# Guiding Waters

## Re-imagining the polder landscape of Rotte-boezem

MSC1AR1LA051_2020/21: Ayesha Hussain, Lea Hartmeyer and Yin Wah Wong, Nicolle Cobben and Xulingyun Ji, Martine Schull and Pingyao Sun, Hylke Warmerdam and Yunshu Jiang, Juul ten Hove and Xinyu Zhang, Jolt Wiersma and Yan Liang, Jantine van Halsema and Sui-Hui Kuo.

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# GUIDING WATERS

Re-imagining the polder landscape of Rotteboezem

AR1LA051 - Dutch Landscape - Design Studio

2020/2021 Q2

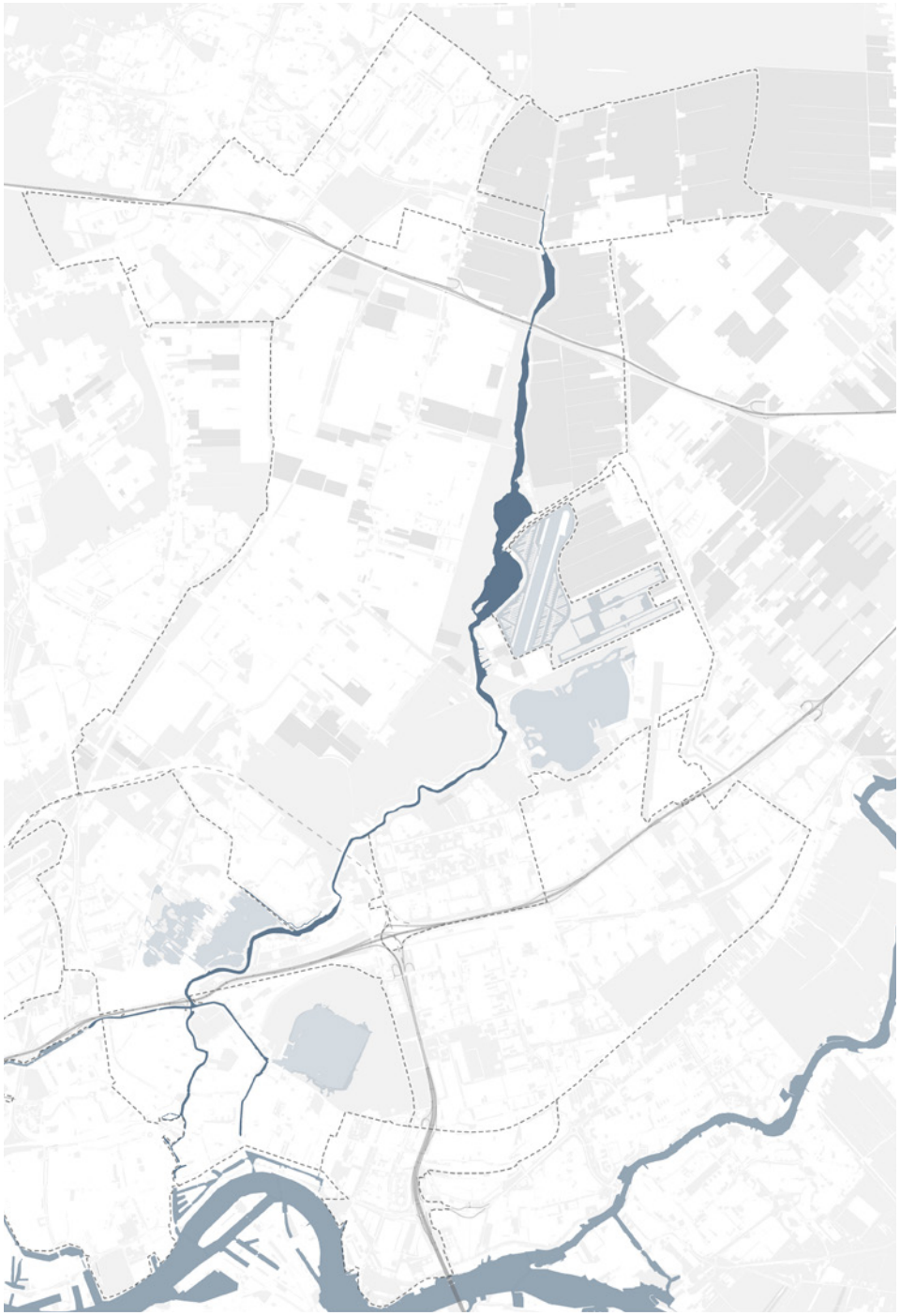
COORDINATOR AND TUTOR
Dr. Ir. Inge Bobbink

## FOREWORD

The course AR1LA051, which is part of the landscape architecture master of the TU Delft, explores the water system of the Dutch lowlands. In a collaborative effort 15 students, split in seven teams, work together to transform a “boezem”-system on the fringe of Rotterdam. The individual efforts of each group and the overall group strategy are summarized in this book.

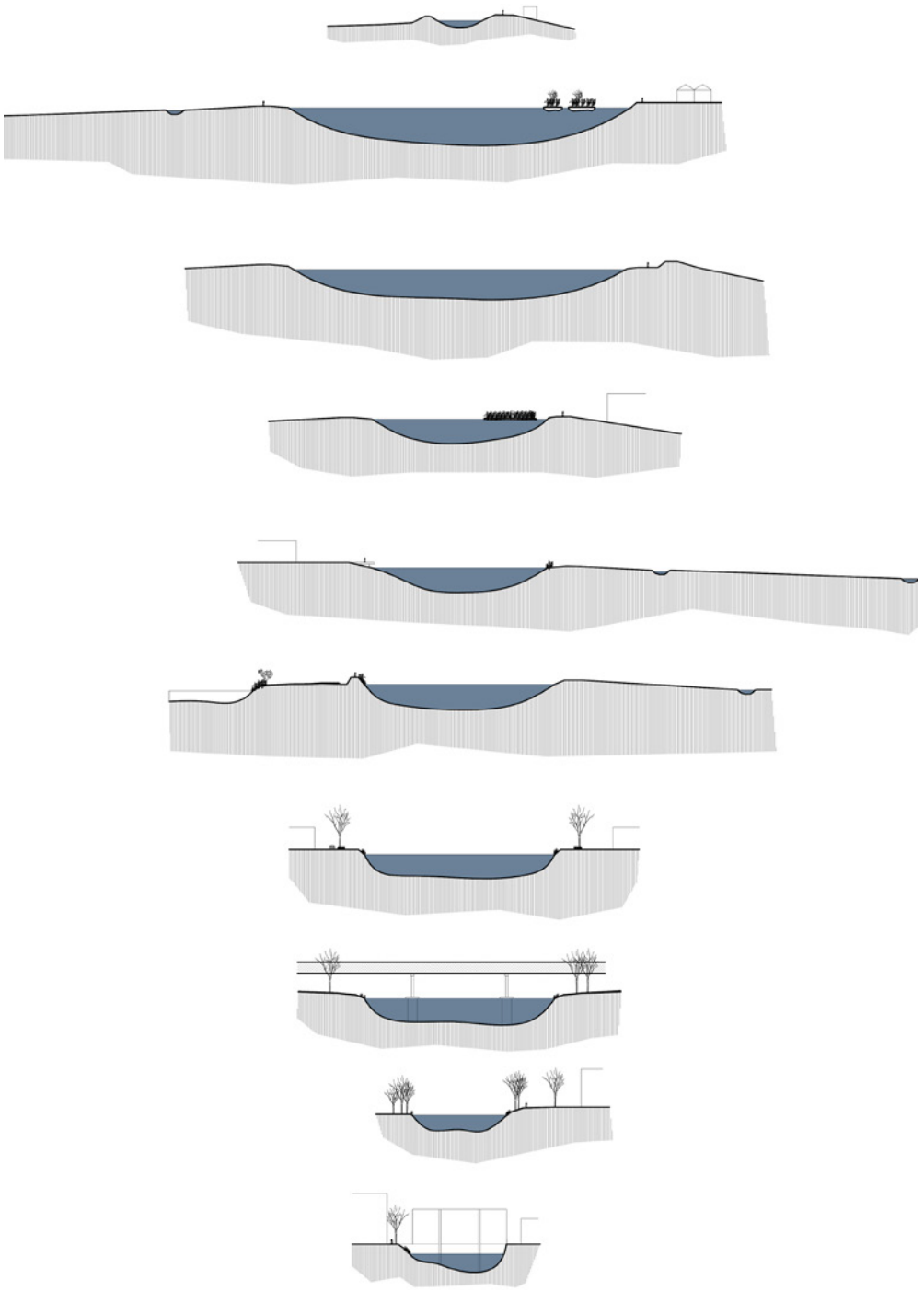
This module was the first big group project for the first year master students and as such required a lot of organizational effort and a general willingness to discuss and find consensus and compromise. While this was made more difficult by the COVID-19 pandemic, the group nonetheless collaborated together to deliver a comprehensive project.

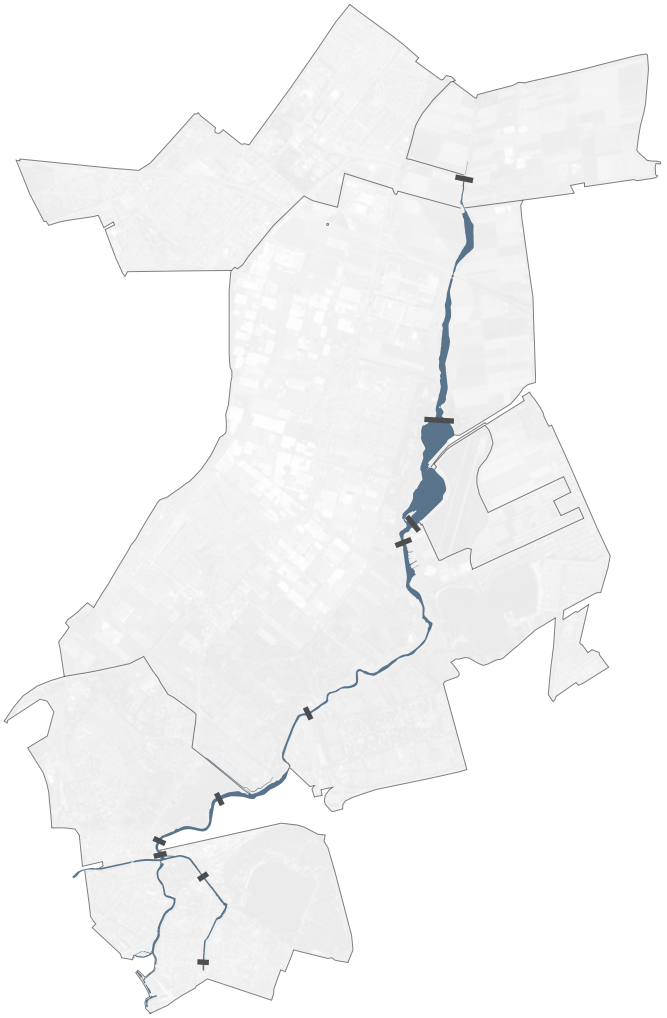
## CONTENTS




## INTRODUCTION

Since the land cultivation in the 12th century the Rotte area has been intensively used by humans. The draining of the soil into the natural peat river, which gave Rotterdam its name, allowed the land to be used for agriculture. It also initiated an ongoing process of land transformation, in which the presence of the water machine grew ever more prominent. Water transformed land and land transformed water from the windmills that were built to pump water out of the sinking agrarian polders in the 15th century , to the first "droogmakkerijen" established to dry the lake landscape left by peat excavation between the 17th and 19th century to the highly complex "boezem-system" of today that supports a mixed use area spanning from the city centre of Rotterdam to the peripheral landscapes of the Randstad used for agriculture and industry. Under the increasing pressure of climate change, but also intensified land by various stakeholders – farmers, business parks, recreational visitors – the Rotte area is due for another transformation. The central question revolving once again around the topic of water: How can the "boezem-system" counteract the negative consequences of both too dry summers and too wet winters caused by climate change? From there various others questions develop: How can we support biodiversity and silent stakeholders such as plants and animals within this new system? How can we ease the pressure of agrarian pollution on the landscape? How can we convey the transformations of the land to the people, who interact with it and how does this transform into an recreational experience?
To address these questions a comprehensive strategy was developed for the whole "boezem-system", which was worked out by seven different teams tackling various areas. The work of each of the 15 students is compiled in this book.

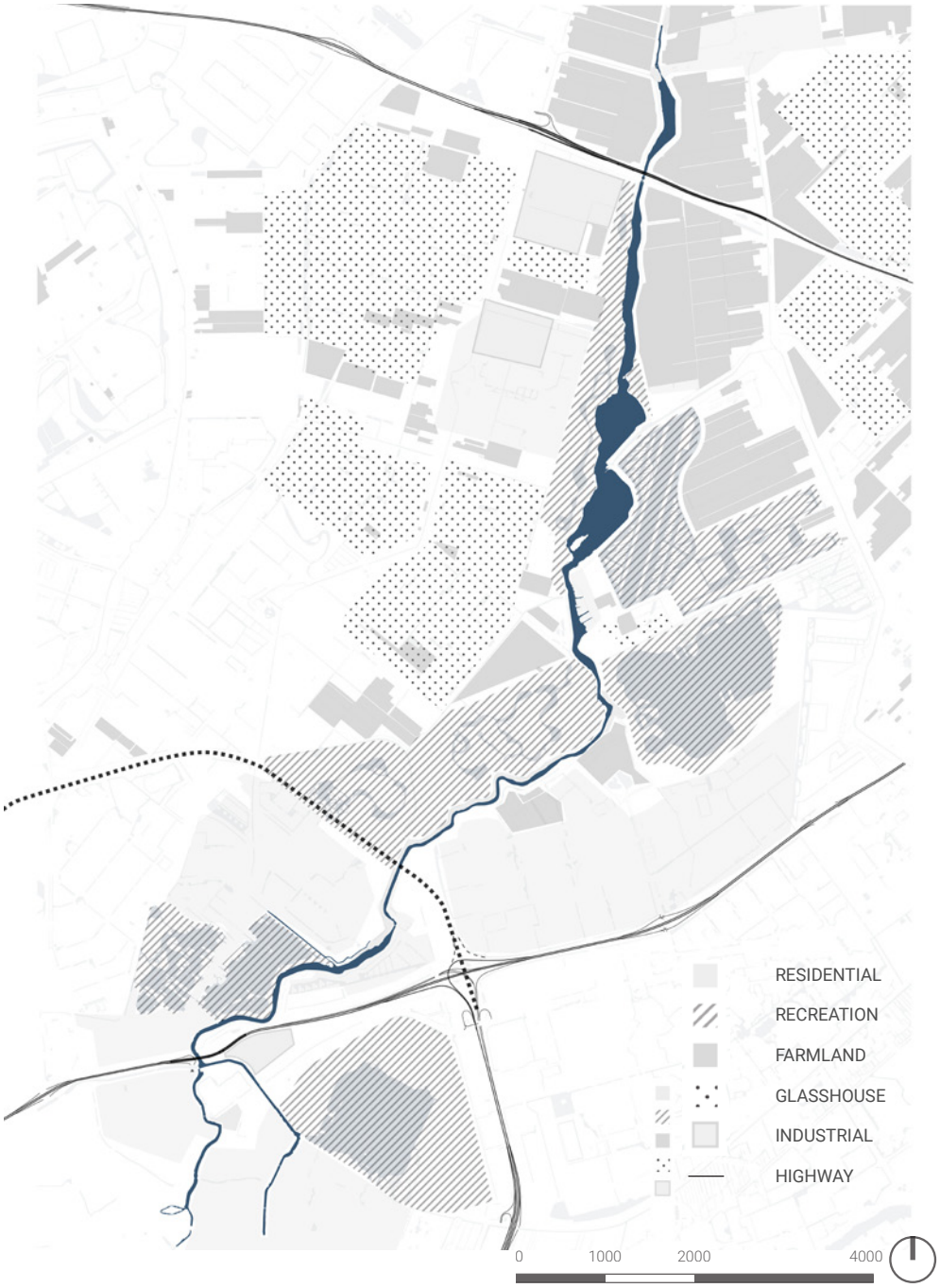




## ANALYSIS - COURSE OF THE RIVER

For the first site visit we biked 20 km along the Rotte, starting from the pumping station in Rotterdam to the origin of the river. This sectional analysis shows the changes in the width of the river and the densities of its immediate edges, with trees, dikes, islands, planting and urban fabric.

## ANALYSIS - LANDUSE OF THE AREA





RESIDENTIAL


RECREATIONAL


FARMLAND

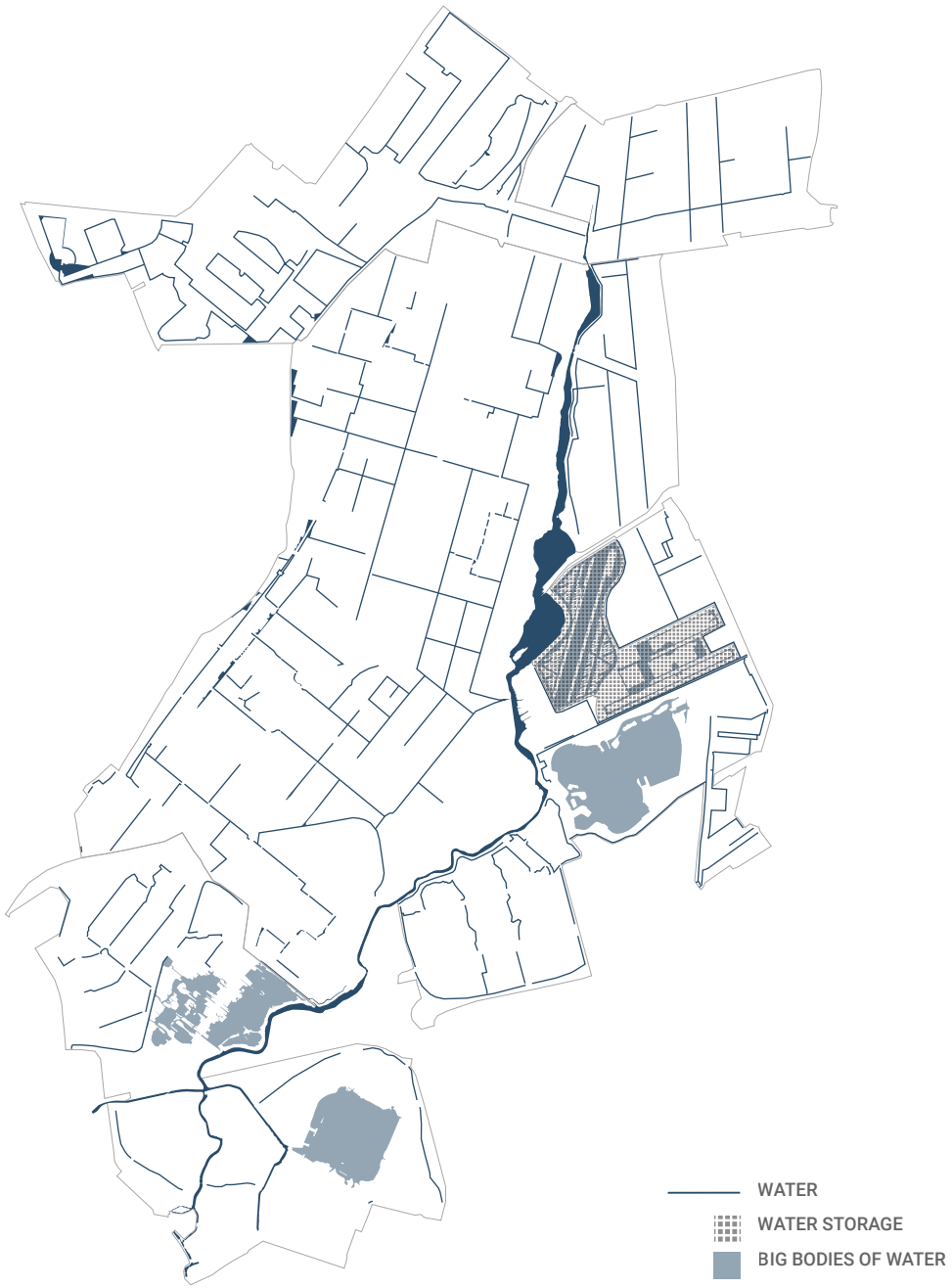

GLASSHOUSES

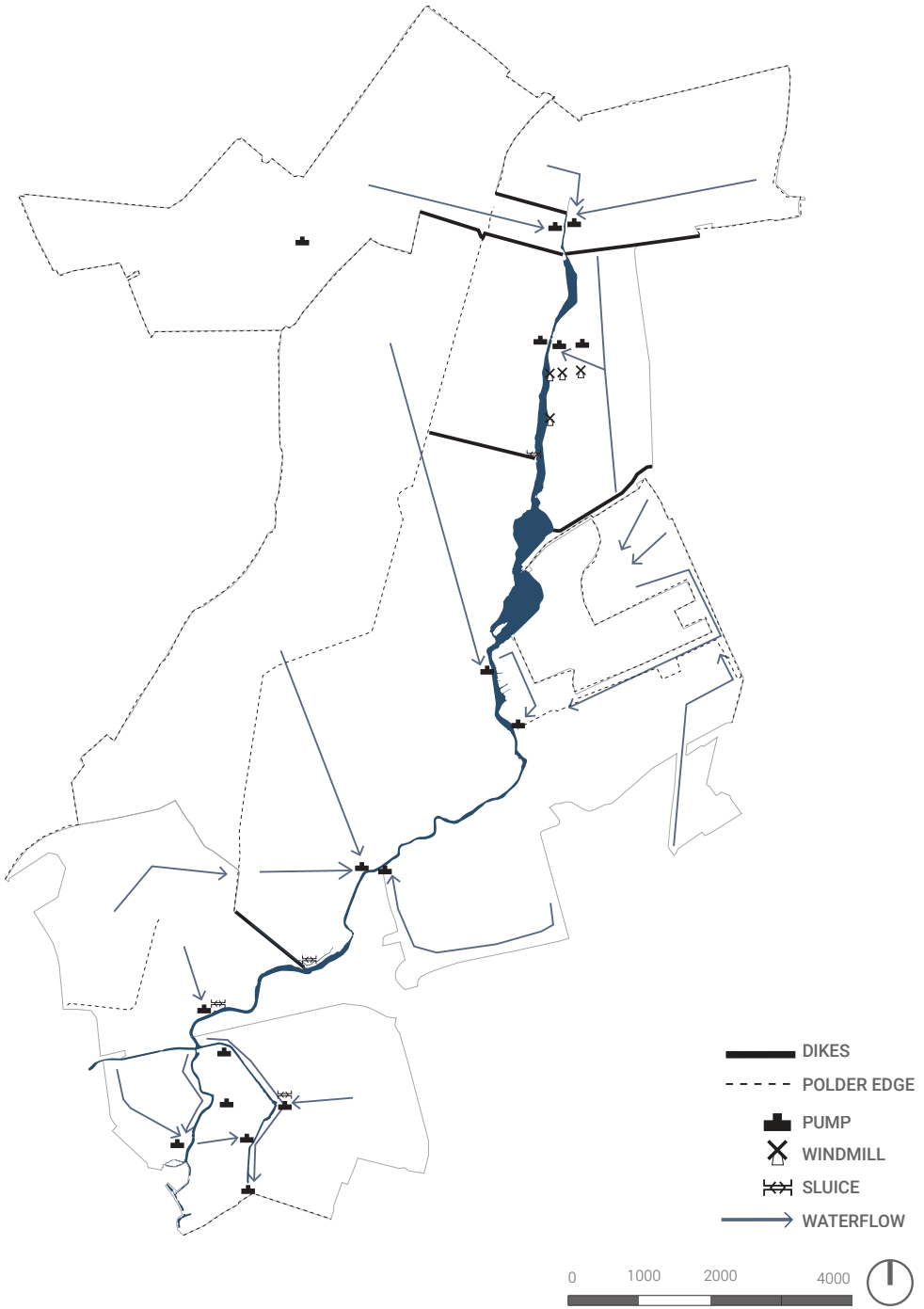

INDUSTRIAL

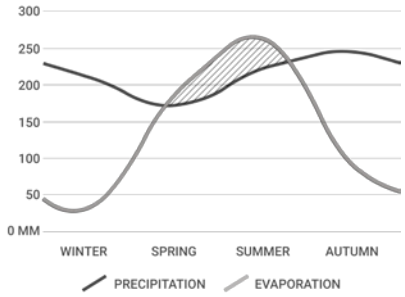

HIGHWAYS

## ANALYSIS - LAND USE

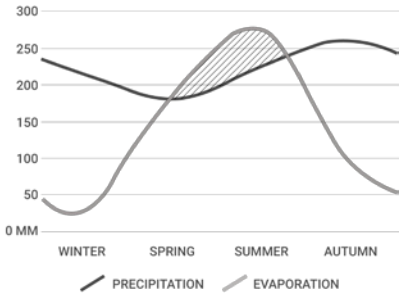
The Rotte connects the city of Rotterdam to the popular recreational places in the countryside, for instance Hillegersberg and Rottemeren. The site is highly accessible with cycling paths passing through in multiple levels. However, large monoculture areas are found at the northern part. Glass houses and industrial zones are unpleasant to visitor experience and the wildlife. The infrastructures, such as highway, form segregation and become points of disconnection to the visitors.


WATER
WATER STORAGE
BIG BODIES OF WATER

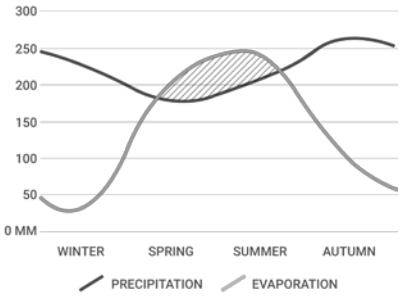

DIKES
POLDER EDGE
PUMP
WINDMILL
SLUICE
WATERFLOW
0
1000
2000
4000



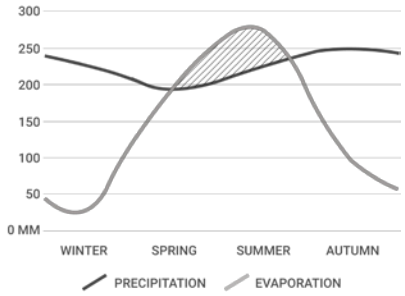

1. REFERENCE PERIOD (1981-2010)



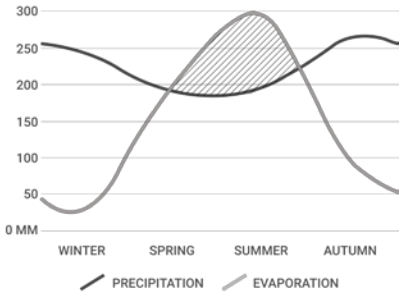

2. SCENARIO G(L)




3. SCENARIO G(H)




4. SCENARIO W(L)




4. SCENARIO W(H)

Climate scenarios of the Royal Dutch Meteorological Institute (2014) for the period 2036-2065

There are four scenarios for the future: G(L), G(H), W(L), W(H)
G=+1 degree temperature increase on average
W=+1 degree
(L)=small change in wind pattern
(H)=large change in wind pattern

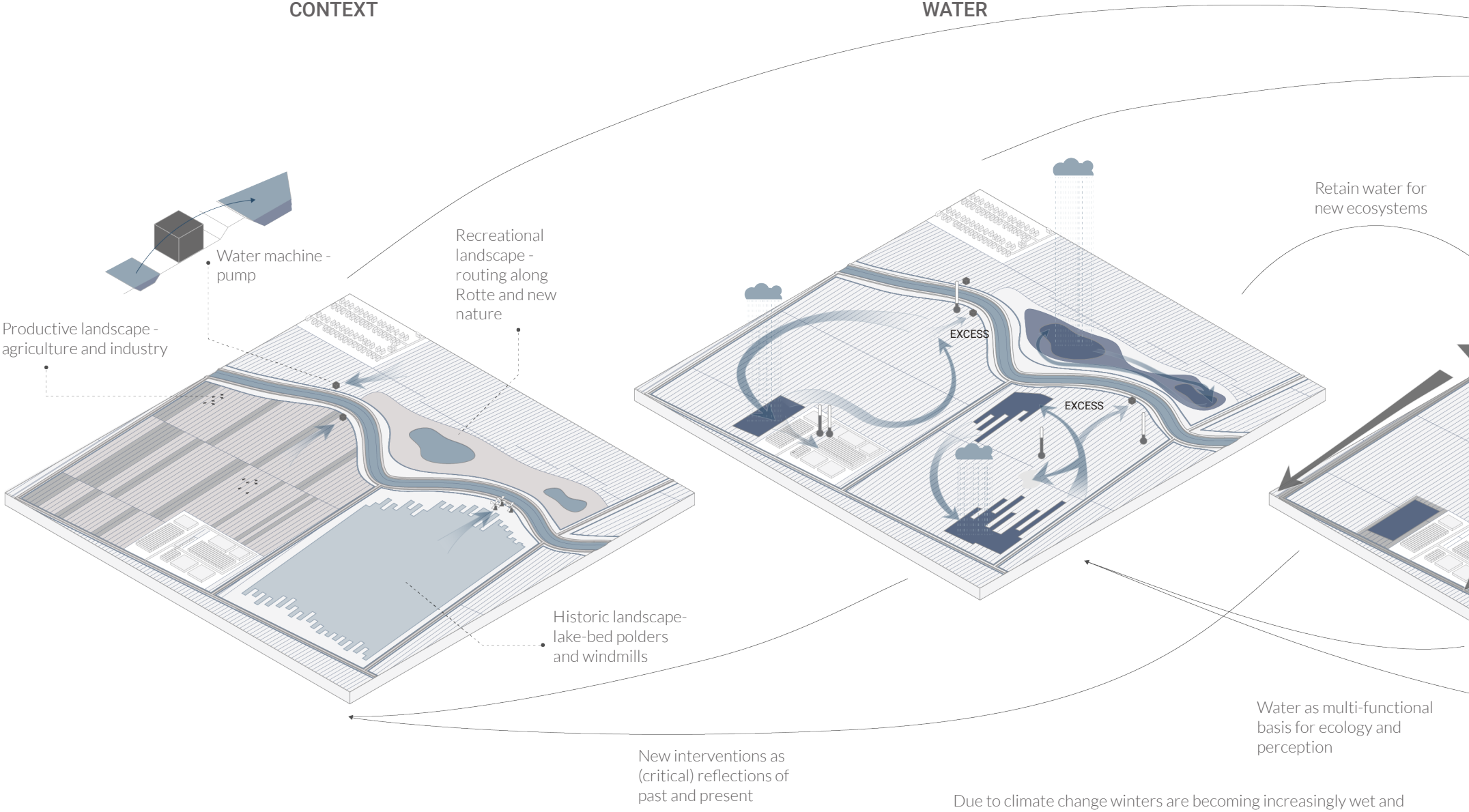
## ANALYSIS - WATER SYSTEM

The Rotte acts as the “boezem” for seven polders. Some are split between two different “boezem” systems, but most drain completely into the Rotte. A variety of waterworks from pumps to sluices and overflows allow for the movement of water despite varying ground levels. The Rotte itself forms the highest point of the whole water scheme as the polders around it sunk in over time due to peat extraction and ground subsidence. While the clay polder today are not threatened by further ground subsidence, sine the peat has disappeared, they are now facing water management issues due to climate change. Most prominently a shortage of water in the summer, which they are yet not prepared for.

## THE GUIDING PRINCIPLES

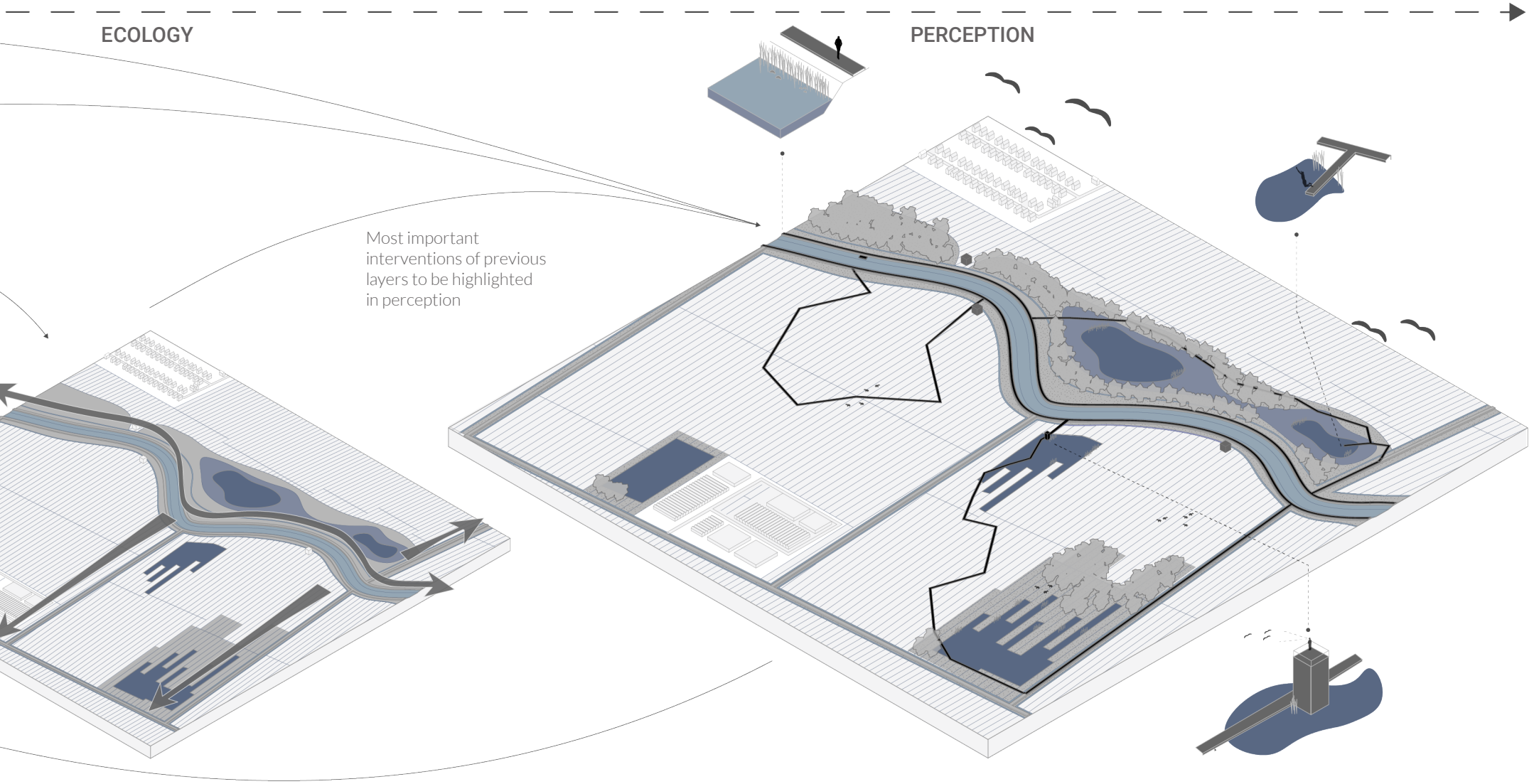
CONTEXT

WATER



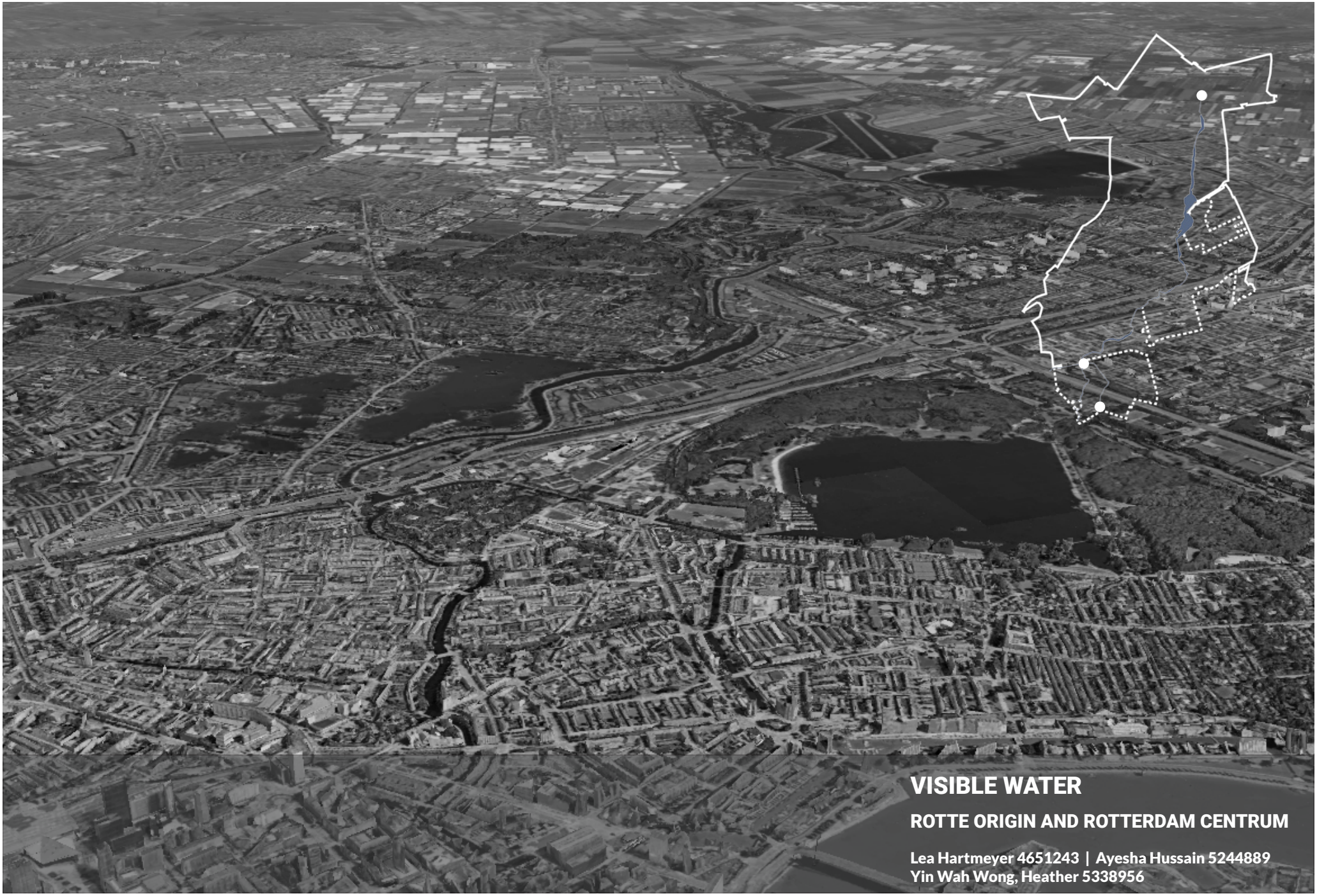

Studying the context of the polder - the historic layers, the water system and the current use - acts as a base for understanding and placing the interventions that have to be made in order for the polder to become resilient.

Due to climate change winters are becoming increasingly wet and summers increasingly dry, to balance this out and ensure that the polders do not run dry in the summers retention will be added, which can supply the soil and agriculture with water. To ensure that the water quality is improved water is cleaned and circulated.




To strengthen connections and biodiversity a green network running along the dikes along the Rotte and from the Rotte into the hinterland is established. Furthermore larger areas are reserved for new nature, which is also made possible by the introduction of more water in the polder.

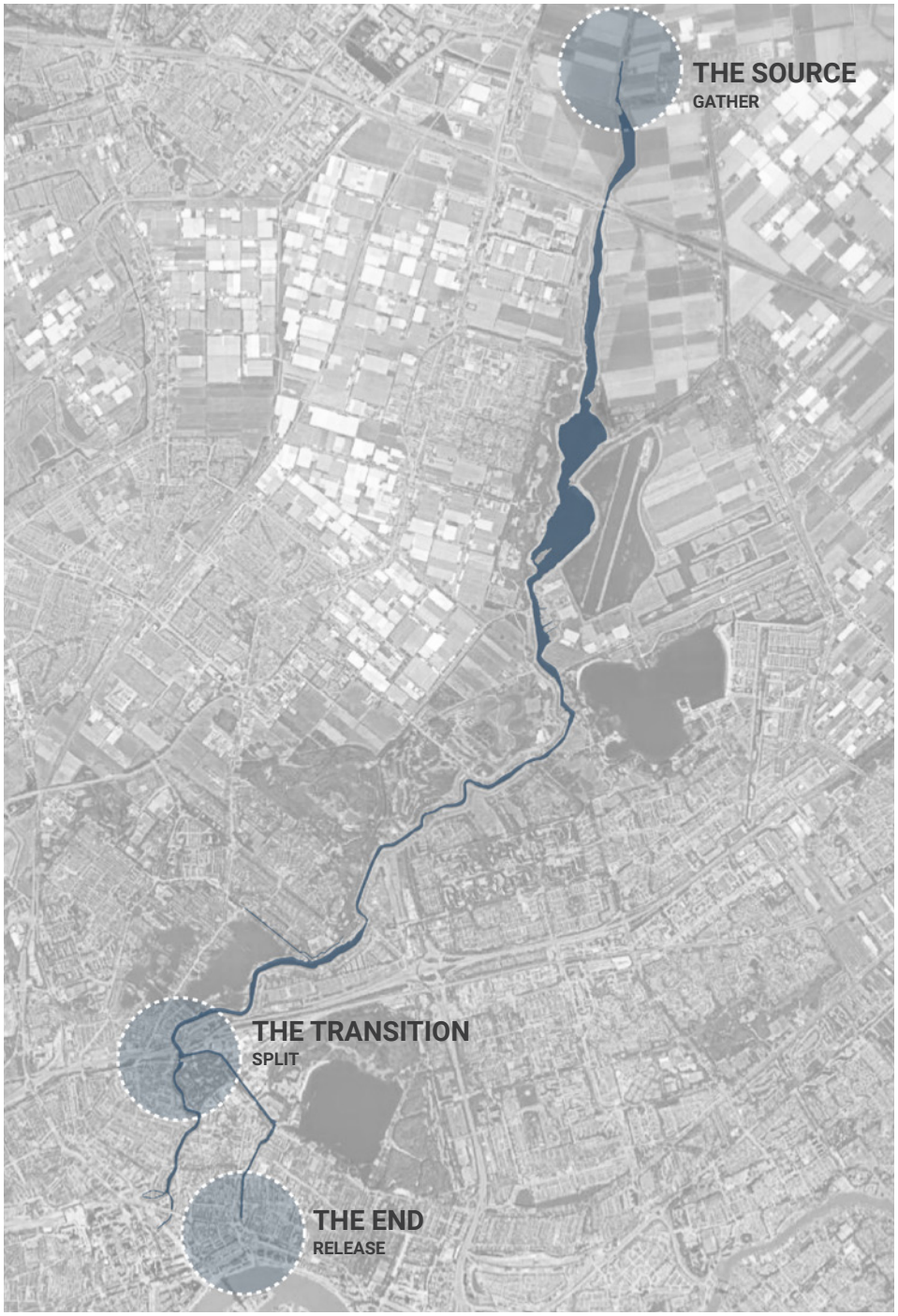
To make the relationship of land and water with all its new interventions into an educational and perceptive experience that is guided by a routing that travels along the dikes into the polders. This routing allows visitors and residents to engage with the polder in different ways.



# VISIBLE WATER

## ROTTE ORIGIN AND ROTTERDAM CENTRUM

Lea Hartmeyer 4651243 | Ayesha Hussain 5244889
Yin Wah Wong, Heather 5338956



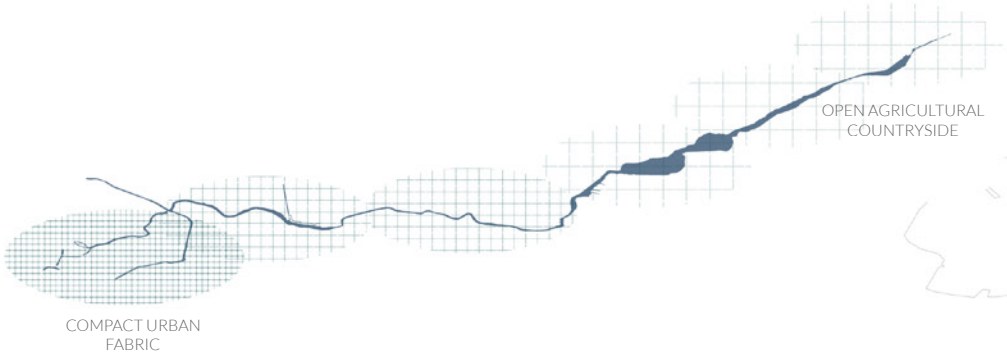

## CONCEPT

The Rotte forms the binding element of the whole water system and with that it brings together every polder worked out by the group. It also narrates the transition from country to city, from a natural watercourse to a highly engineered one, it guides visitors and tourists in the area and showcases the passage of time through its various alterations. To establish the Rotte as a focal point within the project as well, special attention was given to three places along its course. They correspond each with a different environment along the Rotte: the wide and open agrarian polders, the periphery of the city dominated by infrastructure and the dense urban fabric of the city centre. But more importantly they highlight significant developments throughout history related to water management and the water machine: The source that once developed on a peat bog and changed position throughout time; the split with its transition from a natural water body to an artificial one needed to pump bigger quantities of water into the Maas and lastly the highly engineered outlet, that itself lost connection to the water it moves. For each of the spaces direction becomes an important notion that illustrates the history and current use of the space: The gathering of water at the source; the split, where water gets directed towards the outlet; and lastly the linear flow from pump to Maas at the outlet. By playing with the notion of direction in their entirety the three projects narrate past, present and future of the Rotte.

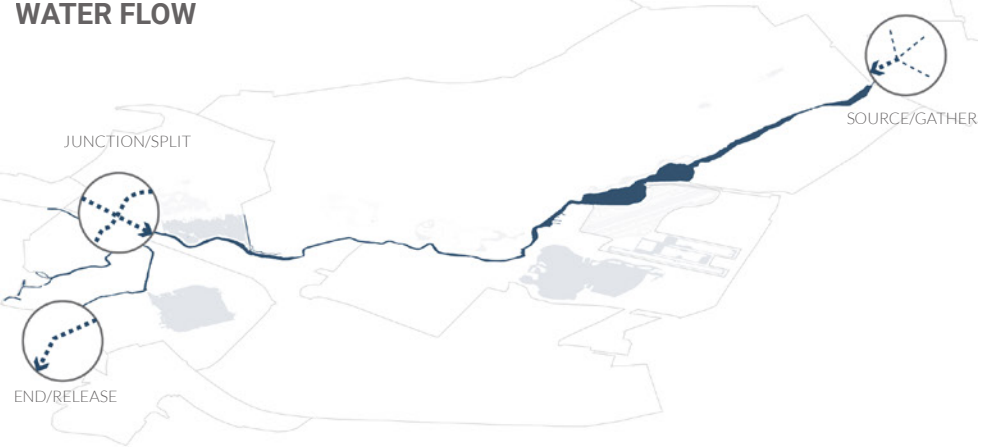
## DIRECTION


## TRANSITION


## DENSITY




## WATER FLOW



## HISTORY OF THE ORIGIN OF ROTTE

The source of rotte varied towards the north through time with human interference. The current landscape is part of the historical legacies.

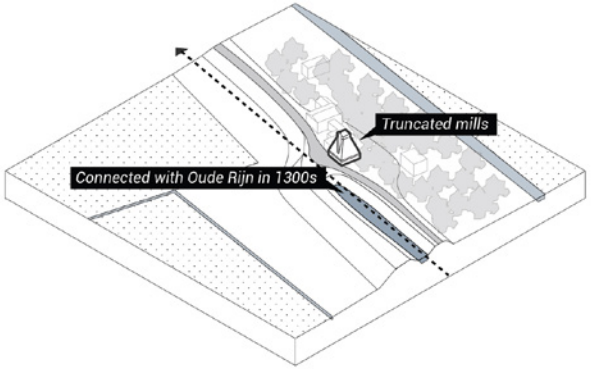
1300s — Rotte was connected with the Oude Rijn over the Hildam via the river Wilck. A marshy lake area, called the Wild Veenen, acted as a source of Rotte.

1644 — Windmill construction

1600s — The Wild Veenen were drained

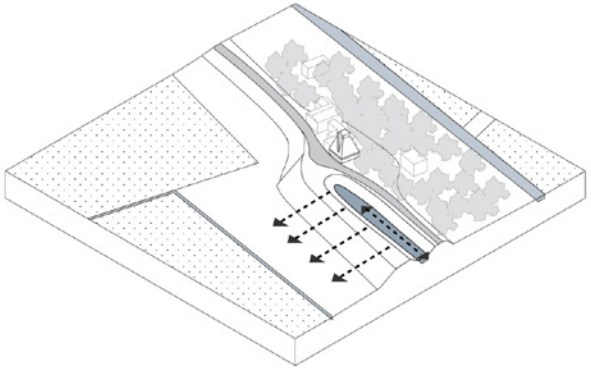
1759 — Peat river Wilck was drained so Rotte was no longer connected to the Oude Rijn

1924 — Truncating windmill



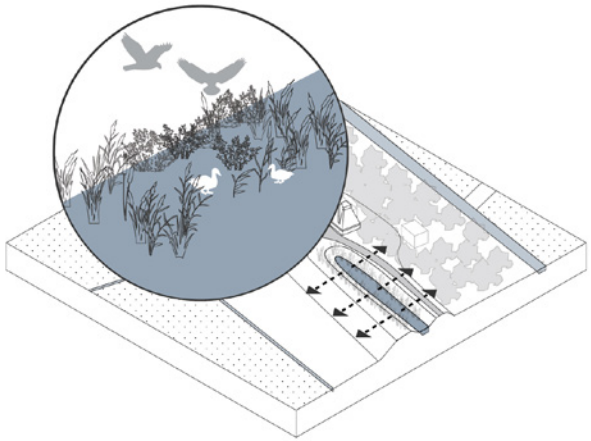

## CONTEXT

Understanding the origin of rotte and historical legacies by design intervention



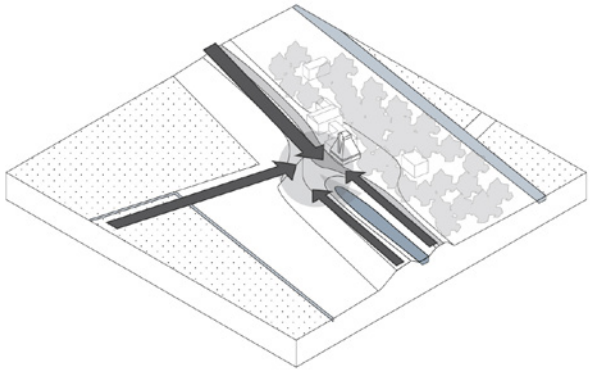
## WATER MANAGEMENT

Widening the dike to make more space for Rotte
Creating overflow effect by shallow and sloped shorelines



## ECOLOGY

Enhancing biodiversity by introducing shallow and vegetated water bank

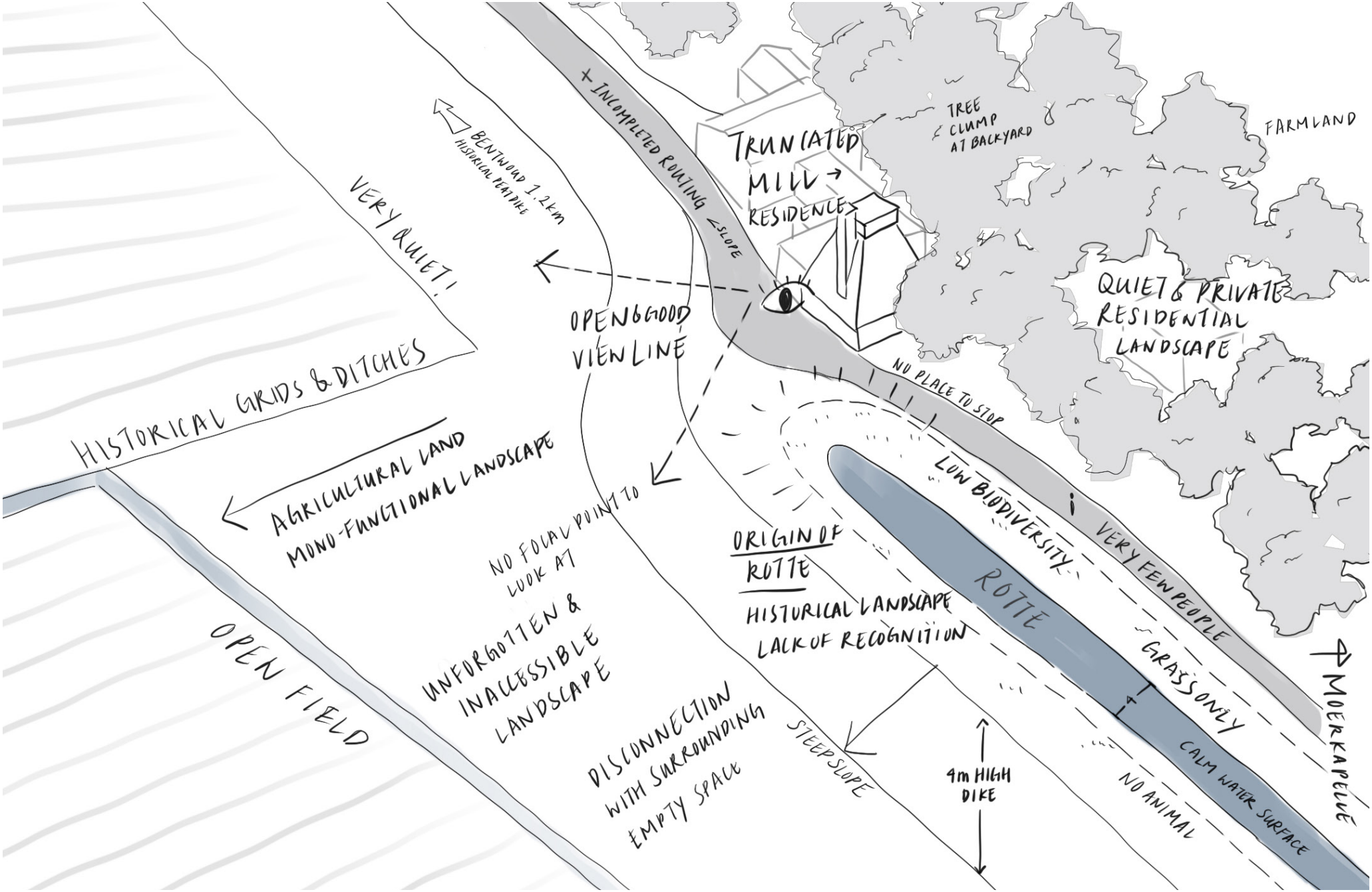


## PERCEPTION

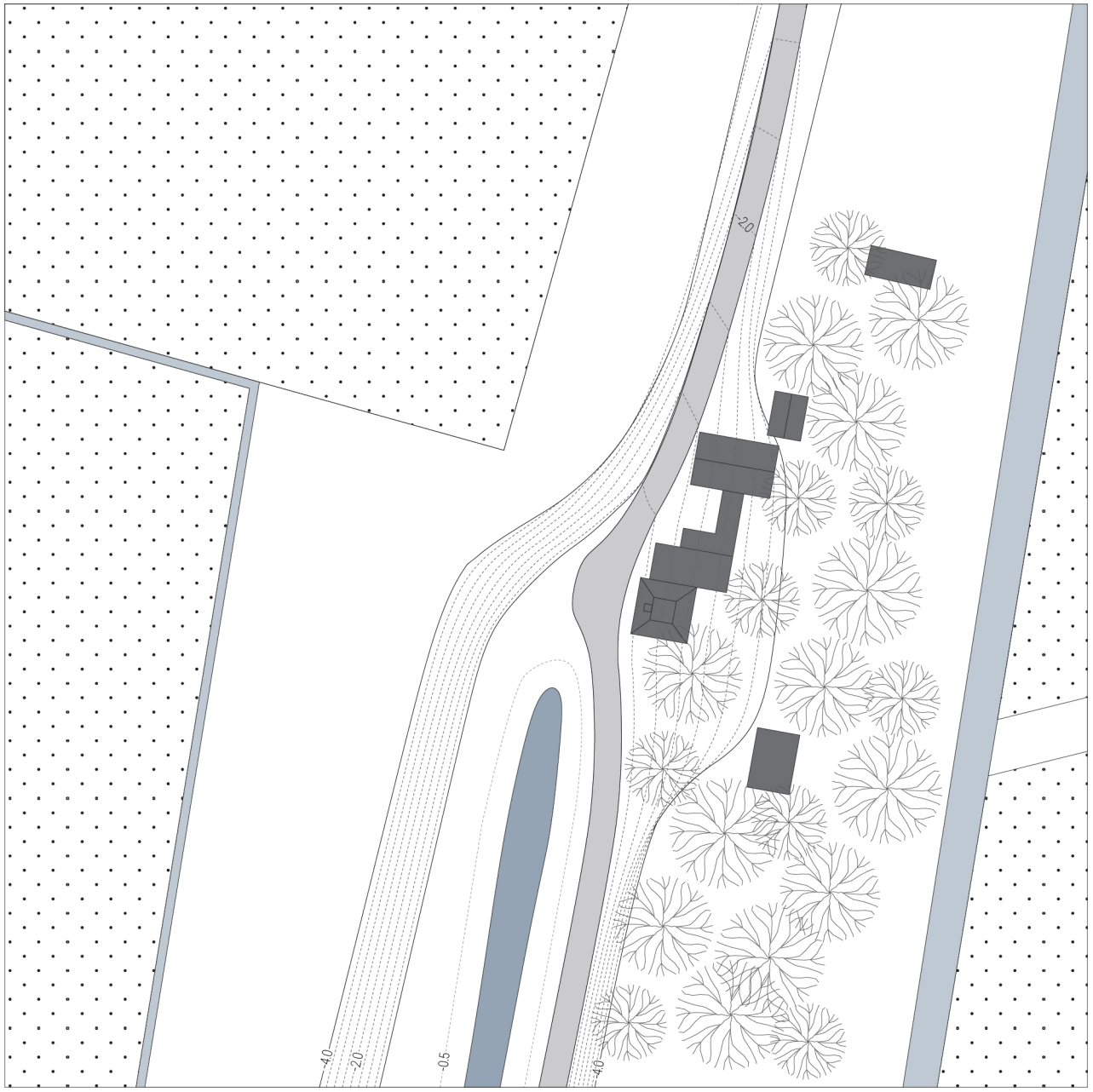
Establishing a routing and a node to accentuate the origin

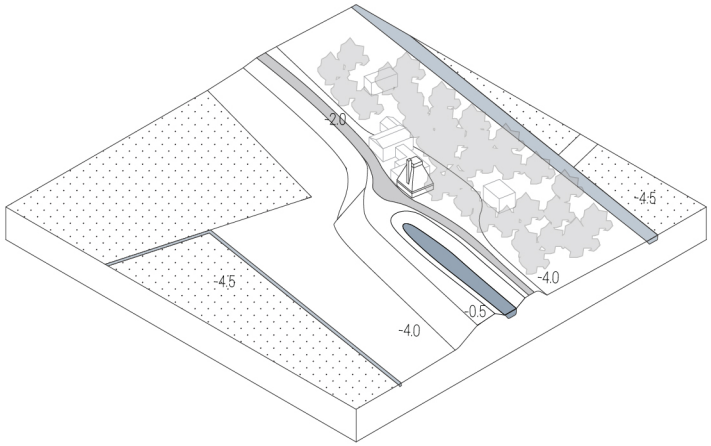
## THE ORIGIN

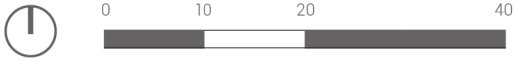
The source of Rotte is one of the design locations where water is firstly collected and flows towards the city of Rotterdam. The design proposal is developed on the basis of the four layers we proposed.
As the origin of Rotte, the history of the site is one of the important layers in the design, where traces of different times can reinforce through intervention. The overflow design is a natural process that is reminiscent of the varying waterscape in the past. Visual connections are formed to bring the mills and dike together. Dike widening and shoreline modification make more room for the Rotte and favor the growth of flora and fauna. To reinforce the perception of the Rotte source, routing and sightline play a fundamental role in the design, forming a poetic node in the area. The U-shape cycling path enhances the connectivity and routing experience next to the Rotte. The viewing platform and stepping blocks establish the connection between the human and the Rotte.




**CURRENT CONDITION ANALYSIS**



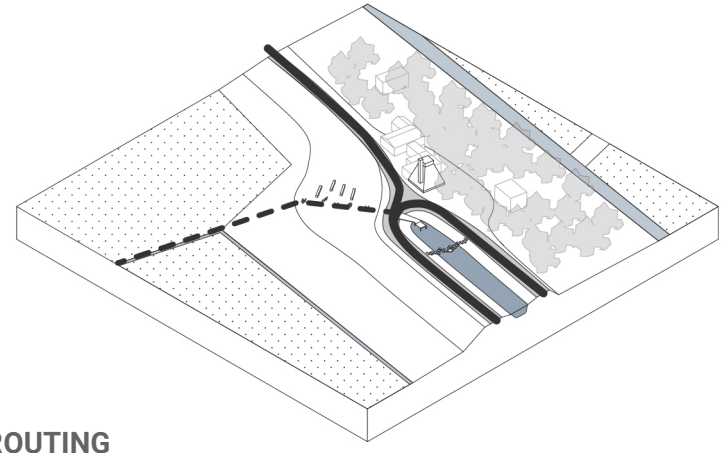




## ANALYSIS

The site is located adjacent to an open agricultural field and a small neighbourhood accommodated in the truncated mill house.

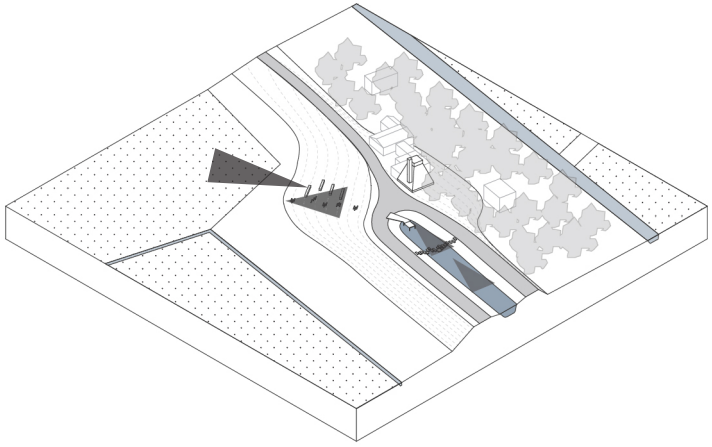
Despite the historical meaning as the origin of Rotte, this area is always be forgotten due to the lack of historical recognition. Very few people would come because of the disconnection with the surroundings and mono-functional landscape. The lack of vegetation results in the low biodiversity. Besides, this area is also very mono-functional and disconnected to the surrounding.

However, the quiet and introverted atmosphere forms a comfortable place for human and birds. The openness offers a good panoramic view on the dike. Instead of making this area as a popular recreational attraction, it can remain for the explorers to stop , minimizing the interference to the historical landscape and the surrounding neighbourhood.



## ROUTING

Enhance routing experience & accessibility to the surrounding



## SIGHTLINE

Establish various levels of sightline to the Rotte, mills and group 1 design

3

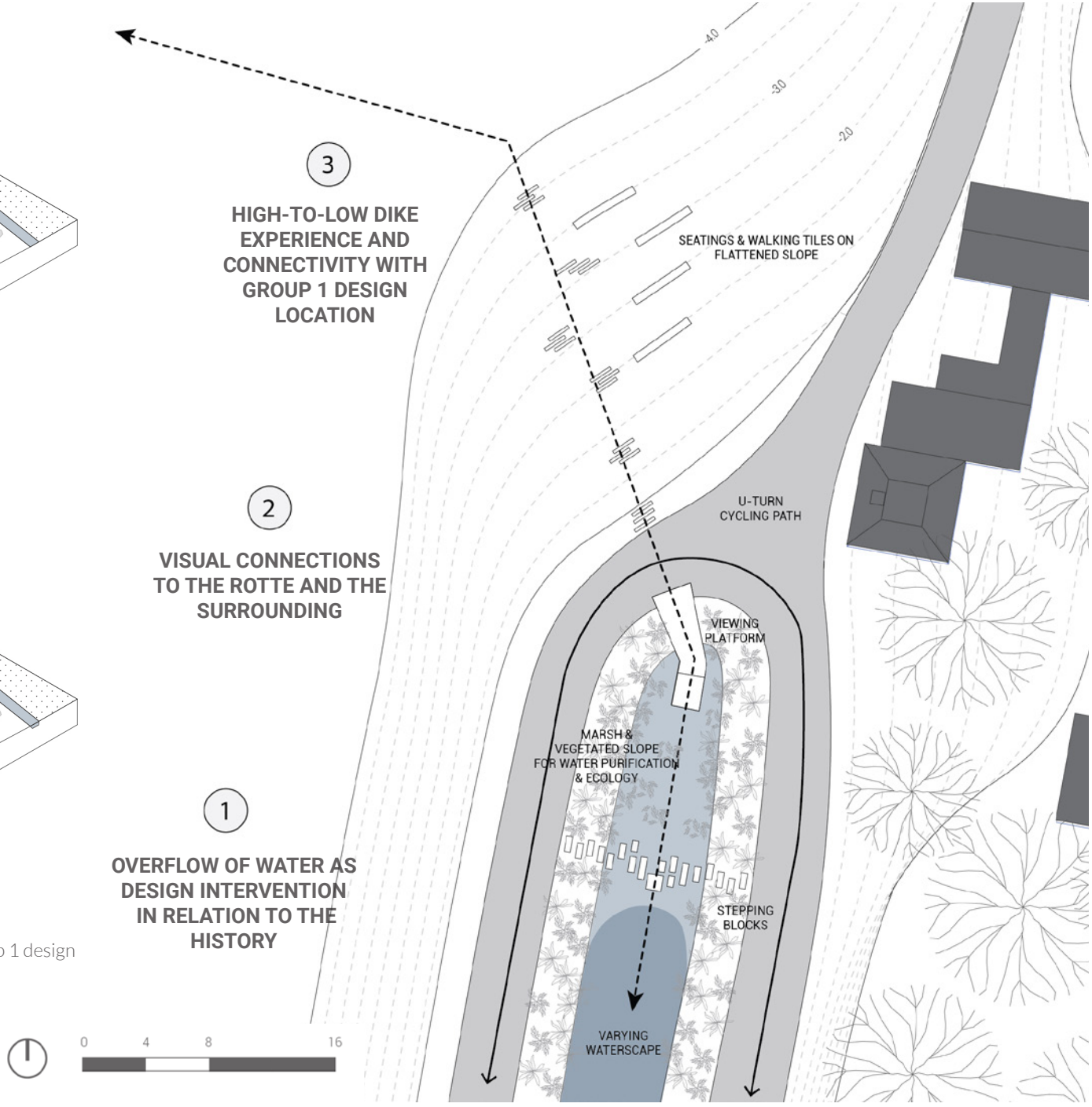
**HIGH-TO-LOW DIKE EXPERIENCE AND CONNECTIVITY WITH GROUP 1 DESIGN LOCATION**

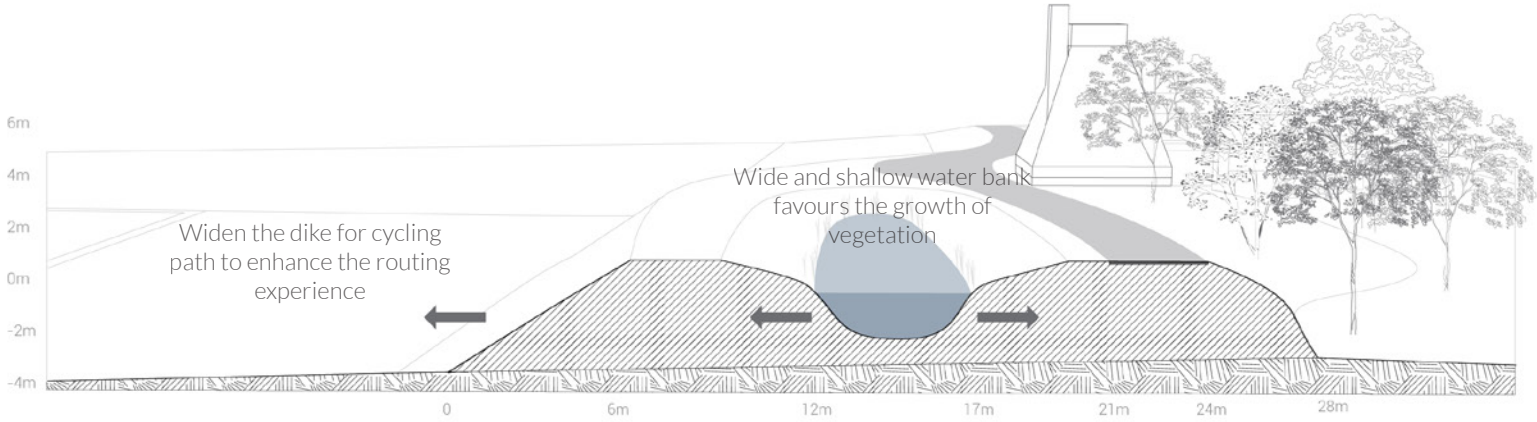
2

**VISUAL CONNECTIONS TO THE ROTTE AND THE SURROUNDING**

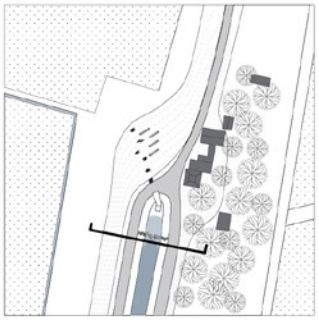
1

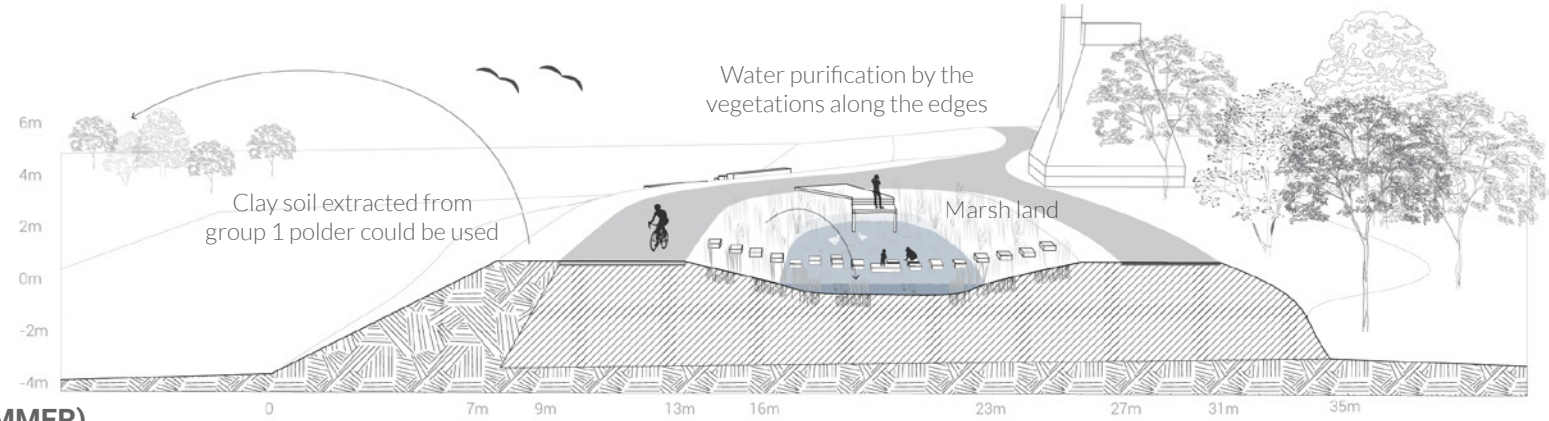
**OVERFLOW OF WATER AS DESIGN INTERVENTION IN RELATION TO THE HISTORY**



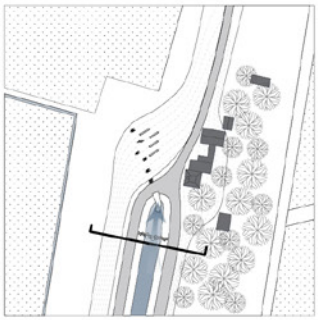


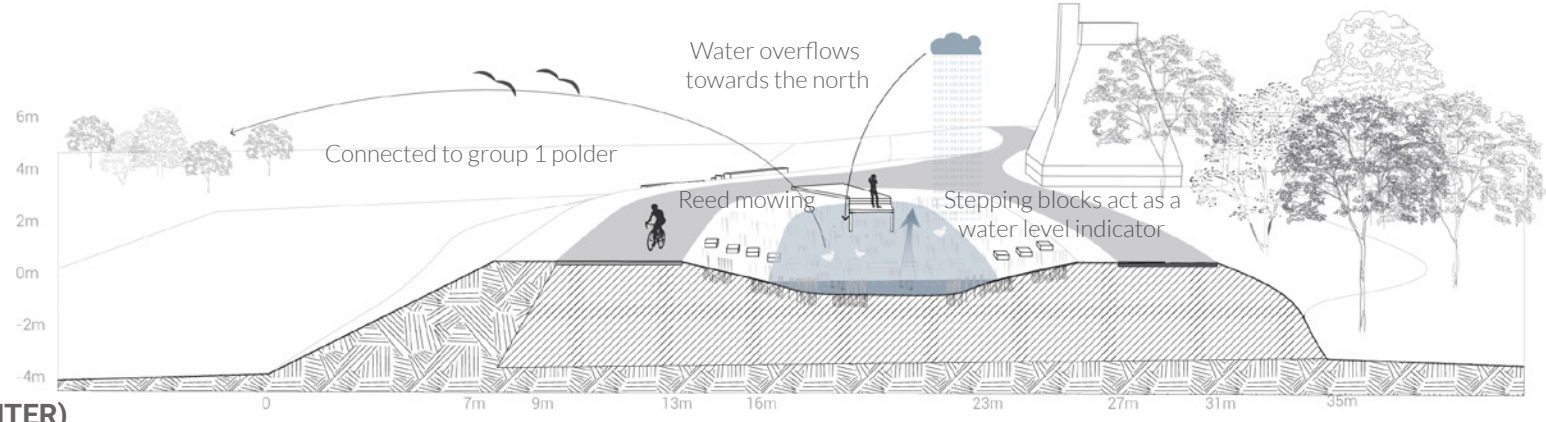

**EXISTING CONDITION**






**DESIGN CONDITION (SUMMER)**

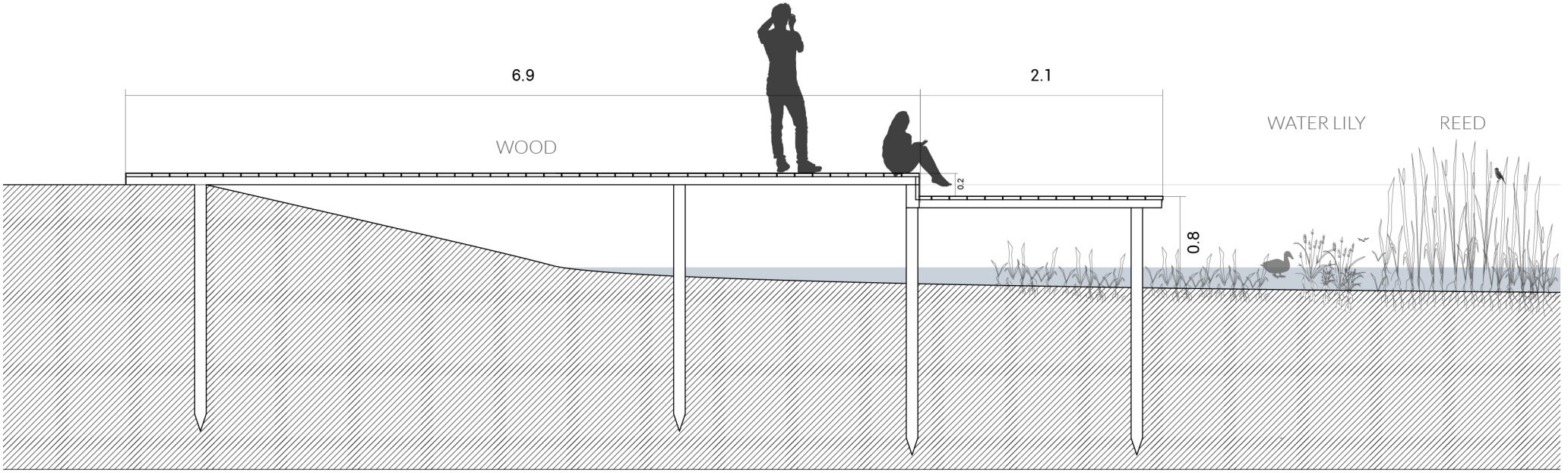




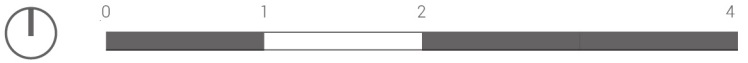

**DESIGN CONDITION (WINTER)**

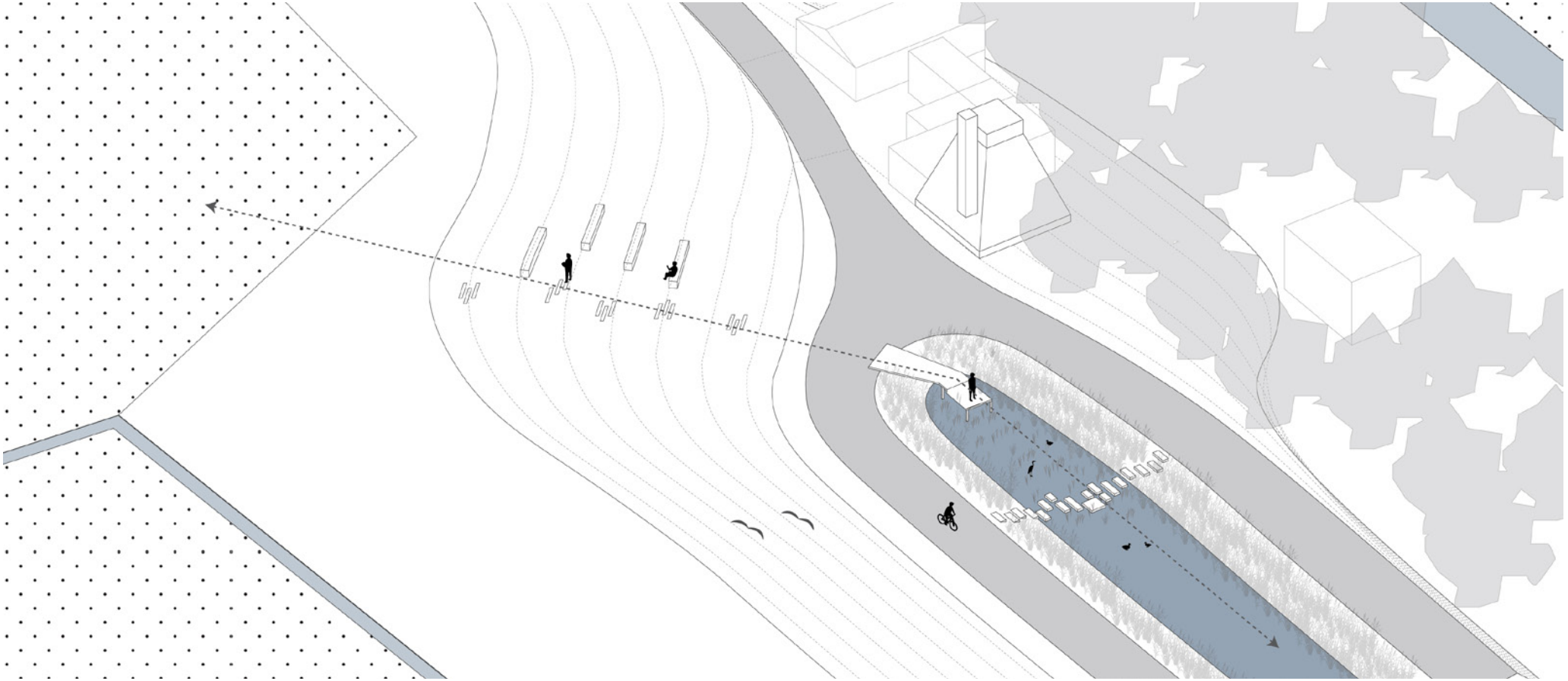
People could  get closer to the water on the stepping blocks

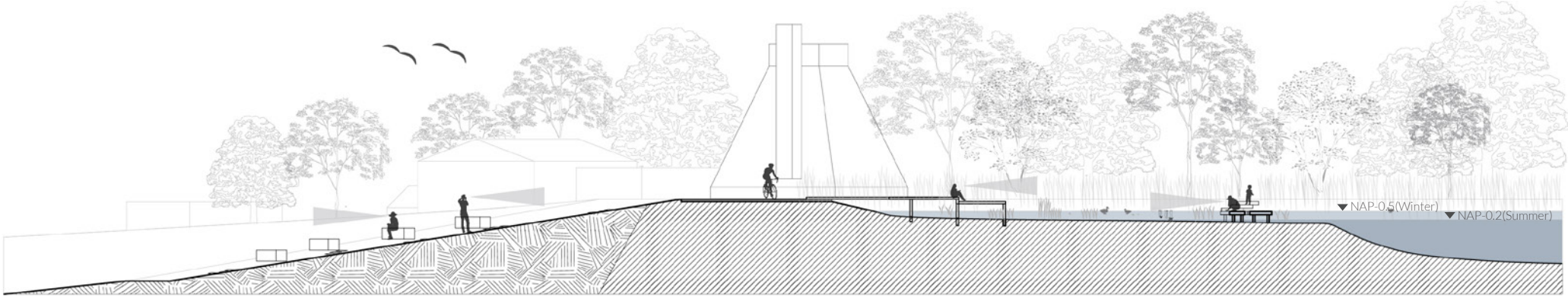
Shallow shoreline allows more plants to grow and enhances biodiversity




**DETAILS OF THE WOODEN DECK**

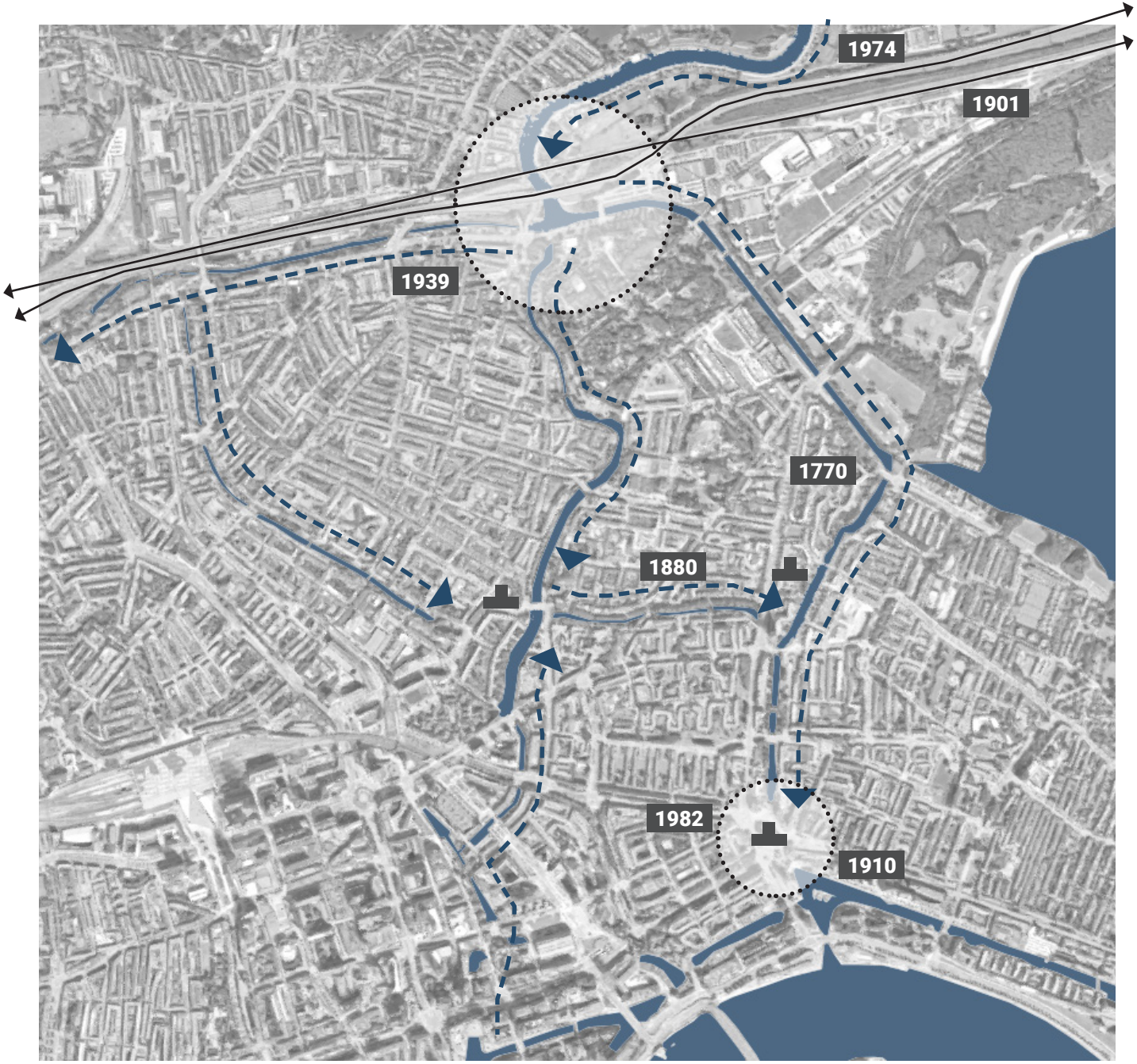





NAP-0.5(Winter)
NAP-0.2(Summer)


0
4
8
16

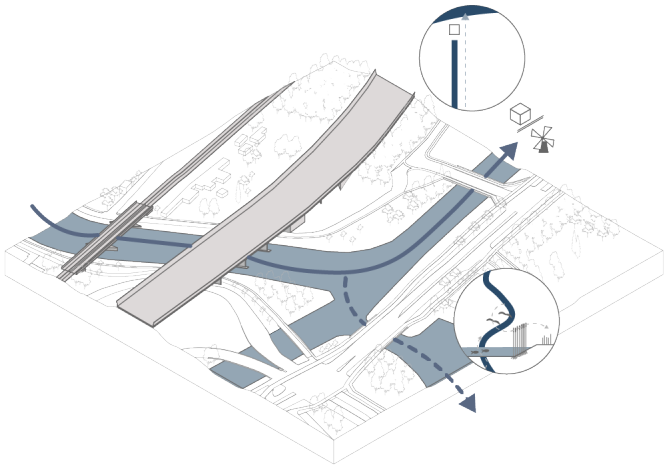
## THE CITY CONNECT




## TIMIELINE

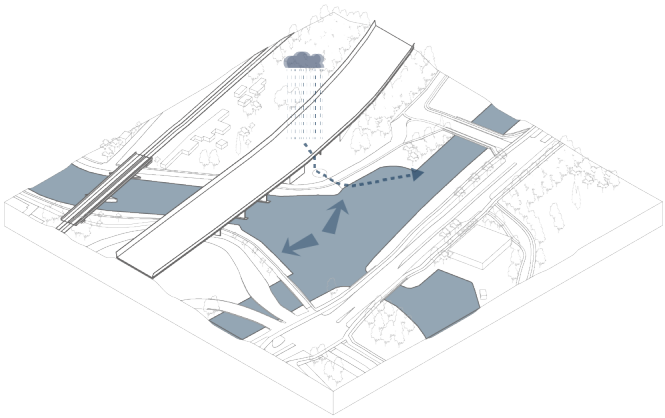
| | |
|---|---|
| 3000 BC | Peat starts developing behind newly formed dunes, within it peat rivers develop - the Rotte as one of them. |
| 1270 | Dam through Rotte near what today is Hoogstraat lays foundation for Rotterdam |
| 1655 | First “Droogmakkerij” wilde veenen |
| 1770 | Boezem created |
| 1880 | Connecting canal between Rotte and Boezem |
| 1901 | Construction of the train line |
| 1910 | Water inlet in front of existing pumping station converted into a plaza. |
| 1939 | Schie connection established |
| 1974 | Highway development started |
| 1982 | Pumping station at Boezem to connect Rotte to Maas |

## CONTEXT - LOST AMBIGUITY



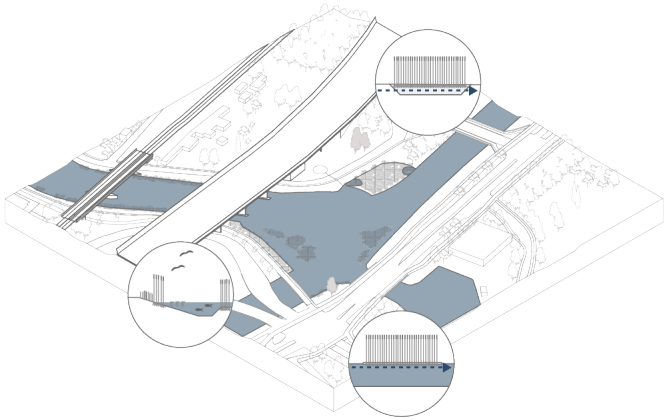
At the split the boezem, which is part of the watermachine, departs from the natural course of the Rotte. The visibility of this divide has become lost due to the dominance. Furthermore the difference between the engineerd boezem and the former natural river (which has been modified by humans) is lost.

## WATER - ROOM FOR THE ROTTE



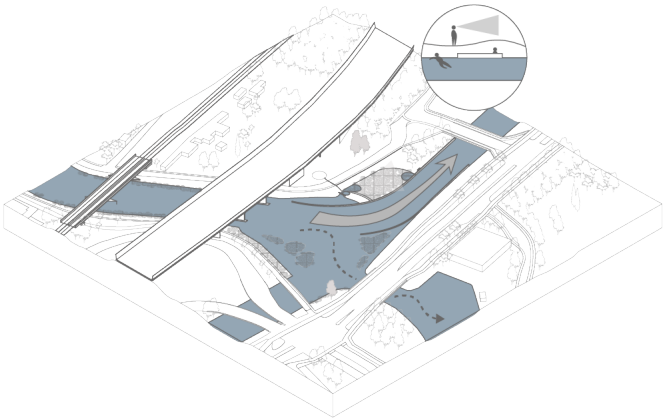
A new waterscape is introduced around the split, which allows for new uses of the shoreline. The highway run off is also redirected into the Rotte to ease the pressure on the municipal drainage system.

## ECOLOGY - A NEW SHORE



In order to reintroduce ecological diversity to the split the newly wet shorelines are transformed into either a natural double bank or a helophyte filter, which also cleans the run off from the Rotte before pumping it into the river.

## PERCEPTION - RETRACING THE TWO ROTTE'S



In order to transform the shores not only in a more ecological space reminiscent of the former peat river, but also express the engineered boezem a hard concrete edge is added, which also prevents the shoreline from deteriorating. The space behind it is converted into a swimming pool.

## THE SPLIT

At the border between Rotterdam and Hillegersberg the Rotte splits into two – the boezem on one hand and the remaint of the former peat river on the other. The project aims to retrace this divide as an expression of the ambiguity of the Rotte. The watercourse is both river and canal, both carrier of water management processes and natural processes. Especially the latter has been lost over the years in favour of a greater focus on civil engineering. When looking at the split right now these connotations of the Rotte seem to be mutually exclusive at first glance, but one quickly realizes that even in a design focussed on the technical sides of the Rotte animals and plants are fighting for their place. The design aims to formalize their place alongside the water machine. By that the relation between infrastructure, plants, animals and humans is explored.

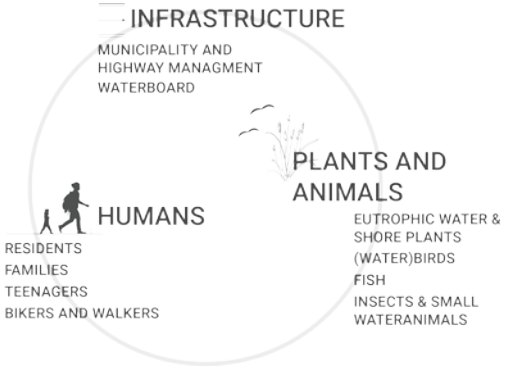
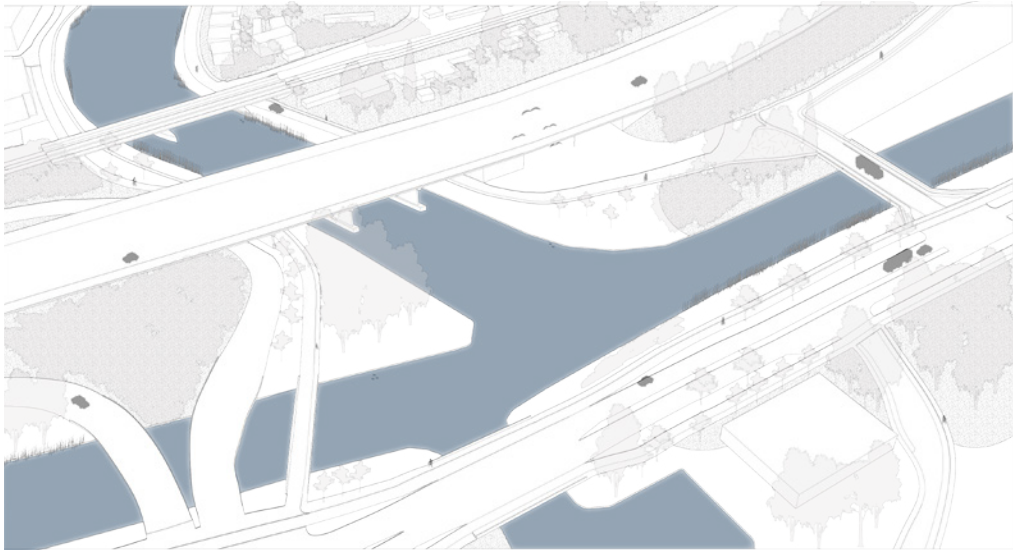
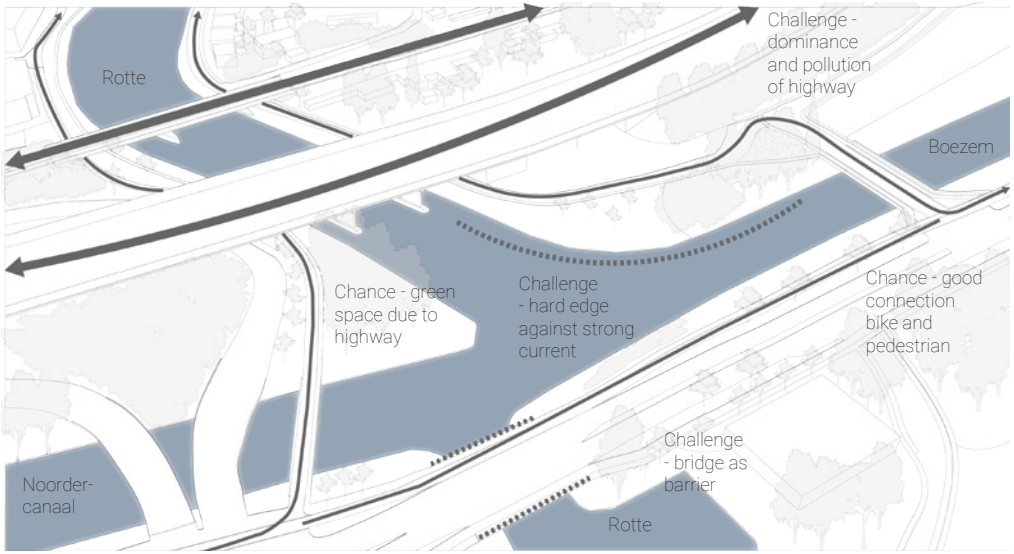



DIAGRAM STAKEHOLDERS AND INVOLVED PARTIES



BIRDSEYE VIEW EXISTING SITUATION




SPATIAL ANALYSIS CHALLENGES AND CHANCES

QUERCUS PALUSTRIS

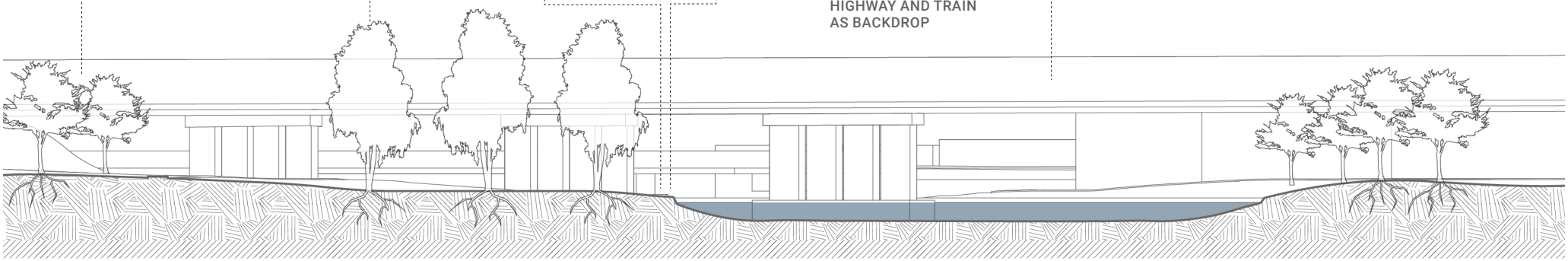
ULMUS "PLANTIJN"

REED AND SALIX ALBA

MEERKOET

PIGEONS

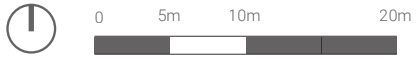
HIGHWAY AND TRAIN AS BACKDROP



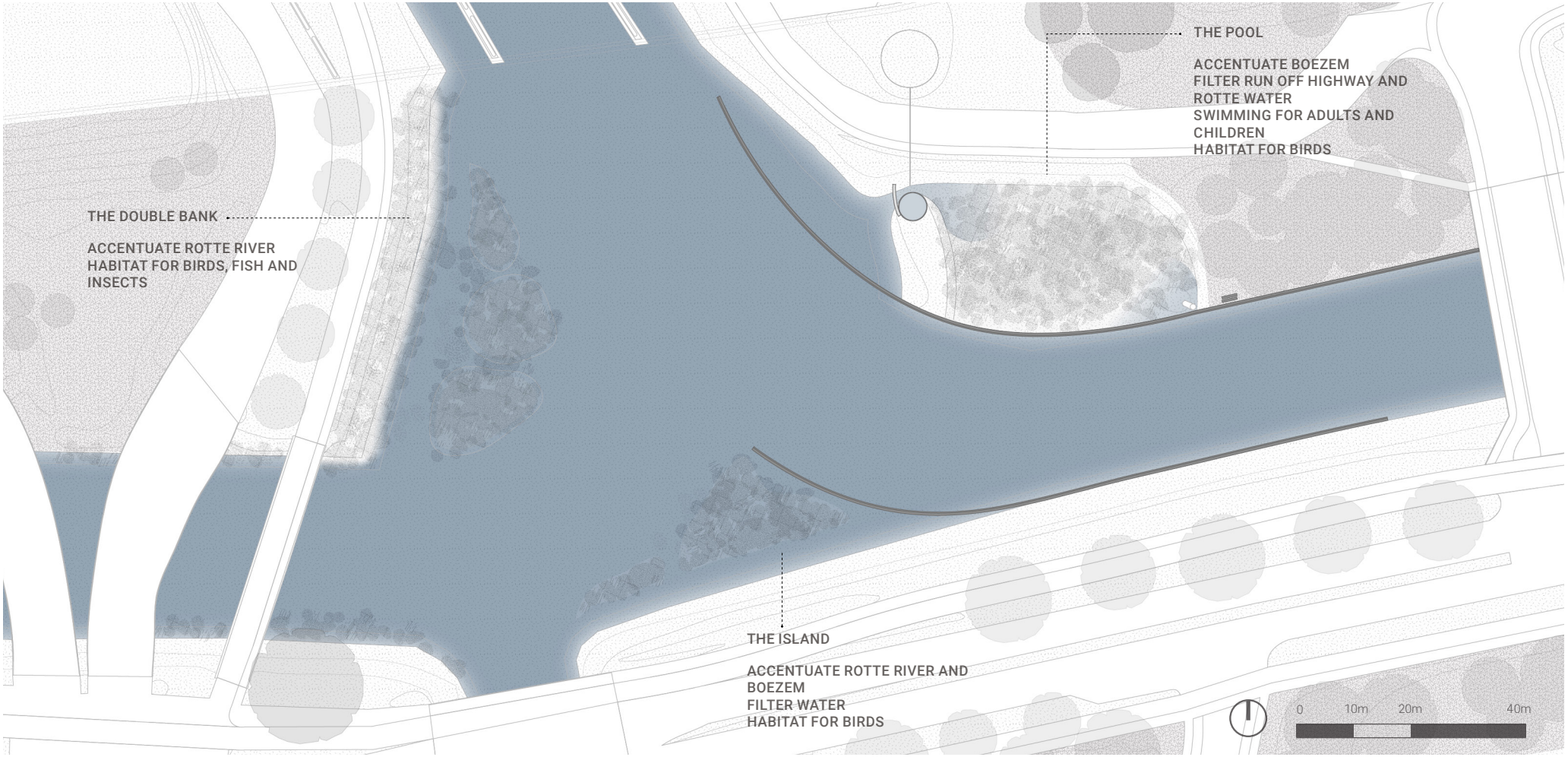
SECTION ACROSS ROTTE WITH WIDE BANKS

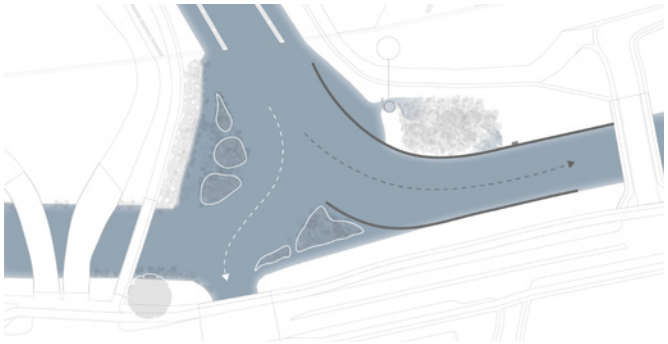
HARD CONCRETE EDGE ON BOTH SIDES

TOP LAYER CLAY (3,5 METERS), SECOND LAYER PEAT

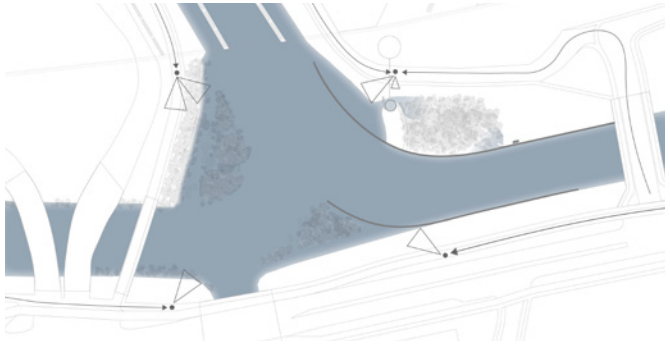



# SPATIAL AND ECOLOGICAL ANALYSIS



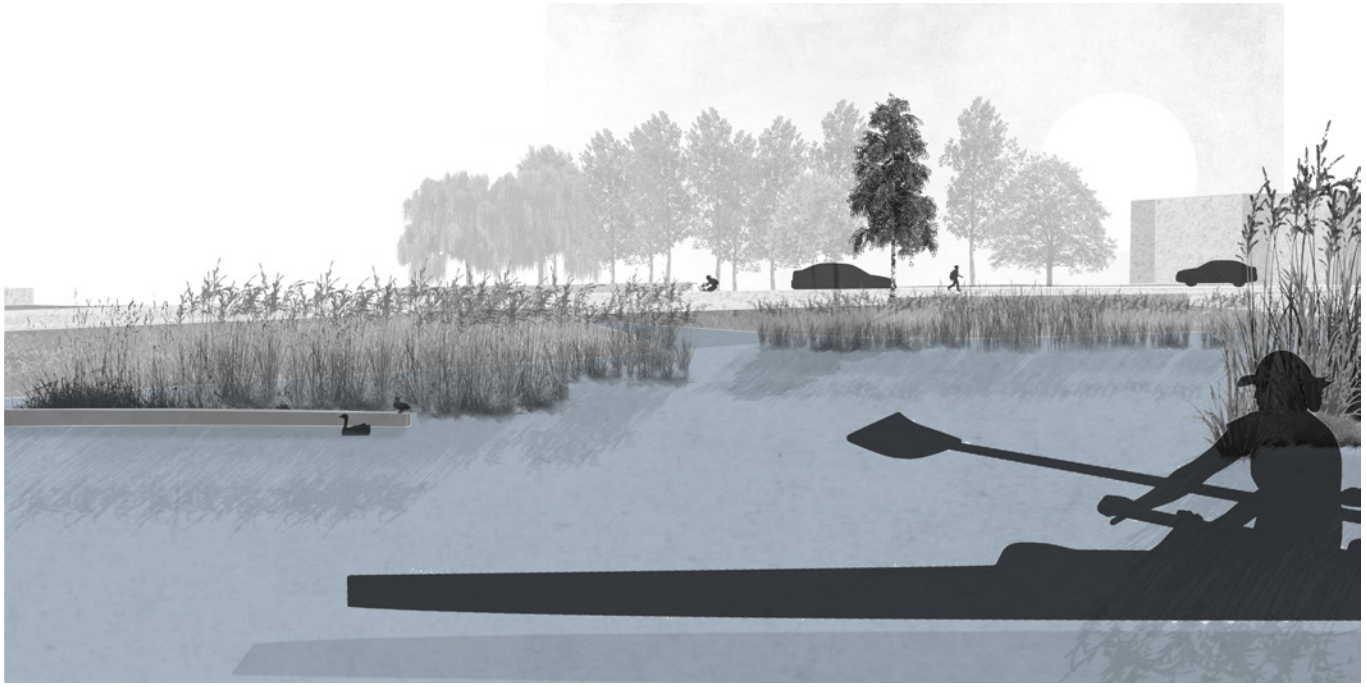
MORPHOLOGY INTERVENTION



EXPERIENCE THROUGH MOVEMENT ALONG EXISTING PATHS

## ROUTING AND EXPERIENCE

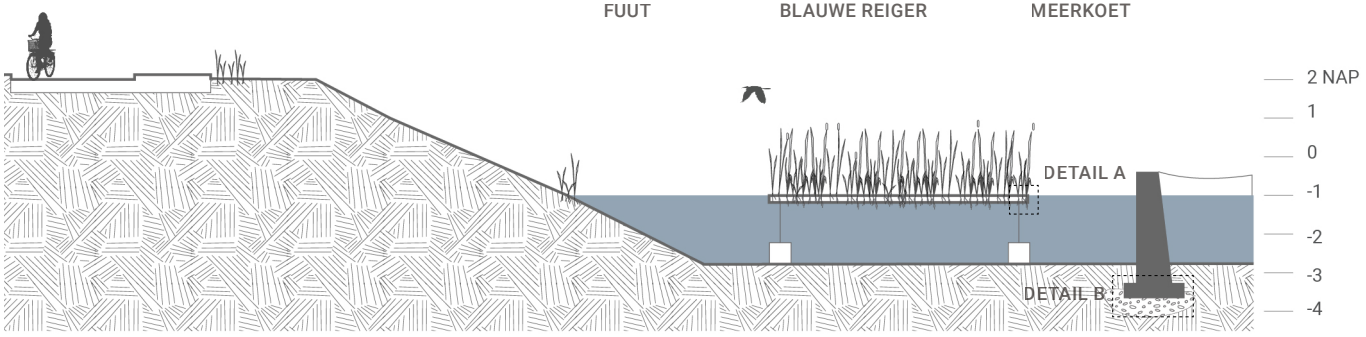
The overall plan expresses this ambiguity between the engineered and the "natural" by way of morphology and also materiality. Since the area is already dominated by infrastructure, this is utilized to create an experience through movement rather than superimpose a new routing or look out structure. There is also no specific direction from which to approach or a particular route to follow. The plans is conceived so that different directions of approach grant different views on the Rotte centred around the experience of the split. The design can be subdivided into three parts, which all emphasize the directionality of the Rotte, but at the same time also better watersystem, ecology and create a public space.



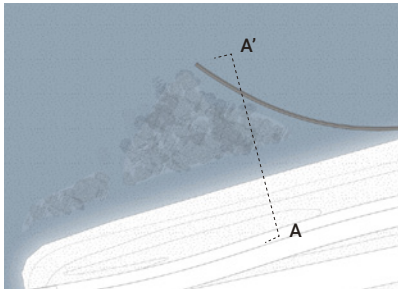
VIEW FROM WATER ONTO FLOATING ISLAND AND CONCRETE EDGE

FUUT | BLAUWE REIGER | MEERKOET

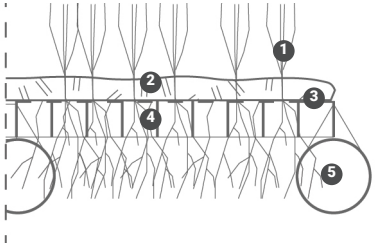
WATERBIRDS, WHICH HIDE AND LIVE IN THE REED




SECTION AA' FLOATING ISLAND



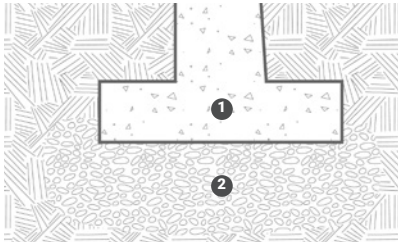

SECTION LINE




DETAIL A

1. REED
2. COCONUT FIBRE MAT
3. WIRE MESH
4. INTERWOVEN PLASTIC STRIPS
5. HDPE PIPES

FIBRE MATS WILL HAVE TO BE REPLACED EVERY 10 YEARS.

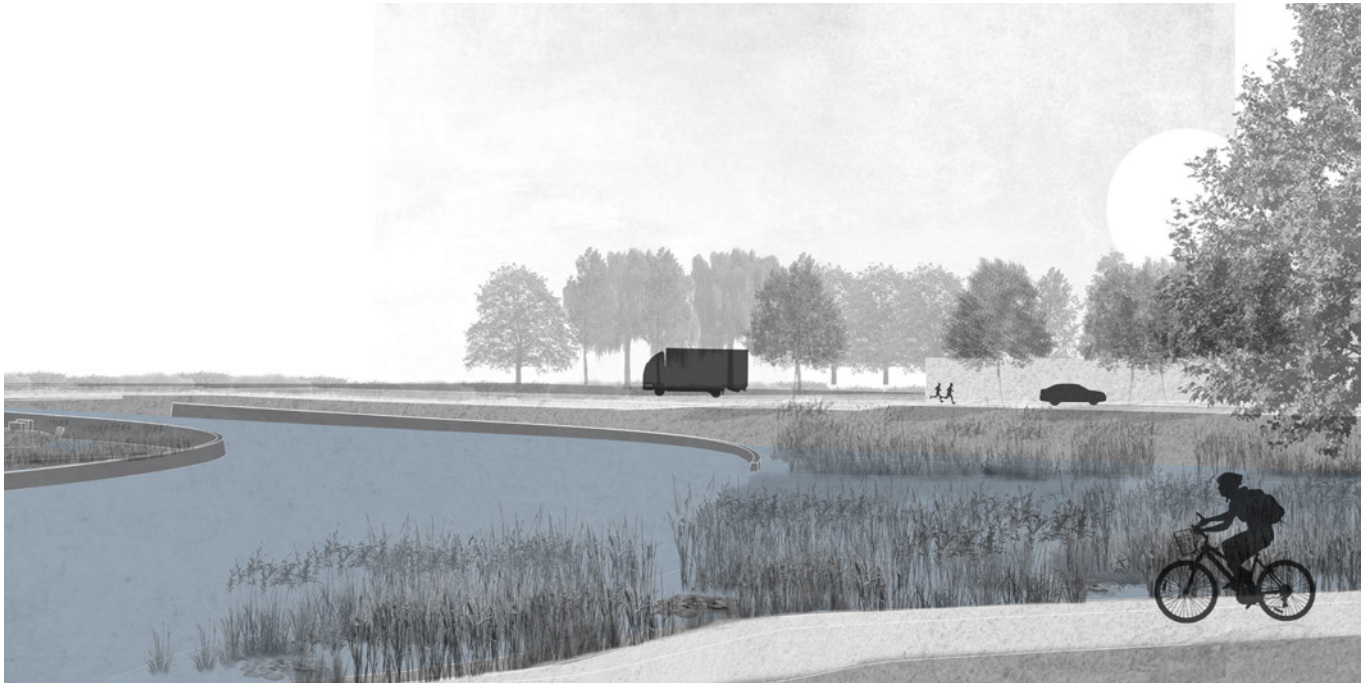



DETAIL B

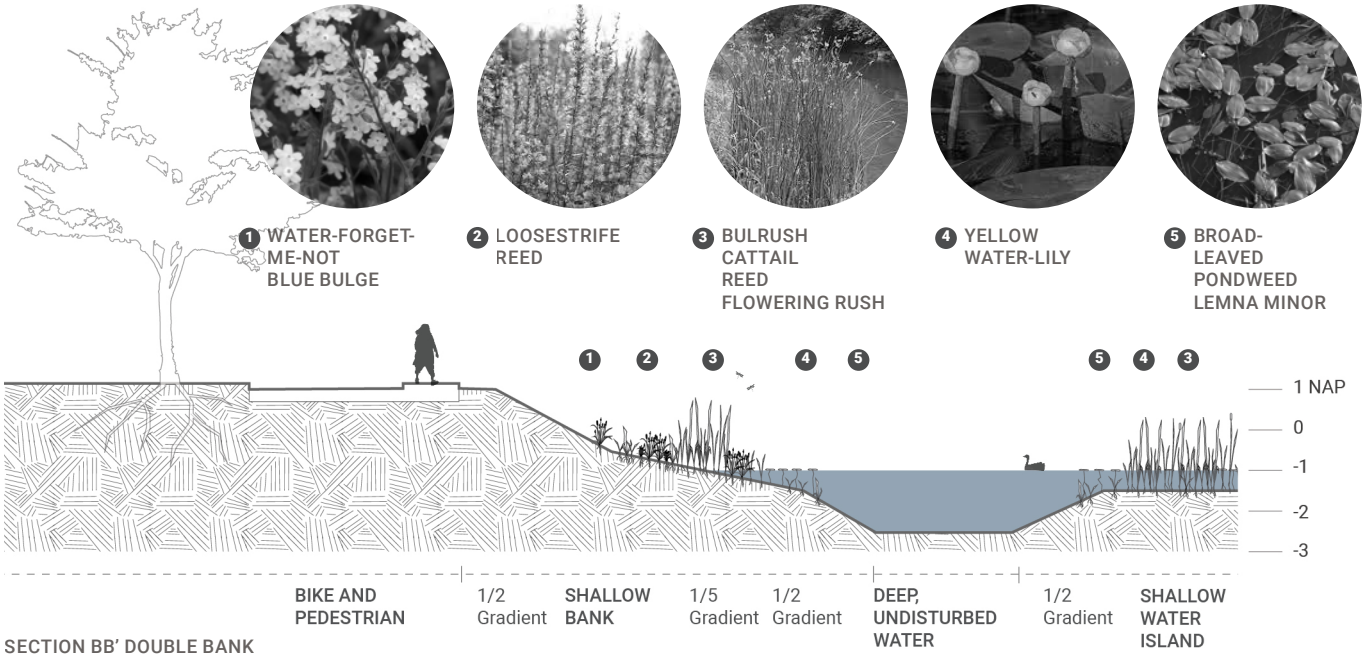
1. CONCRETE FOOT
2. RUBBLE TO STABILIZE

## THE ISLAND

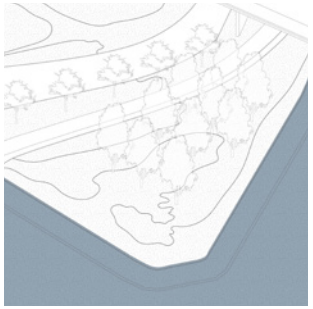
The island was primarily conceived to enhance the split of Rotte and boezem. The design element consists both of the reed island, shaped like a triangle and the concrete edge pointing towards the boezem. While the concrete edge follows the island in terms of morphology, their materiality emphasizes the difference between the two. The reed island is floating as to not decrease the overall water volume in the Rotte too much and also to subtly show that this element has been added to the Rotte. The island filters the Rotte water through its construction as a floating helophyte filter.



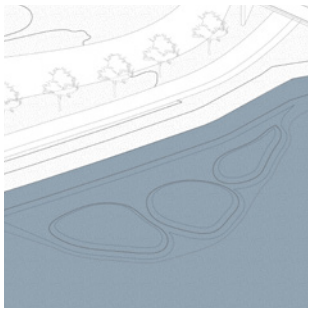
VIEW FROM BIKE PATH ONTO DOUBLE BANK AND BEYOND




SECTION BB' DOUBLE BANK

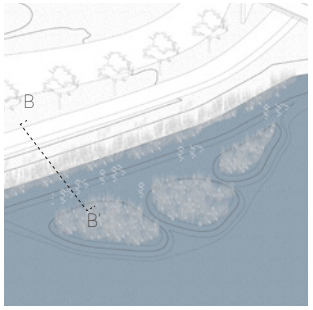


SHORE BEFORE



SHORE AFTER EARTHWORK

trees are removed and Clay is reshaped to form a double bank, this new condition is then left alone so plants so that plants can develop there naturally, earth is used to establish new natural edges along the Rotte.

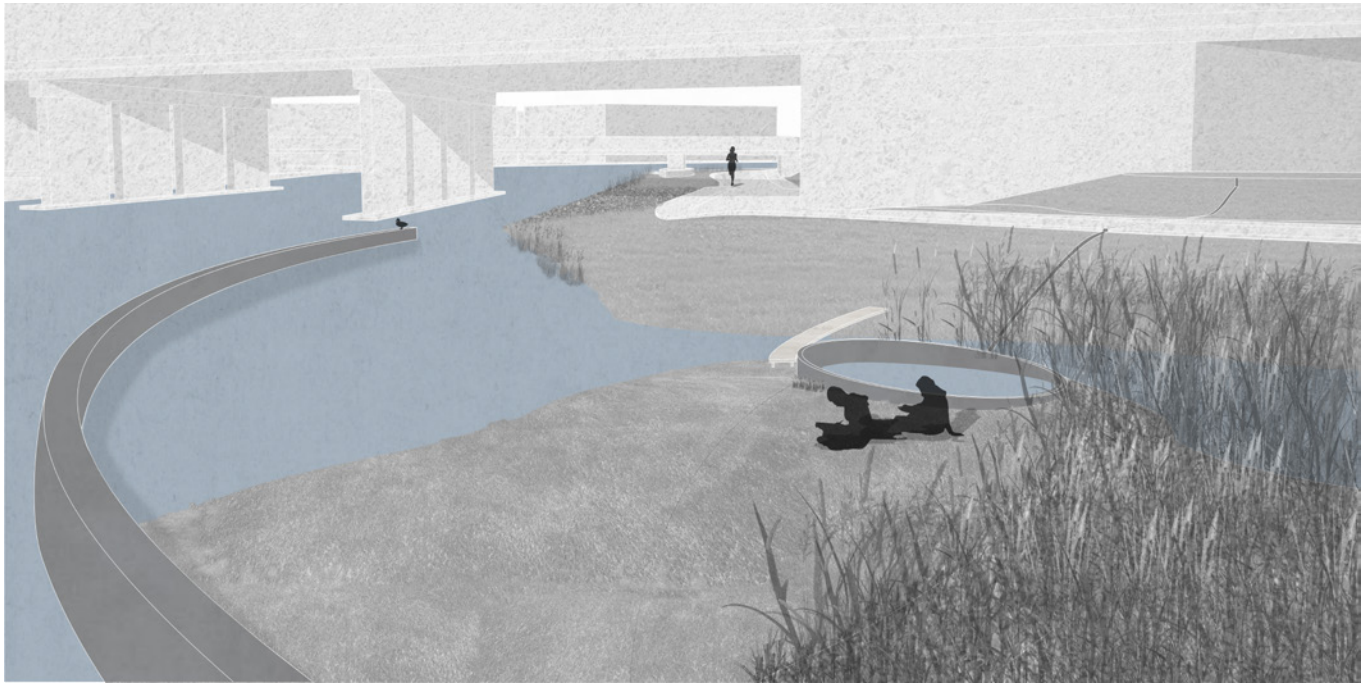



2 YEARS

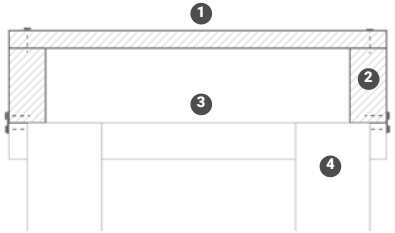
Plants have grown along the shore and on the island, 5o% of the reeds are mown every year to prevent tree growth, with soil particles settling the islands will grow together over time.

## THE DOUBLE BANK

The double bank stands in stark opposition to the concrete edge on the other side of the Rotte. Here the transition of water and land is very gradual. As such it also becomes a special space within the dense urban fabric, where the transition of land and water is often mediated by a hard edge giving the expression that land and water stand in opposition to one another, when in reality they are dependant on one another. The plants and animals that can find their home along this eutrophic double bank illustrate this. The space not only allows for a different narrative of the inner city Rotte, but also becomes an ecologically important space.



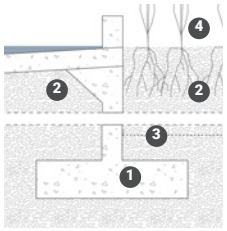
VIEW FROM CONCRETE EDGE OVER POOL



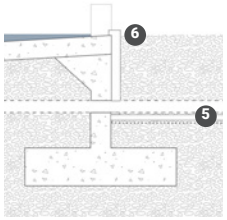
1. WOODEN DECK
2. WOODEN UNDER-CONSTRUCTION (100X50)
3. STABILIZATION WOOD COLUMS (50)
4. STABILIZATION WOOD COLUMS (100X100)

DETAIL A WOODEN BRIDGE

0 10cm



DETAIL B

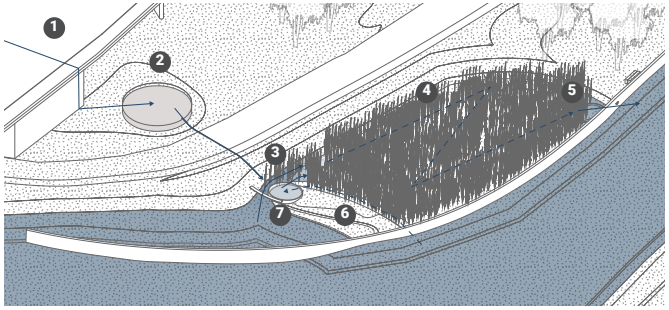


0 0,4m

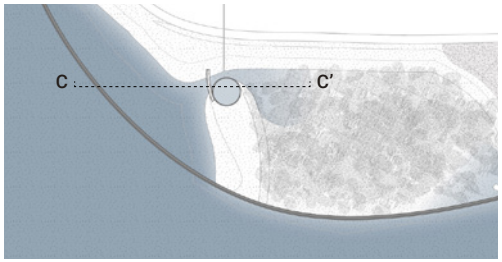
1. CONCRETE POOL
2. RUBBLE
3. FOIL
4. HELOPHYTE-FILTER
5. WATER COLLECTION PIPE
6. EFFLUENT PIPE

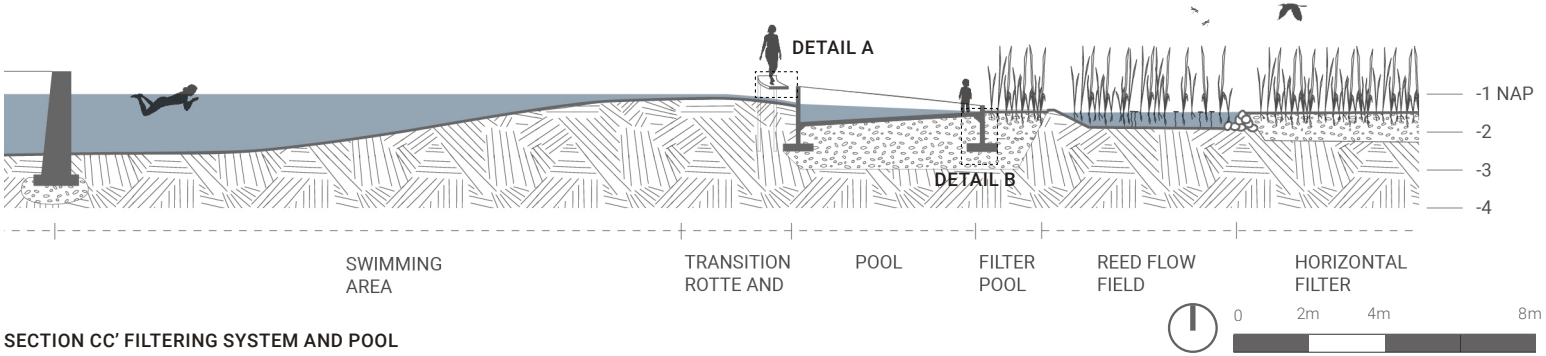
## THE POOL

While the other two areas in the design are mostly focussed on the educational and ecological elements of the overall scheme, allowing humans to partake in the design only visually, the pool creates a public space. Places to access and swim in the Rotte are lacking right now and the pool aims to create that space as a safe destination for families by placing the swimming space behind the concrete edge needed against the current and also by introducing a pool for toddlers, where the water is filtered before being let in the pool. The scheme for the pool is accompanied by a filtration system, which filters both run off from the highway and Rotte water bringing humans, infrastructure, plants and animals together in one space.



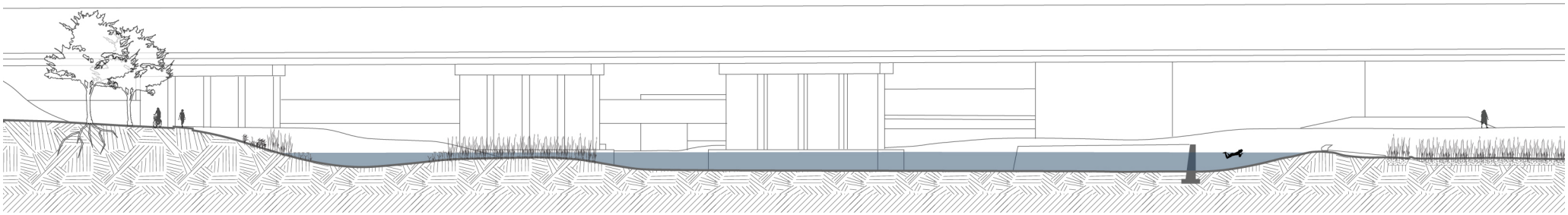
1. HIGHWAY → 2. CATCHMENT TANK
6. HELOPHYTE-FILTER POOL → 7. POOL → 3. INLET BIG FILTERING SYSTEM
ROTTE → 3. INLET BIG FILTERING SYSTEM
4. HELOPHYTEFILTER
5. ARCHIMEDEAN SCREW

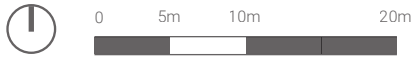


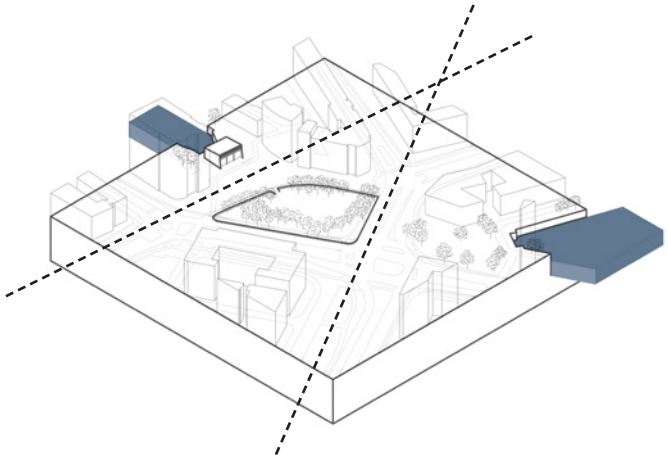

SECTION CC' FILTERING SYSTEM AND POOL

BIRDS-EYE VIEW INTERVENTION



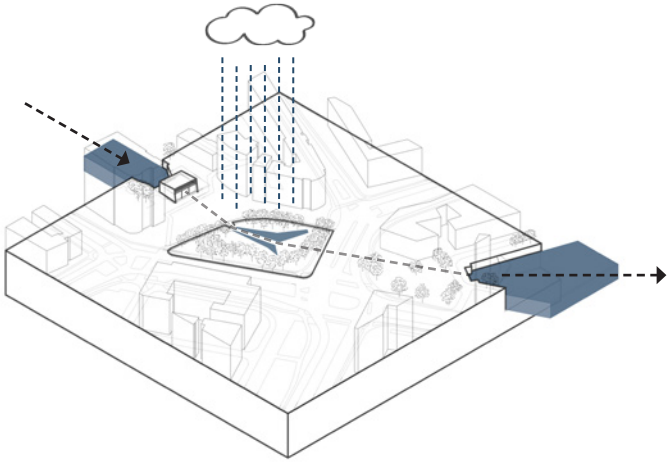



SECTION ACROSS ROTTE WITH INTERVENTINO



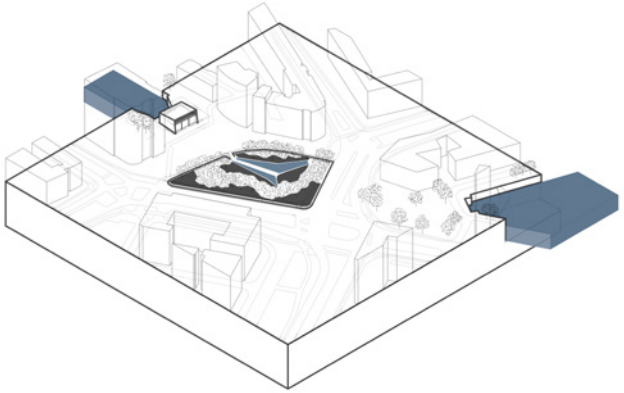
## CONTEXT

Dense urban fabric and busy traffic intersection create a strong disconnect between the Pumping Station and the Maas Harbor. The water connection is not physically visible as the old node has been converted into a metro plaza that is a lost space.



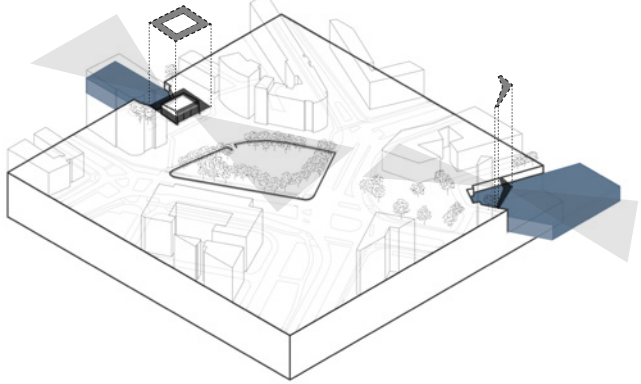
## WATER MANAGEMENT

Reinstating the existing water node through the creation of a catchment area to create an understanding of the flow of water. Expressing direction through the form of the catchment zone.



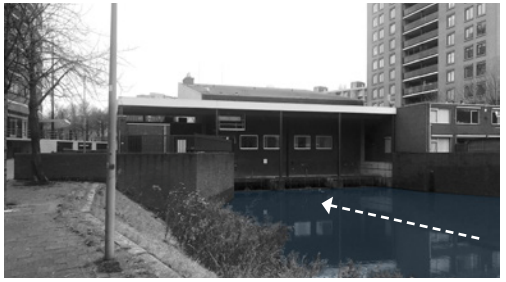
## ECOLOGY

Activating the metro garden plaza as a space for gathering and a point of connection. Revitalizing the area with new ecology through the introduction of water and rainwater plants.



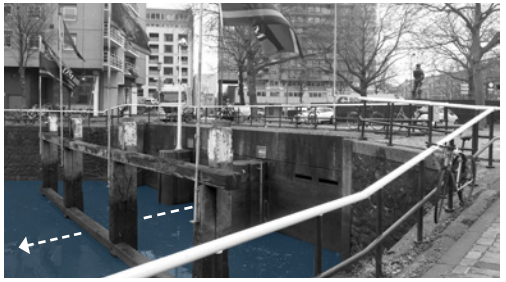
## PERCEPTION

Creating elevated elements at the Pumping Station and Maas Harbor that establish a visual connection between the two, rendering them as points of attraction to encourage an understanding of the Rotte-Boezem River movement.



BOEZEM PUMP INLET

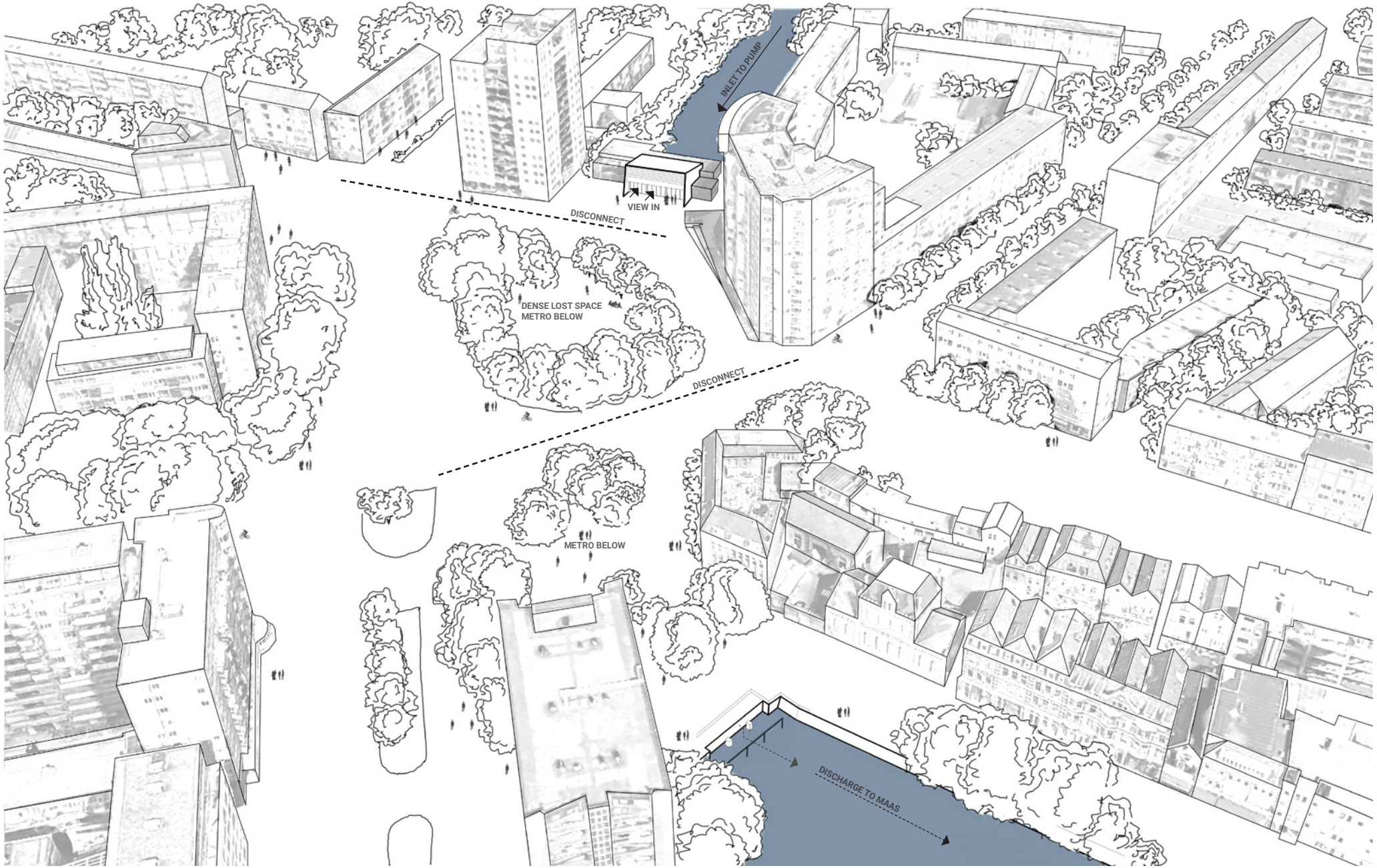
METRO GARDEN PLAZA



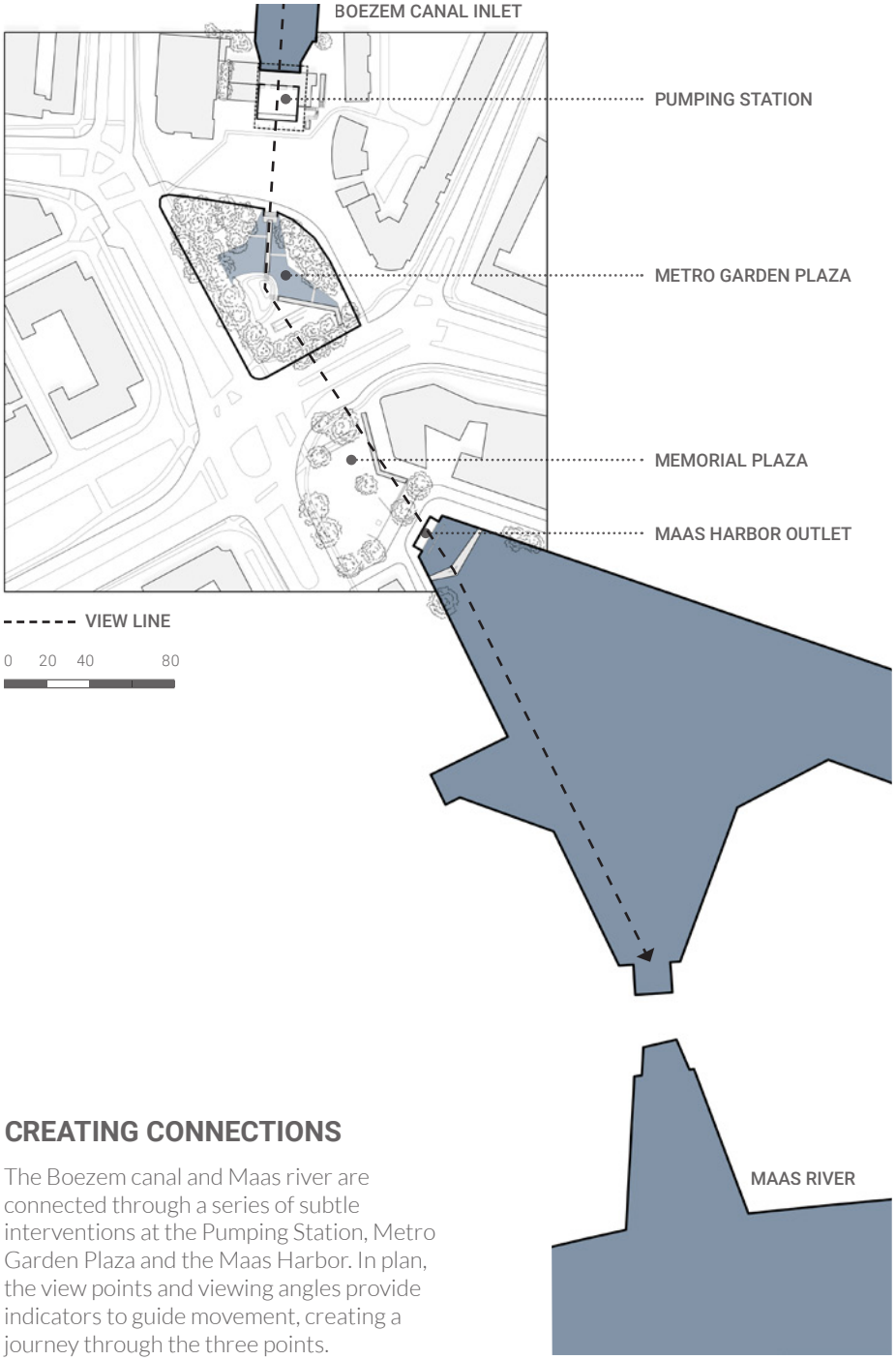
MAAS HARBOR OUTLET

## THE RELEASE

This intervention addresses the end of the Boezem and its connection with the Maas. The pumping station and area around is surrounded by infrastructure resulting in  loss of connectivity between the two. To bring this connect back, a series of elevated interventions are created. These interventions are bound by planting and materiality wherein a visitor sees hints of elements in the urbanscape that guides them through this experience. The raised elements ensure elongated view lines, and planting revitalises the space. Natural and light materials ensure a subtlety to the overall experience.

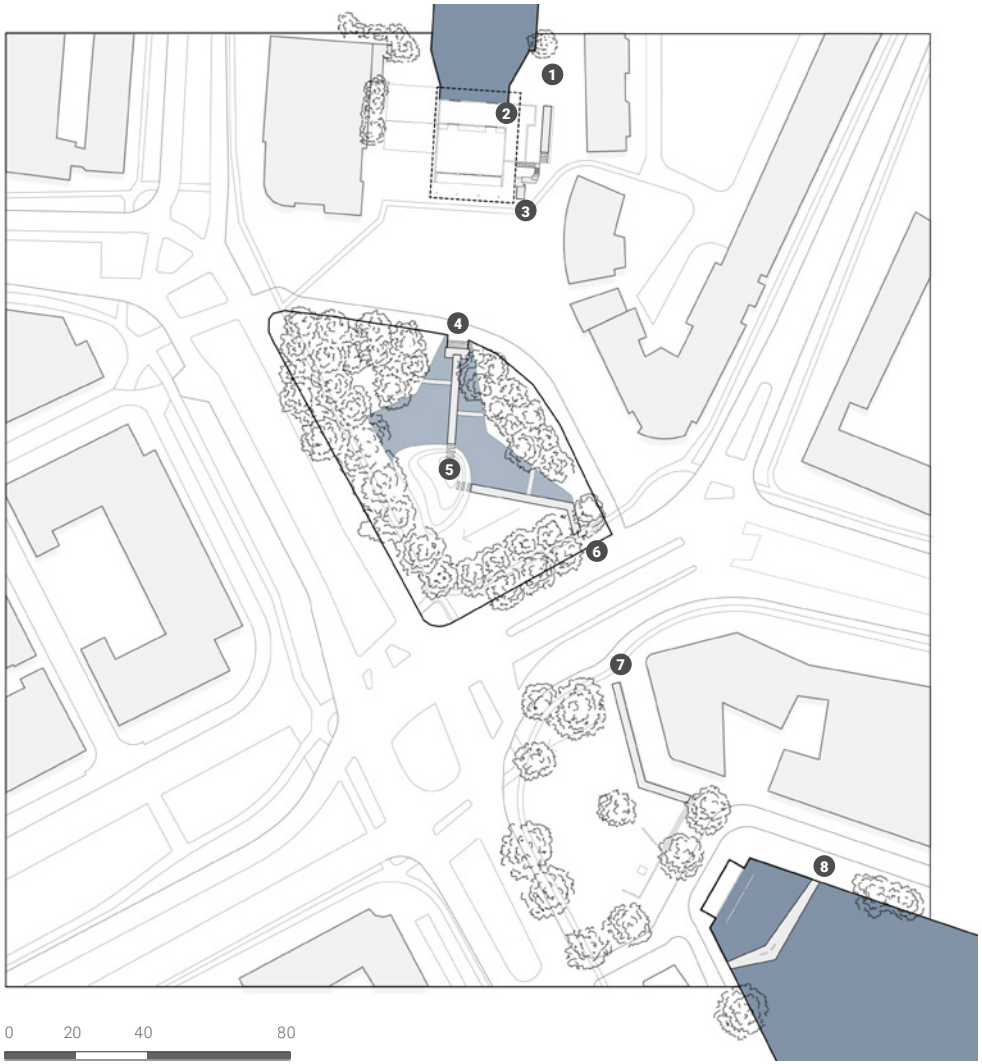



**CONTEXT - PUMPING STATION AND MAAS HARBOR DISCONNECT**



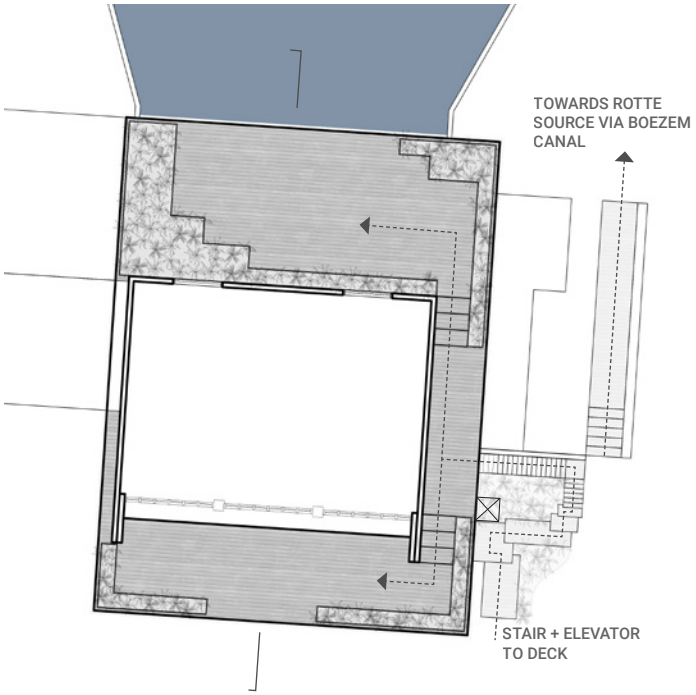

## CREATING CONNECTIONS

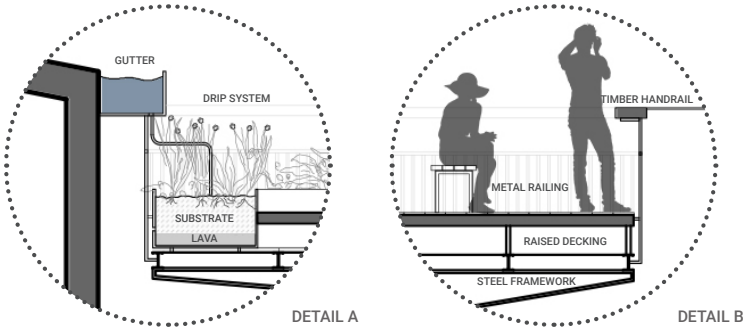
The Boezem canal and Maas river are connected through a series of subtle interventions at the Pumping Station, Metro Garden Plaza and the Maas Harbor. In plan, the view points and viewing angles provide indicators to guide movement, creating a journey through the three points.

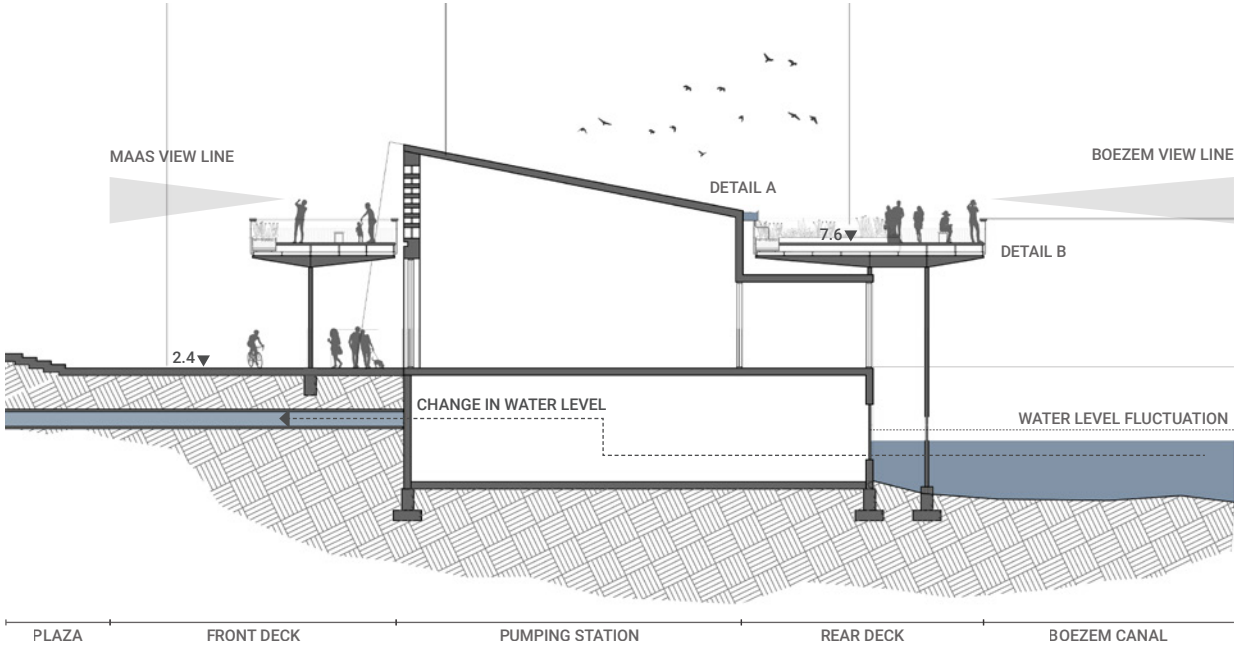



1. APPROACH ALONG BOEZEM
2. PUMPING STATION - WITH ELEVATED DECK INTERVENTION
3. STAIRCASE APPROACH TO ELEVATED DECK
4. ENTRY TO METRO GARDEN PLAZA
5. ELEVATED VIEWING POINT IN METRO GARDEN PLAZA
6. CONNECTION TO MEMORIAL PLAZA
7. BOARDWALK INDICATOR IN MEMORIAL PLAZA
8. VIEWING BRIDGE AT MAAS HARBOR

## PUMPING STATION




## DECK EXPERIENCE

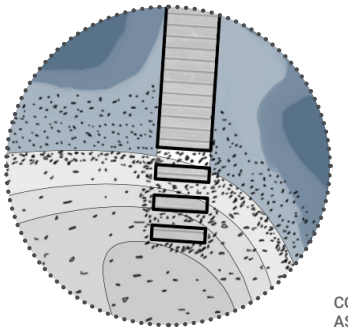
The experience at the Pumping Station starts with an inviting staircase that takes you up to the deck. The slender steel structure and timber deck allows for a lightness to be experienced. The planters are designed to be lower than the decking level so that the edge experience is that of only plants. Rainwater is collected and stored which is distributed to the plants through a drip irrigation system. A diverse species of plants is planted on a bed of lava soil and substrate top soil that thrive in rainwater - cotton grass, peat moss, sweet gale and swamp ferns.

## METRO GARDEN PLAZA EXPERIENCE

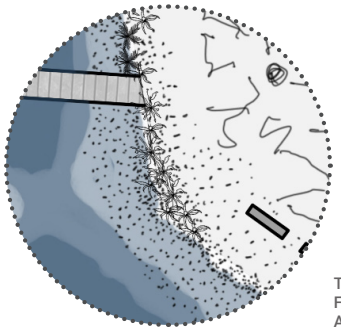
The metro garden plaza connects the pumping station to the Maas Harbor. Presently, due to the infrastructural elements around it, it has become a lost space. Introducing directional elements of water with shallow banks not only activates the space but also allows for a new diverse species of water friendly plants to grow in the area. The pathways act as guiders for visitors to walk up to a viewing point within the plaza that has a visual connect to the harbor and subsequently a pathway gently nudges the visitor to walk towards the direction of it. Seasons play an important role in the activation of this plaza as the waterbody depends on rainwater.

Summer
Shallow waters, with shallow banks allow for a water body that can almost completely be walked on. The plants and grasses dominate, and the tree canopies provide shade.

Winter
In the winter the water level is higher. A lot of the plants are submerged in water and the designed pathways form major movements. The tree canopies are leafless and the space has a more open effect.

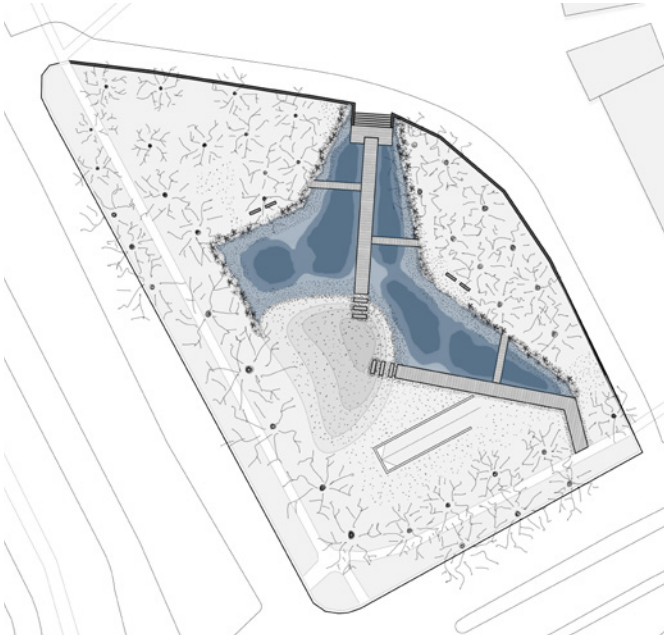


CONNECTION WITH HIGHER GRASSY HILL AS A TIMBER BOARDWALK



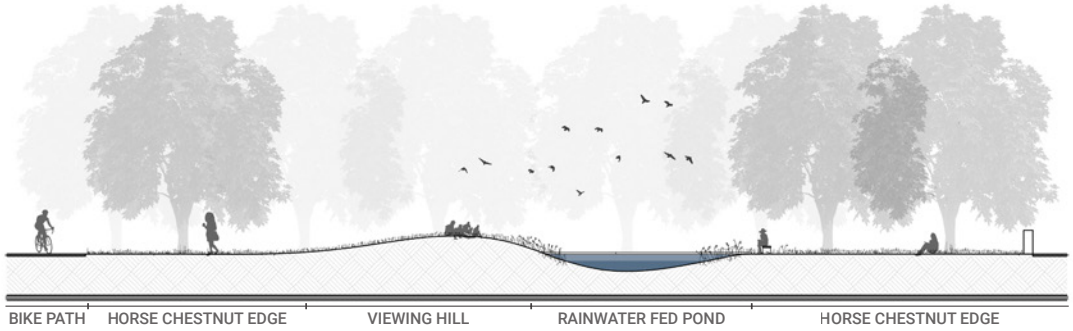
TIMBER BOARDWALK, SHALLOW EDGES FOR INCREASED VEGETATION AND WATER ACCESS, BENCHES FOR RESTING


SUMMER

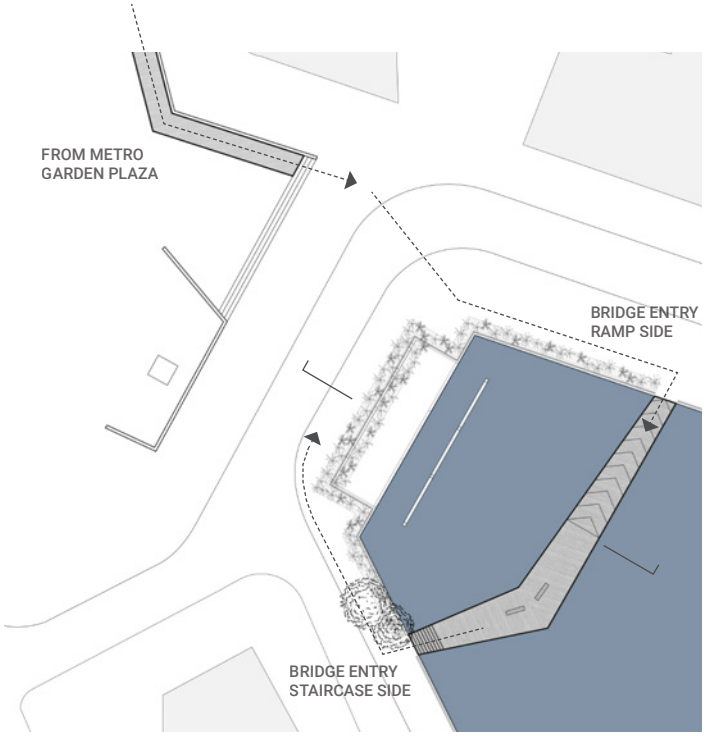


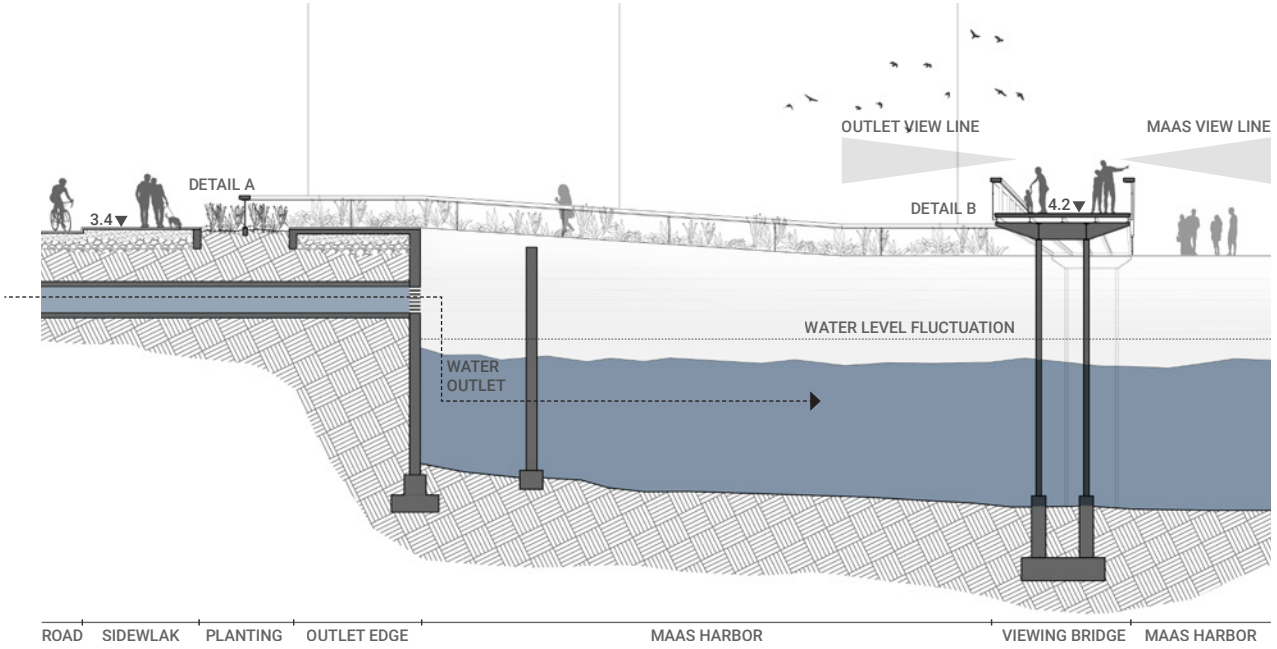
WINTER

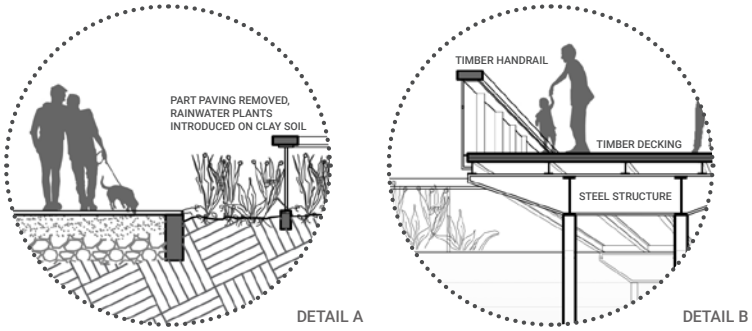

SECTION AA




SECTION BB

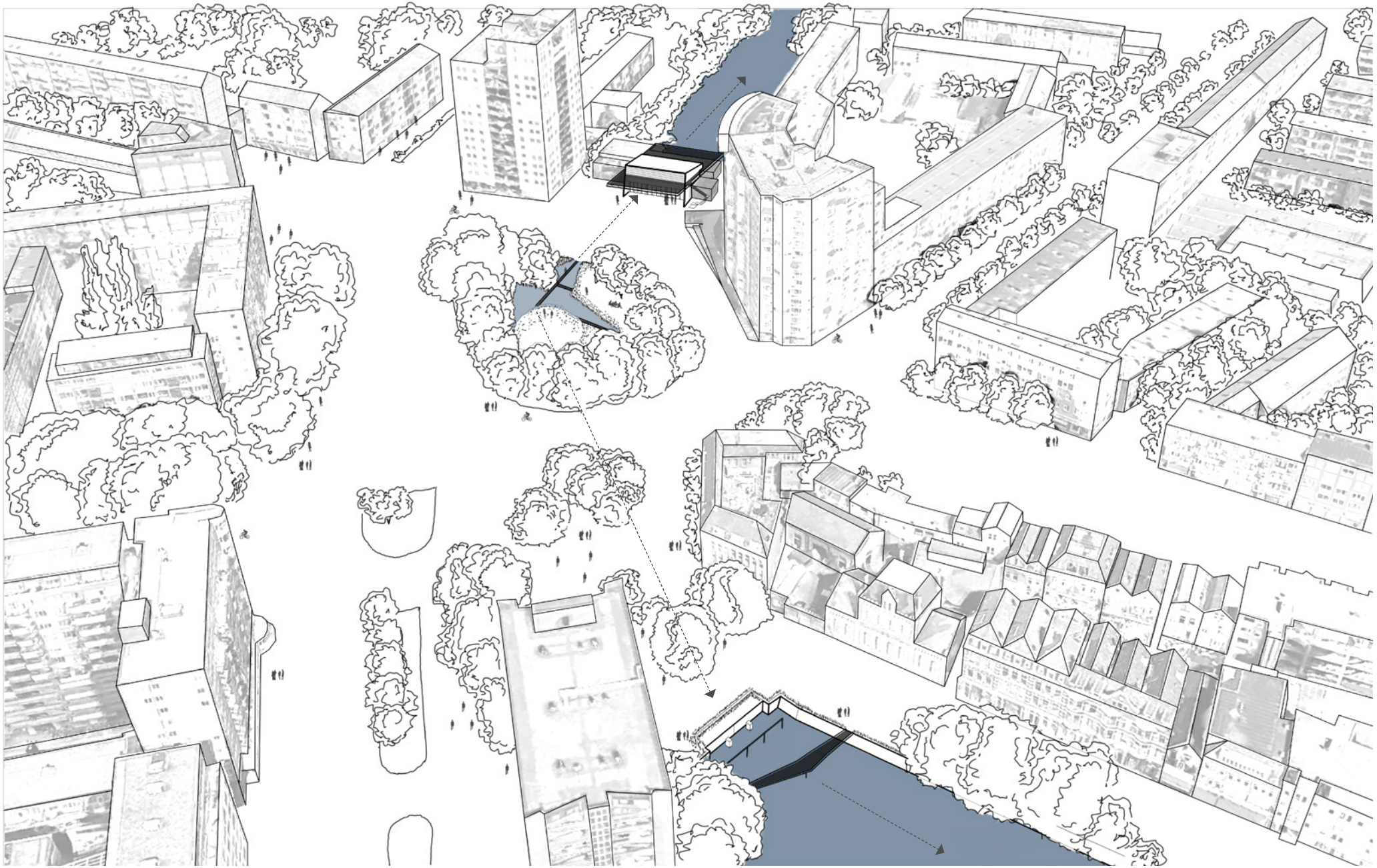



## BRIDGE EXPERIENCE

The experience at the Maas Harbor is enhanced with the introduction of an elevated bridge that connects its two sides. From the bridge one can visually connect back to the pumping station and also to the Maas river. The bridge is designed to be disabled friendly with a staircase on one side and a ramp on the other. Another introduction is that of planting. Parts of the sidewalk are converted into live edges to create an inviting experience and also allow for more water to percolate into the ground. Rainwater plants are used to ensure seasonal endurance.



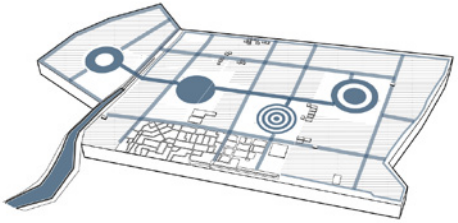
**INTERVENTION - PUMPING STATION AND MAAS HARBOR CONNECT**

# NEW SHAPE, NEW CHAPTER

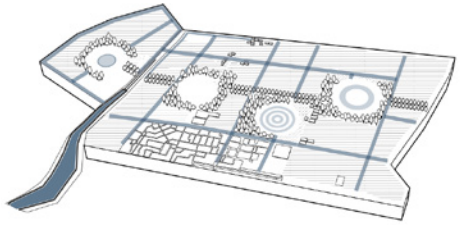
## De Wilde Veenen en 140 Morgen

Nicolle Cobben 4589386 | Jessica Xulingyun 5344050

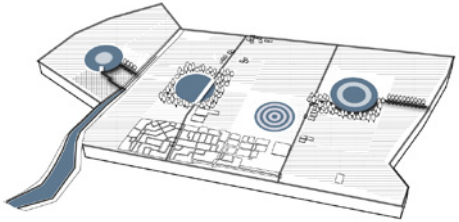
### WATER MANAGEMENT



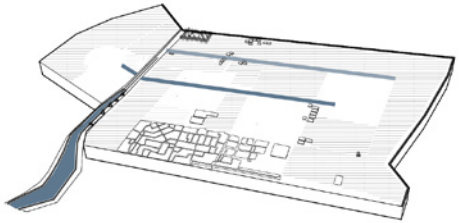
### ECOLOGY

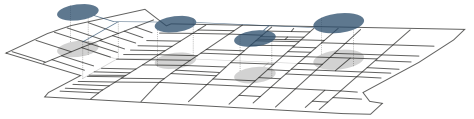


### PERCEPTION



### CONTEXT





## CONCEPT - *New shape, New chapter*

The Wilde Veenen and the 140 Morgen are polders with a long and rich history. The Wilde Veenen is the oldest polder of the Rotteboezem area. Together they share many historical elements which makes them distinguishable to other polders along the Rotte.
However, the current program and the lacking of a route do not let this layer of the landscape be fully appreciated.

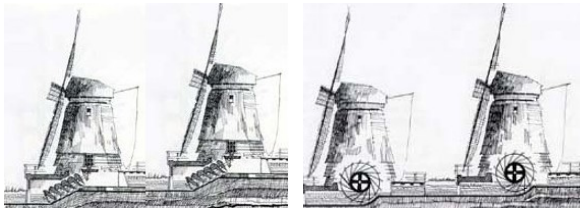
The current monofunctional program, agriculture, occurs different problems. First of all it lacks of biodiversity. Landscape elements have disappeared and the water quality is nutrient rich. Furthermore causes the climate change an alternate of the seasons whereby farmers have to face unbalanced water levels; water shortage in summer and water surplus in winter.

In order to make the polder resilient for the future, the main goal of our design is to store water in our polder. We designed four ponds, one located in the 140 morgen polder and the other three in the Wilde Veenen polder. To connect these four ponds, we used one the remain and location of one the historical main ditches (the Kleine Duikertocht). We choose to create 'circles', because we want to emphasize the new layer not only by introducing a new function to the land- 'water retention', but also a new shape. The four ponds differ in looks regarding the creation of different experiences and environments for both human and nature.
Beside the water storage, we make room for experimental and renewal farming too. This is done to improve the (bio)diversity of the polders.

In the end, our design with its new shape adds a new chapter to the landscape.

# TIMELINE

**WINDMILLS PARALLEL TO THE ROTTE**



2 windmills: mortar wheel



4 windmills: paddle wheel

Windmill number 7 pumped the water out of the Kleine Overtocht

**ESTATES WERE BUILD IN ORDER TO EARN MONEY AFTER THE EXPENSIVE RECLAMATION**

7 windmills pumped the water out
**START LAND RECLAMATION DE WILDE VEENEN**

**1651**

**SQUIRE WARNARD VAN DER WEL GAVE THE ORDER FOR LAND RECLAMATION**

**1640**

**DIVISION LAST PLOT OF LAND**

**1655**

Small hole behind the Rotte dike is still visible
**DIKE BREAK 2.0**

**1682**

**LAND RECLAMATION 140 MORGEN POLDER IS FINISHED**

**1779**

**CA. 1400**

**START DIGGING PEAT IN AREA AROUND MOERKAPELLE**
**PEAT WAS SHIPPED VIA THE ROTTE**

**1673**

**DIKE BREAK 1.0**

**1715**

**DIKE BREAK 3.0**

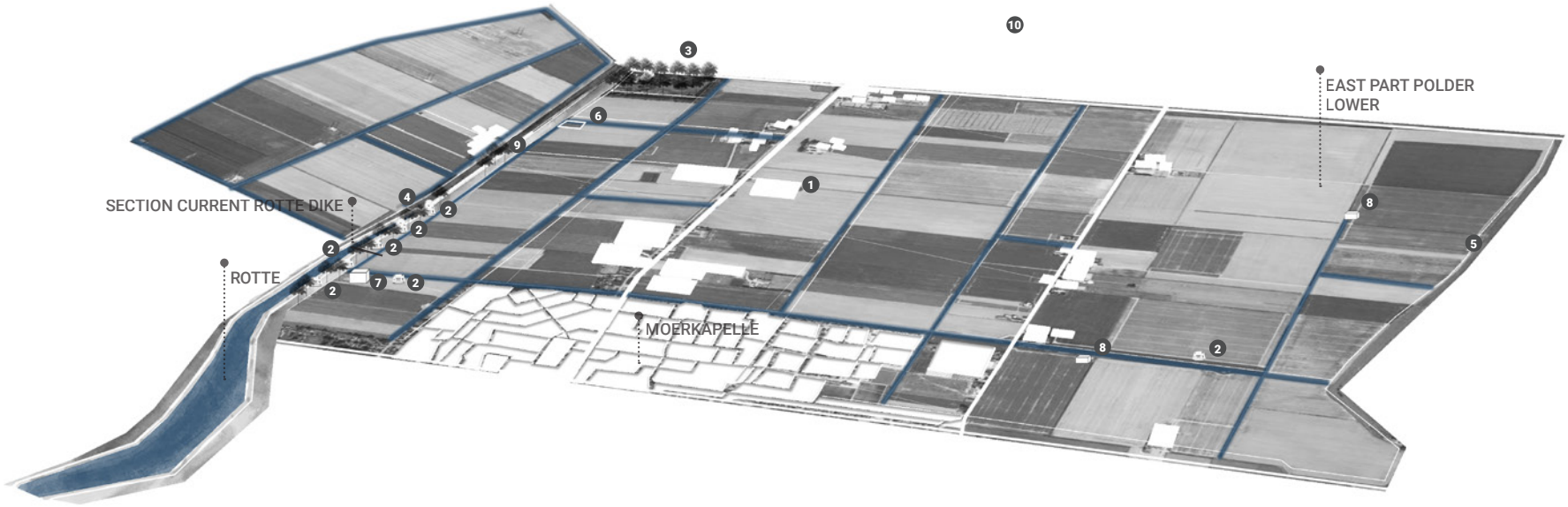
**1924**

**START PUMPING STATION DE WILDE VEENEN**
The windmills were partly demolished and became residents

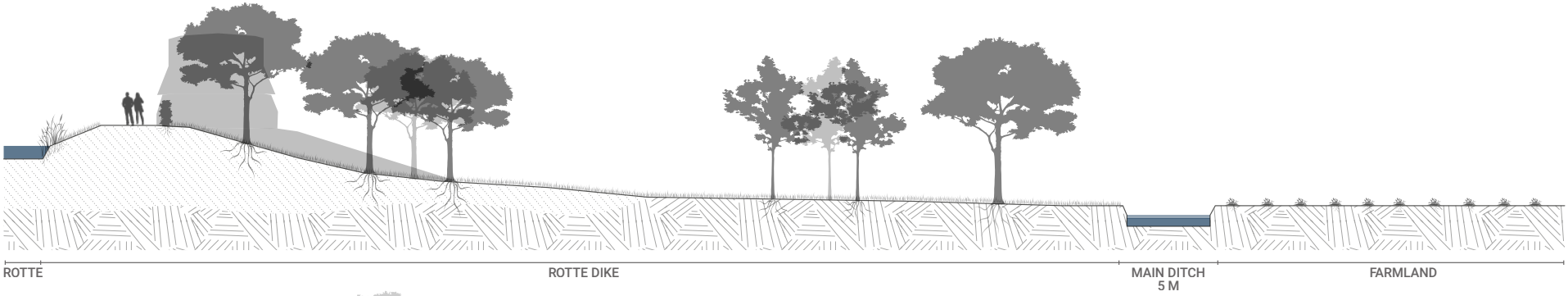
**PEAT LANDSCAPE** ----------→ **LAKE** ----------→ **LAKE BED POLDER**

**MAP DE WILDE VEENEN**
Polder-water pattern: square pattern of main ditches
Smaller ditches divide the squares in plots

# CURRENT SITUATION



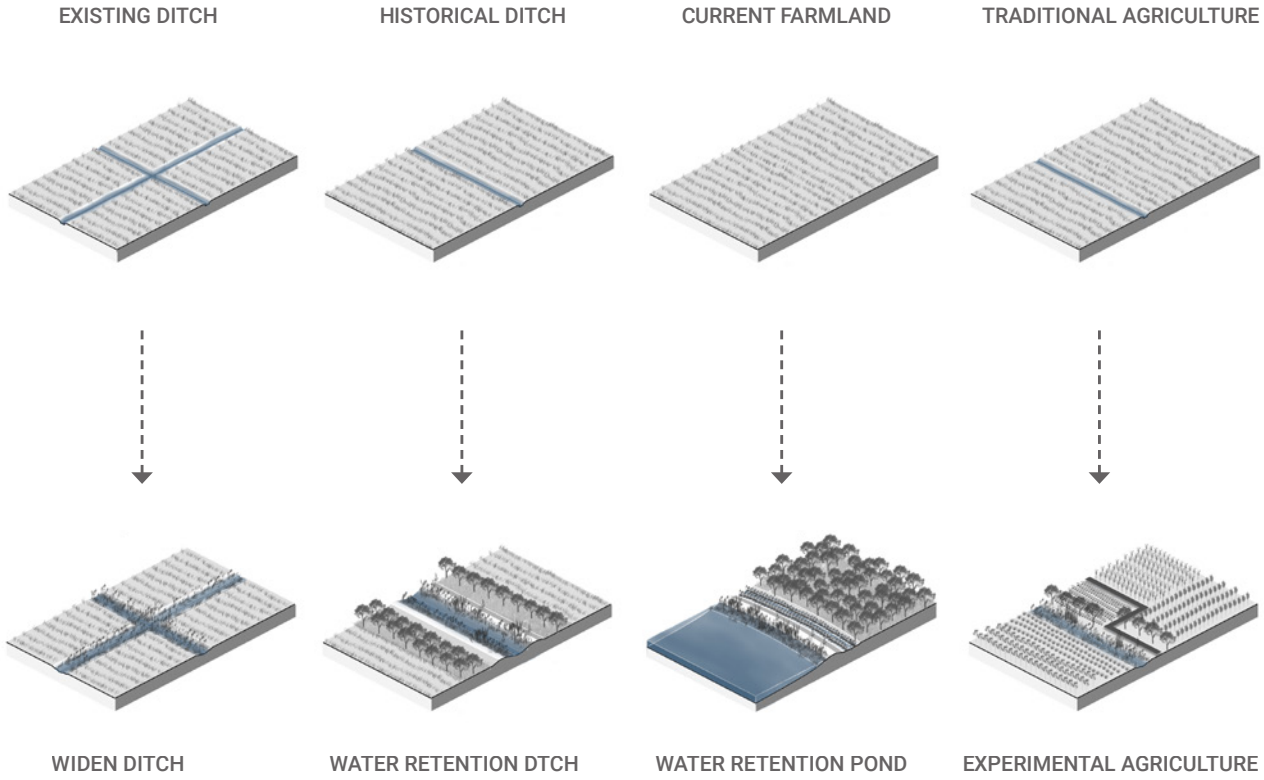

BIRDVIEW CURRENT SITUATION




SECTION CURRENT ROTTE DIKE

0 150 300 600

## TRANSFORMATION STRATEGY




# ANALYSIS

Wide, open landscape with orthogonal, straight lines

1. Monofunctional program:
   - Crop farming and glasshouses

Historical elements:
2. - Windmills
3. - Estate Land van Belofte
4. - Origin Rotte
5. - Peat dike 17th century
6. - Remain dike break

Clear, equally divided and closed water system
7. - Pumping station de Wilde Veenen
8. - 2 private pumps

Unbalanced water level:
- Shortage summer
- Surplus winter

Water quality:
- Eutrophic

Loss of biodiversity and landscape elements

9. Route along the Rotte does not continue to the north

10. Nature reserve and recreational area Bentwoud borders the polder in the north

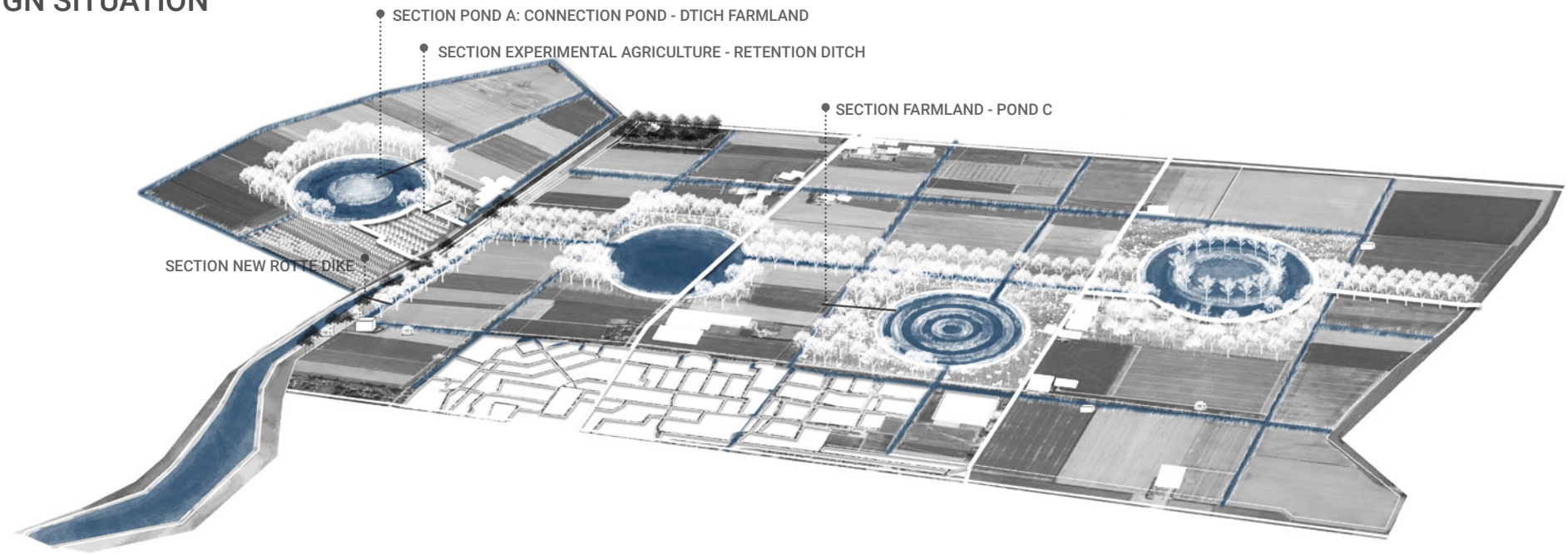
## DESIGN INTERVENTIONS

Water management:
- Water retention system

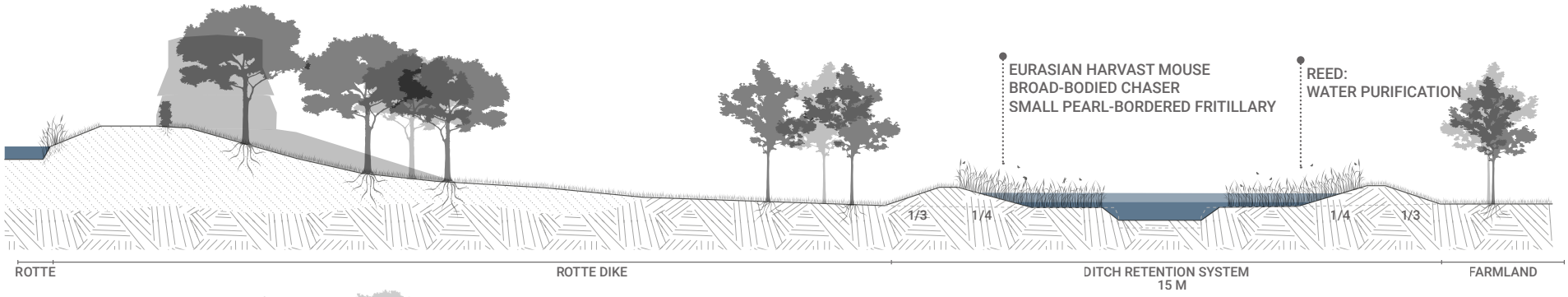
Ecology:
- Widen ditches
- 4 ponds; grassland, open water, reedland and ash-elm ring
- Food forest
- Bufferzone dikes
- Ecological zone; flowery grassland

Perception:
- Extension route Rotte dike
- 2 routes along retention ponds
- Experimental agriculture

# DESIGN SITUATION



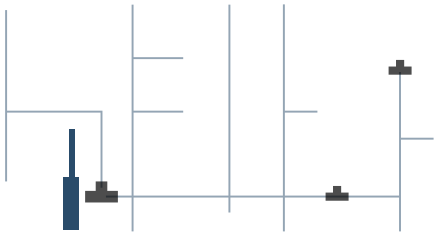

BIRDVIEW CURRENT SITUATION



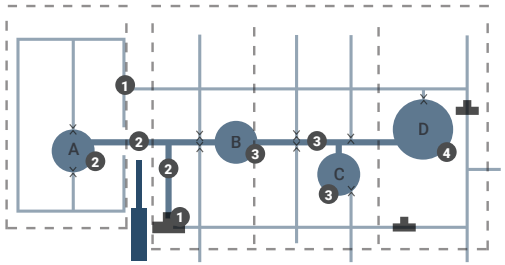

SECTION NEW ROTTE DIKE

0 150 300 600

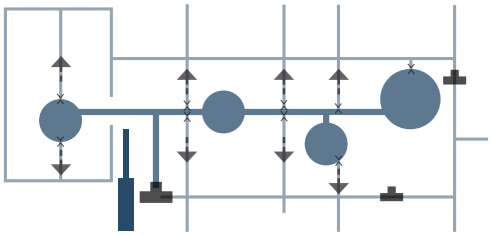
# WATER MANAGEMENT



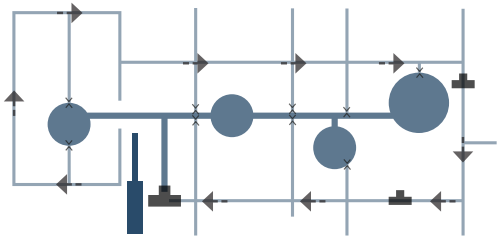
CURRENT WATERSYSTEM




PLOT FARMER + GROWING PLAN



WATER FLOW SUMMER

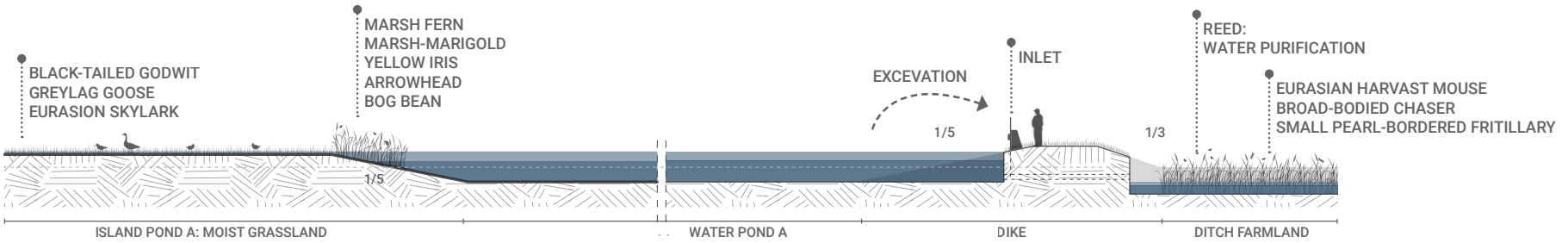


WATER FLOW WINTER

## GROWING PLAN RETENTION SYSTEM

1. Phase 1:
   - Create new connection between the polders
   - Adjust pumping station de Wilde Veenen
2. Phase 2:
   - Construction pond A and ditch
   - Transformation ditch
3. Phase 3:
   - Construction pond B, C and ditch
4. Phase 4:
   - Construction pond D

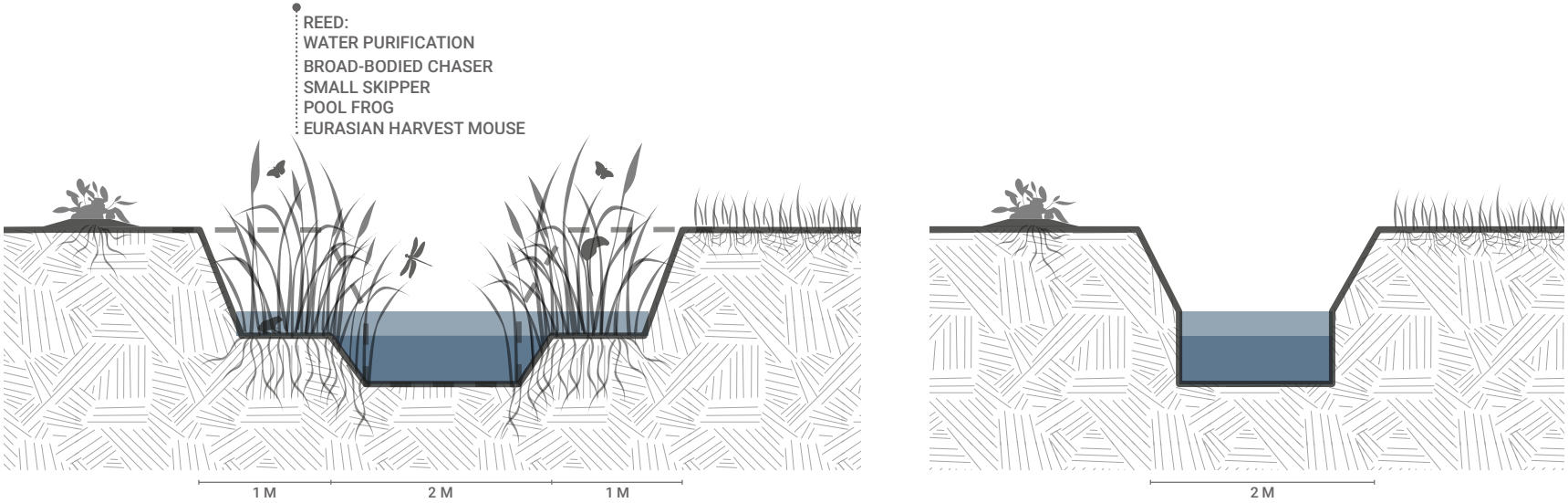
Future perspective: resillient polder which no longer depends on water provided by the Rotte



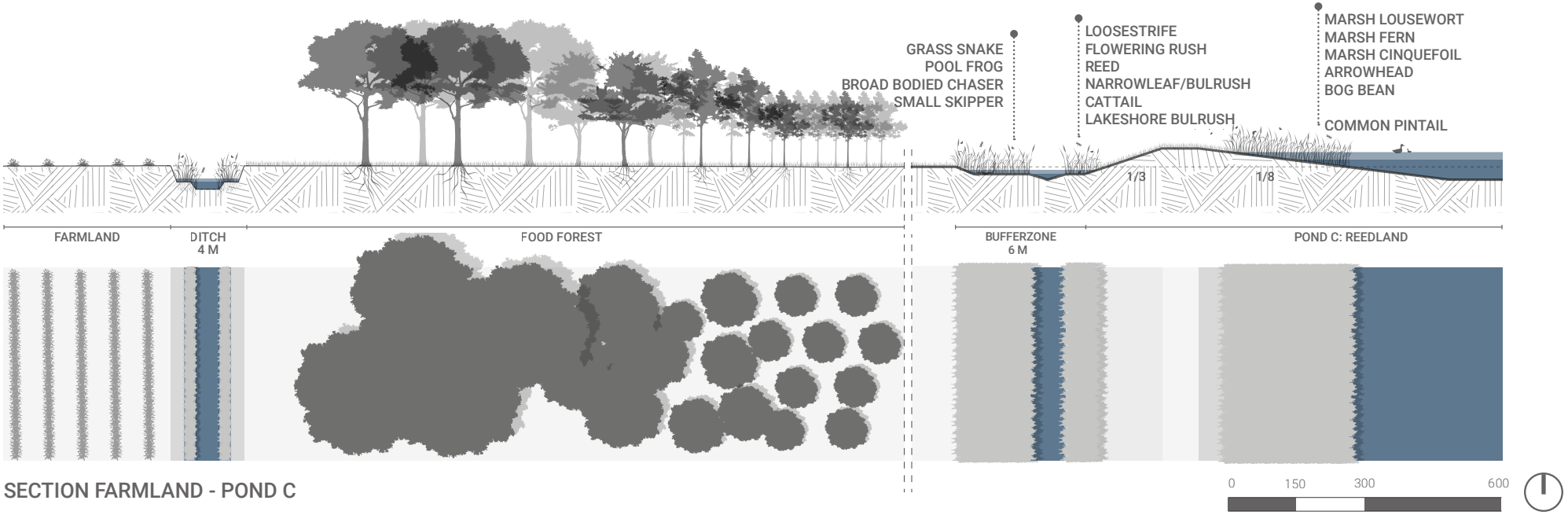

SECTION POND A: CONNECTION POND - DTICH

0 150 300 600

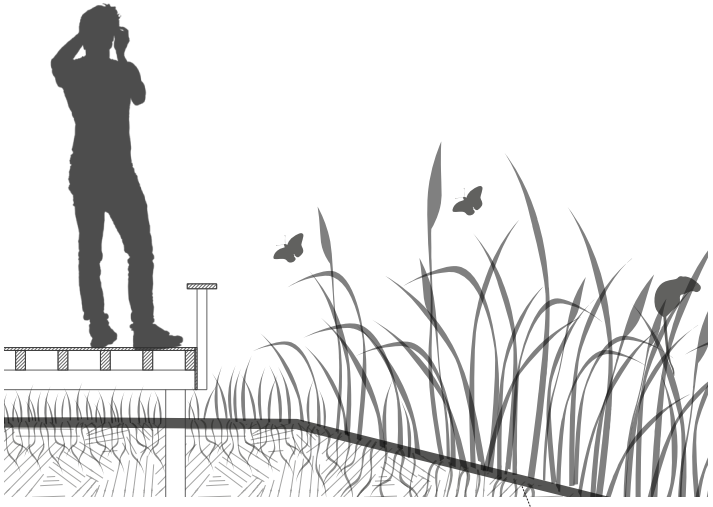
# ECOLOGY




DETAIL DITCH FARMLAND: NEW (LEFT) AND CURRENT (RIGHT) 1:50




SECTION FARMLAND - POND C



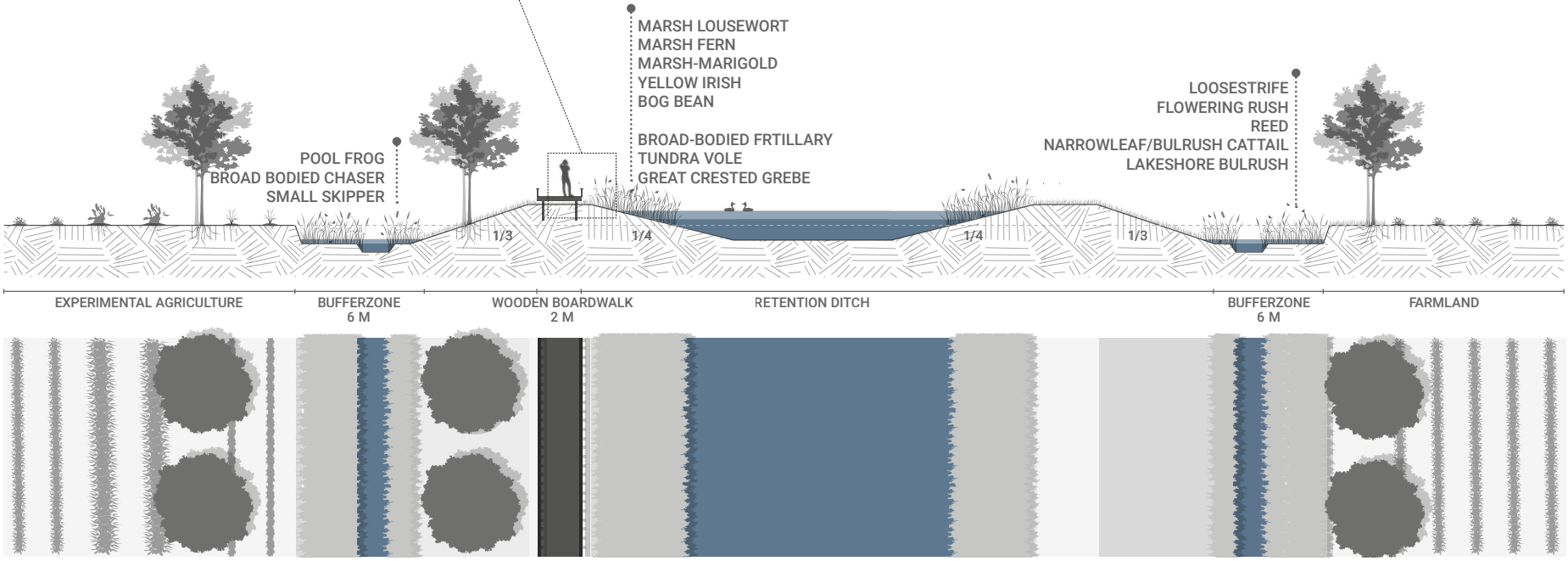
DETAIL WOODBOARD - DIKE 1:50

## CONSTRUCTION WOODBOARD

Wooden board 2000 mm x 150 mm x 15 mm
Wooden beams 50 mm x 100 mm x 3000 mm
Wooden beams 50 mm x 100 mm x 2000 mm

Wooden poles 100 mm (diameter) x 750 mm

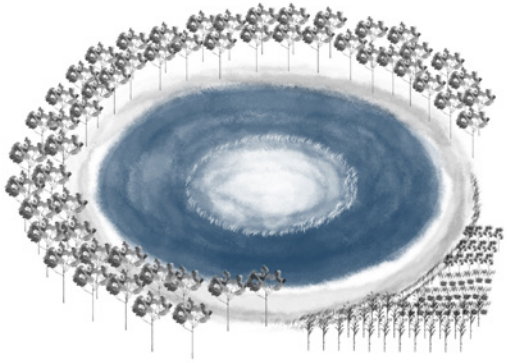
Dimension soil - woodboard: 100 mm (to prevent rot)



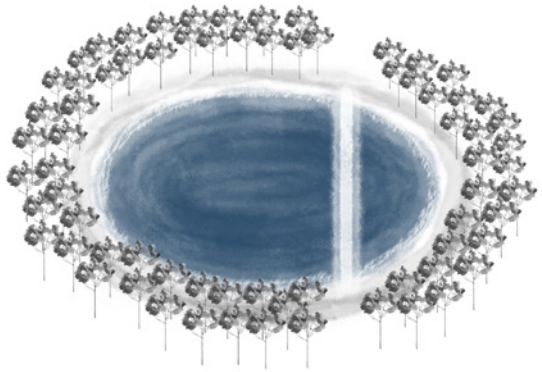

SECTION EXPERIMENTAL AGRICULTURE - RETENTION DITCH

0 150 300 600

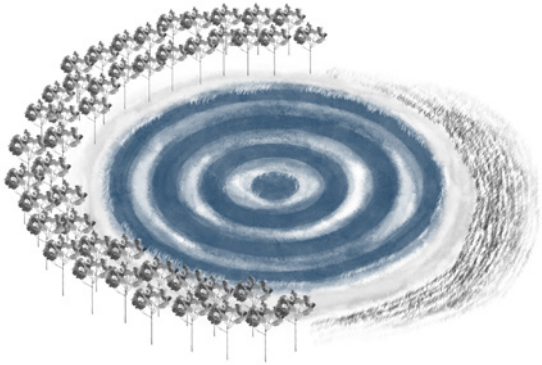
# POND



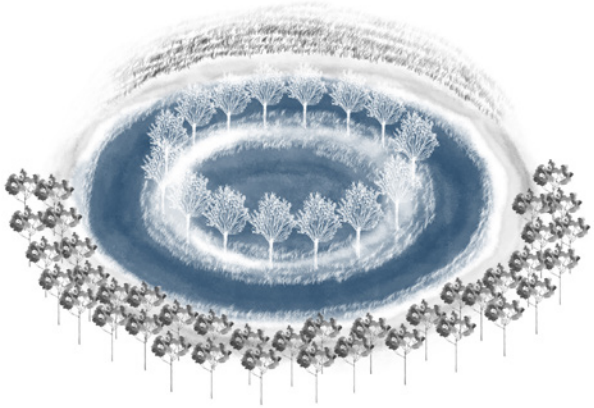
POND A: WET GRASSLAND



POND B: OPEN WATER



POND C: REEDLAND



POND D: ASH-ELM RING

## DETAILED INFORMATION PONDS

Differentiation in heights to create different looks and environments

Fluctuation ponds 40 cm:*
- Water level summer 1,1 m
- Water level winter 1,5 m

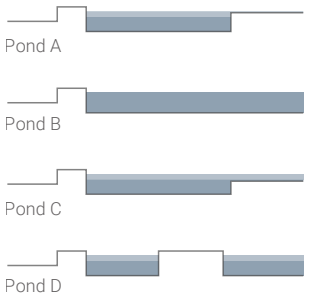
*Except for pond B

Pond A: pond with island
- Summer: island is dry
- Winter: island is flooded (10 cm)

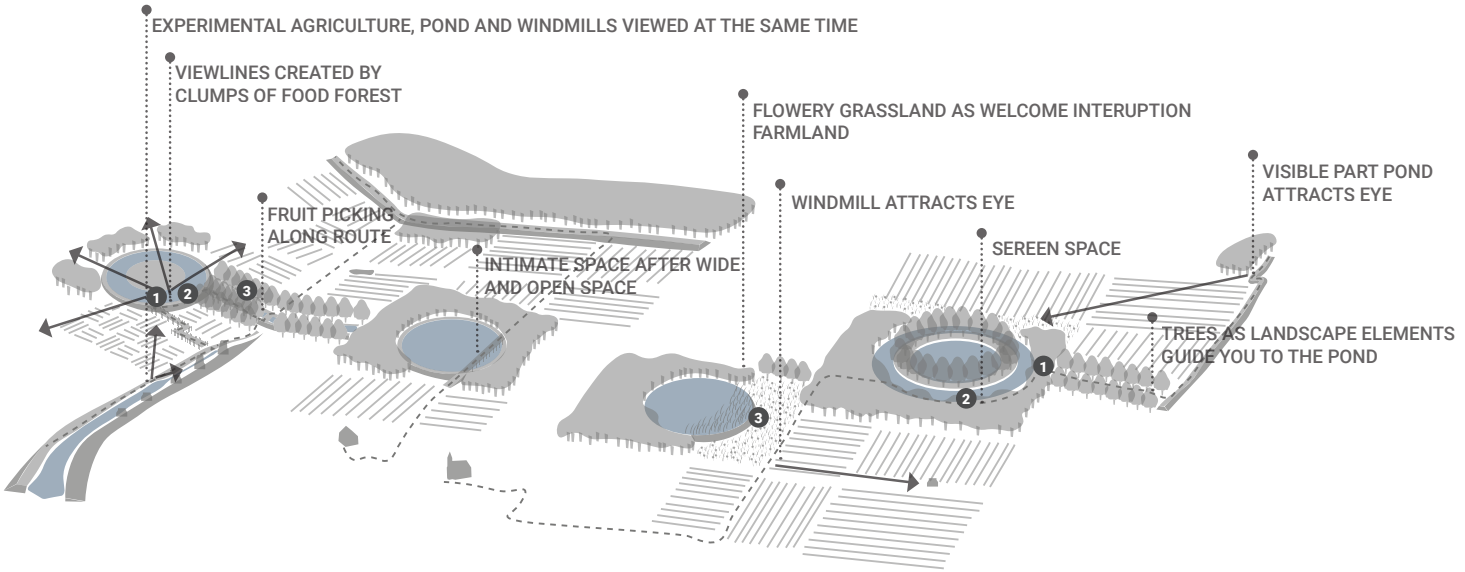
Pond B
- Constant water level winter and summer (1,5 m)

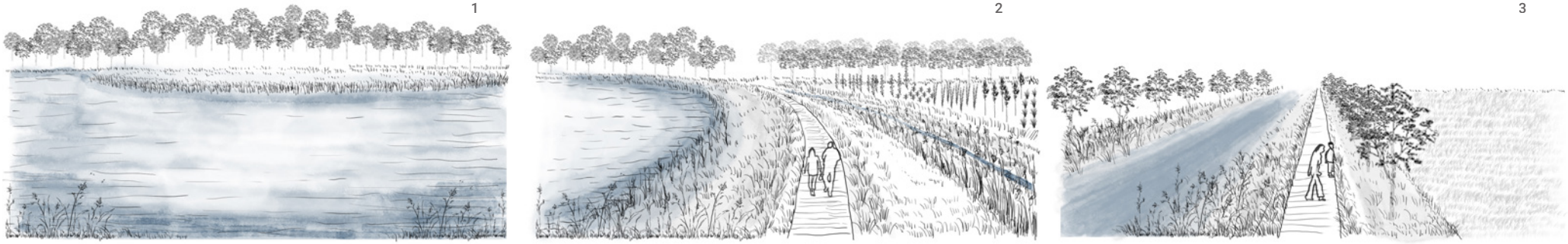
Pond C: pond with shallow rings
- Summer: water level rings (10 cm)
- Winter: water level rings (50 cm)

Pond D: pond with island ring
- Island ring is dry the whole the year



# PERSPECTIVE



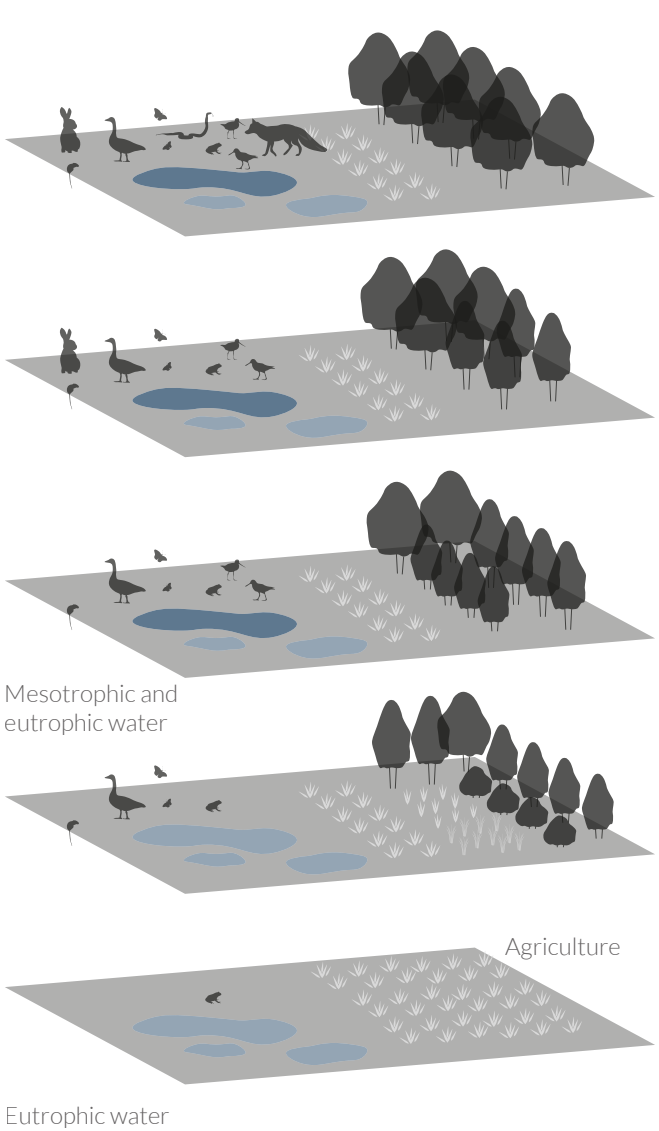




**SERIAL VISION ROUTE 1: POND A**


**SERIAL VISION ROUTE 2: POND D**

Animal perspective

# CHANGE OVER TIME




### 40 YEARS

Food forest
- nuts

### 20 YEARS

Food forest
- high trunk fruit
- nuts (90%)

### 10 YEARS

Food forest
- low trunk fruit
- high trunk fruit (90%)
- nuts (35%)

### 5 YEARS

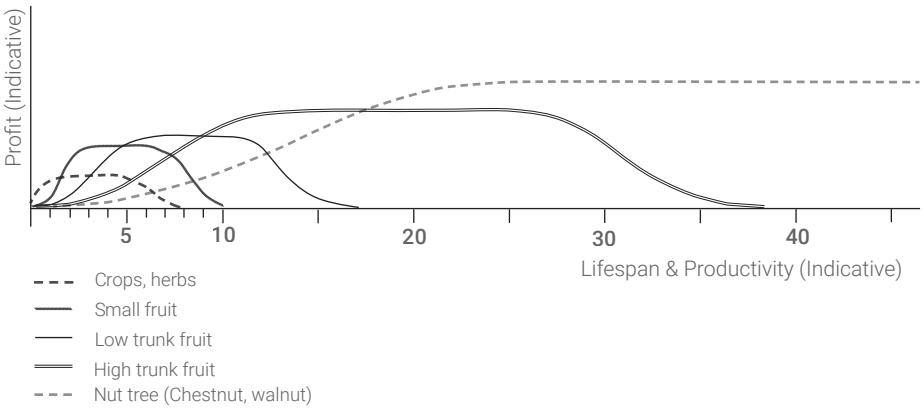
Food forest:
- herbs and crops
- small fruit
- low trunk fruit
- high trunk fruit (20%)
- nuts (5%)

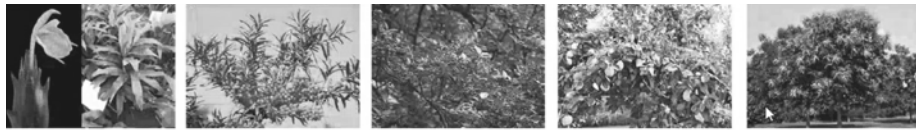
### CURRENT SITUATION

For the changes over time, first the plants will grow larger and form their own phytocoenosium. These plants will also attract some animals, like birds, rabbits, insects etc. , increasing the biodiversity of polder. Some plants and animals can even help the crops to grow better when they work together.

Also, we want to grow different types of fruit trees which could creat profits for farmers at different time depending on their lifespan. These different fruit trees will also attract various animals, making the polder even more diverse and activated.

**Fruit trees grow over time**



# MANAGEMENT OF LANDSCAPE

## REEDLAND

Pond C, swamp and banks

Goose naturally maintain reedland*

*Mesotrophic: more flowery due to less nutrients
*If needed: mowing every few years

## DRY GRASSLAND

Dikes and ecological zone

First years adding nitrogen and clover-grass mix

Grazing in spring

No mowing until july

## ASH-ELM RING

Pond D

Start: planting young trees*

*Full grown after 20 years

## OPEN WATER

Pond B, swamps and banks

Eutrophic water: dredge once in a while
Eutrophic swamp: mowing occasionally and dredge sometimes
Eutrophic bank: winter mowing encourages reed, summer mowing encourages herbs

Mesotrophic water: do nothing, inlet is a long supply line
Mesotrophic swamp: mowing occasionally, summer mowing prevents domination of reed
Mesotrophic bank: mowing occasionally

## WET GRASSLAND

Pond A

Goose naturally maintain grassland*

First years adding nitrogen and clover-grass mix

*If needed: grazing in spring and no mowing until july

### Process of management

The design consists of five different environments and each of them ask for different ways of management. During the first period, which is about 10 years, the land has to recover from all the years of farming. For example the grasslands need to be treated with more care by adding nitrogen and clover-grass mix. After the first period, some environments will change due to the transition of eutrophic water to mesotrophic water. This means the type of management will change too.

At the beginning the management of the environments will probably be more done by humans. However we expect over the years, when the biodiversity increases, the environment will step by step manage itself more and more naturally. If not, human can always intervene.

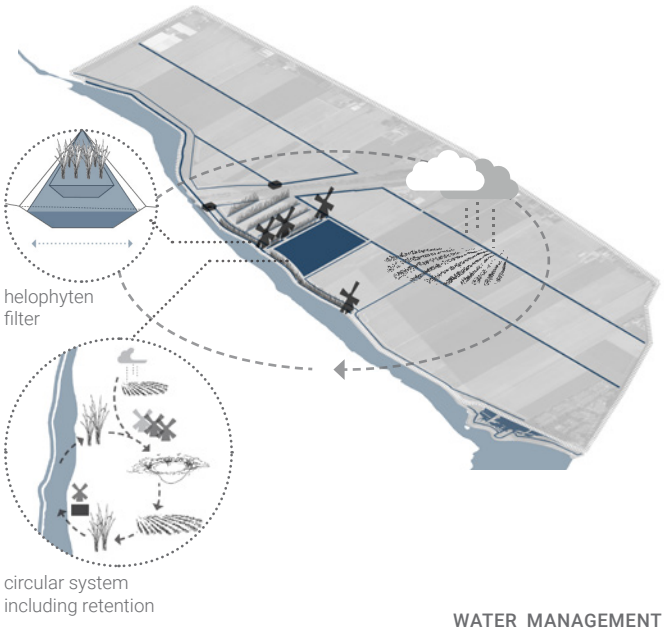
One example of how the management can be done naturally is with the help of birds, especially goose, which will maintain the grass and reed land because it is part of their daily meal. With the increase of the biodiversity, the environments will grow and eventually a balanced ecosystem will be the outcome.

# INCLUSIVE AGRICULTURE

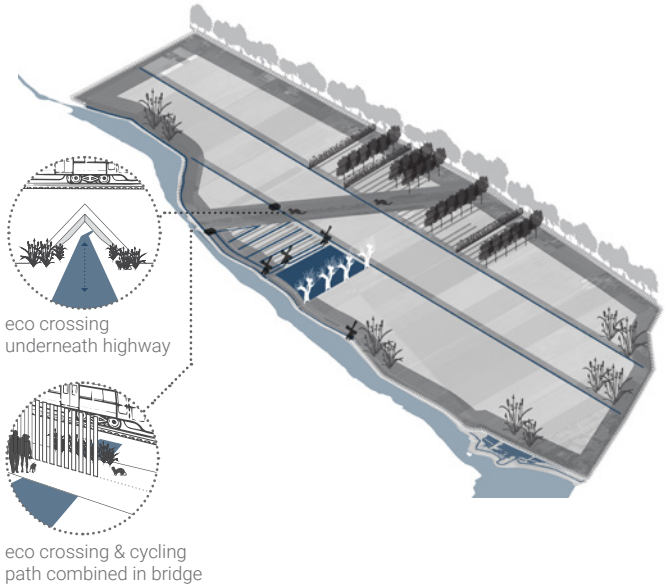
## Tweemanspolder

**Pingyao Sun 5334101 | Martine Schull 4429508**

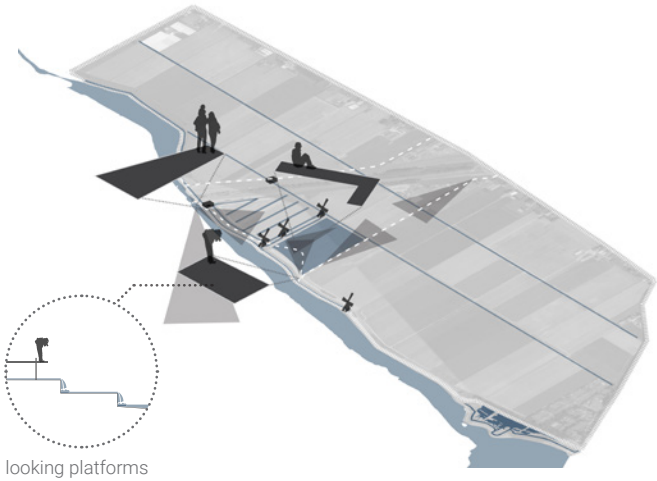
# INCLUSIVE AGRICULTURE - FARM WITH WATER FOR ALL




WATER MANAGEMENT




ECOLOGY



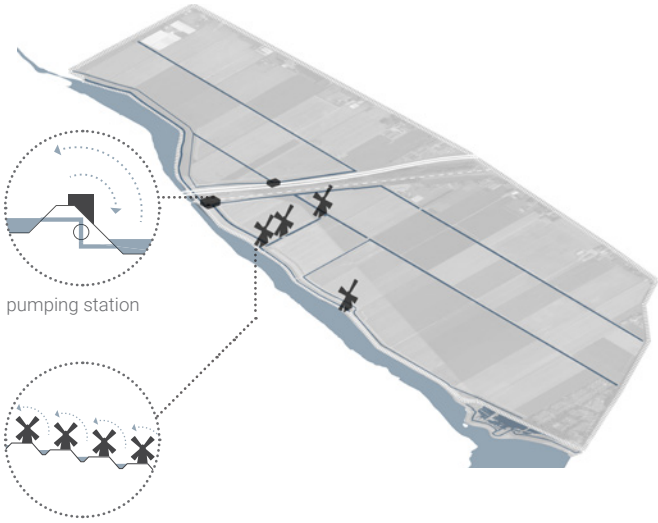

PERCEPTION

**WATER MANAGEMENT**
THE CREATION OF A RETENTION POND - ensures a sufficient amount of water for the farmers year round.
THE ENHANCE OF THE IDENTITY OF DIKE - a play of accentuating the straight and steep shapes of the clay waterways in the polder and simultaneously enlarging the irregular, natural edge of the peat Rotte dike.
THE DESIGN OF A CIRCULAR WATER SYSTEM - the iconic mills will become part of the new circulating and filtering water system, pumping up water that can flow into the retention pond. A robust and flexible system will be created by the catchment of rainwater, widening of the ditches, and using the filtered in- and outlet water of the Rotte.

**ECOLOGY**
ECO LINER SPACE - feeding the land of the farmers from inside out by establishing green strips in and along the ditches and dikes. The settling insects will help farmers to reduce the needed pesticides.
FARMING PILOT - encourage the farmers to join a more sustainable way of farming such as strip cropping.
PUBLIC PARTICIPATION - Stimulating the residents and volunteer to join the green movement in the polder by reviving the kitchen gardens and orchards at the eastern edge. Guidelines will help them become part of a flourishing green strip.
ANIMAL PATH - the segregation of the highway will be neutralised by adding crossings underneath for small animals; a fauna path add to the exiting bridge to help the animals crossing to the opposite polder.

**PERCEPTION**
POETRY OF THE MILL - Enriching the view of the mills by locating the water retention in front of the mills to establish a poetic mirroring effect.
PLAY WITH WATER - Two platforms on different height levels near and in the water retention pond create an opportunity to enjoy the mills and interact with the new water system.
LERAN THE WATER SYSTEM - The elevated lookout point at the existing bridge offers a diverse view, including the restored inner boezem, pumping station and the new design for the bank on both sides of Rottae.
DETOUR EXPLORITION - detour route takes you into the polder to engage with the agriculture activities.

**CONTEXT**
OPEN LANDSCAPE - an open polder that contains 4 iconic mills, a huge amount of farm land.
DIVIDED INTO TWO - segregated by a highway and train line.
WATER - the water system is well visible, but lost part of the smaller ditches.




CONTEXT

"Years ago, I followed in the footsteps of my father. I started farming in a different region but along the way, I was forced to find another plot of land. Nowadays, I try to accomplish a stable business for my son or daughter to take over."

Words, spoken by one of the 8 to 9 farmers working on the fields of Tweemanspolder, an area that owns its identity primarily by two aspects: a row of 4 working mills amidst of large, open space filled with crops, varying from potatoes to onions and kale. A polder that has not changed dramatically compared to other areas.

The current zeitgeist brings new challenges for the farmer. "I feel pressure from multiple stakeholders. First of all, a cheap, stable, and pretty looking harvest is demanded by the supermarket, but at the same time, I'm supposed to invest in nature-friendly interventions. I even heard that the nature authority wishes to turn this whole polder into a nature reserve. A proposal that brings me distress. It will leave me with an unproportionate amount of money and high costs for moving. I truly hope that I can stay here. I'm open to change, but profitability is my first priority.

We've listened to the struggle of the farmer. It becomes clear to us that he doesn't feel appreciated anymore by society. He is caught in a web of seemingly conflicting interests. We made it our mission to come up with a concept for the Tweemanspolder that will use the entrepreneurial character of the farmer in a positive way and preserve the open appearance of the landscape. And foremost, a concept that will intertwine farming with nature, residing & recreation.

**STAKEHOLDERS**

**FARMER**
**I wish** to continue my agricultural activities at Tweemanspolder. I desire economic profit & appreciation (by society) for my work and a future perspective for my children.

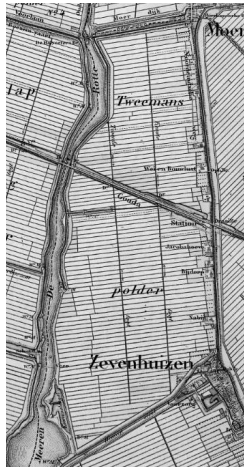
RESIDENT
**I wish** to feel part of the identity of the landscape. Be involved in local activities.

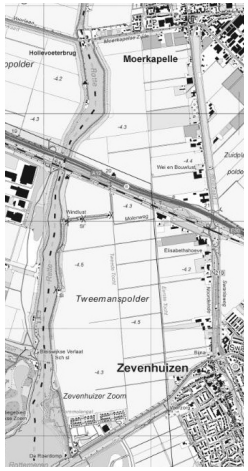
**VISITOR**
**I wish** for more (exiting) recreational activities. To engage in unique countryside experiences.

**ANIMALS**
**I wish** for a friendly living & crossing environment

**NATURE AUTHORITY**
**I wish** to acquire more space for nature development.

**1900 & 2020**




**ENTREPRENEURIAL & COMMUNAL LIFE OF FARMERS**
This land has a long history of agricultural activities. Farmers have been working on the fields since the water was retracted from Zevenhuizerplas. In 1720, the first mill was build, located at the Rotte. Subsequent, 3 other mills were built to pump up more water. In 1734, the polder was entirely emptied, leaving adequate clay soil for agricultural purposes.

Since then, the polder has been a décor for farmers' life. They worked together, lived from each other's harvest, and celebrated harvesting together. The farmer's houses at the Ringvaart (eastern edge) were surrounded by a kitchen garden and orchards. Farmers sold their local goods to villagers. On the weekends, visitors from Rotterdam came by boat, buying fruits from farmers and millers orchards.

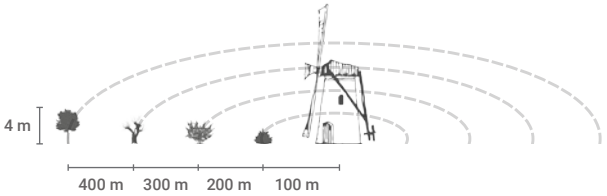
The farmers can be characterized by their entrepreneurial and communal mindset. A mindset that will help them to overcome future challenges. We hope with our plan to revive the past connection between farmer, land & residents.

# SITE ANALYSIS

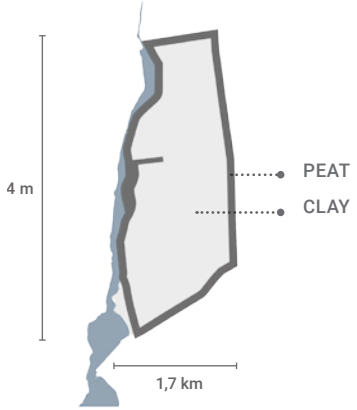
## IDENTITY OF TWEEMANSPOLDER

When entering the polder, the monofunctional appearance of sole farmland will establish the first impression. The four working mills, a national monument, rise from a distance in a dominantly flat landscape. The long view lines over the polder are the direct result of the preserved mill biotope (see diagram).
With exception of the mill biotope, the polder can be preserved as dull at first sight.

However, various experiences will surprise you when having a closer look as can be seen in the identity map. For instance, a walk along isolated Koornmolengat provides excellent views and sounds of rare cormorants. Even the segregation of the polder by the highway brings a great visual experience. That is when crossing the skyline of Rotterdam can be seen in the far distance.




**MILL BIOTOPE**
The height of vegetation or buildings is limited to secure optimal wind circumstances. The first 100 meters should be entirely free of interruptions.




**SOIL MAP**

1. **WILLOWS**
Pleasant interruptions of openness by small groups of willows.

2. **HEIGHT**
Large height difference between Rotte and farm land.

3. **WATER CROSSING**
Overall look on watersystem of polder and skyline of Rotterdam.

4. **MILLS**
Undisturbed view on four working mills due to preserved mill biotope.

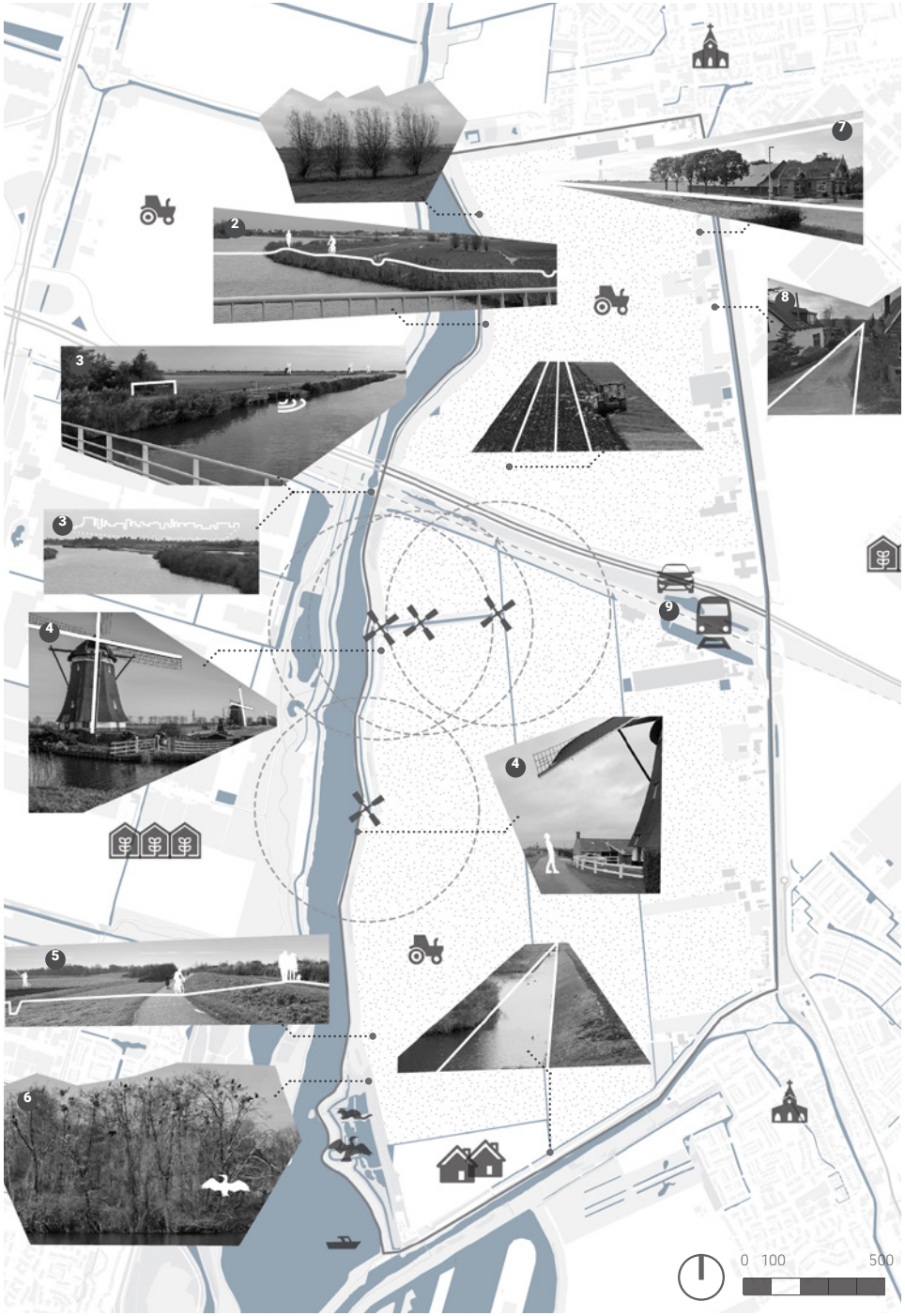
5. **PEAT DIKE**
Interesting contrast between smooth appearance of peat dike and straight edges of clay ditches.

6. **KOORN-MOLENGAT**
Exiting sounds of nearby cormorants.

7. **COURTYARD TREES**
Accentuated long views over polder due to lines of trees.

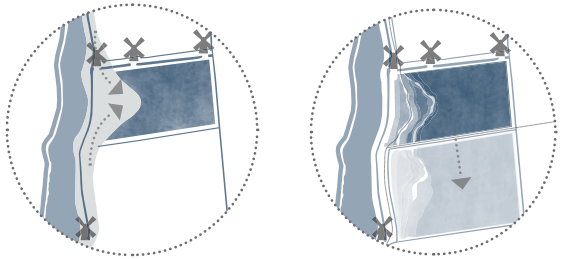
8. **GLIMPSES**
Sudden views to the opposite dike.

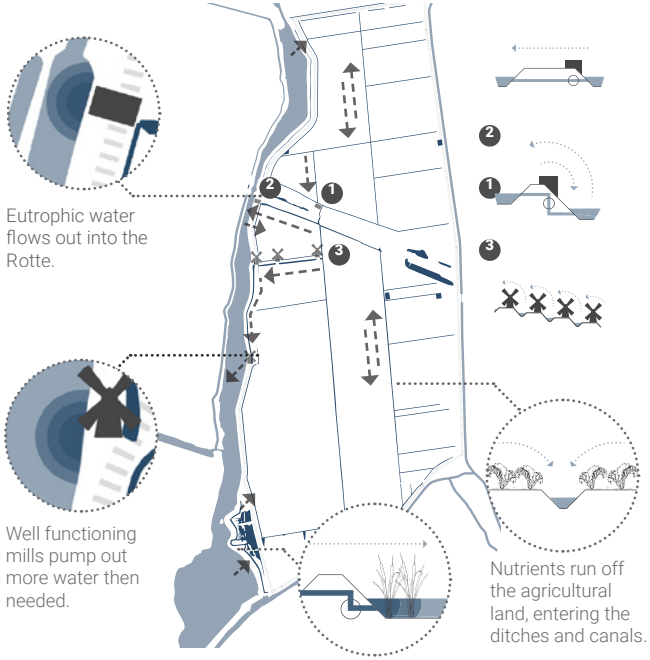
9. **SEGREGATION**
Interruption of polder by highway and train.



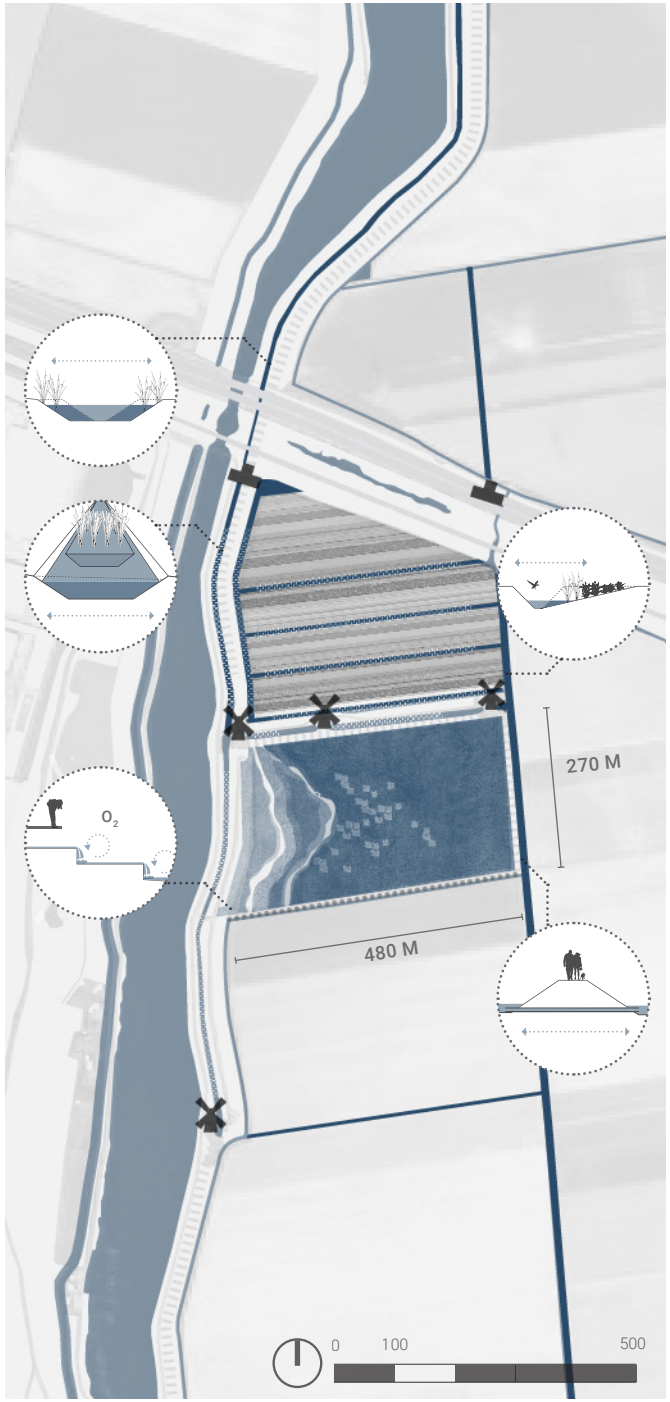
# NEW DESIGN

## CIRCULAR WATER SYSTEM






EXISTING SITUATION




Design

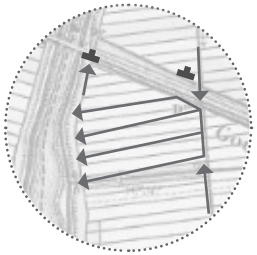
The retention pond connects the smooth, gradual and irregular edge of the peat dike with the straight and steep clay canals in the polder. The green strip along the dike is visually extended into the retention pond. The different height levels of the dike continue in the retention pond, creating various microclimates for flora & fauna and new experiences for visitors. It's designed in an efficient way to store a large amount of water on a relatively small surface, to minimize the impact for the current farmers.

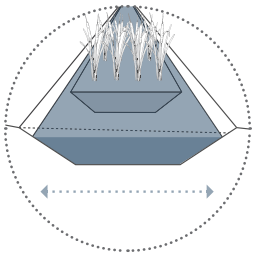
Future extention

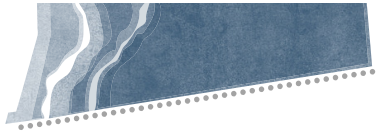
The retention pond is approached as a pilot project. It's designed in a fashion that it can be extended easily without losing its intended appearance. In the future, it might be possible that more water storage is required or wished for. By then, one of the farmers might have left the area, leaving room for additional retention. The extension would make the visual connection between the mills even more present.

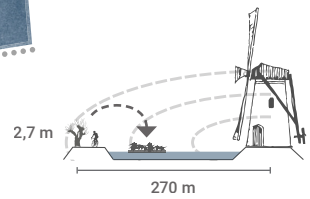
Once the farming has become more future proof, the filtering in the inner boezem can leave again, and a clean and clear landscape will remain.

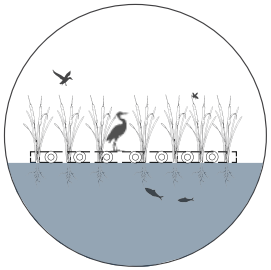
# CIRCULAR WATER









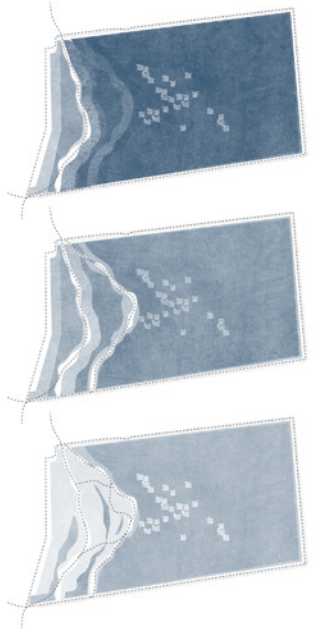
**WILLOWS**
Willows will be planted on the southern edge of the retention pond, next to the cycling lane. They need to be cut every year to preserve the mill biotope. The branches will be used to make more floating platforms.

Filtering system
The new water system includes filtering of the eutrophic run off water by reed and cattail. This is done in 2 locations.

The first location is in the strip cropping fields between the mills and the pumping station, visually connecting both elements. We propose an experiment in which strip cropping is combined with a helophyte filter in the ditches. As a means, the historical ditches pattern can partly be restored. The water is distributed along four ditches, resulting in a lowered resistance compared to a harmonica system with only 1 lane. This makes it more plausible that the system will work without the installation of an additional pump to force the water through the ditches. The length of 400 meters per filtering ditch is assumed to reduce enough nutrients.

Why this combination? All small ditches in a polder are known to have a higher level of biodiversity together than the large canals. We assume that they will accommodate beneficial insect life for agricultural purposes as well. And since insects often travel no more than 50 meters into a field of crops, it would be of interest to see if a spread system of ditches improves the quality of the crops. To prevent run off nutrients form the strip cropping fields, the first three meters next to the ditch could be used as green strip. It offers perfect conditions for flower beds, enriching biodiversity even more. These flower beds can function as sensorial routes for visitors.

A second filtering location takes place in the restored inner boezem that runs from the pumping station, which has a water inlet from the Rotte, to the retention pond. Rotte water will be cleaned resulting in clear water suitable for different plants and recreation.



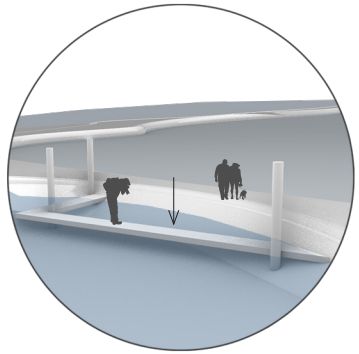

**SEASONAL CHANGE**
The declining water level makes more passages accessible.

# CIRCULAR WATER

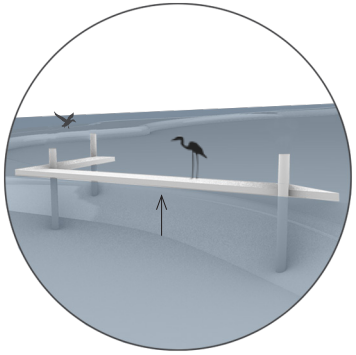
Present



Present

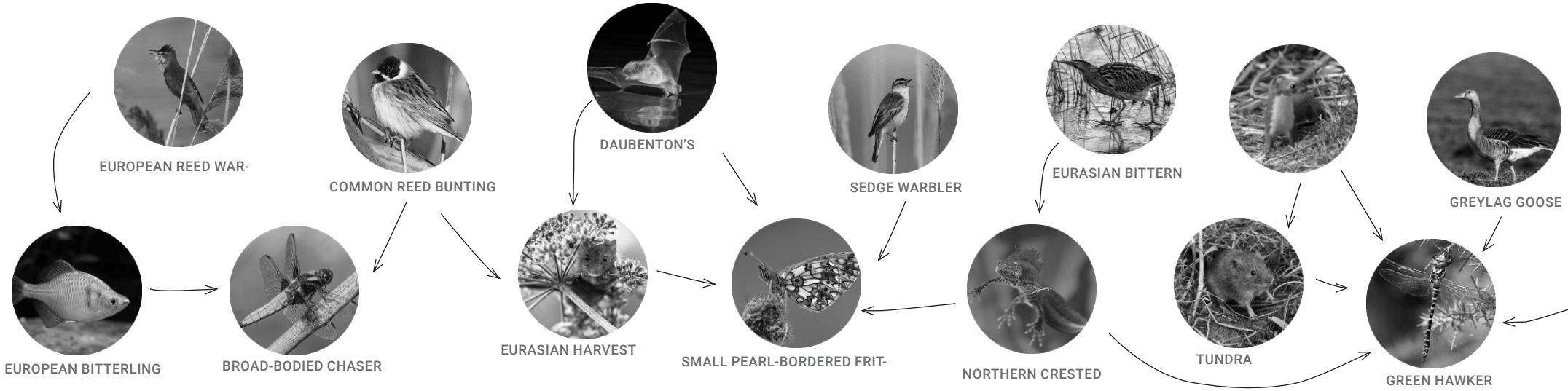


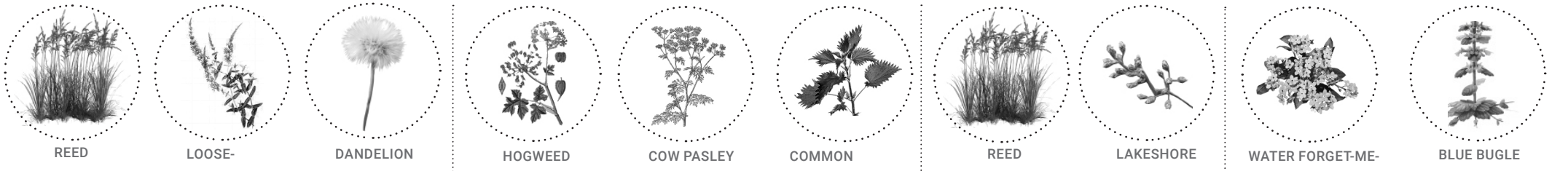
Summer: -5.5NAP

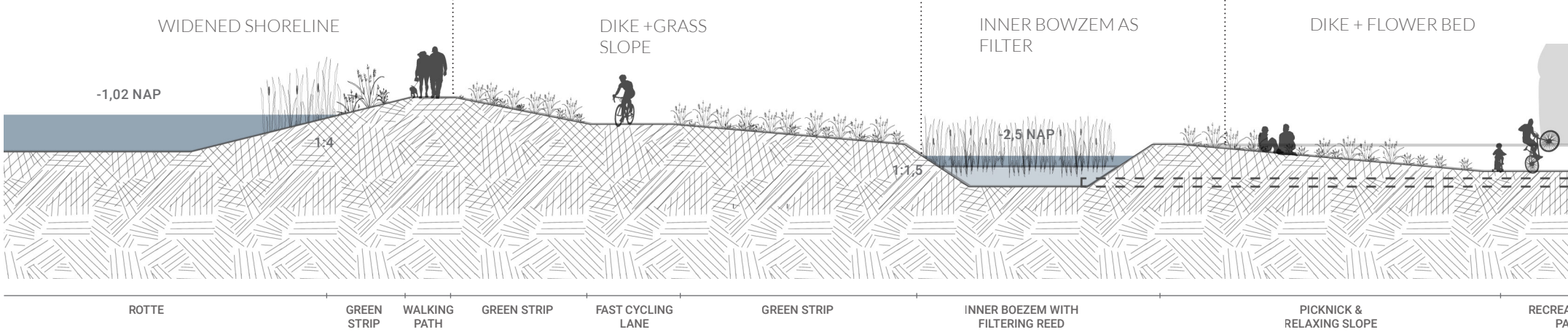


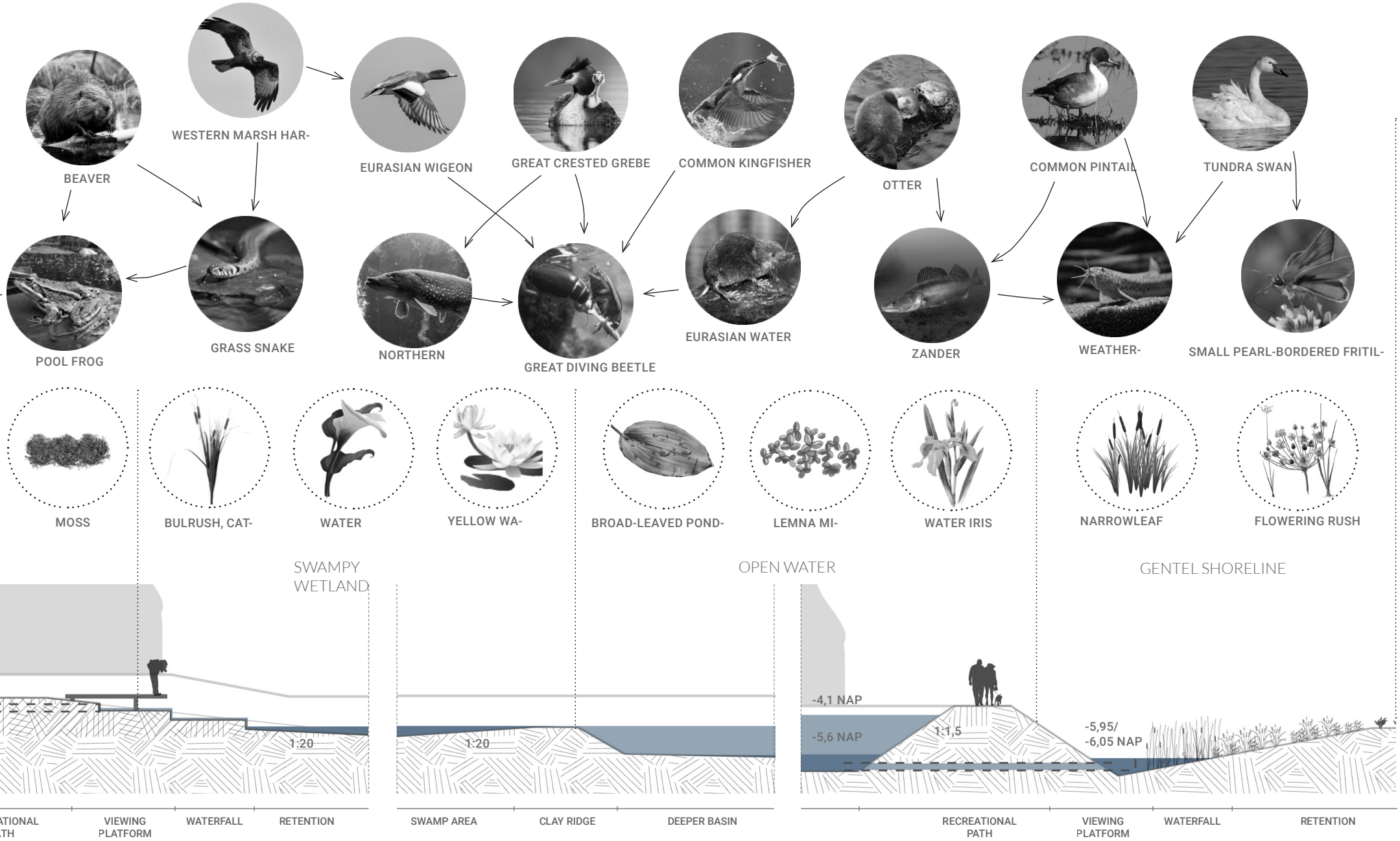
Winter: -4.1NAP

# CIRCULAR WATER



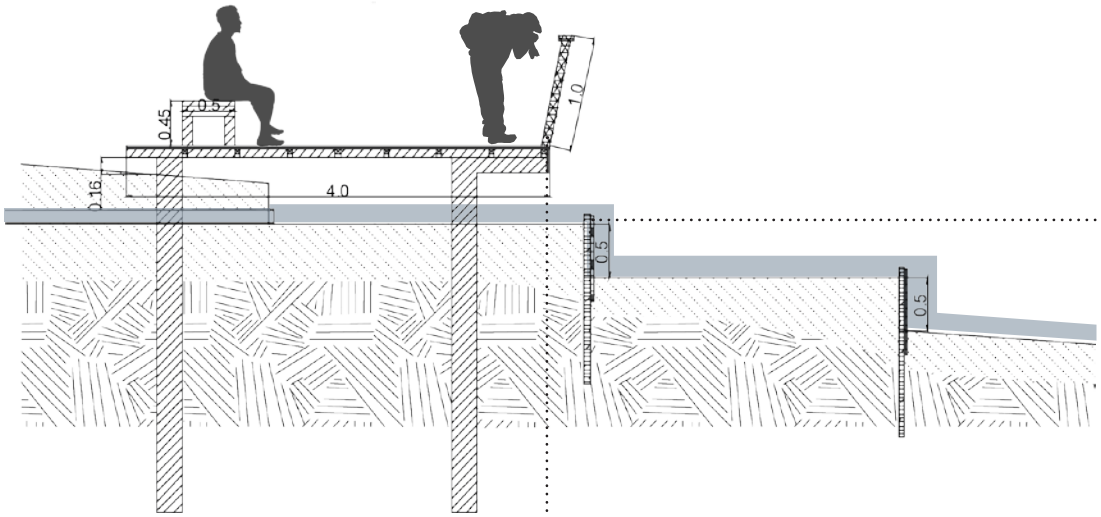



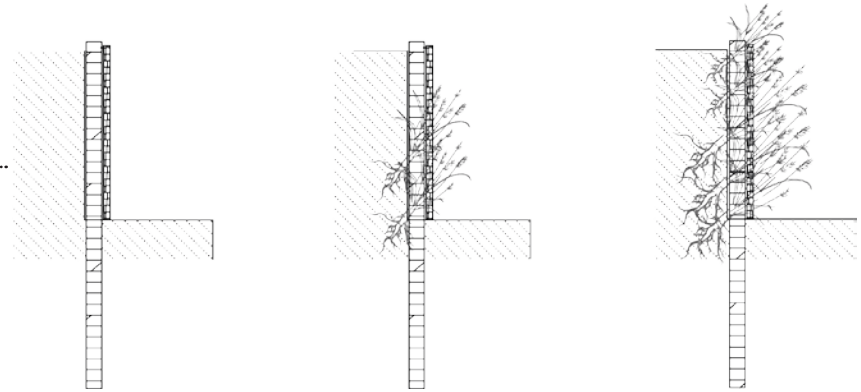

BEAVER
WESTERN MARSH HAR-
EURASIAN WIGEON
GREAT CRESTED GREBE
COMMON KINGFISHER
OTTER
COMMON PINTAIL
TUNDRA SWAN
POOL FROG
GRASS SNAKE
NORTHERN
GREAT DIVING BEETLE
EURASIAN WATER
ZANDER
WEATHER-
SMALL PEARL-BORDERED FRITIL-
MOSS
BULRUSH, CAT-
WATER
YELLOW WA-
BROAD-LEAVED POND-
LEMNA MI-
WATER IRIS
NARROWLEAF
FLOWERING RUSH
SWAMPY WETLAND
OPEN WATER
GENTEL SHORELINE
1:20
1:20
-4,1 NAP
-5,6 NAP
1:1,5
-5,95/
-6,05 NAP
ATIONAL
TH
VIEWING PLATFORM
WATERFALL
RETENTION
SWAMP AREA
CLAY RIDGE
DEEPER BASIN
RECREATIONAL PATH
VIEWING PLATFORM
WATERFALL
RETENTION

# CIRCULAR WATER

## WATERFALL




## PLANTS GROW THROUGH WILLOW BRANCHES



## MATERIAL

Anticorrosive wood

Hollowed-out steel handrail

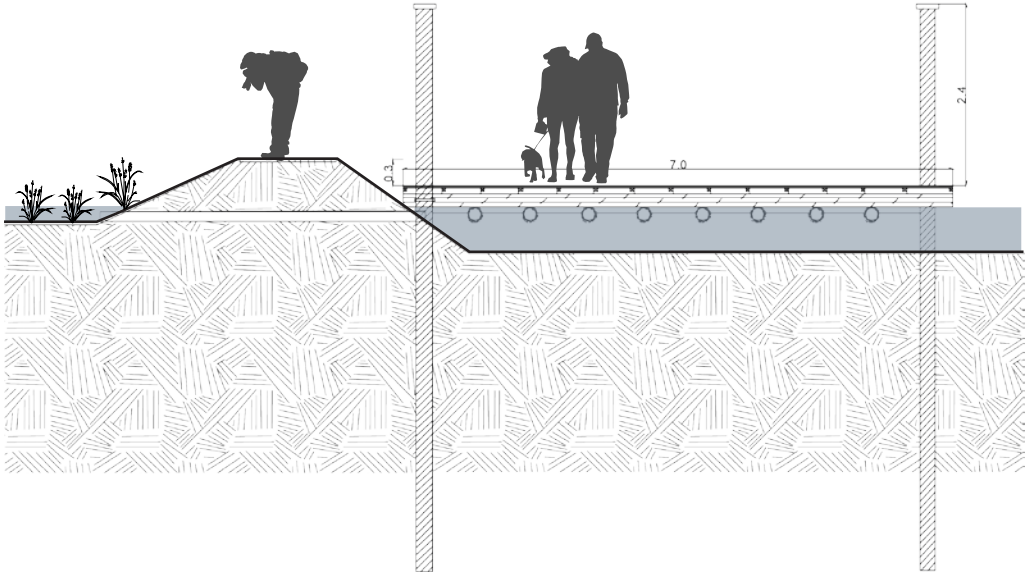
Wood-plastic composities

Willow branches

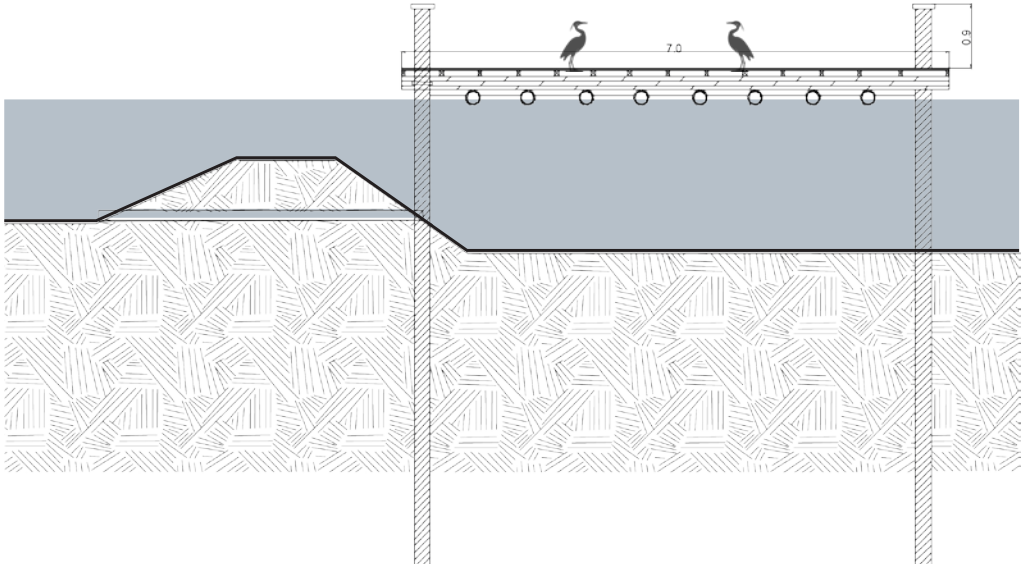
HDPE

## FLOATING PLATFORMS

SUMMER




WINTER




WATERDALL: Use the wooden frame and willow branches as the block to fix the soil from erosion of the waterfall, the willow branches as a natural material, with large pores, can allow the plants to grow through it gradually, which can be considered as a more ecological way to the construction for the small waterfall.

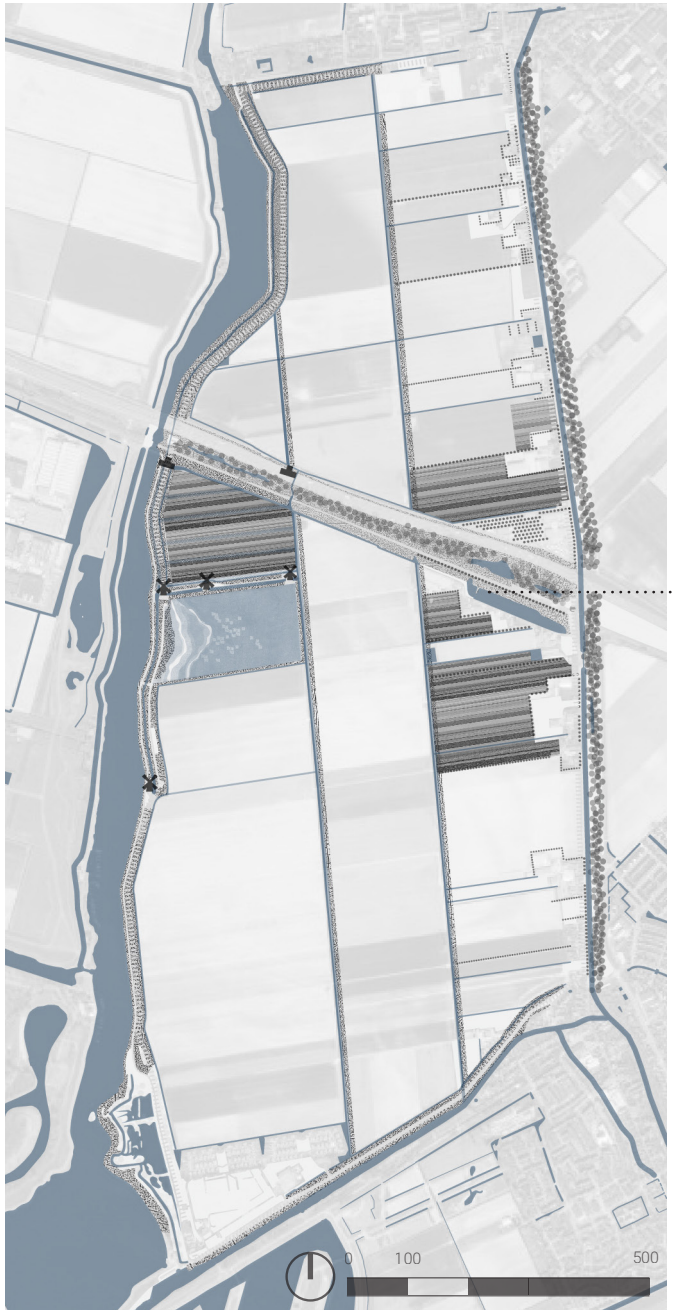
FLOATING PLATFORM: According to the water level difference between summer and winter, we design a floating platform which will be fixed by the stake, the small pontoons underneath the platform will provide buoyancy, allow the platform to lift and down following the water level change naturally. Consider it is a more wet situation, we suggest using wood-plastic composites as the material to build the platform, which is a sustainable and ecological material that can last a long time be along with water. In the summer, people can easily jump to the platform or use the platform when playing with water, in the winter the platform will be a floating island for birds.

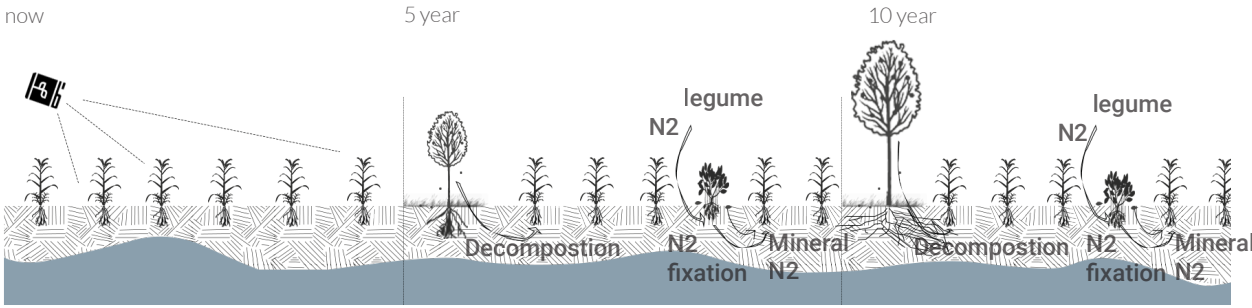
LEGEND

- Clay
- Peat
- Wood plank
- Wood-plastic composities
- Anticorrosive wood
- Steel
- Willow branches
- HDPE

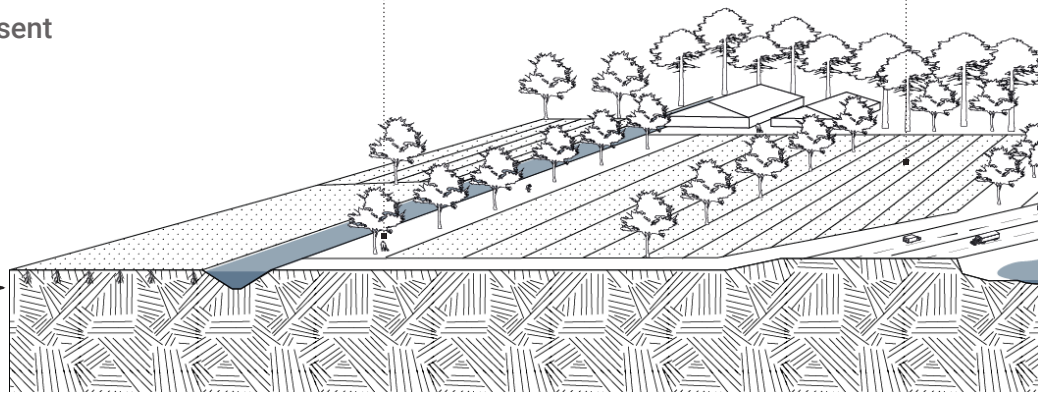
0 1 2 4

# EXPERIMENTAL FARMING

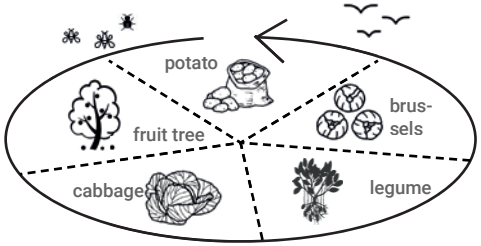


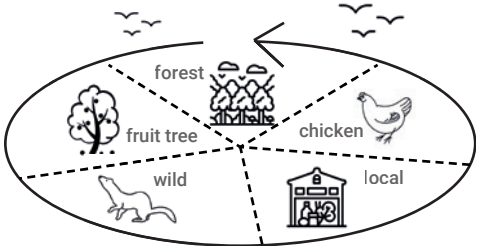

Present



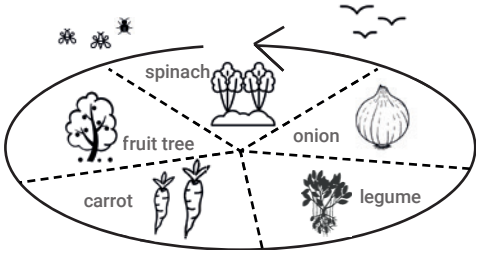
STRIP CROP COMBINATION 1 + FOOD FOREST

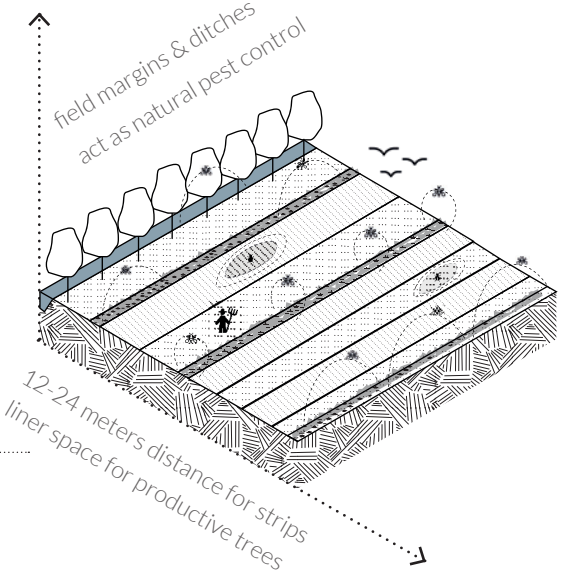


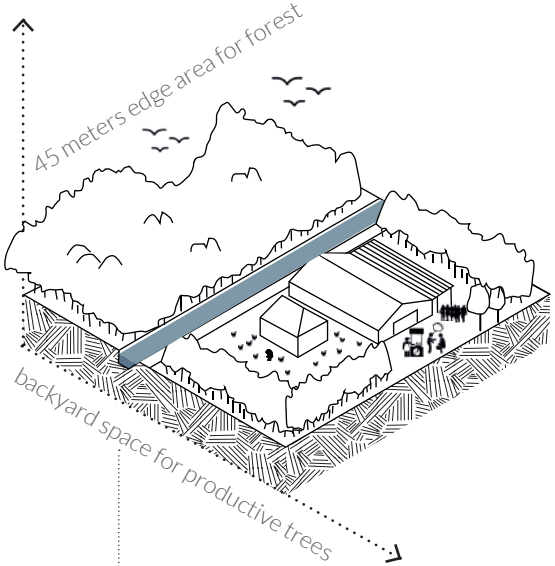

ECO CORRIDOR +FOOD FOREST + HOUSE
(MARKET, DWELL, RESTAUTANT) + CHICKEN

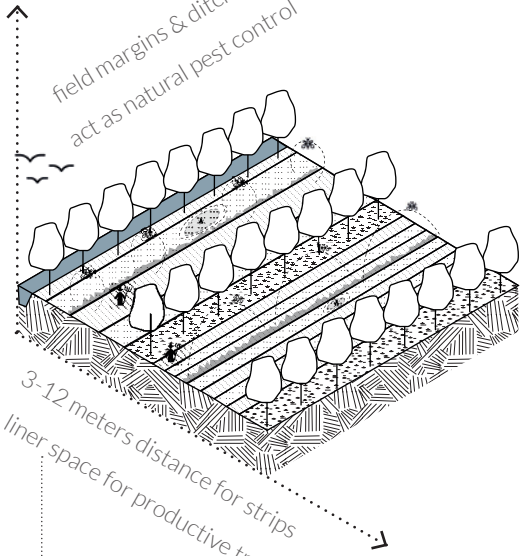


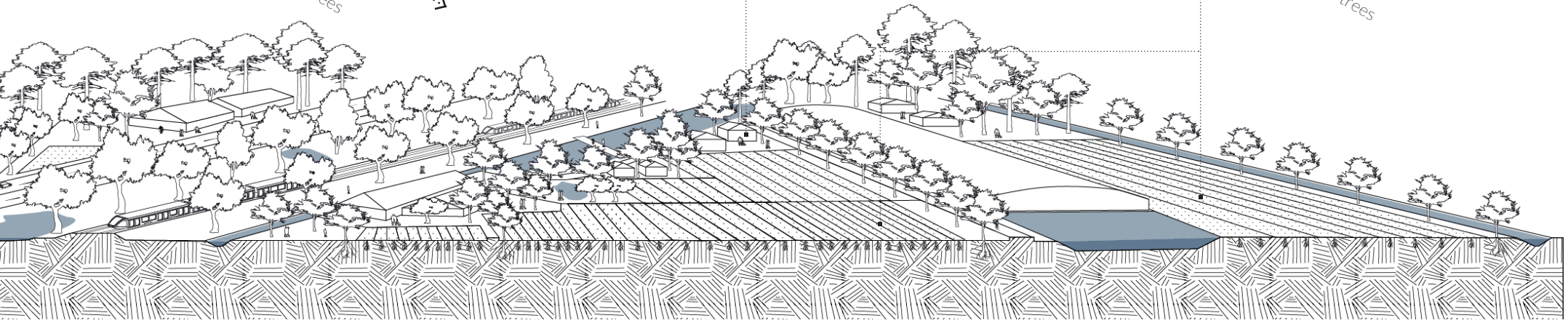

STRIP CROP COMBINATION 2 + FOOD FOREST



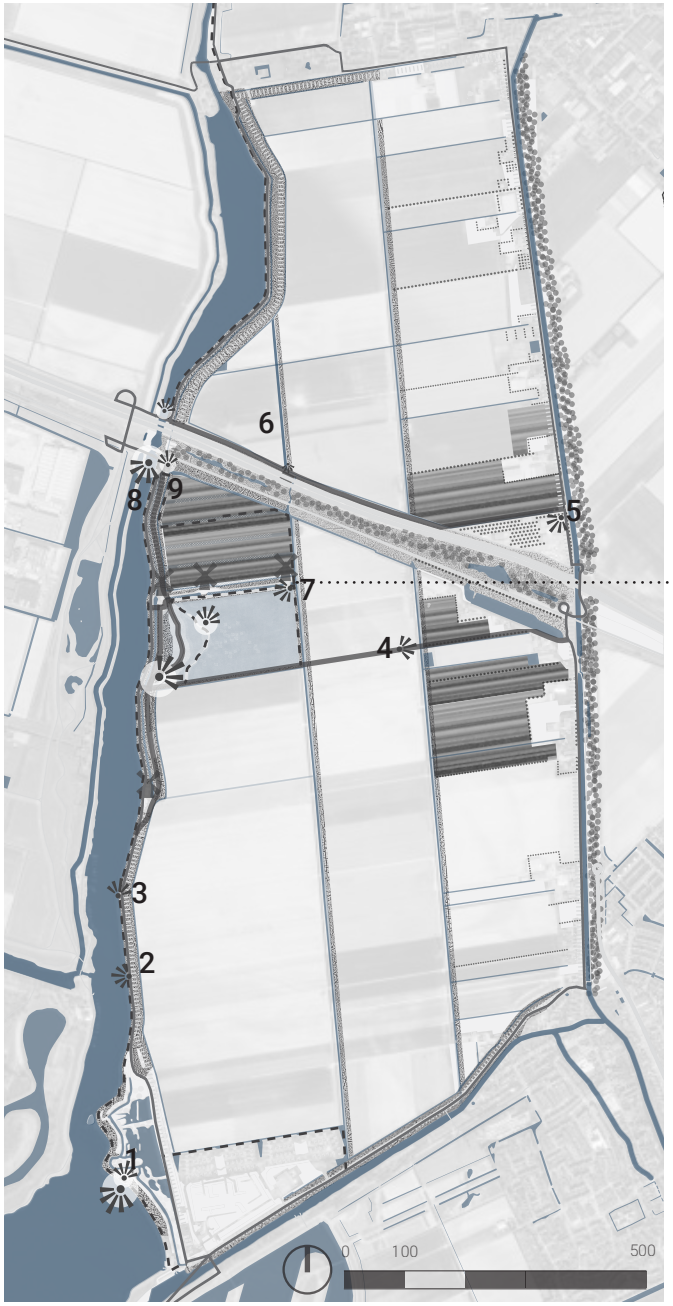



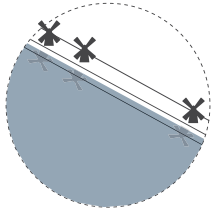



# ROUTING




7. SEE THE THREE MILL

Present



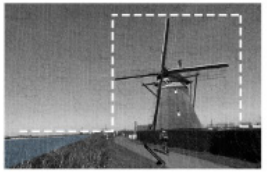
MILL & DIKE & WATER REFLECTION COMBINE

LEGEND

- lookout
- walking path
- fast cycling path
- recreational path

1. BIRD WATCHING POINT

2. SEE TEH SLUICE



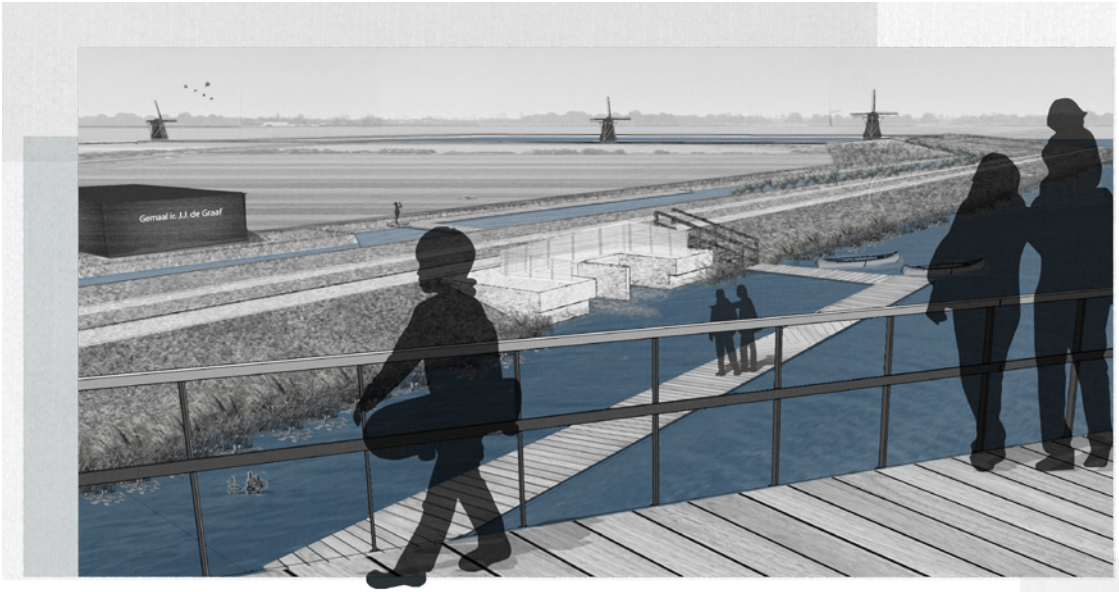
3. FIRST GLIMP OF THE MILL

4. SEE THE STRIP CROP

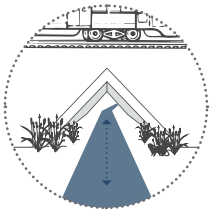
5. INVOLVE IN THE FOOD MARKET

6. SEE THE SECOND PUMP STATION

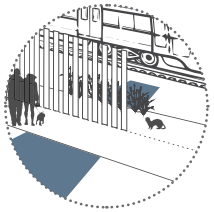
8. SEE THE WHOLE SITE




Present



ECO CORRIDOR & RECONNECTION OF INNER BOEZEMS



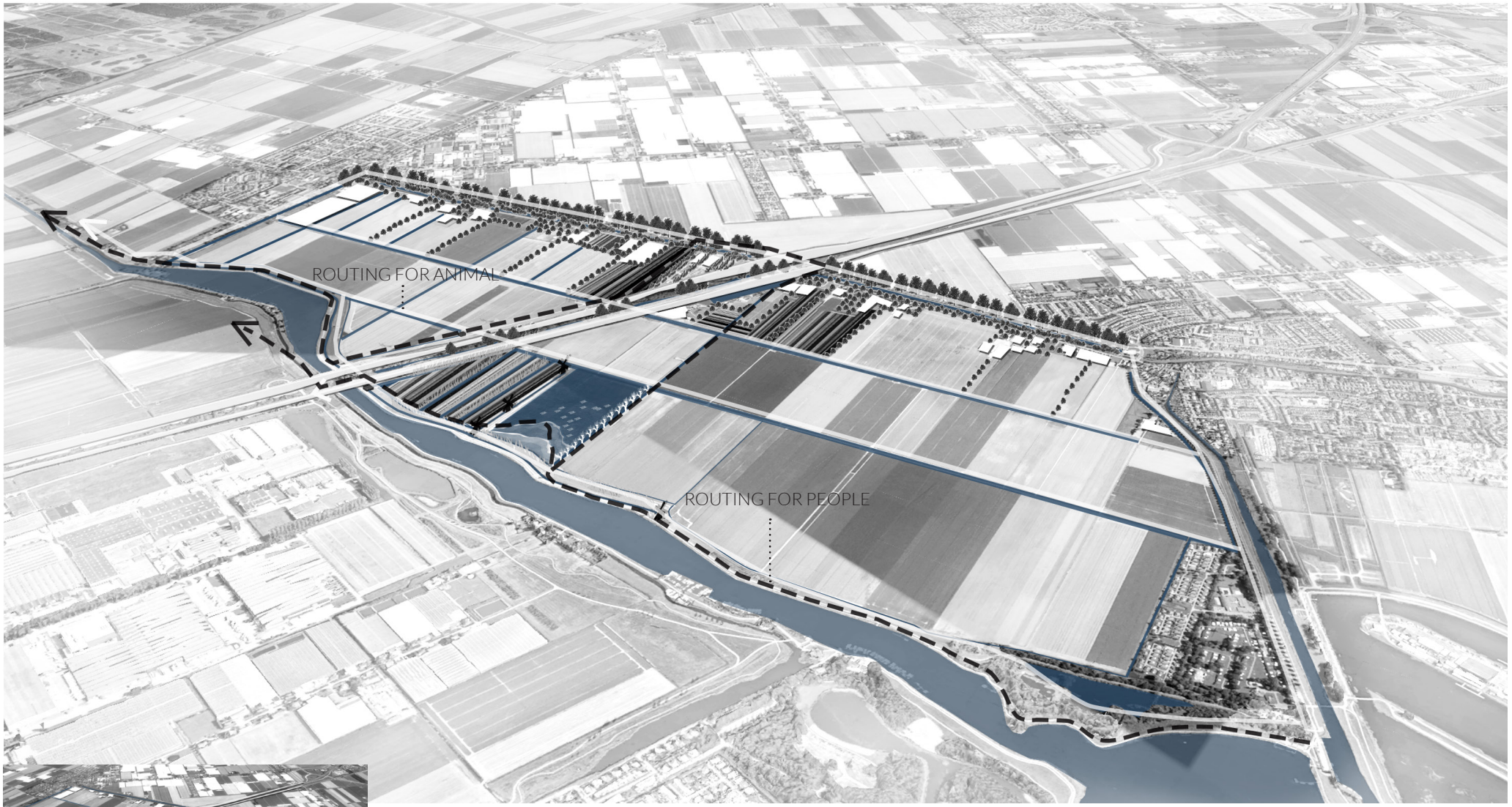
ECO CORRIDOR & TILTED VIEWING PLATFORM COMBINED

9. SEE THE ANIMAL GANGWAY

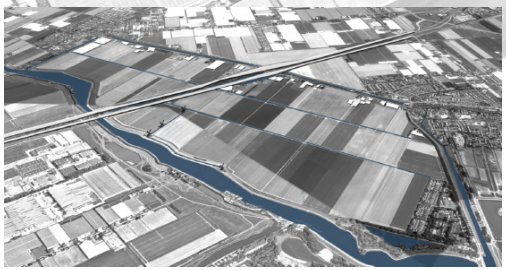
When you walk into this seemingly open field, you will find many surprises. We have designed observation points where there is a turning point in the line of sight or where there is a higher terrain, combined with the rest platforms to allow people to stay. In many places, you can not only see interesting scenery, but also hear bird calls at bird sightseeing spots, participate in transactions at food markets, enjoy peaceful nature in water retention, and see farmers farming new types of agriculture in the fields, smell the fragrance of fruit trees...

Present

# BIRD-EYE VIEW OF THE WHOLE




AFTER



BEFORE

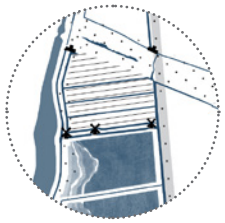
In this design proposal, we incorporated several future nature inclusive possibilities for the entrepreneurial minded farmer. We will conclude with summing up the opportunities that lie ahead and the change of the landscape that we envision.

❶ PIONEERING PHASE
Two or three farmers will experiment with the new business models, thanks to a financial incentive by the local authority. Sharing knowledge is important in this phase. These farmes can collaborate with their colleagues of nature-inclusive 'De Voedselgaarde' in Eendrachtspolder to exchange tools & distribution channels of Boer&buurt. Another possibility is to collaborate with camping Koornmolen to start up recreational activities, for instance in offering tours around the agricultural activities.

Local governments play a role in evoking excitement among the residents of the eastern edge of the polder. They can offer guidelines for the suitable trees to make their courtyard part of the food forestry strip. The authority can approach a local tree farmer to provide the suitable (fruit) trees for a reasonable price.

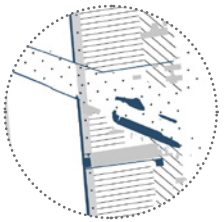
❷ PHASE OF GROWTH
Once nature inclusive strip cropping has proven to be beneficial for their colleagues, more farmers will follow. Around the edges, more small scale food forests arise.

❸ PHASE OF SOLID INTEGRATION
Most farmers have changed their way of working. Farmers work together and profit optimal from the new water system & increase of biodiversity. Nature has now become a prominent element within the agricultural landscape.



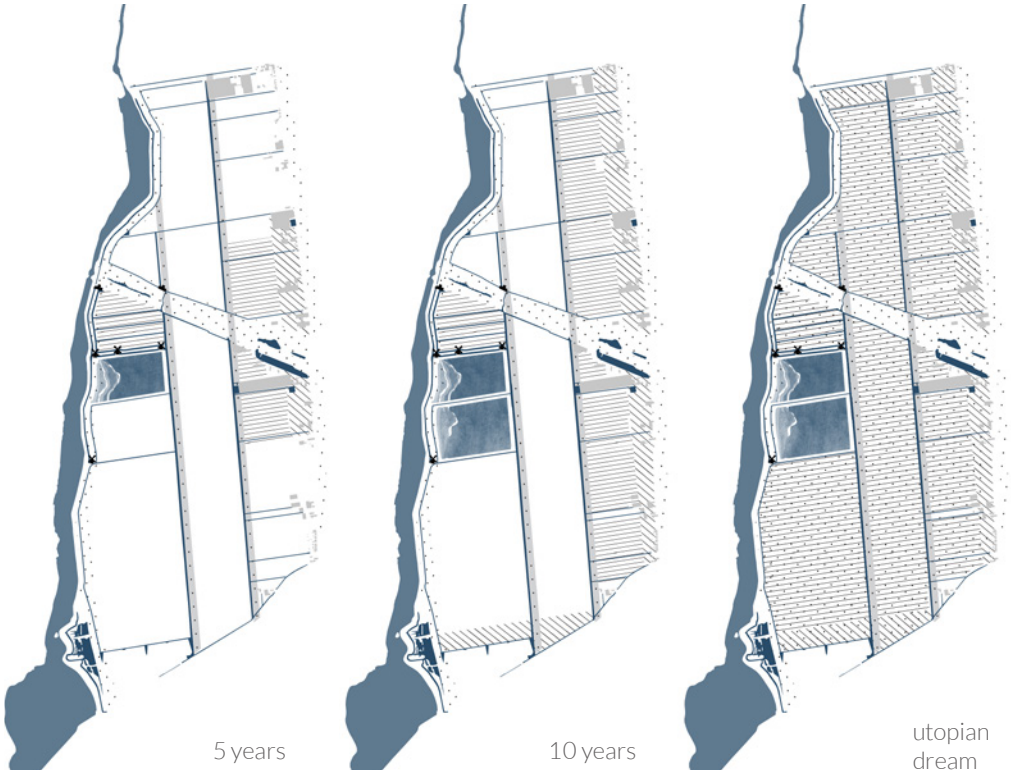
**COMBINATION 1**

- Strip cropping
- Agricultural nature maintenance of retention pond - ANLb, subsidized by government (11.5 hectares).
- Small scale biomass production - reed & small cattail of helophyten filter ditches.
- Recreational activities - eg. sup boards/ canoe rental, tour guide, collaboration with camping.



**COMBINATION 2**

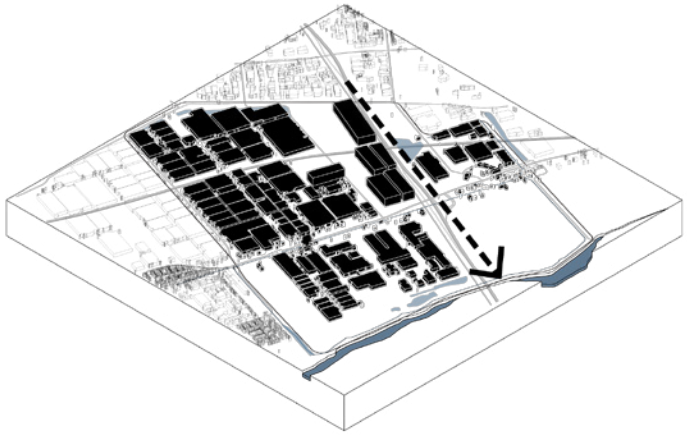
- Strip cropping
- Food forestry (small trees)
- Agrotourism - eg. farm visit, farm shop, fruit picking, harvesting party, open restaurant in de field.
- Agricultural nature maintenance of widened canals - ANLb, subsidized by government.



# FROM BARRIER TO ROUTES

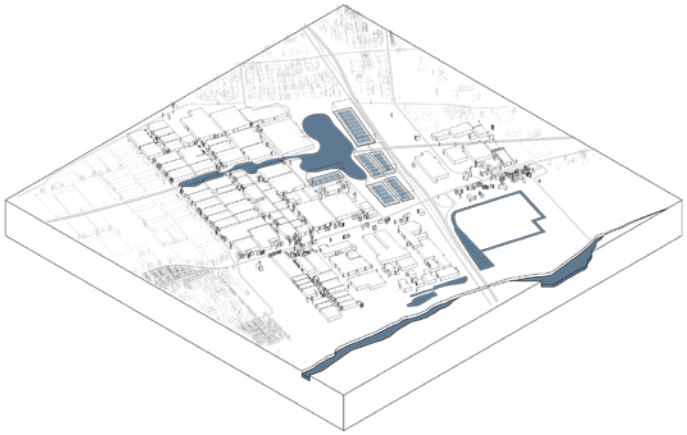
## OVERBUURTSE POLDER & KLAPPOLDER

Yunshu Jiang 5066891 | Hylke Warmerdam 5168597



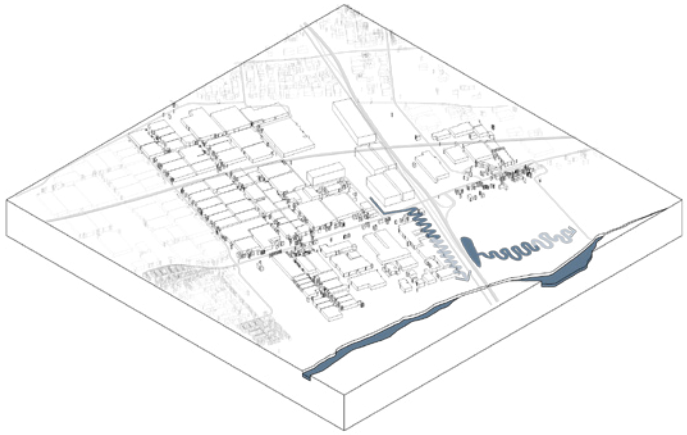
## CONTEXT

During the last four decades, the former rural landscape has changed to a landscape largely covered by glasshouses. Since the last decade, large distribution centers also fill the last parts of the open landscape as well. We want to save the last open spaces in the landscape for people instead of buildings.



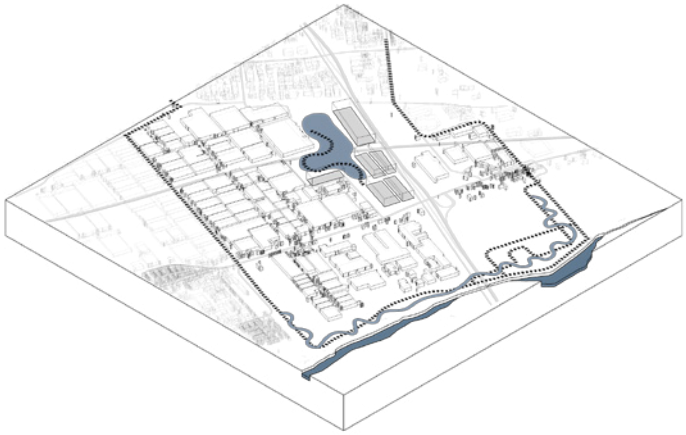
## WATER MANAGEMENT

Storage and use of water in the area is the idea behind the concept for sustainable water management. We adapt to climate change with enough space to store water. This water is then as much as possible used in the area for ecology or agriculture.



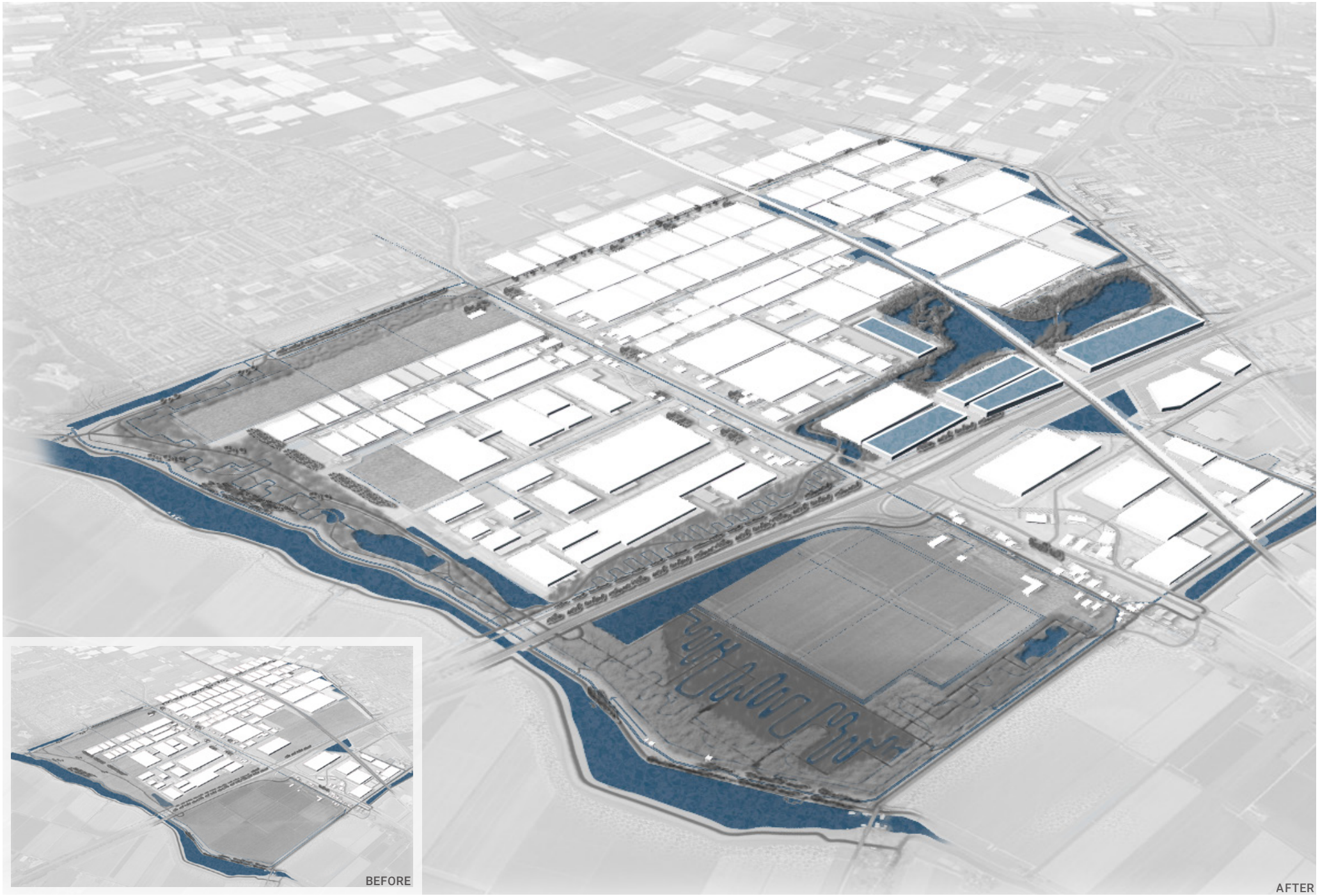
## ECOLOGY

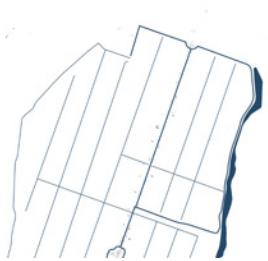
Rainwater from the eastern part of the area, the Klappolder, is purified by reed in a system of canals. This makes the water clean enough to create marsh marigold reedlands, a rare type of nature. Rainwater that falls on roofs of glasshouses and distribution centers is kept separate from ditch water. It is stored in a large area with gently sloped banks with space for ecological development.



## PERCEPTION

The area is experienced by different routes. They show the different characteristics of the area and different parts of the water management system: storage, purification, and ecology. The flowery vegetation refers to the core business in the area: flowers from glasshouses.


BEFORE
AFTER



1900:
AGRICULTURAL LANDSCAPE

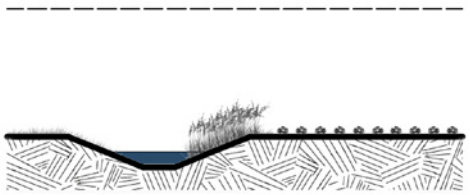
1980:
FIRST SMALL GLASSHOUSES

2010:
LARGER GLASSHOUSES

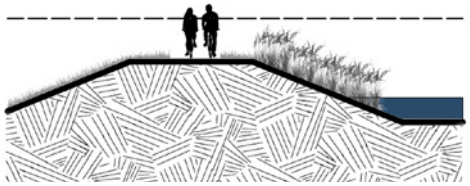

2020:
DISTRIBUTION CENTERS HAVE OCCUPIED A LARGE PART OF THE LANDSCAPE

0 500 1000 2000

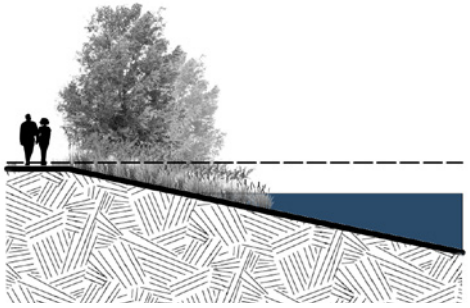
2030 PLANS:
MORE DISTRIBUTION CENTERS



SECTION A-A': DITCH



SECTION B-B': BOEZEM



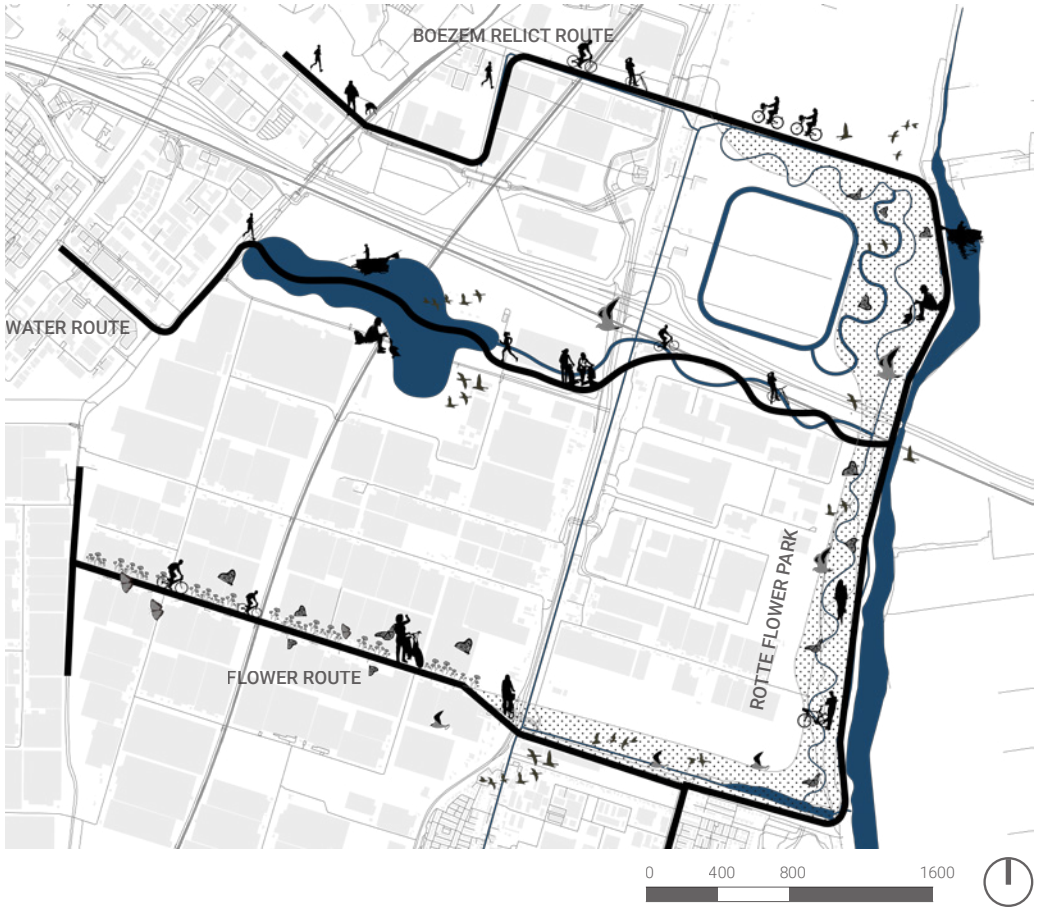
SECTION C-C': ROTTE

0 4 8 16

## WATER SYSTEM

The water system in Overbuurtsche Polder and Klappolder can be divided into 3 types of water bodies.
- At the lowest level, at around NAP -6m, a system of ditches.
- At around NAP -2,5m, elevated in the landscape, we find a system of "boezem" relicts. The system has dikes on both sides, often with roads on them.
- On the highest level, around a meter higher than the "boezem" relict system, we find the Rotte. This is the actual boezem, draining water from the polders.

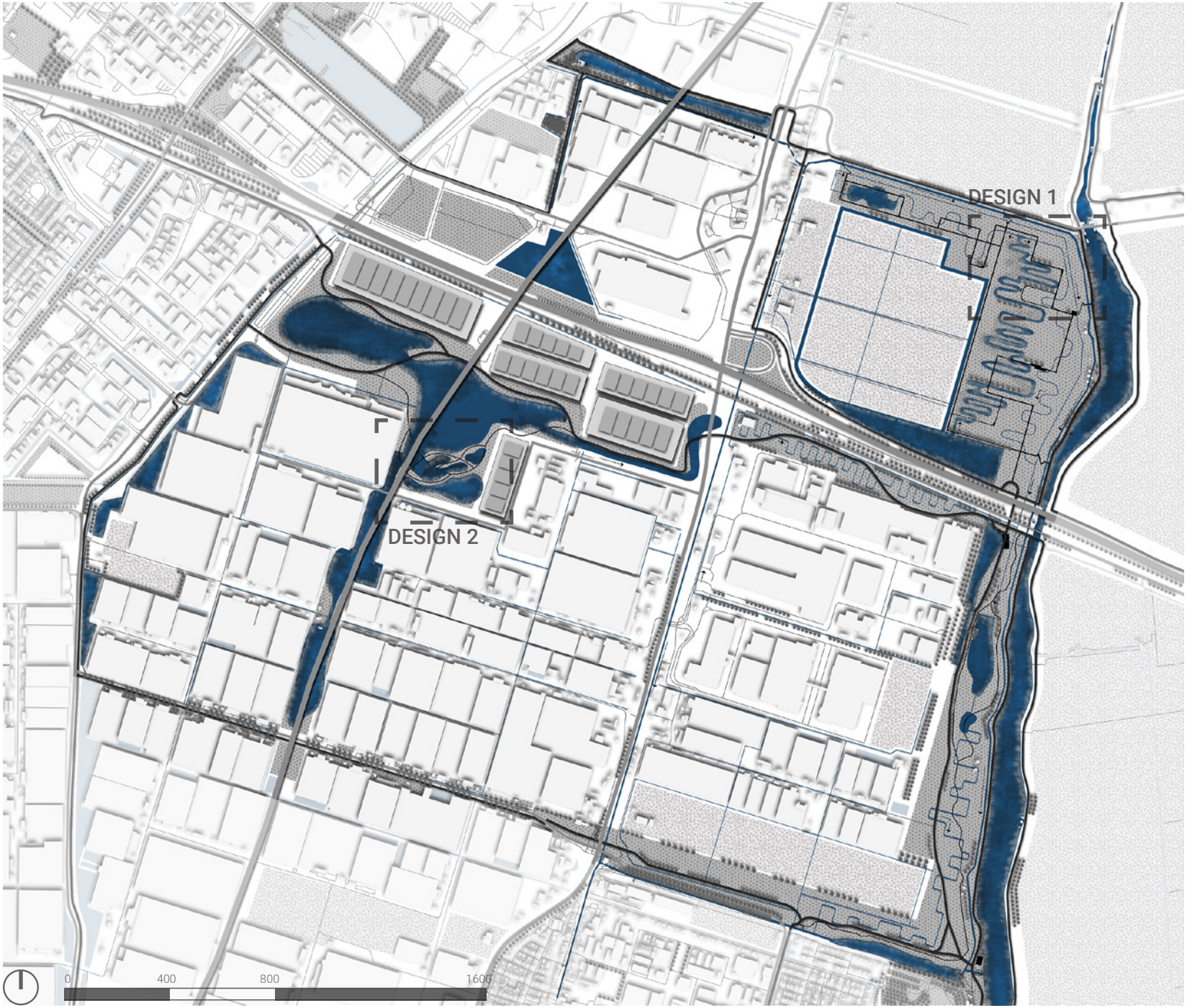
## CONCEPT

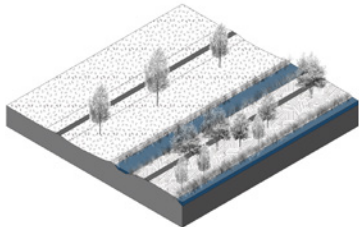
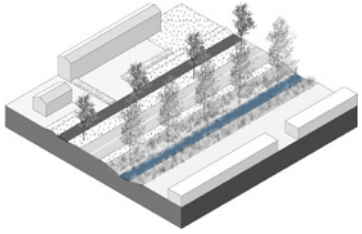
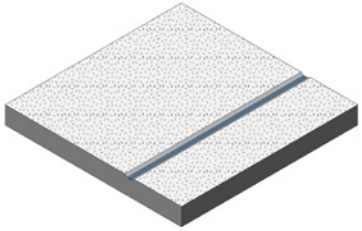
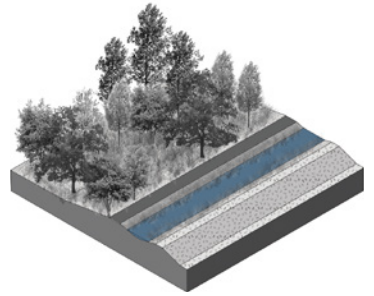
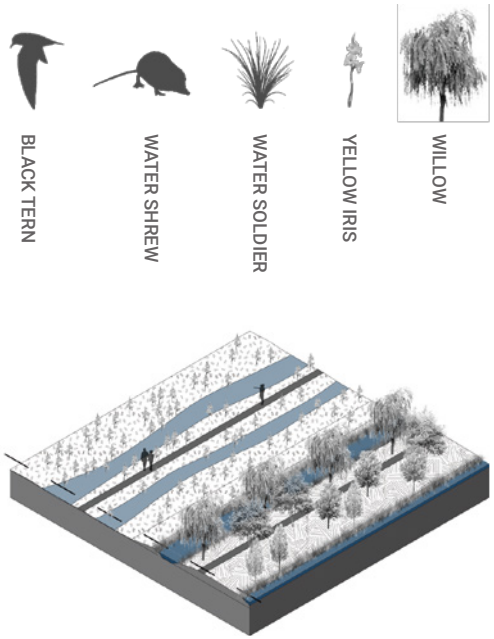
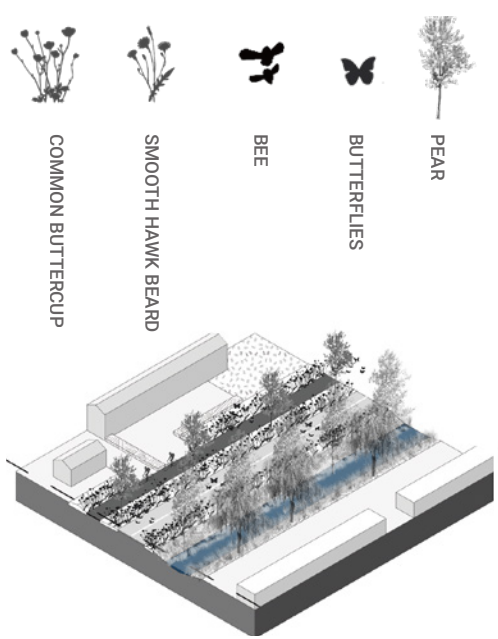
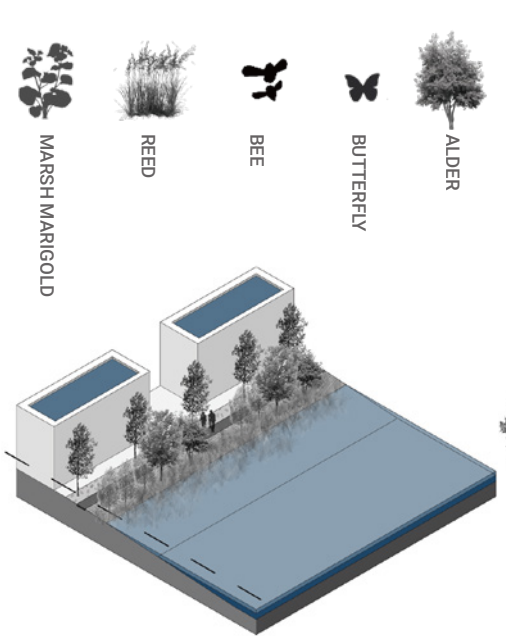
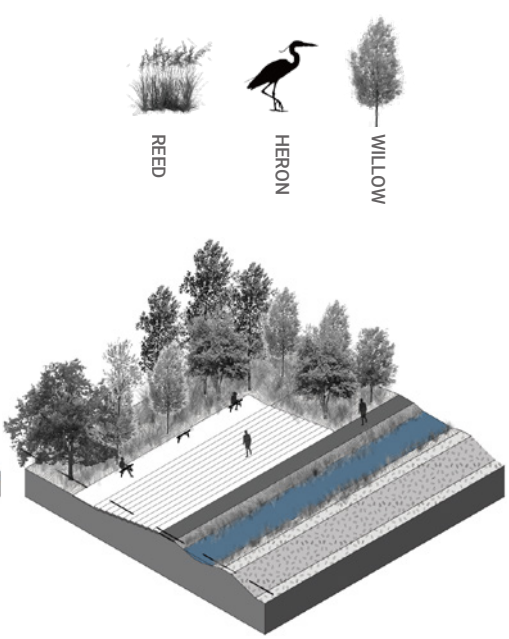



WATER CYCLE:
LOCAL STORAGE AND USE

CONNECTION BETWEEN PEOPLE
AND ROTTE

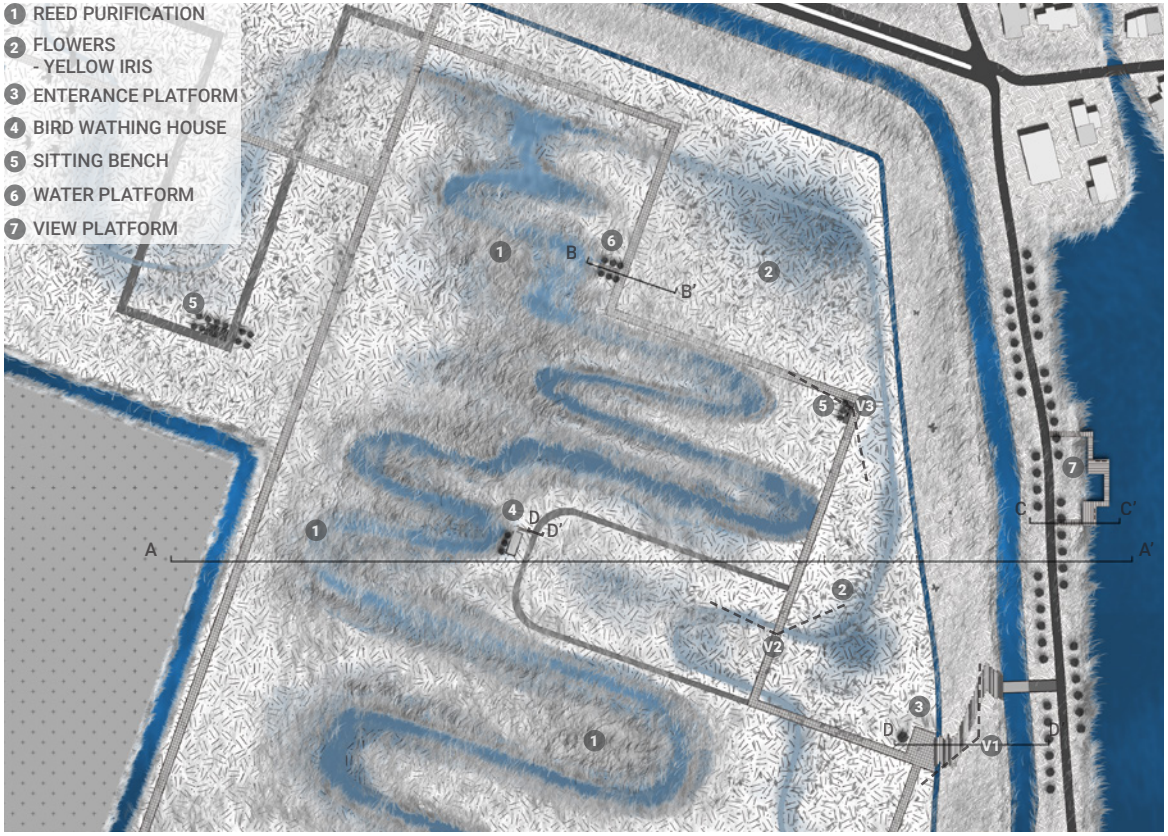
Two goals are the most important for the concept: an attractive connection for people between the urban area of Zoetermeer and the recreational area of the Rotte, and sustainable water management. We make an attractive connection by creating 3 different routes. The Boezem relict route follows the edge of the polder. It follows the old drainage canal from the Rotte to the starting point, providing a view over the area.The water route is all about sustainable water storage. Sustainable water management is essential, as a large part of the area is covered by buildings. All routes connect to a park along the Rotte with water purification and space for ecological development. The flower route crosses the glasshouse area. By planting flowers and trees, we show the economy of the area: flowers from glasshouses. At the same time, this makes the route through the glasshouse area more attractive and connect with flower park along the Rotte

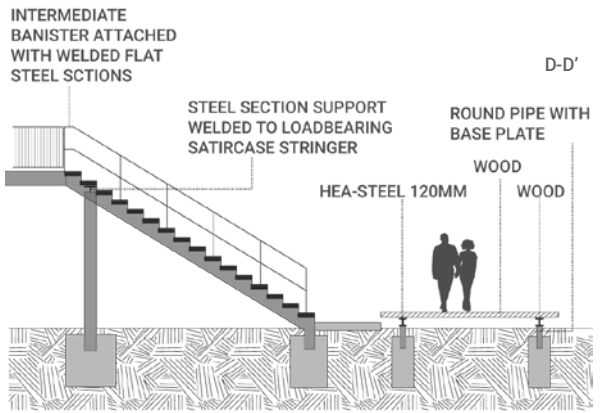

DESIGN 1
DESIGN 2
0
400
800
1600
LEGEND
CYCLE PATH
FOOTPATH
CAR ROAD
RAILWAY
WATER FLOW DIRECTION
ECOLOGICAL AREA
FARMLAND

| | ROTTE FLOWER PARK | FLOWER ROUTE | WATER STORAGE ROUTE | BOEZEM RELICT ROUTE |
|---|---|---|---|---|
| |  |  |  |  |
| 2020 | Excavation park & purification area planting reed | New pavement & benches | Excavation first half of storage & construction rainwater collection system | New pavement, sand bed & new road crossing |
| 2021 | Planting flower species<br>Winter mowing | Winter mowing 1 side per year | Construction new buildings,<br>new pavement & park objects | Planting flowers |
| 2022 | Winter mowing every 1 to 2 years | Winter mowing 1 side per year | Summer mowing every 1 or 2 years | Summer and winter mowing |
| . . . . . |  |  |  |  |
| 2030 | Winter mowing every 1 to 2 years | Winter mowing 1 side per year | Summer mowing every 1 or 2 years | If climate changes a lot: construction second half of storage |

## DESIGN 1 ROTTE FLOWER PARK & BOEZEM RELIC ROAD

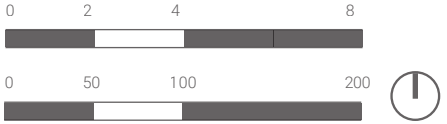
This area contains three systems, water retention area created by Widen the ditches, water purification area with reeds, and a park full of wild flowers.Rain was collected in ditches and ponds, then cleaned up and got clean.Clean water flows through shallow gullies and moistens the soil, which, combined with excavating the surface soil, makes naturally growing wildflowers possible.People cycle along Boezem to look out, or they can stop to enter the park and wander among the wild flowers and reeds

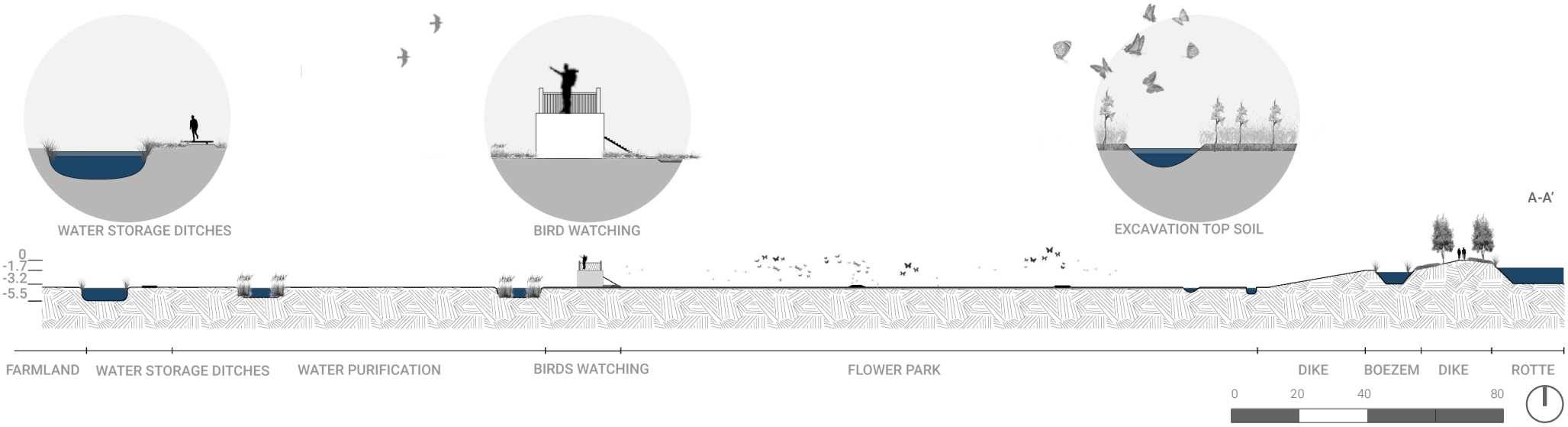


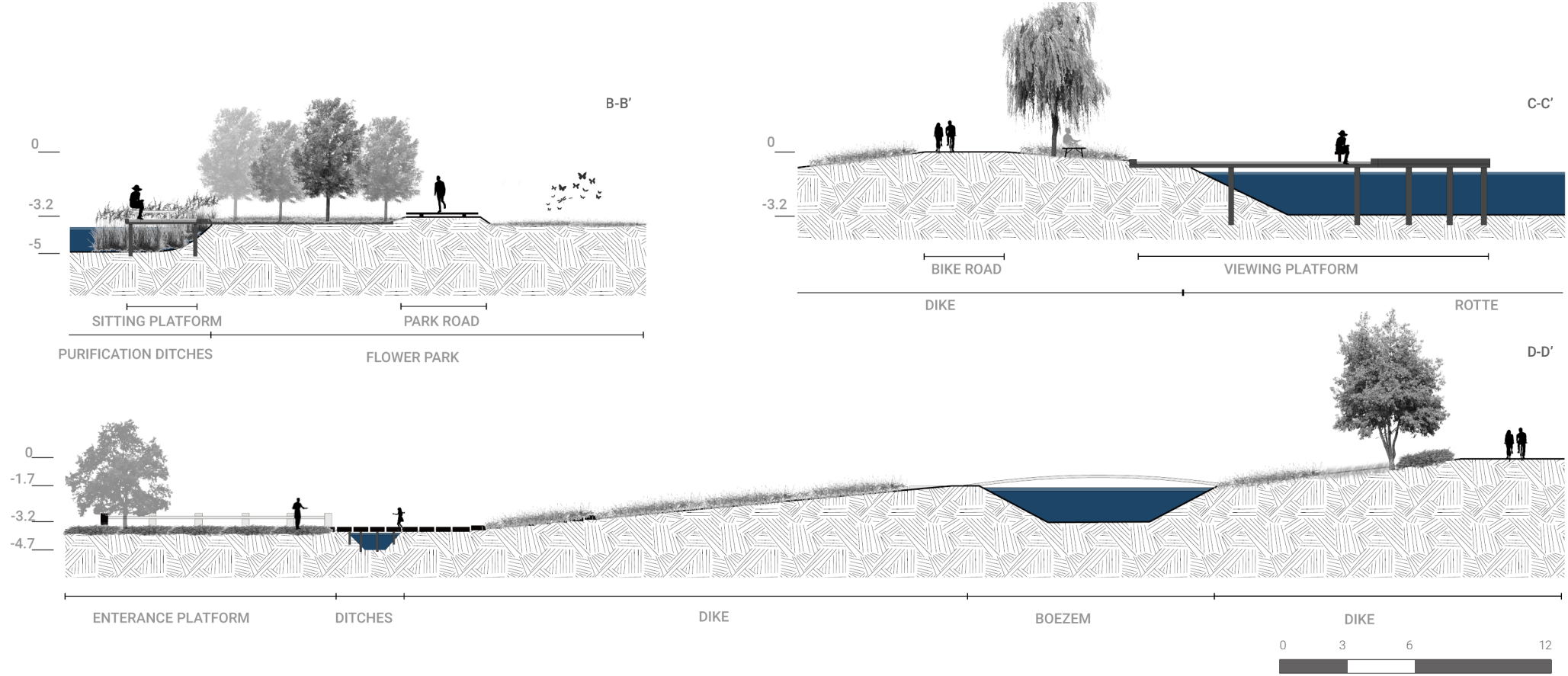



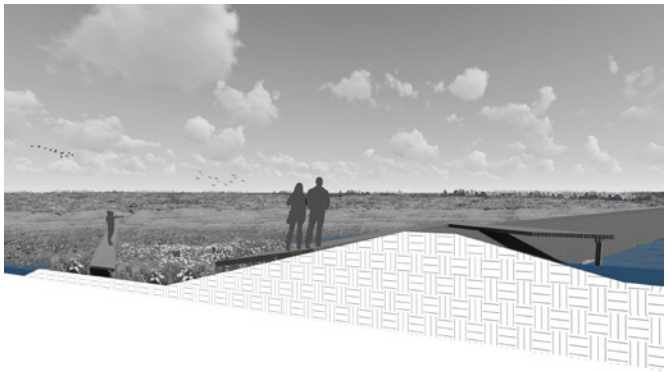

The steps uses steel structure with welded connection

The loadbearing sub-structure consists of steel tubes and moldings. To secure the covering wood on the steel substructure, another wood are placed in between. Where the covering woods meet, the steel molding is divided, so that any water seeping in can escape downwards.

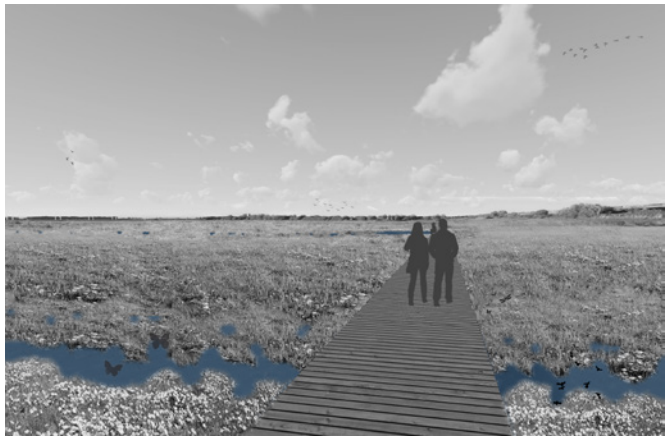




V1 ENTERING THE AREA FROM A BRIDGE ACROSS THE BOEZEM RELICT

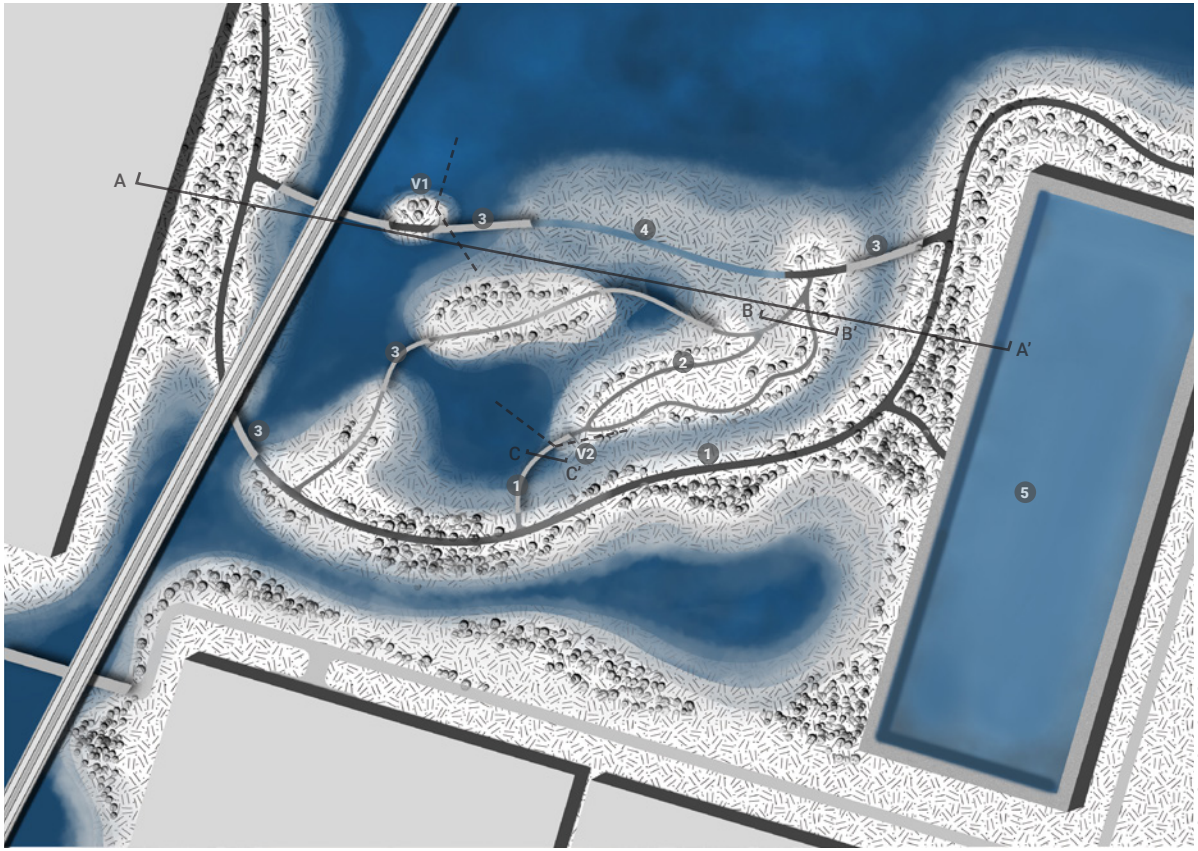


V2 WALKING IN THE MARSH MARIGOLD REEDLAND

V3 SITTING PLATFORM IN THE REED PURIFICATION FIELD

## DESIGN 2 WATER PARK

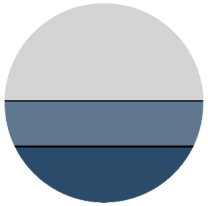
The water storage area is a new way of dealing with water in the Overbuurtsche Polder. Rainwater is stored within the area instead of being drained. And the water level changes seasonally, instead of being the same the whole year round. In other words: we adapt the landscape to natural processes, instead of adapting the natural processes to the landscape.
The waterpark tells this story. As the elevation of the land differs, some areas will be flooded seasonally. That means that nature controls how humans can use the park. With a low water level, all paths are accessible. But when the water level rises, some paths will be flooded. To reach a certain location, visitors will have to creatively respond to it. Sometimes the route is longer, sometimes stepping stones are the only way to get to the other side with dry feet.



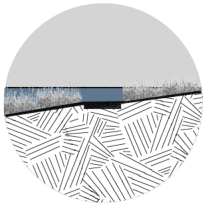

1. CYCLE/FOOTPATH
2. FOOTPATH
3. BRIDGE
4. FLOODED CYCLE/FOOTPATH
5. ROOF WATER RETENTION

0 50 100 200

SURROUNDED BY DIKES TO STORE MORE WATER



SEASONAL CHANGE WATER LEVEL

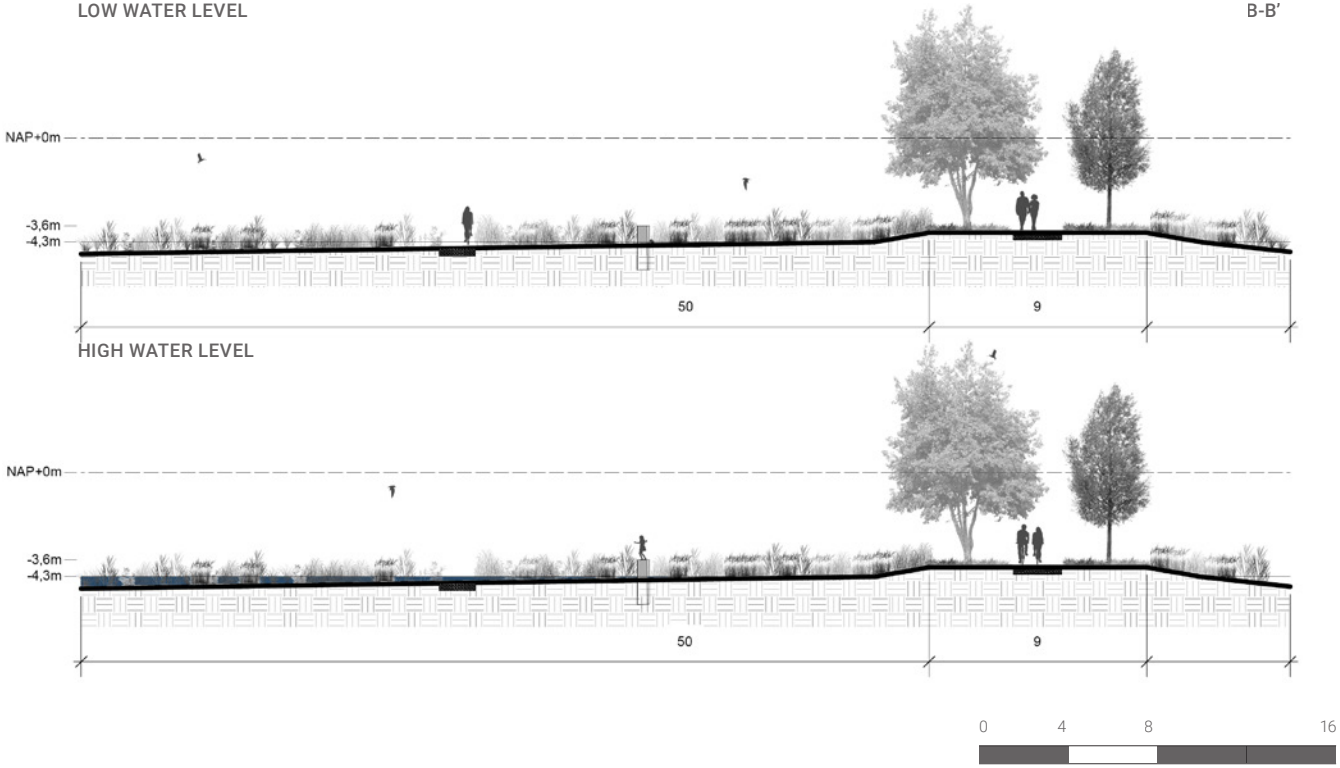


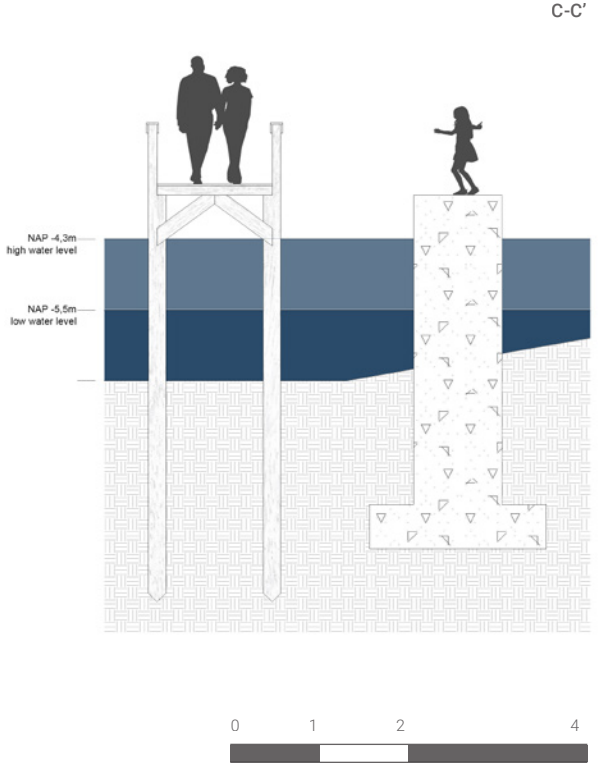
SOME ROADS ARE FLOODED FROM TIME TO TIME

A-A'


0 25 50 100

LOW WATER LEVEL




V1 SOME PATHS ARE FLOODED FROM TIME TO TIME

V2 LOW WATER LEVE

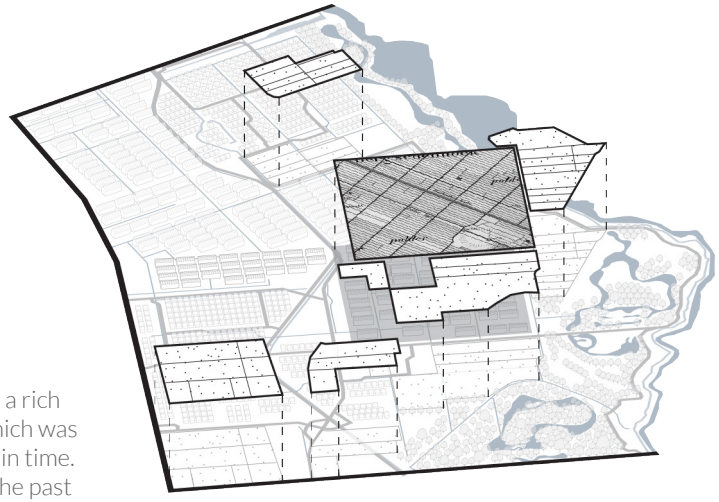
V2 HIGH WATER LEVEL

# FRAMING WATER

## BLEISWIJK POLDER

Juul Ten Hove 4603168 | Xinyu Zhang 5263085

# OVERALL CONCEPT

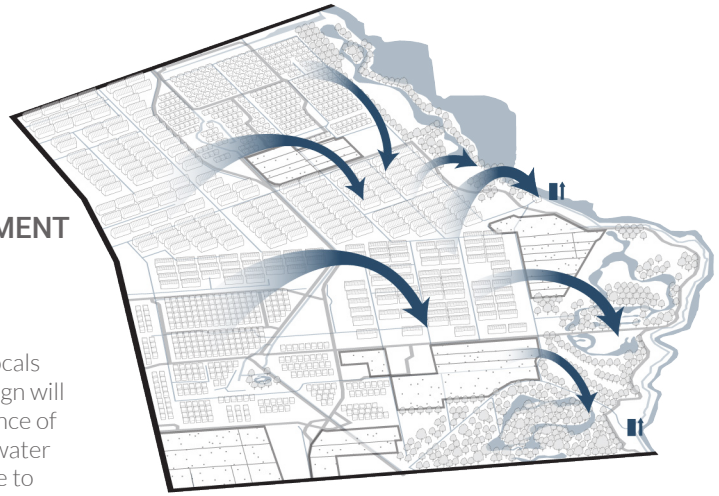


## CONTEXT

The Bleiswijk area has a rich agriculture history, which was gradually overwritten in time. The design will make the past of boezem and polder more accesible in everyday life.

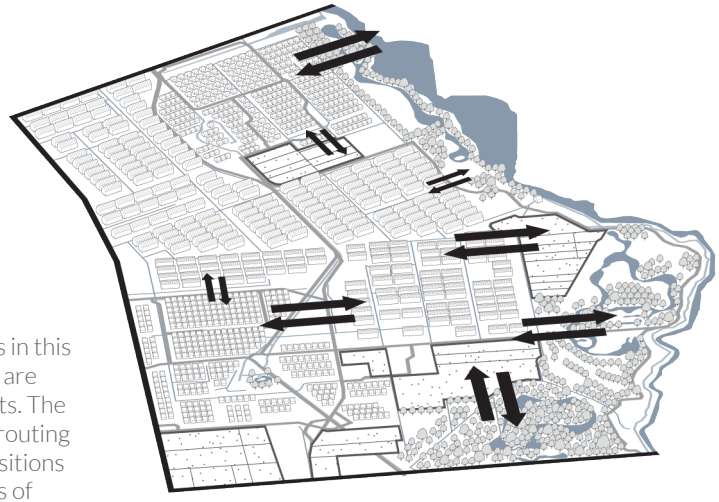
## ECOLOGY

Despite the large porportion of green spaces in this polder, they don't seem to play an active role of ecology. The idea is to use the existing to add a biodiversity view to recreational area.



## WATER MANAGEMENT

The complex water management in site is also covered during the development, leaving locals unaware of it. New design will create physical experience of important steps in the water management procedure to restore the awareness of this benificial project.

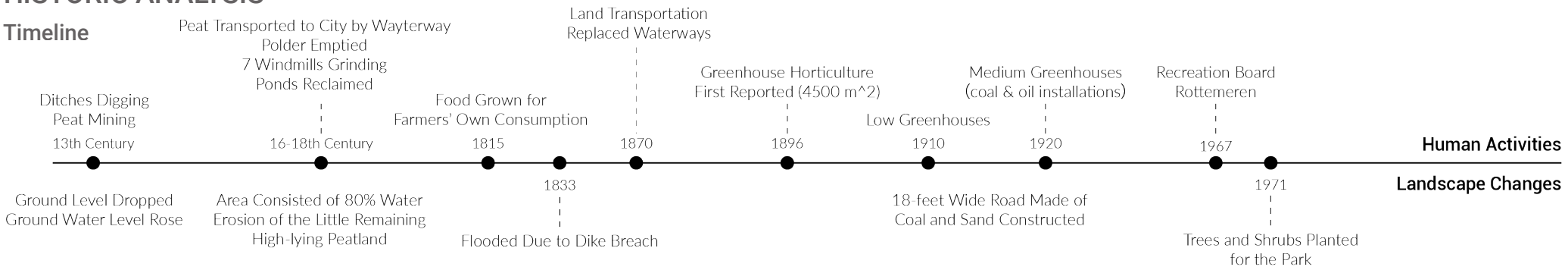


## PERCEPTION

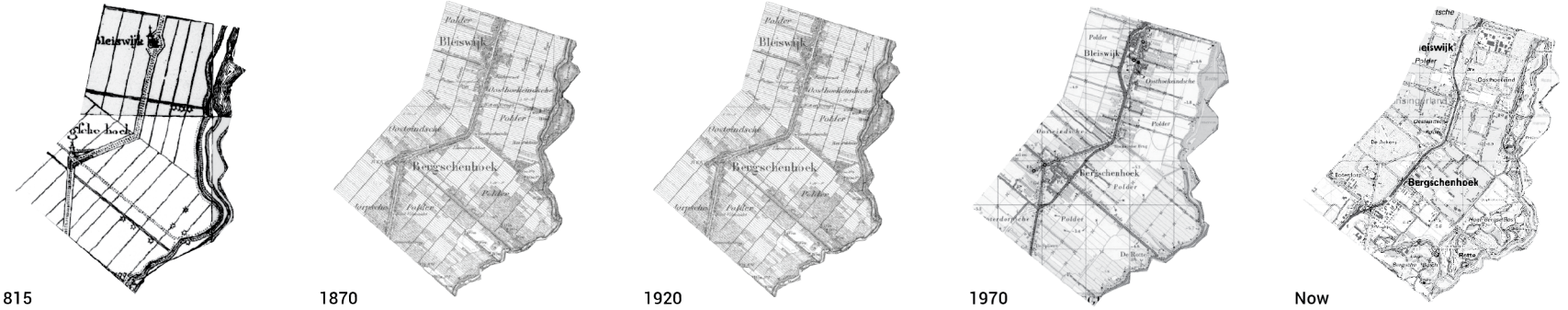
With multiple functions in this area, sharp boundaries are now dividing it into parts. The purposal is to design a routing between different transitions led by various functions of water to emphasize this impression.

# HISTORIC ANALYSIS

## Timeline

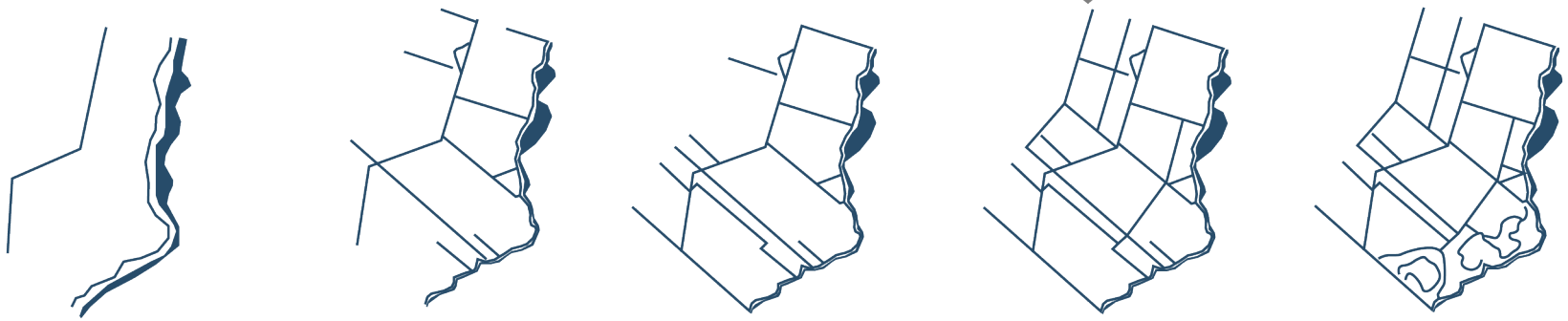



## HISTORIC MAP



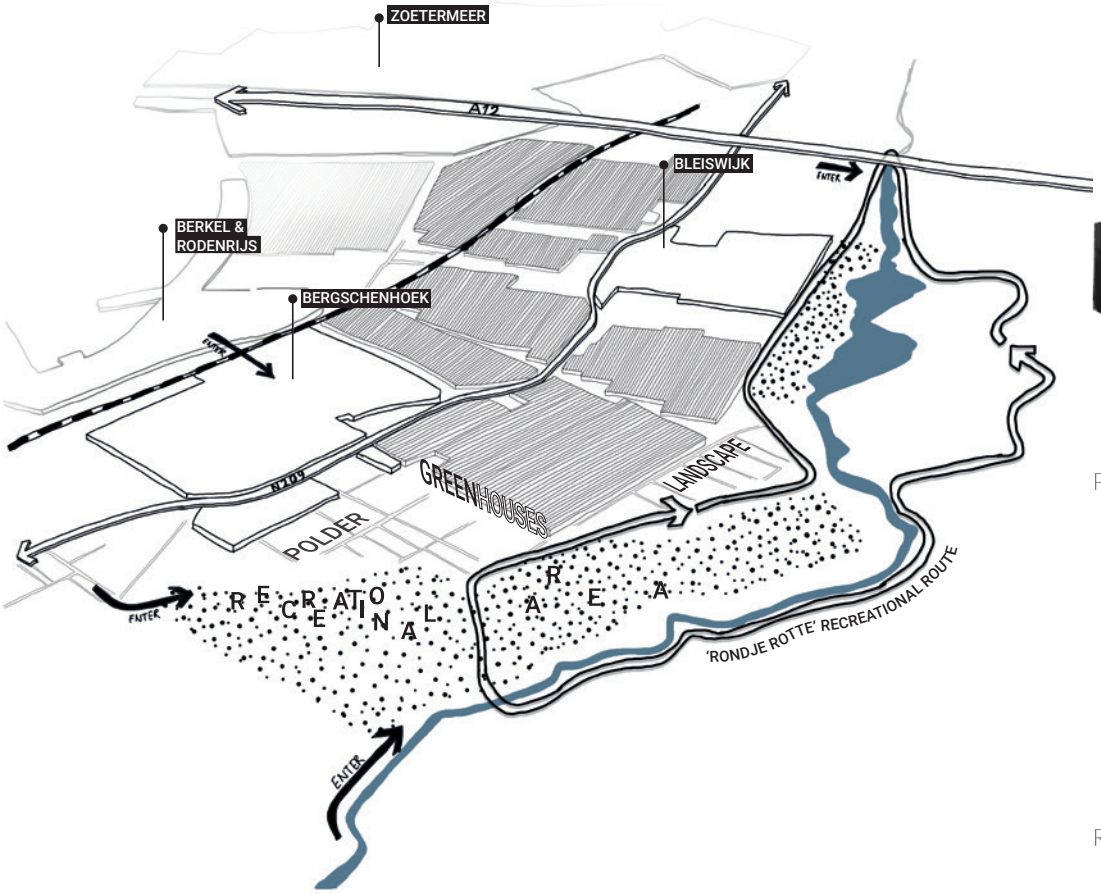

## POLDER AREA

## WATER SYSTEM



# SITE ANALYSIS

## PROGRAM MAP




## SPATIALITY

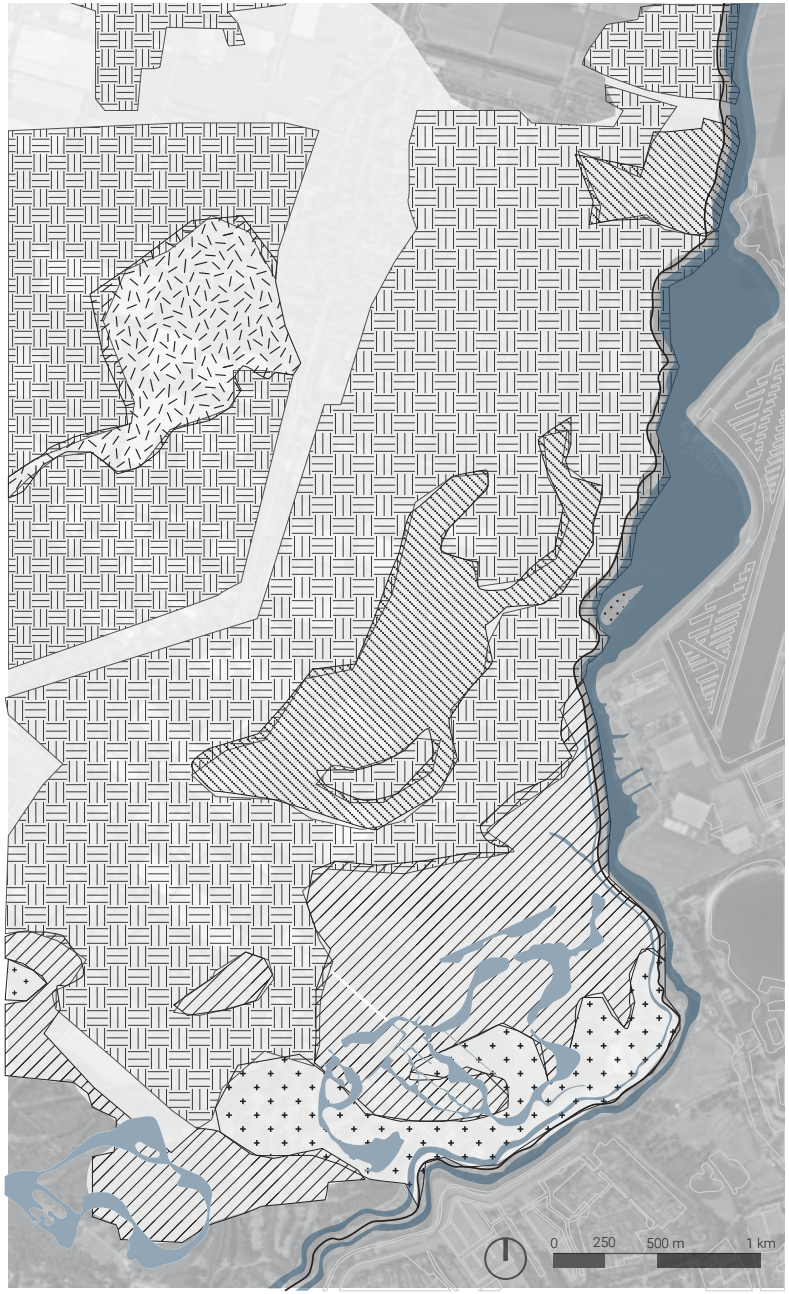
Residential

Greenhouse

Polder

Recreational

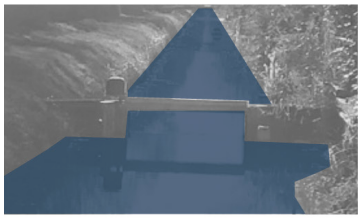
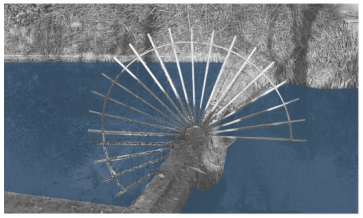
## SOIL



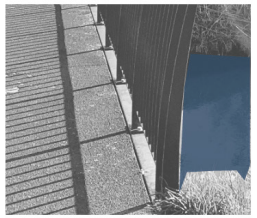

light clay homogeneous profile
clay heavy interlayer
peat on unripened clay
compacted topsoil on deep peat
sulfur with homogeneous profile

## WATER MACHINES

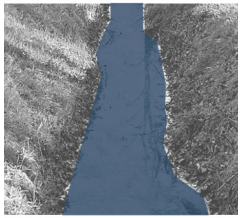


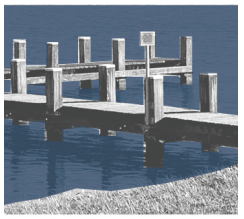



## BRIDGES


## WATERFRONT

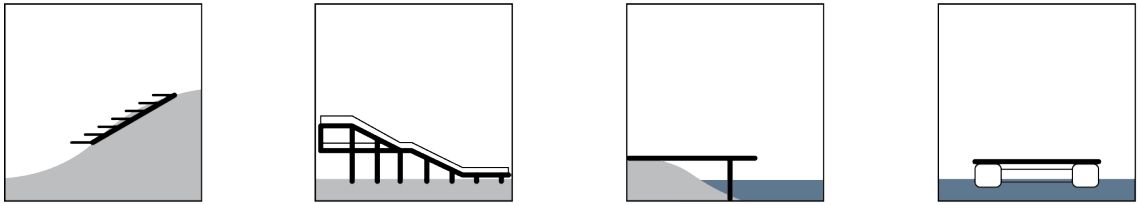



# DESIGN ELEMENT CATALOG

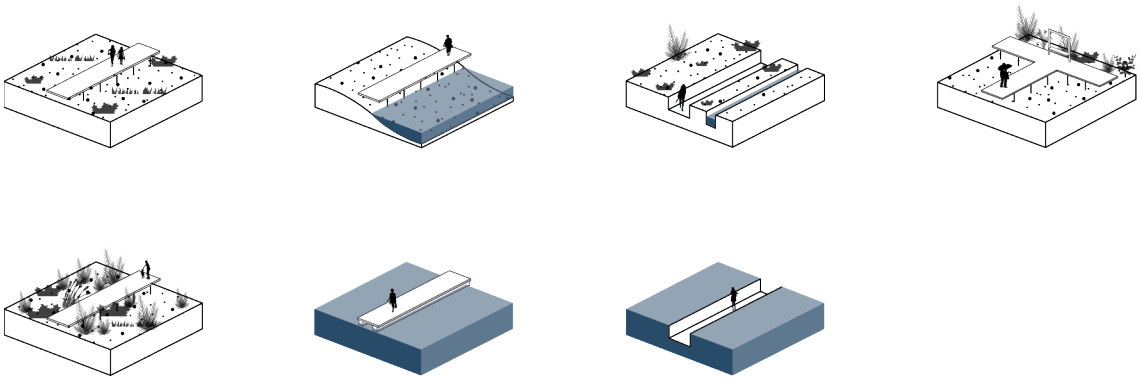
## MATERIAL

WOOD
STEEL

## STRUCTURE

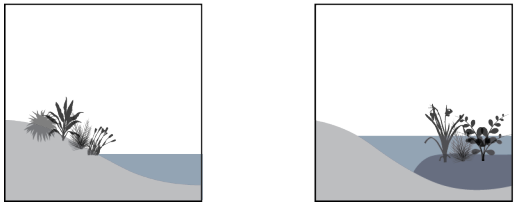


## SPATIAL



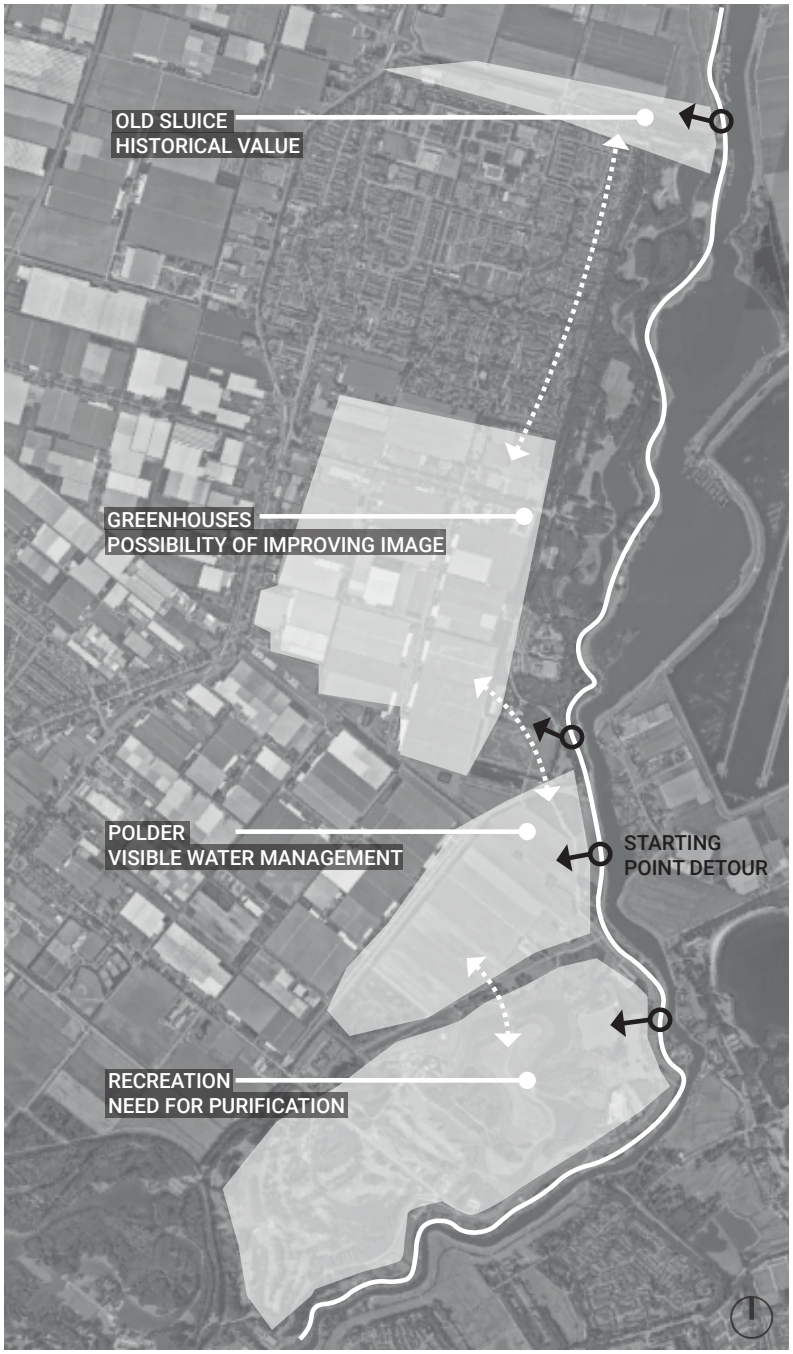
The spatiality will be focused on using the new pathway to experience different water levels, with a frame-bench to observe important stories in each site.

## PLANTING

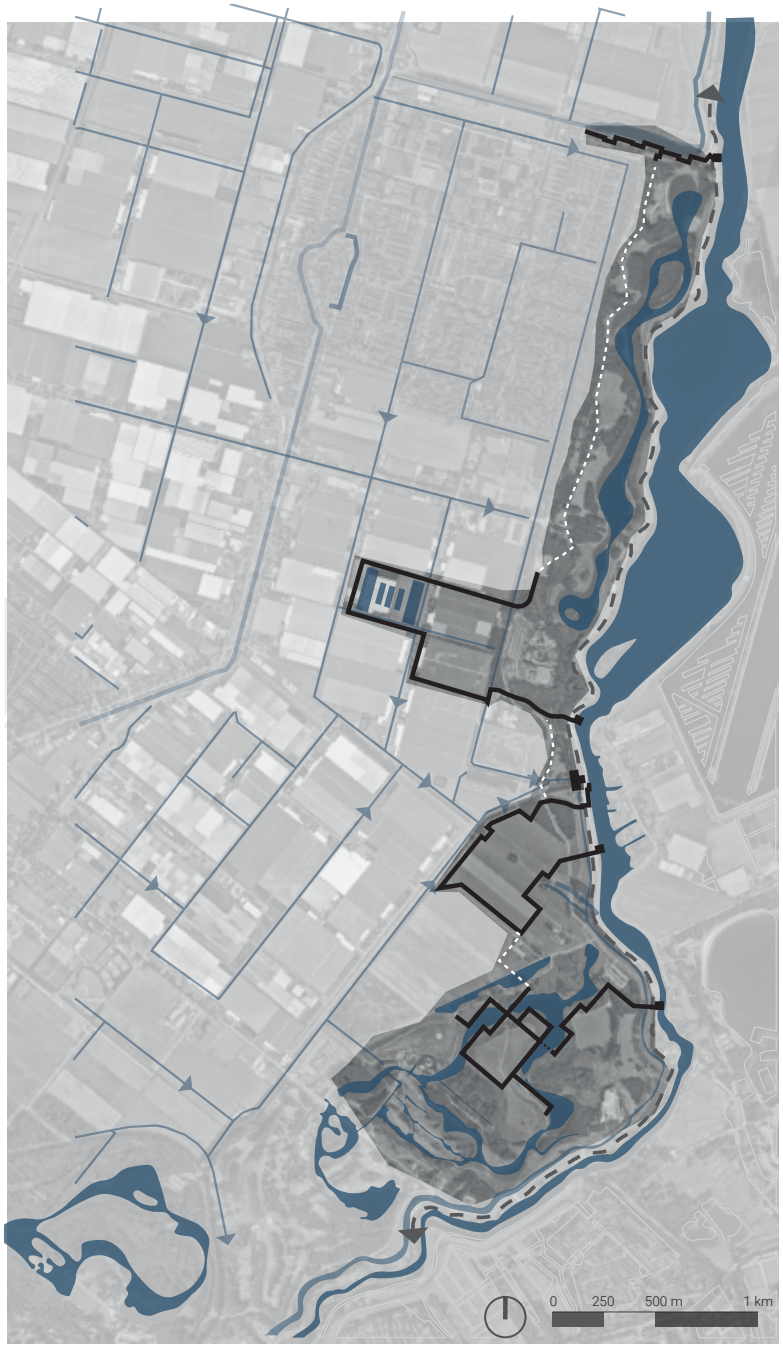


Planting strategies are applied only in waterfront and on water surface, to emphasize on site's topic of water.

## SITE SELECTION




## GENERAL PLAN



# DESIGN CONCEPT FOR EACH SITE

## SITE A Old Sluice

Make easy but strong connection between historic installation and residential area, and gradually in time to make history part of the everyday life.

## SITE B The Greehouses

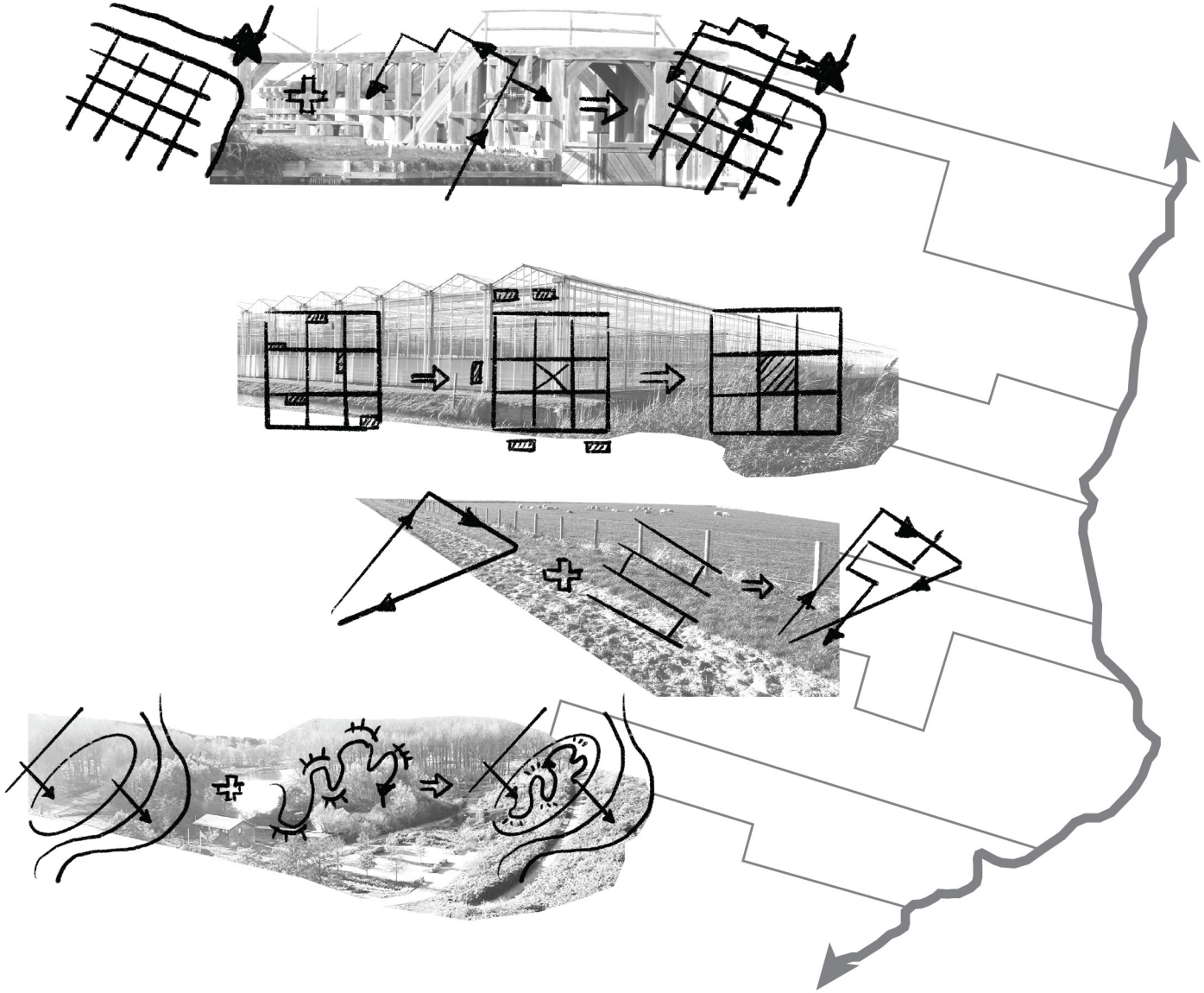
Eliminate the stereotype of maasive, indifferent impression of modern argriculture, by gathering the important steps during production process, give people a chance to get to know the indispensable foundation of daily life food and how it works.

## SITE C Triangle Polder

The remains of polder era in this site still perform its function, so it is a great cut in to see the original layer.

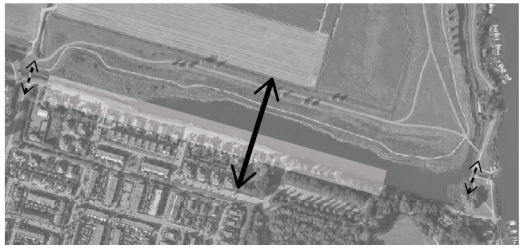
## SITE D Recreational Park

As the last step in the water pumping procedure, recreational park should be more active and visible in the water management system as well as its important role in the ecology.

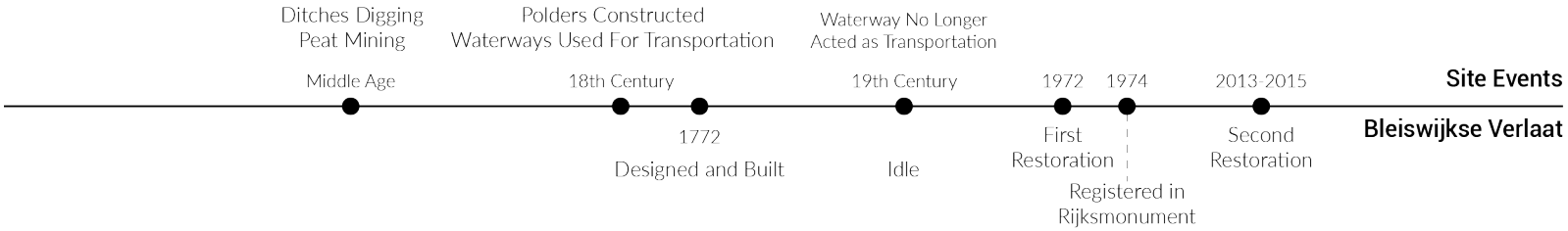


# SITE A OLD SLUICE

## SITE ANALYSIS

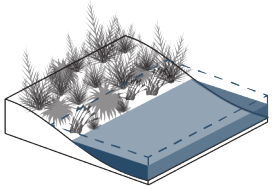




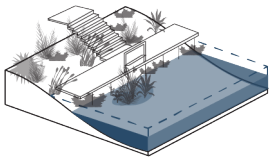



## SITE PLAN

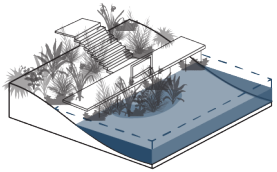

## DESIGN PHASING



Present

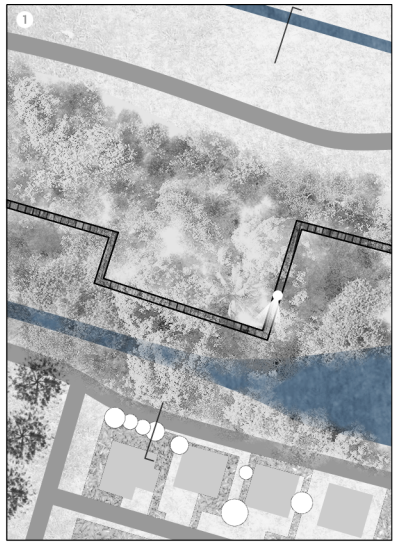


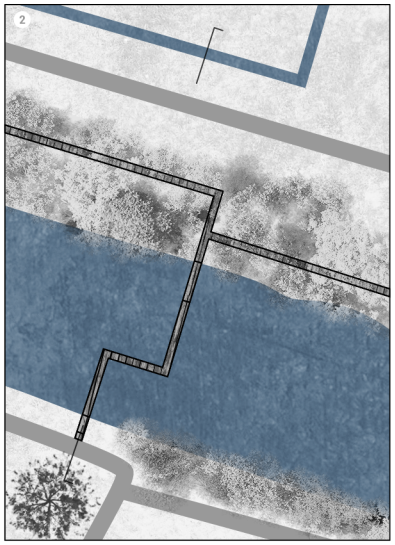
Design

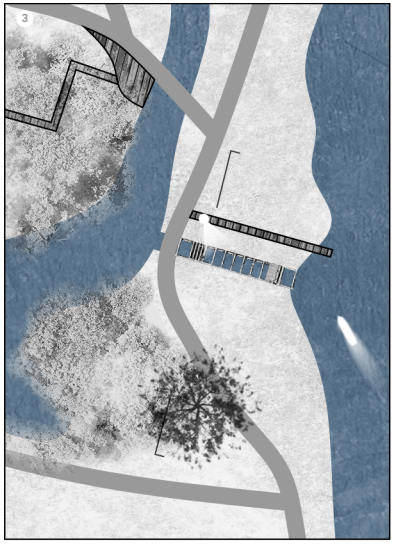


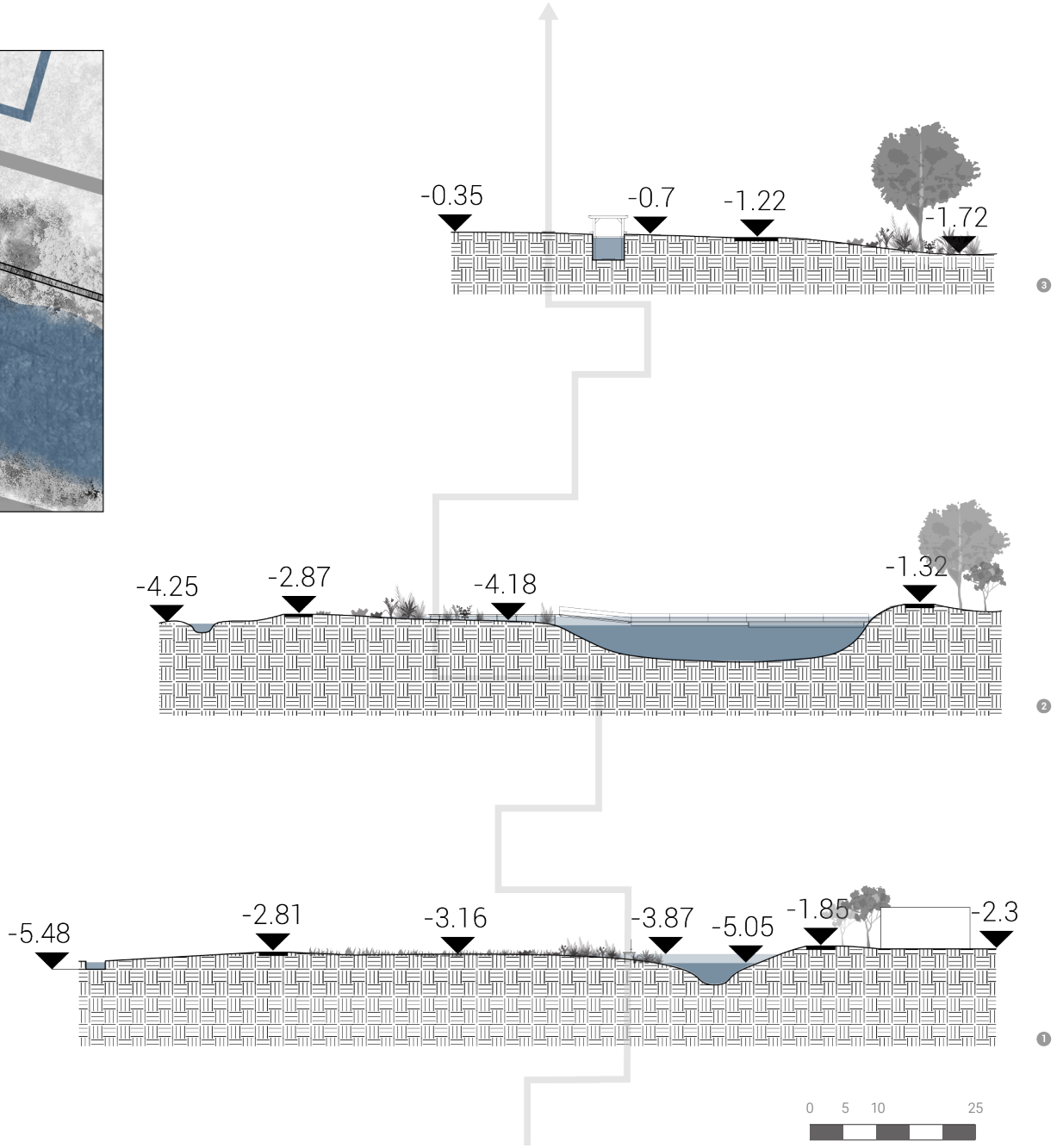
10 Year Vision

# SITE A OLD SLUICE



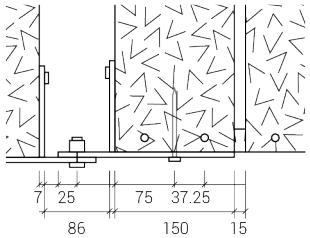



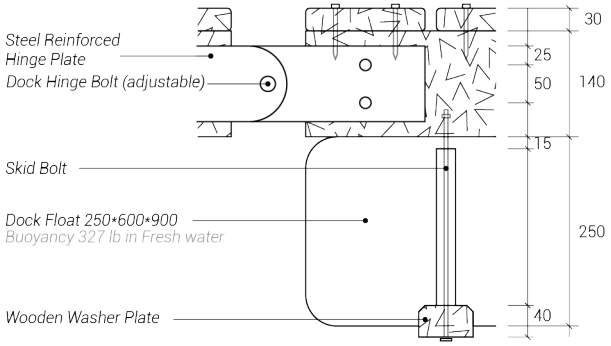



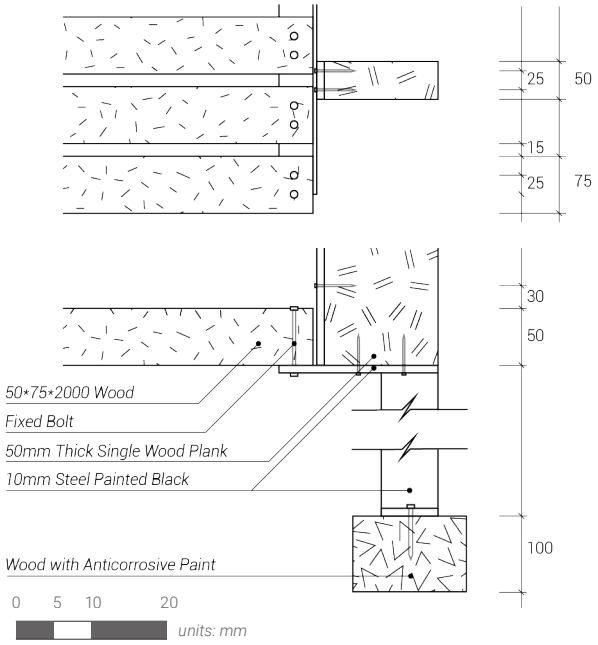

# SITE A OLD SLUICE

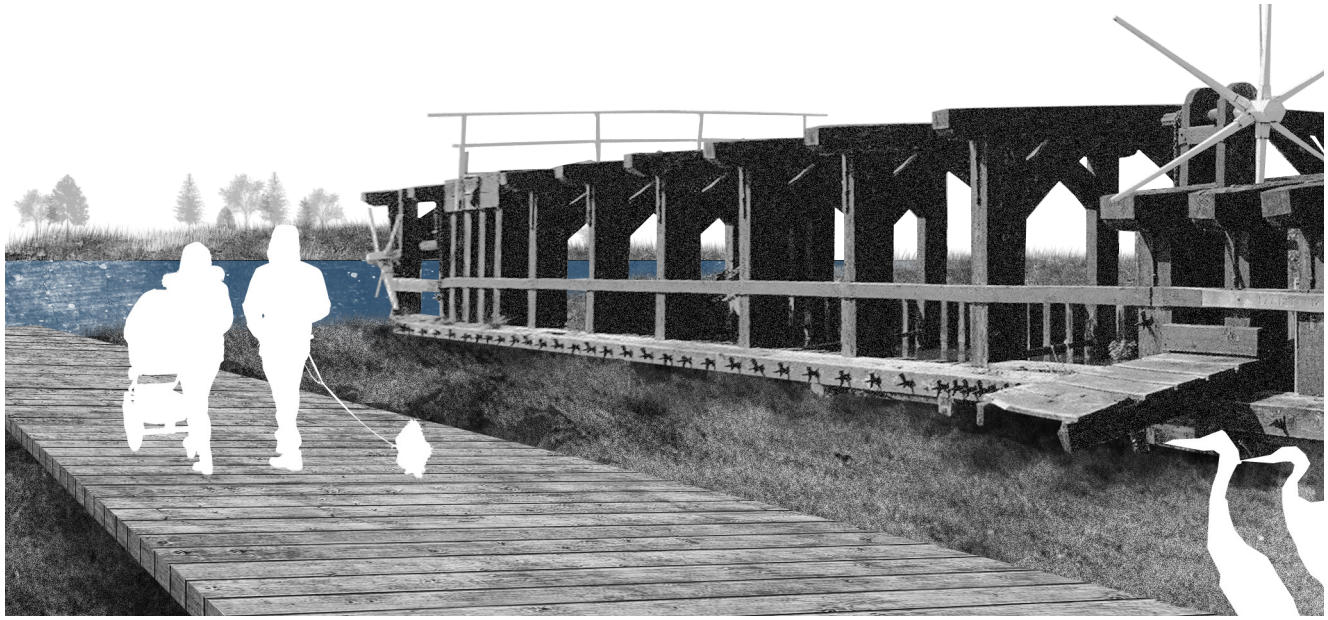
## Platform and Floating Pathway Connection Detail

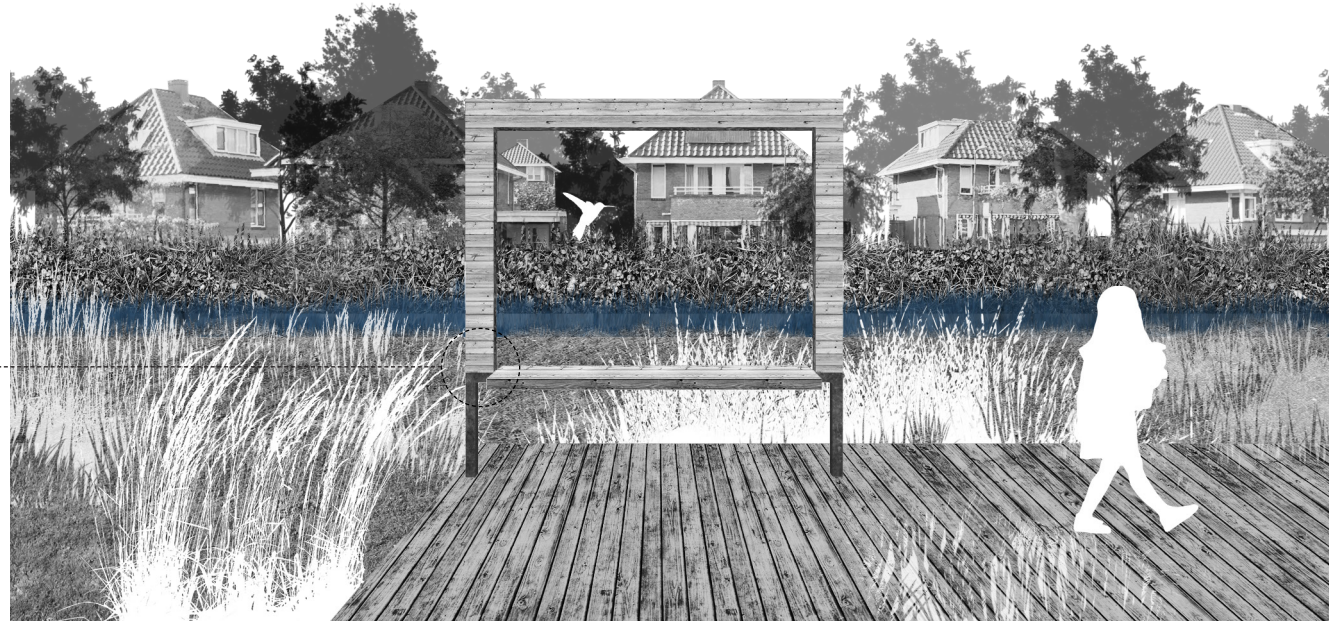



## Frame Bench Detail

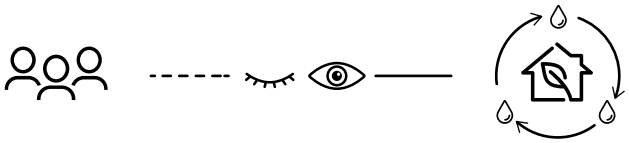


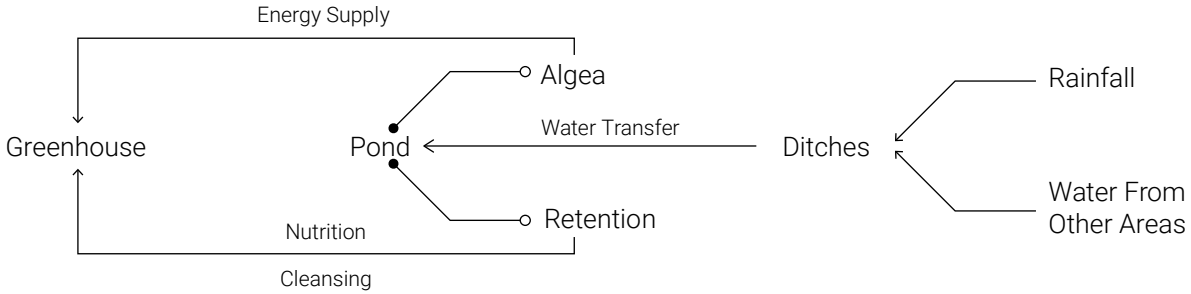



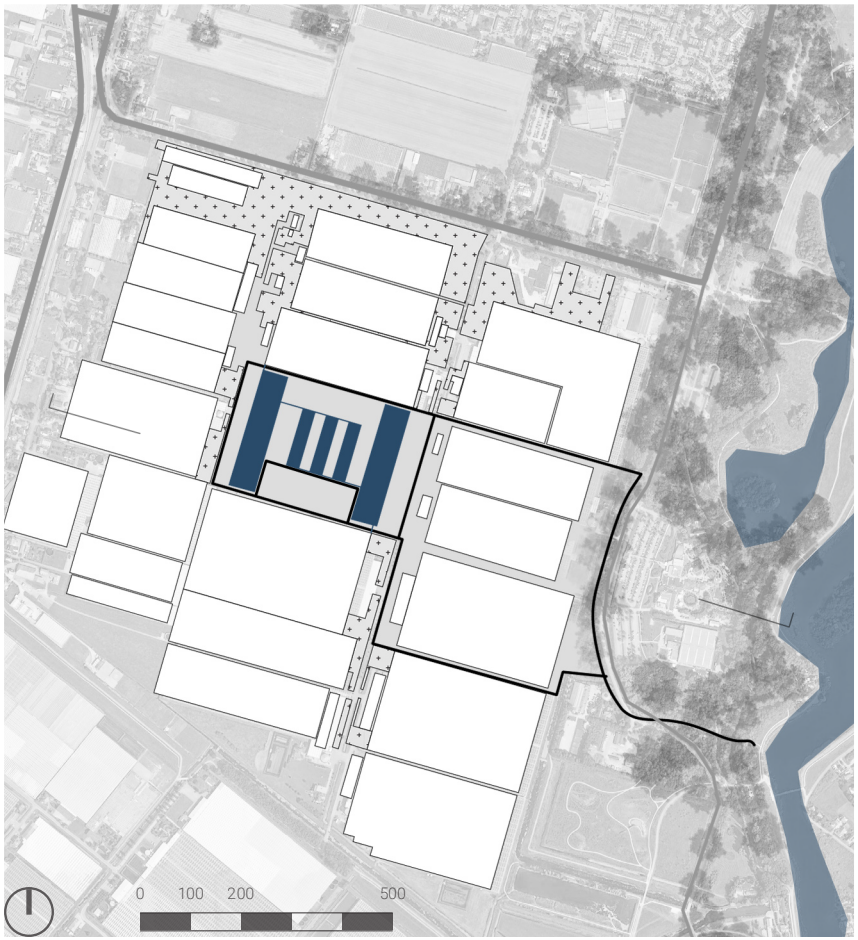


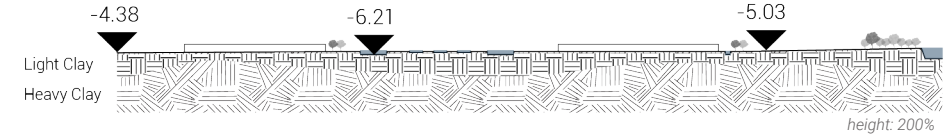
# SITE B THE GREENHOUSES

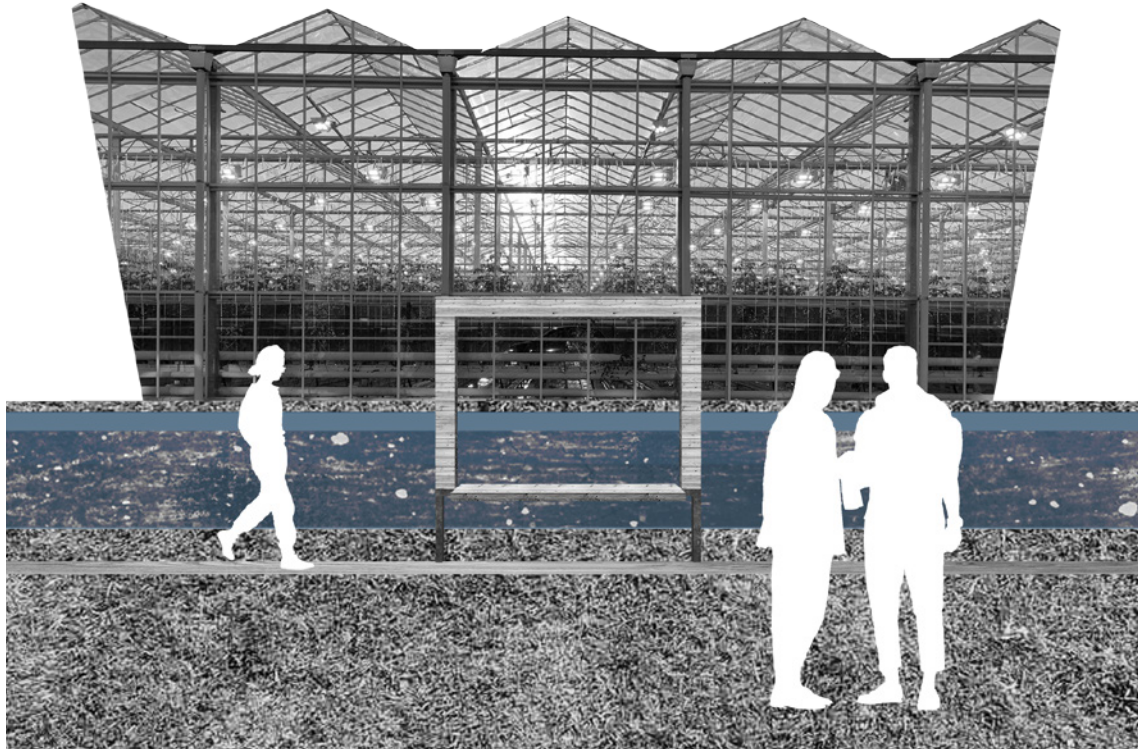
How the water engage in the modern agriculture is now nearly invisible due to high efficiency, which also lead to the lack of acknowleage from common people. New design will relink the process and show it.



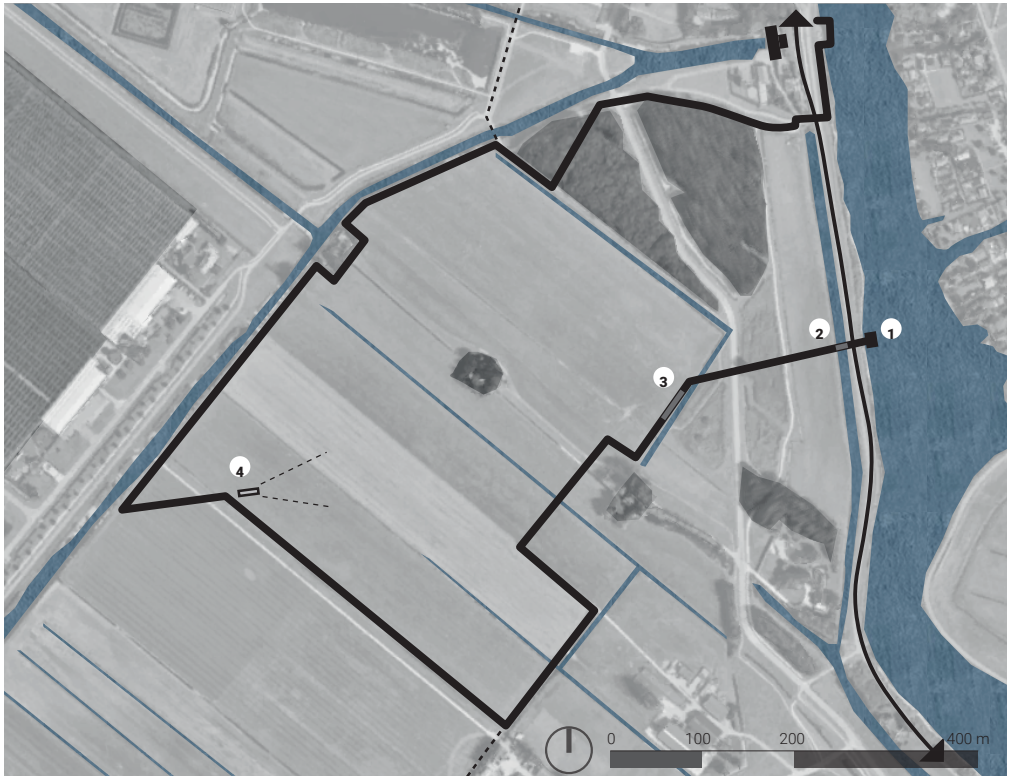


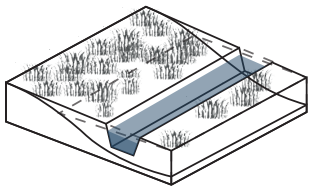



# SITE C TRIANGLE POLDER

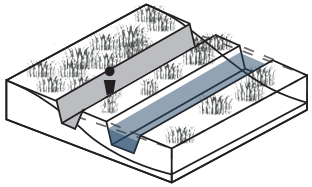



The differences in elevation in the landscape are visible, especially in this open polder area. The area gives the space to see all the levels of the water, but do people see this? By physically experiencing the different water levels, awareness is created about the formation of the polder area.

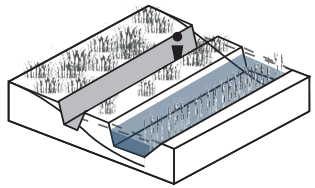
Present

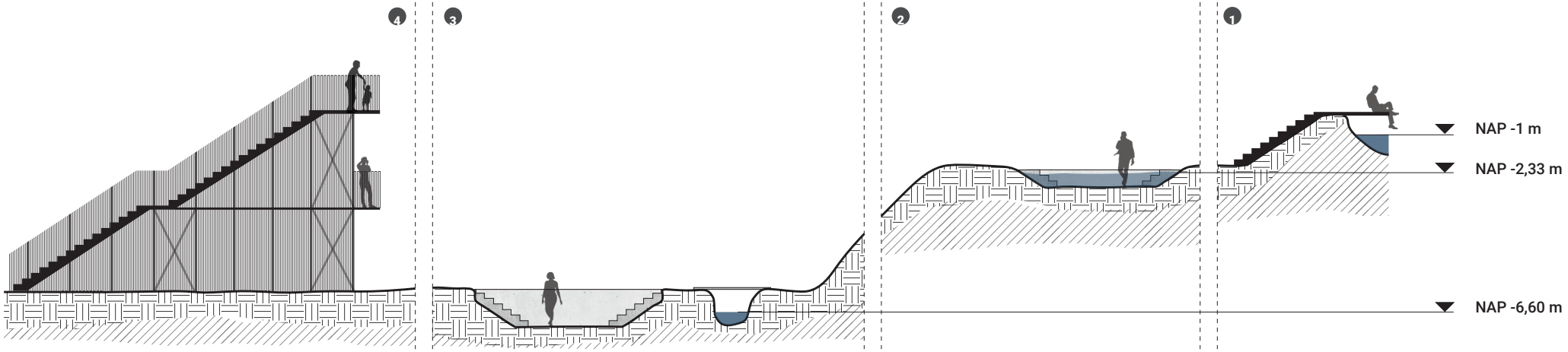


Design

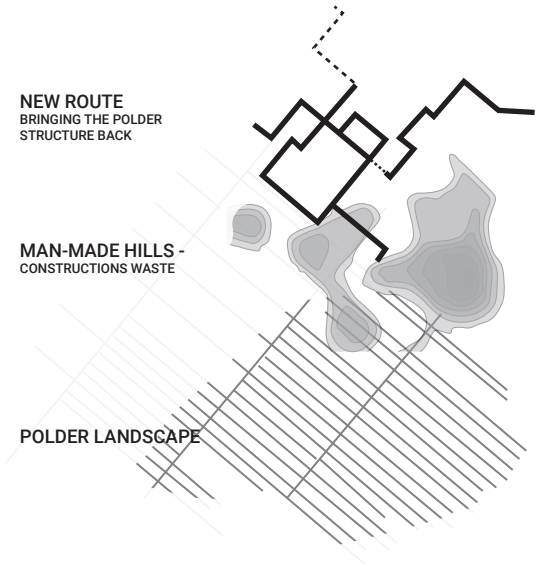


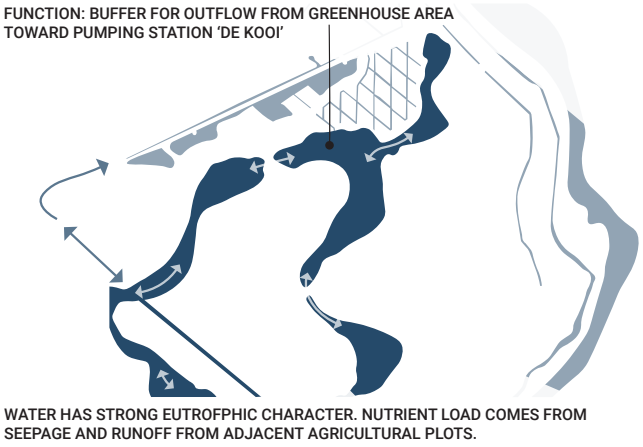
10 year Vision

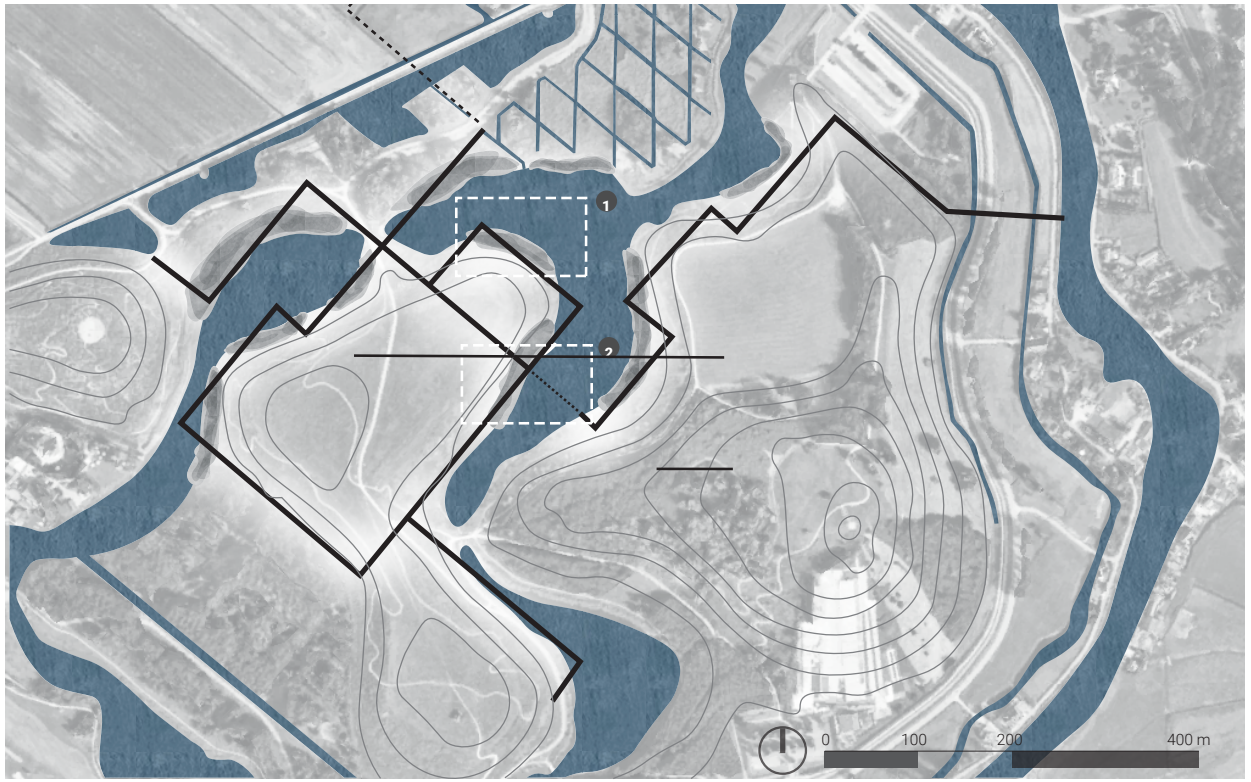


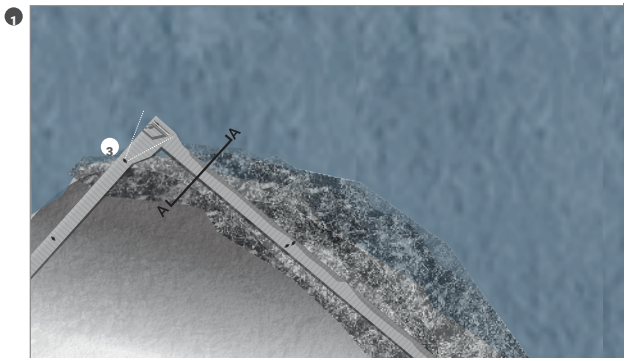


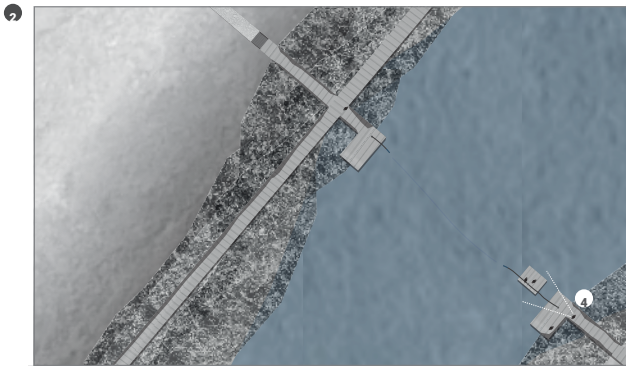
# SITE D RECREATIONAL PARK



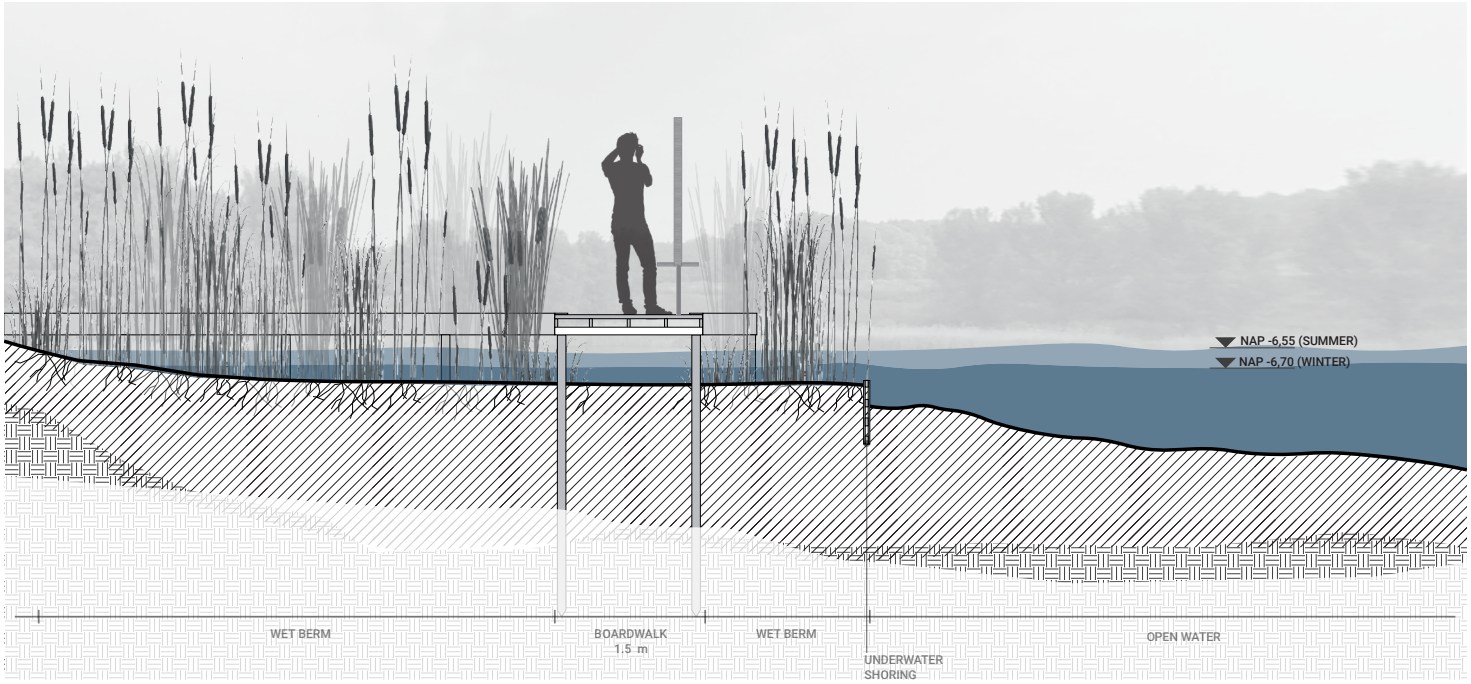




The Hoge Bergse Bos was formed in the 1960s from debris. Later the area was developed into a recreational area with all kinds of hiking, cycling and mountain biking trails. Of the old polder landscape hardly anything can be seen anymore. With the design for the Hoge Bergse Bos, the old polder landscape is made visible again and a connection is made with the adjacent polder landscape.
Water purification is badly needed in this area, but because it also functions as a buffer, efficiency remains low. In the new design, water is purified as locally as possible, by means of reed and bulrush. This creates an exciting landscape.

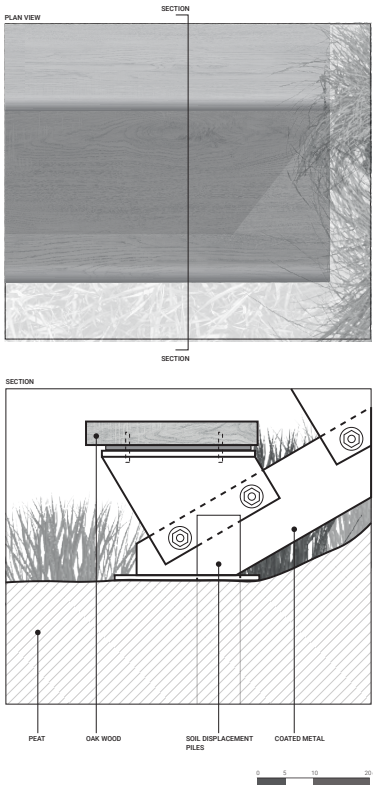
# SITE D RECREATIONAL PARK



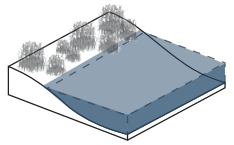

Section A-A



## Dike stairs detail




Present



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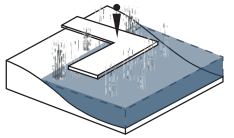
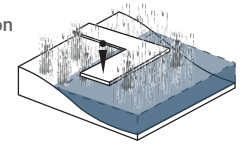


10 year Vision

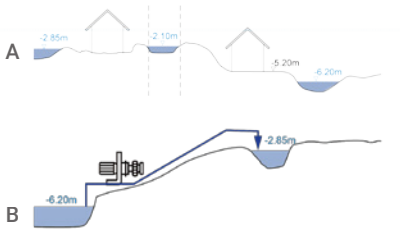


# POLDERWORKS

## SCHIEBROEKSE + BLEISWIJKSE POLDER

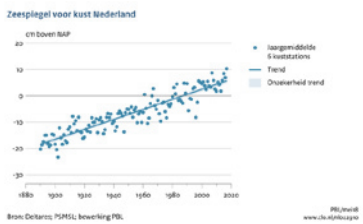
Jolt Wiersma 4719379 | Yan Liang 5296226

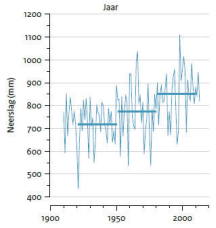
# ANALYSIS (CURRENT SITUATION) - TECHNICAL

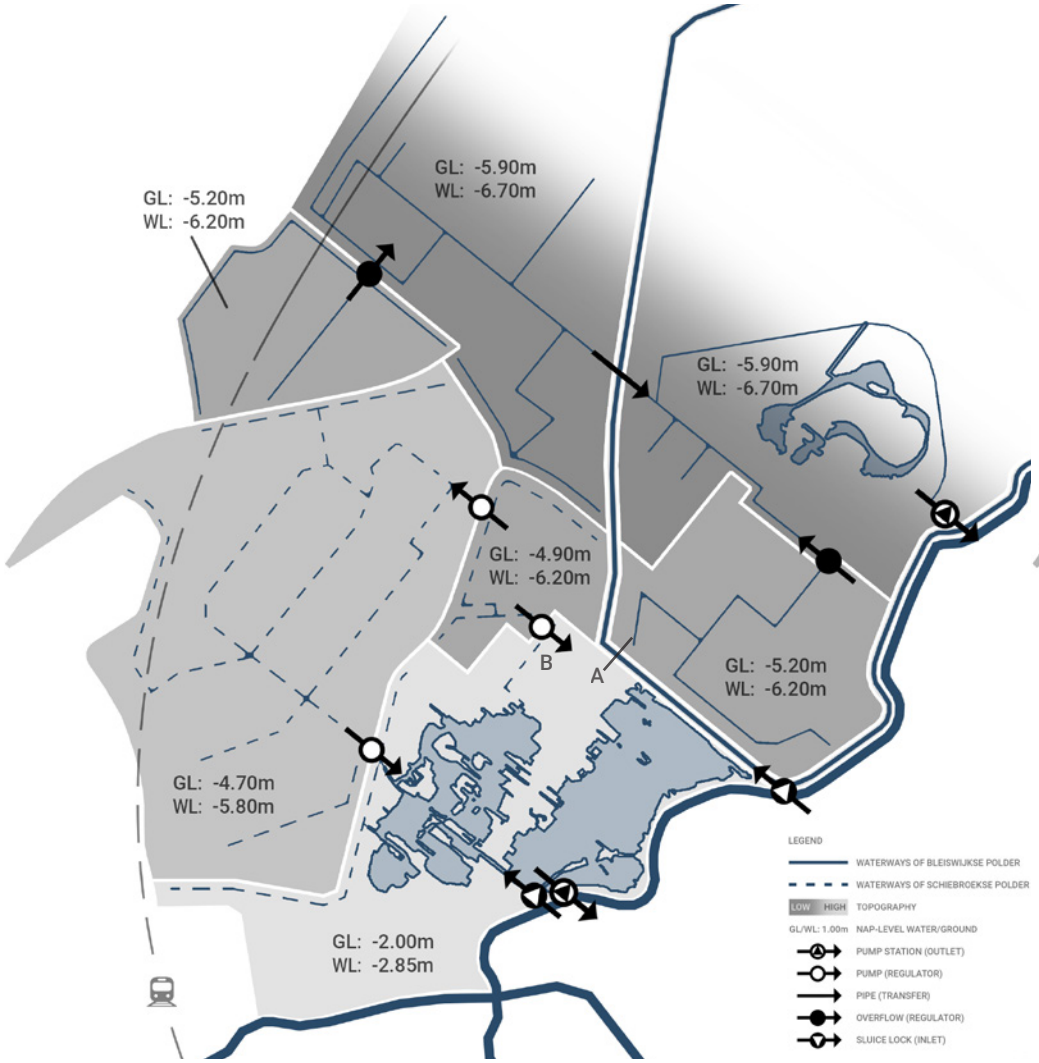


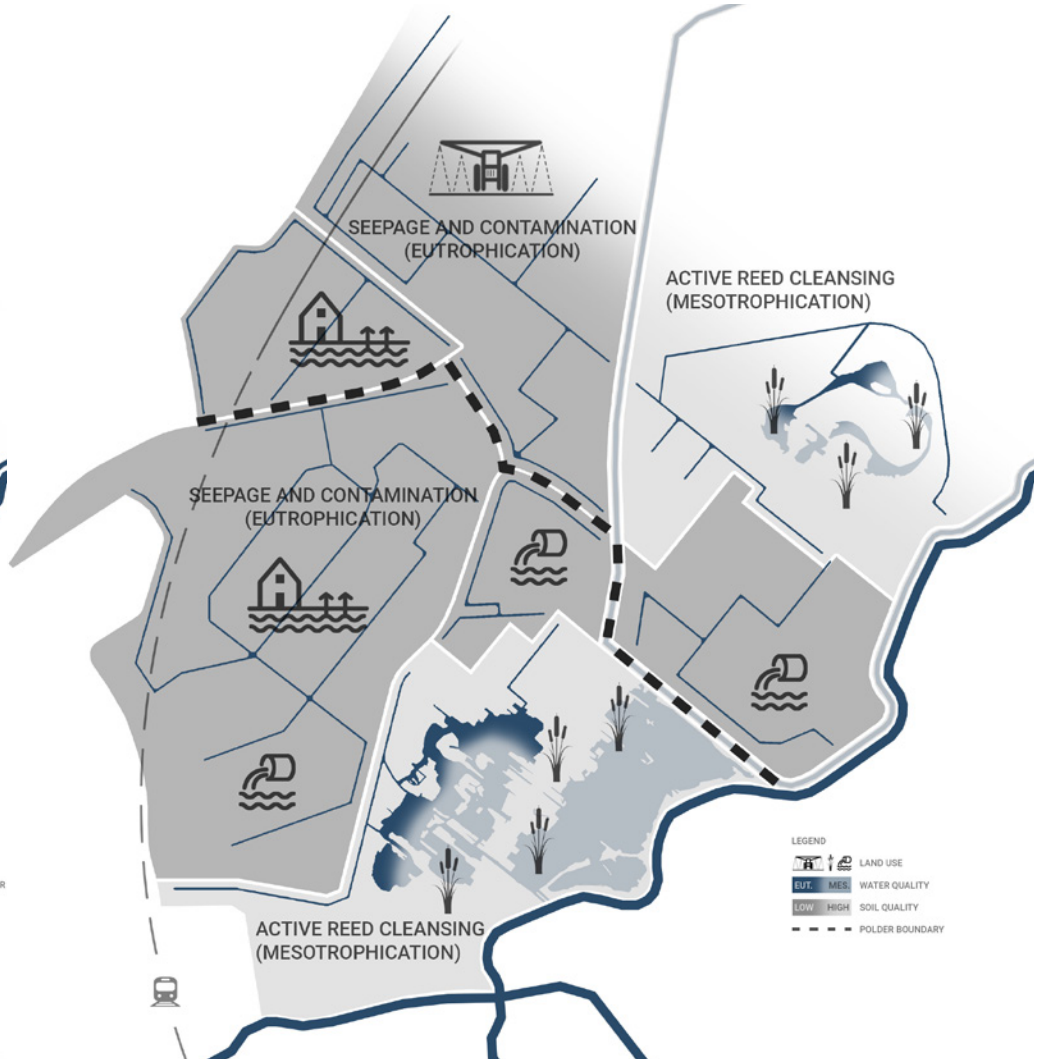

## WATER SYSTEM AND LAND USE

Currently, the water system pumps water from all lowering lying areas into adjacent higher lying areas until it is pumped into the lake and then the Rotte. With the issue of climate change, this can become a problem: the low areas need to be emptied more often. Meanwhile, mixed urban land use leads to eutrophication of water which is discharged into the mesotrophic lake.



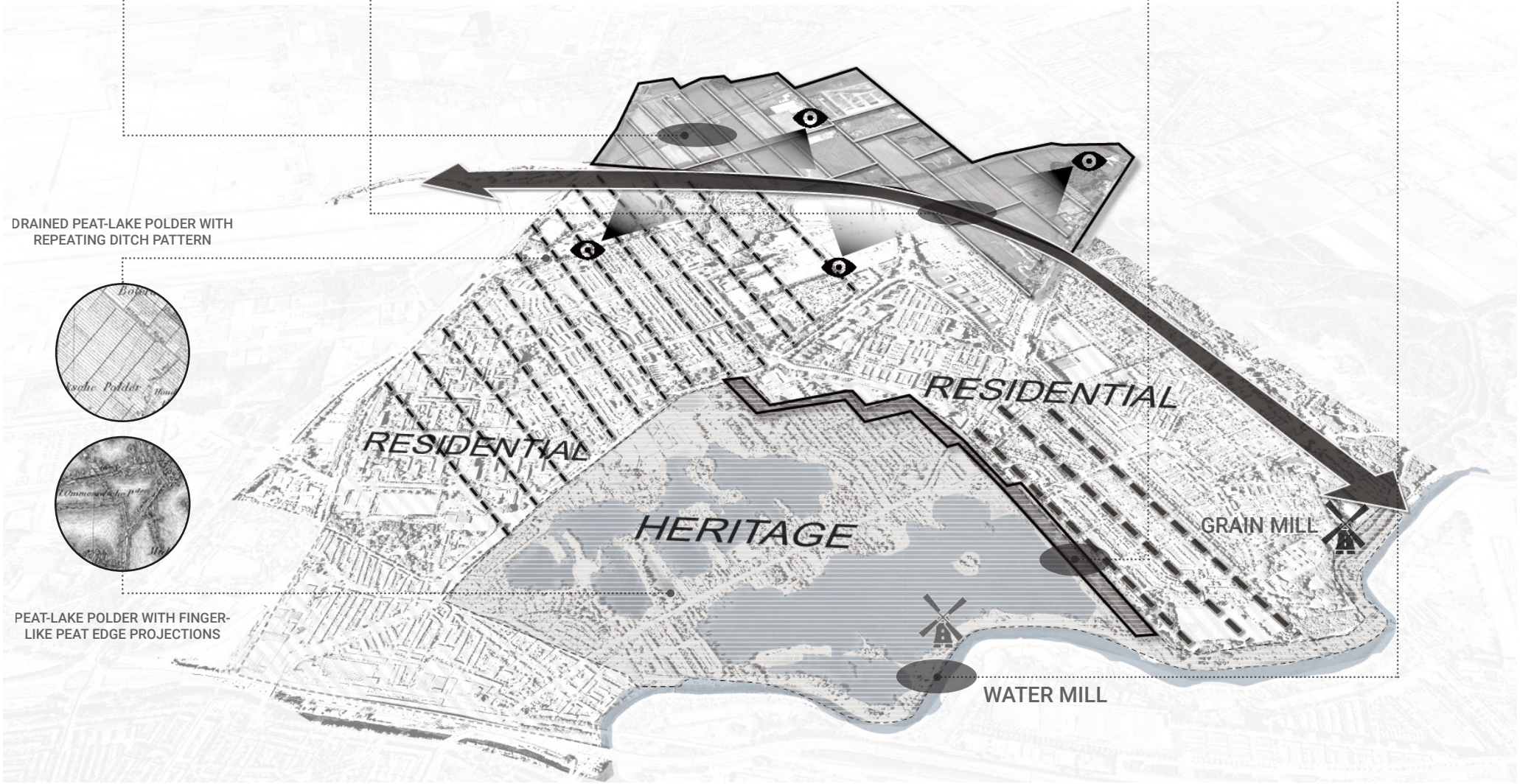



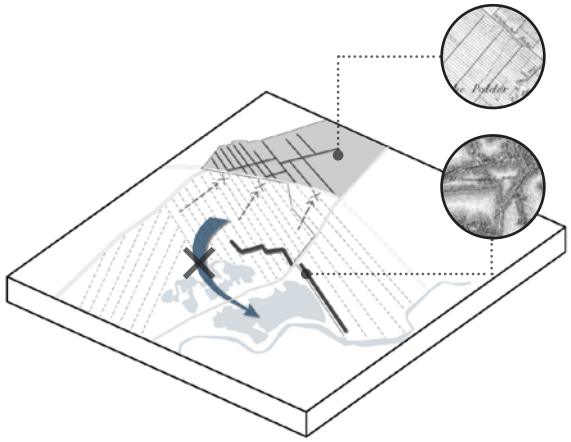



# ANALYSIS (CURRENT SITUATION) - SPATIAL

## SPATIAL CHARACTERISTICS

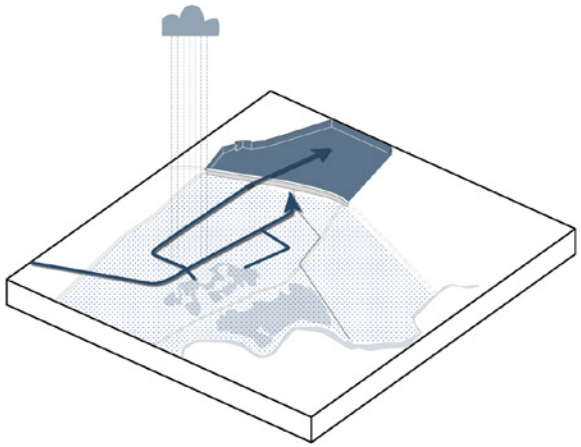
Currently, the site is divided into two polders with different characteristic patterns: the peat-lake polder and the ditch polder. The under construction A16 highway cuts the ditch polder in half, dividing the visual and experiential connection as well. The peat-lake polder focuses on heritage and recreation, but this is stronger along the lake and Rotte and poorer in the urban core.





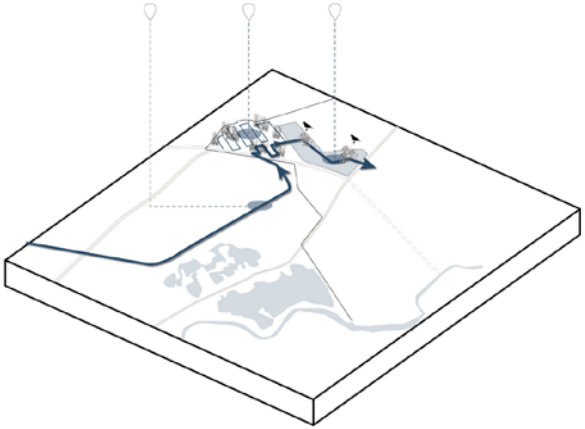
## CONTEXT

The two different polder typologies (peat-lake polder and ditch polder) are accentuated. There are peaty edges near the lake and the ditches get a common form language to so re-establishing the connection cut by the highway.



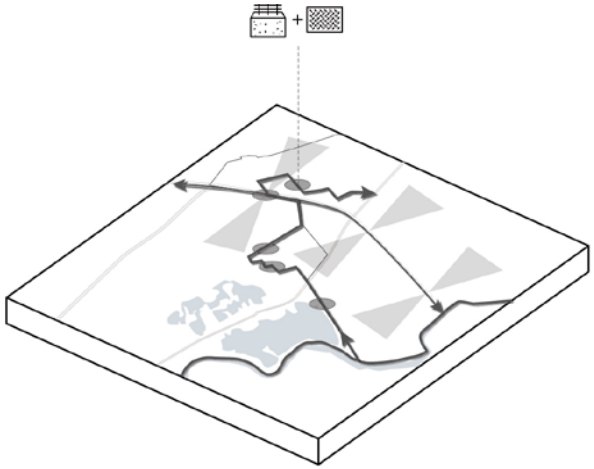
## WATER MANAGEMENT

Climate change means the water system should be reversed, letting it flow down with gravity. The polder is given room for water retention during wet winters. During dry summers, the retention pond functions as source of water.



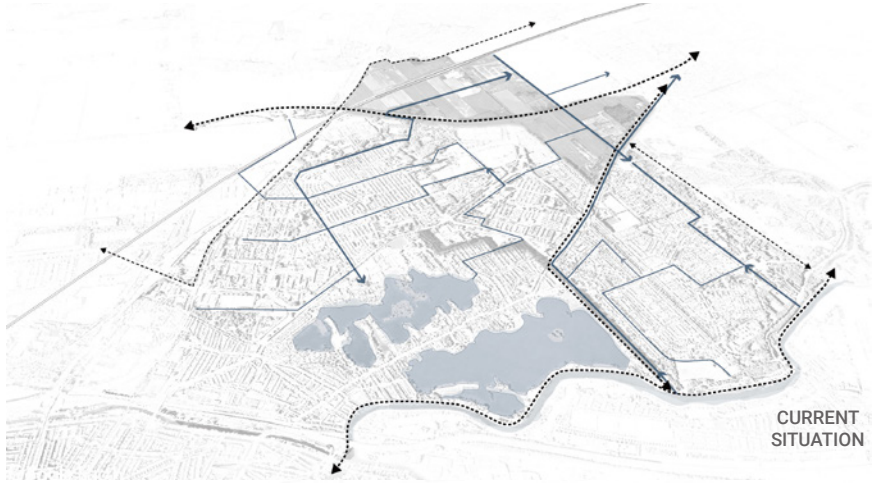
## ECOLOGY

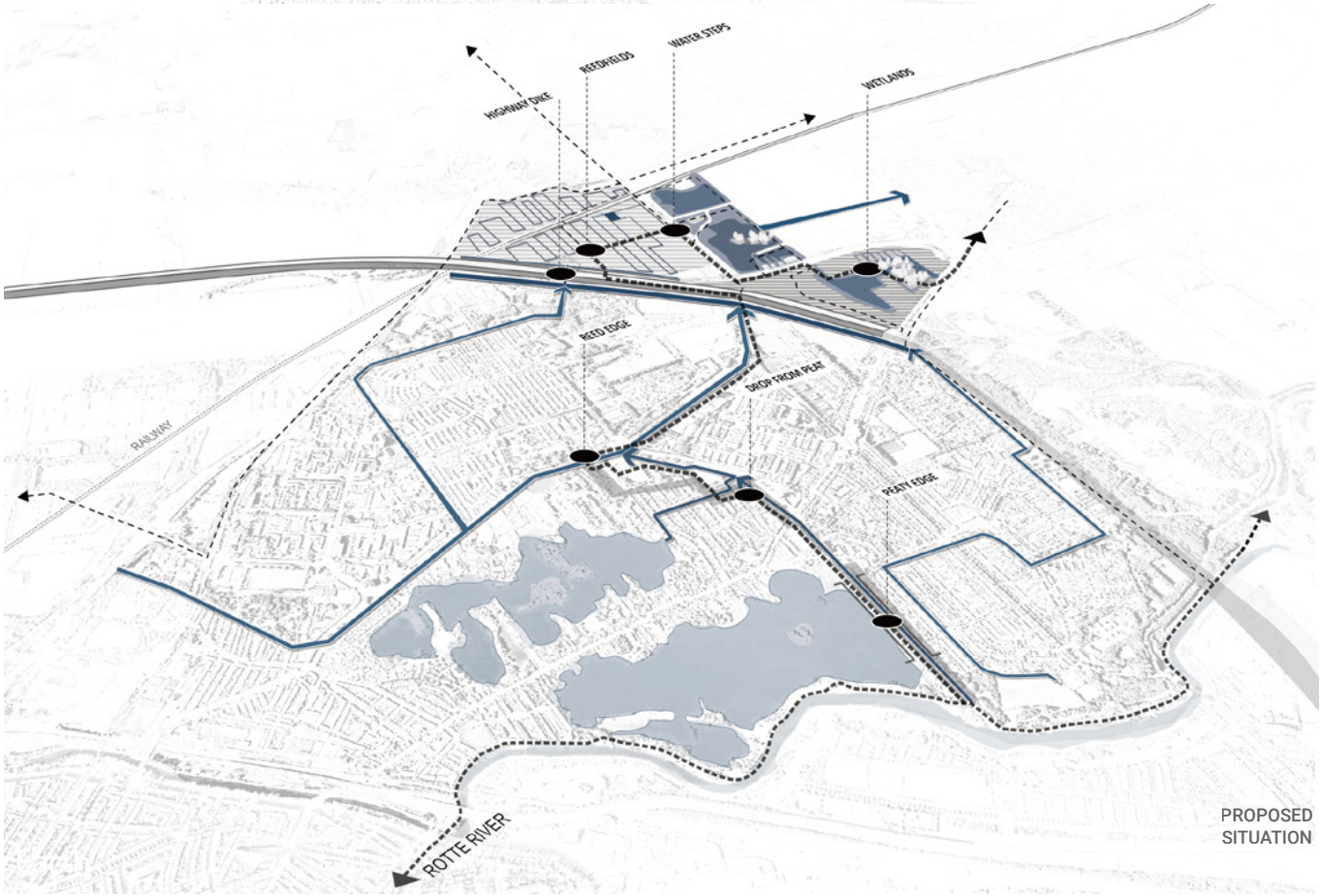
Purifying the rainwater during its flow from the higher areas to the lower area means that the trophic quality will increase. Reed fields and constructed wetlands ensure that the water stays mesotrophic. Meanwhile, biotopes are diversified.



## PERCEPTION

The flow of the water is a guiding element. Concrete and steel materiality along the route act as a supplementary thread. The highway will act as a panorama dike giving overall views of the system allowing for educational interpretations.



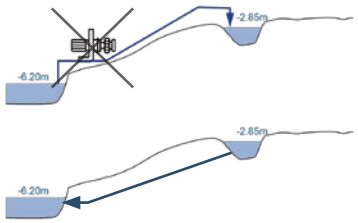




## CONCEPT

On the whole, the reversal of the water system and its influence on ecology is the underlying transformation that influences additional layers in the landscape. The original water channels become drainage channels and the pumping locations become overflow locations. The destination of the water is the open polder north of the new highway. During the drainage, eutrophic water from the urban areas is purified and filtered by means of natural edges and oxygenation in overflows. The water slowly becomes mesotrophic, a quality that is sustained in reed filtration beds and wetland ponds of the polder.

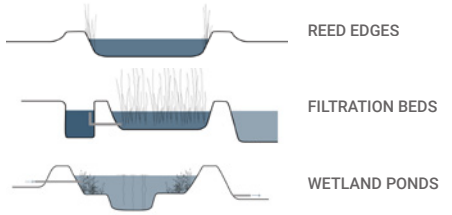
In terms of the layer of perception and context, the route follows and accentuates the historic characteristics of the two existing polder landscapes. There are certain locations that incorporate form language specific to those polders. A new form language of materiality is also introduced so that the locations where this is applied are interpreted as spaces significant to the changes in the water system and quality. This provides an educational aspect along the route: at every location a new step in the process of the water system and quality can be observed. This route fits well with the existing route along the Rotte which plays into education using heritage and historical relics.

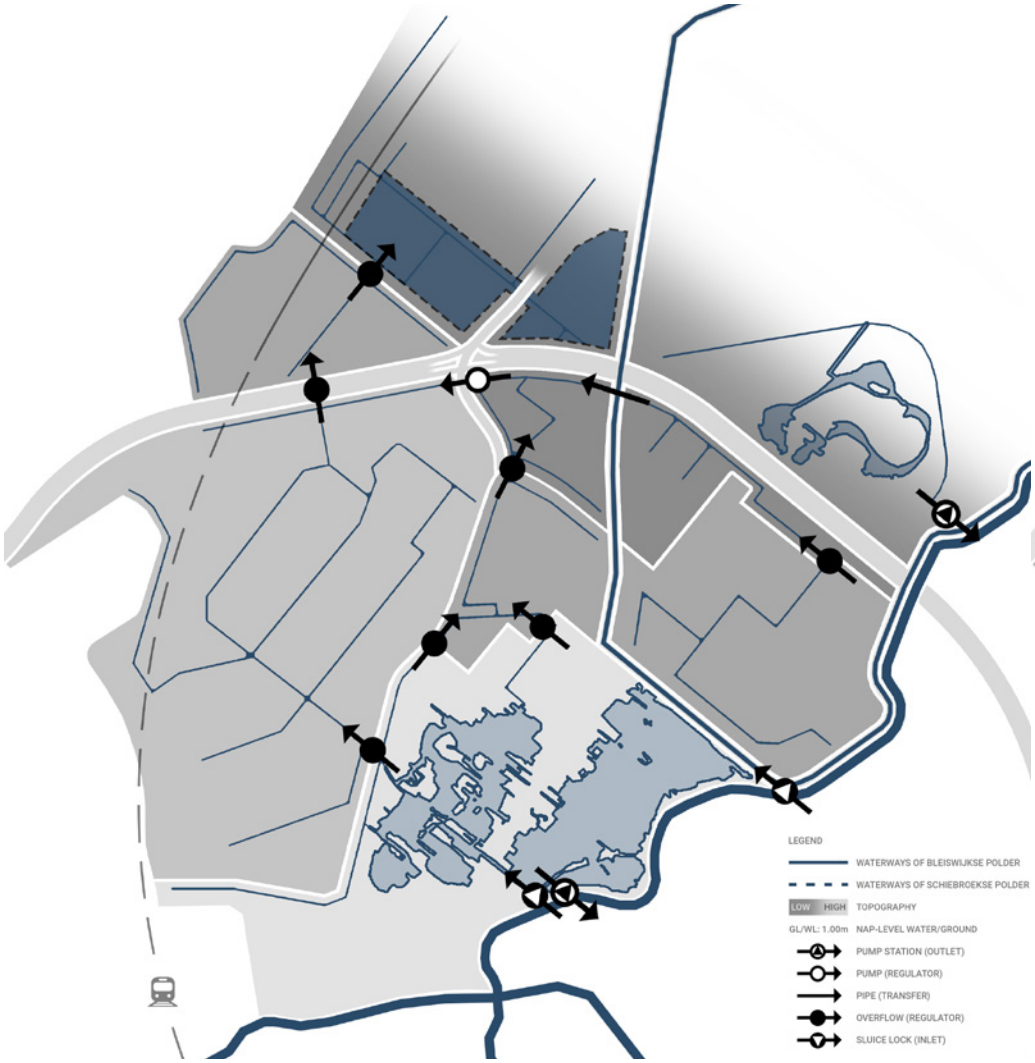
# CONCEPT (PROPOSED SITUATION) - TECHNICAL

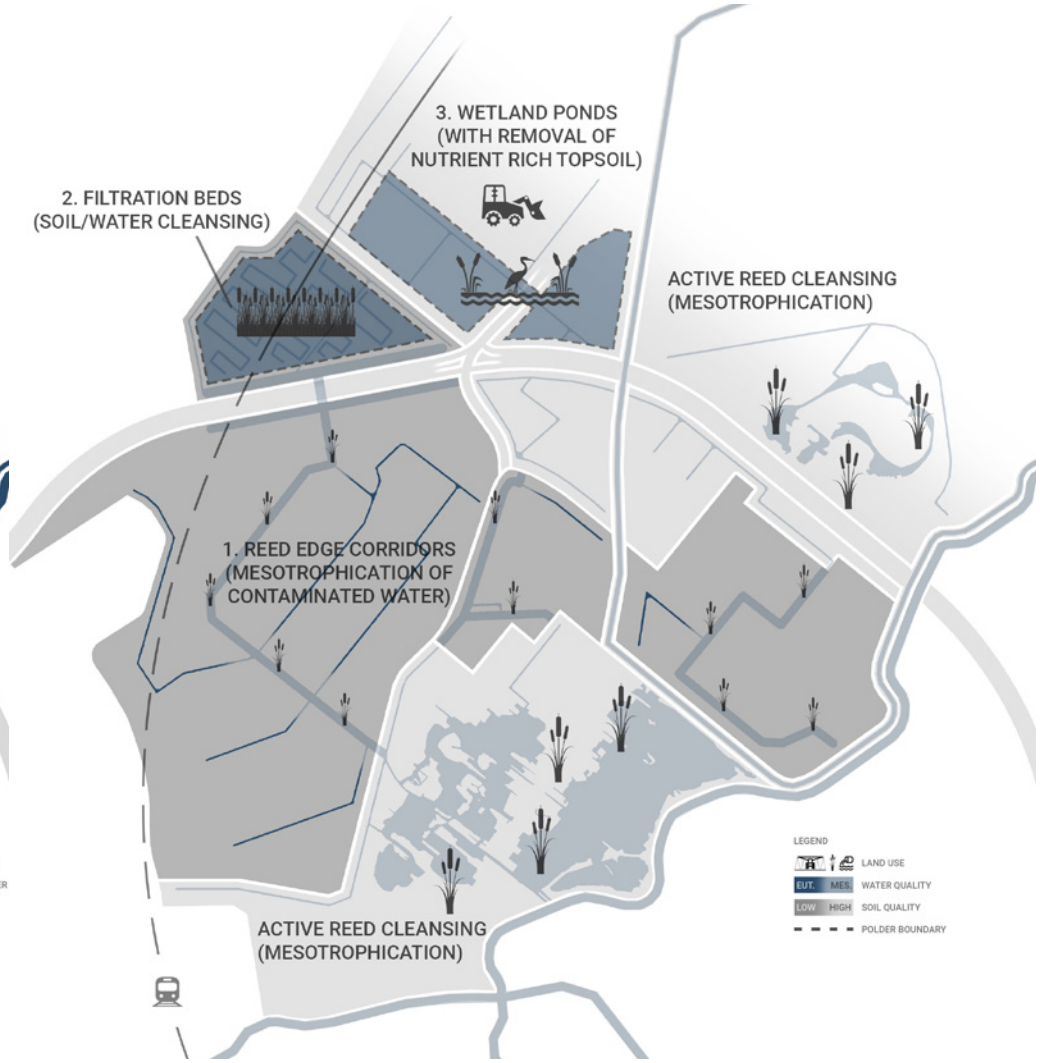



## WATER SYSTEM AND LAND USE

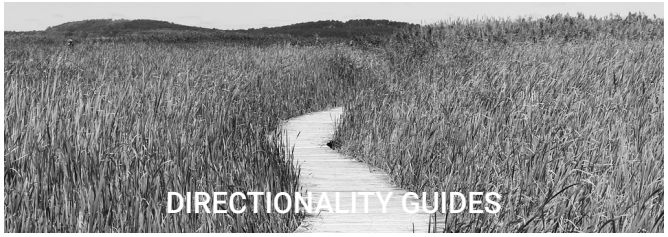
The proposal to reverse the water system requires some pumping areas to be transformed to overflows. The water levels must stay the same in order to ensure the security of the soil. The purification assignment occurs between the overflows as reed corridors, filtration beds, and wetlands. The wetland also serves as the retention pond (winter) and water source (summer).



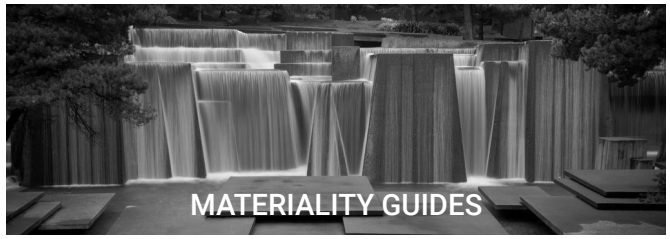



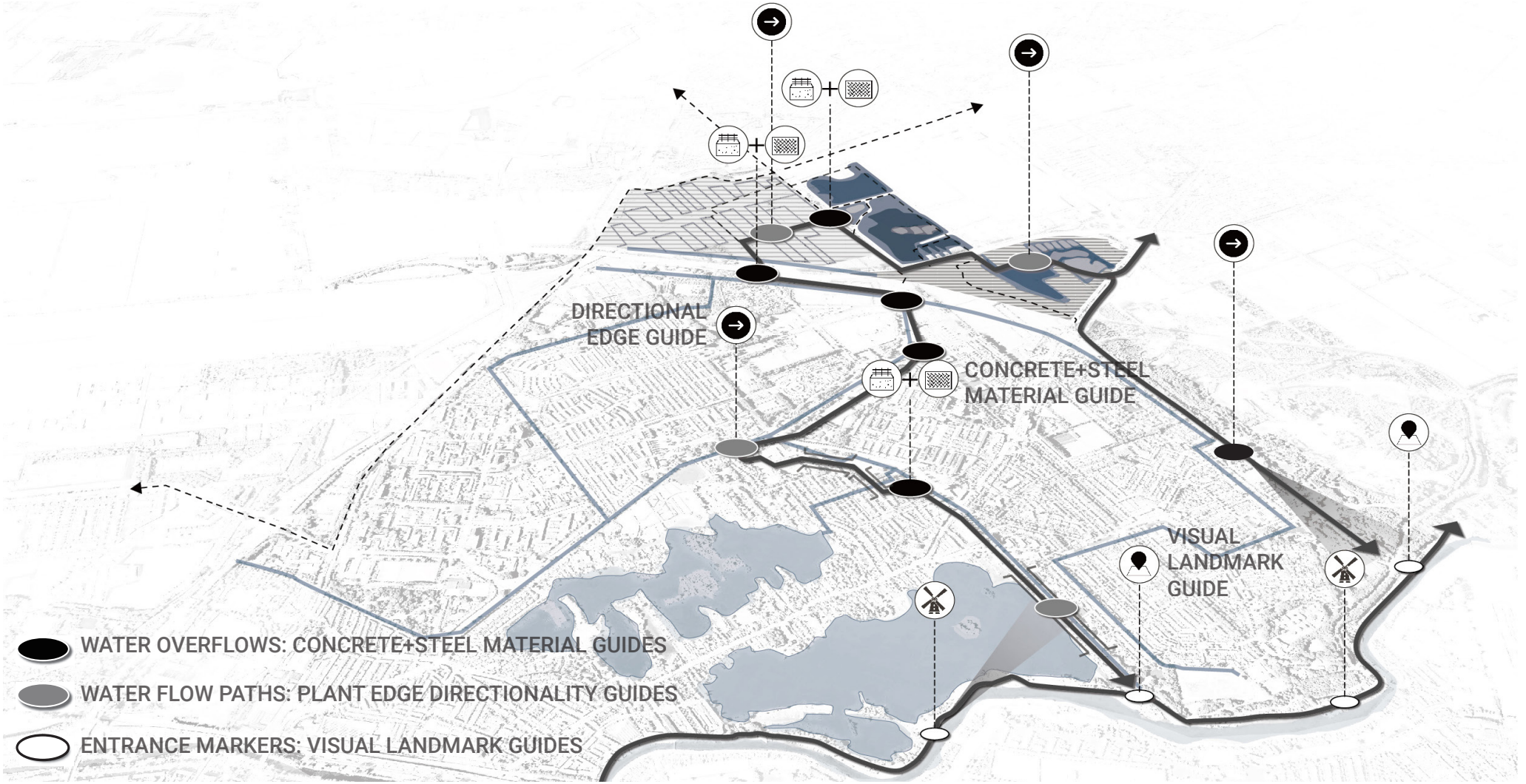
# CONCEPT (PROPOSED SITUATION) - SPATIAL




## SPATIAL CHARACTERISTICS

The proposal for the route guiding interventions occur at different locations: entryways along the Rotte (at existing landmarks), overflows (using concrete and metal elements), paths between the overflows (using directionality elements such as edge planting). This new route creates a narrative that accentuates and integrates the water, ecology, and context layers.



# MASTERPLAN

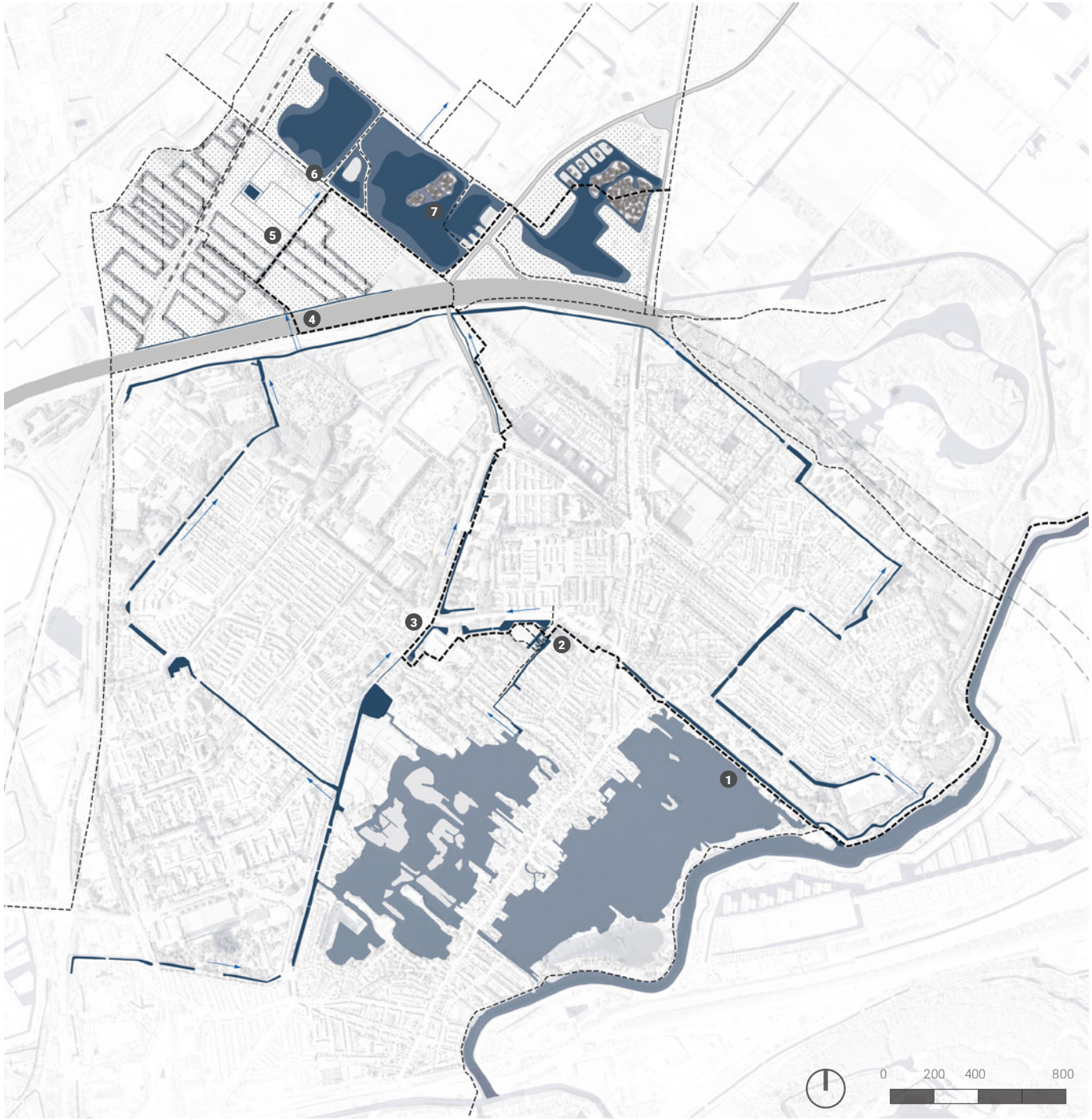
The conceptual proposal translates itself into the following masterplan. It includes seven design interventions that act as guides along the main route:

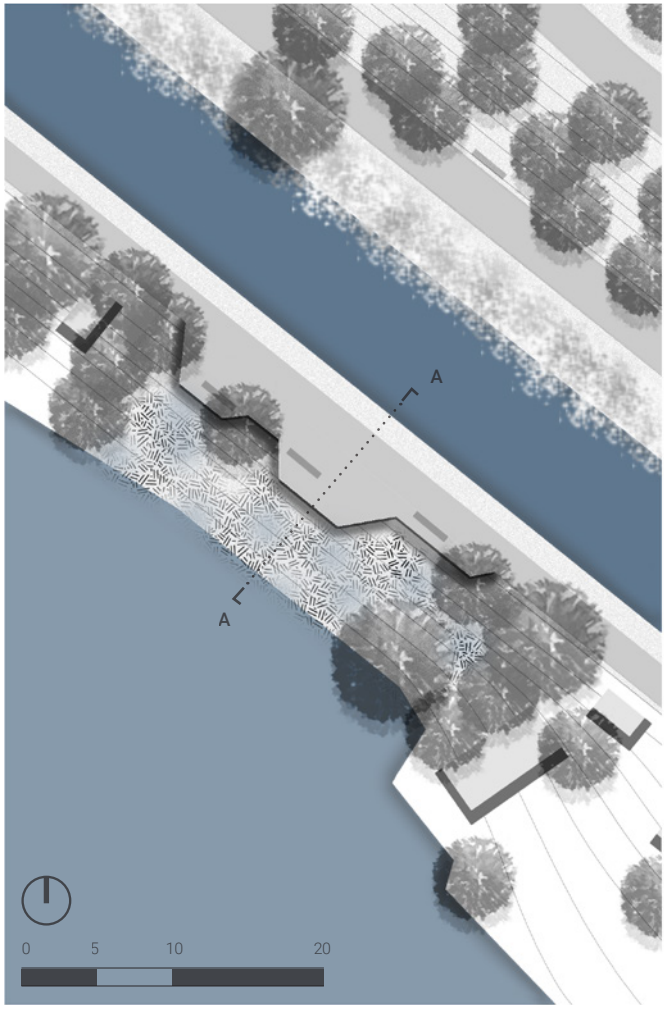
There are guides that accentuate the topographic differences in the landscape: the concrete and steel overflows (2, 4, 6).

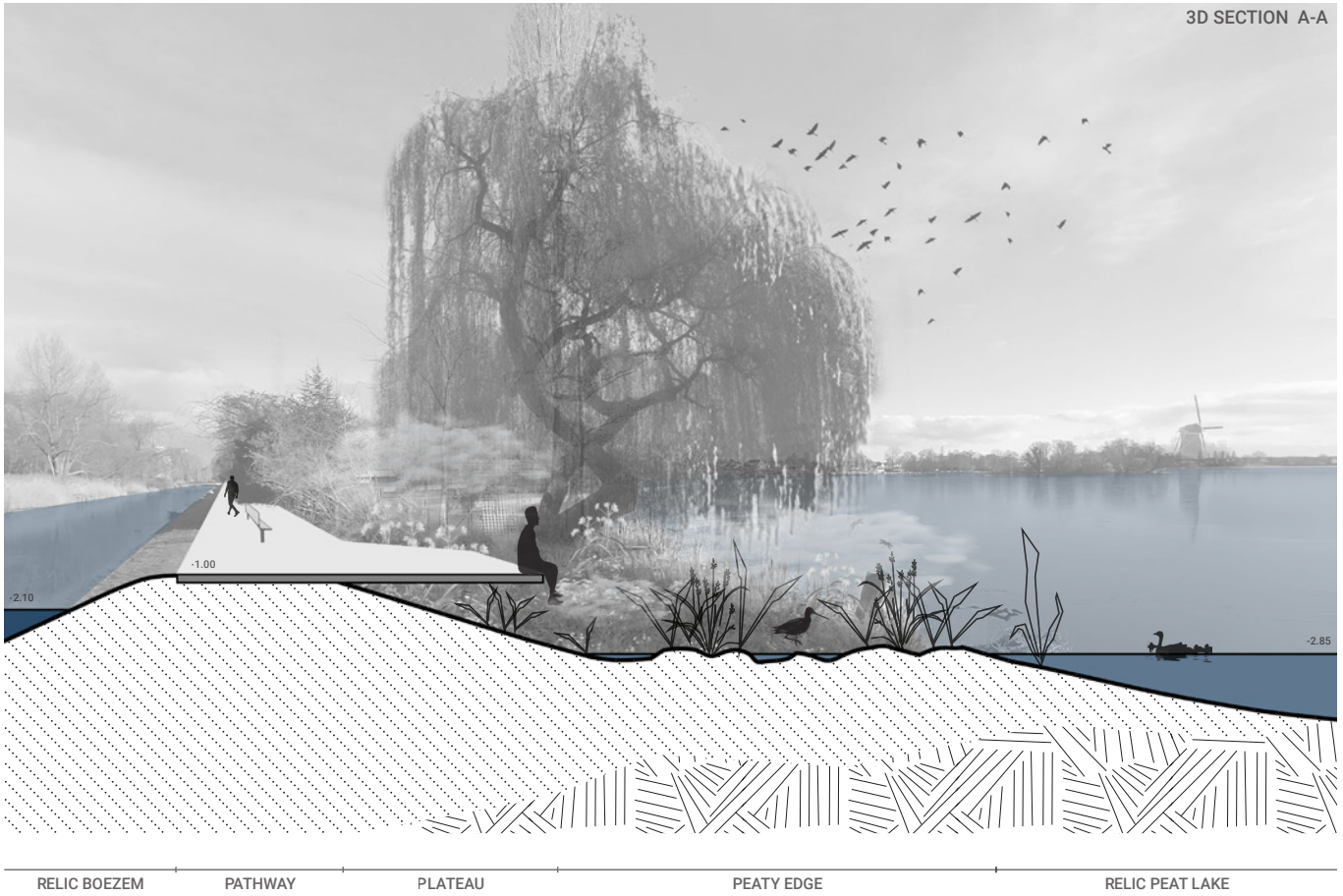
There are guides that accentuate the flow directionality of the water: the locations with specifically planted edges (1, 3, 5, 7)

It can be assumed that the form language used for these guiding locations can be incorporated elsewhere, for example where other overflows or other water flow paths exist in the concept.

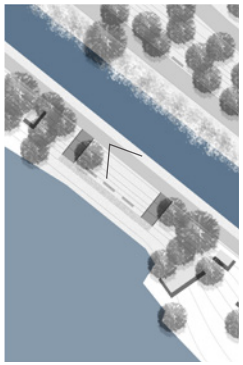
1. GUIDE 1: PEATY EDGES
2. GUIDE 2: OVERFLOW DAM
3. GUIDE 3: REED EDGES
4. GUIDE 4: OVERFLOW DIKE
5. GUIDE 5: REED FILTRATION FIELDS
6. GUIDE 6: OVERFLOW STEPS
7. GUIDE 7: WETLAND RETENTION PONDS






***flora:*** bog myrtle, cross leaved heath, purple moor grass, willow trees
***fauna:*** lapwing, gray goose, damselfly, black-tailed gotwit

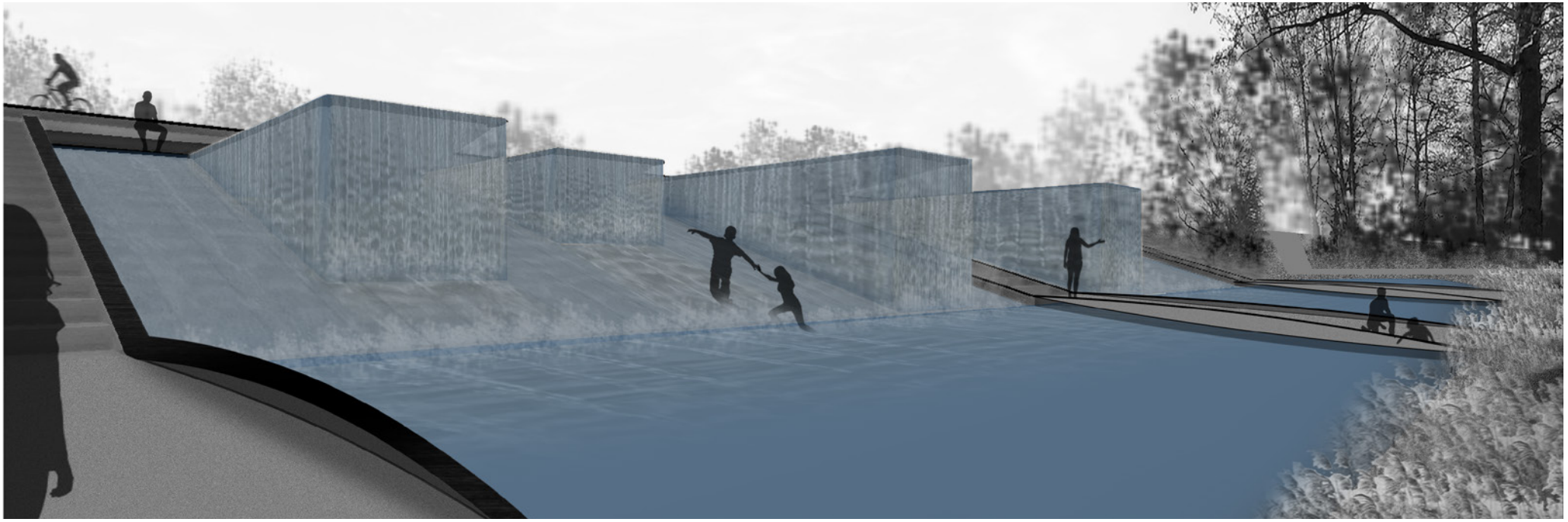


CURRENT SITUATION

# GUIDE 1 - PEATY EDGES

## INSIDE THE UNDRAINED PEAT RECLAMANTION POLDER: THE PEAT-LAKE POLDER

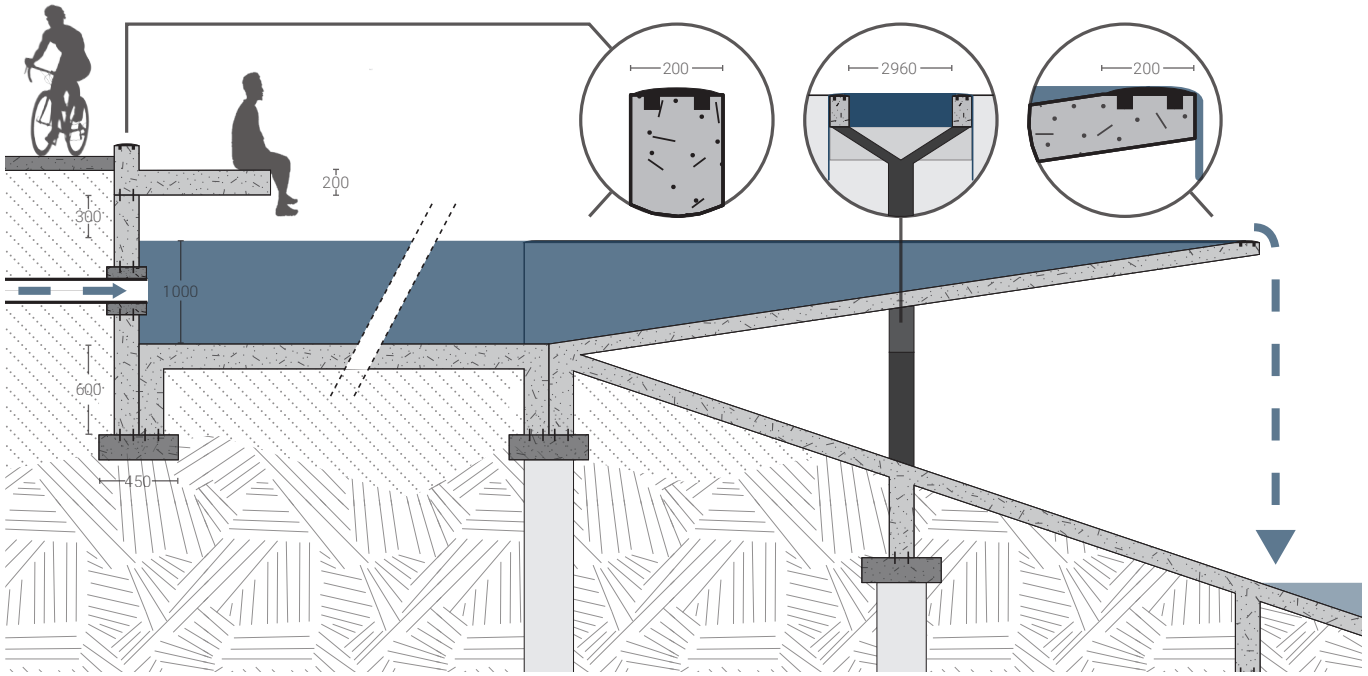
From the relic water management landmarks along the Rotte (windmill, sluice lock), the first guiding point along the routing can be easily encountered. Following the relic boezem alongside the peat lake, the characteristic peaty atmosphere is exposed in the edges. Currently, these lakeside edges are designated resting spaces with benches and patches of grass. They are over time, however, becoming inaccessible due to its growing muddy nature. Nevertheless, this process is useful in accentuating the peaty characteristic of this peat-lake polder. Therefore the edges are transformed to preserve the muddy peat edges while still allowing for human interaction. This is done by means of concrete plateaus extending outward from the main pathway above the edges. Sitting on the edge gives the feeling of being inside the peaty edge without impeding its natural processes. New flora and fauna growth is stimulated creating pleasurable sights and sounds and thus a whole new lake biotope. The growth of willow trees, for example, allow for both new habitats for animals and resting spaces for people. At the same time, the natural edges allow for further cleansing of the water.

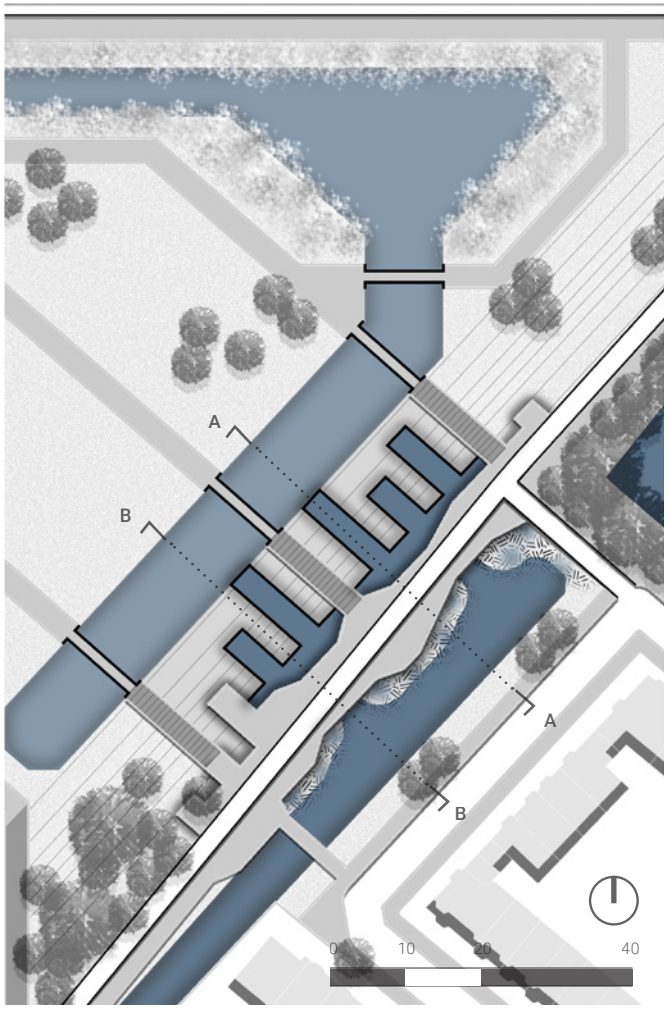


# GUIDE 2 - OVERFLOW DAM

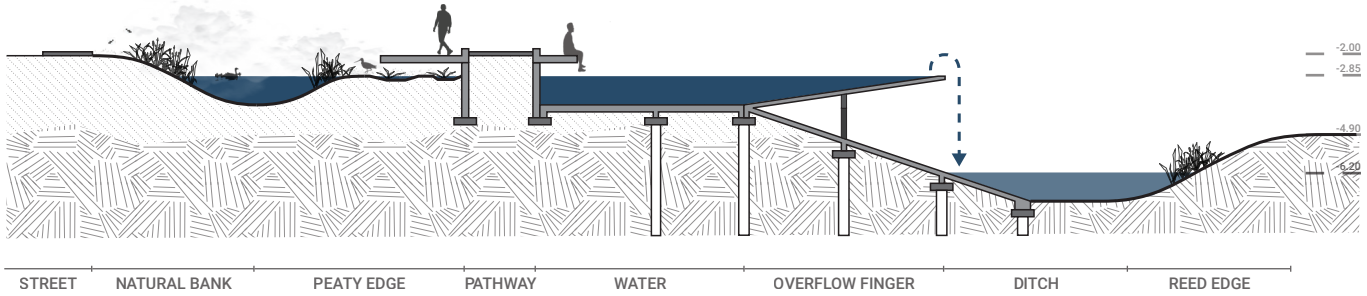
## FROM PEAT-LAKE POLDER TO DITCH POLDER

Continuing along the peaty edge and relic boezem beside the peat lake eventually guides toward a major topographic height difference. This is the boundary between the undrained peat-lake polder and the ditch polder, a drained peat-lake polder. Currently, since the water system pumps water directly to the Rotte, a pump is needed to traverse this height difference. In the new water system in which the flow direction is reversed, this location needs a transformation. In this overflow dam both the polder-type boundary and the reversed water system are accentuated. On the peat-lake polder side of the the overflow, the peaty edges, as previously seen along the lakeside, come back showing a typological link. On the ditch polder side of the overflow are a series of fingerlike projections with concrete and steel elements. These refer to the projections of land that would historically have been here to serve as drying strips for reclaimed peat from the peat-lake polder. Now that this polder has been drained, it is the water that flows across these strips. The sound of a thin film of rushing water gives the place a relaxing atmosphere and also allows for play, interaction, and educational reflection. The water also becomes oxygenated, further cleansing the water.






FINAL SITUATION: SECTION A-A

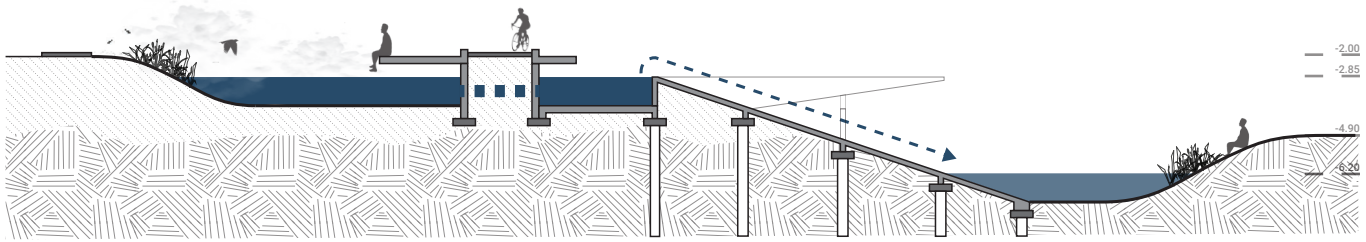



STREET | NATURAL BANK | PEATY EDGE | PATHWAY | WATER | OVERFLOW FINGER | DITCH | REED EDGE

***flora:*** bog myrtle, cross leaved heath, purple moor grass
***fauna:*** lapwing, gray goose, damselfly, black-tailed gotwit

***flora:*** reed, meadowsweet
***fauna:*** damselfly, harvest mouse, warbler

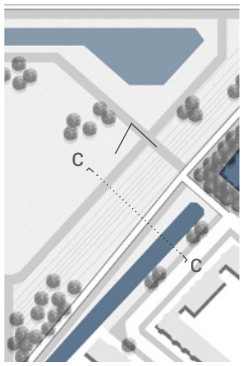
FINAL SITUATION: SECTION B-B




STREET | NATURAL BANK | DITCH | PATHWAY WITH PLATEAUS | WATER | OVERFLOW SLOPE | DITCH | REED EDGE

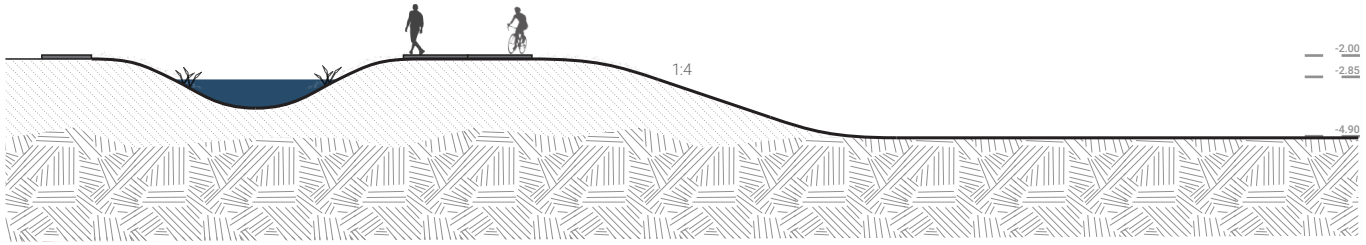
***flora:*** bog myrtle, cross leaved heath
***fauna:*** lapwing, gray goose, damselfly

***flora:*** reed, meadowsweet
***fauna:*** damselfly, harvest mouse, warbler

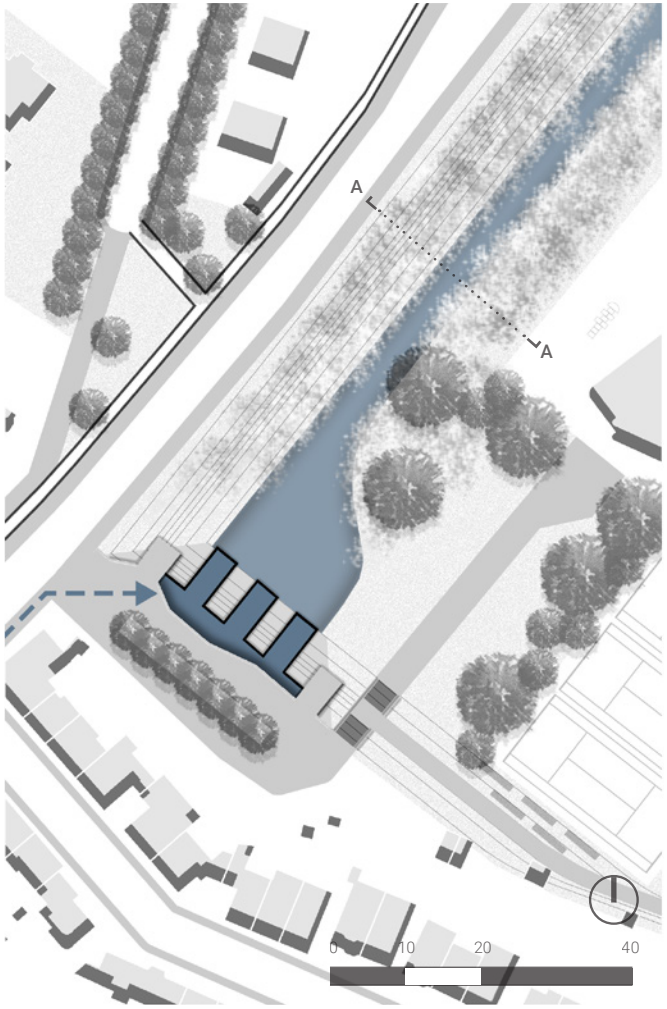



CURRENT SITUATION

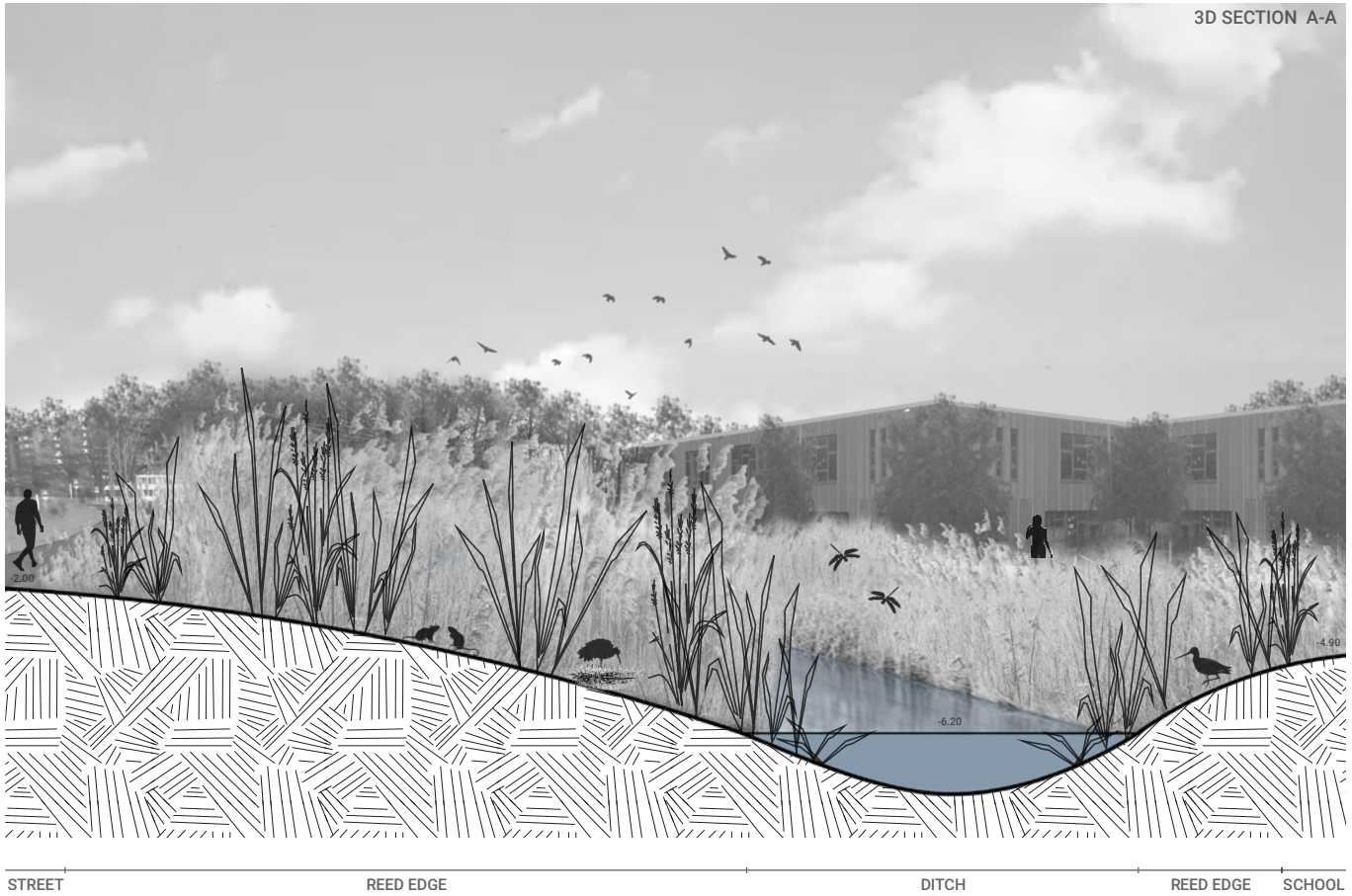
CURRENT SITUATION: SECTION C-C




STREET | DITCH | PATHWAY | SLOPE | PARK



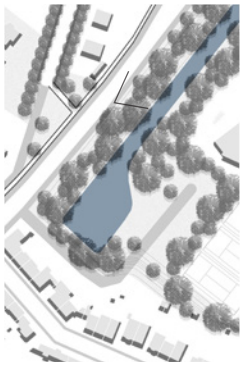

3D SECTION A-A




STREET | REED EDGE | DITCH | REED EDGE | SCHOOL

***flora:*** reed, meadowsweet

***fauna:*** damselfly, harvest mouse, warbler

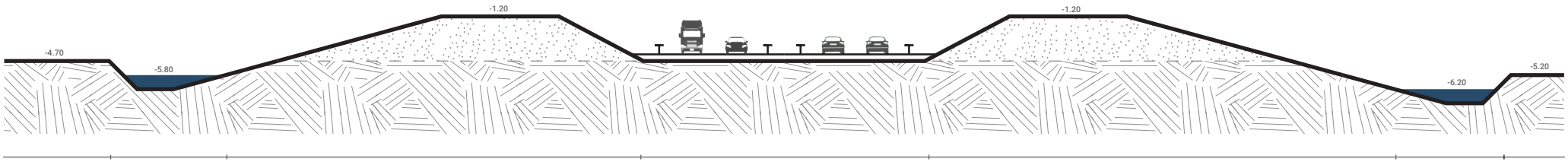


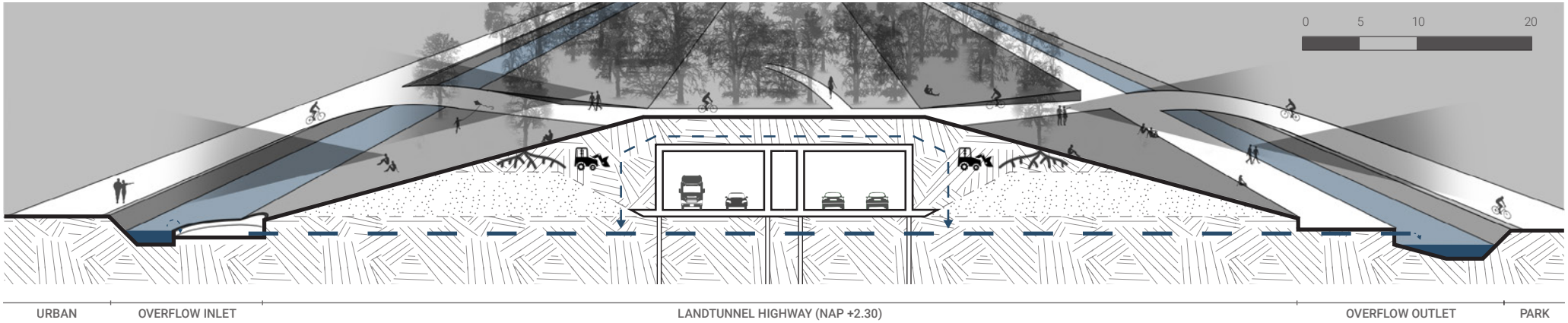
CURRENT SITUATION

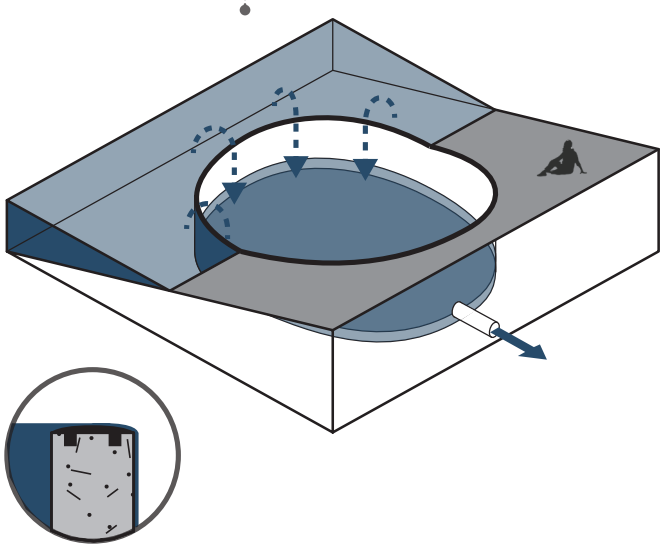
# GUIDE 3 - REED EDGES

## INSIDE THE DRAINED PEAT RECLAMATION POLDER: THE DITCH POLDER

Following the flow of the water further into the ditch polder, a new form language is applied to the edges of the waterways and waterbodies that is different from the form language used along the edges in the peat-lake polder. Here, the edges are accentuated specifically with reeds in order to show the difference between the two polder typologies. Currently, most of the edges along the waterways are either neglected, resulting in uncontrolled overgrowth, or they are hard edges, resulting in ecologically unfriendly habitats. Although this is a high density urban area, most of the edges along the main water flow direction routes allow for a transformation to incorporate reed edges. The contrast of the light coloured reeds along the waterways act as visual guides for people wanting to go even further into the ditch polder. The tall reeds also create calming noise as they wave through the wind. In locations where reeds can grow on either side of waterways, the water becomes inaccessible to people allowing flora and fauna to create new habitatats. The flow of the water along the reed beds once more filters the water and therefore increases its trophic quality.



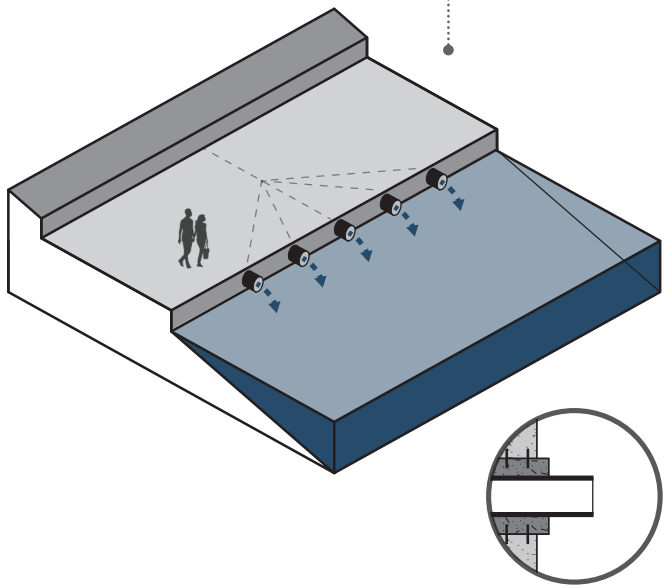



# GUIDE 4 - OVERFLOW DIKE

## UNIFYING THE DITCH POLDER ACROSS THE A16

Continuing along the reed edges and following the water flow direction, leads to a barrier that divides the ditch polder in half. This barrier is the A16 highway. Currently it is being designed as an open and exposed highway that, due to the noise, proves unsettling to cross. Alongside it run 3.5m tall sound barrier dikes. However, at the location of the Bergse Bos the highway is designed to be covered with soil creating a landtunnel. In order to reduce the barrier within the ditch polder, the highway is now covered in soil to run as a landtunnel through its entire trajectory. The soil needed for this is excavated from the agricultural side of the ditch polder. Overall, the entire 'highway dike' becomes a recreational axis. The slopes of the dike allow for panoramic views of both the urban ditch polder and the agricultural ditch polder. In this way the highway dike becomes an orientation point in the landscape. The water system requires water to cross this barrier in order to flow further downward into the depths of the polder. This is done by means of another overflow that incorporates concrete and steel material elements. The inlet is a bathtub, alluding to the issues of low lying polders. The outlet is a series of faucet pipes, alluding to the benefits of flooding polders.



# GUIDES 5/6/7 - THE POLDERPARK

The Polderpark includes Reed Filtration Fields, an Overflow and Wetland Retention Ponds. There are perspectives that the Polderpark focuses on: water system, biotopes, routing and program. The program introduces functions that can integrate with the other layers.

The main route follows the waterflow purification direction so people will understand how the water is getting cleaned.

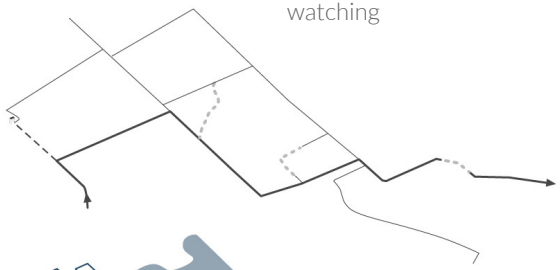
## PROGRAM

canoeing fishing muddy pond

camping bird watching hiking

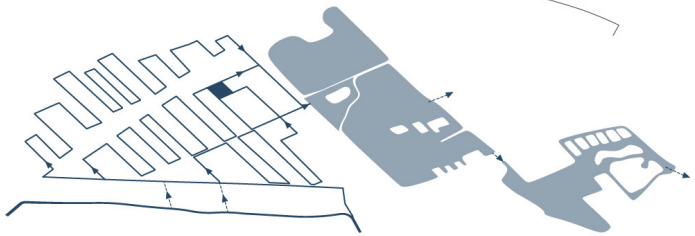
## ROUTING

- MAIN PATH
- SECONDARY PATH
- WOOD PATH BRIDGE
- PLANK PATH



The reed fields function as filtration beds so the waterflow goes from eutrophic to mesotrophic.

## WATER SYSTEM

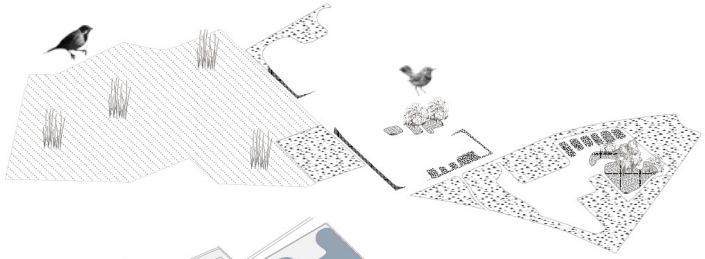


Various biotopes increase the ecological diversity.

## BIOTOPES

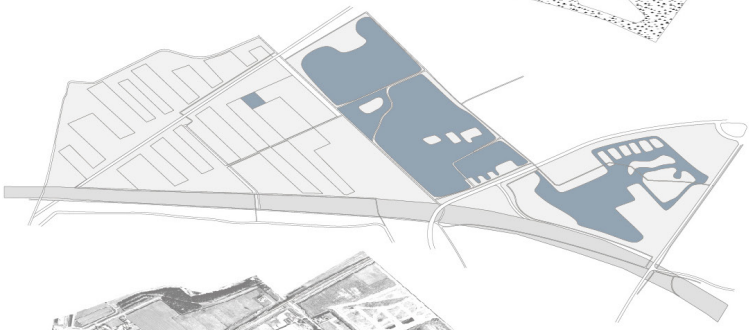
| *Flora:* | *Fauna:* |
|---|---|
| reeds | reed bunting,snake |
| buttercup,cuckoo flower, rattle | black-tailed godwit |
| purple moor-grass, small cranberry | northern lapwing |
| Parsley, loosestrife, meadowsweet | |
| willow, birch | bluethroat |

- REED FIELDS
- MOIST GRASSLAND
- FLOWERY BANK
- MOIST ROUGHS
- WOODLANDS



The proposed situation is a park-like environment that accentuates the historic context, agriculture, ecology, and water flow.

## PROPOSED SITUATION



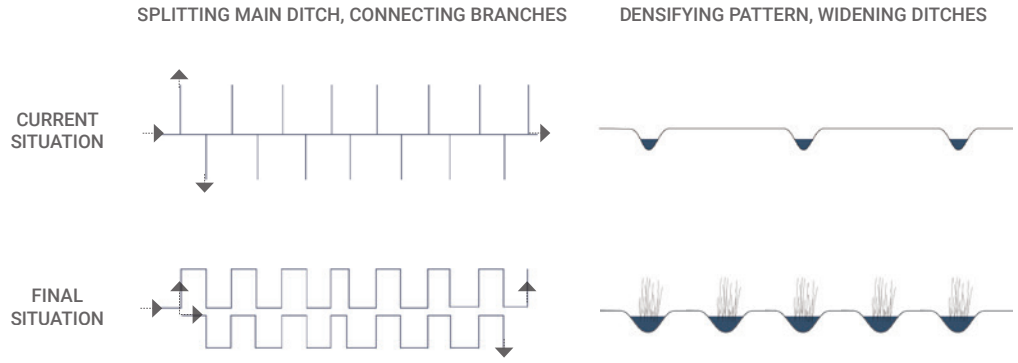
The current polder is a mixture of grassland, woodlands with oak, birch and pine, buildings.

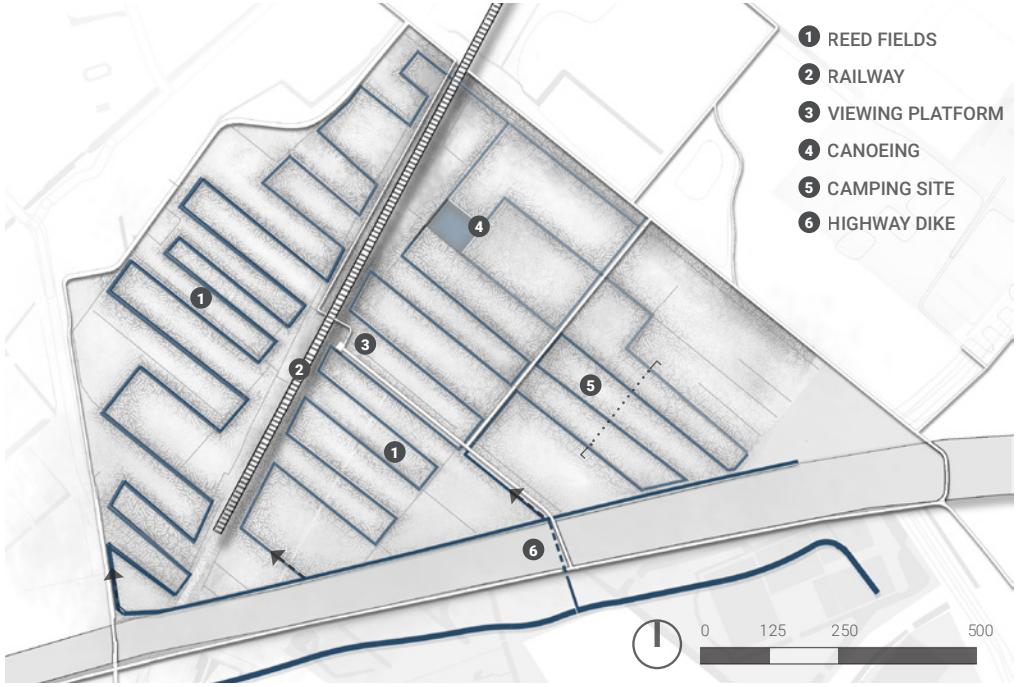
## CURRENT SITUATION

# GUIDE 5 - REED FILTRATION FIELDS

## DITCH PATTERN INTEGRATION

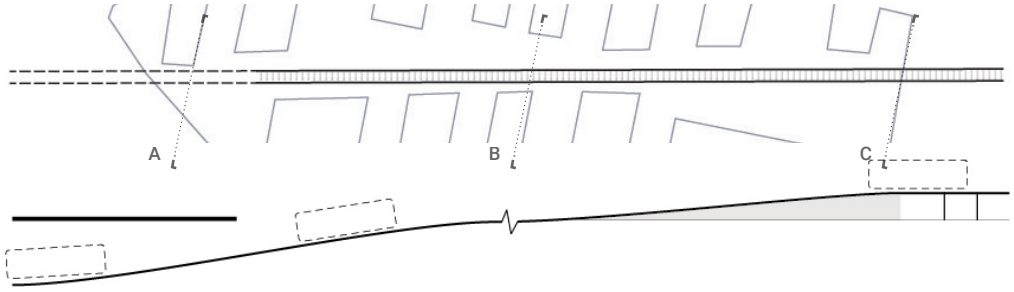
Following the flow of water out of the outlet in the highway dike, the reed filtration beds are reached. These are transformed from the existing ditches in the polder and function to further purify the eutrophic water flowing down from the urban area. The process requires a long length of reed filled ditches and thus the existing main ditch is split and the branches densified and connected at their ends. The vacant spaces between the denisified ditch pattern with tall reeds is a pleasurable place for a campground. Furthermore, the vacant spaces allow for the reed branches to be maintained and seasonally harvested, ensuring the the filtration process remains effective.

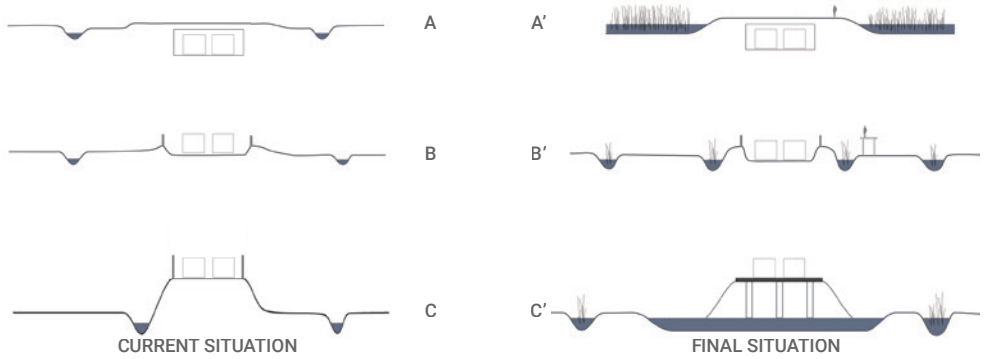



## RAILWAY TRAJECTORY INTEGRATION

The trajectory of the high speed railway line will continue to pass through the site, ascending from underneath the A16 up to and embankment within the site. However, with the tall and densified reed beds in the ditches any passing train will appear to rush up out of a sea of reeds. This spectacular scene can be captured by on a viewing platform. Meanwhile, the viewing platform allows for a panoramic view of the entire reed filtration field. Facing perpendicular to the ditches, the dense reed beds look like a sea of reeds. Facing parallel to the ditches, the underlying pattern of the ditch polder typology reappears. This creates new visual layer in the landscape palimpsest.

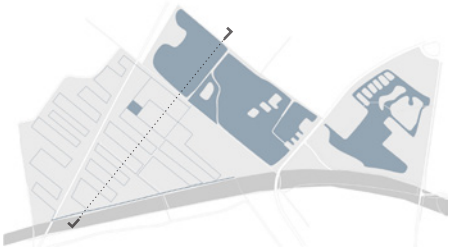


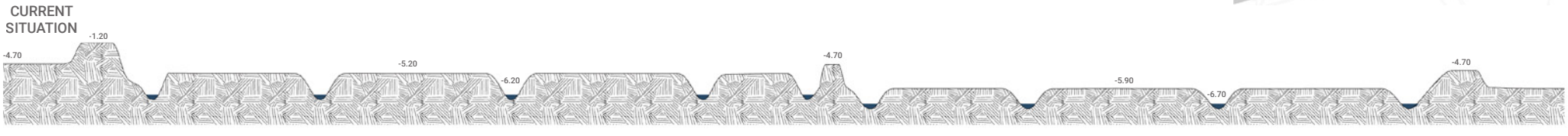



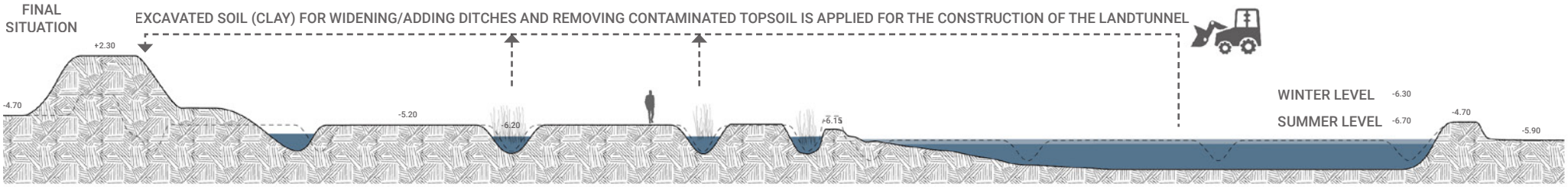
# GUIDE 6 - OVERFLOW STEPS

## FROM FILTRATION FIELDS TO RETENTION PONDS

Continuing deeper into the ditch polder the destination of the water, the wetland retention pond, becomes visible. It functions to retain water in the wet winter season and to provide water during the dry summer season. To sustain the mesotrophic quality of the water which has been arduously established up to this point, the nutrient rich agricultural topsoil must be removed. It is removed such that an interesting topography results. The soil is applied for use on the A16 landtunnel.

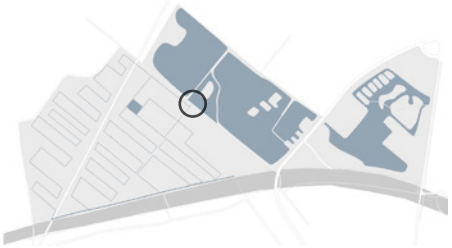


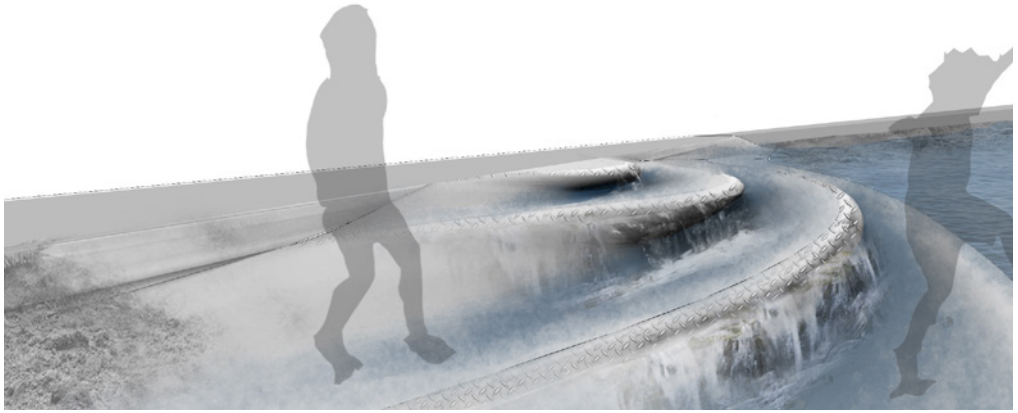


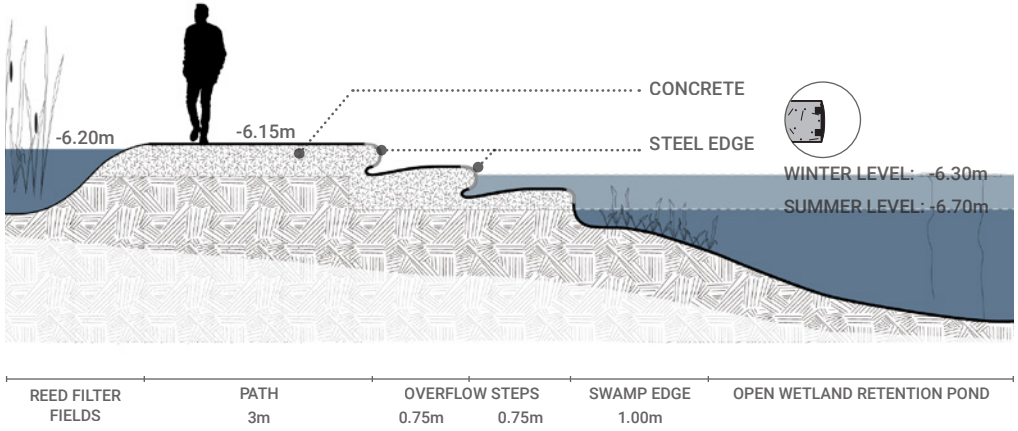




## REGULATING THE WATER LEVEL

The existing overflow at this location is transformed to become part of the series of overflow waterworks designed using concrete and steel material elements. In this way it becomes part of the guiding thread along the main route and water flow direction. Its form language of a series of concrete overflow steps alludes to the seasonal water levels in the retention wetland. The steel lips with non-slip texture allow for the water to break when falling down the edge. The active mixing oxygenates the water keeping its quality good. The noise and white colour of the waterfall remind people who interact with this intervention of the previous overflows and their largers scale function.



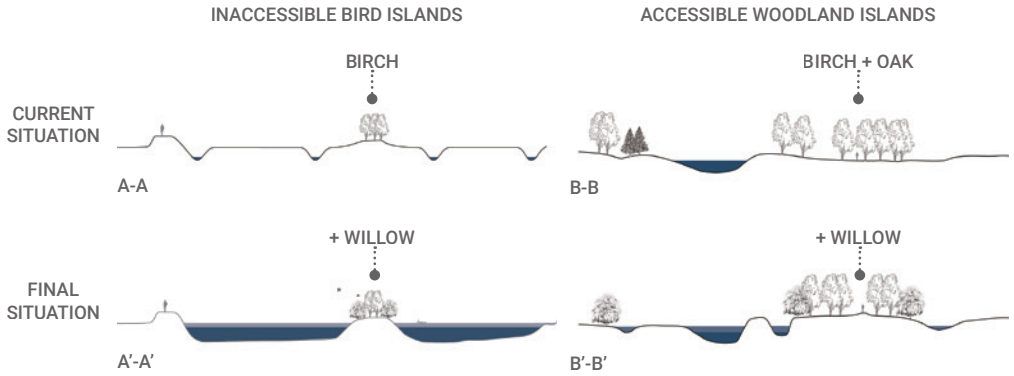


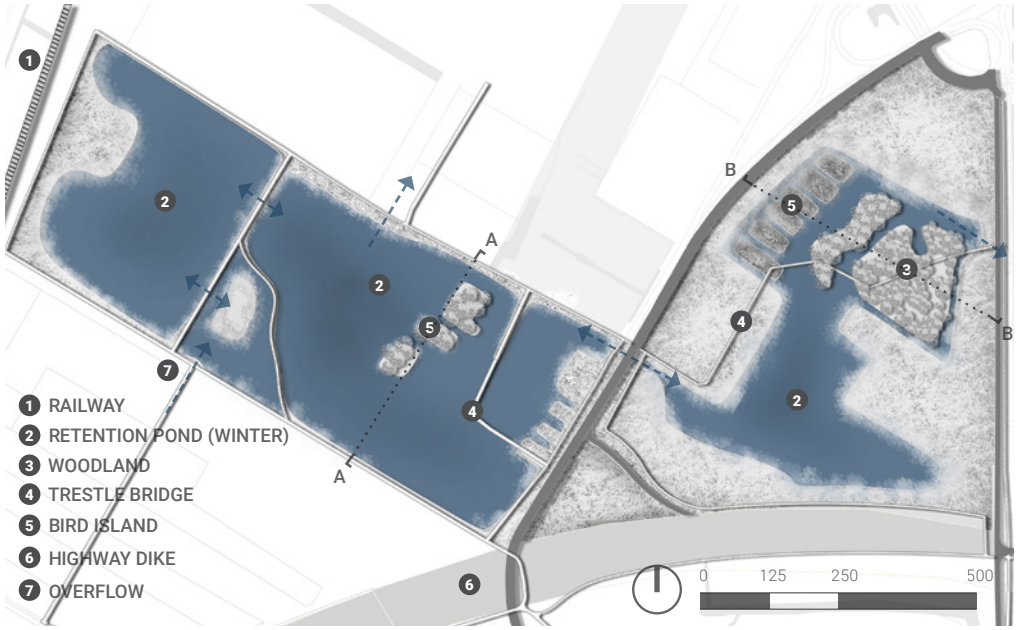


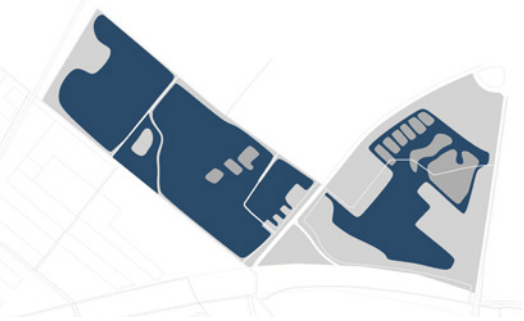
# GUIDE 7 - WETLAND RETENTION PONDS

## ROOM FOR NATURE AND PEOPLE AND WATER

Passing beyond the overflow steps, the wetland retention pond is reached. The main purpose of this pond is water storage. However, the summer and winter water levels work with the diverse topography to also create an interesting ecological landscape. The reed edges become seasonal landscapes introducing different biotopes throughout the year. This part of the Polderpark gives flora and fauna different accessibilities. There are, for example, bird islands inaccessible to people to ensure for undisturbed habitats. Other island, such as woodland island, are fully accessible. A setup like this, with specific division of biotopes, makes this wetland more like a feature-rich park.

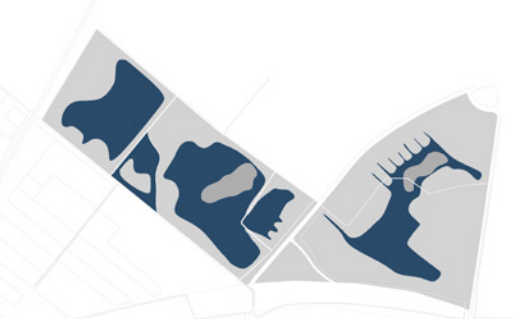


SEASONAL LANDSCAPE:

WINTER WATERLEVEL



SEASONAL LANDSCAPE:

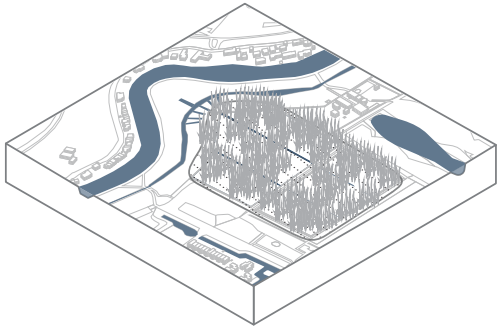
SUMMER WATERLEVEL

# A BLUER OMMOORD

## OMMOORD POLDER

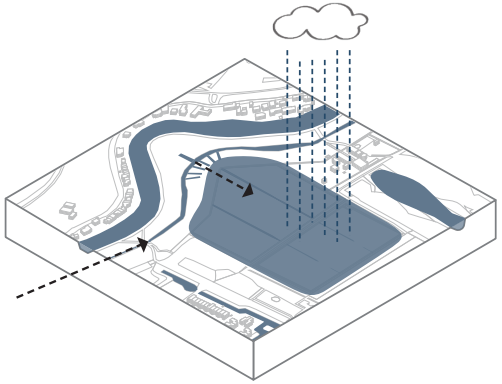
Jantine van Halsema 4559886 | Sui-hui Kuo 5286441

# CONCEPT



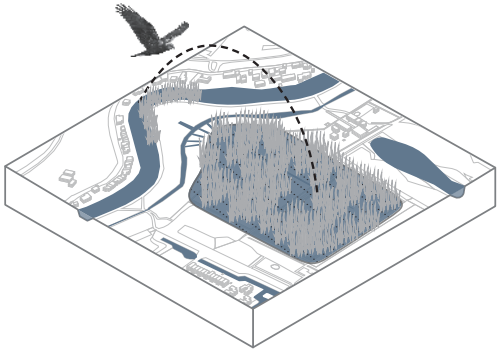
## CONTEXT

Ommoord is one of the few places with peat soil left. Therefore preservation is important.



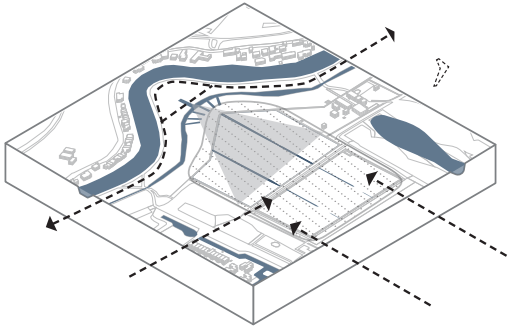
## WATER MANAGEMENT

A purification and retention system is added to the current system. In this way the area is more resilient for heavy rainfall and the peat soil can be made wet in dry periods.



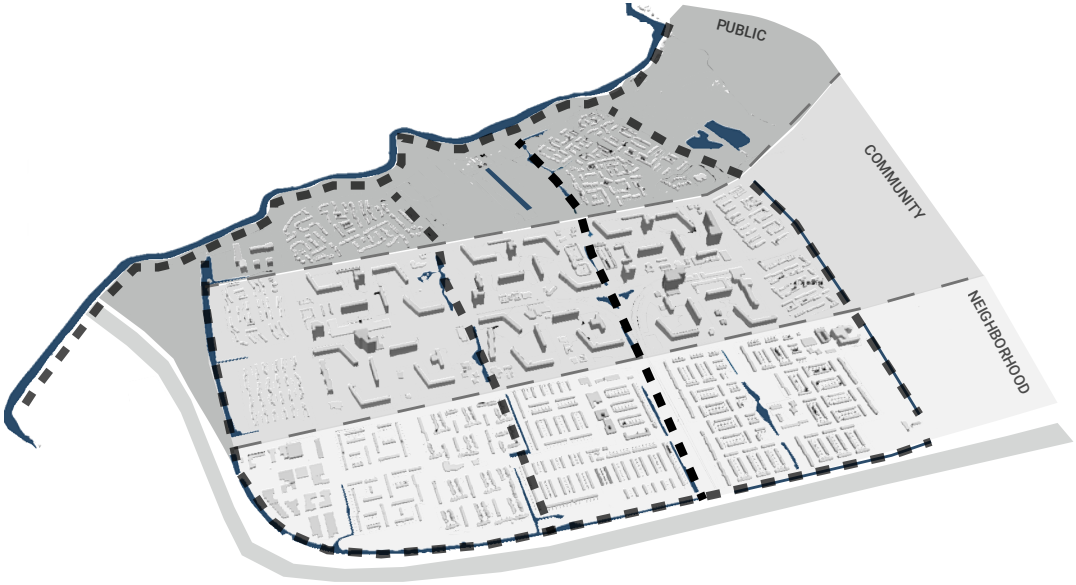
## ECOLOGY

On parts in the Rote natural banks will be created to improve biodiversity. Also the wetting of the peat creates a special habitat for flora and fauna.



## PERCEPTION

Along the Rotte the perception on water and land is changed by guiding people closer to the water and closer to the historic peat landscape.




NEIGHBORHOOD

COMMUNITY

PUBLIC

## CONCEPT

Ommoord is a district within Rotterdam that lies right along the Rotte. It is characterised by its abundant green public space, cosy family neighborhoods and open high-rise ring. However, besides a lot of strenghts there are also problems that can be seen in this area. The main ones being lack of (bio)diversity in the public spaces, a water system that is not resilient, disappearing peat and overcrowding along the Rotte dike.

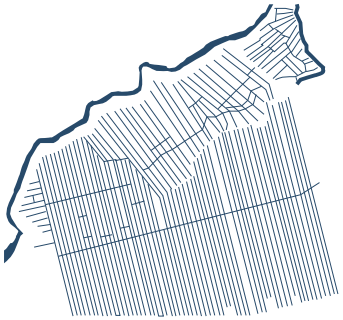
To solve these problems we have divided the area into three different zones: neighborhood, community and public. Each zone is different and therefore needs a different approach to solve a number of these problems. Through a routing system that goes along the main water streams, the zones are tied together. In this routing relations to the water are explored that reconnect people with the water and improve biodiversity, at the same time it forms a clear route that leads people to the Rotte.

To make the area more resilient for heavy rainfall and dry summers, more water will be retained in the area by widening water streams and creating a series of purifying and retention ponds. In this way the peat soil can be kept wet enough all year around so it does not subside.
Another way to bring more attention to the water is through perception. By guiding people along and over the water and stressing certain views, people will become more aware of the water(system) and the landscape around them.

In this way we try to create a bluer Ommoord!

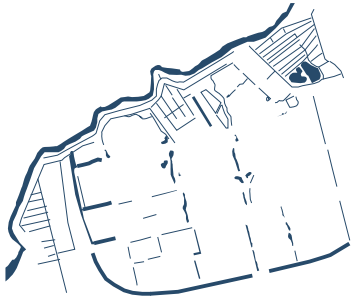
# ANALYSIS OF OMMOORD

## HISTORY



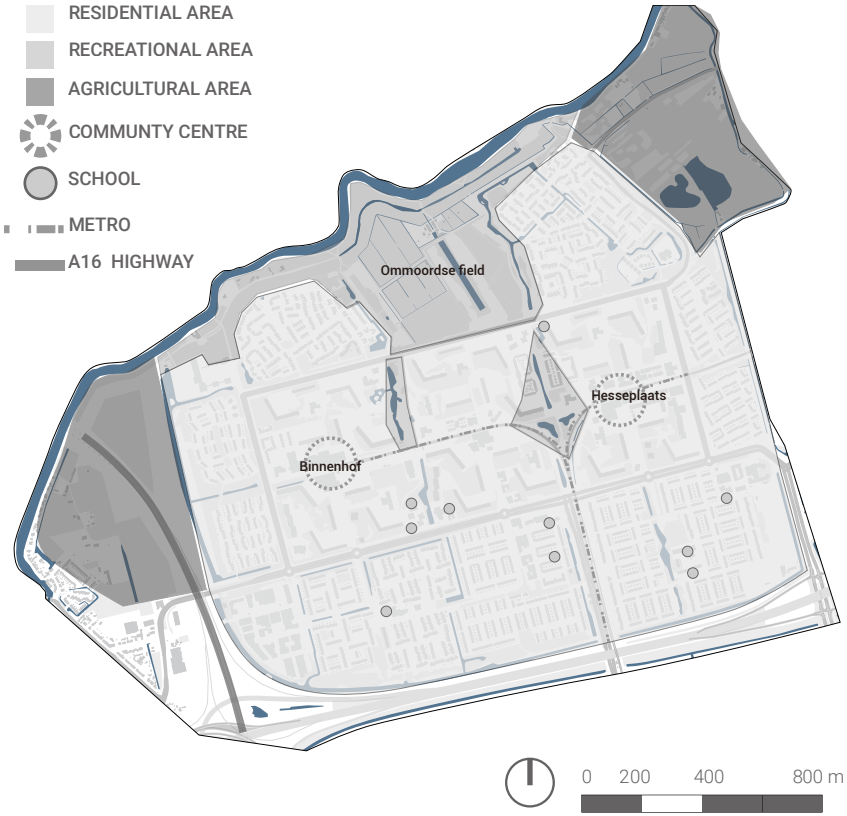
1872
This is the result from the dry making of this polder from a peat lake that formed from extensive peat digging that started form the middle ages on. Long before, around 4200 B.C it was a swamp area inhabited by hunters and fisherman.

1980
In 1965 the city of Rotterdam starts building a new residential area. The design by urban planner Lotte Stam-Beese is characteristic for its high rise ring with a lot of green public space in between. However, because of this most of the peat landscape is lost.



2019
Over time the residential area gets extended towards the Rotte. Only a few patches of peat are left. After protests from inhabitants large public spaces such as the 'Ommoordse veld' are kept. Efforts are made to create more water surface to retain water and handle heavy rainfall.

## CURRENT LAND USE AND PROGRAM




## INHABITANTS AND USER GROUPS

**Total of 25,730 inhabitants (2020)**

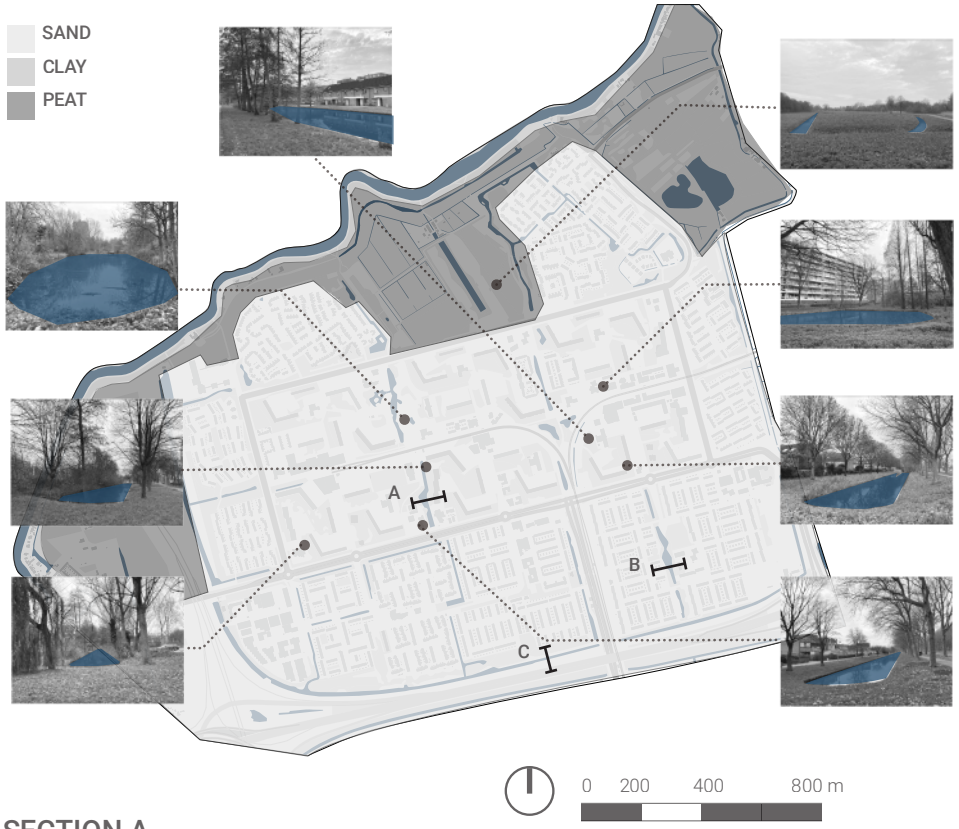
**31% OF INHABITANTS 65+**
**56% IS 45 YEARS OR OLDER**
**14% IS 0-15 YEARS OLD**

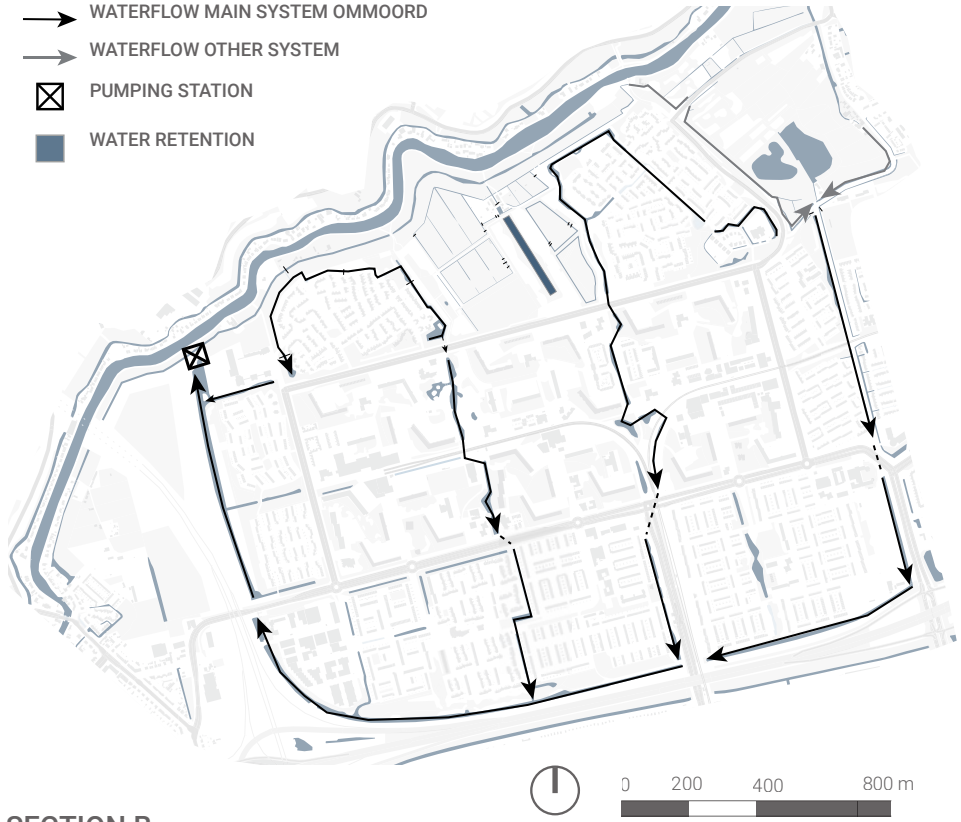
**Alot of elderly people live inside 'the ring' in apartment buildings.**

The Rotte is a popular space to recreate along. The Rotte dike is used extensively by people hiking, rowing, running and cycling. Both local and from the whole surrounding area running from Delft to Gouda. For the inhabitants of Ommoord the 'Ommoordse veld' is also a popular place to get some fresh air.

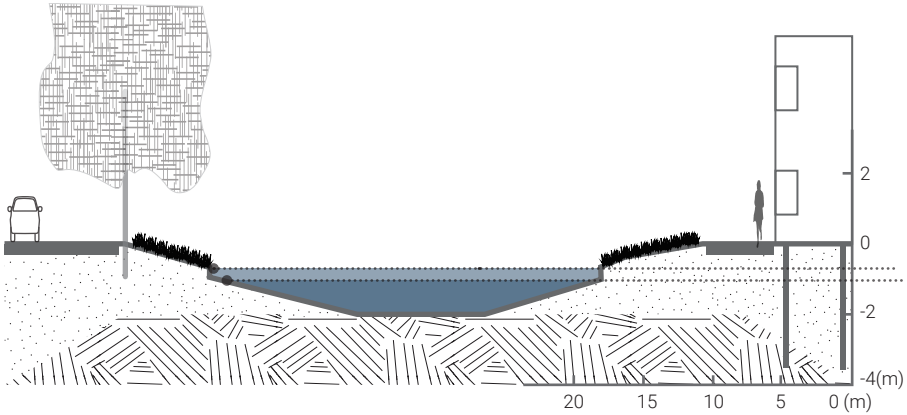
# ANALYSIS OF OMMOORD

## ECOLOGY AND WATER SYSTEM

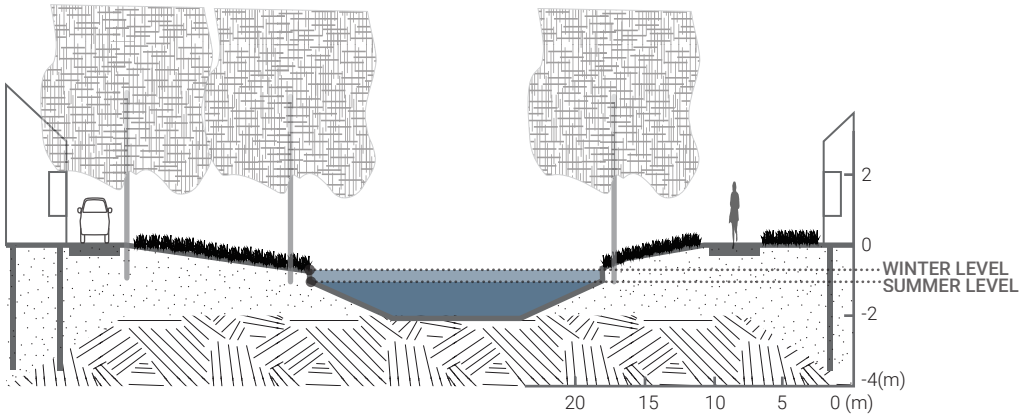


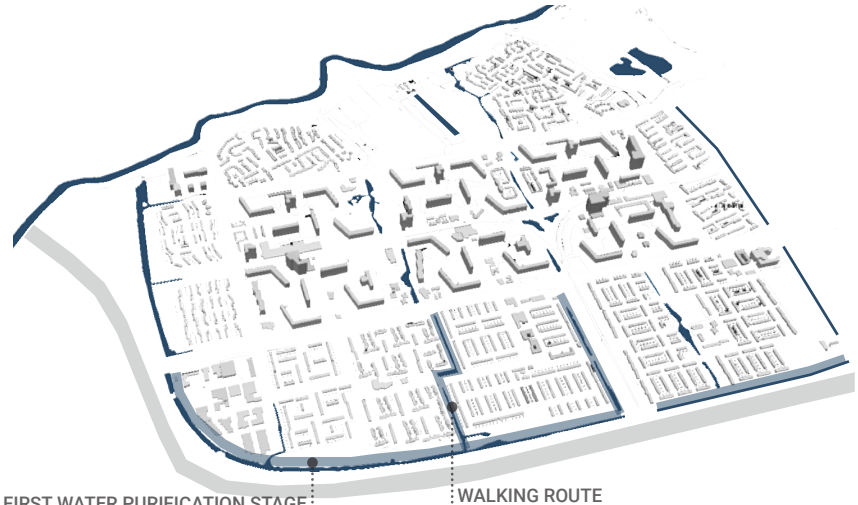

## SECTION A




## SECTION B



# MEANINGFULL INTERVENTIONS WITHIN CONCEPT



**FIRST WATER PURIFICATION STAGE**
Widen banks of the waterway
Creating natural banks
Adding plants with cleaning properties

**WALKING ROUTE**
Making water edge more acccesible
Diversifying banks

**NEIGHBORHOOD**

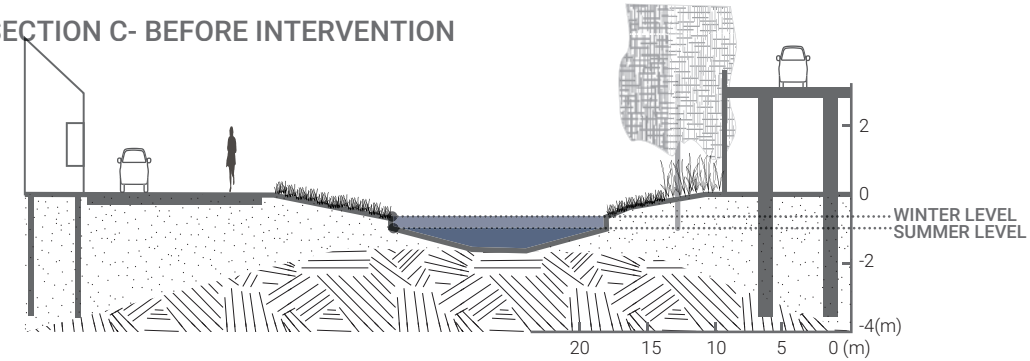
INCREASE BIODIVERSITY

ENHANCE TRAVEL EXPERIENCE

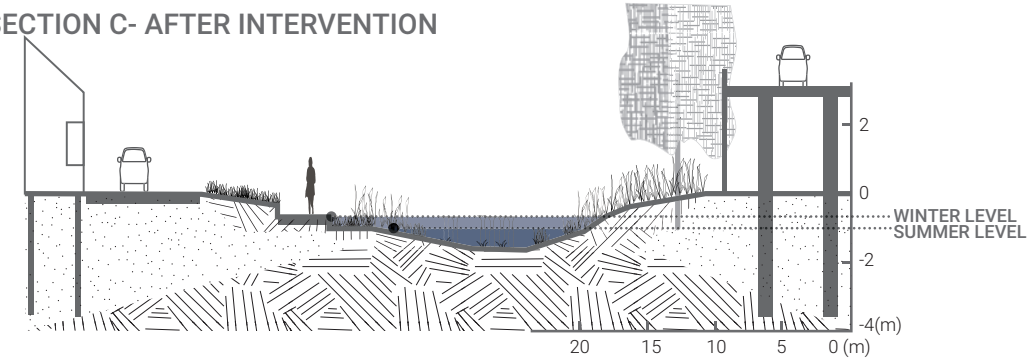
WATER PURIFICATION

WATER RETENTION

**SECTION C- BEFORE INTERVENTION**

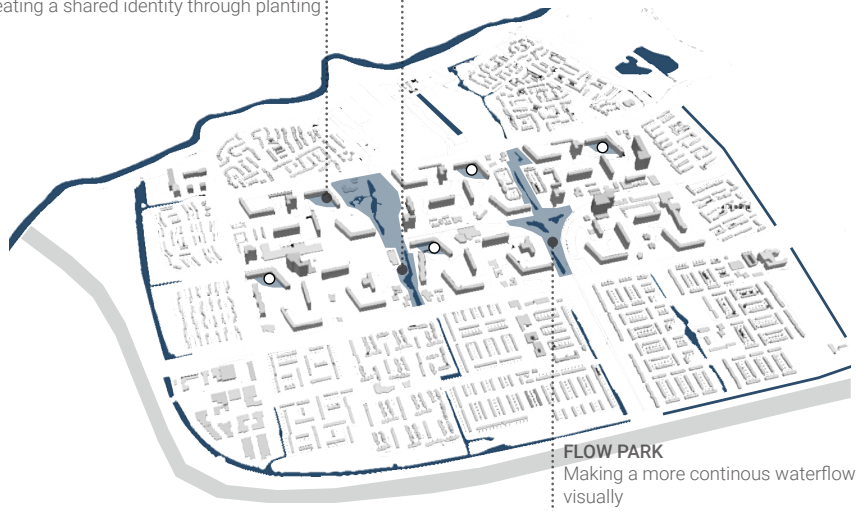



**SECTION C- AFTER INTERVENTION**




**COMMUNITY GARDEN**
Expand garden to the south
Renewing relations to the water
Creating a clearer route along the water

**IDENTITY INITIATIVES**
Diversifying public green space
Creating a shared identity through planting



**FLOW PARK**
Making a more continous waterflow physically or visually
Creating a clearer route along the water

**COMMUNITY**

CREATE SENSE OF COMMUNITY

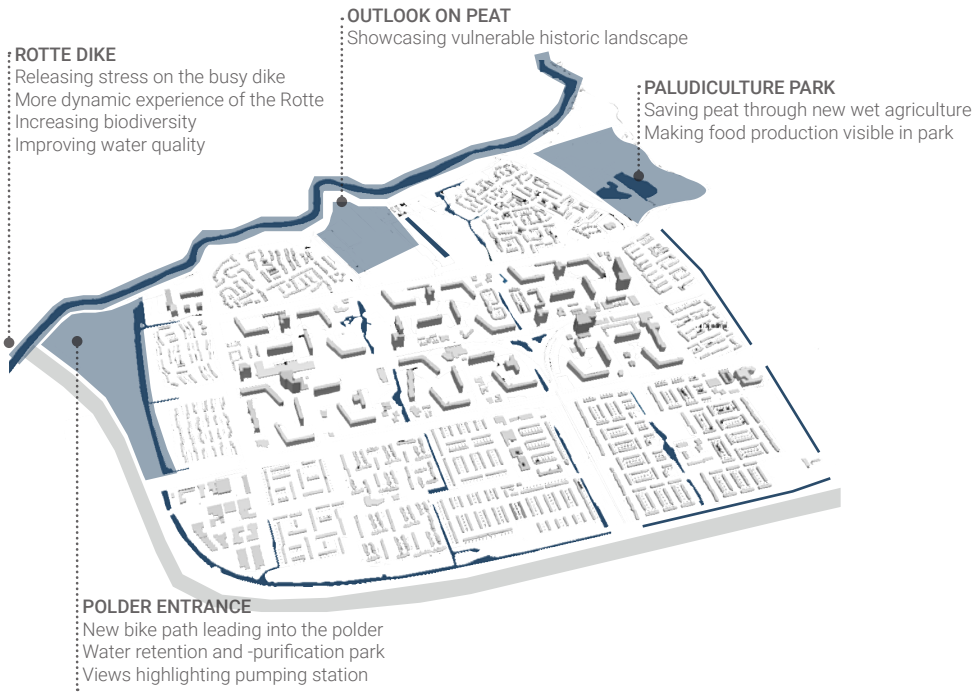
INCREASE BIODIVERSITY

CURRENT SITUATION
Very little diversity in green public spaces make them feel anonymous and has little value for biodiversity

NEW SITUATION: IDENTITY INITIATIVES
Half of the empty fields of grass will be transformed into fruit or nut orchards, and herb and flowergardens. Hereby a shared identity and activities are created for the different buidling blocks and there is an increase of biodiversity.

# THE PUBLIC ZONE

## INTERVENTIONS




PUBLIC


## IMPORTANT ROUTING


**1. ALONG THE ROTTE**
The Rotte dike is improved with pedestrian bypasses, that firstly give an outlook onto to the pumping station. Furthermore they put focus on biodiversity and relation to the water. The bypass over peat will engage people with the vulnerable historic peat landscape.

**2. DETOUR INTO THE POLDER**
The retention pond will provide an open view to the pumping station. Then a path over water will attrackt people to go into the polder. Here they will be lead along the water in the opposite flow direction back to the Rotte again.

## IMPORTANCE OF THE PUBLIC ZONE

This public zone is under high pressure because of the general rising need for recreational space. The Rotte dike here is only 3 meters wide and has to house cars, cyclists and pedestrians. Currently this causes unsafe and uncomfortable situations for people that are recreating here.

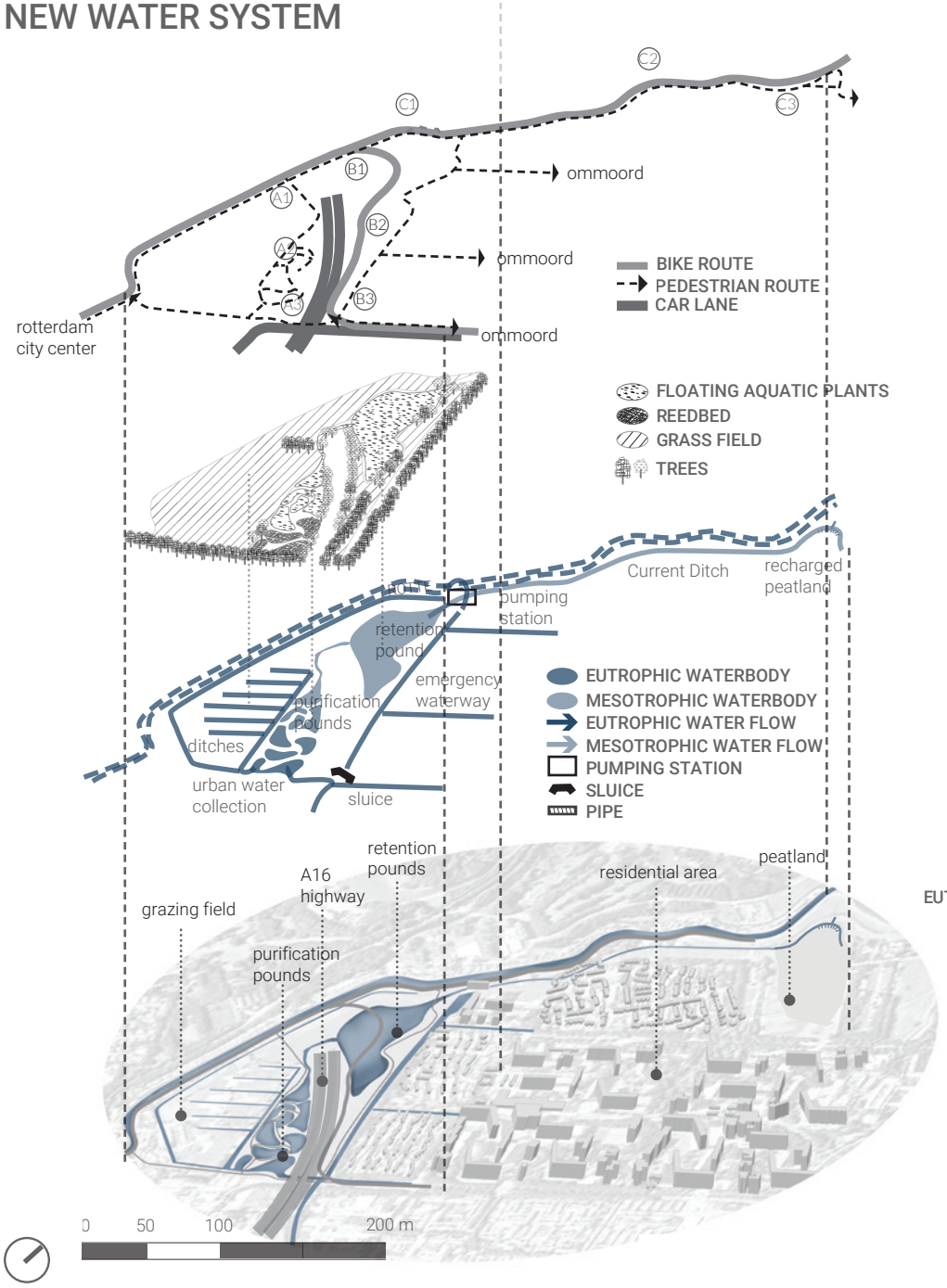
At the same time, there is also pressure on the few remaining patches of peat soil that can be found in this area. Due to drought in summers and influence from the agricultural sector the peat threathens to dry up. This means further sinking of the land, loss of an important greenhouse gass absorbant and the loss of a historical landscape.

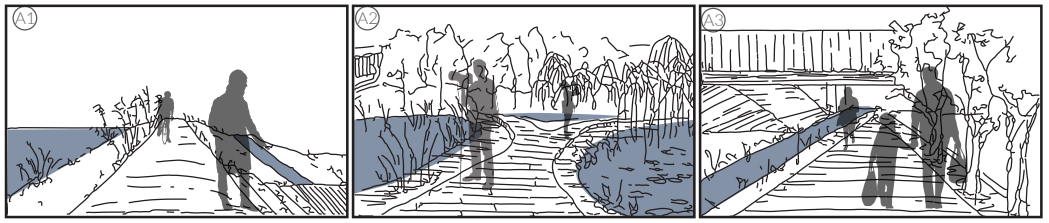
## THE PROPOSAL

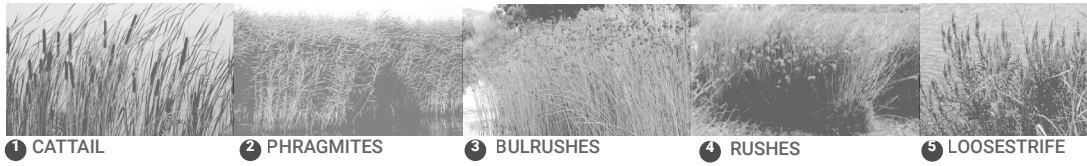
In the following designs we attempt to solve these issues.
By creating a retention and purification system water can be catched and cleaned in order to keep the peat soil wet enough in dry periods. Also a bicyle path running over the new retention pond will lead people into the polder, providing an alternative route for cyclists. At the same time the purification area makes a new recreation zone where people can learn about the relation between water quality and ecolgy through experience.

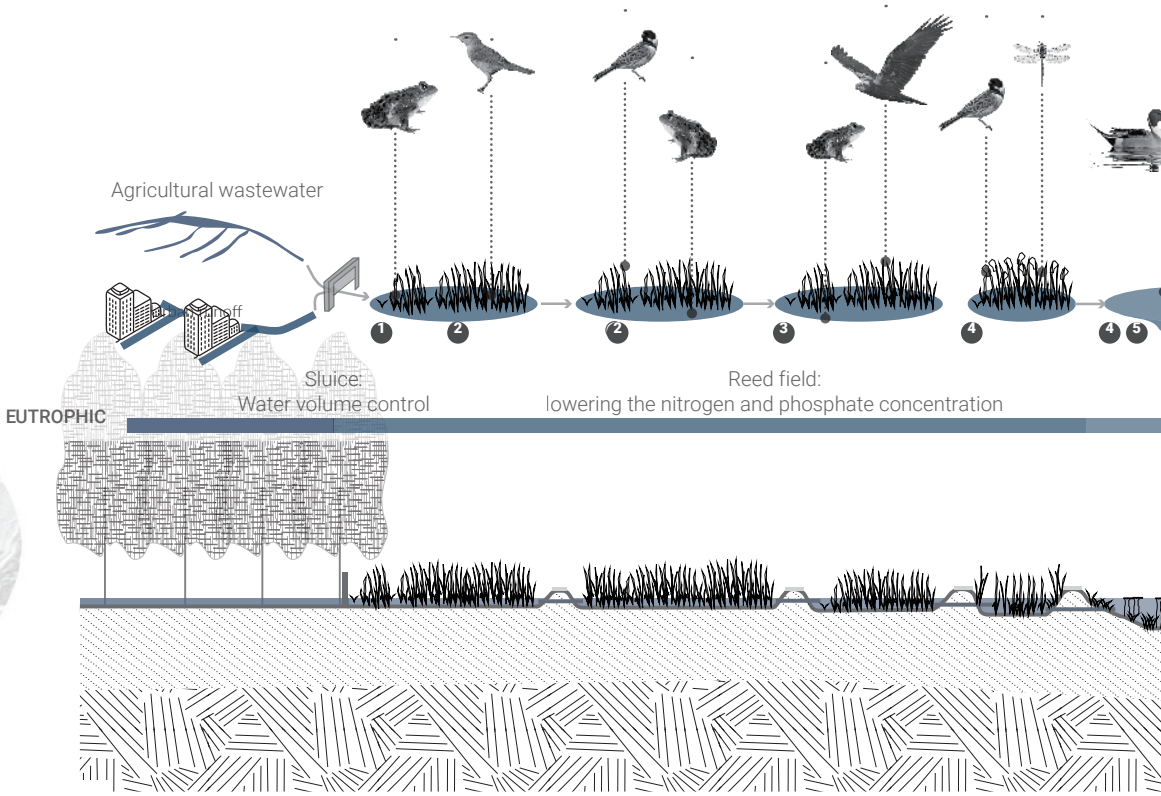
Furthermore, along the dike itself pedestrian bypasses will be created. This will not only give pedestrians and cyclists more space on their seperate paths. It will also give the pedestrian a more dynamic experience along the rotte. A special bypass over land will direct attention towards the historic peat landscape where water from the purification system can be seen flowing in.

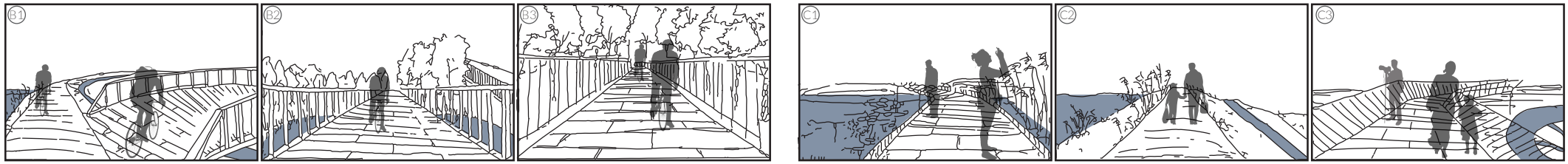
# NEW WATER SYSTEM

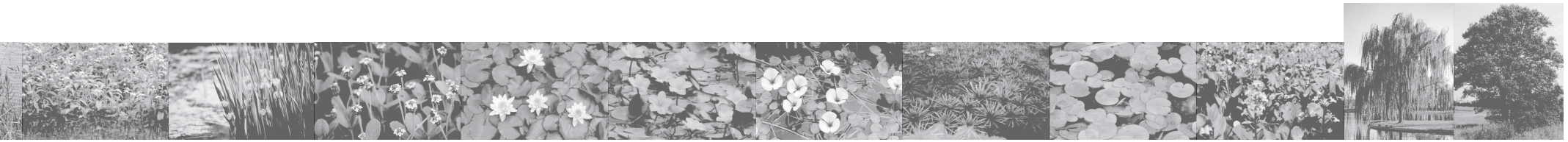


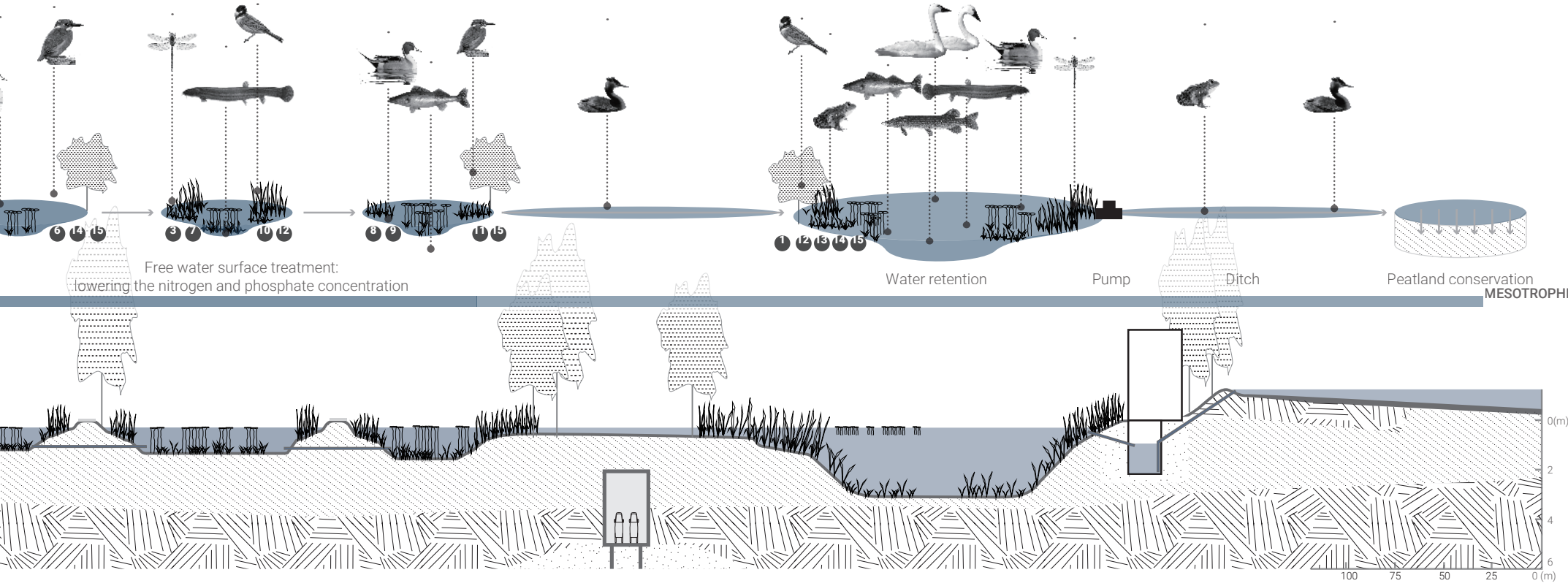



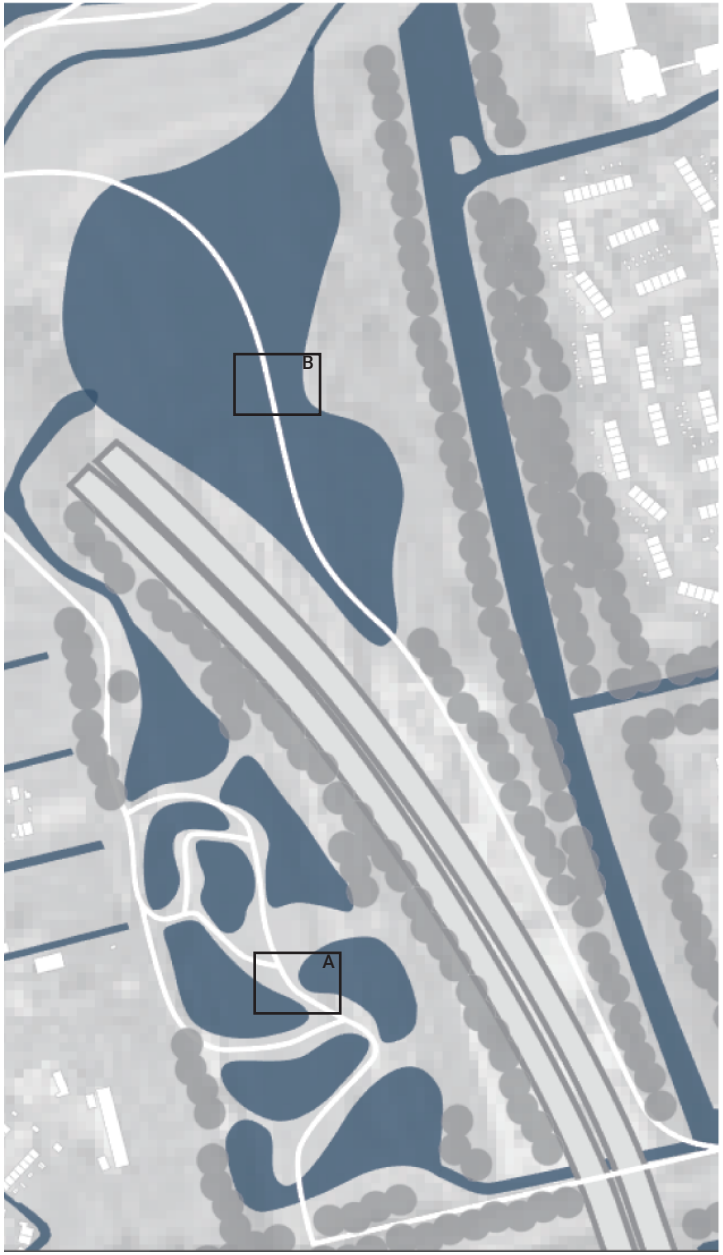


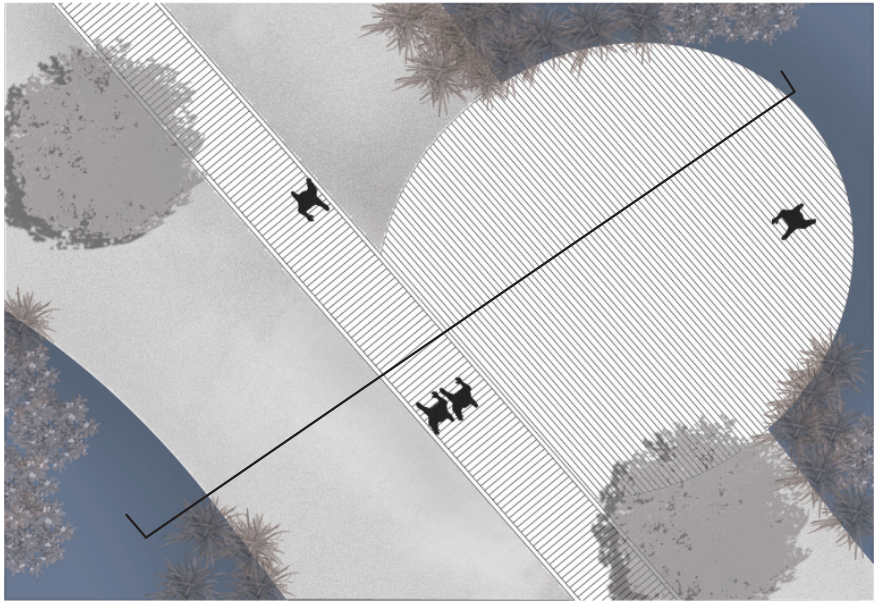
6 WATER FORGET ME-NOT
7 GOLDEN CANNAS
8 LANCELEAF FROG FRUIT
9 WATER LILY
10 FRINGED WATER LILY
11 WATER POPPIES
12 WATER SOLDIER
13 FROGBIT
14 BOGBEAN
15 WILLOW
16 ALDER



# WATER PURIFICATION PONDS




## DETAIL PLAN A



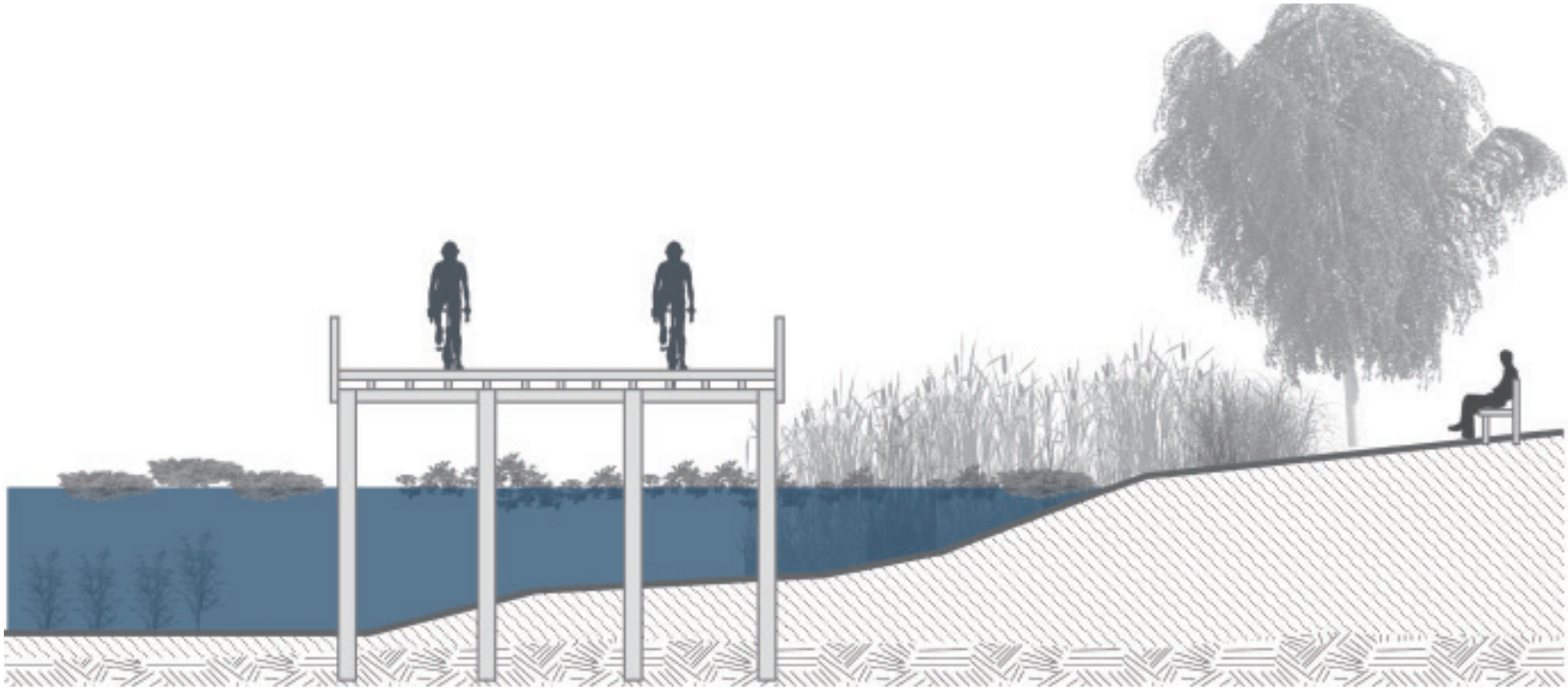
Pedestrians are lead to the water purification area by a walking path. Here the visitors can walk between the pounds of the water purification process. Vegetation varies between pounds because of the preference for different waterquality of certain plants. This demonstrates the purification process and makes it visible for the visitors.

## DETAIL PLAN B

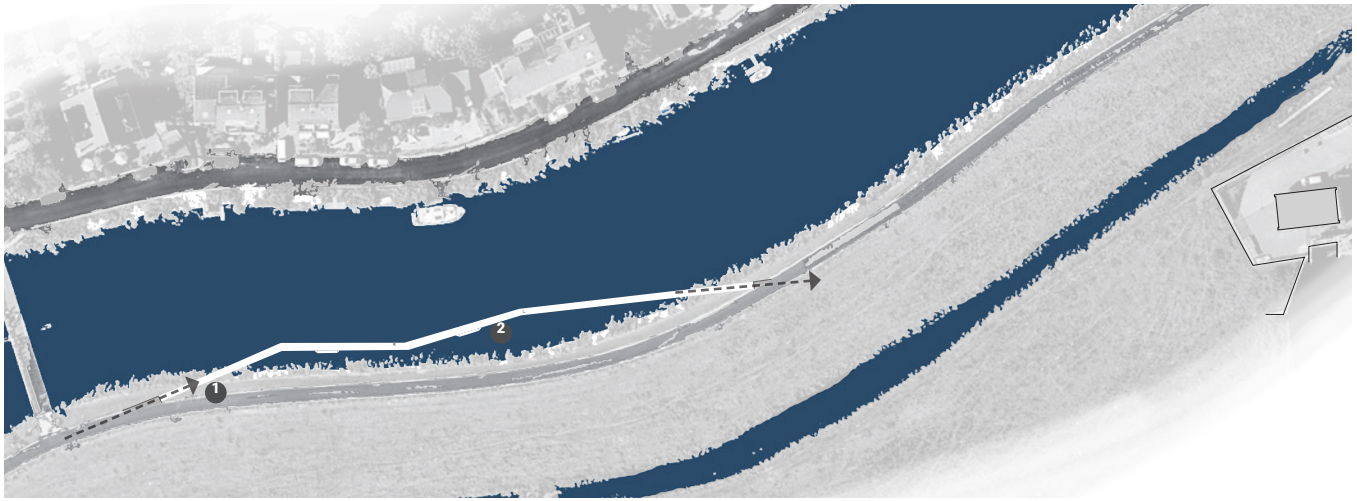

Cyclists are lead to turn right from the dike and cycle onto a an elevated pathway over the water retention pond. The wide pond creates a wide open view. The cycling path will take cyclists into the polder of Ommoord, effectively seperating the busy trafic on the dike.

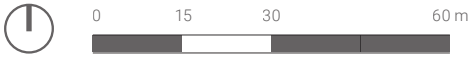
## DETAILED SECTION A

## DETAILED SECTION B



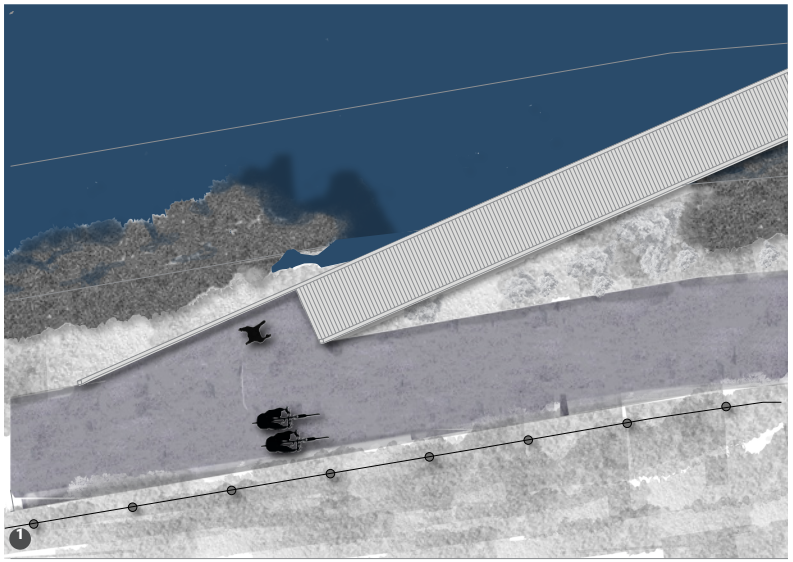
# BYPASS OVER WATER




## START OF BOARDWALK

## PLAN VIEWS

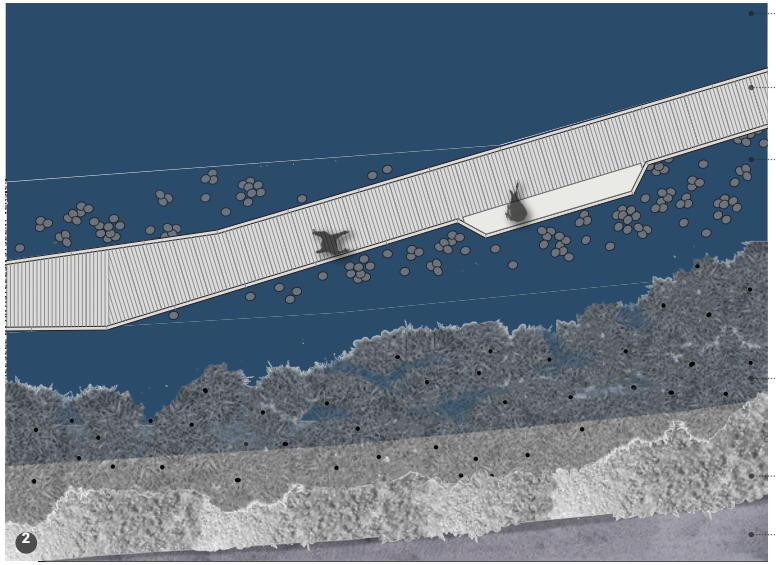




**A NEW ROUTE**

The boardwalk is an additional path besides the busy dike along the Rotte. This creates a seperation between pedestrians and cyclist which makes recreating along the Rotte safer and more enjoyable.

Furthermore it gives people a new and less monotonous experience of the Rotte. Including seeing more plant and animals species along the banks.




**WATER 1.5 -2 M DEEP**

**BOARDWALK**

**WATER 0.5-1.5 M DEEP**

Boardwalk creates sheltered area with less dynamic water. This area becomes suitable for numerous aquatic plants and forms a habitat for different animals.

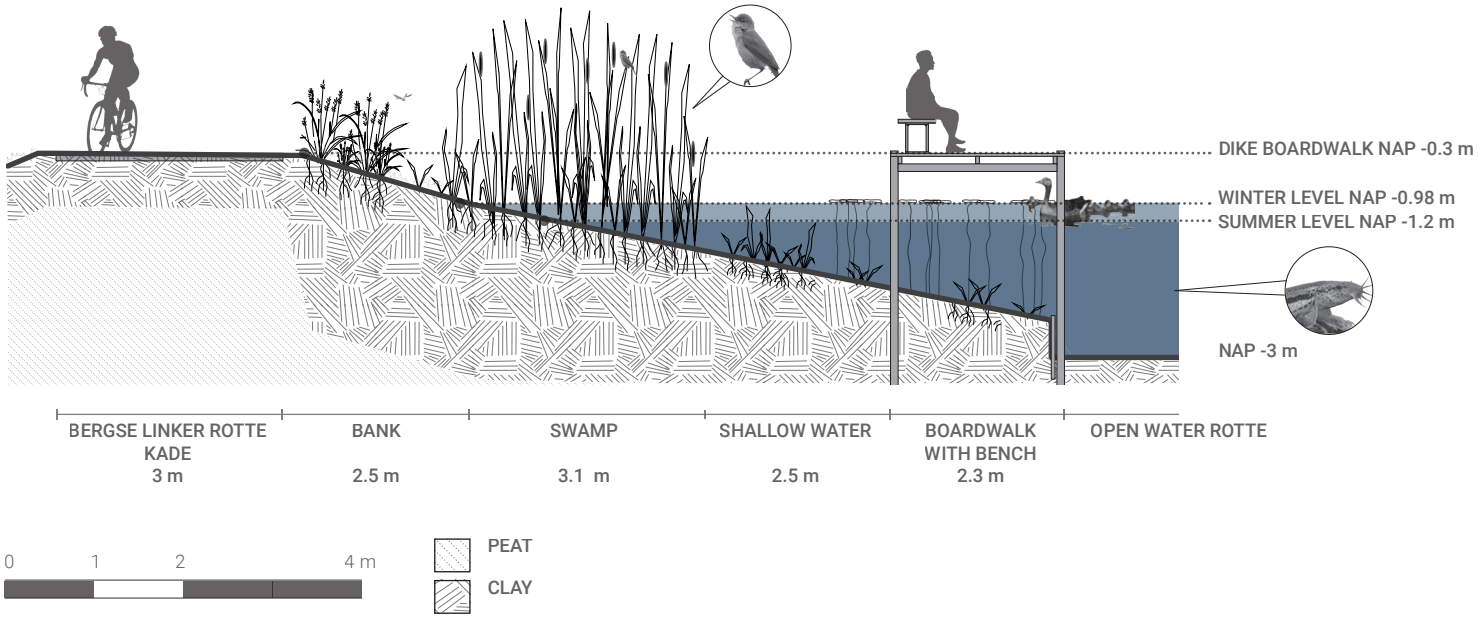
**WATER 0-0.5 M DEEP**

In this shallow water, reedbeds with species such as cattail form.

**BANK**

**DIKE**

## TRANSFORMED NATURAL BANK ALONG THE ROTTE




## IMPROVED BIODIVERSITY

By creating this natural bank more plant and animal species can thrive here, improving the biodiversity.

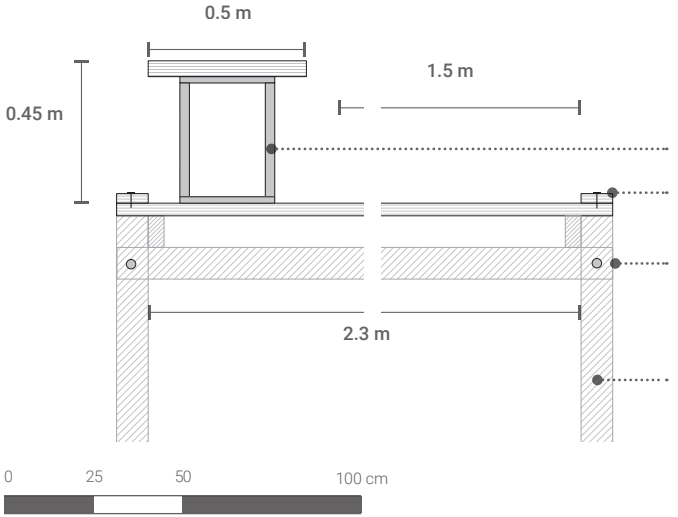
The dry bank will be enlarged, creating space for plants such as **loosestrife and goldenrod**. These plants will attract more **insects such as dragonflies and bees**, which in their turn attract more birds.

Because of the long slope a swampy area will form where **reeds** can thrive. These plants will also help **improve the water quality of the Rotte**. Furthermore a habitat for multiple bird species is created, such as the **small reed warbler, grey goose and waterfowl.**

By also creating shallow water, a habitat for fish with a critical status such as the **big weather fish** is created. Also aquatic plants such as the **yellow waterlilly** can grow.

The bank will be mowed in a mozaïk pattern once every 2 years. In summer for the dry bank and in winter for the reed beds.

## DETAIL SITTING ELEMENT




The construction consists mainly out of steamed birch, except for the steel sitting frame and the columns that go deep into the soil and water.

STEEL FRAME SCREWED INTO PLANKS

10 cm WIDE PLANK ATTACHED WITH NAILS

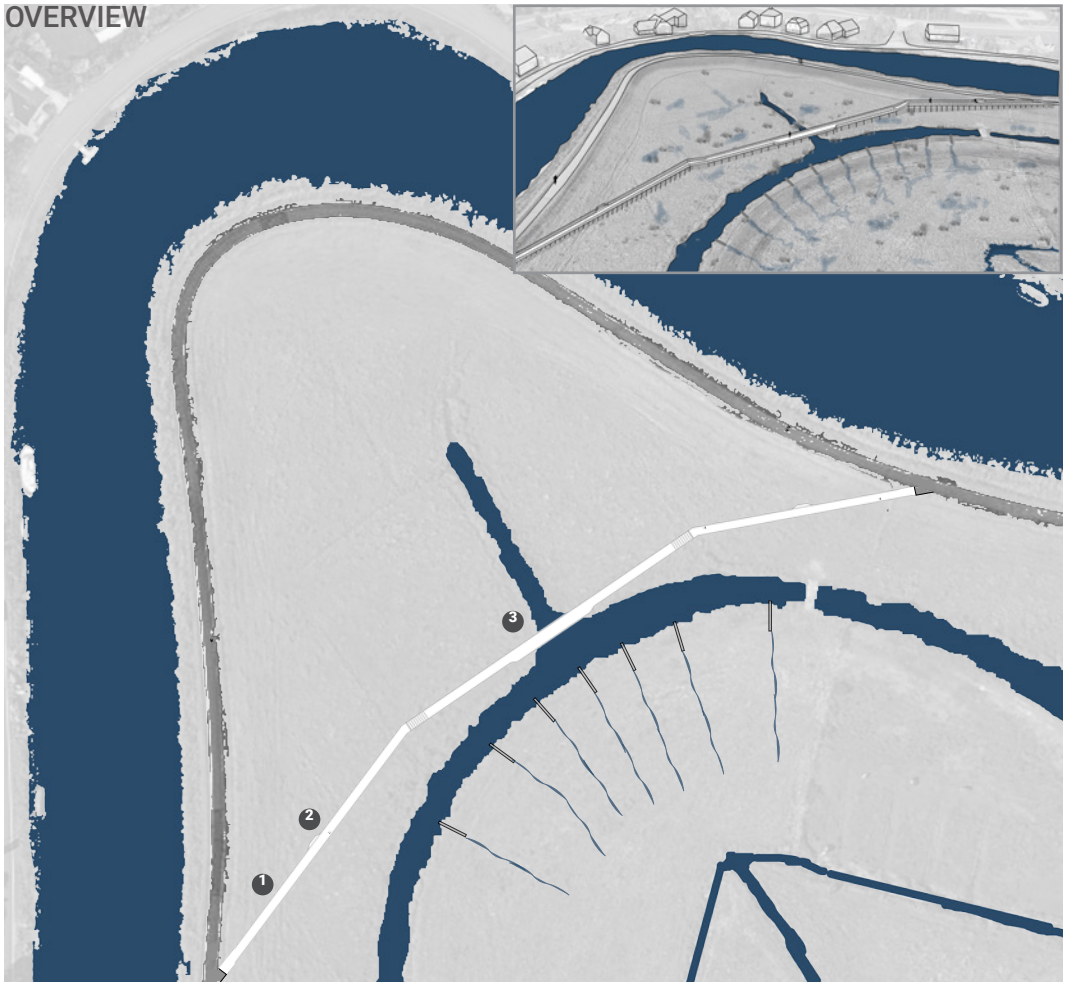
DOUBLE WOODEN BEAM ATTATCHED TO COLUMN WITH M8 BOLT

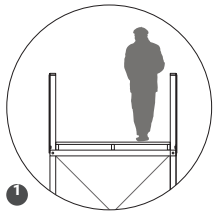
WOODEN COLUMN 4 m DEEP IN CLAY SOIL
Tropical wood

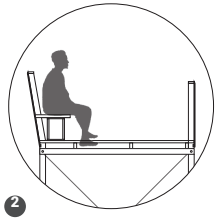
## BRINGING PEOPLE CLOSER TO THE WATER

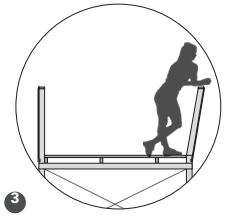
# BALCONY OVER PEAT LANDSCAPE

OVERVIEW




START OF WALK

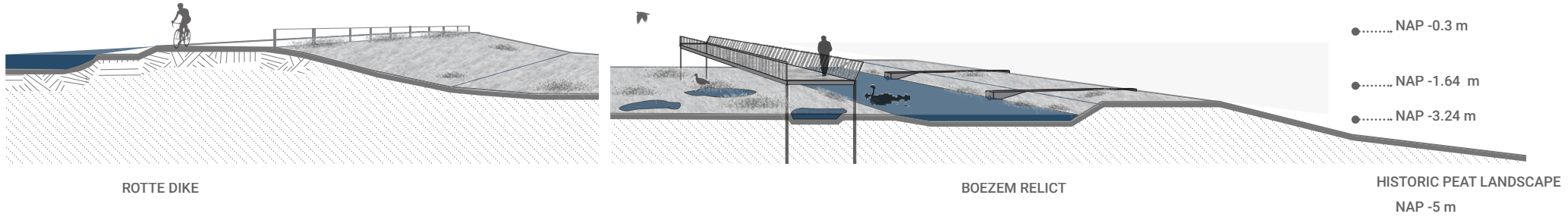
VIEW ONTO PEAT FROM BALCONY

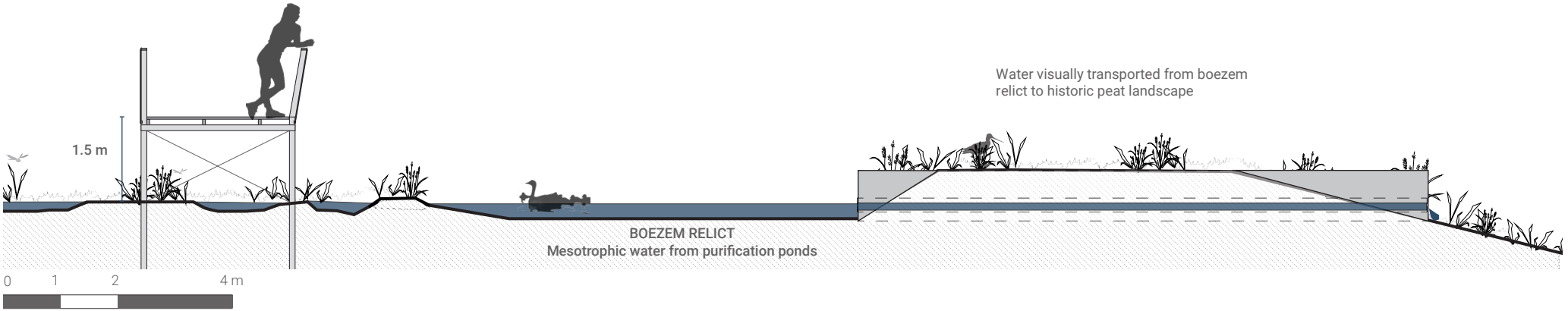
0 15 30 60 m

OVERALL SECTION

0 5 10 20 m

# A WALK IN THE PEAT LANDSACPE

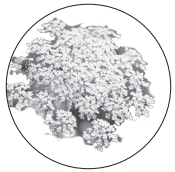



## ECOLOGICAL VALUE

Currently this peat land is used for grazing. By removing the grazers the water level can be raised, and a new ecological dynamic will be established.
The meadow will be transformed to a herb-rich moist grassland on peat soil. This grassland will hold long grasses and herb and flower species that will attrack a number of bird species. By removing the grazers the grassland will also be less nutrient rich, and other animals will be undisturbed. Instead the field will be mowed around once every 2 years in a mosaïc pattern to keep the planting dynamic.

## PLANT SPECIES


COW PARSLEY


CUCKOO FLOWER


GOLDENROD

## ANIMAL SPECIES


GREYLAG GOOSE

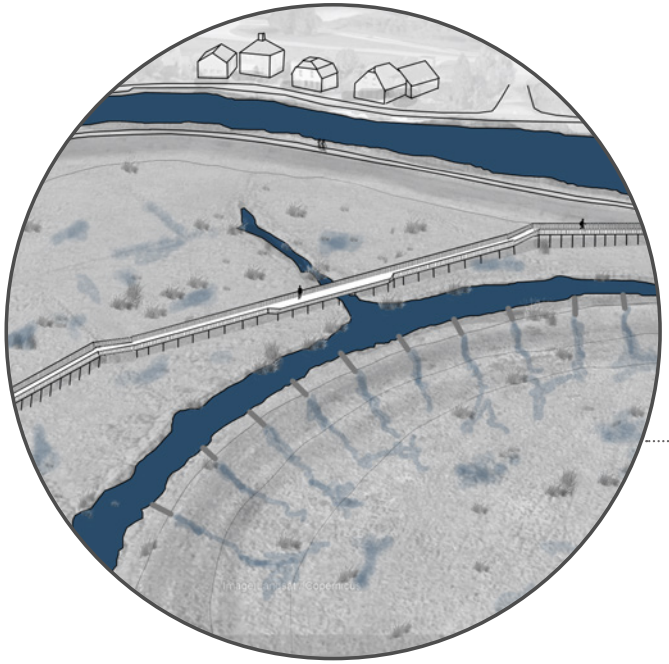

BLACK-TAILED GOLDWIT

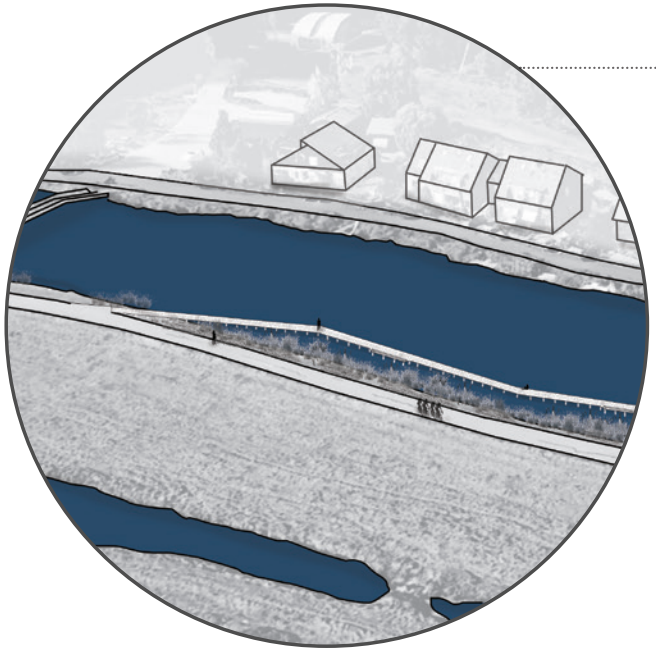

EURASIAN SKLARK


POOL FROG

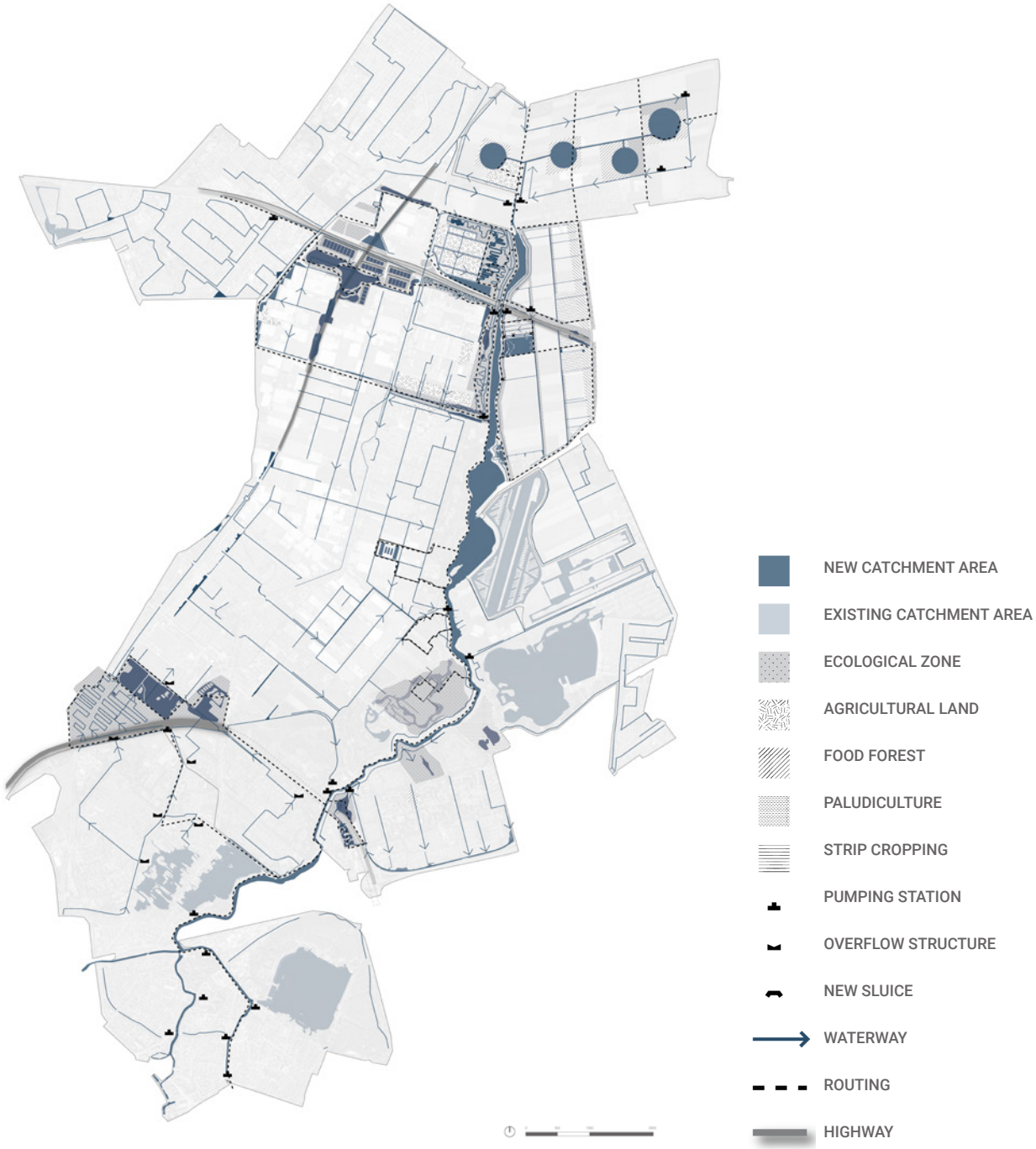
# FINAL RESULT

BEFORE





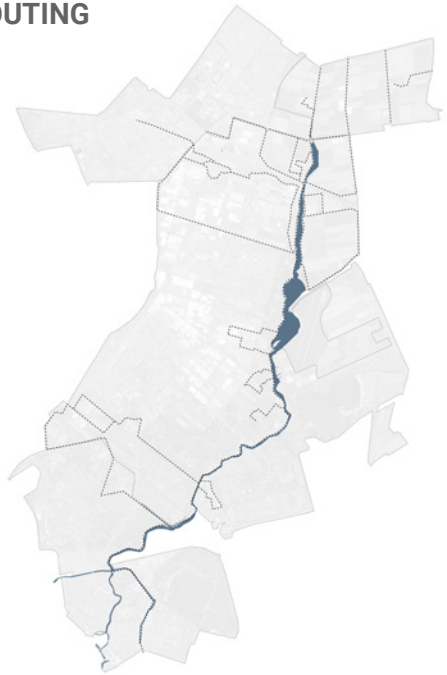
AFTER

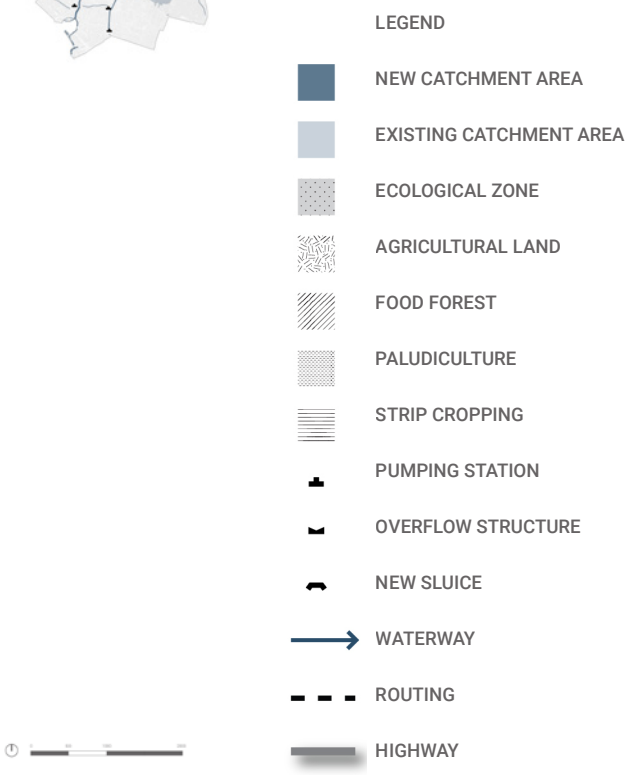

NEW CATCHMENT AREA
EXISTING CATCHMENT AREA
ECOLOGICAL ZONE
AGRICULTURAL LAND
FOOD FOREST
PALUDICULTURE
STRIP CROPPING
PUMPING STATION
OVERFLOW STRUCTURE
NEW SLUICE
WATERWAY
ROUTING
HIGHWAY

## LAND USE

## WATER SYSTEM

## ROUTING






## CONCLUSION

The overall outcome of the project can both be described in terms of its unity, as well as its diversity. The guiding themes - context, ecological intervention, water management systems, and human perception – all emerged in one way or the other through each project. The water management aspect as well as the routing experience are particularly evident in all designs providing a binding element for the overall approach to the Boezem area. With increased site specific understanding from each group, the interpretations of the concept have been diverse and radical, almost always recognizing the context of each site, and understanding its potential. Despite these site specific interpretations, the underlying larger scheme has remained intact. While routing is in itself a very context dependent element to a design, the water systems aspect of the overall concept was interpreted in a very unambiguous way – store water in big water bodies, circulate it and release it in the soil. Nevertheless, within this rather clear cut strategy each group found an unique approach to this system. While one could say this was asked of us as designers, it was also a rather new and certainly complex element, which each group remained committed to. This was especially good to see for us, as our group who created the larger guidelines for this water management scheme, did not actually work on ourselves, due to our respective design locations along the Rotte where such a large scale approach was not deemed possible. It is also certainly reassuring and gratifying to see that our overall idea was honoured and understood given the difficult context this quarter was set in, where we could not spend as much time working together as we would have liked to. Overall the unity and divergence of these projects complement one another and create a rich catalogue of design approaches and ideas that we as a group can draw on going forward.

## REFLECTION - GROUP 7

### Perception

Each of the interventions within the group is human centred. Rather than changing the landscape, the projects aim to reveal how various aspects of the landscape operate. Using the overall guiding factor of direction, each individual design inadvertently deals with the flow of the water from source to outlet. In order to showcase this, two principal methods were deployed: framing the view of the visitor and framing the Rotte directly. Each site required individual intervention due to their differences in scale and surroundings. While materiality has been used as a binding factor, a bigger effort could have been made to ensure that visitors understand the connection of each of the sites to the others.

### Palimpsest

The choice of design locations is predominantly informed by the reading of the Rotte as a body of water that has seen transitions over time. Each site relates back to points in time when either the river was formed, or changed direction or completed its course. Rather than history being the guiding factor of the design, the current context is highlighted through these interventions. Each design expresses the relationships that the river has with its context in the specific location, in an attempt to understand the river in its habitat.

### Process

Due to the size of each of the design locations process design is limited. Varying water levels and the collection of water are utilized to show the progression of time. Water collection and water cleaning through filtration are further employed to better water management within the Rotte itself, but also the dense urban fabric of Rotterdam. These however nearly become symbolic rather than operational. When the group set up the project this became clear quickly and was chosen consciously. The idea behind this was that each project could nearly act as an example to illustrate how water management and ecological processes could be tackled within other parts of the city and polder network.

### Scale continuum

By the very set-up of the project different scales are addressed. Each design intervention addresses different aspects of their specific site, but together they represent the entirety of the Rotte. Due to this focal point of the river however the designs are rather linear in terms of scale continuum. They engage with the river, and only its immediate surrounds. The intervention at the source was conceived in tight-knit coordination with group 1, and connects to the polder landscape of the area. At the junction, the intervention addresses the infrastructure at the edge of the city – at a time of transition from rural to urban. At the culmination, the intervention addresses a connection that is lost due to the urban fabric. Each of these interventions, though isolated, address the problem of disconnectivity, and thereby aim to bring it back, in their respective scales.

## REFLECTION - GROUP 1

### Palimpsest

Firstly, we researched the history of our polder and the historical grid pattern of the farmland. The polder is rich with historic elements such as windmills and most of the grid pattern is still visible. However, this layer of the context is quietly on the background due to the overriding agriculture and lacking of a route. In order to change this, we used the historical grid for our design and extended the route along the Rotte. With the design, a water retentions system, a new shape (circle) is added to the landscape in order to enhance the new function – a new layer which differs from the current a lot. Combined with the design elements (the experimental agriculture, the pond and food forest) the route becomes more interesting which attend to perceive the historical elements more consciously.

### Scales

We add a detour to our route which starts from the start of Rotte. The detour goes down through our polder, passing through our experimental agricultural land, to make our polder more connected with the experience along the Rotte from a larger scale and enhance the characteristic of the polder as well. Furthermore we extend the route along the Rotte which connects at the same time Rotterdam with the nature reserve and recreational area Bentwoud in the north.

### Perception of space

At certain point of the routes, multiple elements come together in order to create a more interesting and mindful experience. For example we combined the end of the Rotte with the start of our detour through the experimental land and along the pond. Furthermore at the same route fruit trees are placed which visitors can pick along the way.
The four ponds of the retention system all have their own look, which creates four different types of environments. Two of them are connected with a route, the other two are connected with an existing road. So all of them are part of how the polder will be experienced while walking, cycling or riding through it and create more diversity.

### Process

In our design we consider the changes over time. Ecosystems will develop, creating habitats so more animals will eventually live in the area. The question is only how nature and farming will live next to each other and what the impact is of one another. Nature will create some benefits and take over some farm activities. For example animals which eat insects make sure farmers don't have to use pesticides anymore. However, some animals probably affect the farmland by eating or destroying the crops.

### Ethical Dilemmas

The design makes all the layers work better together and thus stronger. With the water retention system the polder will be more resilient for the future and at the same time increases the biodiversity. One of the outcomes is that more people will be attracted and come to visit the area. On the other hand, the farmers (which are an important user) don't actually like visitors. Visitors will make the are more busy and perhaps even pollute the land. Furthermore one of the characteristics of the site is the restfulness all these visitors will possibly change that.

## REFLECTION - GROUP 3

### Palimpsest

During site visit we met with a farmer, one of the main actors of the Tweemanspolder. We felt his appreciation for the agricultural activities. This encounter guided us into the perspective of the farmer, seeing the Tweemanspolder as a productive land with good quality soil and beautiful décor of 4 mills with a long history. It changed our mission for the area. Instead of minimizing the agricultural activities, we strove to intertwine desired activities for this land. Especially we see many opportunities for the farmer. By inviting residents, visitors to participate in food forestry, farm tours, or shopping for local goods, we think the appreciation for the farmers will take a positive turn and a decent revenue. Adding new activities to the revenue model (eg. agrotourism or nature maintenance) is more common these days. The plan relies on the willingness of farmers to change in a more sustainable way of harvesting. Therefore, we see the first phase of design as a pilot that can slowly change the landscape.

### Process

We chose a relatively minimal manner of designing with nature. The remote location and the private atmosphere of the Tweemanspolder asked for this strategy. Examples are the waterfall made of willow branches that allow plants to grow over time; the flora paths for animals to cross. In the interventions, we started from a circular principle. The willow branches that be cut off will be brought back by forming floating platforms in the water retention. The food forestry and strip cropping will have large influence on the sustainability of farming. A process thatimproves the soil over time and therefore increases the capacity to store water and decreases the need for pesticide.

### Perception

Our design proposal connects the existing water system elements in a clearer way. From the water retention area, visitors can make a detour along the water flow, seeing the connection with the northern side of the polder and ending (or beginning) at the pumping station where circularity is the new main goal. By bringing people into the landscape, we intend to increase the awareness of the water situation that is at stake. Moving between the water retention levels, playing with the seasonal opportunities and accentuating the mirroring mills brings understanding. One of the important destinations will be the renewed bridge from where all different layers of the landscape can be experienced. That is the distant skyline of Rotterdam, the glasshouses, the newly designed flower route of Bleijswijck, the contrast between the meandering peat dikes and the straight clay shapes of ditches and canals.

### Scale Continuum

Having inclusive agriculture as a goal, we always think about how it will influence the larger systems as part of the riverside of the Rotte and a recreational destination. The boundary of the polder is clear while the effects for stakeholders is wide, so we create an interaction mechanism that people (also animals) with different background can all be involved.

In the end, we read a sentence that describes the vision we have in mind: “Everything comes together in the landscape. There you can see the beautiful Dutch skies, you can smell the scent of elderflower, cow parsley, and freshly mown grass. A farmer is at work and your future meal is growing. On the side of the ditch, you can see the cuckoo flower, you can hear the frogs croaking and in the summer you can see the skylark rising and you can hear it rioting. You can cycle, walk, stand still or lie on the grass. You can feel the storm, and the lashing rain-feel one with the elements.”

## REFLECTION - GROUP 2

During the last 9 weeks, we have been working on the design of a former agricultural area that is occupied by a lot of large buildings and infrastructures. We have clearly seen 2 historical layers. The layer of modern buildings, glasshouses and distribution centers, on top of a centuries-old lakebed polder. We have added an extra layer, with an important role for sustainable water management, ecology, and human perception. In the design, these three layers together made the design.

Little is left of the first layer, only a small part of the area is still an open landscape for agriculture. But very clearly, we can still see three different types of waterways in the area: the Rotte, the old Boezem, and the ditches, where our interventions take place. But the different characteristics of the three types that we showed in the analysis could have been expressed more clearly.
We have also paid attention to the more recent developments. Flowery species in our ecological areas express the current economy, distribution centers with water storage on top have a function in water management and provide jobs.

We have tried to make an integration between the layers with 3 different routes, all in between the urban area of Zoetermeer and the recreational area of the Rotte. The first route crosses the glasshouse area. A soft feeling as a result of planting more trees and flowers makes the route more pleasant for humans to walk or cycle. Flowers also show the current economy of the area, which is usually hidden behind glass. But the link is not that strong. Only if we had included the glasshouses themselves in the design, the ecology on the street would really work together with the economy.

The second route is about sustainable water storage. We create a large basin between existing and new large buildings. The expression of the location is really man-made, with bridges, large buildings, and the elevated railway. The relation between the water storage and the surroundings might be a bit unclear: should the design show or hide the infrastructure? That is not made clear enough.

Natural processes play an essential role in our design. We manage water in such a way that we hope to create certain natural conditions. But without frequent mowing, the area will not look like intended. And then there is uncertainty about climate change. We have shown that the design can be built in steps, based on future needs, but we did not elaborate on how this works spatially. It would have been an interesting extra step.

Connection with the larger scale is also something that deserved more attention. We have discussed with groups 7, 1, 2 and 3 and made sure that our plans would work next to each other. But true integration did not happen. Developing a strategy for water storage together with group 4 in the same polder would have been logical. Extending the routes would have made the concept stronger.

And there are some choices that are rather debatable. Distribution centers provide jobs but do we really want more of them in this area? And there is plenty of open agricultural land north and east of our area. Does it really make sense to save the small part in our area? And did we save it? We have build reed land around it. A better argumentation in the early stage of the design would have made the final design even stronger.

## REFLECTION - GROUP 4

### Perception

People come to the Rottemeren area for recreation, to reside or to work. Many different functions and programs can therefore be distinguished in the area. In the polder Bleiswijk all the functions lie directly next to each other; there are hardly any transition zones. The water connects all the functions via ditches, lakes and the Rotte. How water connects and what role water has in each area is made visible with the four routes.
Each route starts at the Rotte and continues its way through the landscape. People are taken along the water and the role of water in the area becomes increasingly clear. By framing the connection between water and land, the landscape changes into a painting. A painting in which people can sit and be part of.

### Palimpsest

The Bleiswijk polder was formed by people. The land was needed for agriculture and therefore it had to be dry enough. By means of ditches, the excess water was pumped, via the Boezem, into the Rotte. The Boezem has now lost its function and the mills have been exchanged for powerful pumping stations. Production is now efficient, leaving more space for living and recreation. Agriculture has been given a different character by the greenhouses. With this design the different functions are reconnected and the history is made visible again. Interventions such as filtering water and the shared water storage for the greenhouses are steps towards a more sustainable landscape. With this step a part of the future is already shown.

### Process

The most obvious landscape situation in overall is that the land keeps sinking each year, and that the more and more severe climate change will require a balance for the site to adapt to it. By focusing on the water management and trying to keep the land wet, the sinking process will be slowed down, that's why we're designing to raise people's awareness.
In our design, we will not constantly engage in the process afterwards. To achieve a more natural atmosphere, we try to keep the maintenance as low as possible for the vegetation, and the constructions like staircase on the slope and pathway under ground level will merge with nature in time by means of detail design. The newly planted vegetation will also live with the original ones so the perception change takes year as the time unit.

### Scale-Continuum

As the largest site in all groups, the scale is quite a challenge but also gave us a novel cut in for the concept. With multiple programs, we focus on the differences in large scale and the consistency in the small scale. Despite the clear boundary between different programs, the stakeholders are not that various, we think of the site is now dominated by a common phenomenon of neglecting the history overwritten by development, so our design intervention will start small in all the aspects we hold in site and hopefully become a large influence penetrated into daily life.

By reflecting on our design by using the four perspectives, it becomes clear that our design is about a slow transformation for a more sustainable landscape by revealing the past, showing the present and framing the future.

## REFLECTION - GROUP 6

During this project, we have learned to integrate technical interventions with spatial interventions, therefore touching upon multiple layers in the landscape palimpsest. From the start we wanted the design to be meaningful at both the large scale and small scale. We think this was achieved as the design is a reaction to climate change issues as well as routing and spatial cohesion issues at the location. The scale continuum and idea of perception is therefore also thoroughly touched upon. The landscape architectural lens of process is also a large focus point of the design with water management and ecological changes playing the largest roles. However, we may have focused somewhat too much on the techniques and strategies on intervening spatially and technically on infrastructure. We have learned a lot from this, for example, the function of water management facilities can be adjusted according to topographic height differences and pump stations can be transformed into overflows and highways into landtunnels. Nevertheless, the experiential nature of design should go hand in hand with these technical and ecological interventions. Through research and personal ideas on nature, we got a deeper understanding in the goal of solving environmental problems while at the same time create an environment suitable for people to live it. With such strong technical interventions as we have done, the changes to the environment and the experience of 'people' should have just as much importance. We began with this shift in attention to the subjective perception of the landscape after the midterm but at this point, we believe that our design does not yet fully seem to be in place in that aspect. Although a coherent routing and guiding system is defined, its functionality at the large scale is to us not yet so convincing. This is because our project accommodates a variety of programs (pathways, overflows, landtunnel, filtration fields, wetland ponds). We would want to put extra work into this and how to accommodate different groups of people with the same storyline. For example, how do different people react to water? Is it even important to them? How do we make water stand out? We only gave partial answers to that. We also learned not to do too much. For example, we had many questions during the excursion such as why some the edges in the urban area were so artificial. We vowed to do something about this in our proposal. However, after learning of the importance of the historic layers in our concept and next to this the importance of the edges in the historic layers, the edge transformations could be meaningless (they are an integral part of the historic layer). Leaving these edges as is or emphasizing others did create meaning. Something we thought limited our design capabilities was the requirements for presenting, specifically the black and white colour scheme with blue highlights. Although the end result look very coherent because of this, during the design phase some of our design decisions were based on how it would look in this colour scheme. This is bad practice from us. We therefore appreciate that was introduced so that we can start applying this strategy in the future without it influencing our design choices.

## REFLECTION - GROUP 5

The core of this design project was to find balance between the technical and ecological aspects and the social and experiential aspects of landscape architecture. To see to what extent we have reached such balance we will reflect upon our designs using the four perspectives discussed in 'Landscape architectural perspectives as agent for generous design' by I. Bobbink and S. de Wit.

Both detailed designs that we have made arise from a different starting point. The design for the purification and retention ponds starts from the need to preserve peat and make a more resilient water system. While the design for the bypasses originates from a more human centered look on the overcrowded dike. Both designs work together to solve the same problems, only they focus on the technical and social aspects to a different extent.

The processes of climate change and land subsidisation play main roles in our designs. By creating more room for retention the area becomes more resilient for heavy rainfall and the peat soil can be kept wet to prevent it from subsidising. In the design for the purification ponds the natural process of cleaning played a big role in what plants are used and how they are organised spatially. Furthermore in our design we prepare the landscape for social changes in which people start using the outside space more. Another aspect of processes is taking into account maintenance. We could have looked more into the future social and ecological effects that the realisation of the A16 highway might have.

Perception played a big role throughout the design. We create routes that reconnect people with the water by bringing them closer and make them more aware. We also work with perception to lead people into the polder by designing from open to closed. In the bypasses, the routing over water and into peat land creates a more dynamic experience which engages people more with the landscape. We could have improved this by focussing not only on the visual but also the other senses.

Within the palimpsest perspective the distinction between the approaches can very clearly be seen. Both designs are directed to do something with the historic and valuable peat landscape. The design of the peat balcony is quite subtle. Here a layer is added to amplify the historic layers of the vulnerable peat landscape that is still there. The water retention helps preserve this historic layer, but at the same creates a more drastic change in the landscape. More in depth research could have improved the design regarding palimpsest.

Lastly, we look at the scale-continuum. In our design creating a clearer route towards the Rotte was important. This route can make it easier and more attractive for people from Rotterdam Alexander to go to the Rotte. This might make the area even busier which might not be desirable. On the other hand because of the construction of the highway, a barrier is formed to the area west of Ommoord. In our design we could have integrated connections to make the highway less of a barrier. Furthermore in our approach on the water system we worked on a very local level, making the design work well for Ommoord itself. By zooming out we could have looked more into relations with the surrounding polders to strengthen their overall resiliency.