



ZOMERHOV
KVARTIER
CLIMATE PROOF

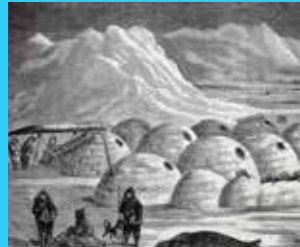
CLIMATE ADAPTATION

Biological adaptation

In the field of biology, adaptations are those changes to the structure or behaviour of an organism that improve its chances of survival or of successfully raising offspring.



Climate adaptation



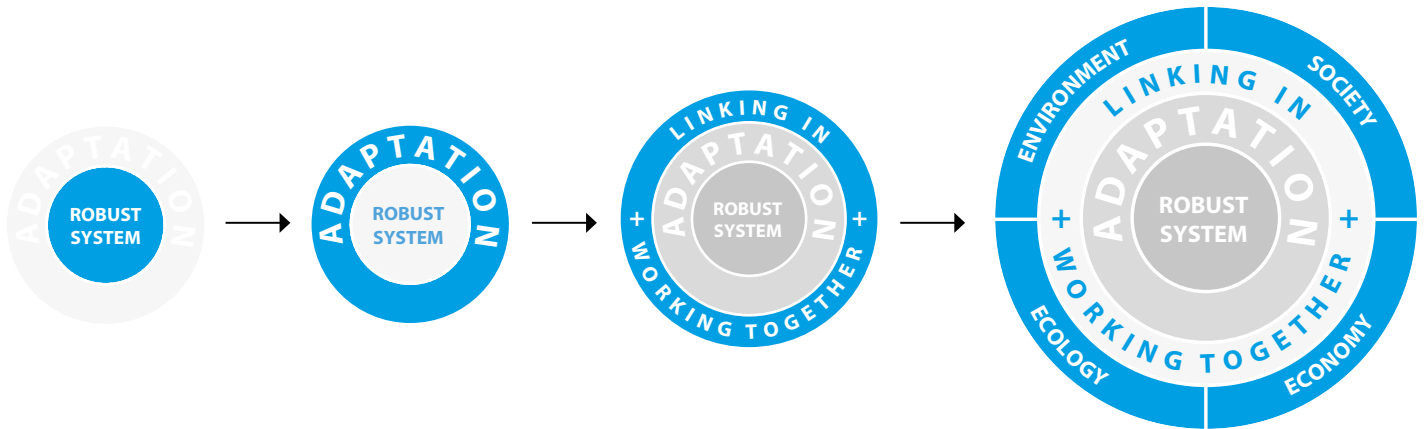
Adaptation to climate change is the process whereby society reduces its vulnerability to climate change or whereby it profits from the opportunities provided by a changing climate.

CLIMATE ADAPTATION = OFFICIAL ROTTERDAM POLICY

*The Rotterdam adaptation strategy
In 2008, the City of Rotterdam ratified the Rotterdam Climate Proof (RCP) programme. The aim of this programme - which forms part of the Rotterdam Climate Initiative - is to start working towards a climate proof city and to create the maximum possible economic spin-off in the process. One of the results of this is the Rotterdam Climate Change Adaptation Strategy. This strategy provides the framework and the starting point for a future proof development of Rotterdam. The Rotterdam Climate Change Adaptation Strategy ensures that, in the future, topics such as water safety, accessibility and the robustness of the city are included as the basis for each (spatial) development right from the start of the process.*

Rotterdamse adaptatiestrategie





We bring the basic principles of the Rotterdam Climate Adaptation Strategy in practice



Port



City harbours



outer-dike urban districts



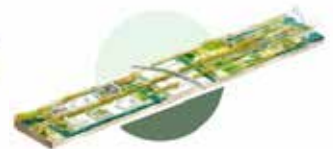
inner-dike urban districts



Compact city



Post-war districts and suburbs



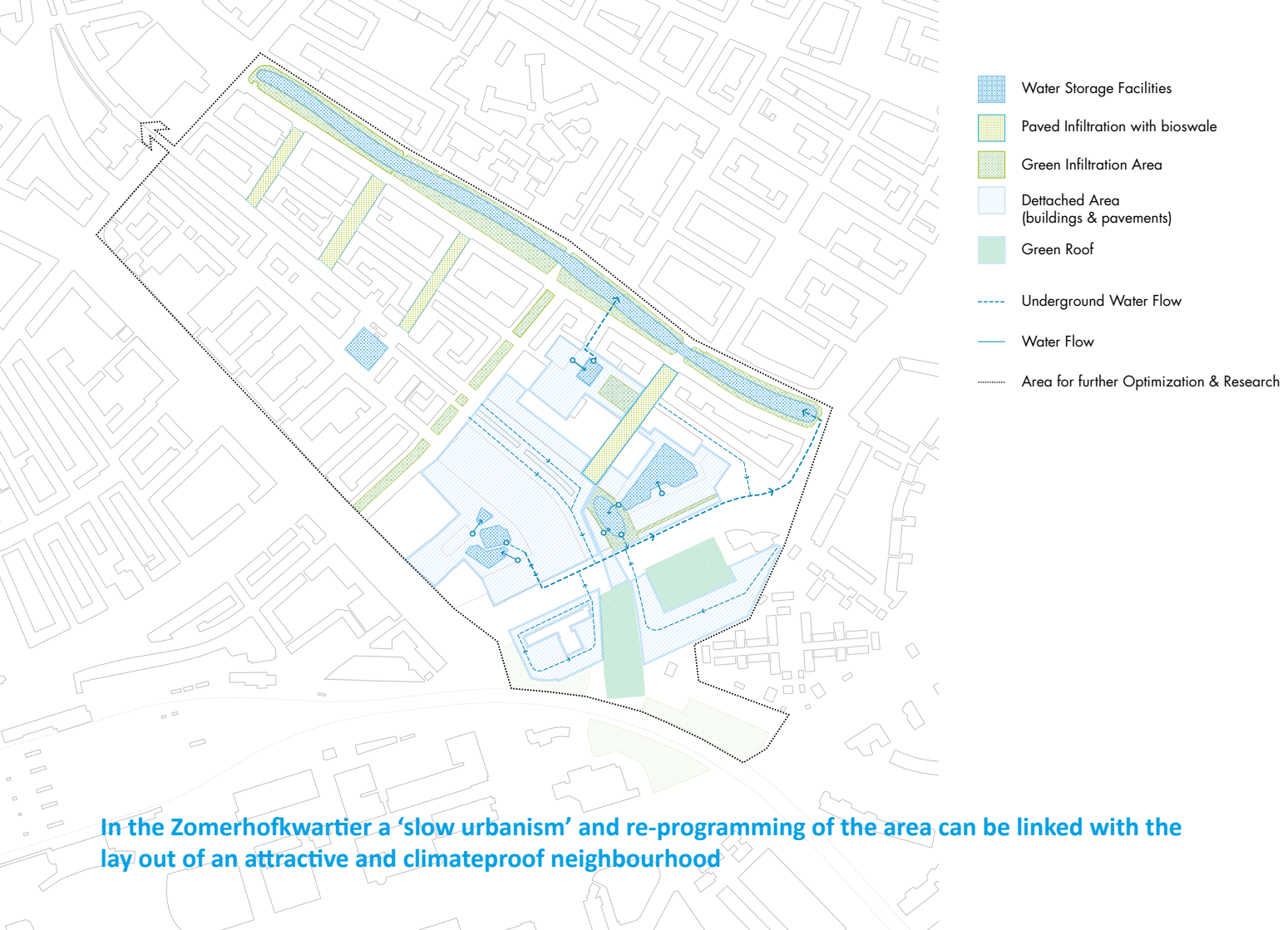
The Rotterdam Climate Adaptation Strategy is related to different typologies of the city of Rotterdam



The Zomerhofkwartier -ZOHO- is a perfect pilot area for the implementation of the Rotterdam Climate Adaptation Strategy on a district scale



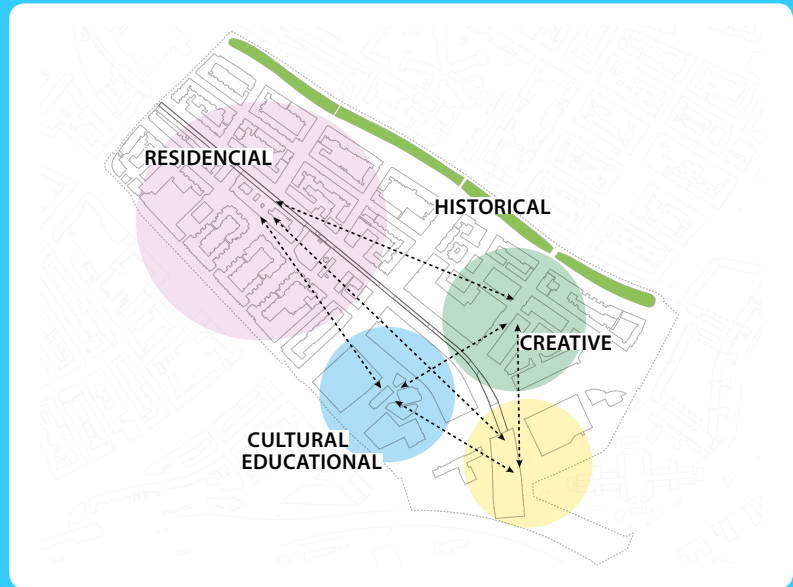
Extreme rainfall , drought and heat stress make ZOHO vulnarable for effects of climate change



In the Zomerhofkwartier a 'slow urbanism' and re-programming of the area can be linked with the lay out of an attractive and climateproof neighbourhood

A CLIMATEPROOF STRATEGY

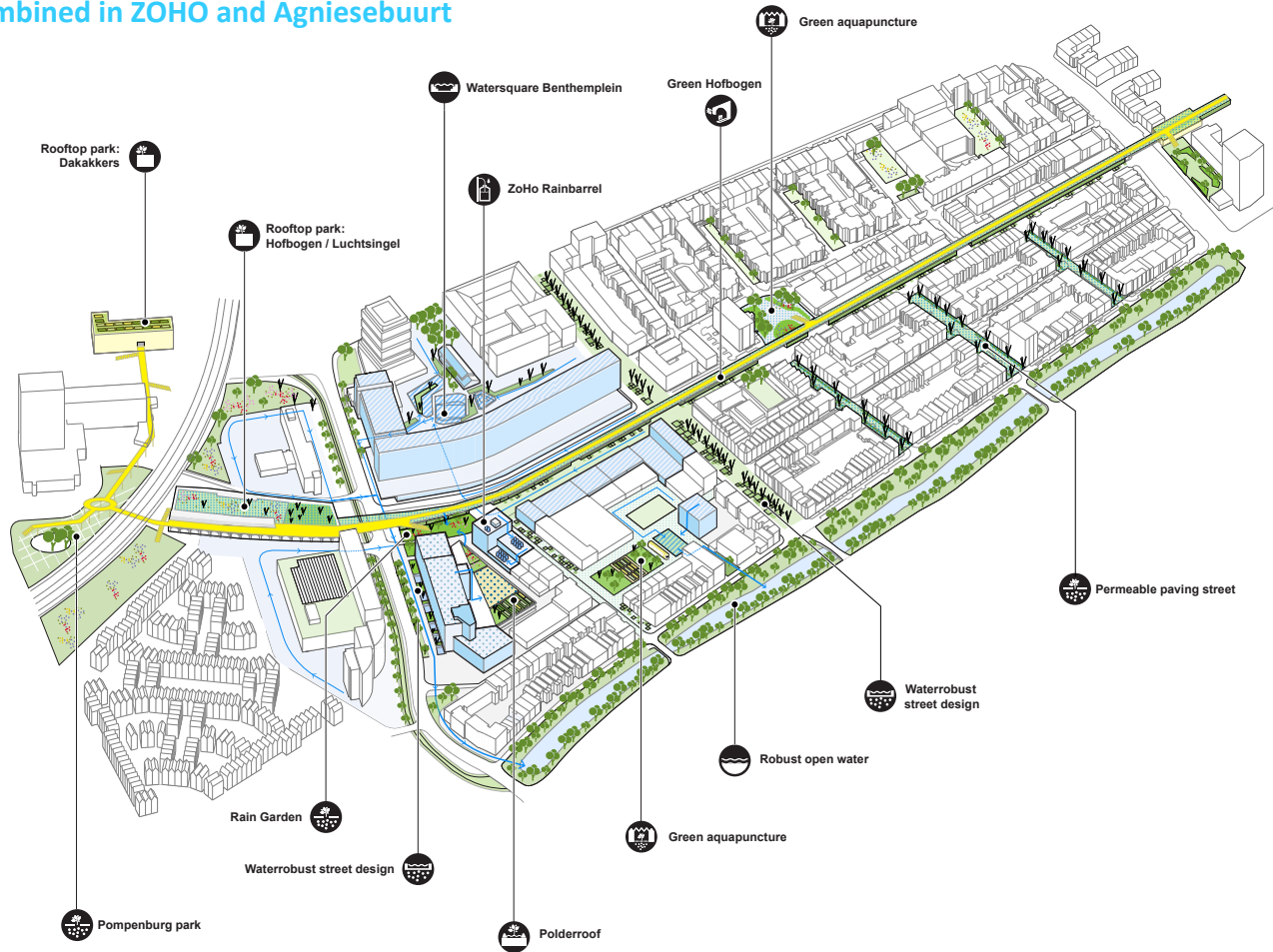
In two workshops all stakeholders of ZOHO joined to work on a climate-proof ZOHO. Together we developed a shared perspective and four site specific strategies: Depaving ZoHo, a series of Zomerhoven, Greening Hofbogen and the ZoHo-rainbarrel. The overall perspective is organized around three large open spaces (Zomerhoven) that are or have to be climate proofed: the Watersquare, the communal garden of 'Gare du Nord' and the 'Polder roof'.



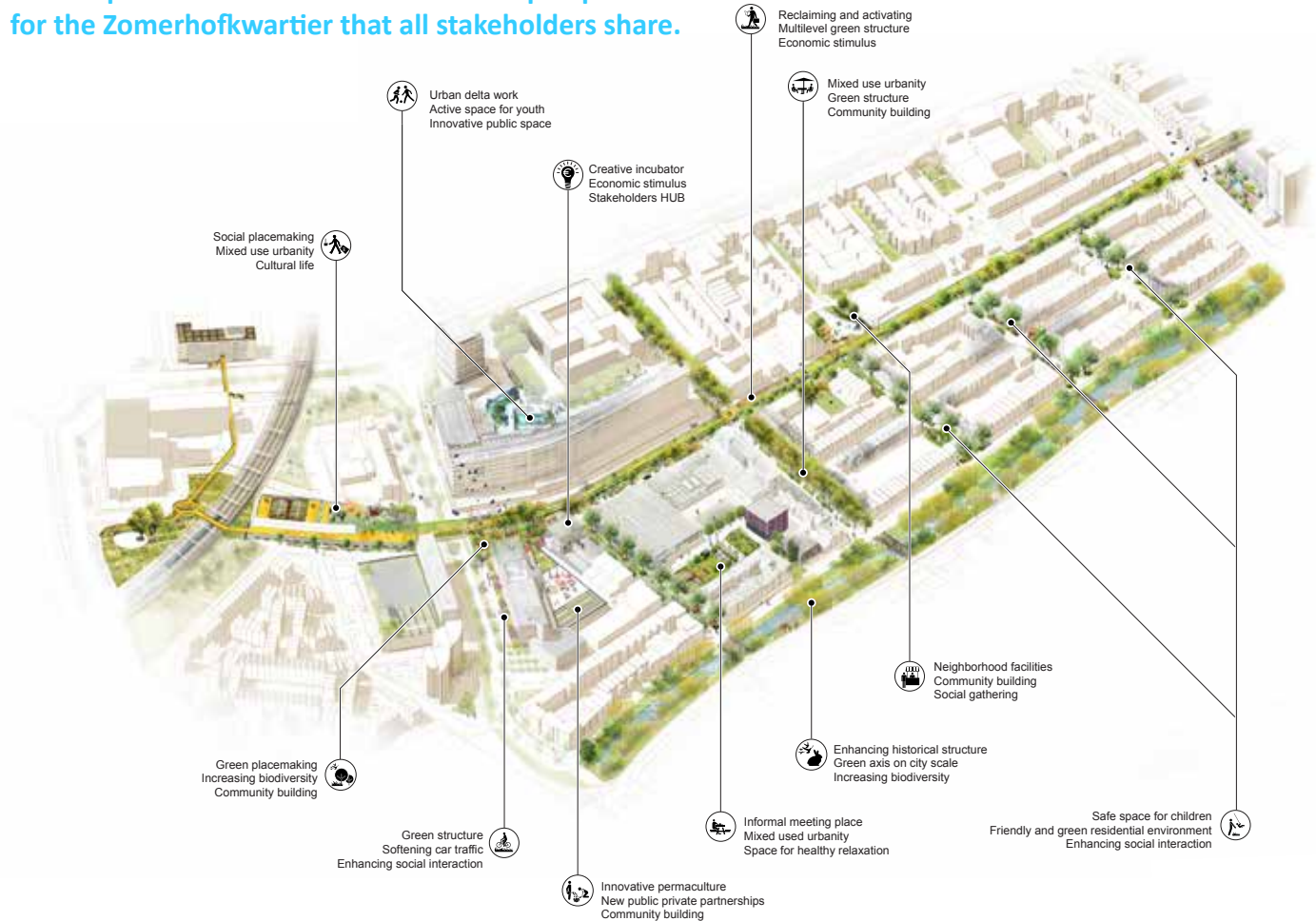
ZOHO has a high dynamic of urban transitions, organized by stakeholders in the district



A wide range of adaptive measures can be applied and combined in ZOHO and Agniesebuurt

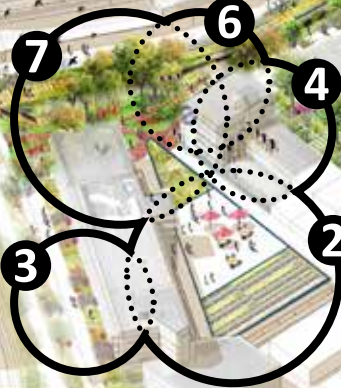
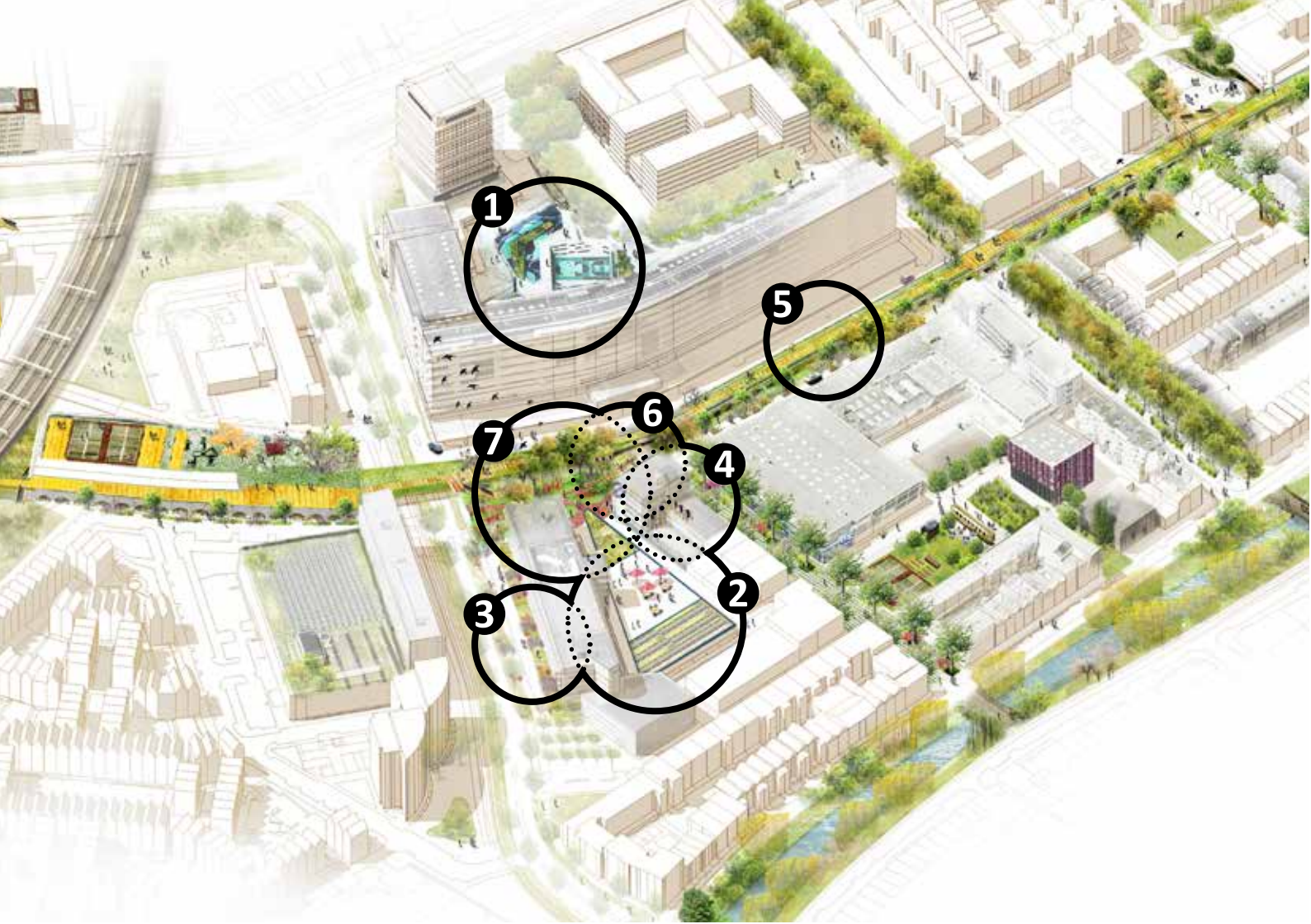


Climateproof ZOHO creates an attractive perspective for the Zomerhofkwartier that all stakeholders share.



PROJECTS

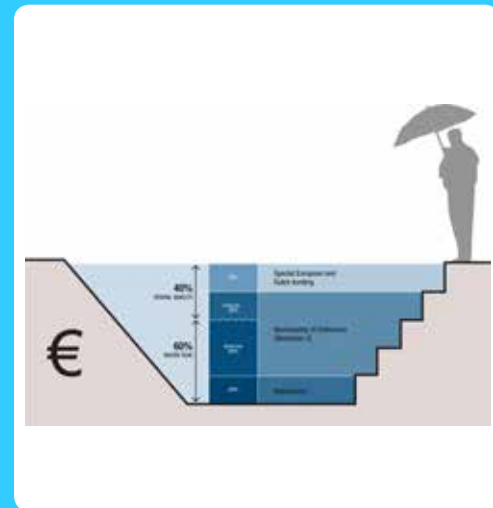
- ① *BENTHEMPLEIN WATER SQUARE*
- ② *POLDER ROOF*
- ③ *KATSHOEK RAIN(A)WAY GARDEN*
- ④ *ZOHO-RAINBARREL*
- ⑤ *GREENING HOFBOGEN*
- ⑥ *LIVING PAVEMENT*
- ⑦ *ZOHO-RAINGARDEN*



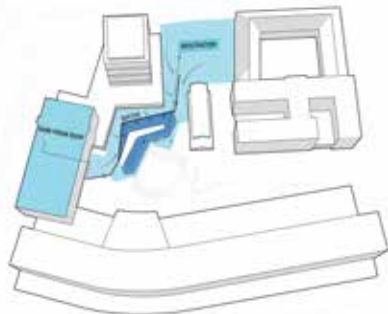
BENTHEMPLEIN WATER SQUARE

The water square combines water storage with the improvement of the quality of urban public space. The water square can be understood as a twofold strategy. It makes money invested in water storage facilities visible and enjoyable. It also generates opportunities to create environmental quality and identity to central spaces in neighborhoods. Most of the time the water square will be dry and in use as a recreational space.

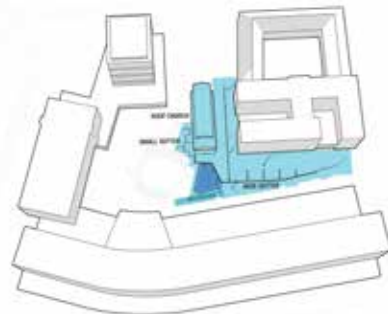
Year	2011-2013
Client	City of Rotterdam: Rotterdam Climate Initiative; Waterboard Schieland & Krimpenerwaard
Design	De Urbanisten
Status	Realized (2013)
Collaborators	Rotterdam Engineering Bureau
Project management	Rotterdam Project Management Bureau
Construction supervision	Rotterdam Engineering Bureau
Construction works	Wallaard
Budget	4 million euros
Surface area	9.500 m2 (incl. street and parking) square: 5.500 m2
Storage capacity	1.800 m3
DE URBANISTEN	Initiative, concept, design, workshops supervision



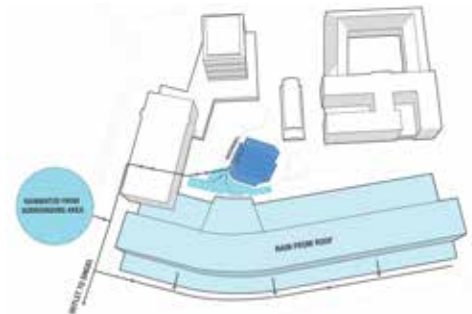




catchment area of basin 1



catchment area of basin 2



catchment area of the deep basin 3

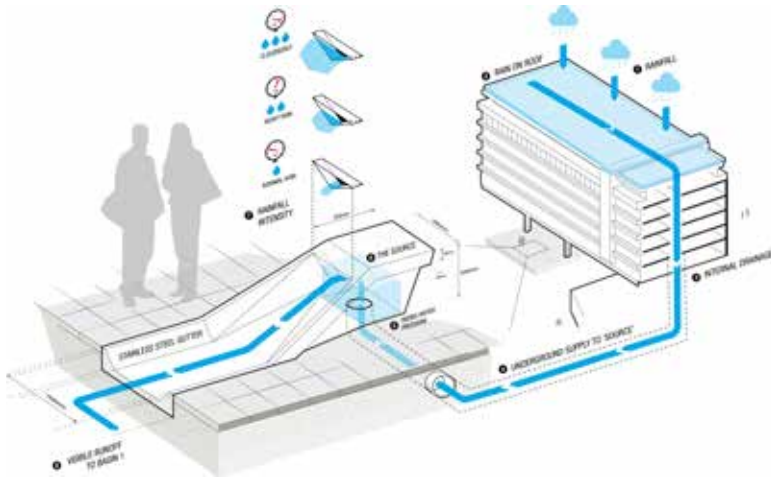


overview of the water square

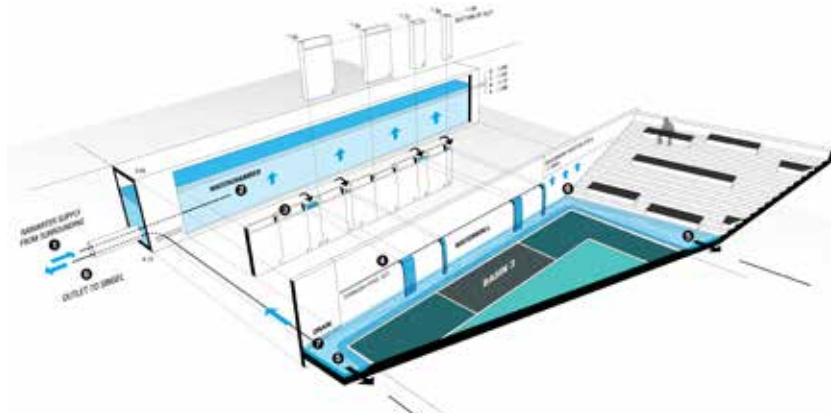
different atmospheres for different activities







the "rain well" leads the water from the roof into the gutter



the "water wall" takes the water from further surroundings into the deep basin





After a cloud burst





WORKSHOP 1



WORKSHOP 2



WORKSHOP 3



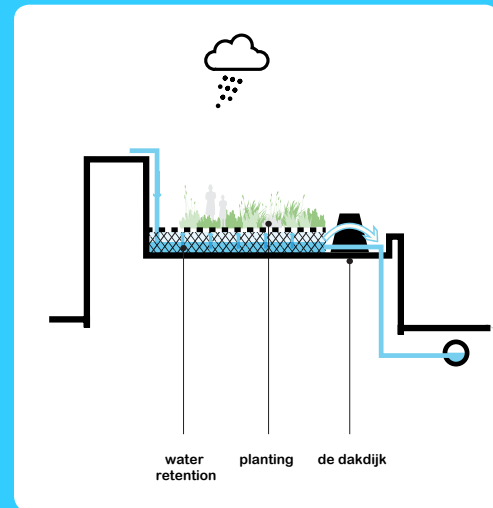
In an intense participatory trajectory with the local community we jointly conceived ideas about the square

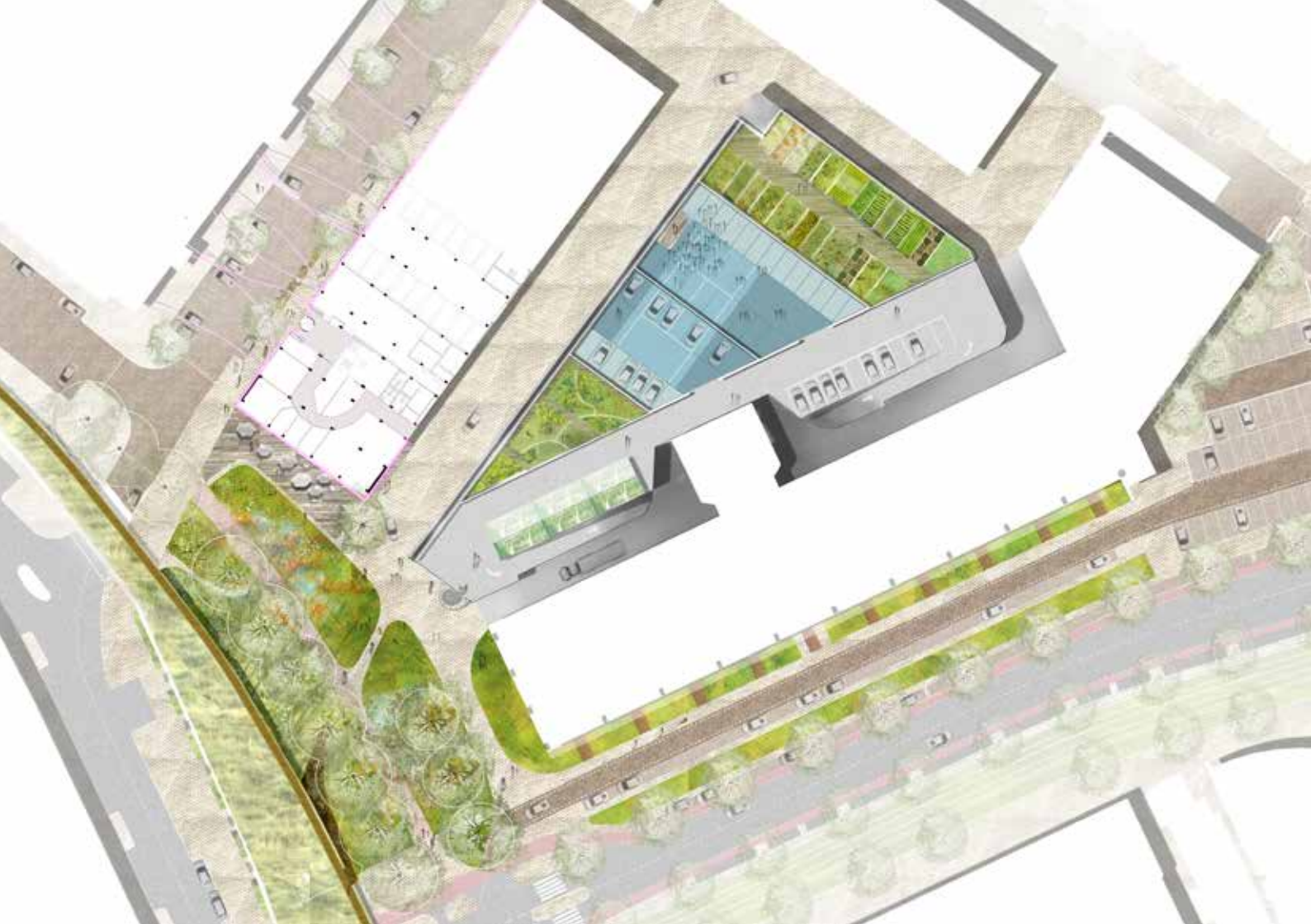


POLDER ROOF

Transformation of an underused parking rooftop into a green-blue roof that reuses and stores rainwater from the nearby buildings in a controlled way. The polder roof adds substantial capacity to the water system. It also functions as a central space for urban agriculture and recreational activities. It adds values to the surrounding buildings.

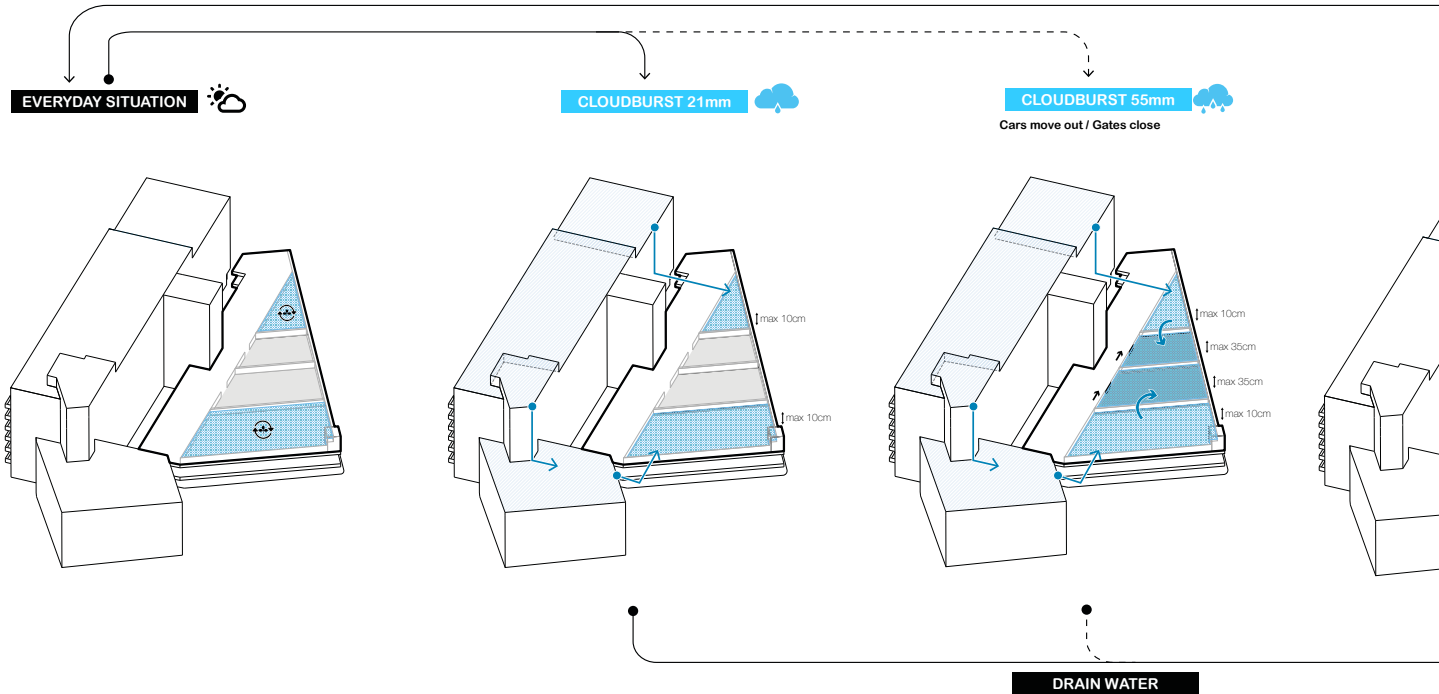
Year	2014-ongoing
Client	City of Rotterdam
Status	Feasibility study
Collaborators	Basement BV Valorisation program Delta technology & Water Dakdokters
Costs	412.000 euros (estimated)
Catchment area	5.573 m ²
Storage capacity	367 m ³
DE URBANISTEN	Research, design



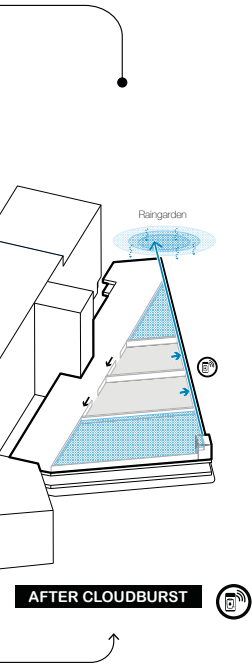




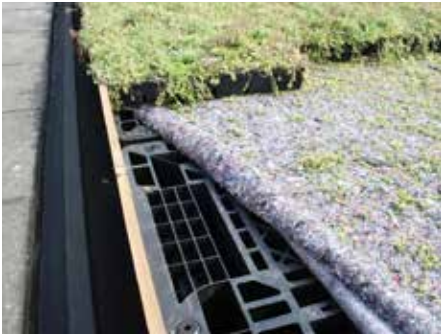




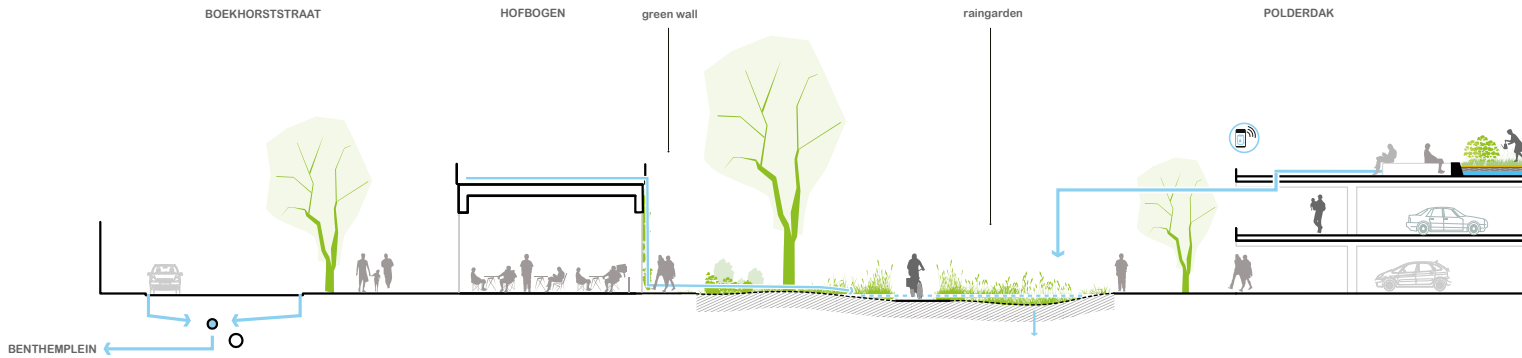
The polder road can handle stormwater storage and reuse in a controlled way. by using smart applications



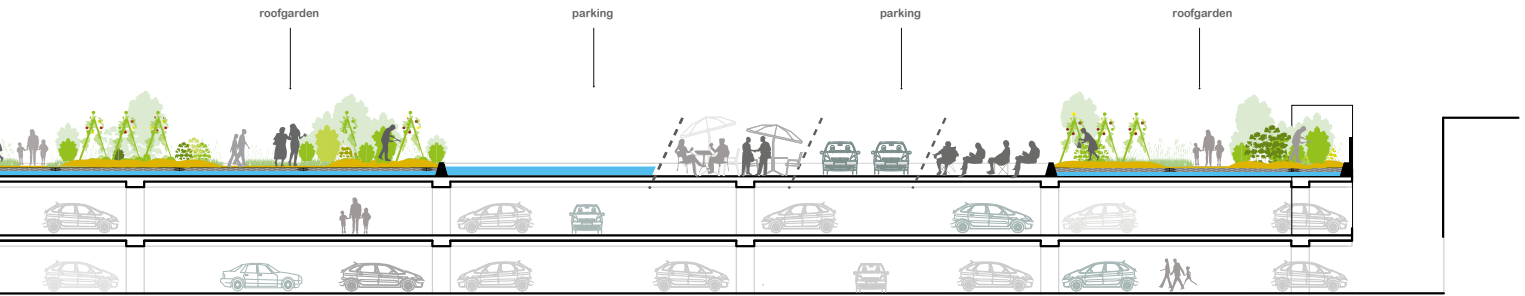
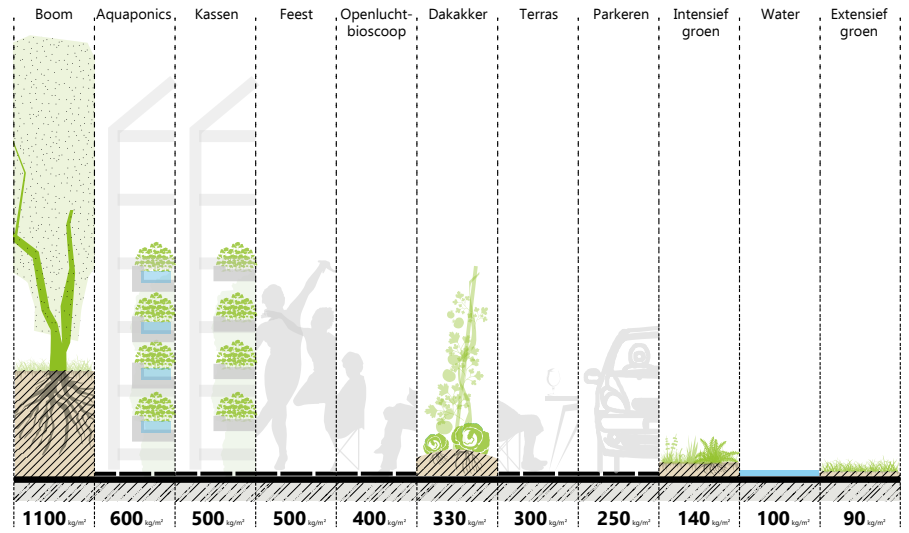
The polder rood is linked to a larger water management system.

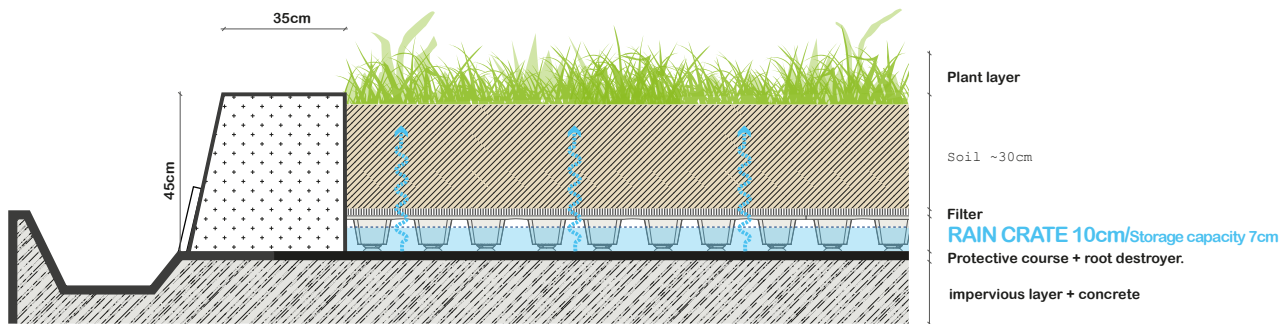


A first polder roof has been realized in Amsterdam (designed by Dakdokters)

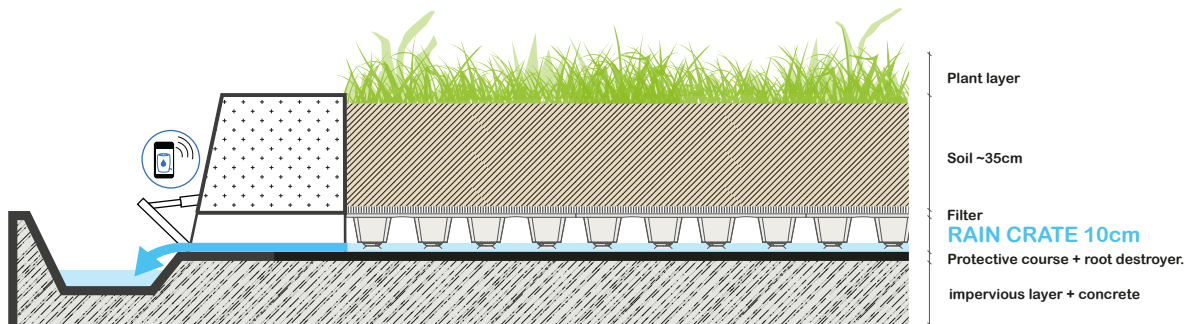


A wide range of activities can be hosted at the Polder Roof





The stored rainwater can be used to water the gardens



With a smart-app, the water capacity in the system can be controlled to create space for extreme cloudbursts



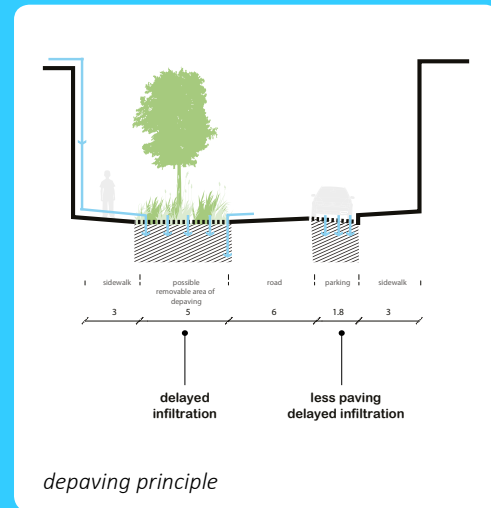
Noorddingel



KATSHOEK RAIN(A)WAY GARDEN

In front of the Katshoek building a new garden will test and show the innovative Rain(a)way permeable pavement designed by Fien Dekker as part of a green landscape that will contribute to the infiltration capacity of what it used to be a hard surface paved street.

Year	2015-ongoing
Client	City of Rotterdam Basement BV Valorisation program Delta Technology & Water Waterboard Schieland & Krimpenerwaard
Status	Final design (approved)
Collaborators	Fien Dekker (Rain(a)way tile) Binder groenprojecten Thijssen - den Brok beton
Construction supervision	Rotterdam Engineering Bureau
Surface Area	400 m ²
DE URBANISTEN	Supervision, landscape design

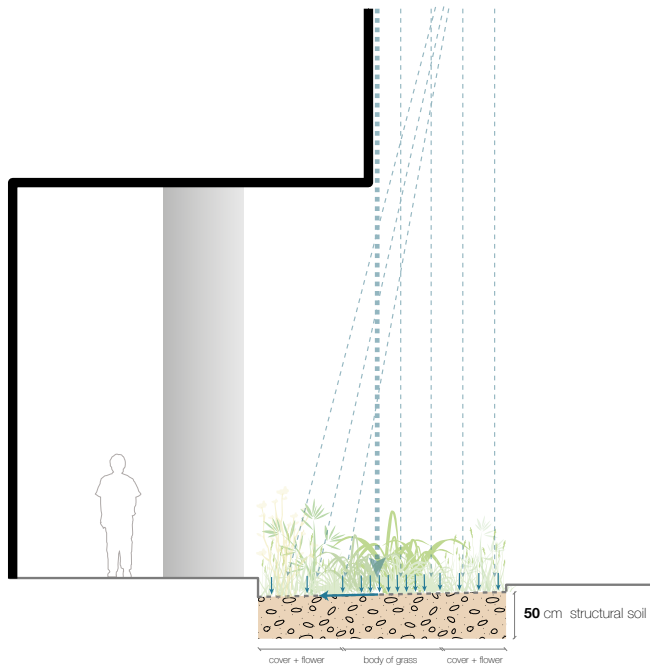
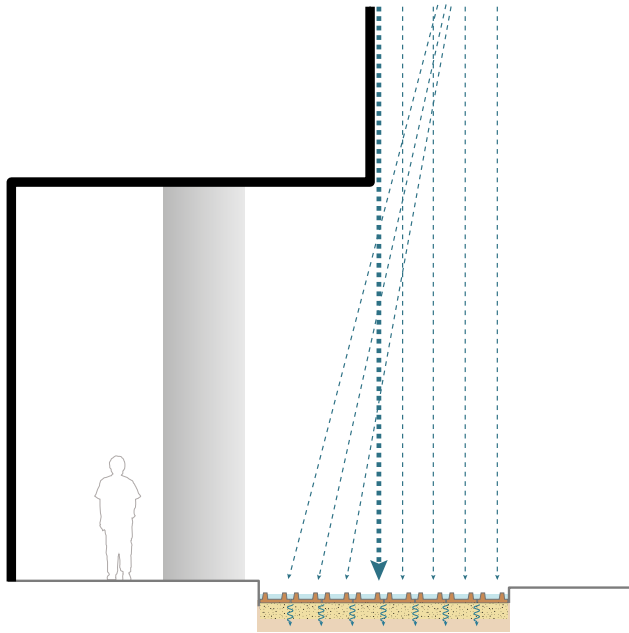


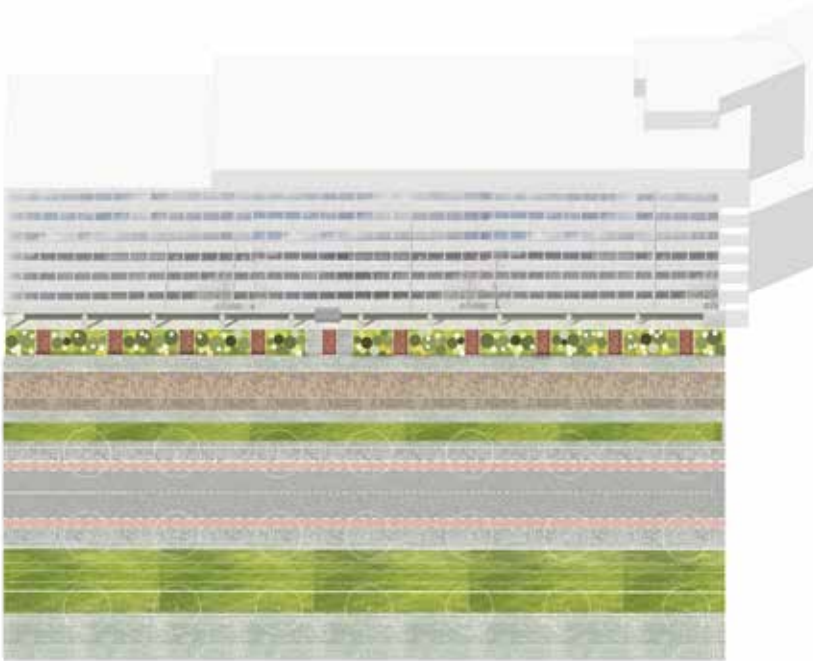




The garden will showcase the whole set of Rain(a)way tiles

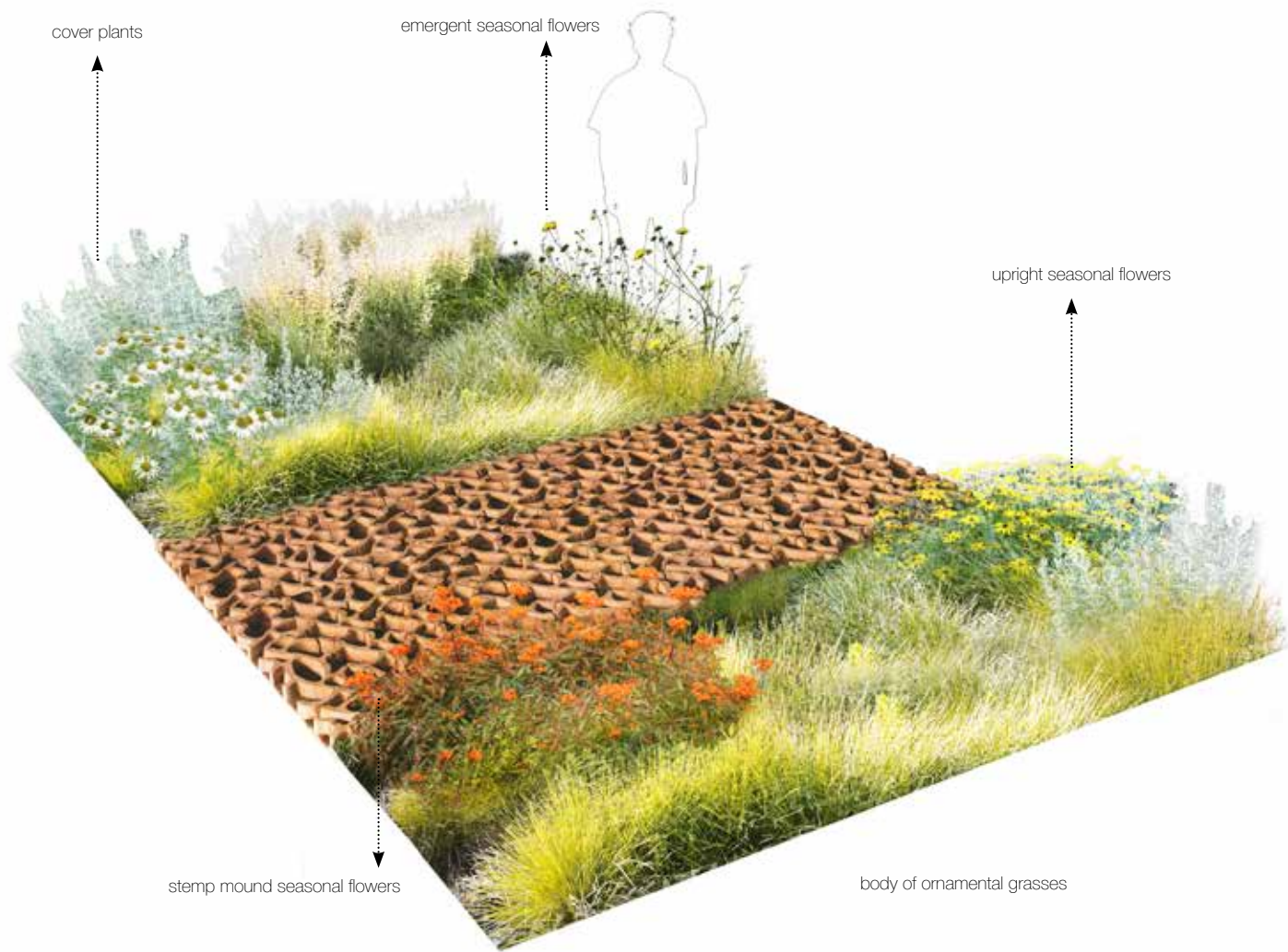






The Municipality is digging the street in order to split the sewage system, creating a perfect opportunity to rethink the street profile





cover plants

emergent seasonal flowers

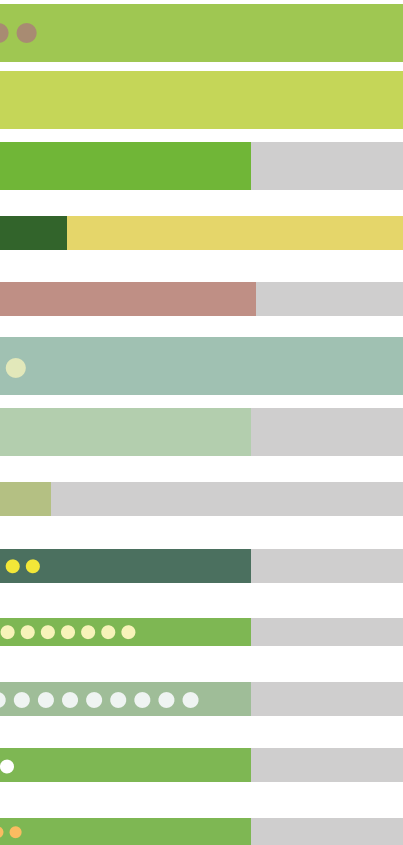
upright seasonal flowers

stemp mound seasonal flowers

body of ornamental grasses



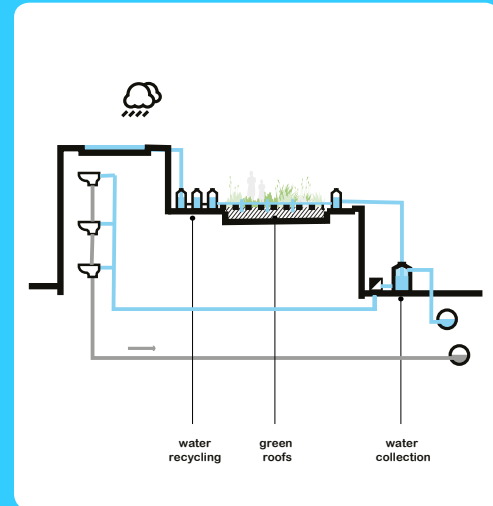
SEP OCT NOV DEC

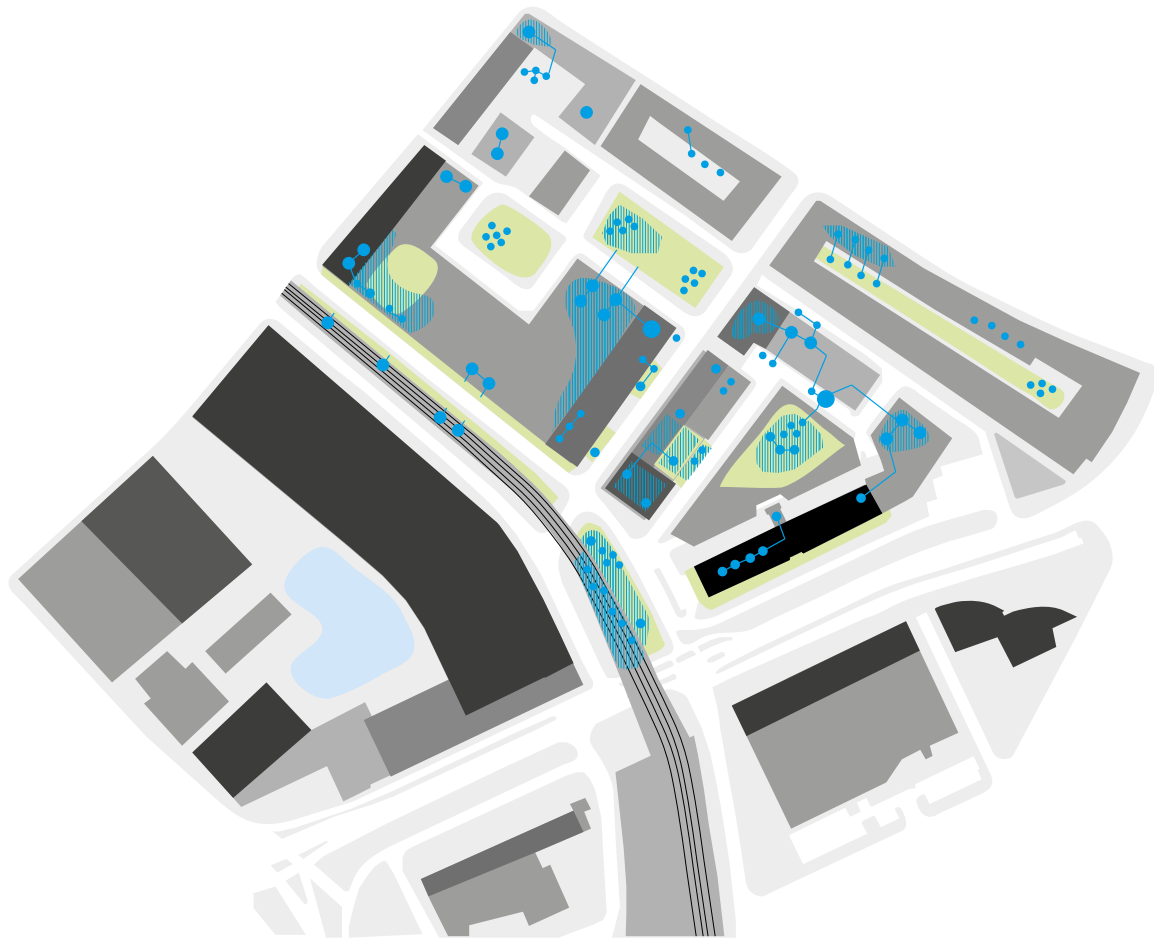


ZOHO-RAINBARREL

The ZOHO-rainbarrel is a system designed to be an icon for the neighborhood and a smart solution for rainwater reuse and temporary storage. It will be installed all over the ZoHo-district, creating awareness and a shared community feeling. A smart control device - (B)Rainbarrel - makes it possible to control storage capacity within the system.

Year	2014-ongoing
Client	RVO
Initiative	Rien Hilhorst, Studio Bas Sala
Status	Feasibility study
Design	Studio Bas Sala T.U. Delft, P.J. van Overloop (Brainbarrel)
DE URBANISTEN	Supervision

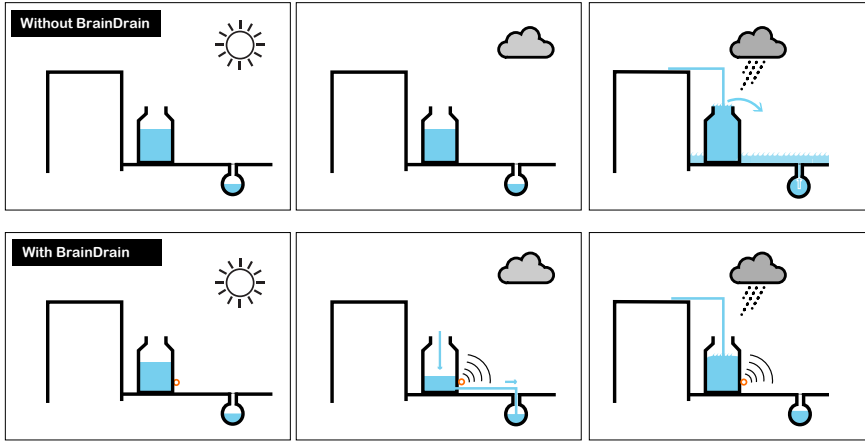




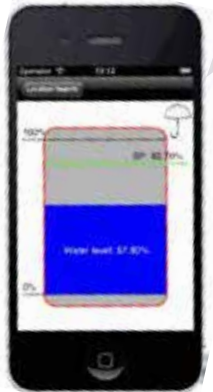
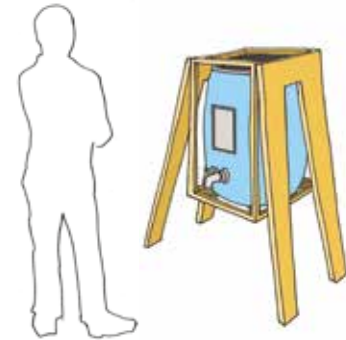
+10 m
0 m bouwlagen

Rain Barrell locations

Brain Drain is a smart app to predict the water storage capacity needs



1



Prototypes

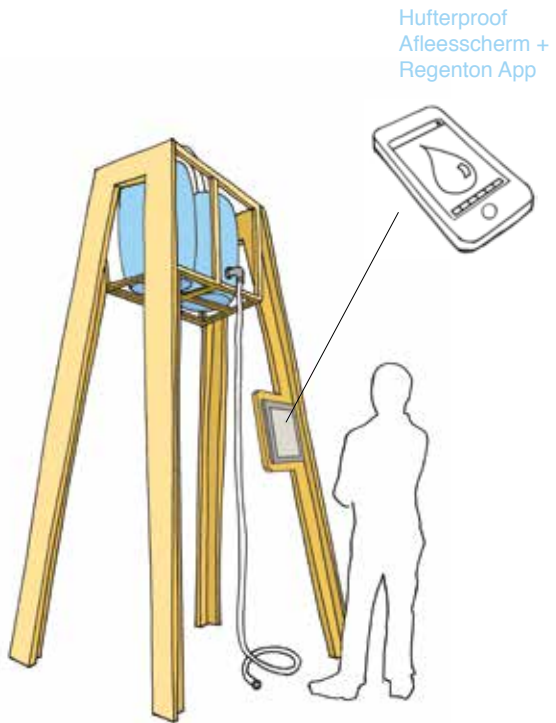


a scale model of greenhouse and waterreservoir



The BrainDrain on a rainbutt

2



3

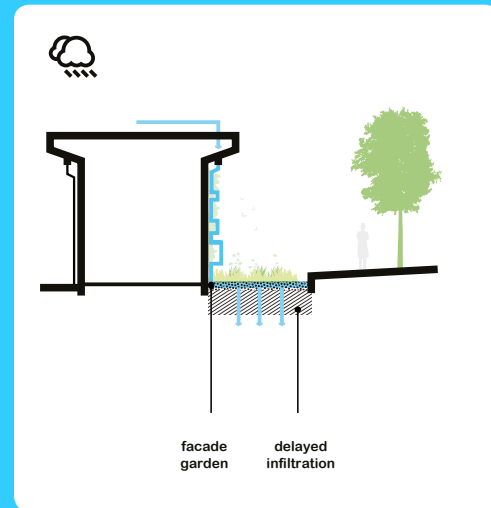


Studio Bas Sala developed 3 different prototypes to fit the requirements

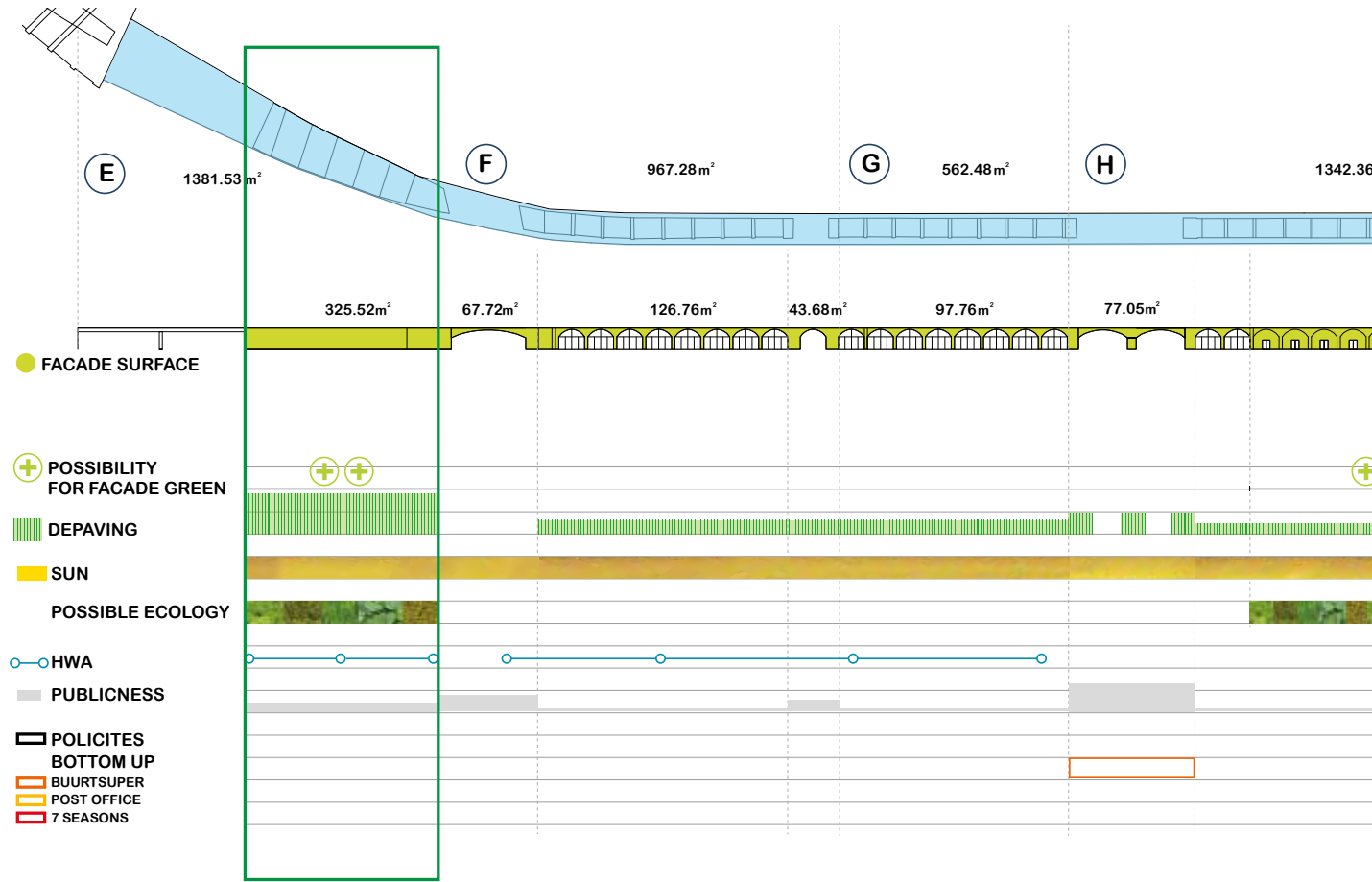
GREENING HOFBOGEN

This initiative aims to intervene the building and its surroundings from the street level from a bottom-up perspective, addressing issues as vegetation, ecosystems, edible grow, rainwater storage/infiltration and urban furniture.

Year	2014
Client	City of Rotterdam
Design	DE URBANISTEN
Status	Post-Office (frontyard)
Collaborators:	Study Post-Office 7 seasons Hofbogen BV
DE URBANISTEN	Research and design, supervision







E

1381.53m²

F

967.28m²

G

562.48m²

H

1342.36

325.52m²

67.72m²

126.76m²

43.68m²

97.76m²

77.05m²

● FACADE SURFACE

⊕ POSSIBILITY FOR FACADE GREEN

▤ DEPAVING

■ SUN

🌿 POSSIBLE ECOLOGY

○ HWA

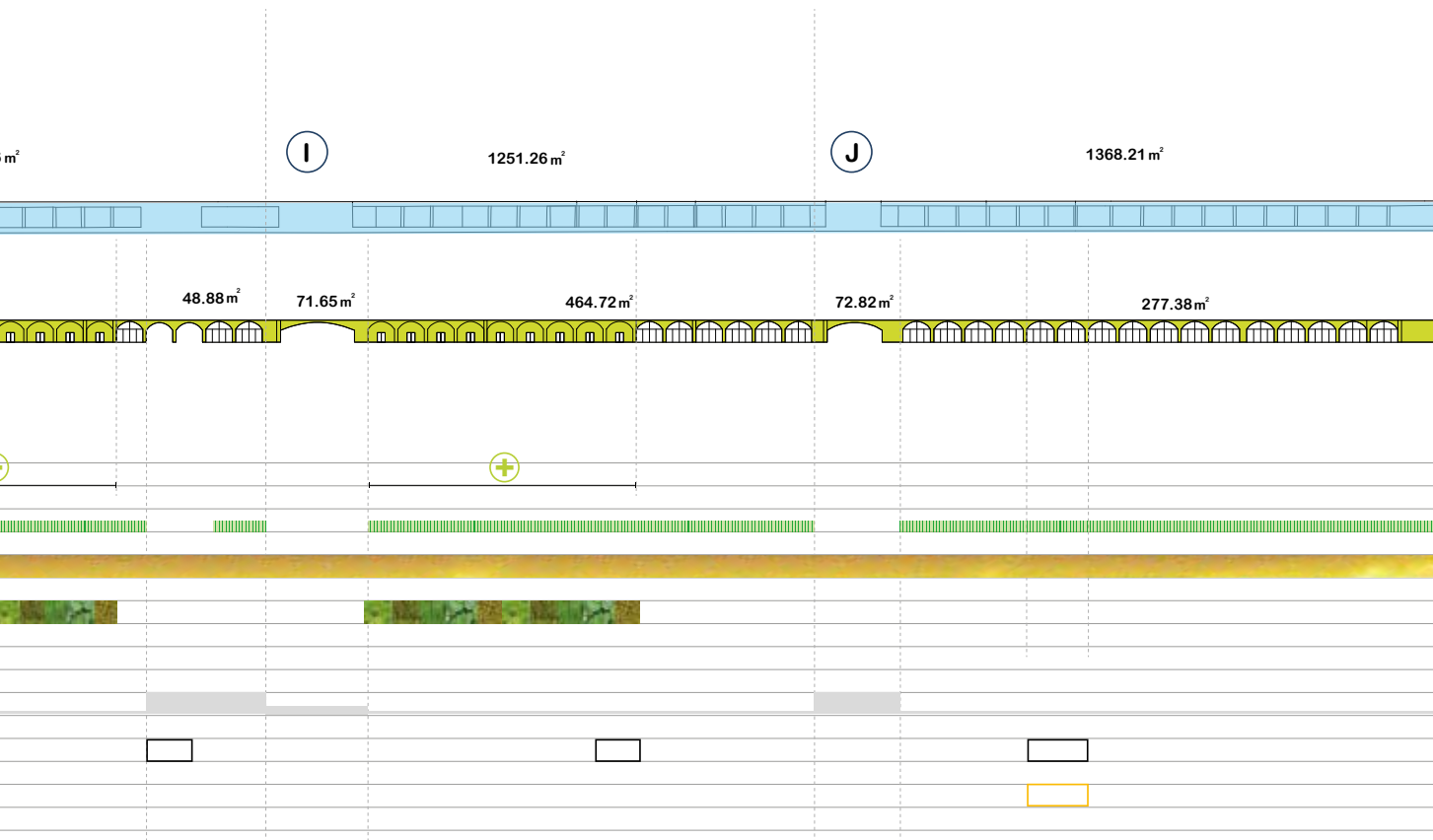
■ PUBLICNESS

▭ POLICITES
▭ BOTTOM UP

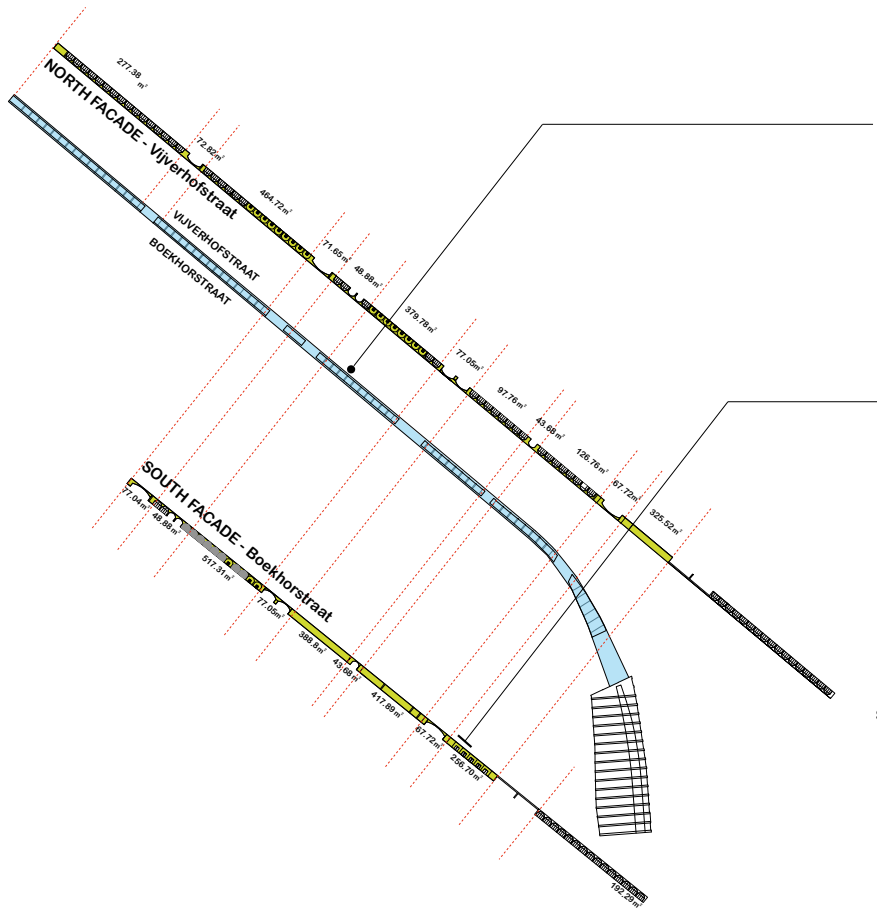
▭ BUURTSUPER

▭ POST OFFICE

▭ 7 SEASONS



Analysis of conditions and potential of the Hofbogen north facade



TOTAL ROOF SURFACE

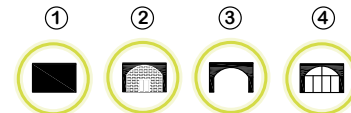
● 6833.36 m²

average annual rainfall in Rotterdam : 800mm
 6833 m² x 800mm ----- 5466400 liters / year

TOTAL FACADE SURFACE


● 3880.61 m²

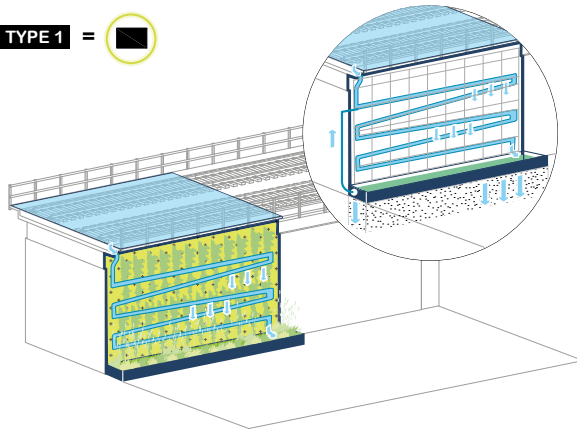
FACADE TYPOLOGY




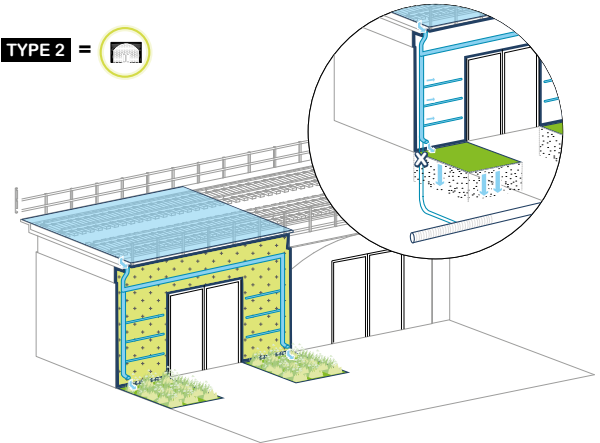
	①	②	③	④
NORTH	325.52	357.36	795.06	729.13
SOUTH	1195.33	289.93	216.73	385.37


Facts and most suitable sections to green

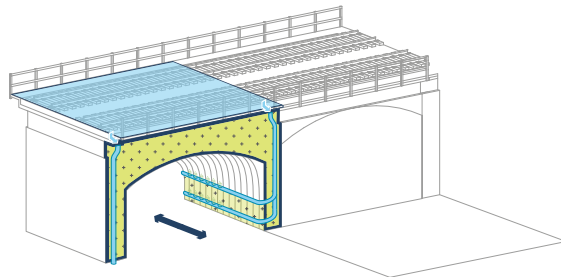
TYPE 1 = 




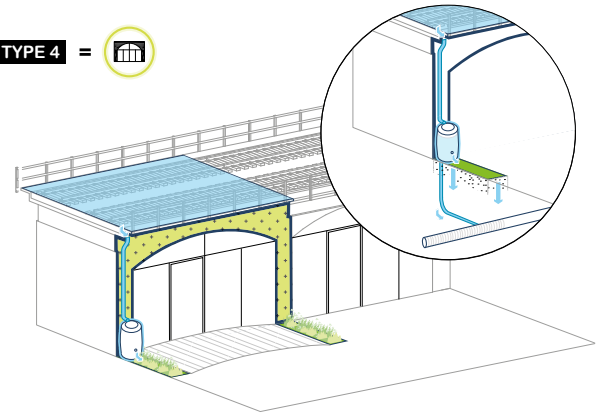
TYPE 2 = 



TYPE 3 = 



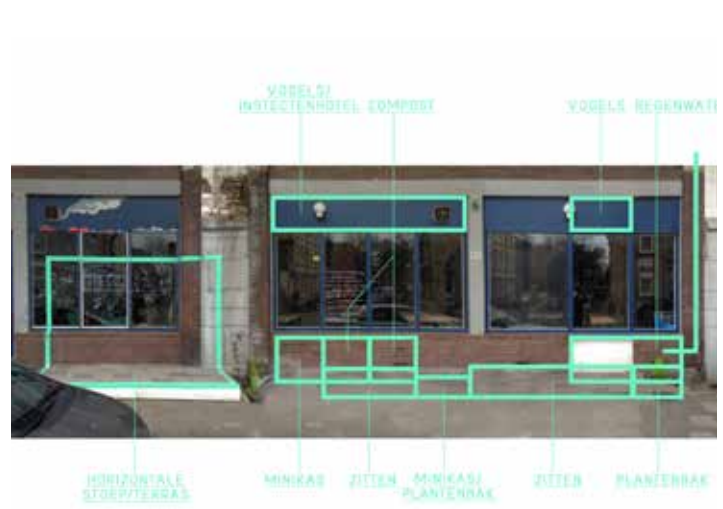
TYPE 4 = 



Possible facade intervention typologies



SCHOP initiative built a first prototype with the help of Agniesebuurt neighbors

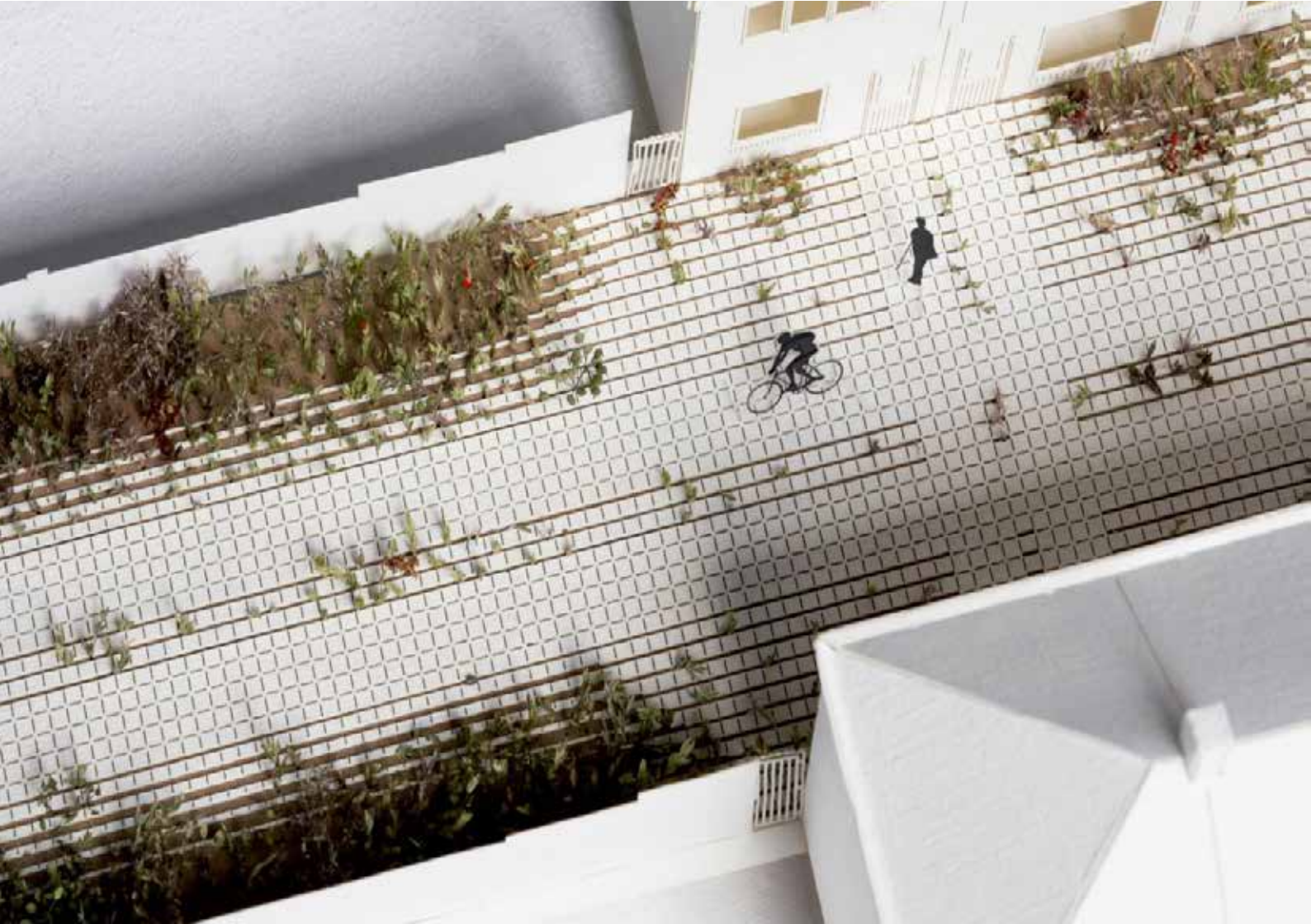


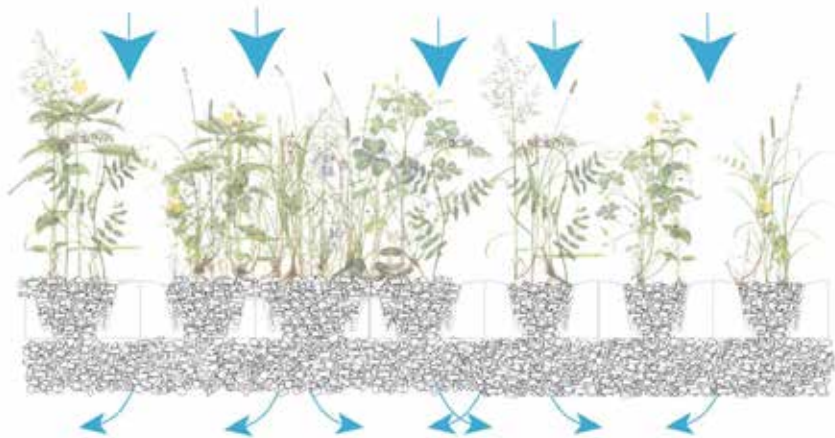


LIVING PAVEMENT

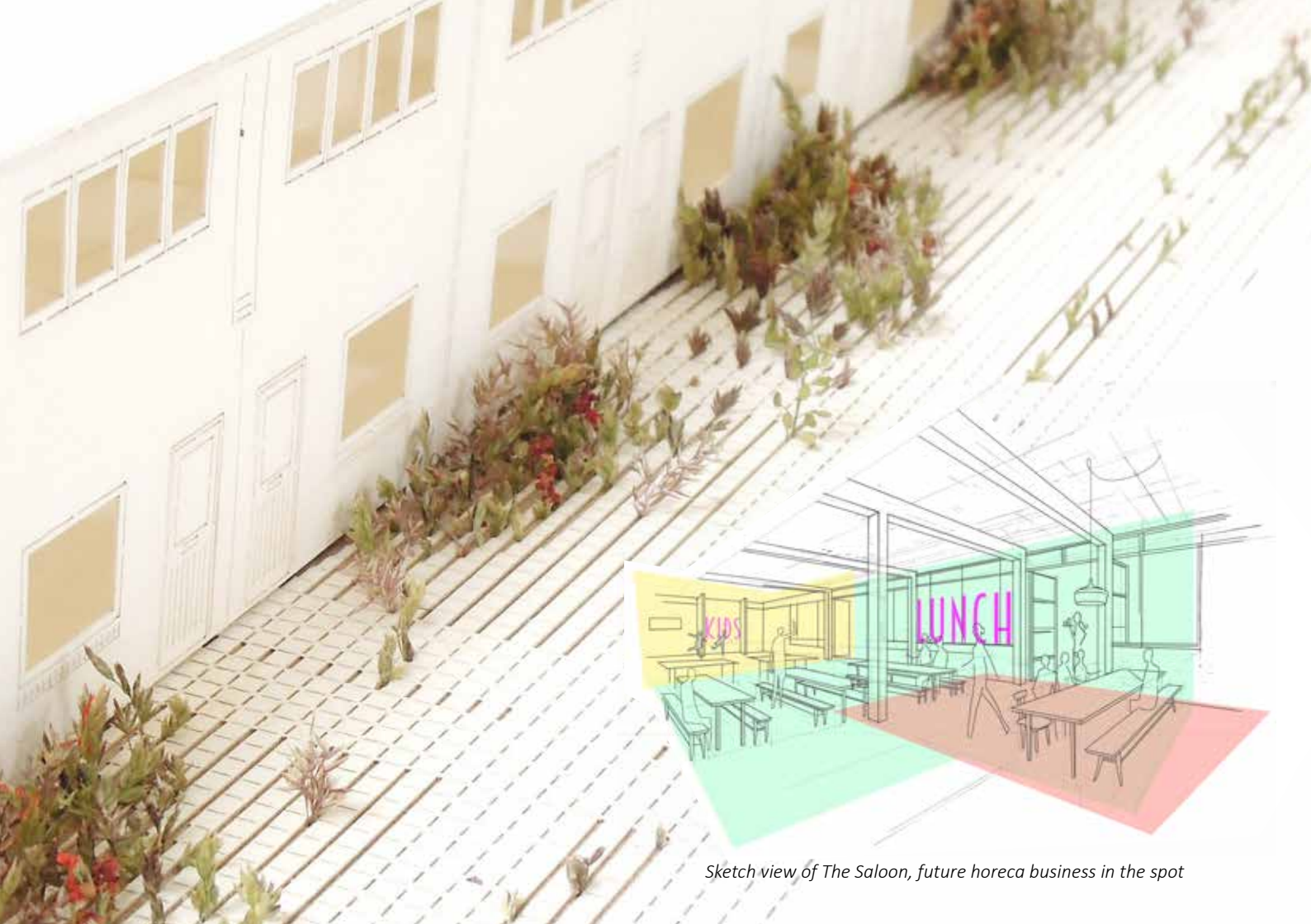
Living Pavement is an open-tile system developed by Studio Meek together with Vincent Wittenberg that enables spontaneous vegetation in urban public spaces. An outdoor space linked to the future horeca space at Het Gele Gebouw street level will serve as a test site for these tiles, bringing the public space quality the place deserves.

Year	2015-ongoing
Client	City of Rotterdam Havensteder Creative Industries Fund NL
Design	Studio Meek
Status	Study
Collaborators	Van Schagen Architects Green Sparrow DE URBANISTEN
DE URBANISTEN	Supervision





A modular set of 30x30 tiles with 4 different designs allows both the spontaneous vegetation and the rain water infiltration

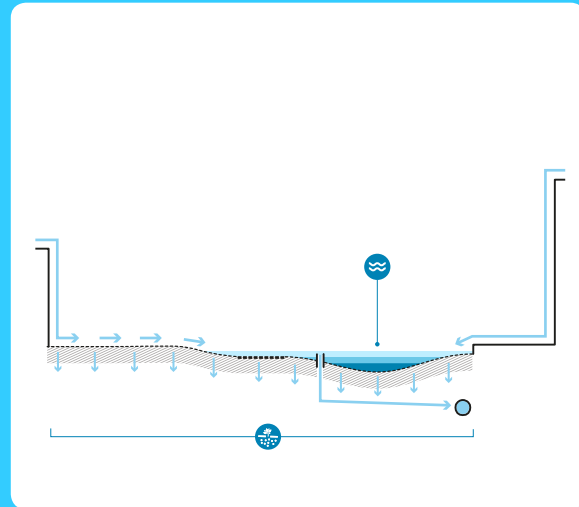


Sketch view of The Saloon, future horeca business in the spot

ZOHO-RAINGARDEN

ZOHO-Raingarden is a public space intervention linked to Hofbogen viaduct and the Katshoek parking garage that uses the rainwater collected from the rooftops and the surrounding street to irrigate a new green structure that replaces the underused street. The area shows an excessive amount of paved surface and parking spots and with a smart reorganisation it can be upgraded to a green spot to linger and enjoy nature, linking the surroundings (Polderdak, Katshoek, Gele Gebouw, Hofbogen...) and solving climate issues as rain, drought and heat stress.

Year	2014-ongoing
Client	City of Rotterdam
Design	DE URBANISTEN
Status	Realized pilot, approved plan
Collaborators	Van Dijk contractors GreenSand Municipal Nursery of Rotterdam
Maintenance	NAS (Nico Adriaans Stichting)
Surface area	2.590 m2
DE URBANISTEN	Initiative, urban and landscape design, supervision







A green public space on a daily basis



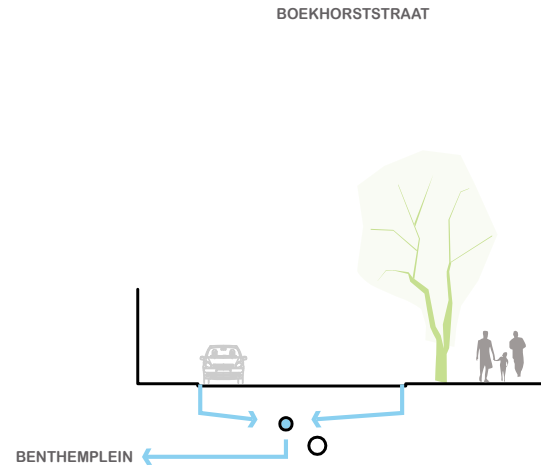


A water catchment and infiltration area when it rains





The deepest part attracts the water flow from the surroundings

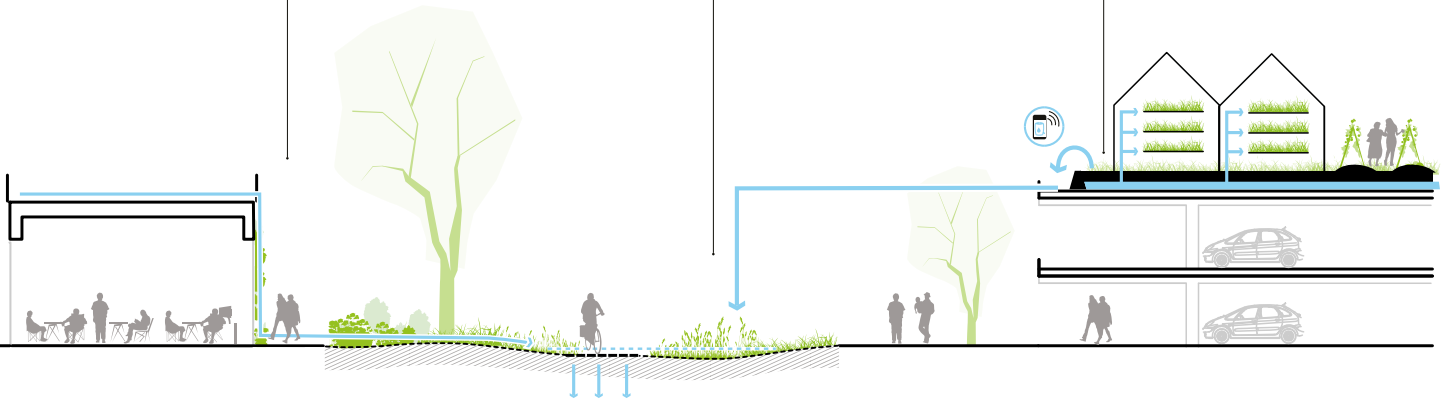


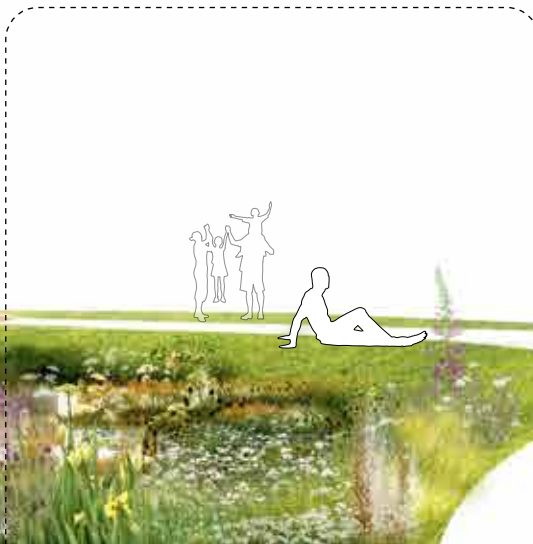
HOFBOGEN

green wall

regentuin

polderdak





wet plants



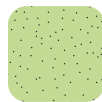
bruine kikker



libel



wilde bij



grass



welcome flower garden



vlinder



hommel



shadow-climber garden



Gierzwaluw



Zanglijster



Dwergvleermuis



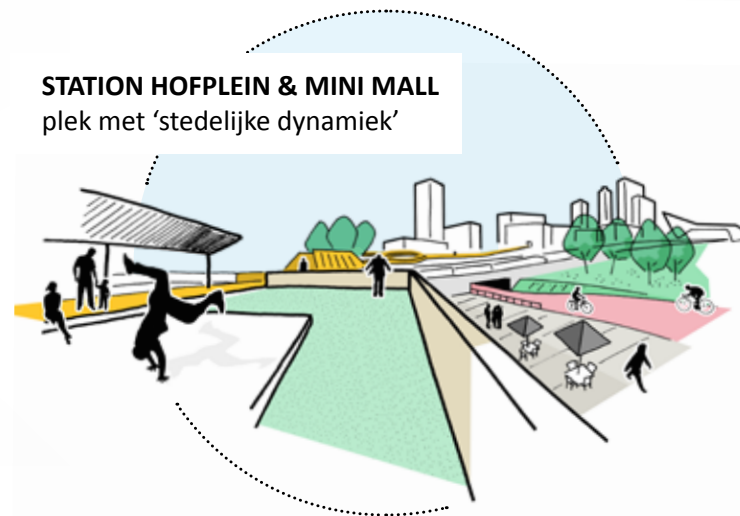
Effectively on the spot we started the Depaving ZoHo. In just two days and zero budget we created the first piece of ZoHo Raingarden. Together with the local community, Van Dijk contractors and the municipal Nursery we started to depave the Vijverhofstraat to make it greener, friendlier and climate proof.







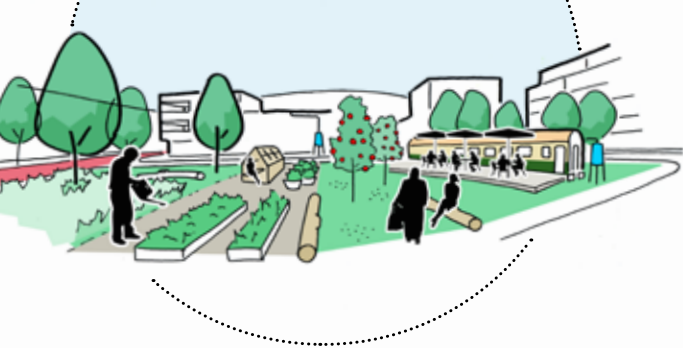
ZOHO Raingarden will play a key role in the future urban structure of the district



STATION HOFPLEIN & MINI MALL
plek met 'stedelijke dynamiek'

ZOHO-PARK

een ontmoetingsplek voor de buurt



REGENTUIN

de welkomsttuin van het Zomerhofkwartier



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