Narrative Infrastructure and Functional Heritage

The Renovation of the New Dutch Waterline around Utrecht

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1. Introduction
New Dutch Waterline in the Netherlands
The New Dutch Waterline
Urbanization along the New Dutch Waterline
Heritage, also Infrastructure

In a normal situation, the water table is higher during winter. During a dry summer, water needs to be taken in from the boezem system.
Water direction during the war

Boezem

Polder

Windmill

Functional Infrastructure

Narrative Heritage

Landscape as machine

Heritage, also Infrastructure

In a normal situation the water table is higher during winter. During a dry summer, water needs to be taken in from the boezem system.

Linie as Heritage and Infrastructure

Introduction | Narrative Infrastructure and Functional Heritage
The New Dutch Waterline
Urbanization along the NDW in Utrecht
Utrecht Urban Plan in 1924

Urban Expansion in Utrecht by now

Linie is Urbanized
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Urban Expansion along the New Dutch Waterline in Utrecht by now
Visible and invisible landscape along the New Dutch Waterline in Utrecht
2. Research Question
Research Question

Is it possible to **transform the language** (historical image, composition grammar and spatial features) of Nieuwe Hollandse Waterlinie into a functional and narrative framework of urbanization?

Specifically, the design is aimed to **make the visible and invisible heritage legible** (represent historical stories and the new characters of heritage colored by the complex environments) and **solve the urban problems** (de-fragment and water management challenge).

In this case, landscape plays the role as language and machine at the same time.
Research Question

Functional

- repair fragmented heritage and urban space
- resilient water management

solve the urban problems

Narrative

- represent historical stories on inundation and defence
- represent the spatial characters of heritage which is being colored by the urban territory

make the visible and invisible heritage legible
Methodology

Research

Theory study
- Landscape Urbanism
- Landscape Narrative
- Heritage Regeneration

Case study
- Infrastructure
- Heritage
- Narrative landscape

Site study
- The New Dutch Waterline
- Utrecht
- Selected Site

Design study
- How to represent history and the influence of history
- How to repair fragmented space and improve water management

Design

Theory study
- Scenario for urbanism
- Resilient City

Case study
- Resilient Water Management
- Urbanism Framework

Site study
- Specific Problems and Space Features

Research Question I Narrative Infrastructure and Functional Heritage
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3. Site Reasearch: Problem Statement
The New Dutch Waterline
Functional

Water Management Challenge

Narrative
Water Management Challenge

Site Reasearch : Problem Statement I Narrative Infrastructure and Functional Heritage
Possible climate changes for the 1990 – 2100 period, according to KNMI’06 scenarios

- **Wet periods**
  - Ten-day precipitation totals that will be exceeded once every 10 years:
    - Winter: +8% to +24%

- **Dry periods**
  - +7 to +30%

- **Annual precipitation**
  - From -5% to +6%

- **Sea level at Dutch coast**
  - +35 to +85 cm

- **River discharges**
  - River Rhine average in winter: +12% to +27%
  - River Rhine average in summer: -41% to +1%
  - River Rhine extremely high discharges: 4 to 40 times more often


www.pbl.nl
Water Management Challenge

Site Reasearch : Problem Statement | Narrative Infrastructure and Functional Heritage
Cycling paths cross the infrastructure.

Poor connection between urban fabrics.
The New Dutch Waterline
Historically illegible: linear landscape
Historically illegible: illegible image

Poor maintainance and function change
Territorially illegible: heritage on the complex environments
Territorially illegible: heritage on the complex environments
Territorially illegible: heritage on the complex environments

Illegible Heritage
Site Reasearch : Problem Statement I Narrative Infrastructure and Functional Heritage
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Territorially illegible heritage on the complex environments
A fort inside the polder

A fort inside the city

Experience of the path inside the polder

Experience of the path inside the city

Territorially illegible: illegible heritage environments
4. Design
The New Dutch Waterline

Functional

- reparaire fragmented heritage and urban space

Narrative

- represent historical stories on inundation and defence

Territorial park system

- resilient water management

Narrative water infrastructure

- represent their spatial characters of heritage which is being colored by the urban territory
Territorial park system
Territorial park system

Strategy
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Narrative water infrastructure
Narrative water infrastructure

Strategy
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Master Plan and Strategy
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Transition nodes
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Transition node 1
from the city to clay polder

Transition node 2
from the forest to clay polder

Transition node 3
from agriculture field to university campus

Transition node: the door from city to clay polder

Transition node: the buffer zone from forest to clay polder

Transition node: the tunnel from agriculture field to university campus
Transition nodes
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Transition nodes
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Tool A: Seasonal wetland

seasonal wetland for cultural narrative and resilient water management.

Vegetation absorbs the nitrogen and phosphate among the water from agriculture area. These substances act as nutrients and help the vegetation to grow. The purified water is discharged to the water system. Vegetation can be harvested as biomass.
Tool Kit for Flooding Representation
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Tool B: Solar panel field

In some area which can not be seasonally flooded can be transformed into solar panel field, sometimes combining with farm. The shining image of solar panel field remind people of the water easily. Therefore, it is also used as a tool to represent the inundation.

Tool Kit for Flooding Representation
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Path as basic framework connecting different forts in complex environments

Expand the path as a park
shooting range as a program framework + seasonal wetland for cultural narrative and resilient water management
combine the two strategy as the basic framework
Narrative water infrastructure
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Steep slope and walls shape the clear land form and represent the inundation basin. Tree rows start from the fort and point to the distance, just like shooting. The pits along the trees look like craters.

The water flows into the seasonal wetland in the rainy days. Water is shaped as a curve, which showing the water flow direction. The "craters" collect the rainwater and turn into scattered mirrors.

In stormy weather, the basin is full of water like during the war. The tree rows and sky are mirrored. The peaceful view inspires people to reflect war and peace.

Narrative water infrastructure
invisible shooting range

urban forest and other elements represent the invisible shooting range

open areas in the shooting range provide flexible functions, like football field, farm, lawn and plaza. Similarly, dense areas also provide flexible functions, like housing, forest and greenhouse.

flexible framework combines with experience path which connecting different forts and other urban fabrics.
Scenarios of Fort Lunet Park
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Scenario 2: sport park
Renaissance of Landscape Architecture

Landscape narrative in Italian garden

Functional Landscape

Performance and narrative
Conclusion I Narrative Infrastructure and Functional Heritage
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Renaissance of Landscape Architecture

Performance and narrative
Conclusion | Narrative Infrastructure and Functional Heritage
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