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NEW BRIDGE KEEPERS
Highlighting opportunities

Experiment site:
the Schie, South Holland, The Netherlands

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Bridge control houses, water system, development strategy, top down, bottom up, participation, succession, network, urban acupuncture

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GRADUATION LABORATORY:
FLOWSCAPES

CHAIR OF LANDSCAPE ARCHITECTURE
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N E W BRIDGE KEEPERS

THE BLUE LIGHT DISTRICT

 # URBAN ACUPUNCTURE # URBAN PROSTHESIS # MAKING PARTICIPATION POSSIBLE # RE-ENACTING SPACE # MINIMAL INTERVENTION

PREFACE

Vacant places and buildings always have seemed to attract me. At these places I felt in a different world: here was more possible. There were no specific rules, and people find their own creative ways to adapt to the place. But there still are so many empty spaces. The potential is amazing. Especially the bridge houses: small buildings with a 360 view over road and water for bridge traffic control.

The laboratory 'Flowscapes' of the master track Landscape Architecture focusses on flows of/in space as its indicator.

The field of Landscape Architecture fascinates me for its continuous and integral dialogue between regional and local scale. The project concerns a minimal spatial design that re-invents the water system in South-Holland by connecting waterways with roads through social use.

The water system of Holland functions not only as a very important structure to keep our feet dry, as well as a vital transport organ and recreational layer. Because of the

developments in the past century, the water system is mainly taken over by train and car infrastructures. As a result, vacancy and water systems correlate (such as: bridge control houses).

The intertwinement of the Dutch water system with the geo-morphological, natural, social-economical and historical context of the Netherlands make the intersection of the water and ways (bridge) an interesting occasion to (re)root the urban layer (the Randstad) with its underlying context.

But creating a project of this scale is impossible. Where to start the connection? In the next chapters, a design solution and all its justifications will be presented, and will clearify and reintegrate the growth of this lost connection.

In advance: thanks to my mentors Frits and Leo for their solid and sharp support. Thank you, both of you were truly what the word 'mentor' means to me. Something I can see more clearly afterwards.

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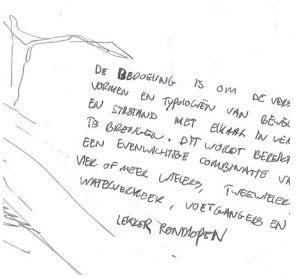
The first problem that is highlighted, is that we live in a fast growing society, where the urban sprawl takes over the underlying structures that once gave form to our cities. Unrelated new buildings are put everywhere, and old buildings seem to lose their meanings.

In this homogeneous field, we tend to loose our connection with the underlying layers of our history and importance of water management in our water kingdom. An interesting water structure, the boezem system of Holland, is analysed and put in it's historical context, where we can see that this water system played a vital role Hollands economic and cultural growth. It can easily be stated as the grand design of Holland.

Due to development in the fields of transportation during the last three centuries, a lot of companies and factories changed their face from transportation by water into fast connections with highways and railway systems. These systems cross the water ways without pardon and even the secondary roads orientate themselves primarily on how they



THEORY & METHOD

flow to the fast systems most easily.

Then, a correlation between vacant buildings and this water system can be found. At first, a lot of buildings related to the management of this system lose their old purpose and become vacant places. Then, the factories that were using this system, leave these buildings empty. At least, the interstitial places of different infrastructures such as waterway and road are an typological element of the bridge.

It seems that these vacant places are screaming for attention, while individuals are full of initiatives and dreams. Those who see, still can't, and those who can't see, don't even know they can.
Mainly the vacant bridge control houses play an interesting role in this problem, since they are the main connector of this urban world by its bridges, the vacancy and the use and history water line.

In the literature we can find a theory called the 'Two Networks Strategy', that explains us how water structures can work as carrying backbones of the urban environment. The method tells us about what principles we can use and what the potentials are for a symbiosis between these two in the large scale. In 'Places of Flow' the meaning of the traffic intersection as an transitional place between fast and slow flows is researched. Here fore a method is found that helps us understand how we need to connect fields by giving opportunities for flows and actors to exchange. Triangulation and the concept of field, frame and flow make us understand how these processes that take place on he small scale, can be created.

In 'Massive Small', an urban theory is found that helps us to combine the stakes of big and small scale, by providing us with three simple facets: simple rules, providing conditions and open leadership.

Finally, a more practical way is found of how we need to embed these ideas into reality, and what is needed to provide this elements.

We search for a way to make people connect and interact with their environments in Inviting Participation. In what way do we include people to a different theme of public space and what actions are necessarily to create a white canvas that also inspires others?

The outcome of this research brings us to a schedule of requirements for design, which plays as a base in the conceptualisation and spatial design of the project.
Provided with a framework, the step towards the concept and its design can be made.

PROSTHESIS & SUCCESSION

Because the core of the concept is about creating a development that starts to grow from one person towards a regional impact, the idea is put into four strategical phases that also refer to their spatial, social and time scales: small, medium, large and big.
The goal of the design is to provide the right elements that give us the potential to use and create a dialogue with a space. The key element of the designs are how the transitions between the four steps are creating a good opportunity for those in public space to get hooked into the thematic of looking towards the space in a different way: a creative way. The following steps are providing insights into the design by the elaboration of the concept.

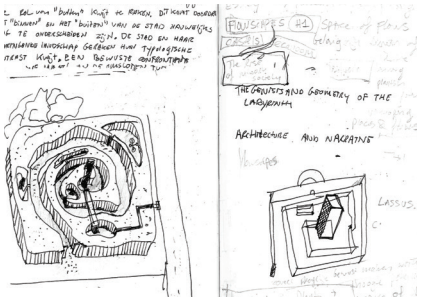
Small provides us with the explanation of how the pioneer of initiative is tempted to use the bridge control house in the first place, by the use of a special designed door that is the only formality in the specificness of the bridge control houses

CONCEPT & DESIGN

typologies. This door is open and unique, and makes the trespasser understand something is different. Rules are: free for use by a reservation and you take your own initiative. This place is also able to be found in the digital world via an online application. It can be seen as the analogy of the point.

Medium creates the conditions for others to walk by and start to connect with the specific user and his theme of intervention. It focusses on the first steps of creating a small community. Triangulation makes us understand how human beings connect to each other by seeing something peculiar, and how this concept works as an attractor for creating the first groups. This is provided with the use of the interstitial space around the bridge, an online application to digitalise the community what will work as a way to overbridge boundaries. A small square with the same visual language as the doors, created by the same material and vegetation, is put there. It will connect to the water system as well as to the roads, using a small stages with a functional basement. The part on the waterside can be used for supplies by boat, since cars are not necessarily invited to this place. The place will be marked with the same little fruit trees as that is found in small. This composition will provide for small events and the possibility to reclaim nearby interstitial spaces. It can be seen as the analogy of a point with a radius.

Large is when medium is going viral. Medium will provide for a small group of people for mostly temporary events, even though they



Sketch 1: *First doodles and attempts of defining the problem. A small study of the labyrinth: an analogy for the urban sprawl.*

will be made semi-public by the growing community, but after some years it might be happening that other places nearby, search for attention too. It is the same step from small to medium, but then for a group. By the design of a small place where one can sit nearby the water, and where the rules are licensed free for selling (for start-ups), we will find interesting buildings that are looking for a new purpose and life. These places will always be in connection with the little bride house, which is the connection to this type of universe.

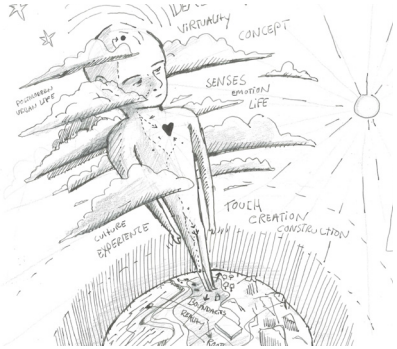
Luckily the bridge house is made to have a 360 degrees view around itself over the water so this visual element is already strong apparent. From the bridge, the special buildings and its free spots will be framed in from its particular view, what invites us to understand that the same thematic is applied on these places. Also, the use of the water system is even more encouraged by the places next to the water.

Big is where large has taken place on different places, and therefore urge for an inter-local connection.
On this point, the concept reach the regional scale and applies itself on bike routes, water ferries, green structures and better and bigger creation of the canal.

In ‘Reflecting Frameworks’ which is combined with the concept and design chapter, I search for the outcome of the supports I used. The literature together gave me a solid ground to stand on. Most of the times, my research went intuitively, where-after I grabbed some structure out of the cloud of examples and literature. That, to make the idea able to stand on its own, without me.

CHAPTER I

PROBLEM& ANALYSIS



Sketch 2: *Visualization of the balance of mind , heart and body - concept, design and realisation.*

INTRODUCTION

We live in a fast growing society, where the urban sprawl takes over the underlying structures that once gave form to our cities. Unrelated new buildings are put everywhere, and old buildings seem to lose their meanings.

In this homogeneous field, we tend to loose our connection with the underlying layers of our history and importance of water management in our water kingdom. An interesting water structure, the boezem system of Holland, is analysed and put in it's historical context, where we can see that this water system played a vital role Hollands economic and cultural growth. It can easily be stated as the grand design of Holland.

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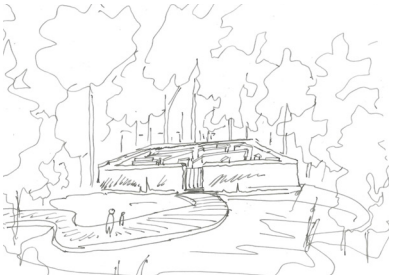


Sketch 3: *The labyrinth in nature: chaos by order (design) within order by chaos (nature).*

I.I HOW TO LOOK AT A LANDSCAPE?

LANDSCAPE ARCHITECTURE BINOCULARS

Merely as an introduction to this thesis, the first question that can be raised in general is: how can we comprehend and intervene in the landscape as a designer?
Further than creating places that are 'just pleasurable', it is interesting how deeper significance can be provided, such as the illumination of regional orientation, understanding scales and meeting the 'genius loci'. Landscape Architecture explores and designs in all scales: from chair to region. The less obvious elements bring another dimension to the sense of place which makes it, consciously or not, even more pleasurable and educational. The way the landscape architect looks at the world, influences his design- and a better understanding can bring to more conscious decisions.

Sketch 4: *Future landscapes. Landscape Binoculars.*

FOUR PRINCIPLES OF UNDERSTANDING THE LANDSCAPE

In Marot, S., (1999) "The Reclaiming of Sites"[1] a constellation of the four most significant ways to look at the landscape are explained, though inseparably interrelated: the palimpsest, landscape as scale-continuum, as a process and as an three-dimensional sequence. This four pillars will stand for the structure that will provide us a broader understanding of the landscape, when put in line with concepts of different authors.

(i) For the way of looking at underlying layers that are brought in the landscape by its time of existence, landscape architects use the term 'palimpsest'. It refers to the re-use of manuscripts that were used before the invention of printing. The medieval writing block was invented in 190 B.C., by King Eumenes of Pergamon. The parchment is strong enough to be preserved for a long time, but the material was too expensive to be mass-produced. That is why people repeated

A PALIMPSEST

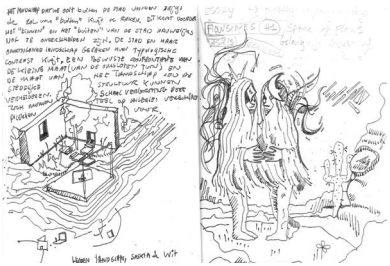
writing and erasing on the parchments: to recycle them. The word 'palimpsest' means the parchment that has been recycled numerous times. The palimpsest indicates a condition where the layers of complex meaning are involved, where old layers can be rediscovered and give new meaning and interpretation. Based on the cognitive process of transferring meaning of the palimpsest's nature with the memory of a place, can give the conclusion that the place is not a fixed physical entity, but an organic one, that evolves and transforms continuously (Koo, 2009)[2].

Due to Olwig K.R (1996)[3], the combination of both their physical origins and the cultural overlay of human presence, that are created over millennia, made landscapes reflect

1 Marot, S., (1999) "The Reclaiming of Sites" in Ed. Corner, J., (1999) Recovering Landscapes. New York: Princeton Architectural Press.

2 Koo, Y. M. (2009), An analogy of palimpsest as a strategy transforming urban structure intro architectural discourse - focused on Dominique Perrault's architecture of strata. School of Architecture, Inha University [published online]

3 Olwig K.R., (1996) Recovering the Substantive Nature of Landscape, Washington: Annals of the Association of American Geographers



Sketch 5: *Ideas for rooting the urban sprawl trough the palimpsest.*

A SCALE CONTINUUM

the living synthesis of people and place. Olwig notes that the character and quality of landscapes, help to define the self image of a region, the sense of place that differs from other places

Instead of having a 'tabula erasa', how A4 prints and the next screen on the iPad can be seen, the manuscripts contained writings that had to be erased before new sentences could be written. The old writings were never fully erased, so the ideas and techniques from the past were showing their glimpse of existence. This is an analogy for how we can look at the historical layers of our environment. With the coming of modern technologies, the human influence on the landscape is thus greater, that it is easier to totally overlay and dominate the other layers. The effect of global cities, giving the generic idea of looking at the landscape as an A4 print in a merely virtual way, that can be thrown away and printed again, is an important notion of why this underlying layers can become ungraspable. And therefore, can be illuminated by the design of the landscape architect.

AN ETERNAL PROCESS

Referring to the sense of place, there is a strong relationship between the palimpsest and the well known term genius loci. The genius loci can be seen as a way of looking at the character of the site- and due to Nikolaus Pevsner (1956)[4], not only focussed on the geographical character, but also historical, social and its aesthetic character in special.

The Romans, where the term genius loci[5], origins from, used to read places like faces, giving it a life and showing its essence, and called this the genius loci. Every place had it own protective spirit of the place, and is a description of a place and its distinctive qualities, its material, spatial and historical aspects. Rather than this guardian spirit, the genius loci can be seen as an archetypal

4 Pevsner, N., (1956) Picturesque England. In: The Englishness of English Art. London: Peregrine Books.

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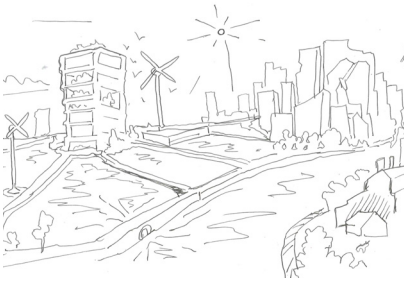


Sketch 6: *'Inverse polders' Water as land in the future.*

A THREE-DIMENSIONAL CONSTRUCT

constellation that yet has to be translated into form (de Wit, 2011)[6].

It is not a pledge for maintaining all old structures in the world, so we end up in a world-sized museum of the world, but rather an exploration of meaning and purpose in real space, which is the only thing that is hard to find in generic virtuality. Between total erasure and conservation there is the grey field of intervention.

(ii) By understanding that the concept of palimpsest must be noted in a subtle way on the regional scale considering design for the individual, it is necessary to be able to look at this landscape as a brotherhood of all scales: the landscape as a scale-continuum.
This refers to the fact that landscape architects always study the site as a part of something smaller and bigger: interventions have impact on different scales, and have influence on different entities in that dimension. A particular site is always part of the larger context (de Jong, 2006)[7]. B. Lasses (1998) also says here that everything that exists in the landscape can be seen as a spectrum: adding something does not only change one colour, but redefines the whole spectrum.

(iii) Small interventions and big processes are always connected: the context defines the object, and vice-versa. From the approach of the palimpsest, the landscape is a build up of past happenings, it is likely to think that these kind of operations also place their marks in the future as well: the landscape will always change and is an always undergoing process. Landscape is seen as never finished: projects are approached in having an open-ended strategy and thoughts about the future: landscape is always dynamic and interactive (Marot, 1983)[8]. The landscape, with the approach the open-ended strategy can be

6 Wit, S.I. de, (2011) Articulating the site. Nordic Journal of Architecture 1(1), 18-23

7 Jong, T. de, (2006) Context Analysis. Delft: Delft University of Technology

8 Marot, S., (1999) "The Reclaiming of Sites" in Ed. Corner, J., (1999) Recovering Landscapes. New York: Princeton Architectural Press.

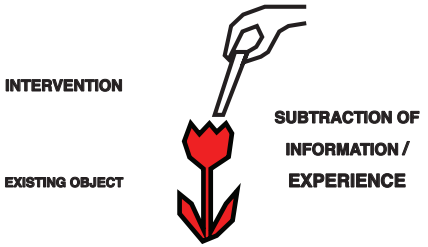


***Figure 1**. The minimal intervention. B.Lassus theory of the implementation of creating a new information experience without changing the object. Also after the intervention, the perception of the tulip is altered. Image by author.*

THE MINIMAL INTERVENTION

seen an ongoing process that doesn't have a master plan, but reacts on certain guidelines that tend to give direction to this process.

(iiii) In order to illuminate certain parts of history, one must communicate this by making the landscape tactile and design with the knowledge of this landscape as an three-dimensional construct in which we move. B. Lassus[9] explains this role as 'a reading that crystallises the fractions of appearances.' Shortly before that he notes the difference between the visual and tactile scale: with appearances he seems to mean the complete experience of an entity in space.

Sébastien Marot choose to call it 'the unfolding of the pathway that is followed on the human scale'. The experience of a landscape is sensory, shows itself by movement, what is determined by objects and light intensity. The landscape unfolds in a sequence, when our bodies pass the space. It is a rich and complex vision, which involves a project with all the layers that compose this landscape. This principle tells the visual story and the way this effects the humans who experience it. It has a strong connection with architecture, since the human scale is the dominant factor.

In this part, all other views come together: how does the gained knowledge fold together by the architect, and unfold for the eye of the user? How is it possible to represent all different looking glasses in one design? In my opinion this view on the landscape is more then the sequence of images, but also the tangible reality check of these images. In their own turn, these images project the ideas of palimpsest, processes and being part of something bigger: but it is the human touch with the environment that plays the important bridge between mind and world.

After consideration of this constellation that helps us look at the landscape, it helps the designer to gain more consciousness of the complexity of space: and thereby also the effects of the proposed intervention on its context.

9 Lassus, B., (1998). The landscape approach. University of Pennsylvania Press. ISO 690

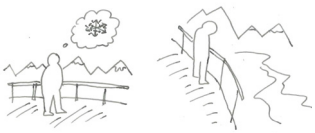


***Figure 2**. The visual scale is all that we can imagine how it would be, how it would feel. But we are not able to move there physically and check it. Image by author.*

But linking, or creating a relationship with something, always has consequences. So does different knowledge change the experience of space. This can happen by every kind of information: words, sounds, colours, touch. Even the re-naming of a place changes the notion of space. Lassus gives some examples for the change in this experience by the notion of a place. A nature reserve becomes more noisy when it is under the name of a nature reserve, a landscape becomes more unique when the plans for a highway take form: the choice of a landscape as natural is already an human intervention.

'The landscape entity' is the concept of how a place can be perceived different by the notion of it as an complete being on its one. It can be compared to the term genius loci, which means 'ghost of the place' and also creates a whole new world and identity around the spoken subject. So: the recognition of the landscape as an entity is not only a visual problem, but also a symbolic one. The meaning of a place is more than visual, and can be extracted about ideas that inform us about the culture and believes of society. Referring to hyper-realism, this is the 'fiction' or symbol that is seamlessly mixed with the visual world (Jiffin, 2005).

TACTILE SCALE

Another concept that illuminates the impact of intervention, is the 'minimal intervention'. For this concept Lassus experimented on a red tulip (see figure 1). He added a white narrow strip of paper, that he putted gently inside of the tulip's goblet, without touching. The effect, is that the colour of the flower reflects on the white strip of paper in the form of a gradient. Another element is subtracted from the flower: we get a glimpse of another dimension that makes the tulip what it is. The information of only the gradient on the strip informs us about the colour, but also about the amount of colour that is reflected, the deeper the strip is in the goblet. Even after removing the strip, the notion of the tulip and the paper is different: both are experienced more and embedded stronger in our minds by a broader connection of ideas.

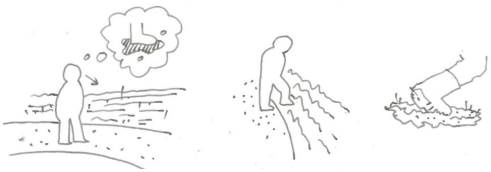
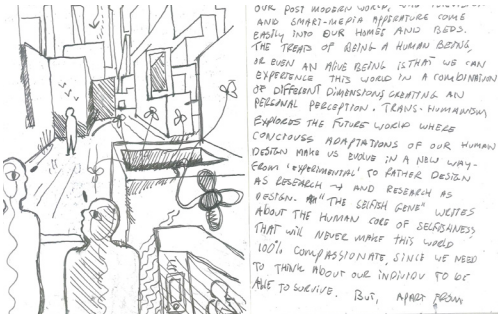


Figure 3. *The tactile scale is that what we can check, how it would feel, how it is going to feel. Image by author.*

There can be found a lot of similarities between Marot and the description of landscape architecture by Lassus, though Marot's version is more structured, while Lassus enters a more philosophical approach of these subjects. The four principles of landscape architecture, as explained by Marot, are less distinctively described in the literature of Lassus, but they both try to form a better sense of analysing the landscape. More than Marot does, Lassus includes the effects of this way of looking on the perception. What is most interesting when we try to understand the role of the landscape architect and in what way the landscaper gives his analytic skills to society. That what the considered landscape architect tries to give, is an anticipated design solution on a problem that is seen from a holistic view. But the real thing he really gives to the public space comes most close to the user: it is only trough this looking glass that the other aspects: the palimpsest, understanding of processes and landscape continuum can be reached. It is the bridge from tactile to visual. So at the actual realisation of a project, the only way to give the knowledge and consideration of the solution and different point of views is by the design - it is the design that reaches the tactile scale. Under the direction of 'providing understanding' by the architect to the user of space, (apart from the ones that could attend the architect's final presentation) must happen by the design. Vice versa, the understanding role of the landscape architect of what to design, must come from the understanding of the landscape, the same that he would or would not try to communicate with his design.

Concluded from this we can find the importance of the reality of a design, and how the everlasting dance of knowledge and experience is underlined by the landscape architect designing tactile projects with an abstract understanding of regional events.

In the modern world, the great amount of media is giving us a multitude of visual experiences, we as landscapers are the ones that should encounter different things around us to understand this connection between



Sketch 7: *The urban visual world and the need of tactile experiences.*

VISION AND TOUCH

tactility and the visual world. According to this way of thinking, we can both find the relevance of the landscape architect, as well as its role for shifting society. In an environment that is dominated by visual and speed, the landscape designer can provide an anchor to give balance to the urban landscape, as well as a sandbox for personal experiences.

To give an idea of the properties of this dualism, Bernard Lassus makes a clear distinction between the tactile and the visual scale. Logically, everything that we can touch, is merely visible, but here we can also find the distinction between the two: the landscapes that appear in a distance or that we are never able to touch, like mountains or skyscrapers, belong to the visual scale (figure 2). Indeed, a certain image gives us an idea of the touch, and these ideas are based on tactile memories. But when it is actually possible to check if this idea and reality correspond on the moment, the experience belongs to the tactile scale (figure 3).

CONCLUSION

The landscape can be perceived in various ways, which should all be brought together as different senses. The understanding of the big scale can provide the environment an integrated design. The landscape architect is, in my opinion, ought to work in the connection of all scales, from doorknob to water system, ecological effect to social-economic time lines. That what is given is a connection with other places, other scales without losing the essence of the specific place. With the discipline in he spatial environment, the tactile and visual scale are important mediums in the communication of the design.

I.II
RANDSTAD POLDER METROPOLIS

What are contemporary developments in the Dutch landscape and what problems do they bring?

The population of Holland has multiplied in the twentieth century. Until the 70s the cities were still individual elements of the landscape. The outside area was within walking distance for city dwellers, which is also in the city daily country life encountered at markets and stores. The urbanization of Holland transported green spaces far away and made them less accessible. Prosperity and leisure increased and with this, recreation and tourism. What are the consequences and where lays a focus point for these cities?

***Figure 4**. Growth of the urban tissue from 1980 to 2010. Exaggerated image predicts a 100% domination of the urban tissue. Image by author.*

THE URBAN LANDSCAPE

The urban landscape of the Netherlands is growing vastly. The underlying landscape is threatened to lose its meaning by the impact of the anthropocene.[10] The Randstad, an urban agglomeration of several cities in the Netherlands, is showing signs of a global metropolitan area. The power and the facilities of this area express themselves at great economical, technological, cultural, logistic, politic and scientific ground and thus can be stated this area is of great global meaning (Meassens, 2010)[11]. Figure 4 illustrates the domination of the urban layer. But with the development of the urban area, the underlying natural and cultural landscapes are blending. Since the environment and its users are influencing each other, this change has a direct impact on human behaviour. The effect of this blend creates a homogeneous field where urban and natural aspects are entangled fragmented elements where the sense of place, and genius loci gets lost. The landscape, that used to be the exterior of the city, is now losing its role as such, because it becomes harder and harder to distinguish them. The contrast of city and landscape and the understanding of its meaning is fading (Aben & de Wit, 1998)[12]. Modern technologies made us able to benefit from many communicative and transportation infrastructures, that go faster and faster: the name network society[13] is in it's place.

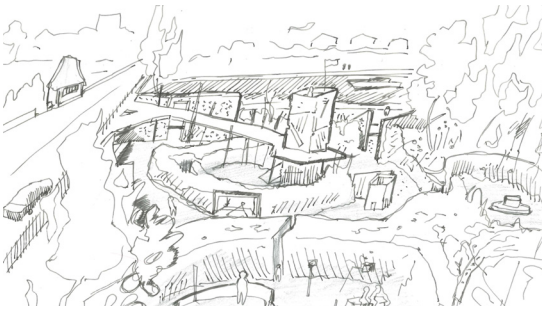
A very essential development that goes hand in hand with urbanisation, is the strong growth and meaning of infrastructures. Modern technologies made us able to benefit

10 The anthropocene is a proposed geologic chronological term for an epoch that begins when human activities have had a significant global impact on the Earth's ecosystems. Source: https://en.wikipedia.org/?title=Anthropocene , summoned on 24/6/2015

11 Meassen, P., (2013). De Poldermetropool. Rotterdam, nai010 Uitgevers. ISBN: 978-94-6208-047-8

12 Aben, R. & Wit, S.I. de, (1999). The Enclosed Garden: History and Development of the Hortus Conclusus and its Re-Introduction into the Present-Day Urban Landscape. Rotterdam, nai010 Uitgevers

13 '... definition, if you wish, in concrete terms of a network society is a society where the key social structures and activities are organised around electronically processed information networks. So it's not just about networks or social networks, because social networks have been very old forms of social organisation. It's about social networks which process and manage information and are using micro- electronic based technologies.'' Conversation with Manuel Castells, http://iis.berkeley.edu/. Summoned 19/06/2015



Sketch 8: *The modern infrastructure world as a complex labyrinth.*

THE MAGNETIC CITY

from many communicative and transportation infrastructures, that go faster and faster: the name network society is in it's place. With traffic and energy infrastructures, places could be explored, assimilated and controlled. Natural landscapes have been transformed into urban, logistic, industrial and waste landscapes (Nijhuis & Jausling, 2015)[14]. Societal changes have a great influence on the use of space (Böhme, 2008)[15]. The upscaling of the living environment caused a higher complexity of the landscape that is harder to grasp by the individual. This, while a lot of places we pass during the movement that is made possible, provide us with a great deal of understanding the landscape.

The developments in society, desire a new way of thinking, and a considered design strategy. How can we get to an approach that makes us able to (re)locate ourselves in the urban landscape? The outcome benefits regional systems, as well as the life of individuals. Is it possible that these in-between places can function as a new kind of gateway to the Dutch landscape, by illuminating the water infrastructure by other infrastructures? Can this be a concise way to carry the urban landscape, where both regional area and individual can benefit from? In what way does the spatial designer anticipate on this?

To get closer to these answers it is of a great help to find principles that make an understanding of infrastructures and their surroundings.

In the past, the population of the Randstad grew even faster than in the rest of the Netherlands, but less quickly than today (the unpredictable trend of migrants due the contemporary developments is not included). The Randstad is growing quite rapidly.

In five years (2006-2010) there were approximately 225,000 inhabitants in which around 70 percent by natural growth. Migration played

14 Nijhuis, S., & Jauslin, D., (2015). Urban landscape infrastructures. Designing operative landscape structures for the built environment. Research In Urbanism Series, 3(1), 13-34. doi:10.7480/rius.3.874

15 Böhme, K., (2008). Shifting Sense: Looking Back to the Future in Spatial Planning edited by Edward D. Hulsbergen, Ina T. Klaasen, & Iwan Kriens. Journal of Regional Science, 48: 849–851. doi: 10.1111/j.1467-9787.2008.00591_12.x

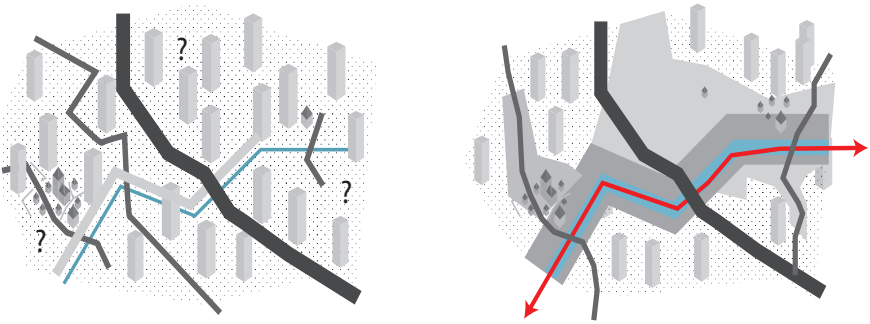


Figure 5. *Could the boezem system be a structure that roots the homogeneous field of the metropolis?*

Figure 6. *Built environment and building era (the warmer, the younger) around an important boezem system of South Holland the Schie, Vliet and Schie-Rijnkanaal.*

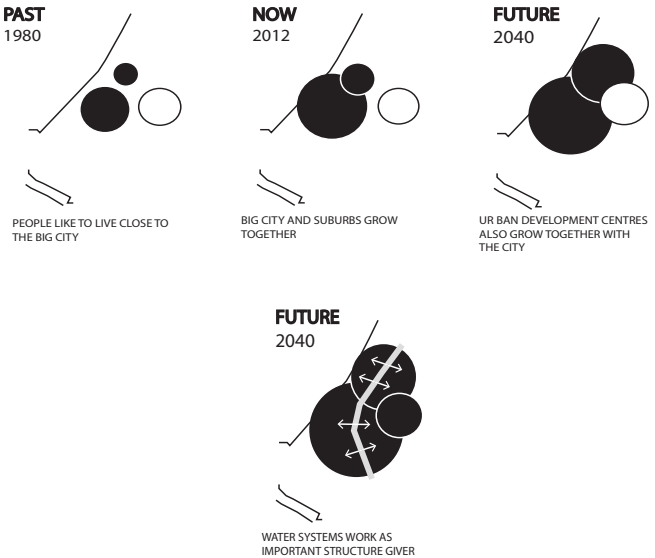


Figure 7. *The developments of the Dutch cities in South-Holland and future idea. Image by author. Based on information from CBS.*

an important role in the growth: around 15 percent of inhabitants there are by foreign migration, and only around 10 percent raise was through internal migration. Especially the south of the Netherlands is an important 'supplier' of new residents for the Randstad. Compared with the past, the proportion of international migration has become smaller, and that of internal migration just a little bigger.

In the future, population growth, although somewhat weakened, will still be concentrated in the Randstad. The increase is then determined primarily by natural growth, as well as by foreign migration; internal migration contributes very little to growth. It is generally known: a large part of the Netherlands is below the sea level. At the present, even the majority of the population lives in the vulnerable west of the country (figure 11).

Expectations are that this concentration of population increases, because of training opportunities and jobs provided in the future. The Randstad attracts immigrants, young people and families, who probably continue to live here. The Randstad urban population (the provinces of North Holland, South Holland, Utrecht and Flevoland) will grow from 7.9 million in 2012 to 8.9 million in 2040[16].

16 http://www.cbs.nl/nl-nl/menu/themas/bevolking/cijfers/ (opened on 3-11-2015)

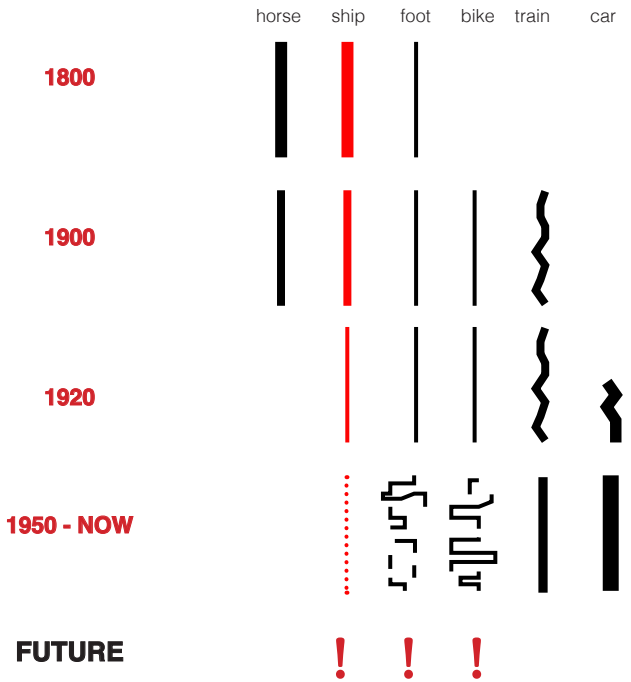


Figure 8. *The development and simultaneous obstruction of infrastructures in the last centuries. Image by author.*

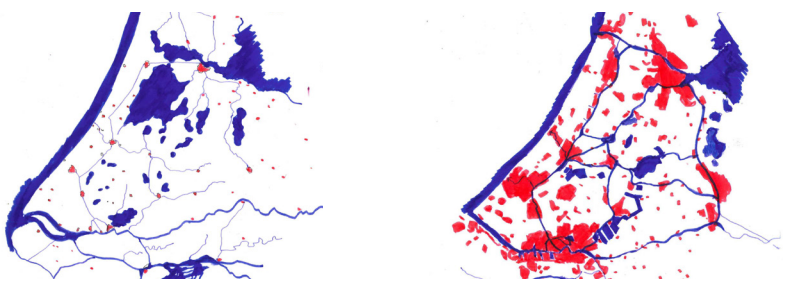


Figure 9. *The urban growth in the Provence of south Holland. 1860 - 1990 Image by author.*

TRAIN INFRASTRUCTURE

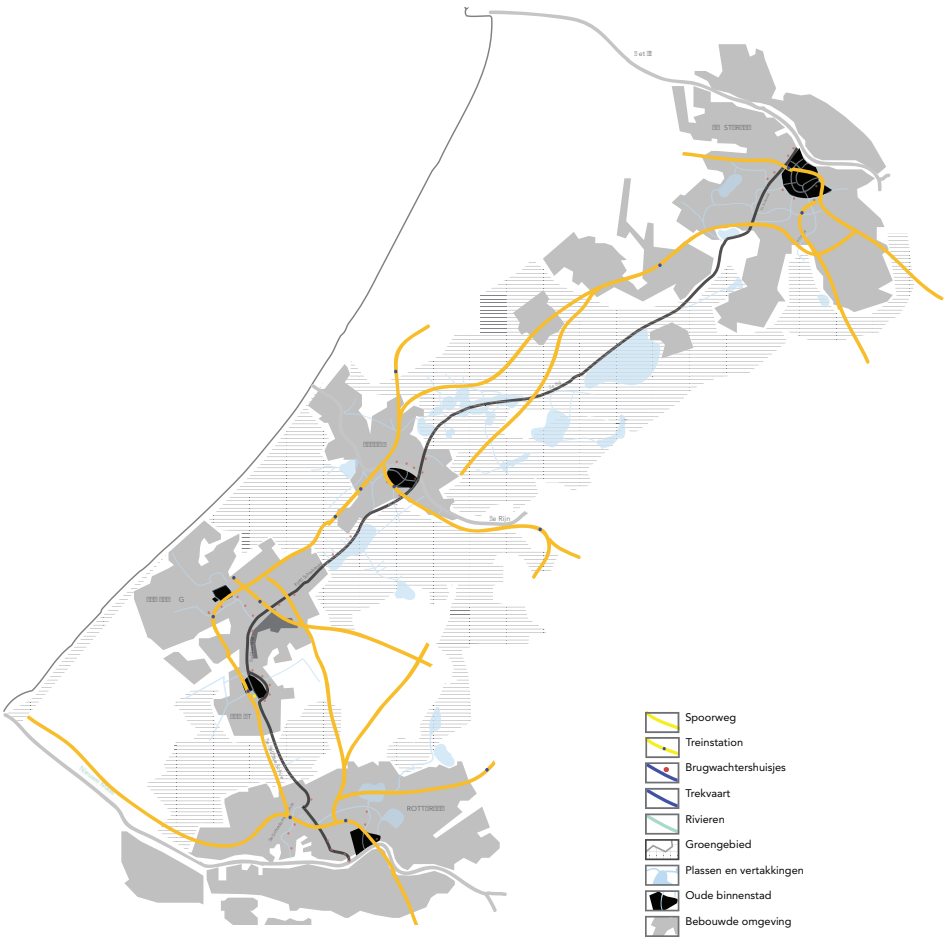


Figure 10a & b. *New infrastructures such as the train and highway took over the necessity of the water system as a main transport infrastructure. Location is the west corridor of the Randstad, showing the17th century cities and their urban sprawl. Image by author.*

HIGHWAY INFRASTRUCTURE

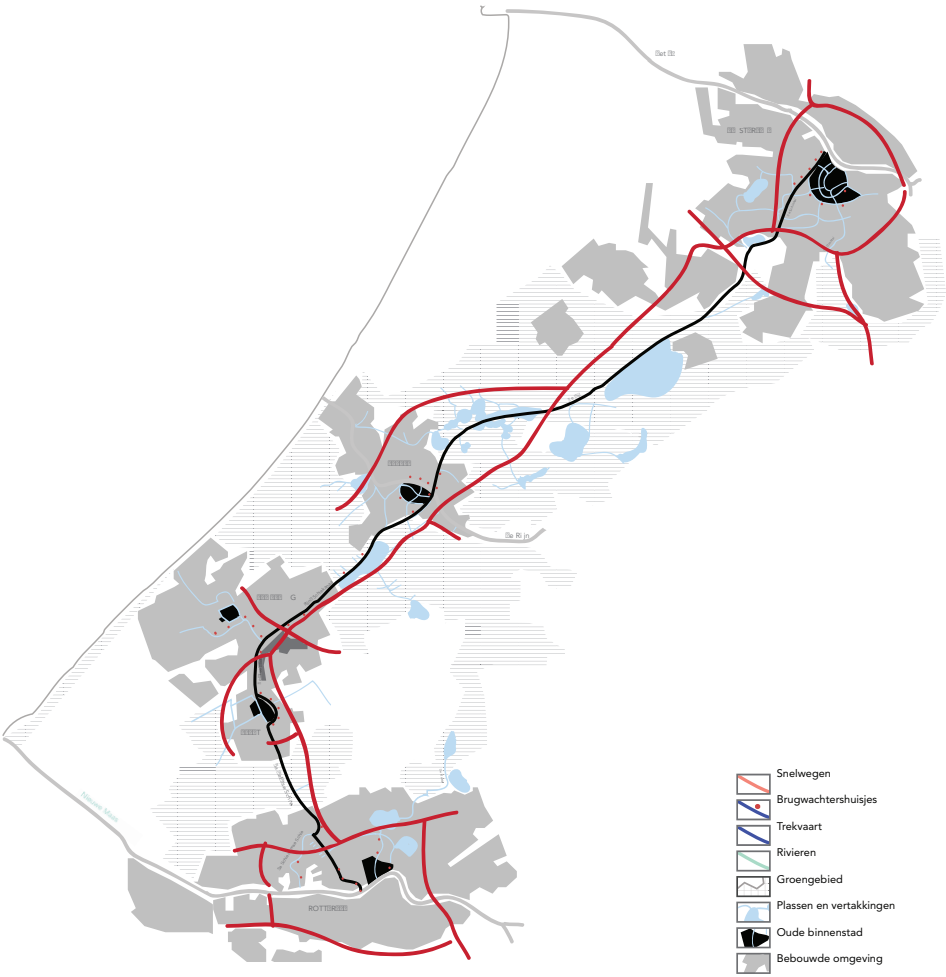


Figure 11. The train making it's introduction in the Dutch landscape. Constant Gabriël (1828-1903), Il vient de loin (hij komt van ver) ca. 1887, olieverf op doek, Kröller-Müller Museum, Otterloo.

I.III THE DUTCH WATER KINGDOM

Why do the Dutch water systems play such a big role for the identity of the Netherlands, and why is this system currently undervalued?

In order to understand what is so interesting about the water system in Holland in the first place, we dive into its historical context. For that, it is important to get an understanding of how the geomorphology of the Netherlands came to existence. Then the role of the water system in the Dutch history is researched. From here we can state that the water system and its elements belong to the grand design of the Netherlands.

Figure 12. *At the present, even the majority of the population lives in the vulnerable west of the country. Image by author.*

Almost all Dutch cities of significance, were founded along water ways, often close to a dam or sluice within, something we can find in the particular name. Along the water, it was possible to connect to the hinterland, and maybe even more important, it was possible to connect to the big stream of good that had been transported from east to west and even more from south to north.
In the medieval times, Holland was the intersection of waterways, the spot where the Rijn, Maas and the route between Vlaanderen and 'The East' (north of Germany to Scandinavia and East Sea Area) met each other.

It is very obvious: an efficient system of waterways for cheap transport of mass goods is of big importance for the cities that were connected by them.

But before that, it is interesting to find out what story comes before. This land, that is changed by human interventions and their usage of the water, wasn't always so controlled as it is now.

GEOMORPHOLOGICAL HISTORY

During the Miocene, the recent Netherlands was yet a part of the North Sea, which was shallow and had very low, flat shores with extensive sand and alluvium. The Rhine resulted in Nijmegen in by the Romans called Northern Ocean.

Until the Pliocene the North Sea retreated, so a connection between Europe and England came to existence. The retreat of the sea was caused by the impending ice age (in the Pleistocene).
During preglacial, when the ice of Scandinavia and England each had not yet reached the rivers, the rivers could still flow into the North Sea preglacial, thus forming a delta of coarse fluvial deposits (pebbles, gravel, sand).
During the Ice Age, however, the rivers were forced to find another course, they created a valley of erosion, and that was the cause of the formation of the strait (± 100 000 BC).
The glaciers tucked the preglacial delta (Dogger Bank, Veluwe). When the ice retreated and the rivers could flow into the North Sea, their walk was through that folds somewhat committed. After the first North Sea again

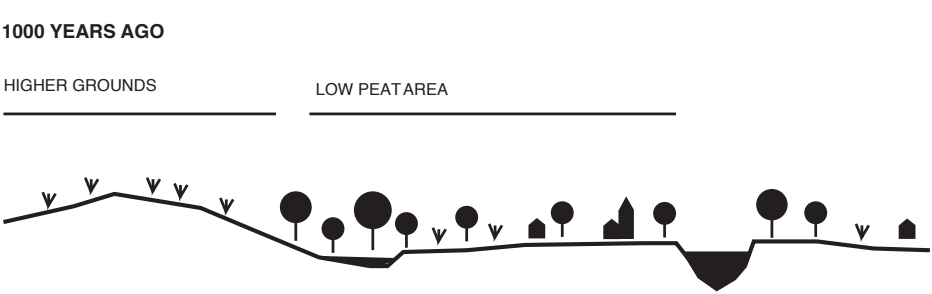


Figure 13a. *The Dutch landscape existed of wet flood areas where peat formed in swampy forests. In this time people lived on small hills (terpen). Later, people started to build dikes to keep the water away from the wet areas. Image by author.*

deeply penetrated in the Netherlands, he moved again back to the last ice age, which does not reach the massive ice field of the Netherlands. During this period the various rivers formed a delta of sand that stretched from the Humber Mouth in England to Cape Skagen so the whole southern area of the then North Sea was covered with a thick layer of fluvial sand.

In the old-Holocene the North Sea expanded to the South, on the one hand by the increase of the sea level, the other by the then occurring subsidence of the land, which phenomena still occurs.

The peat formation increased during this period. In North and South Holland, Zeeland and Flanders alluvial deposits of the ancient Holocene Sea came up to 24 km inland, which means that there was no shoreline. This phenomenon, by sea deposit padded estuaries and the formation of a tidal zoom has been a result of rising sea levels and evolving waves.

In the young Holocene, ± 400 BC., the development of the shoreline began, which is very important for the formation of the Netherlands, and happened almost simultaneously with the formation of the strait. If the material from the strip of land Calais-Dover was the material supplier for the shoreline, or that both the formation of the shore and the breakthrough of the strip of land at Calais were due to the same cause (a transgression sea level and the associated development the wave is no closed discussion.

Behind this wall, the river clay was able to settle in this quiet backwater, this was gradually filled in. On the fluvial areas peat formation occurred while the peat layer at the future sea level rise at the location of the tidal channels were swept away and elsewhere was covered with 6-12m thick young sea clay layers.

In the first half of the Christian era young dunes were formed up from the south, in some places the old dune area already existed (approximately 850).

The turning tidal currents in the North Sea changed all the mouths of the rivers to divert to more southerly locations.

As the Rhine from Katwijk to the Nieuwe Maas (by Lek) was reversed, the Meuse or the Maas

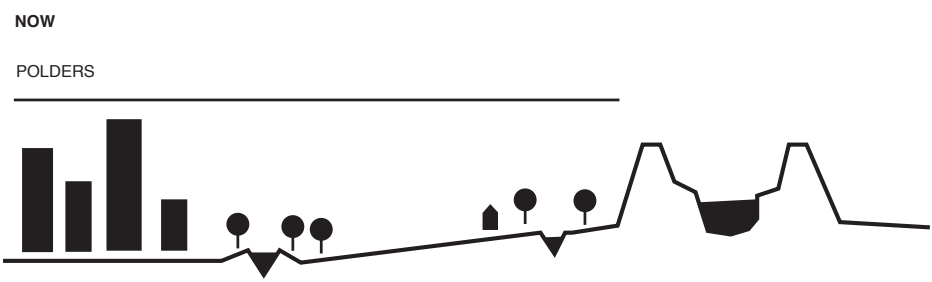


***Figure 13b**. The dikes that were build, made the land dry. Small canals in the landscape bring the rain and drainage water towards the river. That's why windmills play such an important role in the Netherlands. Image by author.*

HUMAN ADAPTATIONS OF THE LAND

estuary near Hoek van Holland now takes care of its removal via Haringvliet and Zijpe, so also the Schelde changed from its original course to the current Westerschelde.
After the last Ice Age there was the retreat of the ice sheet, the waves of the North Sea to develop again and closed dunes raise from Calais to Jutland. Behind the shoreline created by the vegetation thick layer of peat, which tpv the holes in shore to the delayed rise in sea level was again swept away and replaced by sum marine deposits. One of these high sand ridges were the dunes and the underlying moorland in South Holland. The occupation of this land by people has changed its looks in a very big scale.

Next to the natural processes that had their influence on the forming of the land, the humans already made drastic change on the land too. The Romans where the first to create water systems in the Netherlands. From our year zero, they started to mark the Rhine, now called the Oude Rijn, as their north border of their imperium. To mobilize their army fastly, the Corbulo canal and Drusus canal have been made. The Corbulo canal, also called Fossa Corbulo was the connection between the Mase and the Rijn, closely behind the dunes. From archaeological findings, it was concluded that the width of this canal was around 13 meters, and 2 to 3 meters deep. The canal was found on the height of Voorburg. In the east of the land, the Drusus canal made a connection between de Rhine and de Gelderse IJssel. Where this was positioned exactly, is not certain..

Karel de Grote had the idea to connect the North Sea with the Black Sea. In 793 he ordered the start of the Fossa Carolina, a connection between the flows systems of the Rhine and Donau. In the South-German village Graben we can find a three kilometers long open canal. It didn't come further than that. The plan of Karel was too far advanced in relation to the technical possibilities in that time. The water traffic here and in other parts of Europe mainly used natural waterways, like small rivers as de Regge, de Dinkel and the

Belgian Ourthe. On the local level, small canals were made, but they mainly functioned as connection between two existing waterways. Rotterdam got, when it gained its city charters in 1340, approval to dig a waterway between the center and the Schie, and Delft made a connection between Overschie and Delfshaven in 1390. Later I will zoom in to the story of the Schie.

In the Southern Lowlands, that had an economical advance from the Norther Republic, a diversity of canals found its existence in the sixteenth and seventeenth century. A canal of 30 kilometers long was created between Brussel and de Rupel in 1561, so Brussel was connected to the Schelde. On this canal, the first intercity by water was established. Also, in 1561 the Sassevaart, a direct connection of Gent with the Westerschelde was in use, followed by the Canal of Gent- Brugge. At the Vrede van Munster in 1648, Zeeuws Vlaanderen became part of the young Republic of the United Netherlands, used this opportunity to block the Westerschelde. The canal Gent-Brugge functioned by lack of something better, 150 year as the Belgium way towards the sea.
In the seventeenth century, the Dutch Golden Age, a strong economical blooming was going on. The expanded wealth stimulated the necessity for mobility. In the period between 1632 and 1665 an network of 658 km water canals was build on the initiative of city governments and private investors. There were passenger services between 39 cities. Where it wasn't possible to drive with the trekschuit, ferries were used. Sometimes it wast needed to create a new canal, and it was only needed to use an existing haunting route.
Innovative was the regular service with prices that stayed the same. The connections were inter-local, there was no central government regulating the system. The boats were 10 to 15 meters long and transported around 30 passengers. The trekschuit was comfortable, reliable and cheap and went fast for its time. This system was used for two centuries, until the steam train took over the transportation, which was way more faster and efficient.

THE NINETEENTH CENTURY

The nineteenth century was a period of radical political and technological changes. After the defeat of Napoleon, the allies decided to merge the Netherlands and Belgium into one kingdom and made the Rhine as an international toll-free river. In the Act of Mannheim in 1868, this was achieved officially. The CCR, Central Committee for the Rhine shipping, got the task to guarantee a free and safe sailing over the Rhine.

King Willem I tried to merge the Netherlands and Belgium into one nation by the making of diverse canals, especially in the period of 1815-1830. His inspiration came probably during his exile in England. King Willem I meant a lot for this development: the Willemsvaart (Groningen - Assen), the Zederik canal(Amsterdam - Rijn), the Apeldoorns canal, The Zuid-Willemsvaart (as alternative route for the unreliable Mase) and diverse canals in Belgium, such as the canal Brussel-Charleroi, mostly useful for the transportation of coal.
The same time, the expanding size of the sail ships led to problems in the accessibility of the

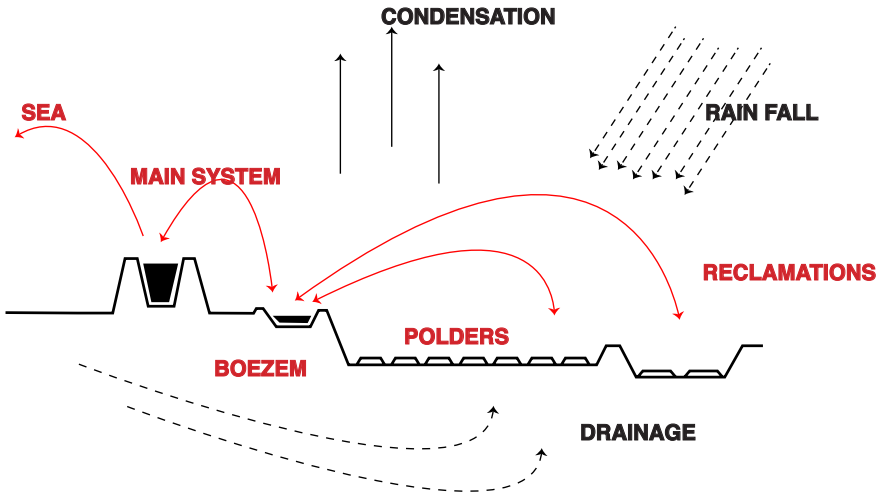


***Figure 14**. The water system of the Netherlands works in two directions. First, to keep the land from flooding, the water in the polders is brought to a secondary system: the boezem. The threads come from rain, drainage and the position of the land. The boezem brings the water to the main river system, that comes out in the sea. In the other way: the land needs to keep wet and fresh water to maintain its ecological and geological form. Image by author.*

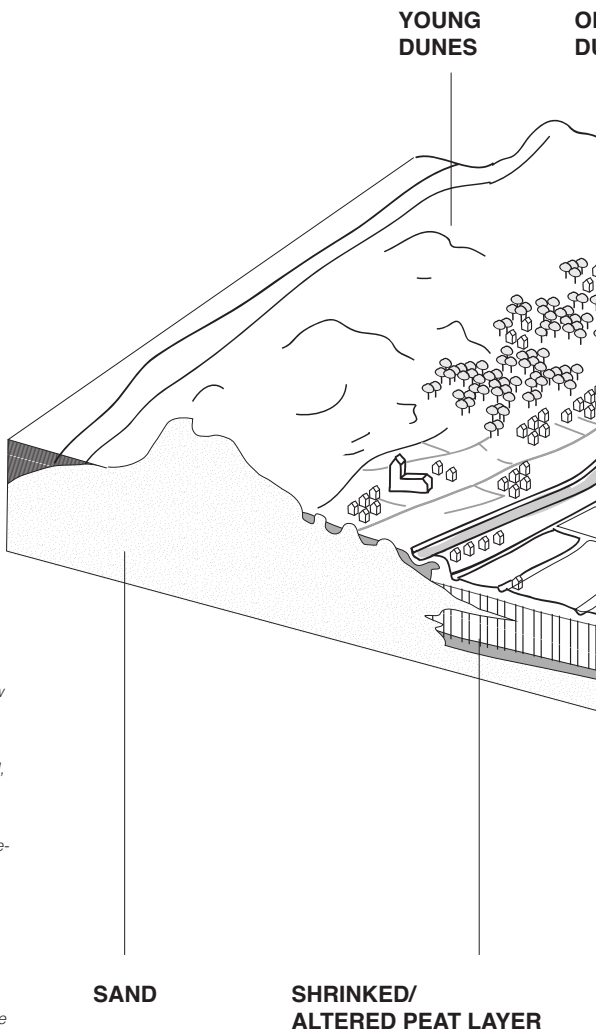
sea harbours. Under the pressure of Willen I the Groot Noord-Hollandsch Kanaal, the Canal though Voorne and the canal Gent-Terneuzen were made as harbours of Amsterdam, Rotterdam and Gent. The last one was opened in 1827, but due to the Belgium rebellion, was closed in 1830.

The Groot Noord-Hollandsch Canal and the Canal trough Voorne met quickly to be too small for the still growing sizes of the sea ships. The North Sea Canal of 1876 and the Nieuwe Waterweg of 1872 substituted the small canals. From this period, until 1916, the rivers profile of flows were normalized to prevent water outbreaks and floods with peers and dames. The main goal was the water management, but a very important output was the better water system between Rotterdam and the industrialising German hinterland. In the nineteenth century steam came as a force, and metal became a building material. Especially in the delta area, where the train wasn't available as a concurrent, the network of steam beats was used for passenger services. Steam ships weren't dependent on the perks of wind and water, what reacted in a raise of productivity. Rhine and inland shipping bloomed again. The huge reclamation of the North of the Netherlands began in the seventeenth century, and happened until the end of the twentieth century, until the use of peat as a natural resource was replaced by coal, oil and later gas. For the disclosure and removal of peat, a lot of canals were made such as the Windschoterdiep, Stadskanaal, Musselkanaal, Hoogeveense Vaart, Oranjekanaal

In the second half of the nineteenth century,

CROSSECTION OF SOUTH HOLLAND GEOMORPHOLOGY & TISSUE

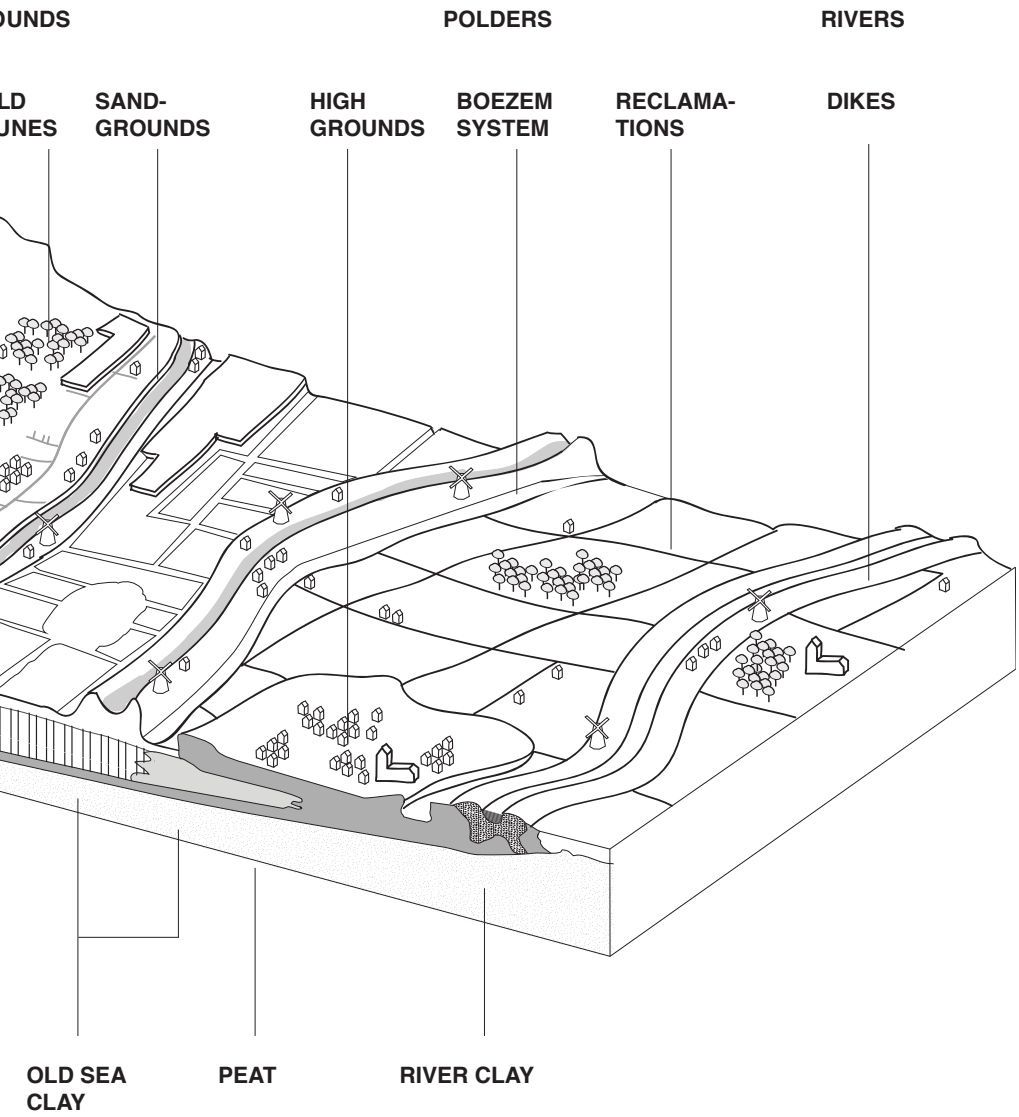
***Figure 15**. Cross section of the South-Holland Provence of the Netherlands.*
See: Geomorphological history, pages 31-32.



Old sea clay indicates the inland attendance of the sea. Clay formed on places where rivers and the sea led. The old dunes, that are on the back of the new dunes, show how the dunes are continuity recreated by the wind and the sea. Behind the dunes was place for safe settlements.

On locations where clay and sand were mixed, high nutritional ground gave the possibility to successful farming (bulbs, vegetable farms, later green houses). In order to keep the swampy peat areas in control, ditches and boezems were created, to channel the water in manageable structures. The boezem was used as the link between land and open water such as the sea and rivers. Most cities thank their location to higher grounds that were naturally dryer than the hinterland. The foundation of clay made that often possible.

Next to the dunes, the pattern of polders is different as you look to the reclamations. That is because the polders were created in an vernacular process, while the reclamations were created once, like the Noordoostpolder, which used to be a lake.
Image by author.


OUNDS
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CLAY
PEAT
RIVER CLAY

Figure 16. Painting of the life along the vliet in the golden age.
Jan Hendrik Weissenbruch, The Trekvliet, 1870, oil on canvas, 94.9 x 128.7 cm, Gemeentemuseum Den Haag.

Figure 17. *GIS map of interventions and expansions in the system of the waterway in chronological order. 1100 -1434. Image by: Brand, N. & van Zande, J.L., (2013) TSEG magazine jrg. 10 no 3. Infrastructuur in een stedenlandschap.*

Numbers in the map show the interventions and expansions of the system of waterways in chronological order:

1) the lengthening of de Schie into the "Oude Delft" (ca. 1100) connecting de Schie with Delft.
2) de Vaartsche Rijn (ca. 1122),
3) de Vleutense Wetering (end of 12th century),
4) de Woudwetering (ca. 1200),
5) the connection of the "Oude Delft" with the Vliet (begin 13th century),
6) connection of de Gouwe with de Oude Rijn (first half of 13th century),
7) de Nieuwe Vaart (ca. 1288),
8) cutting the de Vecht (ca. 1300),
9) de Nieuwe Vecht (ca. 1338),
10) the channeling of de Kromme Rijn (ca. 1384),
11) de Haagse Trekvliet (ca. 1345),
12) de Rotterdamse Schie (ca. 1340),
13) de Delftse Schie (ca. 1389) en
14) de Kostver- lorenvaart (ca. 1434).
- By the creation of circa eighty kilometers of new connections, 350 kilometers of north-south directed waterways were created. 144 of that were totally free of practical obstructions.

the Netherlands was in its Industrial Revolution. The still expanding size of transportation and goods asked for the creation of diverse canals, such as the Eemskanaal, the Overijsselse kanalen. Amsterdam got a better connection with the Rhine by the creation of the 77 km long Merwedekanaal, that was opened in 1892. For the locks was a chosen size of 120 x 12 x 3,1 m, based on a tug with four boats. Soon was found out that these locks were too small, what resulted in long waiting times.

Figure 18. *GIS map of interventions and expansions in the system of the waterway in chronological order. 1577 - 1658. Image by: Brand, N. & van Zande, J.L., (2013) TSEG magazine jrg. 10 no 3. Infrastructuur in een stedenlandschap.*

THE TWENTIETH CENTURY

The twentieth century marks itself with big contrasts. The first years were like the economic growth in the previous century. But than the events of the First World war, then a small economic regrowth and after 1930 the years of the big depression, the second world war, the cold war and finally the explosive growth in wealth during the 1960s.

In the start of the twentieth century, the first motorised ships came into the vaarten. After the second world war, steam ships were

1) de Mallegatsluis at Gouda (1577-1580),
2) de Dordtse Kil/Kil of Bonaventura (1597),
3) de opengestelde route over de Hogeveense vaart / Weipoortse Vliet (1613),
4) de Haarlemmertrekvaart (1630),
5) de Weespertrekvaart (1638) / Muidertrekvaart (1640) / Naardertrekvaart (1641),
6) the route between Vliet en Schie made public (1636-1655),
7) de Leidse Rijn (1644),
8) de Aar-Amstelroute (1658)
9) de Leidse trekvaart (1658).
In total: 230 km of new water ways.

Figure 17. *GIS map of interventions and expansions in the system of the waterway in chronological order. 1819 - 1867. Image by: Brand, N. & van Zande, J.L., (2013) TSEG magazine jrg. 10 no 3. Infrastructuur in een stedenlandschap.*

1) het Noordhollands kanaal (1819-1824),

2) het Aarkanaal (1824-1825),

3) de Keulse Vaart (1825) / Merwedekanaal (1892) / Zederikkanaal (1825) / Merwedekanaal (1892),

5) het Rijn-Schiekanaal (1893),

6) de Nieuwe Waterweg (1872),

7) het Voornse kanaal (1830)

8) het Noordzeekanaal (1867).

In the nineteenth century, 200 km of new canals was dug.

replaced by motor ships and the last wooden sail ships disappeared. The growth in scale by the introduction of pushing-ships like tugs, the radar made it possible to drive at night and the invention of the container opened a new market for the inland water transportation.

But in the twentieth century the inland water transport got the competition of the truck. The beurtvaart, transportation of goods and packets on regulated points of time, left the picture. The main goal was now mass transportation.

With the growing wealth, more and more people had the money to have a boat. The recreational use of water systems flourished, and the small water systems that were not interesting for mass transportation, got new attention. Mainly in England and France, but also in the Netherlands. Old canals were rebuild for recreational use. The only planned new canal is an side track for the Zuid-Willemsvaart oost van 's Hertogenbos, not more than 10 kilometers, replacing the small traverse of Den Bosch.

THE SCHIE: ZOOM IN

The provincial waterways that form the connection between the many wetlands have thus two formerly subordinate positions given an important role in their existence.

New developments can change the view of the waterways in certain places. The cause is to be found in different areas. Demands from the commercial to include faster and larger ship types, from public works management for maintenance and strengthening embankments, optimal bosom functions. In fulfilling this are demands from cost savings, safety, working conditions and efficiency often directing.

Developing the cultural and historical aspects of this system in combination with recreational and touristic opportunities, and the developments in the urbanisation of the land, will play an vital role in the considerations and threads. It goes too far to explain all waterways in the context of this investigation. As a brief example, we take the part of the Randstad waterway between Overschie and Delft. This water system is an ultimate example of an important historical water system in an urbanising Dutch metropolitan environment. Most water systems, are after all, works that represent only a short period in history: for example canals of Amsterdam as an example of the Golden Age. Waterways like the Rhine Schiekanaal and Gouwe however examples of continuity in the Dutch history: they have adapted over the centuries to the demands of the times and offer a sample of Dutch history from Roman times to the present.

The history of the Rijn-Schie Canal is in a matter of fact, a tangible illustration of the cultural history of the Netherlands. It started with the flow area of the creek de Gantel, that started to form after floods some centuries before the counting of years. Since before the Roman empire, there are settlements on the back of the creeks. The Romans used these small creeks to create a canal between de Rijn and de Maas: het Corbulo kanaal.

De Schie found her existence in the neighborhood of Schiebroek, as a swamp-like creek that opened in the Merwede (now called, de Nieuwe Maas). The Schie was connected with this system and even party cultivated with the establishment of the canal of Corbulo. Archaeologic findings suggest that the north of Delft, partly is the same as de Corbulo.

Delft is grown from a strategic place it had found it's existence next to one of the creeks of de Gantel. Around the twelfth century, the court of Delft was established with the settlement of the county and monasteries. In the actual structure of and around the canal, the medieval system of creeks for

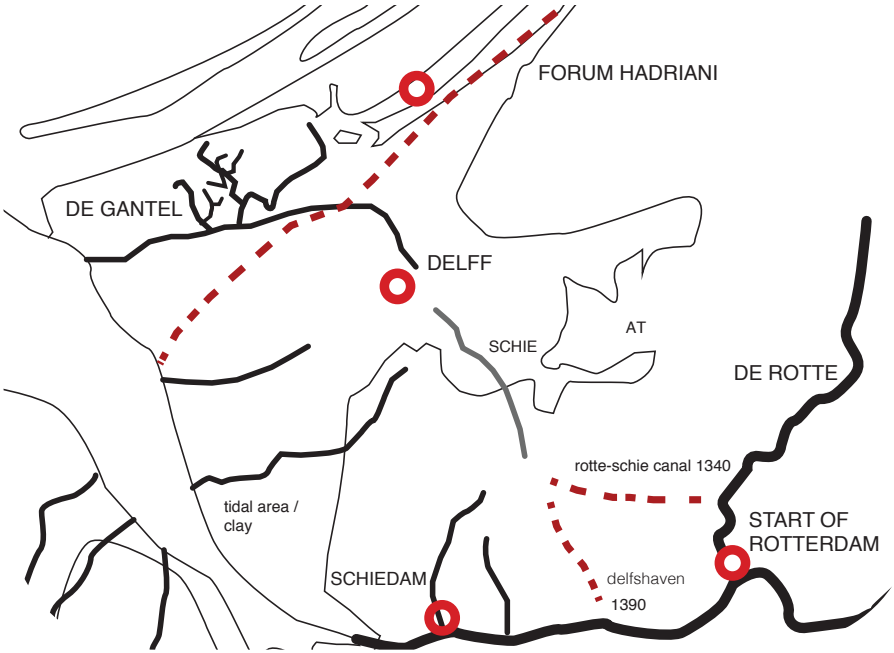


Figure 20. *The Schie and its context trough time.*
De Gantel is a creek that allowed sea water to go in and out, and thus a layer of clay formed. This allowed the city Delff to find a founding. The schie is a canal that is one of the first systems that was created by man in the Netherlands. To keep their ships safe from the wild sea, the Romans created a canal that led parallel with the sea. This created a waterway from Delff to the sea. The damming of the Schie created the important section for the city Schiedam. Image by author.

drainage of the reclamations are still retractable. In the parcellation of and the location of the Rotterdamse weg, the old precursor of the Oude Delft is still visible, that has only been canalised as a straight system after the big flood in the twelfth century.

The medieval center of Delft thanks its intact remaining especially to this water system, that first ran through the Westvest and from the late nineteenth century trough the Oostvest. The Delftse Schie was called the Delff or Delf until the fourteenth century, and probably continued until the creek system of de Oude Leede. The city of Delft owes its name from the Delff, which was dug in the 11th century for the drainage of the area's water towards the sea. Later it formed, together with the Schie, a shipping route to the Mase from Delft, what connected the trading town for exporting beer, cloth and butter exported and the count's court stocked. The channel Delft then connected to its own port at the river, Delfshaven. Since then, the Albrecht lock was used for the drainage of the Hof van

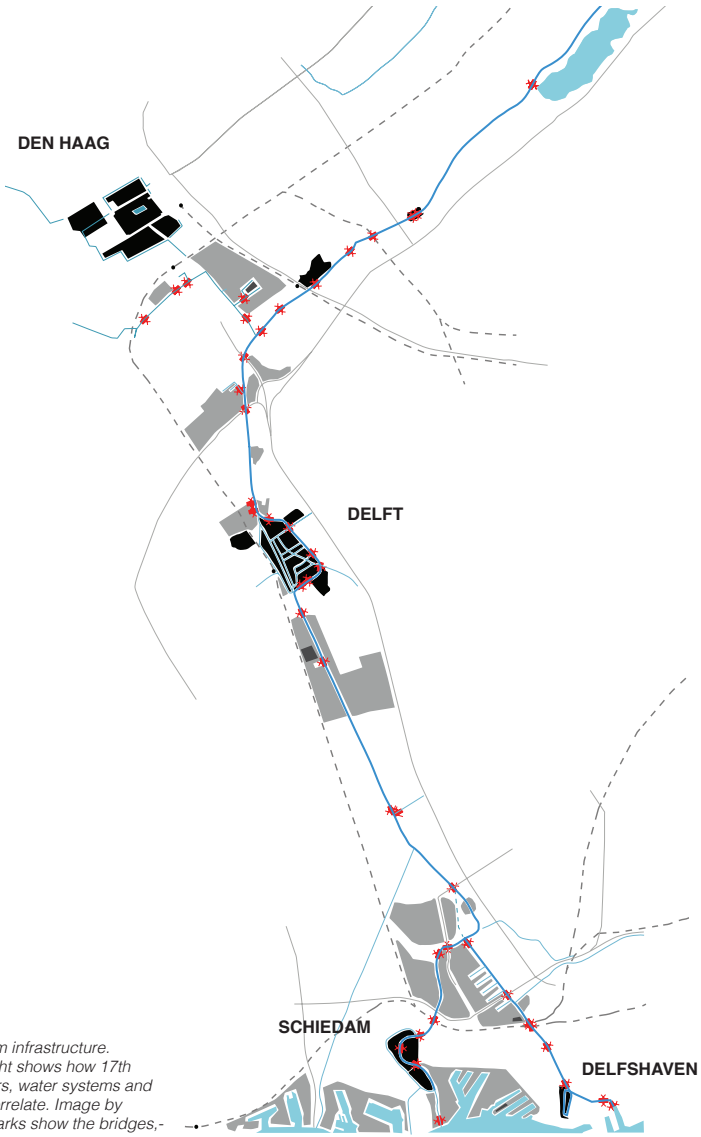


Figure 21. *Boezem infrastructure. The map in the right shows how 17th century city centers, water systems and industrial areas correlate. Image by author. The red marks show the bridges,- containing 32 bridge houses.*

1200

250

***Figure 22**. Mills and sluices and their number in the Netherlands. Source: Rijkwaterstaat 2015. Images by Author.*

Delft. Around 1280 there was a better water management with the construction of the Kandelaar and Poldervaart between Vlaardingen, in which five locks were put. The Delff was extended northward to the Hoornbrug where it connects to the Vliet in The Hague. Because the level of Rhineland is higher than that of Delfland, a dam was provided in Leidschendam.

Drawbridges and swinging bridges were the main types for centuries, because it was sufficient to raise them with little strength (weight of the bridge guard). Until the mid-19th century, it was possible to control the water management structures by hand. With the increase in the tonnage of the ships the required passage width at bridges and locks grew. Rail traffic, in the nineteenth century, already needed heavy bridges. In the twentieth century, the road in number and axle load: from a few hundred kilos beginning of the century, sometimes more than 50 tonnes at the end of the century. This explains the rapid replacement by ever wider and heavier bridges.

The development began in the major port cities, where the first mechanised bridges were built in the second half of the 19th century. The principle of the bascule bridge fit well within the requirements for mechanisation of bridges for road traffic. For much heavier rail traffic, the drawbridges and swing bridges were more appropriate.

The bridge or lock-keeper had to the various operating steps all arrange themselves in sequence and in time. So it had to respond to the current situation on the water, but also in terms of traffic over the bridge. With the progressive computerisation of the scheme was also him that work is increasingly taken out of your hands, until it only the on / off and emergency remained. The modern visual communication then made the remote control possible. That saves on jobs and hence costs. From central checkpoints are now several bridges are operated from a single point. Road traffic means watch out, because there is no bridge keeper's more that can halt a declining barrier to traffic jams or other delays. The control of the traffic lights at the bridge is now often integrated with the systems of the

950/40000

***Figure 23**. Number of bridges and movable bridges in the Netherlands. Source: Rijkwaterstaat 2015. Image by author.*

obvious before lights (rather stop traffic for the bridge road section) and underlying (bridge road section empty). This has the reliability and safety optimised by remote control.

SLUICES / LOCKS

Sluices or locks lay in the barrier between two areas with different water levels. The forerunner of the lock was the Overtoom, a facility where small boats could be pulled over the dam. For this, both sides of the lock were performed as slight slopes. With a windlass they pulled the vessels on the dam. To leave, a discharge was built from the upper level. A seething within two sets of gates with fixed bridge connections across the leaves. The discharge could also be used for the locking of ships, but the fixed and limited headroom chamber length was very restrictive. With increasing freight rates and thus the tonnages, these systems were abandoned quickly when they proved to be too small and shallow. Therefore, the newly built sluices now tune in to the most common types of ships and all provide movable bridges.

In the past, service homes were built on bridges, locks and pumping stations. There was hardly any communication between the various bridges and locks possible, therefore it was needed to have he service personnel next to the lock or the bridge. The shipping yet announced its arrival with three blasts on the horn or whistle, the service was spot on “demand” and came well into the last century by hand. This is good to see around the Merwede, where every bridge had its own bridge keeper’s house and every lock keeper own their homes.

The oldest example is the Hoge Brug in Overschie, where a seventeenth century bridge keeper’s house is now serving as a control post. At the Sluis Tolhuis between Amstel and Drecht / Aarkanaal we can find seventeenth century lock keepers houses and on the splitting up of Delft between old waterway through Spoorsingel and the new channel along the Oostsingel state late seventeenth century staff residences.

In the second half of the last century the company houses became redundant with the general introduction of the car and the expansion of the road network. Also in the rural areas, a ministry house was only adequate. But even these small distinctive water control structures now lost almost all of their duties through further automation and the introduction of remote control.

Figure 23. Famous painting that shows the view on Delft, 1600. The architecture of the city is oriented from the water. Zicht op Delft, Johannes Vermeer, 1662

I.IV 17th CENTURY CITIES AND WATER MANAGEMENT BUILDINGS

Most residential water management buildings were build before the mid-20th century and functioned as the official residence from which the lock or bridge keeper did his job.

Because the service house was almost always situated next to the lock, shelters were provided for hand-operated locks. Here you could find the lock keeper searching for protection from wind and rain, before there were houses like this.

A beautiful but neglected example of an open shelter can be found at the cemetery lock of Gorinchem. On the big lock in Vianen there was another one until the renovation of the lock a few years ago. Bigger, more dense examples can still be seen in the range between Leidschendam and Voorburg. At the Nieuwe Tolbrug and Kerkbrug at Voorburg, the houses are renovated.

Outside the town, almost all bridges in busy water ways had a keeper house. Along the Merwede canal they still exist, all of the same design. After World War II, many mechanised bridges in the rural area and the company houses were abolished. There were

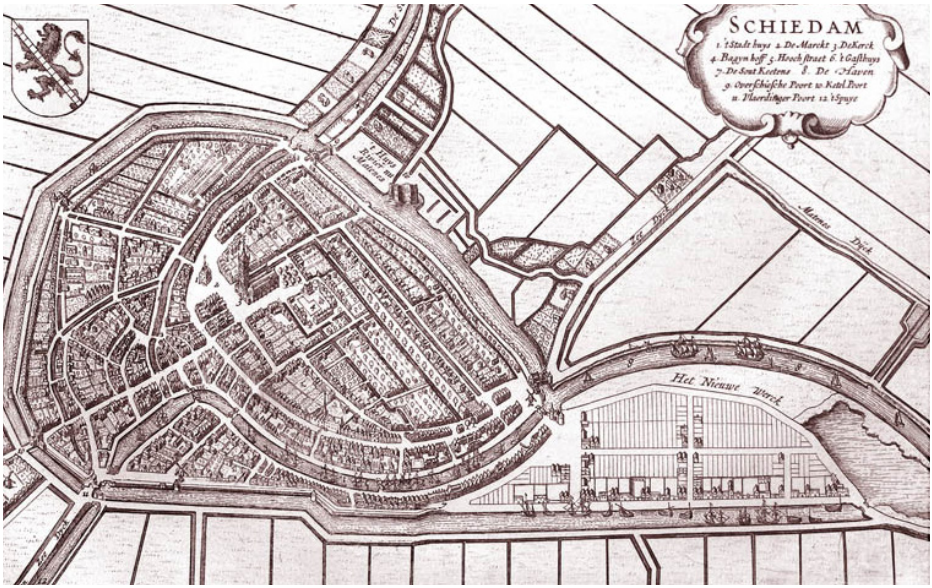


Figure 24. *Schiedam circa 1600. (Source: Municipal Archives Delft)*

control houses, as in the urban areas. The mechanisation of the bridges was a centralised operation of the bridge. This contained of a small house that required space for the machine and the bridge operator. Also to ensure a good view of these houses are located right next to the bridge openings. Only for tolls or port fees the bridge keeper still came out the building. The earliest examples are found in the late 19th and early 20th centuries in the cities, often as visually dominant architectural element of the bridge.

Along the Merwede is the change of service house to the ministry noticeable: almost all bridges are a (former) official residence and an (empty) control cabin, all three to a standard design.

Meanwhile almost all control houses at now redundant bridges and locks are operated from a central station. However, one can always operate the bridge on the spot with the aid of a "Chineesje", one in the hand-held control unit with the necessary buttons. This box plugs in a jack of the control of the bridge in or near the engine room. The new bridges are therefore without control houses: the Kandelaarsbrug, Overhaalbrug and Vlietland Brug in the Rhine-Schie canal and the recently built bridges in the Merwedekanaal. Older bridge can operated in an emergency even from the existing panel in the house. But often they replace it with the connection for the Chineesje.

Thus arose the opportunity to give these homes a different function or if necessary to demolish them. Vandalism is an important

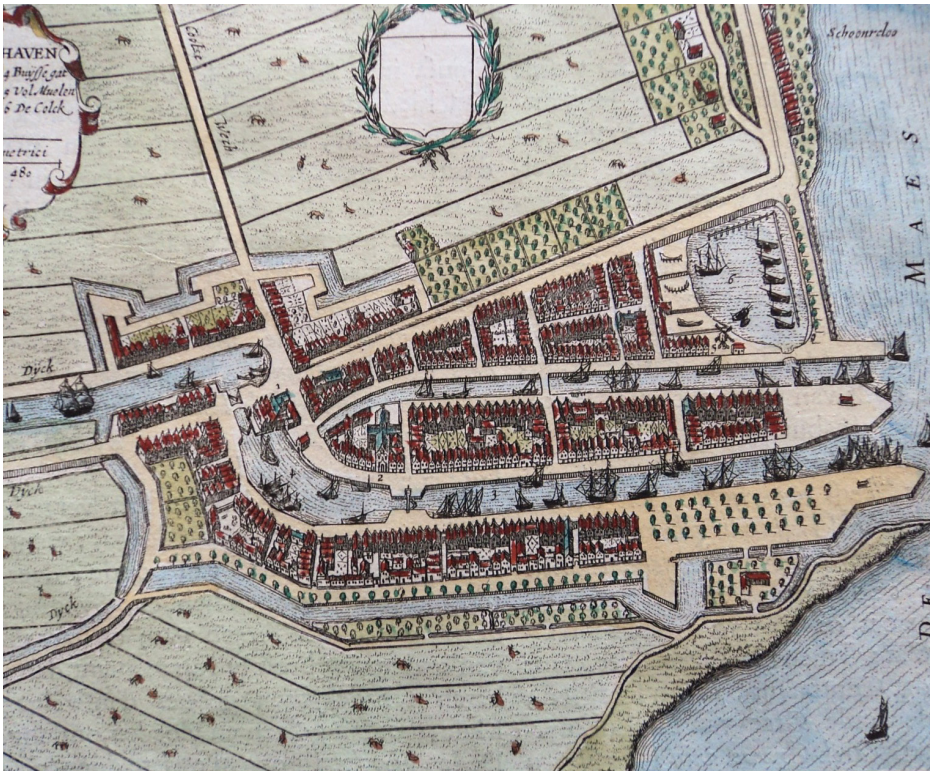


Figure 25. *Map Delfshaven 1649. (Source: Nederlands Scheepvaartmuseum Amsterdam)*

motivation to think about the future operation of houses that have lost their function
The two functions did not always work together. Here were many different and mostly involve local interests: agriculture, trade, art and music. With the intervention of the States of South Holland, the local interests were put overboard. Between 1850 and 1940 the three provincial waterways are thoroughly adapted to the new opportunities offered by the shipping. The Merwede is now added to these three.

In the 19th and 20th centuries the road and rail traffic conquer the water traffic at a rapid pace. Fast increasing population growth has different effects: the canal over the Schie and the postilion of the road to Rotterdam no longer gave a competitive offer on the A13. A high frame rate is difficult to reconcile with the possibilities of water movement. Nevertheless, the inland has emerged as a fast, competitive form of transport for large quantities. That means as usual adjustments of the waterways on the problems that arise when there are

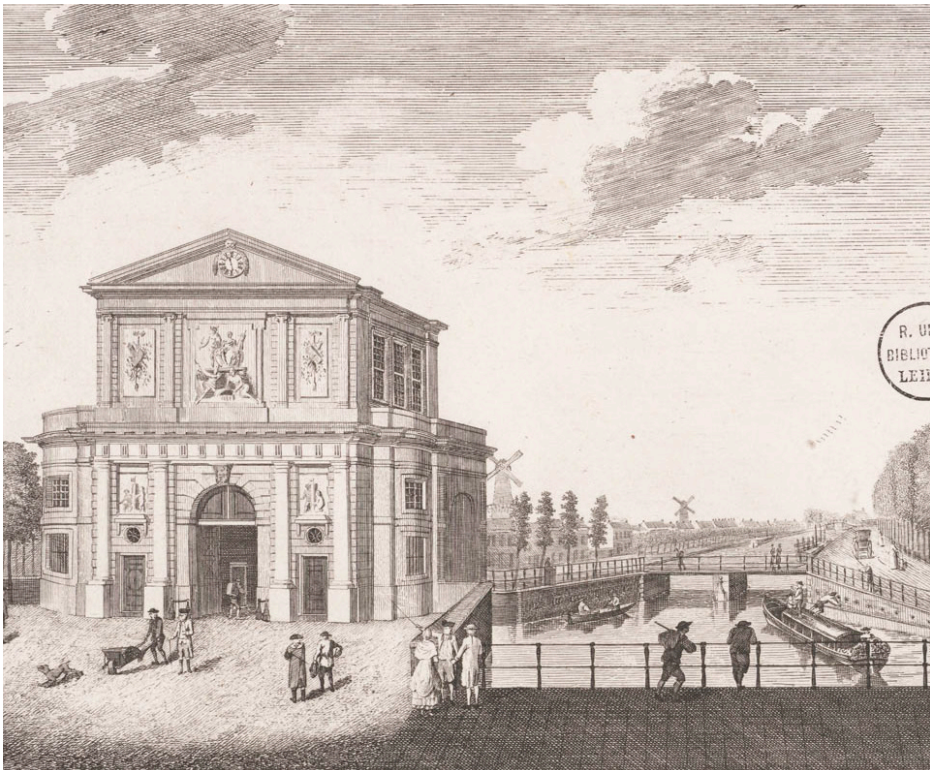


Figure 26. *Delftsche Poort Rotterdam (Source: Maritime Museum Rotterdam)*

faster and larger ships to sail.

The network of water systems created a connection between the bigger cities, what resulted in a growth of public transport by water. The boats 'barges' made it possible for travelers and merchants to travel easily between cities. The places where boats stopped, also called 'departures' where a very important place for people to meet and trade. Also, travelers brought news and work for the local inhabitants.

SCHIEDAM (figure 24)

As the city of Schiedam has been created by the damming the Schie, the city also lies at the most original route of the Schie. Among the travelers of the barge service were traders, who moved to the city, mainly because of the gin industry. The barge came along Overschie Poort to the Fair Luis in the center of town. Not only barges that were full of passengers departed from this location to Delft, but also brought a great amount of people that explored the city and its goods. A good example

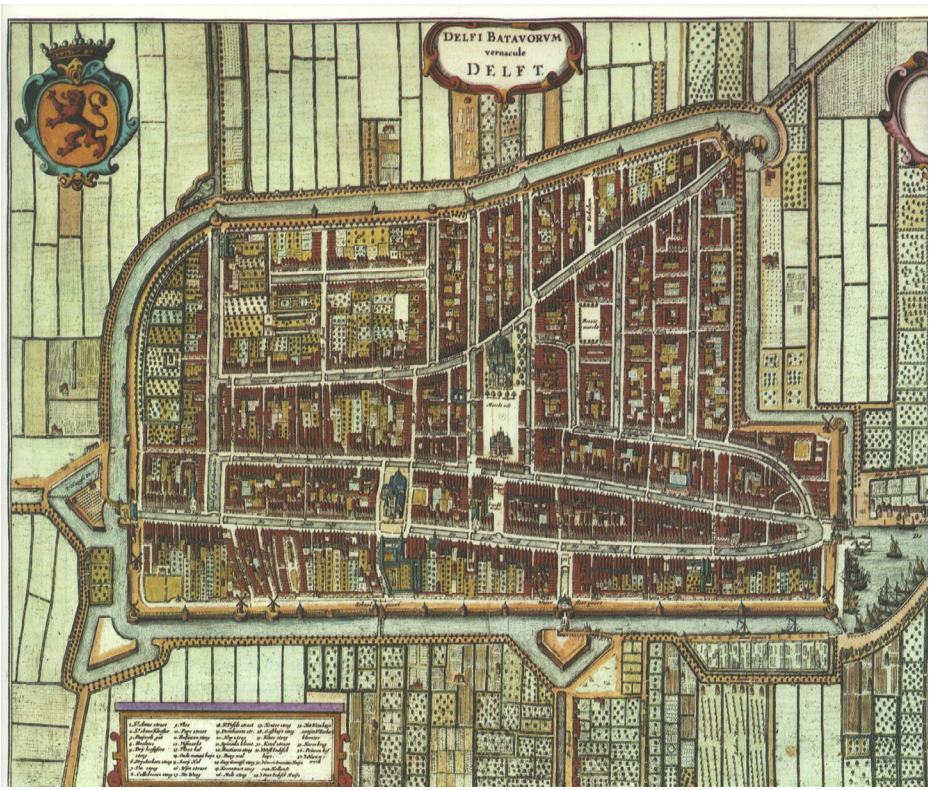


Figure 27. *Map of Delft 1652 (Source: Gemeente Archief Delft)*

of freight is the flush, which as a byproduct of the gin industry, was delivered to farmers in the countryside.

DELFSHAVEN (figure 25)
Delfshaven was as a port on the river and was now directly connected to the sea, for the VOC an important position in relation to overseas trade. Digging Delfshavense Schie improved direct connection to Delft and this gave Delft an important position with its own seaport. The emergence of the barge services created a permanent ferry service between Delft and Delfshaven, where the barges were pulled by horses. The arrival and departure station of the barges can be traced in Delfshaven to the Aelbrechtskolk, departed from this place the barges in permanent employment towards Delft.

ROTTERDAM: DELFSCHEPOORT (figure 26)
When Delftschepoort in Rotterdam were the barges ready for departure to Delft. On the oil painting of Francis Louis van Gulik (1860-

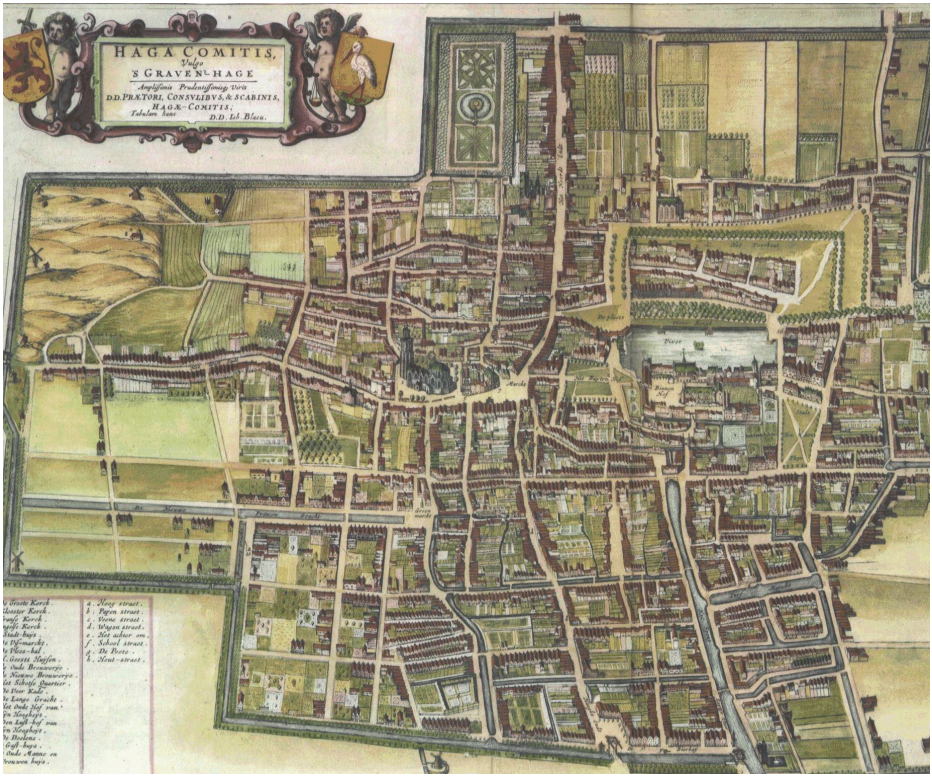


Figure 28. *Map of the Hague (Source: Gemeente Archief Delft)*

1880) include recognizing a barge for the Delftschepoort, in the background is also to recognize the Laurenskerk. The Delft Gate, also known as the St. George Gate was demolished in the 30s of the 20th century. After the bombing of Rotterdam, the Rotterdamse Schie was filled up. The only way to recognize the canal structure now, is as the streets Schieweg and Schiekade.

The Delftschepoort was reconstructed in 2005 to its original location on the Haagseveer in Rotterdam. The fairway was called the Delftsevaart by the locals. Delft was an important VOC town and had much to gain from a good transport network nearby, so the commission of the canals meant enormous progress. The barges departed from different gates to cities in the area. From the Schiedam Poort in the south of the Delft barge service moved to Rotterdam, Schiedam and Delfshaven. On the north side of the city the barge drove from the Haagpoort. From the south of Delft all ships drove along the river Schie to dock in the

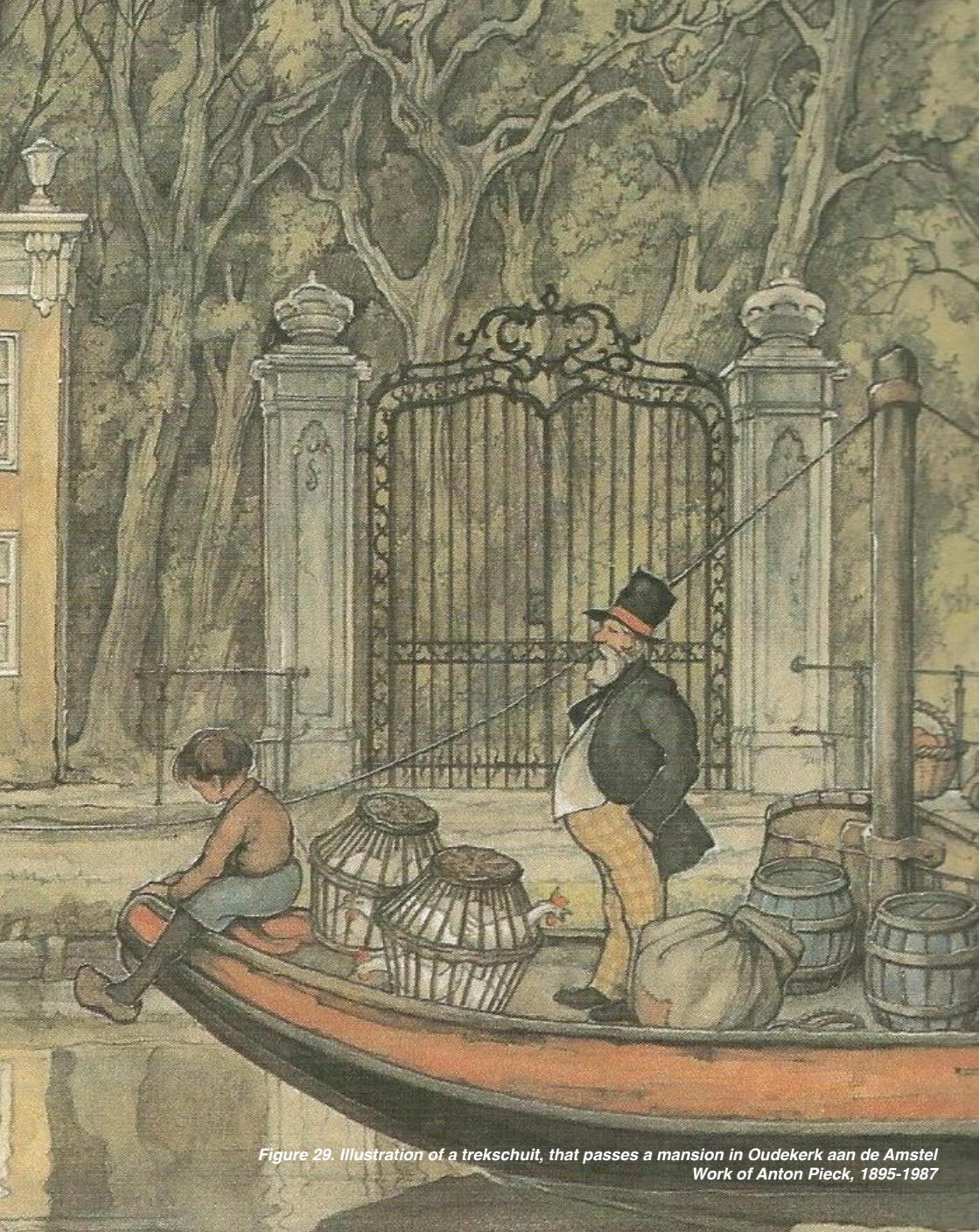


Figure 29. Illustration of a trekschuit, that passes a mansion in Oudekerk aan de Amstel
Work of Anton Pieck, 1895-1987

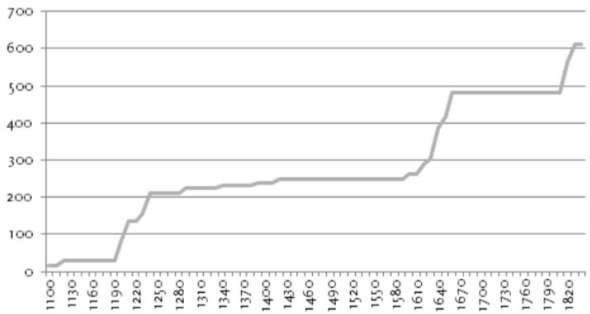


Figure 30. *Km's of waterways trough the time. Source: Brand, N. & van Zande, J.L., (2013) TSEG magazine jrg. 10 no 3. Infrastructuur in een stedenlandschap.*

Kolk, as the barges did too. The barges had a special dock at the Kolk, where travelers switched. Through the Schiedam Poort, also called the Kethelse Poort, the travelers entered the city of Delft.

HAAGPOORT (Vliet)

On the northern edge of Delft the barges came together in a port that was within easy reach of the Haagpoort. When the harbor was filled up in 1862, the barge service got a new location on the Wateringsevest. The ferry service to Den Haag and Leiden left both on their own locations.

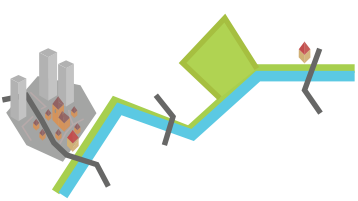
THE HAGUE (figure 27)

The Hague was at the time of the barges, a rapidly growing city. This city not only was the home of the Stadhouders: The Princes of Orange, also many ambassadors and foreign and domestic dignitaries stayed in The Hague. The Hague had two large barge ports that were arranged to lead the barge and ferry in an easy way.

The ferry service between Hague, Leiden and departed from Amsterdam was called the Amsterdamse Veerkade.

GROENEWEGJE (Vliet)

The barge service to Delft connected the city with two other major cities in the area, which had a positive effect on trade and the economy. The ferry service to Delft departed from the Groenewegje at de Ziek, on the south side of the Bierkade.[17]



17 Province of South Holland 2010

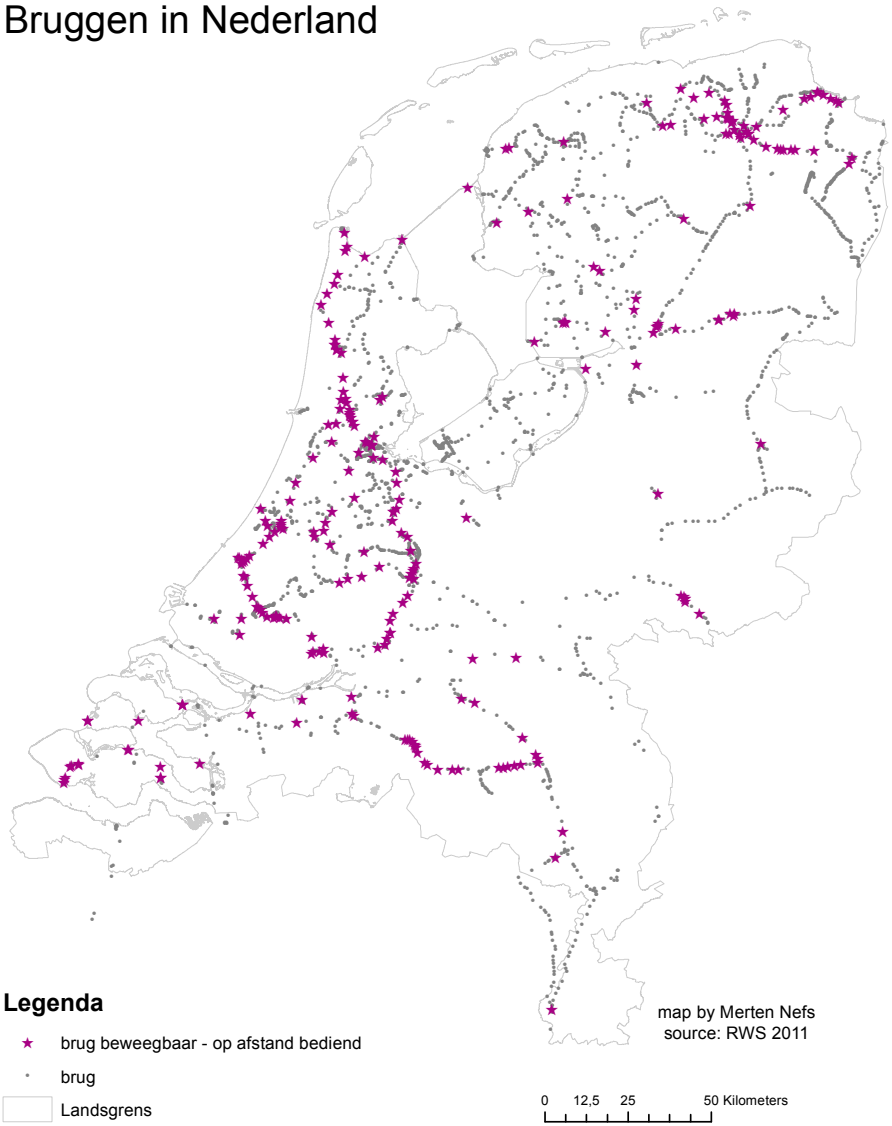
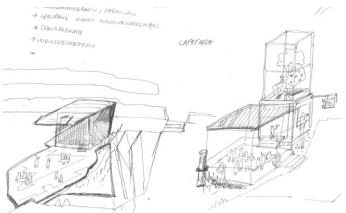
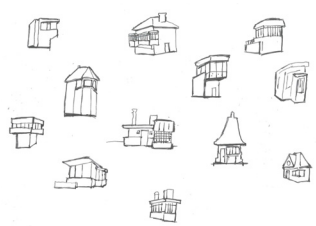


***Figure 31**. All bridges in the Netherlands. Source: www.brugwachtershuisjes.nl*



Sketch 11: *New use of bridge control houses.*

I.V THE VALUE OF BRIDGE CONTROL HOUSES



Sketch 10: *Types of bridge control houses.*

In order to explore where the particular houses find their value, a research into existing sources is done. Are the houses valuable? Can the water system of Holland indeed been seen as the grand design of the Netherlands? After finding help of research, a grasp of three houses along the water system is done. This is done to give us an brief understanding of what the houses are and why they are important to the Netherlands.

The South-Holland waterways play an important role in the history and cultural development of Holland. As read before, many cities have emerged from settlements of ancient waterways to estuaries around dams, locks and litters. The waterways thus represent important cultural and historical values. In fact they are living monuments, monuments that are always evolving from the positions they have for centuries. The waterways owe their existence to the public works function and their transport function. Thanks to the first Holland was mined and made habitable, thanks to the second cities like Delft, Leiden and Gouda grown from places. The

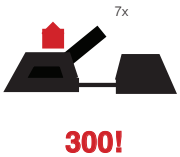


***Figure 32**. Estimated vacant bridge houses in the Netherlands. Source: www.brugwachtershuisjes.nl. Image by author.*

waterways were the arteries of these cities. Once the waterway was closed and silted up, the prosperity of the city stopped. Cultural historical values are of great importance to the quality of the environment. Water system related objects are often centuries-old crossroads of land and water connections, and they are among the most characteristic elements of the Dutch landscape.

We can definitely consider the provincial waterways as the cultural and historical "backbones" of the area. The Belvedere Memorandum entitles major historical works as representatives of the "Grand Design" of our country. In addition, she gives as an example that the canals, polders and reclaimed or military water lines strongly determine and colour the cultural identity of the Netherlands in an international context.

These are after all, works that represent only a short period in history: for example canals of Amsterdam as an example of the Golden Age. Waterways like the Rijn Schiekanaal and Gouwe however examples of continuity in the Dutch history: they have adapted over the centuries to the demands of the times and offer a sample of Dutch history from Roman times to the present. They are living monuments, works that are still in progress and will continue. They certainly belong to the Grand Design and are excellent examples of monuments that are still functioning.

The province has integrated and regional approach as a basic principle enshrined in the Cultural Preservation Plan 1997-2000 and then in the Cultural Plan 2001-2004. Water state objects in their relation to the waterways are ideally suited for this approach. Along the waterways are small monuments as leading for the canal, larger monuments like windmills, country estates and building complexes are seen as protected cityscapes. The waterways also provide an excellent infrastructure to provide access to this wealth.

BRIDE CONTROL HOUSES AS LANDMARKS

The Netherlands has around 2595 bridges, where 1353 are movable ones and 269 bridges are controlled from a central with camera. (Rijkswaterstaat, 2011). Stichting Brugwachtershuisjes predicts that all of these contain bridge control houses, that are now vacant.

This amount is very convenient for an overlapping idea, but can these houses be re-used, and is that valuable?

For these questions, 'yes' can be answered clearly. The reuse of the buildings is preferred above vacancy or demolishment. Vacancy

***Figure 34**. A. Reineveldbrug. Image by author.*

***Figure 35**. B Koepoortbrug. Image by author.*

creates undesired environments and the demolishment destroys the visual image of the bridge.
The most important reasons to keep the houses, due to Ingenieurs Associatie Van den Bos & De Jongh[18] are:
1 the architectonic, cultural historical and situational value of the bridge and the house
2 the big economic and touristic-recreative potential because of laying next to busy traffic intersections.

Because the houses are important landscape architectonic elements of the historical and regional position, these buildings are of regional importance for the Netherlands. There should be a way that activates the image of the architectonic elements in a concise way for the regional scale. Besides mills, it is the movable bridges and locks that mark the refined water infrastructure of South Holland;
In the CHS[19] reports these waterways make it in the top rating because of their leading role in the development of Holland regarding water management, politics and commerce;
A note from Belvedere values these waterways the designation 'Grand Design' from Holland, as living monuments of the development from Roman times to now;

Between The Hague and Rotterdam, there are 13 water management complexes that have have a significant historical and spatial value and or examples of hydraulic architecture from the last century and a half. Only since 1930, the major infrastructural role of water was taken over by the road.
These 13 complexes are valued by the same engineer office, which did a research in cultural value.
South Holland draws a clear cultural identity with the connection with the water. The most interesting cultural and historical waterways are largely owned and operated by the province and they offer an accessible infrastructure over the water along many large and small monuments from the Dutch history.

18 Found in a report created by Ingenieurs Associatie Van den Bos & De Iongh 'Rapport brughuisjes'. 2002.
19 Culturele Hoofdstructuur Zuid-Holland, Provincie Zuid-Holland, 2002.

***Figure 36**. C St. Sebastiaansbrug. Image by author.*

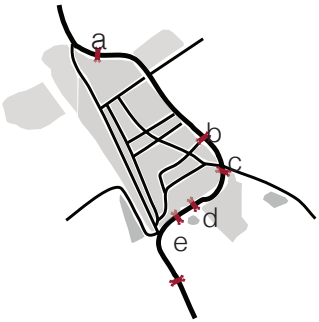


***Figure 37.** Map of Delft and bridges. Image by author.*

So, the waterways provide direct access to historic sites and within cities, so many monuments are better reached over water than by road. This are properties that should be taken with for the implementation of the design for the plan.

SIX BRIDGES IN DELFT

In the historical centre of Delft, six movable bridges can be found, that also include bridge control houses. Image 37 shows a map of their locations.

EXAMPLE: REINEVELDBRUG TE DELFT(1931) (figure 34)

A particular example of a bridge in the style of the Amsterdam school outside Amsterdam. An elevated bridge across the full width of the water, in a green environment. Wide application of natural stone pillars. The house is the focal point of the bridge: hexagonal shape, the circumferential strip windows with panes, a high roof with chimney.
The 'new' Reineveldbrug was the cornerstone of the project Haagweg Werken. In the 20s of the last century Delft carried out a major project of urban modernisation. Until then all traffic along the Vliet through the heart of the old town which was wedged in its medieval foundations. The bridge gave Delft the opportunity to undertake the large-scale urban development and give actual content to the then phenomenon of the 'regional plan'. The bridge connected Delft directly to the new Rijkswegen, and made the city possible to expand eastward, which freed downtown trough tram car traffic.

Ir. W. Gijzen made in 1927 to the design of the bridge with a structure modelled after the Amsterdam Schinkelbrug was completed in that year. The Reineveldbrug is inventoried in the Monuments Inventory Project (MIP), where the architectural style, the rarity of such a bridge outside Amsterdam and integrity were the main issues in the valuation. The bridge is technically completely renovated in 2001, so the image and the details of the architecture are largely preserved.

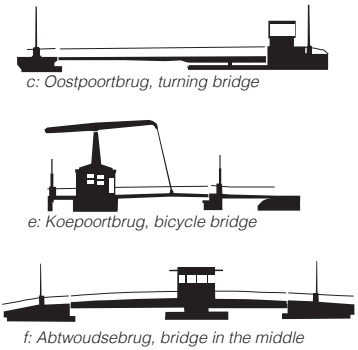
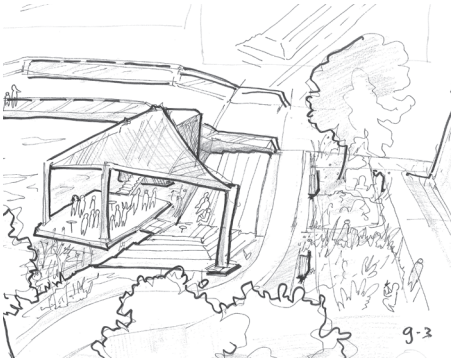


***Figure 38**.The other movable bridges of Delft. Image by author.*



***Sketch 11:** Connecting with water around the houses.*

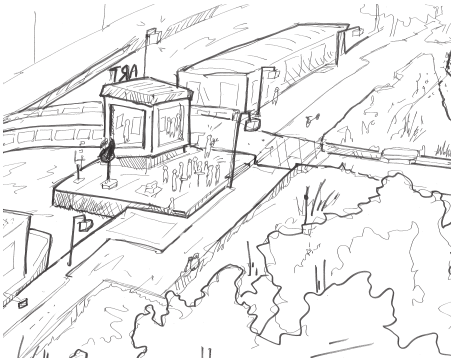
EXAMPLE: REBUILT PERIOD (1940-1960)

SEBASTIAANSBRUG in DELFT (1963) (figure 36)

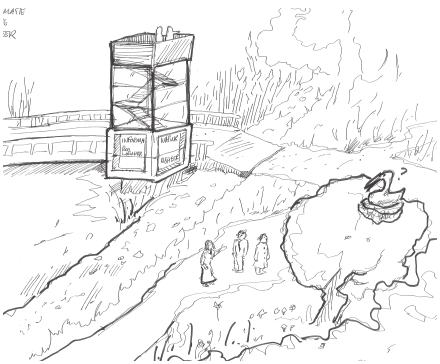
Representative of the huge high concrete road bridge that was built in the time when the traffic was able to drive in the heart of the city. The demolition and subsequent construction of the old town “In the Veste” was part of this. The control cabin, high on a concrete column is a typical expression of functionalism in glass and concrete, typical water management architecture. The house has been taken out of use, and her demolishment is in planning. Though, a visit on the house together with Rijkswaterstaat, the Province of South Holland and Stichting Brugwachtershuisjes gave me the information that the house probably would stay, except the bridge may be renewed.
The houses are especially important because of their historic architecture and situational value as a valuable representative for the concrete post-war public works architecture. The materials used and the associated layout is characteristic for the construction time.
It is an example of the new infrastructure provision in the 60 city redevelopment. The bridge keeper’s house is iconic and rare in appearance as a forerunner of purely utilitarian design at later bridges.[20]
In the literature we can find a theory called the Two Networks Strategy, that explains us how water structures can work as carrying backbones of the urban environment. The method tells us about what principles we can use and what the potentials are for a symbiosis between these two in the large scale.

In the sketches on this page an illustration is made of the potential that these houses carry as small buildings that provide for the needs of the neighbourhood.

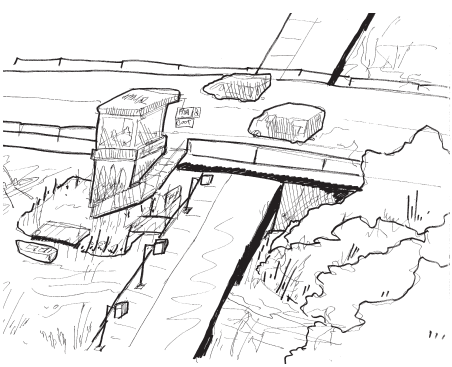
20 Geschiedenis van binnenvaart en vaarwegen | 5 October 2010, Rijkwaterstaat



Sketch 12: *Carrying potential such as exhibition space.*



Sketch 13: *Carrying potential such as management of nature.*



Sketch 14: *Carrying potential such as connecting scales.*

Figure 39a, b & c. *Images of bridges and their surroundings. Image by author.*

a. Upper image: Interior of the Hoflandbrug, Leiden. The space has a 360 view on its environment.

b. Middle image: Reineveldbrug, Delft. In this panorama the unused space is visible.

c. Lower image: People in movement at the Koepoortbrug, Delft. The bridge is about to open, and about to close for the water traffic.

Figure 40a, b & c. *Images of bridges and their surroundings. Image by author.*

Figure 41. Illustration of a trekschuit and its surrounding theater. Made by Anton Pieck, 1895-1987

CHAPTER II

THEORY & METHOD

Figure 42. *Cross sections of water and roads. Image by author.*

In 'Places of Flow' the meaning of the traffic intersection as a transitional place between fast and slow flows is researched. Here for a method is found that helps us understand how we need to connect fields by giving opportunities for flows and actors to exchange. Triangulation and the concept of field, frame and flow make us understand how these processes that take place on he small scale, can be created.

In 'Massive Small', an urban development theory is found that helps us to combine the stakes of big and small scale, by providing us with three simple facets: simple rules, providing conditions and open leadership.

Finally, a more practical way is found of how we need to embed these ideas into reality, and what is needed to provide this elements. We search for a way to make people connect and interact with their environments in Inviting Participation.

In what way do we include people to a different theme of public space and what actions are necessary to create a white canvas that also inspires others?
The outcome of this research brings us to the schedule of requirements, which plays as a base in the conceptualisation and spatial design of the project.

II.I INTER-SECTING FLOWSCAPES WITH PLACES

Provided with a framework, the step towards the concept and its design can be made. The Flowscapes[21] concept gives a set of principles typical for urban landscape infrastructure design and suggests three potential fields of operation: transport-, green- and water-landscape infrastructures. The two network strategy looks how these structures can work together to carry the urban landscape and creates conditions for multi-functional environments of synergy.

21 The 'Flowscapes' concept was developed for a comprehensive way to communicate the interrelated different pillars in the Landscape Architecture Graduation Studio at the Faculty of Architecture and the Built Environment, Delft University of
Technology The Netherlands (Nijhuis & Jauslin, 2013).

Figure 43. *The start of Ablasserdam. A city like Rotterdam developed likewise. Image from Maritime Museum, 2016.*

Combined, the space of fast flow associates with the more functional and regional focused movements, and can be compared with the (water) traffic network or transportation infrastructure from the Flowscapes theory. The space of slow flow is associated with the human scale, leisure and less intense systems of movement: this can be set along with the green infrastructure, as well as the water drainage movement infrastructure. The place of overlap, can be considered as the space of place or flow-place. In this area, the landscape designer has to design a spatial design that provides actors and flows to create synergy and transition. The residue of the different Flowscapes typologies remains at this spot, and creates the opportunity for green, water, and transport to influence each other.

These places are the vital points that illuminate networks that can carry structures of the landscape. Design solutions lay in the tactile landscape architectonic detailing of places, sufficient ability to design with proportions and an understanding of transitional areas, as to make these environments stand out and compete to the urban world of speed and visuality.

The crosspoint of two different networks could be compared with two people that cross in a field. When they don't greet, they don't meet, there is no exchange of information, no opportunities for new events. How can we provide that these 'persons' have the opportunity to benefit from each other? To find a way to carry the urban landscape is essential, because understanding the environment is a vital part of human well-being. Next to direct human benefits, it is of great concern to integrate the spatial environment with natural and functional aspects in a qualitative way, for economical, ecological and cultural reasons.

In this essay, the potential of infrastructure intersections as vital element in the backbone of the urban landscape, is explored. Approaches for perceiving infrastructures as key elements in the landscape are elaborated. The focus lays on the fact that infrastructures influence there surroundings, what often is seen as an obstruction, can actually be the

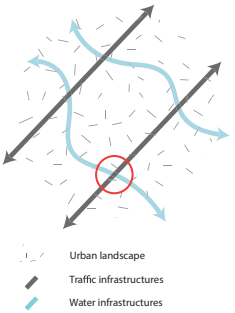
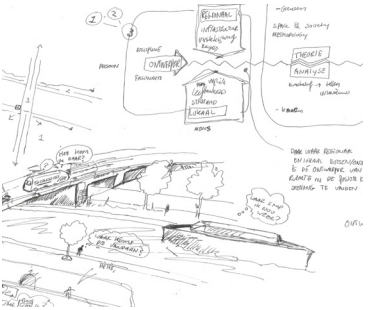


Figure 44. *Flowscapes intersections. The situation at the intersection becomes an interrelation of different flow typologies, seen as an landscape on its own (author's work, 2015)*



Sketch 15a: *Connecting infrastructures.*

potential. Finally, a strategy to use these locations as starting points to illuminate the carrying structures of the landscape, is given. Design solutions lay in the tactile detailing of places, as to compete to speed and visuality with human scale.

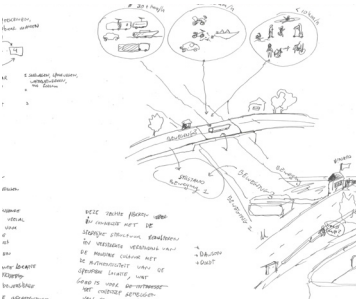
SPACES OF FLOW

The Flowscapes concept perceives infrastructures more than a connection from A to B. The term does consider the infrastructure as a type of space with its own meaning. If a structure is a constellation of dots connected by lines, the infrastructure is the kind of relationships that these lines and dots form. The Flowscapes, can be considered as the third dimension of the structure. It considers the place of movement as a space on its own.

In 'Urban landscape infrastructures' S. Nijhuis and D. Jauslin[22] explore the complexity of the urban landscape infrastructure as the Flowscapes. 'Urban landscape infrastructures facilitate and frame flows of people, living organisms, materials and information. Urban landscape infrastructures are not only support structures that direct, facilitate and create conditions for urban development, but also have spatial, ecological and socio-cultural qualities themselves' (Nijhuis, 2015, p. 24).

The work investigates the meaning of infrastructures as more than functional, as a design concept to provide systems that can grow along with the consistency of infrastructures. Systems that the landscape architect is able to understand and connect with the direct environment. In this way these design have the possibility to have a great effect on the environment. The way of looking at infrastructure systems as landscape, gives the notion of the landscape as an entity - the infrastructure becomes the object and the landscape is defined by the influence of the flow and its environment. Vice versa, the way of looking at the landscape as infrastructure, sees the landscape as an operative field that defines and sustains the urban development. The interrelation of these two approaches gives

22 Nijhuis, S., & Jauslin, D., (2015). Urban landscape infrastructures. Designing operative landscape structures for the built environment. Research In Urbanism Series, 3(1), 13-34. doi:10.7480/rius.3.874



Sketch 15b: *Connecting infrastructures.*

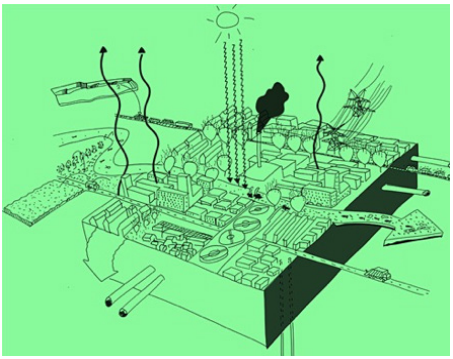


Figure 45*. Infrastructure as a landscape. Source: symposium of urban by Nature, Simons, D (2015)*

us the understanding of what the Flowscapes means. The Flowscapes concept gives a set of principles typical for urban landscape infrastructure design and suggests three potential fields of operation: transport, green and water landscape infrastructure.

Transportation infrastructures are the technical systems that give space for transportation, energy, waste treatment and communication traffic. It includes all networks that are made by vehicles, but also pipelines and power lines are important elements. Of course these networks are a blend of different values in technical, aesthetic and social degrees. Green infrastructures are Flowscapes that provide spaces for the natural ecosystem, while they also compose benefits for humans in social, economic and aesthetic ways. Green spaces can work as networks that give structure to the metropolitan area, where nature development, leisure, urban agriculture and cultural heritage acts. The water infrastructures are the systems that work for the management control of rivers, coasts and inland water systems that work with the benefits of water supply, aquatic nature development and all kinds of modifications in the sewage, collection or disposal of water.

The movable bridge often consists of all three of these types of Flowscapes, which makes the understanding of this place very complex. Instead of choosing one of the types, is it possible to find a strategy that focuses on the link between these networks? To create a new kind of approach, that directs us towards the link between the three kinds of Flowscapes, how they can work together, it is necessary to merge the Flowscapes view with another framework.

So, the Flowscapes is a combination of looking at infrastructures both as vital organs for its surrounding, as the way it forms an organism with its surrounding elements. Looking at infrastructures as the potential carrying bones of complex spaces, Sybrand Tjalingii (2015)[23] created the two networks model

23 Tjallingii, S., (2015). Planning with water and traffic networks. Carrying structures of the urban landscape. Research In Urbanism Series, 3(1), 57-80. doi:10.7480/rius.3.832

Figure 46. *Image of Rotterdam: the urban layer and the blue infrastructure.*

that considers the combination of water and traffic networks as the carrying structure for urban landscapes. He finds at least three fields of synergy between activities that ask for carrying structures. From area, flow to actor. The area perspective gives the context and considers the activities that take form by spatial composition and typology. The flow perspective directs to the activities that relate to flows passing trough these areas, while the actor perspective focuses on what human activities and plans are involved.

The two networks create conditions for multi-functional environments of synergy. The fast lane is the competitive profit-oriented zone where efficient production comes first. The traffic network is the carrier. This can be connected to the transport landscape that is elaborated before. The slow lane is the co-operation based non-profit oriented zone where water safety and quality, landscape and heritage, biodiversity, recreation and local food production are brought together. Here, the water network based on the drainage pattern is the carrier. This can refer to the green infrastructure Flowscapes.

What is interesting is where the different typologies of Flowscapes cross. The social aspect of slow lane and fast lane is based on understanding “how vital it is for a town to give people both intense activity and deep and satisfying quiet” (Alexander et al., 1977)[24]. This is the contrast the city has to offer its citizens. In general terms the slow lane environment asks for landscape ecology that can work on the basis of the ecology of diversity. Activities support landscape diversity and even urban agriculture ultimately serves landscape diversity. The fast lane landscape, on the other hand, supports the efficient productivity of activities. This includes the industrial ecology of recycling, waste treatment and waste prevention strategies. From a planning perspective the slow lane environment requires for strategies of co-operation and key involvement from non-profit organisations, both private and public. In the fast lane,

24 Alexander, C., S. Ishikawa & M. Silverstein, (1977). A Pattern Language. New York, Oxford University Press

Figure 47. *The green infrastructure.*

Figure 48. *The gray infrastructure.*

strategies for competition are the driving force. There can be no fence between the two worlds of course. They need each other and should be planned as a polarity of magnetic fields that prevent conflicts and support a synergy of activities (Tjallingii, 2015).

We can look at infrastructures as landscape themselves, by their typology and use. They influence their environment. The flows can be divided in three groups: transport, green and water-flows. But where different flows cross each other, something interesting happens: here is an exchange of information. The two network strategy of Tjallingii anticipates on the high potential for synergy that two different kinds of networks can provide. But these networks are basically focused on how they can carry certain areas in the urban landscape.

Where these networks come together, and are able to exchange information to each other. So in order to look at the two networks strategy in Flowscapes perspective, it is important to find the qualities of the types of Flowscapes, and how they can be important factors in the composition of a space of place or flow-place (figure 4).

The different types of infrastructures and flows can be divided in three groups at their intersection, when we look at the type of movement as the basement: the fast Flowscapes, the slow Flowscapes and the Flowscapes overlap, the field that is influenced by both infrastructures and is determined by their similarities and differences. This place thus is a (social) meeting point - for similar and different types of areas, flows and actors.

The space of fast flow associates with the more functional and regional focused movements, and can be compared with the traffic network or transportation infrastructure from the Flowscapes theory. The space of slow flow is associated with the human scale, leisure and less intense systems of movement: this can be set along with the green infrastructure, as well as the water infrastructure. The place of overlap, can be considered as the flow-place. On this particular spot, the landscape designer has to provide a spatial composition that enables actors and flows to

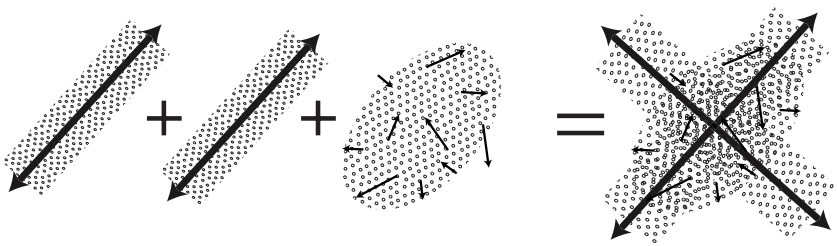


Figure 49. *Flowscapes intersections. The situation at the intersection becomes an interrelation of different flow typologies, seen as an landscape on its own. Image by author.*

synergise. At this place, the sediment of transport, green and water Flowscapes remains- and creates opportunities to develop along the other infrastructure type.

INTERSECTIONS AS CONNECTORS

If we look at the map of the Randstad, where bridges in the Netherlands are marked, the strong correlation between roads and water infrastructures becomes visible (figure 31). Considered that we found a strategy for the cooperation of different networks by providing a place, it suffices to place this idea in a bigger perspective. The idea to use points to articulate lines, that give structure to a field, can also be found in Parc de la Villette by Bernard Tschumi . The project involved the design and construction of over 25 buildings, promenades, covered walkways, bridges, and landscaped gardens. A system of dispersed "points"—red steel follies that support different cultural and leisure activities—is superimposed on a system of lines that emphasizes movement through the park.

It is possible to overlap the earlier imposed flow-flow connection by creating places, next to the strategy of points, lines and fields that we can subtract from Bernard Tschumi's plan. The different lines of both structures create spots of high intensity of action and reaction.

To connect these Flowscapes, an overlap of slow Flowscape in both fast and water Flowscape is desired: the flow-place. Common users of both infrastructure types like pedestrians, bikers should be able to easily relate and change to both infrastructures and experience the environment, the infrastructure as an landscape. The particular users of roads and water, cars and boats, must be able to relate to this created area to enable interaction. From this perspective, the design of the place of flow becomes very vital, and from this point of view, we can find an approach to define the character of these places. In order to give a brief understanding of what the core of the design objective is, we look at the properties of different scales the interventions take place: the existing regional, becoming more hard to understand for the individual. And on the other

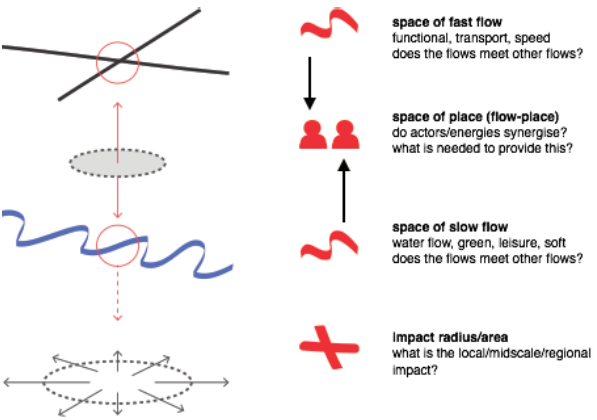


Figure 50. *Spaces of flow can be connected by creating interaction between the actors of these spaces. The place of stay, is there where people can meet. Image by author.*

hand the local, undesigned and becoming disembodied from its context. Between two different worlds an transitional area is desired.

To return to the gateways of personal experiences in relation to the understanding of a broader knowledge, we can refer to the theory of the minimal intervention. For this concept Lassus experimented on a red tulip. He added a white narrow strip of paper, that he putted gently inside of the tulip's goblet, without touching. The effect, is that the color of the flower reflects on the white strip of paper in the form of a gradient. Another element is subtracted from the flower: we get a glimpse of another dimension that makes the tulip what it is. The information of only the gradient on the strip informs us about the colour, but also about the amount of colour that is reflected, the deeper the strip is in the goblet. Even after removing the strip, the notion of the tulip and the paper is different: both are experienced more and embedded stronger in our minds by a broader connection of ideas. In this case, the personal experiences by all senses on a specific flow-place, can function as the incubator of the regional and visual understanding in the urban landscape.

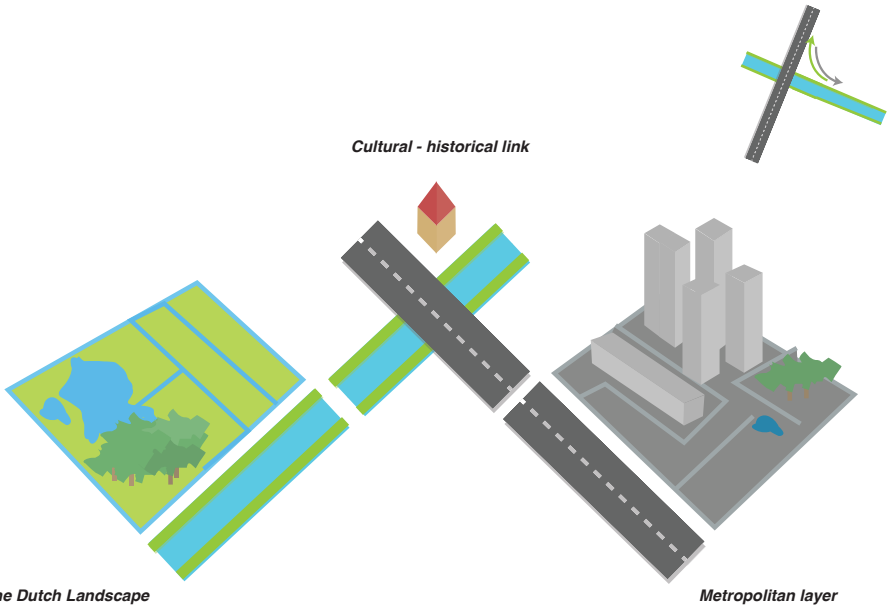


Figure 51. *Concept diagram of how the city can be implemented into the landscape by associating the fast lane with urbanisation, and the slow lane by its history. Image by author.*

CONCLUSION

The intersection is an complex typological encounter of movements. With the understanding of infrastructures as more than lines from A to B, the infrastructure can be interpreted as a landscape, just as a landscape can be interpreted as an infrastructure. This approach, combined with the idea that different kinds of infrastructure help us to create a carrying body of the urban landscape by linking different elements and scales with each other, gives an approach that works with minimal interventions, giving a big impact. The importance of these minimal interventions is the way they will work together: in this way the points can articulate a line, that will become a structure, carrying the homogeneous field of the urban landscape. Where landscape architectonic solutions give contact, it is the understanding of what way to design with proportions of human scale, social connection and transitions to provide landscapes with emphasis on the tactile

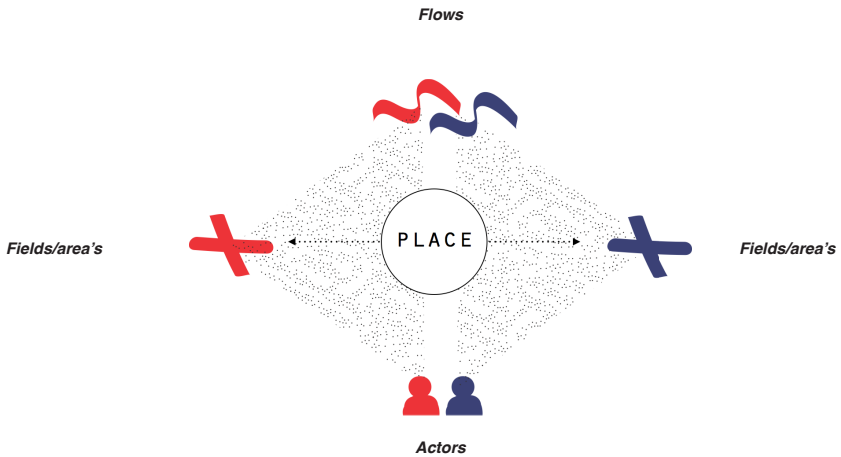
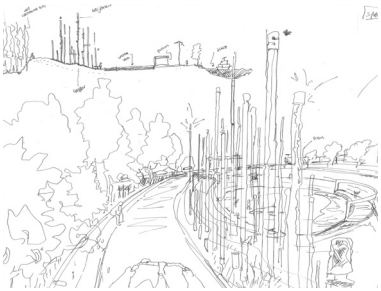


Figure 52. *Synergy between different infrastructures goes by connecting flows and their actors. Image by author.*

scale. This, to enable flow-places to stand out and compete with a landscape defined by visualities and flows. The flow-place is a concept born out the idea that space of interaction of different flows can not only be seen as a landscape which man moves trough, but finds its highest concentration on the point of encounters. By that, it becomes a vital point of intervention. It is the designers virtue to provide landscapes with scales that make us relate with different aspects of our environment, from local to regional.

The place of infrastructural intersections is vital for creating portals of contact between scales, since they form a diverse tangent of flows in the urban landscape. Tactility and human scale in flow-places will articulate the points that embody the users regional connectivity. The designer is asked to shape this accessible environment where synergy and activism on the spot are encouraged.



Sketch 16: *Study of the transitional zones between infrastructures.*

II.II INVITING SPACES AND SUCCESSFUL PUBLIC PLACES

What is an inviting space? What architectonic frameworks can we find for this?

In this study a research towards the constellation of public space is done. The requirements for the space to become inviting, open, interesting and thus 'successful' are searched in different references that played a vital role in the theories of public space and architecture.
"The street is the river of life for the city. We come here not to escape them, but to partake them."
W. Whyte[25]

It is explained how the fast lane and the slow lane together can be used as carrying structures of the urban landscape. Then, a research is done how the location of 'the flow-place' means to be an important location in the embedding of the water structure in the metropolitan landscape. The intersection of different infrastructures is a vital emitter of

25 Whyte, W. (1980), The Social Life of Small Urban Spaces, Washington: The Conservation Foundation.

Sketch 17: *Study of the transitional zones between infrastructures.*

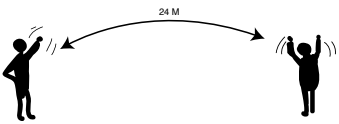


Figure 53*. The distance, that two persons can recognize each others face clearly, is until 24 meters. Image by author.*

different information.

Many places in our spatial environment seem to be unused and hosted with a spirit of unease. Is this just unenviable, or could small interventions make this space a contribution to the happiness of all users in its environment? Some places are too big, too confusing and too scary. What kind of spatial solutions can we find for this problematic?

MANAGEABLE SCALE

Problems in the spatial environment are often of such size and wickedness that one does not even know where to begin. The magnitude of many situations lead to arrangements that reduce the possibility of participation. Reducing the scale or the size of the operation turns out to be an important step in helping things make sense and in making participation possible. This often takes the form of decentralisation, a procedure that may apple to entail a duplication of effort. Not just one body of decision making, but rather on a lower level of the organisation, decisions should be made.

In his interesting book, 'Small is beautiful', Schumacher (1973)[26] discusses the advantages of decentralisation in the context of aid to less developed countries. He suggest that many governments might benefit from greater respect for local strengths and local concerns.

Many public spaces suffer from being too big, and too wide open. These places do not have the visual complexity necessary to break the larger space down into more comfortable rooms that feel human in scale.

In any redevelopment area, designers are encouraged to develop spaces that are comfortable and human in scale. Large barren spaces consisting of redundant patterns or monotonous forms are strongly discouraged.

Several noted urban designers have developed the following observations regarding open space dimensions:

26 Schumacher, E. F. (1973). Small is beautiful: Economics as if people mattered. New York: Harper & Row.

- Kevin Lynch suggested that a dimension of 12 meters appears intimate in scale, up to 24 meters is still a pleasant human scale, and that most of the successful enclosed squares in the past have not exceeded 140 meters in the smaller dimension[27].
- Jan Gehl proposed a maximum dimension for a public space of 70 to 100 meters, as this is the maximum distance for being able to see events[28].
- The maximum distance for seeing facial expressions (often considered a measurement of human scale) is 20 to 24 meters.[29]

APPARENT STRUCTURES

Some problems are not so much difficulties of magnitude as difficulties of legibility. If one does know the questions that needs to be asked, one is less likely to find the answer. Many contemporary problems make it difficult for the citizens to even to know that there might be alternatives. The concept of 'making the city observable' captures the essence of these problems. Maps that defy being understood, organisation charts that make it impossible to figure out what the corporate office might be, transportation systems that are functionally inaccessible to their potential clients. There are all comment misfortunes that inhibit participation. Such inadvertent obstacles foster a sense of helplessness an stifle comprehension of the environment.

27 Lynch, K. (1971), Site Planning, Cambridge, MA: The MIT Press

28 Gehl, (1987/2011), Life Between Buildings: Using Public Space J Washington - Covelo - London: Island Press, ISBN: 978-1597268271

29 Found in the Report for PPS, Project for Public Spaces, an online available compendium. http://www.pps.org/reference/grplacefeat/ summoned on 20/10/2015

Children books recognise that the presentation of the material makes a difference in comprehension. But strange as it may seem , adults are assumed not to need aids to imagery and comprehension. Authors of adults works seem to believe that their own hard earned cognitive maps can indeed be transplanted whole into the mind of their readers.

So, one of the things that are wrong with our environment is the widespread sense of non-comprehension and helplessness. So, we have to put spaces in such a manner, that human environments will be formed with their right spatial elements, with the right proportions and the right boundaries.

DUALISM OF FEAR & SAFETY

Though it is not just a good clearness of a space that makes something interesting. We as humans always need to be in the middle of something, in a paradox, a dualism. For example, the philosopher Immanuel Kant[30] states, that we can look at nature as the sublime. Therefore, the landscape has to be experienced as a source of fear. We can feel fear, without experiencing anxiety, as the landscape turns into a depiction of ourselves. At this point it is our desire to offer small resistance and recognise to ourselves that this resistance is very low. It is impossible to get satisfaction from fear, when it is maintained forever. The pleasant feeling of

30 Immanuel Kant, Critique of the Power of Judgment, Edited by Paul Guyer, translated by Paul Guyer and Eric Mathews, Cambridge and New York: Cambridge University Press, 2000. The Cambridge Edition of the Works of Immanuel Kant. ISBN 0-521-34447-6

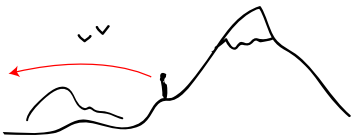
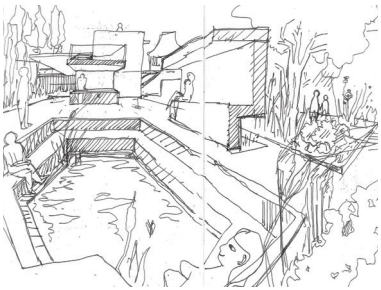


Figure 54. *Humans are dwellers of transitional borders. We are safe and comfortable to be able to choose where to go. Image by author.*



Sketch 18: *Study of sitting zones and safe feeling area's.*

joy finds its source in the acknowledgement of the cessation of an uneasiness. This joy is dependent on the release from the danger. Not only natural, but also human structures ought to raise this feeling: from pyramids, churches to big Manhattan skyscrapers as well as metropolitan landscapes.

With ourselves placed in a secure position, we seem to experience the appearance of these powers way more attractive, because of their frightening way. From this moment we are ready to call them sublime: they arise our souls above the vulgar commonplace, and discover a resistance within our inner selves that exists of a completely different nature. This gives mankind the courage to compete with the seeming omnipotence of nature. It gives the feeling of existence, the feeling having place in something of significant importance.

So its more than just comprehension, management and appearance that makes a place interesting, but we also benefit from places that are in between security and insecurity: this brings us closer to ourselves, and makes us able to position ourselves, in what we are.

A COMPREHENSIBLE ENVIRONMENT

To find how it is possible to encourage people to participate in a certain space or plan, it is wise not to follow my own assumptions, but it is strongly recommended to enrich myself with existing work. In the book 'Humanscapes' Kaplan & Kaplan (1978)[31], the final chapter dedicates itself to the topic of 'making participation possible'. People, they argue, are capable and effective when dealing with something they can comprehend. They also respond well to challenge. They benefit greatly from being needed for something, and conversely, the sense of being surplus must be one of the most corrosive to an individual's identity and self-esteem. There are innumerable opportunities for people to participate in processes and decisions that

31 Kaplan, R. & Kaplan, S. (1987) Humanscape: Environments for People, Edition 86-89

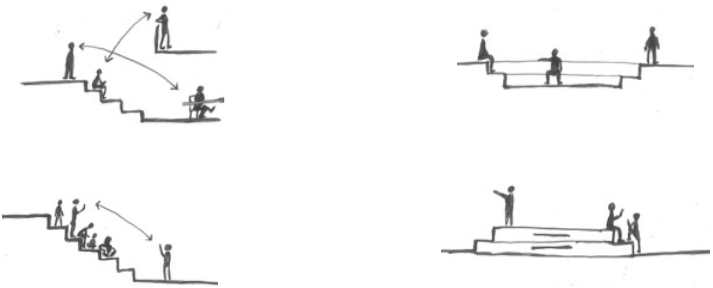


Figure 55. *Transitional zones can be created by differences in height. Images by author. Based on Herzberger (2005).*

influence their lives.

How does one enhance peoples ability to make sense? The experts have always been happy to tell people that what we need to do, is to give hem the cognitive maps they need.

But cognitive map transplants have a high rejection rate. The process of accruing knowledge, of developing an internal model, cannot be related to someone else. Many factors: physical, social, and informational influence the rate. There are other ways, however of presenting information that greatly facilitate the process. As was written before, the role of the spatial designer is to bring translate the information into a spatial form. What virtues can bring us closer to do so?

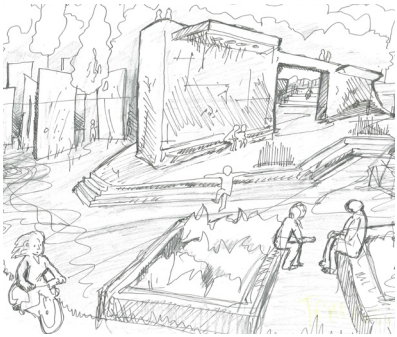
In the book 'The Architecture of Happiness' the philosopher Alain de Botton (2006, pp 107-220)[32] does research about design and the happiness of humanity. In the end of this chapter, he concludes that it is impossible to built something that pleases everyone. There is no silver lining, and what is beautiful never stays the same. But he does give five virtues: *Order, Harmony, Elegance, Consistency and Self-Knowledge*. These principles give ways to talk about the revealing layers and relationships between the topic and the context, in space and time.

These virtues also find their source in environmental psychology. De Botton writes that these virtues make the user able to understand their environment in a logic and ordered manner. This gives peace to the user. Design can communicate by raising associations (Botton, 2006 p. 112). These associations make a place more recognisable and more complete, so it is better to be grasped and remembered by the mind. Botton does not notice whether these associations are only visual or that also the other senses are included.

Canter (1974, pp. 110-113)[33] concludes that physical space is generally

32 De Boton, B. A. (2006). The architecture of happiness. Toronto: McClelland & Stewart.

33 Canter, D. V., & In Lee, T. (1974). Psychology and the built environment. London: Architectural Press.



Sketch 19: *Study of sitting places and height differences.*

Sketch 20: *Study of transition zones.*

used by people to create a comfortable position towards others. This is the value that is putted in the way the individual can have a good sight over others, but feel safely enclosed themselves so they can easily move themselves towards or away from the happenings.

We can conclude from this that a more conscious way of design of public space in a social and spatial way, it is possible to make easier to understand spaces that are more pleasurable for the user.

The opinion of Sommer (1969, p. 87)[34] is that in a lot of places there is almost no real conscious thought made about the functions of use by humans in the public space. He states that there are too little places where people can hide themselves. Buildings have too much power in the public space, while the power of a building is brought by its good public space, since that is the space that belongs to everyone.

DWELLERS OF BORDERS, TRANSITIONAL SPACES

In The Social Life of Small Urban Spaces, Whyte explains that we are indeed 'species of borders'. We descend from ape-like creatures that like to stay at the border of the field, in the forest, in the border of the dark, always being able to choose between different environments.

'People come where people are', is an old Scandinavian saying (Gehl, 2006, p. 25)[35]. But where is the place in public space where the people gather, and how do these borders manifest? Herman Herzberger (2005, pp. 32-43)[36] notes the importance of transition and linking between places that hold a different amount of 'publicness'. He states that this element is an import factor for social activity. The meeting finds place on the place where the person gets an identity, that is accessible for everyone and in this

34 Sommer, R. (1969). Personal space; the behavioral basis of design. Englewood Cliffs, N.J: Prentice-Hall.

35 Gehl, (1987/2011), Life Between Buildings: Using Public Space J Washington - Covelo - London: Island Press, ISBN: 978-1597268271

36 Hertzberger, H. (2005). Lessons for students in architecture. Rotterdam: 010 Publishers.

way, naturally open for everyone. For this to happen, he states that not a strong border, but an overlapping connection between the different worlds has to be made.

In Hajer en Reijndorp (2001)[37] we can find a distinction between public space and public domain. The public space is a physical area, that is permanently open. The public domain is the place where people of different backgrounds can come together, and the area that comes to existence when they gather. Because of this they see the design of public space is not as a design of different slaces, but a conscious way of linking their relationships. This link brings confrontation or persuasion. The authors underline the importance of this kind of space. The design of transition spaces and borders is the core of every design problem, because in this way the context of the area gets the possibility to play its important role (Hajer & Reijndorp, 2001, pp. 134-136).

This public domain is to be defined in three types of activity: necessary activities, optional activities and social activities. Social activities can be seen as the rest activities that take form by the other activities. (Gehl, 2006, pp. 9-14). Due to Hopper (2007)[38] the human scale is defined by a great notion of proportions in relation to the human body, as well as elements that give us the ability to interact.

Herman Herzberger (2005, pp. 32-43) notes the importance of transition and linking between places. He states that this element is an import factor for social activity. Social activity can be seen as the motor of synergy, since it is in this condition that exchange between entities is enabled. He states that the difference of steps and heights of the floor level active the floors as working area.

In Space and Learning, Herzberger (2008)[39] called the street and the square the archetypical places that bring people together in public space. They can be seen as heart and vein. Squares create a centrality, while streets, however their importance, are less likely to step to the foreground. Streets belong to daily life, while special events take place at squares.

A good example of this, is the central square of the Italian mountain village Liguria, which seems to be an extrusion of rocks, created by the small houses that are packed together. The surrounding streets pierce trough the clusters of housing, and come together at the spot. The daily activities of the people that live in this village, cross at this spot. Small shops and café's are here. Height differences find place by the creating of terraces on the surrounding walls.

ARTICULATION BY CHANGES IN ELEVATION

Changes in elevation can have a significant psychological impact on the attractiveness of a space. Many people enjoy the sensation that viewing public activities from a height provides. Perhaps it is the anonymity they feel while still participating in a very public urban

37 Hajer, M. & Reijndorp, A. In search of new public domain : analysis and strategy Rotterdam : NAi Publishers

38 Hopper, L.J., (2007). Landscape Architectural Graphic Standards. New York, John Wiley & Sons

39 Hertzberger, H. (2008). Space and learning: Lessons in architecture 3. Rotterdam: 010 Publishers.

Figure 56. *Humans feel more safe and encouraged for interaction when they have something above their heads to protect them. Also, creating an interactive environment that encourages people to move object, gives them the feeling their power is significant to the place. Images by Author.*

experience.

Changes in elevation can also help to separate activities like seating from pedestrian circulation, and can help to break larger spaces down into human scaled rooms. William Whyte (1980) notes that small grade changes into public spaces seemed to draw users in.

Radical changes become problematic when they are so significant that the space is no longer visible from the street. Sunken plazas have proven to be difficult to attract people to. Places that are sunken (40 cm to 1 meter) can also deter access to them, particularly when walls and hedges around them limit views to the inside.

Generally, modest grade changes of 25 to 40 centimetres in plazas and squares are encouraged as long as accessible routes are provided to each level change, and as long as the change is handled in a gracious manner. “Gracious manner” means small riser heights for steps around 10 centimetres, coupled with wide treads of at least 30 centimetres. This can also be found in the principles of human measure design in the book ‘de menselijke maat’ by A.J.H. Haak (2005)[40].

Herman Herzberger (2008) enlightens us in his book about the spatial design for learning environments. He deepens out on the importance of articulation of spaces and transitional zones:

‘Spaces should be articulated in such a way, that places will be formed that on the one hand one knows how to provide the right space, and on the other hand one knows how to restrict this space its boundaries in right relation of patterns. The core of spatial articulation is creating the conditions for use of singular big groups, as well as the use for multiple, small groups. The more articulation and division, the more the centre of attention can be existent and how more individualising its effect: that means that on the same time, there can be more activities, independent of each other.’

In the school ‘De Koperwiek’, a deepened square forms the

40 Haak, A.J.H. (2005), De Menselijke Maat, Delft, Delft University Press

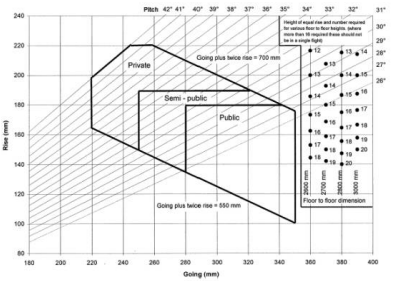


Figure 57. *Transitional zones and their composition depend on the scale of use: public stairs are less steep than private stairs. Image from Haak, A.J.H. (2005), De Menselijke Maat, Delft, Delft University Press*

USES & ACTIVITIES

The space is occupied reasonably consistently.
It is used by a wide range of age groups.
There are a variety of activities to participate in (walking, eating, relaxing, reading, active recreation, games).
It is obvious that the space is managed and cared for.
Successful places have a wide variety of activities

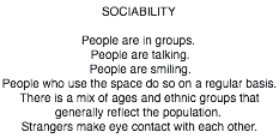
middle area of the hall, and because of its clear function of this field, the kids are not necessarily urged to walk trough it randomly. The fragile project that are exhibited on this field are respected. This is an example of articulation of a space, what makes people understand its meaning.

The kind of environment I search for, a creative entrepreneurial space, and where groups and individuals for themselves can function, asks for as much as possible places that are divided in such way so people can focus on their own work, as well as they have a view over each others work, to stimulate interest in each other to create ideas and inspiration. The importance of view on the spaces is here highlighted.

There are several spatial means that can create independent places of interest and inspiration. They all focus on the right form of spatial articulation, that not only focus on capacity, as well as the balance between group-feeling and individual actions. Herzberger (2008) gives several spatial elements that we need to give our respect, and give conscious meaning in our designs. The ones below are chosen to be tools that help us understand the space, as well give us the security to seclude or exclude ourselves:

-By accenting the difference between long, street like views and spaces that form rooms.
- By making places that are outside the route, even if these places make the route change their way
- By creating small walls that merely create an visual and acoustic barrier
- By creating different heights, like small pits and island in the floor
- By making differences in heights that give a different feeling: higher are more related to the public, while lower places focus more on intimacy and feel more protected
- By the creation of sitting stairs, that everywhere and always attract people for the same level of attention.
- By being aware of sight lines created by the way space is organised
- By rationing the admission of light. Light attracts people an encourages them to

socialise.
-By profiling clear contrasts between light and dark, for example by rationing local concentration of artificial light.
- By rationing the sound in a space, acoustics.
- Juxtaposing different materials for purposes of articulation and place identification. Materials arouse particular associations that can influence how places are used. Wooden steps will sooner bring to mind a table than would stone steps do.



SUCCESSFUL PUBLIC PLACES

A report of the PPS[41], Project for Public Spaces, an organisation that found its origin in William Whyte's ideas, gives instructions of how better public spaces are composed. That means spaces that are used more by people, where people feel more comfortable to take part in a collective. They give a diagram where the designer of the public space can check, the actual place or the design is able to be rated as a successful public places.

Sociability

Successful places have a wide variety of ages and ethnic groups. They are consciously designed to foster interaction between people. A simple example would be ensuring that the way seating is arranged is conducive to conversation. Another example would be providing community garden space within a mini-park. The gardens give strangers with similar interests something to talk about. This is what Canter (1974, pp. 110-113) also concludes: physical space is generally used by people to create a comfortable position towards others.

Comfort and Image

Users must perceive that a place is safe. It should be clean and it should be obvious that it is managed and being cared for. No one likes to come to a place that appears to be forgotten.

Uses and Activities

Successful places have a program established for them that ensures there is a reason to go there, and a reason to come back. The most successful places are intensively scheduled with events de- signed to bring a wide variety of people to them throughout the year. It is

41 PPS was founded in 1975 to expand on the work of William (Holly) Whyte, author of The Social Life of Small Urban Spaces.
PPS founder and president Fred Kent worked as one of Whyte's research assistants on the Street Life Project, conducting observations and film analyses of corporate plazas, urban streets, parks, and other open spaces in New York City. When Kent founded PPS shortly thereafter, he based the organization largely on Whyte's methods and findings. More than anything, Whyte believed in the perseverance and sanctity of public spaces. For him, small urban places are "priceless," and the city street is "the river of life...where we come together." Whyte's ideas are as relevant today as they were over 30 years ago, and perhaps even more so. Source: Wikipedia, summoned on 24/10/2015

important to consider both winter and the summer programs.

Food & Art & Freedom

Food, like no other amenity, draws people to a place. It can be provided by restaurants and cafés, or by temporary stands and carts. Designers of public spaces are encouraged to accommodate places for vending carts, and managers are encouraged to arrange for them to operate. Food attracts people who attract more people. The ultimate effect is that those coming to a small park to eat may also grab an ice cream cone from the shop a couple doors down from the plaza on the way back to the office. In the end, everyone benefits from the higher concentration of users and activity. Moveable seating is strongly encouraged. As William Whyte (1980) noted, "(moveable) chairs enlarge choice: to move into the sun, out of it, to make room for groups, move away from them. The possibility of choice is as important as the exercise of it. If you know you can move if you want to, you feel more comfortable staying put." As much as we prize creativity in cities today, the cultural centres that we've built to celebrate it rarely hit the mark. Culture is born out of human interaction; it therefore cannot exist without people around to enjoy, evaluate, remix, and participate in it. What elements make people comfortable to interact with their environment, so, what makes it possible for creativity to dwell, and what kind of structure should we provide for that?

CONCLUSION & REQUIREMENTS

To create an elaborate conclusion of what elements make people comfortable to interact with their environment, what makes it possible for creativity to dwell, and what kind of structure we should provide for successful public space, we have found the following rules:

First, a place is inviting by its spatial composition. Therefore, the most important part is its visibility from the street. From this point of view, it should be understandable and made of human the scale. This is to give the person a safe feeling of overview and

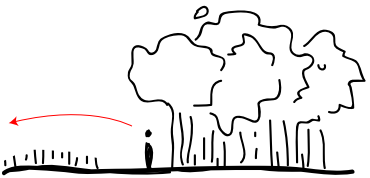


Figure 58. *Humans are dwellers of transitional borders. We are safe and comfortable to be able to choose where to go. Image by author.*

Sketch 21: *Study of places to hide.*

possibility to hide themselves.
Small elevation changes in the space help to create a subtle border. Then, the space should offer the users to feel intimate enough to actively participate in the space on their own, as well as in groups. To make a material space able to provide for the flexible humans, free functions as movable chairs and free zones help to make people capture the space for them selves more.

In this particular case of the bridge:

Vision The place underneath the bridge, and its users must be visible from the street. The place at the street must give a comfortable position towards its view.

Size The size of one square should be at most around 20 meters in length. This is around the distance of one's sight/. The place should create openness, as well as a way to hide.

Borders The articulation of the place can be done in a subtle way by creating different heights of elevation. These transitional spaces should be comfortable for 1 person, as well as useful for a group.

Functions The place should be adaptable to the users. Such as movable chairs can help to give people their own way of creating space. The location needs water and electricity, and light, trash cans and bike racks. Special lockers with functions help the users to play.

Program To attract other people, food and art are great ways to attract people. In the reuse of bridge houses, food and art will be encouraged.

Community An online application is another way to help community start growing, in these modern times.

Sketch 22: *What kind of space is open for everyone, yet feeling safe?*

II.III MAKING PARTICIPA-TION POSSIBLE

How do we participate? How can we create a synergy between top down and bottom up approach?

It is explained how the fast lane and the slow lane together can be used as carrying structures of the urban landscape. Then, a research is done how the location of 'the flow-place' means to be an important location in the embodiment of the water structure in the metropolitan landscape. The intersection of different infrastructures is a vital emitter and exchange point of informations. On this spot, is concluded, a place of stay should be created. How can we invite people to participate in this space and make it possible to have an impact on a greater scale?

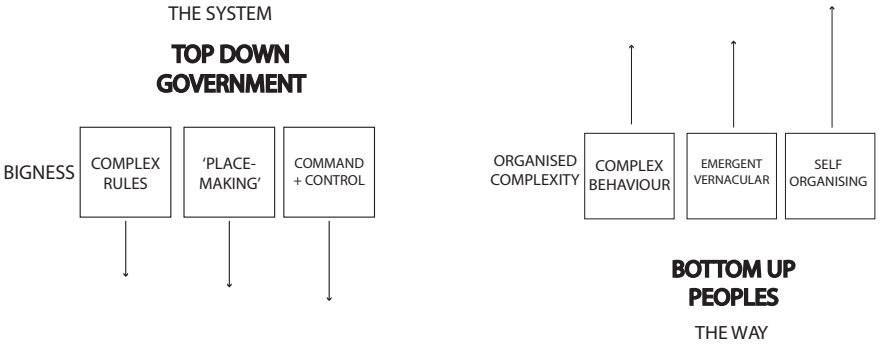


Figure 59. *Top down and bottom do not often seem to reach each other. Image by author.*

The problem with participation in the context of environmental design is an complex issue. It is greeted with a host of a lot of different emotions. Where and when it works well, the emotions are as warm positive as they might be in any effective situation. But unfortunately, this is rarely the case.

In a short interview about the people on the street about empty bridge houses, the citizens often say 'I didn't know about it before you told me', 'No one ever asks us everything' or 'Its too hard for me to make a change alone, so I give up' or 'They will pretend to ask, but didn't want to listen'.
The designers side of the story, goes to a broader spectrum. They might be disenchanted with their attempts to include citizens in the decisions. 'No one listened' 'Its always the same kind of person that opens up, and you don't know what others think'. 'Hardly anyone showed up at the public hearing'.

Others are not sure what is gained by asking people about things they don't know about. You can read often that a 'good designer' is one who can, put himself in the shoes of any client and fill the needs of any group (Jensen, 1974)[42]. I do not share these thoughts, and I think that public space should be made public and social, by encouraging everyone to take actively part in it. So there are two powers working on the making of decisions, that we call 'top down' and ' bottom up'

BETWEEN TOP DOWN & BOTTOM UP

Top down is the way of looking at the world in a, as the term may expect you tot think, way from above. Designs are planned from the notice of a map and a concept, that should be implanted. The models for these plans came of a time of big government and big thinking. There is no real part of the actual implementer in the site itself.
In our top down world, the thinking, models and operating processes we use to plan towns and cities are found to be wanting. They were created at a time of big government. Here, the

42 Modgil, S., & Modgil, C. (1987). Arthur Jensen, consensus and controversy. London: Falmer Press.

rules have become so complex that they are asking for innovation and arresting progressive evolution of successful urbanism. Our 'place-making' models that look to predict and plan every outcome with absolute certainty, determine what we do, forcing us down the narrow corridors of complete compliance. In this world, people cannot be trusted to do the right thing. Do it our way or else! There is no room for experimentation; no room for creativity; and no room to learn!

Firmly nailing things down, we operate our planning system with 'command-and-control' as the watchwords – reactive. restricting and limiting. The unintended consequences of this kind of 'top down' is 'bigness': big sites, big players, big processes…big plans that demand big outcomes.

In the bottom up world, the thinking, models and operating processes that evolve from the activities of many agents, create rules of behaviour that are both liberating and structuring. Here we see how the emergence of a myriad of spontaneous actions by many individuals, all working together, leads to complex behaviour. Things are tried and allowed to fail. We learn and we get better at what we do. The best solutions survive. Regularities form and this leads to creation of an emergent vernacular that is highly adaptive. Self-organisation is the operating process. It is open and connected. In this world people can be trusted to do the right thing. We will work it out! Here individual freedoms are replaced with collective action. This can be called community. The outcome is the organised complexity that we strive for our cities, towns and their neighbourhoods.

THE BEST OF BOTH WORLDS

So 'bottom up' displaces 'top down', or can we find something better? A new form? Bottom up systems display a remarkable ability to innovate in difficult conditions, but top down has the real power to enable. And both are necessary.

As these bottom up processes evolve, community rapidly demands the need for some form of governance. Bottom up needs top down, only just a better and new form of top down. It demands that our complex rules are replaced with simple rules. Our rigidly deterministic place-making models are replaced with condition-making models that lead to more responsive environments. Restrictive command-and-control practices are replaced with permissive enabling leadership that facilitates a greater level of bottom up activity. The new top-down gives the 'light touch'. The consequence of this is an evolved planning, design and delivery system. With this comes a new social contract between government and community to do the right thing.

This combination gives us 'Massive Small' change, the collective power of many small ideas and actions to make a big difference. This is the concept of Smart Urbanism[43]. The following three basic guidelines are given by this organisation to create a better world of receptive governance.

43 Campbell, K. (2011) Massive Small: The Operating Programme For Smart Urbanism.. ISBN: 9780956860002 (0956860001)

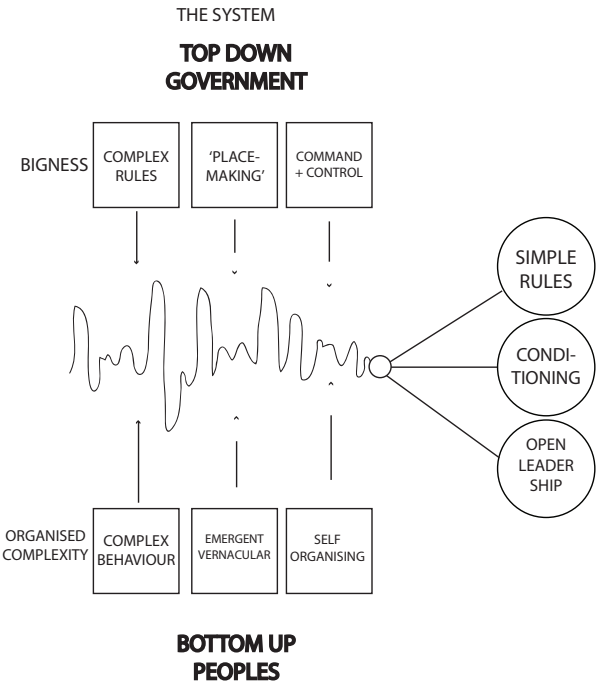


Figure 60. *Kelvin Campbell's methodology of linking Top down with Bottom up: a fruitful combination can be created by the right application of properties: simple rules, conditioning and open leadership Image by author.*

1 FEW SIMPLE RULES

From the understanding of complex systems in life, business, information technology and choice architecture we can extract certain lessons; these are used to derive the simple rules that can be applied to achieving a better urbanism: These rules shape our thinking before it becomes operational. They provide the freedom for multiple actions to emerge.

2 CONDITION MAKING

Moving away from the 'place making' agenda to that of 'condition making', we offer an alternative to our existing prescriptive and legalistic planning system to evolve. Core conditions for urban viability provide the medium essential for places to flourish (see: 'inviting spaces, pages 88 - 99) This creates more responsive environments, allowing a wider range of bottom up responses by the many.

3 ENABLING LEADERSHIP

Open adaptive systems like those of the city are organic rather than mechanistic, and require a completely different mindset to run them: Rather than using the command-and-control model, our new breed of civic leaders must now enable activity that generates the best ideas and outcomes: Continuous strategy and feedback are far more important than detailed planning.

FOUR REQUIREMENTS FOR PARTICIPATORY PLANNING

The success of participation depends, due to Kaplan & Kaplan (1989), on at least four critical requirements. It must be said that there is no adequate way that these are met, nor can these be considered as what the author calls a 'foolproof avenue to success'.

1) The first requirement searchers for *the possibility of genuine impact*. For participatory processes to have its desired effects, the planned environmental change must become in some sense the property of the participants. With the widespread suspicion of officialdom of the establishment, an honest presentation of the extend of possible impact and the ways in which it can have its effect is in order. If there are economic and political uncertainties at issue, these must be shared. People are often willing to take a risk. They can, however, become unruly when what they took to be a promise turns into a possibility.

2) *Adequate sampling of the user population* is the second requirement. This means that the different reactions between people that pass by in a setting, work there, and those who live there are not the same. Without awareness of the discrepancies between people it is unlikely that design solution will consider the different needs of affected groups.

3) The third requirement focusses on the eagerness on the part of some designers to build monuments, to build now and forever, to build at once, and once and for all. Participation, by contrast, gains much by ***gradualism and impermanence.*** There a profound advantages to a growth model, to a provider that is oriented to the mass production of error. This might seem an unreasonable expensive route.

'The city that is not a tree' (Alexander, 1965) relied on gradual evolution and sequential changes. Concern about expenses, and particularly the expense of maintenance, may turn out to be misguided. Maintenance may be an opportunity for the involvement, correction and change. It is a thing that can keep out vandalism, design solutions that rely on such human power may be more human as wall as cost-effective. Most organism depend on a degree of impermanence

4) The final requirement involves the use of a *satisfactory medium.* Participation has relied almost exclusively on verbal interchange. Since, however so much of design concerns the visual and the spatial, alternative media are likely to hold greater promise. But the issue goes behind the need for more extensive use of graphics. It is, after all not that unusual to be surprised by the actual building after having

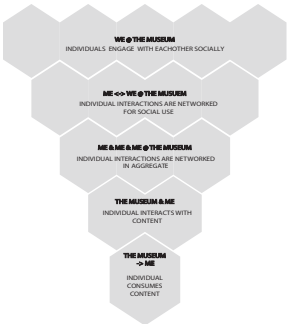
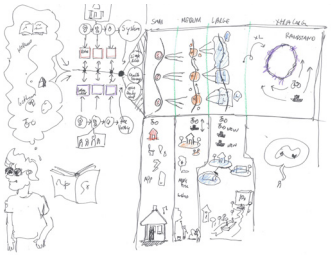


Figure 61. *The Hierarchy of Participation. Based on Simon's method in her book 'The Participatory Museum' Image by author.*



Sketch 23: *Attempt to combine frameworks and visions.*

seen the artistic renditions of the proposed building. Nor is simply a matter of presenting enough detail. As a matter of fact, the detail might lead to misinterpretation.

Ironically, public involvement often is incredibly un-involving. The information is often presented in an un-engaging way. This is one of the reasons gaming procedures have met such

wide acclaim is because they readily involved the participants in the task. But that is not to say that the involving qualities of games cannot be translated to other contexts. In fact. the context of participation it should be far easier to engage the inserts of the effected public. (Kaplan & Kaplan, 1978)

THE HIERARCHY OF SOCIAL PARTICIPATION

Its not only certain conditional requirements that make a participation possible. Its is good to understand the participational approach as a process. As Simon (2003)[44] says in her blog, the truly social interaction has to start with the individual, who start to clime a participatory ladder from a personal entry point. She called it 'Me-to-we' design. She explains the ladder as a hierarchical pyramid. Though it is based on interaction for museums, I think this material is interesting for finding a similar method to define the way to participation.

She was writing on an article for the journal Museums and Social Issues, and tried to found a way to promote civic discourses in musuems. In this, she promotes the argument about the 'hierarchy of social participation'. She believes that, as with basic human needs, also the experience design in all kinds of places occur on many levels, and that is hard to achieve the highest level without fulfilling, or at least understanding those that come before it. One of the impediments to discourse is the fact that designers want to jump straight from individuals interacting with content, to interacting with each other. It's a tall order to

44 Simon, N (2010) The Participatory Museum. Santa Cruz, CA: Museum 2.0

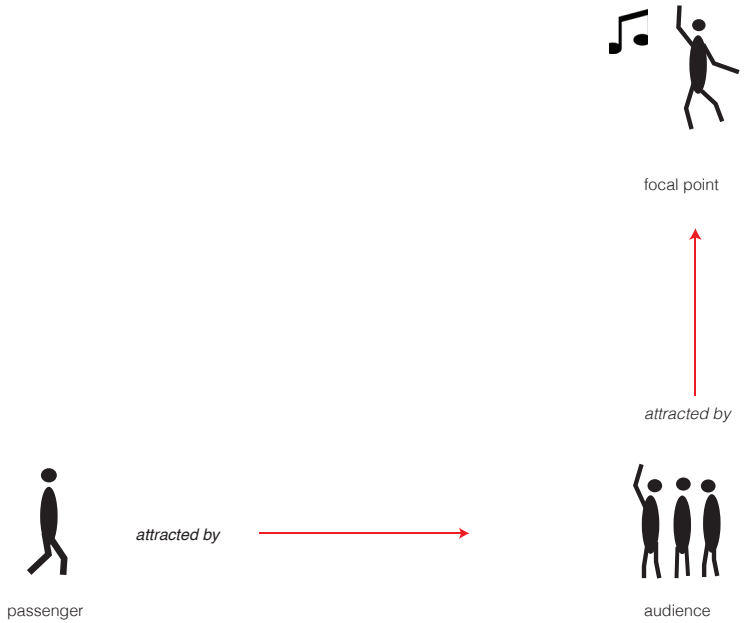


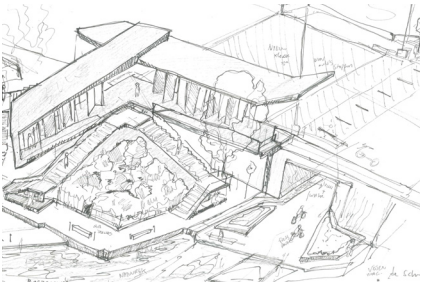
Figure 62. *Triangulation. Whyte[6] .Example of design principles from literature. At last, the connection with other people is thus very important for individuals to create a gathering. First sociability: crowds attract people & encourage social interaction, and The 'shill effect' – if you stand and point at a distant object in a public place, eventually other people will join you to see what you are pointing at Image by author.*

get strangers to talk to each other, let alone have a meaningful discussion. For this, Simon offers the pyramid of hierarchy in social participation.

Level 1: Individual Receives Content
(Museum to Me)
On this level, the content provider or museum delivers content for the user to passively receive. The user looks at an artefact. Watches a video. Listens to a news clip, or read a label. The level of user engagement is self-determined by your interest in the content and your motivation to reflect on it, either singly or with your companions. A successful level 1 experience features content that is meaningful and interesting to viewers. If the visitors are hooked on your content, ground for level 2 is made.

Level 2: Individual Interaction with Content
(Museum with Me)
Most interactive content in museums can be put into this category. The exhibit provides

Sketch 24: *Transitional spaces. Borders defined by height, water.*



Sketch 25: *Eye catcher as triangulation point.*

an opportunity for the user to play with the content. The user presses the button. He drops the balloon. The content may be responsive, but the interactive experience is non-networked; that is, your interactions with the content are not affected by other people's interactions with the content. Again, the level of social engagement is self-determined. A successful level 2 experience builds on 'killer' content (level 1), not interaction for its own sake. The interaction provided enhances the visitor's engagement with the content.

Level 3: Individual, Networked, Interaction with Content (Me & Me & Me & Museum)
These are experiences in which the individual interaction with the content is networked so that each individual's interaction is available, in a limited capacity, to the entire group of users. Voting f, but also 'liking' falls in this category. The action is not influenced nor influences others, but the use is able to be aware of how others have acted in the same context. A level 3 experience makes you feel connected to others who have used the same content.

Level 4: Individual, Networked, Social Interaction with Content
(Me to We with Museum)
Individuals still do their interacting with the content singly, but their interactions are available for comment and connection by other users. And the architecture promotes these connections automatically. A successful level 4 experience uses social interaction to enhance the individual experience; it gets better the more people use it.

Level 5: Collective Social Interaction with Content (We in Museum)
This is the 'holy grail' of social discourse, that what most designers want to create at once. Where people interact directly with each other around content. Personal discussions, healthy web bulletin boards and coffee gossips of grandmothers fall in this category. Healthy level 5 experiences promote respect among users, encourage community development, and support interaction beyond the scope of the group.

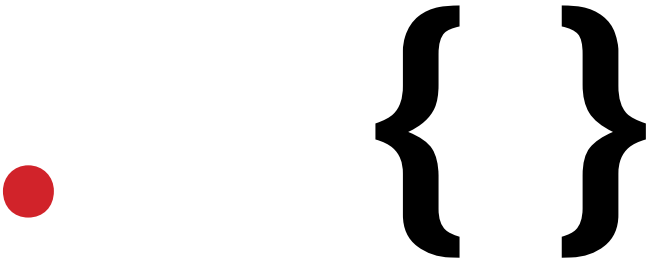


Figure 63. *The act of urban acupuncture and the device that does this action, that can be called the urban prosthesis, are different in nature and should not be confused with each other. Image by author.*

CHAPTER III

CONCEPT& DESIGN

Figure 64. *The act of urban acupuncture and the device that does this action, that can be called the urban prosthesis, are different in nature and should not be confused with each other. Image by author.*

In this chapter, the concept and design of the Flowscapes laboratory are elaborated. First, the concept of 'SUCCESSION' is explained. Here I explain the development strategy of revitalizing the water network step for step, with the focus on the genuine impact of small interventions. This is implemented on the water system that links Rotterdam with The Hague. Along this system, we find 30 bridges that also contain houses.

The concept is, to establish a stronger connection between city and water system by using the bridge as transition zone. Then is elaborated how what the idea behind these implementations is on the human scale. What is the idea behind the design elements and why are they put in these different scales? The concept of 'URBAN ACUPUNCTURE' explains the idea of the elements.
After the framework is given, a result of the concept is implemented on the Reinevelbrug, Delft. The different elements of S, M, L and XL are shown, as well as its effects on public space. Some elements are clearly the same in every place, the elements that give formality to the structure such as the smart phone app and the design language and material.

III.I REFLECTING FRAME-WORKS

The research of this project goes hand in hand with the design. First, the duality of research by design and v.v. design by research, gives an idea of how these two aspects are interrelated with the process. Figure 65 illustrates this duality.

DESIGN BY RESEARCH

From this approach, I searched in literature for answers that allowed me to understand basic rules in, for example, how to make public space that invites people, or how to understand the process of participation and what spatial elements are required due to the literature. These aspects gave me principles to hold on to, when brainstorming only made me feel lost: that gave too many options. Another example: the choice for a building material was too specific to find out with sketching. For this, I went into a research of what the general elements of the water system were. The concept together with the analysis of the water system, brought me to a simple solution: sheet pilings.

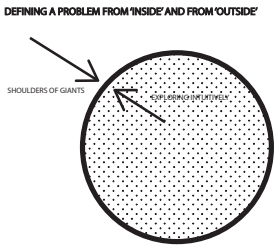


Figure 65. Defining the problem and it's framework by personal experimenting and from 'shoulders of giants'. Image by author.

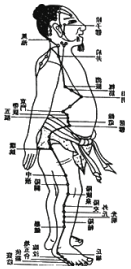


Figure 66. *Acupuncture. Image by author.*

RESEARCH BY DESIGN

In research by design, which tends to be the natural overhand in my approach, is developing a greater knowledge of for example the location by implementing design ideas in it. This does not only give an indication of how the landscape is composed, also the proposed implementation brings a greater understanding what I actually think (unconsciously) is the problem of the case. The reflection of seeing my own drawings, is as having a dialogue with myself. After having drawn, I discover what I meant with the drawing. It structures my ideas, and brings me closer to the core of the problem. It makes the ideas and theories come alive for a moment, what gives the time to judge the design scientifically, practically and emotionally.

In this project, the design by research came, in most cases, second. The drawings and experimenting with small models came first, what raised a lot of questions in me. To answer these questions, I looked for approval in literature. Some I already absorbed partly in the inventory phase, others I found new, when the veil of what my topic actually was, became thinner.

The act of designing is used as a research tool, as well as research is used to help myself define the paths of designing. I think the combination of both freely experimenting and knowledge of creating restrictions are inevitable for innovation and research.

THE RELATIONSHIP BETWEEN THE THEME OF GRADUATION AND THE SUBJECT/CASE STUDY CHOSEN BY THE STUDENT WITHIN THIS FRAMEWORK

The Flowscapes concept perceives infrastructures as more than a type of connection from A to B. The term does consider the infrastructure as a type of space with its own meaning. If a structure is a constellation of dots connected by lines, the infrastructure is the kind of relationships that these lines and dots form. The Flowscapes, can be considered as the third dimension of the structure. It considers the place of movement as a landscape on its own.

In 'Urban landscape infrastructures'

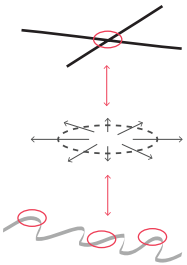


Figure 68. *Different infrastructures can be linked by the creation of a 'Flowscapes'. This stimulates interaction between different flows, and has impact on its nearby surroundings. Image by author.*

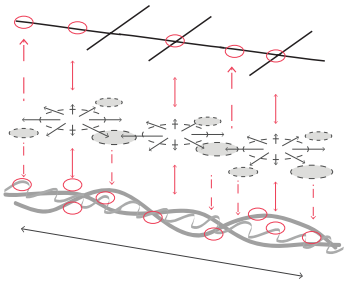


Figure 69. *In exaggerate, the use of several places can provide a strengthening of the water system, and highlight (vacant) places on this system. Image by author.*

S. Nijhuis and D. Jauslin[45] explore the complexity of the urban landscape infrastructure as the Flowscapes. 'Urban landscape infrastructures facilitate and frame flows of people, living organisms, materials and information. Urban landscape infrastructures are not only support structures that direct, facilitate and create conditions for urban development, but also have spatial, ecological and socio-cultural qualities themselves'.

The Flowscapes is a combination of looking at infrastructures both as vital organs for its surrounding, as the way it forms an organism with its surrounding elements. The first three pictographs in Figure 66 illustrate the landscape as infrastructures and infrastructures as landscapes. Looking at infrastructures as the potential carrying bones of complex spaces, Sybrand Tjalingii[46] created the two networks model that considers the combination of water and traffic networks as the carrying structure for urban landscapes.

In the project, the search for an ultimate form of the Flowscapes was the inspiration. The bridge is a perfect example of a Flowscapes: this place exist because of different movements of flows in the landscape. It is a landscape as an infrastructure. A device, to make it physically possible to transport cars over a water structure. The location of movement itself is also a landscape: this kind of place, the distinction it makes in the environment, would never have existed without transportation.

How to connect flows of different properties and what is needed for that to make them interact more? What can we provide for that? The place of interrelation of movement, that must be, a location of stay, can thus be called a 'flow-place'. The bridge should be a place where flows of both words are conditioned to develop into each other in exaggerate (figure 69). Social sediment (not to be confused with 'sentiment') is what is the goal:

45 Nijhuis, S., & Jauslin, D., (2015). Urban landscape infrastructures. Designing operative landscape structures for the built environment. Research In Urbanism Series, 3(1), 13-34. doi:10.7480/rius.3.874

46 Tjallingii, S., (2015). Planning with water and traffic networks. Carrying structures of the urban landscape. Research In Urbanism Series, 3(1), 57-80. doi:10.7480/rius.3.832

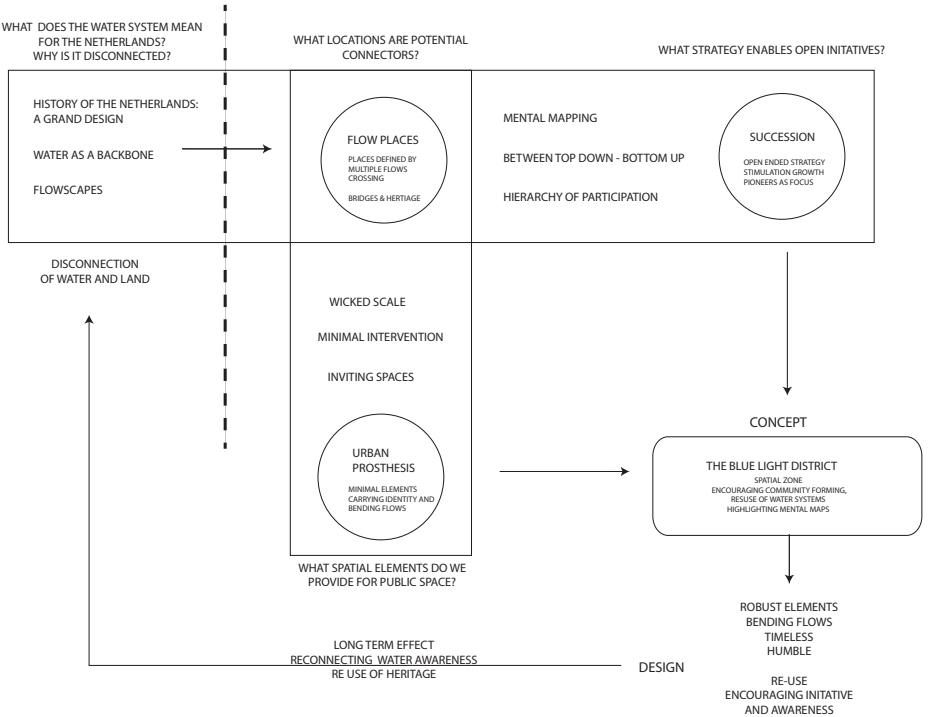


Figure 70. *A diagram of used methods and theories, creating concepts ideas. The Flowscapes, Succession and Urban Prosthesis were founded from existing ideas. Together, these concepts created the field where 'The Blue Light District' could find its existence. Image by author.*

how can we encourage people to make them see there is more to see than just one element, what design should we provide to create awareness of the big system by communicating on the eye level?

The project focuses on how bridges and the vacancy of the bridge control houses, together with the interstitial spaces around bridges, can be re-invented to create a stronger awareness for and sustainable re-use of the water system. To make this happen, a minimal intervention must take place: not to break down the place's identity, not to be in need of too much money and to make this intervention realistic.

The definition of Flowscapes, working as the bridge as connector of infrastructures and thus flows , is well presented in the case of bridge control houses between Rotterdam and the Hague.

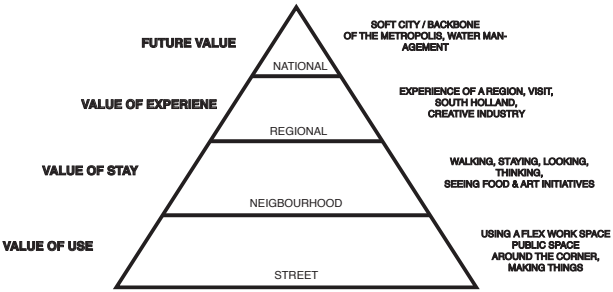


Figure 71. *Value in societal context. Different scales speak to different realities and groups. Image by author.*

THE RELATIONSHIP BETWEEN THE METHODICAL LINE OF APPROACH OF THE GRADUATION LAB AND THE METHOD CHOSEN BY THE STUDENT

The combination of 'Flowscapes' of Nijhuis with the 'Two Network Strategy' of Tjallingii, gave me the understanding that the fast lane and the slow lane are two important flows, that can help carry the urban landscape. The water system can embed the urban layer into the landscape, to 'root' the city: historically, economically and socially. The importance of the intersection of these two systems and the ability to see the overlap as place of connection made me create the method of 'Flow Places'.

From this point of view, there were two ways to approach the realisation of a regional plan that is of a scale that is hard to grasp: the method of the Minimal Intervention of Lassus[47], made me understand a big change can be caused by already a small subtle adaptation, that not even alters the situation. Together with this point of view and the theory of the known literature from Whyte[48], Lynch[49], Herzberger[50], Gehl[51], and others, I looked up what the minimal requirements are for public space to become inviting, and what transitional zones mean for creating spaces. This brought me to the 'Urban Prosthesis': a method to create minimal interventions that bend flows of people by highlighting (flow) places on a subconscious level.

From Santos[52] we can understand the city as a system set by objects and actions. Objects (immovable) which constitute the city are technical, intentionally conceived, produced and located for a specific purpose, constituting the material representing actions

47 Lassus, B., (1998). The landscape approach. University of Pennsylvania Press. ISO 690

48 Whyte, W. (1980), The Social Life of Small Urban Spaces, Washington: The Conservation Foundation.

49 Lynch, K. (1971), Site Planning, Cambridge, MA: The MIT Press.

50 Hertzberger, H. ,(2005). Lessons for students in architecture. Rotterdam: 010 Publishers.

51 Gehl, (1987/2011), Life Between Buildings: Using Public Space J Washington - Covelo - London: Island Press, ISBN: 978-1597268271

52 Santos, M. (1979). O espaço dividido. Os dois circuitos da economia urbana dos países subdesenvolvidos. Rio de Janeiro: Francisco Alves.

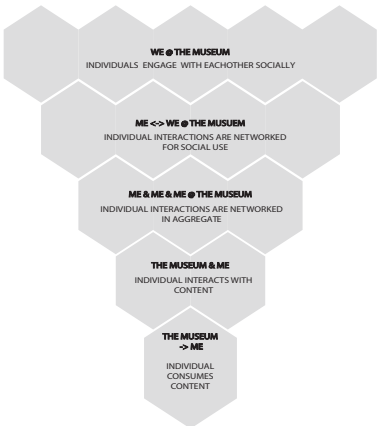


Figure 72. *The Hierarchy of Participation. Based on Simon's method in her book 'The Participatory Museum' .Image by author.*

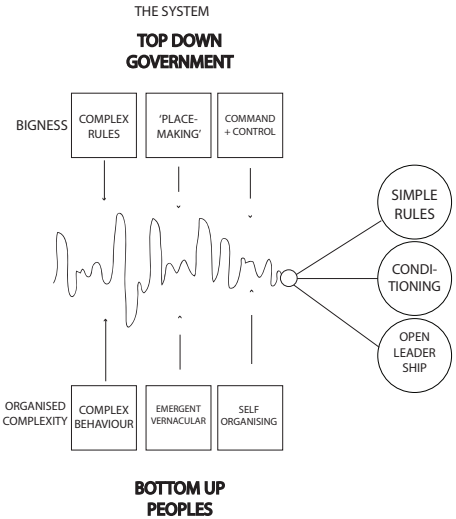


Figure 73. *Kelvin Campbell's methodology of linking Top down with Bottom up: a fruitful combination can be created by the right properties: simple rules, conditioning and open leadership. Image by author.*

from a time, being at the same time result from that actions. The actions (flows) associate to spatial order of objects; in this sense, if they are technical or functional, and, as consequence, they tend to be formatted and materialized by the productive forces that organise the space. The 'Urban Prosthesis' are subtle 'braces' that bend the flows.

Not only spatial elements are important, also time and the human psyche are parts that needs to be taken in account, especially when a project deepens in on processes on the big scale. The search of how to be in between top down and bottom up, Massive Small (Figure 73), a smart urbanism method from Kelvin Campbell[53], where formality and specificness create a simple language to communicate. In combination with the Simon's[54] Hierarchy of Participation (Figure 72), a theory that focuses on how museums can become participatory, and with the backing spatial planning and social sciences found in Kaplan & Kaplan[55], Jacobs[56] and Alexander[57] I came to a better understanding of how a spatial designer can make participation possible.

53 Campbell, K. (2011) Massive Small: The Operating Programme For Smart Urbanism.. ISBN: 9780956860002 (0956860001)
54 Simon, N (2010) The Participatory Museum. Santa Cruz, CA: Museum 2.0
55 Kaplan, R. & Kaplan, S. (1987) Humanscape: Environments for People, Edition 86-89
56 Jacobs, J. (1961) The Death and Life of American Cities
57 Alexander, C. et al. (1977), A Pattern Language, New York: Oxford University Press.

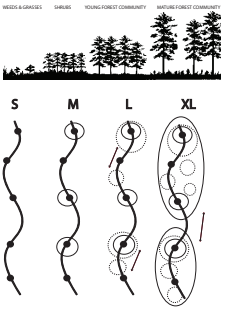


Figure 74. *Gradual growth of a place, in an acupuncture way can be compared to 'succession' of a forest. Image by author.*

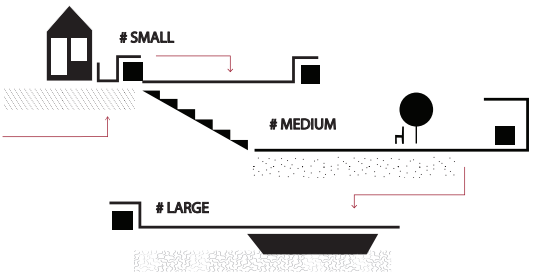


Figure 75. *Different robust objects play as devices that bend flows. The urban prosthesis bends flows with a minimal intervention and finds its ground in three different scales. Small, Medium and Large. Image by author.*

The social growth and community forming as the gradual growth of a forest, under the condition that is has the right aspects in its environment can be seen as 'Succession' (Figure 74). This starts from creating conditions for pioneers, to enable them to take action and lead their followers. Small 'plants' together enable bushes to root into the ground, and invite not only insects but also other animals to become a user of the place. The *'Flowplaces', 'Urban Prosthesis'* and *'Succession',* three merges of different theories that where created on the shoulders of giants, created the basis of *'the Blue Light District'* concept. It is the concept where small robust elements, minimal interventions, enable and invite people to be part of something that has the possibility of regional impact. This can start right now, on the vacant location where water flows connect with urban flows. In this case the water system of South Holland, an important backbone for the city. From these frameworks the design of a formality in objects was asked, to give a top down hand to the specificness of places. Important is that there is a duality of regionalistic design that speaks to the scale of one person. The design resulted in a family of small objects that differ from doorknobs, chairs, stairs to scaffolds, all made from a material that was found in the regional approach (Figure 75).

THE RELATIONSHIP BETWEEN THE PROJECT AND THE WIDER SOCIAL CONTEXT

The theme of 'wider social context' is one of the core topics that this project addresses. The philosophy of the design relates with the questions of how intentional spatial design can stimulate local people to reclaim a particular place in public space. How is it possible to make people realize that it is them, one by one, that make a difference, not a government deciding for them? In the course Space & Society given by dr.ir. Machiel van Dorst, the embedding of an intervention into the mental map of its society, is researched. The lectures focused on how space can be totally perceived differently by a diversity of groups. This made the search for a design that is robust enough, to be able to stand in all situations

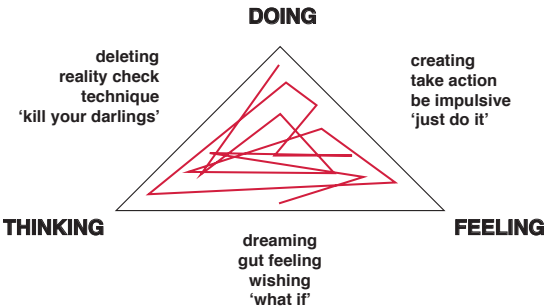


Figure 76. *Personal method. The designer or everyone is always in between the triangle of doing, feeling and thinking. To position yourself and find what you need to do when stuck, place yourself in this triangle and find what direction will give you balance. Image by author.*

and different perspectives. Figure 71 shows how different scales search for different values.

The search was, how regional planners can provide small elements that are site specific- small elements that on the one hand remain the constructive argumentation of big-scale analysis and thinking, and on the other hand consider the genius loci of the place. The function of governance is, however, not ignored. In contrary, the importance of top down thinking is emphasized: the communication between these two are the key of a society where individuals still believe their specific dreams can be true, and a government that trusts its people to claim responsibility. Basis rules, open leadership and providing conditions are the core principles that enable the contact between planner and user. A project and its wider social context are not two separate things that have a relation with each other: they are entangled and, merely the same. A project in public space should always considered and put in the wider social context.

PERSONAL METHOD

The diagram in Figure 76 shows what kind of way I approach my own way of working. As a person, you are always situated between thinking, feeling and doing. For example, when I became conscious that I was dreaming too much, I understood I had to go to doing, and start to make things and find more restrictions. When I was only making things, I needed to take a step back and find out what my real ideas were, and what their restrictions were. When I was only thinking too realistic, I had to step out of this and started to create without any restrictions.

Figure 77a & 77b. Inside the bridge. The machine to lift the bridge is so big, it needs a basement. Images by author.

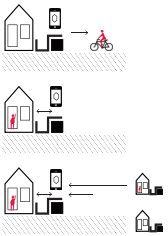


Figure 78a. *Interaction with the bridge house. Image by author.*

III.II THE CONCEPT: FROM SMALL TO BIG

The following images illustrate the concepts per element of interaction. The diagrams show the general rules that were set up for the locations, before an actual design was created.

Figures 78a & b show how the interaction of the local inhabitant's discovery of the bridge house and its re-use program is directed. It is put parallel to the theory of Simon's. The method that was used in this book, had an surprising overlap with the intuitively developed strategy (see: 'the Hierarchy of Participation', page 105).

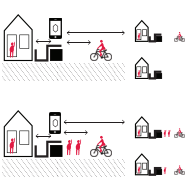


Figure 78b. *Interaction with the bridge house. Image by author.*

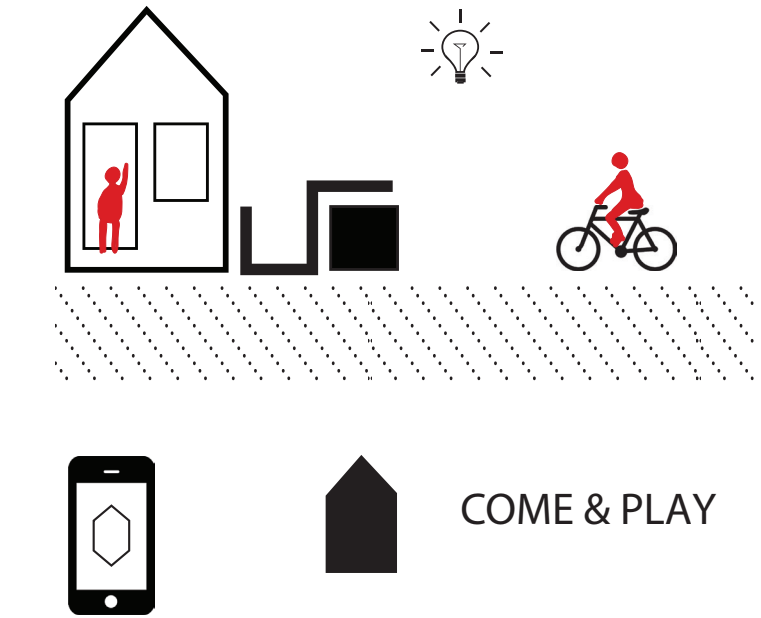


Figure 79. *'Small' Come & Play icon. Focuses on creating an interest in empty buildings. Image by author.*

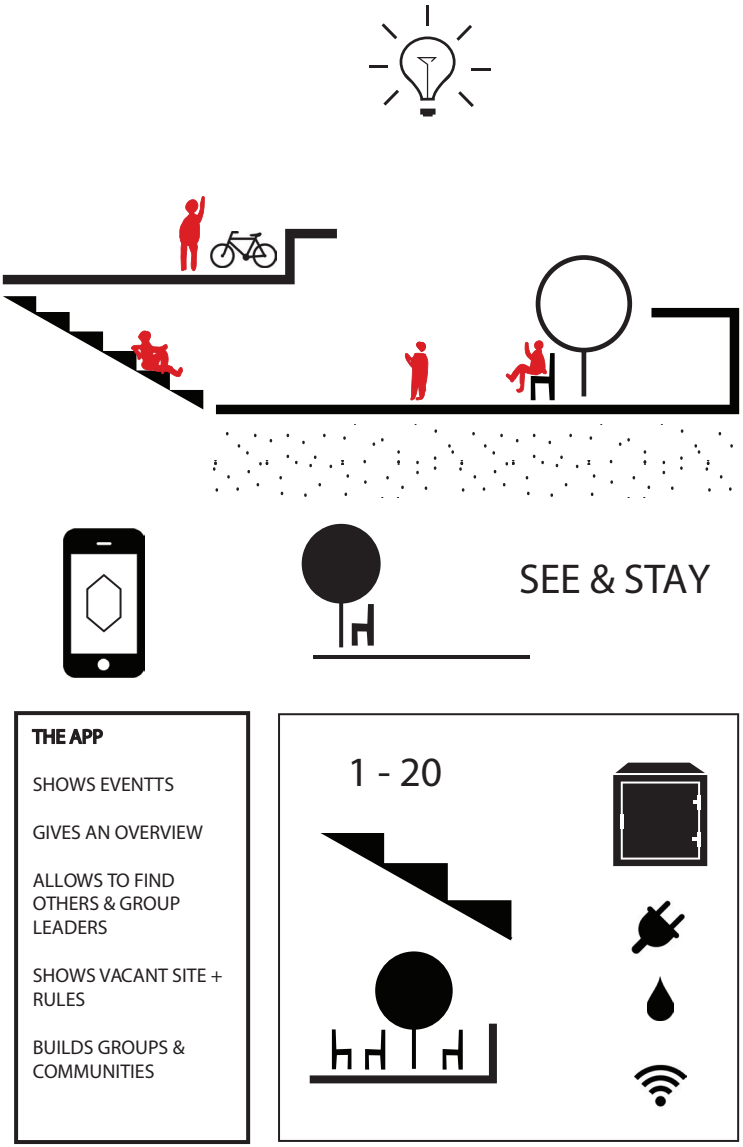


Figure 80a. *'Medium' icon. Focuses on the interaction of level heights and creating a place to stay. Image by author.*

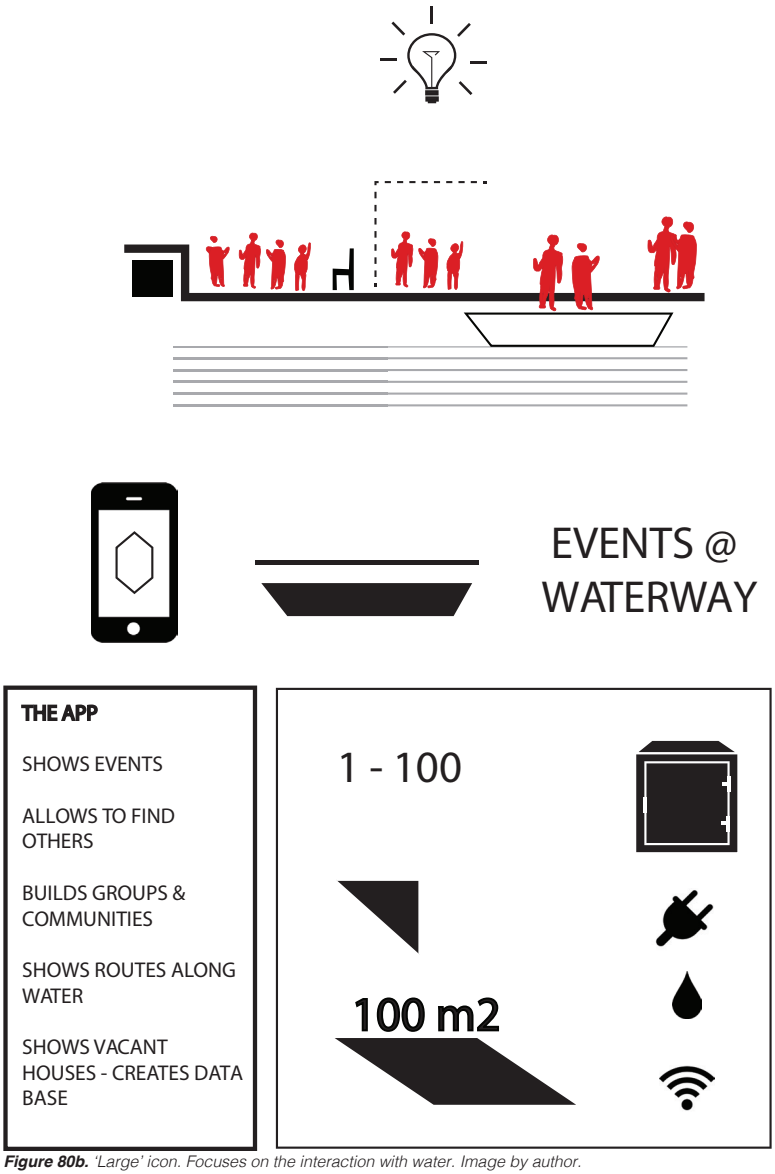
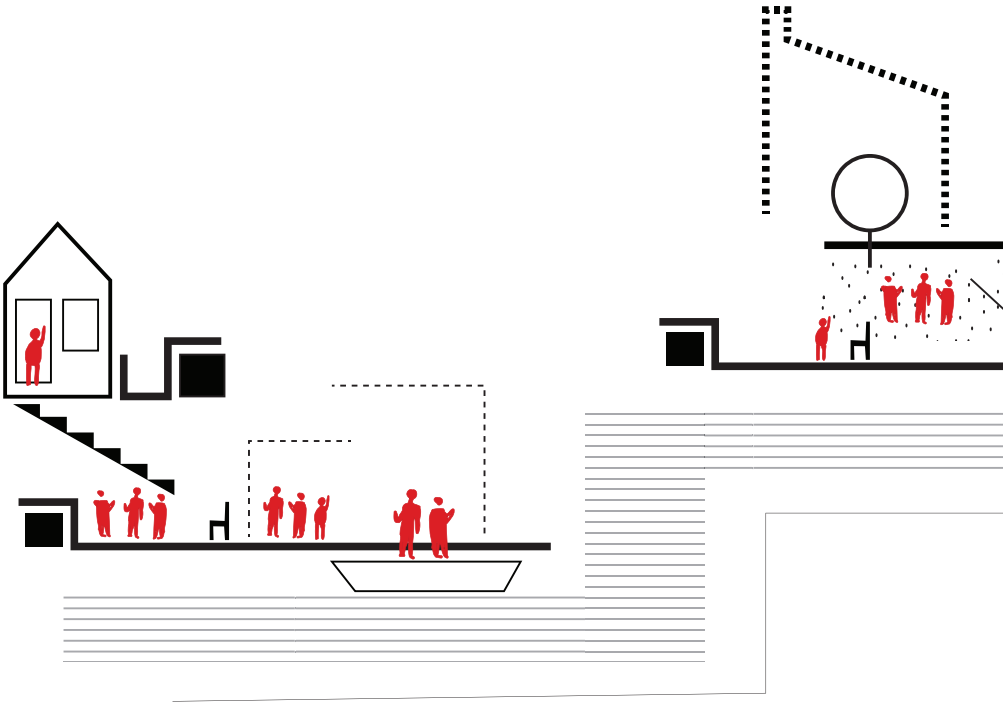
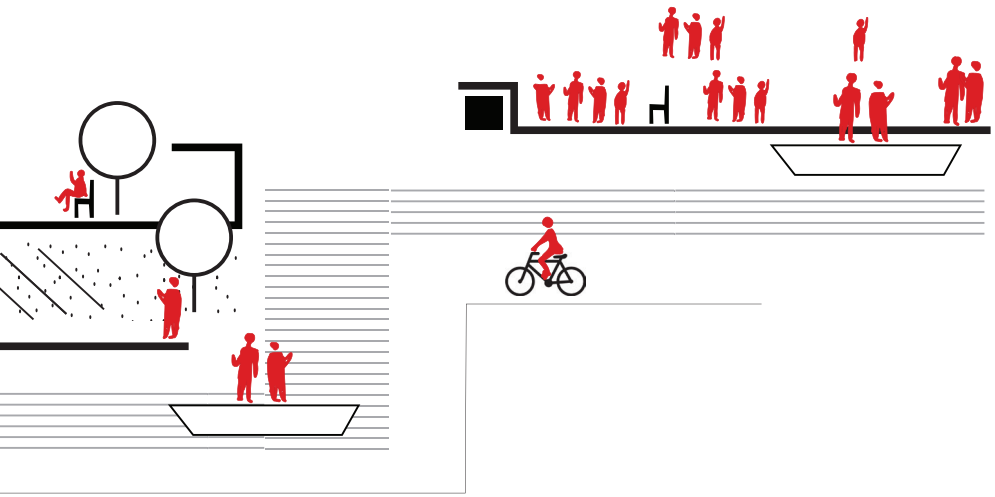


Figure 80b. *'Large' icon. Focuses on the interaction with water. Image by author.*



FESTIVALS,
VACANT
BUILDINGS @
WATERWAY



THE APP

SHOWS EVENTS

GIVES AN OVERVIEW

ALLOWS TO FIND OTHERS

BUILDS GROUPS & COMMUNITIES

SHOWS ROUTES ALONG WATER

SHOWS VACANT HOUSES

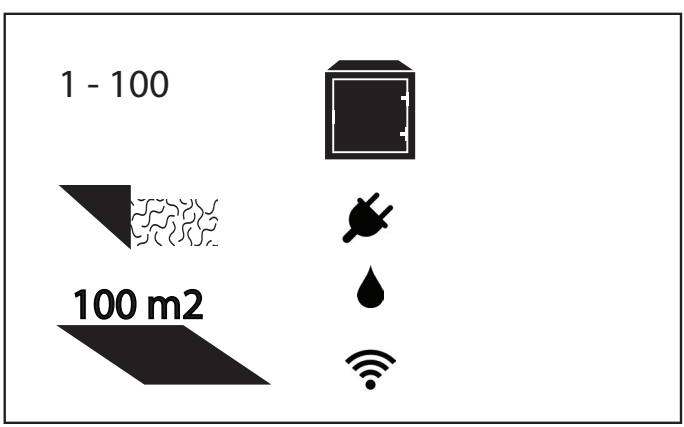
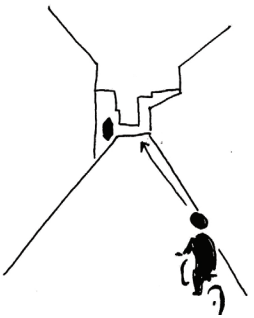


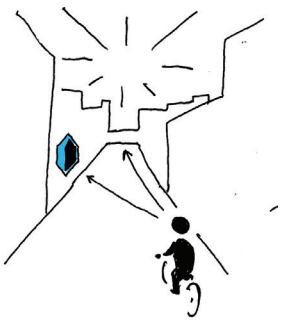
Figure 81. *'Extra Large' icon. Focuses on the interaction with other locations. Image by author.*

III.III
CARTOON ILLUSTRATION

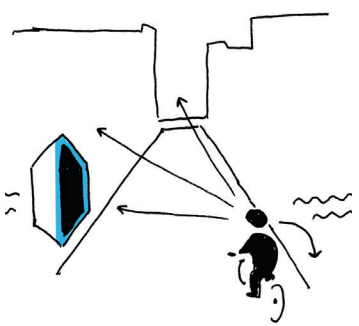
COMIC 1. *Narrative of the experience. Images by Author).*



Person rides the bike through the built environment

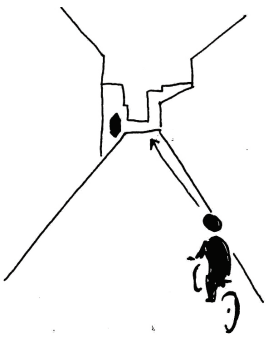


The built environment opens... A broader view develops.

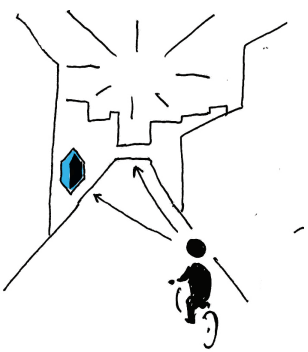


Passing the bridge, the person passes the object.

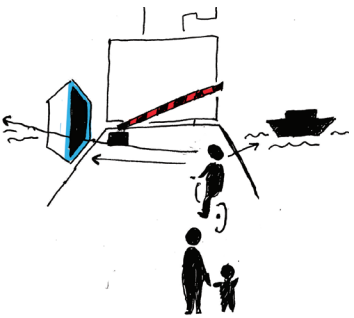
He slightly notices it, and goes on with his own thoughts.



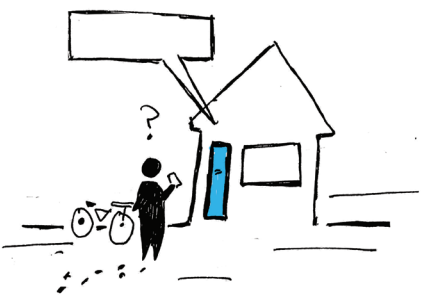
Another day. The biker passes the same way.



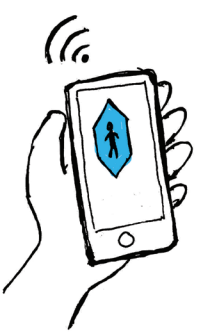
He sees the object he saw before again.



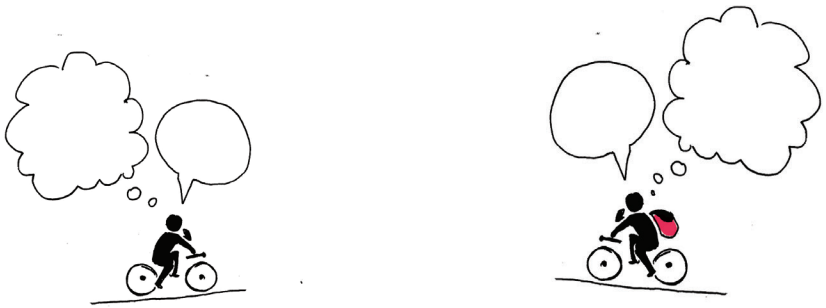
This time, the bridge opens... Stop! Whats there?



A small house on the bridge, and it contains a code...



The user finds a hint towards an mobile app. He searches it.



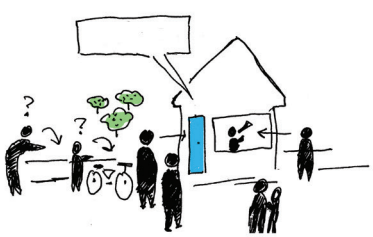
He has a new idea... And comes back to the location!

With the app.. The door opens.

His idea becomes reality! He is a pioneer!

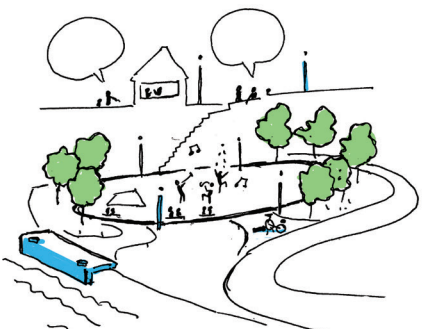
He likes it! And does it more than often.

Early adapters. Others see him do something. What is he doing over there?



More people get interested in the idea. They also download the app. And see that other parts of the environment belong to the place.

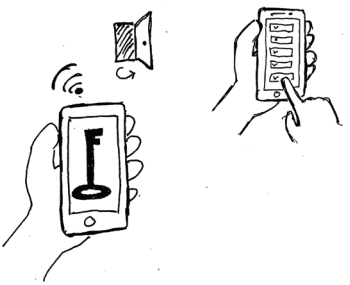
Multiple actors gain the knowledge and possibilities the app includes about vacant spaces.



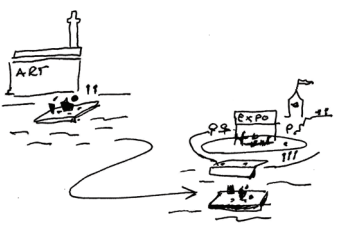
Also around this space, people are using the space in an special way.

A larger amount of people get known by the concept and the locations. They start to talk and network.. Form new communities. Baking communities, music teaching communities.. etc.

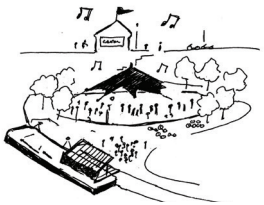
These communities start to form and organise events.



Together they link events, locations and people.

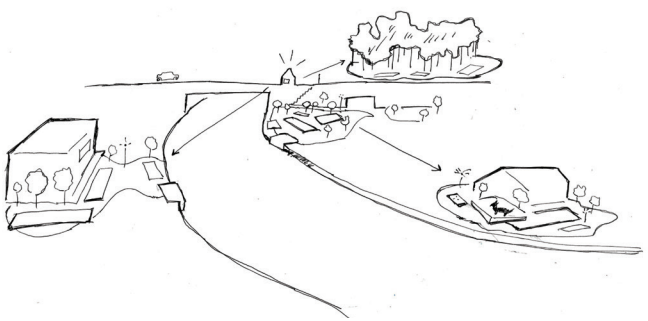


Their ideas involve the direct environment. What can we do with the water? A transport? Extra space when needed? What about that empty building over there? They read in the app.

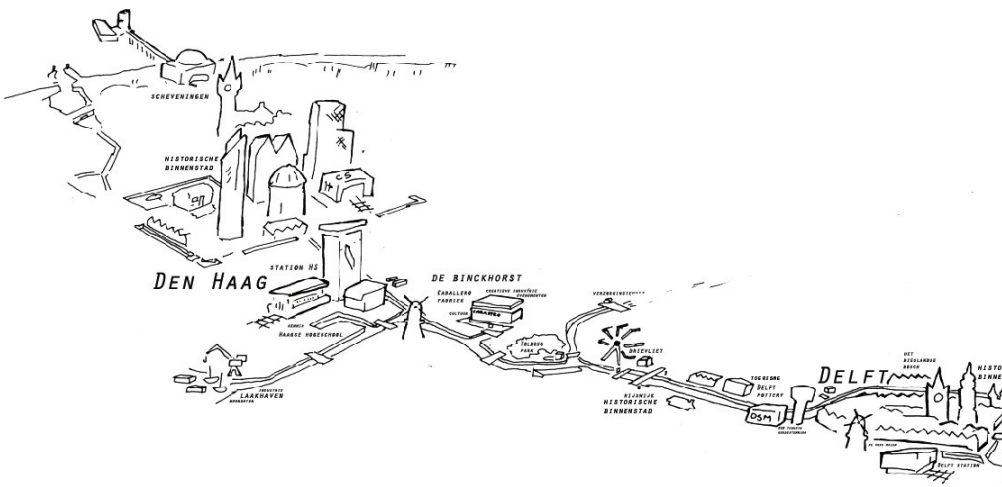


The first events of big scale take place. Temporary buildings and water as an adaptive field are used.

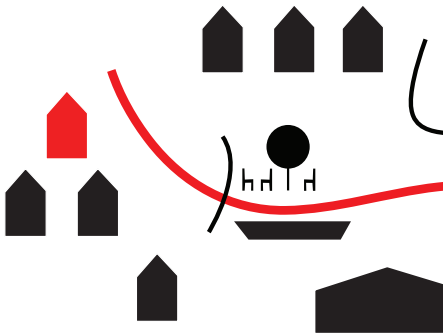
More networking....



Stakeholders, owners of houses, neighborhoods, municipalities, the government. Top down developers. They start to see the community has value, and they join the group.


SCHEVENINGEN
HISTORISCHE BINNENSTAD
STATION HS
DEN HAAG
DE BINCKHORST
CABALLERO FABRIEK
HAAGSE HOGESCHOOL
LAAKHAVEN
DOSM
DELFT

And... the next time you ask someone where Rotterdam is. Or how to bike to the next city. He will tell you in this perspective. A water bus will lead you there. THE BLUE LIGHT DISTRICT found its meaning.



III.IV
THE MOBILE APPLICATION

The mobile application is created to link places with each other, and to develop a database of vacancy in the whole land. The system gives a list of used places and what their purposes where. With the bridge control houses as an example, vacancy that is related to water can be boosted and form its own community for neighborhoods and within the metropolitan region. Not only this is a very useful overview of the vacancy, also it created an encouraging element for everyone to re-use old buildings.
Scan the QR code for the app.

Figure 82. *Connecting vacancy. Image by author.*

Figure 83. *This exact QR code will lead you a mock up version of the application. Image by author.*

AFTER EVENT STATISTICS

12 PEOPLE
CAME TO YOUR EVENT

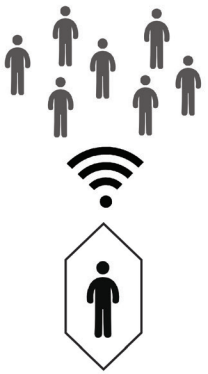
TRUUS_DE_VRIES IN-
VITED YOU TO
[MUSICIANS]

JAFETH_NOORD REC-
OMMENDED YOU TO
OOSTPOORTS NEXT
EVENT AT 15 OCTO-
BER

YOU DID NOT USE
ANY BLUE ZONE
TOOLS

← THANK YOU

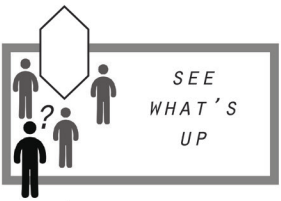
← BROADCAST THIS EVENT
TO YOUR COMMUNITY



TODAY 14:00- 18:00
PLAYING THE CLARINET

← CLOSEBY

WHAT DO YOU
WANT TO DO?

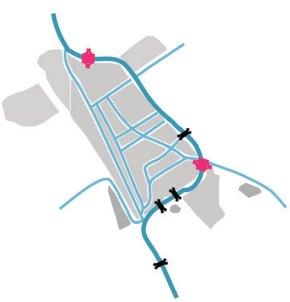


BLUE ZONE

LOG IN

← OVERVIEW

[DELFT]

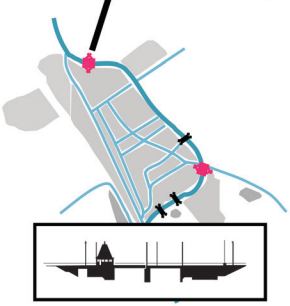


← OVERVIEW

JAM SESSIONS
@REINVEVELDBRUG

HOSTED BY
MARCO_STEK

TODAY 12:00-19:00



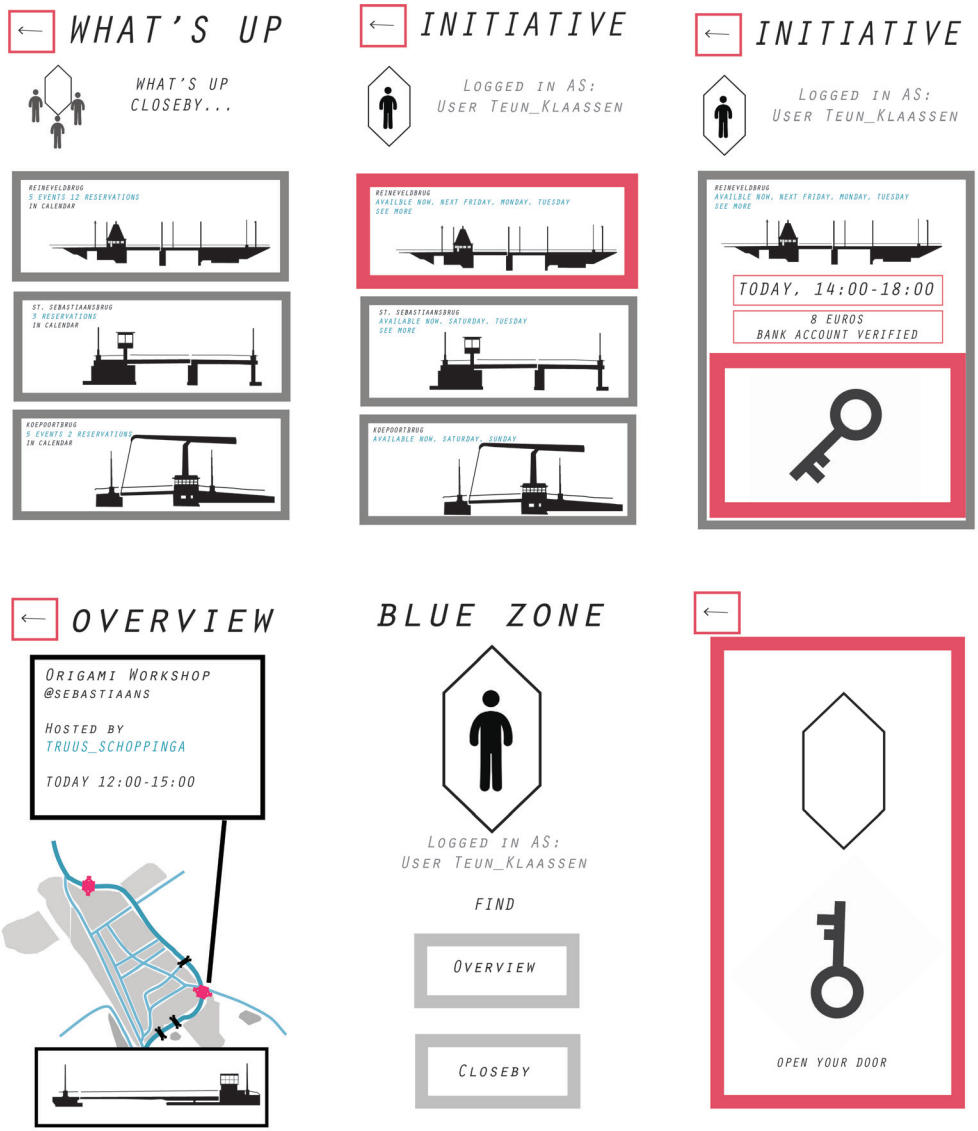


Figure 83. *Slides of the app's interior. Image by author.*

III.V IMPLEMENTATION

THE REINEVELD-BRUG, DELFT

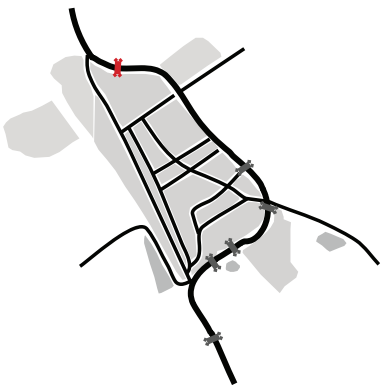


Figure 84. *Map of delft and its six movable bridges. containing a bridge control house. Image by author.*

Situation

The six bridges of Delft (Figure 84) are a good example of the typical bridge houses that lost their function (*see chapter I.VI The value of bridge houses)*. The choice for an experimental site is rather arbitrary, and therefor could be every bridge. The point is, in this way, that the design can be used for all locations, in order to bend the flows. The next pages will give an exploration of the site, and the situation of the elements.

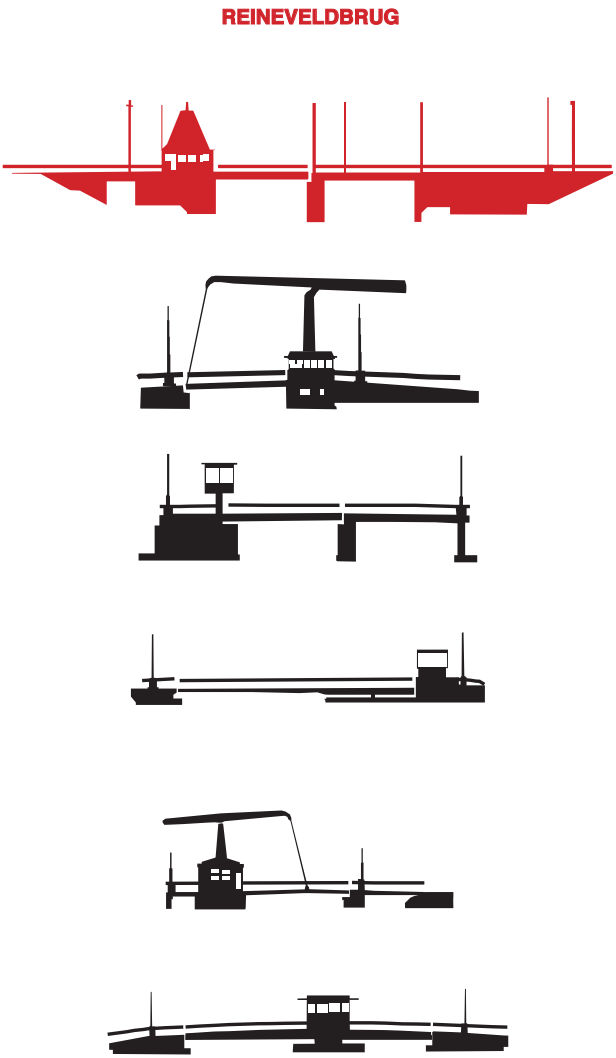


Figure 84. *Silhouettes of the bridges. Image by author.*

NEARBY BUILDINGS - VACANCY
SIGHT LINES & DOCKING SPACES

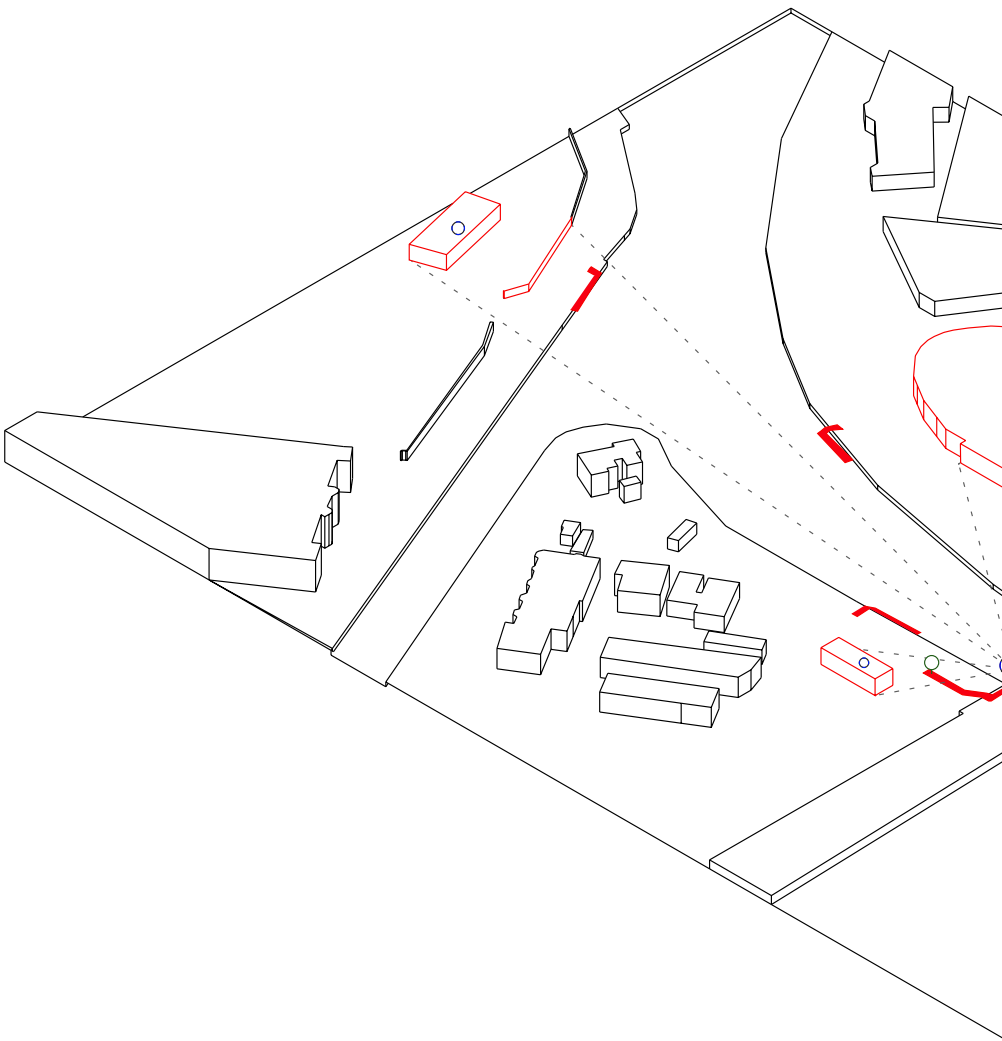


Figure 85. *Isometric of the situation, showing the bridge house, surrounding empty buildings and the elements. Image by author.*

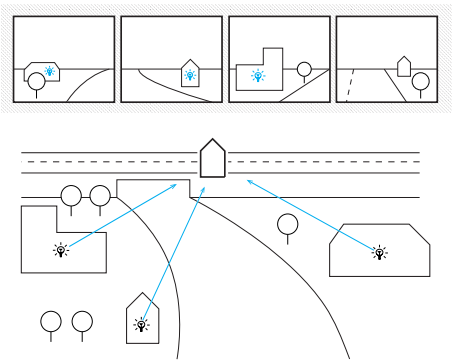


Figure 86. *Surrounding buildings are often good visible from the bridge house.. Image by author.*

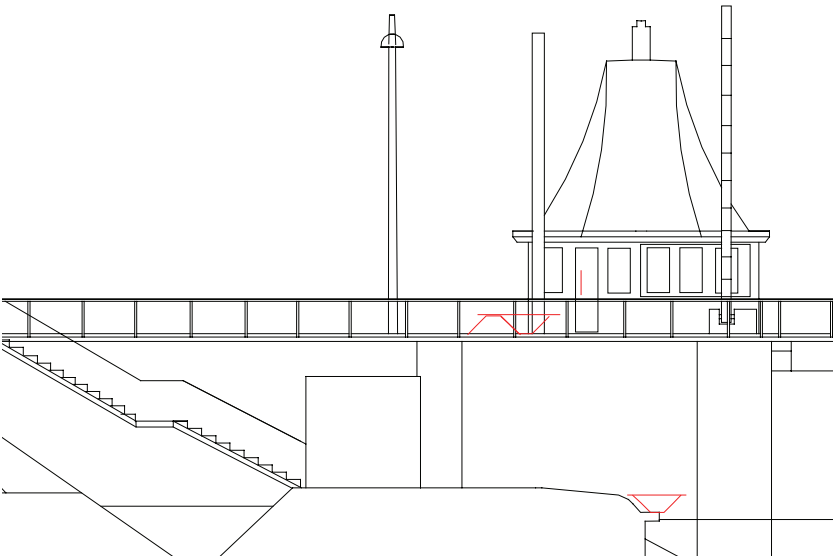


Figure 87. *Side view of the bridge house of the Reineveldbrug and it's significant surrounding. Image by author.*

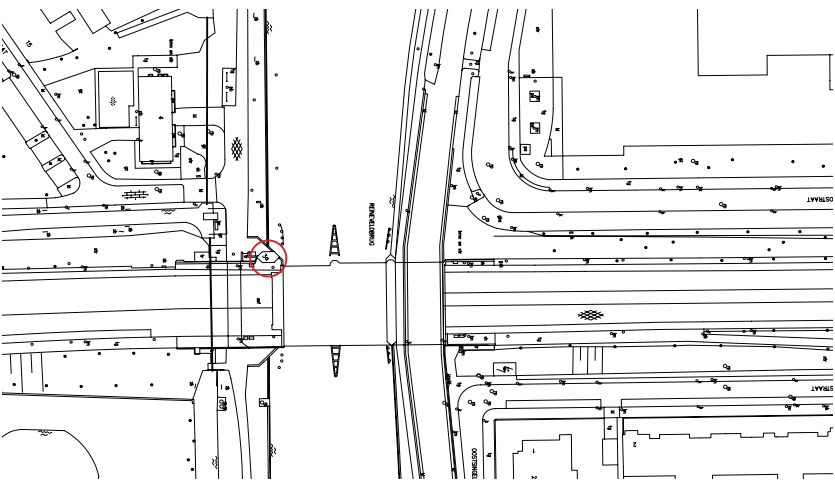


Figure 87. *Location of the bridge house of the Reineveldbrug and it's significant surrounding. Image from CBS Delft.*

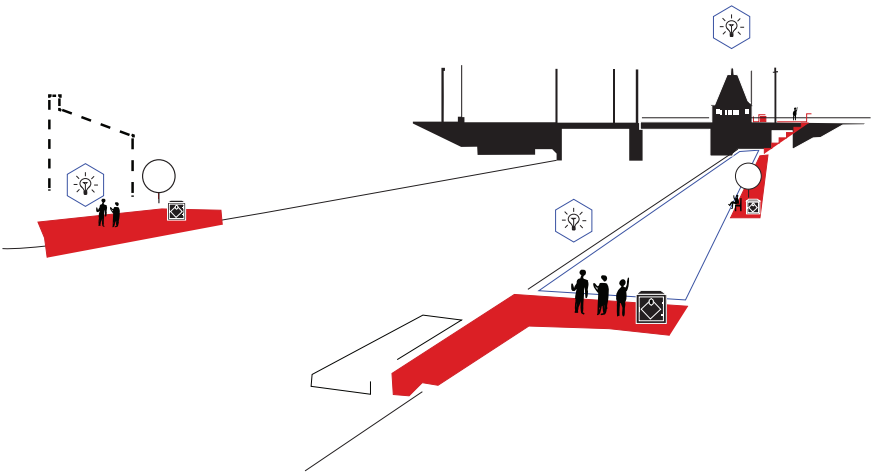


Figure 88. *The desired enacted spaces Image by author.*

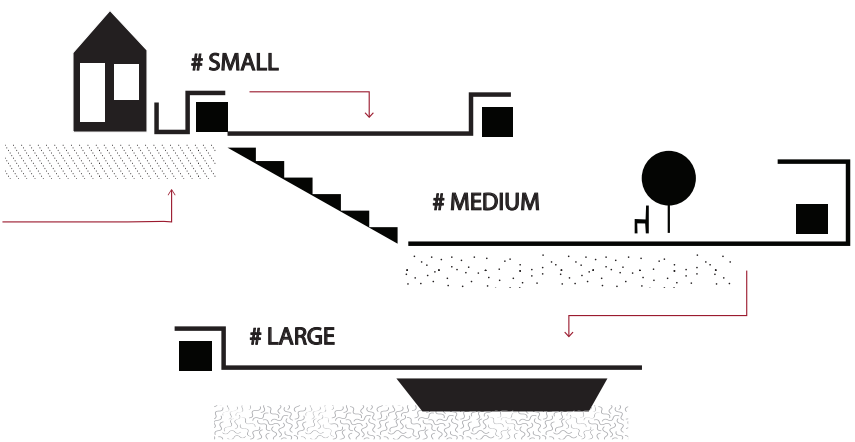
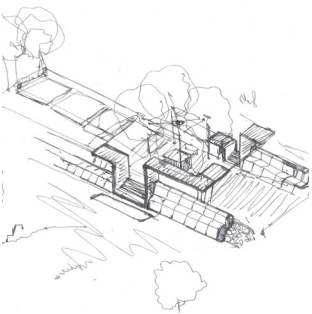


Figure 89. *The figured concepts that need to be implanted in the location. Image by author.*

III.VI MATERIAL: SHEET PILING

After finding a design concept that could be a solution to the found issue, I tried to find a way to make it come into our dimension. The consideration of the sheet piling came after a lot of long walks along the water system. What kind of material is regional, always there, leftover, associated with waterways? Normally a strong border, now a transition between different fields: the shield piling. The following images show the search for the material and the experiments that contributed the design.



Sketch 26: *Local design with regional tendency... What kind of material to use?*

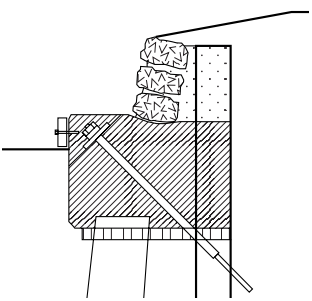


Figure 90. *Cross section of the waterfronts. Image by author.*

Figure 92, 93, 94 & 95.
Experiments with sheet pilings.
In collaboration with Luuk Smits.

III.VII DESIGN

‘NEW BRIDGE KEEPER’

Design solution in elements

The following pages show the chosen design in the form, led and justified by all the literature and findings in the research that is done. The design should be simple, minimal and capable of bending flows, robust and recognizable. The design should carry out a regional tendency but interact on a local level. The design should be cheap, adjustable, re-designable and easily removable.

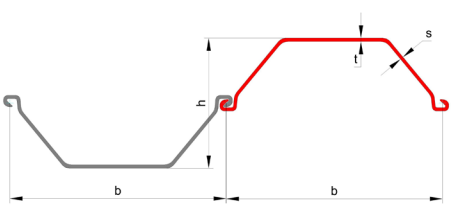
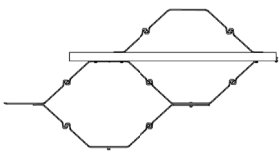
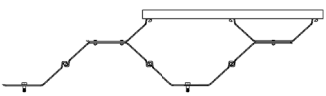


Figure 96. *Technical drawing of sheep piling. Render of possible furniture. Image by author.*

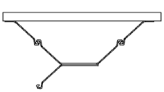
HOUSES

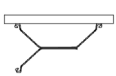
STREETS





STAIRS





WATER SIDES

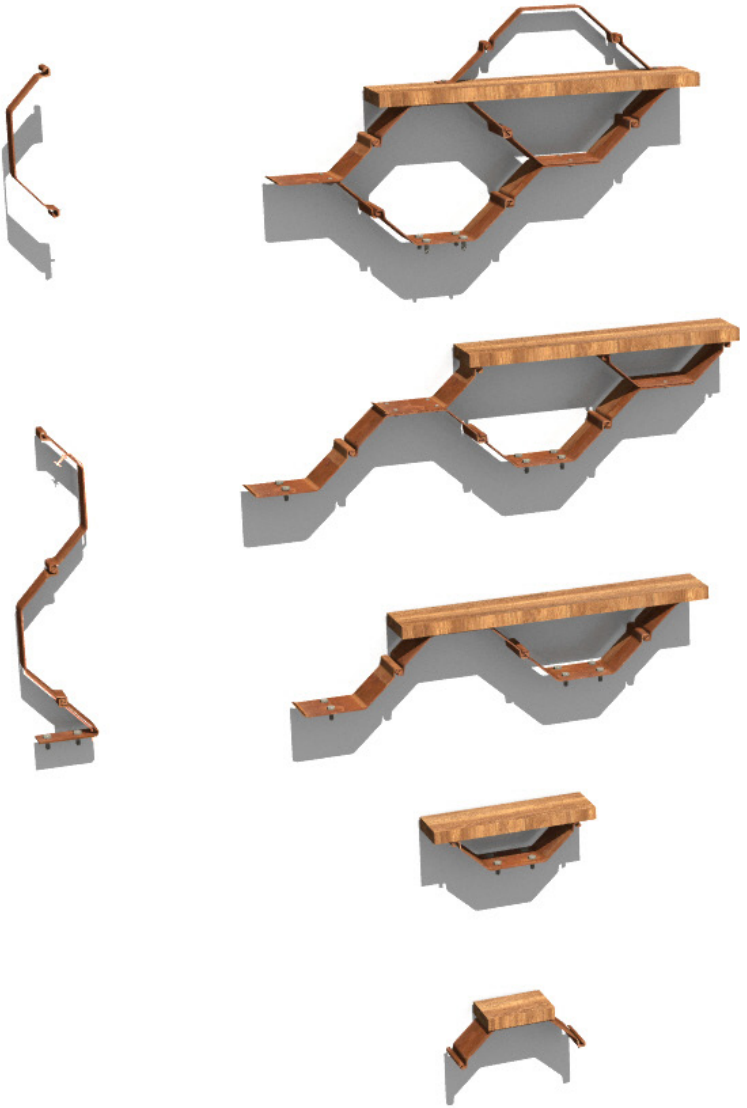


Figure 97. *Render of types of elements. Image by author.*

Figure 97. *'Small'. Side view of a bridge house and objects. Image by author.*

Sketch 27: *Re use of little house. Framing by elements.*

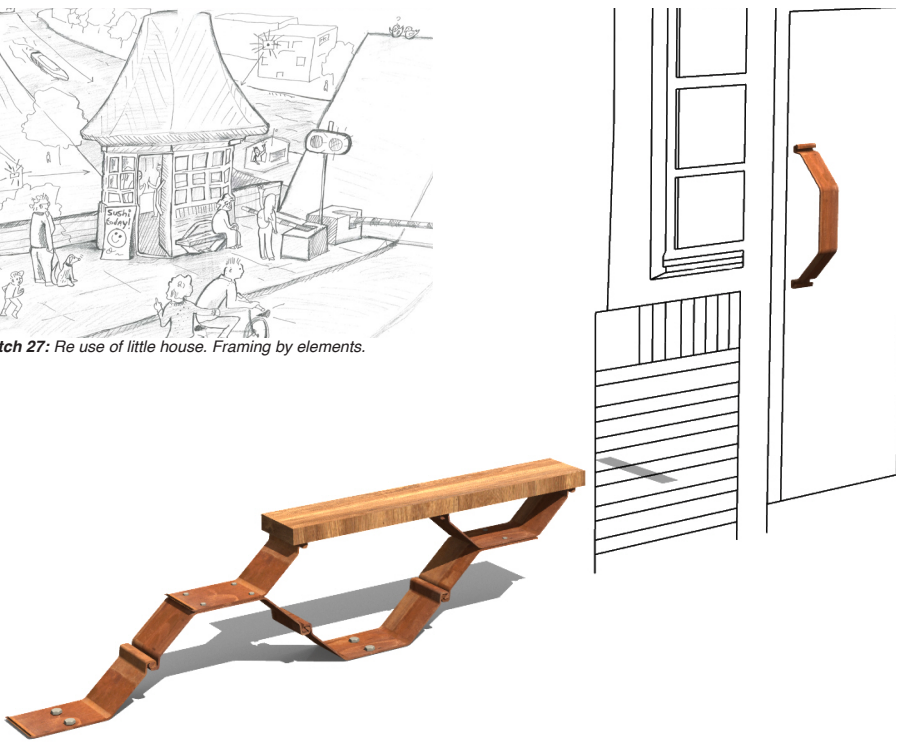


Figure 98. *'Small;. Render of a bridge house and objects. Image by author.*

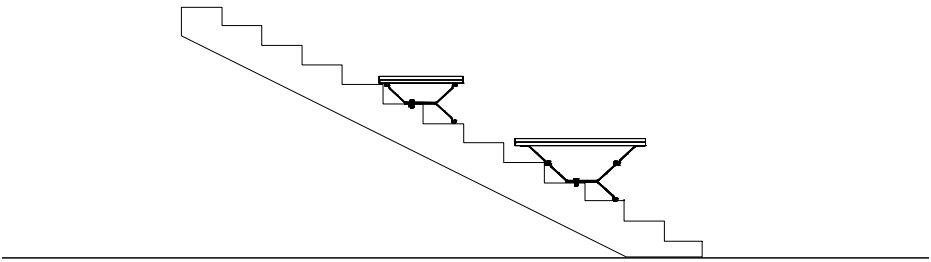


Figure 99. *'Medium;. Section of stairs and sitting elements. Image by author.*

Sketch 28: *Revitalization of stairs by the elements.*

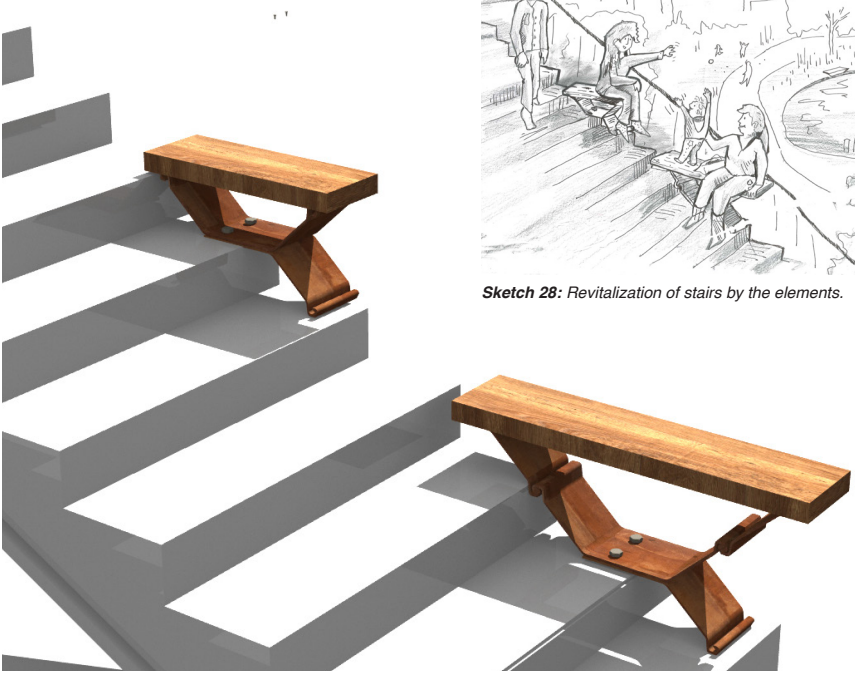


Figure 100. *'Medium;. Render of stairs and sitting elements. Image by author.*

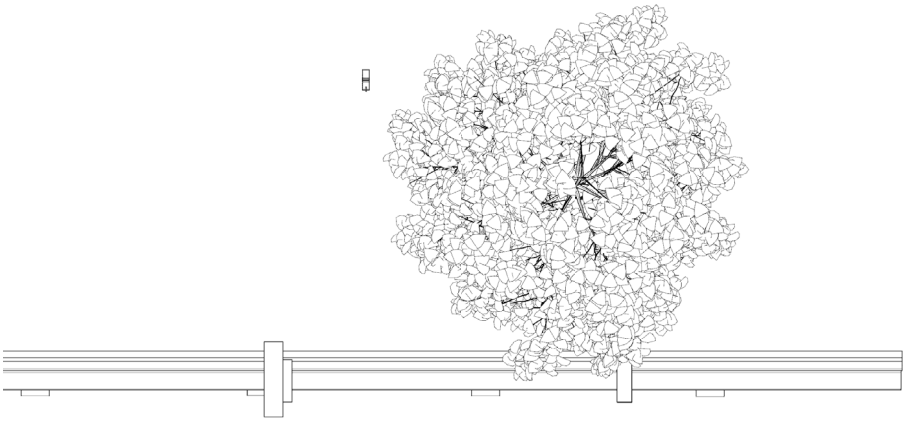


Figure 101. *'Large;. Top view of elements on the water side. Image by author.*

Figure 102. *'Large;. Render of elements on the water side. Image by author.*

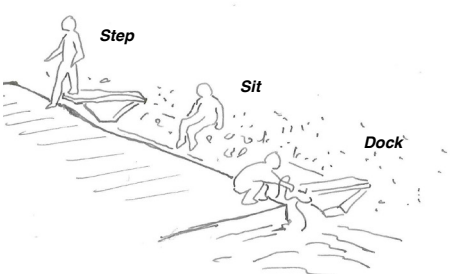


Figure 103. *Use of the elements next to the water. Image by author.*

Sketch 29: *Re use of space around the water.*

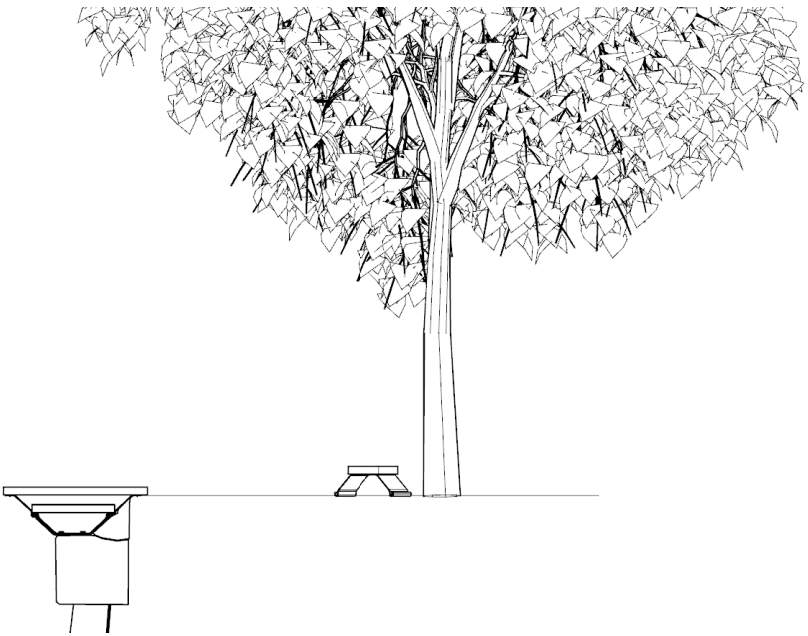


Figure 104. *'Large;. Section of elements on the water side, with a tree to create a protected environment. Image by author.*

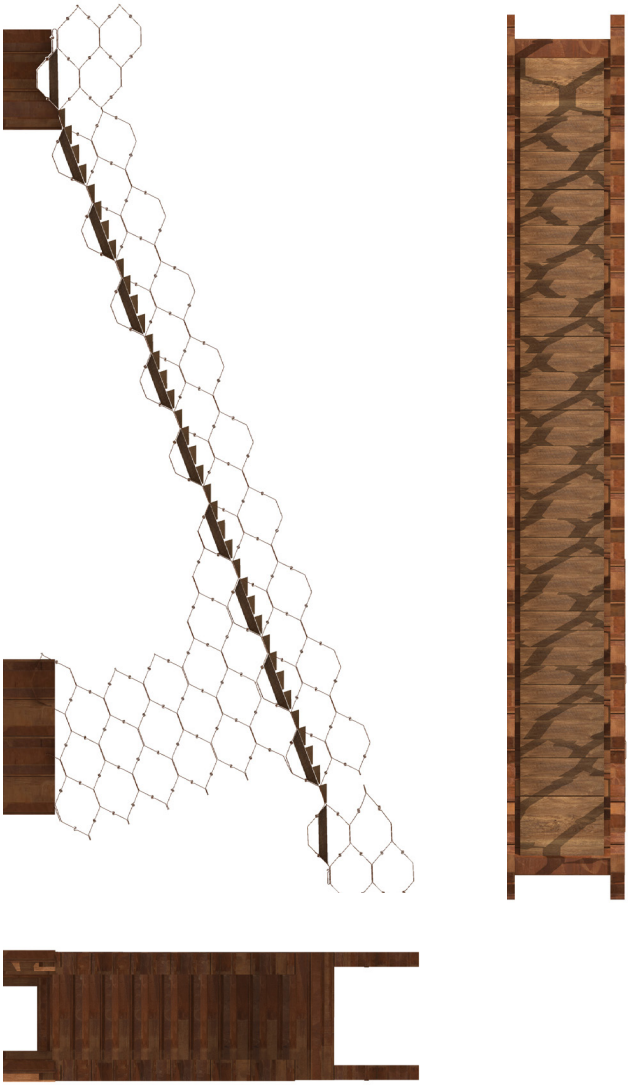


Figure 105. *Side views of a stairs made out of the specific elements. Image by author.*

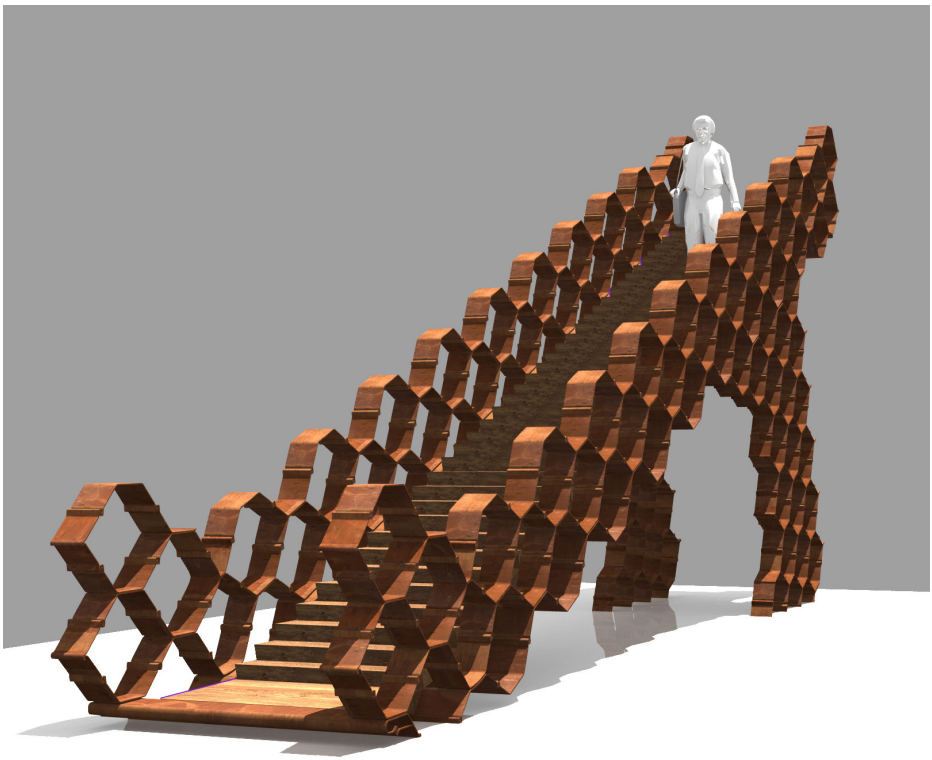
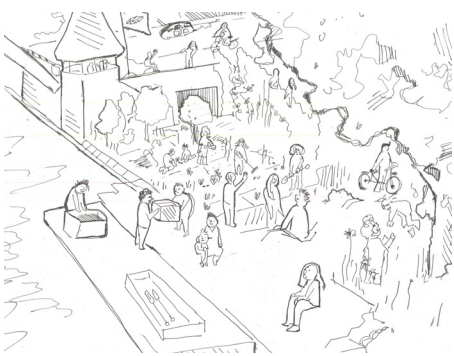


Figure 106. *Render of stairs made out of the specific elements. Image by author.*

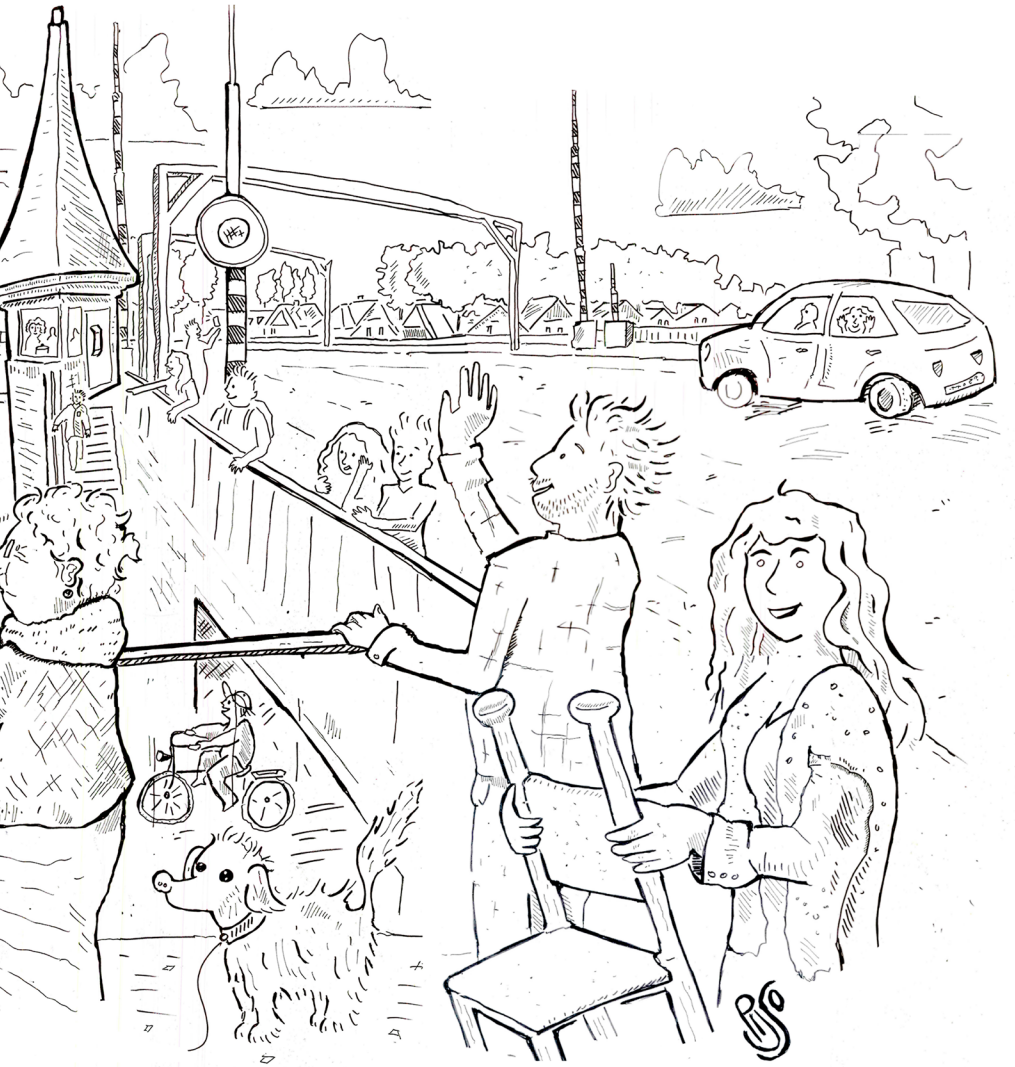
Figure 107. *Close up render of stairs made out of the specific elements. Image by author.*



Sketch 30: *Re-use of space around the water.*

Figure 108 & 109
Sheet piling elements

Figure 110. *The area of the Reineveldbrug. Image by author.*



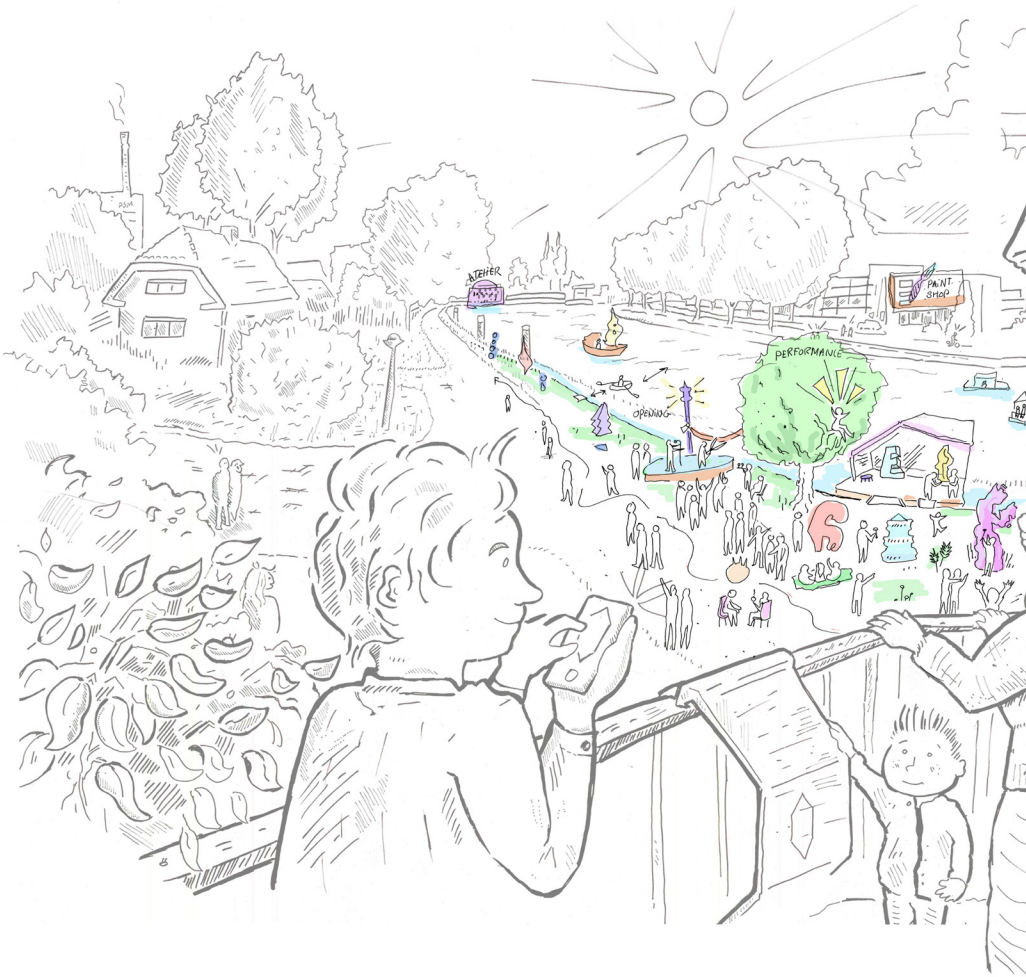


Figure 111. *Art Route. Image by author.*

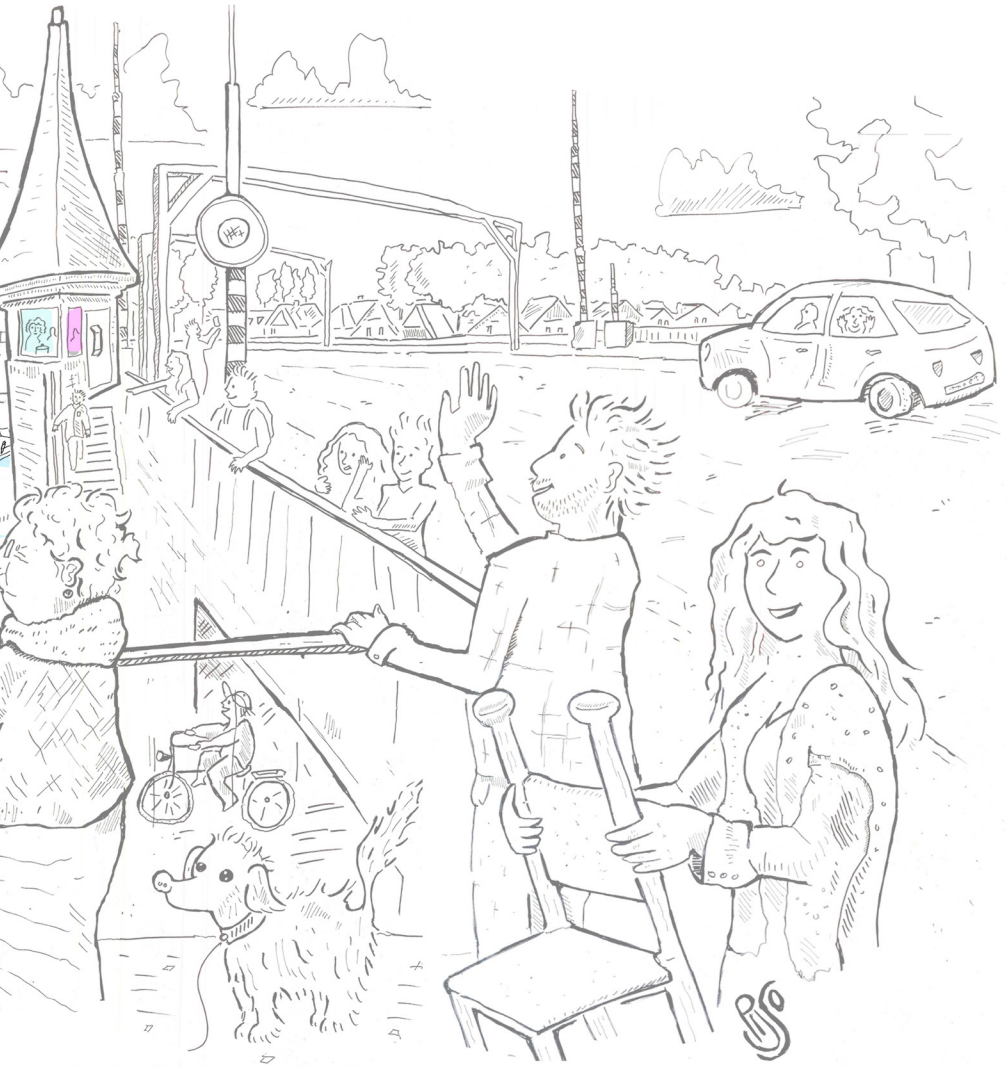


Figure 112. *Garden route. Image by author.*

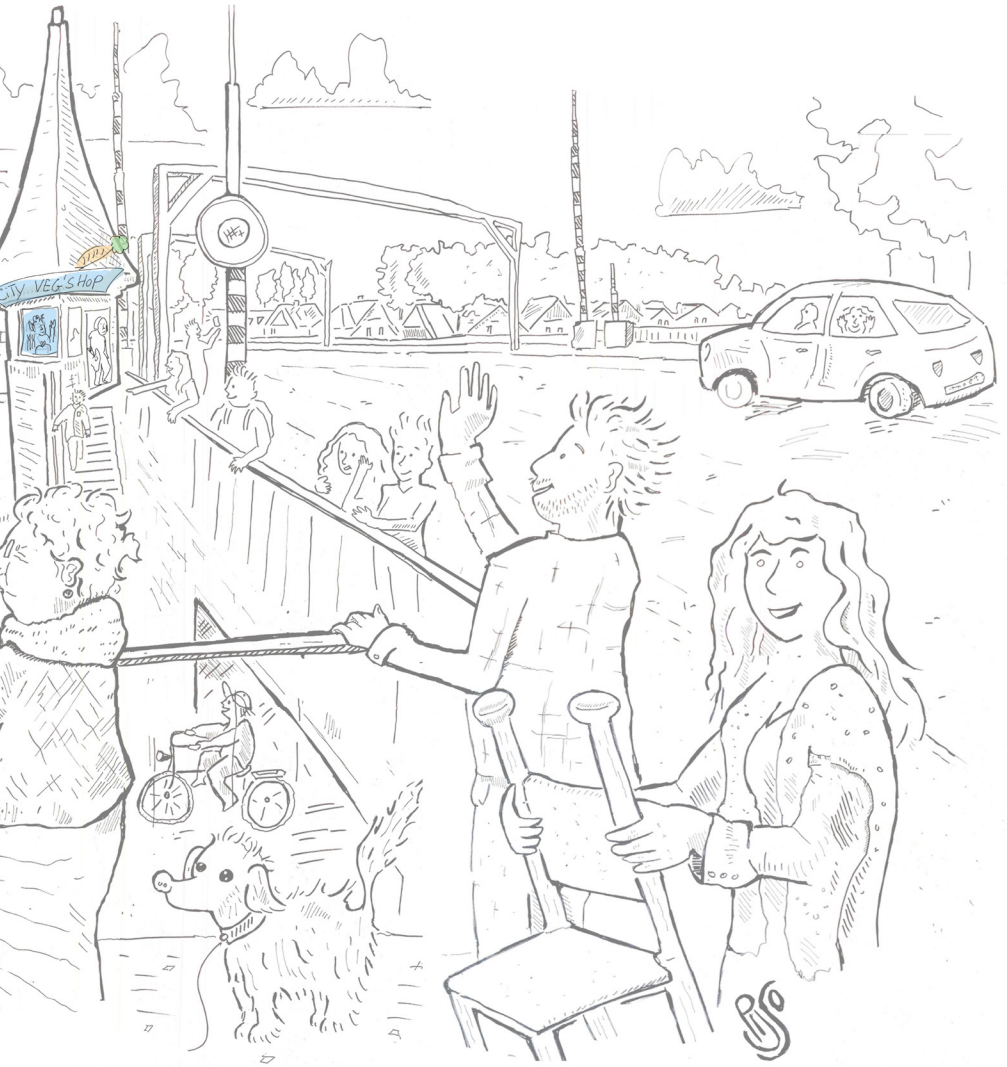
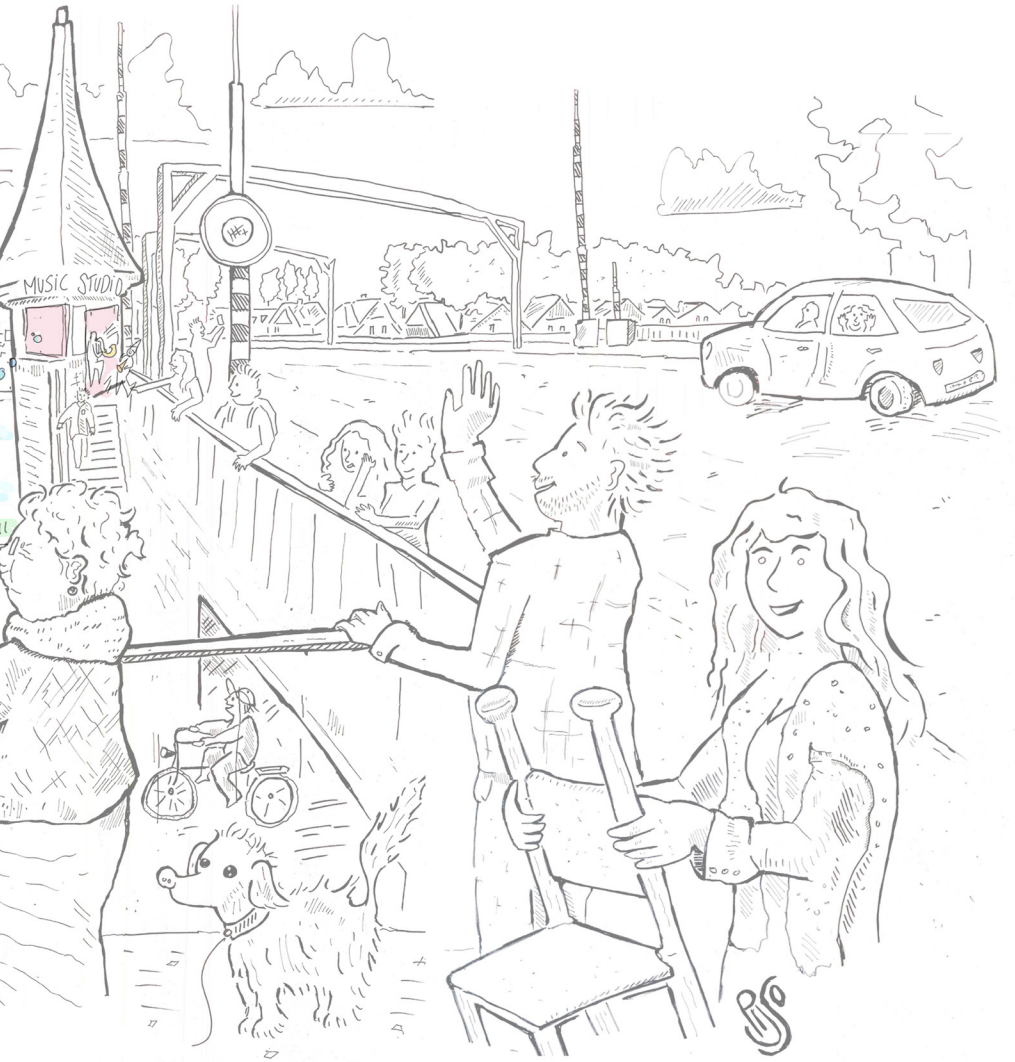

VEG'S HoP

Figure 113. *Festival. Image by author.*


MUSIC STUDIO

III.VIII LOCAL REGIONAL IMPACT

Local happenings, greater regional insight

The use of this New Bridge Keeper together with the Application will provide a framework wherein information and spatial bending combine to encourage individuals to take place into a larger system, a system of creativity and with an open ending. Since water systems and vacancy have a correlation, and water systems combined with roads an even larger amount of this phenomenon, the strategy can have a large impact. The examples that were shown before are only ideas of what effect the minimal intervention of the elements can have. In the next pages the gradual growth of the system will be shown in maps.

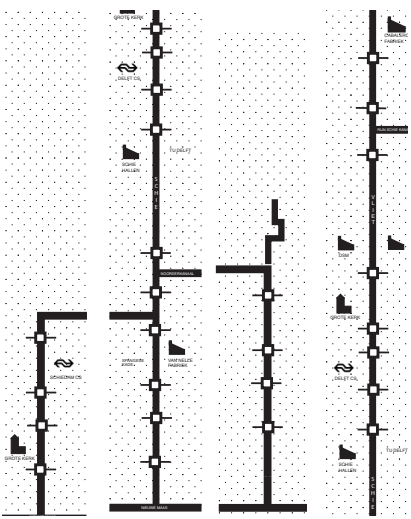


Figure 114. *Abstract map of the water system. Image by author.*

Figure 115 a, b & c. *Social impact on the surroundings. Image by author.*

S

SMALL
In this phase, the bridge houses are simply highlighted by the use of a sheet piling as a door handle. On some places, a sitting space will be provided.
The houses are built to have an overview of the environment, and also those who are in the houses will be seen.

In the mobile application people learn about eachothers locations.

Elements
- Door handles

- Smart Phone application
- Wi-fi and water

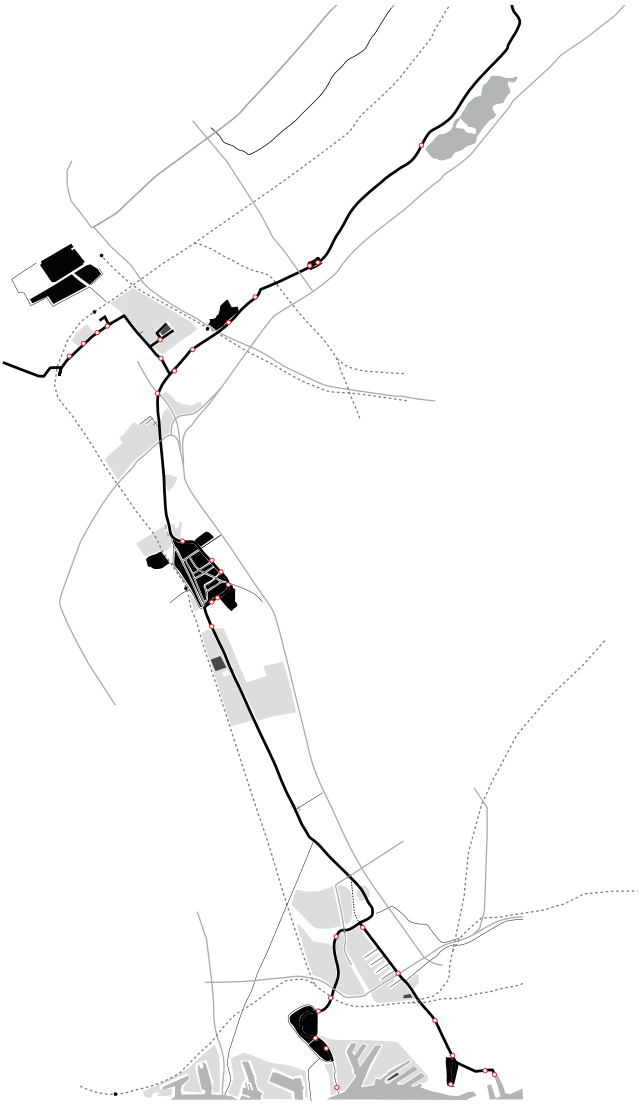
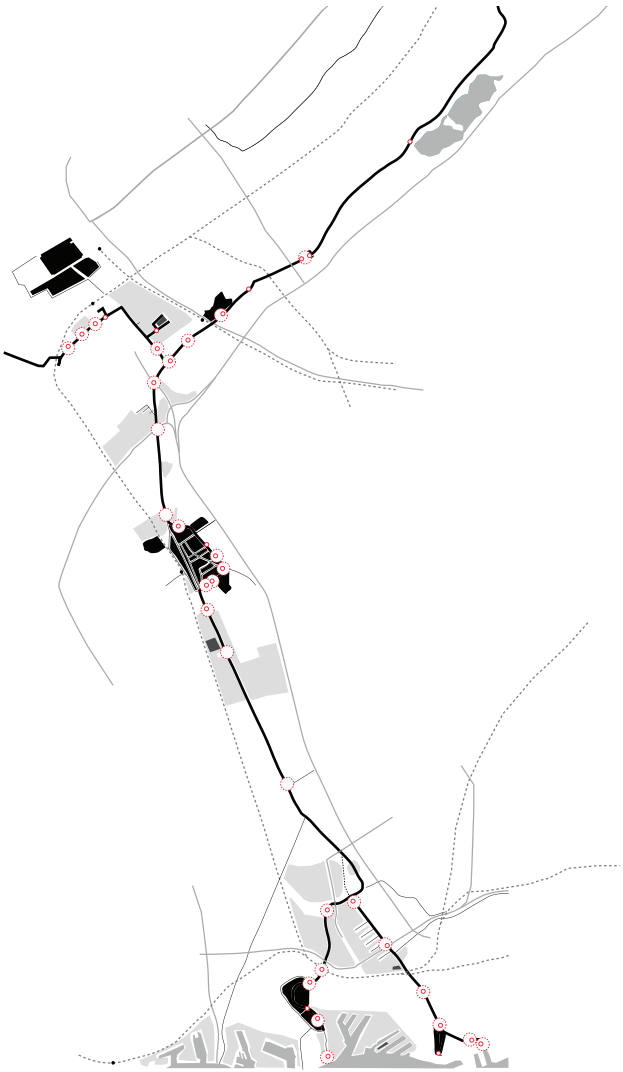


Figure 116. *Gradual growth. 'Small.' Image by author.*



MEDIUM
Some places around the houses are open to be reclaimed as well. A strong correlation between traffic connections and vacant public space is found. As well as next to the bridges. These places are designed to invite the user to come down the bridge.

Elements
- Stairs
- Movable chairs
- Single iconic tree
- Unused land
- Mobile app (development suggestions)

Figure 117. *Gradual growth. 'Medium.' Image by author.*

L

LARGE
In this phase, which indicates the first connections with nearby places around the water, the design of a small space next to the water invites the users to be more involved with the watersystem.

Some creative areas or vacant industrial areas are directly connected to the water. The placement of small scaffolds make a visual and transport connection with these places. The bridge control house is still the central point, but other buildings start to connect.

Elements
- Scaffolds
- Small stairs
- Sitting space

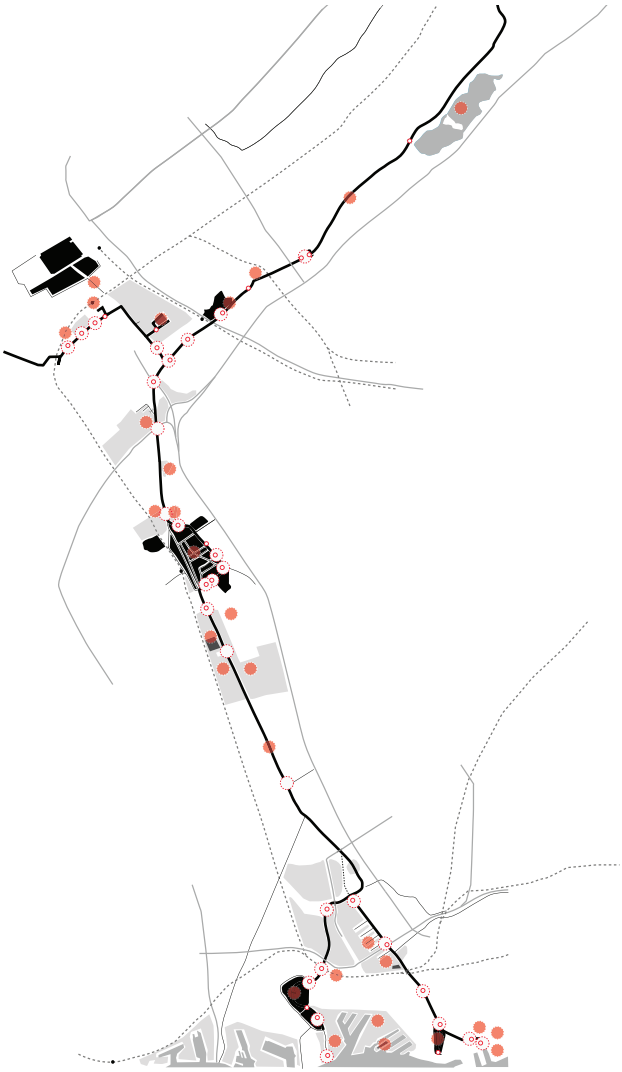
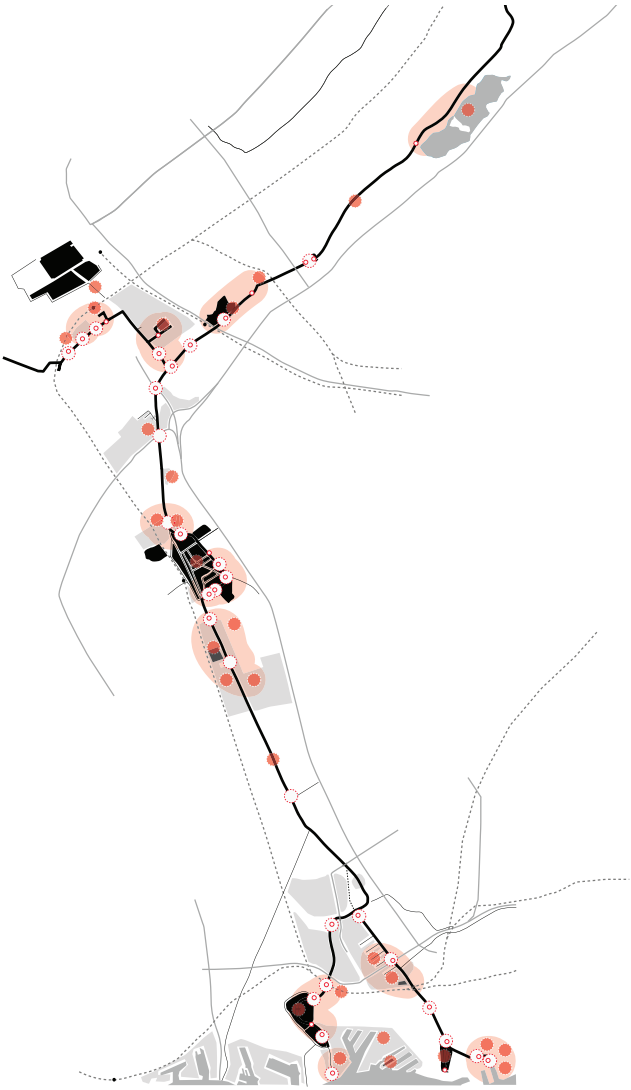
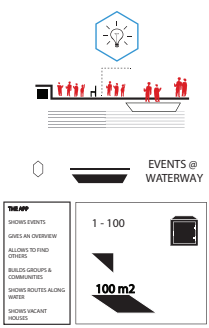


Figure 118. *Gradual growth. 'Large.' Image by author.*



The implemented acupuncture elements and the surrounding valuable places have been created the opportunity to grow as a certain area, wearing a specific identity and theme, and with this the awareness of the citizens close to the water is created.

Also other places that do not contain a S or M, can be made accessible with L. The communities handle in exaggerate.



Elements
- Events
- Small ferries going between destinations

Figure 119. *Gradual growth. 'Large.' Image by author.*

EXTRA LARGE
The next step brings the water system into a higher scale level.
It does emphasize on the fact that the little places have grown their own communities and identities, but with the shared properties as the bridge houses and the water system, these places find a connection to each other.
The small networks that grew around these places, connect with each other now. Different stake holders get same interests. Clusters of water related networks are born.

Elements
- Bycicle paths
- Ferries
- Road improvements
- Water front renewal
- Publicness of the waterfront
- Intercity relations

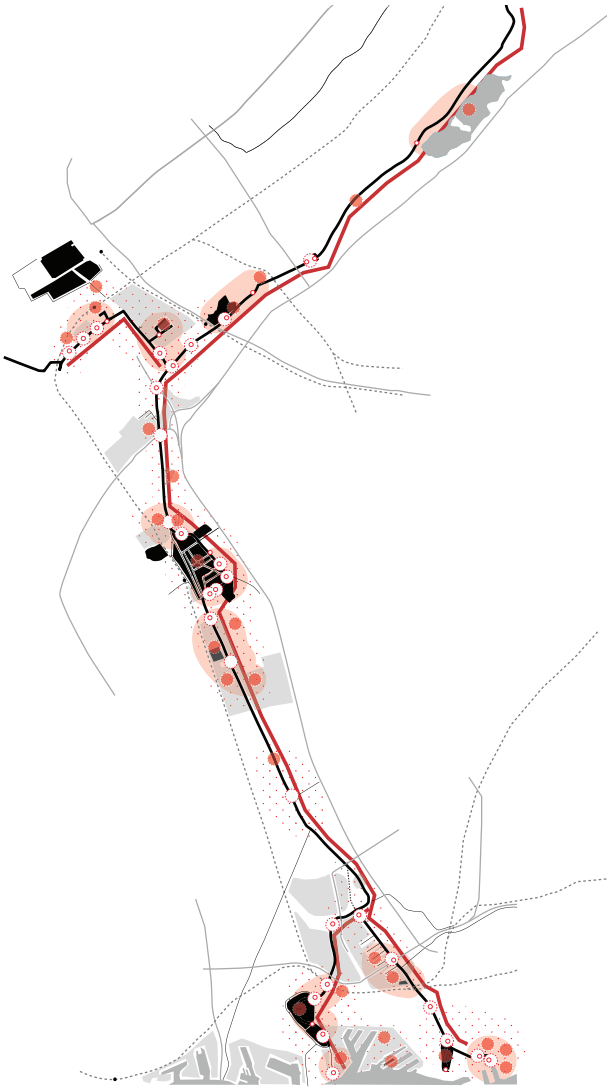
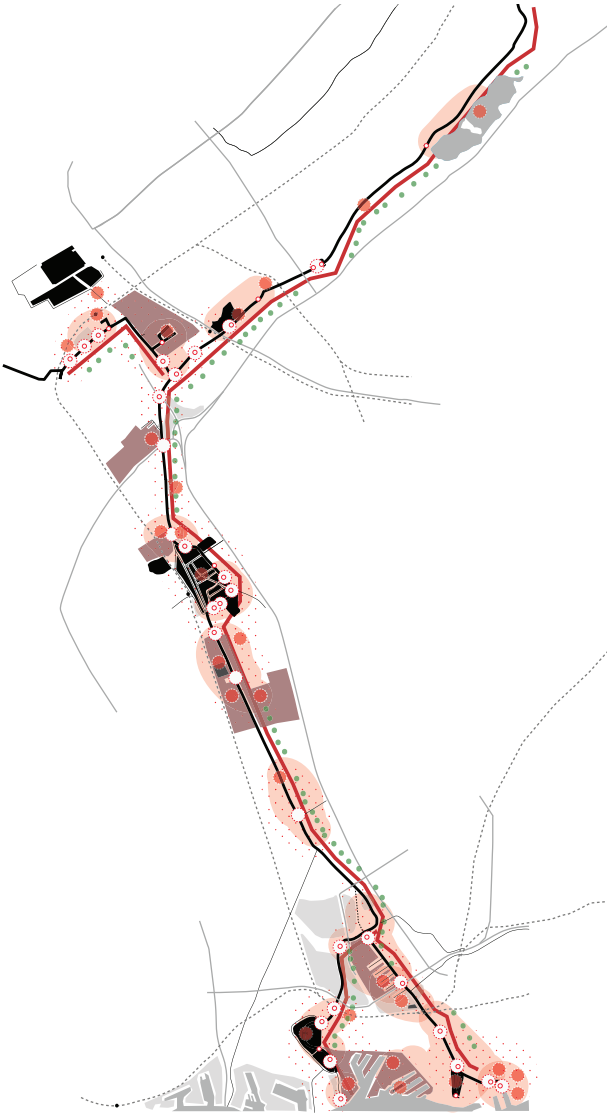


Figure 120. *Gradual growth. 'Extra Large.' Image by author.*



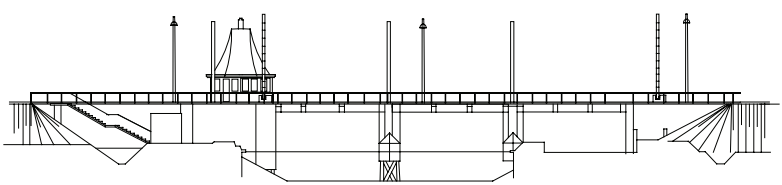
The system is brought back on the map and even works as a social soft network within the metropolitan city. The city found, with the help of its people, it roots back. Though in another form, the awareness for the importance and potential of the water system has been brought to light.

Elements
- Bicycle paths
- Ferries
- Better roads
- Water front renewal
- Publicness of the waterfront
- Intercity relations

- Agriculture
- Water cleaning
- Water management awareness
- Recreation in the city
- a DUTCH DESIGN

Figure 121. *Gradual growth. 'Extra Large.' Image by author.*

LOOKING BACK



Figures 122 & 123. *The effect of the local design can be brought back to its origin: the regional understanding that the water system can bring you from Rotterdam to Amsterdam, for example. The bridges as new indicaters of our landscape. Images by author.*

QUESTIONS THAT KEPT COMING BACK

Do architects know, the designer is not the one to decide how we are going to live? It is those who live there, who should create. The designer 'simply' creates the possibilities.

So: how does a spatial planner involve the real world, and the real individuals into the plan? How can we create an environment where people are feeling free to express themselves, feel equality and shared opportunities?

Equality so that everyone around feels they can participate, and mean something to their worlds. How to design something, that is not to be designed, but about to be created by life itself?

And how can we create this the most efficient, as close as possible to reality?

These questions have been coming back over all the years I studied at this university...

In the field of spatial planning, we built our concepts on assumptions. Of course we justify these assumptions with the right analysis and literature, but in a way, they stay assumptions. That is because spatial planning is an applied science: it is the science of creating environments. And environments are always unique. There is no formula that can calculate the best design, and there is no reliable anatomy of space where we can apply surgery. The subject is formed by too many factors. So many factors, that the designer himself has to make his own decisions in what he thinks is important or not. It is guided by human intuition. Luckily, we are humans ourselves, so we have the great opportunity to test our designs. But even then, it is a moment in time.

The only way to minimize mistakes and to approach the reality in a humble way, is by creating a type of design that anticipates in a direct way with its users. A design that interacts in such a way, that the users have the feeling that their presence is indeed having an effect on the location. Space is something that we breath, not just consume.

I think that I found a way to answer my burning questions with the design of the blue light district.

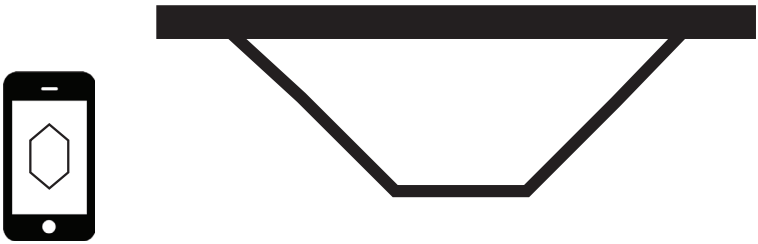


Figure 124 & 125 The project. *A regional idea, an information device, and a spatial 'prosthesis' to create a portal from knowledge to use. Image by author.*

First, I think design for people is really for people. In order to do that, you need to be able to let go of your own ideas. Designs that are made for only one purpose, do not survive long. When the purpose changes or leaves, the dependable design loses its meaning. A lot of times you see that the best and most used objects are useful for multiple meanings. So, be able to believe in the creativity of others.

Second, working things do not come out of the blue. Never. So it is not natural to create a whole new city out of nowhere. Or a forest. It is not adapted to the existing flows of energy. It can be a short-time solution, get a lot of attention, but after a while people go back to the things that feel natural. Everything needs time to function and develop. That is something the designer needs to be able to let go too: your perfect fragment of time, on that beautiful render, does not exist as real, it is a frozen idea. All we can do as a designer is to bluff, to be as close to something that feels real, that answers dreams of others.

THE CREATIVE PROCESS

The Hunch

I had a hunch about vacancy, a lot time ago already. I felt I needed to do something with the bridge houses. I remember three years ago, I already wanted to call the municipality to do something with the house. I believed that there was something of value. Also on a regional scale.

Talk About It

With the start of the year, I talked to almost all teachers of landscape architecture, as well as my friends and family. It could be hard to not talk about it sometimes.

The Sponge

I went biking with my dad along the water system. I met the people of the bridge keeper association. I went to the control center of the bridges and their traffic. I met people of the government that guided me to the inside of the houses and underneath the bridges. I also read about water network strategies, labyrinths, social design, etc.

Build Your Own Adventure
It is to build ideas, over and over again. What is already a 'fact' for your concept, what parts do you need to leave for a moment, what scale do you think? And just try it all: make it a game for yourself. Do not put any boundaries. The only way to find the real boundaries is by crossing them...

Confusion
Doubt. Who on earth am I to interfere? Why would I do anything, and why not just leave it all. So arrogant to think you have the right to do that! And the design is so minimal, its actually almost nothing. Why? Why not destroy everything? Also: frustration.

'Beam me up, Scotty'
Not just kill your darlings, or reconsider some aspects. Just leave it all behind, as if you beamed yourself to another world. A world where the project does not exist. And find yourself again. Maybe the ideas were not that bad. 'Well this part is maybe, but that other part clearly comes close to the core idea.' Soon you start to look brighter to yourself.

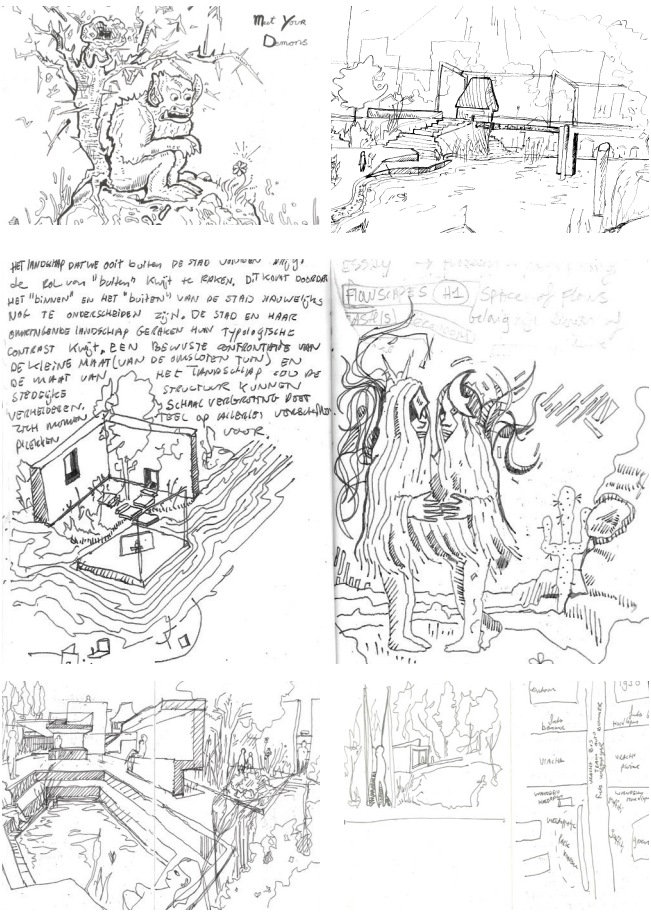
Always be kind to yourself - stay vulnerable
To give constructive feedback, always snuggle it in love. We are only human, and we are vulnerable. Set expectations for where you are in the project, then ask questions in a way that allows for "the love sandwich": First, "What works for you?" Then, "What doesn't work for you?" Then, "What works for you?" again.

The Premature Breakthroughlation
You'll find in a project that you'll have many small breakthroughs: and you have to celebrate those breakthroughs, because they're ultimately going to lead to the Big Breakthrough. Celebrate by accepting the project the way it is. Do not identify yourself with your work.

Revisit Your Notes
I always do this throughout the project, but especially during that last home stretch… I revisit all my notes and think back, and always find a clue that missing link that brings it all home. Such as this list of the creative process. The paragraphs come out of a revisited note.

Know When You're Done
Really, know when to stop, and also do not punish yourself for it.

I like to see a project as a baby. First it doesn't exist, the idea comes, an energy explodes. It starts to develop inside, then gets born. After some time it grows. It learns. Soon it is not you anymore. And it should be able to live without you someday...
So: know how and when to let go.



Sketches 31, 32, 33 & 34: *Be impulsive, revisit your notes, kill your darlings & know when you're done.*
Oh, and take care.

APPENDIX POSSIBILITIES

St.Sebastiaansbrug, Delft
Character: a busy car traffic bridge with a limited amount of pedestrians and bikers. The Hambrug is used for biking.
Environment: the connection between the TU neighborhood and Zuidpoort, an important entrance for the center of Delft. There is a big parking garage and a cinema, theater and shops.
Water traffic: there is no place to dock your ship, but there are possibilities.
Thread: the house is very small and only accessible by stairs.
Chance: gets a lot of attention, is not affected by the sounds of the bridge. It can be of use as an important object to display something that will reach a lot of people.
Recommendation: Create a small pavilion that make the access of the bridge house possible, as well as some places to dock the ships. Students can promote their student club here, or start a small company for 3D printing. Anything that is university related fits well for this location.

Koepoortbrug, Delft
Character: busy traffic by pedestrians and bikers.
Environment: the connection between a neighborhood east of the channel and the city centre. On this route you find a lot of shops, businesses and in the market. East of the channel the entrance of the parking garage is there that is made for tourists and visitors.
Water traffic: there is no place to dock a ship.
Thread: the house is partly put between the traffic beams.
Chance: The location is very attractive, a lot of tourists pass by the bridge when they leave the parking garage towards the market. The house is therefor very attractive for touristic visitors of Delft.
Recommendation: People that want to expose them selves with art, music, food or typical Delft souvenirs can start a smart shop here.

Reineveldbrug, Delft:
Character: very busy city bridge, high and the North entrance of the city for car, tram, pedestrians and bicycles that live east of the channel. Also tourist often walk on this bridge.
Environment: green, park like with the Wallertuin and Kalverbos. Not so much place for parking. Some vacant buildings and the DSM area are close.
Water traffic: also no place for docking, but the environment asks for it.
Thread: the house is very small, and the stairs are very steep.
Chance: can be a kiosk where people sell picnick stuff, make thee, related to the park like environment. Also it can be part of an interesting walking route that leads along the parks of Delft.
Recommendation: Make this bridge an important link between docking, walking and leisure. Also the surrounding vacant buildings from the industrial areas around function as a great opportunity to connect with the application.

Hoornbrug, Rijswijk
Character: very busy city bridge, high and the North entrance of the city for car, tram, pedestrians and bicycles
Environment: house stands exposed in the middle Vliet as a sort of town gate next to the bridge.
Thread: limited space around the house, for example, dropping the bike.
Water Traffic: no docking facilities, but the channel is broad enough for opportunities
Thread: limited space around the house, for example, to drop the bike.

Geestebrug, Voorburg
Character: busy city bridge, nice and several cultivations around
Environment: living, working and shopping all around. Many pedestrians, cyclists, tram stop near the bridge.
Water Traffic: located outside the main routes for recreation boats.
Thread: current house sits high
Recommendation: create a way to access the building with the sheet piling material, create a way sit on the interstitial space around.

Nieuwe Tolbrug, Voorburg:
Character: small house next narrow bridge for pedestrians and cyclists.
Environment: in a park opposite (rear) entrance theme Drievliet on the corner of Trekvliet and the Vliet. Nice panoramic point, sunny, with a fairly busy road on the other side of the Vliet.
Next to the house is a bigger operation center, which will eventually disappear. Parking within walking distance.
Water Traffic: here was a former dock for Drievliet. On the park side next to the bridge there are good opportunities for docking despite the relatively narrow waterway.
Thread: the house offers hardly any room, located right next to the control center.

Hofland Brug Leiden
Character: spacious house operation at elevated bridge between two green areas for pedestrians and cyclists, closed to ordinary traffic.
Surroundings: fairly quiet place out of sight of the residential buildings on both banks. Next to the bridge is a large flower and plant nursery.
Water Traffic: No dock, but there are opportunities to realise.
Thread: in current situation, no social supervision.
Odds: In conjunction with the nursery the house could work as a flower shop.

Wilhelmina Leiden:
Character: city bridge with heavy traffic within the suburbs.
Setting: spacious, green residential areas, wide entry and exit lanes, traffic lights. Beautiful water tower near the bridge. Parking within walking distance.
Water Traffic: No dock, but there are interesting opportunities.
Recommendation: both water- and land for tourists, this is a striking and useful house, which can be combined with its environment. The water tower can also play a role. It is a stop place for tourists with construction and parking.

THANKS

my greatest thanks to and respect for;

the technical university of Delft;

landscape architect and activating, enthusiastic mentor Frits van Loon;

urbanist and open minded, sharp mentor Leo van den Burg;

enthusiastic architect and associate of Stichting Brugwachterhuisjes Frank Moerman;

the province of South Holland and her associate Cees den Boer;

encouraging architect Remco Rolvink;

friendly workers of de Vries Werkendam b.v. for the sheet pilings;

all the inspiring persons who walk in this architecture building;

my understanding, smart, open and sharp (landscape)architecture friends;

my supportive and enthusiastic roommates of the Nieuwelaan;

my love and closest friends;

my amazing family;

and in special my father and mother;

for that I am very grateful for that all that is given,

for experiencing the unbelievable luxury of this education:

attending to this university is as growing on fertile soil,

thus I know there is always a place where I can find

encouragement, strength and knowledge

what makes me believe

I can make my dreams come true

Pierre

10-3

~~Het~~ idee is om in de Randstad een Netwerk te maken. De oude waterweg, die de stad met elkaar verbindt
heeft een grote potentie. Hoe kunnen we er voor zorgen dat deze structuur zijn kracht weet te behouden in
een tijd van urbanisatie en globalisering? welke dingen zullen we in de toekomst meer nodig hebben
in een gebied als Randstad? Wat is de huidige problematiek en Hoe kunnen wij als ruimtelijke planners
een combinatie van huidige oplossingsgerichtheid met toekomst inzichten tot stand brengen.
Landschapsarchitect is breed van lokaal tot regionaal, als het van tijdsgeest tot toekomst visie
gaat. Wij hebben veel ideeën als ~~het gaat~~ om de ontwikkeling van onze rol als
ONTWERPER HOE WIJ ONZE ONDERZOEKEN INKADEREN. ??

COVER