Rotterdam - Waterstad

*defining and designing the spatial quality of water in a pre-industrial urban context*

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Graduation plan

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Cover:
De Boompjes by Petrus Schenk (source wikipedia.com)
# Table of Contents

- **Rotterdam - Waterstad**  
  - Introduction  
  - Section I - Product  
    - Context  
    - Problem Statement  
    - Location Context  
    - Research Questions and hypothesis  
    - Project Aim  
  - Section II - Process  
    - Methodology in a scheme  
    - Methodology  
  - Section III - Reflection  
    - Societal and Scientific relevance  
    - Time schedule  
    - Literature
Rotterdam - Waterstad

Defining and designing the spatial quality of water in a pre-industrial urban context

Introduction

This graduation plan describes the path I intend to follow in order to define and design the spatial quality of water in a pre-industrial urban context. The design and definition will be made for the pre-industrial urban context of the Waterstad district in Rotterdam, and will be the outcome of my graduation project. In this graduation plan I will explain the title of the plan step by step. The plan is divided into three sections: (I) Product, (II) Process and (III) Reflection. In the first section (I) I will start giving an introduction on the global context of my graduation project: the context of the relation between city and water. That this context can be problematic will be explained in the chapter Problem Statement. I will try to make this problem statement more specific with the addition of a location in the chapter Location Context. After that I will be able to formulate the research question and also the sub questions needed for answering the general research question. The question about how I should aim to answer the research questions is answered in the chapter Project Aims. The second section (II) includes a scheme and explanation on the methods and theories I intend to use for the accomplishment of the aims. Included in this chapter are the expected results and the literature to be used. The last section (III) of this graduation plan includes the statement of societal and scientific relevance and a planning, showing the time path of the project. The graduation plan finishes with an overview of the literature used for writing the plan. The theoretical frame-
Section I - Product

Context

Central in my graduation project is the spatial quality of water. This quality fascinates me, because it can also be enormously disappointing. I chose for the graduation studio Delta Interventions (DI) to search for the cause of this lack in spatial quality. This quality of water is continuously relevant: it is, was and will be relevant. Virtually every city in this world is located near a source of water. This, of course, was vital to a city because it provided access to drinking water. Depending on the size and location of the water, it also provided possibilities for fishing and shipping. During the course of history the possibilities of water increased, as did the role of water in cities (Huang e.a. 2011). Nowadays many of the functions water had in the city are specialized to such an extent that they are located far from the urban core they were initially serving (e.g. drinking, fishing and shipping). Due to increase in scale and technological change these functions are retreated from the city (Hoyle e.a. 1988).

However, despite the shift in use, water is inseparable connected to the structure of the city. You might say that the water structures are part of the DNA of the city (Huisman 2008). At first, the city located at a certain location because of its excellent qualities, and the growth of the city followed the logic of the landscape defined by the body of water (Palmboom 1987). However, not only the characteristics of the natural body of water defined the city, also the artificial bodies of water (e.g. ditches, canals and docks) are inseparable connected to the structure of the city. For they are constructed for a reason. Canals are used for shipping and the economic and physical structure of the city is aligned to these canals, and built along them. In the course of time the function of the water changed and shifted. The water became more and more public space. In the twentieth century many canals were filled in, because water can also be a burden: smelly, long stretched barriers. However their structure remained strong in the cities, and despite initial opposition many canals are reopened (Huisman 2008).

The central theme in my graduation project is the relation between water and space. Or, to put it differently, water as space. Apart from the functional necessity of water it has also an enormous appeal to people as a place to relax or recreate. This appeal of water applies both water in the countryside as well as water in an urban context. My interest is in water in an urban context, for reasons I will explain later. The distinguishing feature of water to attract people and act as a place of gathering gives the water a great symbolic value. This symbolic value is most apparent in an urban context. Sometimes the water is even considered sacred and hence the waterfront the scene of religious ceremonies, with an appearance appropriate for those purposes (Samant 2004; Mann 1988). From the renaissance onwards the water of cities was discovered as an open space in the city. Not only became the waterfront a place for commerce but also more and more a place for leisure and relaxation for an increasingly wealthy population. The defense against enemies coming over water was outsourced to strategically located cities, for example Vlissingen in the Netherlands. Cities located at rivers more inland could transform their bulwarks (the word boulevard is derived from the Dutch word bolwerk) into places of leisure (Hooimeijer & Vrijthoff 2008). Waterfronts started to be designed solely for the purpose of leisure: continuous promenades and waterfront parks offering a stroll along the river, sea or lake. An early example is to be found in Paris, the Cours-la-Reine. Later on the Beaux Arts movement and the City Beautiful movement in the United States produced magnificent showpieces (Mann 1988).

The importance of the urban waterfront as a place for
leisure has only increased our time. Not only have other functions left the urban context, also the demand for leisure and tourism from society is greatly increased. More people have more spare time and more spare money to spend. In this society the likely economic activities or functions at the waterfront will be related to leisure, entertainment and tourism (Huang e.a. 2011). The ability of leisure and tourism in revitalizing the economy of a city is stressed by several authors. Cities who have seen their waterfront economy in decline because of the technological change, have seen it blossom again with the transformation of their waterfront into a tourist destination. Although the effect of revitalization is often felt only on a very local scale, or only beneficial for a limited population group, the revitalization does at least change the general image of the city in a positive way (Law 1988; Hilling 1988; Krausse 1995). The improvement of the image, or symbolic value, of the waterfront in order to attract tourists is also suggested as a strategy for complete groups of cities. According to this strategy, redesigning the public space in a way that makes the waterfront more accessible and links the city to the water, could not only generate tourism and benefit the cultural and public life at a local level but also strengthen the position on a continental scale when following this strategy for a group of similar cities (Gospodini 2001).

The growing importance of tourism as an economic resource is strengthened by another trend, namely, the wish for an individual lifestyle. In this trend the high symbolic value of water and the urban waterfront plays an important role in the design and (re)development of the urban waterfront. Waterfront locations are highly visible and unique in their appearance. In other words, the waterfront can be a special place for special people. This trend can be seen in cities all over the world, where the most prestigious offices and apartments are located at the waterfront. Which is also apparent in the considerable rise of real estate prices and land value when getting closer to the waterfront (Davidson 2009; West 1989).

Tourism and leisure represent a significant part of the economy of cities and at same time the symbolic value of water is both cherished and capitalized. This has resulted in an abundance of waterfront redevelopment projects all over the world. In best, most famous cases, the waterfront is made accessible again for a broad public and has lifted up the image and economy of the city. Notable projects are numerous convention centers, promenades, parks and museums which make a good effort in attracting lots of visitors to the waterfront (Breen & Rigby 1996). However, the earlier projects are often limited in their implementation. In more recent times the strategy suggested by Gospodini (2001) is applied by several groups of cities, to make an implementation of waterfront development which exceeds the local level. This way the development is also made more substantial on the long term (Huisman 2008; Hölzer 2008).
On the following pages the pictures show places that are lacking spatial quality.

Problem Statement

We have seen in the previous chapter that the circumstances for making the urban waterfront a lively public space are highly favorable. However, despite all this, there are waterfronts or waterfront districts which are far from lively, waterfronts that are not part of the system of public spaces in the city, even shunned, for they are dreadful places. This statement comes forth from my own observations in the city where I lived for many years, Rotterdam. In the preparatory stage of my graduation project I was focusing on the course of the river Rotte, more specific, the ending and beginning of the Rotte. The Rotte does not have a clear ending; it stops just before it can flow into the river Meuse. The sluice has been removed in order to built the metro. The stretch of the Rotte which ‘flows’ through the inner city of Rotterdam, the Binnenrotte, is a completely neglected space, the water is filthy and the backs of the buildings are turned towards the river. The reason for this waterfront being dreadful is quite obvious: in the first place the planners are to blame for the orientation of the buildings along the river, and secondly the removal of the original sluice maybe wasn’t such a good idea. However, I believe both problems can be solved. For the first problem, courage is needed from both planners and shop owners to give the buildings along the Binnenrotte a second face, towards the Binnenrotte. This is a process which is already in action, for visions and concrete plans are made to improve the orientation towards the water.

To improve the water quality a new sluice might be needed: a technical solution (which is mainly a matter of money). However, the improvement of the water upstream might even sort a greater effect. Already effort is made to extract phosphate from the water upstream, which will greatly increase the water quality. Probably without too much effort even the waterfront of the Binnenrotte can be turned into a success story, it is only a matter of time.
Relation of housing to the water
by author
The maritime museum turns its back to the water
by author
The problem of unattractive waterfronts gets more mysterious when looking at the Spoorweghaven, also in Rotterdam, at the south bank this time. The Spoorweghaven is more or less in the center of the Kop van Zuid district, a world famous example of waterfront redevelopment. The Spoorweghaven however, is just a rectangular basin of water without a single boat, in the middle of a high density living environment. The absence of ships makes this harbor a boring, unattractive place, which is confirmed by the absence of people. The strange thing is that the harbor next to the Spoorweghaven, the Entrepotdok is the location of City Marina Rotterdam. The Entrepotdok is full of boats, and a substantial part of the harbor is surrounded by shops, bars and restaurants. In contrast with the Spoorweghaven, the Entrepotdok is a pleasant place to be and lively in result. The reason of the difference between the two harbors might be the lack of functional diversity at the Spoorweghaven, or the abundance of competing open spaces in the vicinity. To tackle these problems more effort is needed, because the architecture of the buildings does not have the flexibility to host more functional diversity. To narrow street profiles, fill in water basins or built over parks to get less open space is a very rigorous solution. However you could also question the quality of the space at the Spoorweghaven. As already mentioned its form is rectangular, a predictable space which can be observed at a single glance, only to see that it is very large and square. A solution could be to add a place of interest in or along the water or even transform the whole basin into a single place of interest.

The last example and also the example which will be subject for a large part of my research and design is the Leuvehaven in Rotterdam. The Leuvehaven is part of the Waterstad district on the north bank of Rotterdam. The Leuvehaven is a privileged body of water: it is virtually always in open connection with the Meuse, most buildings along the Leuvehaven are oriented towards the water, there is a great functional diversity (living, shops, bars and a college), a high density, close to the city center, the Leuvehaven is full of historical ships, there are several places of interest (multiple museums, hotels and monuments) and the water can be experienced on multiple levels: on top the dike and along the foot of the dike. Against all odds, the Leuvehaven is far from an attractive, lively place. Of course the most notable and dominant building at the Leuvehaven, the Maritime Museum, turns its back towards the water, but on such a large stretch of water, with so many ways of access to the water, that cannot be the only cause of the unattractiveness. It seems that there is something fundamentally wrong with the Leuvehaven. Moreover, the problem is not restricted to the Leuvehaven. The Leuvehaven is part of a system of canals in a district called Waterstad. The Waterstad as a whole has more or less the same favorable circumstances as the Leuvehaven, and also the same lack of liveliness and attractiveness, except for the Oude Haven. Apparently the district is lacking one or more qualities that could transform this waterfront district into a lively public space. Spaces that can be found all over the world and notably close by: in other Dutch cities, or cities upstream the river Rhine and Meuse, in Germany, Belgium or France.

Concluding from the given examples, apparently the spatial quality of water in the city is not just defined by the fact that it is a open space in the city. It must be defined by several other factors, which determine the eventual success of water as an attractive public space.
Location Context

Before I get to the formulation of the research question, I want to specify the problem statement to a certain location. In the title of my graduation this location is already mentioned, namely Rotterdam and more specific the district Waterstad. The reason that I wanted to connect the problem statement to a location is because the location mentioned, Waterstad, was the immediate reason to formulate the problem statement. Moreover, the choice for a certain location gives the problem statement more handles for specific research and provides a certain pool of comparable cities, which is useful in doing case studies. Therefore I will provide a short context of Rotterdam and Waterstad, so that I will be able to formulate the research question.

According to the Dutch city landscape by Rutte (2008) Rotterdam is part of the landscape of Western port cities. A landscape of cities that gave rise between 1270 and 1400 out of medieval settlements located at the river estuaries of the large Dutch rivers. The cities came to flourish because of an increase of agriculture production in the Netherlands, while the competing port cities in Zealand became lost (Rutte 2008). The settlement Rotterdam was founded at a dam at the river Rotte around 1000 AD. There was a considerable distance between this dam and Meuse. The dam of course prevented the polder landscape from flooding. The water from the polder had to be discharged by the Rotte, via the dam, at the Meuse. The city expanded north, along the Rotte, into the polder landscape. The structure of the city is greatly determined by this orderly landscape, which is the reason that Rotterdam is also considered as a polder city.

At first the main economy of the city was herring fishery and related trade. However, when the Dutch cities came to blossom in the Dutch golden age, the economic activities became more diverse. The development of Rotterdam was taken with great energy. Probably because of a competent city council, but also because of its privileged position at the Meuse (no silting up) and the misfortune of Dordrecht. The uncultivated land south of the dam was being transformed into a large harbor district, with wide canals. At one stroke Rotterdam became one of the largest Dutch cities at that time, larger than Delft, Schiedam and Dordrecht. In contrast to the part of the city that was located north of the dam, the Landstad (land city), the new, southern part of the city was called Waterstad (water city), because of its orientation towards the river Meuse.

Waterstad was being developed as a real part of the city, hosting numerous functions, even though the focus of the district was on trade, shipping and ship building. Although at that time there was no matter of functional zoning in the modern sense, the Boompjes quay was designated as the location for shipbuilding, for it was a filthy line of business and the Boompjes quay was far off the city. Despite the restriction, the East India Company (VOC) decided that they want their office at the Boompjes, to have the brilliant view on the Meuse. The restriction was being let go and many followed the example of the VOC. The Boompjes became the most popular public space of the city. The mighty river, the busy ships, numerous hotels, bars and restaurants: it had an enormous appeal on the people of the city and on people far beyond. The Boompjes was famous.

The Boompjes kept its popularity the next ages, even in the industrial era, when ports in other cities became gated compounds. Although in the nineteenth and twentieth century several canals in Rotterdam were being filled in, the structure of Waterstad remained much the same. After the bombing in the second world war, however, the situation did change. After the war the Basisplan by Van Traa was being implemented to rebuild the flattened city. This plan did change the structure of the city radically: the dam at the Hoogstraat was repositioned to the Boompjes, the Rotte was completely cut off from the Meuse, a strict zoning was employed and the logic of the main roads was altered. Also the
main roads were constructed significantly wider than the main roads before the bombing. The lively, multifunctional, water oriented Waterstad was lost.

Rotterdam became known as a boring and unattractive city. The city center was dominated by offices and shops, and with very scarce living. There was a saying that you could fire a canon at the Coolingsel after 6.00 pm, without the chance hitting a single person, because the shops and offices were closed by then. At the 1970s the city council decided that this could not go on. The city had to be more attractive and cozy, and therefore more houses should be built. In order to make the city more attractive the water had to play an important role. According to this strategy plans were made for Waterstad: iconic buildings had to link the different parts of Waterstad to each other and link the city to the water: the tropical swim paradise Tropicana, the maritime museum, the city library, an Imax theatre and hotel and the cube houses. The apartment buildings had to be developed in the private sector. The Boompjes was projected as a boulevard, flanked by high-rise buildings at the city side.

When we look at the results of these plans, there is only place for mixed feelings. Of course the Boompjes boulevard not only provides the city with a very strong urban structure, but also with an identity linked to the river. The bars district at the Oude Haven thriving, and the city library is a center of liveliness. However, too many of the project have failed: Tropicana and the Imax theatre are closed, the maritime museum turns its back towards the water, many of the houses are in the social sector or low class and finally the cube houses are dividing the city into two parts. Apparently either the followed strategy or the design or both, were appropriate for fighting the problems of the district. Above this, in the 1980s the plans were made to link the north and south of the city, to cross the river. By this strategy the attention shifted to the Kop van Zuid district and the Waterstad was surpassed by this great leap to the south (Duursma 2001; Greef 2005; Hooimeijer e.a. 2005; Laar & Jaarsveld 2004; Meyer 1999; Ravesteyn 1974).

The glory of Waterstad, its spatial quality lies in the past, in its pre-industrial origin. What are the characteristics of this origin and how did these characteristics develop in other cities with pre-industrial harbor districts?
Research Questions and hypothesis

How can the spatial quality of water in a pre-industrial urban context be defined?

How can the definition be implemented into an urban design?

Because of the generic meaning of Waterstad (water city) I will use the English translation ‘water city’ as a synonym for pre-industrial harbor districts. In order to answer this questions I need a clear definition of what I am looking for. What elements contribute to the spatial quality of water? In my preliminary research three themes occurred. The first one I already mentioned in the introduction: the way in which the urban water is connected to the structure of the city. However, I am also interested in the way the water in the city is connected to the water in the region. Can the water city considered to be part of a larger, navigable network of water? This theme is called (1) the connected water city. The second theme is about how the water is used for economic and recreational purposes. And also whether people live or dwell along the water. This theme deals with the functional aspects of the water city and is called (2) the living and working water city. The last theme is about the role of the water city as a place for public life in the whole of the city: (3) the water city as an attractive public space. Aspects of aesthetics and appeal as well as accessibility are discussed in this theme.

More or less the same three themes are stated by Hayuth (1988) as the ‘three dimensions of dockland development: the spatial, economic and ecological dimension’. Although the terminology is different, the dimensions are about the same themes. The spatial dimension is similar to the theme of the connected water city, as it handles about the spatial relationships between water and city. In the same way the economic dimension, which is about functional relationships, is similar to the living and working water city, and the
ecological dimension is similar to the water city as an attractive public space, which is about aesthetics and livability.

In this graduation project my hypothesis is that those three themes or dimensions define the spatial quality of water in the city. However the research questions cannot yet be answered. The themes hint at a certain relationship between the urban water and the city (people, buildings, work etc.). The following questions are needed before I can look for an answer:

1. the connected water city
   a. How can the spatial relationship between city and water be defined?
   b. How did this spatial relationship develop during the history of the city?
   c. How can this spatial relationship be improved?

2. the living and working water city
   a. How can the functional quality of urban water be defined?
   b. How did the functional quality between city and water develop during history?
   c. How can this functional quality be improved?

3. the water city as an attractive public space
   a. What is the quality of water as a public space?
   b. How did water as a part of public space develop during history?
**Project Aim**

The aim of my graduation project is threefold: the three aims are to create a (i) theoretical imaging, to develop a (ii) methodological framework and to make a (iii) design.

It starts with a (i) theoretical imaging of the characteristics of the problem. This graduation plan can be considered as a first result of this theoretical imaging, notably the statement of societal and scientific relevance to be found in this plan. However, during the process of making this plan, new insights have popped up and further research in the form of a literature study will be needed. The theoretical imaging so far has been one of orientation, without being too detailed on the specifics of the different methods or theories. A more detailed, in-depth study will be needed to strengthen the product of the second and third aim of the graduation project. The result of this aim will be experienced as a strong structure supporting the second and third aim, to be found in my final graduation report. Adjoining it will be a second review paper: on the use of space syntax as tool to visualize the relation between water and city. I will elaborate on this in the chapter Methodology.

The second aim is the development of a (ii) methodological framework. The methodological framework is built upon the (i) theoretical framework, and will in turn support the (iii) design. The methodological framework is something I intend to develop as something with generic, scientific value. The methodological framework must be valuable as a general principle for the development and design of urban water. It will exceed the level of the toolbox, for I believe a toolbox would be too much specified to a certain context, and therefore not suitable for a broad adoption. This would be in contrast with the aim of developing an approach, which tries to understand and design the city by learning from its underlying landscape and cityscape, its context. This method can have a broad application. The methodological framework relies on and will be an addition to the contextual oriented methods being propagated at the Urbanism department of the faculty of Architecture in Delft and by Palmboom (1987) amongst others.

The theory and methods will be directly and repetitively tested by implementing the outcomes in a (iii) design specifically for Waterstad in Rotterdam. The design in turn will generate input for the theory and methods. This process already started in making large scale designs and sketches for Waterstad. In doing so, the theory and methods will be strengthened, exceeding the abstract level.

The specific aim for Waterstad will be to make a reconstruction of the urban structure, based on the historical development of Waterstad. The design must demonstrate in a convincing that, following this strategy, Waterstad will be part of the system of public spaces in Rotterdam. Therefore the design aims also at finding ways to articulate and visualize the relation between city and water in an attractive way, by using different drawing techniques. The result will be a final design to be presented at my final graduation presentation.

The disciplines to be consulted will be found in the field of delta urbanism, urban design and spatial analysis. Therefore my mentors will be:

- first mentor: dr. Fransje Hooimeijer (chair of environmental design), as an expert on (Dutch) water cities;
- second mentor: prof. ir. Henco Bekkering (chair of urban design), as an expert on urban (re) design;
- and as consulting expert on spatial analysis by space syntax, dr. Akkelies van Nes (chair of spatial planning and strategy).

Akkelies van Nes is not yet confirmed as a third mentor, I still have to find out if this is possible.
Section II - Process

Methodology in a scheme
Methodology

In this chapter I will explain the followed methodology and expected product and result per theme, based on the scheme. In some cases there is already preliminary research done, which will be included.

1. The connected water city;
   a. how can the spatial relationship between city and water be defined?
      • method: literature study on the use of space syntax for the definition of the spatial relationship between water and city;
        o expected literature: Hillier (2007) and Hanson (1989) to start with;
      • expected result: review paper II;
        o generates input for the space syntax analysis;
   b. how did this spatial relationship develop during the history of the city?
      • method: preliminary (umbrella) literature study on the development of Rotterdam, Amsterdam and Hamburg. I have chosen Amsterdam and Hamburg as subjects for the case study because of great similarities in the founding and development of the cities, but with profound differences in the spatial quality of the water in the city;
        o expected literature: much like the literature already used for the realization of
this graduation plan, to be completed with literature on Amsterdam and Hamburg;

- generates input for case study;

- method: case study on the spatial development of Rotterdam, Amsterdam and Hamburg;
  - generates input for space syntax analysis;

- method: space syntax analysis of the development of Rotterdam, Amsterdam and Hamburg;

- expected result: visual representation of the development of the spatial relationship between water and city in the three mentioned cities;

b. how can this spatial relationship be improved?

- method: designing master plans for the Waterstad district;
  - generates input for testing;
  - generates input for sequential drawing;
  - generates input for final design;

- method: testing the results of the plans in space syntax (recurring process);

- expected result: design for Waterstad, Rotterdam;

- Hamburg 1550
  by author

- Hamburg 1830
  by author

- Hamburg 1650
  by author

- Hamburg 1900
  by author
2. the living and working water city;
   a. how can the functional quality of urban water be defined?
      • method: literature study on the relation between economic activities and public space at the water city;
      • result: review paper I;
         o generates input for the both the second as the third theme;
   b. how did the functional quality between city and water develop during history?
      • method: preliminary literature study (see: 1b);
         o generates input for cases study;
      • method: case study on the development of functional quality of water in Rotterdam, Amsterdam and Hamburg;
      • method: mapping and assessment of the functional quality of water;
      • expected result: three-dimensional, visual representation of the development of the functional quality of water of the three cities;
   c. how can this functional quality be improved?
      • method: detailed mapping of functional quality in Waterstad, for the themes living and working;
• method: observation and photography of functional quality
  o generates input for sequential drawing;
• method: sequential drawing of this quality (much like Cullen (1971));
  o generates input for designing of the plans (recurring process);
  o generates input for the final design;
• expected result: design for Waterstad, Rotterdam;

3. the water city as an attractive public space;
   a. what is the quality of water as a public space?
      • method: literature study (see: 2b);
      • result: review paper I (see: 2b);
   b. how did water as a part of public space develop during history?
      • method: preliminary literature study (see 1b);
      • method: case study about the development of the public quality of water in Rotterdam, Amsterdam and Hamburg;
      • method: literature study on the characteristics of public space and urban form;

On the following pages the first results of the space syntax analysis of Rotterdam is shown. These graphs do not yet show the relation of the city to the water. Some experimenting is needed for showing this relation. However the change of the organisation of the city is clearly visible.
o expected literature: for example Alexander (1977) and Jacobs (1962);

o generates input for the morphological analysis;

- expected result: a three-dimensional, visual representation of the development of the public quality of water in the three cities;

c. How can this public quality be improved?

- method: mapping public quality of water, for the themes accessibility and visibility, as well as aesthetics and appeal;

- method: observation and photography of public quality;
  
  o generates input for sequential drawing;

- method: sequential drawing (see 2c);

- expected result: design for Waterstad, Rotterdam.

During this process there will be a constant input of designs and concept, in turn the process generates input for further design.
On the following pages some results of the preliminary designing is shown, including section and plans.

Blaak sections
by author

Boompjes sections
by author

Waterstad concept drawing
by author

Waterstad concept drawing
by author
Section III - Reflection

Societal and Scientific relevance

A significant part of the social relevance of my graduation project is already stated in the previous chapters. Two conclusions stated were: firstly, the increasing importance of the socially beneficial economic functions of water, namely leisure and tourism, and secondly the symbolic value of water and the waterfront. I already gave some attention to the first conclusion, so I will elaborate on the latter. This symbolic value of water is something that is not directly tangible. However, this value reveals itself in a certain, limited way in the rise of land value and real estate prices close to the waterfront. Already before redevelopment, the land value is higher than districts without water, but as soon as the redevelopment starts to take place the land value at the waterfront rises to a level comparable to the Central Business District (CBD) and considerably higher than in districts without water in the vicinity. Moreover the redevelopment results also in a rise of land value in the surrounding districts (West 1989). In addition, the symbolic value of the waterfront is also seen as an asset in the global competition between cities. A well designed, distinguishable waterfront would not only increase the quality of life in the city, as a place for living, working and leisure, but also would it greatly increase the image of the city (Gospodini 2001). However the ability of the waterfront to generate money has also been a pitfall. In numerous cases of waterfront development the wish to capitalize the waterfront has resulted in bad designs. In these designs, the most important feature of urban water, free access to open space, is neglected, in favor of the highest bidder. In too much cases mono-functionality and more or less gated compounds dominate the waterfront (Davidson 2009), or the waterfront is merely transformed into a parking lot for yachts (Fisher e.a. 2004). My graduation project intends to acknowledge the social significance of the waterfront as a public space by developing a method by which the waterfront is part of the system of public spaces of the city.

The scientific relevance of my graduation project is to be found in the method to be developed for designing waterfront districts. This method will focus on the spatial and public quality of water as part of the city. There is no unambiguous way of defining the spatial quality of water, therefore the eventual definition will be the design for Waterstad. However, the way of finding and showing this definition will certainly have general scientific value. Particularly the use of space syntax will have an experimental character, as the method of space syntax is, as far as I know, not yet applied in showing the spatial relation between city and water.

The stated problem is not specific to Rotterdam or Waterstad. In several European cities effort is made to reconstruct the water in historic city centers, in order to repair the relation between city and water (Huisman 2008). Neither is the problem specific to pre-industrial harbors. As already mentioned, also the Spoorweghaven in Rotterdam is hardly part of the system of public spaces, as it lacks spatial quality. The Spoorweghaven is an industrial dock, differing in multiple ways from the canals in Waterstad. The most important difference is that these industrial docks were not built with a multifunctional purpose, hosting living, working as well as leisure: except for some old industrial docks in London, none of them have ever been a public space (Meyer 1999). The form of the harbor does not reflect the landscape but merely the direction of the railway (the translation of Spoorweghaven is railway harbor) (Palmboom 1987). So, the spatial relation between city and water in an industrial context might be even more complicated than in the pre-industrial context. Therefore an important field of study can be explored, as industrial docks all over the world industrial docks became derelict, and modern docks will soon follow.
Time schedule

Phase 1
Theoretical imaging
- the connected water city
- the living and working water city
- the water city as public space

Phase 2
Methodological framework
- the connected water city
- the living and working water city
- the water city as public space

Phase 3
Design
- the connected water city
- the living and working water city
- the water city as public space
Literature


Laar, P.T. van de & Jaarsveld, M. van, 2004. *Historische atlas van Rotterdam: de groei van de stad in beeld*, Uitgeverij SUN.


