

SUSTAINABLE
ARCHITECTURE
DESIGN STUDIO
BRUSSELS
EX-NATO /
DEFENCE SITE

SUSTAINABLE ARCHITECTURE DESIGN STUDIO, MA-1
BRUFACE - ULB + VUB - 2018/2019

SDS-I PROJECT 2018-19
SUSTAINABLE ARCHITECTURE DESIGN STUDIO
REGENERATION OF BRUSSELS EX-NATO / DEFENCE SITE

TEACHING TEAM:

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HERA VAN SANDE & GEERT PAUWELS (VUB)

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LIVING ON THE EDGE

STUDENT:
LUKAS GEIJSEN

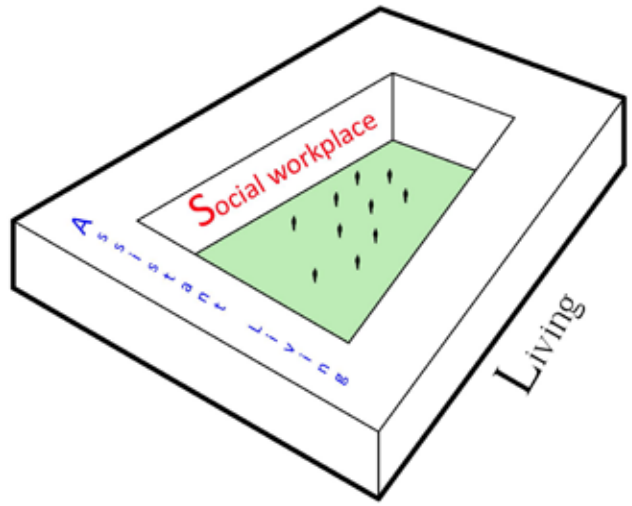




LOCALIZATION IN THE MASTERPLAN

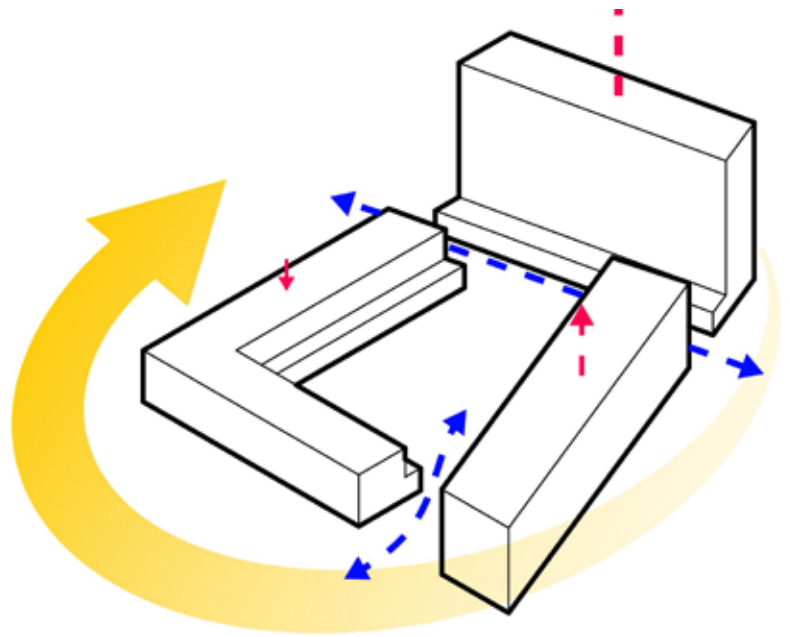
SOCIAL

- Urban mixity
- Shared inner court
- Social workplace



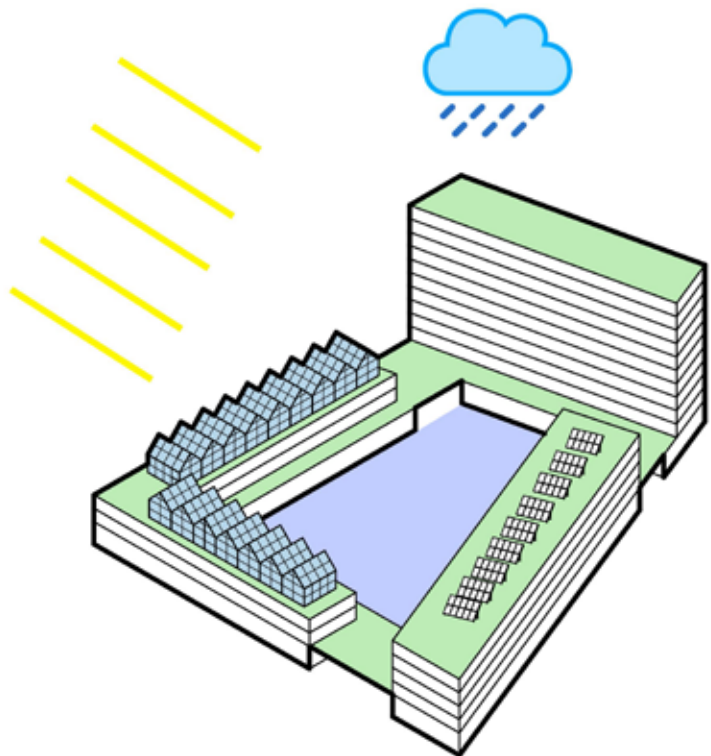
FORM

- Solar path
- Permeable urban block

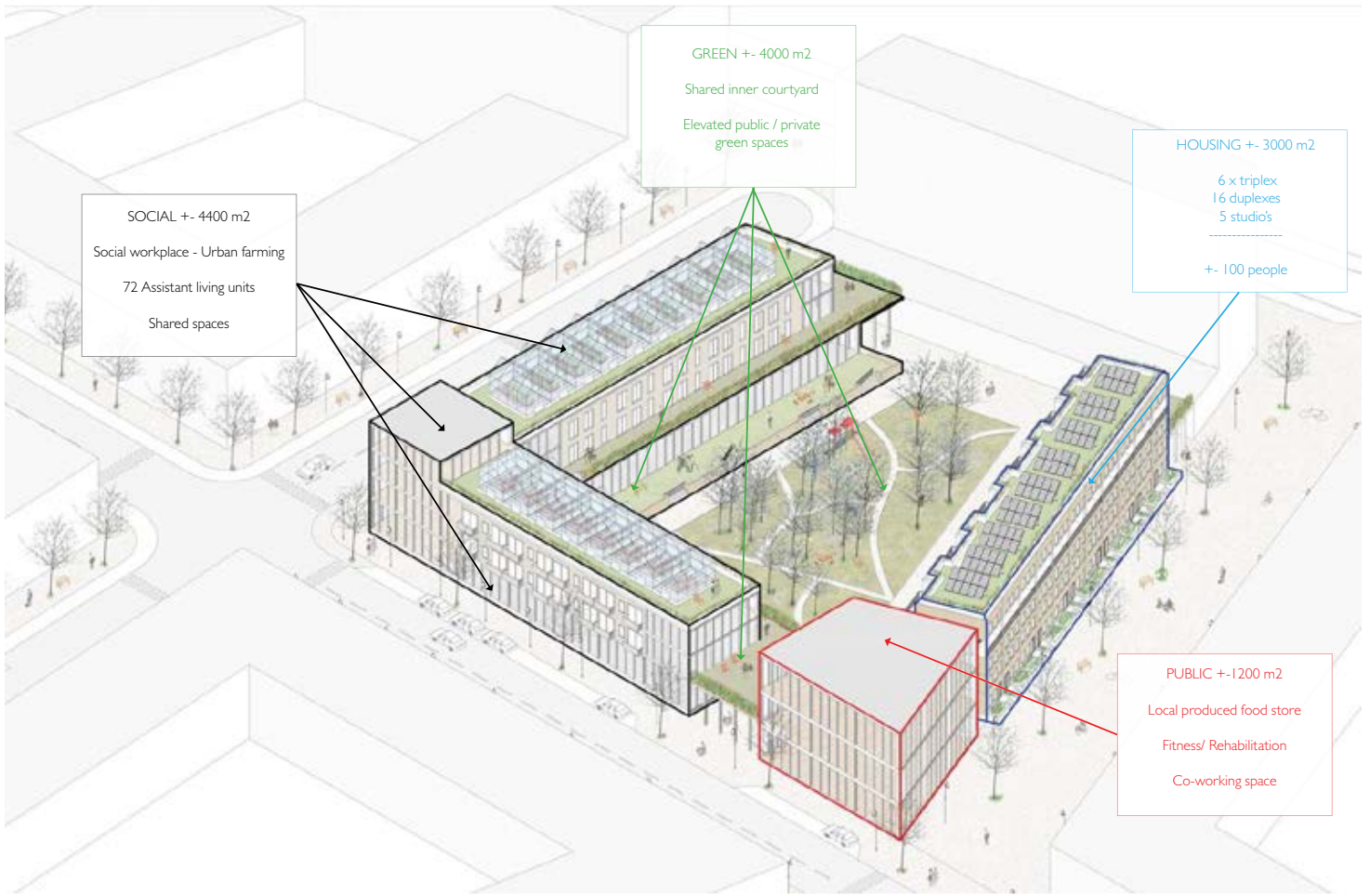


ENERGY

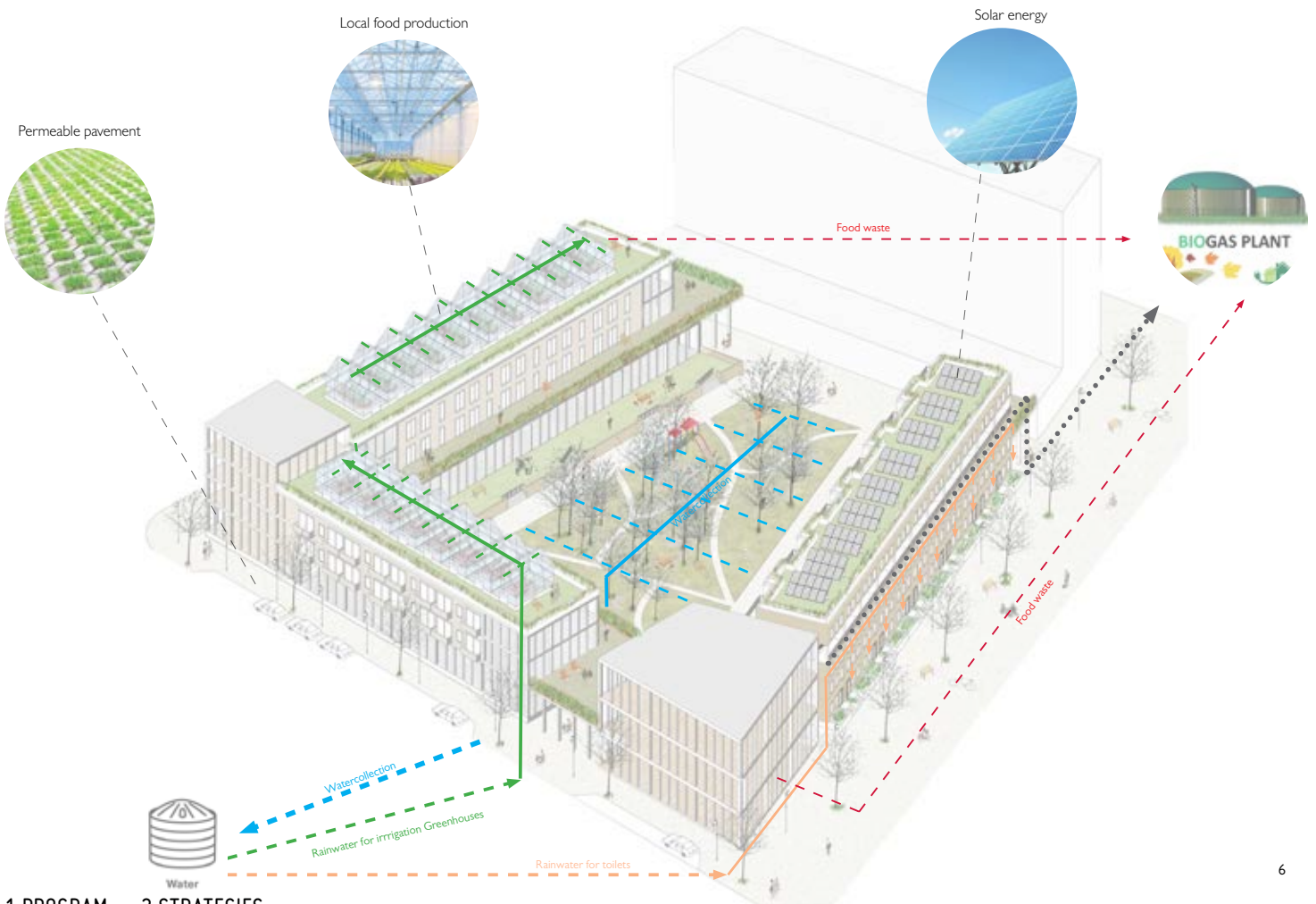
- Urban farming
- Local food production
- Water harvesting
- Solar energy



1



2



1.PROGRAM

2.STRATEGIES

1



2



1.LEVEL 0 2.SECTION

1



2



Level +2



Level +3



Level +4



1



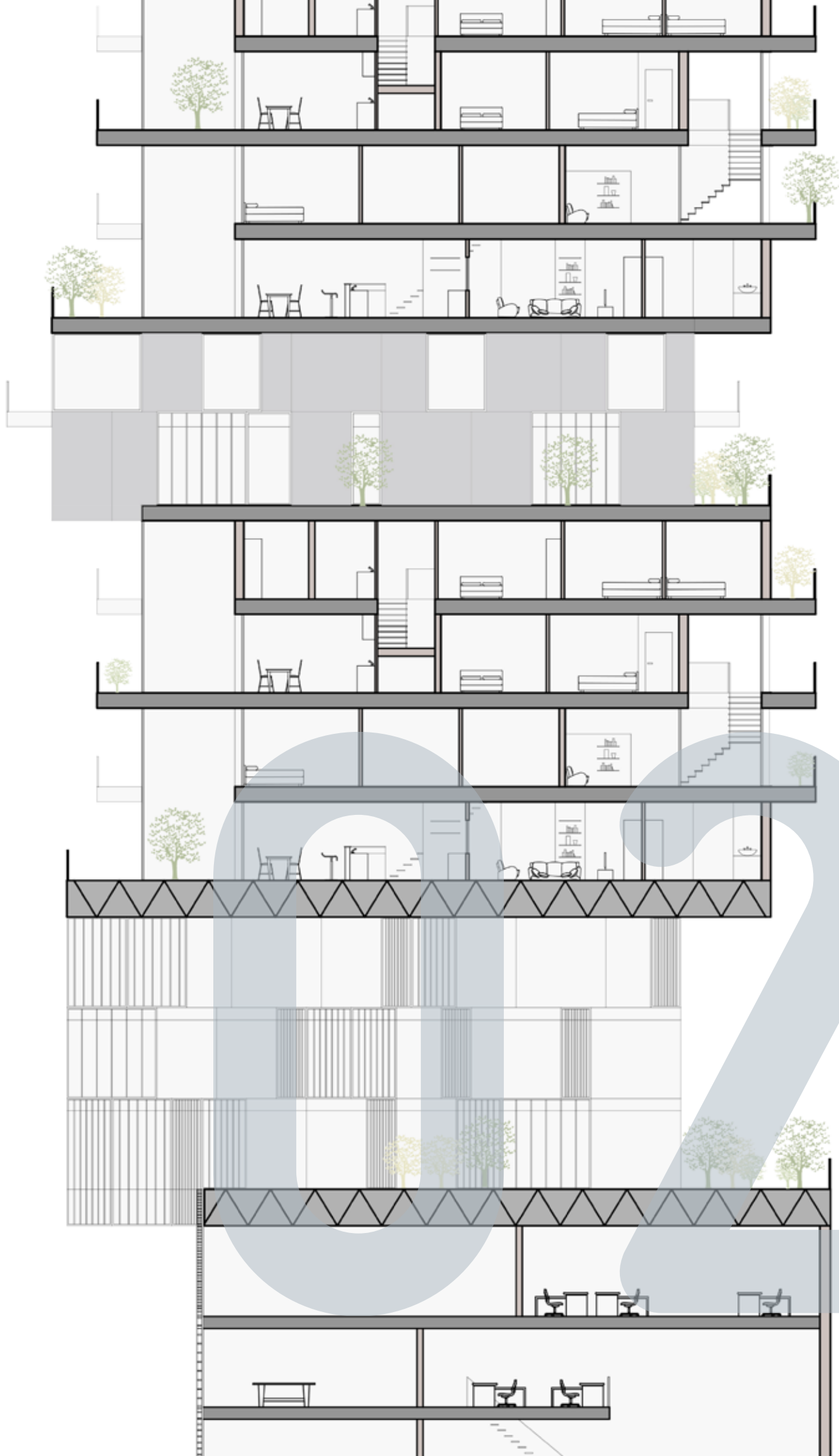
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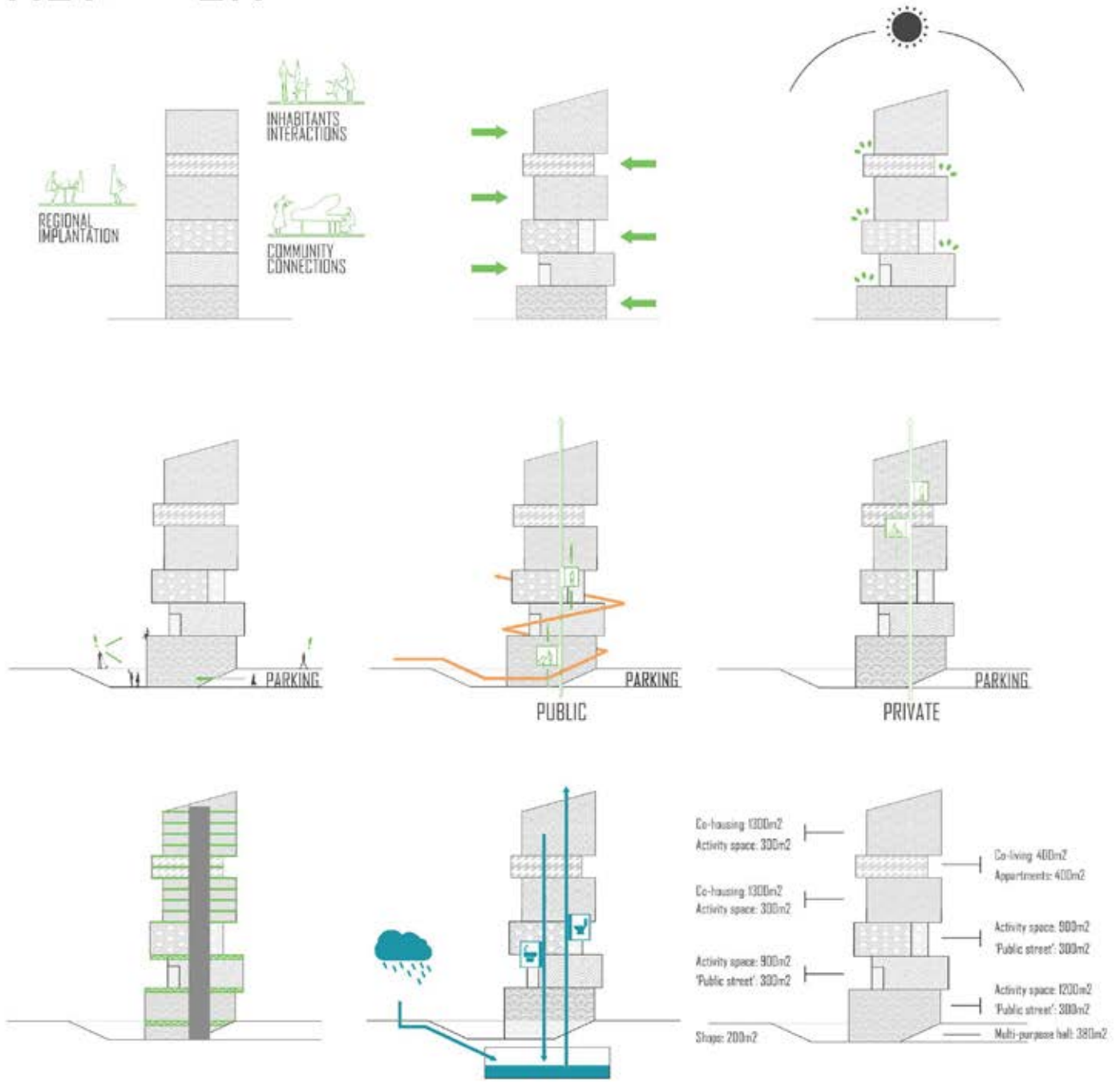
1.VIEW INNER COURT 2.VIEW PUBLIC HUB FROM STREET

ALTOWER

STUDENT:
JONAS RENTS



ALTER

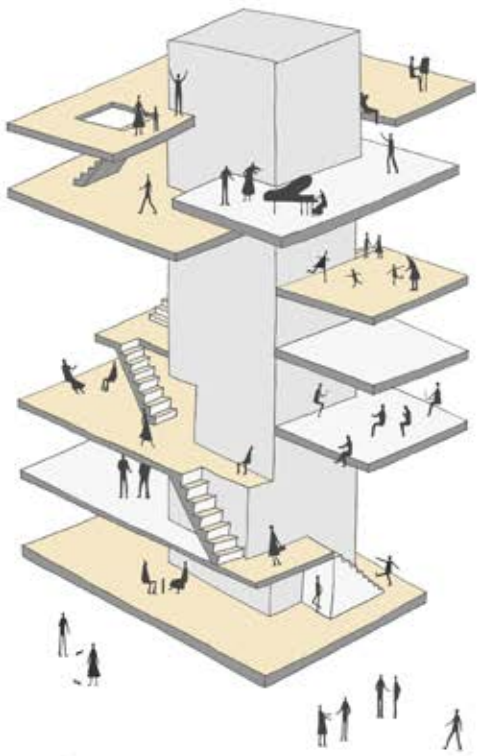


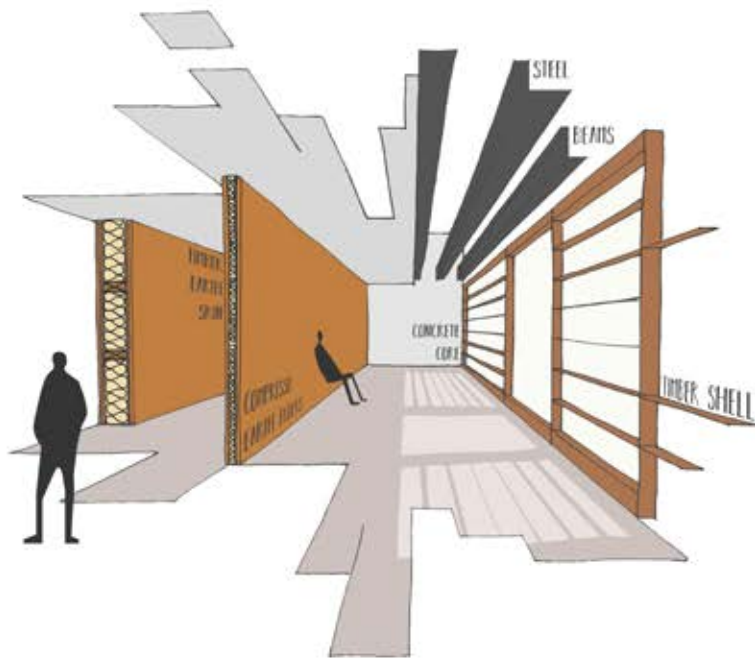
At a time when urban sprawl is an ecological disaster, it becomes natural to think about building vertical cities. But what about its inhabitants? The objective of the project was to reconcile height and social interactions. The ALTowER was therefore designed in this sense by proposing workspaces, housing units, shops while linking them by an architecture that allows meeting.



Co-housing

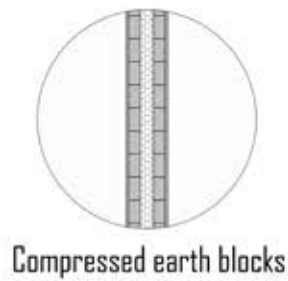




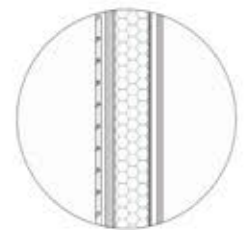
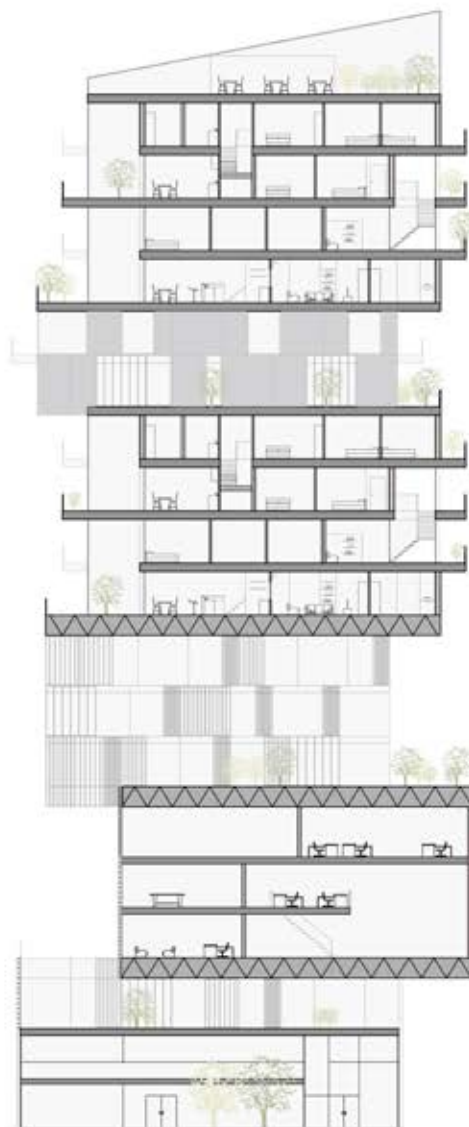


A clear separation was made from the outset of the project design for the construction and the choice of materials between the building's framework and its skin.

This main structure is composed of a concrete core and steel beams in order to have a high load-bearing capacity and above all, to have a long service life. On the other hand, the skin, shell and inner walls have been designed to be made of low-energy materials. As a result, timber and raw earth have become an obvious choice.



Compressed earth blocks



Timber & earth skin



Clay panels

SUSTAINABLE SCHOOL DESIGN

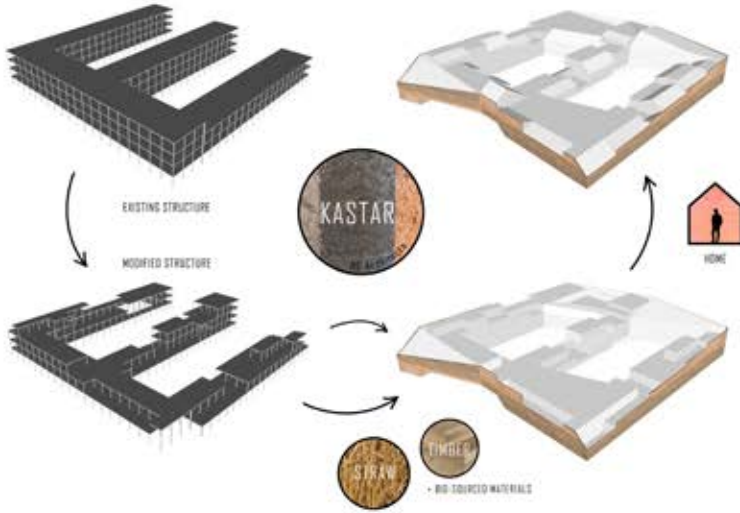
STUDENT:
PABLO RECOURT



SUSTAINABLE SCHOOL DESIGN



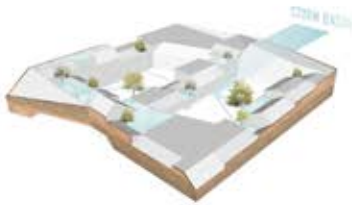
ECO-CONSTRUCTION



When mentioning sustainable architecture, one generally thinks of designing a building that respects the environment with low energy consumption and minimum embedded carbon. A building that lasts in time and which is healthy and comfortable for the users. Today, these goals are generally achieved. The next step is to consider a building that can even have a longer life-span within these criteria: this can be achieved by reusing an existing structure to give it a second life.

The project consists of transforming an office building into a primary and secondary school. This new program suits well the building according to the classic concrete frame (3.6m x 3.6m) which is interesting to convert into an educative space. Moreover, a school is a key element in the development of a new sustainable neighbourhood: creating interaction between people and teaching them how to live in a sustainable way. By modifying the existing structure and reimplimenting the removed materials combined with some other local bio-sourced materials (straw and timber), an energy-effective, healthy and comfortable design can be reached while decreasing the embedded carbon of the building. According to some ideas of active pedagogy, tree main elements were used to design the new building: connection with nature, a various program and social mixity. Social interaction in the building is promoted by including a public library in the school and by mixing the multiple functions. The spaces are designed to encourage the sharing experiences in a comfortable atmosphere.

WATER & NATURE

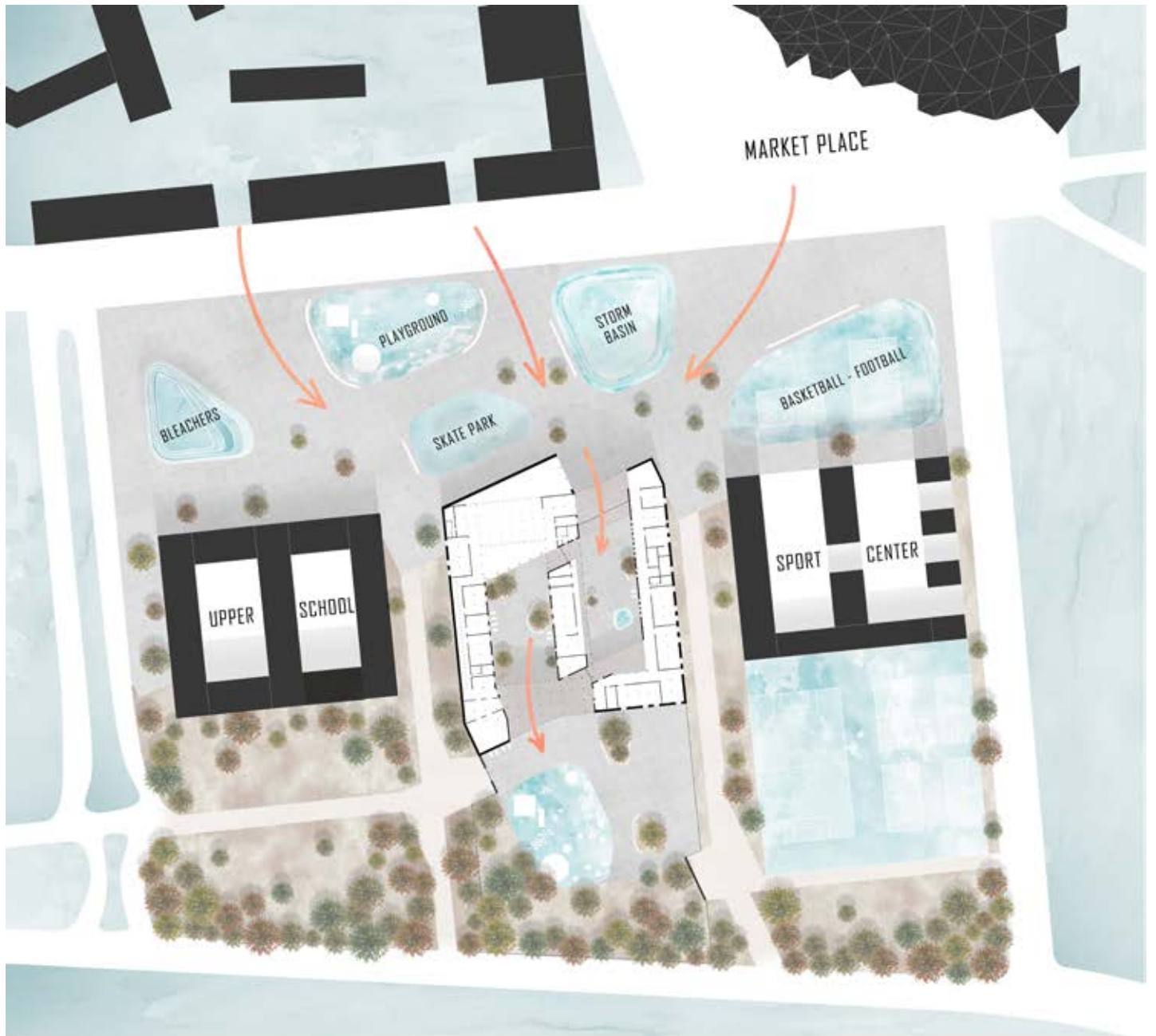


SUNLIGHT



MIXITY





SURROUNDINGS 1:750 ↑

EDUCATION IDEAS



MONTESSORI

RICH ENVIRONMENT
NATURE
LIGHT
ADAPTED SPACES



STEINER

CURIOS CHILDREN
VARIOUS EXPERIENCES
RICH PROGRAM



PIAGET

CHILDREN INTERACTION
DISCUSSIONS
SHARING EXPERIENCES



PLAN +0 1:200



3D VIEW PUBLIC LIBRARY

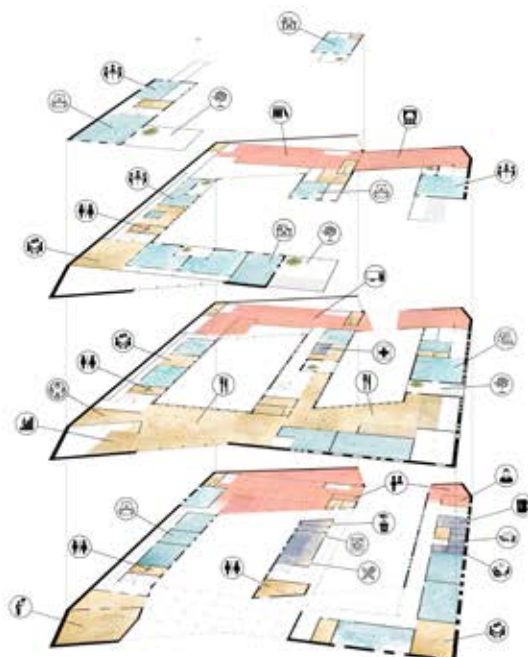


PLAN +1 1:200 ↗



PROGRAM

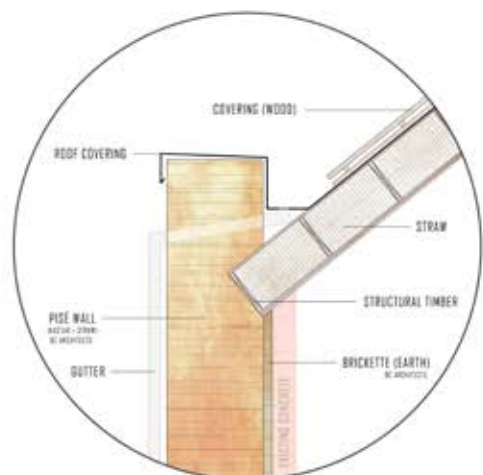
- PRIVATE ROOM (340m²)
- CLASSROOM (1890m²)
- SHARED SPACE (2000m²)
- PUBLIC SPACE (2280m²)



PLAN +2 1:200 ↗



DETAIL ROOF 1:20



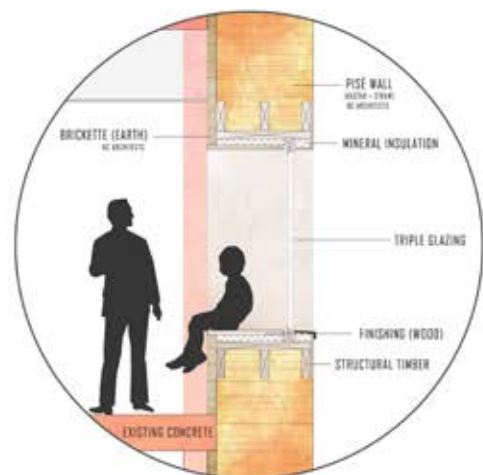
SECTION PUBLIC LIBRARY 1:200



PLAN +3 1:200 ↗



DETAIL WINDOW 1:20



SECTION CLASSROOMS 1:200

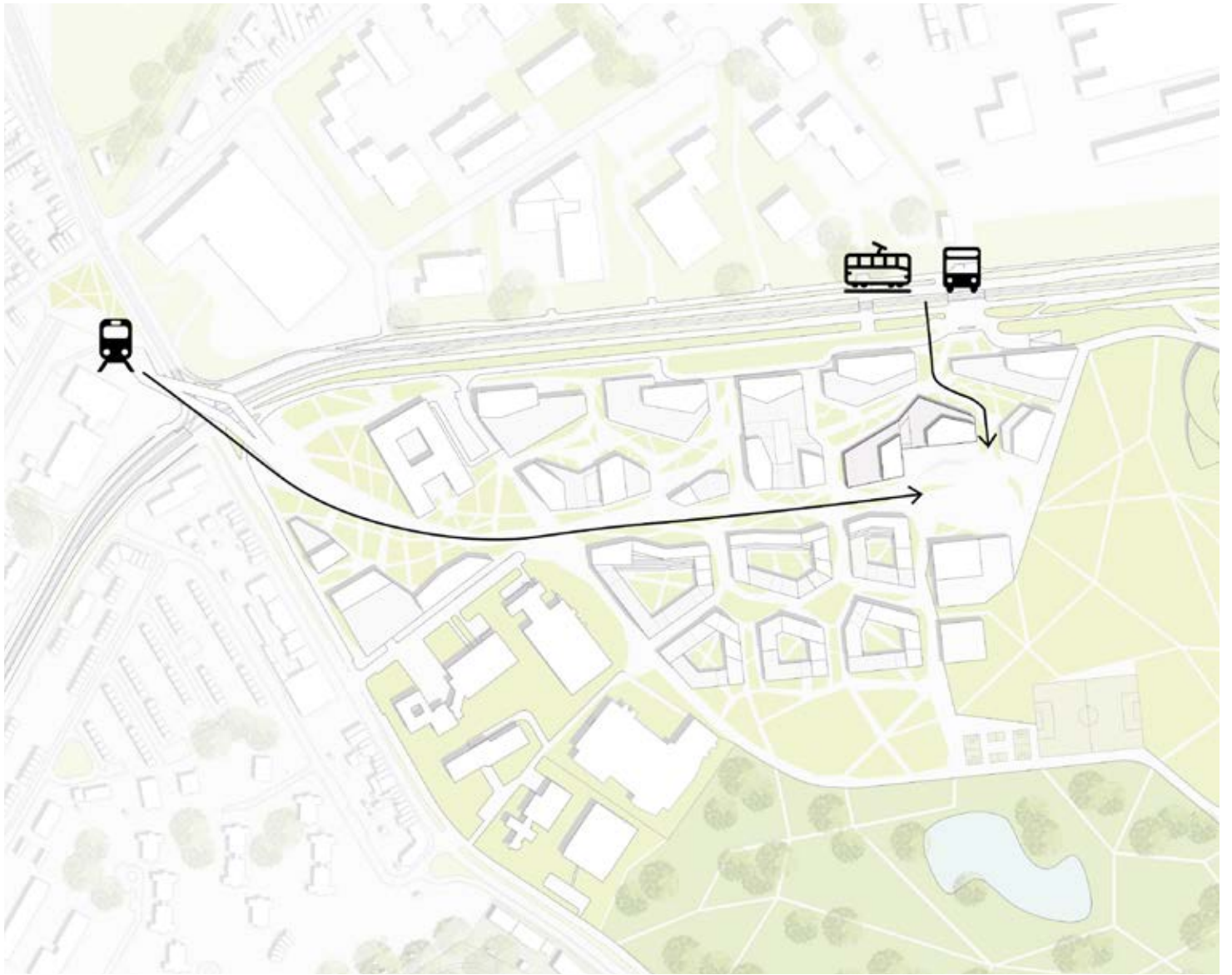


BORDER PUBLIC LIBRARY

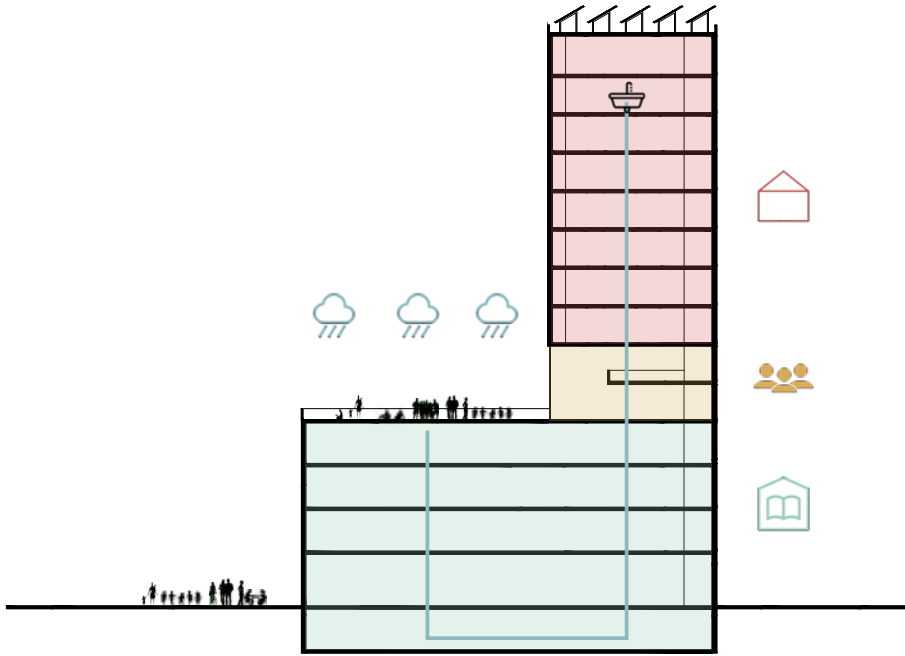
STUDENT:

Anna Locatelli

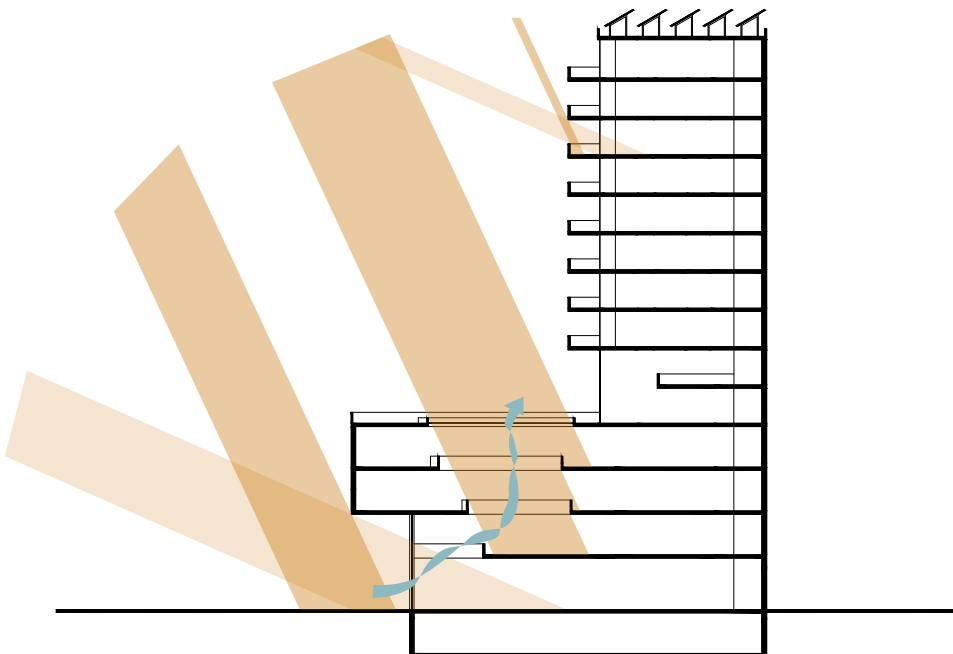
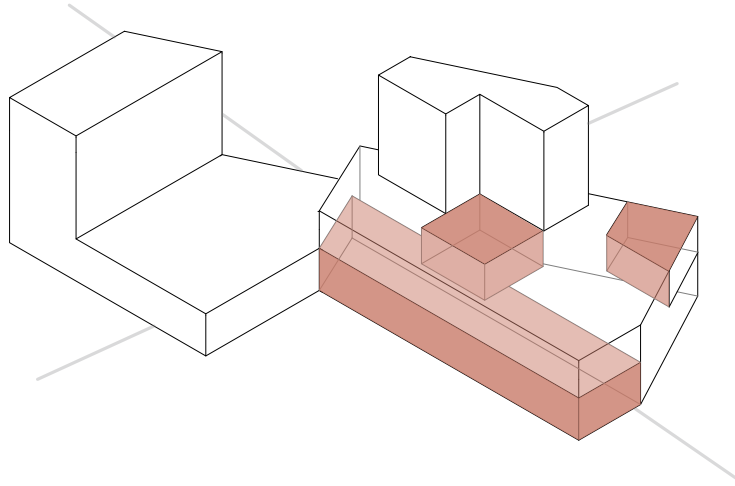




1.



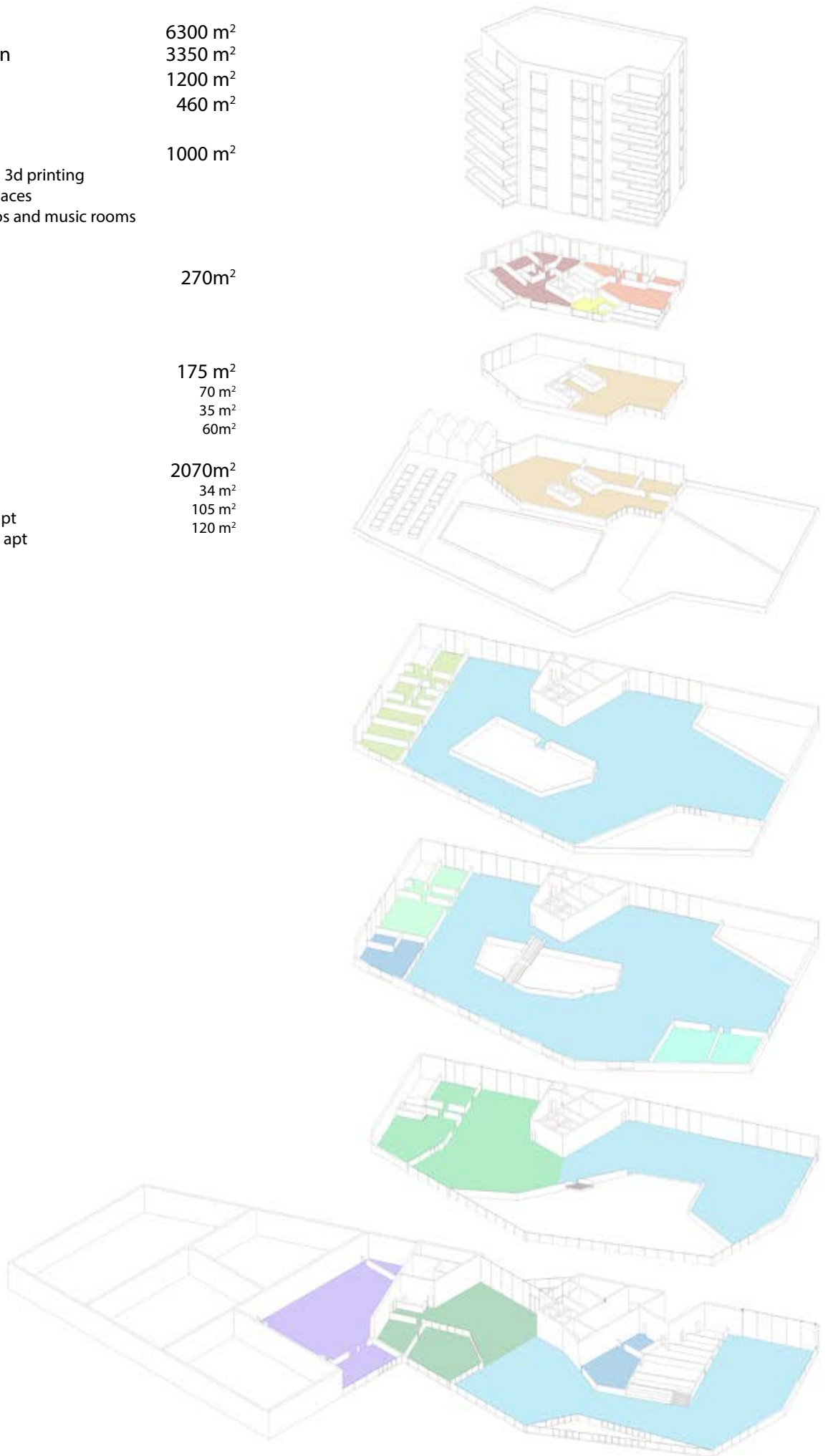
2.



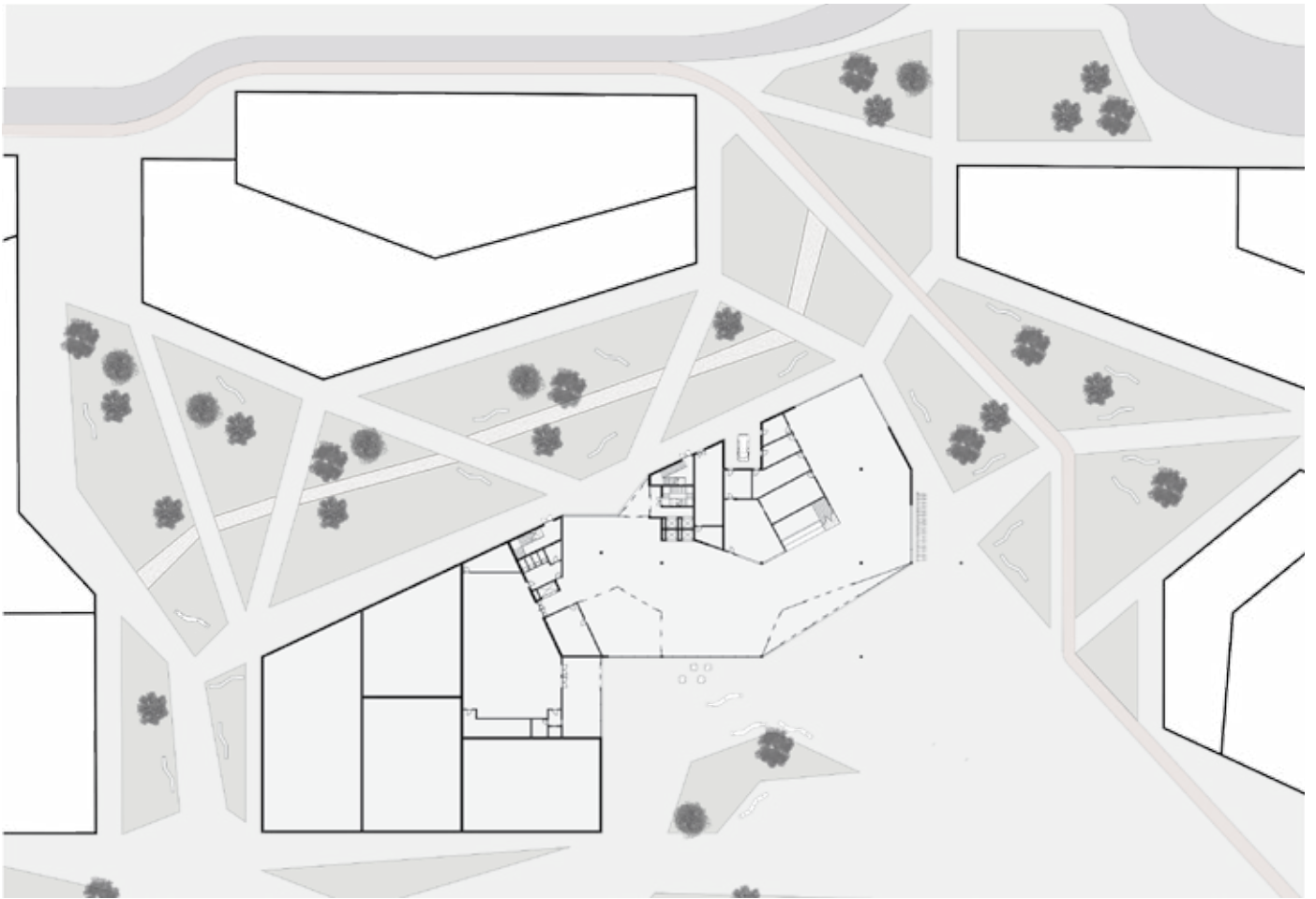
CONCEPT

1. NATURAL RESOURCES 2. DAYLIGHT AND NATURAL VENTILATION

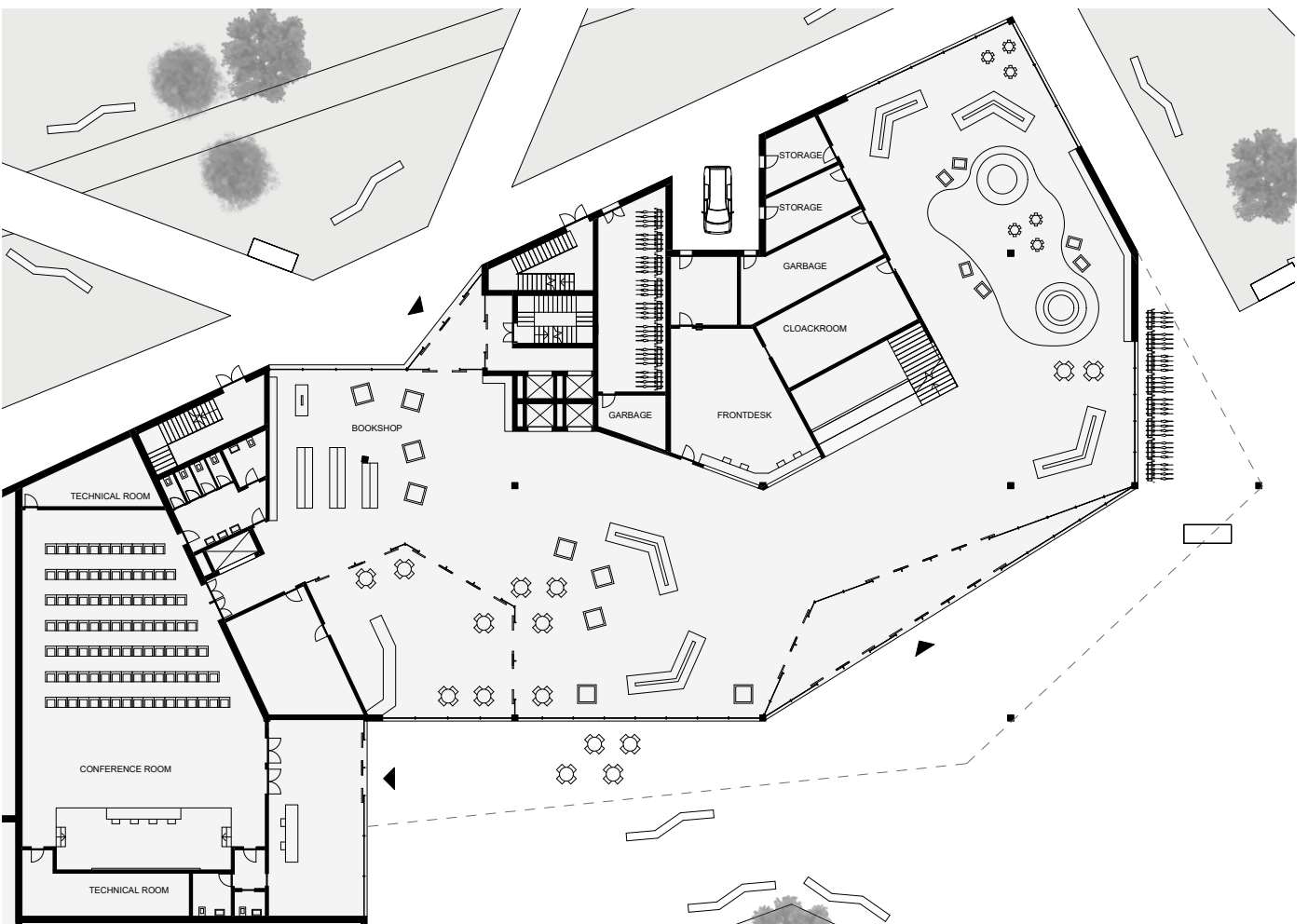
LIBRARY	6300 m ²
Book consultation	3350 m ²
Leisure	1200 m ²
Conference hall	460 m ²
Production	1000 m ²
Lasercutting and 3d printing	
Rentable workspaces	
Recording studios and music rooms	
Commercial	270m ²
Bookstore	
Cafè	
HOUSING	
Common space	175 m ²
Gym	70 m ²
Laundry	35 m ²
Lounge	60m ²
HOUSING	2070m ²
Studio	34 m ²
Two-bedrooms apt	105 m ²
Three-bedrooms apt	120 m ²



1



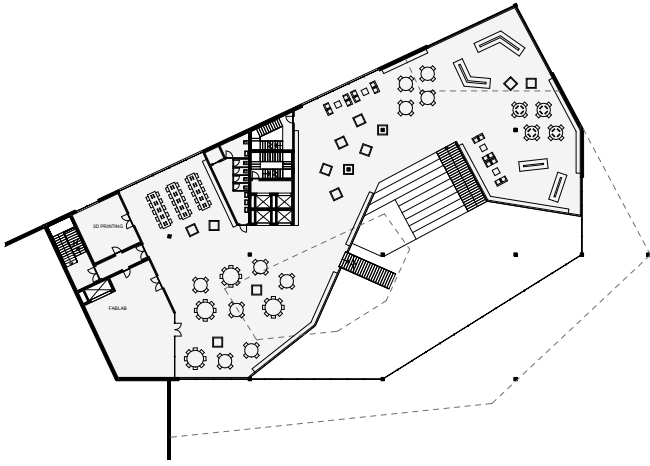
2



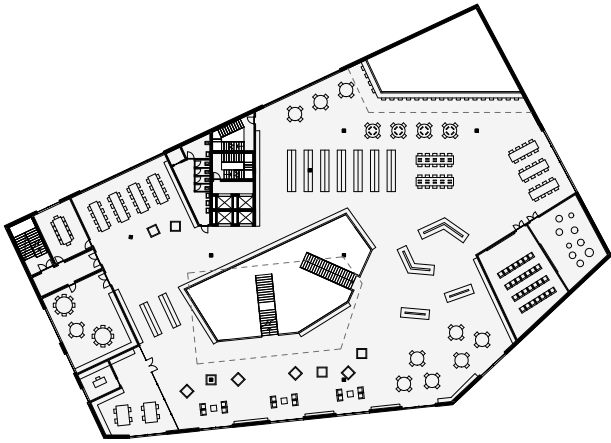
PLANS

1. GROUND FLOOR 2. GROUND FLOOR

1

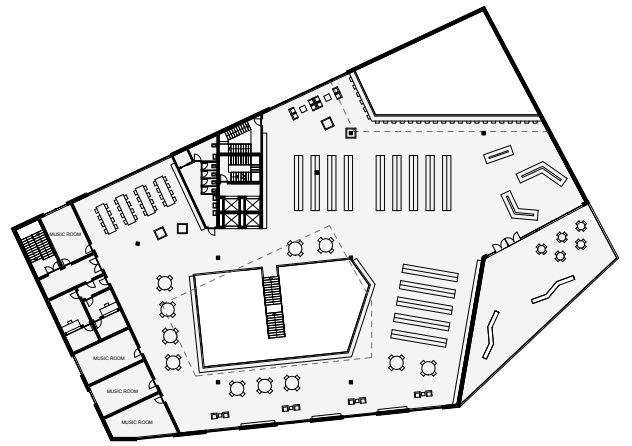


2

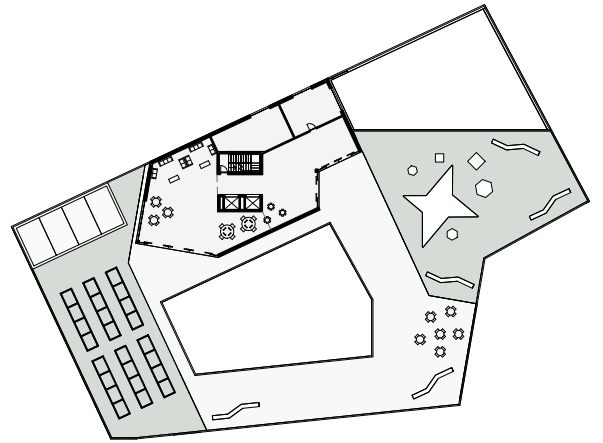


PLANS
1. FIRST FLOOR 2. SECOND FLOOR

1

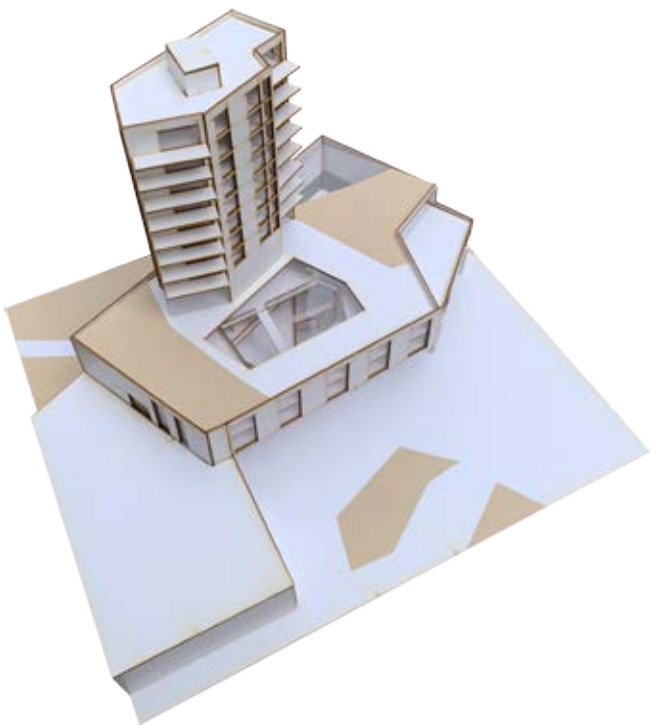


2



PLANS
1. THIRD FLOOR 2. FOURTH FLOOR

3



1

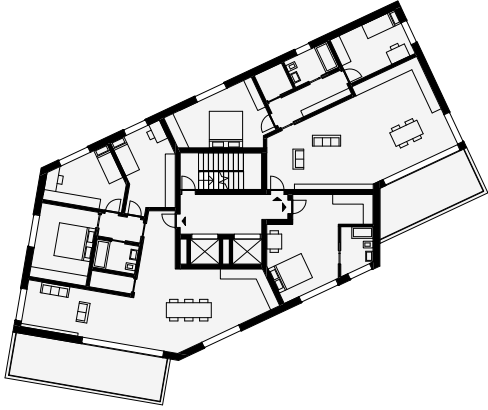


2

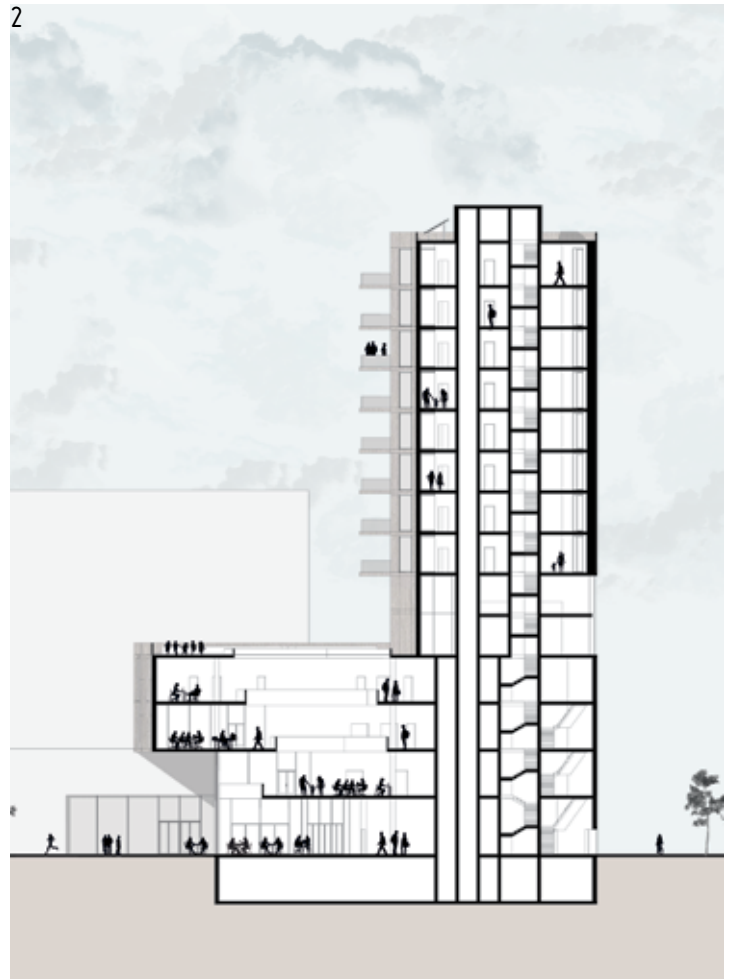


1.RENDERING 2.RENDERING

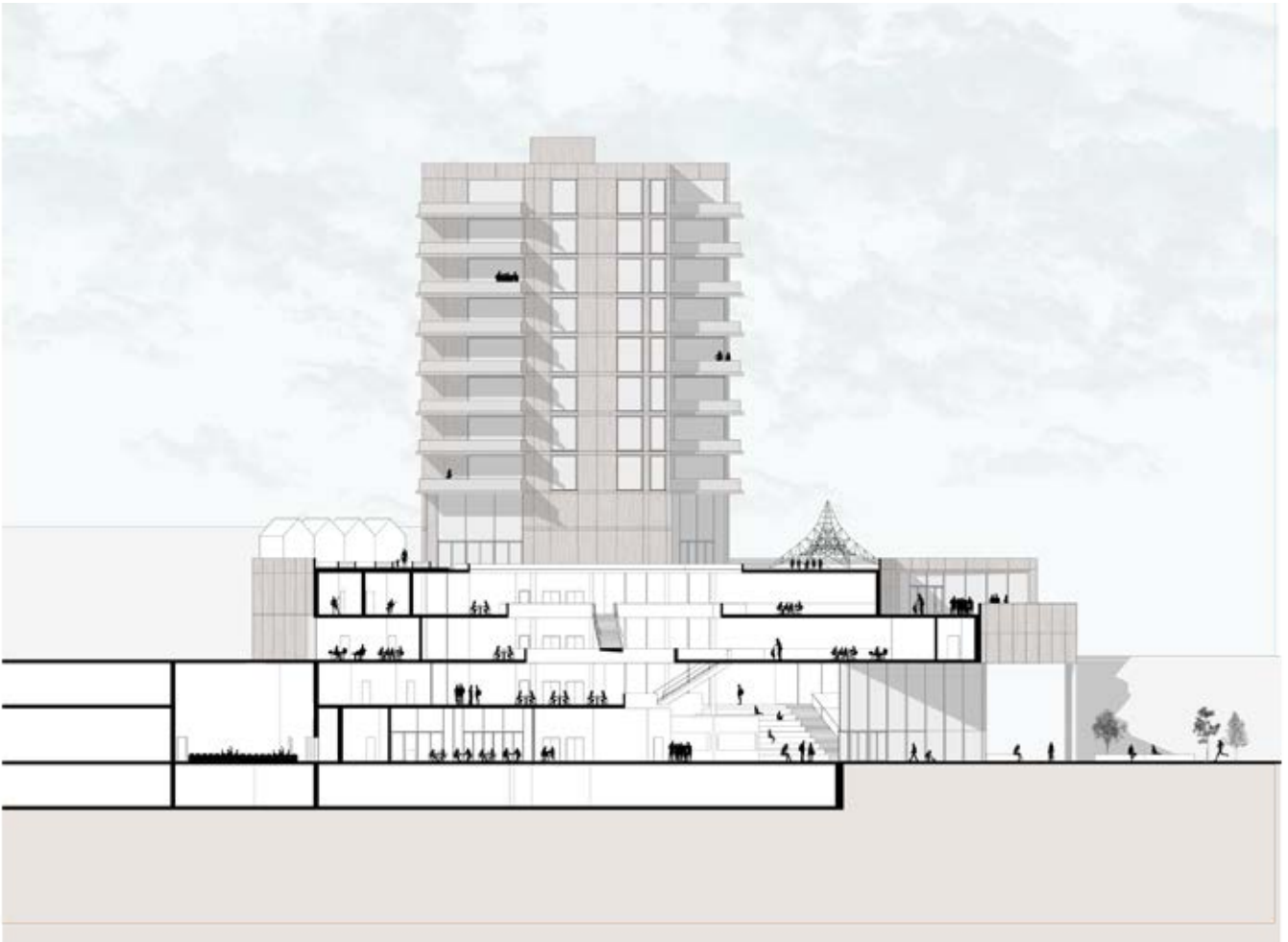
1



2

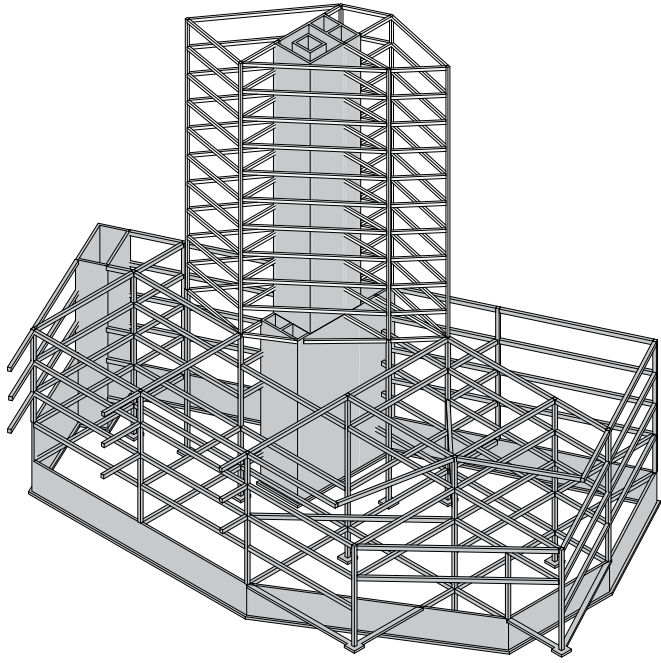


3

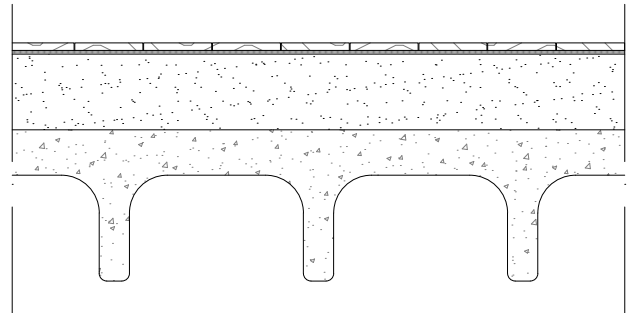


1. SIXTH FLOOR 2. SECTION BB 3. SECTION AA

1



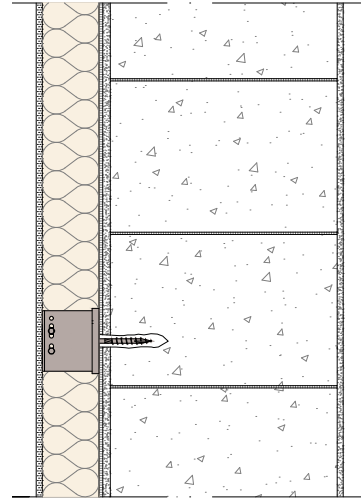
2.A



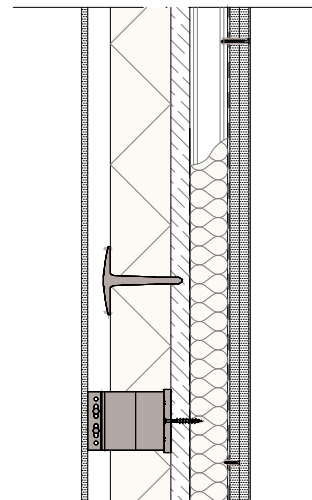
3



2.B



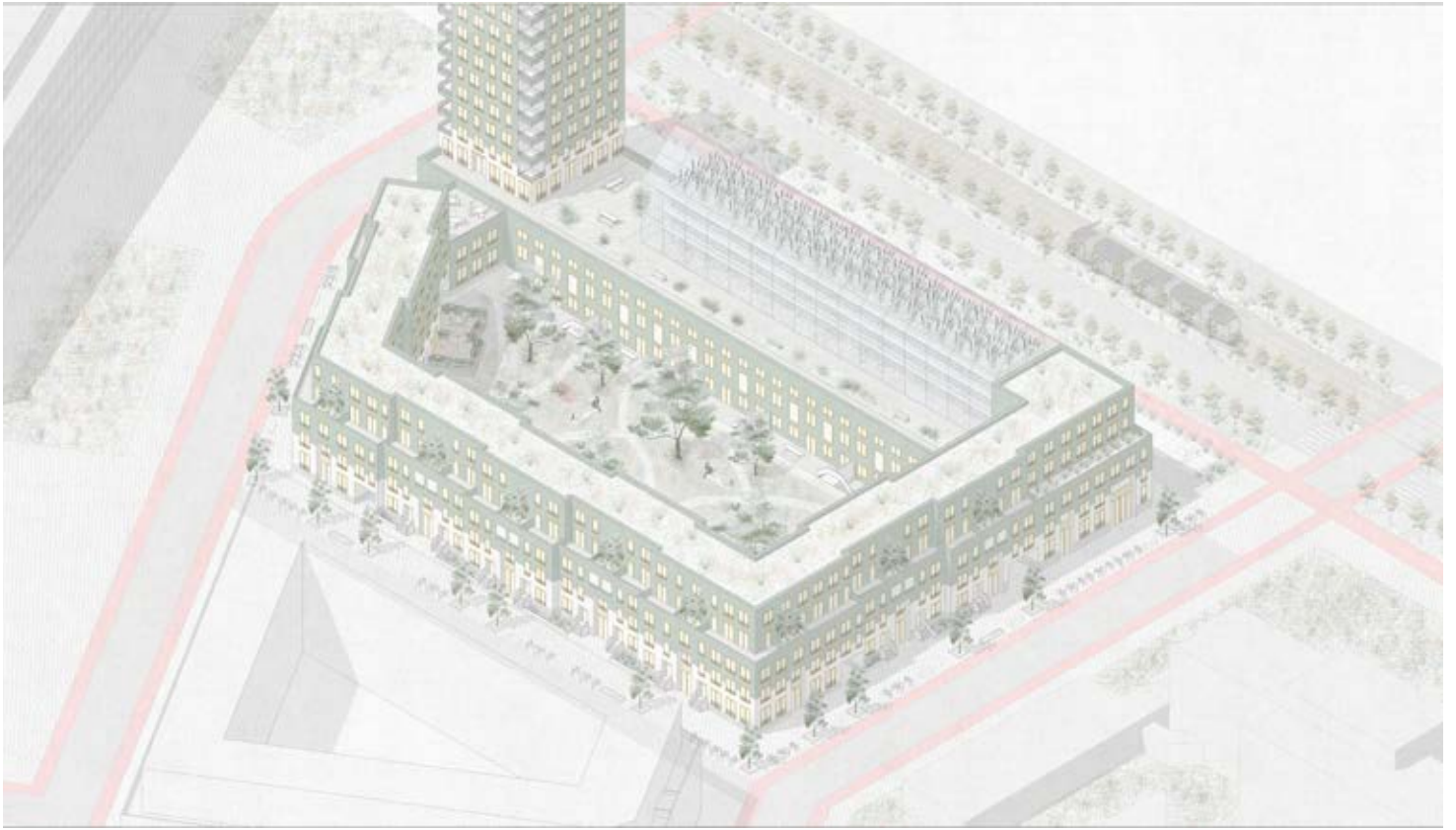
2.C



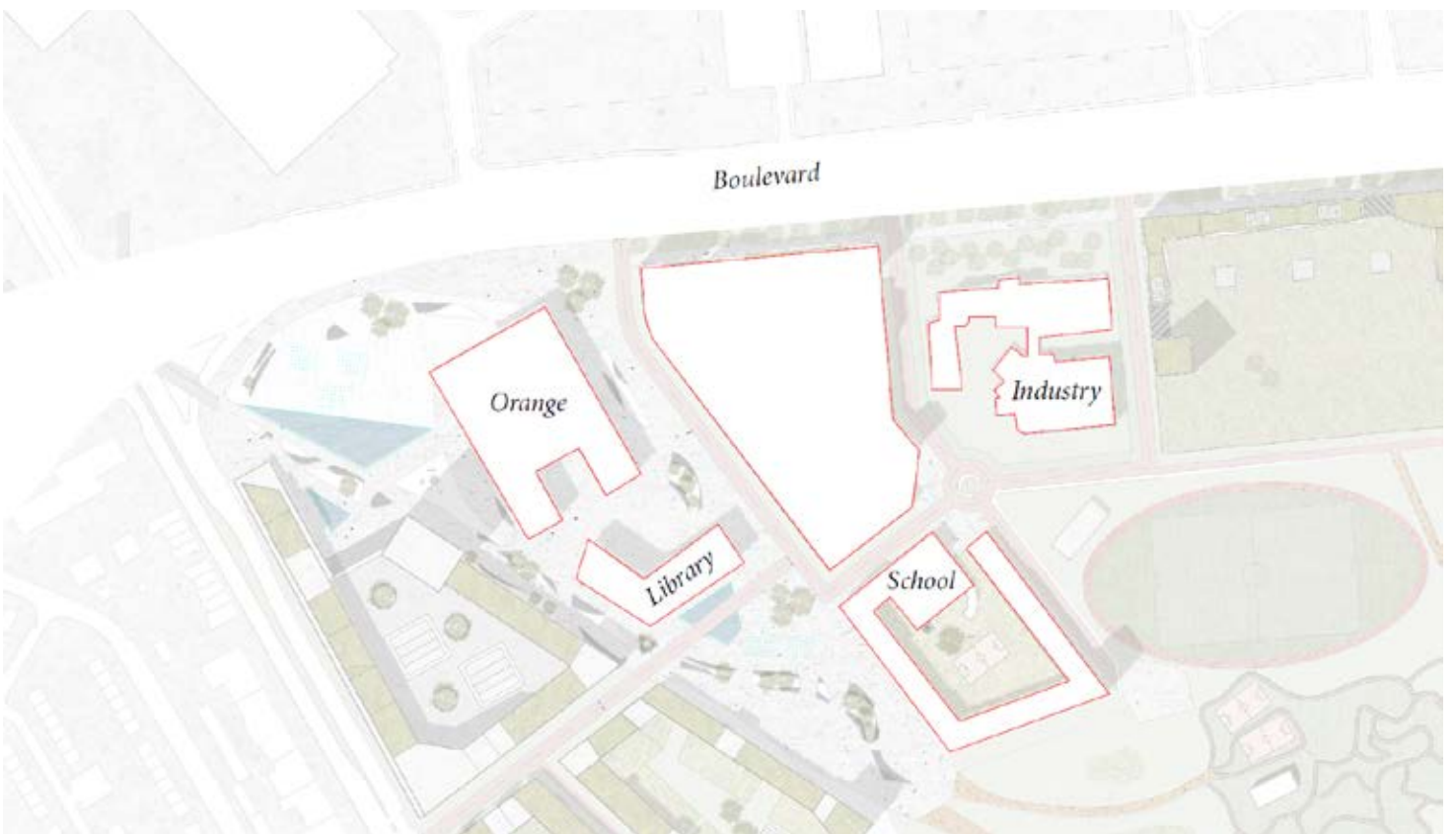
THE PRODUCTIVE COURTYARD

STUDENT:
PELLE DARRAS





AXONOMETRIC VIEW OF THE PROJECT



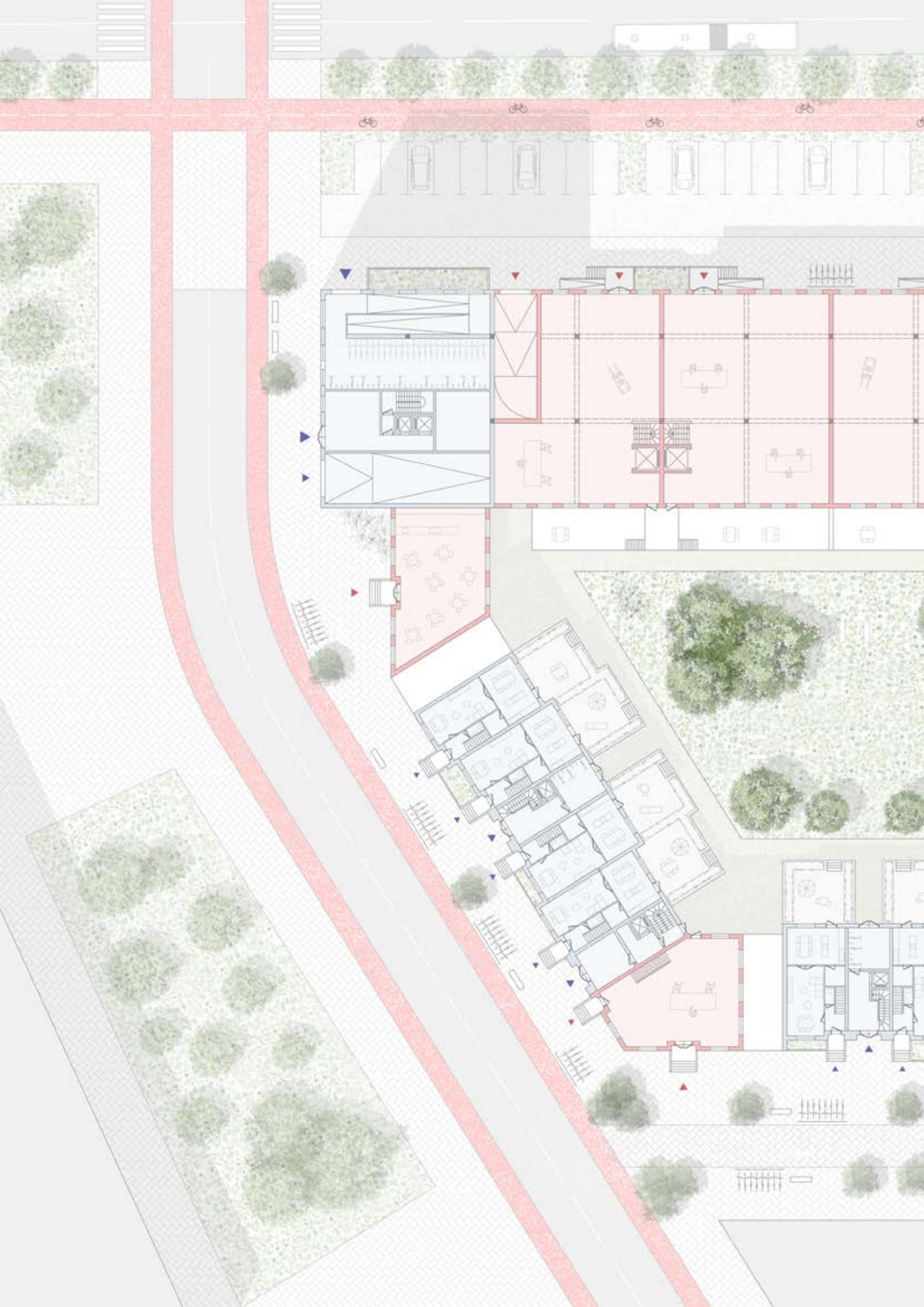
LOCALIZATION IN THE MASTERPLAN

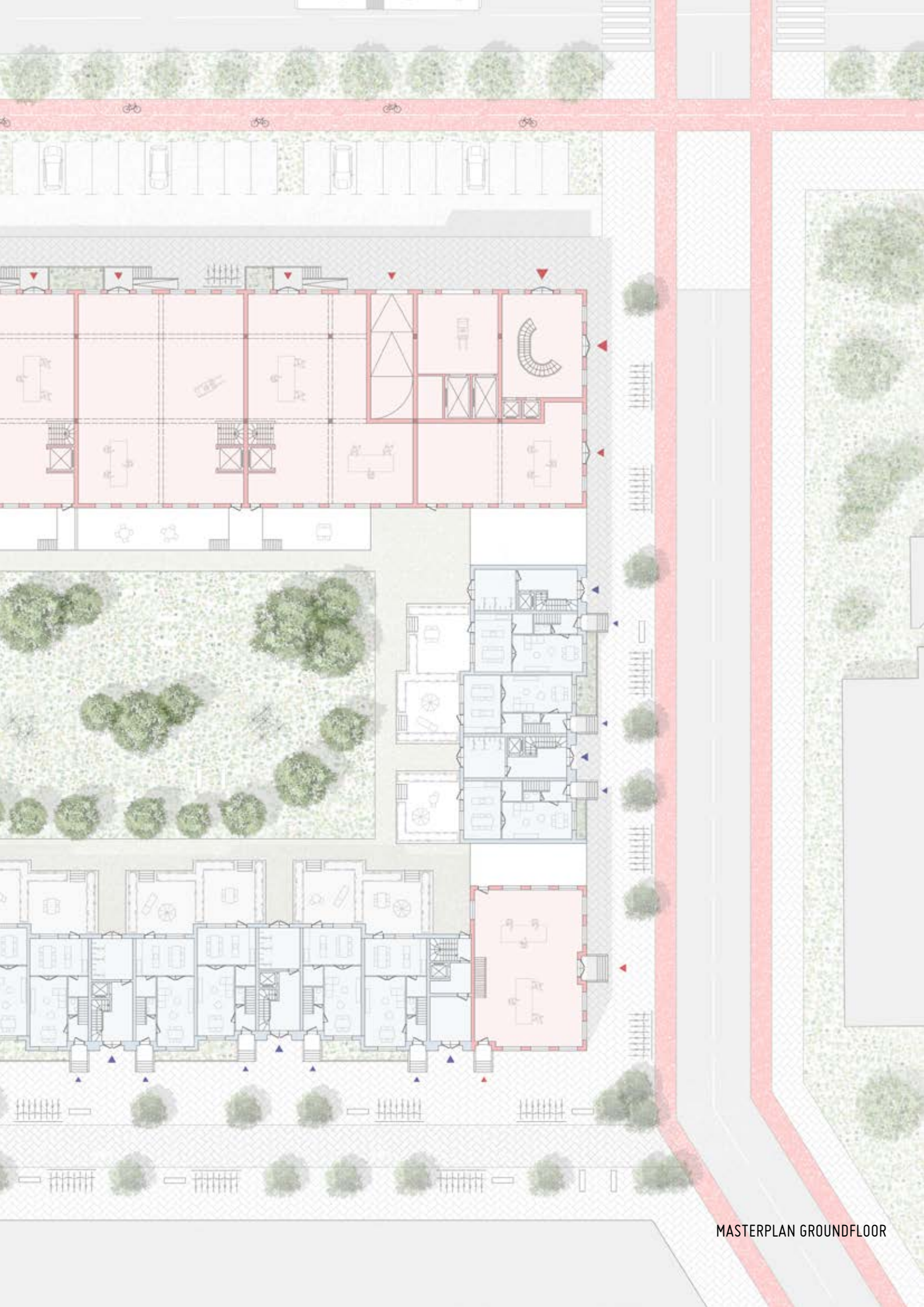


ELEVATION – FACADE PRINCIPLES



COLLAGE OF THE PEDESTRIAN STREET





MASTERPLAN GROUND FLOOR





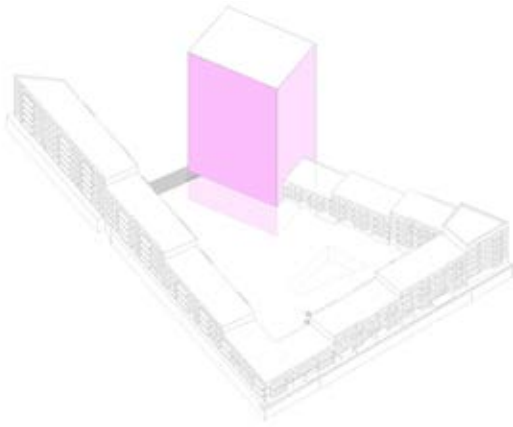
SECTION

TOMAT'HAUT

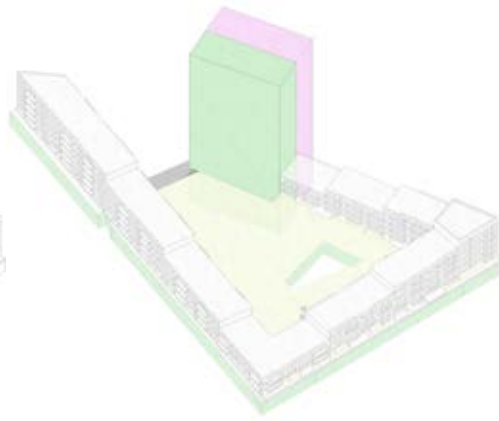
STUDENT:
WOUT DE ZUTTER



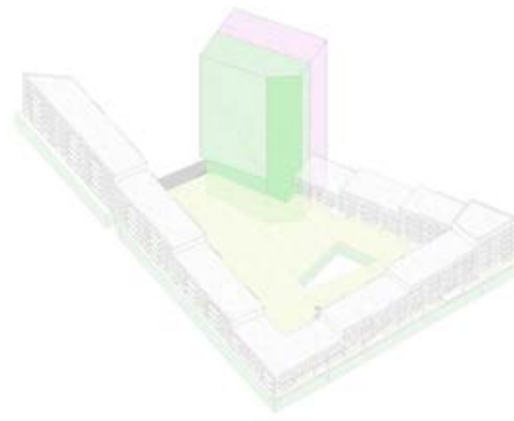




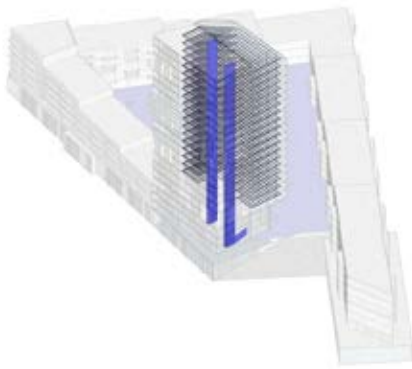
Tower



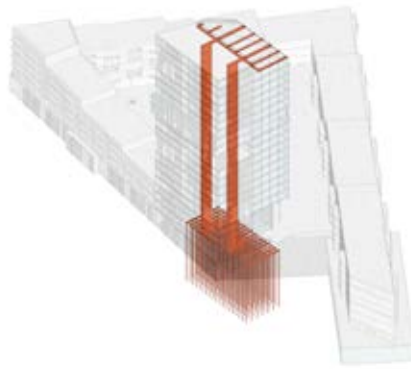
Vertical farm & agricultural school



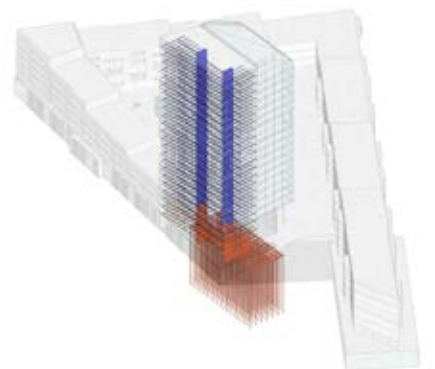
Solar orientation



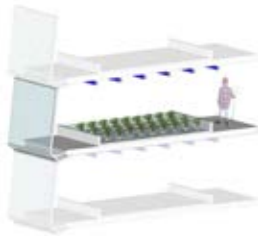
Watermanagement



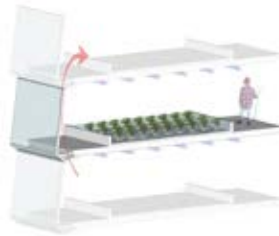
BTES - summer



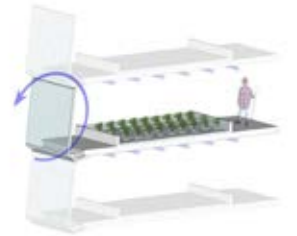
BTES - winter



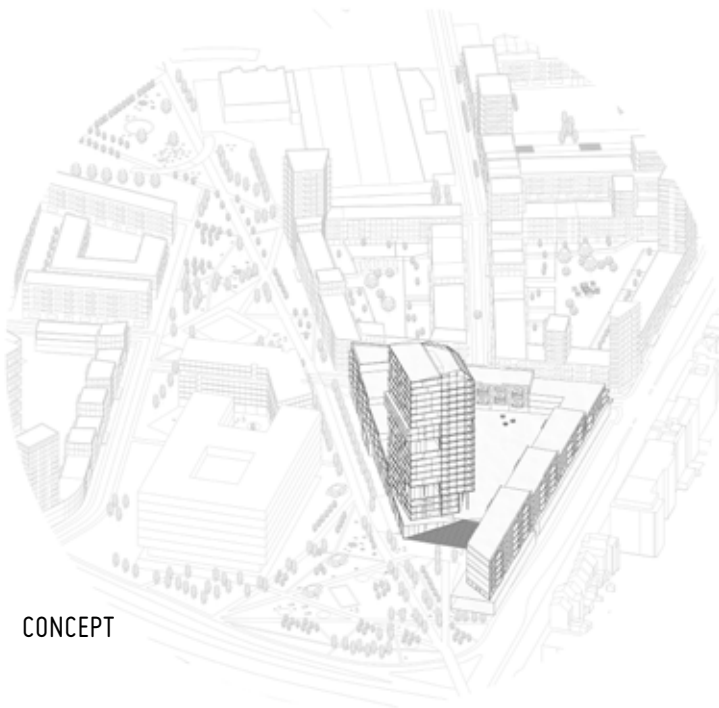
Aquaponics



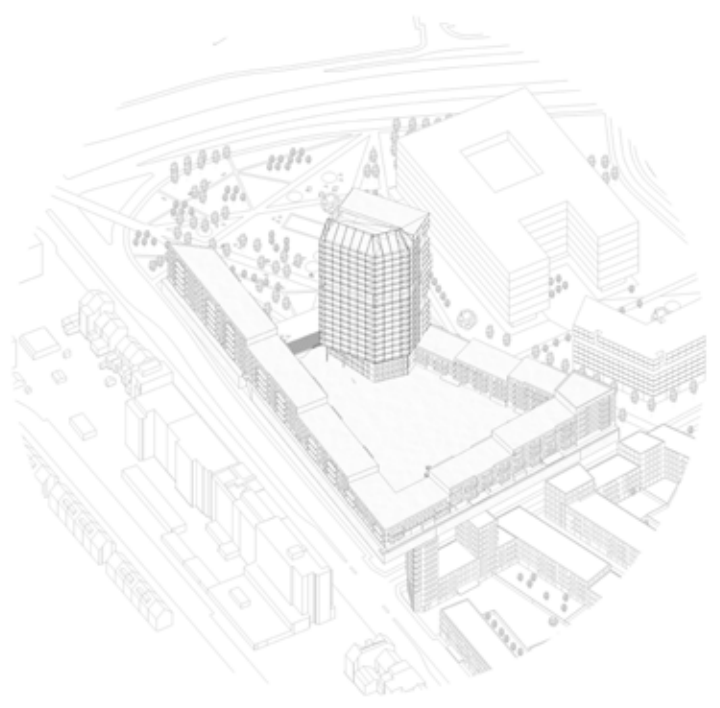
Natural heat flow



Natural ventilation

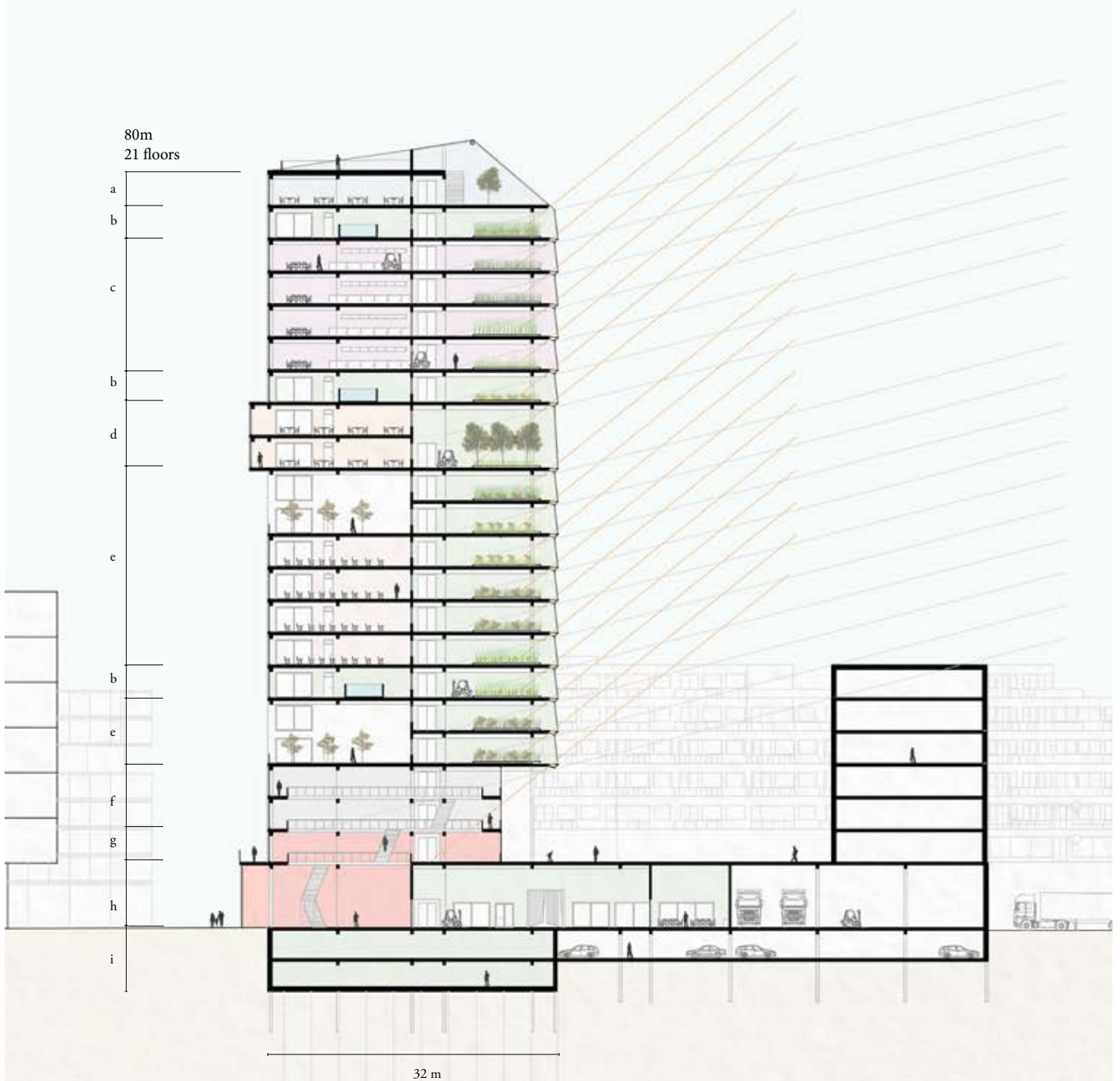


CONCEPT



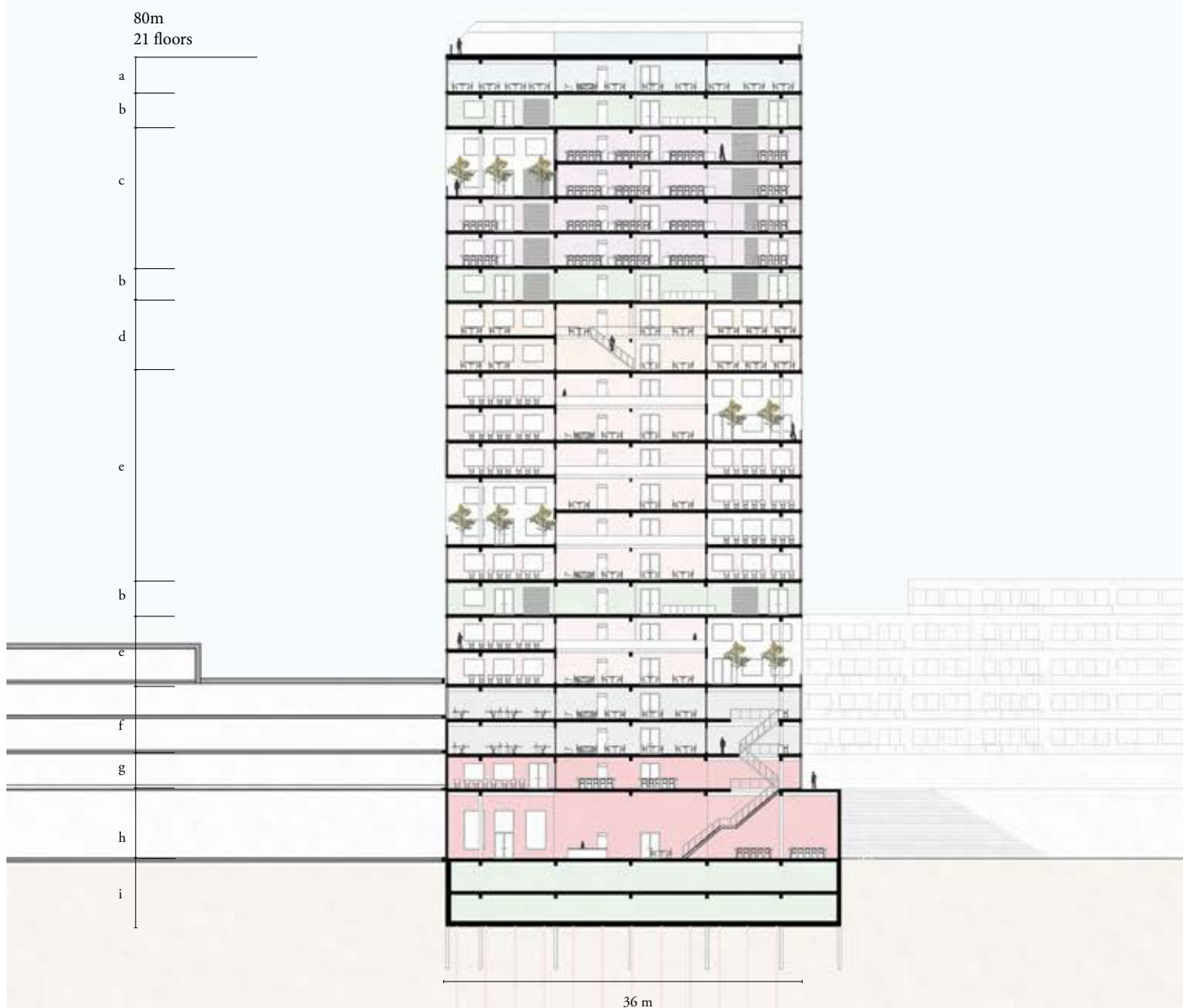
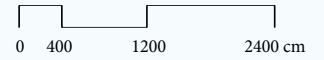
AA' SECTION

0 400 1200 2400 cm

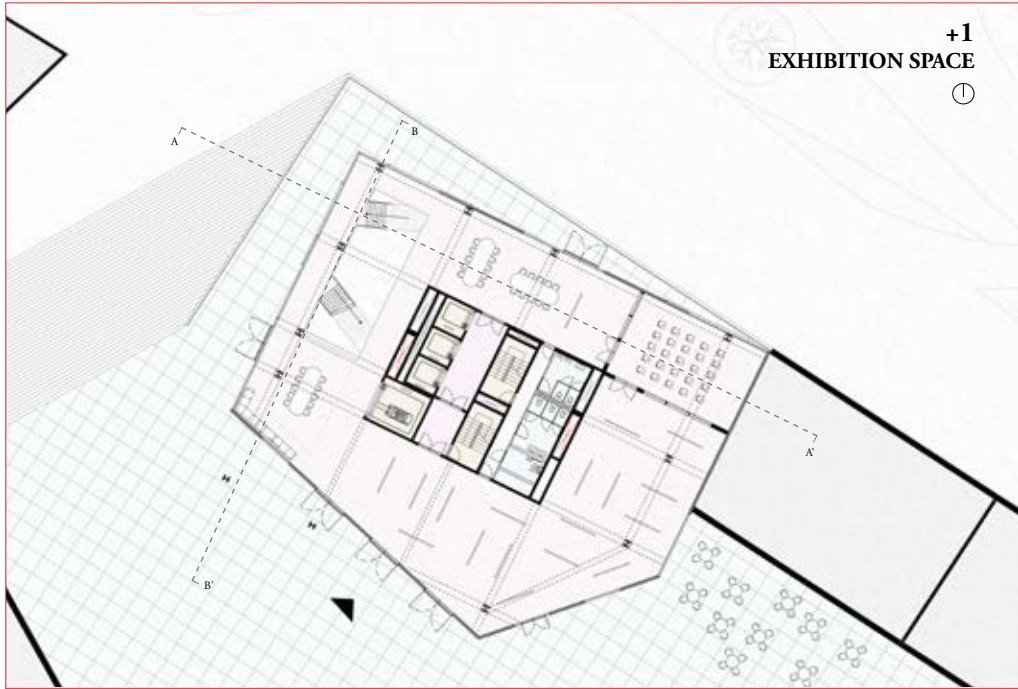


- a. Skybar
- b. Technical space
- c. Laboratory
- d. Student restaurant
- e. Classroom
- f. Study + secretariat
- g. Exhibition space
- h. Entrance + Foodmarket
- i. Waste management

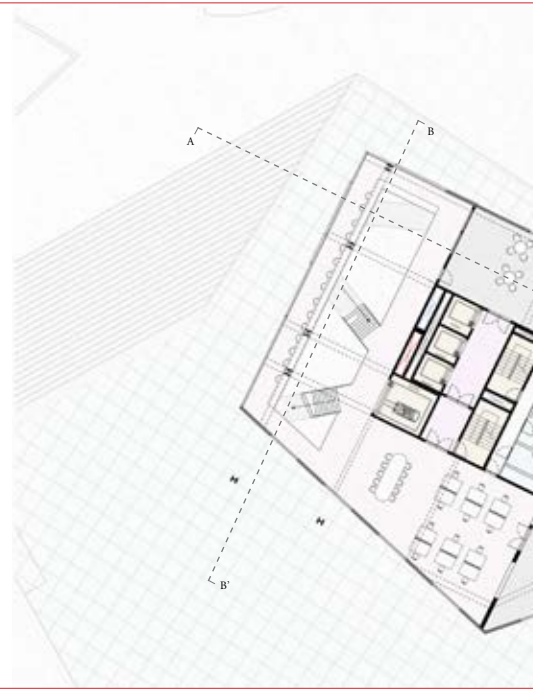
BB' SECTION



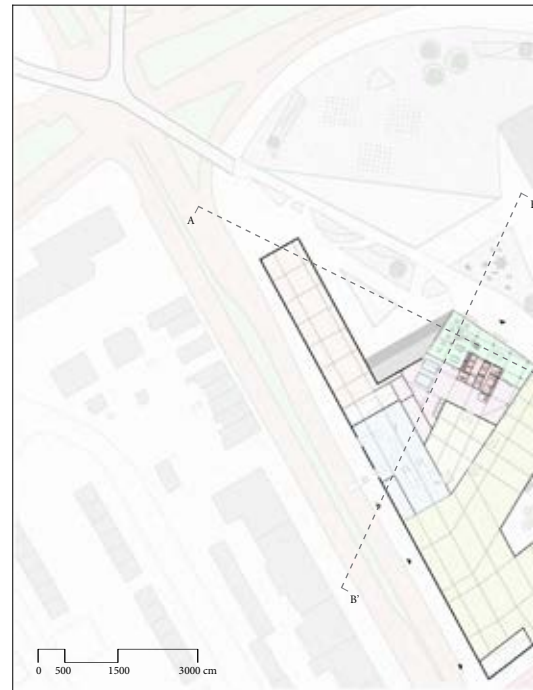
- a. Skybar
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- i. Waste management



+1
EXHIBITION SPACE
⊙



+16/+19
LABORATORY
a.
⊙



+16/+19
LABORATORY
a+
⊙

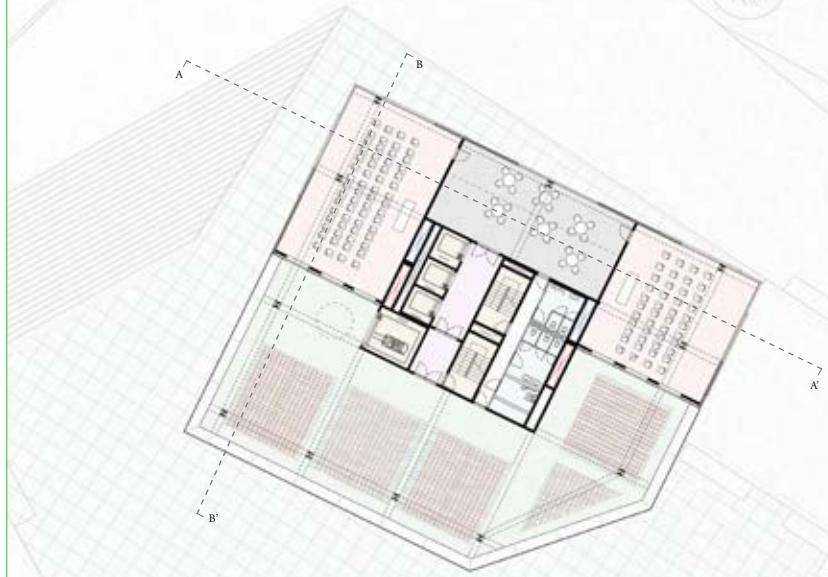


+2/+3
SECRETARIAT



+4/+12
CLASSROOM

a.



+0
MARKET



+4/+12
CLASSROOM

b.



+13/+14
STUDENT RESTAURANT

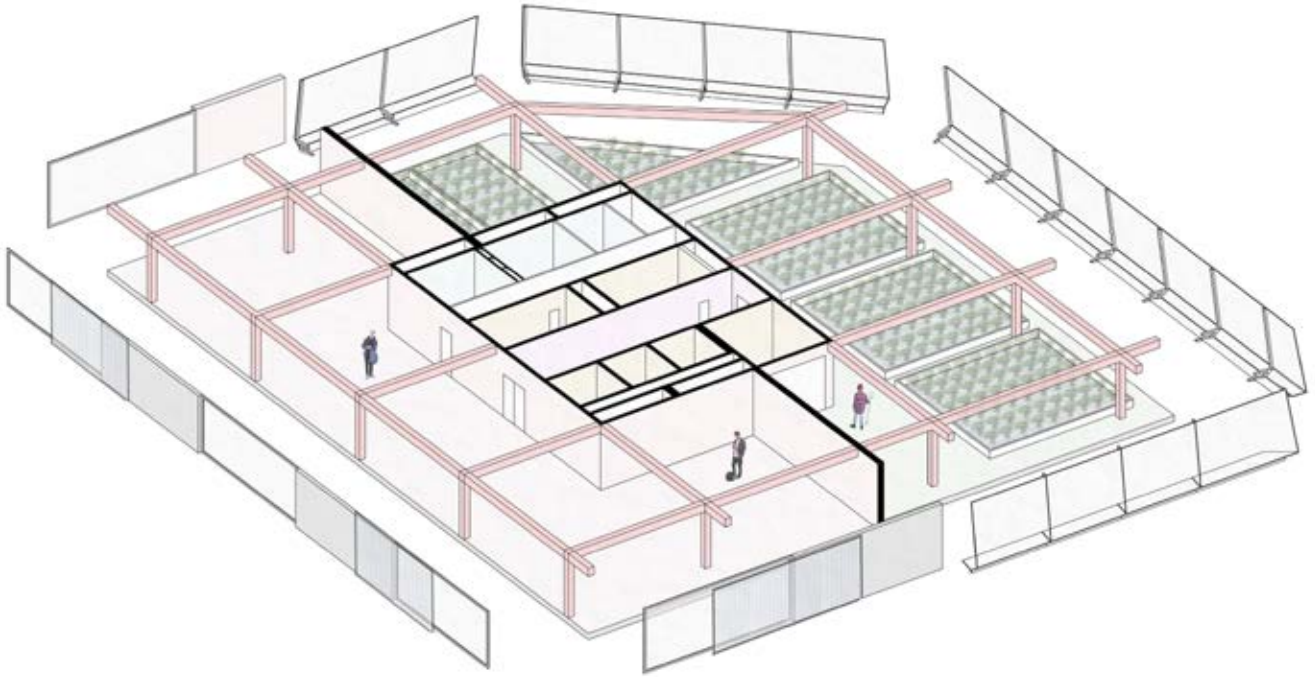
a.



+13/+14
STUDENT RESTAURANT

b.





CT

LAYOUT
STRUCTURAL & FUNCTIONAL



NORTH FACADE

0 300 900 1800 cm



VIEW
TYPICAL CLASSROOM
Visual connection agriculture and school

VIEW
FROM BORDET
A landmark defining the new NATO-site

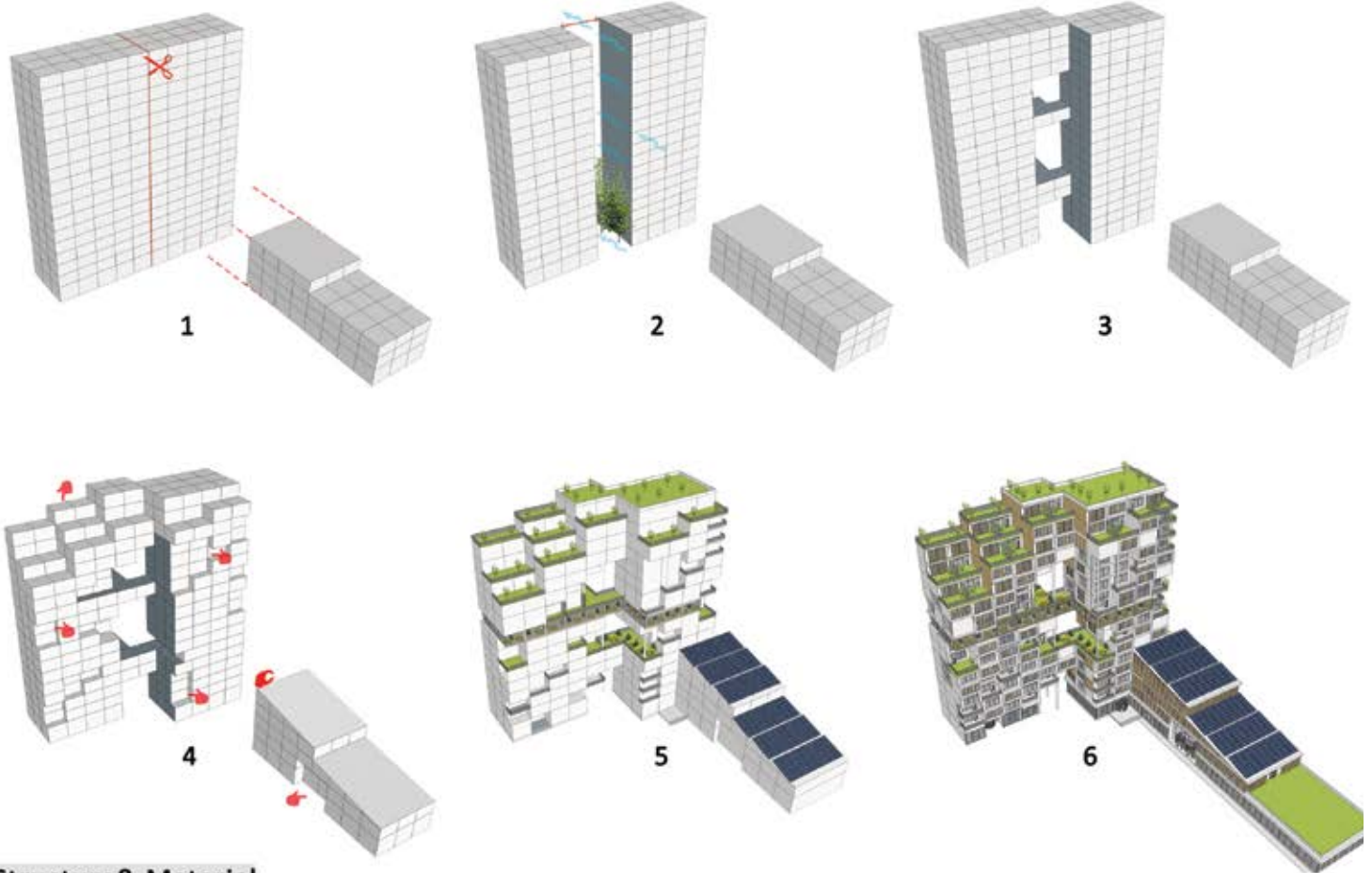


GREEN TOWER

STUDENT:
LAMIS AWAD



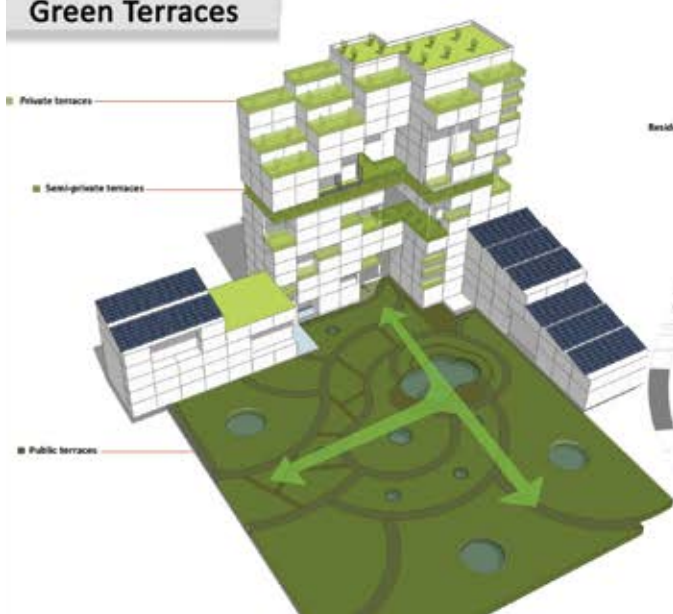
Concept



Structure & Material

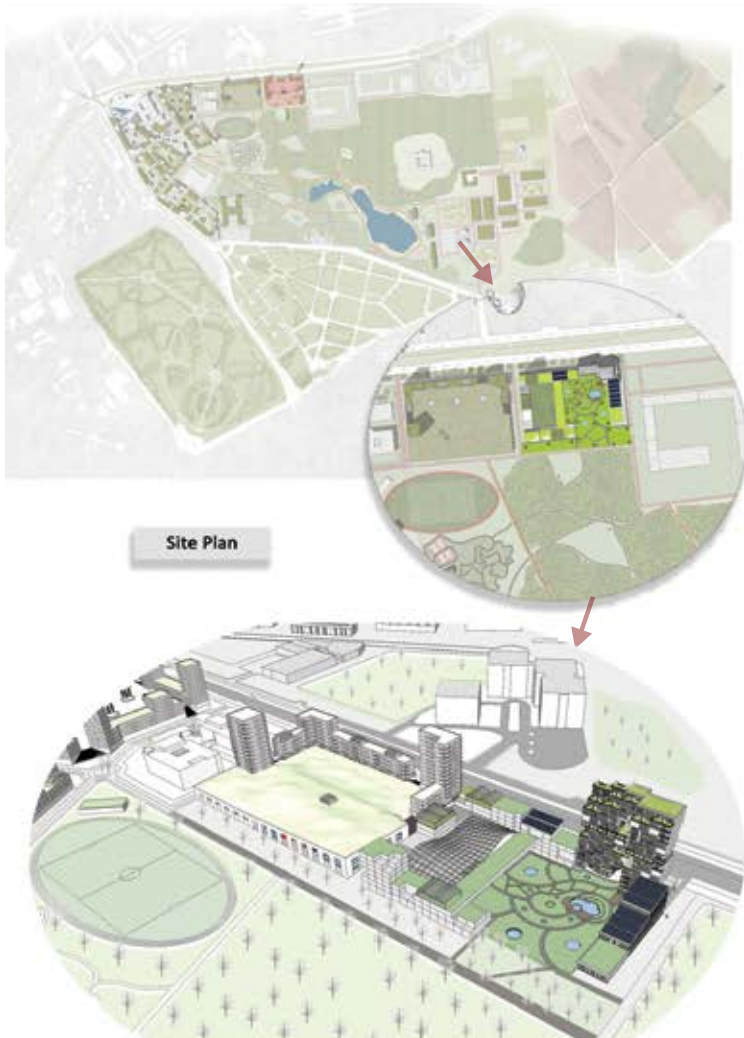


Green Terraces



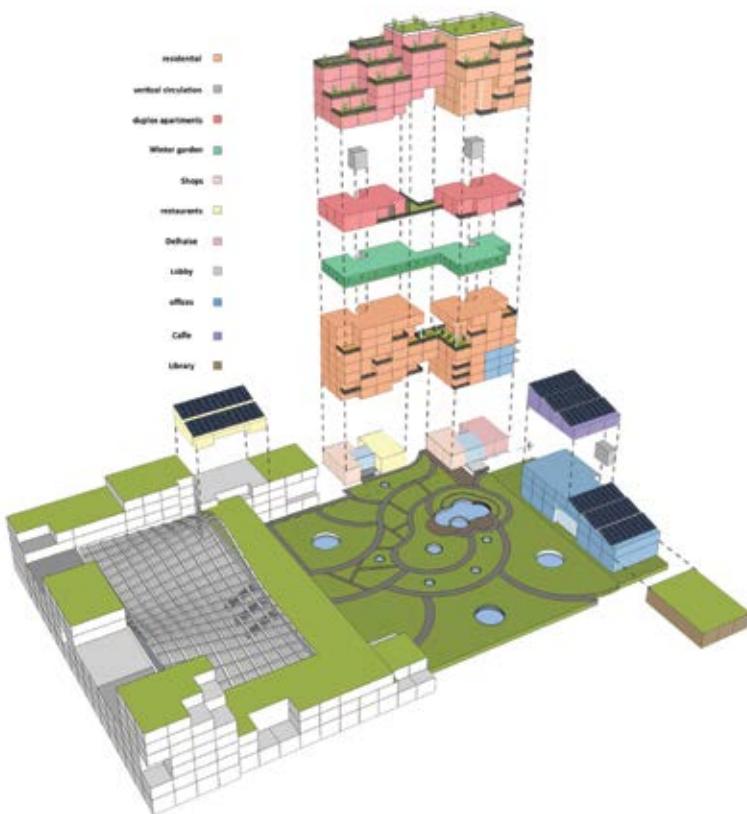
Orientation





Site Plan

Program



Green Tower

Function: residential and mix-use tower

Location: The Tower located in very important position in front of NATO building and LEOPOLDIII street, and next to the main park in our site.

The proposal contains a large selection of apartments range from small apartments for students to large apartments for family, and each apartment opens towards balcony space.

This tower considered as high-rise building and vertical social community
 The design proposes to create a sustainable and collective community, social interaction and natural climate with minimum technology.

The tower consists of 17 stories, with a total area of 11.000 m2, and contains homes, shops, and restaurant.

The offices part consists of 4 stories, with a total area of 3000 m2

Balconies, glass winter gardens and roof terraces has been added to the tower to contribute natural ventilation.

The different spaces offer residents four levels of privacy: private, semi-private, semi-public and public courtyard opened also to inhabitants of nearby neighborhoods
 The result is a light grid enveloping the volume, structuring the facades.

Material used: The building made from durable materials, timber, white concrete, and glasses.

Sustainable design principles that taken into account during the design:

The building is designed to achieve the passive-house standard
 Thermal and ventilation: the building has thermal insulation system with passive ventilation to reduce overall energy consumption within the buildings, and
 Provide a more economical solution to climate control.
 The building sloop sides on the sun site to best capture solar energy and maximize light.
 Solar panel covered the entire roof.

apartments layout 1/200

Master bedroom	12.00
Children bedroom	11.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Storage	10.00
Roof	10.00
Total	76.00

Master bedroom	12.00
Children bedroom	11.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Storage	10.00
Roof	10.00
Total	76.00

Master bedroom	12.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Roof	10.00
Total	55.00

Master bedroom	12.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Roof	10.00
Total	55.00

Master bedroom	12.00
Children bedroom	11.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Storage	10.00
Roof	10.00
Total	76.00

Master bedroom	12.00
Children bedroom	11.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Storage	10.00
Roof	10.00
Total	76.00

Master bedroom	12.00
Children bedroom 1	11.00
Children bedroom 2	11.00
Bath	4.00
Kitchen	7.00
Living area	12.00
Entrance & circulation	10.00
Storage	10.00
Roof	10.00
Total	97.00

Duplex Floor Plan 1/200



Duplex Floor Plan 1/200





First Floor Plan 1/200



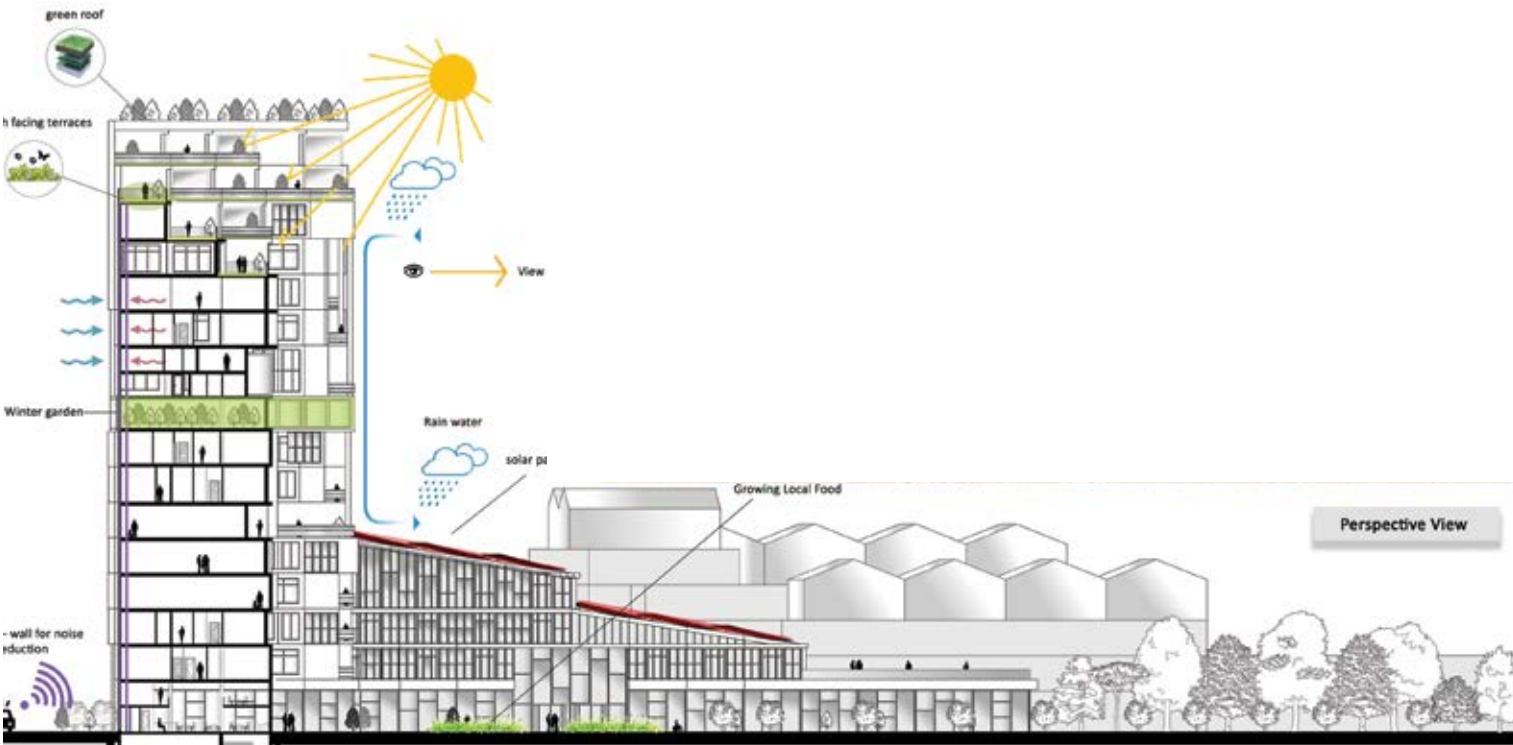
Second Floor Plan 1/200



terraces view

Section with surrounding g 1/500



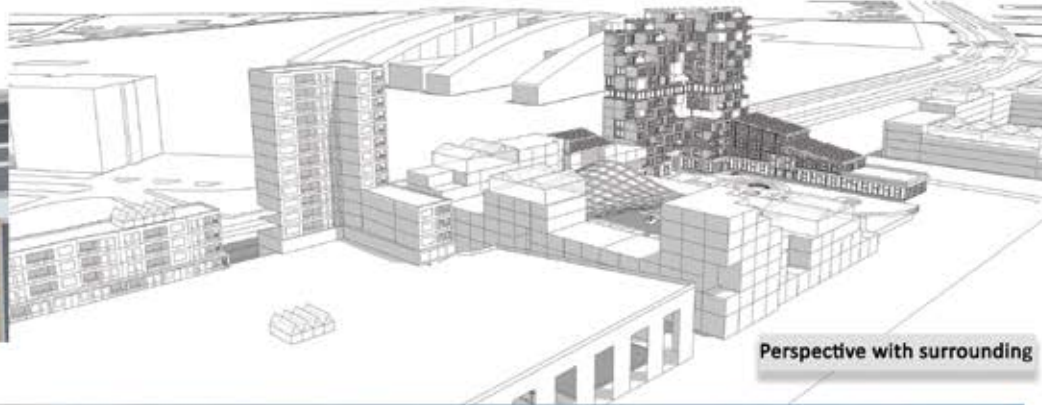




Front Elevation 1/200



Semi - Private terrace view



Perspective with surrounding



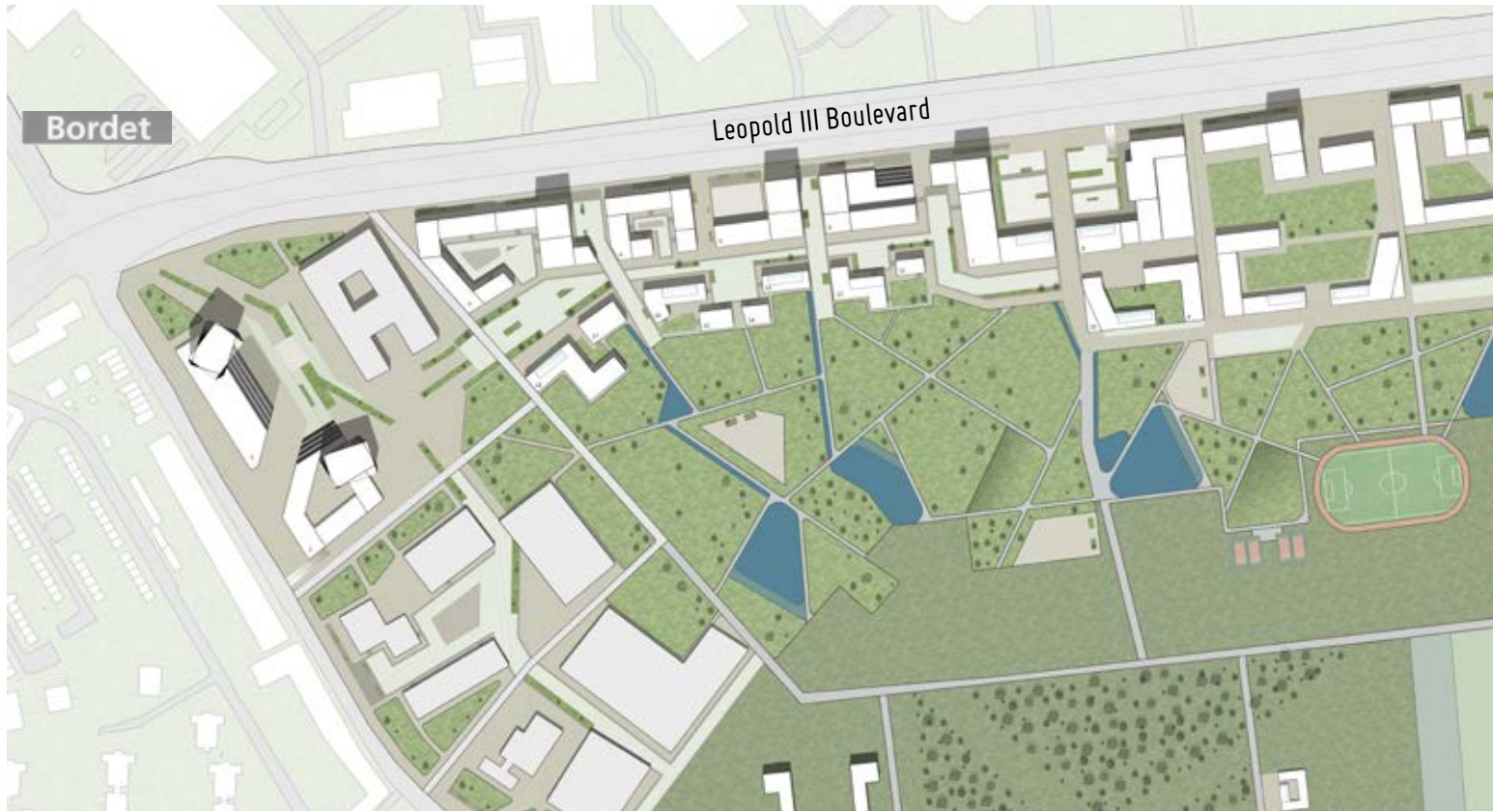
Left Elevation 1/200

BORDET TOWER

STUDENT:
LARA HAELTERMAN

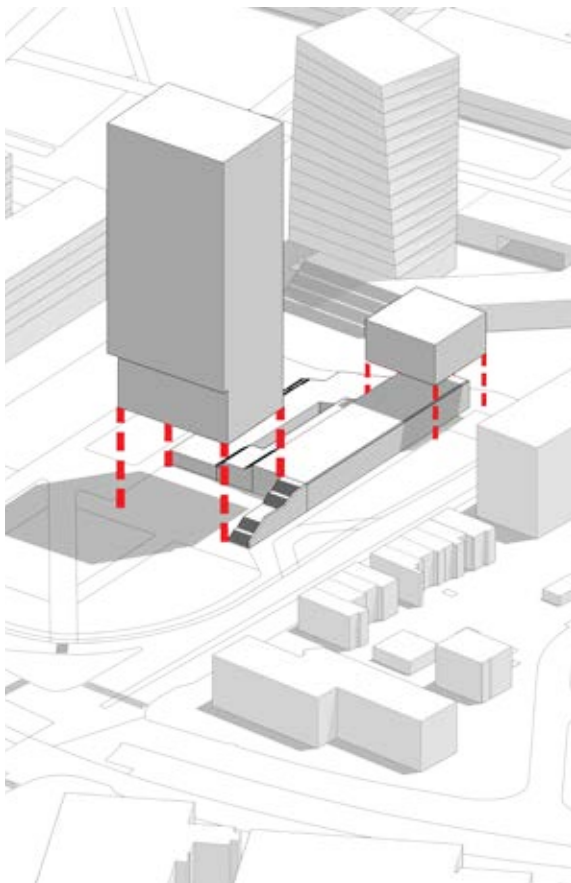


Masterplan Entwined Spines

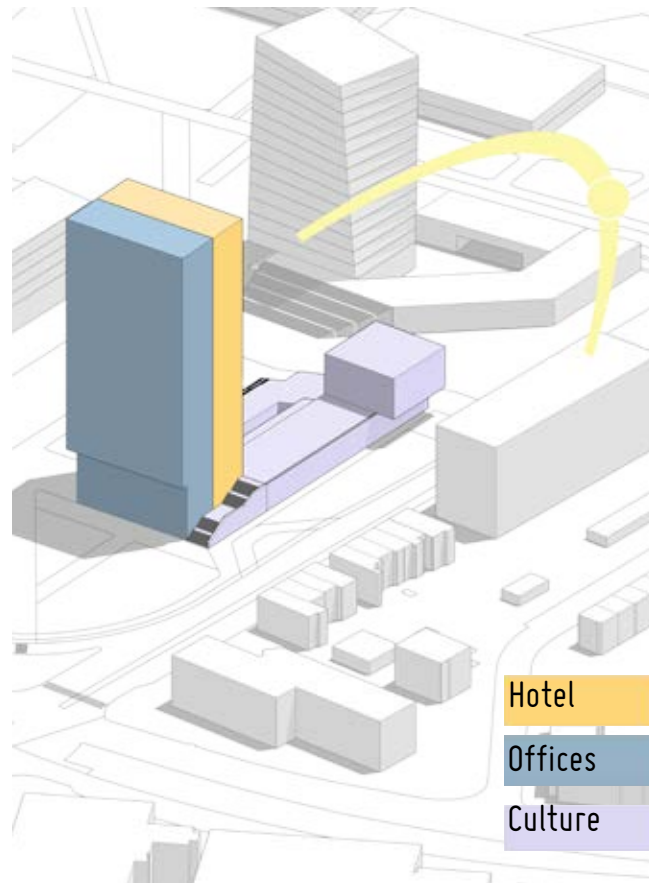


Concept

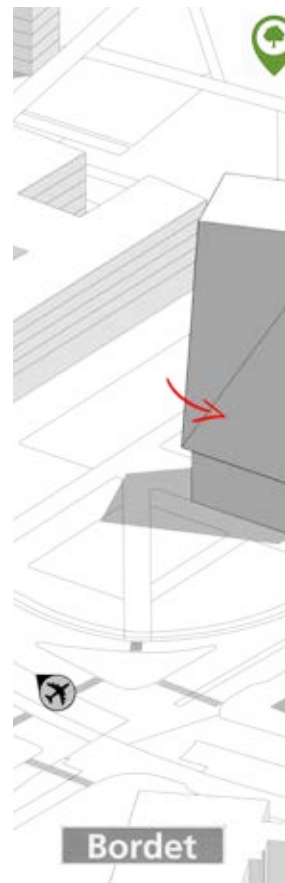
Volumetry

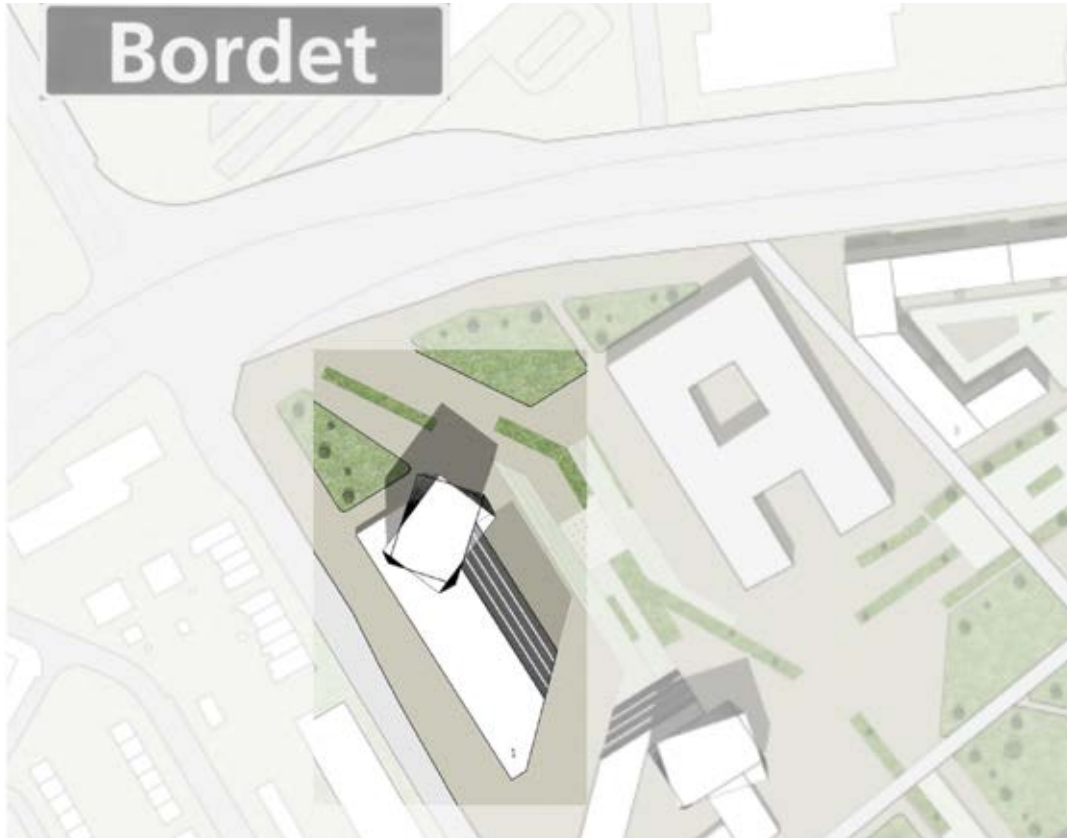


Mix of functions



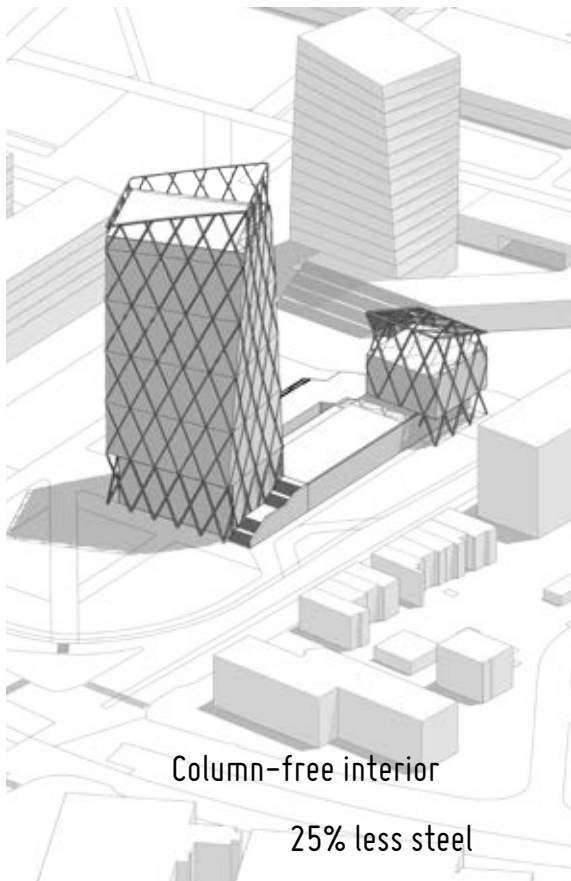
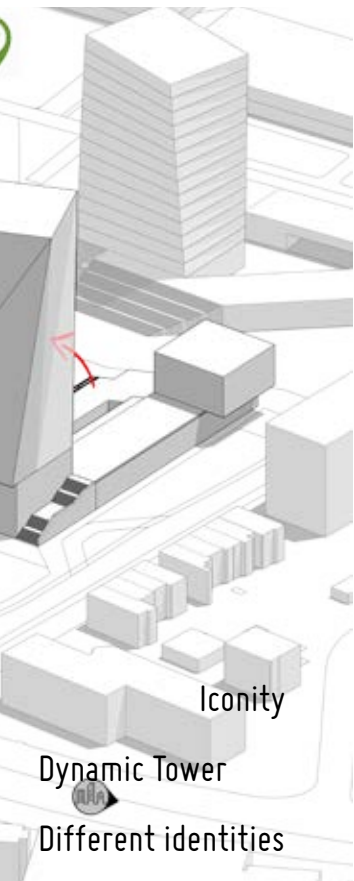
Twist





Diagrid

Stacked green



Iconity

Dynamic Tower

Different identities

Column-free interior

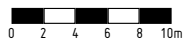
25% less steel

Reuse of stormwater

Sustainable strategies

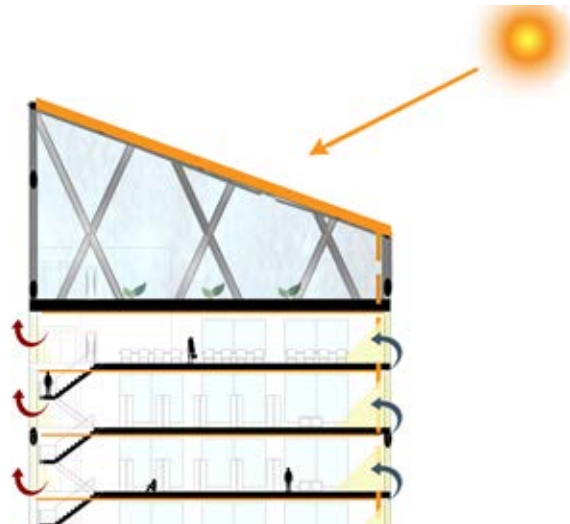
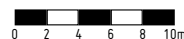
Zoom section BB'

Scale 1/200

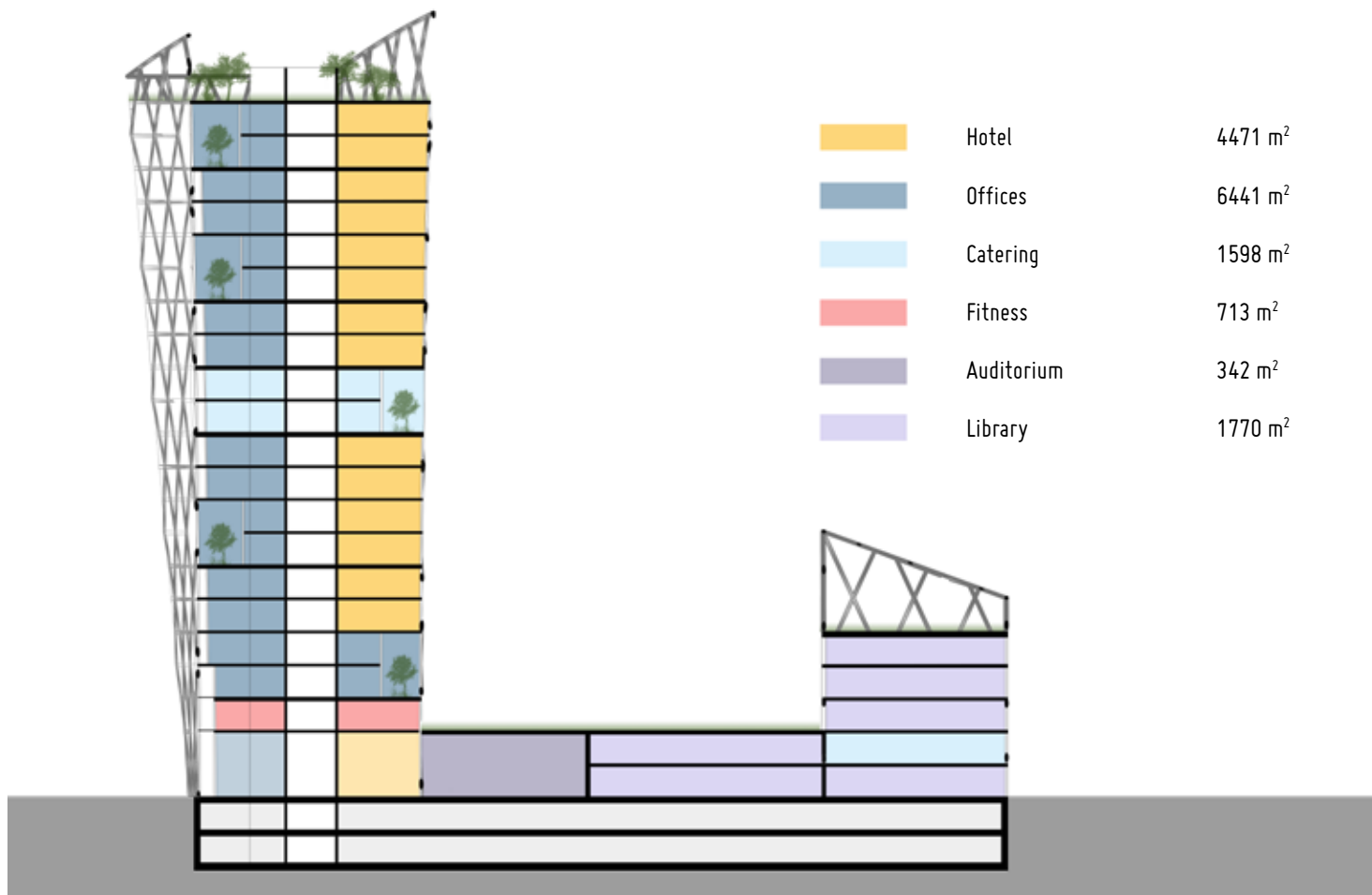


Zoom section AA'

Scale 1/200

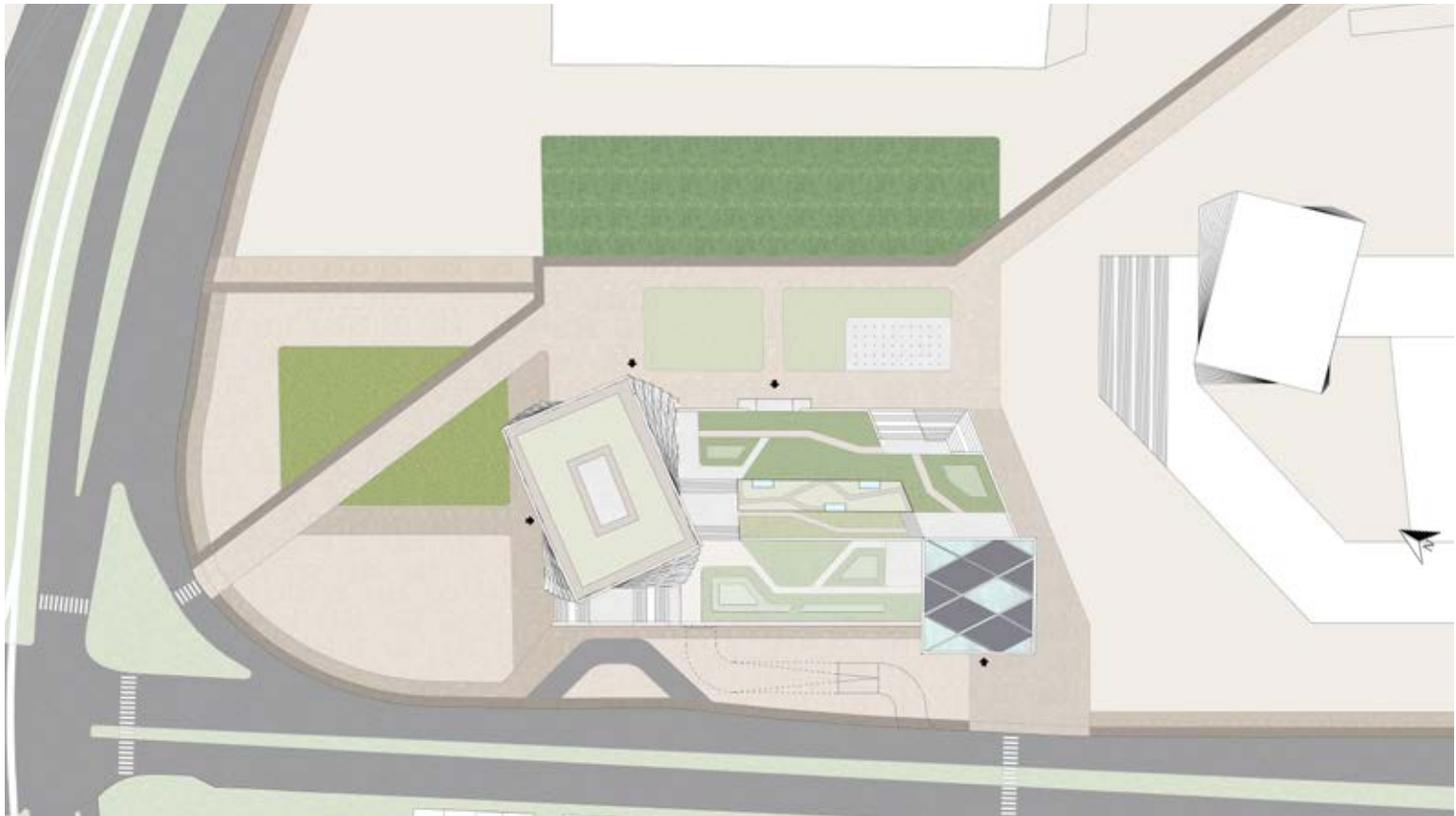


Program



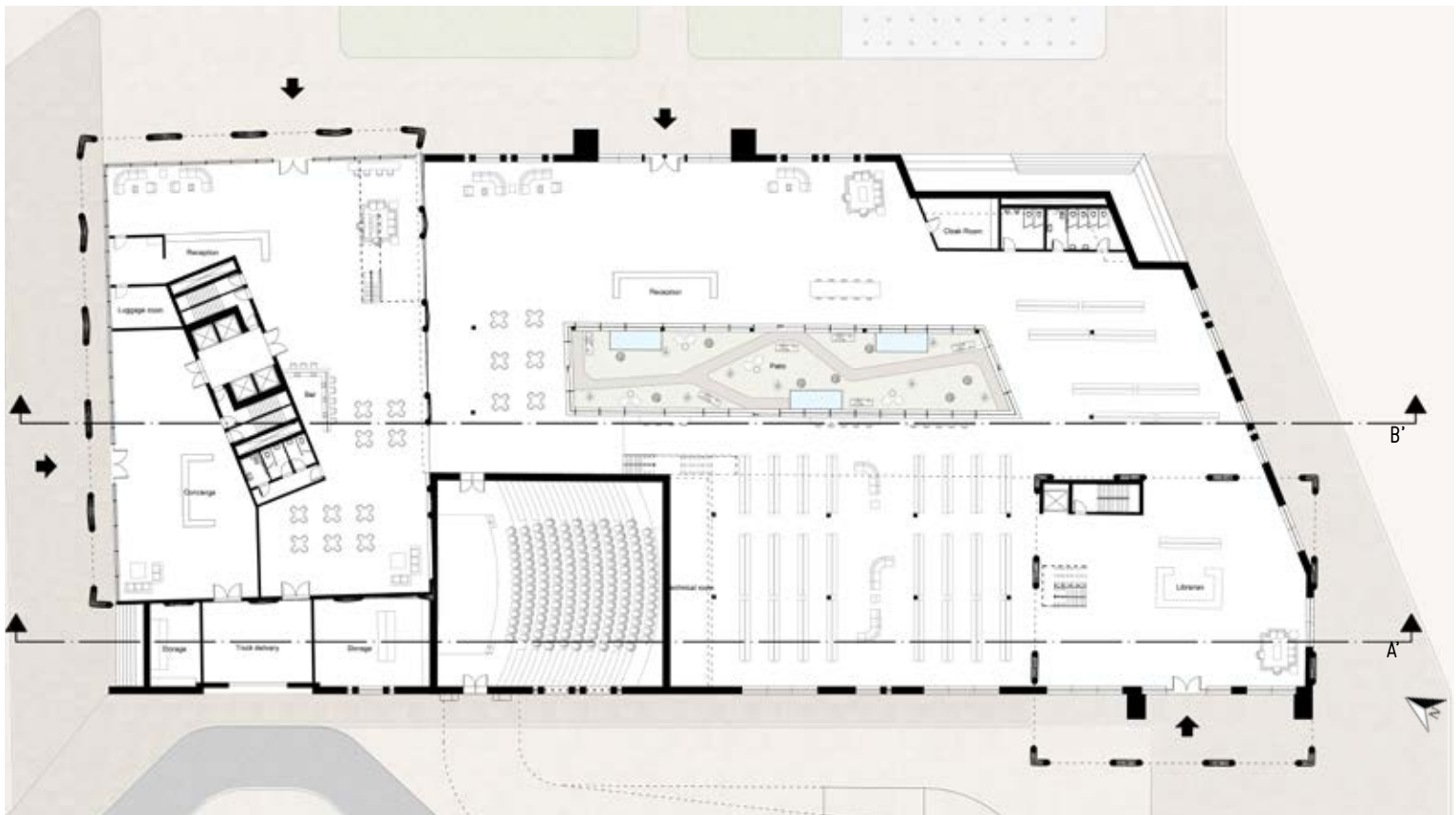
Roof plan

0 5 10 15 20 25m



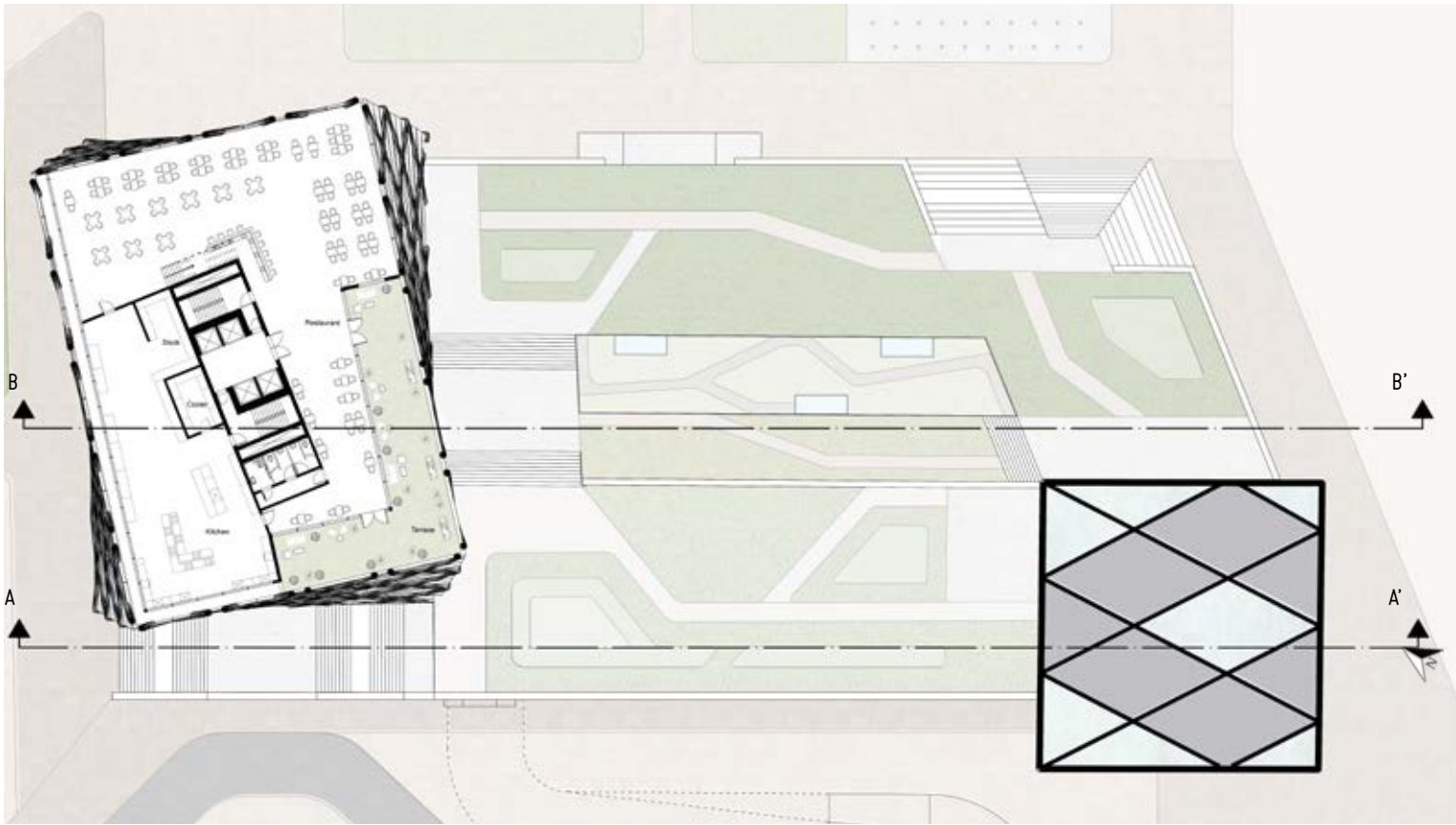
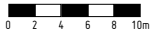
Level 0

0 2 4 6 8 10m



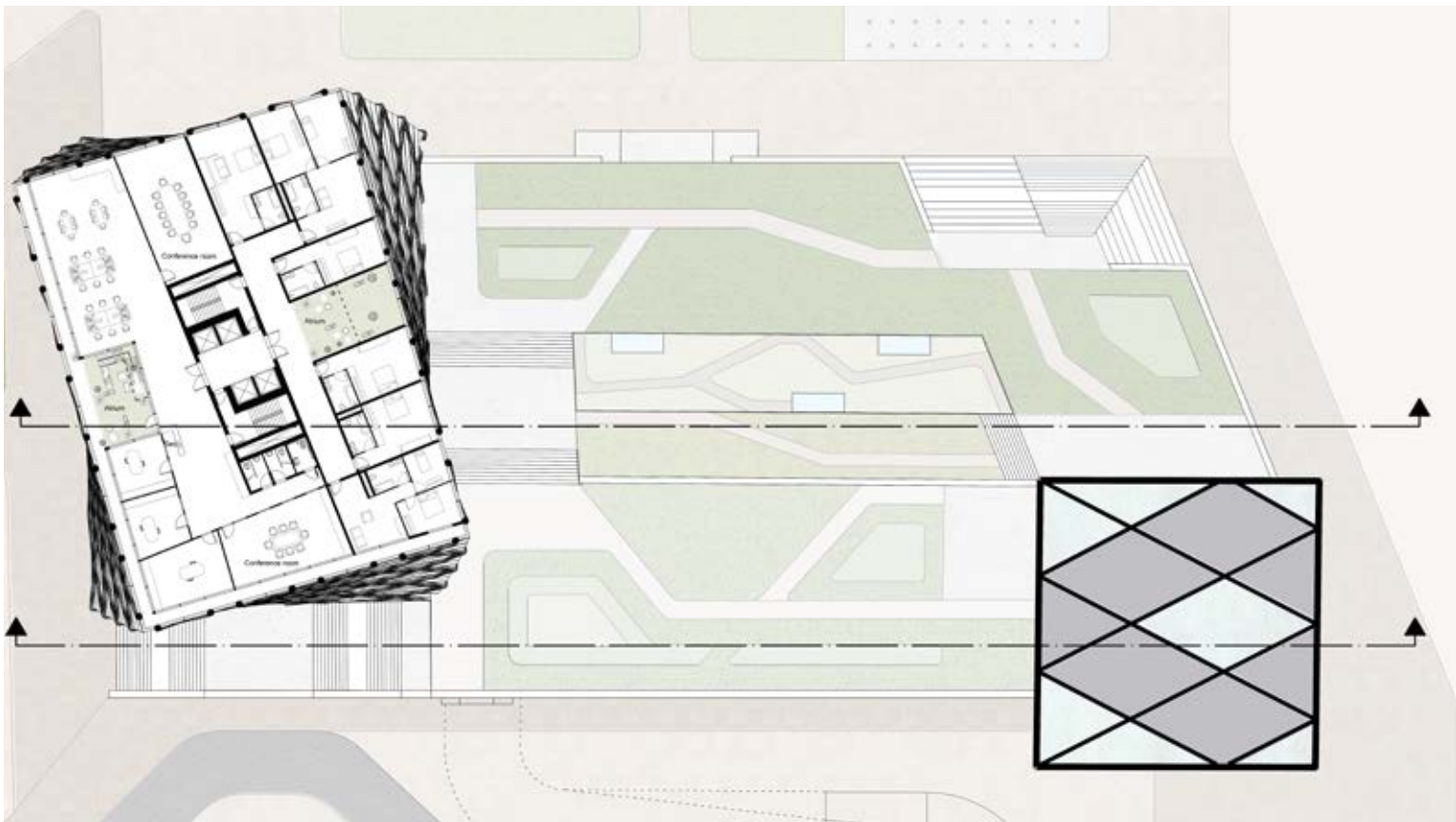
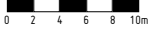
Level 11

Scale 1/200



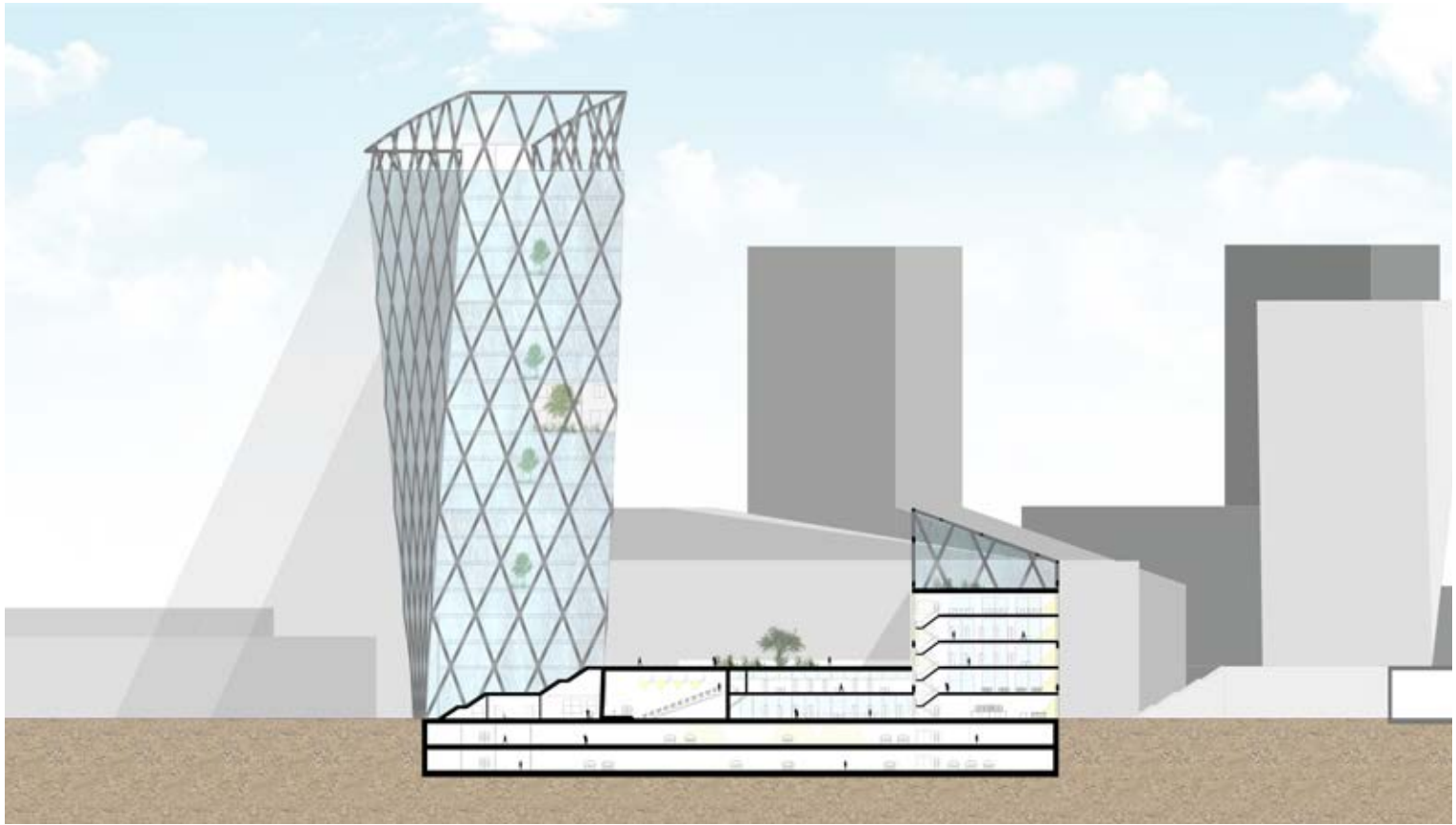
Level 15

Scale 1/200



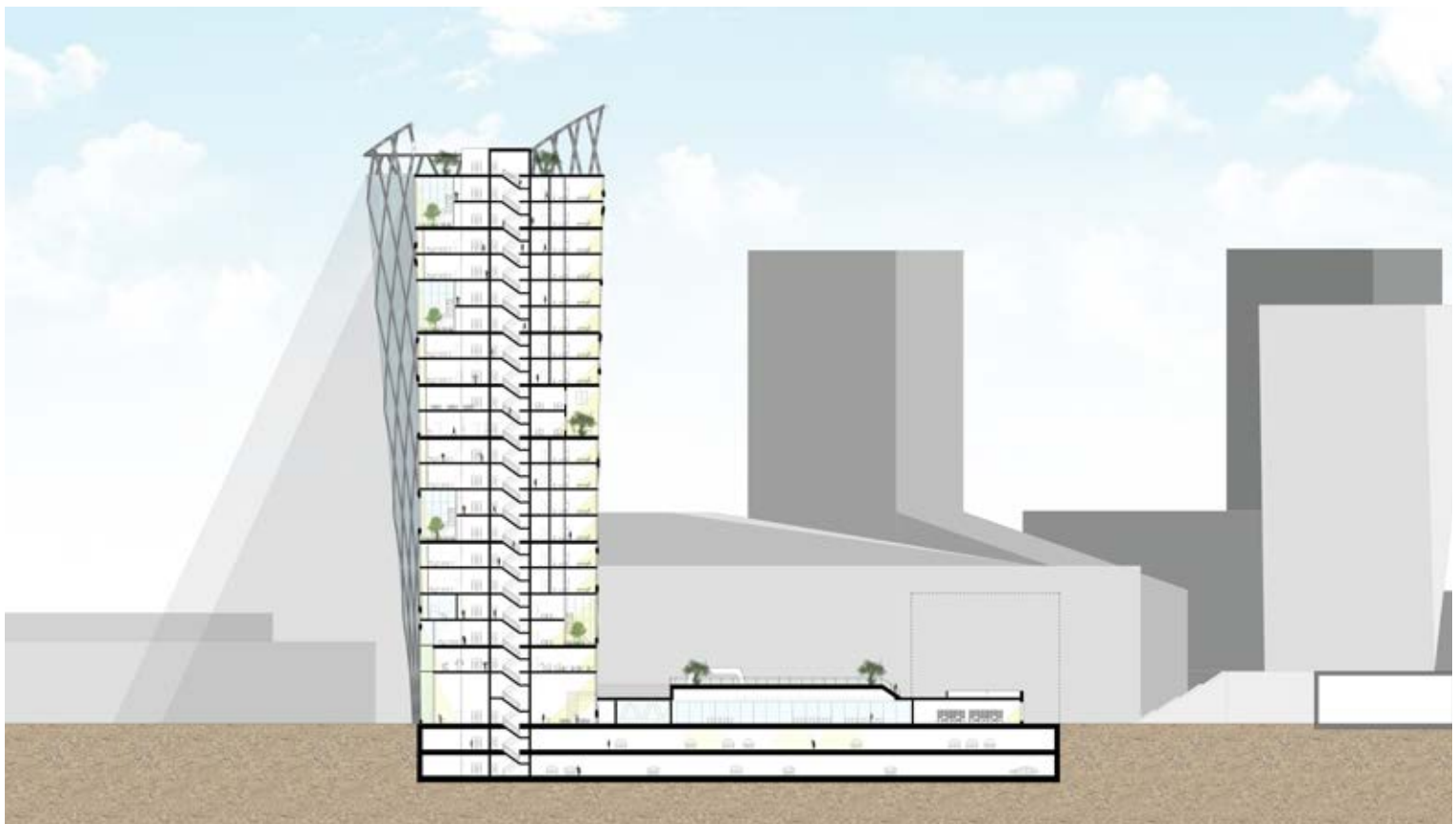
Section AA'

0 5 10 15 20 25m

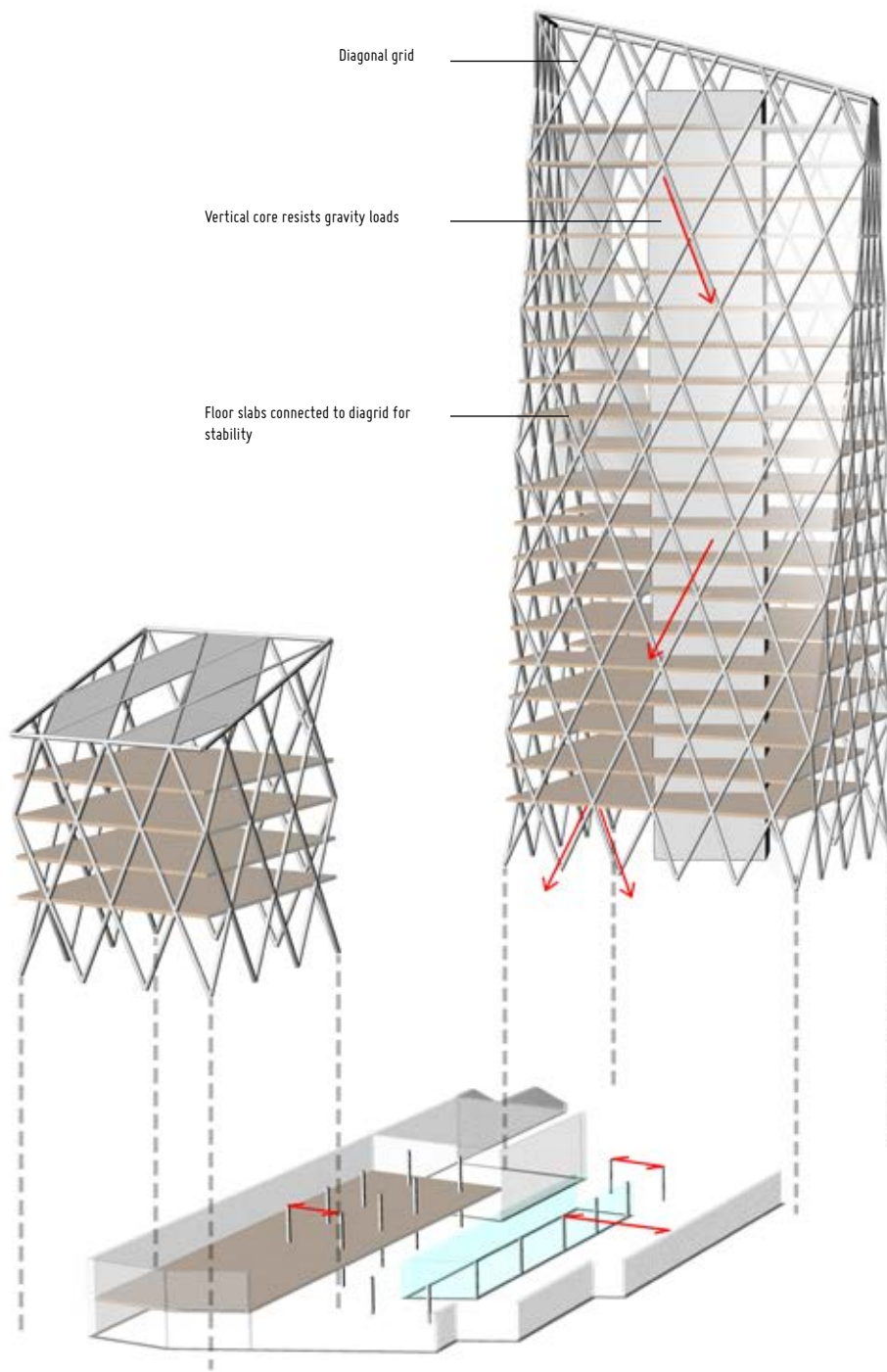


Section BB'

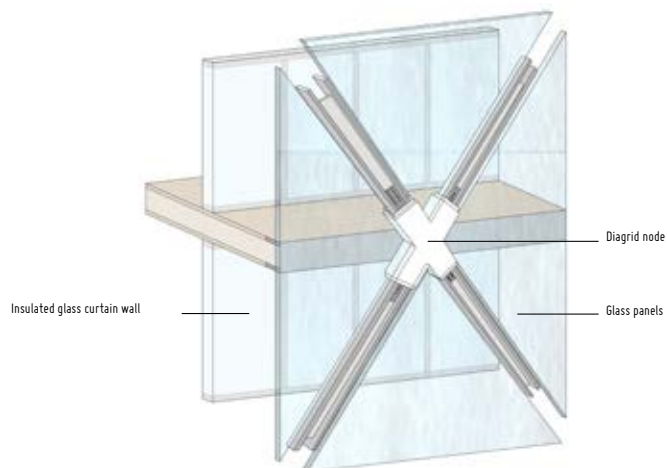
0 5 10 15 20 25m



Load bearing structure



Tower materialization



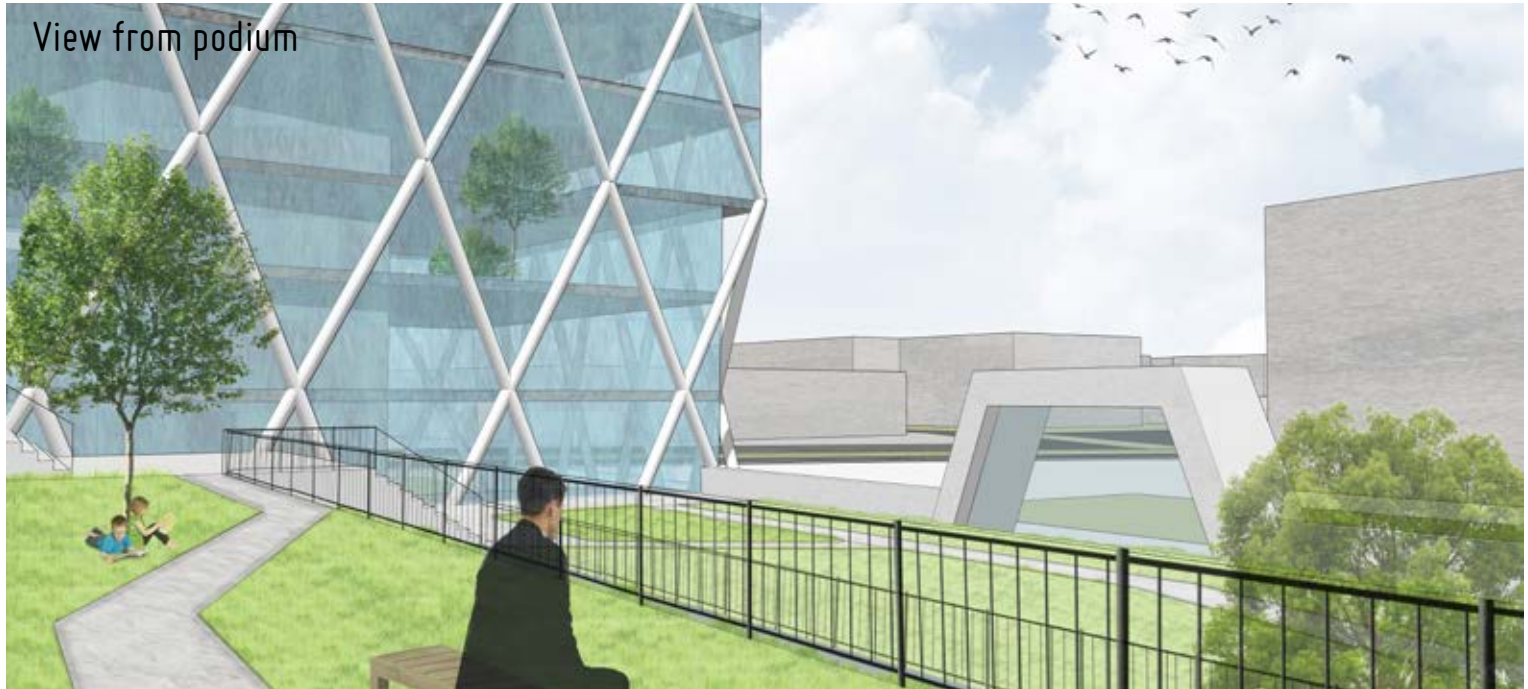
Podium materialization



View from Bordet



View from podium

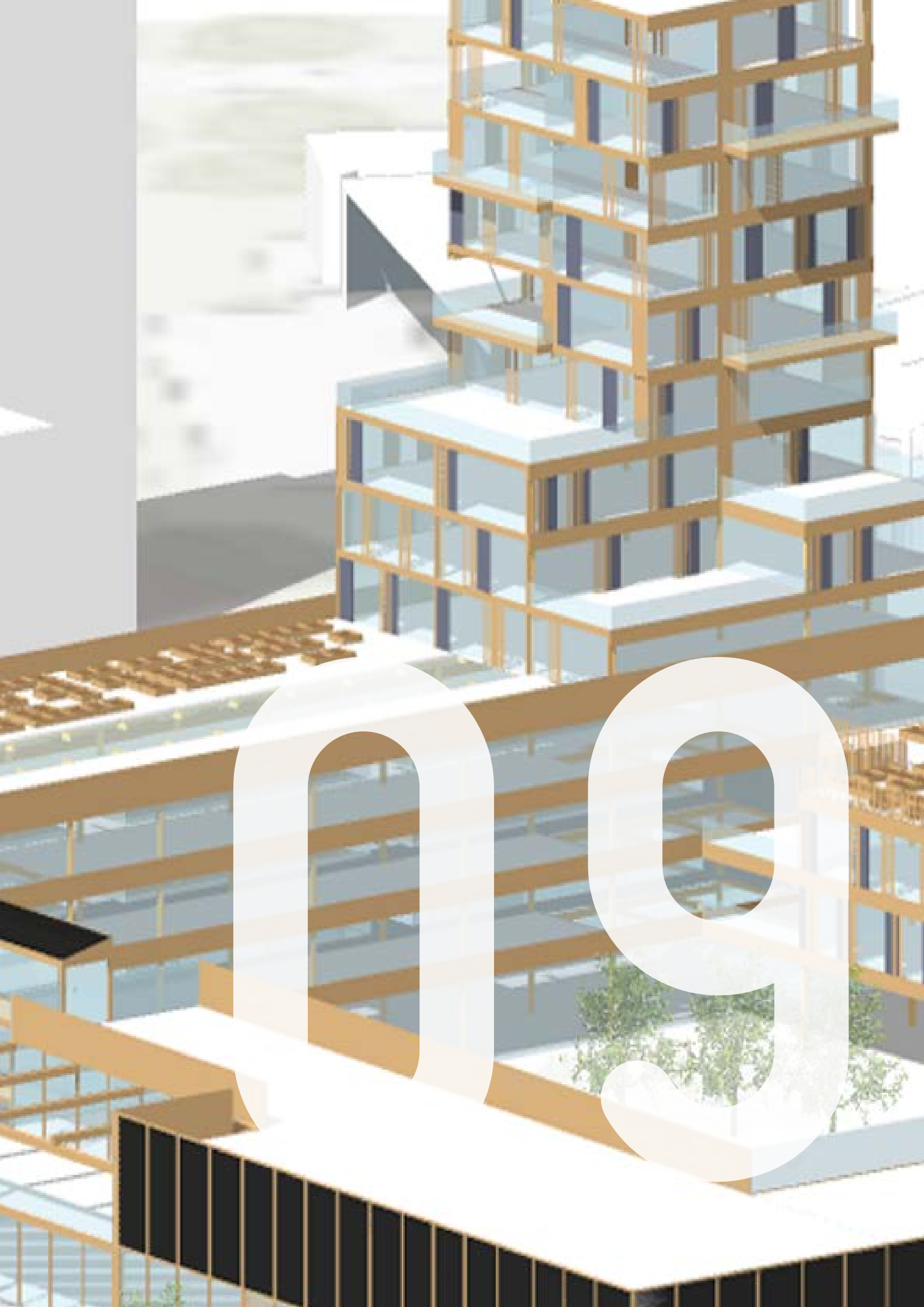


View of atrium

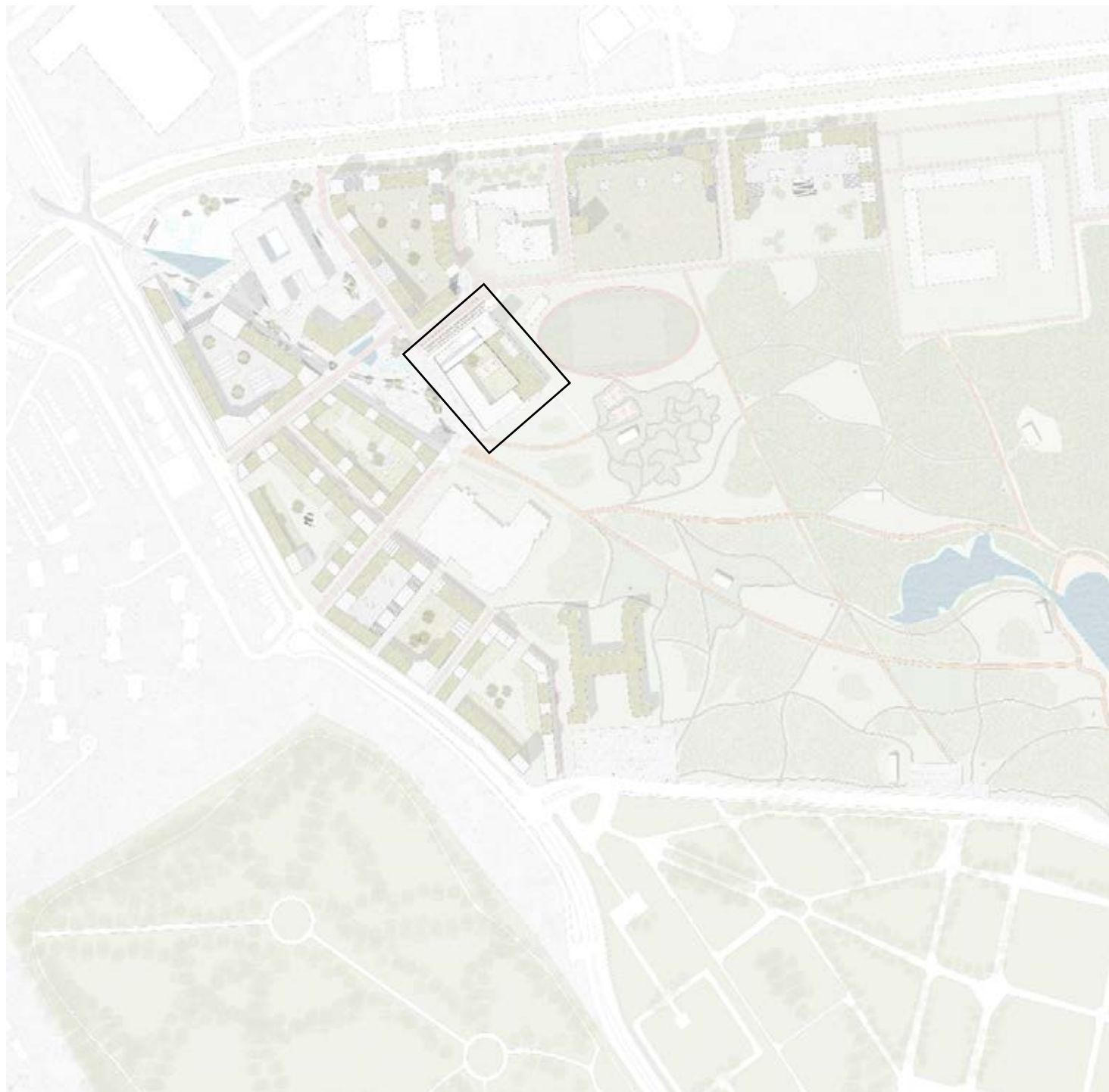


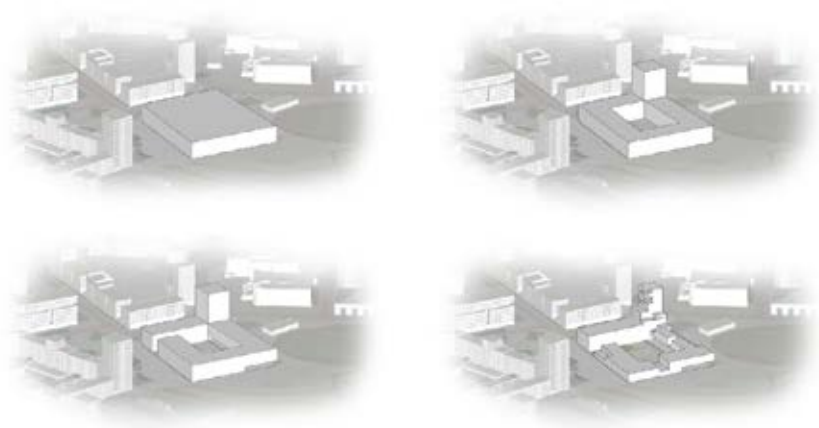
BORDEDUCATION

STUDENT:
Diana Toma



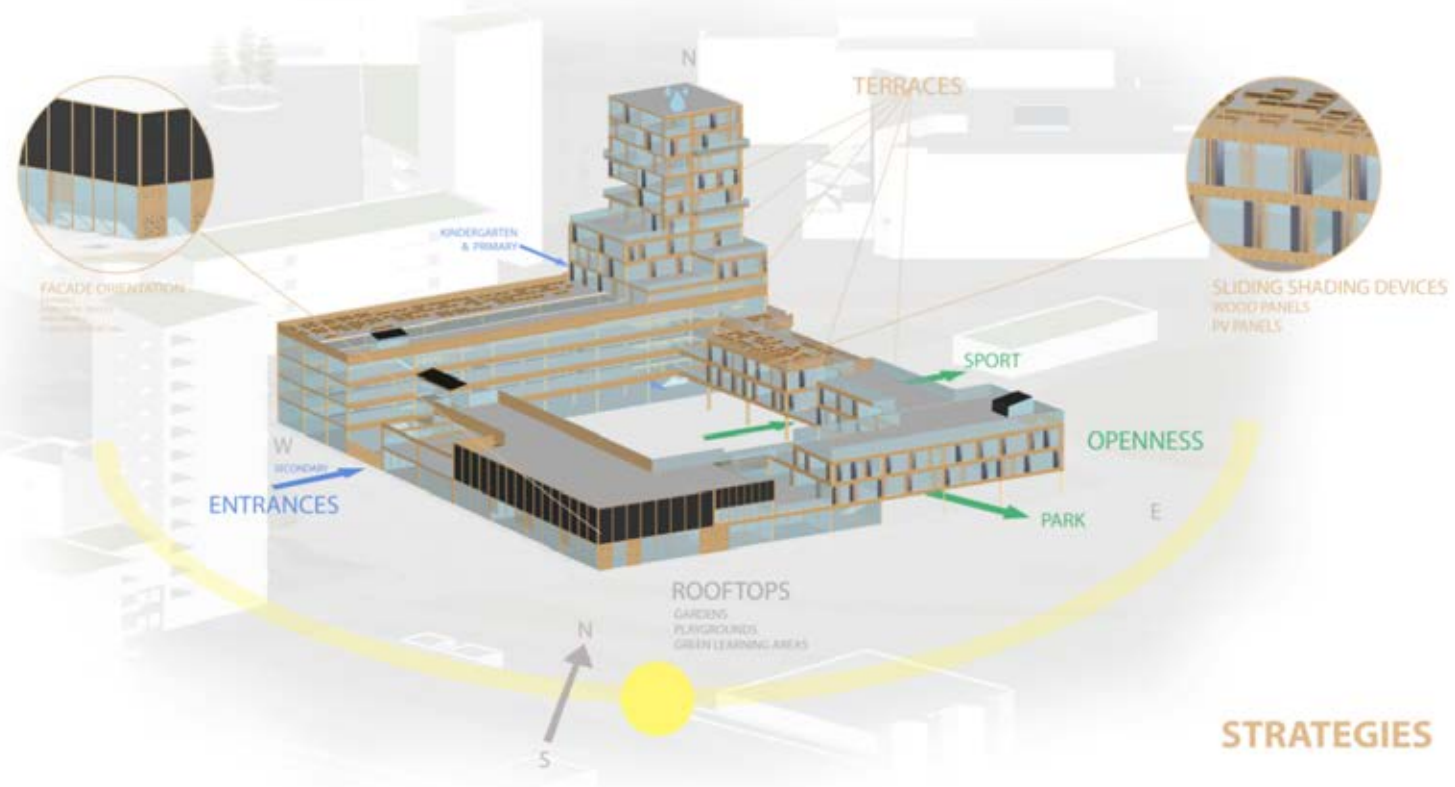
BordE Education





NURSERY NIGHT CLASSES
 EVENTS
 24
 CLASSES

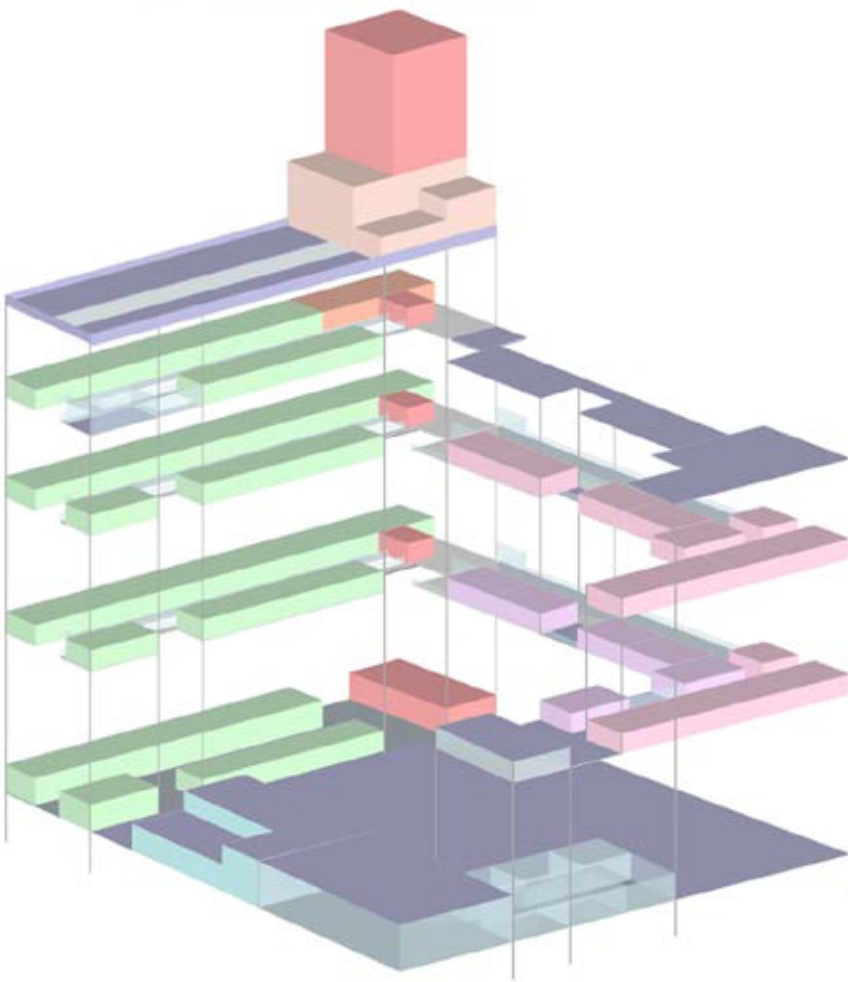
TRANSFORMABLE SPACES
 INTERCLASSES LEARNING
 PEOPLE MEET EACH OTHER
 SHARED FACILITIES



STRATEGIES

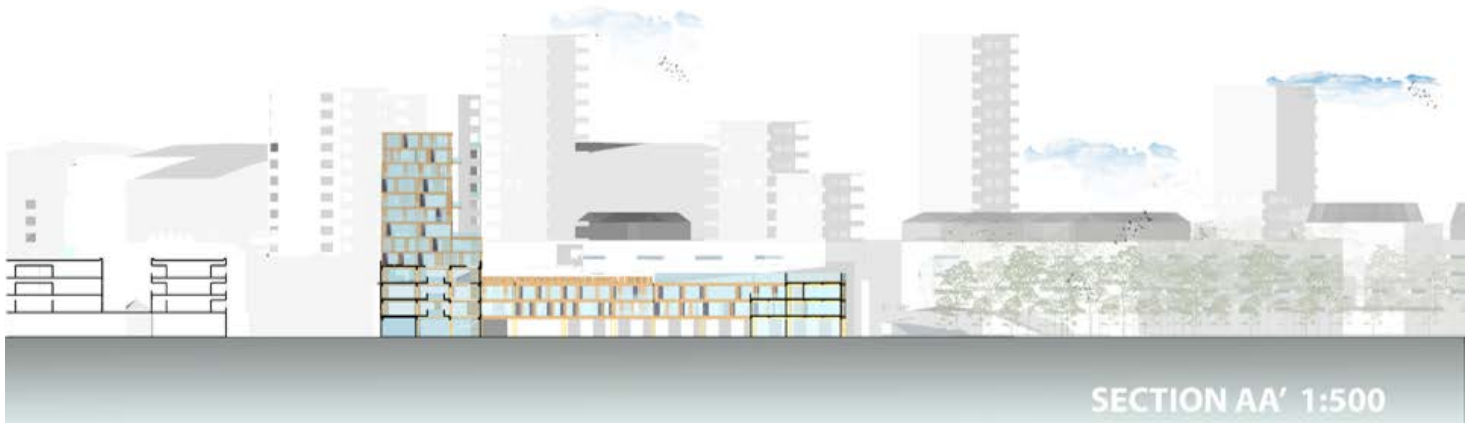
CONCEPT

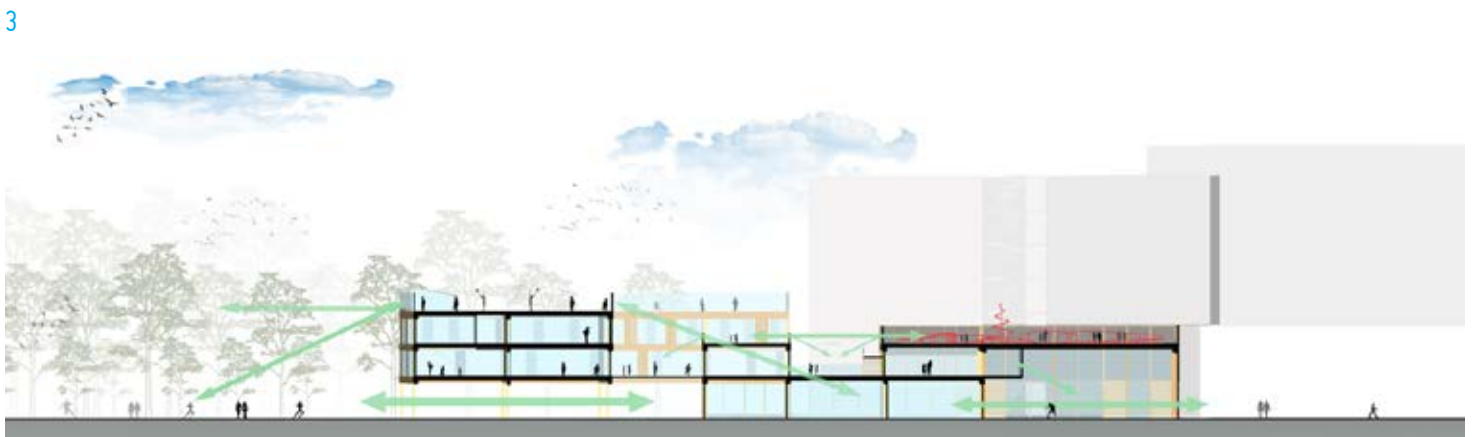
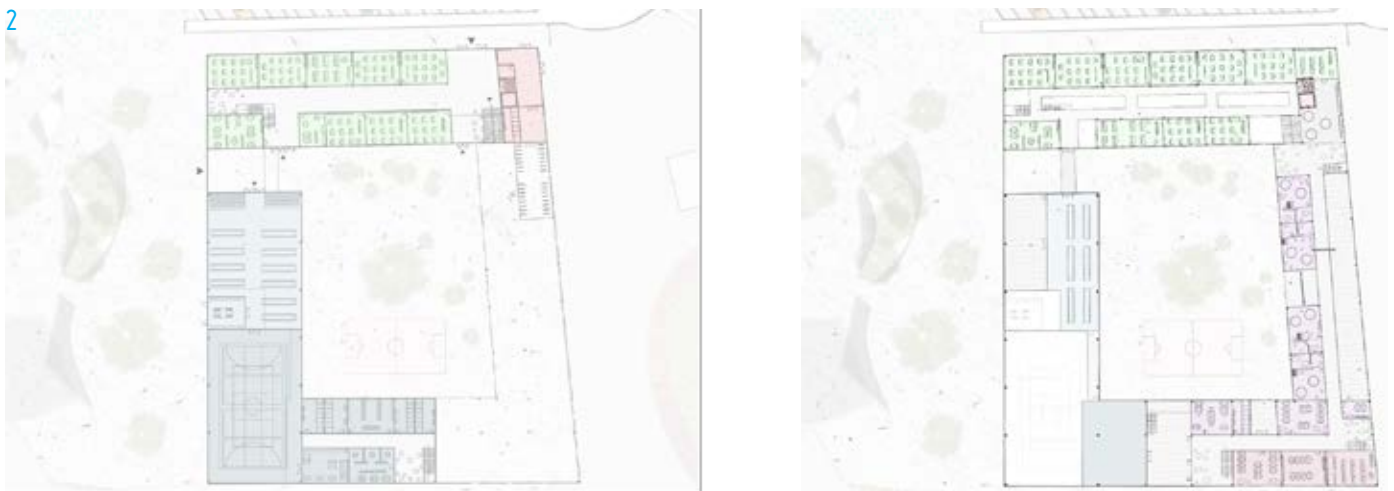
1



- HOUSING 1300 m²
- OPEN SPACES (associations, ateliers) 800 m²
- LIBRARY 320 m²
- SECONDARY 2635 m²
- PRIMARY 810 m²
- KINDERGARTEN 580 m²
- CAFETERIA 770 m²
- SPORTS & FACILITIES 900 m²
- EXTERNAL 6000 m²
- INTERNAL 650 m²

2





1.DISTRIBUTION 2.PLANS R0 & R1 3.SECTION

1

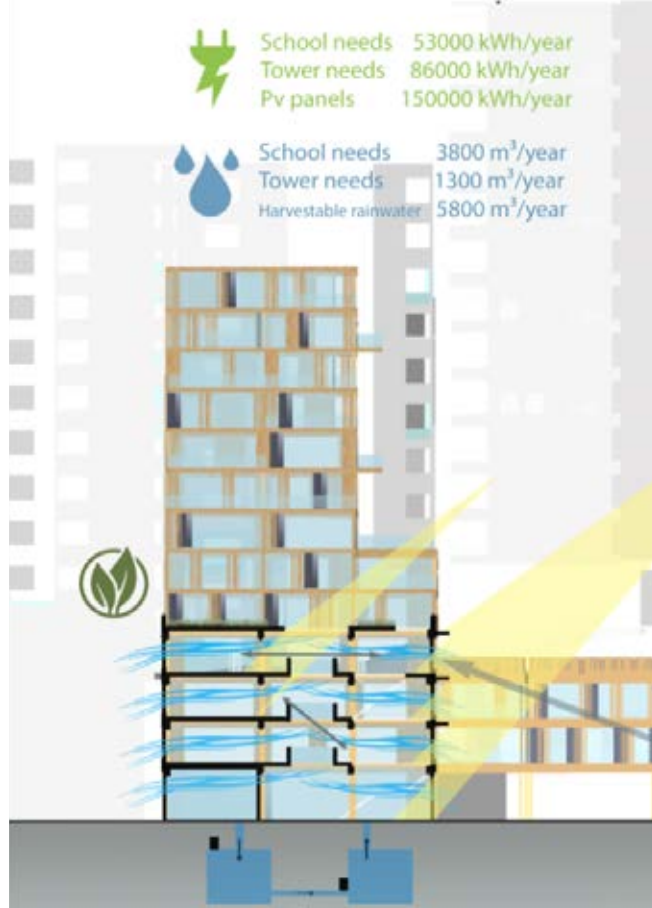
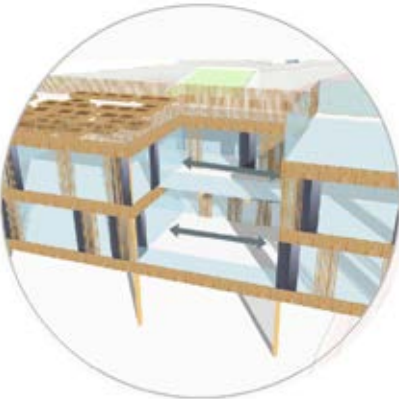


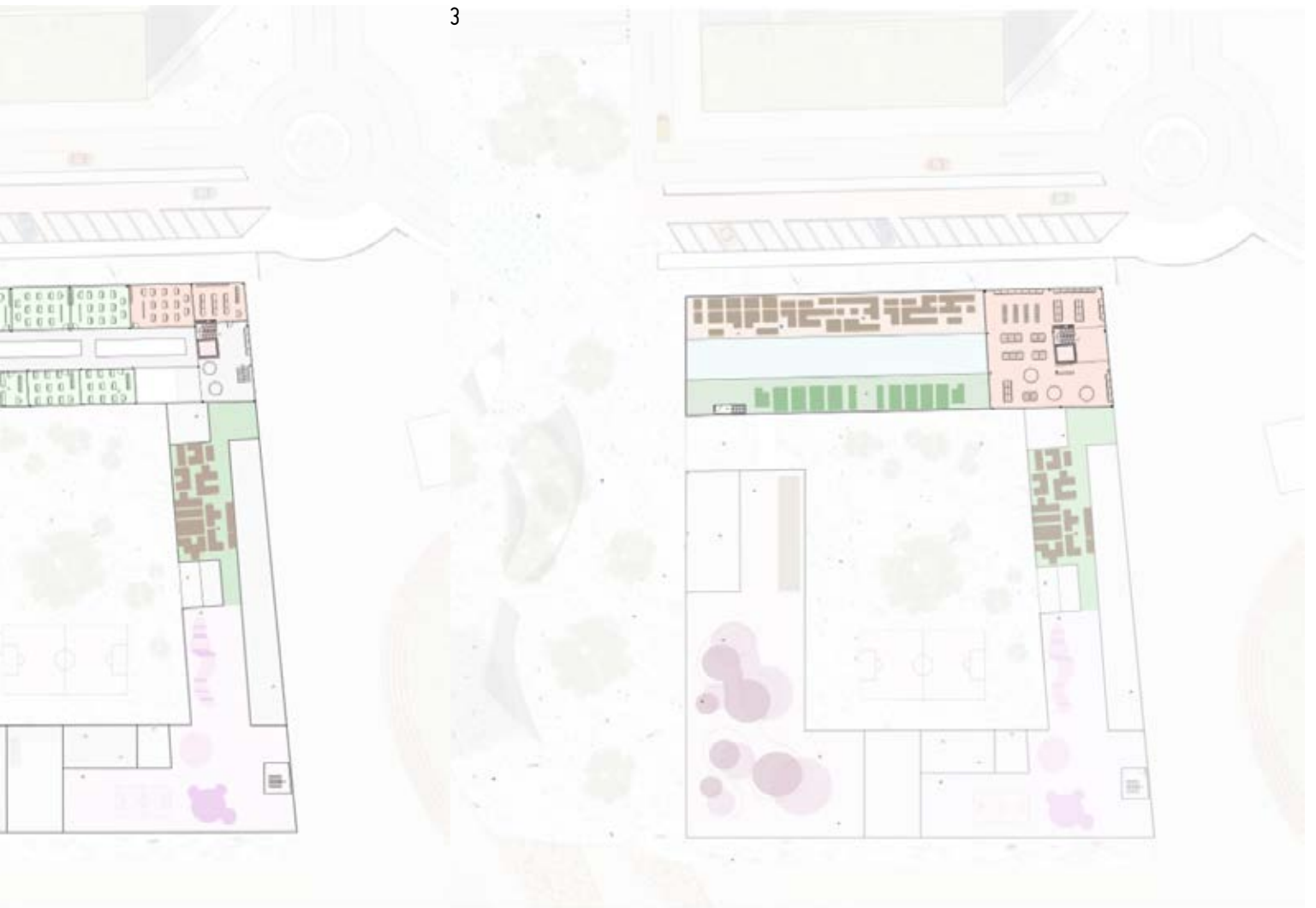
4



Park 'n' Play Rooftop Playground
Lüders, Copenhagen

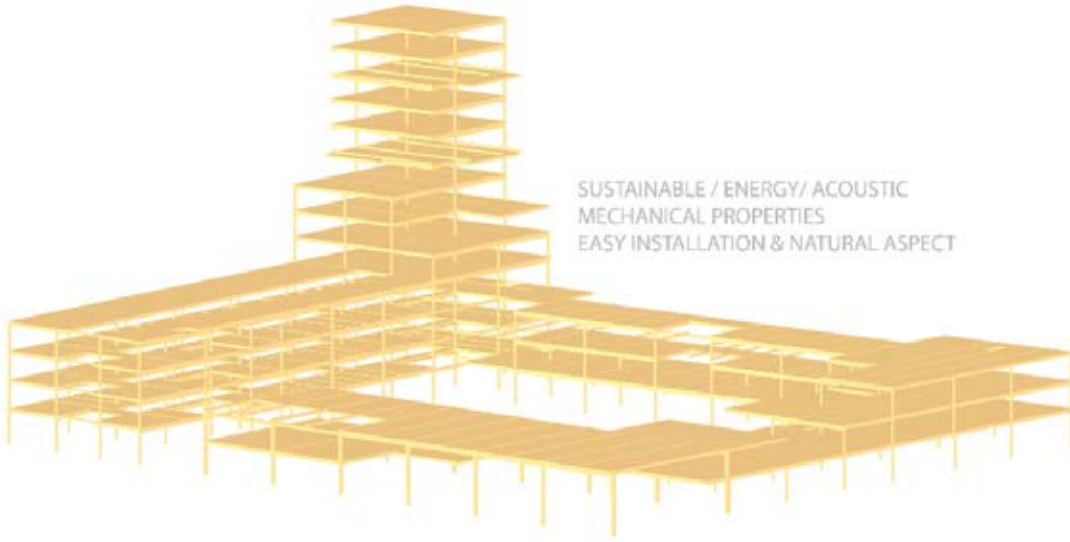
5





SECTION AA' 1:250

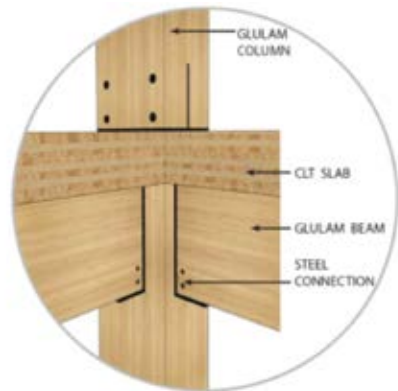
1



2



3





1.RENDERING 2.RENDERING 3.RENDERING 4.RENDERING

SUSTAINABLE ARCHITECTURE DESIGN STUDIO, MA-1
BRUFACE - ULB + VUB - 2018/2019