



The Future Playground
Creating a high-rise community for families

MSc 3/4 Advanced Housing Design
Design Drawing Set

Colophon

Delft University of Technology
MSc3 Dutch Housing Graduation
Studio 2021-2022
AR3AD100 Advanced Housing Design

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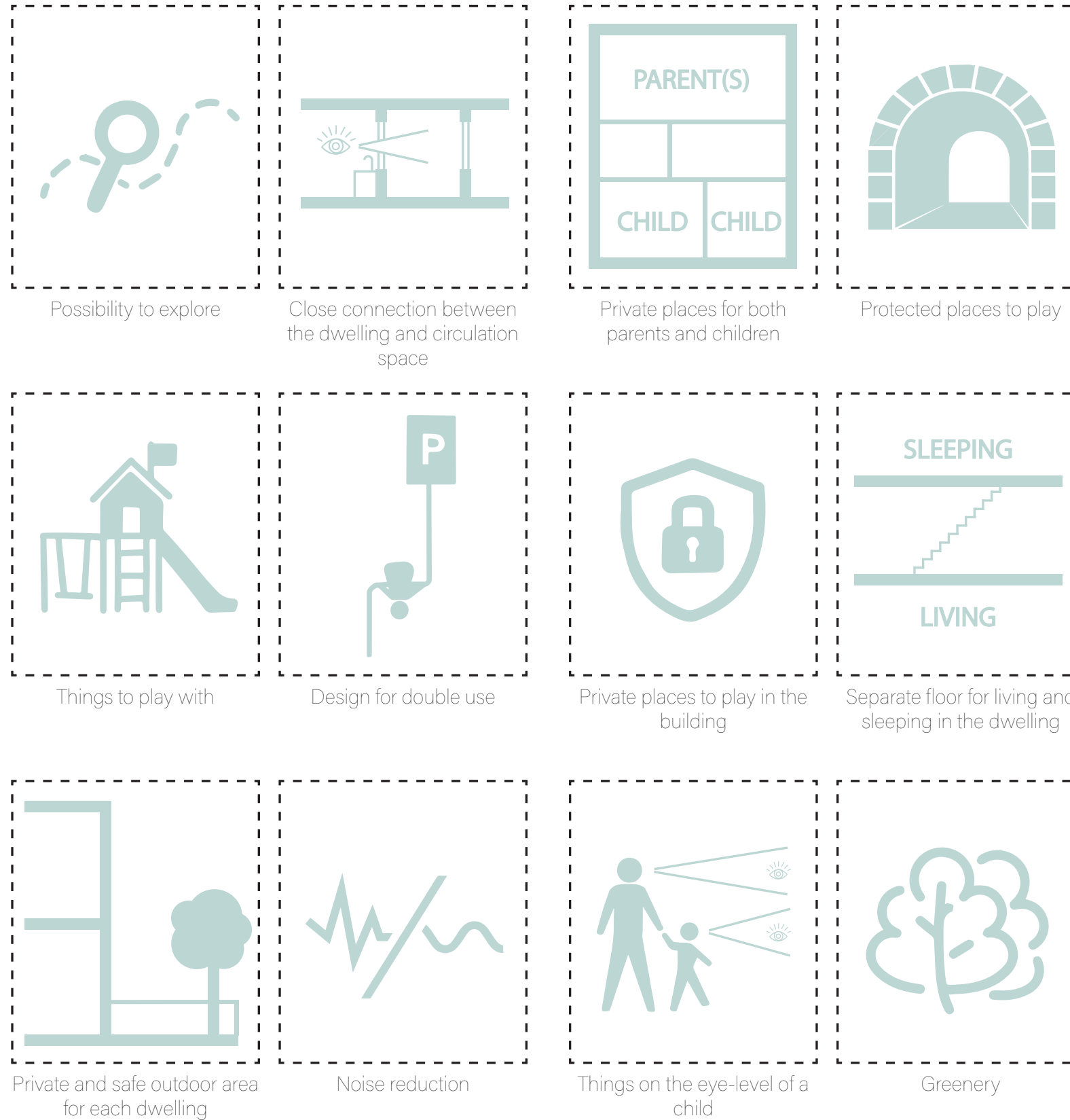
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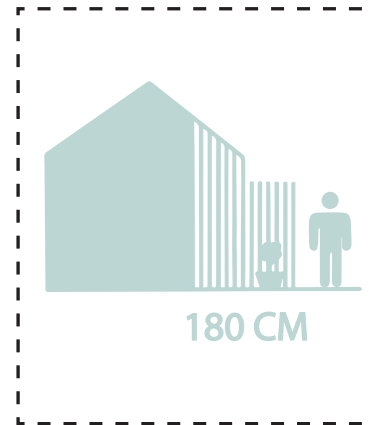
Design guidelines:

Theoretic and thematic support of research and design

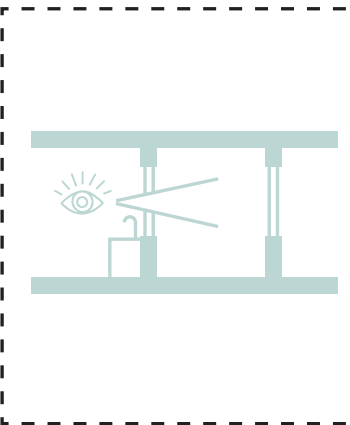
Designing for children



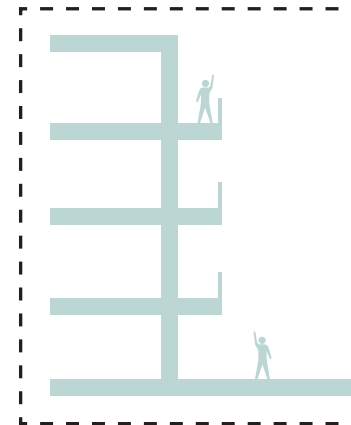
Designing for community building



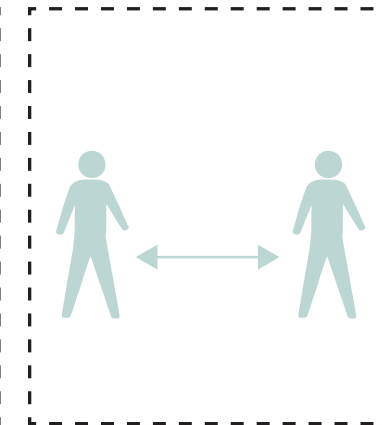
Threshold zone between 90 and 180 cm.



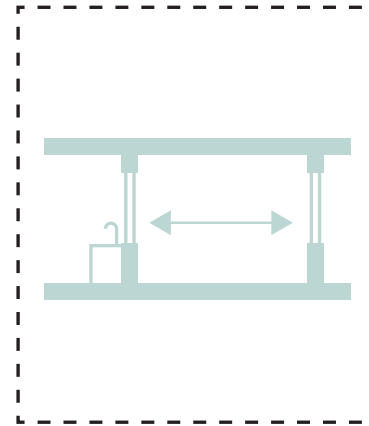
Visual connection with the circulation space



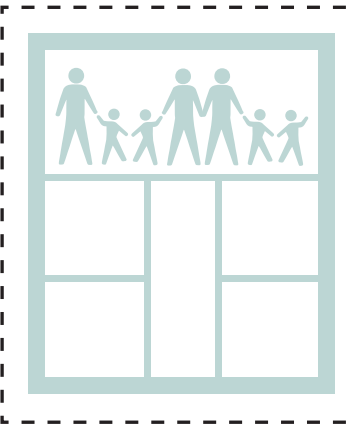
Four visually connected floors



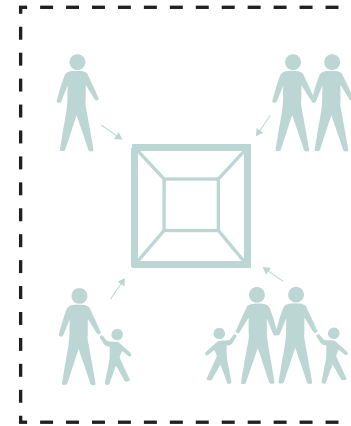
Enough room for social distance



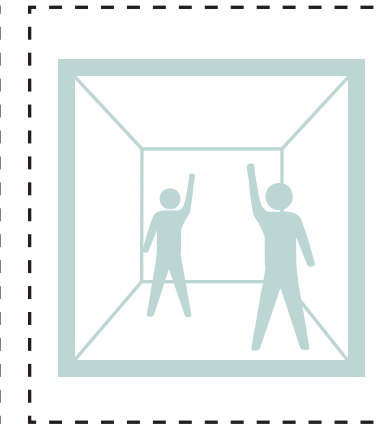
Wide circulation space



Dedicated collective spaces



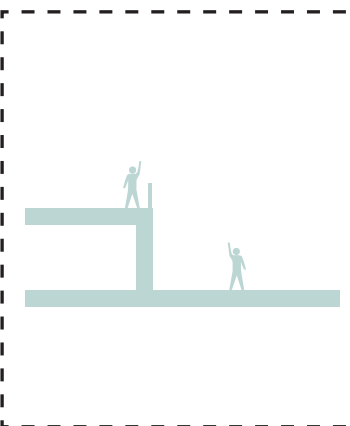
Large amount of residents connected to the same circulation system



Increase possibilities for encounters



Pleasant circulation space



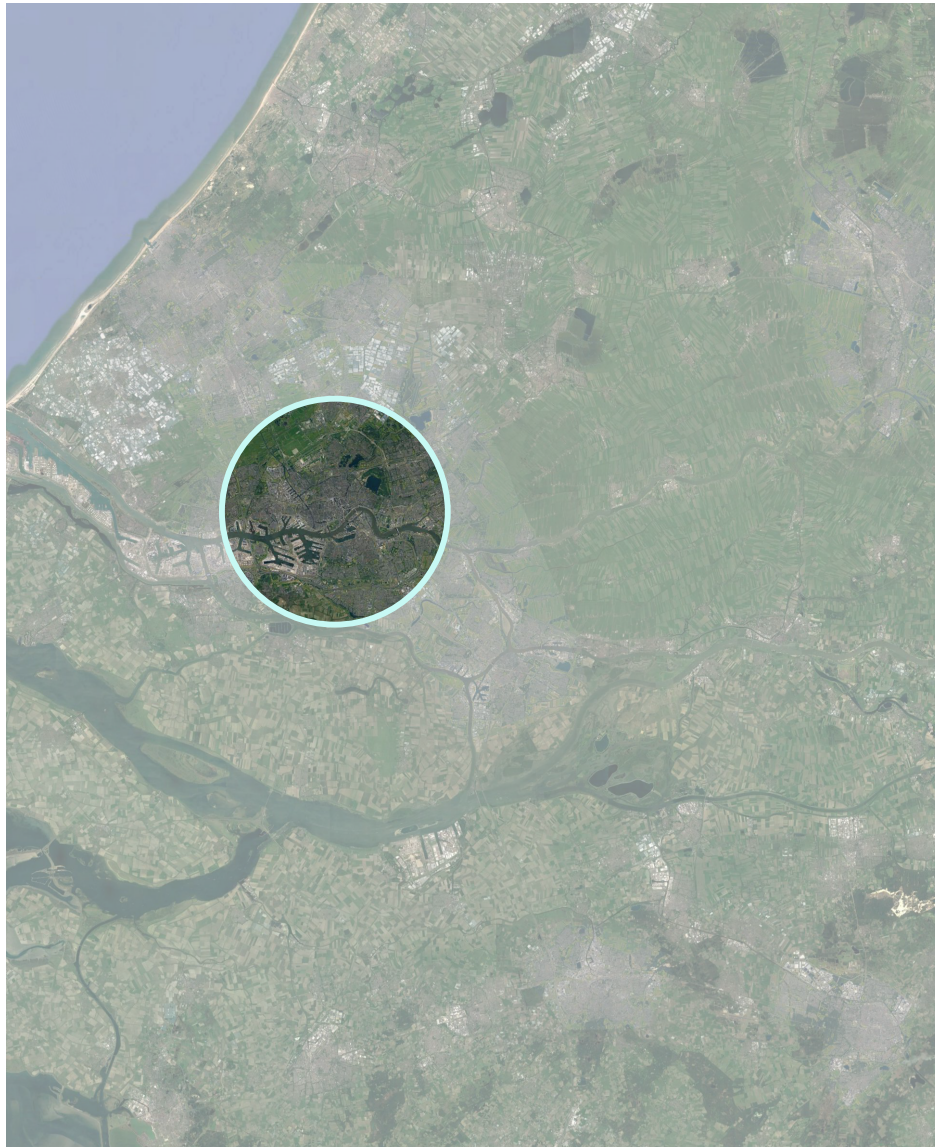
Visually connected floors

Site:

Masterplan and building context

Site location

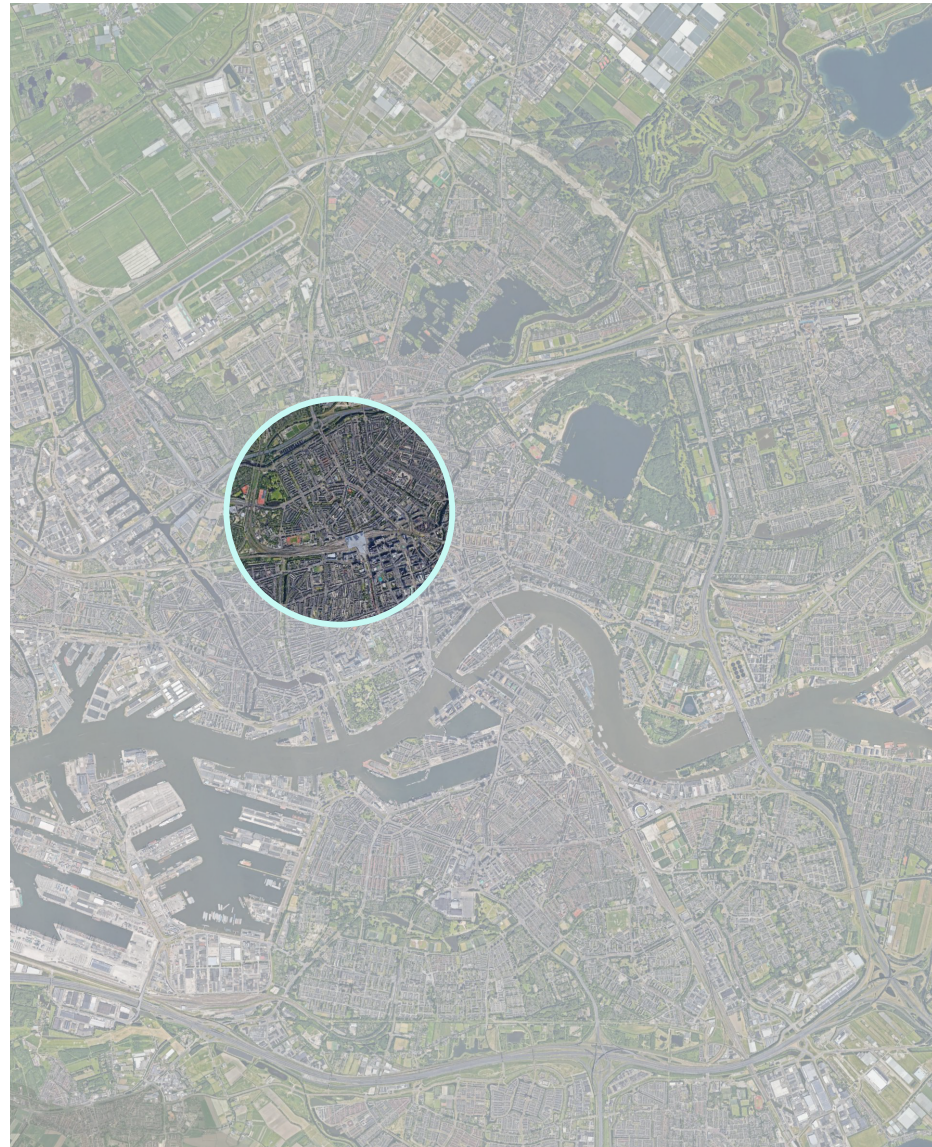
Rotterdam



0 5 10 20km



Blijdorp



0 1 2 4km



Walenburghof



0 150 300 600m



Urban Masterplan



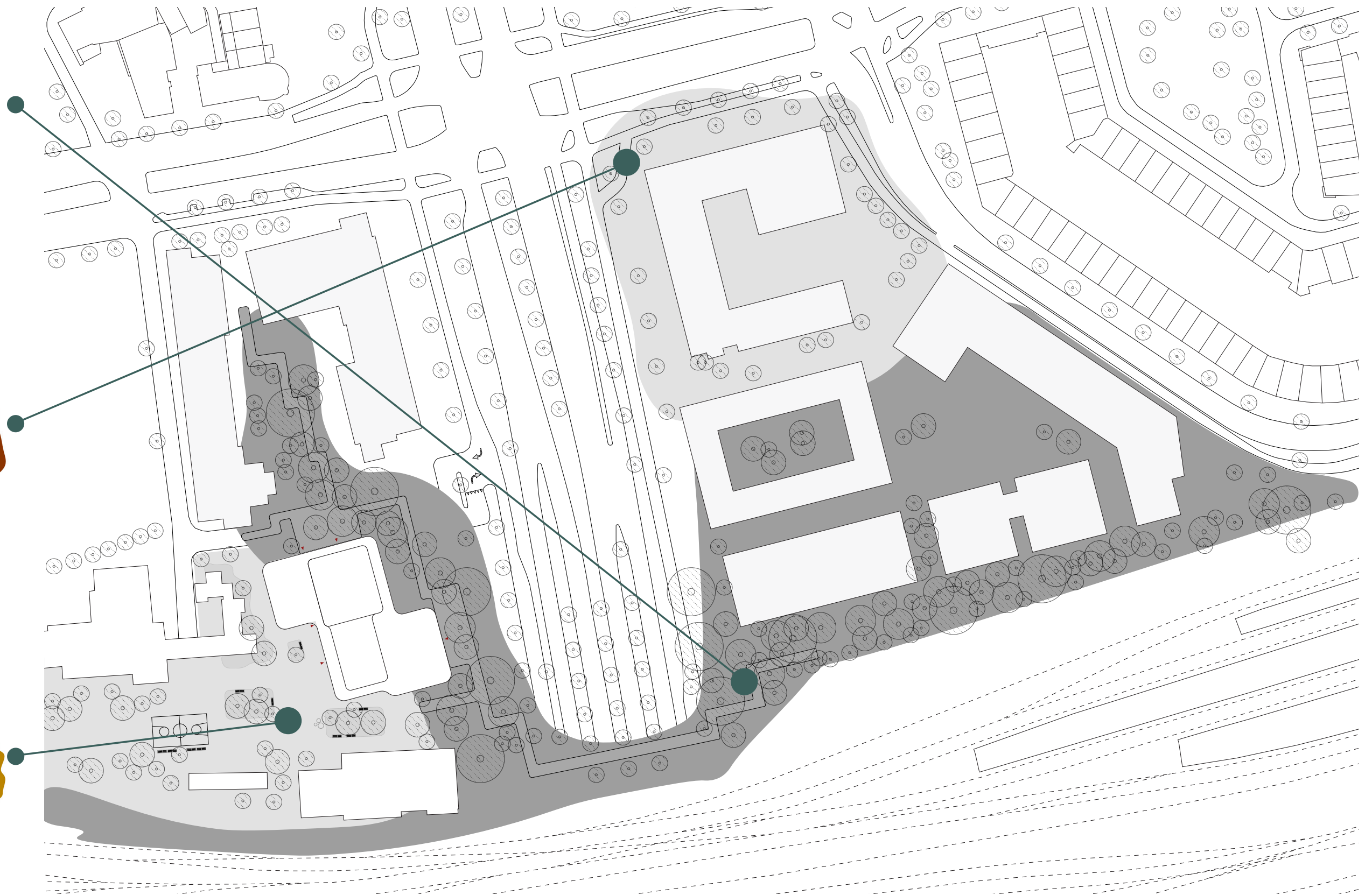
Species & Humans



Centre for Blijdorp



Campus area



0 10 20 40m



Masterplan diagrams

Water infrastructure

- 1 Rainwater retention



0 50 100 200m



Green spaces

- 1 Dense greenery
- 2 Less dense greenery
- 3 Open greenery



0 50 100 200m



Masterplan diagrams

Car/Bike infrastructure

- 1 Cycling route
- 2 Driving routes



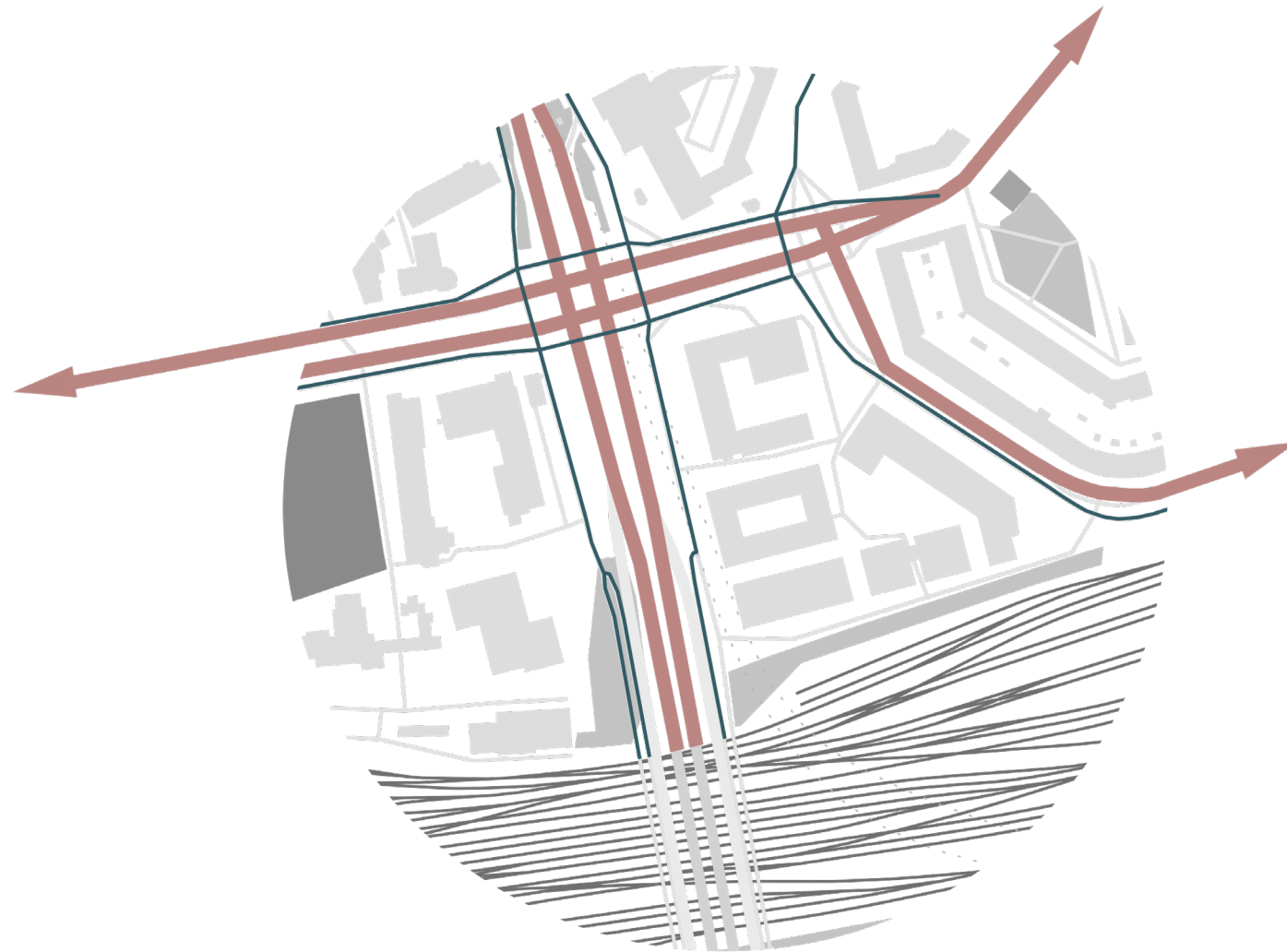
0 50 100 200m

Connecting square

- 1 Connected public space



0 50 100 200m



Masterplan diagrams

Pedestrian circulation

- 1 Primary route
- 2 Secondary routes



0 50 100 200m

Access

- 1 Entrances

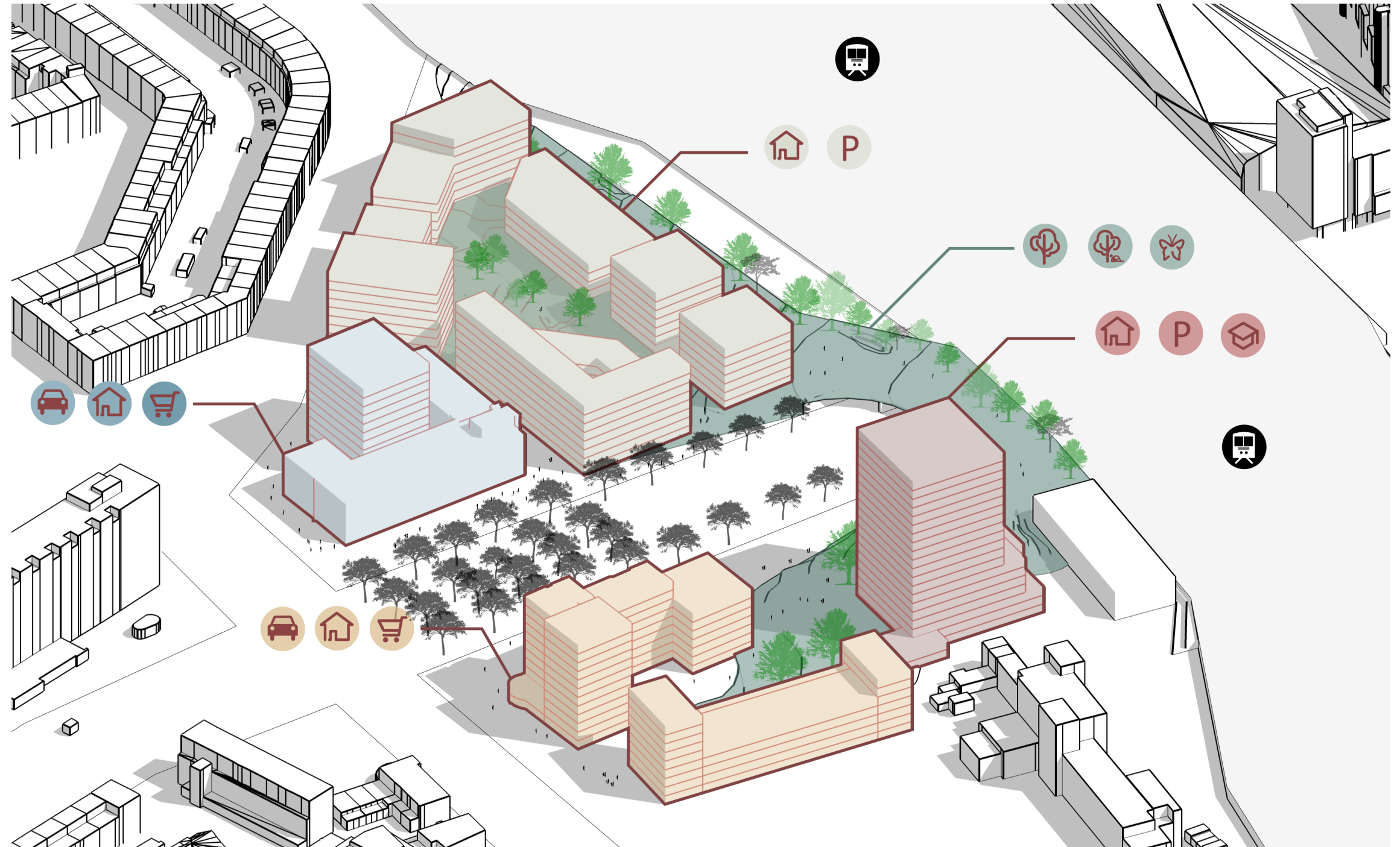


0 50 100 200m



Masterplan function map

The masterplan can be divided into four quadrants with different atmospheres and different characteristics. There is a residential district, a school campus district and two areas that belong and relate to the new centre of the neighbourhood Blijdorp.

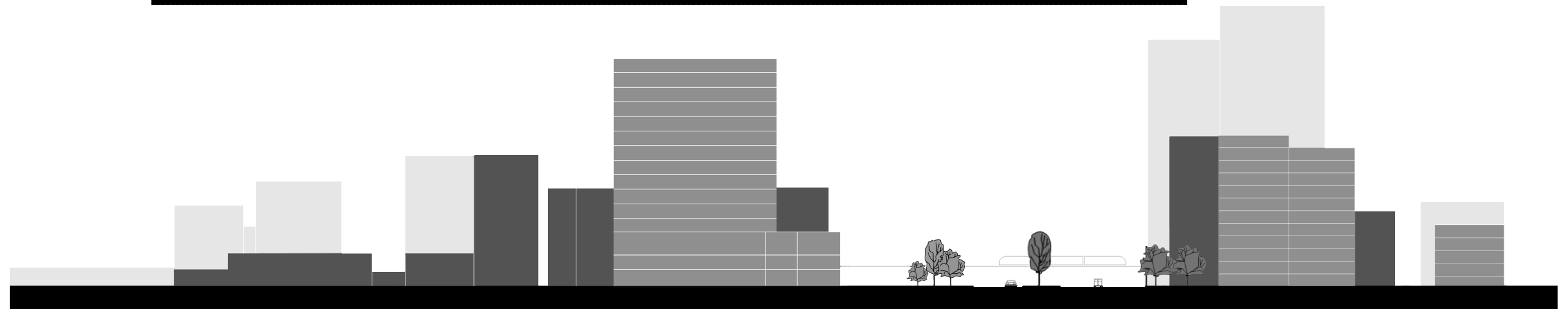
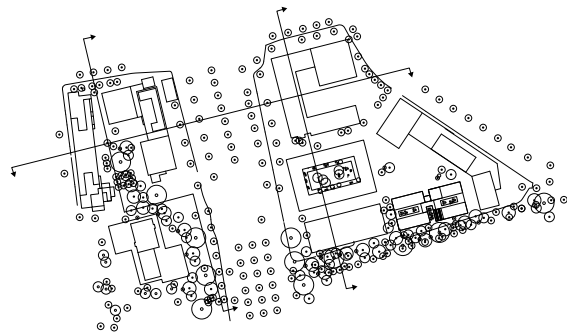
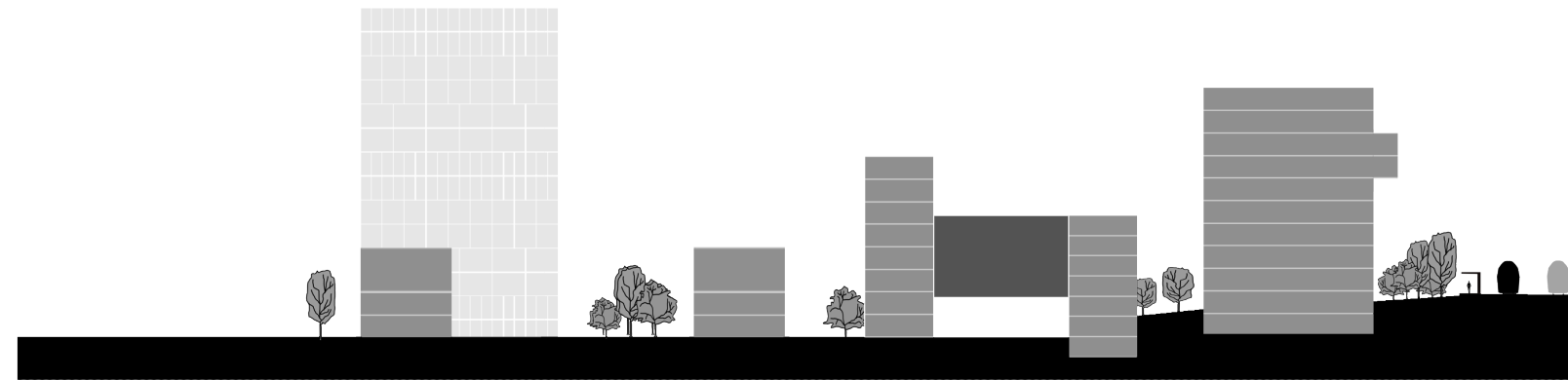
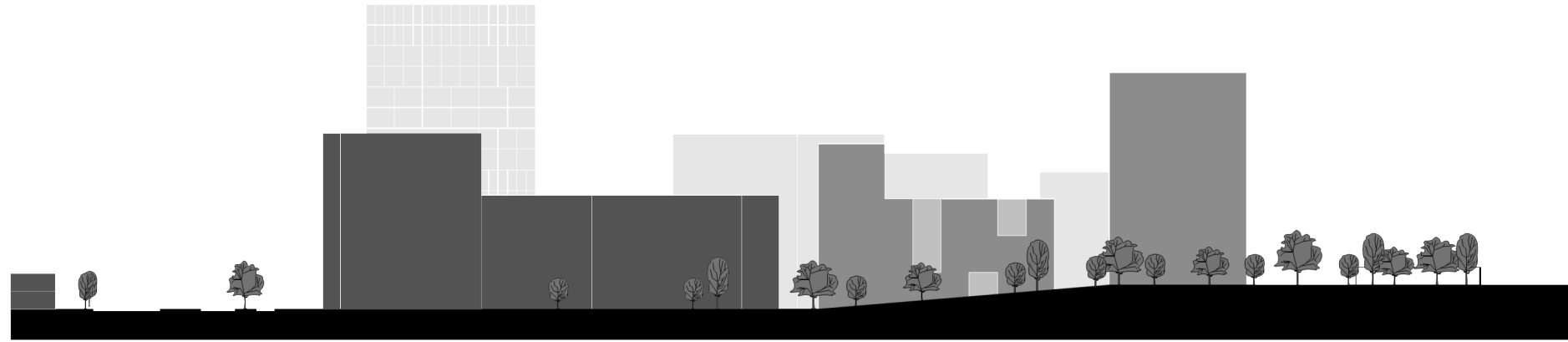


Function Map

- 1 Shops
- 2 Urban Kitchens
- 3 Shared Facilities
- 4 Housing
- 5 Circulation Space
- 6 Plaza

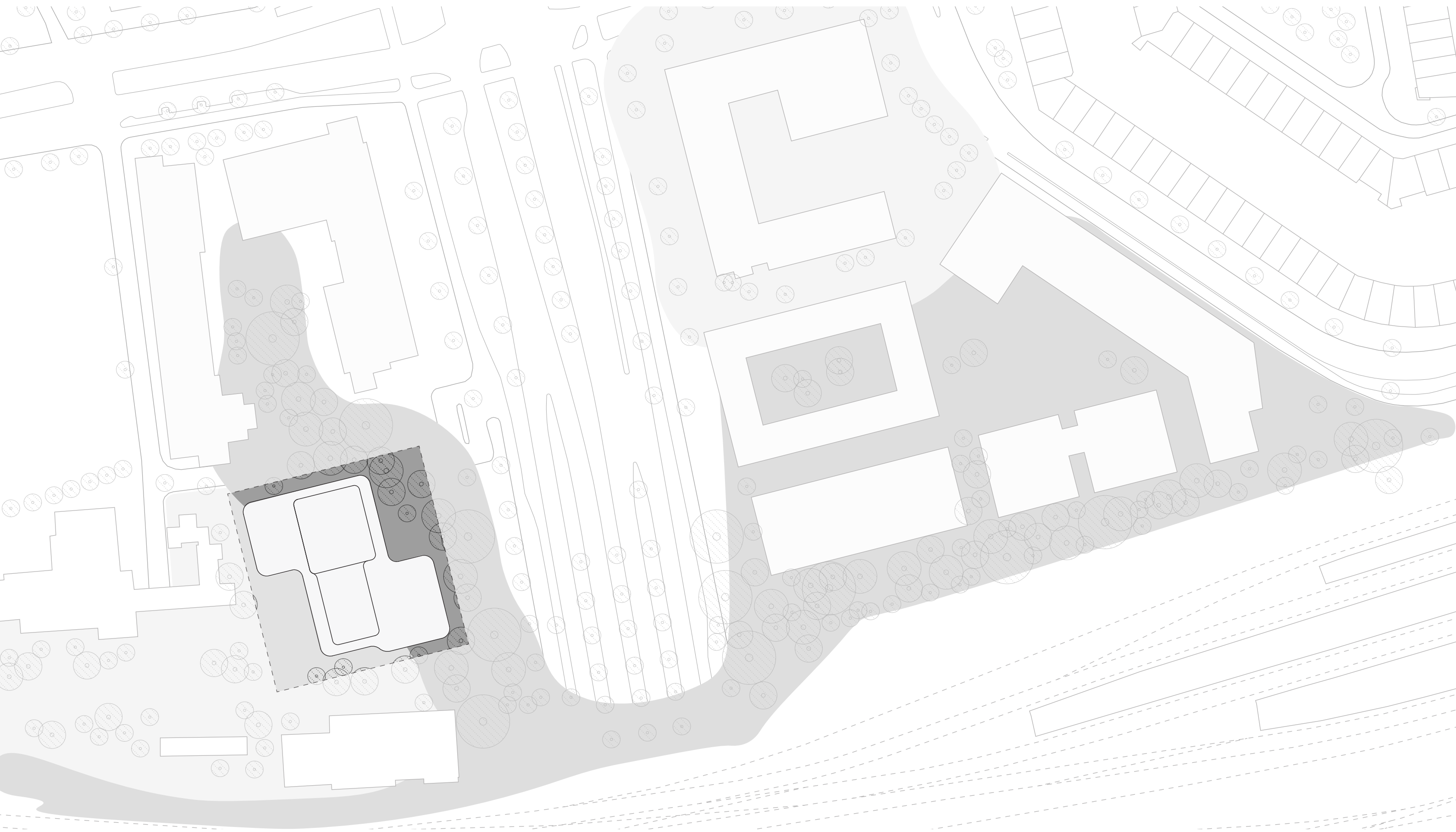


Masterplan sections



0 10 20 40m

Building location

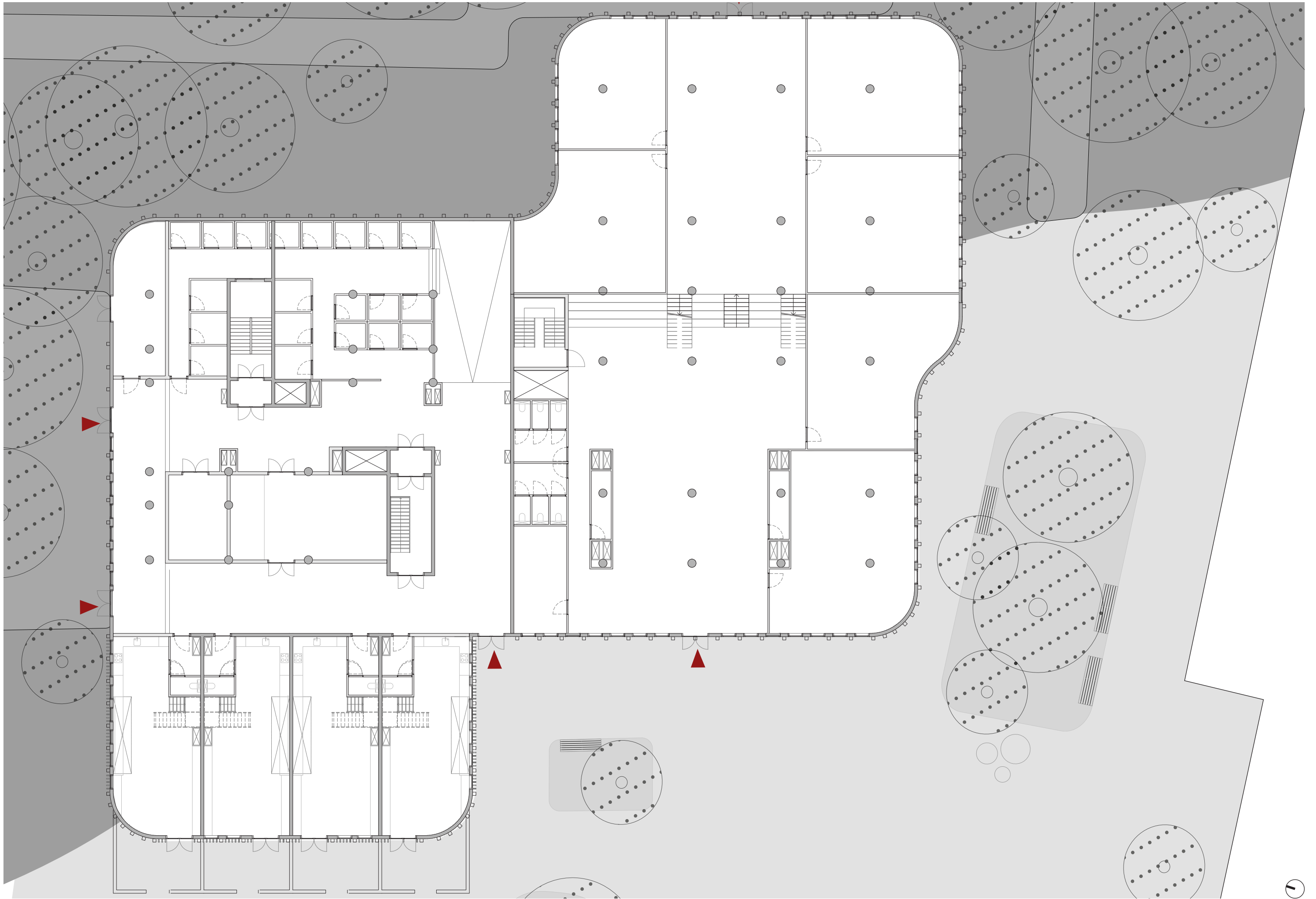


Site Plan



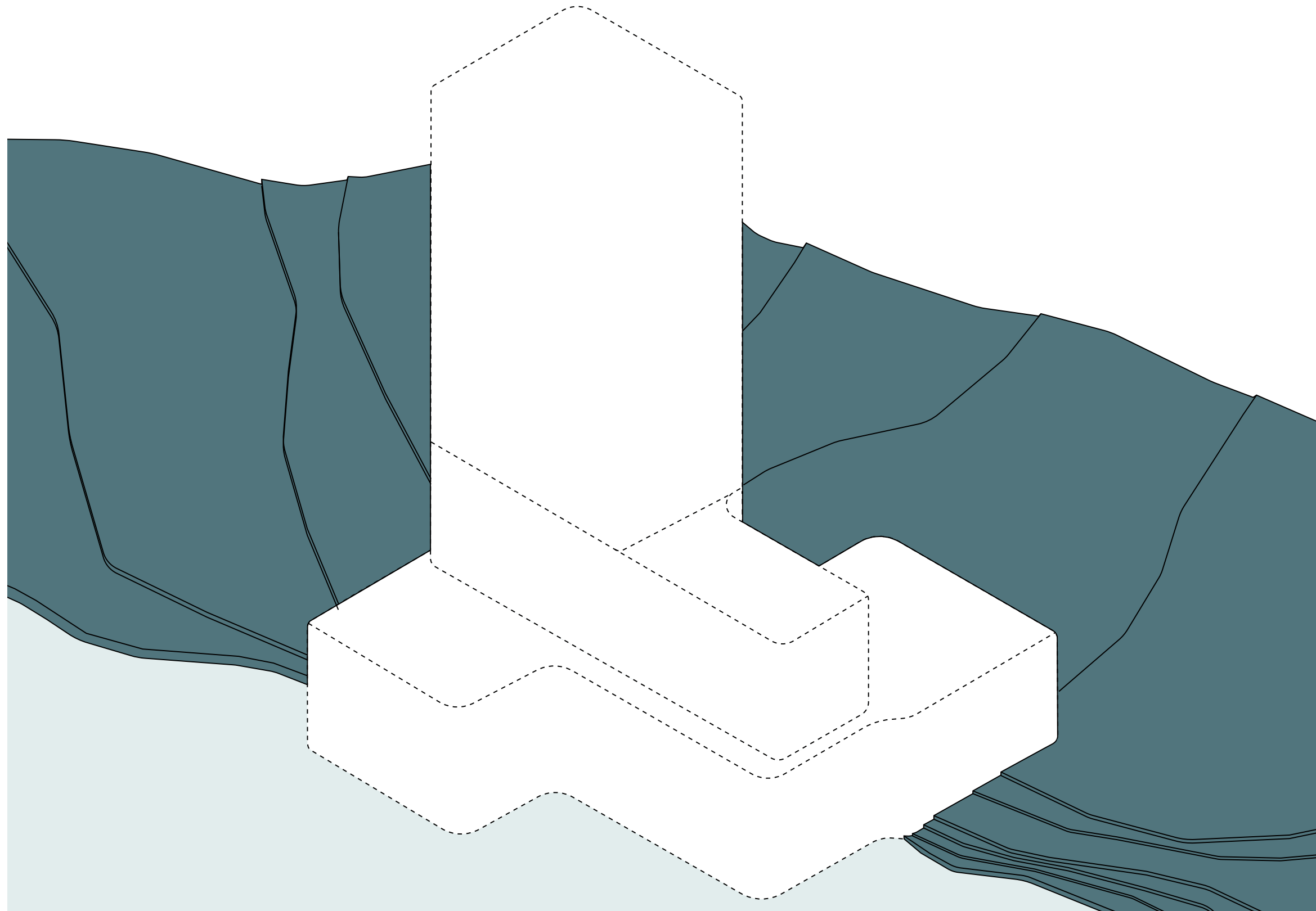
0 5 10 20m





Building concept:
Concept diagrams and program

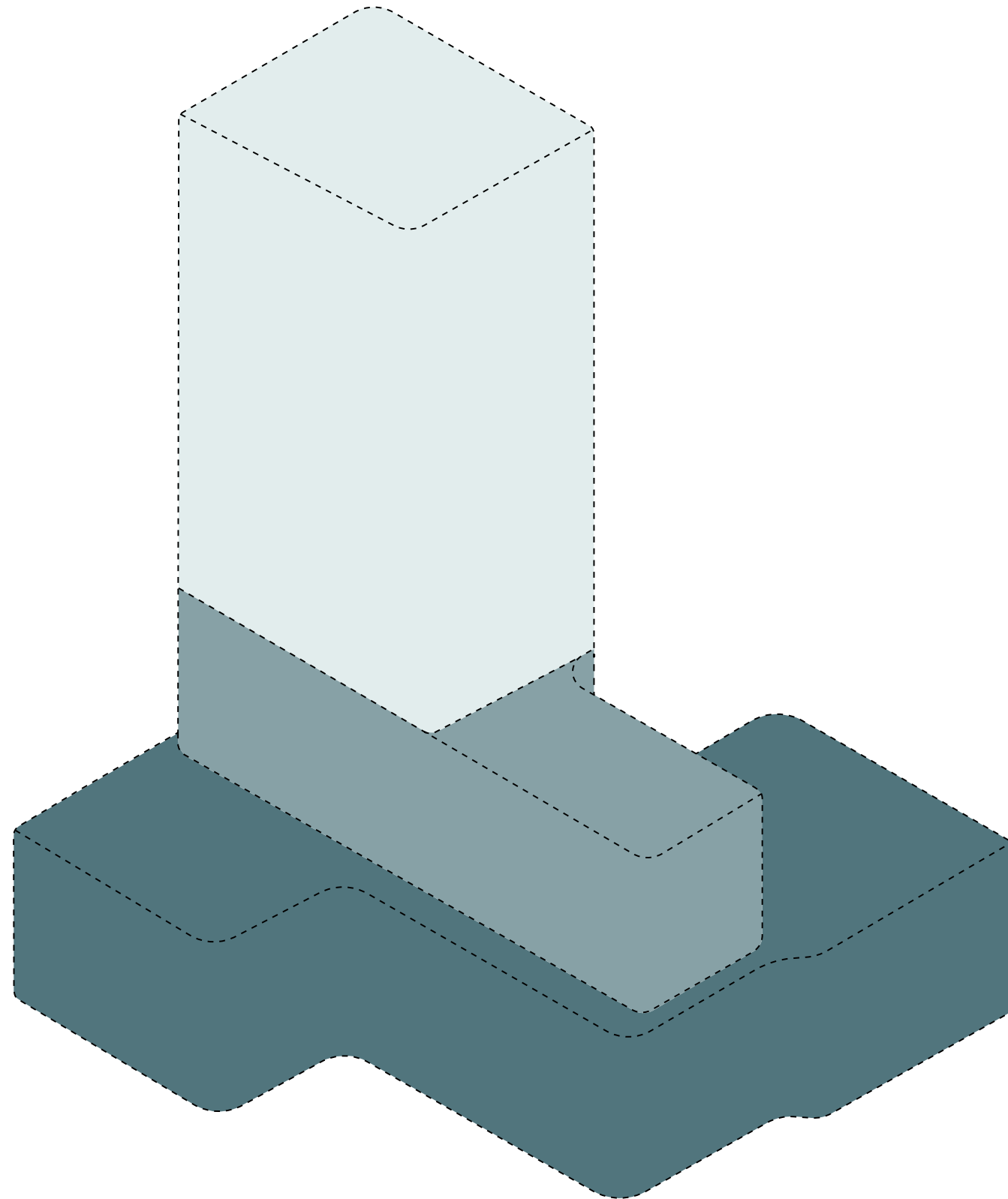
Building concept



Dual character due to the slope on one side and a public square on the other side.

The building has one more open side and one more closed side.

Building concept



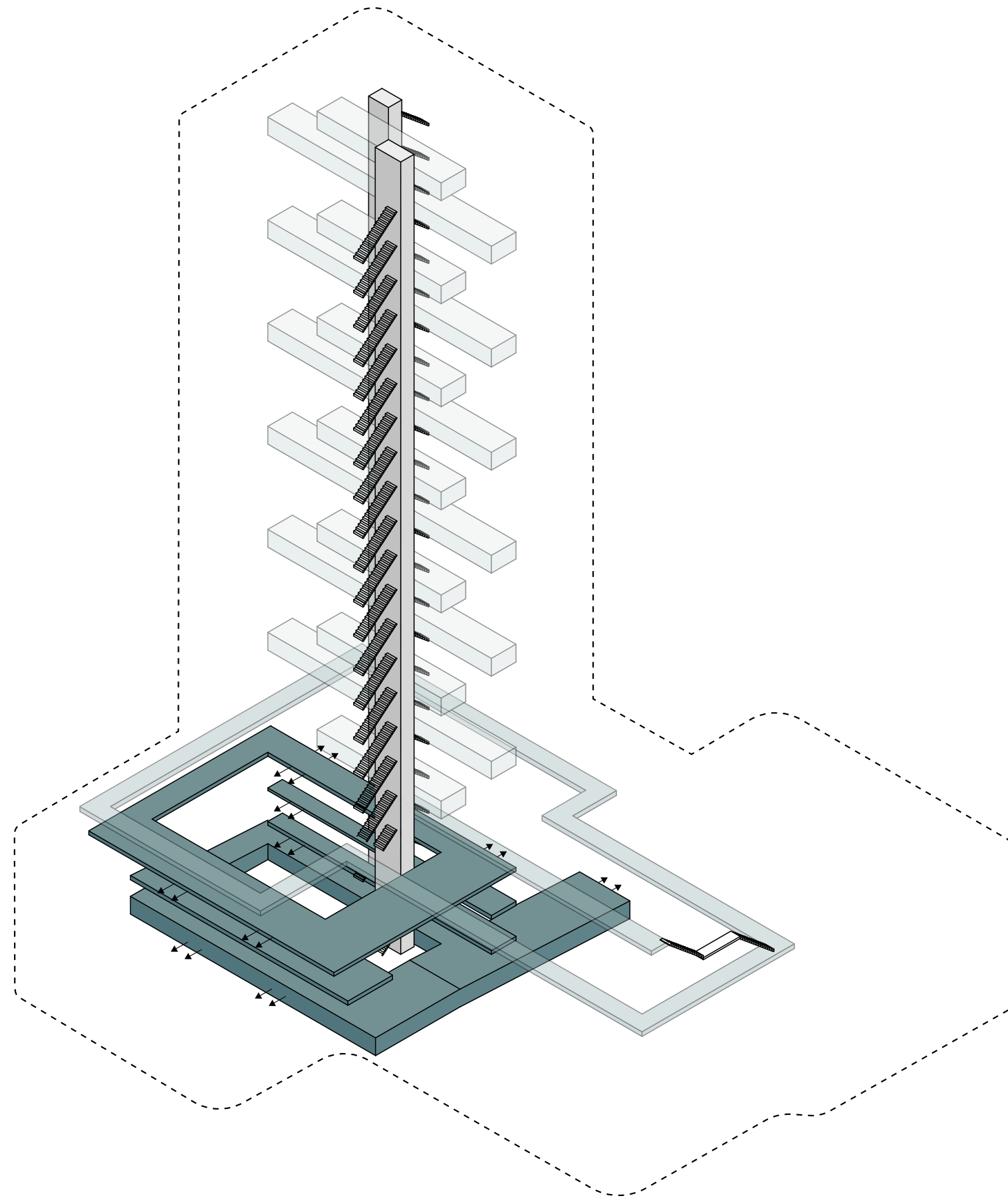
The lowest part of the building has a connection with the ground floor .

Circulation Diagram Block 1



Family Scraper

Interior and exterior circulation space
Visual connection between spaces is facilitated

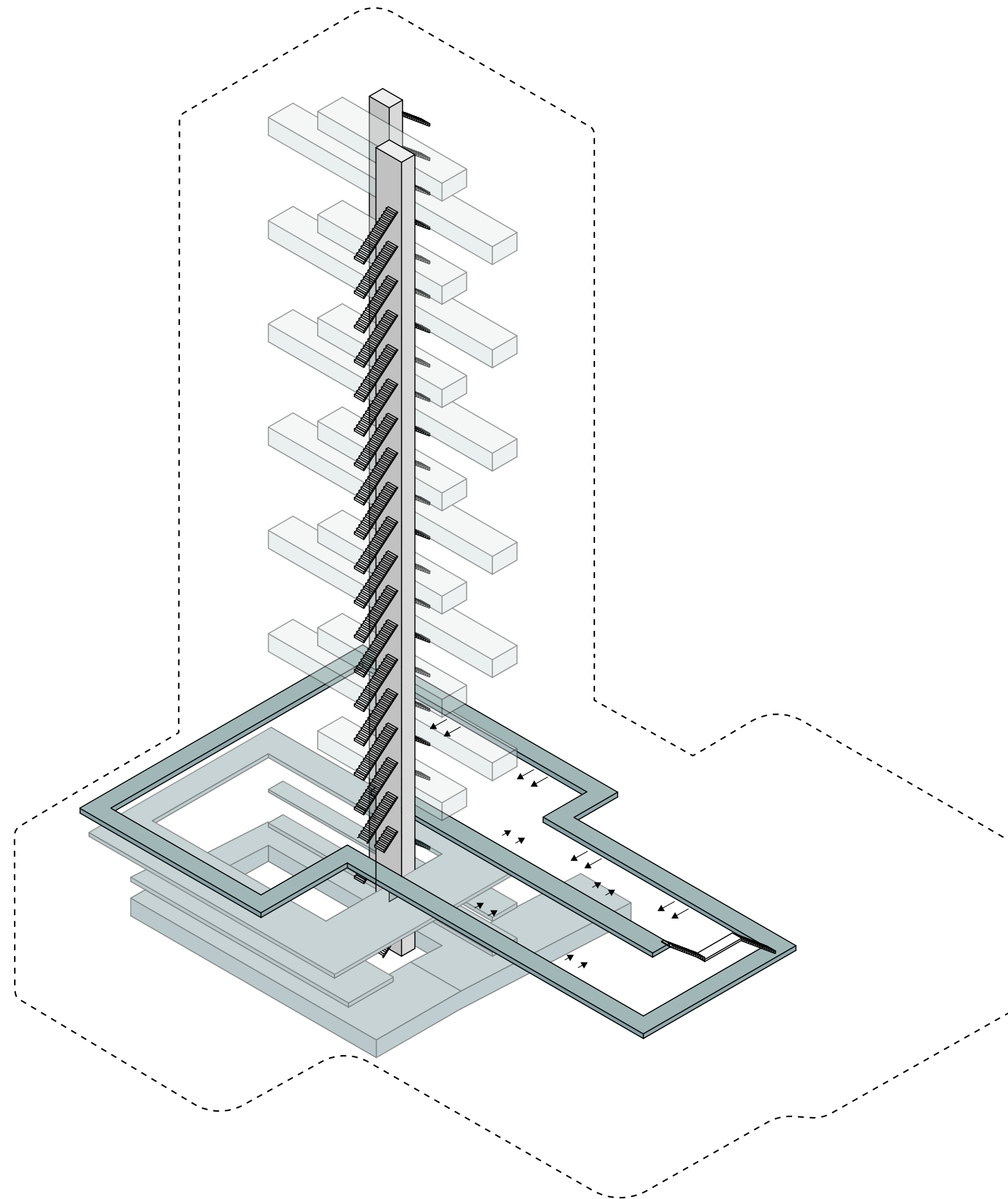


Circulation Diagram Block 2



8-House

Mostly exterior circulation space
Large defined threshold zone

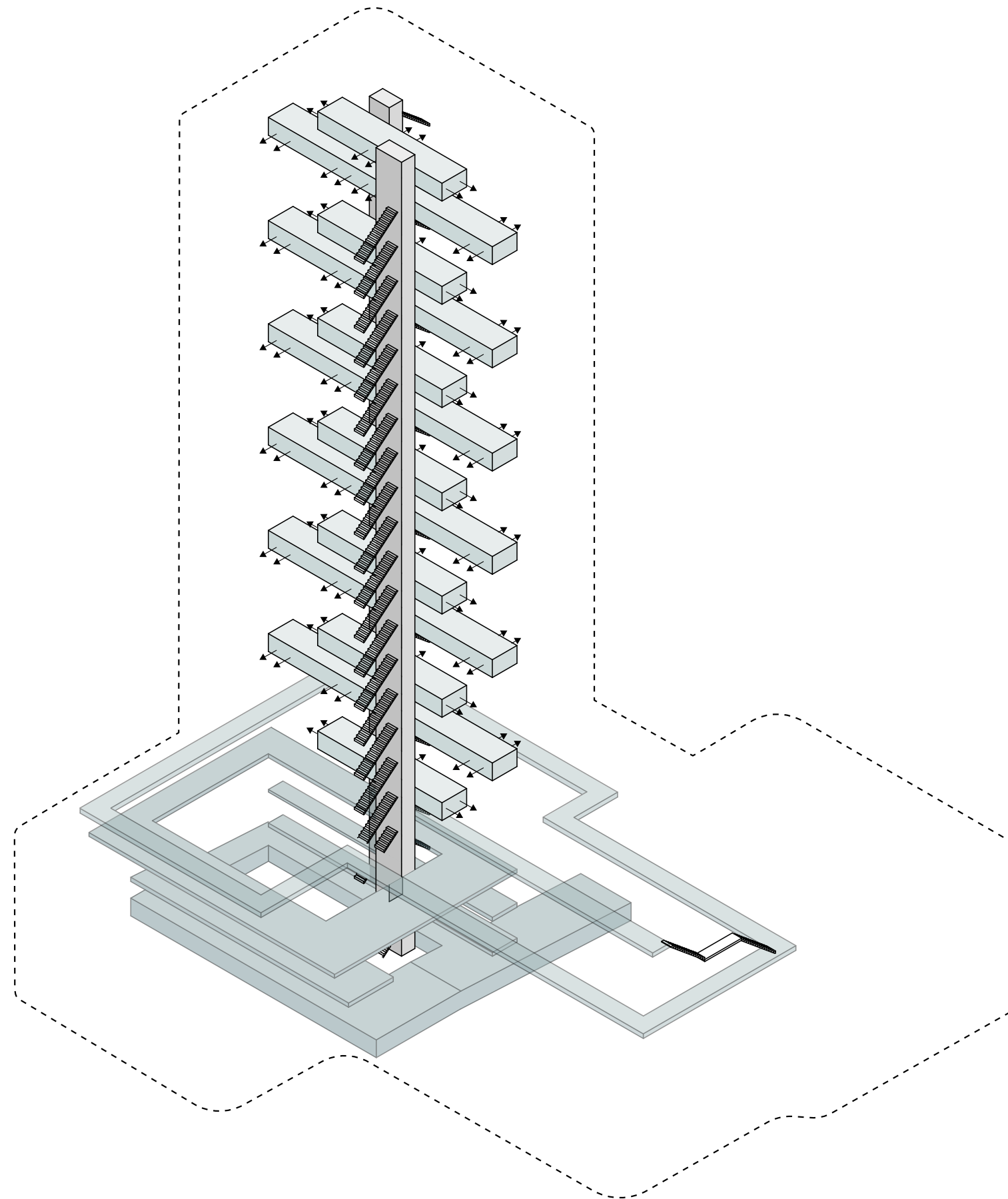


Circulation Diagram Block 3

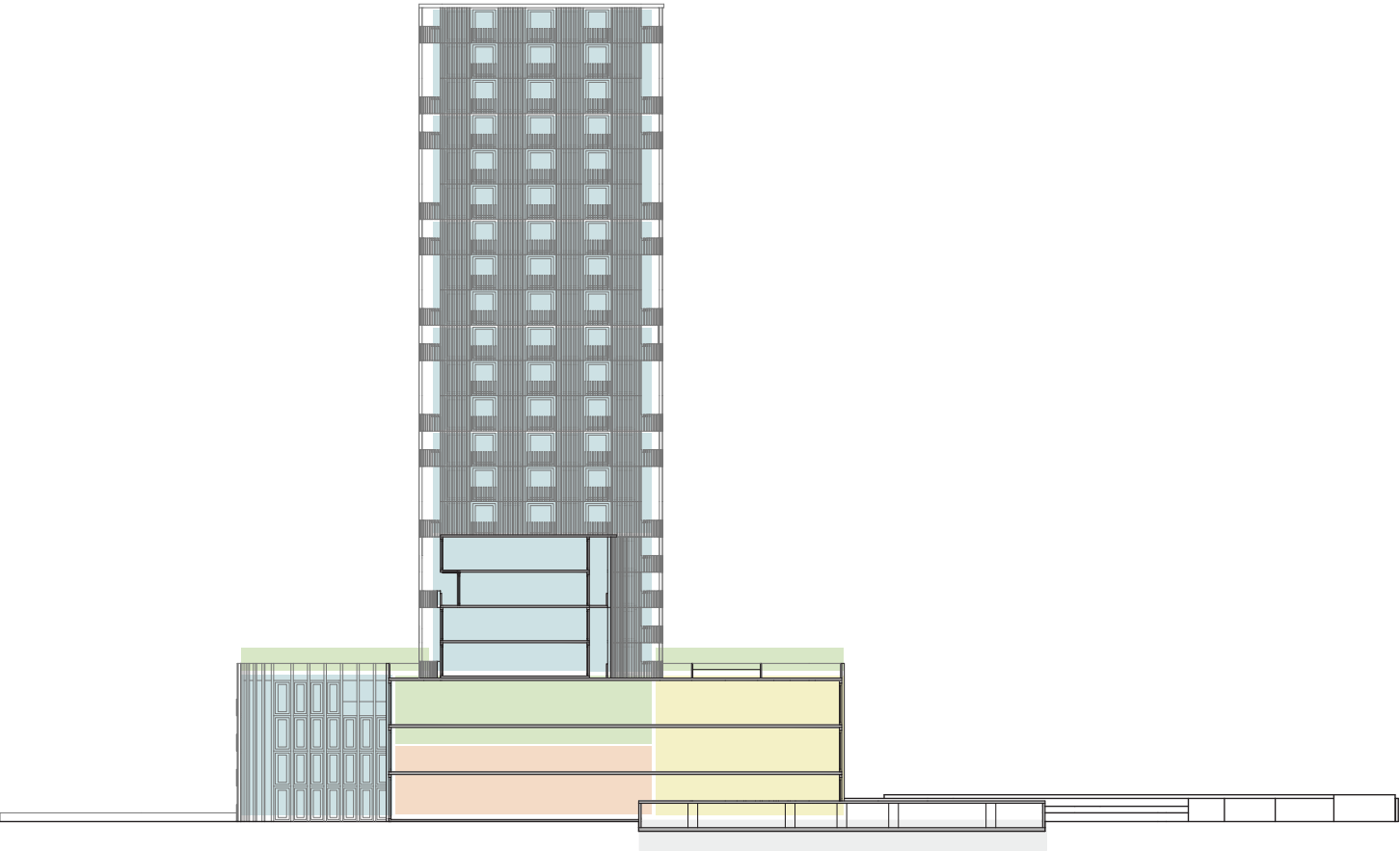


Unité d'habitation

Interior corridor
minimized circulation space



Program Bar



Dwellings: 9410 m²

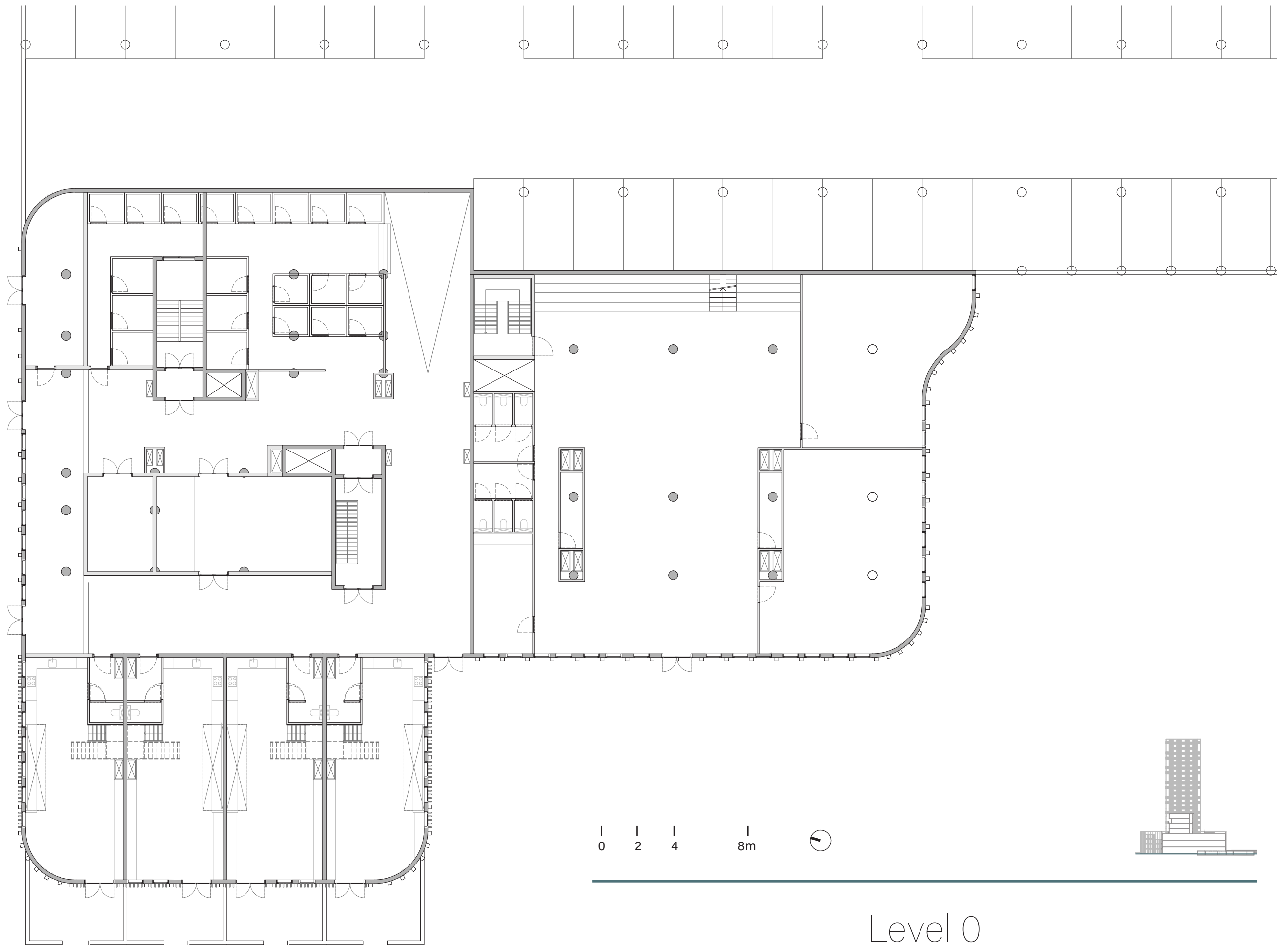
Collective spaces: 1289 m²

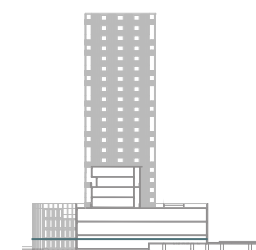
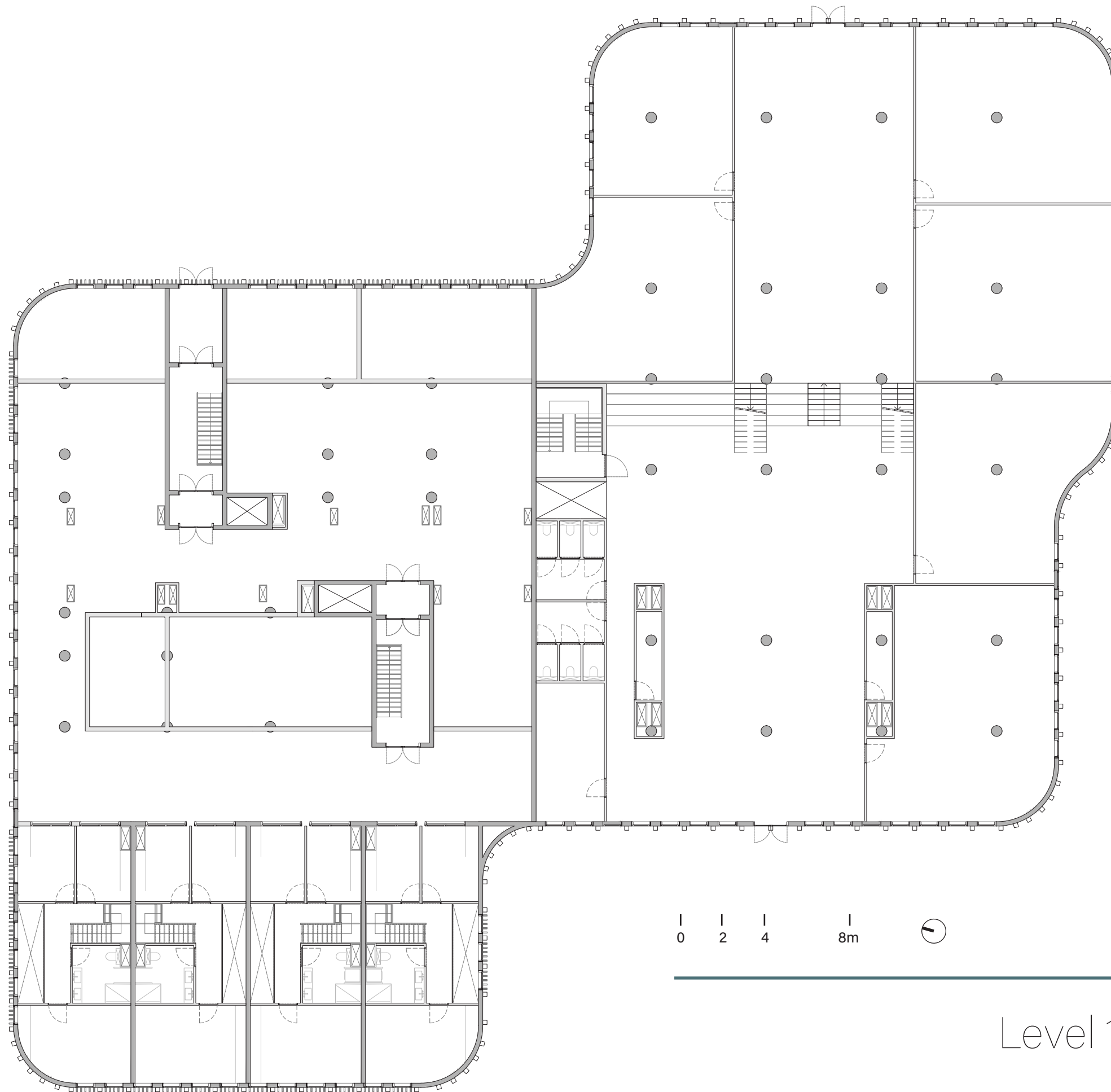
Service area: 1264 m²

Primary school: 3015 m²

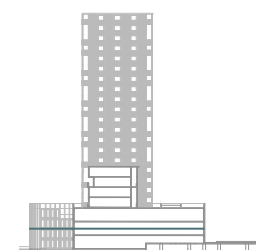
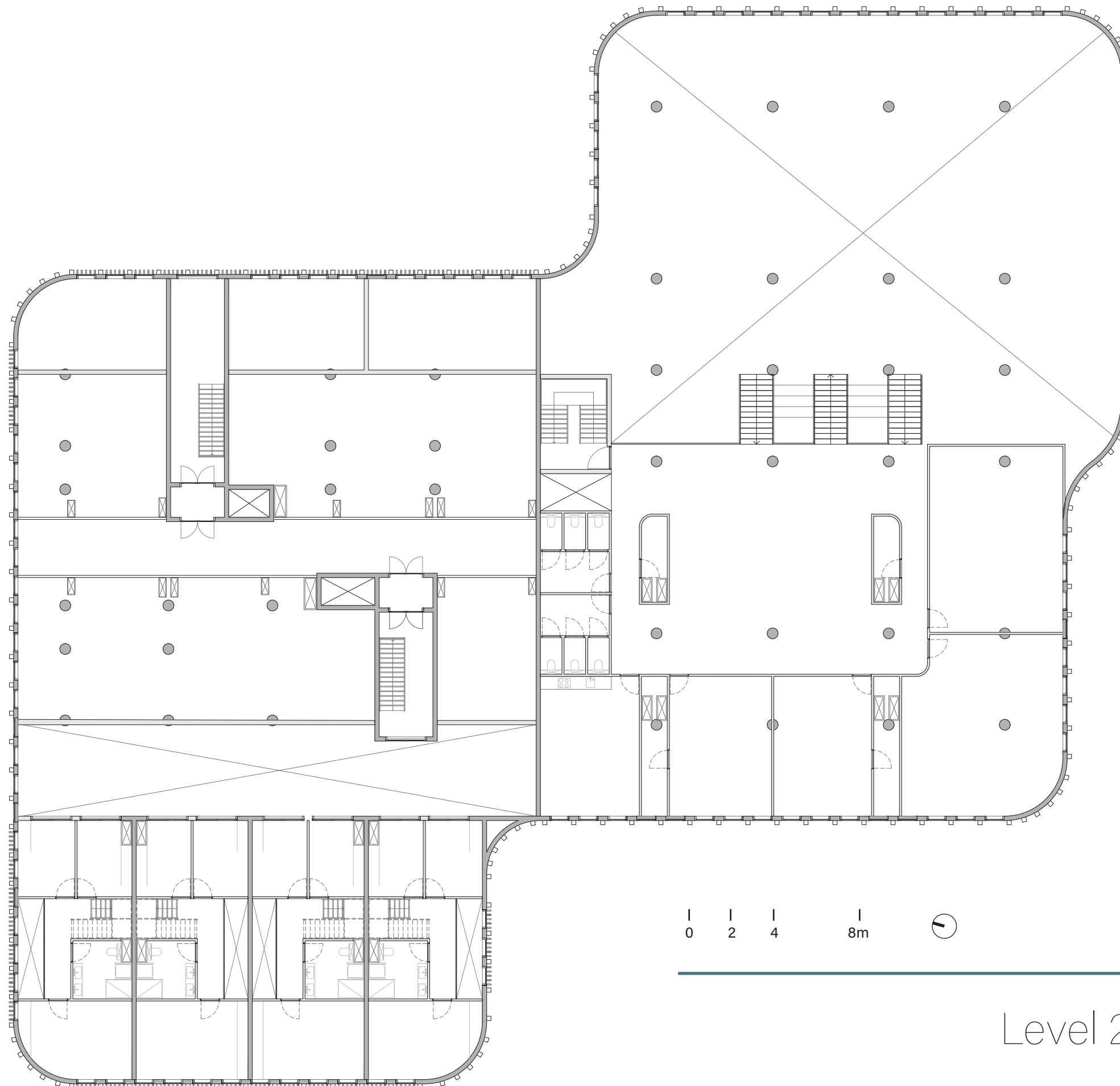
Parking: 2645 m²

Floorplans, Elevations, Sections:
Complete building design overview

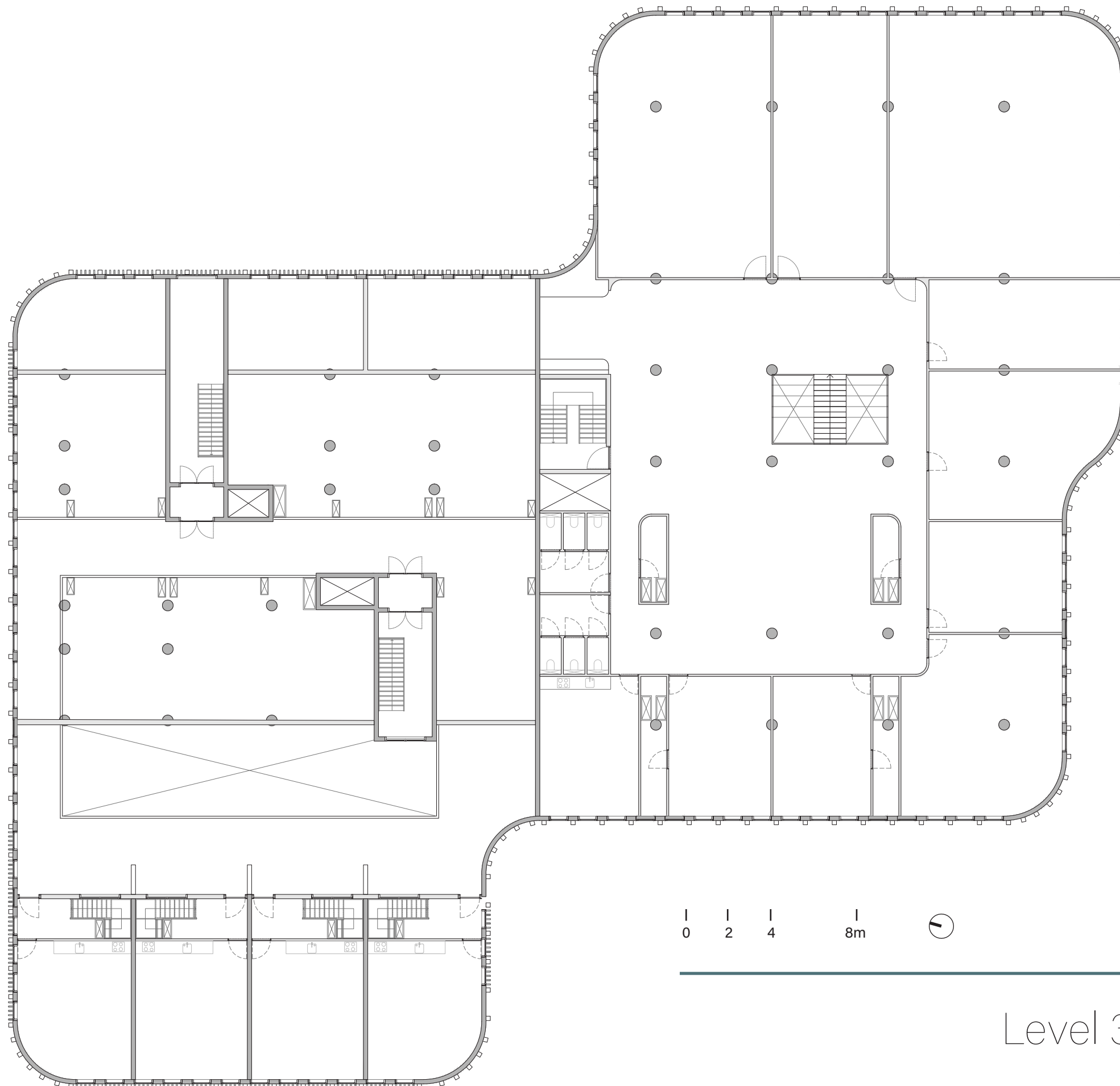




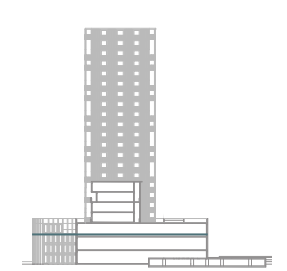
Level 1



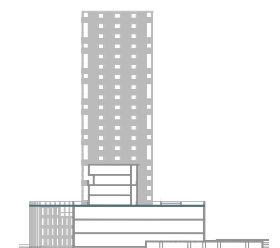
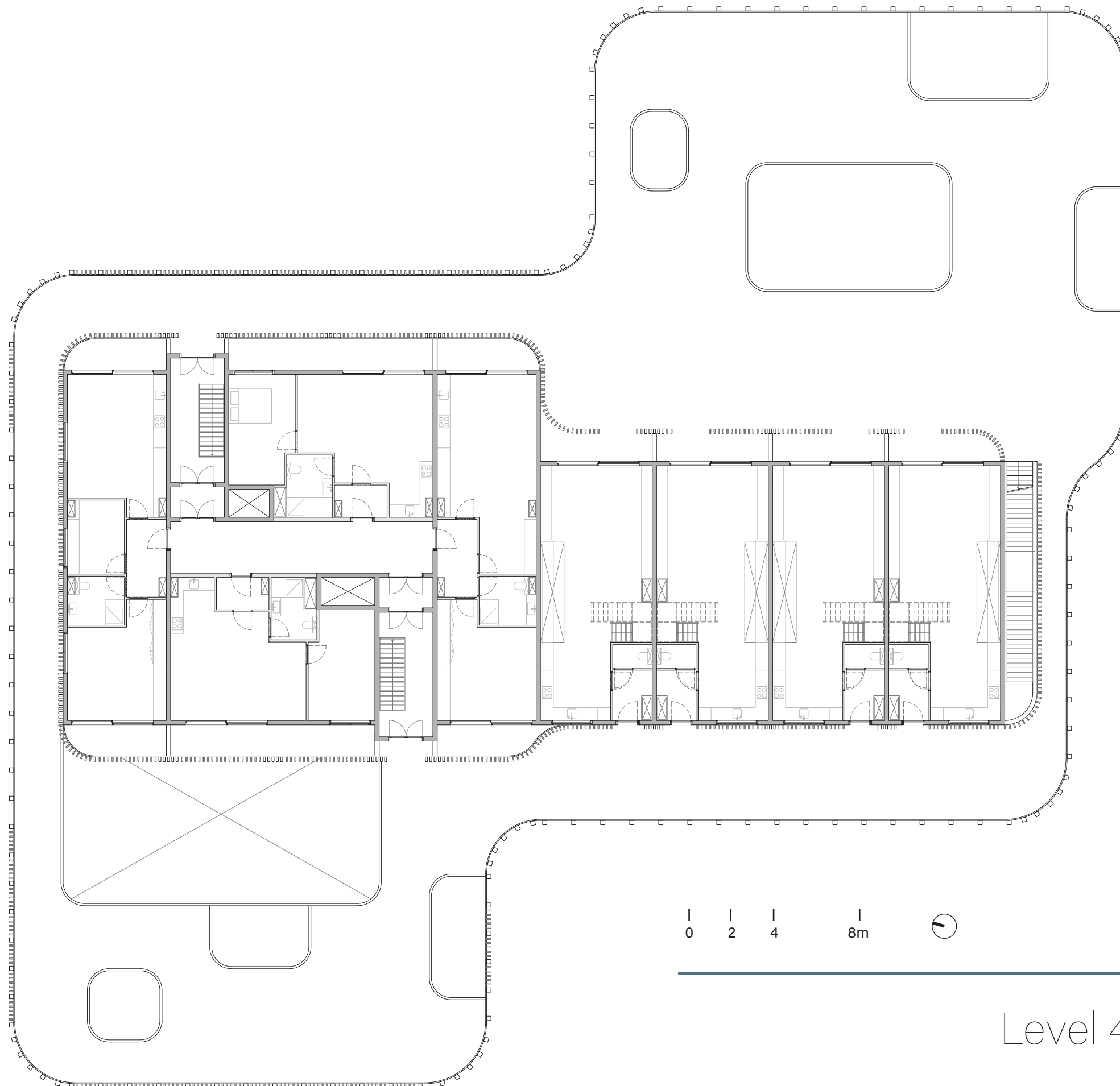
Level 2



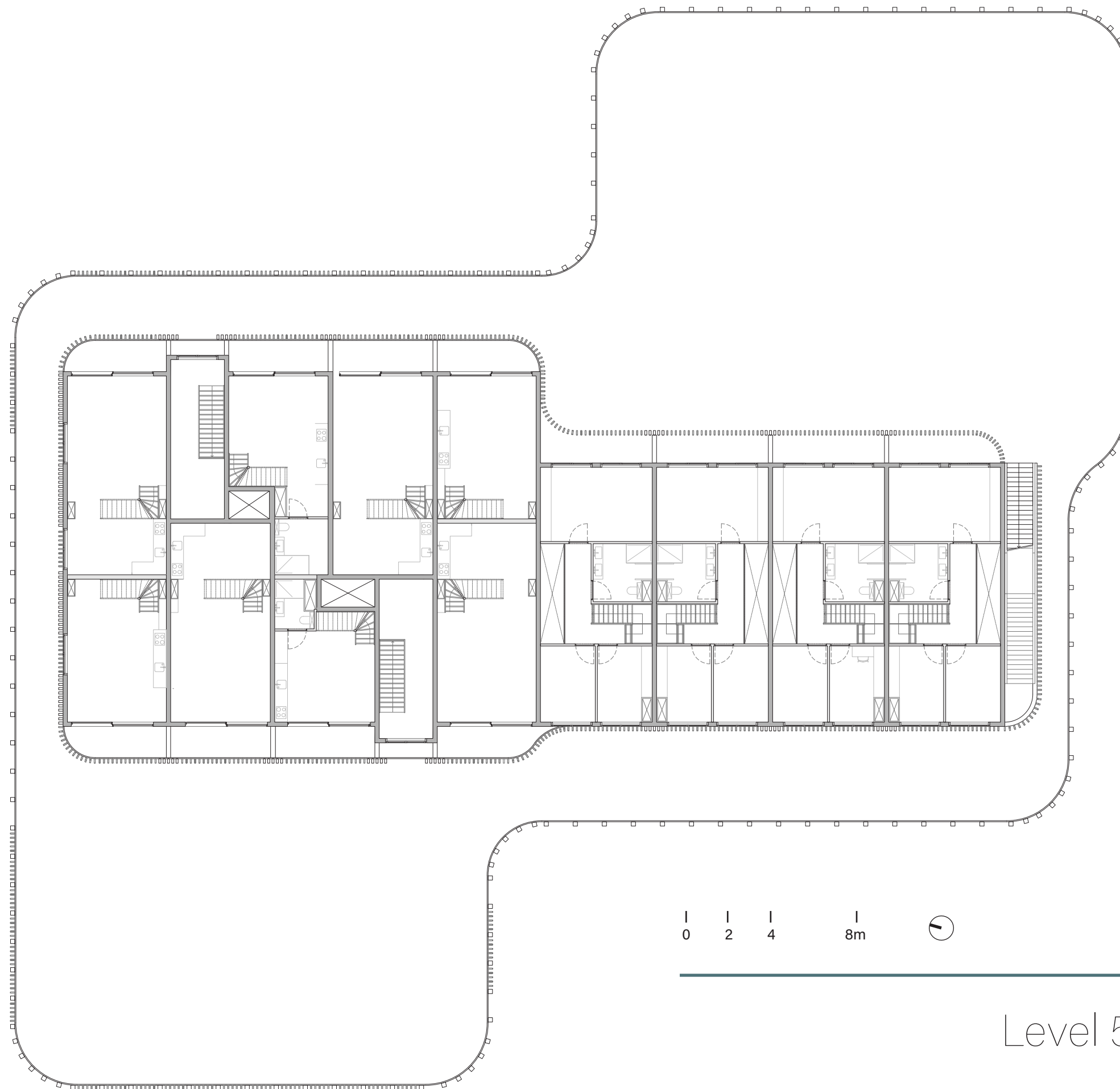
0 2 4 8m



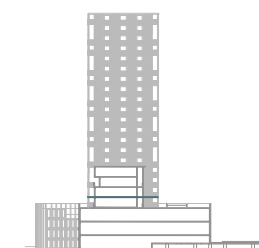
Level 3



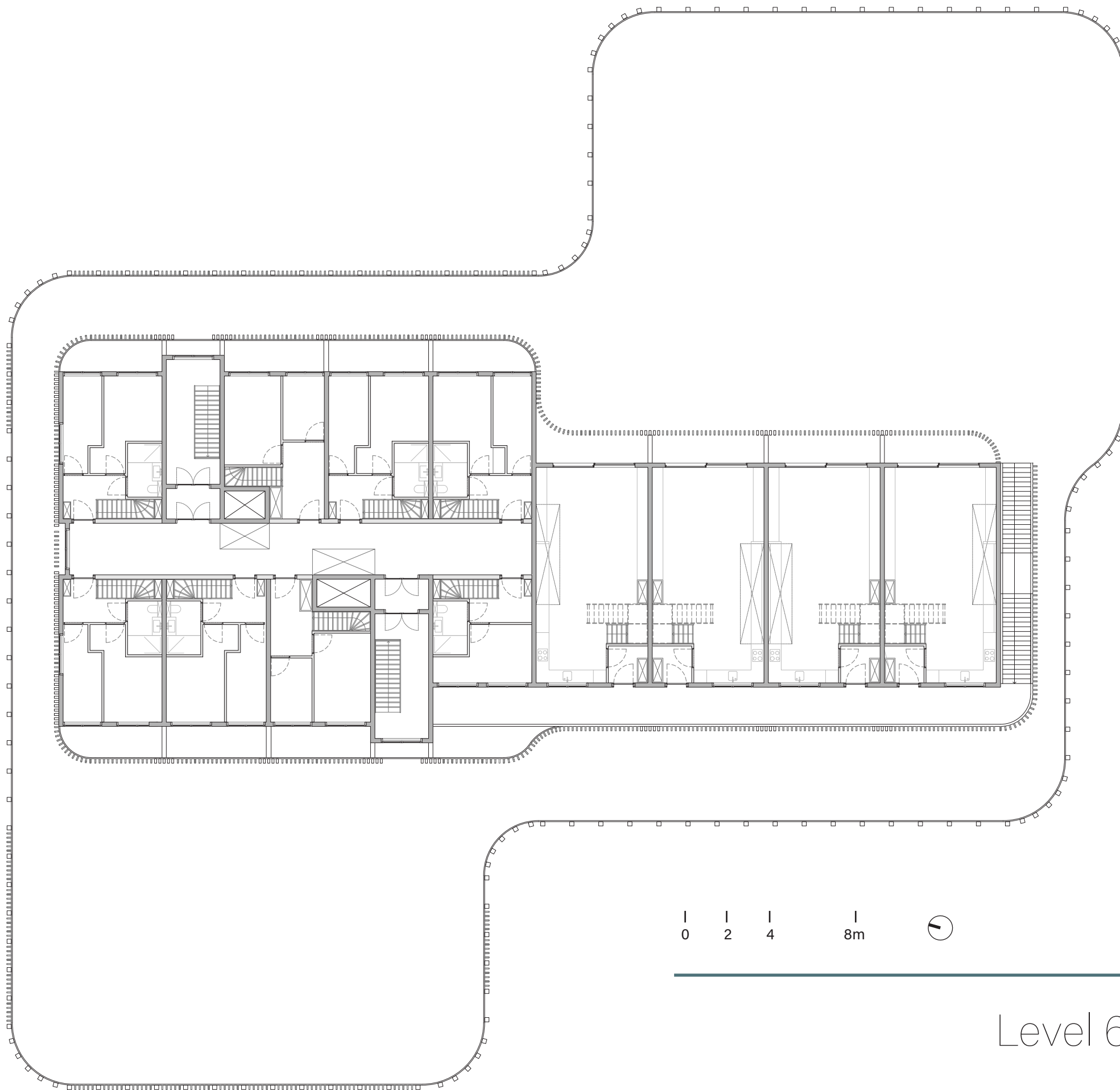
Level 4



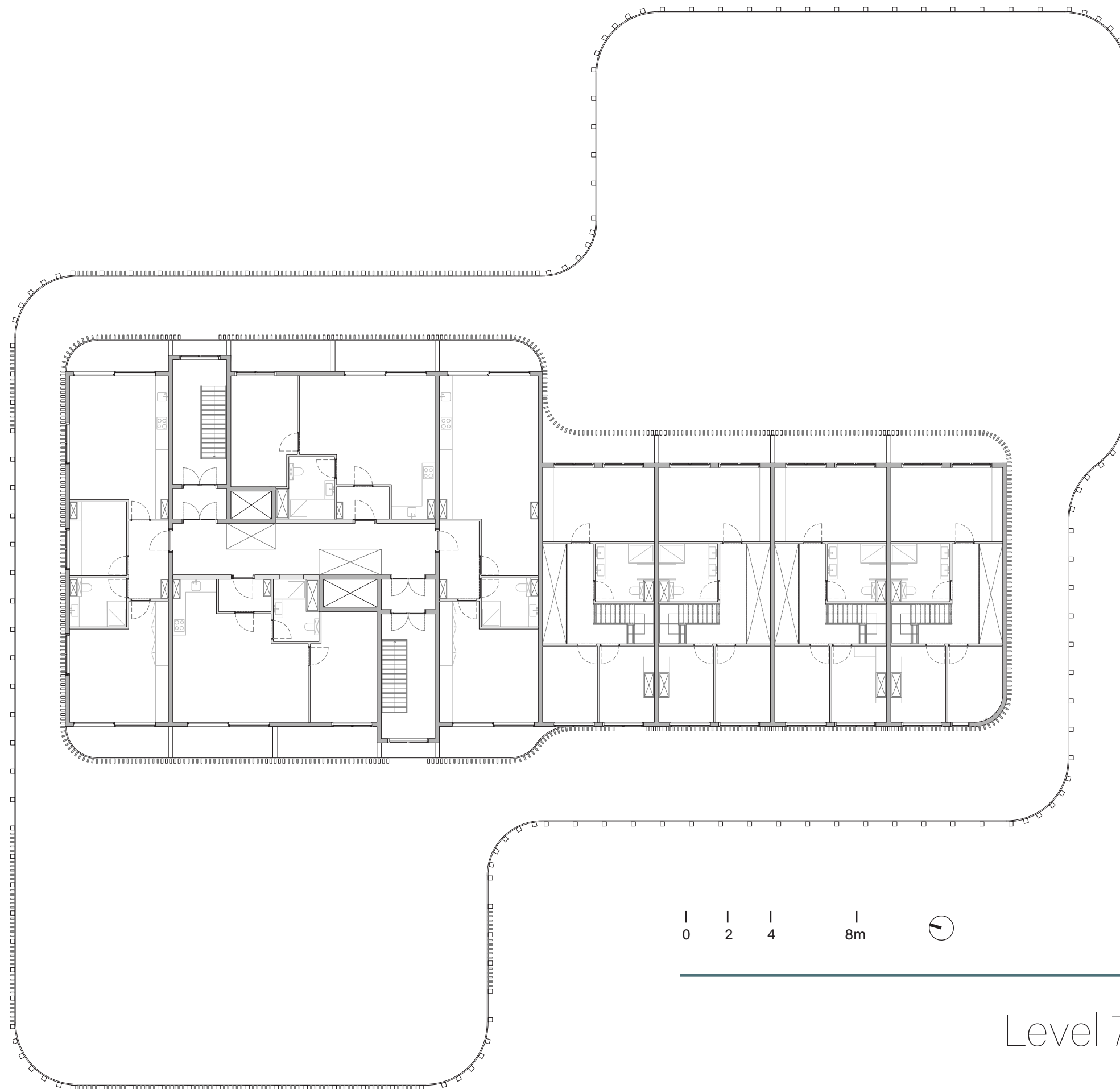
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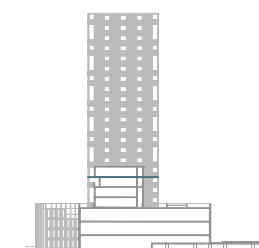
Level 5



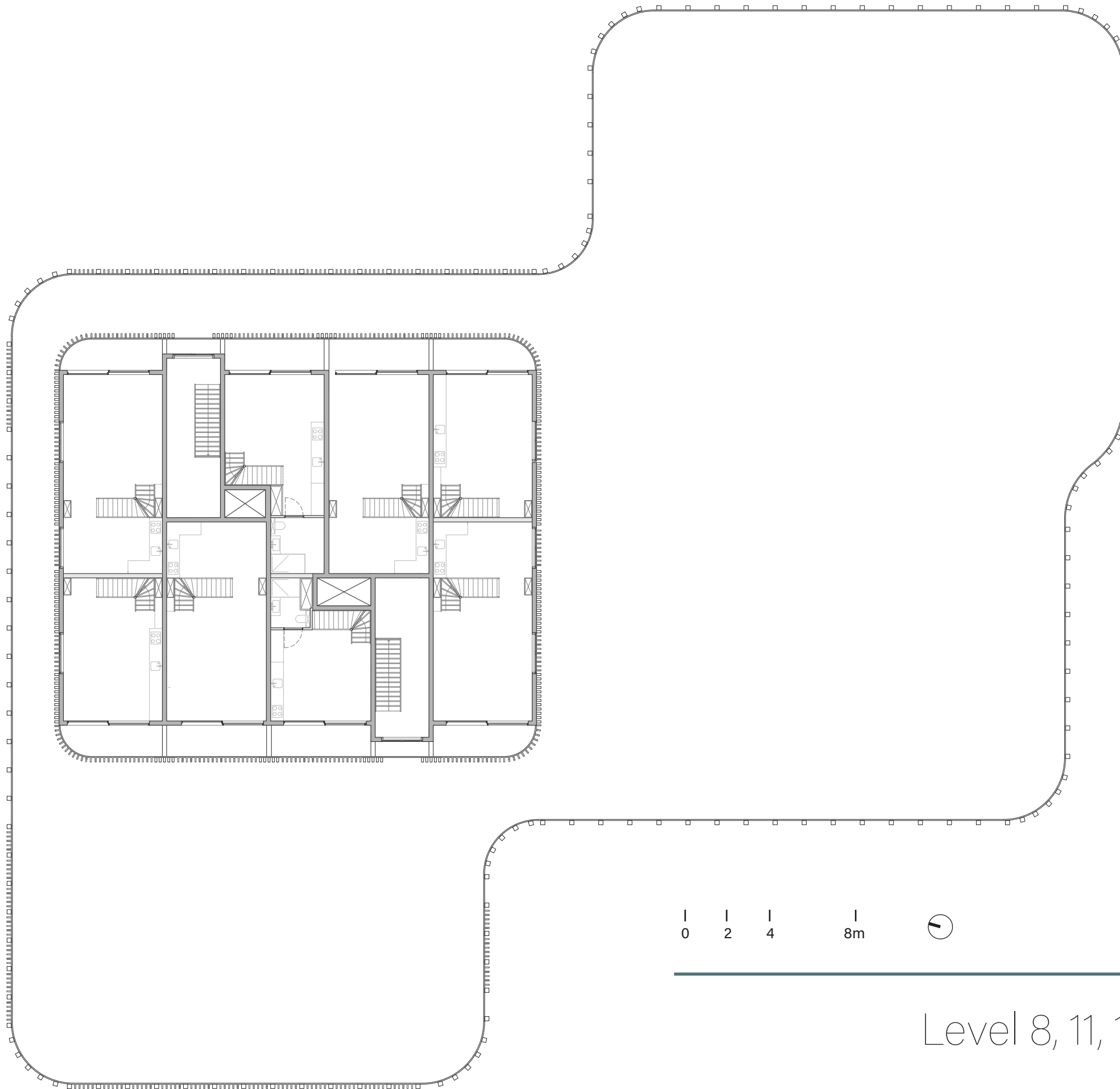
Level 6



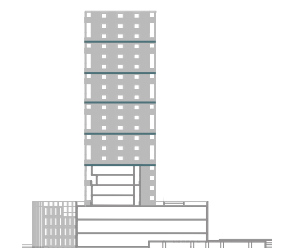
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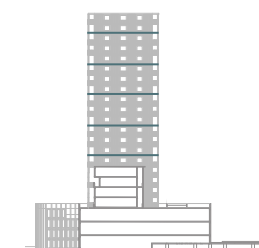
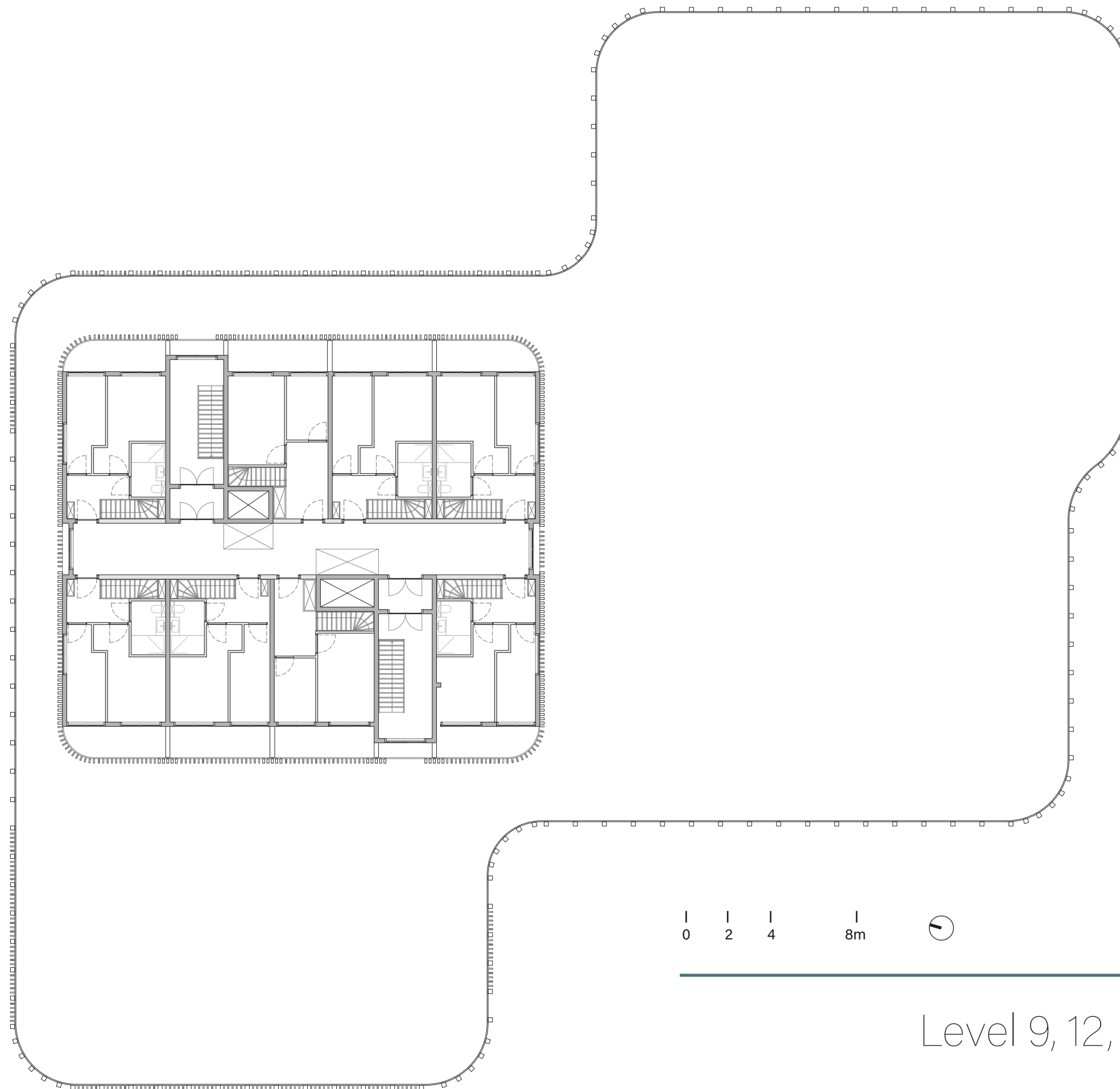
Level 7



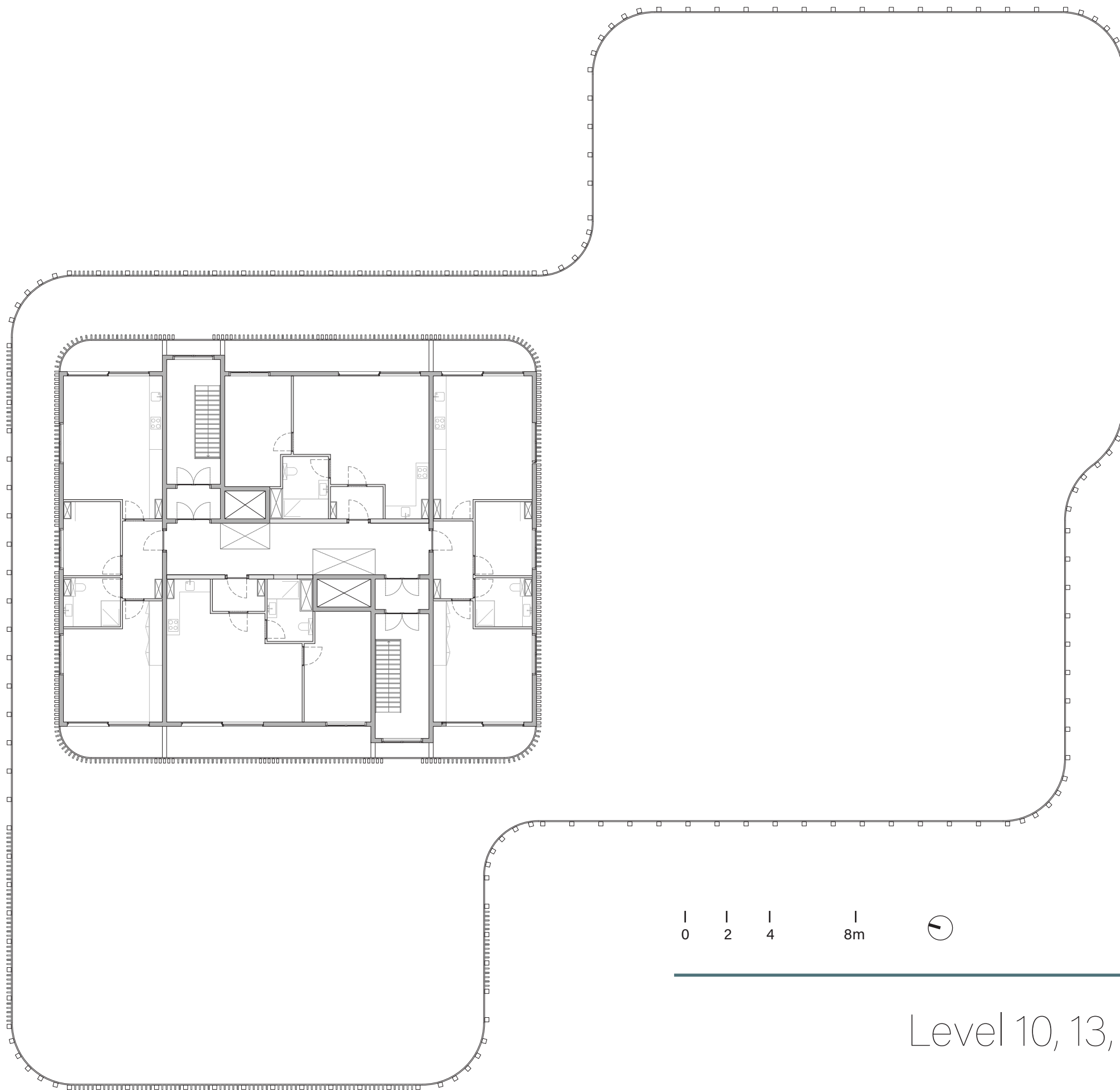
0 2 4 8m



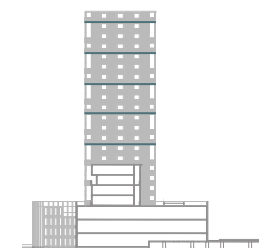
Level 8, 11, 14, 17



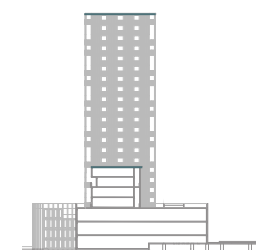
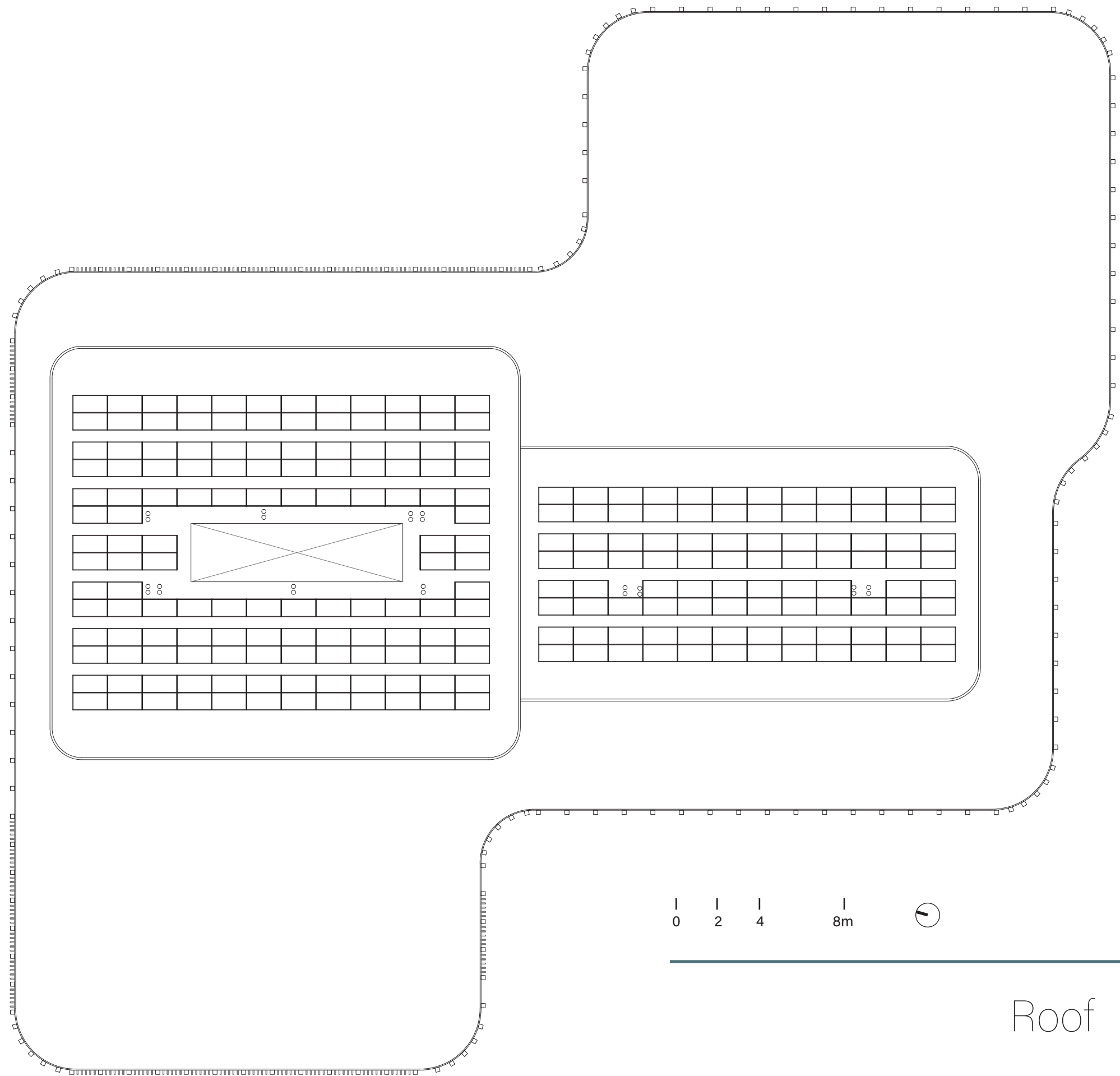
Level 9, 12, 15, 18



0 2 4 8m



Level 10, 13, 16, 19



North facade



East facade



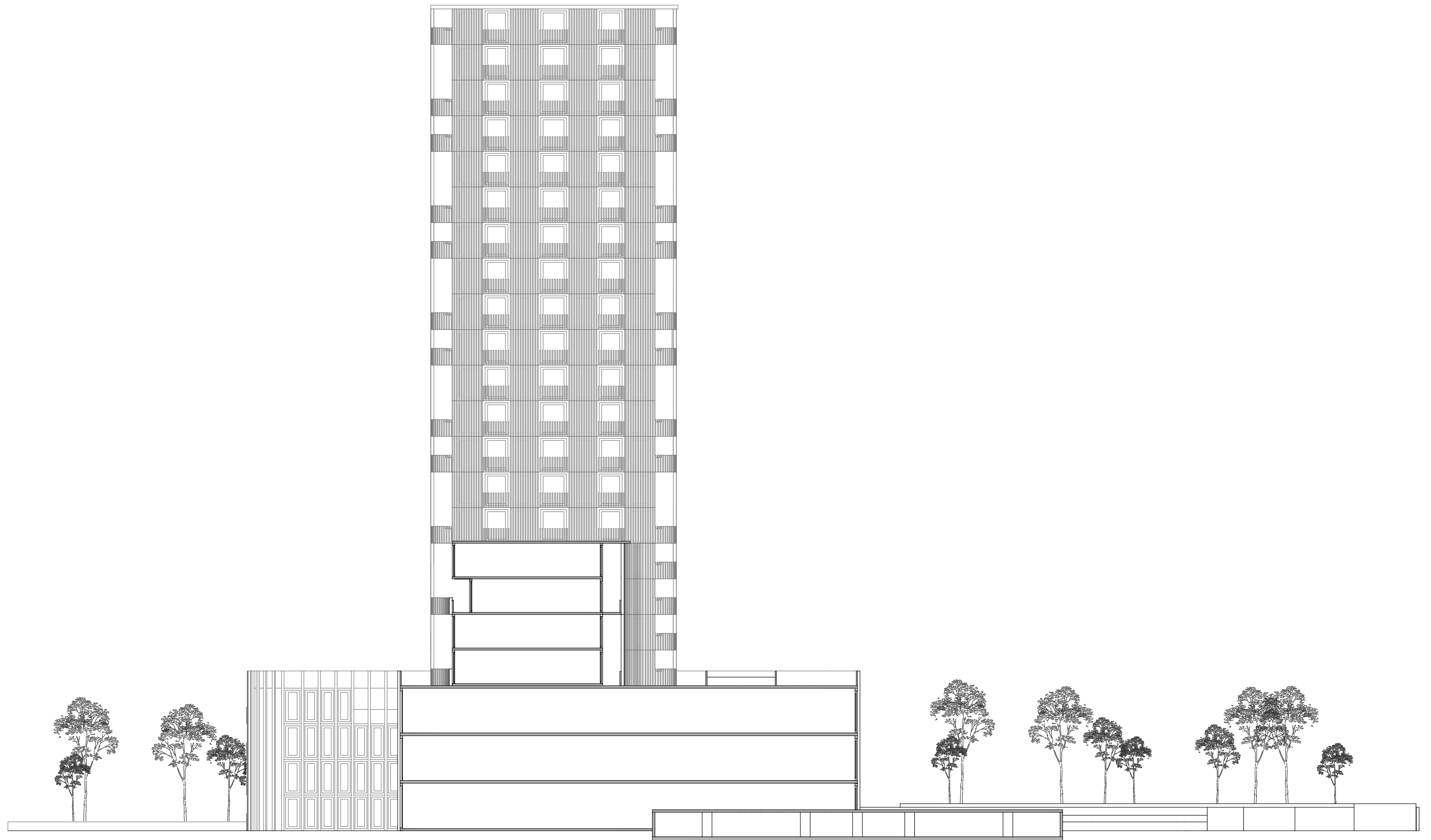
South facade



West facade

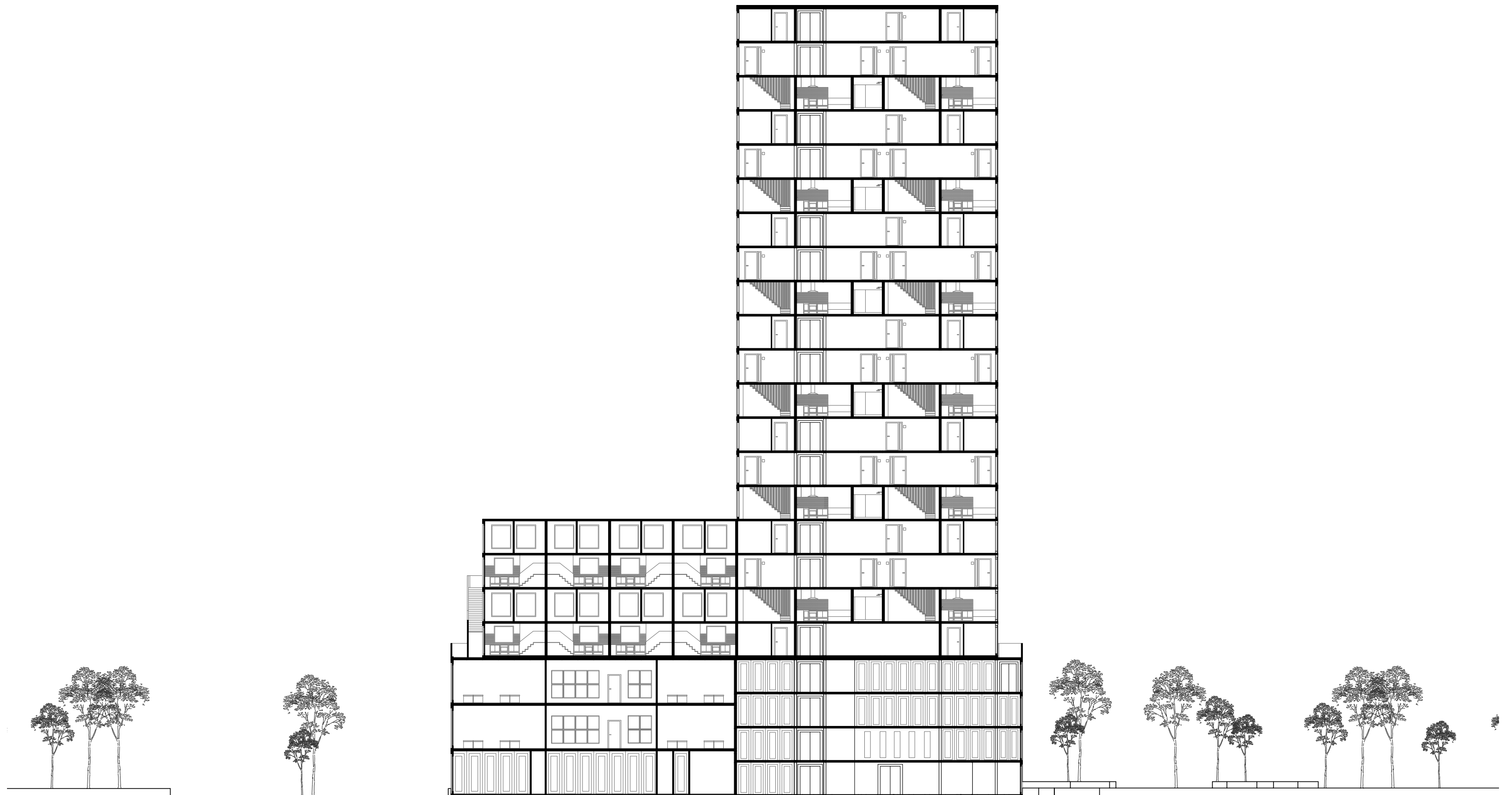


Section west-east



0 2 4 8m

Section south-north

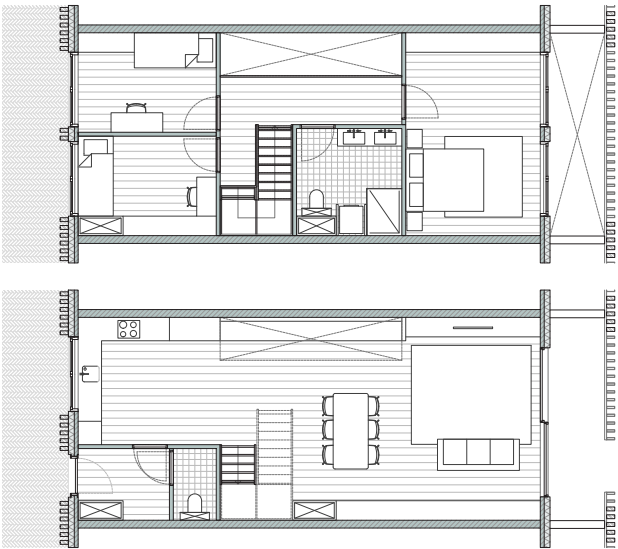


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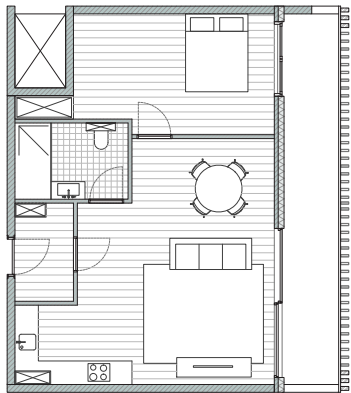
Dwelling floorplans:
Floorplans of each dwelling typology

Dwelling diagrams

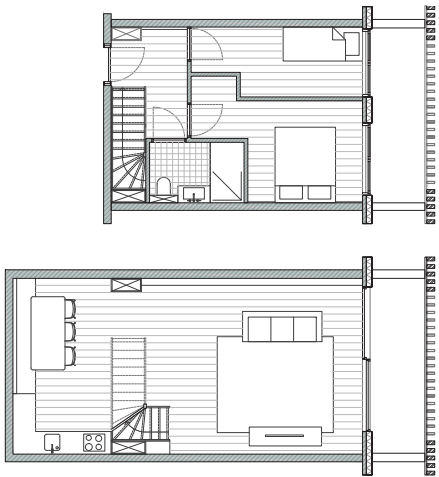
Type 1



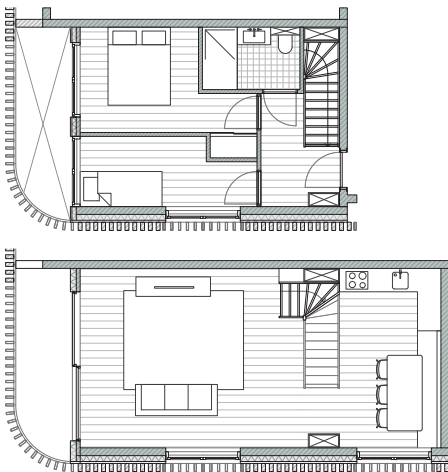
Type 4



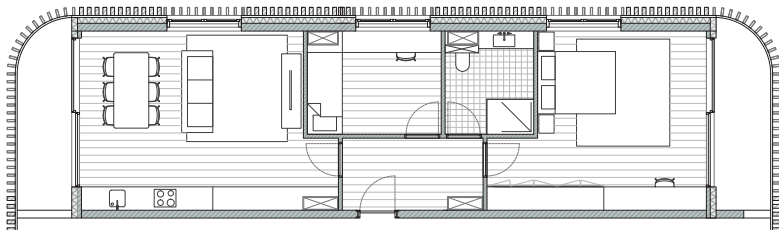
Type 2A



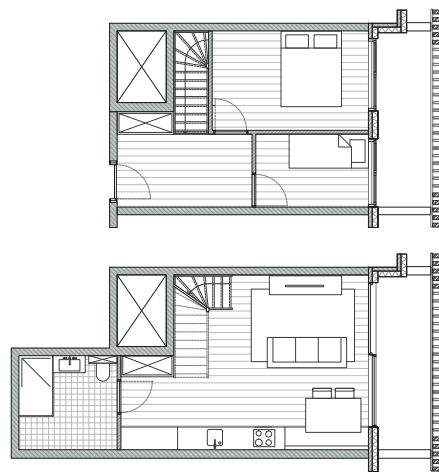
Type 2



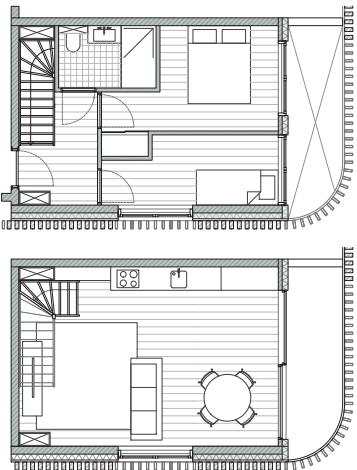
Type 5



Type 2B



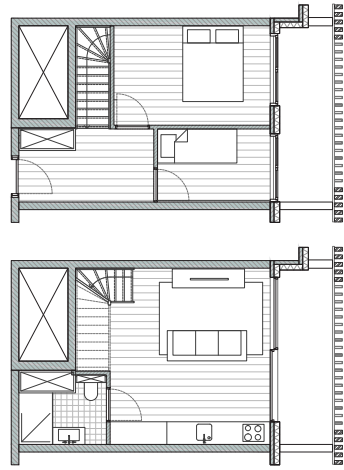
Type 3



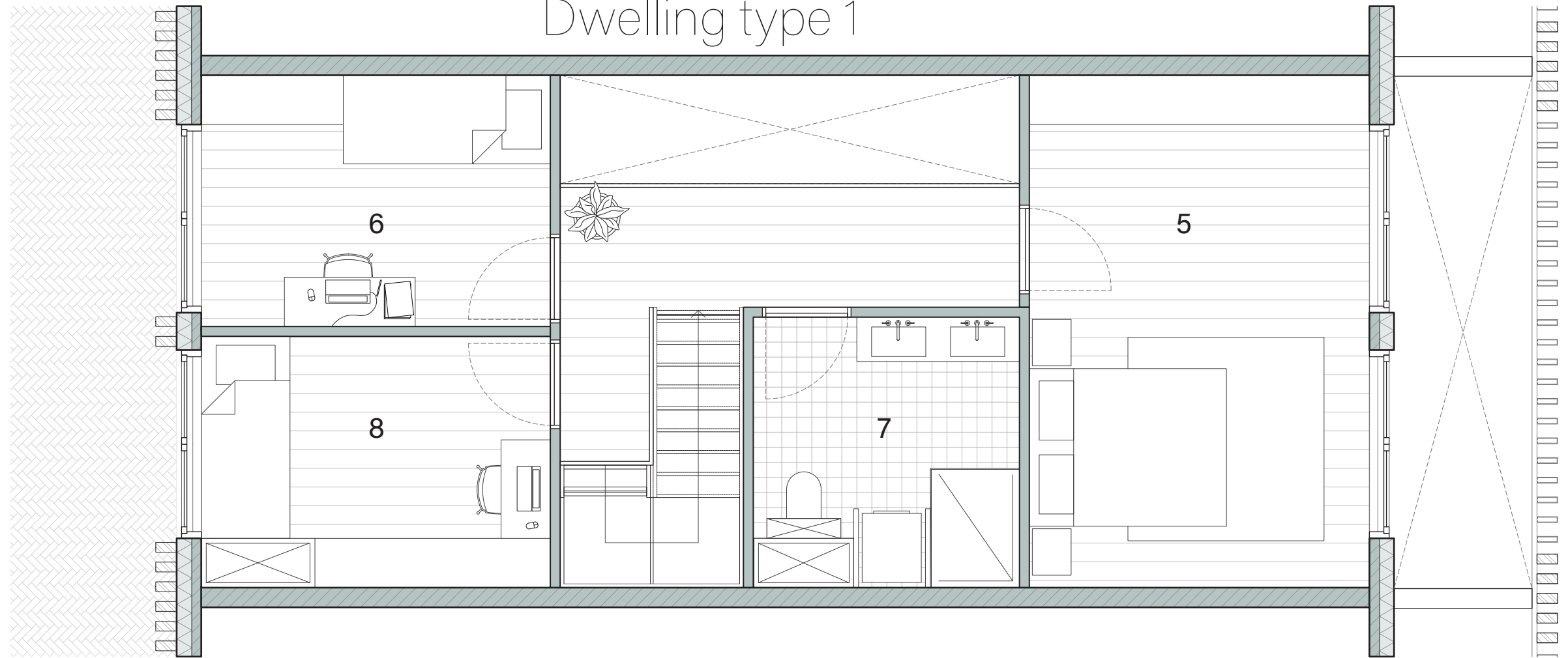
Type 1A



Type 3A



Dwelling type 1



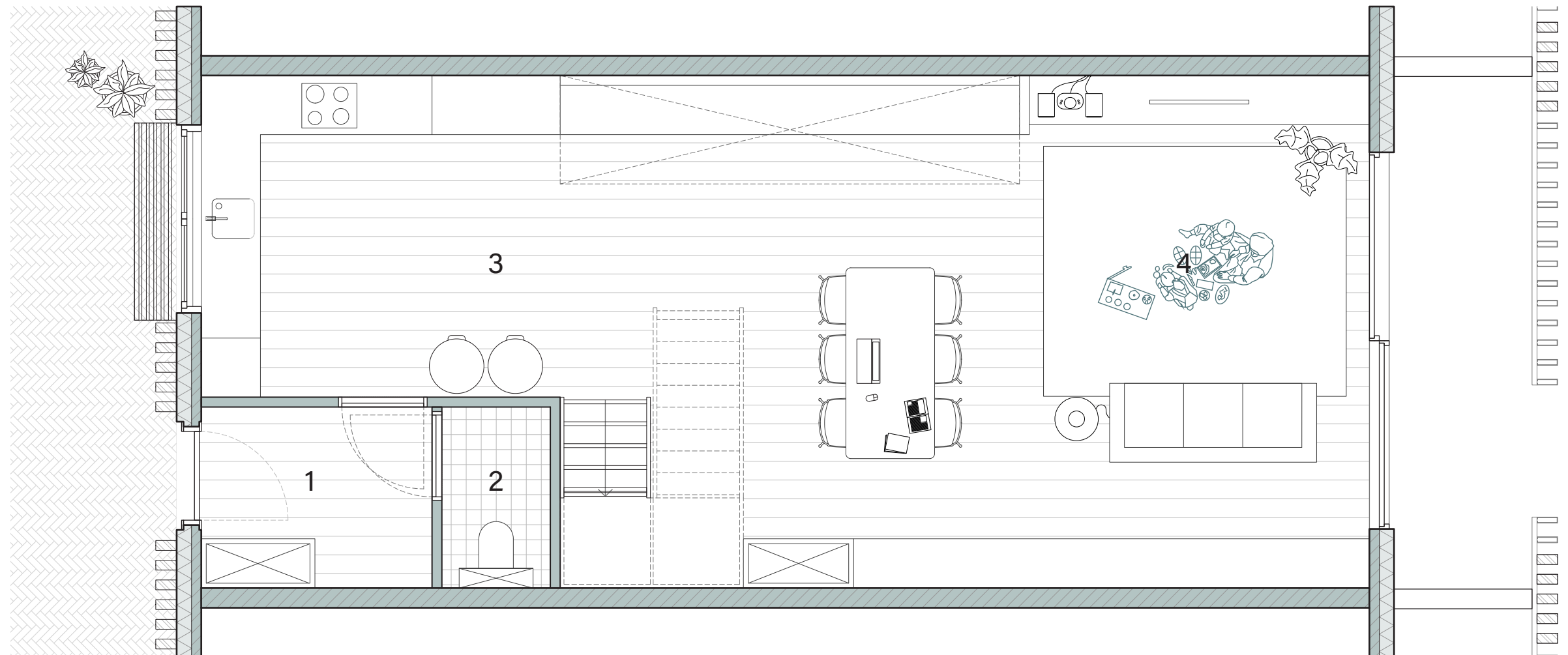
Dwelling Floor Plan

Type 1

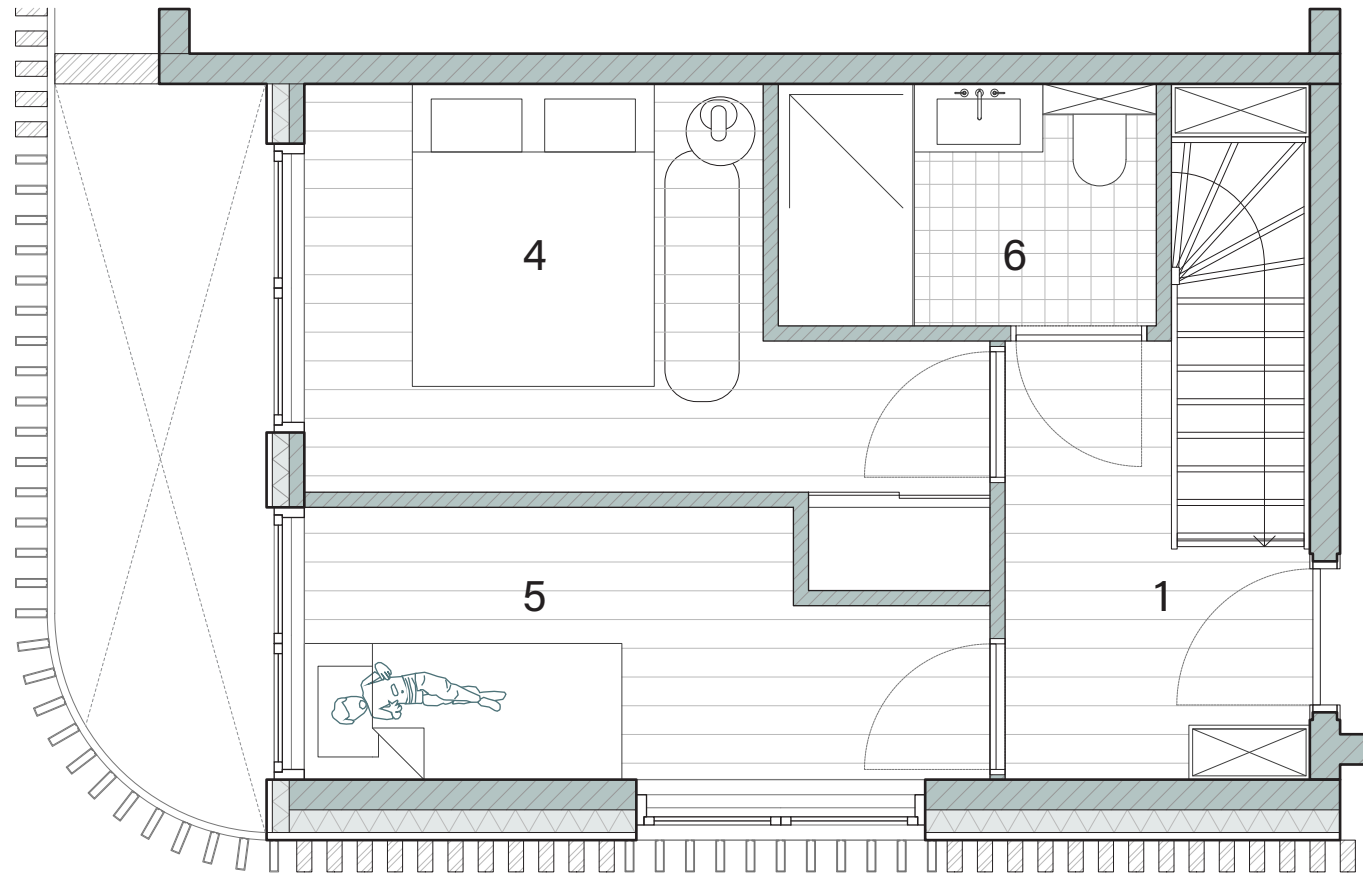
- 1 Entrance hall
- 2 Seperate toilet
- 3 Kitchen
- 4 Dining/Living room
- 5 Bedroom 1
- 6 Bedroom 2
- 7 Bathroom
- 8 Bedroom 3



0 0.5 1 2m



Dwelling type 2



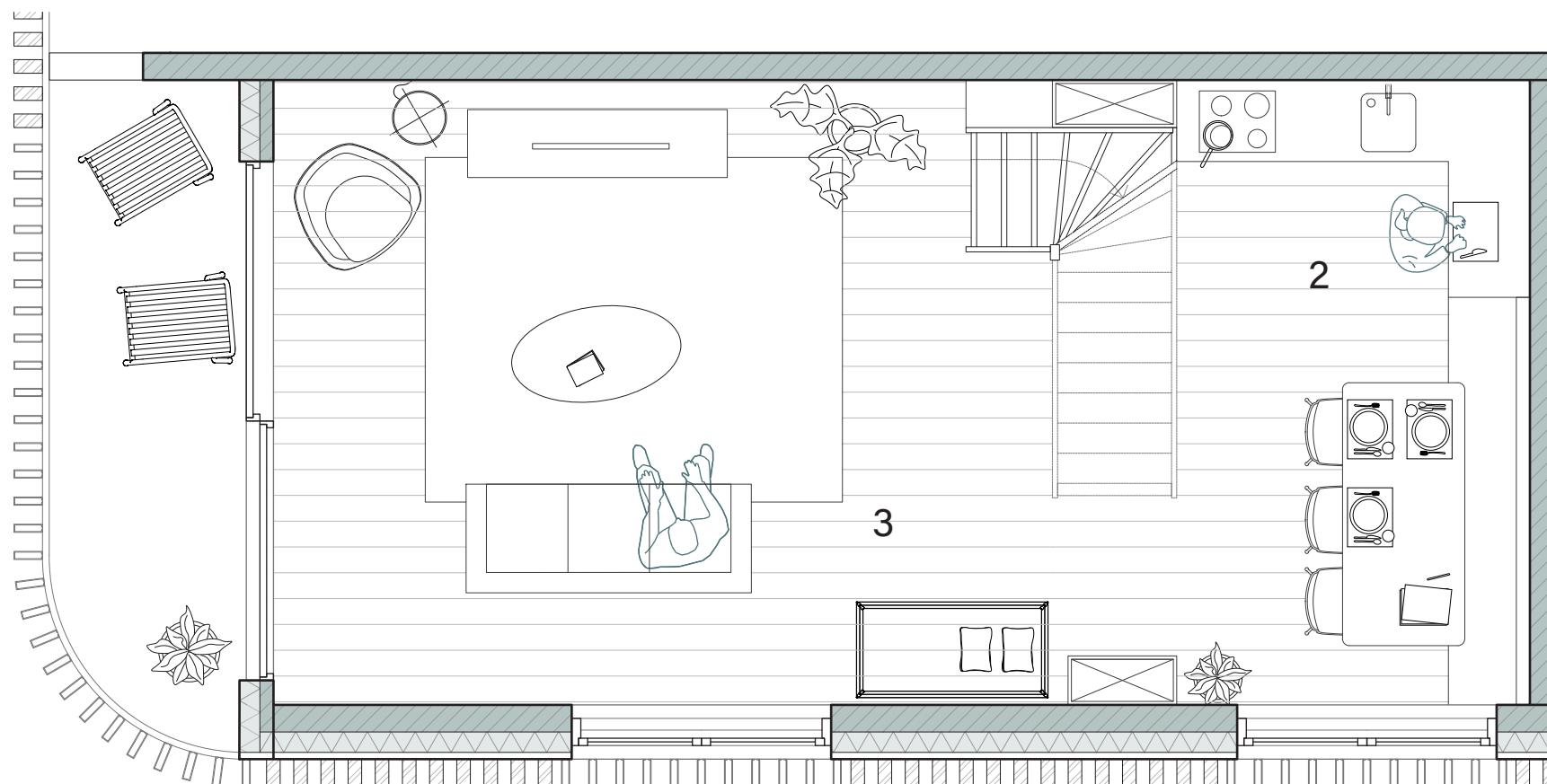
Dwelling Floor Plan

Type 2

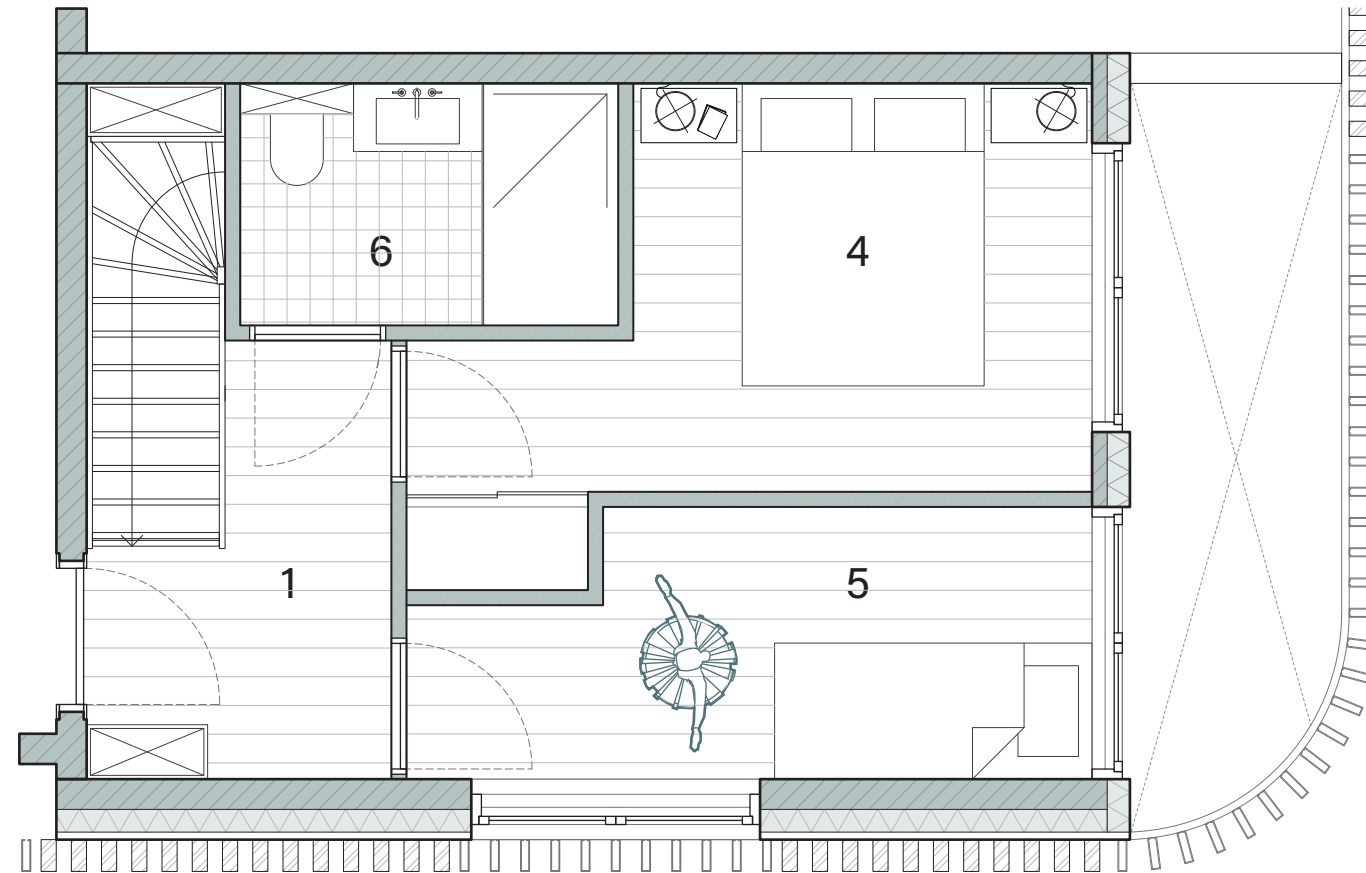
- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom



0 0.5 1 2m



Dwelling type 3



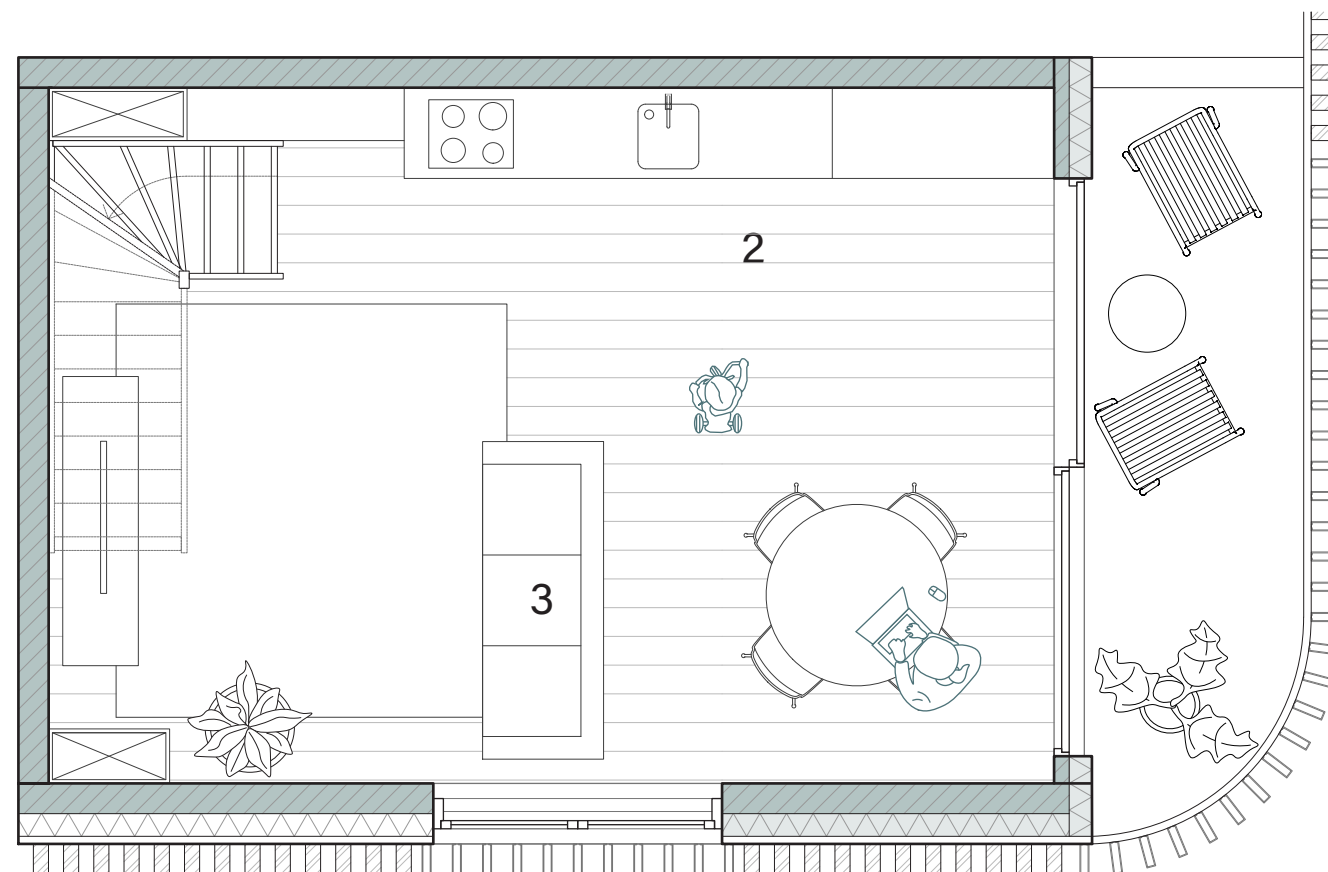
Dwelling Floor Plan

Type 3

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom



0 0.5 1 2m



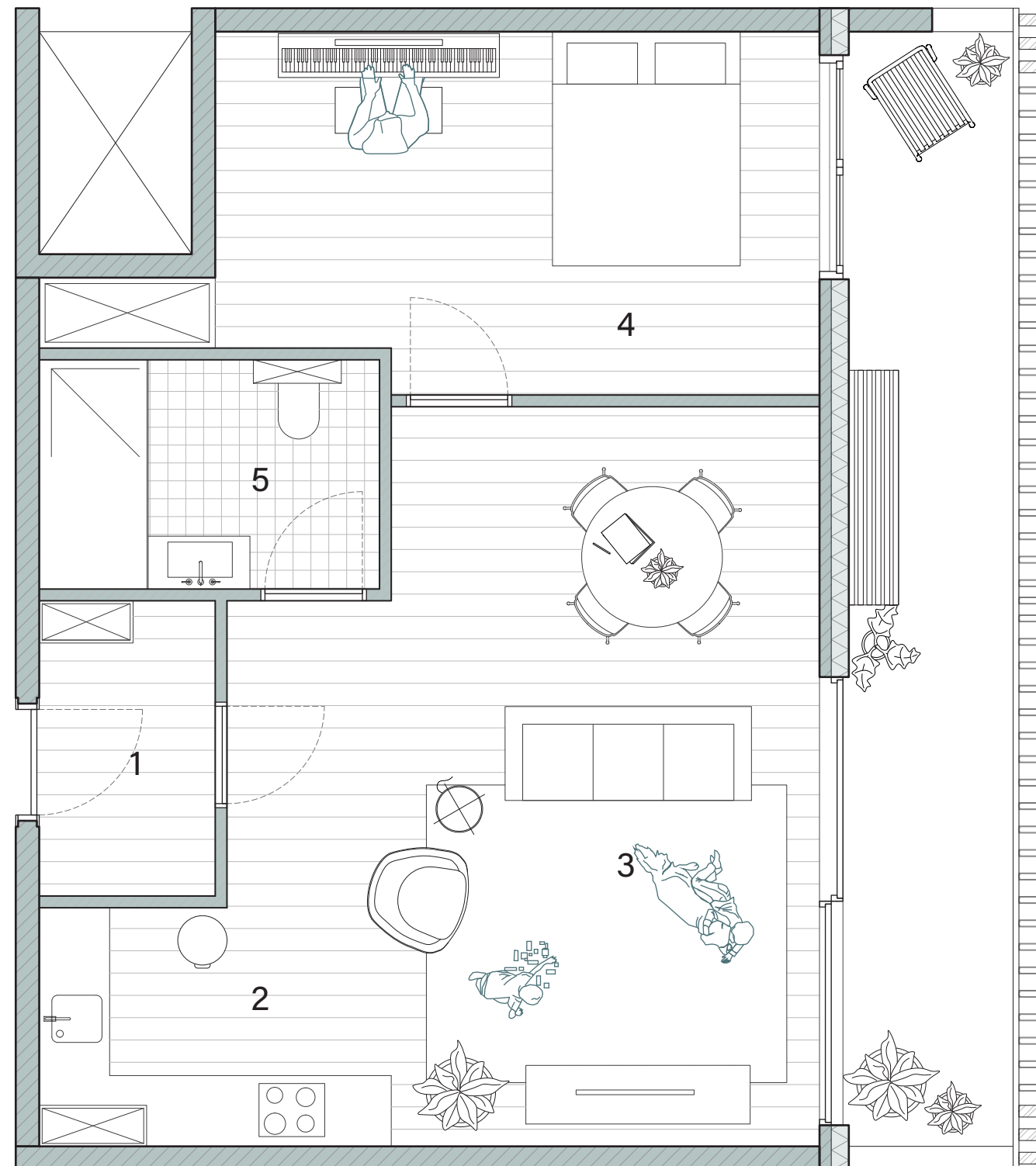
Dwelling type 4



Dwelling Floor Plan

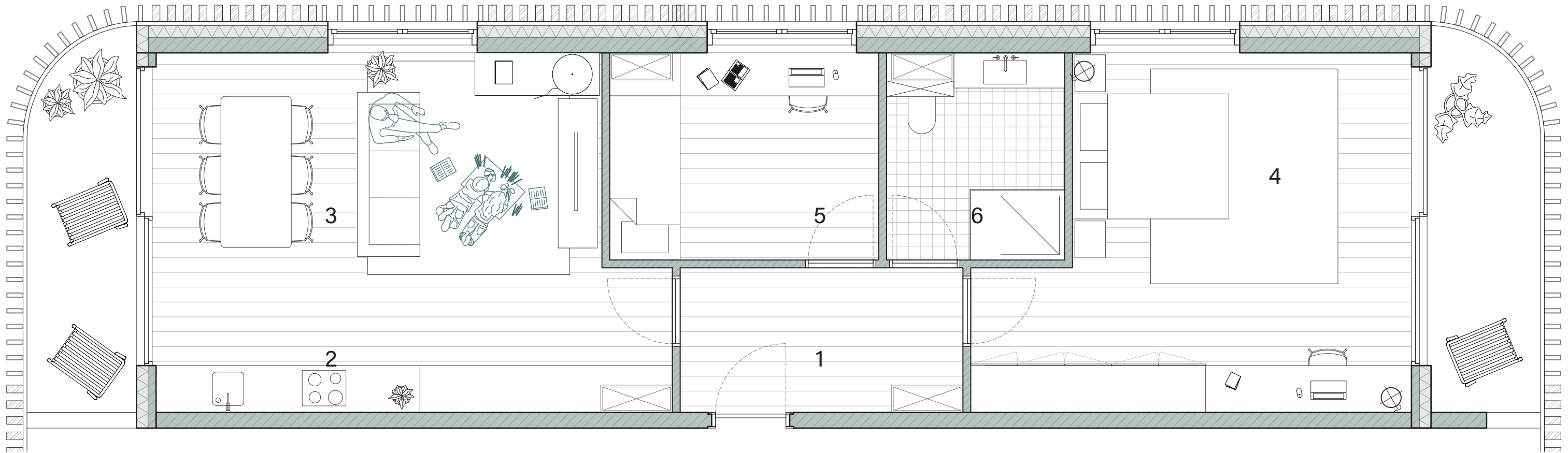
Type 4

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bathroom



0 0.5 1 2m

Dwelling type 5



Dwelling Floor Plan

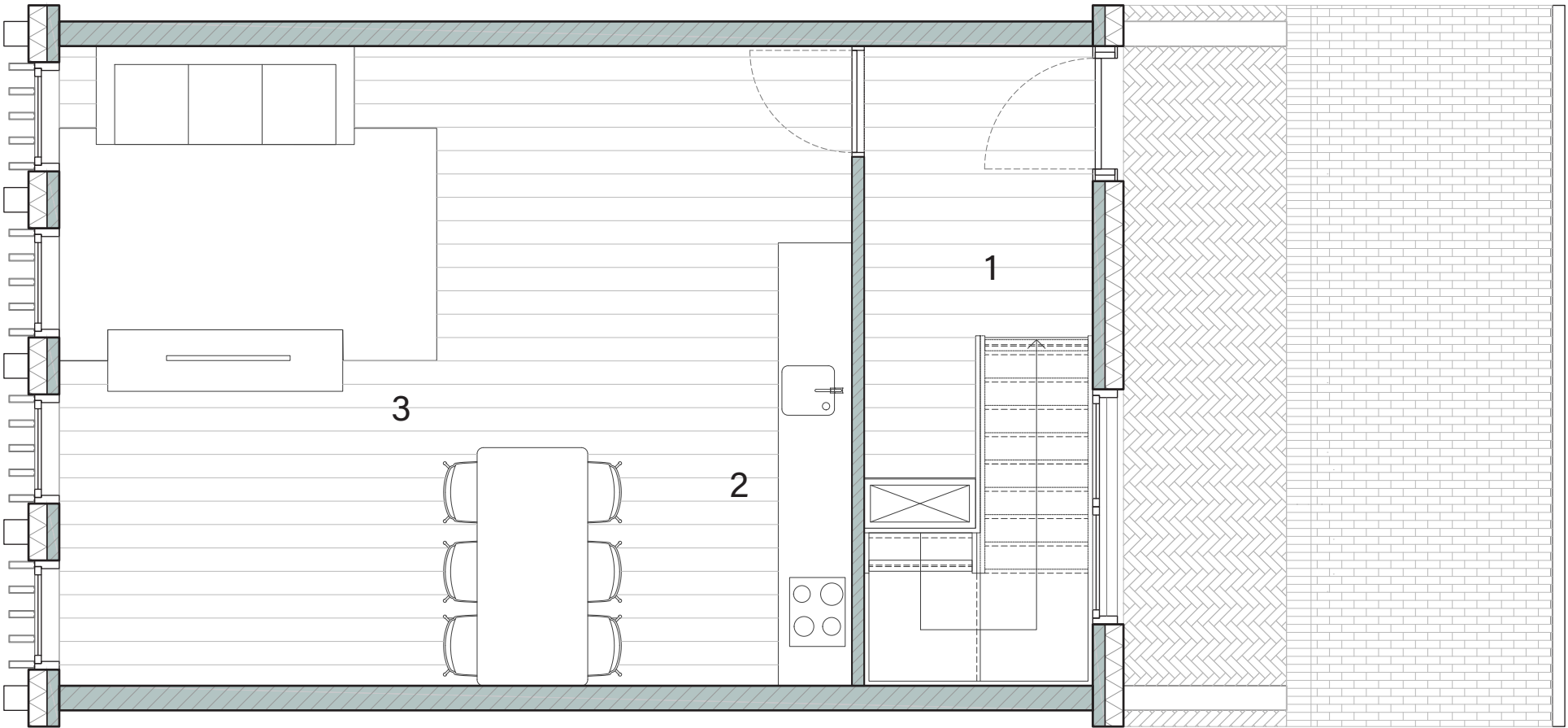
Type 5

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom



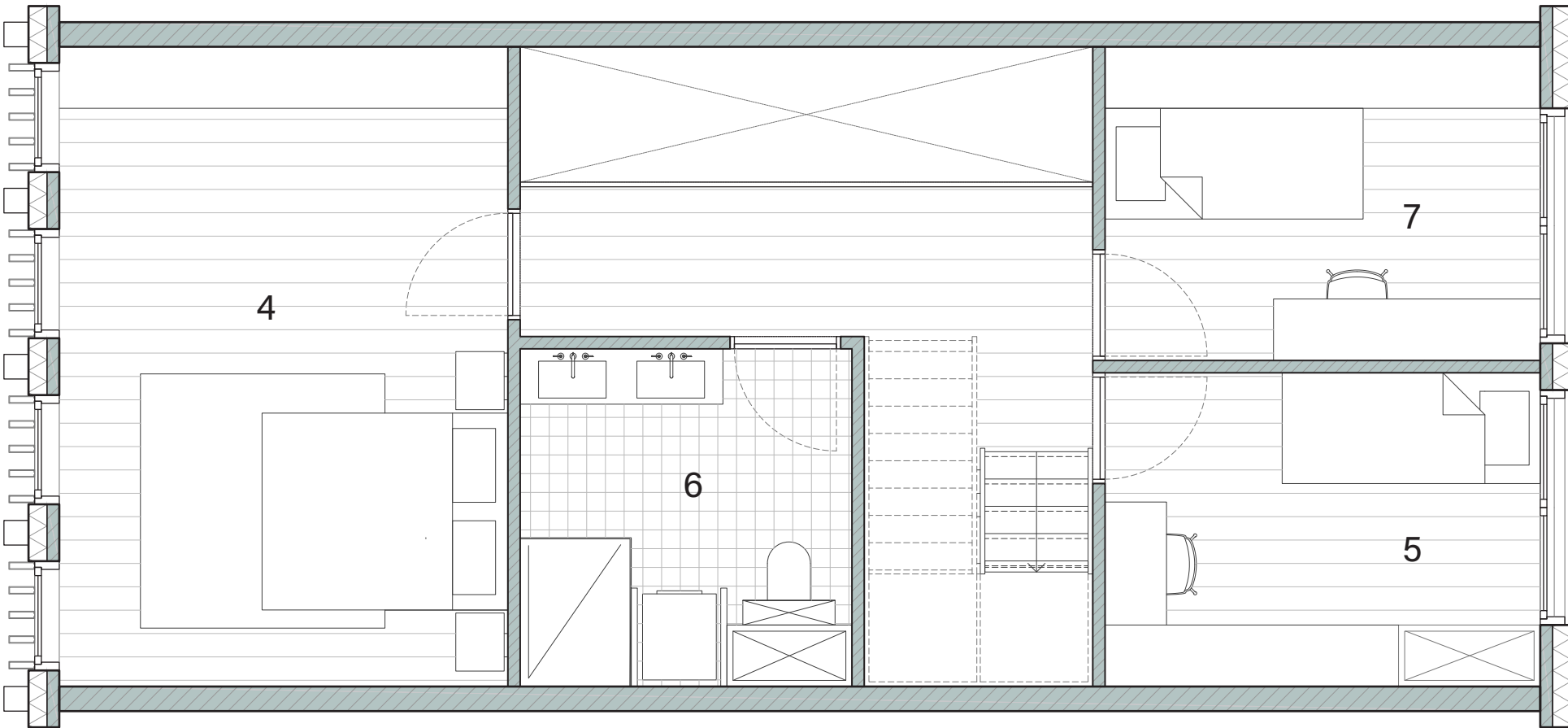
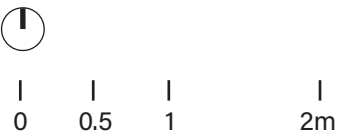
0 0.5 1 2m

Dwelling type 1A

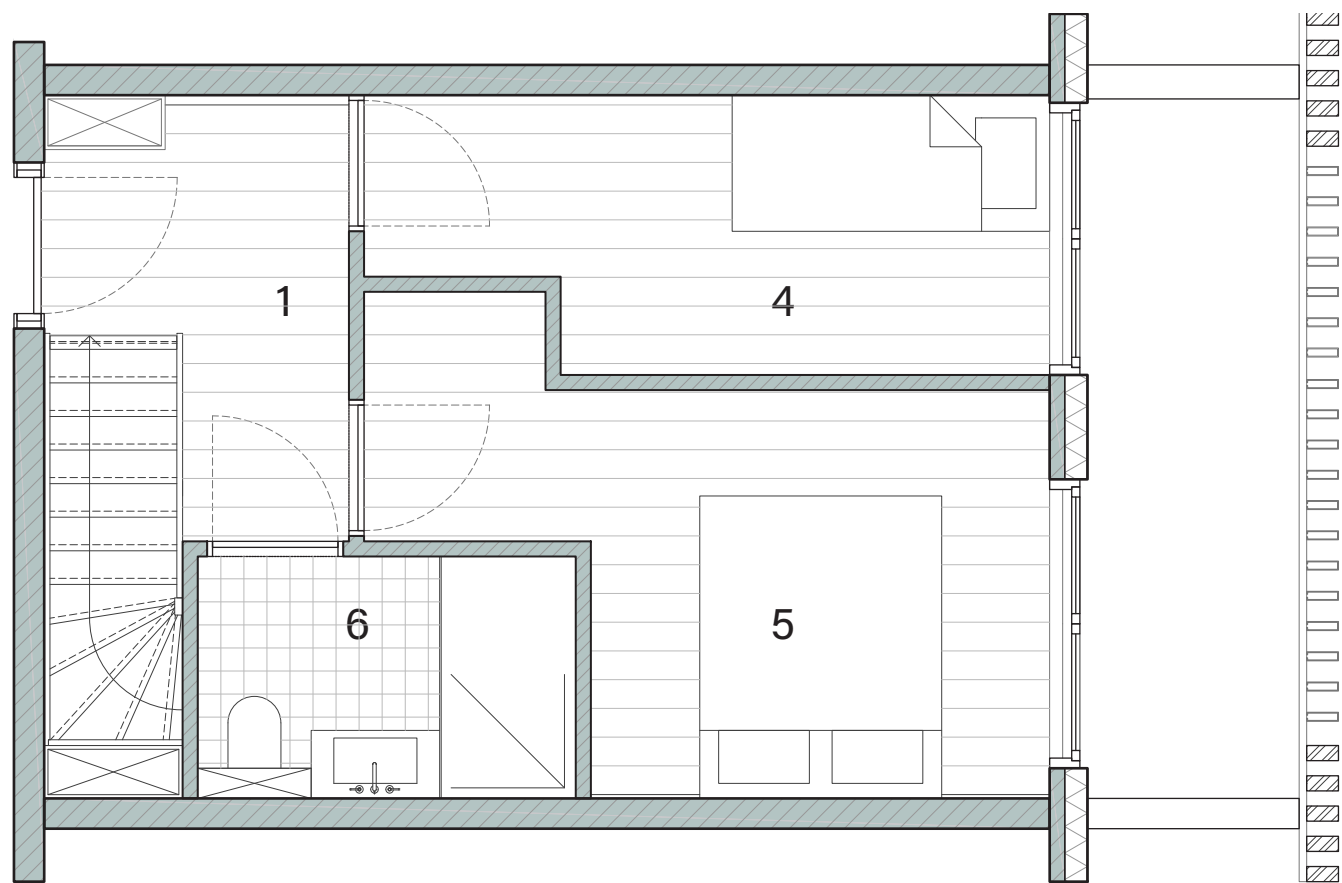


Dwelling Floor Plan
Type 1A

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom
- 7 Bedroom 3

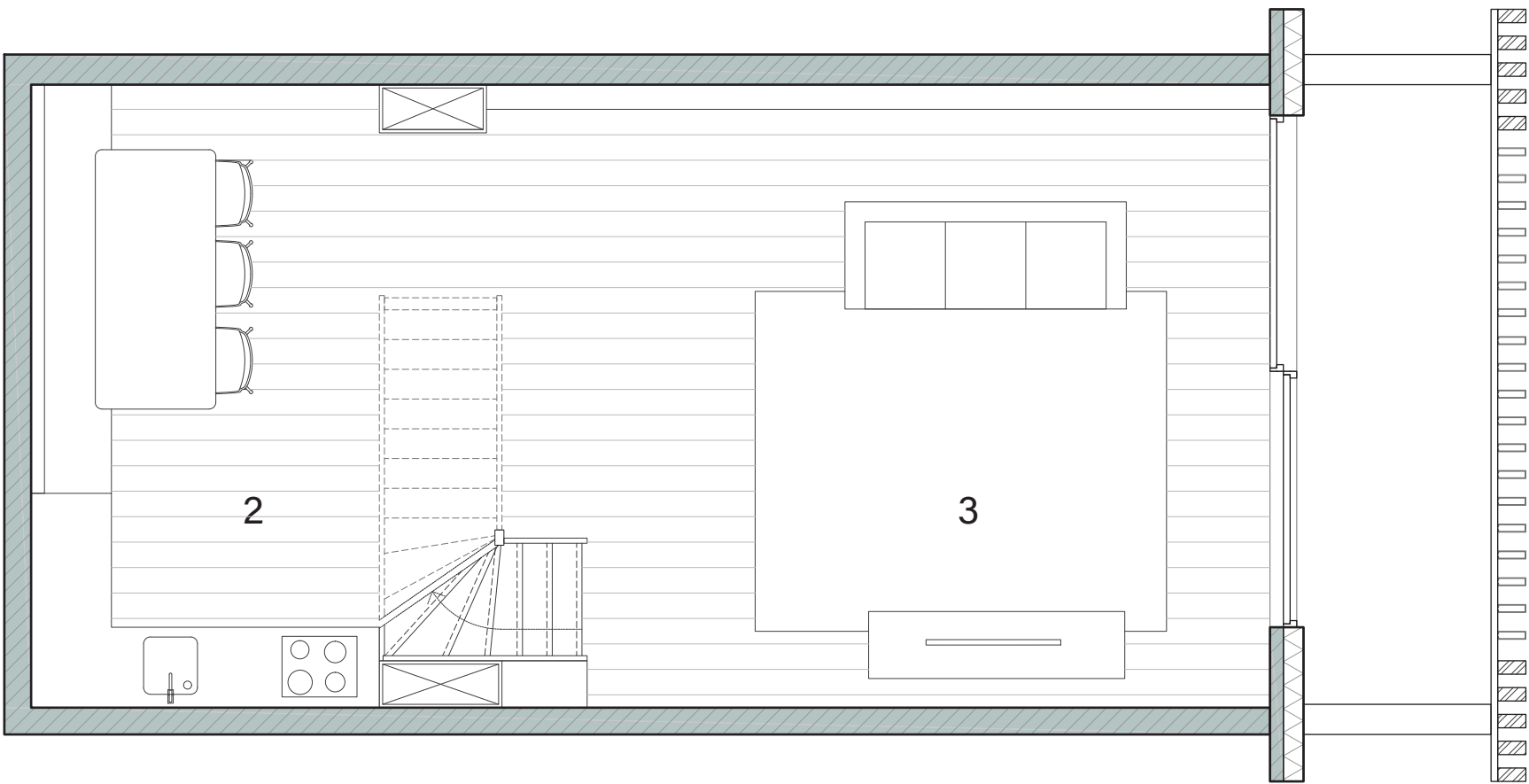
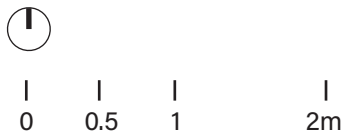


Dwelling type 2A

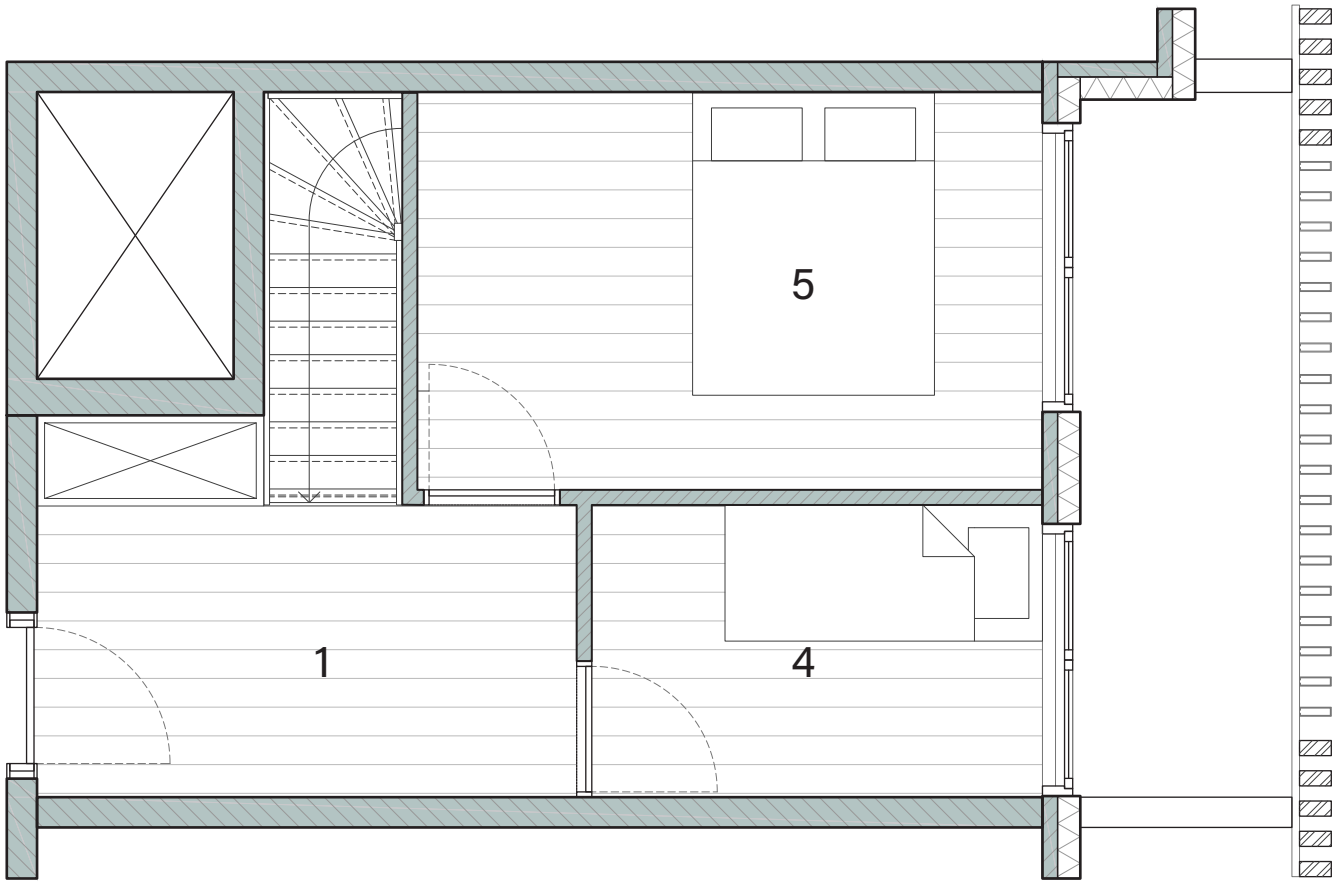


Dwelling Floor Plan
Type 2A

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom

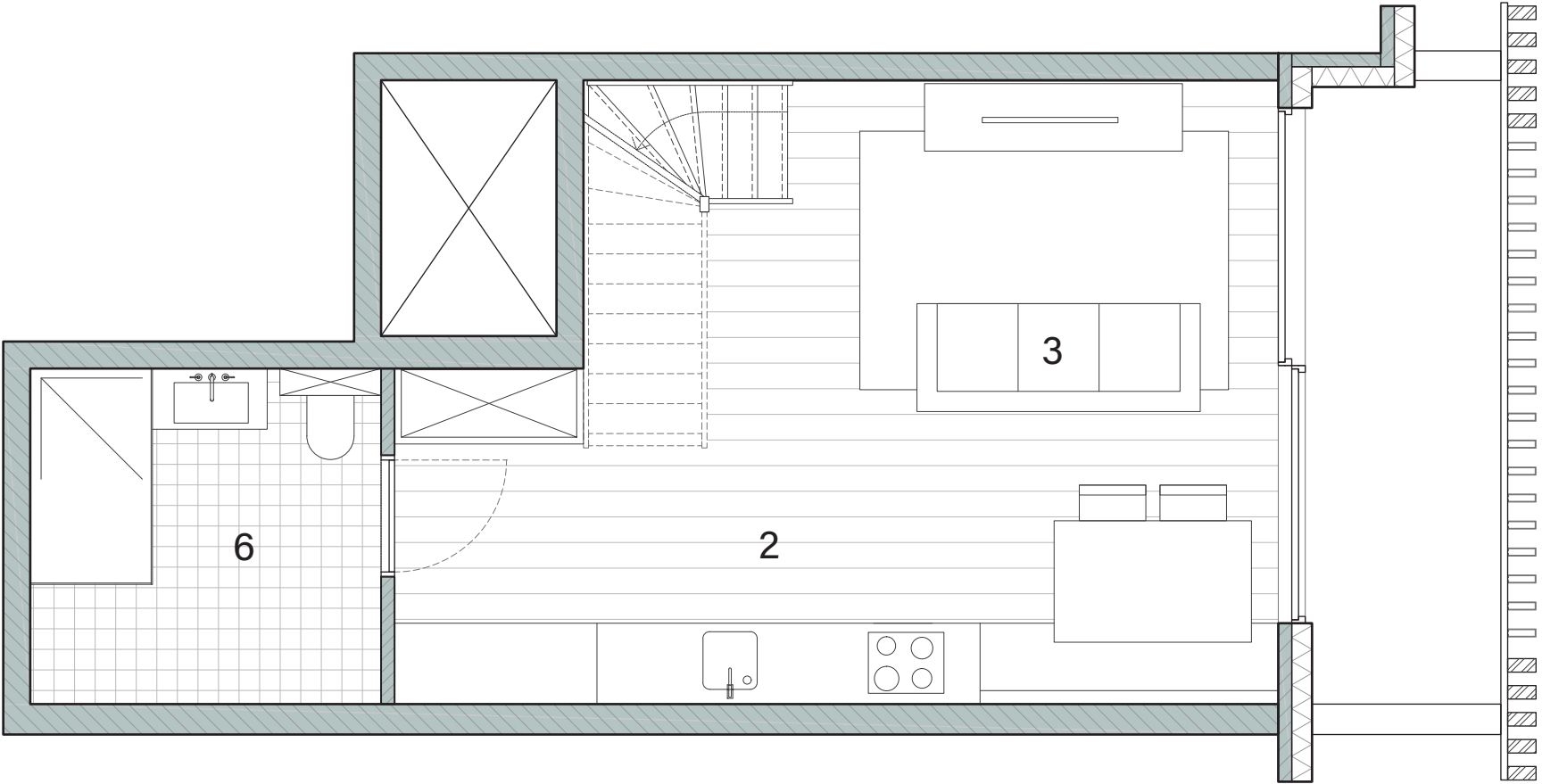
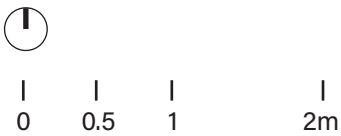


Dwelling type 2B

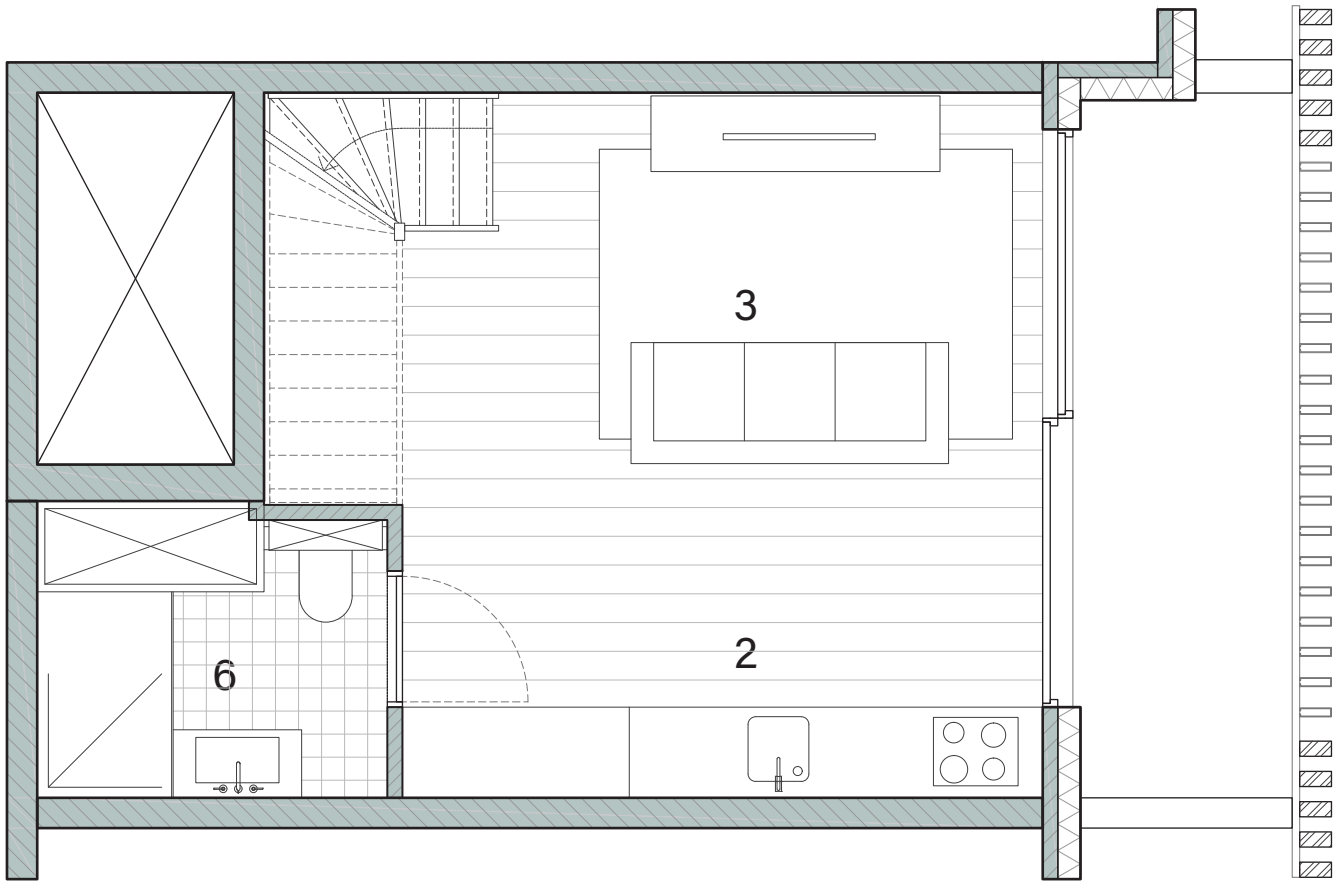
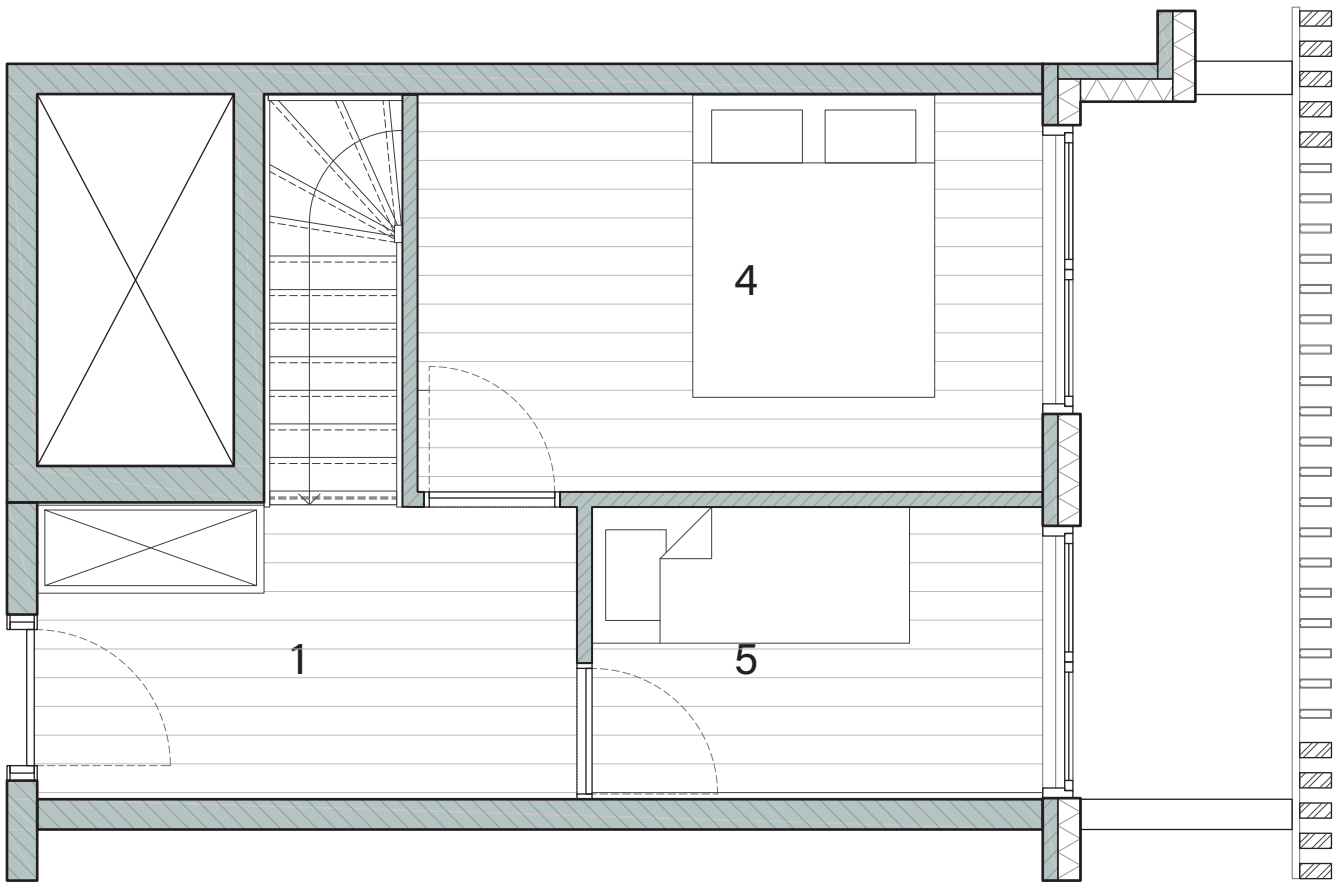


Dwelling Floor Plan
Type 2B

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom

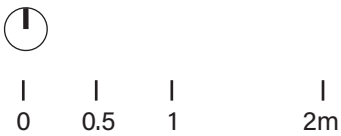


Dwelling type 3A



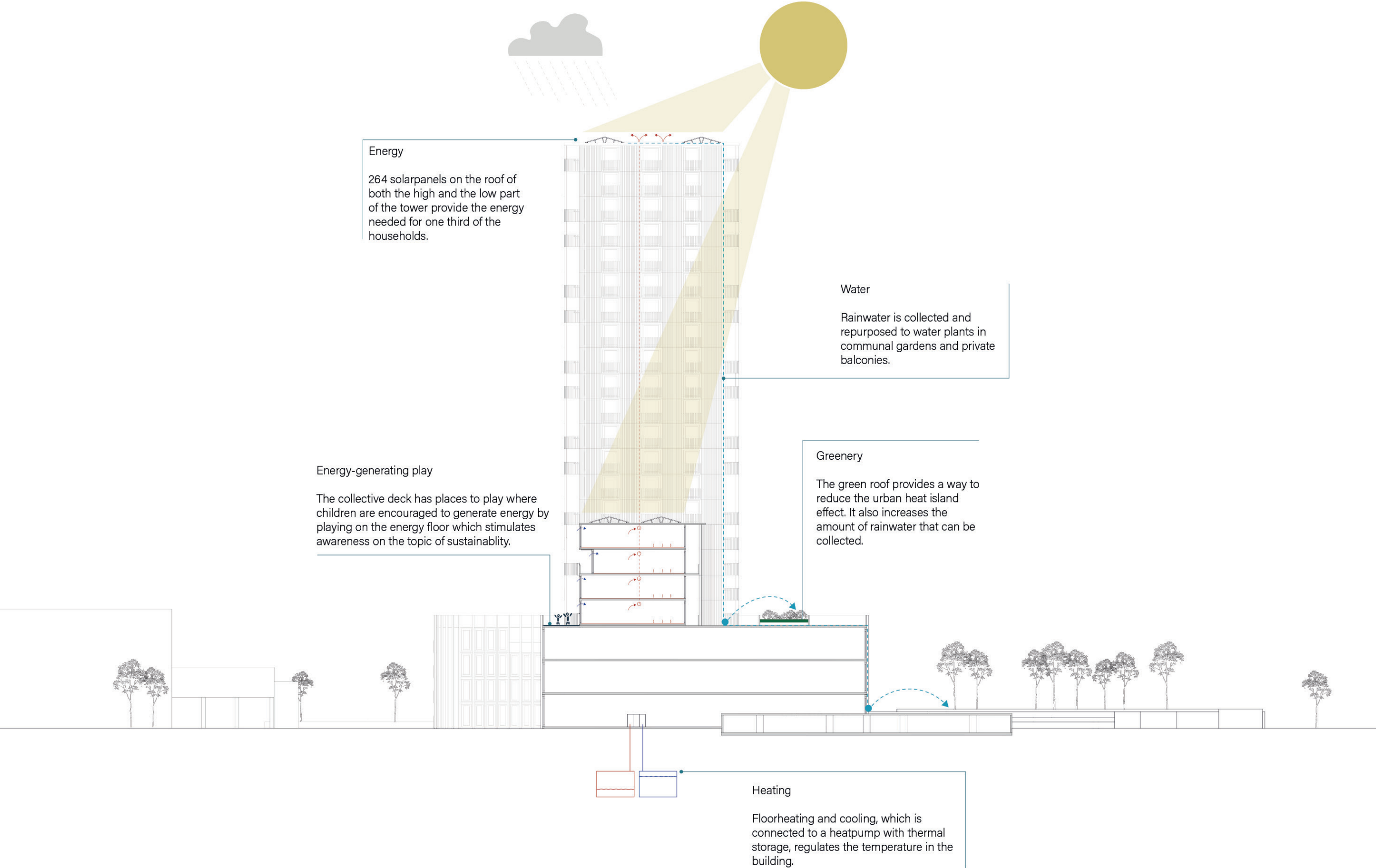
Dwelling Floor Plan
Type 3A

- 1 Entrance hall
- 2 Kitchen
- 3 Dining/Living room
- 4 Bedroom 1
- 5 Bedroom 2
- 6 Bathroom

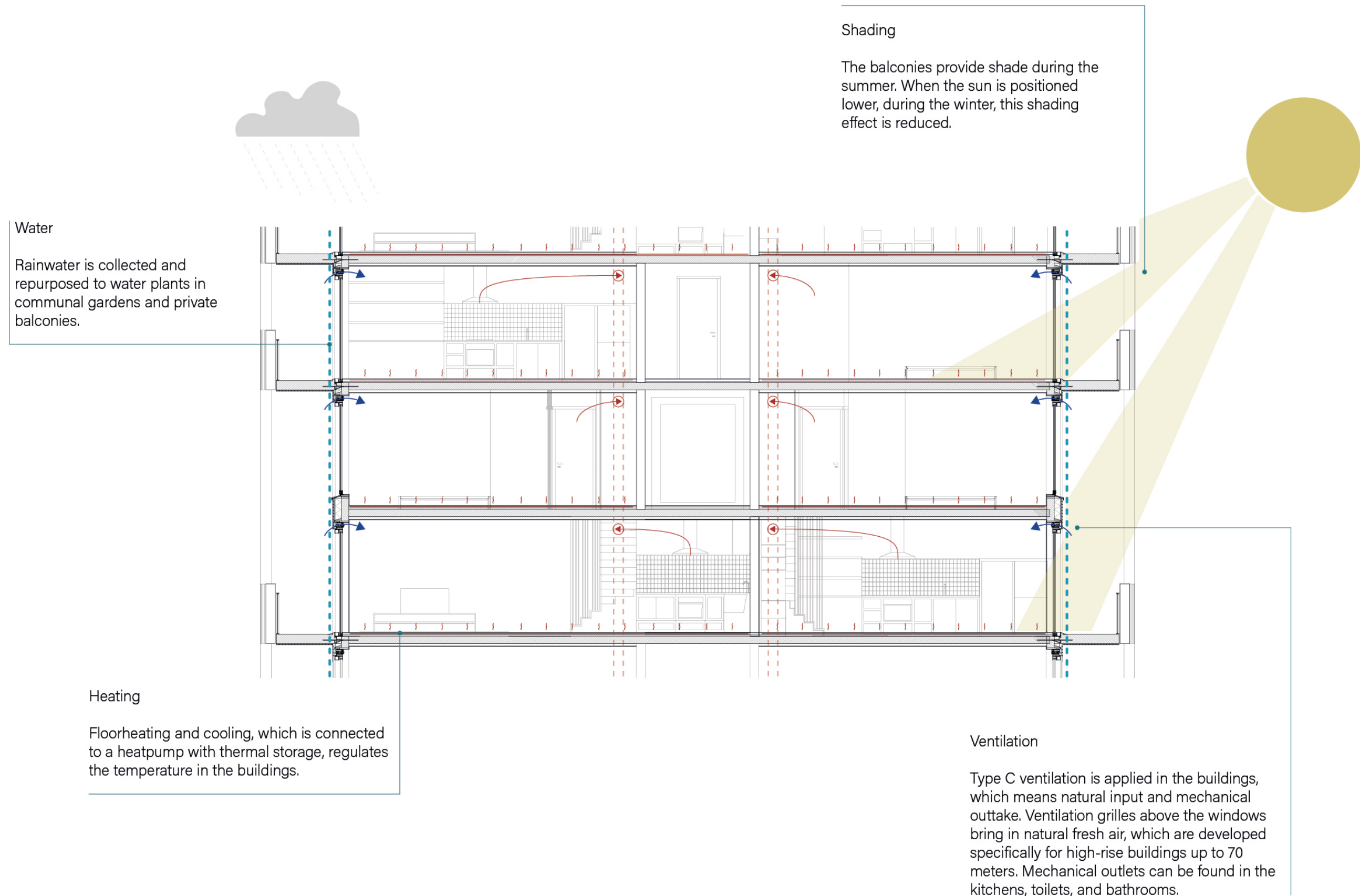


Climate design:
Climate concept on different scales

Climate design: building level



Climate design: floor level



Climate design: dwelling level

Shading

The balconies provide shade during the summer. When the sun is positioned lower in the winter this shading effect is reduced.

Heating

Floorheating and cooling, which is connected to a heatpump with thermal storage, regulates the temperature in the buildings.

Shafts

Every dwelling has at least two shafts, one for the meter cupboard and one for ventilation and other pipes

Water

Water is distributed through shafts that are closely connected to the areas of the home that need running water, such as the bathrooms, toilets and kitchens. Warm grey water from the shower is used to preheat its fresh water supply.

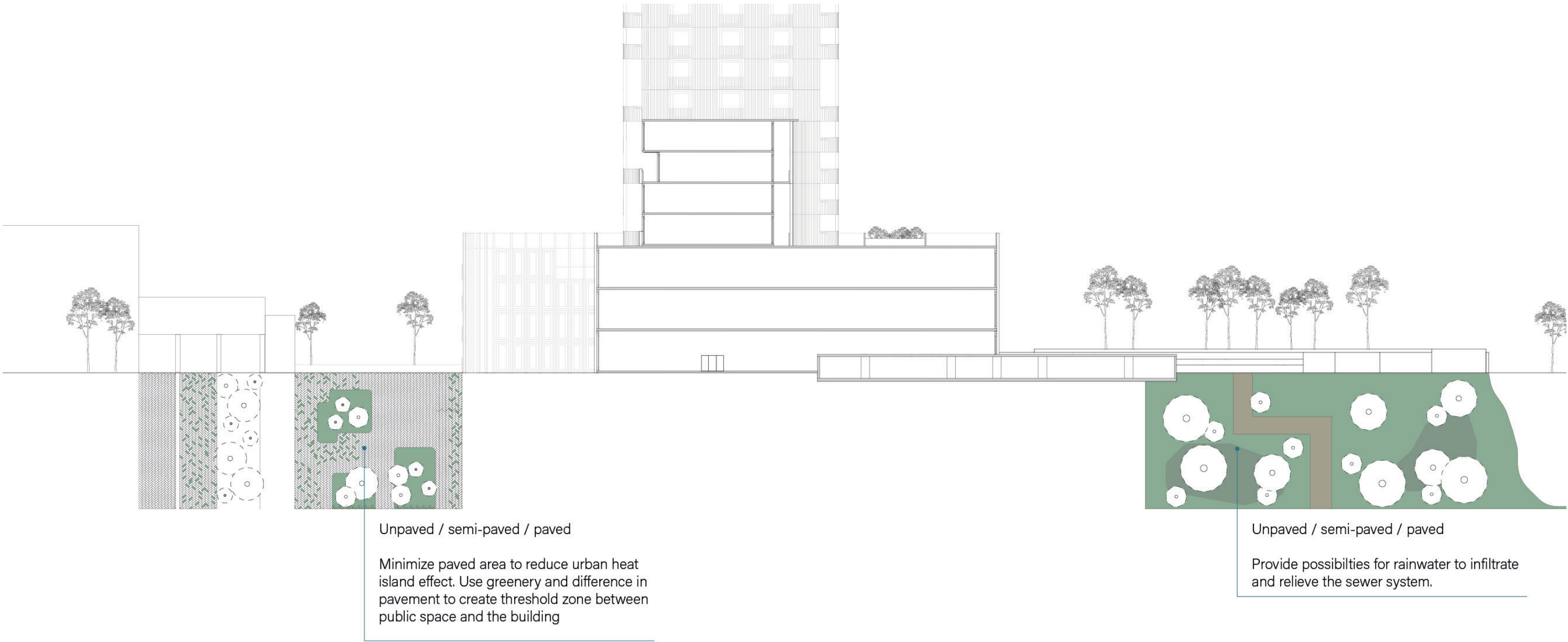
Water

Every dwelling has its own boiler to provide warm water for the kitchen and bathroom.

Ventilation

Type C ventilation is applied in the buildings, which means natural input and mechanical outtake. Ventilation grilles above the windows bring in natural fresh air, which are developed specifically for high-rise buildings up to 70 meters. Mechanical outlets can be found in the kitchens, toilets, and bathrooms.

Climate design: context level



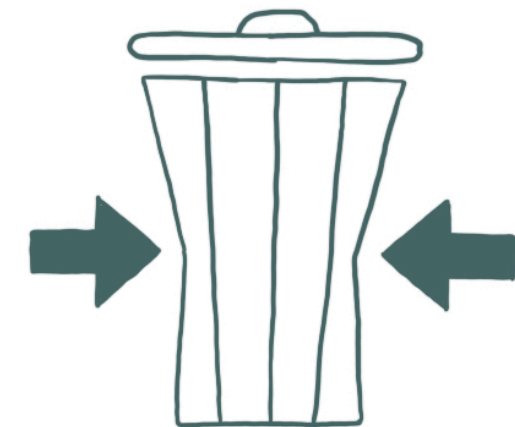
Sustainability principles



Durable materials to limit maintenance and the amount of materials.

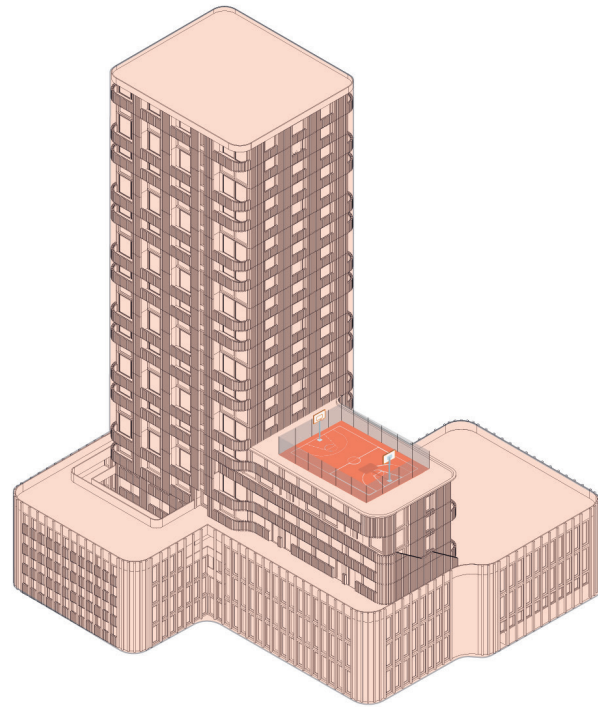


Increase awareness about sustainability



Prefab elements to reduce waste and time at the building site.

Roof use



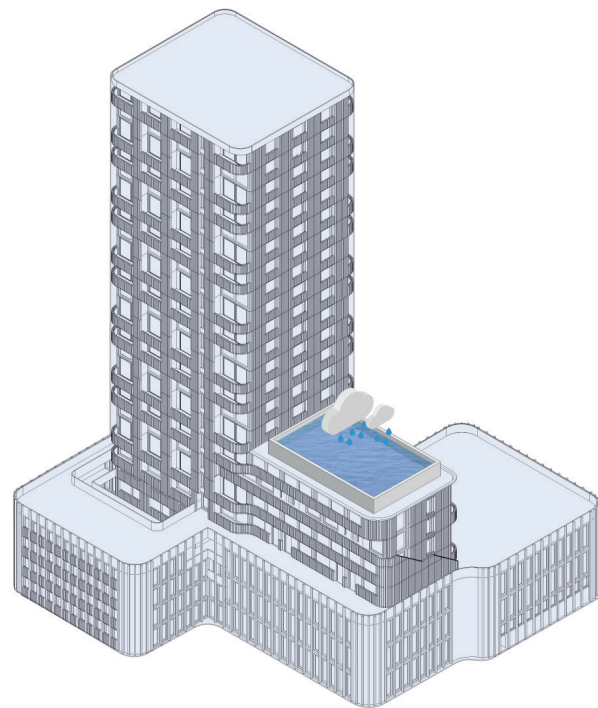
Red rooftop: Social functions



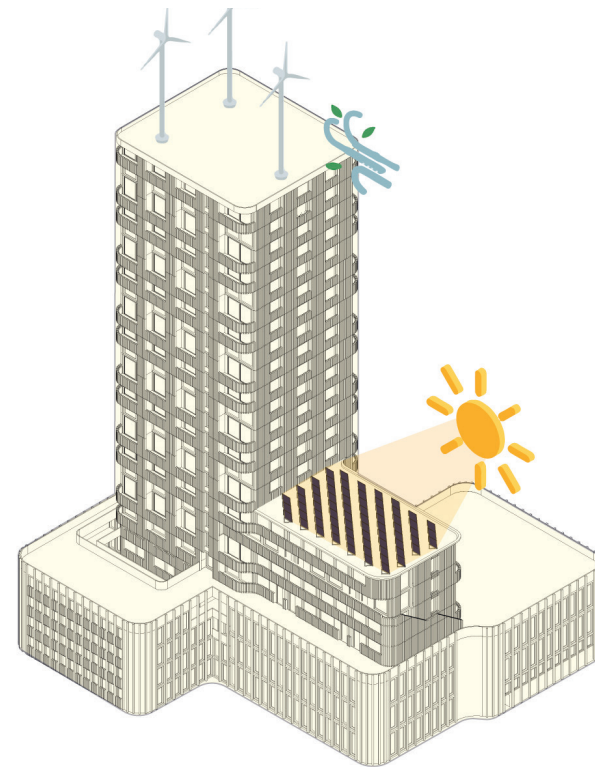
Green rooftop: Providing greenery



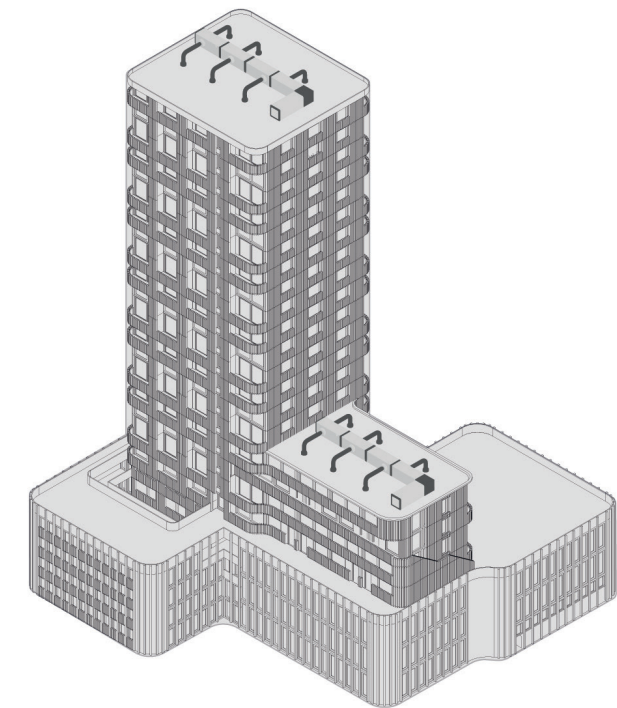
Orange rooftop: Providing space for mobility



Blue rooftop: Collecting rainwater



Yellow rooftop: Providing renewable energy

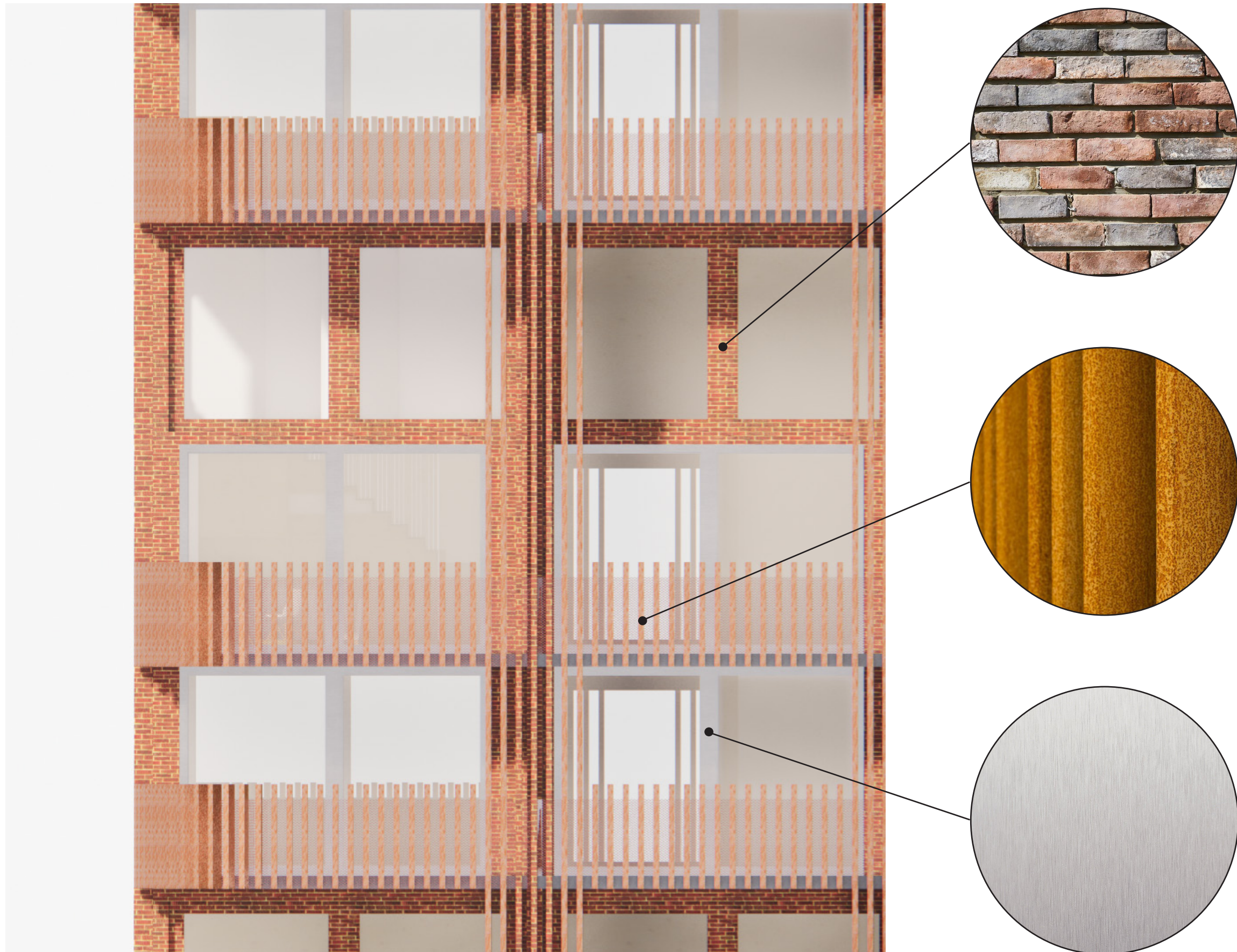


Grey rooftop: Installations and utility services

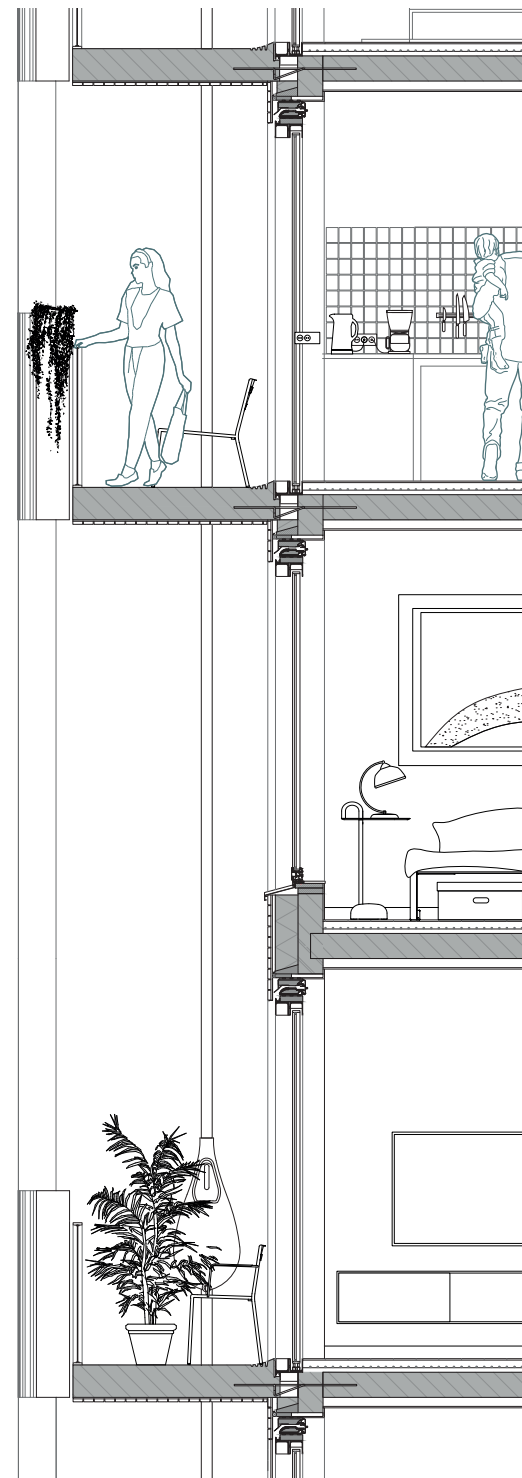
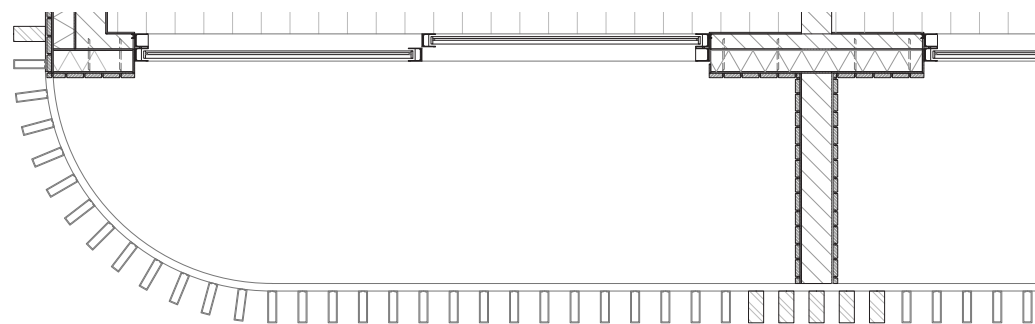
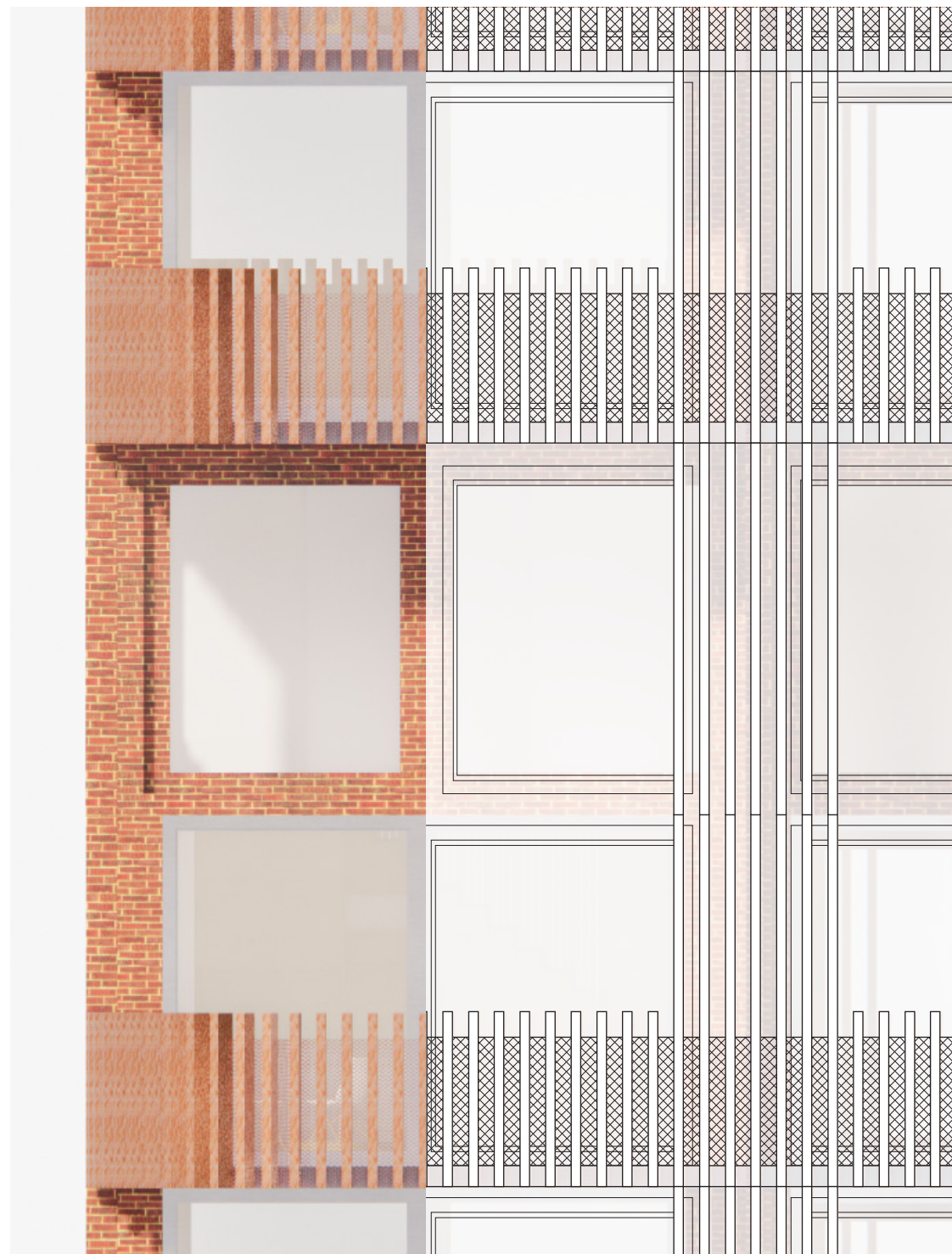
Dwelling fragment:

1:50 section, elevation and floorplan of a dwelling
fragment

Materialisation

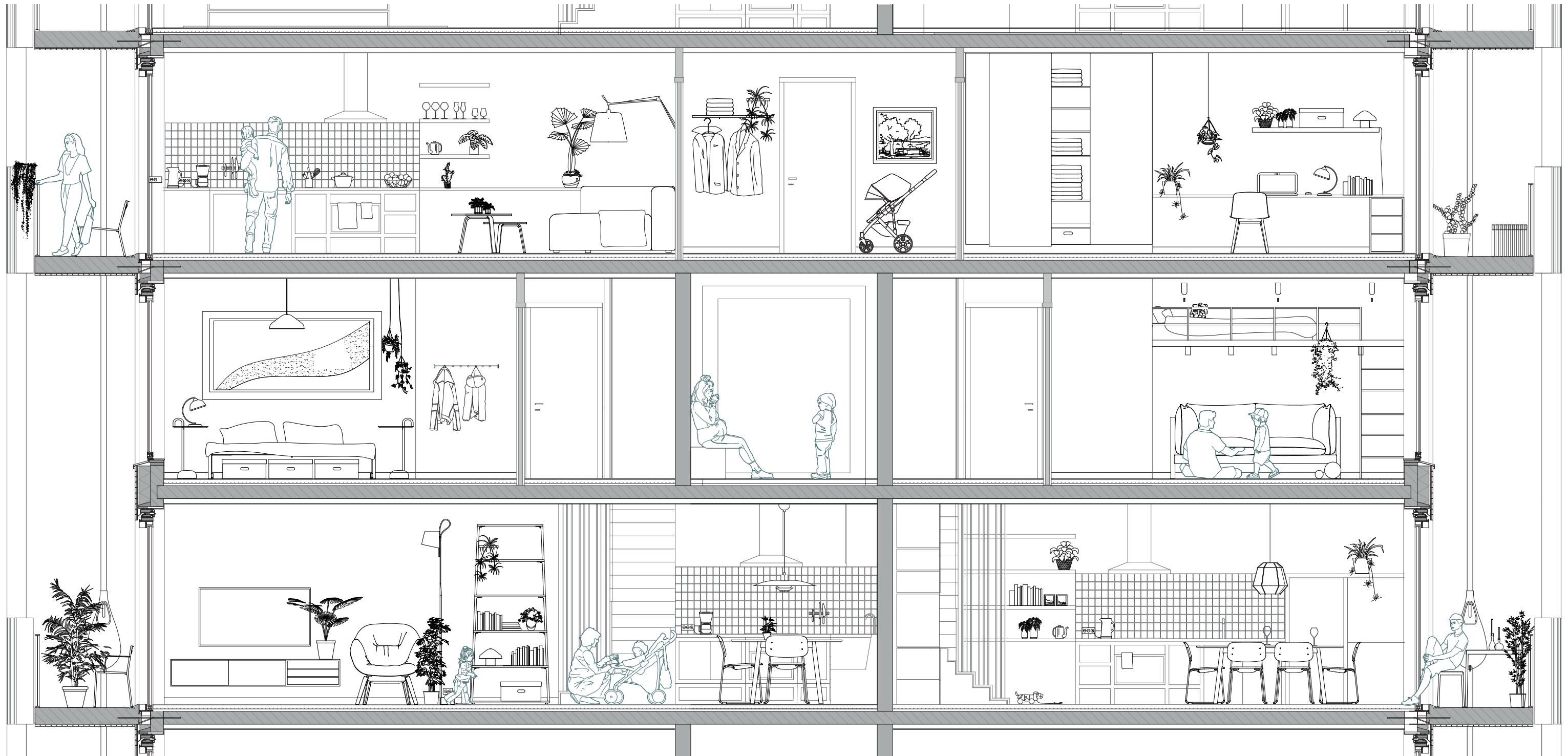


Dwelling fragment 1:50



0 0.5 1 2m

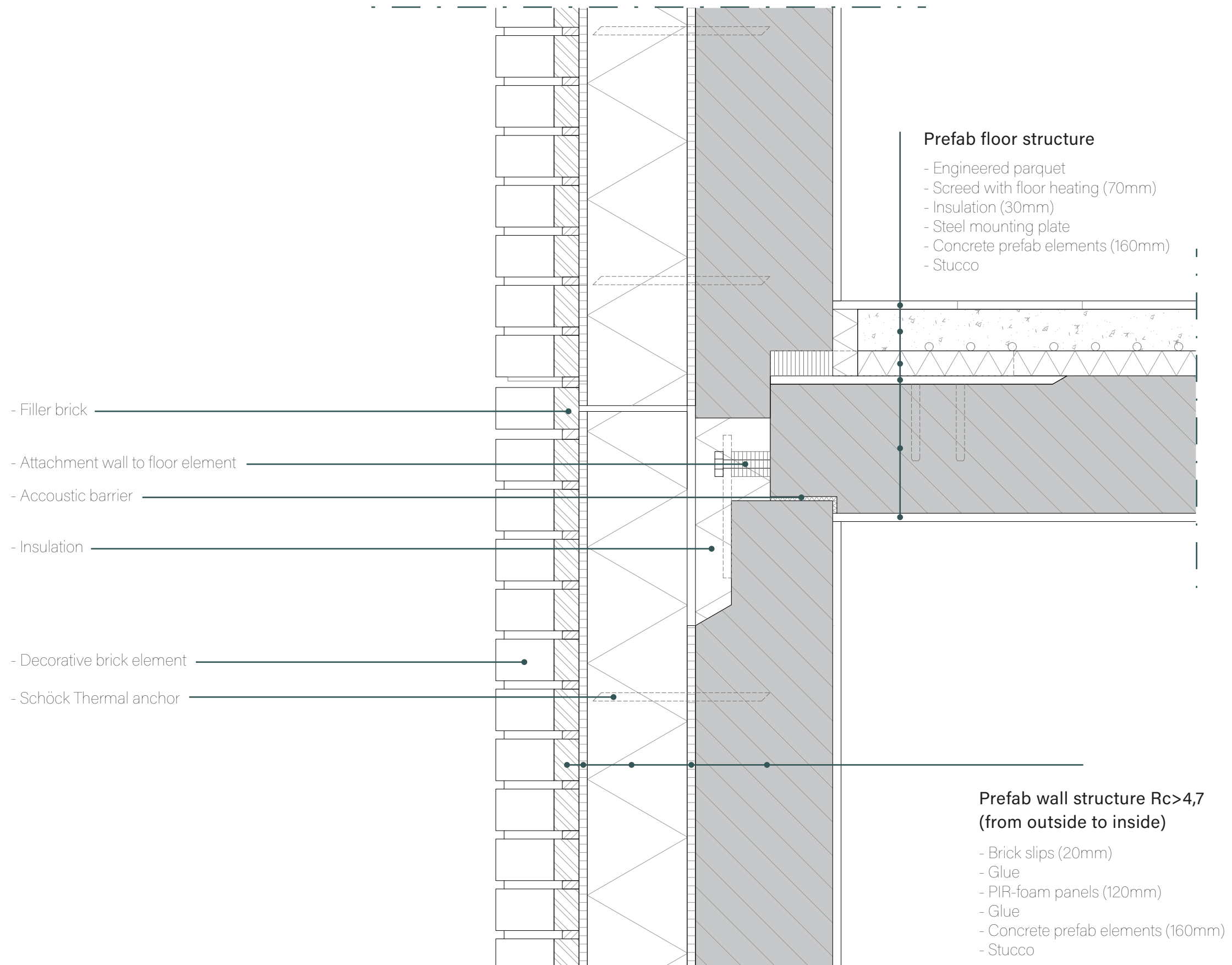
Dwelling fragment 1:50



0 0.5 1 2m

Details:
1:5 detailing

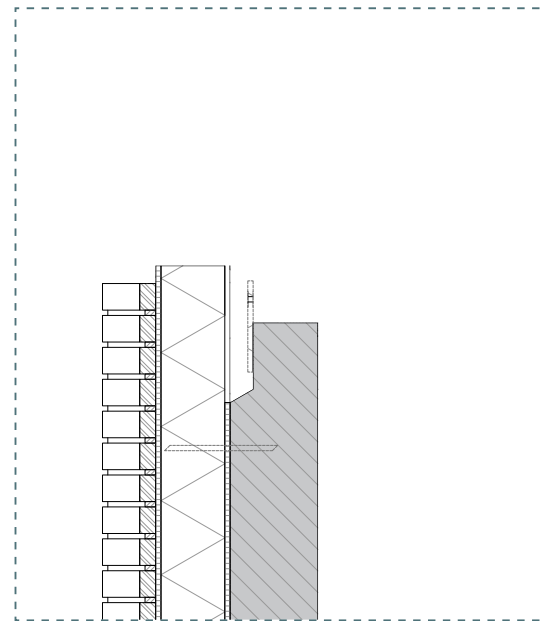
Detail 1



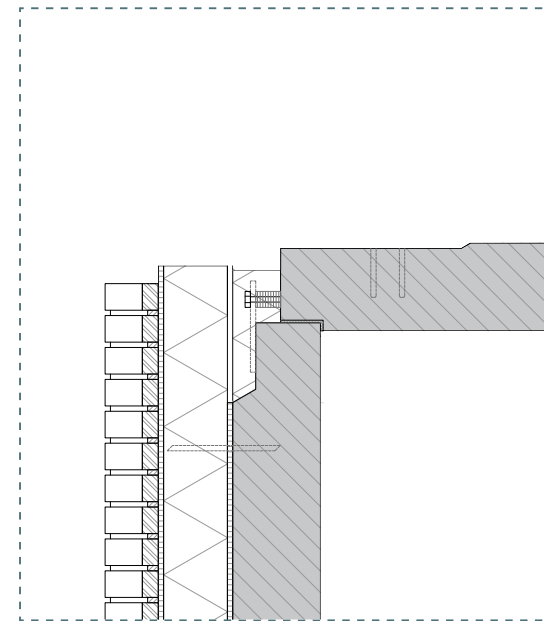
Prefab load-bearing facade

0 5 10 20cm

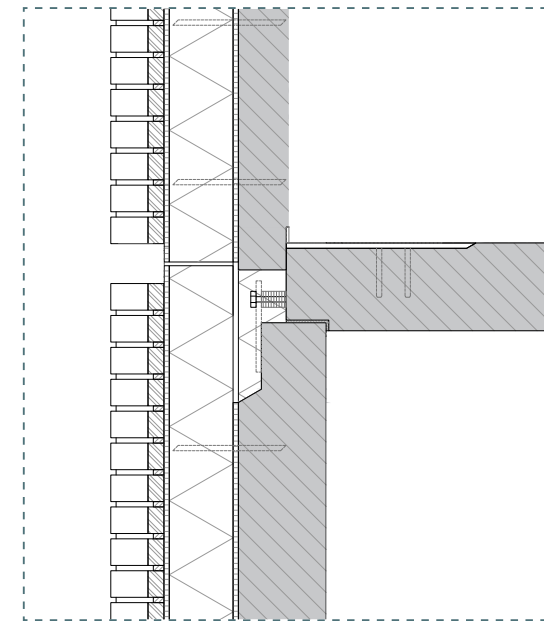
Assembly sequence



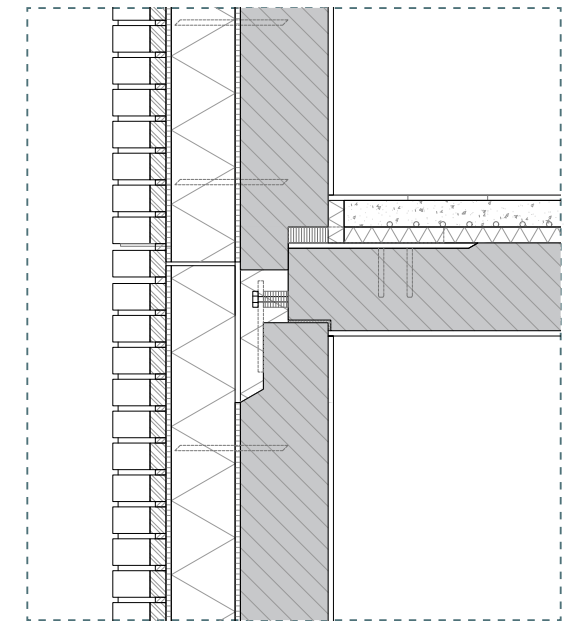
1. The prefab elements from the load bearing façade consist of a concrete structural element, insulation and brick cladding. First the prefab load bearing wall element is placed.



2. Then the next wall element can be placed and connected to the floor.



3. Then the floor is placed on top and secured to the wall below.



4. Lastly, the floor heating and floor finish can be placed. One brick is placed between the two prefab elements on the outside of the building to conceal the gap.

Detail 2

- $U_c < 1,65 \text{ W/m}^2\text{K}$
- Aluminium window frame

Prefab wall structure $R_c > 4,7$
(from outside to inside)

- Brick slips (20mm)
- Glue
- PIR-foam panels (150mm)
- Glue
- Concrete prefab elements (75mm)
- Stucco

Prefab floor structure

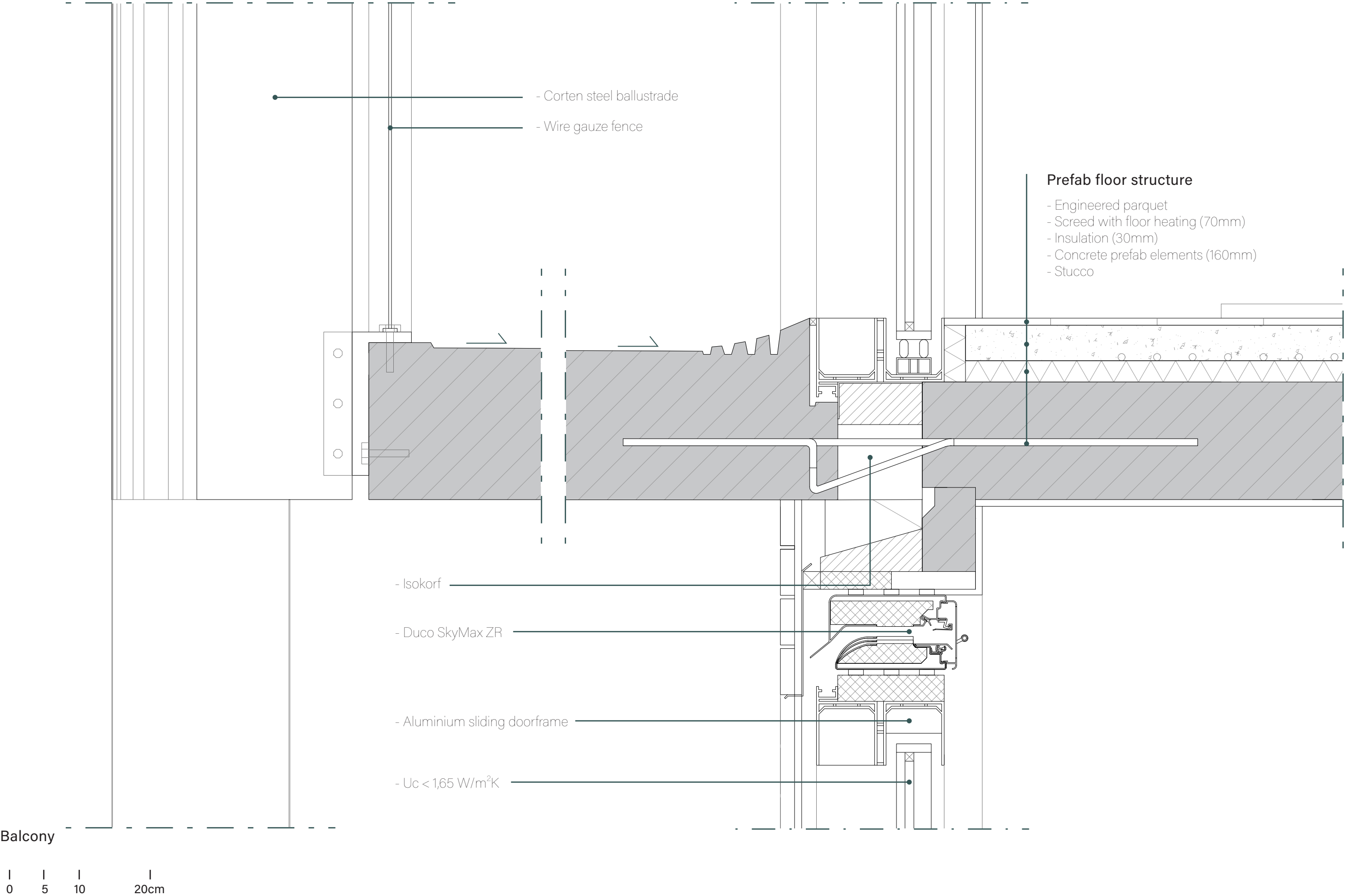
- Engineered parquet
- Screed with floor heating (70mm)
- Insulation (30mm)
- Concrete prefab elements (160mm)
- Stucco

- Duco SkyMax ZR
- Aluminium sliding doorframe
- $U_c < 1,65 \text{ W/m}^2\text{K}$

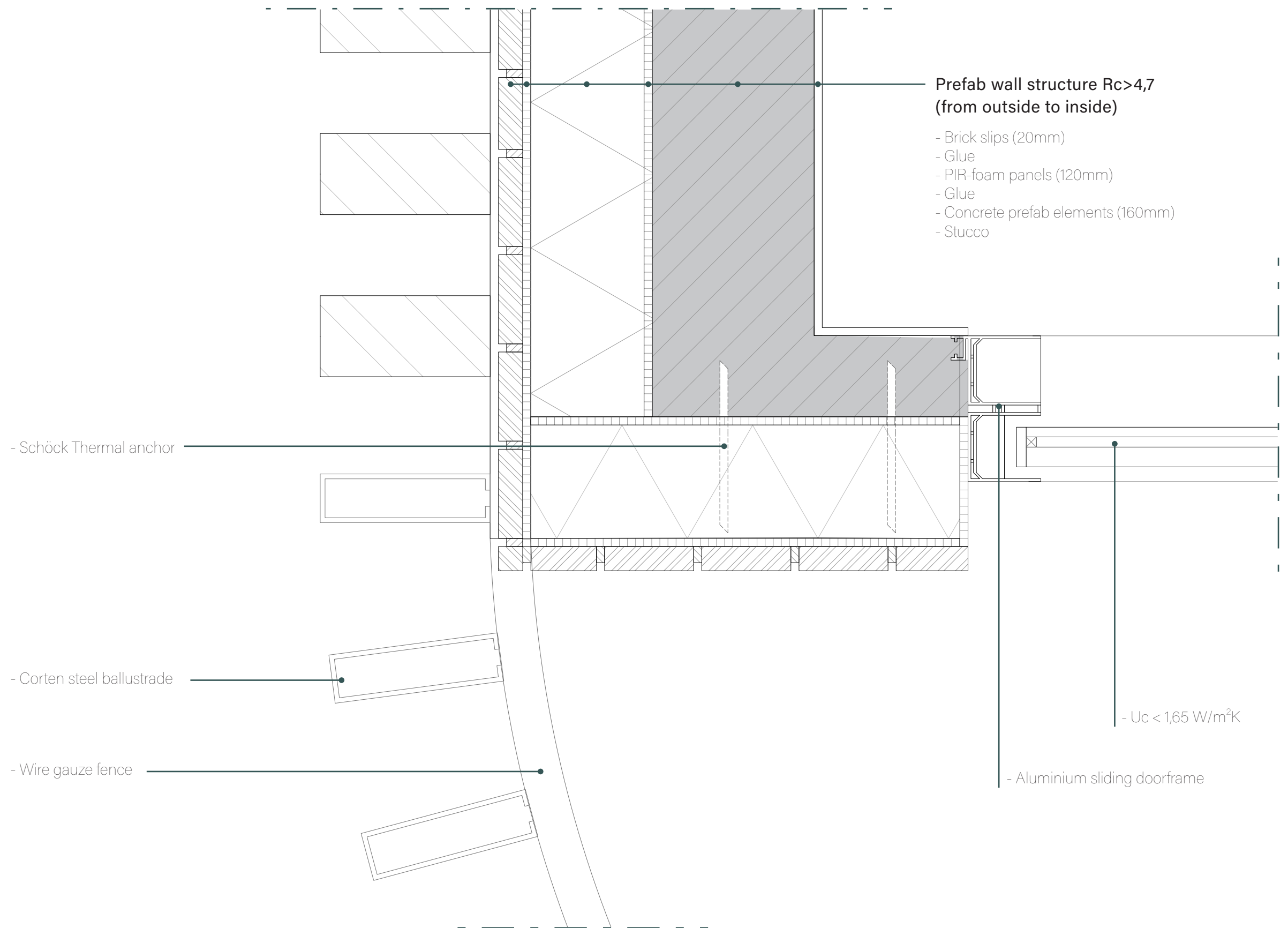
Window and sliding door frame



Detail 3



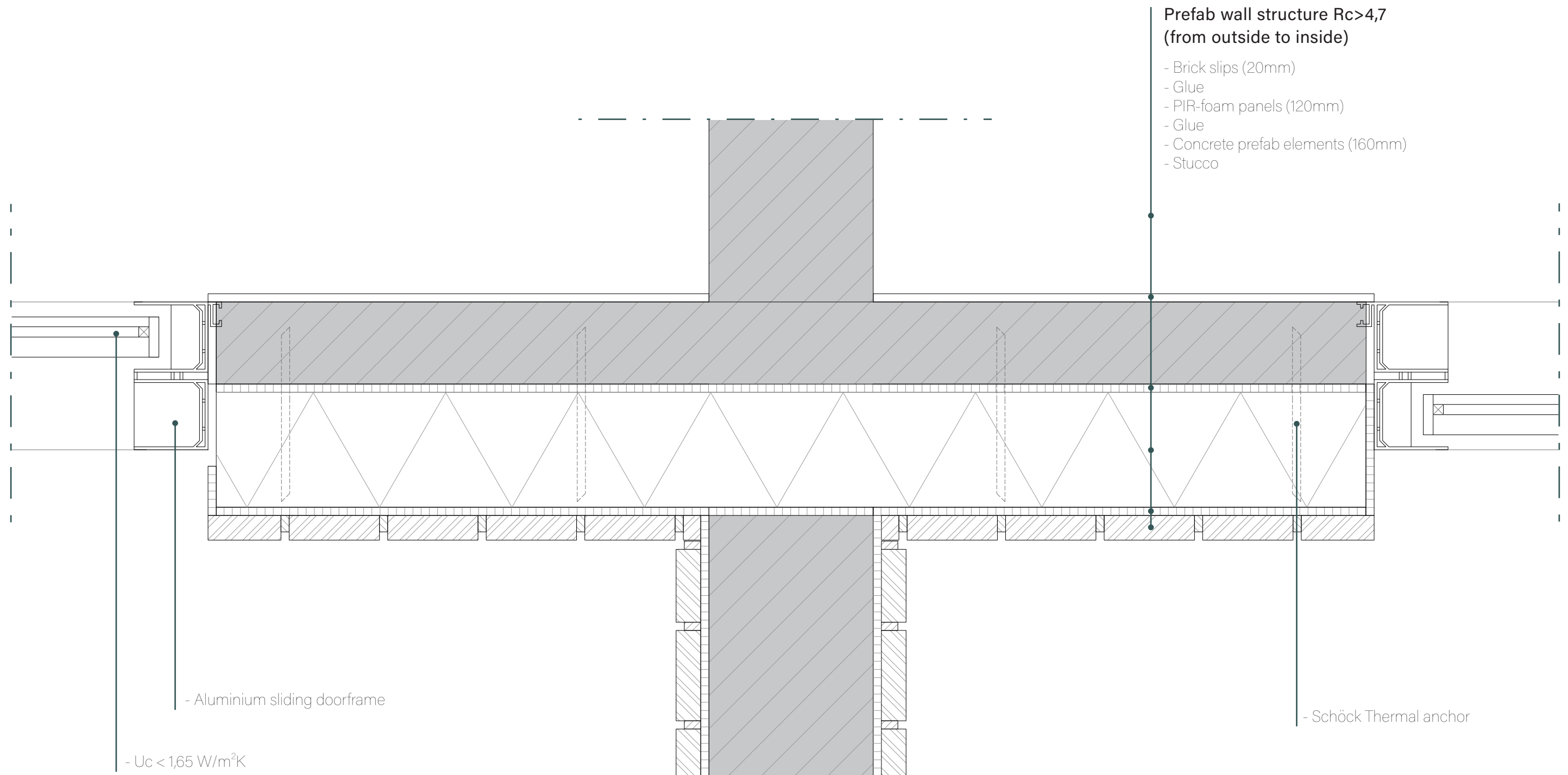
Detail 4



Exterior facade

0 5 10 20cm

Detail 5



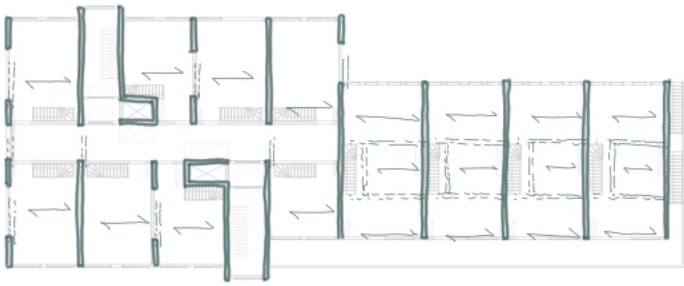
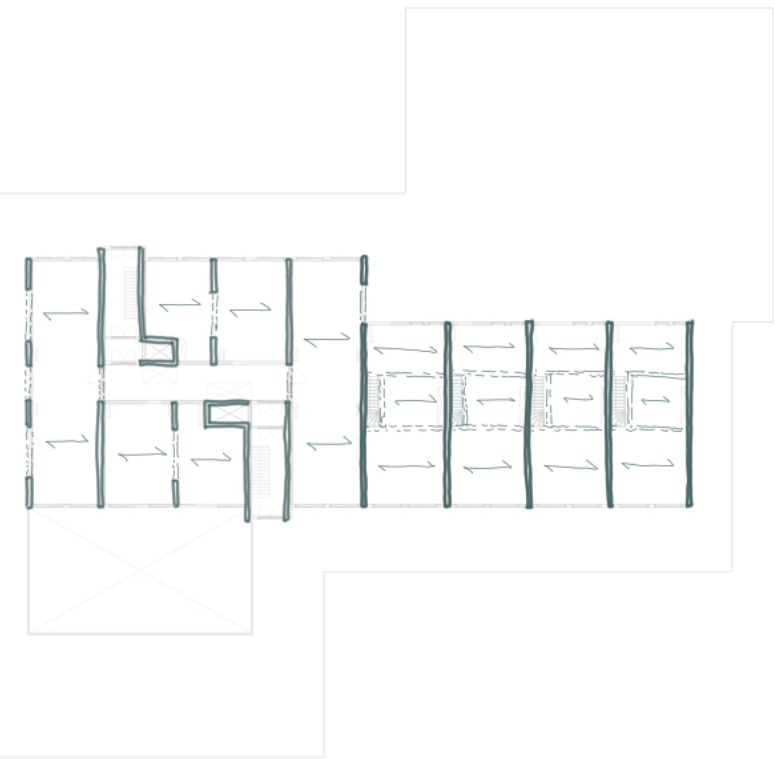
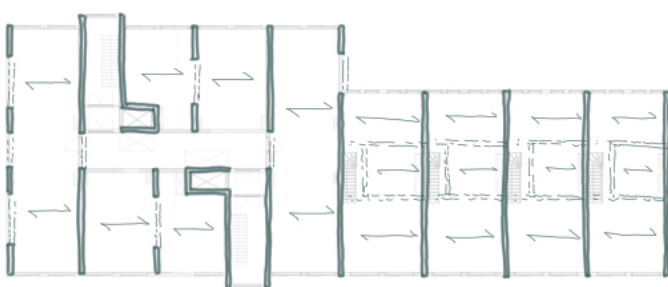
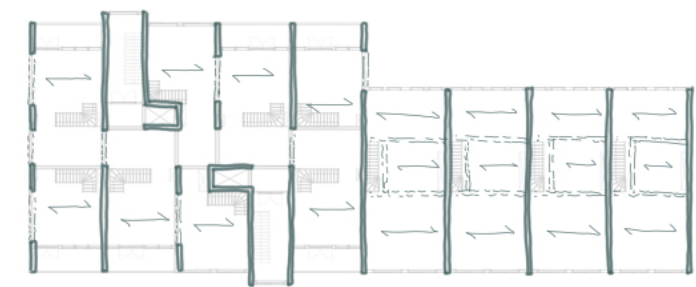
Exterior facade

0 5 10 20cm

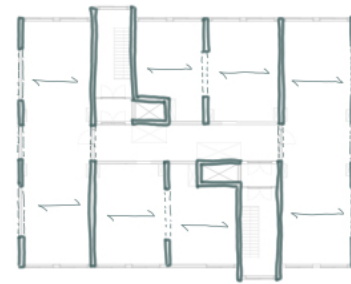
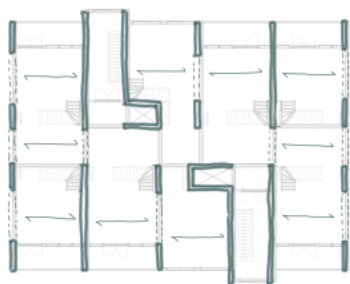
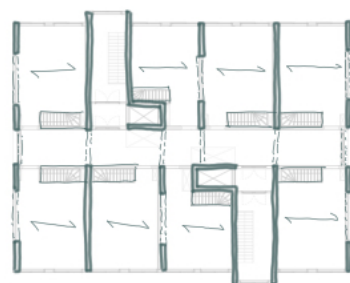
Load-bearing structure



Load-bearing structure



Load-bearing structure



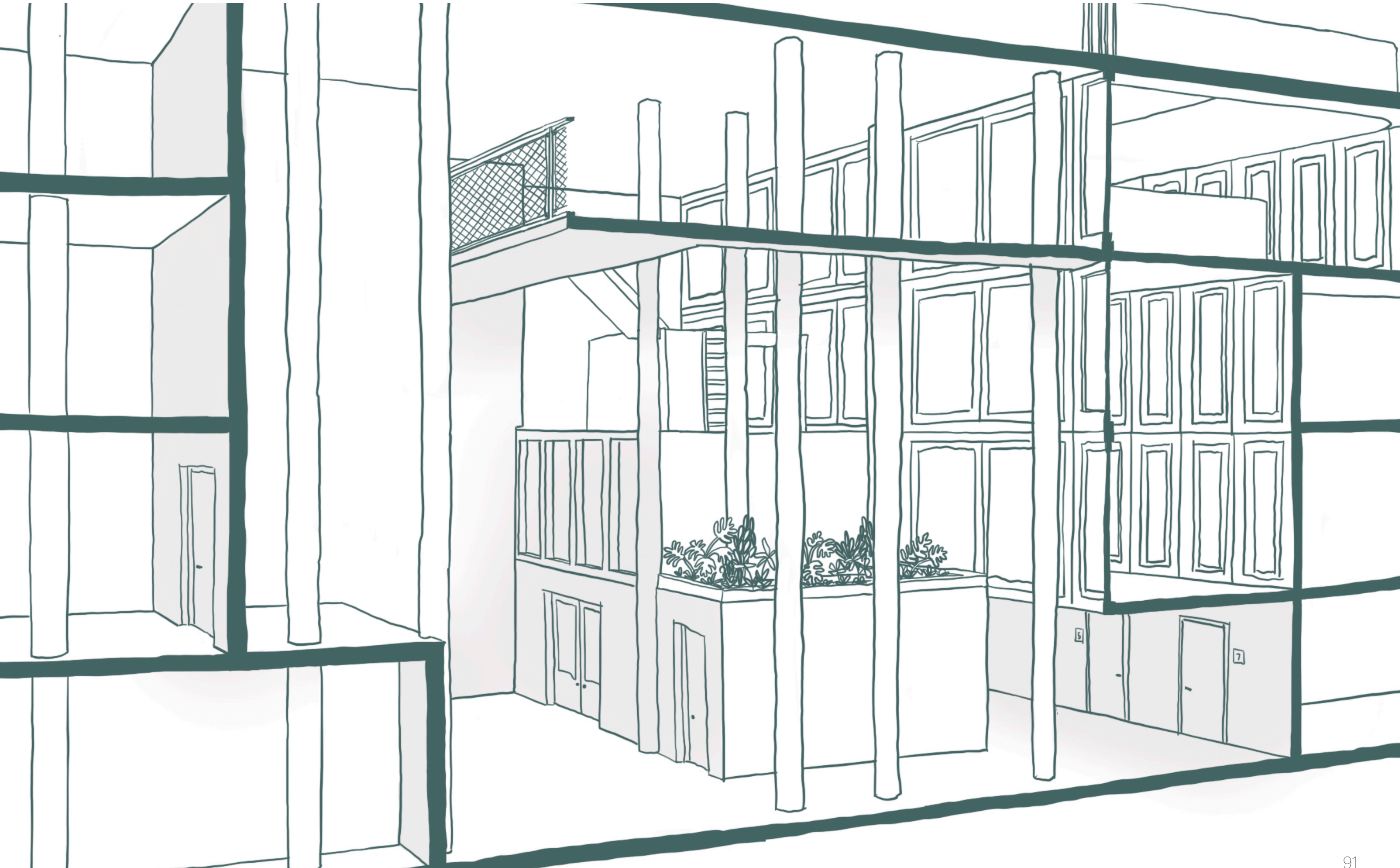
Other:

Extra drawings to further elaborate on the project

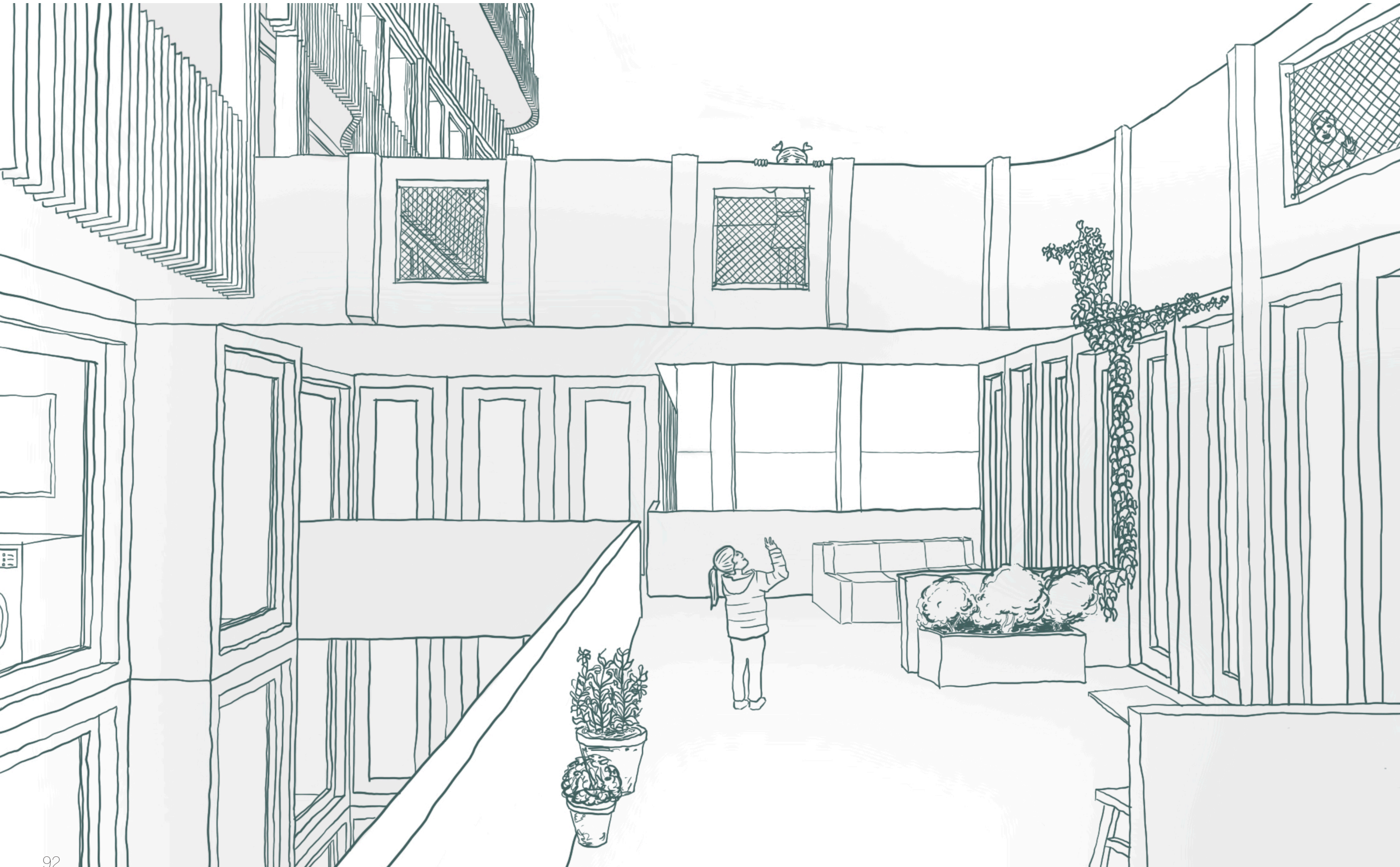
Entrance Hall



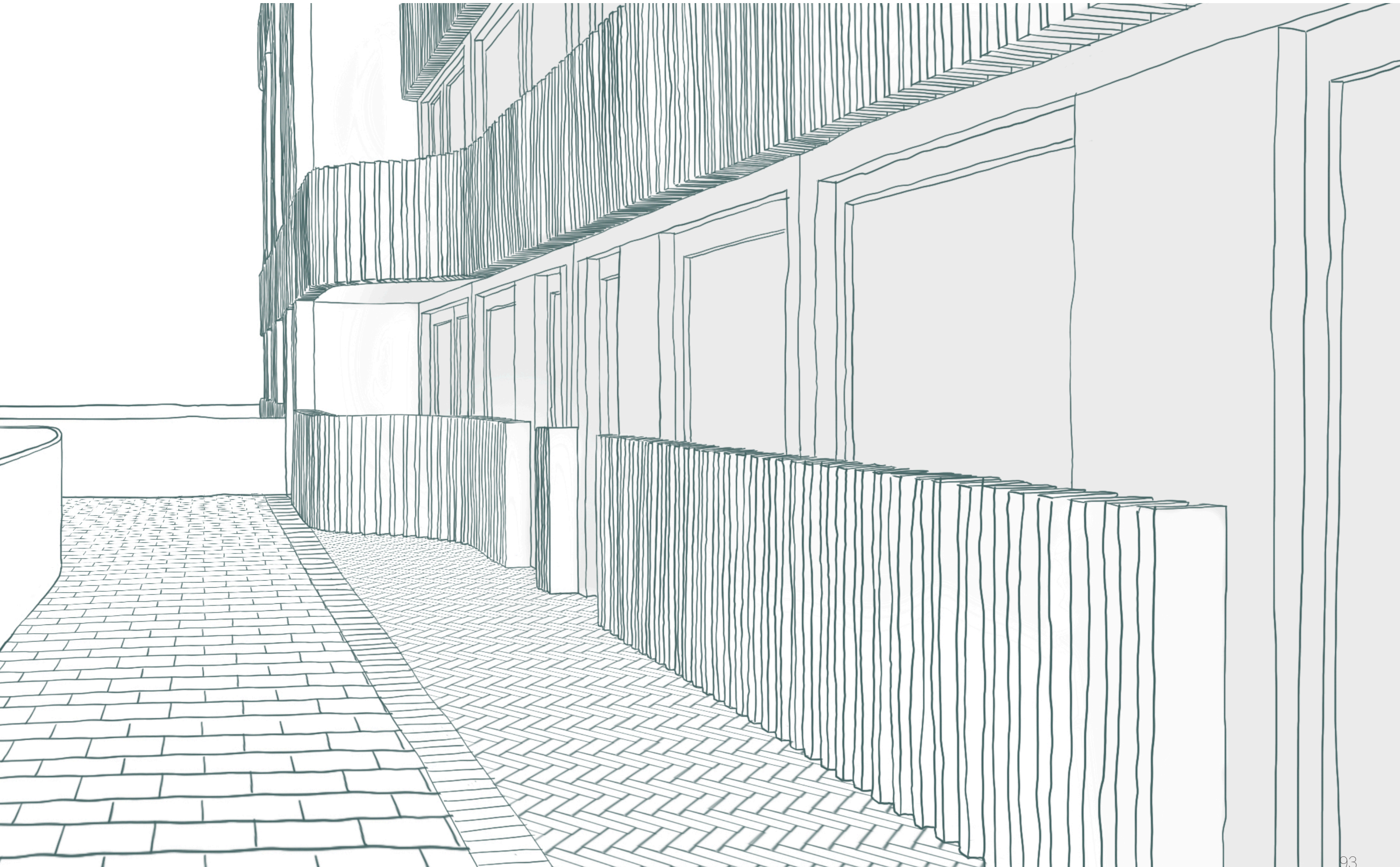
Service area



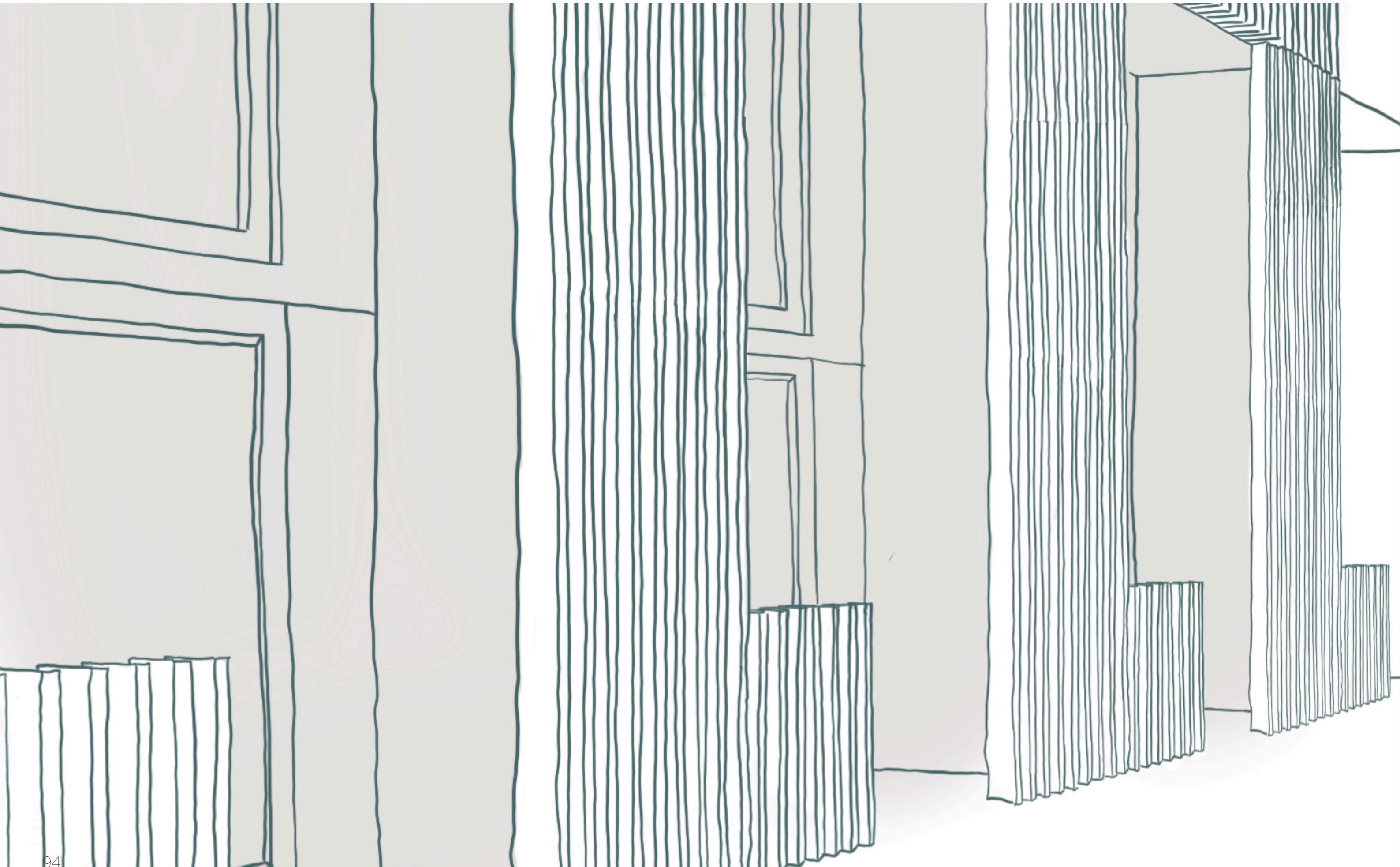
Multi-layered collective deck



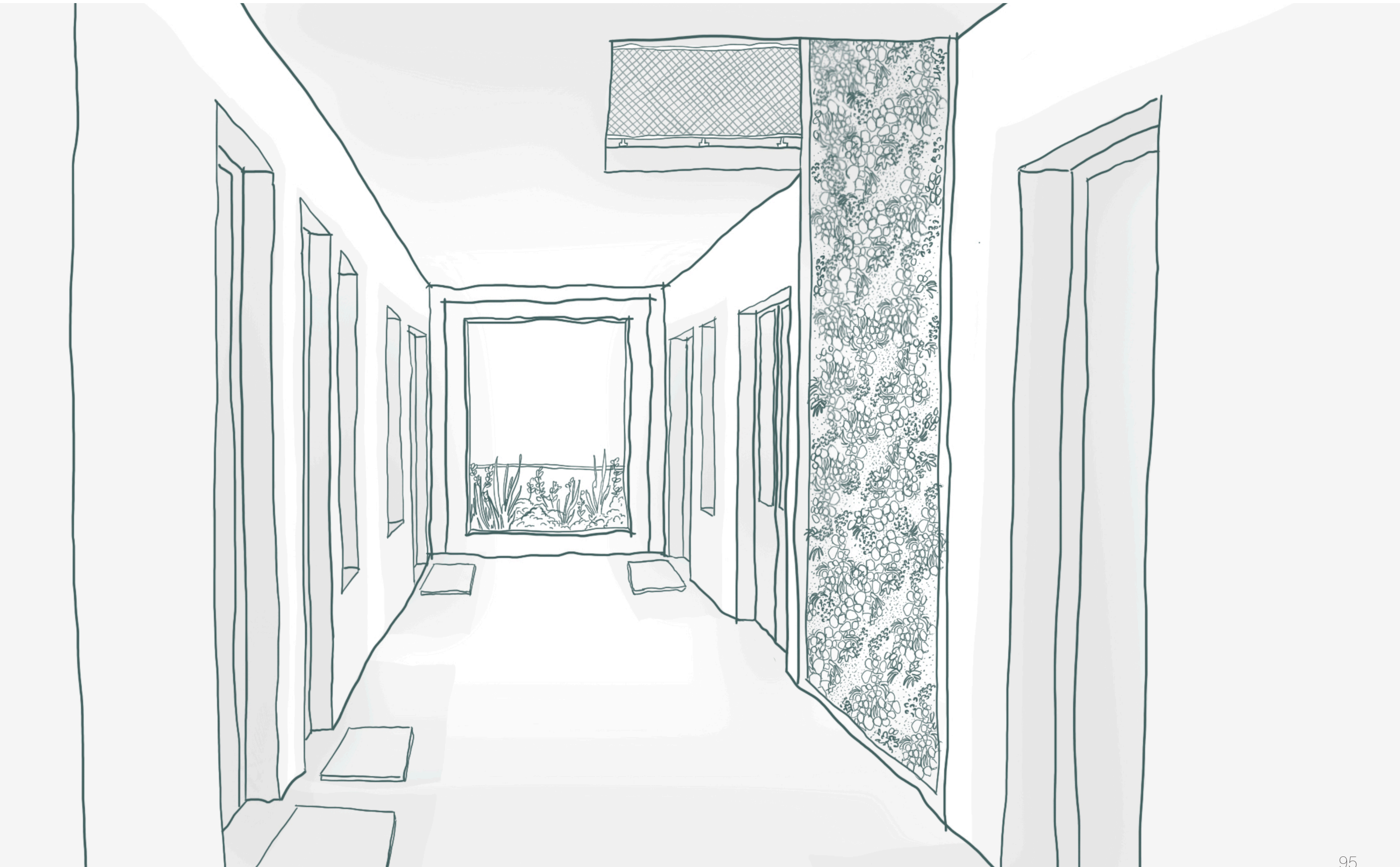
Threshold zone 180 cm



Threshold zone 150cm



Circulation space



Dwelling type 3



Building



Interior playing area



Dwelling type 1



Dwelling type 1



Dwelling type 1



Dwelling type 1



Dwelling type 1



Dwelling type 2



Dwelling type 2



Dwelling type 3



Dwelling type 3



Circulation space



Multi-layered deck



Collective deck



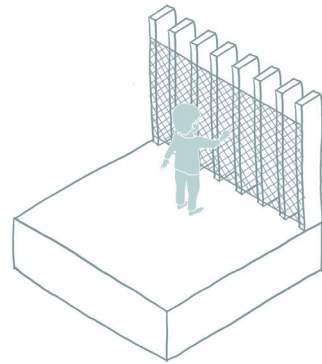
Vegetable garden



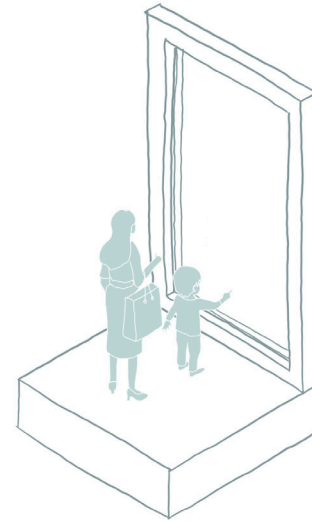
Design interventions



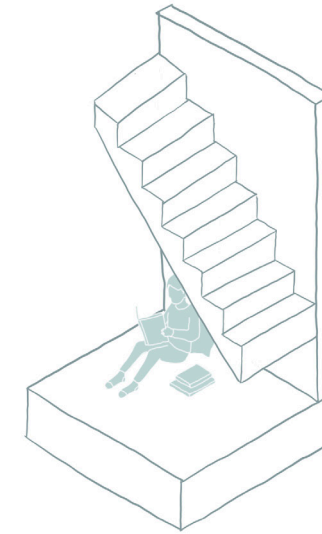
Design interventions



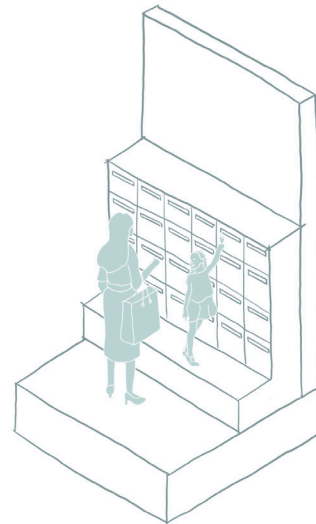
Transparent barriers



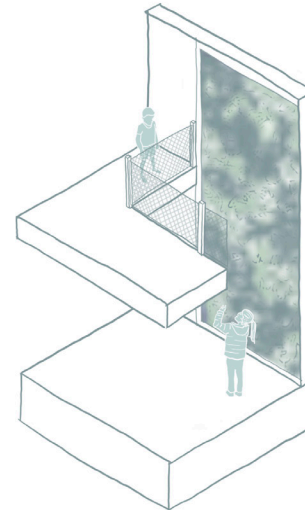
Low windows



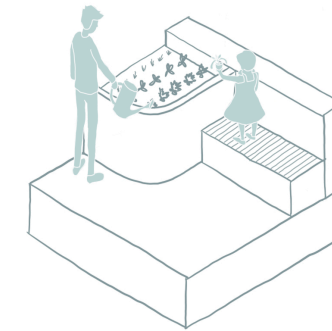
Spaces to withdraw



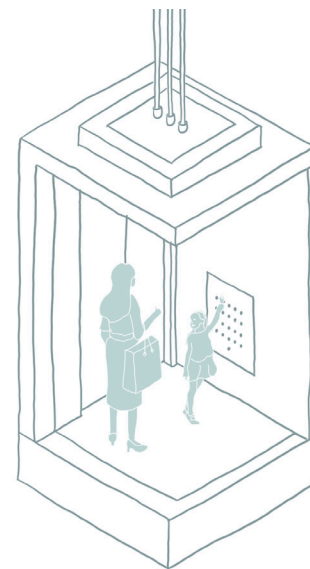
Step to reach mailboxes



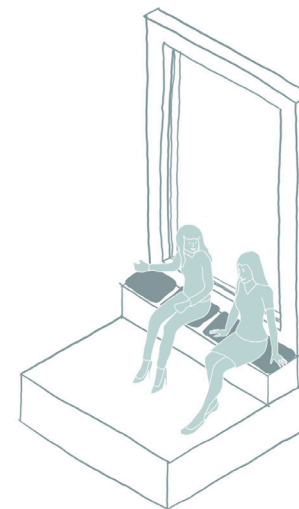
Visual connection between floors



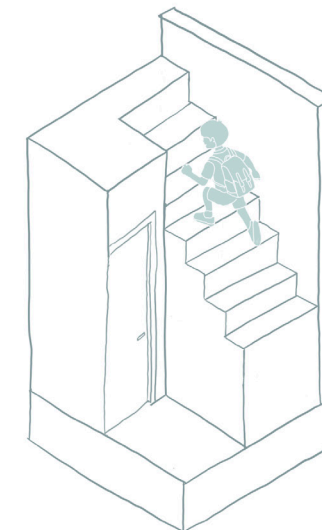
Possibilities for gardening



Low buttons in the elevator



Places to sit



Possibility to explore