



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*

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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?

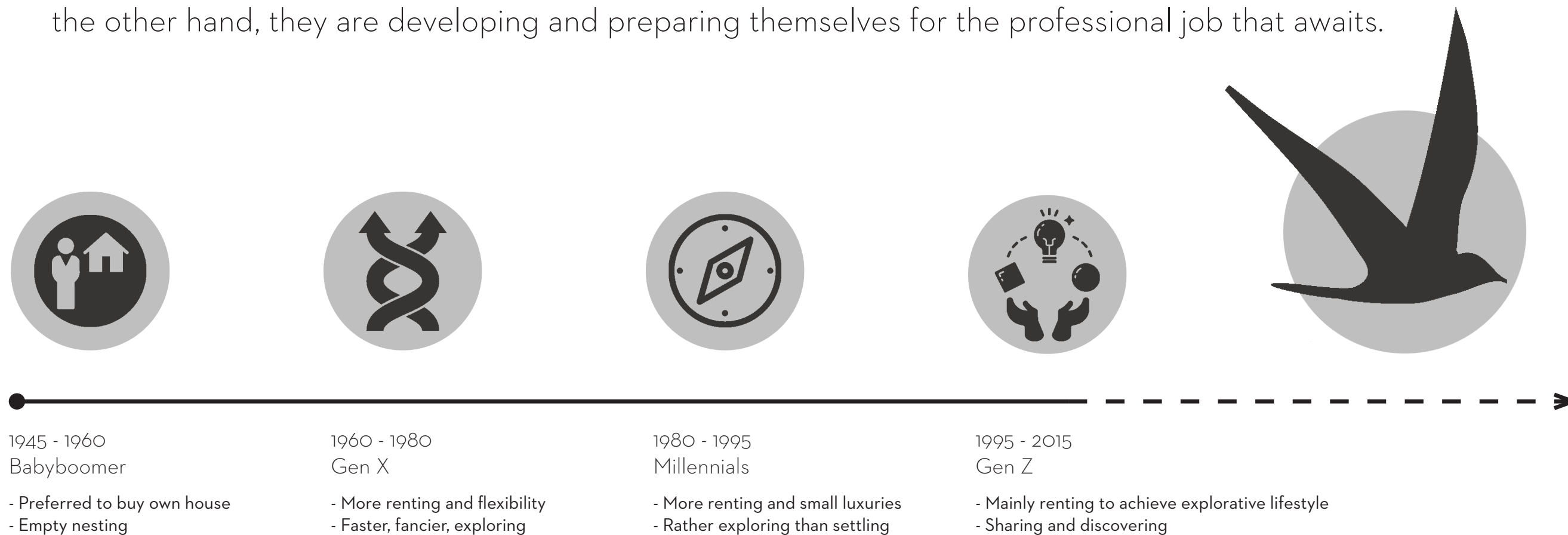
Over time, the different generations of starters in the Netherlands went from a more secured lifestyle to a lifestyle where flexibility, discovering and exploring became the 'standard' lifestyle.

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.

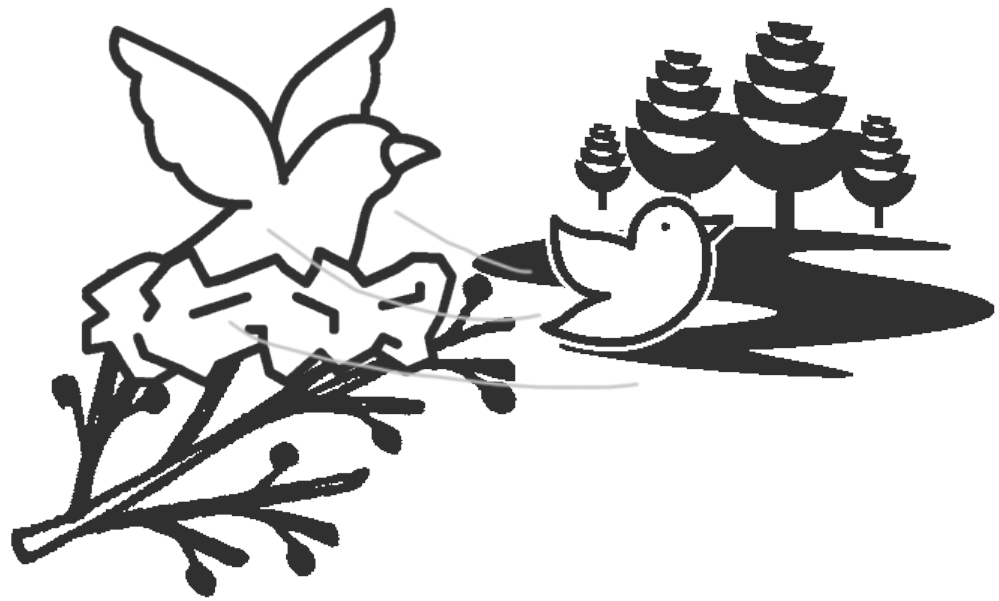


The development of generations starters through the decades

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

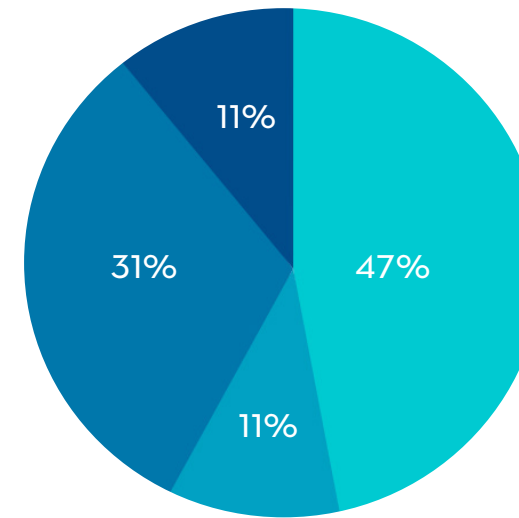
- Find themselves within the ranges of social housing and affordable pricing ranges;
- “No need for a fancy or luxury house, they just want a place for themselves”; separate bedroom and living room, as well as a private toilet and bathroom.

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.



Type of ownership and affordability of starters in the Netherlands

● Social renting (< €720): 47% ● Buying under €250,000: 31%
● Free market renting: 11% ● Buying above €250,000: 11%

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



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



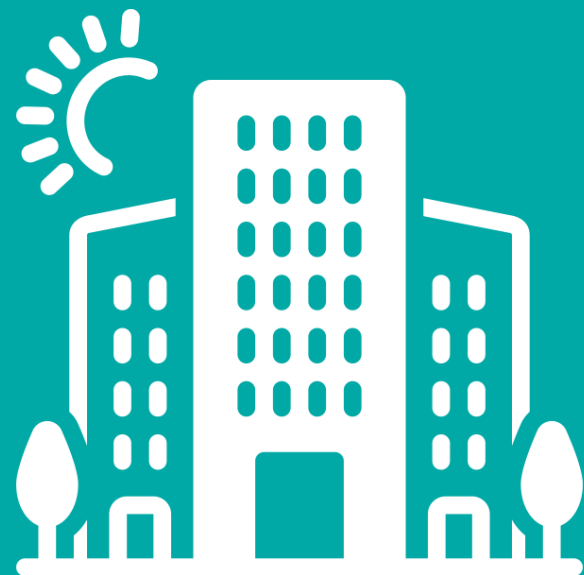
Dwelling

- Start on the housing market, looking for a first own place
- Individuals, couples and collective groups
- Apartments, maisonnettes 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



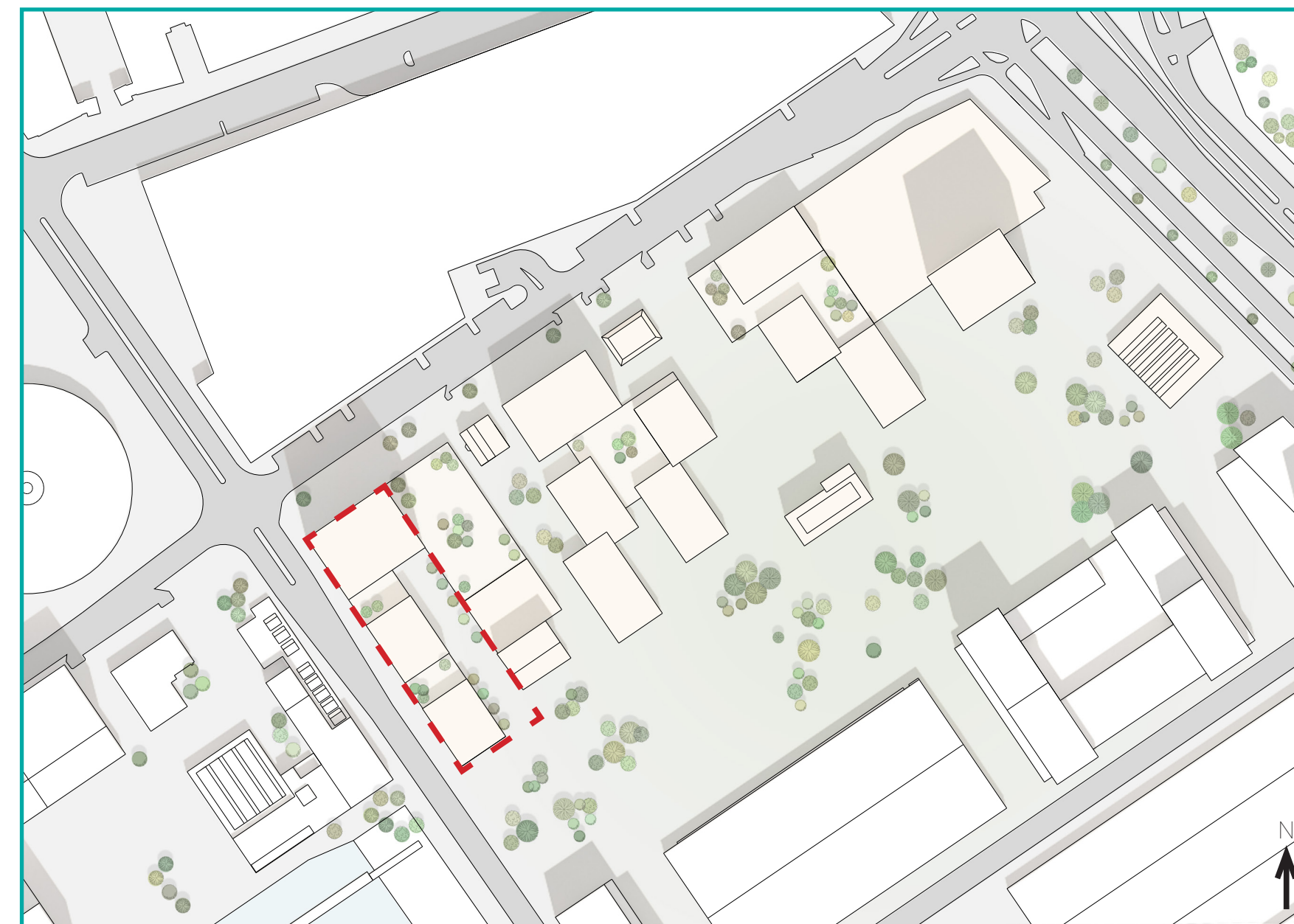
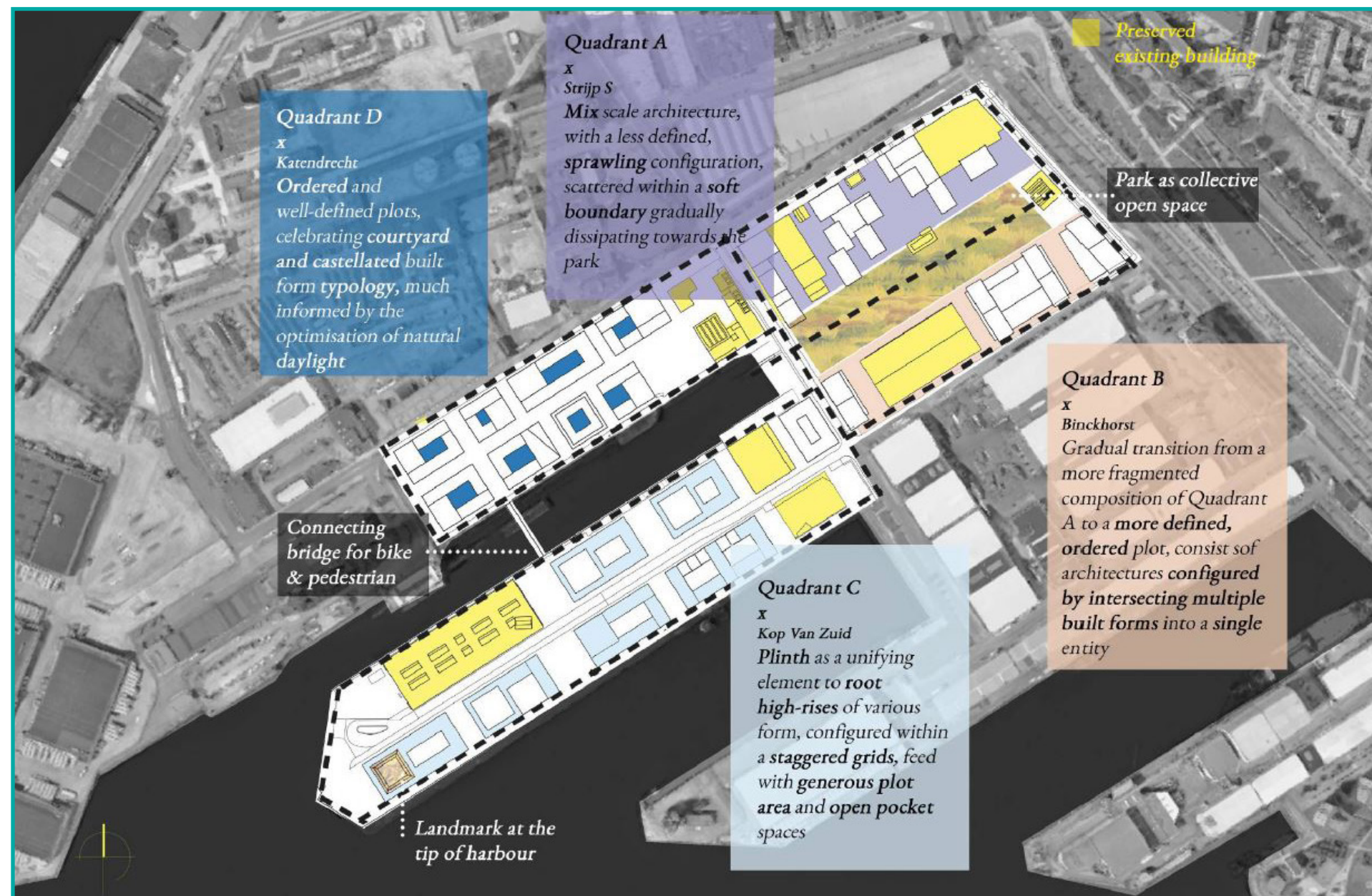
2.

Location

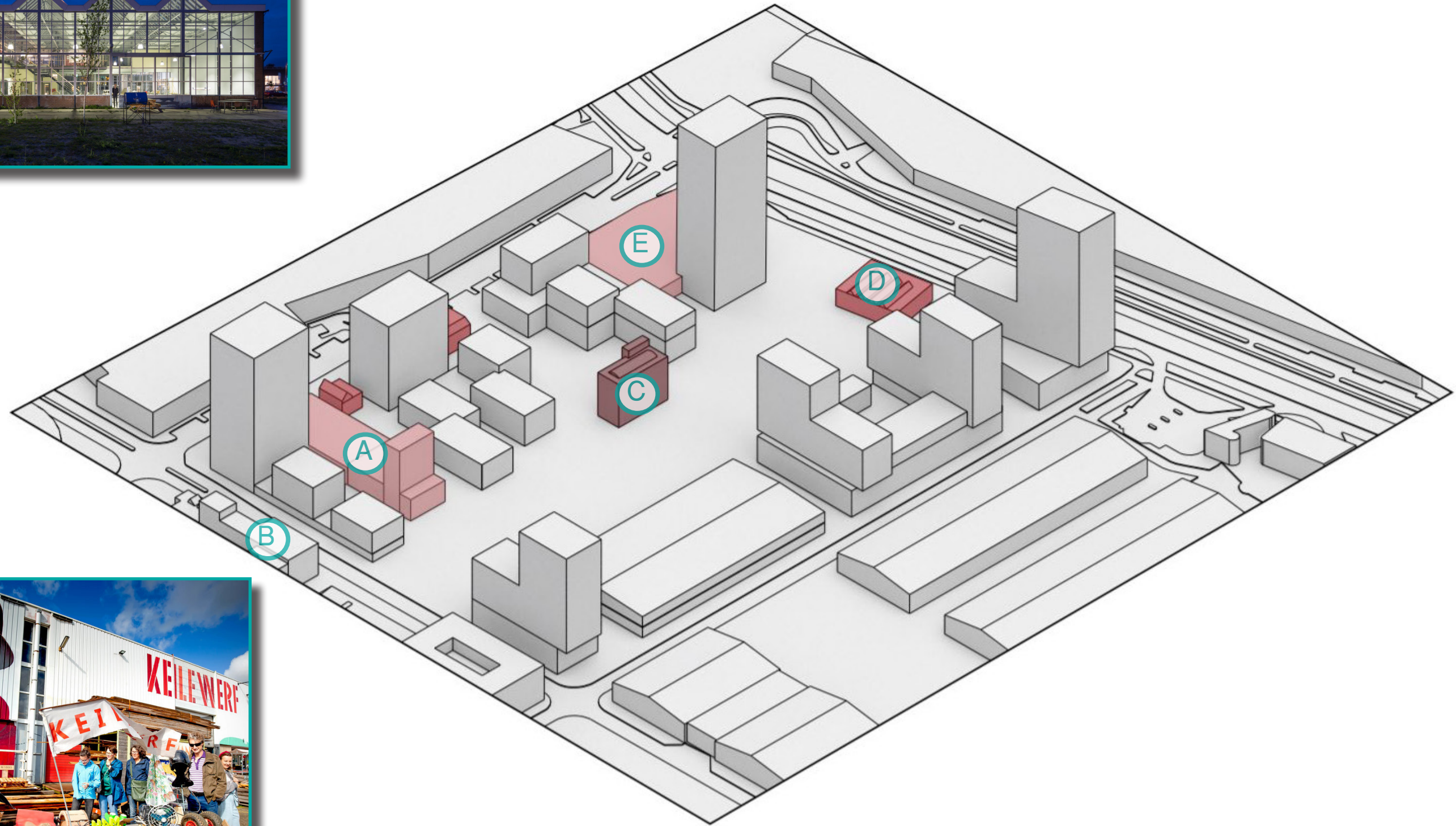




M4H in Rotterdam



Keilekwartier and quarter A



Preserved buildings in the masterplan
Including AVL Mundo, which is directly next to the plot



A place for displaying
art ...



... but also a place for
events

Sculpture park AVL Mundo



3. The Design





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
Birds view



Situation
Scale 1 : 1000

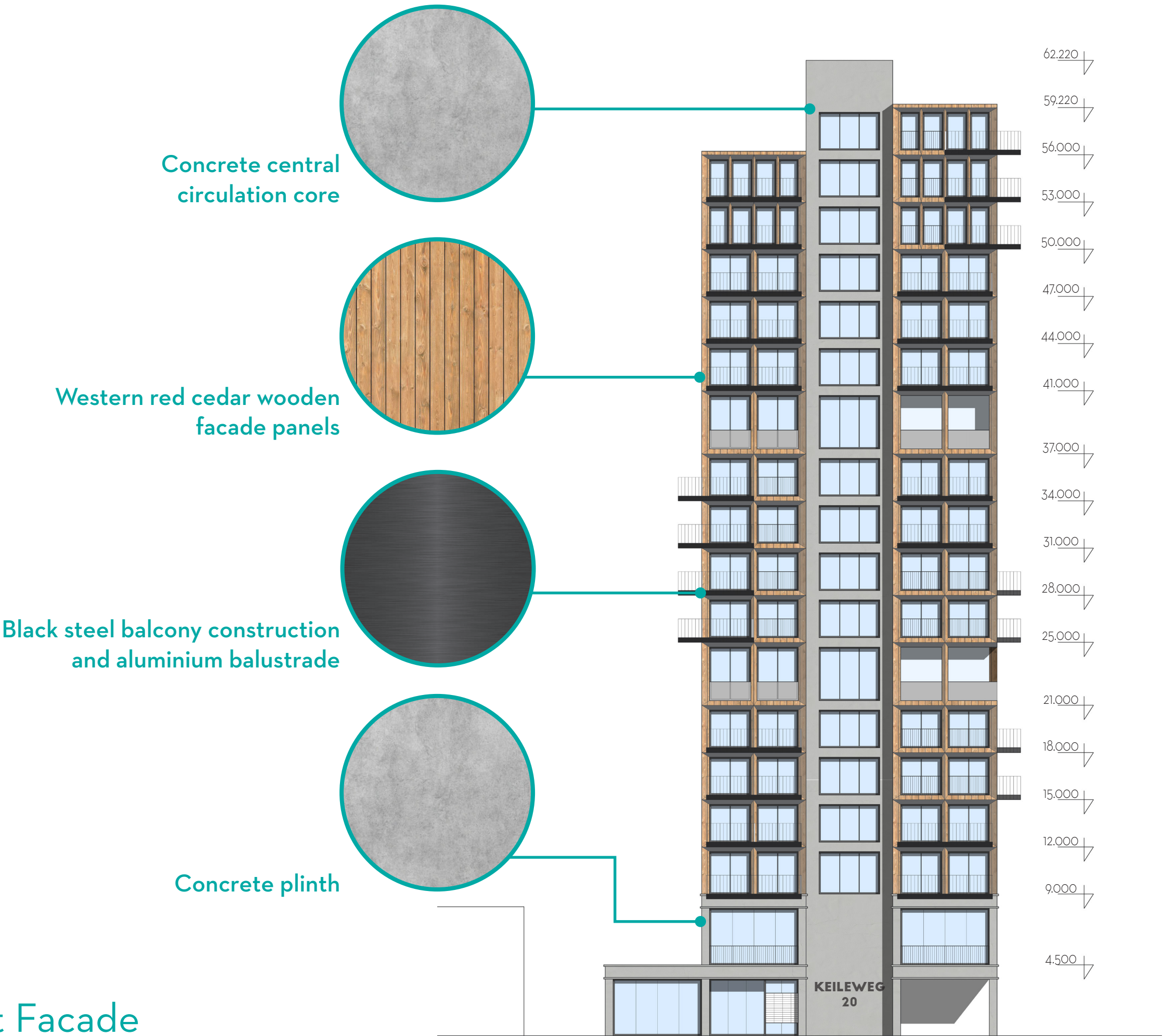


KEILEV
20

Impression
Street side

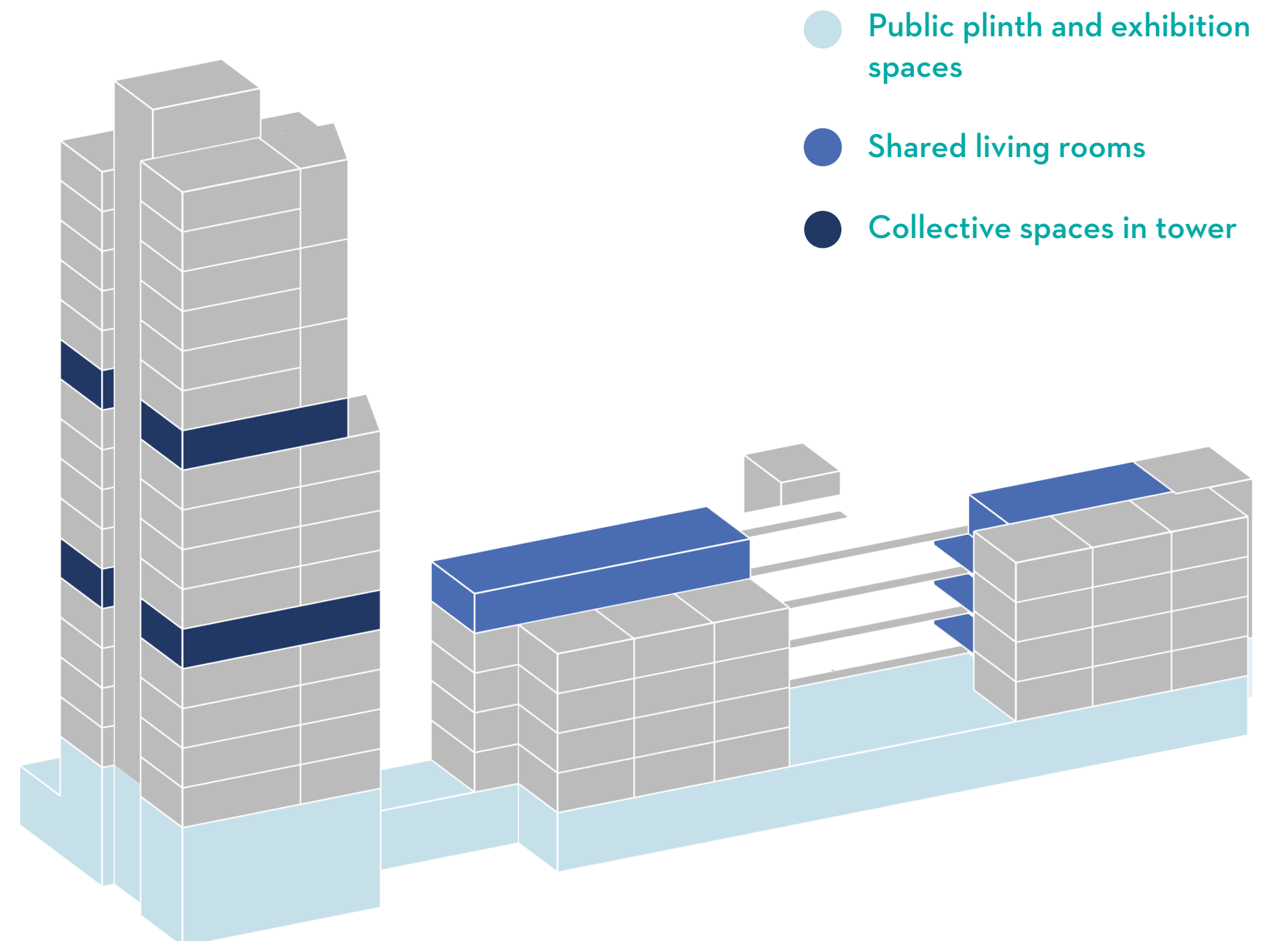
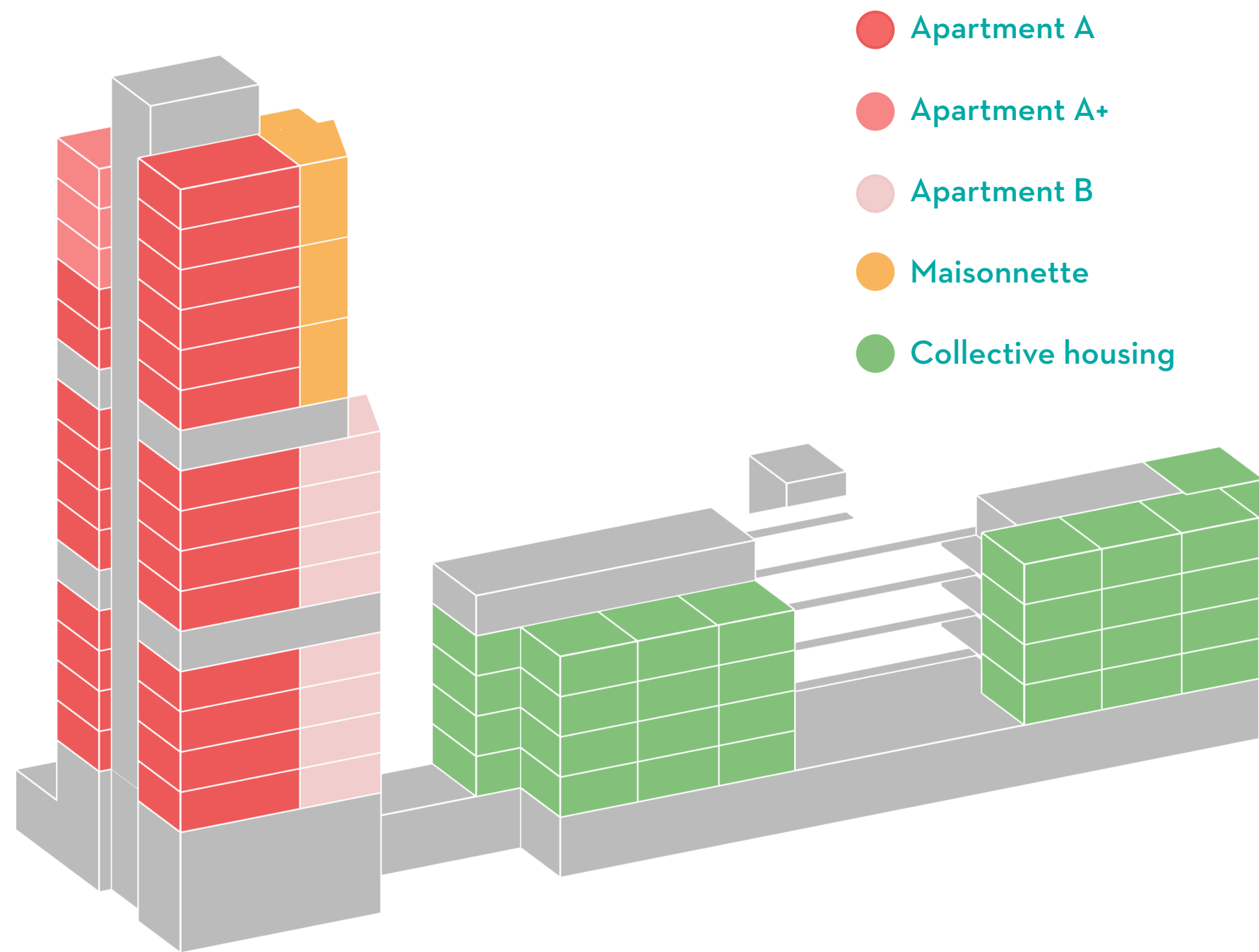
North-west Facade

Scale 1 : 250



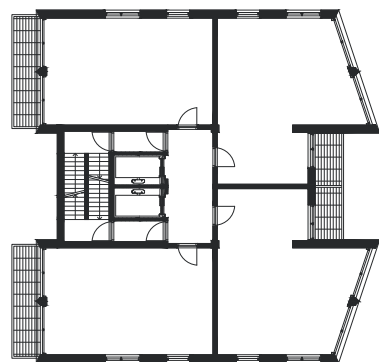
South-west Facade
Scale 1 : 250





Overview of design

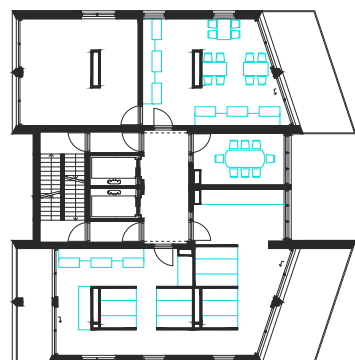
Configuration of dwellings along with collective spaces



A

Floors of dwellings

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



B

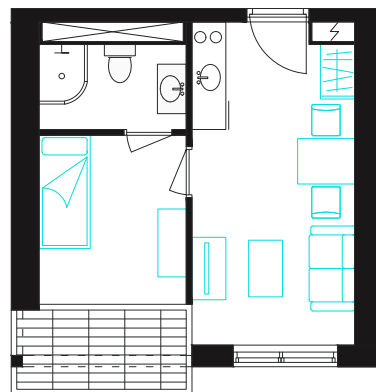
Collective floors

- 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

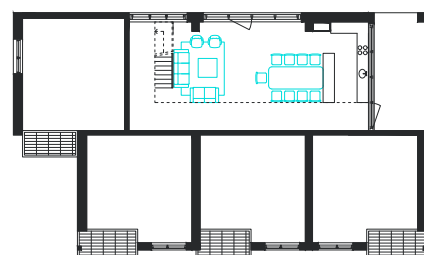




(A)

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)

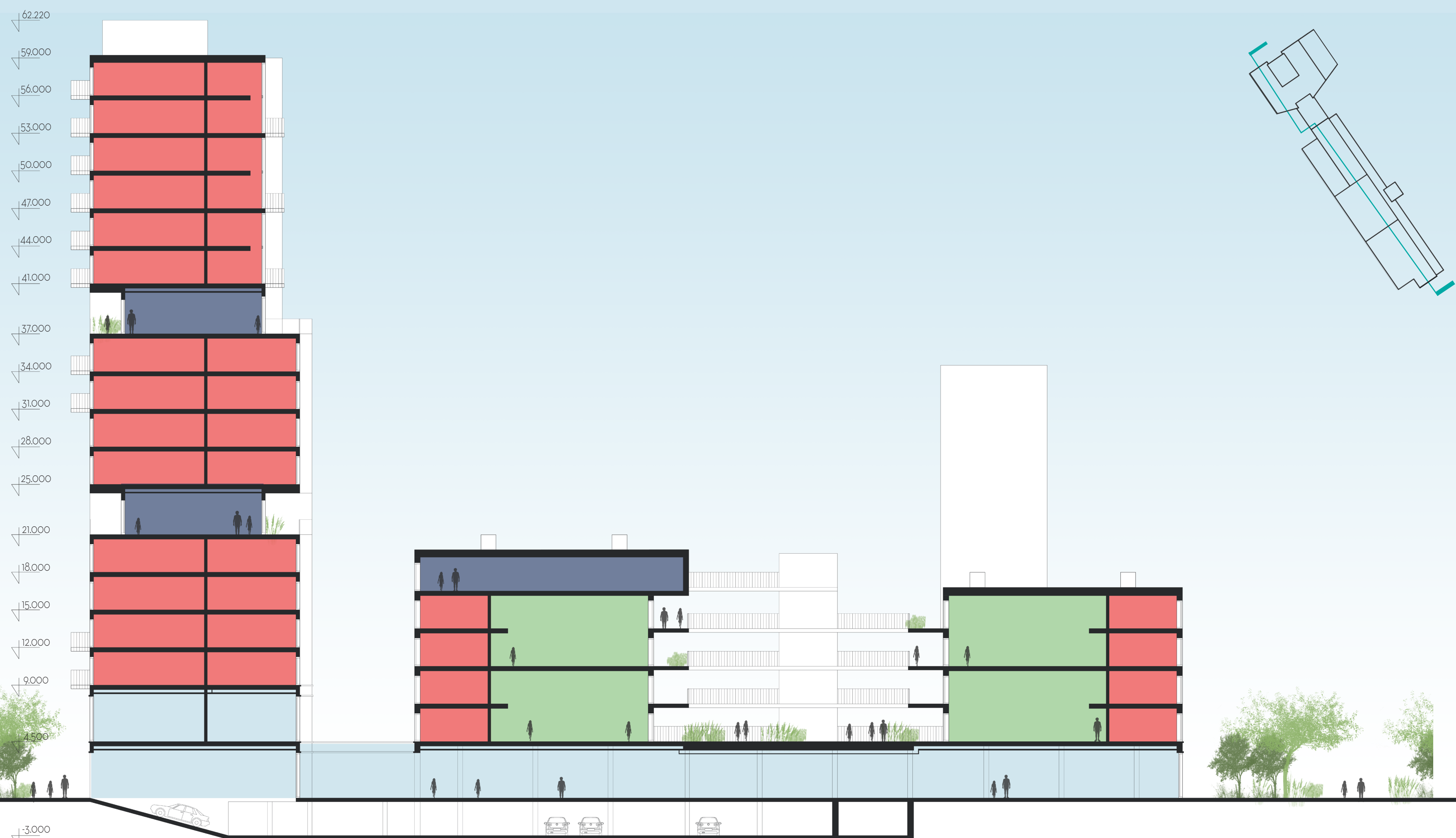
Collective outdoor area

- Rooftop community garden
- Rooftop terrace



Overview of design

Horizontal configuration of amenities in the dwelling blocks



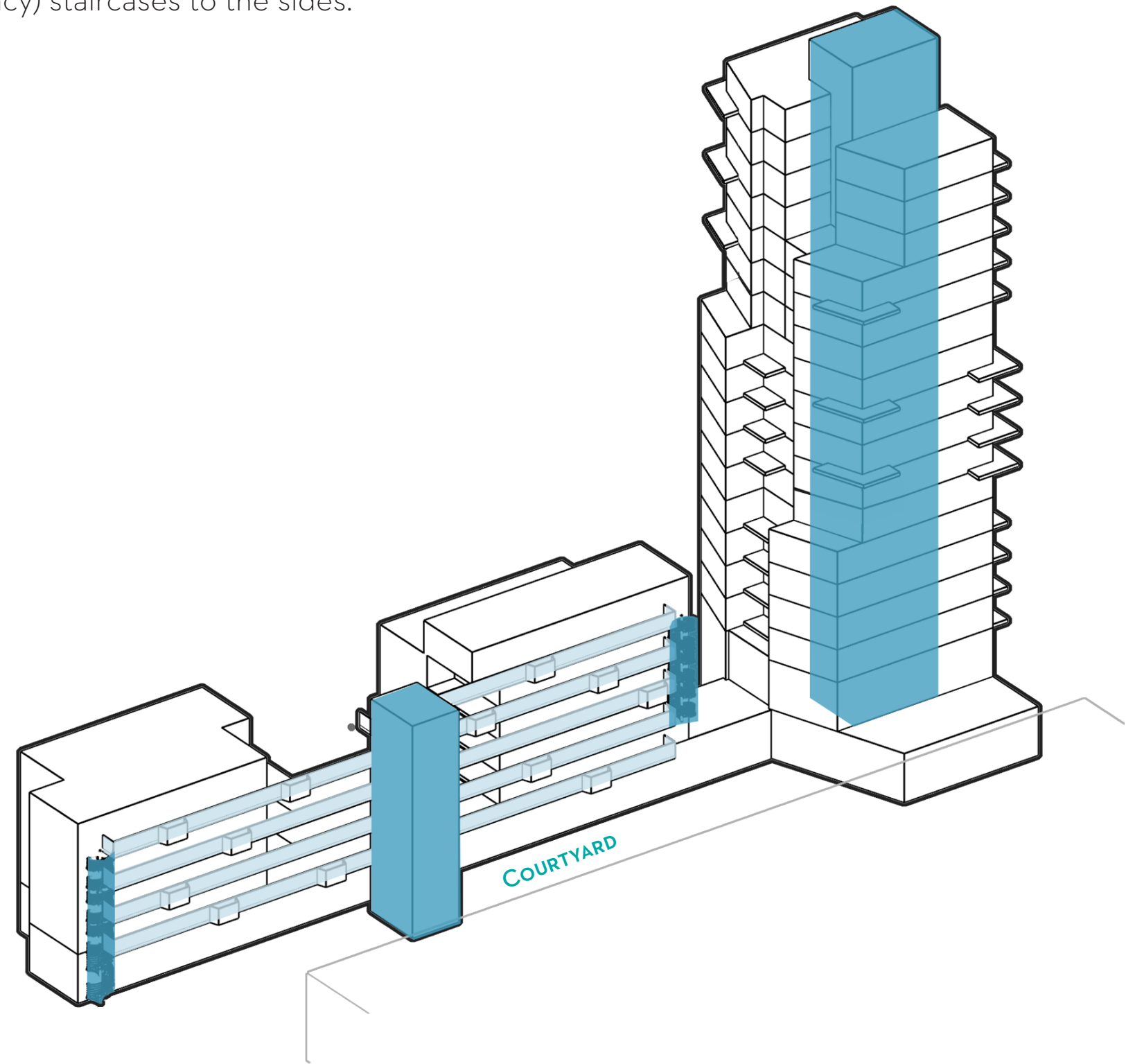
Section

- Dwellings
- Shared living rooms
- Collective floors
- Public plinth



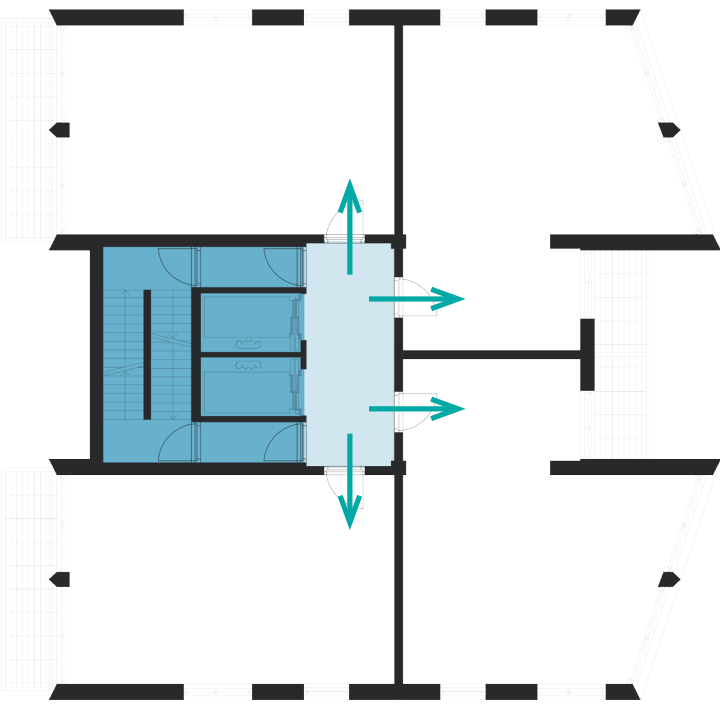
Main circulation routes

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.



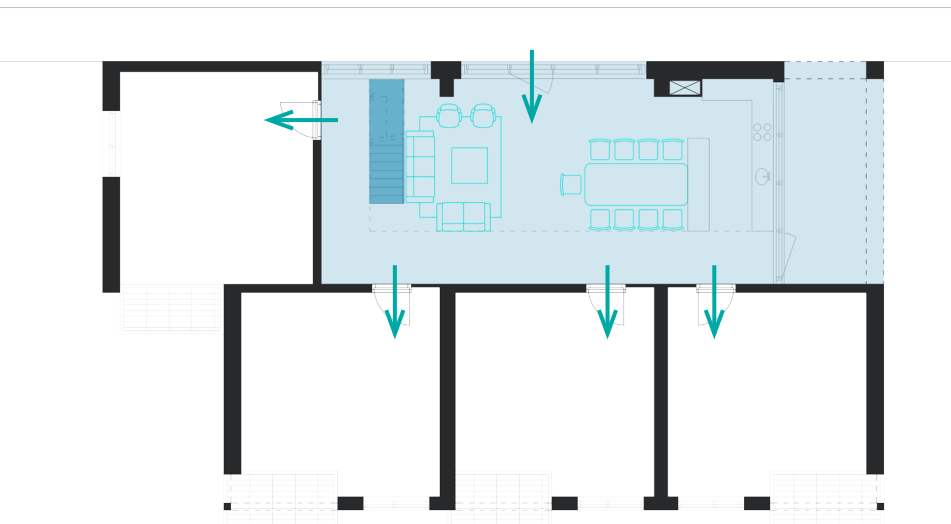
Overview of design

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.

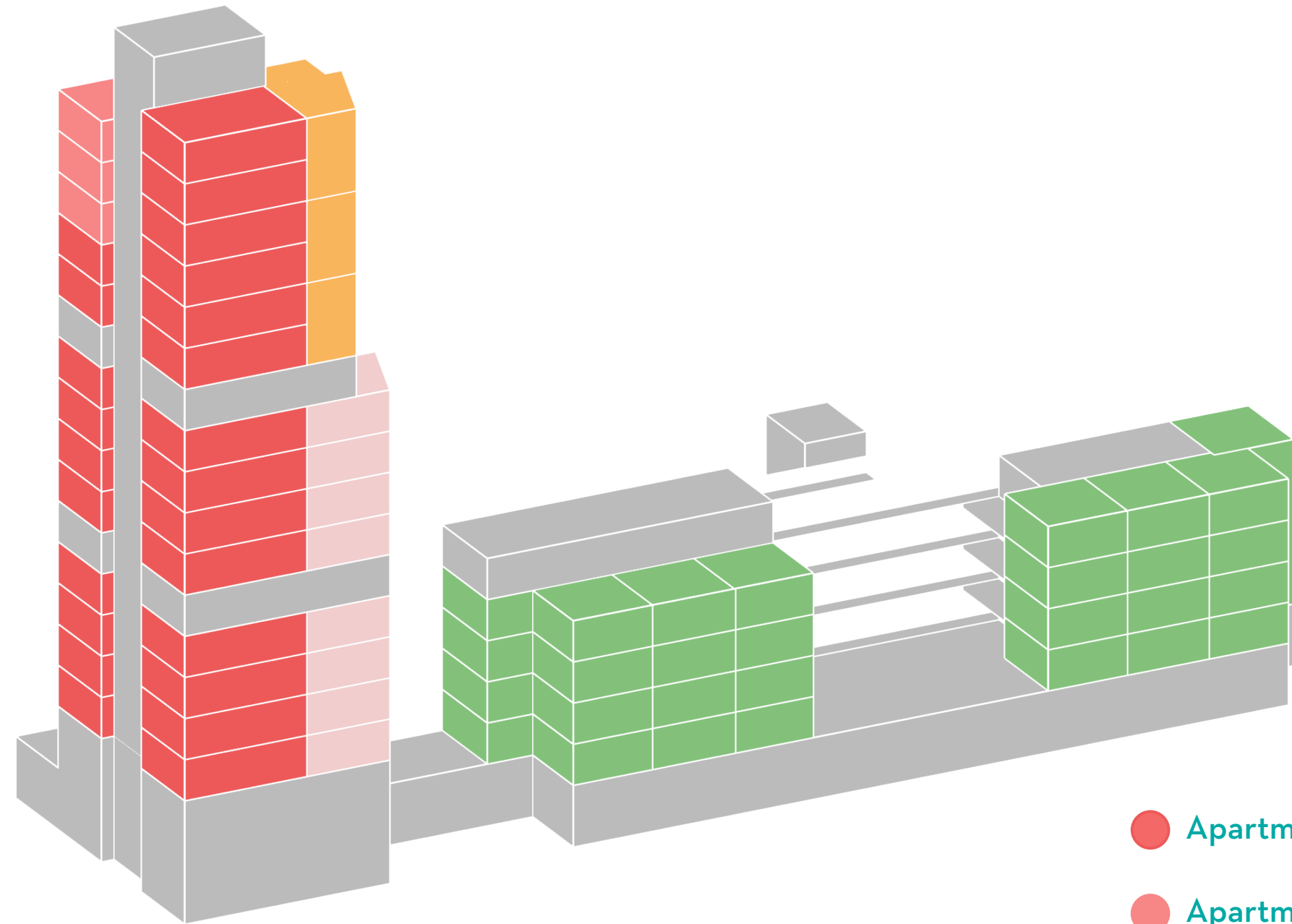


Impression
Main entrance area



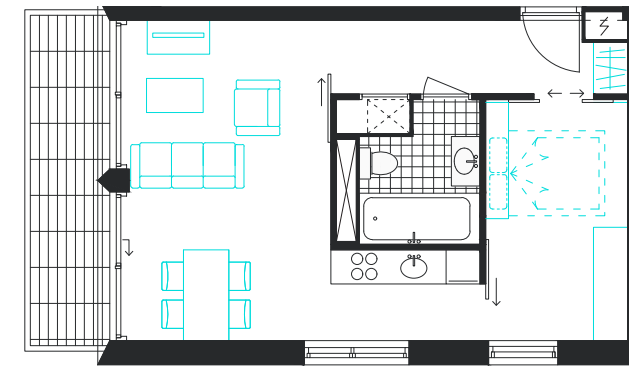
4. Dwellings



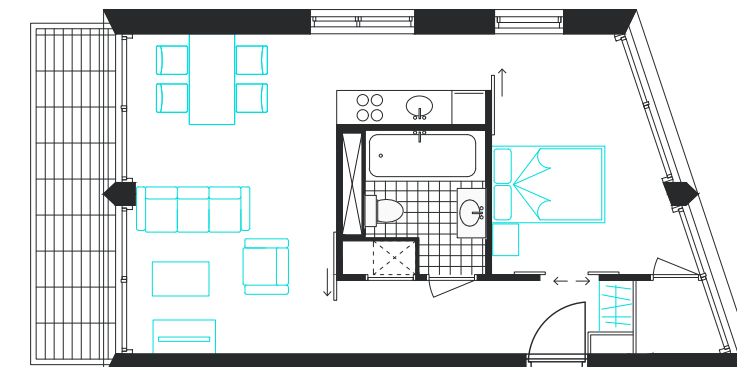


- Apartment A
- Apartment A+
- Apartment B
- Maisonnette
- Collect. housing

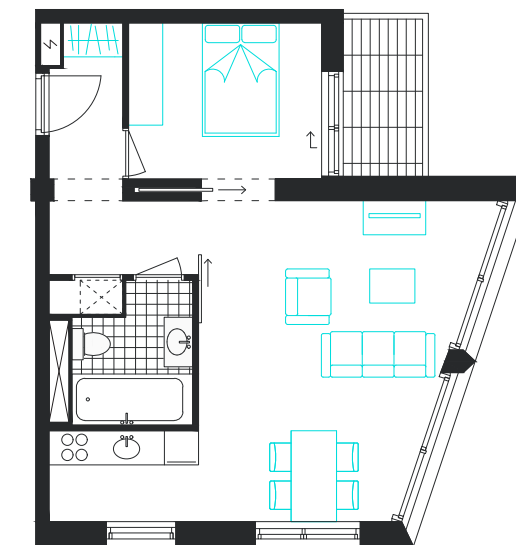
Overview of dwellings Configuration



Apartment A
Typology: Apartment
Area: 49 m²



Apartment A+
Typology: Apartment
Area: 54 m²



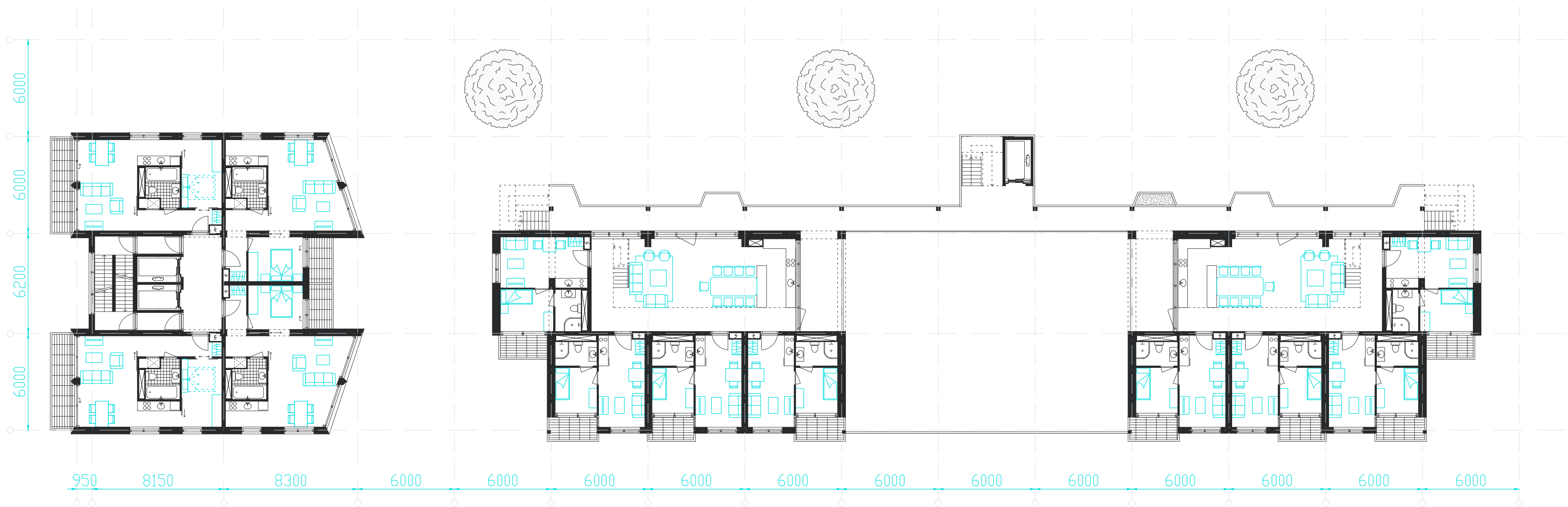
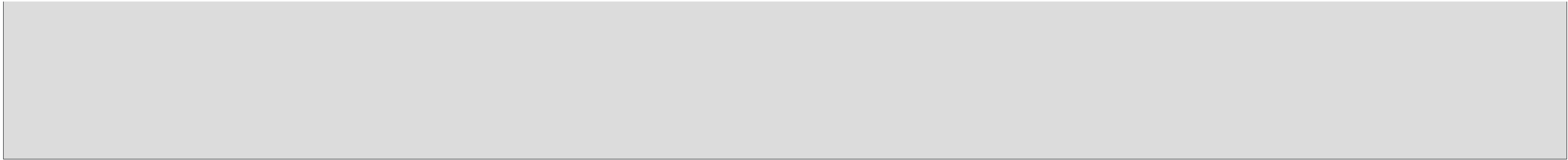
Apartment B
Typology: Apartment
Area: 54 m²



Maisonnette
Typology: Maisonnette
Area: 72 m²



Collective housing
Typology: Co-living
Area: 30 m²

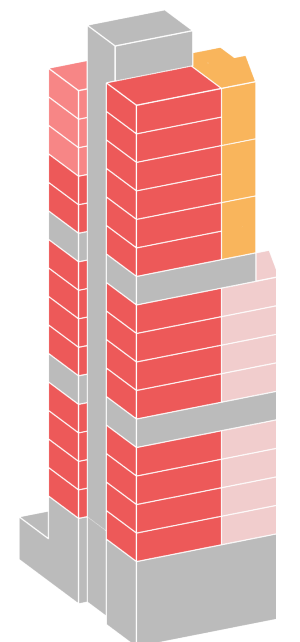
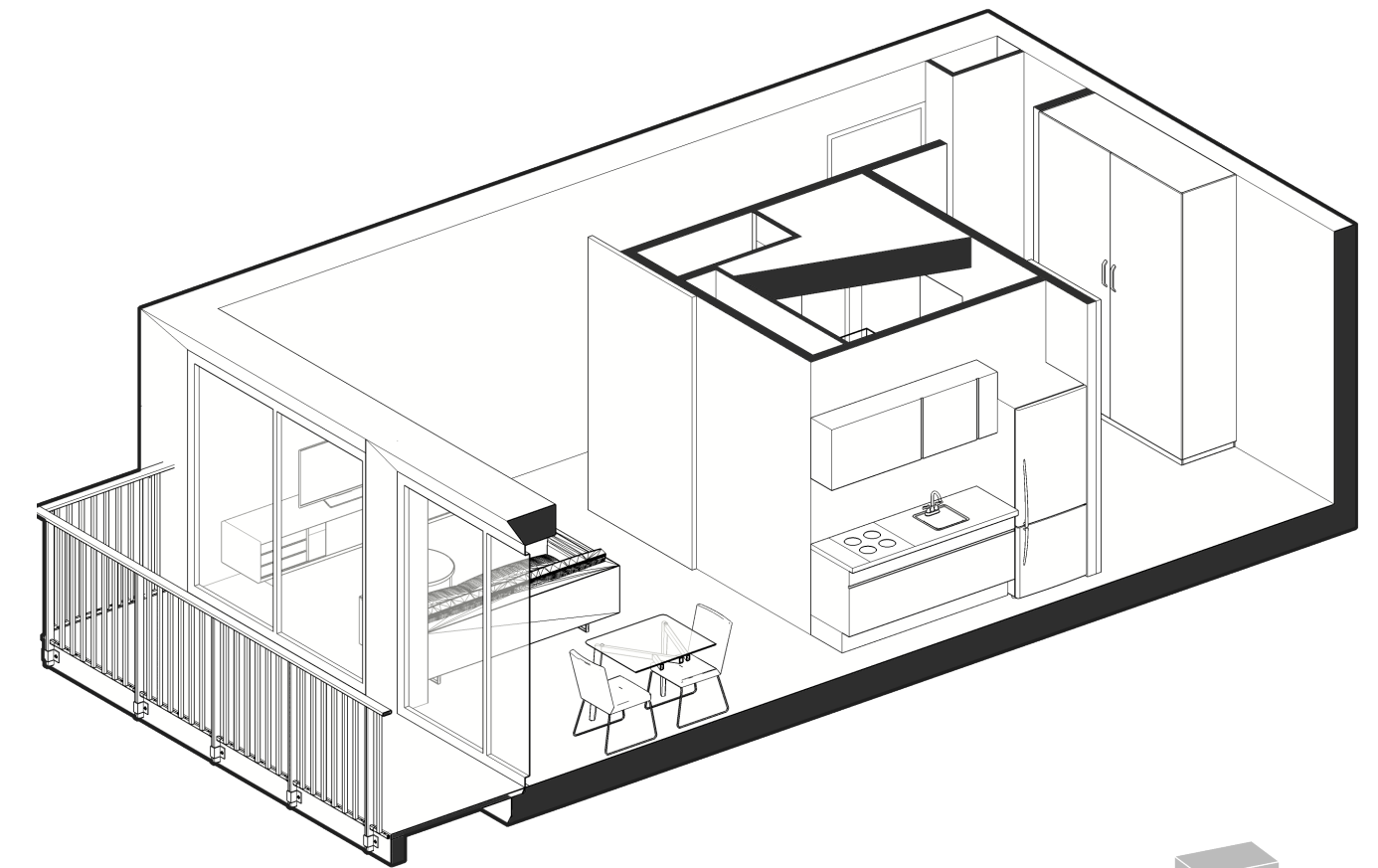
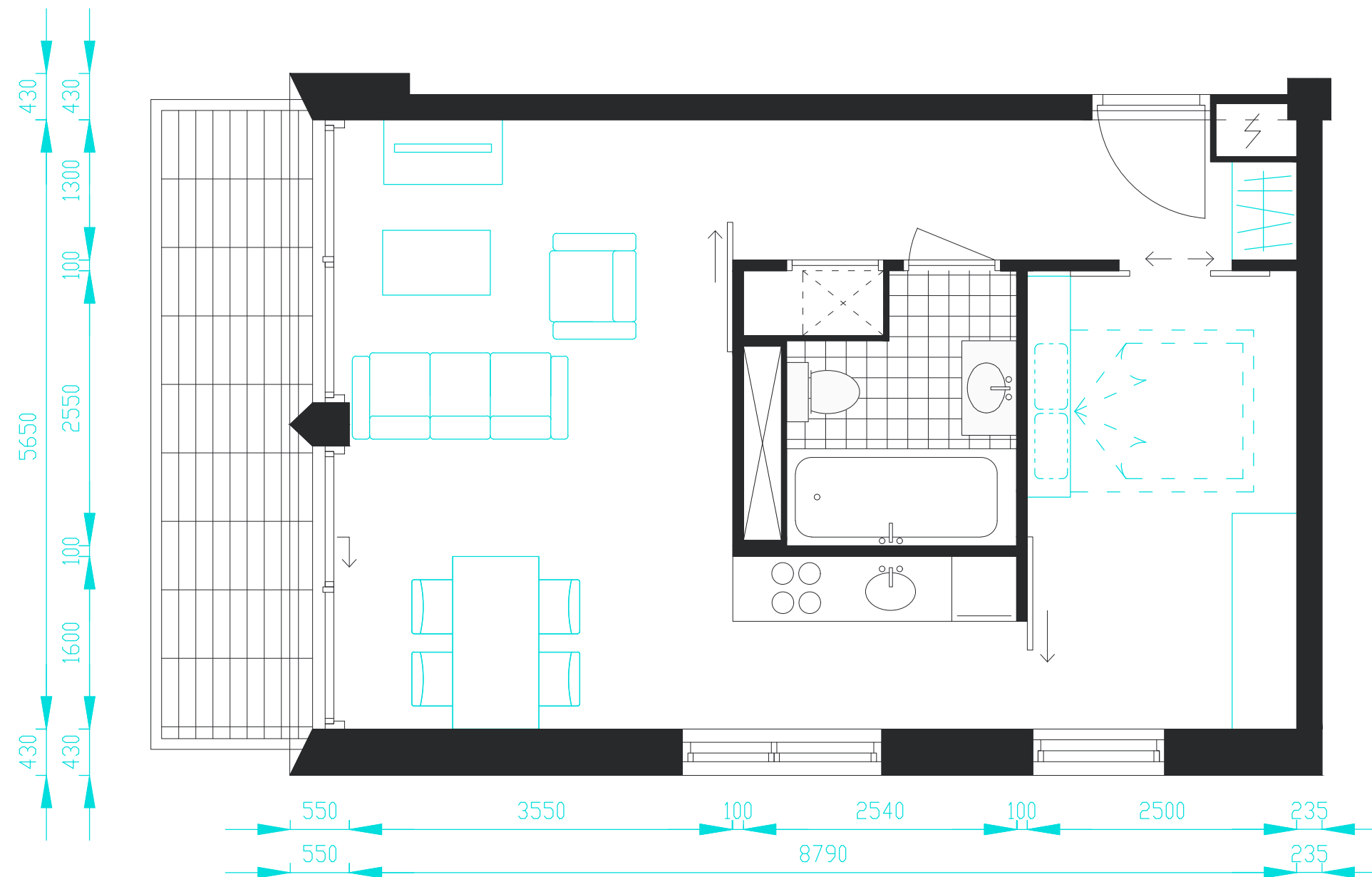


Typical floor plan: Tower and blocks
Scale 1 : 200



Apartment A

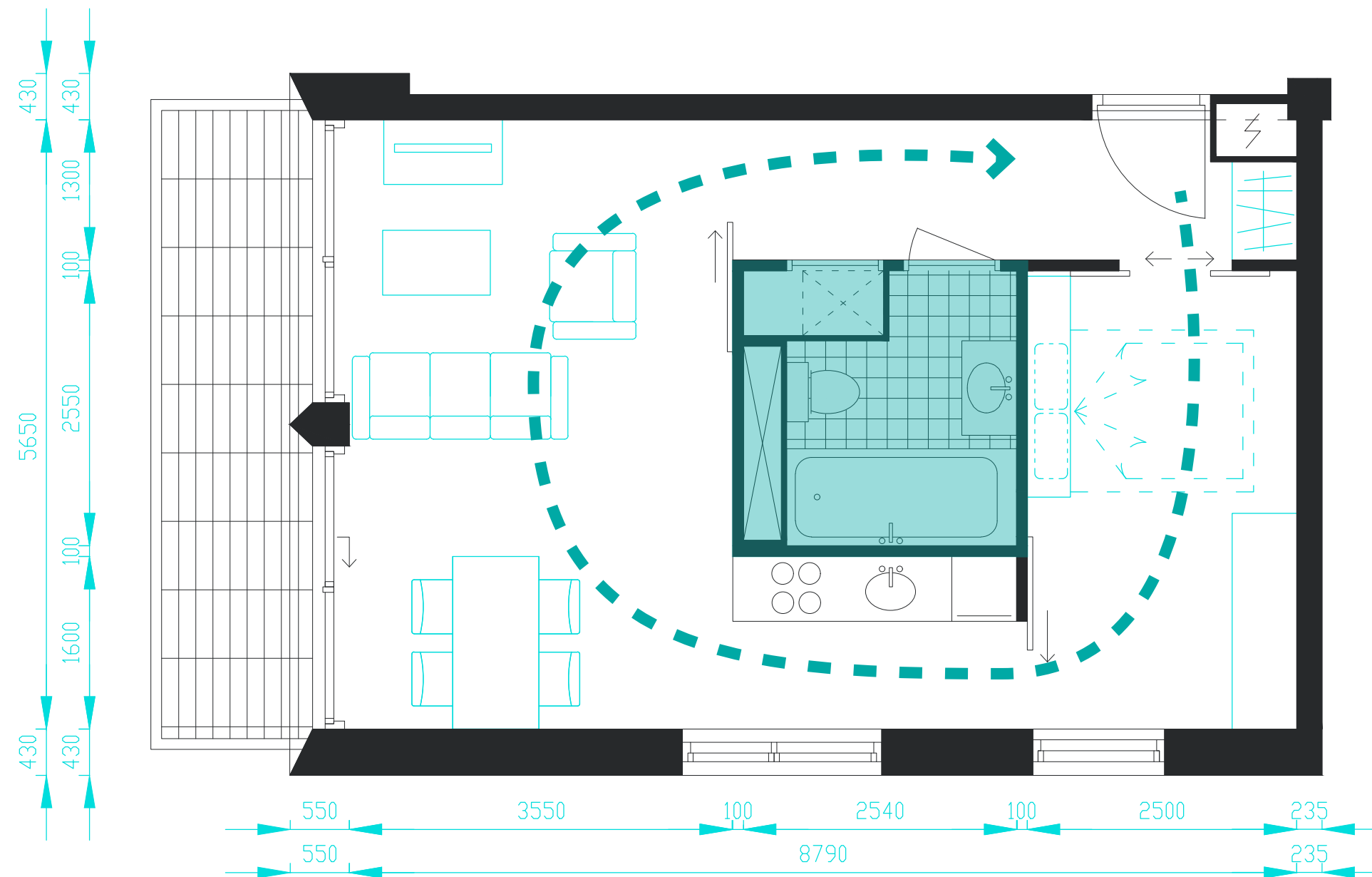
49 m² - open living room with dining area - separate bedroom and bathroom



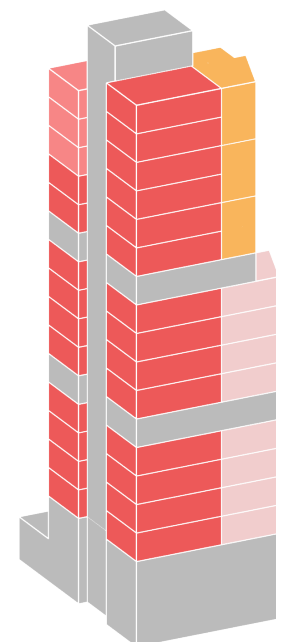
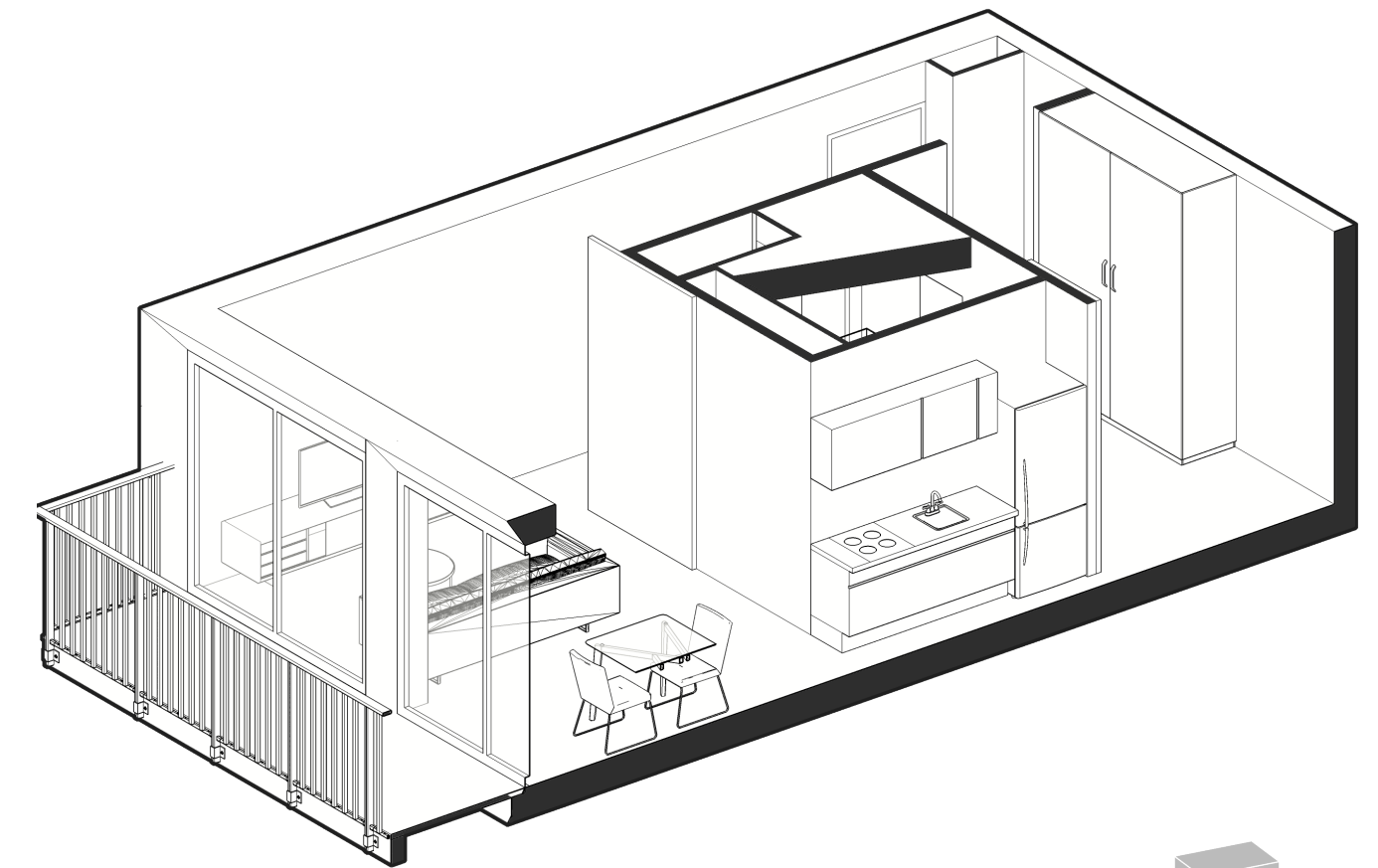
Apartment A ●

Apartment A

49 m² - 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

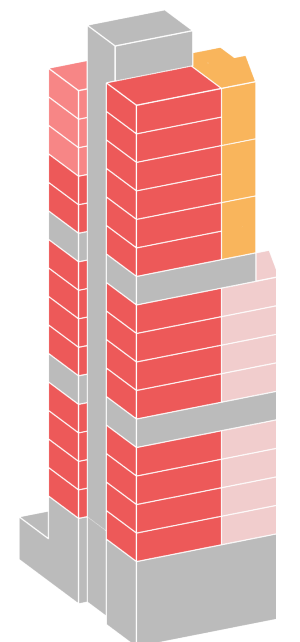
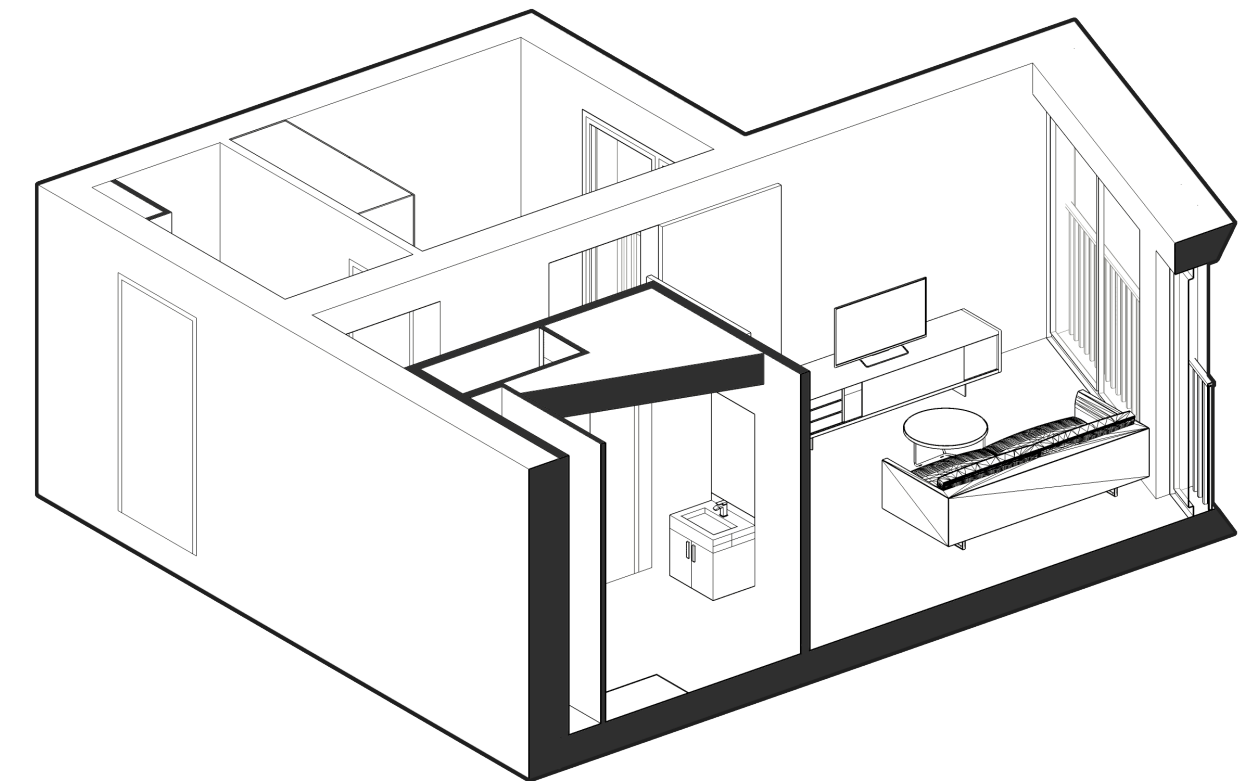
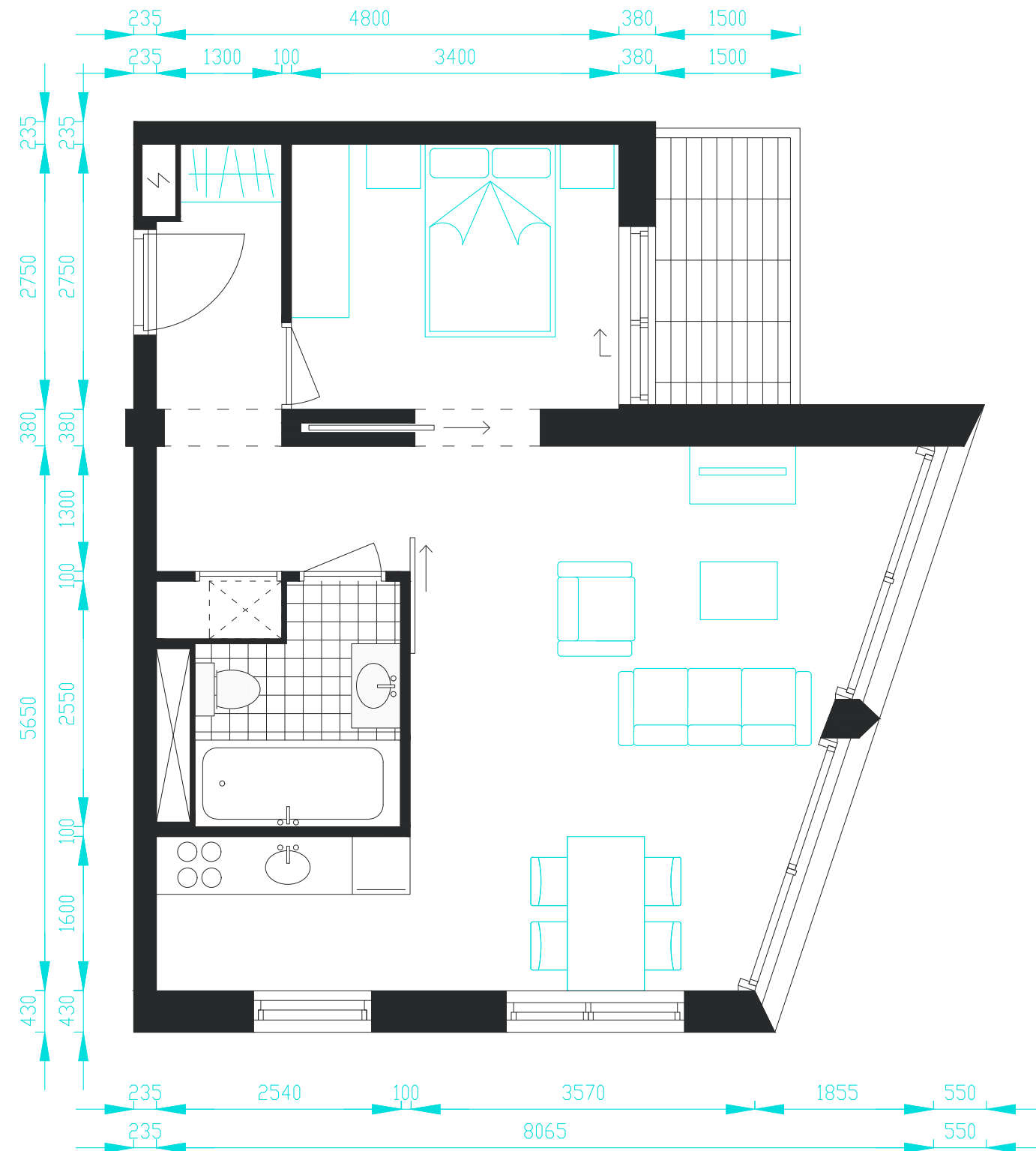


Apartment A ●



Apartment B

54 m² - open living room with dining area - separate bedroom and bathroom

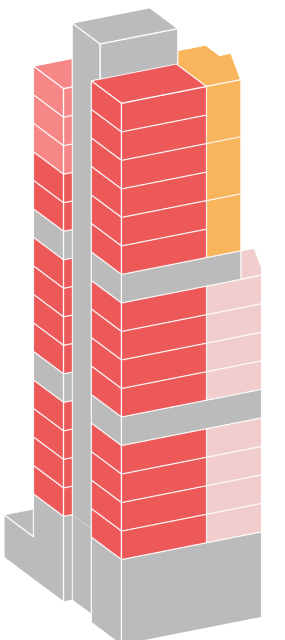
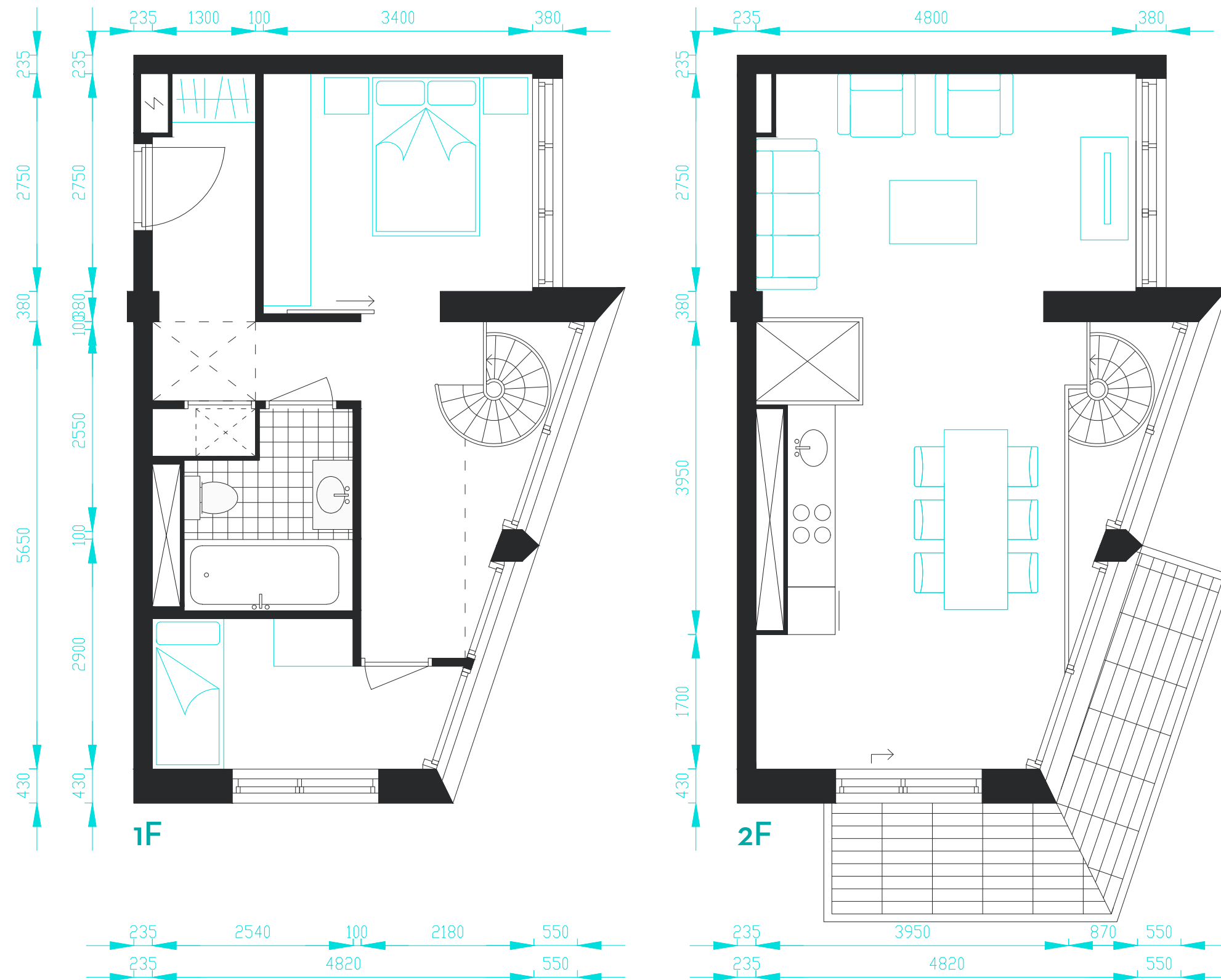


Apartment B ●



Maisonnette

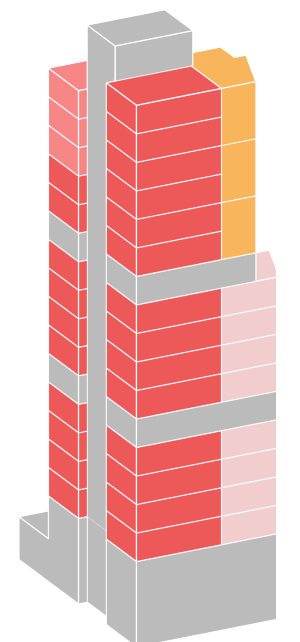
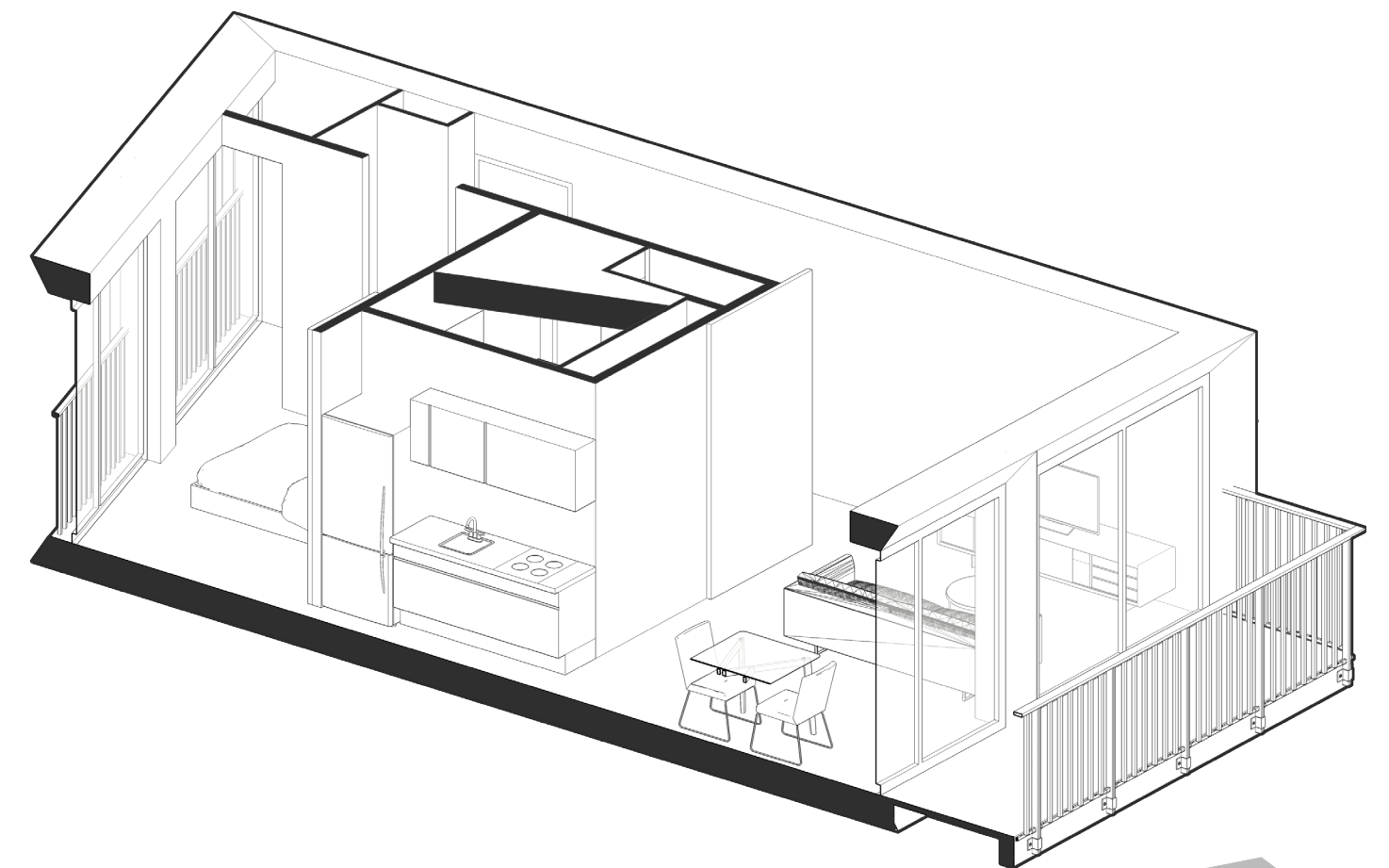
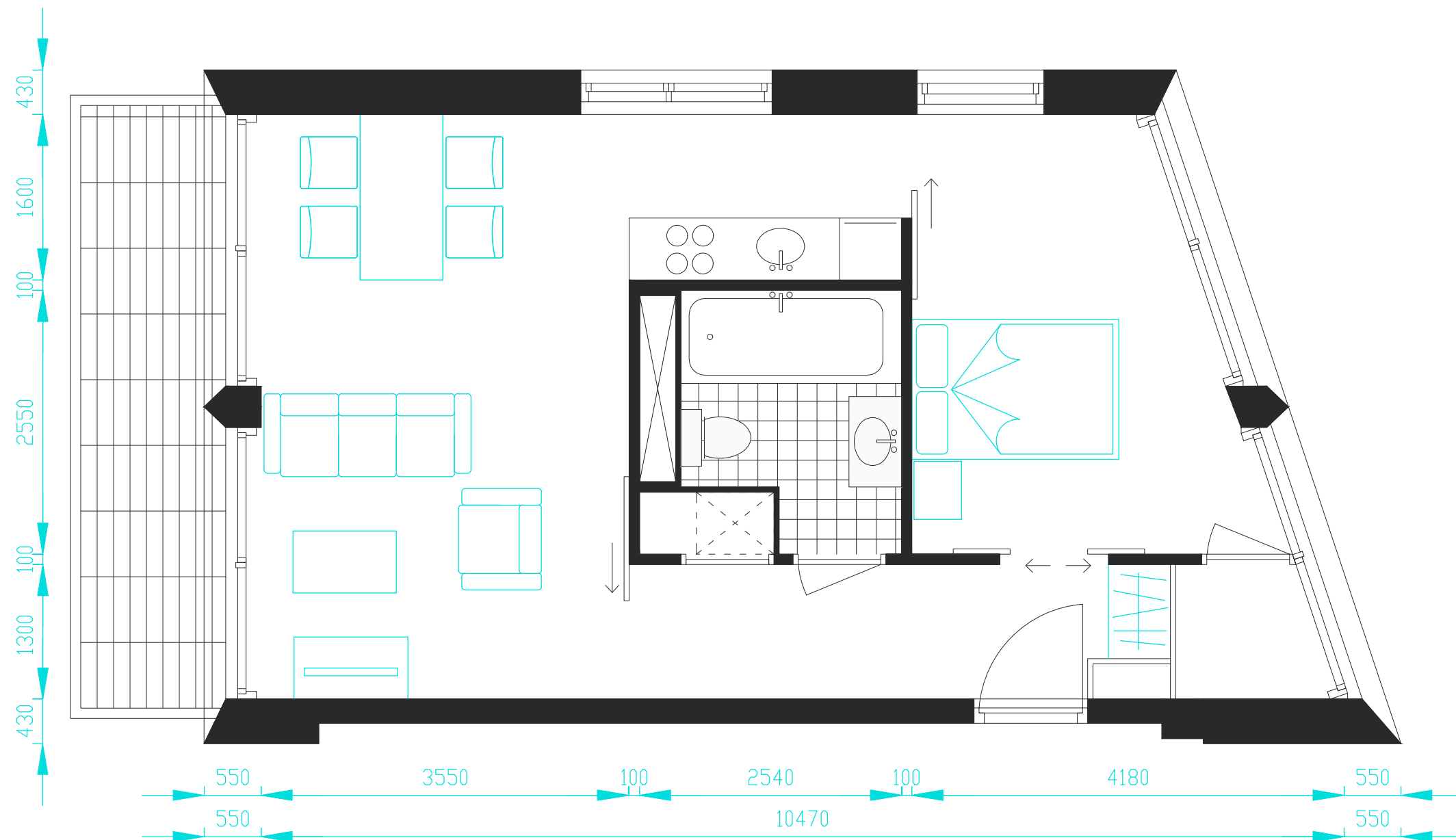
72 m² - two separate bedrooms downstairs - living space on complete upper floor - voids for maximum daylight





Apartment A+

54 m² - '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)

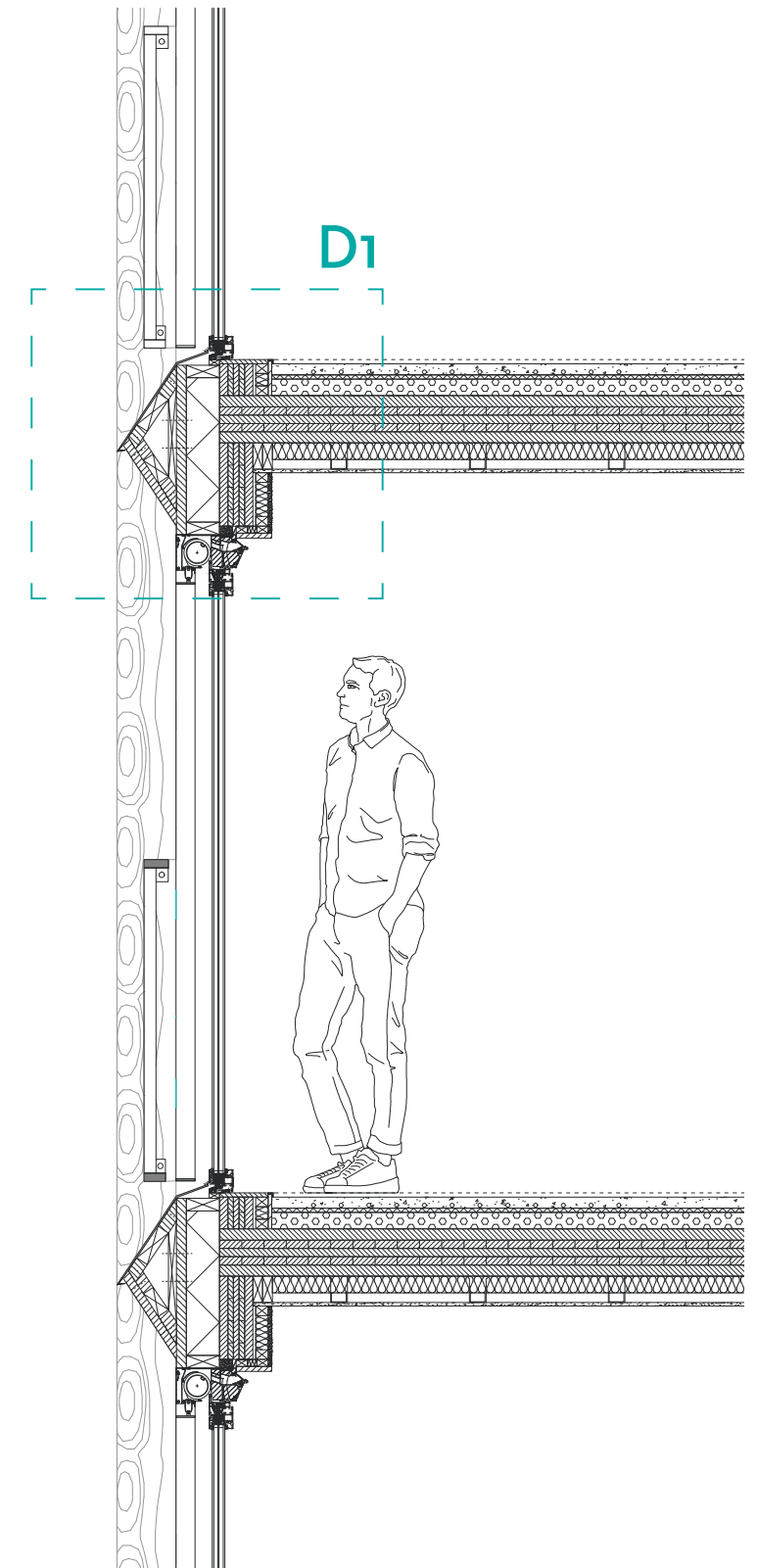
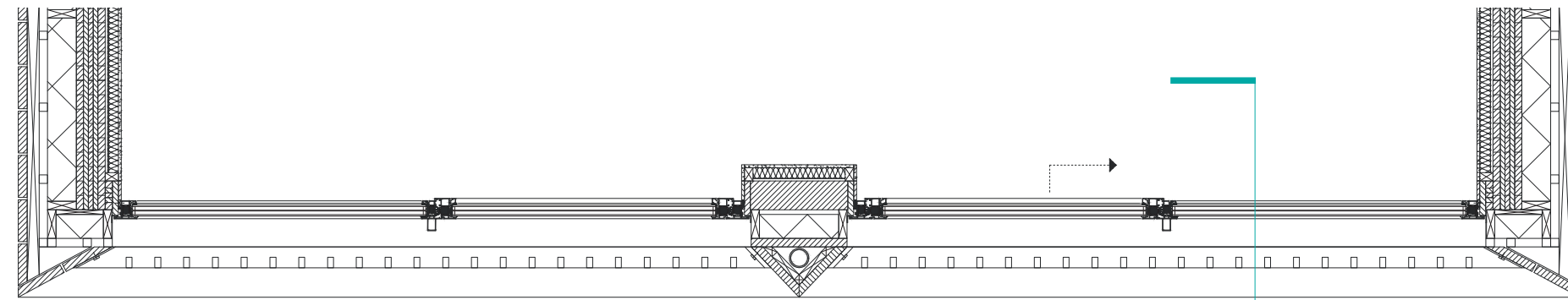
External wall structure (mm)

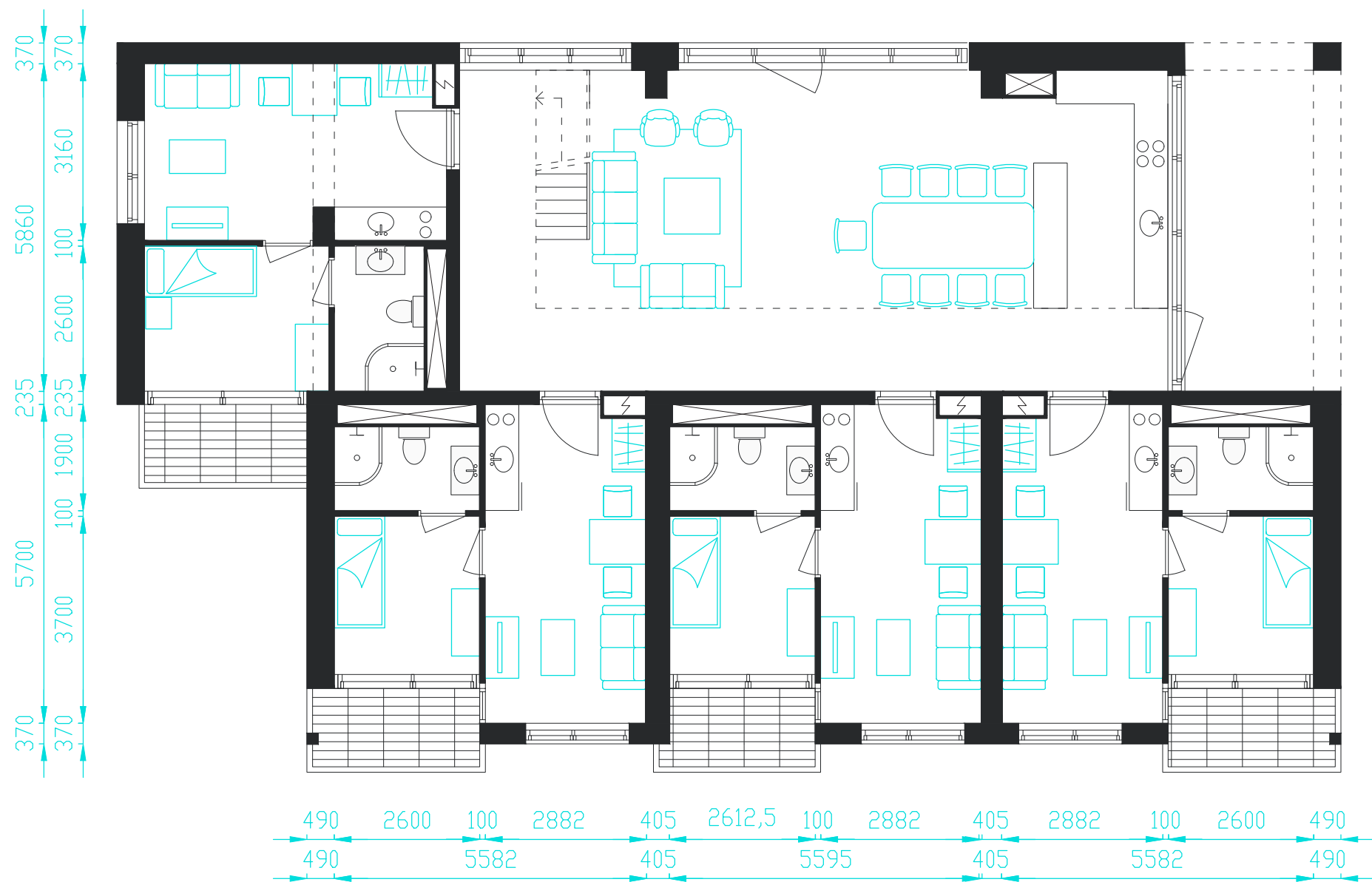
Fire-resistant plasterboard (12,5)
Studs and insulation (45)
Air gap (10)
CLT panel (120)
Insulation (120)
Waterproofing
Wooden battens
Wester red cedar facade panels (30)

Window detail

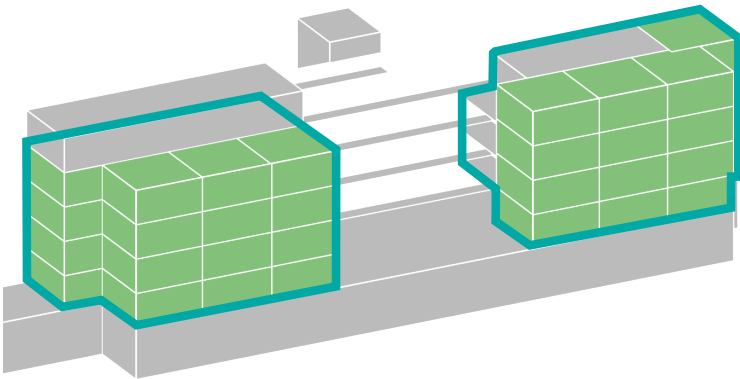
Schuco AWS 75.SI
Integrated sunshading
Black aluminium balustrade
with vertical profiles

Tower facade fragment





Typical floor plan: Dwelling block (lower part)
 Scale 1 : 100

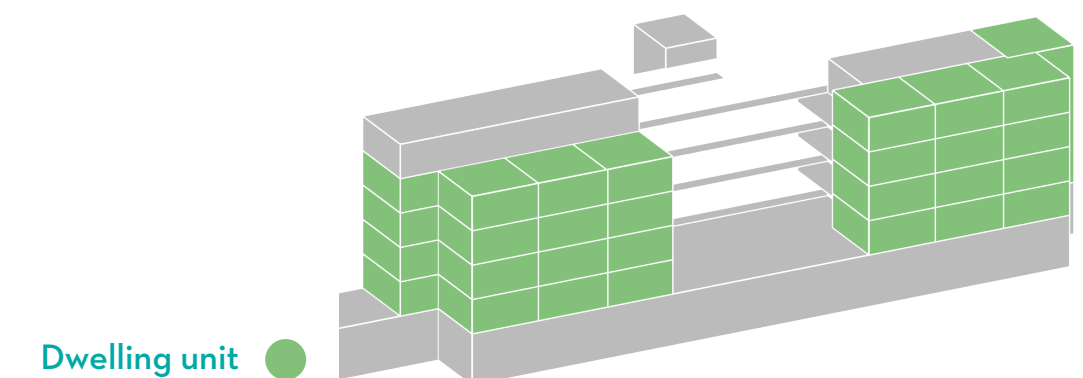
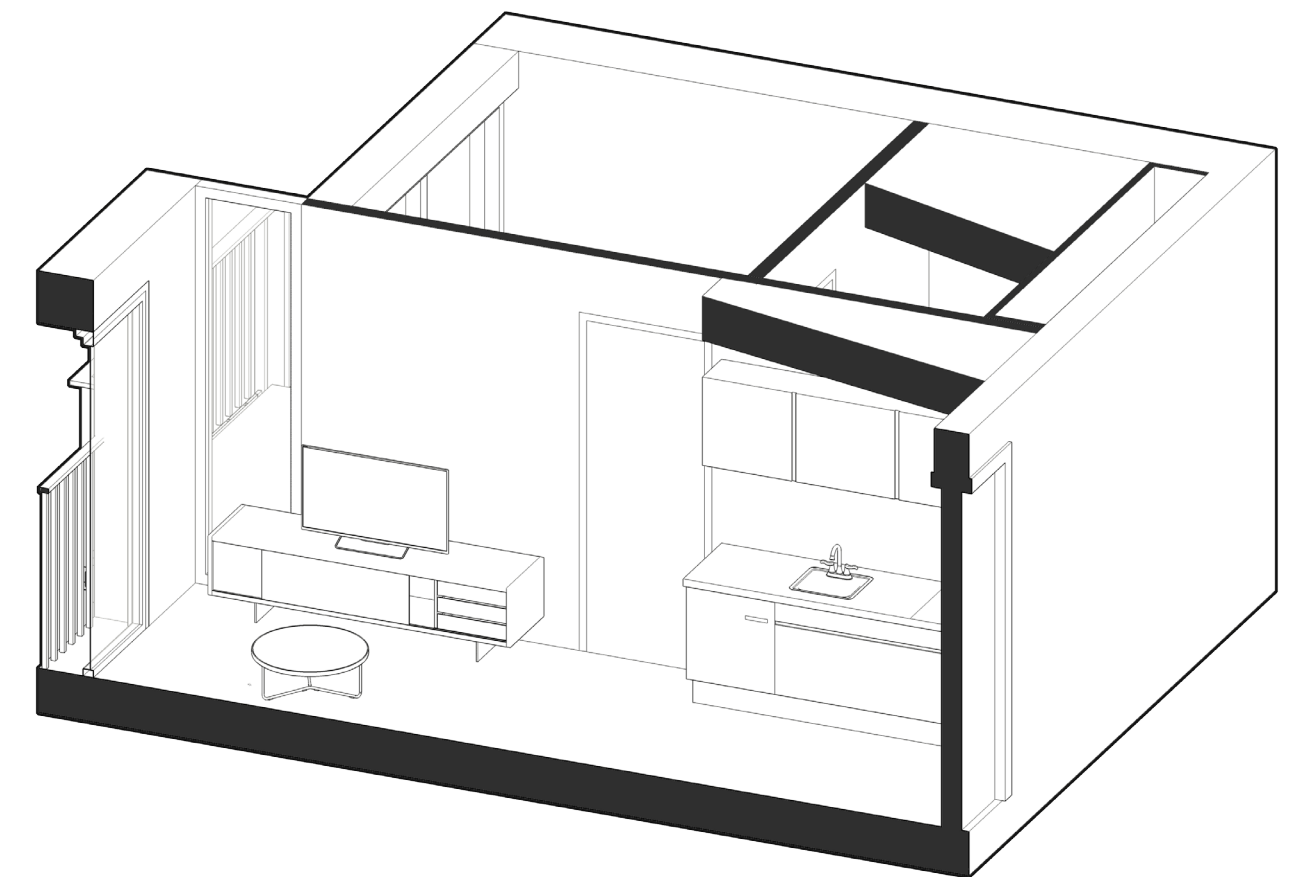




Impression
Collective living room

Dwelling unit

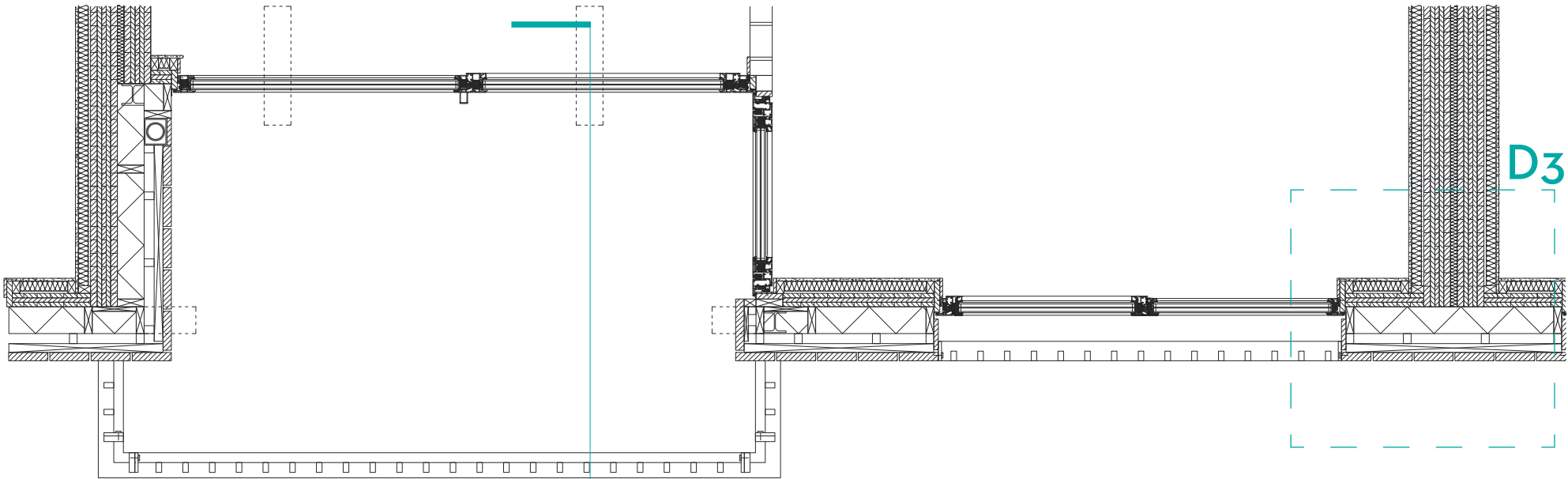
30 m² - private dwelling unit with separate living space, bedroom and bathroom - loggia as extra outdoor area





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 (60)
- Insulation (120)
- Waterproofing
- Wooden battens (85)
- Wester red cedar facade panels (37,5)



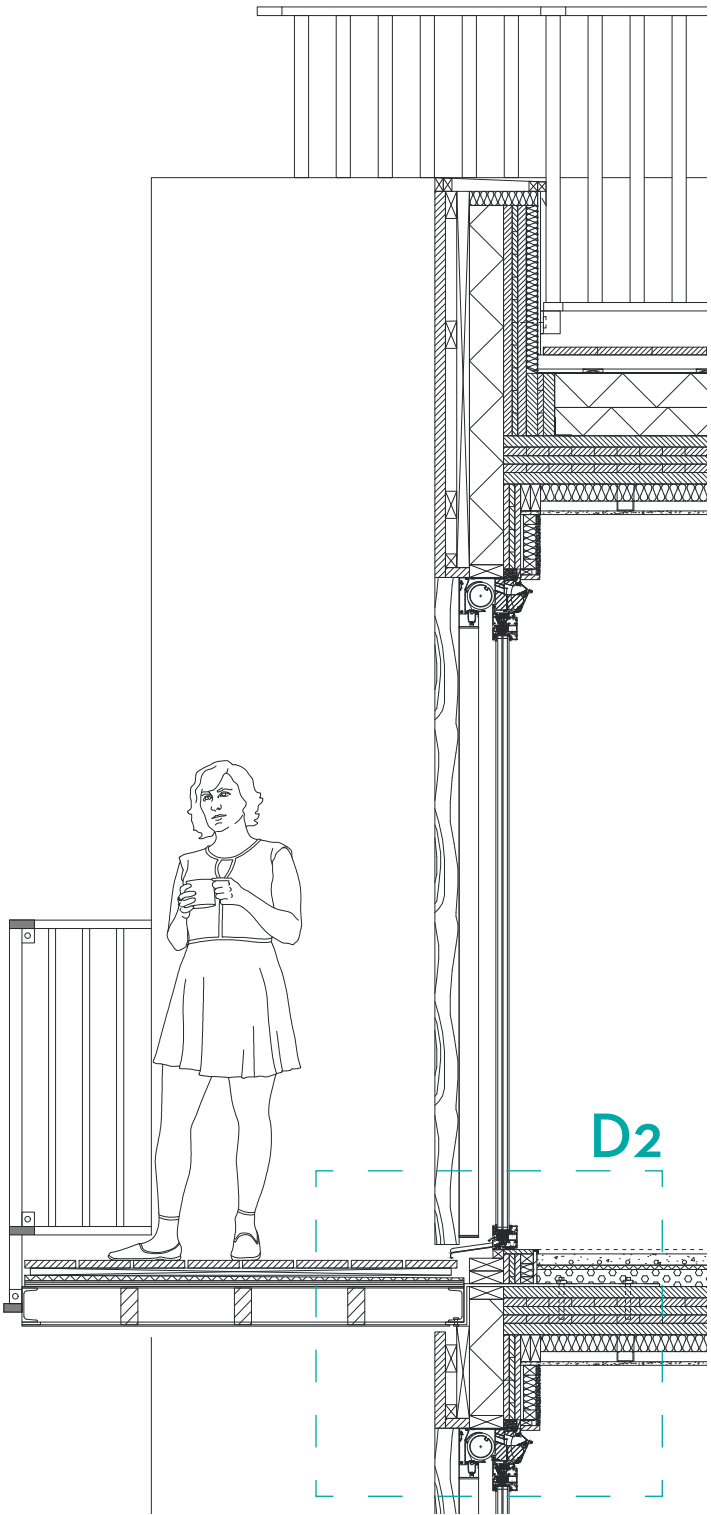
Window detail

- 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?”

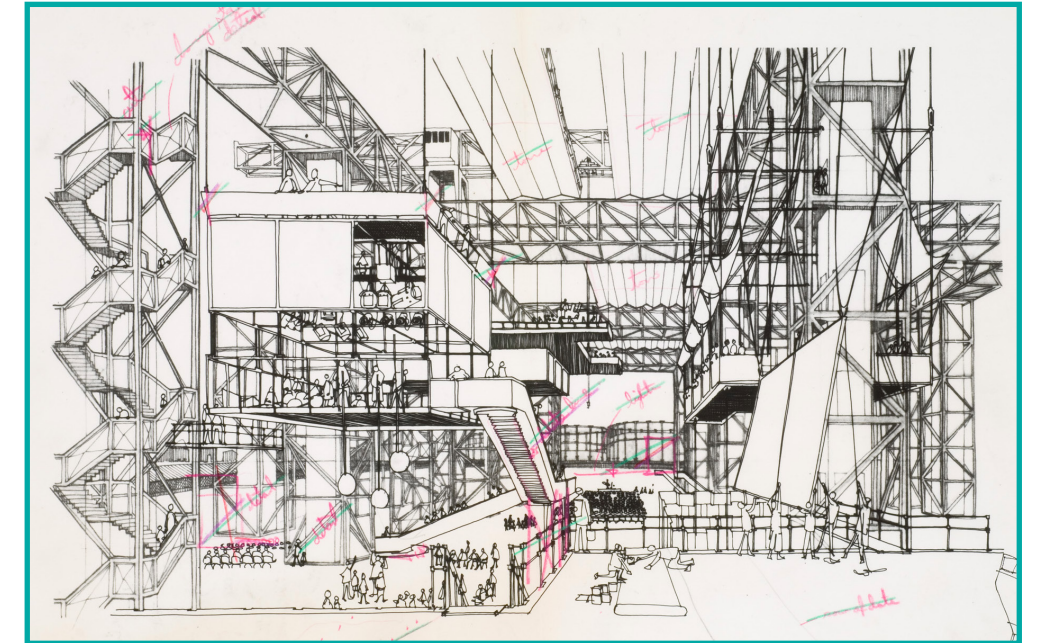
Architect Cedric Price and theater maverick Joan Littlewood joined forces to deal with this windfall of leisure: they wanted to create a place where people in a community could come together to celebrate arts, science and culture.

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

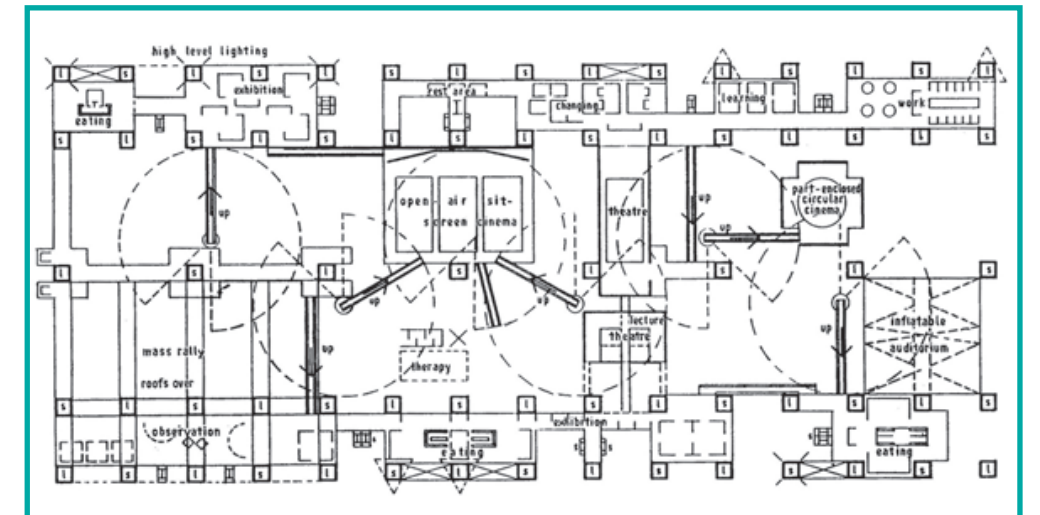
Cedric Price initiated the idea of a new kind of active and dynamic architecture that could allow several uses and would be able to adapt and change; the design interacted and responded to the different wishes of the user.

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.

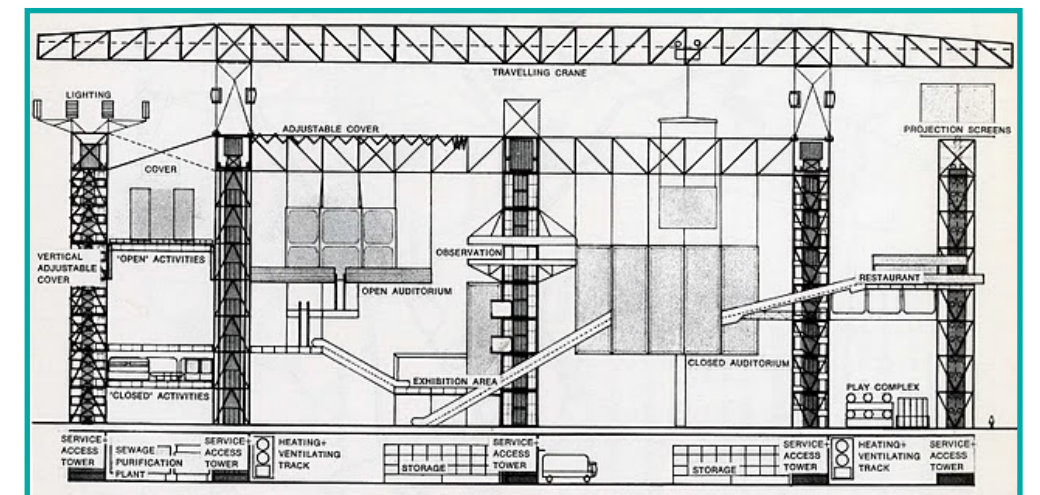
An explorative living environment facilitates and stimulates people to do activities which range from more cultural to a leisure level. It is a place where you decide what kind of nature you would like to explore.



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

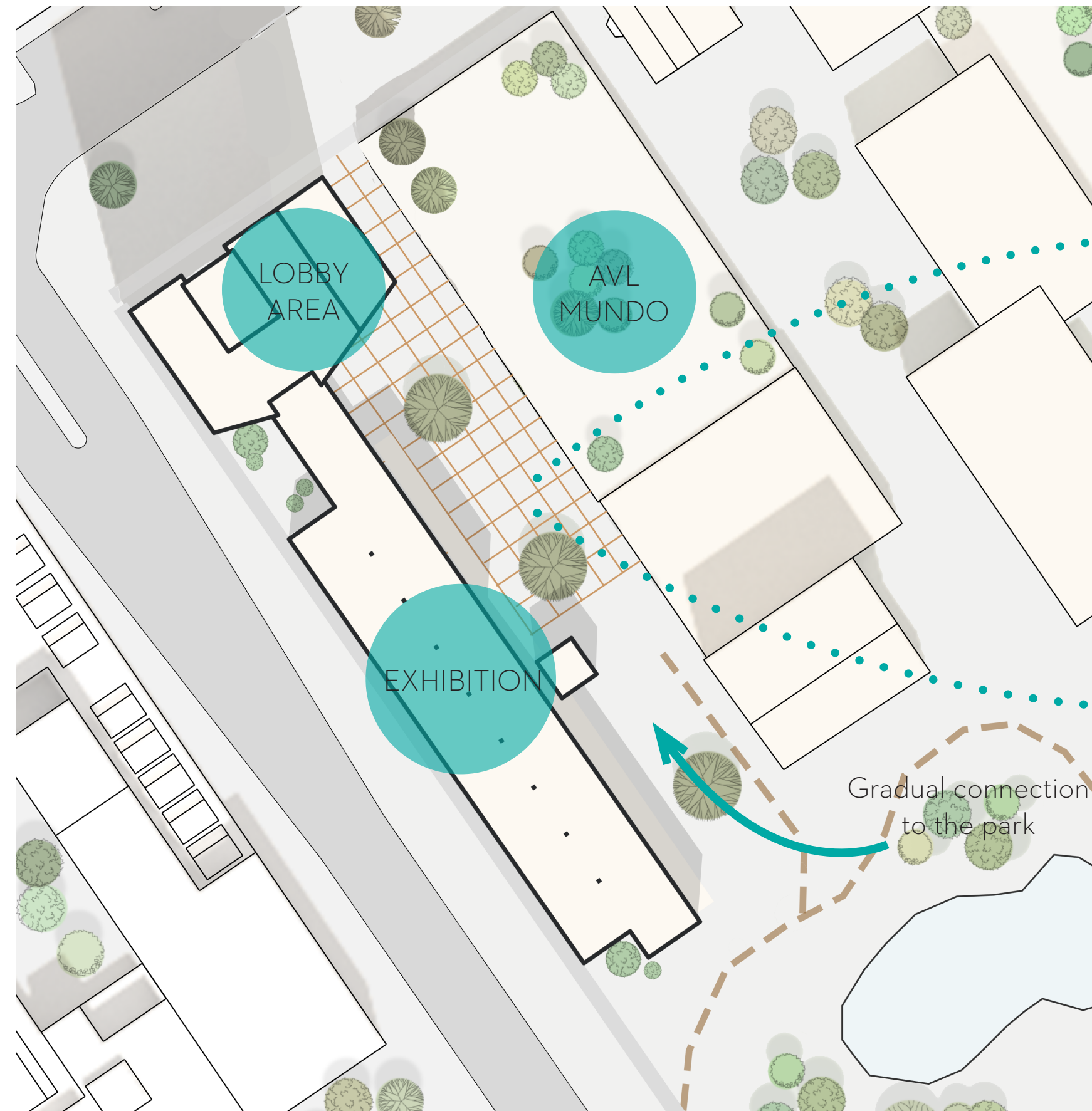


Plan drawing of the design
Source above: Mathews (2005)



Section drawing of the design
Source: Mehta (2014)

Implementation in the design



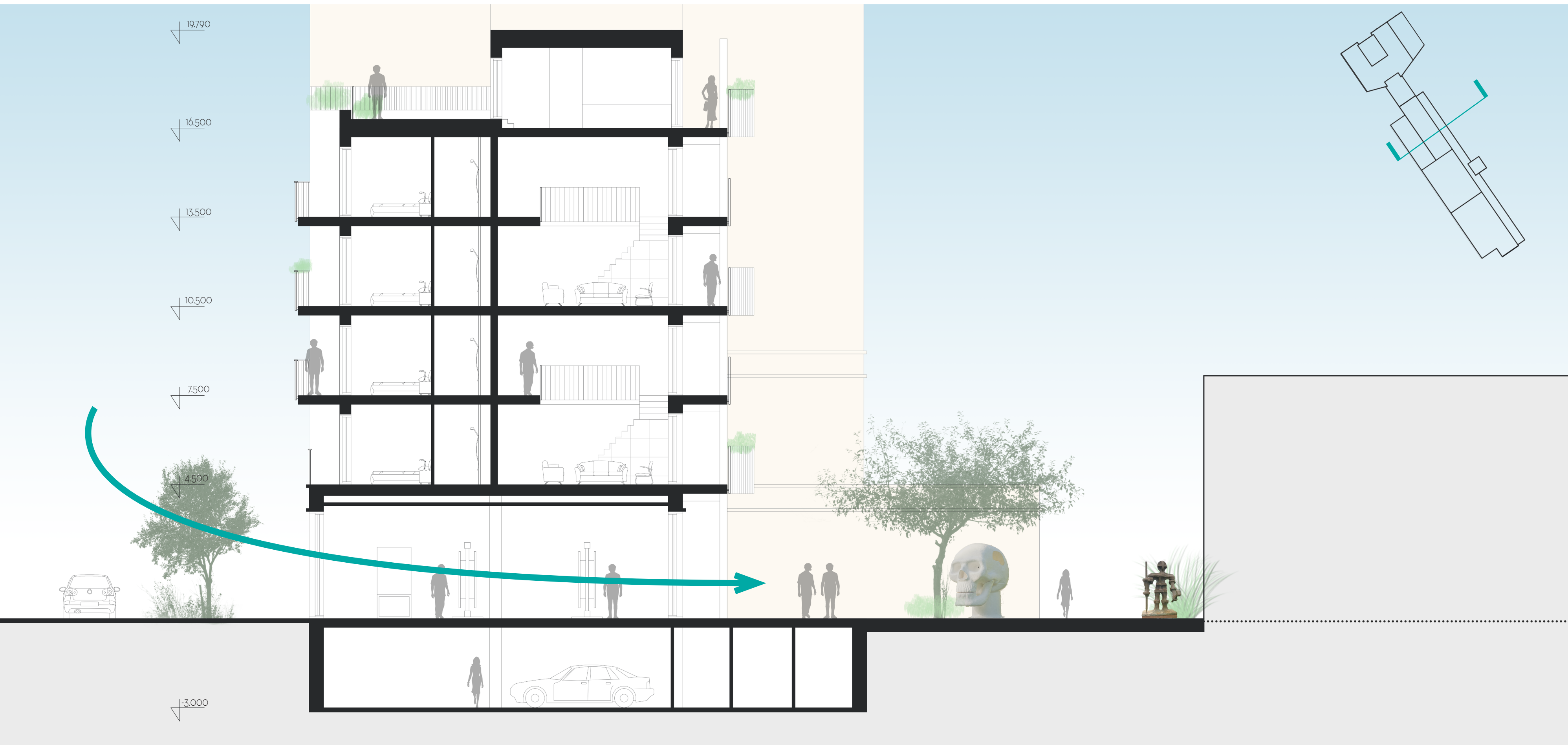
Remain the function to display art as well as organising events



Impression
Courtyard



Impression
Exhibition



Section through courtyard
Scale 1 : 100



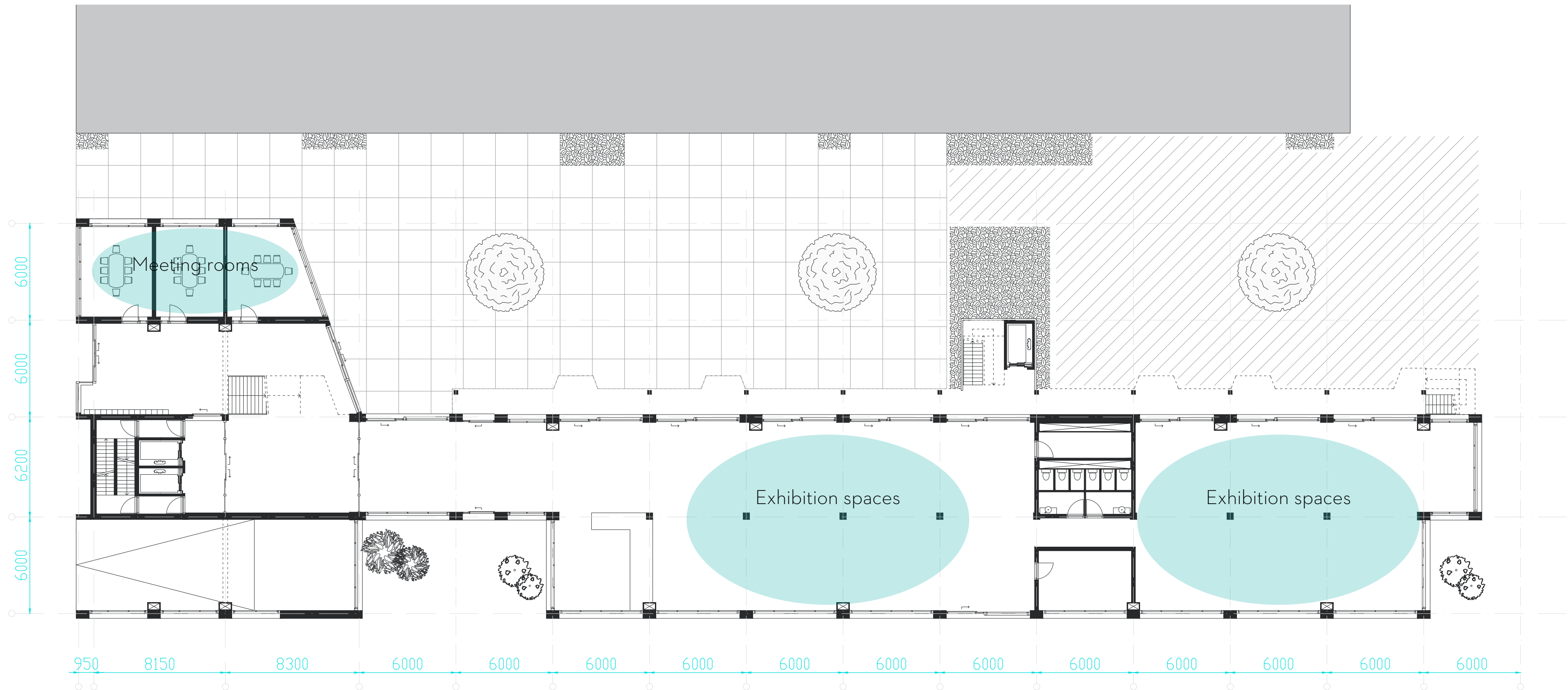
MEETING

COURTYARD

EXHIBITION

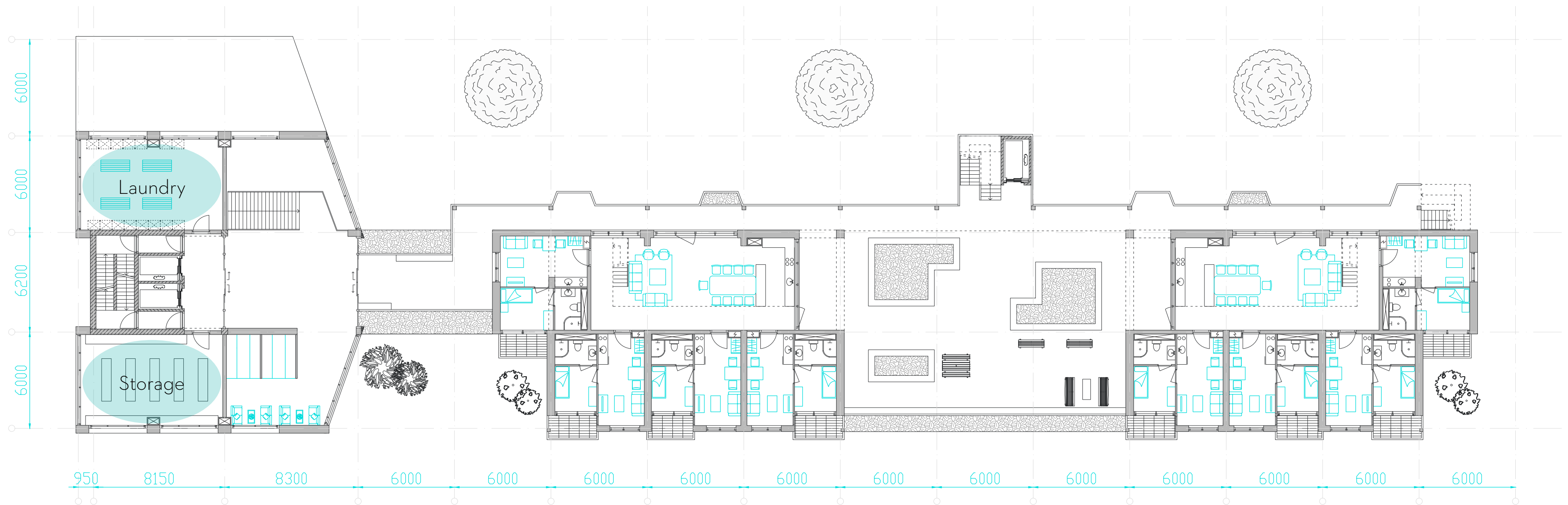
**LIFT &
STAIRS**





Ground floor
Scale 1 : 200





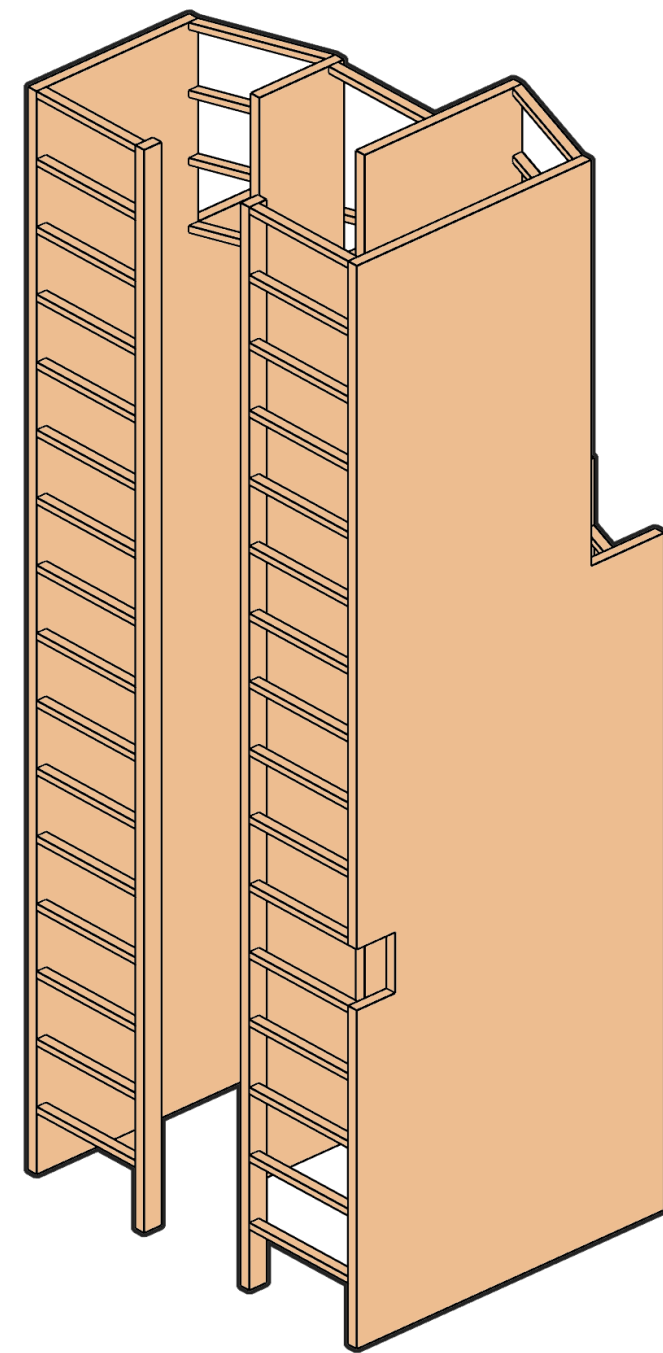
Level 1
Scale 1 : 200



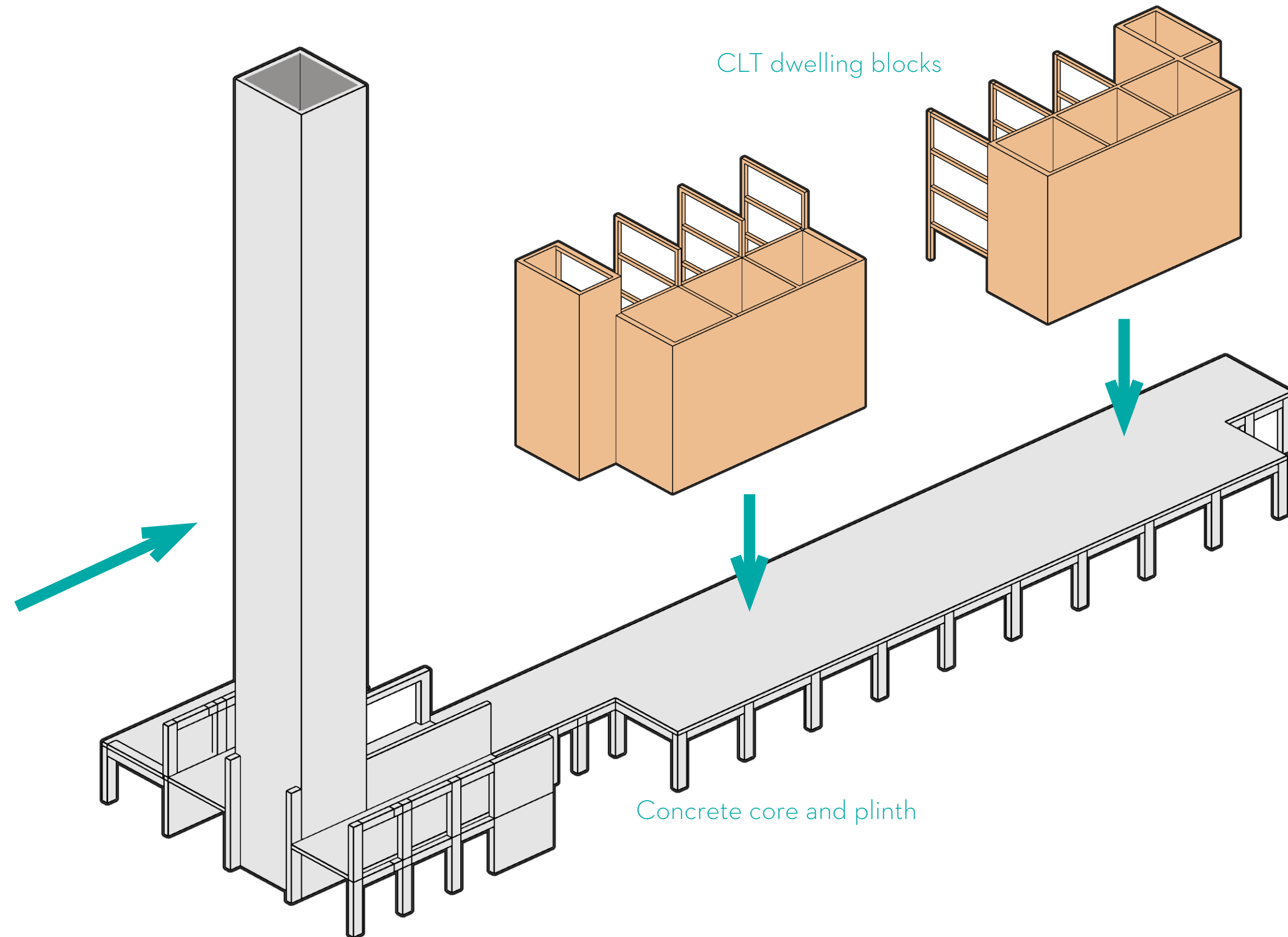
Impression
Roof garden



6. Climate and Construction



CLT Tower

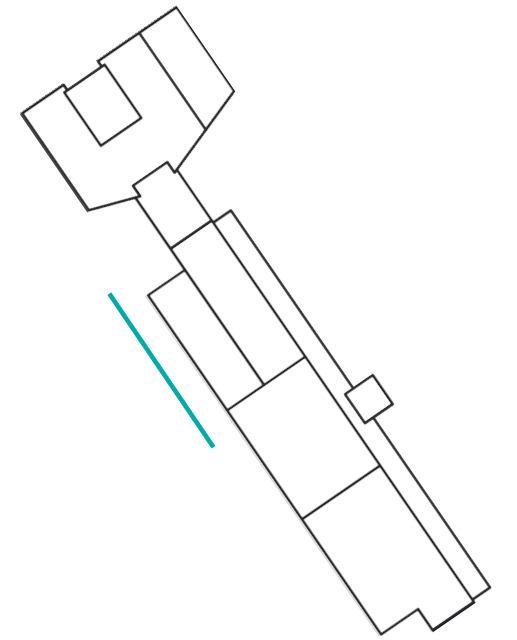
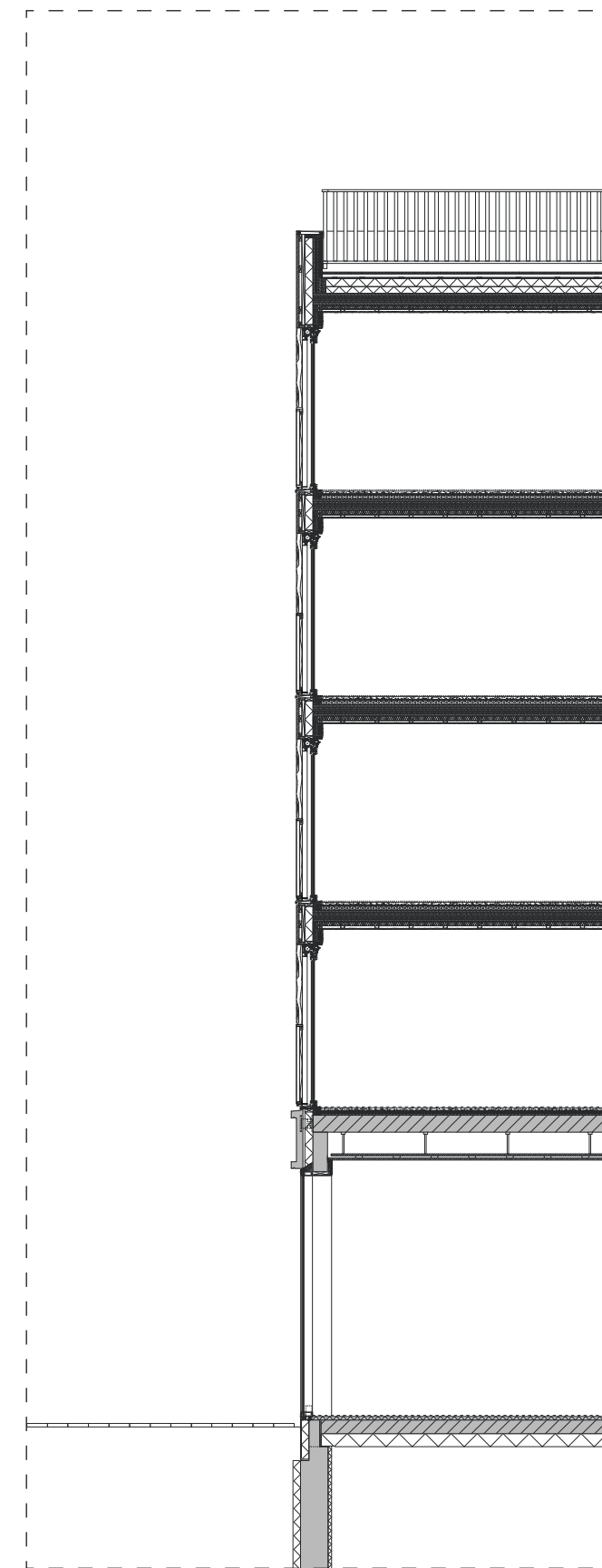


CLT dwelling blocks

Concrete core and plinth

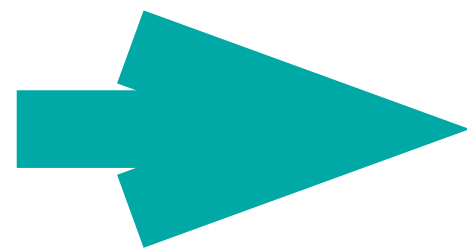
Hybrid construction of CLT with concrete core and concrete plinth

Principle of construction

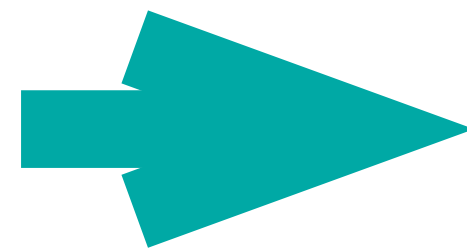


Connection from concrete to CLT

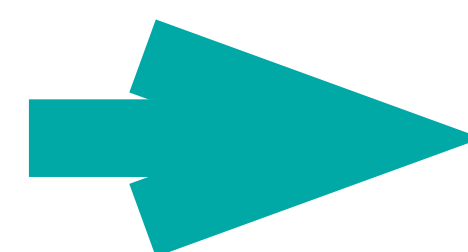
BENG 1 Passive climate design



BENG 2 Main energy sources



BENG 3 Amount of renewable energy



TO_{july} 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 CO₂ 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.

Climate principles
Achieving BENG-requirements

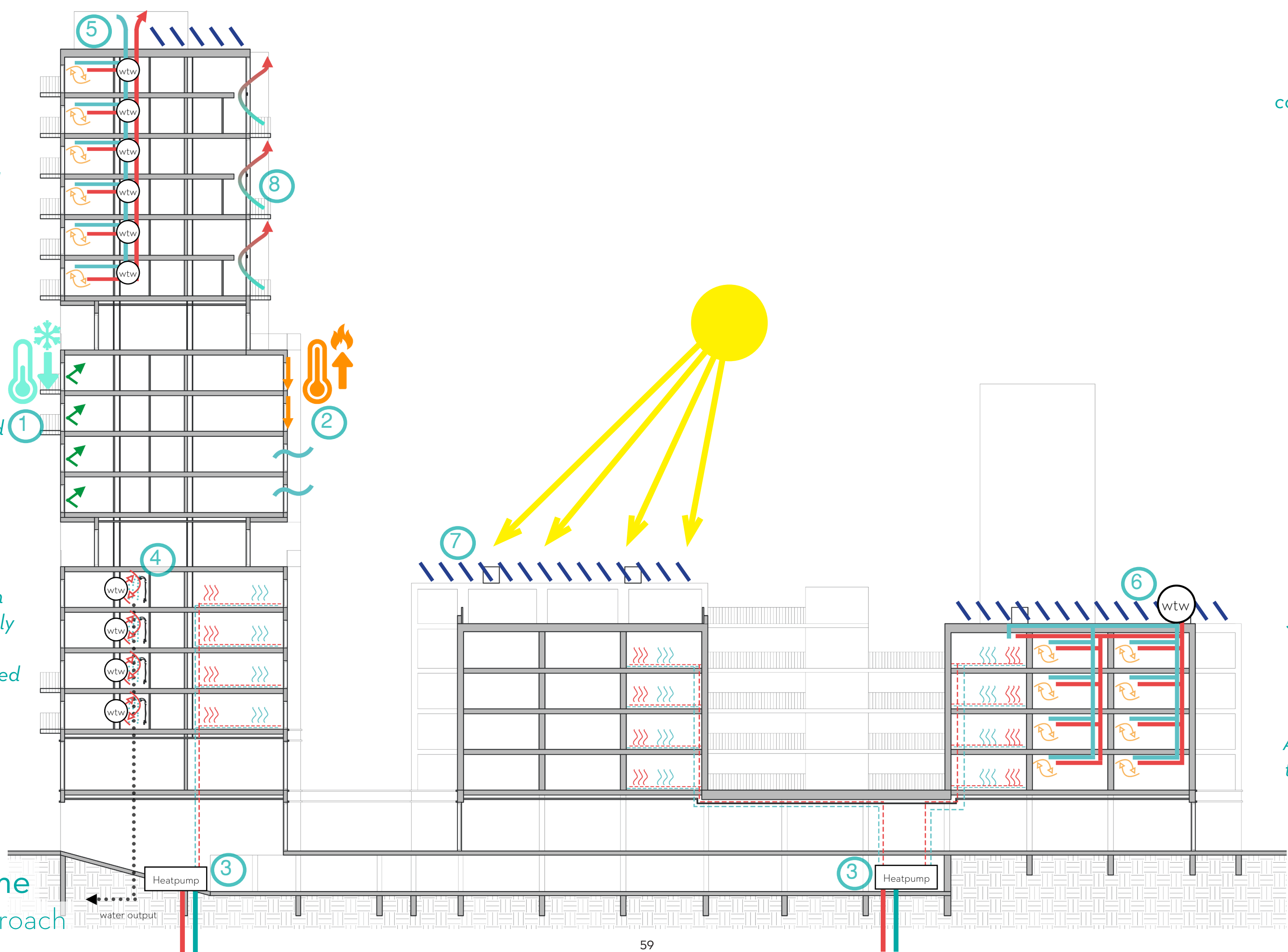
BENG 1

- 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 CO₂ regulation

Climate scheme
Systems and approach



- 6 The units in the dwelling block have collective ventilation type D with CO₂ 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_july

- 8 Summernight ventilation in the maisonnettes 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

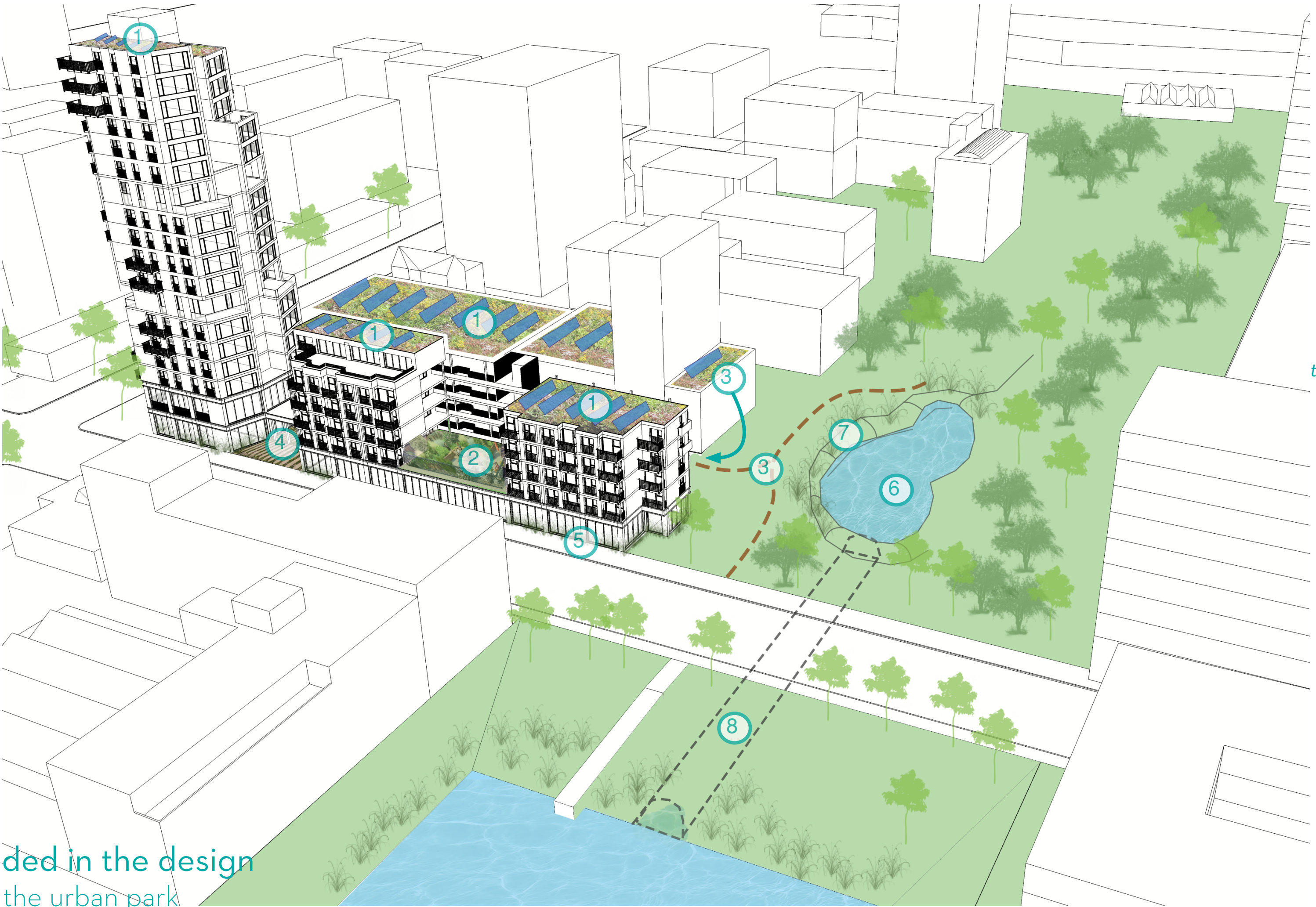
3

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



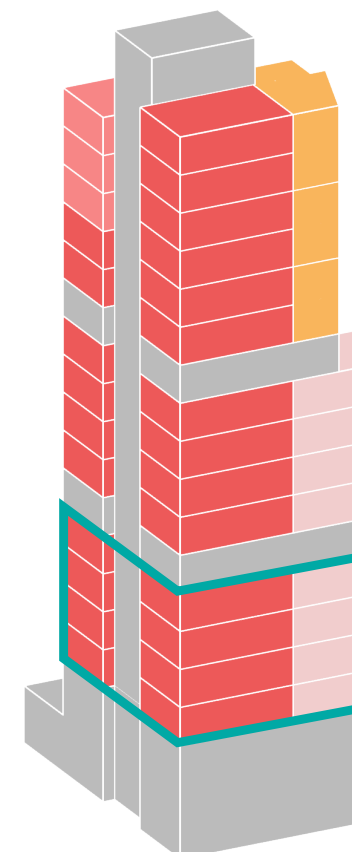
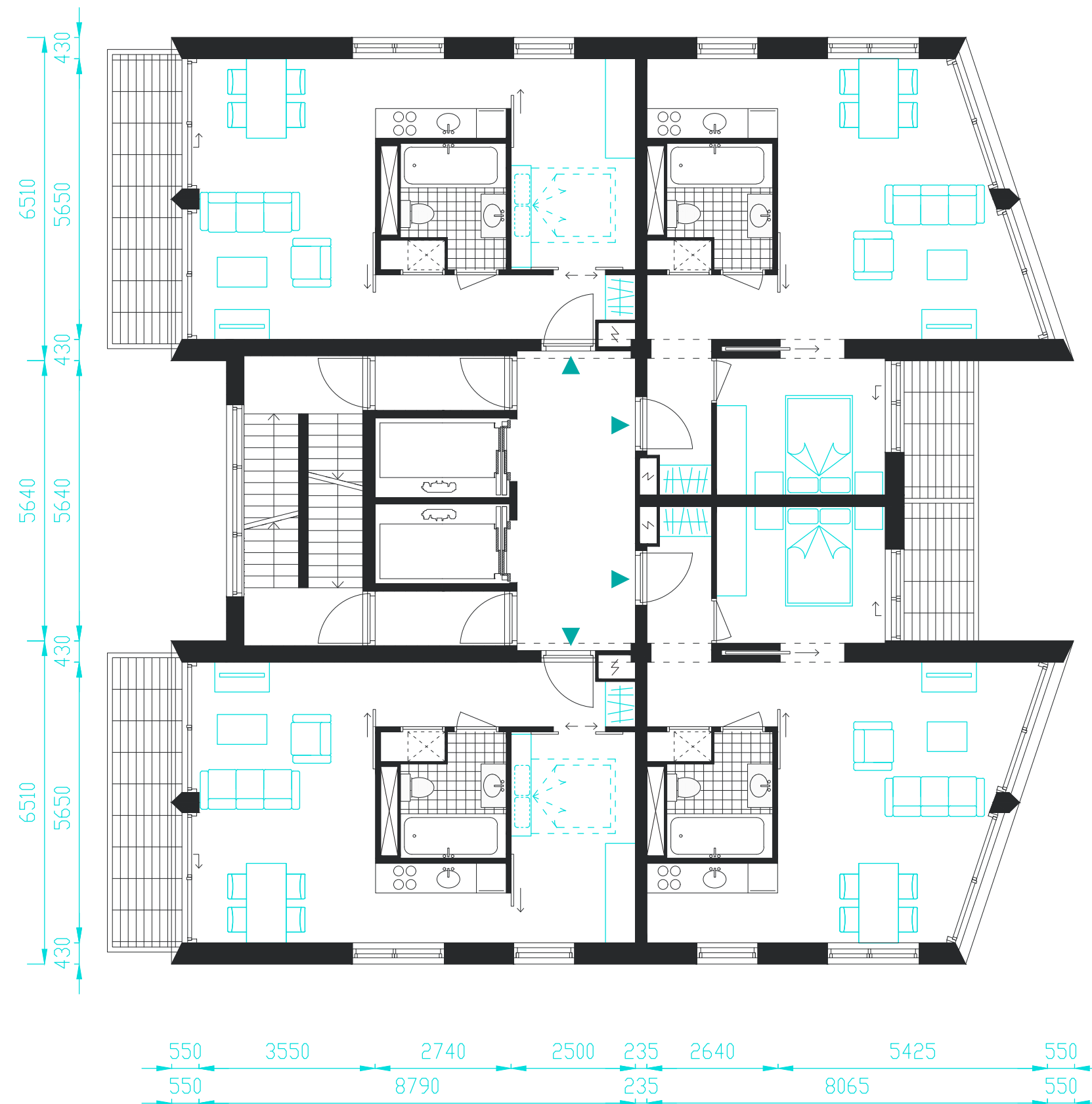


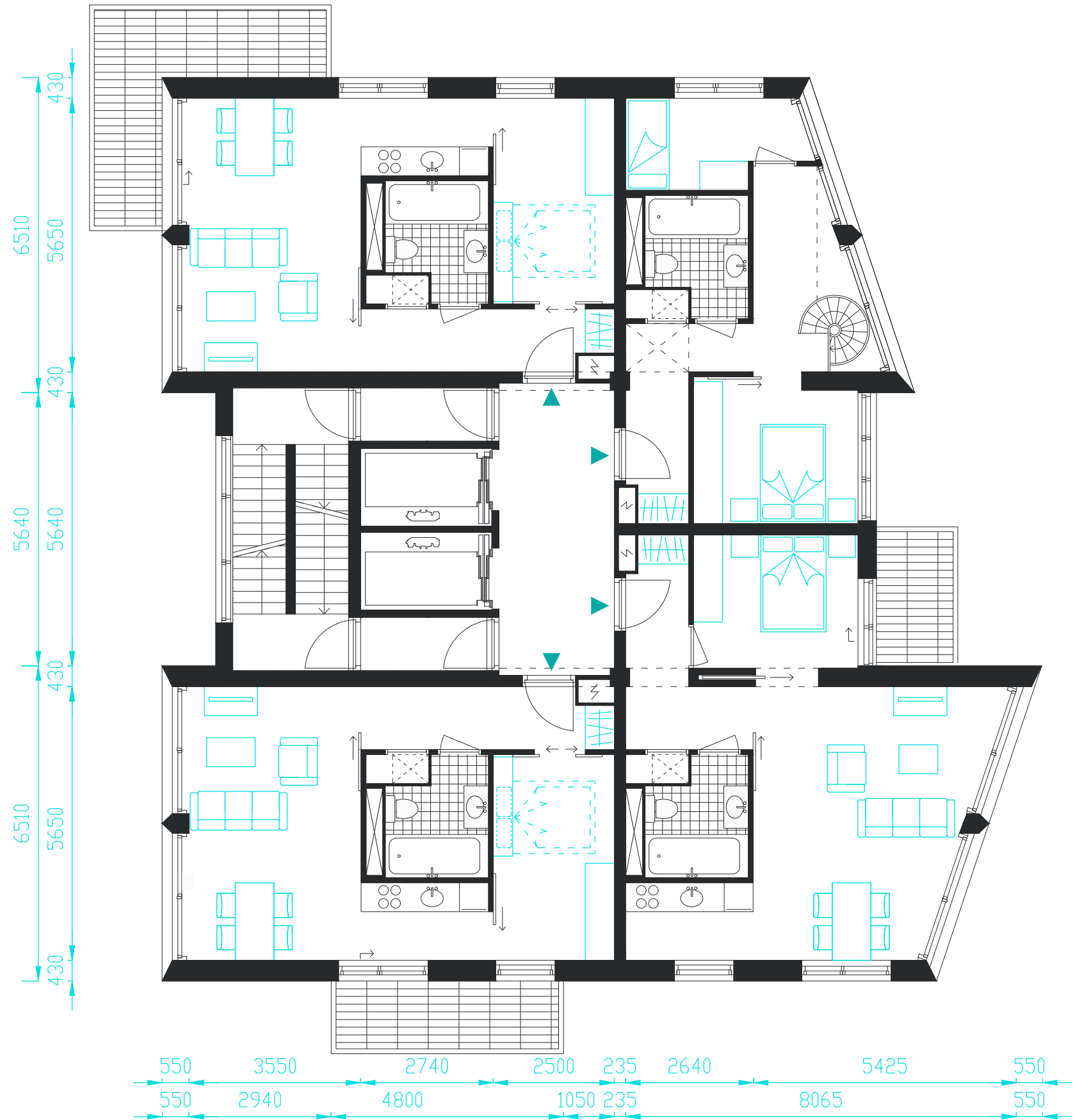
“The Fledgling needs an explorative living environment in order to maintain its exploring lifestyle, seeking to develop him- or herself as an individual”

Thank you for your attention!

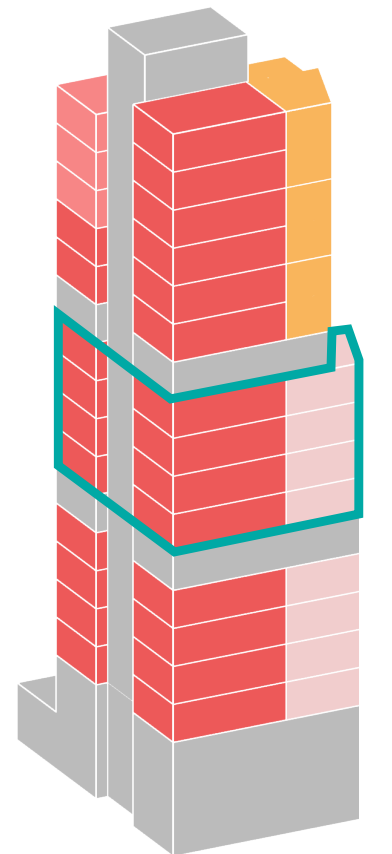


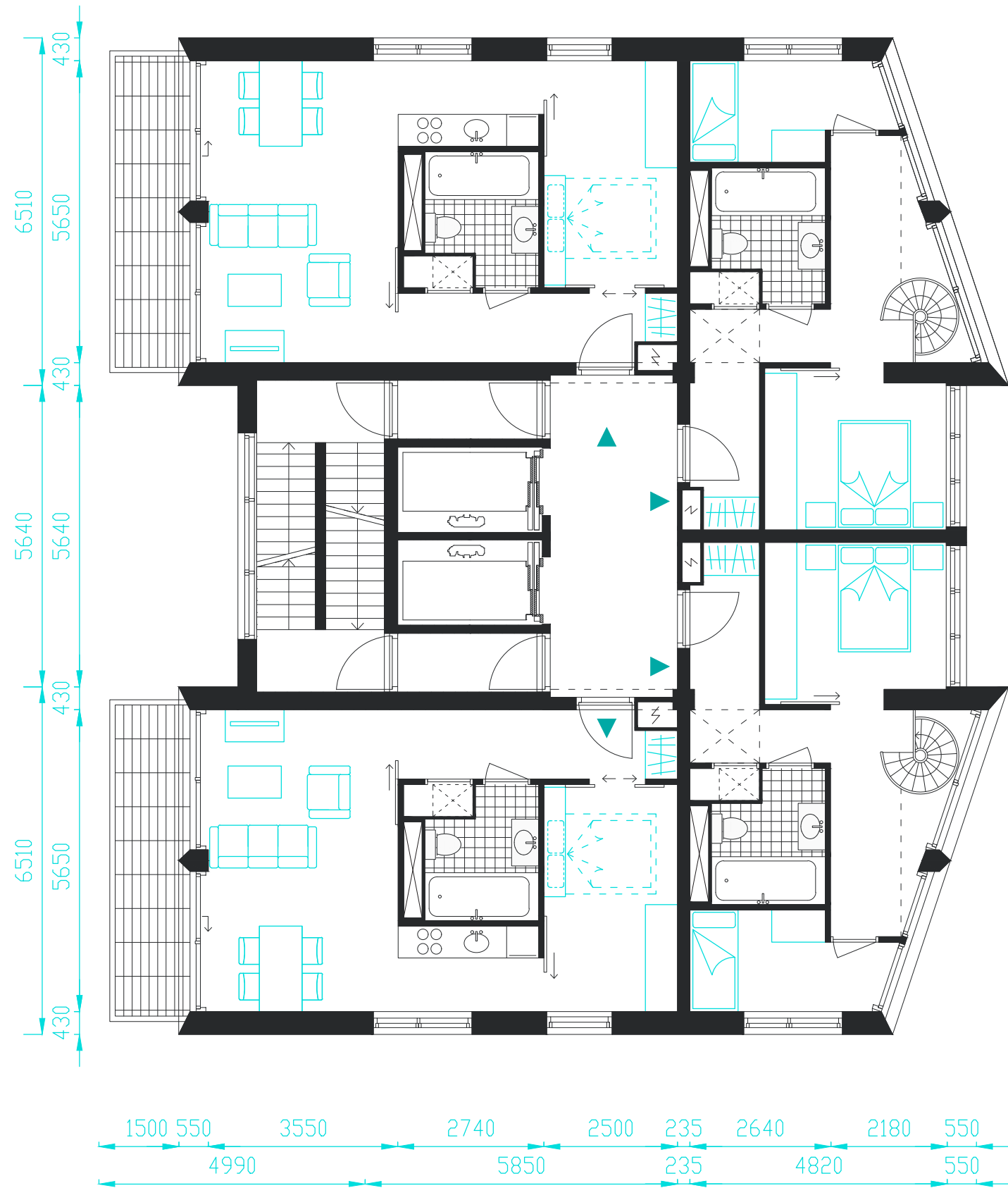
Typical floor plan: Tower lvl. 3-6
Scale 1 : 100



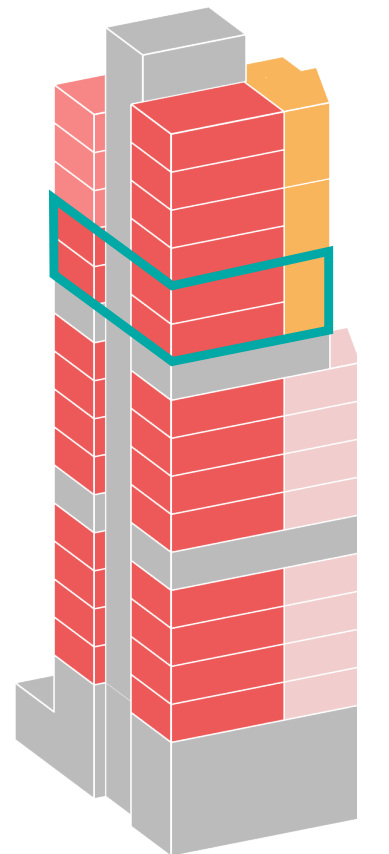


Typical floor plan: Tower lvl. 8-11
Scale 1 : 100



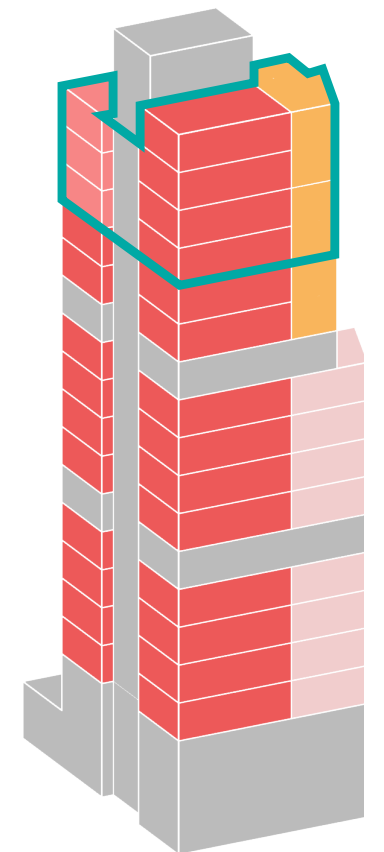
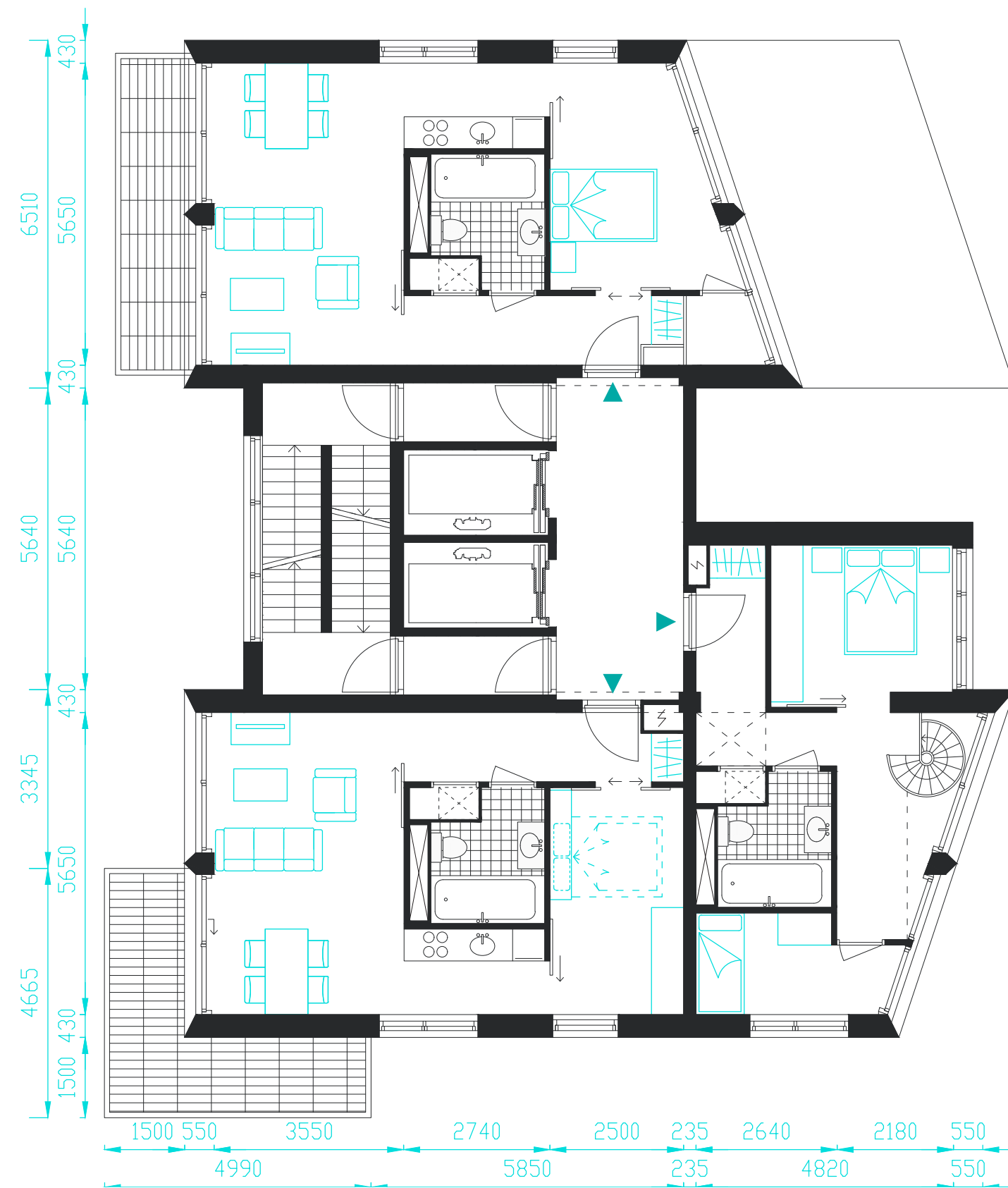


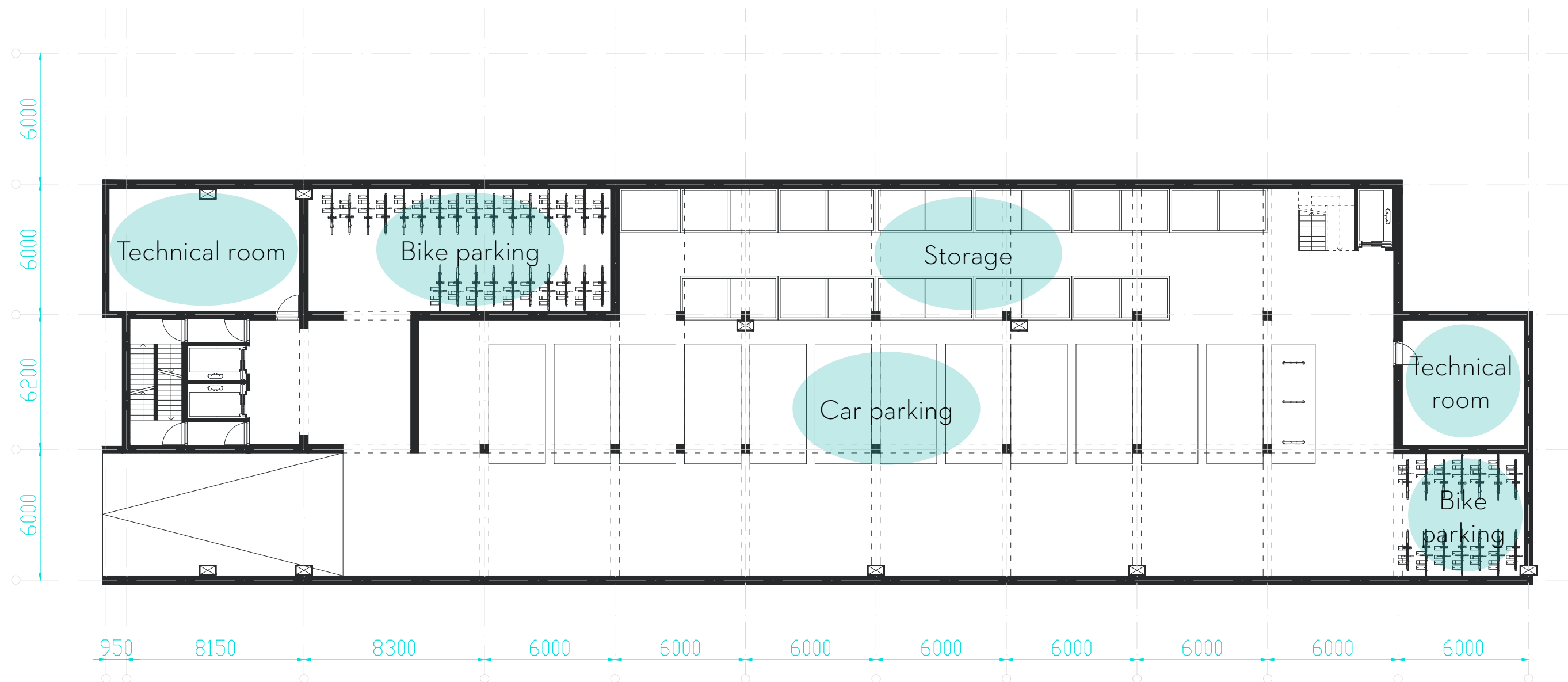
Typical floor plan: Tower lvl. 13 & 14
Scale 1 : 100





Typical floor plan: Tower lvl. 15-17
Scale 1 : 100





12 car parking spaces

80 bike parking spaces

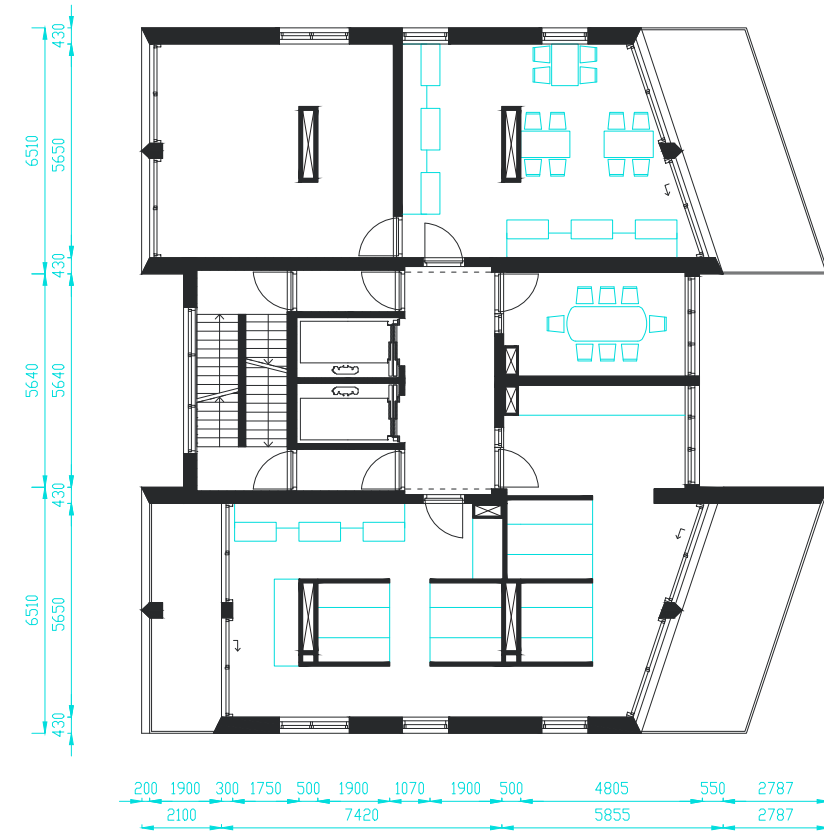
6 scooter parking spaces

23 individual storages

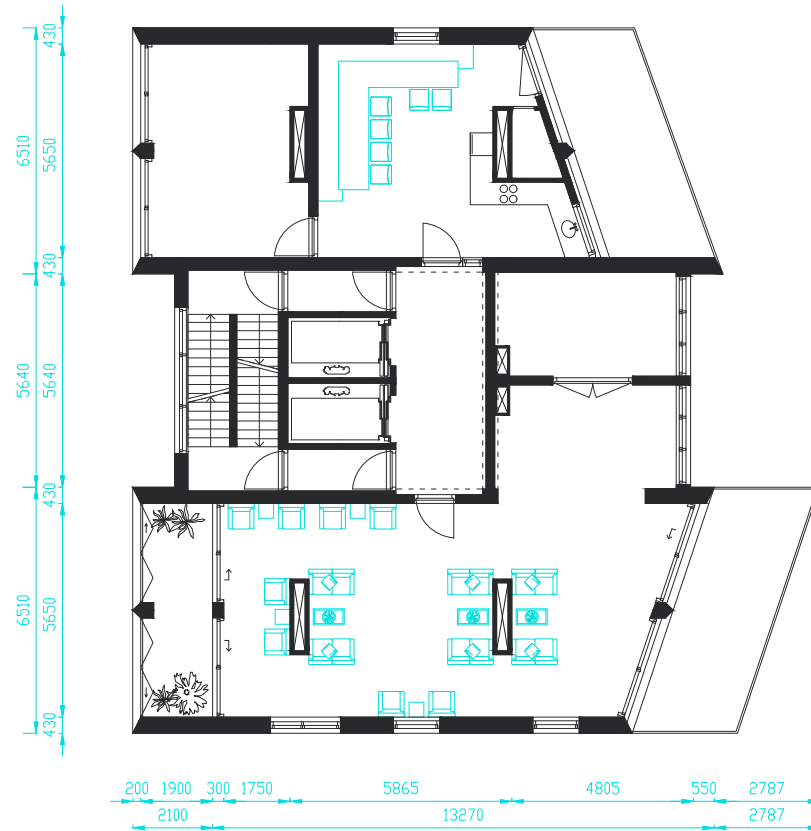


Basement
Scale 1 : 200

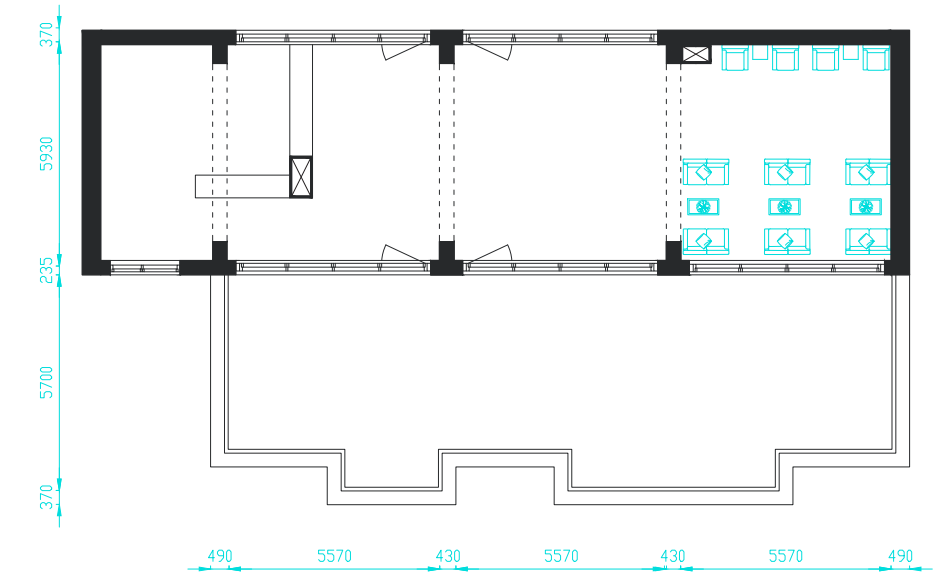
Collectieve voorzieningen



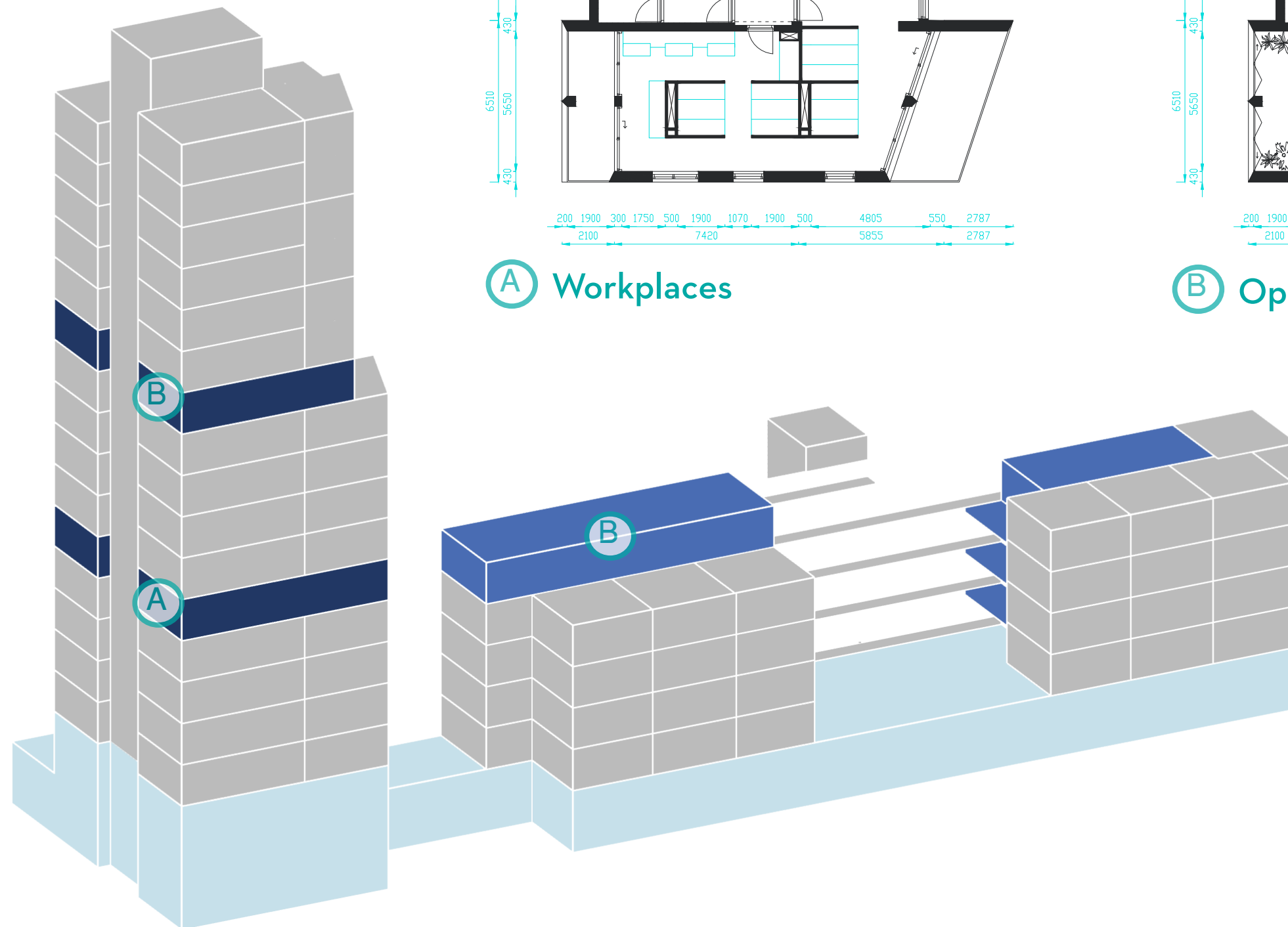
A Workplaces



B Open living room and kitchen



C Open living room and terrace



A Workplaces

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)

D1 Facade detail

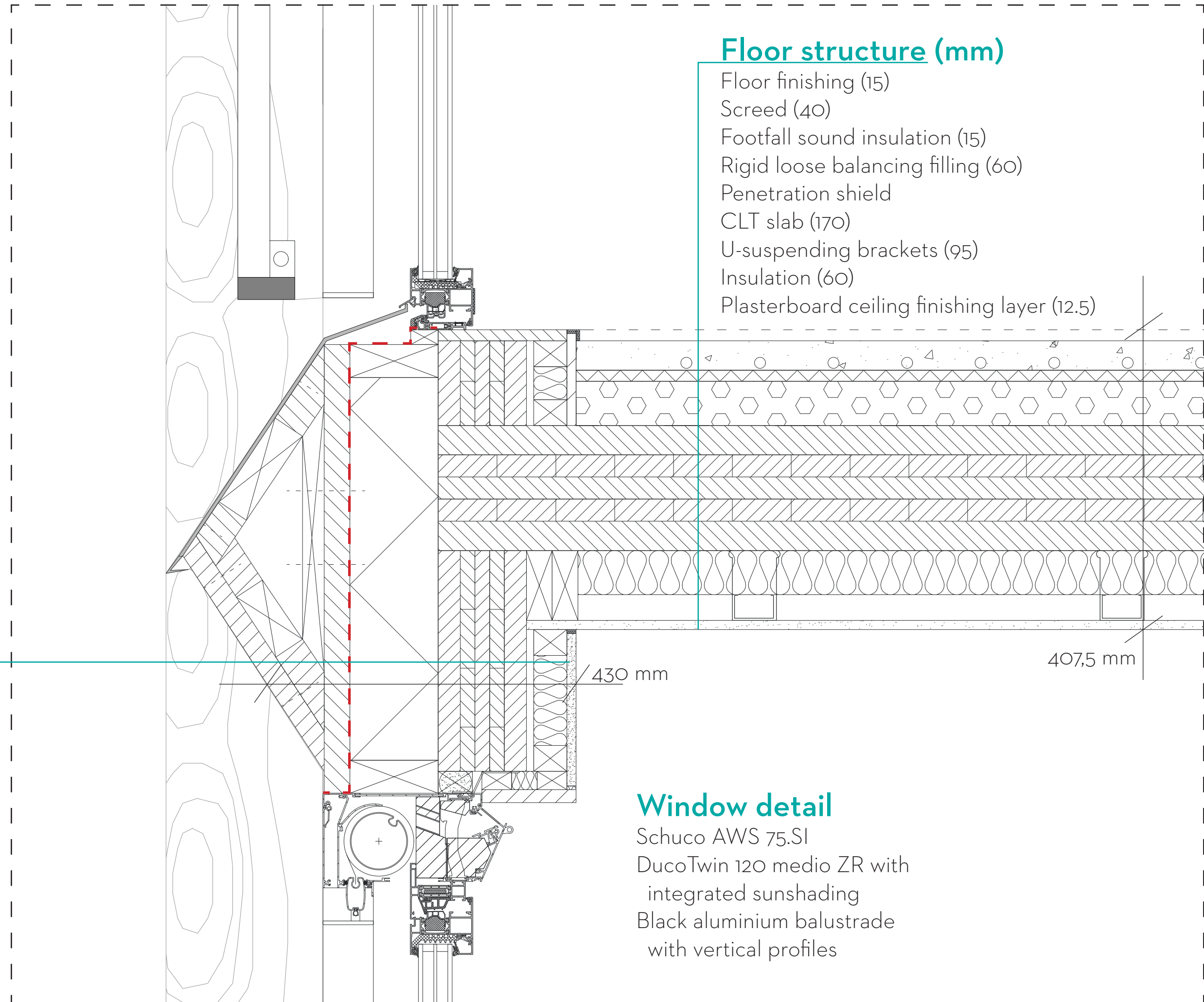
Scale 1 : 5

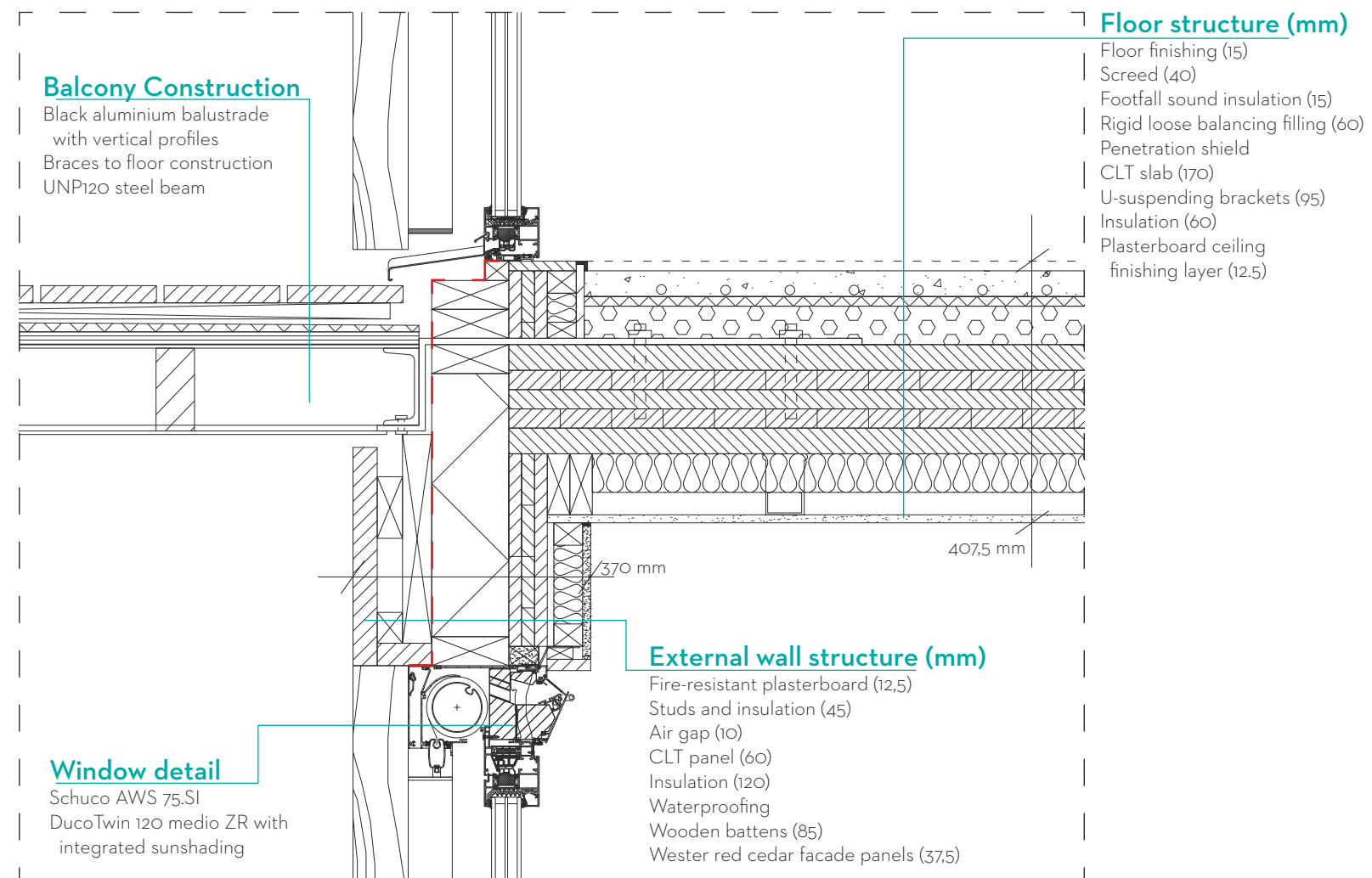
Floor structure (mm)

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)

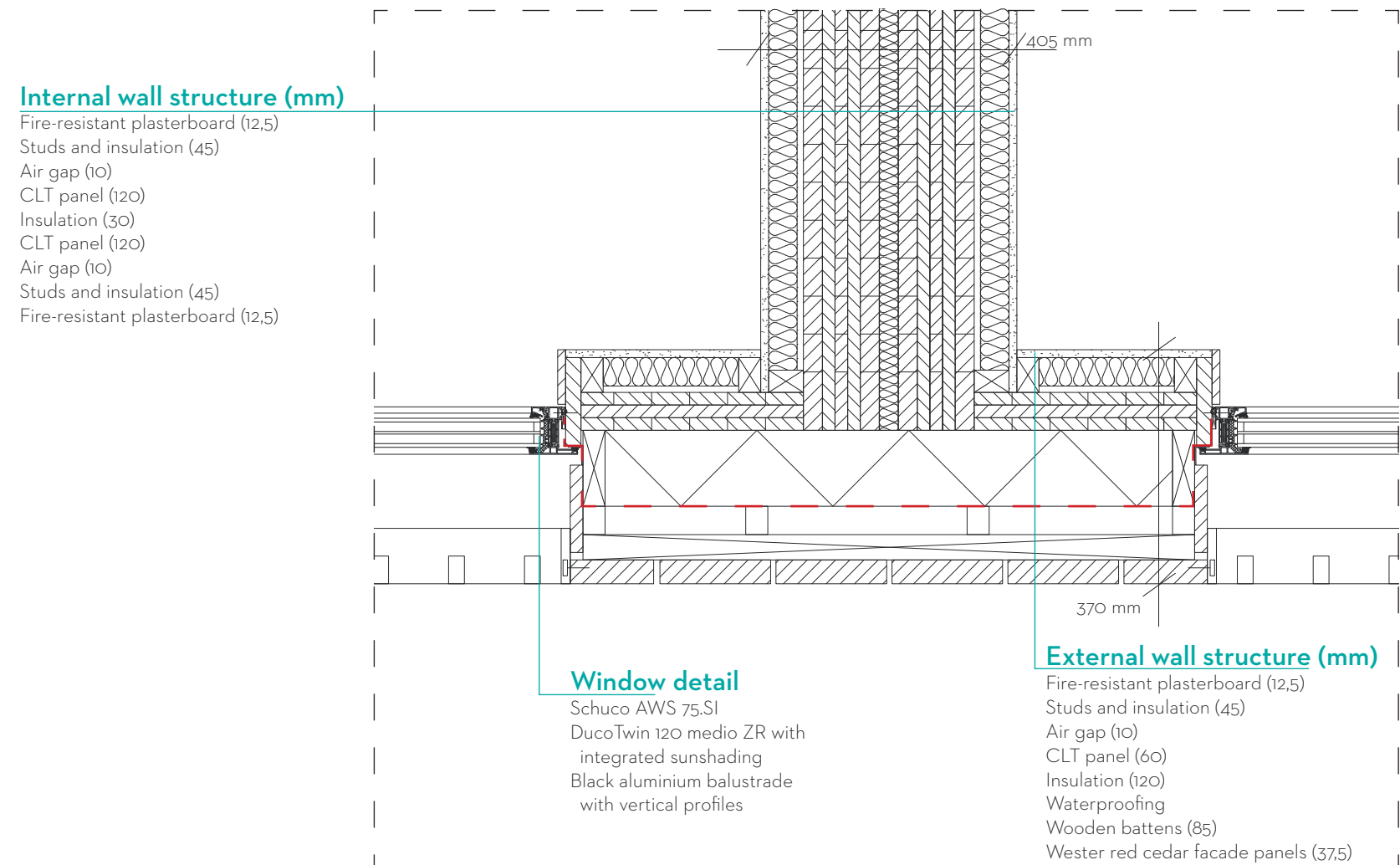
Window detail

Schuco AWS 75.SI
DucoTwin 120 medio ZR with
integrated sunshading
Black aluminium balustrade
with vertical profiles





D2 Balcony detail



D3 Horizontal detail

D2 & D3 details

Scale 1 : 10

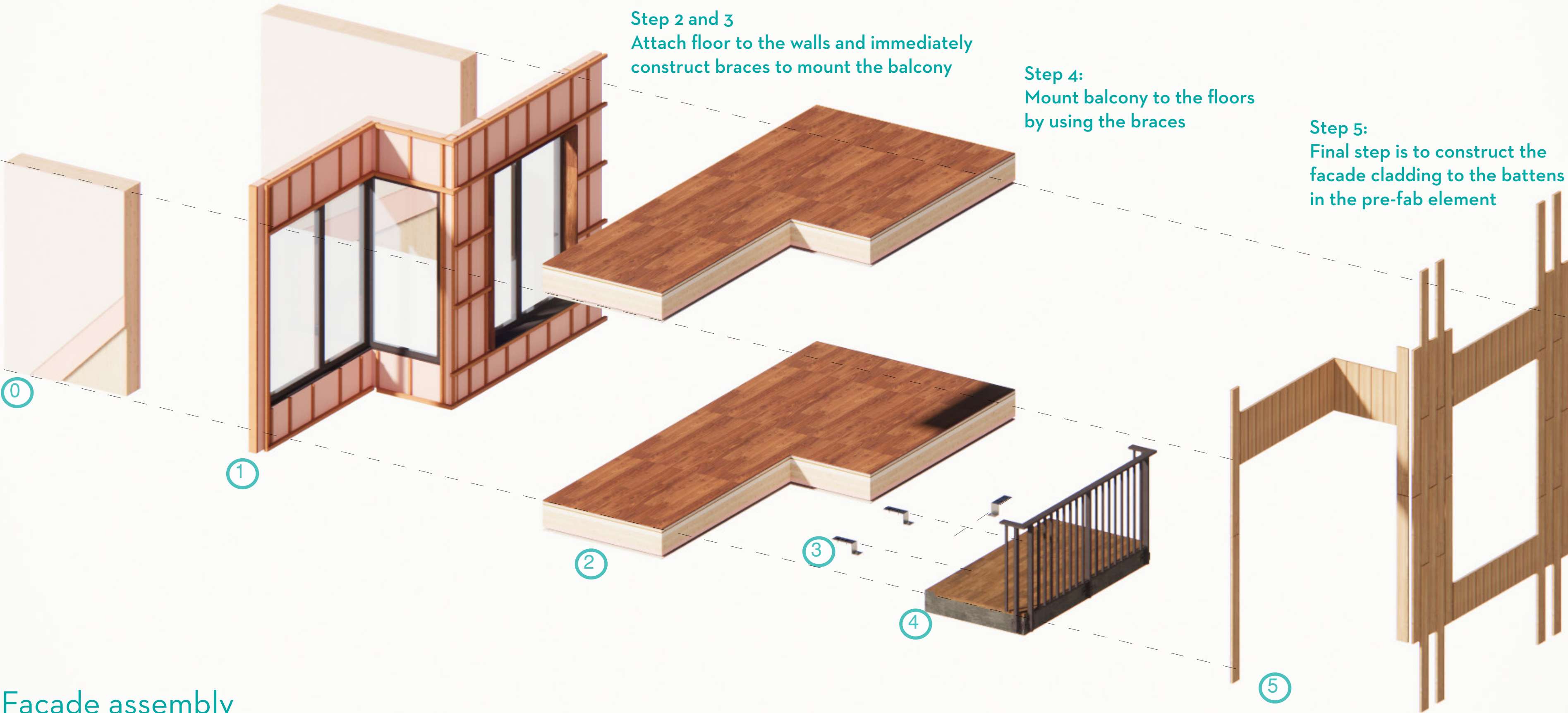
Start:
Wall construction as
starting point

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

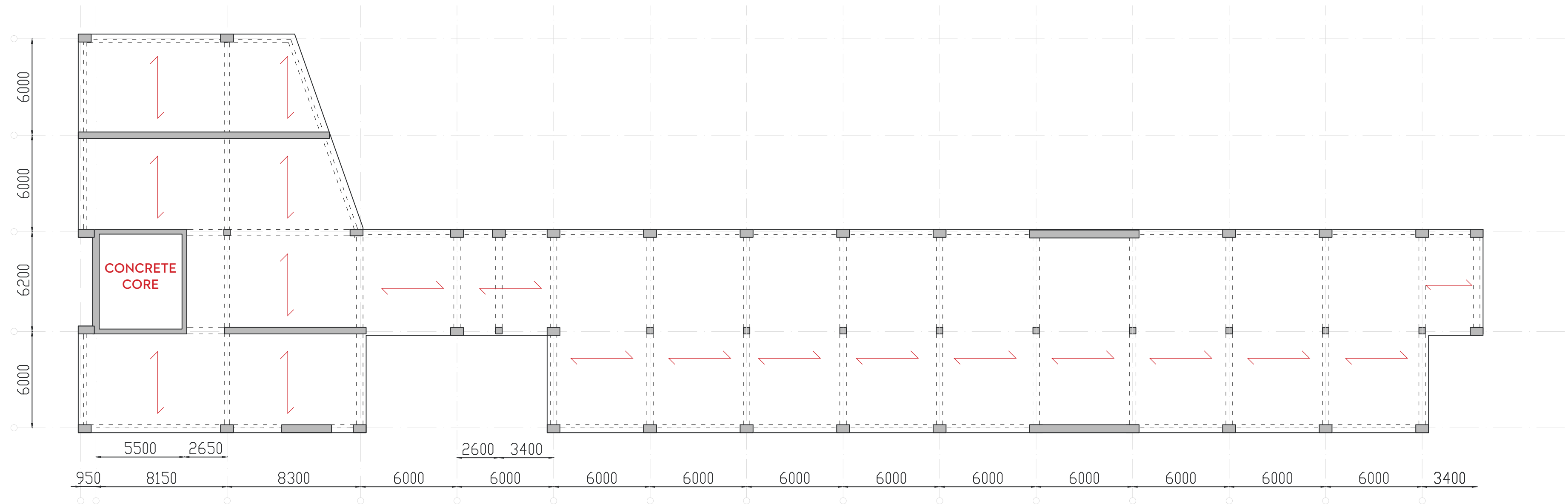
Step 2 and 3
Attach floor to the walls and immediately
construct braces to mount the balcony

Step 4:
Mount balcony to the floors
by using the braces

Step 5:
Final step is to construct the
facade cladding to the battens
in the pre-fab element

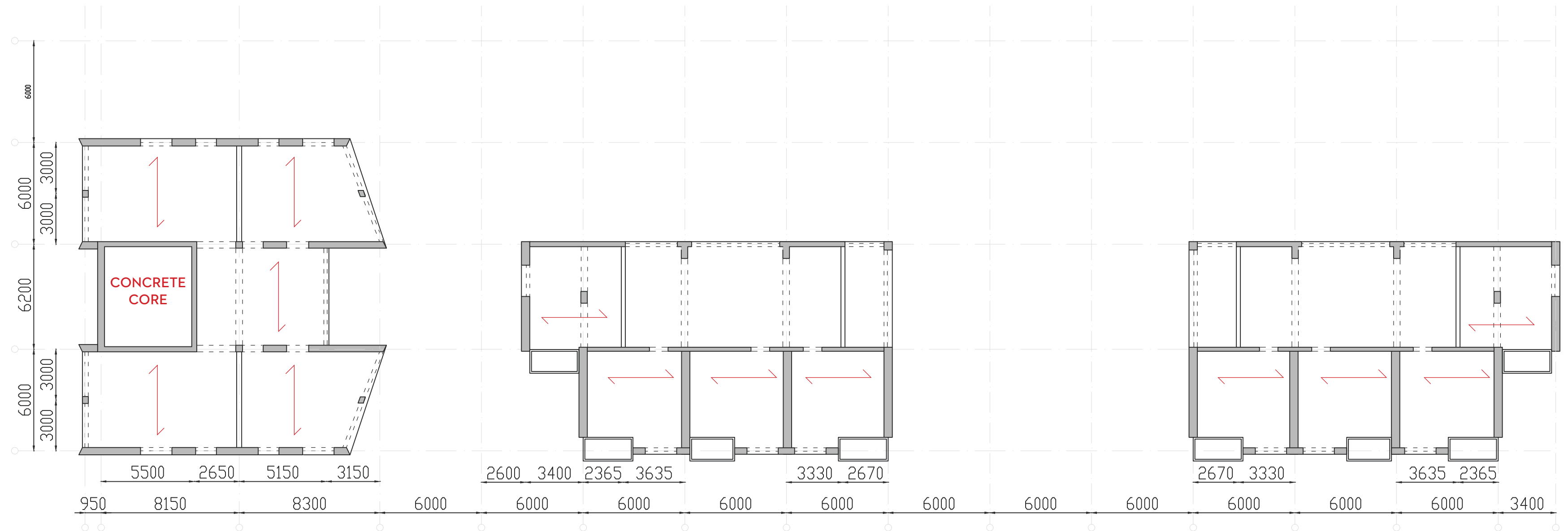


Facade assembly
CLT structure with pre-fab elements



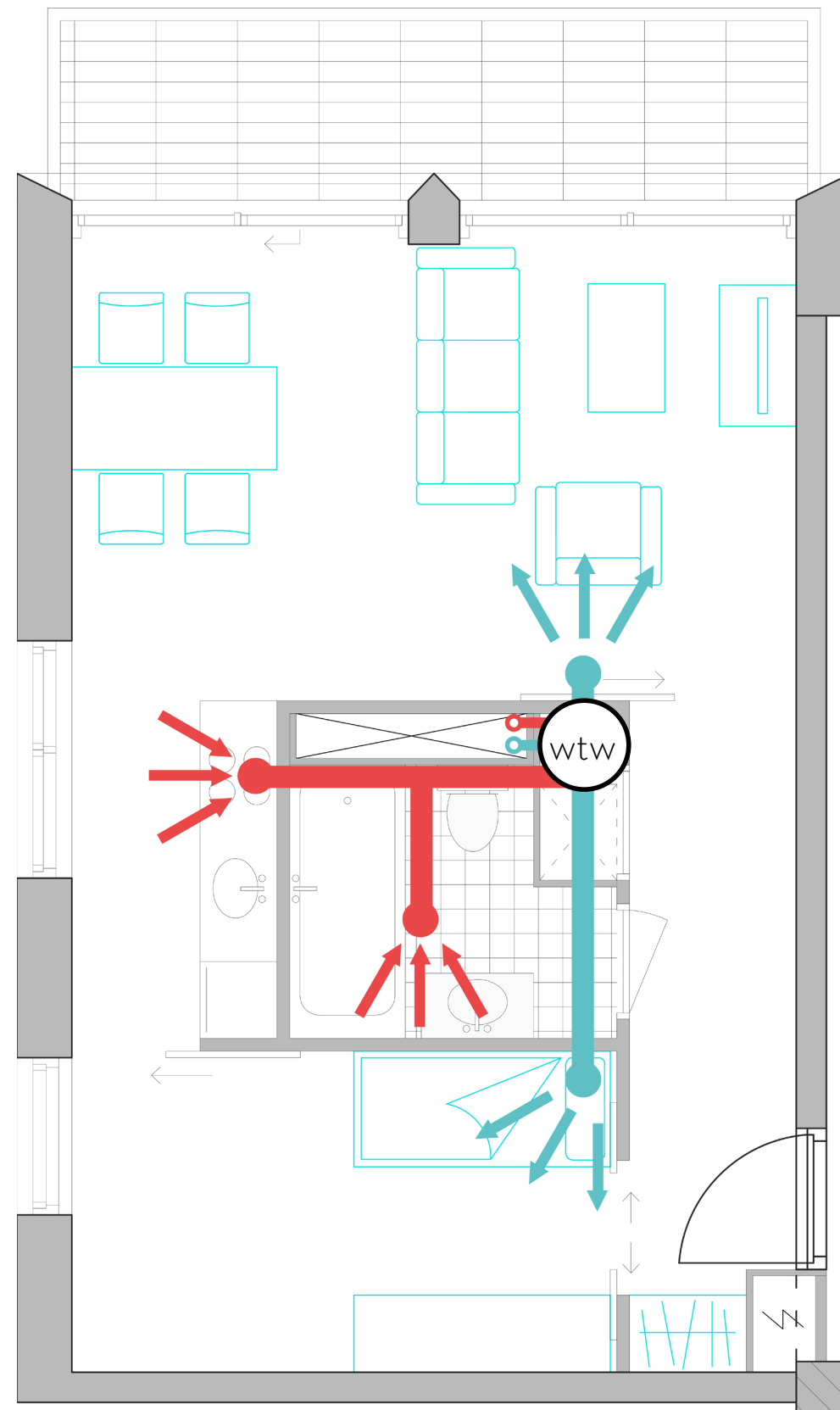
Construction scheme - ground floor

Scale 1 : 200



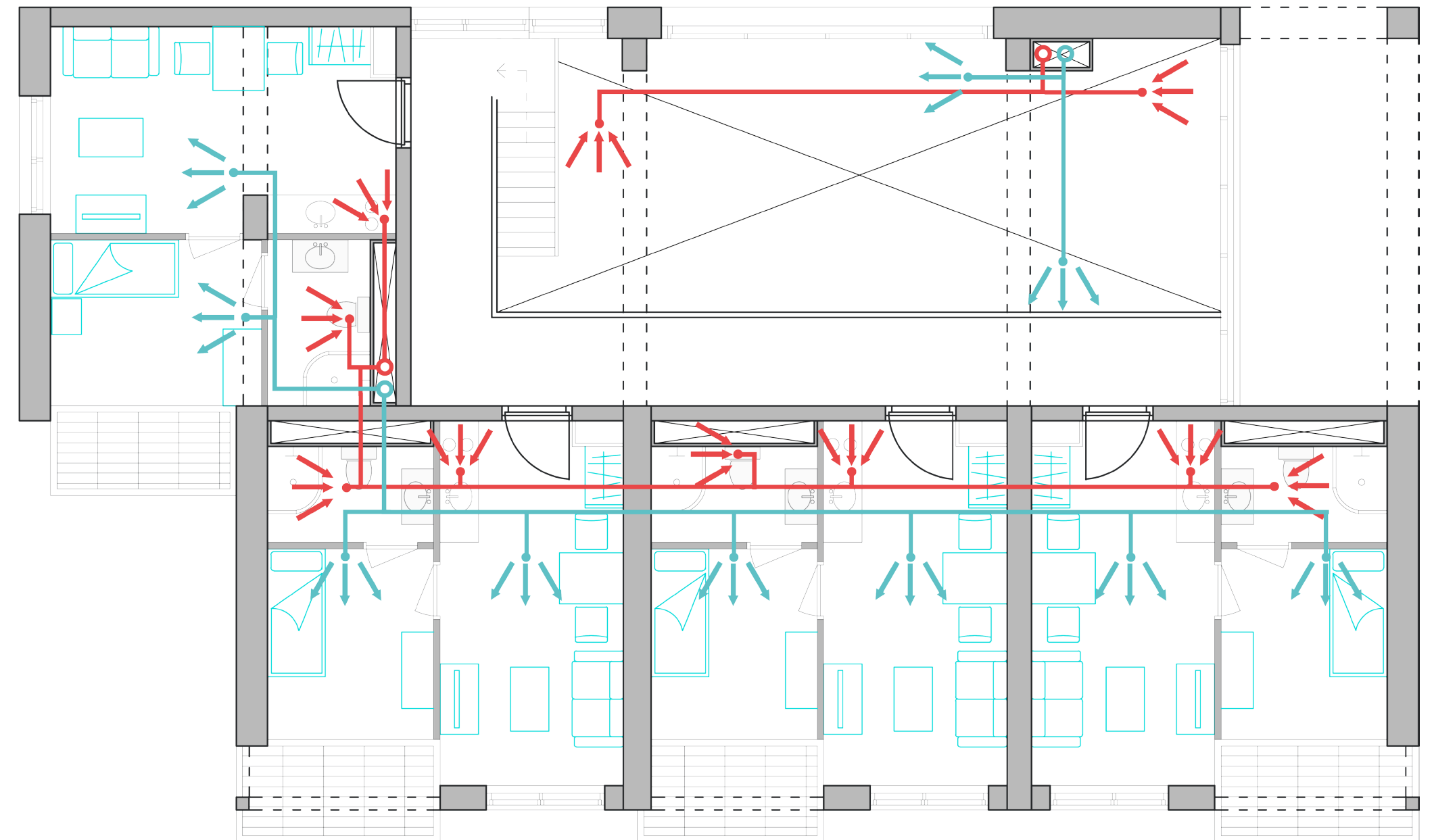
Construction scheme - Tower and dwelling block

Scale 1 : 200



Ventilation in the tower dwellings

Individual balanced ventilation (type D) with CO₂ regulation

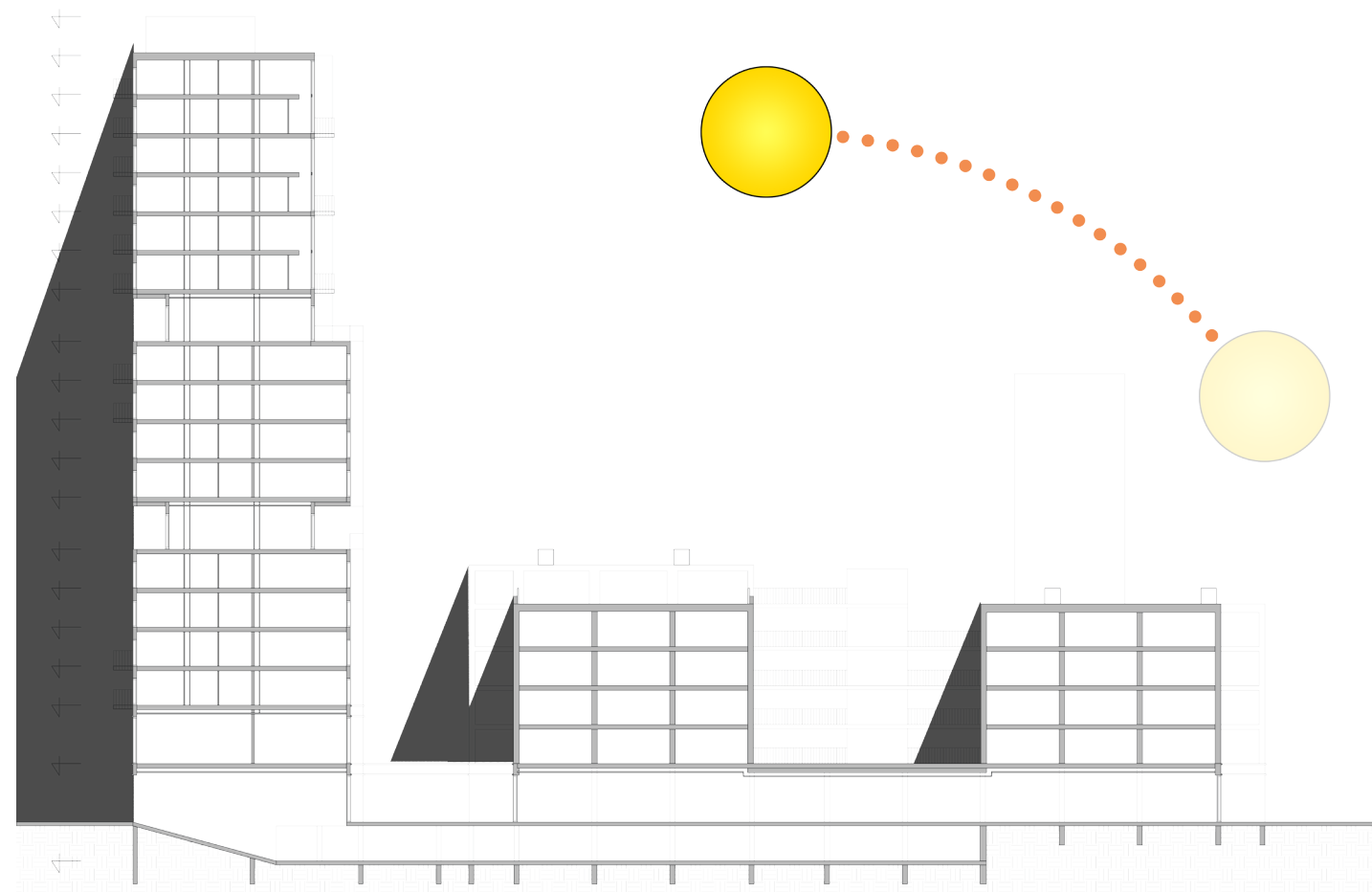


Ventilation in the dwelling blocks

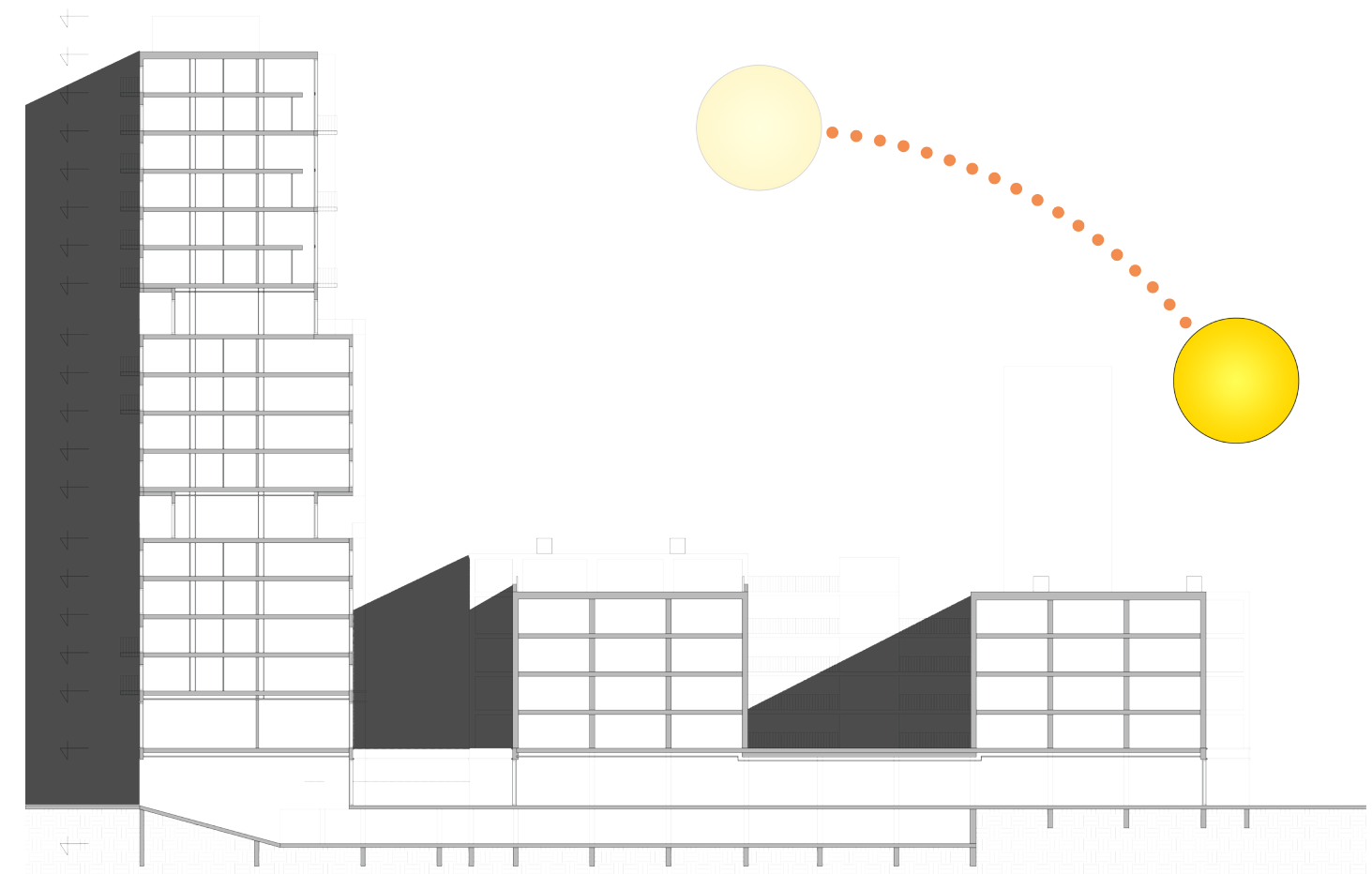
The units in the dwelling blocks have collective balanced ventilation (type D) with CO₂ regulation

Climate scheme

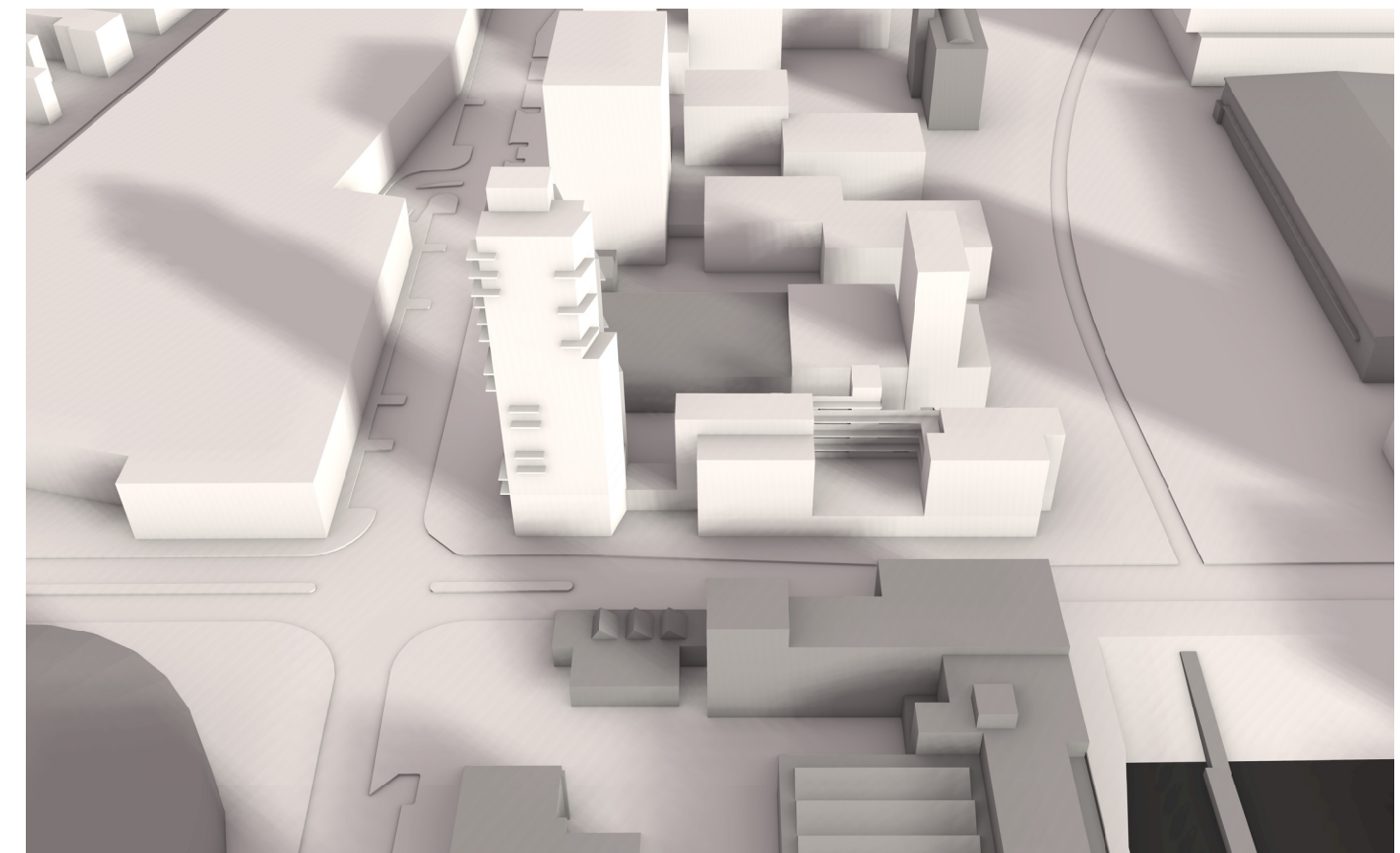
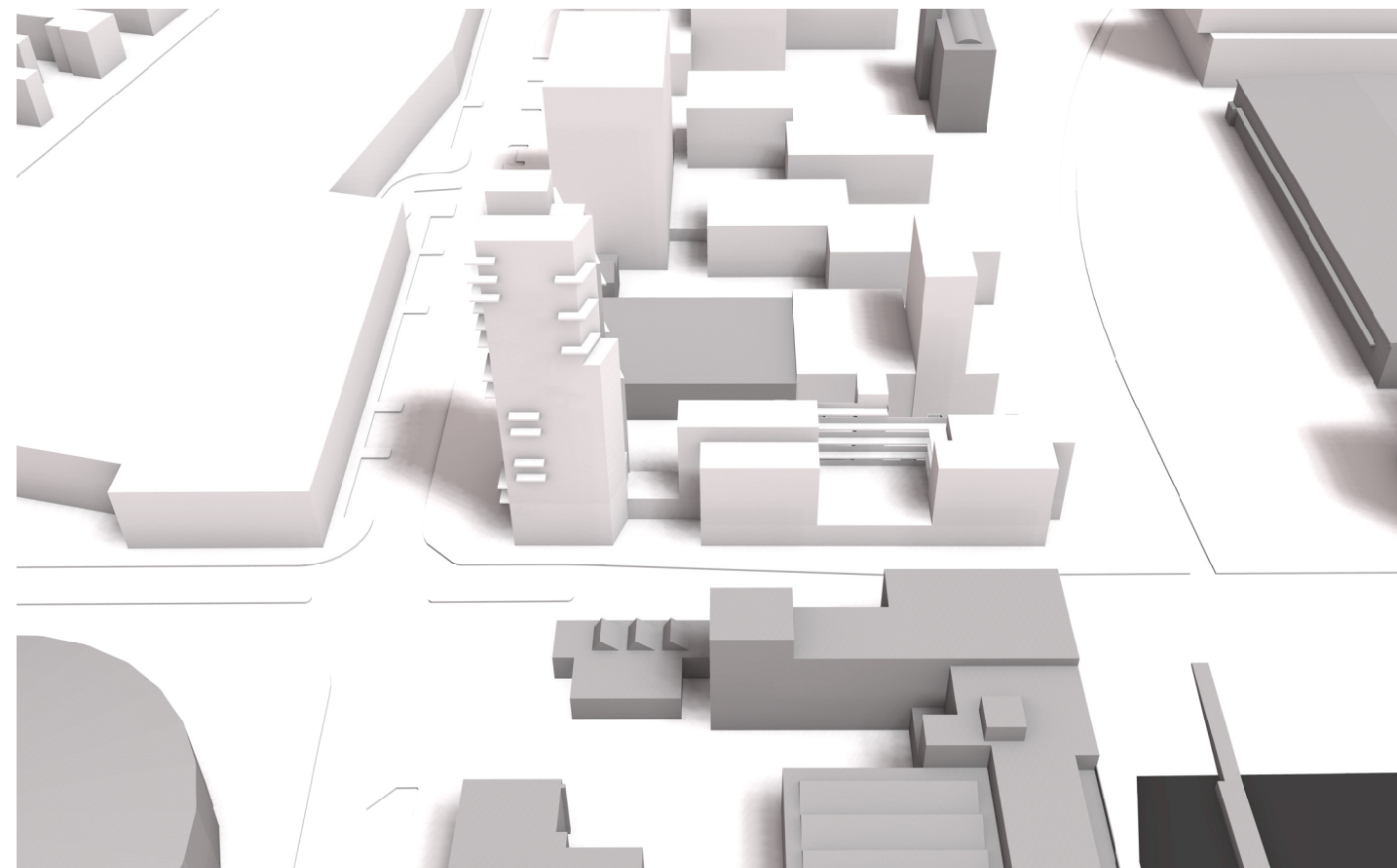
Ventilation



Summer solstice



Winter solstice



Overview of design
Daylight configuration