

# P5 PRESENTATION

## ADVANCED HOUSING DESIGN

### MSc4 GRADUATION STUDIO

**Designing the explorative living environment for fledglings**  
*An architectural solution for starters on the housing market seeking to maintain their explorative lifestyle*

Joël Maxim Swaab (4449150)  
Delft University of Technology

# What will I be talking about today?

1.

Target group

2.

Location

3.

The design

4.

Dwellings

5.

Collectivity in the design

6.

Climate and construction

Outro



1.

## Target Group

# Inspiration

Personal narrative & generation peers:  
What will the near future look like for us?

Early twenties

Late twenties

## Studying

- Graduation
- Living at parents/  
studio/dorm

## Starter

- Start on housing market
- Developing as an individual

## Full time job

- Family
- Settled
- Working on  
professional career



Experiencing several issues when looking for a home, two main reasons being:

- (1) too few + too expensive and (2) the houses that are available do not meet the needs and wishes

## Why do the houses not meet the needs and wishes?

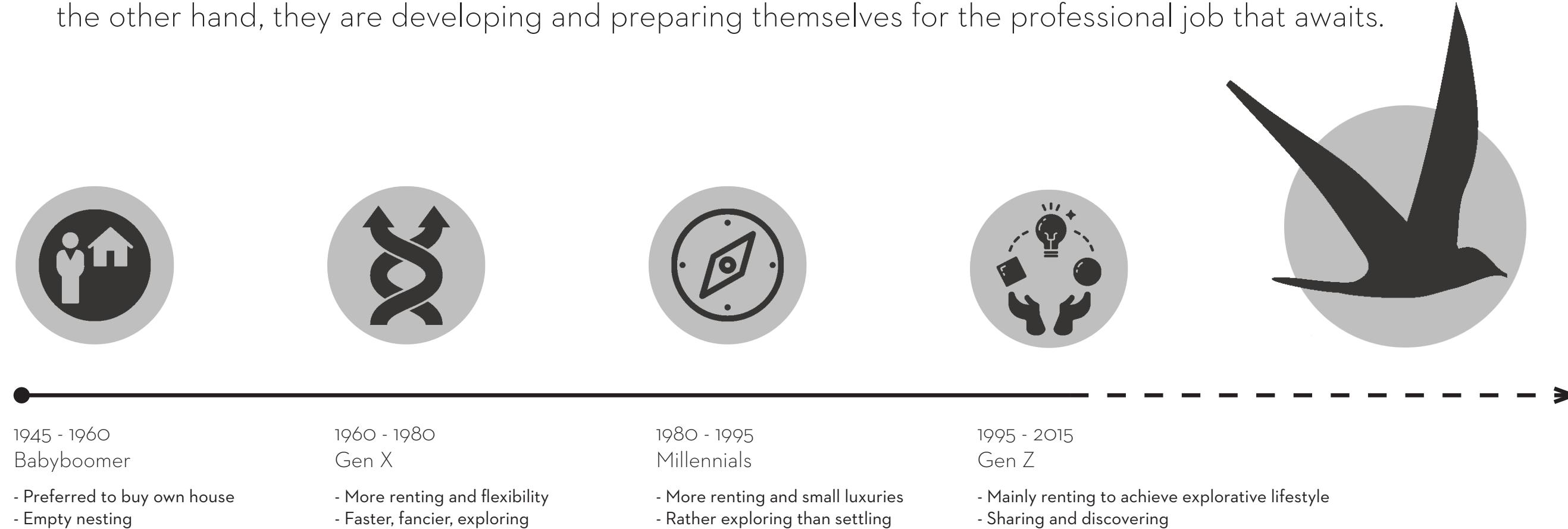
Over time, the different generations of starters in the Netherlands went from a more secured lifestyle to a lifestyle where flexibility, discovering and exploring became the 'standard' lifestyle.

This resulted in an unbalanced supply-demand housing market, as is seen in the recent newspapers.

### A new type of starter seems to be developing: "The Fledgling"

A fledgling is an individual leaving his family/natal home. From: a young bird fledged from its nest.

Compared to the older types of starters, a fledgling gives more value to experiencing moments, both together and individual, and likes to explore many opportunities while growing up has to offer. On the other hand, they are developing and preparing themselves for the professional job that awaits.

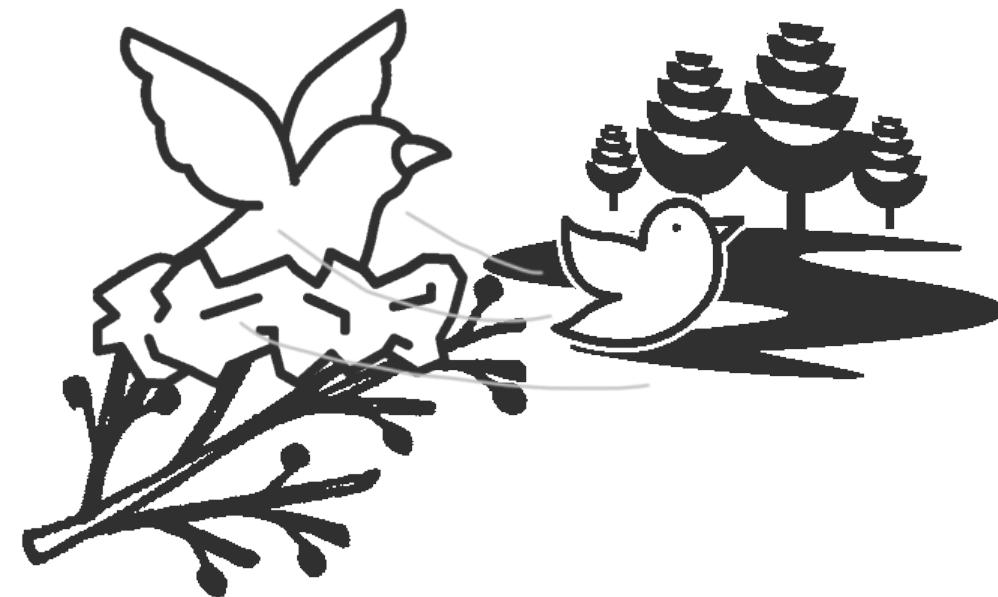


#### The development of generations starters through the decades

According to R.P. Hoekman in Research into housing preferences of starters on the housing market (2019) & According to Boterman, W.R., et al in Sustainable Access for Starters on the Amsterdam Housing Market (2013)

# The Fledgling

The metaphor of a bird leaving its nest characterizes the life of this currently developing type of starter



# Research questions

## Main question:

How can the design for an explorative living environment contribute to the exploring and sharing lifestyle of fledglings?

## Sub questions:

What are the characteristics of the lifestyle of a fledgling?

How can the concept of an explorative living environment best be described?

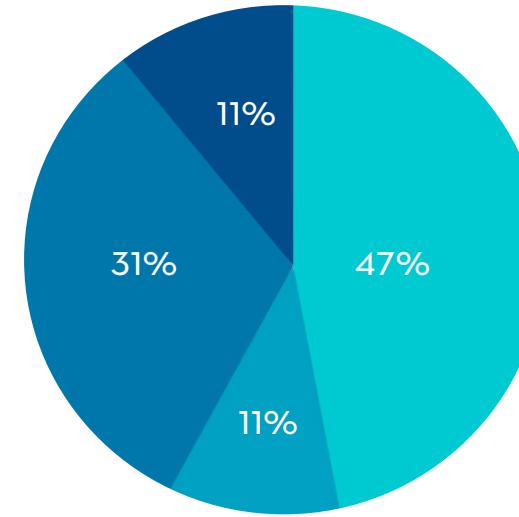
What are the patterns of domestic use of people when they live in a shared living economy?

# The Fledgling

## Three topics that are used to define the lifestyle of a starter:

### 1. Start on the housing market

- Find themselves within the ranges of social housing and affordable pricing ranges;
- “No need for a fancy or luxury house, they just want a place for themselves”; separate bedroom and living room, as well as a private toilet and bathroom.



Type of ownership and affordability of starters in the Netherlands

- Social renting (< €720): 47%
- Free market renting: 11%

- Buying under €250.000: 31%
- Buying above €250.000: 11%

Source: Rijksoverheid in Staat van de volkshuisvesting: Jaarrapportage 2019 (2019)

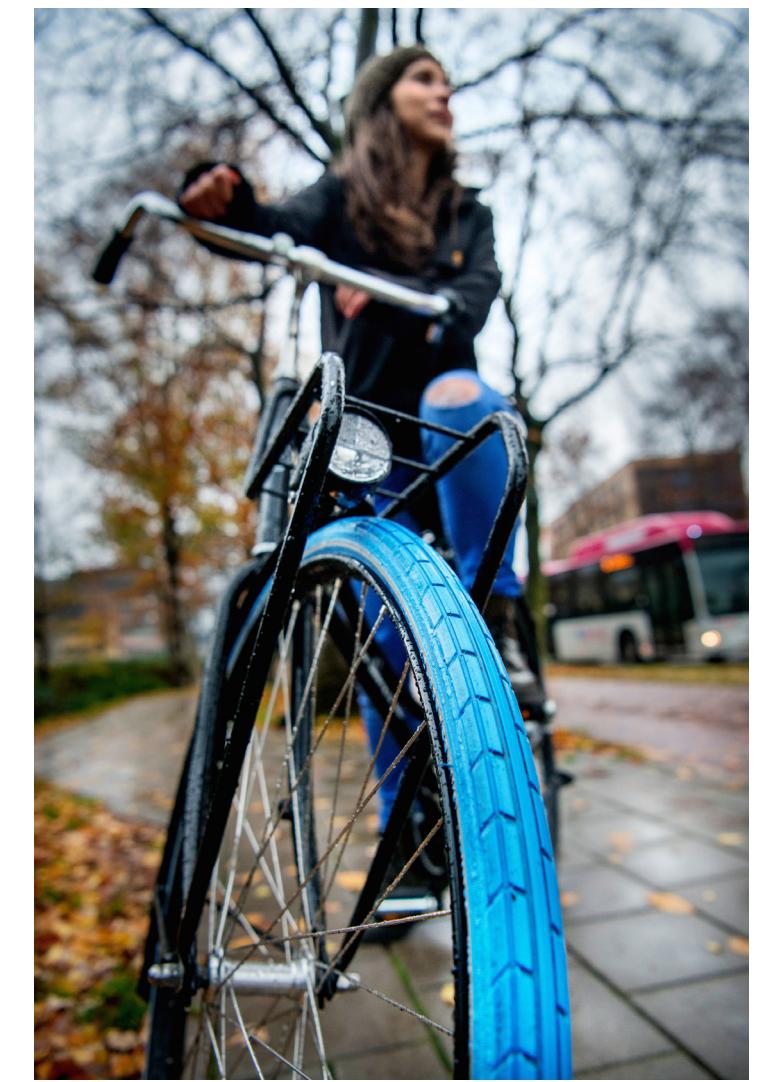
### 2. Explorative lifestyle

- Unfold and develop yourself socially, personally and professionally; meet future husband/wife; discover your potential;
- Desire to have a good distribution of their professional job career as well as time for leisure activities;
- A big city like Rotterdam might give them these opportunities on different levels ranging from social, leisure and career amenities.



### 3. Shared living economy

- Feeling of community when living around people with a similar lifestyle, which contributes to both personal and professional growth;
- ‘Cosmopolitan’ young people: connecting yourself to a global subculture and being part of a group which experiences activities together;
- It offers them financial flexibility as well as social freedom when sharing goods and facilities.



# Design assignment

The research into a fledgling's lifestyle; the Fun Palace; and the case studies offered some interesting take-aways for the design assignment. Out of these take-aways, the design brief can be formulated:



Lifestyle

- Aged between 20 and 30 years old, recently graduated and starting to develop themselves both professional and personal
- Explorative lifestyle
- Finance and affordability
  - 47% social housing rentals (until €720)
  - 31% purchase under €250.000



Dwelling

- Start on the housing market, looking for a first own place
- Individuals, couples and collective groups
- Apartments, maisonettes and communal living
- Small, but clear and efficient housing schemes



Community and shared activities

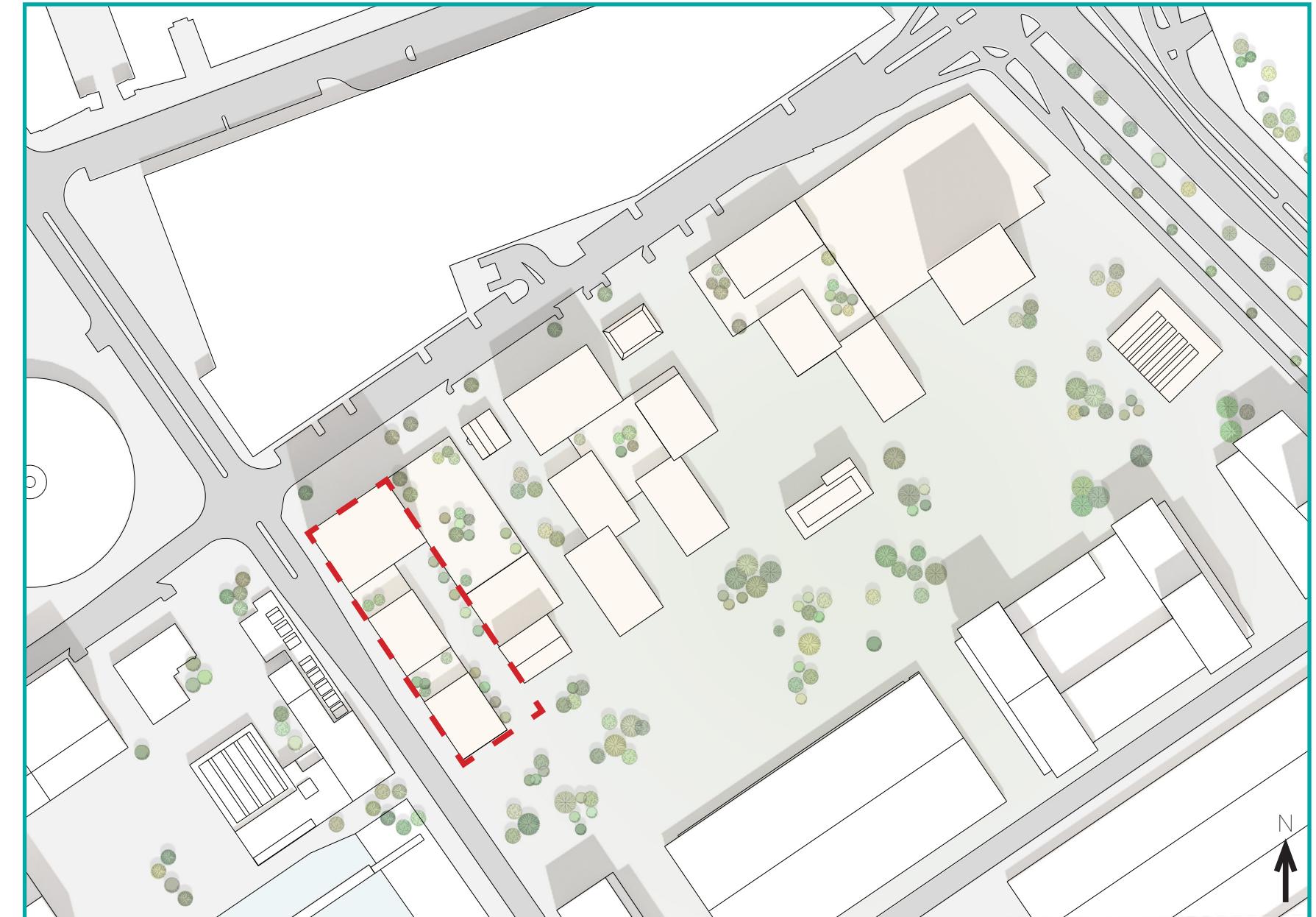
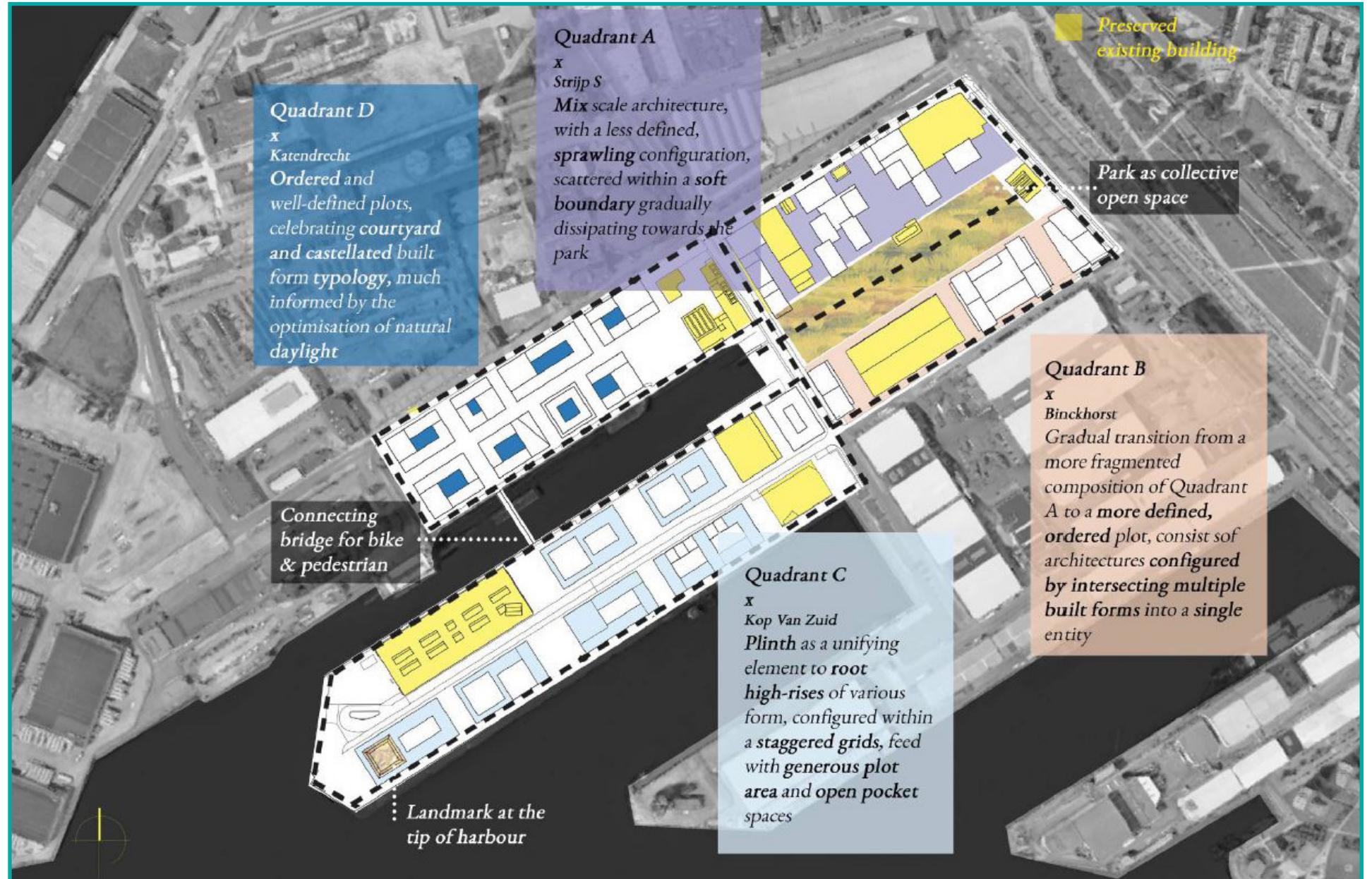
- Developing through communities and communal lifestyle: shared living economy
- Leisure combined with arts and sciences; this will stimulate and facilitate exploring
- Shared indoor spaces: living rooms, leisure areas, functional spaces like laundry, storage and parking
- Shared outdoor space: roof garden & courtyard



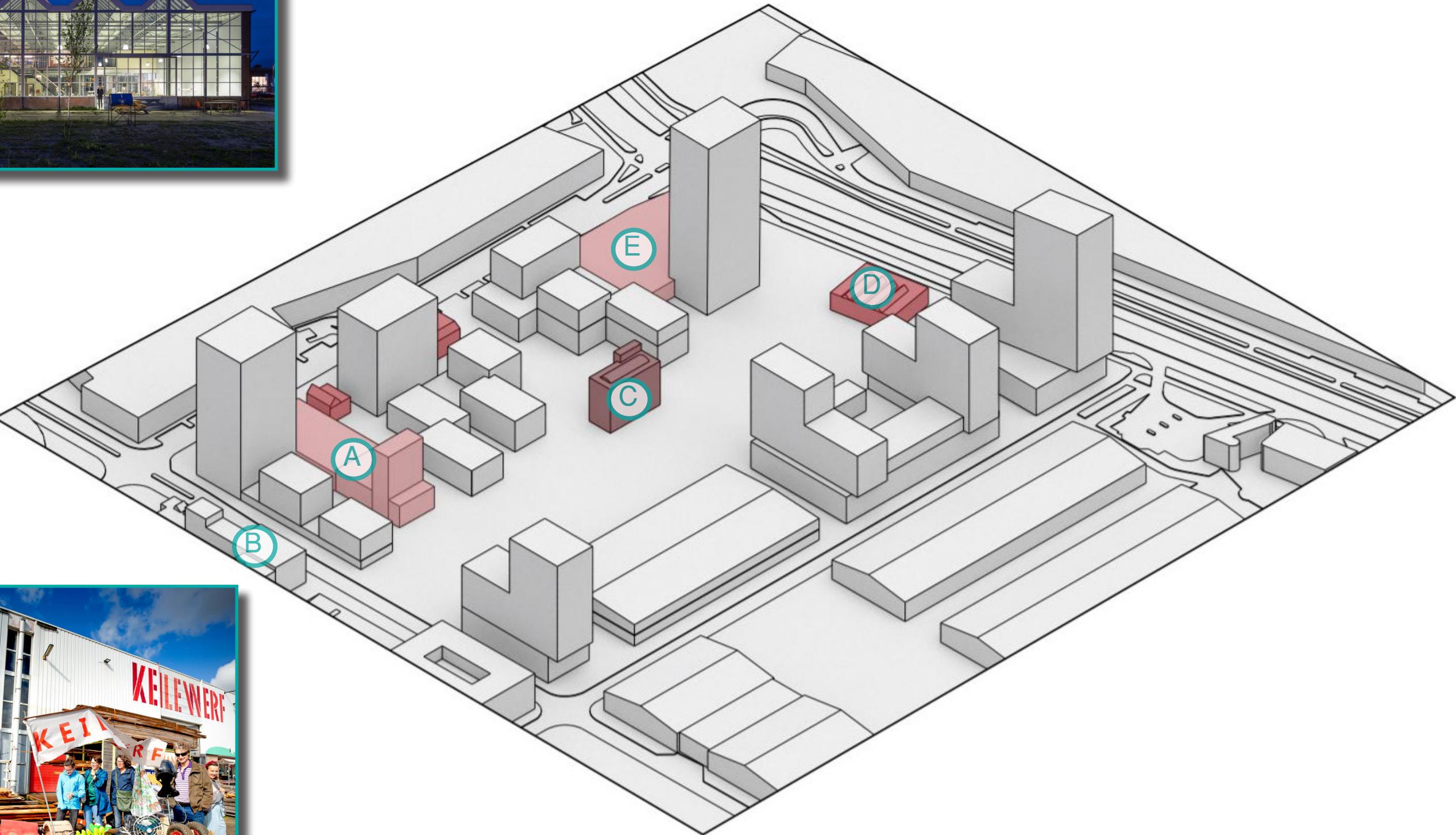
## 2. Location







Keilekwartier and quarter A



## Preserved buildings in the masterplan

Including AVL Mundo, which is directly next to the plot



A place for displaying  
art ...

Sculpture park AVL Mundo



... but also a place for  
events



# 3.

## The Design





Impression  
Birds view

The project consists of two distinctive characters:

- A concrete plinth and core for the stability of the building
- The wooden tower with two wooden dwelling dwelling blocks

The tower, with a height of 62 meters, houses 43 dwellings, while the dwelling blocks contain 32 collective dwelling units.

Collective spaces are scattered throughout the project to enhance a communal feeling in the whole building.

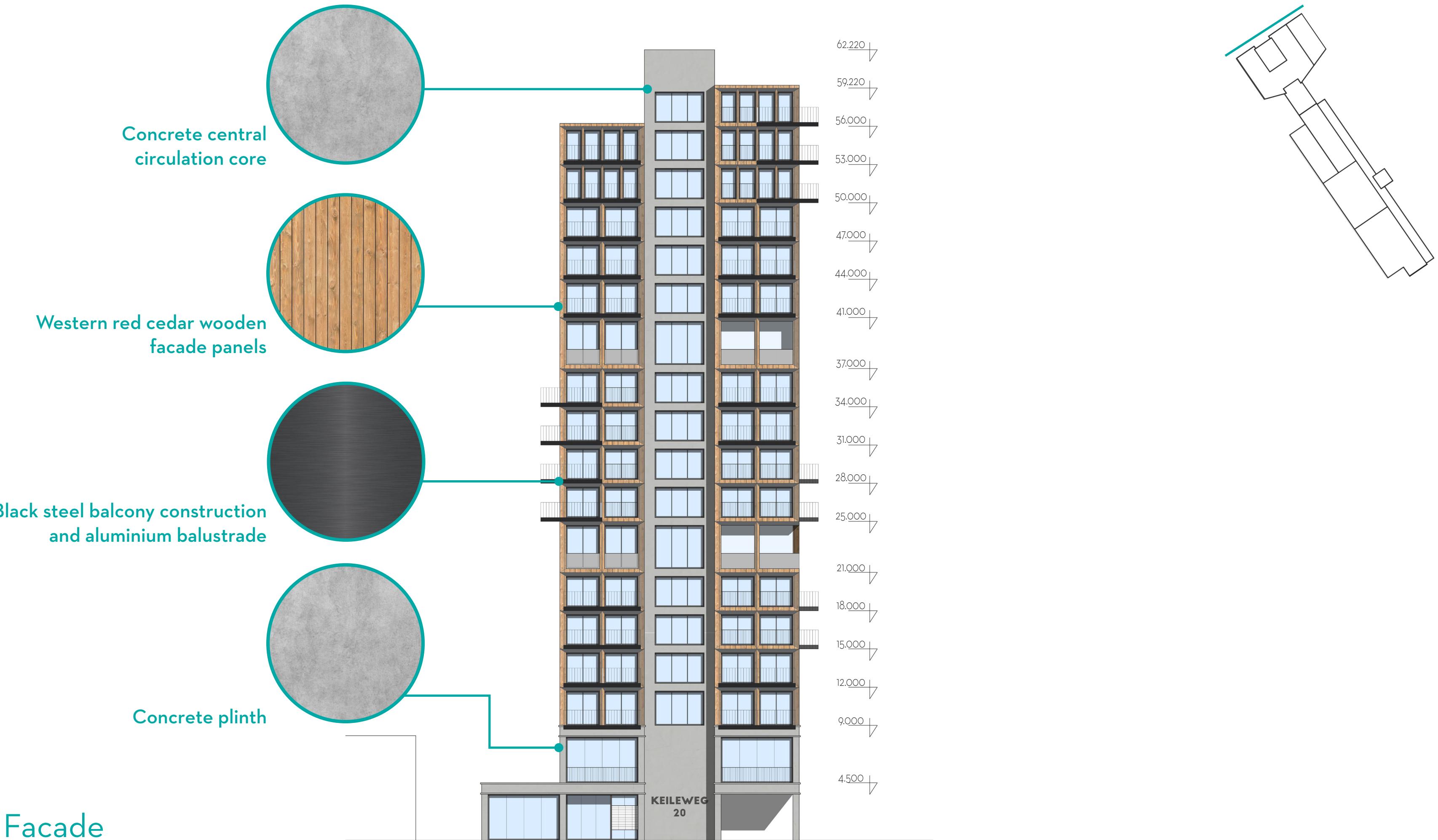




Impression  
Street side

## North-west Facade

Scale 1: 250

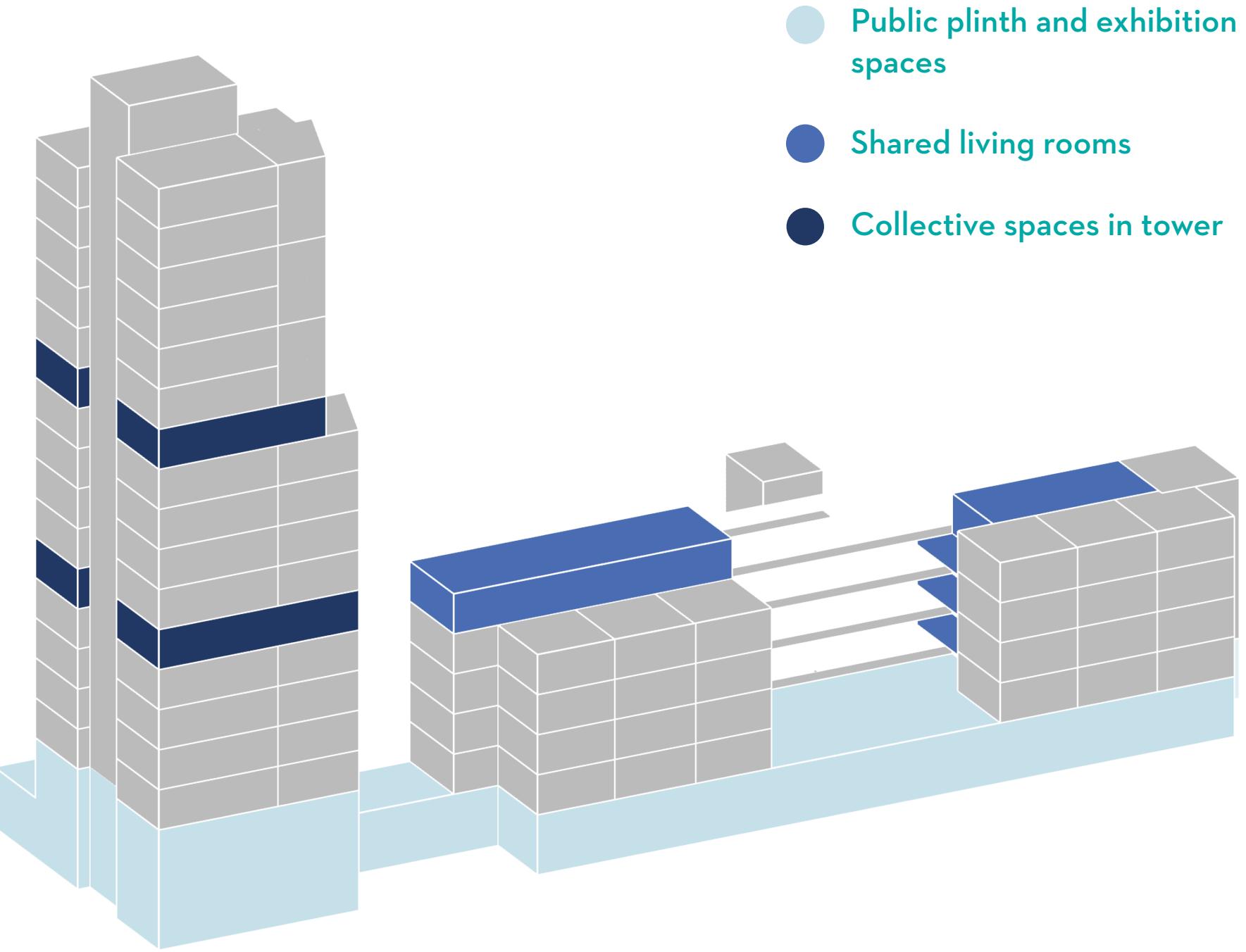


South-west Facade  
Scale 1: 250



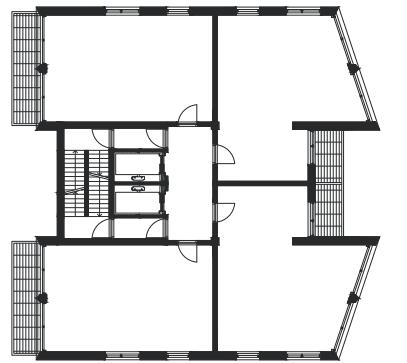


- Apartment A
- Apartment A+
- Apartment B
- Maisonnette
- Collective housing



- Public plinth and exhibition spaces
- Shared living rooms
- Collective spaces in tower

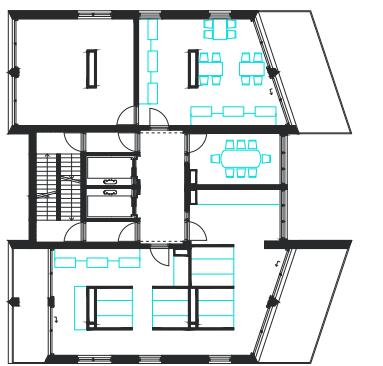
**Overview of design**  
Configuration of dwellings along with collective spaces



(A)

### Floors of dwellings

- Tower apartments and maisonettes
- 3 or 4 dwellings per floor



(B)

### Collective floors

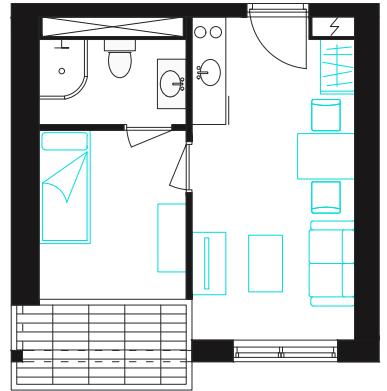
- Shared working spaces and meeting rooms
- Open living rooms and kitchen for residents
- Loggias, terraces and winter garden

## Overview of design

Collective floors combined with the dwellings in tower



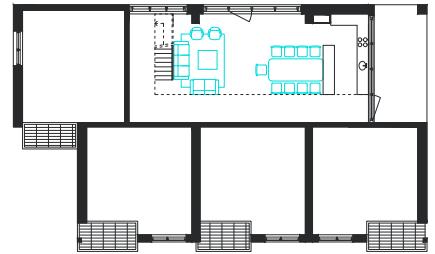
A



### Dwelling units

- Smaller, collective housing
- 8 units per shared living room

B



### Shared living room

- 4 shared living rooms for the residents
- Open kitchen, lounge area and a balcony

C

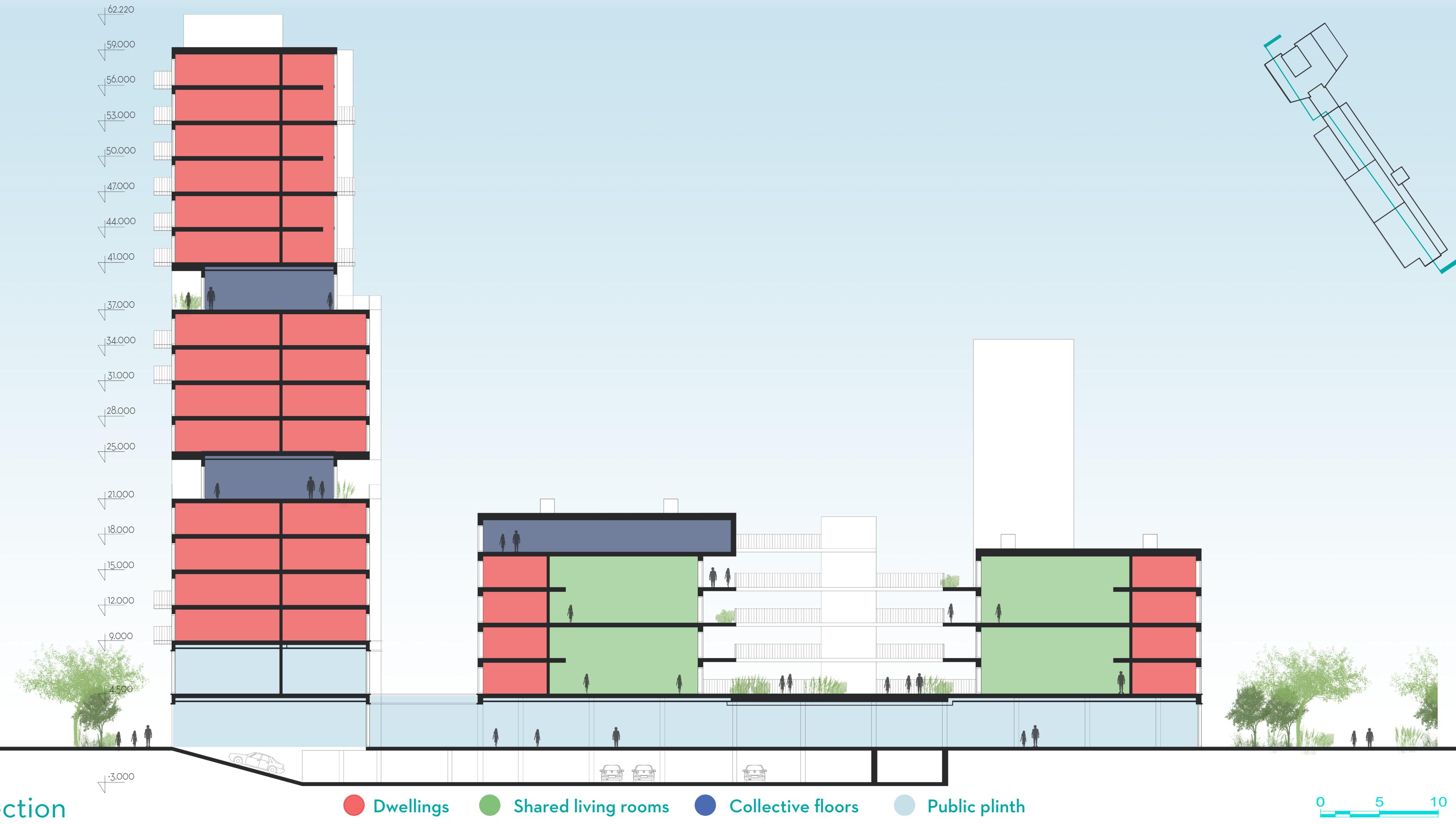
### Collective outdoor area

- Rooftop community garden
- Rooftop terrace



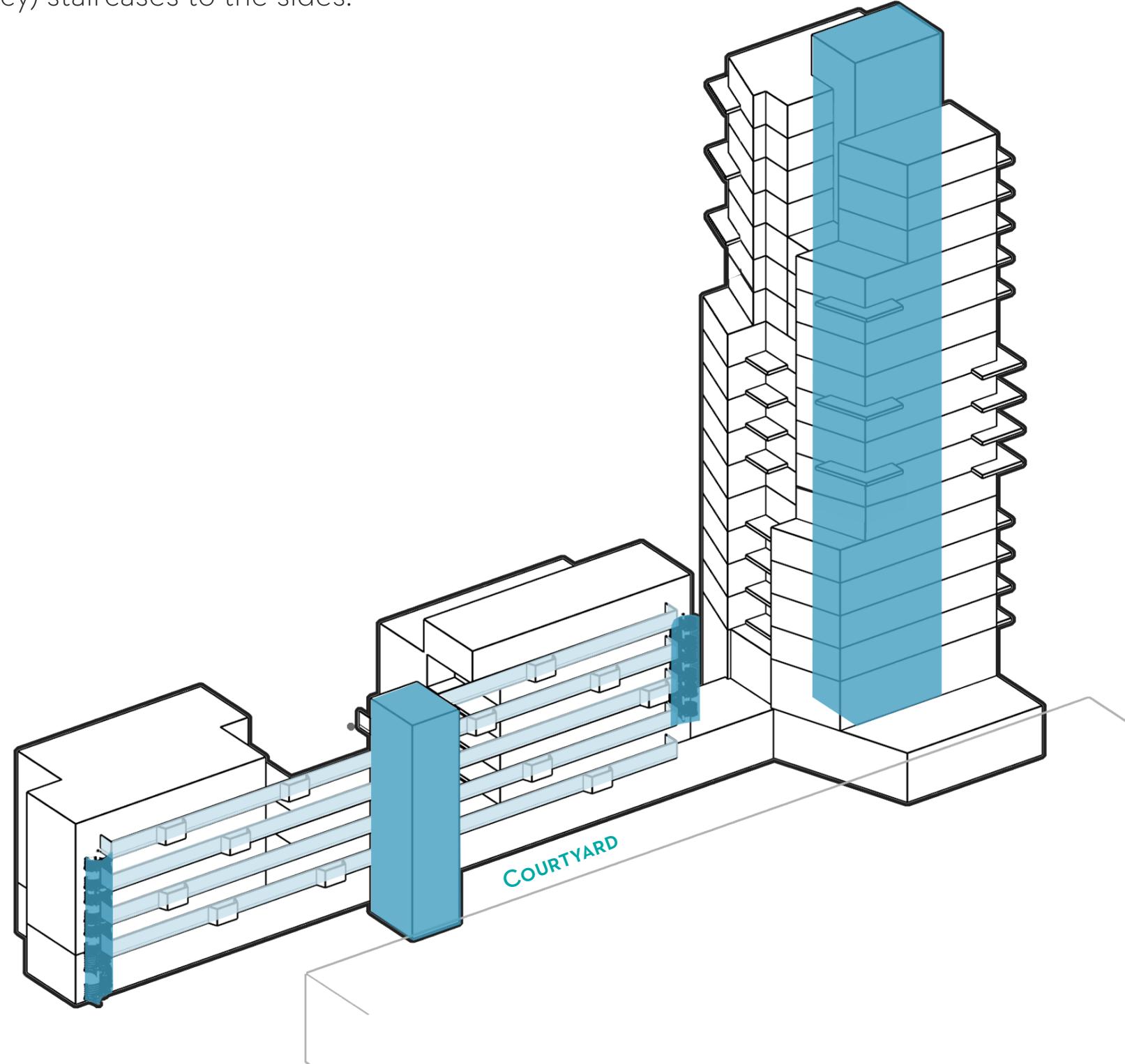
## Overview of design

Horizontal configuration of amenities in the dwelling blocks



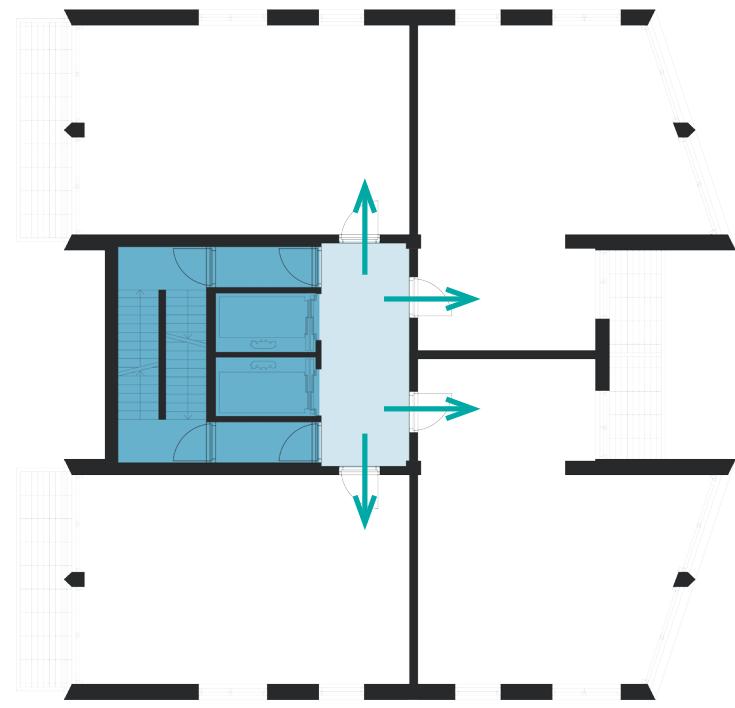
## Main circulation routes

The design consists of several circulation typologies. In the tower the circulation through the floors is accomplished with a central core for stairways and elevators, while the dwelling blocks contain one centralized core with an elevator and a staircase and two (emergency) staircases to the sides.



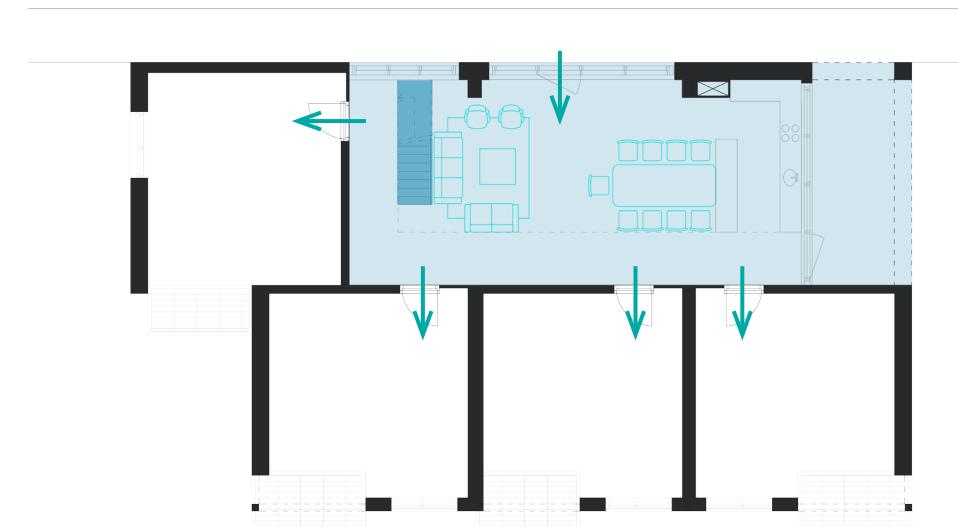
## Overview of design

Circulation and accessibility



## Accessibility of dwellings in tower

When leaving the elevators in the tower, a hallway is reached which connects the vertical circulation with the entrance of the apartments.



## Accessibility of the units in dwelling blocks

The units in the dwelling blocks are connected with a collective living room, housing the shared space of 8 units. These 8 units are spread out to two separate floors, with the collective living room as central spot.

● Vertical circulation

● Horizontal circulation

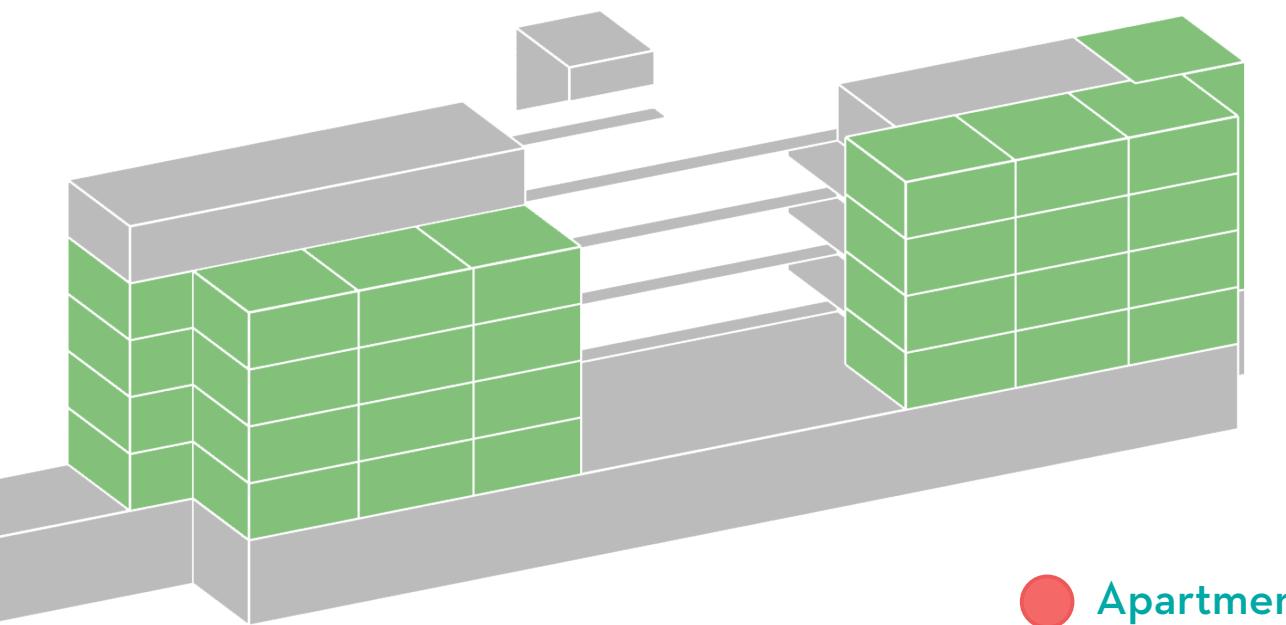
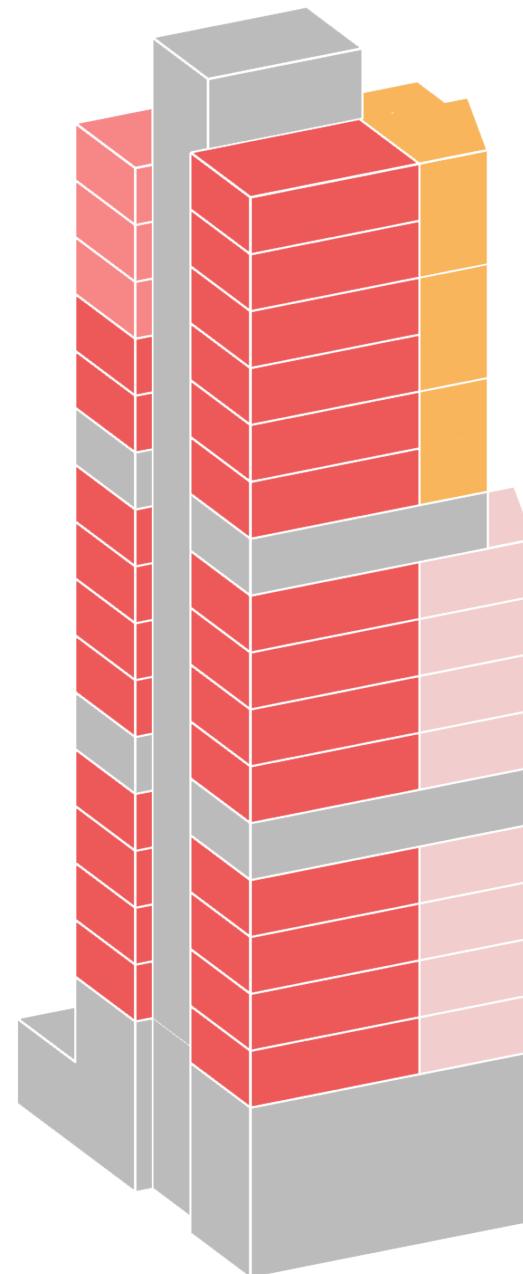


Impression  
Main entrance area



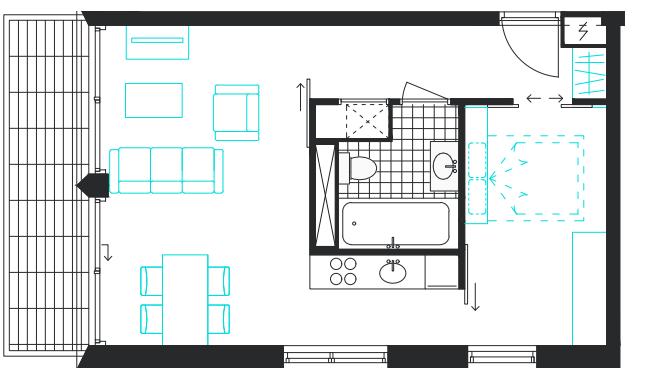
## 4. Dwellings



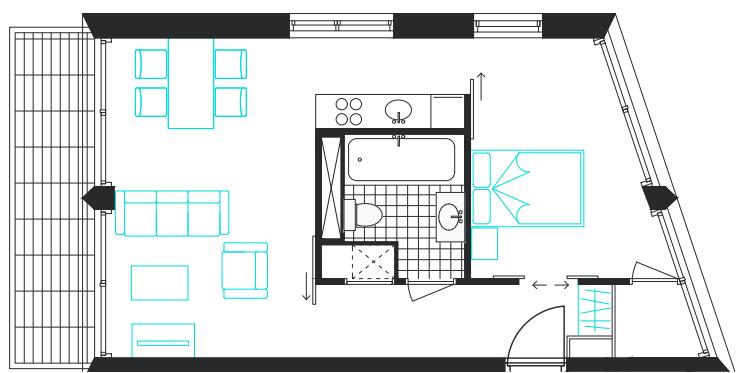


- Apartment A
- Apartment A+
- Apartment B
- Maisonnette
- Collect. housing

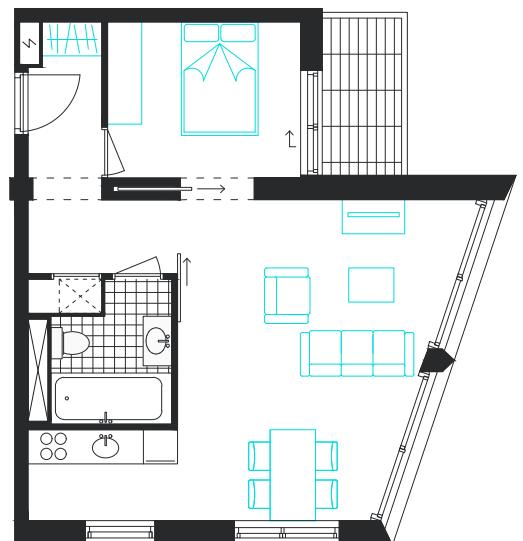
## Overview of dwellings Configuration



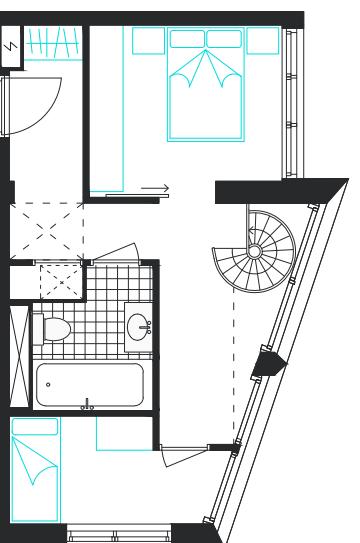
Apartment A  
Typology: Apartment  
Area: 49 m<sup>2</sup>



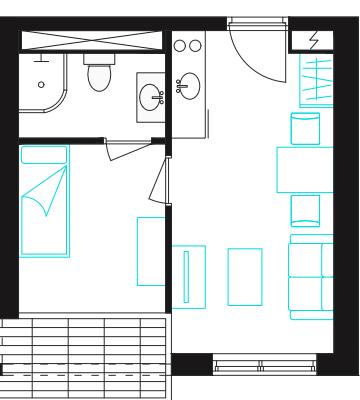
Apartment A+  
Typology: Apartment  
Area: 54 m<sup>2</sup>



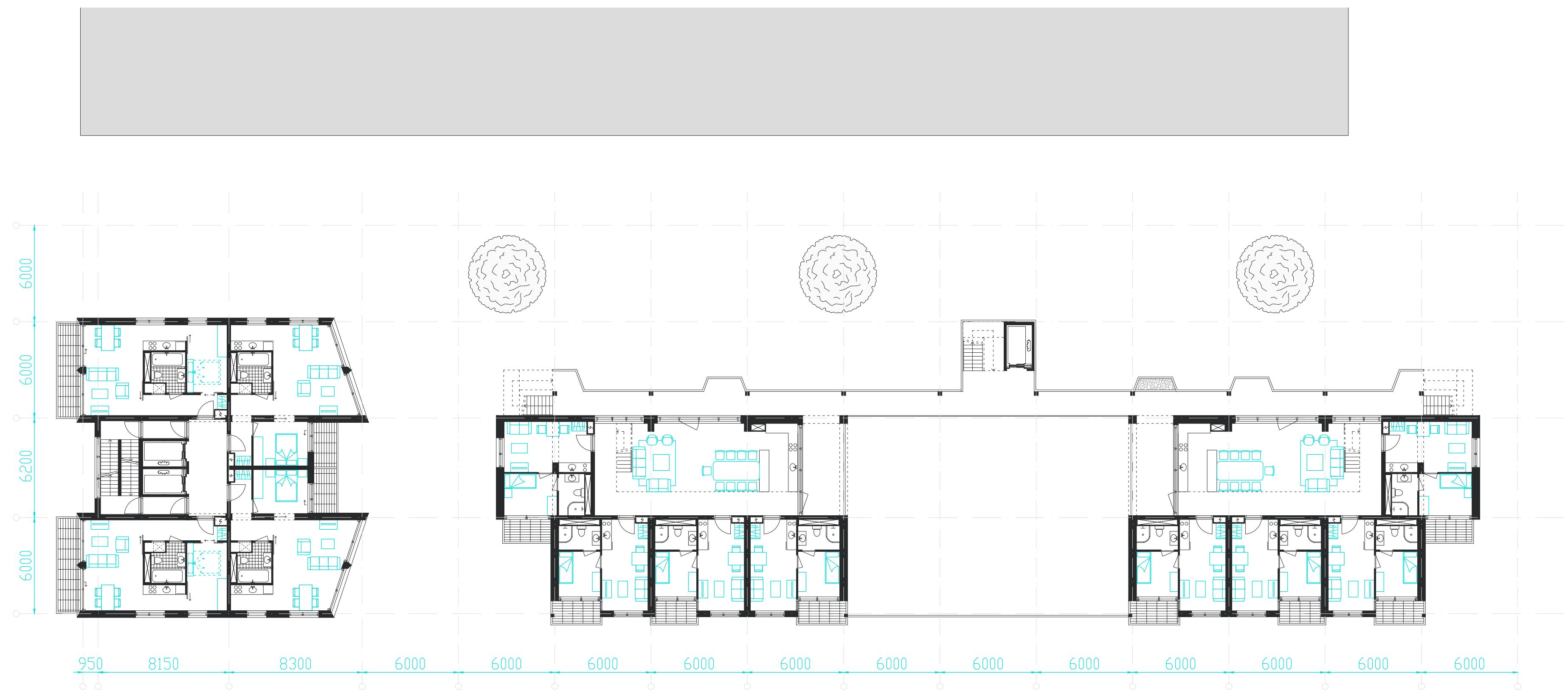
Apartment B  
Typology: Apartment  
Area: 54 m<sup>2</sup>



Maisonnette  
Typology: Maisonnette  
Area: 72 m<sup>2</sup>



Collective housing  
Typology: Co-living  
Area: 30 m<sup>2</sup>

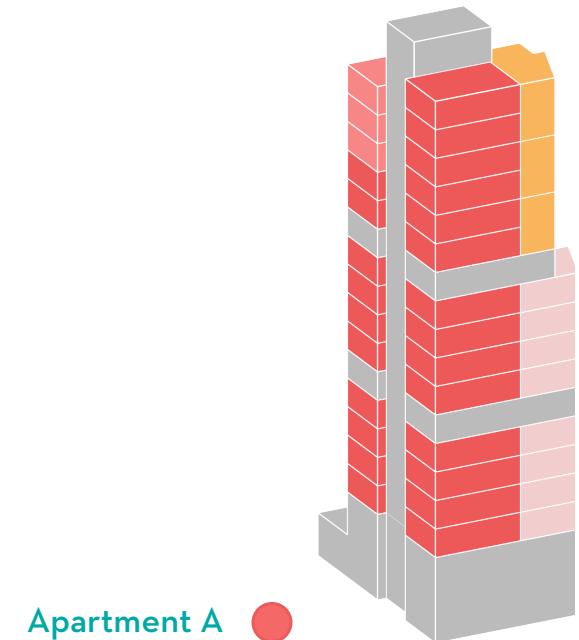
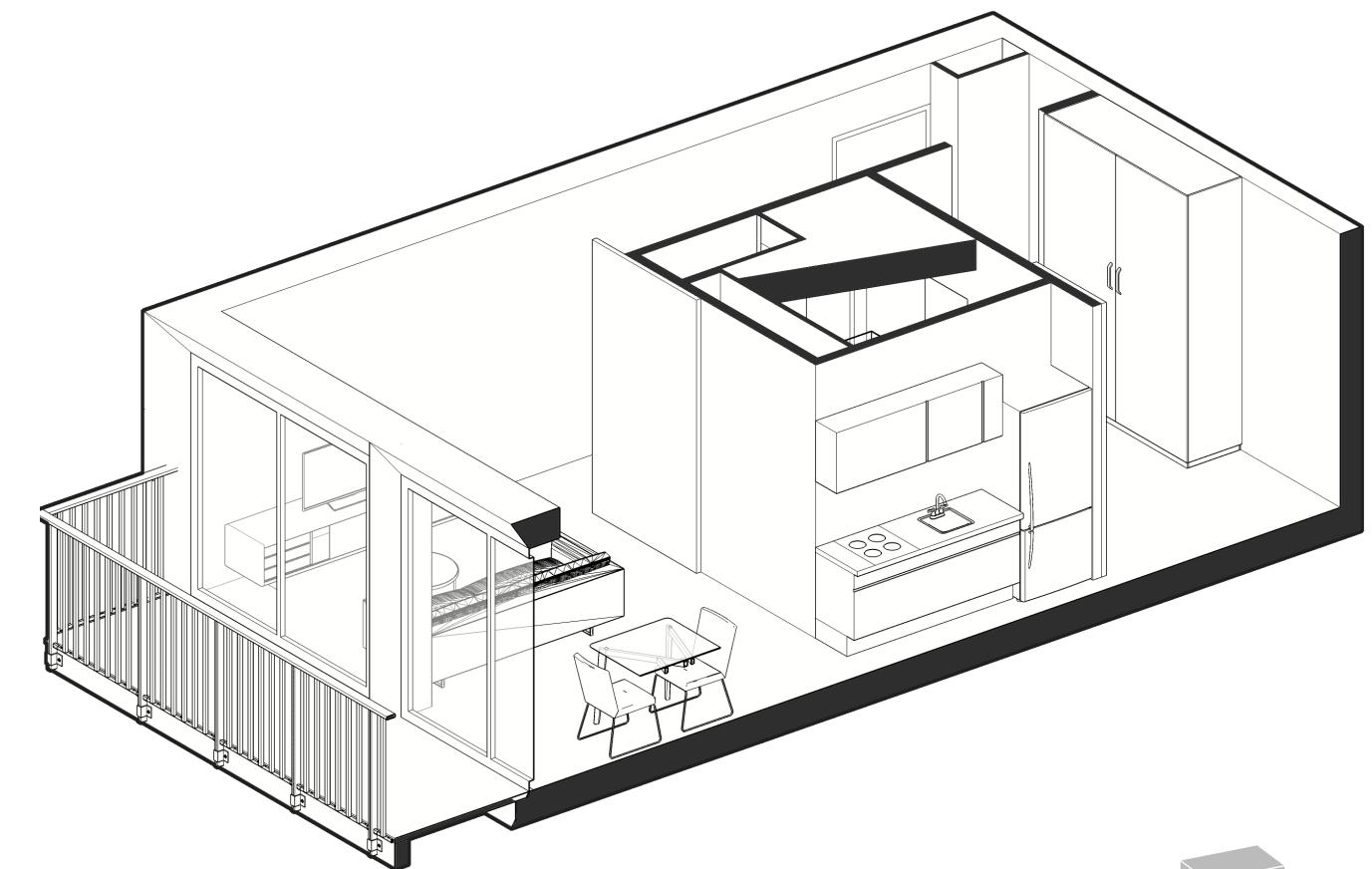
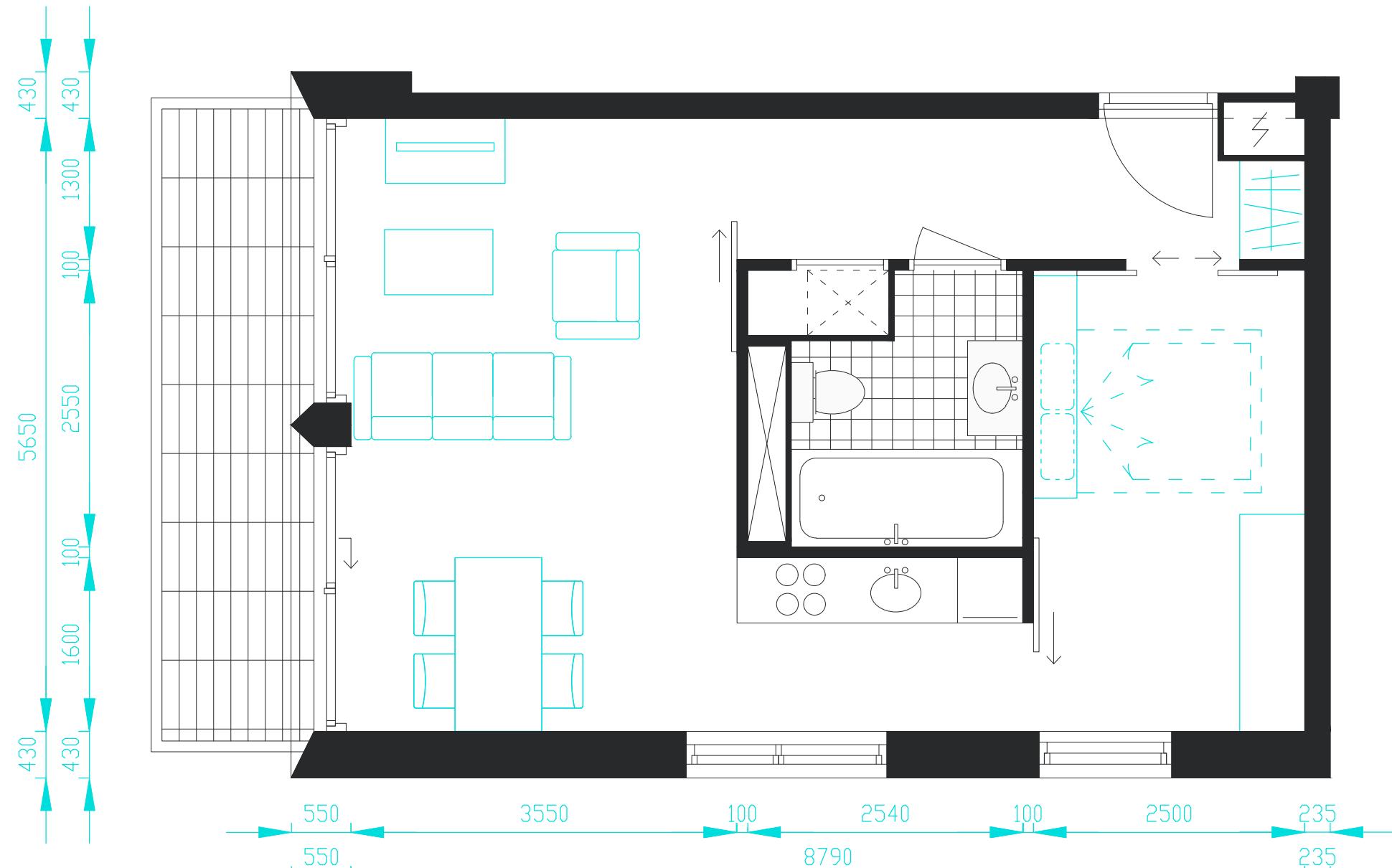


Typical floor plan: Tower and blocks  
Scale 1: 200



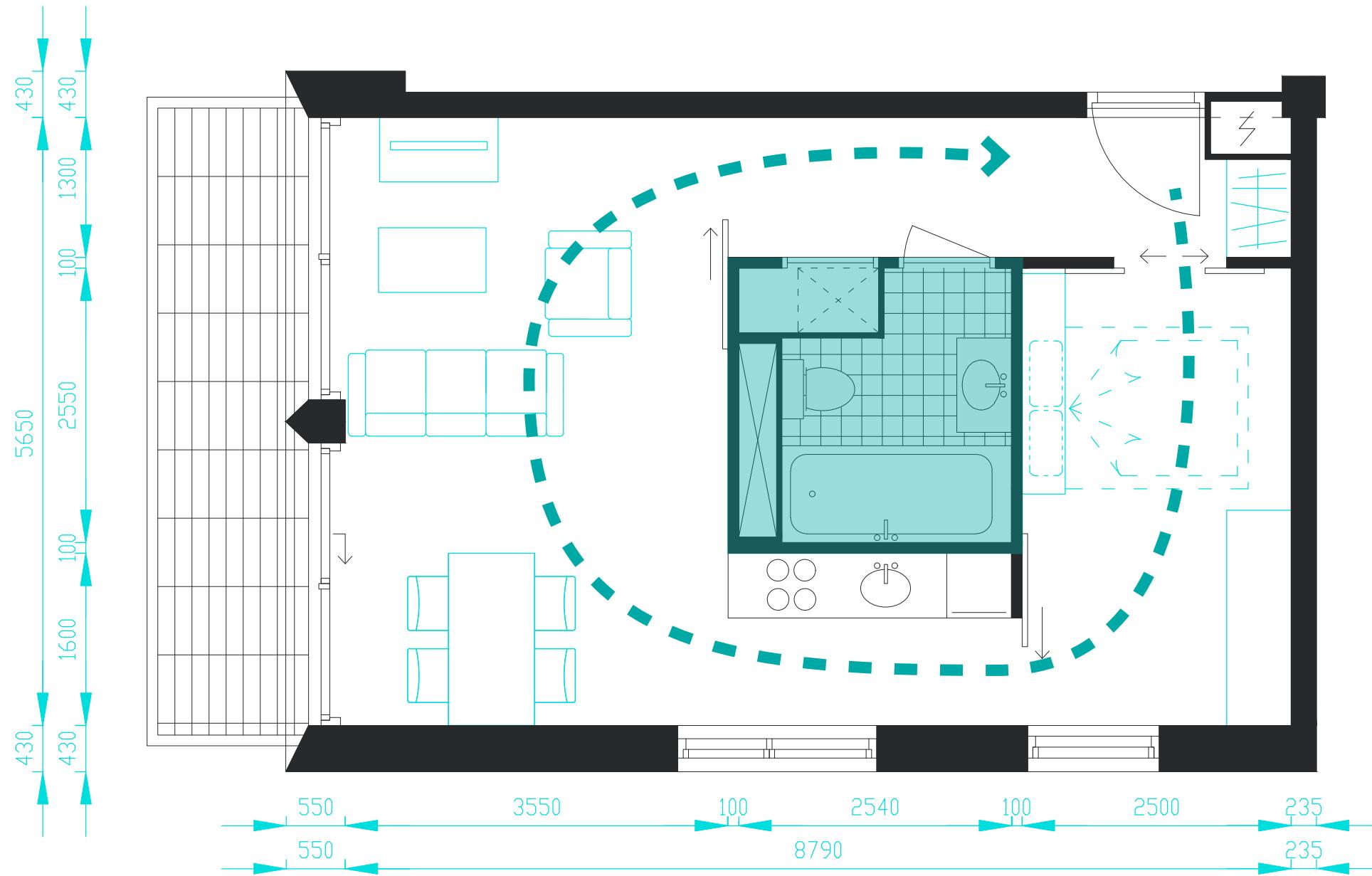
# Apartment A

49 m<sup>2</sup> - open living room with dining area - separate bedroom and bathroom

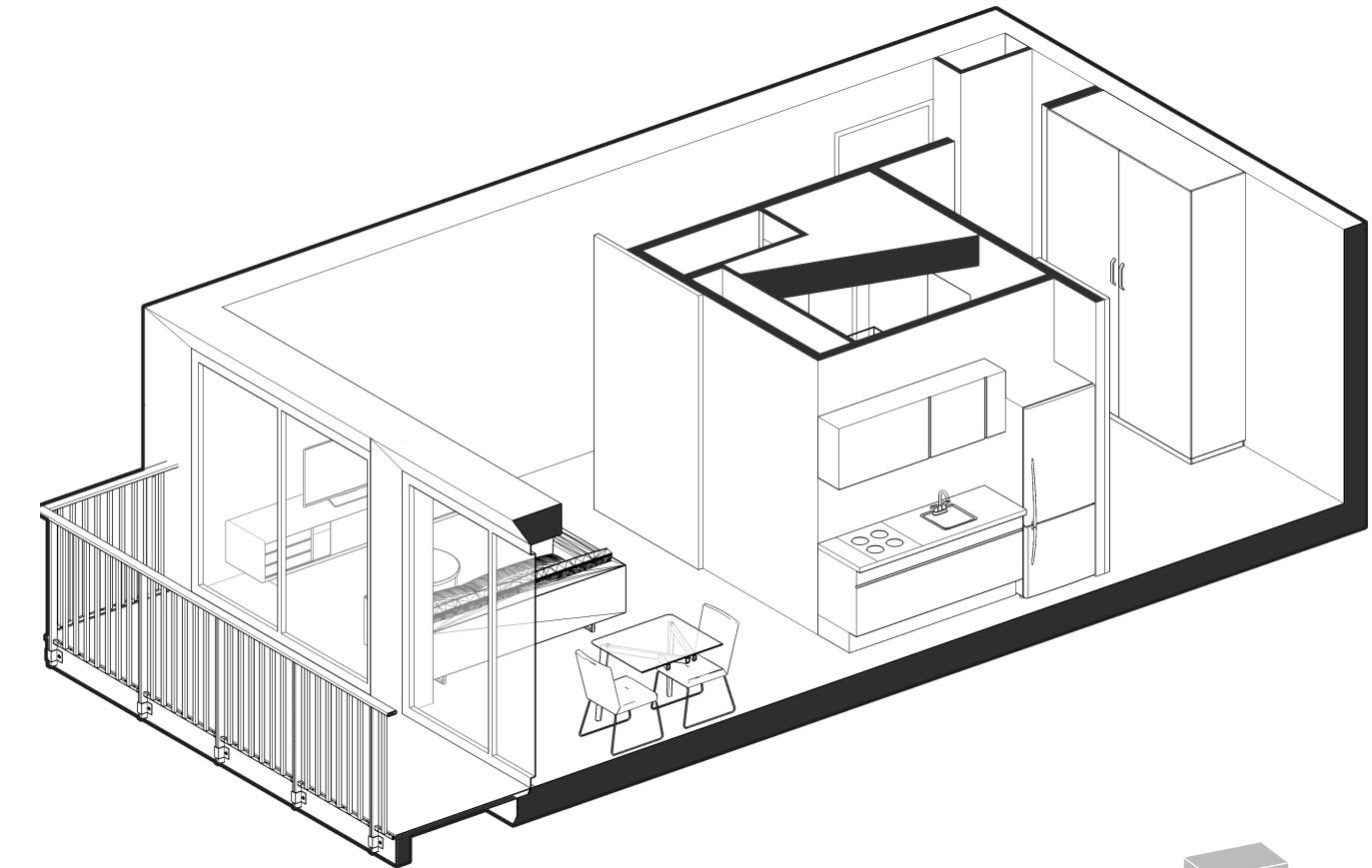


# Apartment A

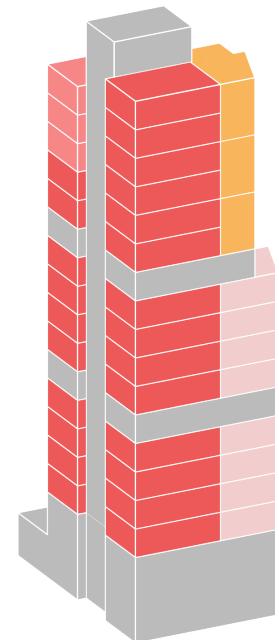
49 m<sup>2</sup> - open living room with dining area - separate bedroom and bathroom

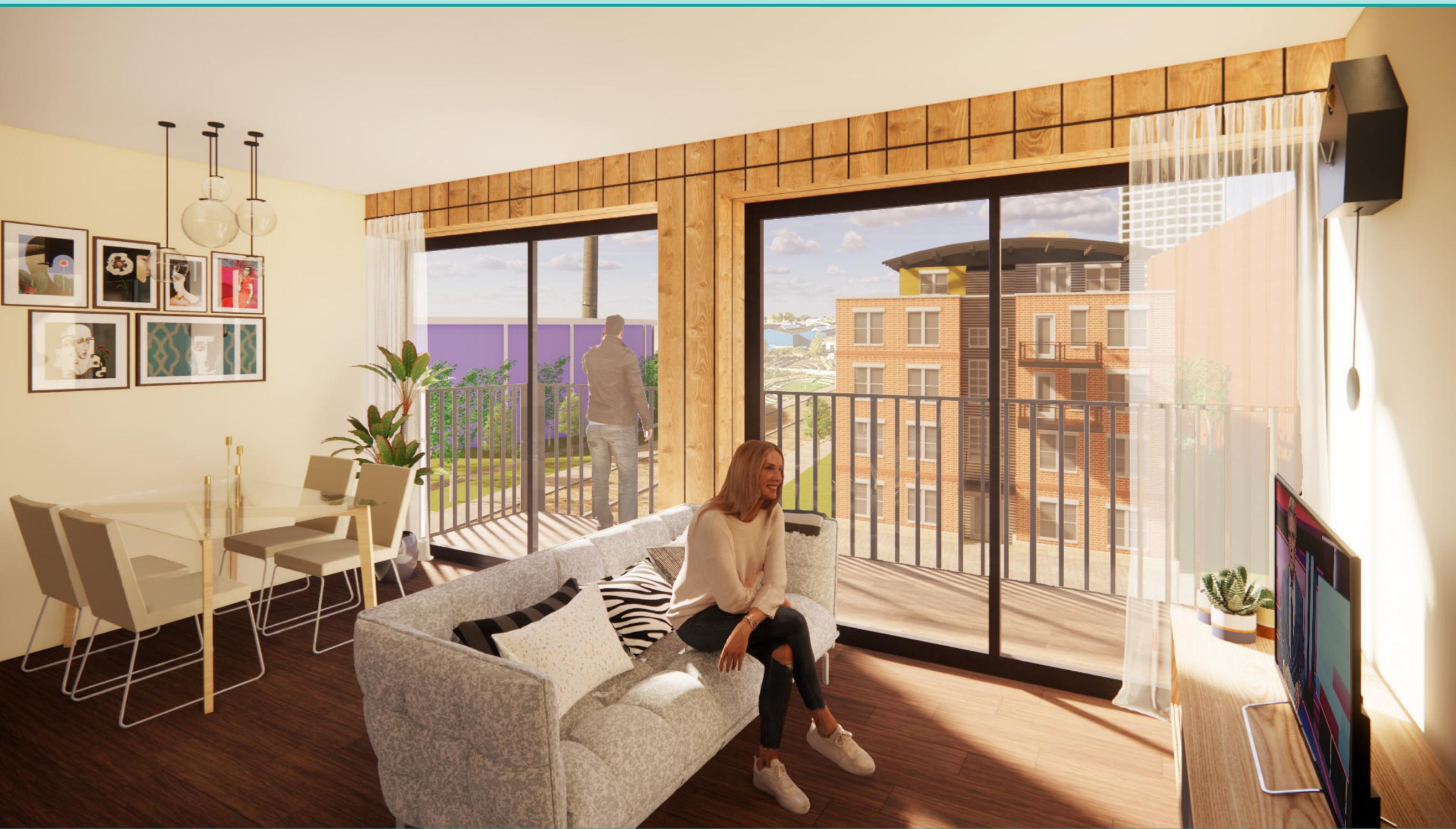


**Wet zones as a square element in the dwelling to make it possible to create living spaces around it**

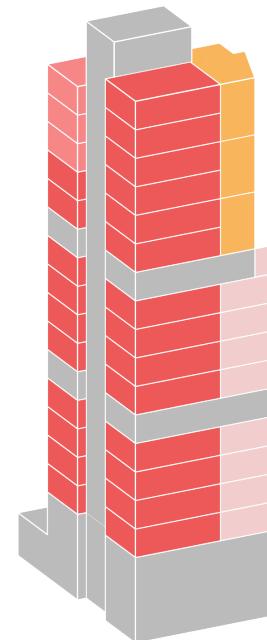
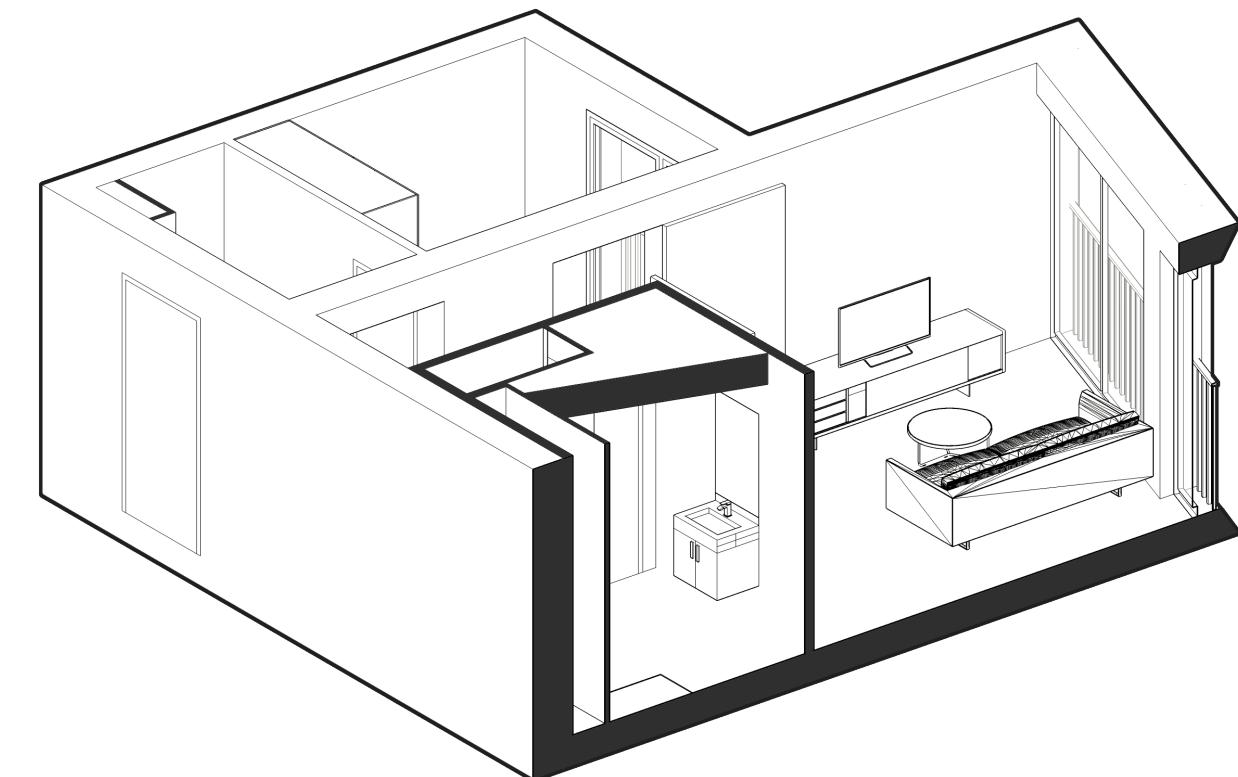
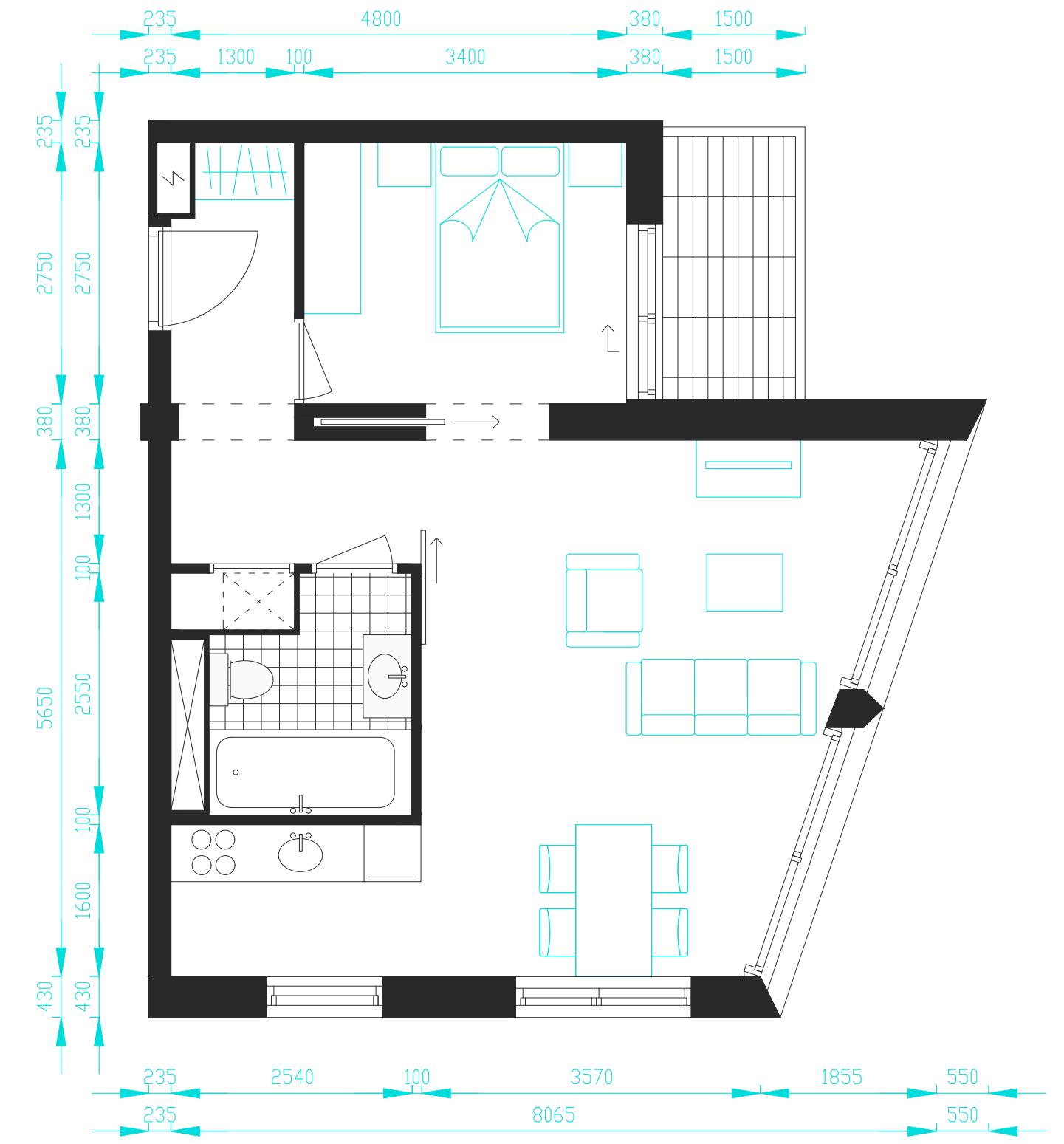


Apartment A





# Apartment B

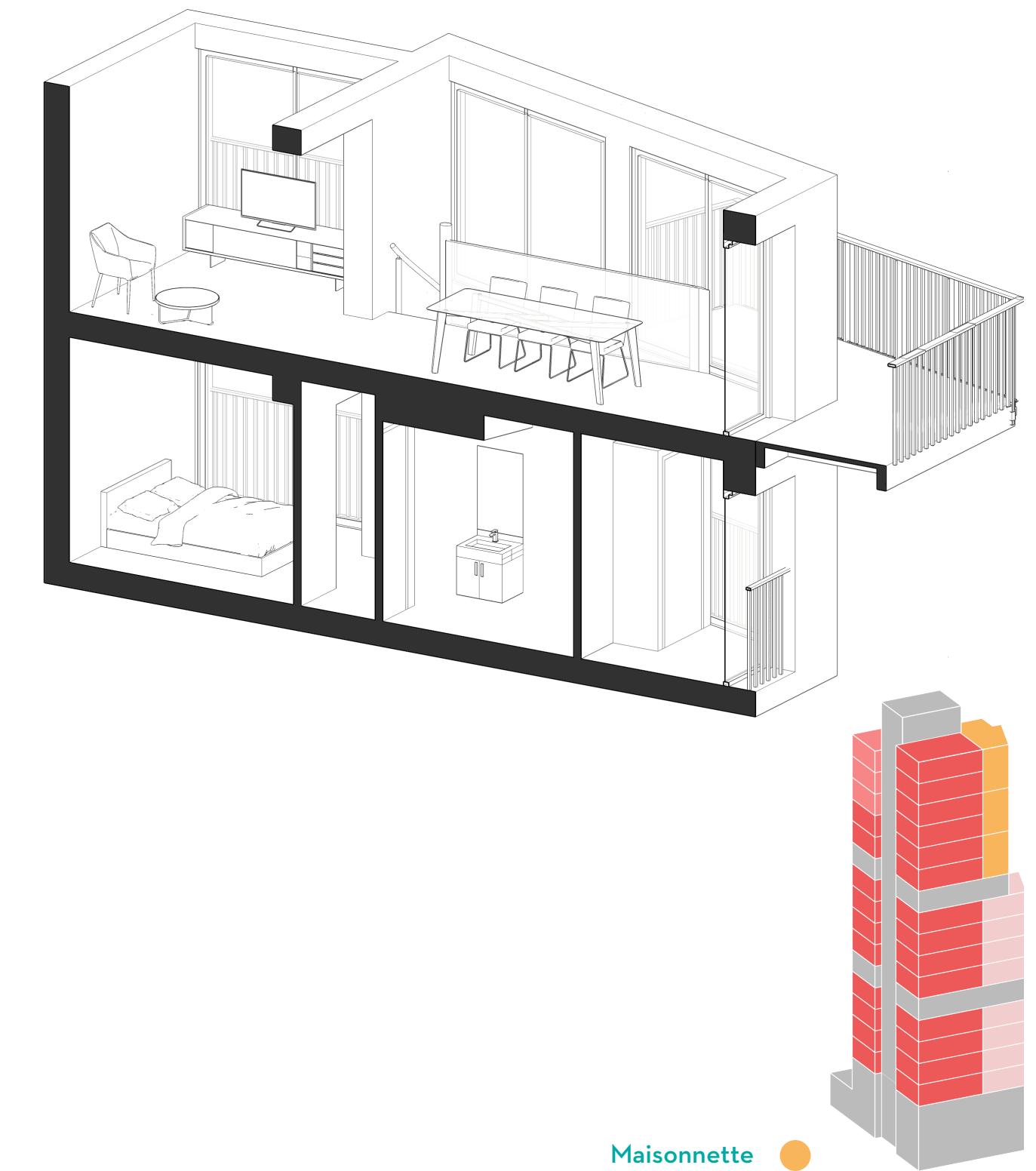
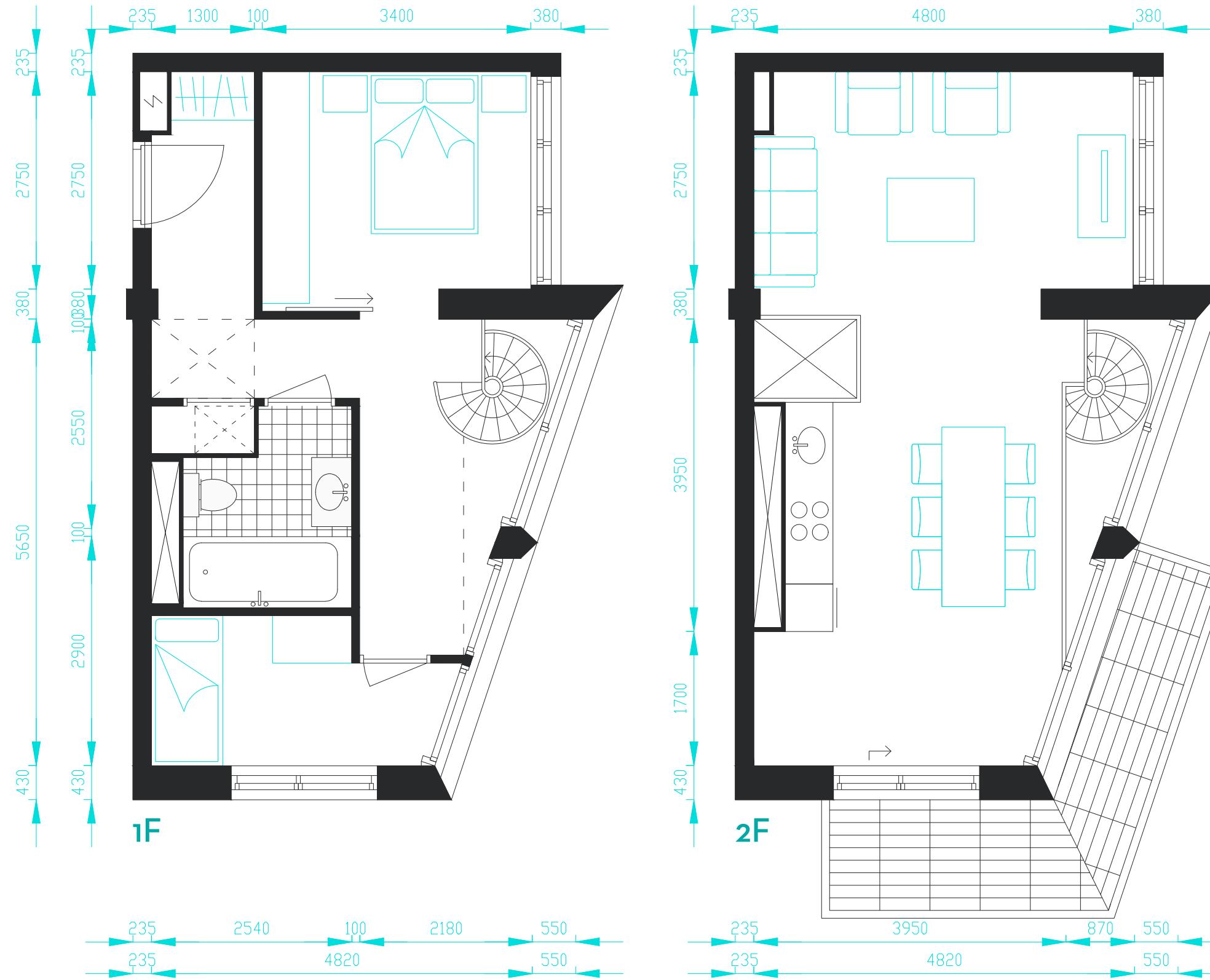


## Apartment B



# Maisonnette

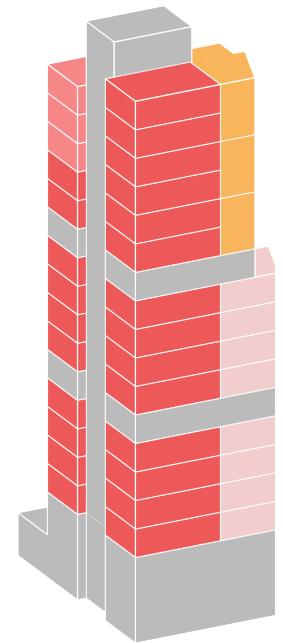
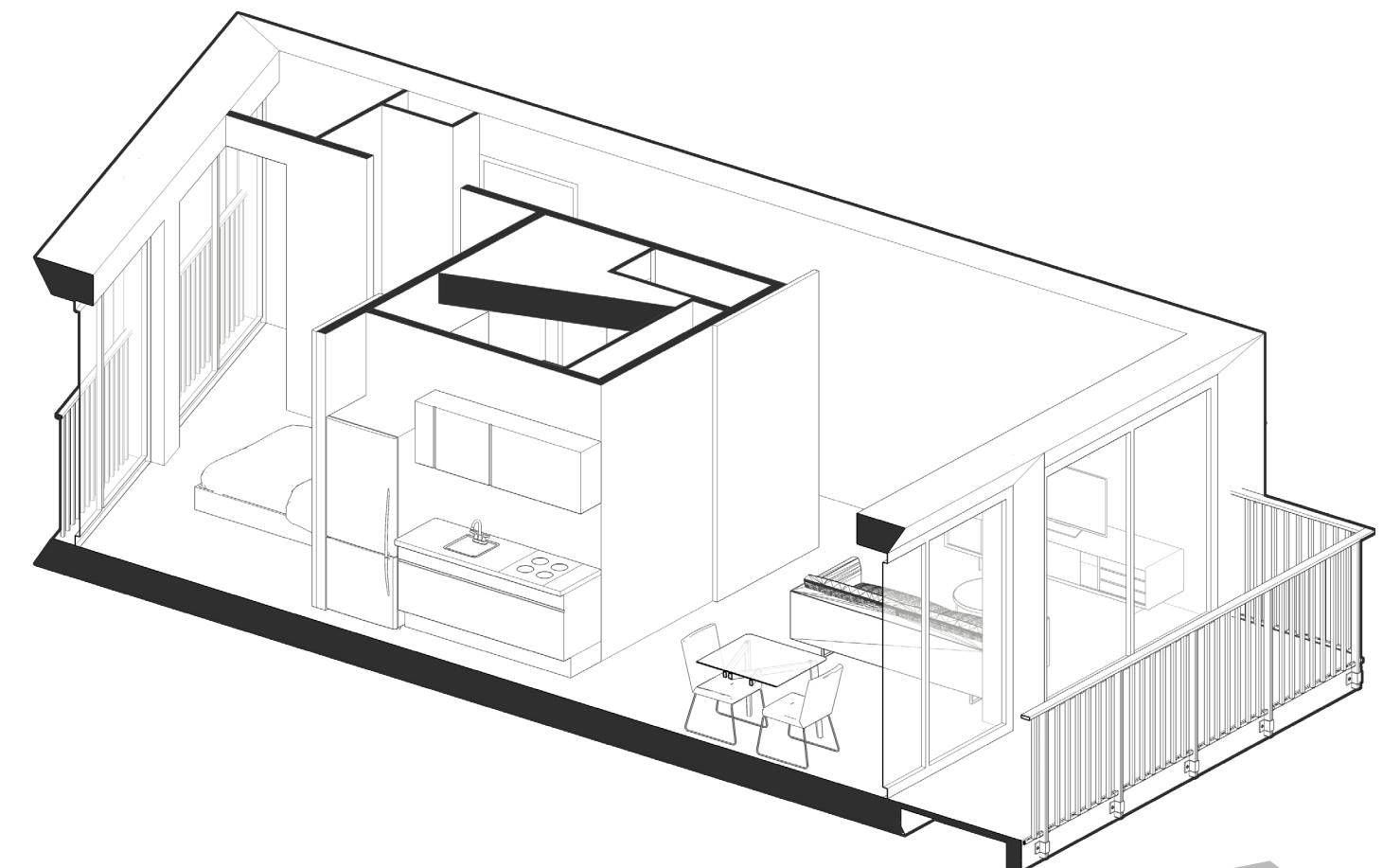
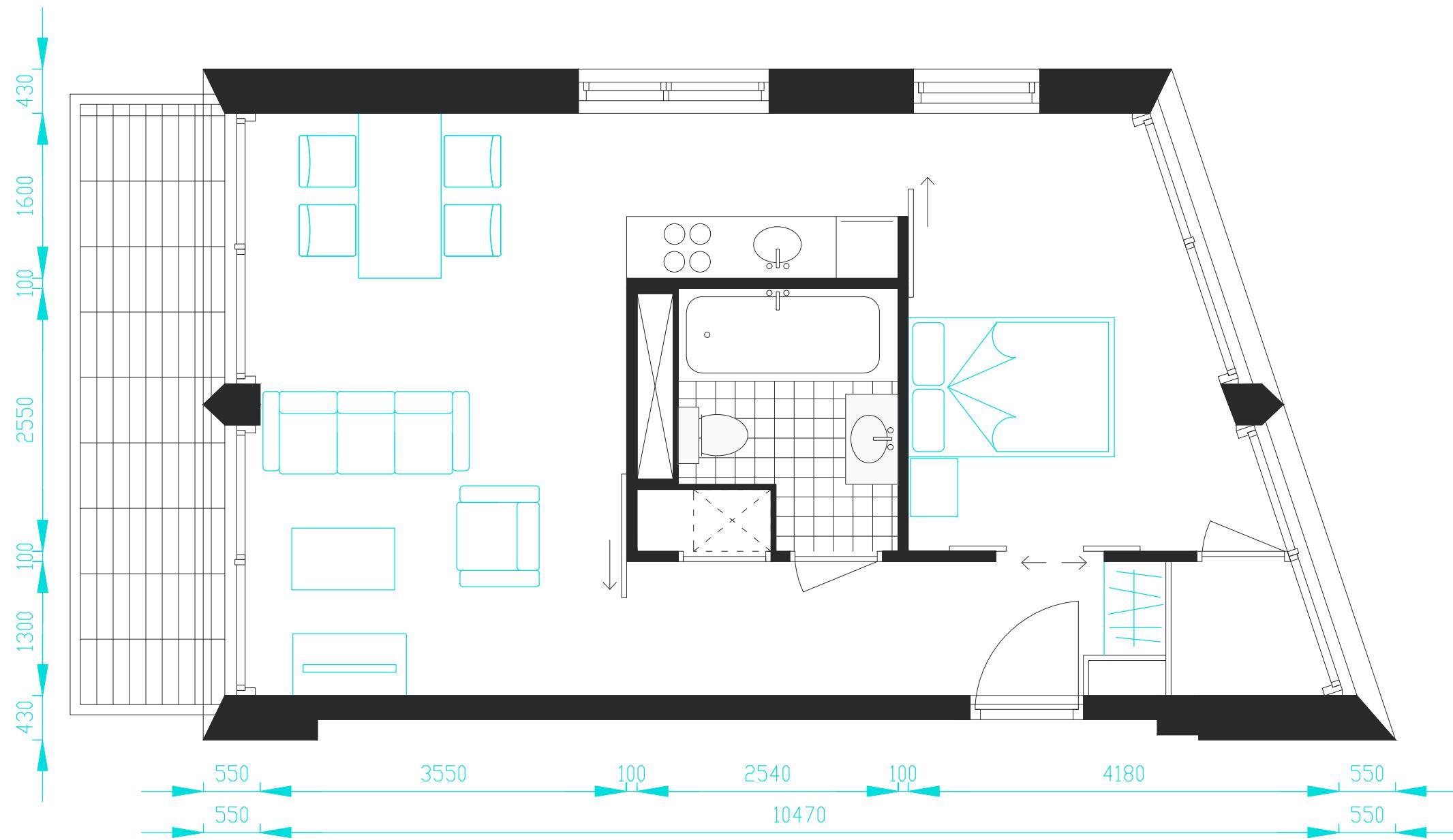
72 m<sup>2</sup> - two separate bedrooms downstairs - living space on complete upper floor - voids for maximum daylight





# Apartment A+

54 m<sup>2</sup> - 'upgraded' version of apartment A - on top of tower with complete open views on two sides

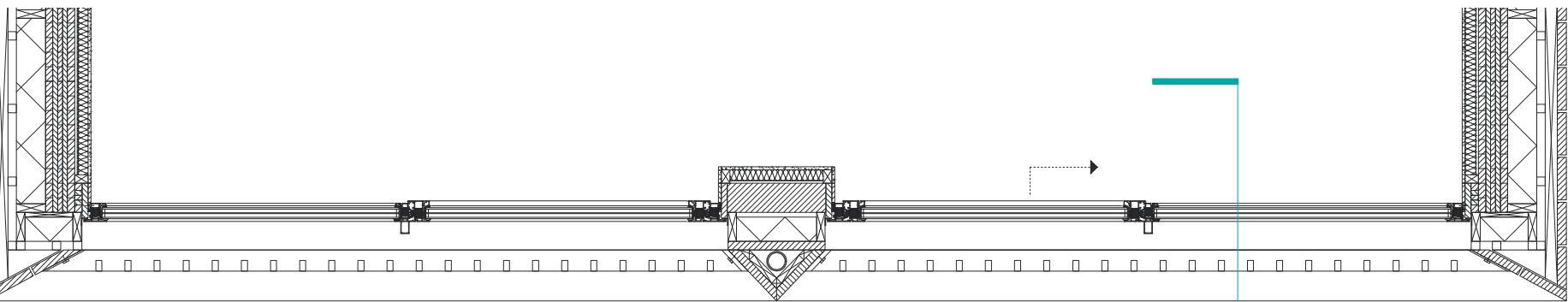


Apartment A+



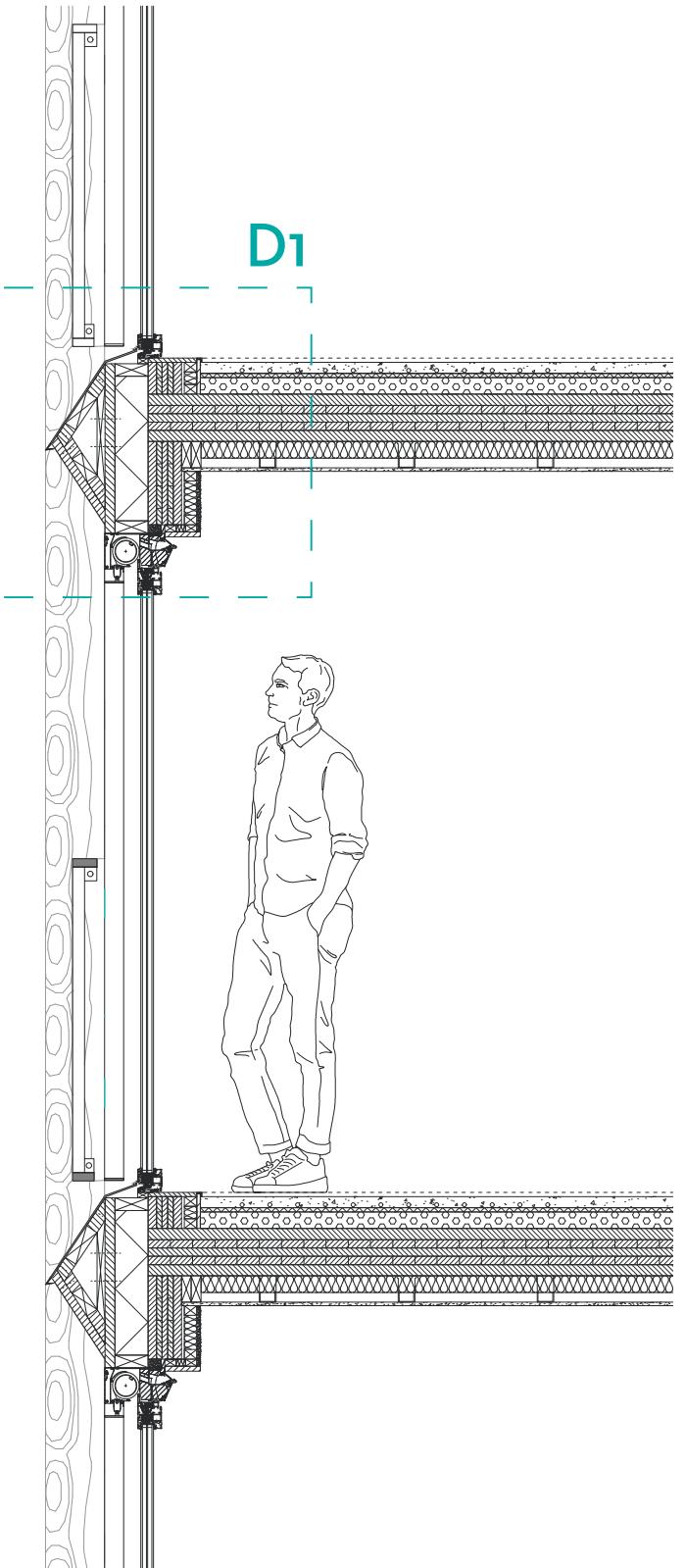
## Floor structure (mm)

Floor finishing (15)  
Screed (40)  
Footfall sound insulation (15)  
Rigid loose balancing filling (60)  
Penetration shield  
CLT slab (170)  
U-suspending brackets (95)  
Insulation (60)  
Plasterboard ceiling finishing layer (12.5)

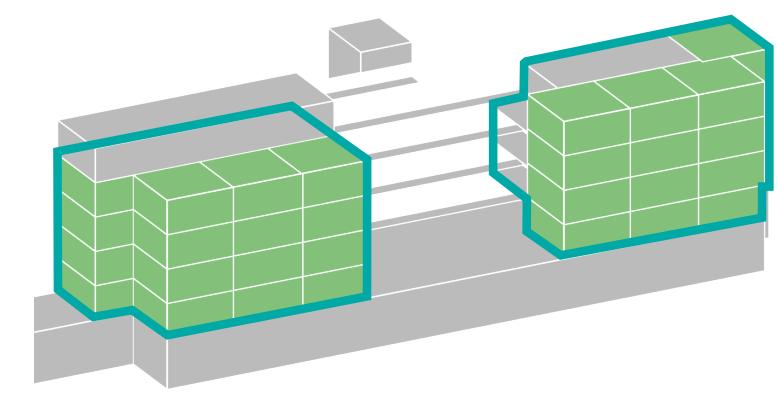


## External wall structure (mm)

Fire-resistant plasterboard (12.5)  
Studs and insulation (45)  
Air gap (10)  
CLT panel (120)  
Insulation (120)  
Waterproofing  
Wooden battens  
Wester red cedar facade panels (30)



## Tower facade fragment

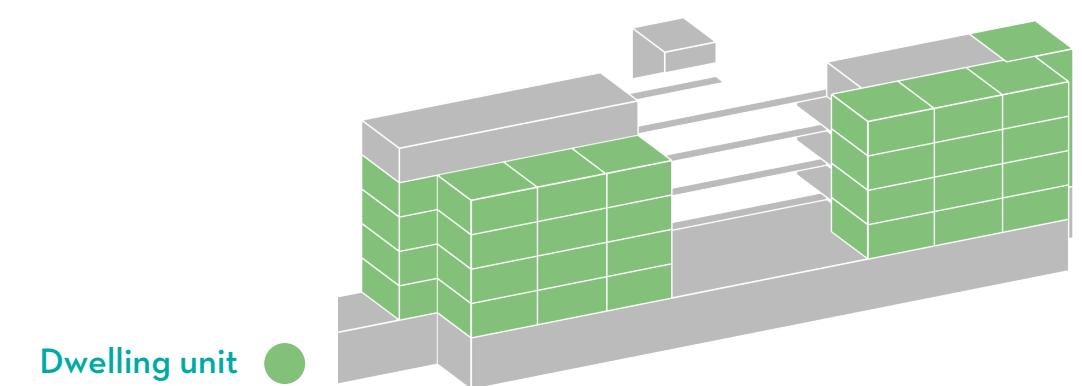
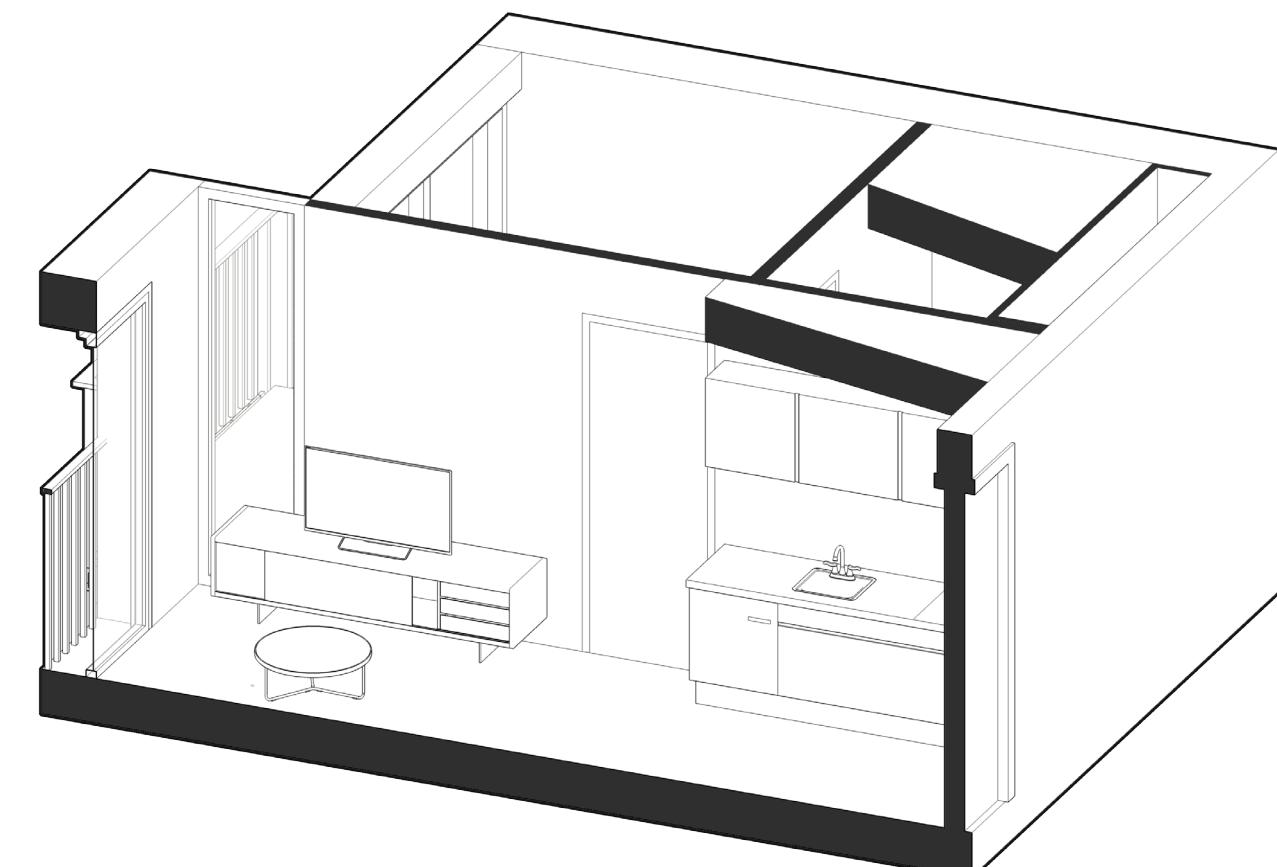




Impression  
Collective living room

# Dwelling unit

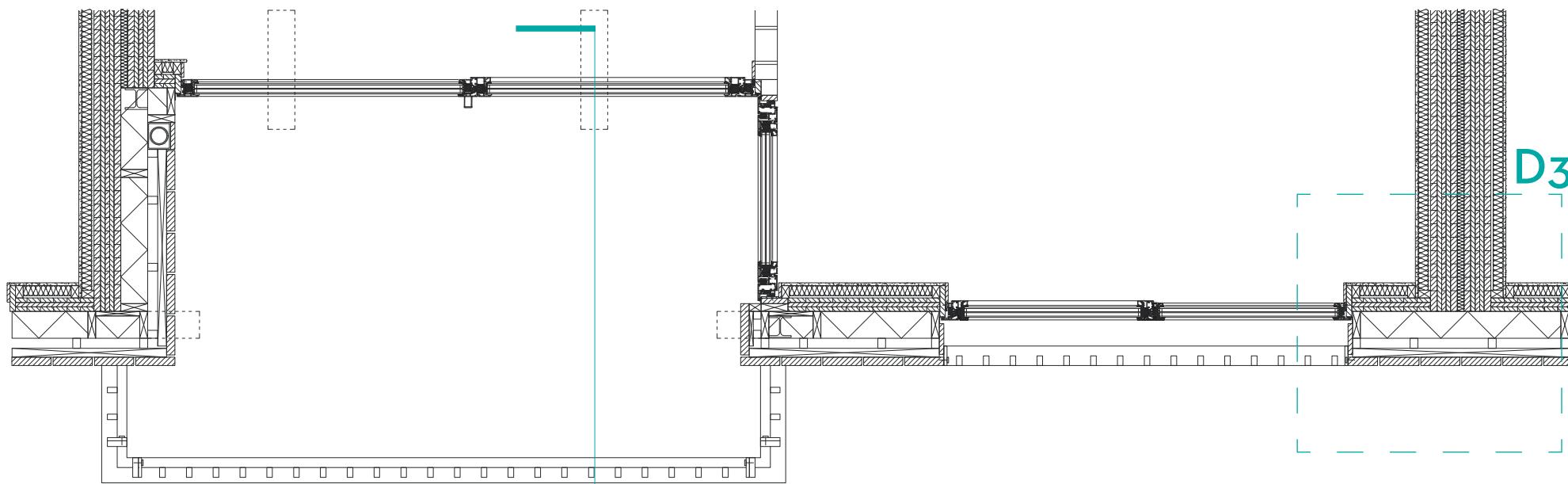
30 m<sup>2</sup> - private dwelling unit with separate living space, bedroom and bathroom - loggia as extra outdoor area





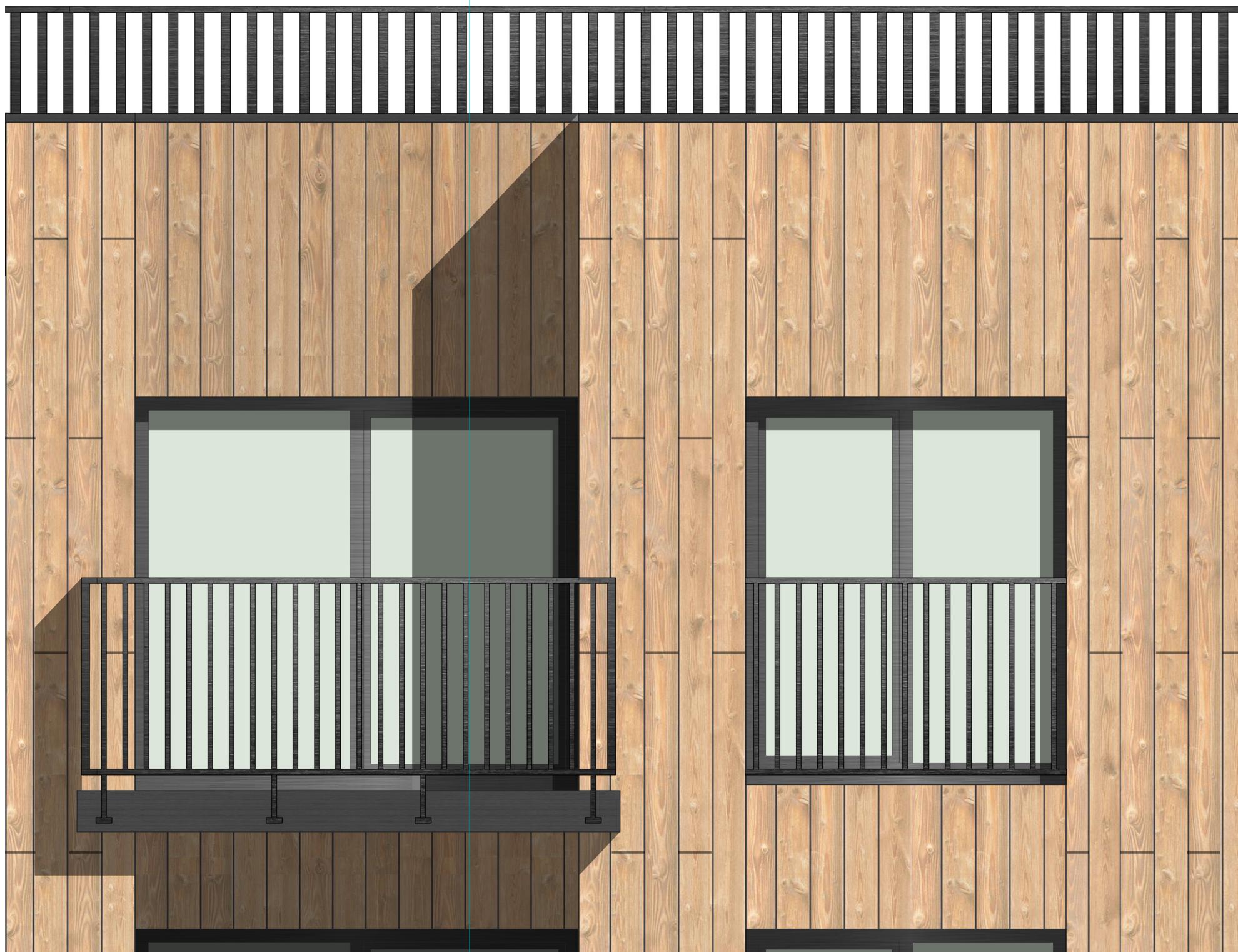
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Insulation (60)  
Plasterboard ceiling finishing layer (12.5)



## External wall structure (mm)

Fire-resistant plasterboard (12.5)  
Studs and insulation (45)  
Air gap (10)  
CLT panel (60)  
Insulation (120)  
Waterproofing  
Wooden battens (85)  
Wester red cedar facade panels (37.5)



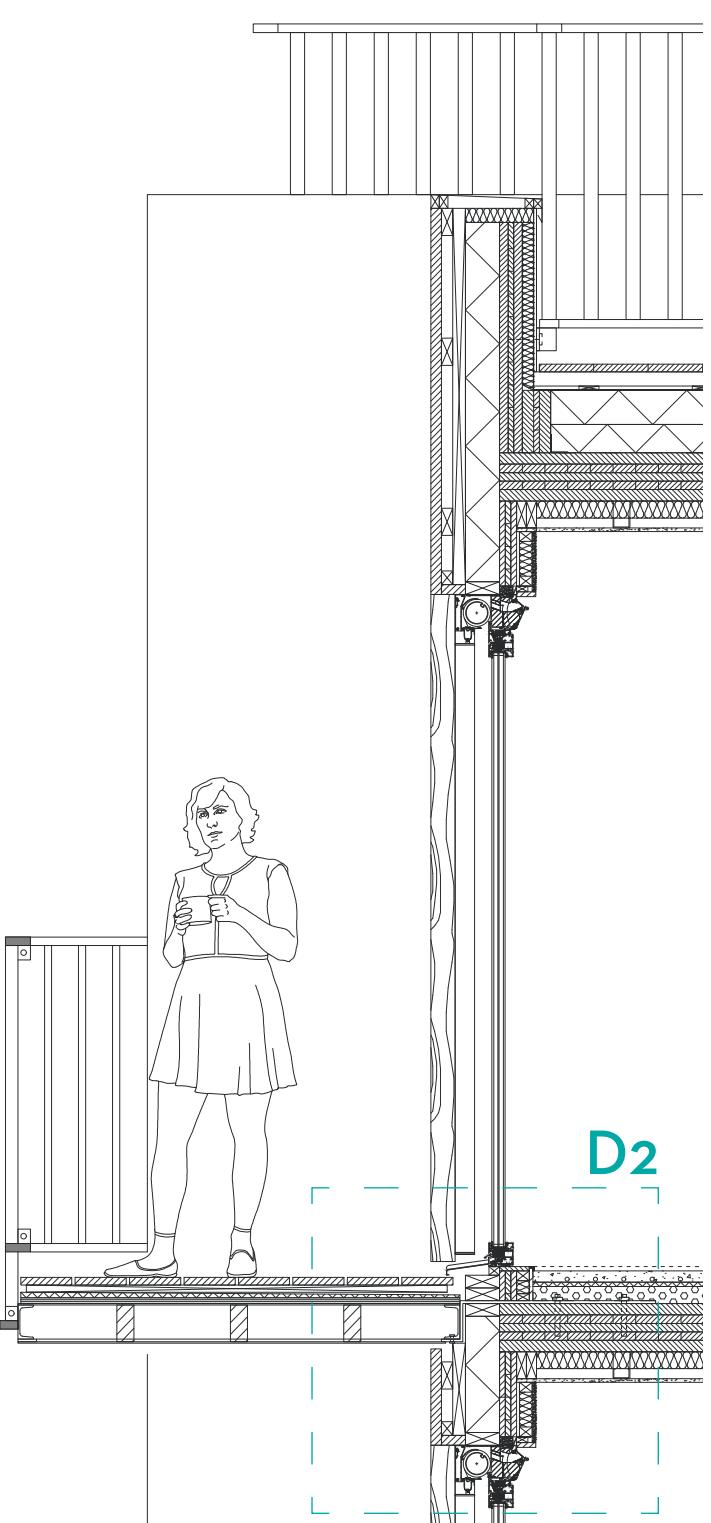
## Window detail

Schuco AWS 75.SI  
DucoTwin 120 medio ZR with integrated sunshading

## Balcony Construction

Black aluminium balustrade with vertical profiles  
Braces to floor construction  
UNP120 steel beam

## Dwelling block facade fragment





## 5. Collectivity in the Design



# The Fun Palace

In the 1960s, after eras of war and political tensions, leisure emerged as a major political, economic, social and architectural issue in Britain. As a result, people started to question: "what do we have to do with all this spare time?"

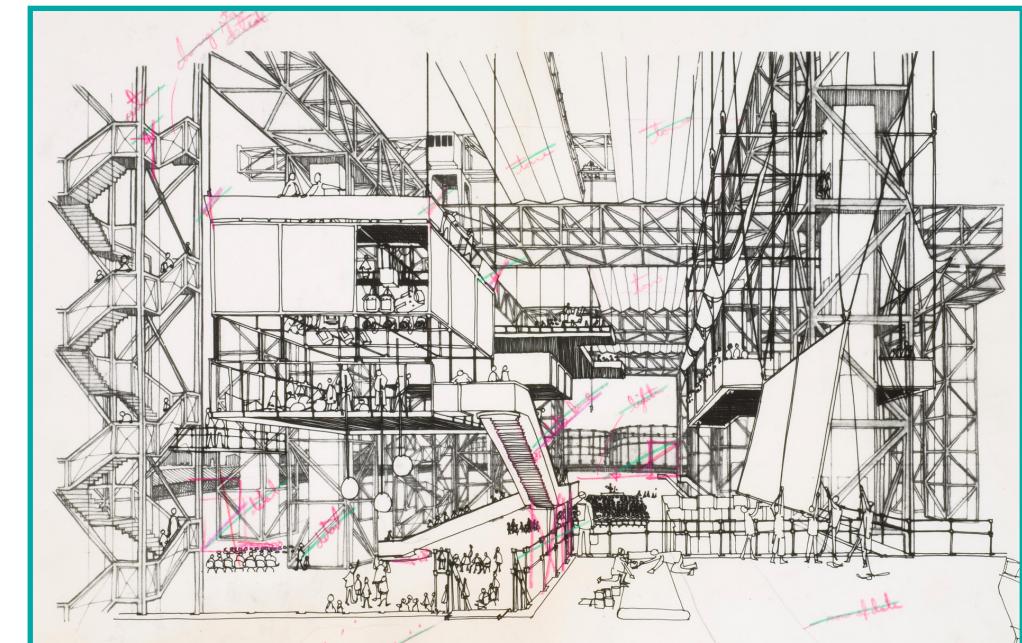
Architect Cedric Price and theater maverick Joan Littlewood joined forces to deal with this windfall of leisure: they wanted to create a place where people in a community could come together to celebrate arts, science and culture.

In their eyes, the Fun Palace could be a possibility for lifelong education, new experiences and discoveries.

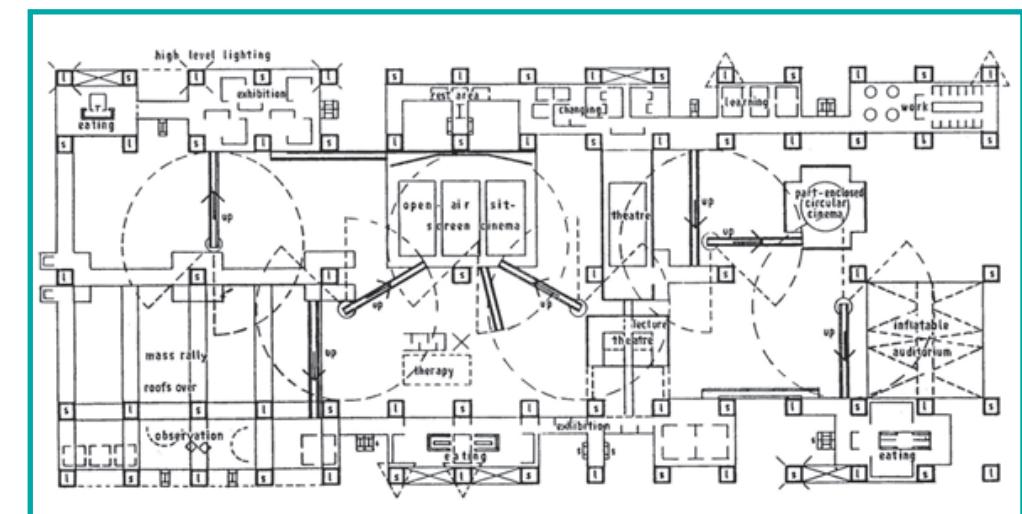
Cedric Price initiated the idea of a new kind of active and dynamic architecture that could allow several uses and would be able to adapt and change; the design interacted and responded to the different wishes of the user.

In essence, the plan was an open structure where people could wander around and do activities on many levels. The feeling of strolling in a park, looking at other people doing things, do activities for yourself or settling down for working by yourself are all sort of things that can be done in such a design.

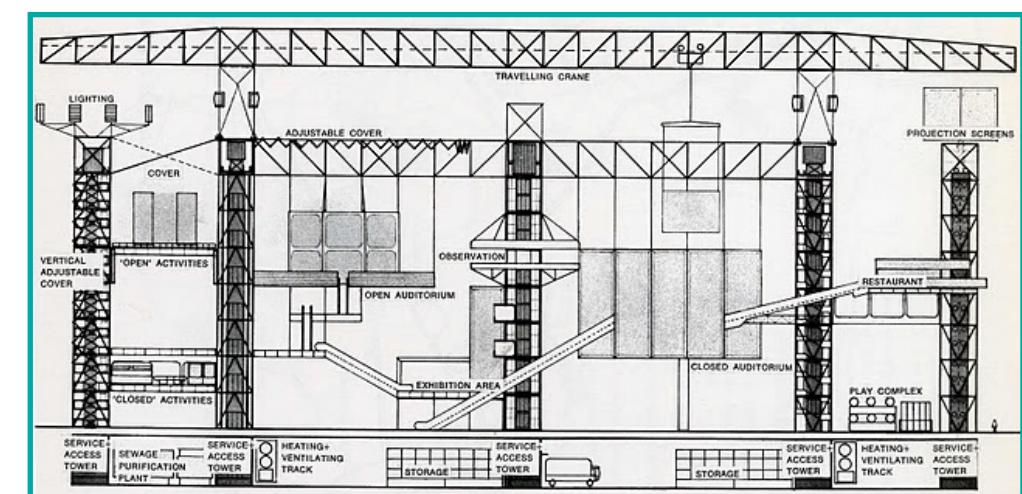
An explorative living environment facilitates and stimulates people to do activities which range from more cultural to a leisure level. It is a place where you decide what kind of nature you would like to explore.



Perspective drawing of the Fun Palace as Cedric Price had it in mind  
Source: Lawther (2016)

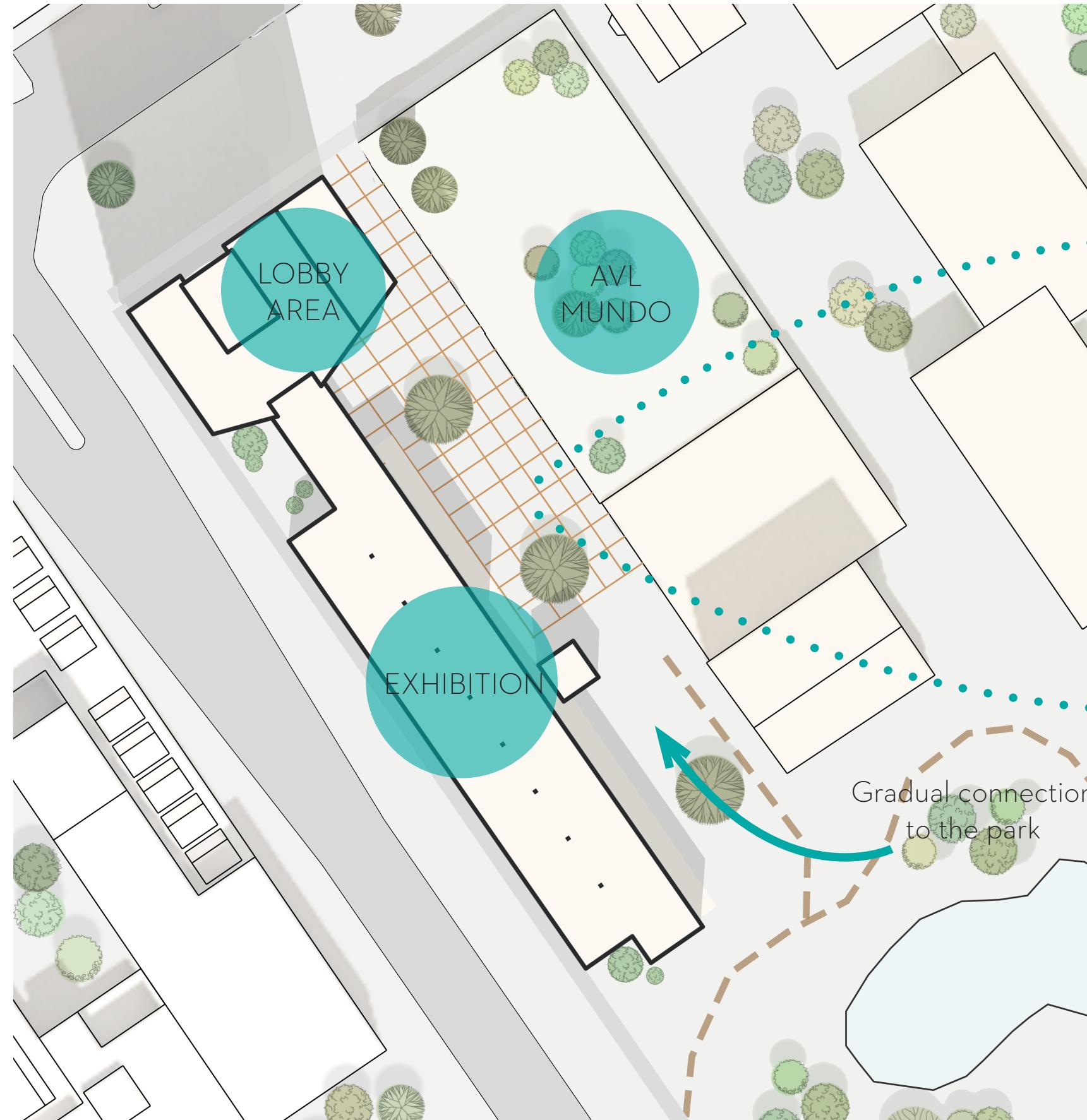


Plan drawing of the design  
Source above: Mathews (2005)



Section drawing of the design  
Source: Mehta (2014)

# Implementation in the design



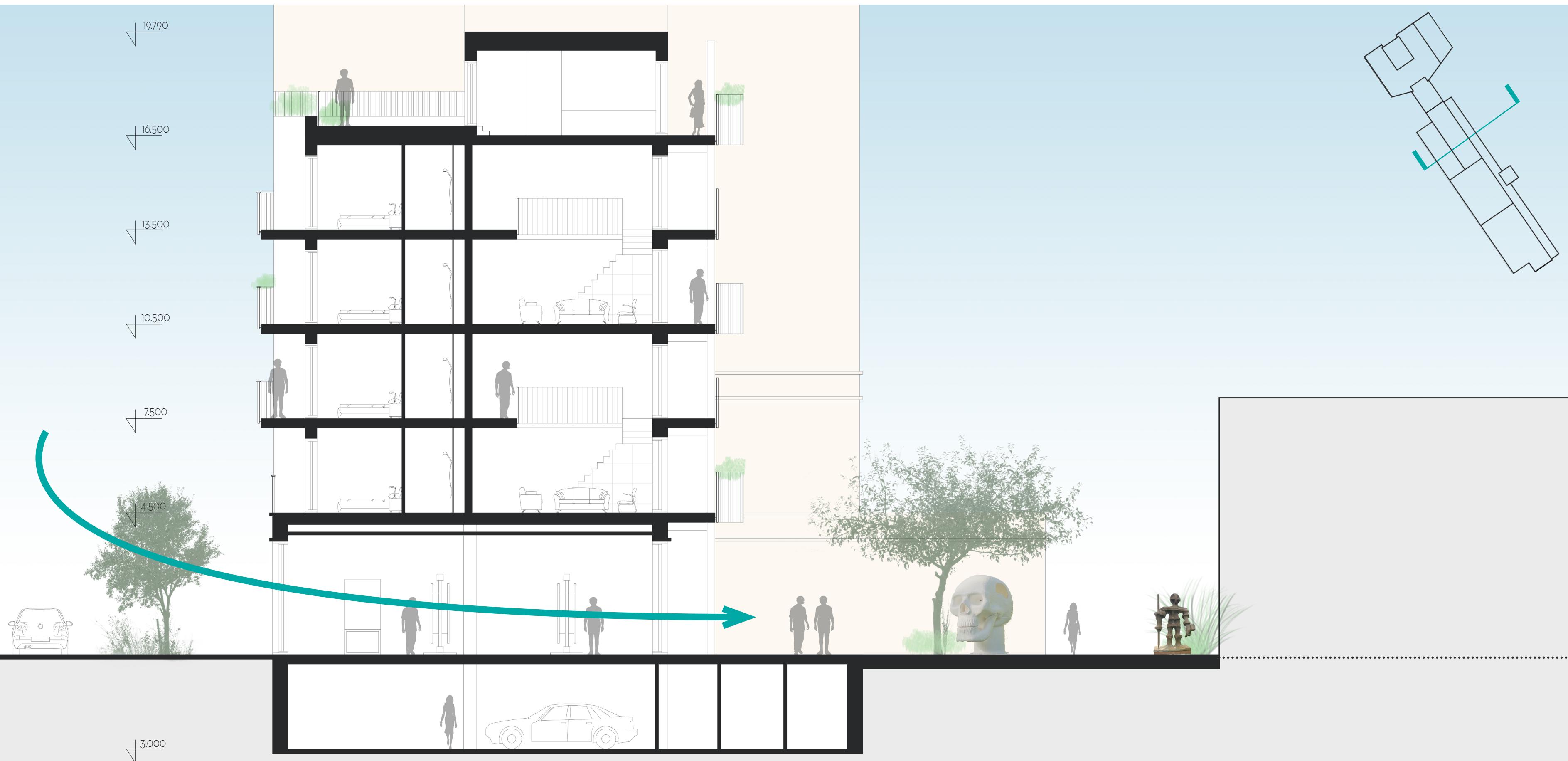
Remain the function to display art as well as organising events



Impression  
Courtyard



Impression  
Exhibition



Section through courtyard  
Scale 1:100

Impression  
Exhibition

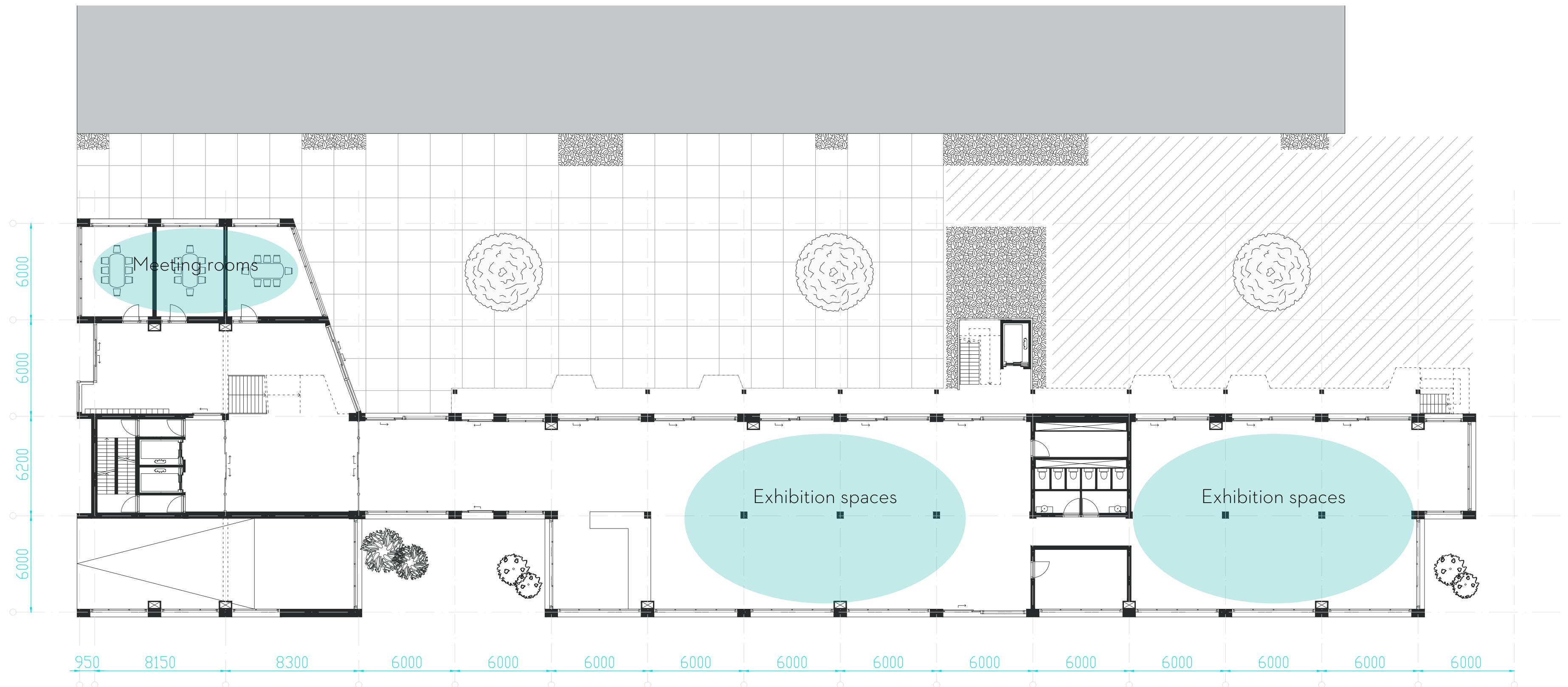
MEETING

COURTYARD

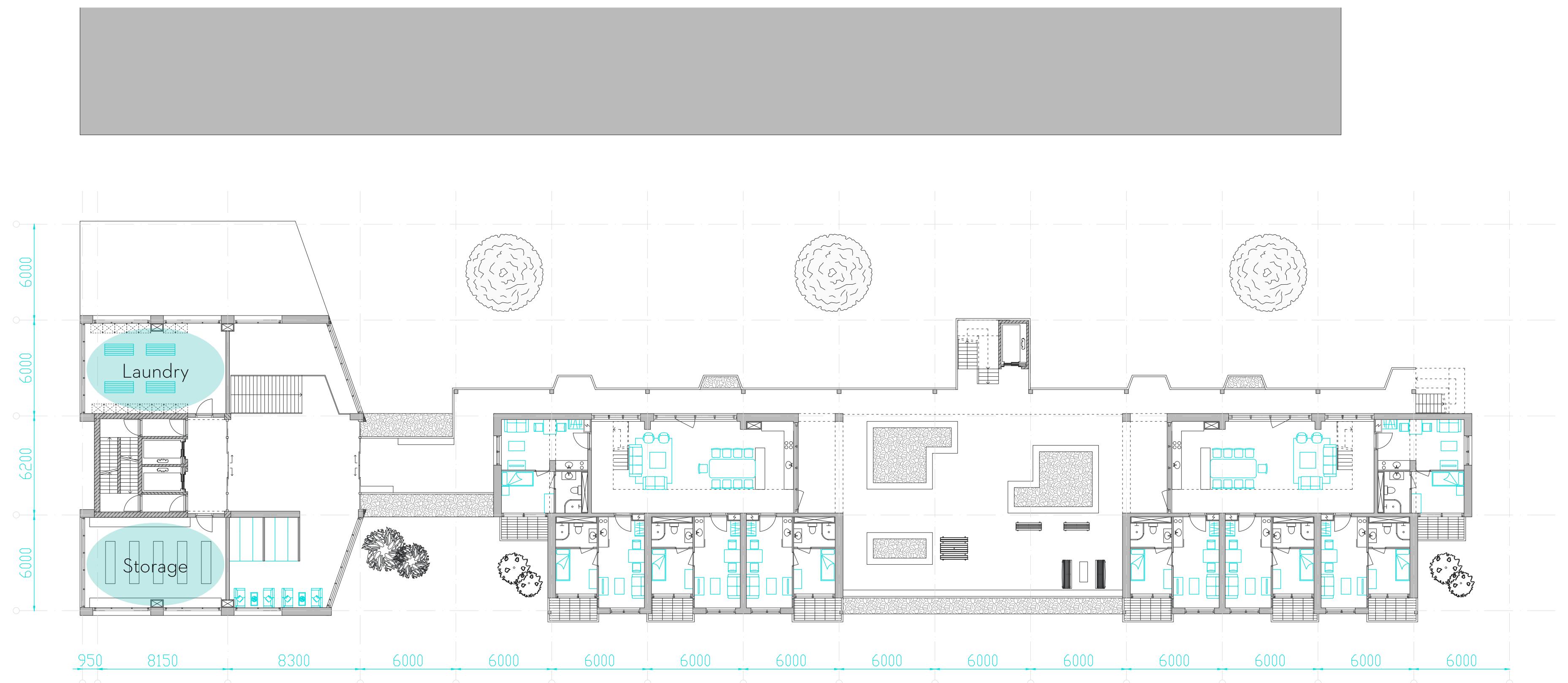
EXHIBIT

LIFT  
&  
STAIRS





Ground floor  
Scale 1: 200



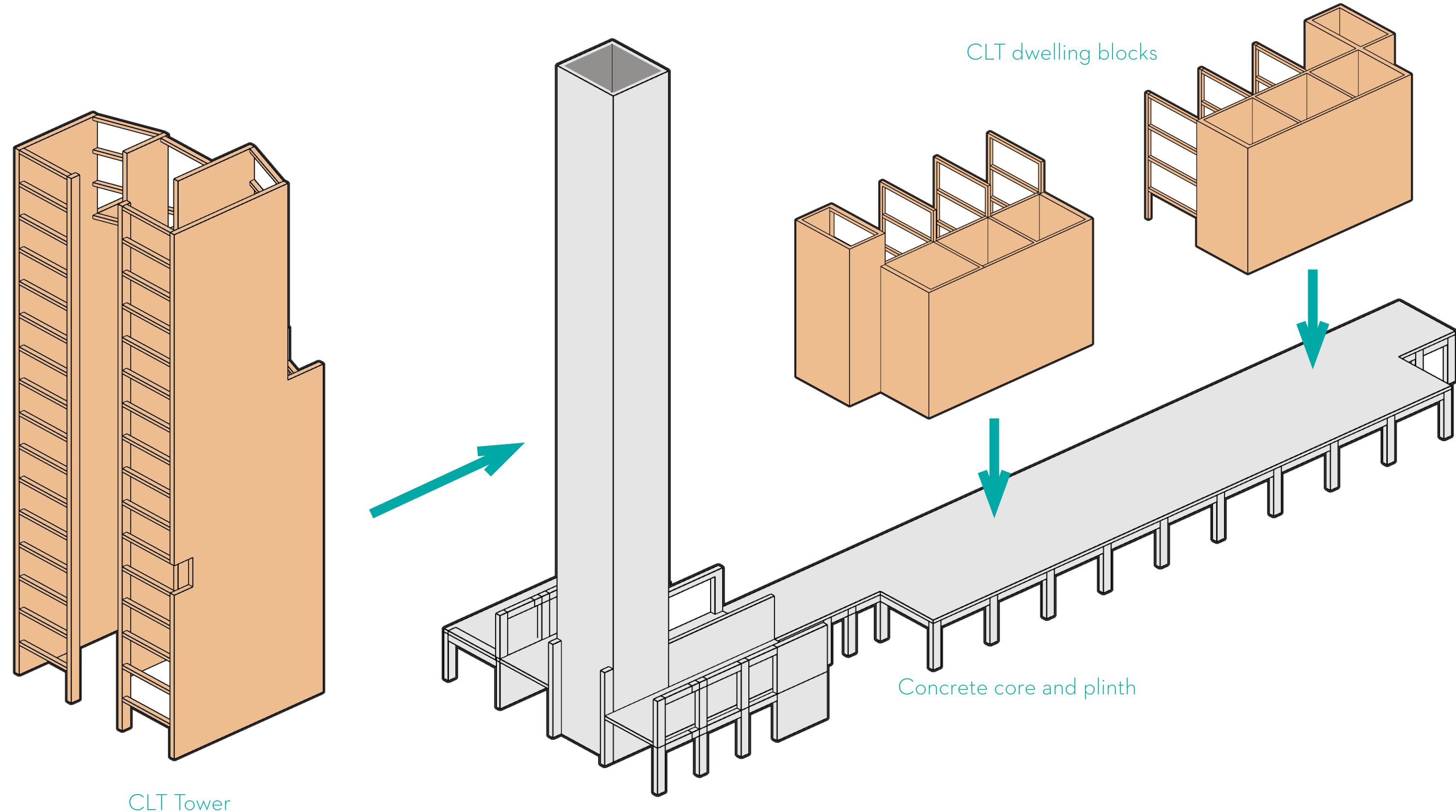
**Level 1**  
Scale 1: 200



Impression  
Roof garden

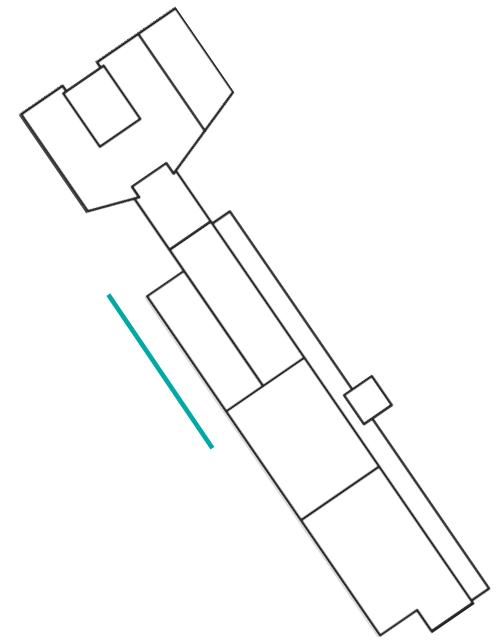
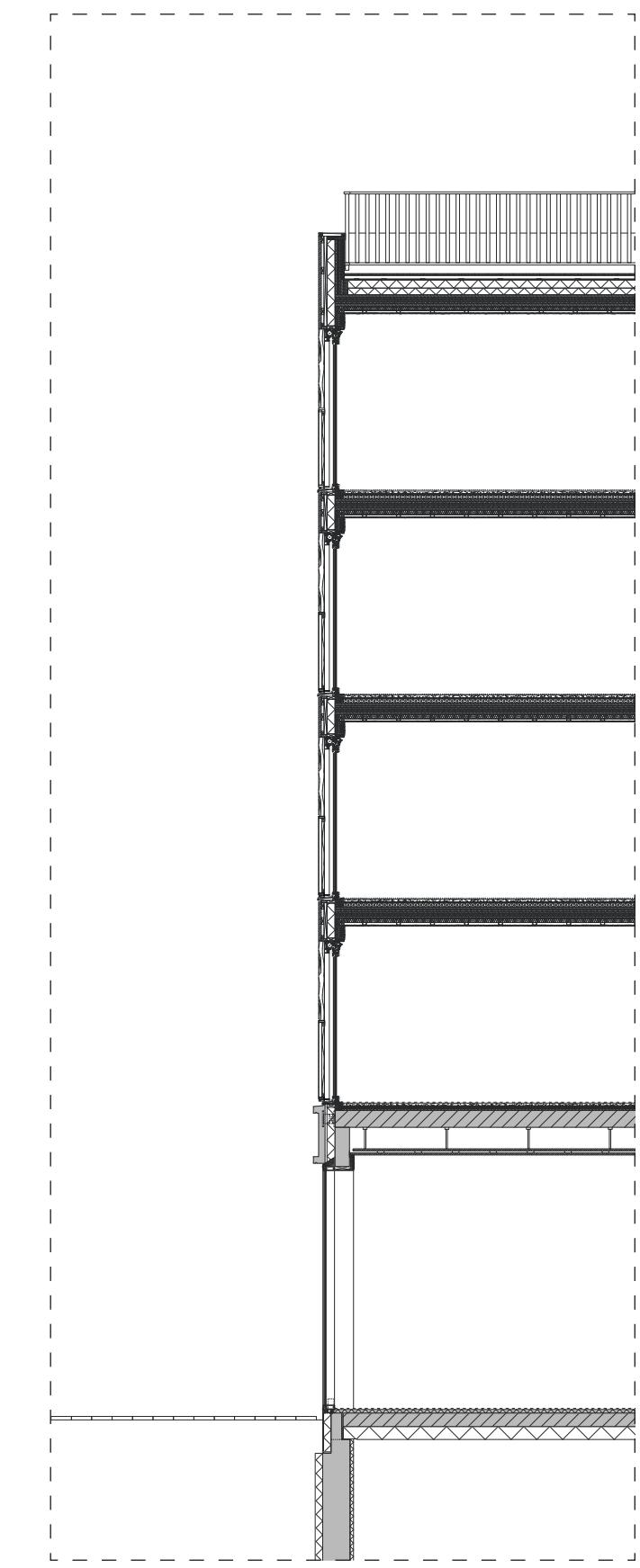


## 6. Climate and Construction



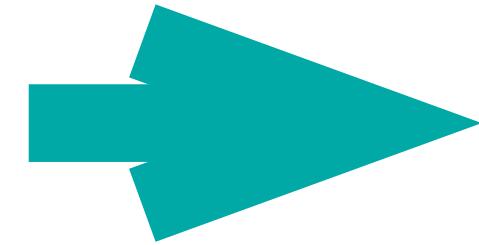
## Hybrid construction of CLT with concrete core and concrete plinth

Principle of construction

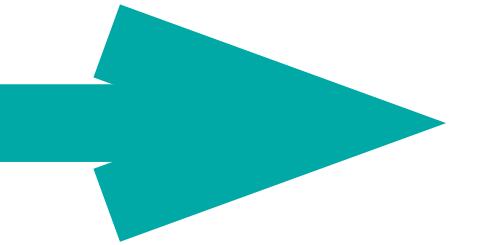


Connection from concrete to CLT

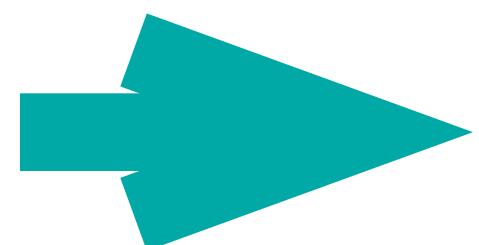
## BENG 1 Passive climate design



## BENG 2 Main energy sources



## BENG 3 Amount of renewable energy



## TO<sub>july</sub> Prevent overheating



- Efficient U-value of the facade

For winter:

- Configured sun orientation for direct sunlight access
- Triple glazing for reduction of heat loss in winter

For summer:

- Limited open facades that make the design vulnerable for overheating
- (Colored) remote sunshading
- Openable windows for direct fresh cold air

- Active heating and cooling is done with a soil heat pump combined with LTV

- Booster heat pump for supplying warm water
- Heat recovery from shower water to decrease required new amount of water
- Balanced ventilation with heat recovery and CO<sub>2</sub> regulation
- Energy loss limited through connection of exhaust for cooking to the ventilation systems with heat recovery

- Solar panels for generating the required electricity in the building

- Soil heat pump to supply and renew the heating and cooling

- Summernight ventilation in the maisonnettes to cool down the dwelling overnight

- Active heating and cooling strategies to cover up when passive climate design might not be sufficient.

## BENG 1

① Triple glazing to reduce heat loss in winter

② Openable windows and remote sunshading to keep comfortable temperature inside during summer

## BENG 2

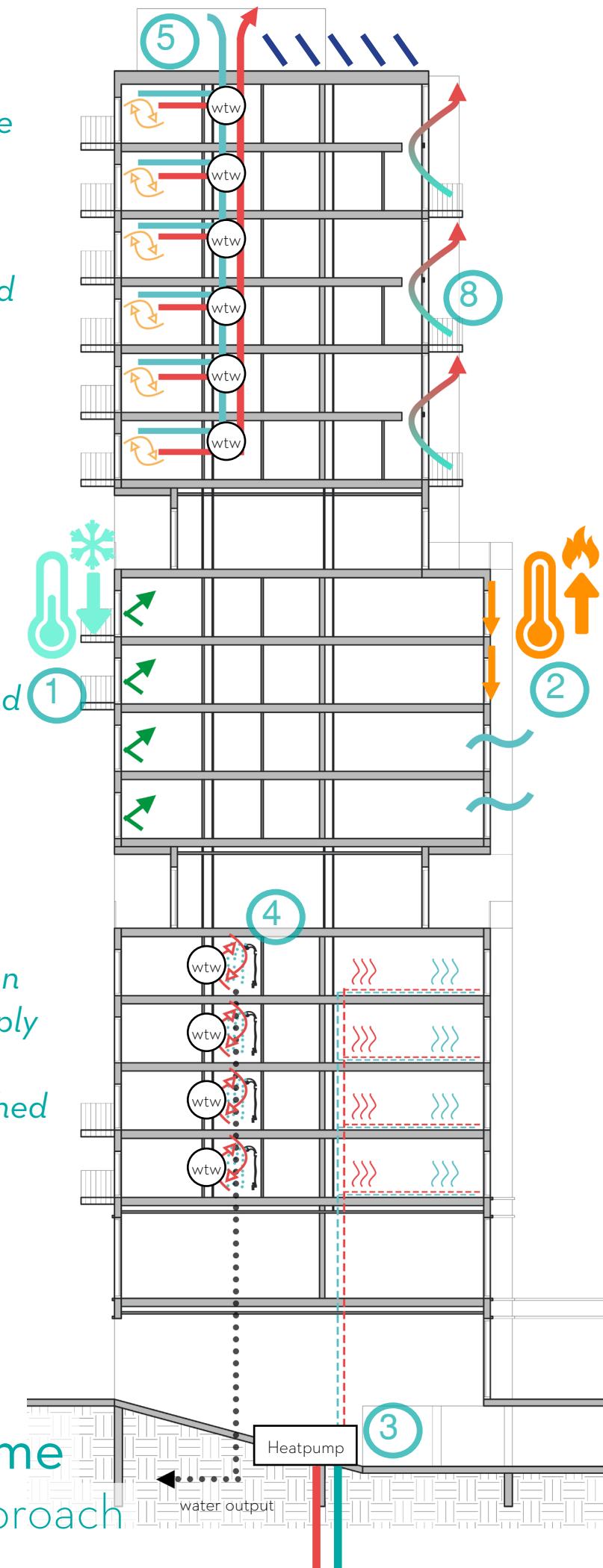
③ Active floor heating and cooling in all the dwellings provided through a heatpump

④ Heat recovery from showers. In combination with heat pump to supply hot water, higher efficiency is accomplished

⑤ The tower dwellings have individual ventilation type D with  $\text{CO}_2$  regulation

## Climate scheme

Systems and approach



⑥

The units in the dwelling block have collective ventilation type D with  $\text{CO}_2$  recovery

## BENG 3

⑦ Solar panels for supplying electricity in the building

③

The soil heat pump is able to supply and renew the heating and cooling in the building

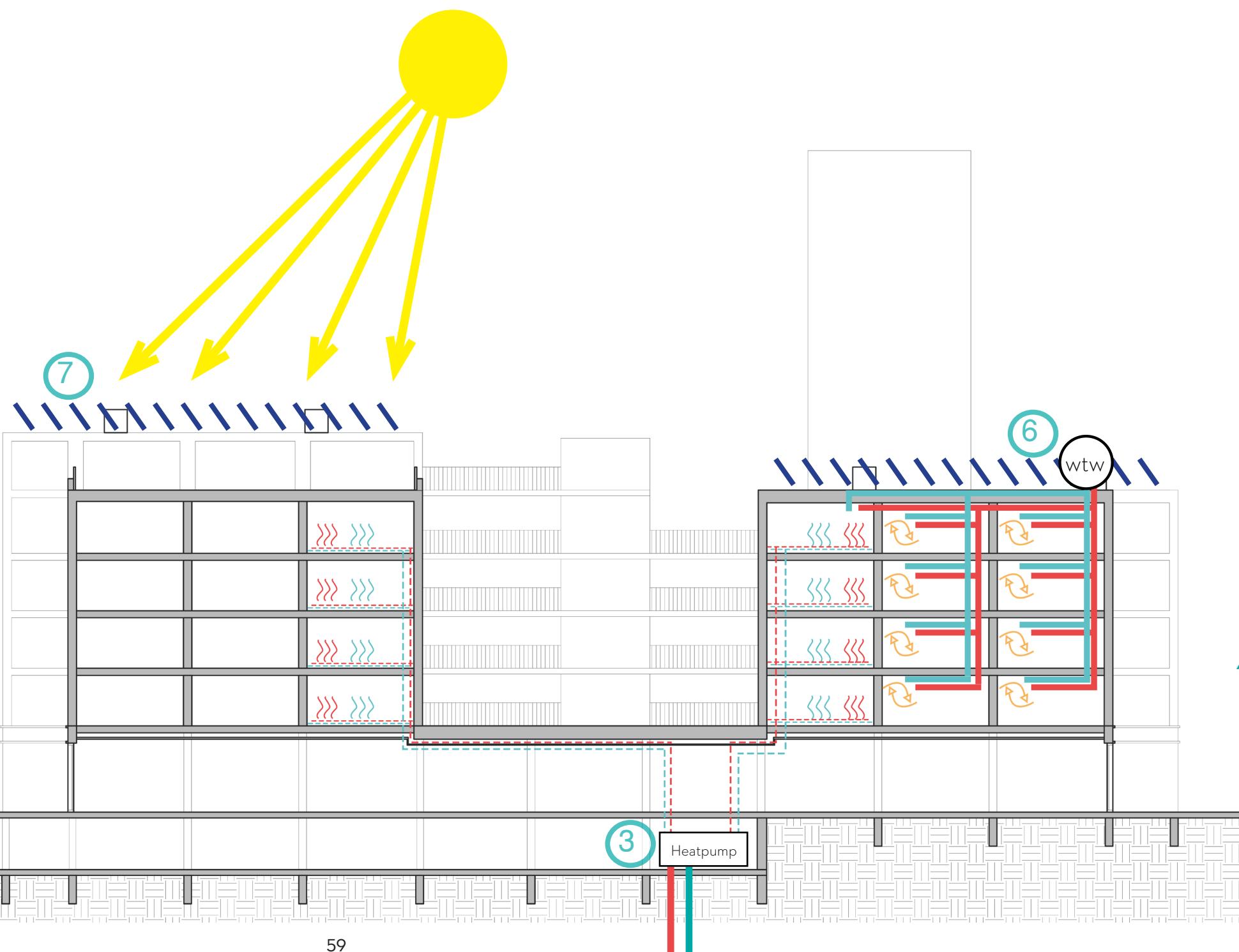
TO<sub>july</sub>

⑧

Summernight ventilation in the maisonettes to prevent overheating

③

Active cooling in summer to cover up extra chance for overheating



1

Sedum roof with solar panels

2

Community rooftop garden

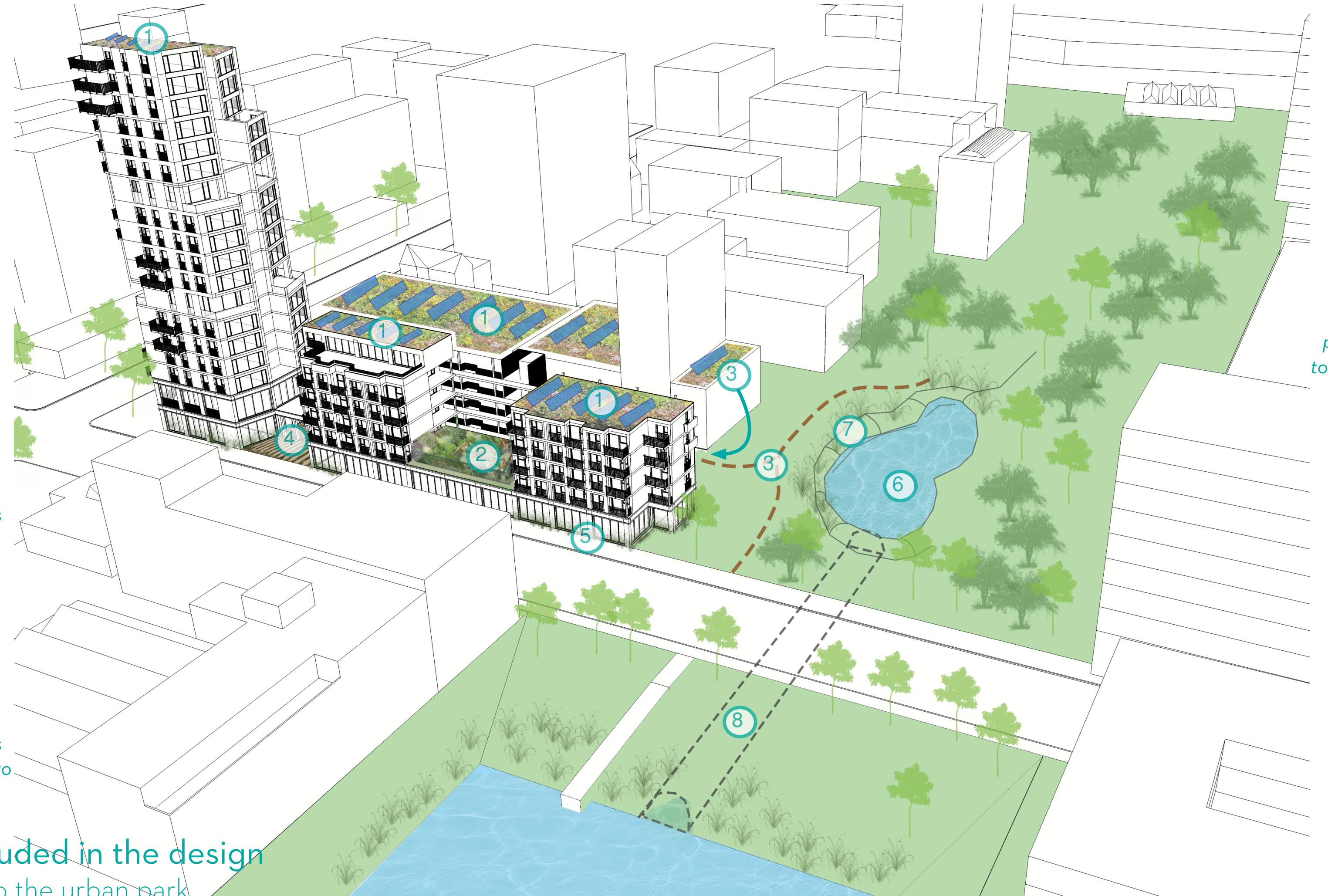
3

Grassconcrete tiles as walking paths through park and courtyard

4

Grassconcrete tiles as (side) entrance to courtyard

Nature included in the design  
Connection to the urban park



5

'Facade garden' (Geveltuin) across the plinth

6

Wadi to make physical connection to the location at the harbor side

7

Banks of wadi with hedges and shrubs

8

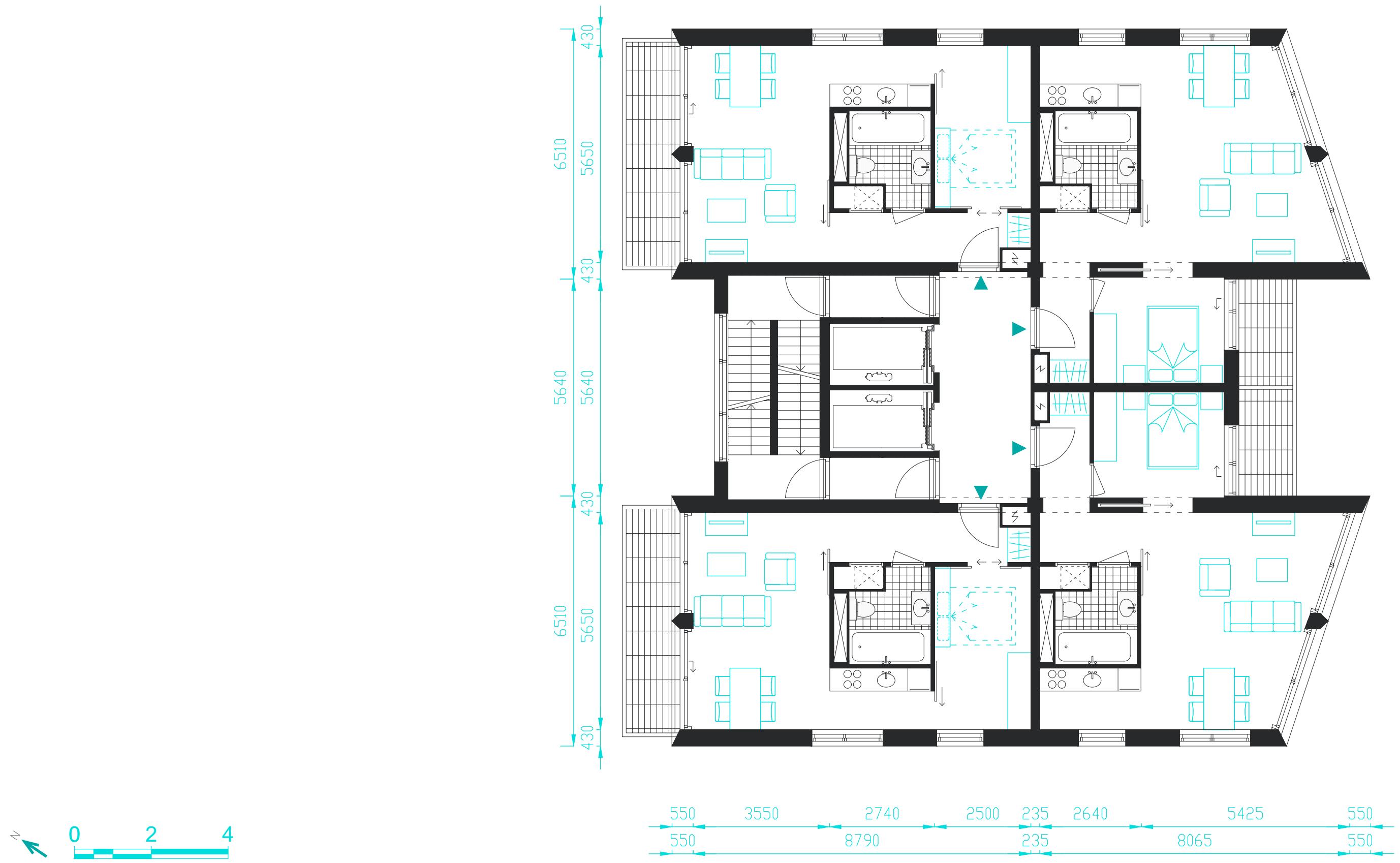
Faunapassage



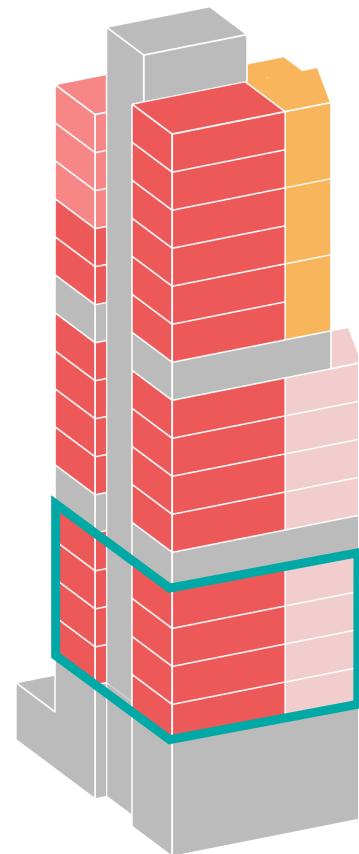


“The Fledgling needs an explorative living environment in order to maintain its exploring lifestyle, seeking to develop him- or herself as an individual”

Thank you for your attention!

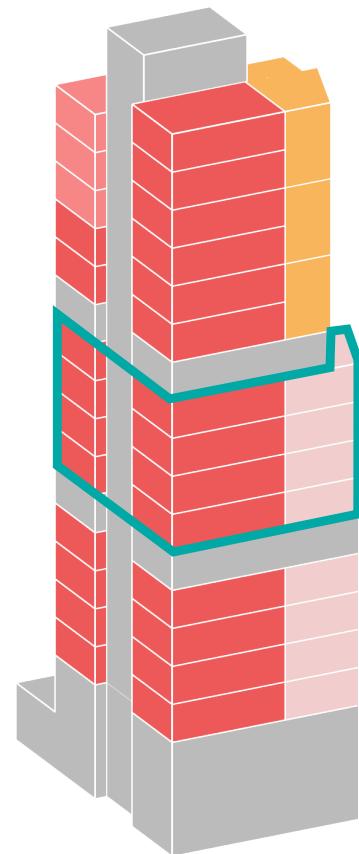


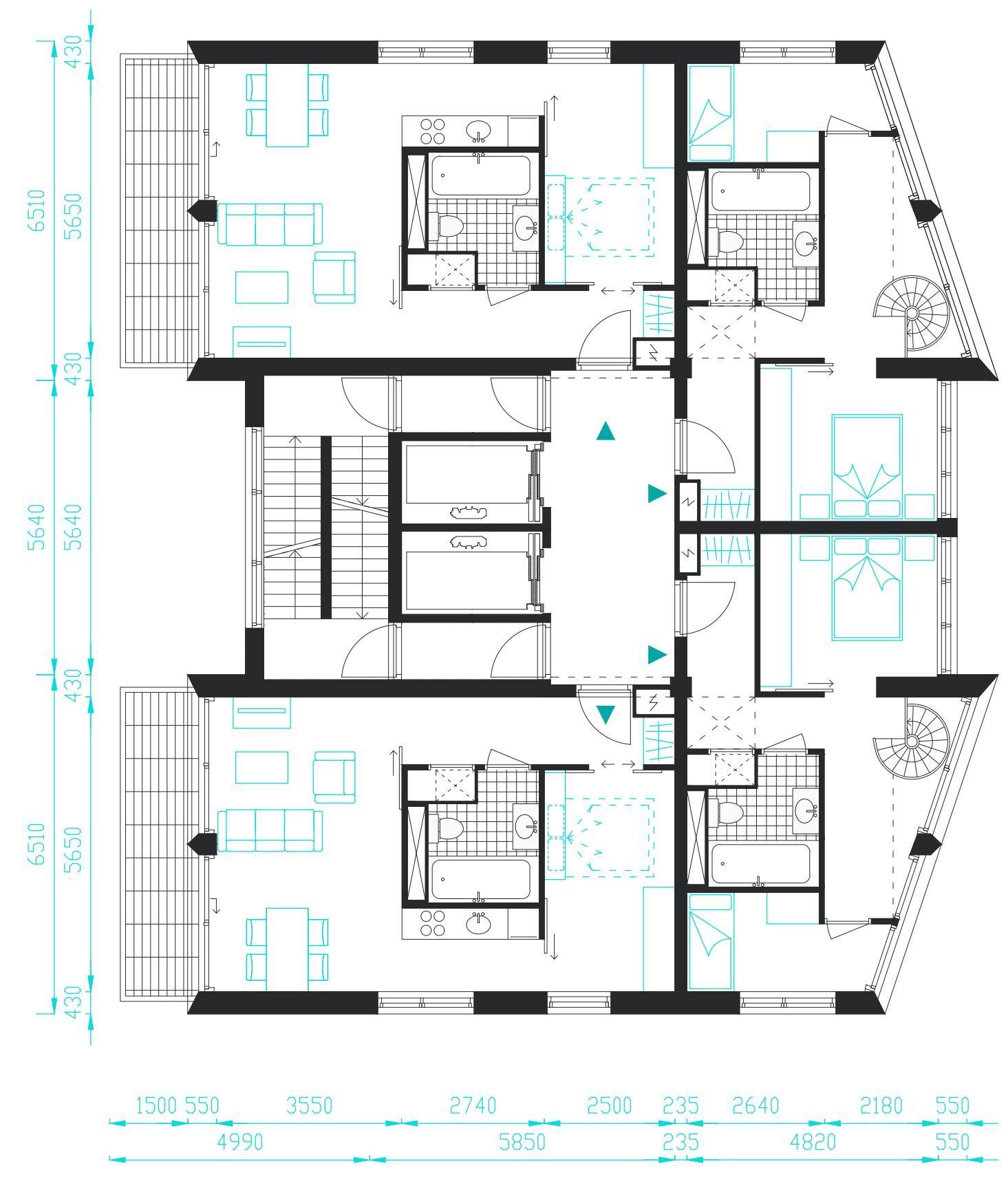
Typical floor plan: Tower lvl. 3-6  
Scale 1:100



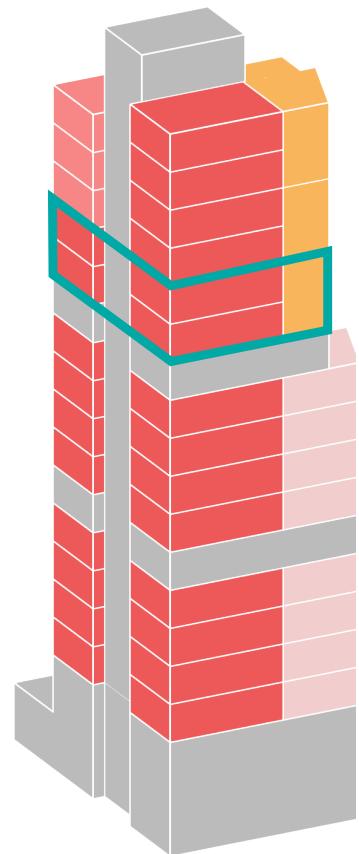


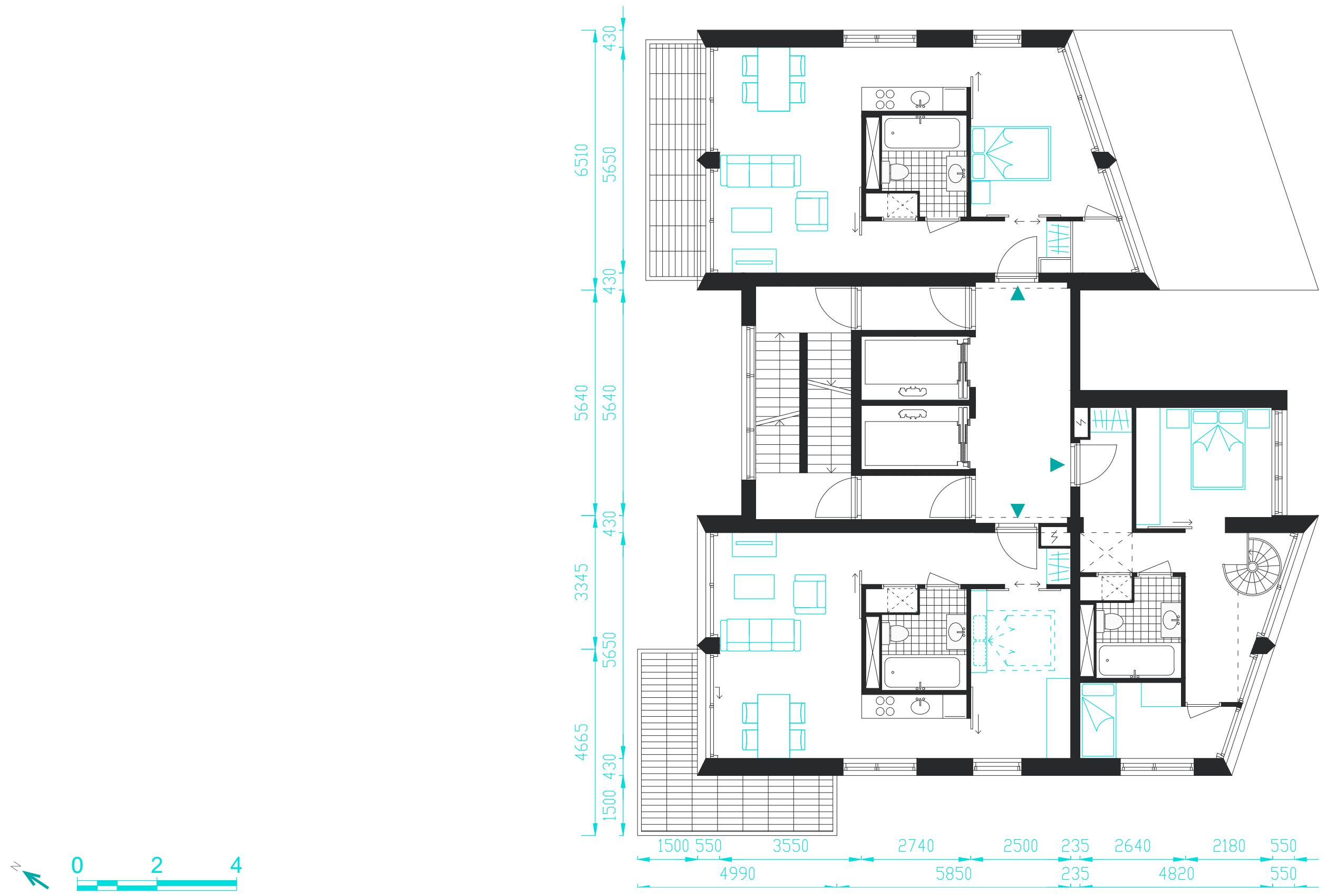
Typical floor plan: Tower lvl. 8-11  
Scale 1 : 100





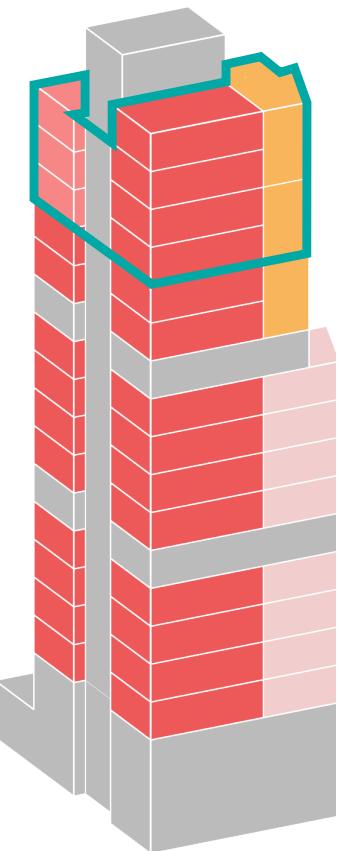
Typical floor plan: Tower lvl. 13 & 14  
Scale 1 : 100

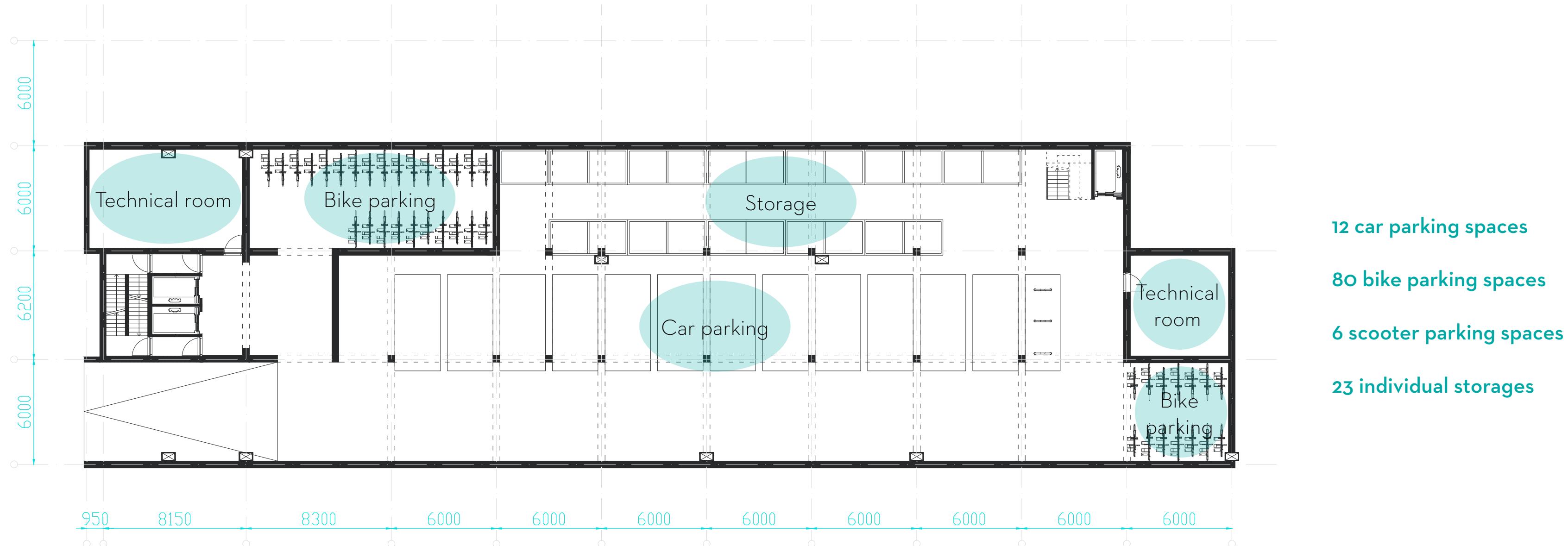




Typical floor plan: Tower lvl. 15-17

Scale 1:100

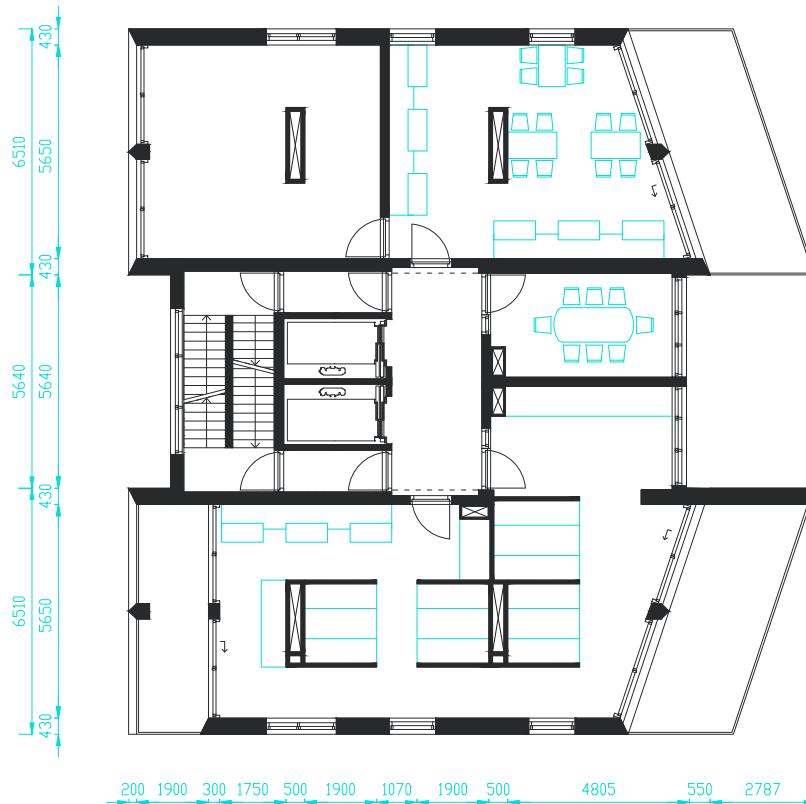
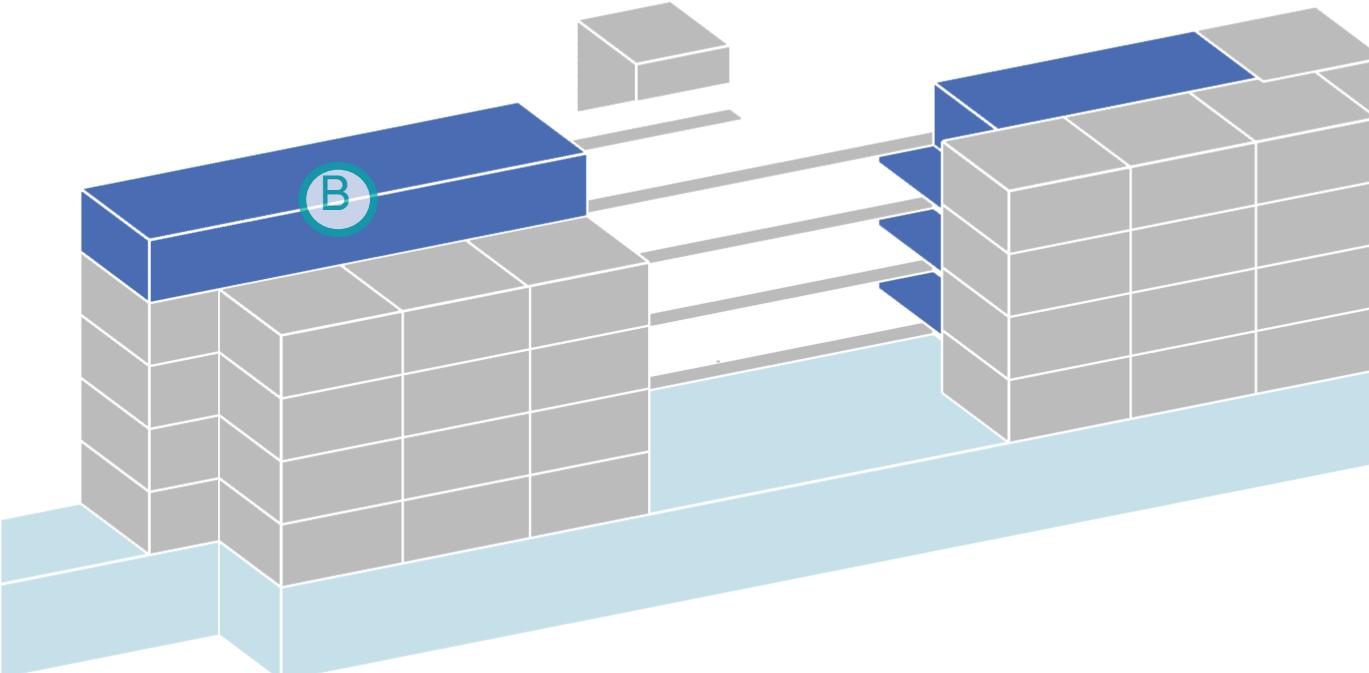
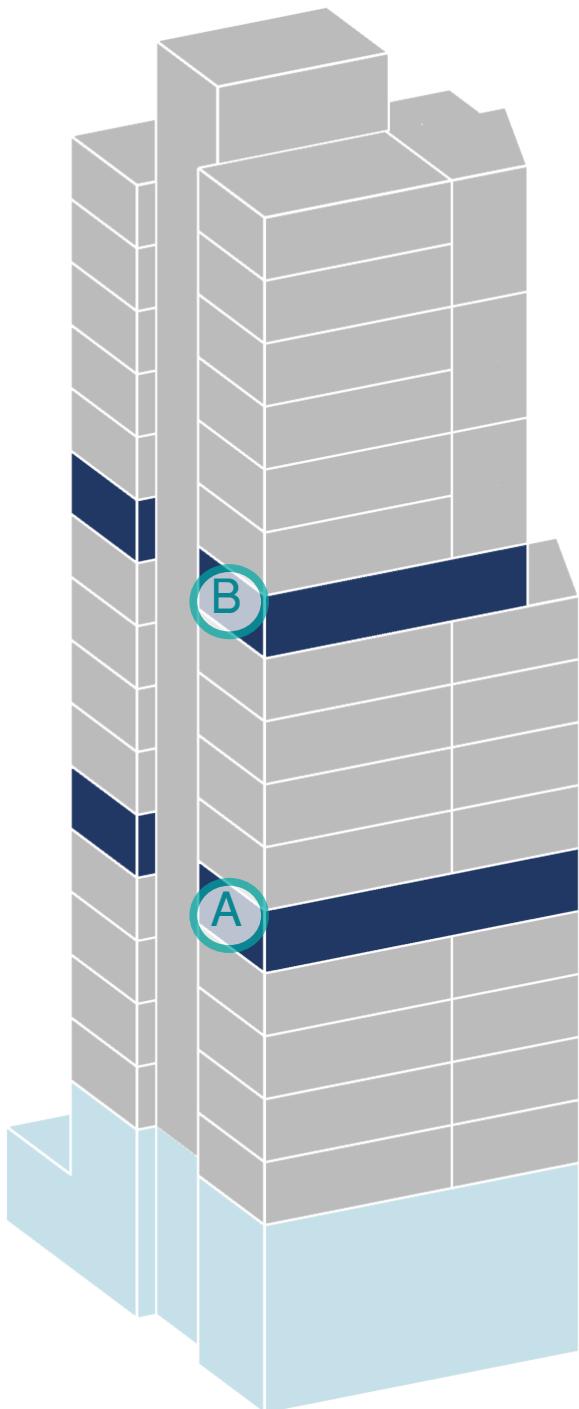




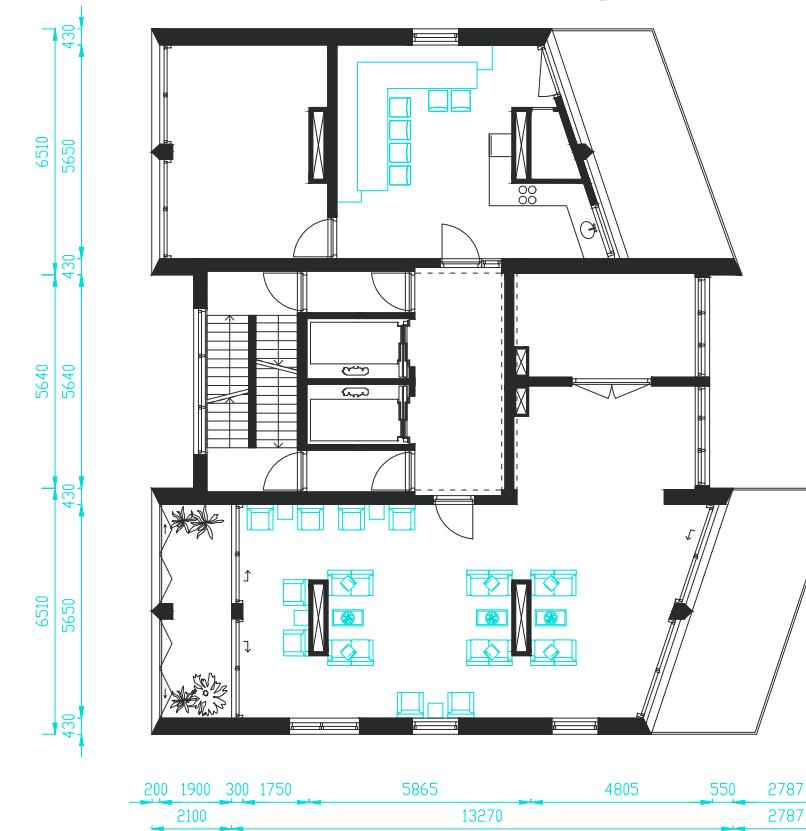
# Basement

## Scale 1 : 200

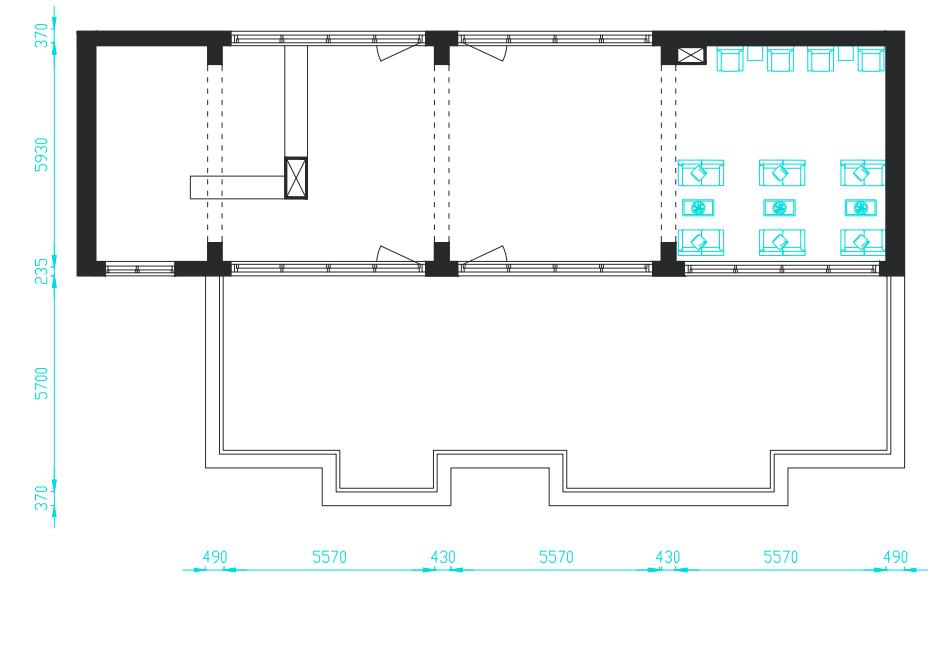
# Collectieve voorzieningen



**A** Workplaces



**B** Open living room and kitchen



**C** Open living room and terrace



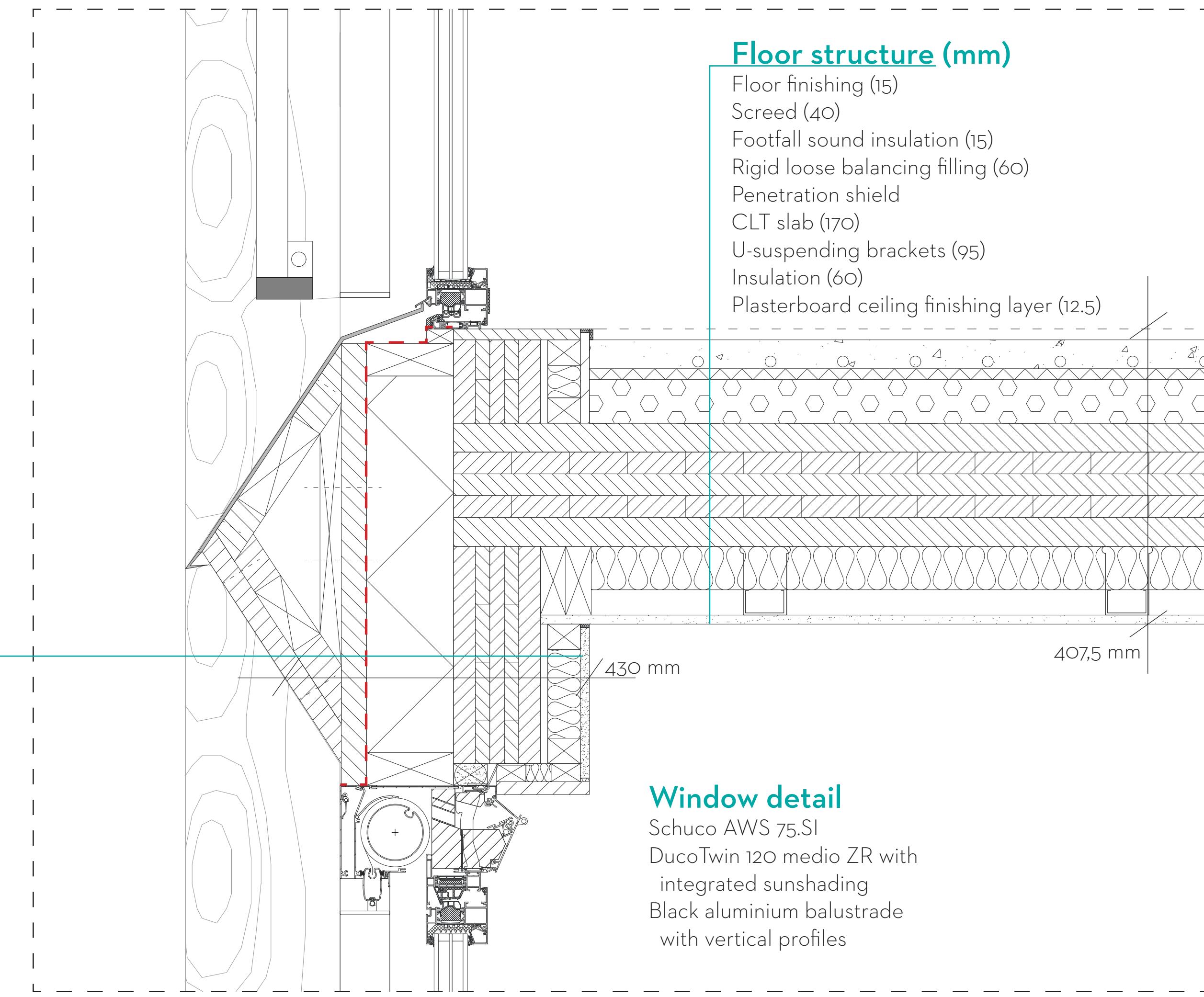
**A** Workplaces

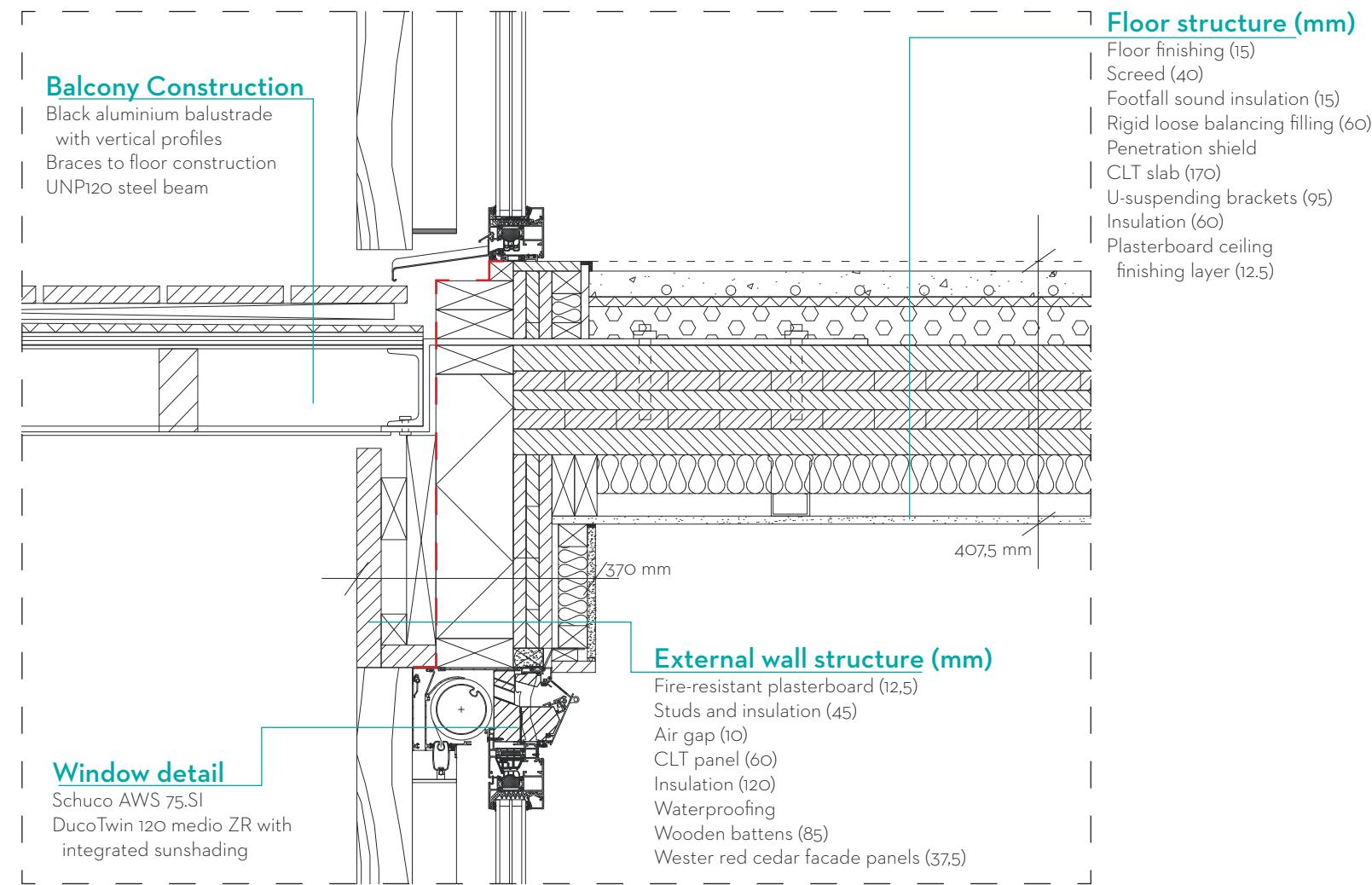
## D1 Facade detail

Scale 1:5

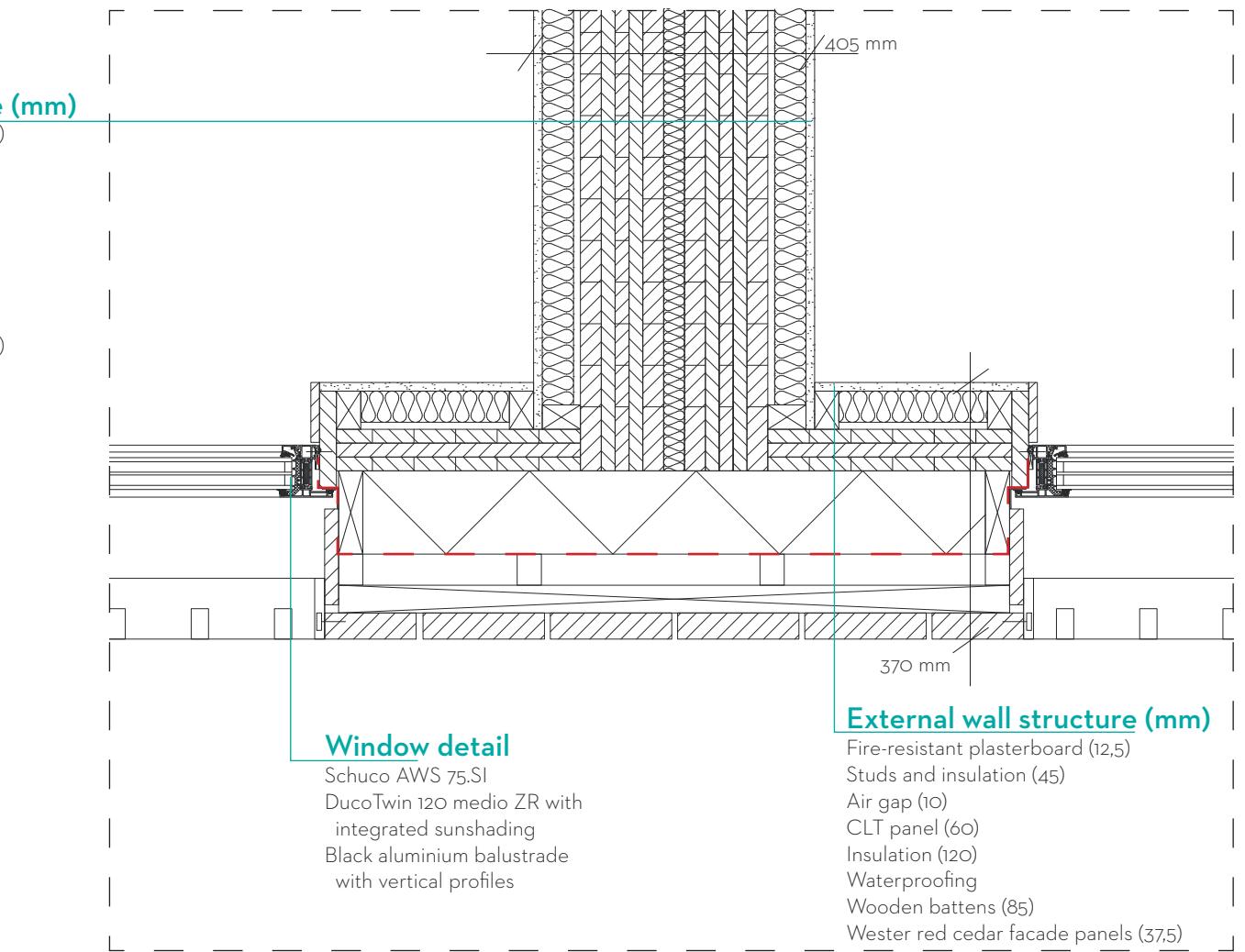
**External wall structure (mm)**

- Fire-resistant plasterboard (12,5)
- Studs and insulation (45)
- Air gap (10)
- CLT panel (120)
- Insulation (120)
- Waterproofing
- Wooden battens
- Wester red cedar facade panels (30)





D2 Balcony detail



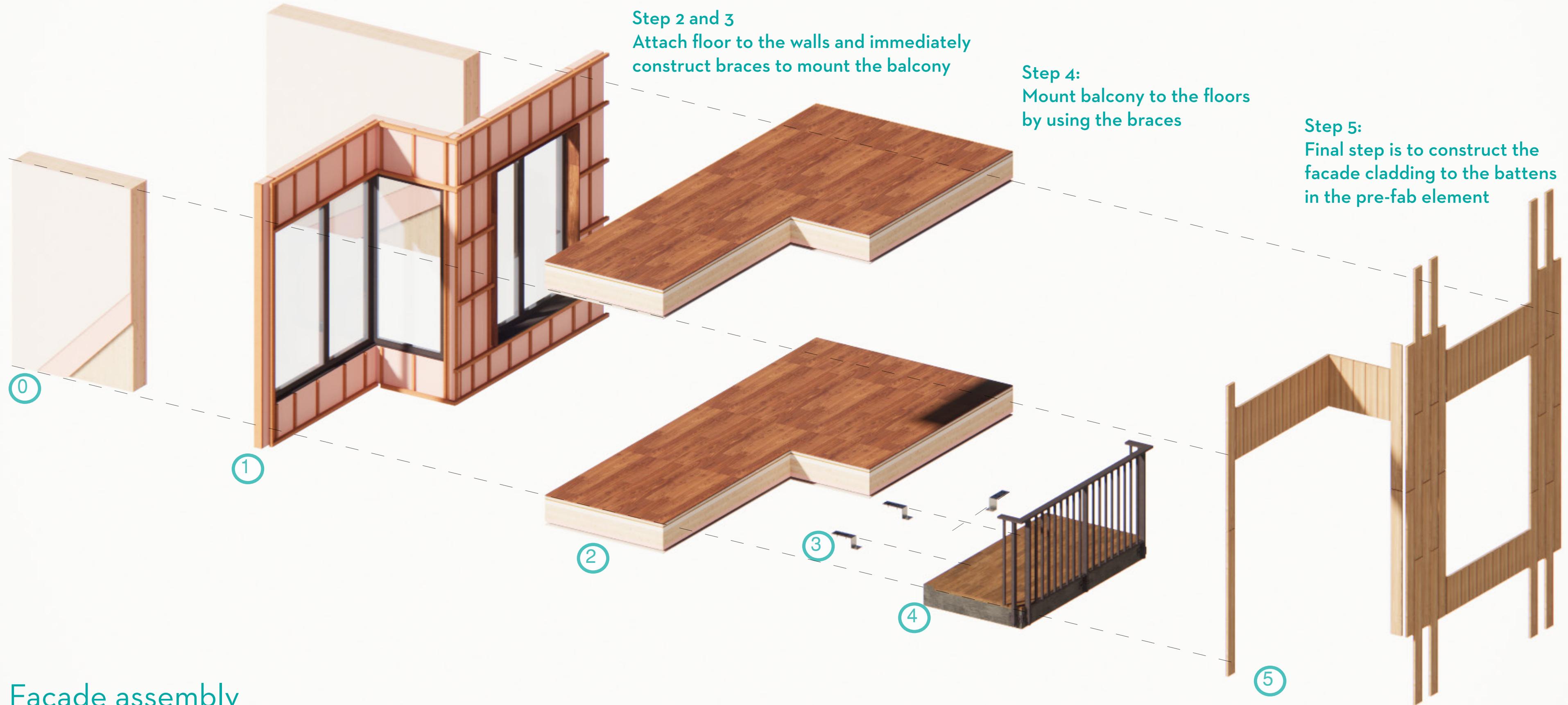
D3 Horizontal detail

## D2 & D3 details

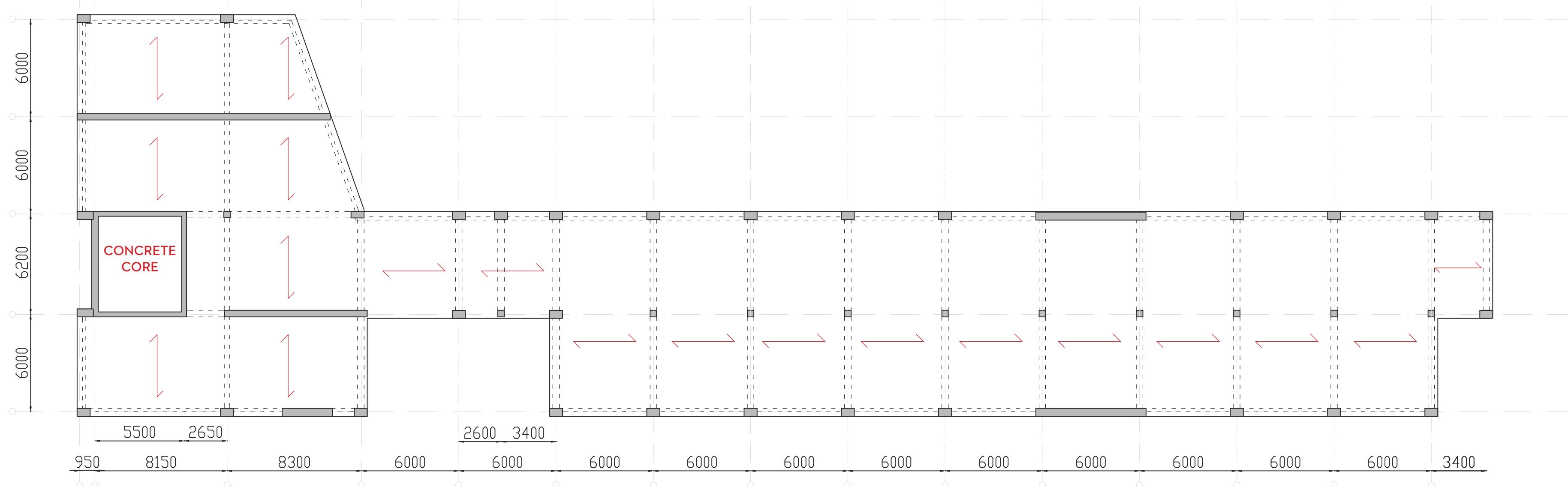
Scale 1 : 10

**Start:**  
Wall construction as  
starting point

**Step 1:**  
First step is to attach pre-fab  
facade element to construction

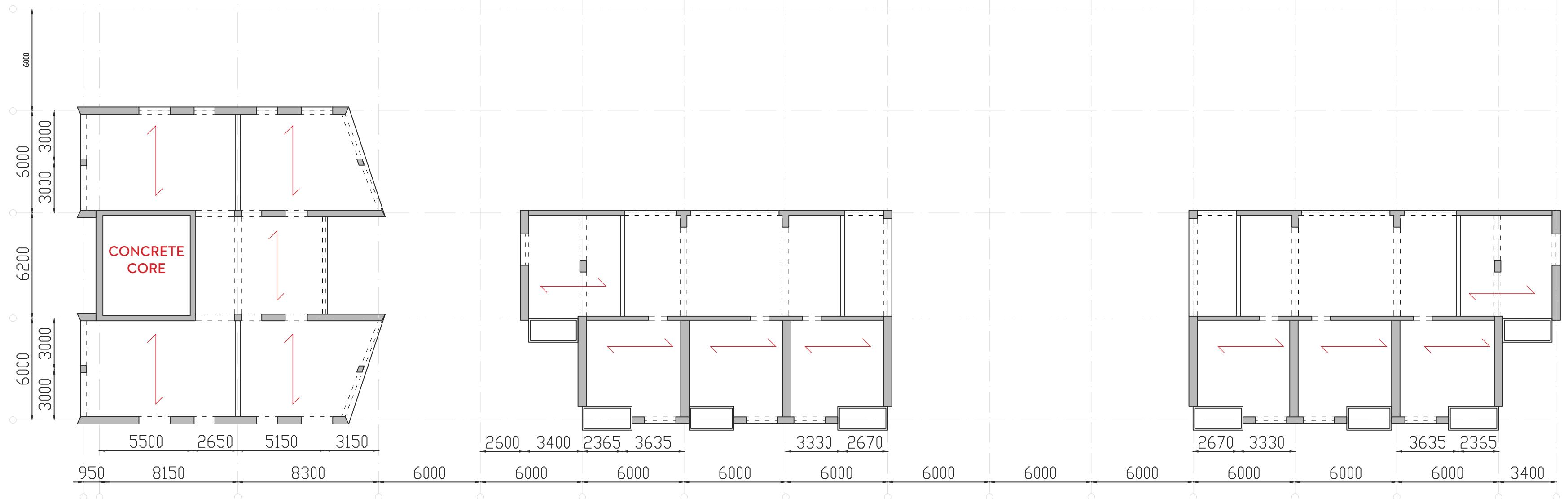


**Facade assembly**  
CLT structure with pre-fab elements

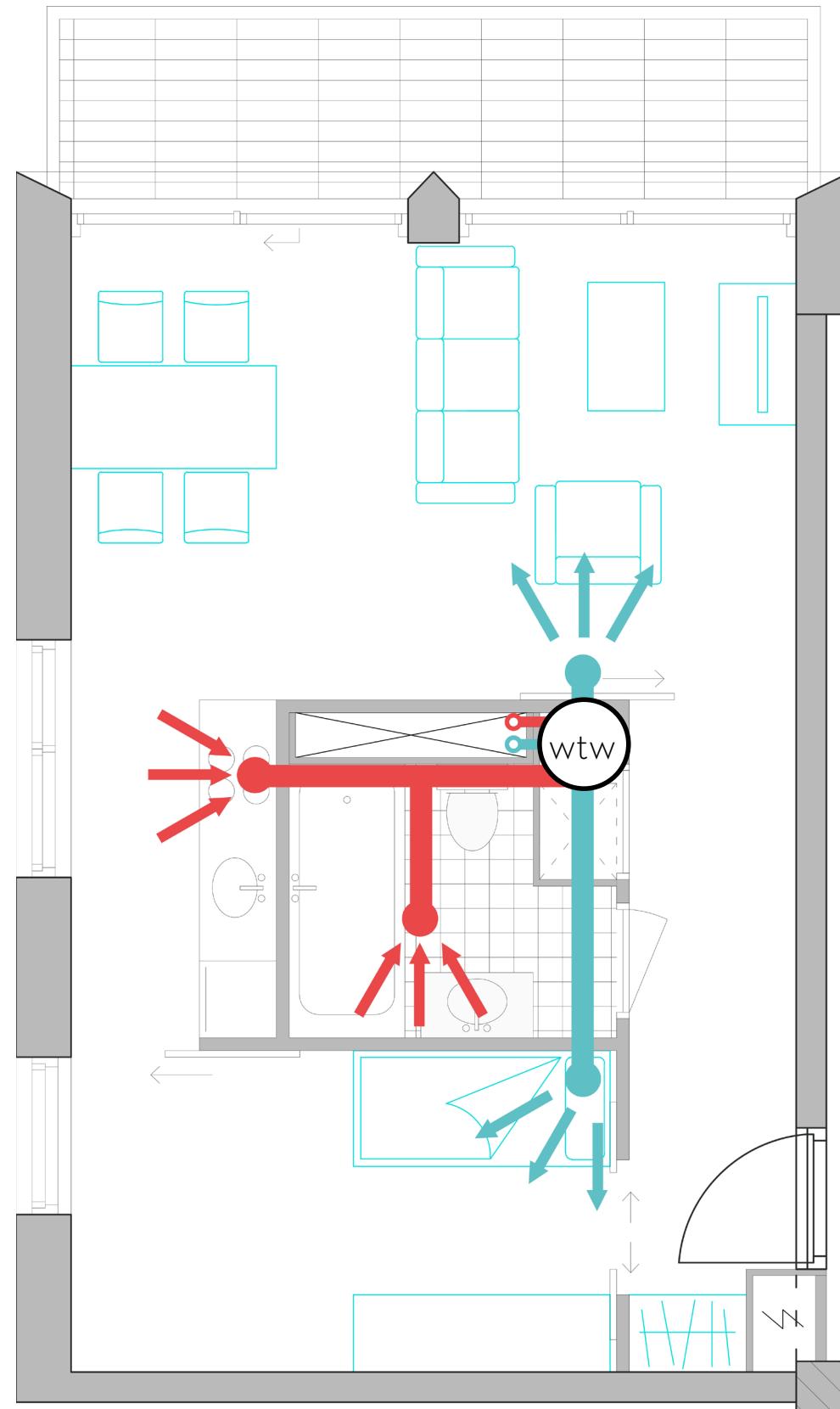


Construction scheme - ground floor

Scale 1: 200



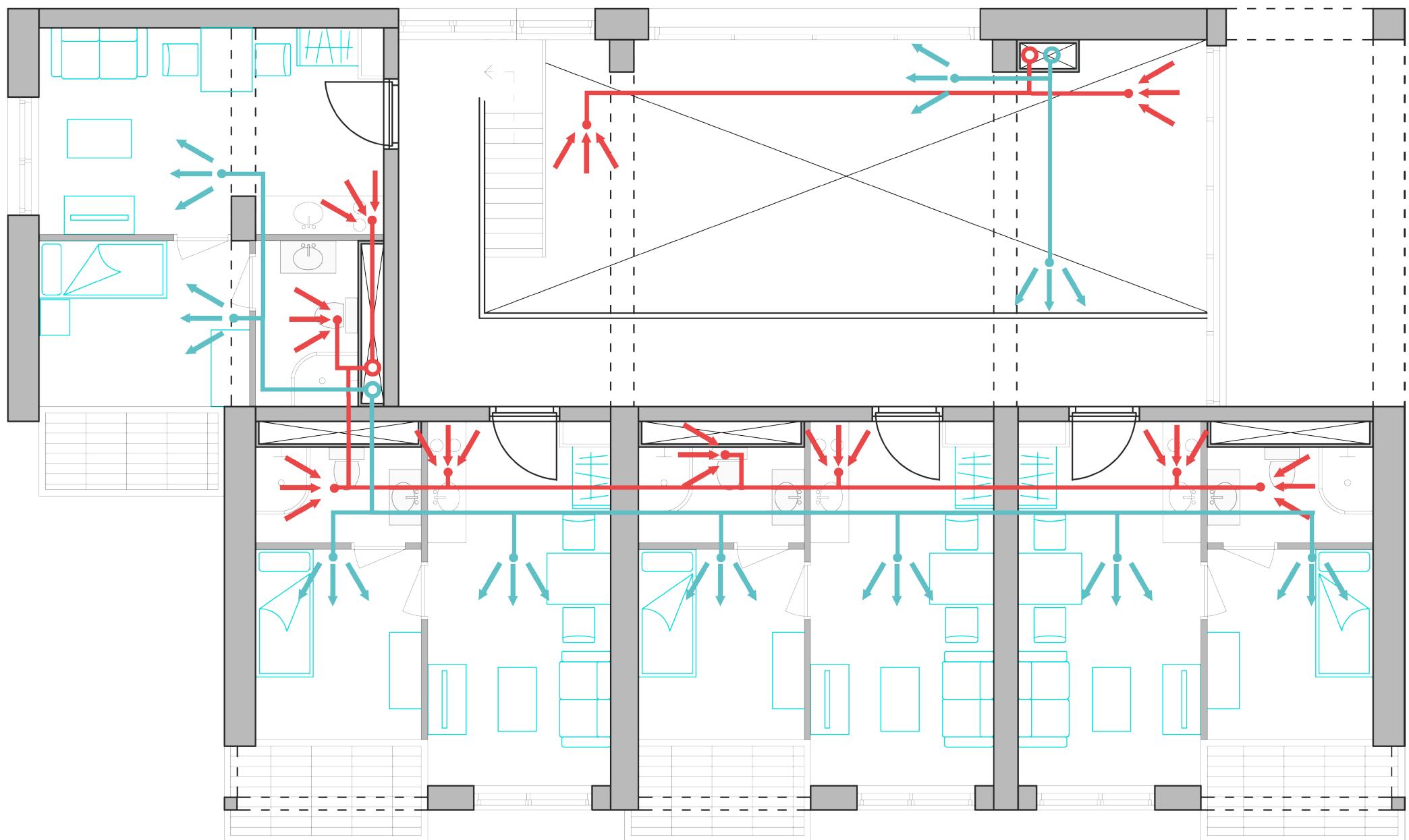
**Construction scheme - Tower and dwelling block**  
Scale 1: 200



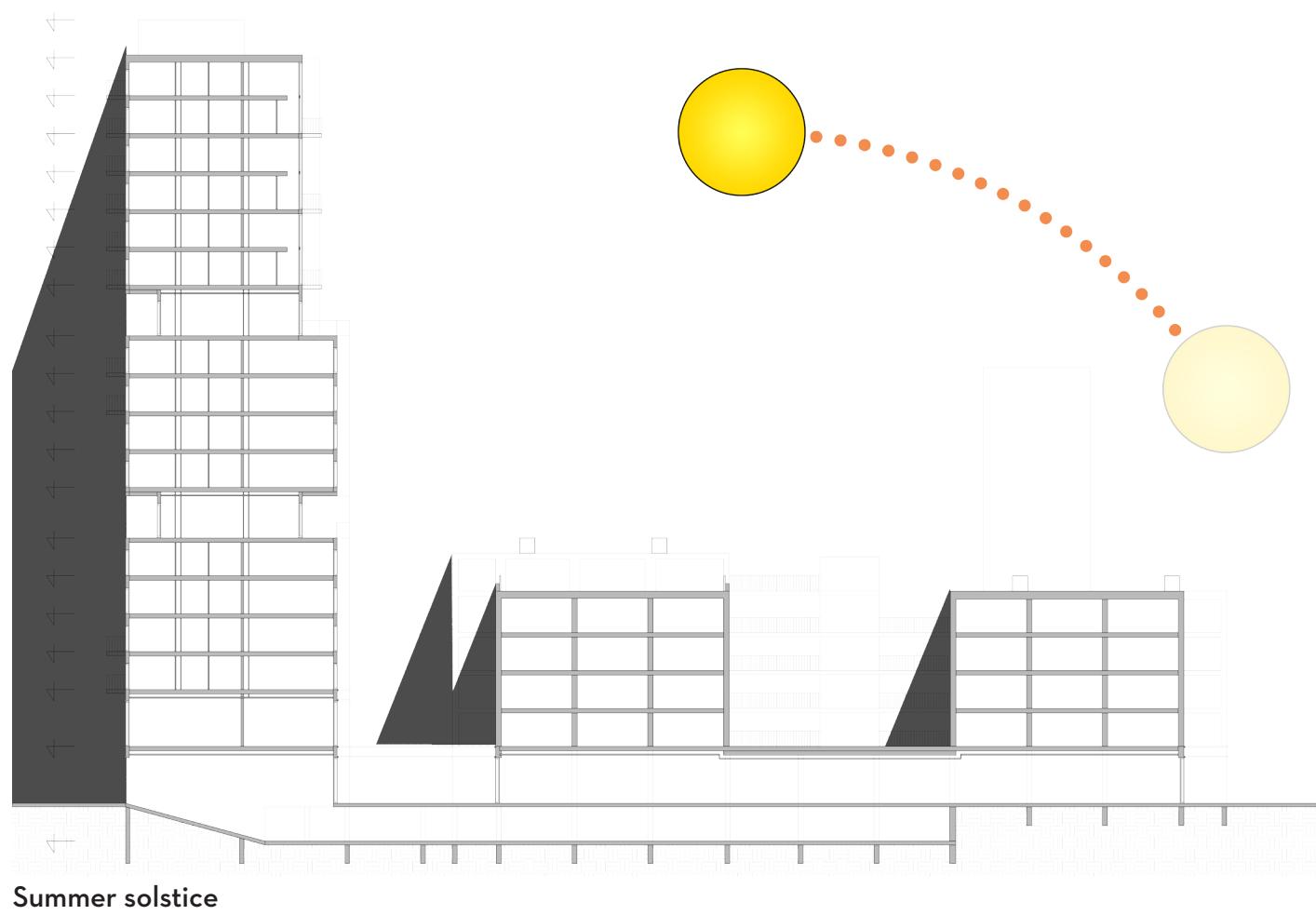
**Ventilation in the tower dwellings**  
Individual balanced ventilation (type D) with  $\text{CO}_2$  regulation

## Climate scheme

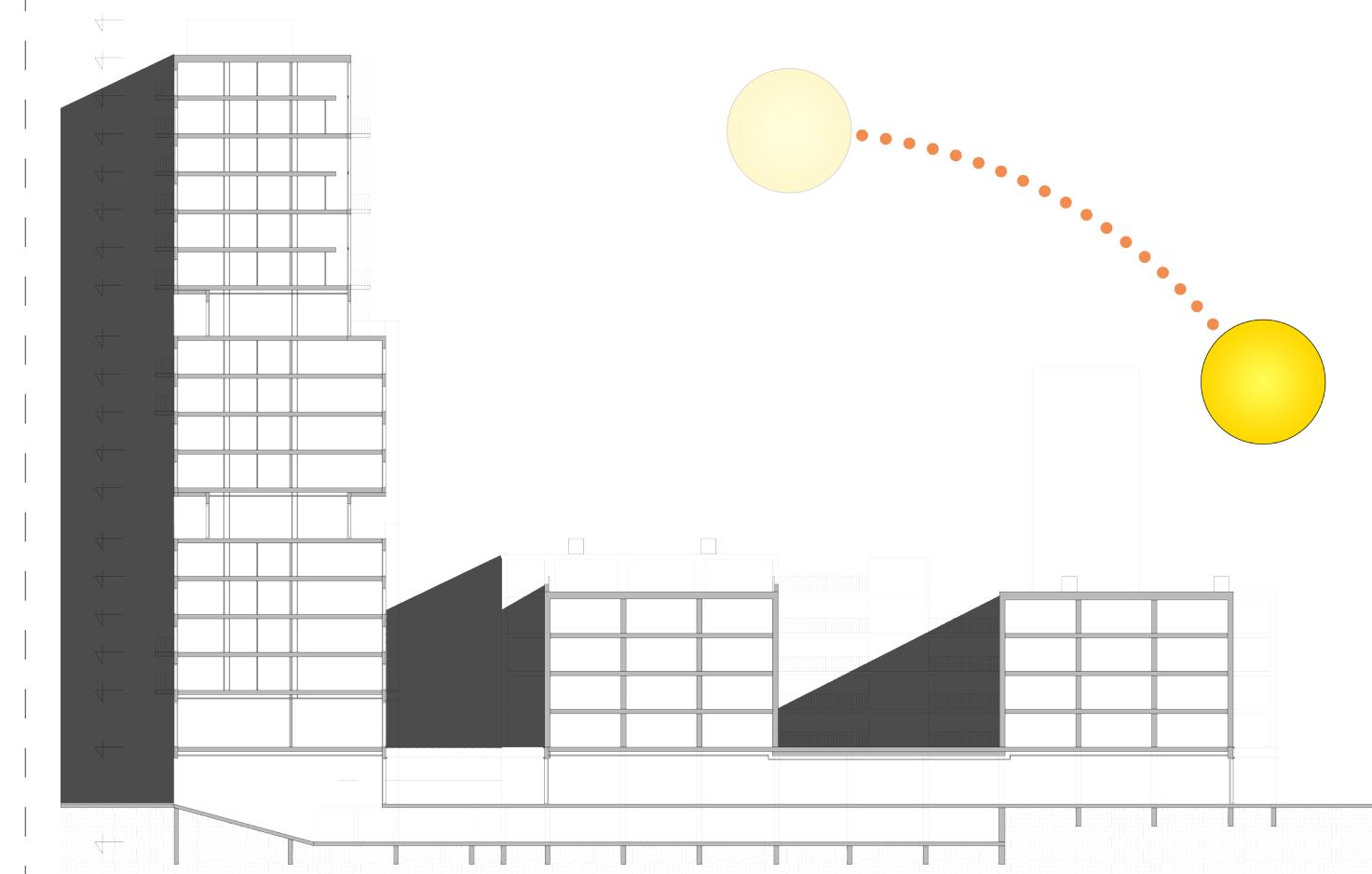
### Ventilation



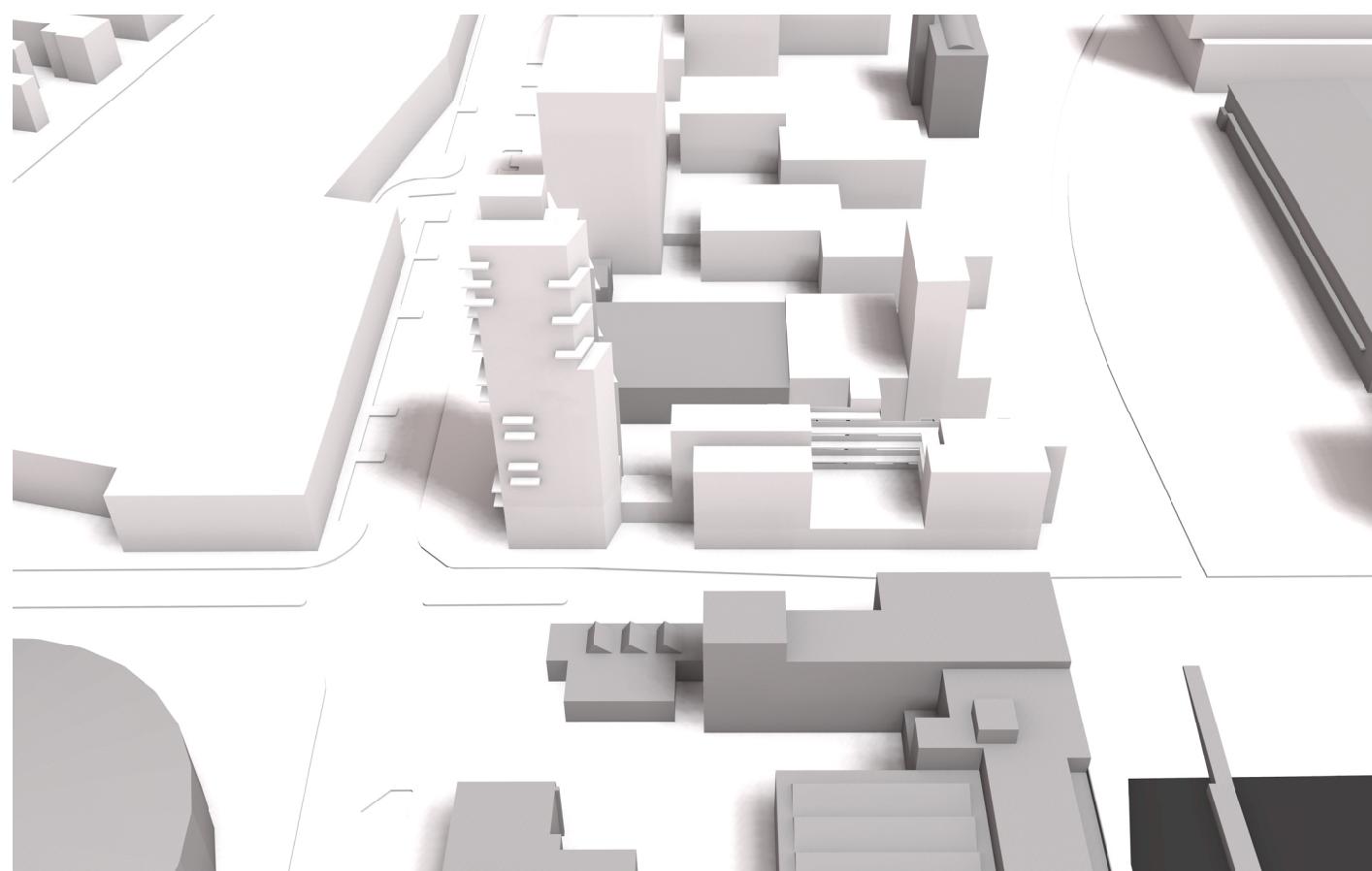
**Ventilation in the dwelling blocks**  
The units in the dwelling blocks have collective balanced ventilation (type D) with  $\text{CO}_2$  regulation



Summer solstice



Winter solstice



## Overview of design Daylight configuration