SUPER CIRCULAR ESTATE

Circular housing development in the region Parkstad Limburg The Netherlands

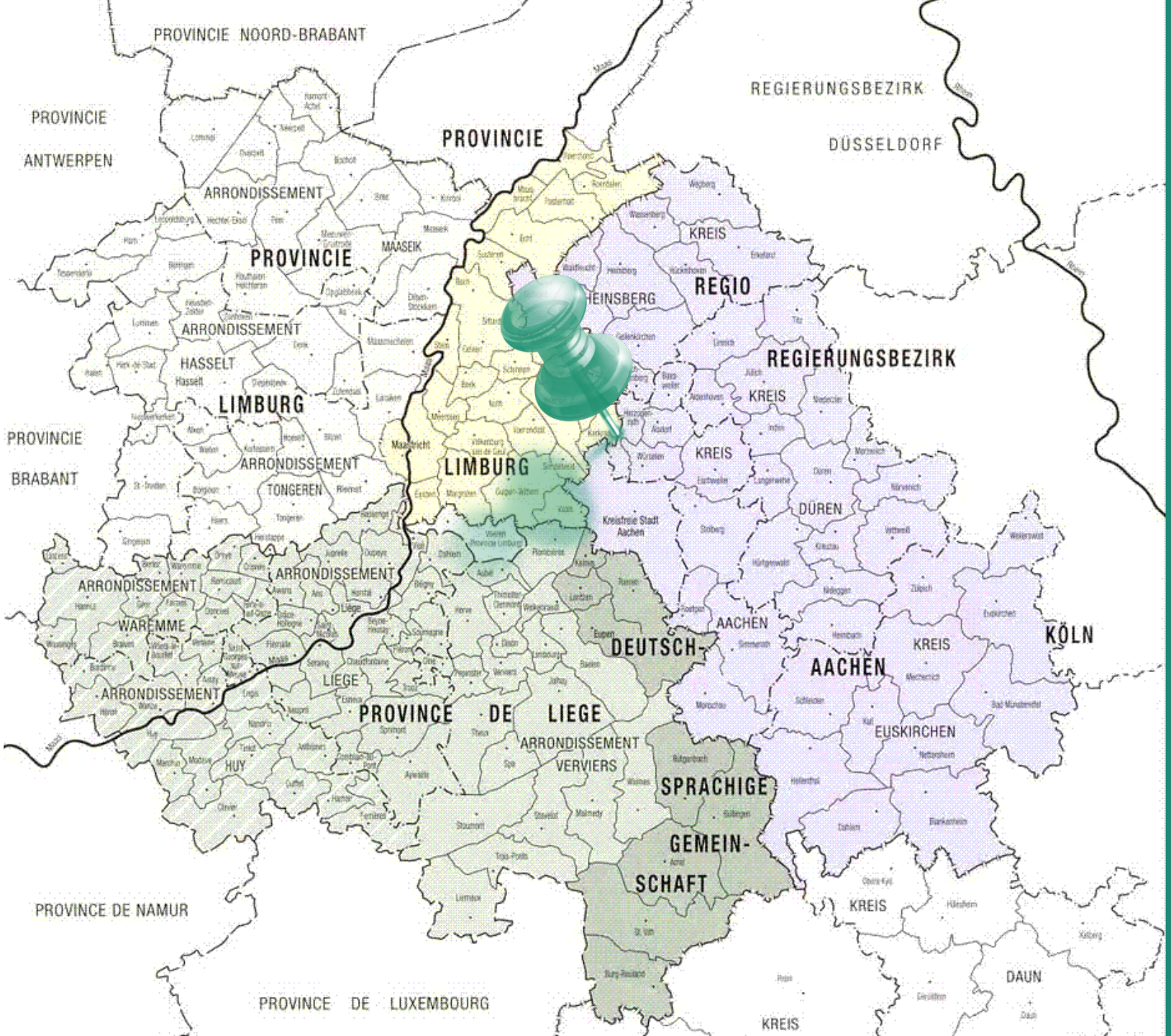
GTB-lab 29 october 2018

EUROPEAN UNION
European Regional Development Fund

UIA URBAN INNOVATIVE ACTIONS

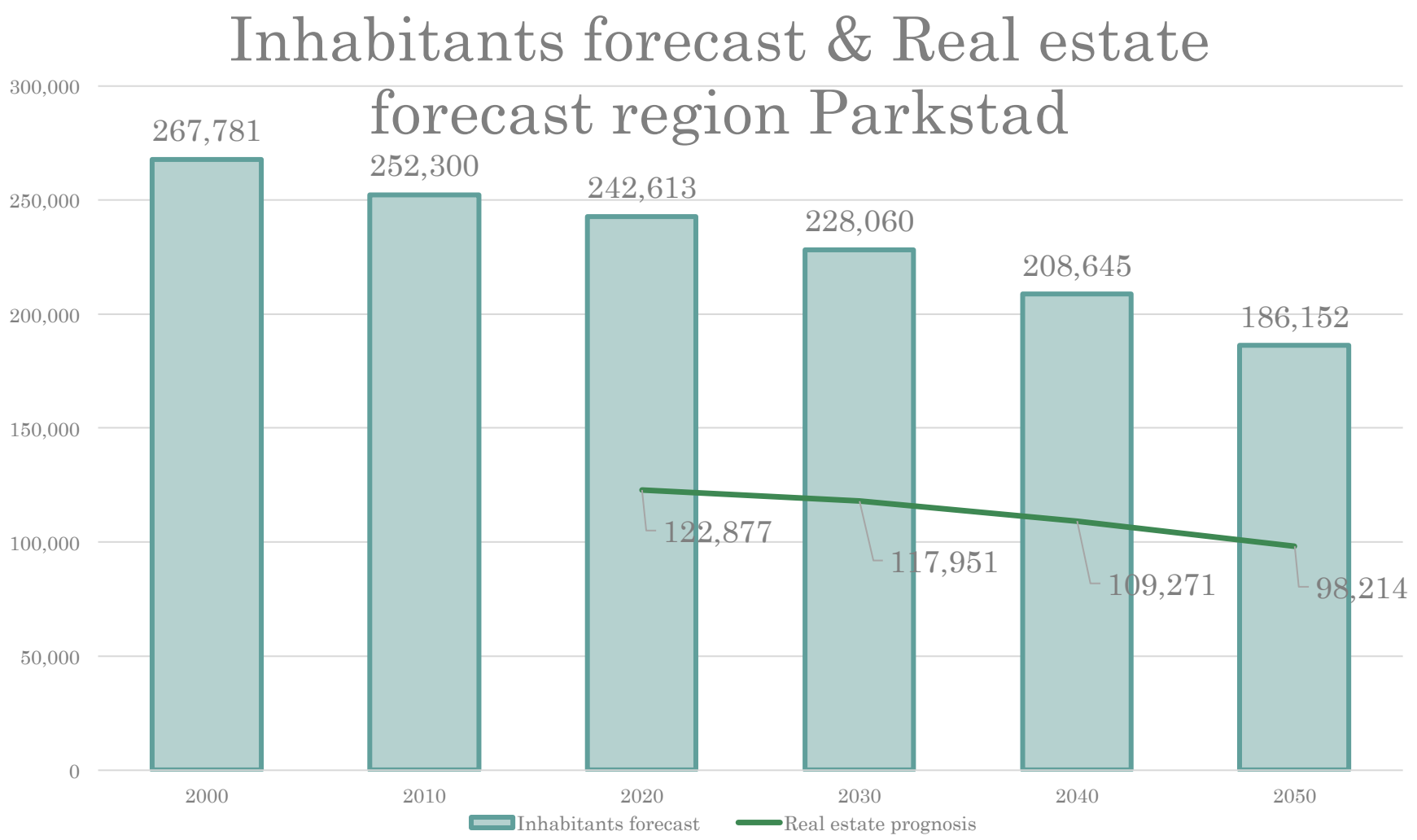
Euregio Maas-Rijn

3.9 million inhabitants



City Region Parkstad

Heerlen
Kerkrade
Landgraaf
Brunssum
Nuth
Voerendaal
Simpelveld
Onderbanken



Neighbourhood Bleijerheide

Close to German Border

Real estate forecase

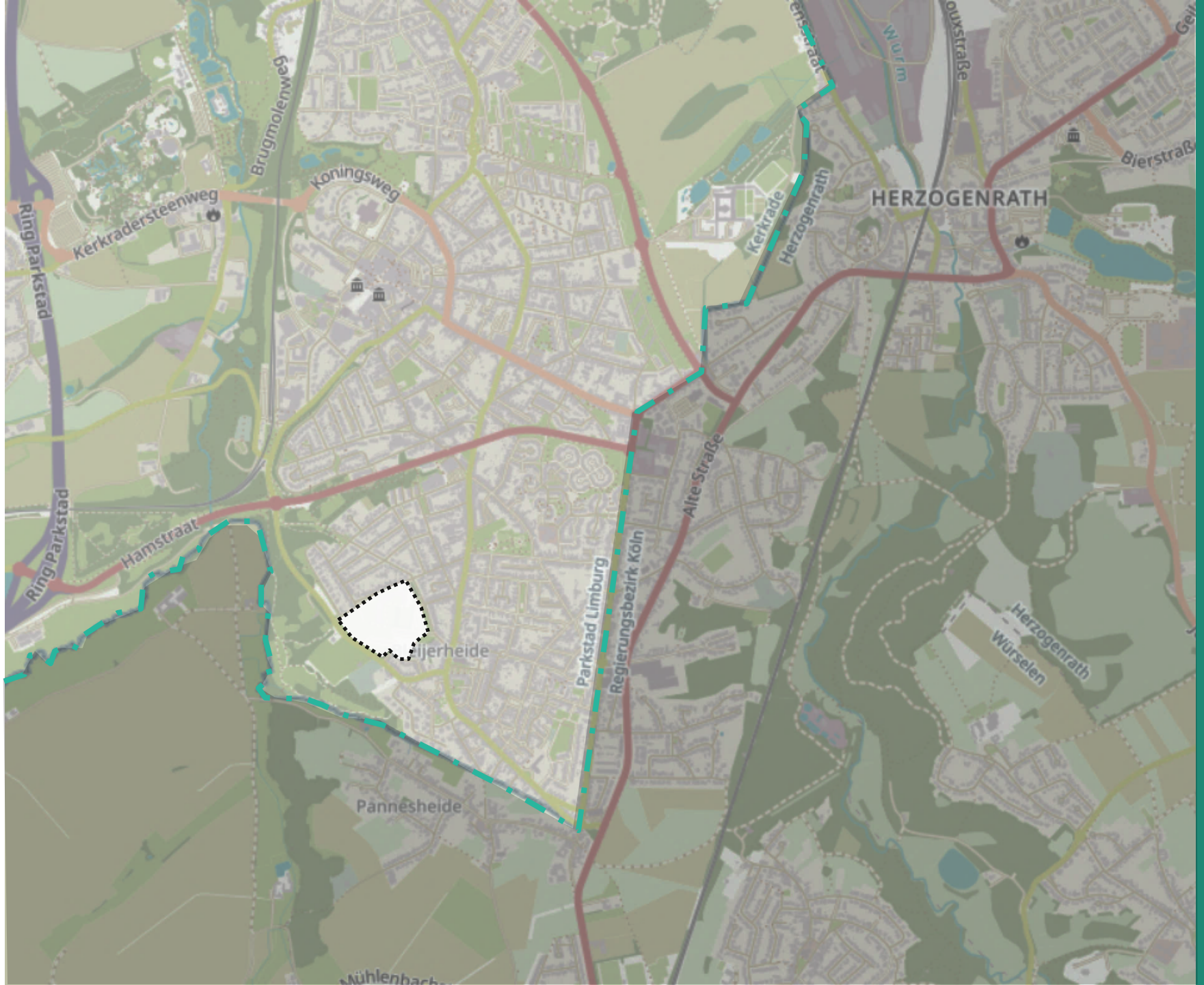
-637 dwellings till 2030

HEEMwonen

Owns ± 800 units

Coöperation between

City of Kerkrade and HEEMwonen for Restructuring



High times high-rise appartments

1967 till +/-1990

Housing shortage
High sociale cohesion
Street'-feeling on galleries

Since 1990

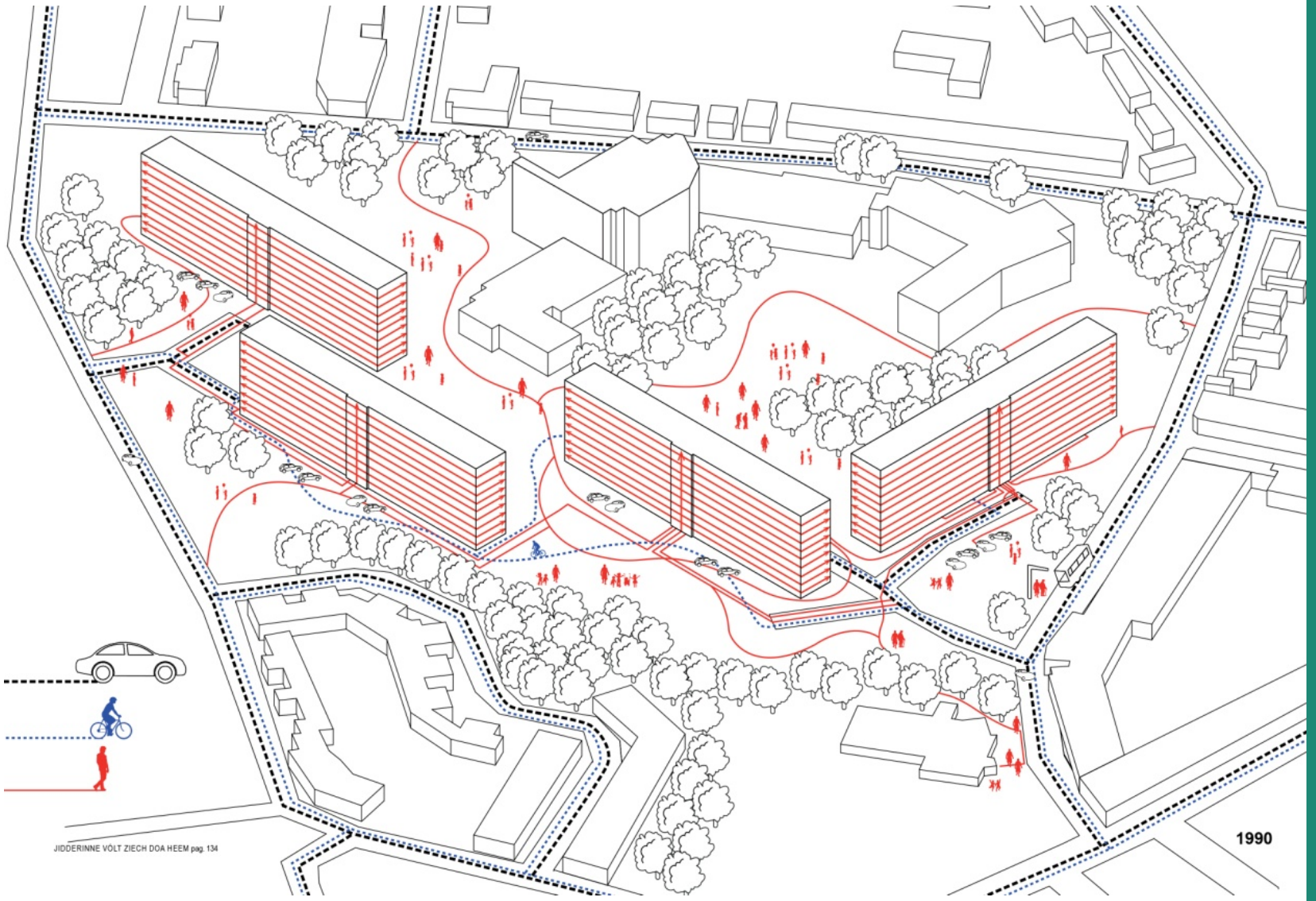
Social and economical problems

Decline in social cohesion

Bad condition of maintenance

Opening of the borders

Changes in society



1967-1990

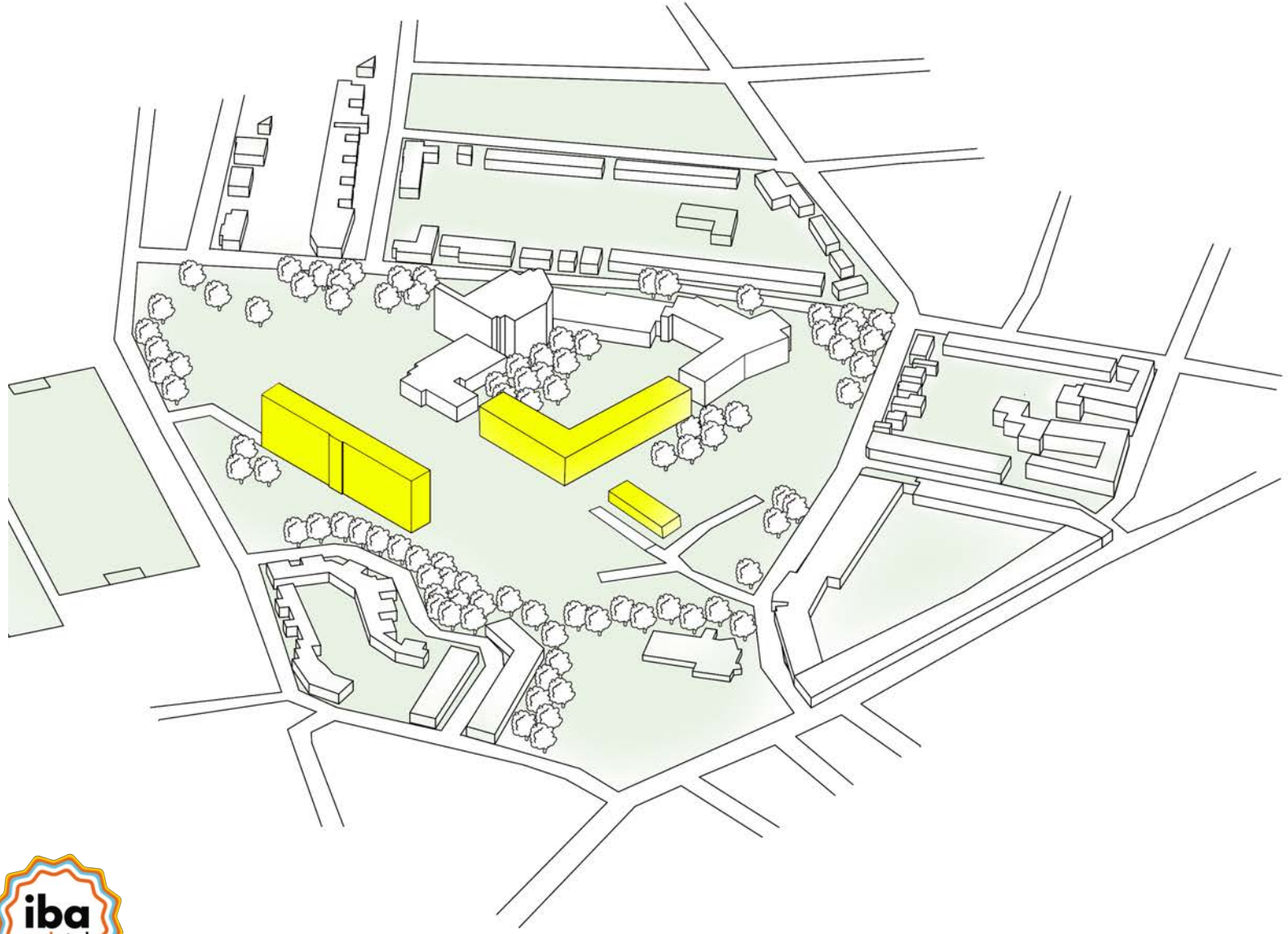
Goal - SUPERLOCAL

Restructure housing
-dilution of housing stock
300 → 125 housing units
-low rent (< 550,- p.m.)
-high quality

Restructure public area
-maintaining values and qualities

Introduce Circulair economy
Aim is to introduce and experiment with circularity

SUPERLOCAL
Estimated costs +/- 30mln



heem wonen

Gemeente Kerkrade

iba parkstad

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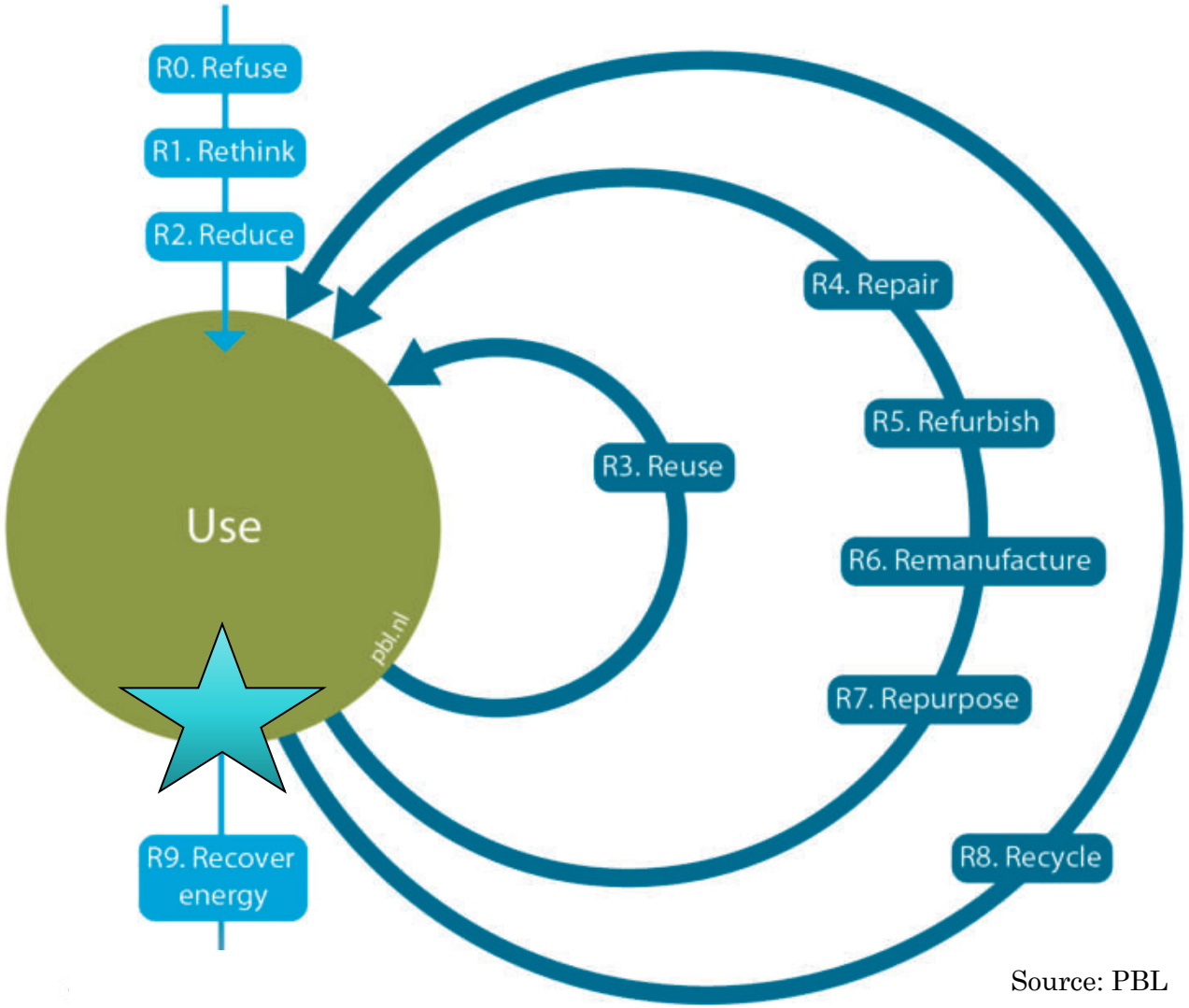
add the Circular layer

"A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models."

Ellen Macarthur Foundation
Towards the Circular Economy (2013)

Circularity is more than materials only!



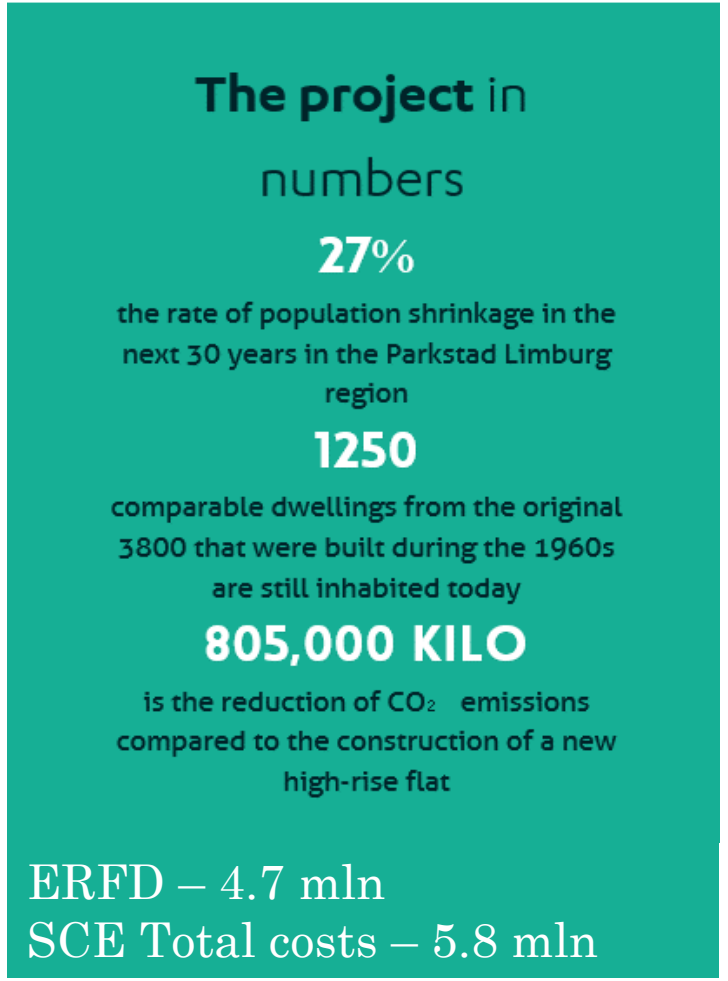
Source: PBL

Circular Economy

Urban Innovative Actions (UIA) is an Initiative of the European Union that Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges.
provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges.

SUPER CIRCULAR ESATE

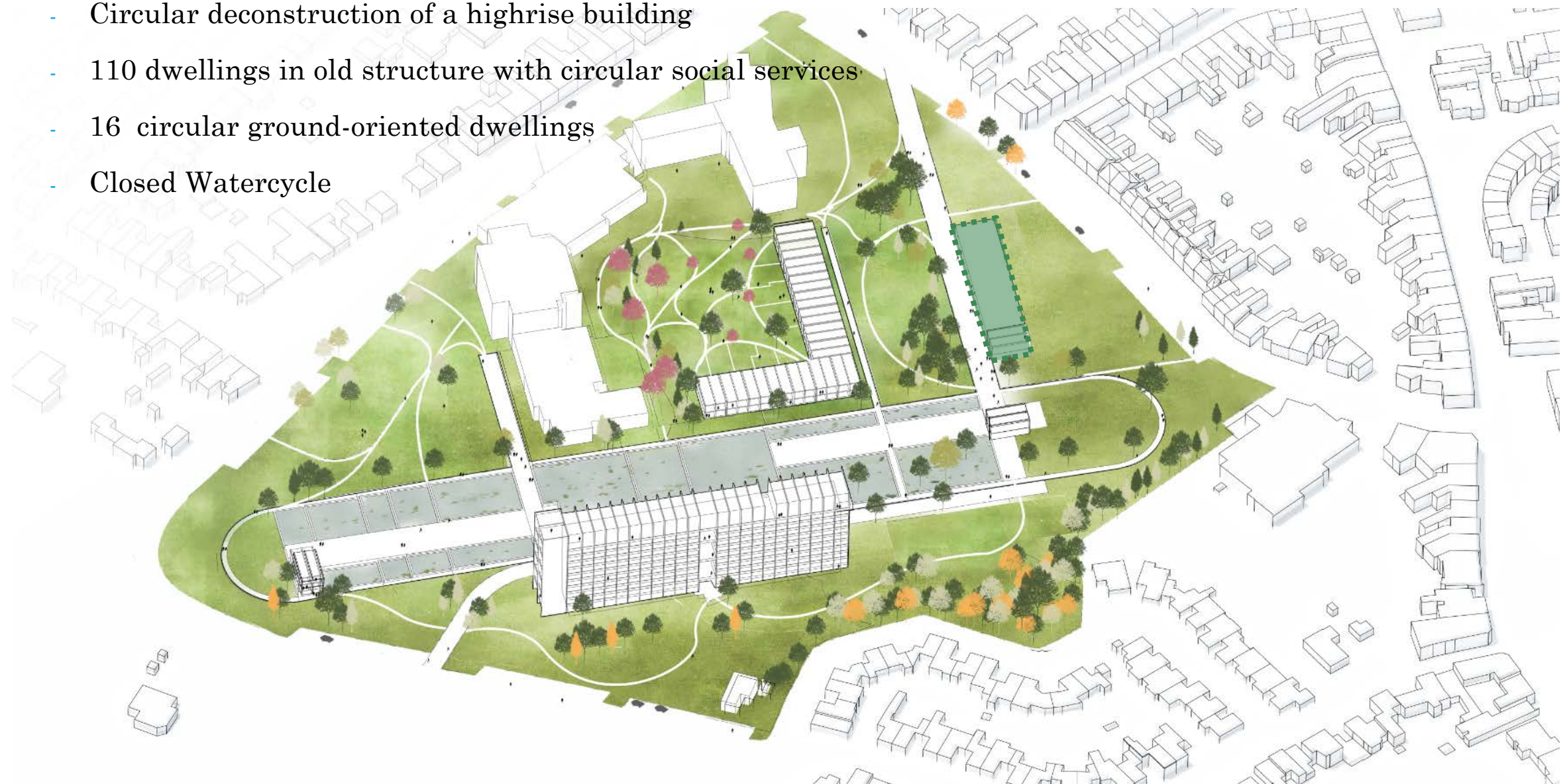
- contributes to a sustainable, low carbon, resource efficient economy
- creating high-quality, desirable urban environment and affordable housing opportunities based on breakthrough innovative material and social circular solutions.
- The objective is to circularly reuse values within the project whilst boosting the local economy and creating a high-quality and desirable urban environment.
- former social structures will be recovered by actively stimulating former inhabitants to take residence in the area again.
- The project serves as a best example for approximately 1250 similar housing accommodations in the Parkstad Limburg region.



ERFD – 4.7 mln
SCE Total costs – 5.8 mln

Master plan SUPERLOCAL – SUPER CIRCULAR ESATE

- **4 pilot dwellings based on first experiment**
- Circular deconstruction of a highrise building
- 110 dwellings in old structure with circular social services
- 16 circular ground-oriented dwellings
- Closed Watercycle



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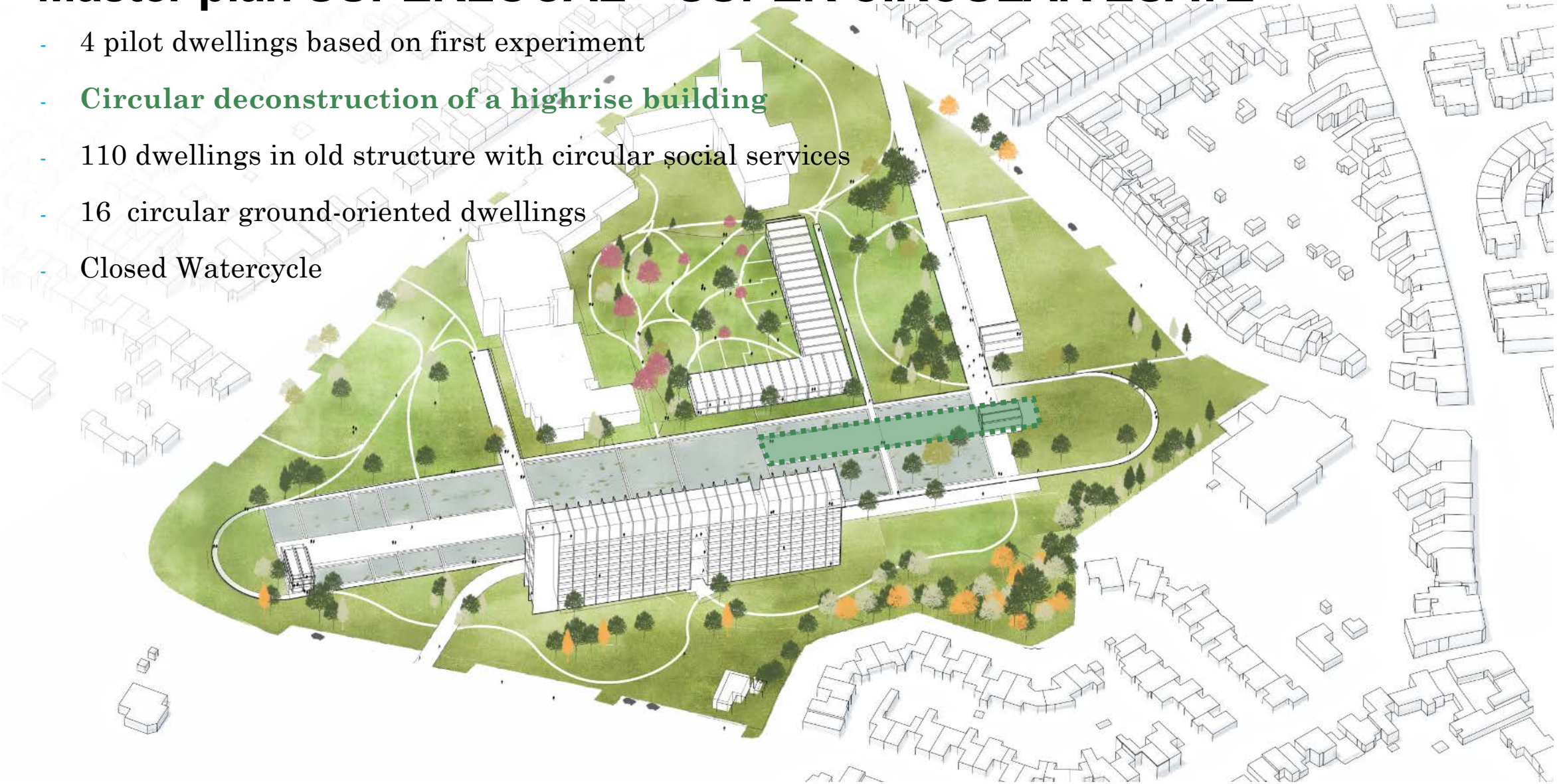

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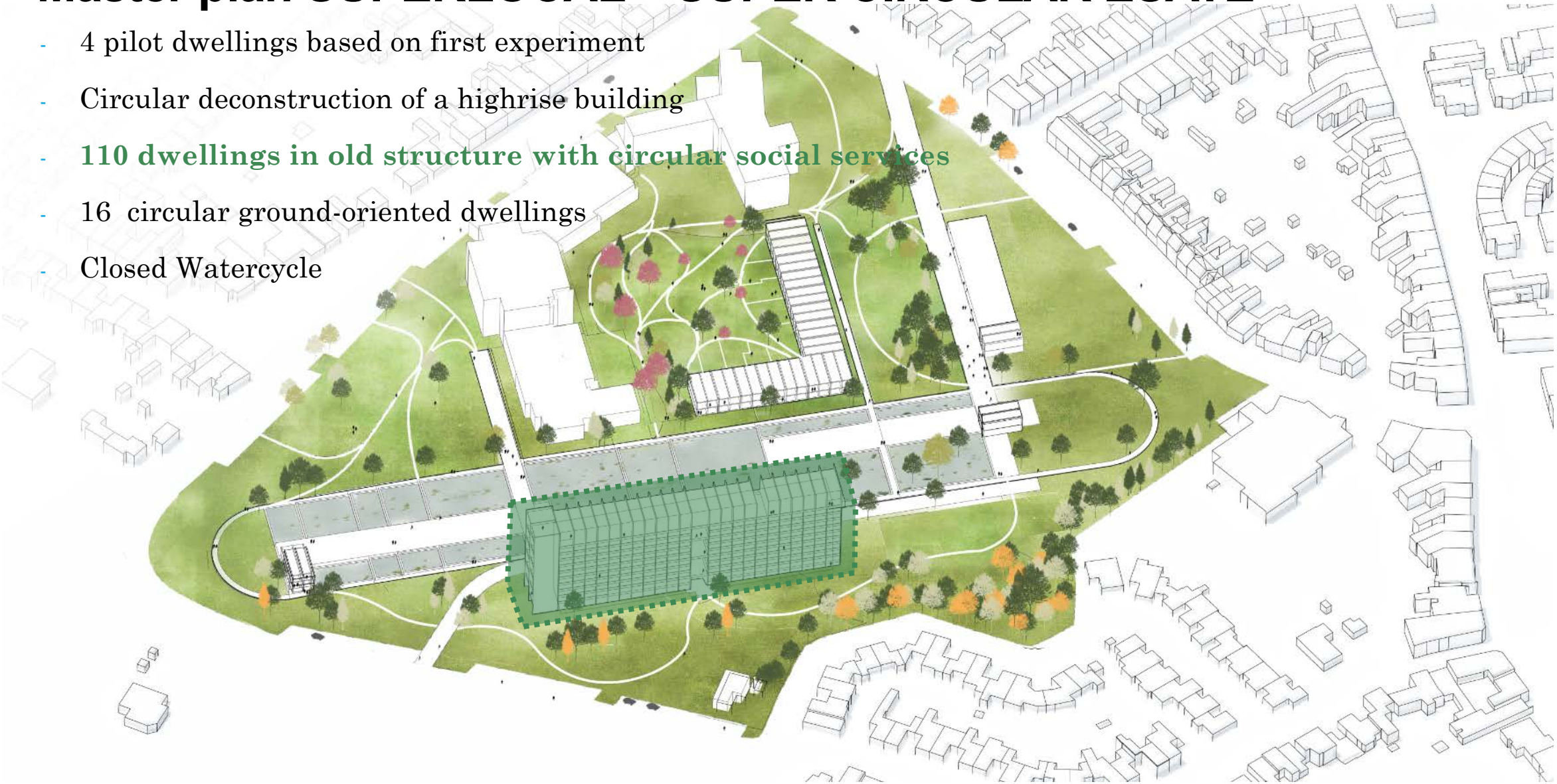

Master plan SUPERLOCAL – SUPER CIRCULAR ESATE

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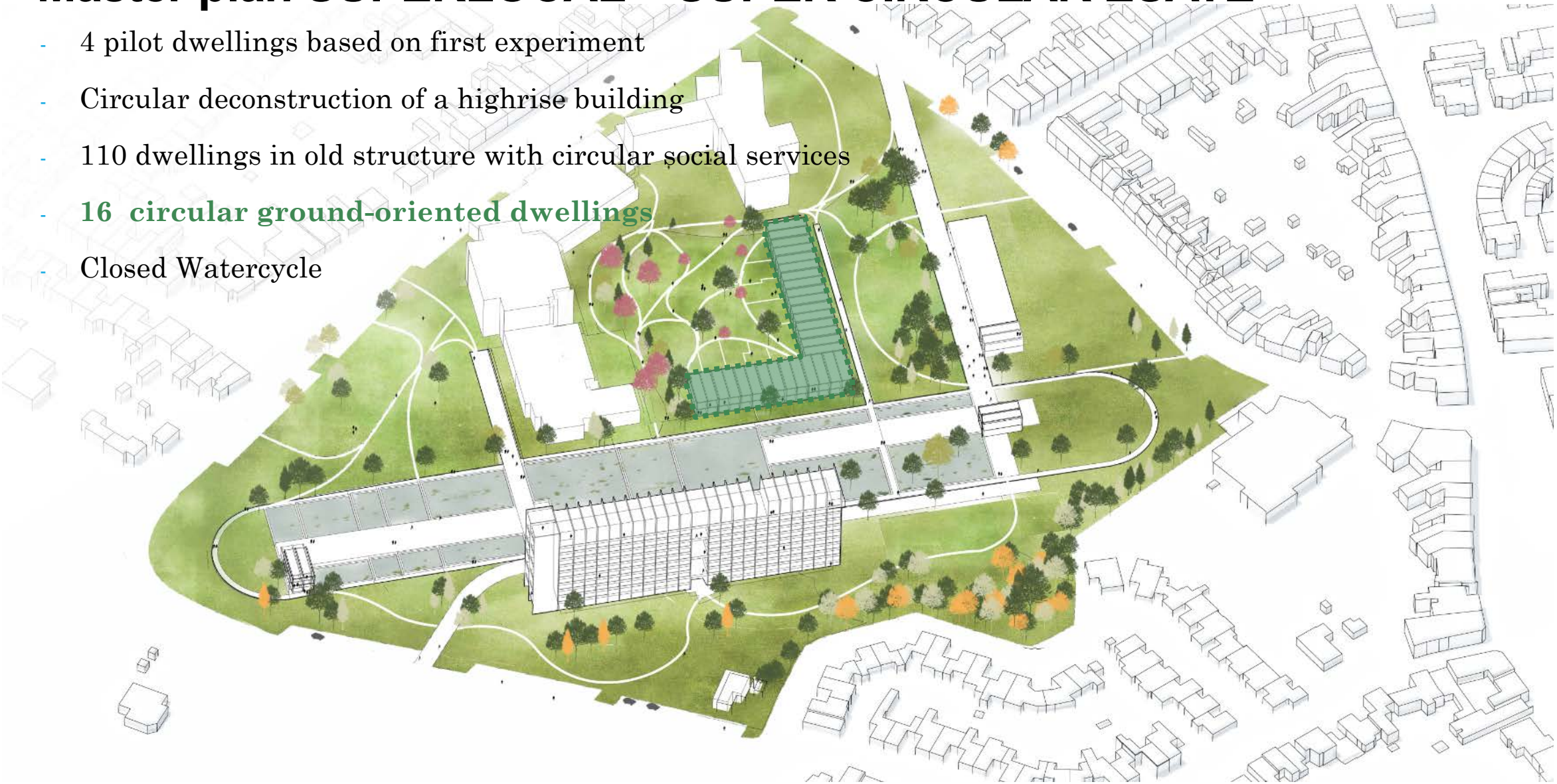

Master plan SUPERLOCAL – SUPER CIRCULAR ESATE

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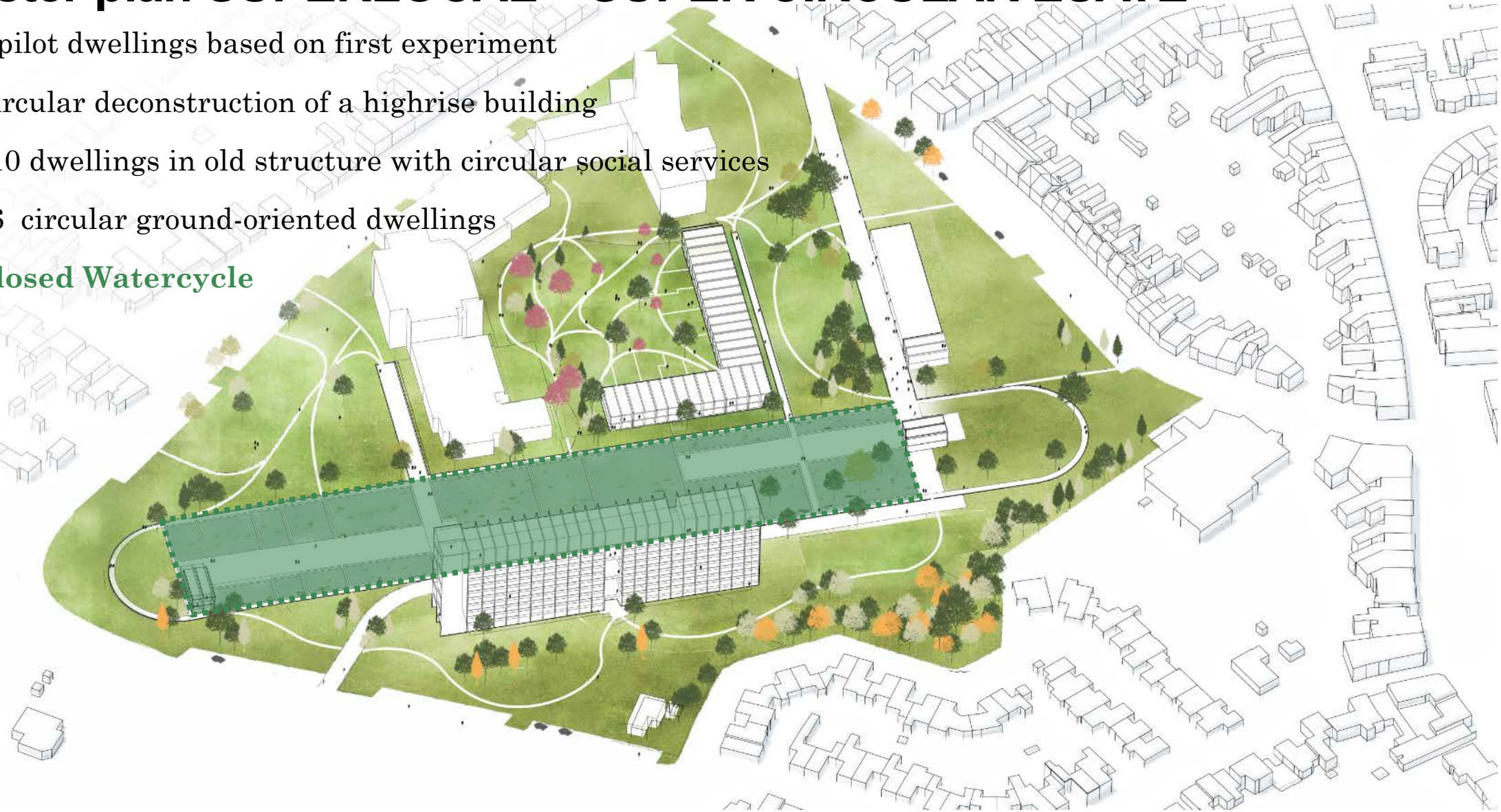
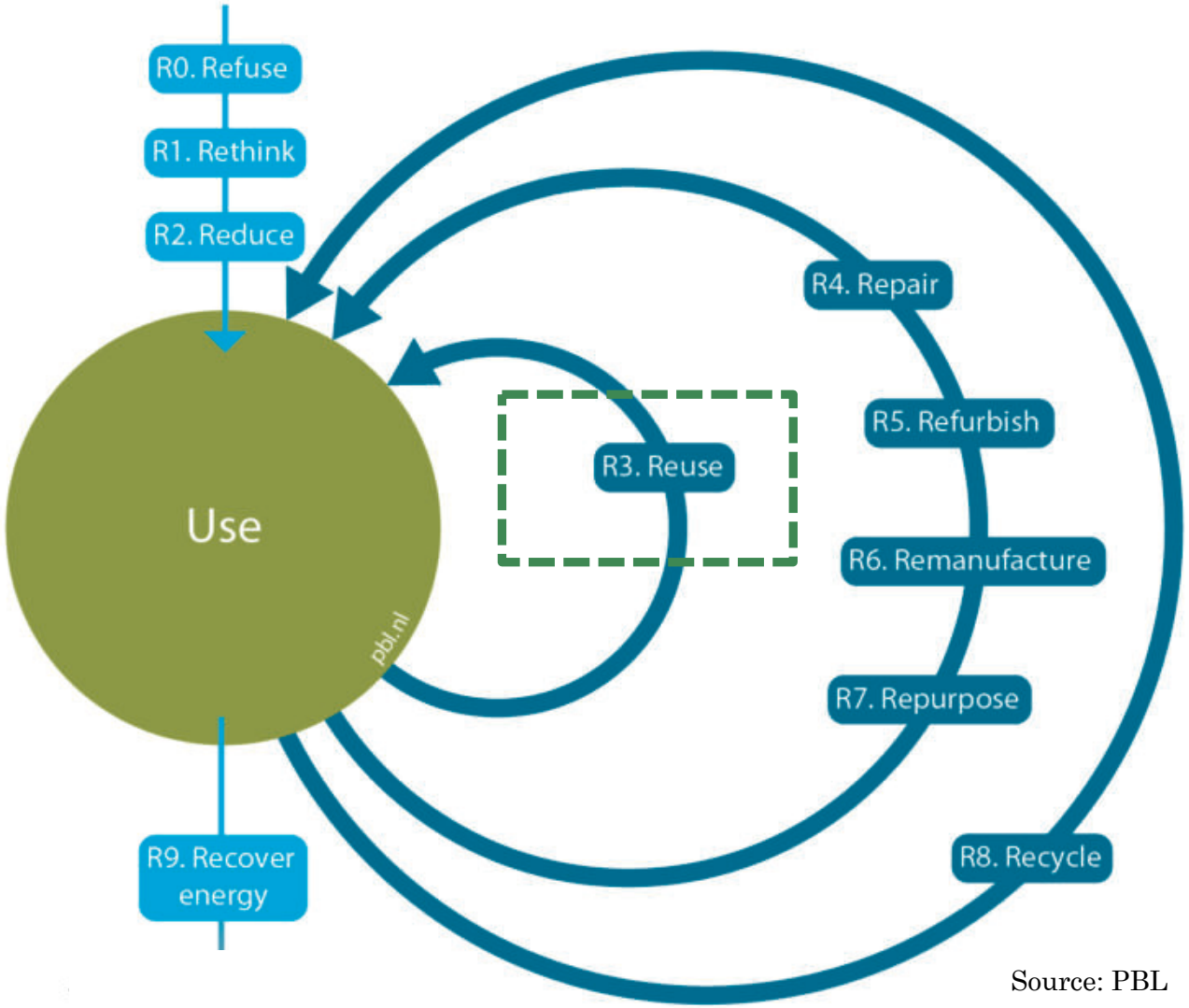


FROM FIRST CIRCULAR EXPERIMENT TO UIA PILOT DWELLINGS

FIRST EXPERIMENT

- Materials 100% from to be demolished appartments

- Test of feasibility and BC case for UIA subsidy and future circular housing



Source: PBL

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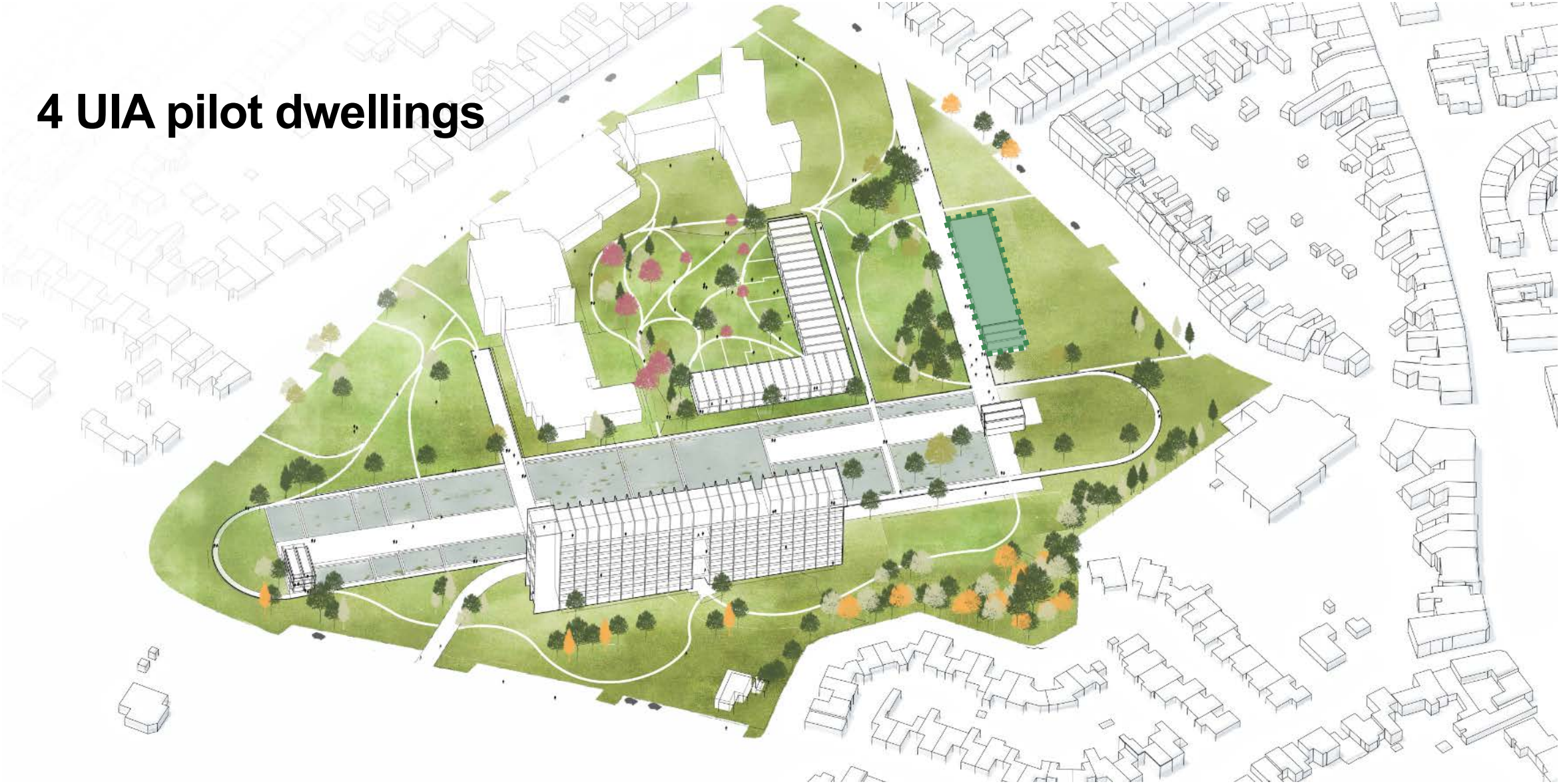
4 UIA pilot dwellings



4 UIA pilot dwellings

Translate the knowledge from the experiment to 4 inhabitable dwellings

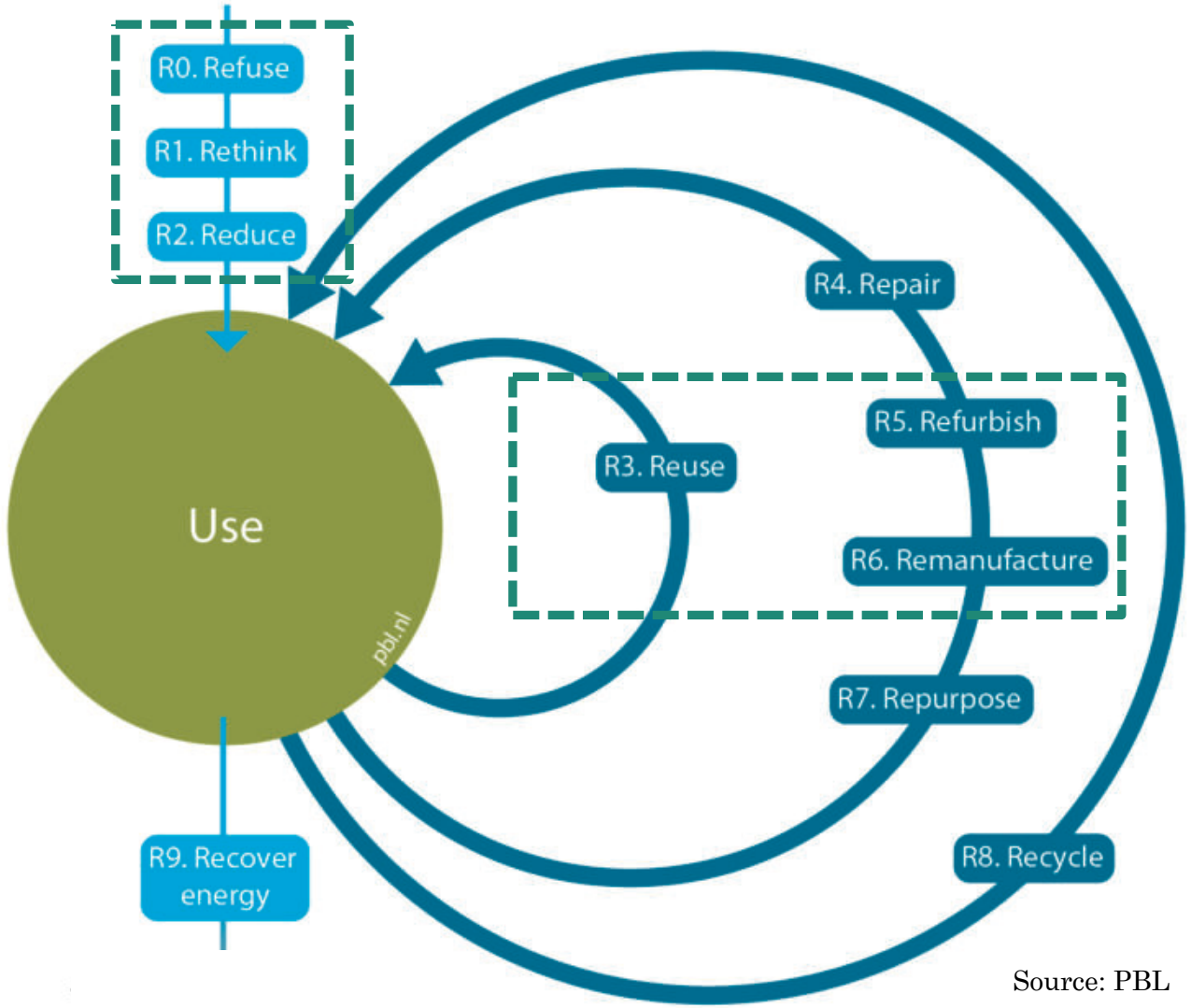
4 types of dwellings (20-80m^2) providing information for all European cities

With circular terrein layout

Goal 90% reused materials

3 grain sizes:
-Reuse of modules
-Reuse of elements
-Reuse of materials

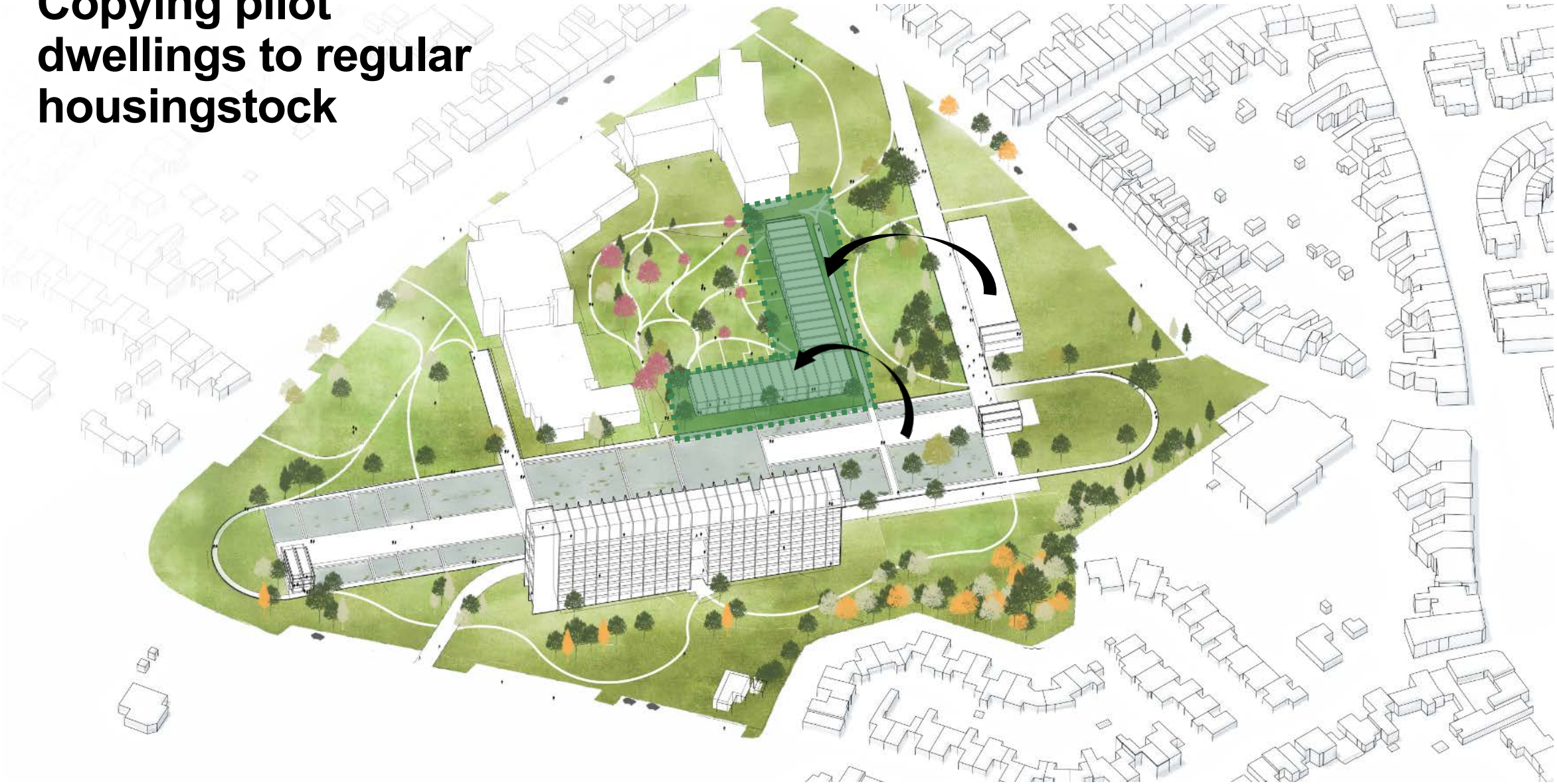
Assessment on technical, economic and social level



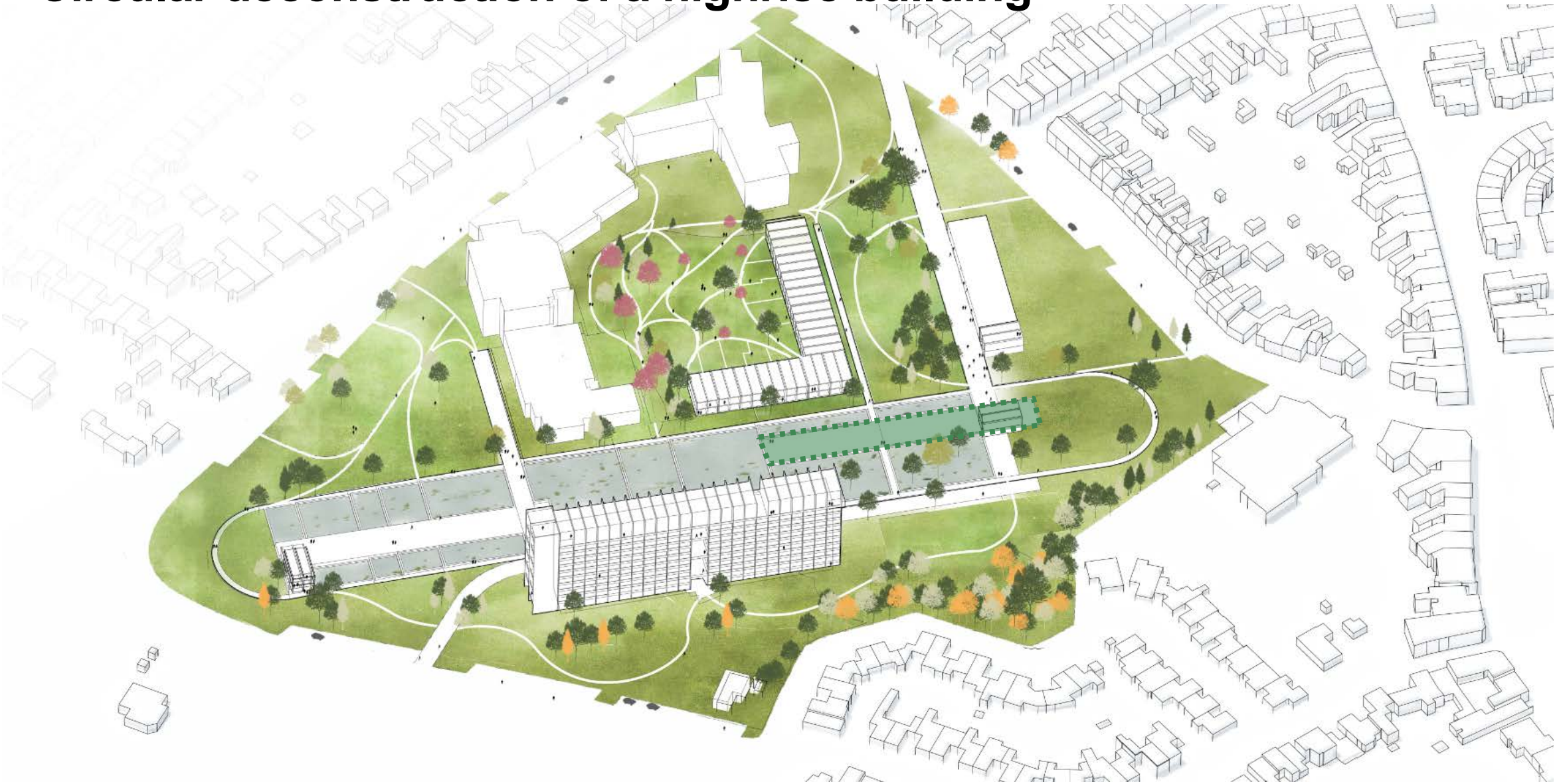
Source: PBL

SUPERLOCAL wordt ondersteund door een
Europese subsidie van Urban Innovative Actions
UIA
URBAN
INNOVATIVE
ACTIONS
EUROPEAN UNION
European Regional Development Fund

Copying pilot dwellings to regular housingstock



Circular deconstruction of a highrise building



Circular deconstruction of a highrise building

From (worthless?) highrise building to materialstock for 4 UIA dwellings, regular housingstock and urban planning.

Established with an IT track and trace protocol (own development) and conducted throug harvesting of at least 24 materialflows

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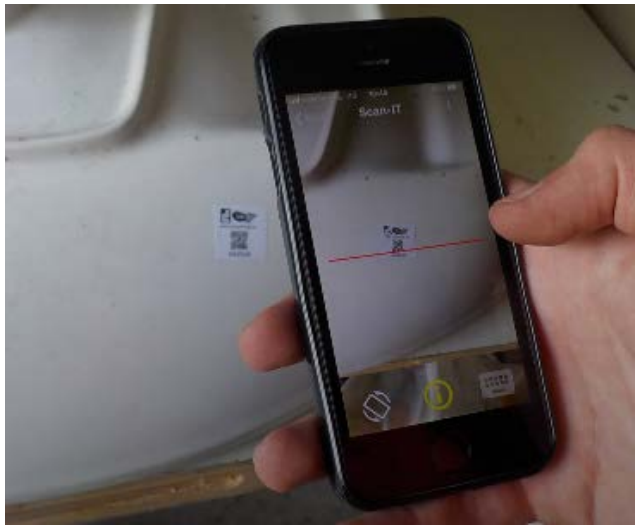
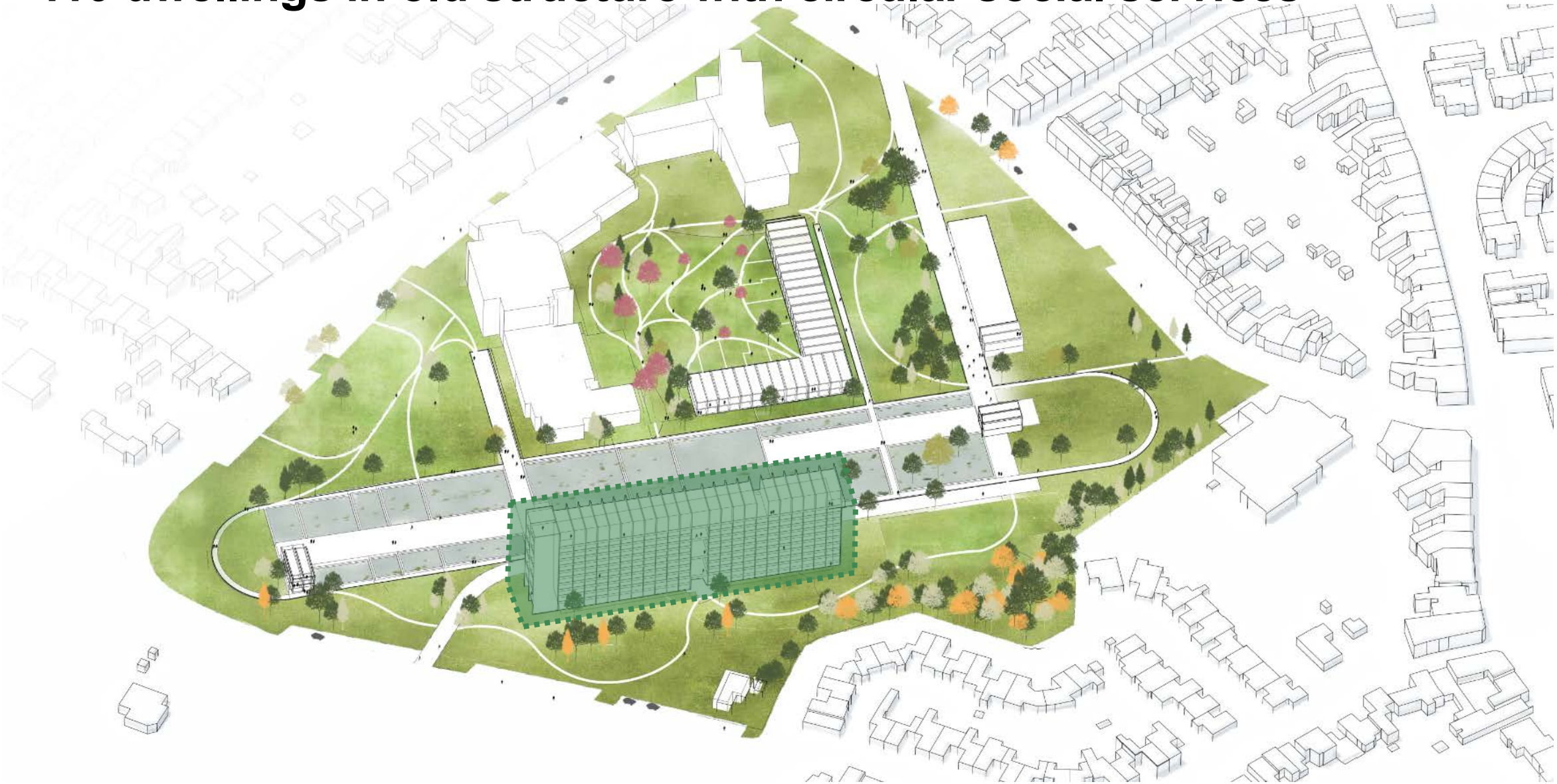
UIA02-240

WP4 (4.2.1) TRACKING AND TRACING PROTOCOL

JONKERBERGSTRAAT 2 - 200 KERKRADE



110 dwellings in old structure with circular social services



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Renovation of highrise building

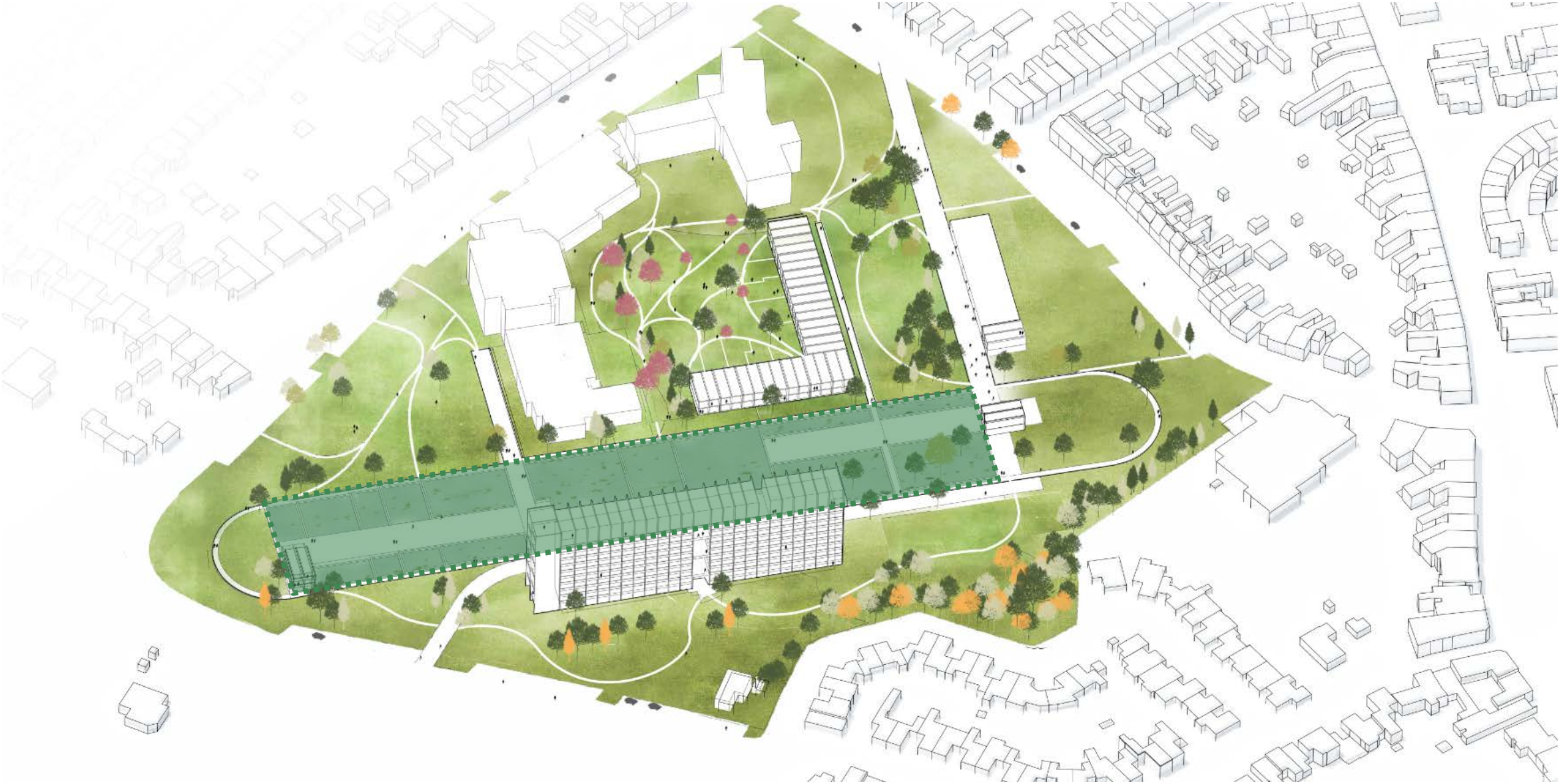
Invitation former inhabitants to come back

Provide space for circular and social cohesion

Mobilty centrum

Together with Neigbourhood steering platform

Closed Watercycle



WATERSCHAPSBEDRIJF LIMBURG

Gemeente Kerkrade

heem wonen

wml Limburgs drinkwater

In collaboration with

EUROPEAN UNION
European Regional Development Fund

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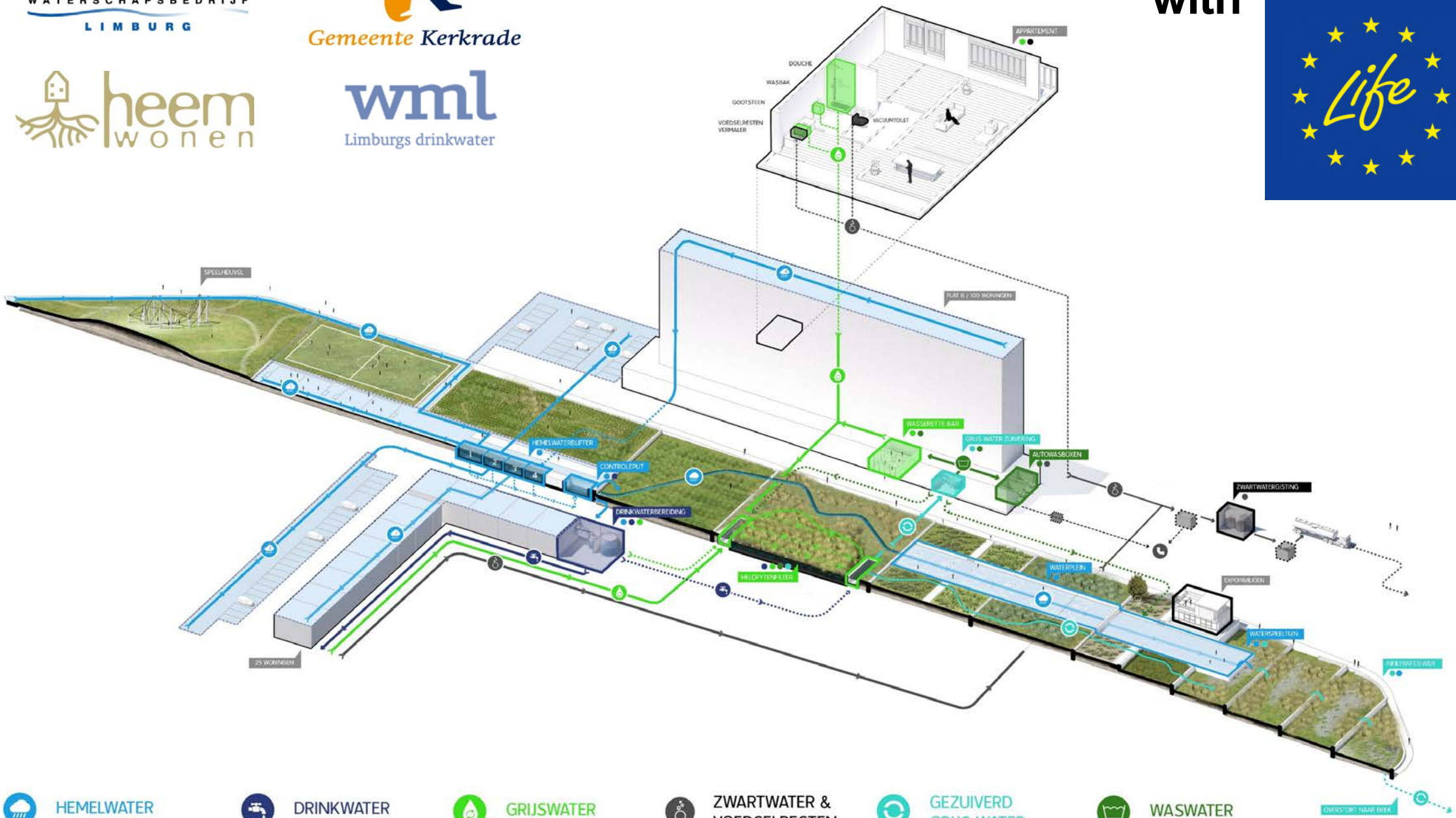

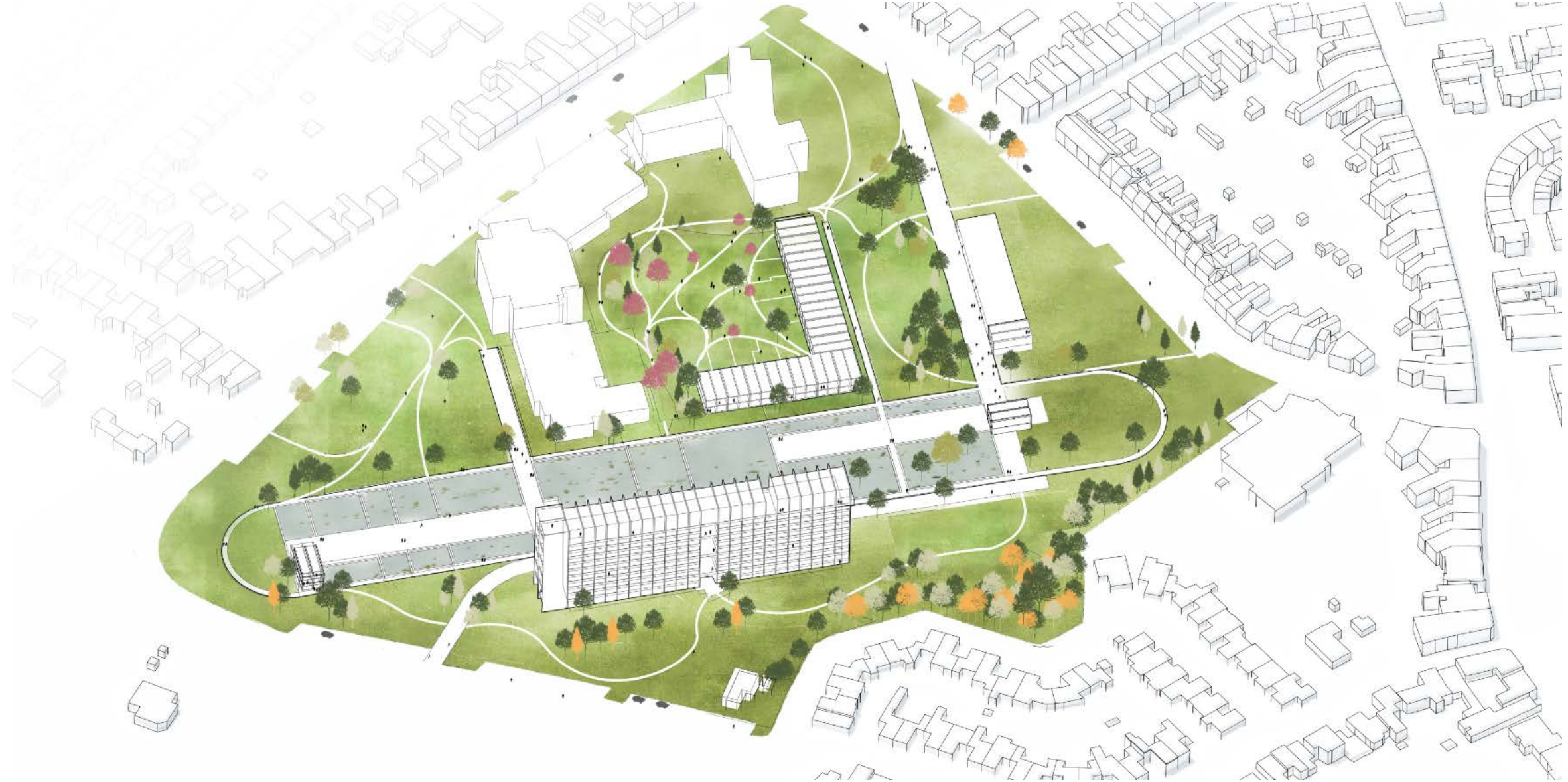

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Elma Durmisevic GTB Lab / Utwente, NL

GTB Lab development

parkstad limburg stadsregio
Rabobank
iba parkstad
UIA
gtb lab
RESOURCE HOUSE
Co-funded by the European Union
Gemeente Kerkrade
provincie limburg
BAMB
EPEA Nederland
bre
IBM
RONNEBY KOMMUN
vito
UNIVERSITEIT TWENTE.
Zuyd Hogeschool
ZUYD
Vrije Universiteit Brussel
Sundahus
TUM
Aurubis
bam
DREES & SOMMER

Laboratory for Green Transformable Buildings

Partners

parkstad limburg
Rabobank
iba parkstad
VD KREEKE
woon boulevard heerlen inspireert
Volta Limburg
Gemeente Heerlen
gtb lab

rodeca
Bluedec®
ClimaLeve
De Groot Vroomshoop Groep
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mooiz
kloeckner metals ODS Nederland
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abt
TU Delft
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bam
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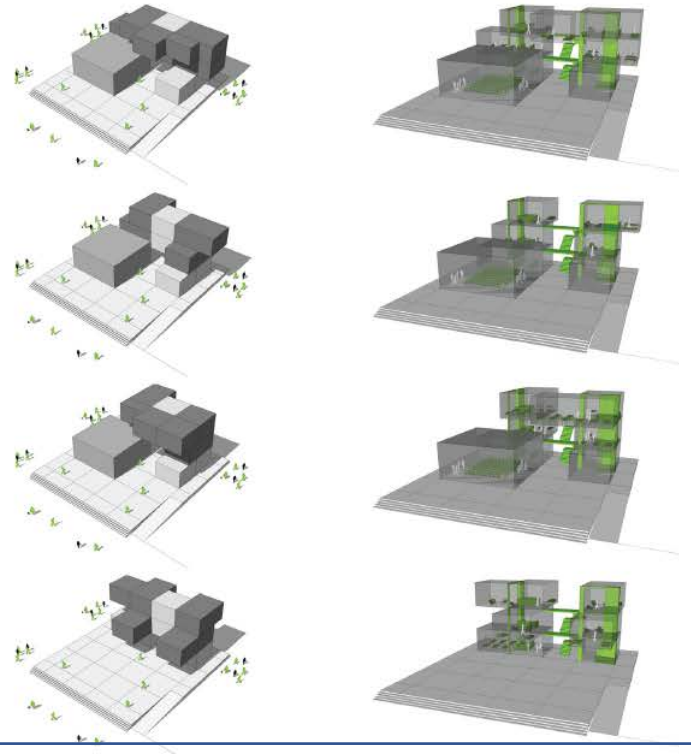
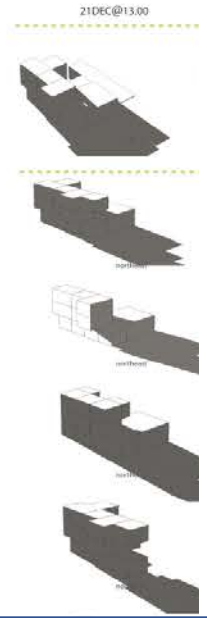
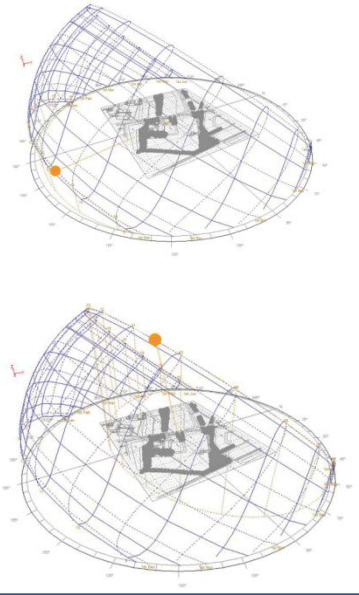
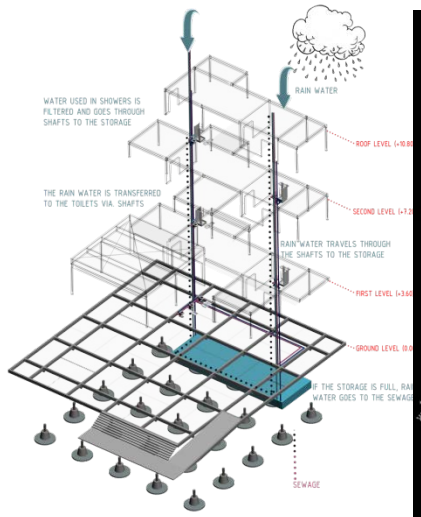
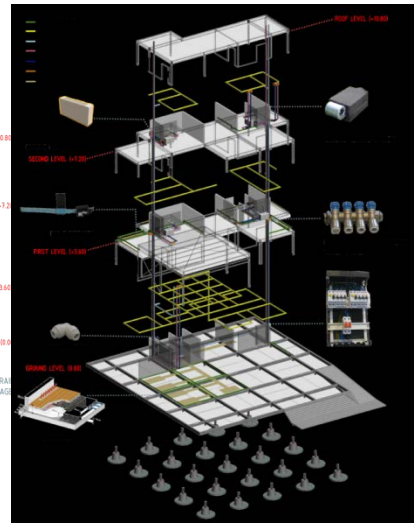
Green Transformable BuildingLab

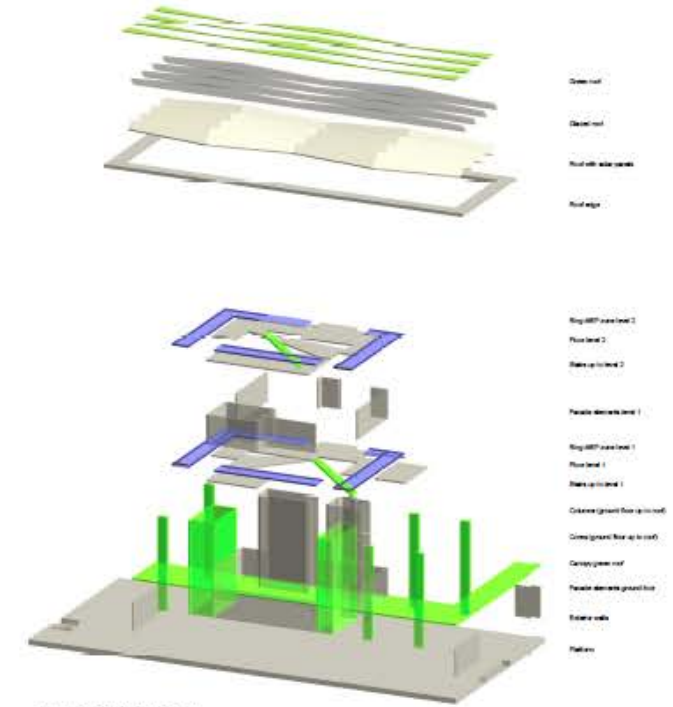




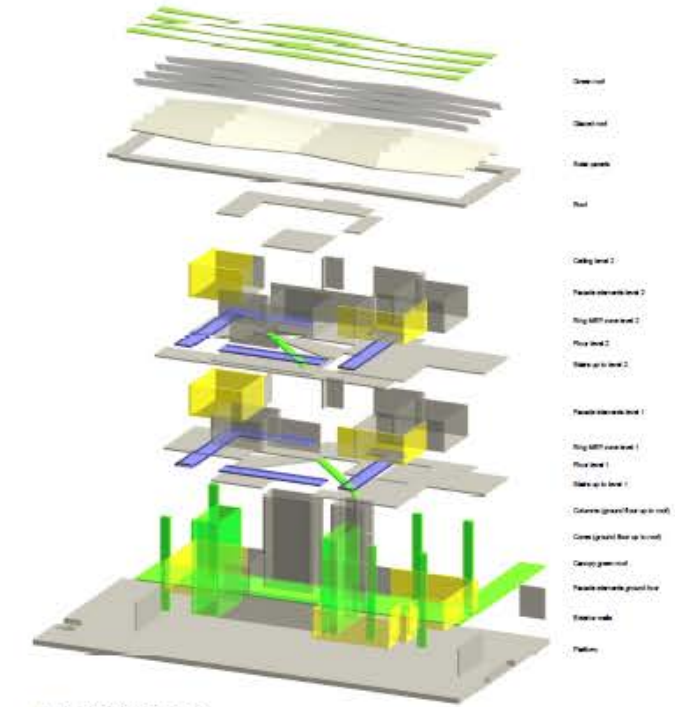




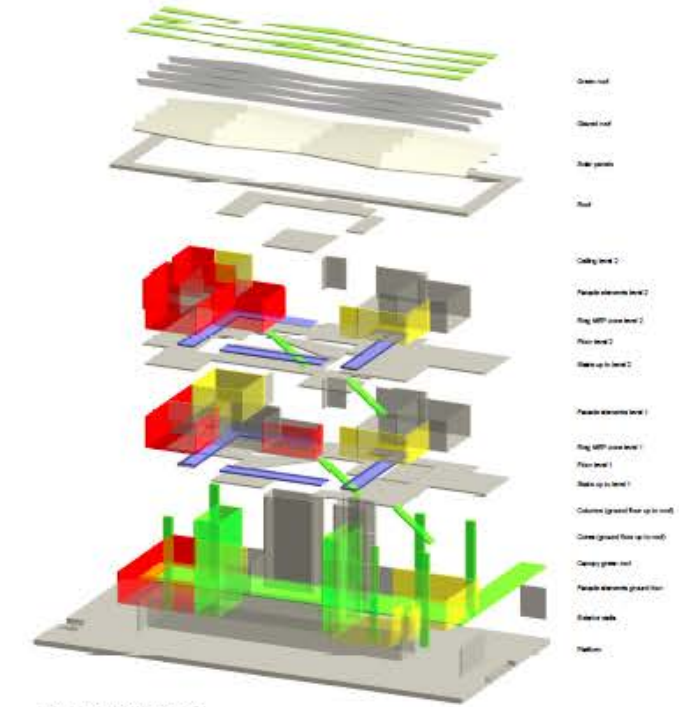




1 Exploded view phase 0



2 Exploded view phase 1



3 Exploded view phase 2

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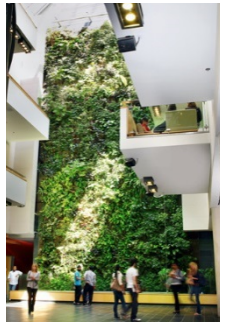
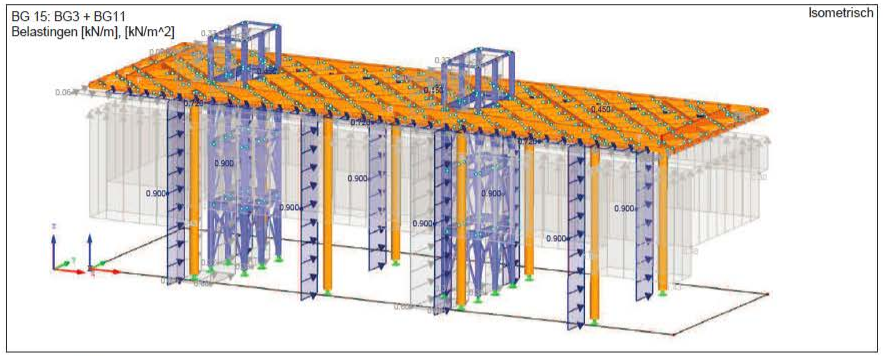
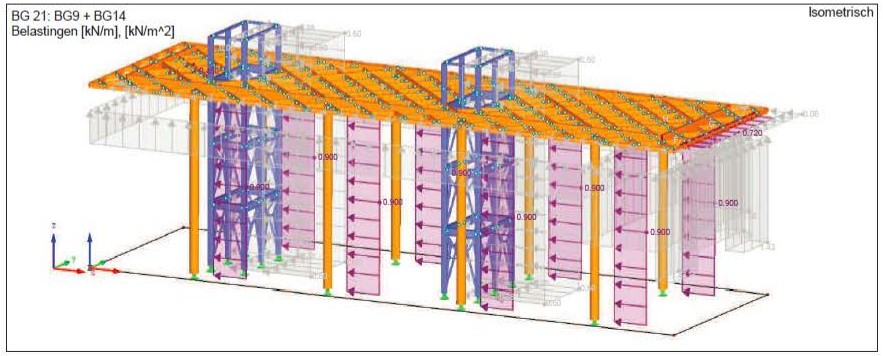
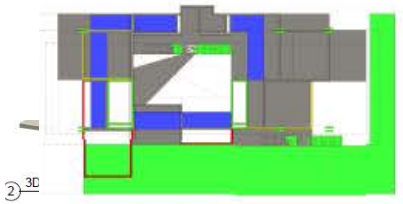
The core

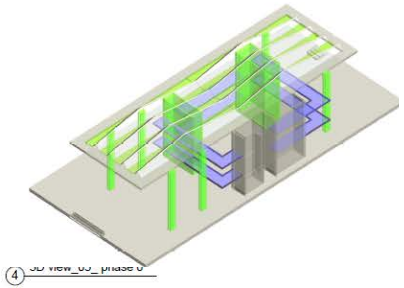


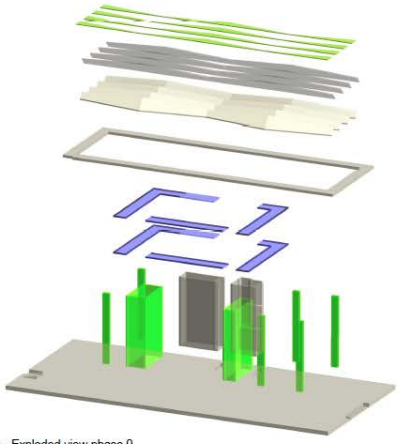


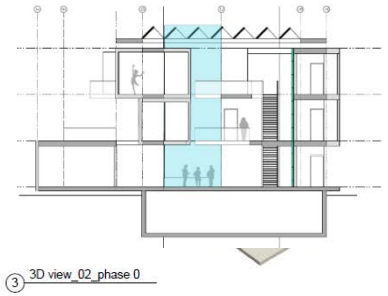
Figuur 5, Wind dak 0.75 kN/m²(basis ⊥)



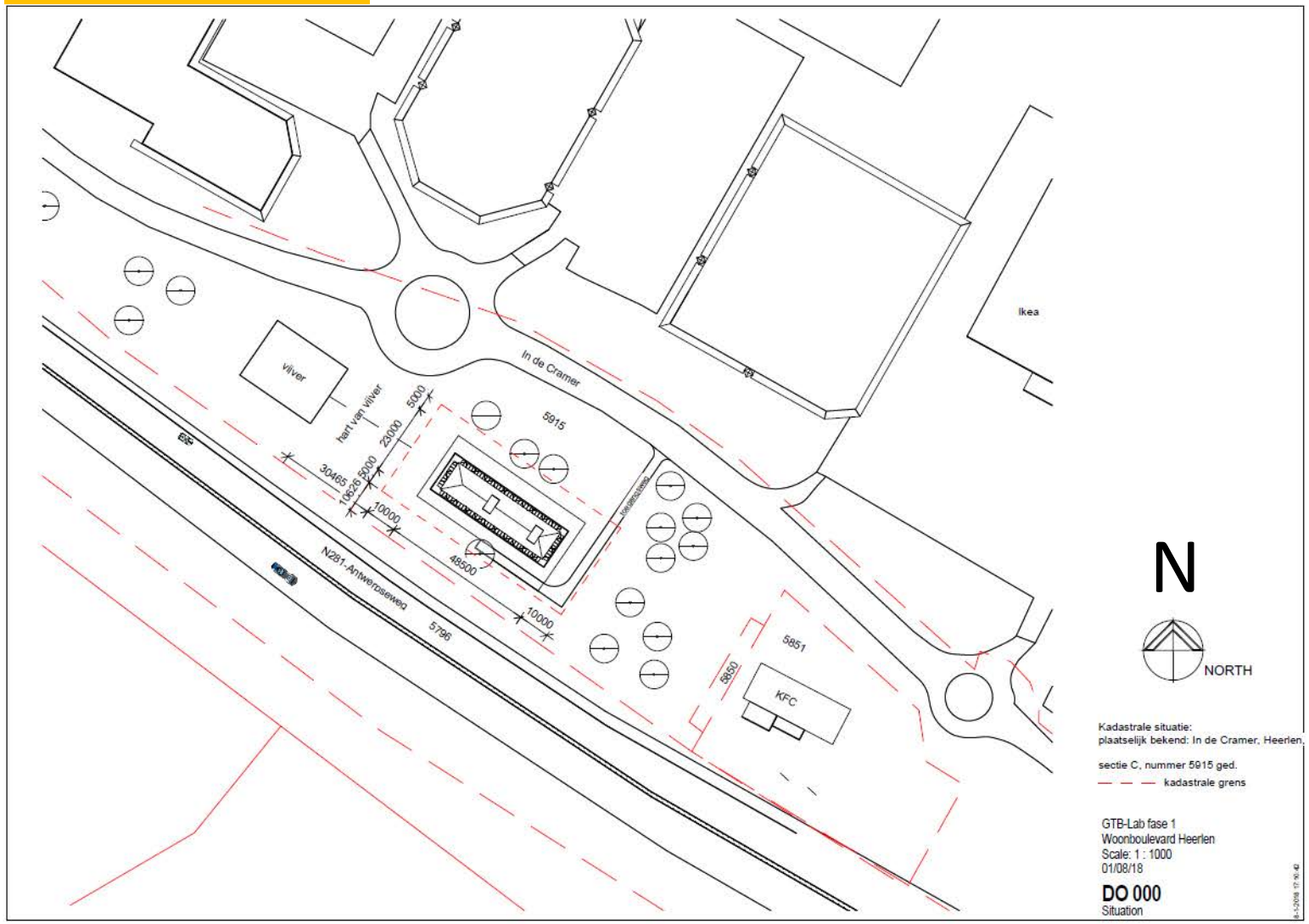




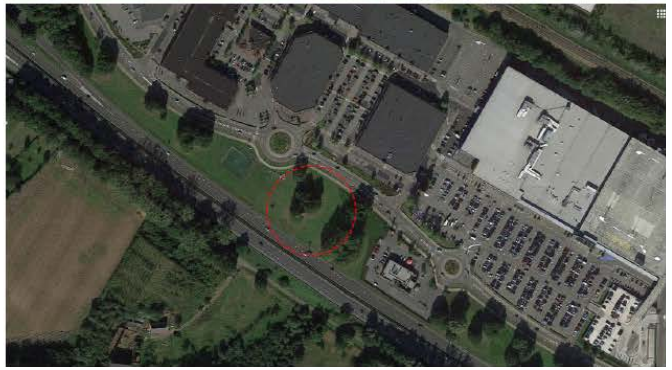




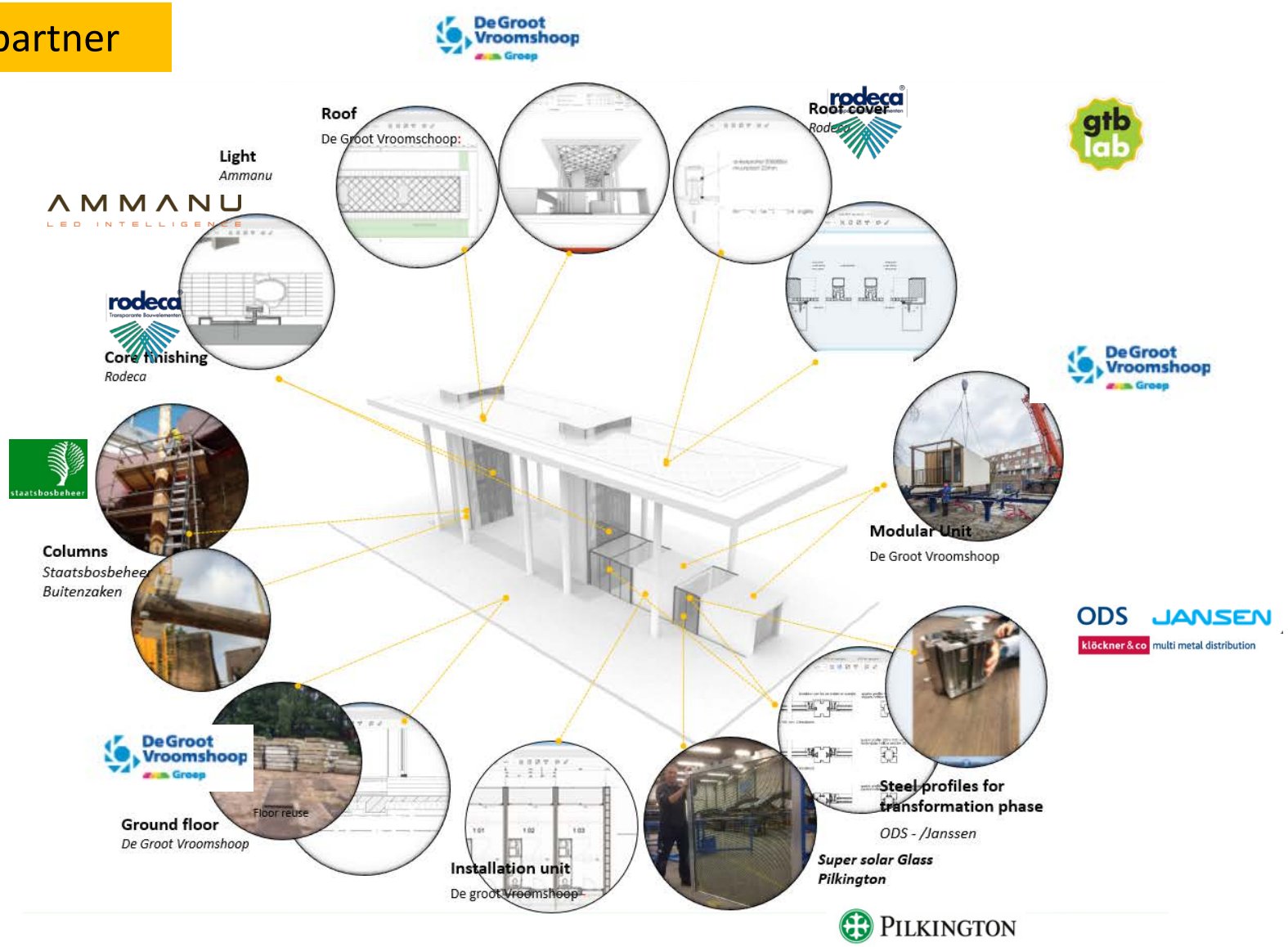
Situation



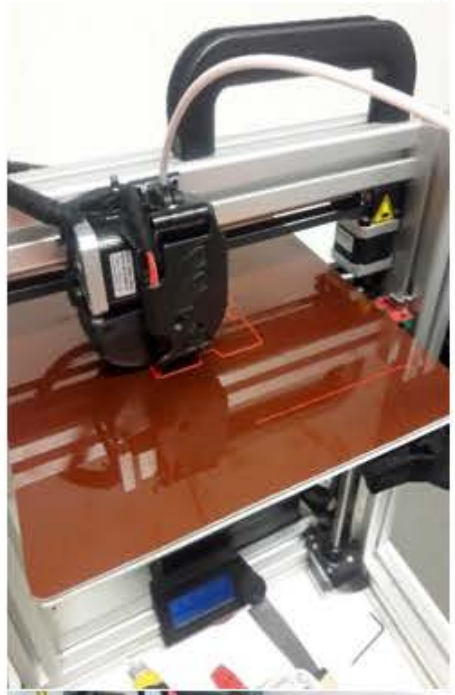
Ikea
In de Cramer
vijver
hart van vijver
5915
5000
23000
5000
30465
10626
10000
48500
10000
N281-Antwerpseweg
5796
5851
5850
KFC
N
NORTH
Kadastrale situatie:
plaatselijk bekend: In de Cramer, Heerlen,
sectie C, nummer 5915 ged.
kadastrale grens
GTB-Lab fase 1
Woonboulevard Heerlen
Scale: 1 : 1000
01/08/18
DO 000
Situation

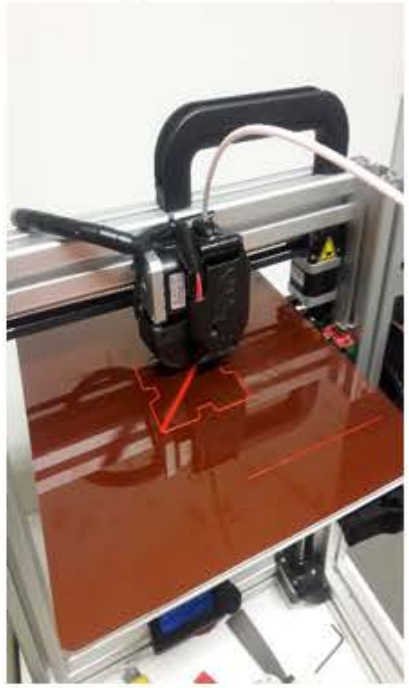


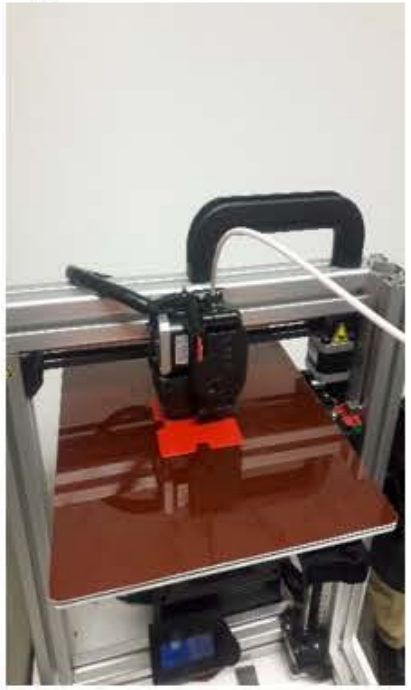
Delivery of parts per partner

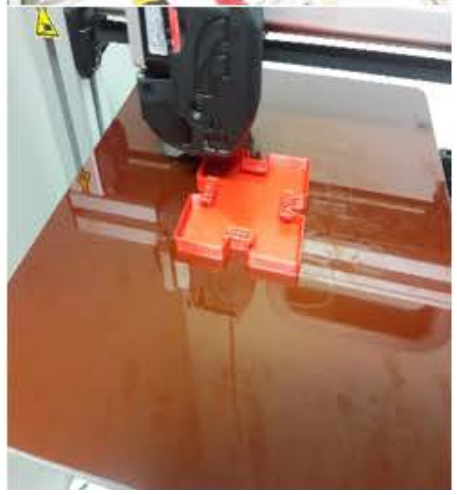


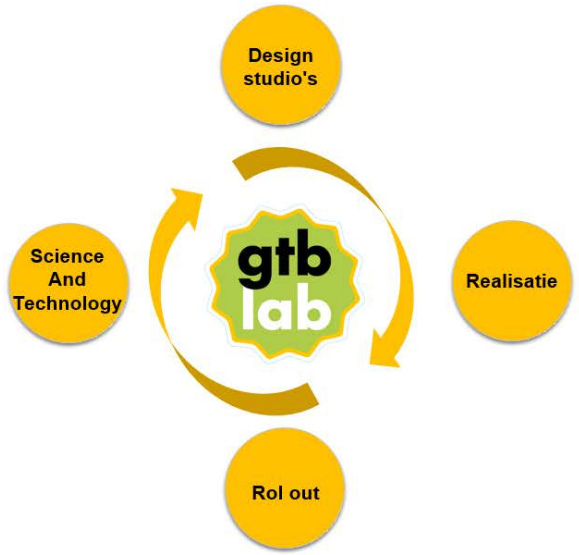
mood
Wolterinck
De Groot Vroomshoop Groep
abt
TU Delft
4D architects
TU/e Technische Universiteit Eindhoven University of Technology

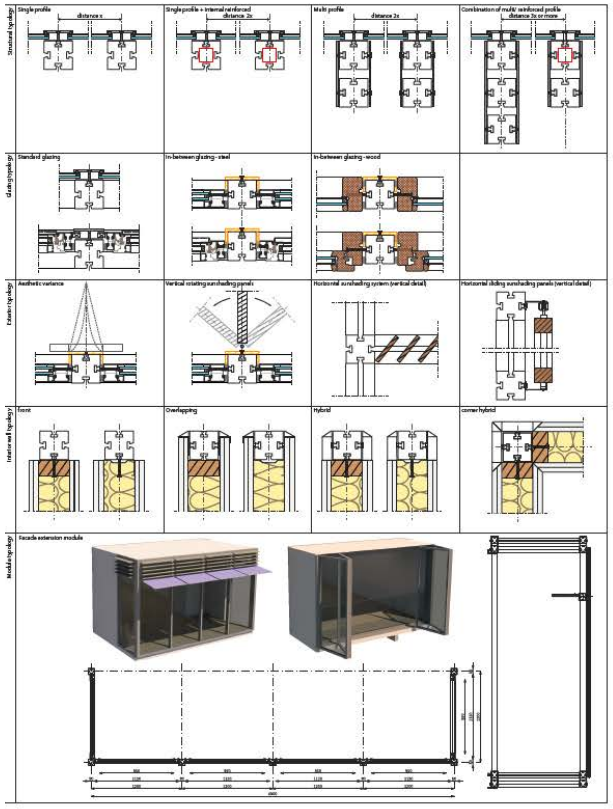


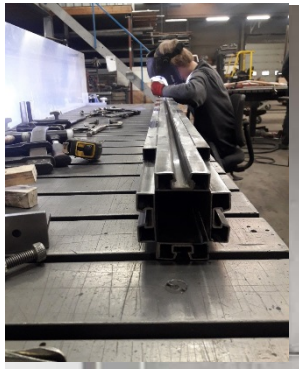






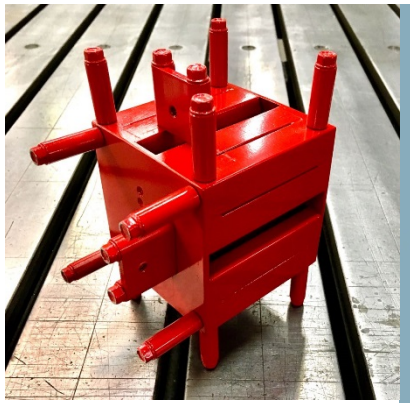

Design studio's
Science And Technology
gtb lab
Realisatie
Rol out

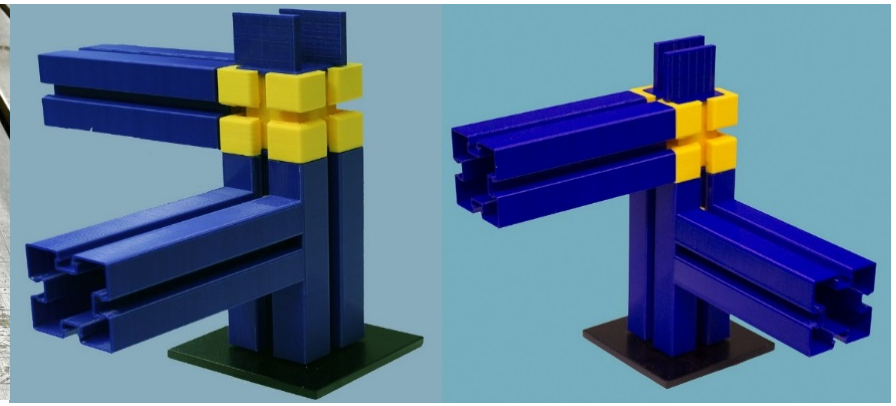




Prototype

JANSEN
ODS
klöckner & co multi metal distribution
kloeckner metals
ODS Nederland





Laboratory for Green Transformable Buildings

TU ACHEN
TU VIENNA
TU PARIS
KENT UNIVERITY
BRE
VITO
RUSSLE ENVIRONMENT
UMINHO
RONNEBY
MOSTAR
SUNDERHUS
TUM
TU HANOVER
EPEA HAMBURG
EPEA EINDHOVEN
UM
TU DELFT
TU EINHOVEN
U TWENTE

USA Florida University
Israel Eco Design Jerusalem
Egypt Cairo University
Turkey Istanbul Technical University
Japan Kobajashi office

Ron Jacobs, ODS NL

GTB Lab development

Co-funded by the European Union

GTB Lab Heerlen

Ron Jacobs

Salesmanager Kloeckner Metals ODS – Dak- & Geveltechniek

KMMA Tervuren (BE) by Stéphane Beel Architects

Steel Façade as a Service

Ron Jacobs
Salesmanager Dak- & Geveltechniek

GTB Lab October 29th 2018

kloeckner metals
ODS Nederland

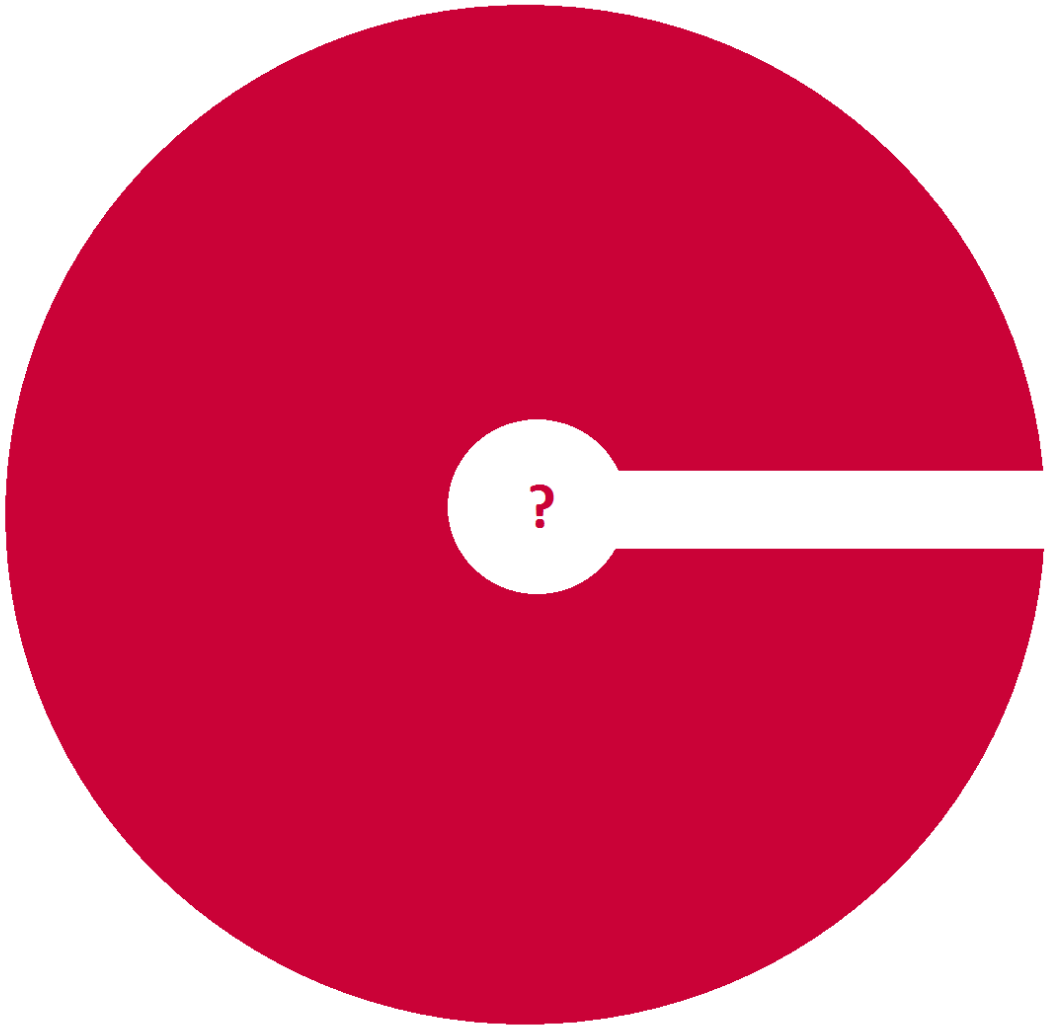
Mondial Movers Alblasserdam by EGM Architects for Wellsun

Steel Façade as a Service

Ron Jacobs
Salesmanager Dak- & Geveltechniek

GTB Lab October 29th 2018

kloeckner metals
ODS Nederland



Steel Façade as a Service

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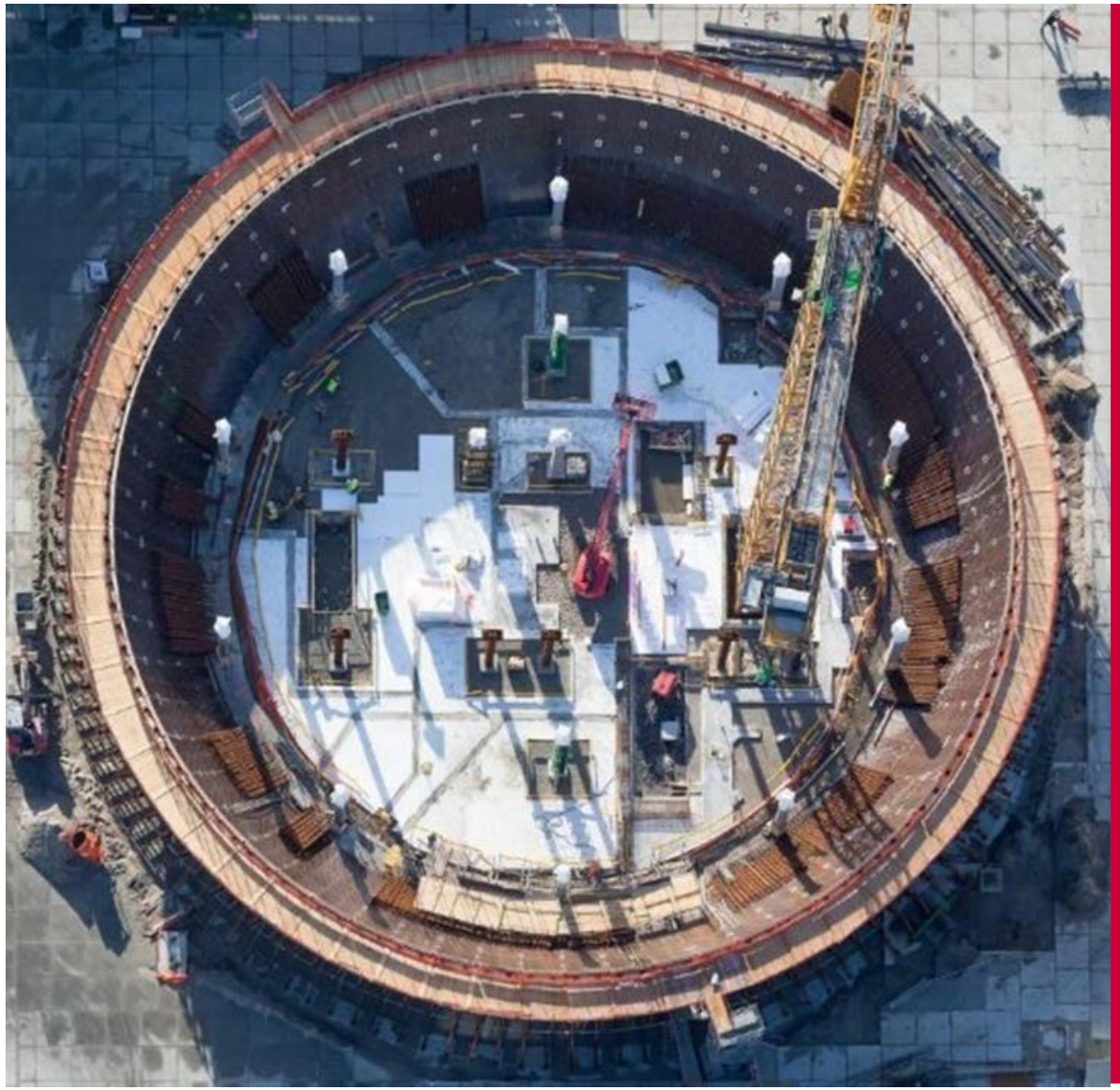
GTB Lab October 29th 2018

kloeckner metals
ODS Nederland



Art Depot Museum Boijmans van Beuningen Rotterdam by MVRDV – Photo BAM

Quick facts:

700 buying customers for Façades NL&BE

(Kloeckner group distribution and service network supplies 120.000 customers)

2500 prescribing customers

300 Running projects

Digital tools being developed

BIM – Materials Passports – Façade Identification system – Harvest map

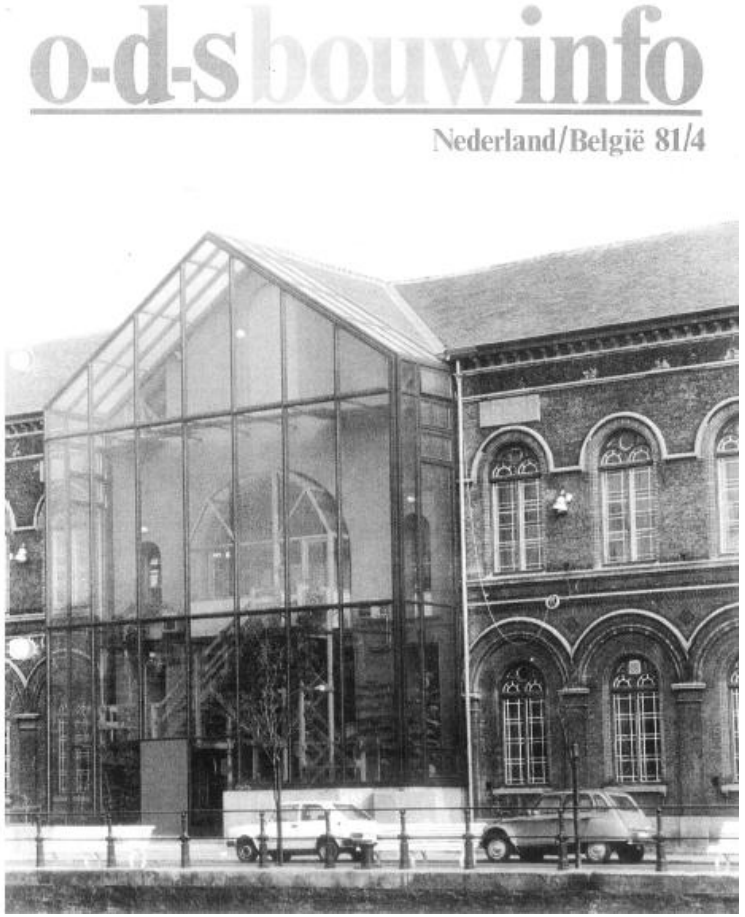
GTB Lab October 29th 2018

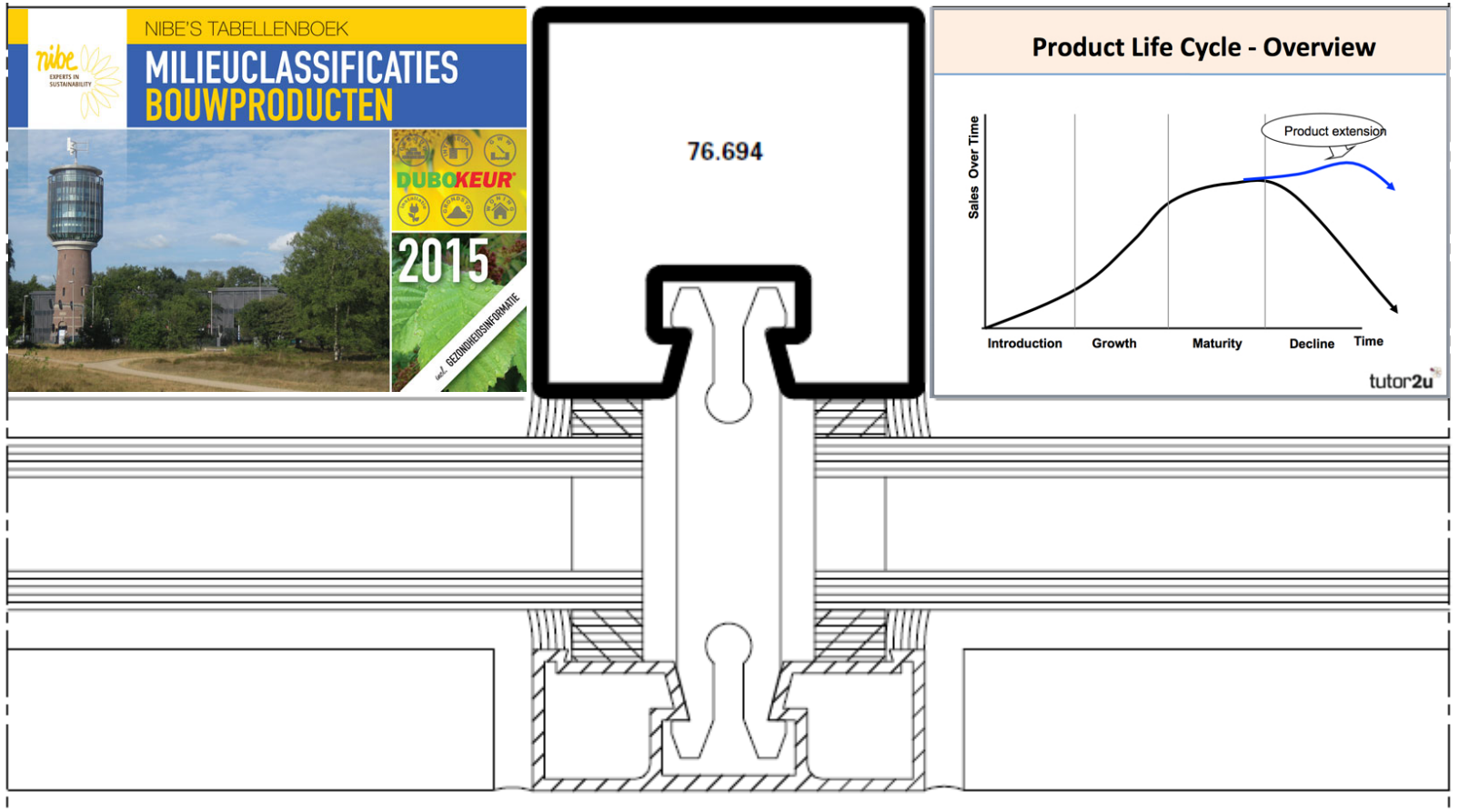
Steel Façade as a Service

KMMA Tervuren (BE) by Stéphane Beel Architects

Herman Teirlinckgebouw in Brussels (BE) by Neutelings Riedijk Architects

“LCA“ vs Product Life Cycle



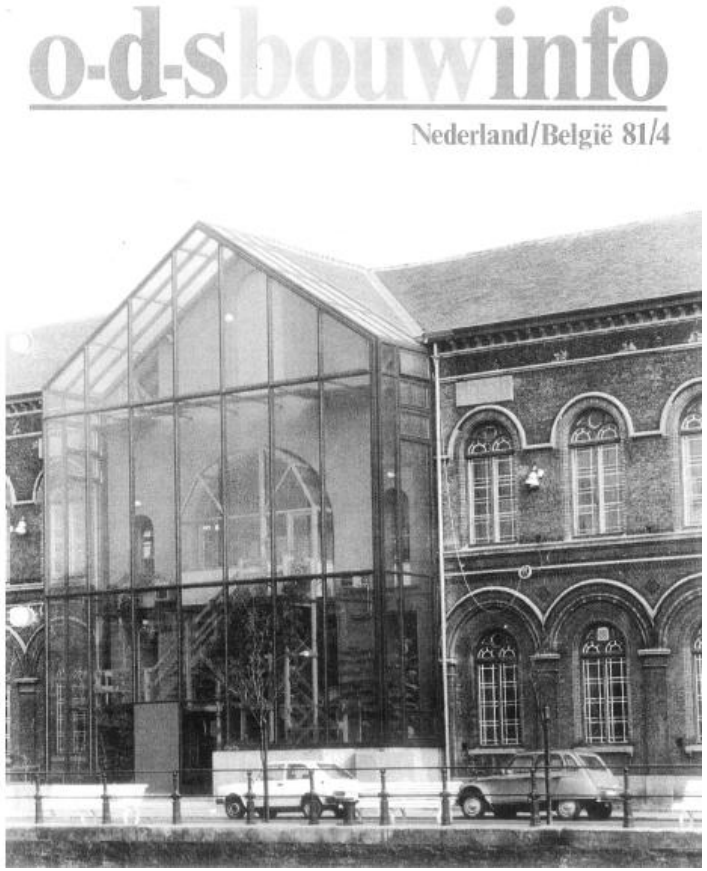


Jansen VISS NV 1969

CIRCULAR BUSINESS MODELS

This Van is 60

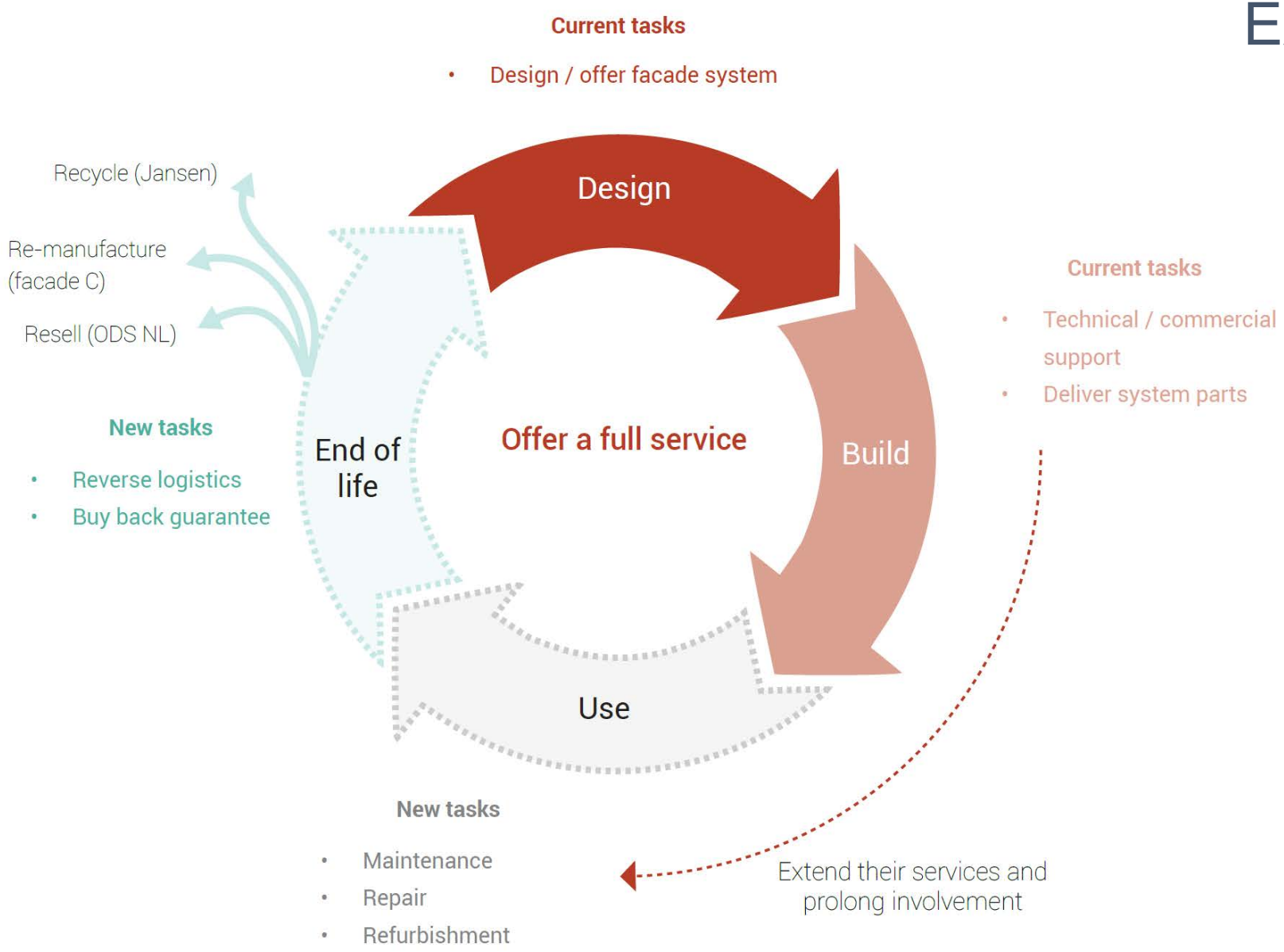
It's unusual to drive the vehicle you were conceived in.



This façade is 40 and was upgraded in 2014

CLASSIC LONG LIFE MODEL

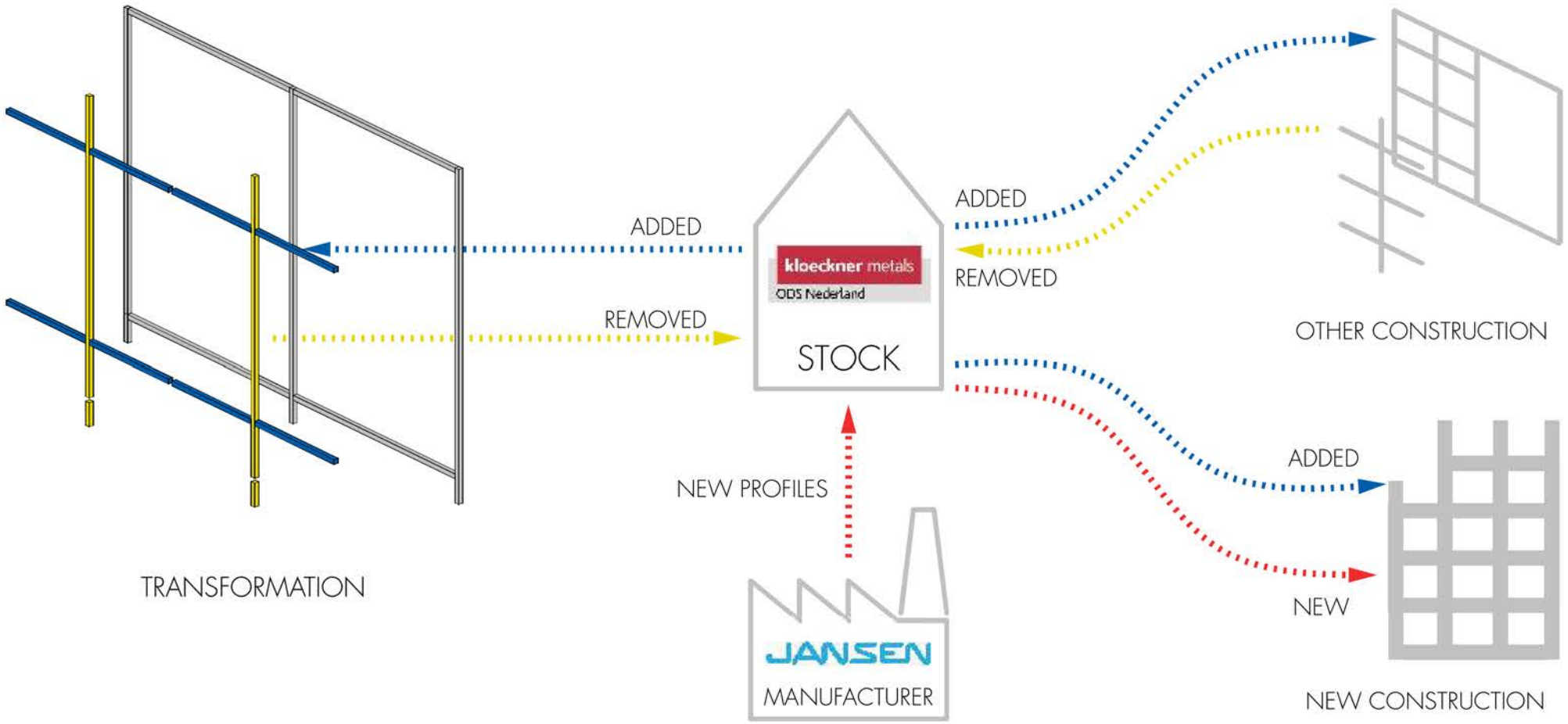
Extend service level



Leising, R. (2017). Graduation Report. Delft University of Technology

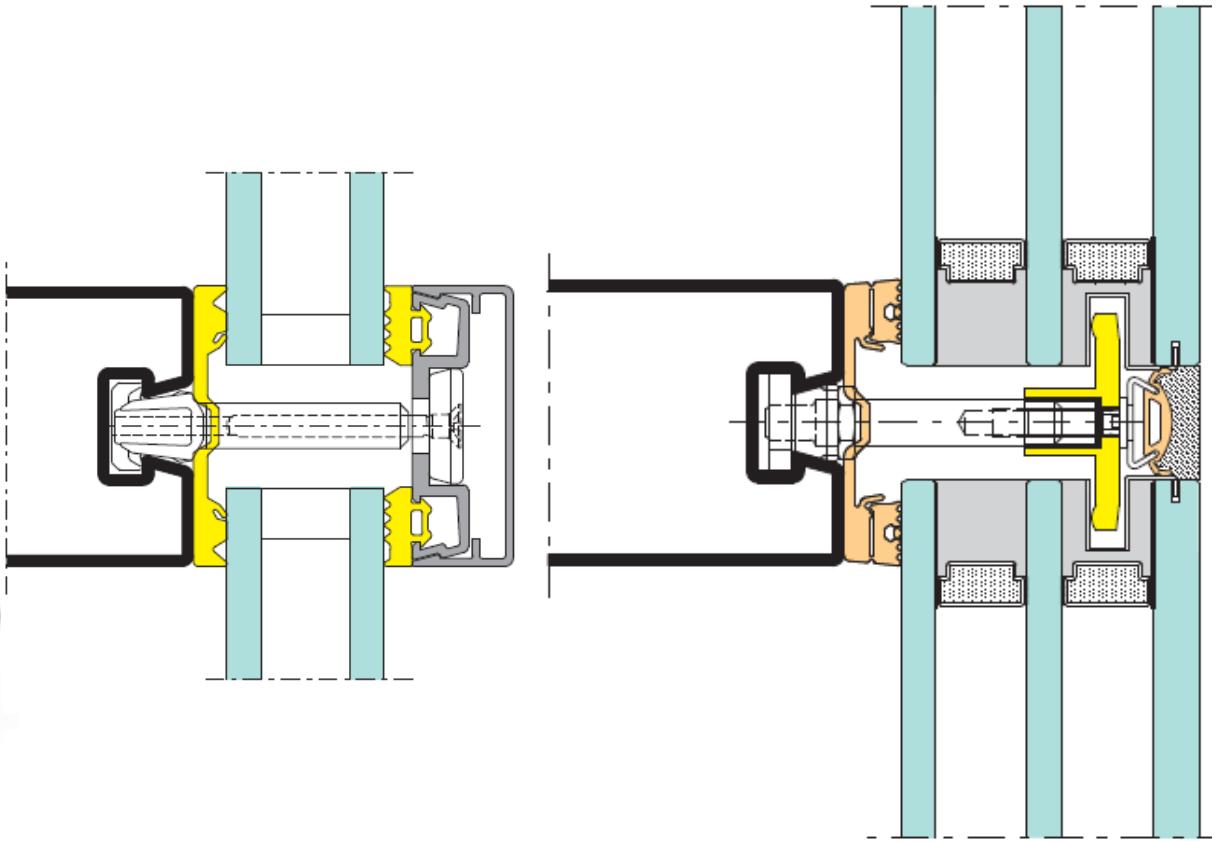
Reverse Logistics

"When a building becomes a material bank, building itself will become a logistic process" – Thomas Rau



Vipat, A. (2017). Graduation Report. Delft University of Technology

CIRCULAR BUSINESS MODELS



Reversible Design

BAMB
BUILDINGS AS MATERIAL BANKS

JANSEN by ods