Growing Up & Growing old in the City

Intergenerational living in a residential urban complex.

Jordy de Rouw

P5 Presentation - 13th of January 2022

Introduction
1 million houses challenge

25 augustus 2018 09:48
Laatste update: 28 augustus 2018 09:20

In elf jaar tijd moeten er een miljoen extra woningen komen, stelde minister van Binnenlandse Zaken Kajsa Ollongren in mei dit jaar. Of dat gaat lukken is de vraag, want de grond raakt op, de overheid laat de bouw grotendeels aan gemeenten over en onze woonbehoefte is veranderd.

Source: (NU.nl, 2018) https://www.nu.nl/wonen/5427335/miljoen-woningen-erbij-2030-gaat-wel-goed.html

Where to build?

For who to build?

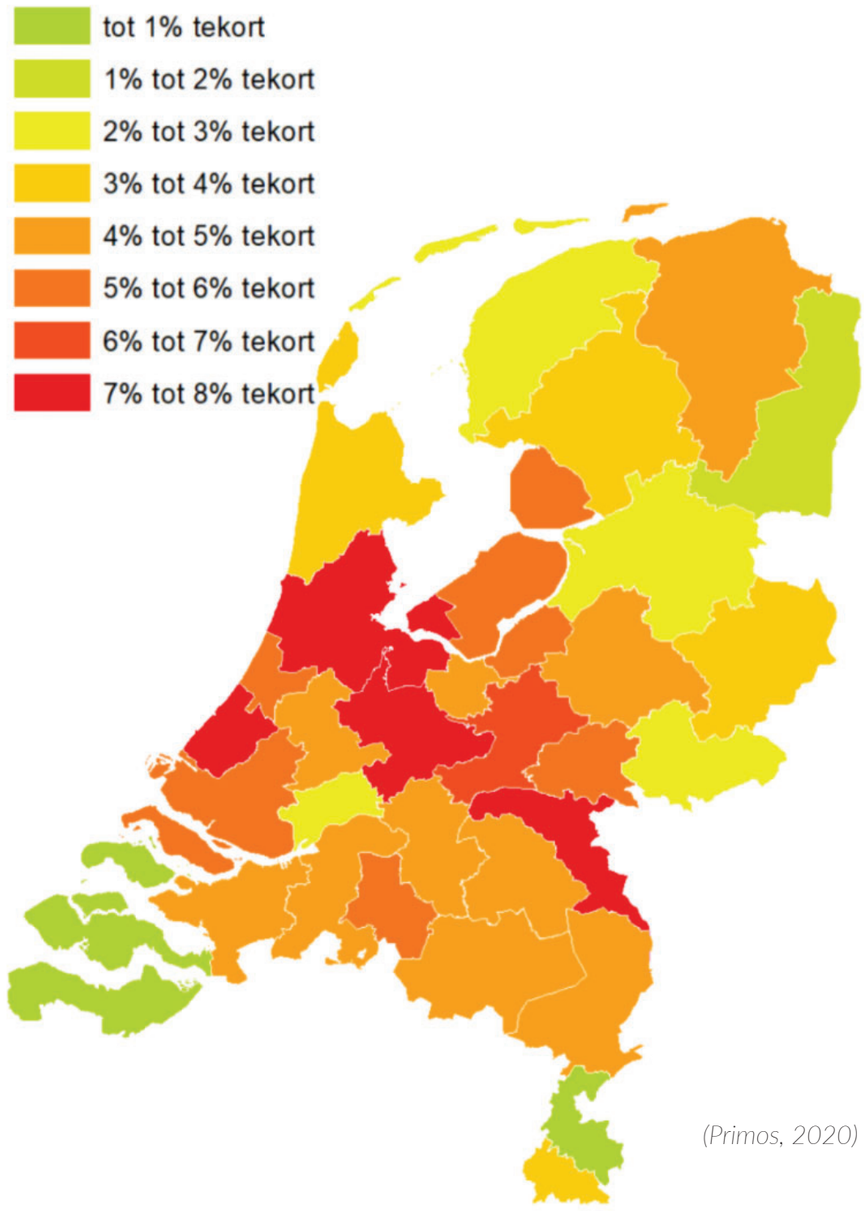
What to build?

Where to build?

Housing Shortage Netherlands

Big shortages in the Randstad

Expected household shortage per region by 2025



(Primos, 2020)

Assigned location Merwehavens

Old harbouw area occupied by warehouses

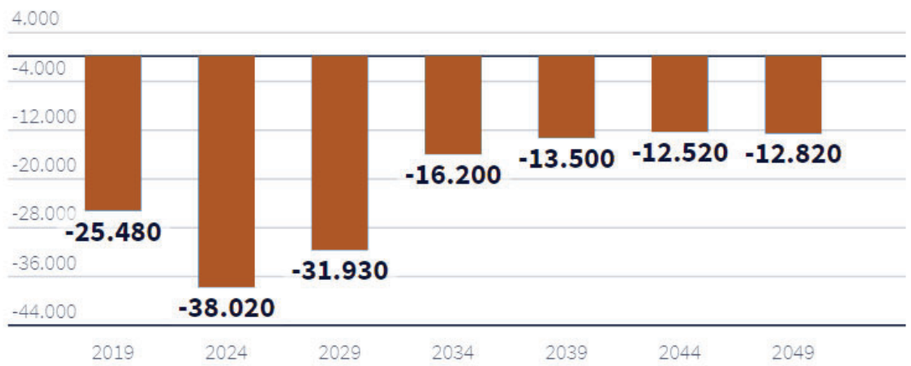
Image: (Google maps, 2021)

Housing Shortage Rotterdam

Project location is Delfshaven

Rotterdam districts

Housing shortage Rotterdam 2019 - 2049



(ABF research, 2020)

History Merwehaven
Transitions over time

Images: (portofrotterdam, 2021), (kustvaartforum, 2021)

Timeline

1932-1933
Merwehaven Constructed as a fruit transshipment port

1960
Due to containerisation port activities move away setting in a period of decay.

2005
Revitalization of the area by attracting new innovative industries and artists

2017
Start planning for the transformation of the area into a work and live neighbourhood.

Photographs site visit

Old warehouses & harbour activity

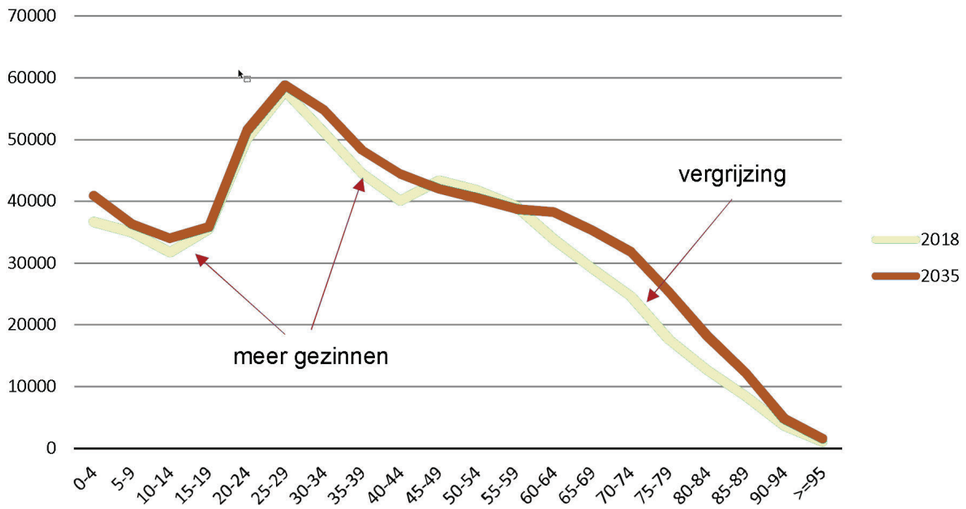
(Images: site visit 2021)

For who to build?

Demographics Rotterdam

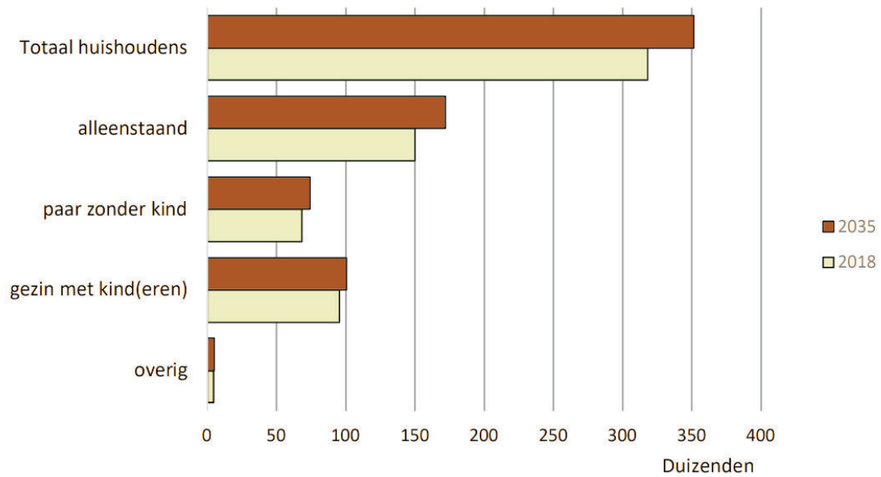
Population growth & Household growth

Expected population growth Rotterdam 2018 - 2035



Hoppesteyn, M., Permentier, M., & Van der Zanden, W. (2018)

Household growth per type Rotterdam 2018 - 2035



Hoppesteyn, M., Permentier, M., & Van der Zanden, W. (2018)

Challenges for elderly & families

Challenges for elderly & families living in the city

Changes:

1) Growth elderly population in Rotterdam

- Post-war baby boom
- Longer lifespans due to better healthcare & living conditions

2) New Governmental Law
(Wet maatschappelijke ondersteuning 2015)

- The elderly have to stay home as long as possible and can receive care there if necessary.

Consequences

1) There is a large deficit of suitable elderly dwellings.

- The current houses were not made with growing old at home in mind.

2) Social challenges

- Dependency on informal caregivers
- Difficulty to maintain a social network increases the risk of loneliness.

Changes:

A new generation of families wants to stay in the city and raise their children there instead of moving to the suburbs.

- Increase in households where both parents work and increase in single parent households
- They have a job in the city and want to live nearby
- They grew up in the city
- They studied there and have their social circle there
- They like to use the many amenities the city has to offer

Consequences

Two thirds of the families in the city is looking for a house that better suits their needs.

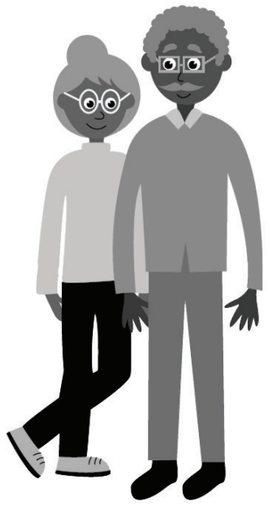
- Not enough space in the dwelling
- Lack of safe playing area for the kids
- Lack of green space
- Difficulty with parking
- Difficulty affording a house in the city

User group specification

Focus on: Family & Senior citizens

Senior citizens

- 65+ years of age



Families

- Parents with school aged kids

What to build?

Elderly

Active Social network
- Stay active in society
- Provide informal care

Nearby amenities
- Daily amenities like supermarket
- Care amenities like doctor, pharmacy and elderly home care centre

Walk-able environment
- Good walk-able paths
- Benches along the route to sit in the shade
- Walker radius of 250-500m
- Elevator access

Spaces with different activities
- Community centre
- Sports club
- Vegetable / Flower garden
- Grand cafe
- Library
- Workshop

Family

Active Social network
- Stay active in society
- Support with child rearing

Safe playing space for the children
- Multiple options within 500m
- Play options for different age groups
- Free of traffic

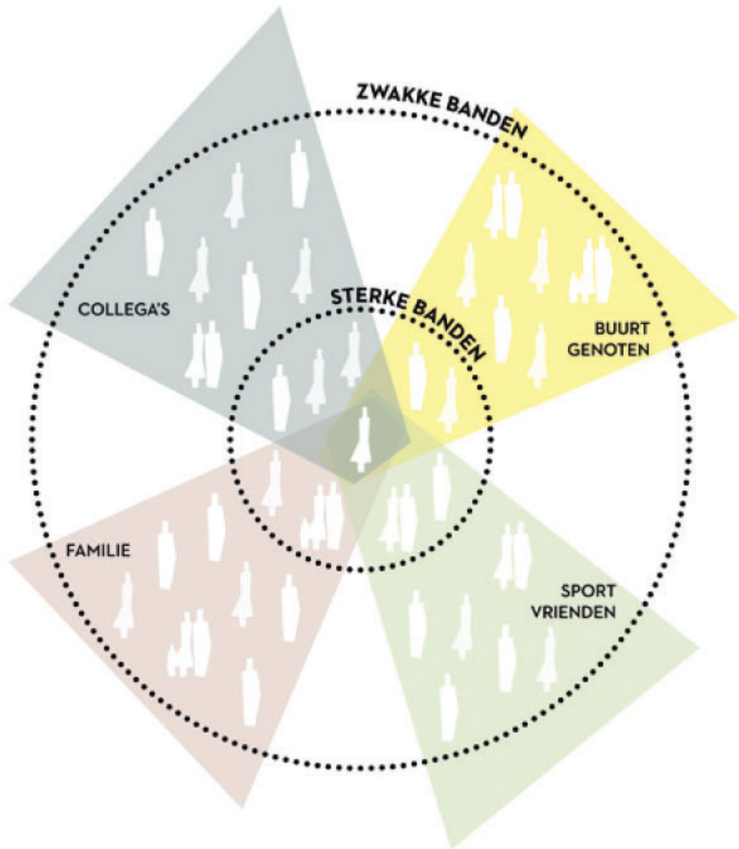
Nearby amenities
- Good school
- Child day care
- Daily amenities like supermarket
- Community centre, playground, sports club, library, parks
- Theatre, cinema, swimming pool

Enough space
- Storage space
- Living space
- Outdoor space
- Play space

Flexibility of Dwelling
- Floor plan organization (extra rooms)
- Dwelling should adapt to life phase (transitionality)

Community Forming & Inclusivity

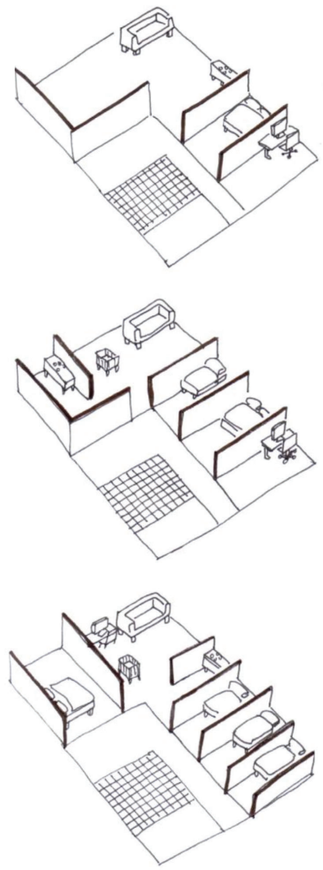
Social network



(Platform31, 2021)

1. **Planned encounters**
2. **Spontaneous encounters**

Transitionality Adapt to family composition & Life stages



(Heren 5 architects, 2010)

Stimulate encounter & Allow for Transitionality

Tools for different building scales

Buurt
(Neighbourhood)

De route van straat naar huis
(Route from street to dwelling)

Woonblok
(Building block)

Drempelzone
(Transition zone dwelling)

Woning
(Dwelling)

(Platform31, 2021)

Neighborhood:
- Different dwellings and programmatic functions
- Outdoor spaces for different inhabitants

Route from street to dwelling:
- Different routes
- Same entrances
- Route passes public & collective functions

Building block:
- Balance between different dwelling types to cater to different inhabitants and life phases

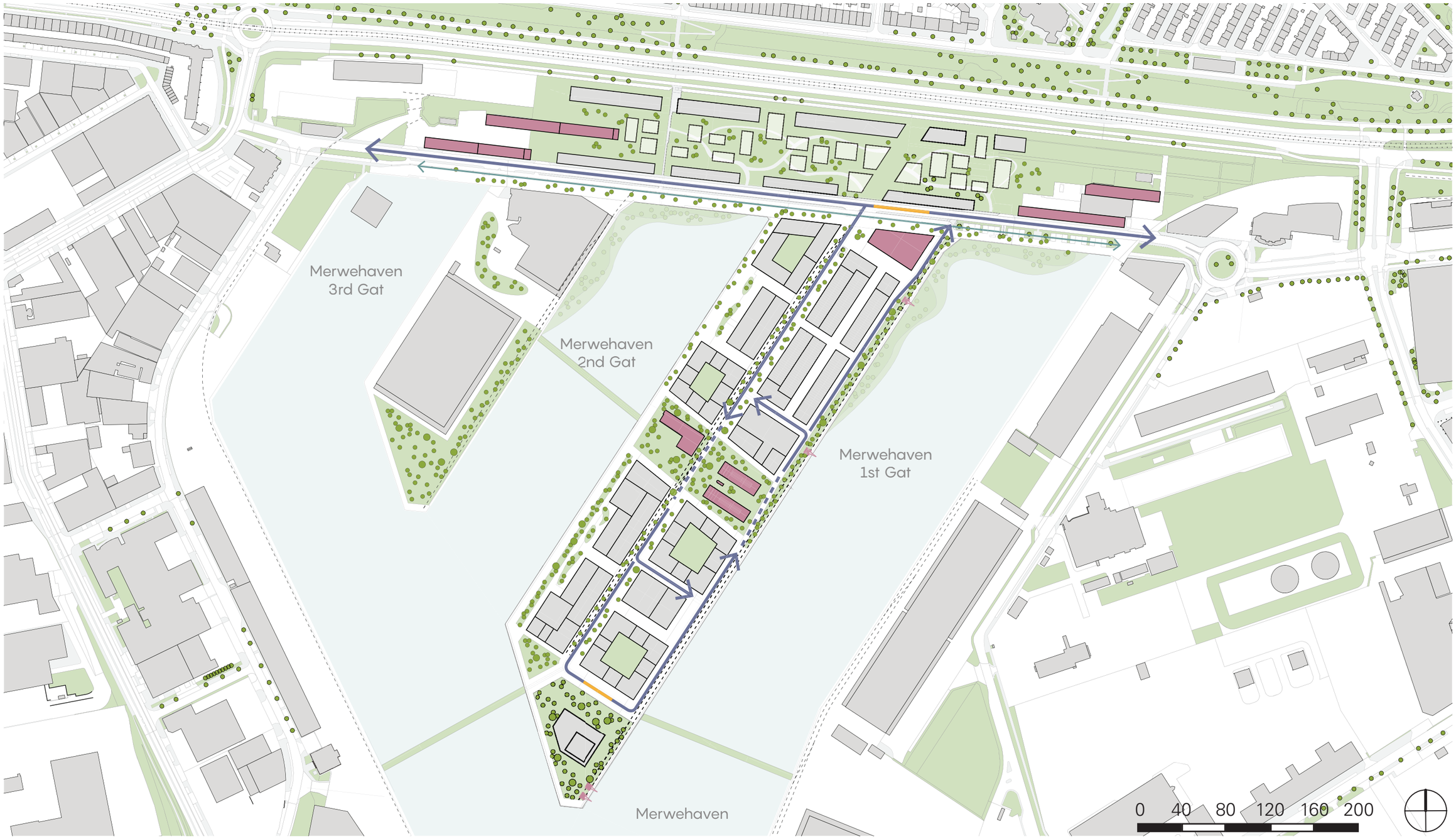
Transition zone dwelling:
- Buffer zone of 1-2 meters
- Connection with kitchen / living room

Dwelling:
- Life cycle resilient floorplans

Design Solution

Urban design Merwe 4 Havens Rotterdam

Top view - Scale 1:4000



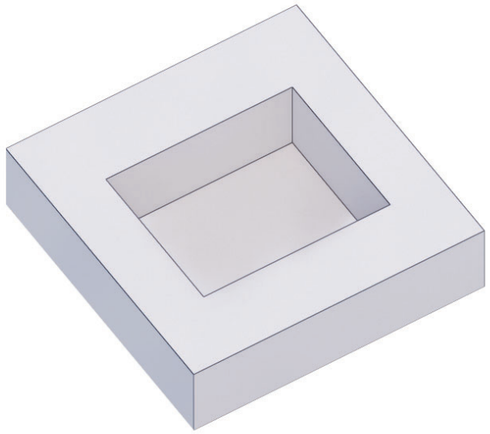
Urban design - Chosen plot

Top view - Scale 1:2000

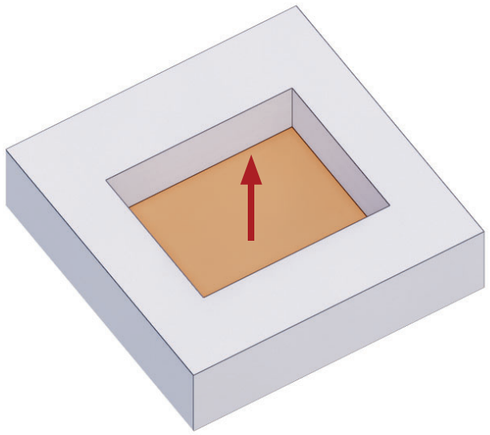
Urban design
Building in context

Design strategy
Courtyard block mass model

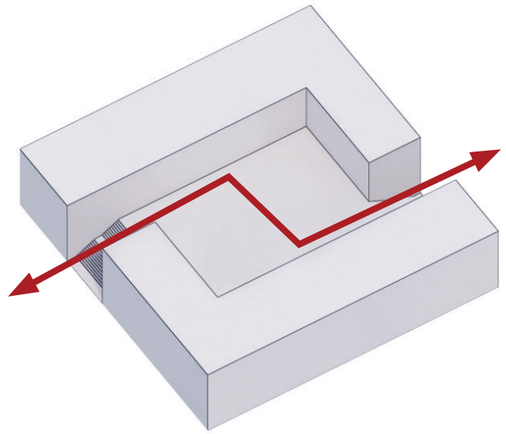
Courtyard block



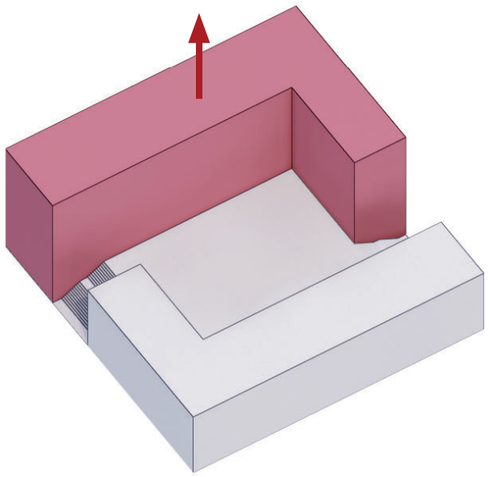
Elevated courtyard for parking & storage



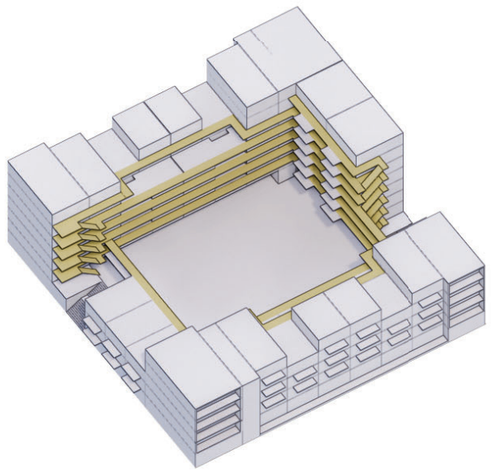
Connect courtyard to urban network



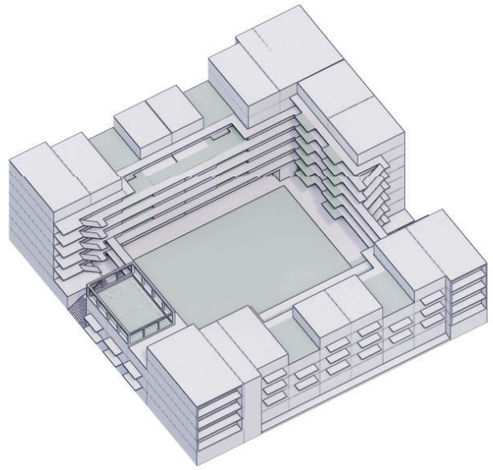
Higher north side For daylight & view



Gallery circulation on the inside

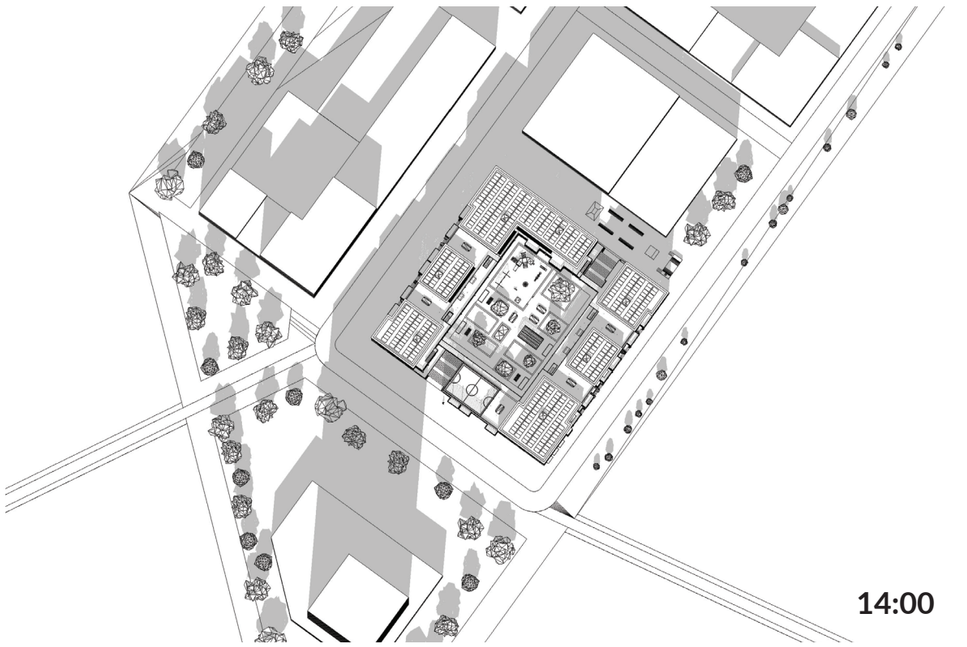


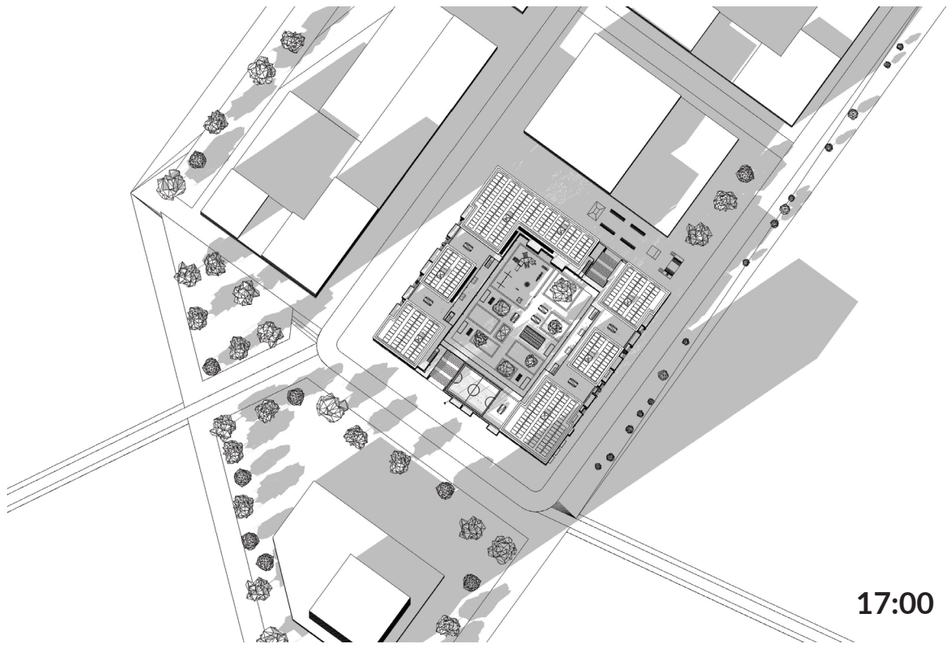
public & collective meeting spaces



Sun study

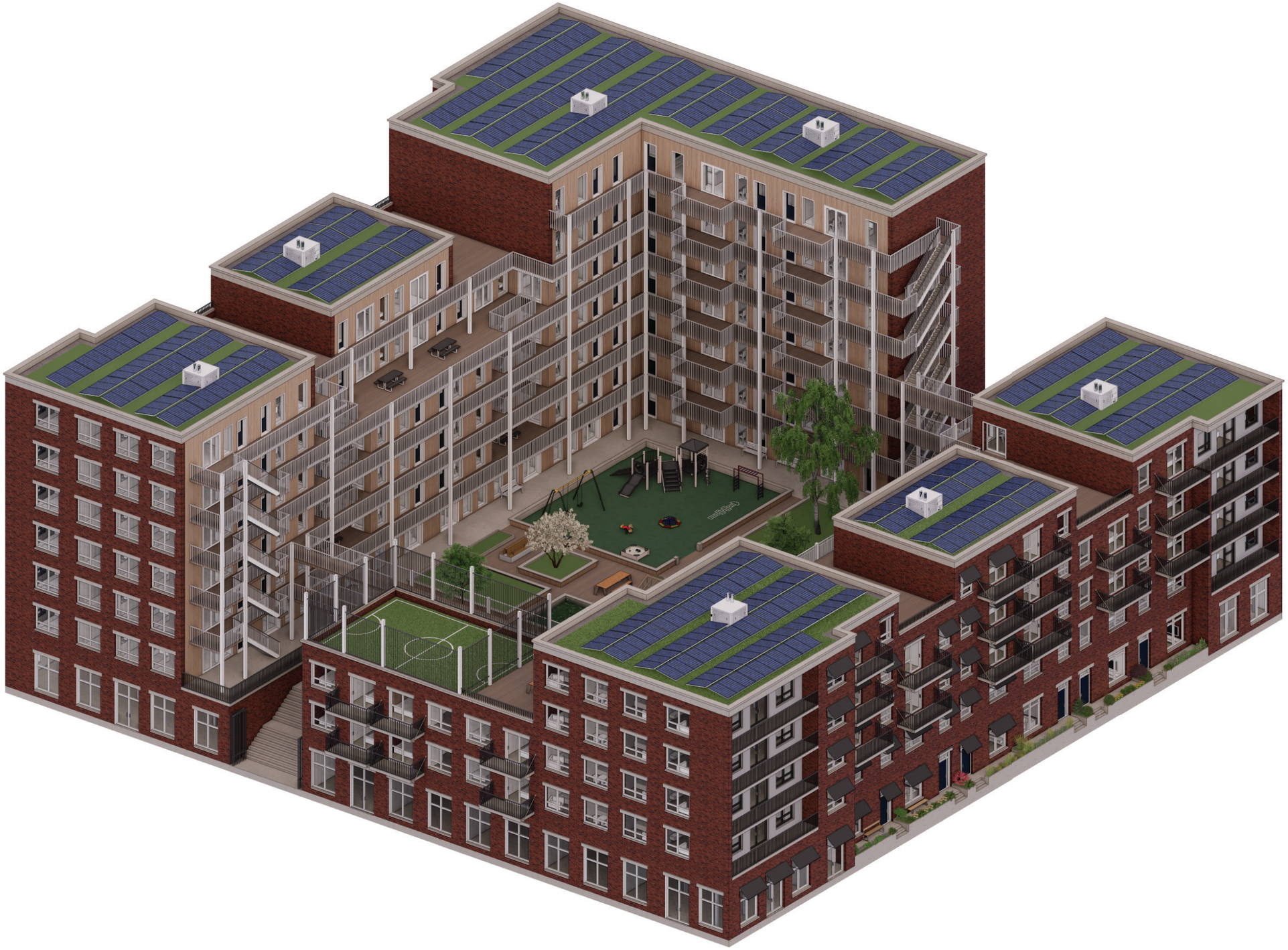
Direct sun March 21st : 9:00 - 11:00 - 14:00 - 17:00





Building Isometric

Bird eye view



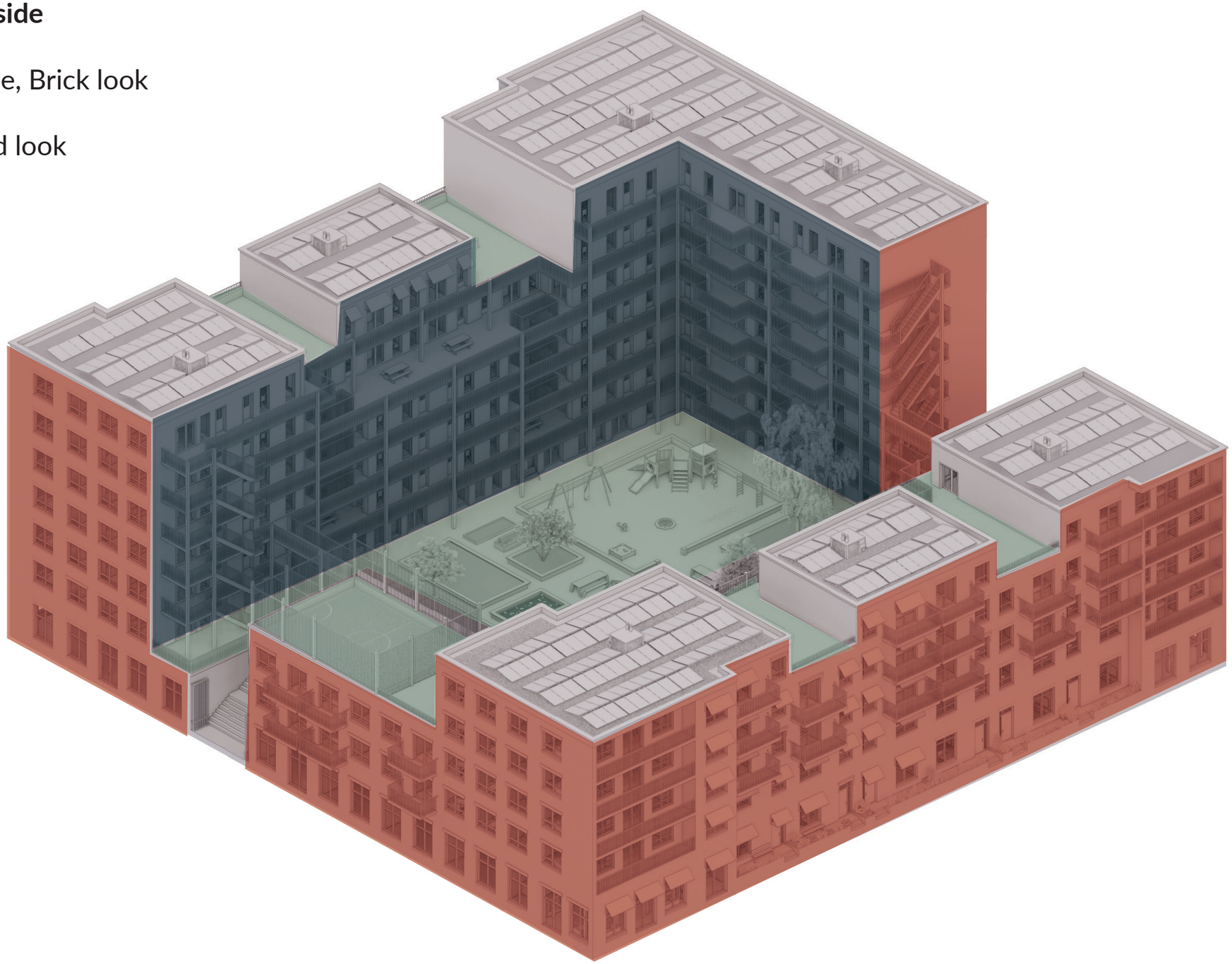
Outside vs Inside

Robust brick look vs Green/Wood look

Outside vs Inside

Robust outside, Brick look

Green / Wood look



Ground Floor

Floor plan 1:250

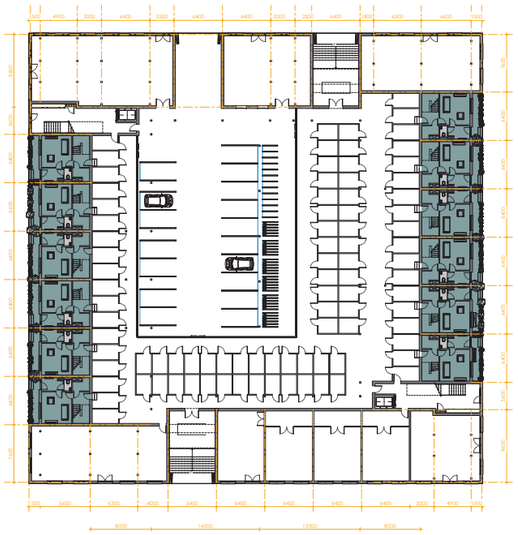
Parking & Storage

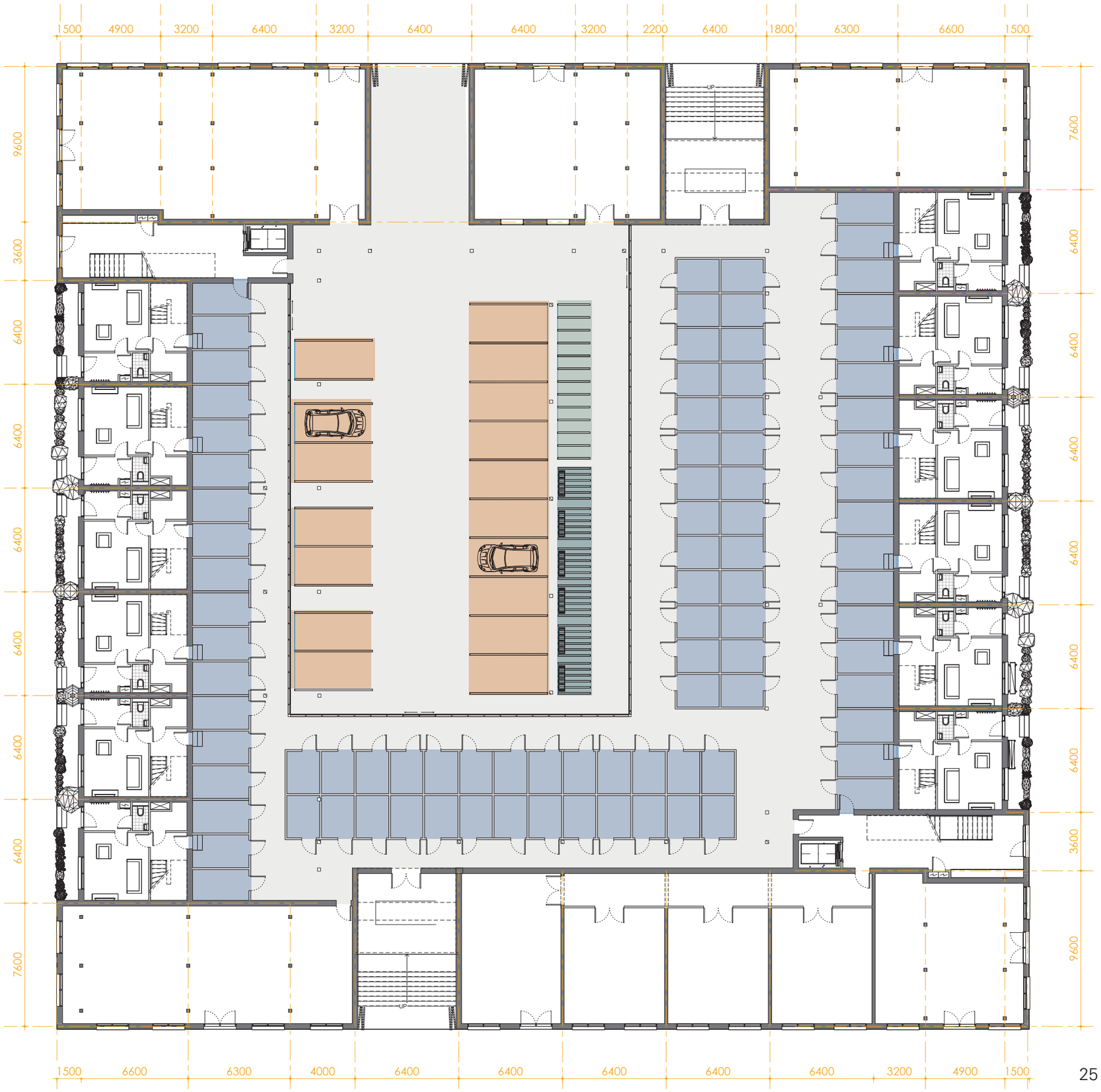
- 17x Car parking
- 12x Cargo bike
- 30x Bicycle parking
- 88x Storage spaces

Desirable functions in empty spaces plinth

- **Small supermarket**
- **Cafe / restaurant**
- **Medical center**
- **Child daycare**
- **Pharmacy**
- **Gym**
- **Workshop**

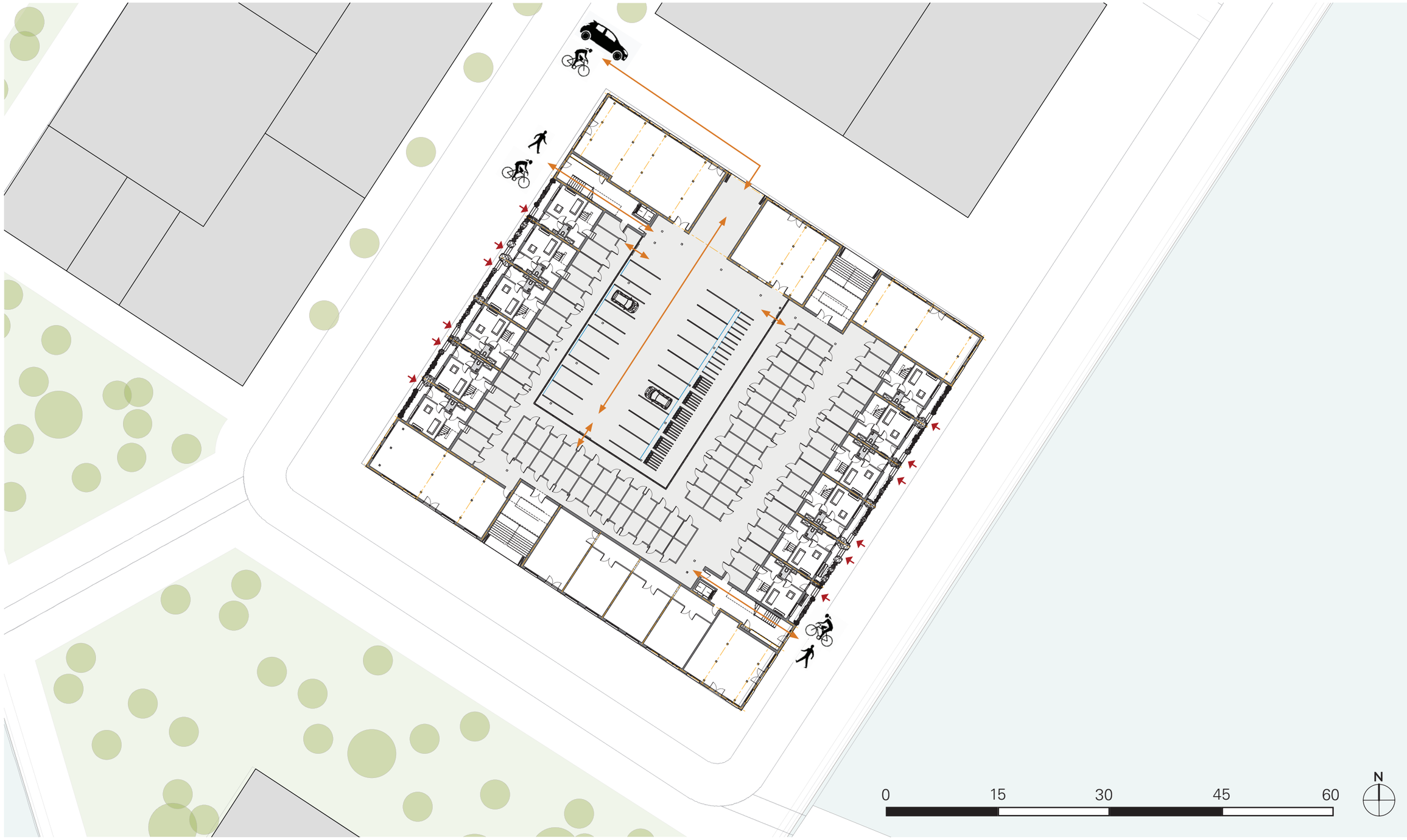
Color guide dwelling typologies





Circulation and Accessibility Ground floor

Top view - Scale 1:500

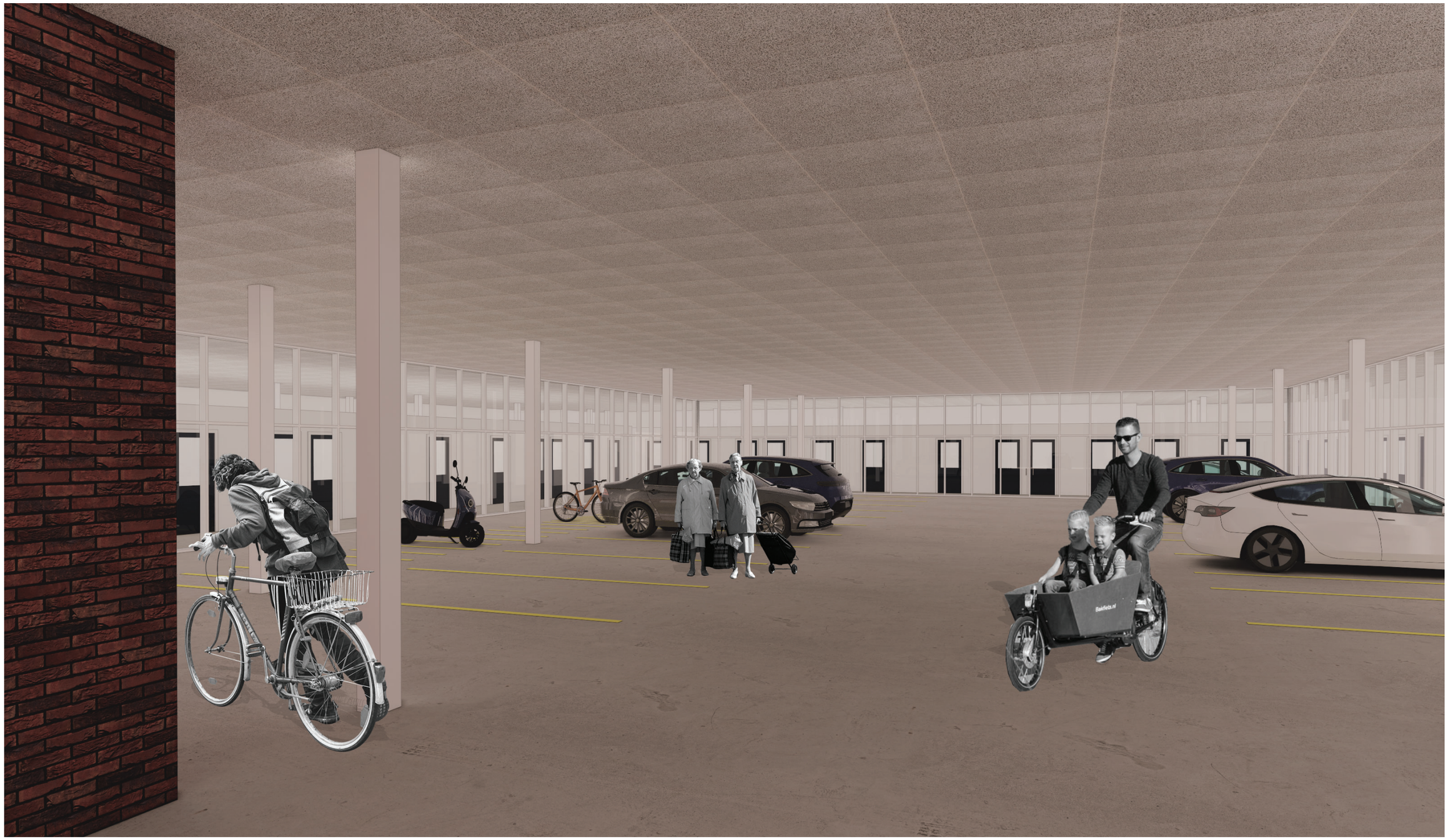


Entrance parking garage

Automatic doors

Parking garage & Storage

Light and view for safety



Private balcony

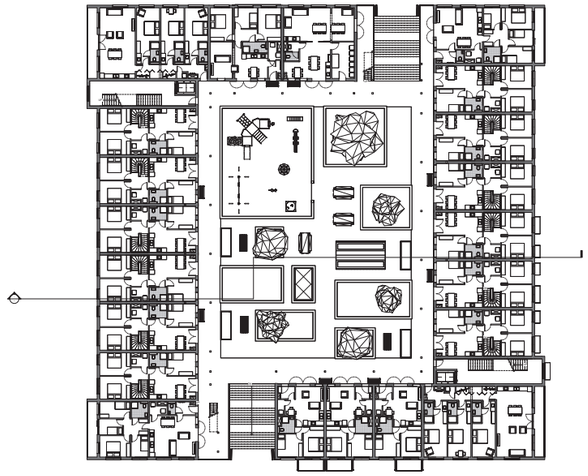
Place to sit in the sun, personal conversation

Private balcony

Place to sit in the sun, personal conversation

Section

East- West 1:200 dwelling types



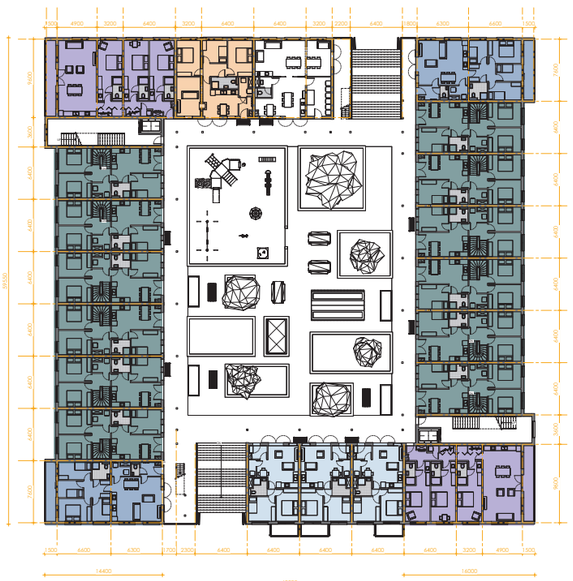
Buffer zone dwelling

Place to sit in the sun, chat with passersby

First Floor

Floor plan 1:250

Color guide dwelling typologies



Circulation and Accessibility First floor

Top view - Scale 1:500

Entrance stairs courtyard

Place to sit in the sun, chat with passersby

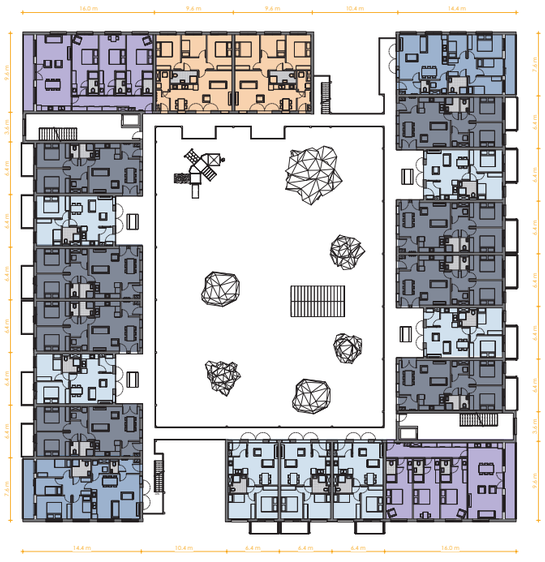
Courtyard ambiance

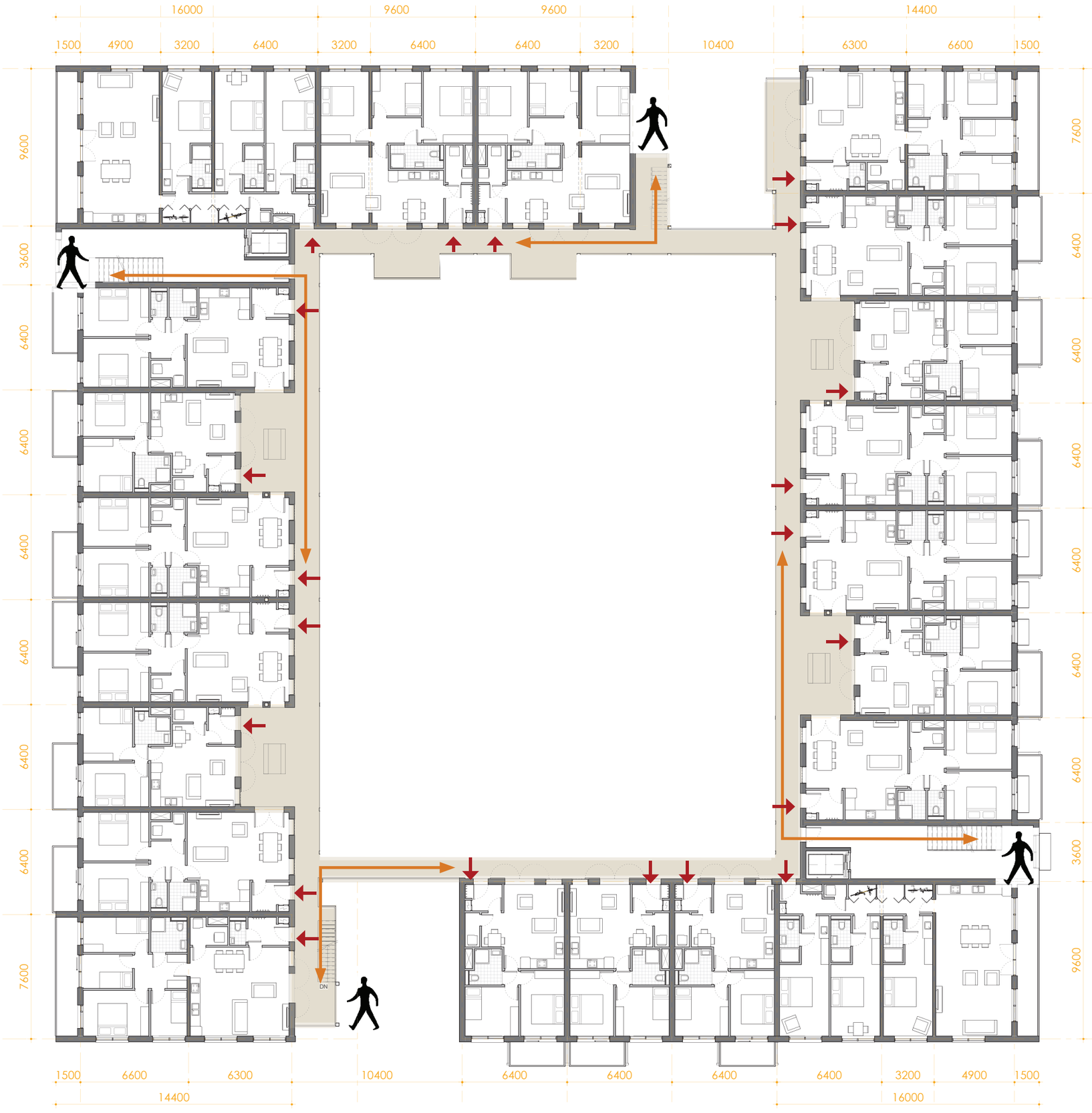
Mixed crowd

Second Floor

Floor plan 1:250

Color guide dwelling typologies





Public & Collective Spaces

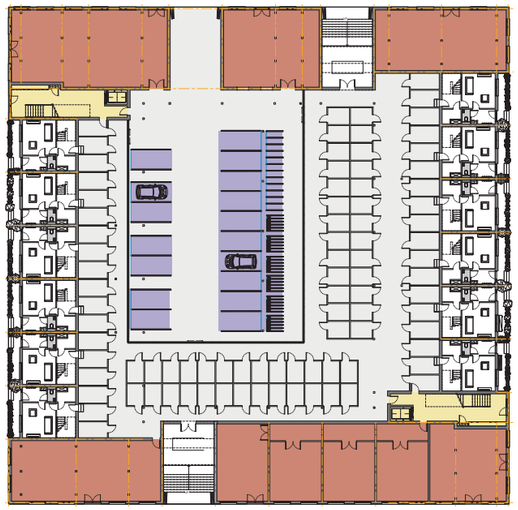
Indoor spaces situated in plinth

- Public Functions
- Public outdoor space
- Collective Functions
- Collective outdoor space
- Entrance / Stairs

Desirable functions in empty spaces plinth

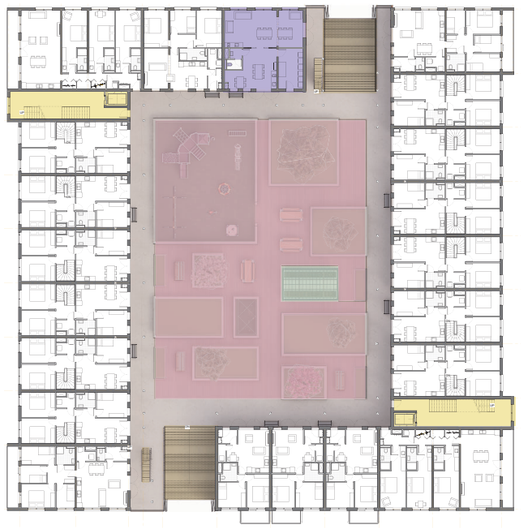
- **Small supermarket**
- **Cafe / restaurant**
- **Medical center**
- **Child daycare**
- **Pharmacy**
- **Gym**
- **Workshop**

Ground level floorplan



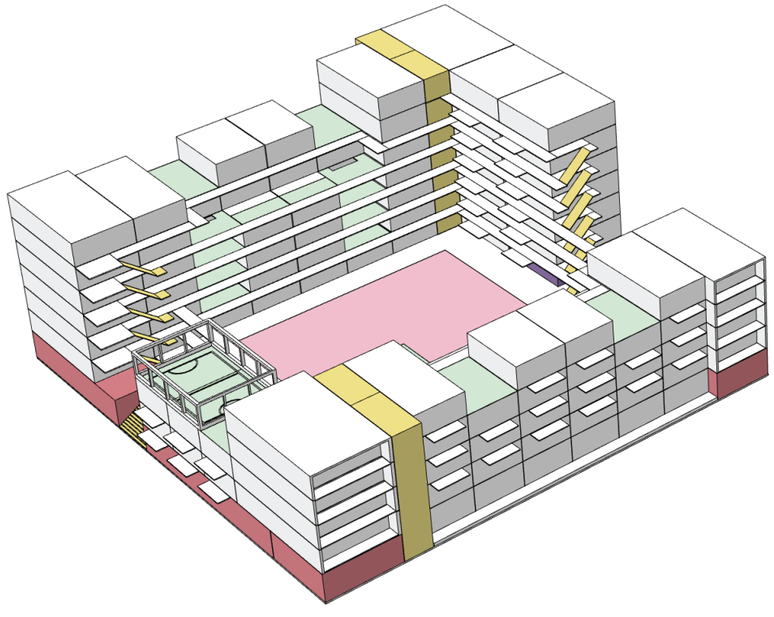
North

First level floorplan

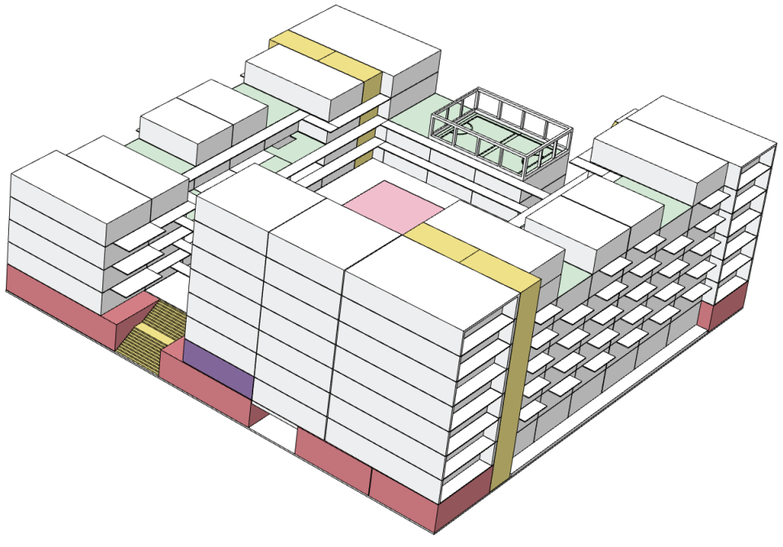


Third level floorplan

South



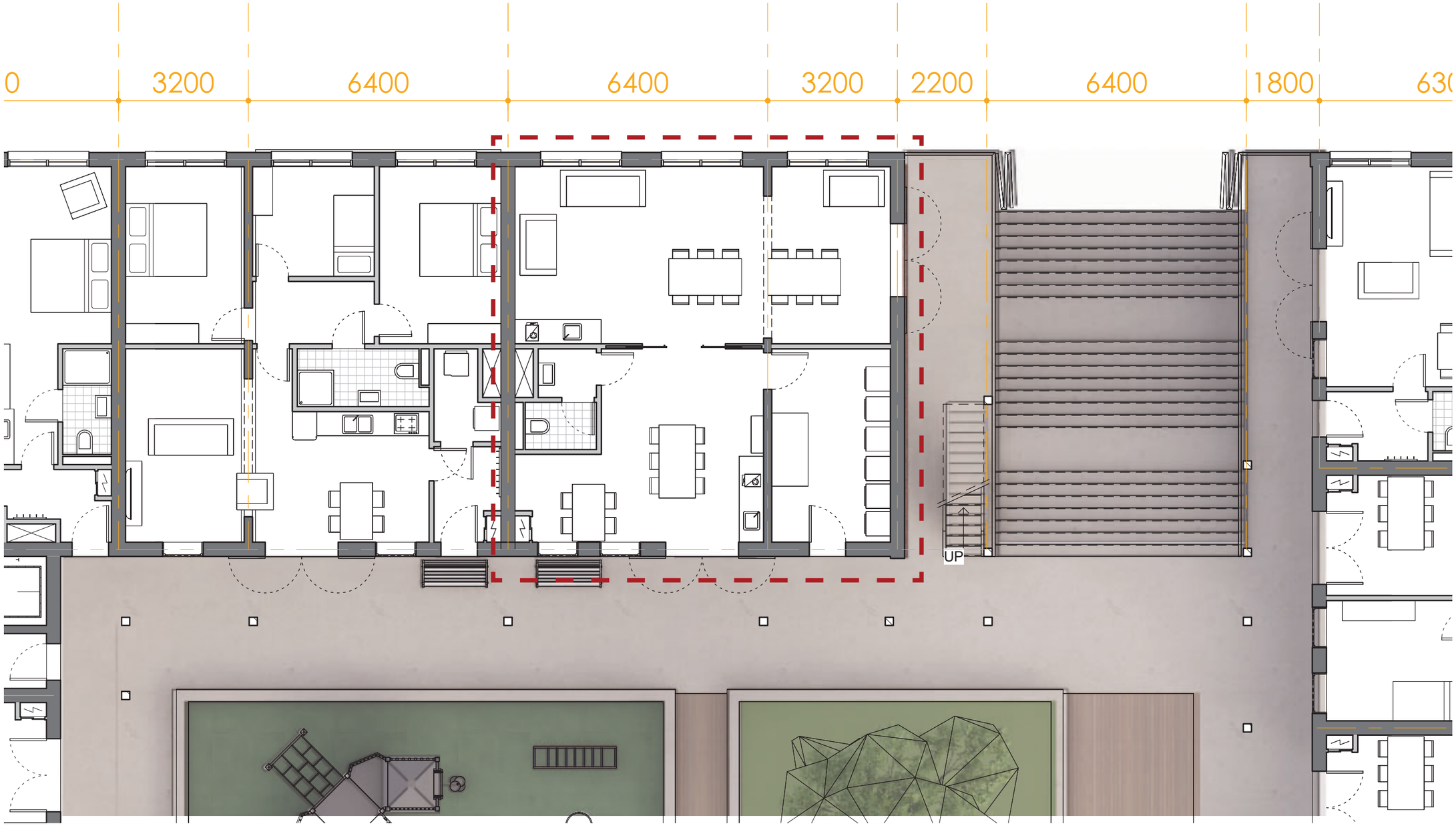
South



North

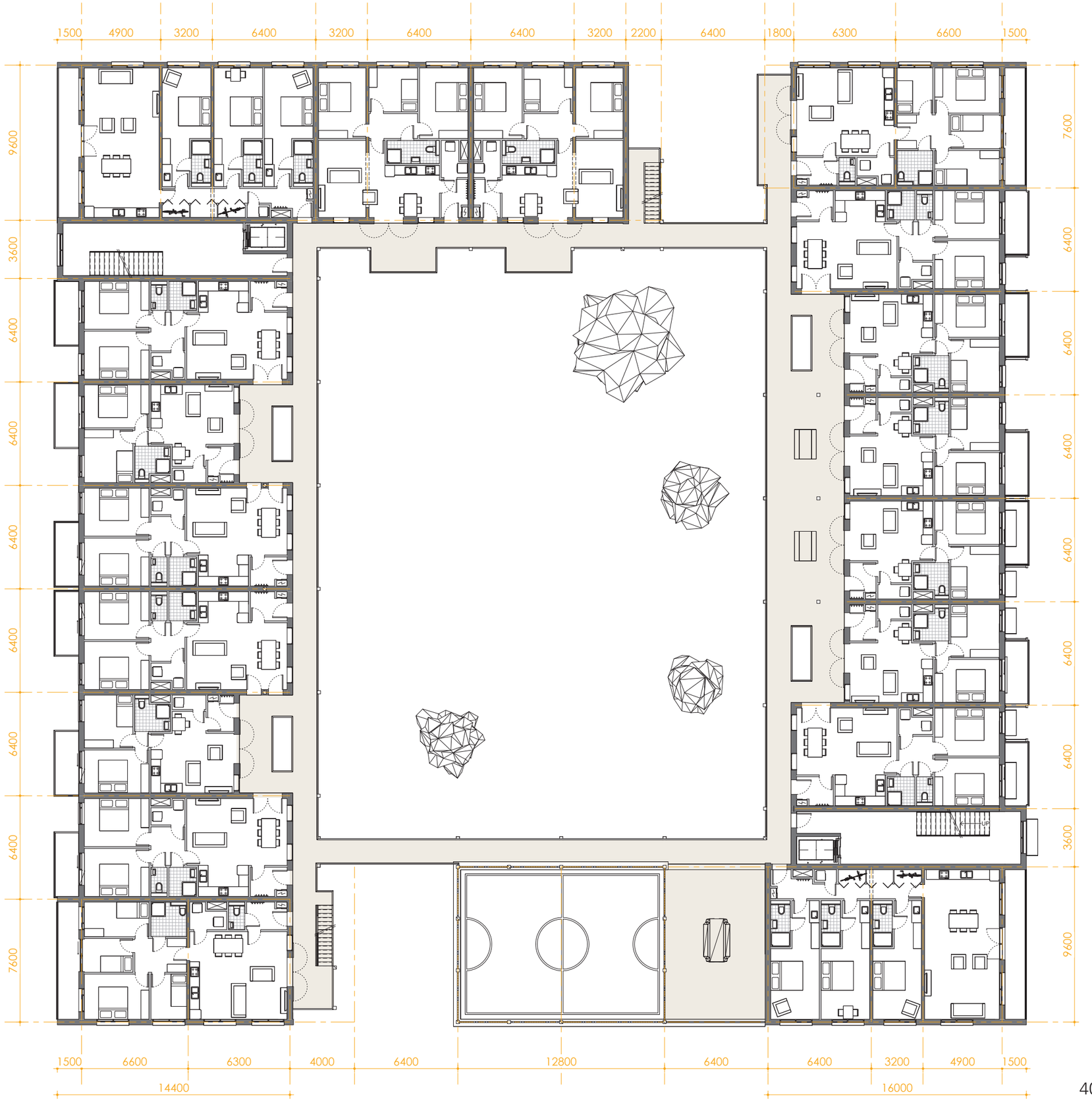
Collective room

Floor plan 1:100



Third Floor

Floor plan 1:250



Color guide dwelling typologies

Spaces to meet

Alcove along gallery - daylight entry

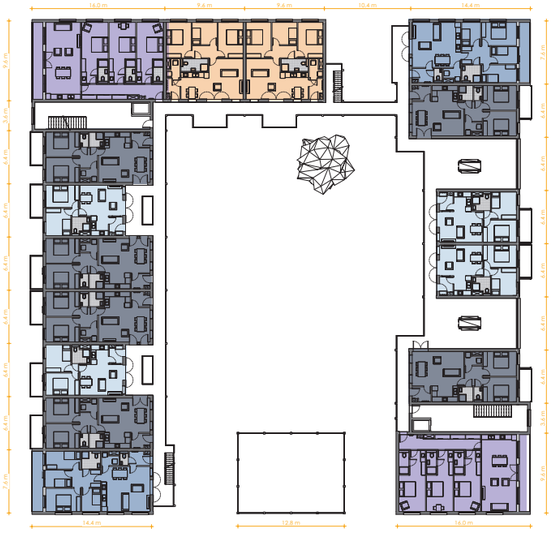
Private balcony

Place to sit in the sun, personal conversation

Fourth Floor

Floor plan 1:250

Color guide dwelling typologies

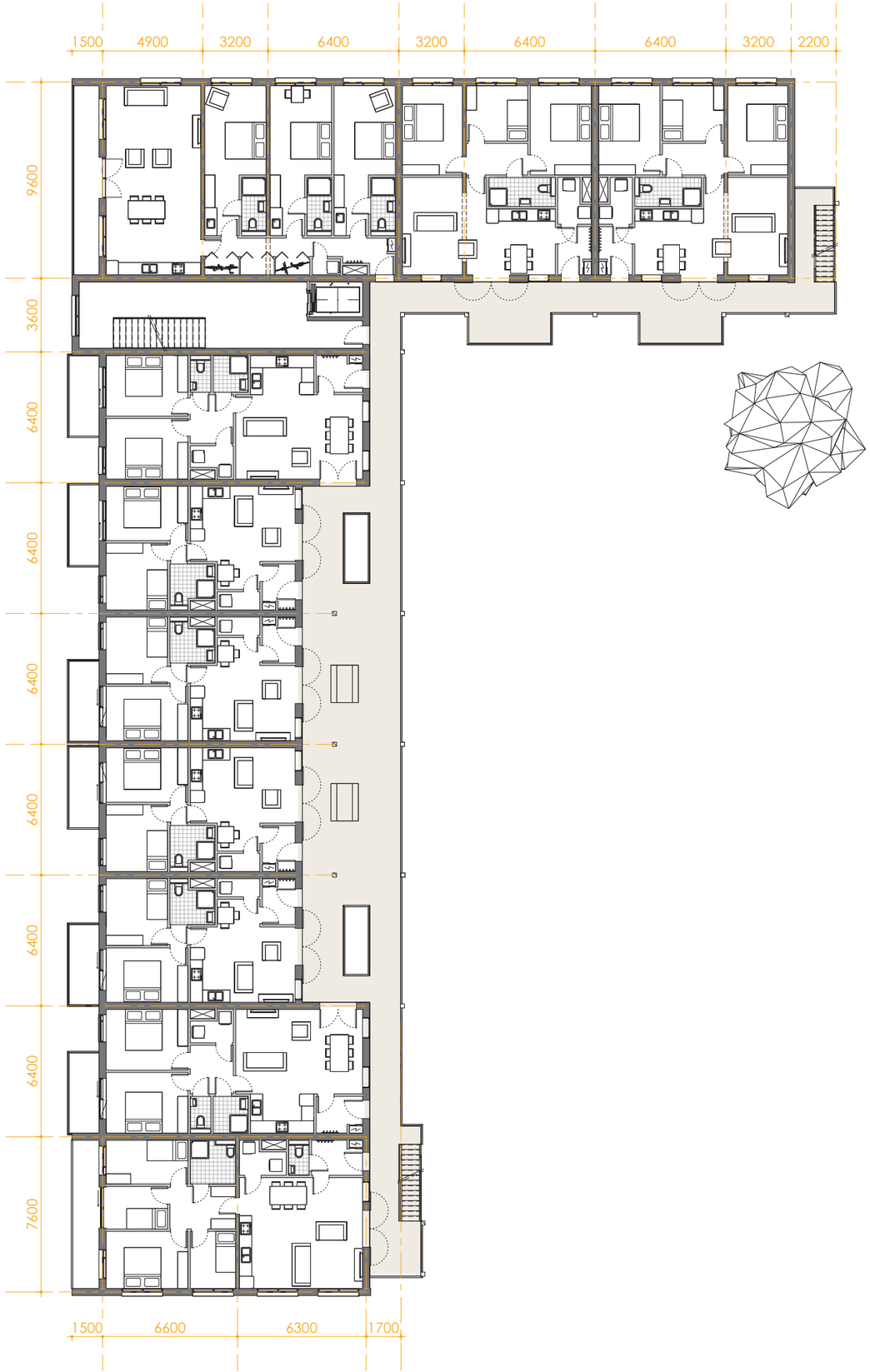


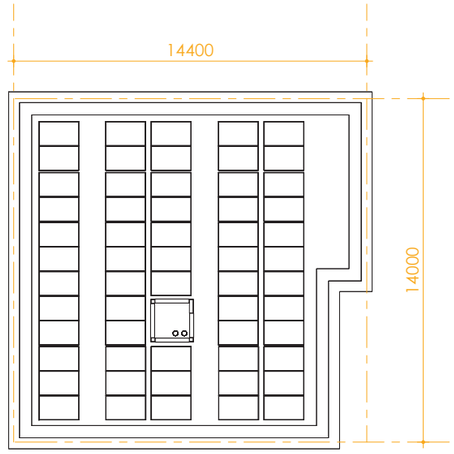
Roof terrace

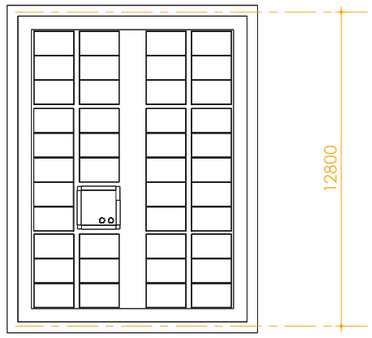
Hangout spot

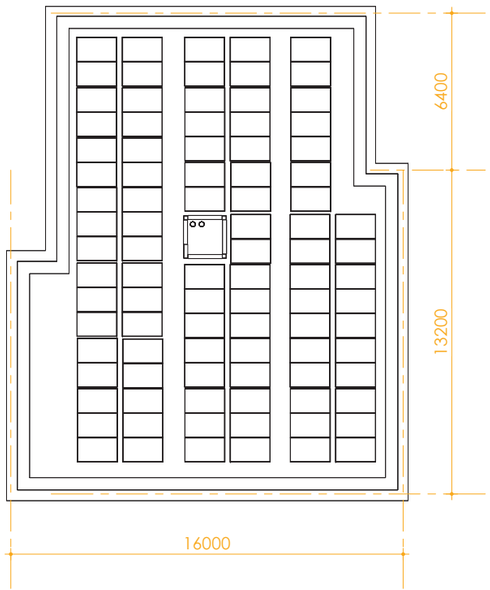
Fifth Floor

Floor plan 1:250

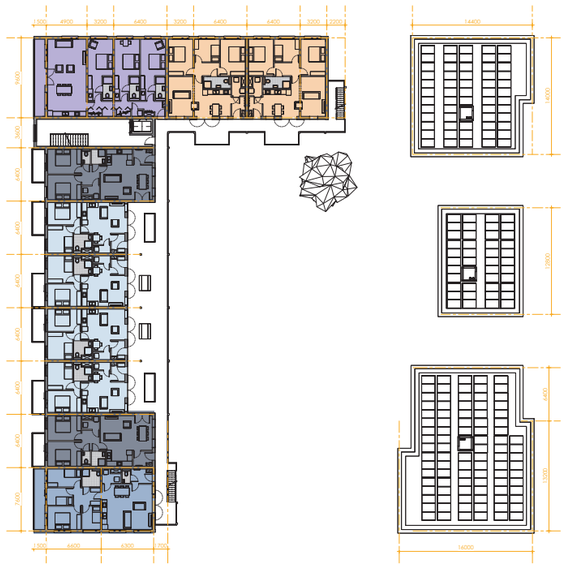








Color guide dwelling typologies

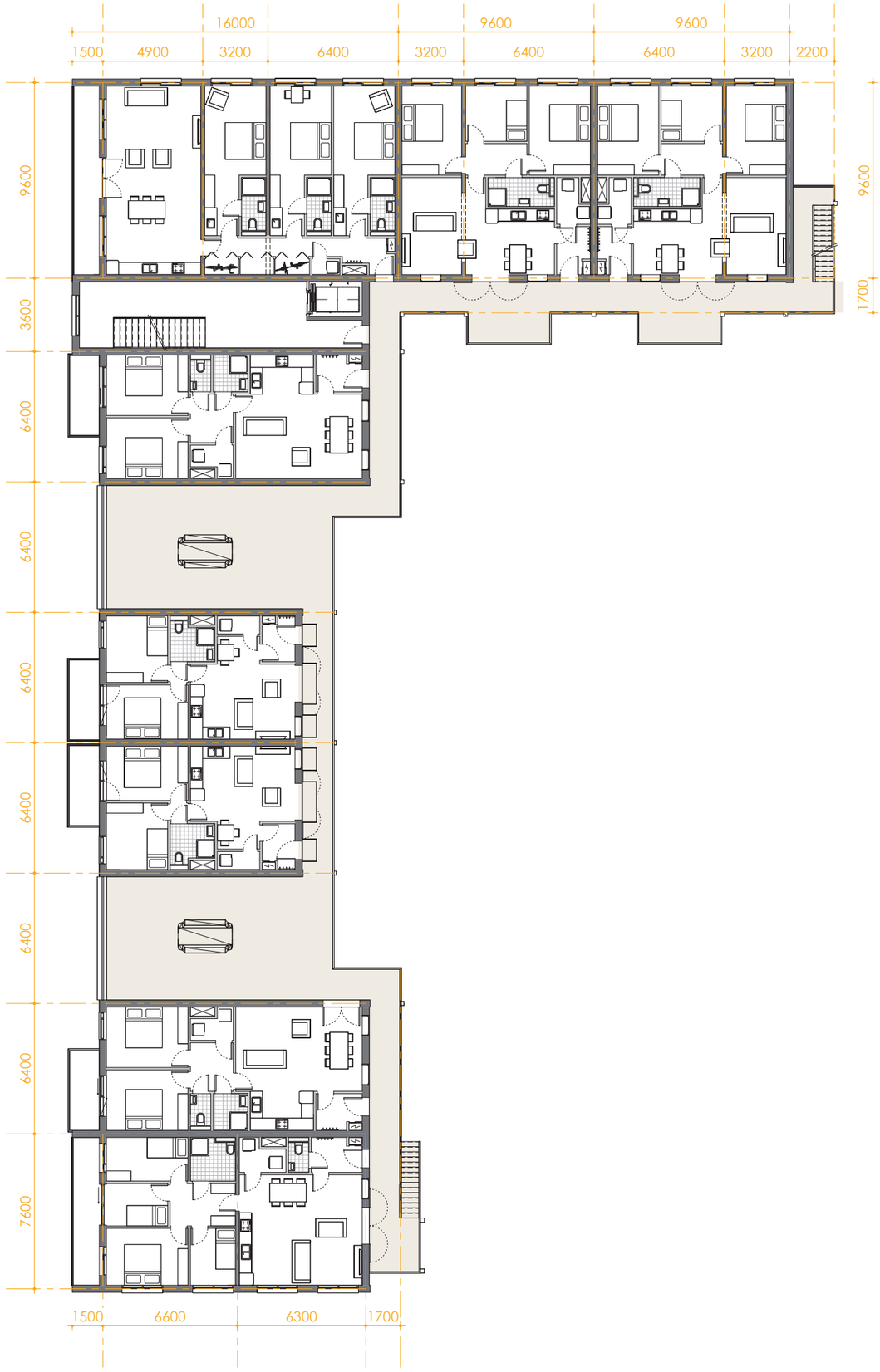


Elevated street

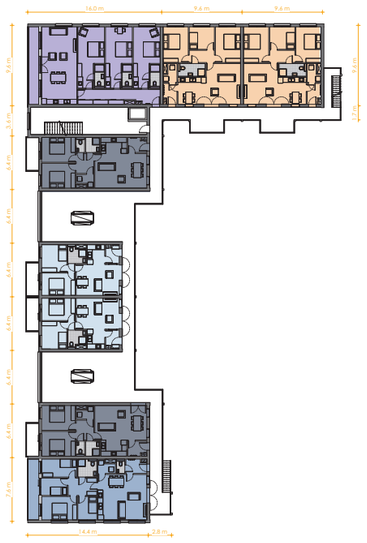
Place to sit in the sun, space to play

Sixth Floor

Floor plan 1:250

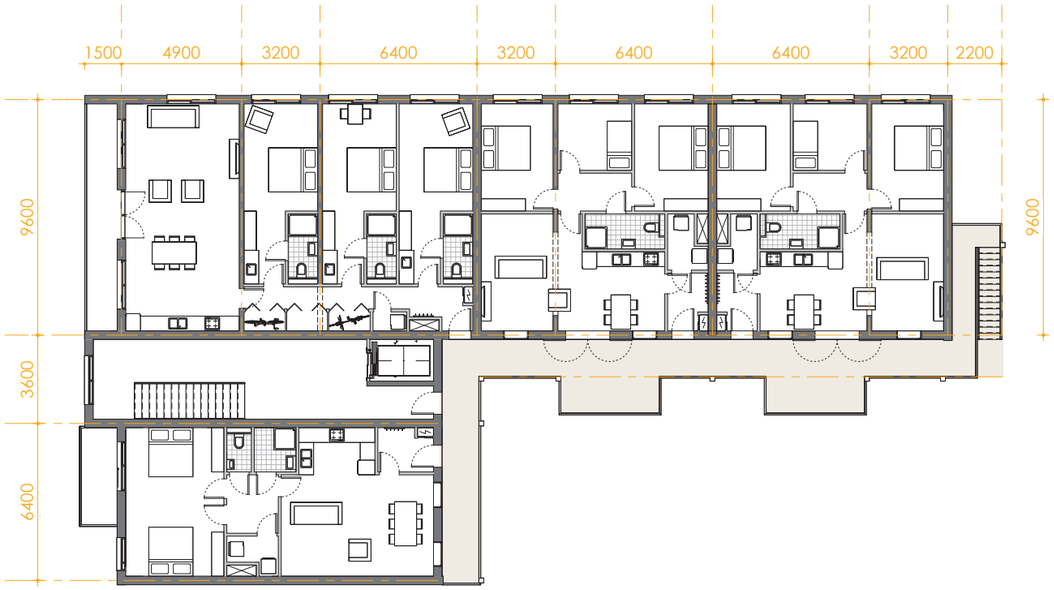


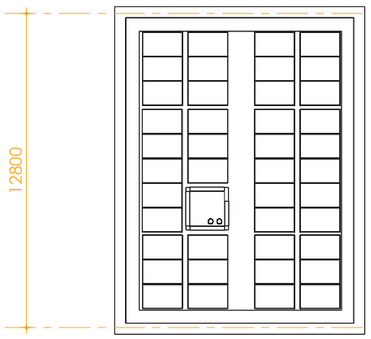
Color guide dwelling typologies



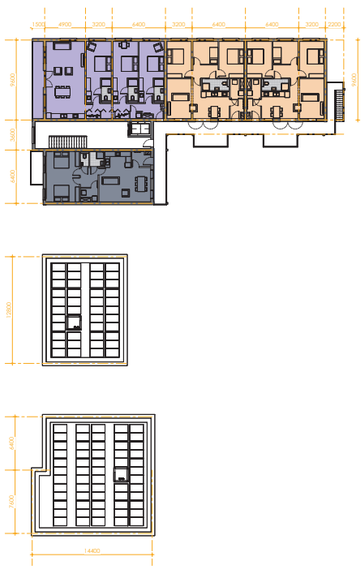
Seventh Floor

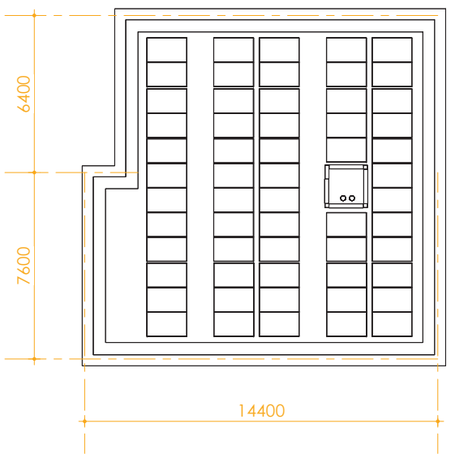
Floor plan 1:250





Color guide dwelling typologies





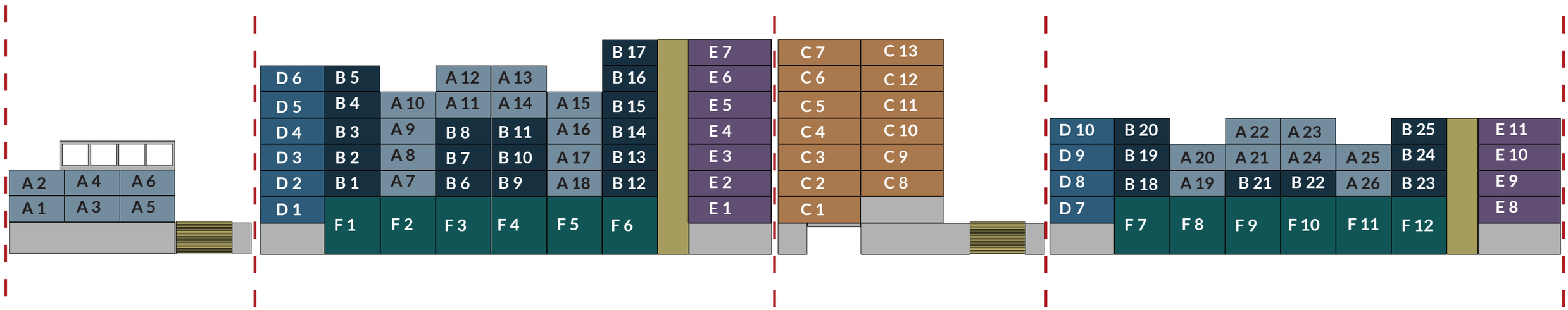
Dwelling typology

Dwelling organization

97 Dwellings Total

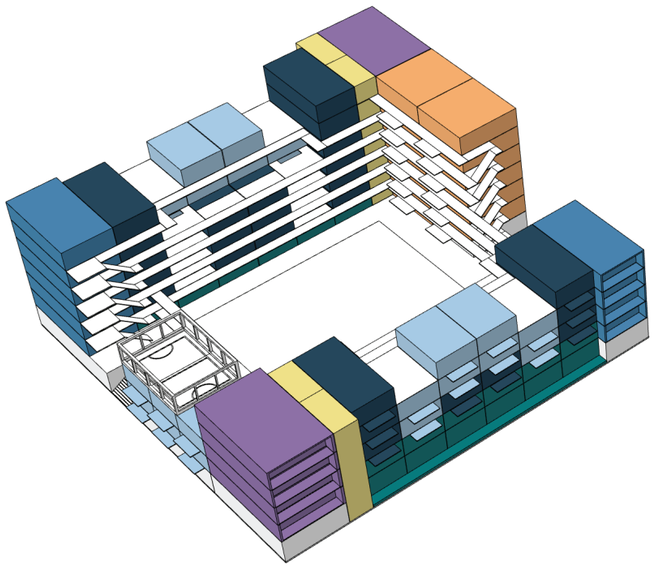
A	26x	Area:	61m2
		Floor:	6.4m x 9.6
B	25x	Area:	82m2
		Floor:	6.4m x 12.9
C	13x	Area:	92m2
		Floor:	9.6m x 9.6m
D	10x	Area:	108m2
		Floor:	7.5m x 14.4
E	11x	Area:	153m2
		Floor:	9.6m x 16
F	12x	Area:	125m2
		Upper floor:	6.4m x 12.9
		Lower floor:	6.4m x 6.7

Stairs

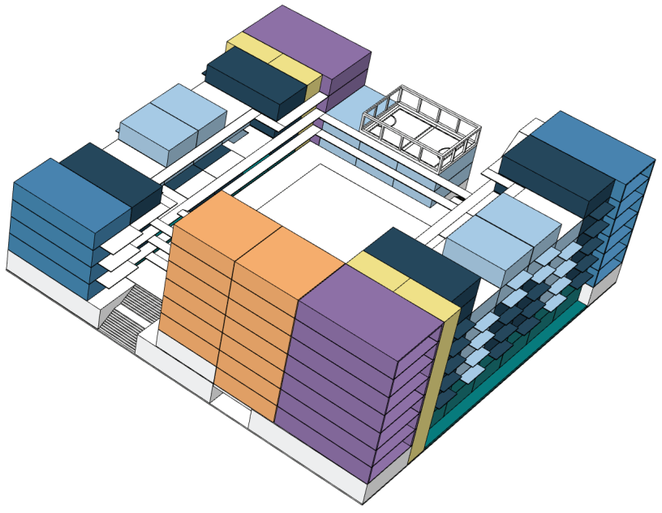


North

South



South



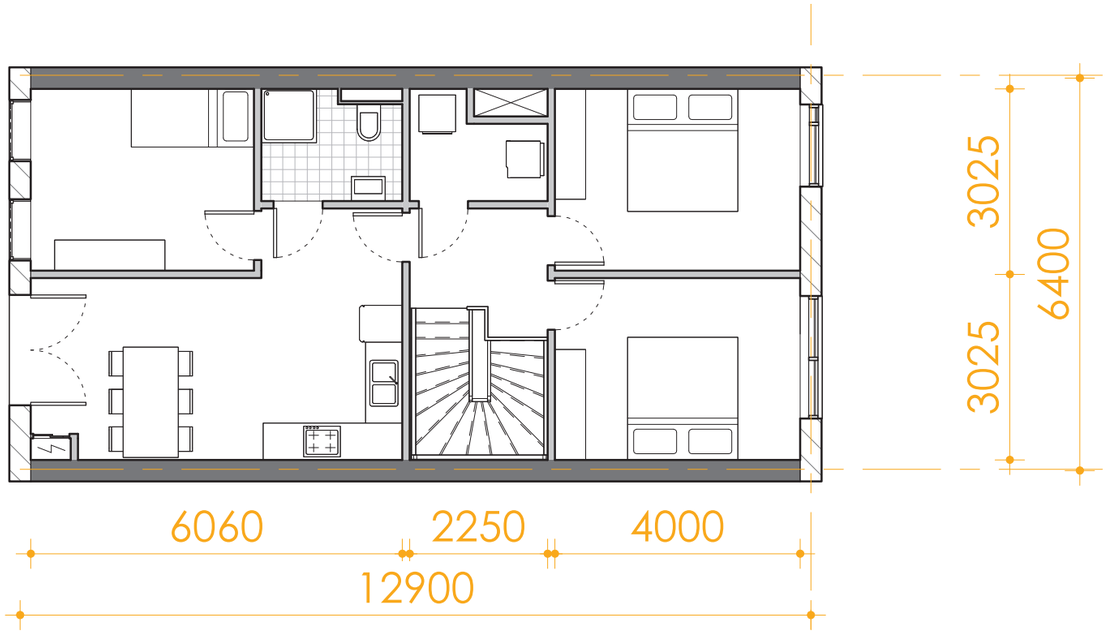
North

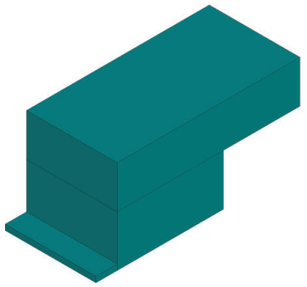
Dwelling typologies

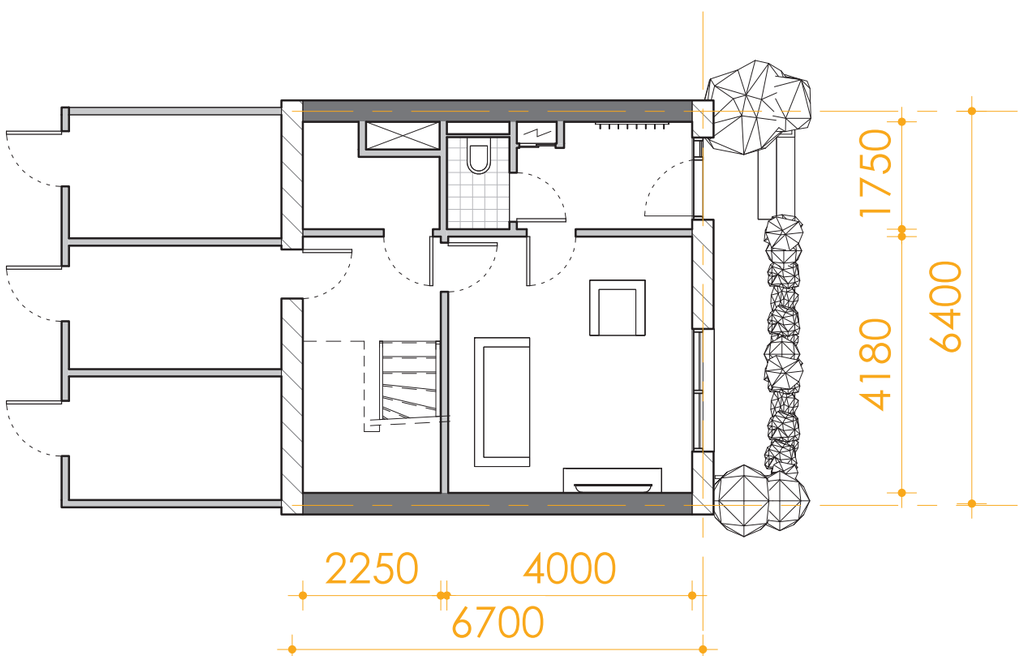
Floor plans 1:100

(97 dwellings total)

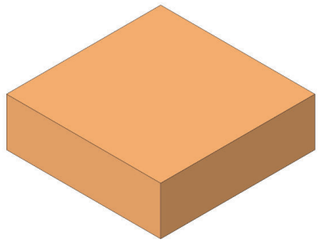
12x Area: 125m2
Upper floor: 6.4m x 12.9
Lower floor: 6.4m x 6.7

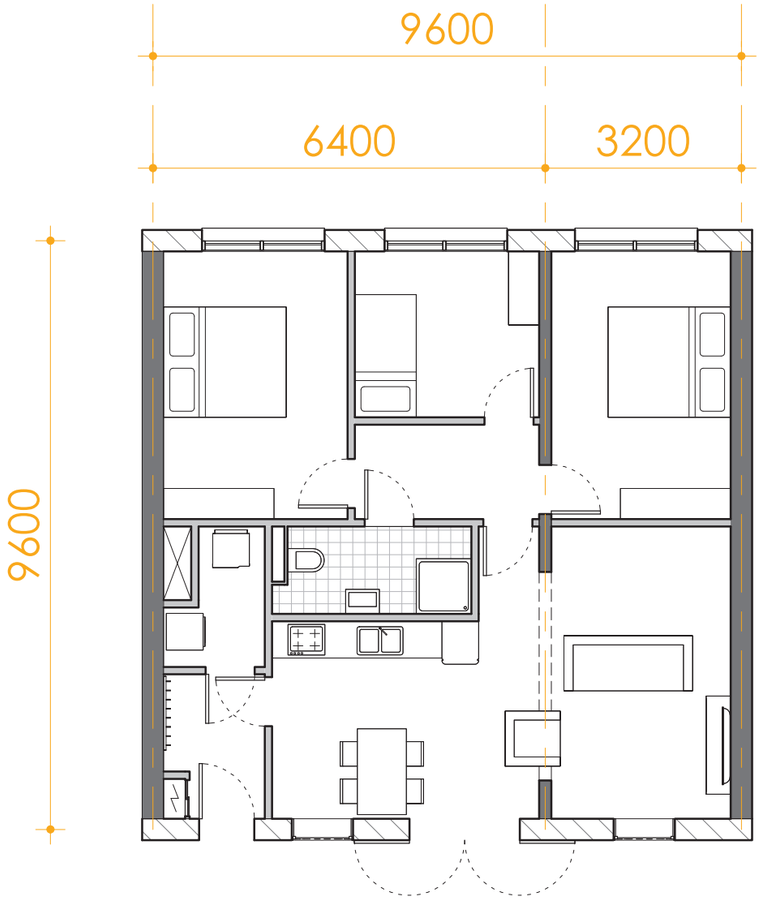






14x Area: 92m2
Floor: 9.6m x 9.6m



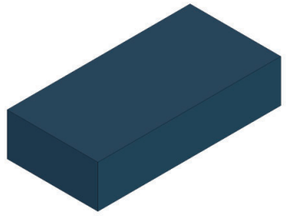


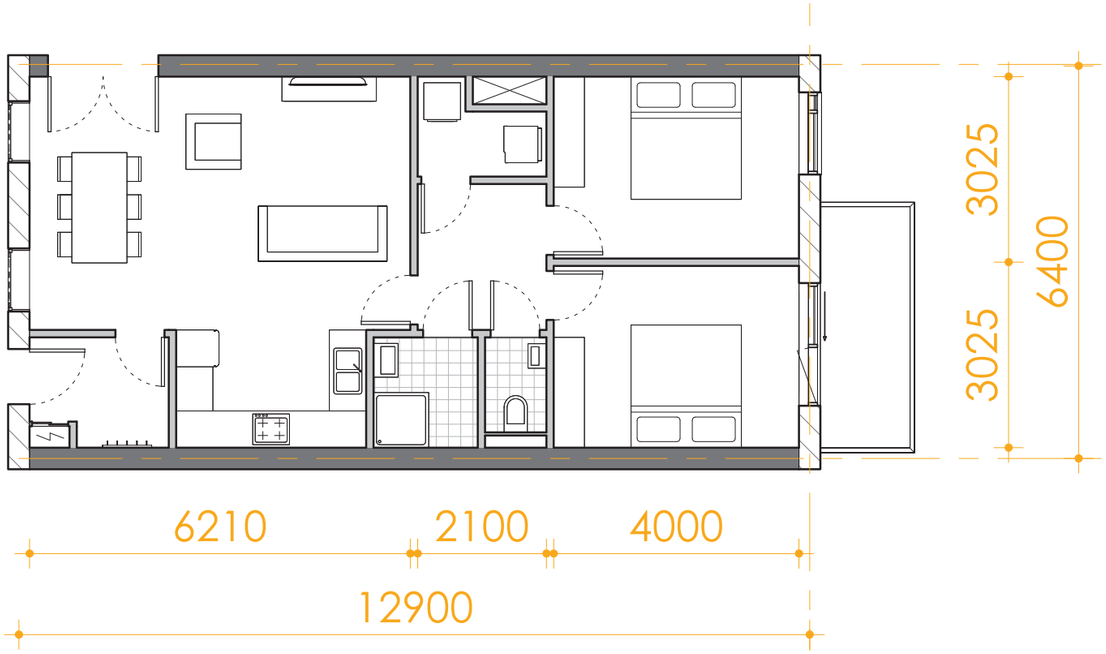
Dwelling typologies

Floor plans 1:100

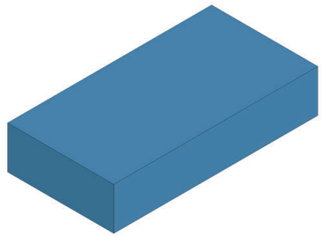
(97 dwellings total)

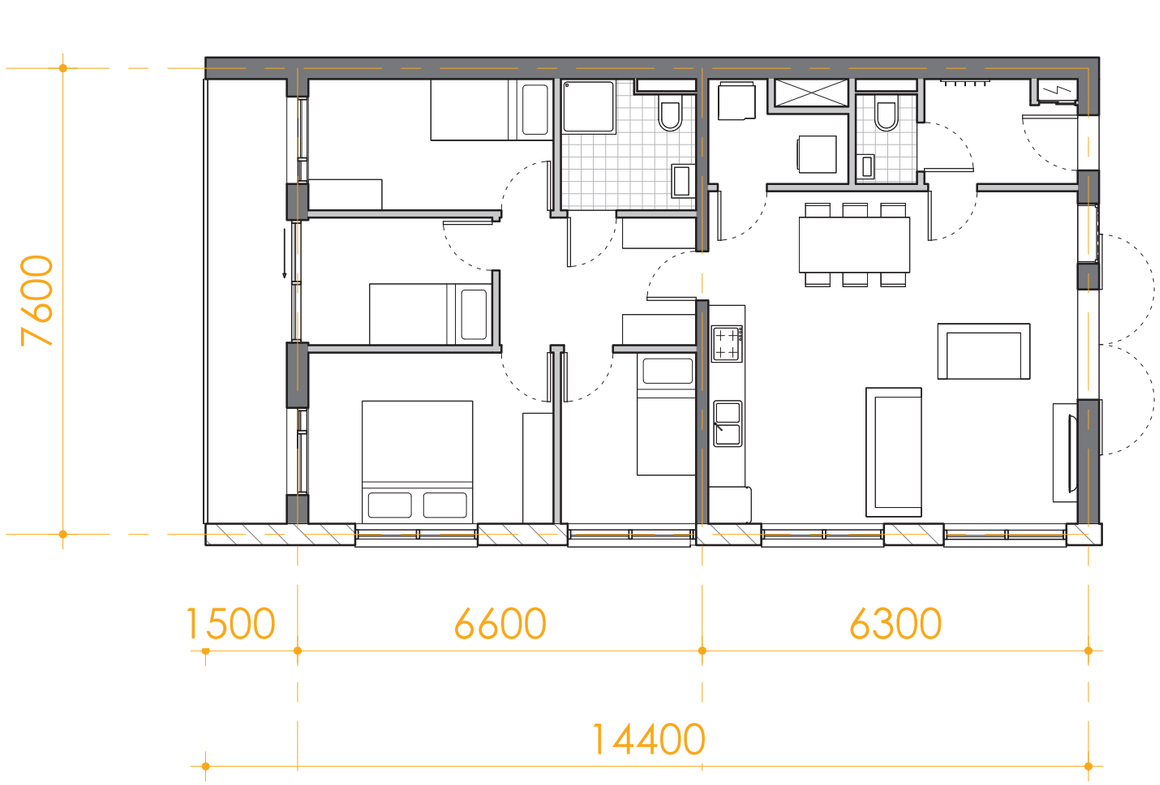
24x Area: 82m2
Floor: 6.4m x 12.9





10x Area: 108m2
Floor: 7.5m x 14.4

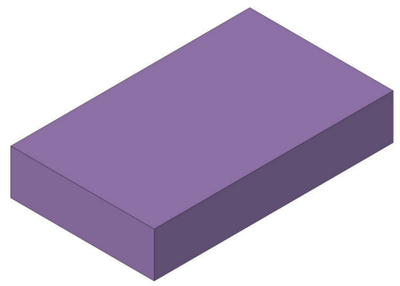


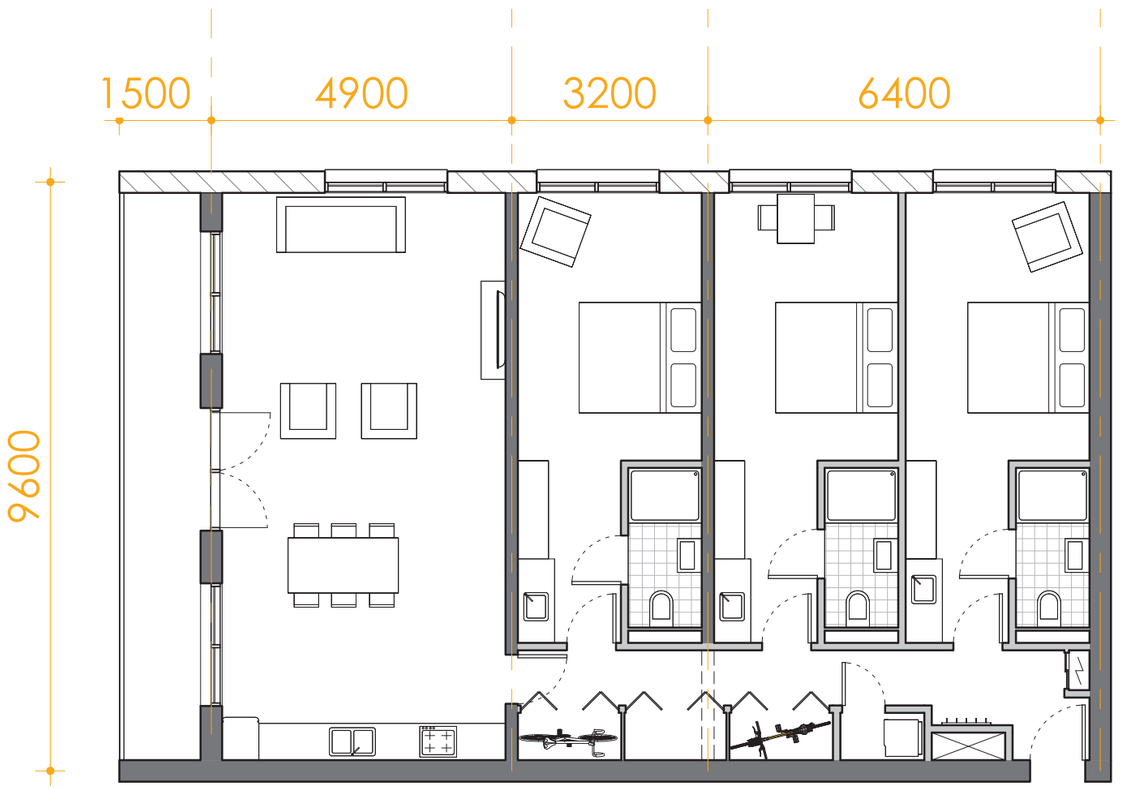


Dwelling typologies
Floor plans 1:100

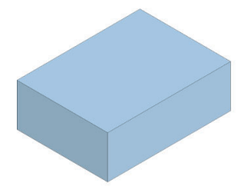
(97 dwellings total)

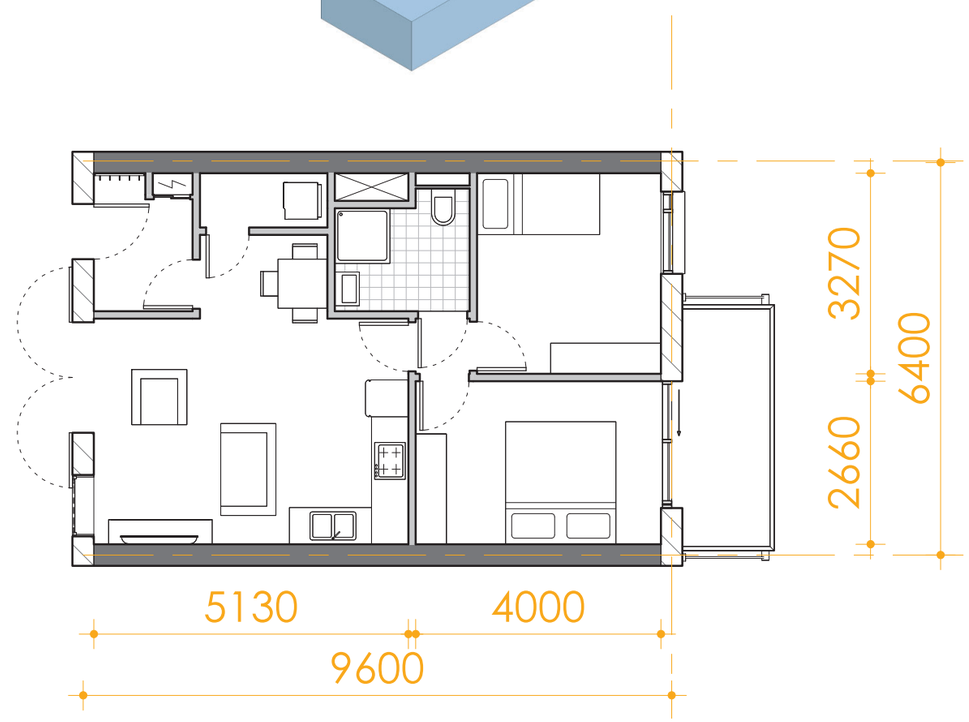
11x Area: 153m2
Floor: 9.6m x 16





26x Area: 61m2
Floor: 6.4m x 9.6





Dwelling interior

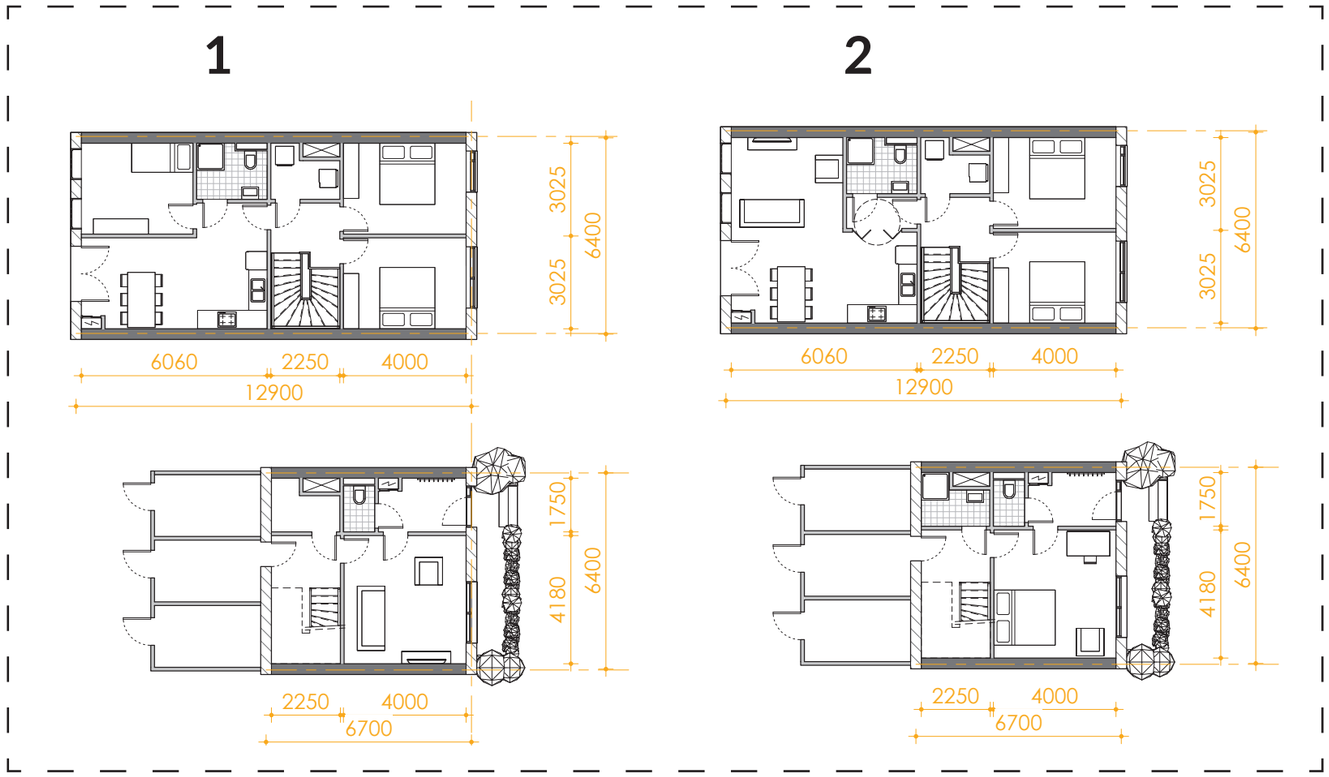
Living room - Kitchen - Dining room

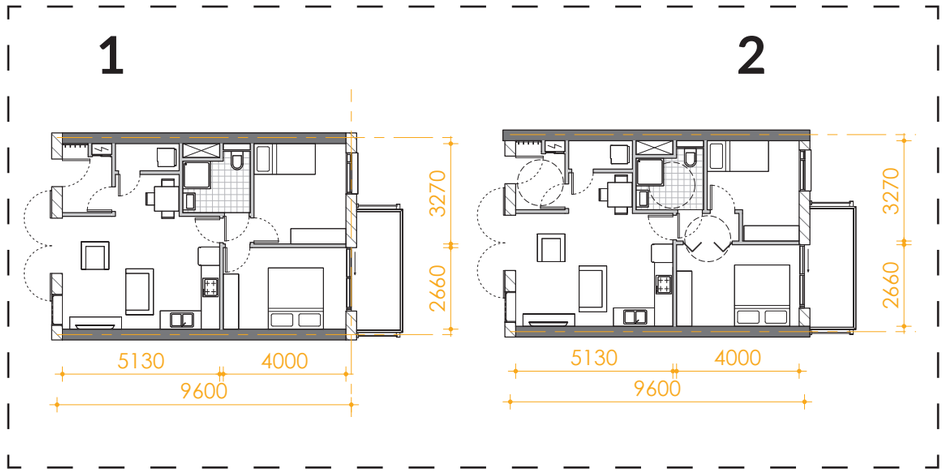
Dwelling interior
Master Bedroom

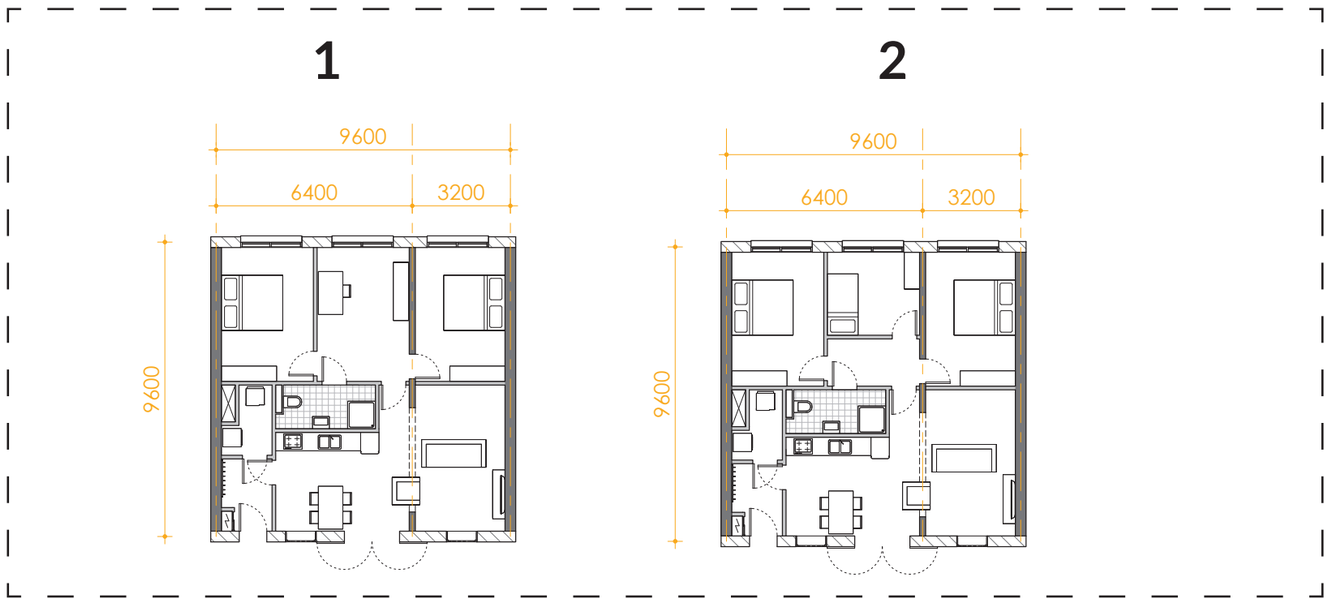
Dwelling interior
Kids room / Guest room

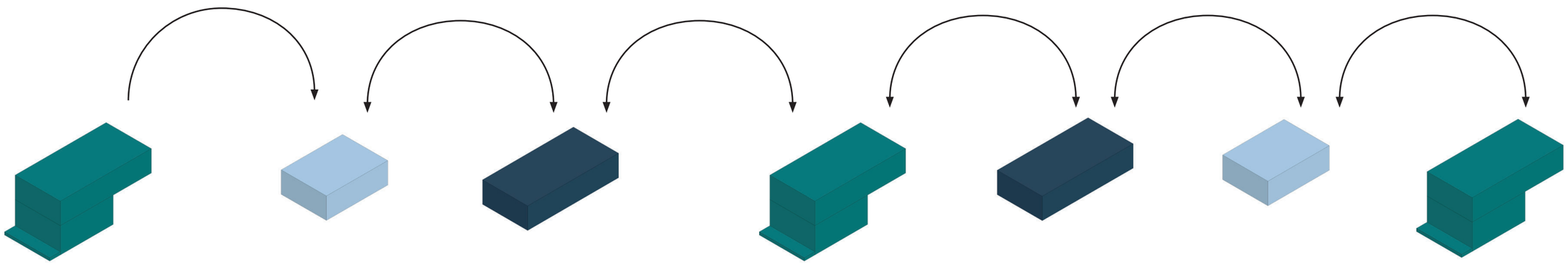
Transitionality Floorplans

Adaptations to floorplans over time









Growing up
Family Home

Moving out
Starter Home
Single

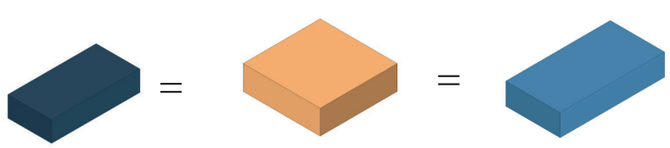
Economic Growth
Family expansion
Couple

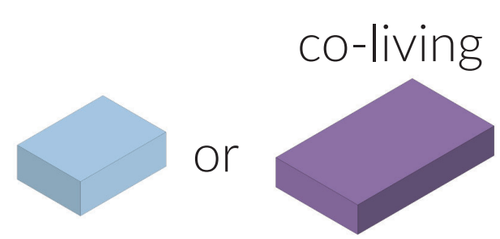
Family Life
Multiple Children

Kids moved out
Parents splitting up
Couple (Elderly)
Single parent

Elderly single / couple
Smaller budget

Move in with family child



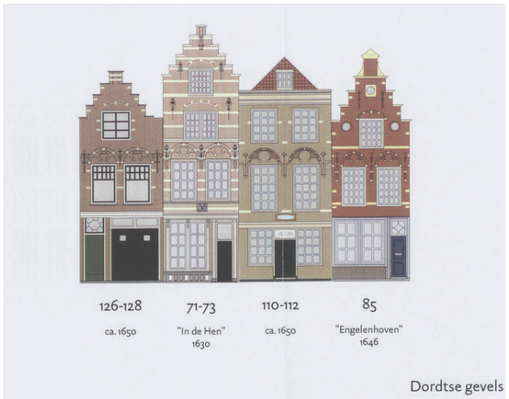


Facade Materialization

Outer facade

raised sidewalk along street with flowers & bench

Wasserstrich Safora
Stretcher bond



Doors in night blue color

Elevations
Outer Facade

East

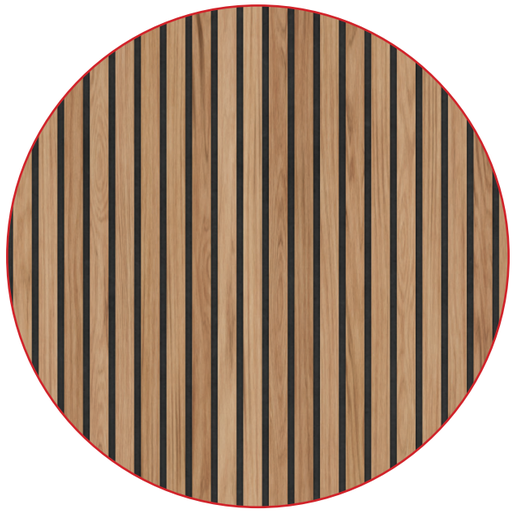
West

South

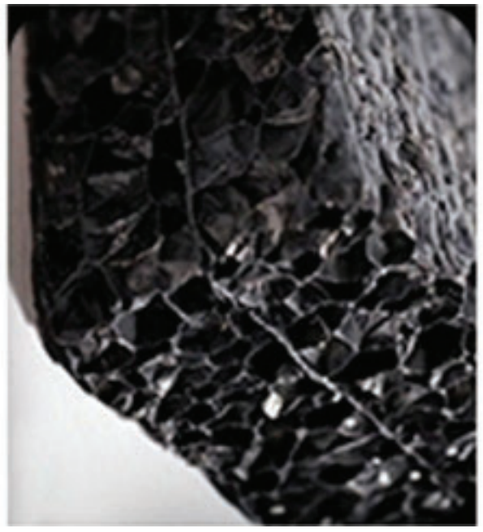
North

Facade Materialization

Inner Facade



Weather resistant woodboards from Larch wood



Whisper Foam for acoustics

Elevations
Inner Facade

East

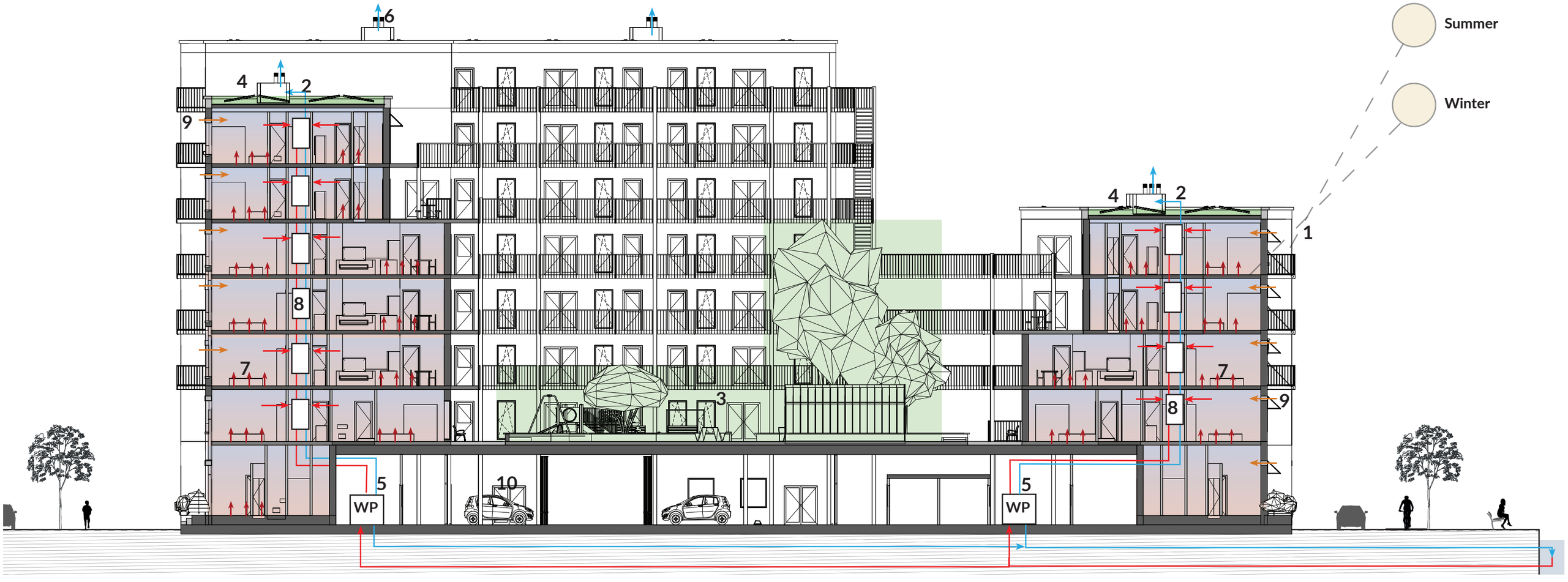
West

South

North

Climate Scheme Building

Climate systems and sustainable solutions



Passive systems

- Insulation layer Rc >6
- Tripple glass windows

1 • Sun shading for cooling (gallery , screens, trees)

2 • Green roofs with water retention, water drainage through shaft

3 • Green courtyard versus urban heat island effect and for biodiversity.

Materials

- CLT (CO2 retention + Recyclable)
- Durable wasserstrich brick on the outside
- Wooden cladding on inside with acoustic panels for noise reduction

Active systems Building

4 • PVT panels on roof for heat and electricity

5 • Heat pump with heat from harbor water

6 • Mechanical air extraction units with heat recovery for public & collective spaces

Active systems Dwelling

7 • Floor heating (low temperature <45°C)

8 • Heat pump recovers heat from air in dwelling

- Air extraction with heat recovery

9 • Natural air supply inlets with preheated air in winter CO2 and temperature driven (Climatop AK60+)

- Heat recovery waste water

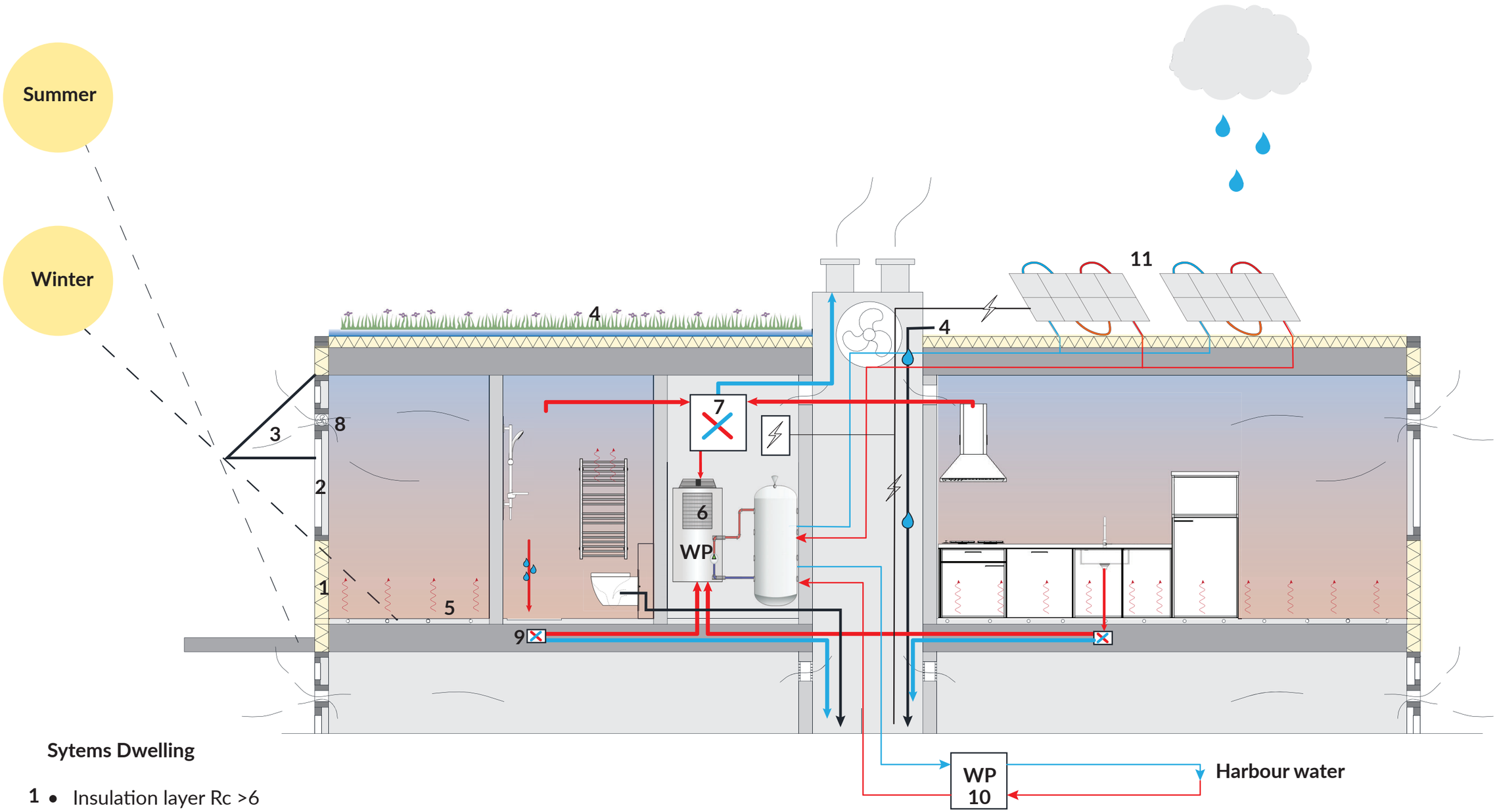
Transport

10 • Car sharing (electric)

- Bicycle sharing

Climate Scheme Dwelling

Climate systems and sustainable solutions



Sytems Dwelling

1 • Insulation layer Rc >6
2 • Tripple glass windows

3 • Sun shading for cooling (gallery , screens, trees)

4 • Green roofs with water retention, water drainage through shaft

5 • Floor heating (low temperature <45°C)

6 • Heat pump recovers heat from air in dwelling

7 • Air extraction with heat recovery

8 • Natural air supply inlets with preheated air in winter CO2 and temperature driven (Climatop AK60+)

9 • Heat recovery waste water

10 • Heat pump based on temperature difference harbour water

11 • PVT panels on roof for heat and electricity

Roof view

Green roofs with PVT panels

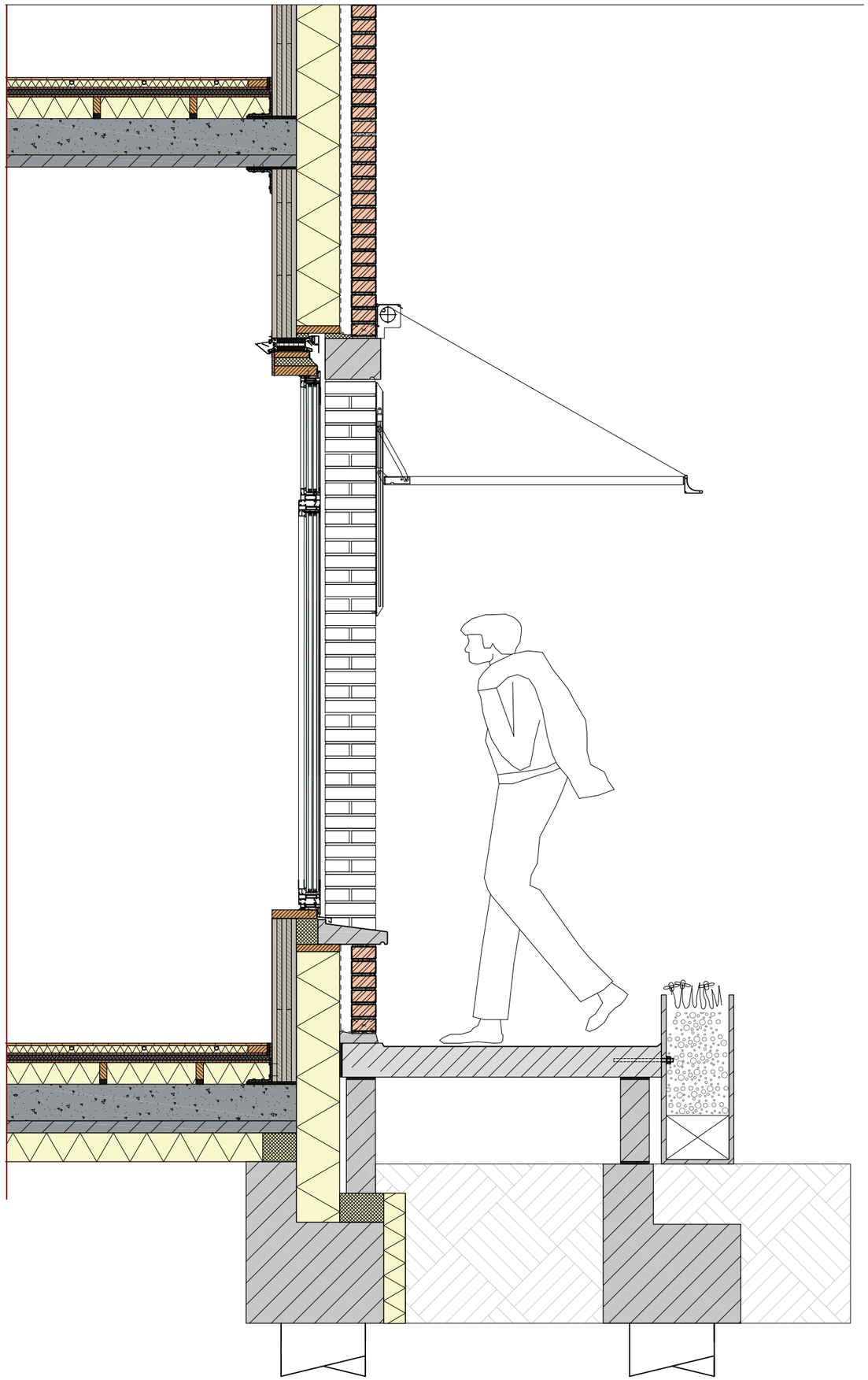
Sun shading

Slide arm drop out screens

Sun shading
Solar louvers

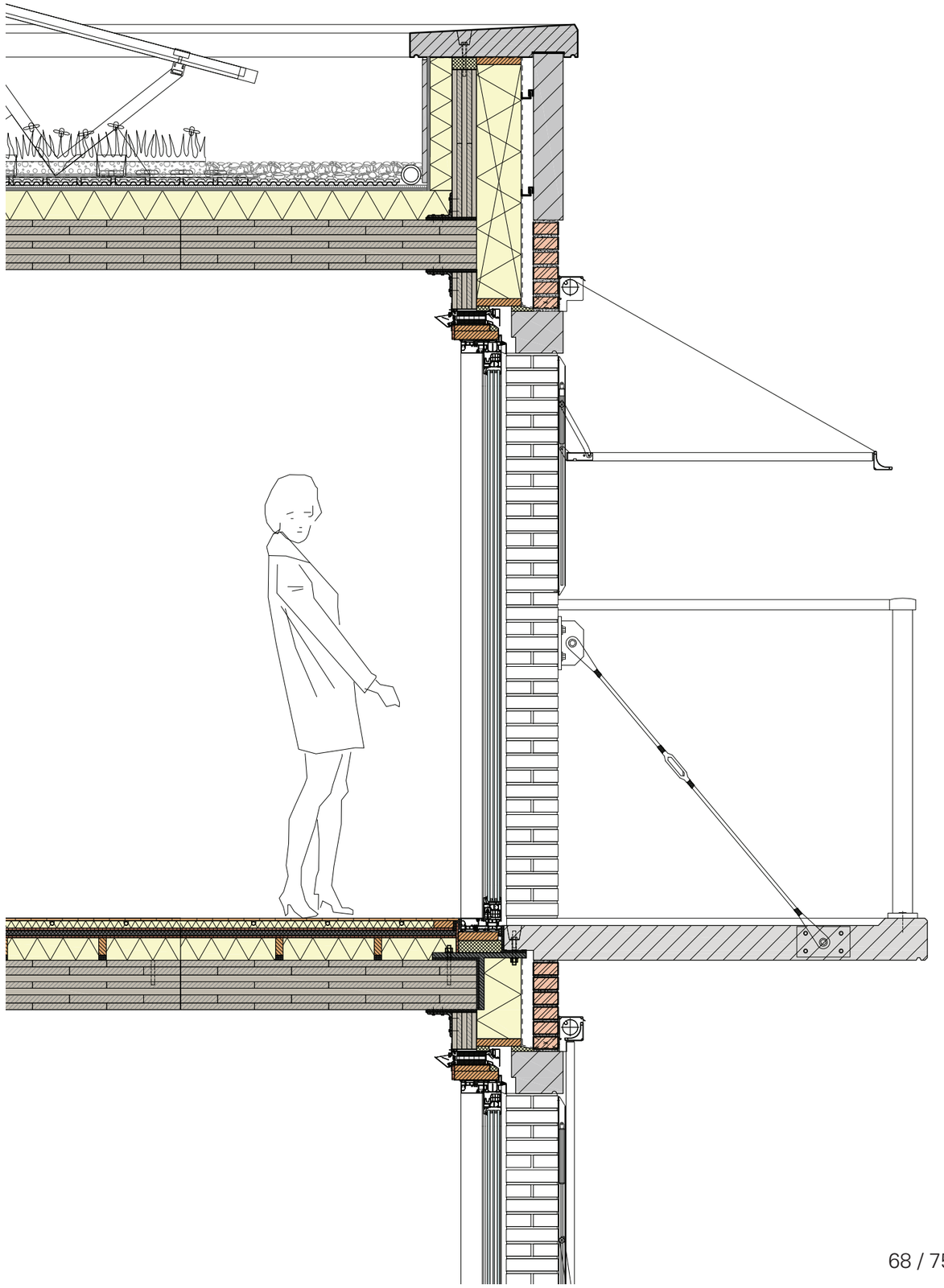
Facade vertical detail

Outer skin - Ground level 1:20

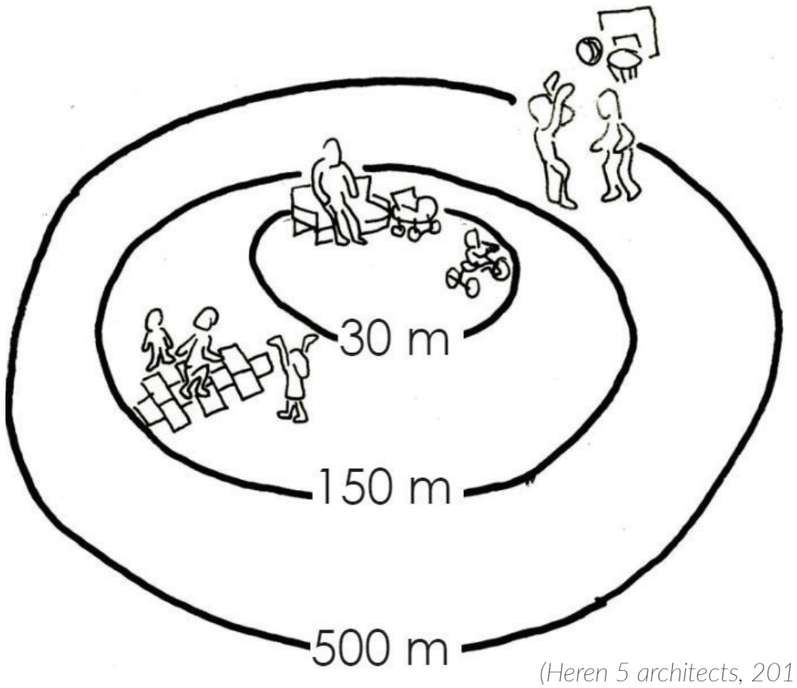


Facade vertical detail

Outer skin - Fouth Floor & Roof 1:20



Children Radius



(Heren 5 architects, 2010)

30 m,	age 0-4,	motor skills
150 m,	age 4-8,	social skills
500 m,	age 8-12,	independence

30 m, age 0-5,
water, sand, clay, branches, stones
hide and seek, swinging, sliding, climbing, stepping, cycling, jumping

150 m, age 5-11,
playing together, risk taking, speed, sport, games (cycling, skating, ball games)

500 m, age 12-16,
sport, meeting place, basket ball,
football cage, skate park, hangout place

Spaces for play

Safe play space for children integrated in the building

Spaces for play

Safe play space for children integrated in the building

Gardening

Collective greenhouse in courtyard

Gardening

Collective greenhouse in courtyard

Courtyard ambiance

Mixed crowd

Thanks for Listening!

Street eye level

South East facade

Street eye level

North East facade

Street eye level

North West facade

Facade Study
Brick Reference Historic

Nieuwe Haagse School
Reference Historic

Ground Floor Spans

Concrete Floorspans 1:250

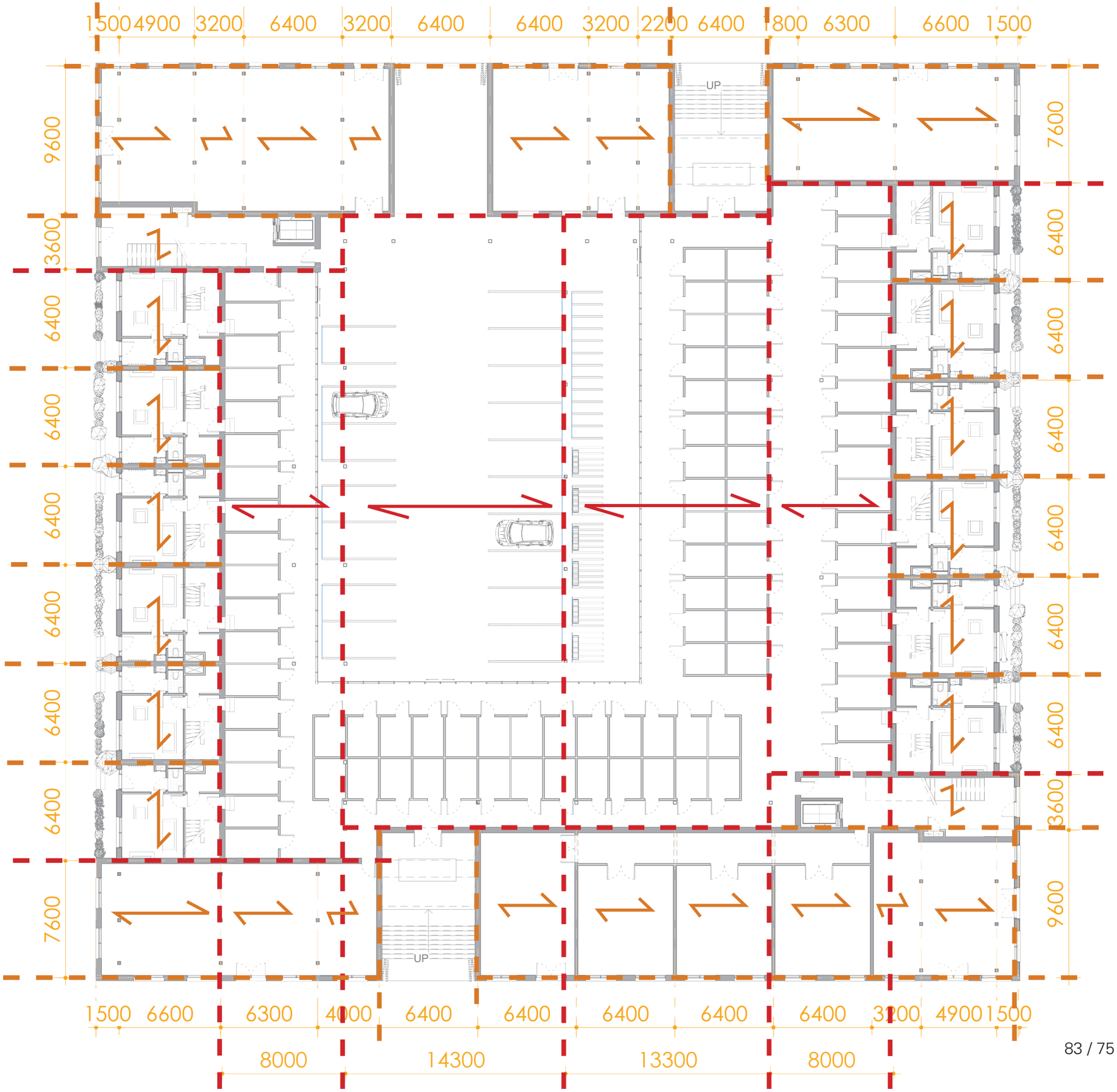
Grid sizes
dwellings / public functions

Common floorspan
6400

Exeptions
3200
3600
4900
6300
6600

Grid sizes
Courtyard deck

8000
13300
14300



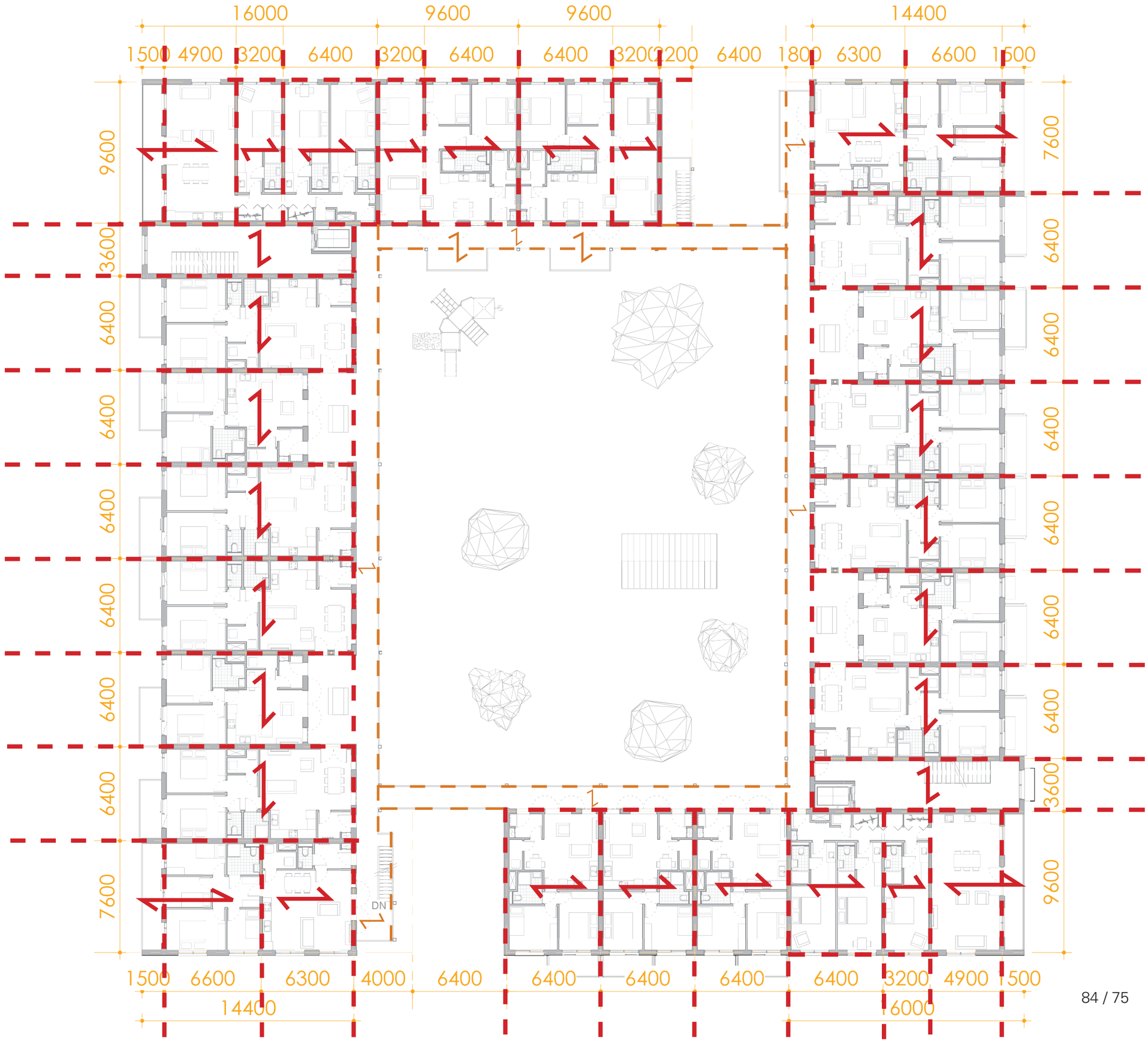
Second Floor Spans

CLT Floorspans 1:250

Grid sizes
dwellings / public functions

Common floorspan
6400

Exeptions
3200
3600
4900
6300
6600



Courtyard garden

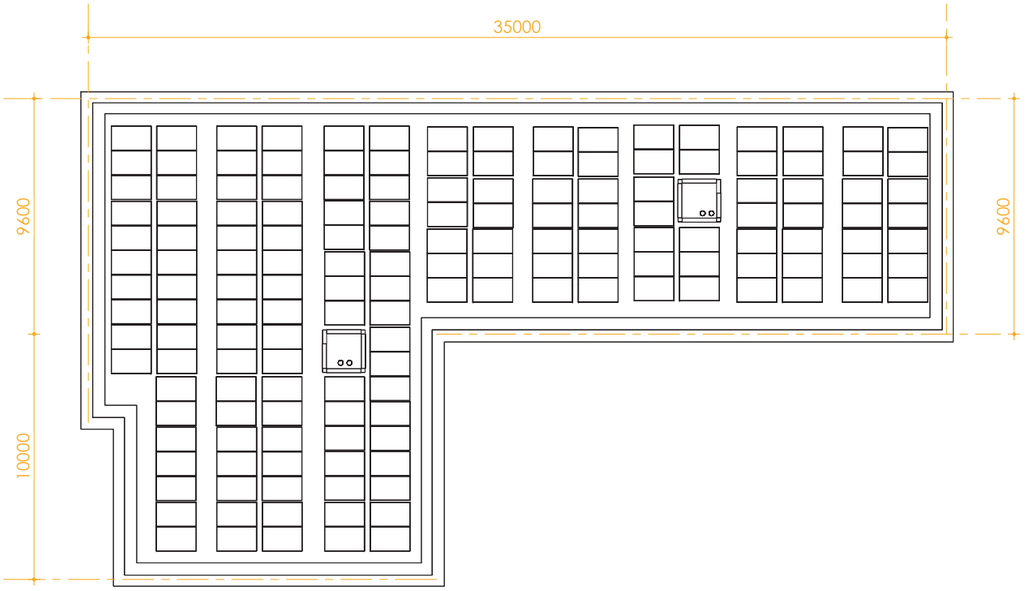
Bird eye view

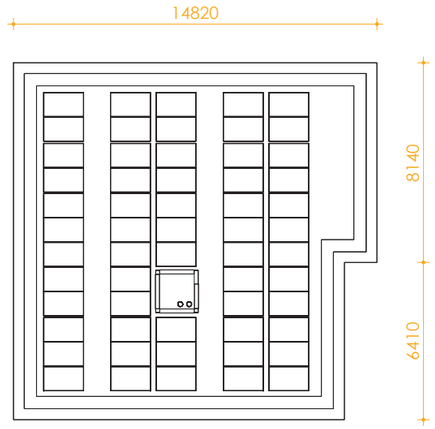
Urban design

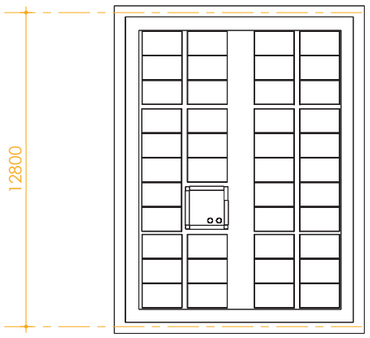
Top view - Scale 1:500

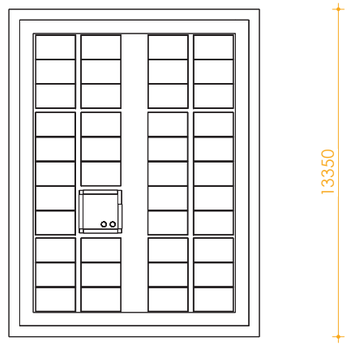
Eight Floor / Roof plan

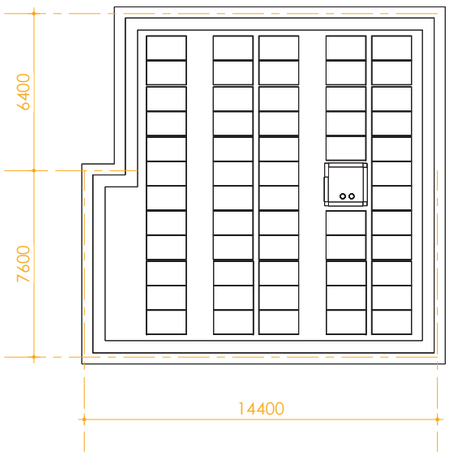
Floor plan 1:250

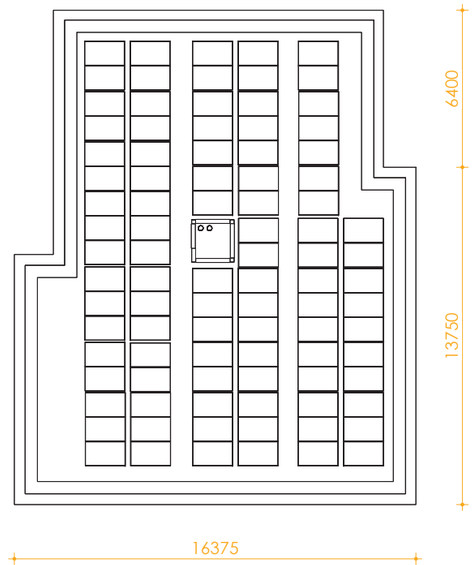






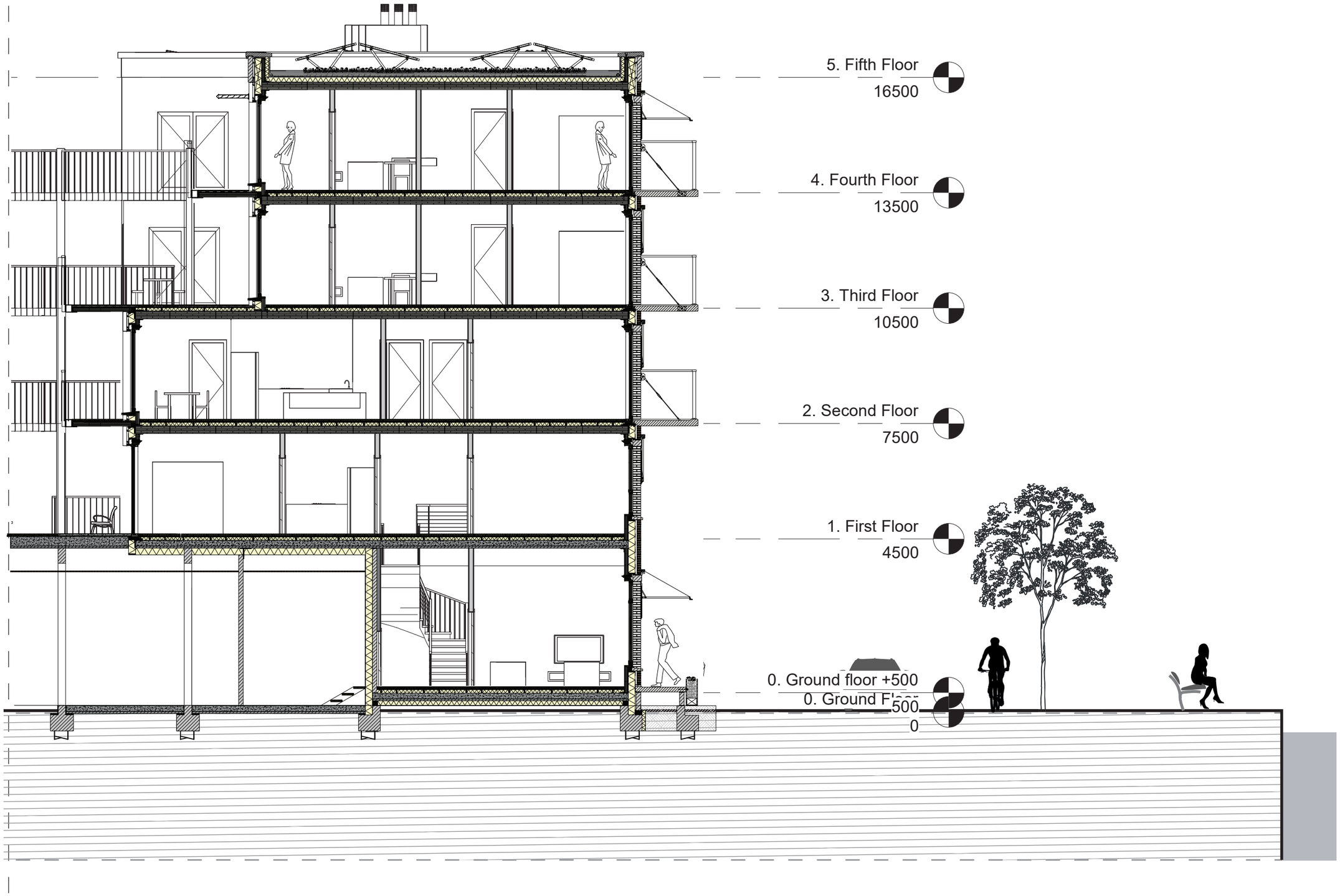






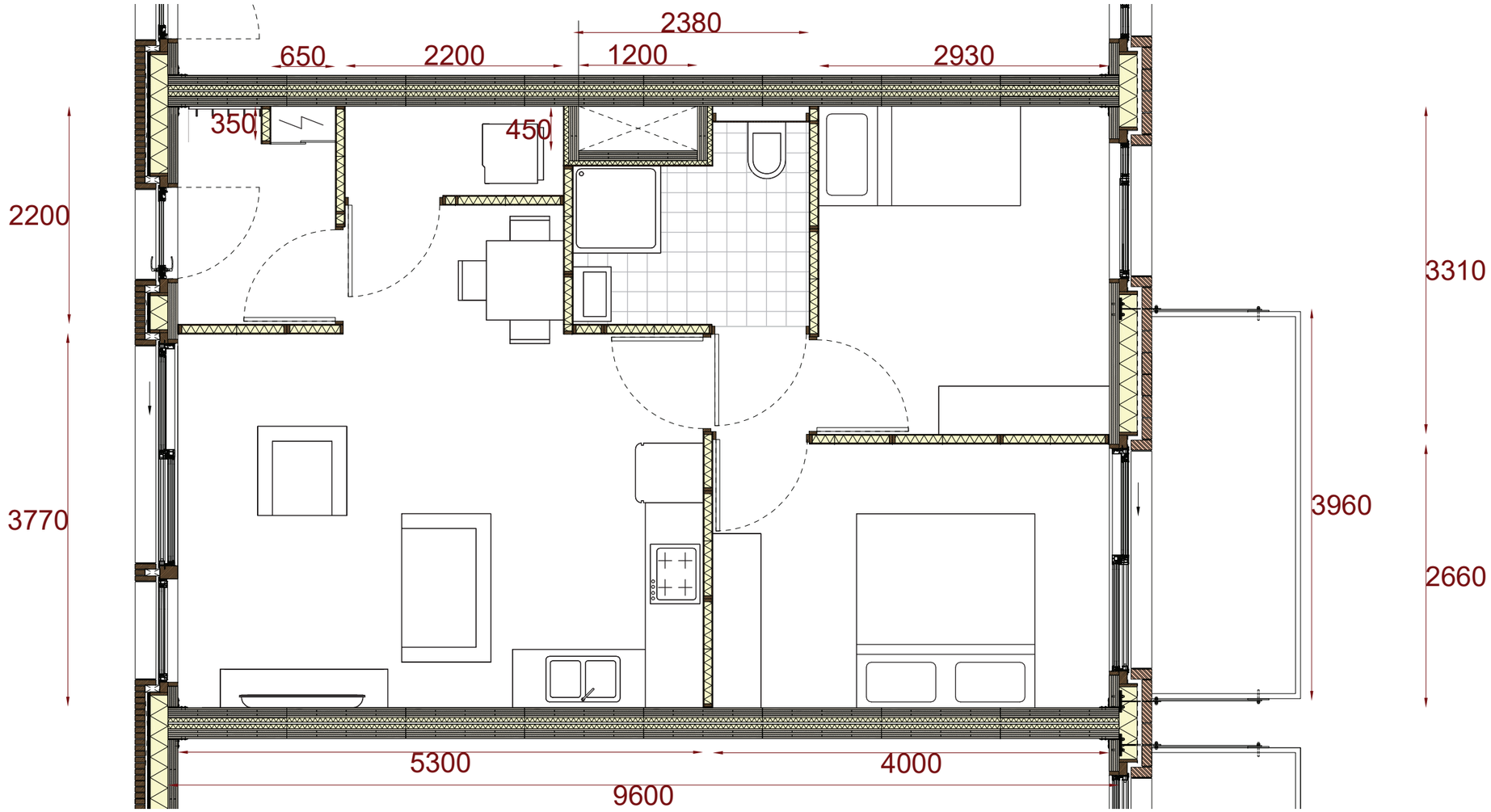
Section

East- West 1:100 dwelling types



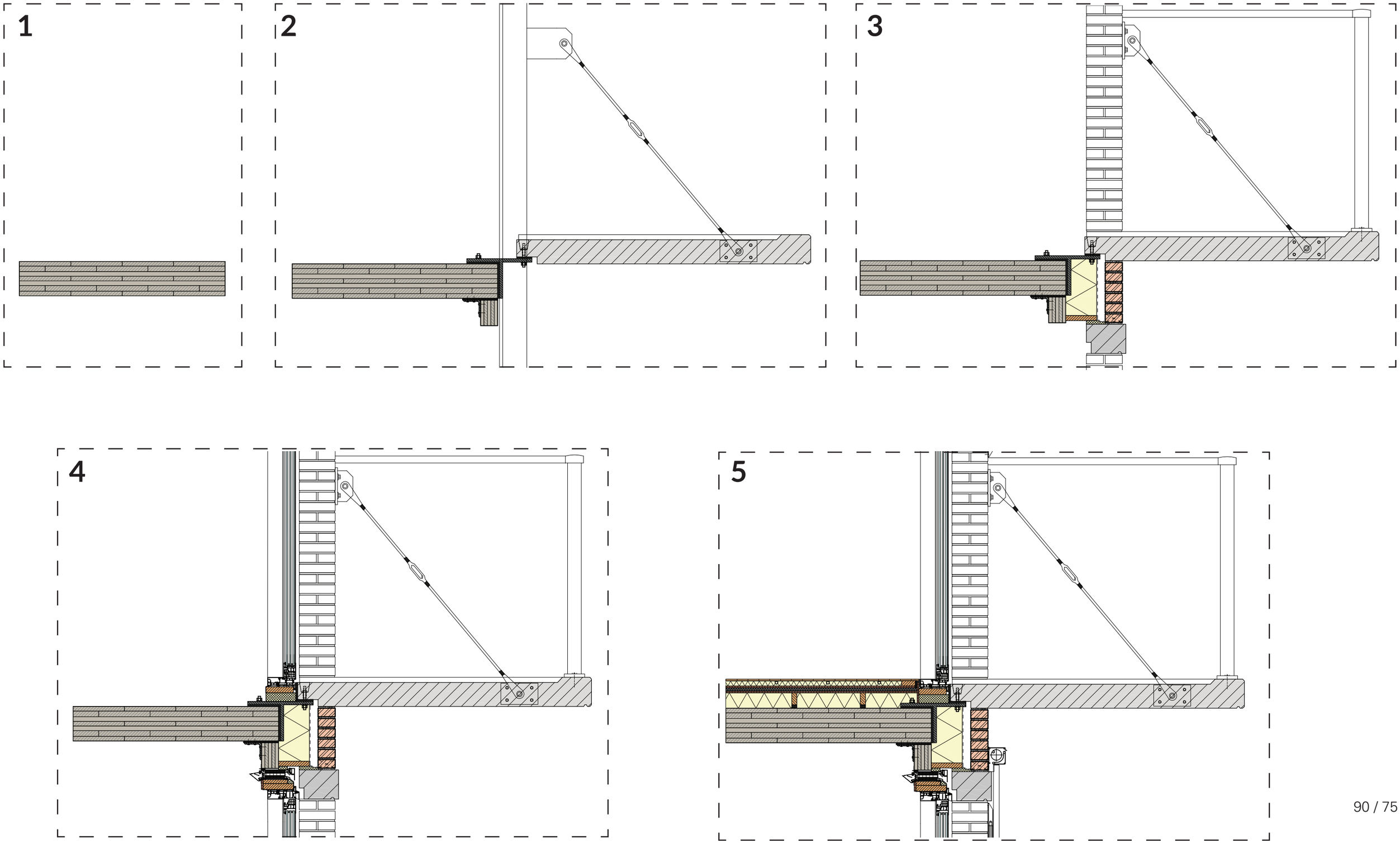
Representative Floor plan

Scale 1:50



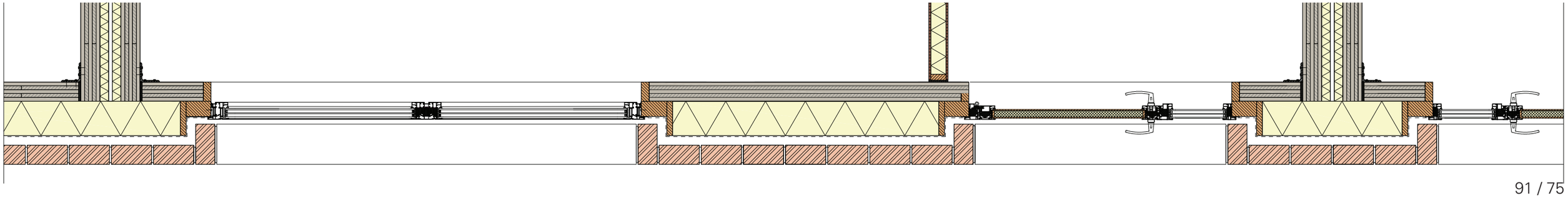
Facade build up steps

Detail Scale 1:20



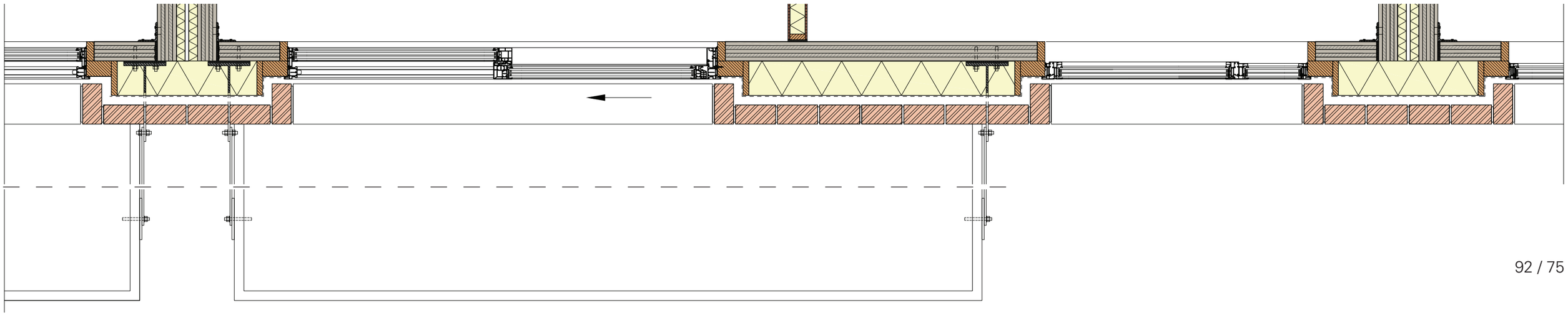
Facade Horizontal detail

Outer skin - Ground level 1:20



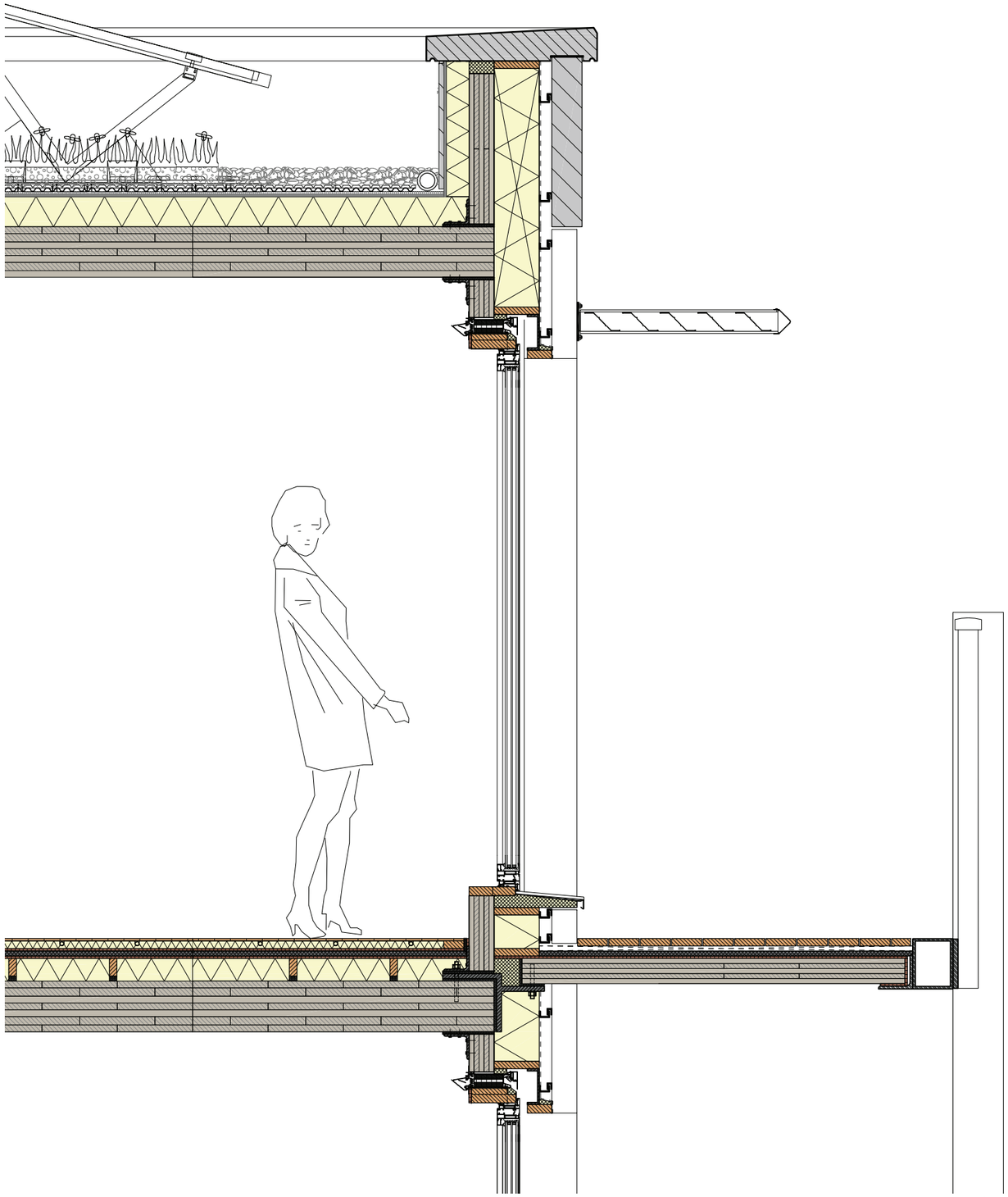
Facade horizontal detail

Outer skin - Fouth Floor 1:20



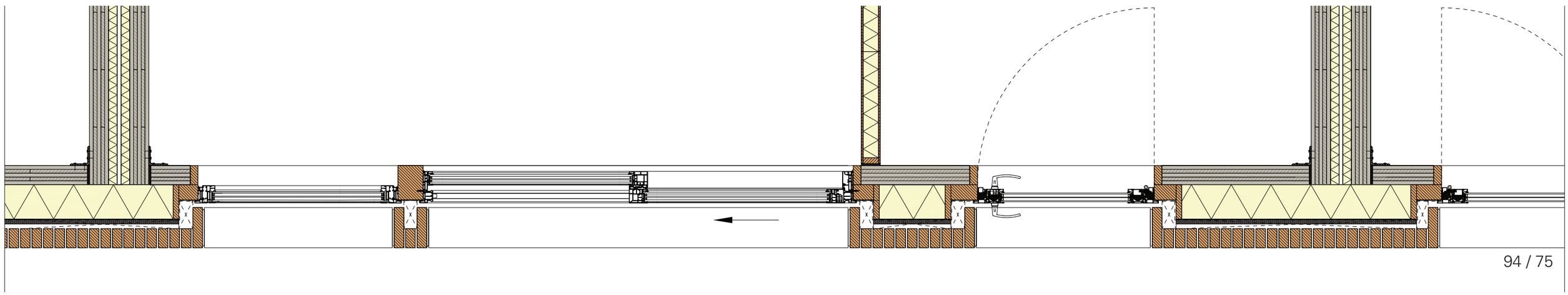
Facade vertical detail

Inner skin - 5th floor 1:20 +16500 > permeable woodwork with sound insulation behind



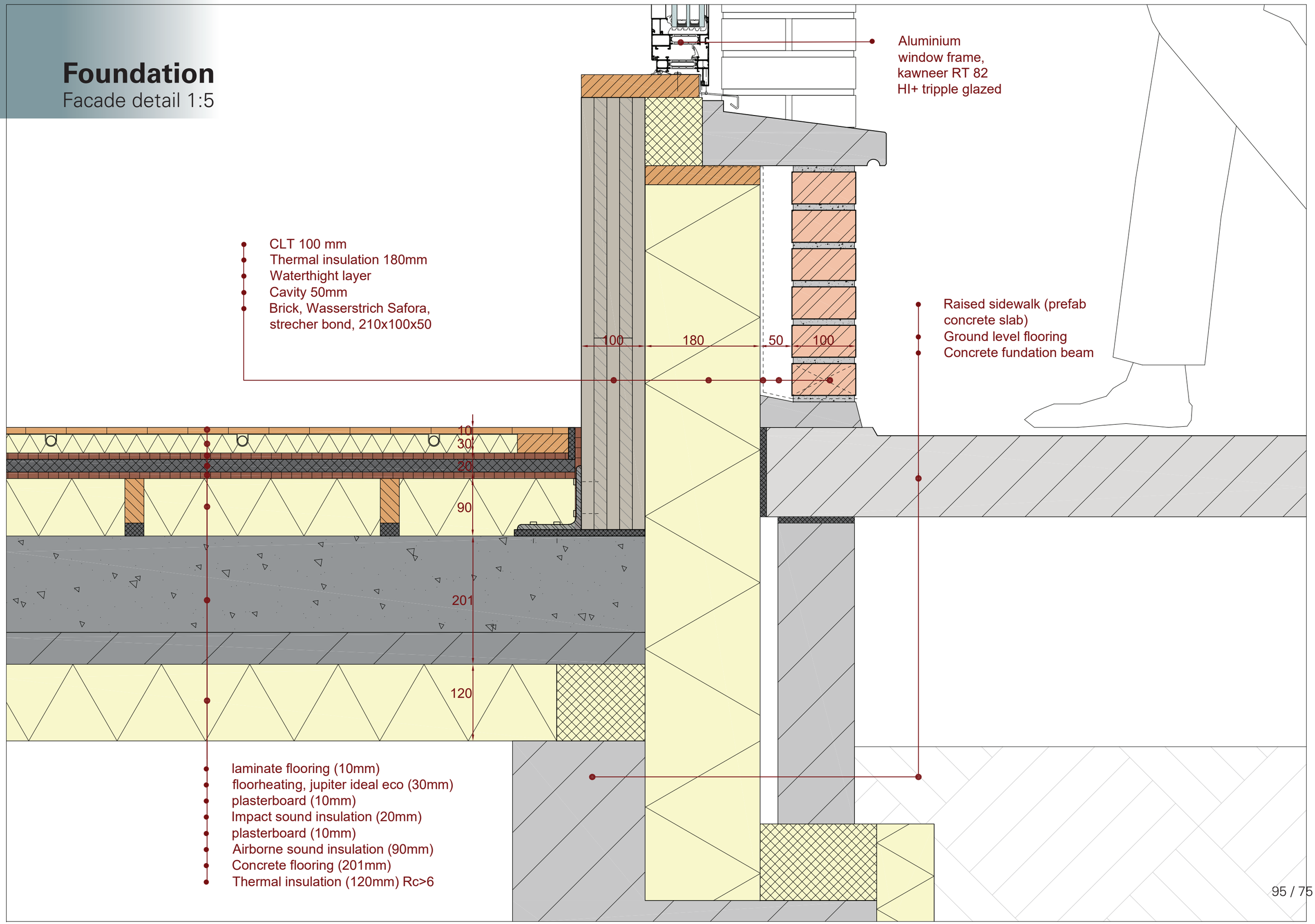
Facade horizontal detail

Inner skin - 5th floor +16500 > permeable woodwork with sound insulation (whisper foam) behind



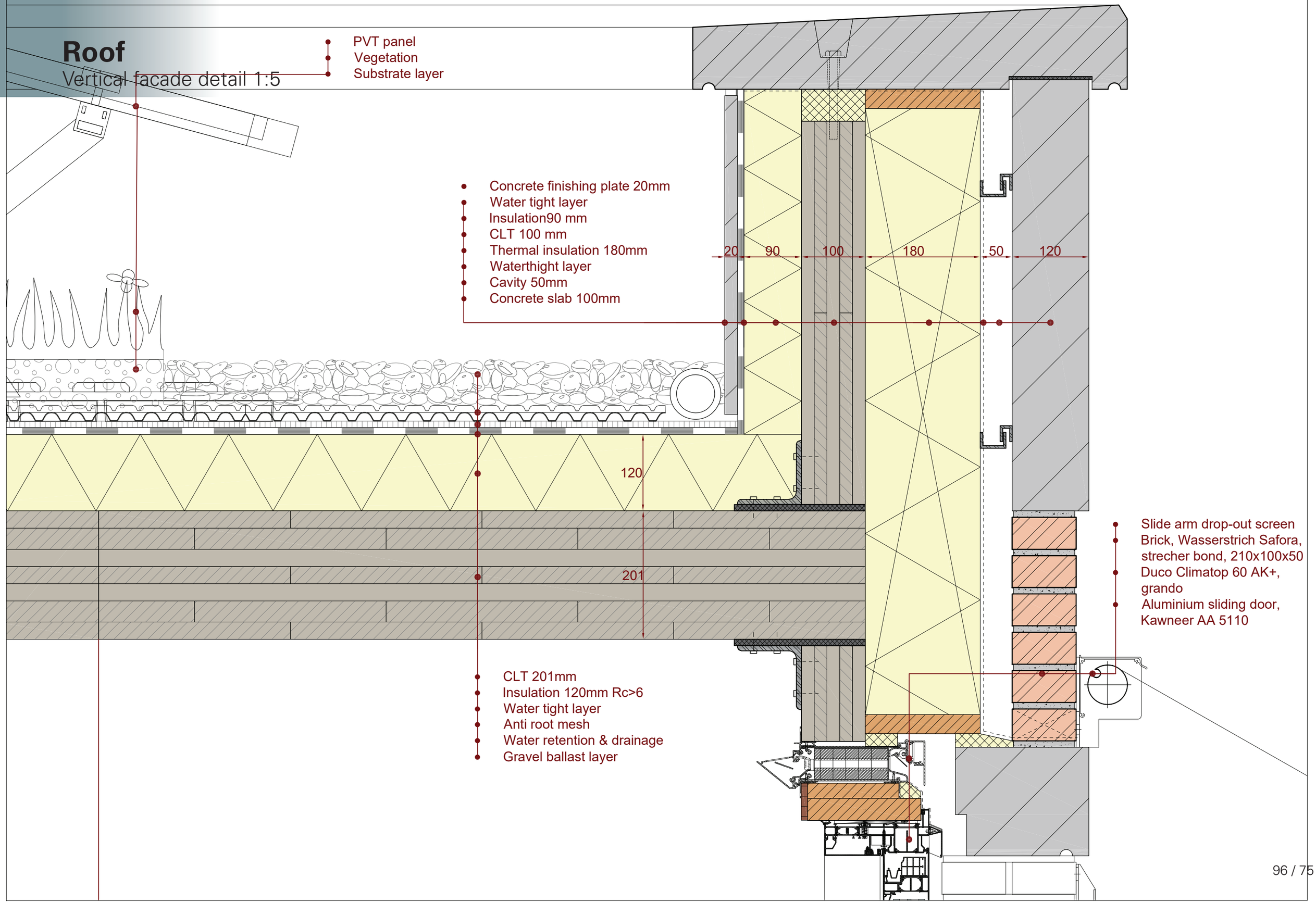
Foundation

Facade detail 1:5



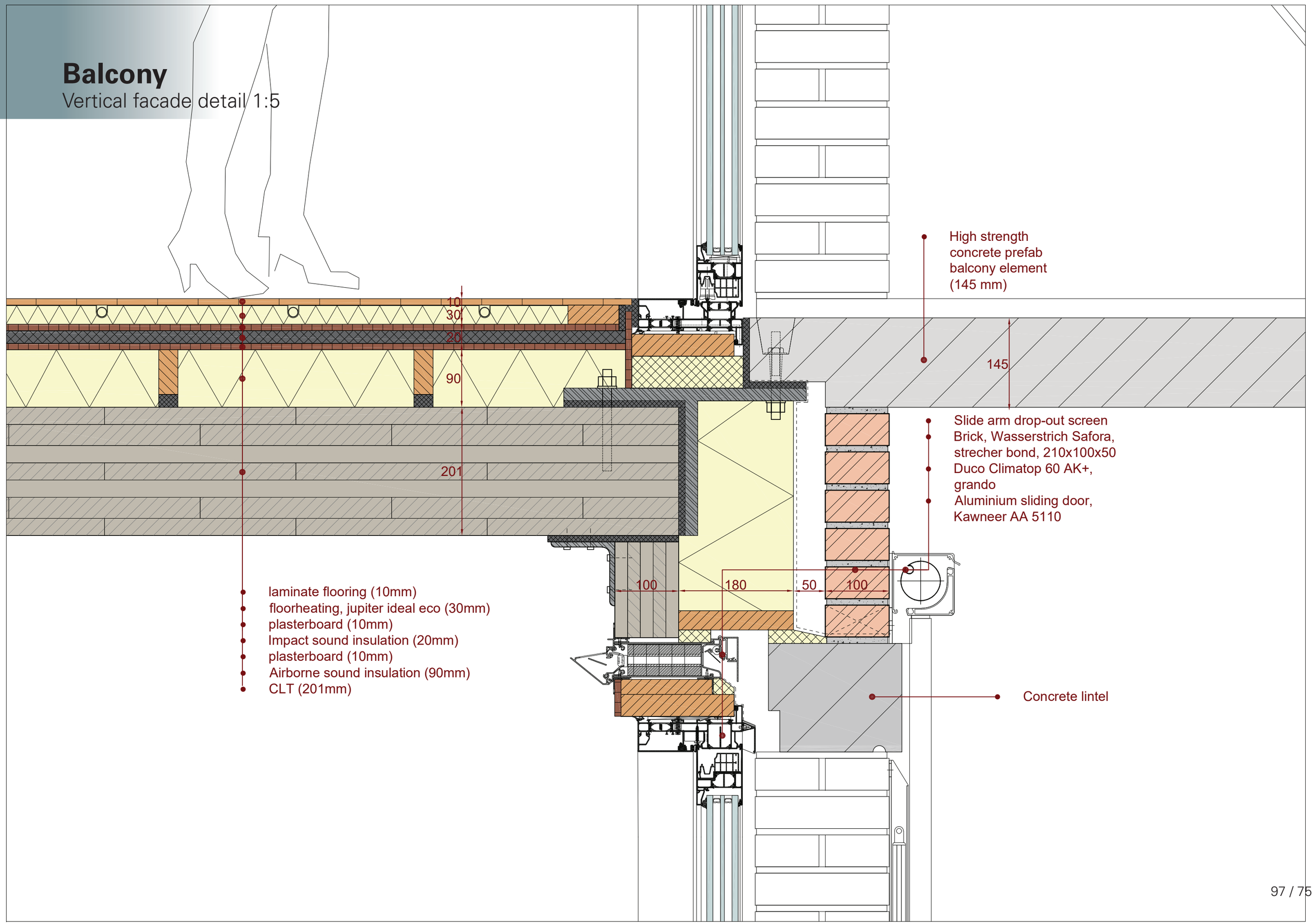
Roof

Vertical facade detail 1:5



Balcony

Vertical facade detail 1:5



Separation wall & balcony connection

Horizontal facade detail 1:5