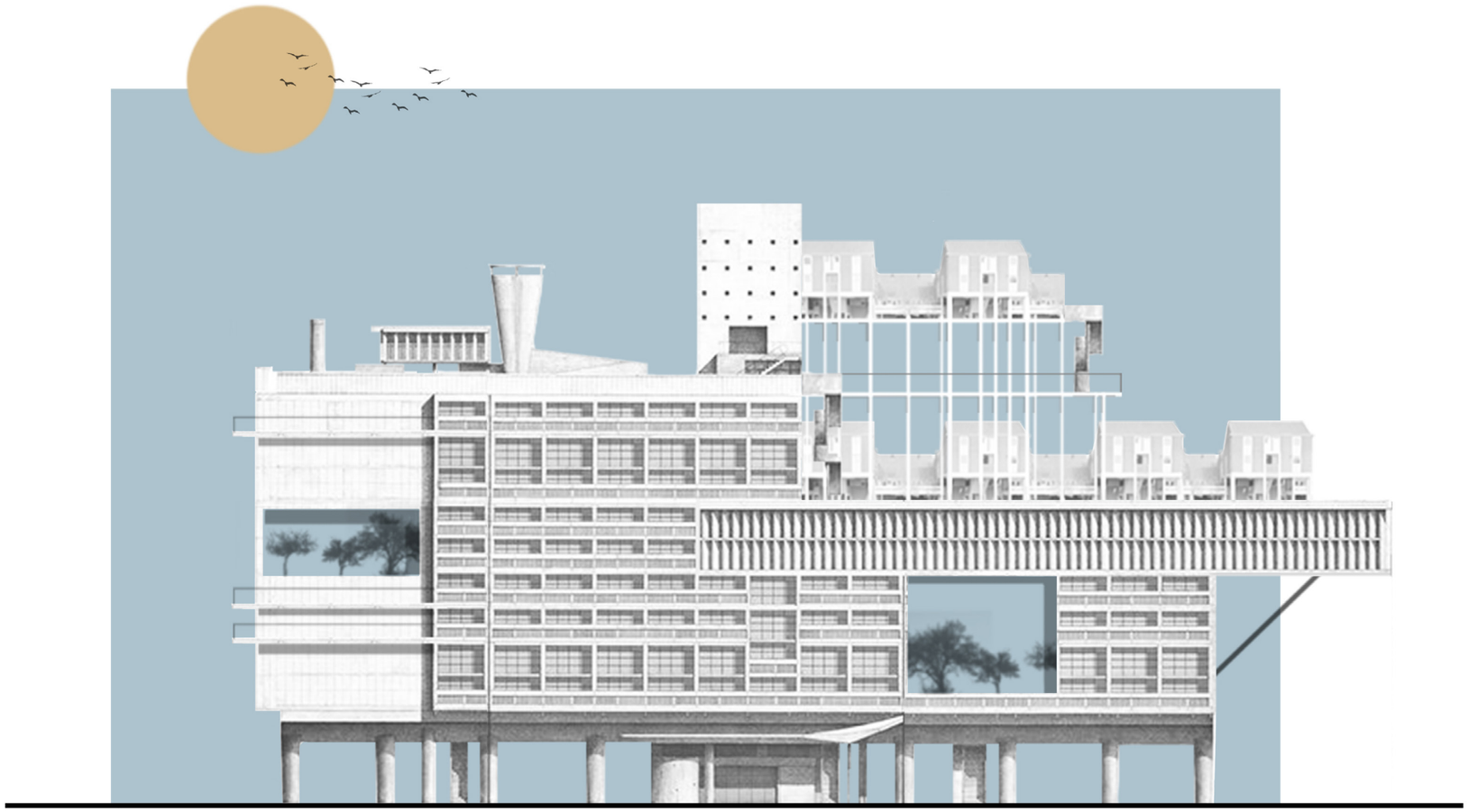
Revisiting the Emmahuis
P5 Presentation



Christoforos- Christos Roungeris 5367751
TU Delft. Faculty of Architecture and Built Environment
AR3AD100 Advanced Housing Design (2021/22)
17 June 2022

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- Introduction
- Research question
- Research conclusions
- Design process
- Design conclusions

**All graphical work in this presentation is created by the author, unless stated otherwise*


THERE MUST BE A WAY TO SOLVE ROTTERDAM'S HOUSING CRISIS!


Now that the neighborhood is nice, why do I have to move?

“Nice room to rent in Amsterdam”
Price: 700 p.m.

Image source: https://www.pararius.com/room-for-rent/amsterdam/76098156/midscheeps

CO OPERATIVE HOUSING

Kalkbreite housing complex
Müller Sigrist Architekten

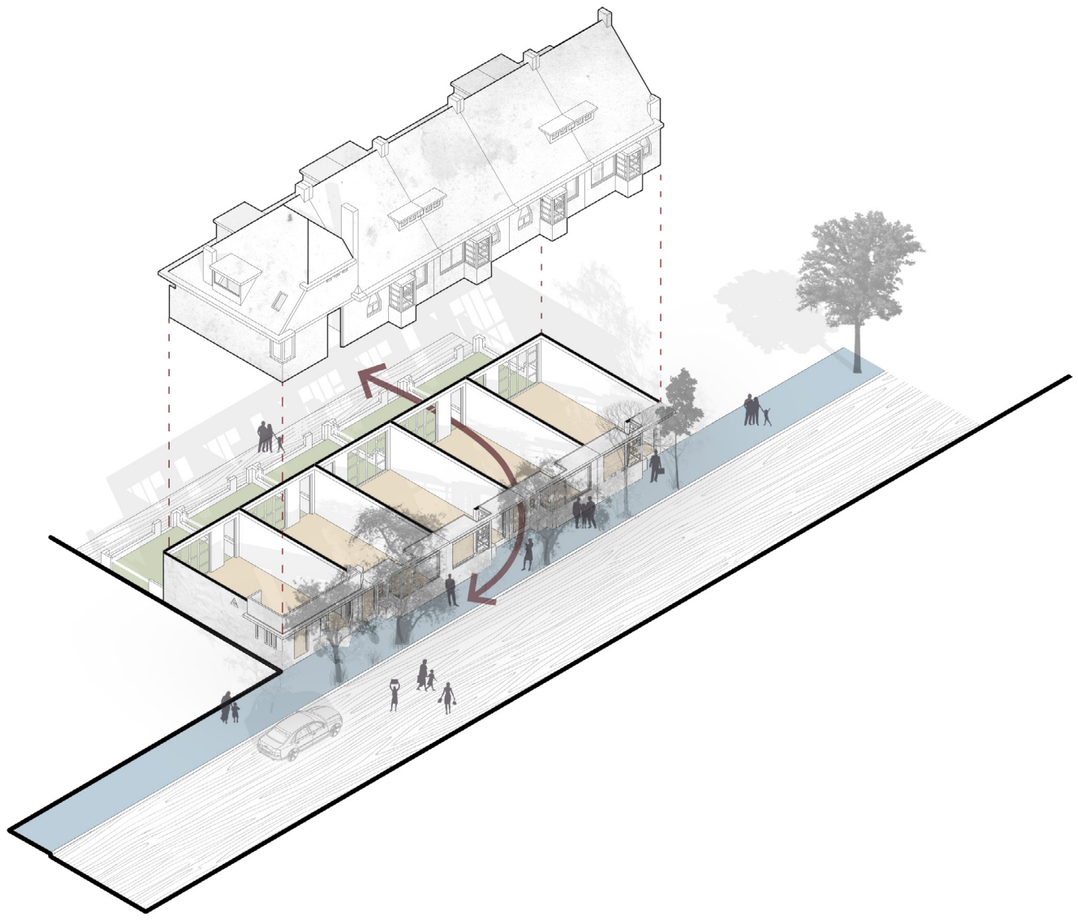
RESEARCH QUESTION

How do we design affordable, high quality co-operative housing units in an ever densifying urban Rotterdam?

SUB QUESTIONS

- *How can we translate the Dutch row house typology into a dense high-rise context?*
- *What should the minimum "architectural standard" for a functional private space be? How does this abstract standard compare to the European legislation on minimal room requirements?*
- *How do we design social cohesion between students and elderly? How does the in-between space affect quality of life within a collective living model?*

CASE STUDIES



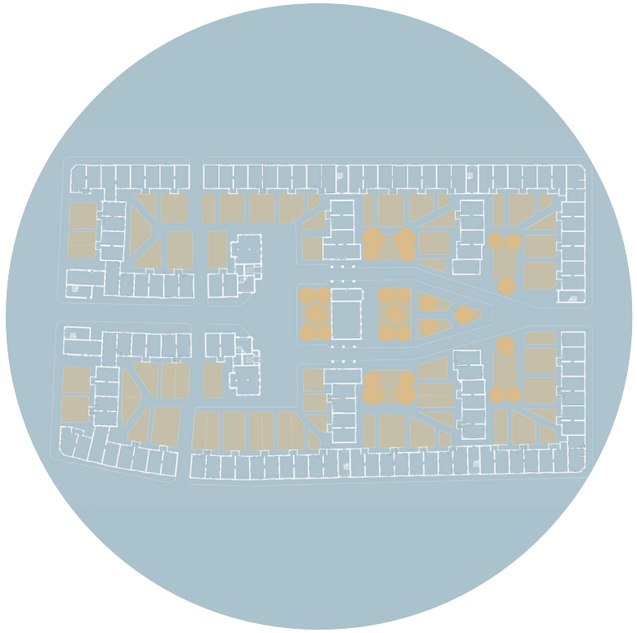
Transition from “public” to “private” to “garden”

Abtswoude Bloeit!
https://abtswoudebloeit.nl

Spangen social housing
http://hiddenarchitecture.net/spangen-quarter-housing/

Kasbah
https://germanpostwarmodern.tumblr.com

Unite d’ habitation
https://hansaviertel.berlin



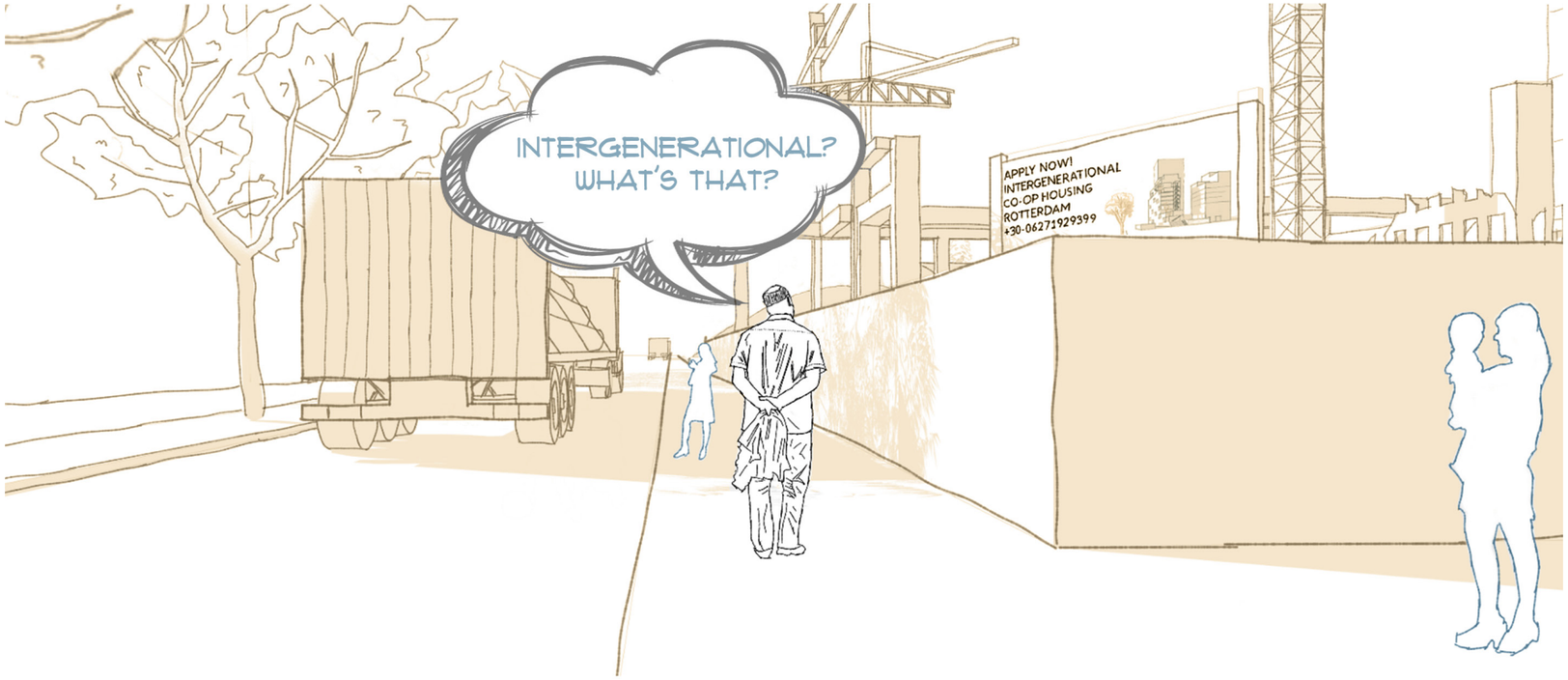
Spangen social housing

Kasbah

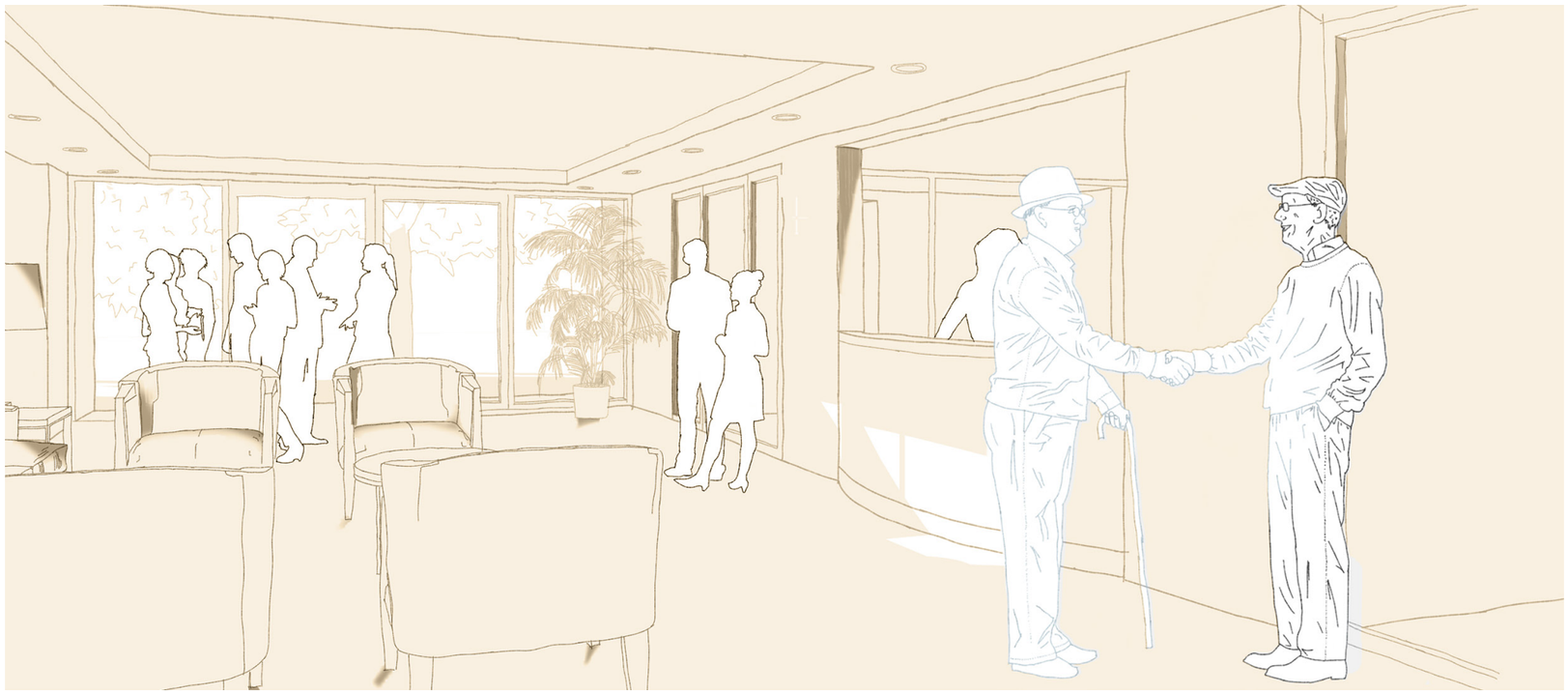
Unite d' habitation

Unite d' habitation

STUDENTS


INTERGENERATIONAL?
WHAT'S THAT?
APPLY NOW!
INTERGENERATIONAL
CO-OP HOUSING
ROTTERDAM
+30-06271929399

ELDERS



ABTSWOUDE BLOEIT


bloeit!

RESEARCH CONCLUSIONS

PROBLEM STATEMENT

Gentrification

Lack of quality housing

Dissolution of the social fabric
Increase of social inequality
Community conflict

Loneliness
Lack of nature inclusive design
Social anxiety + stratification

SOLUTION

Densification

Governmental regulation

Elderly care

DESIGN PRINCIPLES

Housing tower — *Multitude of housing typologies*

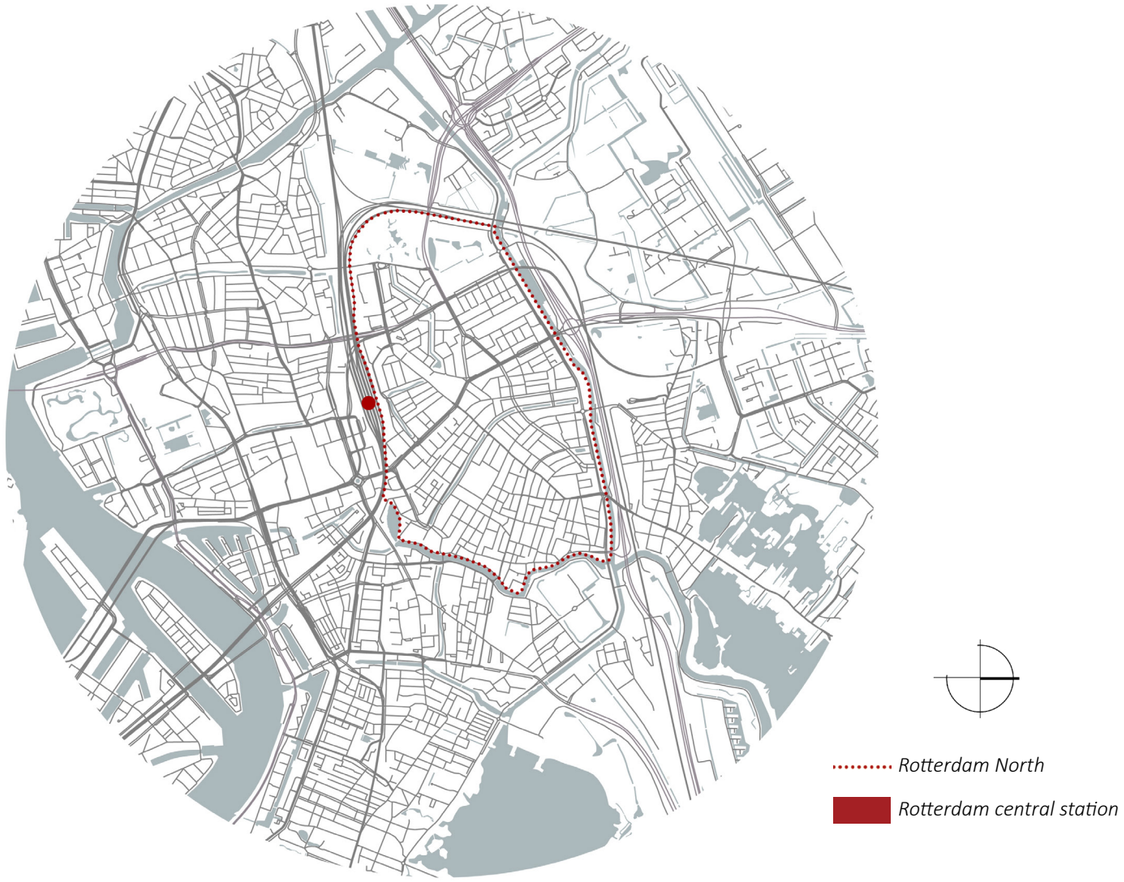
Co operative housing — *Communal areas*
Social interaction

Intergenerational housing — *Students + Elderly co-living*
Daily intergenerational contact

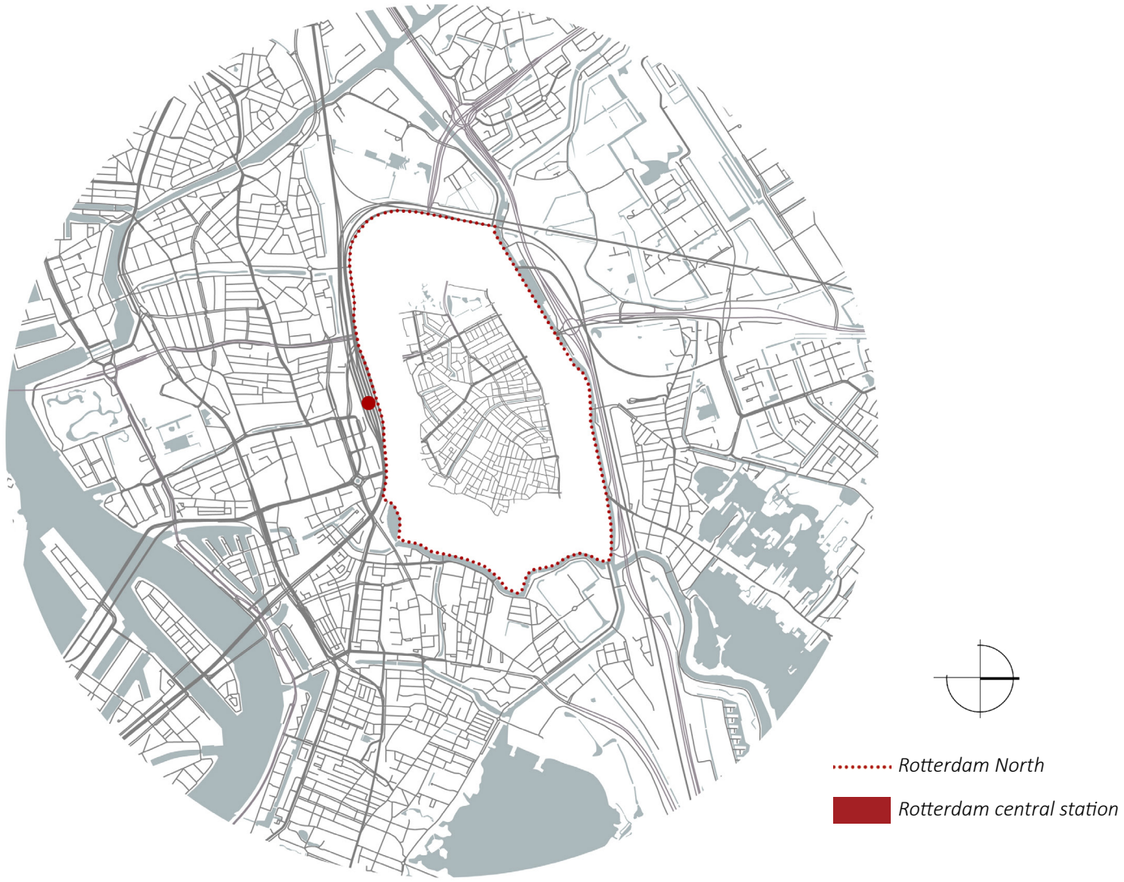
DESIGN OUTCOMES

DESIGN PROCESS

AREA LOCATION



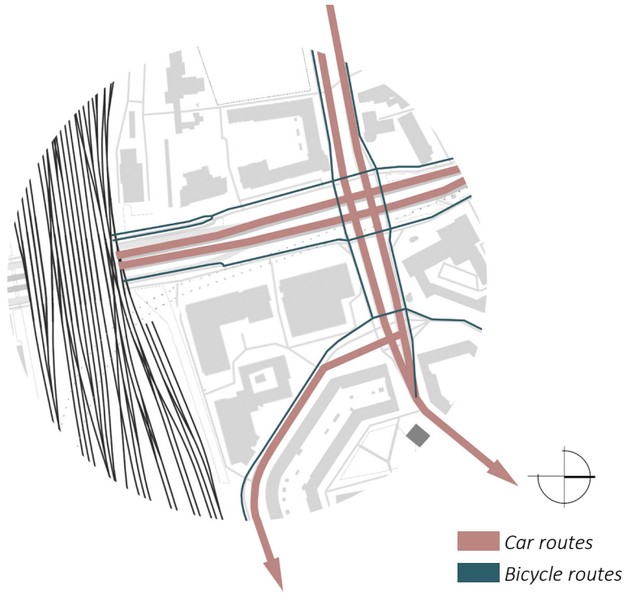
AREA LOCATION



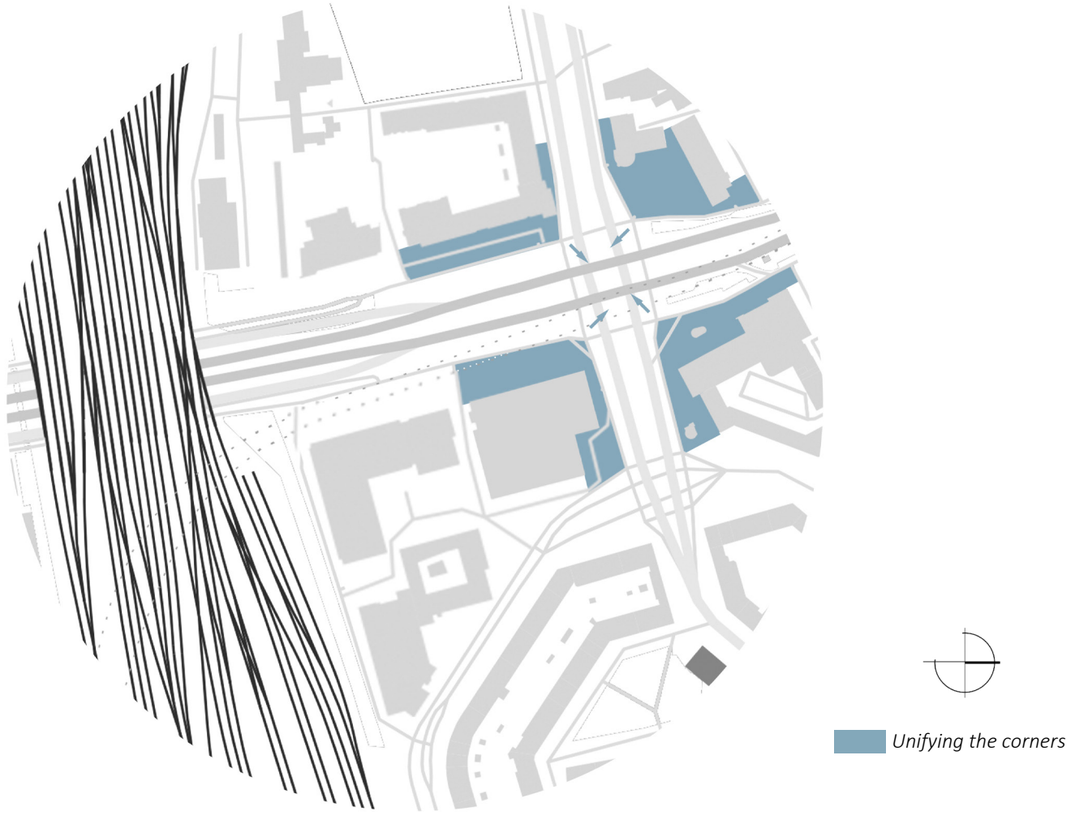
SITE LOCATION

SITE LOCATION

URBAN ANALYSIS KEY TAKEAWAYS



URBAN ANALYSIS KEY TAKEAWAYS



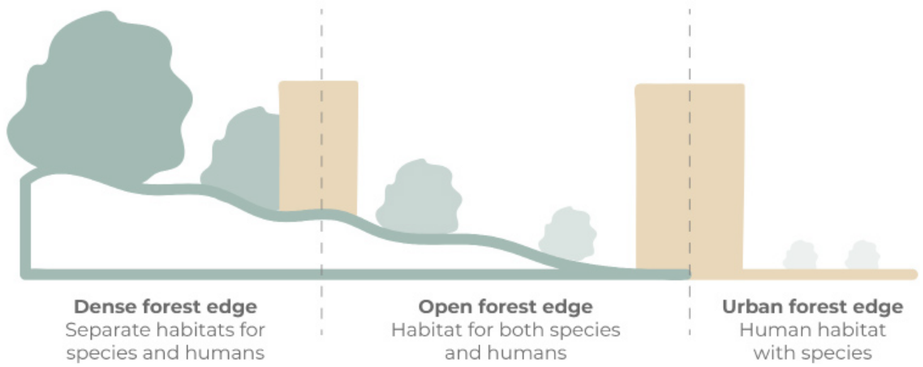
Unifying the corners

URBAN PLANNING

Species and humans

Blijdorp center

Campus area



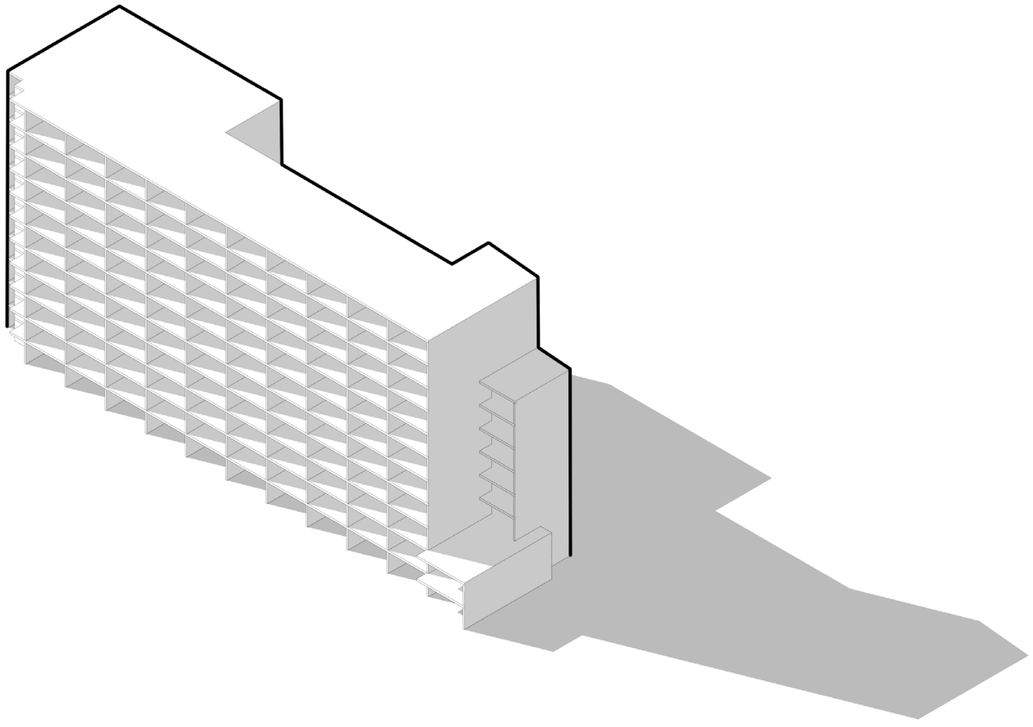
Masterplan

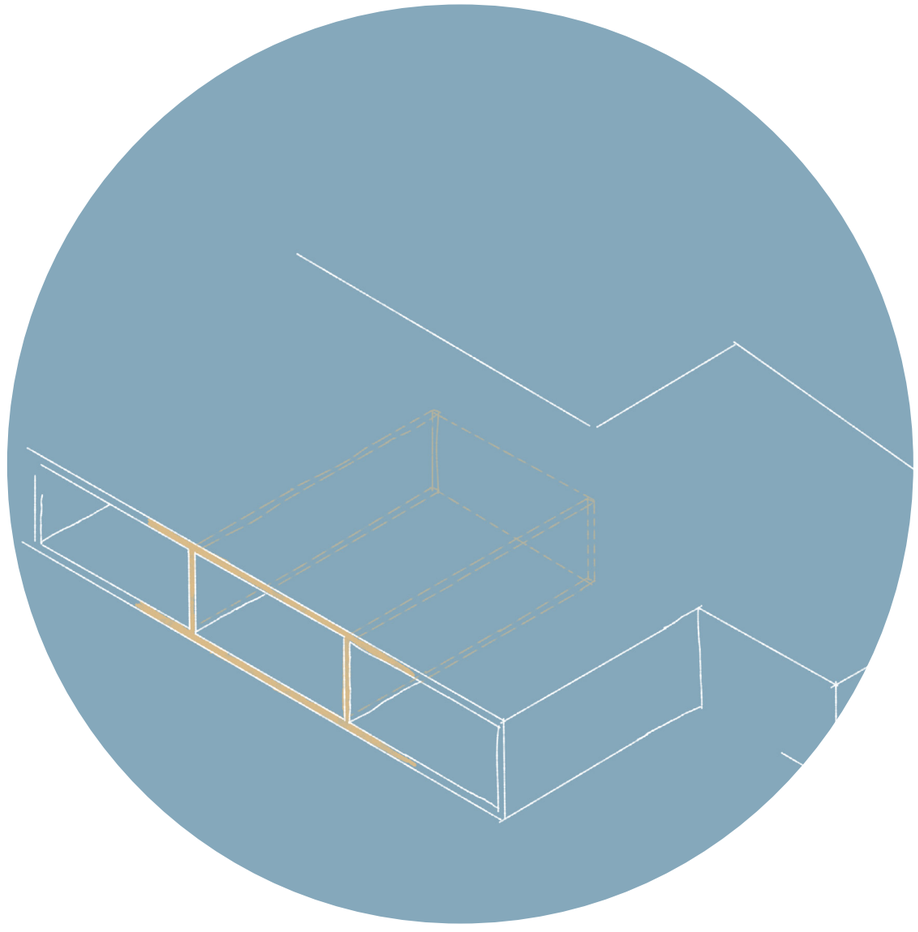
0 10 20 50m

GRADUATION DESIGN

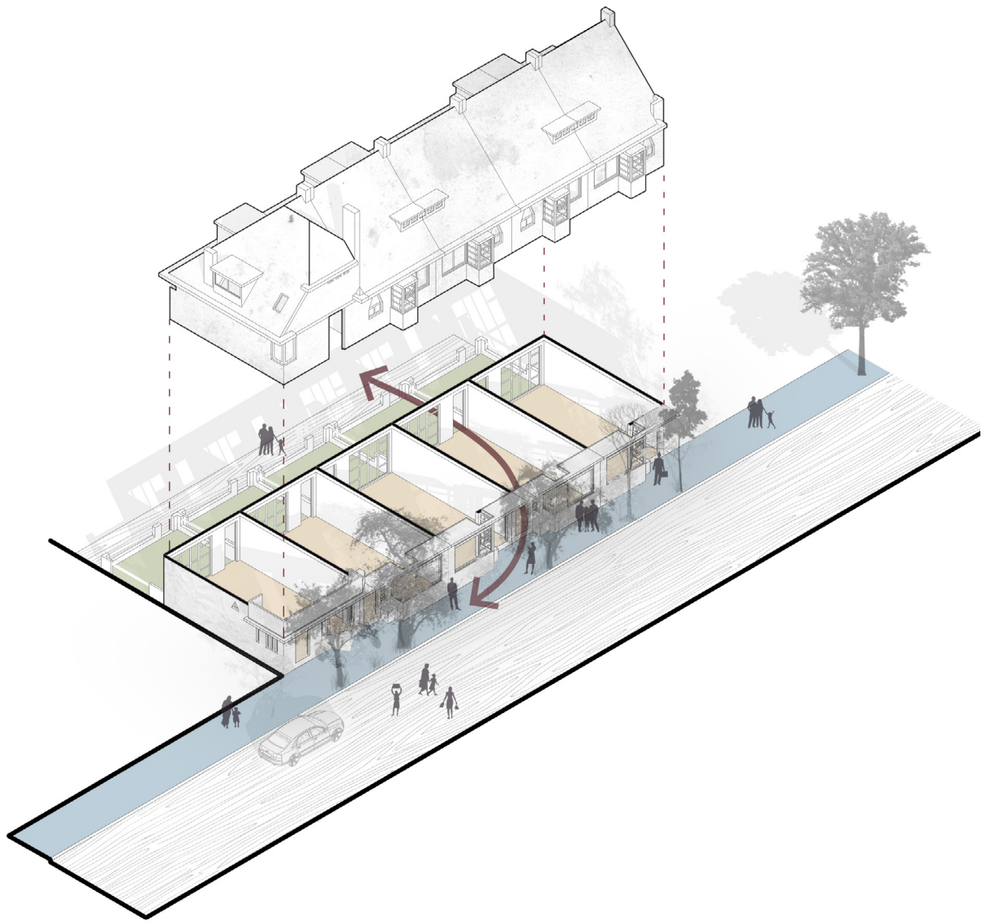
0 10 20 50m

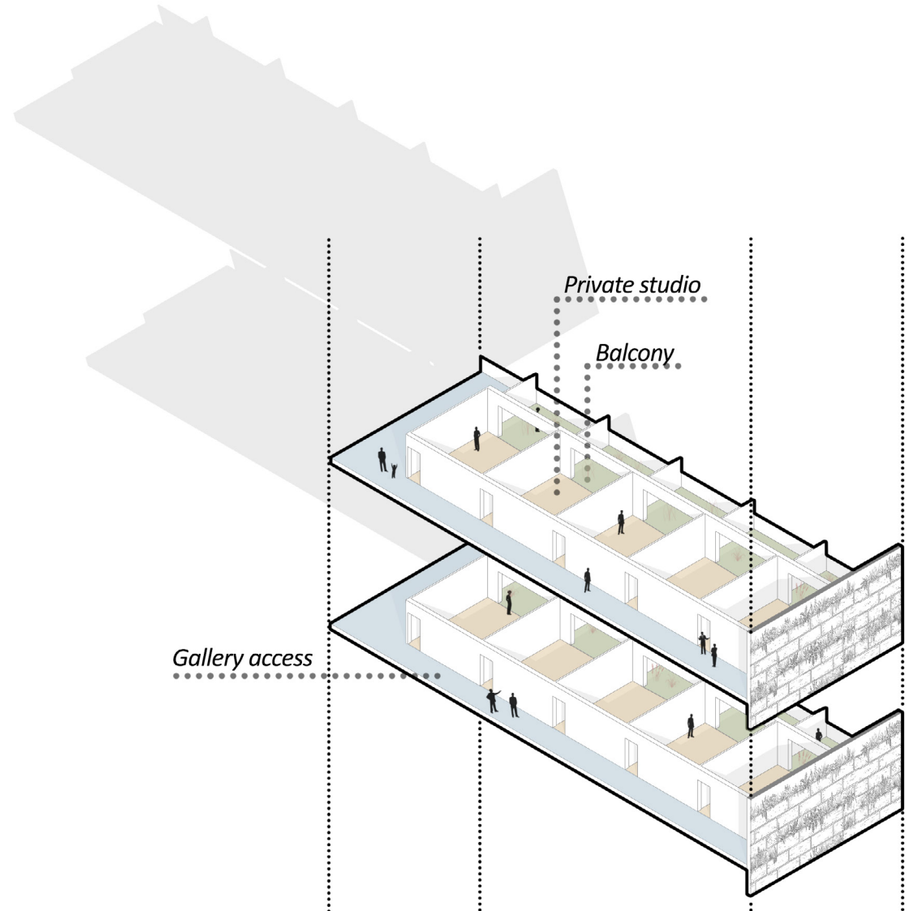
EXISTING STRUCTURE



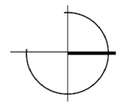


CONCEPT





DESIGN CORE VALUES IN THE URBAN FABRIC

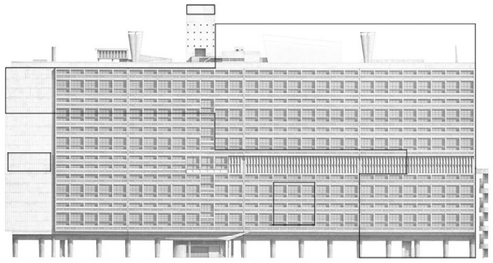


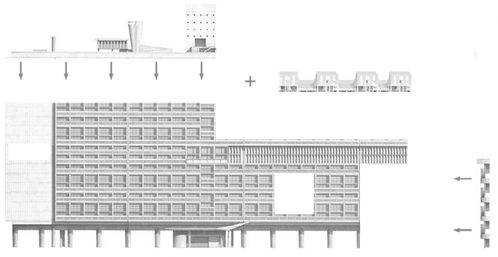
Permeable, public ground floor plinth

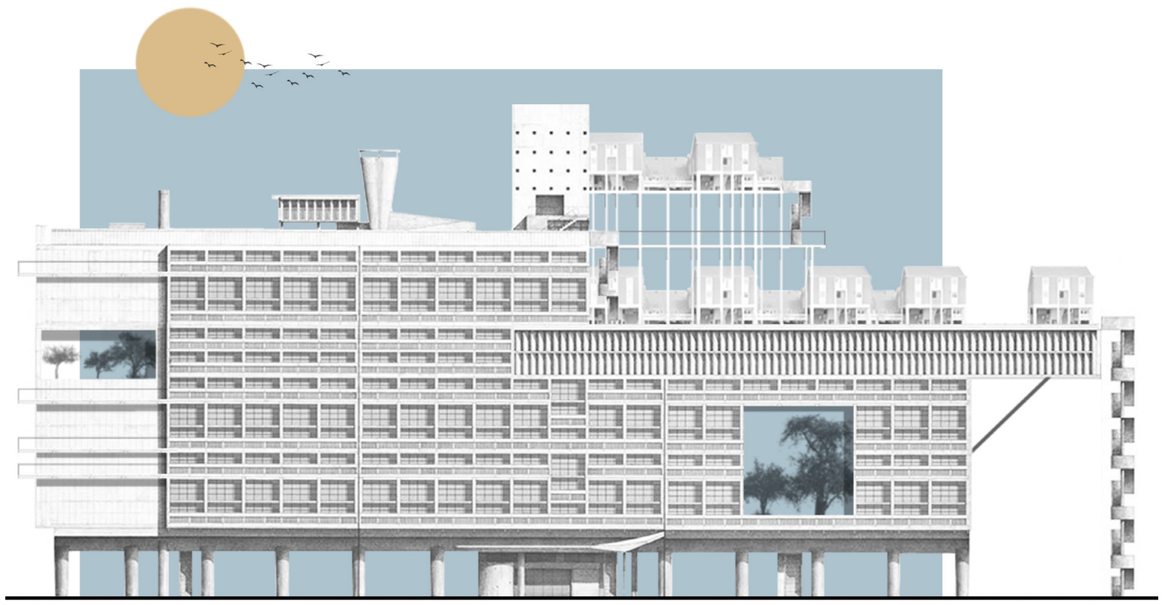
Open/ green areas

Selected building

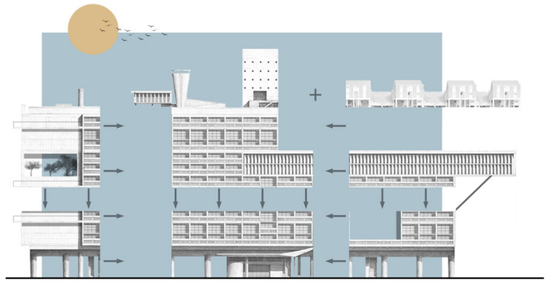
TYPOLOGICAL TRANSFER EXERCISE

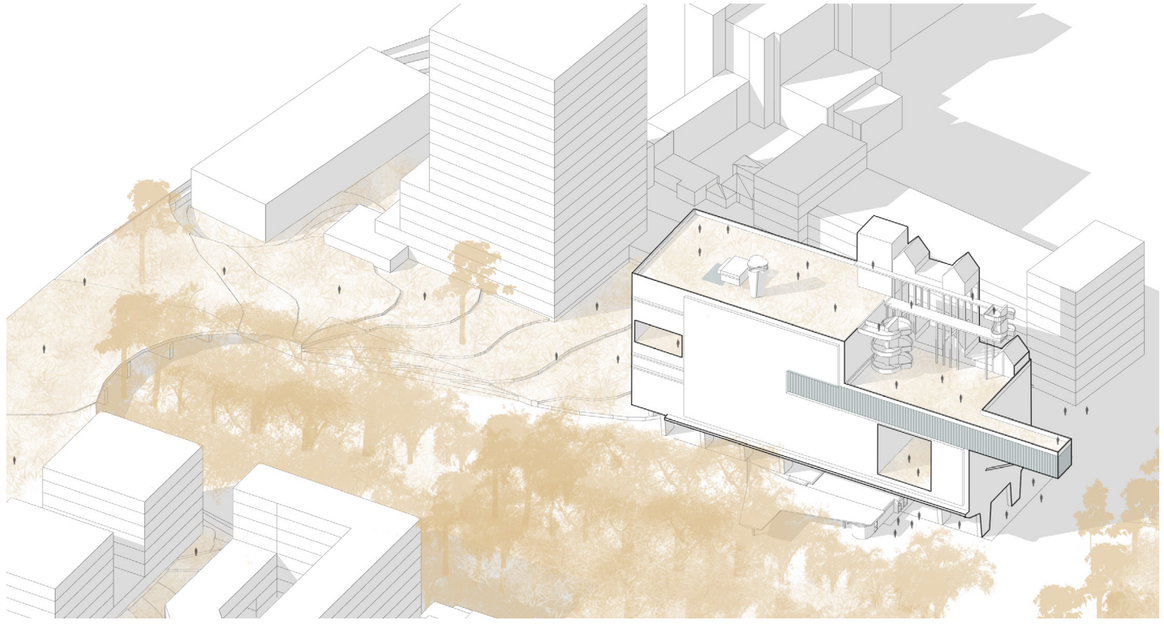


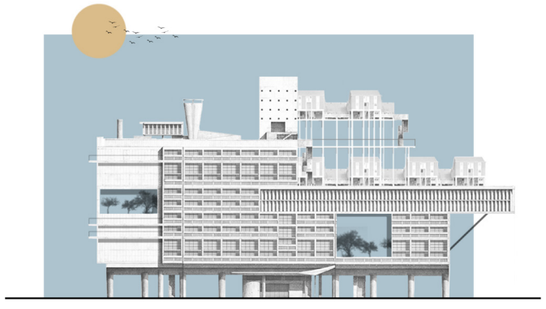


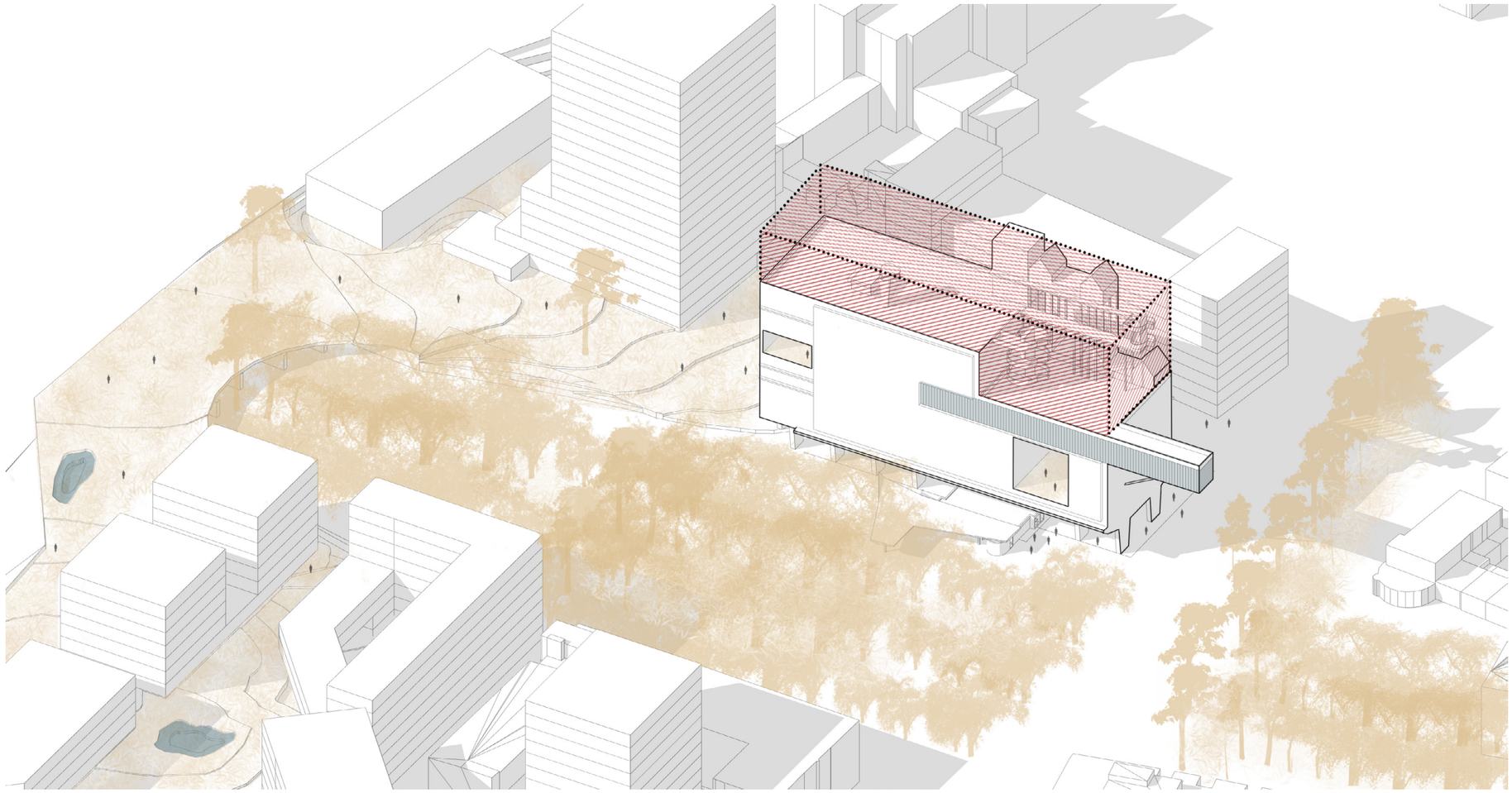


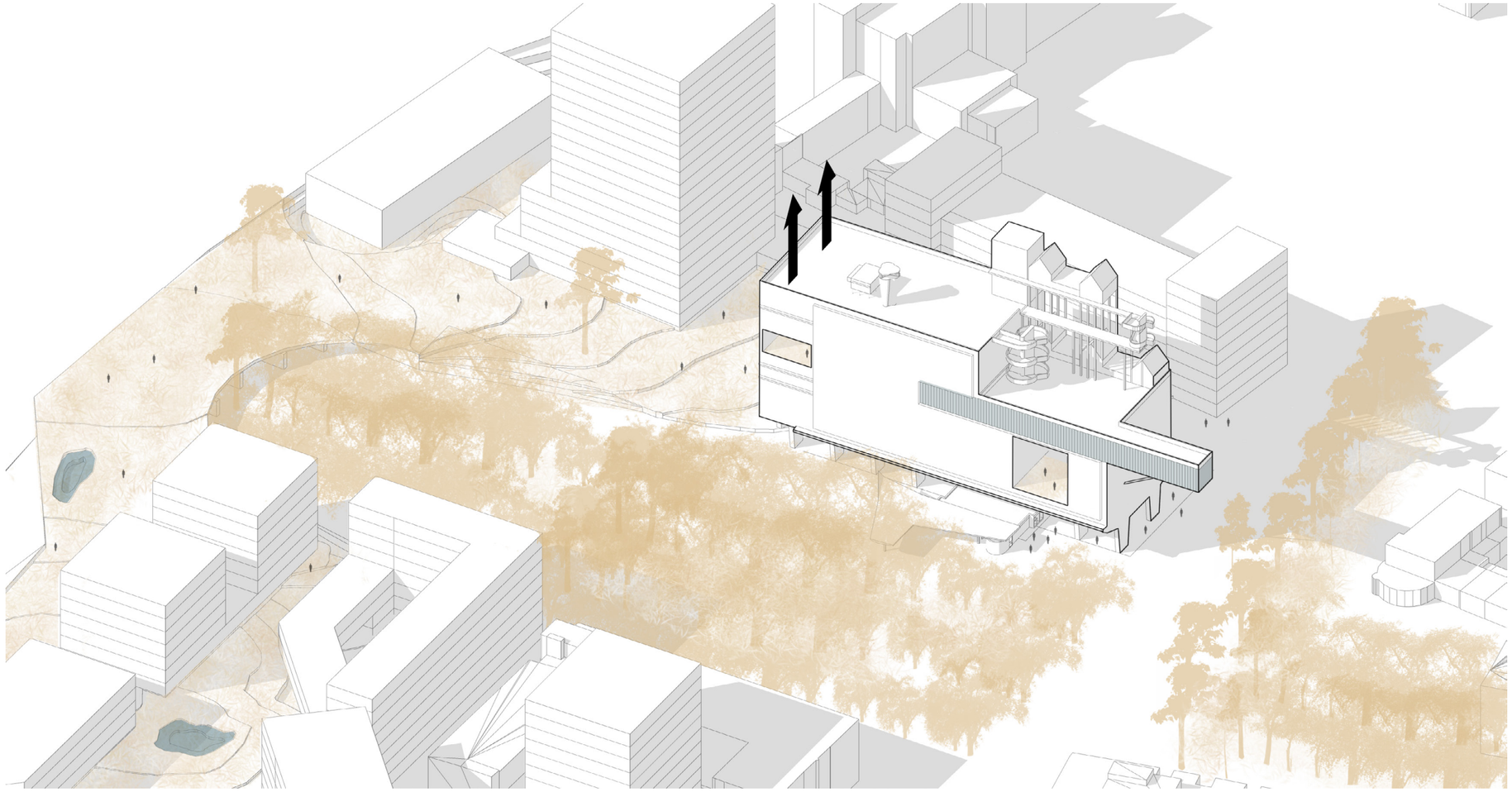
TYPOLOGICAL TRANSFER EXERCISE

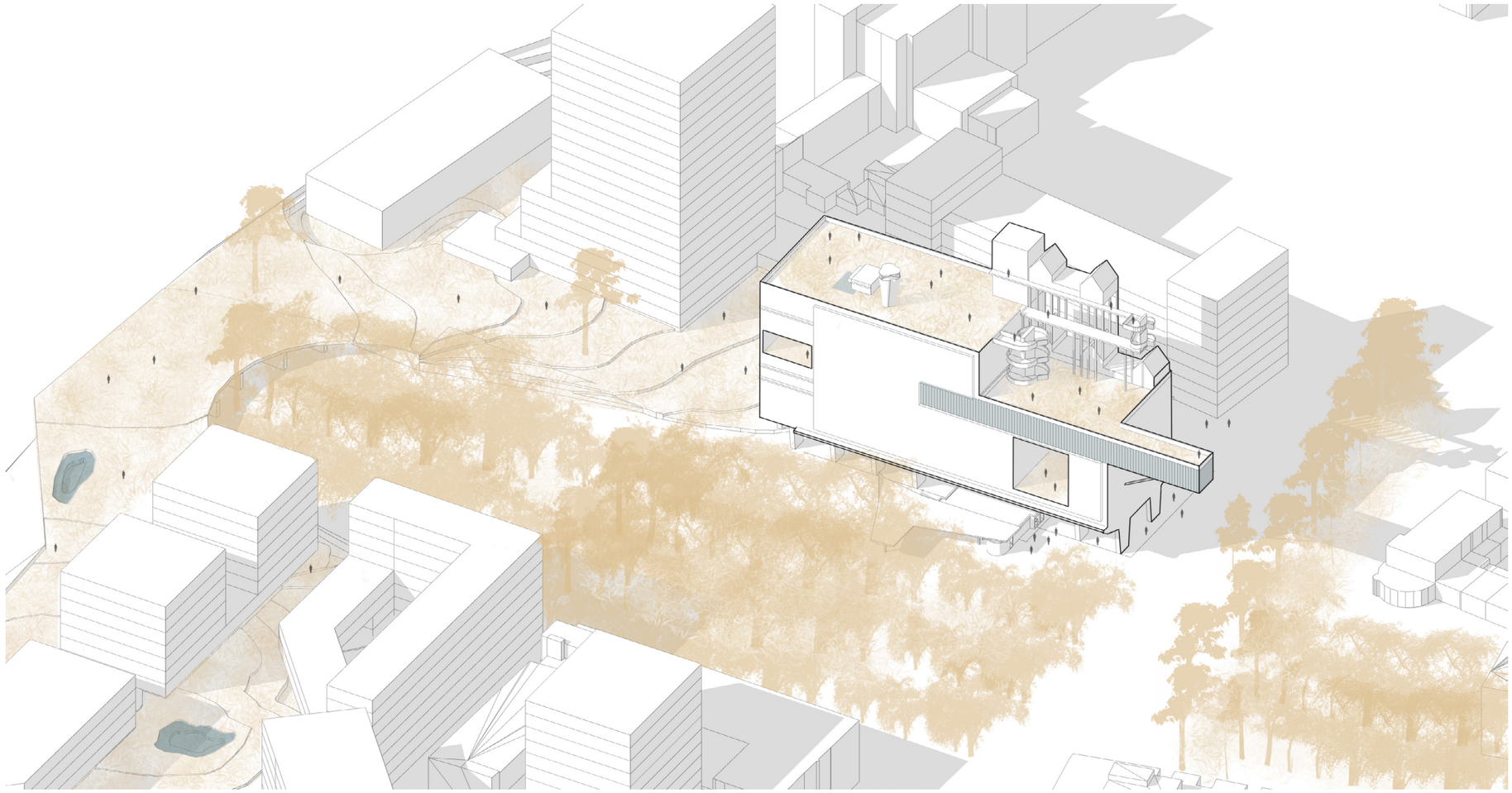


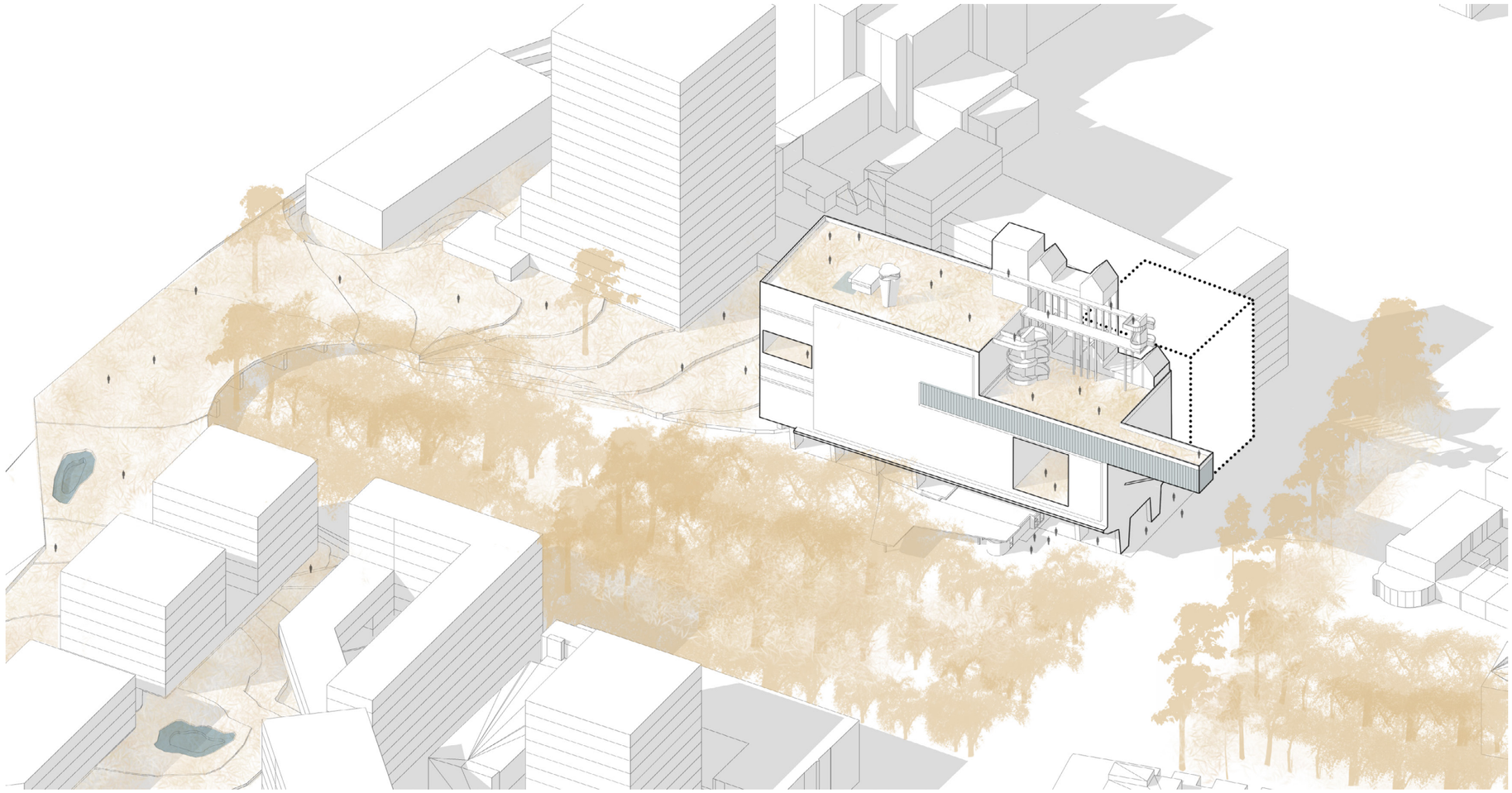




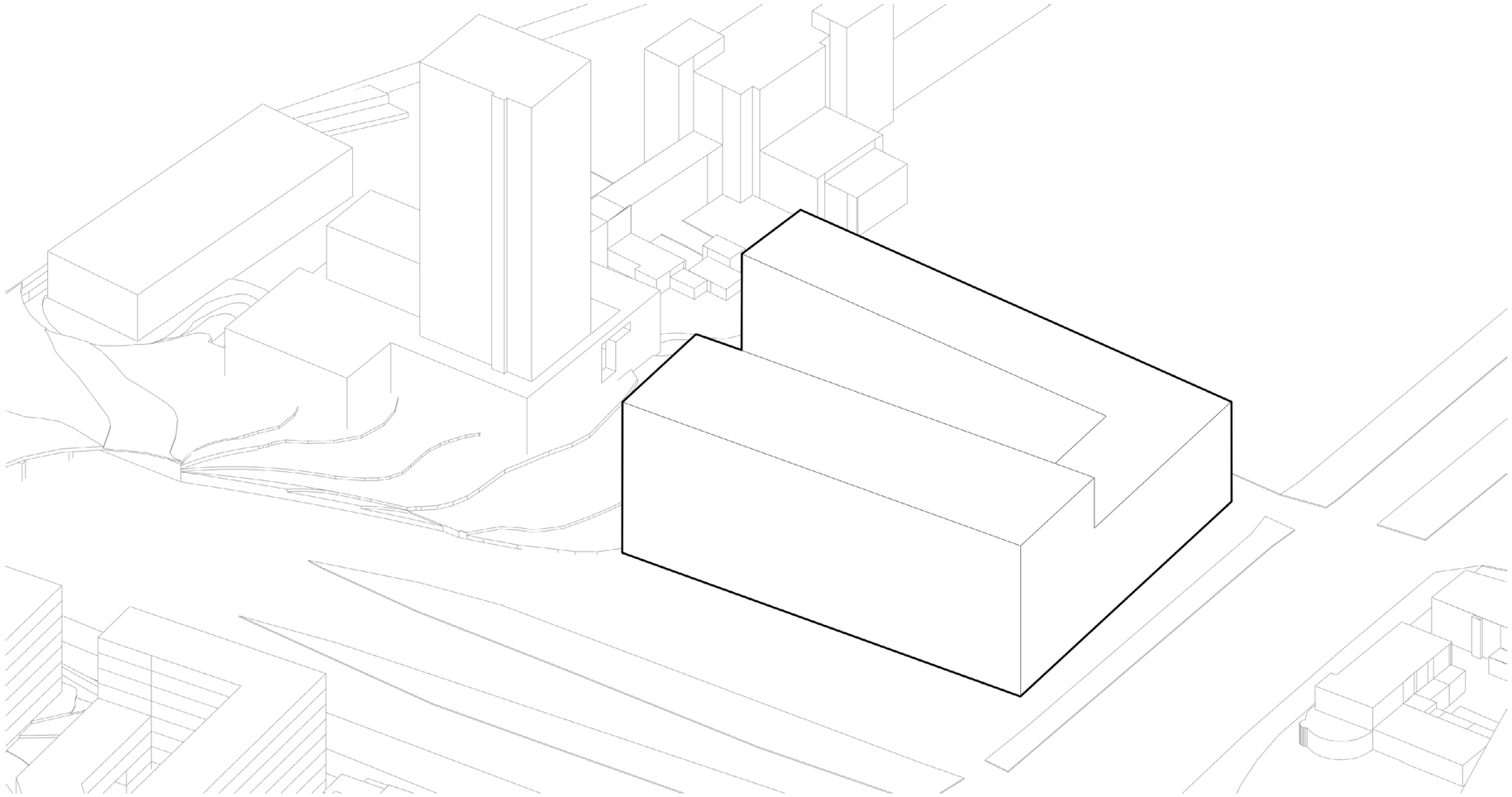


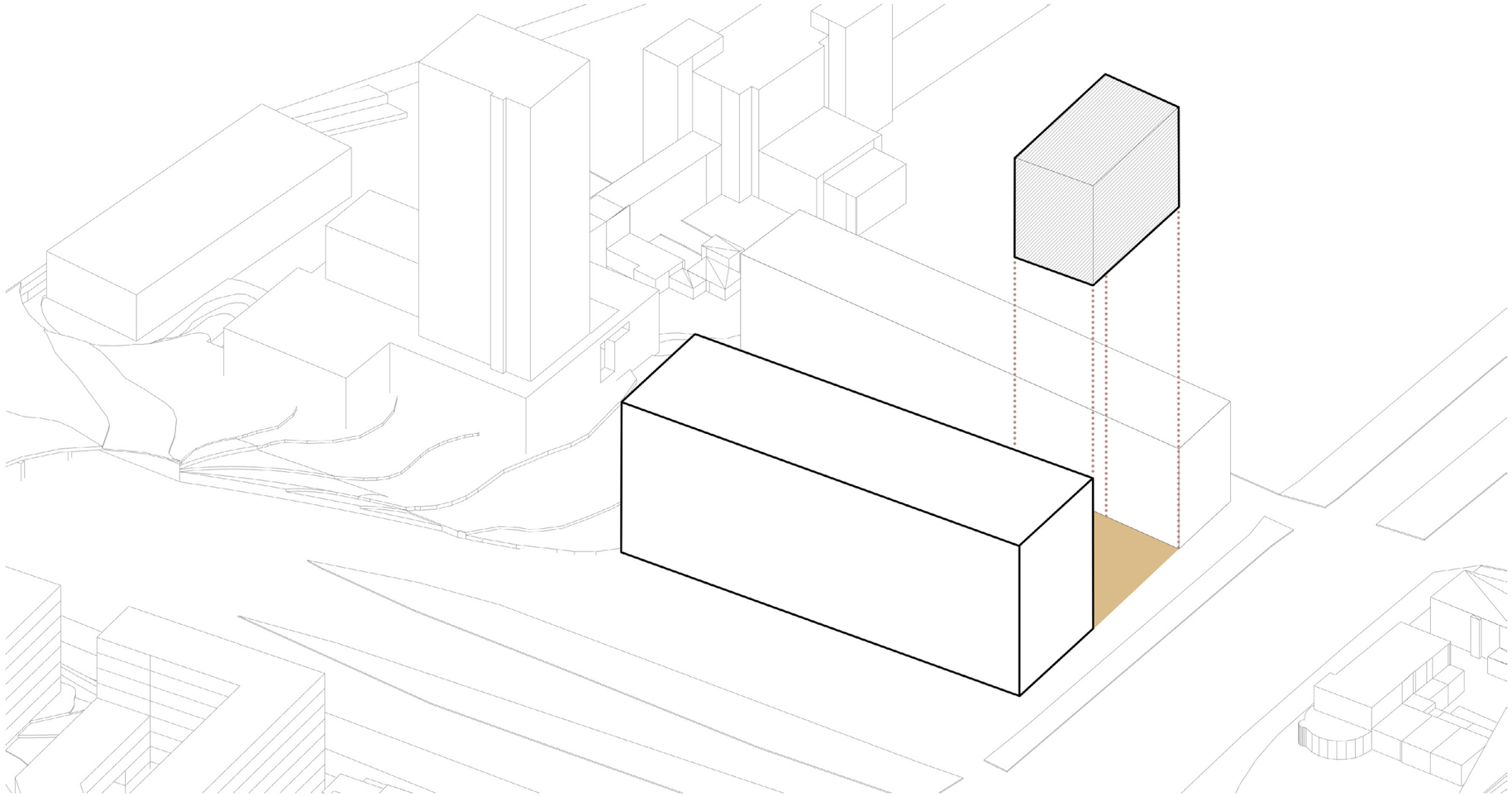


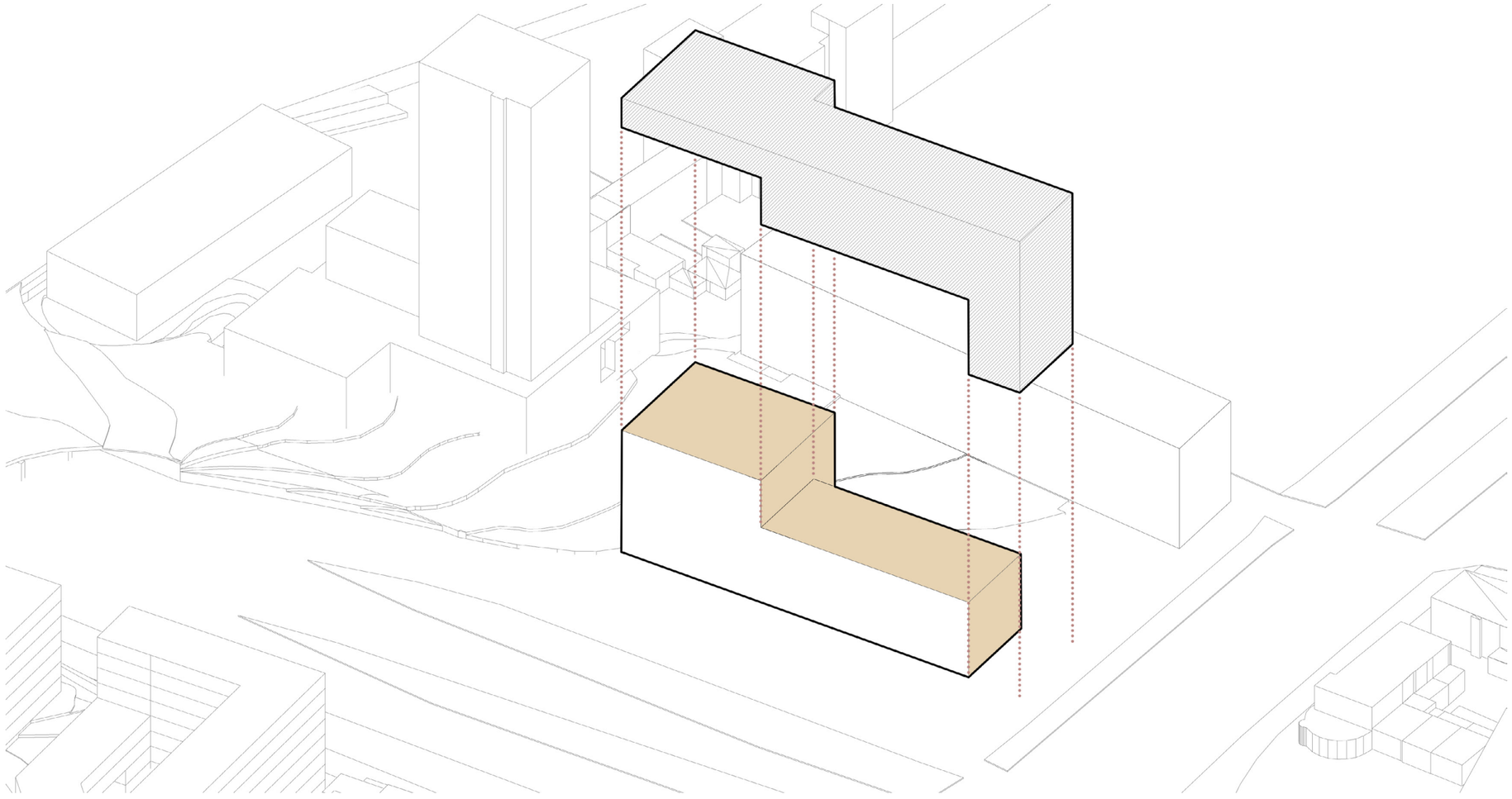


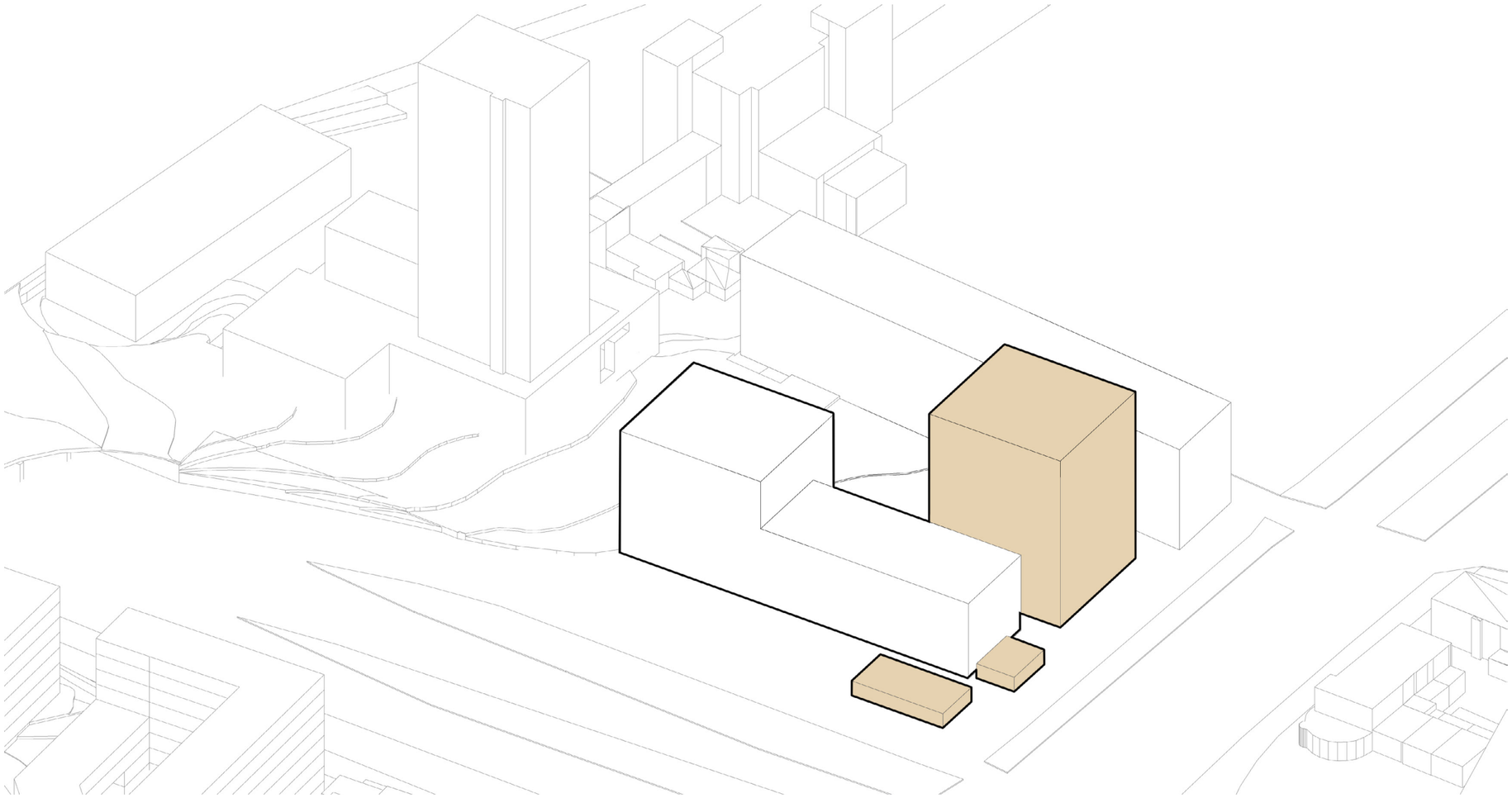


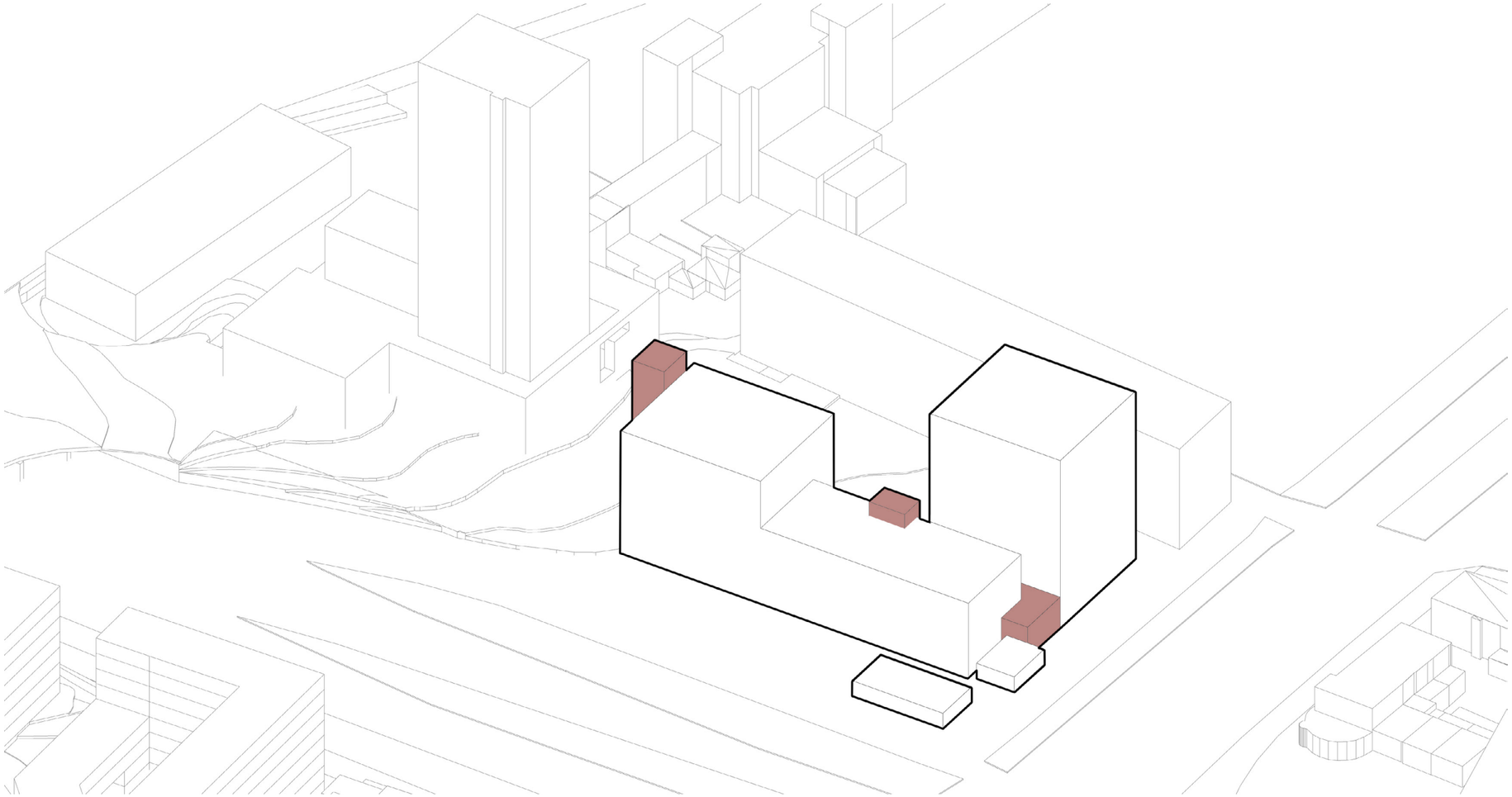
MASSING SEQUENCE

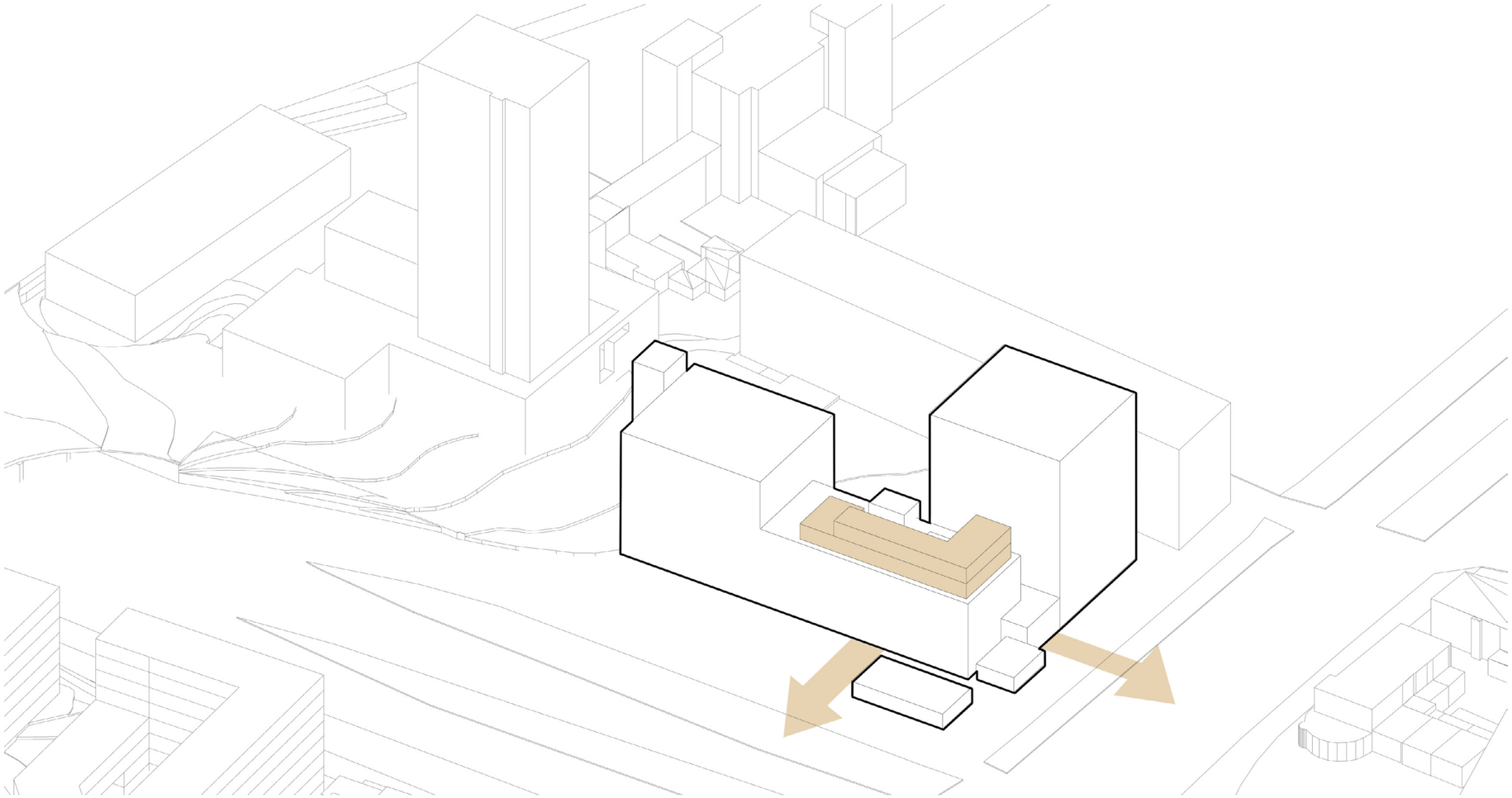


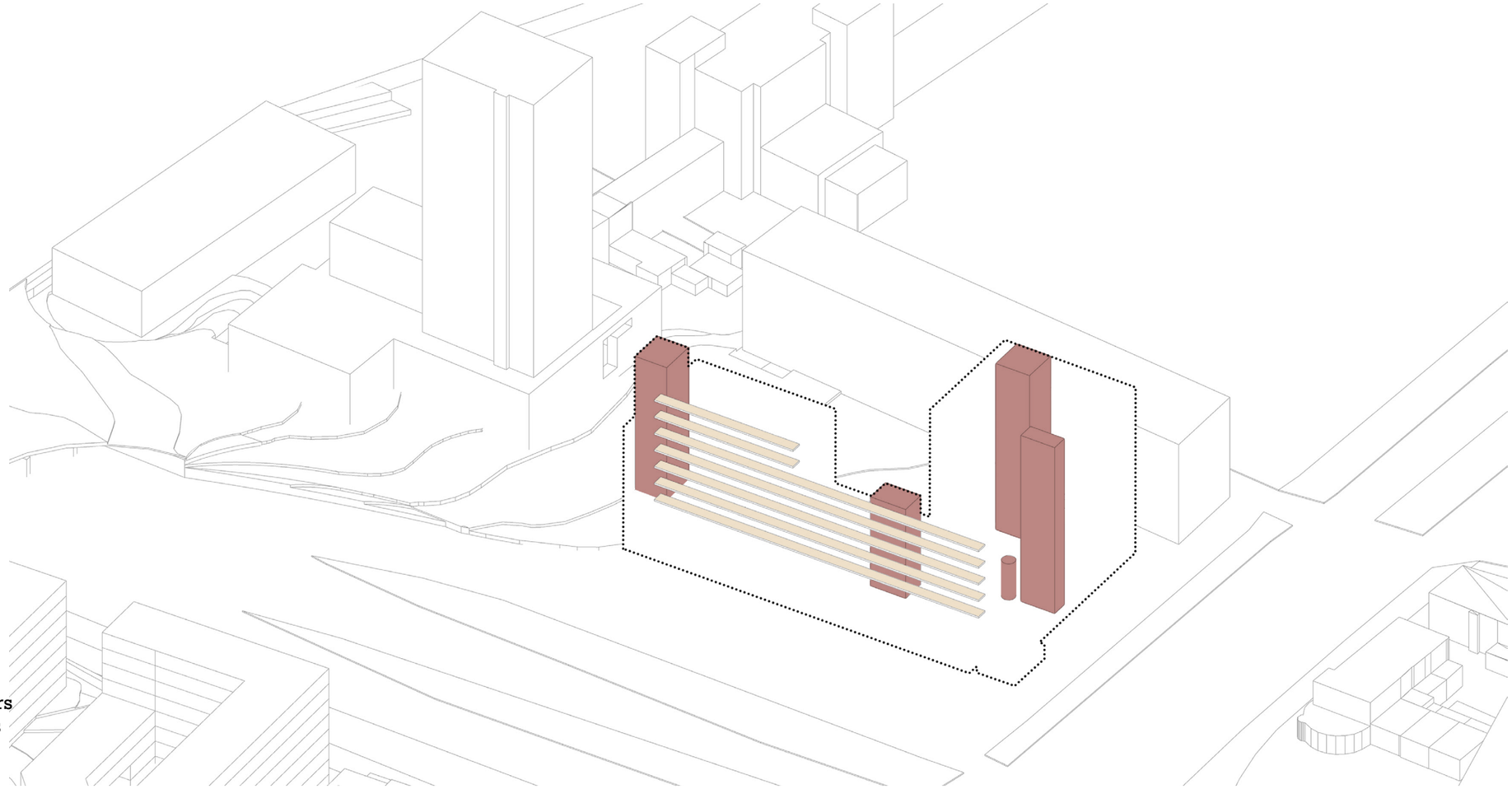






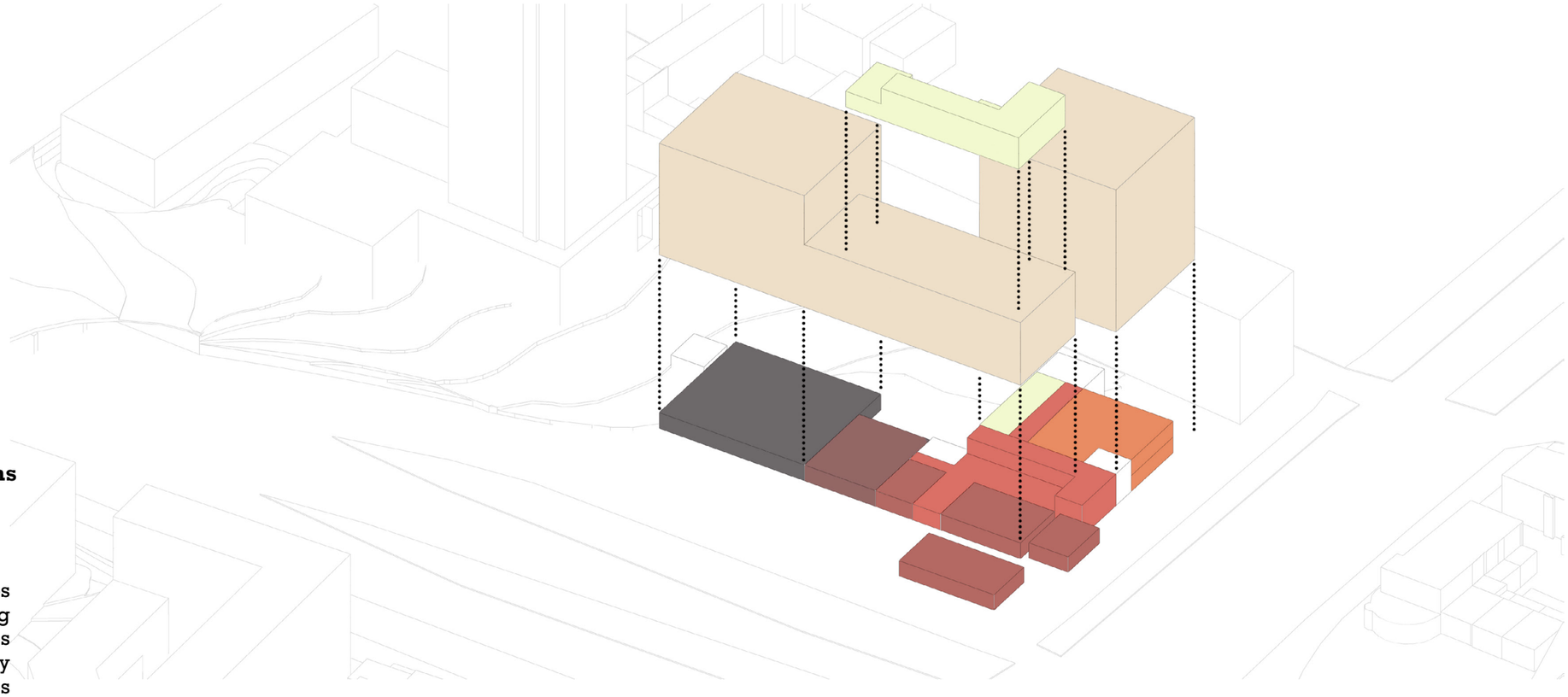






Circulation

Elevators/ stairs
Gallery access



Usages/ Functions

- Workshops
- Housing
- Office spaces
- Lobby
- Stores
- Cafeteria
- Storage/waste

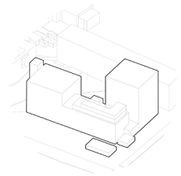
BUILDING PROGRAM

119

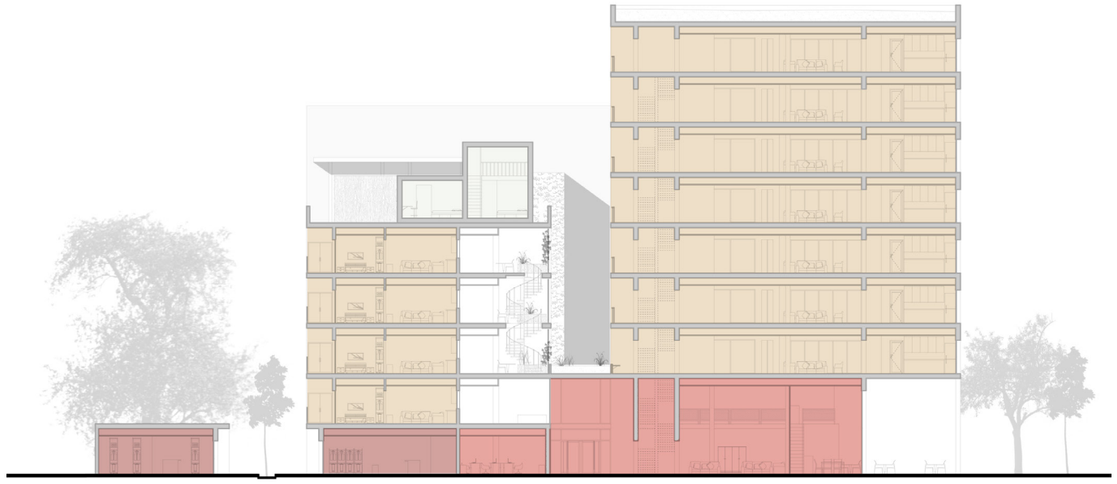
8

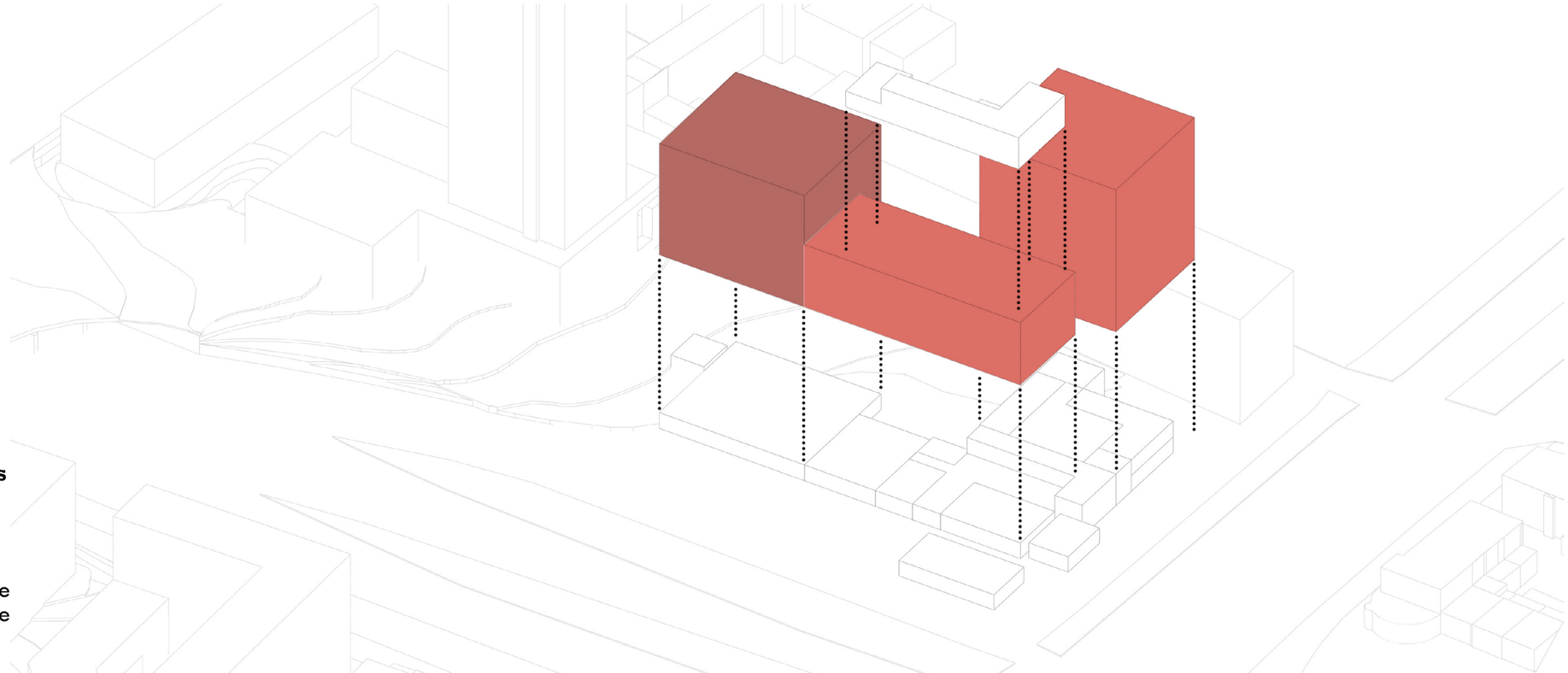
215

30 (off site)



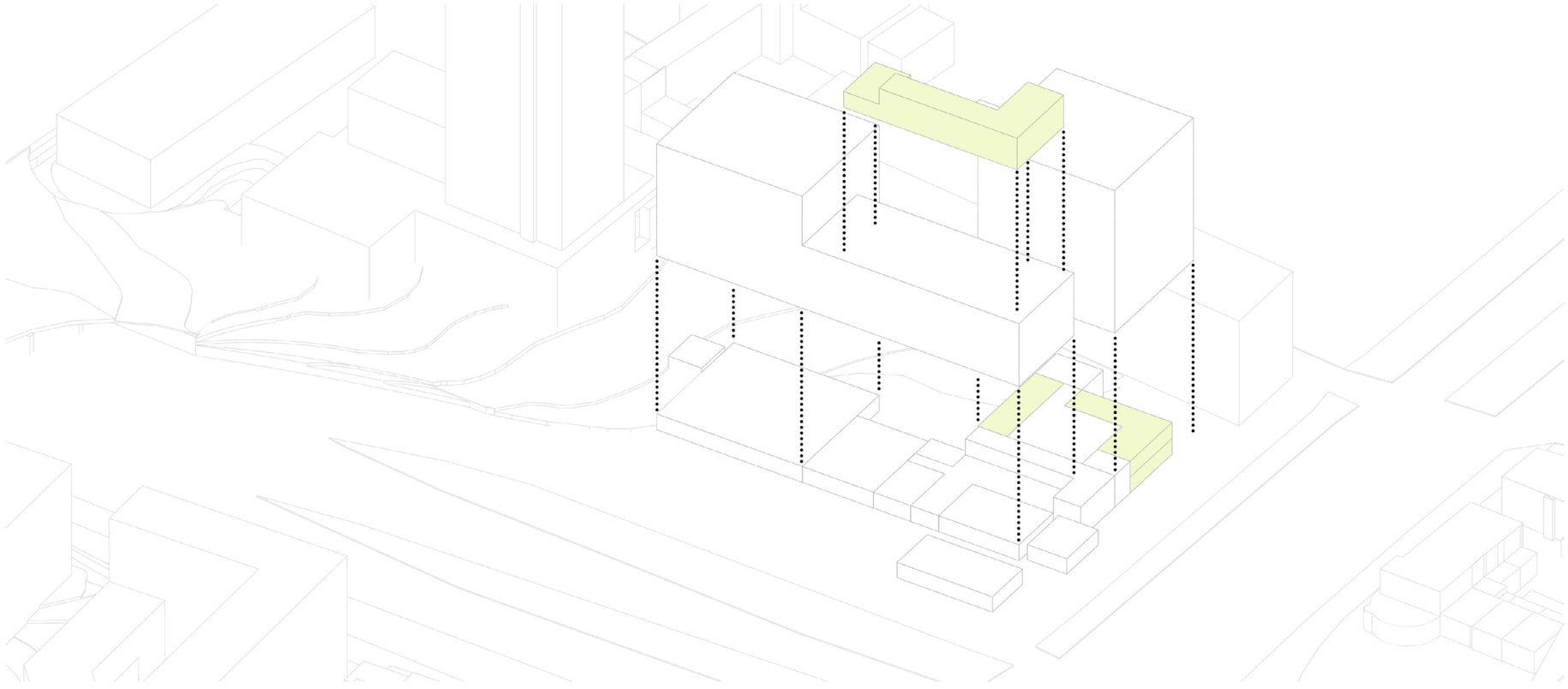
14.584m^2





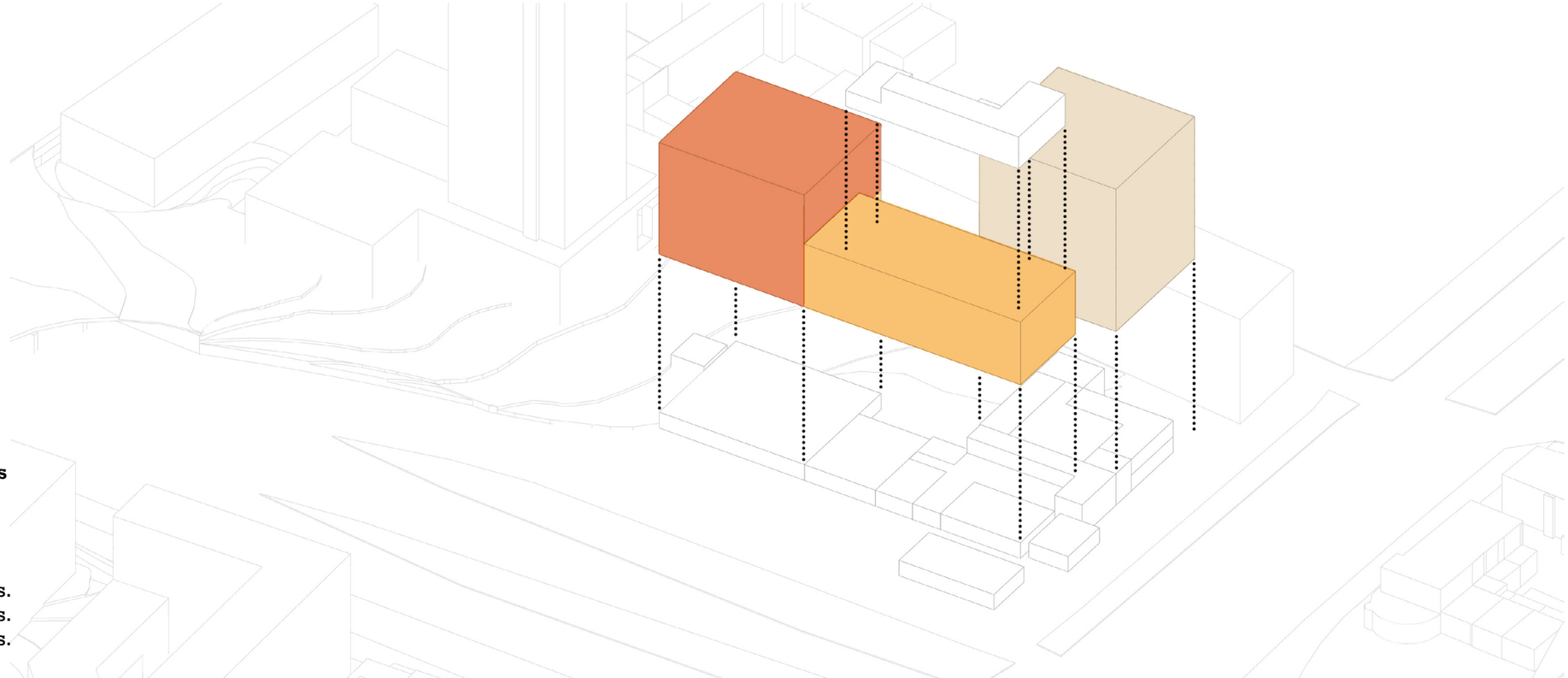
Housing schemes

Co- operative
Private



Space dedicated

to co- operatives



Housing typologies

Tower apts.
Gallery apts.
Interlock apts.

CONTEXTUAL MATERIALITY

Brick Facades

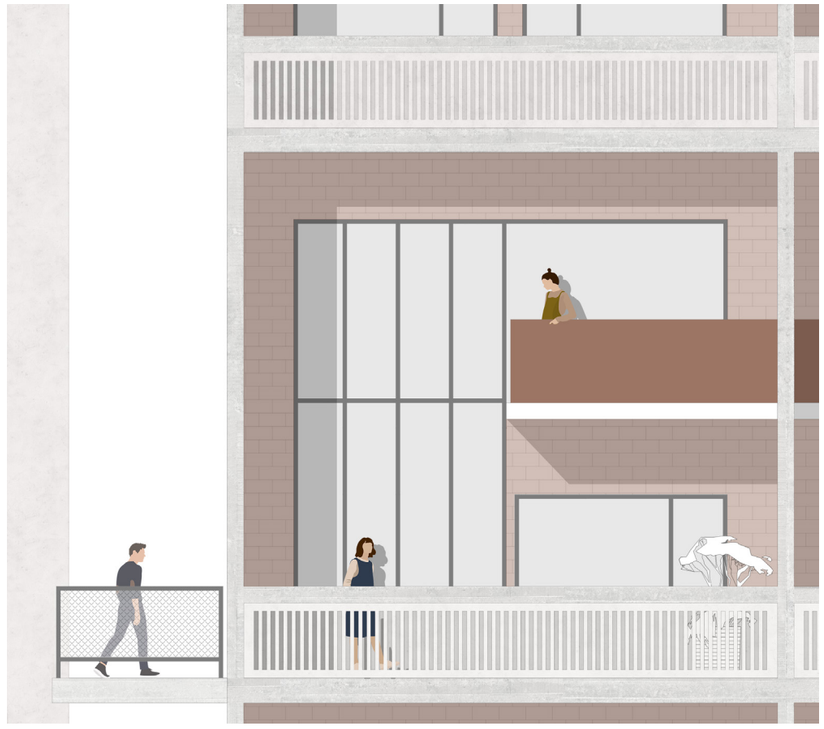
Concrete cladding

Metal Cladding

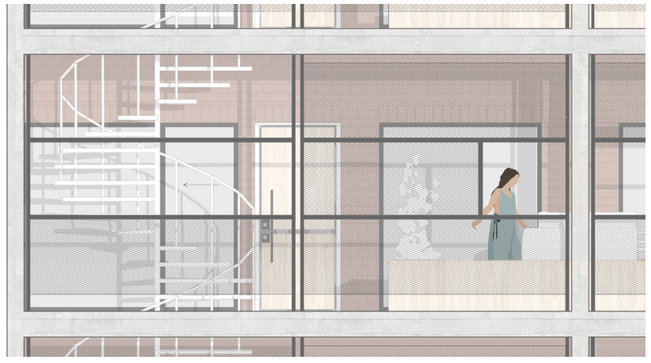
Glass facades

FACADE TREATMENT

Stucco and wood

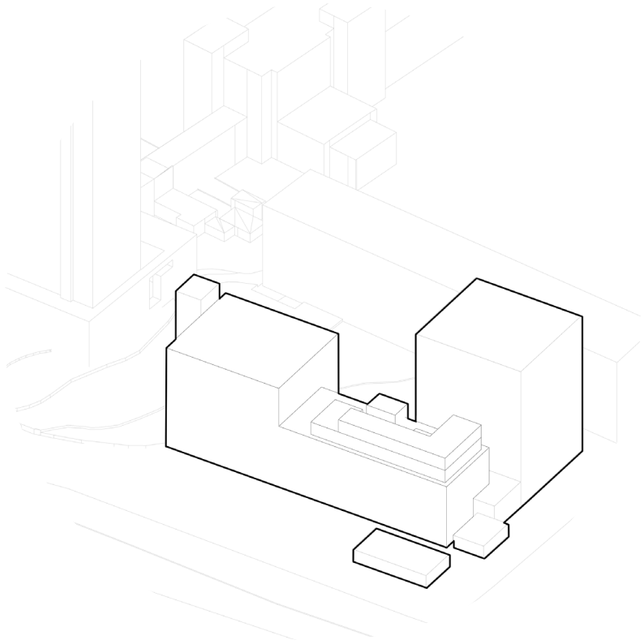


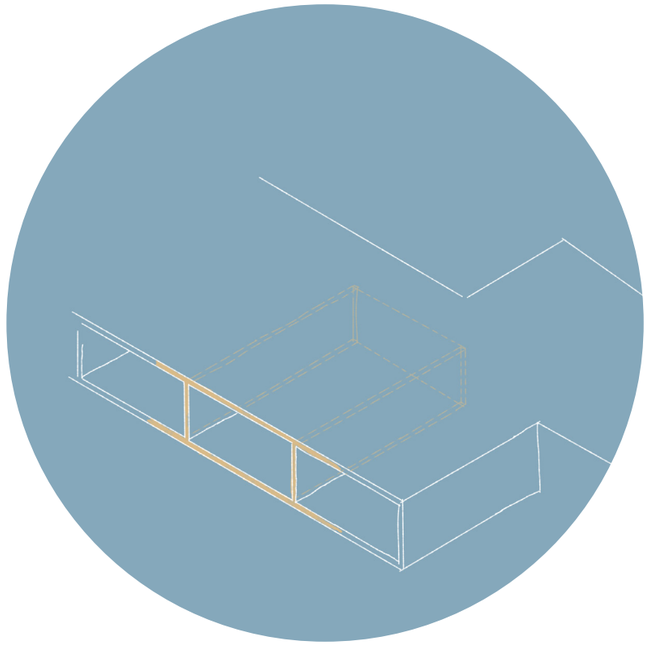
Concrete and brick

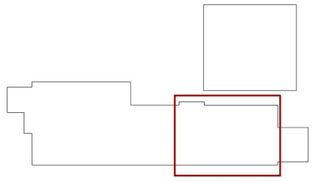


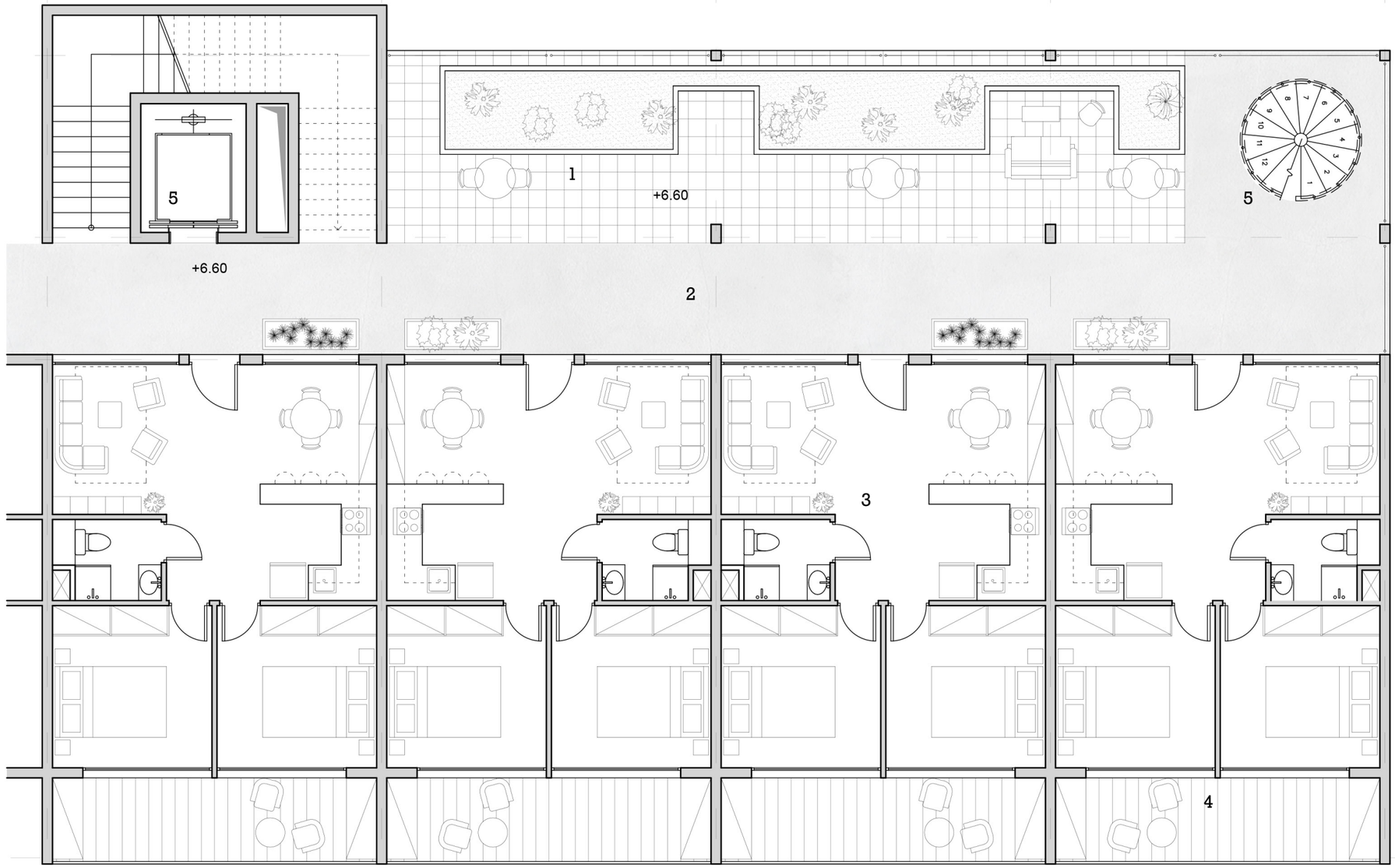
Concrete and brick, steel mesh

DWELLING TYPOLOGIES







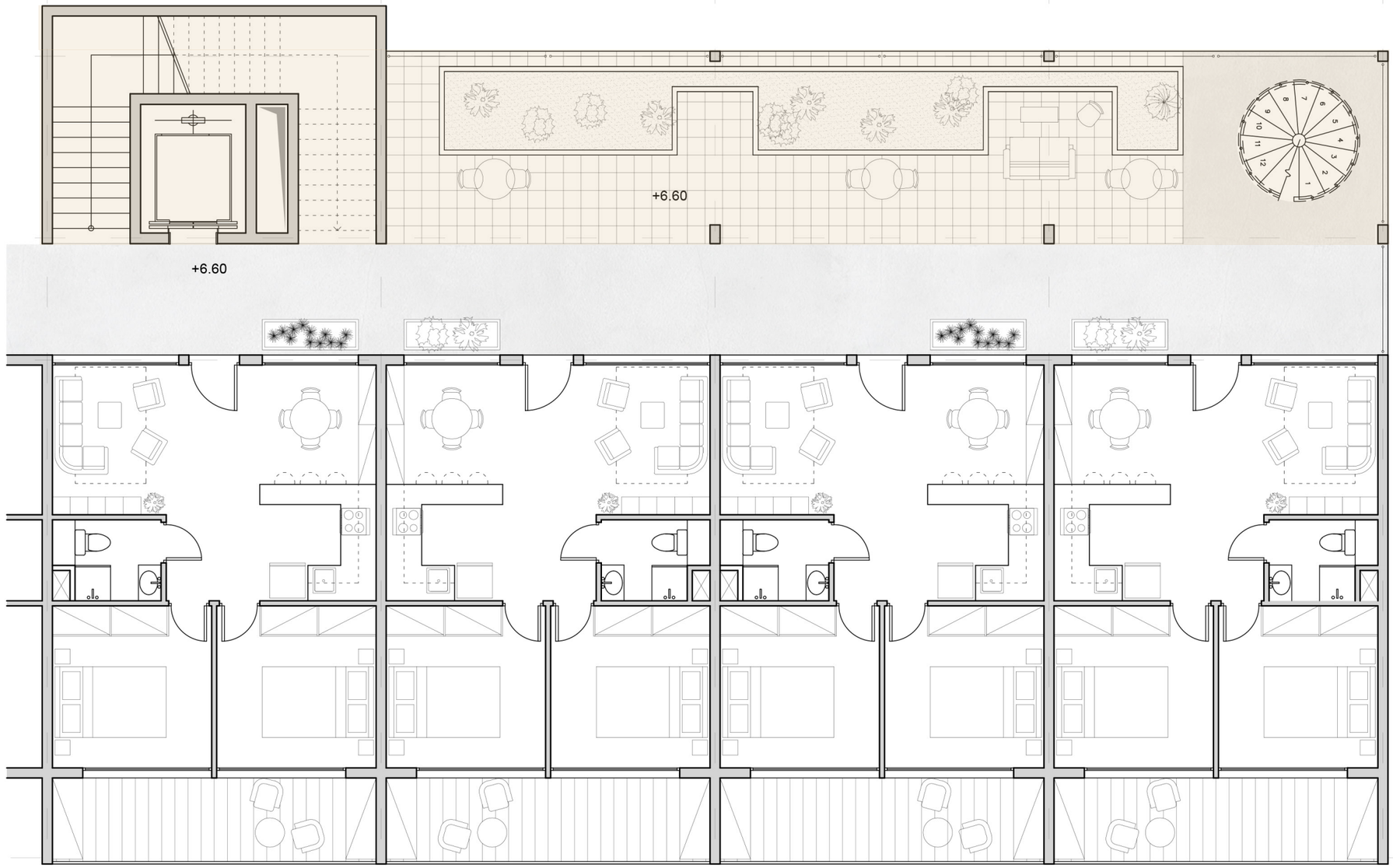


“Dutch row” typology

Emmahuis A

1 Gardens
2 Gallery access
3 Apartment module
4 Balcony
5 Elevator/ stairs

0 0.5 1 2m



“Dutch row” typology

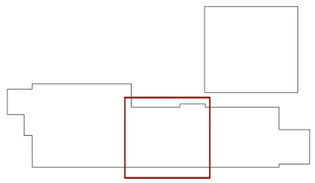
Emmahuis A

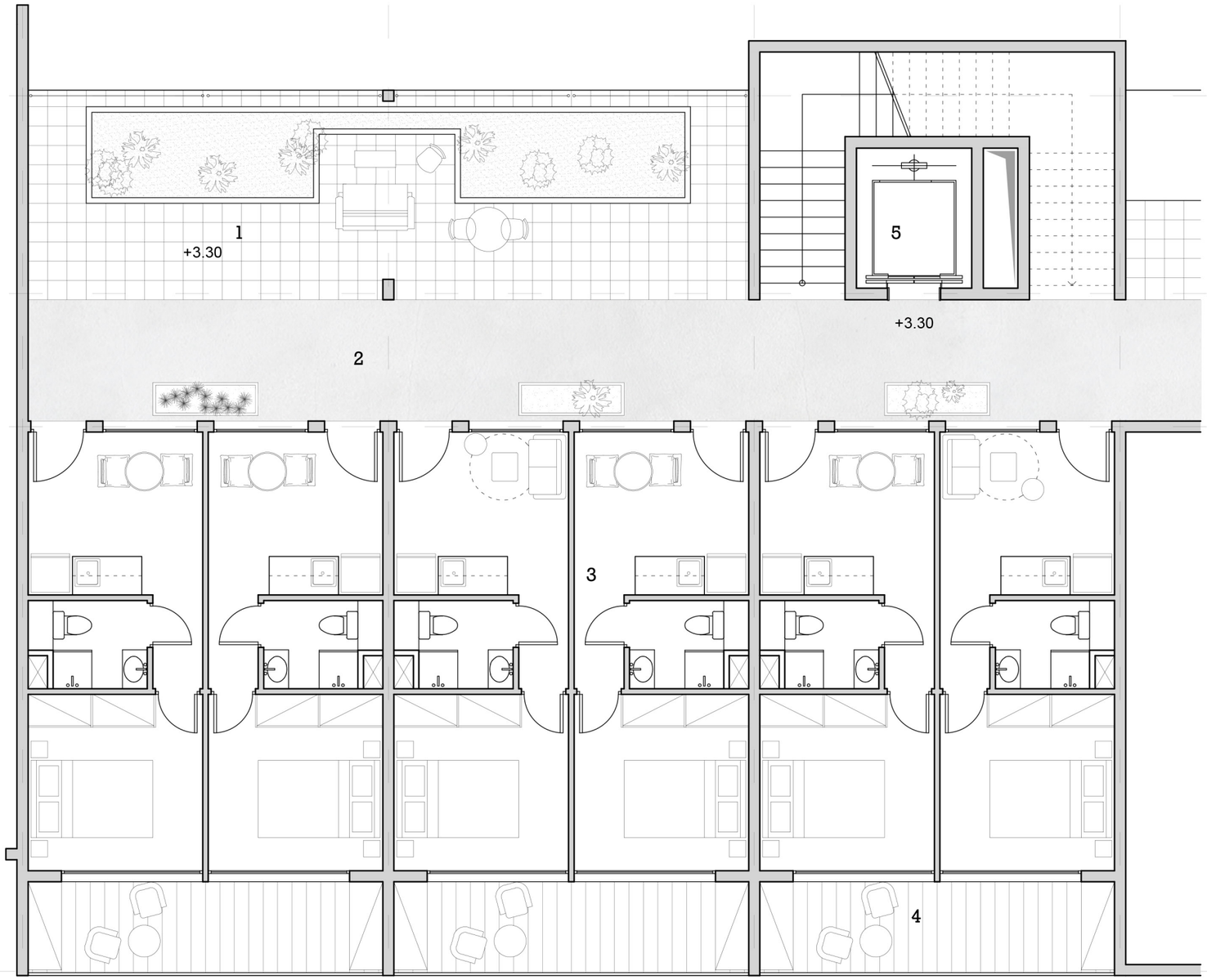
4 meter extension

0 0.5 1 2m

Gallery access- gardens
Impression

Emmahuis A apt living room
Impression



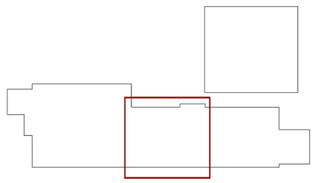


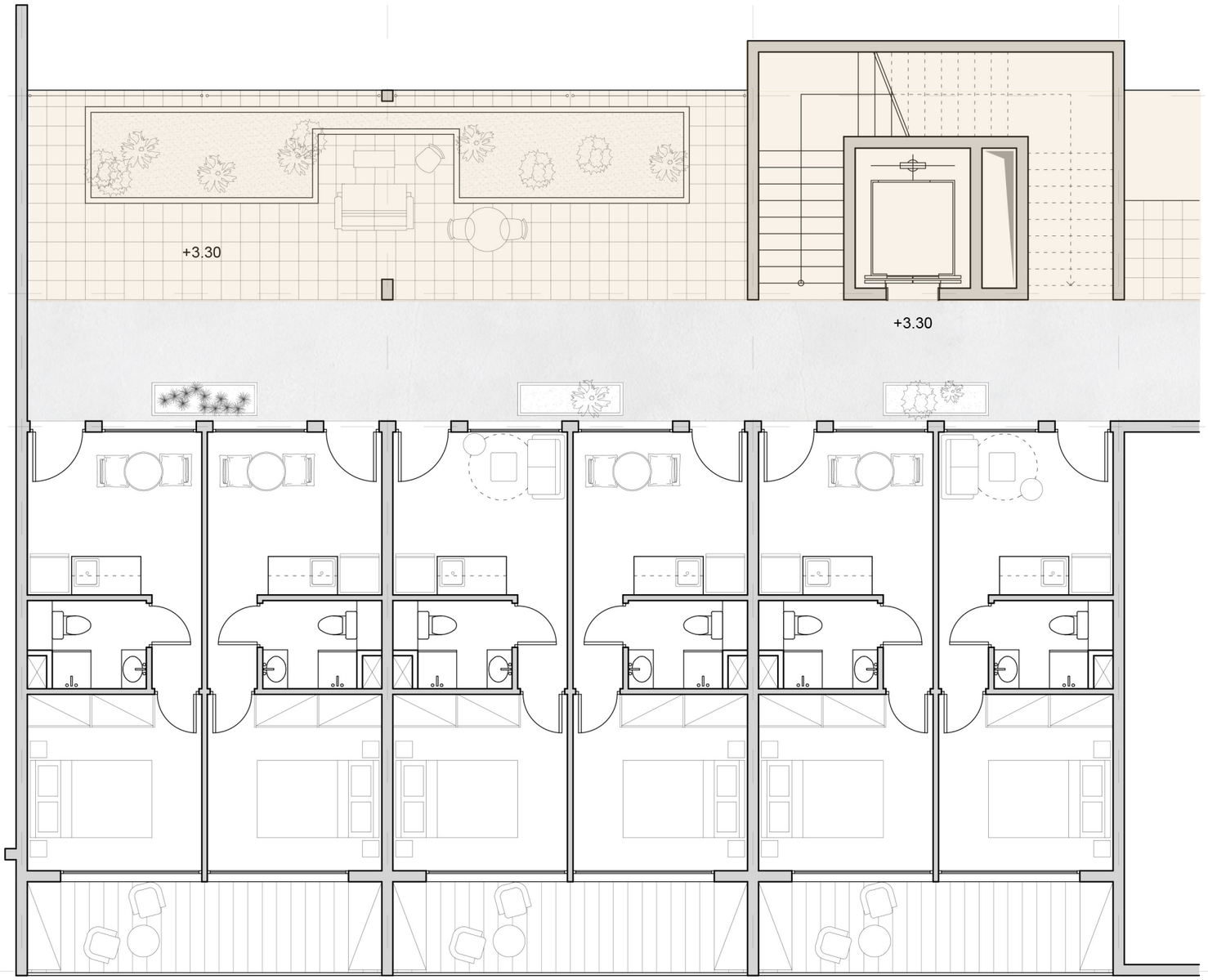
“Dutch row” typology

Emmahuis B

1 Gardens
2 Gallery access
3 Apartment module
4 Balcony
5 Elevator/ stairs

0 0.5 1 2m





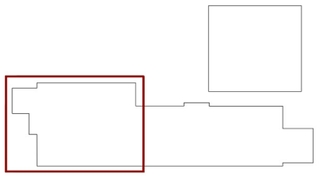
“Dutch row” typology

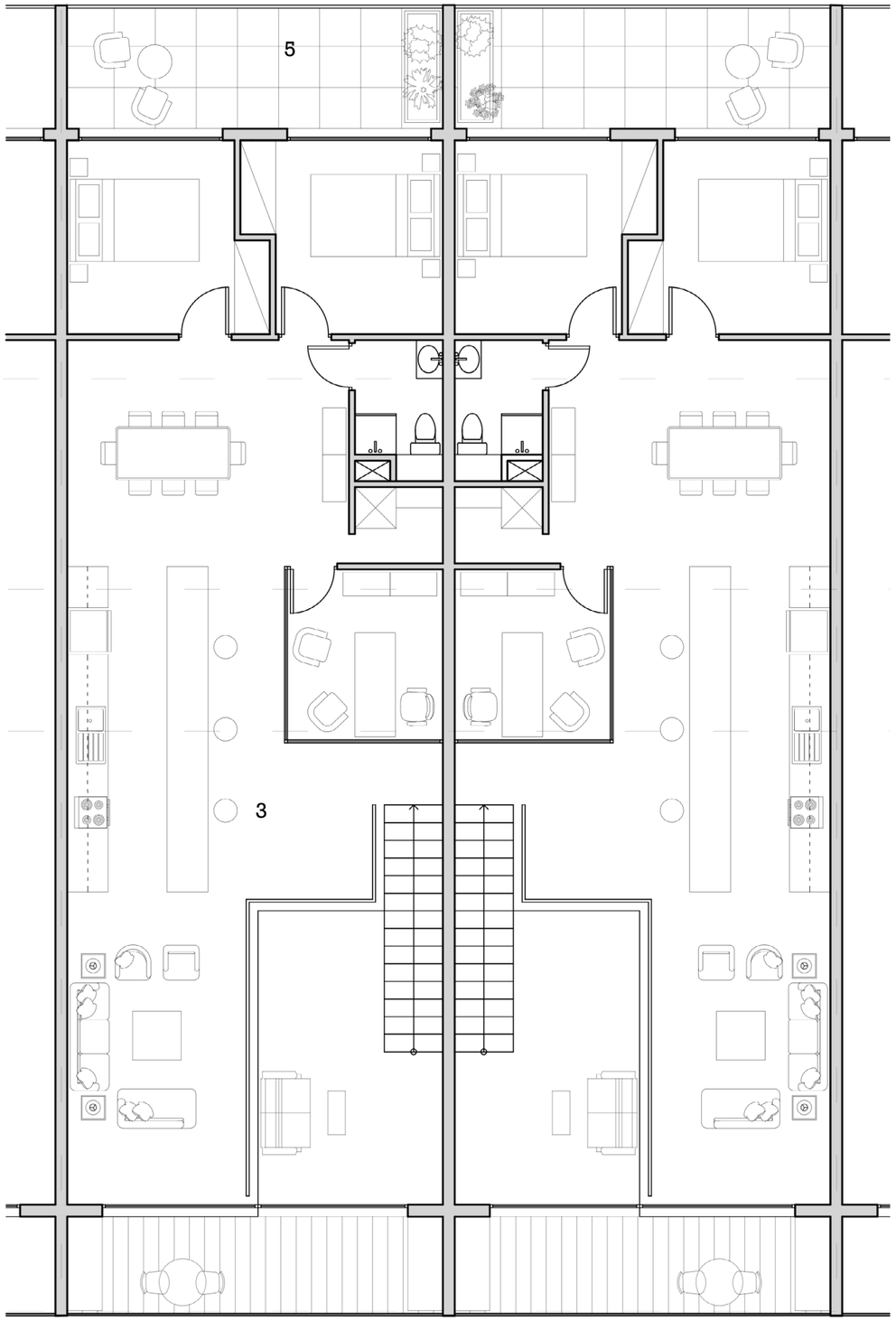
Emmahuis B

4 meter extension

0 0.5 1 2m

Emmahuis B facade
Impression





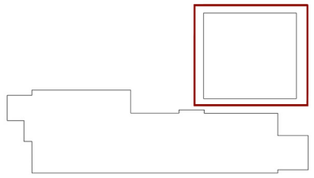
Interlock loft typology

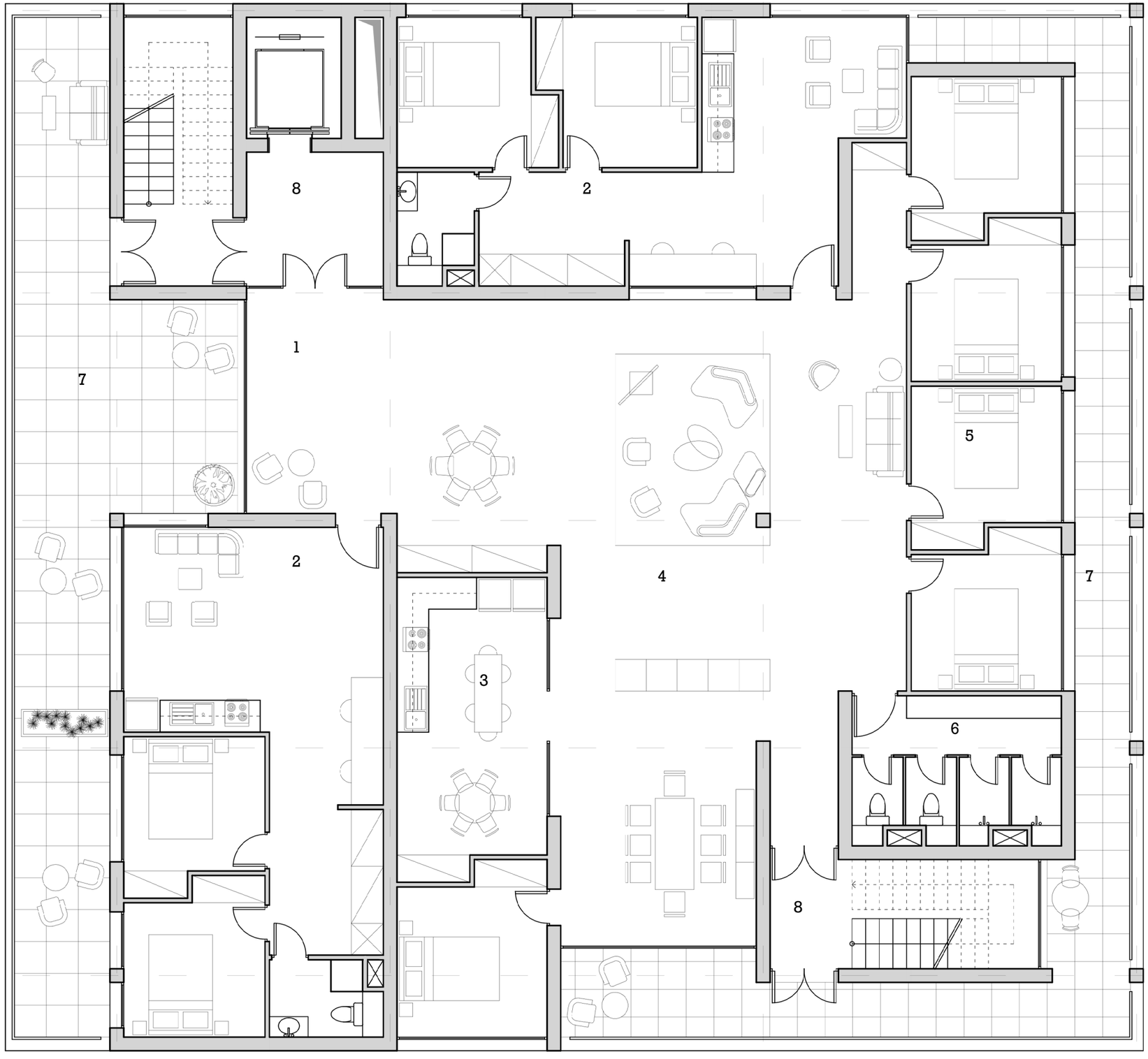
Emmahuis C

1 Gallery access
2 Loft 1st floor
3 Loft 2nd floor
4 Balcony 1st floor
5 Balcony 2nd floor

0 0.5 1 2m

Interlocking lofts facade
Impression



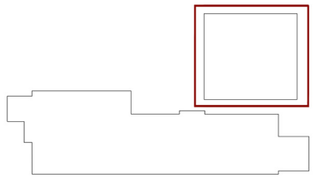


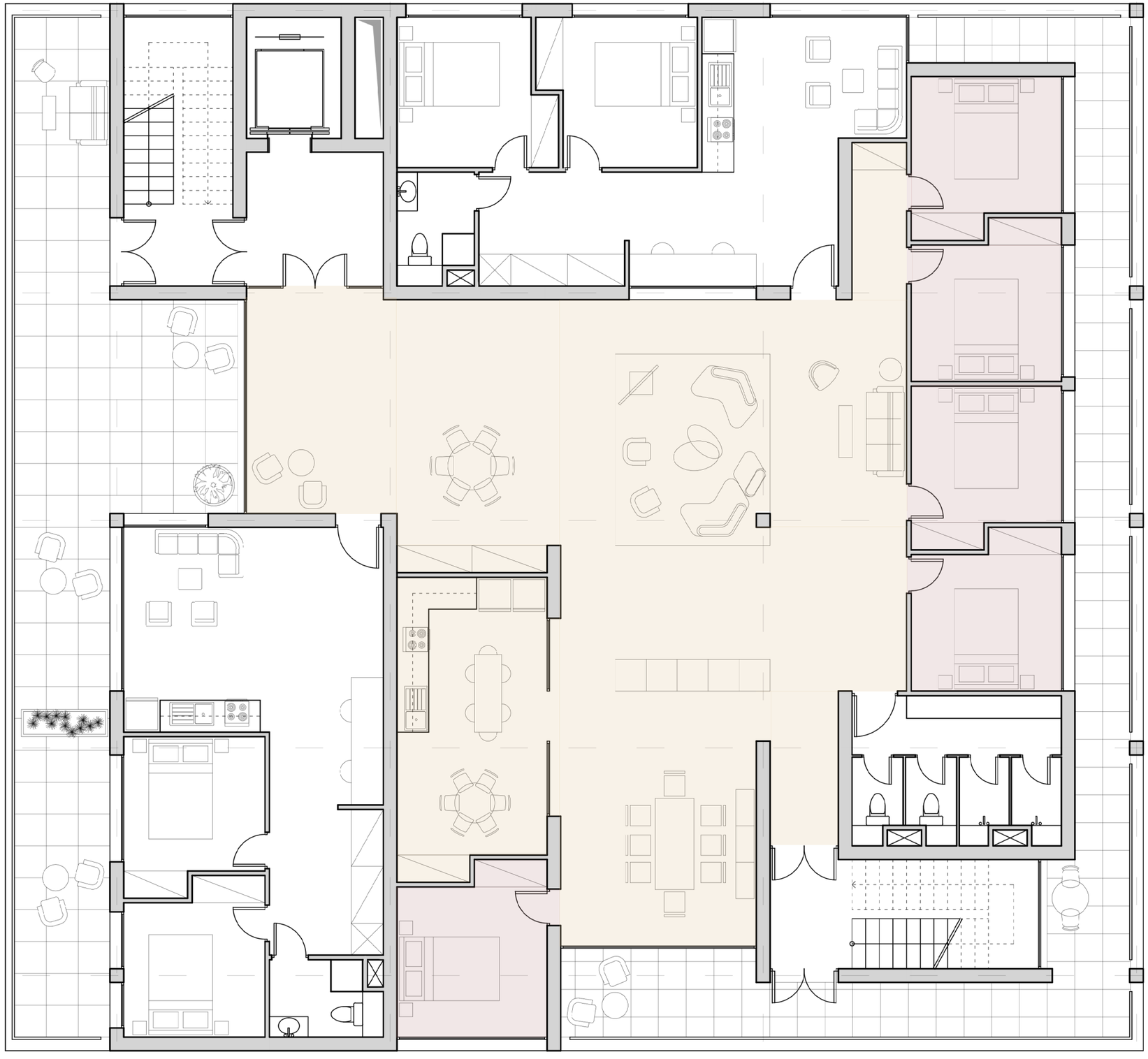
Tower housing typology

Standard floor plan

1 Transfer zone
2 Private apartment
3 Collective kitchen
4 Collective living room
5 Room
6 Shared bathroom
7 Balcony
8 Elevator/ stairs

0 0.5 1 2m





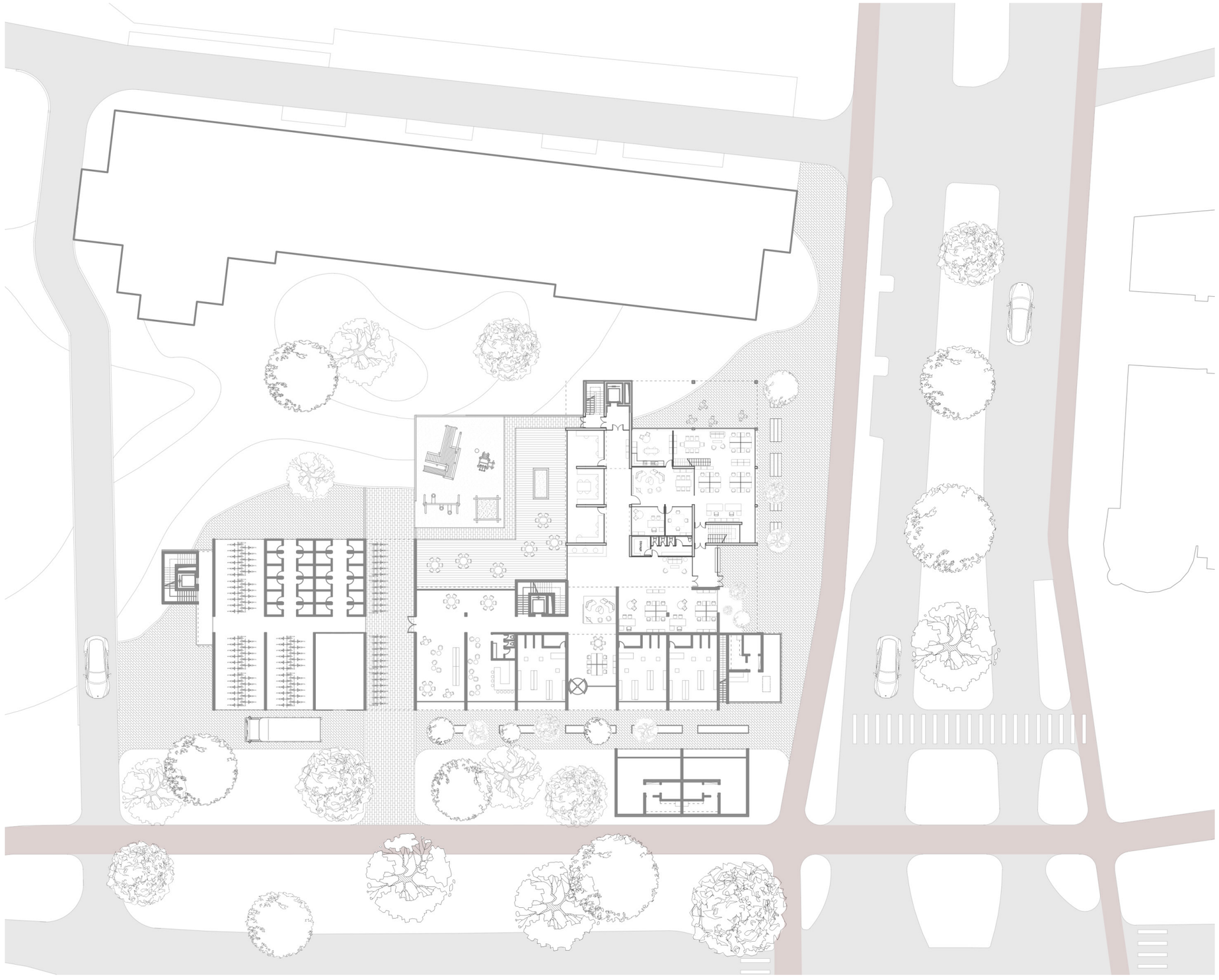
Tower housing typology

Standard floor plan

Shared spaces
Private bedrooms

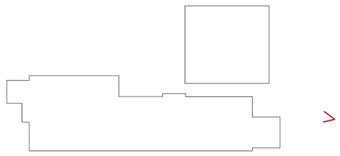
0 0.5 1 2m

Tower living room
Impression

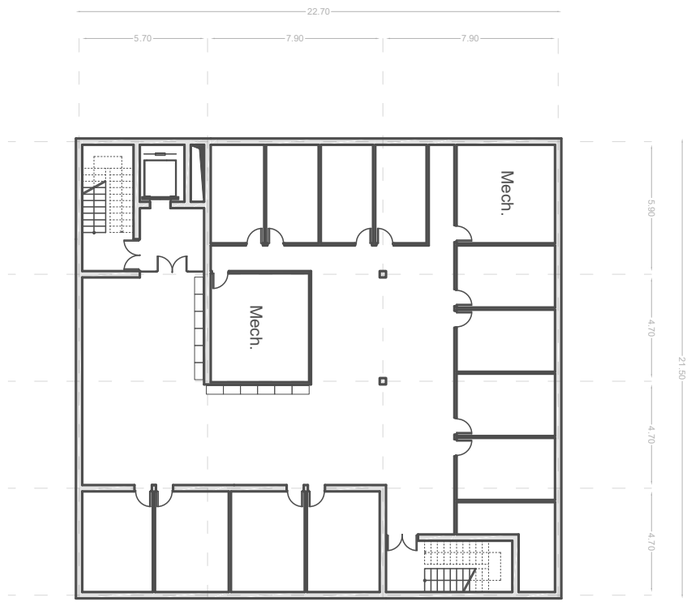


Site plan

0 5 10 20m

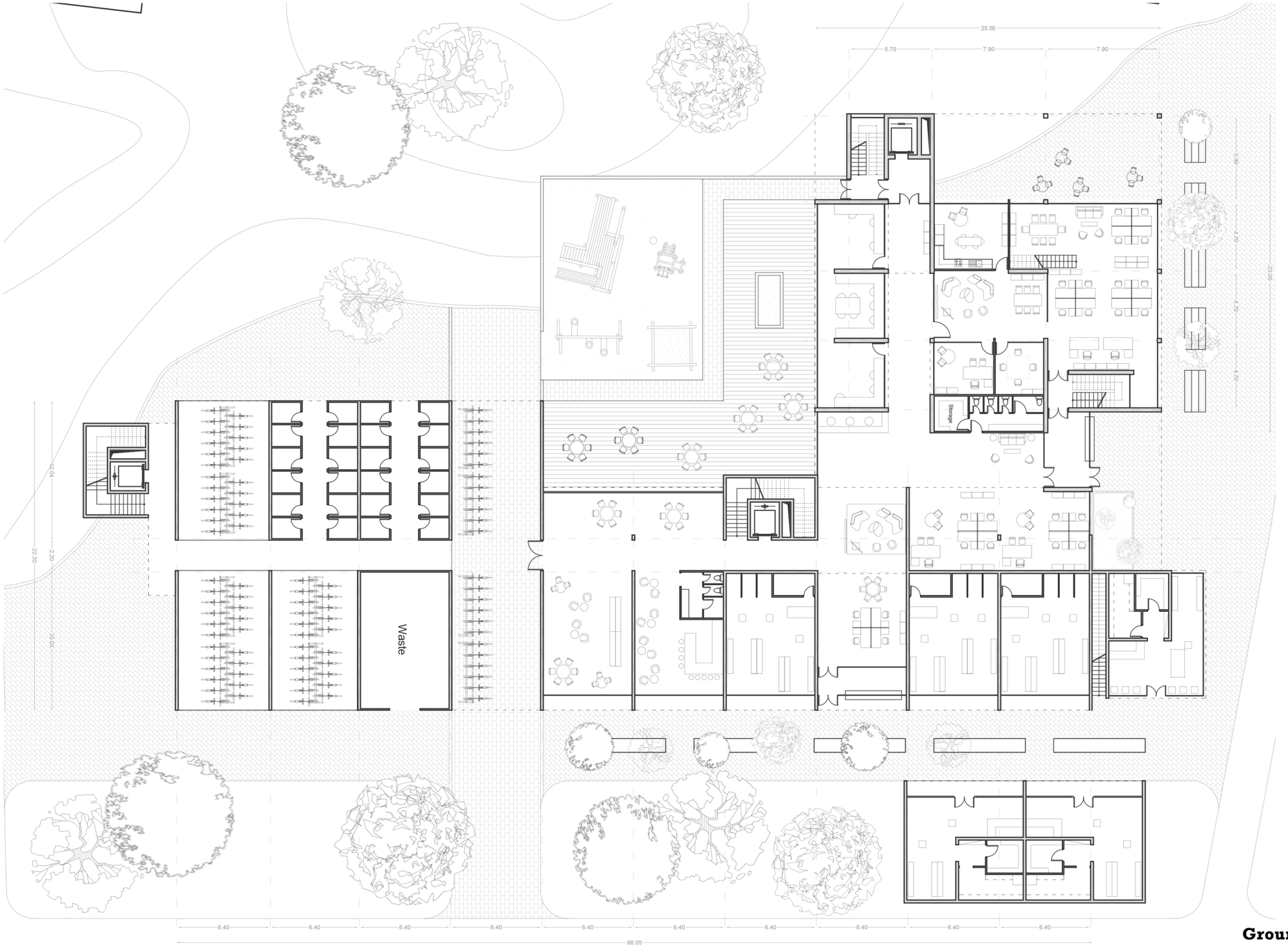


Statenweg impression



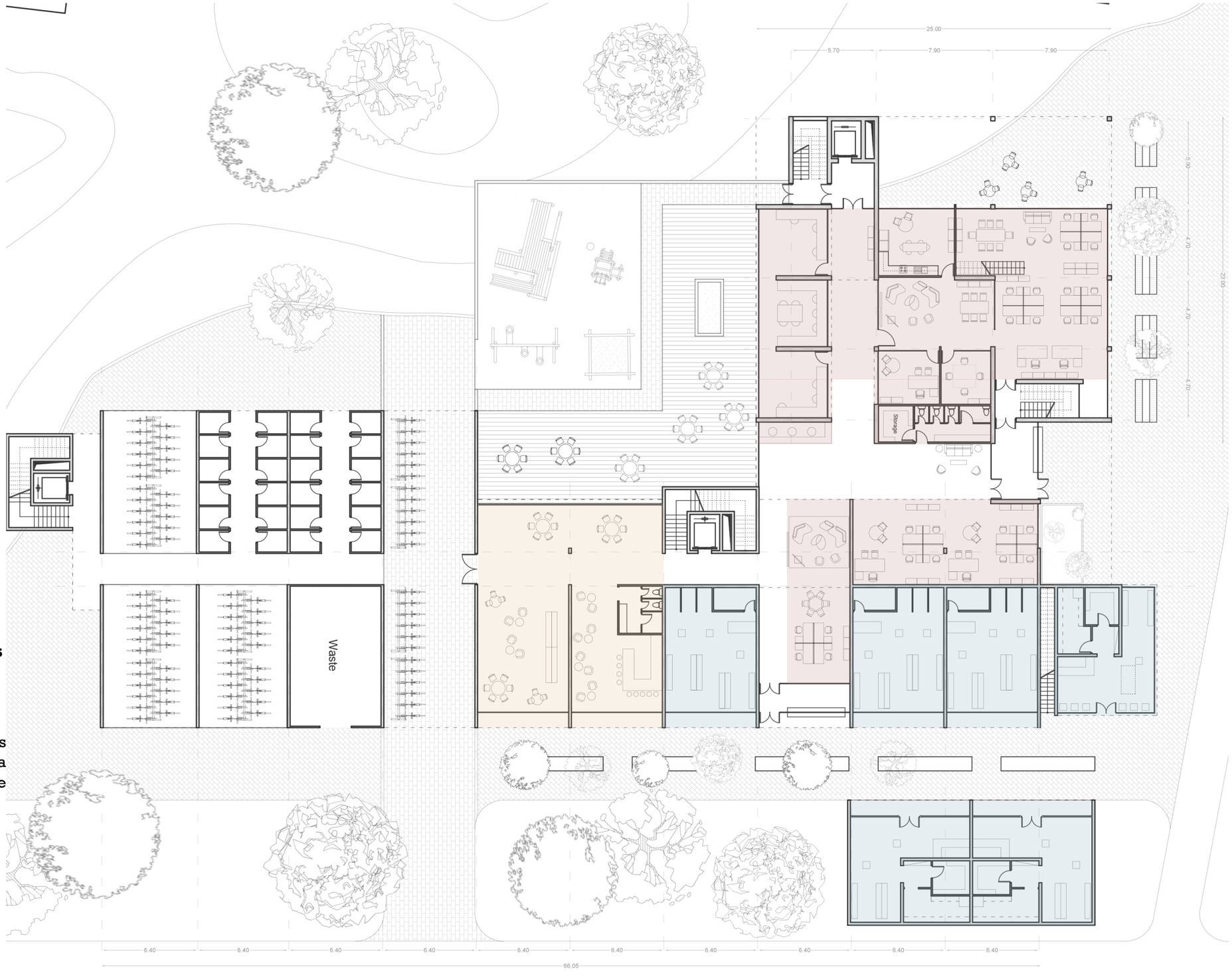
Basement plan

0 1 2 5m



Ground floor plan

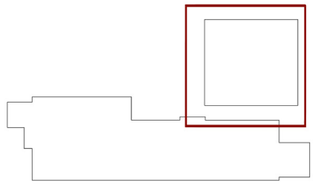
0 1 2 5m

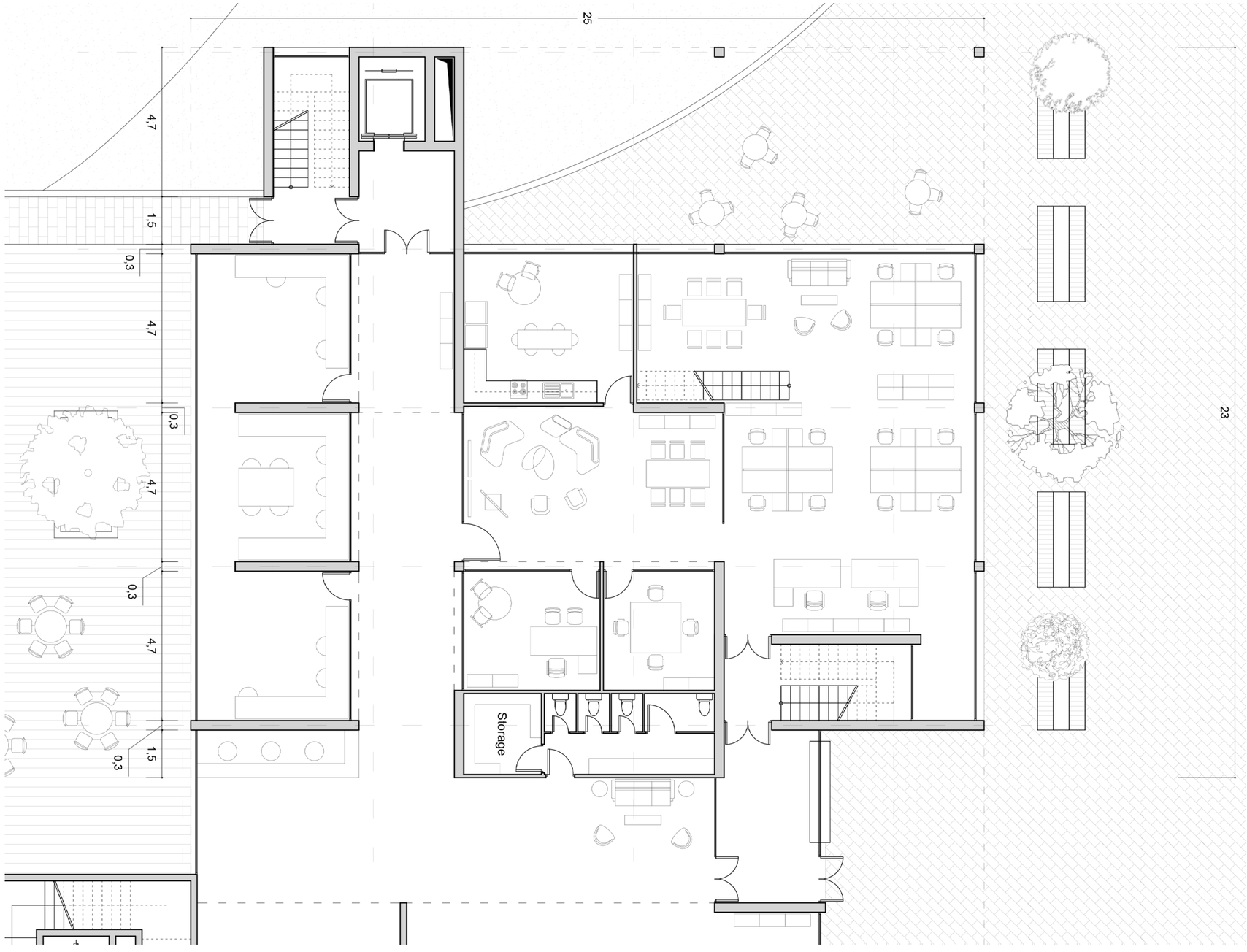


Ground floor land uses

Shops
Cafeteria
Work core

0 1 2 5m

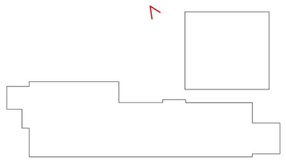




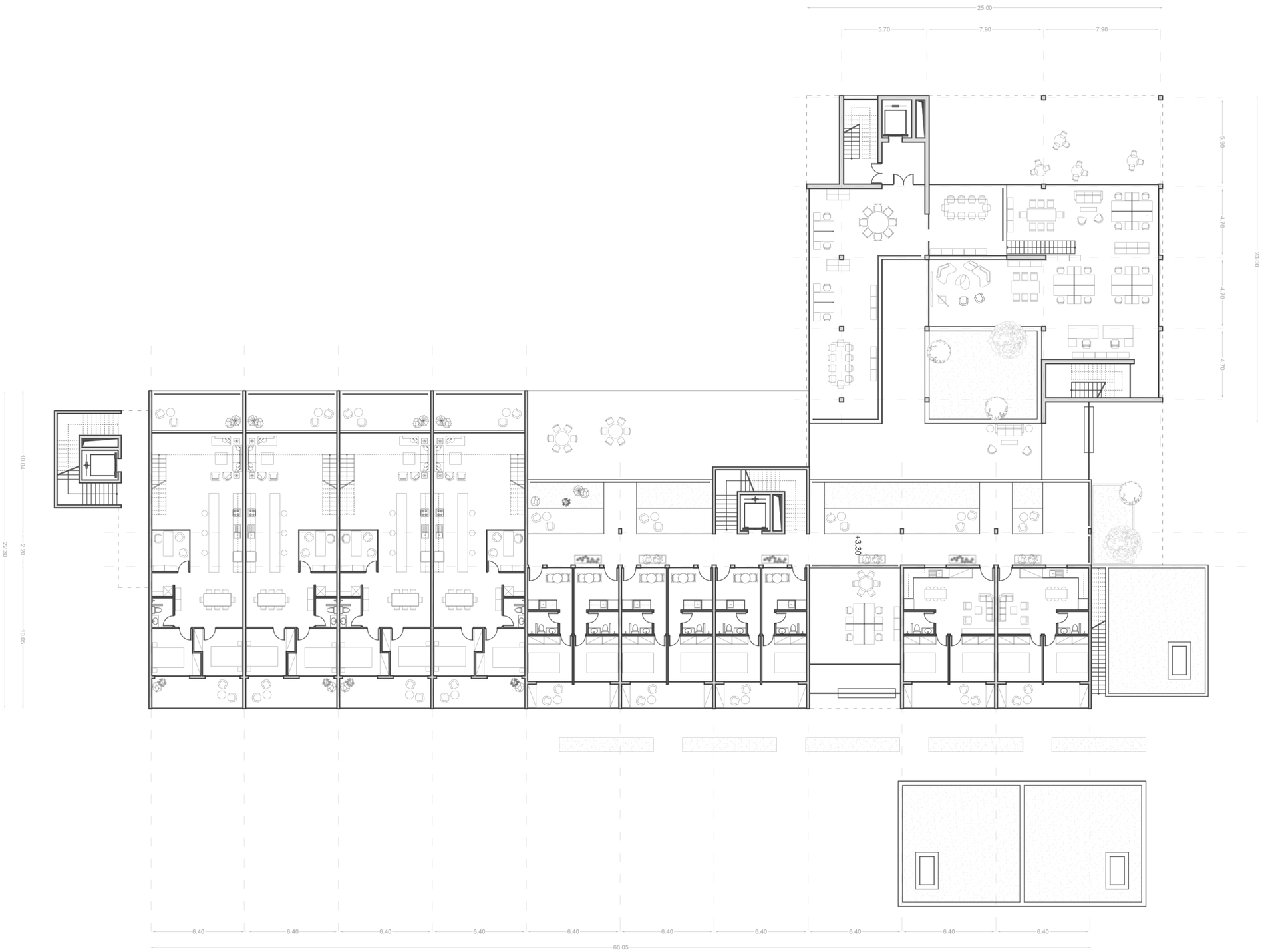
Dedicated co-operative space

Ground floor

0 1 2 4m

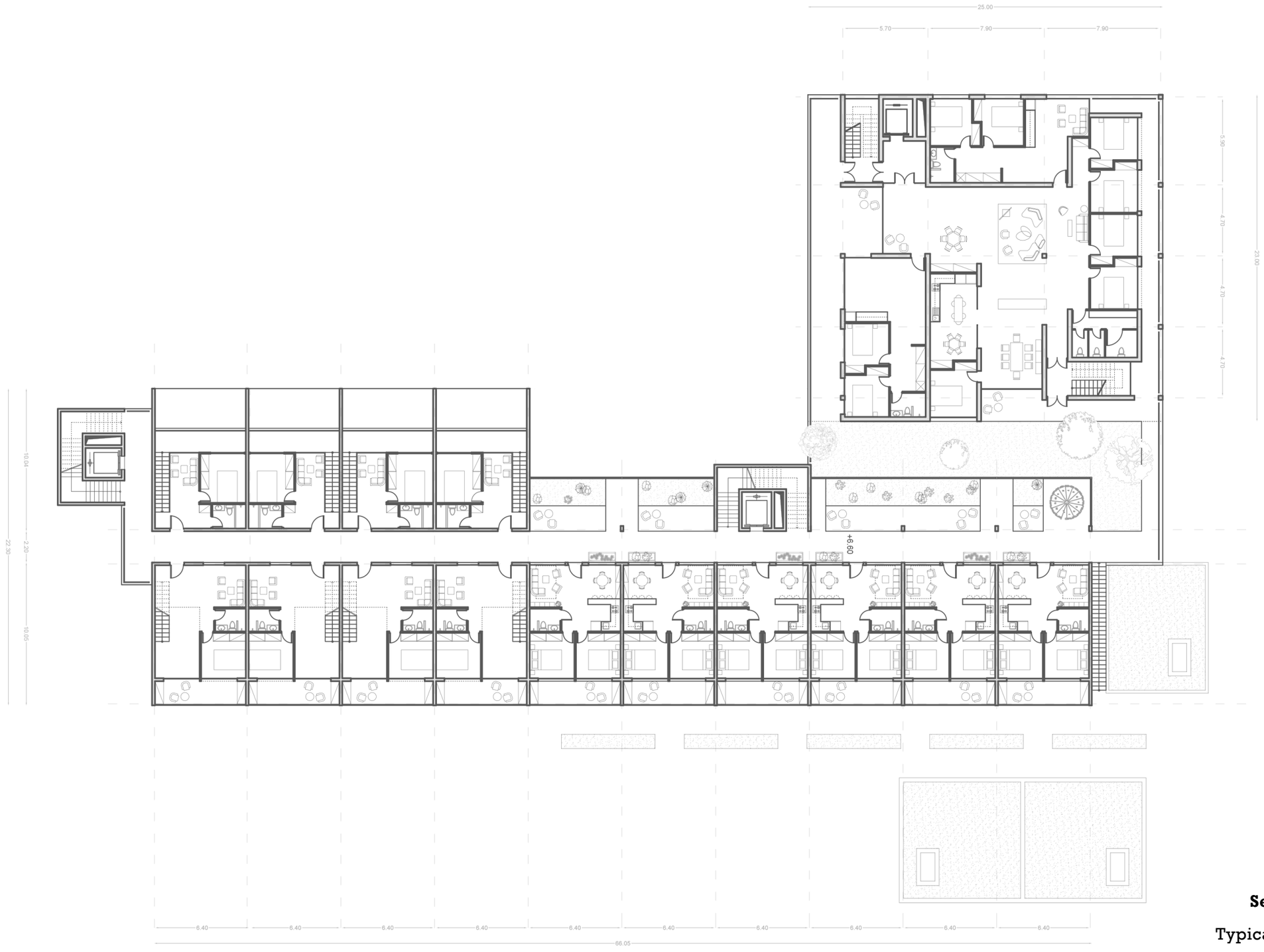


Back garden Impression



First floor plan

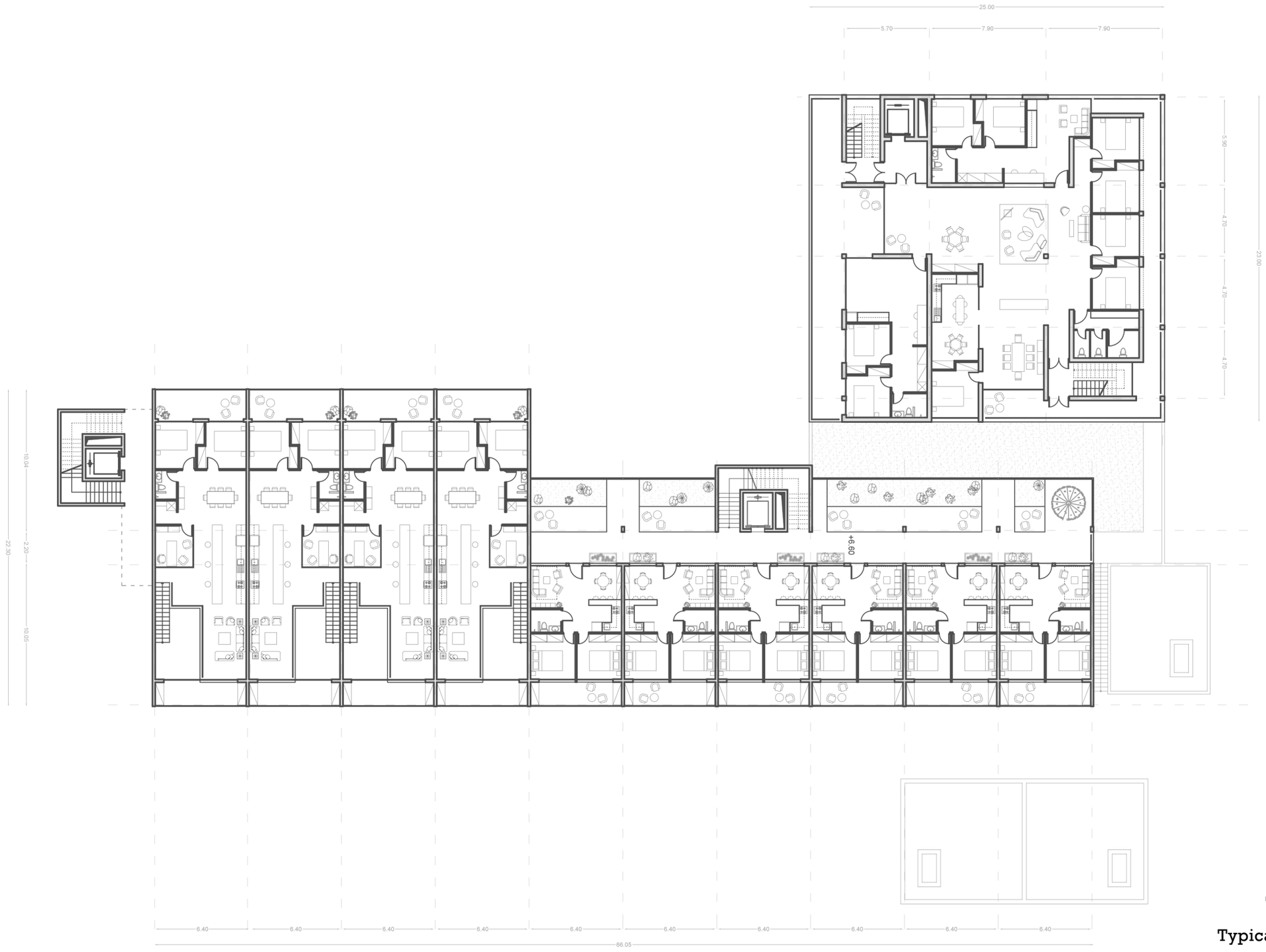
0 1 2 5m



Second floor plan

Typical housing plan 1

0 1 2 5m



Third floor plan

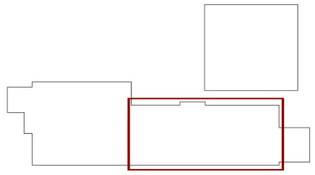
Typical housing plan 2

0 1 2 5m

Fifth floor plan

Emmahuis rooftop plan

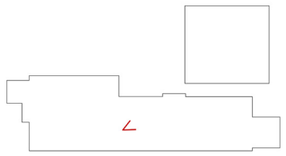
0 1 2 5m



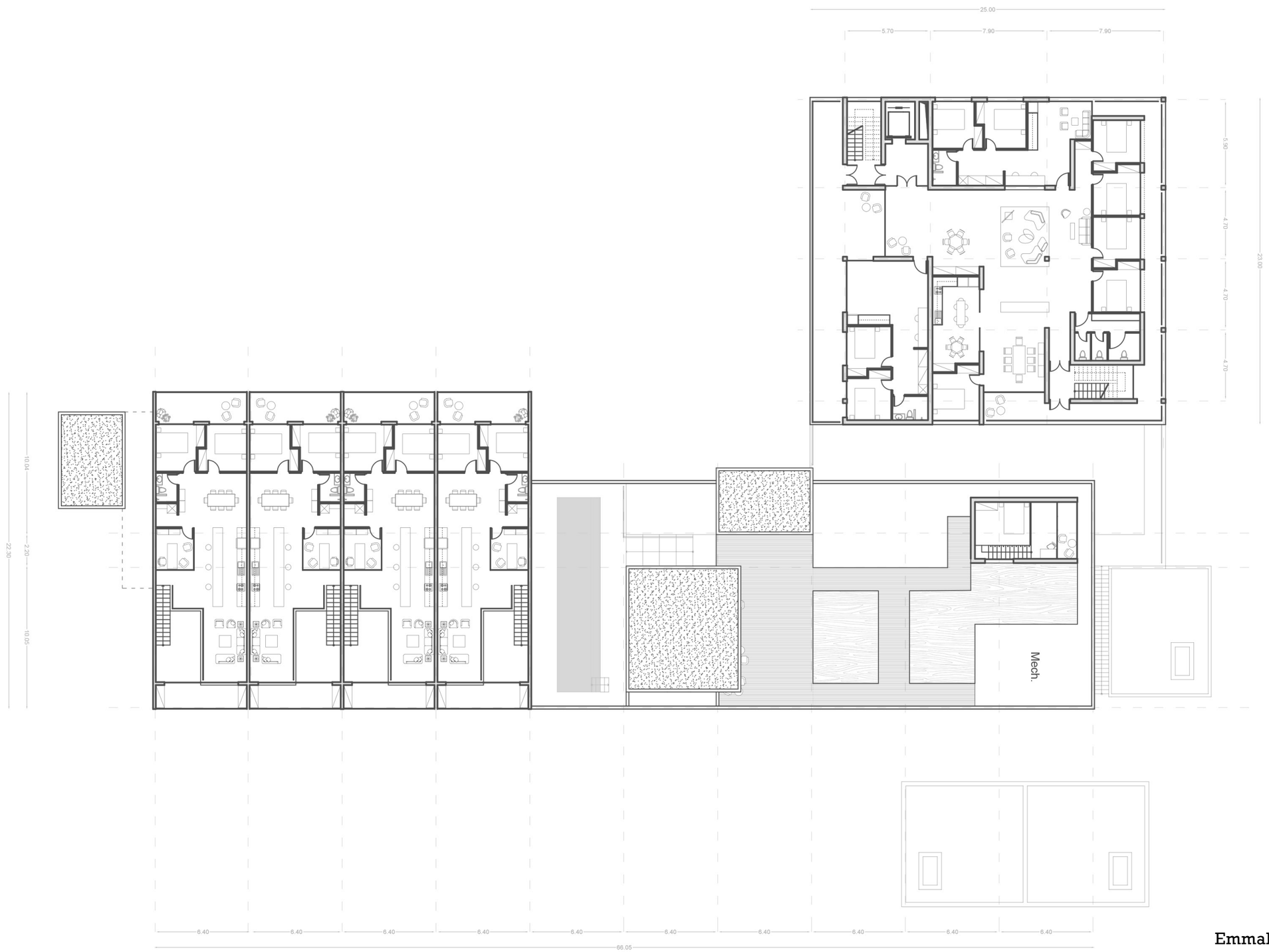
Dedicated co-operative space

Fifth floor

0 1 2 4m



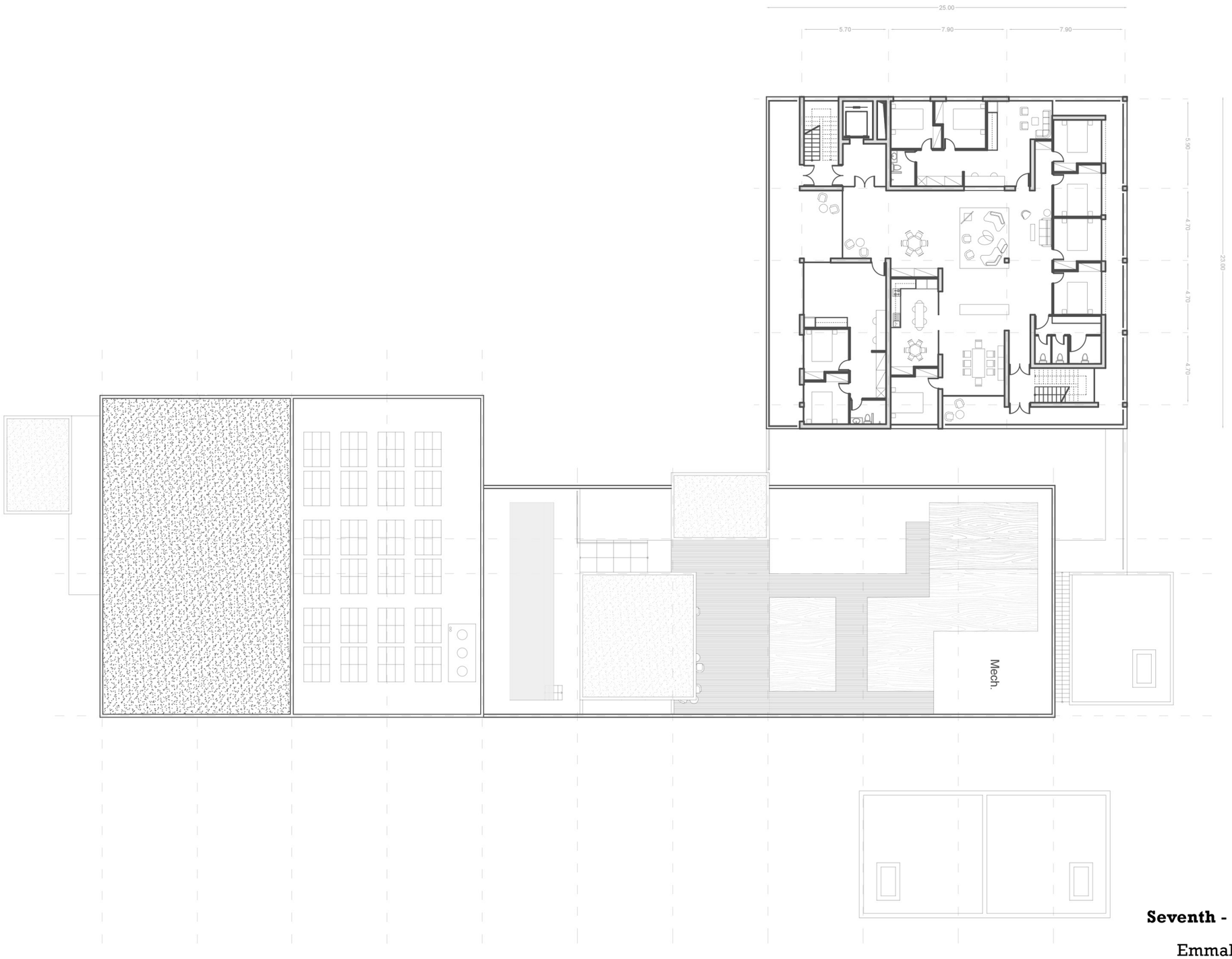
Rooftop shared facilities
hotel rooms
Impression



Sixth floor plan

Emmahuis rooftop plan

0 1 2 5m

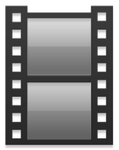


Seventh - ninth floor plan

Emmahuis rooftop plan

0 1 2 5m

CO - LIVING EXAMPLES



Tower

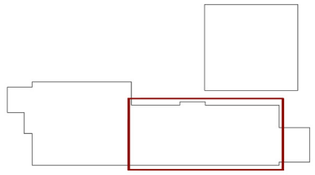
Morning routines

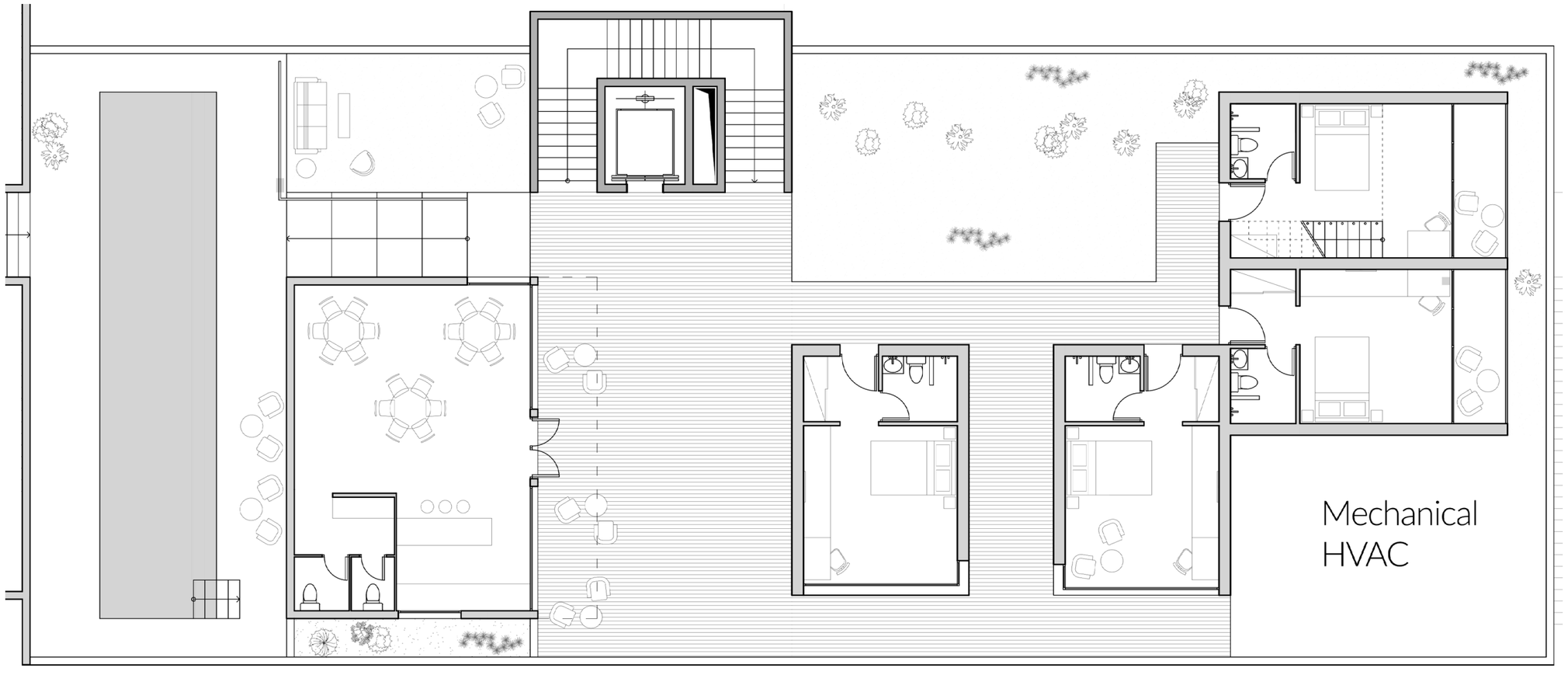
Tower

Afternoon routines

Tower

Possible problems





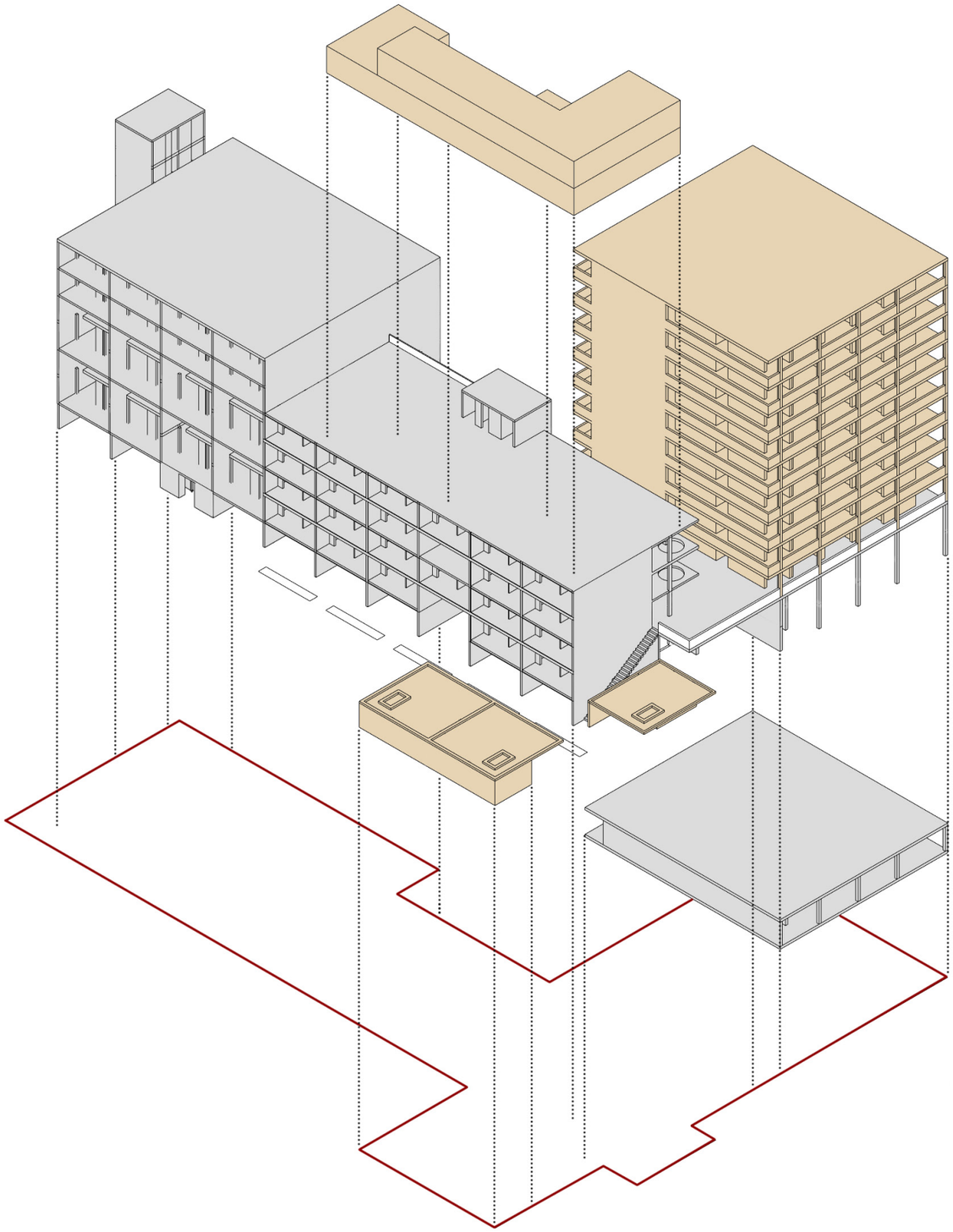
Dedicated co-operative space

Solution to the problem

0 1 2 4m

Existing structure

Reinforced concrete envelopes



Structure Lv. 03-09

Metal structure

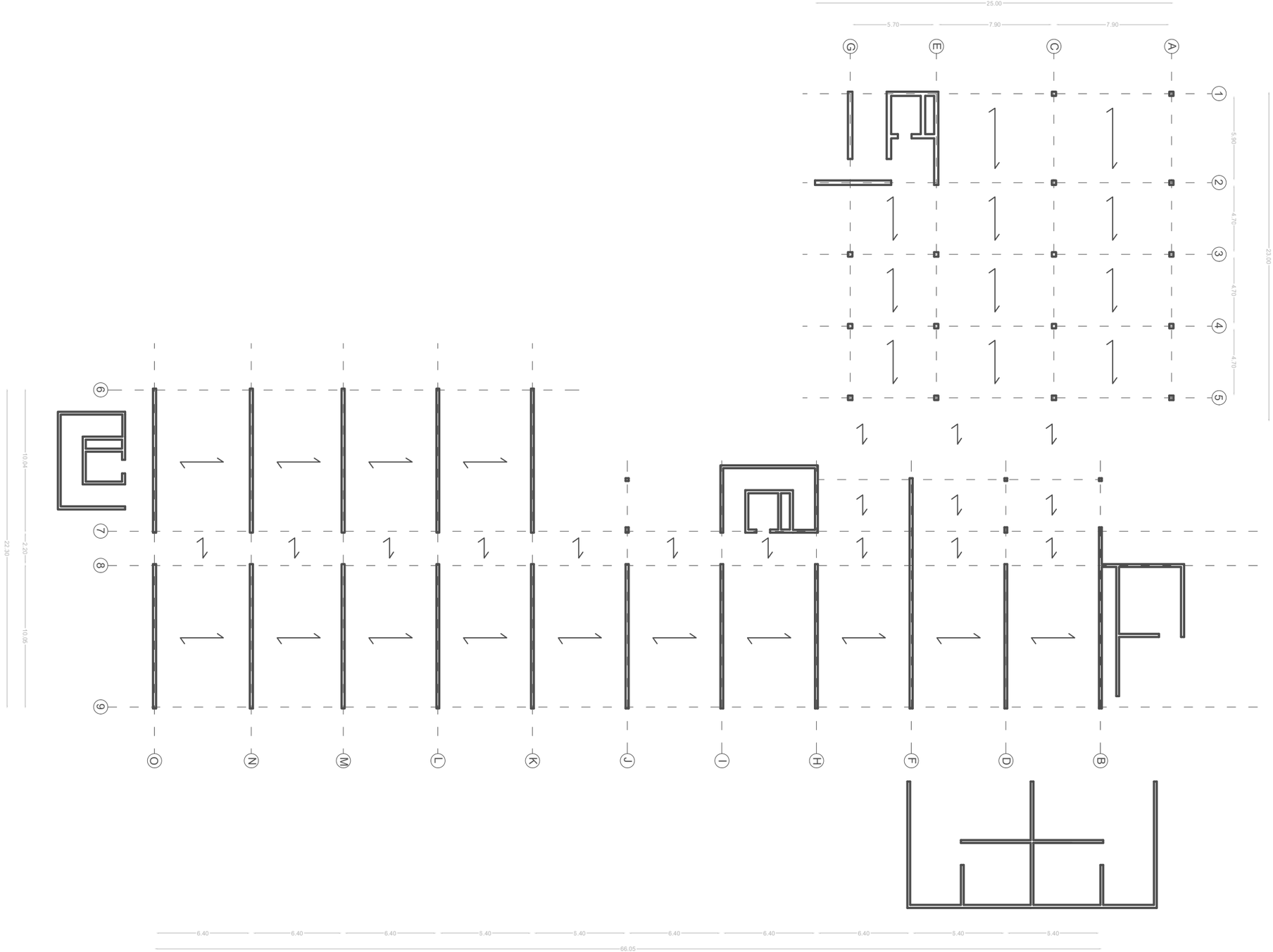
Reinforced concrete cores

Structure Lv. -01-02

Reinforced concrete floors and columns

Site

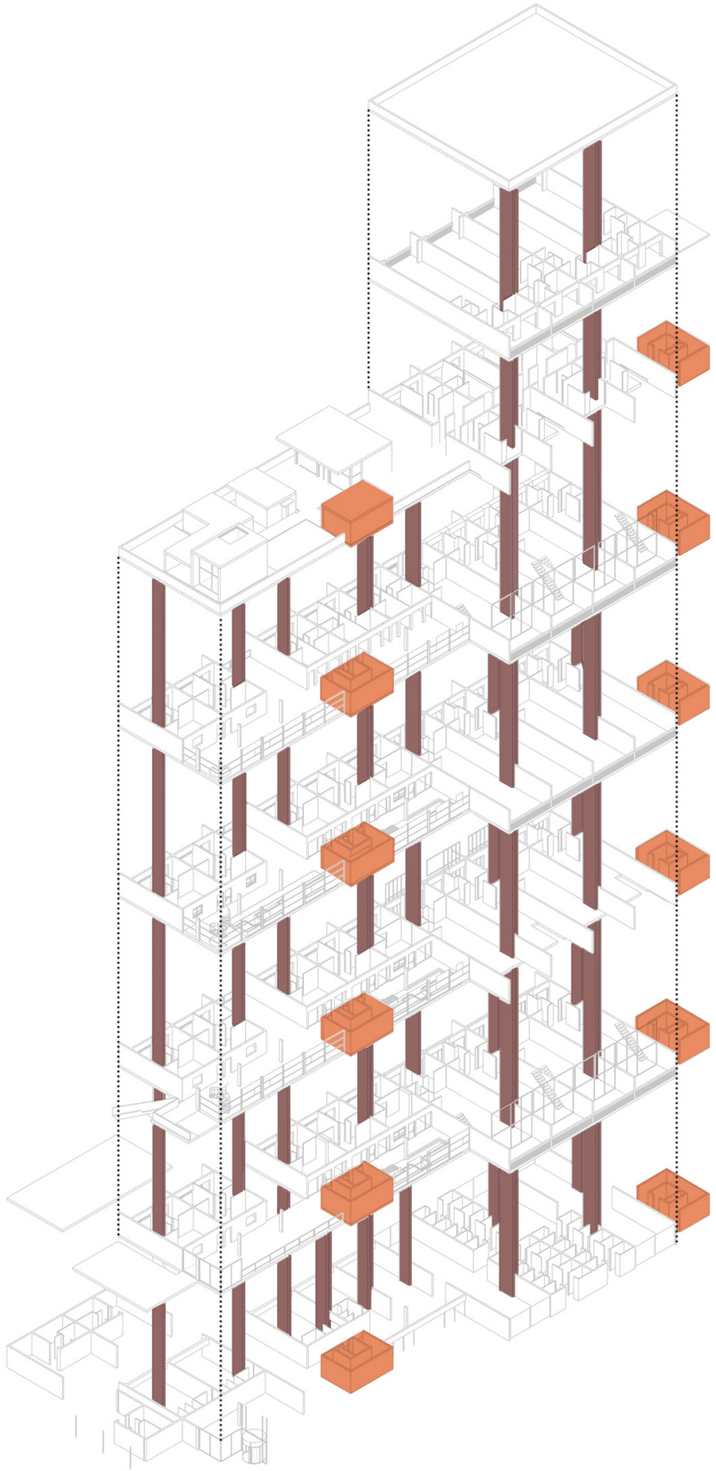
-1.5 meters from sea level



Structure diagram

Concrete beams & columns

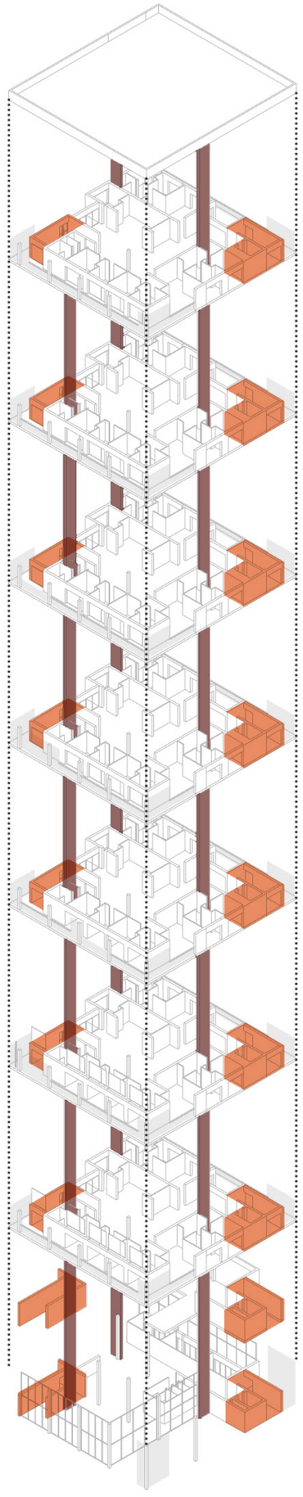
0 1 2 5m



Shafts diagram

Emmahuis

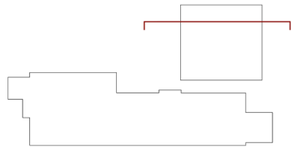
Circulation
Shafts



Shafts diagram

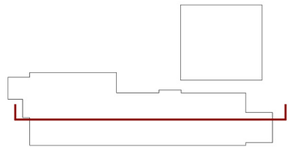
New tower

Circulation
Shafts



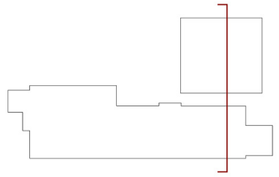
Section AA

0 1 2 5m



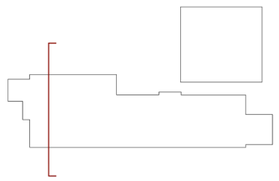
Section BB

0 1 2 5m



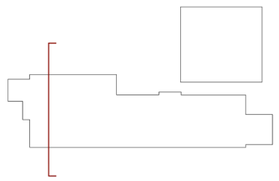
Section CC

0 1 2 5m



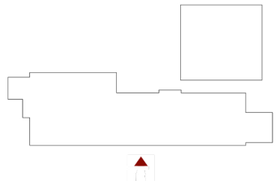
Section DD

0 1 2 5m



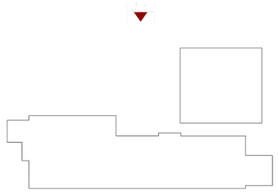
Section DD

0 1 2 5m



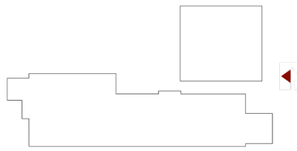
East elevation

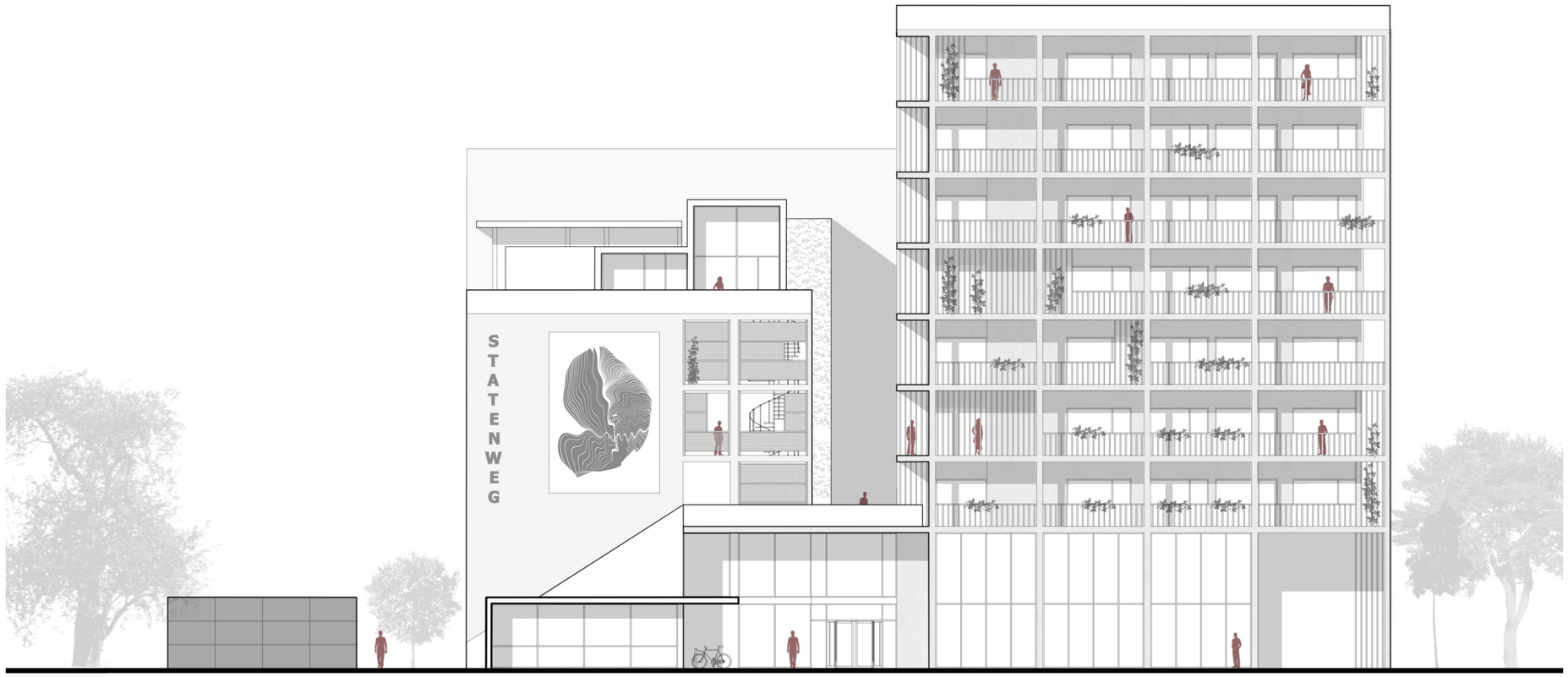
0 1 2 5m



West elevation

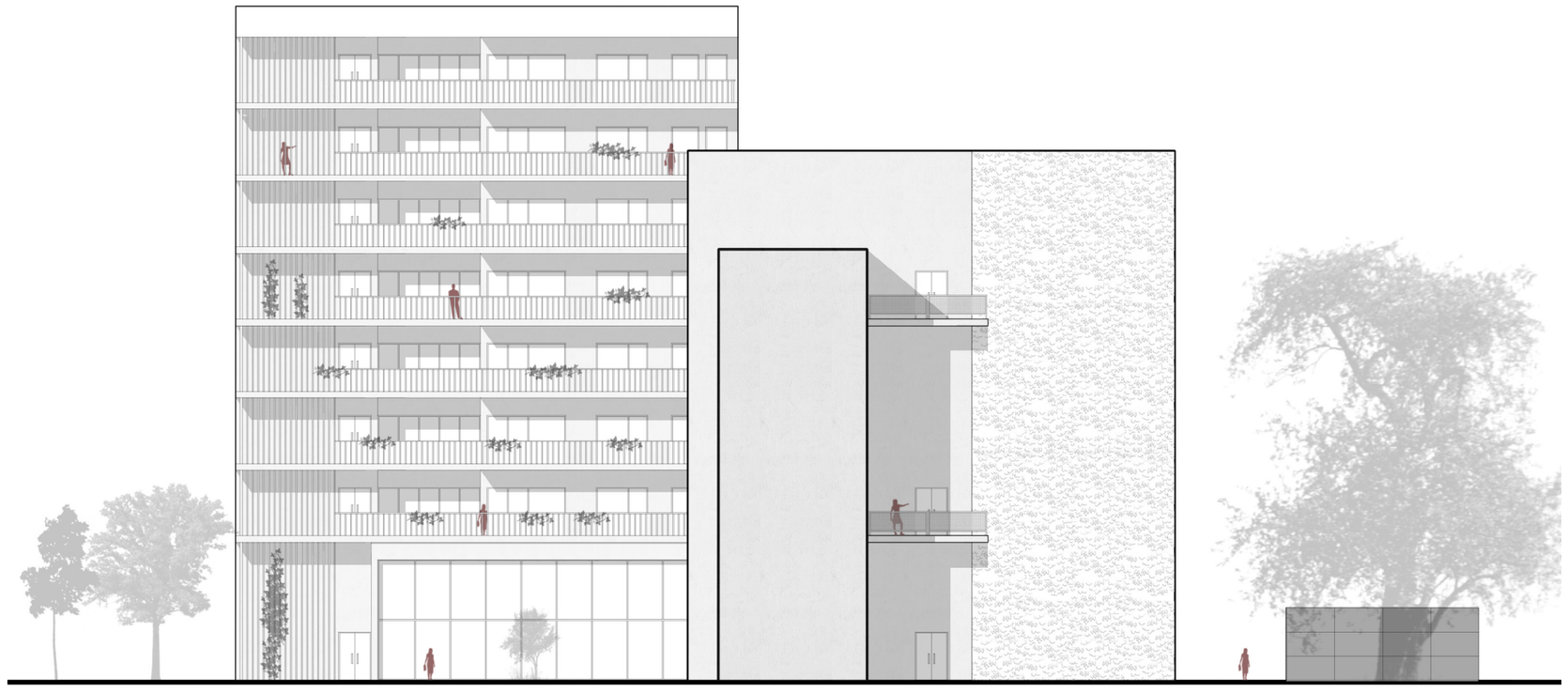
0 1 2 5m





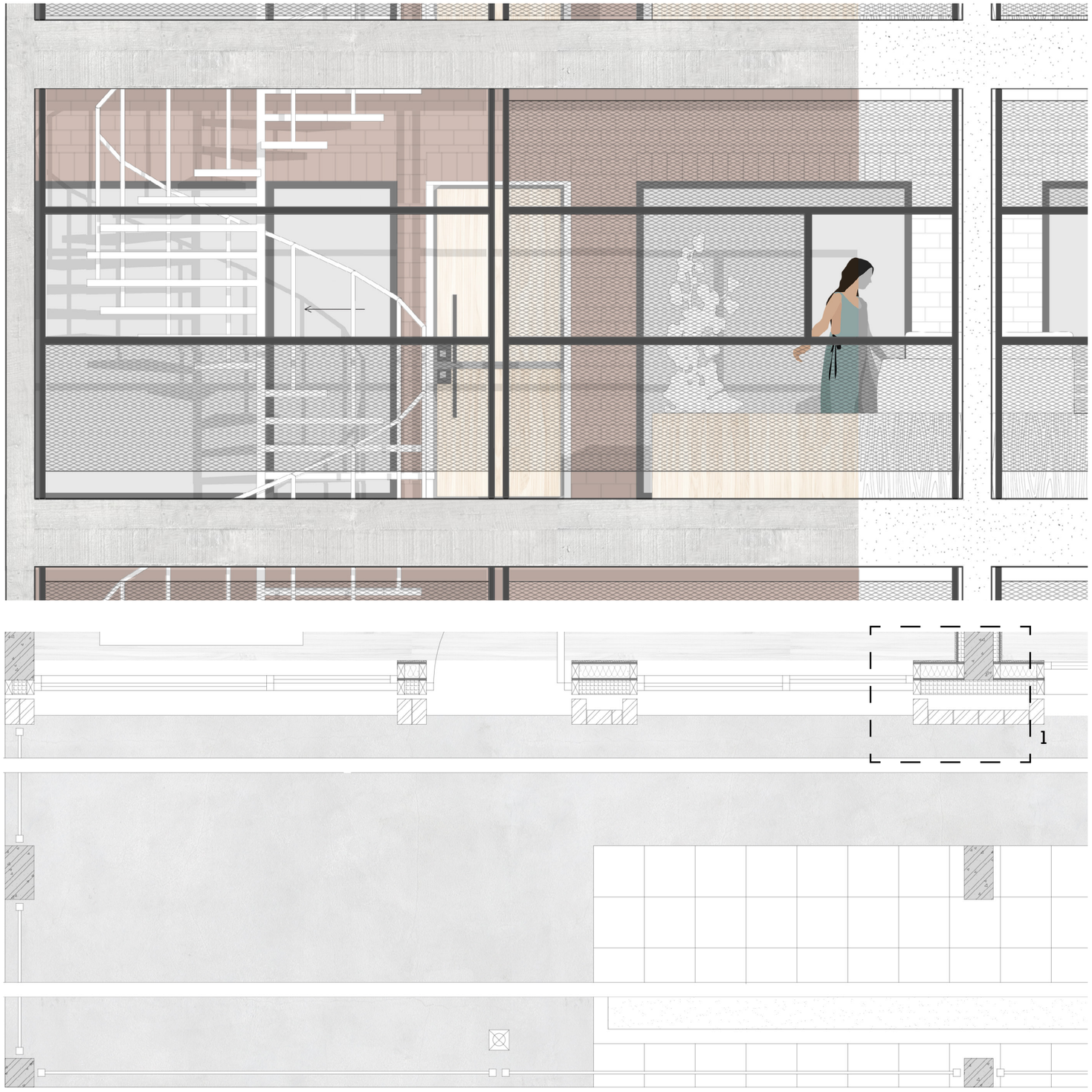
North elevation

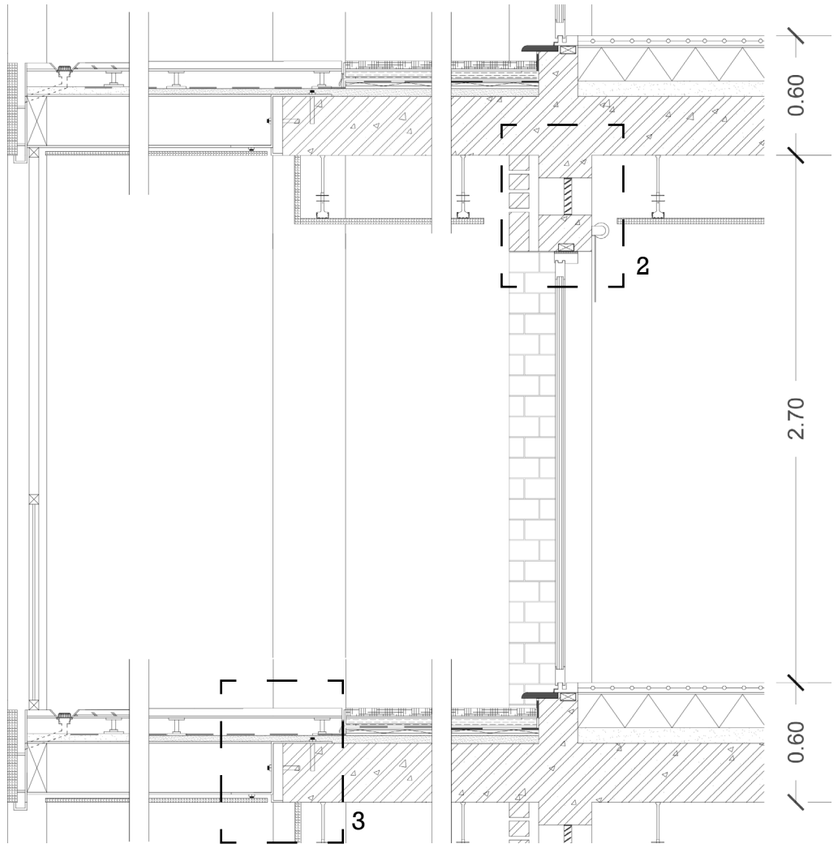
0 1 2 5m



South elevation

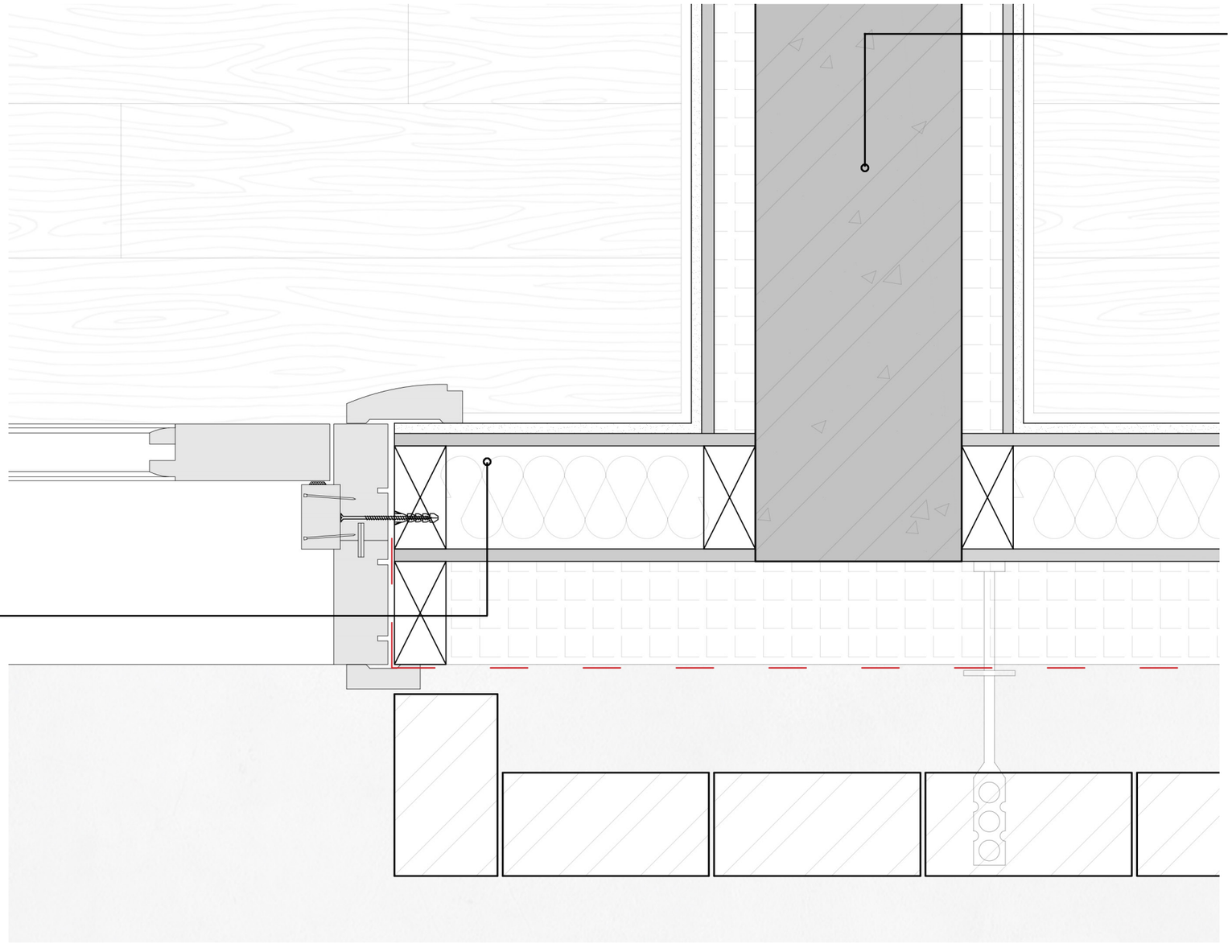
0 1 2 5m





Emmahuis Fragment

0 0.5 1 2m



Interior wall structure

10mm Stucco
12.5mm Plasterboard
40mm Solid heat+sound insulation
300mm Reinforced concrete wall
40mm Solid heat+sound insulation
12.5mm Plasterboard
10mm Stucco

Exterior wall structure

100mm Brick
100mm Air cavity
Waterproofing sheet
100mm Solid heat+sound insulation
12.5mm Plasterboard
100mm Soft heat insulation
12.5mm Plasterboard
10mm Stucco
Wooden door jamb

Detail 1
Door detail

0 7.5 15 30cm

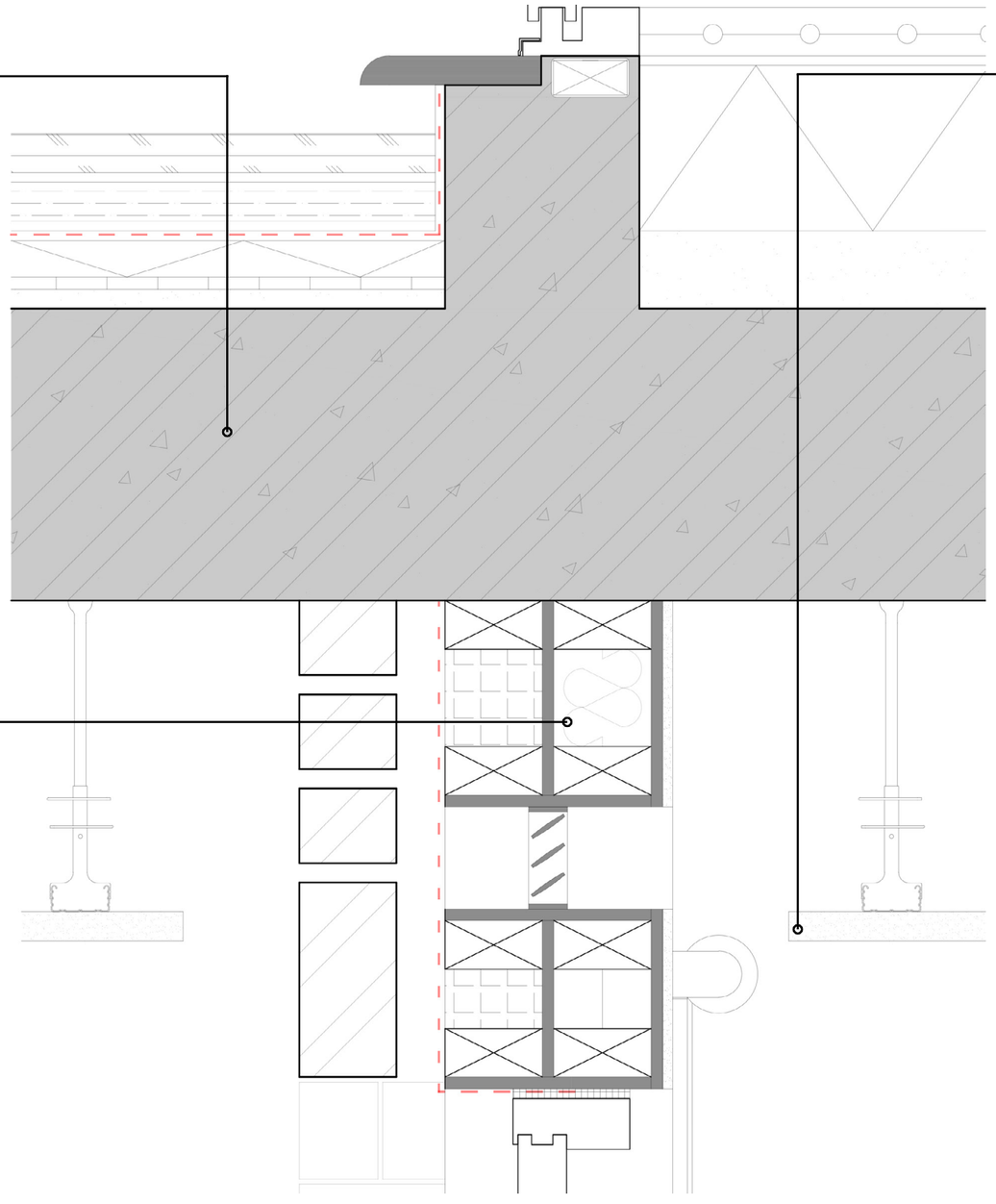
Exterior structure

Final floor surface
Drainage- Water storage
Waterproofing layer
40mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Reinforced concrete structure

Wall structure

100mm Brick
50mm Air gap
Waterproofing sheet
100mm Solid heat+sound insulation
12.5mm Plasterboard
100mm Soft heat insulation
12.5mm Plasterboard
10mm Stucco

HVAC Air filtration / Circulation
Aluminum double glazed sliding door



Interior wall structure

Final flooring
Heated floor installation
Moisture seal
170mm Solid heat insulation
Screed concrete/ leveling
300mm Reinforced concrete structure
320mm Air gap/ HVAC space
30mm False ceiling

Detail 2
Window detail

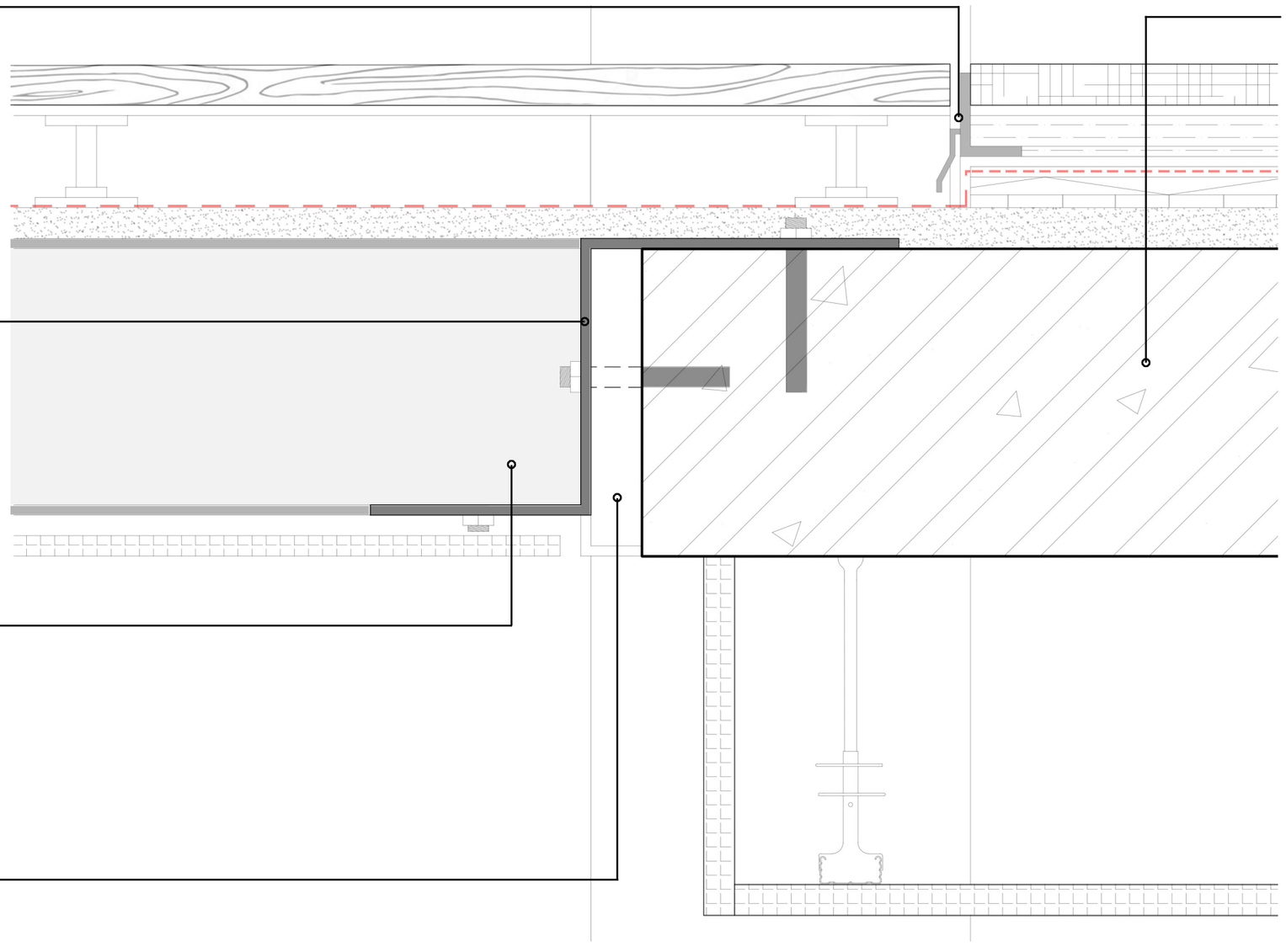
0 15 30 60cm

L finishing bracket

Existing structure

Final floor surface
Drainage- Water storage
Waterproofing layer
40mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Reinforced concrete structure

Steel-to-concrete
"Double L" connecting joint



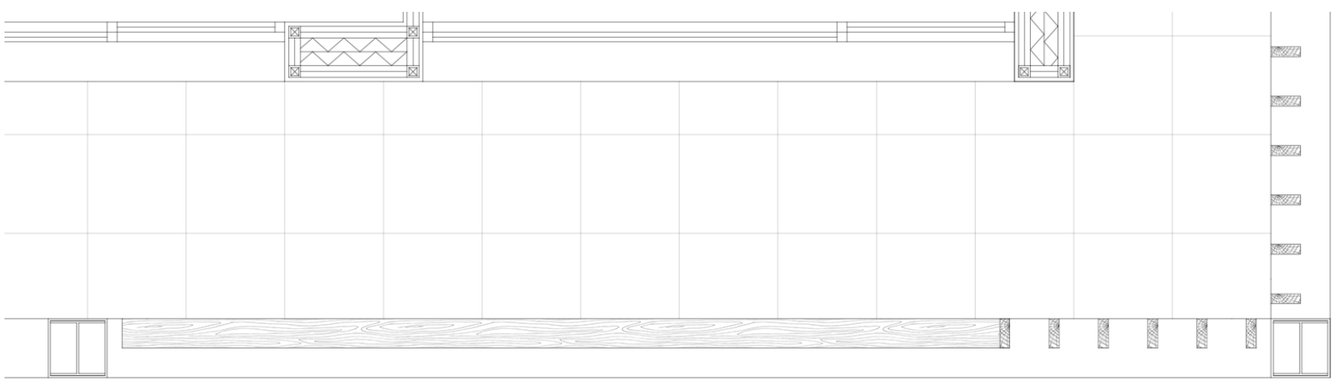
Balcony structure

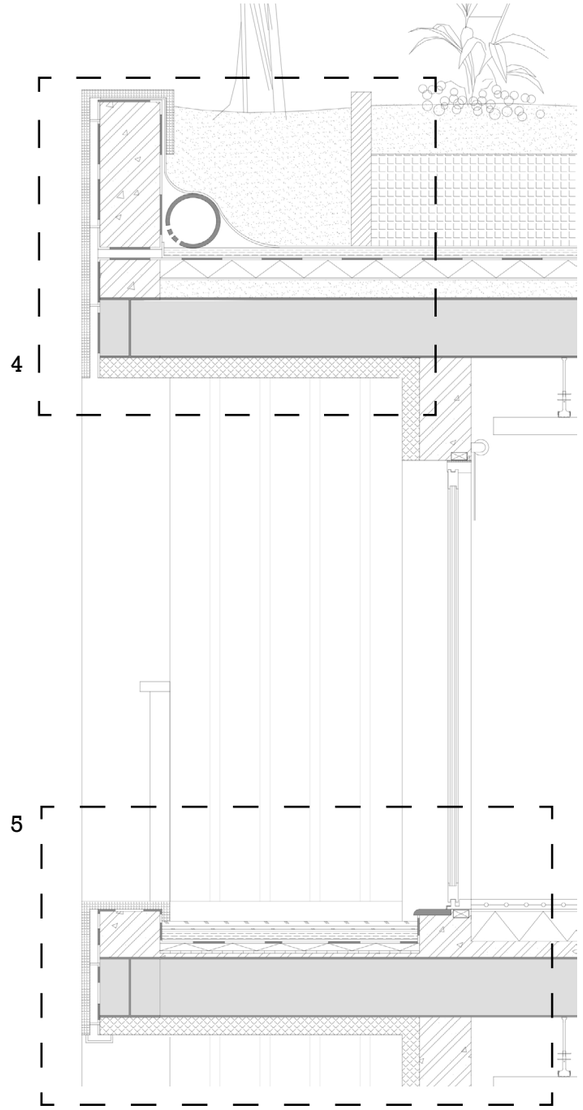
Wooden flooring
Shock absorbing layer
80mm Spacers
Screed concrete - Leveling
300mm Metal structure
25mm Air cavity
20mm False ceiling

50mm Hard silicone buffer

Detail 3
Balcony detail

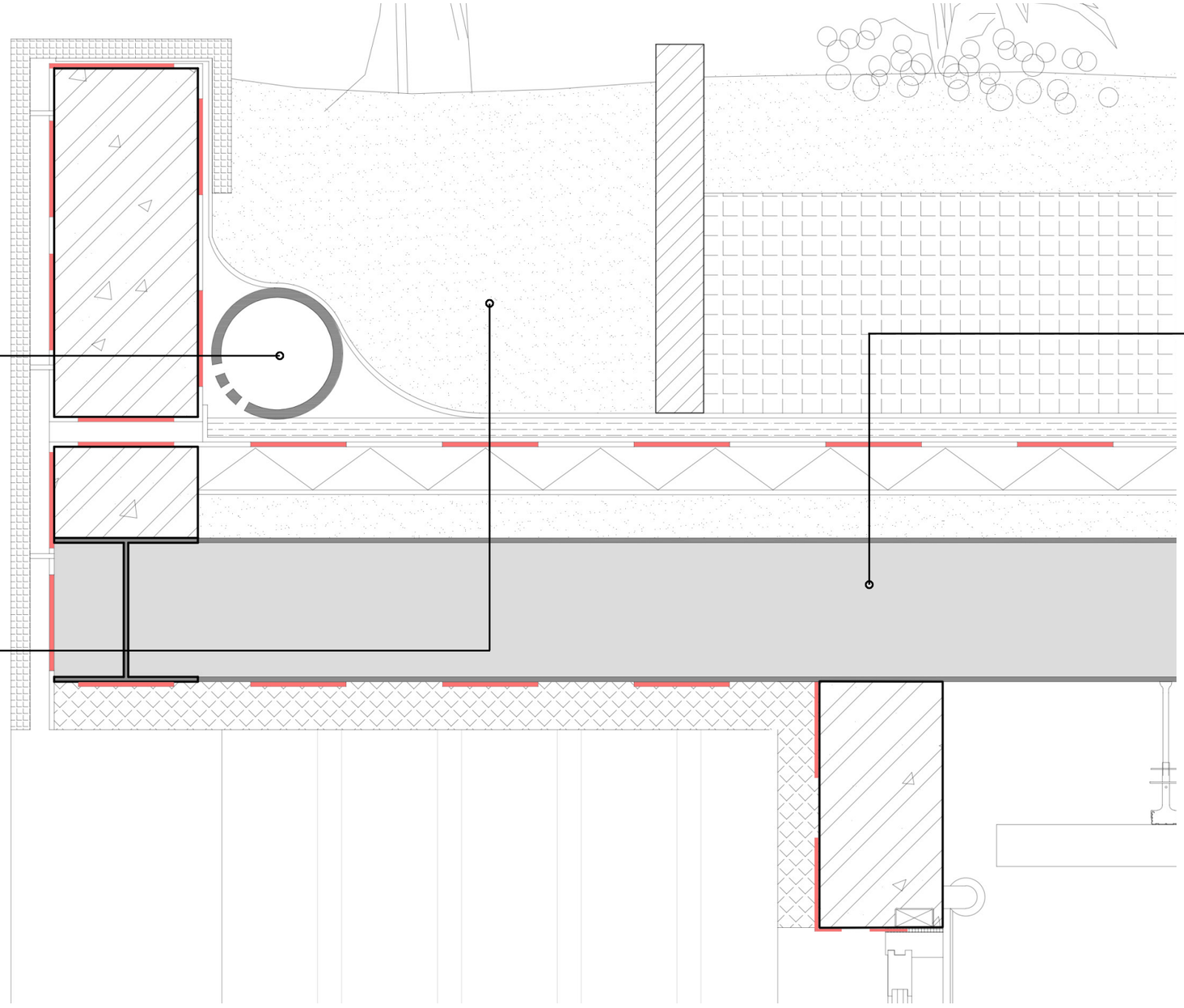
0 7.5 15 30cm





Tower Fragment

0 0.5 1 2m



Perforated piping

Green roof - Medium vegetation

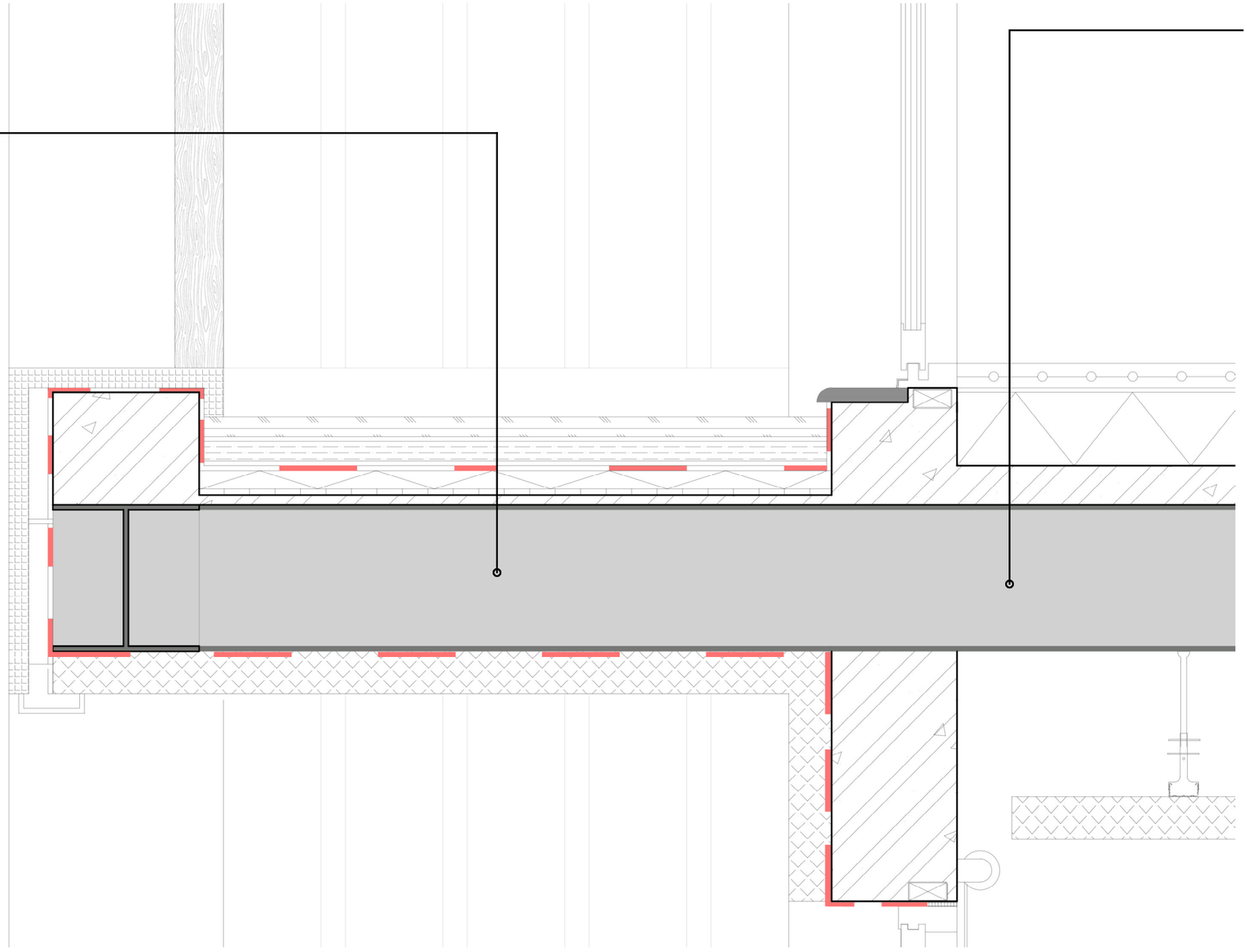
Vegetation
750mm soil
Filter fabric
Drainage - Water storage
Root barrier - mechanical protection
Waterproofing layer
90mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Steel beam structure

Green roof - Low vegetation
Vegetation
300mm soil
450mm Solid styrofoam
Filter fabric
Drainage - Water storage
Root barrier - mechanical protection
Waterproofing layer
90mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Steel beam structure

Detail 4
Green roof detail

0 15 30 60cm

Balcony structure
Final floor surface
Drainage- Water storage
Waterproofing layer
40mm Solid thermal insulation
Vapor barrier
Screed concrete - leveling
300mm Steel beam structure

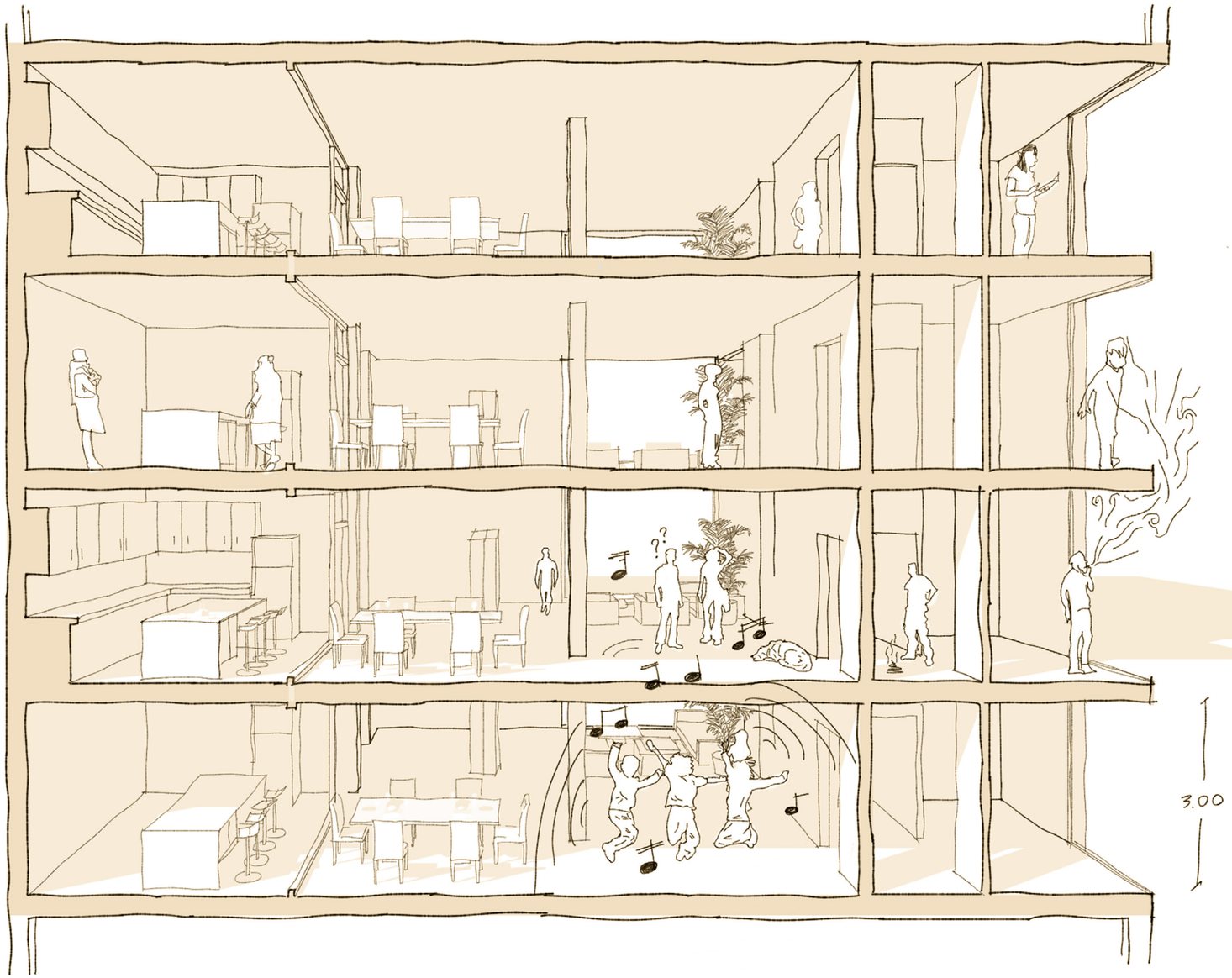


Interior floor structure

Final flooring surface
Heated floor installation
Moisture seal
150mm Solid thermal insulation
Screed concrete - leveling
300mm Steel beam structure

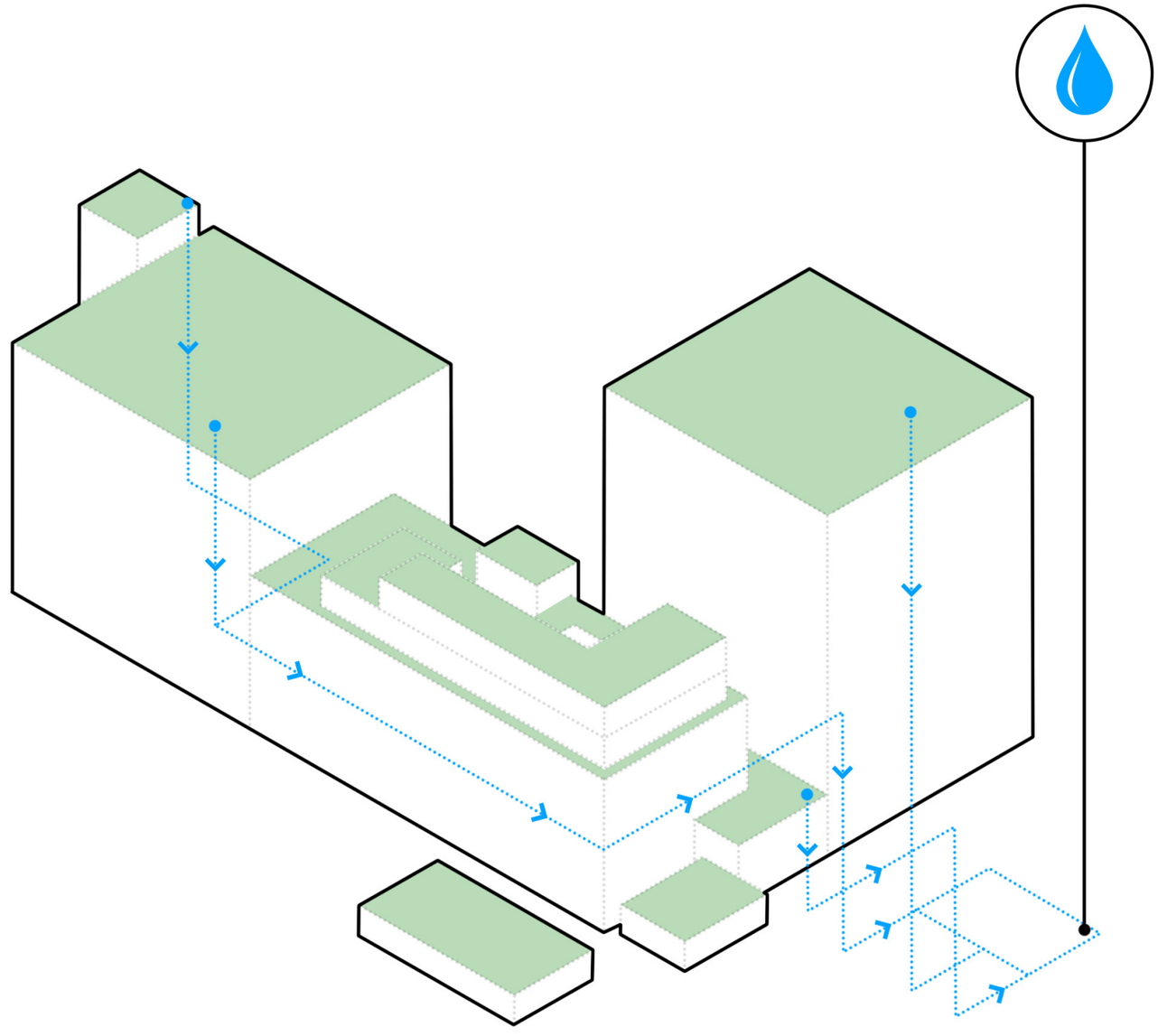
Detail 5
Balcony Detail

0 15 30 60cm



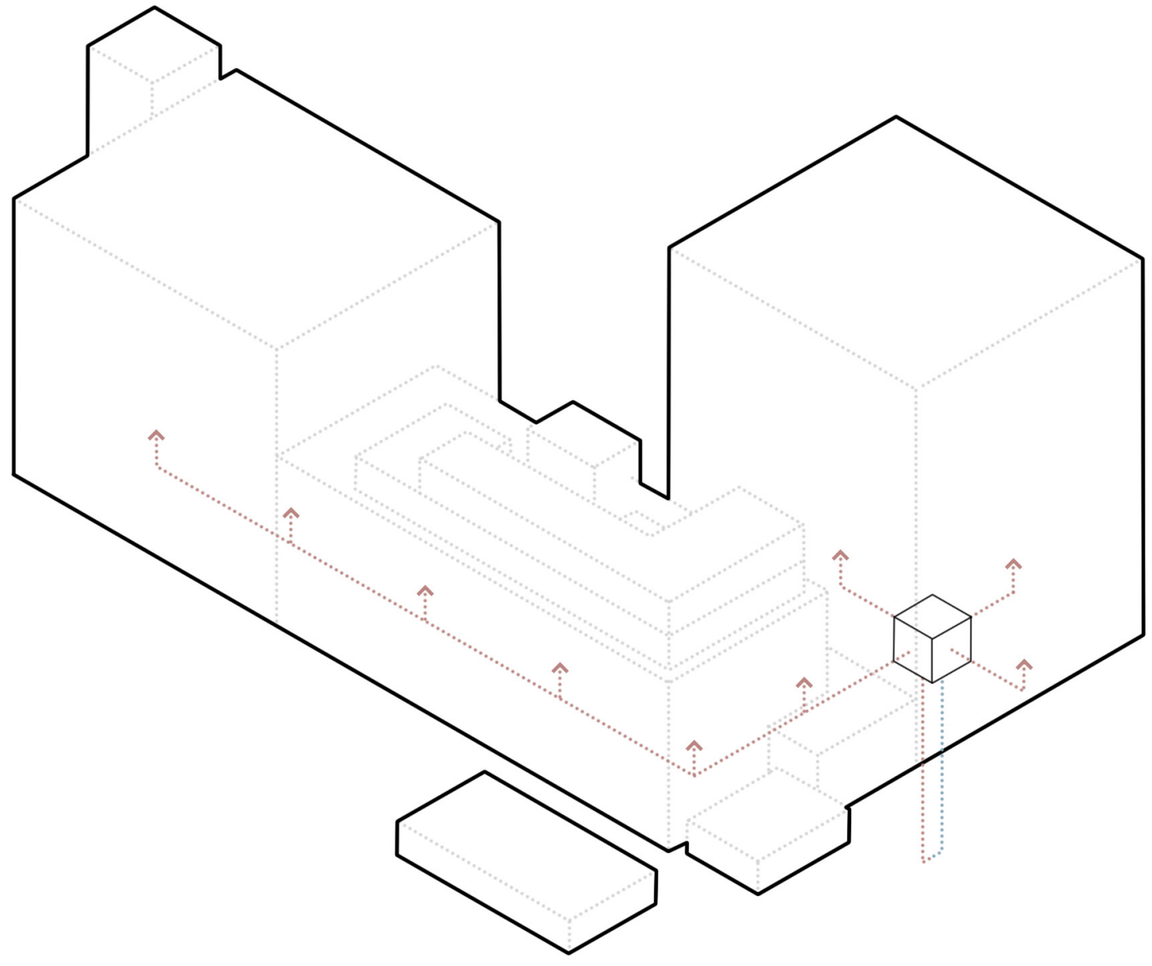
A situation
to be avoided

SUSTAINABILITY



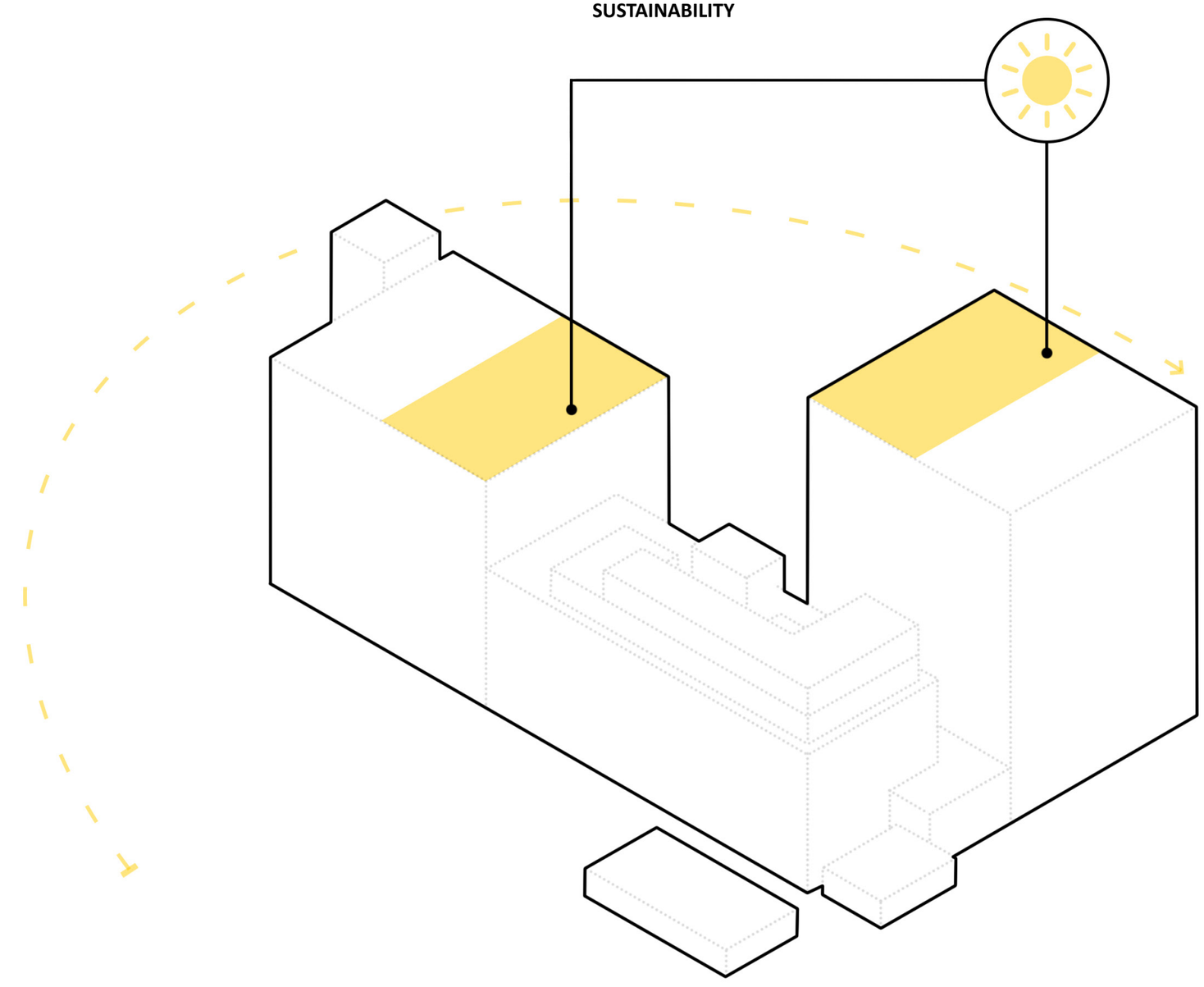
Green roofs and
Rainwater collection

SUSTAINABILITY



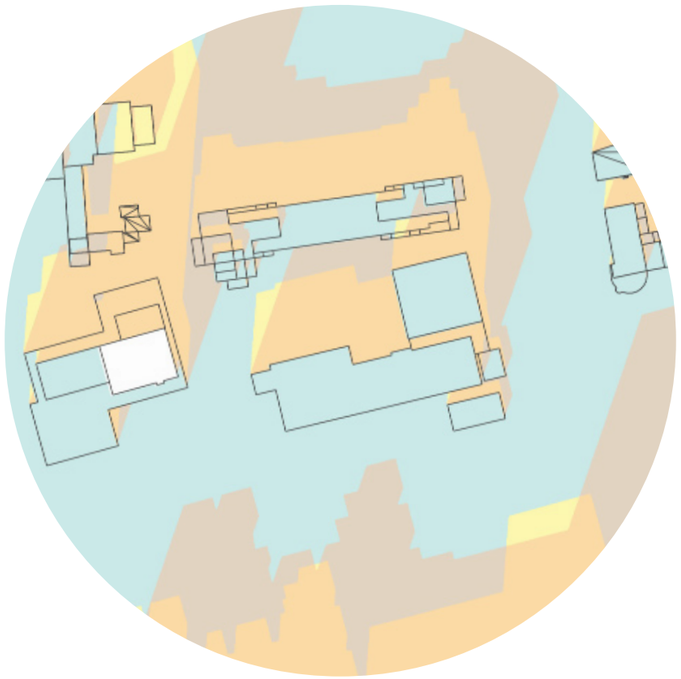
Centralized
underground heat pump

SUSTAINABILITY



Solar panels

SUN STUDY



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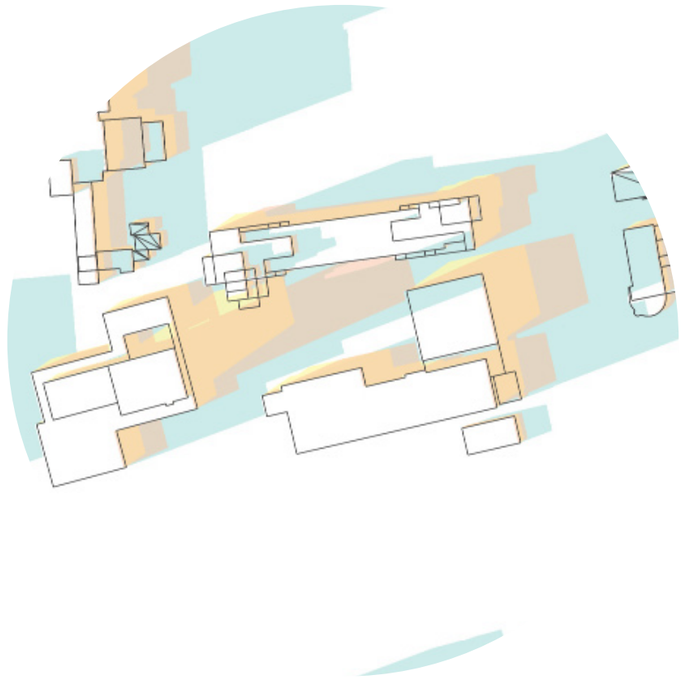
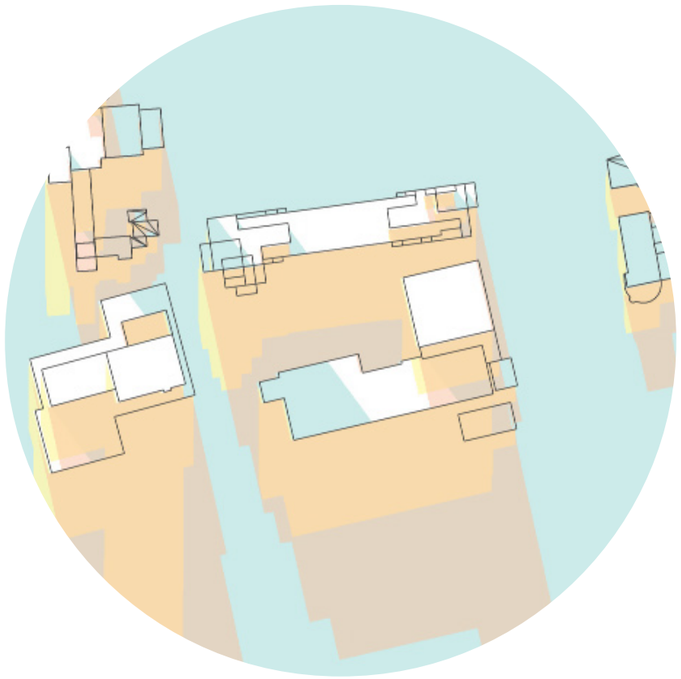


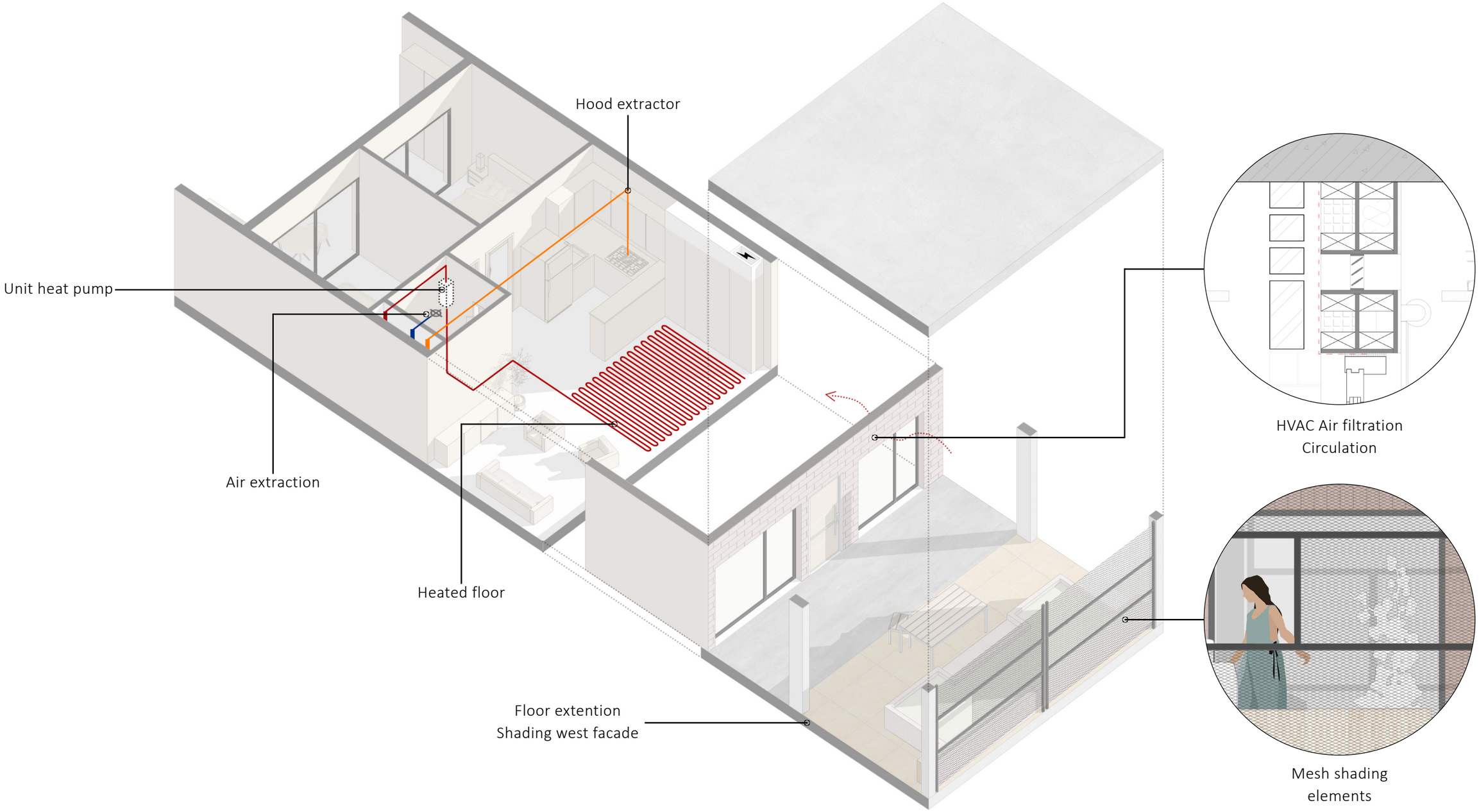
12:00



18:00

January
June
September

CLIMATE DIAGRAM - INDIVIDUAL DWELLING



EXISTING BUILDING

90 individual rooms
Building Efficiency: 76%

Gallery access
Individual room

PROPOSED DESIGN

Total estimated build cost (1.500€ * 14.584m2): 21.876.000 €
119 individual rooms
Building Efficiency: 71.54%

"New tower apartment"
7 units
Rent cost: 400€ / Person

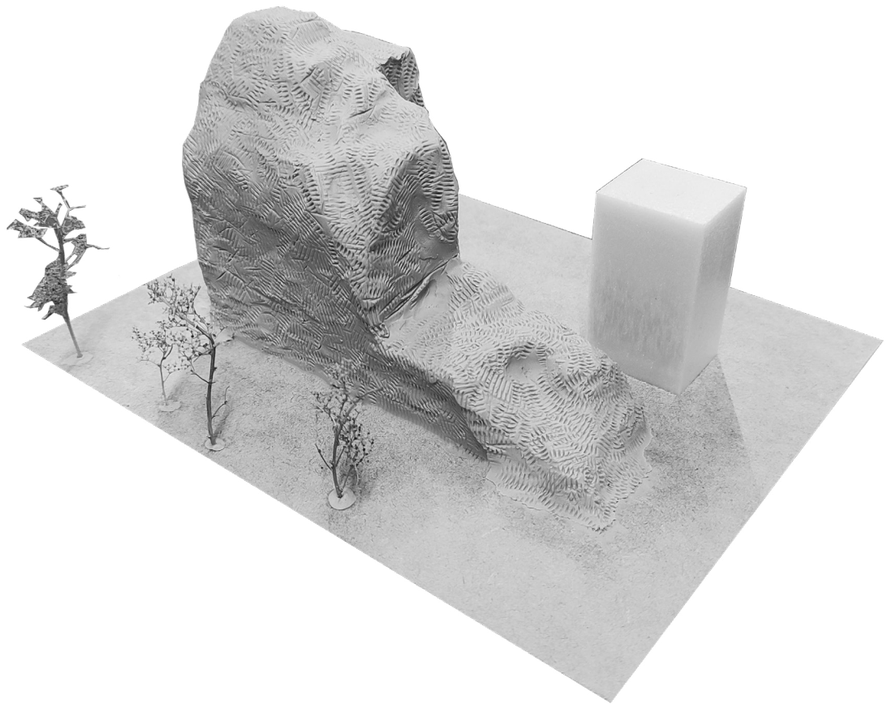
"Dutch row 1"
14 units
Rent cost: 400€ / Person

"Dutch row 2"
6 units
Rent cost: 400€

"Interlock"
16 units
Cost sale price: 316k€

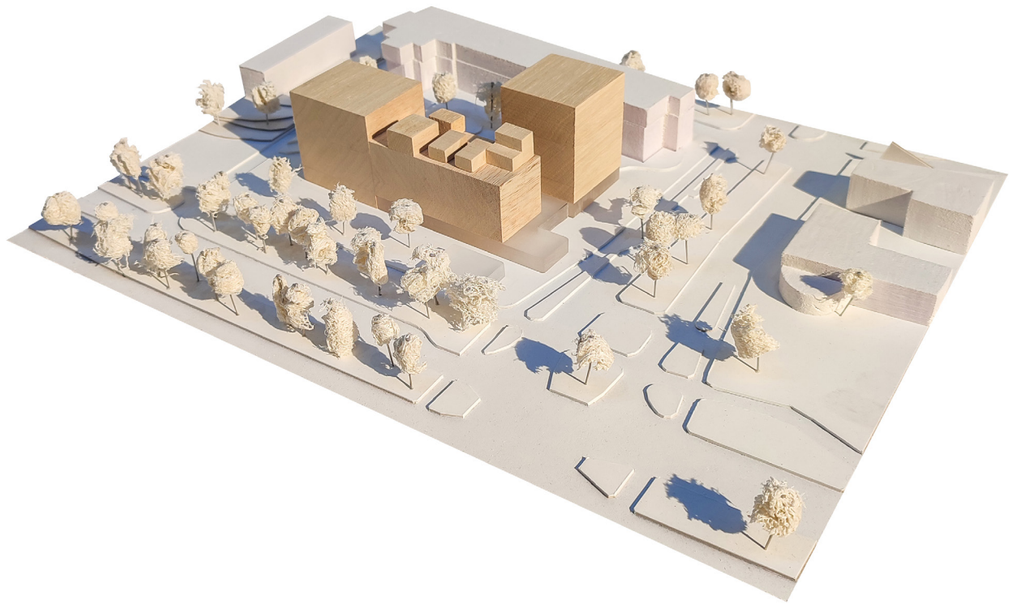
REFLECTION

REFLECTION

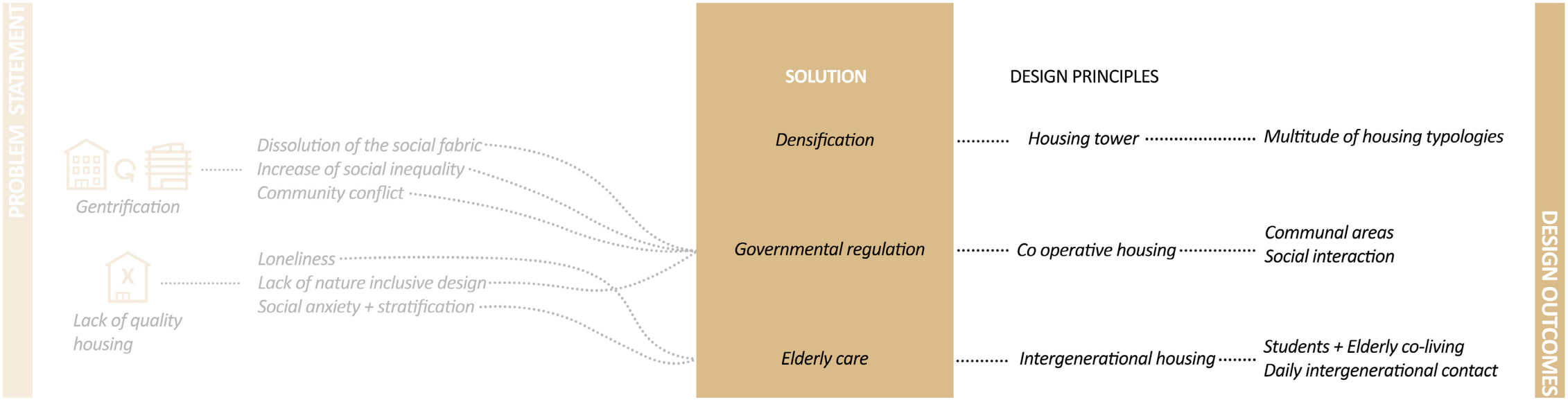


Initial concept
Physical model
submitted at P2

REFLECTION



Final concept
Physical model
submitted at P4


PROBLEM STATEMENT
Gentrification
Dissolution of the social fabric
Increase of social inequality
Community conflict
Lack of quality housing
Loneliness
Lack of nature inclusive design
Social anxiety + stratification
SOLUTION
Densification
Governmental regulation
Elderly care
DESIGN PRINCIPLES
Housing tower
Multitude of housing typologies
Co operative housing
Communal areas
Social interaction
Intergenerational housing
Students + Elderly co-living
Daily intergenerational contact
DESIGN OUTCOMES

THANK YOU