



A HABIT

BASED DESIGN FOR HEALTHY LIVING

P5

PRESENTATION

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AR3AD110 Dwelling Graduation Studio:
Designing for Care in an Inclusive Environment
2024/2025

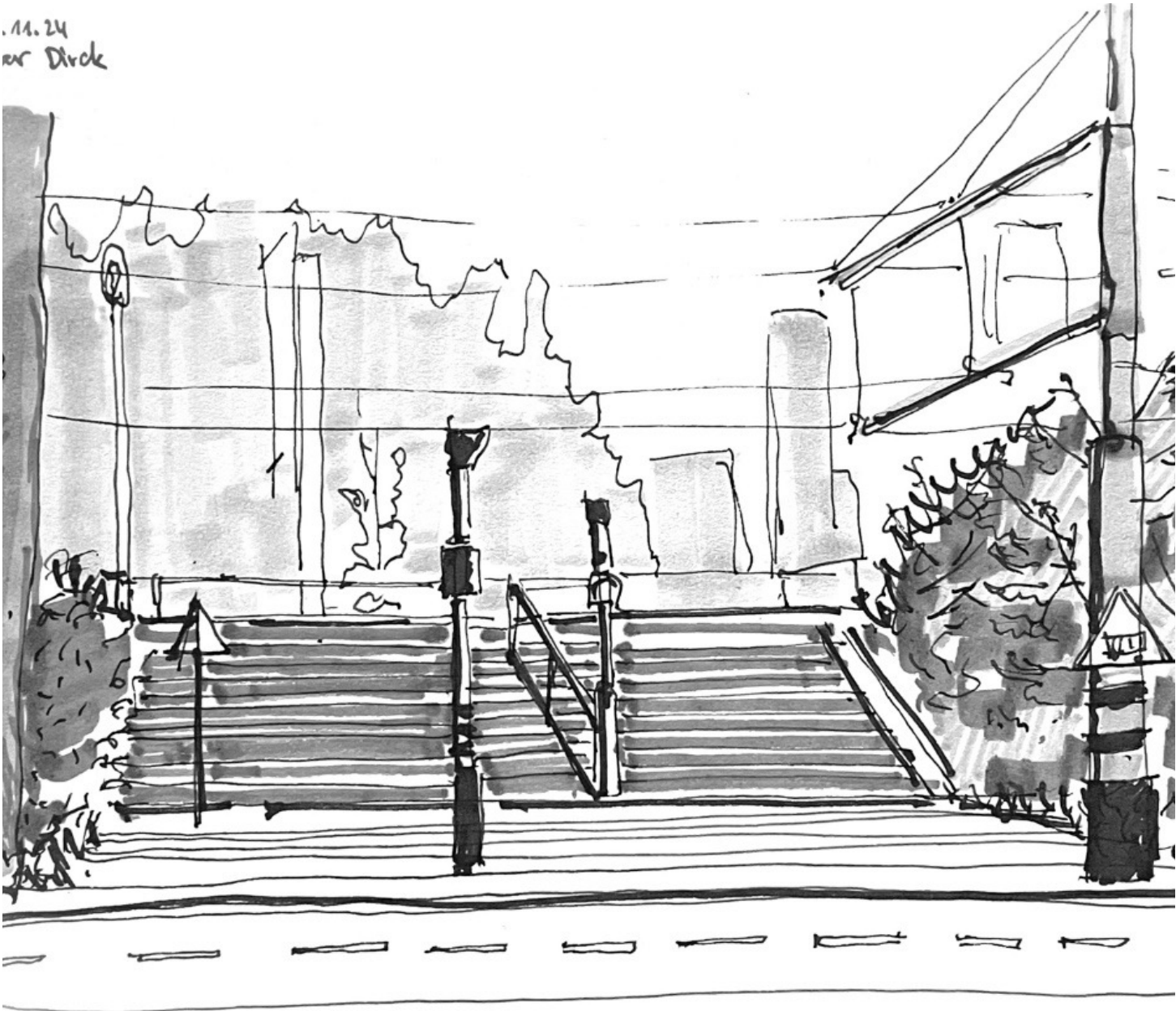
Birgit Jurgenhake, Kobe Macco, Birgitte Hansen,
Annemarie Eijkelenboom

02.07.2025

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RESEARCH

what is a habit-based design

Problem Statement

70% of deaths worldwide is caused by
non-communicable diseases, of which the
primary modifiable cause are unhealthy
habitual behaviours

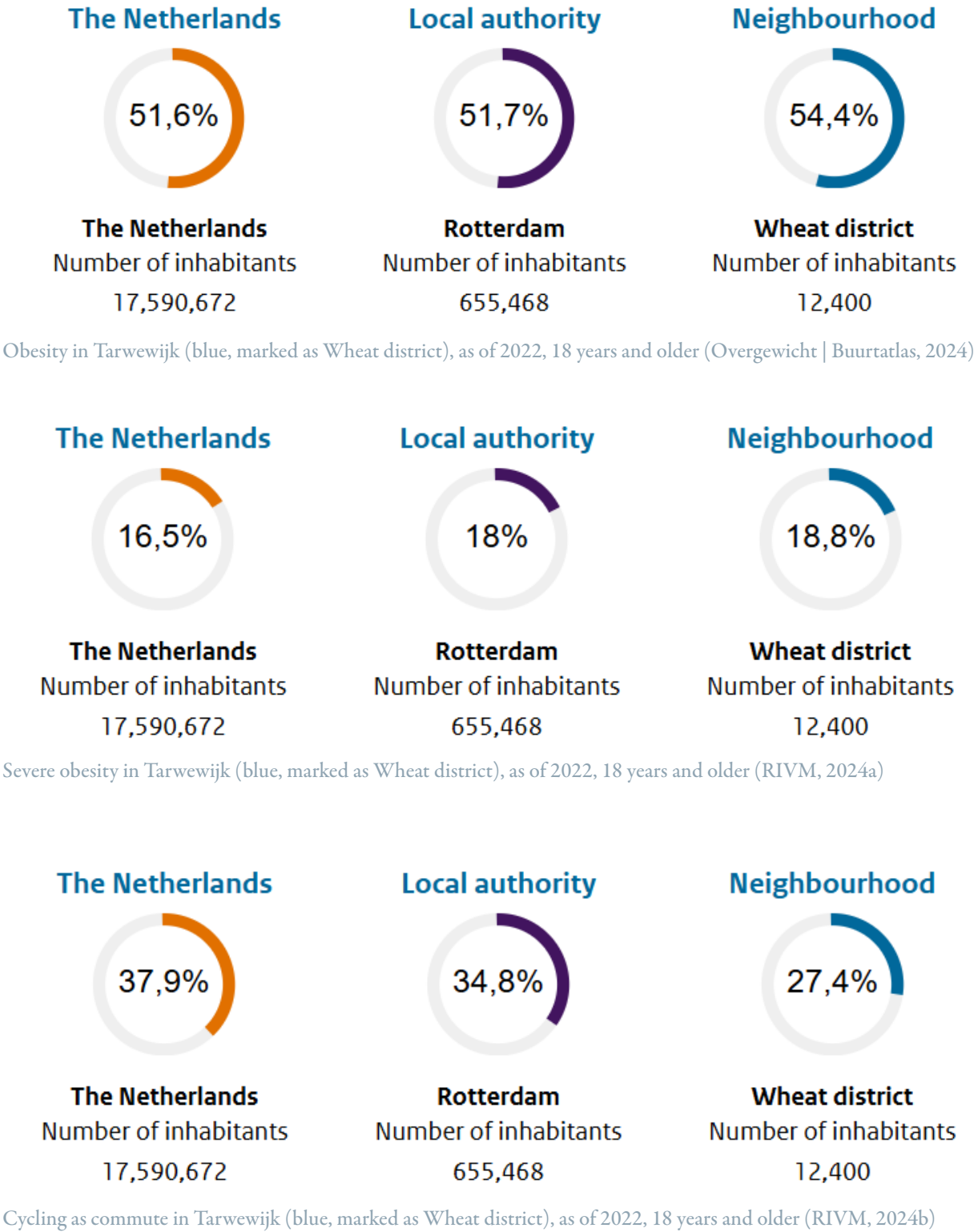
Global

Noncommunicable diseases

According to recent research (Balwan & Kour, 2021; Senapati et al., 2015; Tabish, 2017), conducted amongst others by the Sher-i-Kashmir Institute of Medical Sciences in India, lifestyle diseases, also called noncommunicable diseases (NCD's), are responsible for over 70% of deaths worldwide recently (over 40 million people per year). The most popular are: cardiovascular disease (CVD), cancer, diabetes type two (D2T) and chronic respiratory disease (CRD). Typically, besides non-modifiable risk factors such as age or genetic predisposition and family history, they are caused by unhealthy habitual behaviour, maintained over long periods of time – years or sometimes decades.

The main primary causes are: physical inactivity, unhealthy diet, smoking and alcohol abuse. In the Dutch context, the Centraal Bureau voor de Statistiek (CBS) and the Rijksinstituut voor Volksgezondheid en Milieu (National Institute for Public Health and the Environment, RIVM), established health indicators for each neighbourhood, characterizing the health level of the area (RIVM, 2022, 2024c). In the Lifestyle and Habits category (originally in Dutch Leefstijl en Gewoonten), two subcategories are additionally included – mental resilience and loneliness factors, relating to the social interactions or the lack thereof, and possibly resulting in such.

Local



Research questions

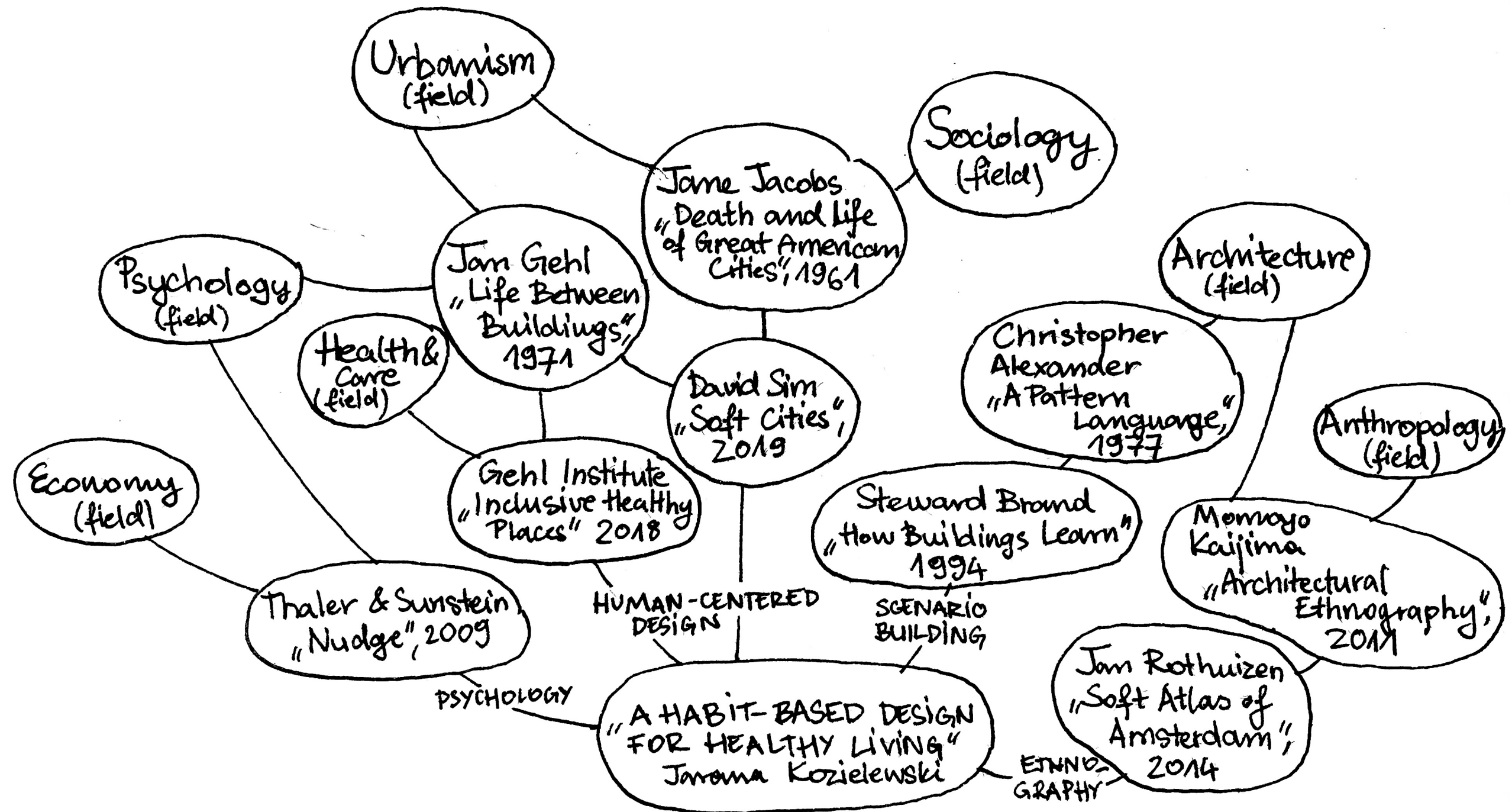
How can an architectural design approach informed by frequent local habits and potential post occupancy habitual scenarios support the mental and physical health of the Tarwewijk inhabitants?

SUBQUESTIONS:

1. What is the relation between habitual behaviours and health?
2. What major health and care challenges in Tarwewijk can be addressed through architectural interventions?
3. What habits frequently practiced in Tarwewijk and around the Balkon aan de Maashaven are influenced by architecture and could significantly impact residents' health?
4. Following Jane Jacobs, Jan Gehl, the Gehl Institute and David Sim, what elements and characteristics of an urban environment foster healthy habits?
5. How can architectural nudging influence health habits responsibly?
6. What is the relation between the meaning attributed to architectural elements and the perceived circumstances in which a habitual action is performed?
7. How does layouts of dwellings and access system of a building affect habitual actions performed in it?

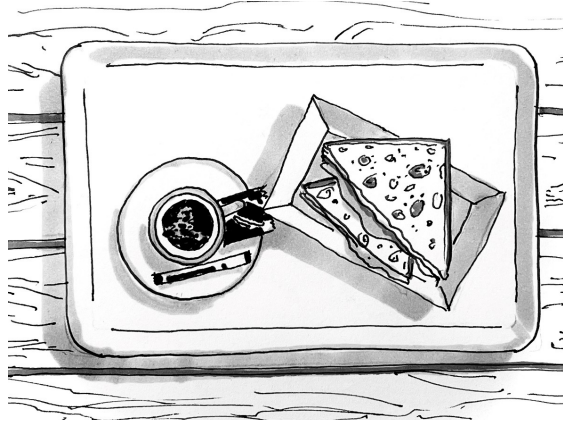
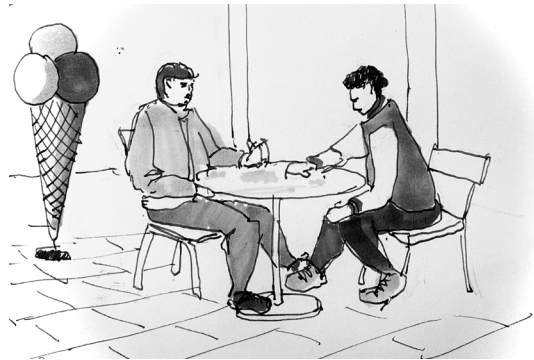
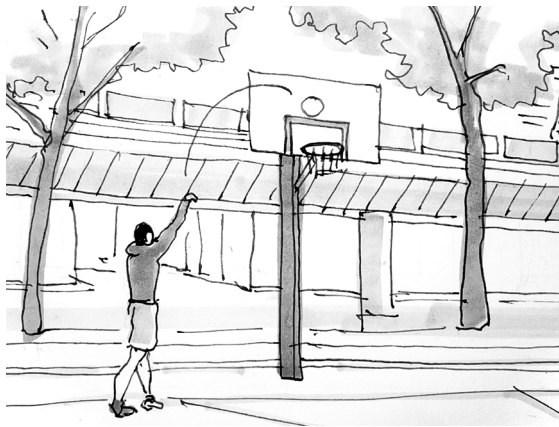
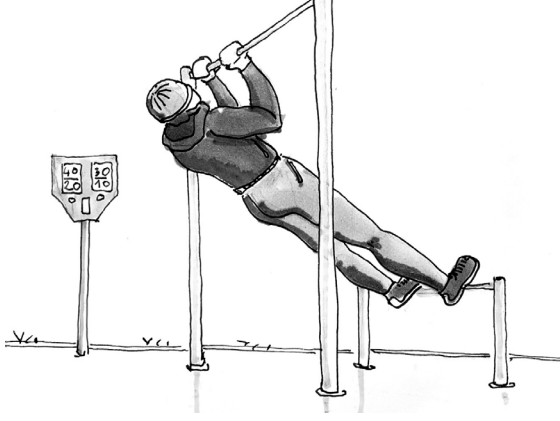
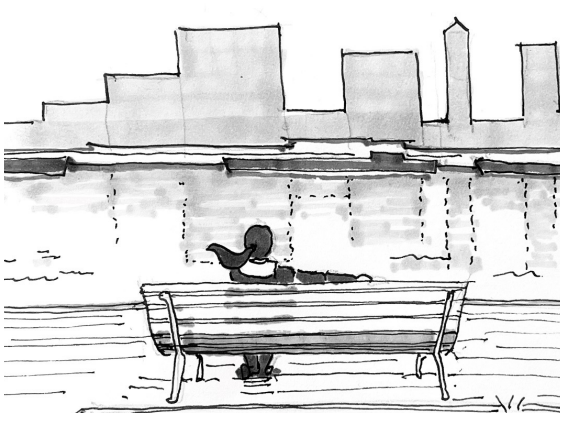


Theoretical framework



Fieldwork

Existing habits in the neighbourhood



Conclusions

As a starting point, it is essential to analyse existing habits – using methods developed by anthropologists and ethnographers - and health guidelines that the project aims to address.

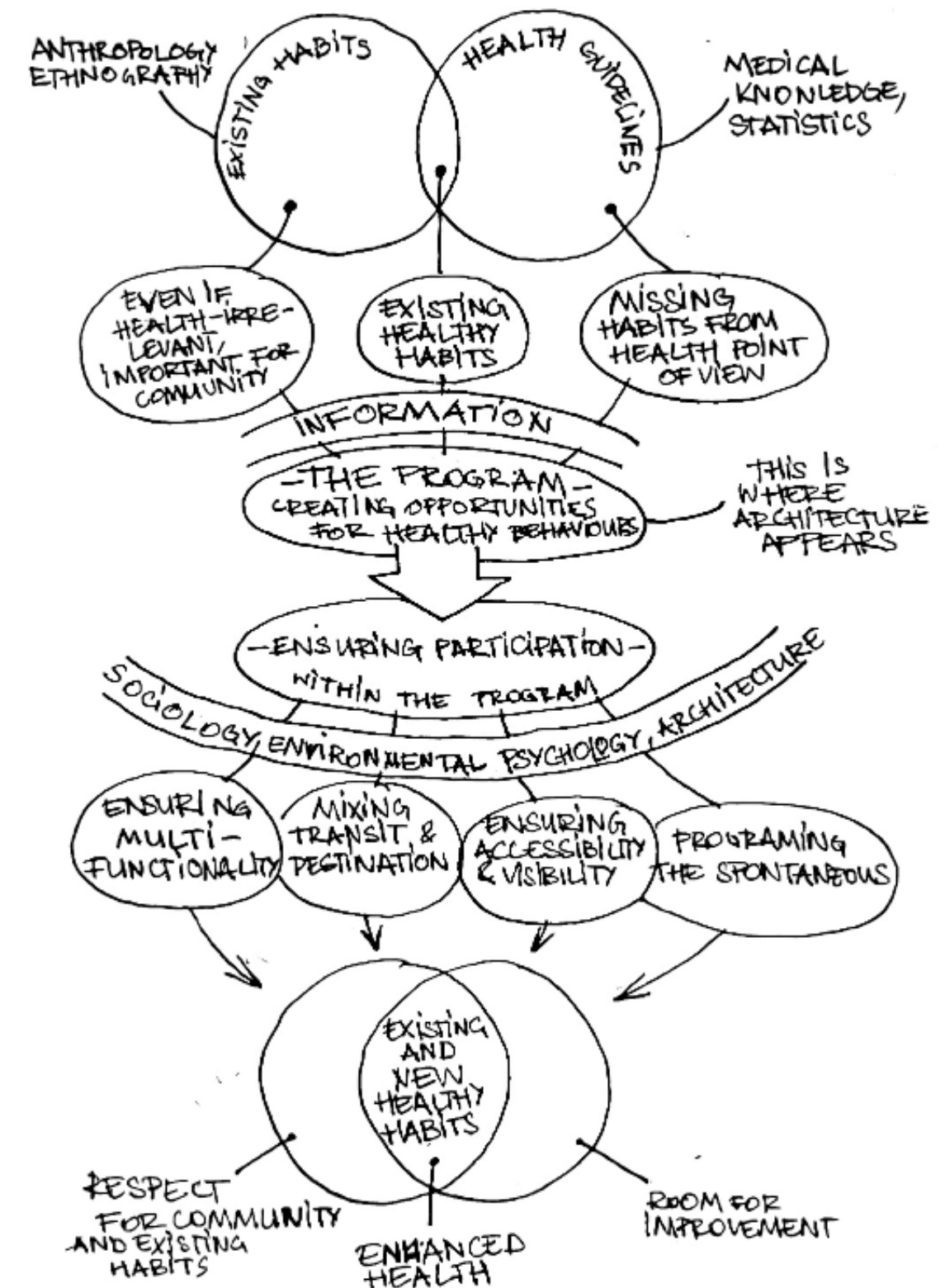
This information is then utilized to develop a program that fundamentally facilitates specific behaviours.

Subsequently, it is essential to ensure active participation in the program. Higher participation encourages more physical activity, foster social interactions, and positively influence dietary habits, particularly when diet-related elements are integrated into the program.

This involves fostering multifunctionality, ensuring accessibility and visibility, integrating transit with destination spaces, and accommodating spontaneous activities unrelated directly to the program.

The supposed outcome is a space tailored to the community, that effectively encourages healthy habitual behaviours through thoughtful design, that nudges users toward healthier choices, while achieving high participation rates.

What is a Habit-Based Design for Healthy Living?



Design guidelines

Creating opportunities in the program

Social Interactions



Places to linger in the park



Places to linger in courtyards

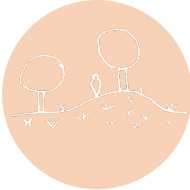


Places to linger next to dwelling access

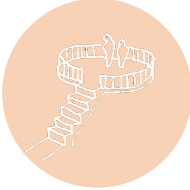
Physical Activity



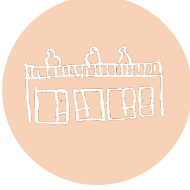
Stairs



Terrain Topography



Elevated viewpoints



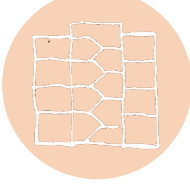
Accessible rooftops



Convenient bike storage



Destinations to walk to



Walk up buildings

Healthy Diet



Communal gardens



Community kitchen



Gastronomic commercial spaces



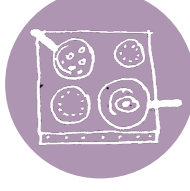
Market



Picnic tables



A rooftop greenhouse



Convenient apartments kitchens

Social Interactions



Physical Activity

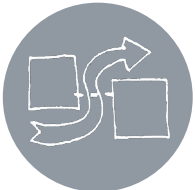


Healthy Diet



Design guidelines

Transit/ Destination



Avoiding dead ends



Open building fronts



Communal functions
in access systems

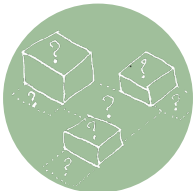


Including transit
roles in the park and
courtyards

Spontaneous act.



Flexibility of use of rooms



Adaptable outside space,
in front of buildings,
courtyards, rooftops

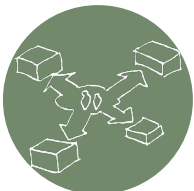


Provide semi programmed
space, podiums,
amphitheatres, shades

Multifunction.



Mixing functions of rooms-
living room, dining room,
kitchen



Many functions accessible
from each outside space

Increasing Participation

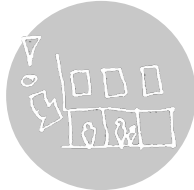
Visibility/ Accessibility



Visual connections
between rooms in
dwellings



Visual connections
between dwellings and
public spaces



Public Functions put on
display



Eliminating barriers – the
dijk and street



Ensuring clarity of access

Transit/ Destination



Spontaneous act.



Multifunction.



Visibility/ Accessibility



URBAN INTERVENTIONS

extending the neighbourhood

Plot choice



Location of the plot in Tarwewijk, scale 1:5000



Photo of the current situation on the plot



Aerial view of the plot (Google maps, 2024)

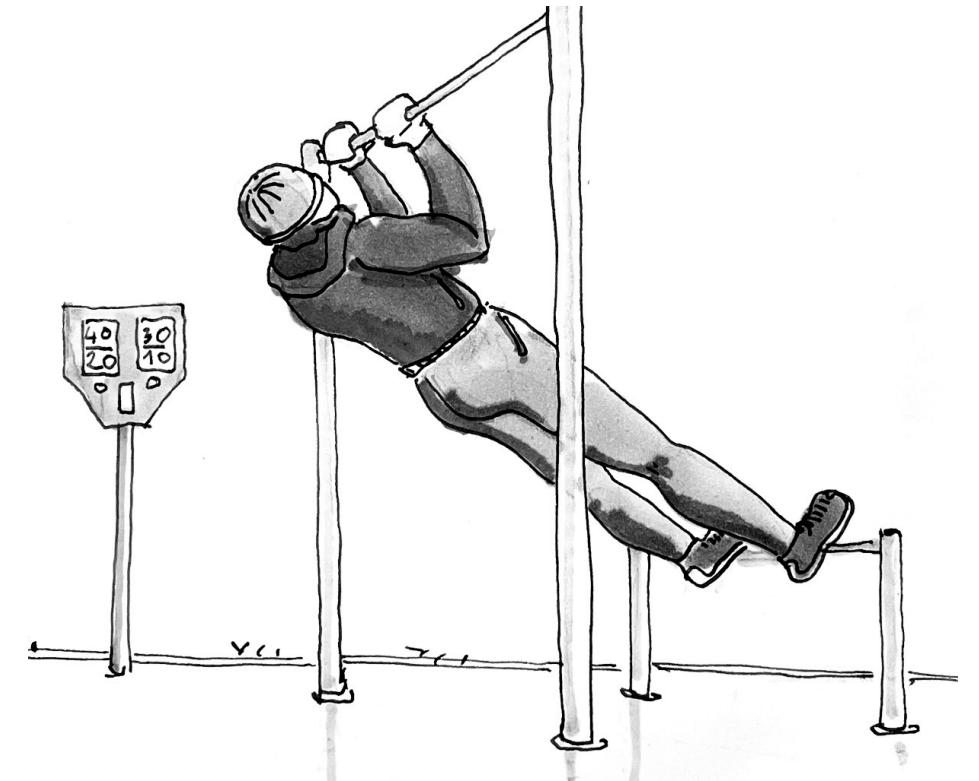
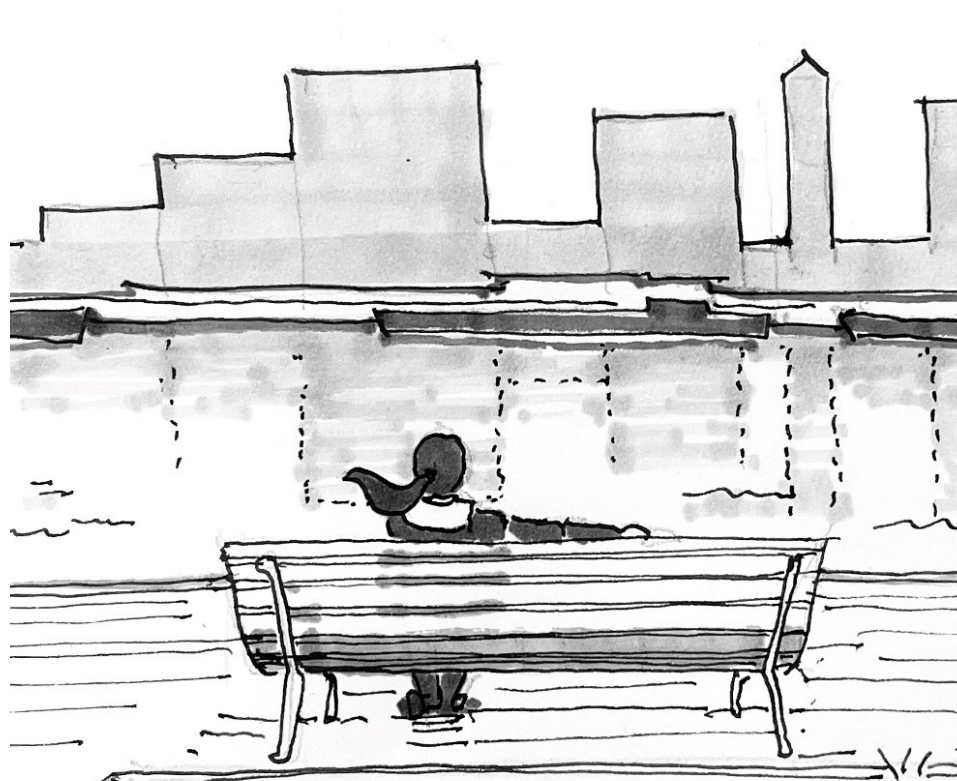
Municipality plans

Opportunities for the future



Habits around the plot

A base for further design



Programme

“First, a few early-bird walkers who live beside the park take brisk strolls. They are shortly joined, and followed, by residents who cross the park on their way to work out of the district. Next come people from outside the district, crossing the park on their way to work within the neighbourhood. Soon after these people have left the square the errand-goers start to come through, many of them lingering, and in mid-morning mothers and small children come in, along with an increasing number of shoppers.”

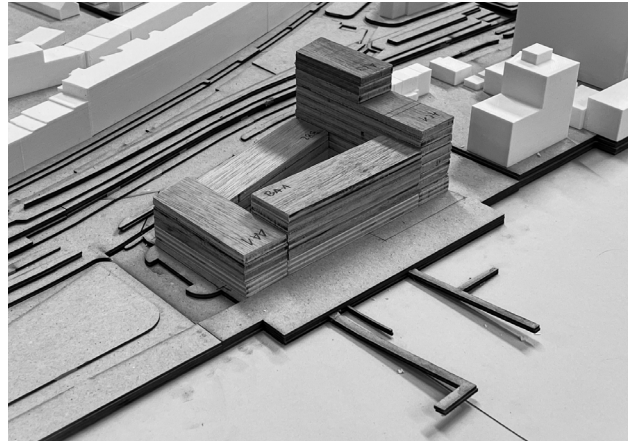
Jane Jacobs cites Joseph Guess, *Death and Life of Great American Cities*, 1961, p. 96

“Density x Diversity = Proximity”

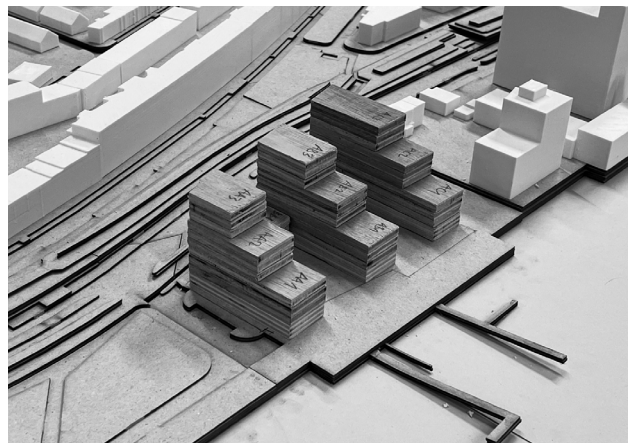
David Sim, *Soft City*, 2019, p.12

Housing 60 dwellings, average 62,5 m² Subtotal 3750 m²	Circulation space With added communal spaces Subtotal 1316 m²
Commercial activities Groundfloors 630 m² Subtotal 630 m²	Supporting facilities Storage 150 m² Climate controls 180 m² Parking garage 1270 m² Subtotal 1600 m²
Community spaces 300 m² Resident’s spaces 240 m² Greenhouses 288 m² Subtotal 828 m²	Total: 8124 m² Ground floor area: 2480 m²

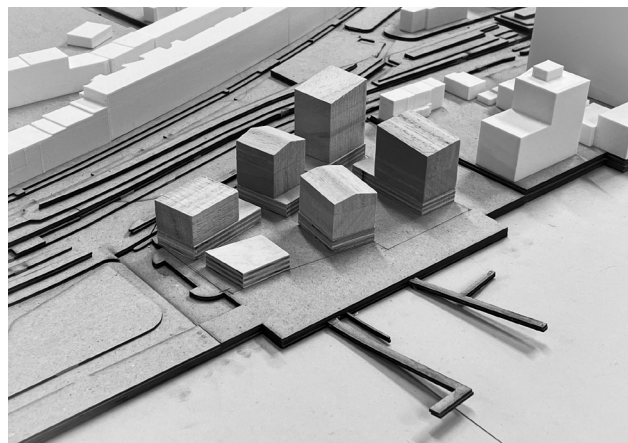
Massing



Mass model, version 1, scale 1:500



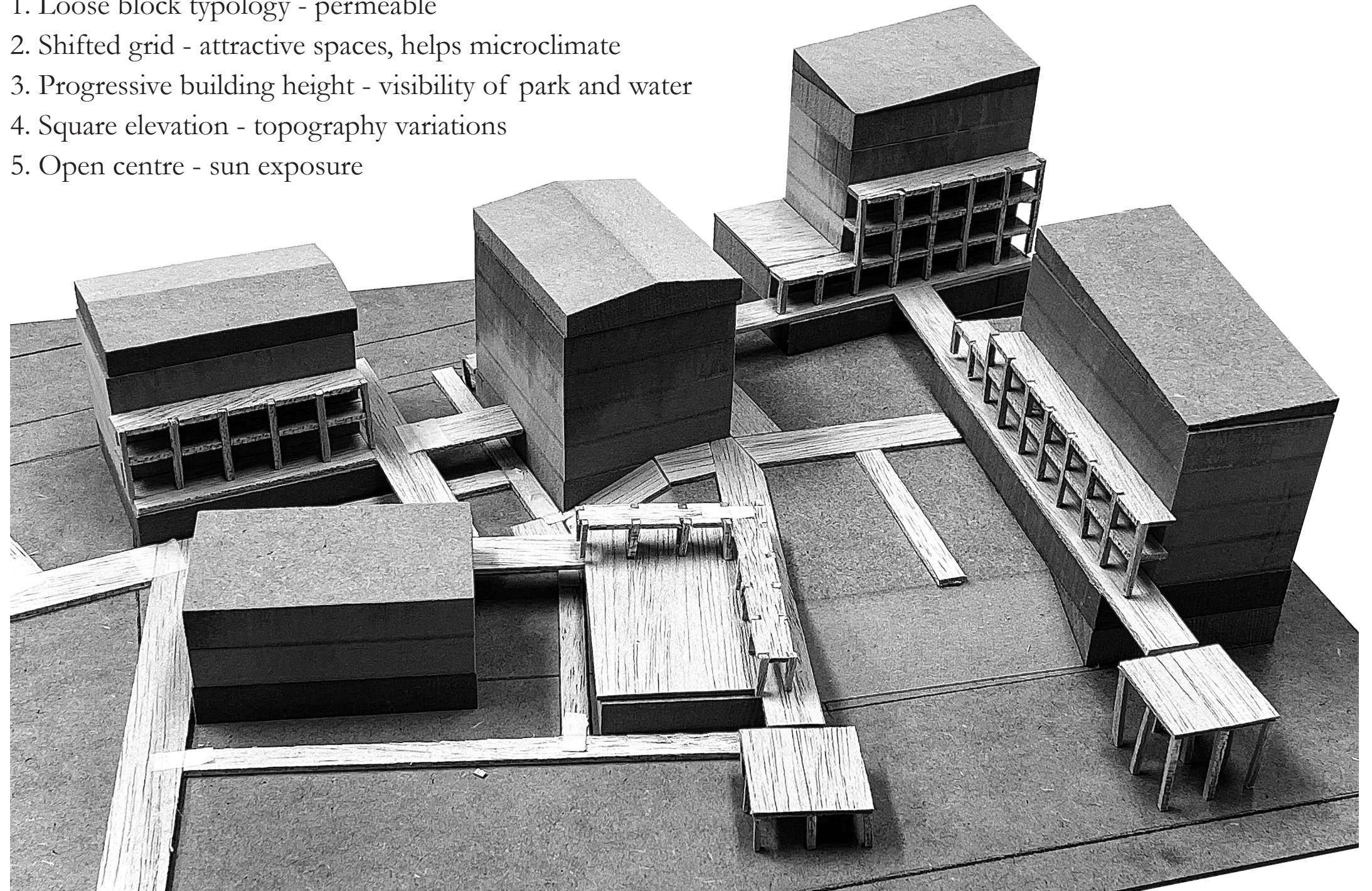
Mass model, version 2, scale 1:500



Mass model, version 3, scale 1:500

Key principles:

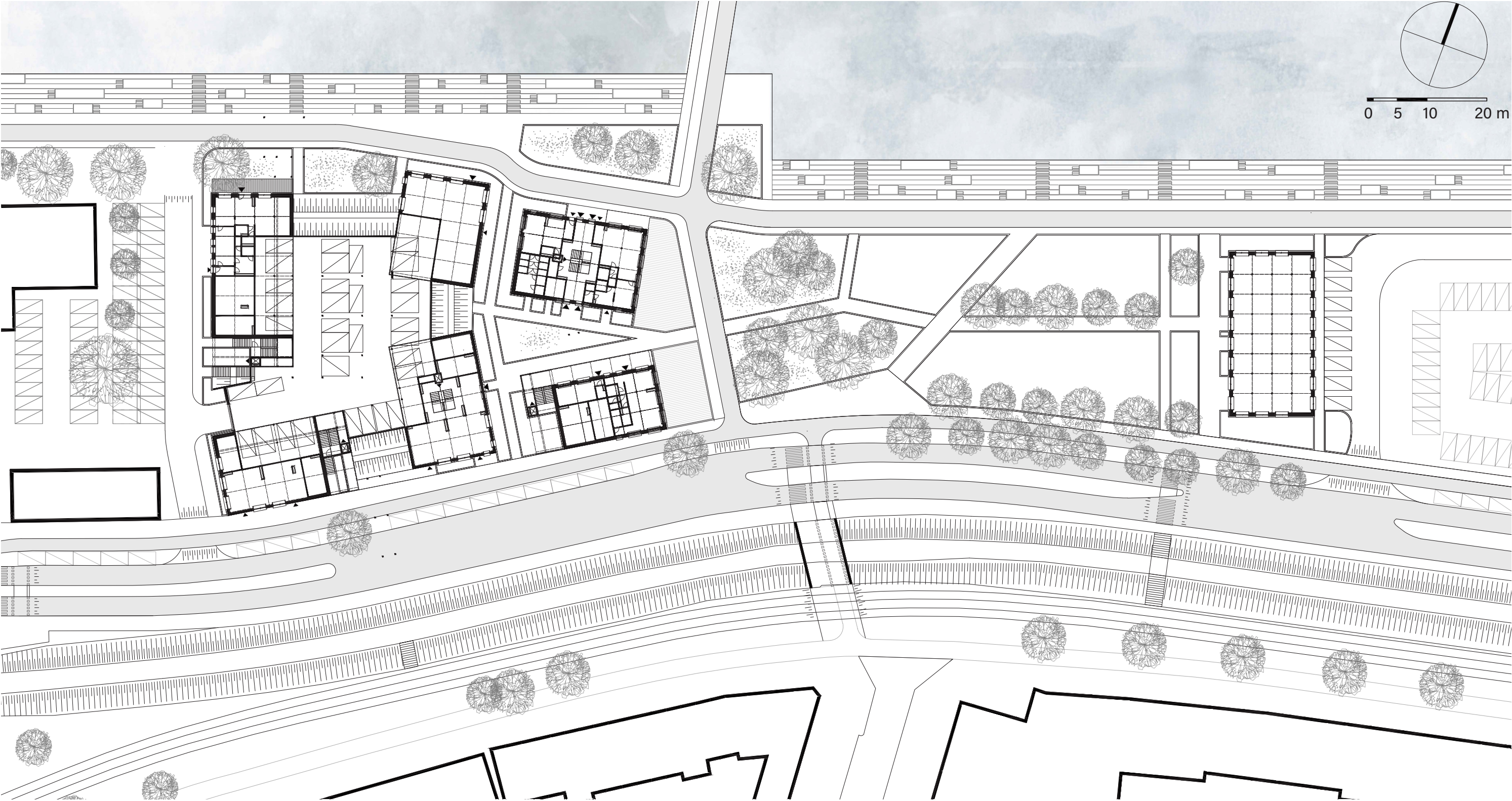
1. Loose block typology - permeable
2. Shifted grid - attractive spaces, helps microclimate
3. Progressive building height - visibility of park and water
4. Square elevation - topography variations
5. Open centre - sun exposure



Mass model, version 4, scale 1:200

Connections with the neighbourhood

Urban scale interventions





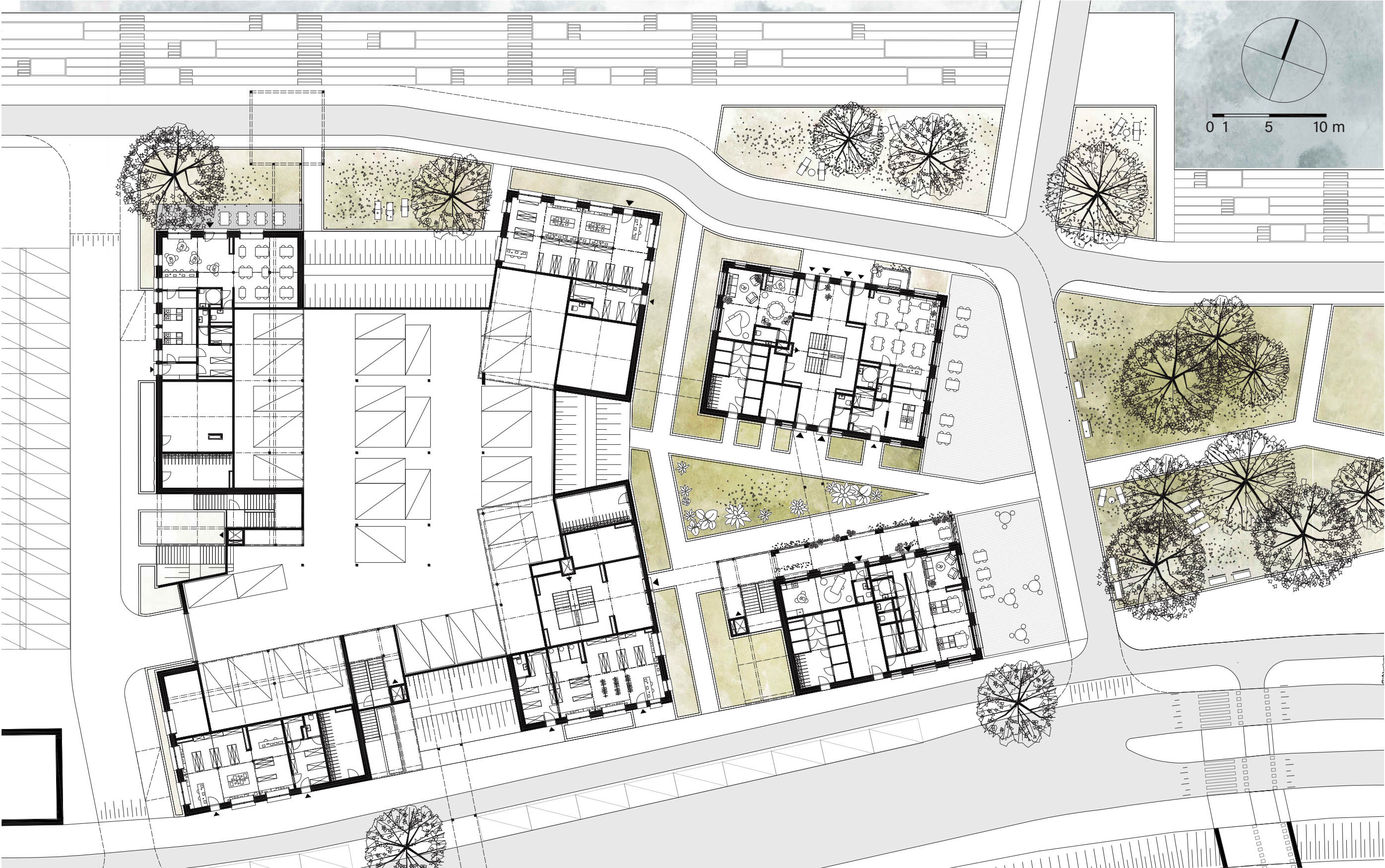
Access to the housing ensemble from Tarwewijk



Entrance to Balkon aan de Maashaven from Katendrecht

PUBLIC LIFE

in communal and commercial spaces

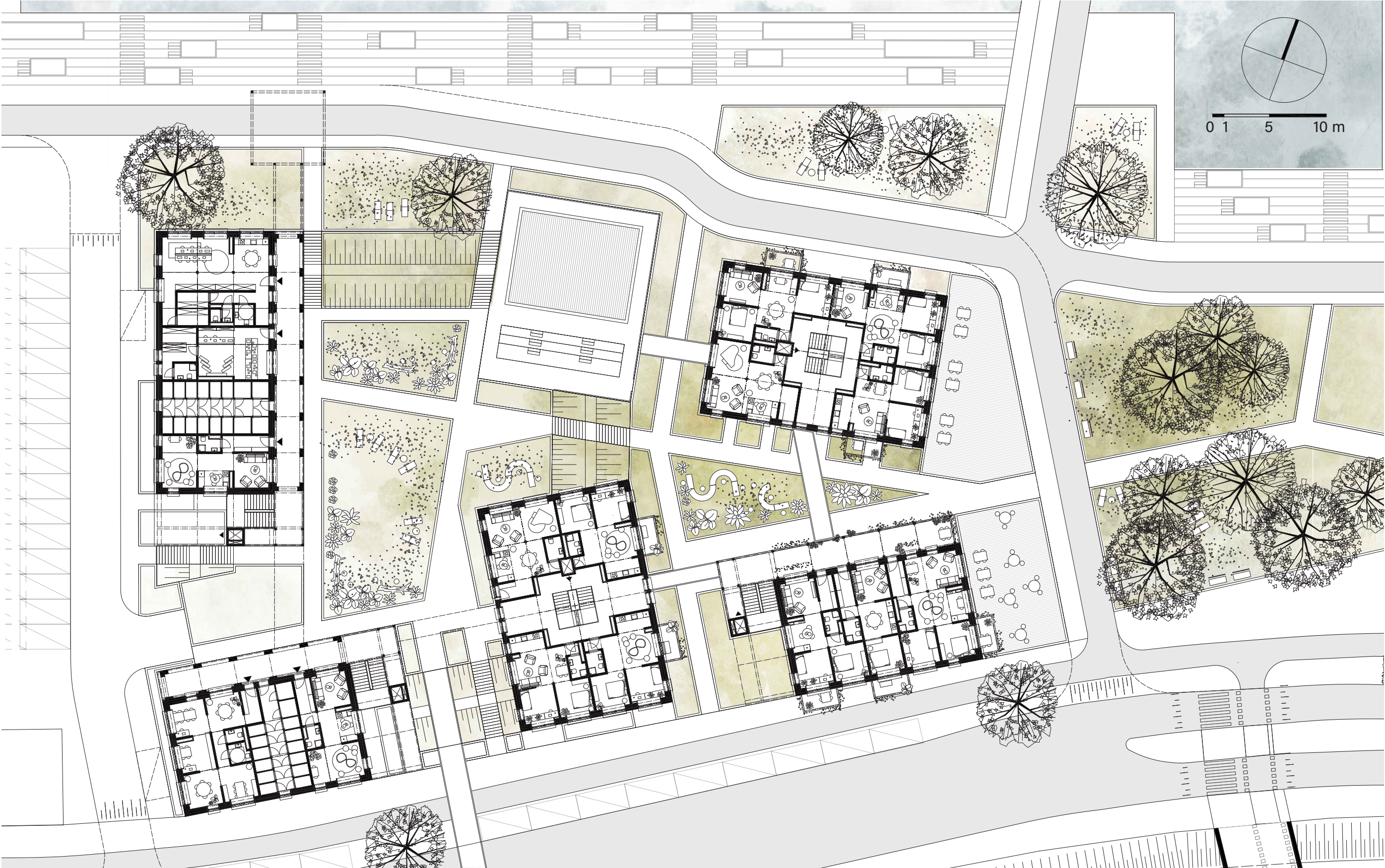


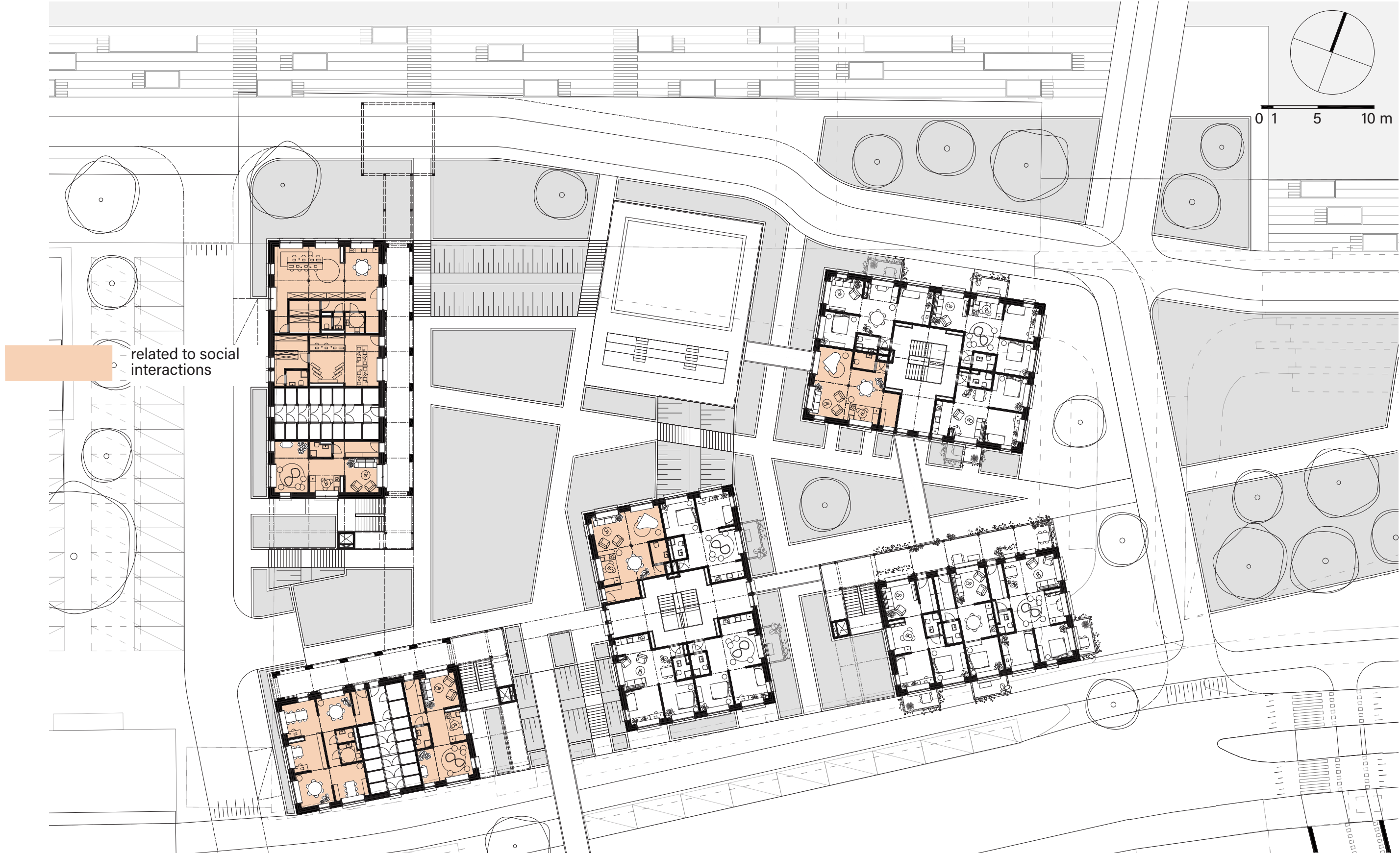






Public life in communal and commercial spaces







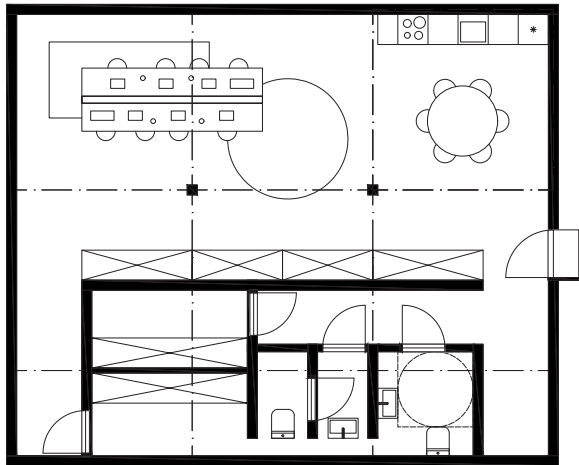


Upper square - birds eye view

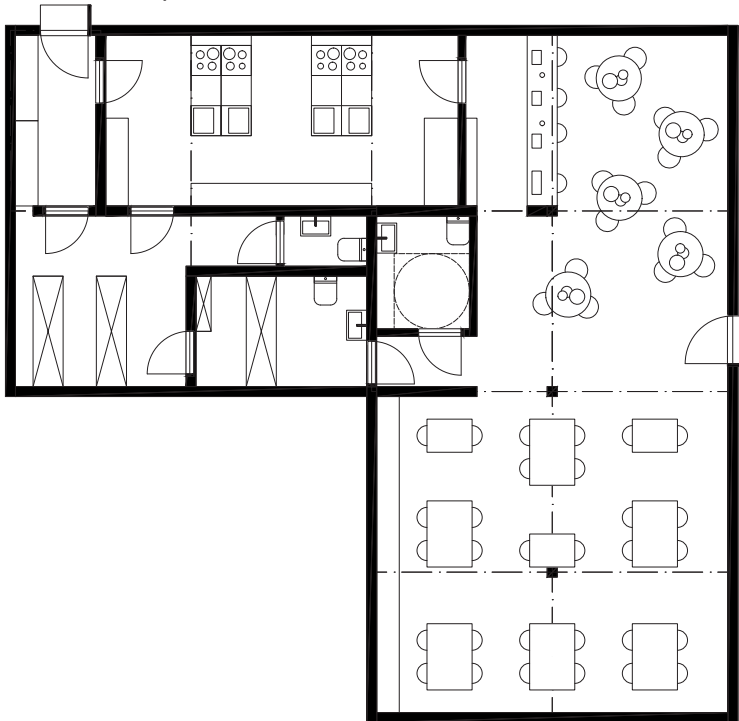
Ground floor - scenarios

Commercial and communal functions

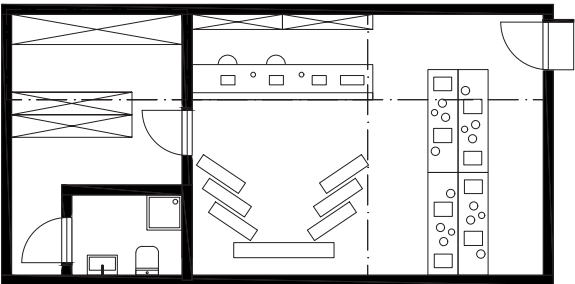
7,5 modules, community centre



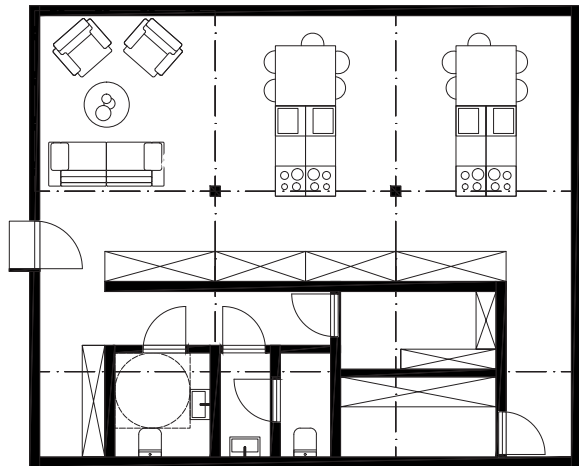
12 modules, restaurant



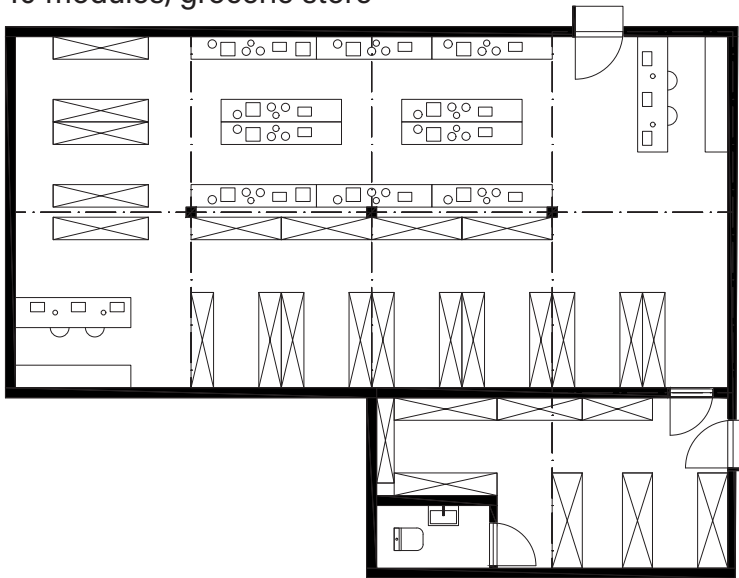
4,5 modules, specialist shop



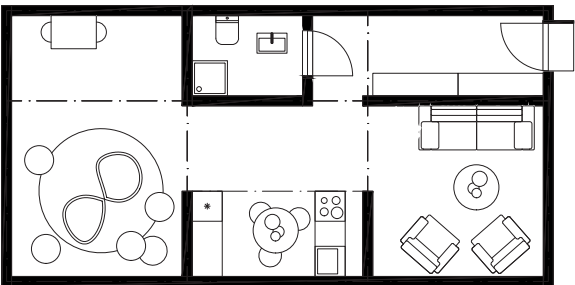
7,5 modules, community kitchen



10 modules, grocerie store



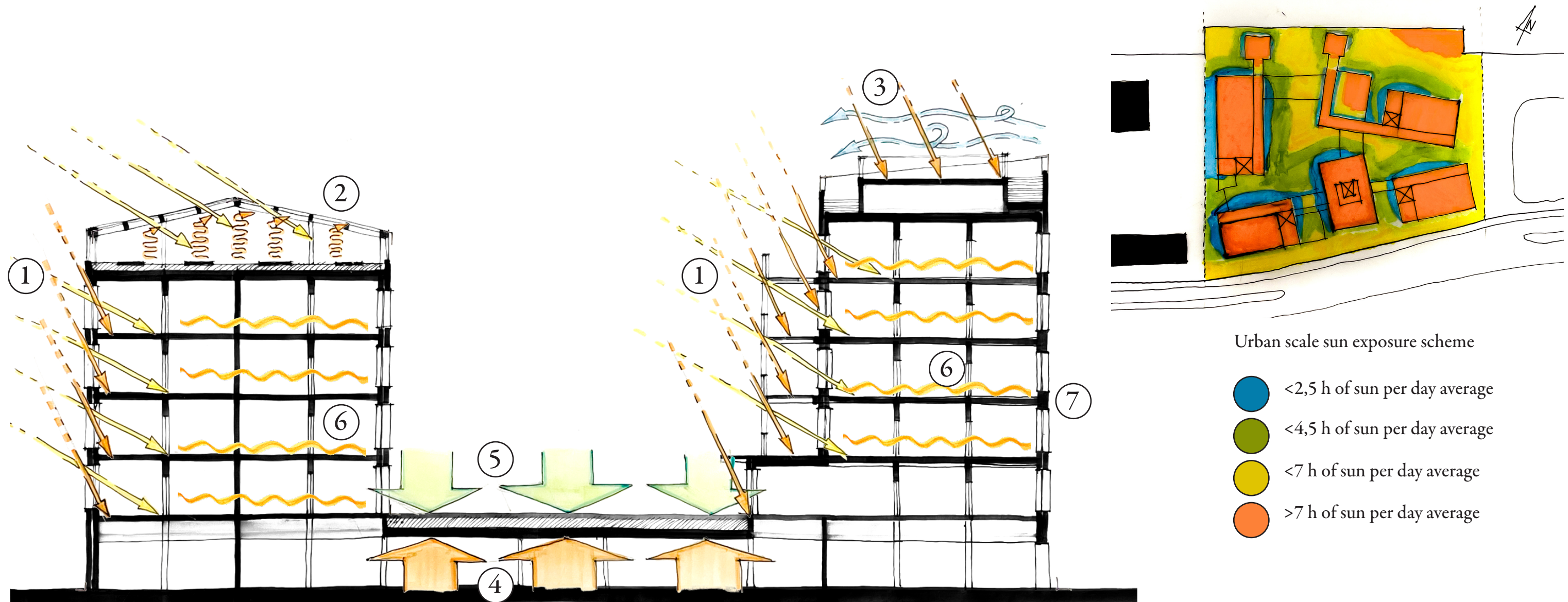
4,5 modules, residents space



SUSTAINABILITY

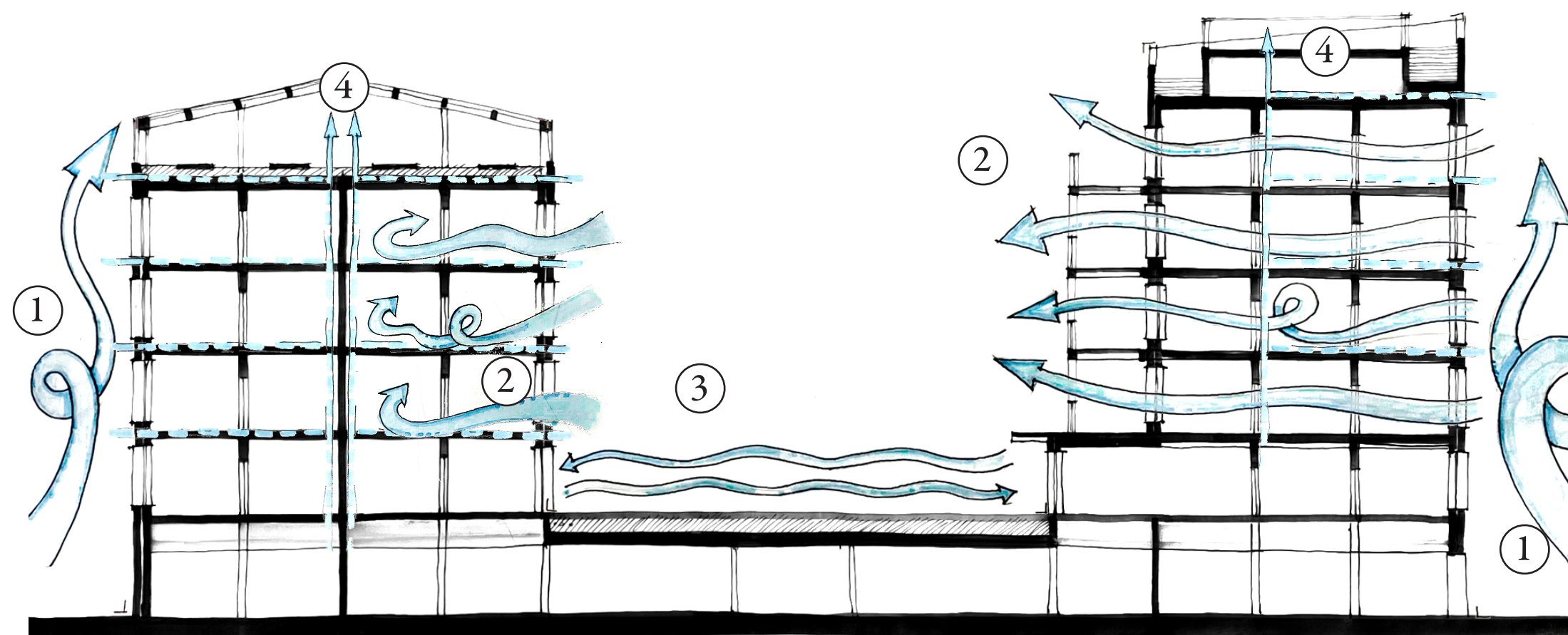
in massing and structure

Sun exposure



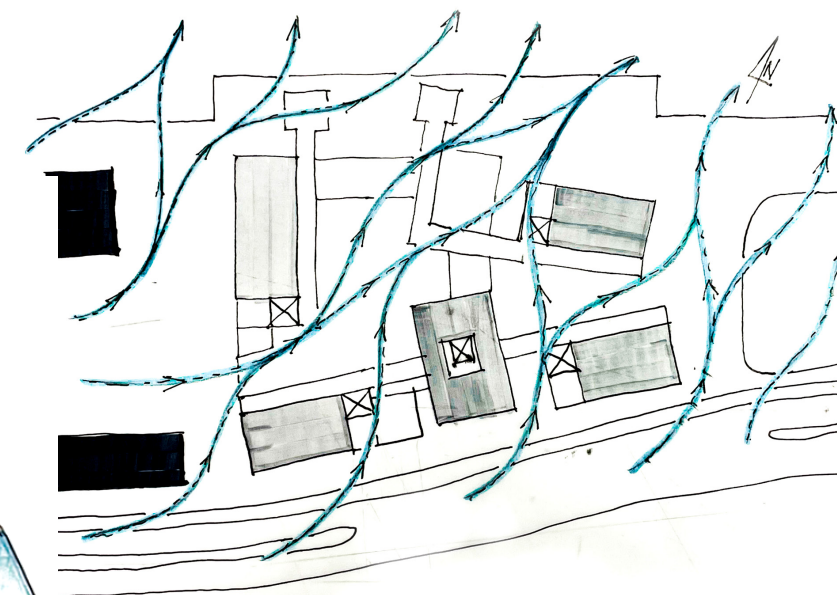
1 - Galleries acting as overhangs, naturally regulating sunlight penetrating the buildings 2 - The rooftop greenhouse as a pleasant place during winter due to sun heating. 3 - The external rooftop as a pleasant space in the summer due to wind cooling and sun heating balance. 4 - Semi-public square elevation making it more sunlit through the year. 5 - Balancing with cooling effect of vegetation in the summer. 6 - Floor heating activated during colder days. 7 - External walls made of bricks increase the thermal mass of the building, helping cooling it during the summer

Wind and airflow



1 - Buildings acting as a barrier breaking the wind. 2 - Airflow through apartments - corner or galleries. 3 - Semi-public square covered from main wind flows. 4 - Mechanical inlet and outlet ventilation (type D), water heatpump in Maashaven

Wind and airflow

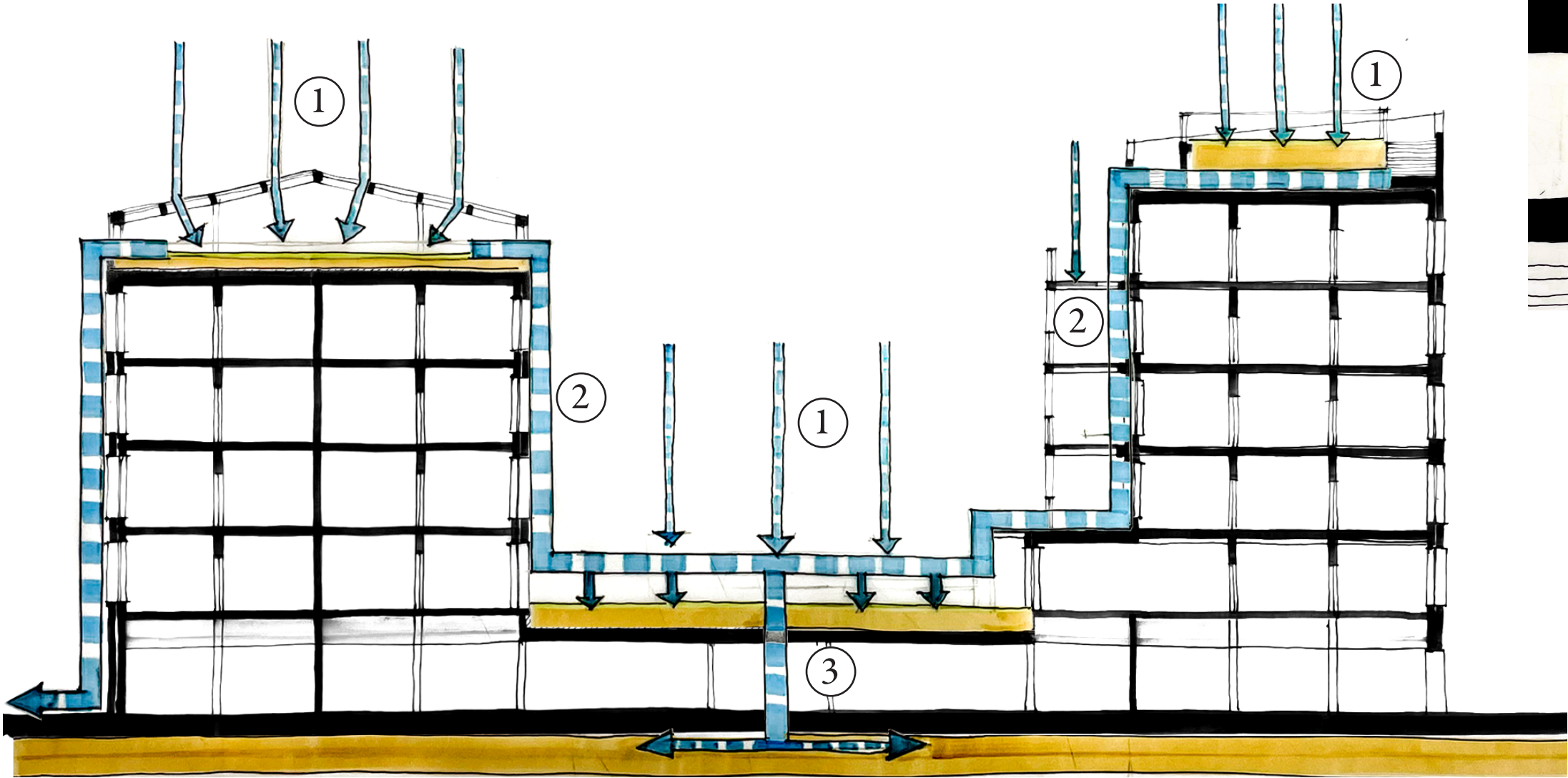


Urban scale wind and airflow scheme - The irregular grid created by the building, and varying in between spaces, permits the wind permeate the complex, while also breaking down its speed.

Additional ventilation strategies:

- During winter, the mechanical ventilation systems are using a heatpump going to the Maashaven as an energy supply to heat up the air entering the building.
- As the ground floor is public and the upper floors are dwellings, the ventilation systems are separated to avoid unnecessary ducts and collisions

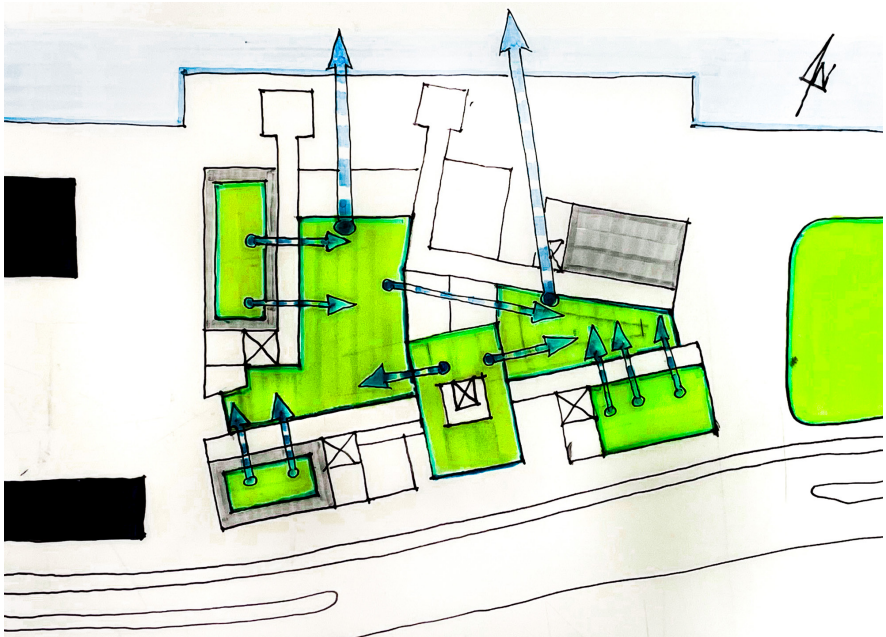
Water management



1 - Primary water collection and retention on rooftops.
overflow water into the Maashaven.

2 - Overflow water transportation on lower levels of semi public spaces.

3 - Dissipation of



Urban scale water management scheme

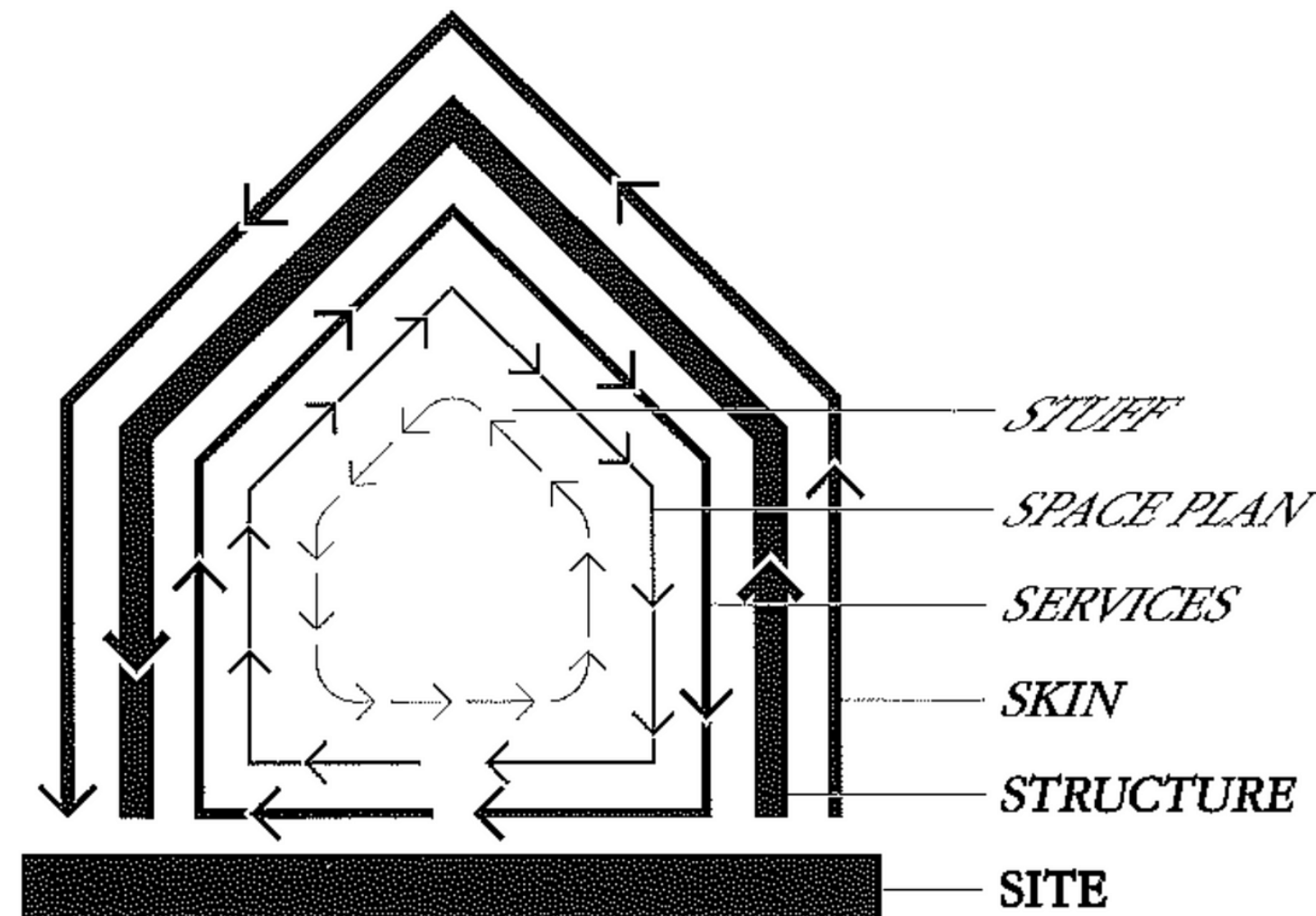
- Maashaven
- Bioactive layers in the park and on the rooftops



Climate and atmosphere on the upper square

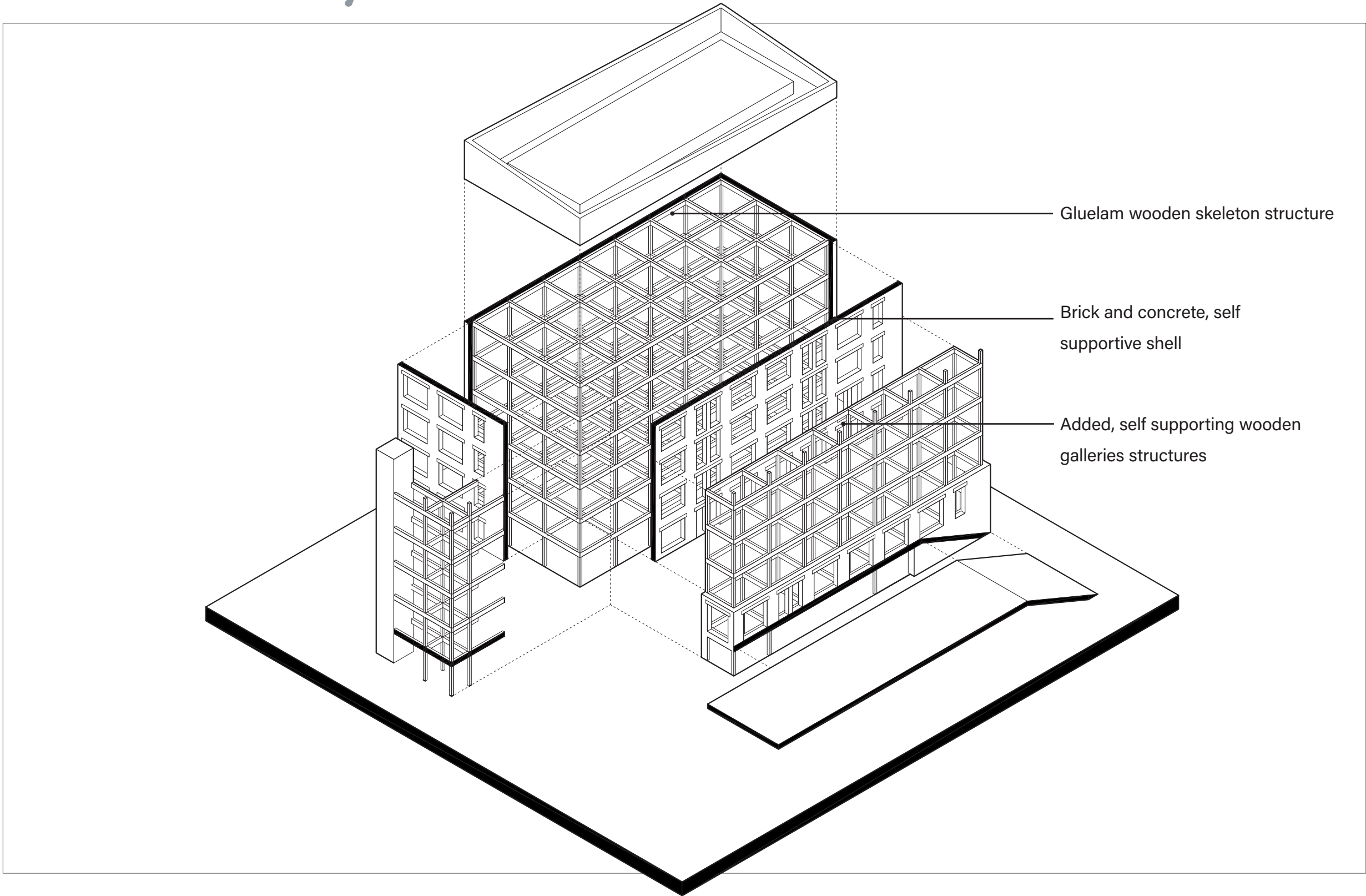
Structural principle

Separation of shearing layers



SHEARING LAYERS OF CHANGE. Because of the different rates of change of its components, a building is always tearing itself apart.

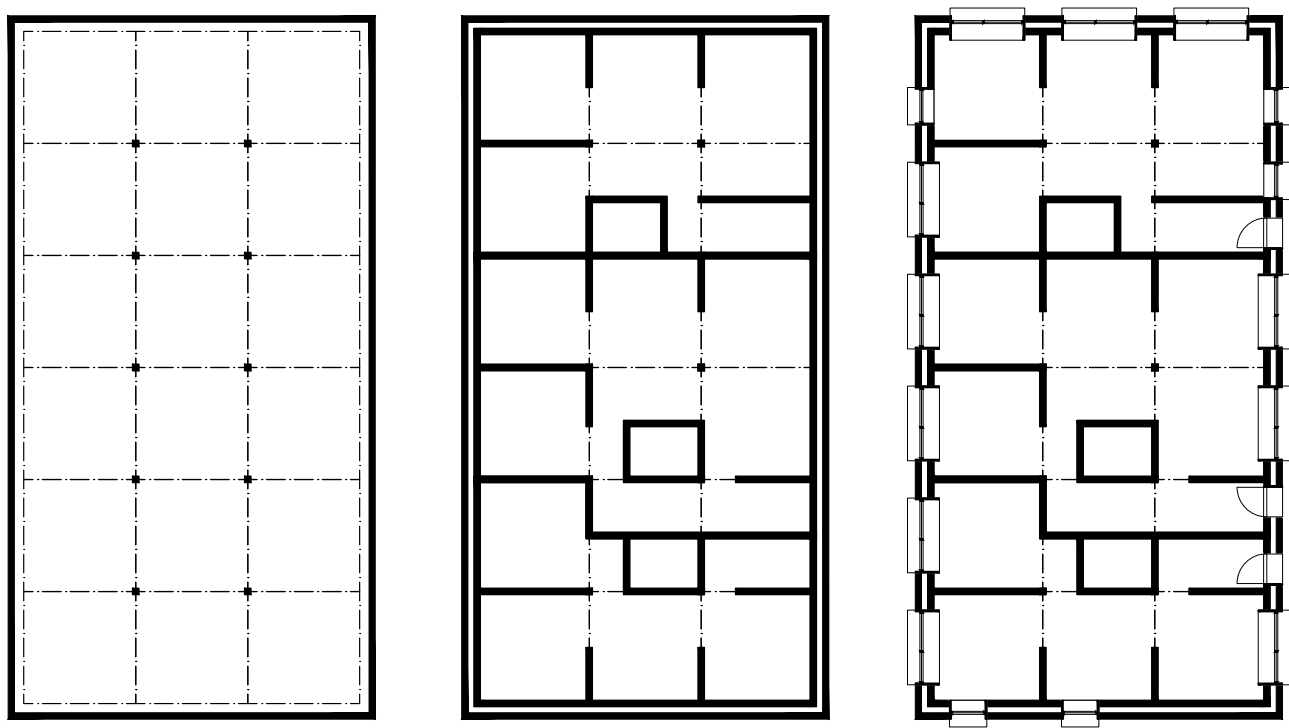
Structure - main systems



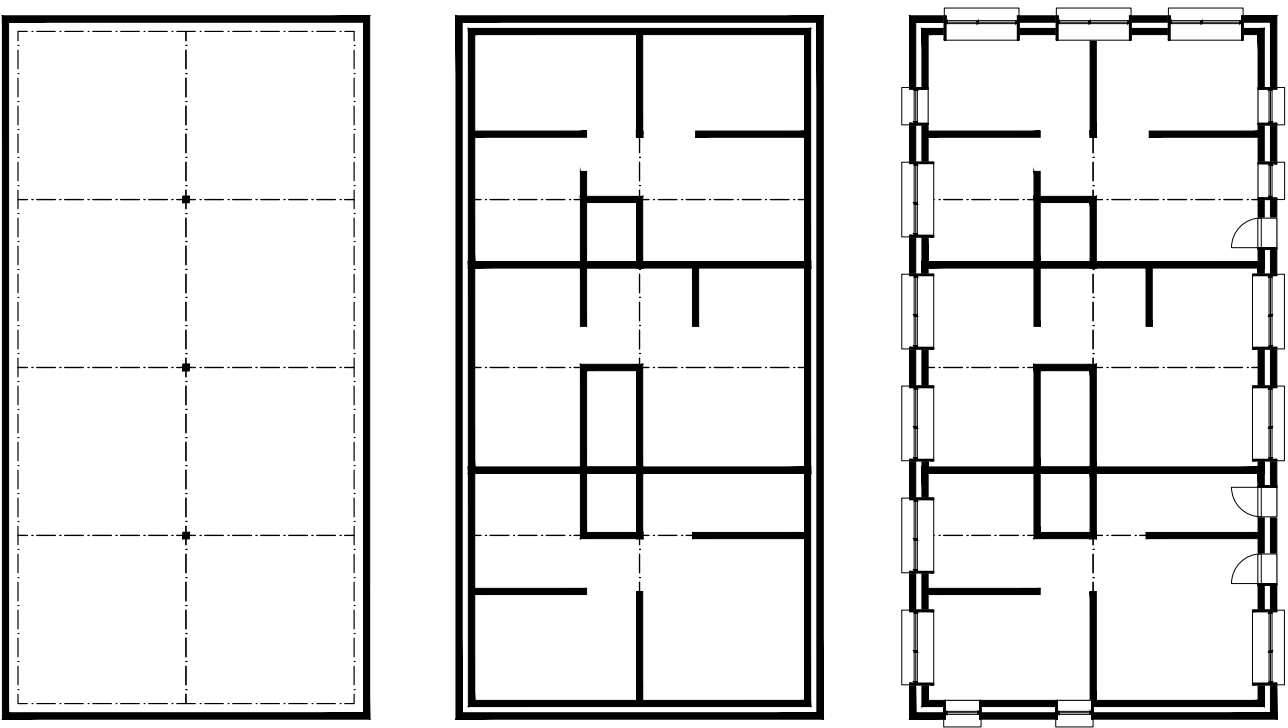
Axonometry - main structures division

Layer separation

3,60 m x 3,60 m (developed further)



5,40 m x 5,40 m



Base module

Basic features of the systems:

- **No load bearing walls**

Leaving maximal flexibility

- **Gluelam beams and columns**

Negative CO2 emissions

- **3,60 by 3,60 [m] axes span**

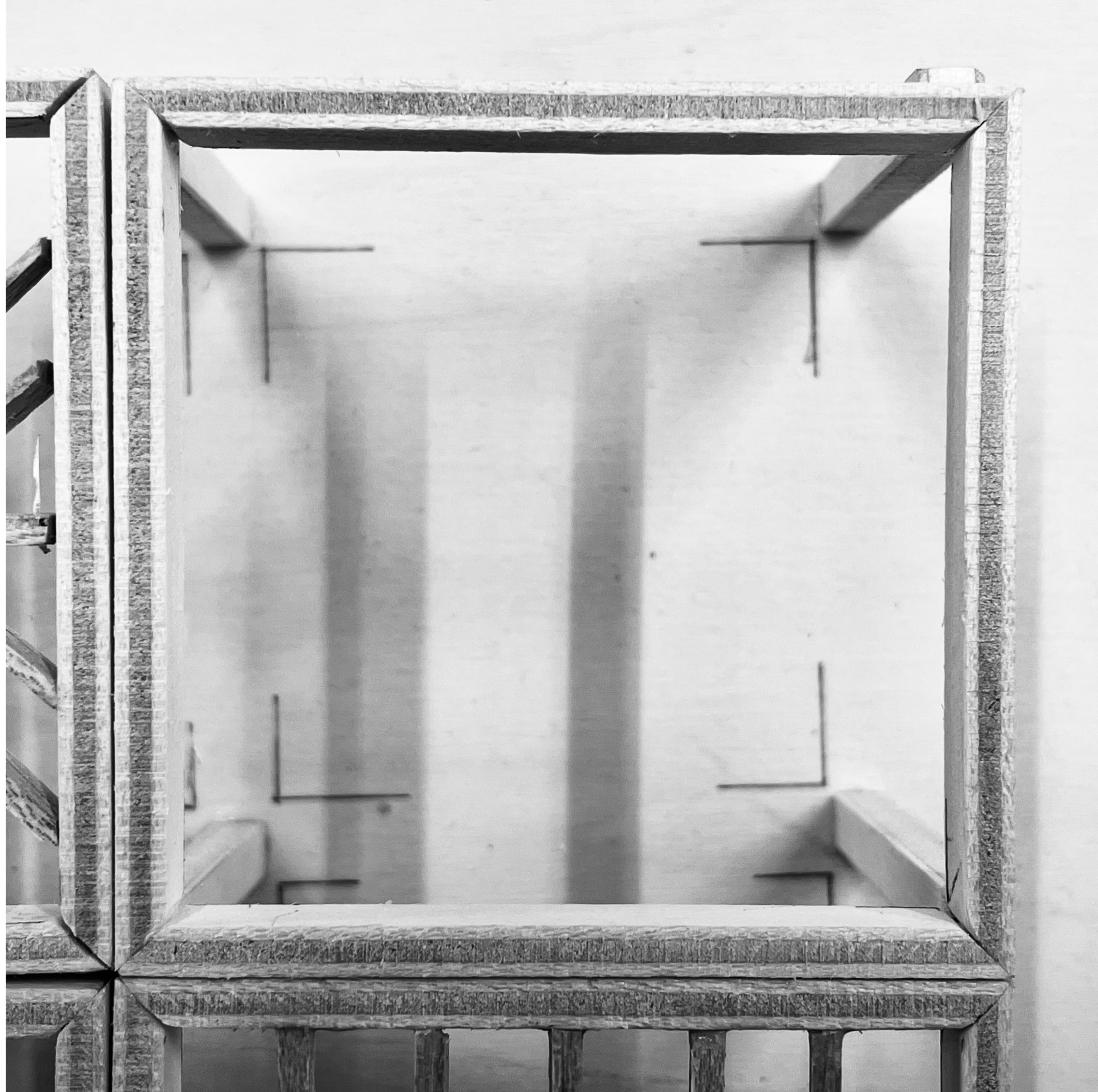
Corresponding to the functional system,
lowering the use of materials

- **Connections made with click-in
Rothoblaas systems (steel hooks)**

Easy to dismantle and reuse

- **Prefabricated elements assembled at
the construction site**

Faster construction, lower impact of
weather

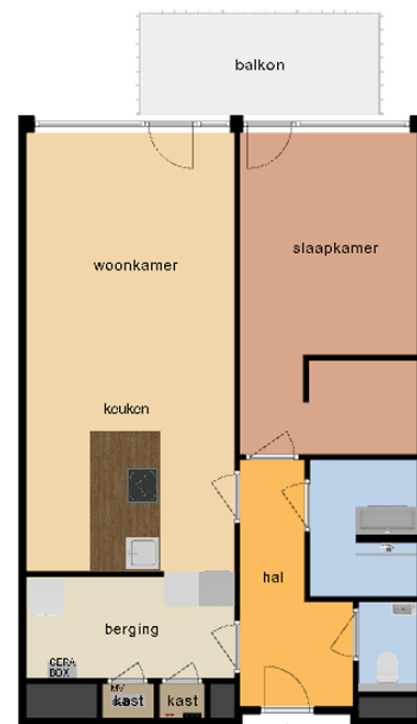
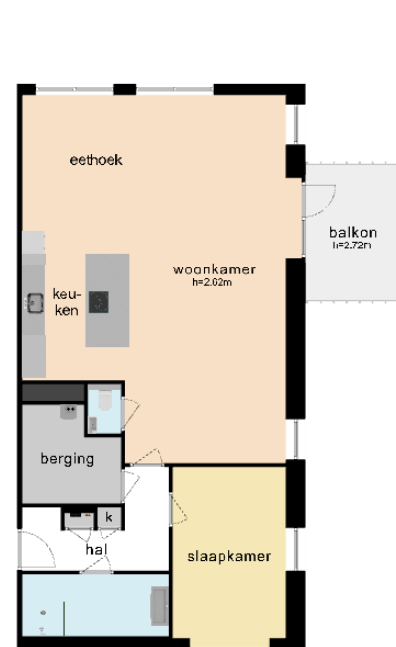


DWELLINGS

a system prolonging the research

Standard development apartments

Examples from Funda



1. Divided rooms

- easy ways to avoid contact between residents

2. Hierarchy of spaces

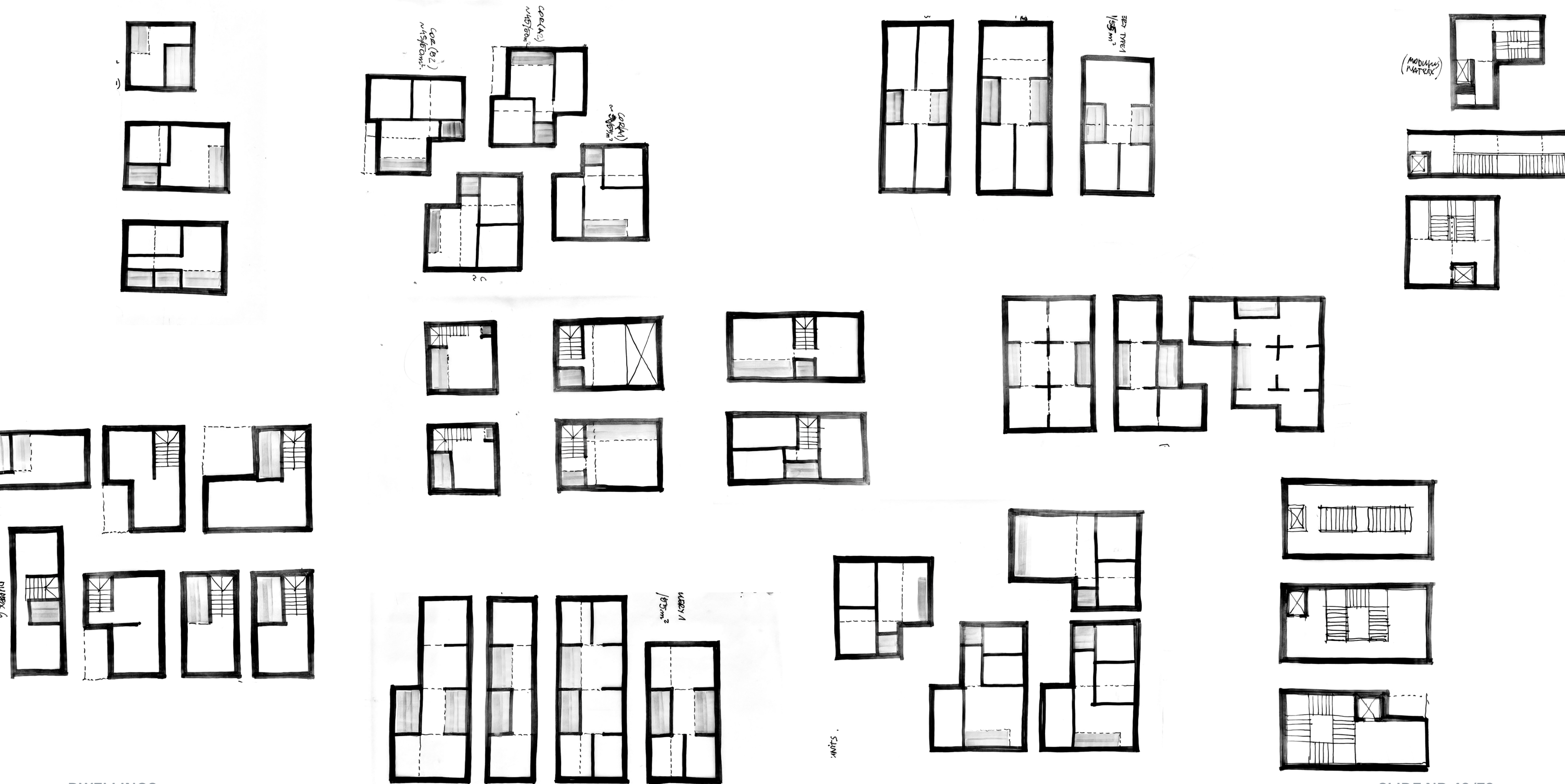
- limited possibilities to adapt the apartments to the existing habits and preferences of the residents

3. Hallway entrance

- very strong separation between the inside and outside

Functional grid

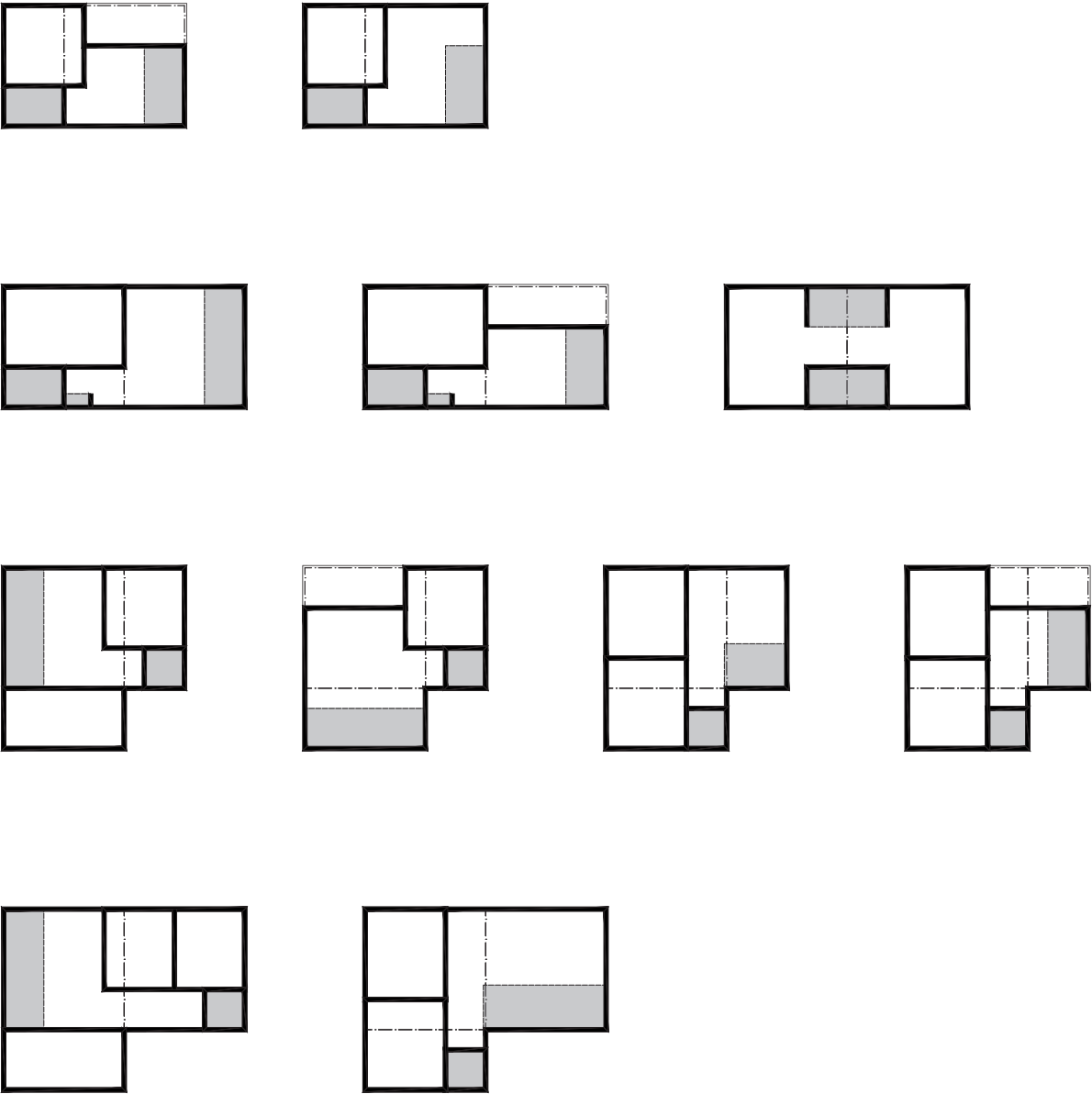
Comparison between grid sizes



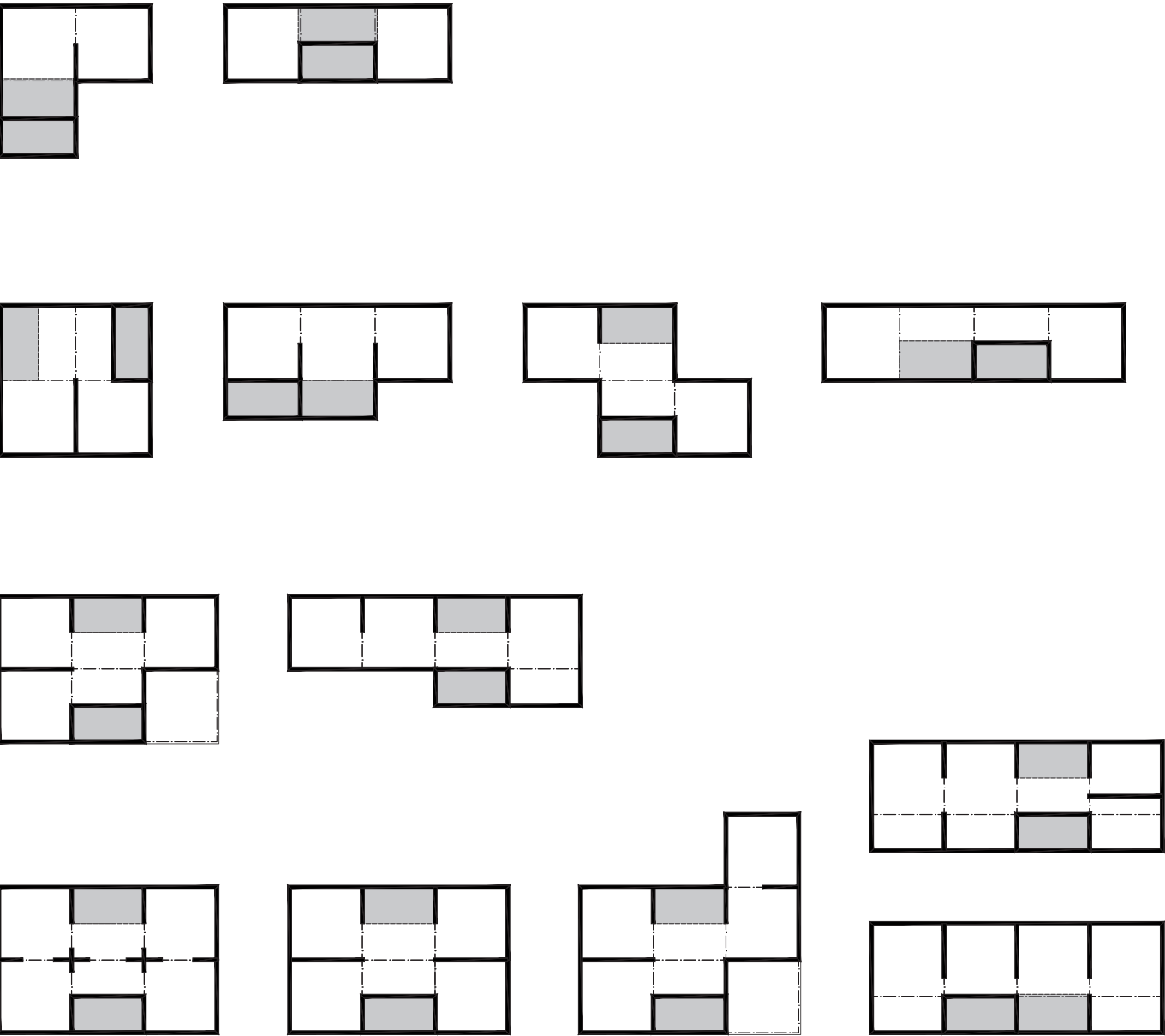
Functional grid

Comparison between grid sizes

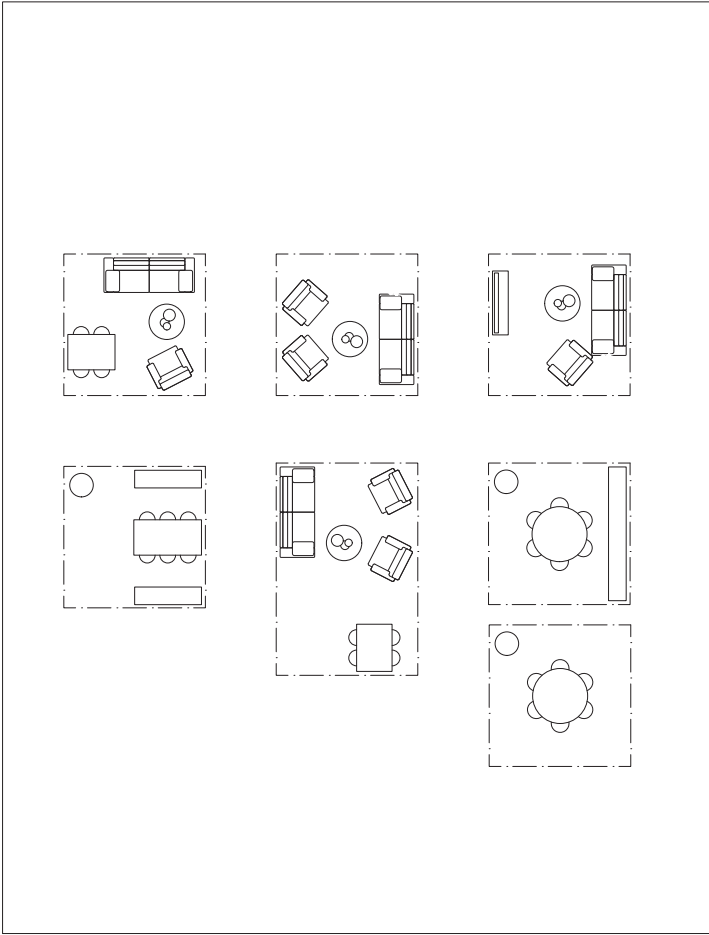
5,40 m x 5,40 m



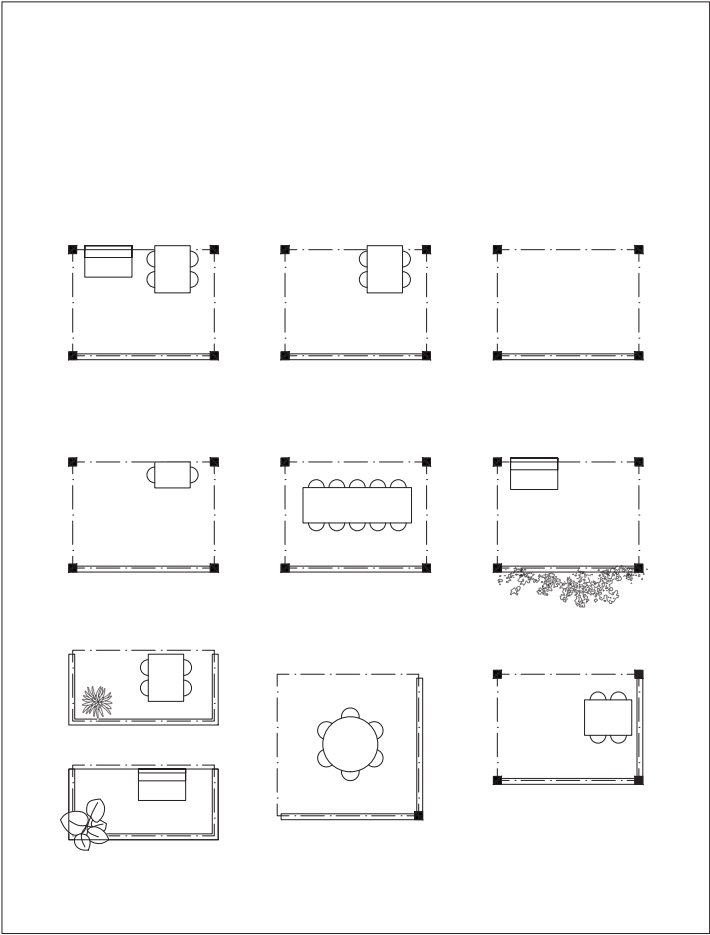
3,60 m x 3,60 m (developed further)



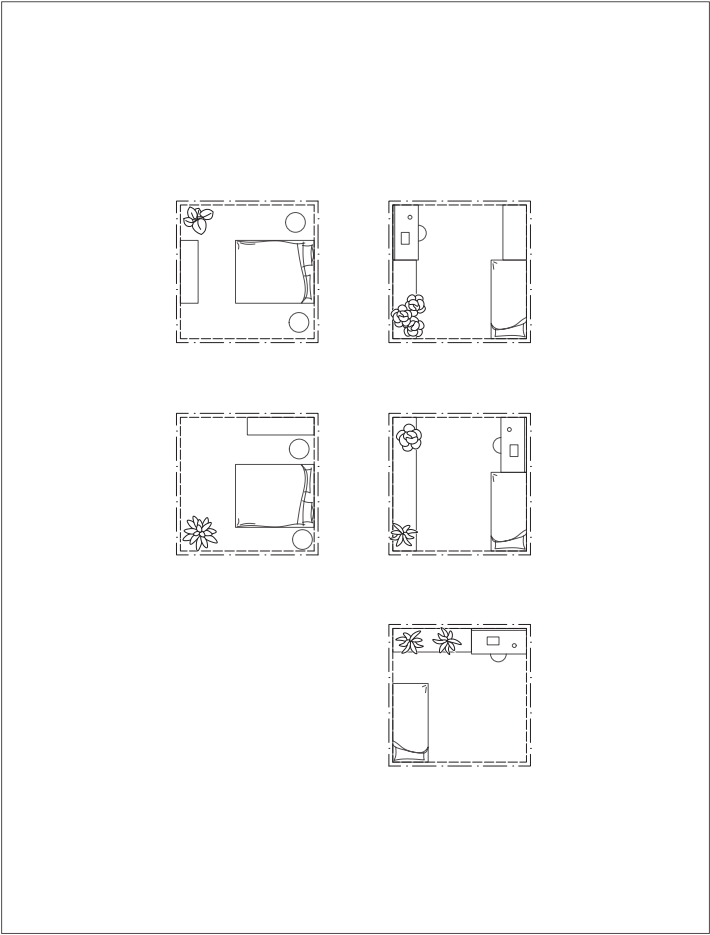
Scenarios



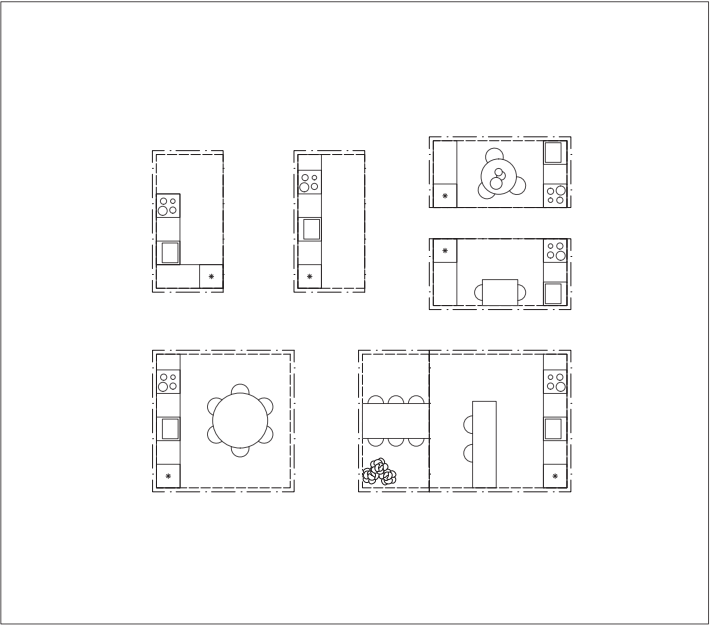
Living 1:100



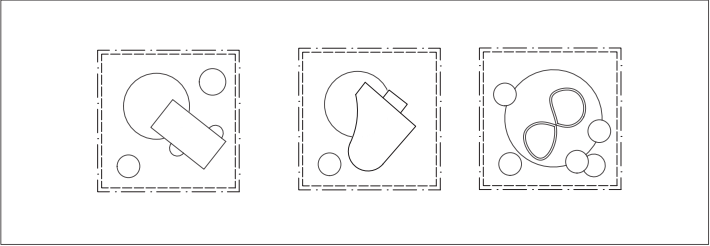
Outdoor spaces, 1:100



Bedrooms, 1:100



Dining, 1:100



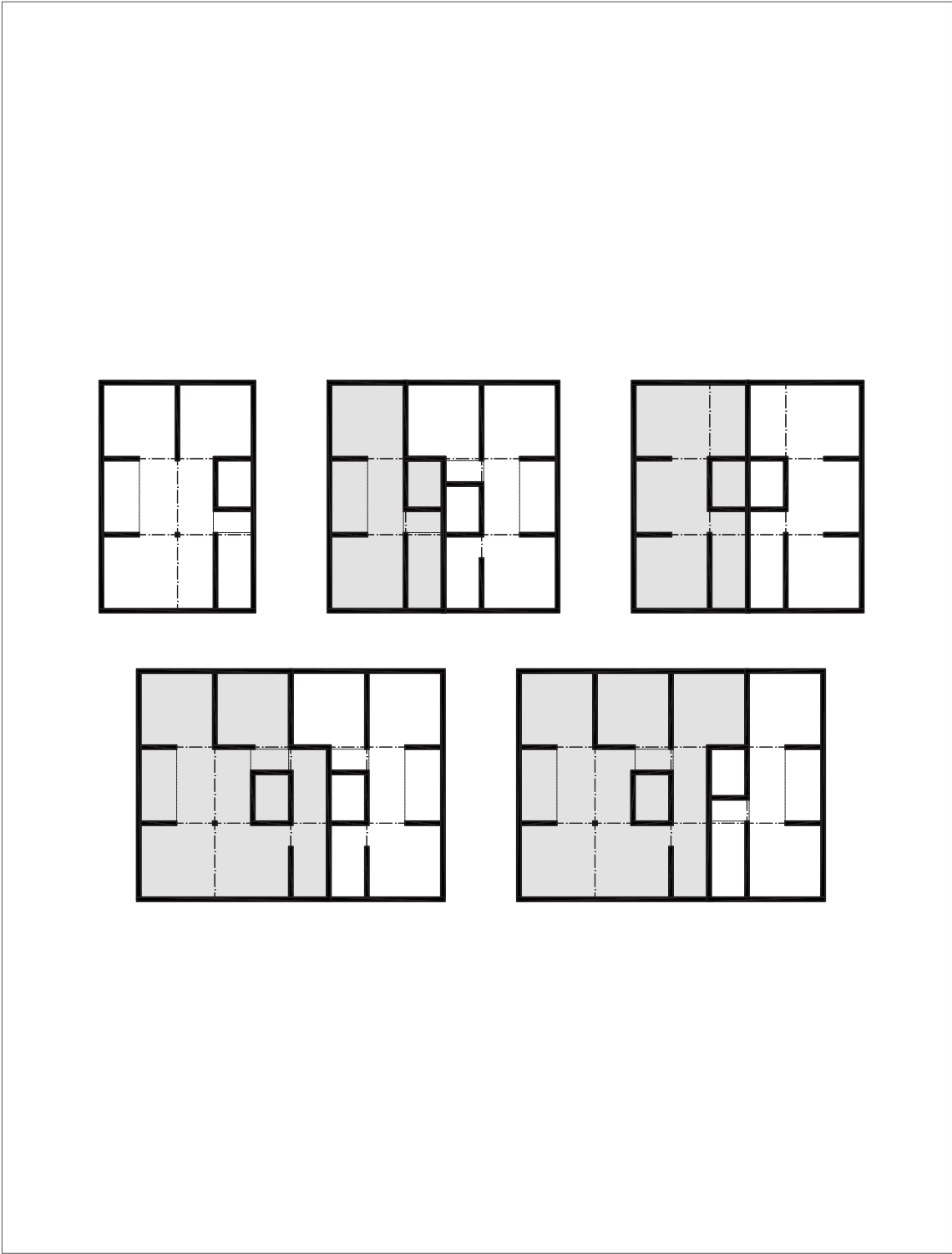
Work and hobby, 1:100

Final dwelling choice

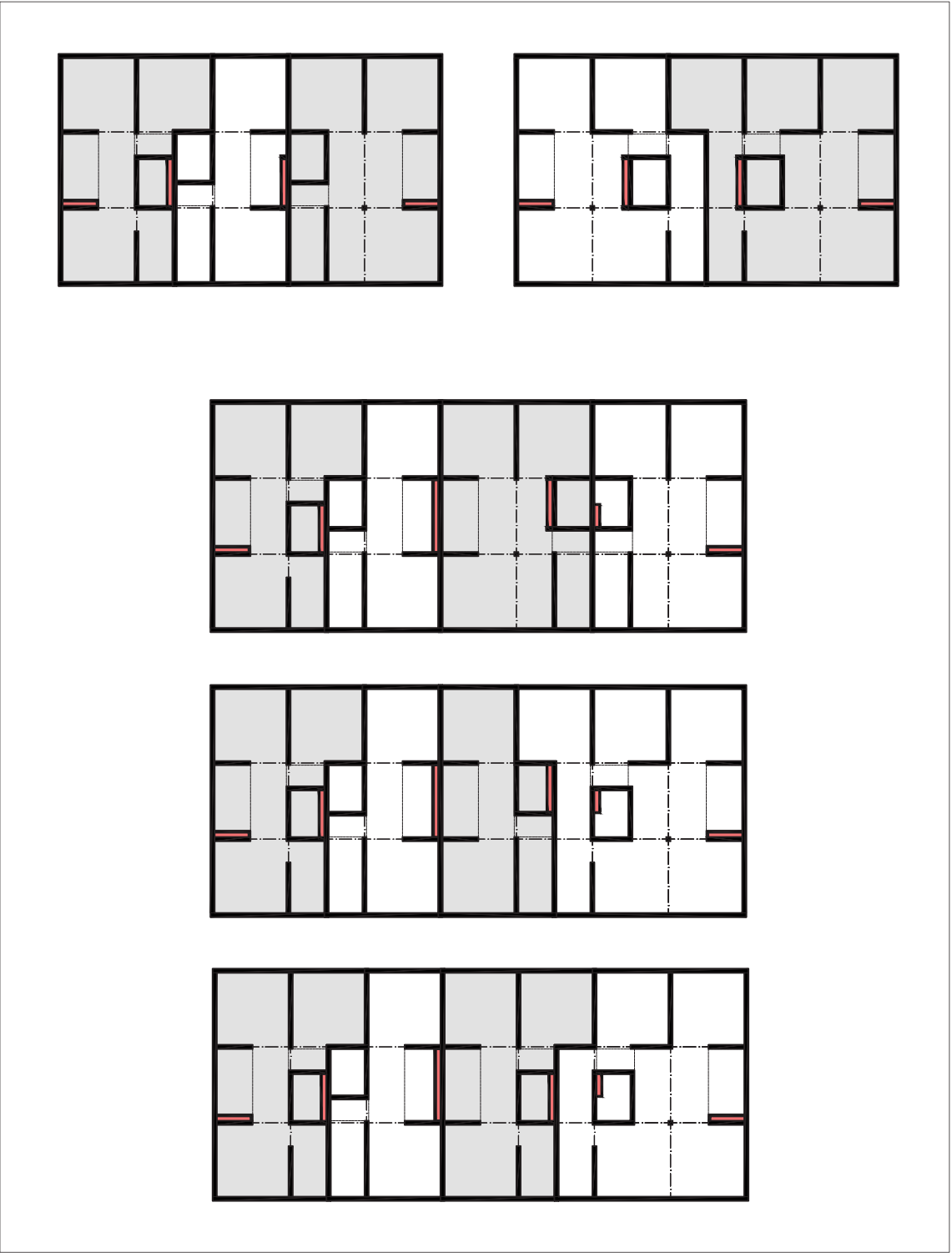
Possible combinations of spaces within the same apartment



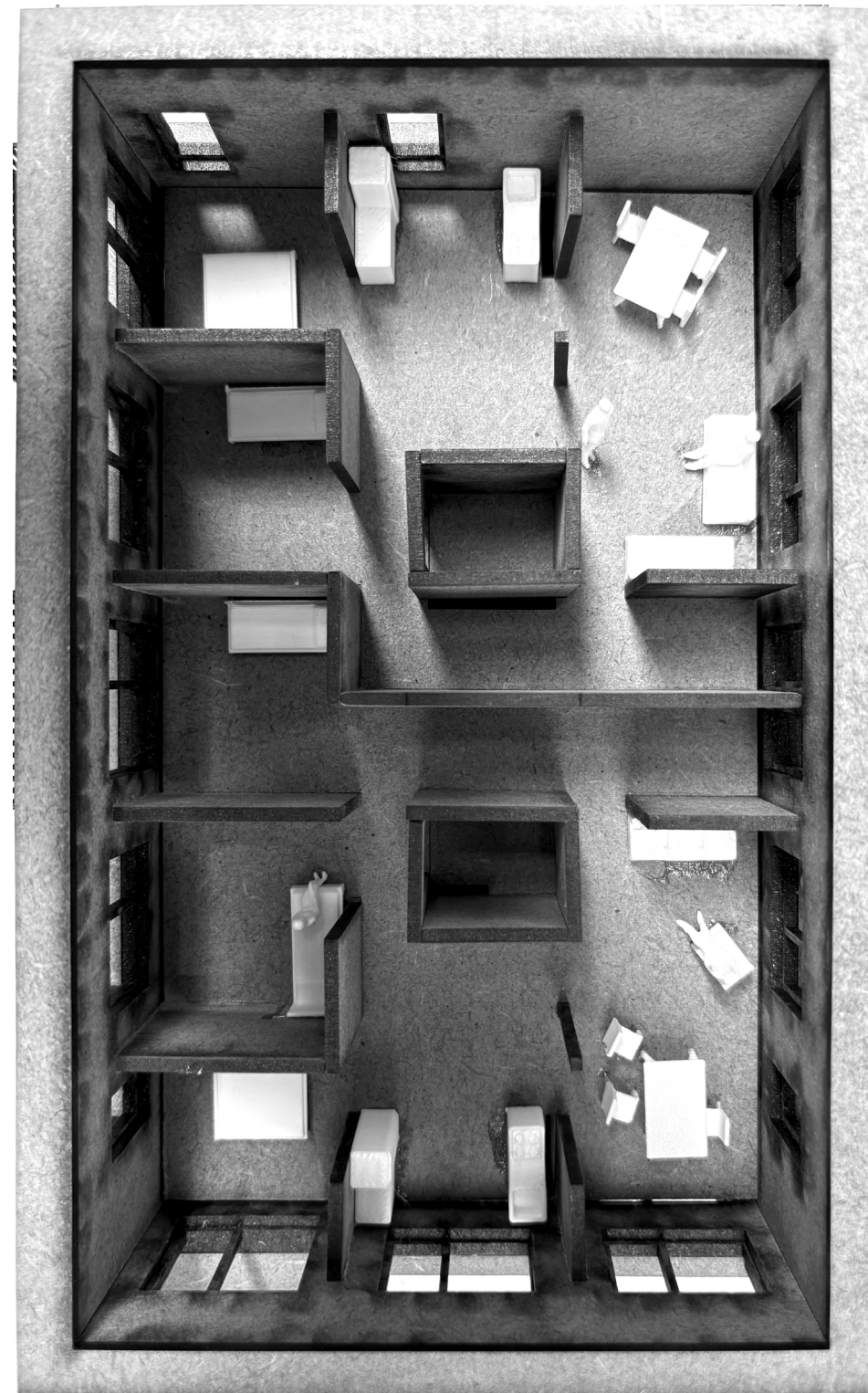
Stacking



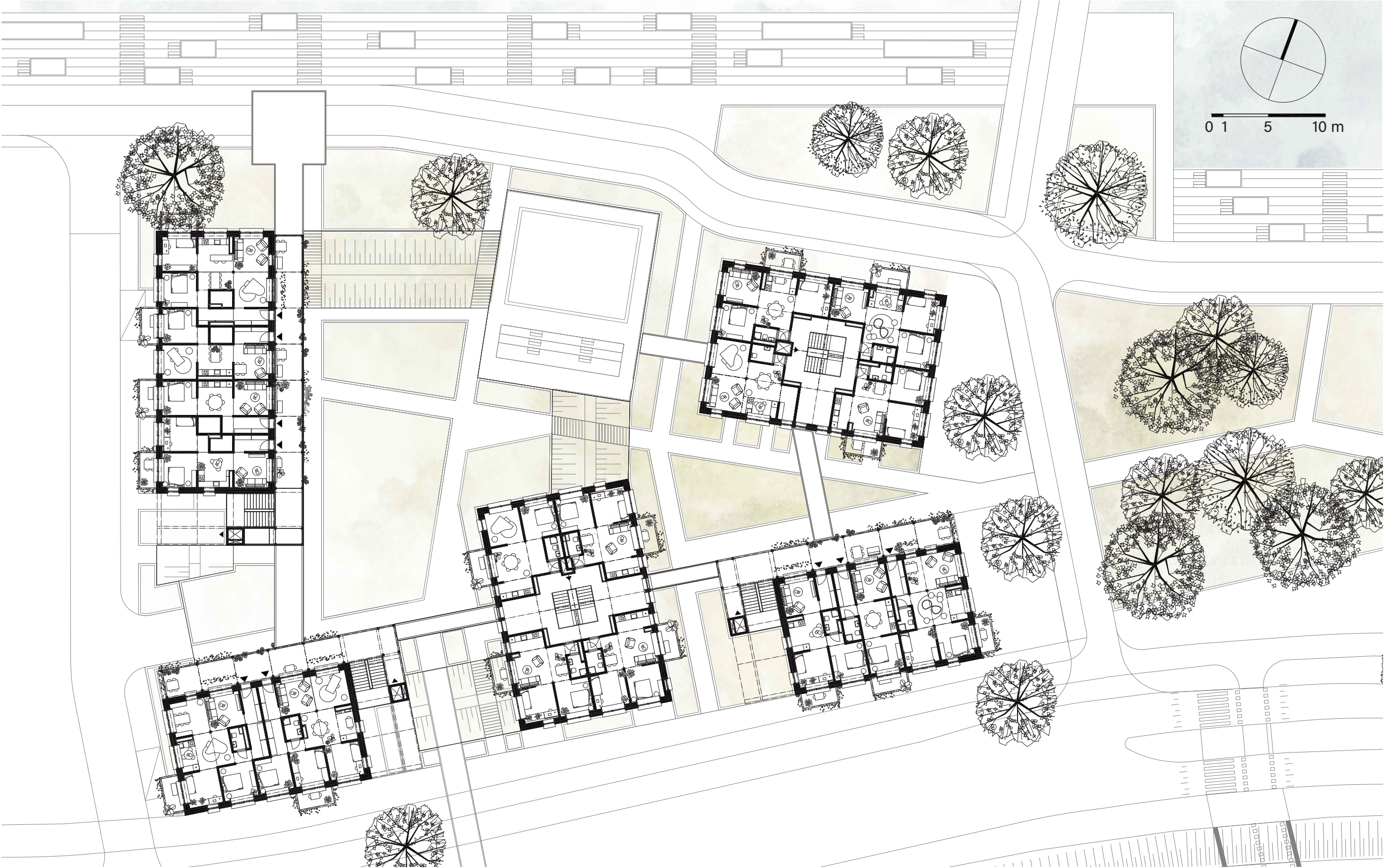
Clusters, 1:100



Floors, 1:100



Floorplans - model photograph



CONNECTIONS

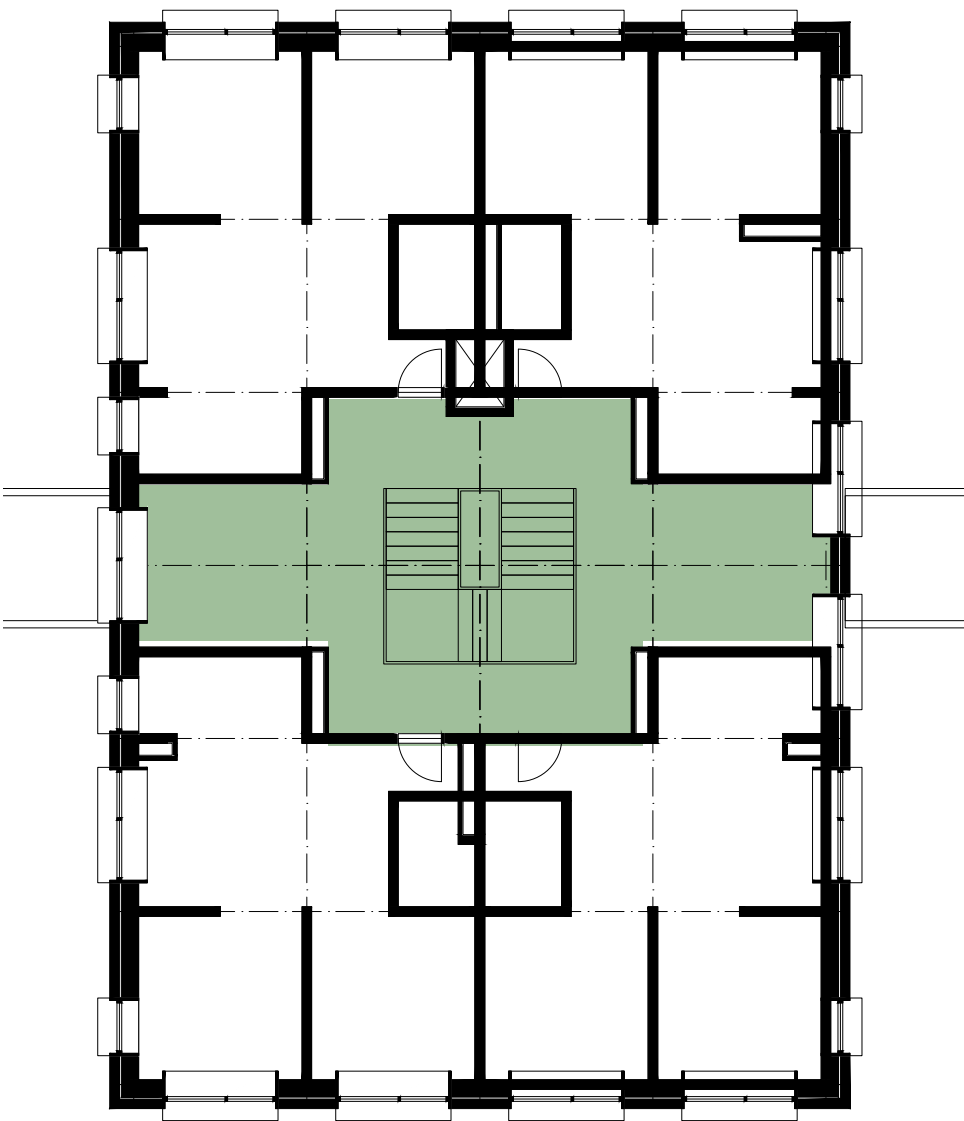
the human scale

Access systems

Main types of accesses



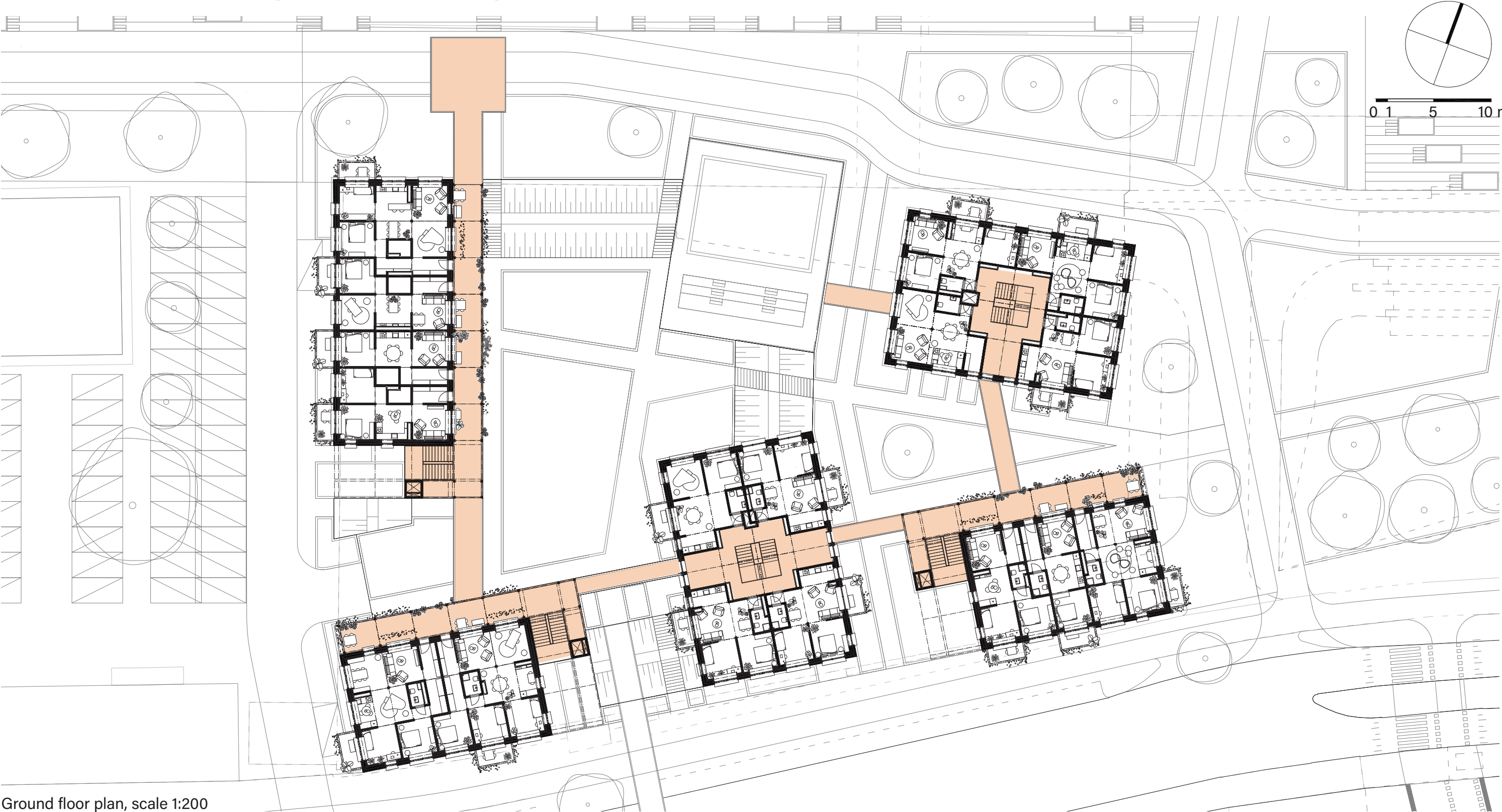
Gallery access -
one main activated side



Central staircase access -
two activated sides

Connecting buildings

Additional structure on levels +1 and +2



Ground floor plan, scale 1:200



View from gallery

Section

Vertical movement topography



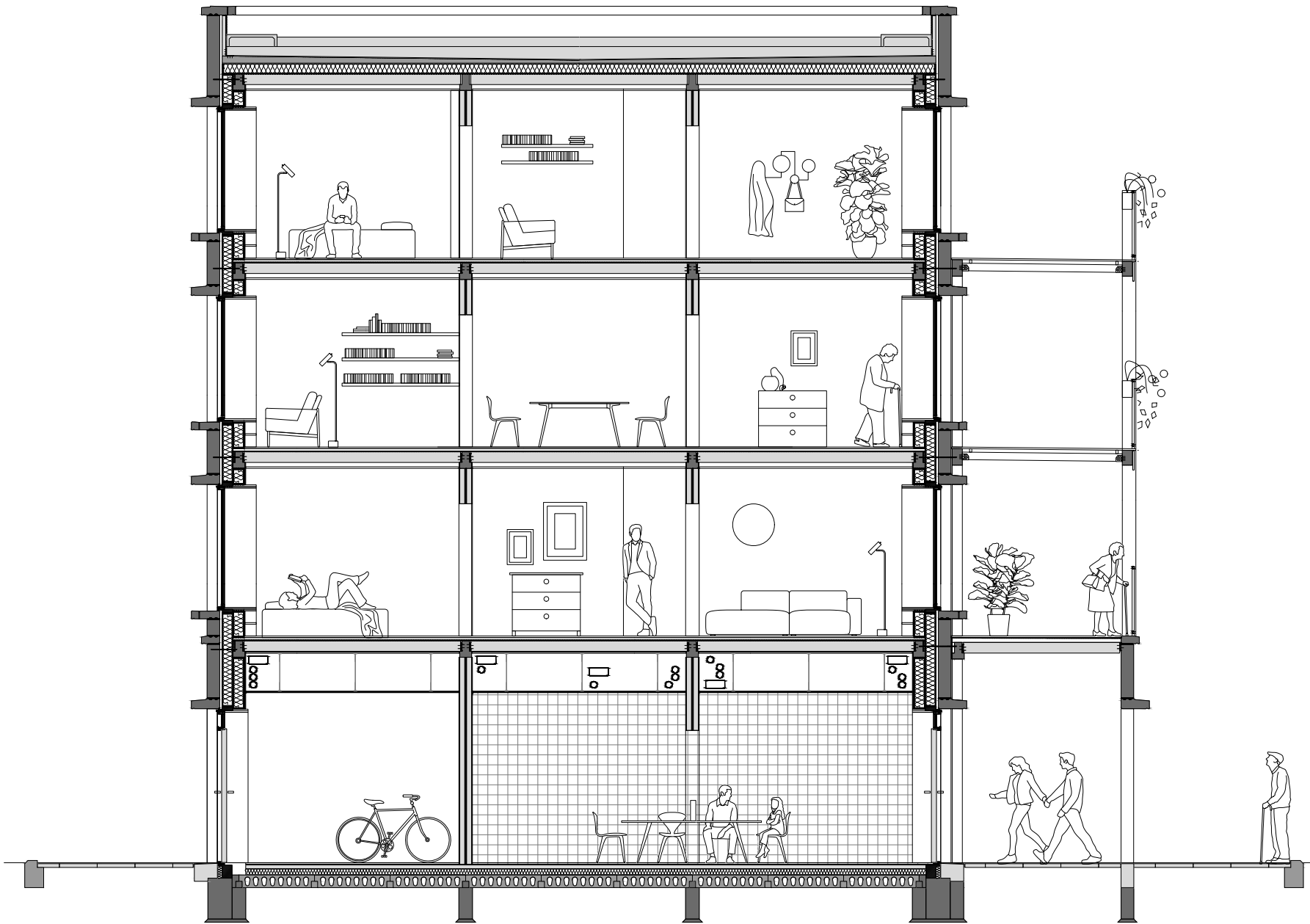
Facade design



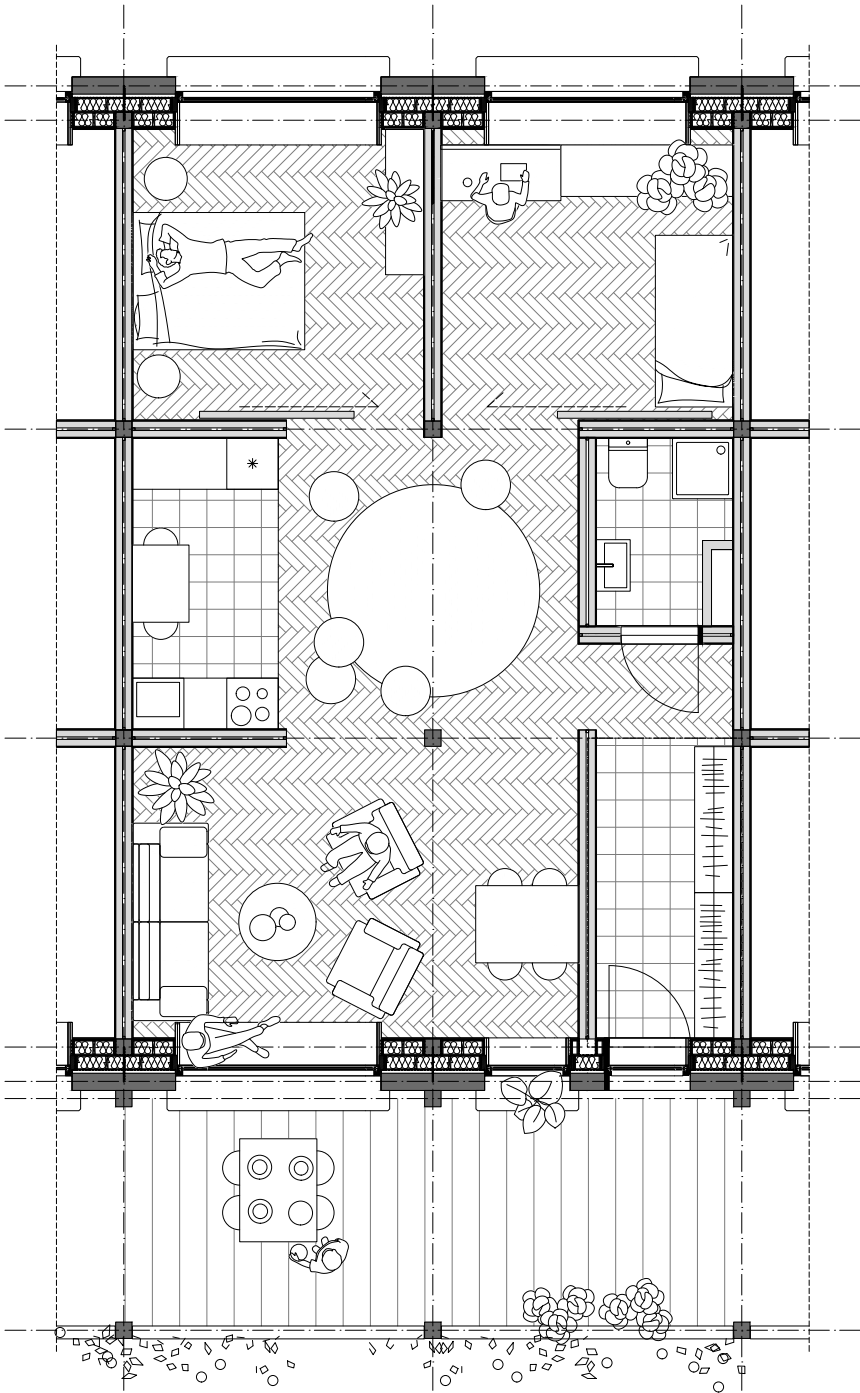
Facades



Fragment



Habits in the dwellings and on the galleries



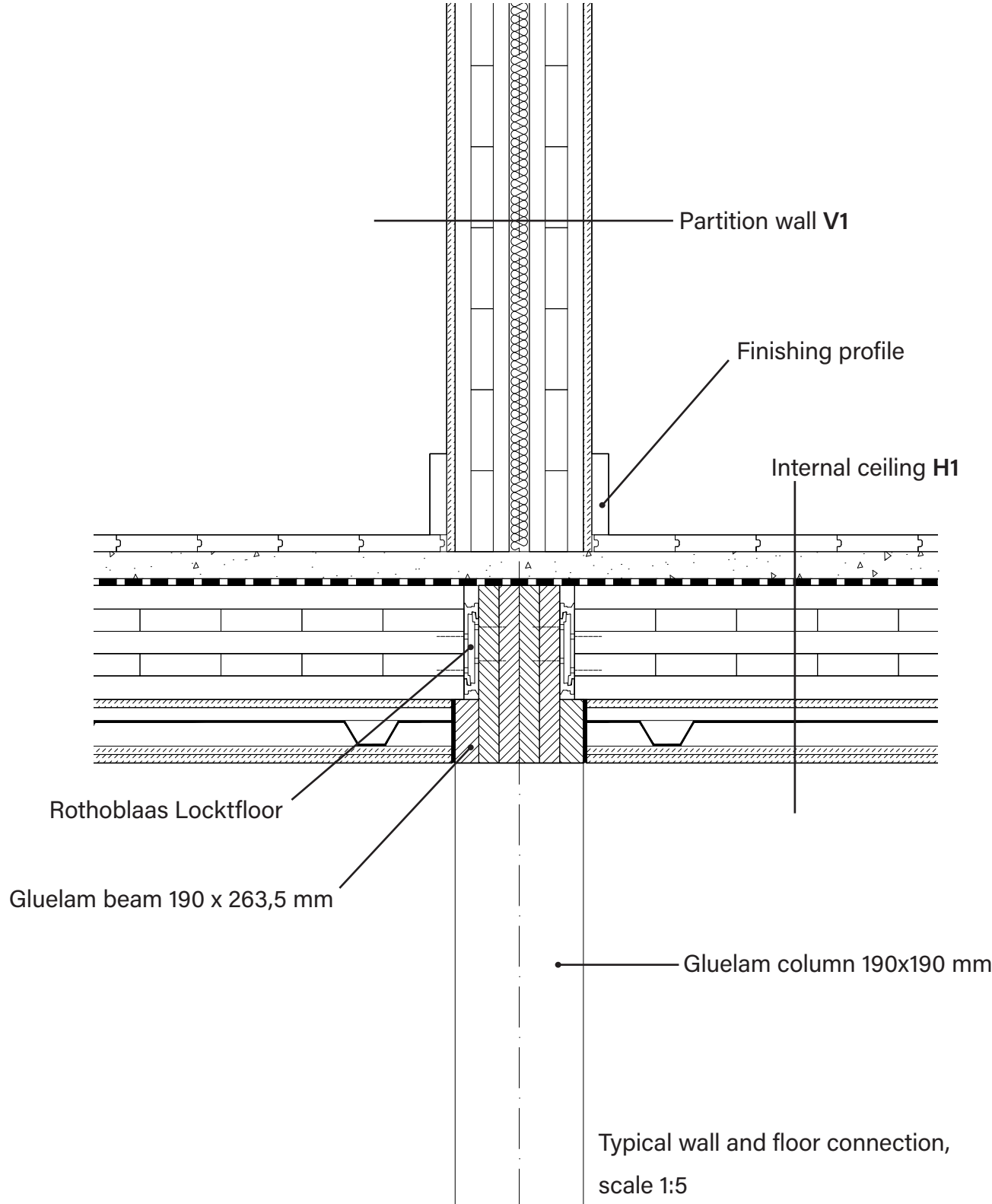


Public spaces in relation to dwellings

DETAILS

in a habit-based design

Typical connection



PARTITION WALL V1

Sound insulation - 56 dB

Fireproof REI 60

Finishing paint

Plaster board 12,5 mm

CLT panel 80 mm

Insulation 30 mm

CLT panel 80 mm

Plaster board 12,5 mm

Finishing paint

INTERNAL CEILING H1

Finishing - wooden floor 25 mm

Screed 40 mm

Sound insulation 10 mm

CLT panel 169 mm

Anti-humidity plaster board 12,5 mm

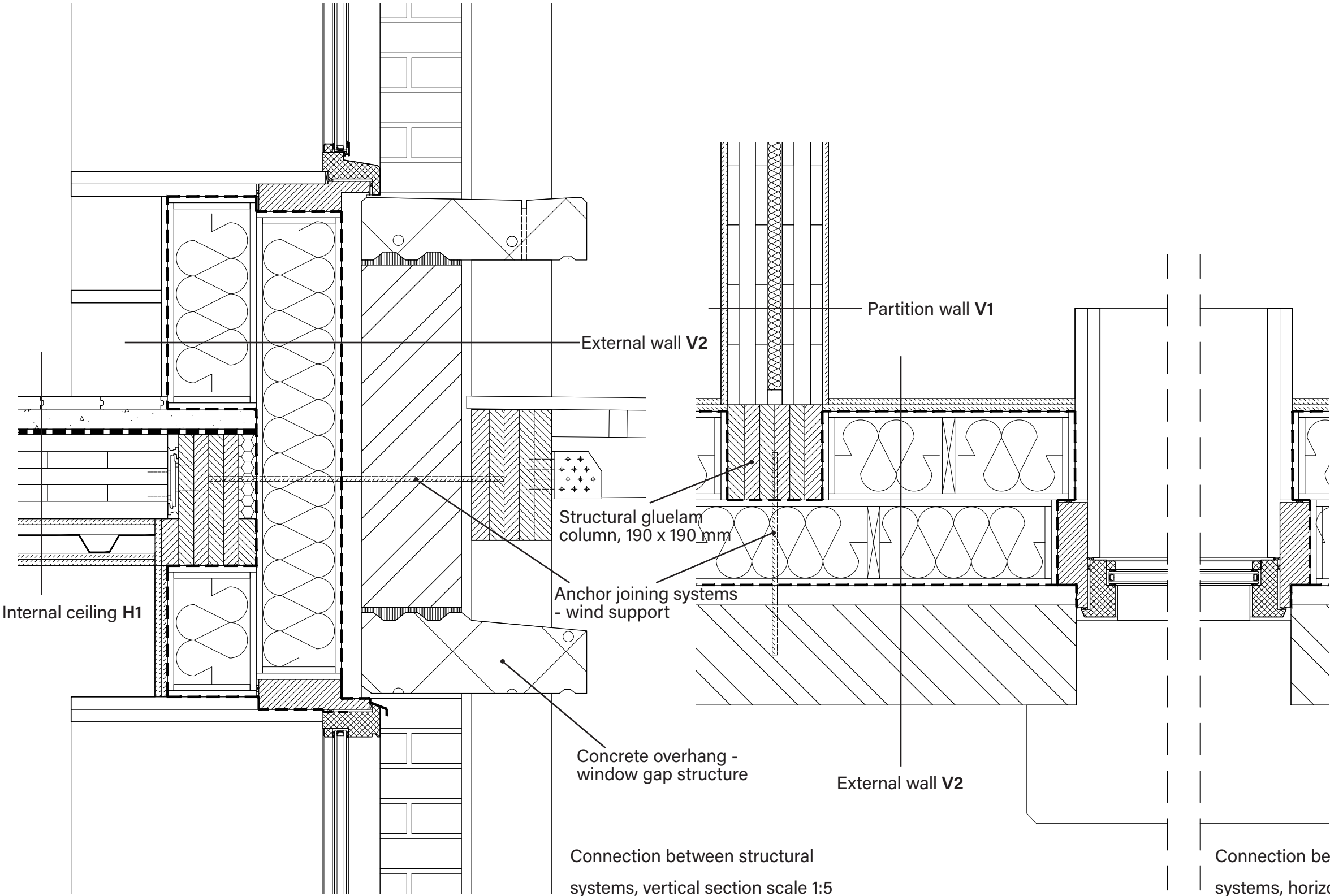
Ceiling substructure 19 mm

Technical void 38 mm

2x plaster board 12,5 mm

Finishing paint

Connection between systems



PARTITION WALL V1

According to typical floor and wall connection, see slide nr 32.

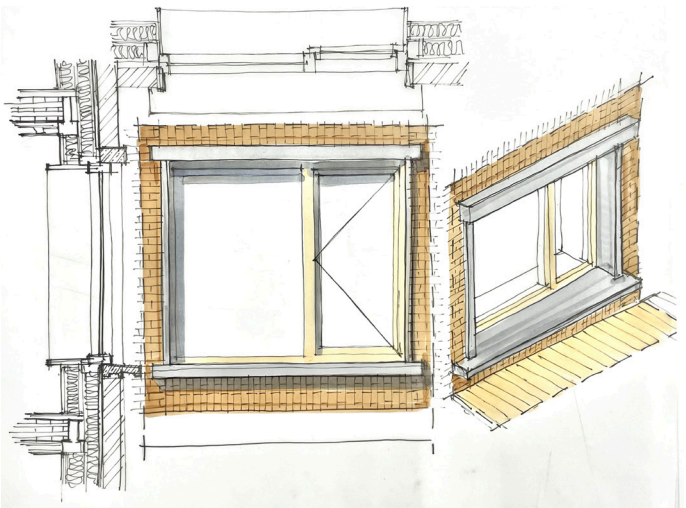
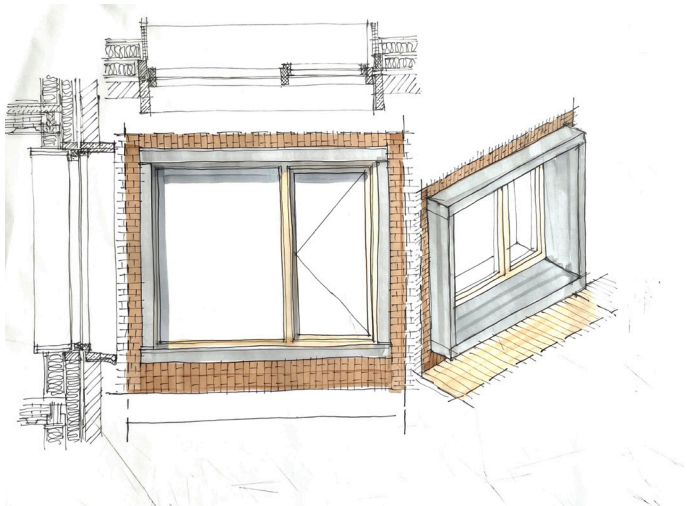
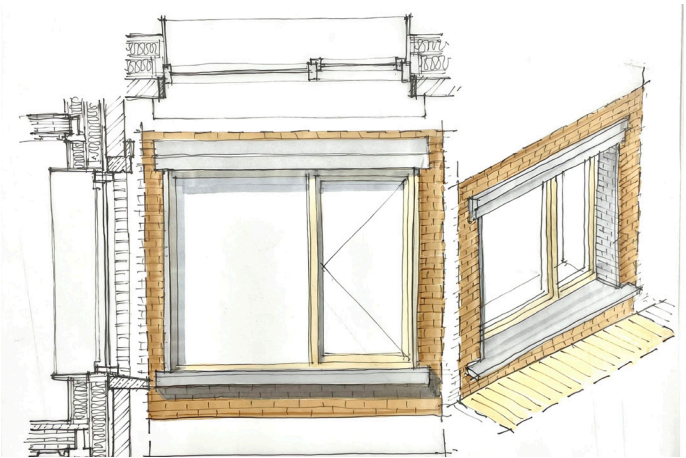
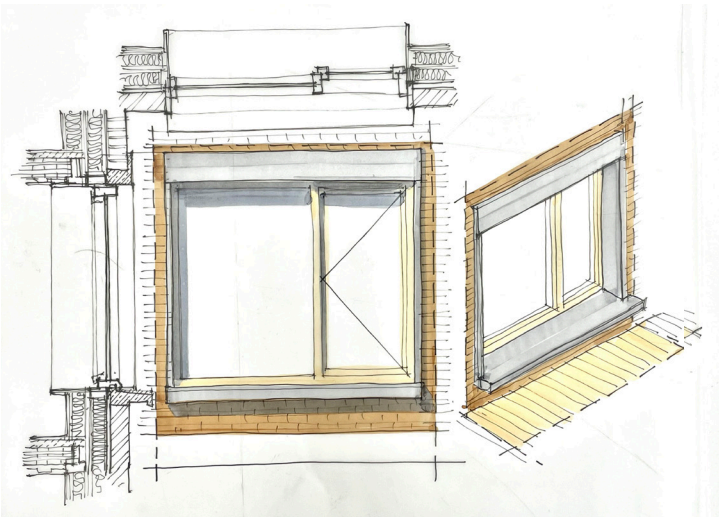
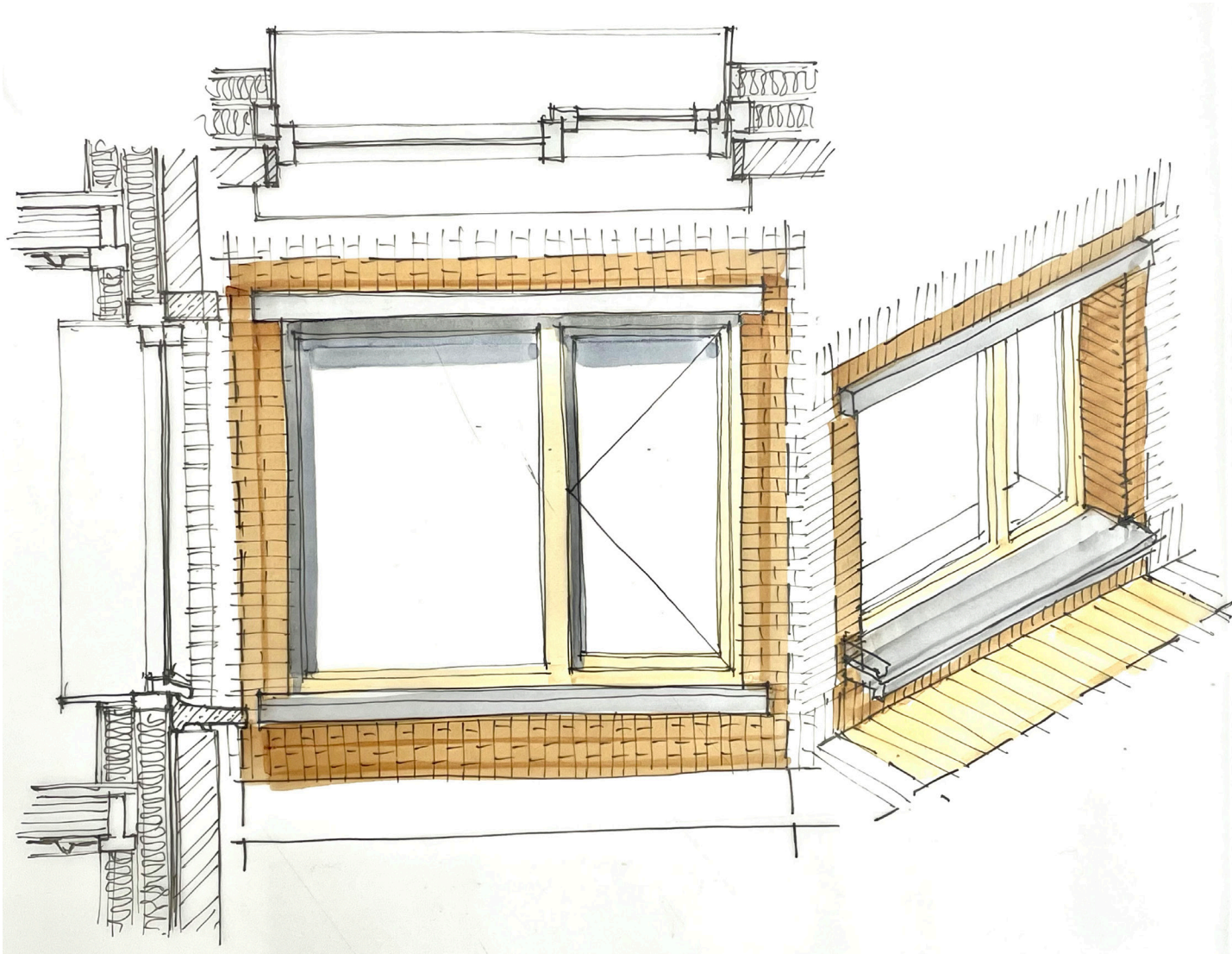
INTERNAL CEILING H1

According to typical floor and wall connection, see slide nr 32.

EXTERNAL WALL V2

- Internal finishing paint
- 2x plaster board 12,5 mm
- vapor barrier
- internal insulation wall panel**
 - OSB board 12,5 mm
 - insulation 152,5 mm
 - OSB board 12,5 mm
- external insulation wall panel**
 - OSB board 12,5 mm
 - insulation 145 mm
 - OSB board 12,5 mm
- water barrier
- ventilation void 40 mm
- structural brickwork 200 mm

Window design



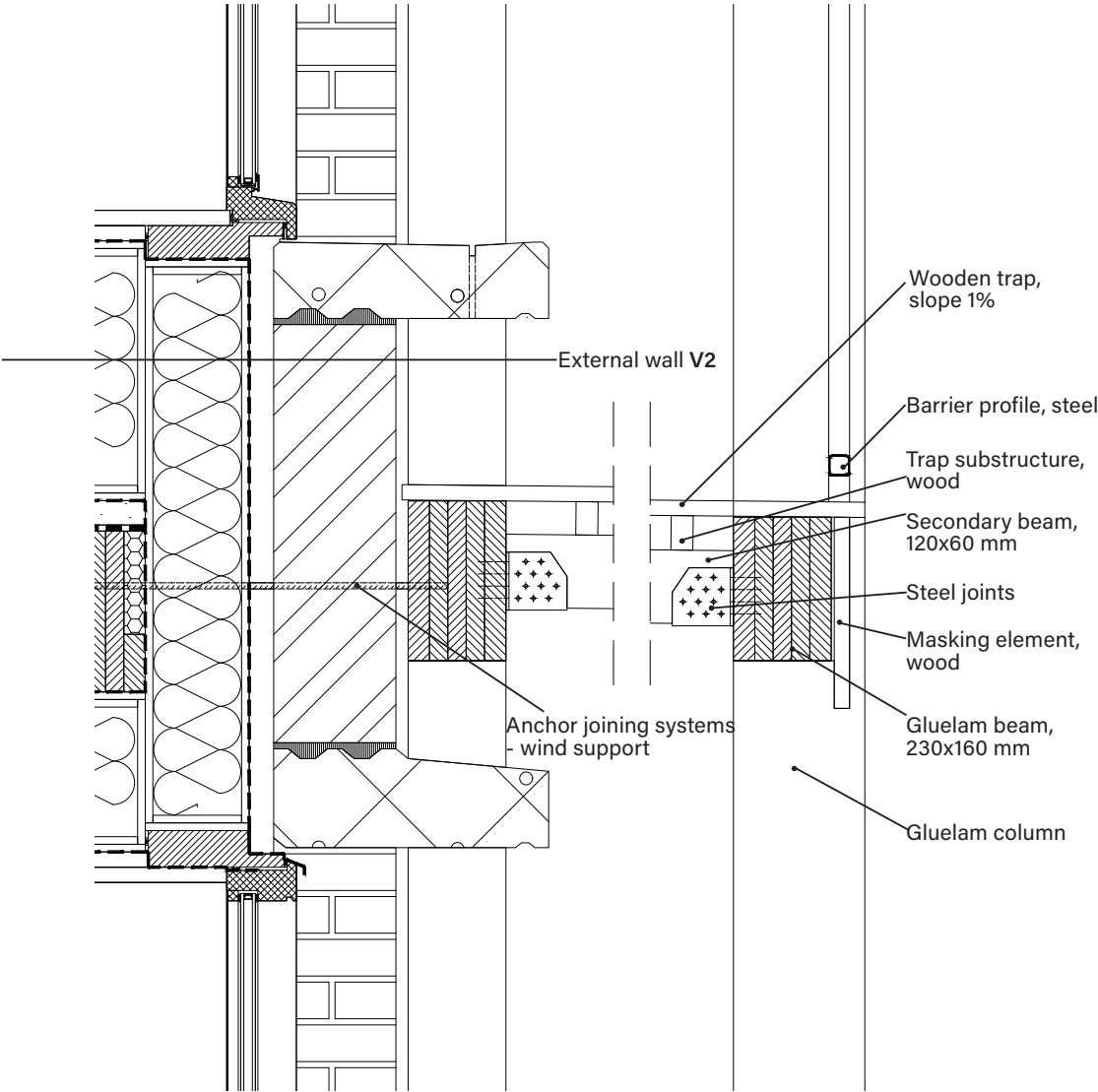
A habit-based detail



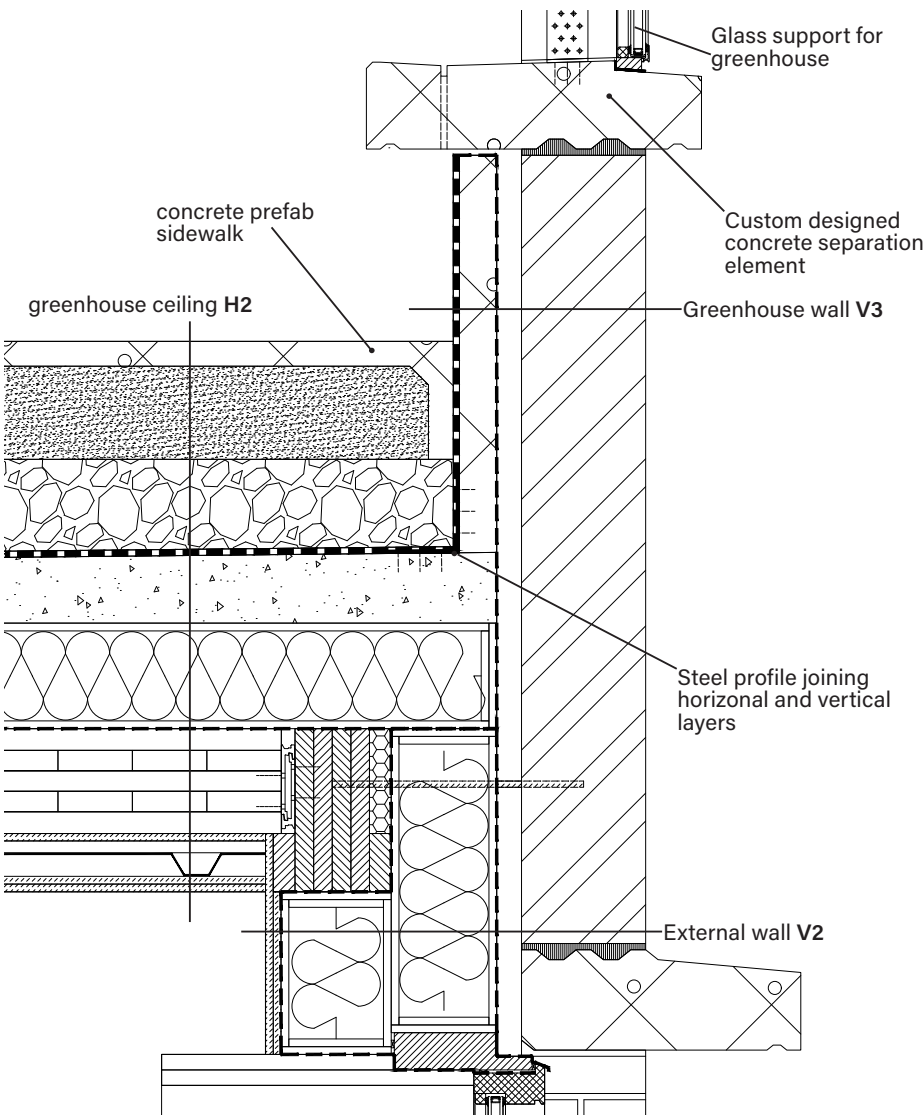
A habit-based detail



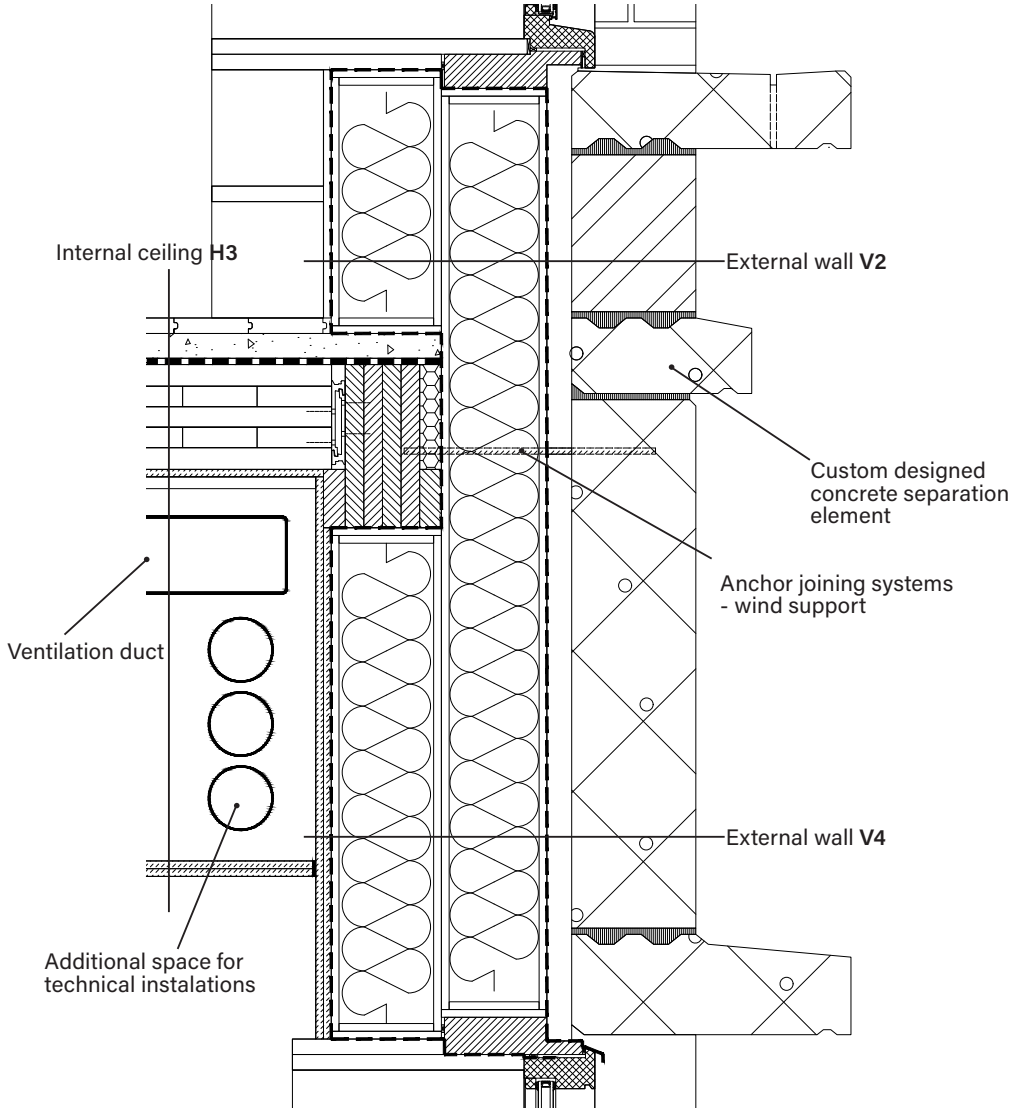
Complimentary details



Connection with external gallery,
vertical section scale 1:5



Connection with greenhouse on public
rooftop, vertical section scale 1:5



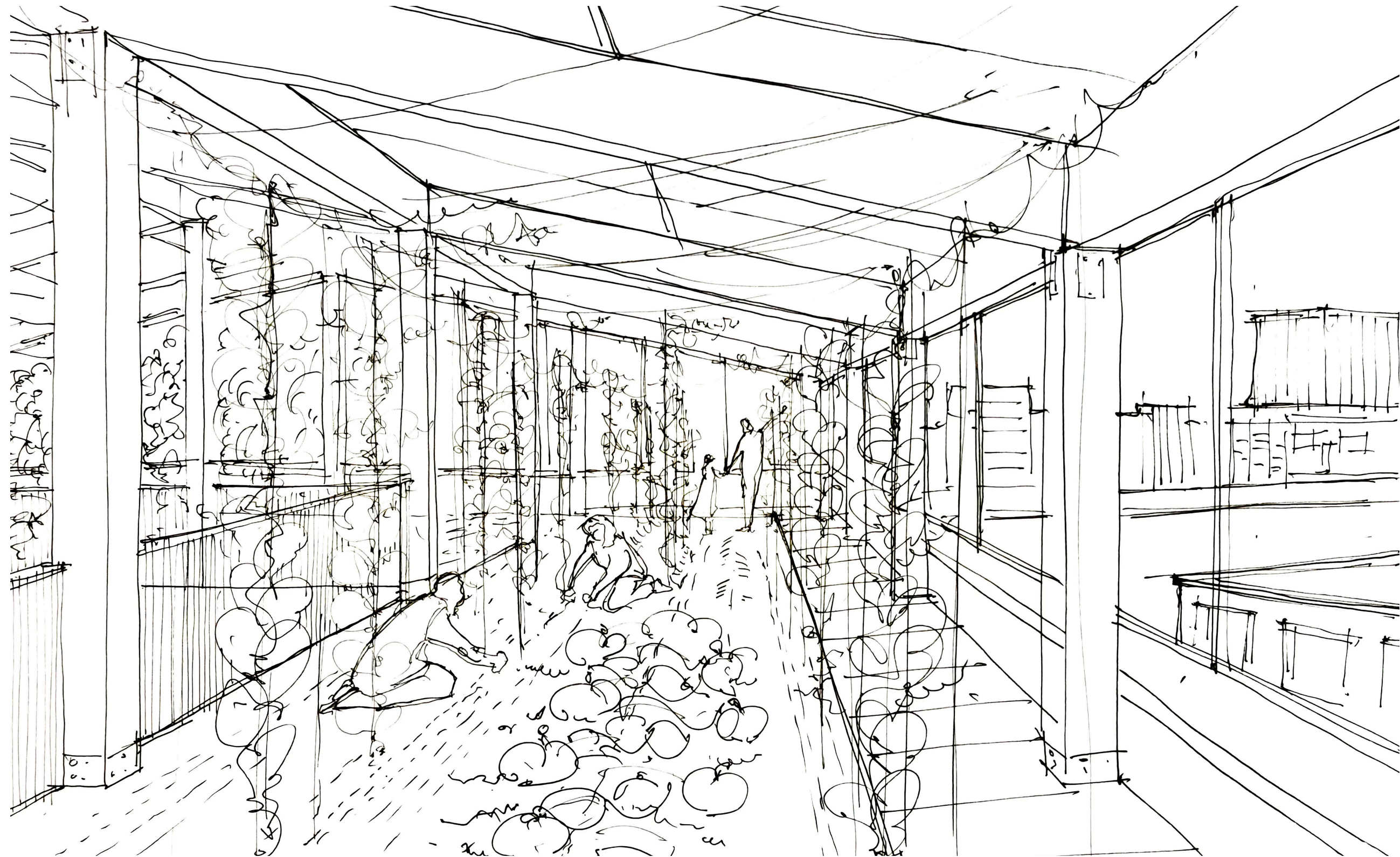
External material change - public/private
transition, vertical section scale 1:5

STORIES

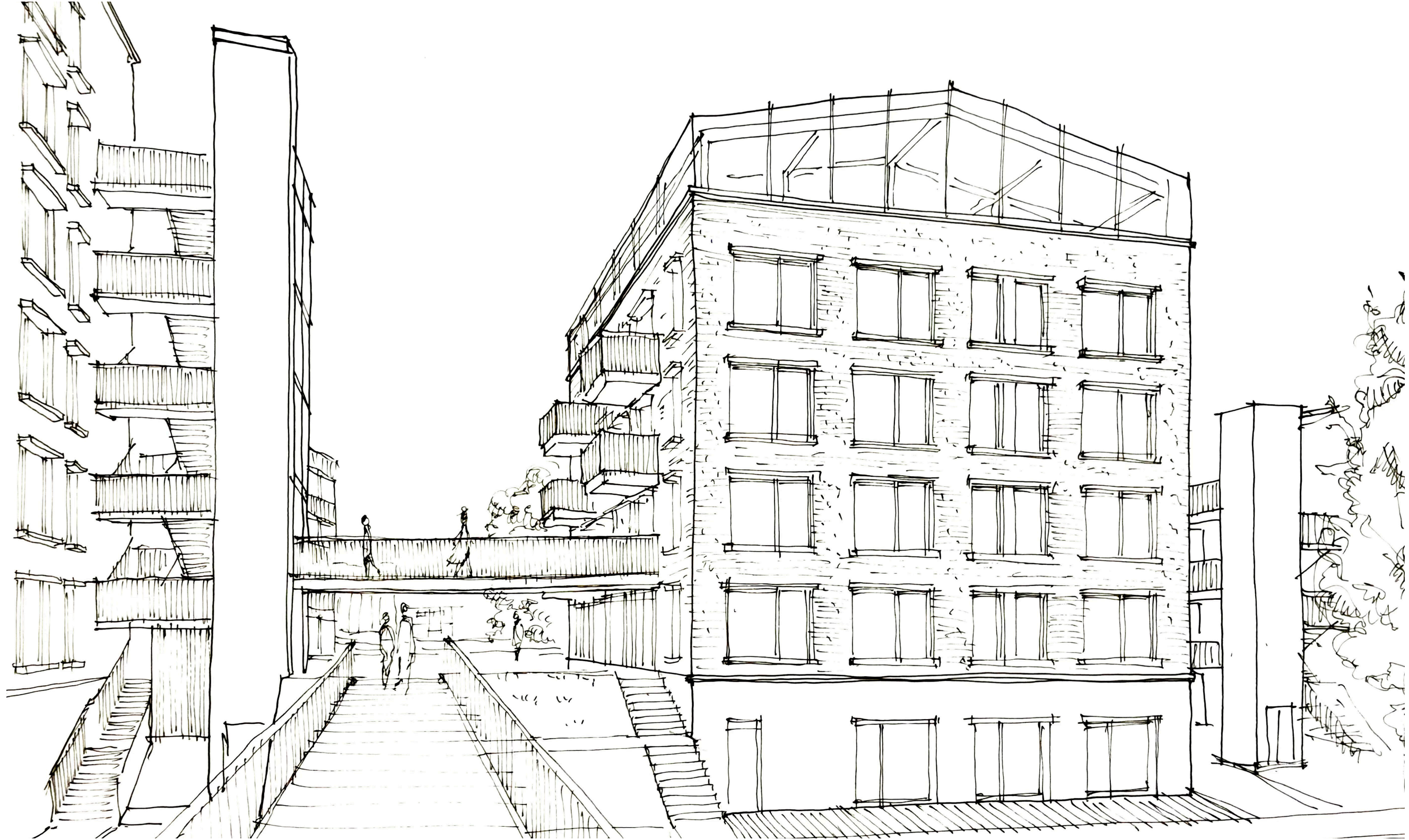
life in the buildings



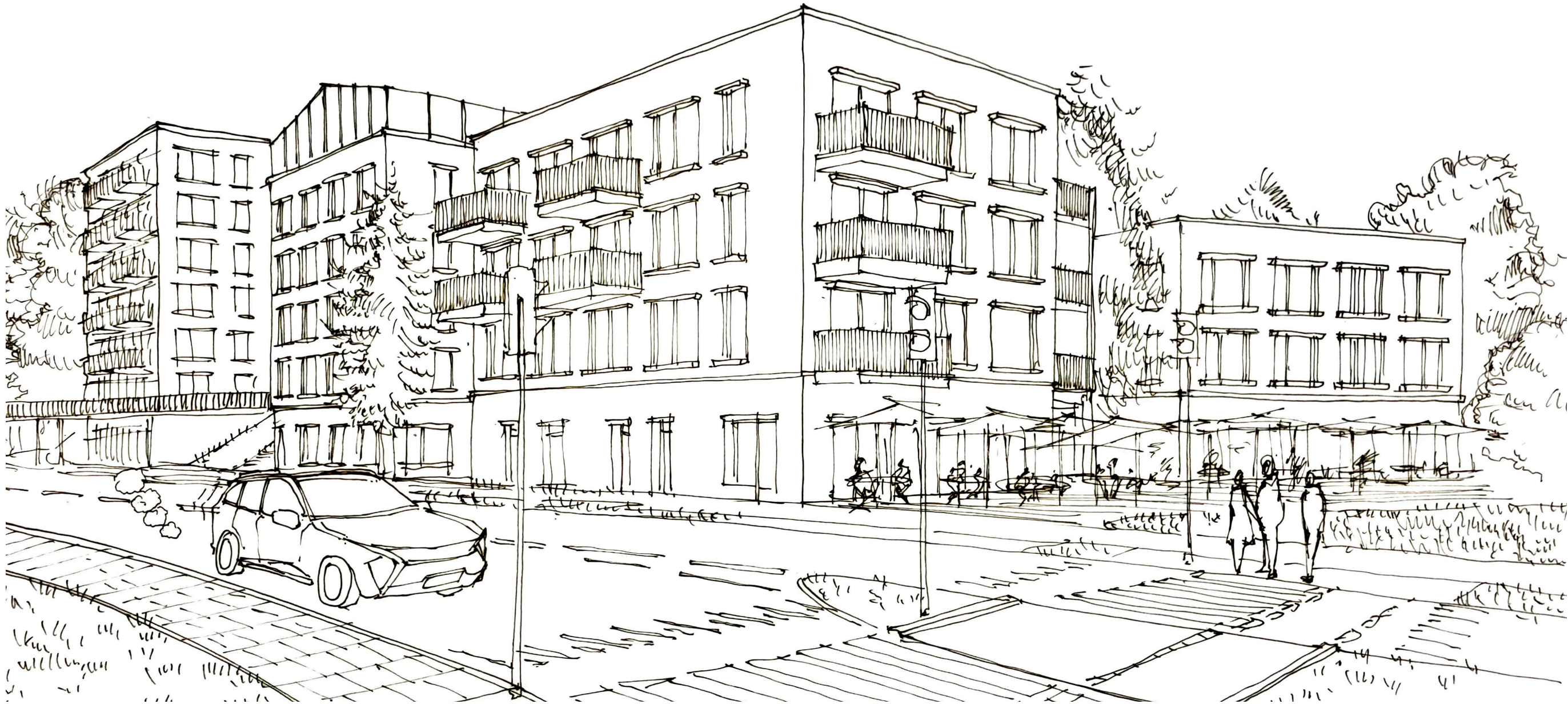
Sitting at the edge between interior and exterior



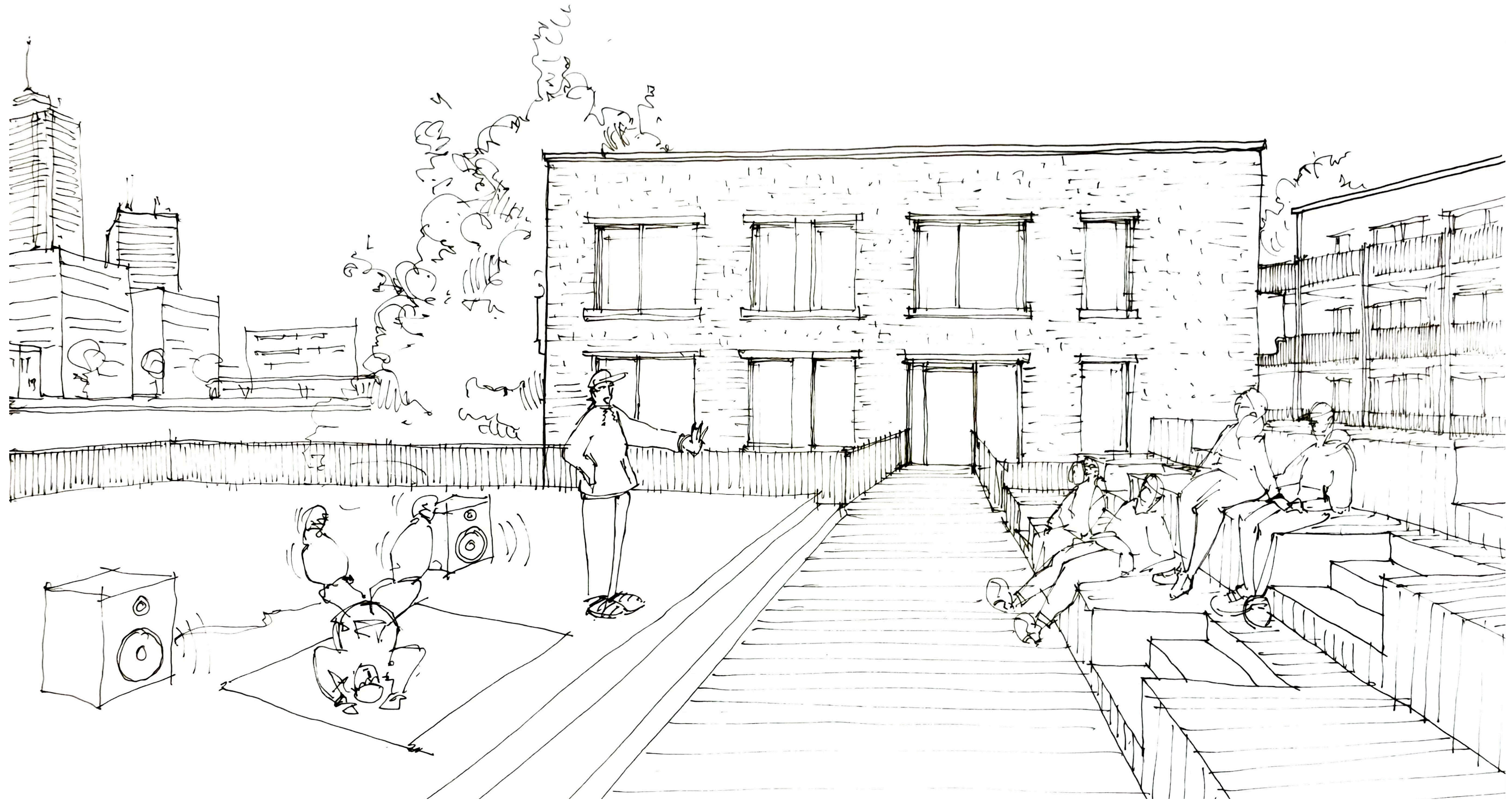
Working together on organic crops



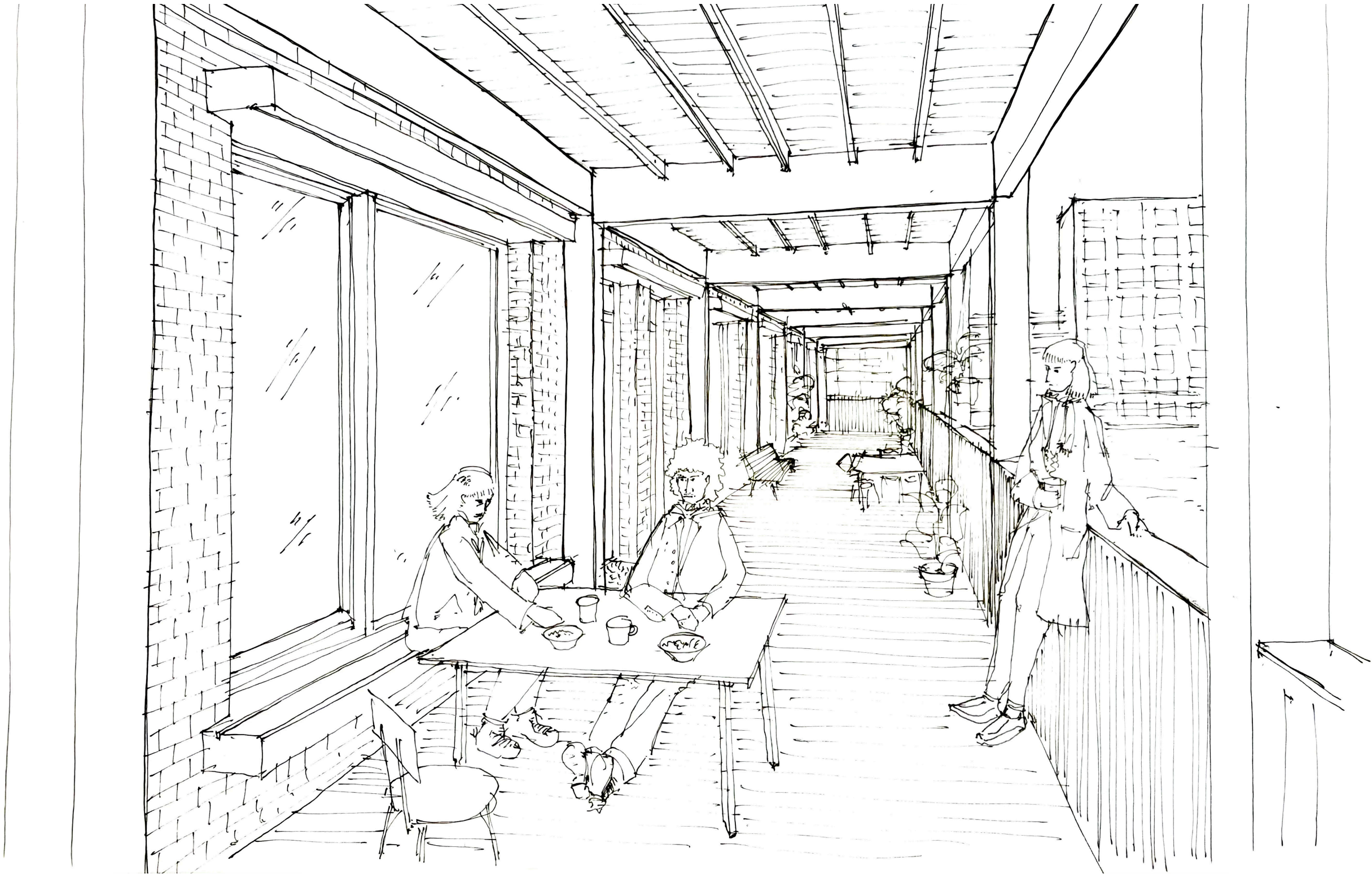
Enjoying a walk towards Tarwewijk



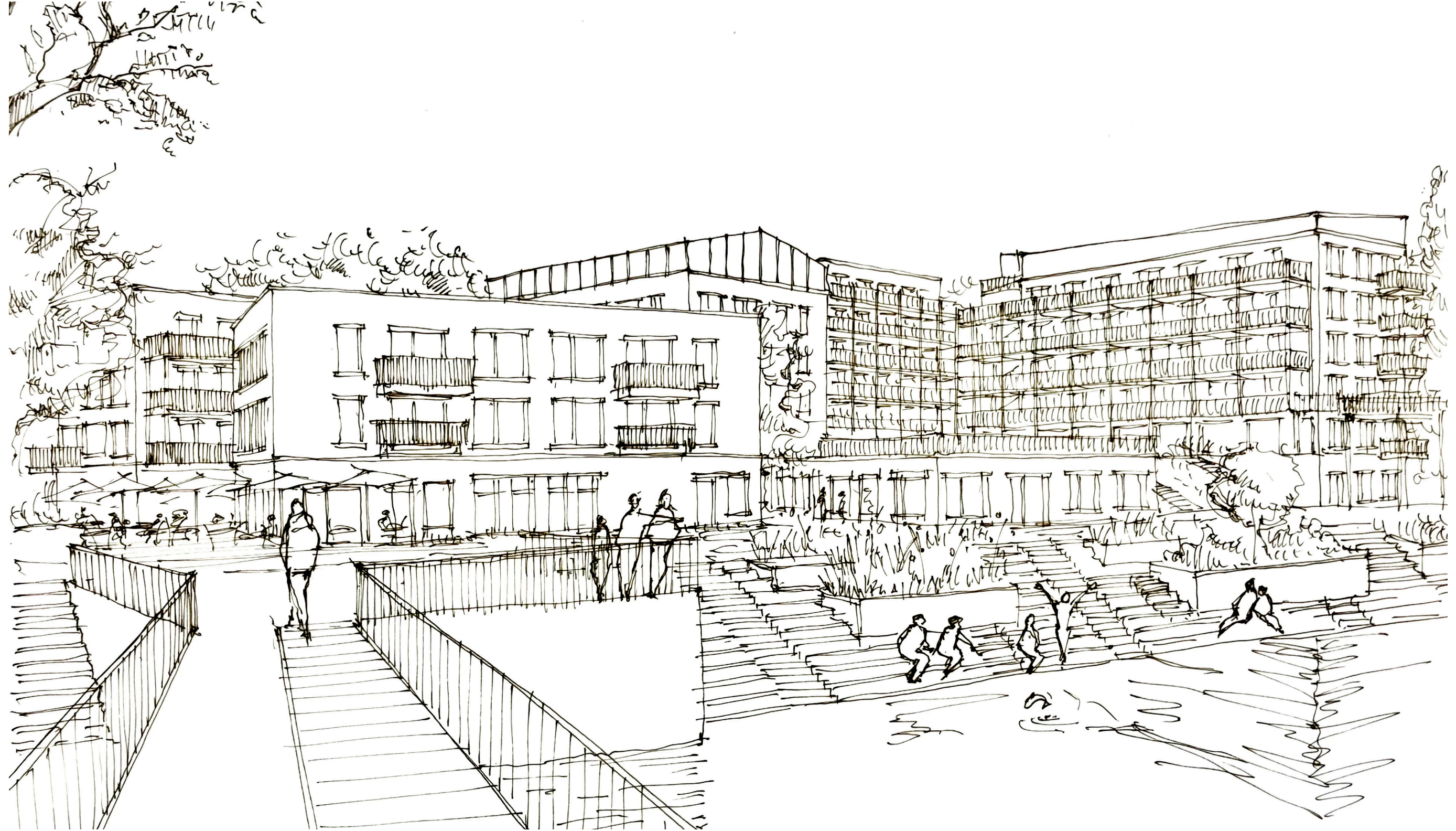
Coming from Tarwewijk without disturbance



Social gatherings in semi programed spaces



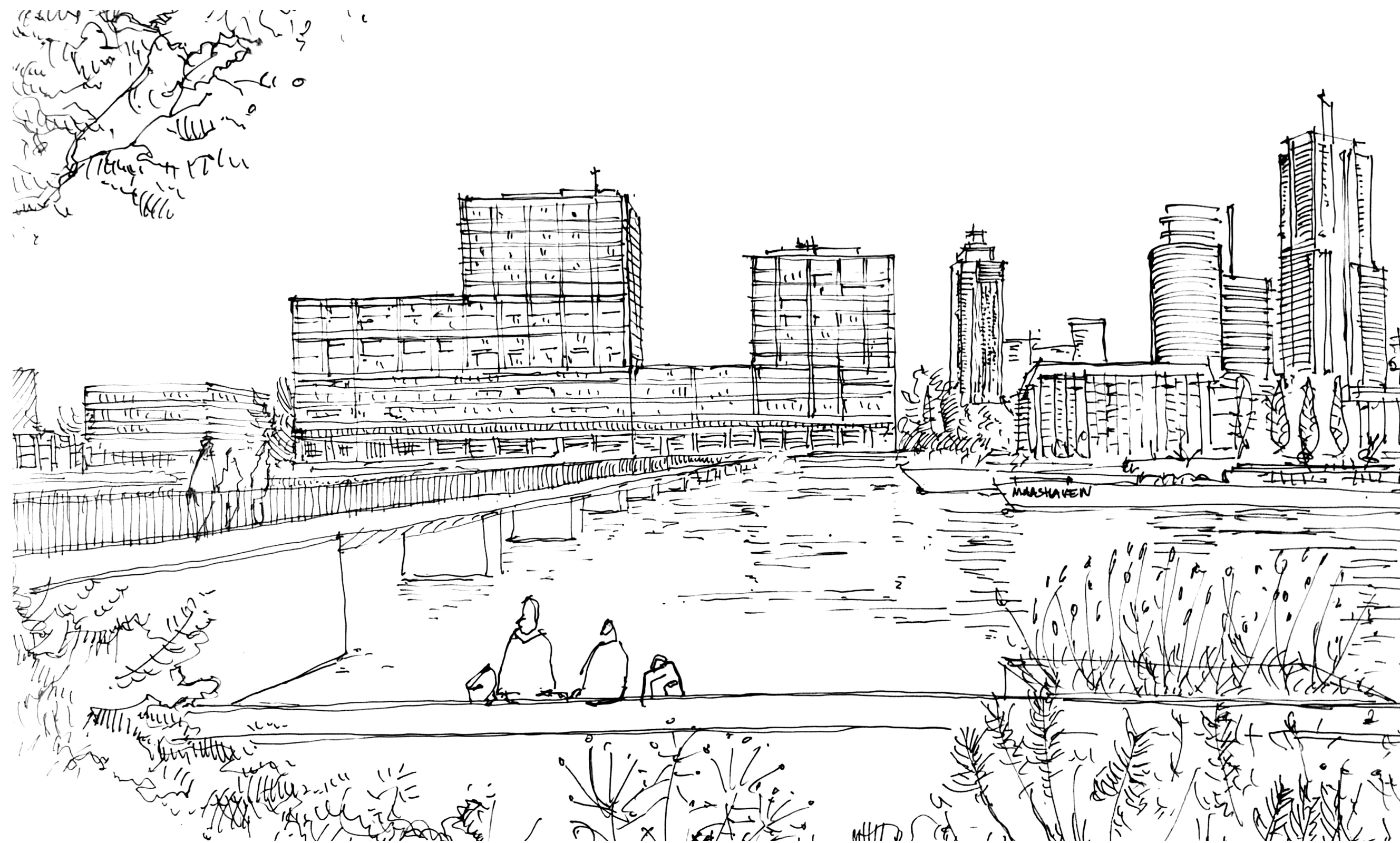
Chiling at a friend's place in the afternoon



Coming directly from Katendrecht



Doing groceries in a market



Enjoying the view - as always

Personal experience

A break in a cycling trip



REFLECTION

A HABIT-BASED DESIGN FOR HEALTHY LIVING



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AR3AD110 Dwelling Graduation Studio: Designing for
Care in an Inclusive Environment 2024/2025

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02.07.2025