Hier werd op Donderdag 4-9-1975 om 10.30 uur de dijk gesloten
From infrastructure to flowscape
The Houtribdijk as an operative landscape structure

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During the landscape architecture design, I am always looking for the harmonious interaction between form (architecture) and process (landscape). One of the most impressive projects that inspired me is Coastal Work Katwijk. Brimming these inspiring features, I started my landscape architecture graduation research in order to seek the formative power and its transforming consequences.
Problem Field and Problem Statement

The Dutch dike, as a symbolic image of the infrastructure in the Netherlands are tremendous components of the urban landscape. However, there are massive infrastructures with a single functionality superimposed in the environment regardless of the dynamic nature and urban development.

The Houtribdijk was built up not only to connect Enkhuizen and Lelystad, but also to make the new south western polder for agriculture (see figure 3). However, the new polder plan was canceled: the Houtribdijk became superimposed into the environment and it causes ecological and social problems.
Under the guideline of "flowscape" framework proposed by landscape architecture graduation studio, the Houtribdijk is regarded as a case study during the entire research process.

In the conceptual drawings, it is shown that the Houtribdijk is treated as a landscape zone integrated into the environment instead of a linear technical structure which has a single purpose. During transforming from the infrastructure to Flowscape, the landscape processes of the nature and urban systems are the main formative power to reshape the Houtribdijk.

I will start to explain how I achieve to design the Houtribdijk as an operative landscape structure.
As the conclusion of the context analysis of the site, it is found that there are two orientations of the Houtribdijk: natural landscape orientation and urban landscape orientation. On one hand, the Houtribdijk blocks the two eco-system which result in different water qualities, floral and fauna diversity, gradient, etc. The dike is the edge of two water bodies.

On the other hand, the Houtribdijk connect two different urban system. However, the dike pushes the city growth inward to the land instead of facing the water.
However, if we regard the Houtribdijk as a part of whole landscape system, there are high potentials make it operative.

The dike can act as an interface between the two lakes in order to balance the ecosystem on both sides.

The dike can offer places to stay instead of only quickly passing by.

The dike can be developed as a cultural center connecting different urban tissues.
In order to get a grip on the dynamic forms and first design principles could be in this area, I made the iconic drawings based on the existing design projects. In this step, there are three main elements summarized from every case: land, water and dike. The understanding of spatial language among these elements helped me reflect on the forms in my transforming design process.
Before directly dive into the design of forms, I decided to search for the formative power, which is the natural process based on the flowscape concept.

The three main natural processes: wind setup, sediment resuspension and seasonal water changing give the direction of my strategic design.
Strategy Design

During the strategy design, there are three main landscape strategies are elaborated. Firstly, to create the soft shore of the Houtrubdijk. By designing the marshland in the shallow water area and expanding the sand plan to offer more habitats for fauna and flora at the same time, it can reinforce the dike and prepare the dry feet area for accessibility.

Secondly, to enrich the lake bed gradient would help to reduce the sediment resuspension. At the end, the artificial elements carry the functions of resource exchanging between the IJSM and MM and the accessibility crossing the high speed traffic line on the Houtrubdijk.
While from human perspective view, all the design eventually should make people appreciate the spatial quality in human scale. In that case, a panorama installation is designed specific to represent the open view of this dancing dike. Within a view range of 13km horizon, every elements we design will matter. And it is clear to show the bay and the cape around the dike.
Landscape Structure of the Houtribdijk

Based on the previous analysis and design, it came up with a landscape structure which highlight the potential landscape spots.

A step before, Design in layering approach:
- Natural process system
  - Construction elements
  - ISO height layer
  - Water depth layer
  - Soil type layer
  - Fauna clusters layer
  - Flora clusters layer
  - Natural power layers (sediment resuspension, wind, waves, drifting ice)
- Expression elements
  - Spatial form of natural elements layer
  - Spatial structure layer
- Urban system
  - Construction elements
  - Civil engineering layer (plan, section, technical aspects of the infrastructure)
  - Program layer (urban function, harbor, recreation)
  - Social and cultural layer (event)
- Expression elements
  - Architecture layer (spatial quality, dancing dike, landing cty)
To some extent, the landscape structure gave a direction to my initial design. However, after trying to make three initial designs for the Houtnriibdijk, I lost the sense of the scale. And I found out later it resulted in a lot of massive intervention. But this step is very helpful to figure out the possible forms for my design.
Existing situation and potentials of Trintelhaven phase

When I zoom in, I found surprising potentials. So I choose one area on the Houtribdijk with higher potentials to develop. The Trintelhaven is chosen because there is shallow water area to the north and sand plain to the south of the dike. Moreover, there are also urban activities happening around the restaurant and recreational beach here.
Ecological analysis of Trintelhaven phase

However, from ecological aspect, there are still unbalanced ecosystems around the dike.

For instance, the sand plain in the Markenmeer is too narrow to hold more bird populations. On the other side of the dike, it lacks the fauna and flora habitat which could improve the local environment.
Ecological landscape design of Trintelhaven phase

In the design, the decision was made to expand the foreshore of the Houtrijsdijk by creating the marshland in the shallow water area of IJsselmeer and widening the sand plain in the Markermeer. At the end, the social activities is also integrated in this area.
As a result, the diversity of the fauna and flora would be increased. Moreover, the soft foreshore would help to improve the water quality. At the end, humans could also benefit from this comfortable landscape.
The landscape need time to grow. So after I proposed a final outlook, I illustrated how the dynamic landscape grow over time based on natural process.
Dynamic Landscape Design C
The new marshland is located within a shallow lake area around 700 meters to the northwest of the Tintolhaven. In the current situation there is an enormous open water surface. Under the dominant northwestern set-up of the wind, without a barrier, waves are heavy near the Tintolhaven. You can see a lot of the white spume near the foreshore of the dike which is very harmful to birds and humans.

But there are potentials to improve this environment. In google maps, it is clear to see more than ten spots of dry land with a diameter of 10 to 20 meters.
In order to figure out how marshland grows, I did a case study: Oostvaardersplassen. It focuses on three aspects:

- Wet and dry areas
- Water erosion pattern
- Marshland growing process
Besides the case study, I also did a real site experiment on the Kijkduin beach. The goal of the experimental design is to have a visualized conclusion of the consequences of water erosion caused by natural powers. The results of this test proved my proposal is logical to be developed further.
Ecological Design

Marshland growth proposal

Based on the site analysis, the case study of the Dodkaardersplas and the experimental design, I propose these new marshland growing principles, taking use of the high lands in the shallow lake area. By setting up a wave breaking structure and reeds planted, the high lands can be protected from water erosion. Afterwards, sand can be dug in the surrounding lake bed and be used to refill the shallow water zones. When a regular maintenance for the vegetation like willow, buckthorn, etc., is needed, at that moment the accessibility (bridge, infrastructure) will be introduced within the marshland. In the long run, the marshland will keep growing within the cycle of the micro ecosystem.
Achievements

The achievement is illustrated from a perspective view on a human scale. It shows how the landscape design brings the spatial quality to the users' nature groups and human society. The principle I use to represent the spatial quality is to use several steps of drawings to show the process of new marshland growth. Before the final result, I use lines and emotional colors to show the change over time. This method is applied specifically for this kind of project: a dominant empty and linear structure (the dike) will influence the spatial quality significantly. At the end, I will have rendered images to demonstrate future proposals with a realistic material design.
A prospect of the new marshland facing to the Tinkelhaven
Case Study: Voth and his arts

Respectful landscape: man is a tiny creature in a great, big world and even his largest monuments are no more than a modest sign of human life in Mother Nature’s empire, like a scratch on a rock.
Experimental design: the form of the connections

Principle application through experimental modeling. "The Form Studies programme is concerned with the furthering of knowledge, insights and skills concerning Composition and Perception in the domains of landscape architecture. In research, the emphasis lies upon the exploration, visualisation and explication of elementary formal phenomena in the context of the discipline of architecture, making active use of digital and physical modelling applications." (Form and Modeling Study, TU Delft)
Experimental design: Emotional modeling

After researching more possibilities of dike forms by modeling, I gradually introduce the design concept and emotional effects into the models. For instance, the project is about the Houttubijk standing in the middle of the lake and facing to the open horizon. The sky and water are the main background of the environment. So the emotional colors of them changing through time and weather matter a lot to the landscape design. To cross the discipline of art, the paintings of Mark Rothko as reference are applied into the dike models. They lead the design into the cultural and social values which are parallel to the scientific and technical design of the dike.
Redesign by Physical Modeling

Delete the top glass in later design.
Shan Shao TU Delft MSc LA “From Infrastructure To Flowscape - The Houtribdijk as an operative landscape structure” Mark Rothko Tunnel design animation

https://vimeo.com/172333300
Initial design of the Operative Bridge
Operative Bridge Landscape Plan Design
Bridge as a interactive LA to the environment: rythem of horizontal line and sand plain by movement
Conclusion of detail design

Based on the new landscape condition, the intervention of two landscape architectures are introduced into the site. They are parts of the landscape and becoming a spiritual media to carry the space and guide your movements at the same time offer the accessibility to both sides of the dike. Because the dike peak shifts, the expression of the two accessible space also changed. One is the tunnel under the dike peak brings you into a heavy dark space then to an open horizon. The other one is a light bridge over the dike peak bringing you into a water forest. These two carriers of the space "share" the inverse spirits. One is closed, dark and mysterious; the other one is open, bright and evident. These experiences of the space have the interaction to the surroundings and they work together to improve the spatial quality. From the cultural aspect, they interact with the "horizons" because the Houtribdijk is the only place you can experience both sides of open lakes horizon. As a result, the exhibition of Mark Rothko's paintings in the tunnel is telling a story of open horizons and his emotions which is corresponded to the real horizon when you get out of the tunnel. When you walk on the curve bridge, the horizon in the distance is going up and down with certain rhythm like the music of John Cage "In A Landscape" and his music notes drawings.
In general, the research is designed to start from a generic problem field, "Flowscape", narrowing down to the research objective, then to a specific landscape design project. At the end, it generalizes the study into the next level which is the lessons learned within the problem field (see figure 5). The Houtribdijk transformation design project under the specific context is regarded as a case study for the entire "Flowscape" design-related research. So the outcome of the Houtribdijk transformation design is not the end of the research. Instead, the lessons learned and elaborated on from the design case study are the end results of the research process.

When the single-purpose infrastructure is transformed into a dynamic landscape system, the scope of the research and design is expanded into spatial, ecological and societal aspects instead of a pure engineering function (Thompson, 1. H., 2014). Regarding to Nijhuis, E., Bobbink, L., and Jasmin, D. (2011), landscape architecture field is composed of natural, urban, cultural and architectural elements. They are considered mainly from ecological, social, spatial, functional, economic and technical perspectives which result in an interdisciplinary framework (see figure 5). Within that scope, it neither simply combines different knowledge nor goes very deep into one professional aspect. As landscape designers, we are developing the balance and integration among different disciplines. Going one step further, we shall aim to add landscape value on the research and design objects. The landscape value here means the dynamic context and the synergy between nature and urban development.

In the research design model (see fig. 6), it is shown the structure of the problem field, research objective, four main research questions and the synthesis conclusions within the "Flowscape" framework.
Lessons learnt: Working through scales and made by hand
Lessons learnt: The Power of the lines

Mark Rothko said "the fact that one usually begins with drawing is already academic."

He started with color.

I started with line.

Design research is the phase that analyses previous and existing situations and designs in order to understand the site and first design principles. In this case, mapping in 3D and case study are the main research tools used in this step. On the other hand, research by design is the phase to discover the innovative design principles and apply them into the project in order to formulate the new design. Here, the experimental design and modeling methods are utilized to develop the transformation design. By mapping in layers and time, we know where we are and we highly dynamic processes happening in the landscape area. The space of flows and the interactions between different natural and social systems are highlighted in the design process. These dynamic flows reframe the space of place, which results in an integrated landscape systems in potential forms. This landscape system provides the environmental conditions for the natural and urban development. Furthermore, the drawing methods are using the power of lines and different perspectives view as well as bird eye view to research the spatial quality of the project.

(Reference is from "seeing-drawing-doing" "Drawing the ground" Fritz Palabreck)
Lessons learnt: Innovative representation call for people’s evoke

“No picture we view can be understood unless its appearance evokes our approval” - Franz Dahlem
Conclusion and Reflection in a large scale

To reflect on the research objective: The Houtnödbijk as an operative landscape structure, I achieved the transforming design around the Trintelhaven which not only aims to solve a problem, but also provide the comfortable landscape condition for the further development.

The intervention of two landscape architectures are not regarded as a isolated object. They are part of the landscape and only a media to carry the space and change your movements. The experience of the space has the interaction to the surroundings. They works together to form the spatial quality. This is the intention of my design.

The Flowscape as a genetic framework are highly applicable and valid. The Houtnödbijk is regarded as a landscape zone which is operative in the environment.