ARCHITECTURE STUDENT CONTEST

19th INTERNATIONAL EDITION, HELSINKI 2024

THE MEETPOINT

TEAM No. 3

Czech Republic

STUDENT

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Czech Technical University in Prague

TEACHER

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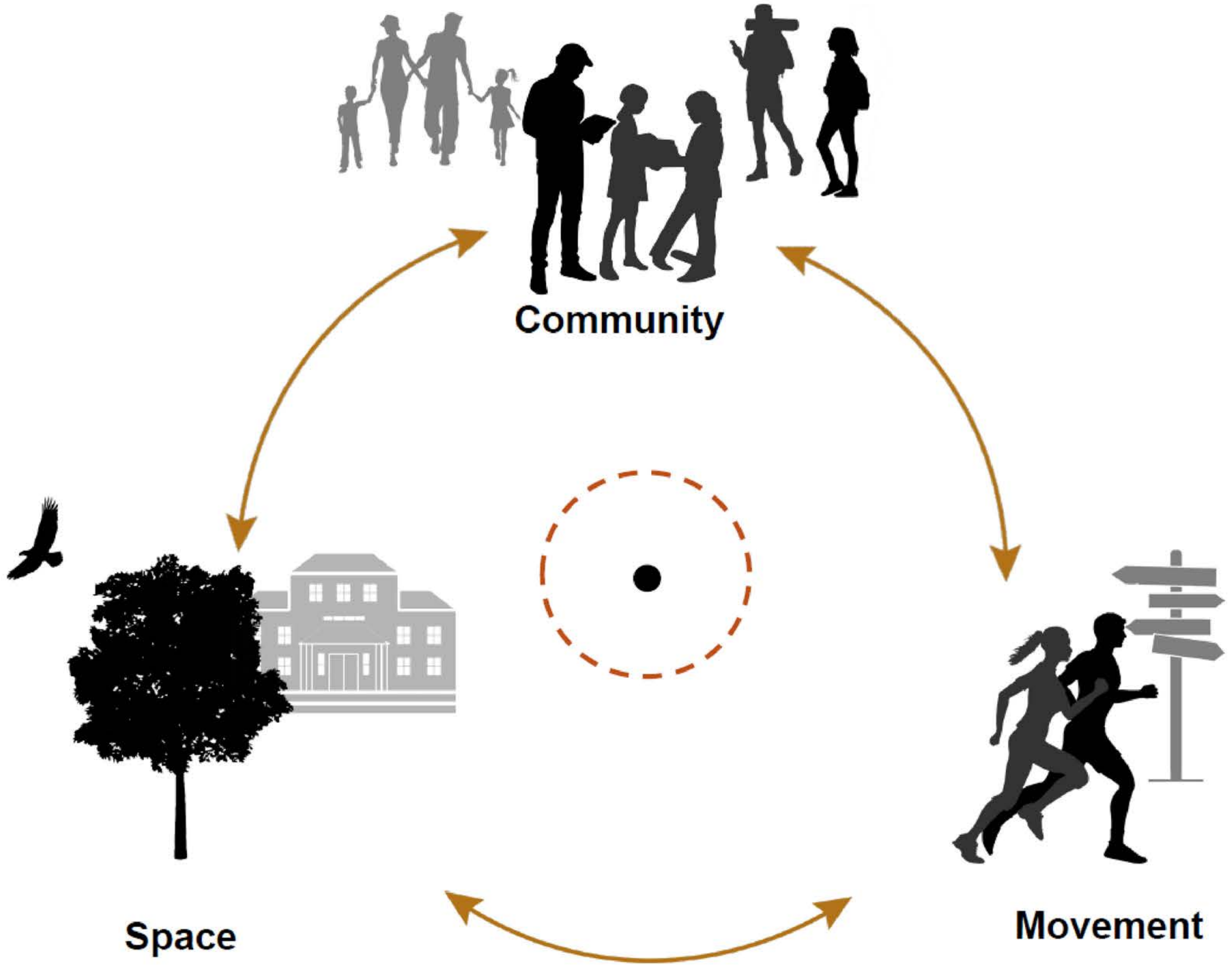
Czech Technical University in Prague

ANALYSIS OF THE LOCATION

We are situated in a very diverse location. We have university campus with a research farm on one side and the residential part and nature reservation on the other. There is an interaction between various people with different interest and this design should support and satisfy everybody.

I created a space which can be used by anyone and can also support public events and socialization. Below you will find a detailed description of the design.

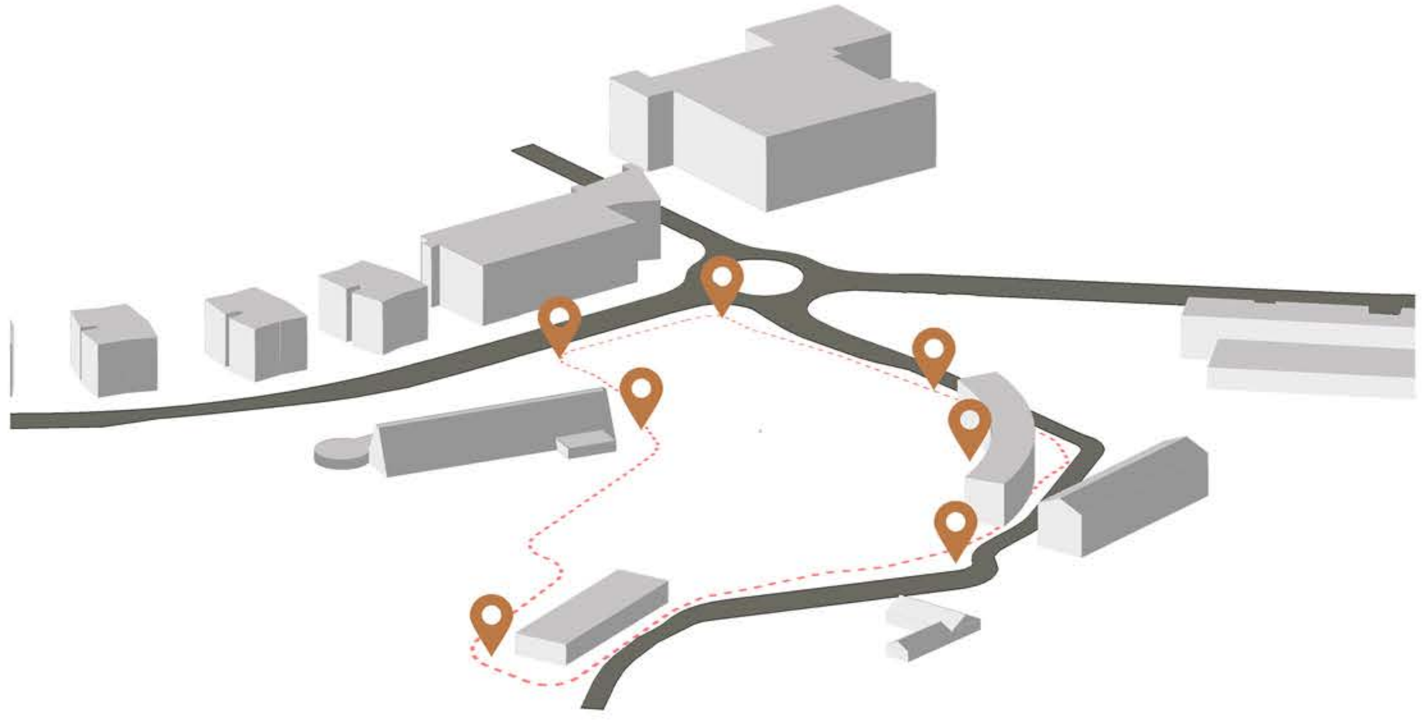
The following three basic principles have been considered in my proposal.



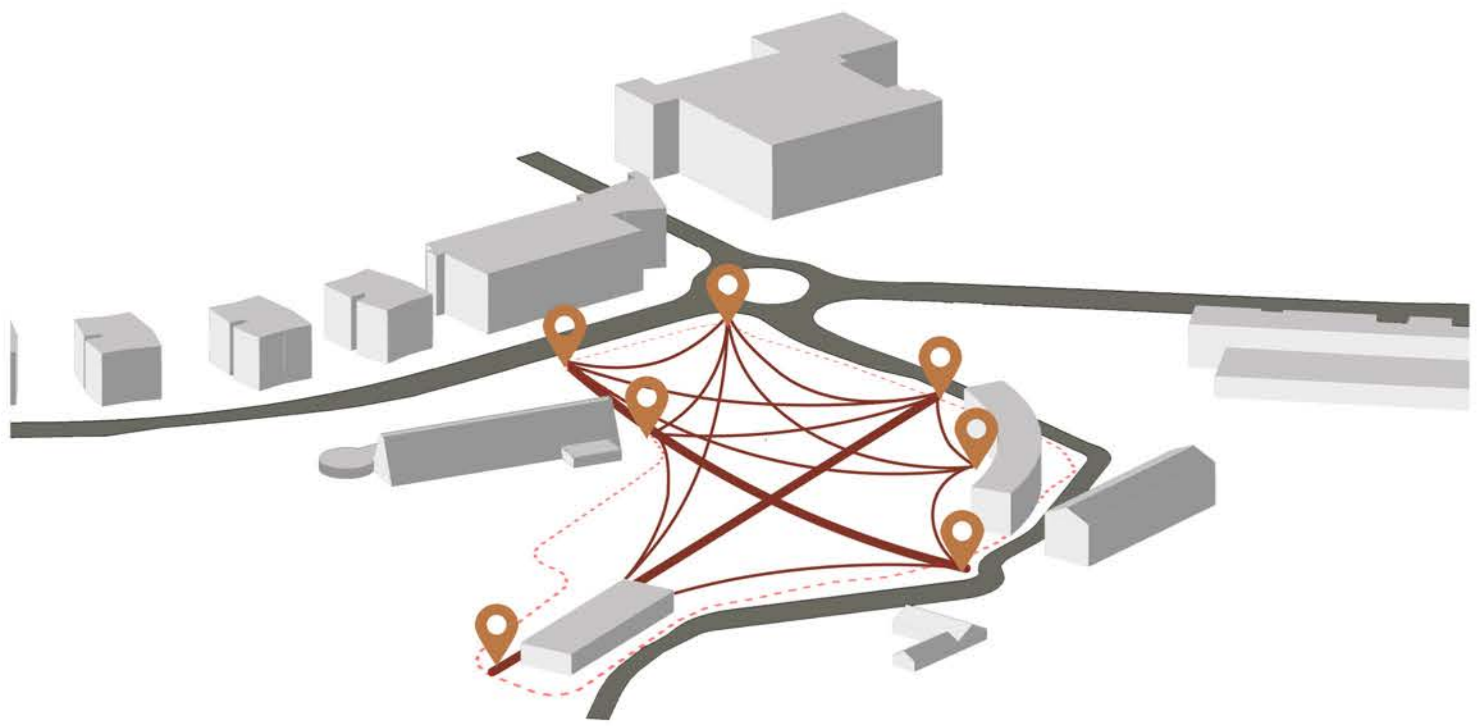
PUBLIC SPACE

I created a space which can be used by anyone and can also support public events and socialization. Below you will find a detailed description of the design.
Into the middle part of the location I have placed a vertical element, which will be used for better orientation, especially in winter months.
The open space around this element will be available for events, farmers‘ markets, etc. Spaces for cultural events, gatherings and sport activities are designed on the southern part of the location, which is distant from the living area, to make the residential part more quiet. The area near the residential buildings is designed like a park. There is also a bicycle path through the whole area.

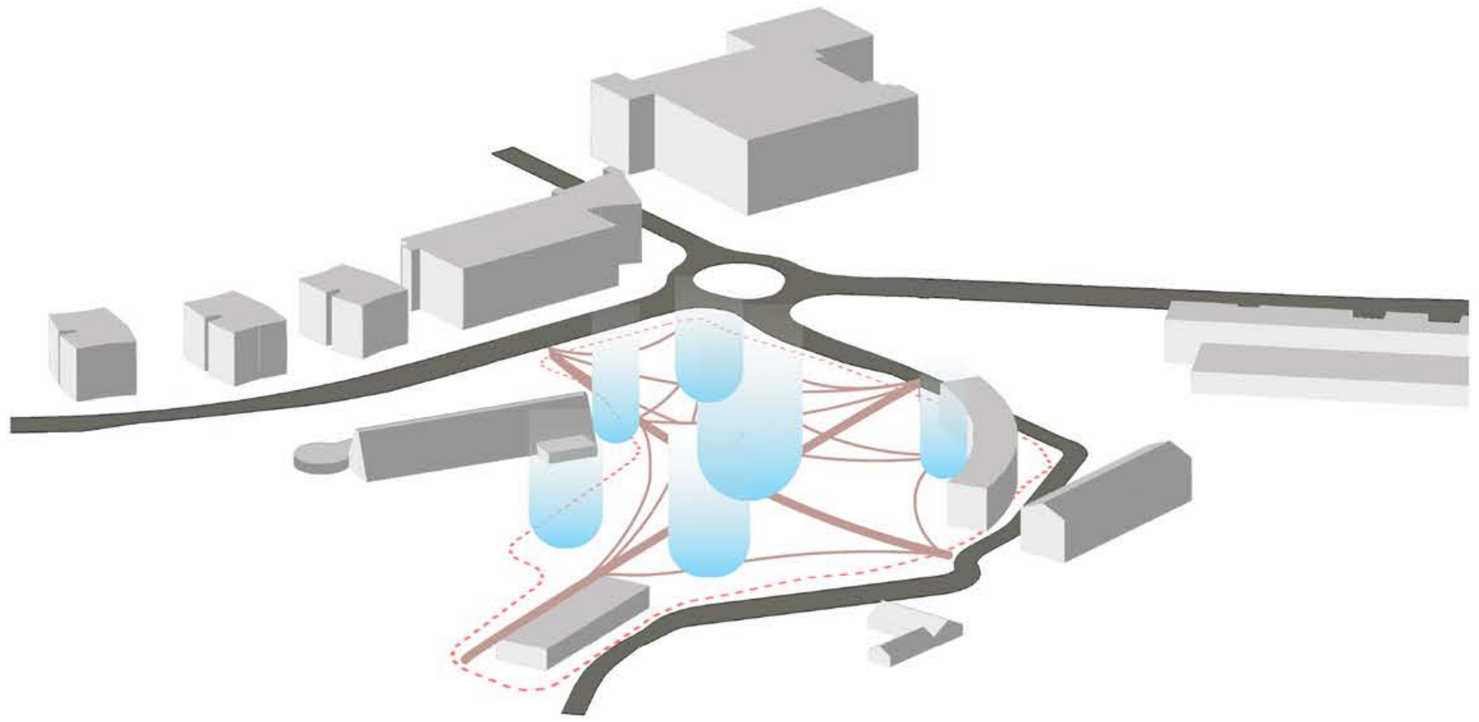
CONCEPT OF THE PUBLIC SPACE



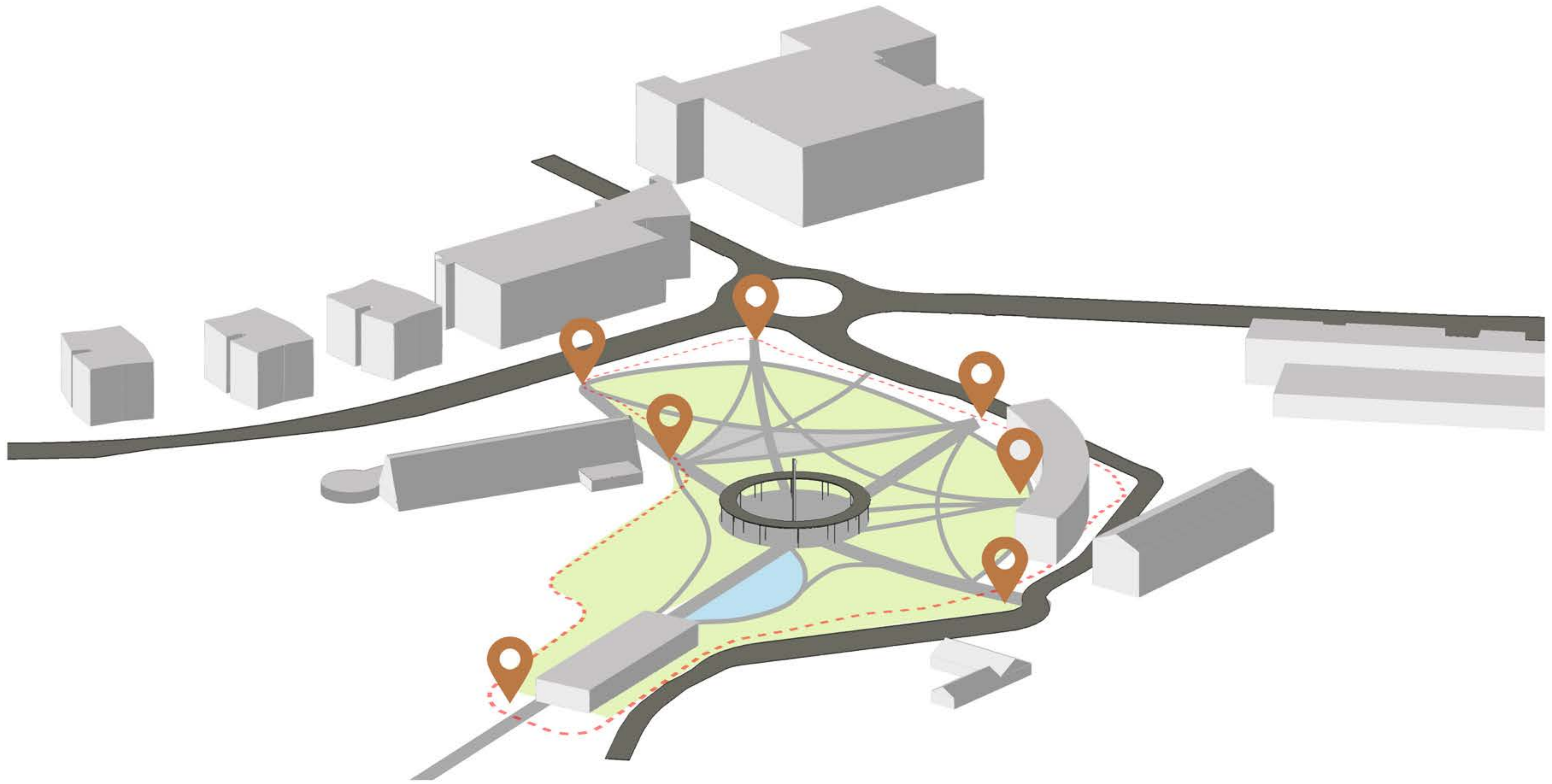
Defining the access points to the location where most of the people will come from.



Connecting the access points with paths that also maintain the two main connecting lines.



Combining paths with places where human interaction will occure and that have potential for use



The result is a pleasent space full of opportunities for sports, public events and relaxation

MATERIALS AND EQUIPMENT USED IN A PUBLIC SPACE

Equipment, furnituring


pond


outdoor workout


outdoor saunas


sport court


cycle stands

Landscaping works


concrete seats in levels


walls with seatings


grass hills

Surface


concrete pavement boards


permeable pavement


cycling path


stepping stones


wooden planks

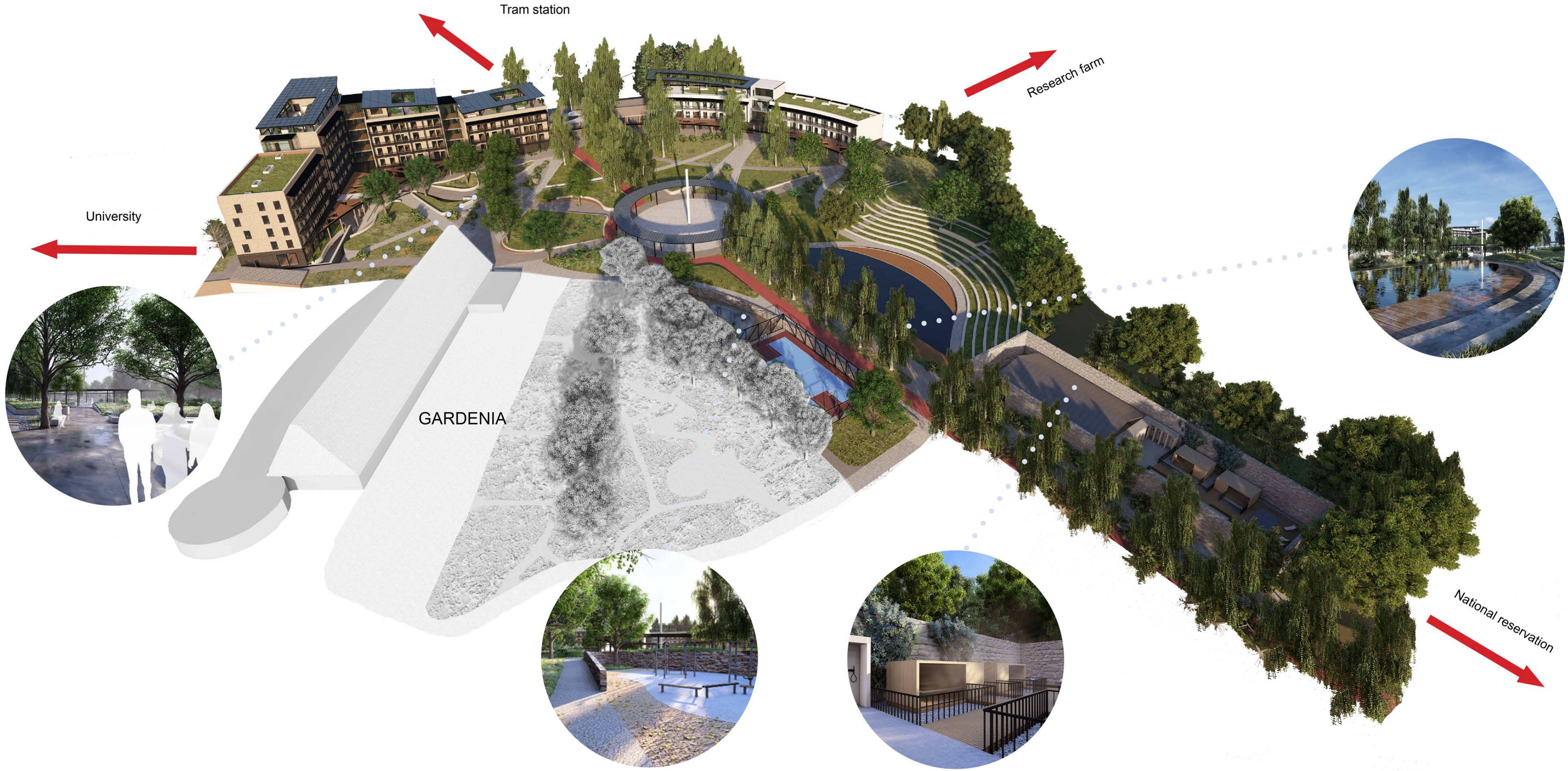
Vegetation - trees

oak tree

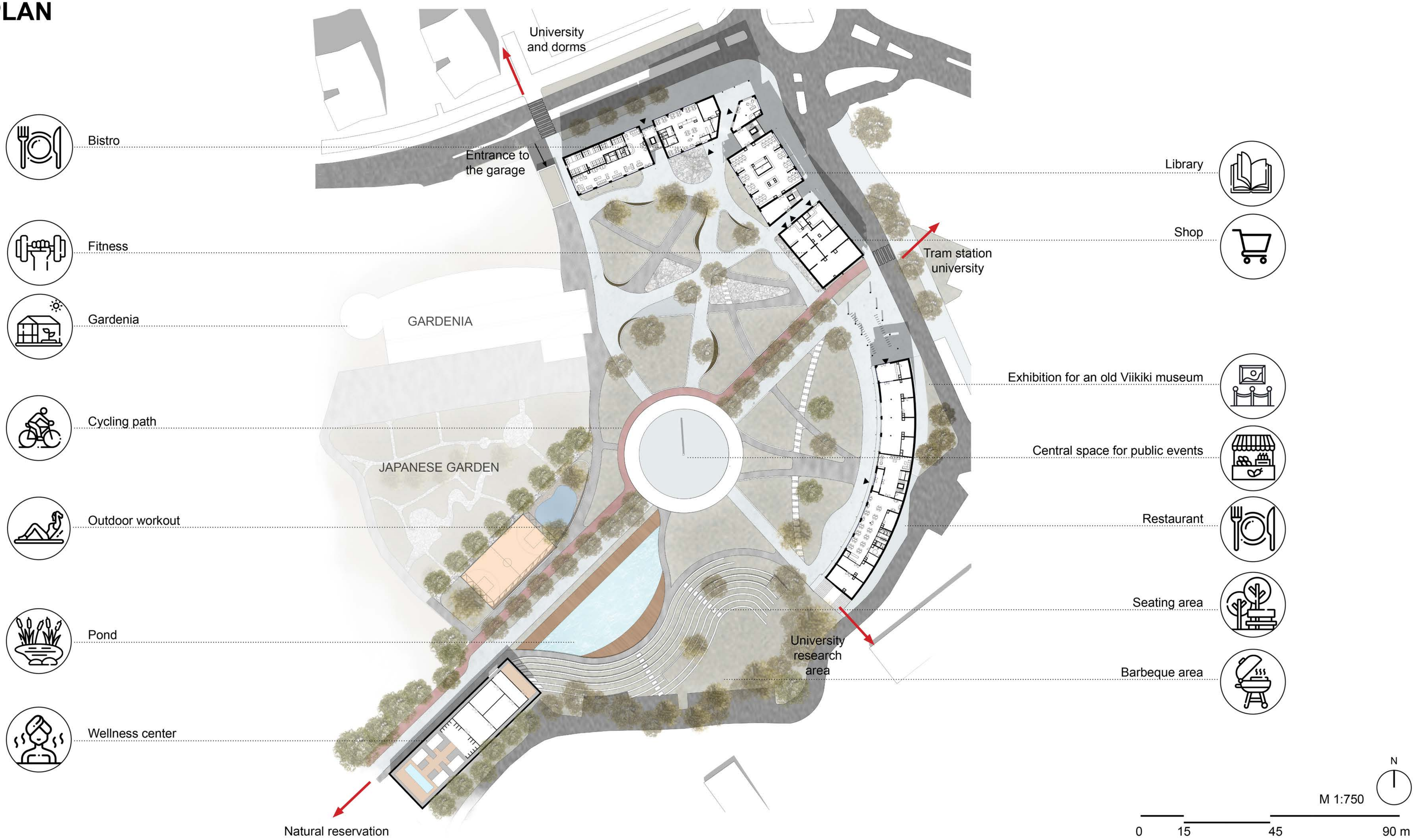

birch tree


pine tree

PERSPECTIVE OF THE LOCATION



MASTERPLAN

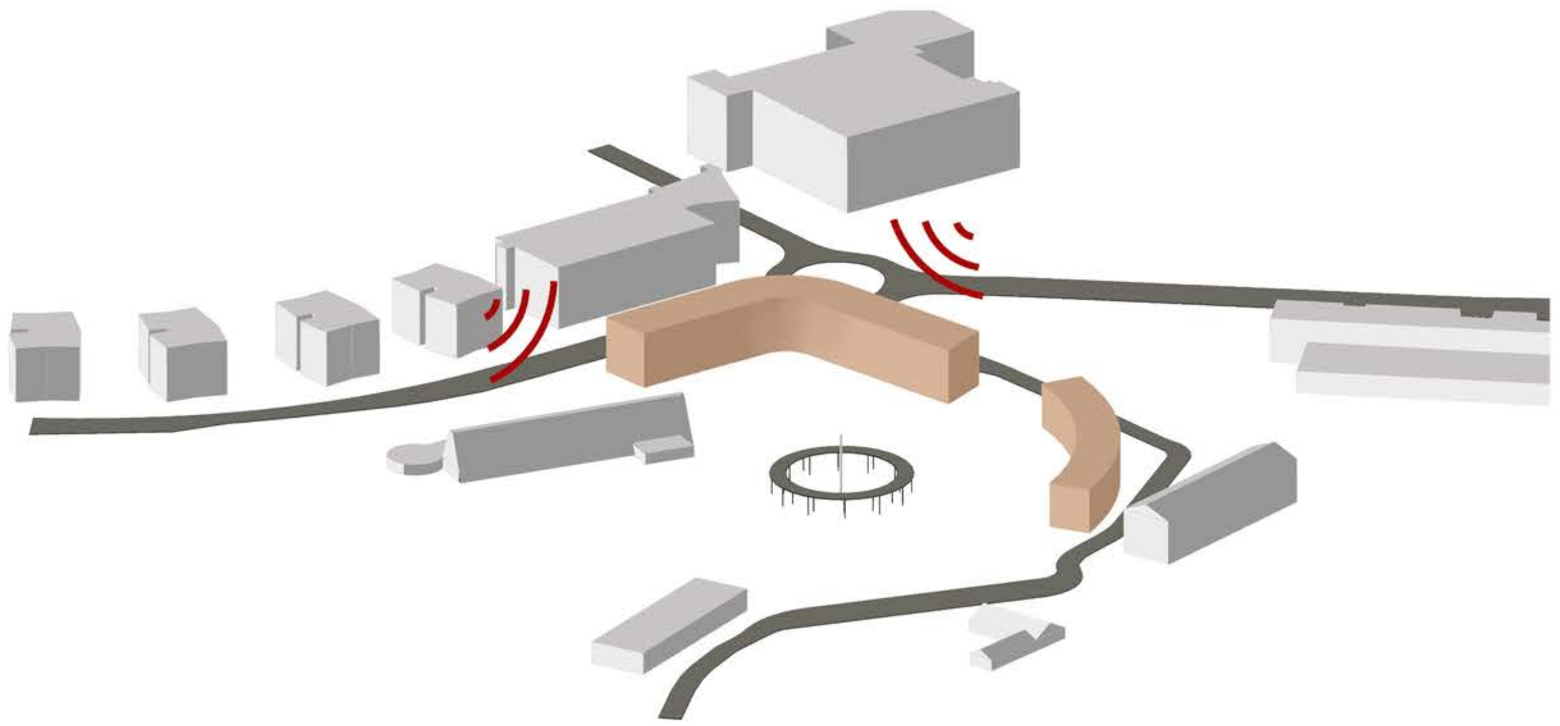


Bistro
Fitness
Gardenia
Cycling path
Outdoor workout
Pond
Wellness center
University and dorms
Entrance to the garage
GARDENIA
JAPANESE GARDEN
Natural reservation
Library
Shop
Tram station university
Exhibition for an old Viikiki museum
Central space for public events
Restaurant
Seating area
University research area
Barbeque area
N
M 1:750
0
15
45
90 m

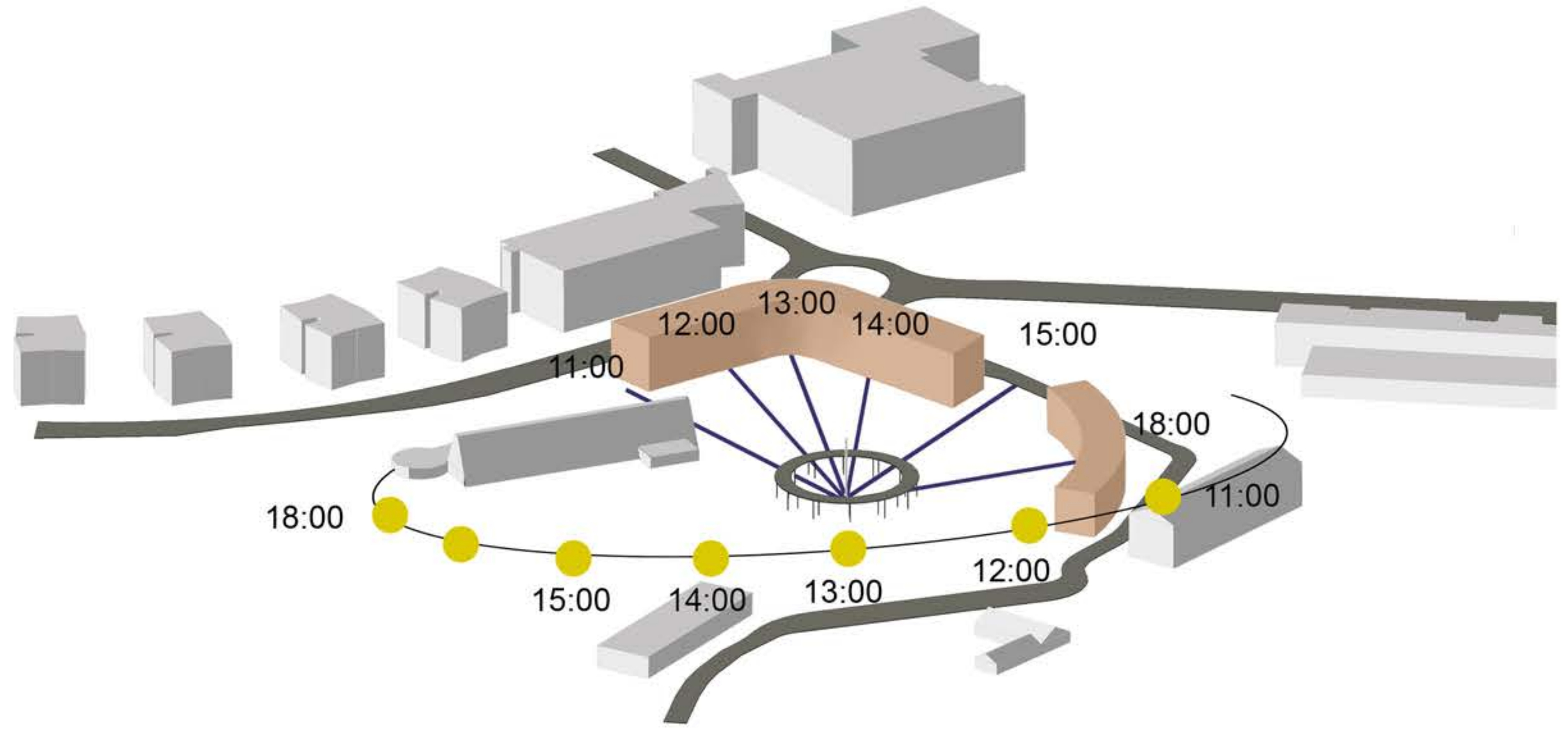
NEW APARTMENT BUILDING

The new apartment building serves especially for students and young families. On each flo-or we can find two level common spaces with common kitchen or loundary room and study room. Every hallway is created as a horizontal communication but also as a space that can be used during summer months as a meeting point.
In the first floor we can find lobby, bike storage, bistro, library, shop and a fitness center.
The new buildings will be enough high to provide a nice view to their surroundings. I have created a green vegetated roofs that can be used by residents in every season. Above these roofs I designed light steel shelters with photovoltaic panels.
3 - bedroom apartments have sauna as a part of bathroom.

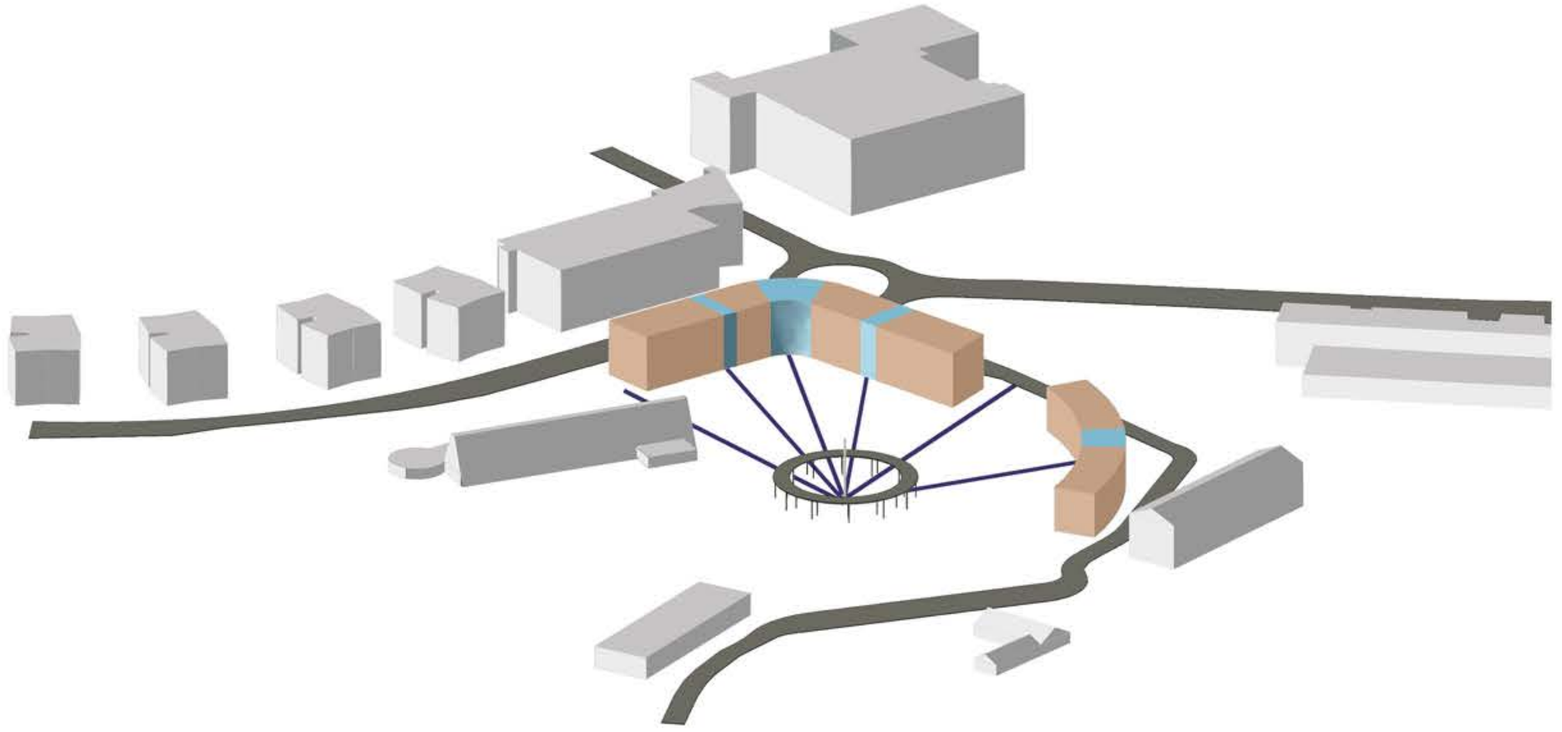
CONCEPT OF BUILDINGS



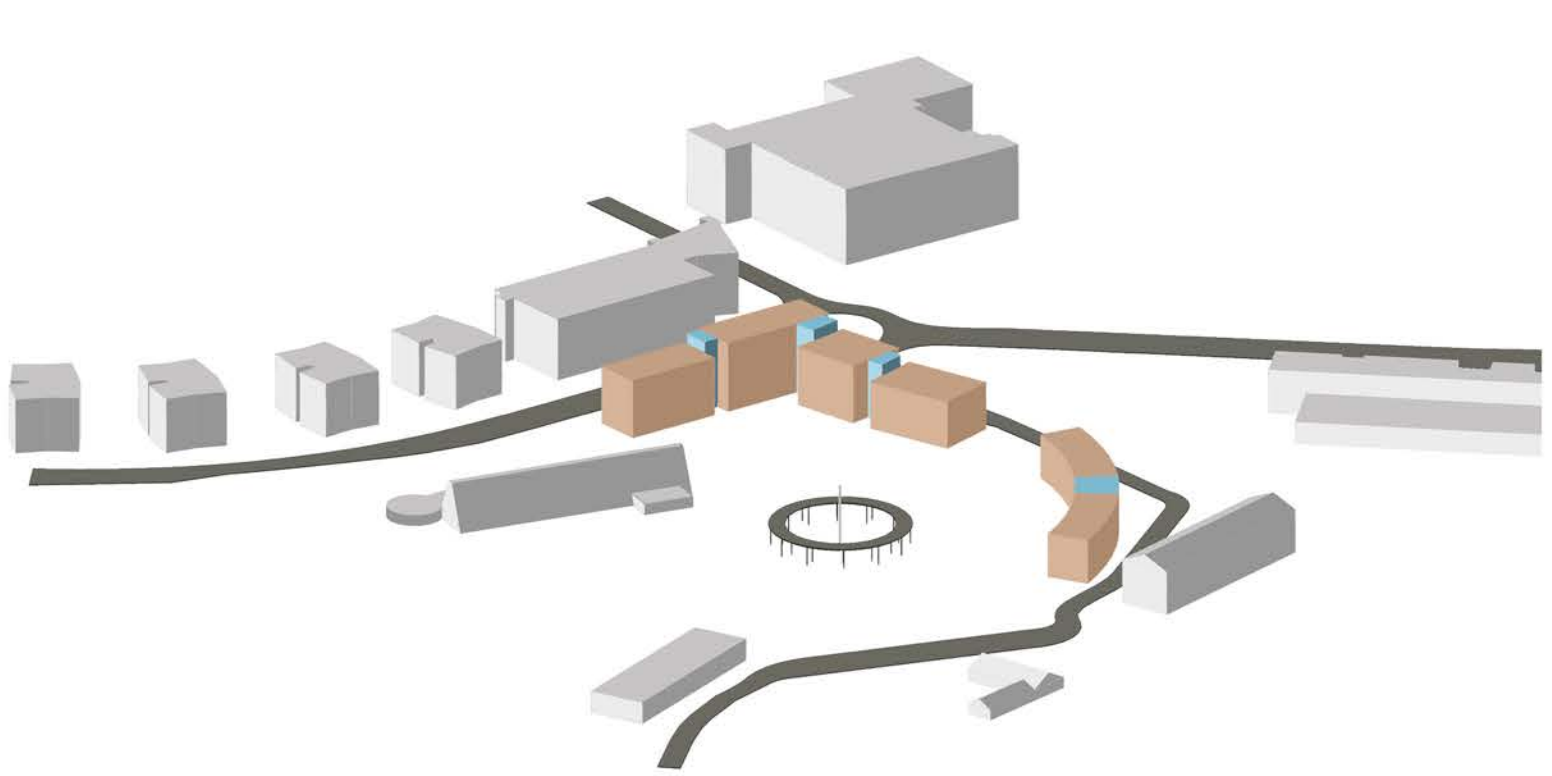
The main building was designed to form a sound barrier between the main road and the public space, but still to be as open as possible to future visitors



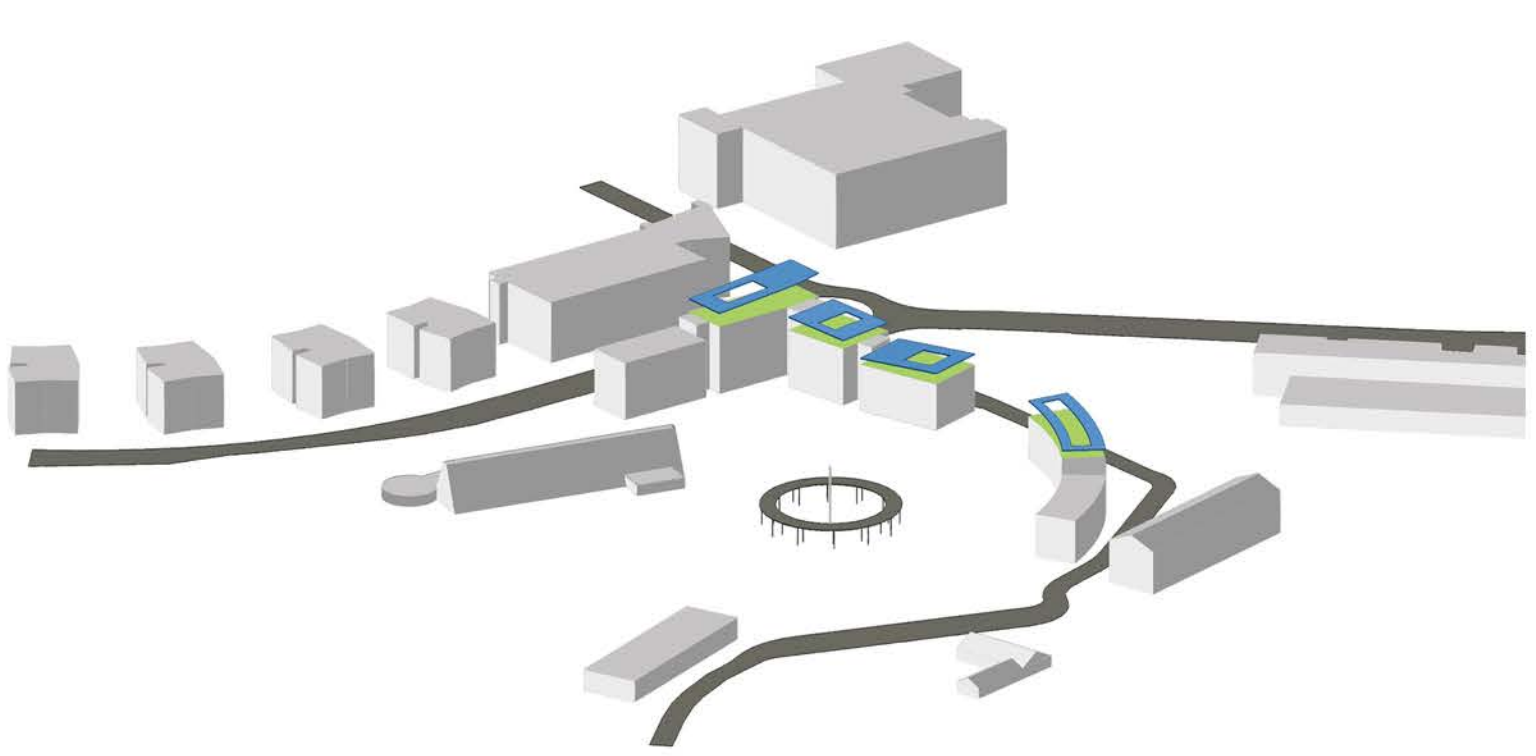
Once the entire block was created, solar analysis was used and it was found that between 11pm - 6pm the vertical element in the middle of the site casts a shadow on parts of the building and also on the paths leading into the site.



In these specific parts I have created glazed vertical cores at locations where shadow appears throughout the hour.



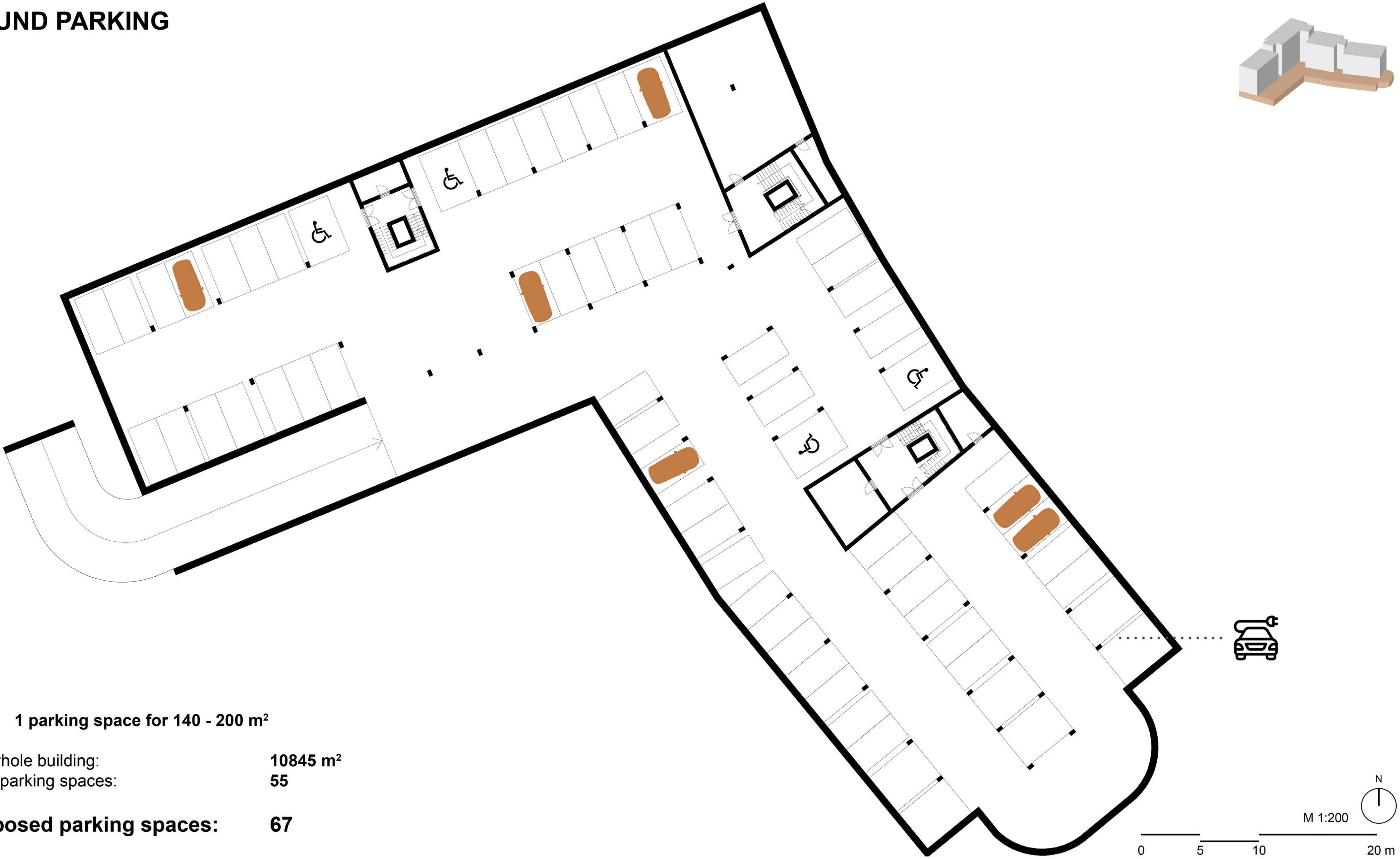
Based on the surrounding development, I gave the building a rectangular shape to create a stronger corners and to stand out in the development of the entire area.



The new buildings will be enough high to provide a nice view to their surroundings.
I have created a green vegetated roofs that can be used by residents in every season.
Above these roofs I designed light steel shelters with photovoltaic panels.


STEINWAY & SONS

UNDERGROUND PARKING



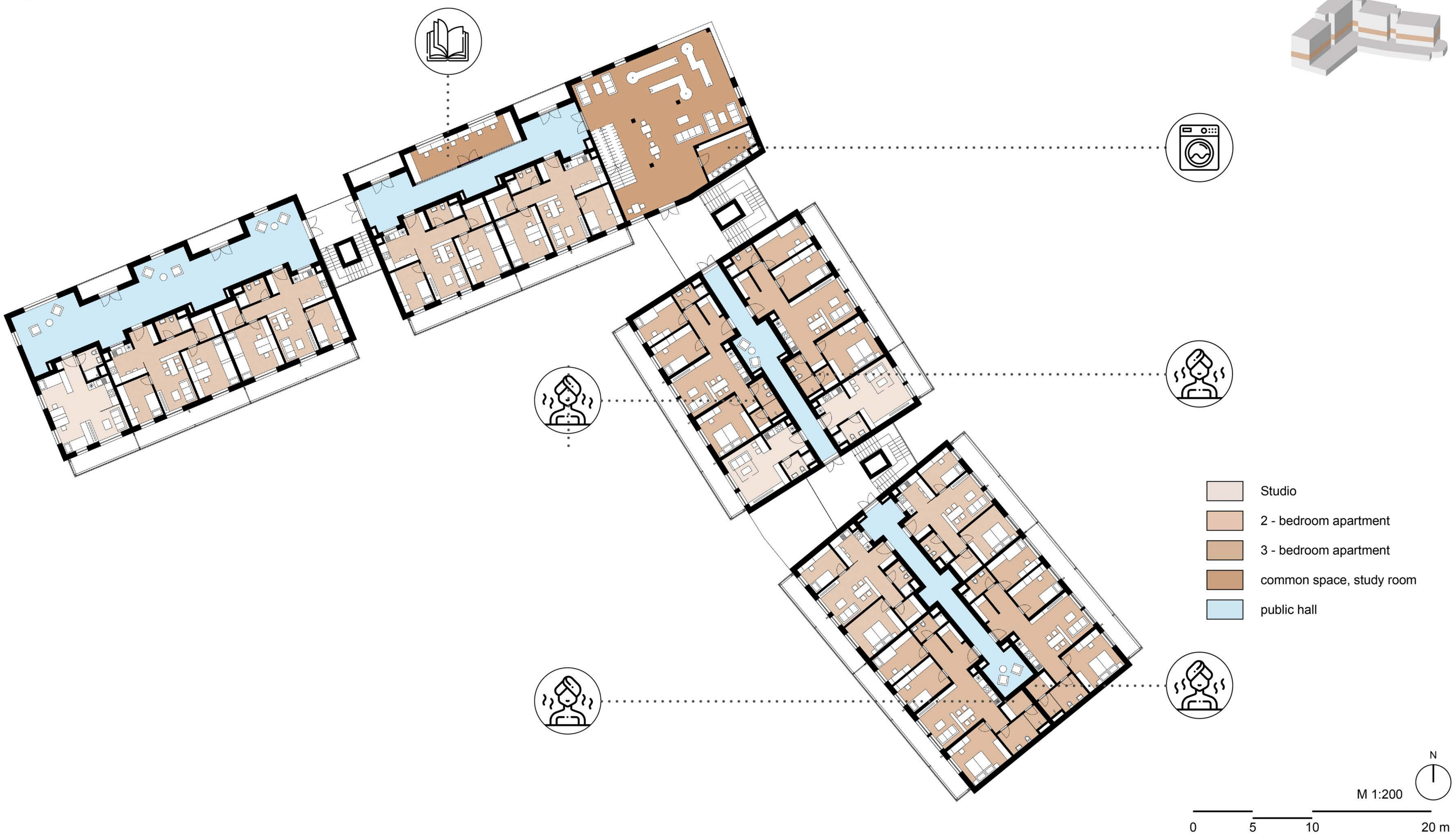
1 parking space for 140 - 200 m²

Usable area of the whole building:	**10845 m²**
Minimum number of parking spaces:	**55**

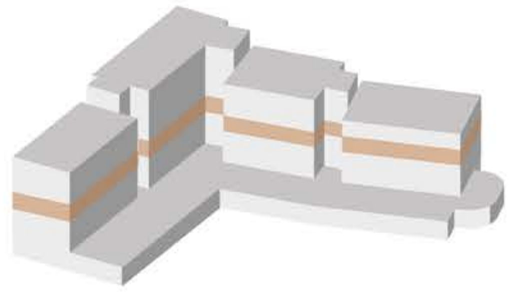
Number of proposed parking spaces: 67

FIRST FLOOR

SECOND FLOOR



THIRD FLOOR



Studio

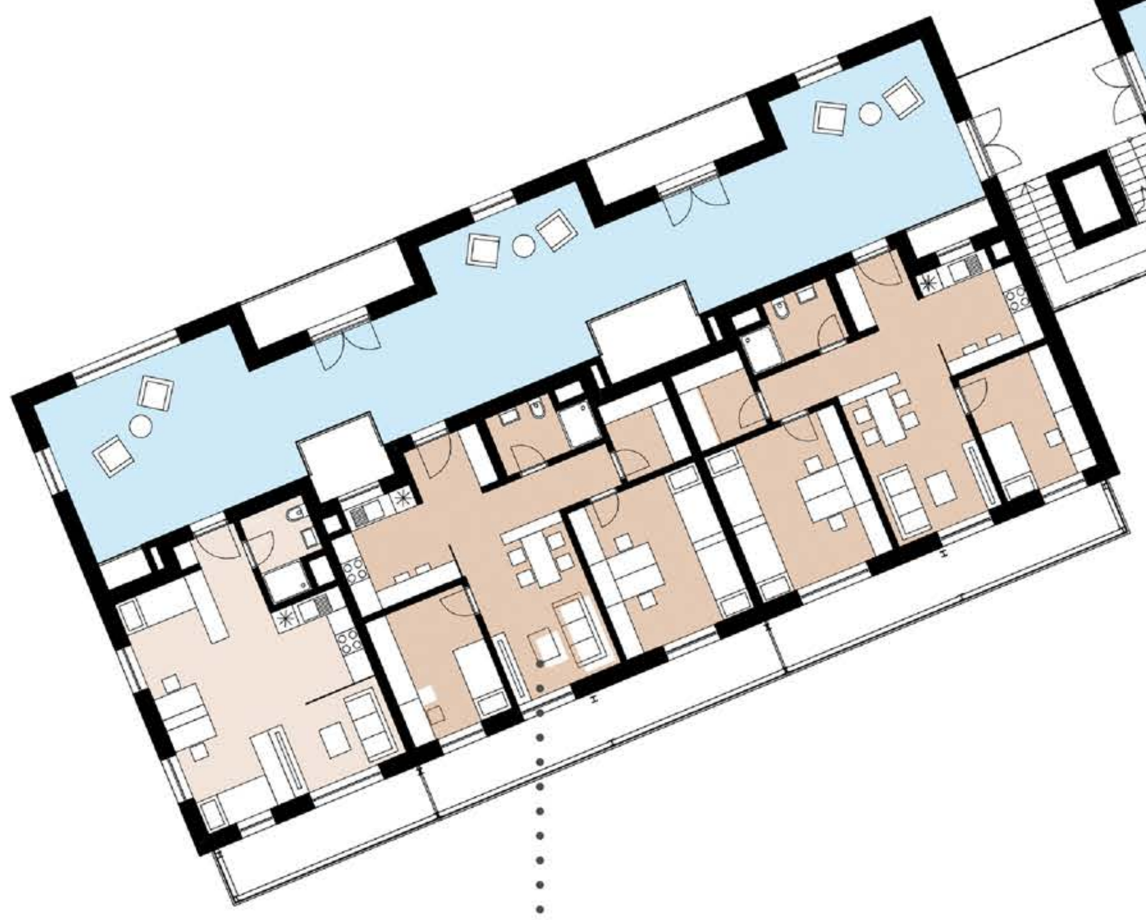
2 - bedroom apartment

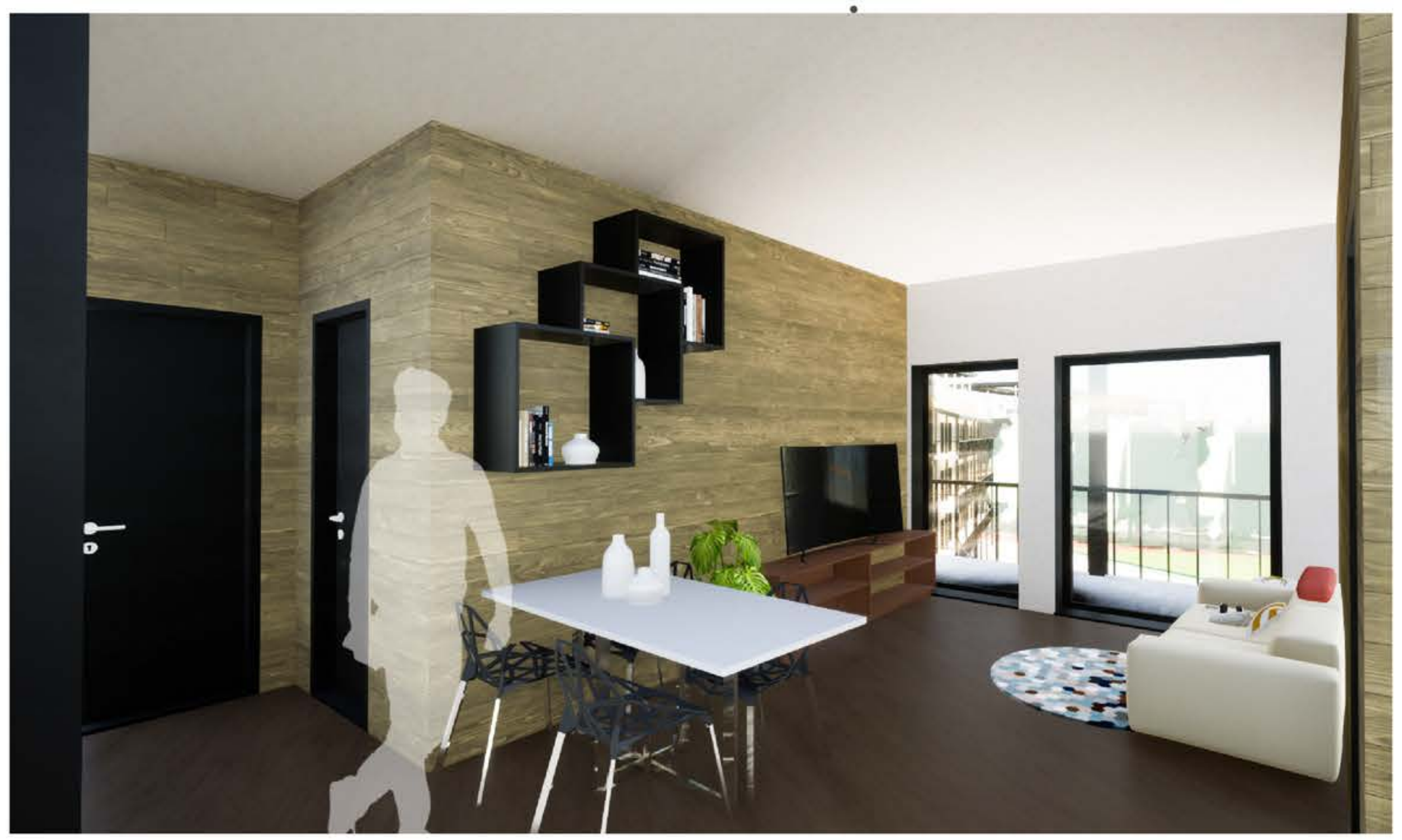
3 - bedroom apartment

common space, study room

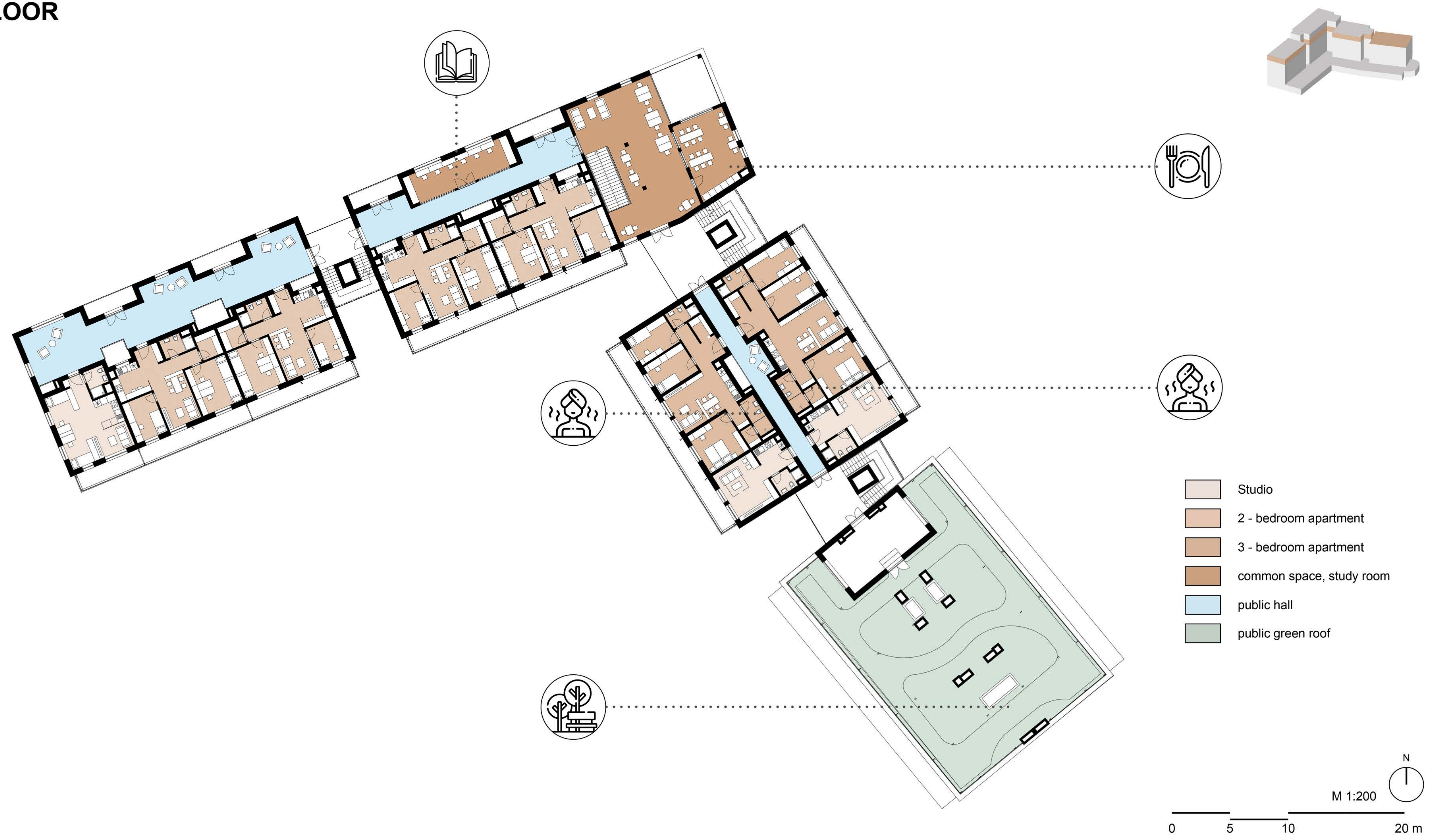
public hall

FOURTH FLOOR



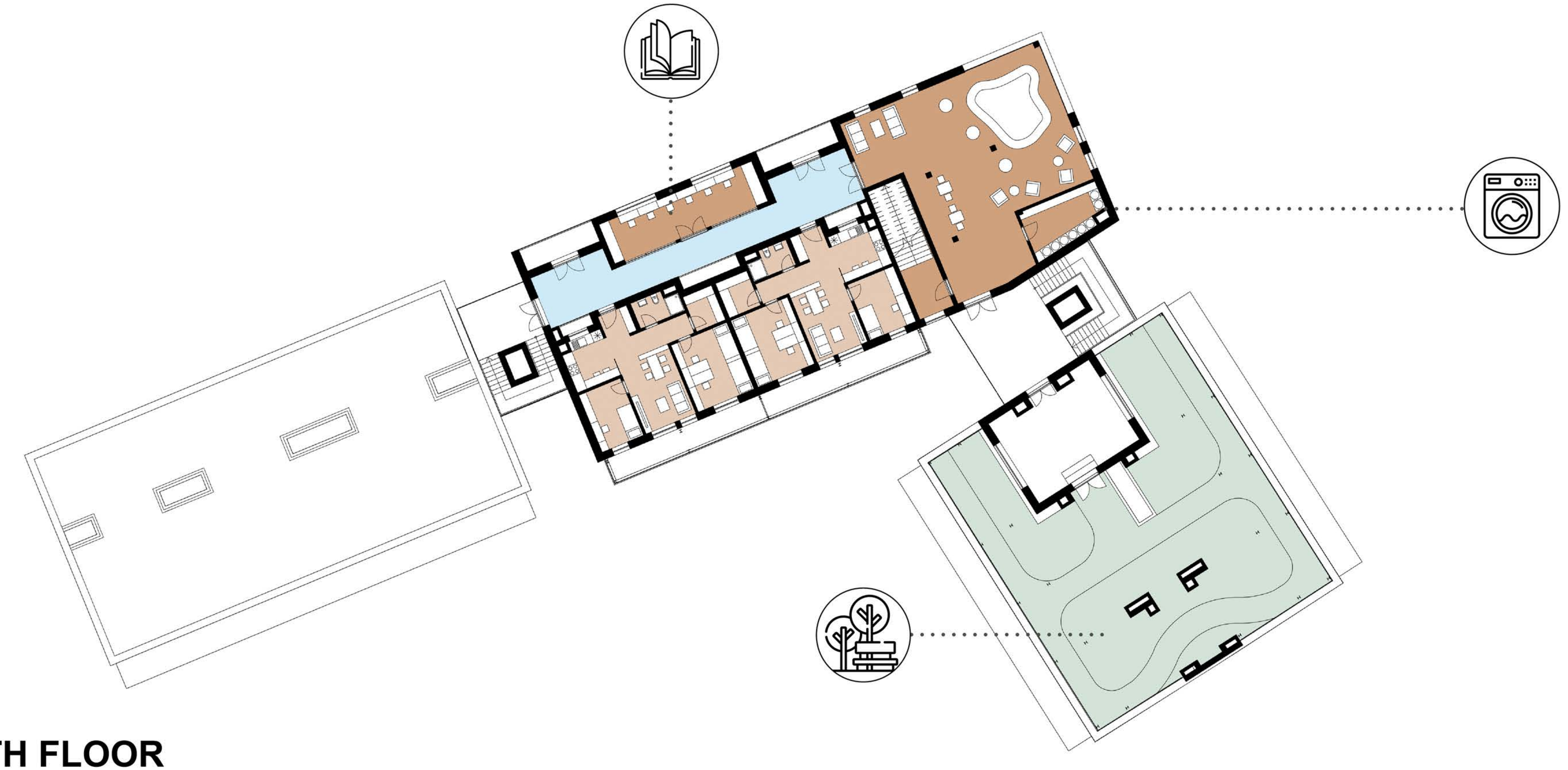


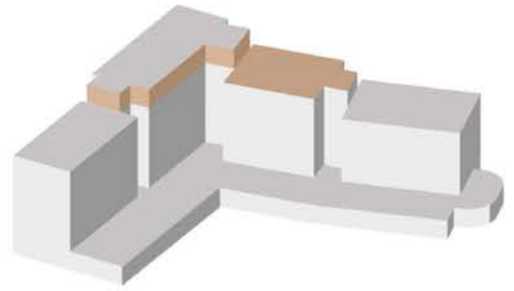
FIFTH FLOOR



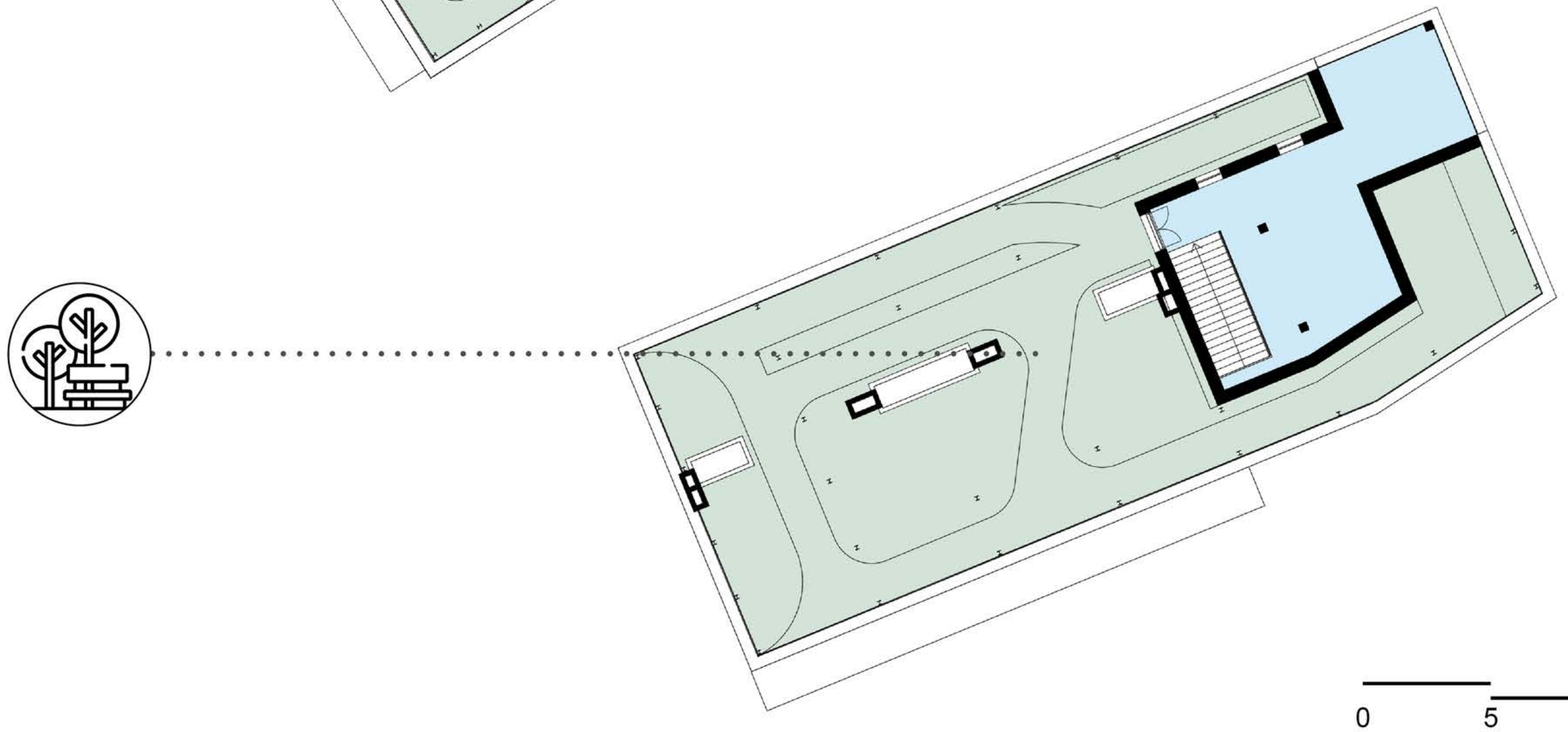
Studio
2 - bedroom apartment
3 - bedroom apartment
common space, study room
public hall
public green roof
N
M 1:200
0
5
10
20 m

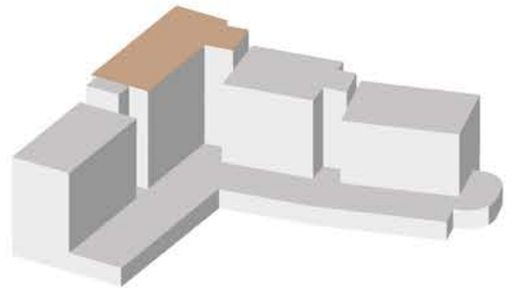
SIXTH FLOOR

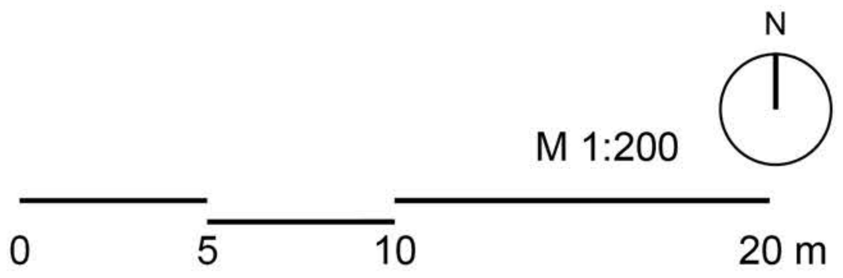




SEVENTH FLOOR

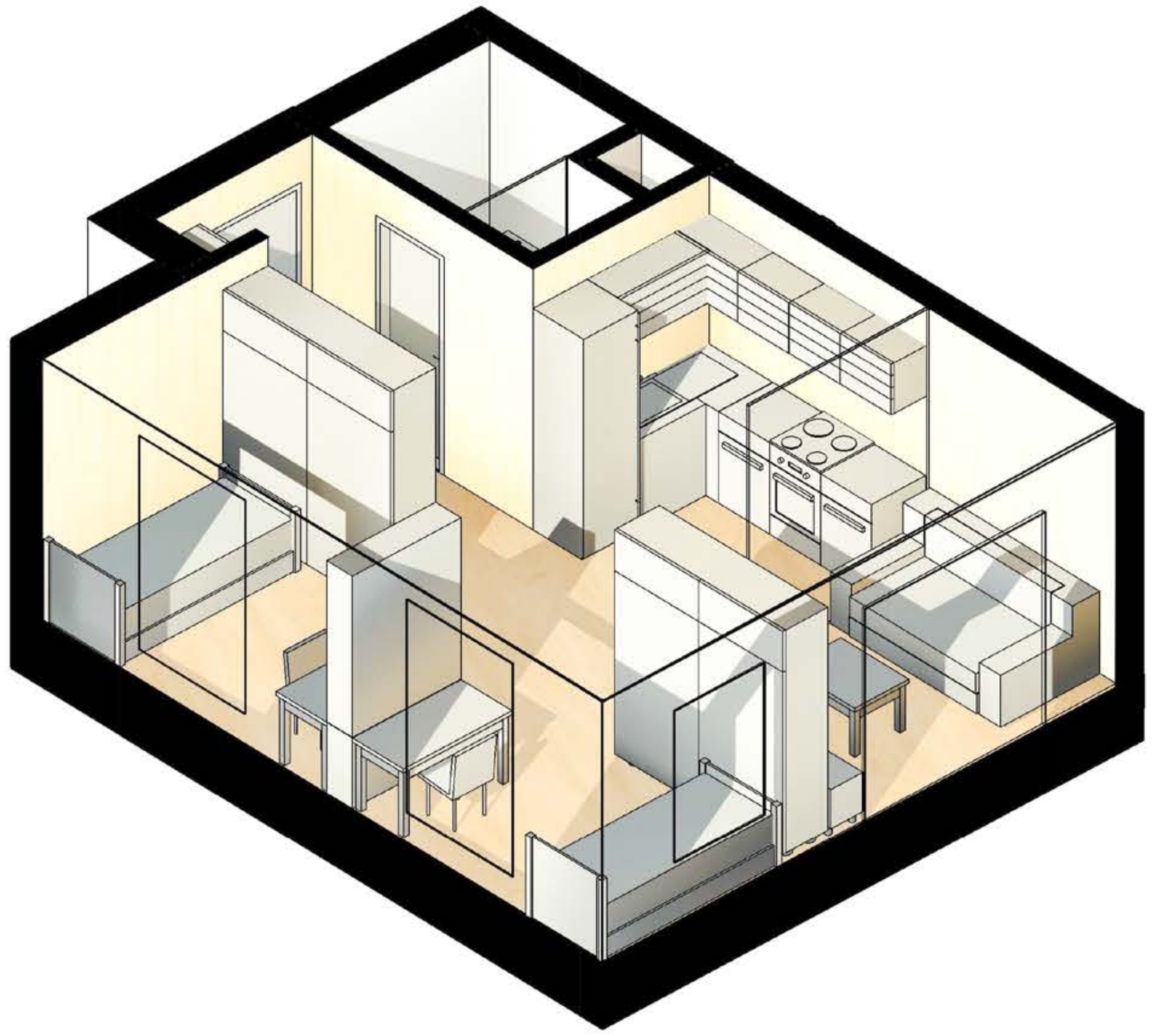




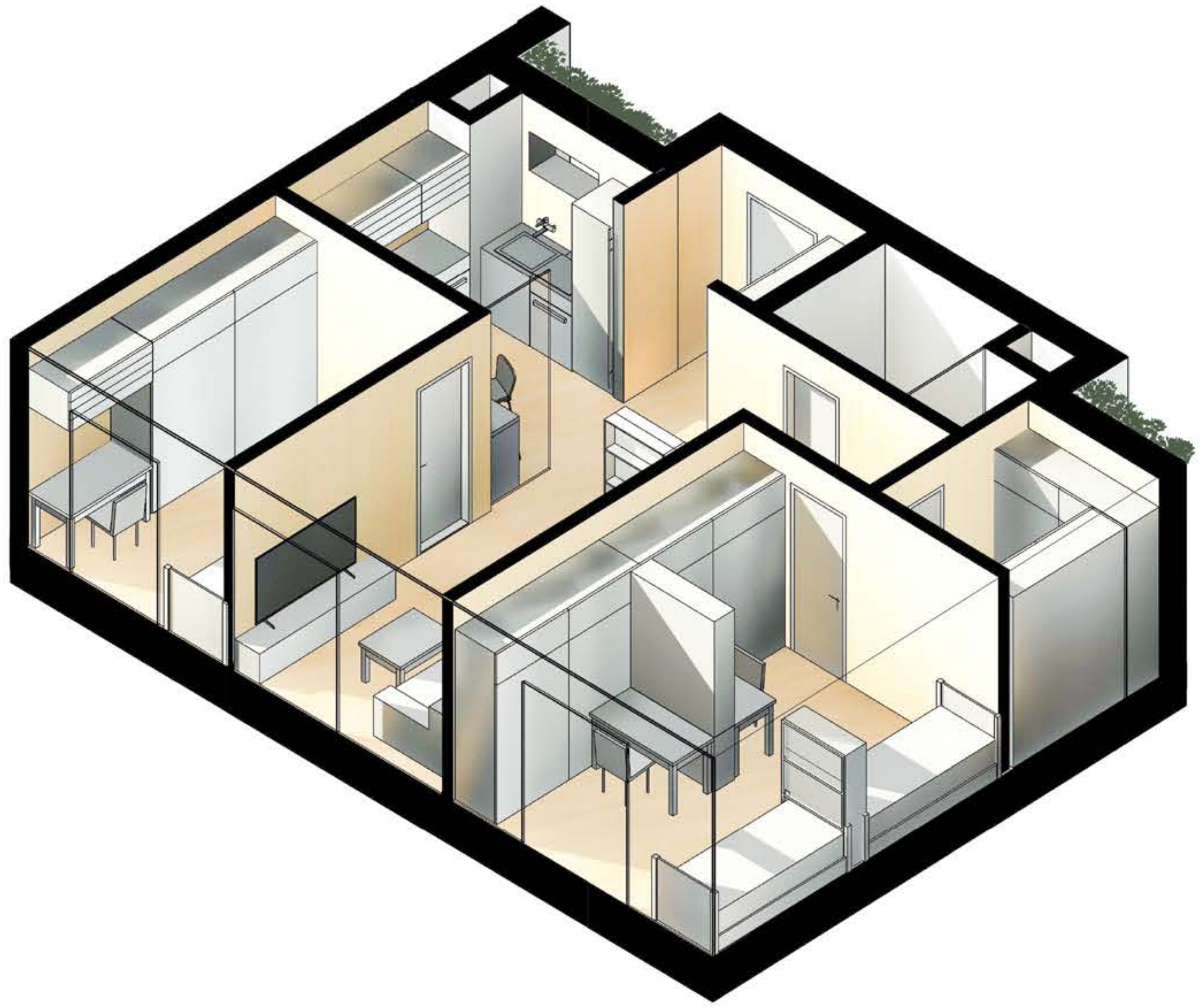



401
402

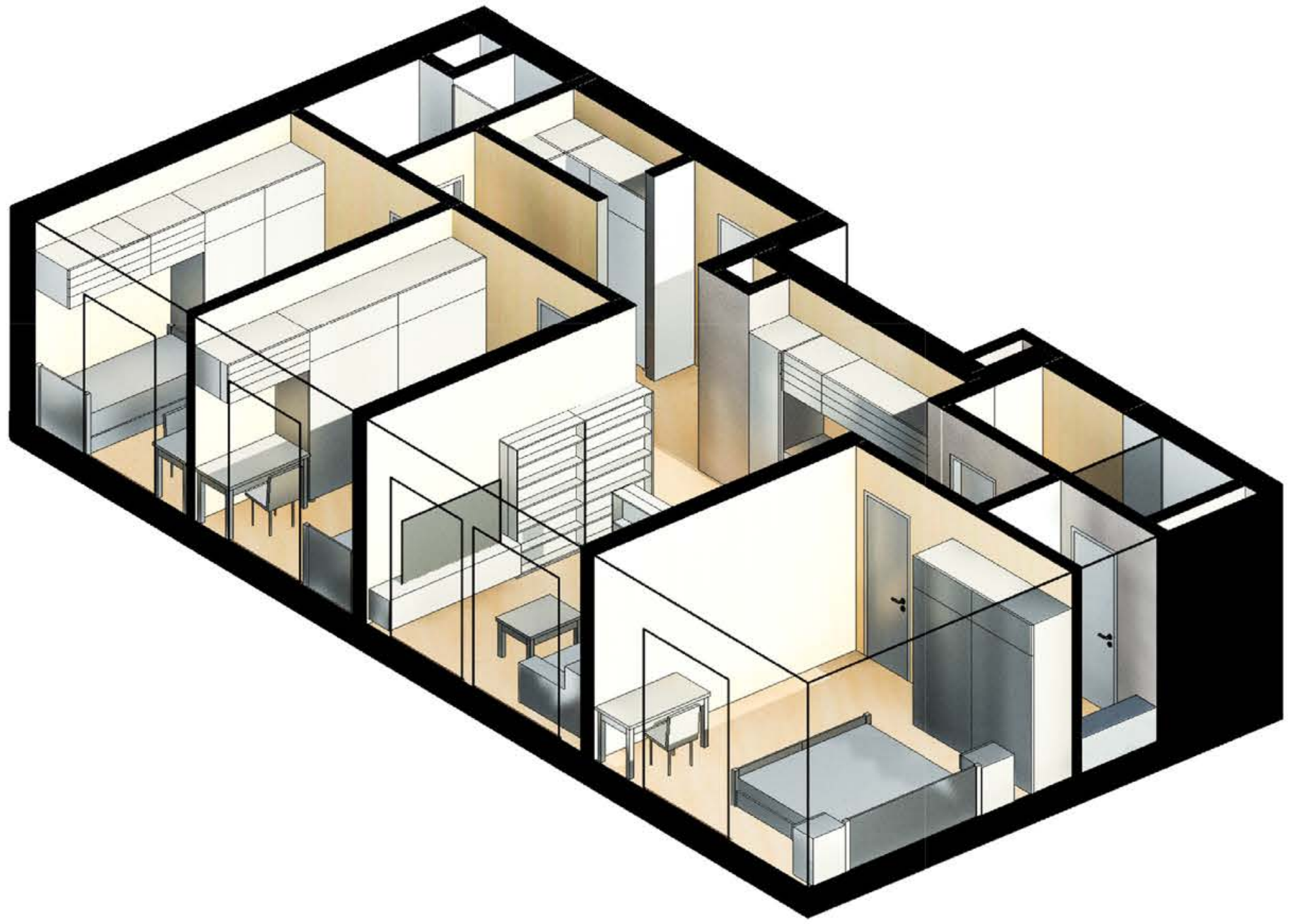
3D MODELS OF THE ROOMS



Studio
39 m²

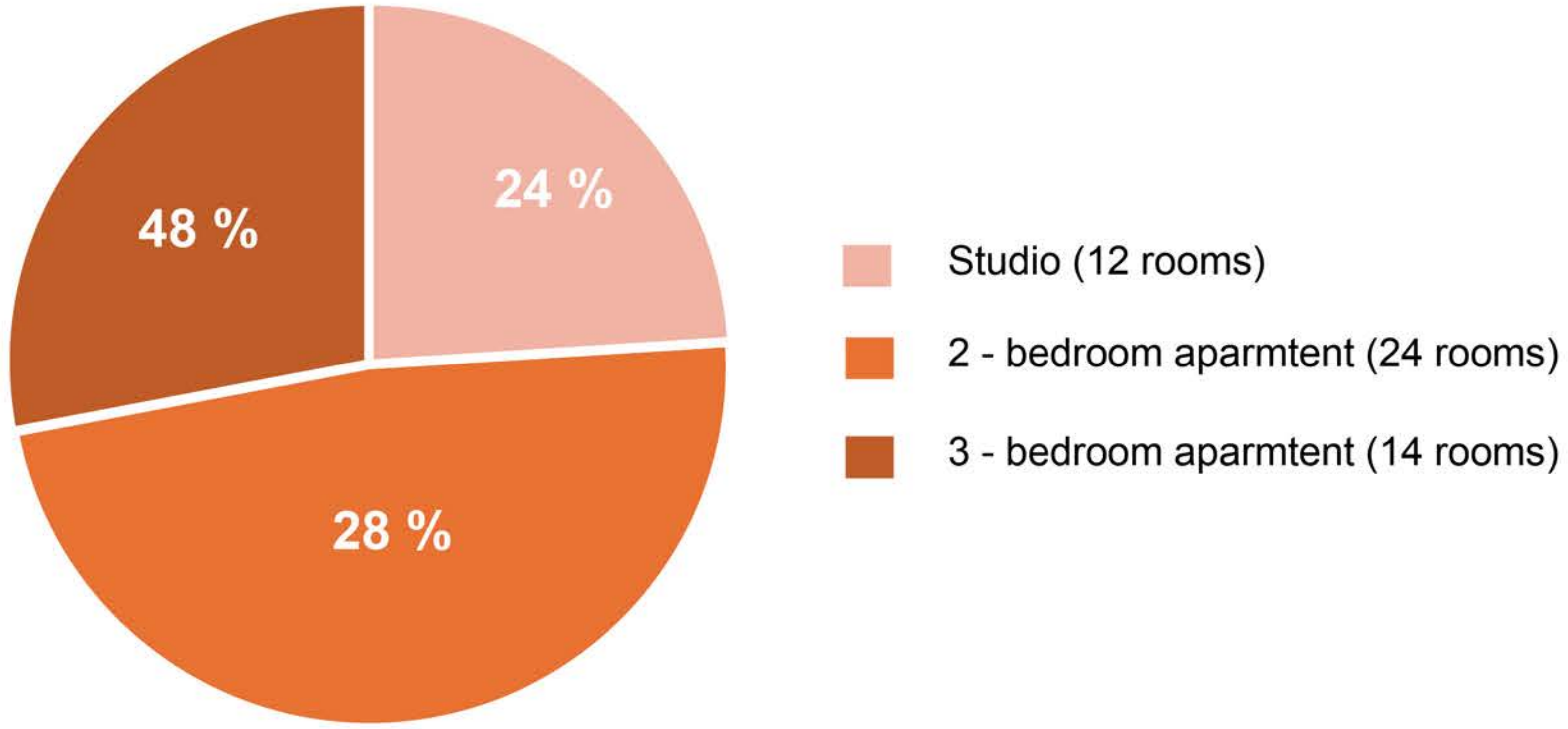


2 - Bedroom apartment
58 m²



3 - Bedroom apartment
78 - 83 m²

Percentage of the rooms

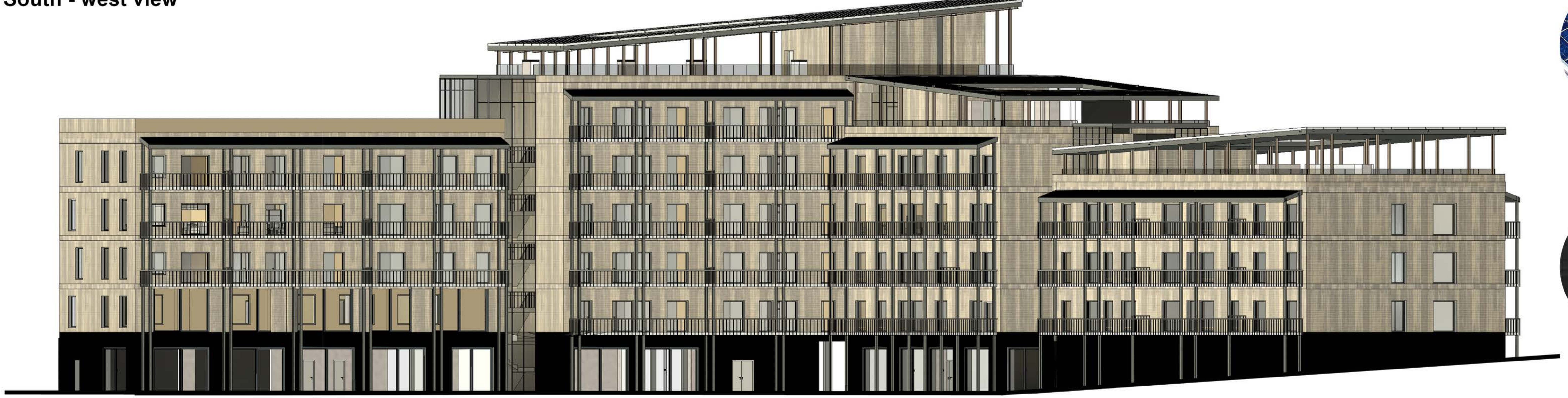


SECTIONS


+ 16,800
+ 13,600
+ 7,200
+ 4,000
+ 0,000
- 3,500
+ 16,800
+ 13,600
+ 7,200
+ 4,000
+ 0,000
- 3,500
M 1:200
0
5
10
20 m

VIEWS AND MATERIALS

South - west view



Photovoltaic pa-
nels on the roof

Steel canopies
and balconies

North - east view

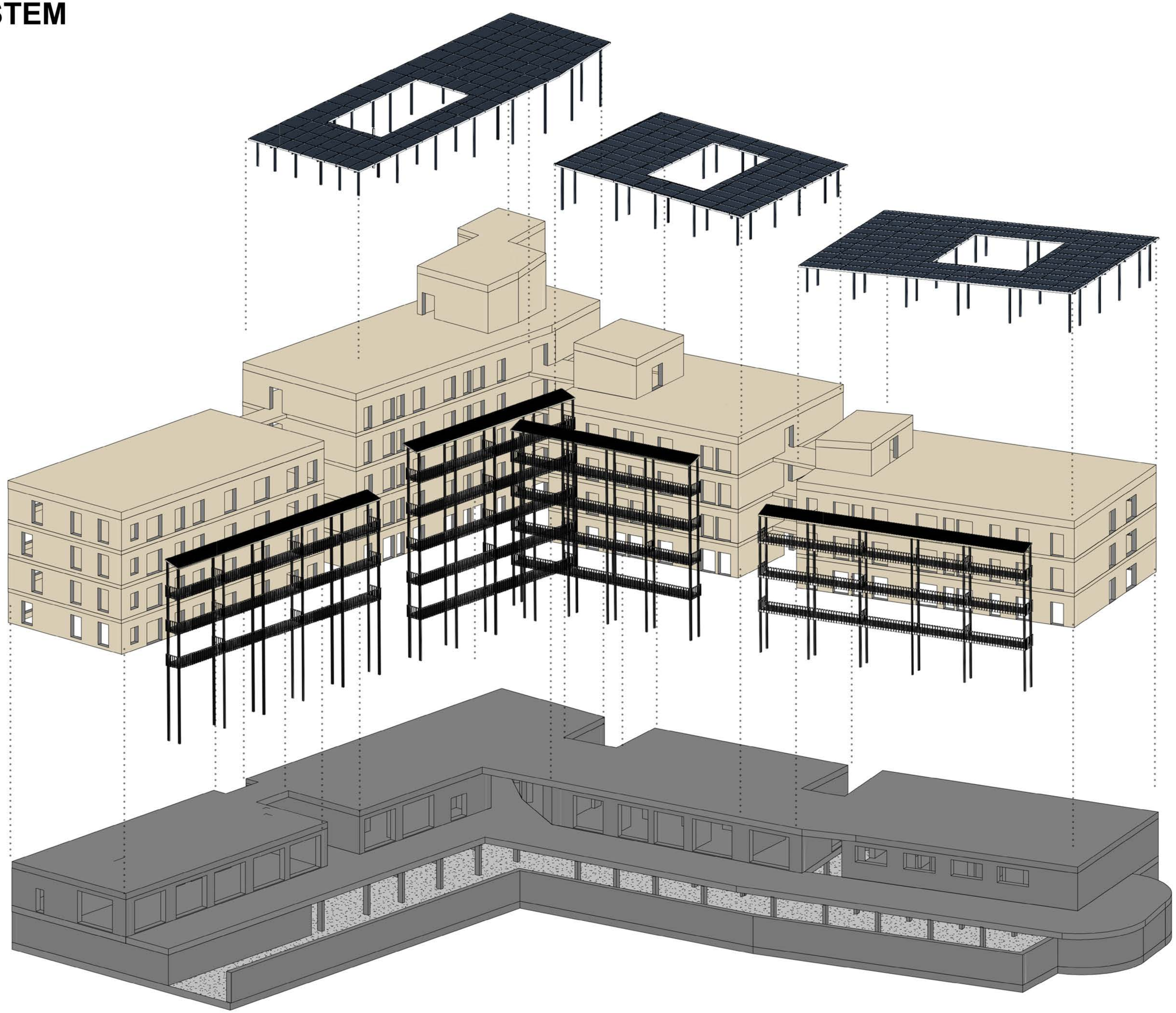
Wooden slats
from Siberian
larch

Concrete panels
in the first floor

M 1:200

0 5 10 20 m

CONSTRUCTION SYSTEM

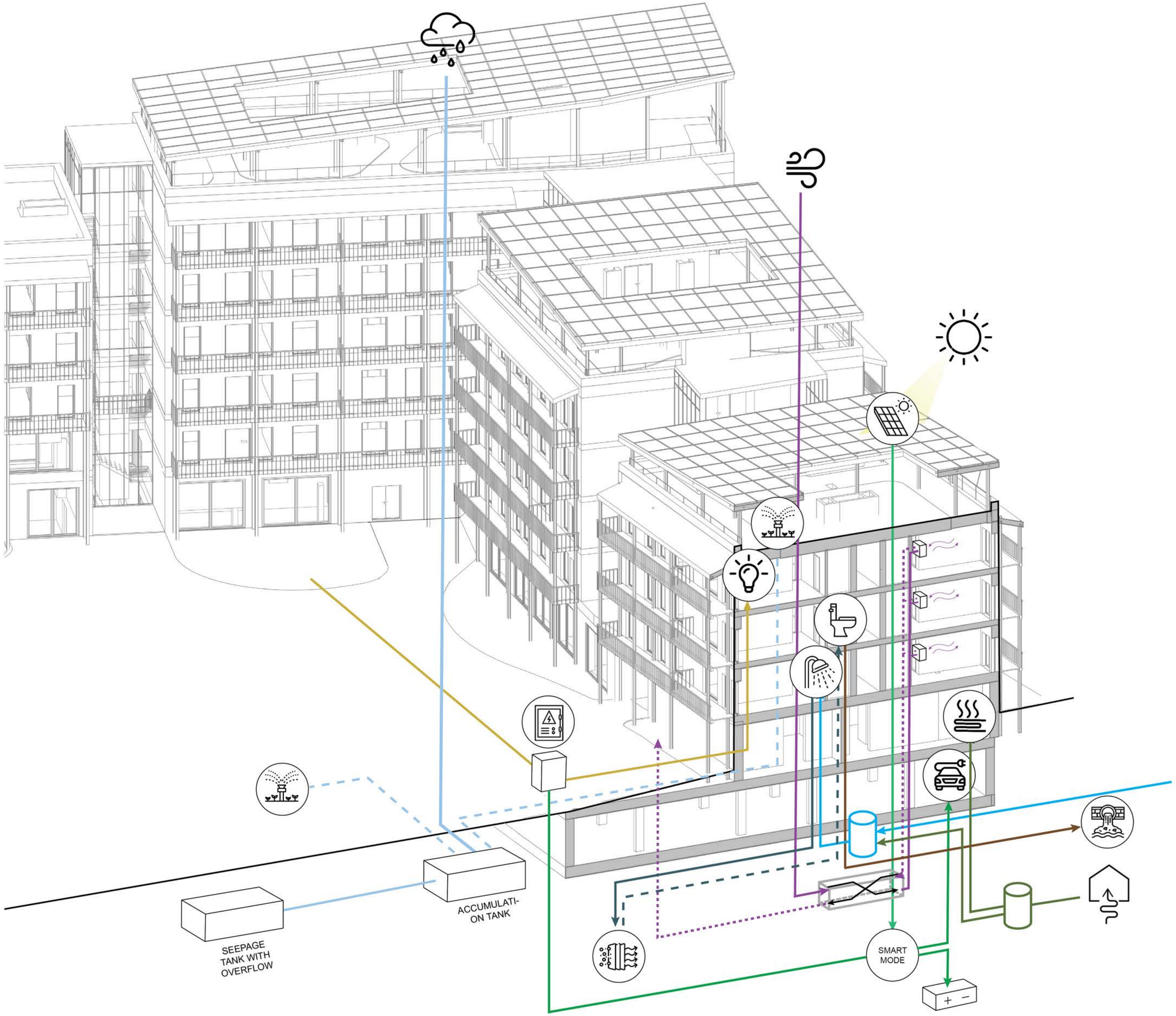


Steel canopies and balconies

CLT panels

Reinforced concrete construction + recycled concrete

USE OF ENERGY AND POWER



HEATING SYSTEM

3 central heating units with a heat recuperation distributing air throu-gh installation cores located in corridors to individual flats
In each floor there is a floor heating

PHOTOVOLTAIC PANELS

Photovoltaic panels situated on a roofs of the building collect solar energy that is stored in bateries

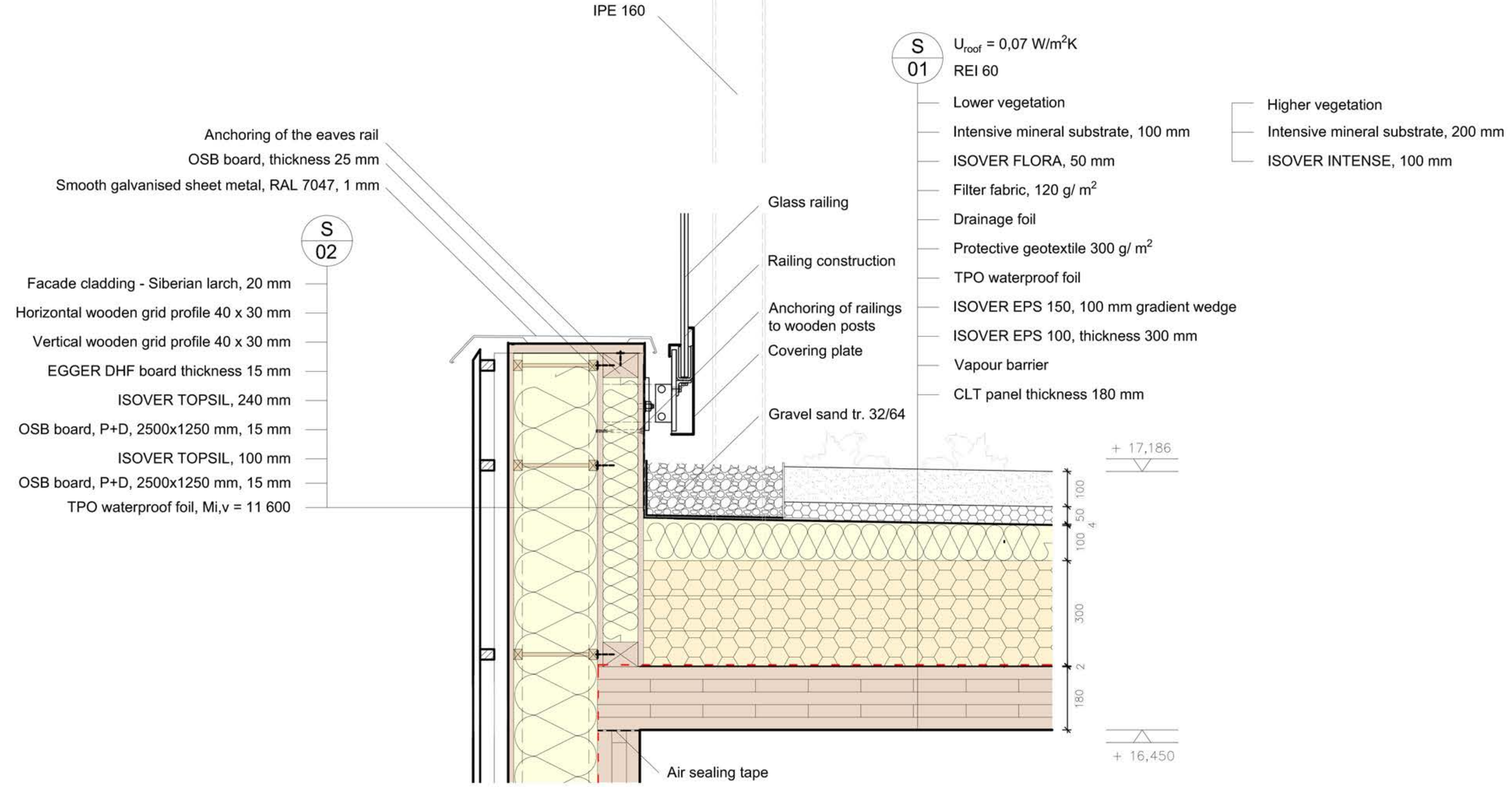
WATER SYSTEM

Water supplied from the public network, heated in a water heater and distributed to individual apartments. In addition to wastewater, grey water is also produced here, which is further used for flushing. Rainwater is separately discharged into a storage tank, where it is used for irrigation

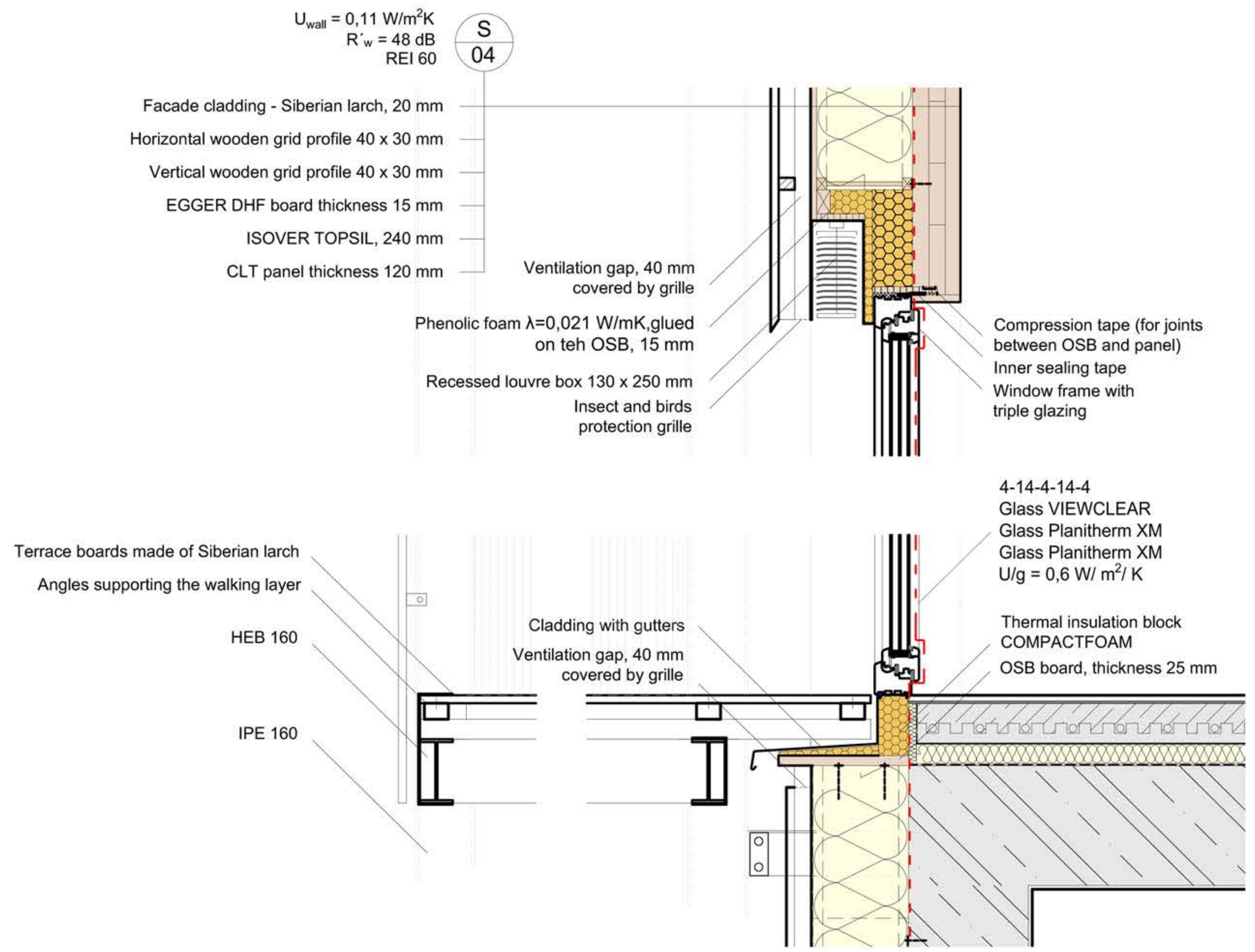
SOURCE OF ENERGY

In addition to solar energy, the building draws energy from a ground source water heat pump

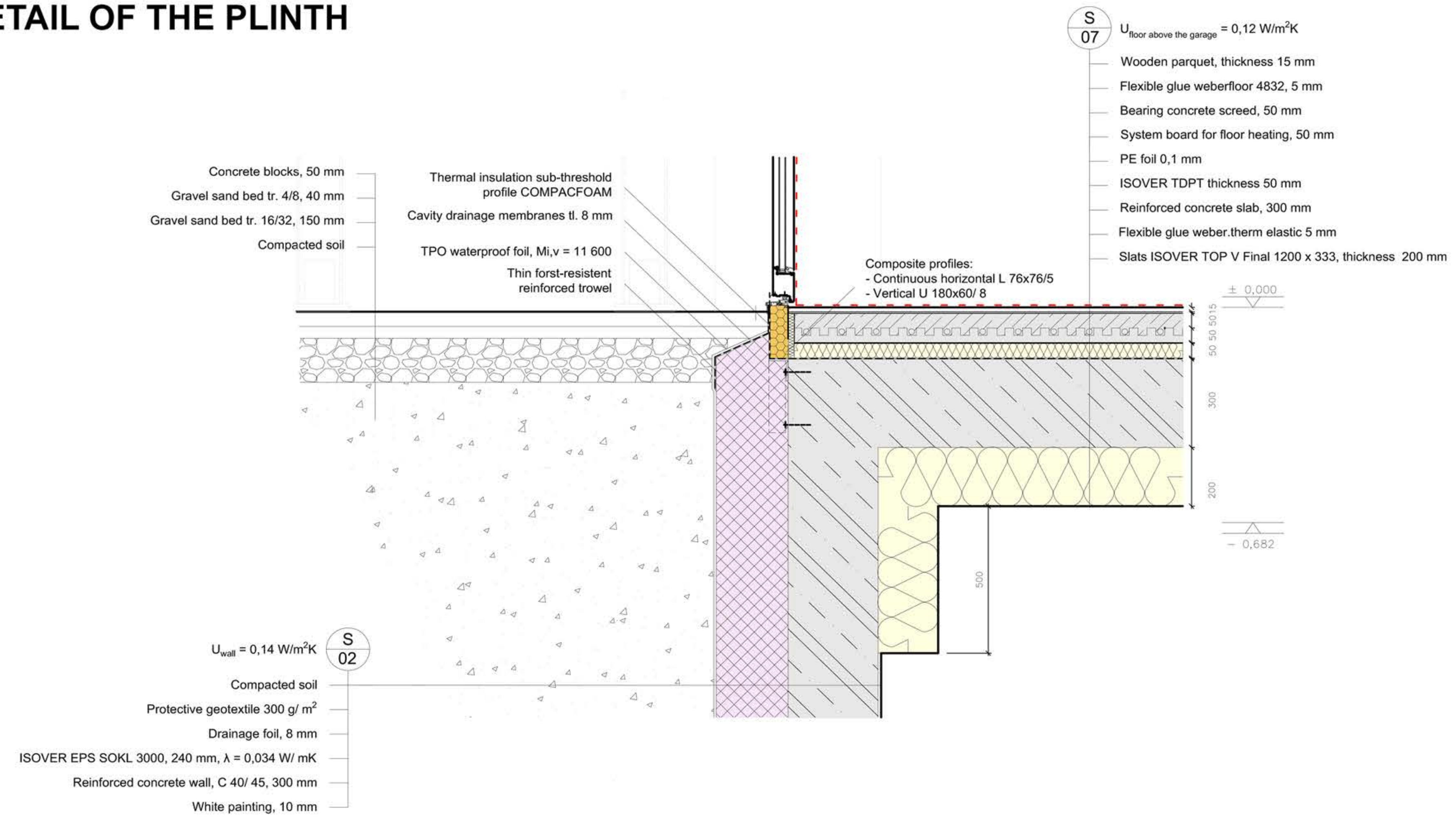
DETAIL OF THE ATTIC



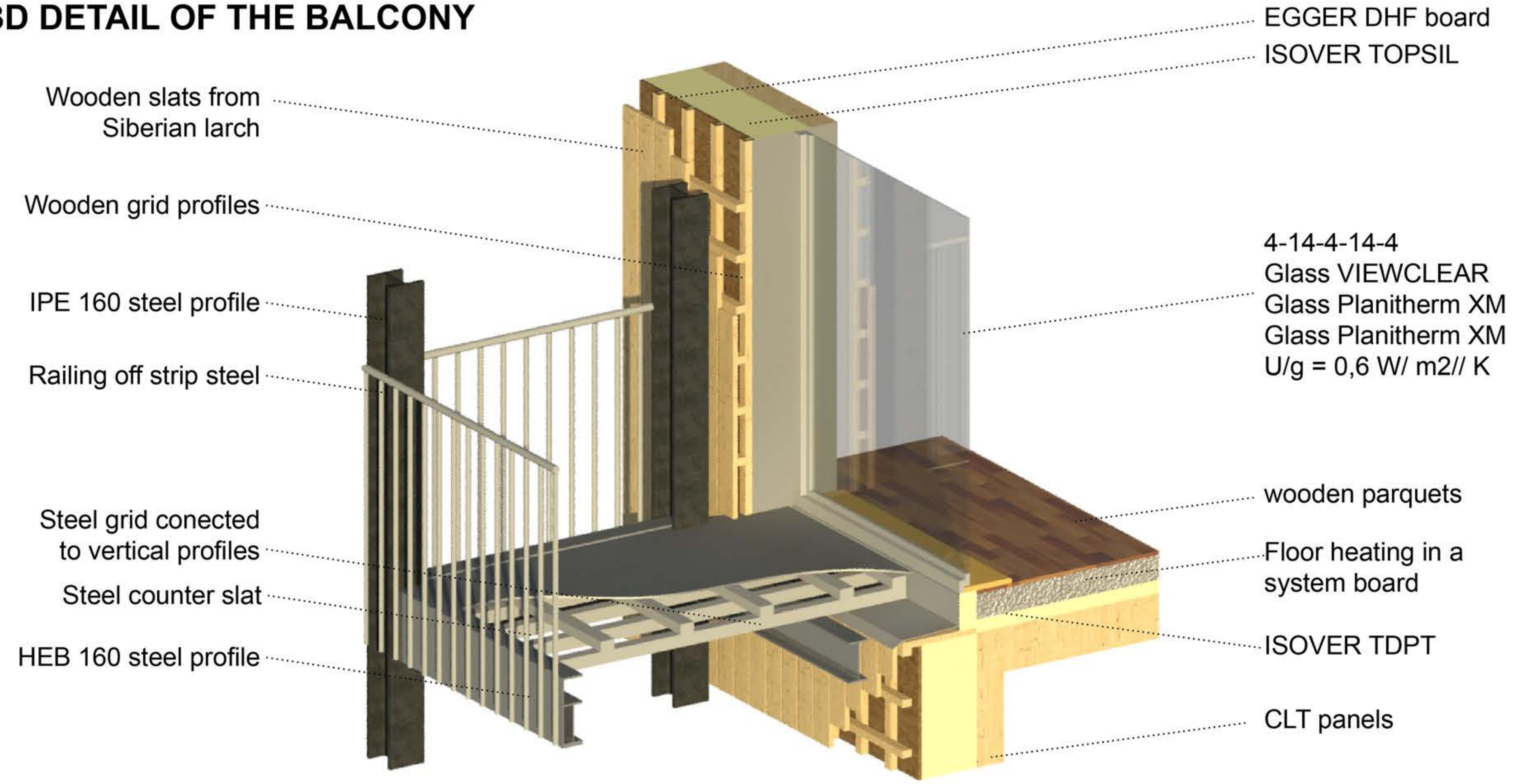
DETAIL OF THE WINDOW



DETAIL OF THE PLINTH

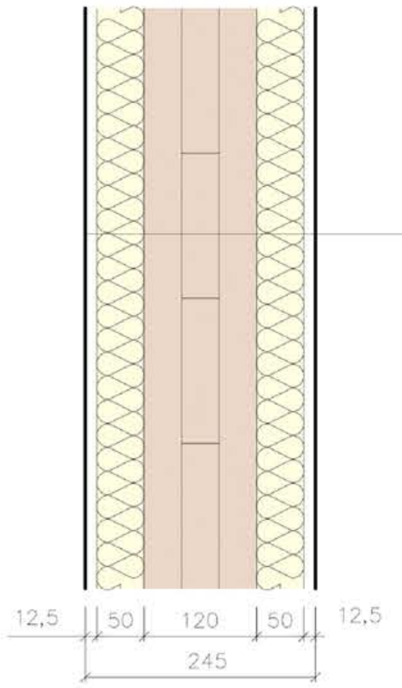


3D DETAIL OF THE BALCONY



SEPARATING WALLS

SEPARATING WALLS BETWEEN APARTMENTS



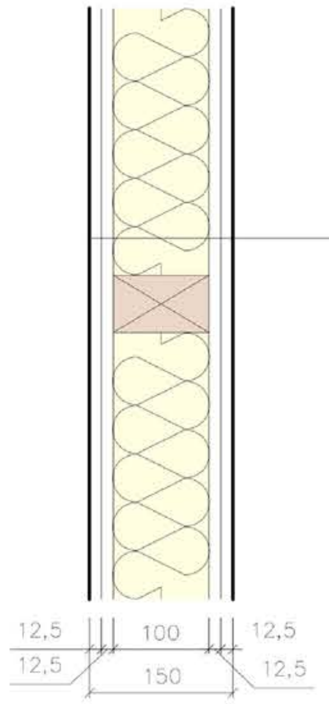
SW 01

R´w = 73 dB

REI 60

- Rigips board ActivAir, 12,5 mm
- Galvanised steel profiles, ISOVER AKU 50 mm
- CLT panel, thickness 120 mm
- Galvanised steel profiles, ISOVER AKU 50 mm
- Rigips board ActivAir, 12,5 mm

SEPARATING WALLS IN AN APARTMENT



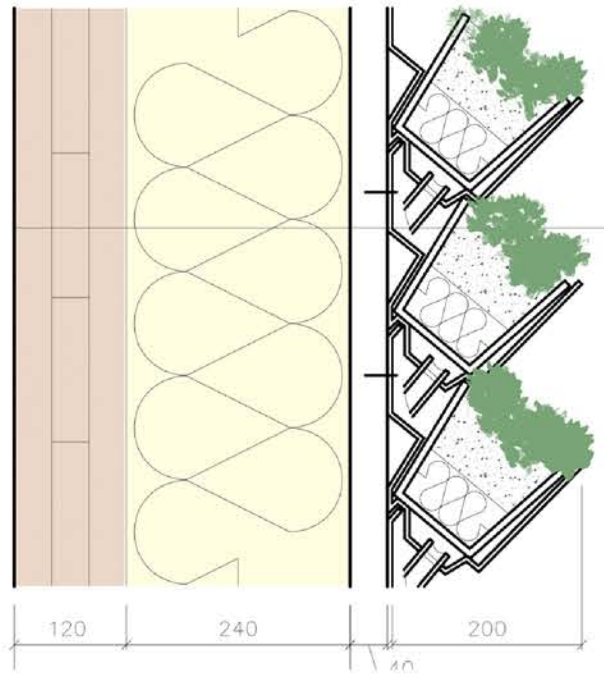
SW 02

R´w = 53 dB

REI 45

- RigiStabil ActivAir board, 12,5 mm
- Habito board 12,5 mm
- Wooden profiles 60/ 100 mm, ISOVER AKU
- Habito board 12,5 mm
- RigiStabil ActivAir board, 12,5 mm

GREEN SEPARATING WALL



SW 01

R´w = 44 dB

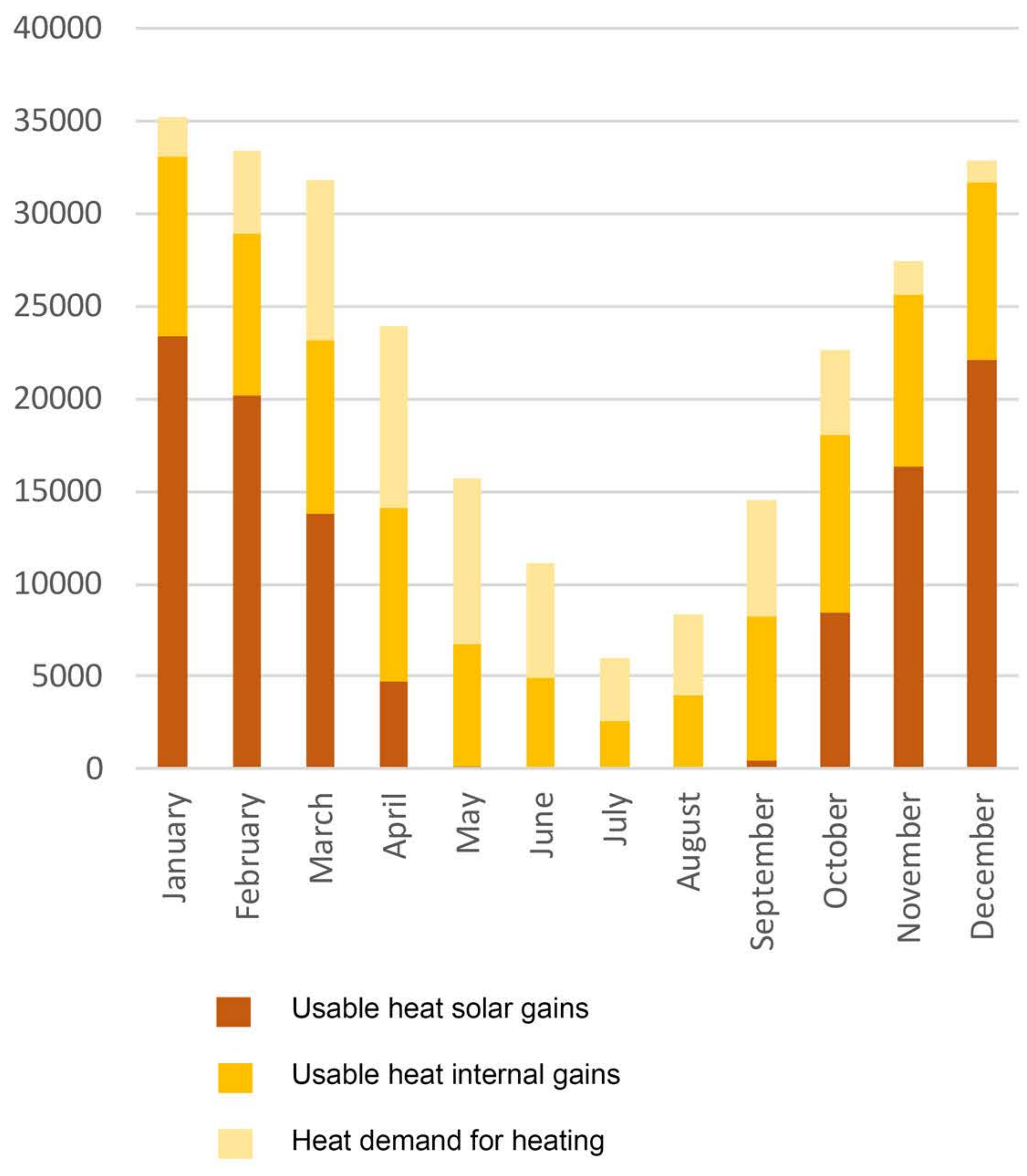
REI 60

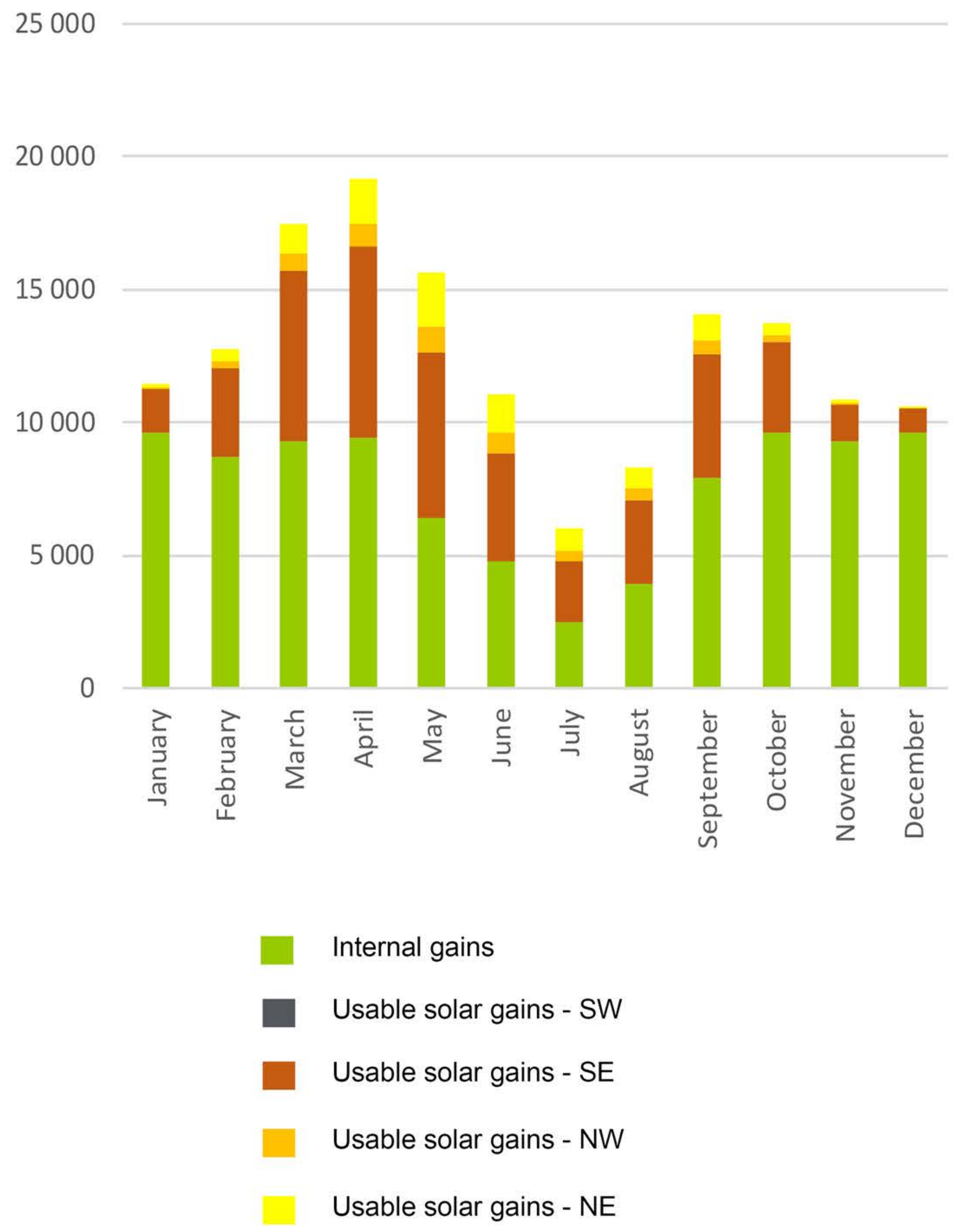
- System of hanging planters ISOVER FLORA panel
- Diffusely open foil
- ISOVER TOPSIL, 240 mm
- CLT panel, thickness 120 mm

HEAT BALANCE OF THE BUILDING AND HEAT GAINS

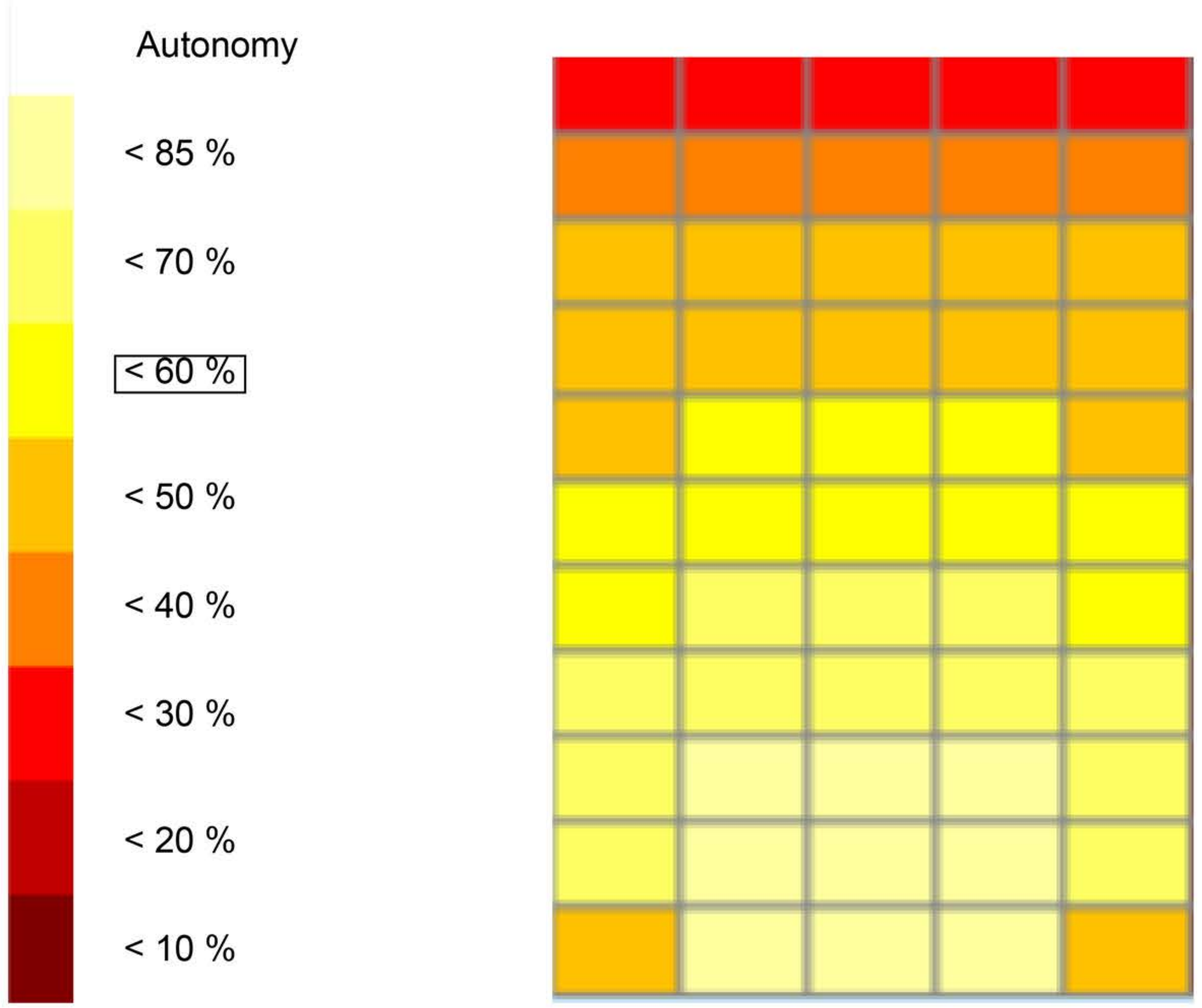
SPECIFIC HEAT DEMAND FOR HEATING
e_A = 14,91 < 15 kWh/(m².a)

AVERAGE HEAT TRANSFER COEFFICIENT
U_{em} = 0,18 kWh/(m².a)

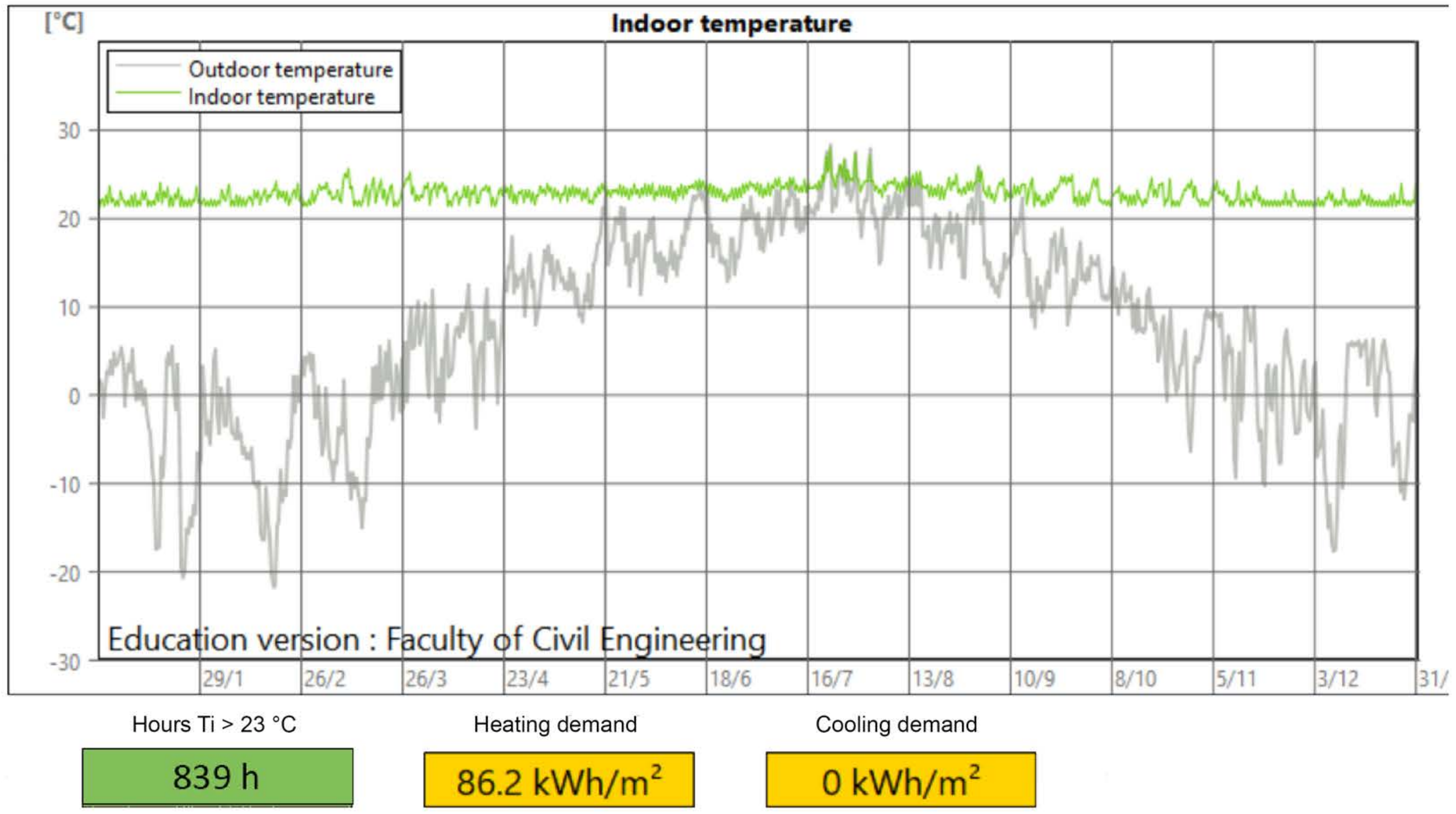




DAYLIGHTING AND OVERHEATING

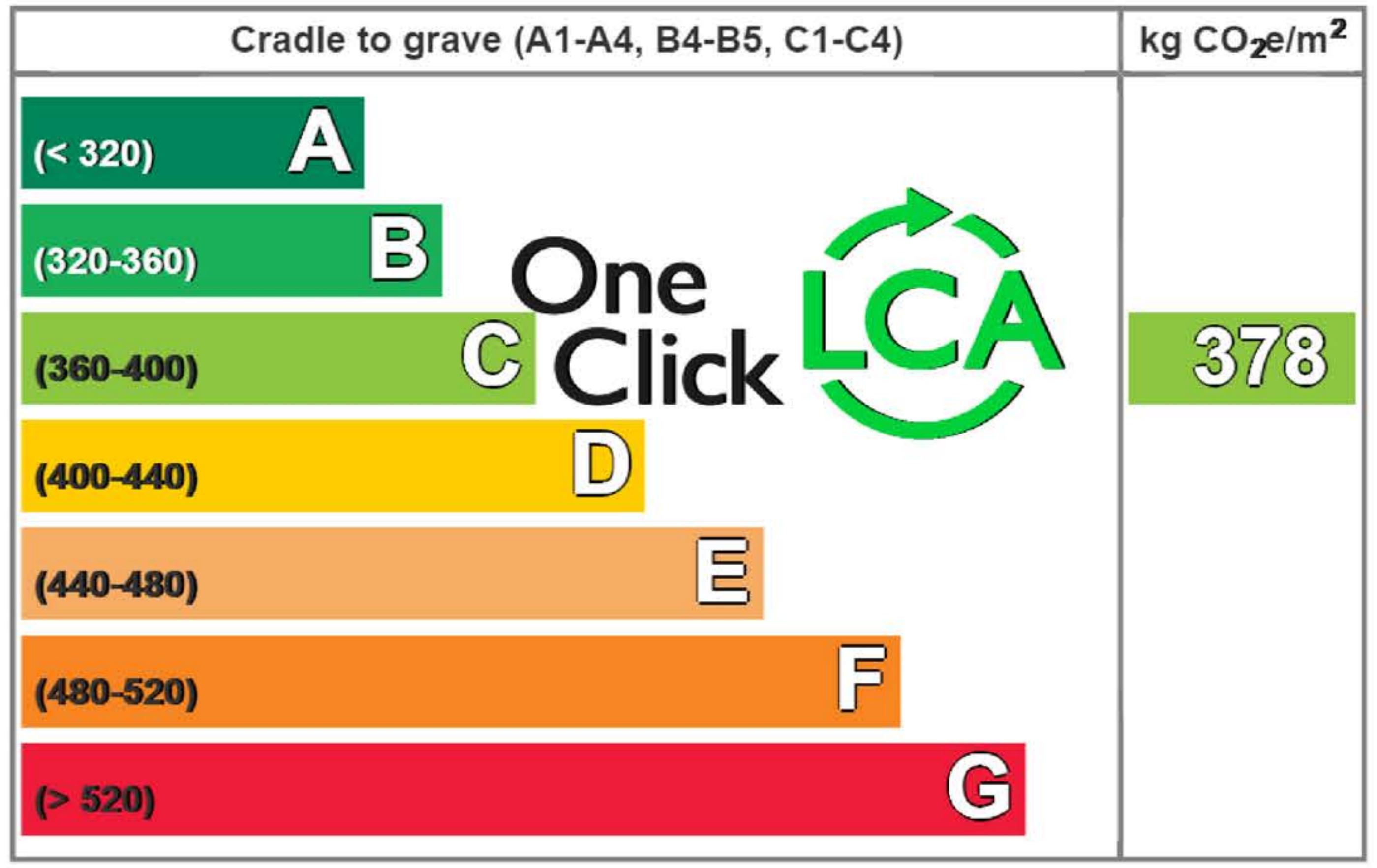


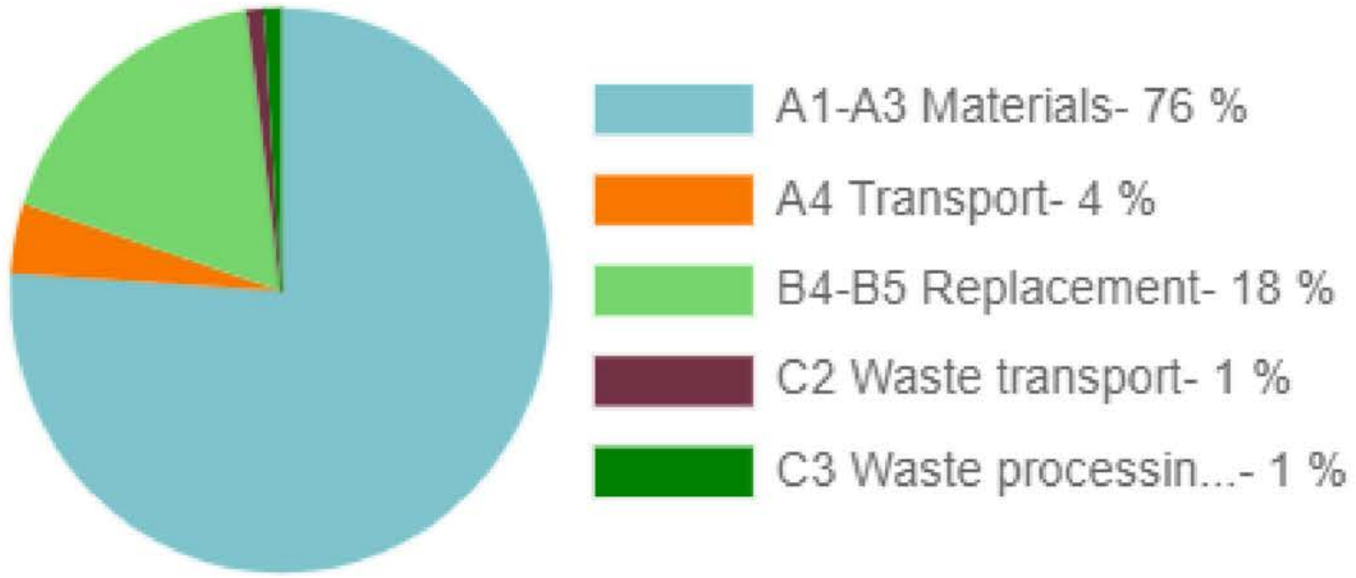
The room is more than 50% illuminated at 300 lux.



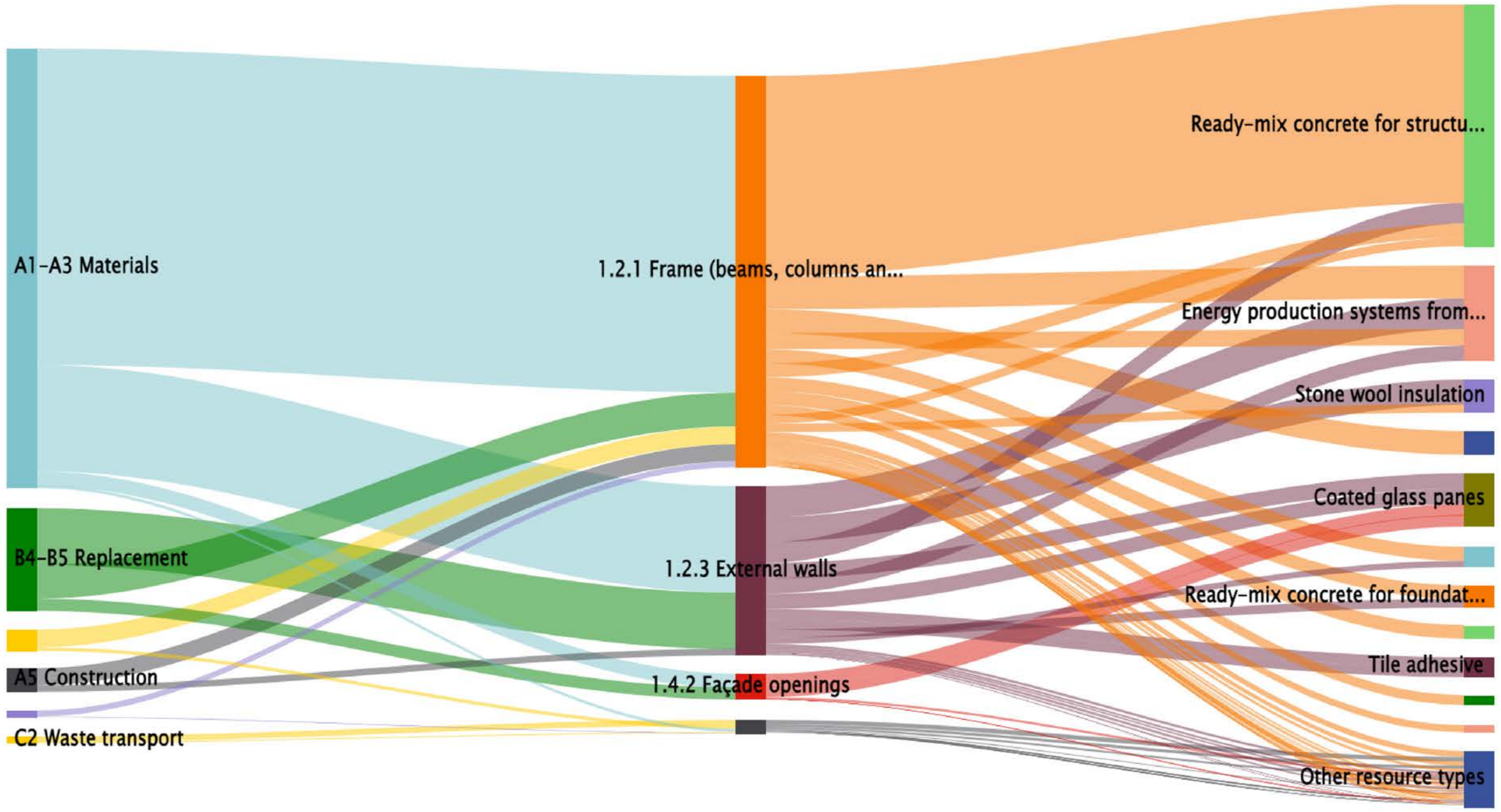
The temperature above 23°C is in the room for 839 hours.
The requirement is a maximum of 10% (876 h).
839 < 876 h

LIFE CYCLE OF THE BUILDING



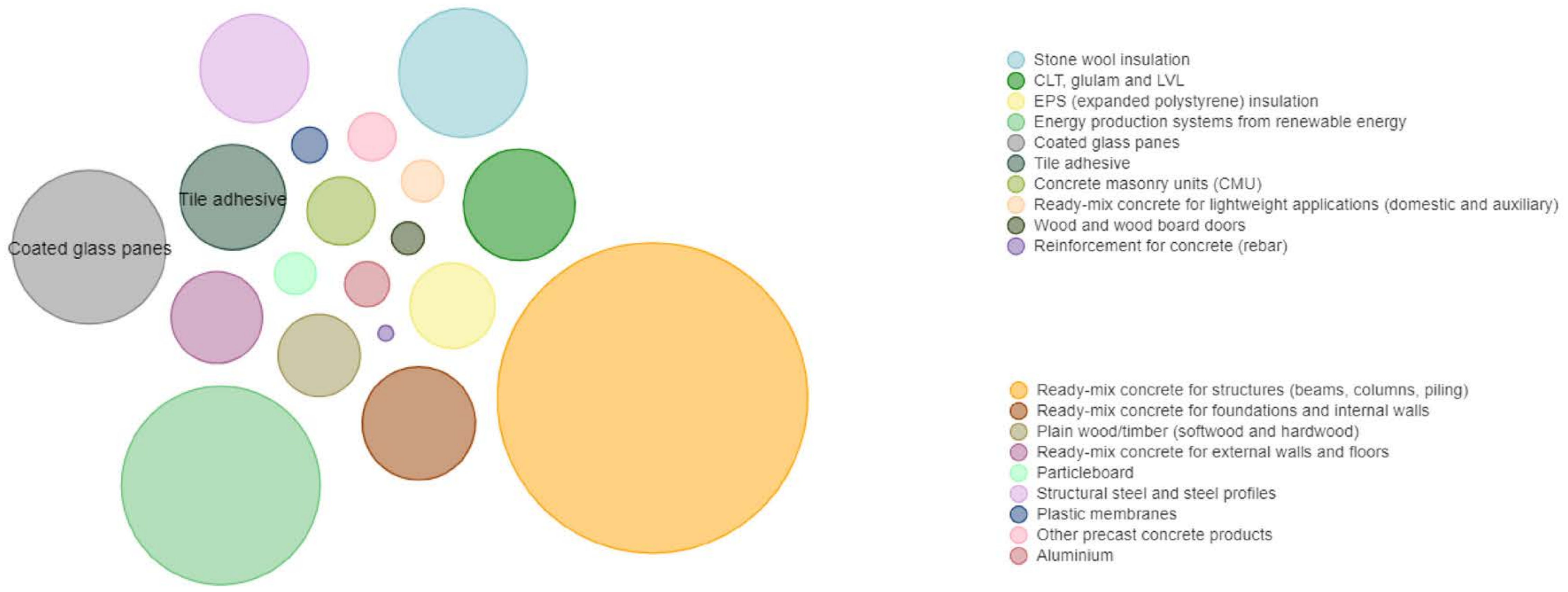


Sankey diagram, Global warming

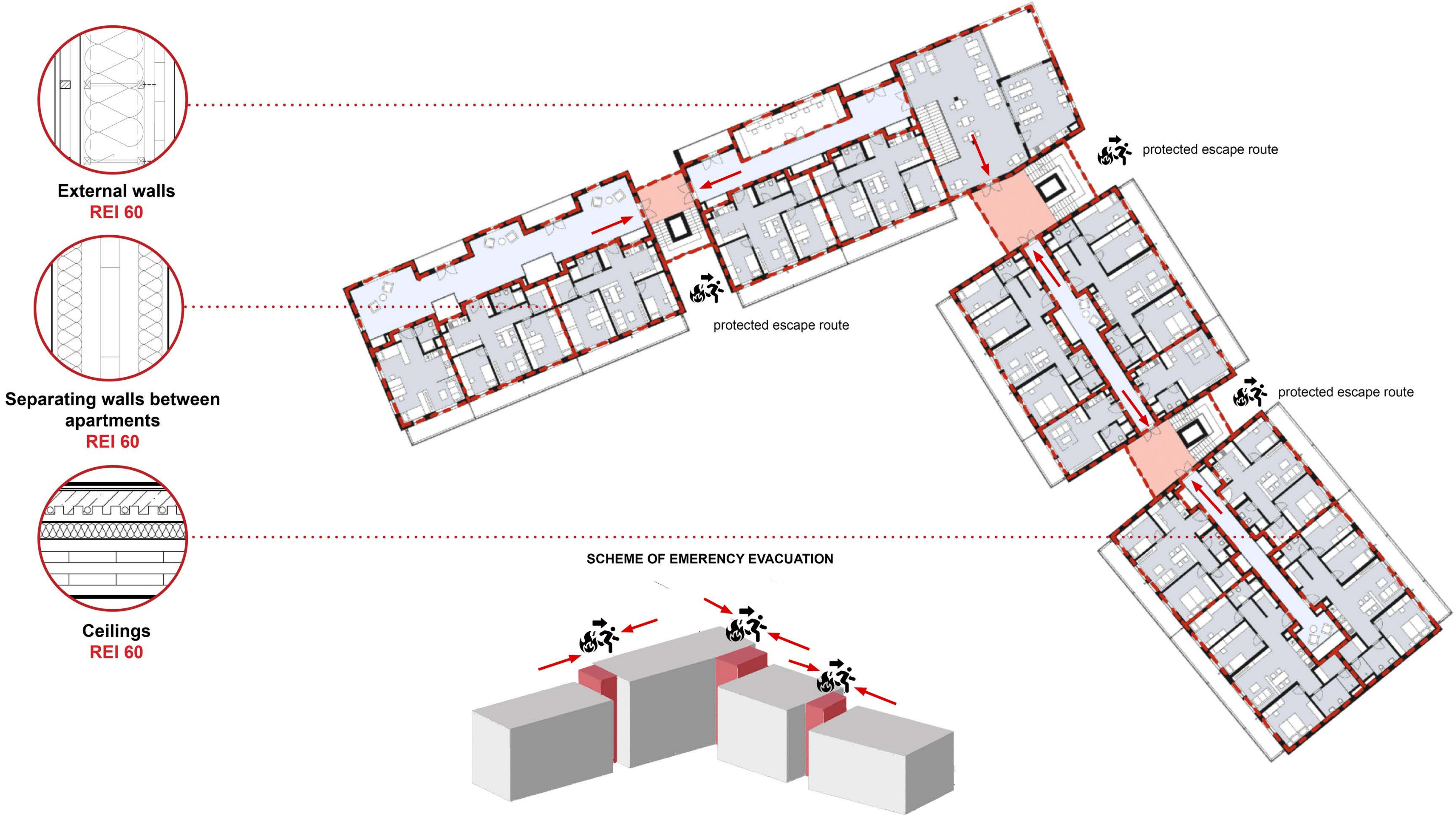


Bubble chart, total life-cycle impact by resource type and subtype, Global warming

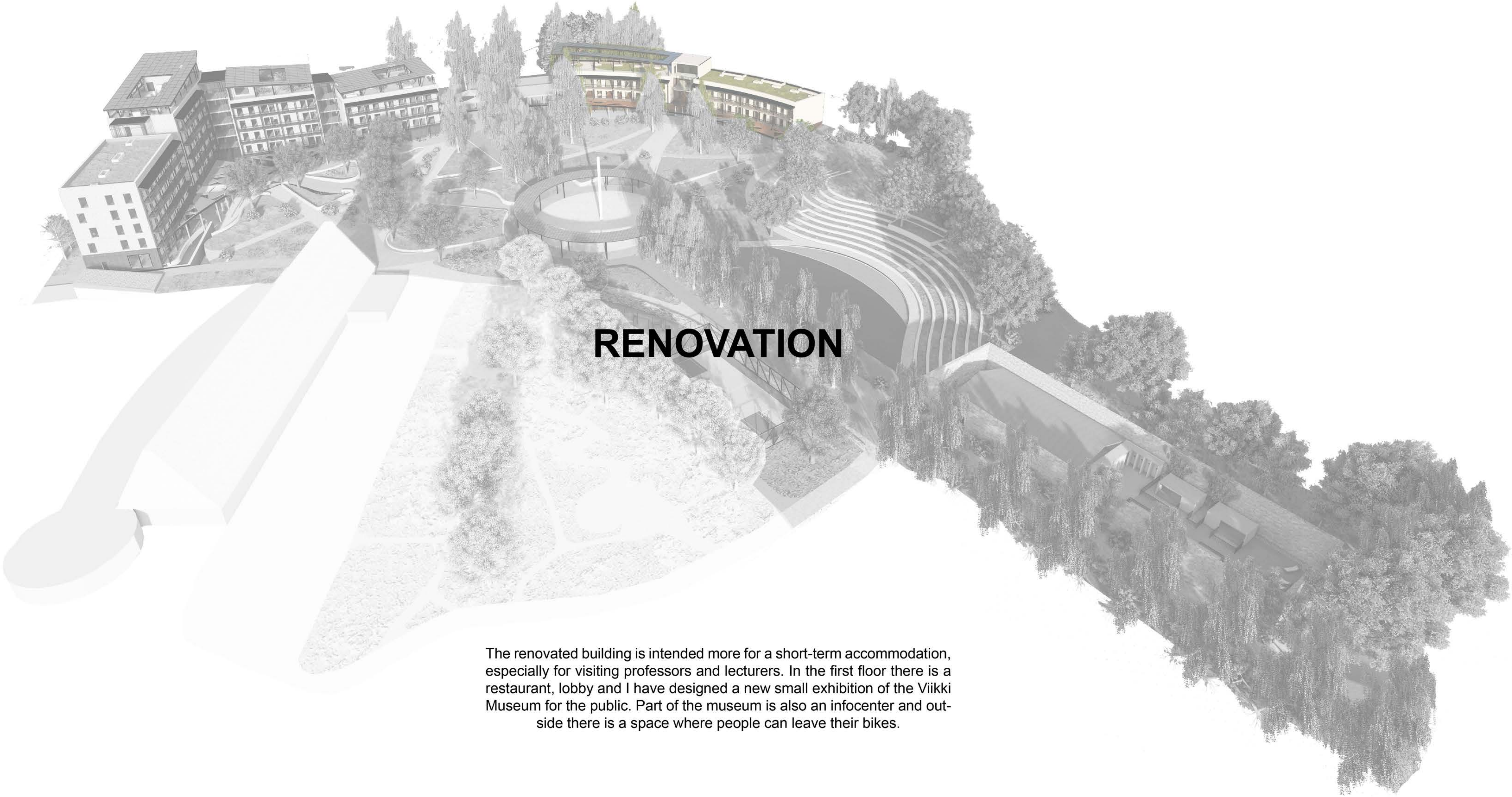
Hover your mouse over legends or the chart to highlight impacts. Bubble minimum and maximum sizes constrained for readability



FIRE SAFETY OF THE BUILDING

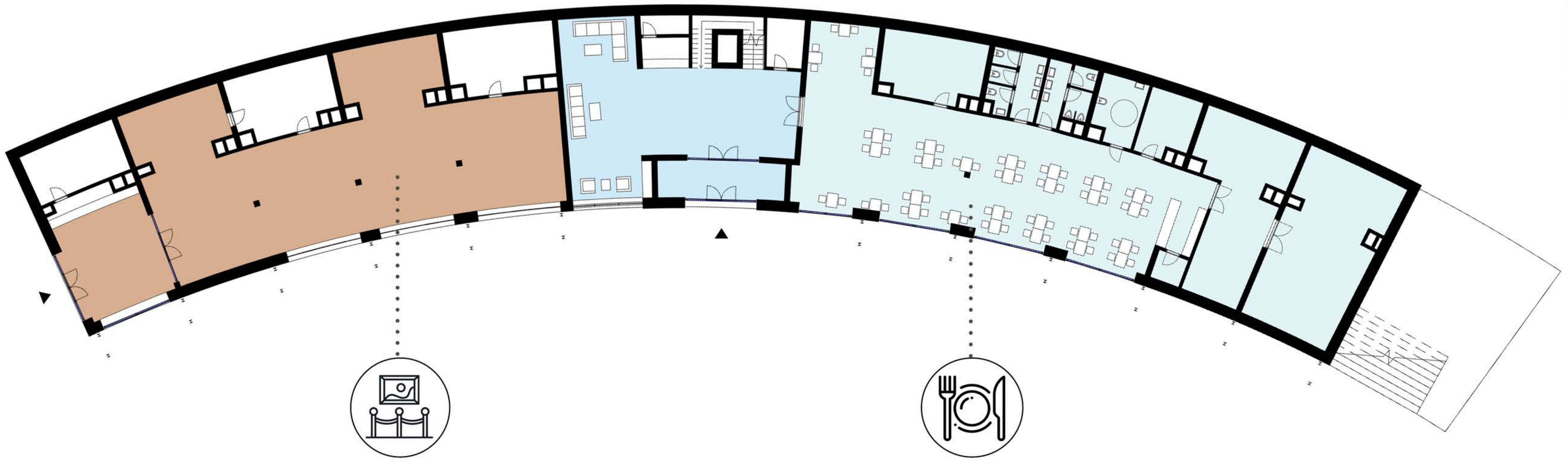


RENOVATION



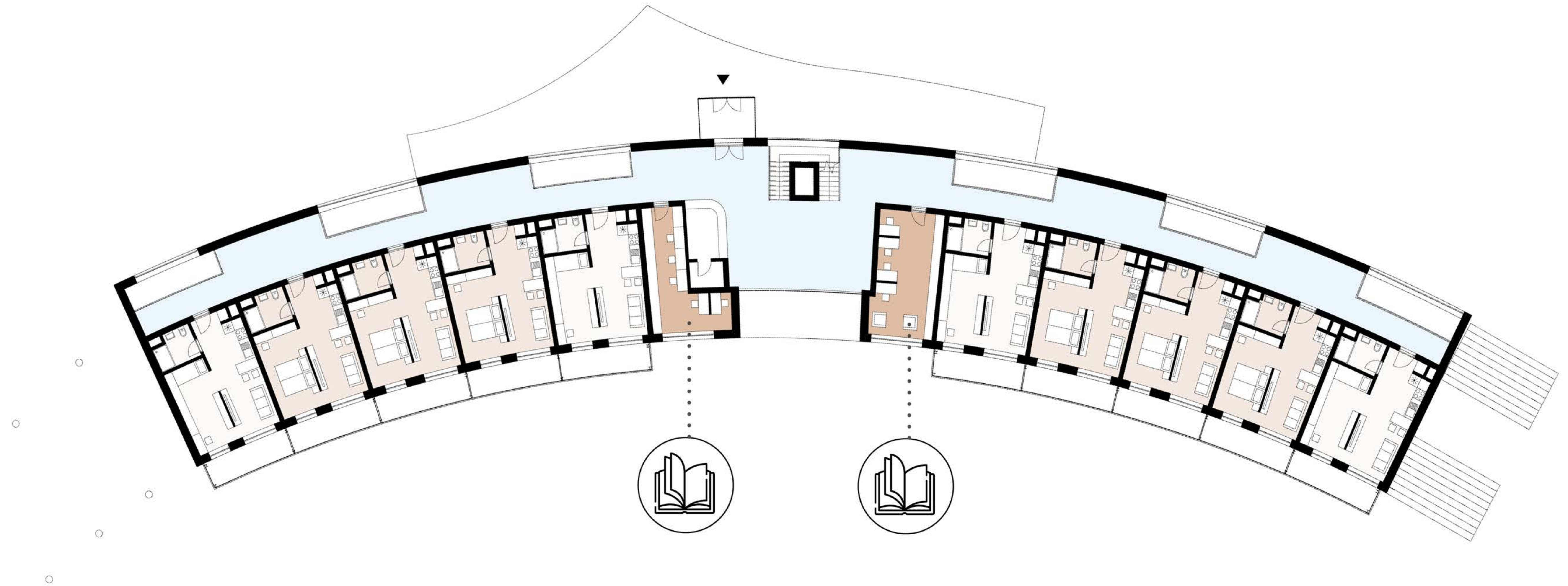
The renovated building is intended more for a short-term accommodation, especially for visiting professors and lecturers. In the first floor there is a restaurant, lobby and I have designed a new small exhibition of the Viikki Museum for the public. Part of the museum is also an infocenter and outside there is a space where people can leave their bikes.

FIRST FLOOR

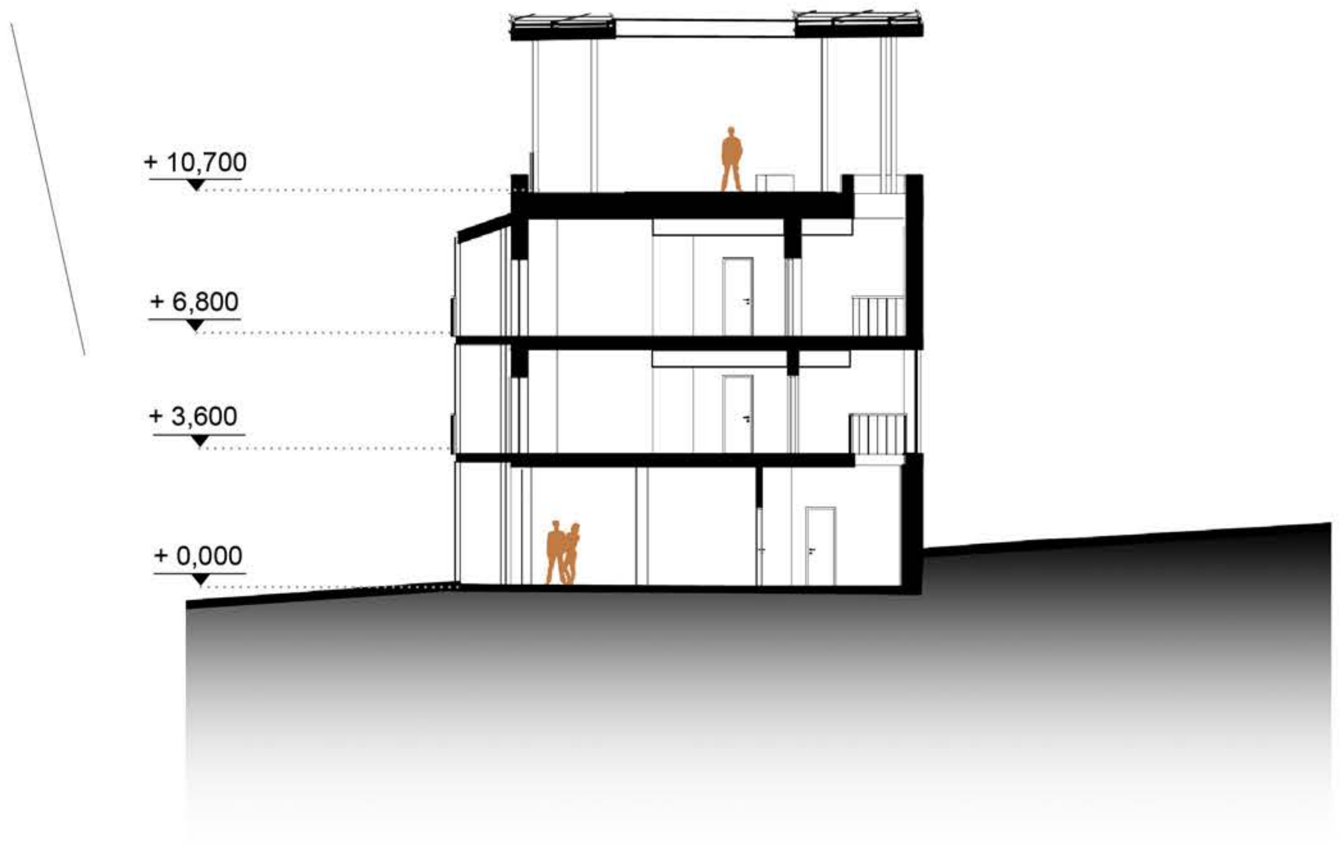


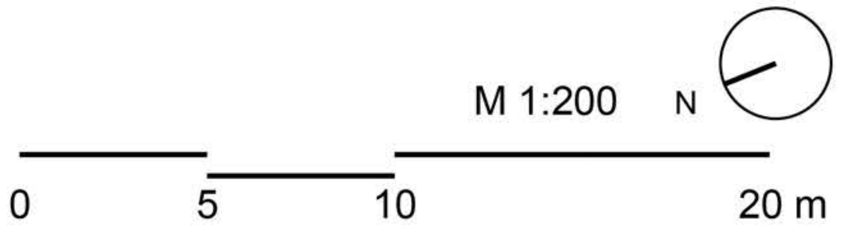
	Studio
	2 - bedroom apartment
	common spaces
	restaurant
	public hall

SECOND FLOOR

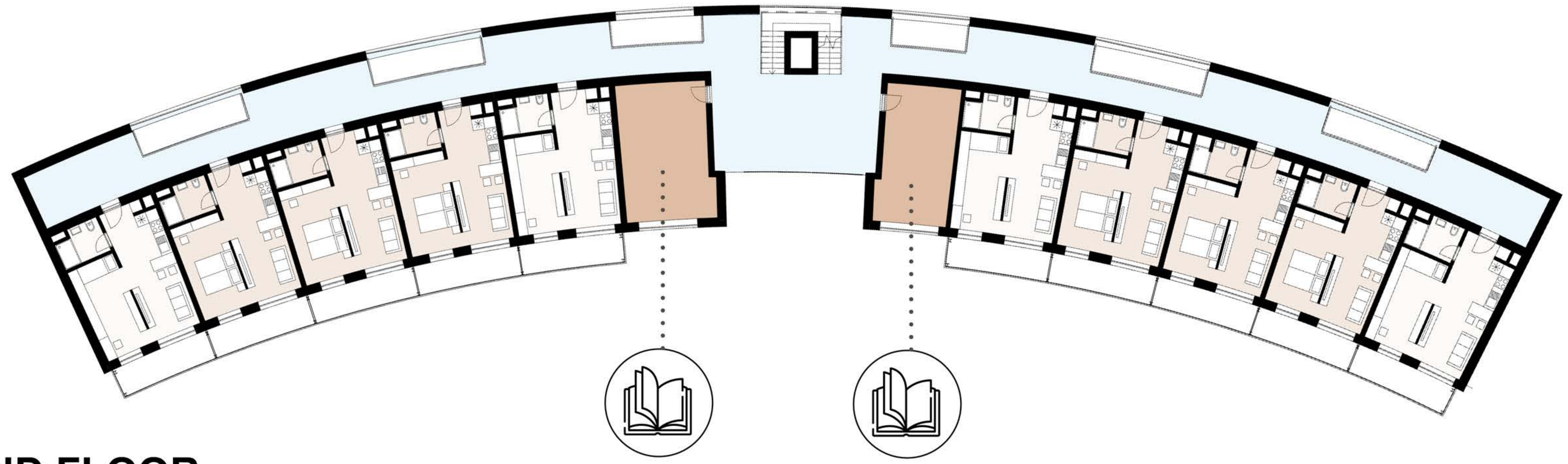


SECTION

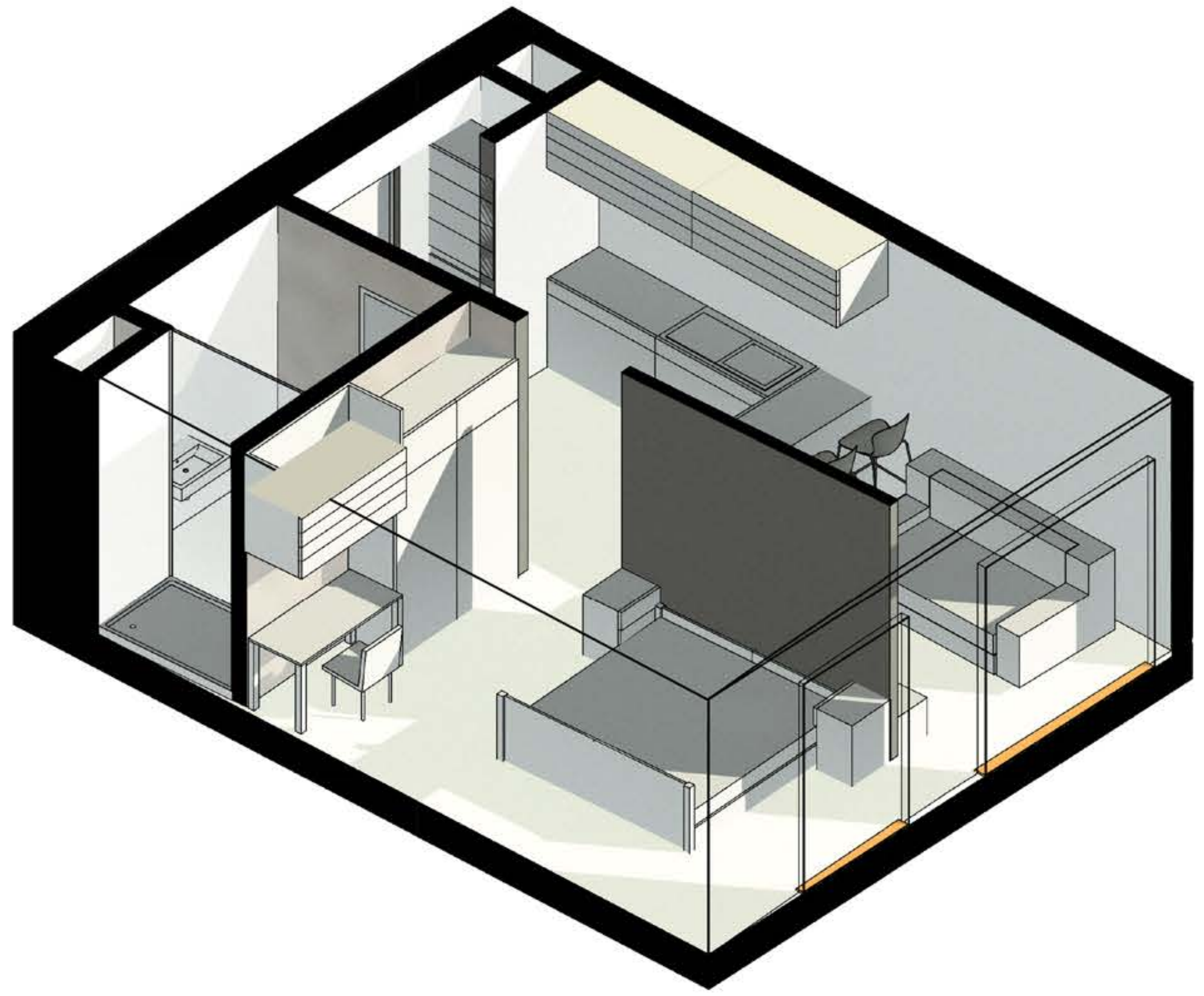




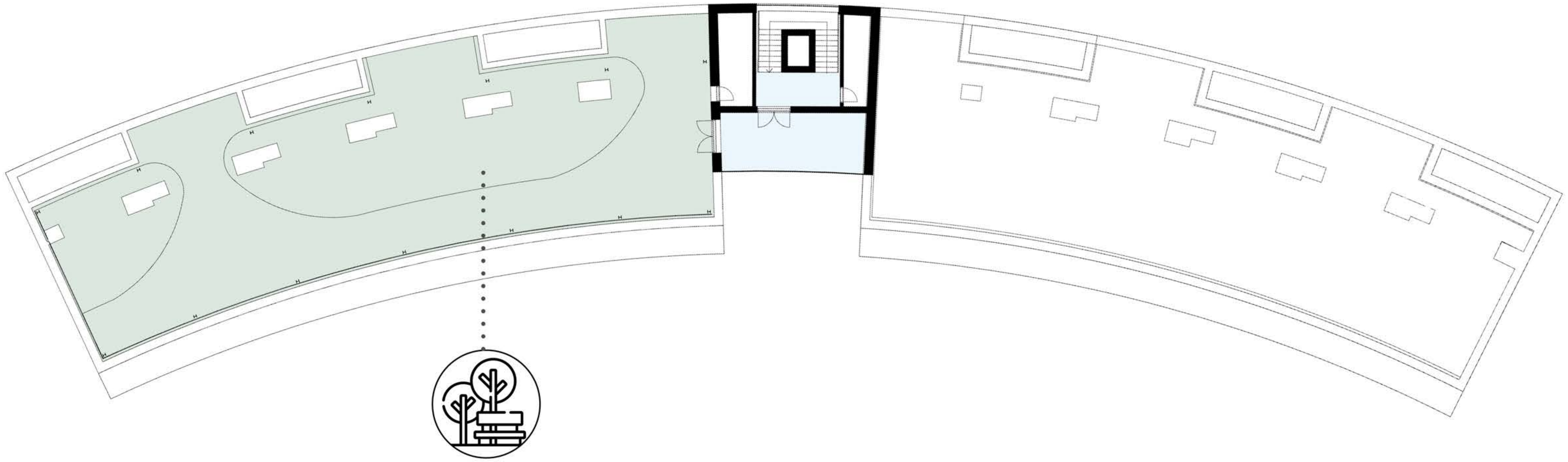
FIRST FLOOR

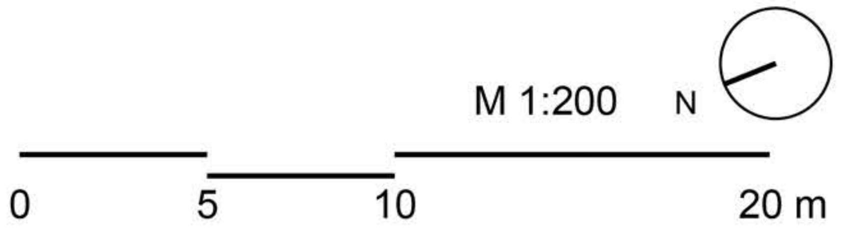


- Studio
- 2 - bedroom apartment
- common space, study room
- public hall
- public green roof

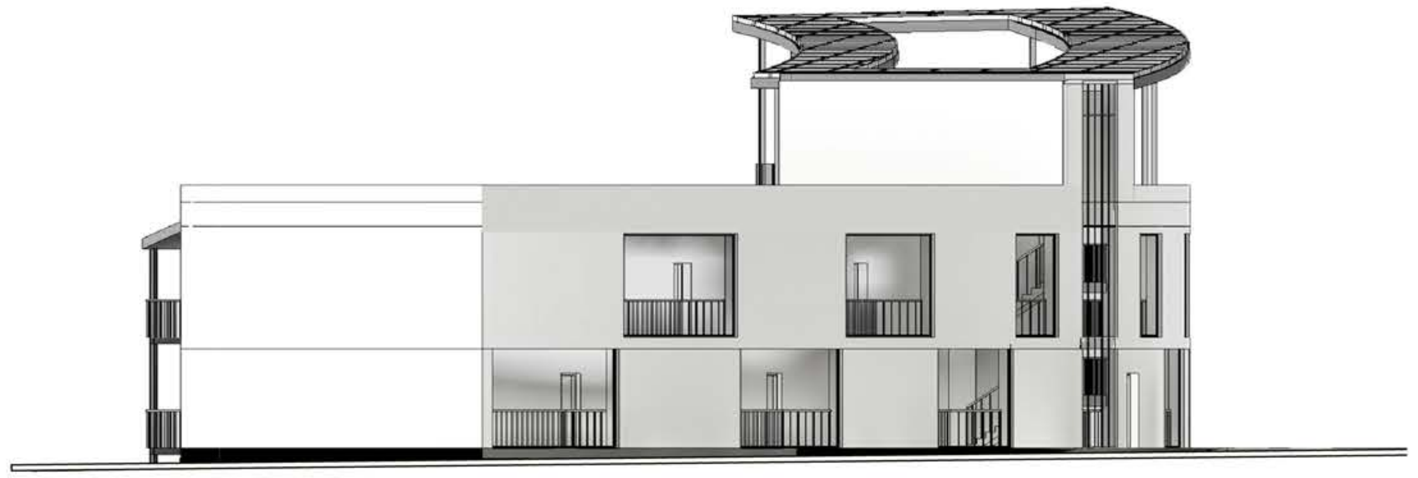


SECOND FLOOR



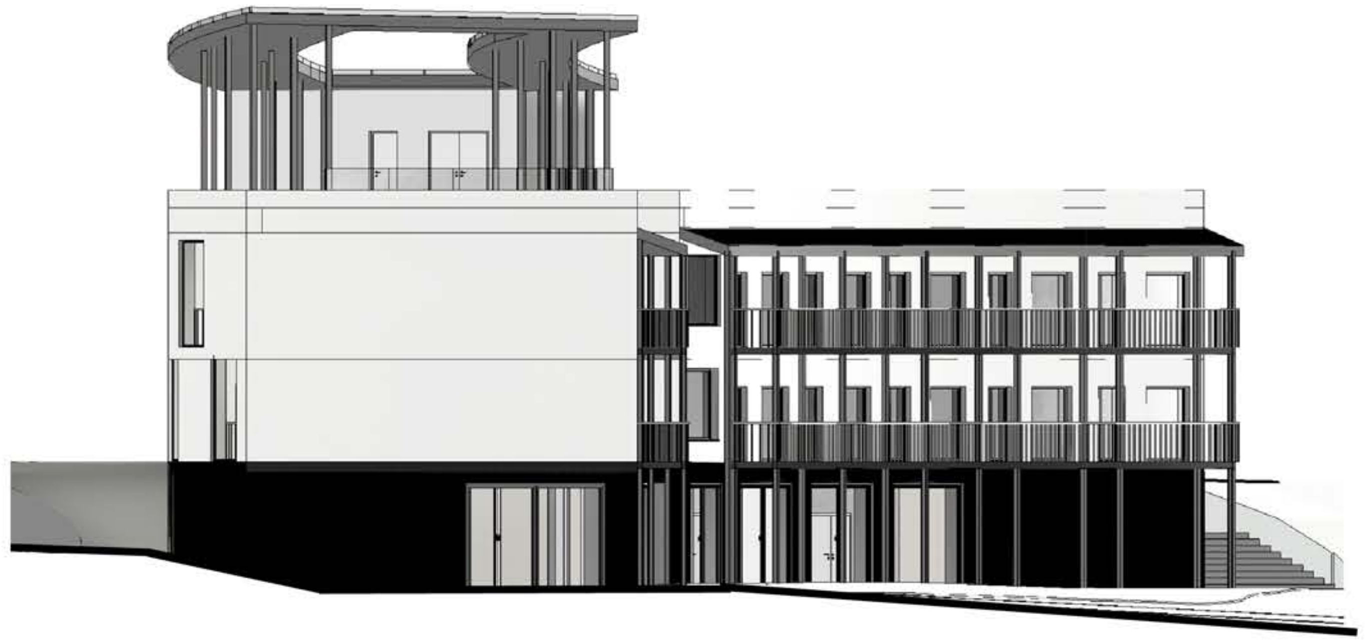


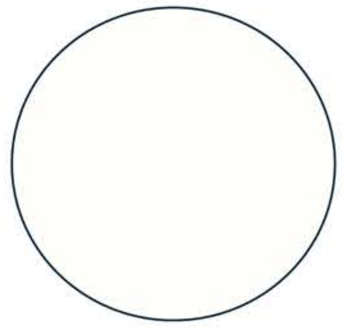
VIEWS OF THE RENOVATION



Photovoltaic panels on the roof

Steel canopies and balconies





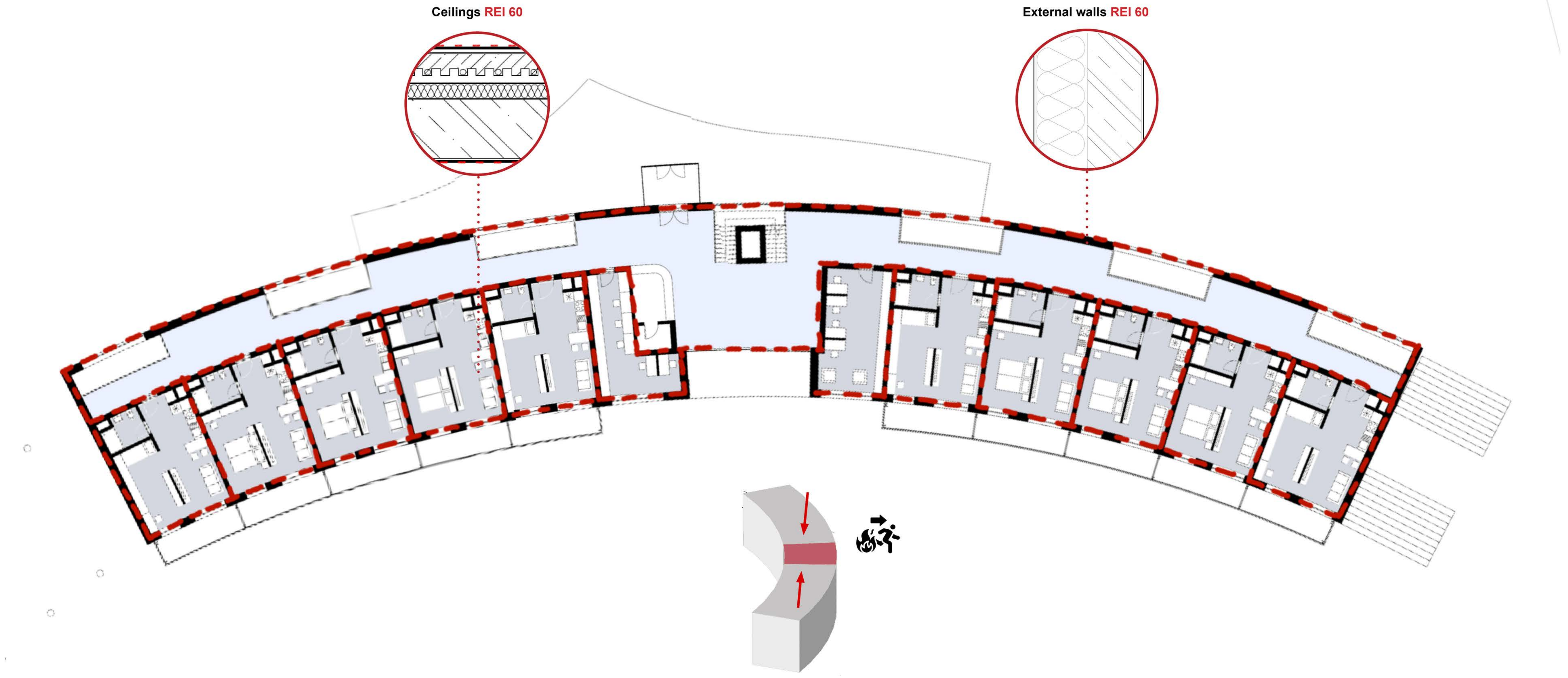
Light exterior plaster

Concrete panels in the first floor

M 1:200

0 5 10 20 m

FIRE SAFETY OF THE BUILDING



USE OF ENERGY AND POWER

HEATING SYSTEM

3 central heating units with a heat recuperation distributing air throu-
gh installation cores located in corridors to individual flats
In each floor there is a floor heating

PHOTOVOLTAIC PANELS

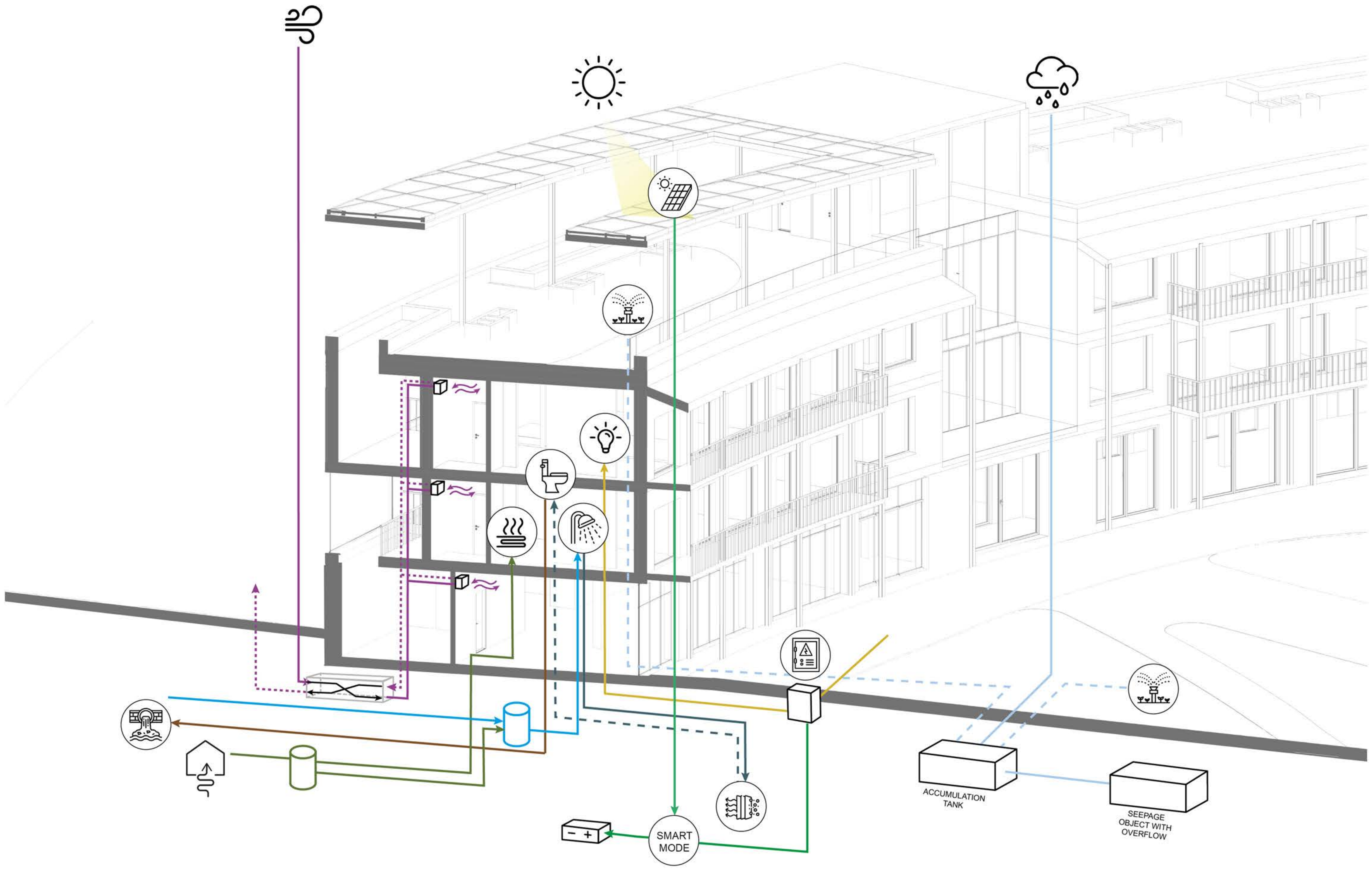
Photovoltaic panels situated on a roofs of the building collect solar energy that is stored in bateries

WATER SYSTEM

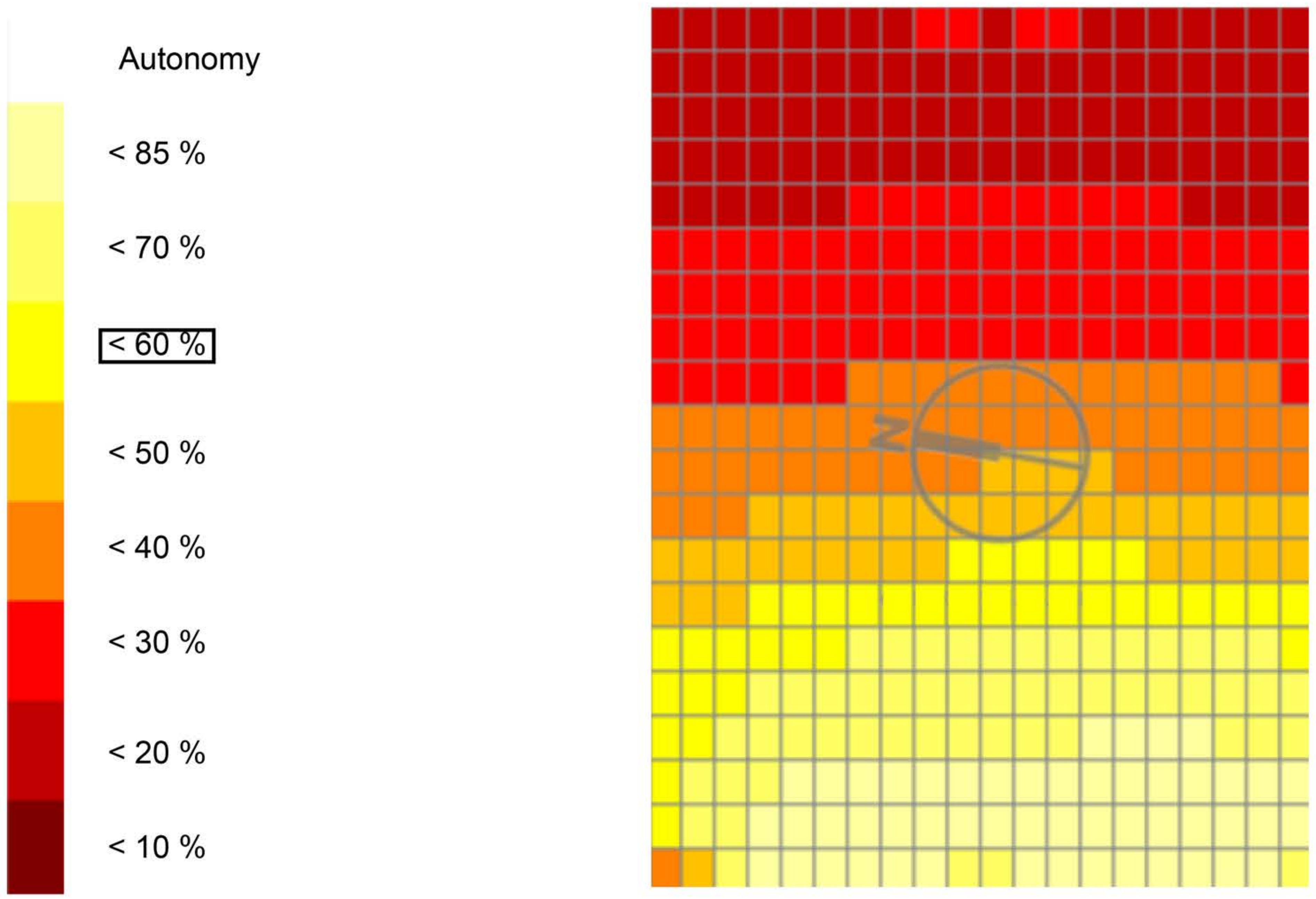
Water supplied from the public network, heated in a water heater and distributed to individual apartments. In addition to wastewater, grey water is also produced here, which is further used for flushing. Rainwater is separately discharged into a storage tank, where it is used for irrigation

SOURCE OF ENERGY

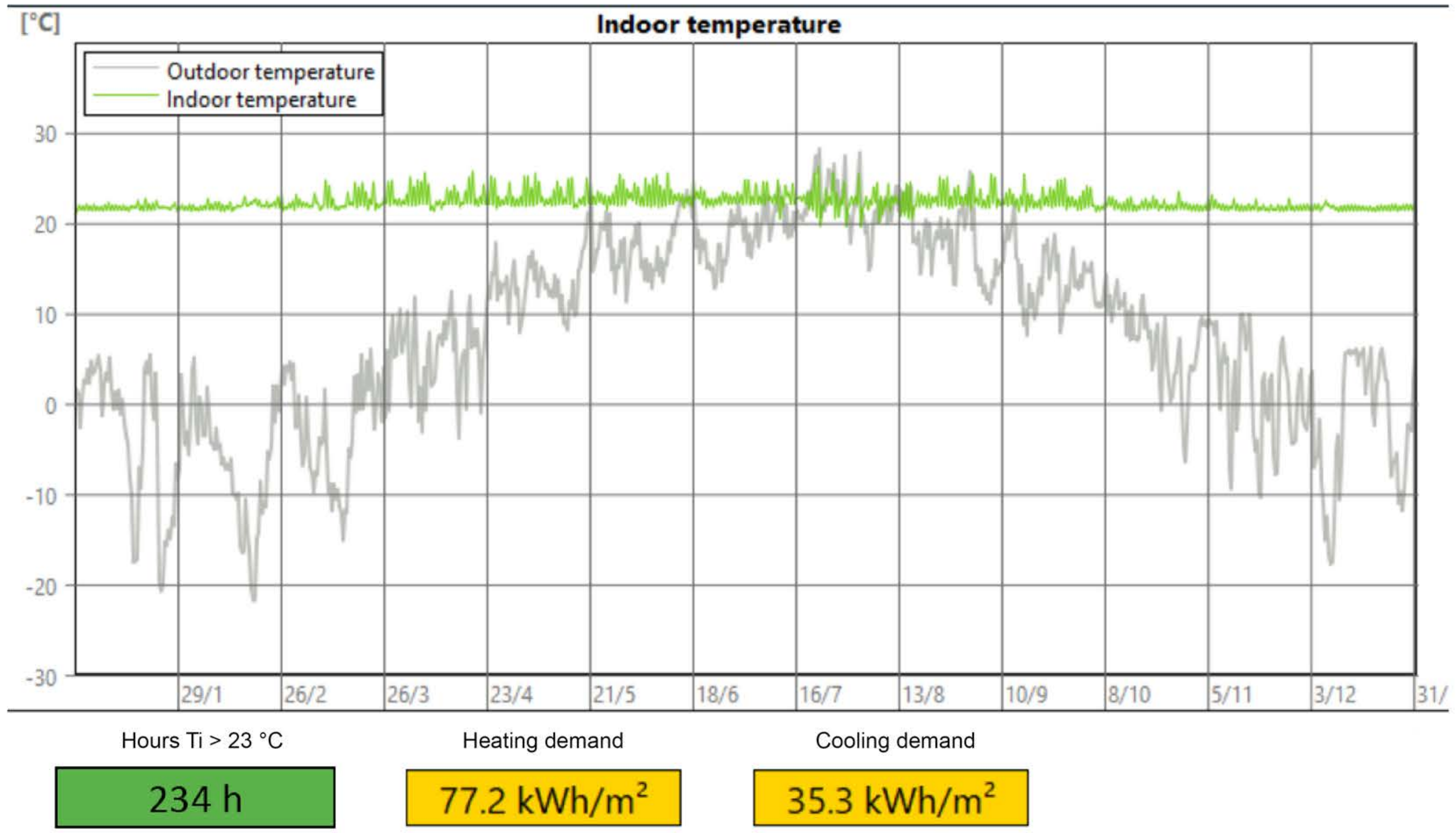
In addition to solar energy, the building draws energy from a ground source water heat pump



DAYLIGHTING AND OVERHEATING

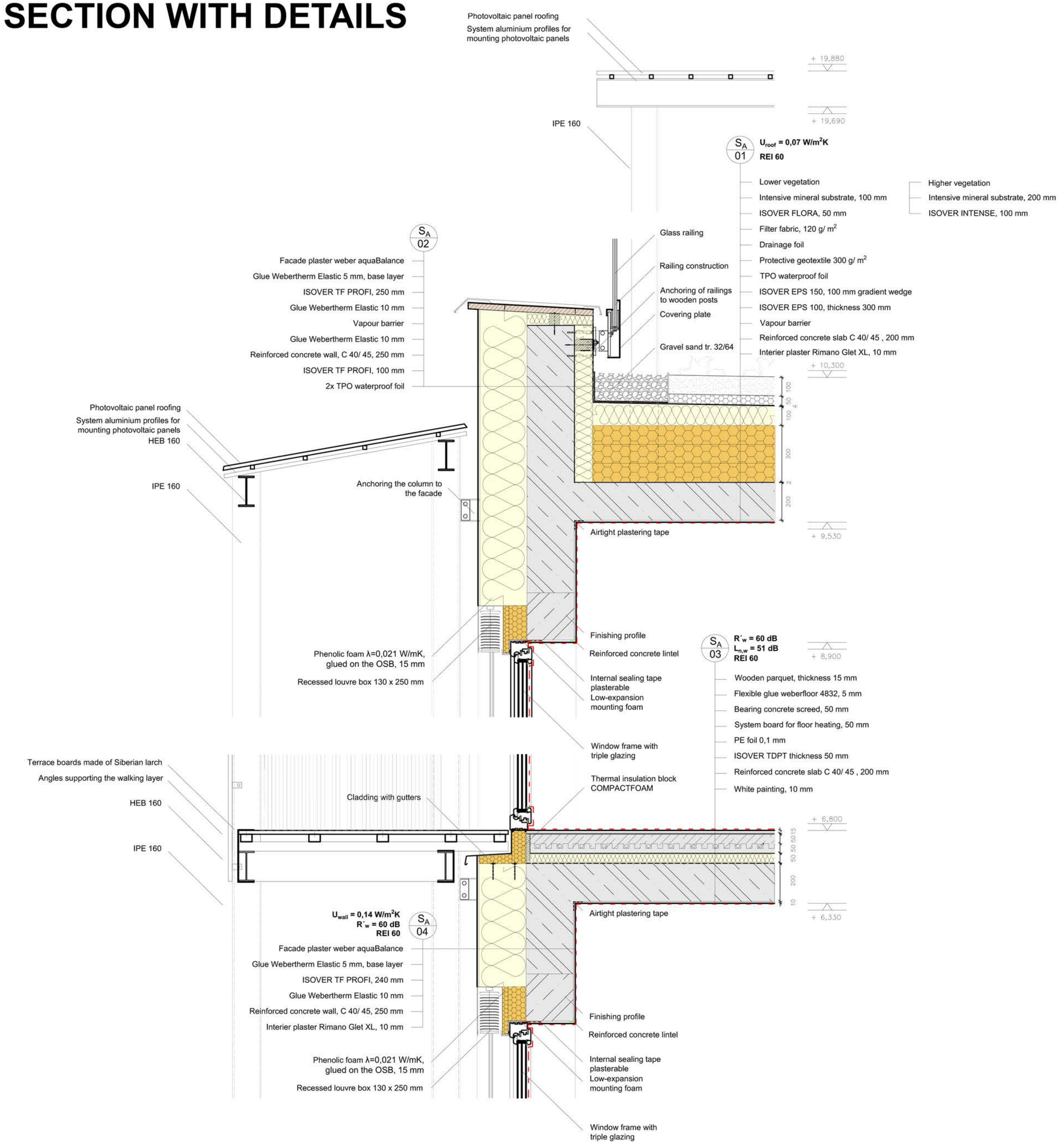


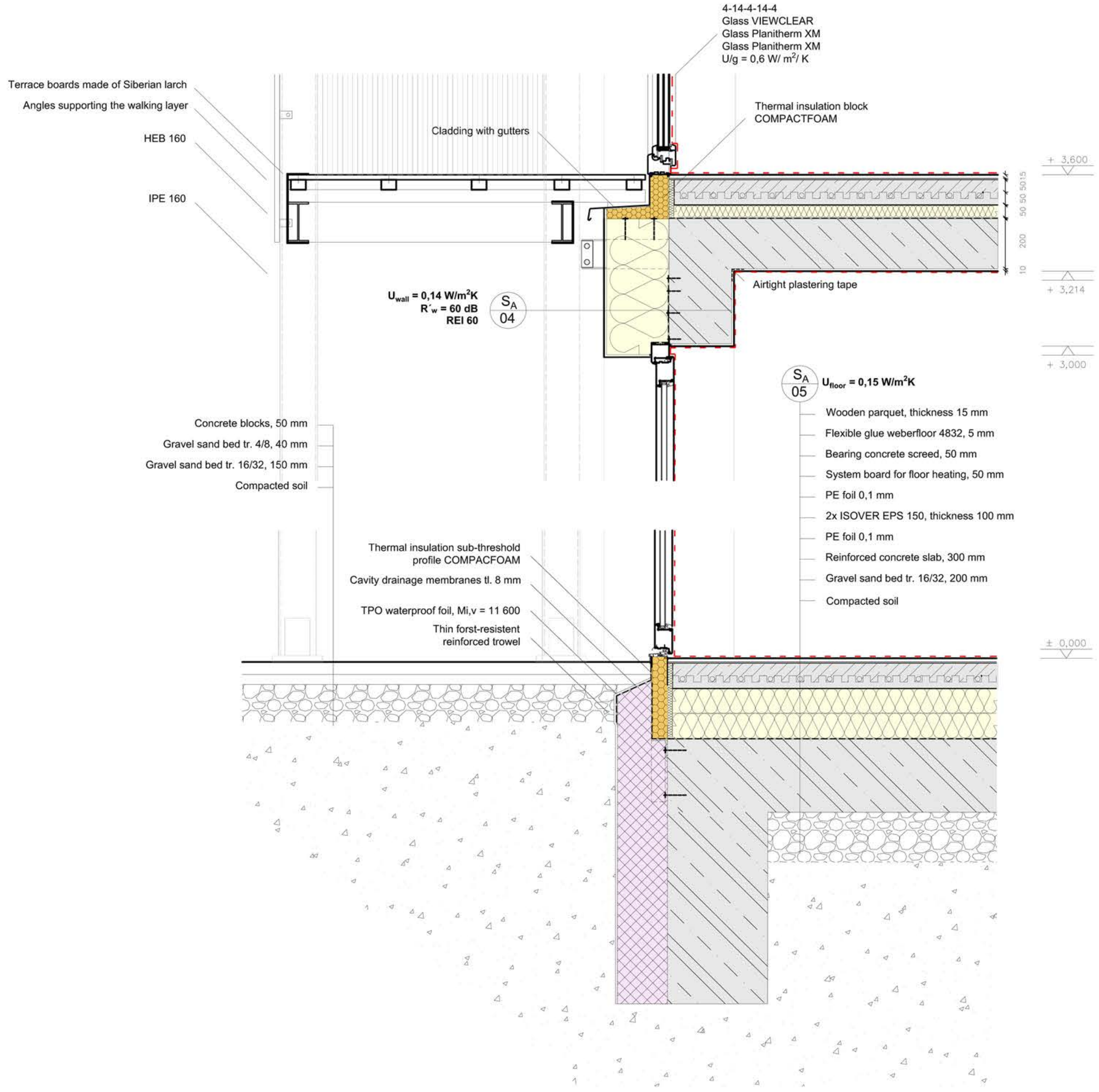
The room is more than 50% illuminated at 300 lux.



The temperature above 23°C is in the room for 234 hours.
The requirement is a maximum of 10% (876 h).
234 < 876 h

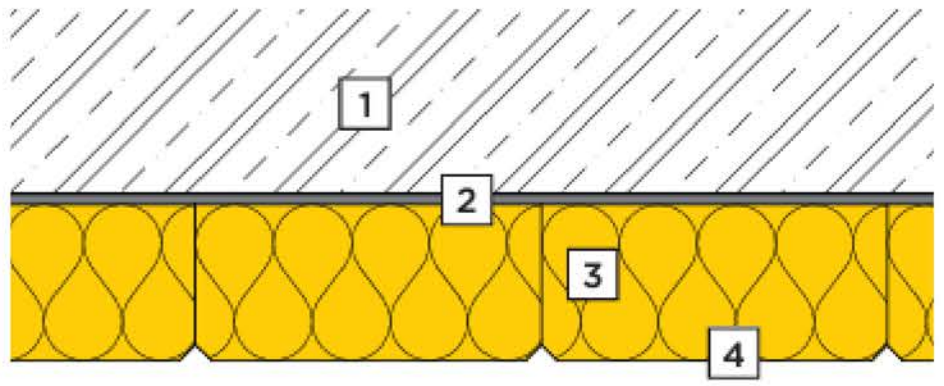
SECTION WITH DETAILS





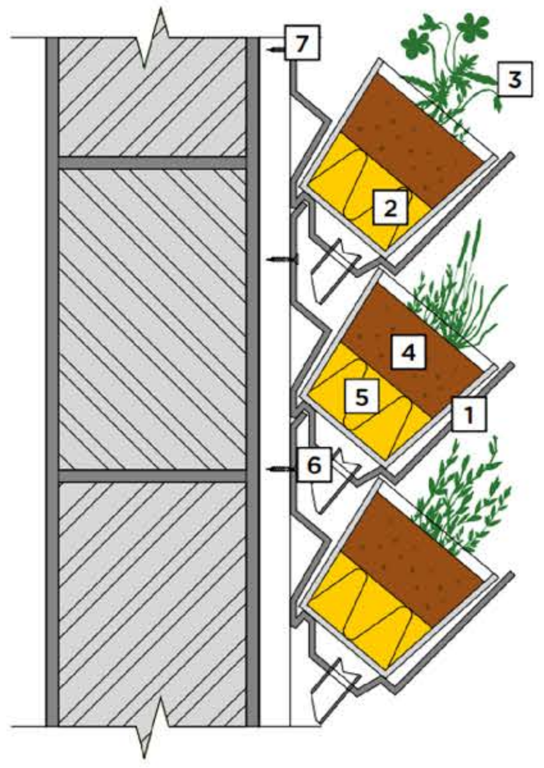
SPECIFIC SOLUTIONS FROM SAINT GOBAIN WHICH WERE USED IN A PROJECT

Isover Top V Final



1. Reinforced concrete slab
2. Flexible glue weber.therm elastik
3. ISOVER Top V Final
4. Penetration weber + weber.ton acrylate

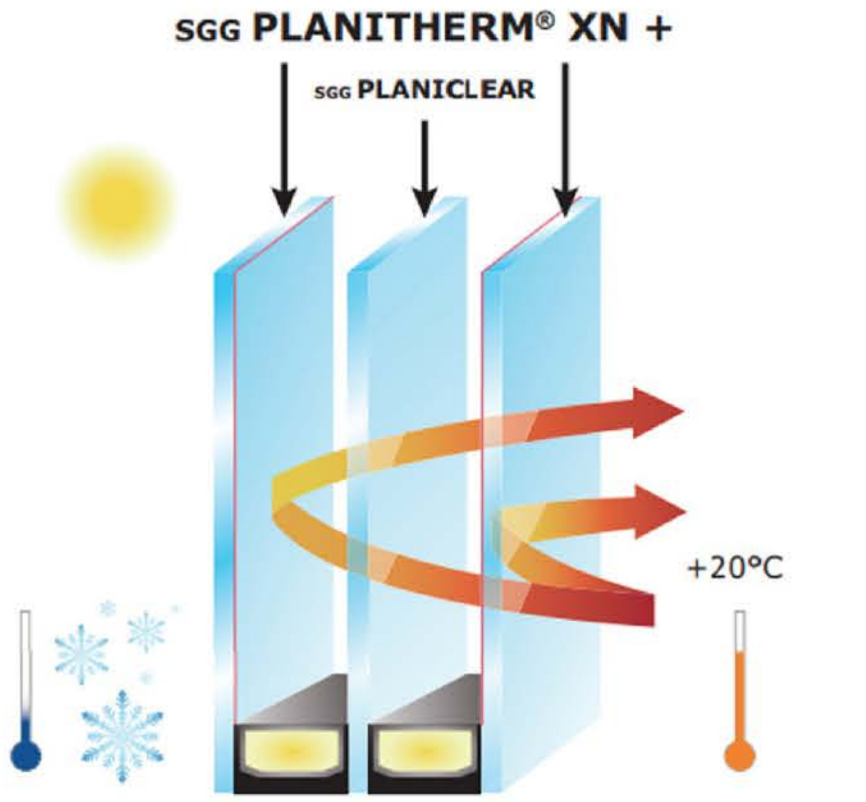
Flora panel



1. Flora Panel 850
2. FloraPot
3. Vegetation
4. Growing medium
5. Isover Intense water retention layer
6. Level overflow
7. Self-drilling screw

ETICS

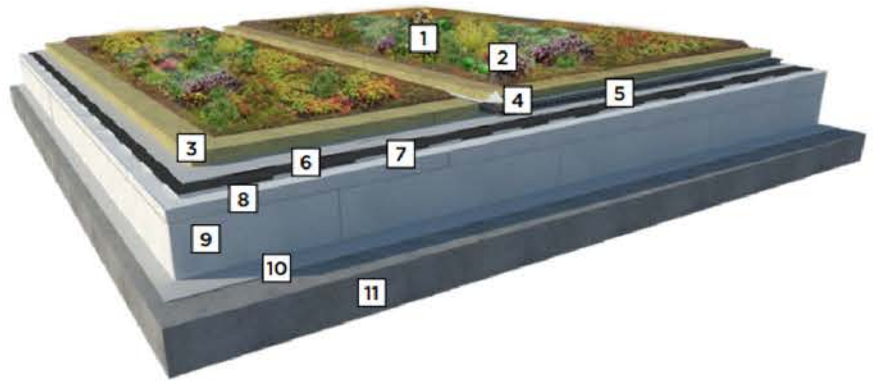
SGG PLANITHERM XN



Uvalue: 0.6 W/m²K with Argon and
0.5 W/m²K with Krypton

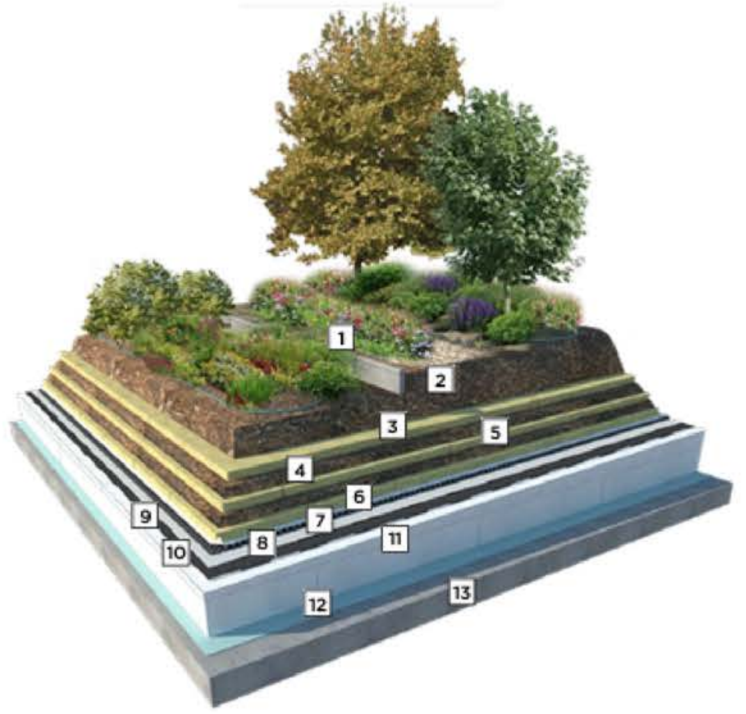
Isover energy - efficient roof

extensive green roof



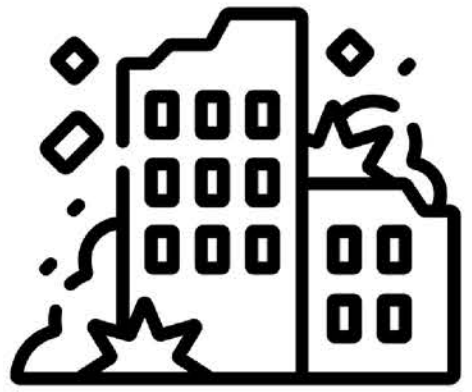
Isover roof garden

intensive green roof



USED MATERIALS

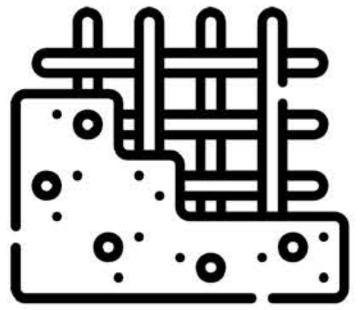
RECYCLED CONCRETE



Existing buildings in area B will be destroyed

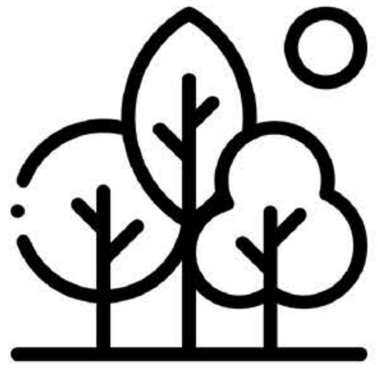
Use of recyclate from the construction debris

Reducing the amount of landfill construction debris and the carbon footprint

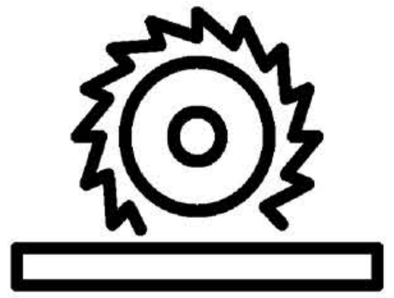


Use of the recycled concrete for the new construction and outdoor equipment

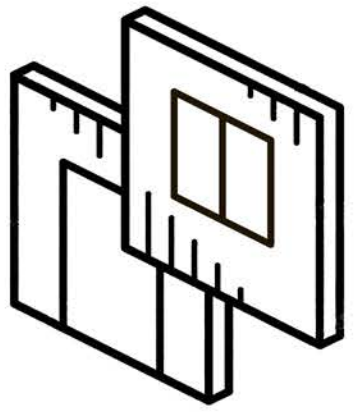
CLT PANELS



By using CLT panels there is a huge reduction of the amount of CO_2 over the lifetime of the building

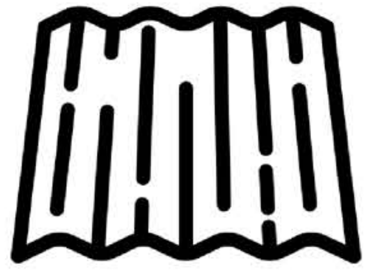


Recreting natural wood into perpendicularly glued layers of solid wood

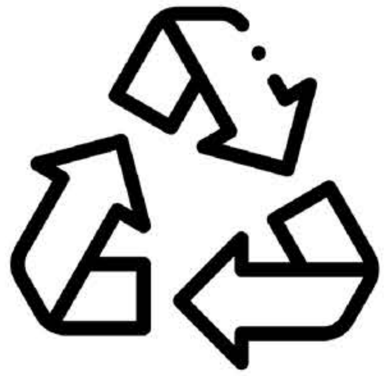


Possibility of prefabrication which leads to the **reduction of the waste** and easier transportation

STEEL

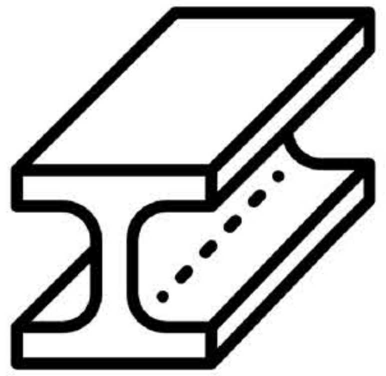


Taking a part of the steel roof from the old Viikki museum and two demolished buildings



Recycle parts that can be reused

In the end, steel recycling efforts save 75% of the overall energy used in production from raw materials.



This newly recycled metal is then ready to be used as a raw material

ENVIROMENTAL PRODUCT DECLARATION

ISOVER TOPSIL
Global warming = **7,75 kg CO_2 equiv/FU**
Non - renewable resources consumption = **70,05 MJ/FU**
Energy consumption = **86,94 MJ/FU**
Water consumption = **0,025 m^3/FU**
Waste production = **8,14 kg/FU**

ISOVER TF PROFI
Global warming = **15,07 kg CO_2 equiv/FU**
Non - renewable resources consumption = **153,13 MJ/FU**
Energy consumption = **194,65 MJ/FU**
Water consumption = **0,049 m^3/FU**
Waste production = **15,45 kg/FU**

ISOVER EPS 100
Global warming = **5,50 kg CO_2 equiv/FU**
Non - renewable resources consumption = **149,42 MJ/FU**
Energy consumption = **163,03 MJ/FU**
Water consumption = **0,00 m^3/FU**
Waste production = **0,21 kg/FU**

ISOVER EPS 150
Global warming = **7,29 kg CO_2 equiv/FU**
Non - renewable resources consumption = **202,32 MJ/FU**
Energy consumption = **220,3 MJ/FU**
Water consumption = **0,00 m^3/FU**
Waste production = **0,26 kg/FU**

RIGISTABIL ActivAir Board
Global warming = **6,16 kg CO_2 equiv/FU**
Non - renewable resources consumption = **80 MJ/FU**
Energy consumption = **93 MJ/FU**
Water consumption = **0,063 m^3/FU**
Waste production = **4,32 kg/FU**

RIGIPS HABITO
Global warming = **8,35 kg CO_2 equiv/FU**
Non - renewable resources consumption = **145 MJ/FU**
Energy consumption = **165 MJ/FU**
Water consumption = **0,102 m^3/FU**
Waste production = **4,67 kg/FU**

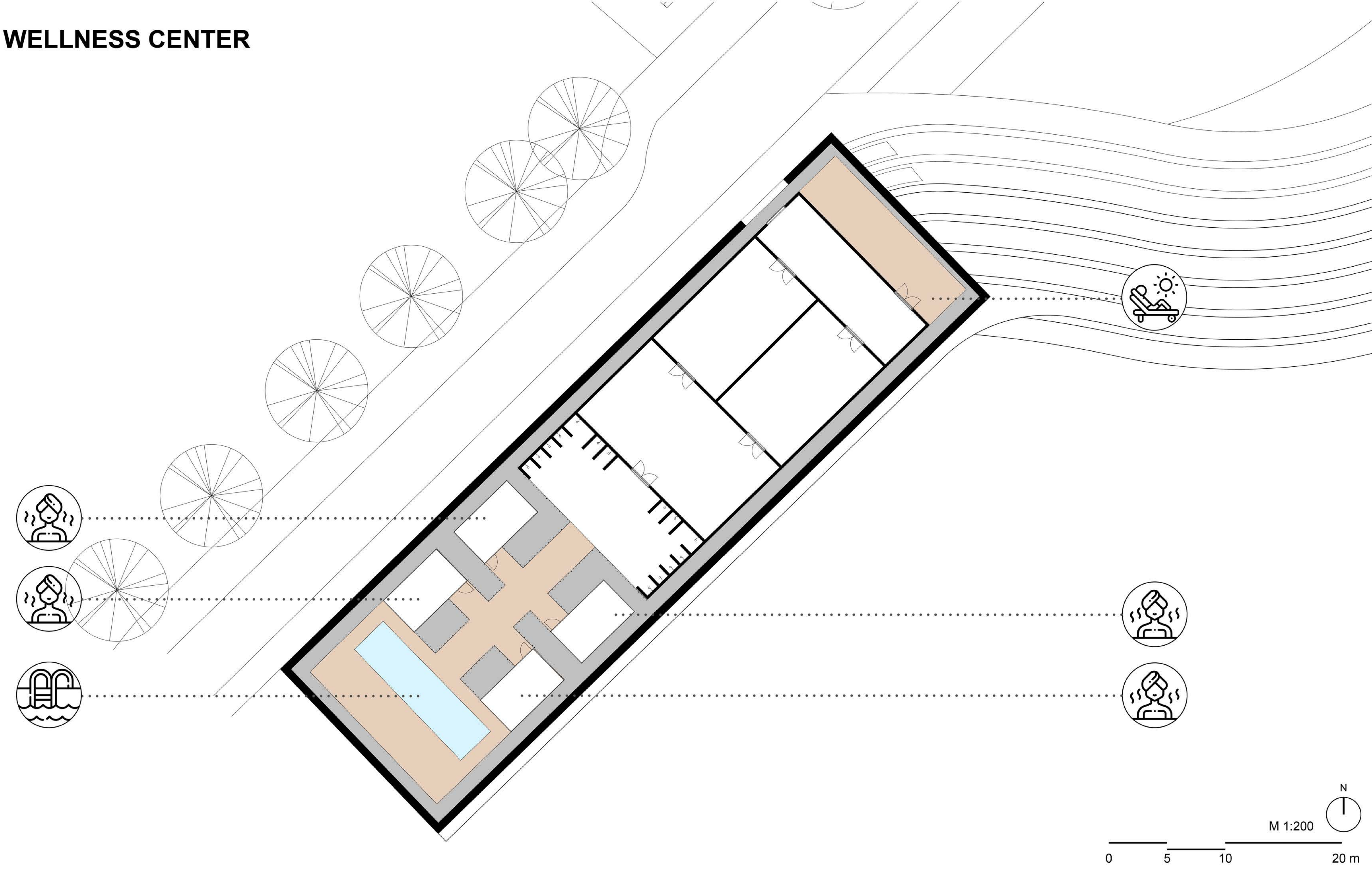
Low carbon glass ORAÉ
Global warming = **6,64 kg CO_2 equiv/FU**
Non - renewable resources consumption = **86 MJ/FU**
Energy consumption = **97,7 MJ/FU**
Water consumption = **0,03 m^3/FU**
Waste production = **10,02 kg/FU**

Green roofs with steel shelters with photovoltaic panels

OLD VIIKKI MUSEUM - PUBLIC WELLNESS CENTER

The proposal here was to preserve the stone walls of the old museum and give it a new function. Since most of us associate Finland with saunas, I decided to incorporate them directly into this building. In doing so, I am creating a public space that will be partly indoor and partly outdoor and will also serve as a hardening place. The walls of the museum will serve as a barrier but also as a natural backdrop.

PLAN OF THE WELLNESS CENTER




THE MEETPOINT
Thank you for your attention