

# HOW CAN WE MAKE ROTTERDAM CLIMATE SENSITIVE?

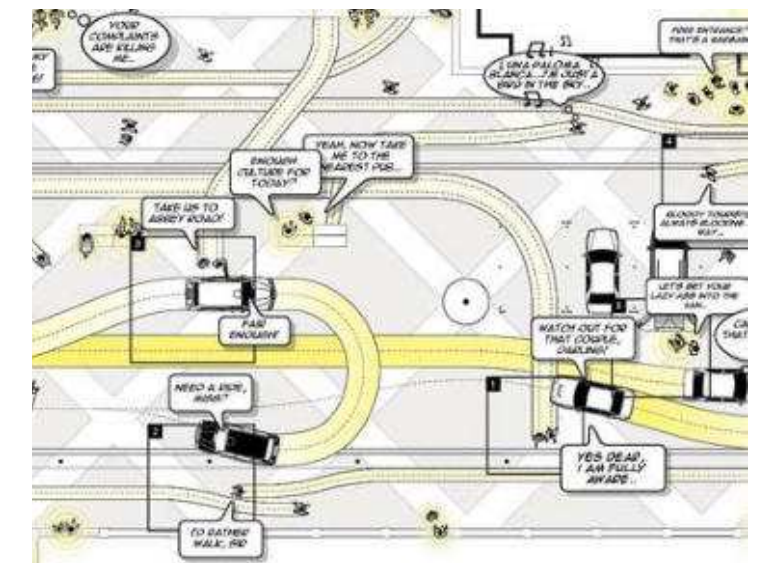
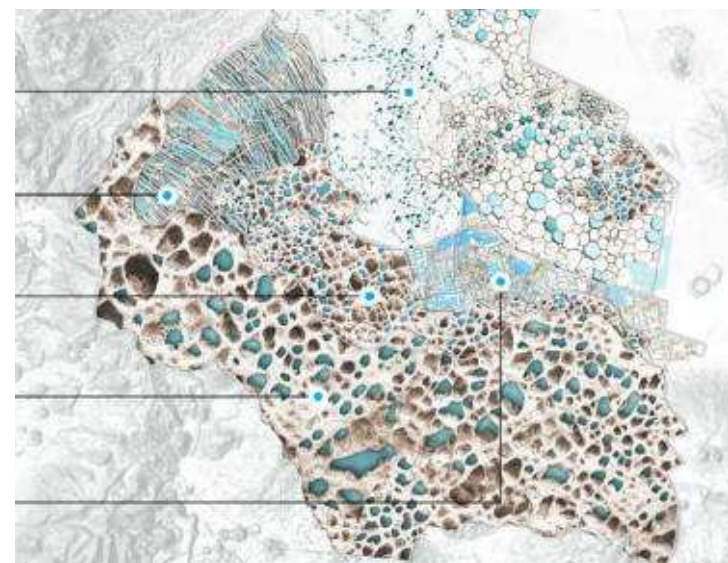
BLUE-GREEN INFRASTRUCTURE CONFERENCE  
PRAGUE - 7 NOVEMBER 2023

DIRK VAN PEIJPE  
**DE URBANISTEN**

# DE URBANISTEN office for **urbanism** and **landscape architecture**



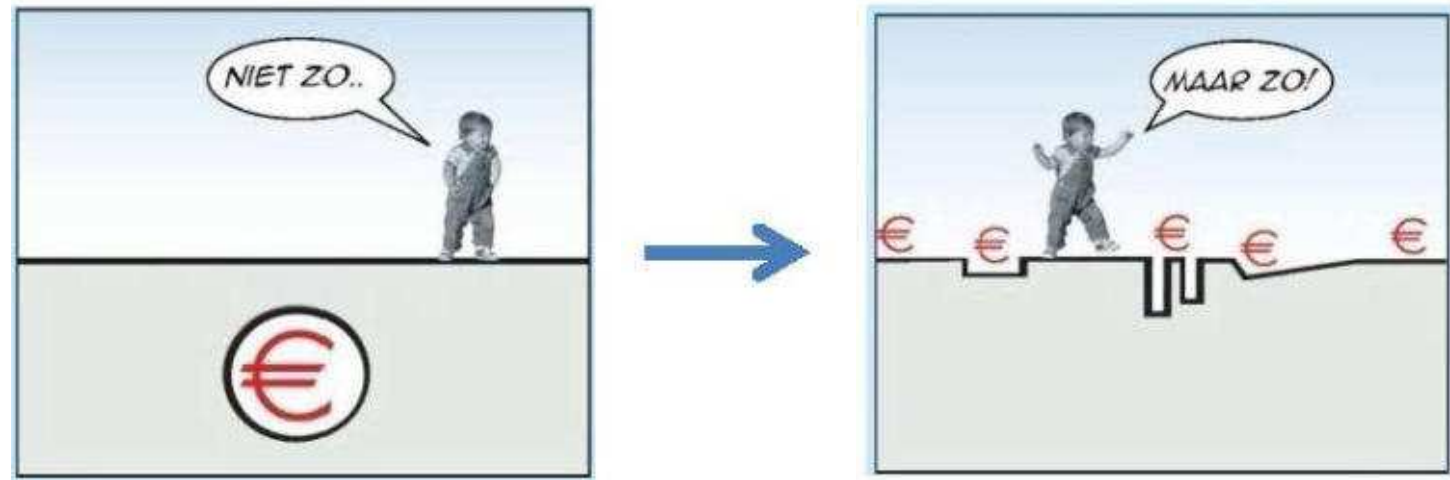
# DE URBANISTEN office for urbanism and landscape architecture



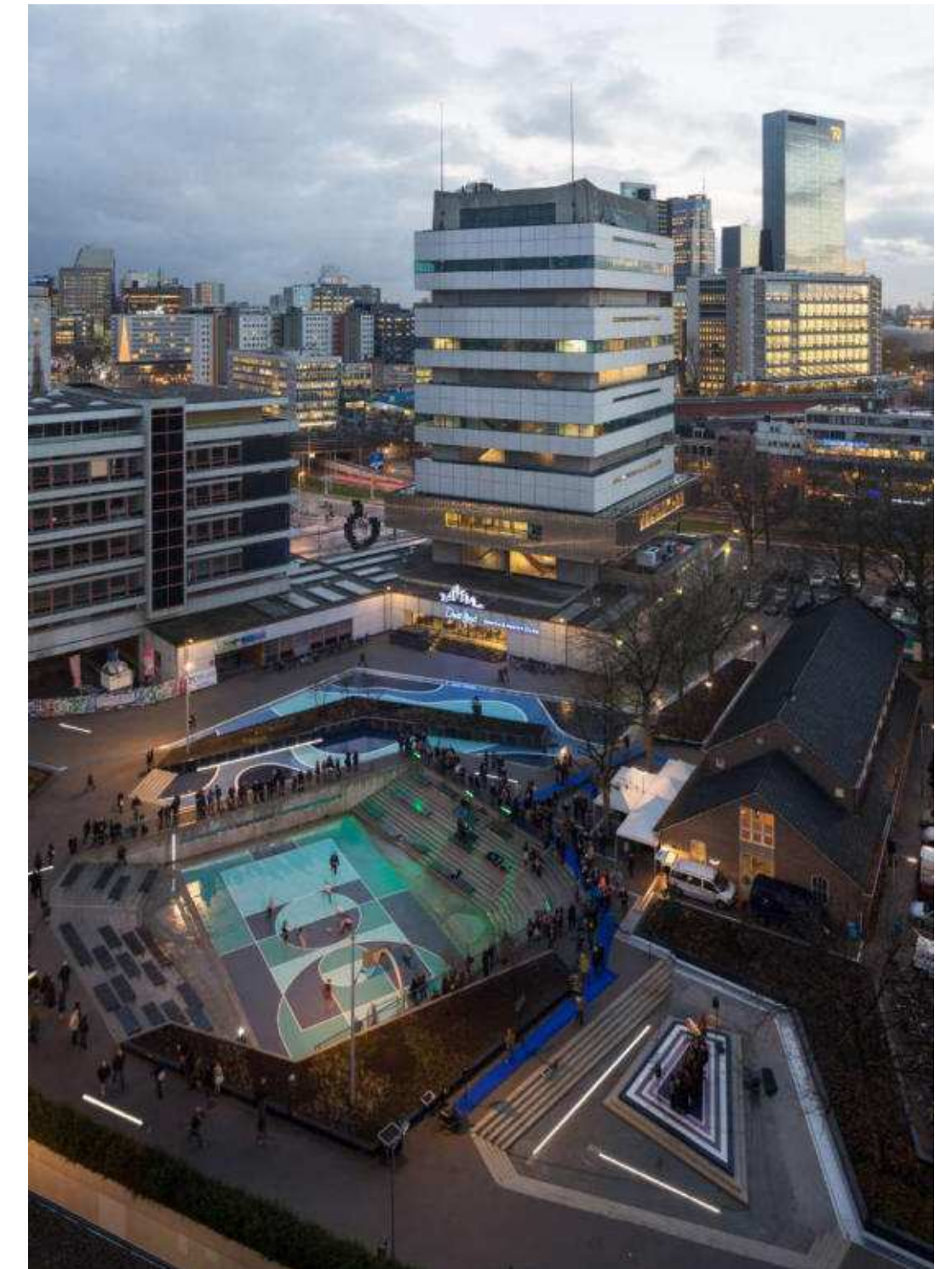
# HOW CAN WE MAKE OUR CITIES CLIMATE SENSITIVE?



# WE NEED TO INTEGRATE OUR CLIMATEPROOF MEASURES IN OUR CITYSCAPES



De Urbanisten and the wondrous watersquare



Watersquare Rotterdam

# DELTACITY ROTTERDAM: HOME TOWN AND 'LIVING LAB'



# 5 PROJECTS BY DE URBANISTEN FOR DELTACITY ROTTERDAM



Watersquare Benthemplein



Tidal Park Keilehaven



Hofbogenpark



Spongegarden

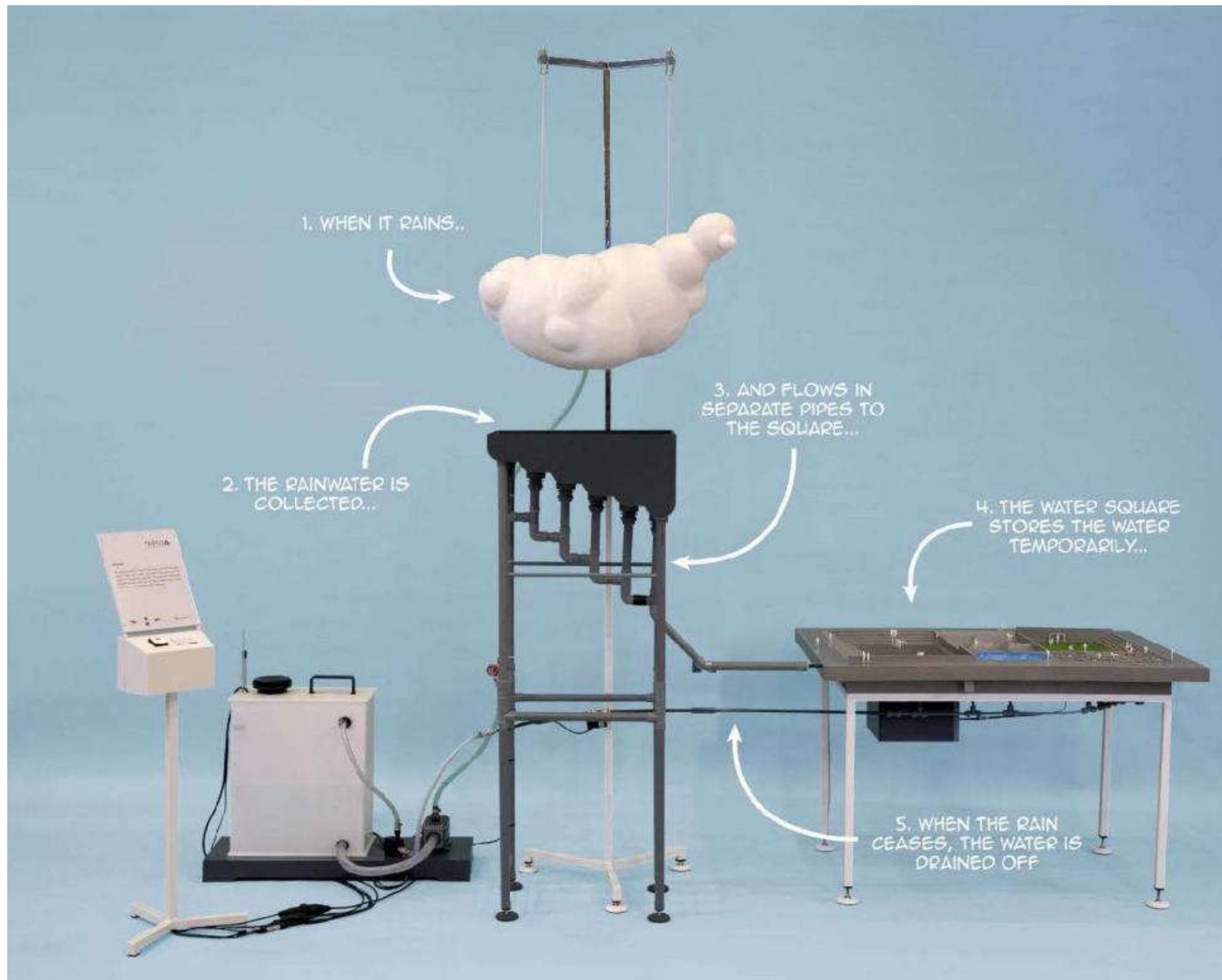
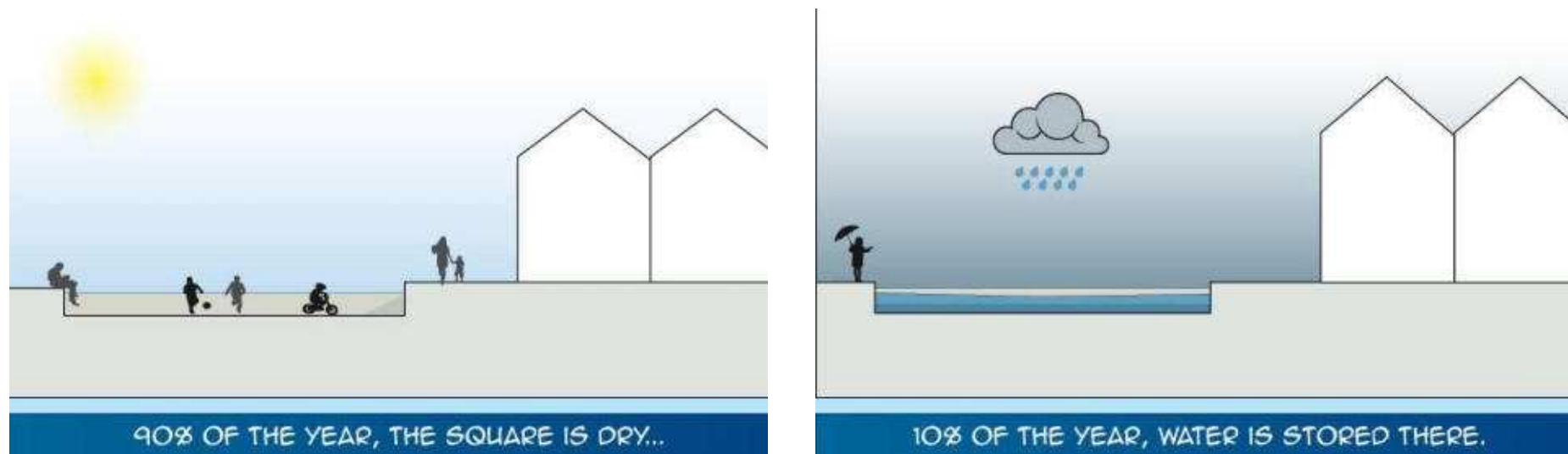
# WATERSQUARE ROTTERDAM



Photo: Ossip van Duivenbode



# CONCEPT FOR THE WATERSQUARE



Watersquare model

Model by Jeroen Bodewitz



Rotterdam Watercity 2035 (De Urbanisten)

# WATERSTORAGE + PUBLIC SPACE



Watersquare Benthemplein (De Urbanisten)

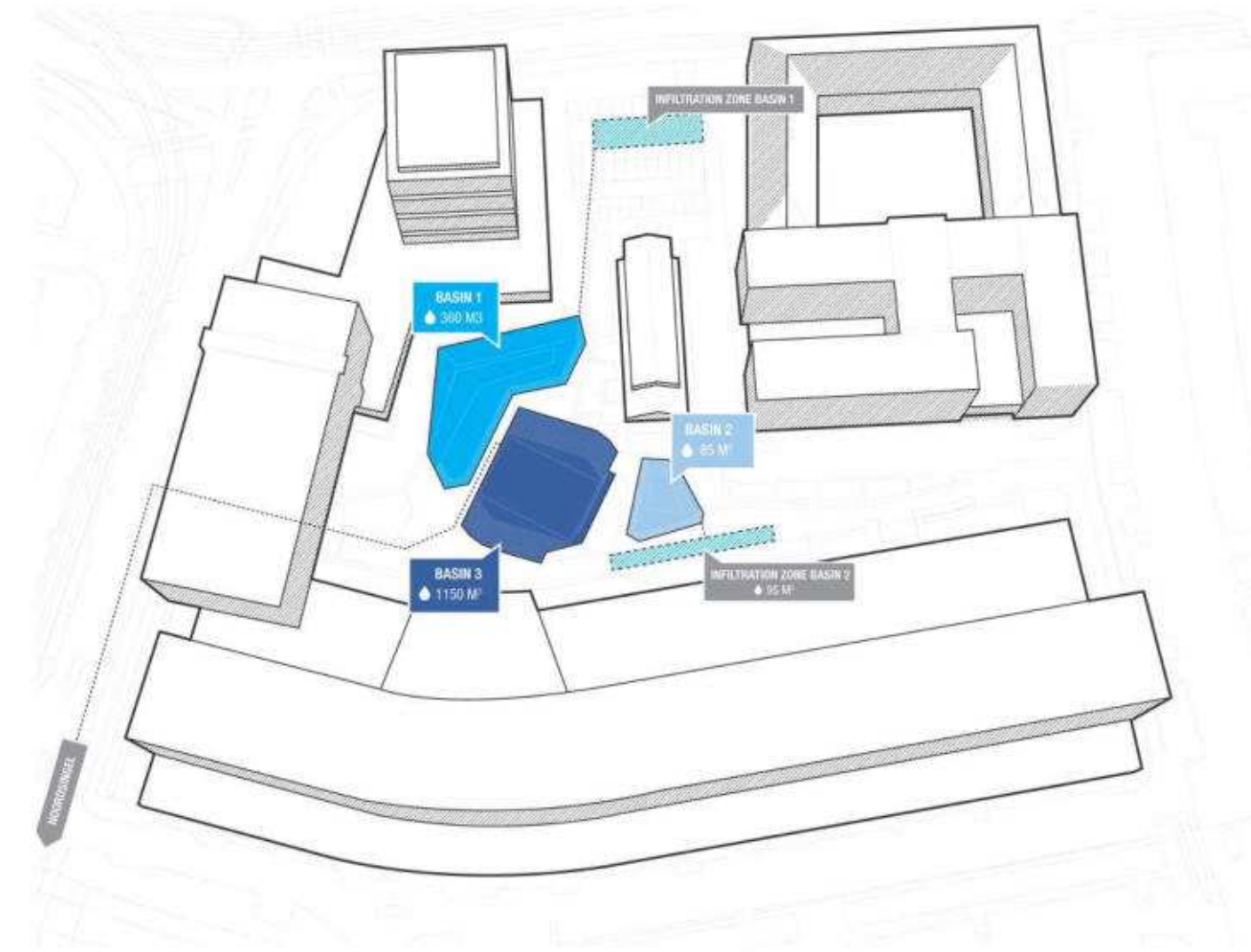


Photo: Jeroen Musch

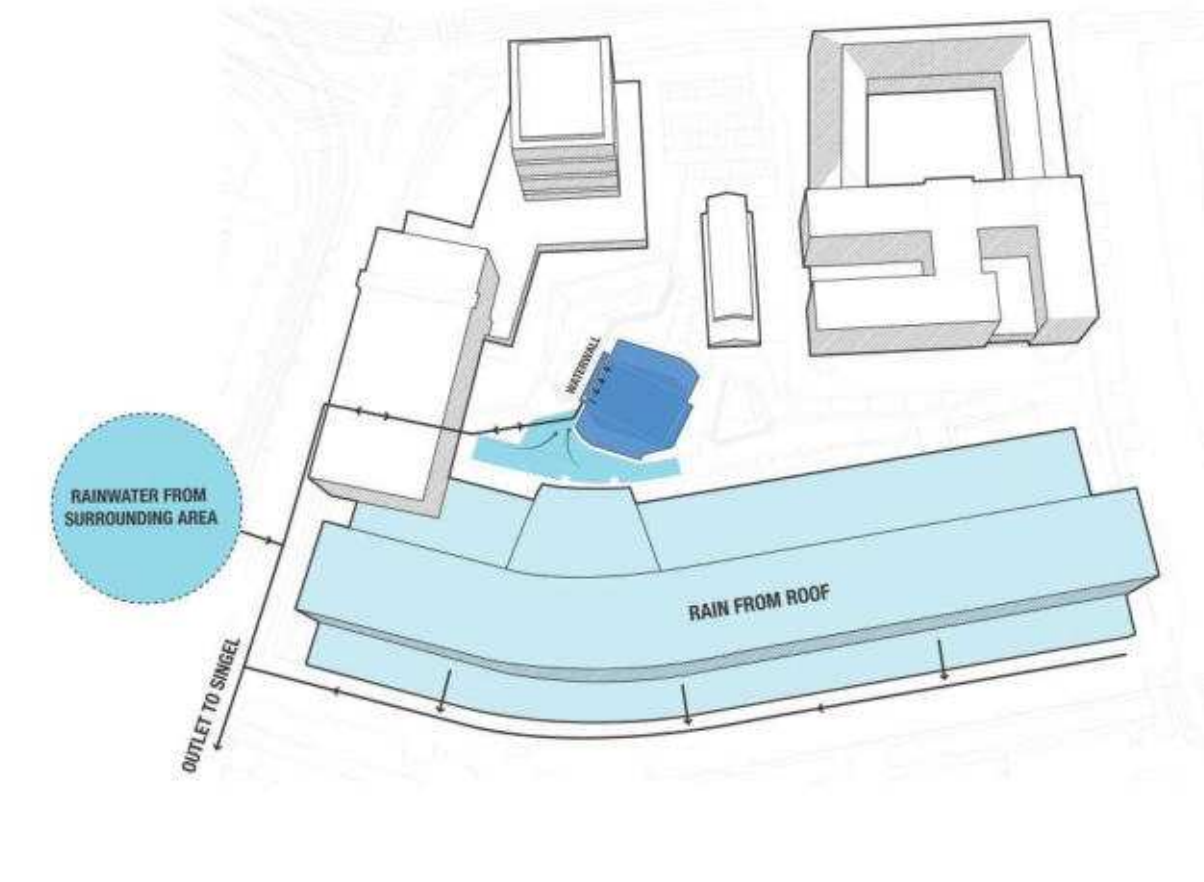
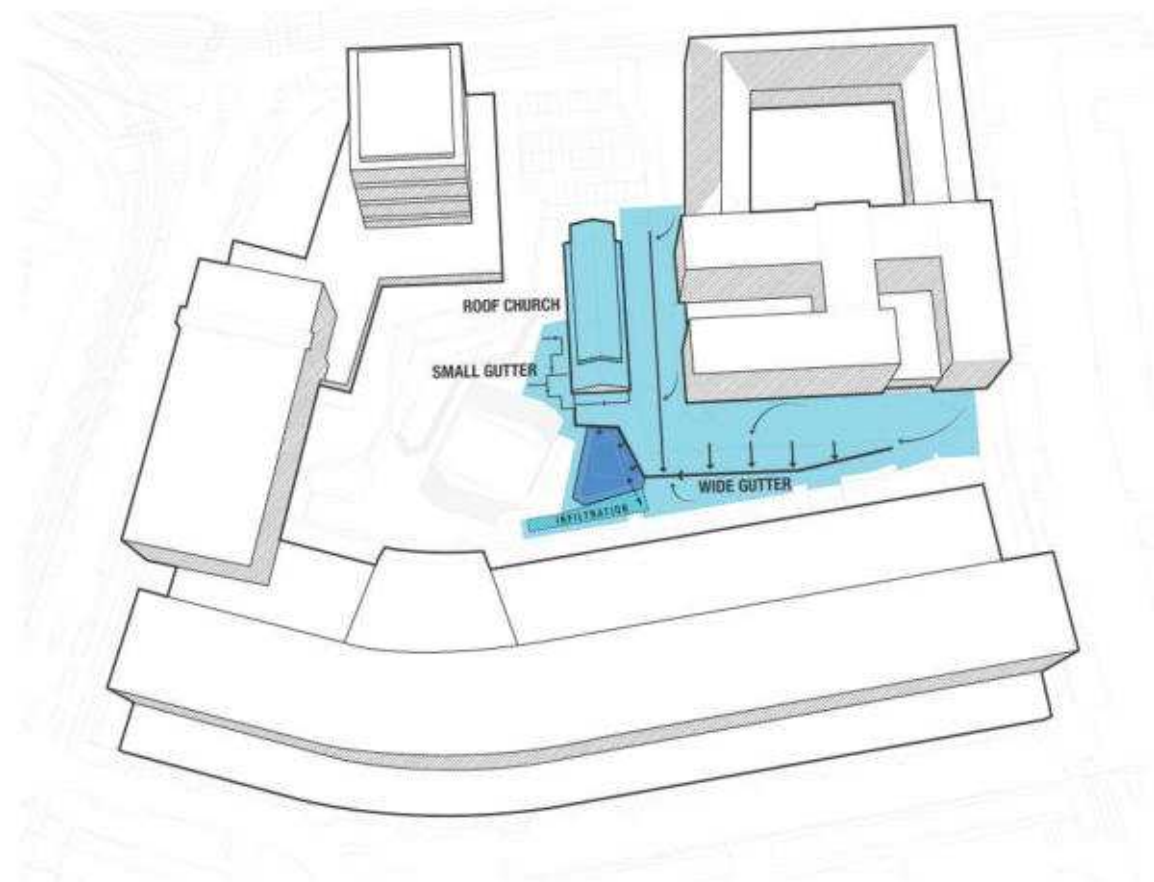
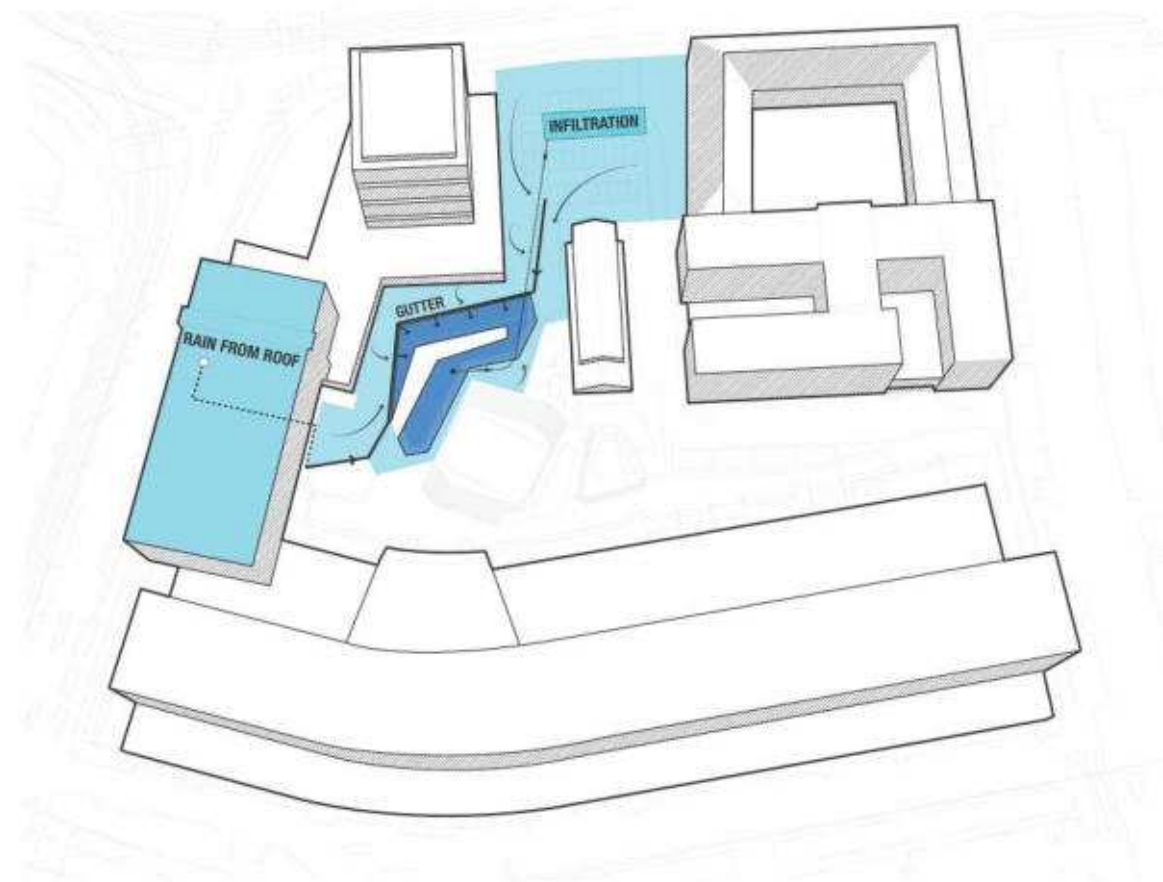
# PLACES FOR TEMPORARY WATER STORAGE



Photo: Palesh-Azarfare



**TOTAL CAPACITY 1700 M<sup>3</sup>**



# FULL SQUARE



Watersquare Benthemplein (De Urbanisten)



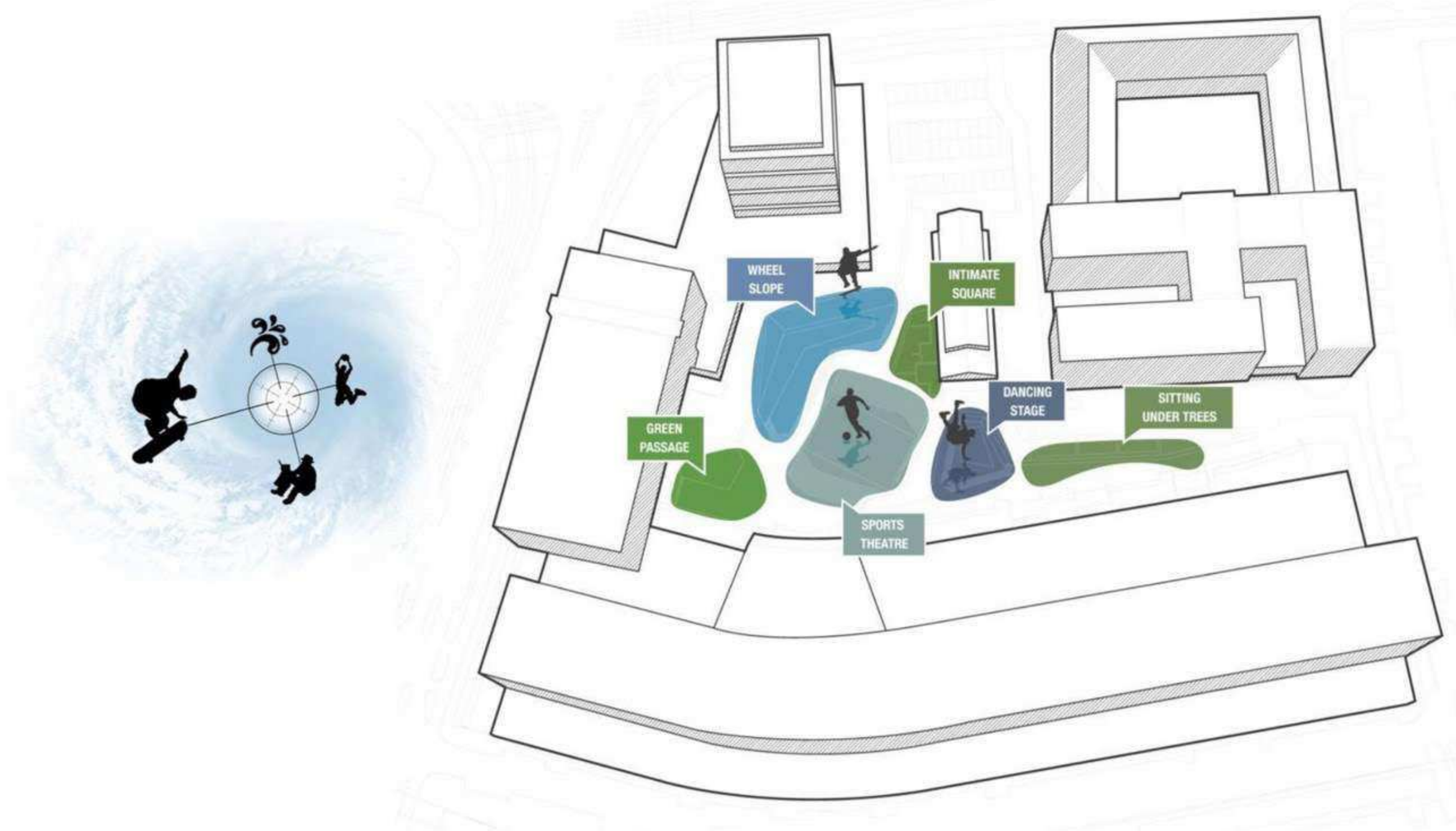
# FULL SQUARE



Watersquare Benthemplein (De Urbanisten)



# A PLACE FOR ALL TO ENJOY AND MEET



ORGANISATION OF ACTIVITIES ON THE WATERSQUARE

# A PLACE FOR ALL TO ENJOY AND MEET



Photo: Jeroen Musch



Photo: Jeroen Musch

# A PLACE FOR ALL TO ENJOY AND MEET





# A PLACE FOR ALL TO ENJOY AND MEET



Photo: Jeroen Musch

# A PLACE FOR ALL TO ENJOY AND MEET



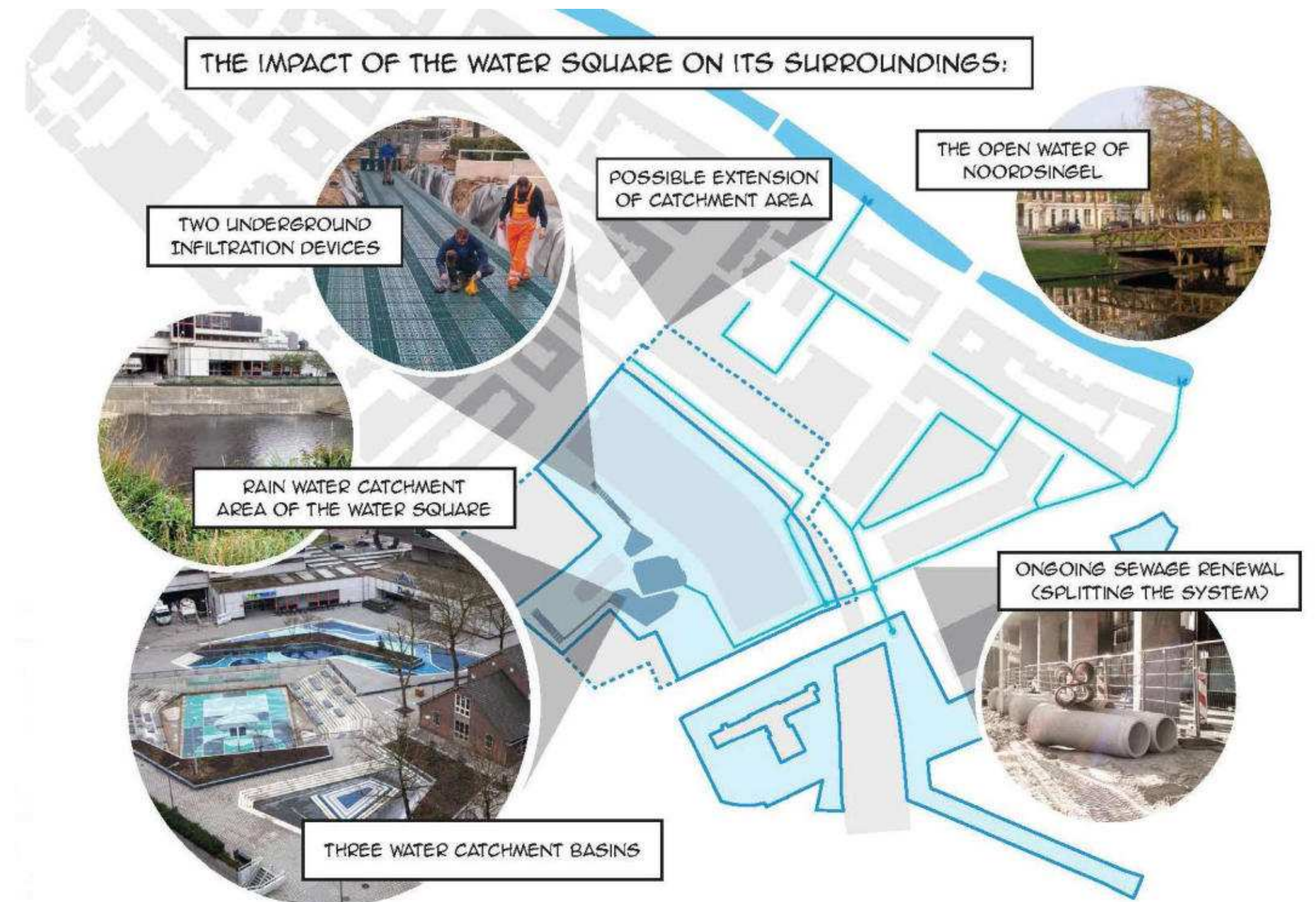
# CLIMATE SENSITIVE DISTRICTS



# SCALING UP THE WATERSQUARE TO THE ZOHO-DISTRICT IN ROTTERDAM



**ZOHO CLIMATEPROOF DISTRICT (DE URBANISTEN)**



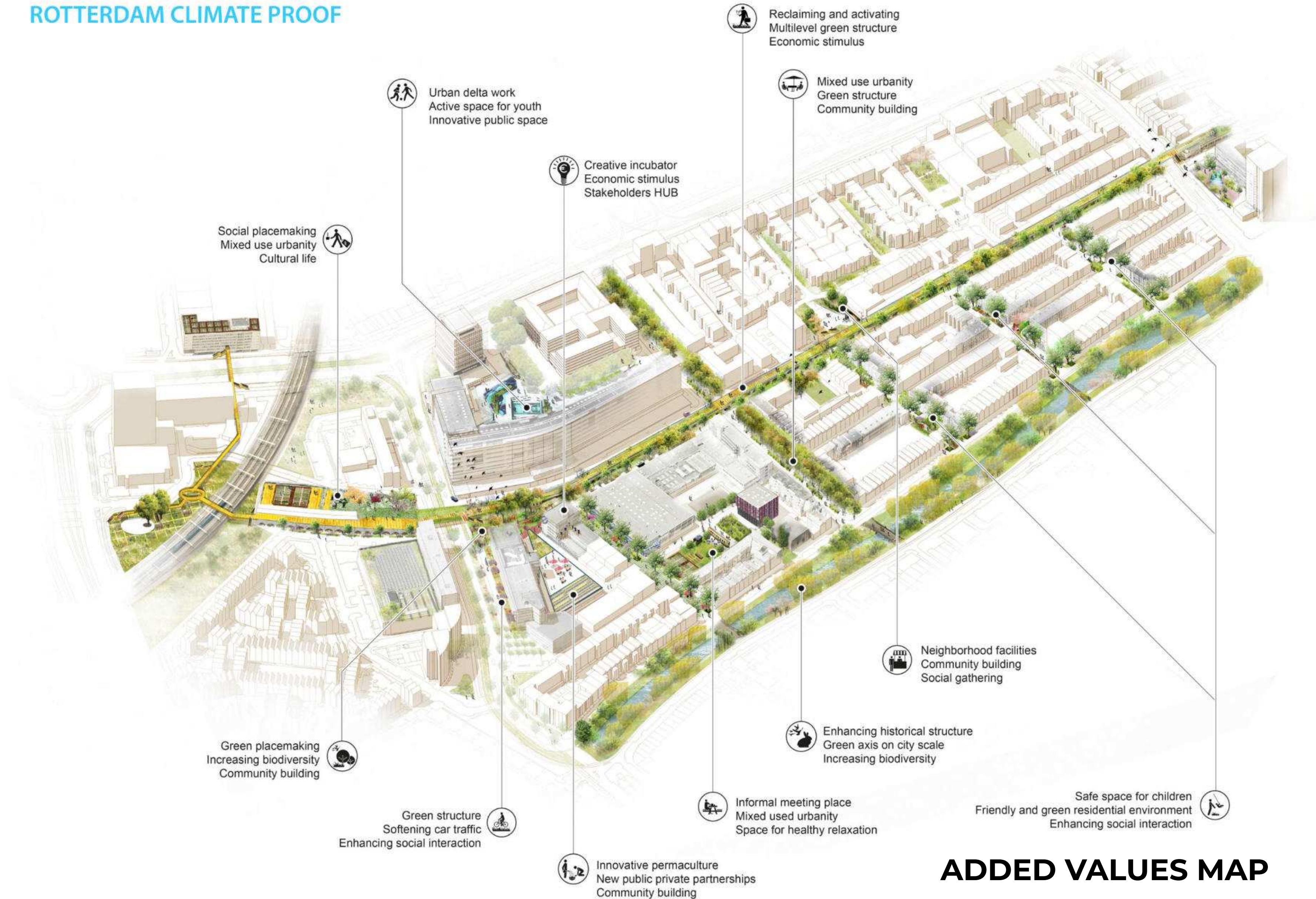
# SCALING UP THE WATERSQUARE TO THE ZOHO-DISTRICT IN ROTTERDAM



CLIMATE\_SENSITIVE MAP

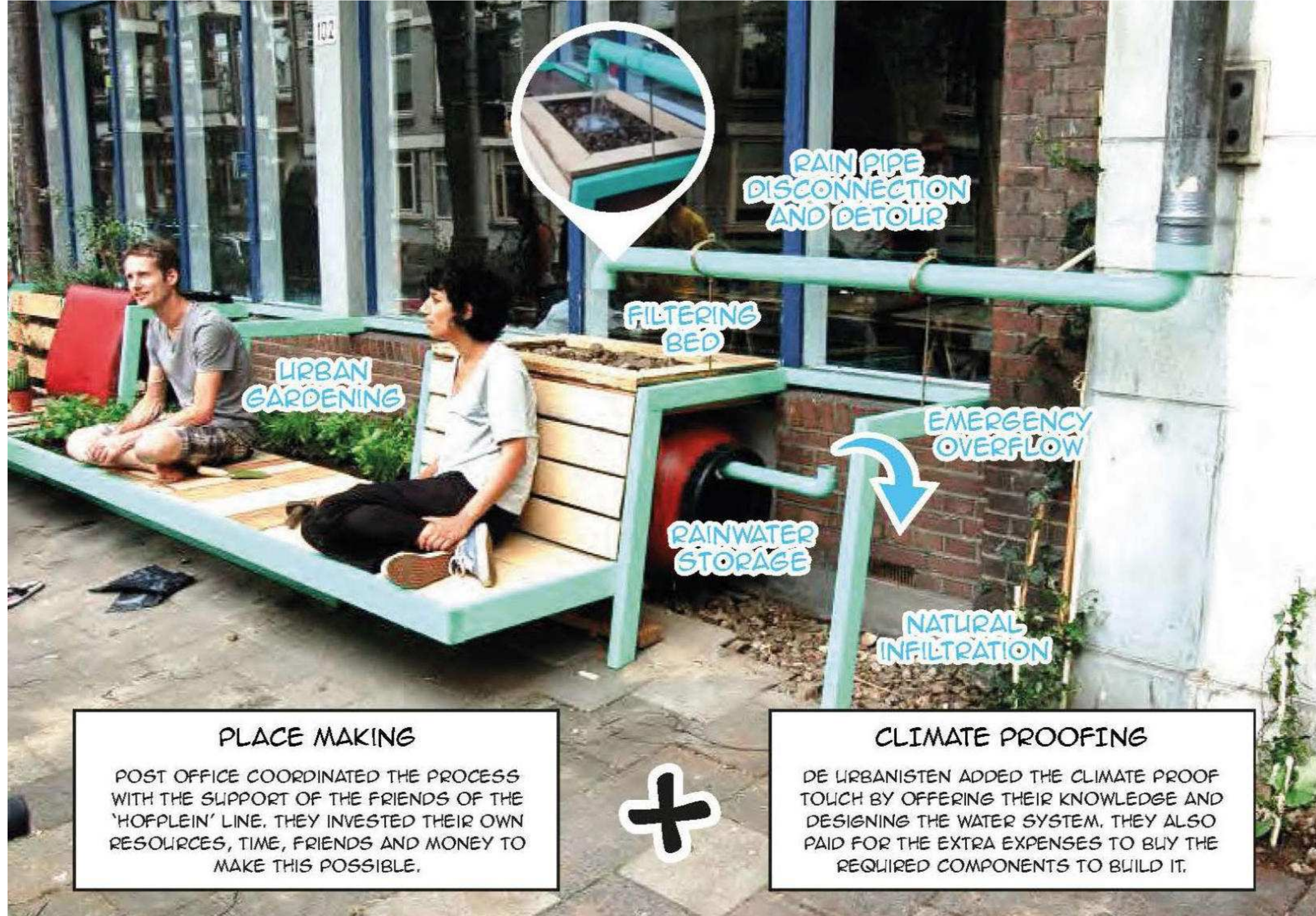
# SCALING UP THE WATERSQUARE TO THE ZOHO-DISTRICT IN ROTTERDAM

ROTTERDAM CLIMATE PROOF



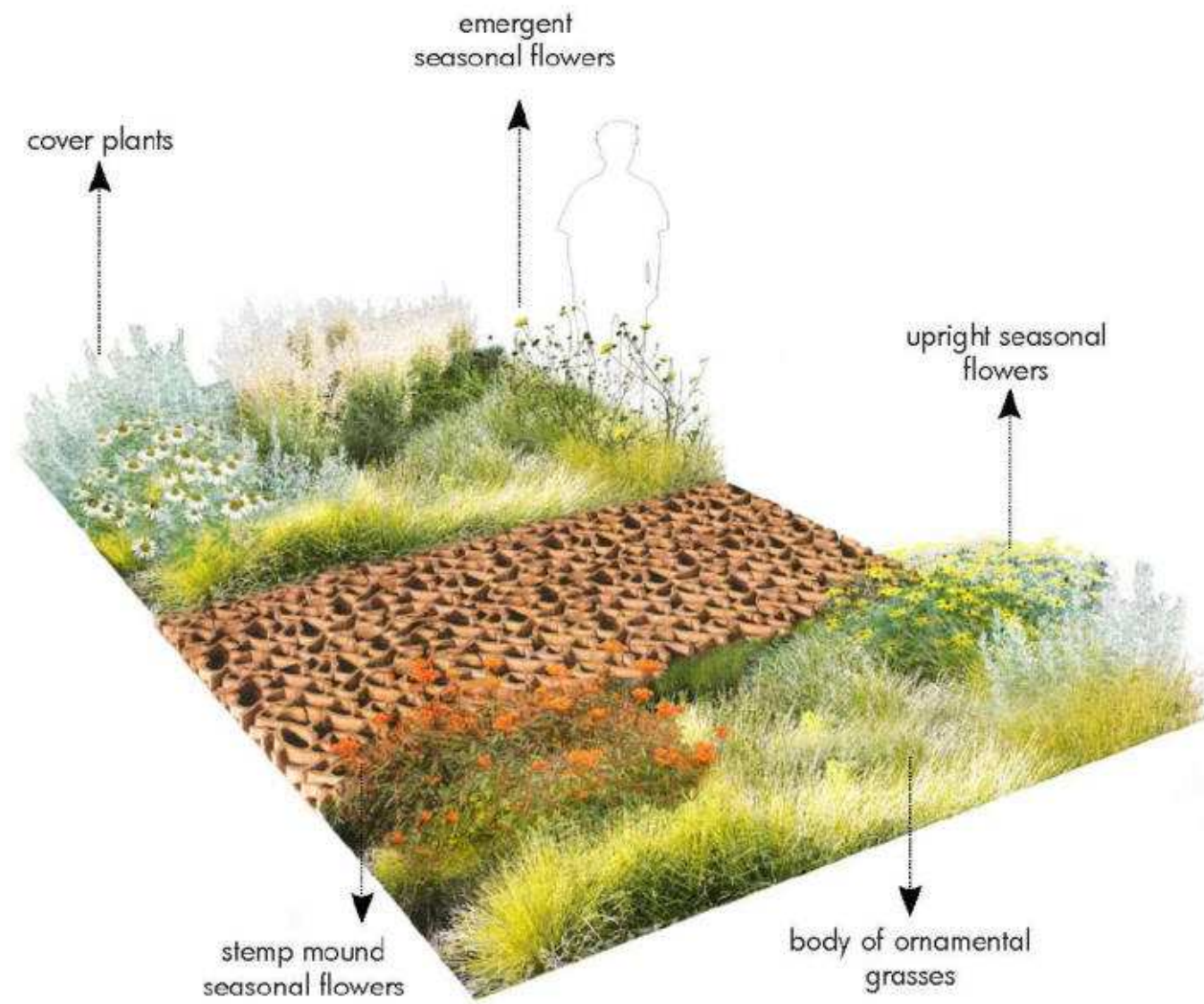
ADDED VALUES MAP

# FIRST PROJECTS: THE POST-OFFICE FRONTGARDEN



**DESIGN BY POST-OFFICE WITH DE URBANISTEN**

# FIRST PROJECTS: THE RAIN(A)WAY GARDEN



## THE ZOHO RAIN(A)WAY GARDEN

Design by De Urbanisten / Rain(a)way pavement by Fien Dekker

## THE RAIN(A)WAY TILE



# FIRST PROJECTS: THE ZOHO RAINGARDEN



**THE ZOHO RAINGARDEN** (First design by De Urbanisten / final design by Stadsontwikkeling Rotterdam)

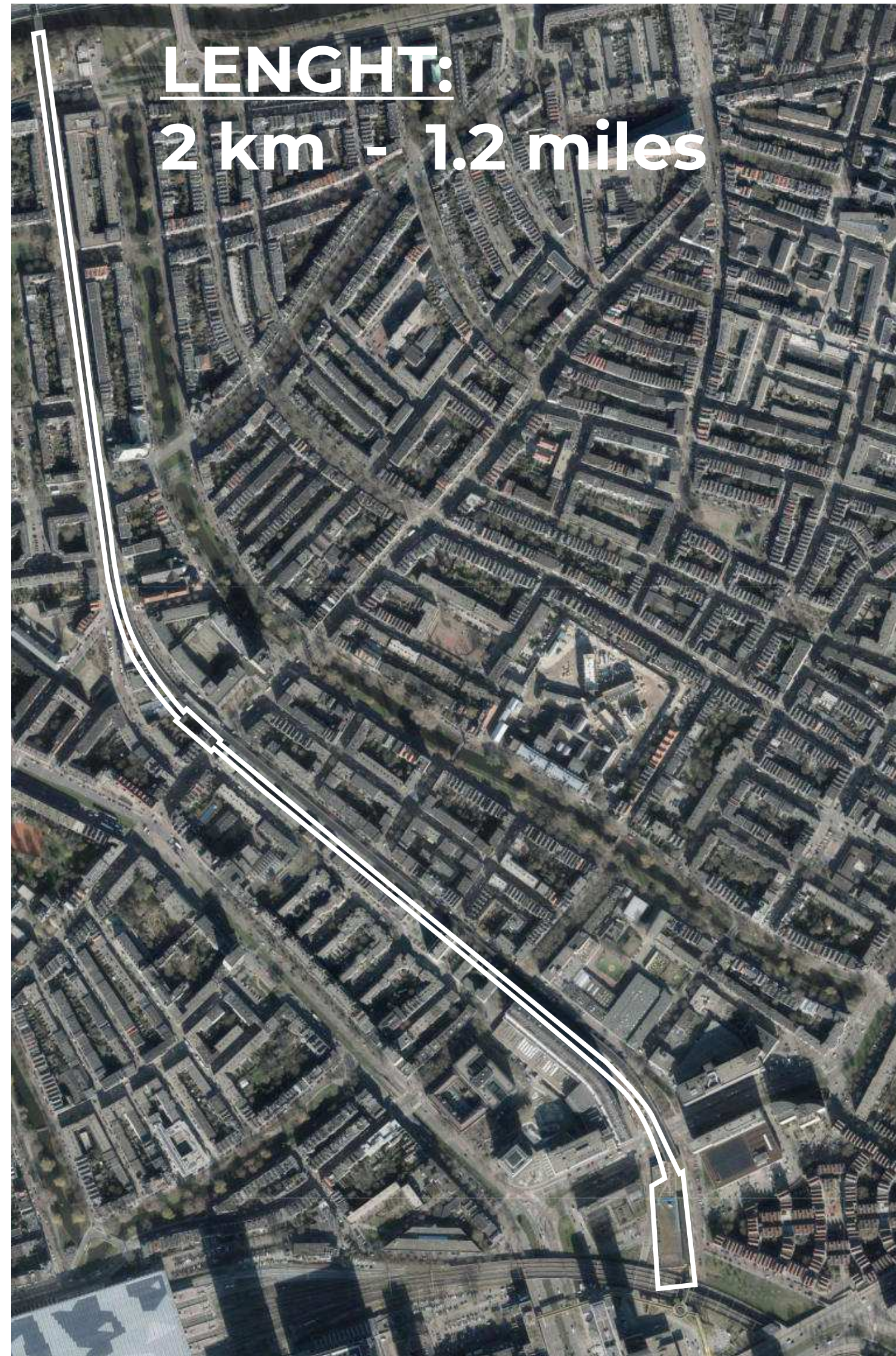
# HOFBOGENPARK



# THE “HOFPLEINLIJN” : AN UNIQUE RAILWAY MONUMENT IN ROTTERDAM (NL)



# THE “HOFPLEINLIJN” : 2 KILOMETERS OF ABANDONED ELEVATED RAILWAY



**WIDTH: 8 meter - 25 feet**



# “HOFBOGEN” AT STREETLEVEL: 189 ARCHES UNDERNEATH THE RAILWAY VIADUCT



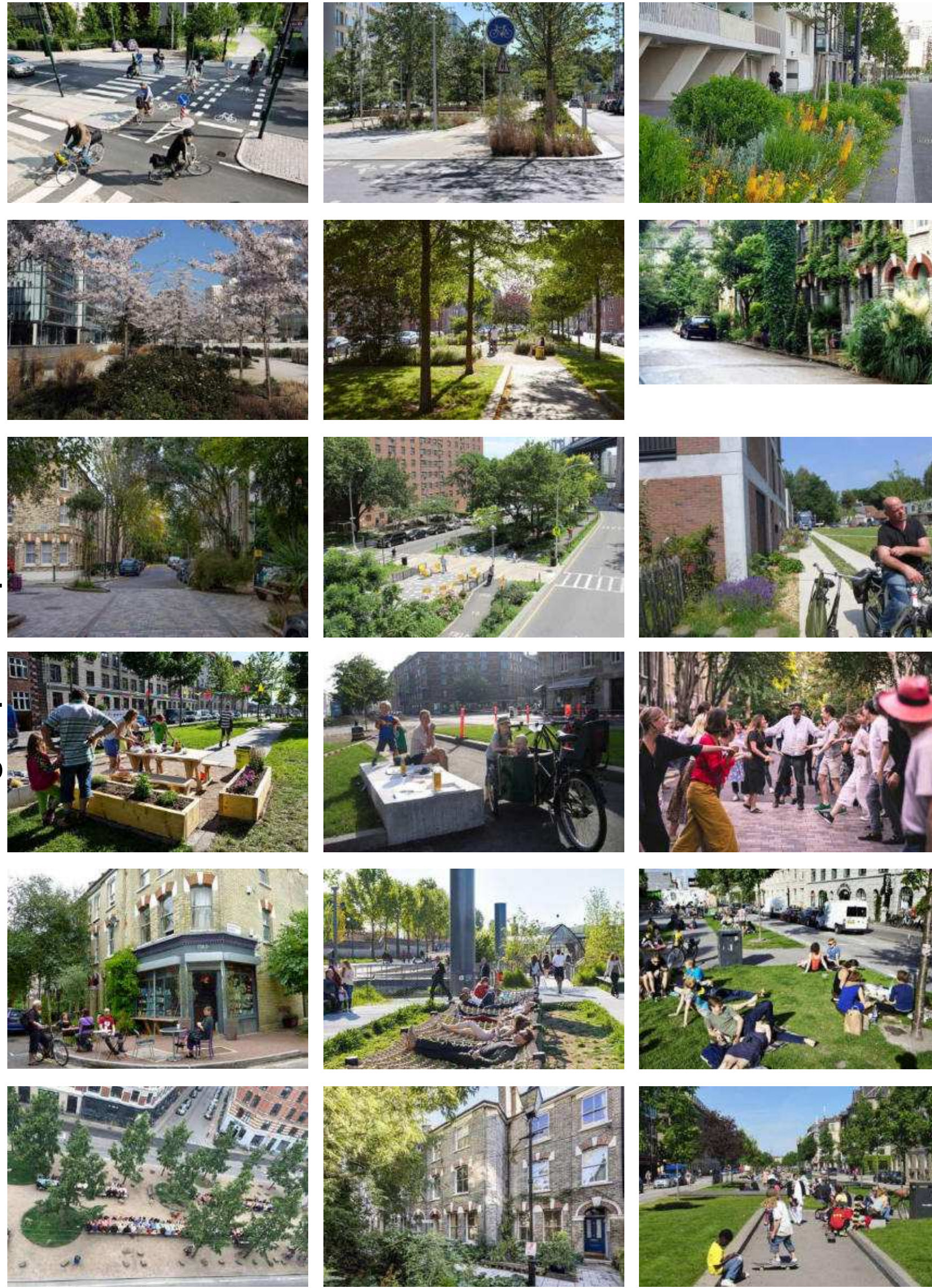
# ON TOP OF THE "HOFBOGEN": A SPECTACULAR WALK & GREAT VIEWS



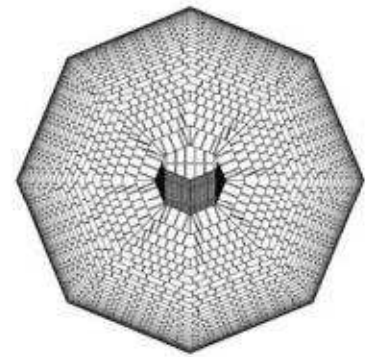
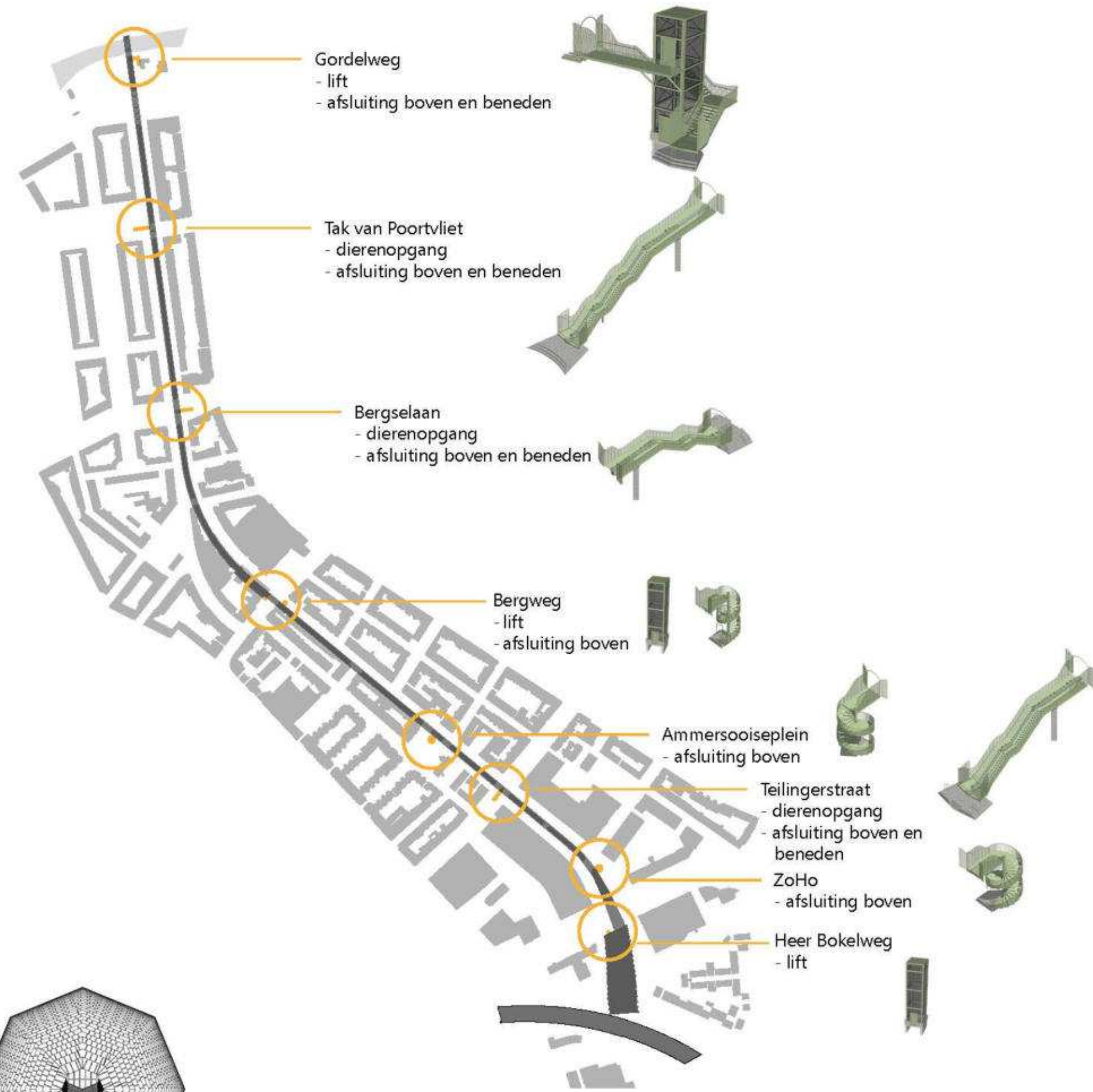
# A NETWORK PARK FOR NORTHERN ROTTERDAM



Referenties voor het Hofbogenpark op maaiveld



# A NETWORK PARK FOR NORTHERN ROTTERDAM



BUREAUVANEIG

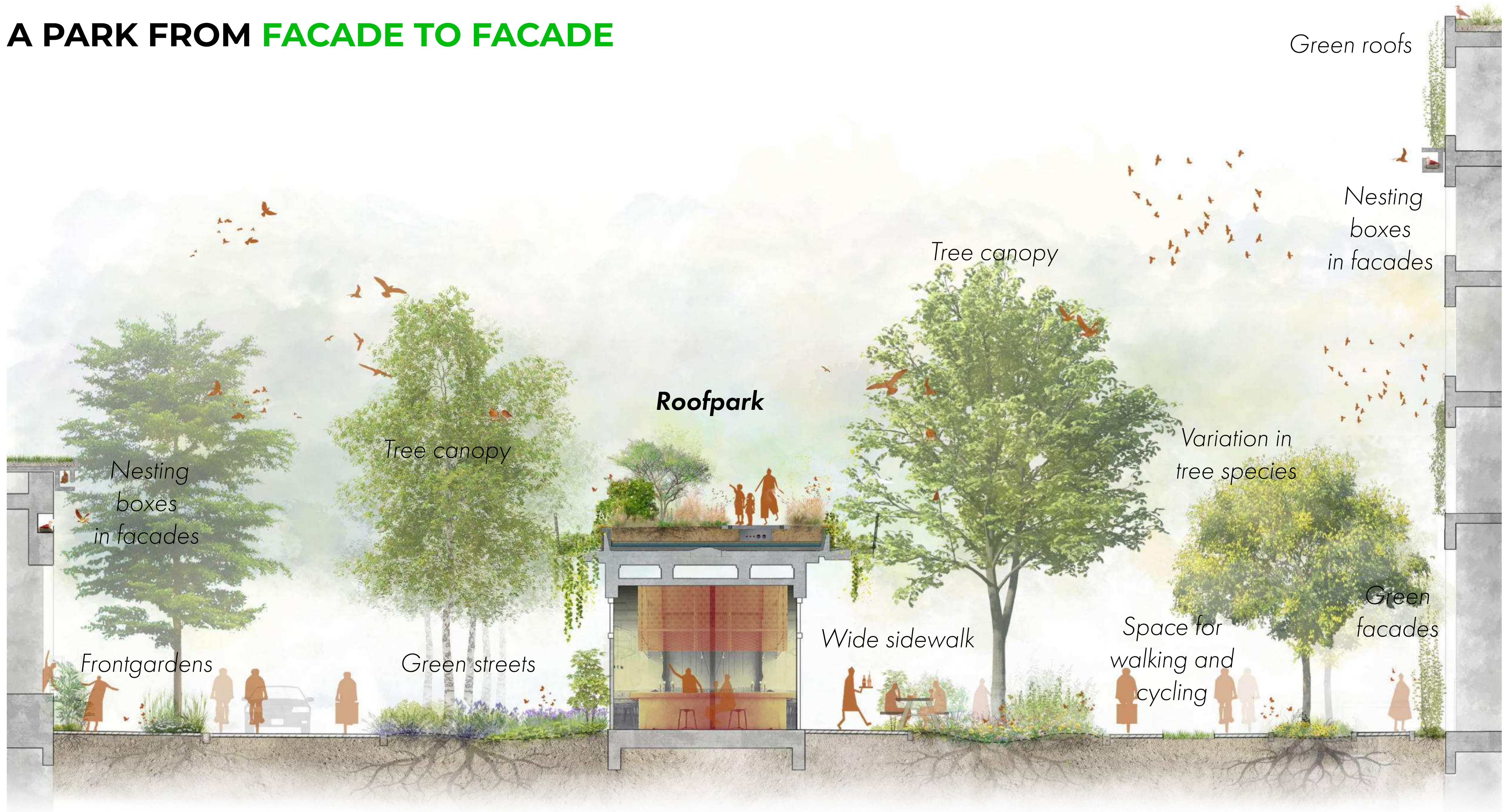


ontwerp opgangen door Bureau van Eig





# A PARK FROM **FACADE TO FACADE**



Green roofs

Nesting boxes in facades

Tree canopy

**Roofpark**

Tree canopy

Variation in tree species

Nesting boxes in facades

Green facades

Space for walking and cycling

Wide sidewalk

Green streets

Frontgardens

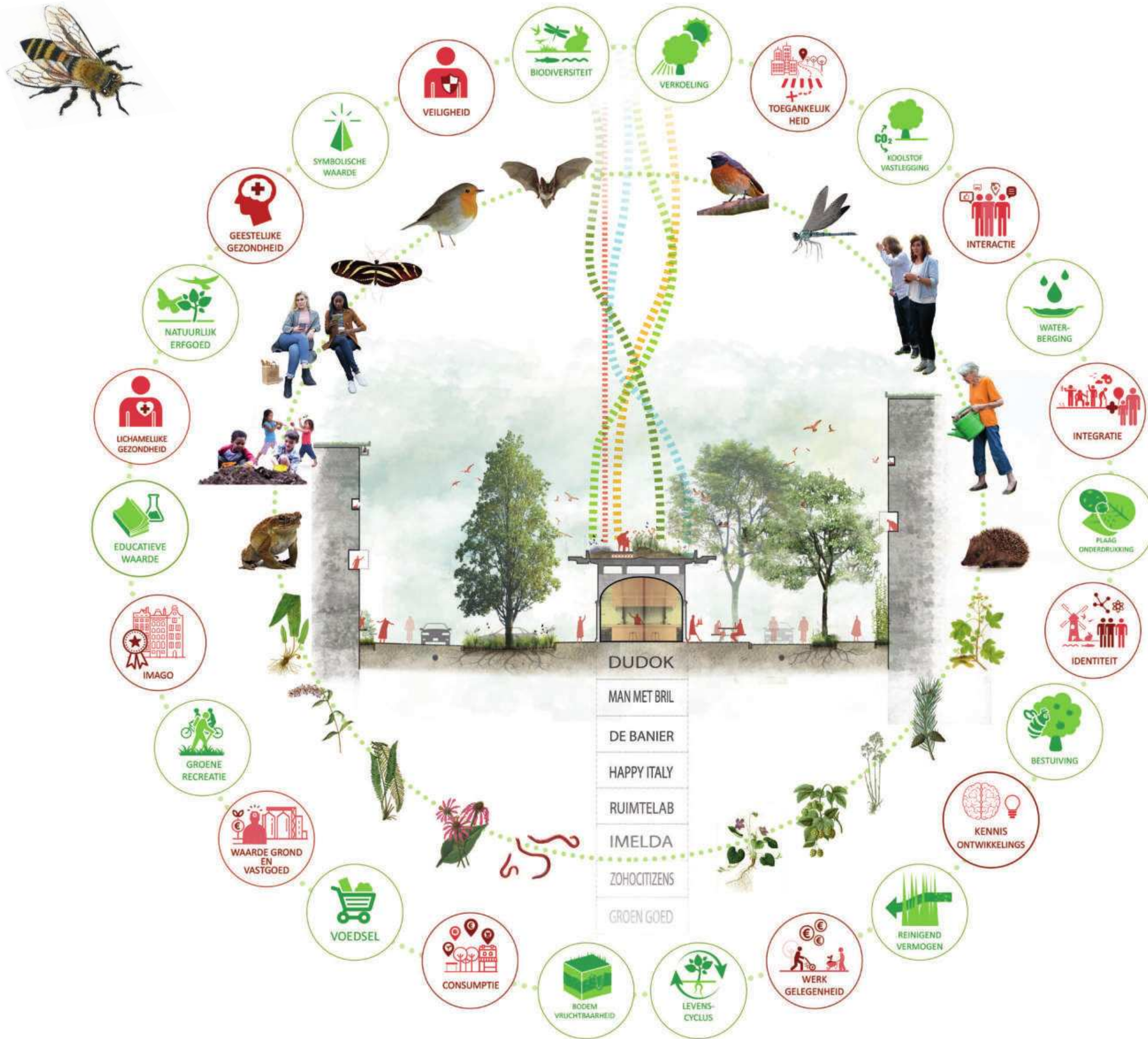
# A PARK FROM FACADE TO FACADE



# A PARK FROM **FACADE TO FACADE**



# THE HOFBOGENPARK IS ALL INCLUSIVE



# A NATURE INCLUSIVE PARK



biels met nummer



ecologische biels (mossen / muurvarrens)



biels insectenhotel  
ecologische biels (mossen / muurvarrens)



biels



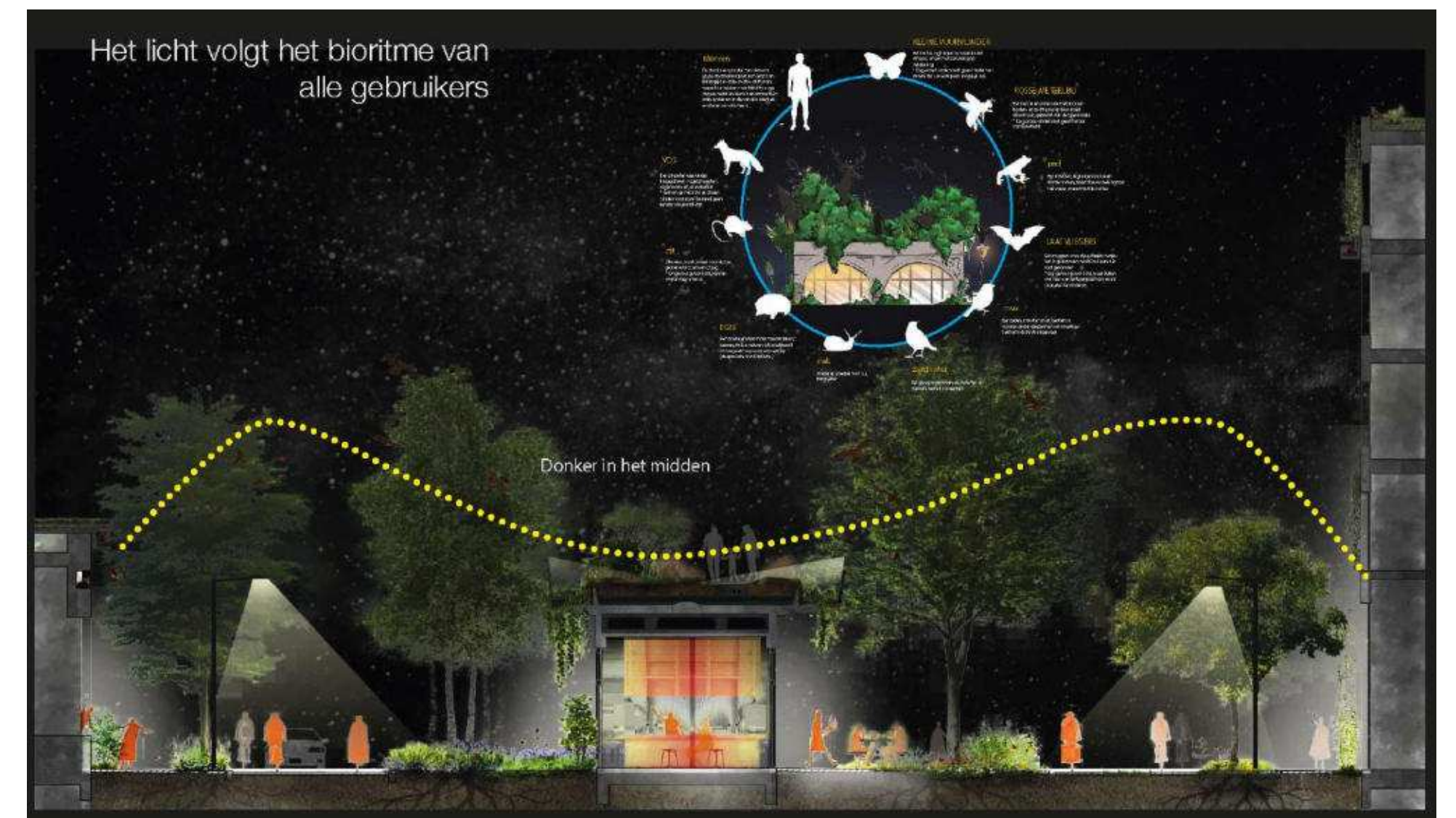
genummerd



natuurinclusief



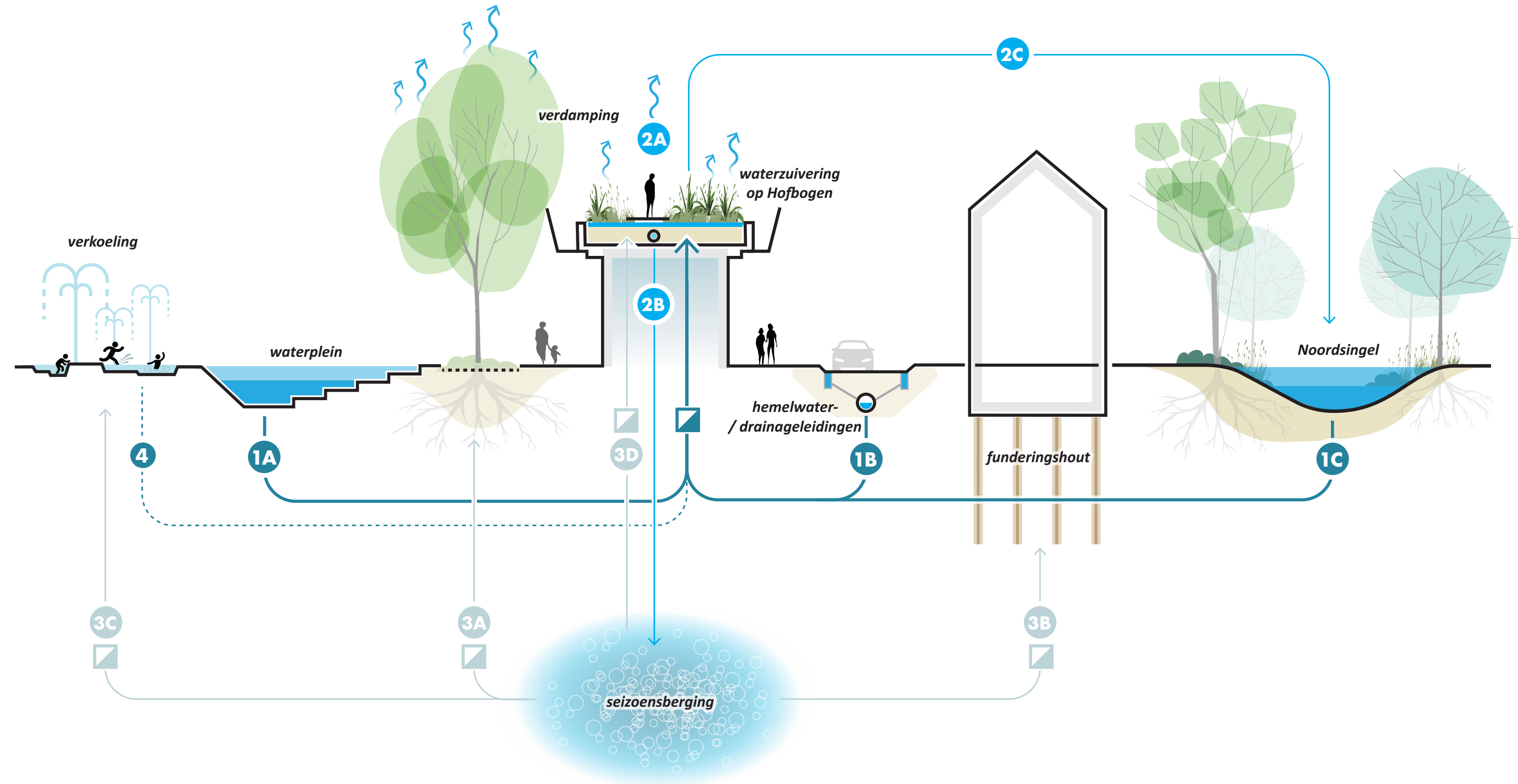
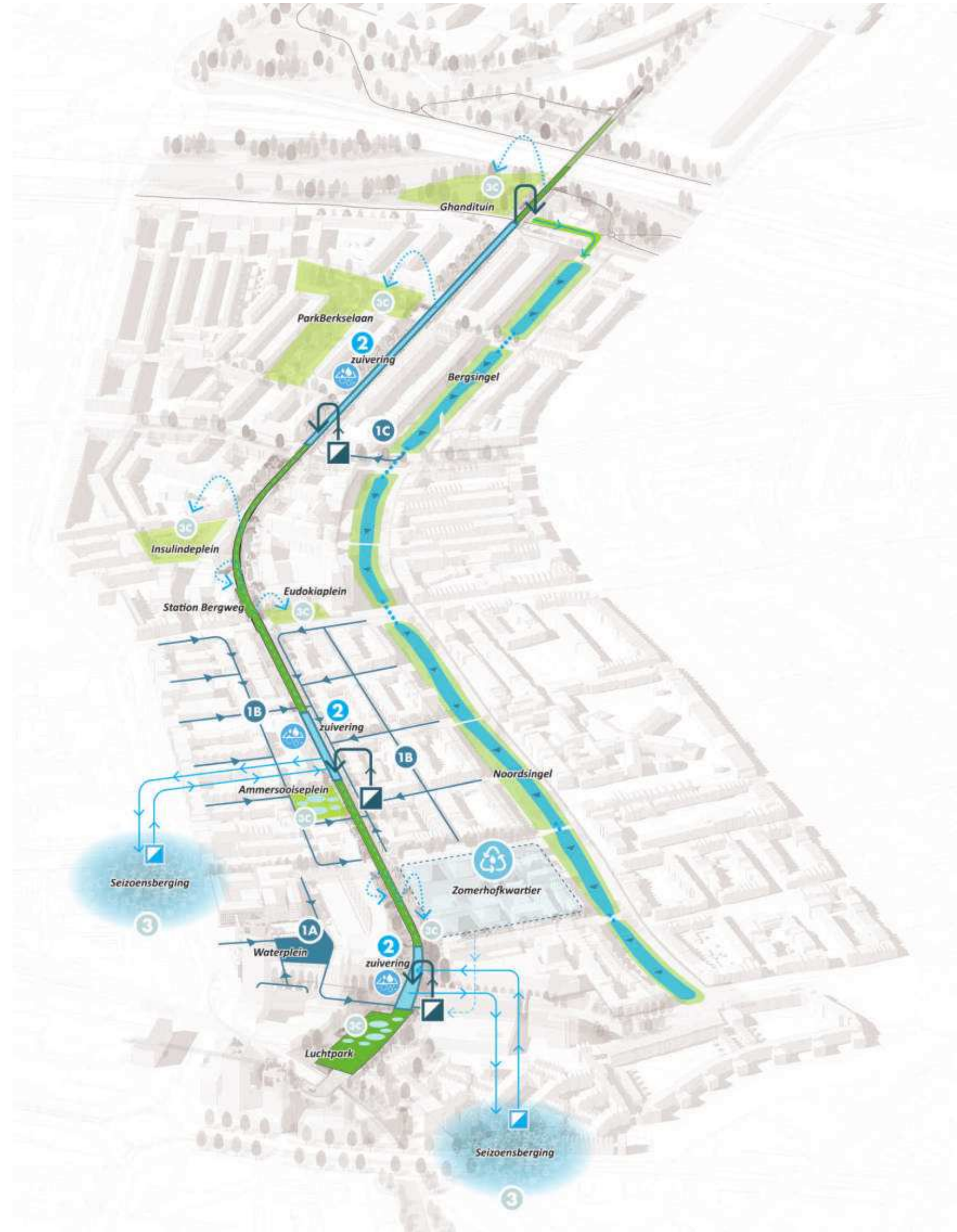
natuurinclusief



# A NATURE INCLUSIVE PARK

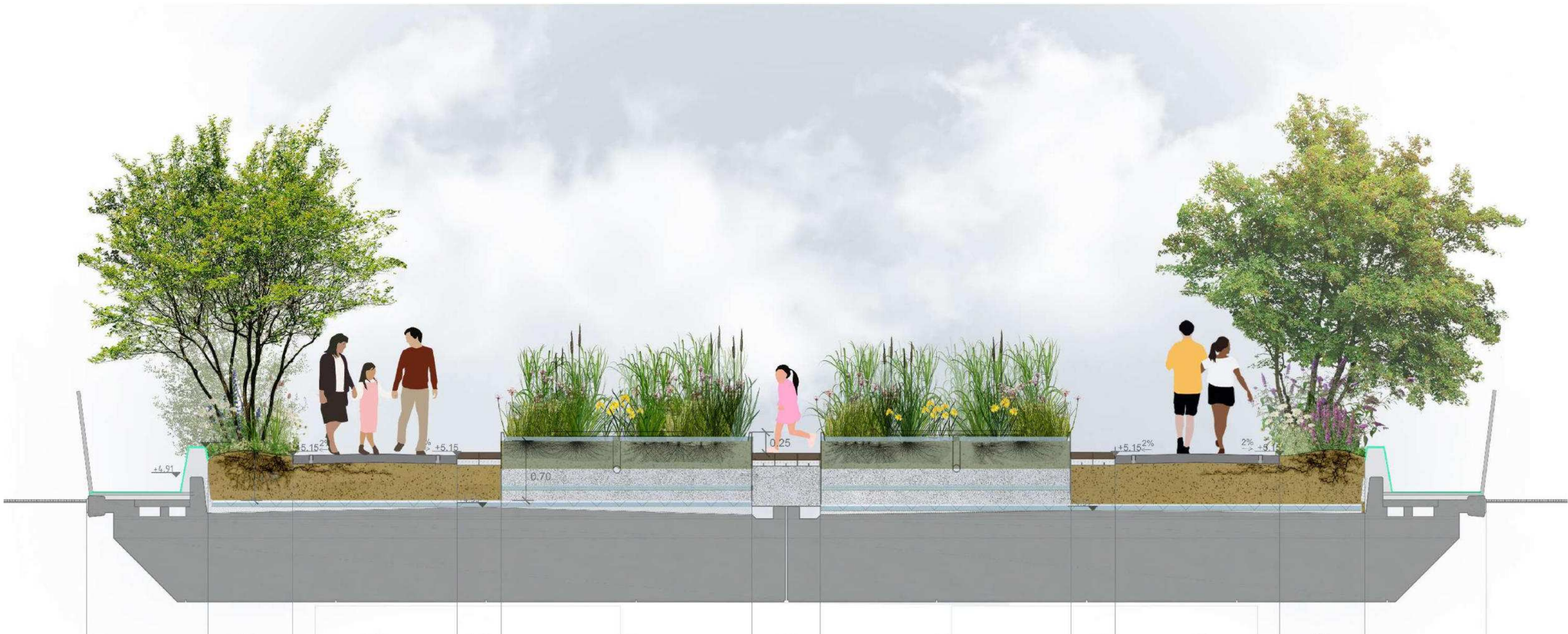


# A CLIMATE SENSITIVE PARK IN NORTHERN ROTTERDAM



Voorgesteld circulair watersysteem voor Hofbogenpark en omgeving

# A CLIMATE SENSITIVE PARK IN NORTHERN ROTTERDAM





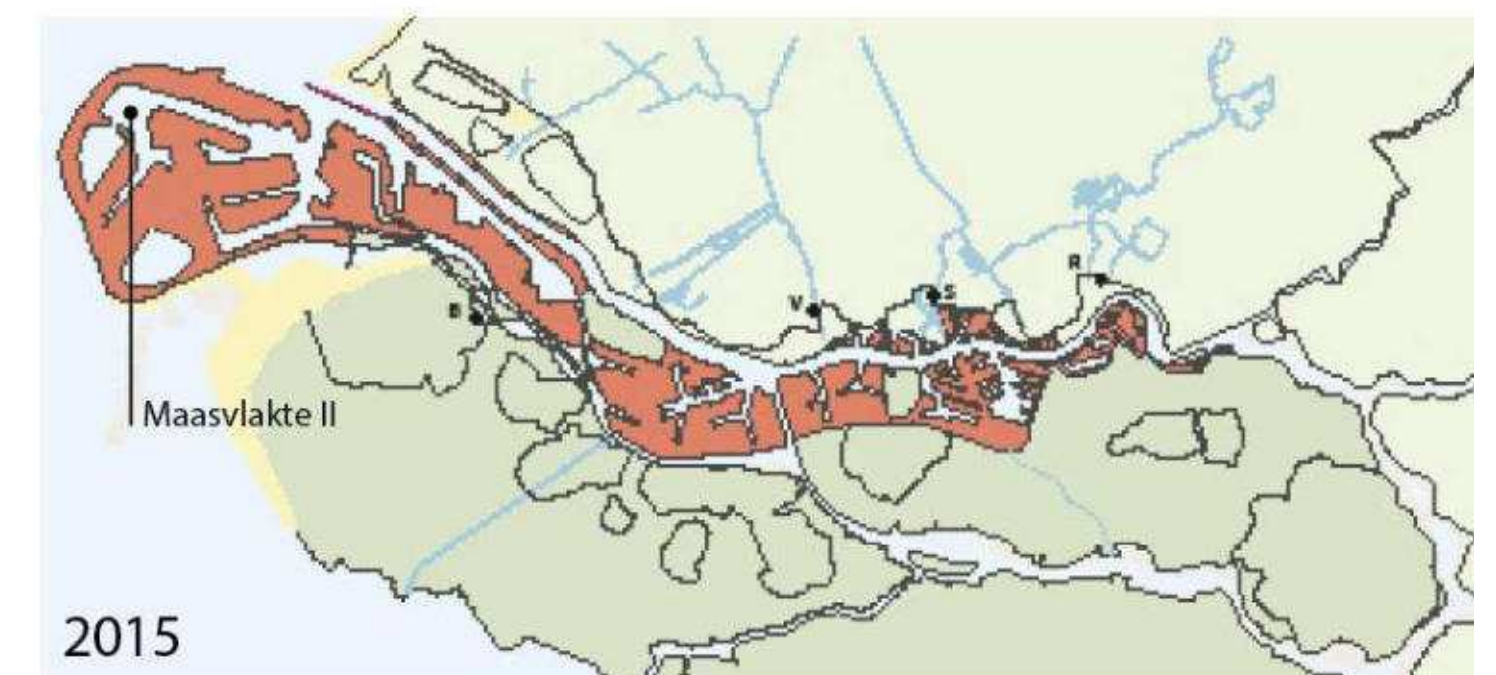
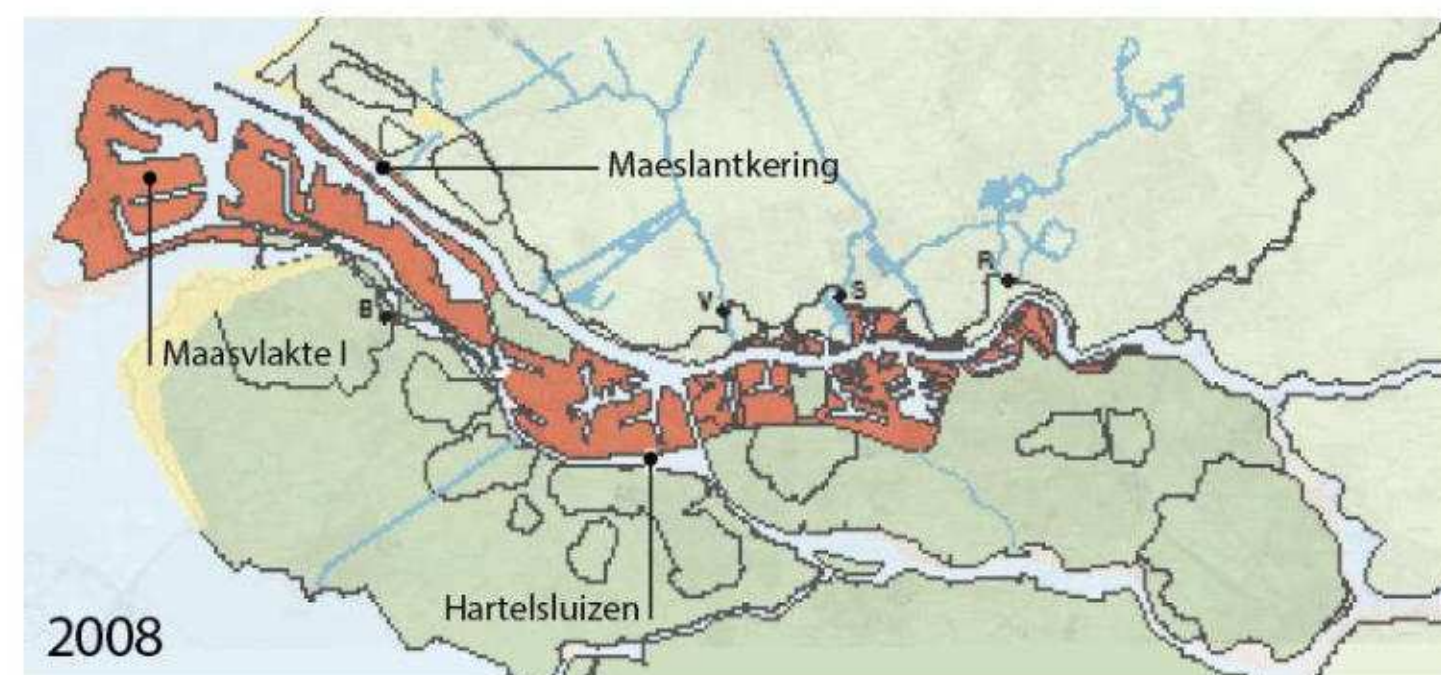
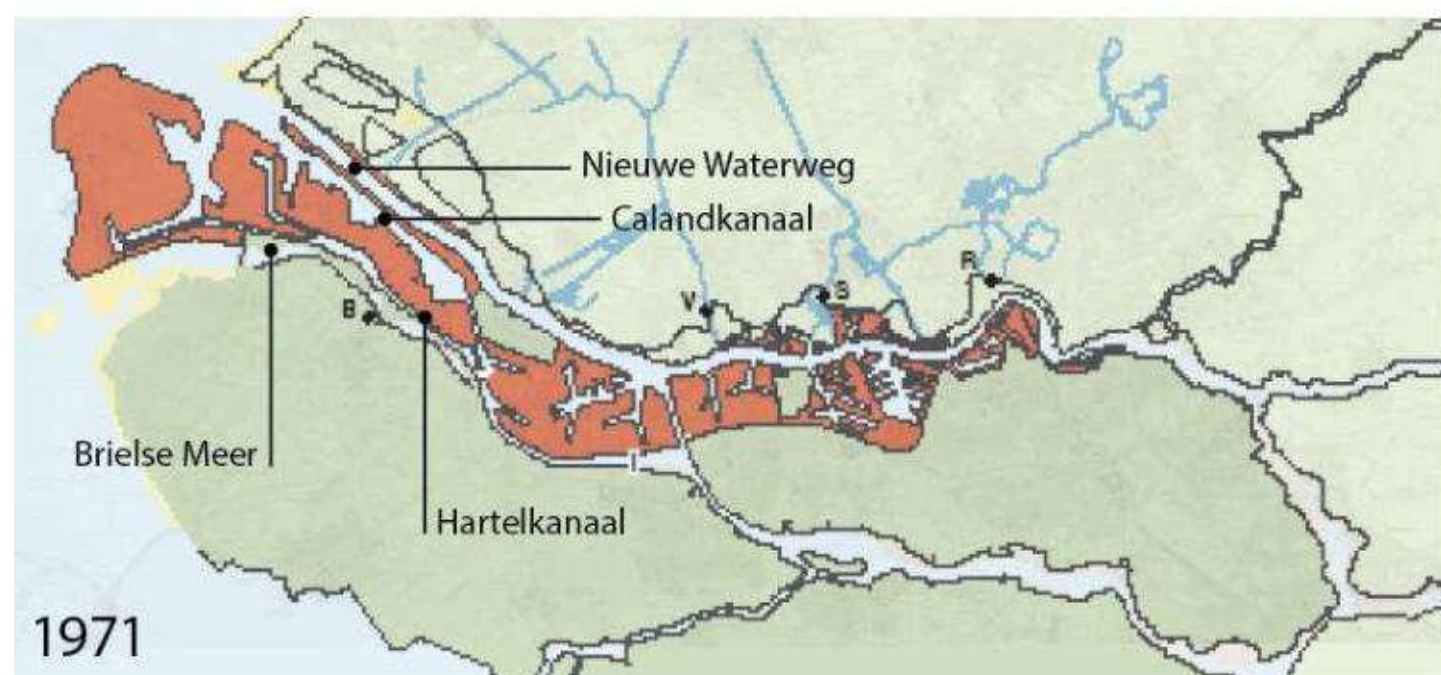
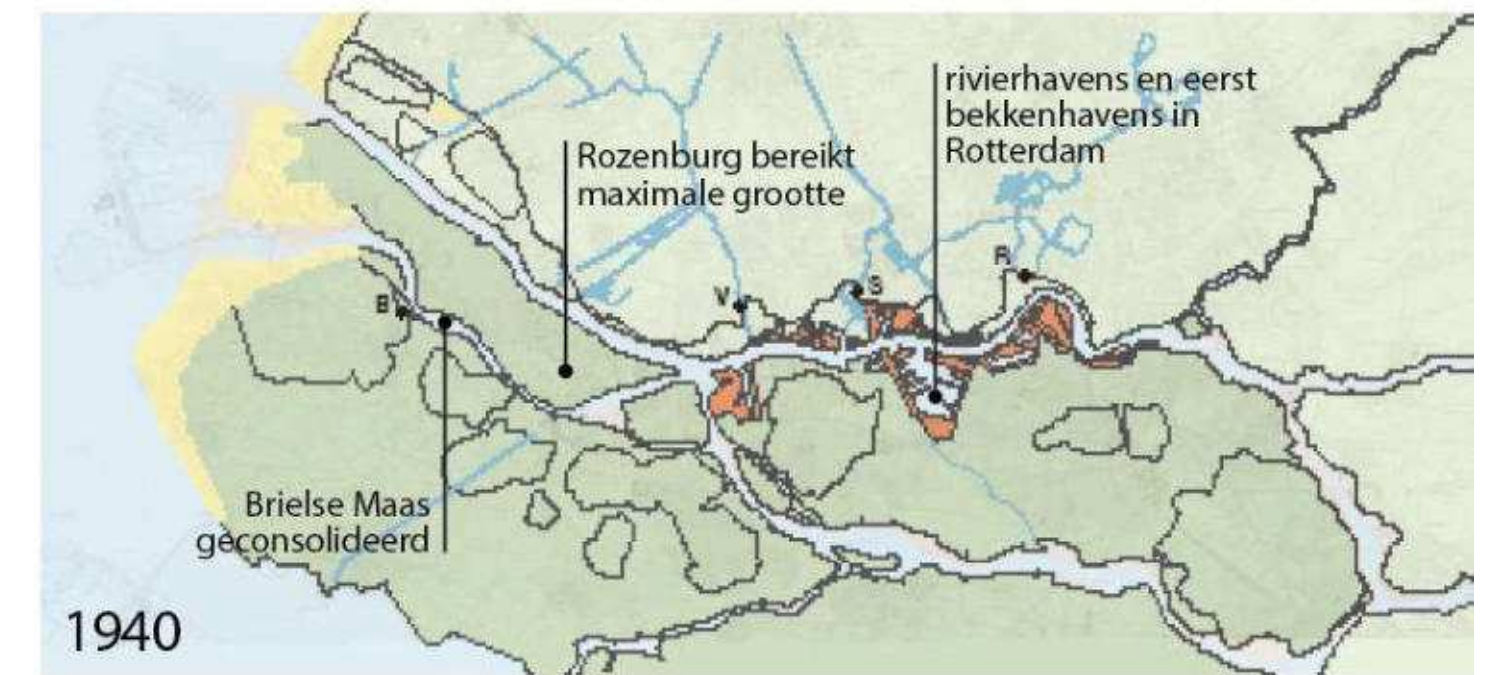
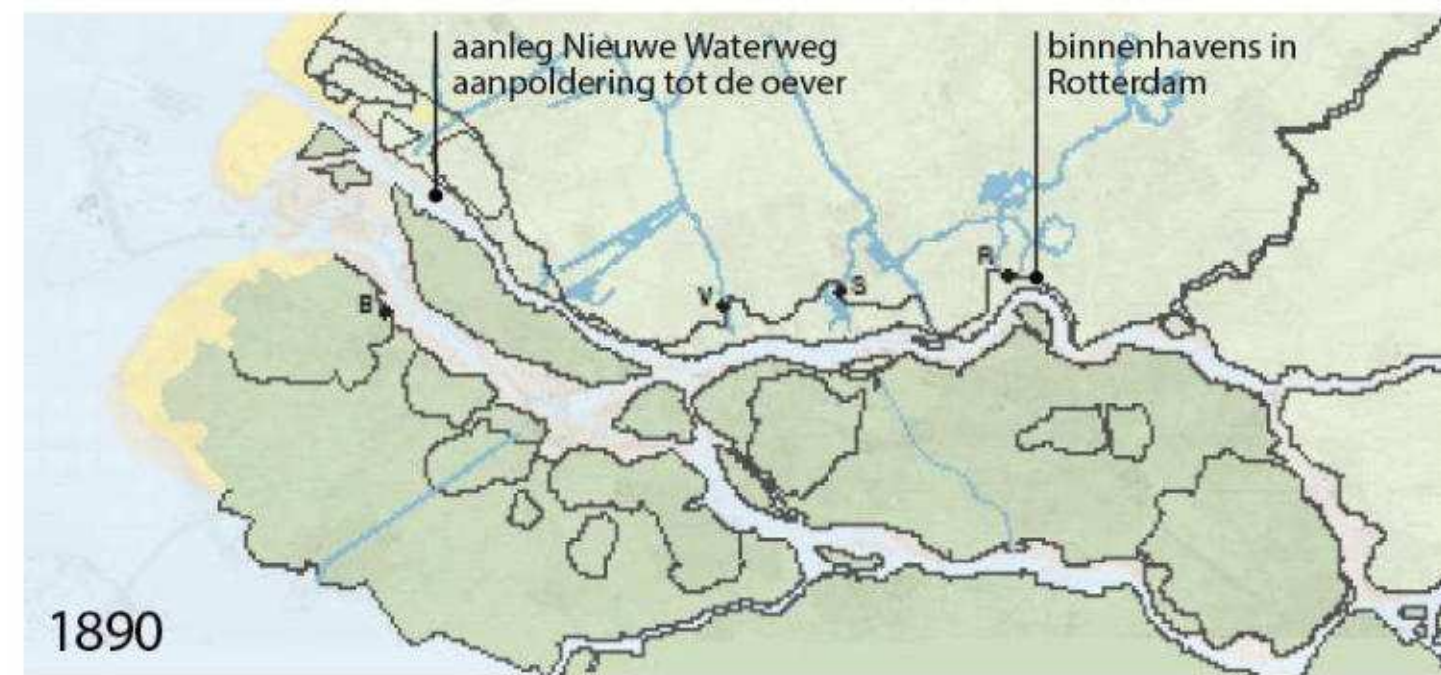
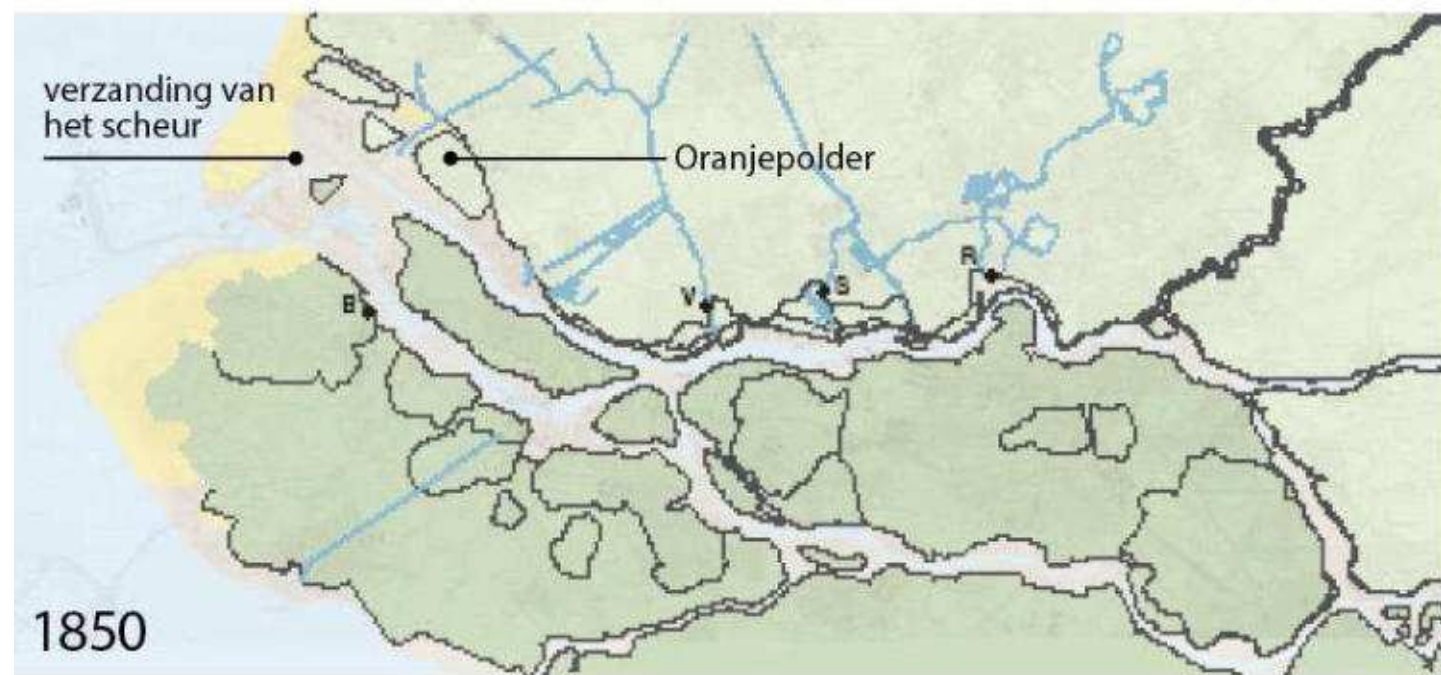
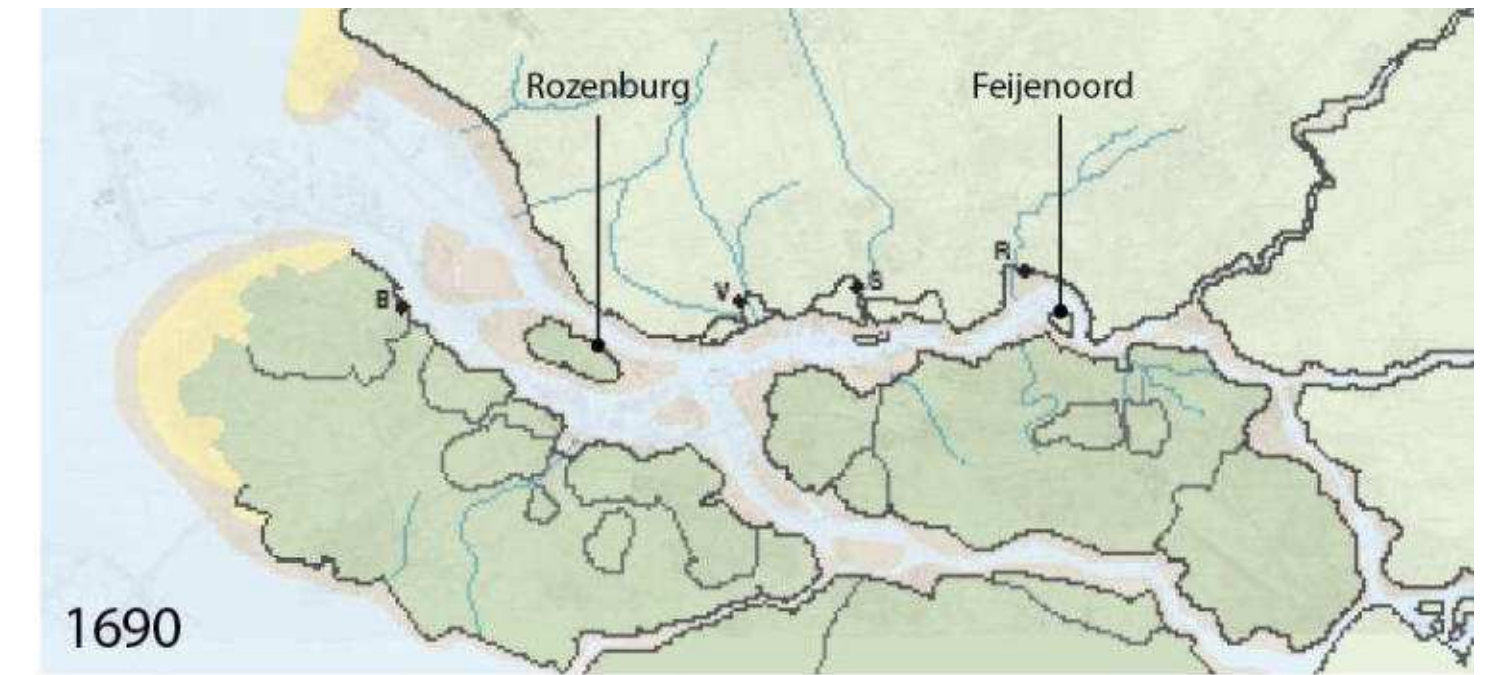
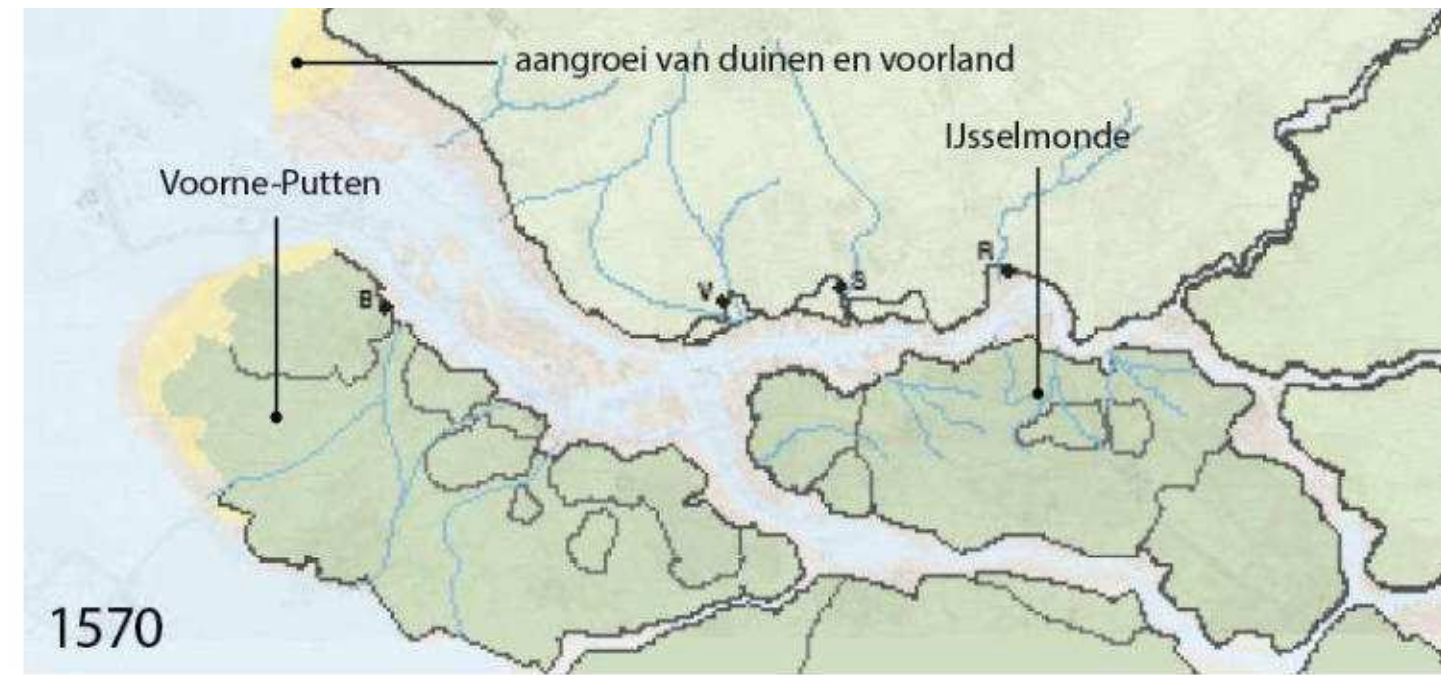
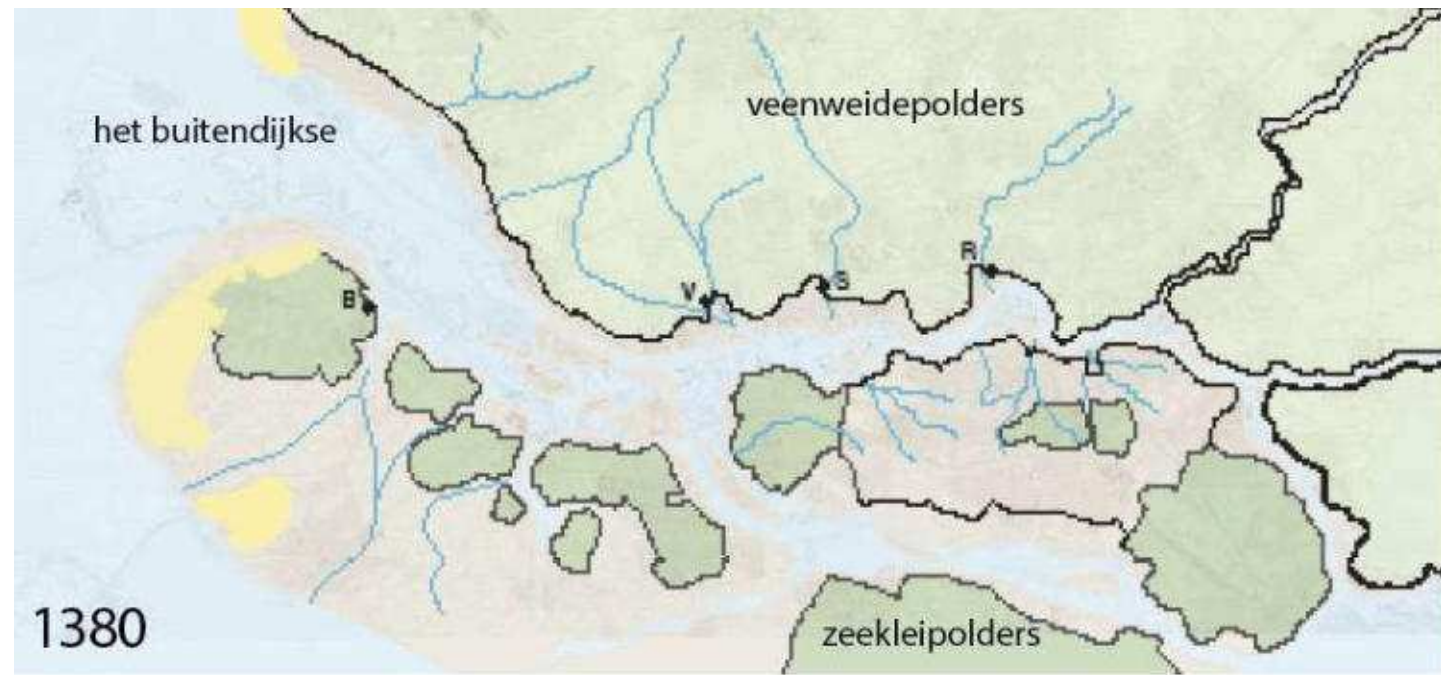
# A CLIMATE SENSITIVE PARK IN NORTHERN ROTTERDAM



# TIDAL PARK - KEILEHAVEN ROTTERDAM



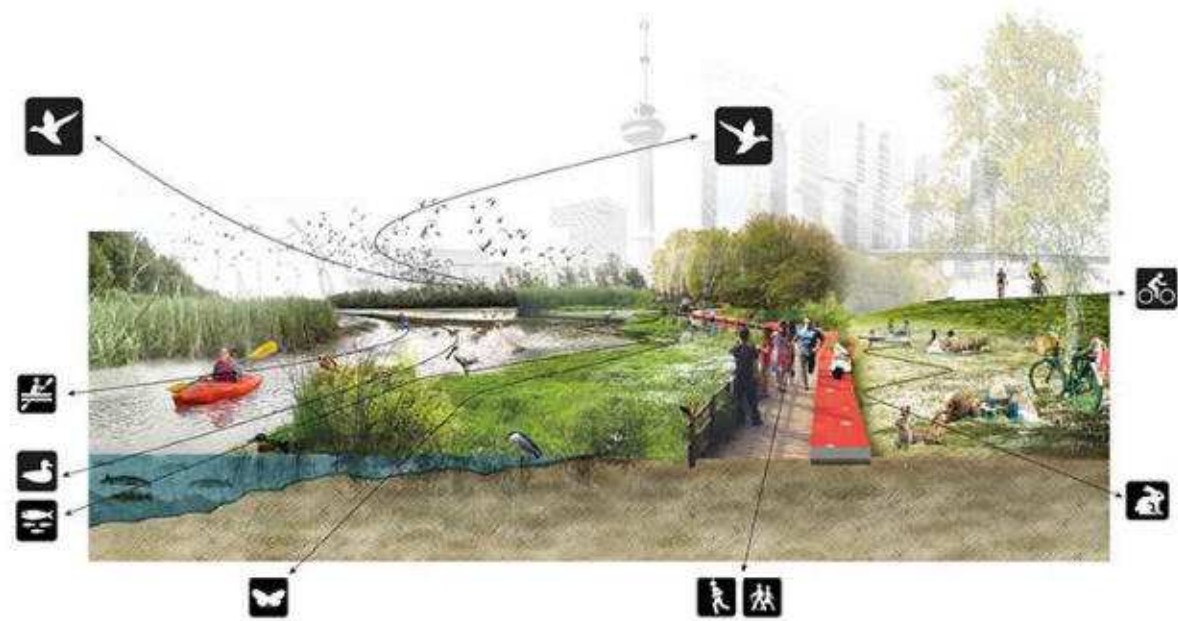
# HOW THE DYNAMIC ECOLOGY OF THE DELTA LEFT THE CITY OF ROTTERDAM



# TIDAL PARKS ROTTERDAM - A ECOLOGICAL PERSPECTIVE FOR THE RIVERBANKS



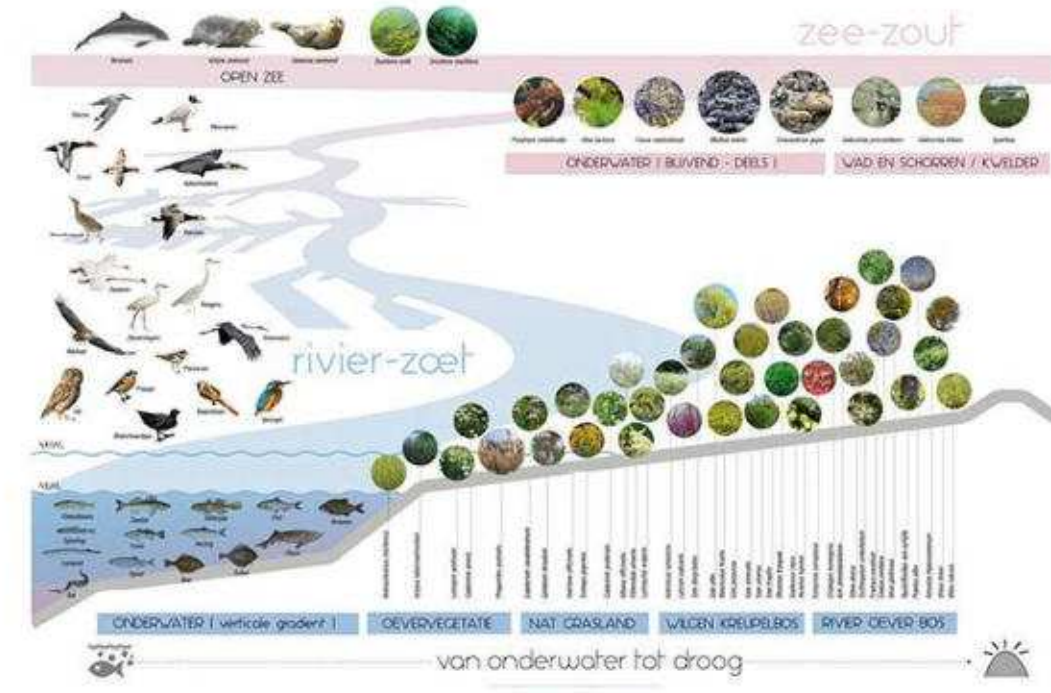
# TIDALPARKS ROTTERDAM - ADDED VALUES



Connecting city and river



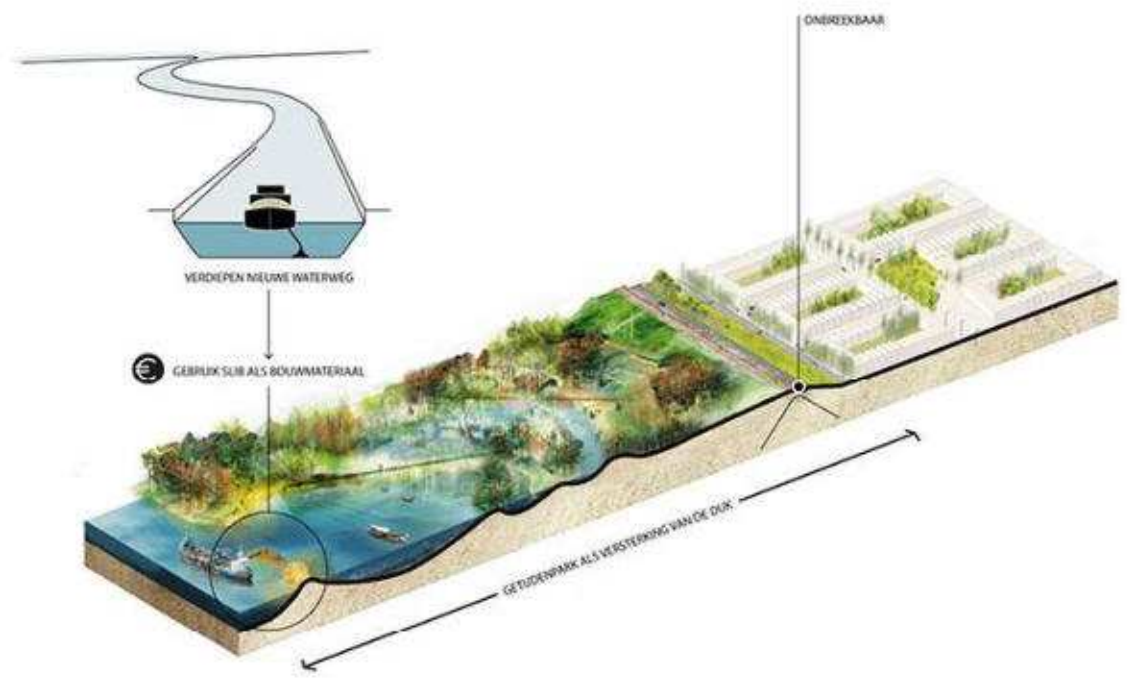
Learning environment



Increase biodiversity



Food production and experience



Improving watersafety



Closing waste cycle

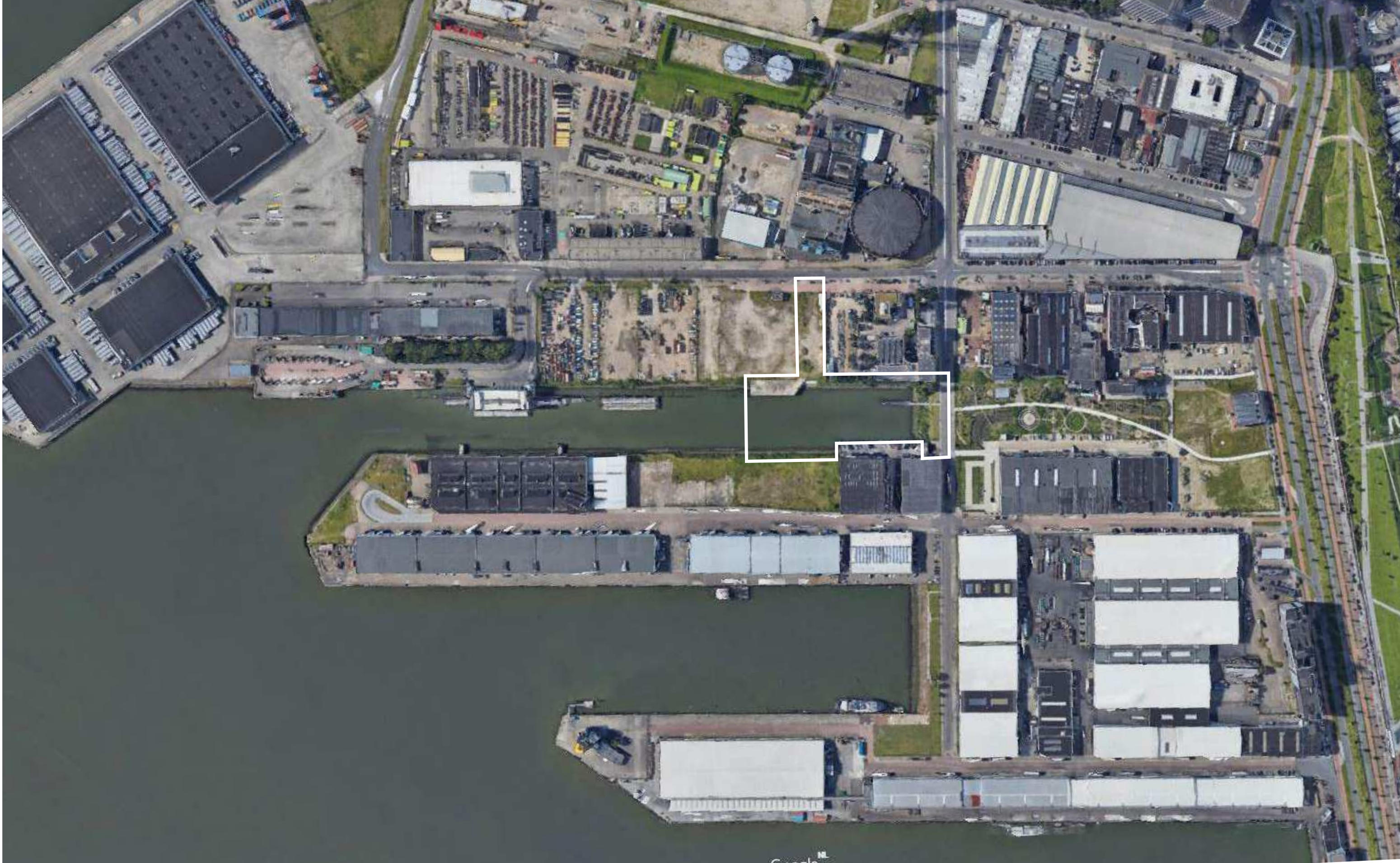


Base for urban development

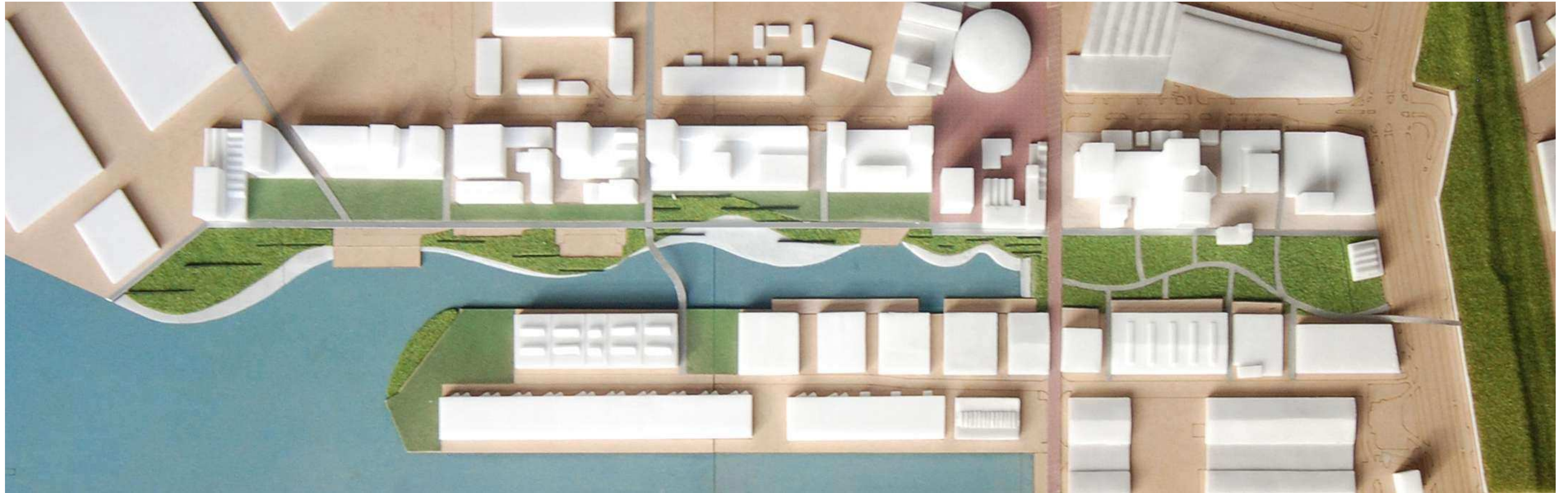


Showcase for Delta innovation

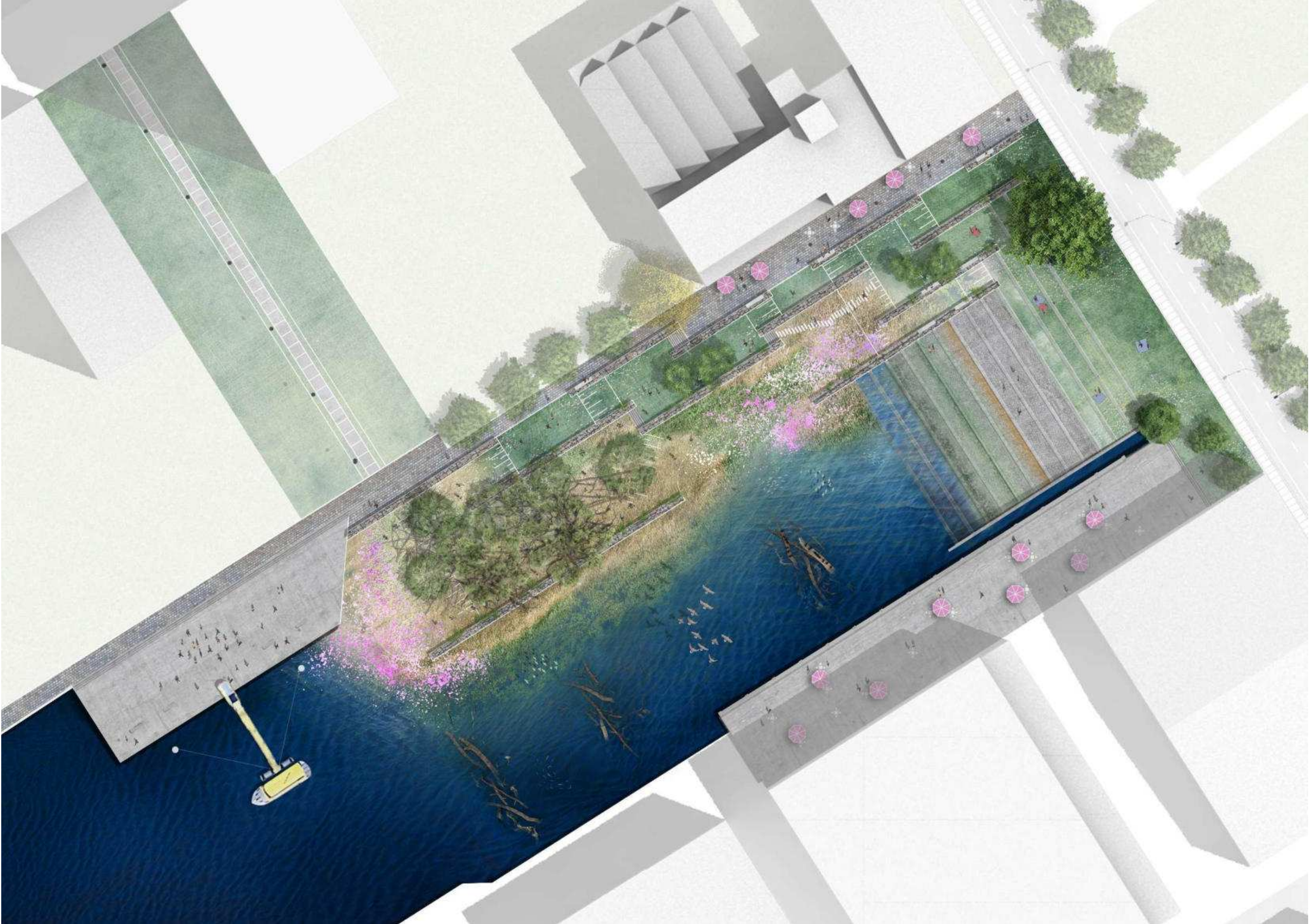
# TIDALPARK KEILEHAVEN - PRESENT SITUATION



# TIDALPARK KEILEHAVEN - FUTURE PERSPECTIVE WITH URBAN DEVELOPMENTS

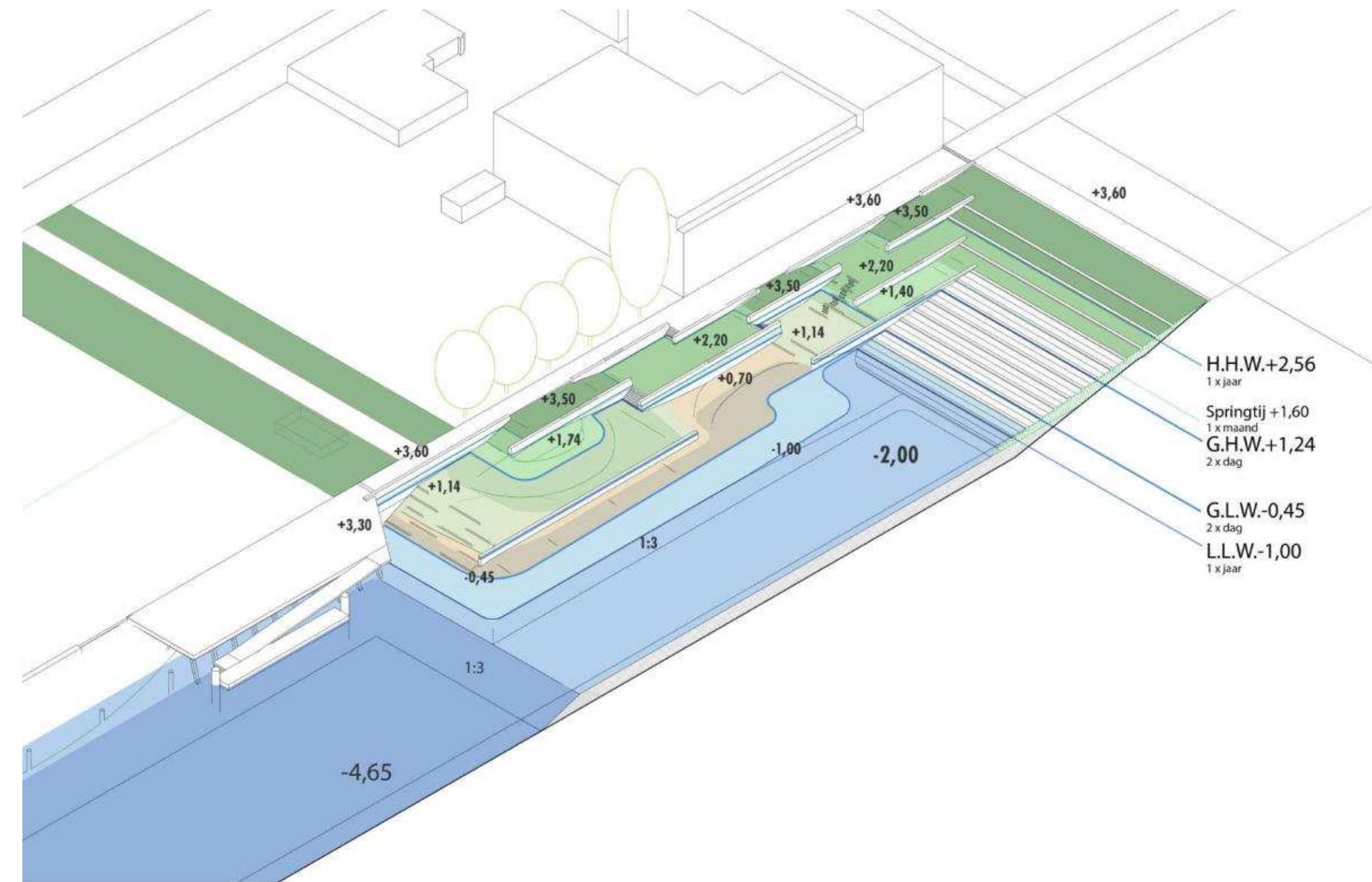


# TIDALPARK KEILEHAVEN - DESIGN FOR THE FIRST PHASE

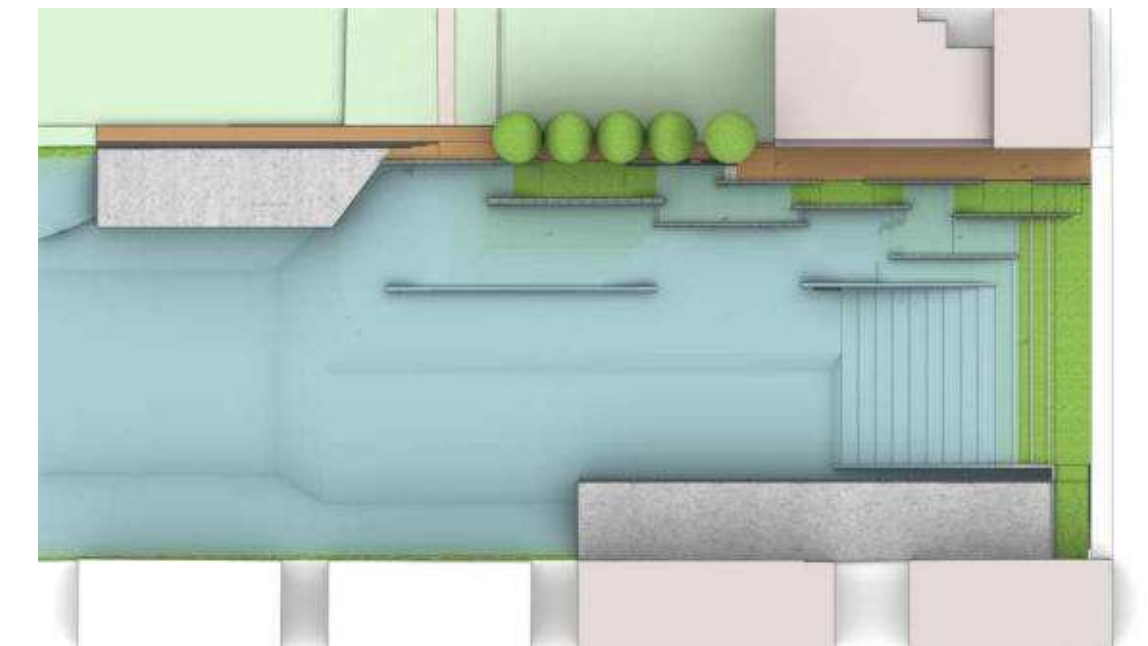
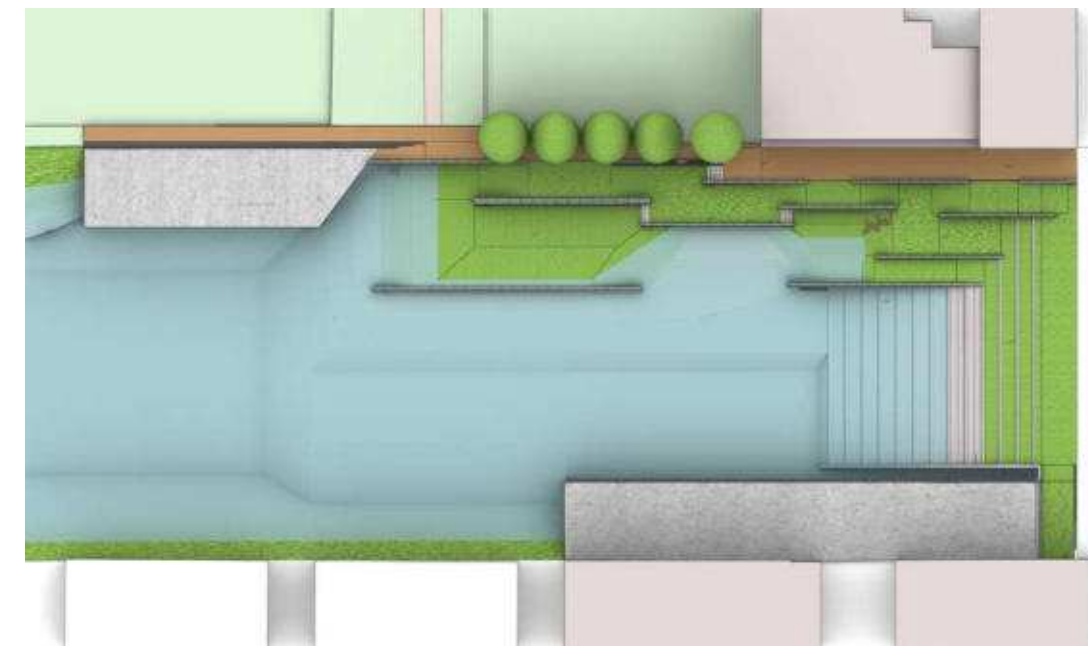
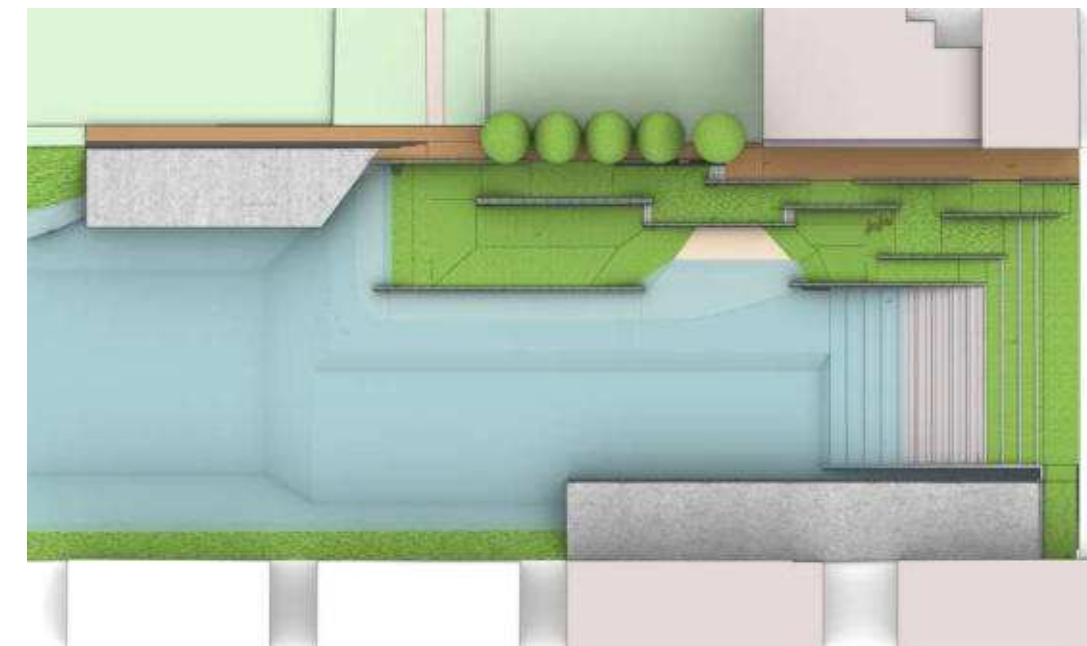
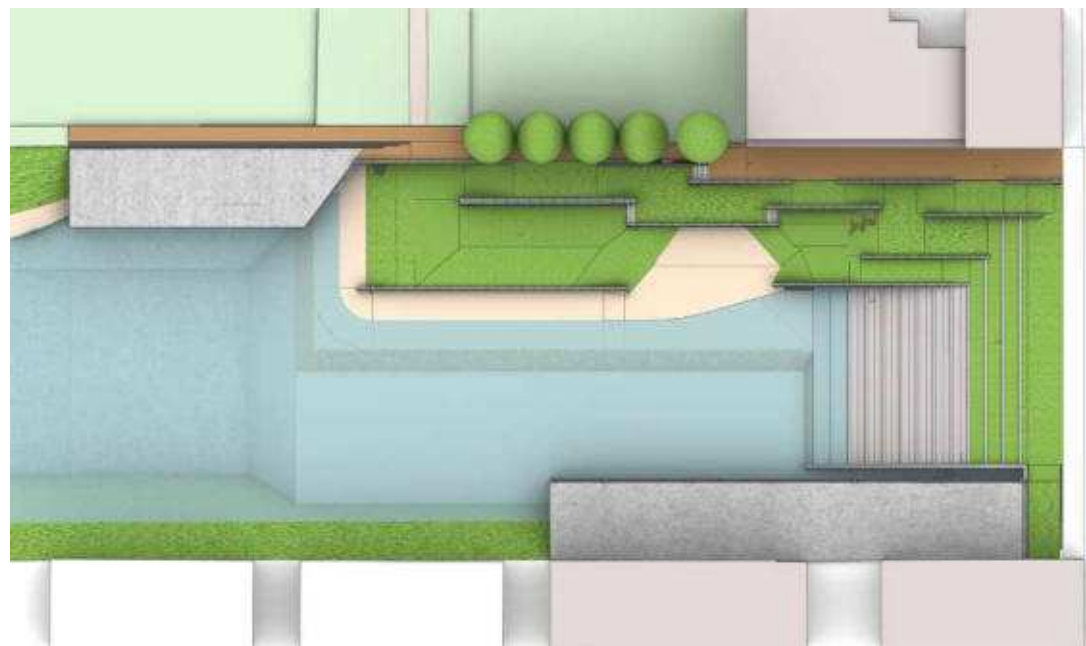




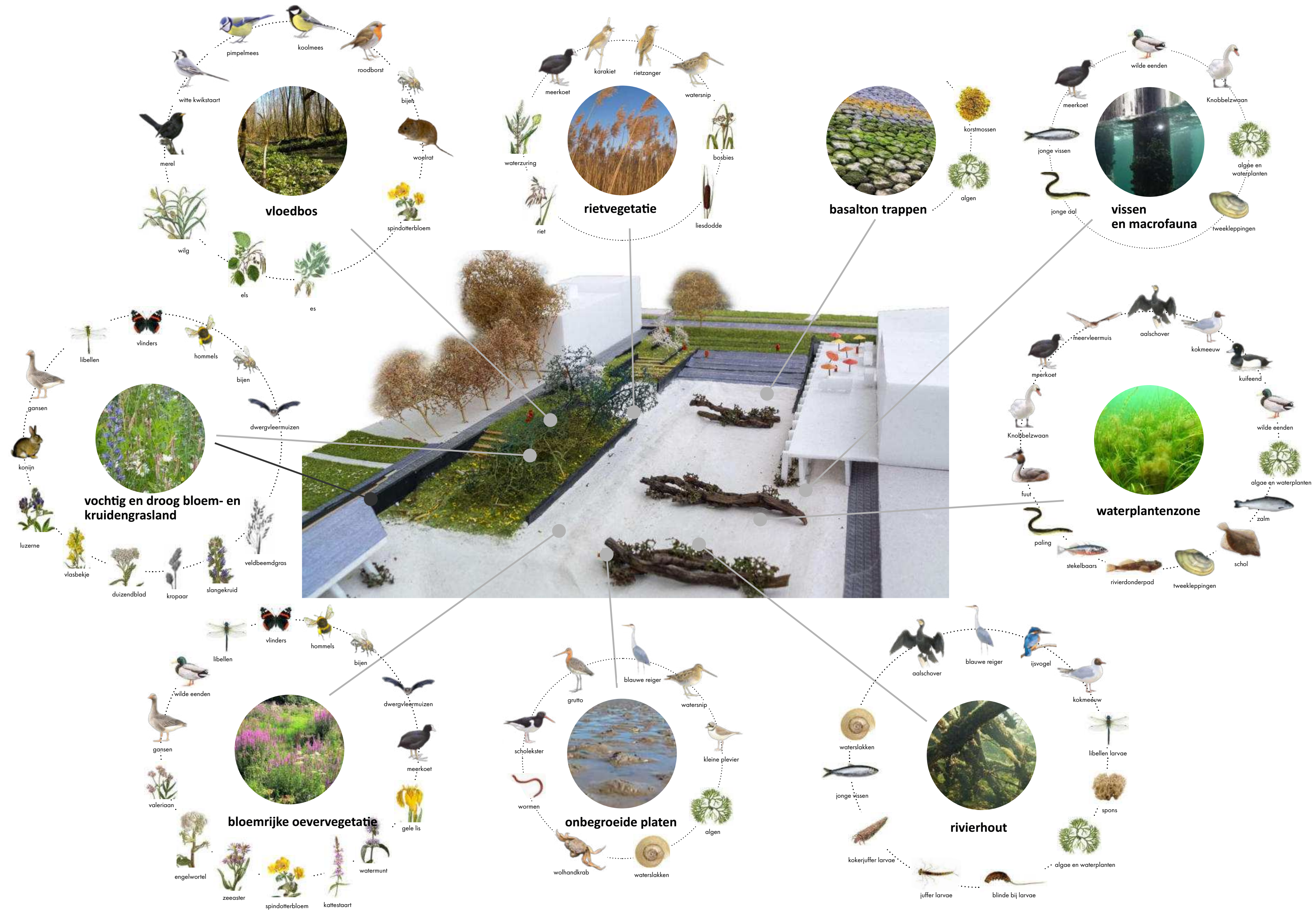
# TIDALPARK KEILEHAVEN - WATERLEVELS AND TOPOGRAPHY DESIGN



# TIDALPARK KEILEHAVEN - WATERLEVELS AND TOPOGRAPHY DESIGN



# TIDALPARK KEILEHAVEN - HABITATS



# TIDALPARK KEILEHAVEN - SECTION 02



# TIDALPARK KEILEHAVEN - WORK IN PROGRESS



# SPONGE GARDEN



SPONSTUIN

SPONGE GARDEN · SPONSTUIN

SPONGE PLANTING

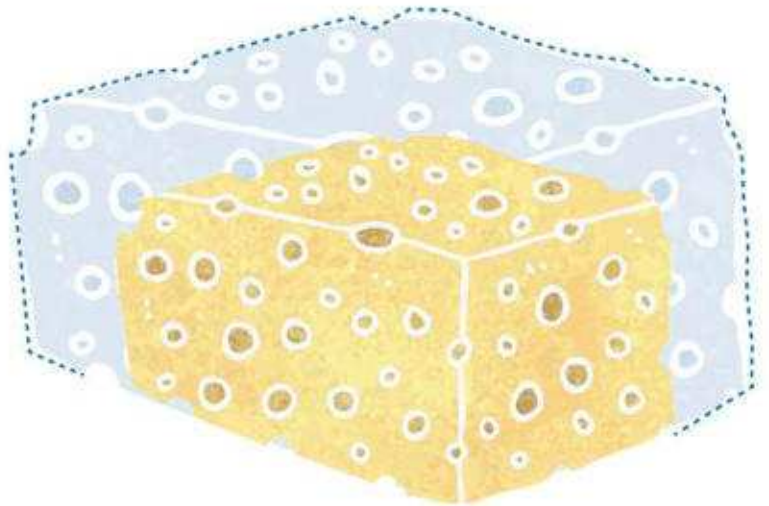
SPONGE VOL

SPONGE WATERWEG

# SPONGE PRINCIPLES



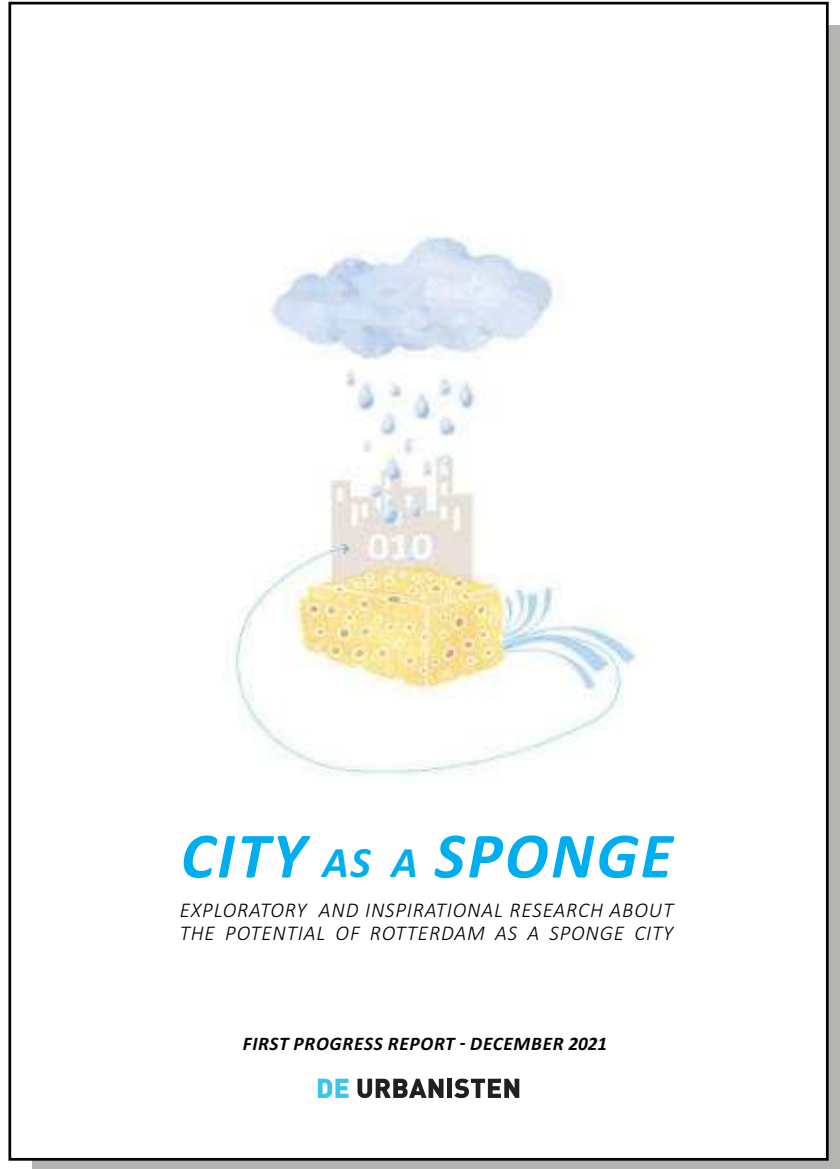
**COLLECT**



**STORE**



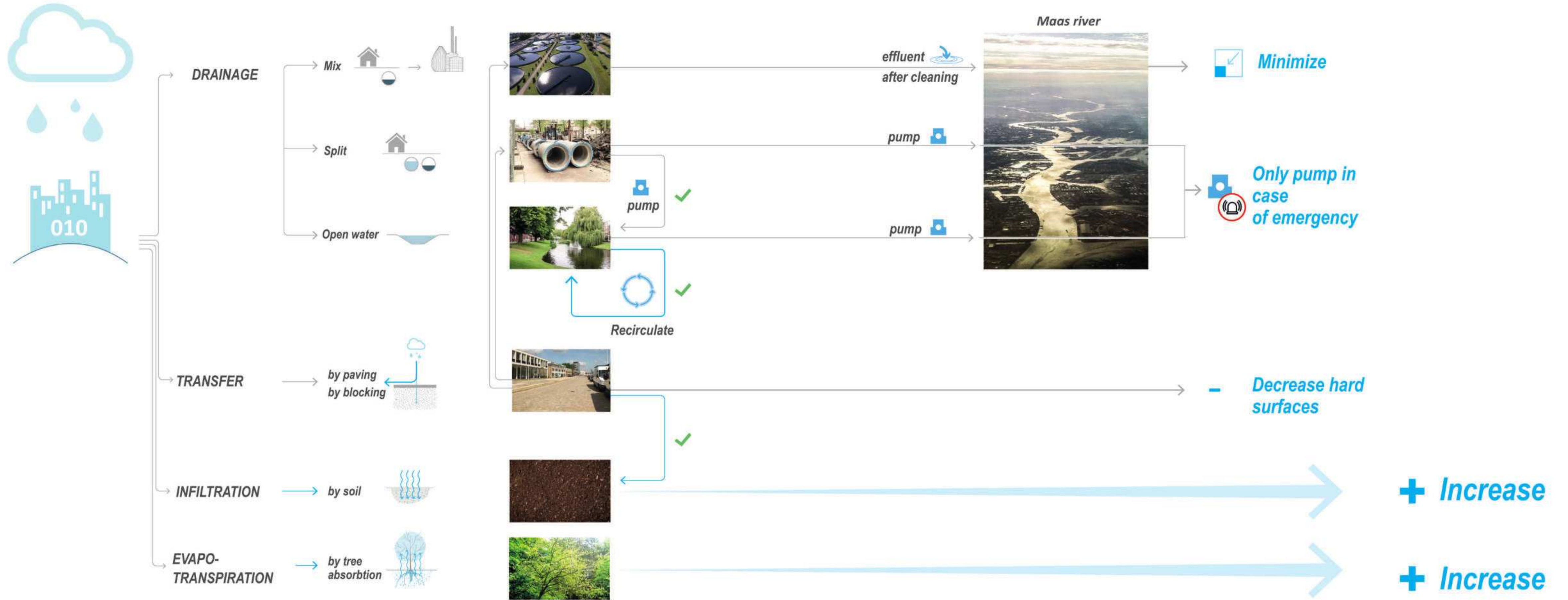
**RETURN**



# CHANGE OF TOWARDS SPONGE CITY

THE DRAINING CITY

THE SPONGE CITY

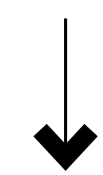
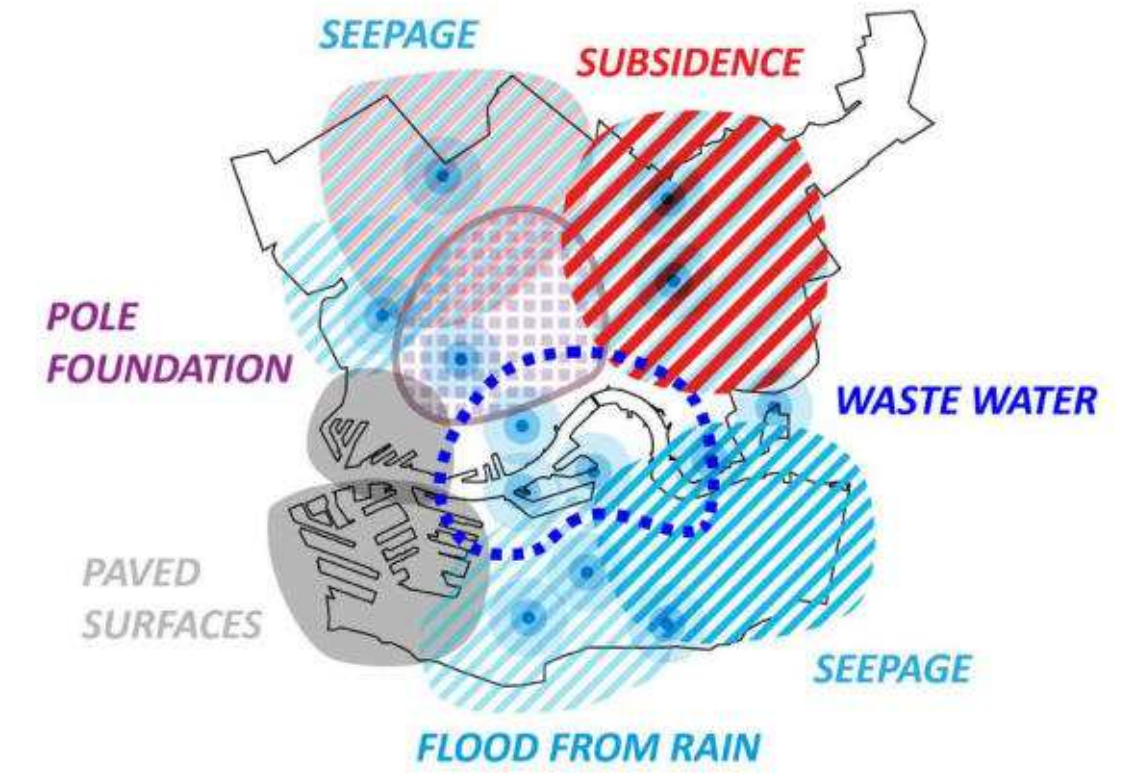




# ROTTERDAM AS A SPONGE CITY



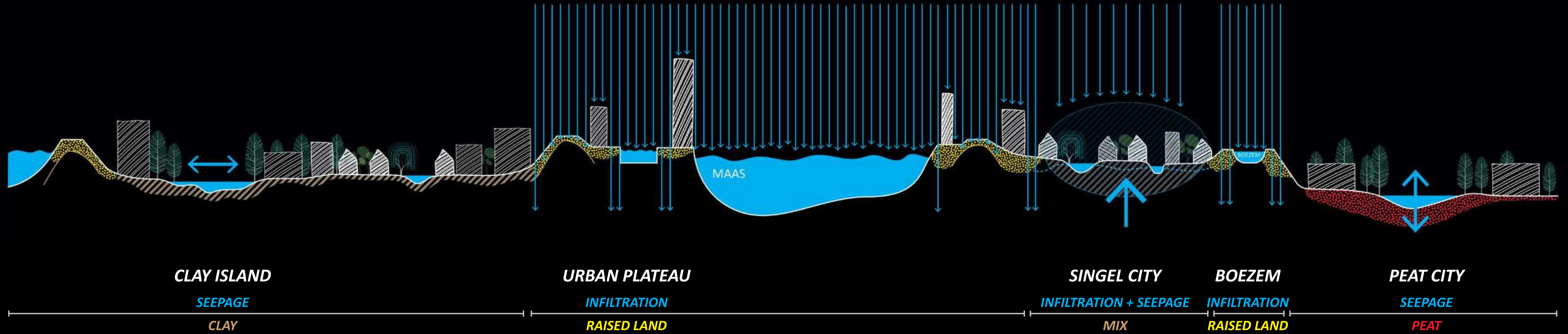
## RISKS



## SPONGE DISTRICTS



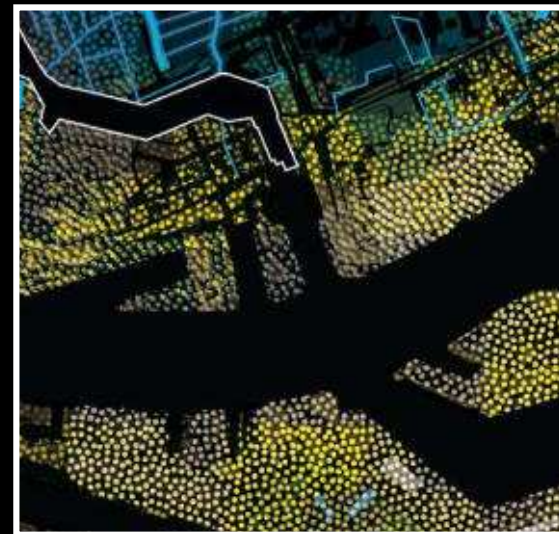
# ROTTERDAM AS A SPONGE CITY



CREATE SPACE FOR OPEN WATER



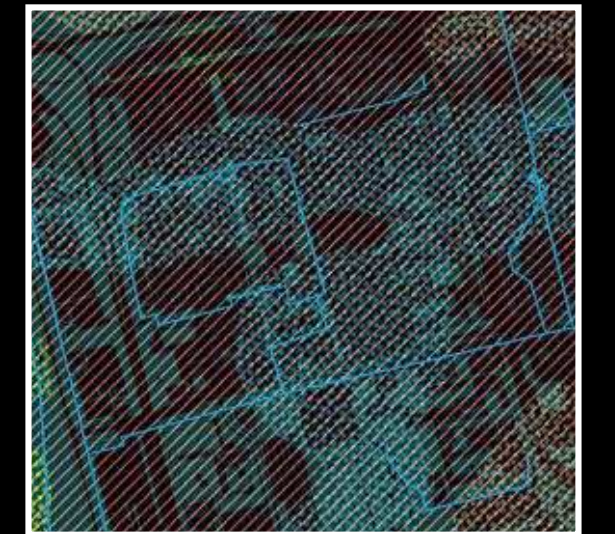
MAXIMIZE SPACE FOR INFILTRATION



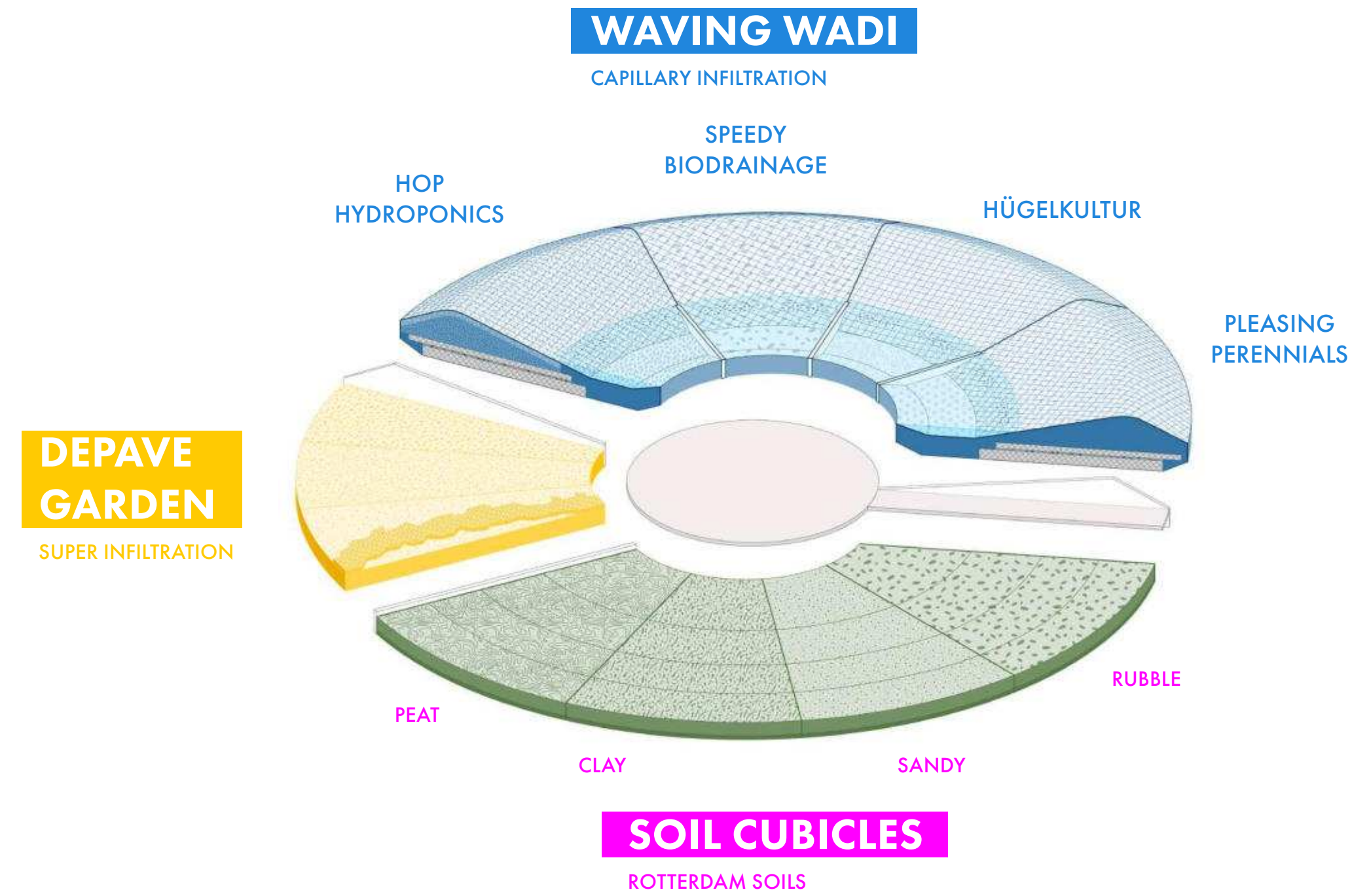
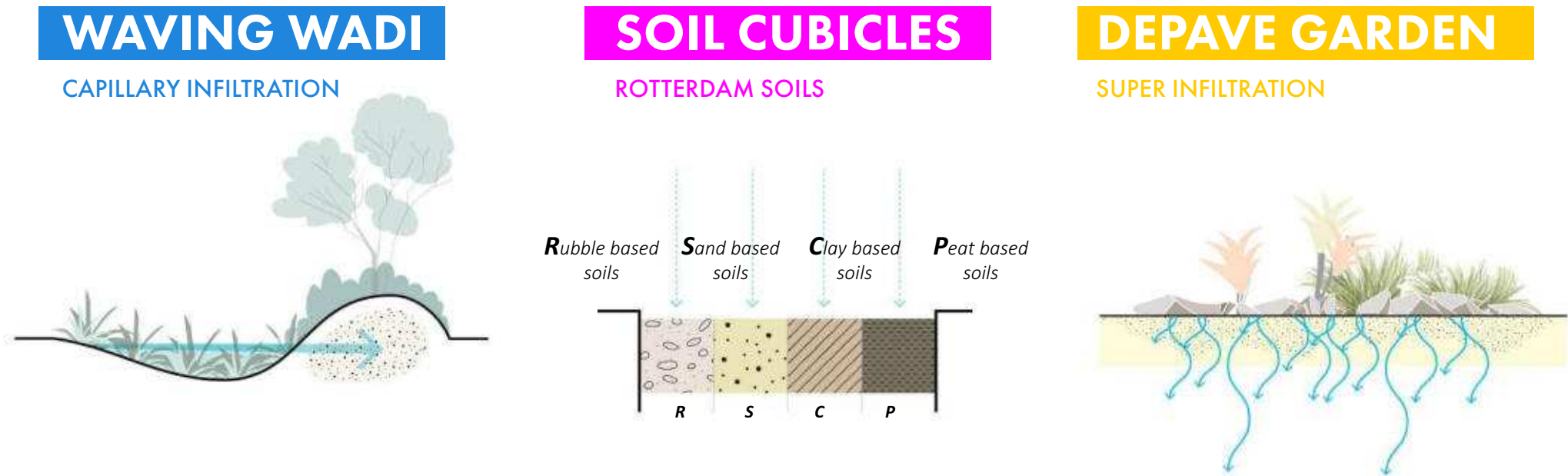
BALANCE BETWEEN ABOVE AND BELOW GROUND



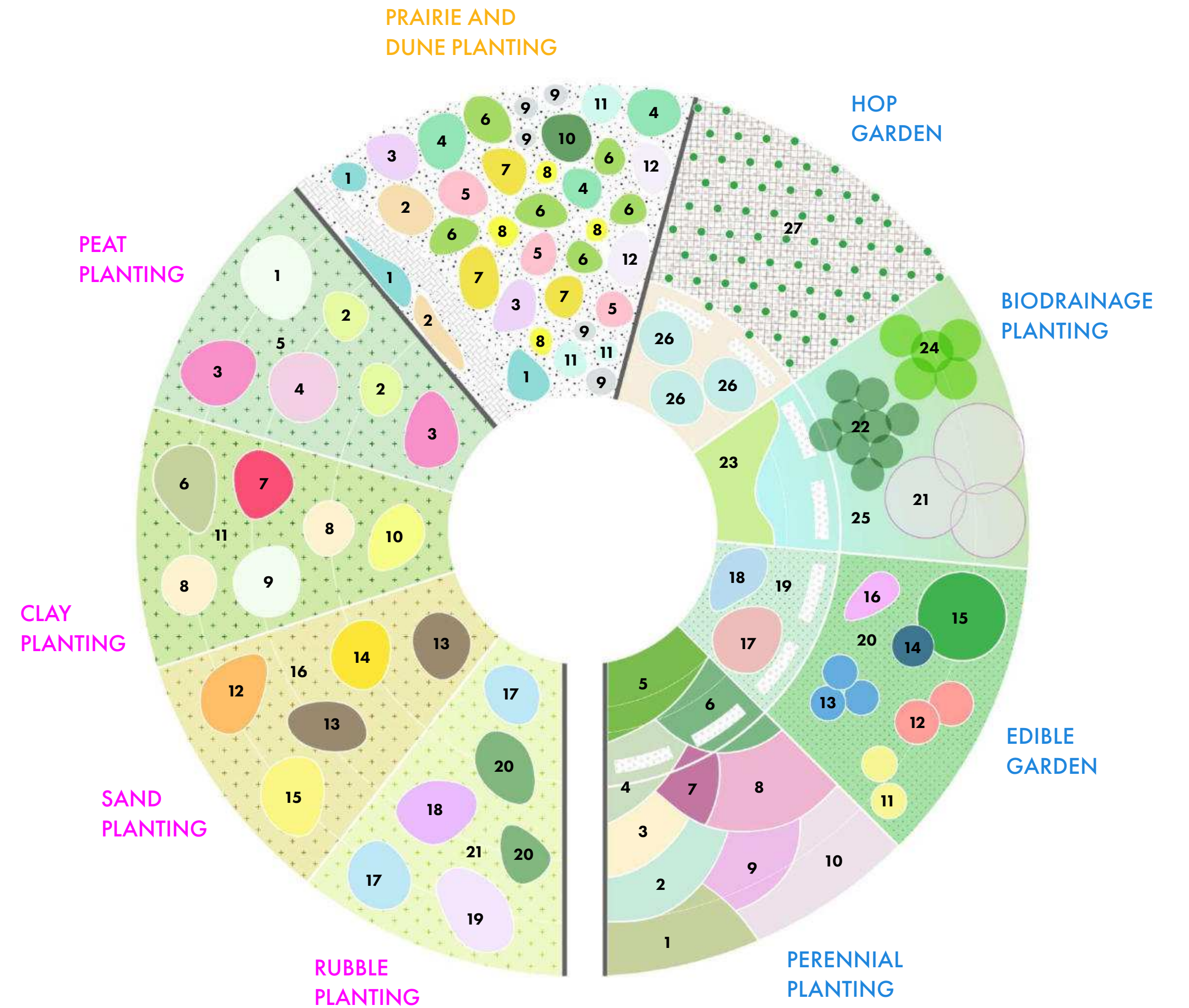
CREATE SPACE FOR GROUNDWATER EXCHANGE



# SPONGE GARDEN



# SPONGE SOILS AND PLANTING

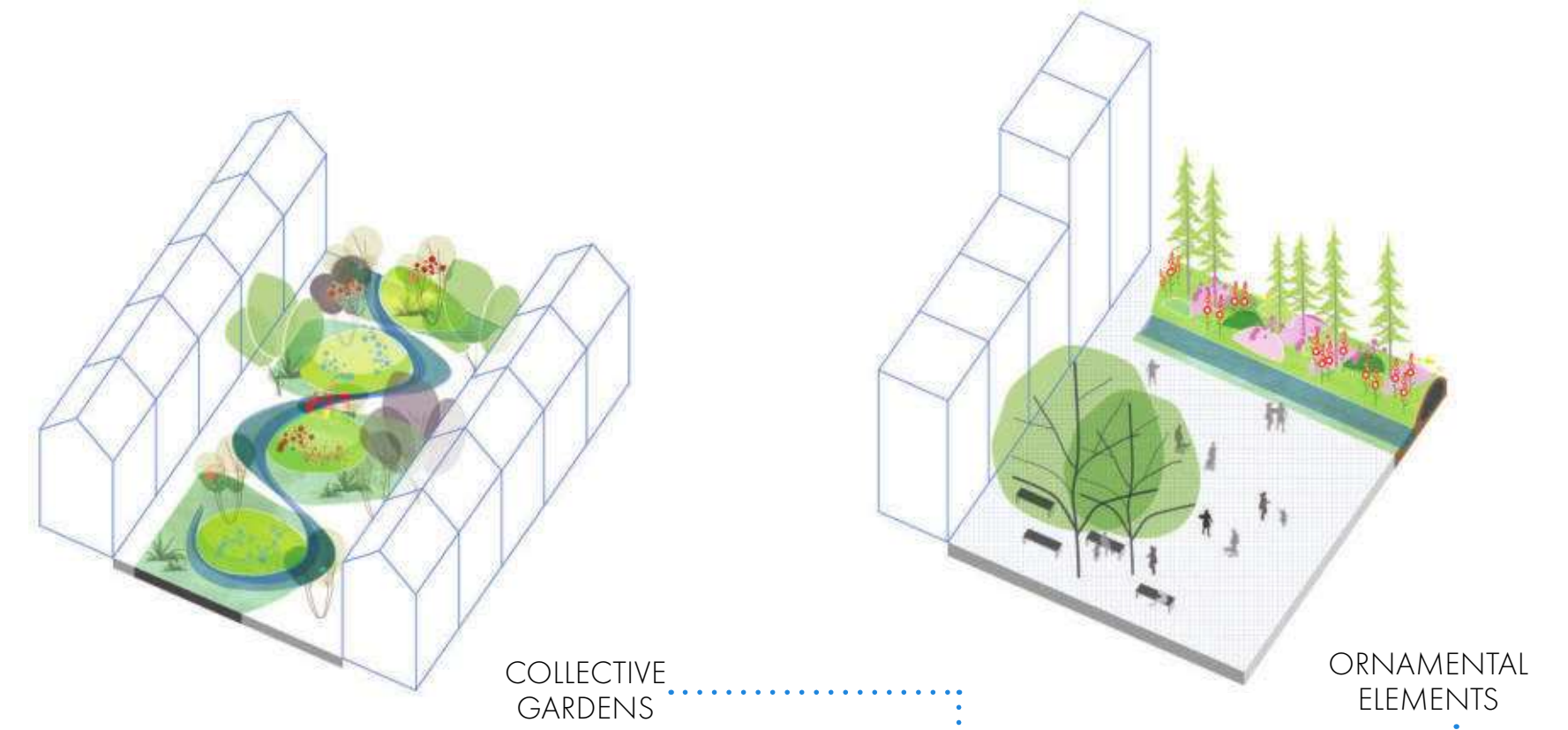


# WAVING WADI

CAPILLARY INFILTRATION

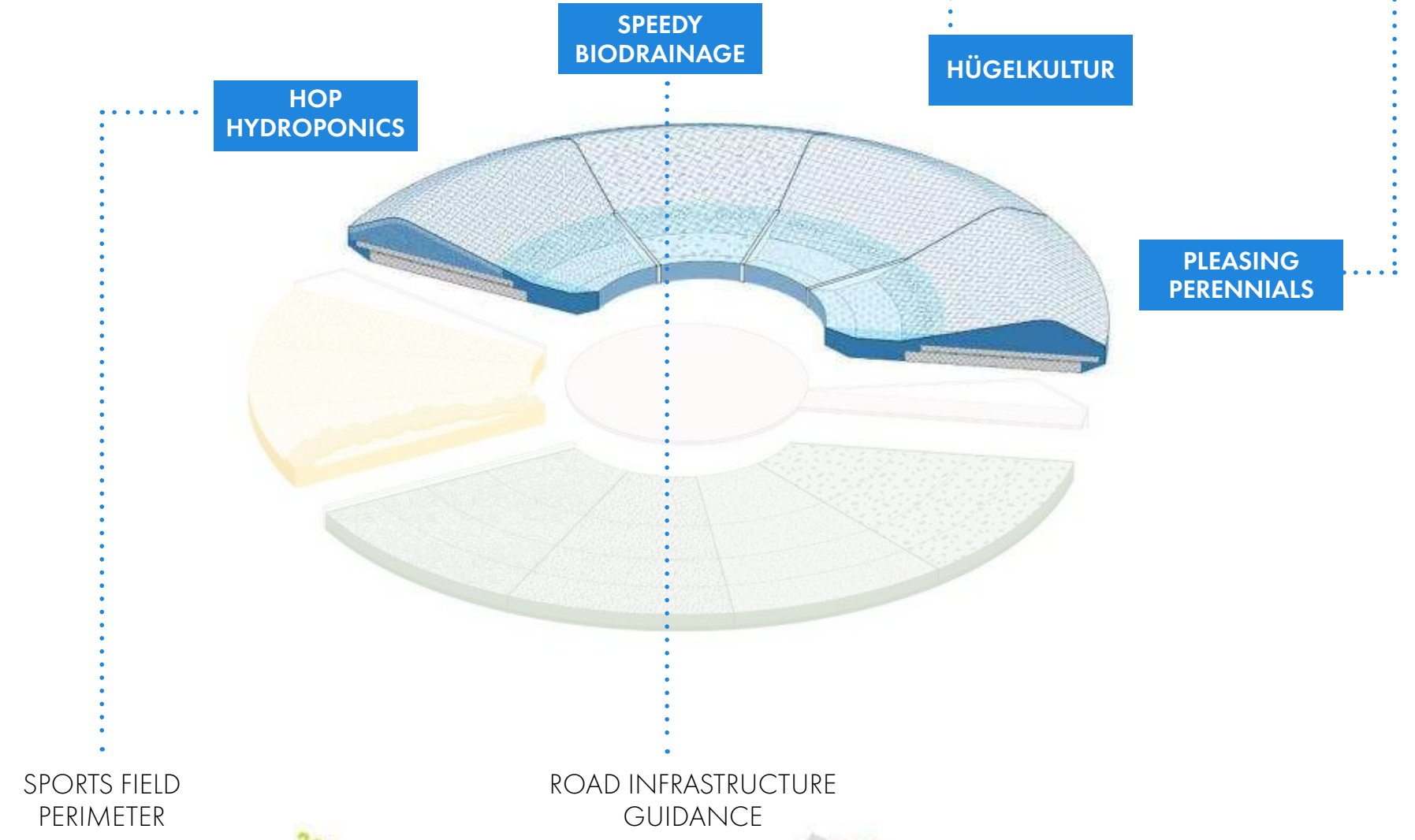


Schematic setup of the waving wadi



COLLECTIVE GARDENS

ORNAMENTAL ELEMENTS



HOP HYDROPONICS

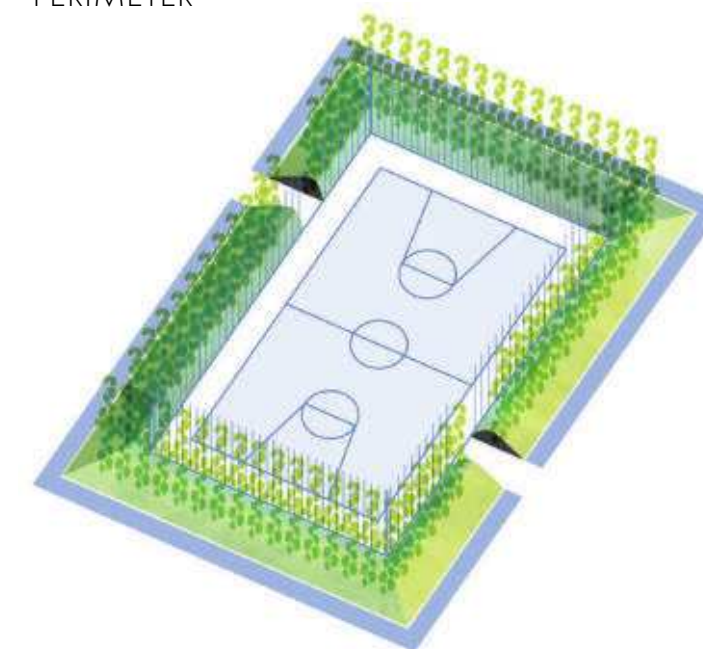
SPEEDY BIODRAINAGE

HÜGELKULTUR

PLEASING PERENNIALS

SPORTS FIELD PERIMETER

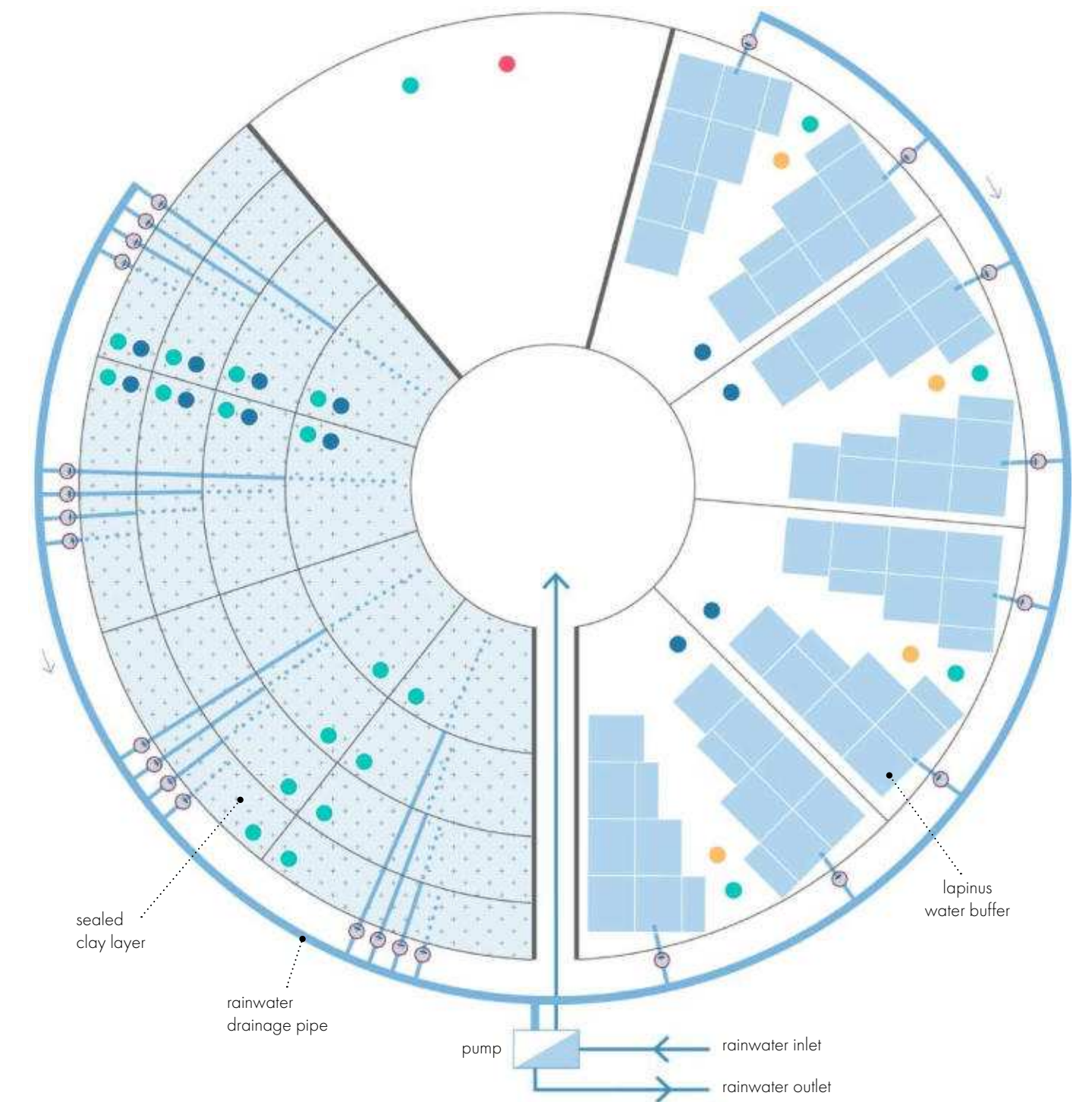
ROAD INFRASTRUCTURE GUIDANCE



# SPONGE GARDEN TEST - WAVING WADI



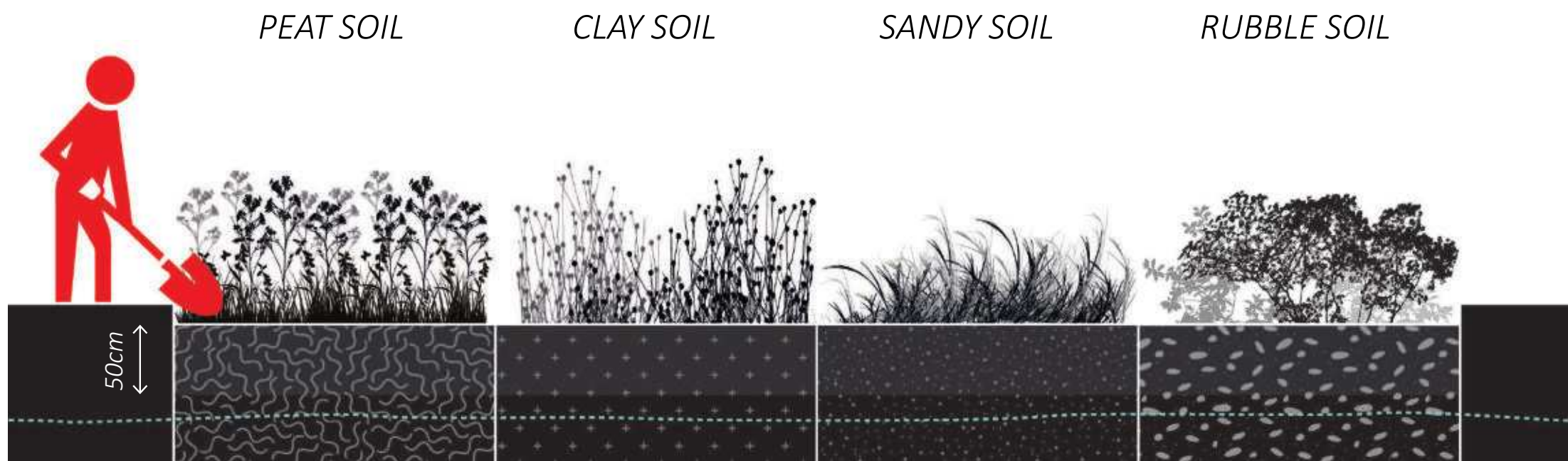
- Deep monitoring well (-4m depth)
- Topsoil monitoring well (-1m depth)
- Surface water monitor
- Hygrometer (humidity monitor)
- ⊙ Underground sluice gate



Setup of the hydrological monitoring infrastructure of the test-site

# SOIL CUBICLES

ROTTERDAM SOILS



Schematic setup of the soil cubicles



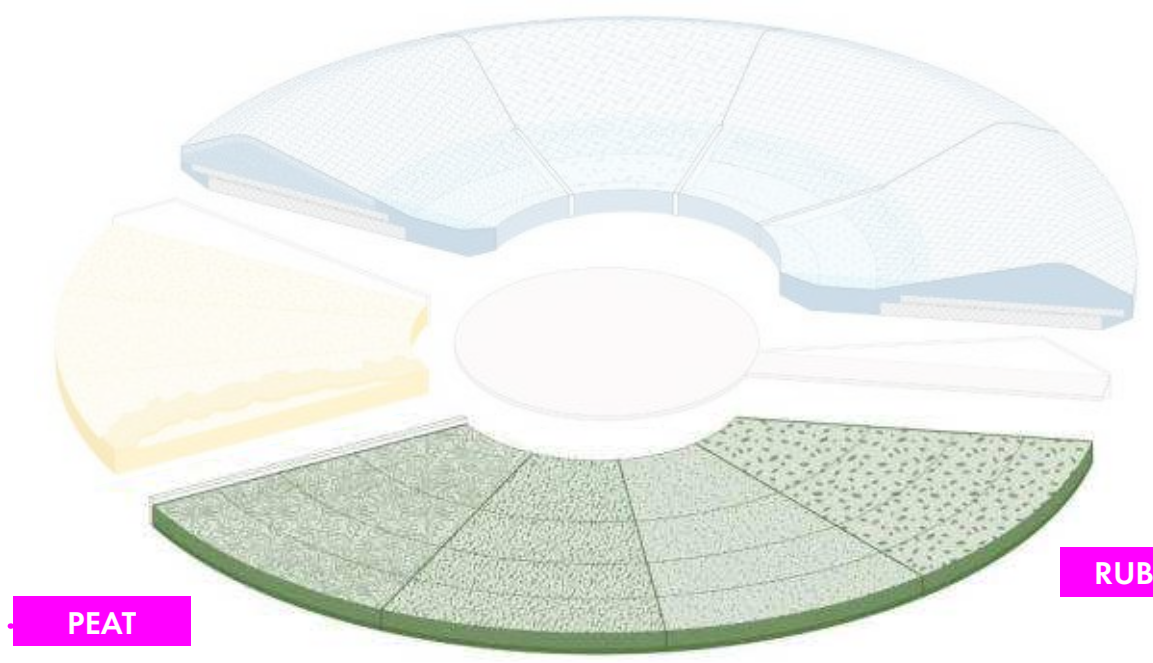
Peat soil      Clay soil      Sandy soil      Rubble soil  
**Rotterdam soils**



Leaves, grass      Woodchips      Compost      Perlite      Vermiculite      Super absorbent polymer      Lapinus fibers  
**Soil amendments**

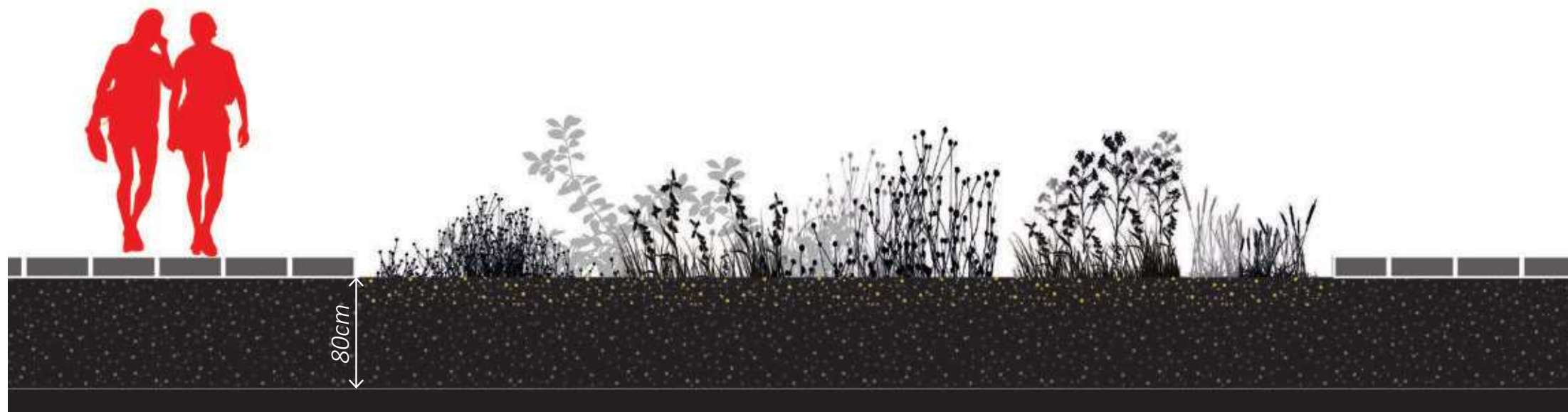


PRIMARY GOAL FOR EASY USAGE IN PRIVATE GARDENS

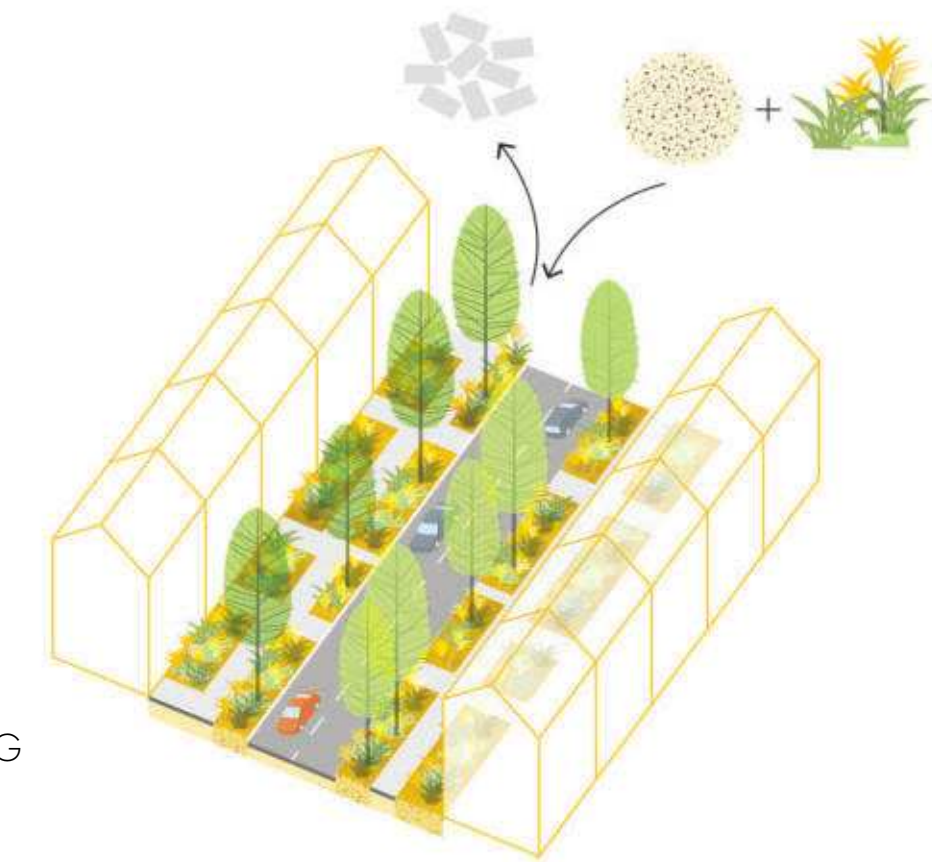


# DEPAVE GARDEN

SUPER INFILTRATION

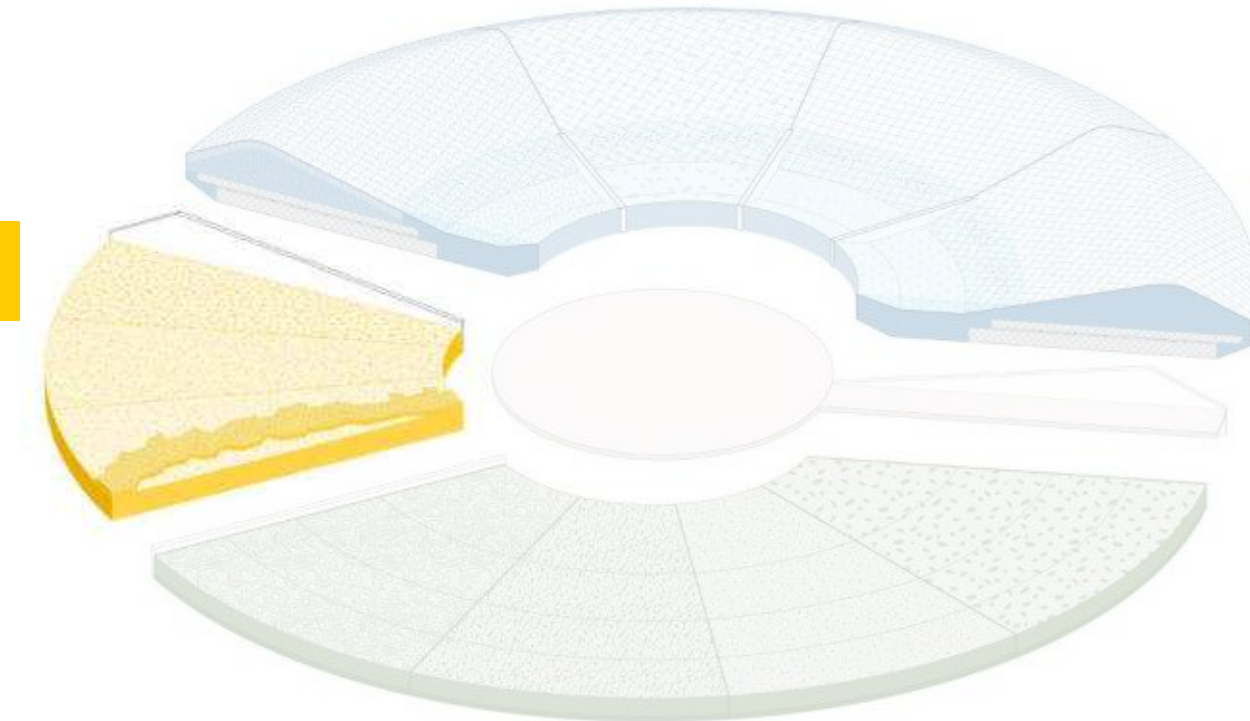


Schematic setup of the depave garden



SOFTENING STREET

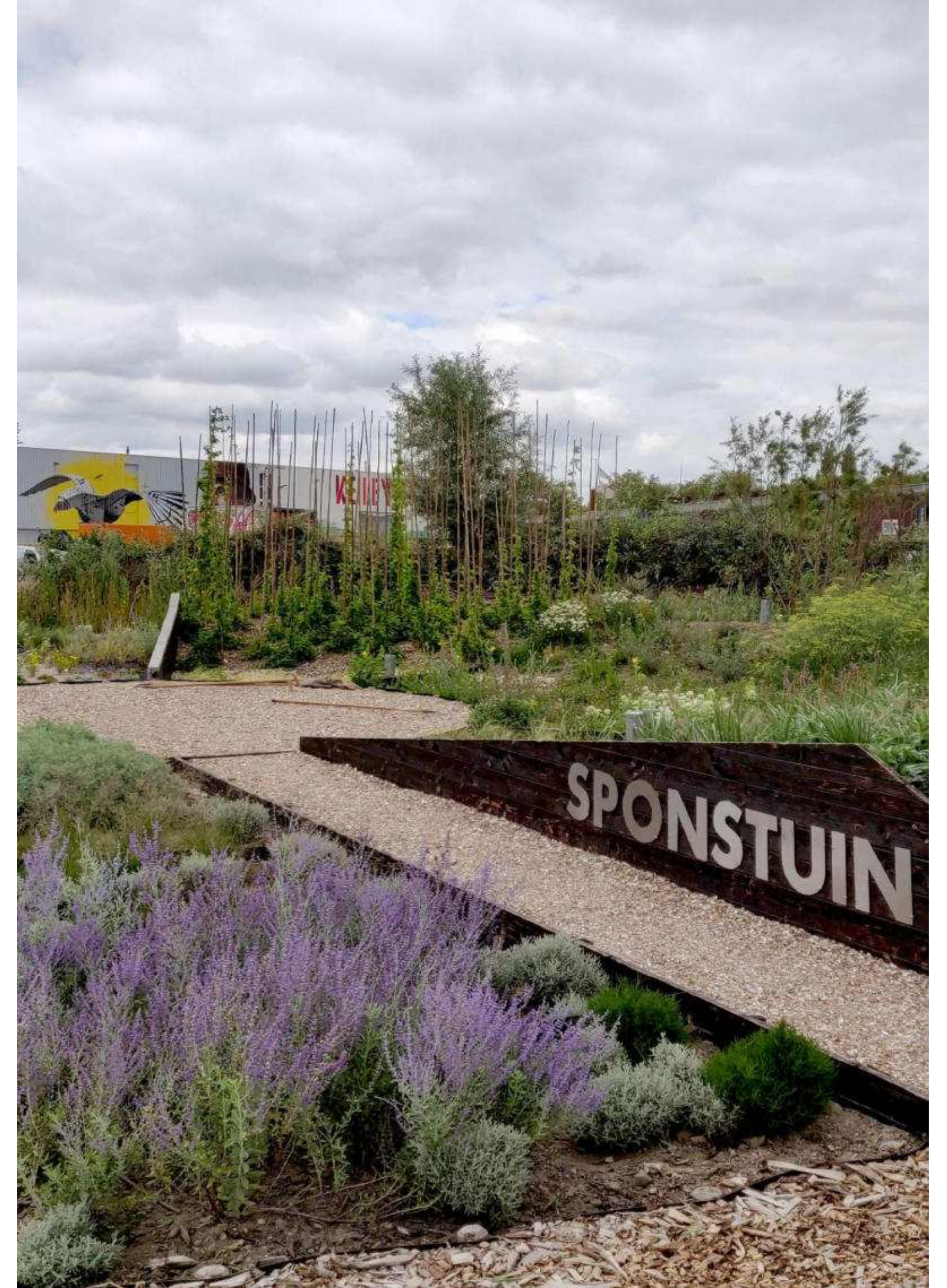
SUPER INFILTRATION

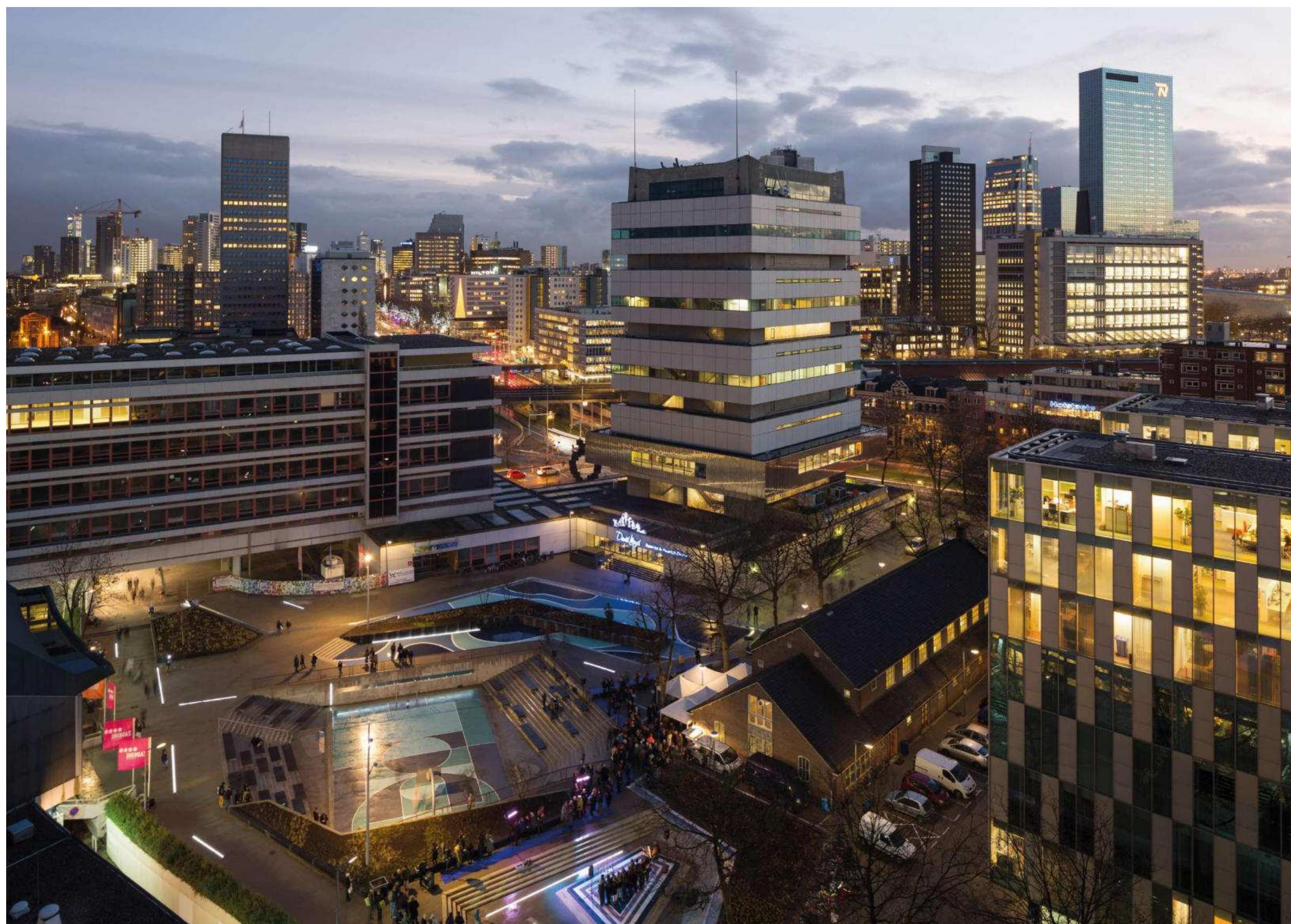


SOFTENING PAVED GARDENS



# SPONGE SOILS AND PLANTING





# DE URBANISTEN

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