

The Spirit of a Biophilic Shopping Mall

Biophilic Design in Post-war Shopping Mall while enhancing the value and the spirit of place



AR3AH105 Graduation Studio adapting 20th Century Heritage
MSc Architecture, Delft University of Technology
Roos Bolleboom
4809076

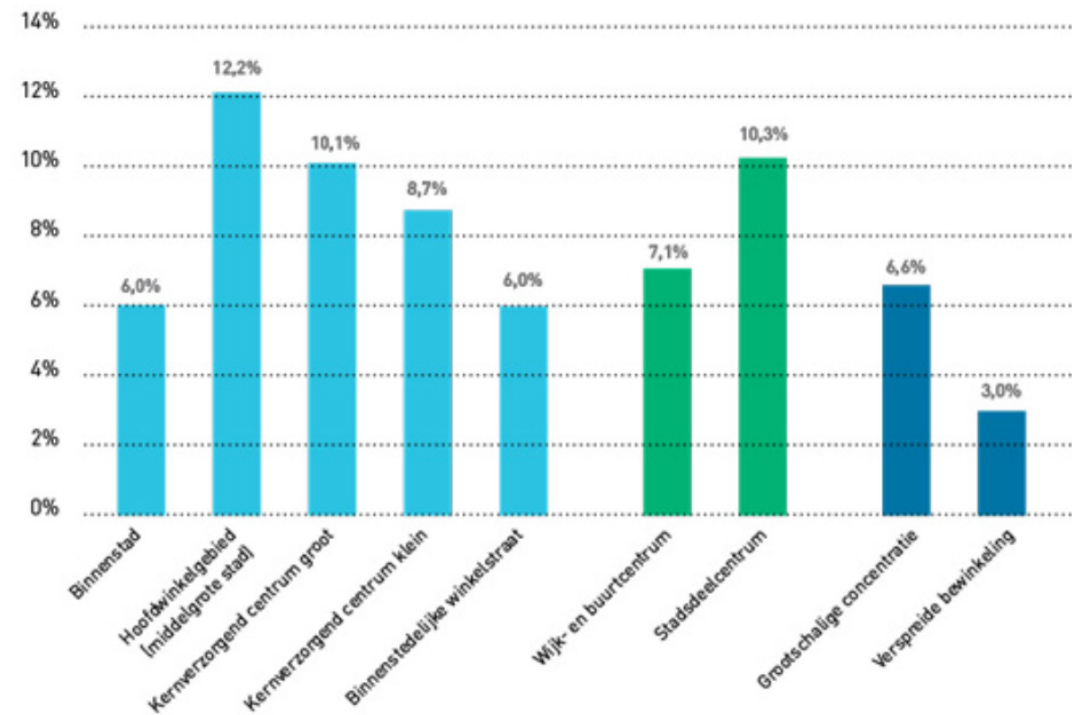
16-01-2024

Lidy Meijers, Anèt Meijer, Federica Marulo and Wido Quist

Vacancy Shopping malls



- Vergelijkend winkelen/
funshopping
- Dagelijkse boodschappen
- Doelgericht winkelen



Medium sized cities and residential shopping malls highest vacancy

Retail expert Fred Rutgers(2022): 'City centers will turn into deprived areas if vacancy rates continue to increase'



Bogaard, Rijswijk
(rtlnieuws, 2021)



Schalkwijk, Haarlem
(noordhollanddagblad, 2021)



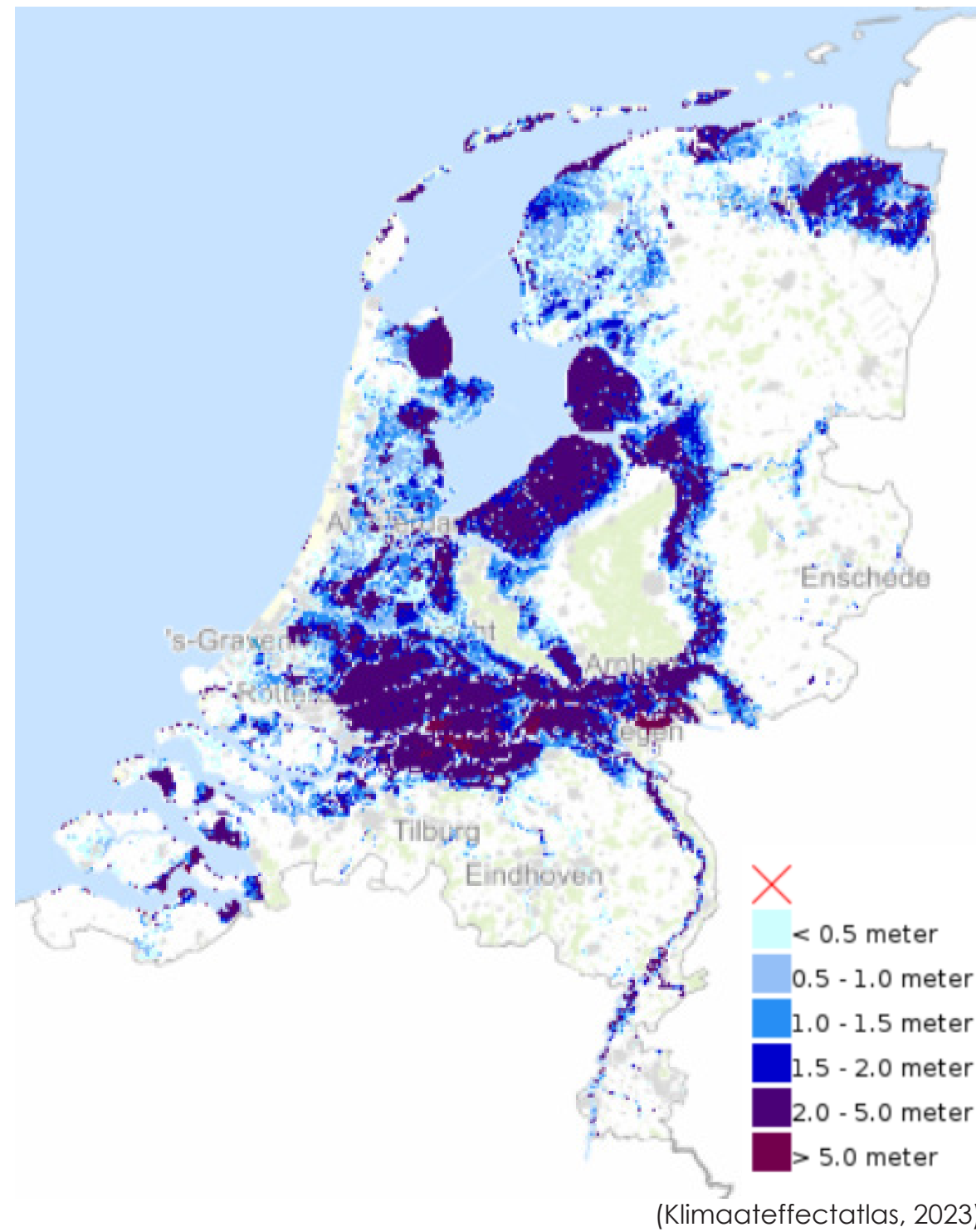
Leyweg, Den Haag
(Bolleboom, 2022)

Climate Change

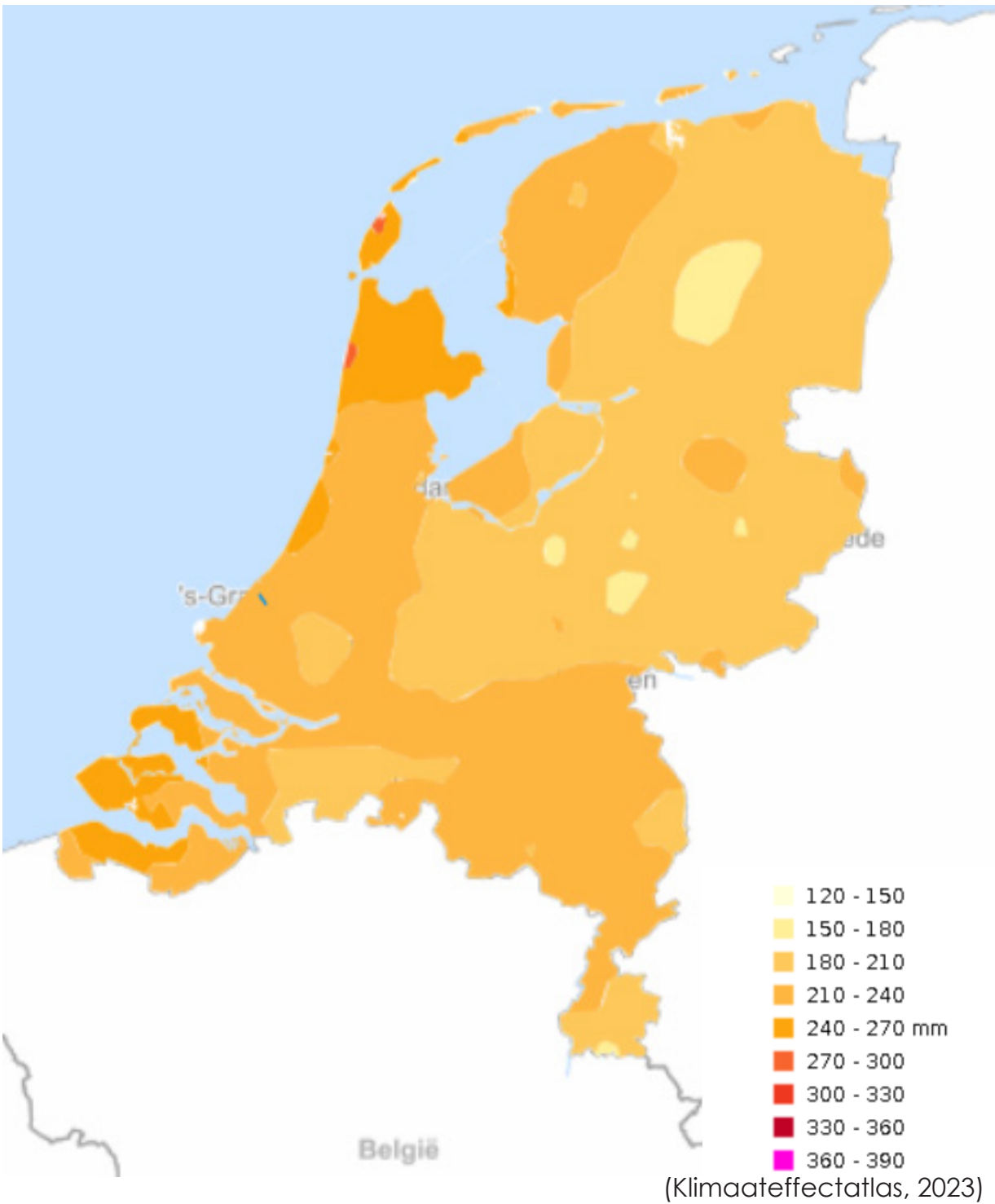
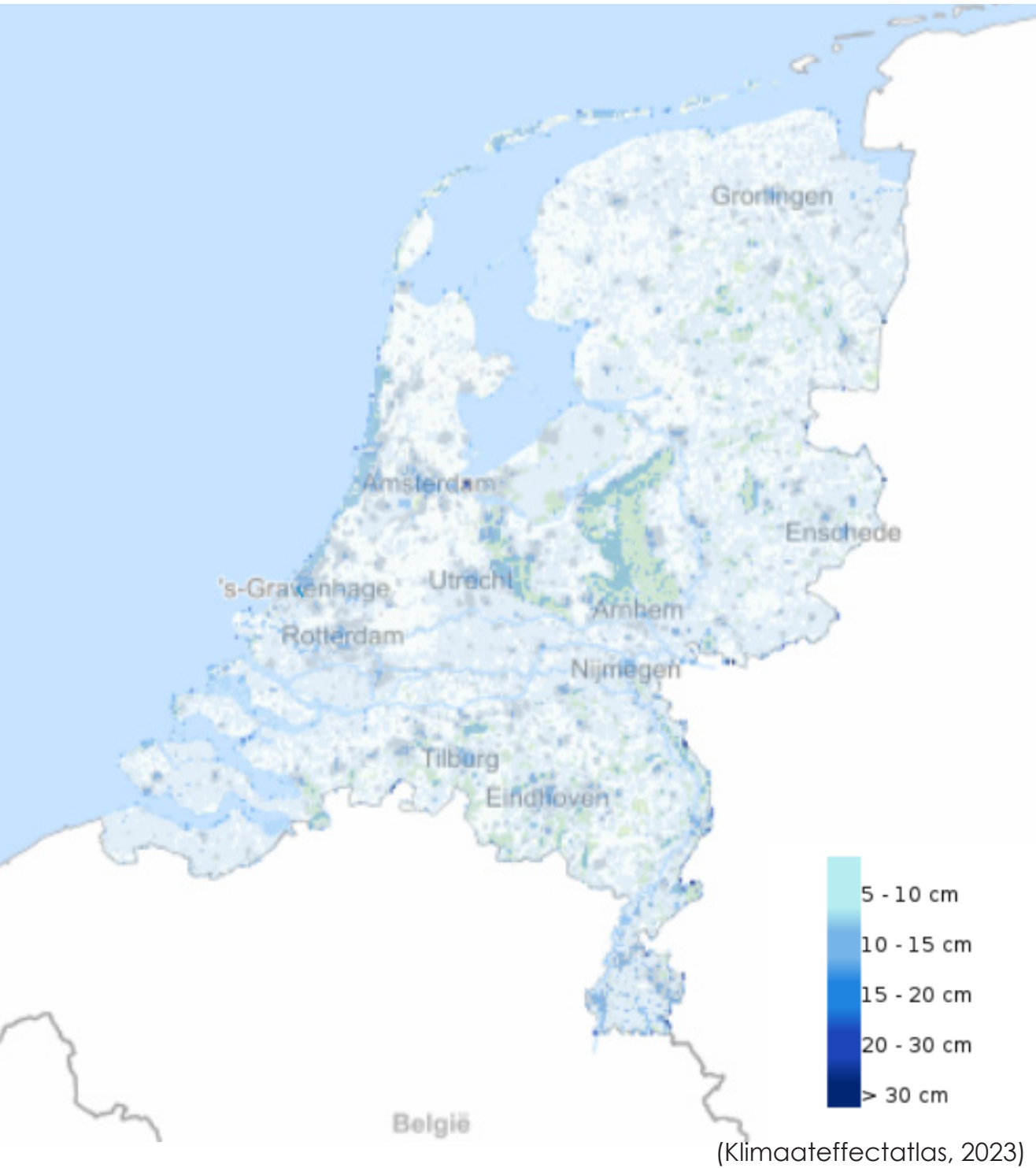


(ConcaveAgri, 2019)

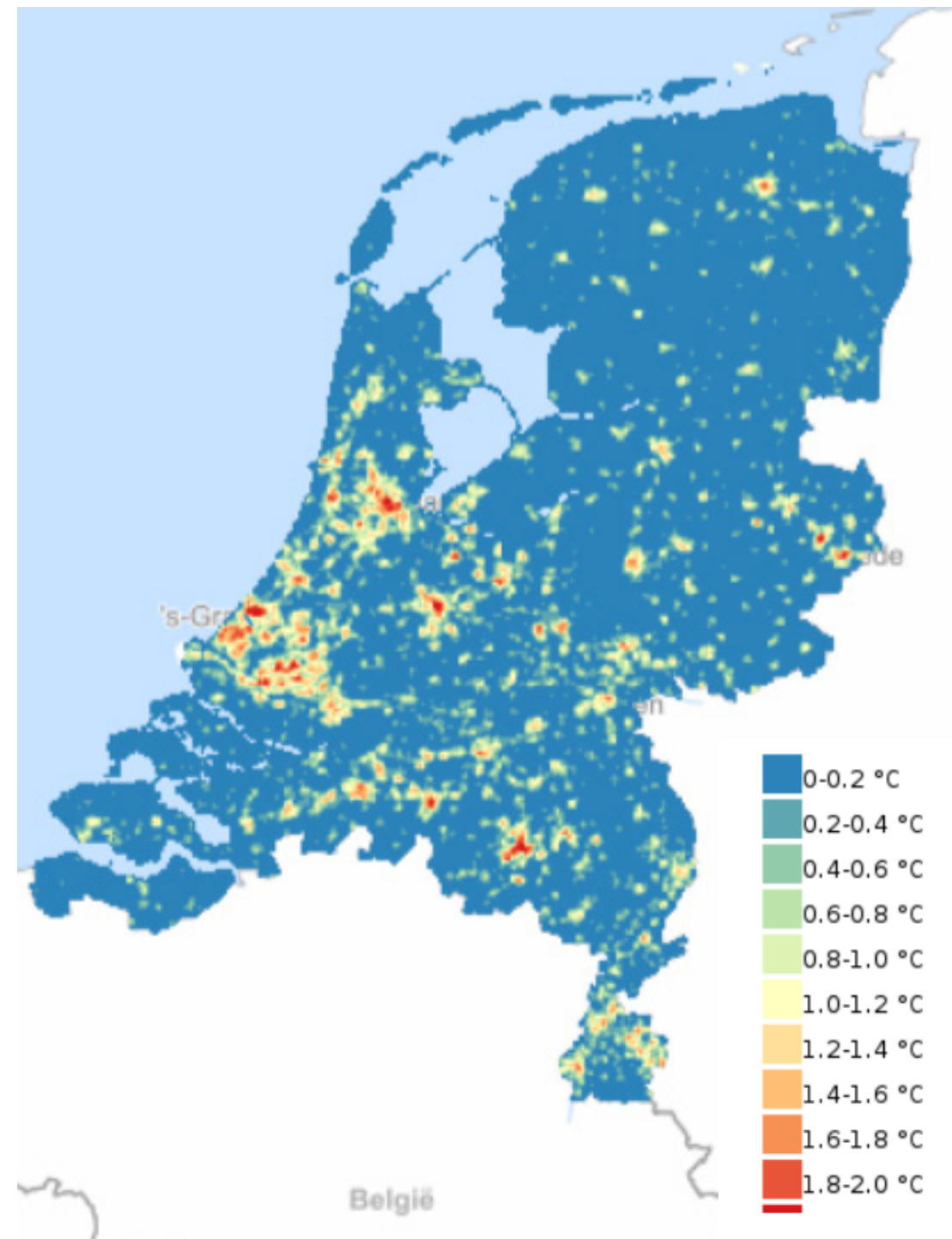
Flood areas 2050



Water in street during extreme rainfall vs Milimeter water shortage 2050

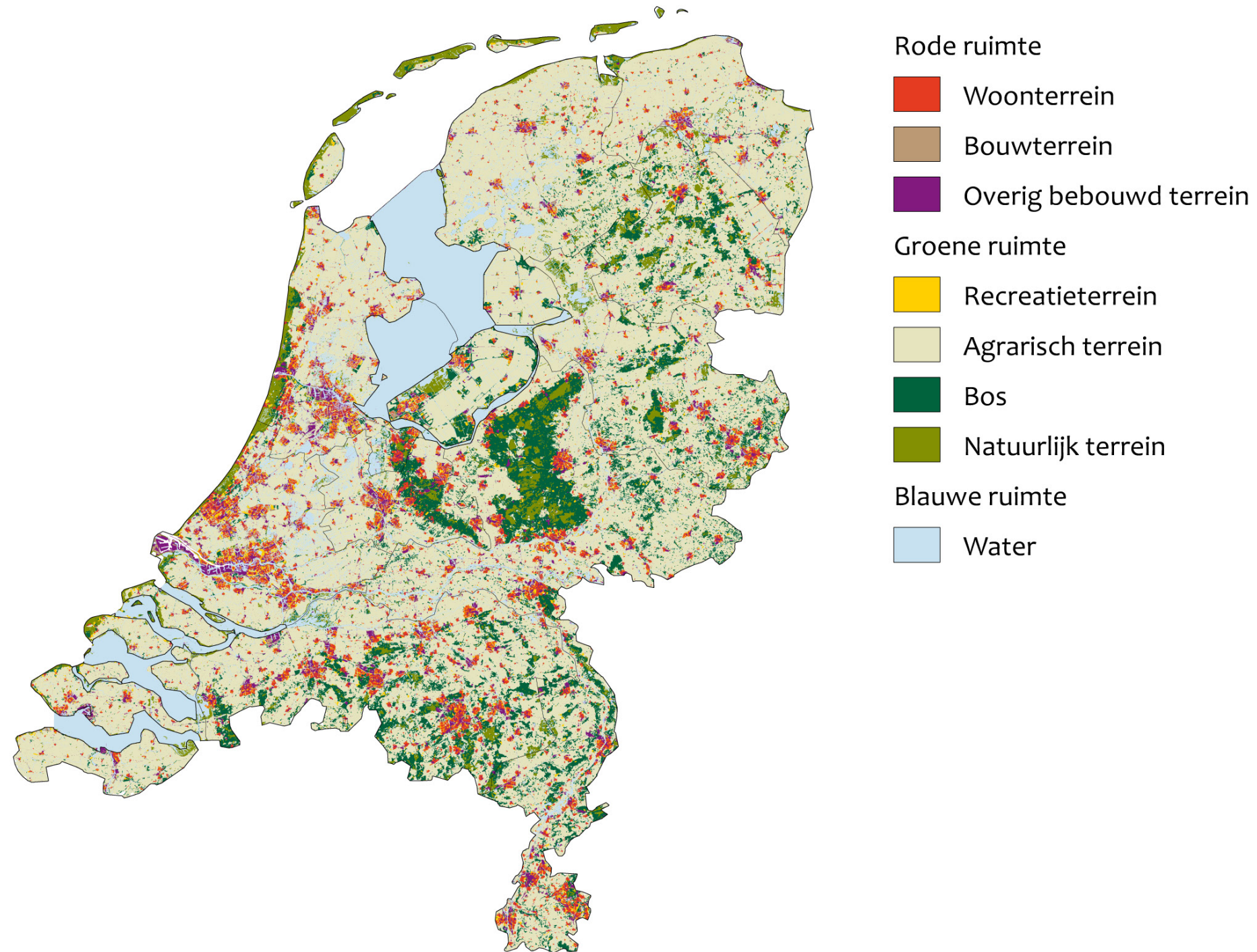


Heat island effect 2050



(Klimaat-effectatlas, 2023)

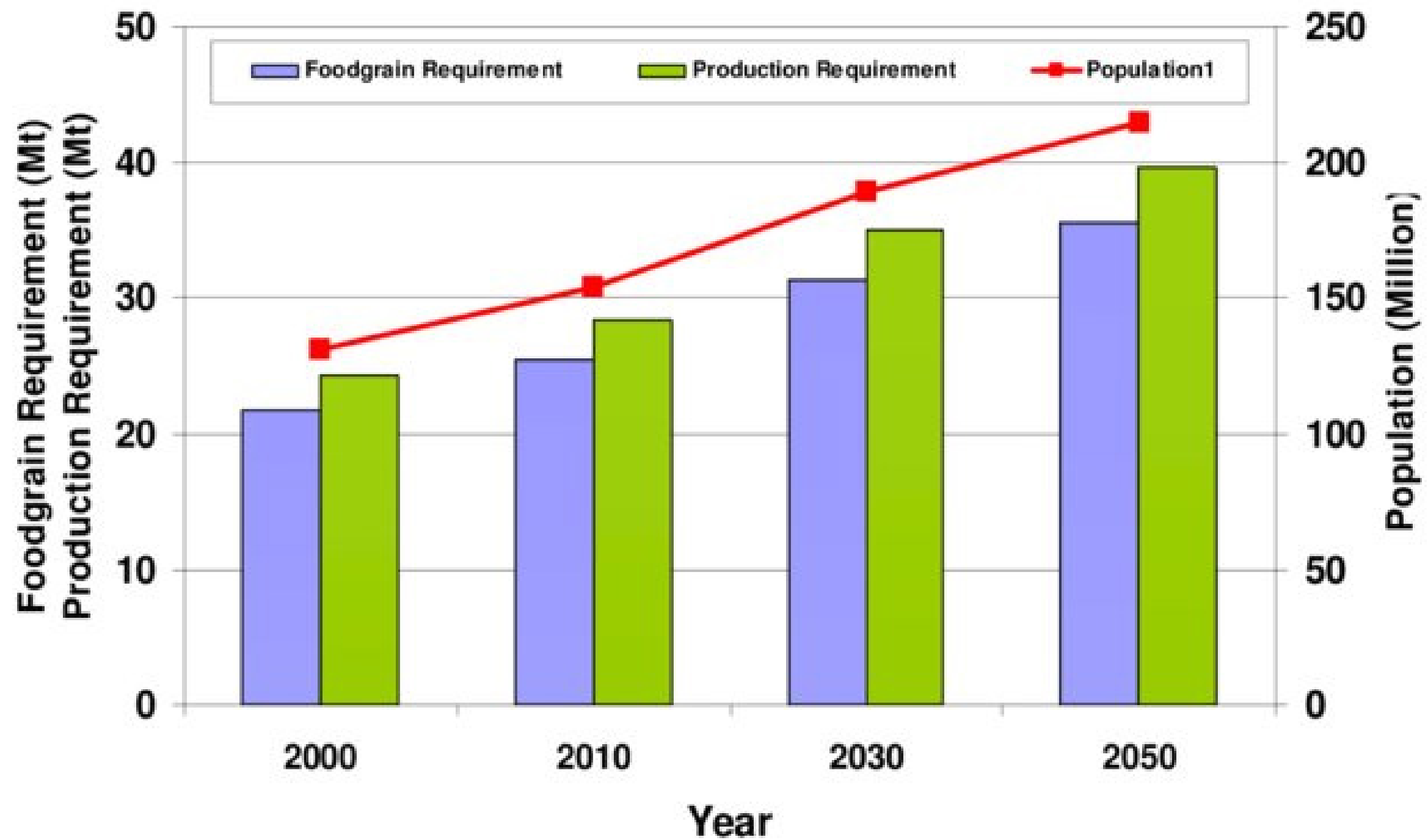
Use of space Netherlands



Bron: CBS, Kadaster

CBS/jan20
www.clo.nl/nl006111

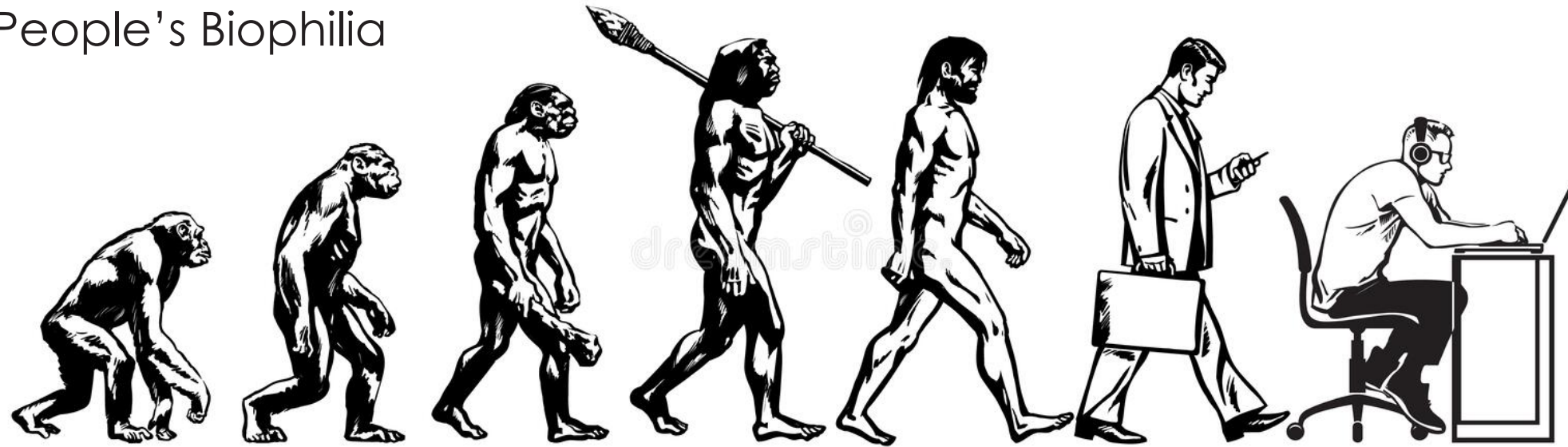
Food vs Population 2050



(Hussain, 2010)

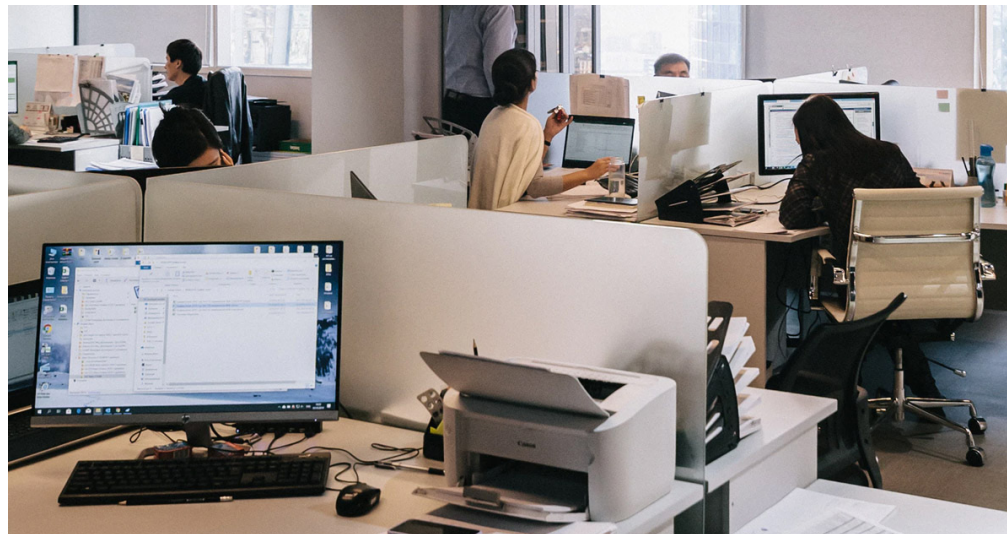
Biophilic Design

People's Biophilia



Damaged: stressed, tired, etc.

Voluntary attention



Involuntary attention



Recover: rested, relaxed, etc.

Biophilic Shopping Malls

Green retail areas



Non-green retail areas



(Rosenbaum, 2018)



Bogota Colombia (Rosenbaum, 2016)

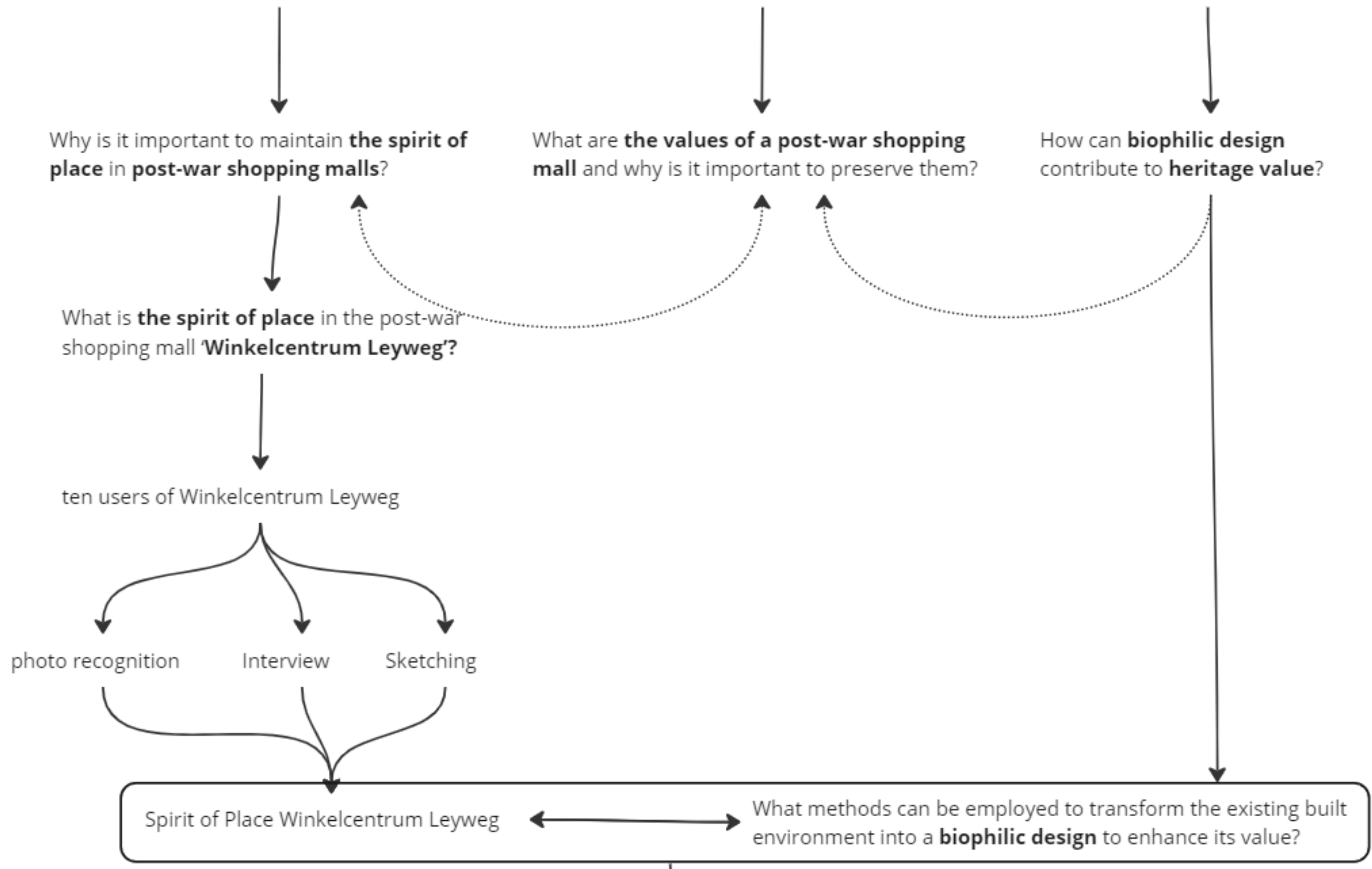
Values of the Post-War Shopping Malls



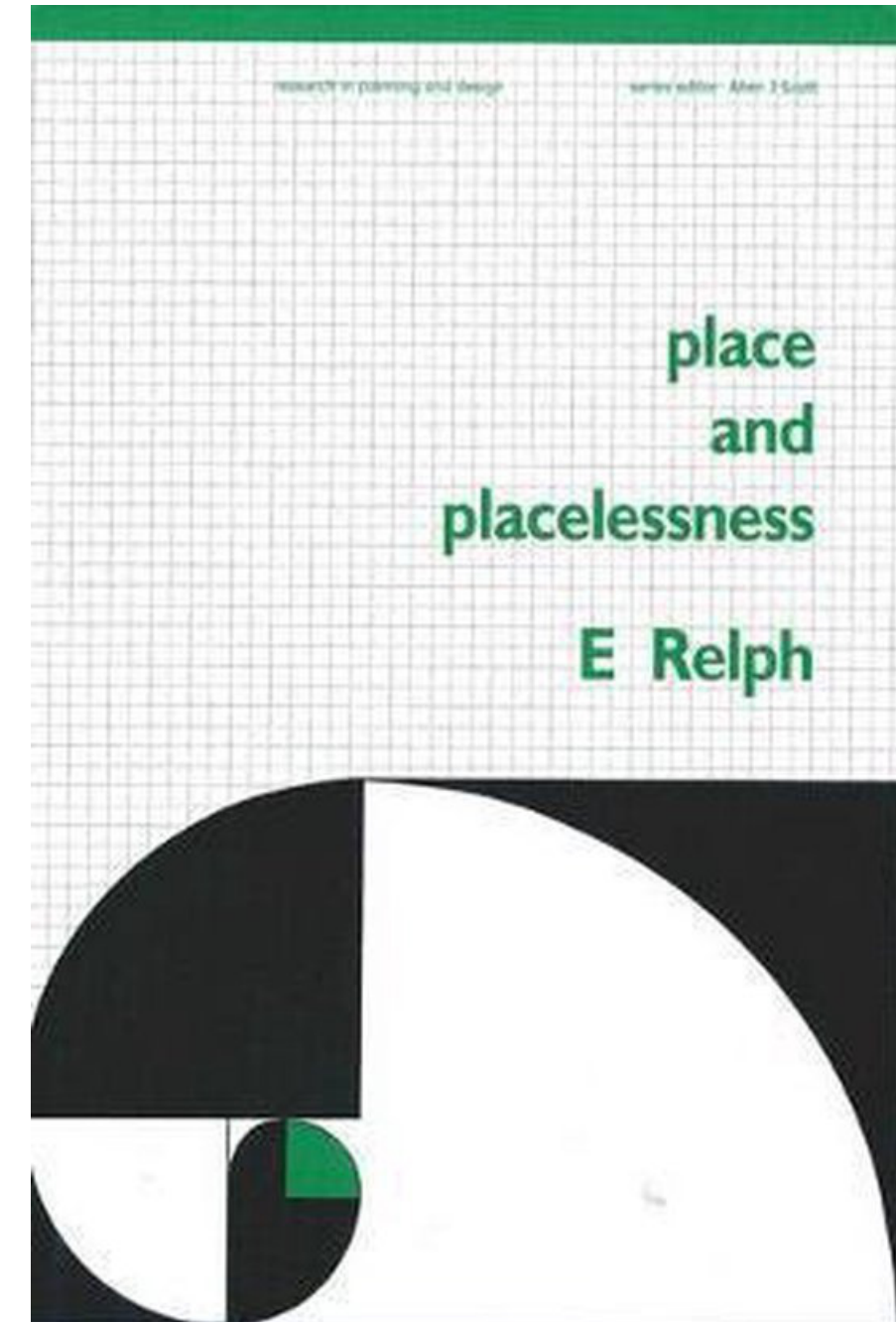
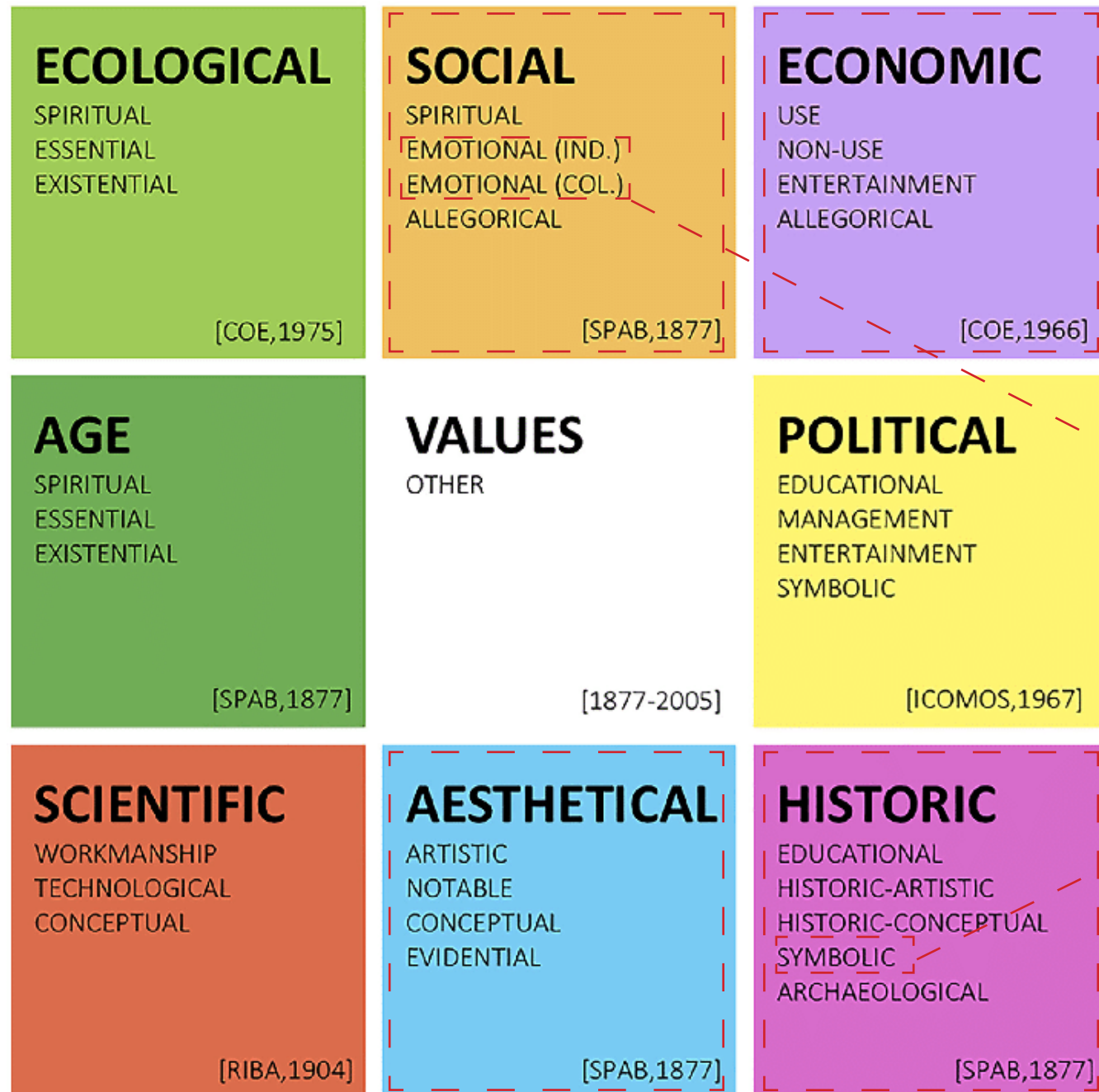
(Indebuurt, 2020)

Research Question

How can **biophilic design** enhance the **value** and **spirit of place** in a **post-war shopping mall**?



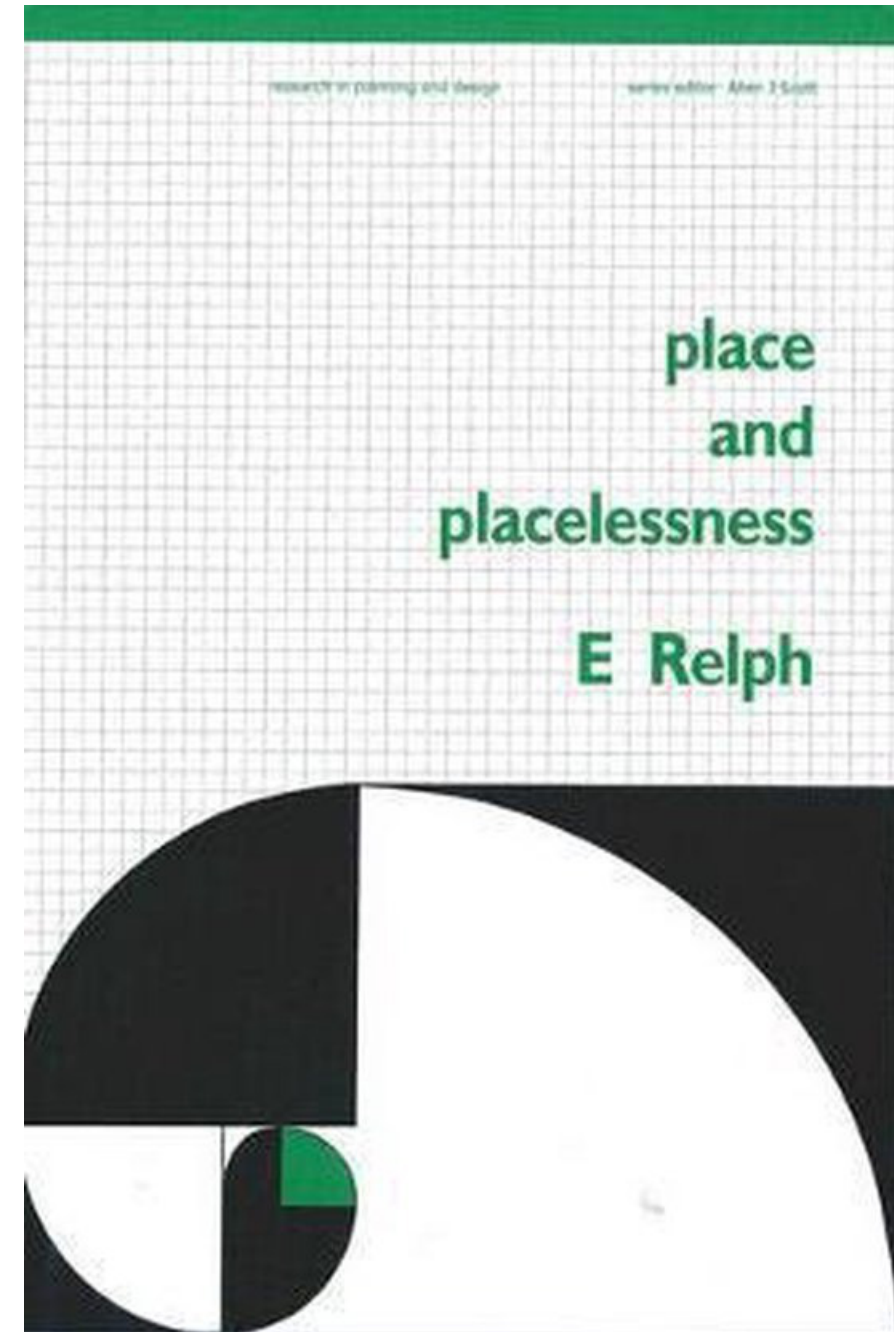
Value of Post-War Shopping Mall



Spirit of Place in a Post-War Shopping Mall

Book 'Place and Placelessness', E. Relph (1976):

'Meaningful connections between people and their built environment are important with regard to fostering a sense of identity and community' (Relph 1976)



Biophilic Transformations

REGIONAL LEVEL

- Green Regions and Compact Cities,
- Parks, Trees, and Urban Forests
- A River Runs Through It

Plan Riverfront Greenway



(Mastrolonardo, 2023)

CITY LEVEL

- Reimagining the Interstices of the City
- Biophilic Streets and Infrastructure
- Limiting Cars, Expanding Nature

Water Square, Tåsinge Plads



(Negrello, 2023)

BUILDING LEVEL

- Food and Agriculture in the City
- Biophilic and Healthy Buildings

Ford Foundation Building



(Leakas, 2008)

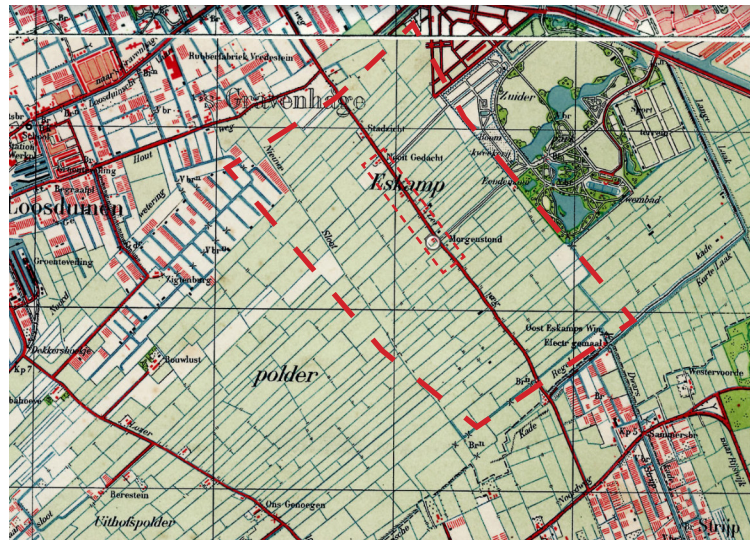
Biophilic Design Enhancing the Value of Heritage



Winkelcentrum Leyweg, Den Haag

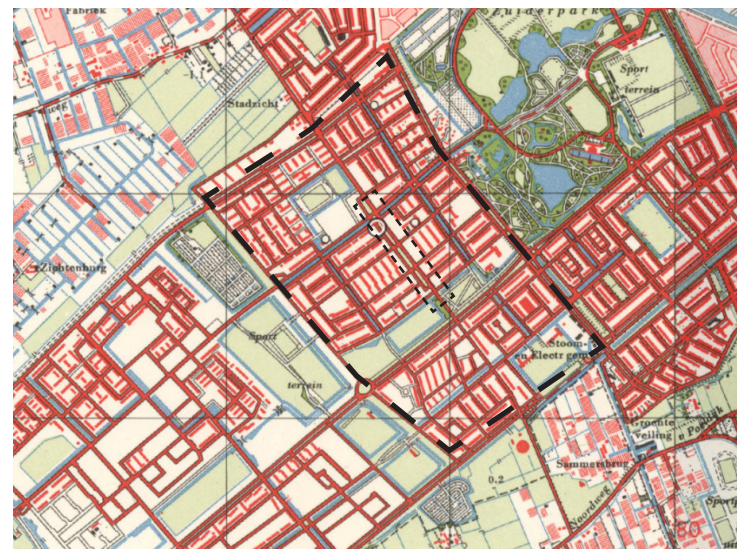
- Located in the hague
- Neighbourhood Morgenstond
- 20,251 residents
- 48,000 m2
- 110 shops.
- Designed in 1960

Morgenstond 1950



(Topotijdreizen, 2023)

Morgenstond 1960



(Topotijdreizen, 2023)



Winkelcentrum Leyweg(Bolleboom, 2023)

Spirit of place Leyweg



Canopees

Town hall

Benches with trees

Church

V&D

Emptiness

Town hall

Benches with trees

Clear

replace old houses
with new houses

Melis Stokepark

arches

beautiful

Passage

don't recognize

○ Nodes
--- Edges
— Paths
⬡ Landmarks
District

Spirit of place and Biophilic Transformations

OPPERTUNITIES

THREATS

STRENGTHS

- Biophilic design can add histroical and social value to the nodes South and North square
- Biophilic design can add ecological value te distinctive heritage buildings 'Hema', 'Church', 'Passage'and 'the V&D'.

- Not able to add ecological value to the heritage buildings 'Hema', 'Church', 'Passage'and 'the V&D' because user don't want them to be changed.

WEAKNESSES

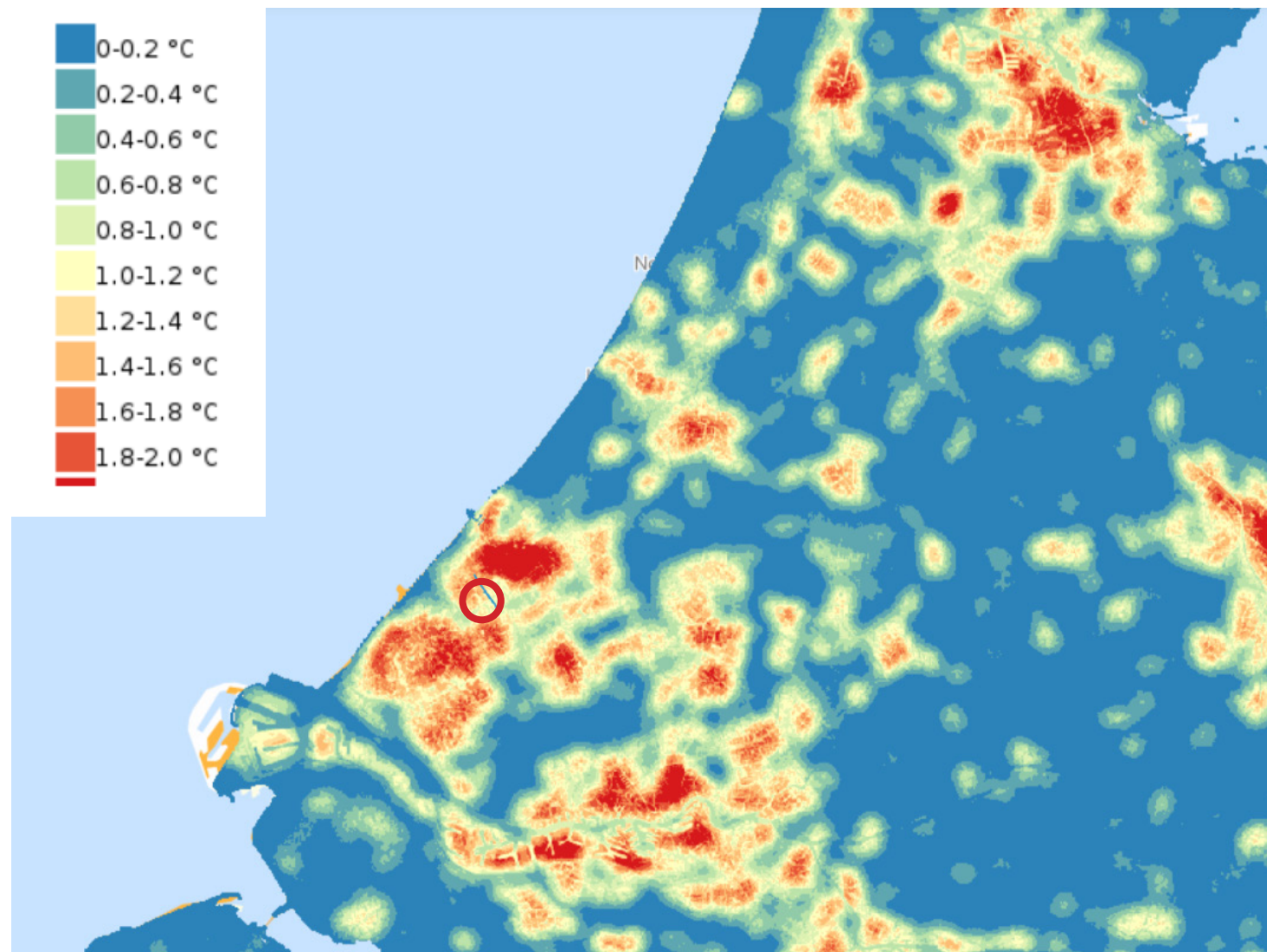
- Biophilic design can help create emotional connection with the site that is now 'not recognized'
- Biophilic design can increase viability of the 'empty' shopping mall
- Biophilic design can add ecological value to houses that 'need to be replaced'.

- Biophilic design won't have the emotional bonding effect due to 'Failure to recognize the site'.

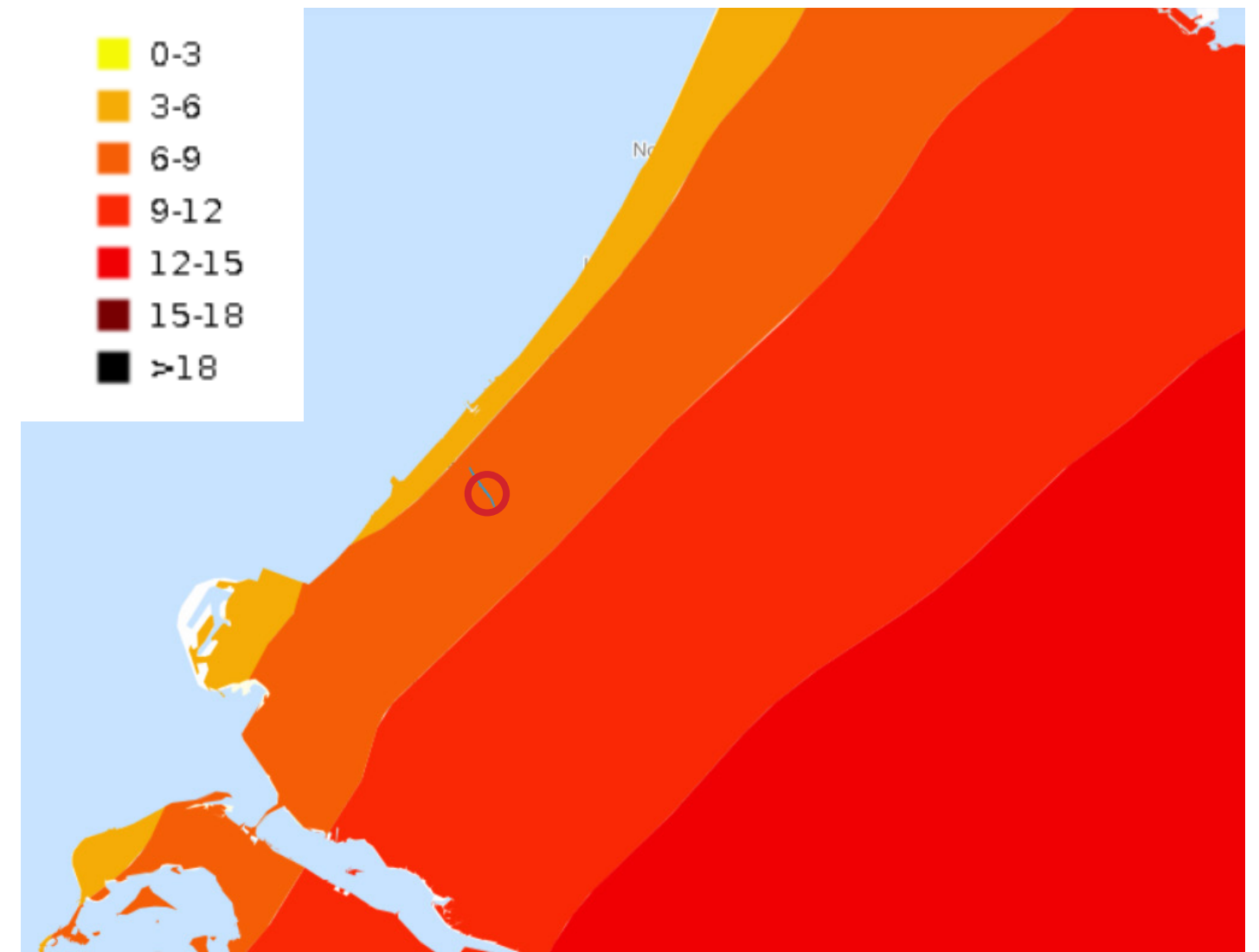
The Design of Winkelcentrum Leyweg



Heat island effect vs Days of heat above 30 degrees 2050

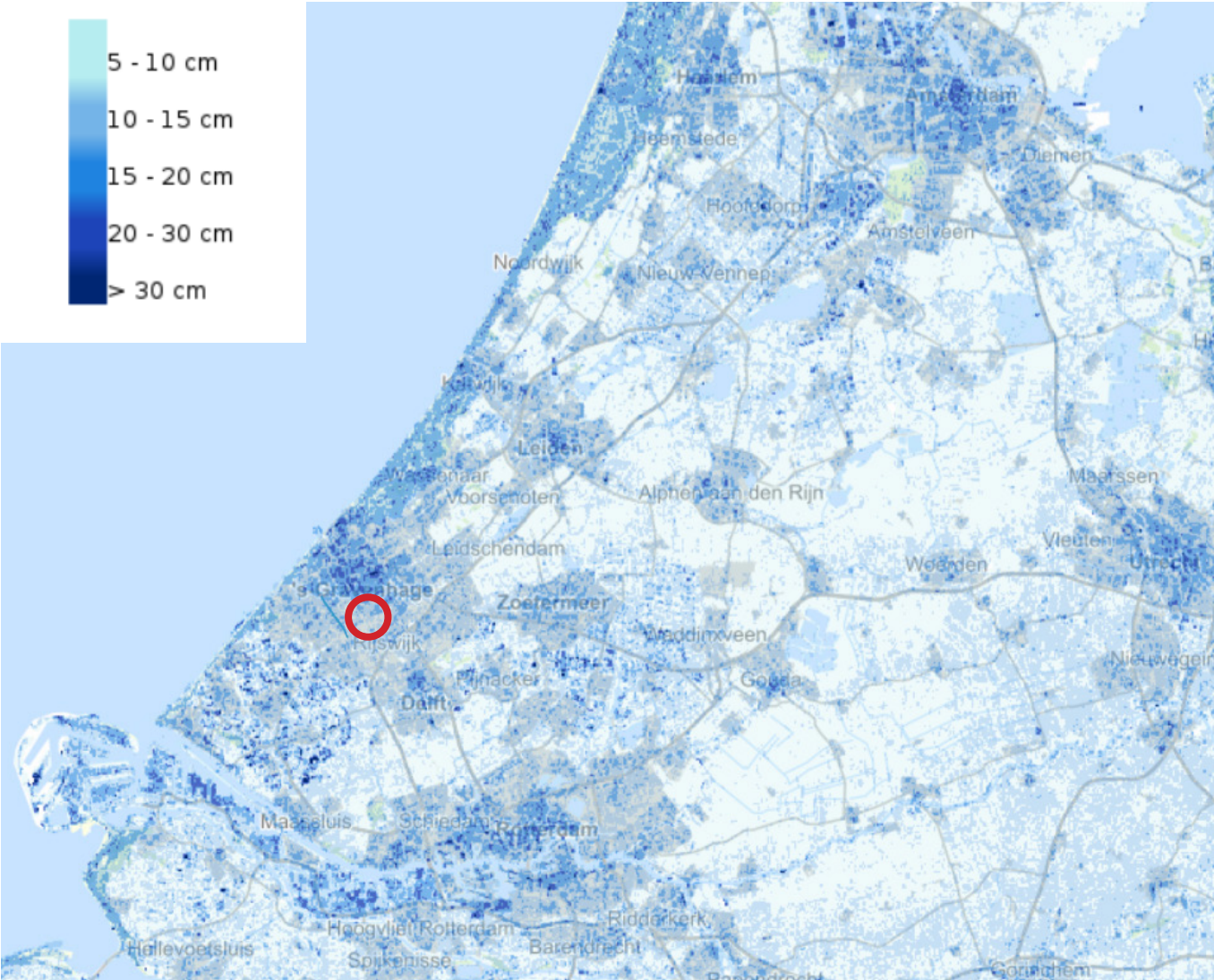


(Klimaat-effectatlas, 2023)

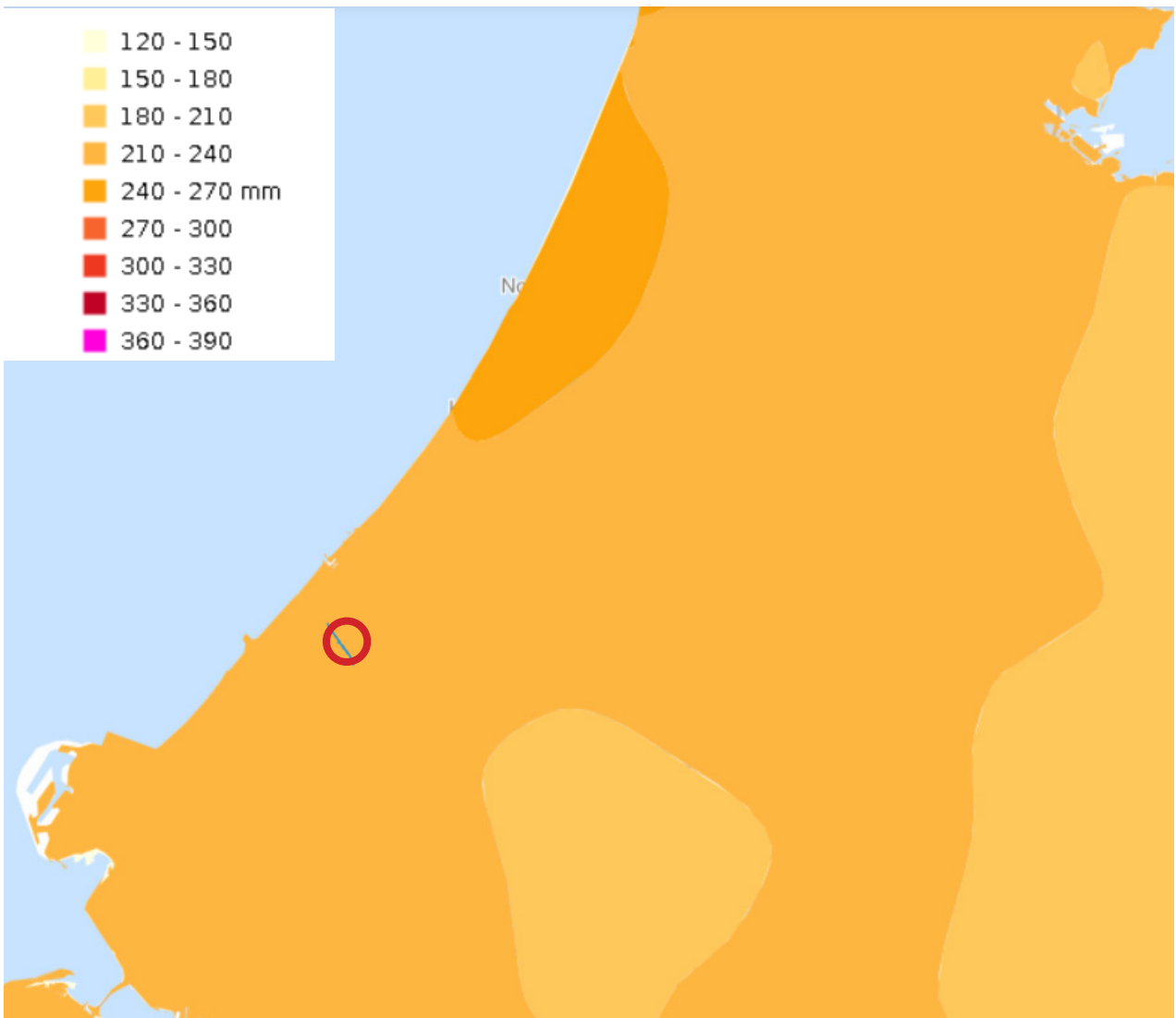


(Klimaat-effectatlas, 2023)

Water in street during extreme rainfall vs Milimeter water shortage 2050

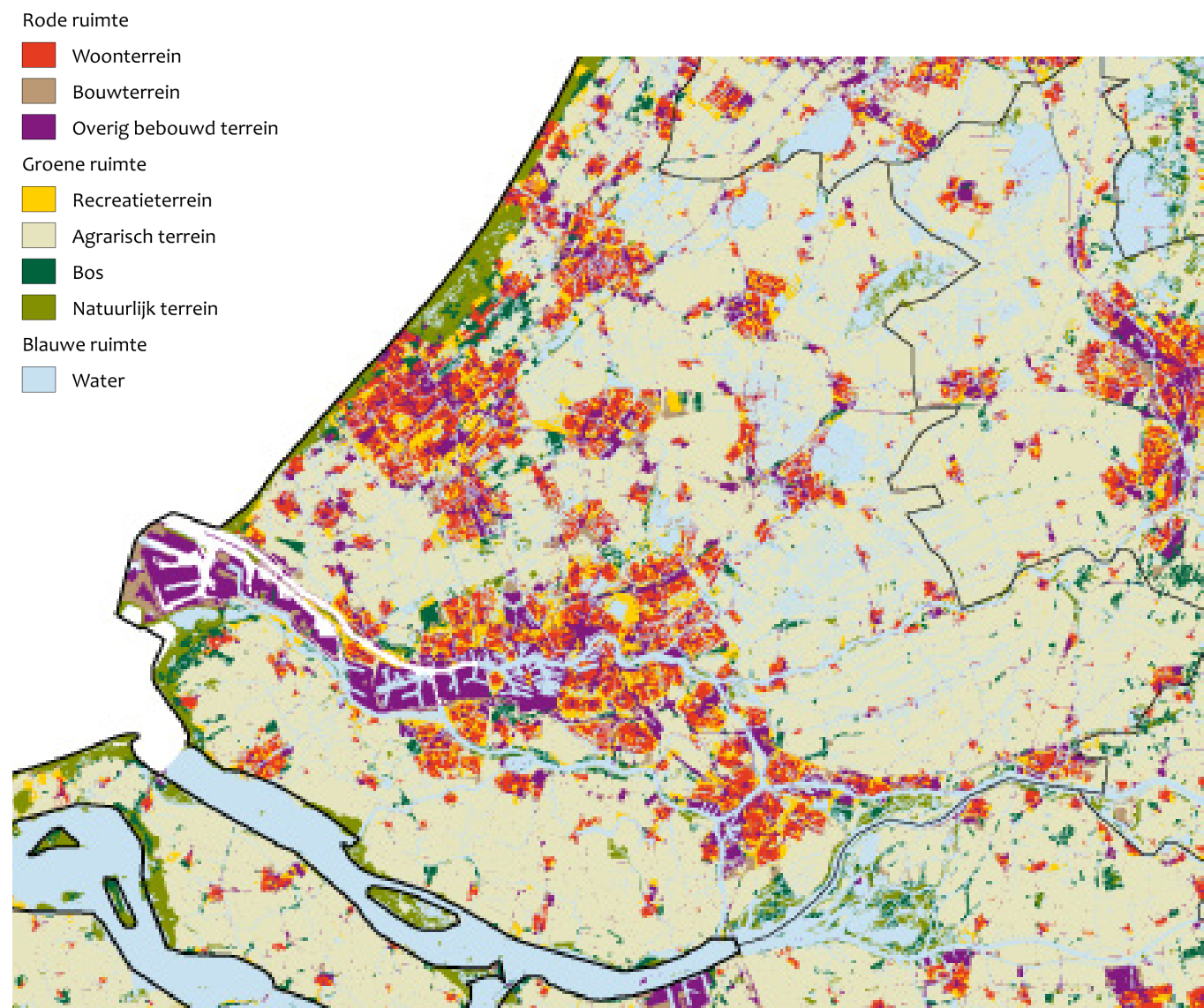


(Klimaat-effectatlas, 2023)

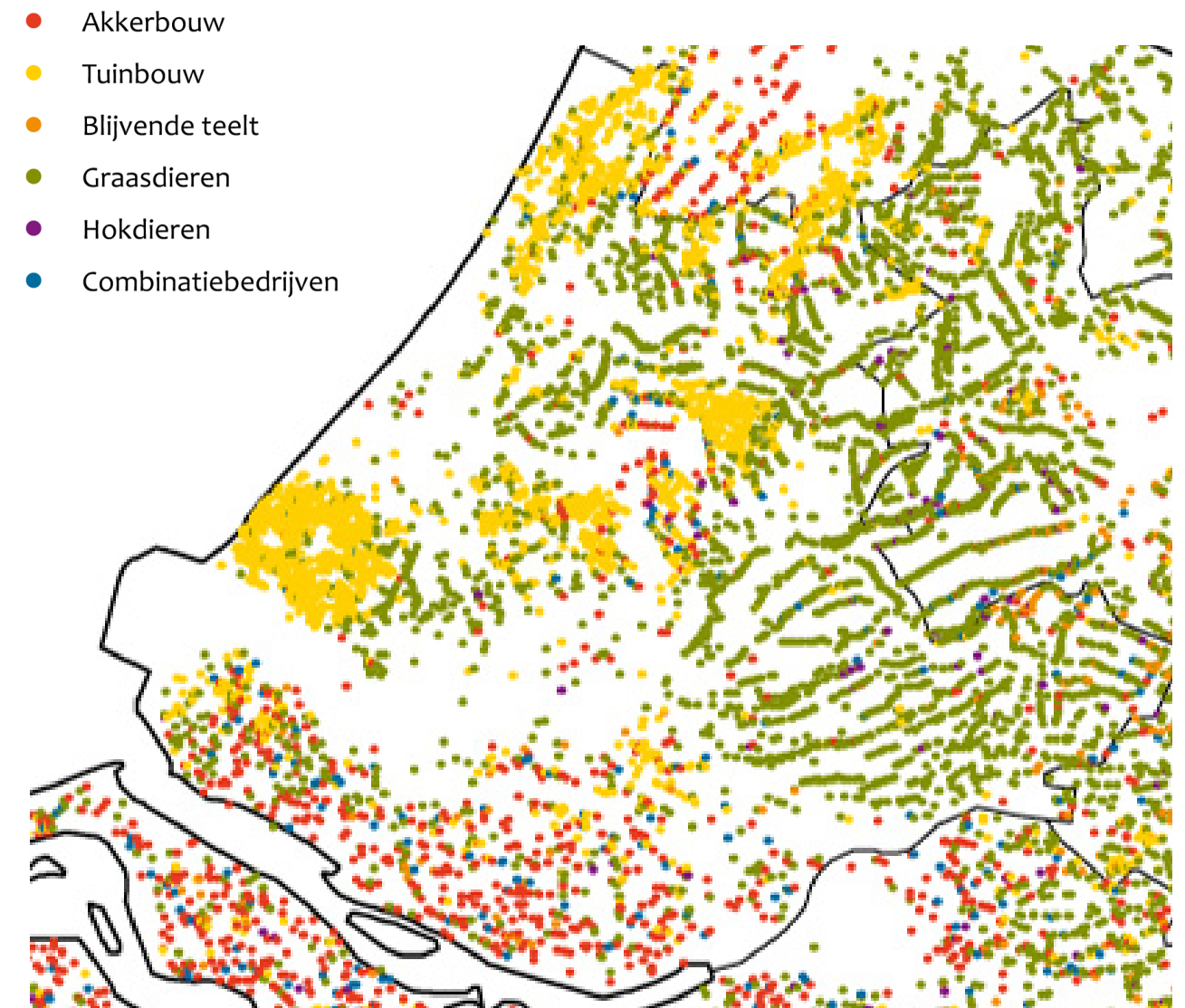


(Klimaat-effectatlas, 2023)

Use of space Netherlands & Type of Agriculture

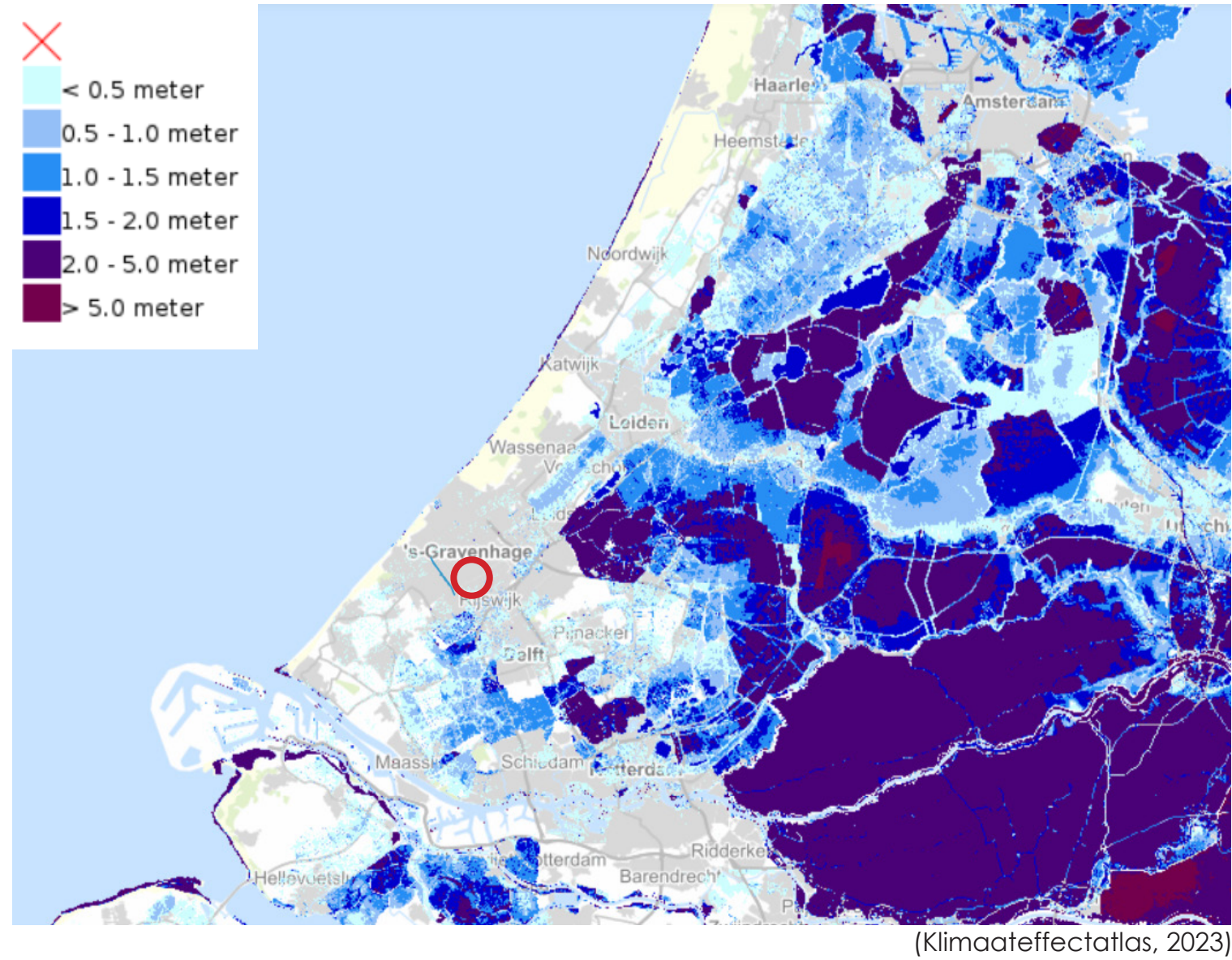


(Klimaat-effectatlas, 2023)



(Klimaat-effectatlas, 2023)

Flood areas 2050



Current Problems

Oak Processionary Caterpillar



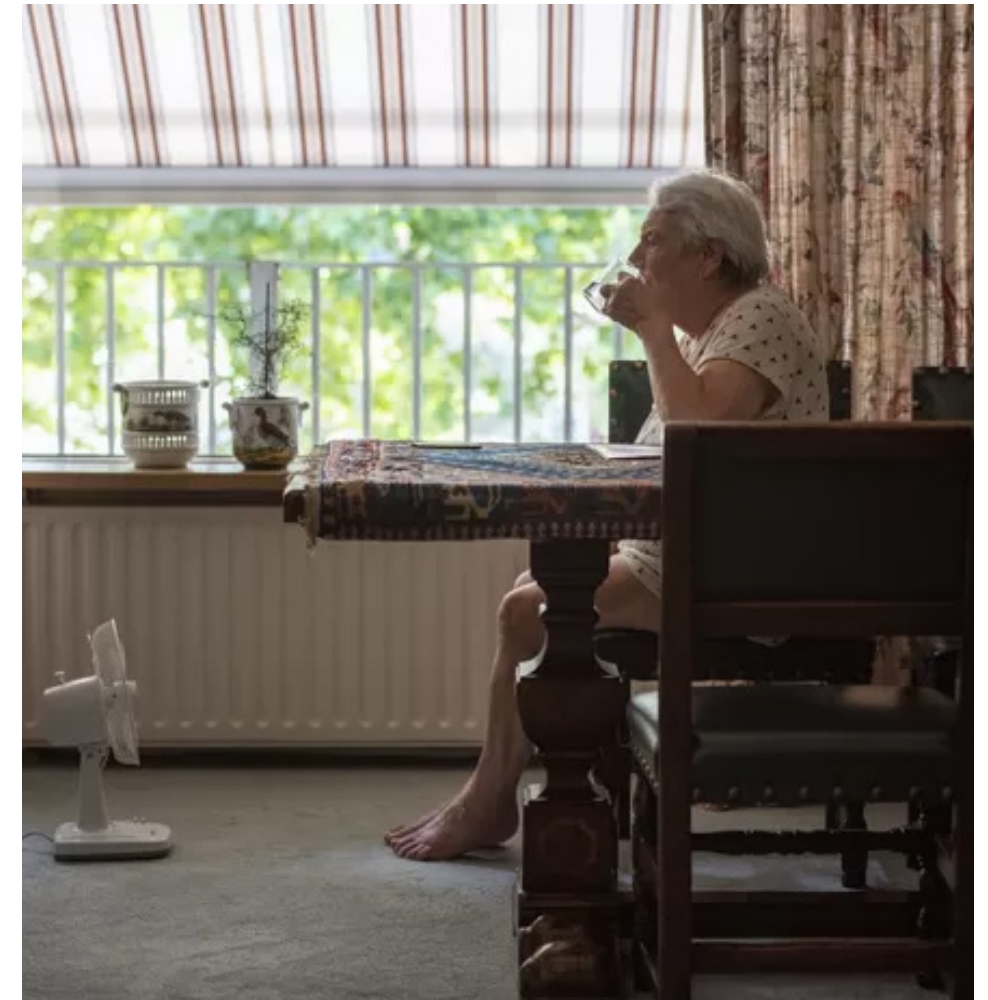
(AD, 2019)

Flooded Basements



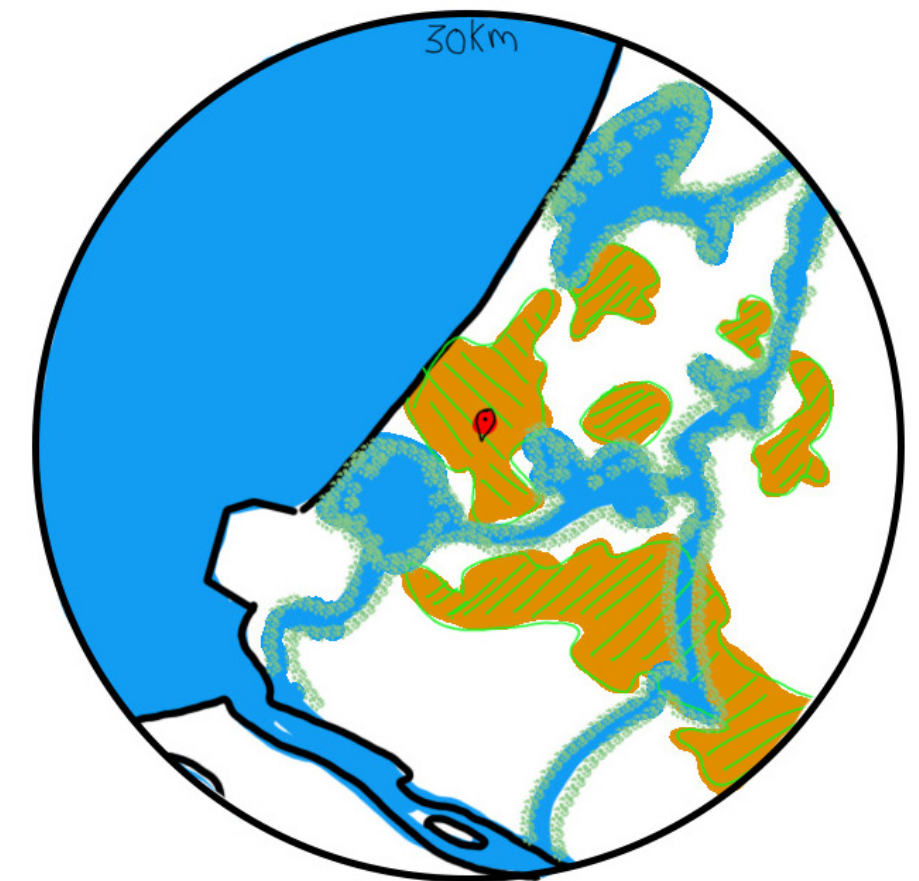
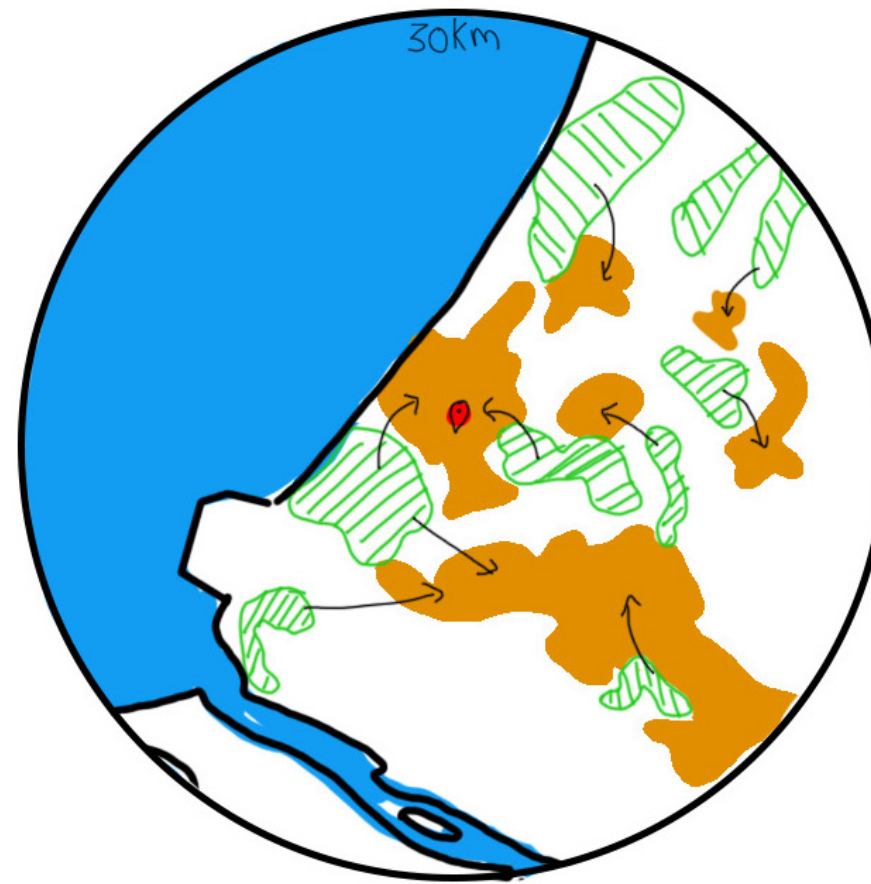
(AD, 2021)

Dangerous Heat Elderly People

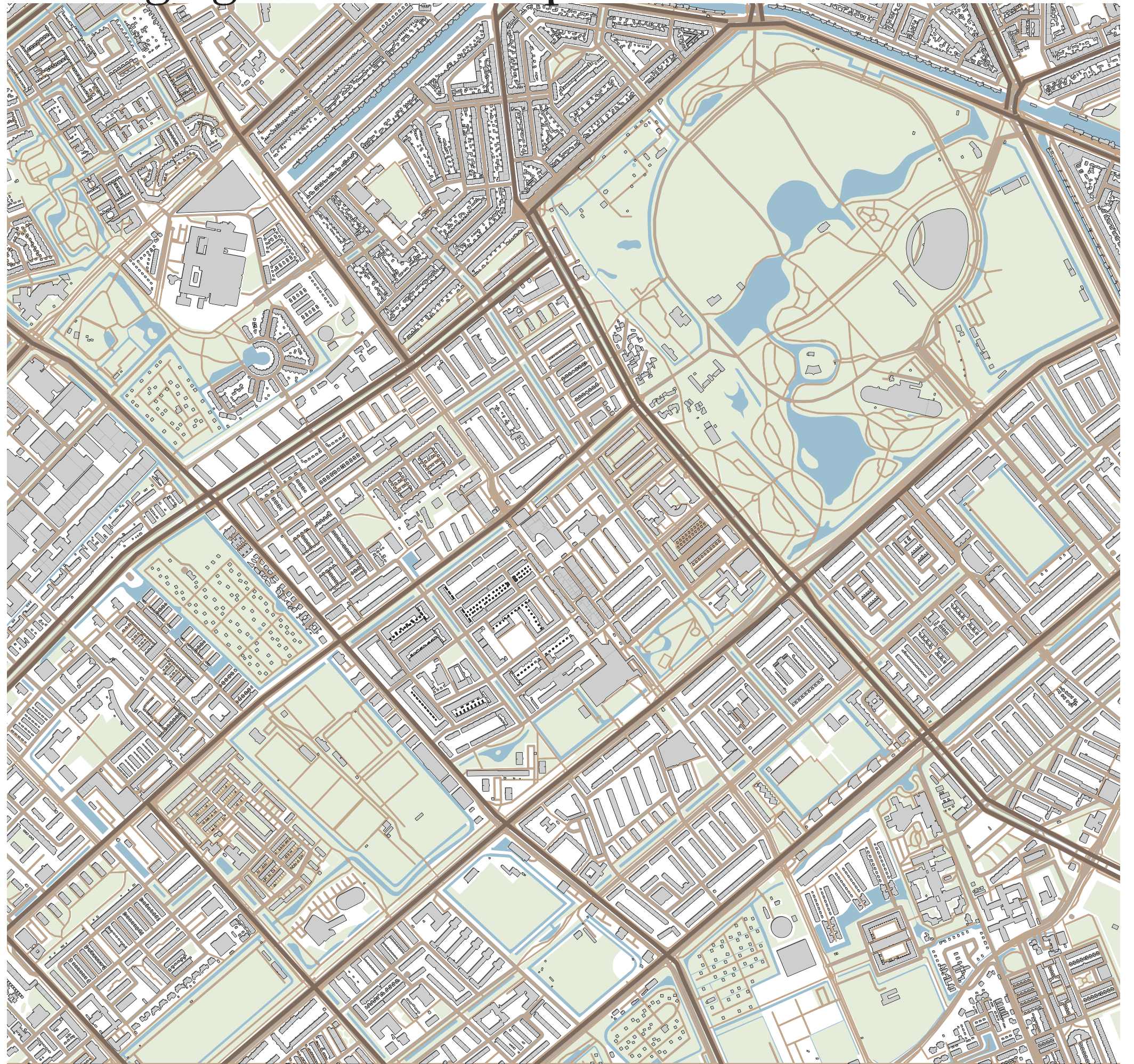
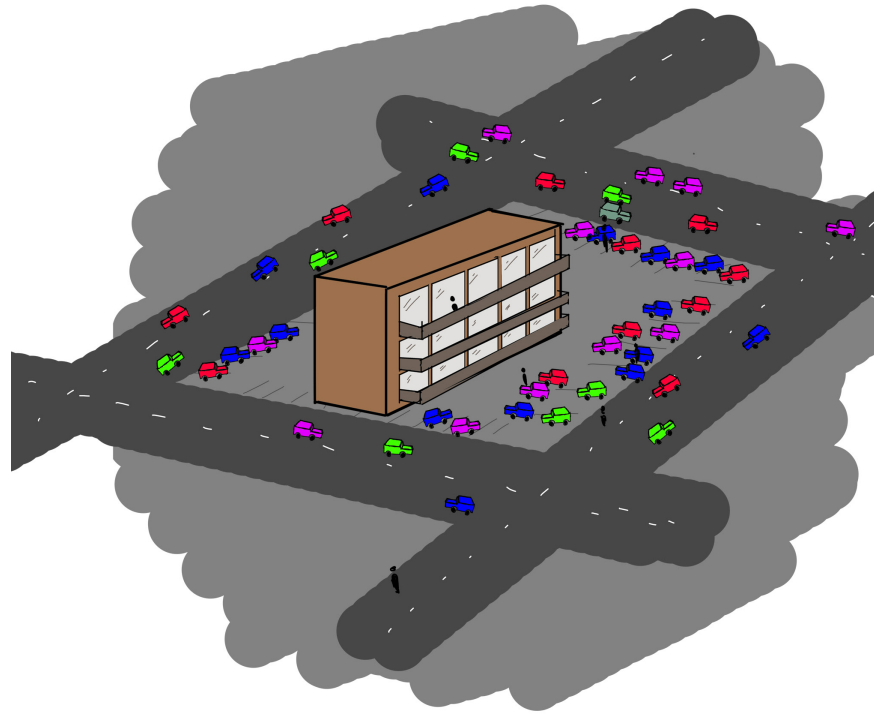


(AD, 2022)

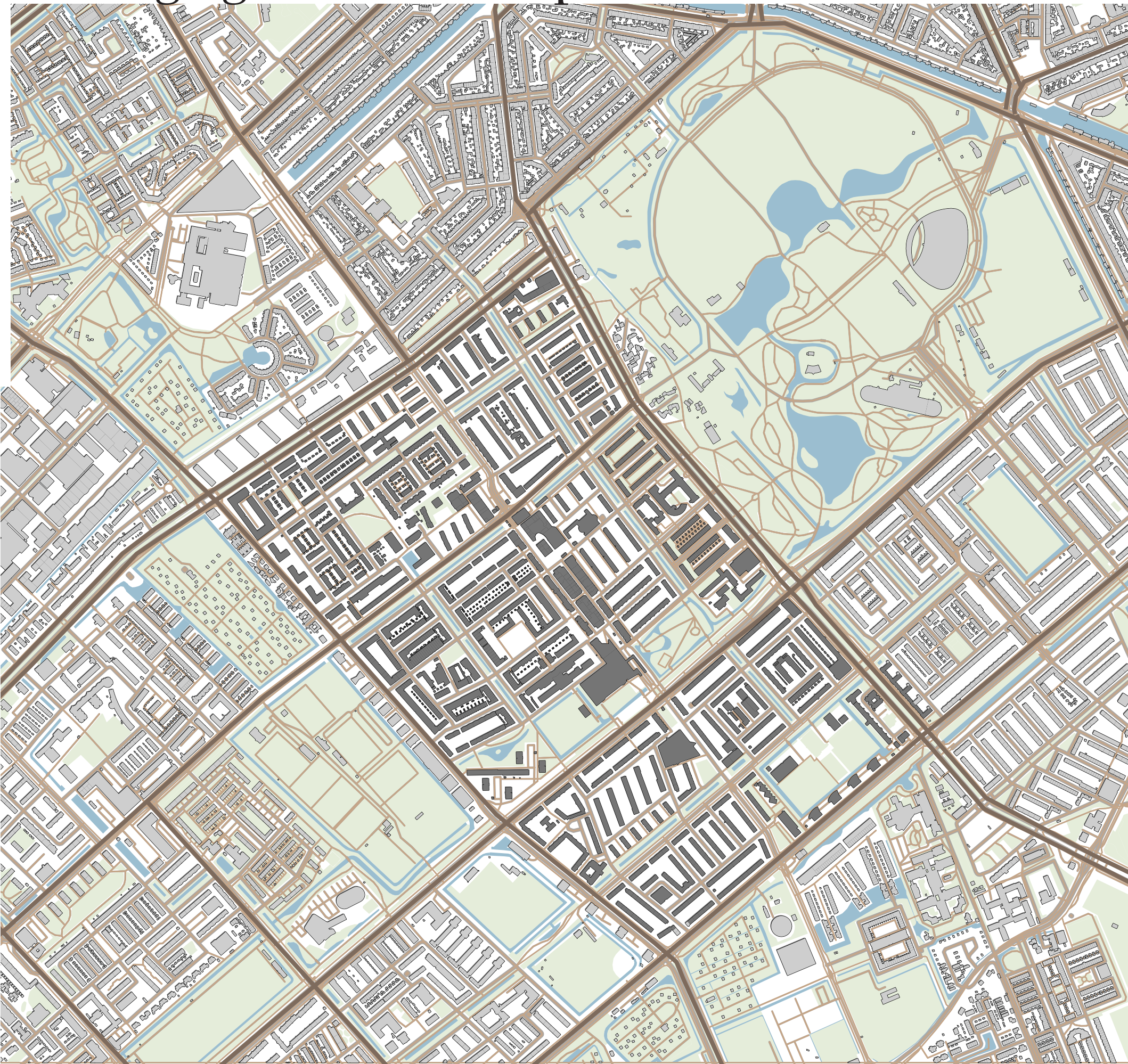
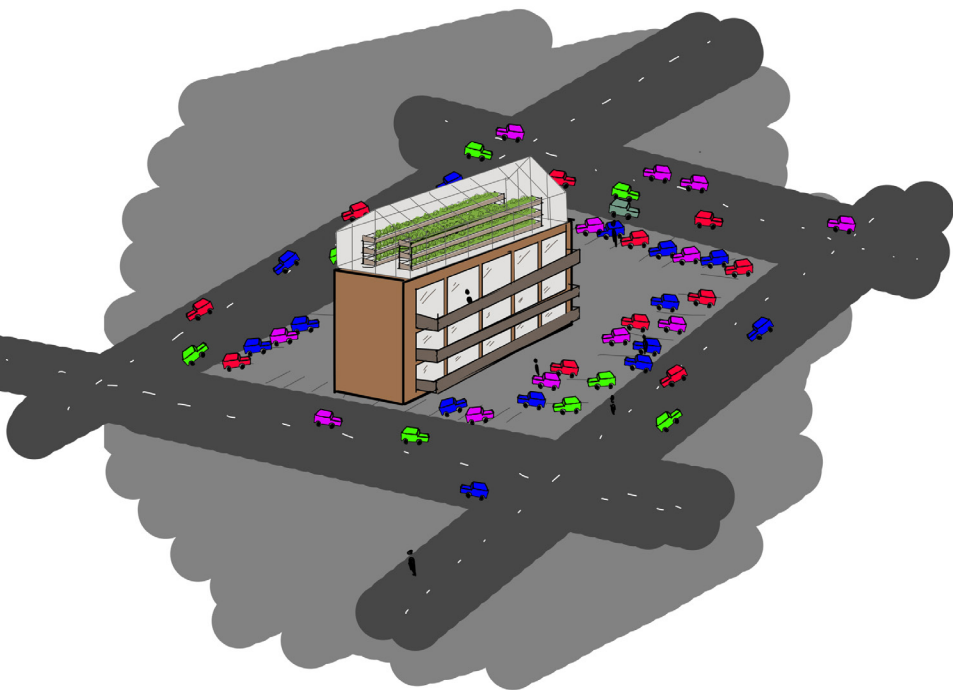
Moving agriculture to the cities



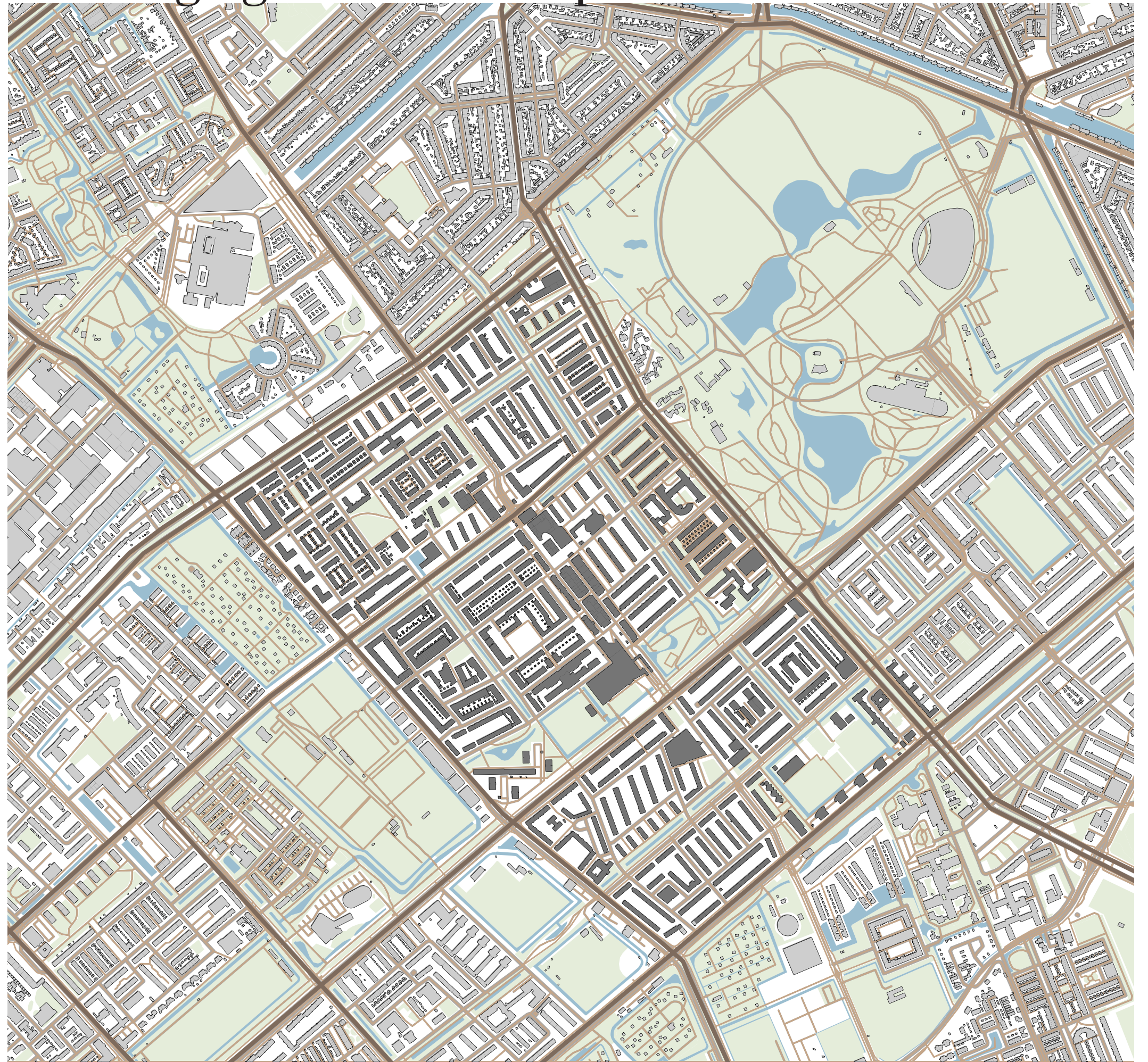
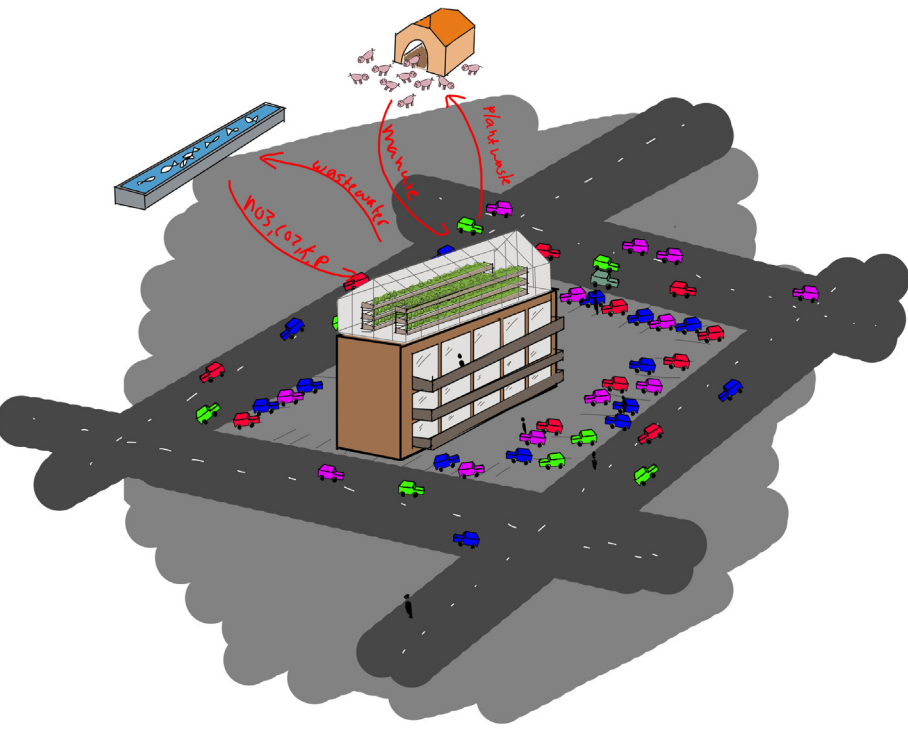
Changing the Cities: Step 1



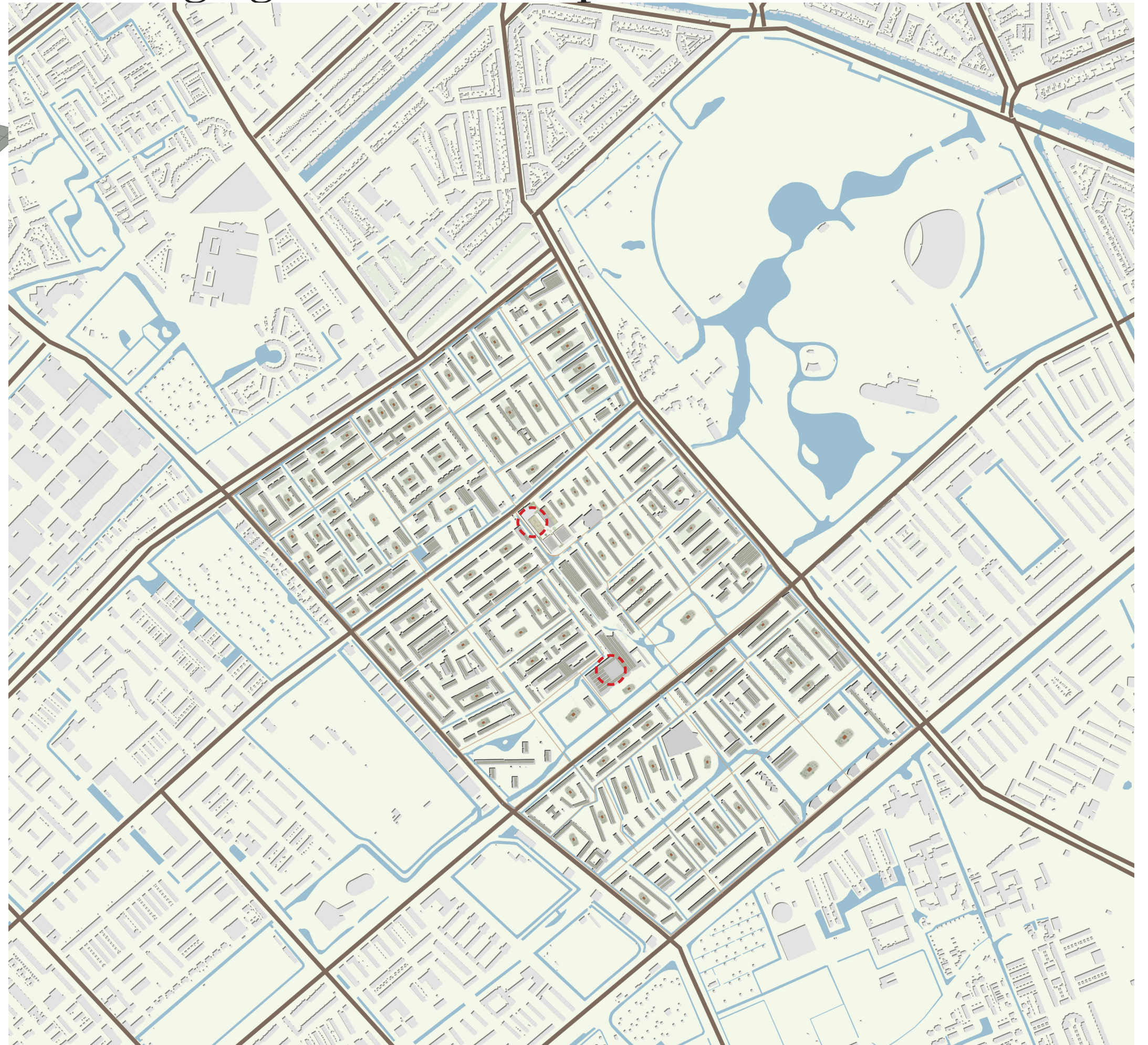
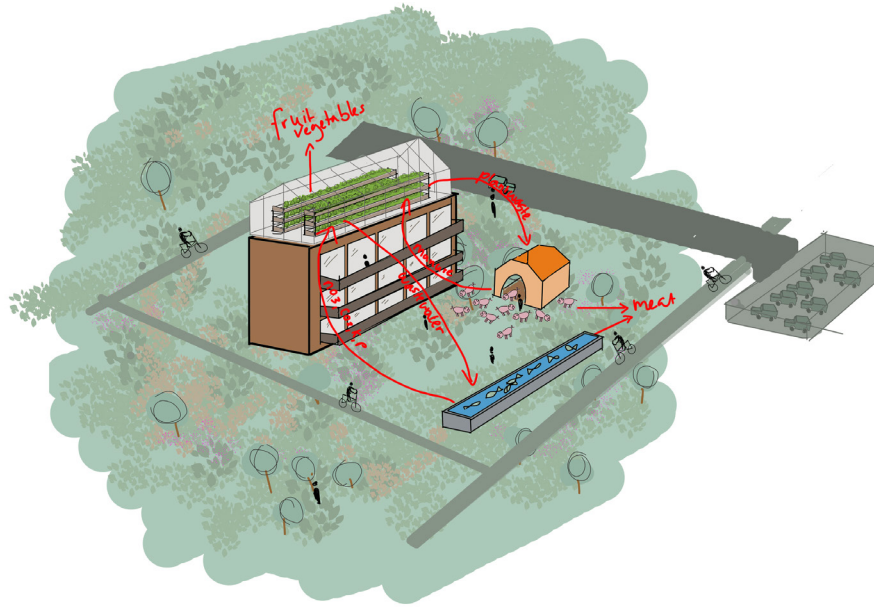
Changing the Cities: Step 2



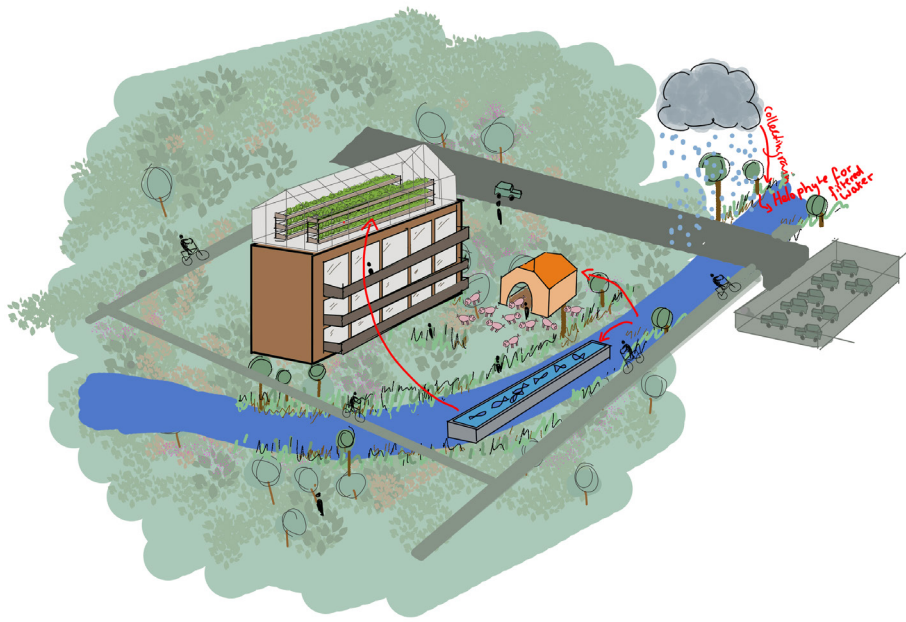
Changing the Cities: Step 3



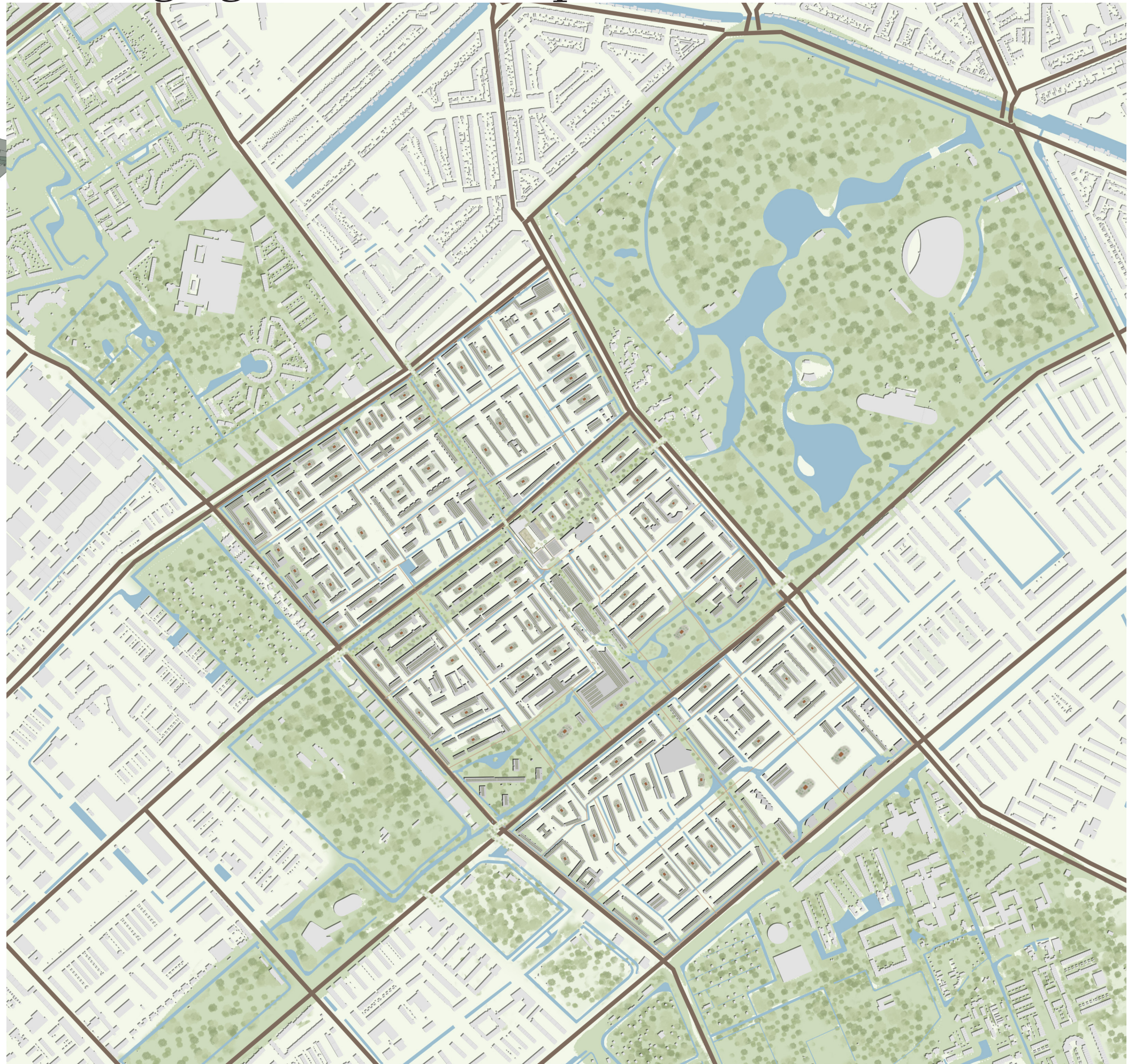
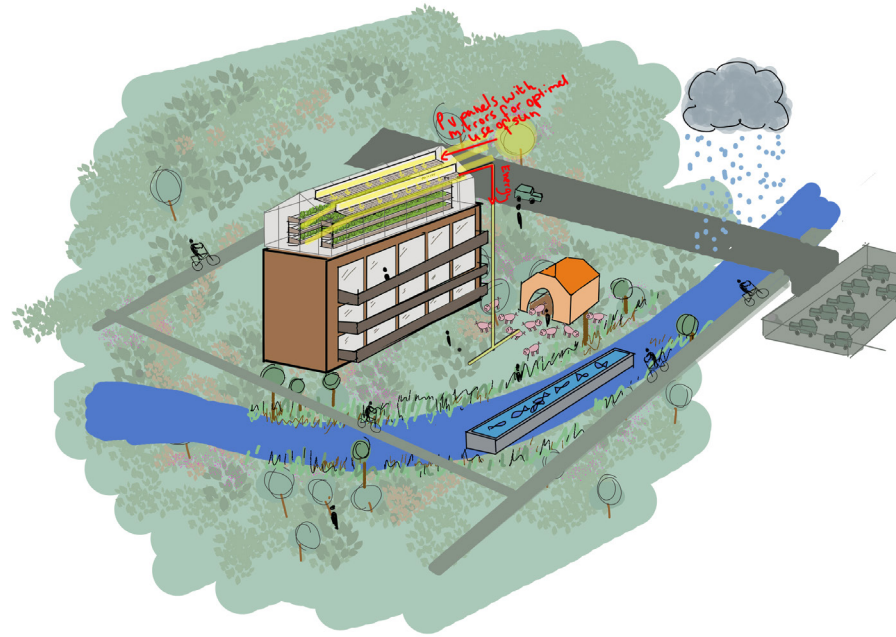
Changing the Cities: Step 4



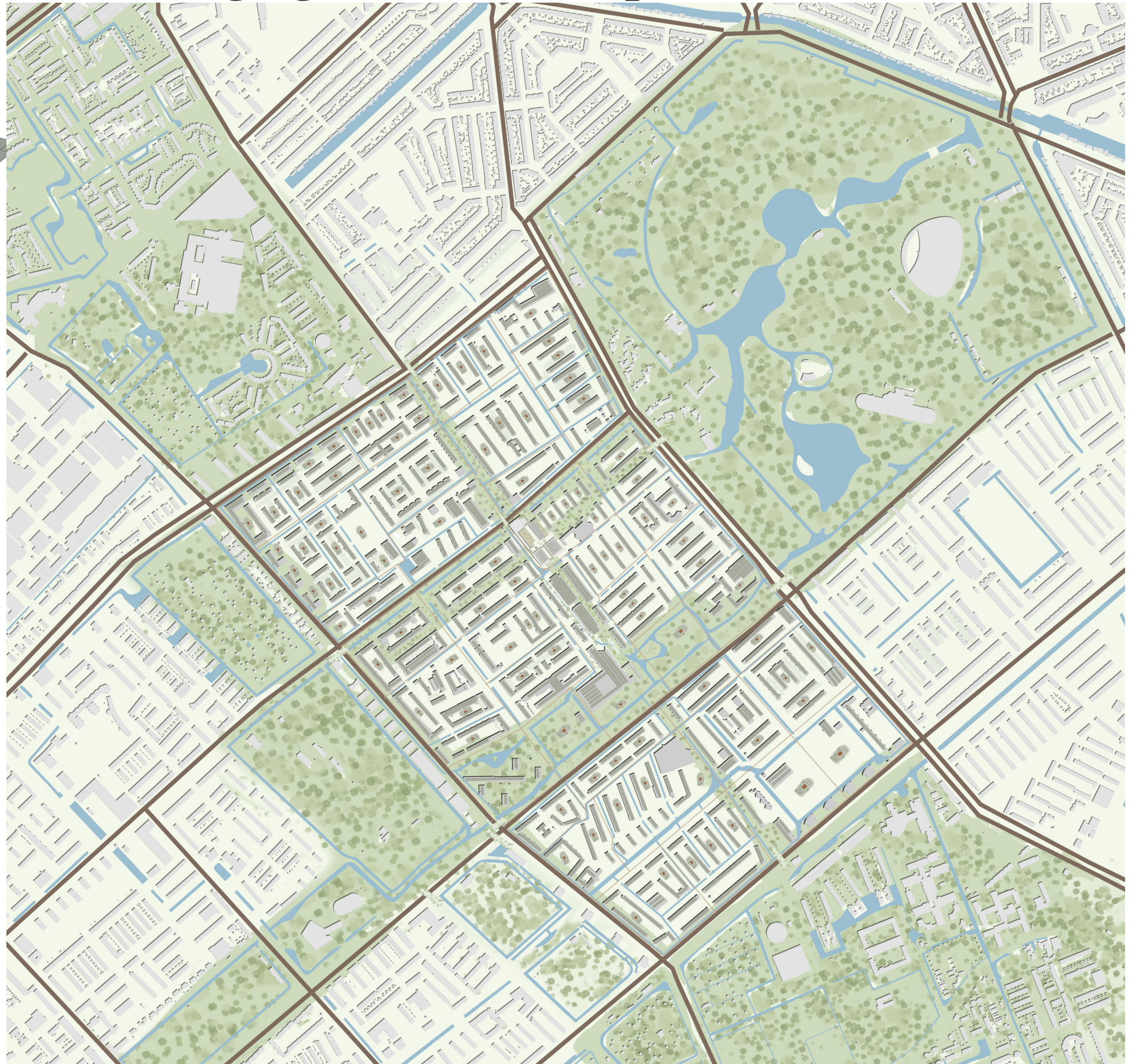
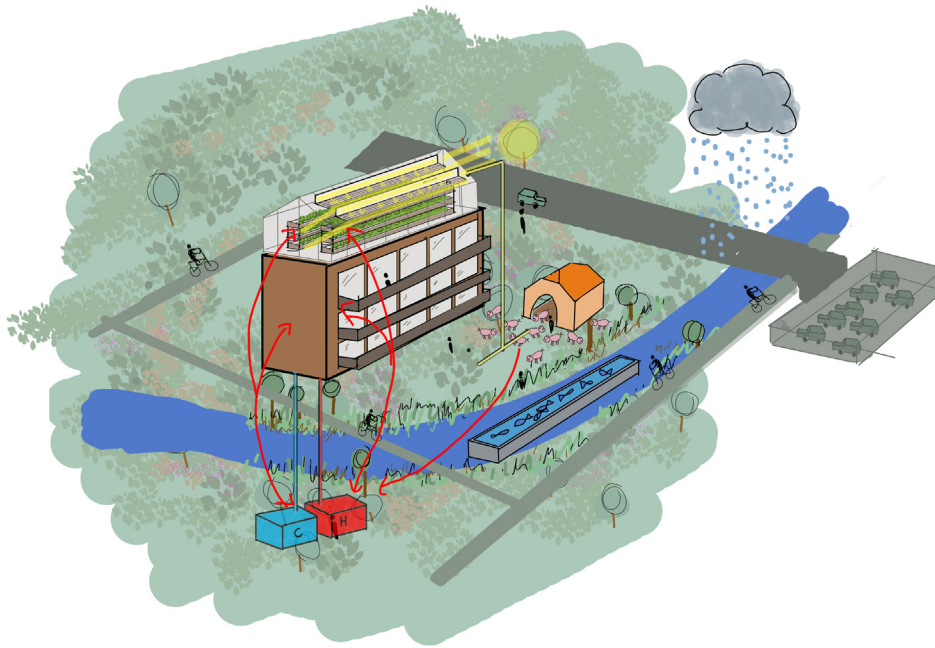
Changing the Cities: Step 5



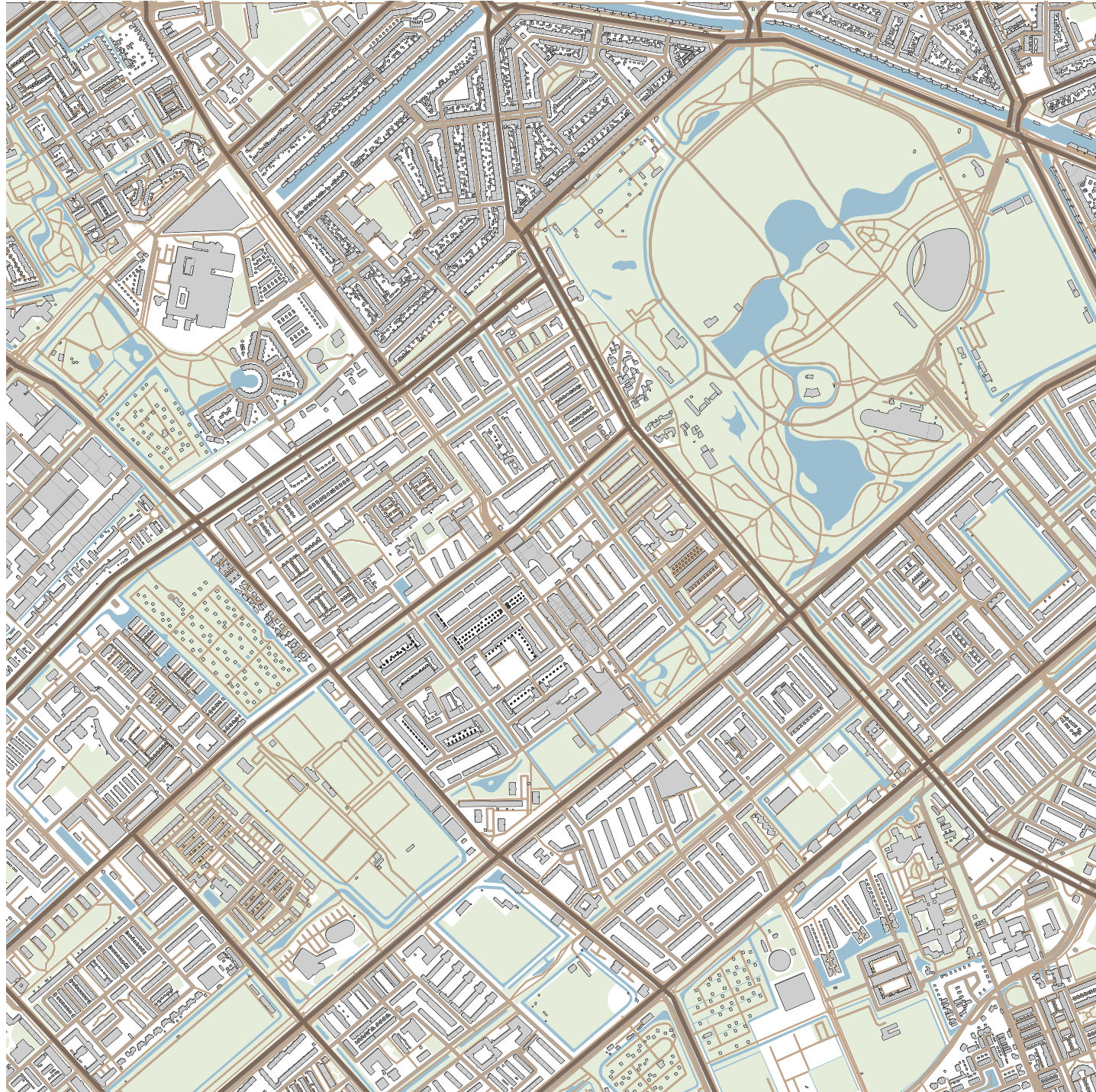
Changing the Cities: Step 6



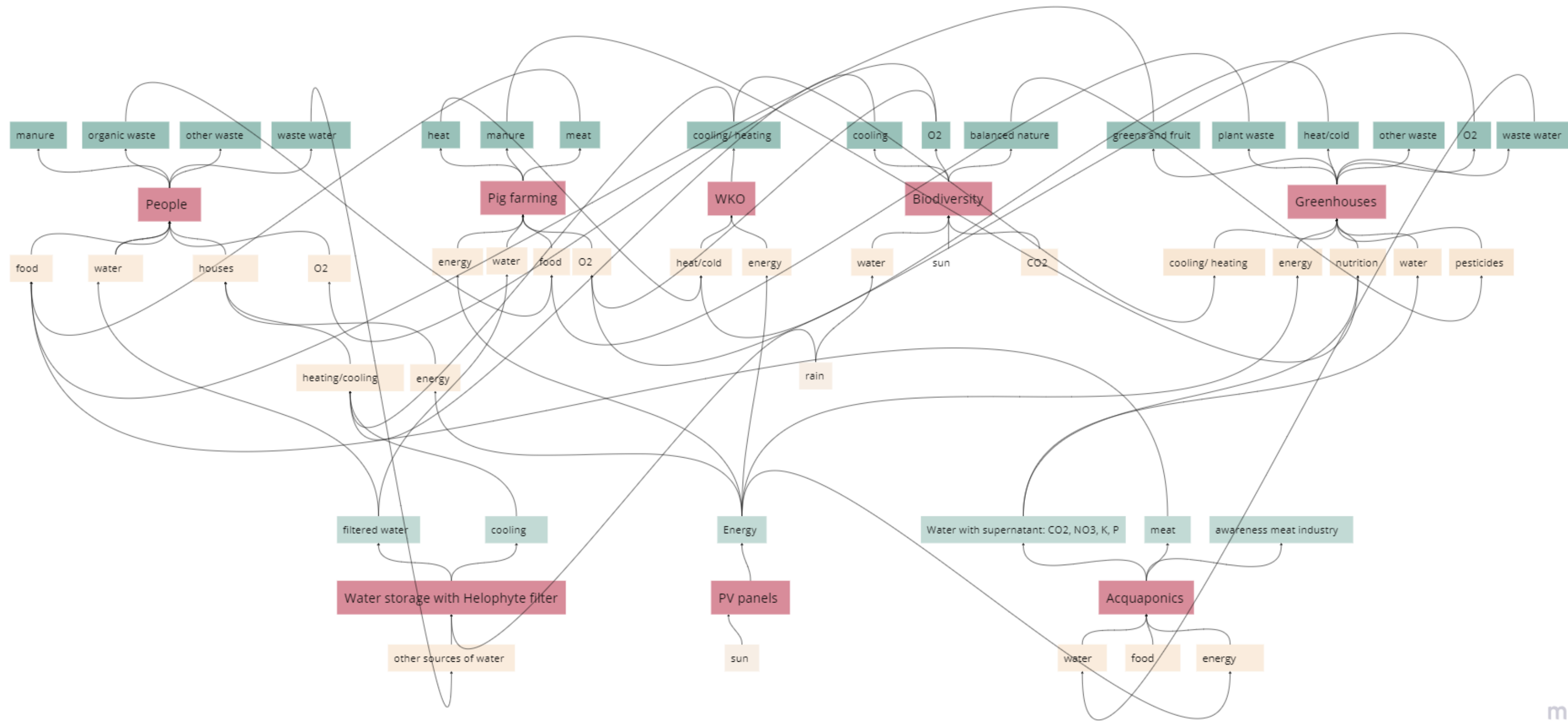
Changing the Cities: Step 7



Old vs New Context Morgenstond



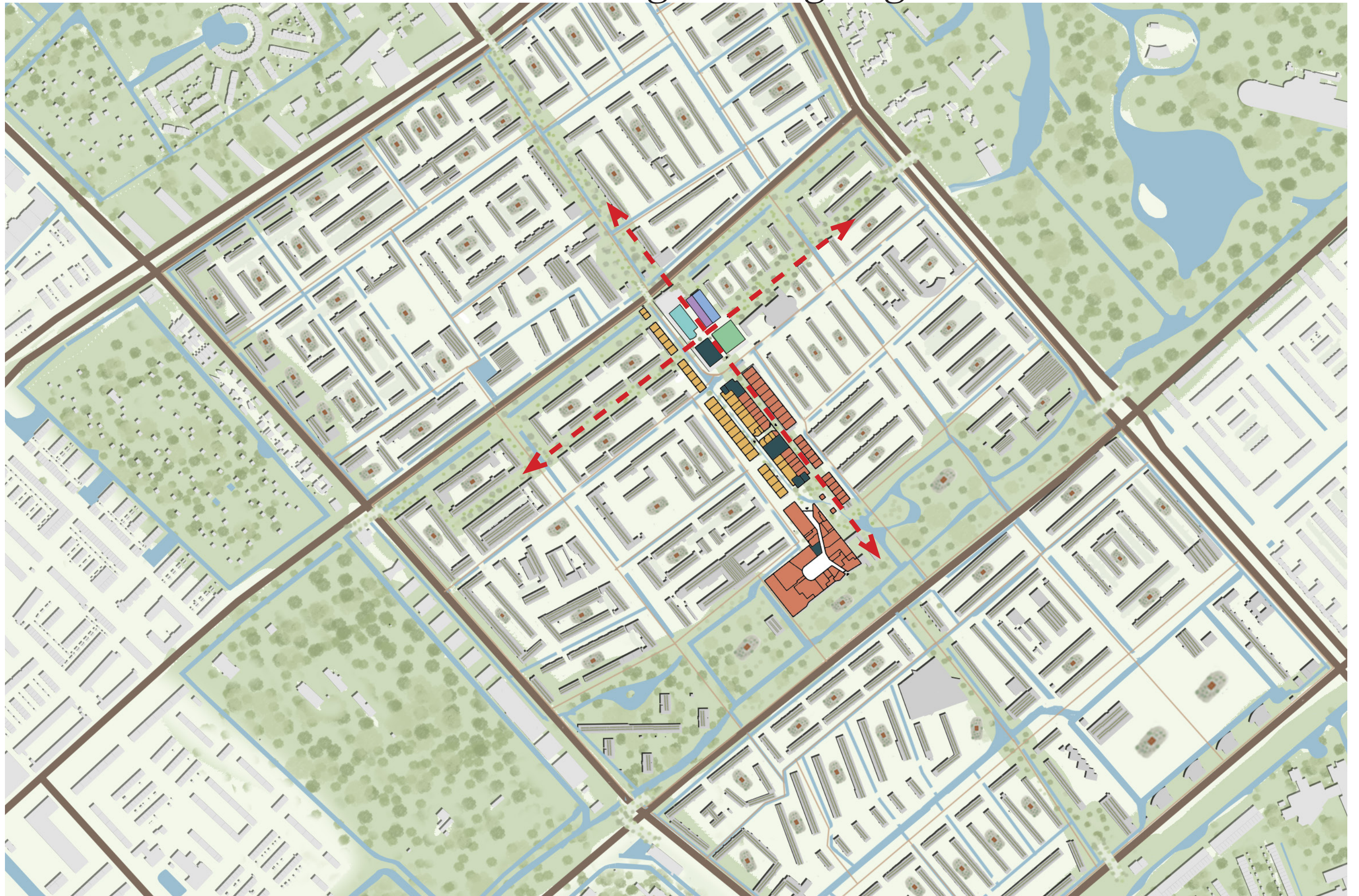
Closed Urban Farming Cycle Morgenstond



Winkelcentrum Leyweg Program



V&D: Vertical Farming & Designing for Nature

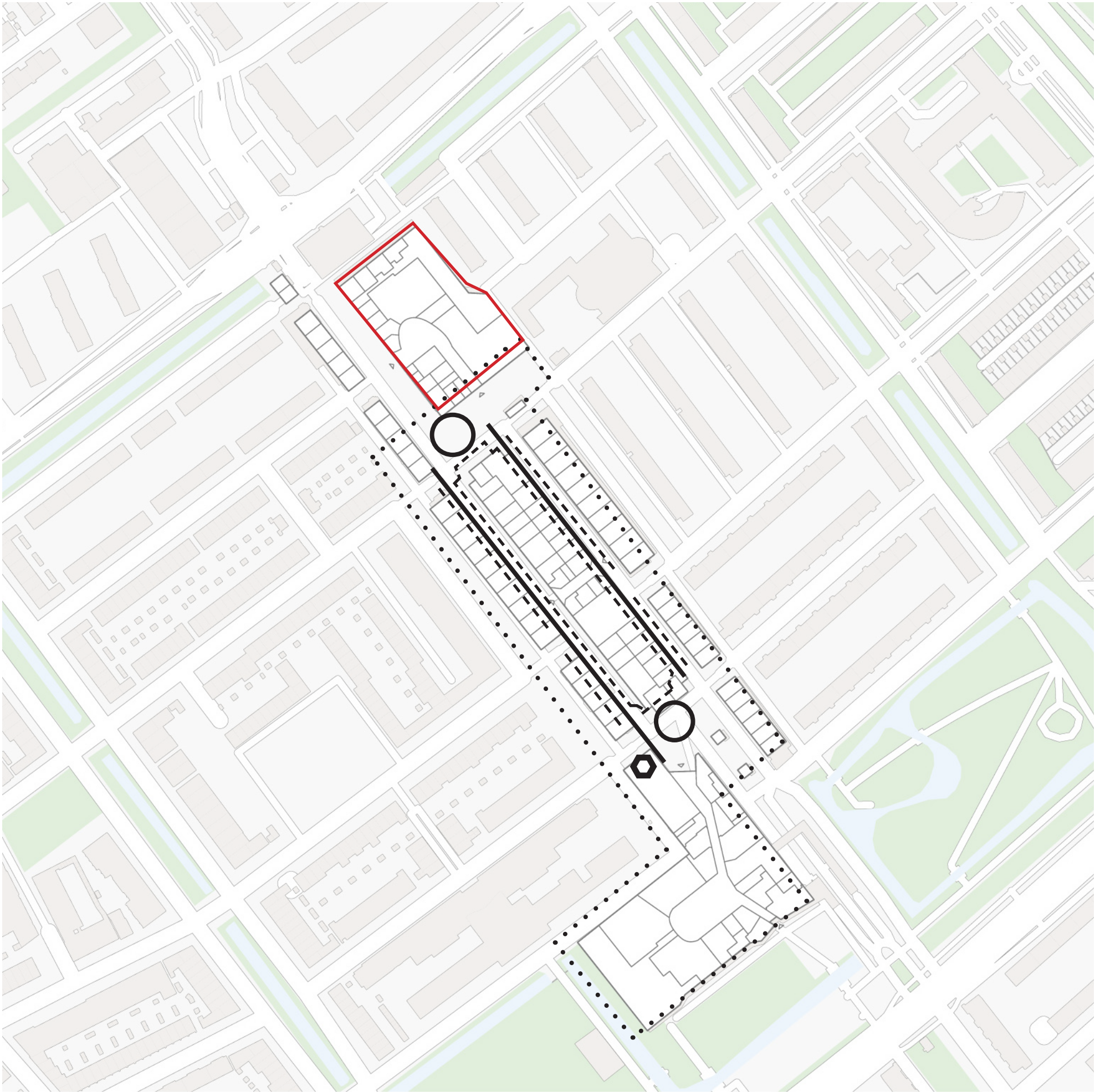


V&D: Vertical Farming & Designing for Nature



Value of the V&D

ECOLOGICAL SPIRITUAL ESSENTIAL EXISTENTIAL [COE,1975]	SOCIAL SPIRITUAL EMOTIONAL (IND.) EMOTIONAL (COL.) ALLEGORICAL [SPAB,1877]	ECONOMIC USE NON-USE ENTERTAINMENT ALLEGORICAL [COE,1966]
AGE SPIRITUAL ESSENTIAL EXISTENTIAL [SPAB,1877]	VALUES OTHER [1877-2005]	POLITICAL EDUCATIONAL MANAGEMENT ENTERTAINMENT SYMBOLIC [ICOMOS,1967]
SCIENTIFIC WORKMANSHIP TECHNOLOGICAL CONCEPTUAL [RIBA,1904]	AESTHETICAL ARTISTIC NOTABLE CONCEPTUAL EVIDENTIAL [SPAB,1877]	HISTORIC EDUCATIONAL HISTORIC-ARTISTIC HISTORIC-CONCEPTUAL SYMBOLIC ARCHAEOLOGICAL [SPAB,1877]



Value of the V&D

ECOLOGICAL SPIRITUAL ESSENTIAL EXISTENTIAL [COE,1975]	SOCIAL SPIRITUAL EMOTIONAL (IND.) EMOTIONAL (COL.) ALLEGORICAL [SPAB,1877]	ECONOMIC USE NON-USE ENTERTAINMENT ALLEGORICAL [COE,1966]
AGE SPIRITUAL ESSENTIAL EXISTENTIAL [SPAB,1877]	VALUES OTHER [1877-2005]	POLITICAL EDUCATIONAL MANAGEMENT ENTERTAINMENT SYMBOLIC [ICOMOS,1967]
SCIENTIFIC WORKMANSHIP TECHNOLOGICAL CONCEPTUAL [RIBA,1904]	AESTHETICAL ARTISTIC NOTABLE CONCEPTUAL EVIDENTIAL [SPAB,1877]	HISTORIC EDUCATIONAL HISTORIC-ARTISTIC HISTORIC-CONCEPTUAL SYMBOLIC ARCHAEOLOGICAL [SPAB,1877]



Value of the V&D

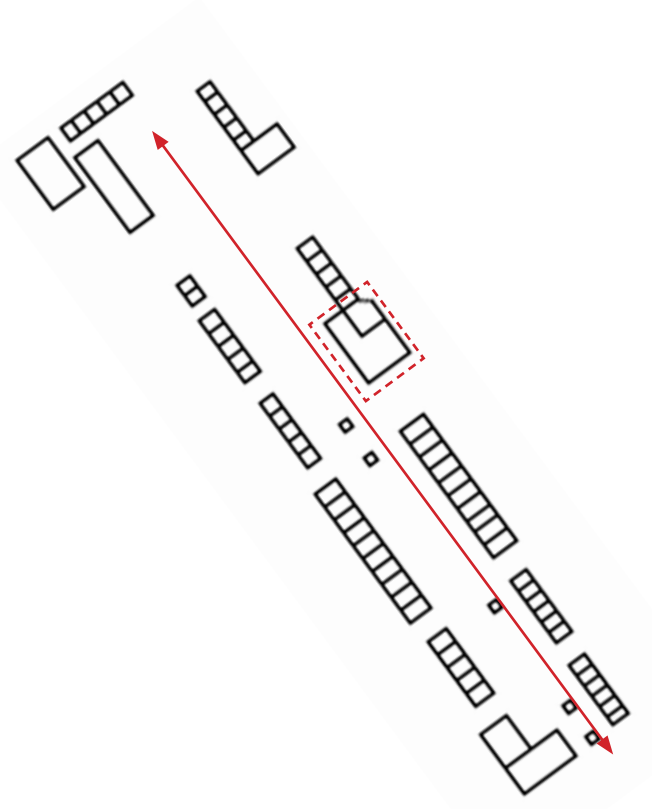
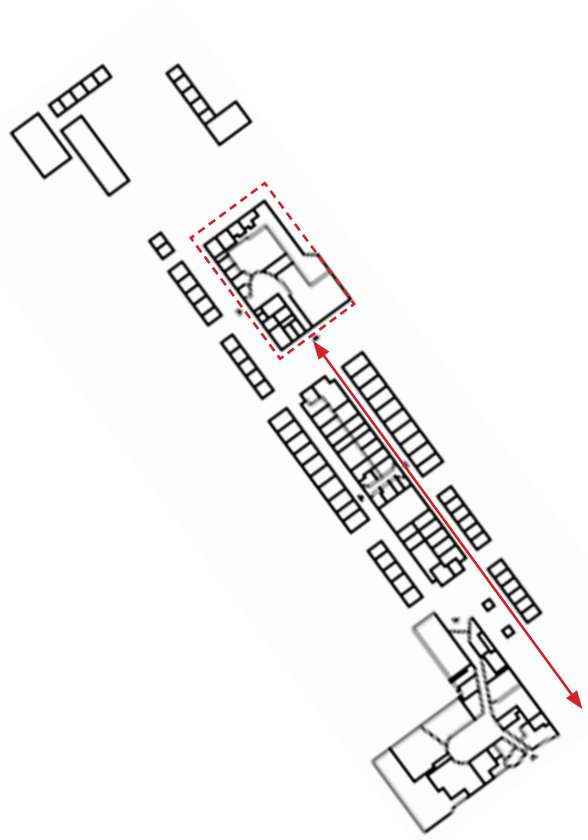


Value of the V&D



Value of the V&D

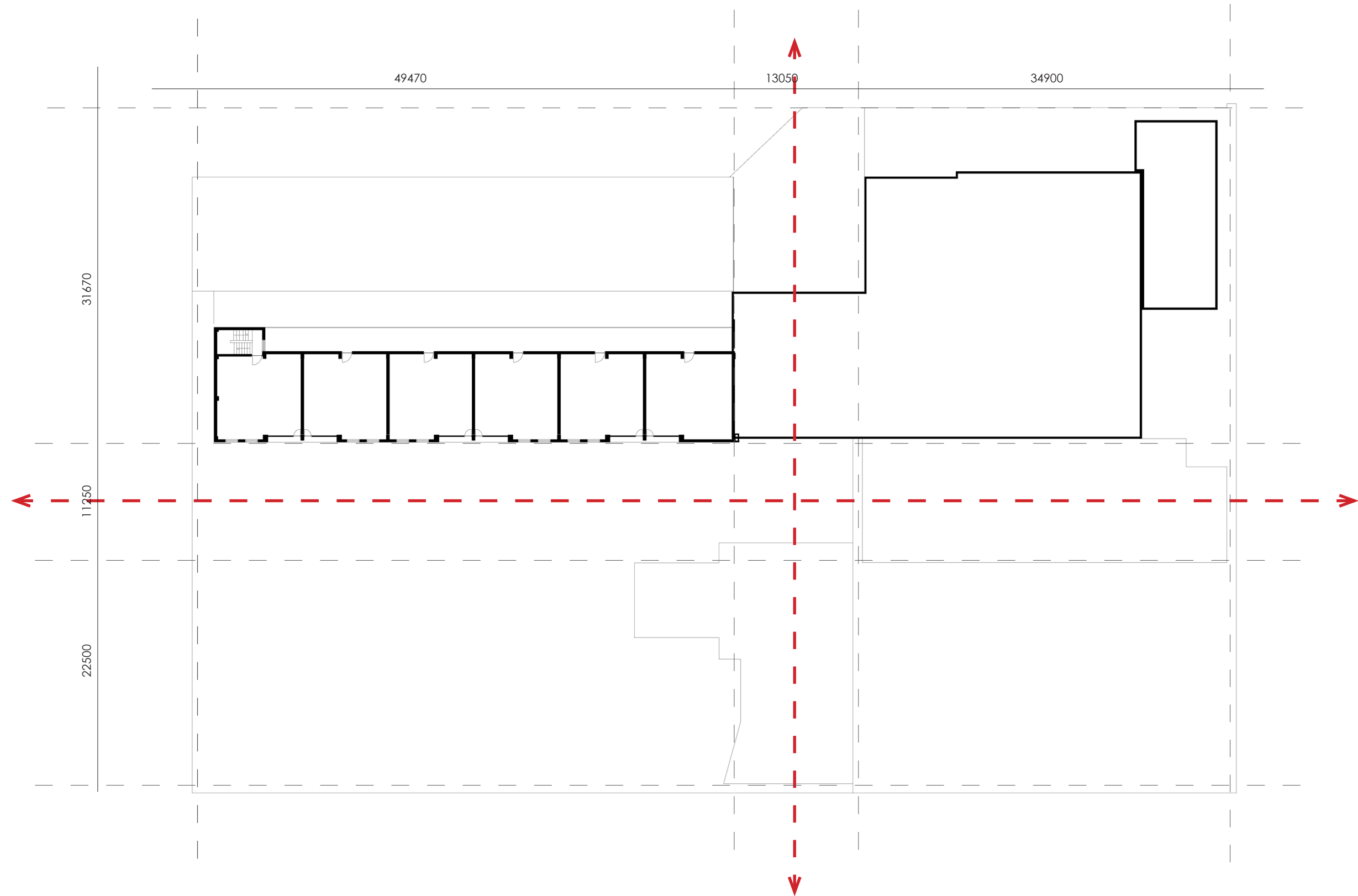
ECOLOGICAL SPIRITUAL ESSENTIAL EXISTENTIAL [COE,1975]	SOCIAL SPIRITUAL EMOTIONAL (IND.) EMOTIONAL (COL.) ALLEGORICAL [SPAB,1877]	ECONOMIC USE NON-USE ENTERTAINMENT ALLEGORICAL [COE,1966]
AGE SPIRITUAL ESSENTIAL EXISTENTIAL [SPAB,1877]	VALUES OTHER [1877-2005]	POLITICAL EDUCATIONAL MANAGEMENT ENTERTAINMENT SYMBOLIC [ICOMOS,1967]
SCIENTIFIC WORKMANSHIP TECHNOLOGICAL CONCEPTUAL [RIBA,1904]	AESTHETICAL ARTISTIC NOTABLE CONCEPTUAL EVIDENTIAL [SPAB,1877]	HISTORIC EDUCATIONAL HISTORIC-ARTISTIC HISTORIC-CONCEPTUAL SYMBOLIC ARCHAEOLOGICAL [SPAB,1877]



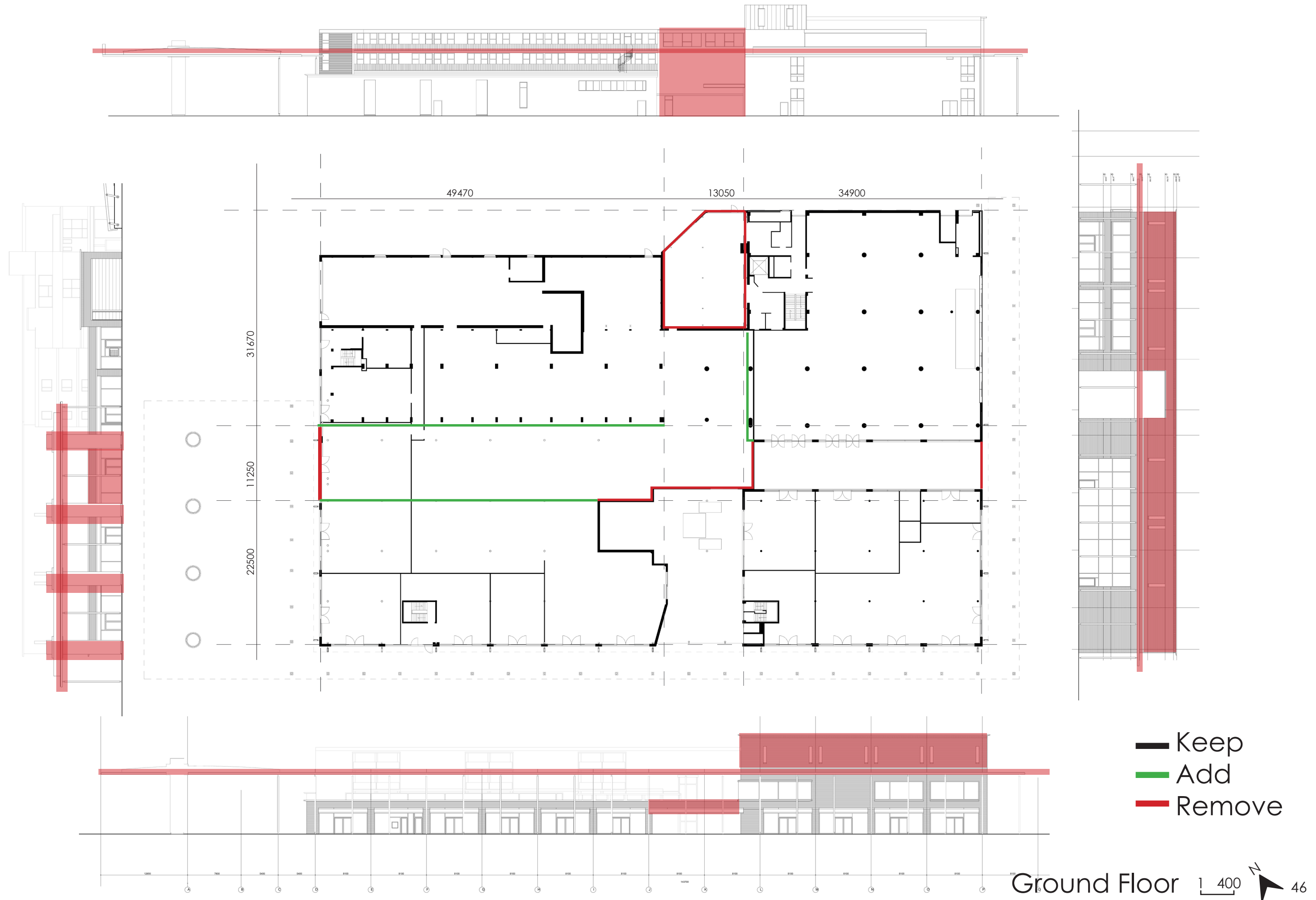
Value of the V&D



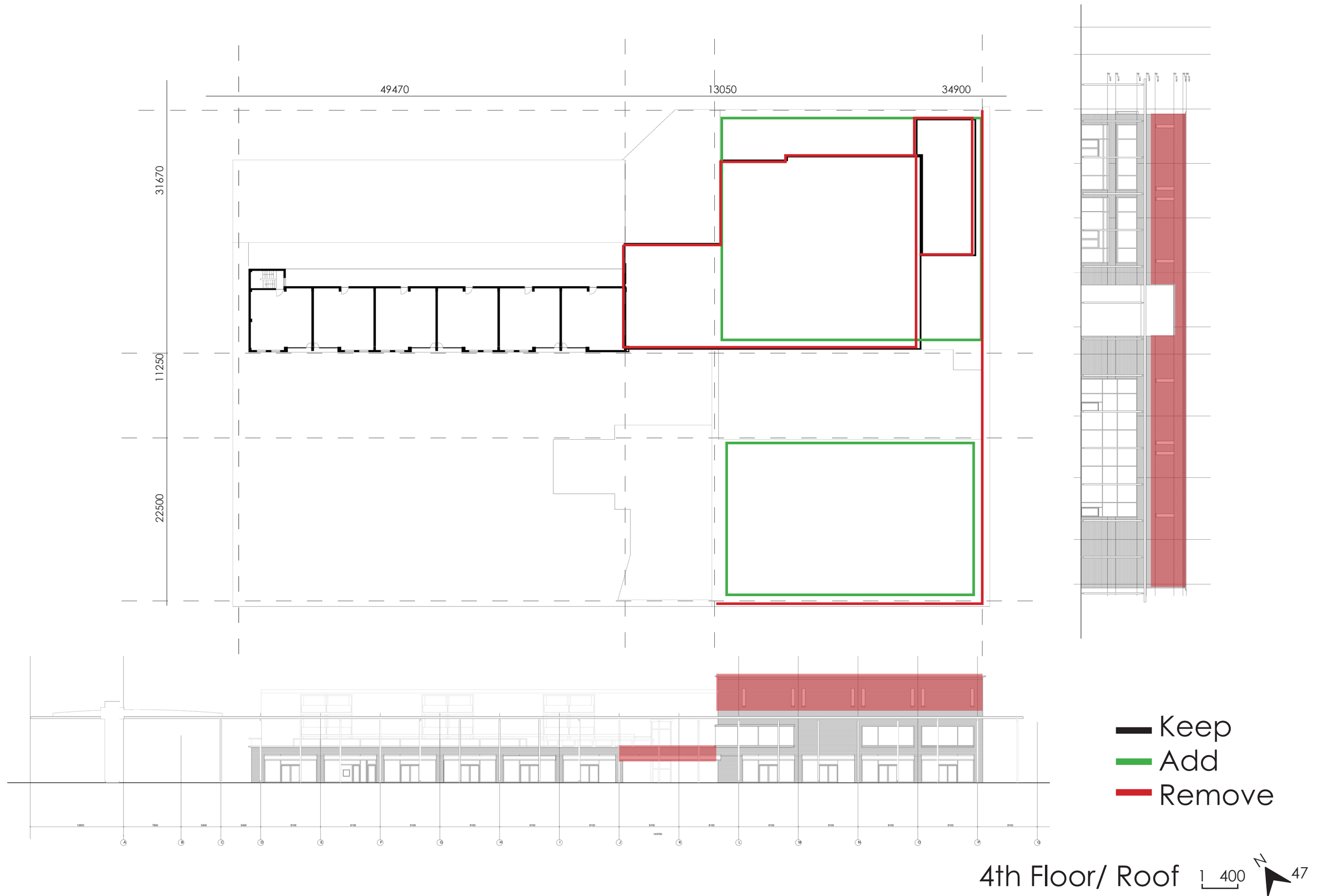
Keep, Add and Remove V&D



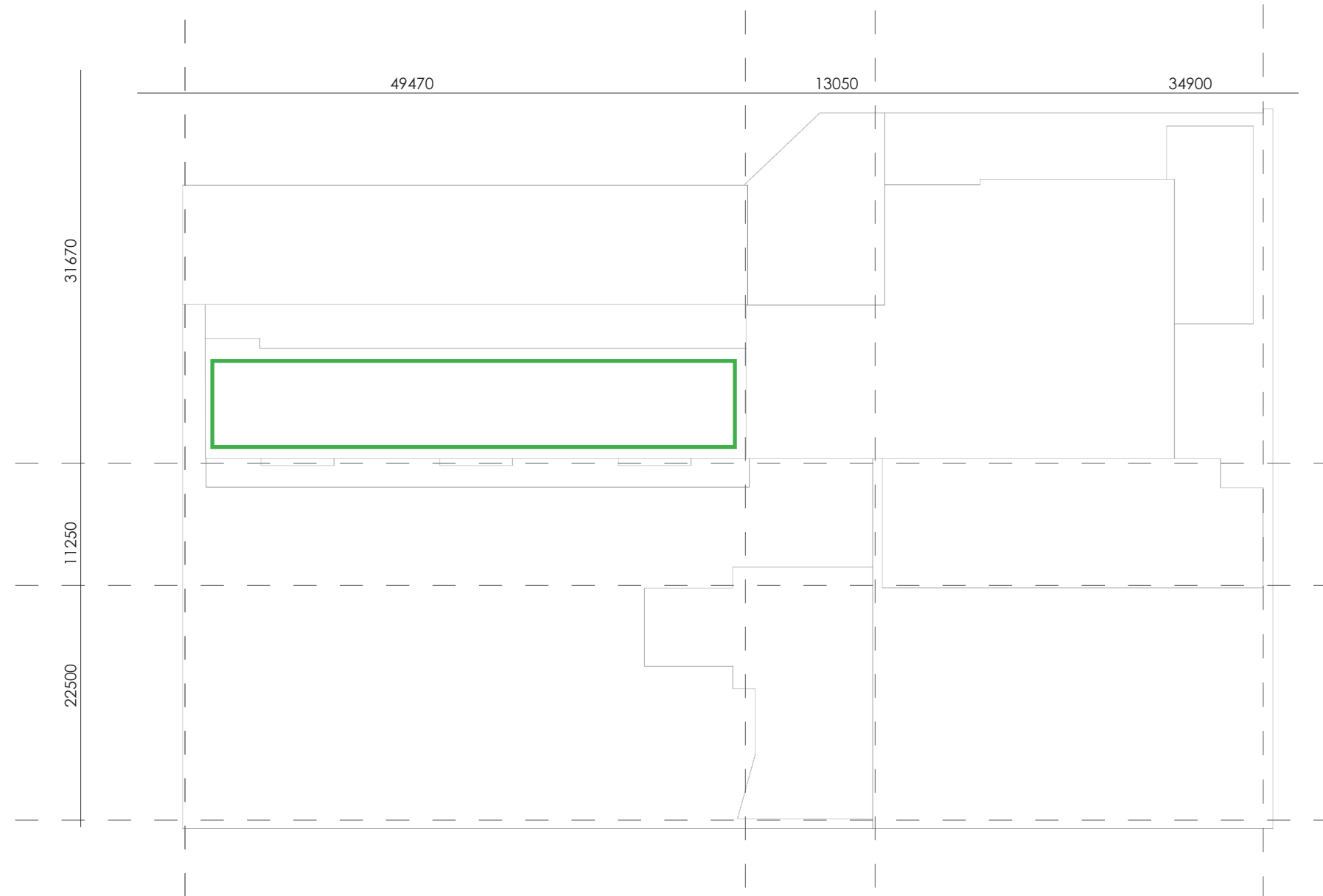
Keep, Add and Remove V&D



Keep, Add and Remove V&D



Keep, Add and Remove V&D

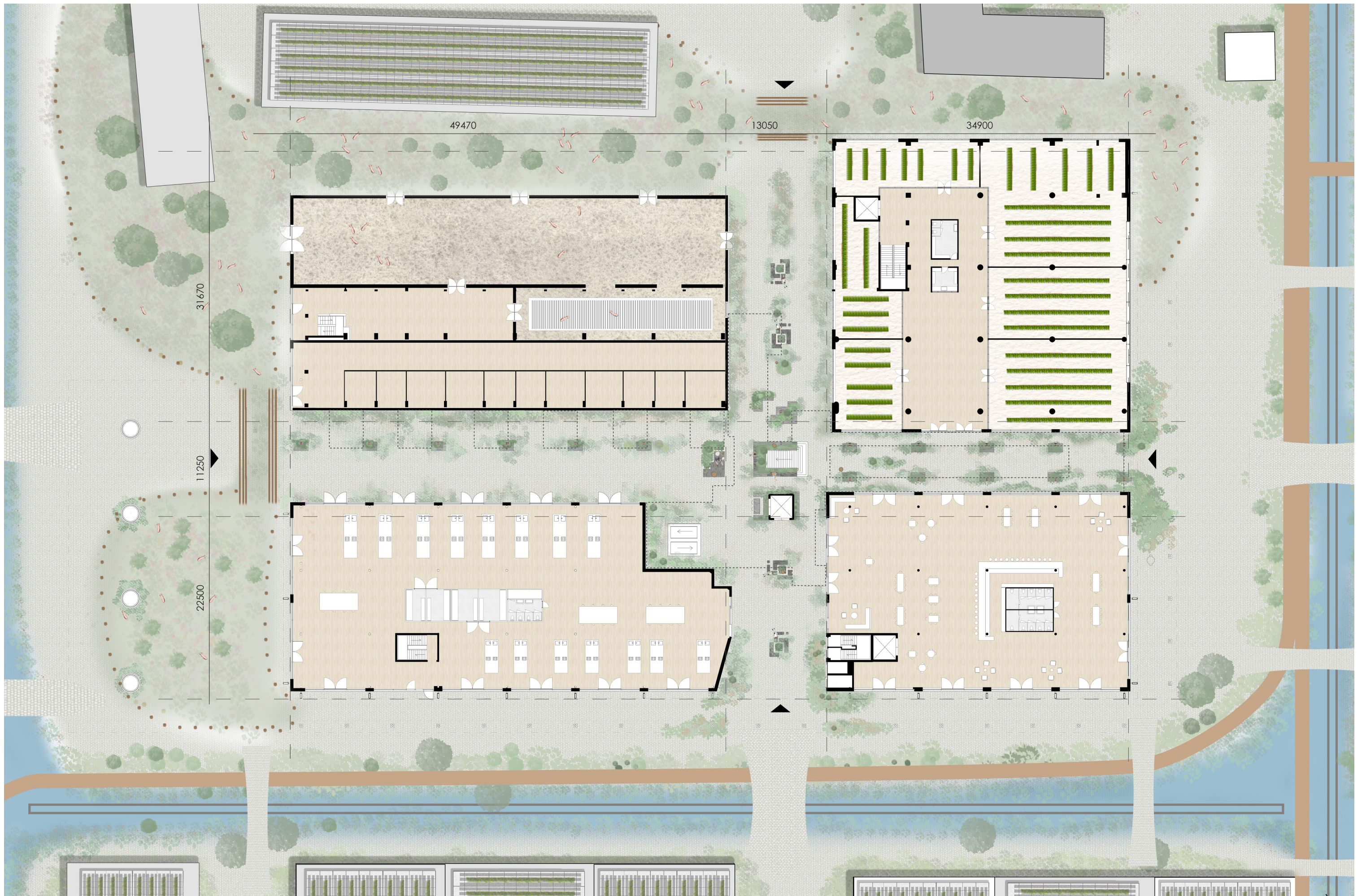


- Keep
- Add
- Remove

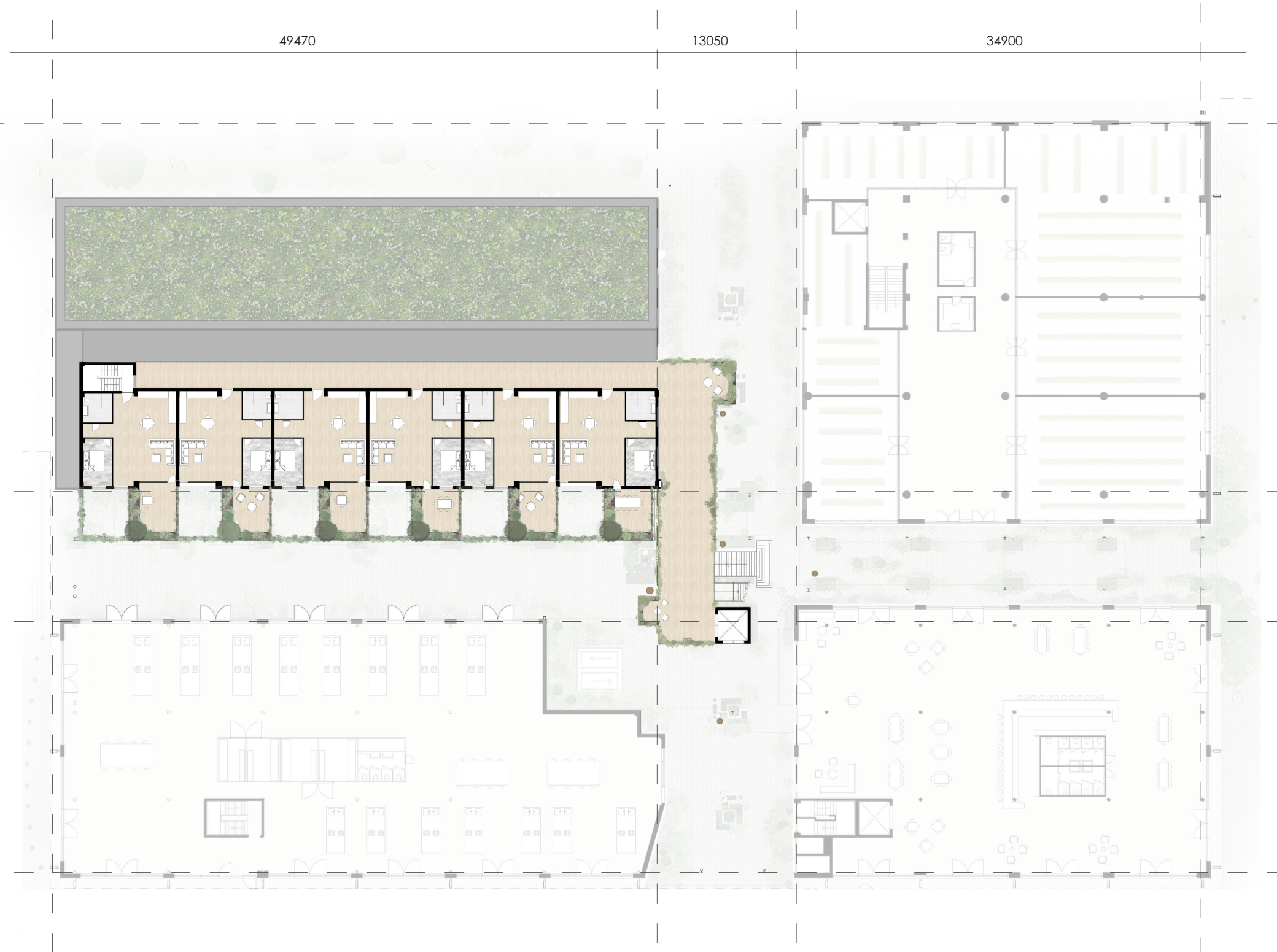
Context V&D



Functions V&D



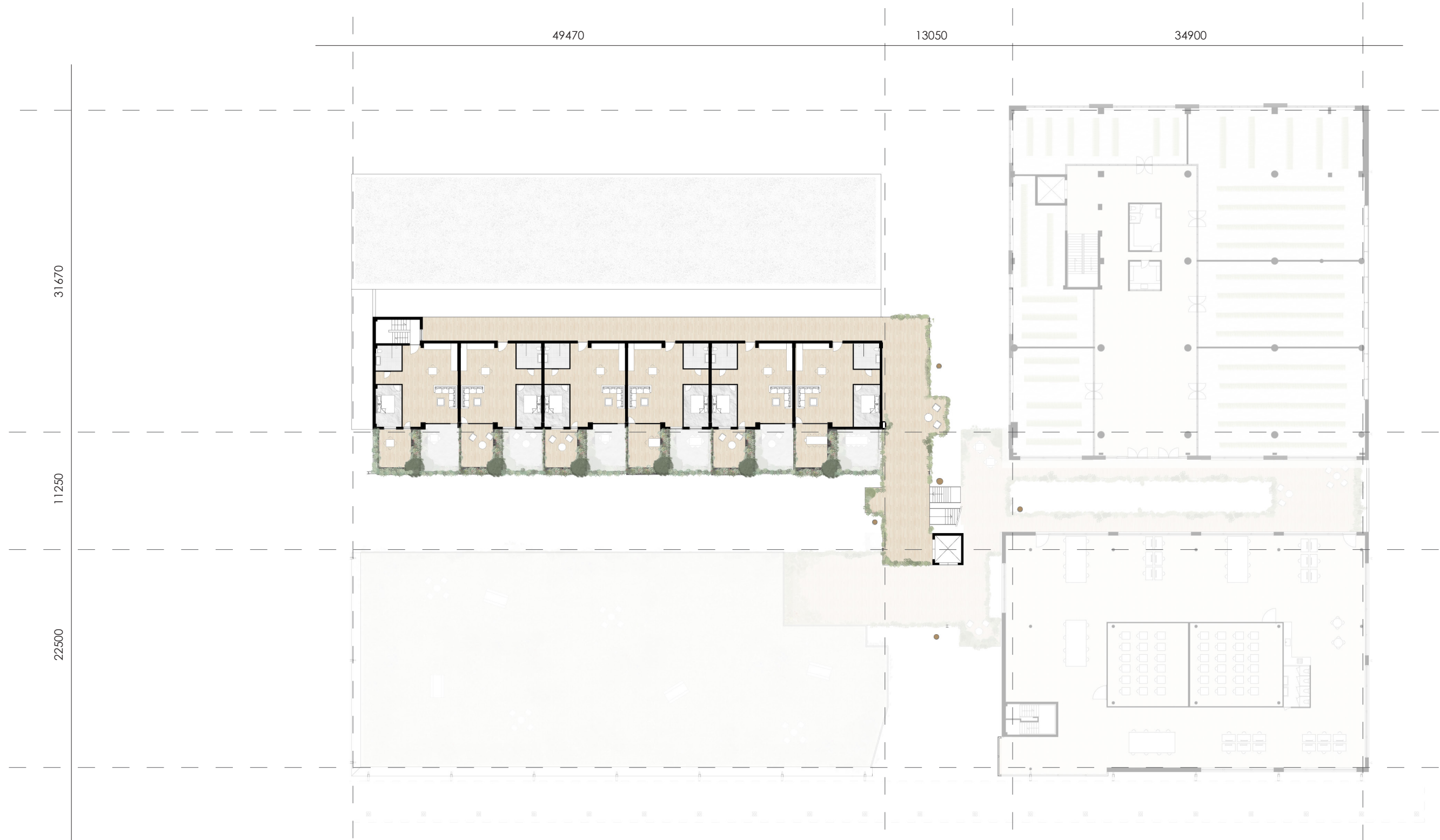
Functions V&D



Functions V&D



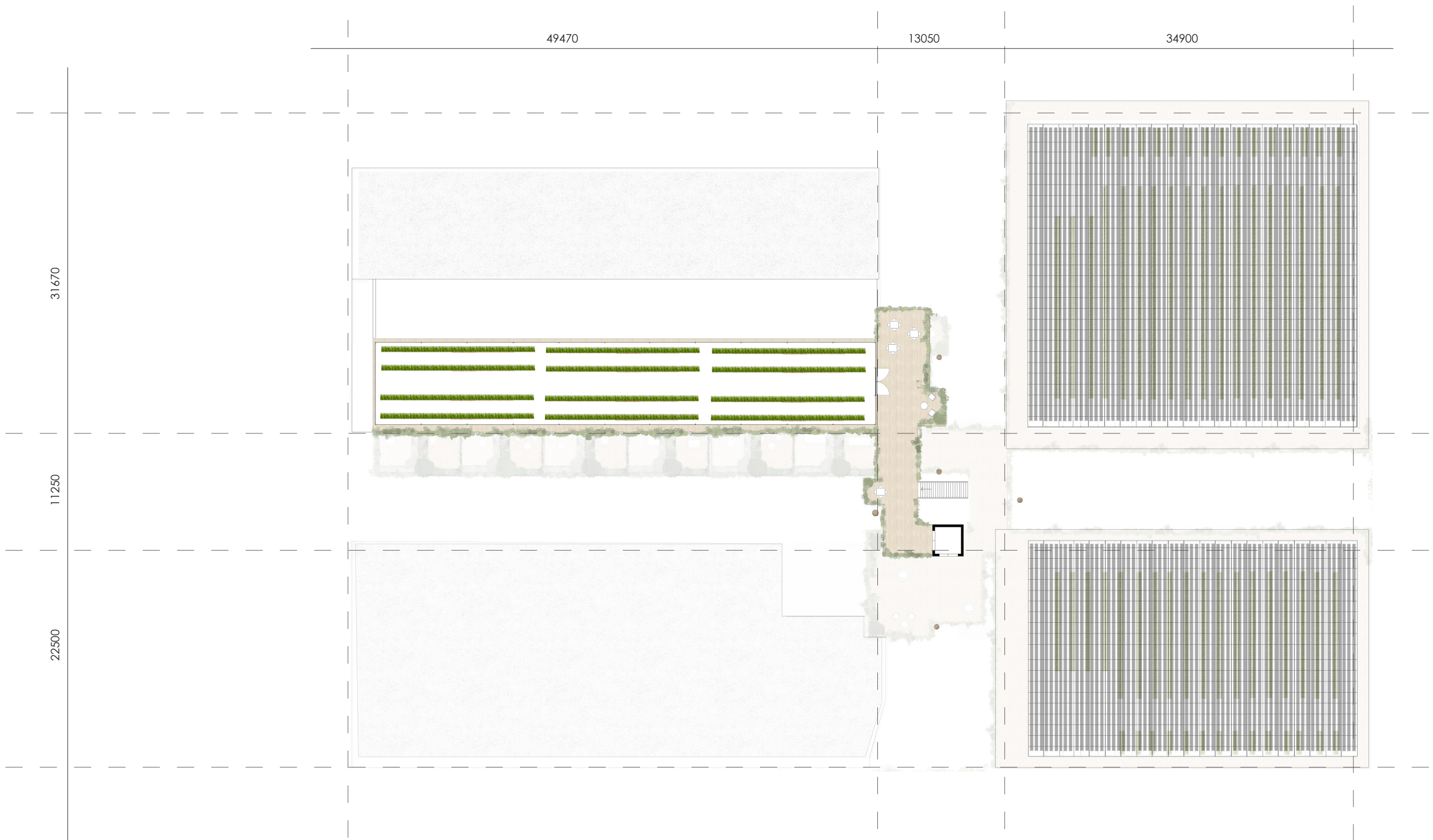
Functions V&D



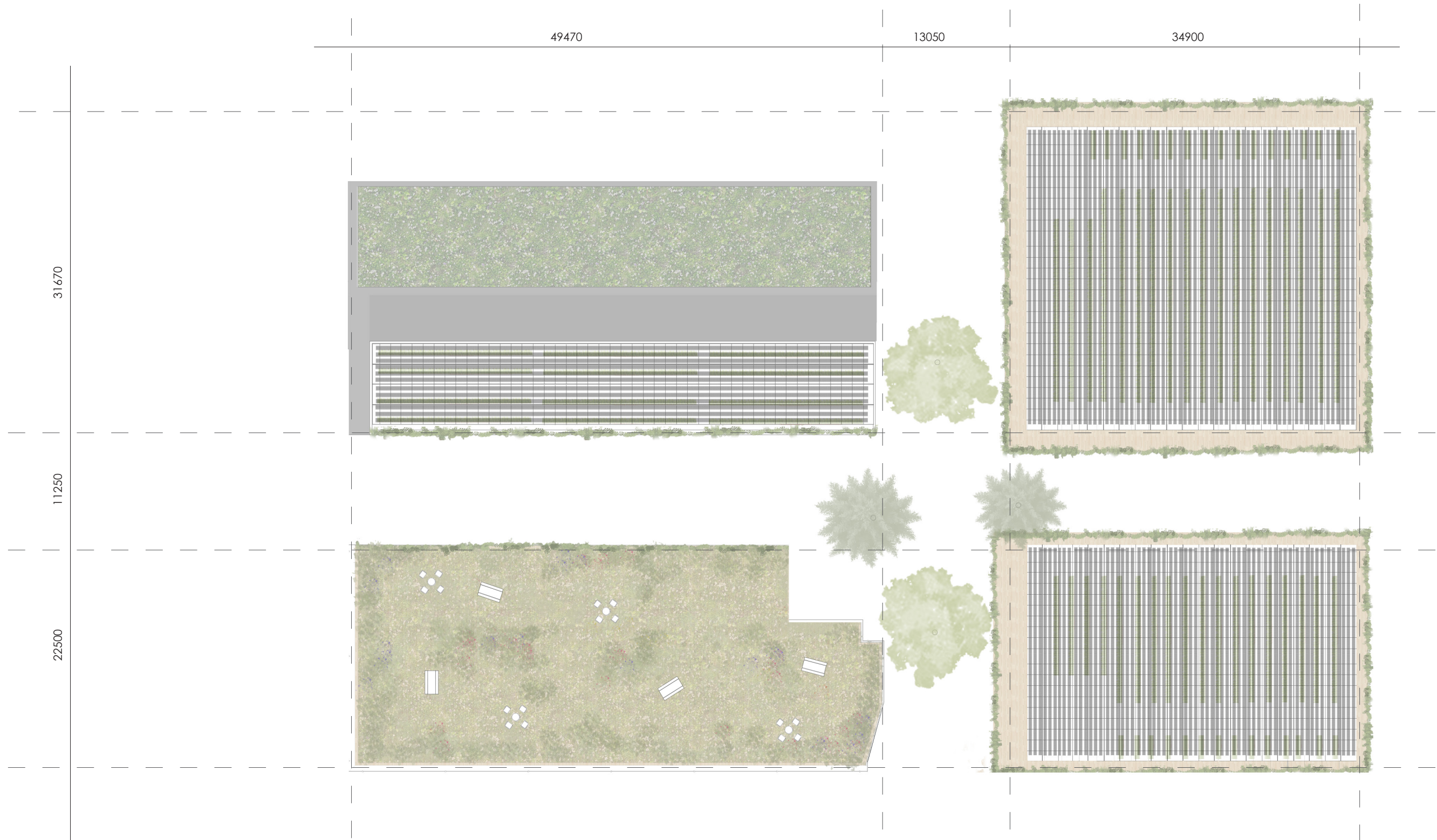
Functions V&D



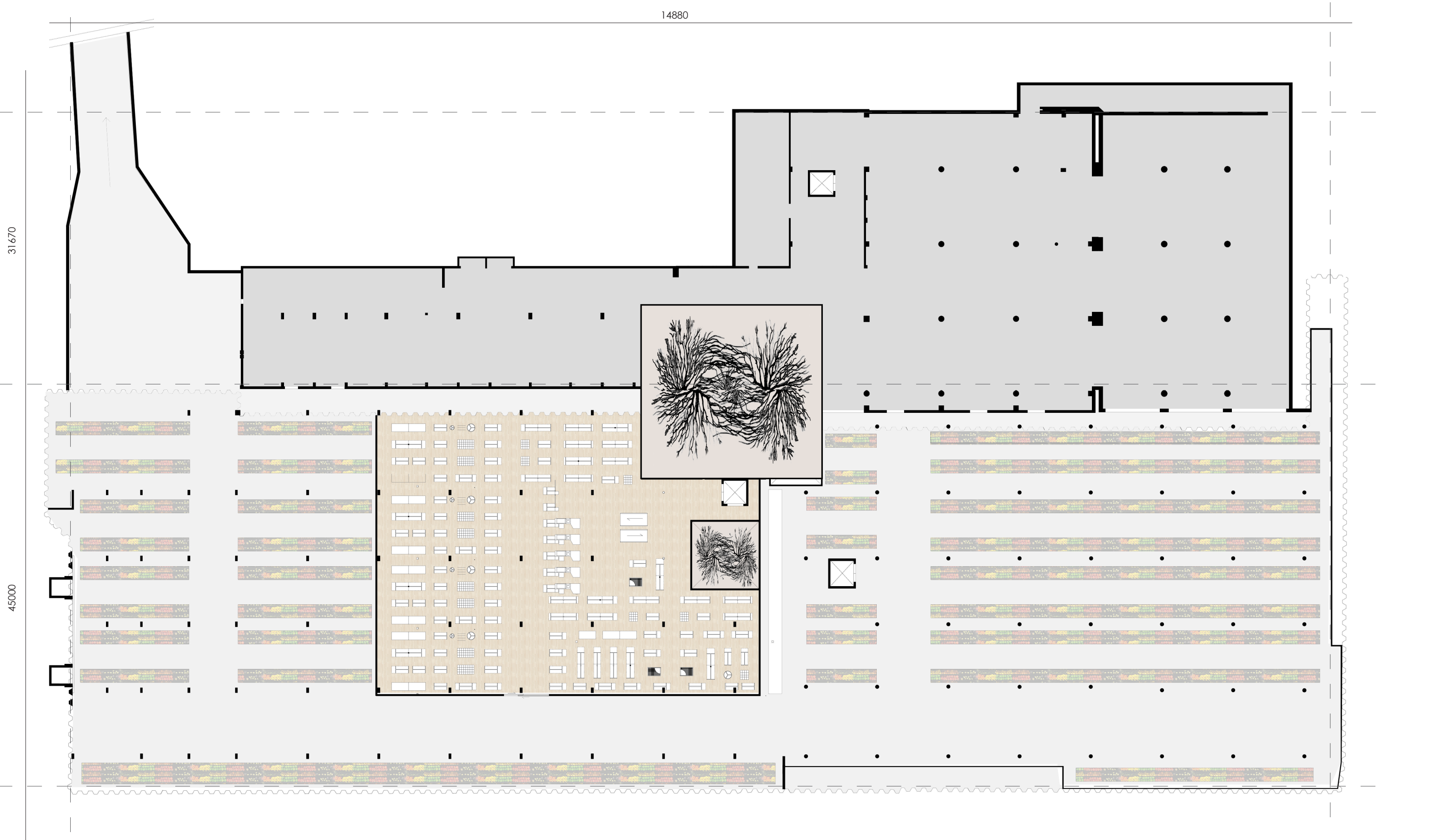
Functions V&D



Functions V&D

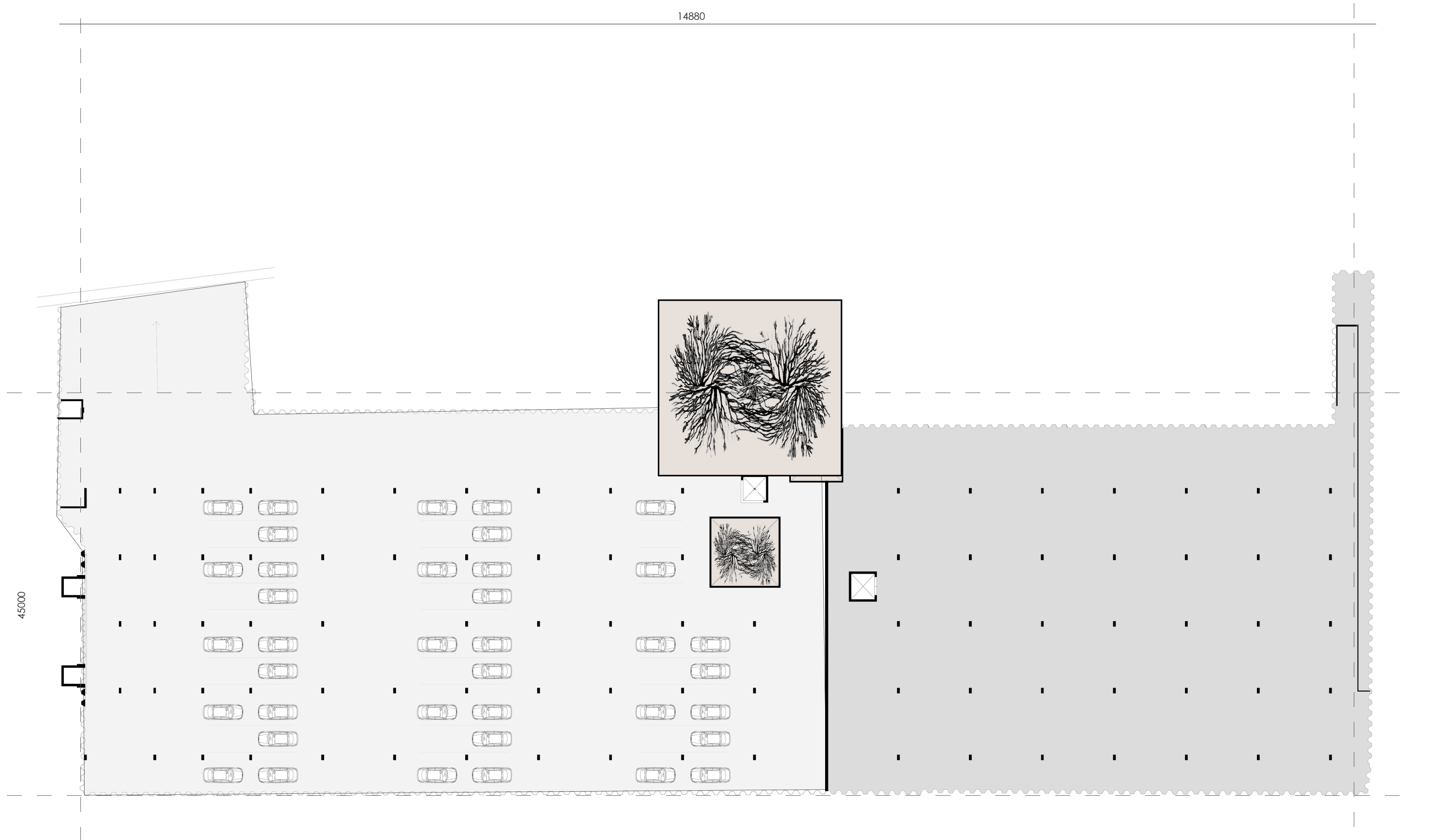


Functions V&D

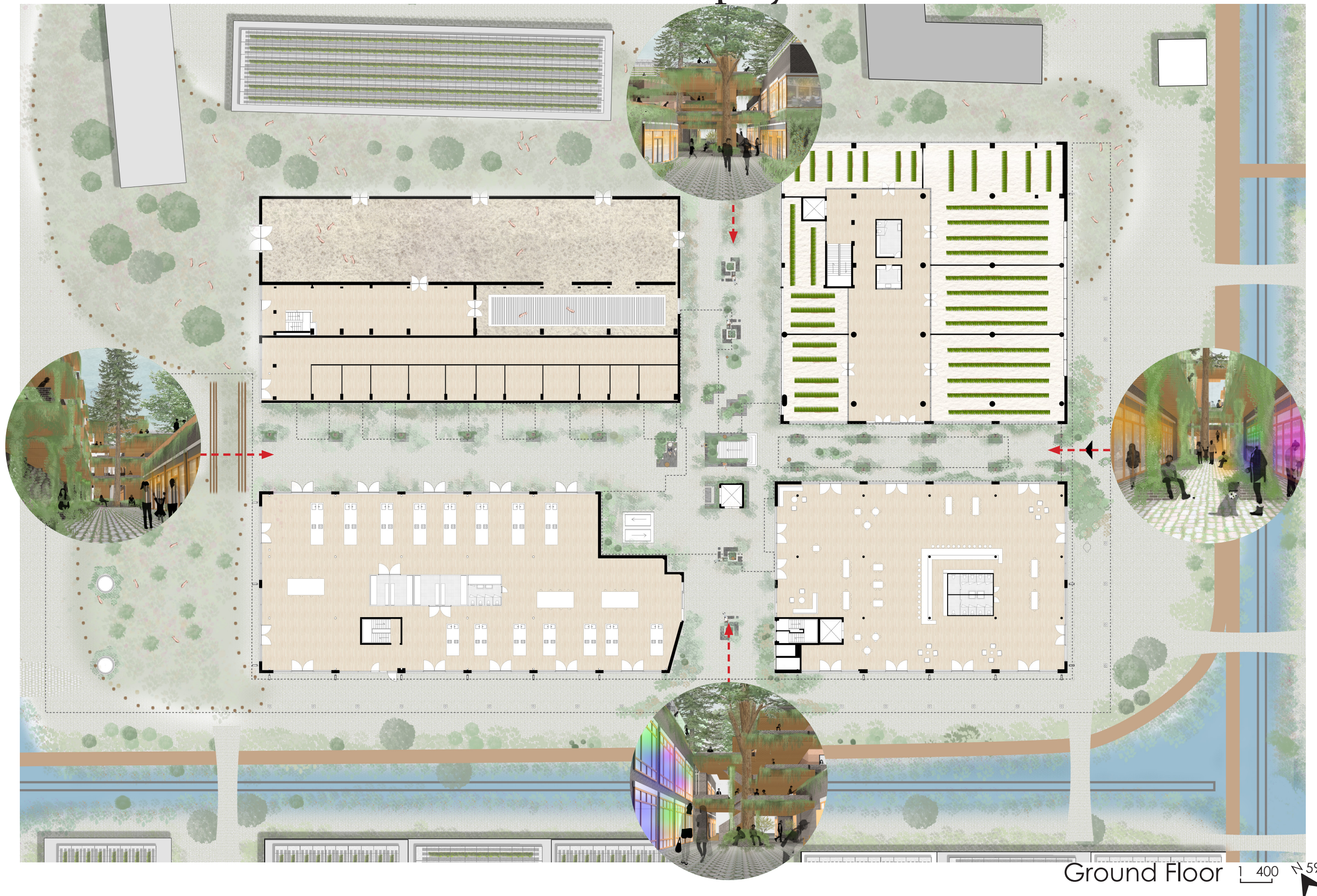


Functions V&D

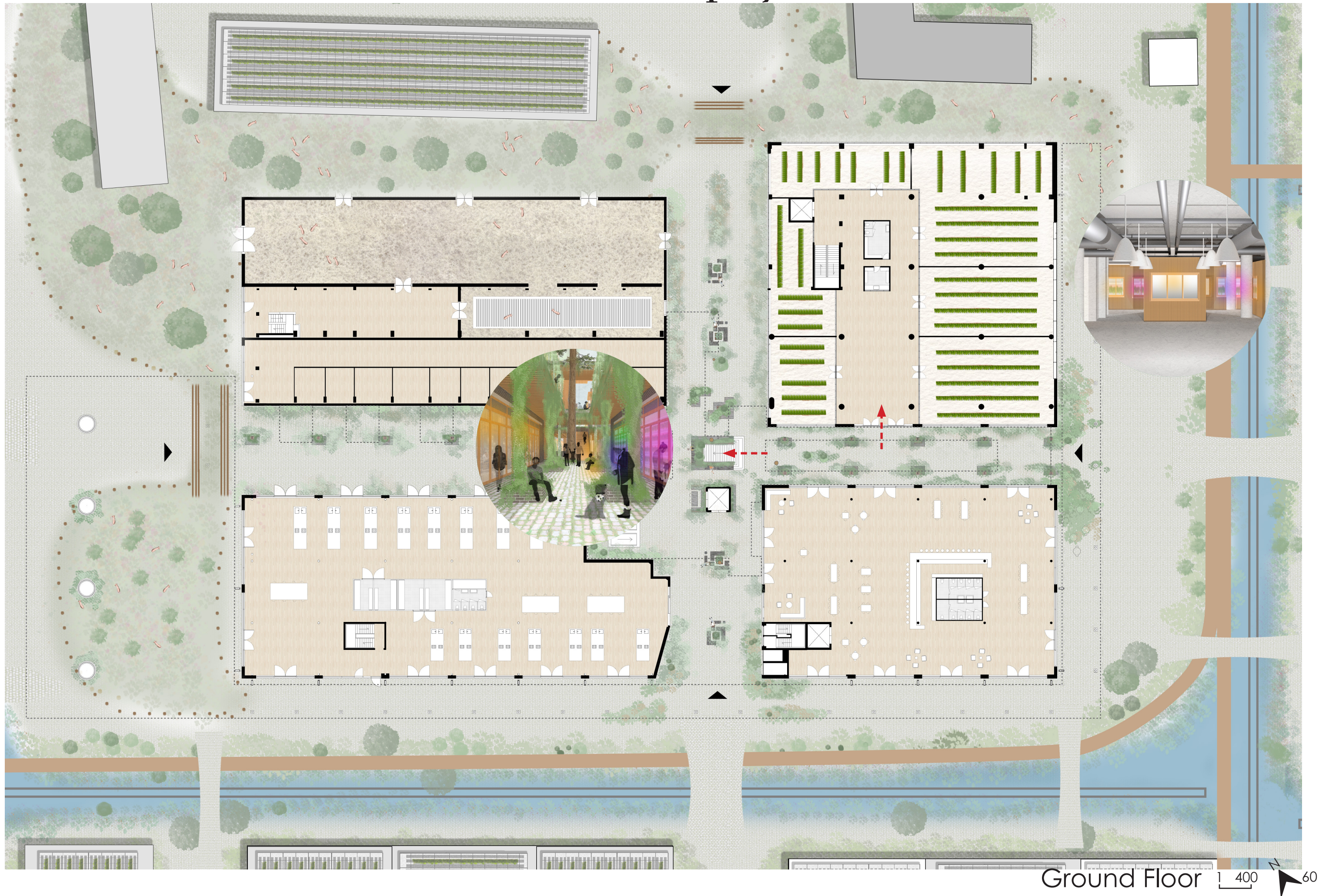
14880



Use of V&D: Employee



Use of V&D: Employee



Use of V&D: Employee



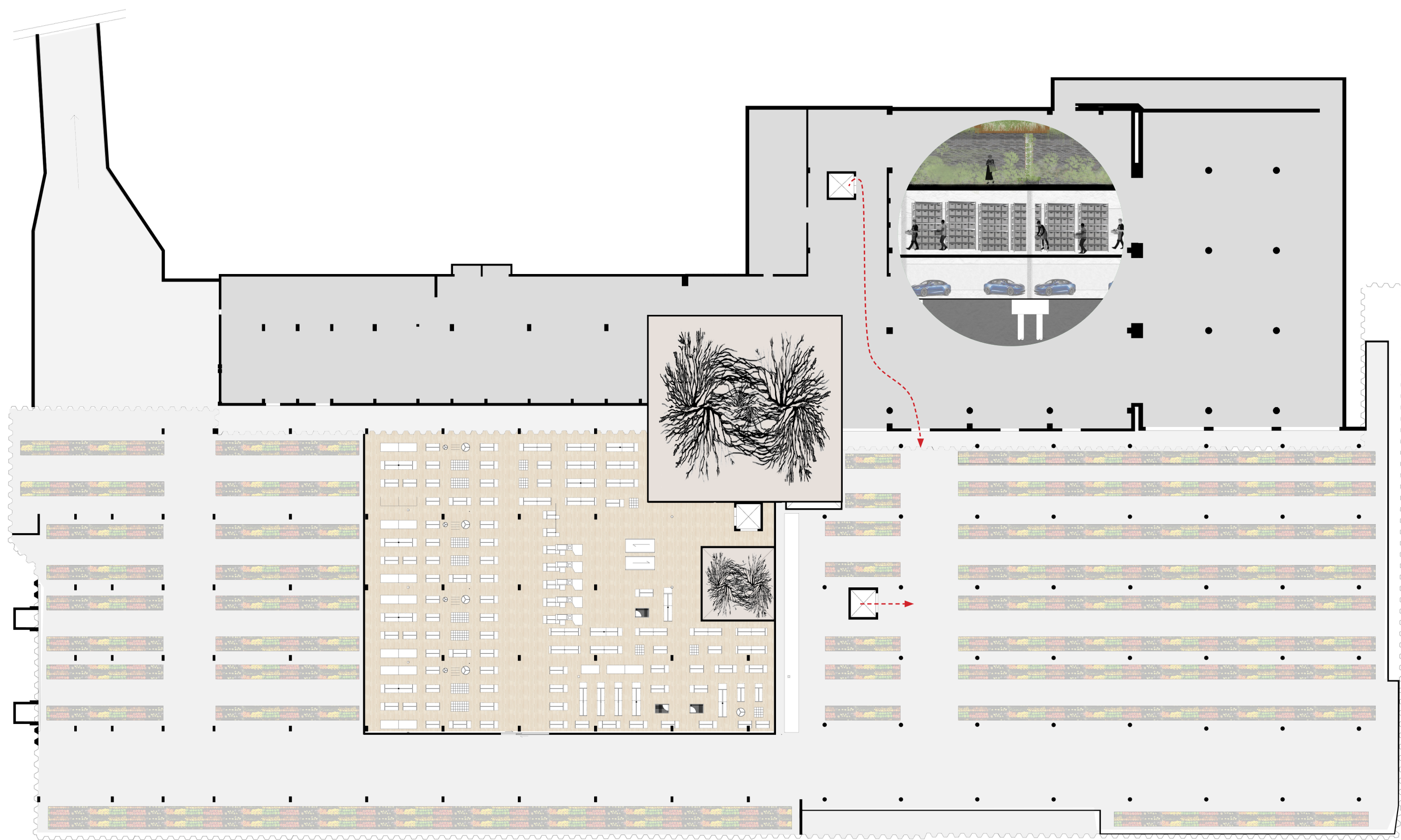
Use of V&D: Employee



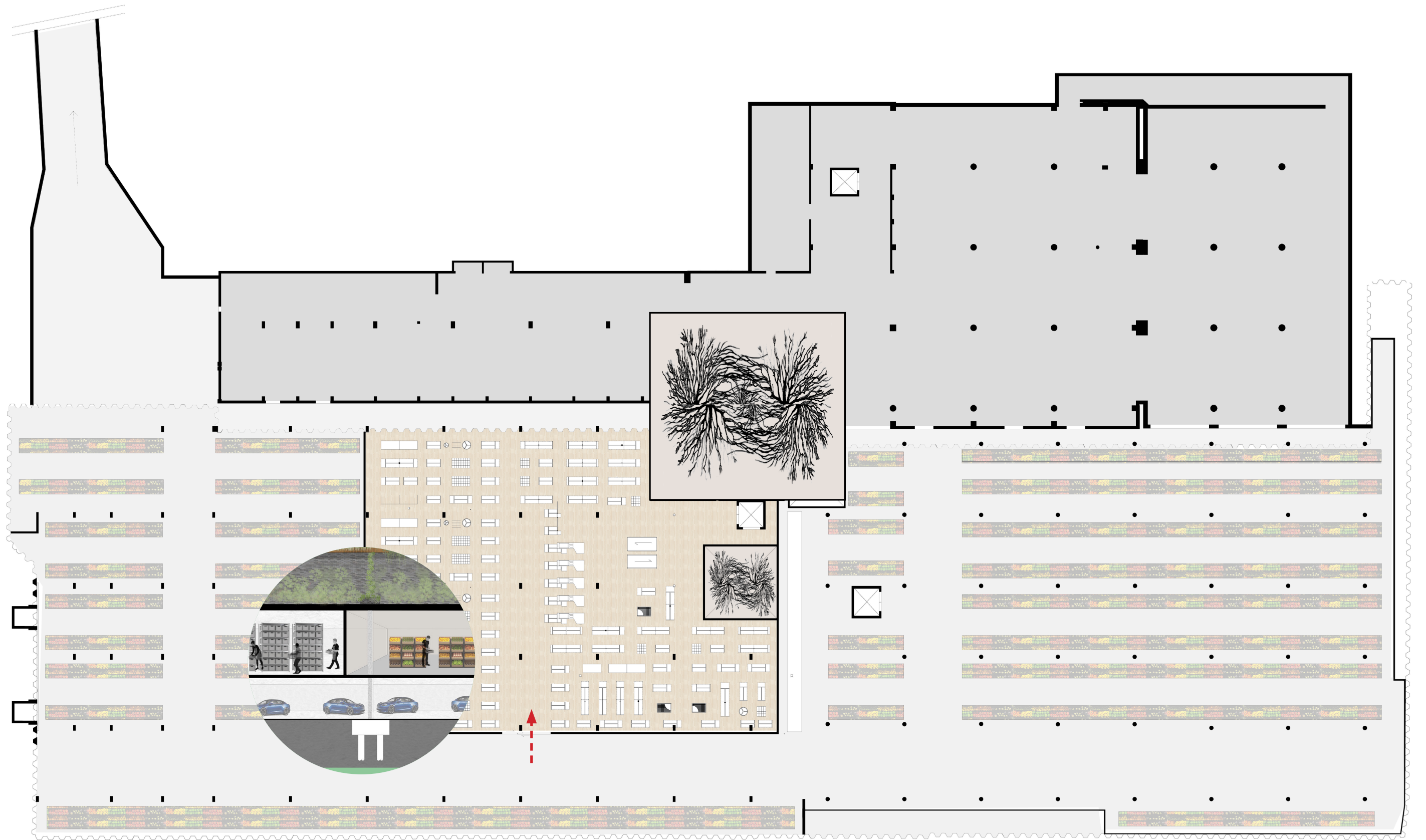
Use of V&D: Employee



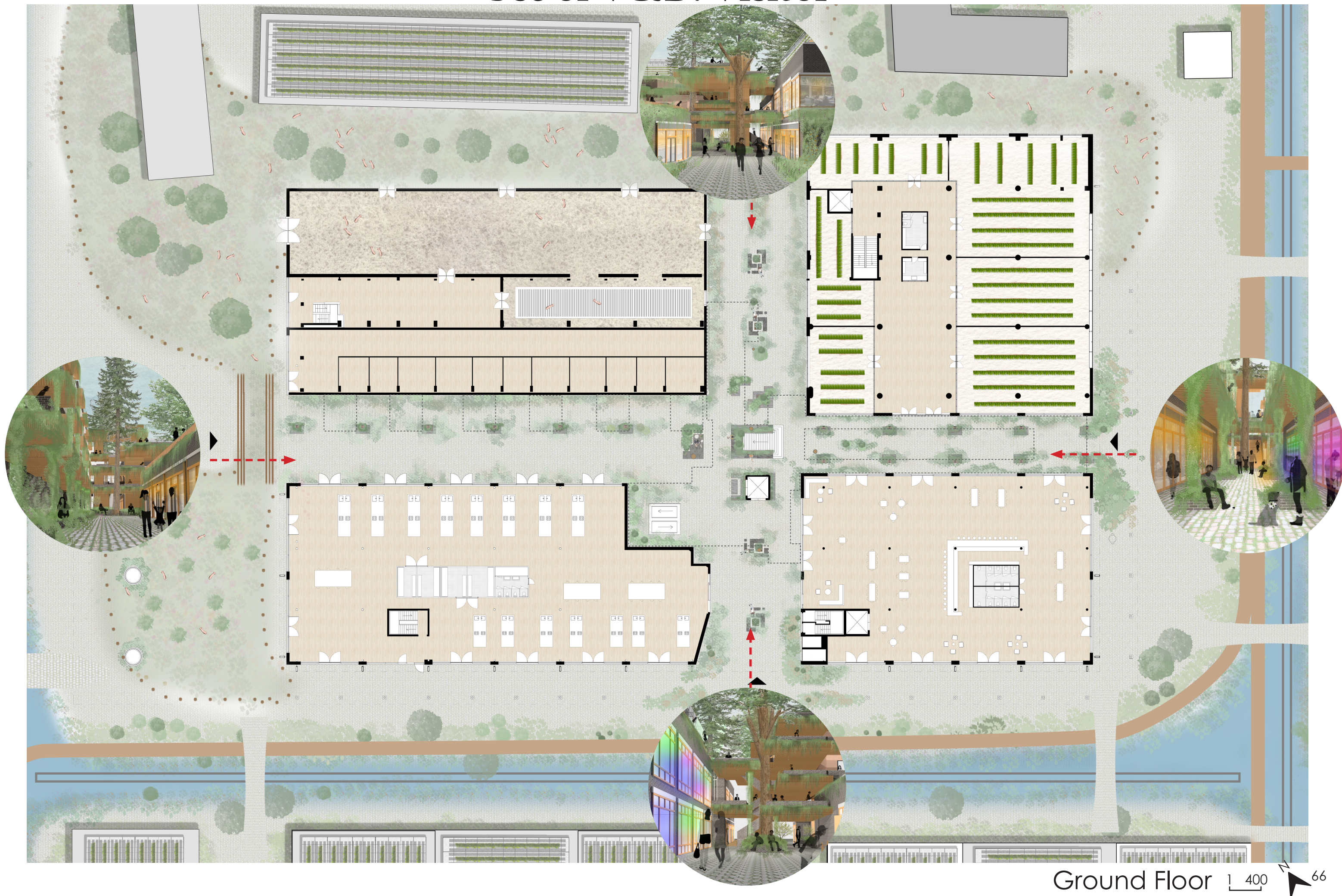
Use of V&D: Employee



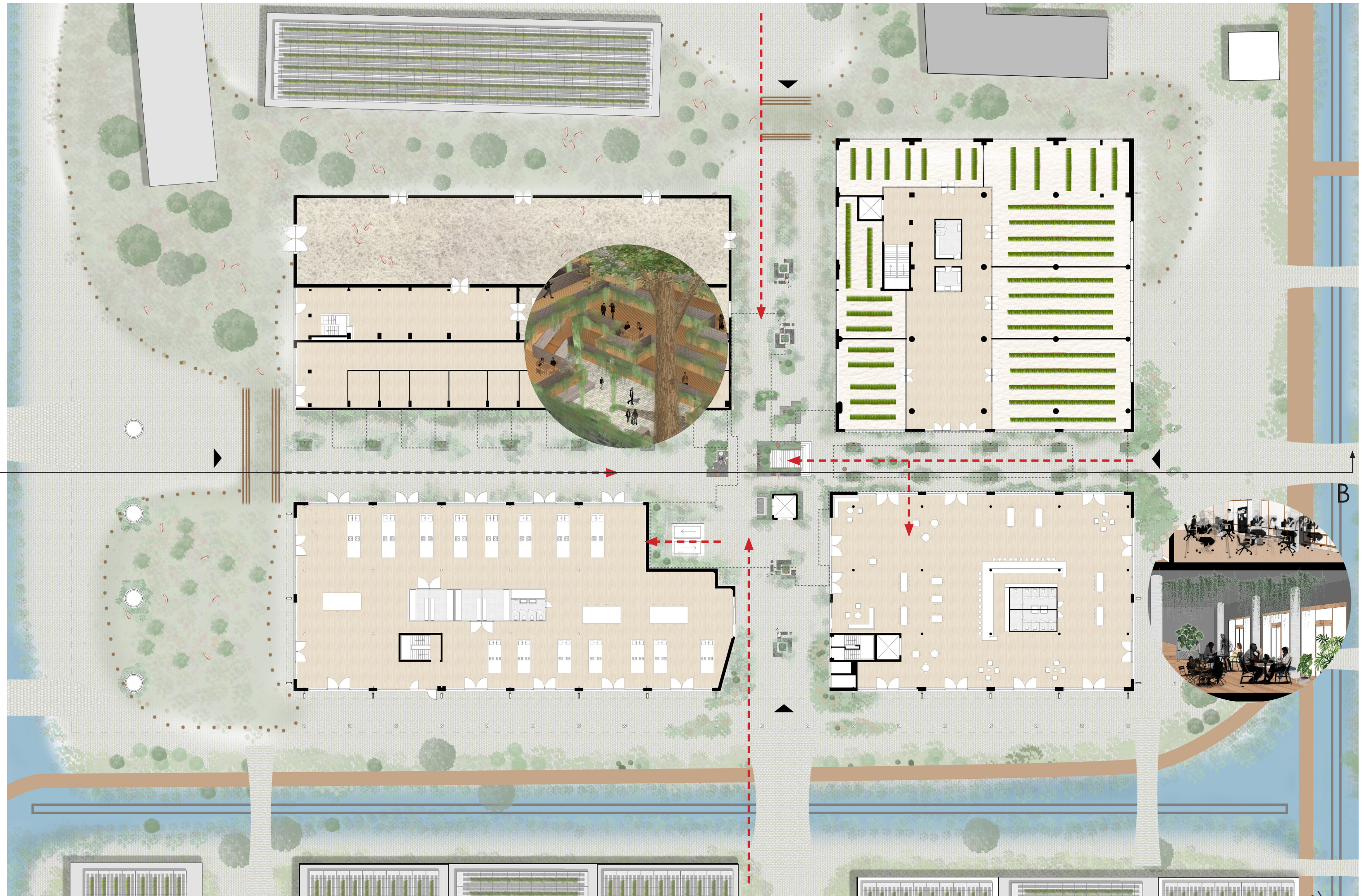
Use of V&D: Employee



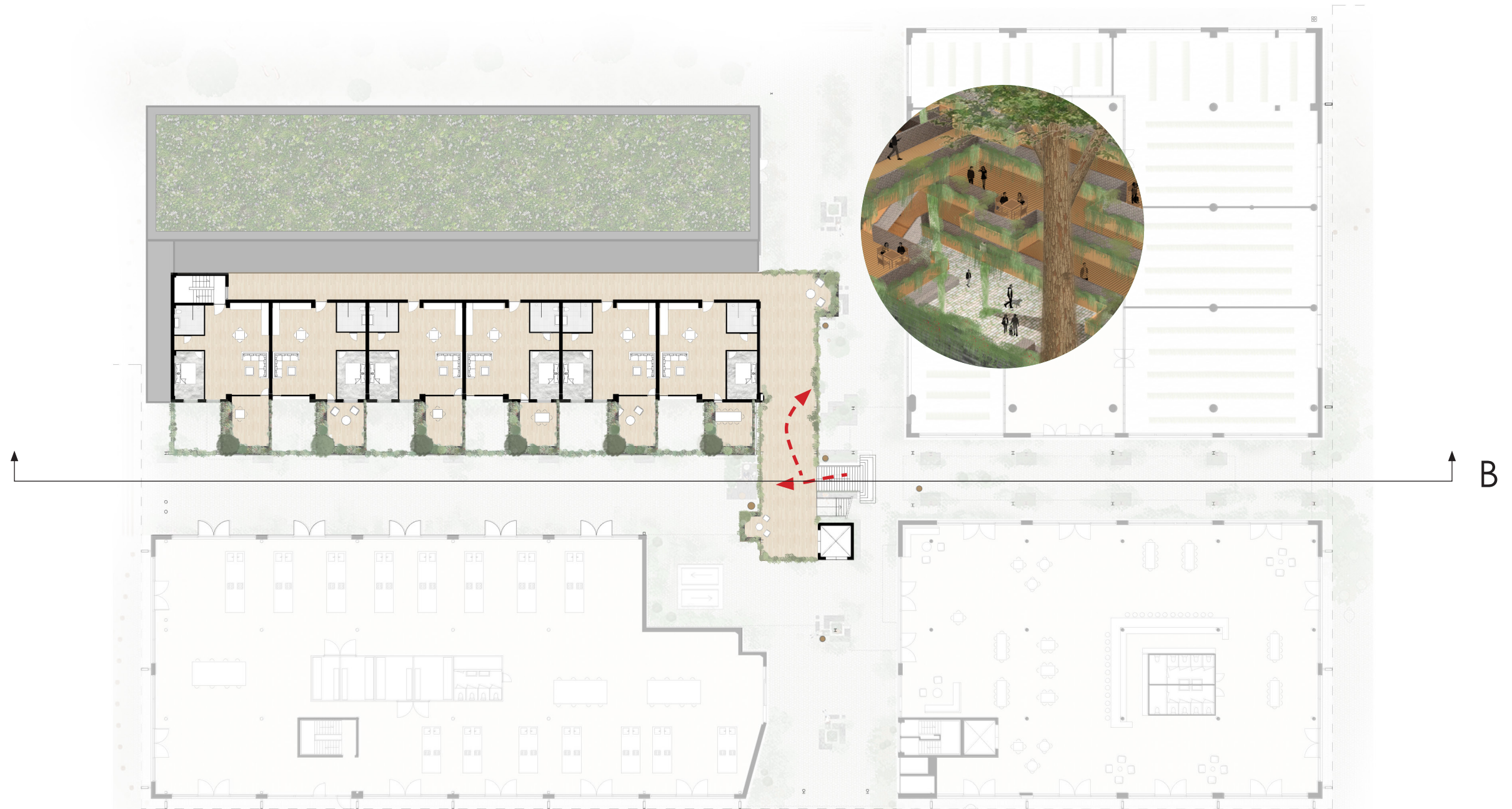
Use of V&D: Visitor



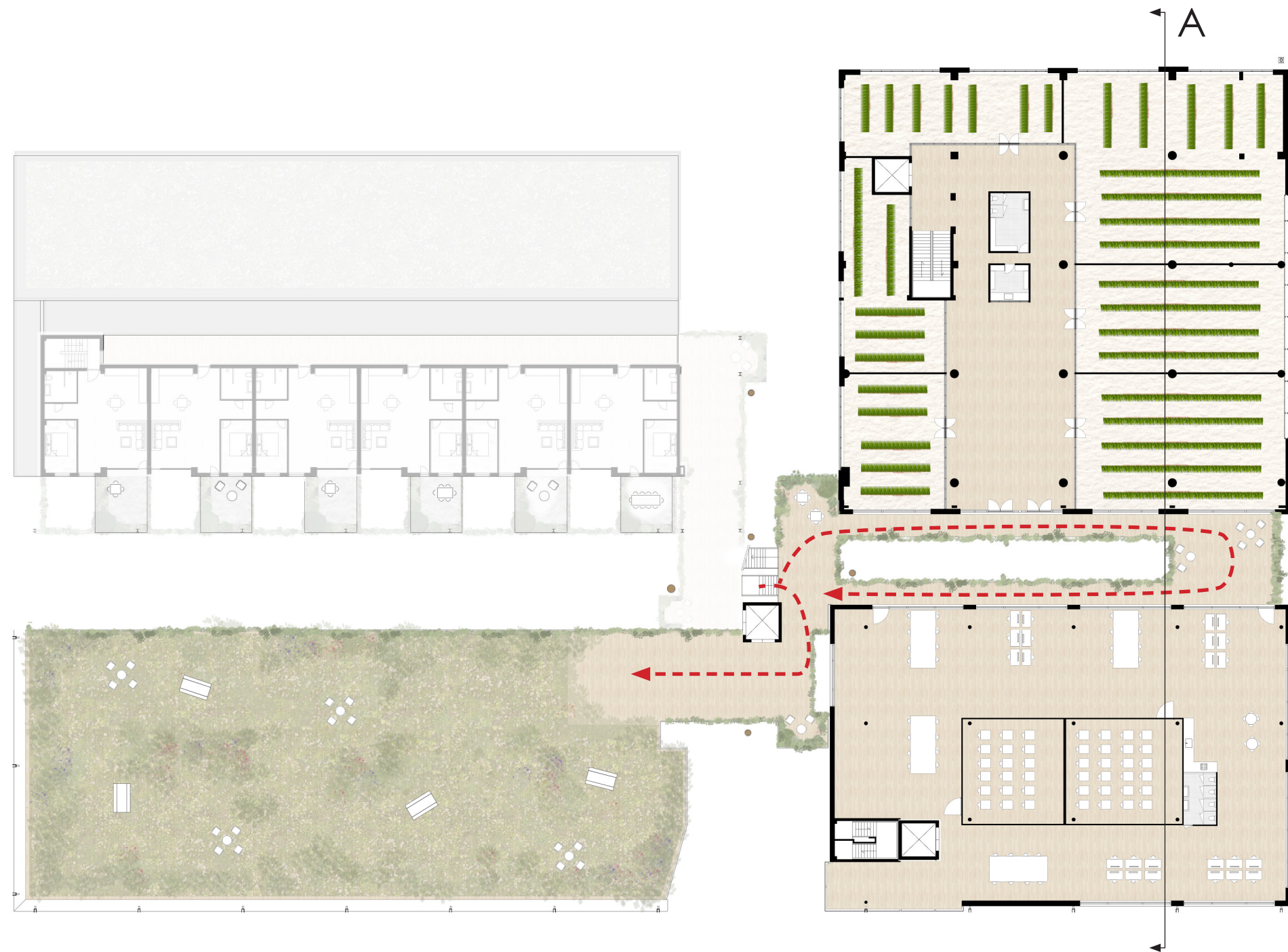
Use of V&D: Visitor



Use of V&D: Visitor



Use of V&D: Visitor

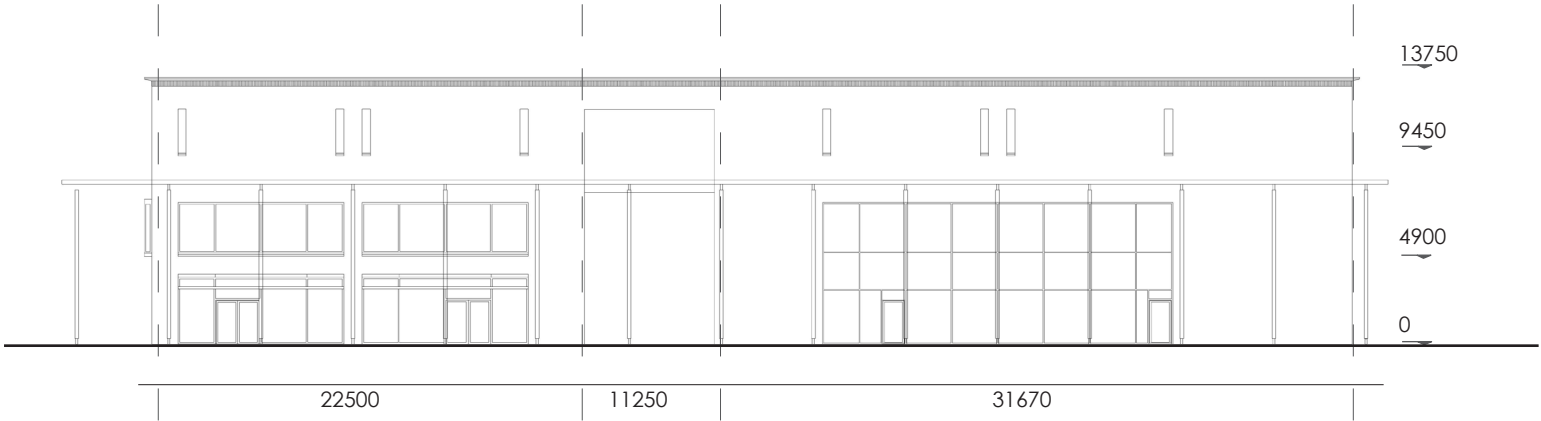


Use of V&D: Visitor

A



Old vs New Facedes V&D



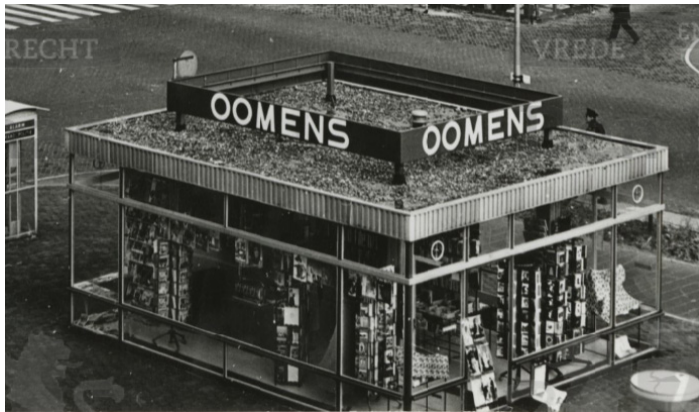
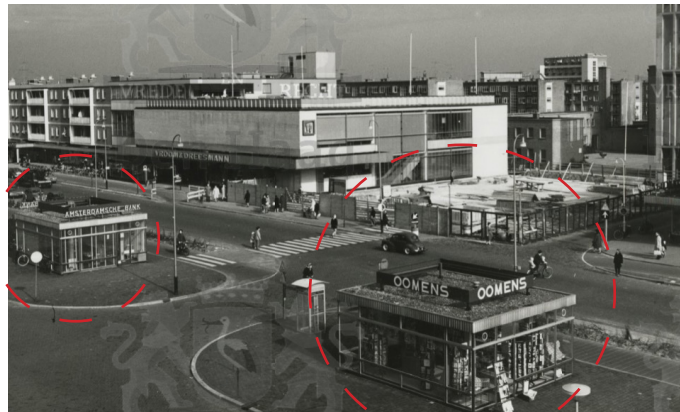
Old vs New Facades V&D



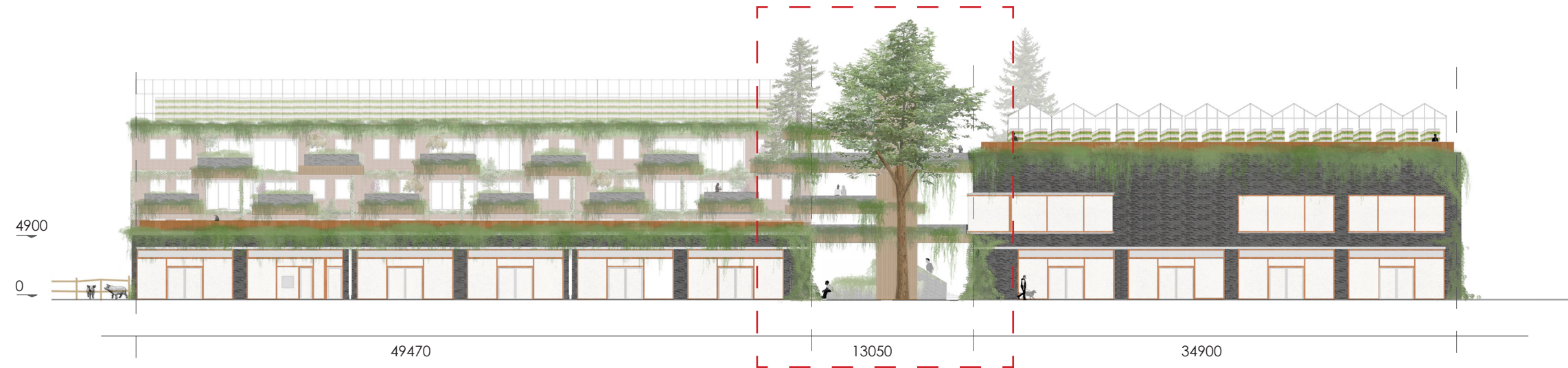
Old vs New Facedes V&D



Old vs New Facades V&D



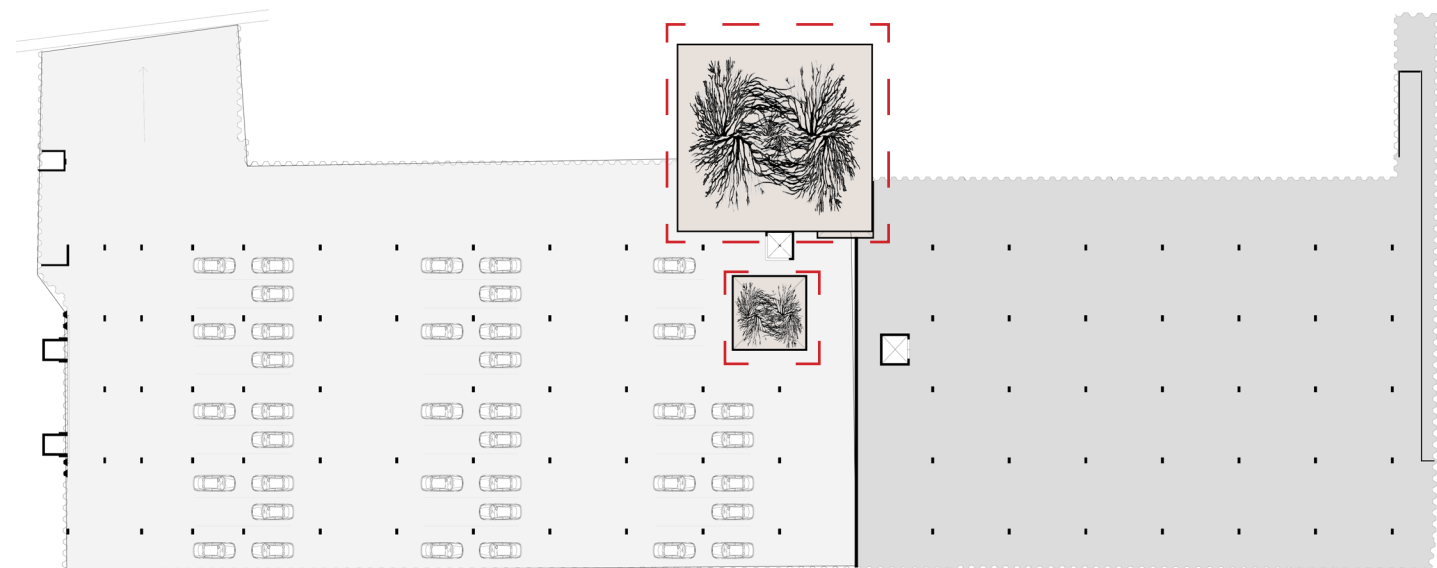
New Facades V&D



New Facades V&D



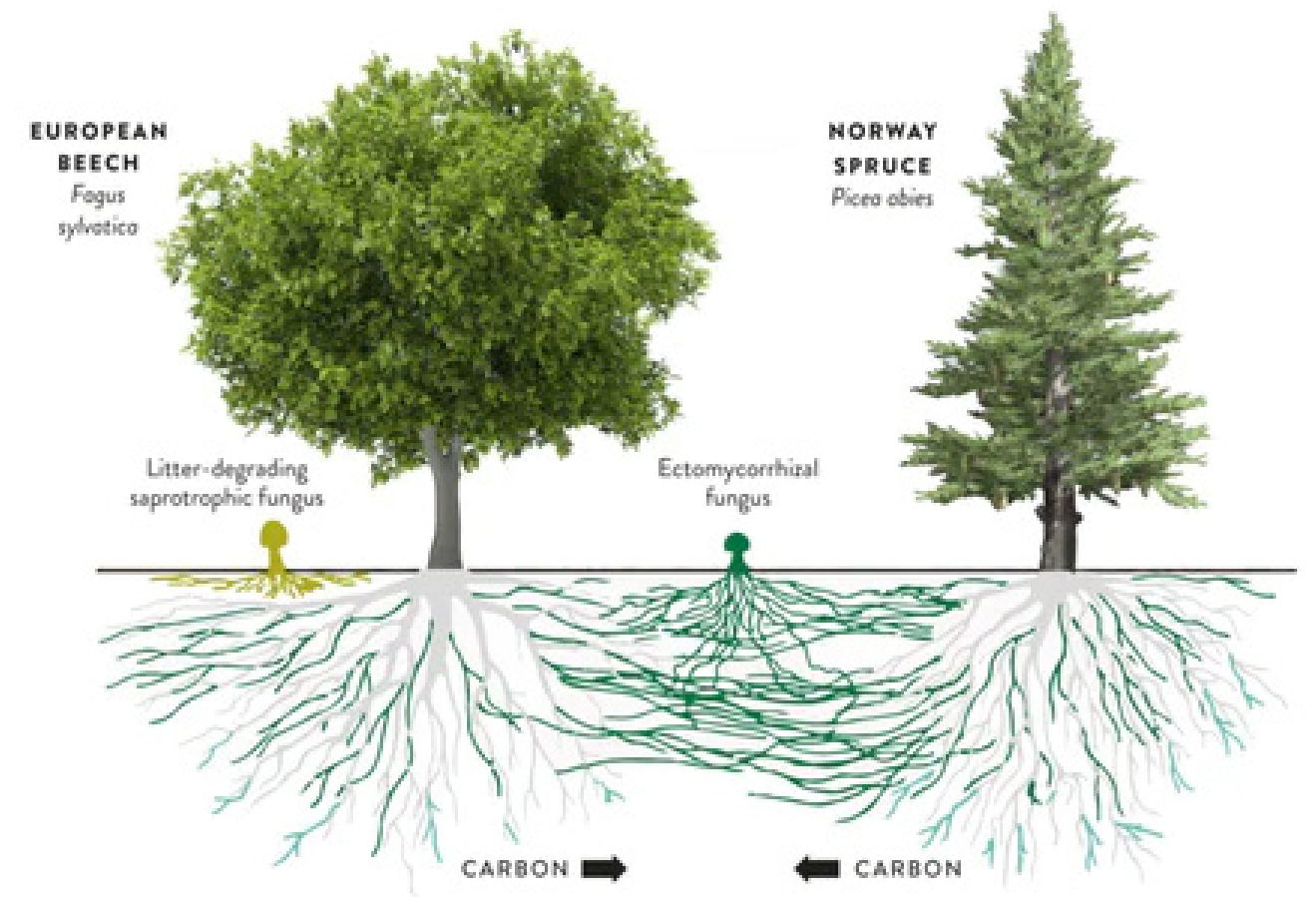
-1 Cellar



-2 Cellar

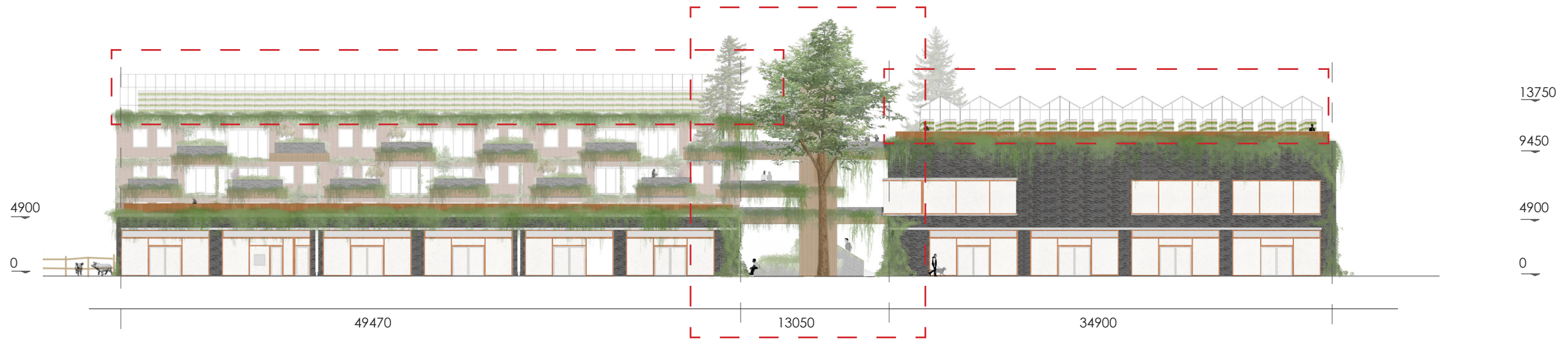


Wood Wide Web

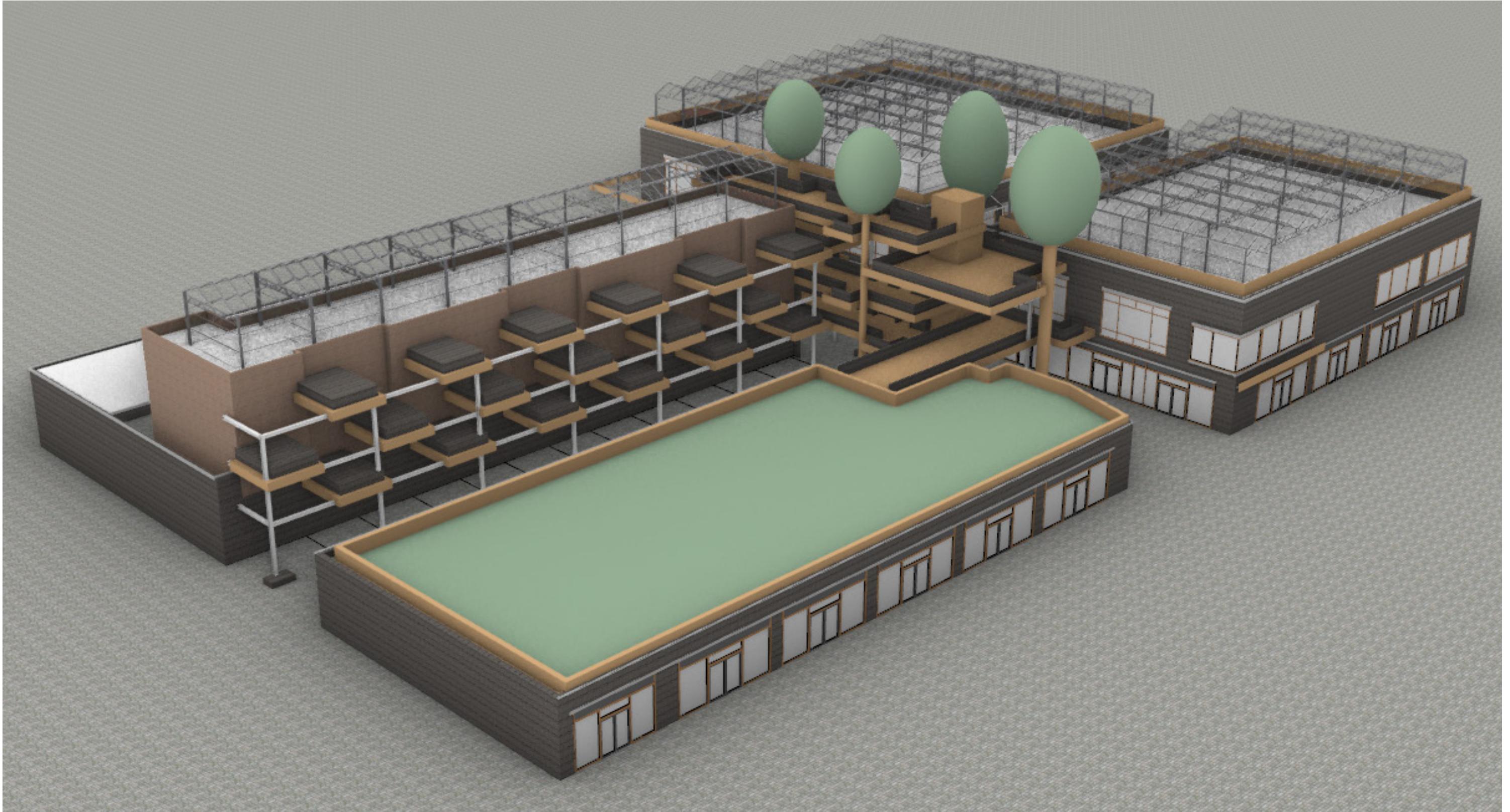


(National Geographic 2020)

New Facades V&D



Inside The V&D



Inside the V&D



Reused Venlo Green House

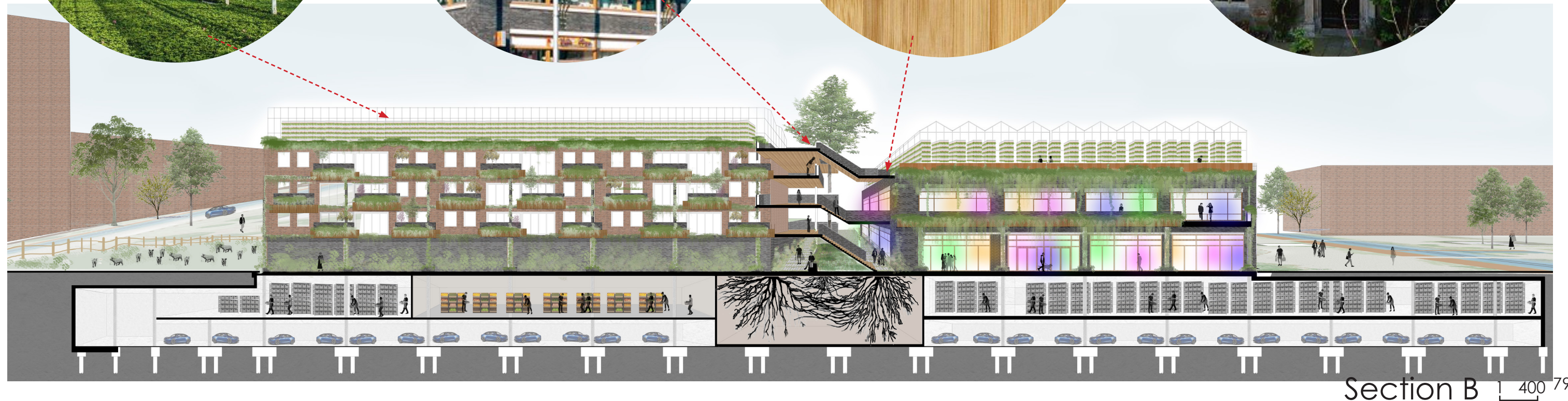
Reused Brick

Bamboo

Hanging Plants



Self Bonder plants



Section B 1/400 79

Inside the V&D



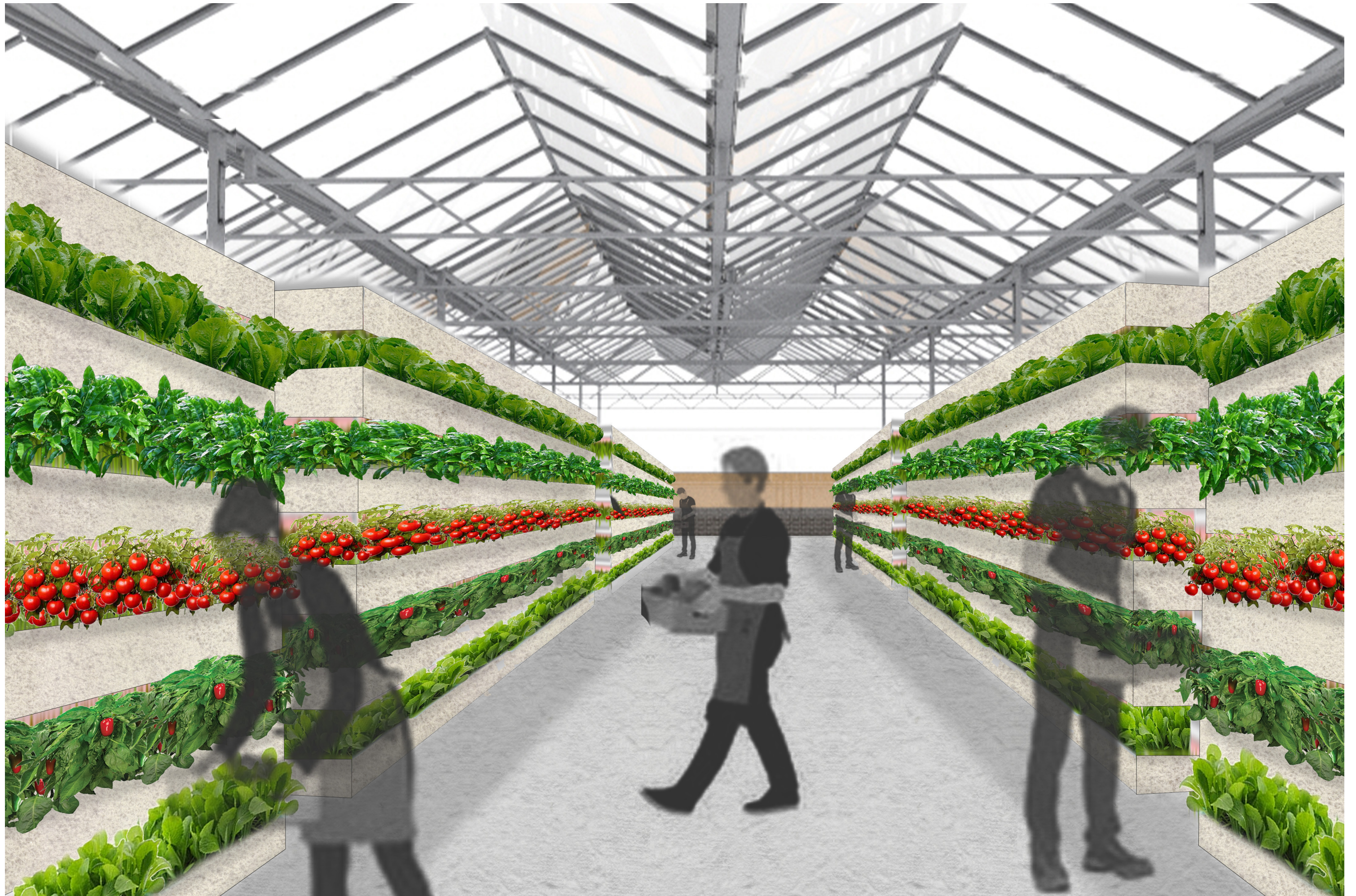
Inside the V&D



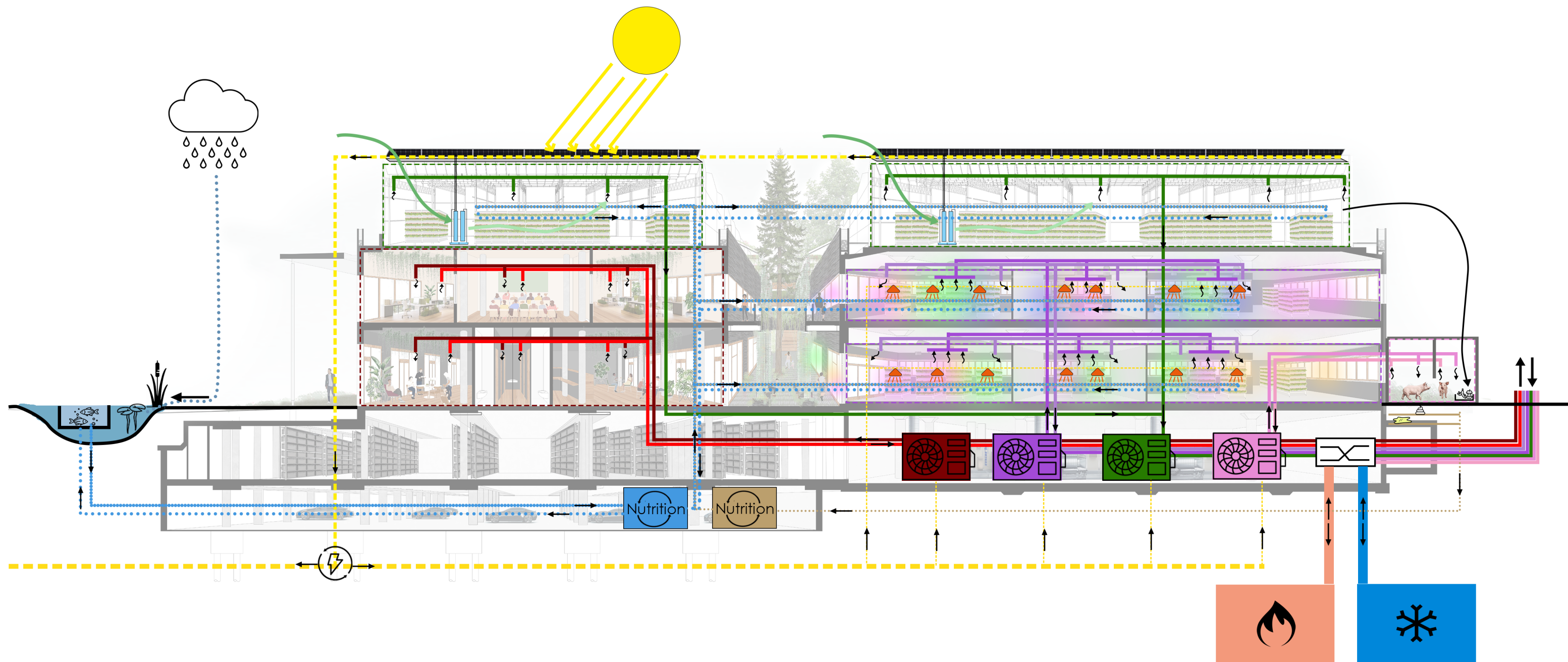
Interior of the V&D



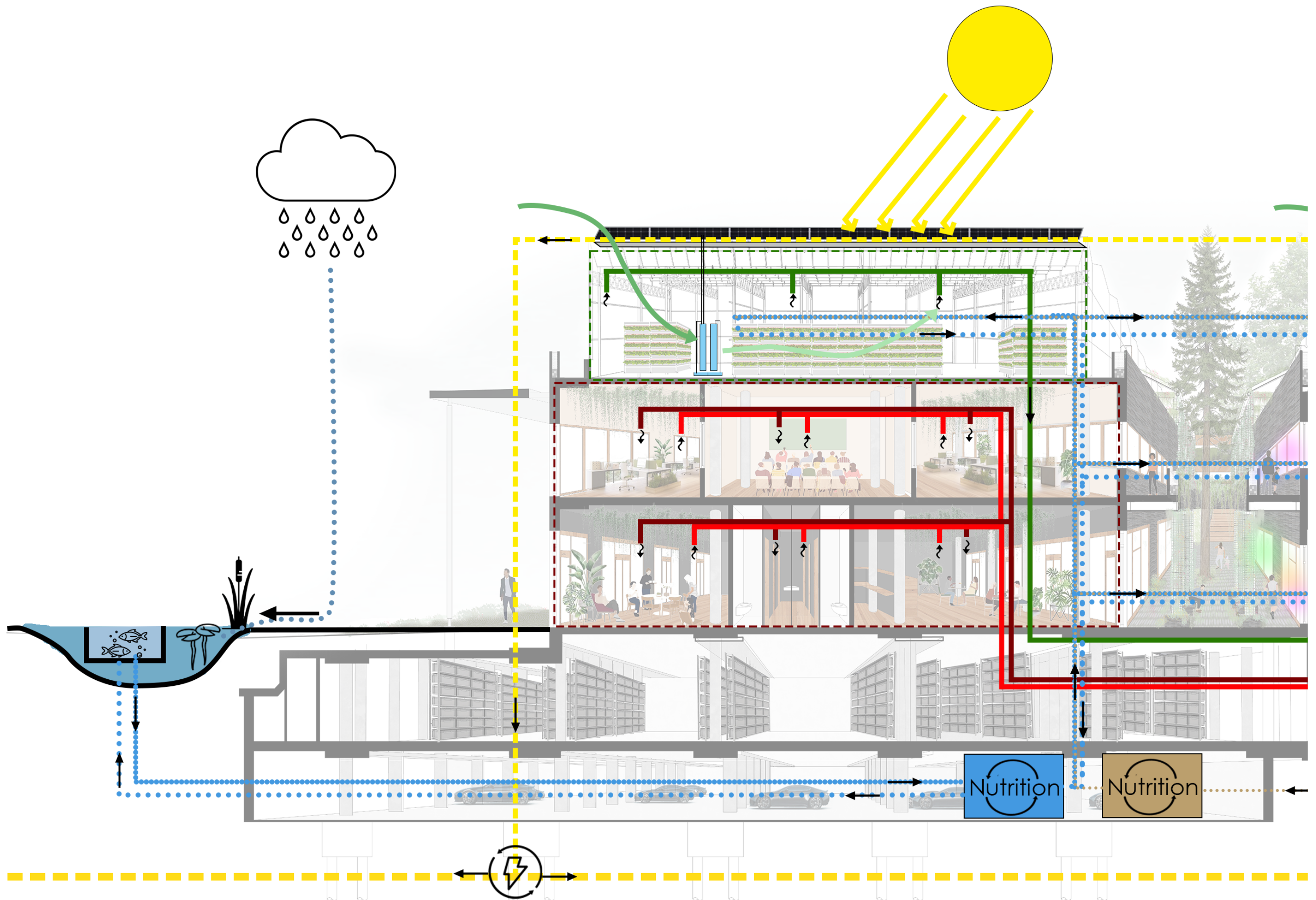
Interior of the V&D



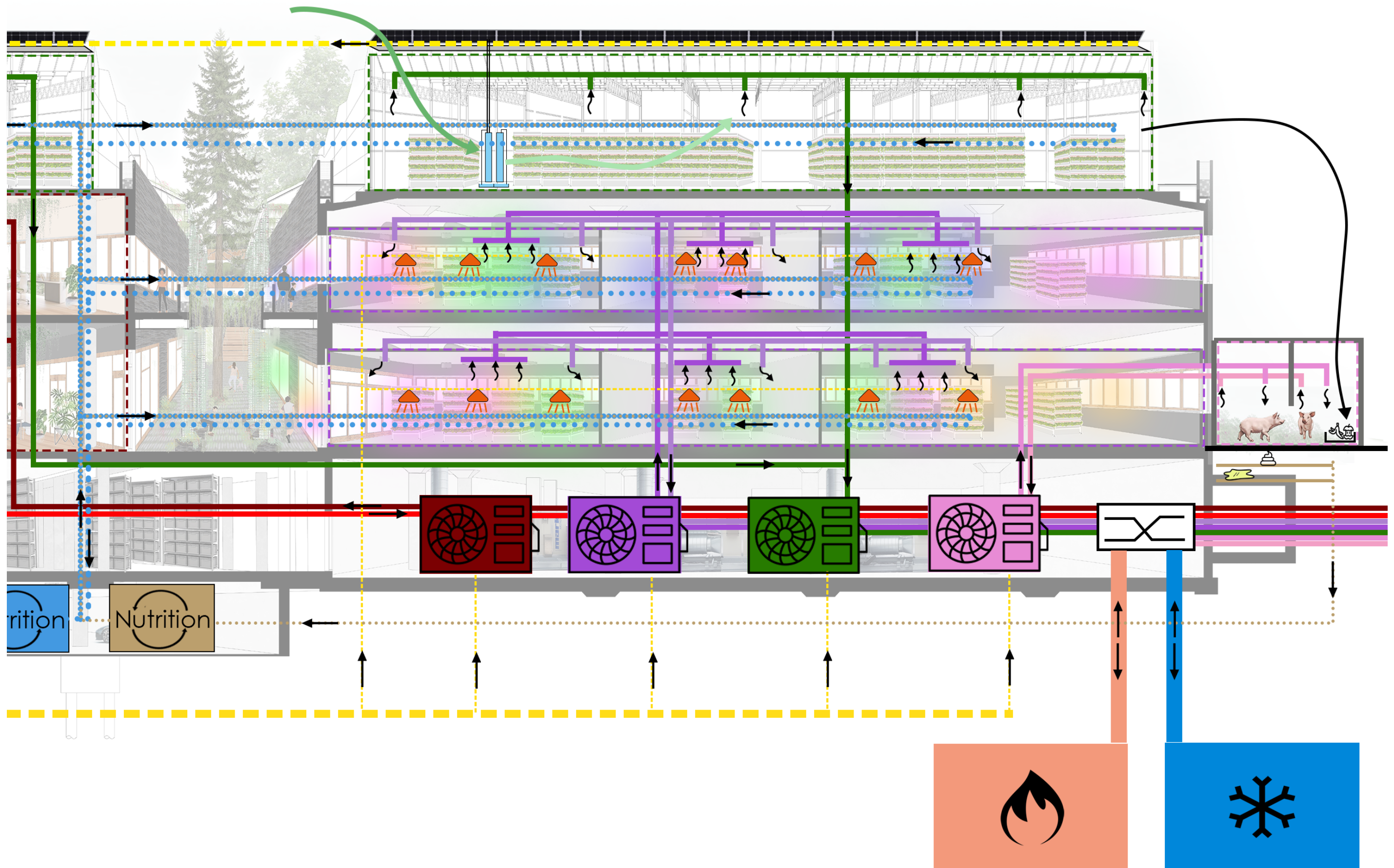
Climate Scheme V&D: Overview



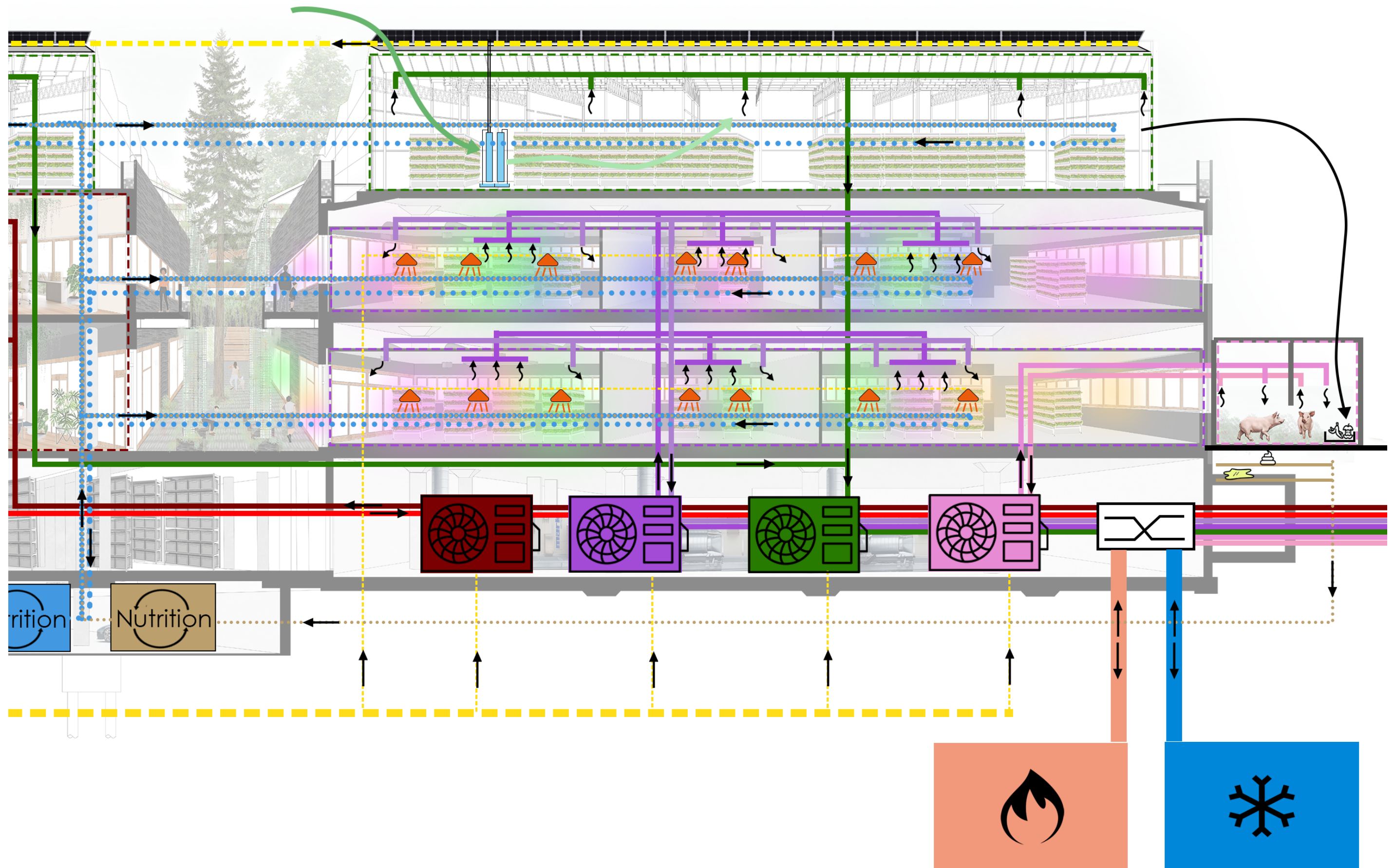
Climate Scheme V&D: Green Houses



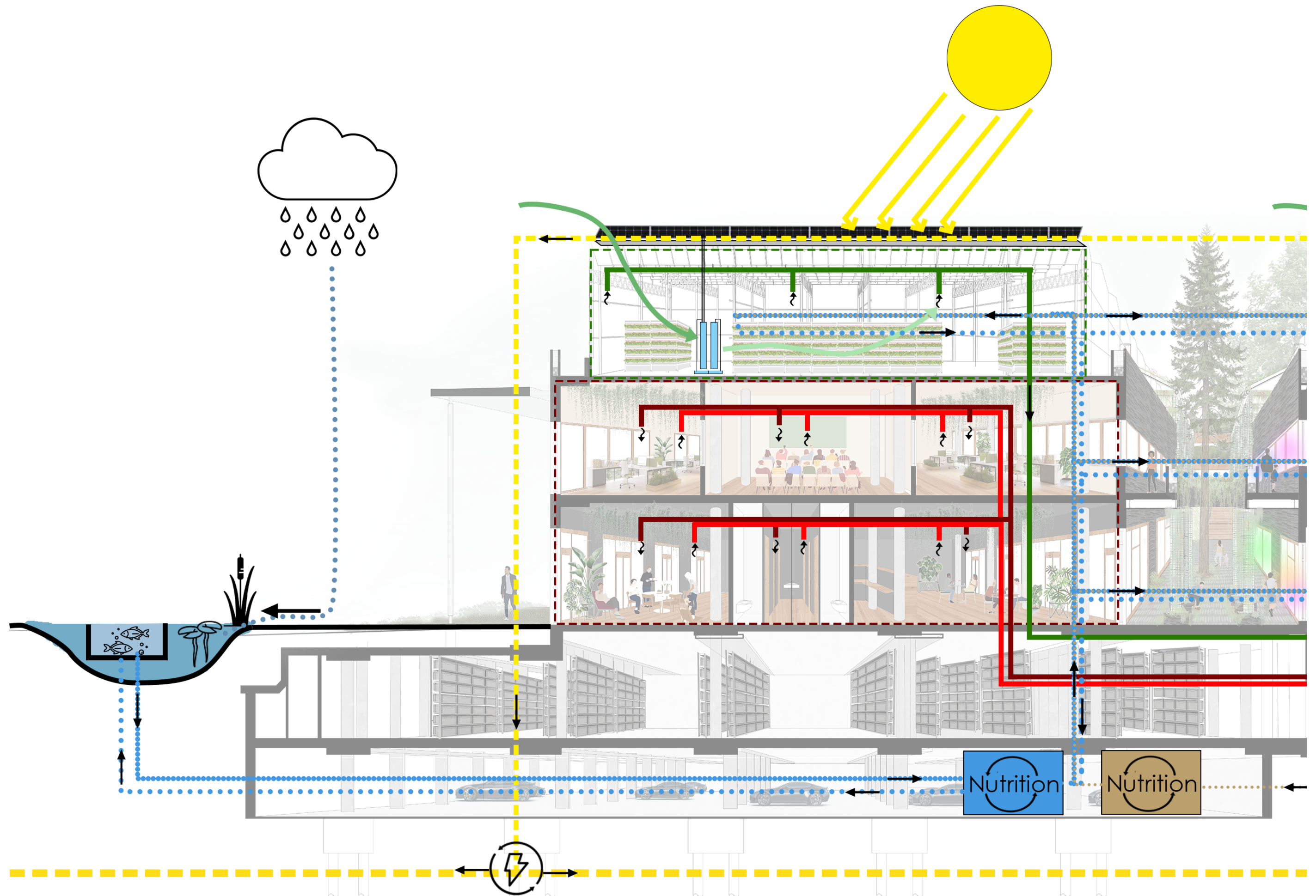
Climate Scheme V&D: Indoor Green Houses



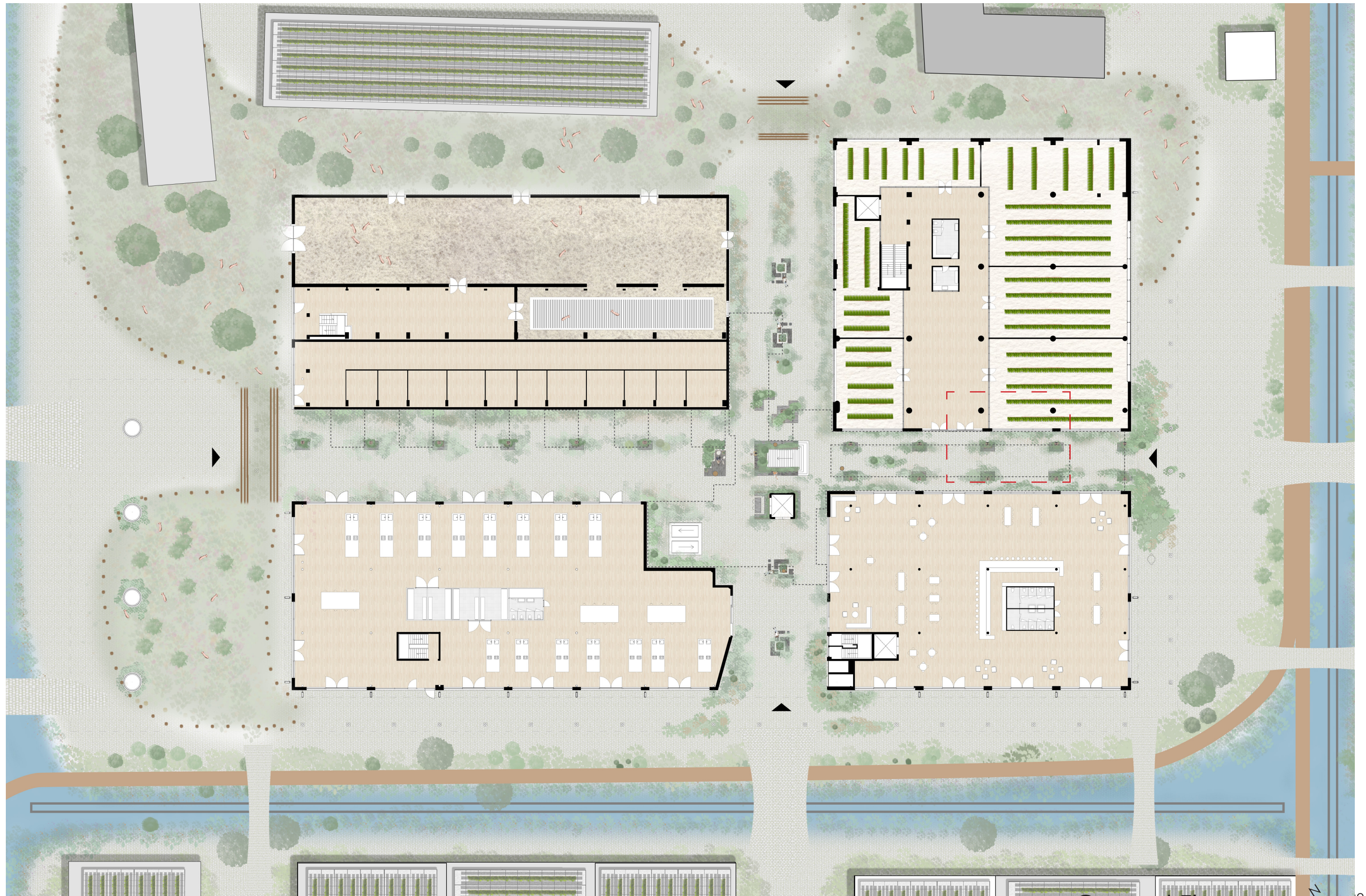
Climate Scheme V&D: Pig Farming



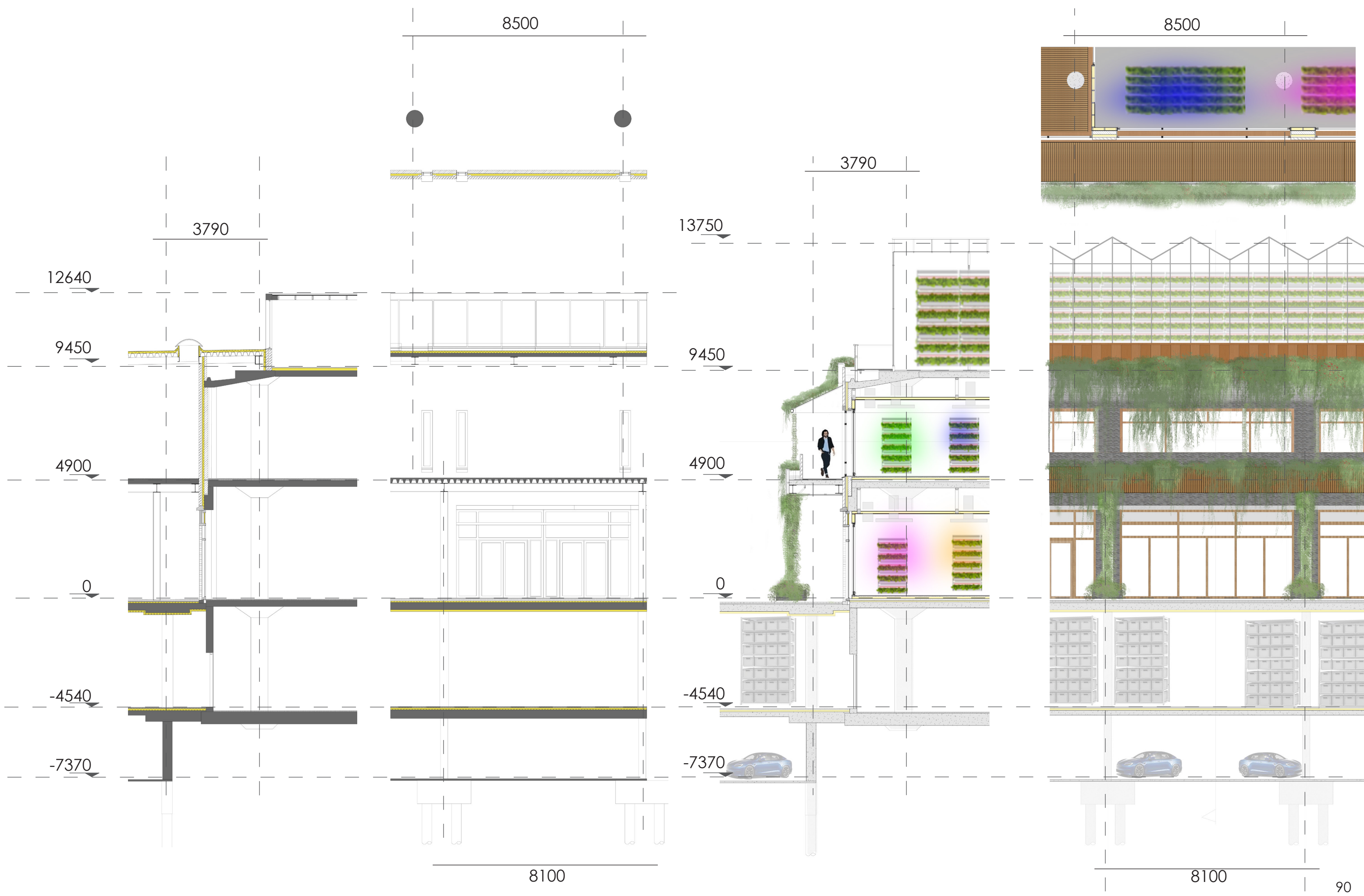
Climate Scheme V&D: Acquaponics



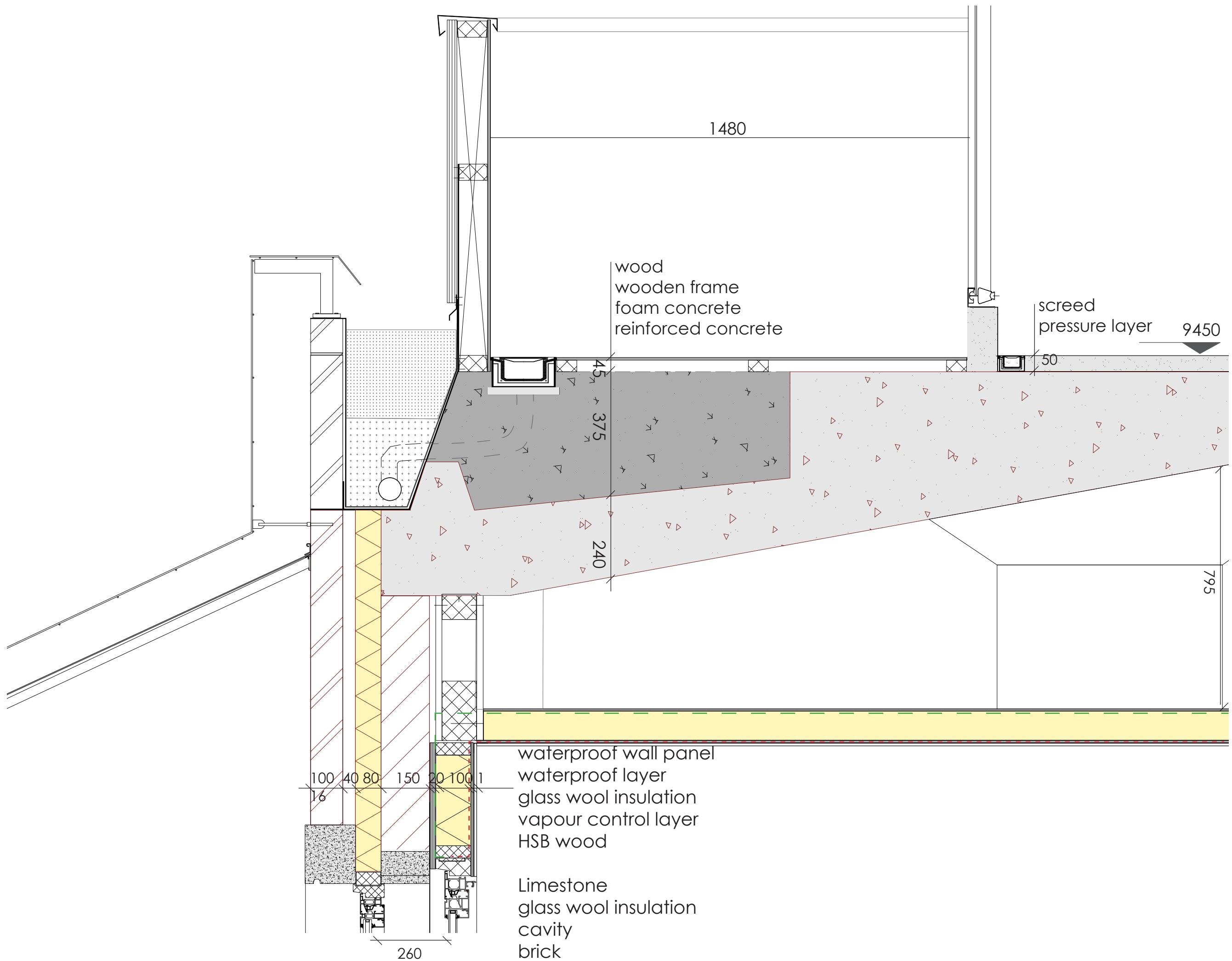
1 : 20 Detail V&D Section



1 : 20 Detail V&D - Scaled to 1:100



1 : 5 Detail V&D - Scaled to 1:10



Calculation construction Green house on V&D

Building had office function which means it had a q weight (opgelegde belasting) of 3,0 kN/m

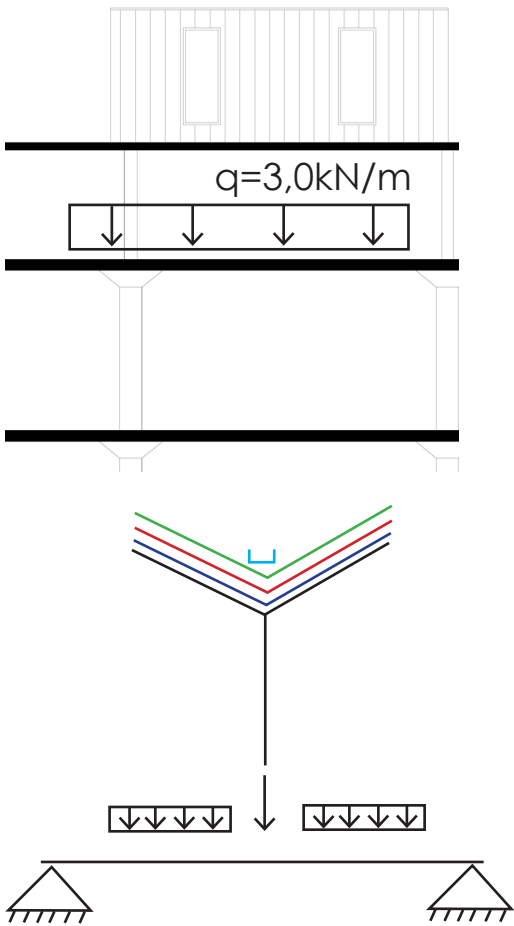
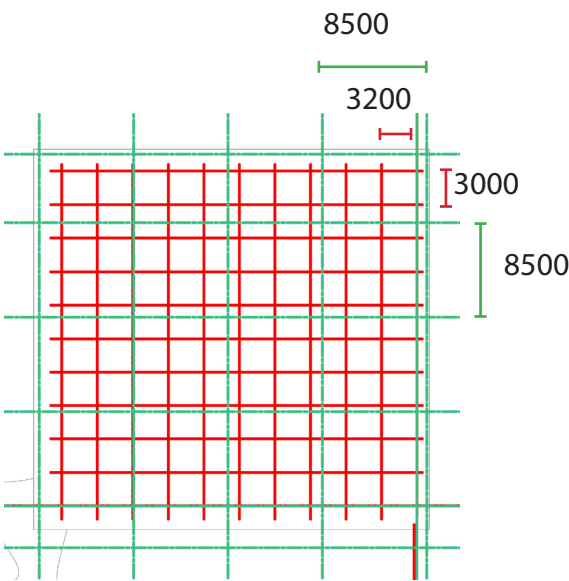
The new weight on the same construction is the green house as a point load and the vegetation.

By comparing the momentums of old and new, it will become clear if the green house can be placed in the construction.

M old:
The momentum with the office funtion was 3,0 kN/m² so, M old = $(ql^2)/8 = (3,0 \times 8,5^2)/8 = 27,1 \text{ kN/m}$

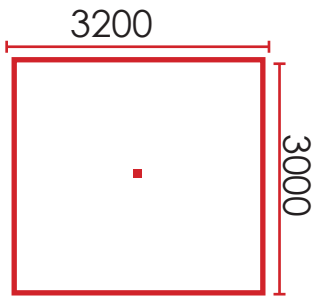
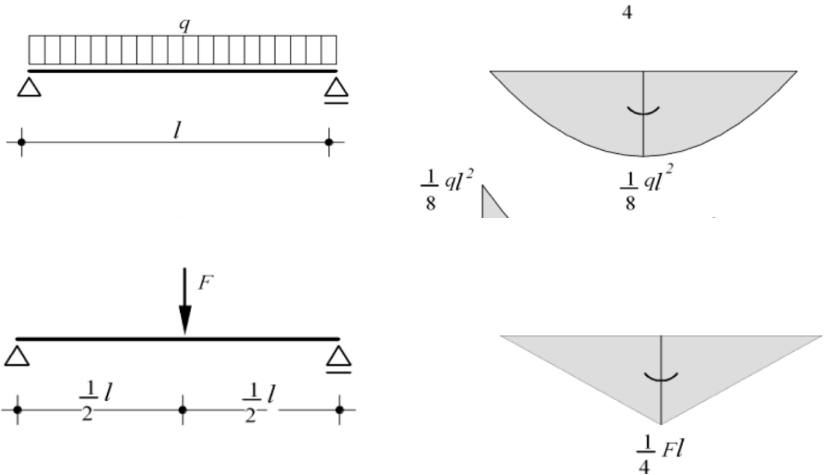
Mnew:
M vegetation = $(ql^2)/8 = (0,15 \times 8,5^2) /8 = 1,4 \text{ kN/m}$
M point load = $M=FL/4 = (5,3 \times 8,5) /4 = 11,3 \text{ kN/m}$
M new = $1,4 + 11,3 = 12,7 \text{ kN/m}$

Conclusion:
The old momentum of 27,1 kN/m is bigger than the new momentum of 12,7 kN/m, so green house can be placed in top of the roof



Gutter= 70 N/m
Snow = 250 N/m²
Services= 70 N/m²
Own weight = 615 N/m

Vegetation= 150 N/m²

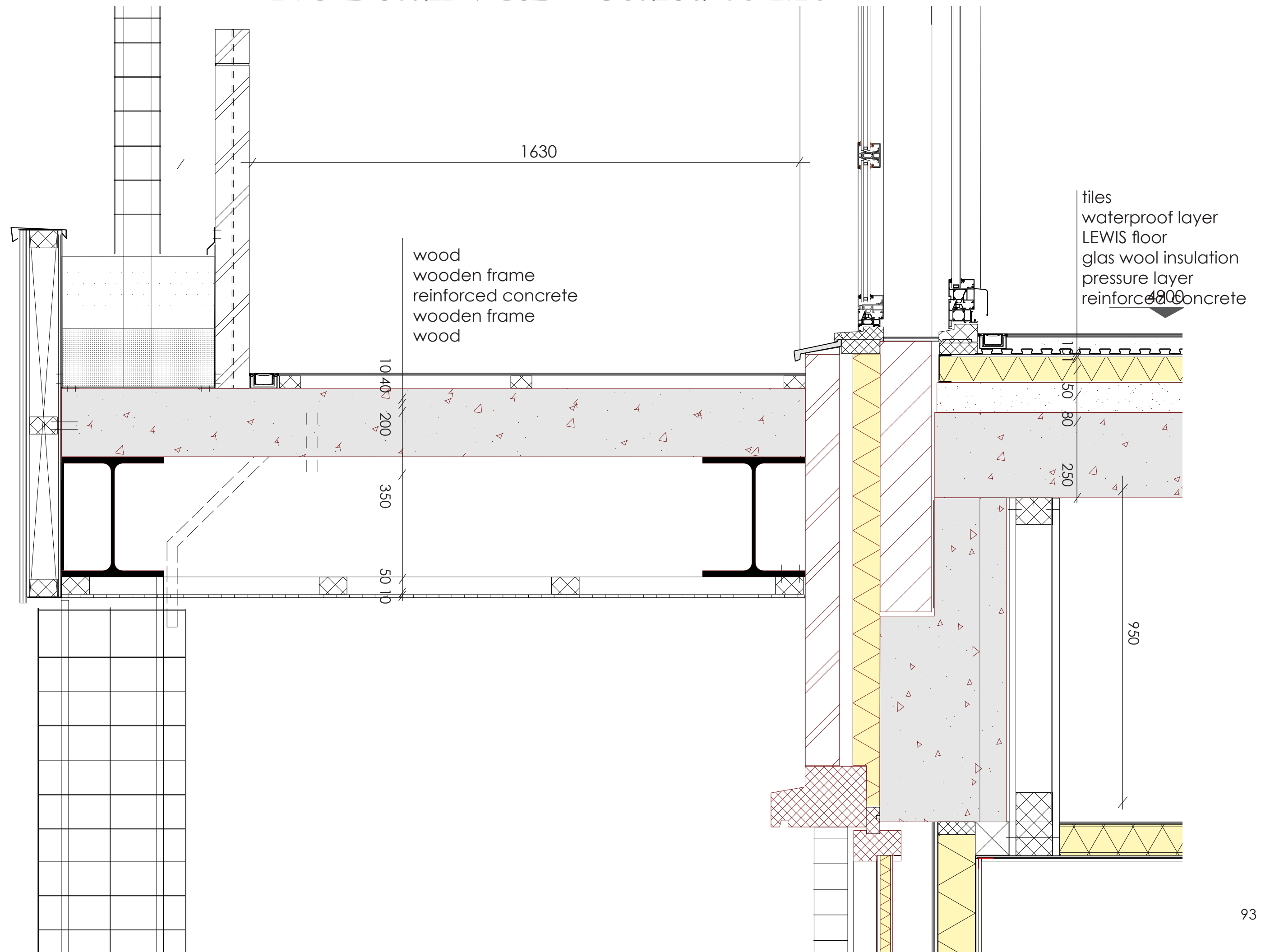


Gutter= 70 N/m x 3 = 210 N
Snow = 250 N/m² x 3 x 3,2 = 2400 N
Services= 70 N/m² x 3,2 x 3 = 672 N
Own weight = 615 N/m x 3,2 = 1968 N

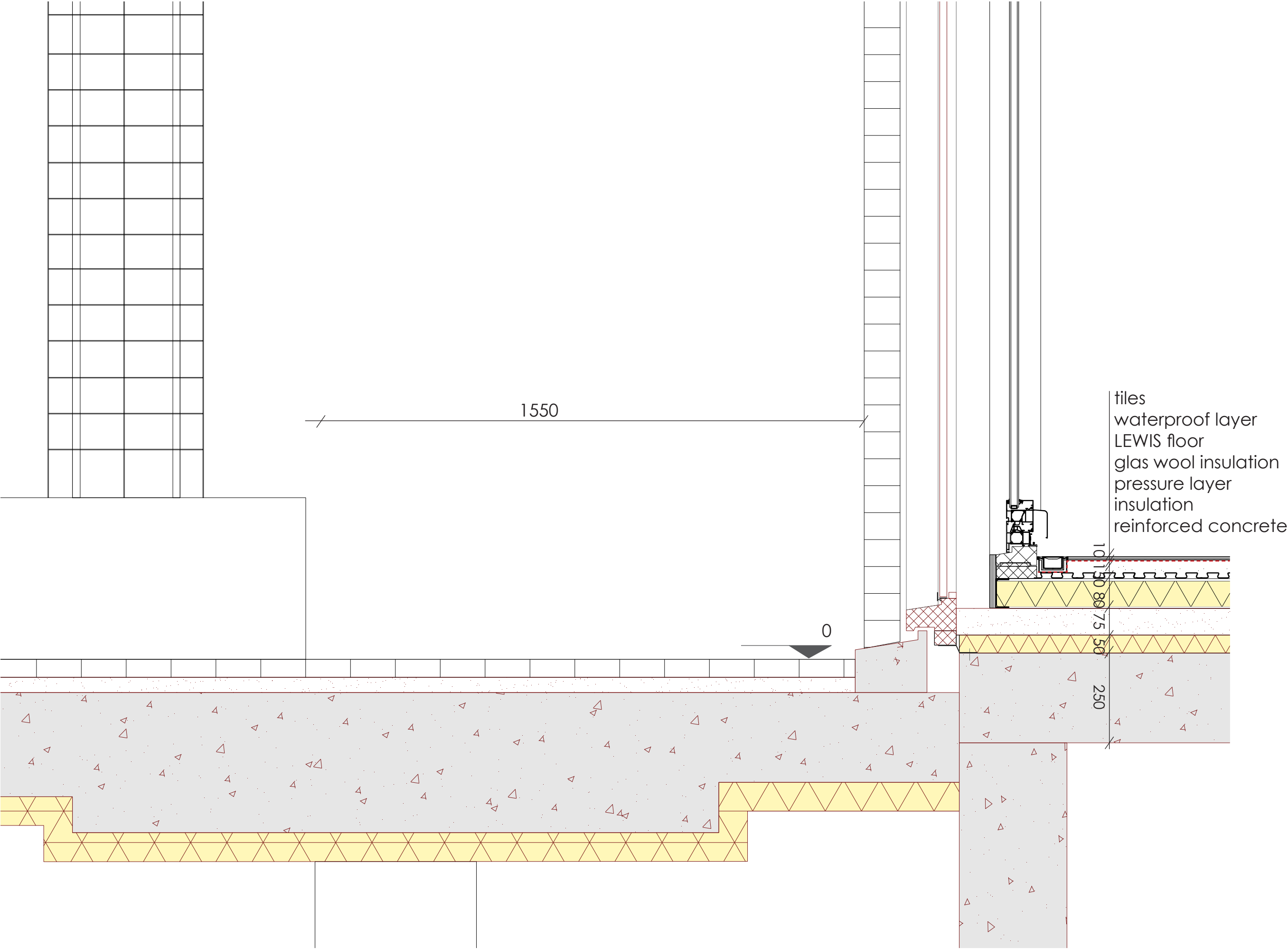
Total 5,3 kN

Vegetation= 150 N/m² = 0,15 kN/m

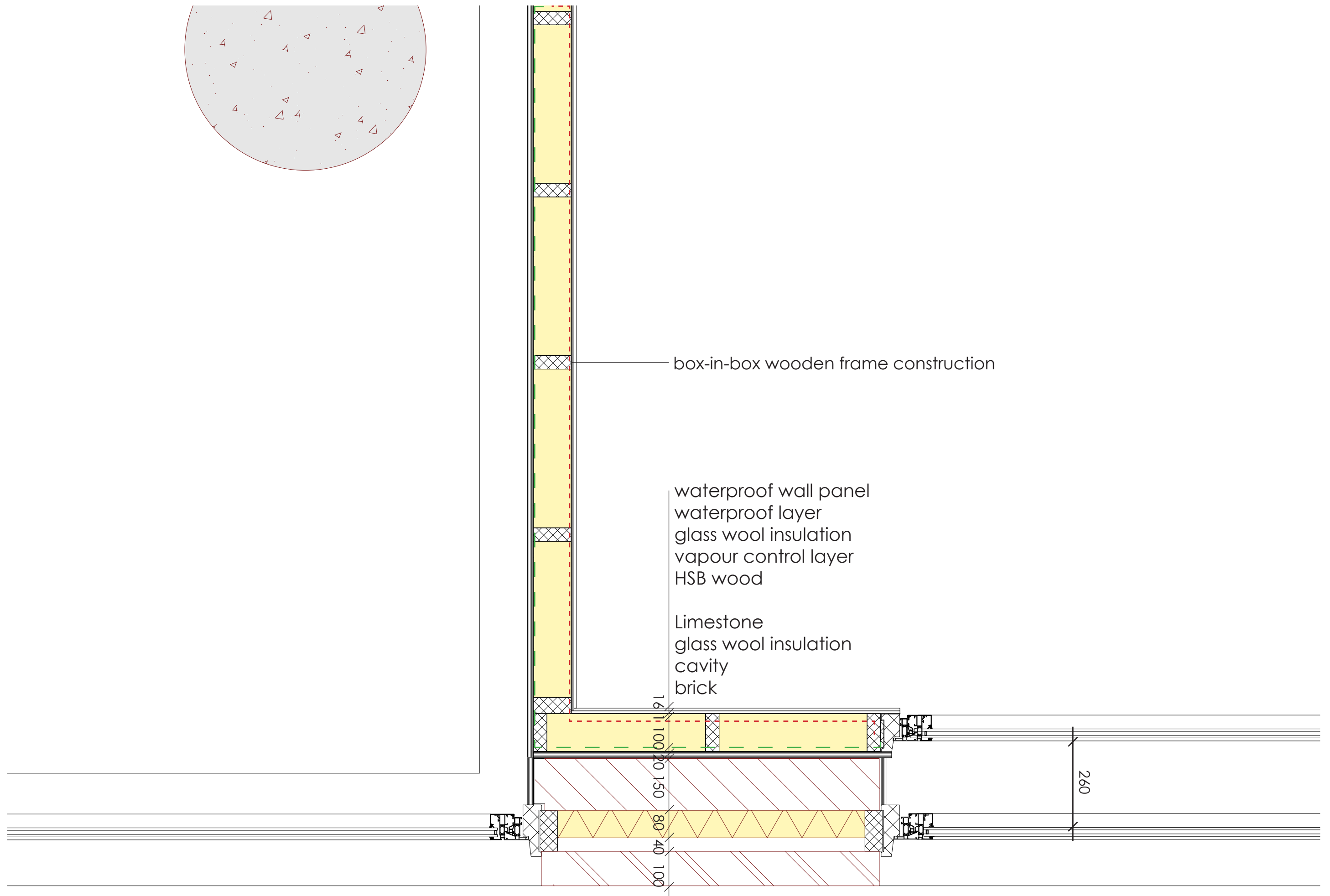
1 : 5 Detail V&D - Scaled to 1:10



1 : 5 Detail V&D - Scaled to 1:10



1 : 5 Detail V&D - Scaled to 1:10



What is the future of the Shopping Mall?

