ARCHITECTURE STUDENT CONTEST

20th INTERNATIONAL EDITION, NORD ISÈRE 2025

Jan & Marta would liko to welcome you to their project.

Feel free to explore it!

looking through the Nord-Iseré

Team n°10 | Lefner - Storkanova | 2025

Residential area and the prototype village - Villefontaine, Nord-Iseré, France
Renovation of the old school building - Chimilin, Nord-Iseré, France

Faculty of Civil Engineering, CTU in Prague

looking through the Nord-Iseré

portfolio

Lefner - Storkanova 2025

Residential area and the prototype village - Villefontaine, Nord-Iseré, France
Renovation of the old school building - Chimilin, Nord-Iseré, France

Faculty of Civil Engineering, CTU in Prague

content:

The competition task:

This project was created as part of an international student competition organised by Saint-Gobain in close collaboration with the town of Villefontain, the school Les Grands Ateliers and the village of Chimilin.
The main focus of the competition is to develop a residential area for the professors and visiting students of Les Grands Ateliers in the town of Villefontaine (capacities are determined by the competition specifications, see the construction programme), and to renovate an old school building in the village of Chimilin into a multi-purpose facility for local associations and organisations. The new campus must include a building to accommodate occasional students and professors, as well as a laboratory for experimentation and prototyping of new projects. At the same time, the way in which the projects created are displayed is a determining factor for the site. For this reason, the specifications include a 'prototype village' where the built projects are to be installed.

Les Grands Ateliers, Villefontaine - general information

The school was founded in 2002. Its distinctive way of teaching involves experimenting with building materials and prototyping architectural designs on a 1:1 scale. The institution hosts about 100 students a year. It collaborates extensively with universities, research centres and companies to experiment with new materials and construction methods. It currently operates in two buildings that serve as technical facilities.

Design options:

A site of approximately 2 hectares is reserved for a residential neighbourhood to serve the development of a campus complementing the existing campus. It also provides space for a wide range of buildings with different uses (e.g. exhibition space, conference centre, student housing, restaurants)

Task for students:

The students will have two tasks in the designated area.Firstly, to design a building for housing for students and teachers and at the same time to solve the connection of the laboratory to the existing buildings of Les Grands Ateliers.
Second, design a campus with additional volumes for other building uses or other services.

Village of Chimilin - general information

The village has approximately 1,500 inhabitants and has been selected for the Villafe d'Avenir programme (a national programme to support projects for the smallest municipalities) It has 27 associative organisations that organise many activities throughout the year.

Design options:

Reviving the life of the village through the renovation of the existing and abandoned old school building. Students should come up with ideas that could be implemented thanks to the Lyon-Turin project (construction of a new railway linking the two cities). Renovate a building that invites the community and visitors to meet and engage in activities. Chimilin, despite its size, is one of the main transport hubs of the territory and, as a result, more organisations in the area can be expected to use the building.

Task for students:

Renovate the building and its interior space into a multifunctional space where it can be used by various associations throughout the year.The building should be designed in a flexible and modular way to maintain the quality of indoor comfort (thermal, acoustic, light, air quality) in case of a potential change of use in the future.

Construction programme Les Grands Ateliers, Villefontaine

accomodation

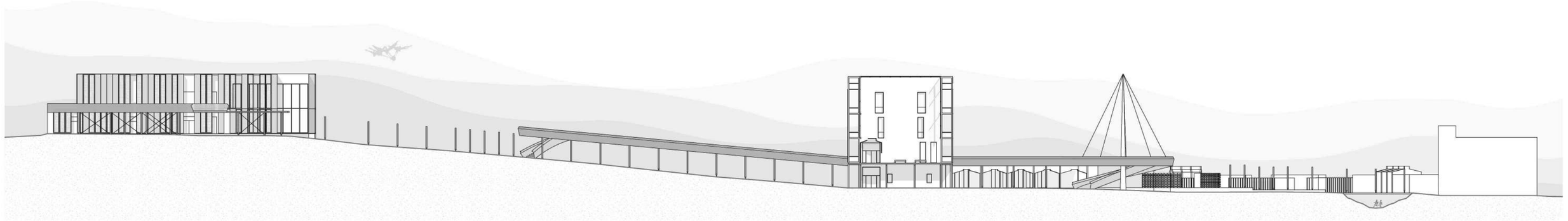
spaces	surface [m²]	number	total surface [m²]
dormitory 6 beds	25	4	100
dormitory 8 beds	30	4	120
single room	10	4	40
double room	12	2	24
bathrooms (H/F)	25	2	50

the laboratory for co-creation

spaces	surface [m²]	number	total surface [m²]
office spaces	150	2	300
multi- purpose room	100	1	100
laboratory	100	1	100
prototyping area	50	1	50
meeting rooms	20	2	40
meeting rooms	10	2	20
cloakroom (H/F)	7	2	14
toilets (H/F)	3,5	4	14
kitchen	10	1	10
reception	10	1	10
machine rooms	5	4	20

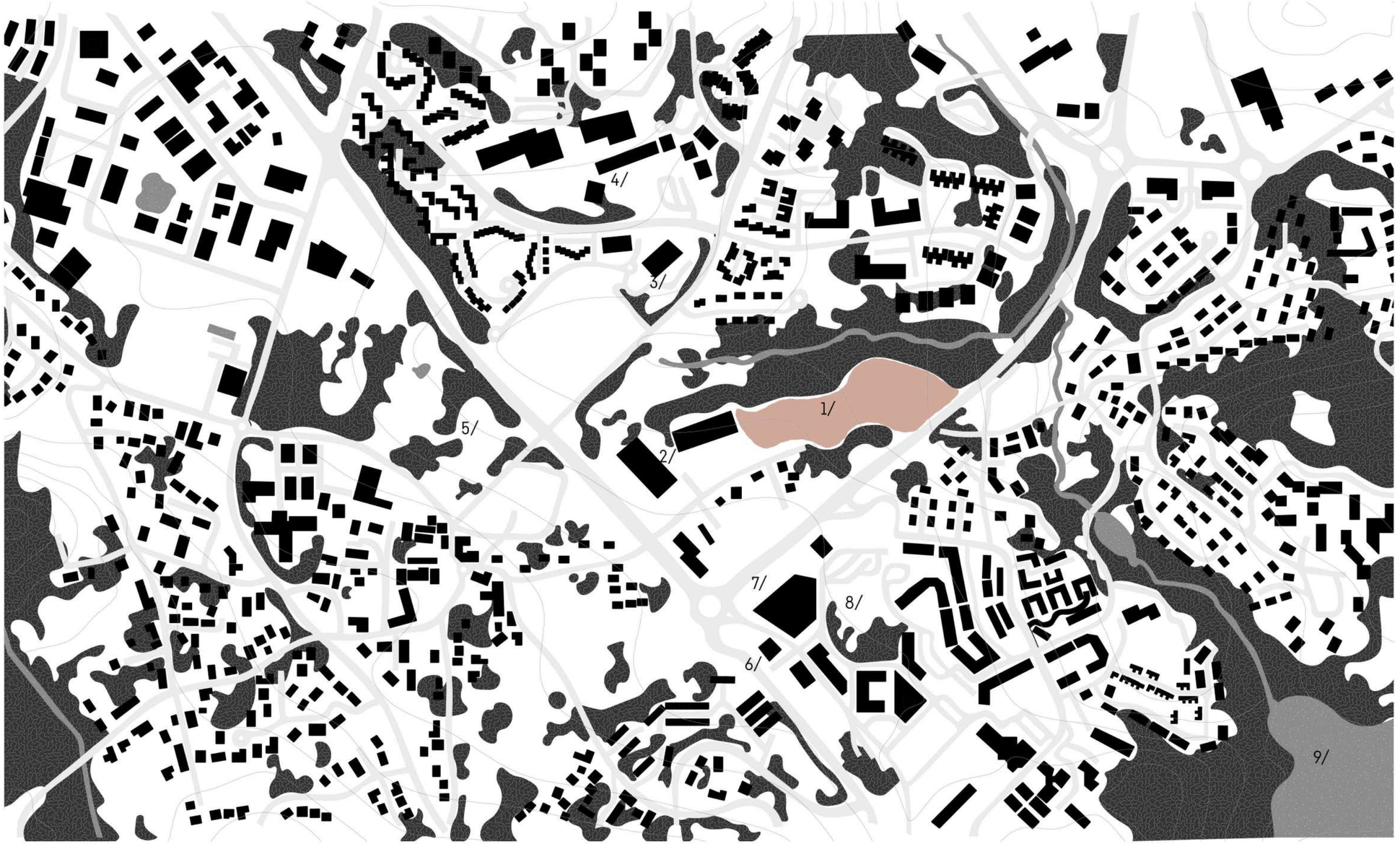
Villefontaine new construction

urbanistic concept



Residential area and the prototype village - Villefontaine, Nord-Iseré, France

section through the area



1/ area of the new construction
2/ Les Grands Ateliers
3/ sport center
4/ community center
5/ parc du vellein
6/ cinema
7/ supermarket
8/ communal swimming pool
9/ nature reserve Saint-Bonnet

site analysis, M1:5000

1:5000

0 50 150 300 m

strenghts

- gentle slope of the area
- good traffic accesibility
- secluded area
- pleasant forest barrier
- many facilities
- near the alpine region
- saturated job opportunities - close to Lyon

weaknesses

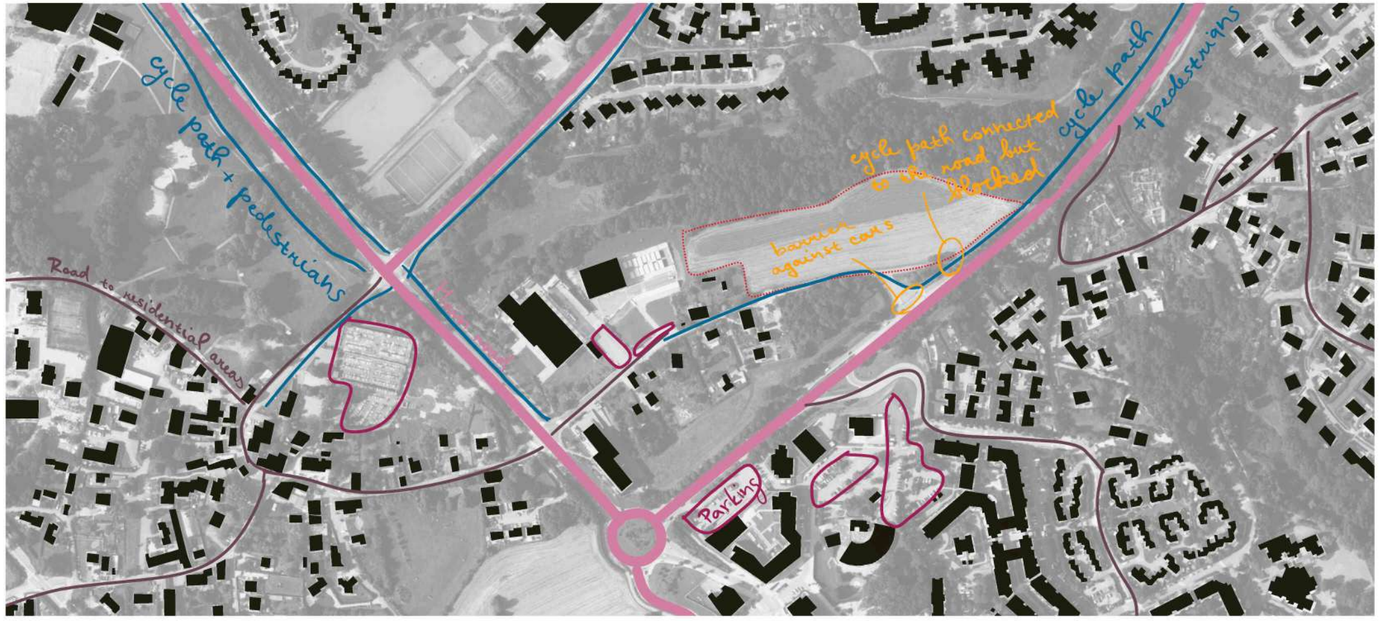
- busy roads
- non-existent views
- buildings of different scale
- non-determining terrain
- noise
- disproportion of the area

opportunities

- link to existing buildings
- connection with facilities
- entry to the area
- creation of views
- creation of social spots
- cluster housing as the reaction to the surrounding area
- compositional axes

threats

- exposed road
- privacy breach at the surrounding housing
- camp-like housing
- non-working link to prototype village



main traffic flow diagram

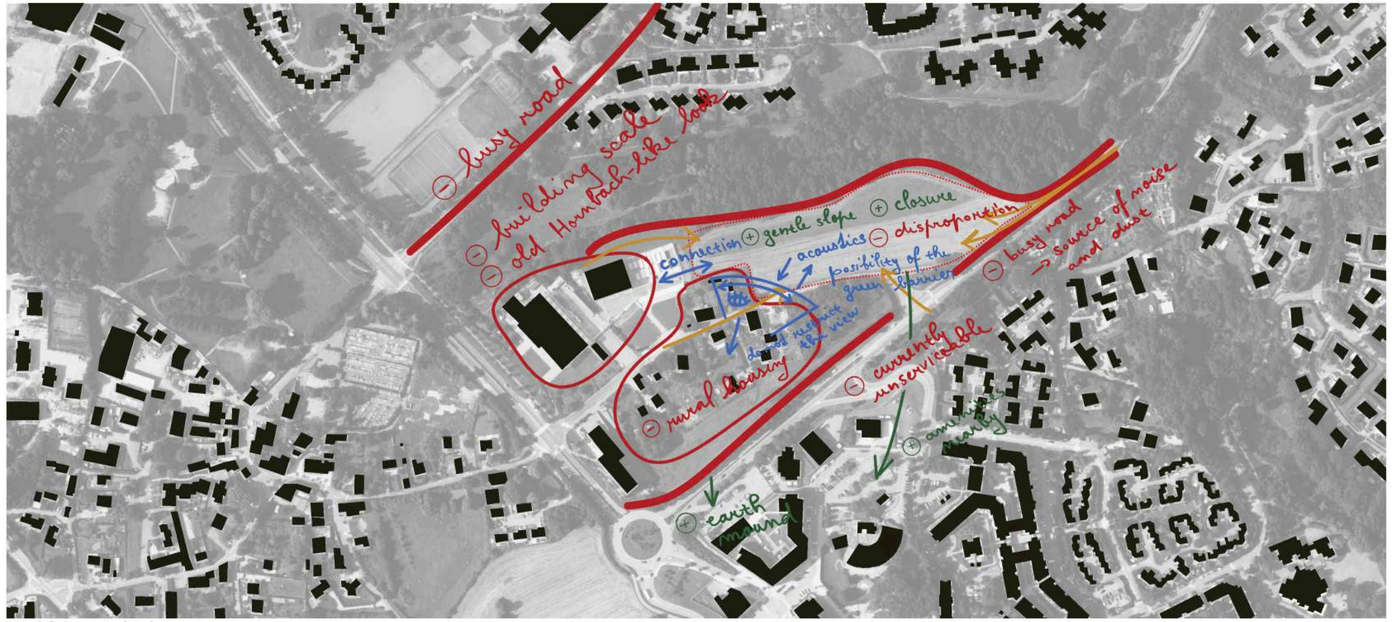
facilities diagram

main traffic flow diagram

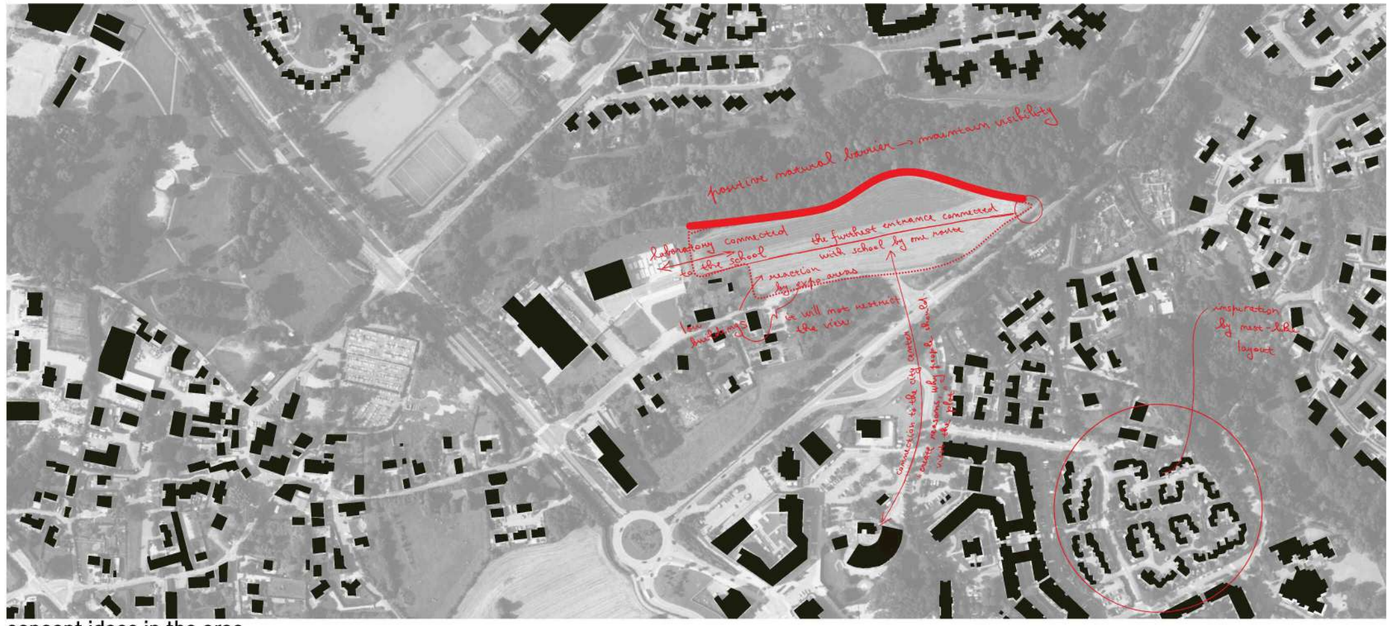
- main roads through Villefontaine are connected to the highway, which leads to Lyon. (estimated time - 28 min. by car)
- the town is interwoven with a network of cycle paths, one of them lines up with the border of the area
- routes are lined up with the cycle paths, the town center is more or less reserved for pedestrians
- parking nearby is located next to the school and other possibilities are connected to the facilities

facilities diagram

- all the types of facilities are represented
- there are objects intended for sports, hospitals, education, commerce, gastronomy, leisure and public administration
- the rest of Villefontaine consists mainly of residential functions
- there is also Lake Saint-Bonnet nature reserve close to the area



problem analysis



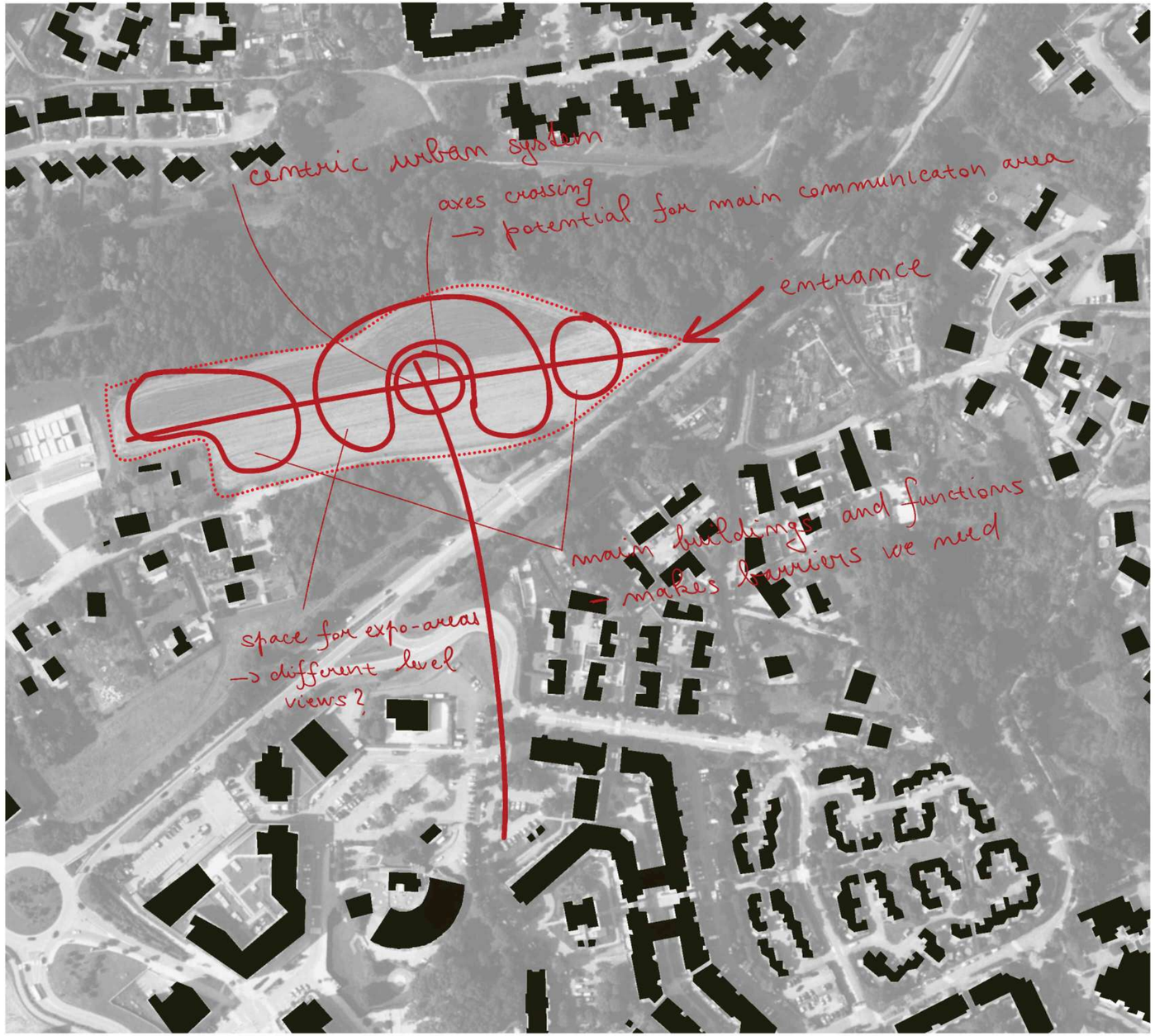
concept ideas in the area

problem analysis

- the problem analysis helped us to determine all the advantages and disadvantages in the area
- [+] gentle slope of the land, enclosure, pleasant forest barrier, nearby amenities
- [-] disparate buildings (different scales), busy roads, problems of continuity with Les Grands Ateliers
- the biggest threat is the possible comfort limitation of the adjacent houses and the functional interdependence of the new laboratory with the Astus platform

concept ideas in the area

- expansion and support of the town center - the building should be part of social life and support civic amenities
- the plot is traversable along one rote - it forms the main compositional axis, which will make it the shortest route through the site
- nest-like neighbourhoods - inspiration for a prototype village
- the scale of the prototype expo areas will respond to the diverse buildings in the areas



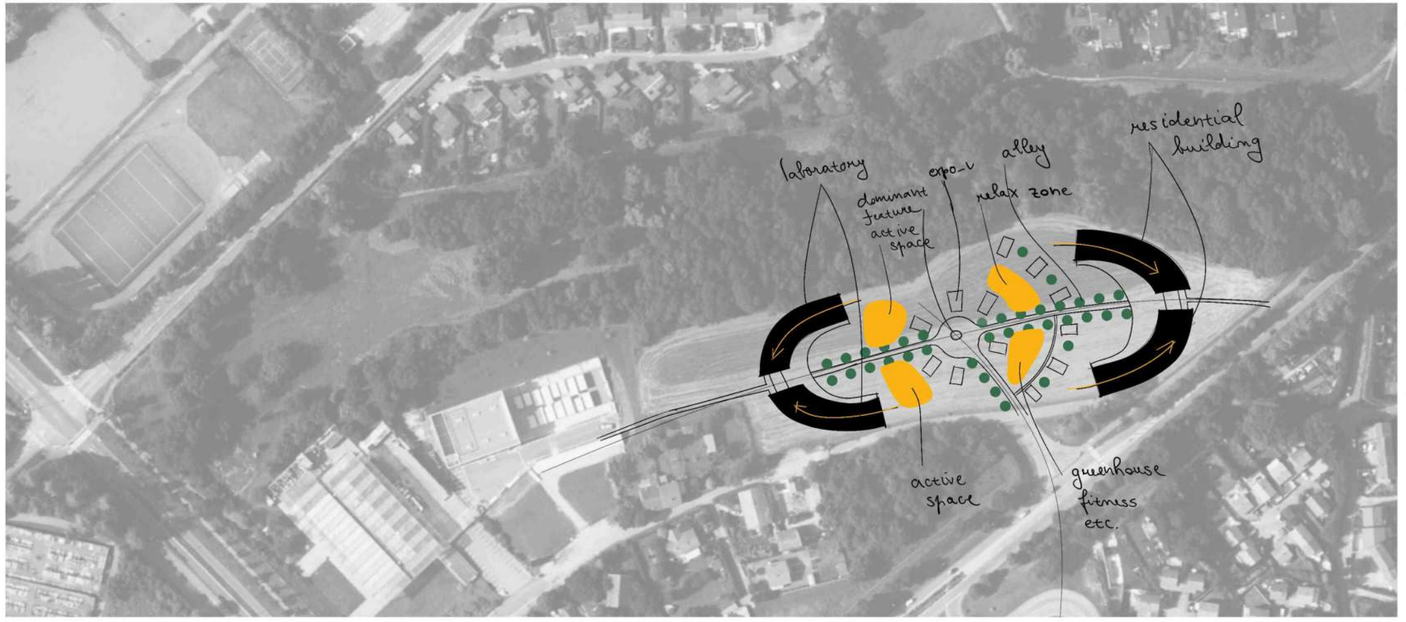
urban conceptual ideas

urban conceptual ideas

- the main compositional axes are linked to the main pedestrian route that connects Les Grands Ateliers and the opposite entrance to the plot
- the intersection of the main compositional axes has a potential for the main public space
- concentrated amenities and an active parterre
- the main function of the territory (laboratory and building for housing) enclose the compositional axes, at the same time they will form the continuities and barriers in the territory that are needed.
- the expo areas will respond to the formation of single-family houses and will directly support the urban concept
- due to the secondary function of the "outdoor gallery" in the form of the prototype village, an elevated route will be designed which will allow the prototypes and the whole area to be seen from a different perspective

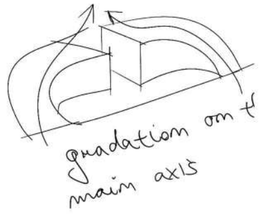
urbanism option A

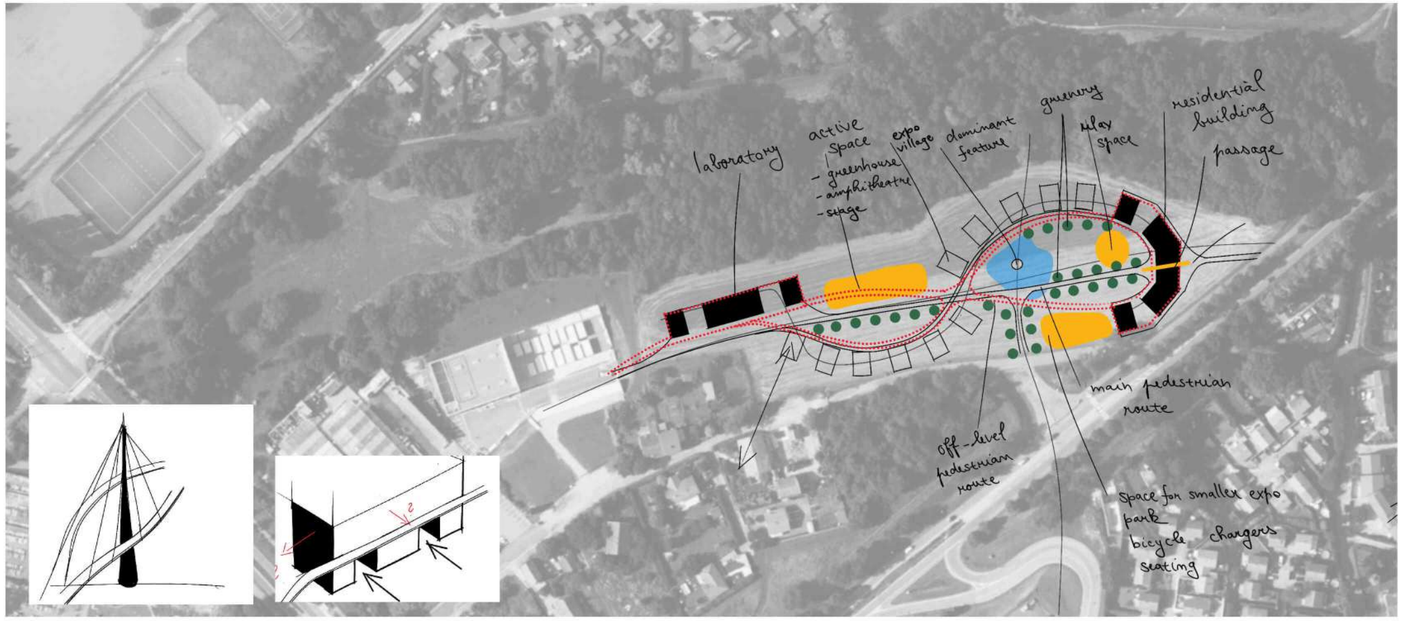
- the mass of the laboratory forms a continuity with Les Grands Ateliers, while supporting the main pedestrian route
- the expo areas follow the massing of the lab oratory and support the pedestrian urbanism of the area
- the building for housing forms a boundary at the cycle path and its mass graduates into the space of the axis connected to the center - it forms an orientation point and a local landmark



urbanism option B

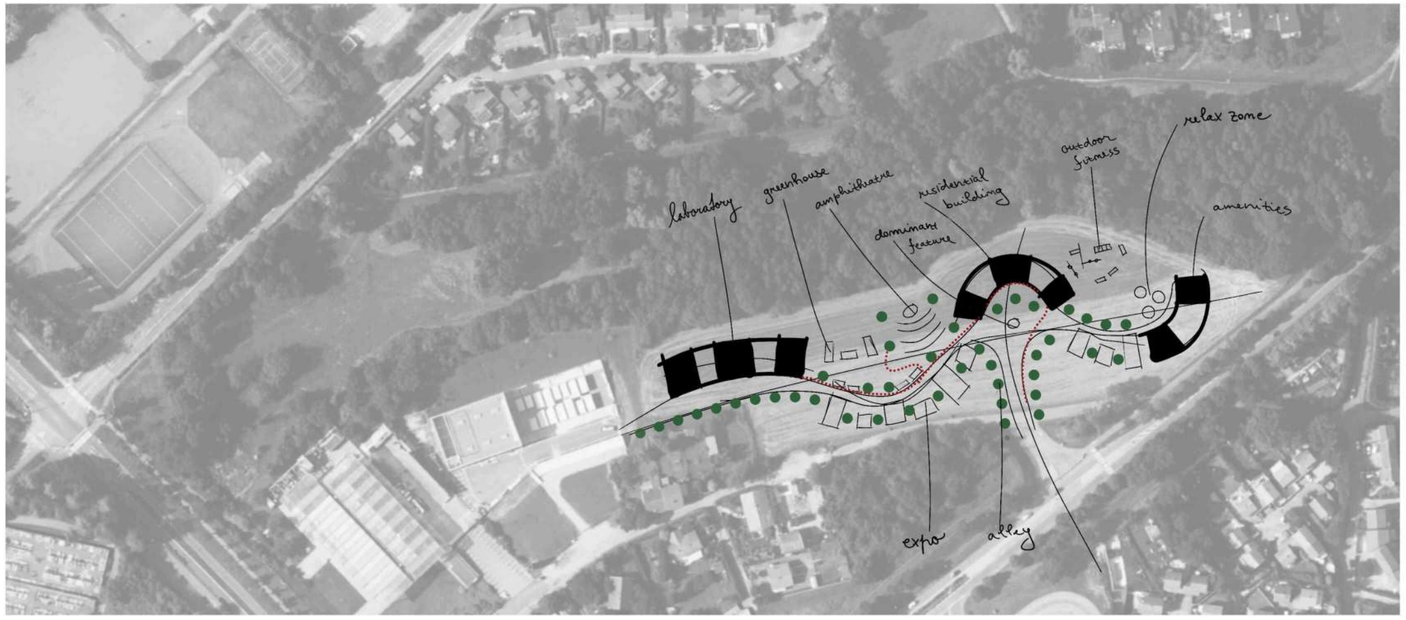
- the main space is located at the intersection of the compositional axes
- it is centrally framed by expo spaces and the active parterre is situated between them
- the masses of the main buildings again from a gradation to the "corners" and mark the main entrances to the area
- the main pedestrian route is supported by alleys of greenery





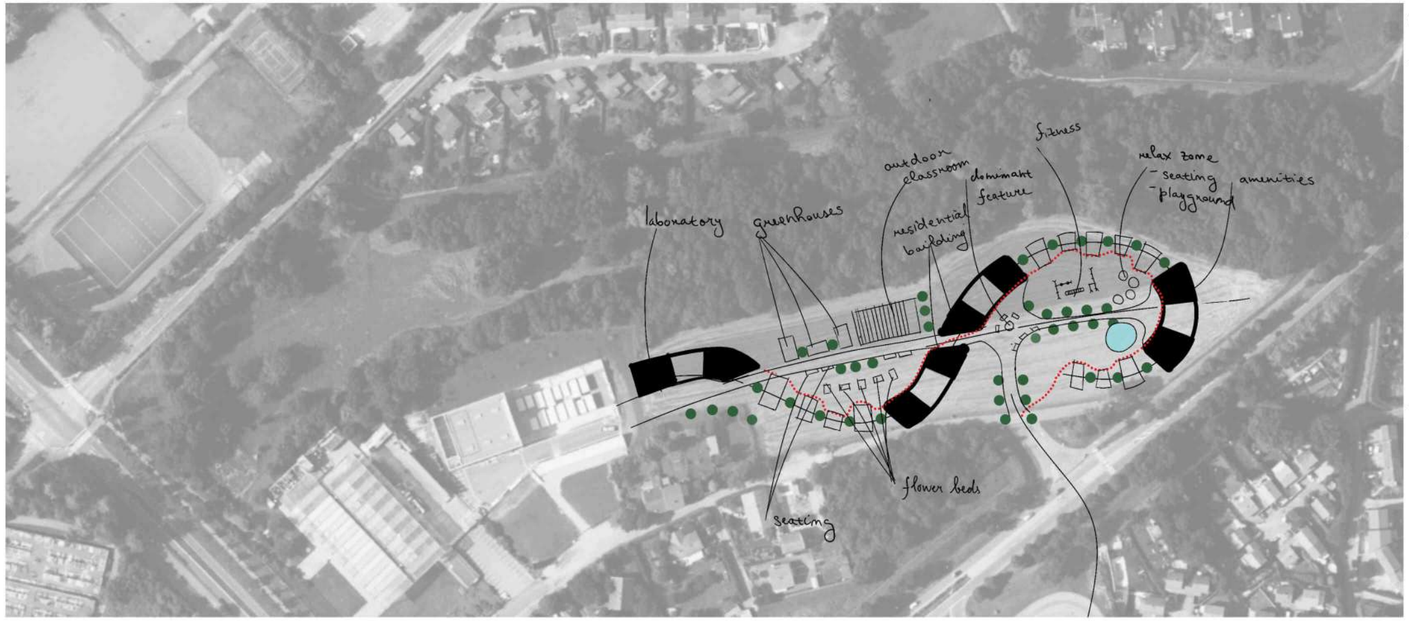
urbanism option C

- at the intersection of the compositional axes lines a dominant pylon which will carry part of the offlevel route
- expo areas are “sewn” into the urban layout - they support other compositional lines in the area
- the laboratory is connected to Les Grands Ateliers and follows the line of the main pedestrian route
- the residential building concludes the main pedestrian route
- the masses in the parterre form compositional sightlines in the site



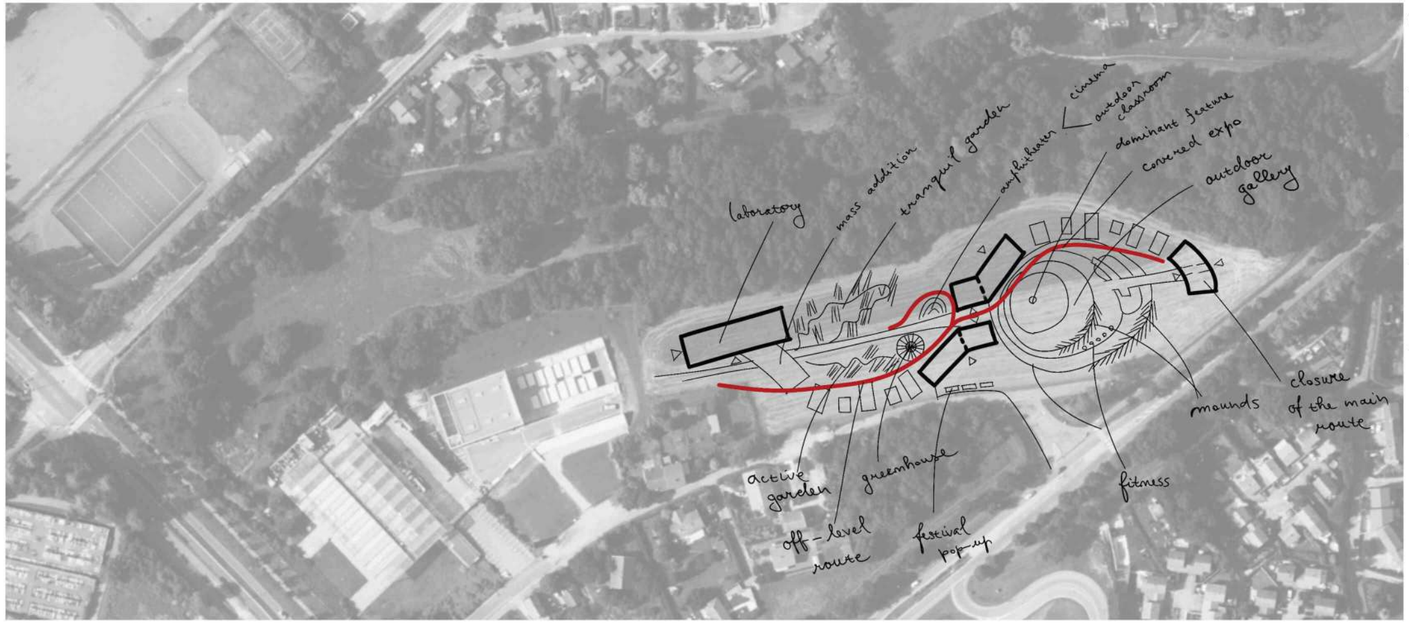
Option C development

- the masses are more supporting the secondary axes and the development of expo areas
- active parterre element are scattered throughout the site
- greenery follows the secondary routes
- we rejected this option



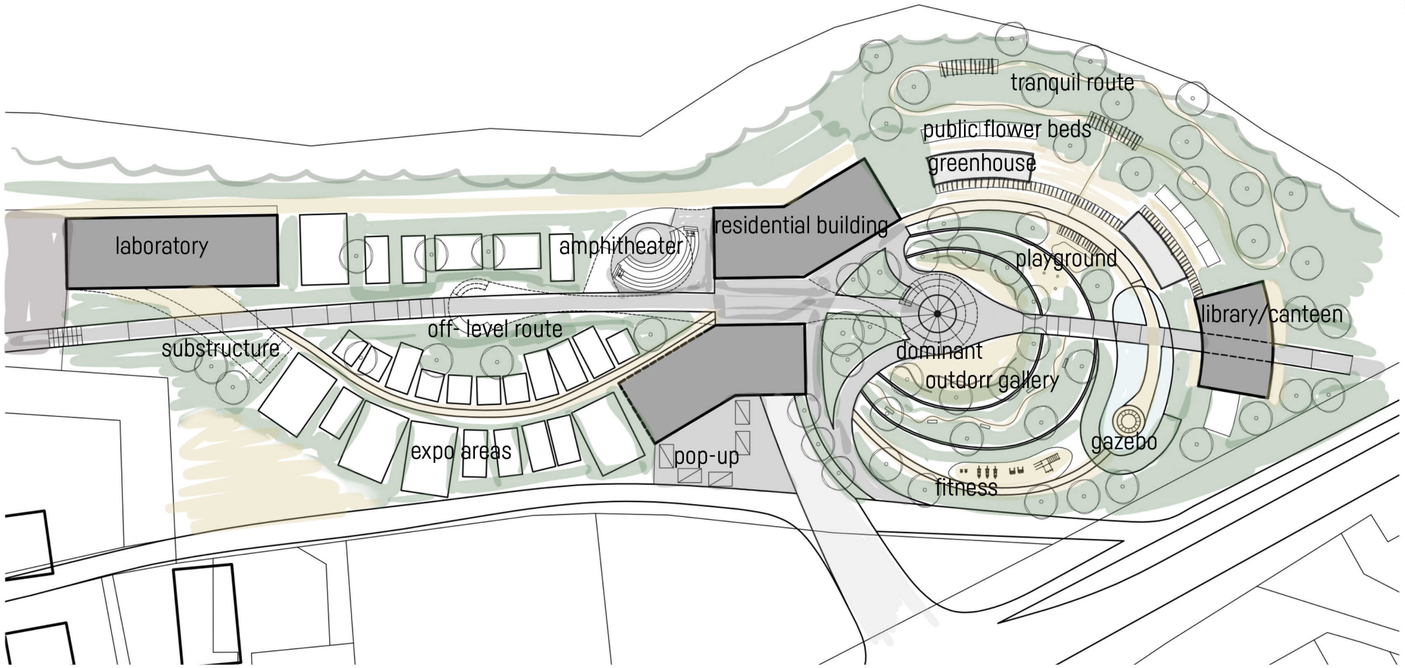
option C development

- the dominant moved directly to the intersection of the compositional axes
- the off-level route follows the path of the expo areas
- the housing building forms a compositional sightline in the centre of the area and the closure of the main pedestrian route is formed by the additional mass
- the active elements of the area are scattered throughout the area



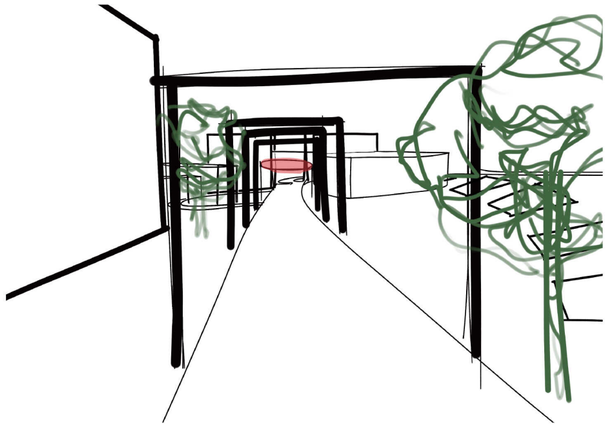
option C development

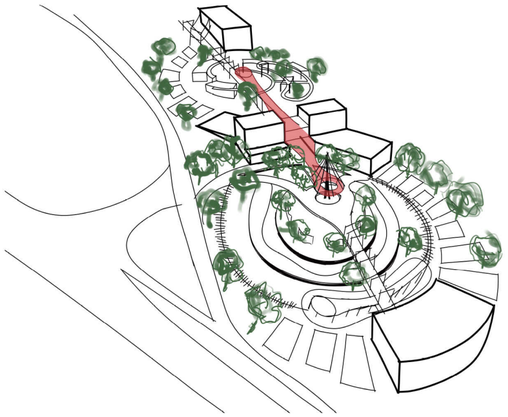
- dividing the are into tranquil and active parts
- addition of the secondary route by means of a substructure near the laboratory building - connection to the expo area
- dividing the active part of the area into terraces in relation to the terrain
- creation of the connection to roads

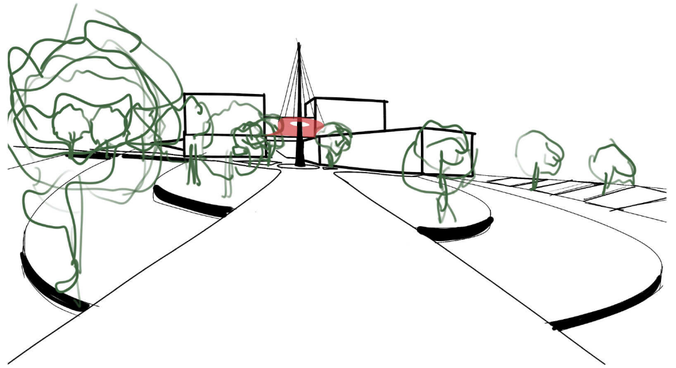


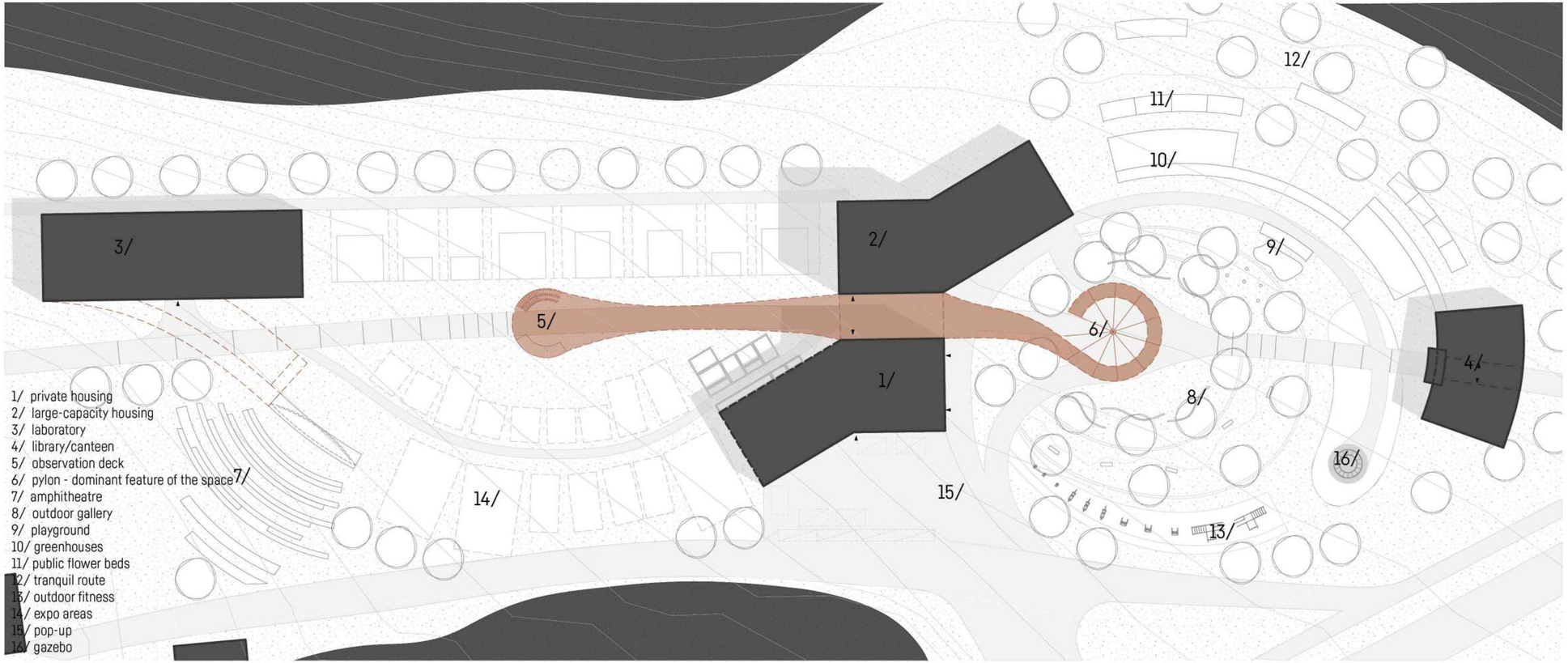
semi-final option of urbanism

- on the basis of the previous options, the area has been re-zoned - to the active and exhibition part
- the laboratory follows the main pedestrian route and its mass is supported by expo areas
- the secondary "exhibitional" pedestrian route is supported by a substructure which forms an orientation point and vissually terminates the main pedestrian route
- the housing building forms an interface between the functional zoning of the area
- the dominanting feature is maintained, carrying the off-level route, covered with greenery (cooling the spase) and forming a compositional element
- in the final version, individual elements of the site were relocated and altered in form (e.g. the amphitheatre)

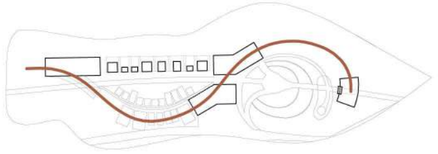






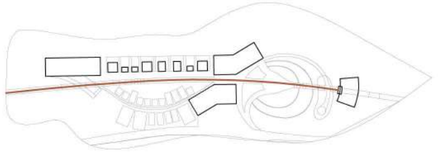


urban concept -overview



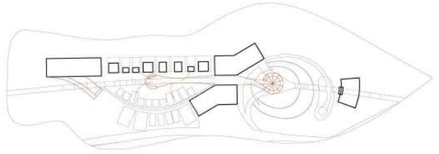
expo areas sewn into urban desing

- plots for scholl expos are sewn into urban design
- long-term support for urban planning in the area



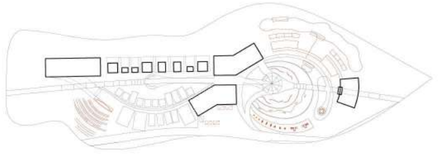
transparency and views

- one pedestrian route runs through the area
- the masses form compositional sightlines
- support through frames on the main route



possibility of overlooking from multiple levels

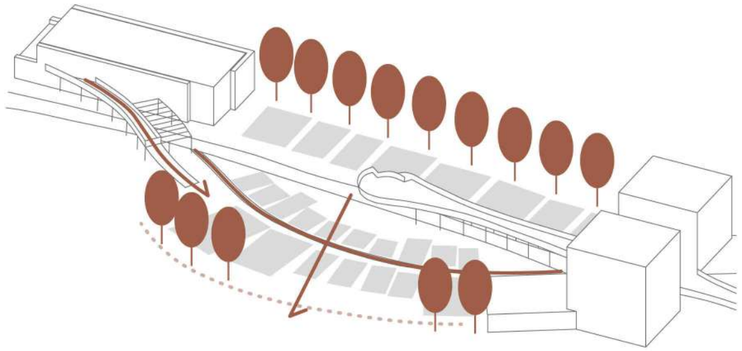
- due to the nature of the area, ramp and substructure are designed for the possibility of overlooking of expo areas
- shielding of the main pedestrian route
- forms a dominant feature of the area

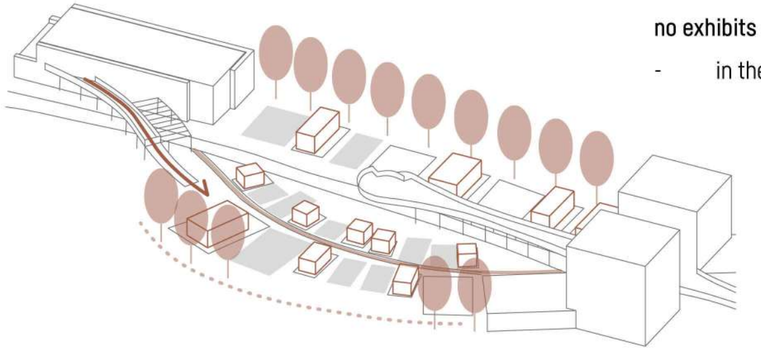


active space

- spaces for outdoor education, festivals, concerts, outdoor movie projections
- pop-up
- outdoor gallery
- fitness

masterplan, 1:600



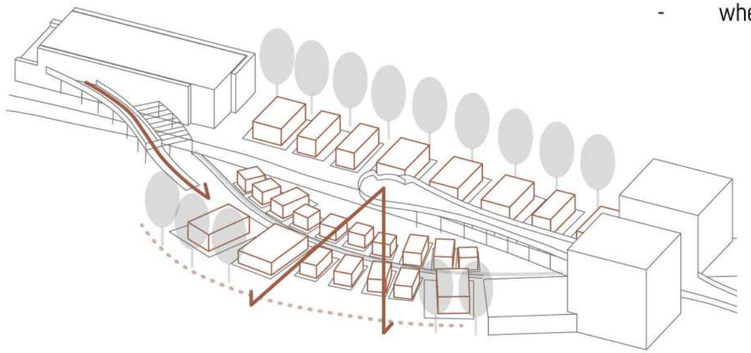


no exhibits

- in the absence of exhibits, the coherence of the space is ensured by composed greenery

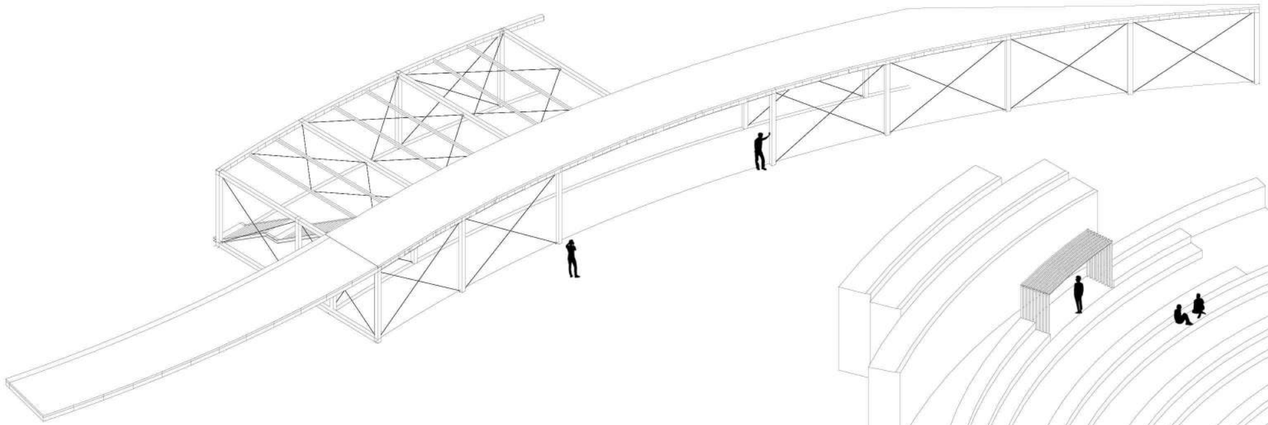
slightly full

- when the areas are slightly full, the concept is strengthened

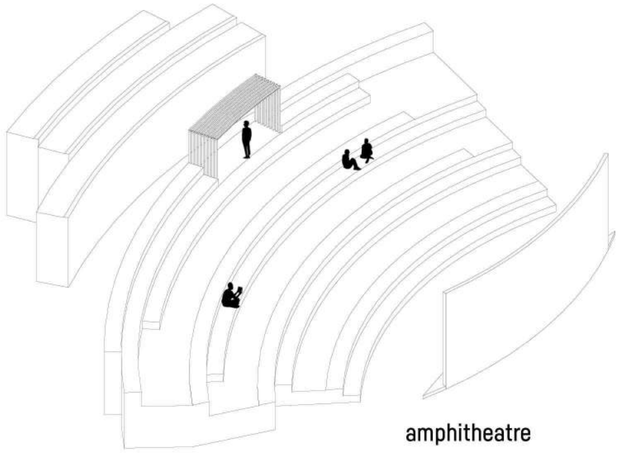


full capacity

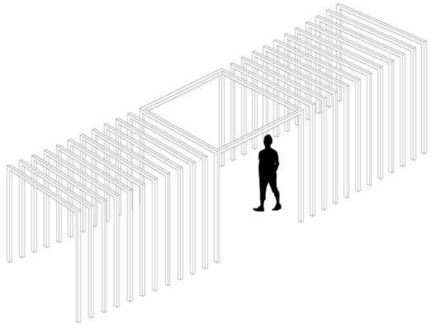
- the structure of the area is the strongest, the visual connection is provided by a footbridge



substructure - urban support

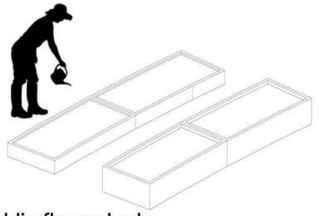


amphitheatre

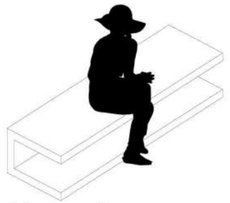


shielding construction

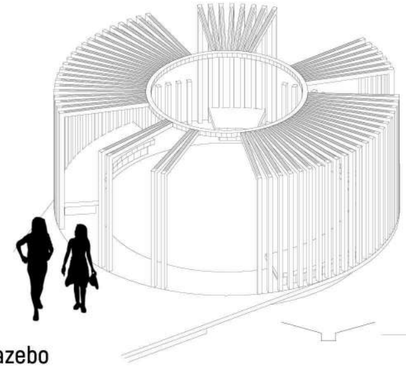
frames - support of the main route



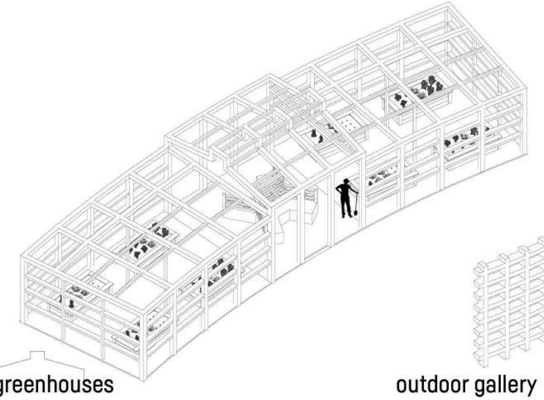
public flower beds



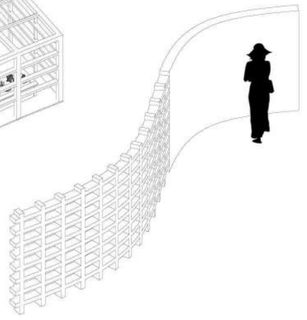
outdoor seating



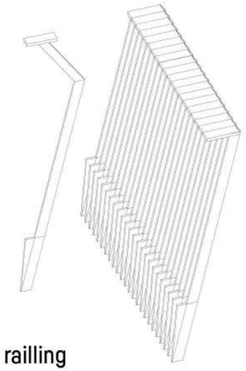
gazebo



greenhouses

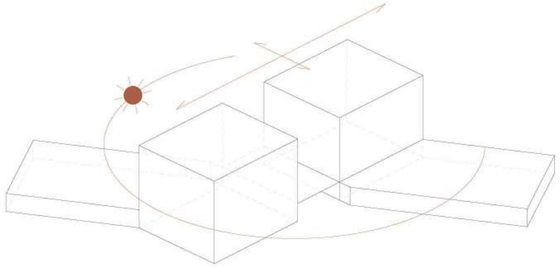


outdoor gallery



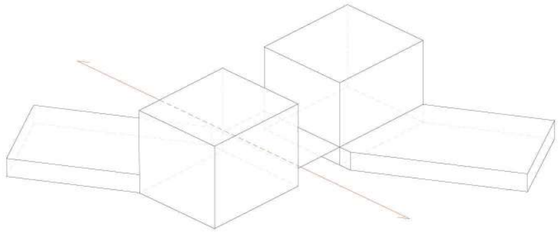
ramp railling

residential building - concept



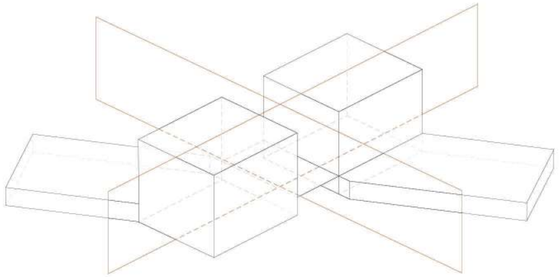
orientation to cafrdinal points

- north-south axis
- sufficient daylight
- solving overheating



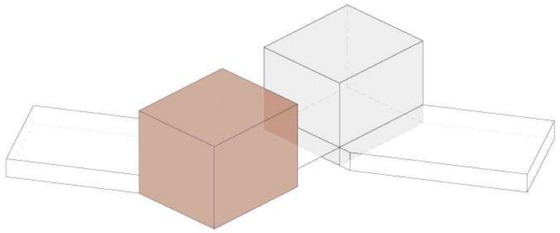
creation of compositional views

- support for the urban concept
- divides the active and exhibitional parts of the parterre



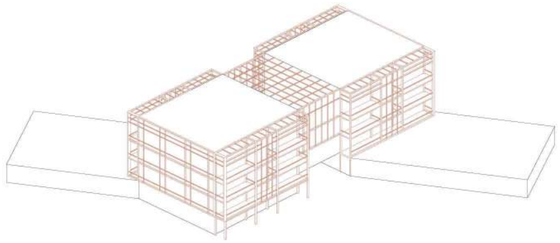
symmetry

- principle of symmetry in mass
- principle of symmetry in layout



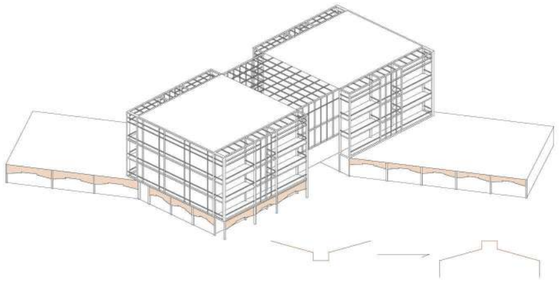
distribution of housing functions

- quiet part in the south, noisy part in the north
- private x large-capacity housing
- large-capacity housing is used for short-term overnight stays



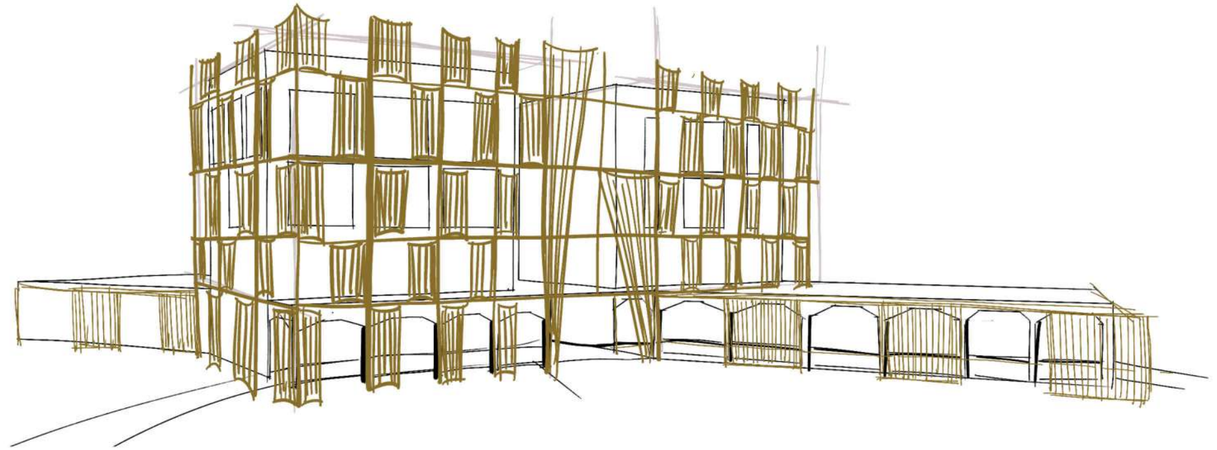
stand-alone structures

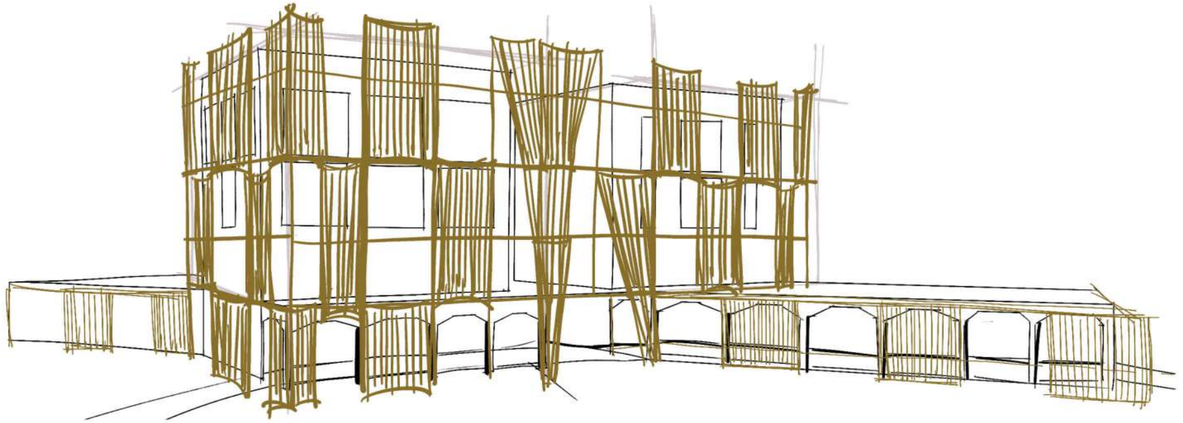
- supporting structure for balconies and facade panels
- carries photovoltaic panels
- shading function
- 2 functions - 1 mass

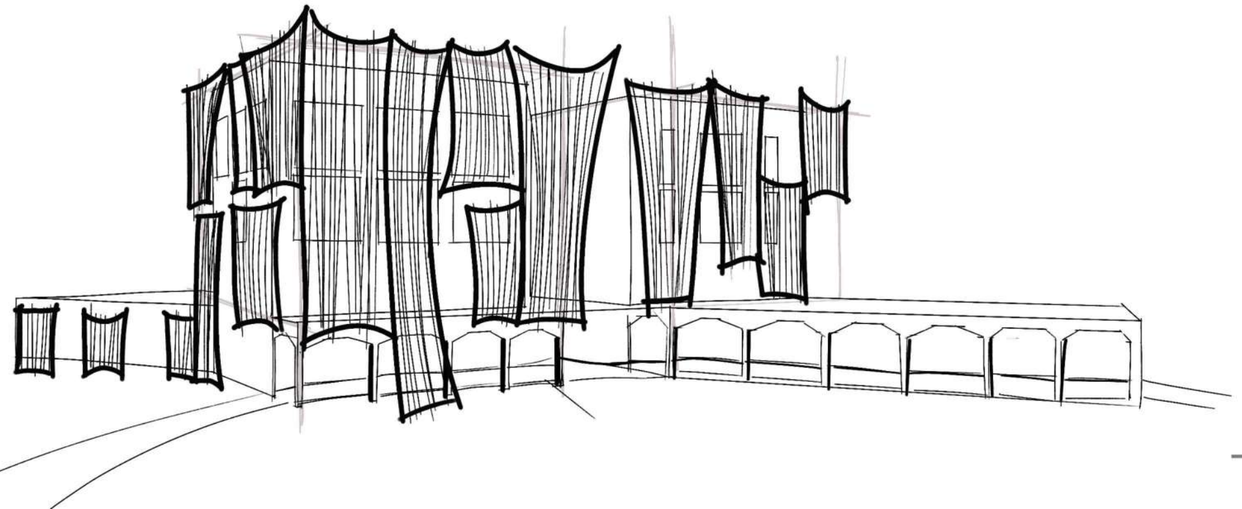


Inspiration in Les Grands Ateliers

- incorporating elements of the existing school into the housing building
- unifying element across the site

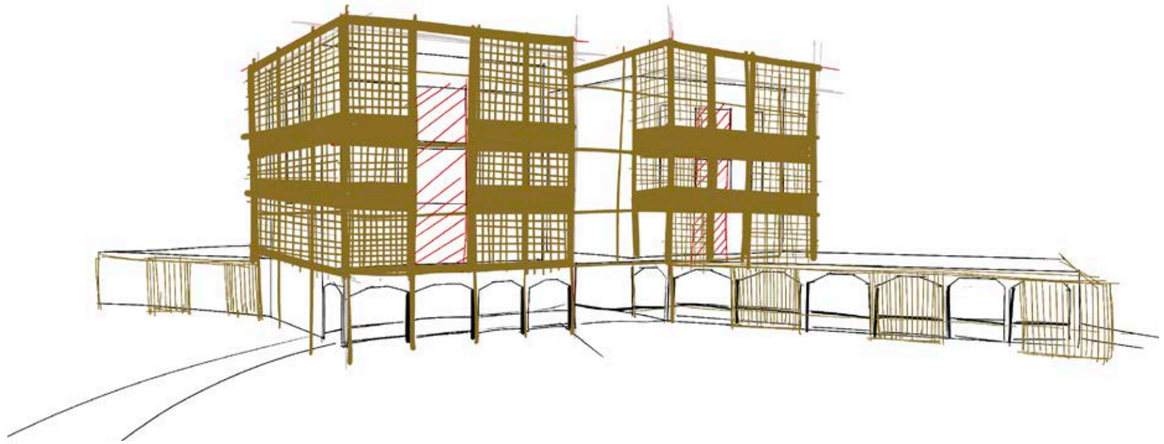


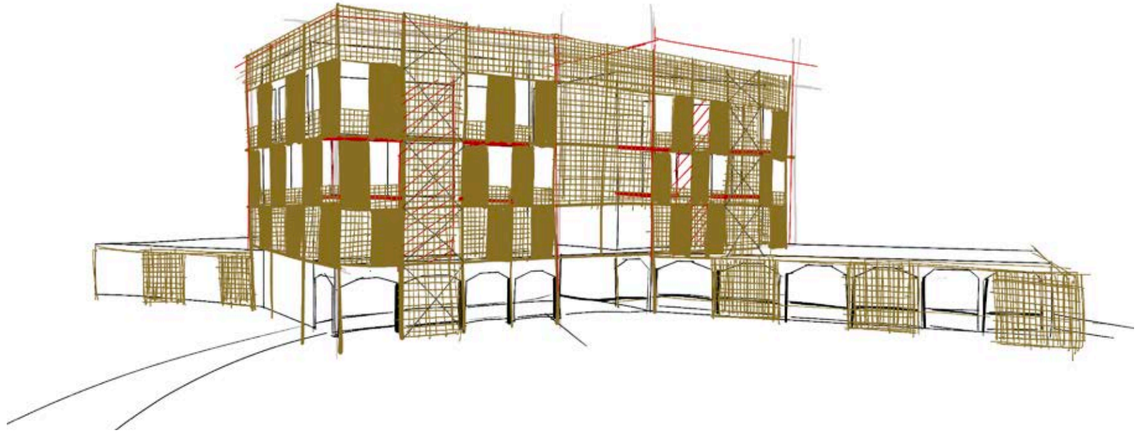


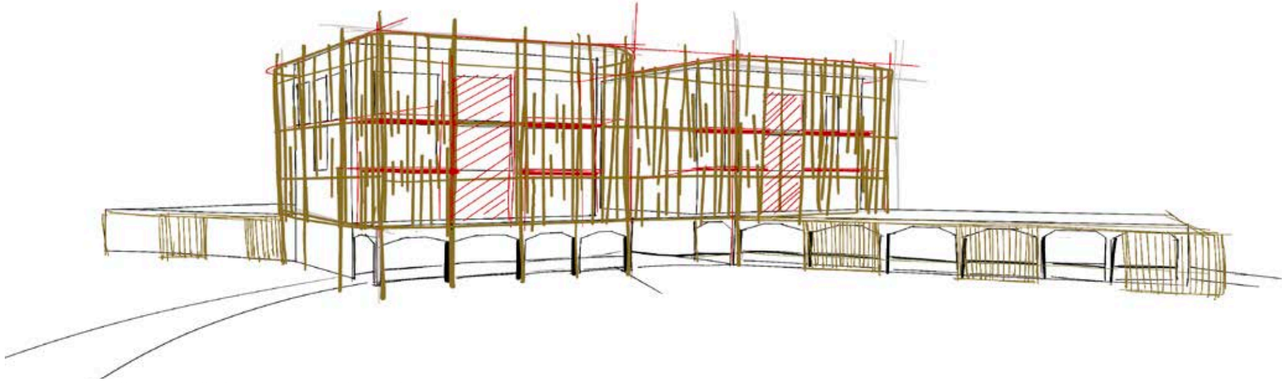


facade option A - vertical louver facades

- the first considered solution
- the use of bent wooden slats that will be fixed to a stand-alone structure of the balconies
- the slats will act as shading - they will prevent excessive heat gain
- the bending of the slats responds to the shape of the roofs of the original astus - inspiration from the original base
- we rejected this option because of inadequate visual appearance of the building - it does not look like a residential building





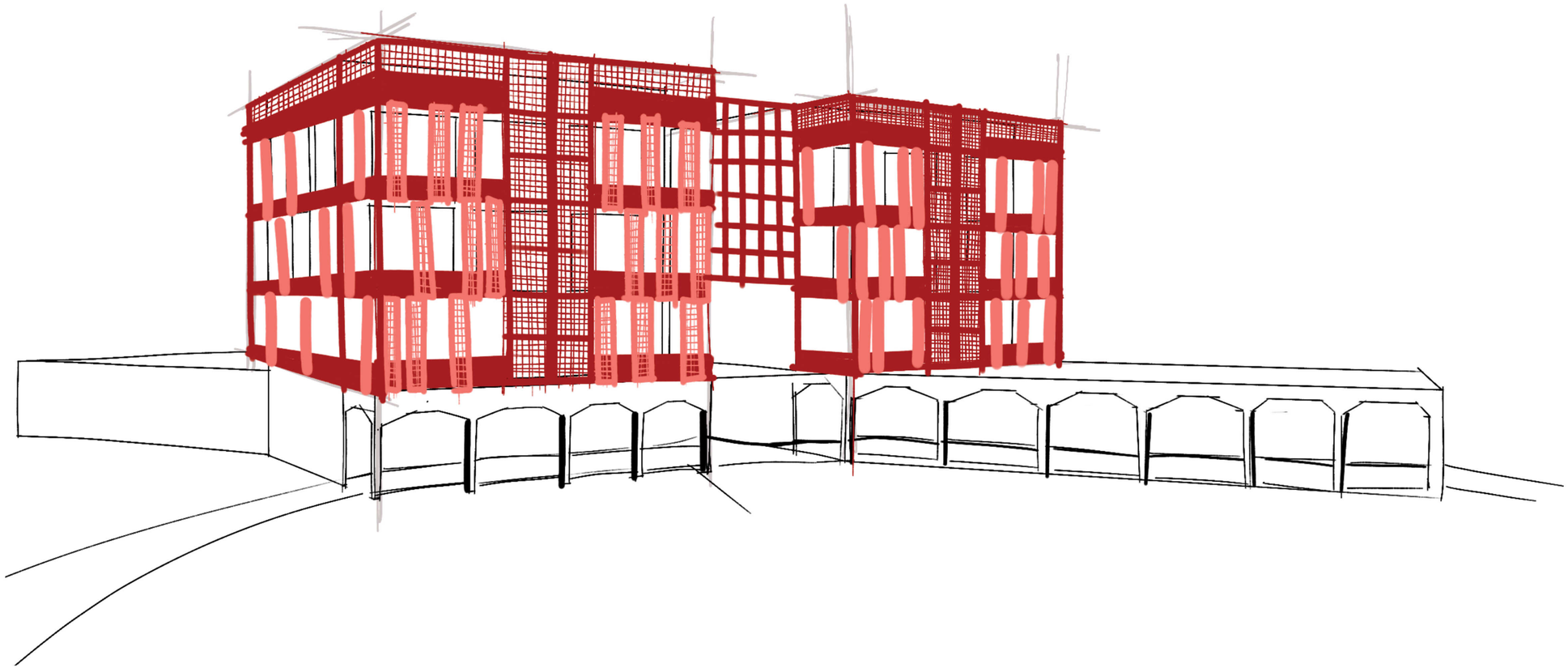


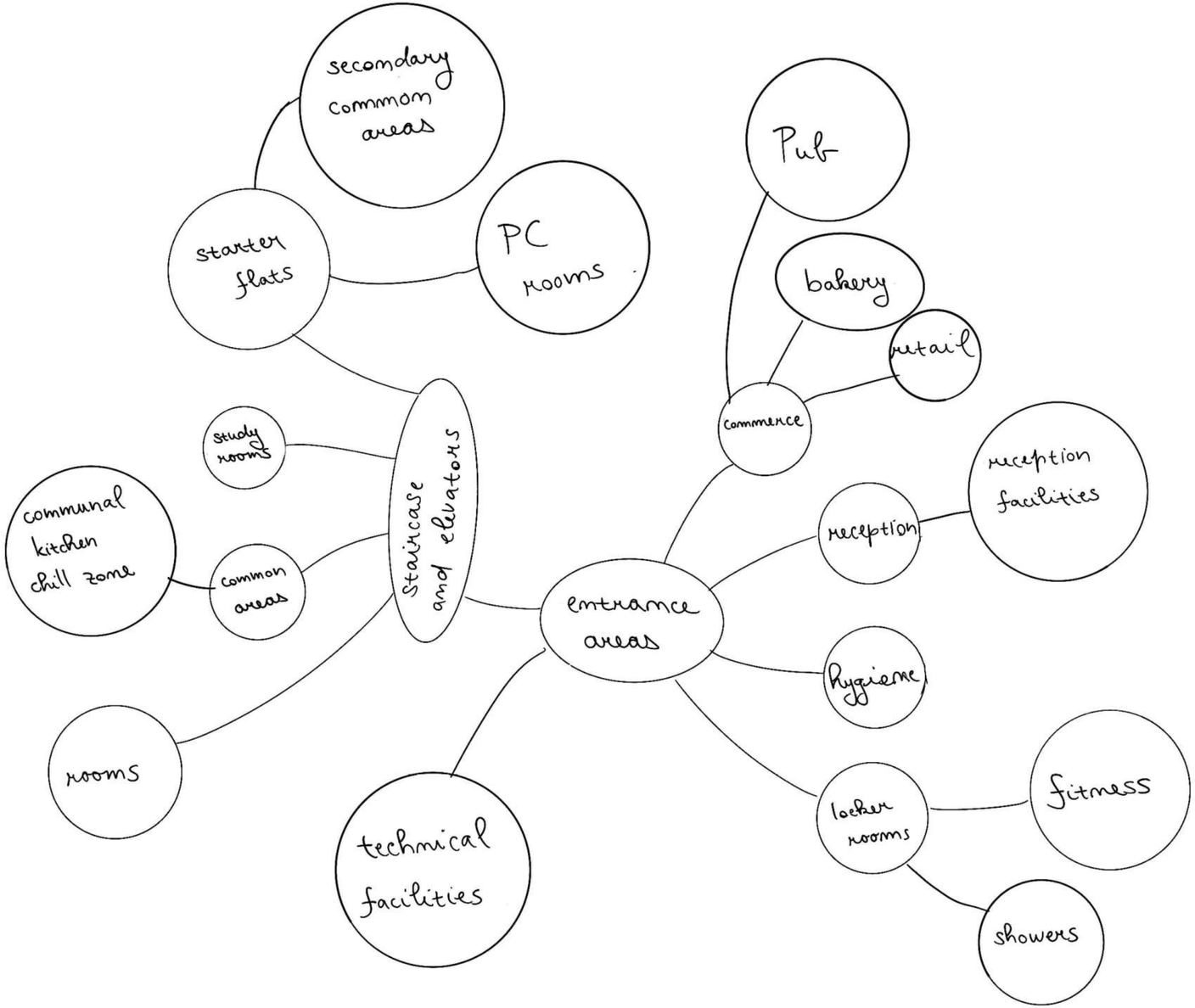
facade option B - perforated panels

- the final version
- use of perforated metal panels on the façade
- the panels serve as shading - they prevent excessive heat gains
- full panels carry photovoltaics - possibility of collecting and using solar energy also from the facade
- the facade is mounted on a stand-alone structure
- reducing thermal bridges in the building

final design

- the perforated panels had to be optimised - lack of daylight in the rooms
- panels are moveable - the possibility of individual shading, flexible solution
- solid panels form balcony railings and carry photovoltaics - safety and energy function




secondary common areas
starter flats
PC rooms
Pub
bakery
retail
commence
study rooms
communal kitchen chill zone
common areas
Staircase and elevators
reception facilities
reception
entrance areas
hygiene
rooms
technical facilities
locker rooms
fitness
showers

residential building - the design

construction programme - bydlení:

1st floor

- technical facilities

- utility room	-	21,95 m²
- clean linen	-	11,99 m²
- dirty laundry	-	10.81 m²
- laundry room	-	26.11 m²
- storage	-	9.32 m²
- cleaning	-	9.32 m²
- corridor	-	32.63 m²

- pub

- pub	-	71,04 m²
- preparation room	-	18,26 m²
- entrance for employees	-	2.35 m²
- warehouse	-	6.49 m²
- restroom for employees	-	2,46 m²
- locker room	-	13,47 m²
- showers for employees	-	4.11 m²
- main entrance	-	6.98 m²
- men's restroom	-	5.10 m²
- women's restroom	-	9.85 m²

- retail

- retail area	-	26,05 m²
- day room	-	3,96 m²
- restroom for employees	-	2,02 m²

- bakery

- bakery	-	30,59 m²
- preparation room	-	11,45 m²
- staff facilities	-	7,87 m²

- entrance private housing

- vestibule	-	16,21 m²
- staircase hall	-	50,70 m²

- entrance large-capacity housing

- vestibule	-	15,77 m²
- staircase hall	-	57,01 m²
- reception area	-	12,59 m²
- reception facilities	-	7,99 m²
- cleaning	-	3,94 m²
- utility room	-	8,28 m²
- sanitary cabin	-	4,11 m²
- women's restroom	-	5,55 m²
- men's restroom	-	9,05 m²

- fitness

- changing room women	-	7,53 m²
- changing room men	-	10,42 m²
- sanitary facilities women	-	10,91 m²
- sanitary facilities men	-	10,93 m²
- corridor	-	9,32 m²
- exercise area	-	181,69 m²
- group training	-	53,95 m²

2nd floor

- private housing

- vestibule	-	16,25 m²
- staircase hall	-	50,70 m²
- restroom for men	-	7,18 m²
- restroom for women	-	9,53 m²
- utility room	-	2,23 m²
- audiovisual room	-	30,59 m²
- quiet study room	-	68,90 m²

- large capacity housing

- vestibule	-	15,50 m²
- staircase hall	-	66,73 m²
- communal kitchen	-	69,20m²
- chill zone	-	21,20 m²
- utility room	-	2,31 m²
- restroom for men	-	5,34 m²
- restroom for women	-	5,34 m²

3rd floor

- private housing

- single room	-	26,10 m²	(4x)
- kitchen	-	5,19 m²	(2x)
- corridor	-	4,19 m²	(2x)
- bathroom	-	4,17 m²	(2x)
- staircase hall	-	33,98 m²	
- PC room	-	16,34 m²	

- large capacity housing

- 8-bed room	-	21,20 m²	(4x)
- bathroom	-	16,70 m ²	(2x)
- staircase hall	-	48,18 m²	
- PC room	-	16,26 m²	

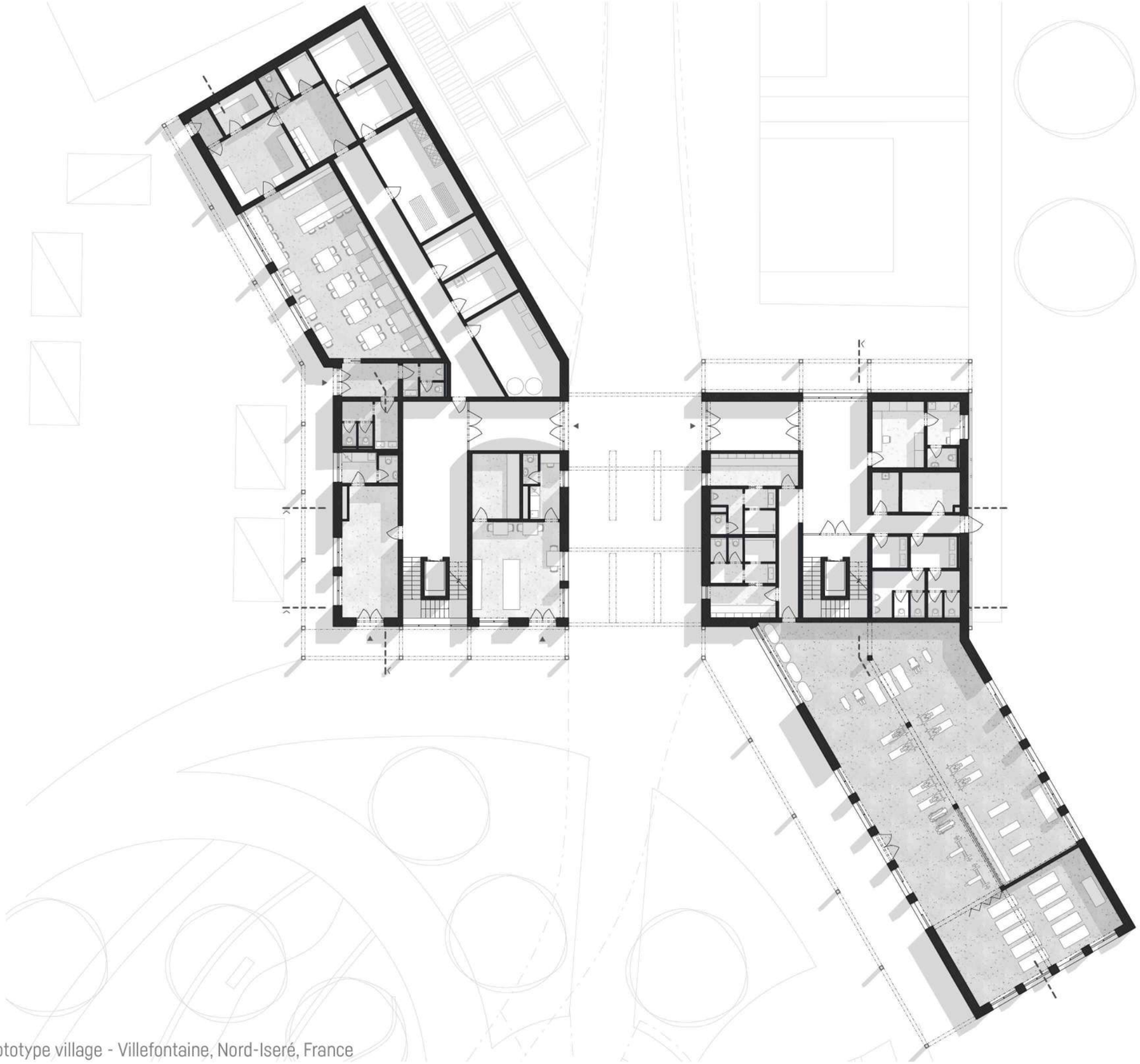
4th floor

- private housing

- 2 double room	-	52,20 m²	(2x)
- corridor	-	4,19 m²	(2x)
- kitchen	-	5,19 m²	(2x)
- bathroom	-	4,17 m²	(2x)
- staircase hall	-	22,77 m²	
- lounge area	-	27,57 m²	

- large capacity housing

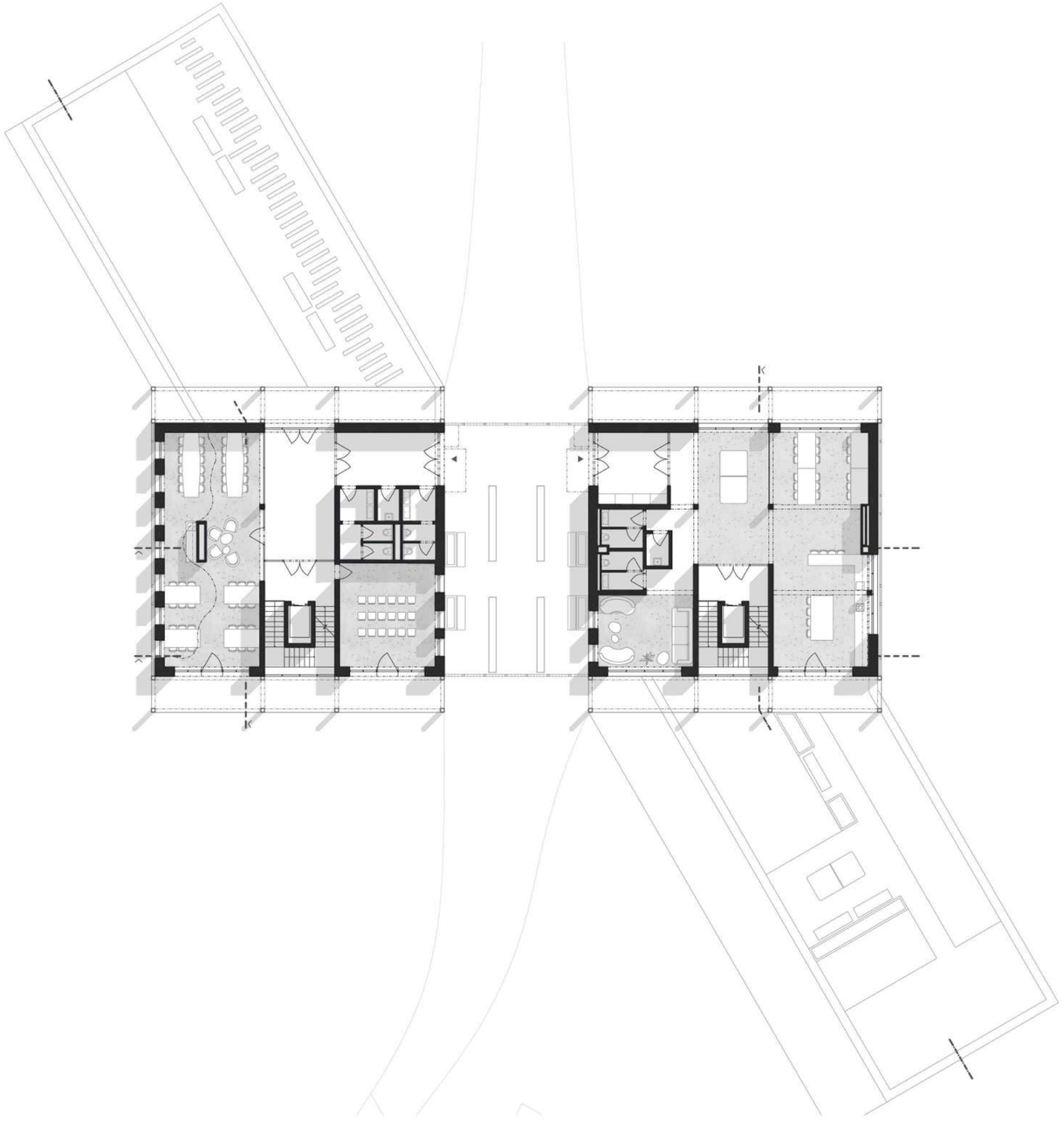
- 6-bed room	-	21,20 m²	(4x)
- bathroom	-	16,70 m²	(2x)
- staircase hall	-	21,60 m²	
- lounge area	-	42,55 m²	



1st floor

1:200

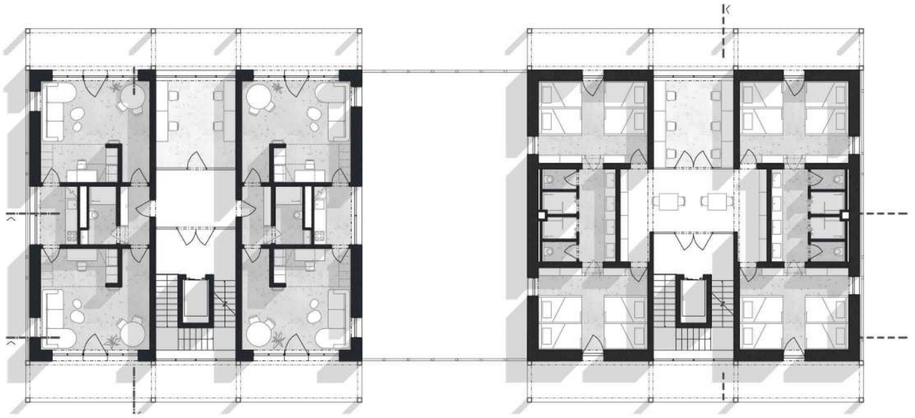
0 2 6 12m

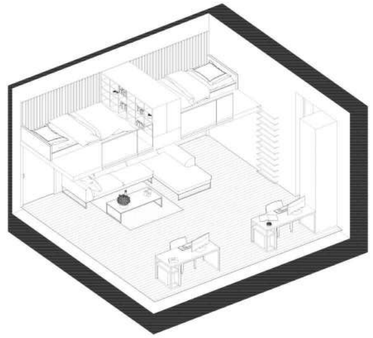


2nd floor

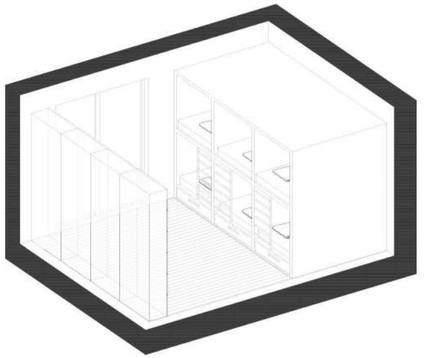
1:200

0 2 6 12m

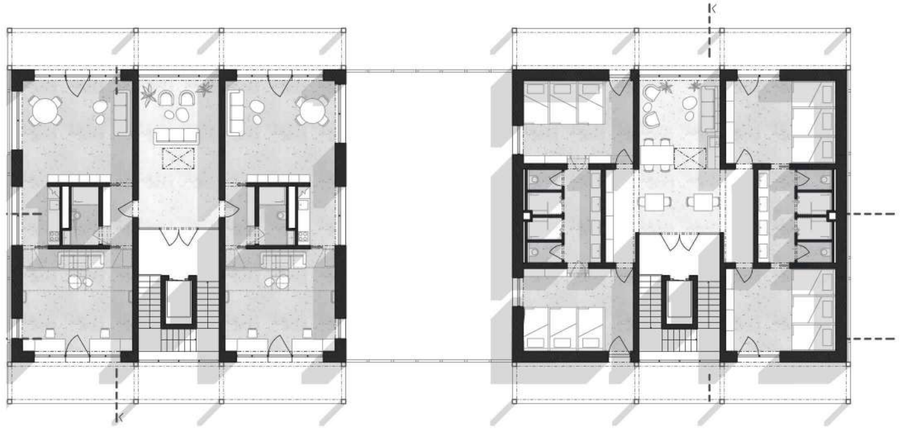


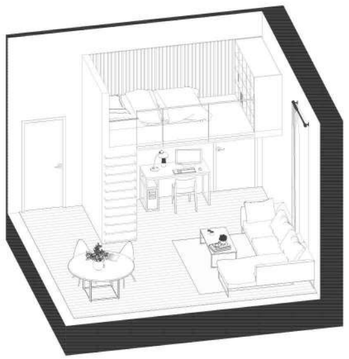


axonometry of a double room

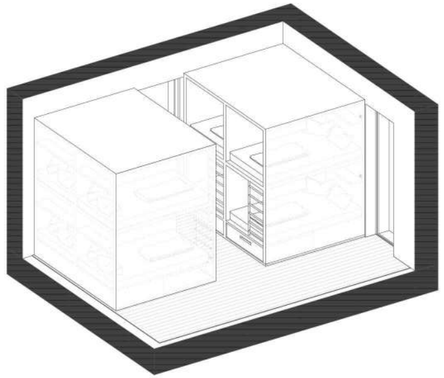


axonometry of a 6-bed room





axonometry of a single room

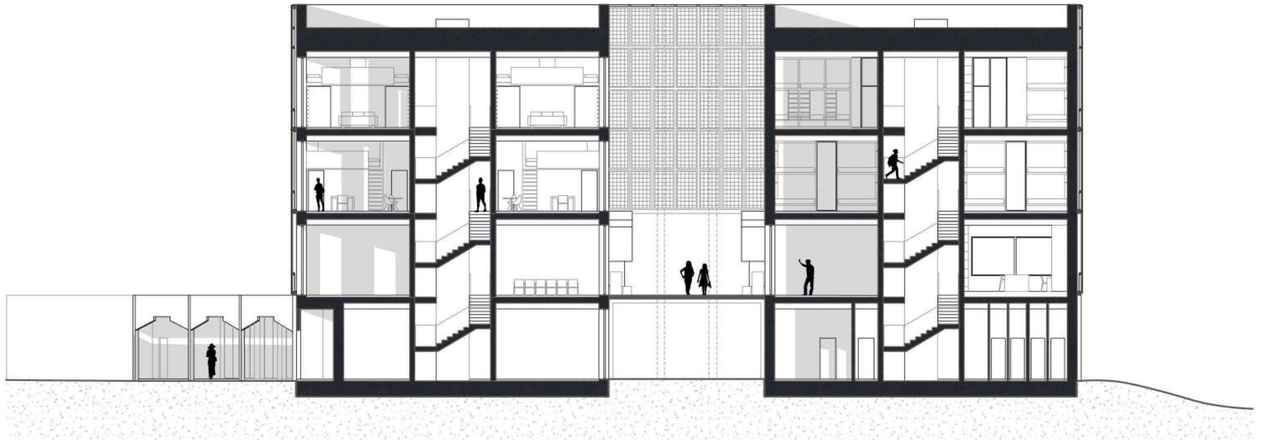


axonometry of a 8-bed room

3rd & 4th floor

1:200

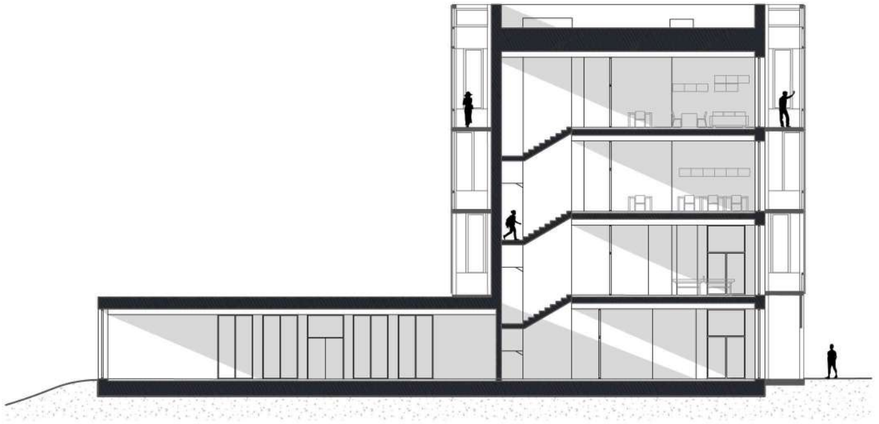
0 2 6 12m



longitudinal and cross section of private housing

1:250

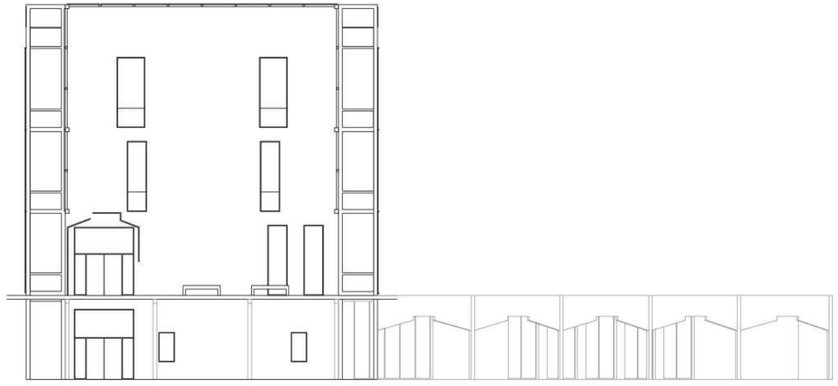
0 2,5 7,5 15 m



longitudinal section and cross section of large-capacity housing

1:250

0 2,5 7,5 15 m



north and south elevations of the atrium

1:250

0 2,5 7,5 15 m

south and north elevations

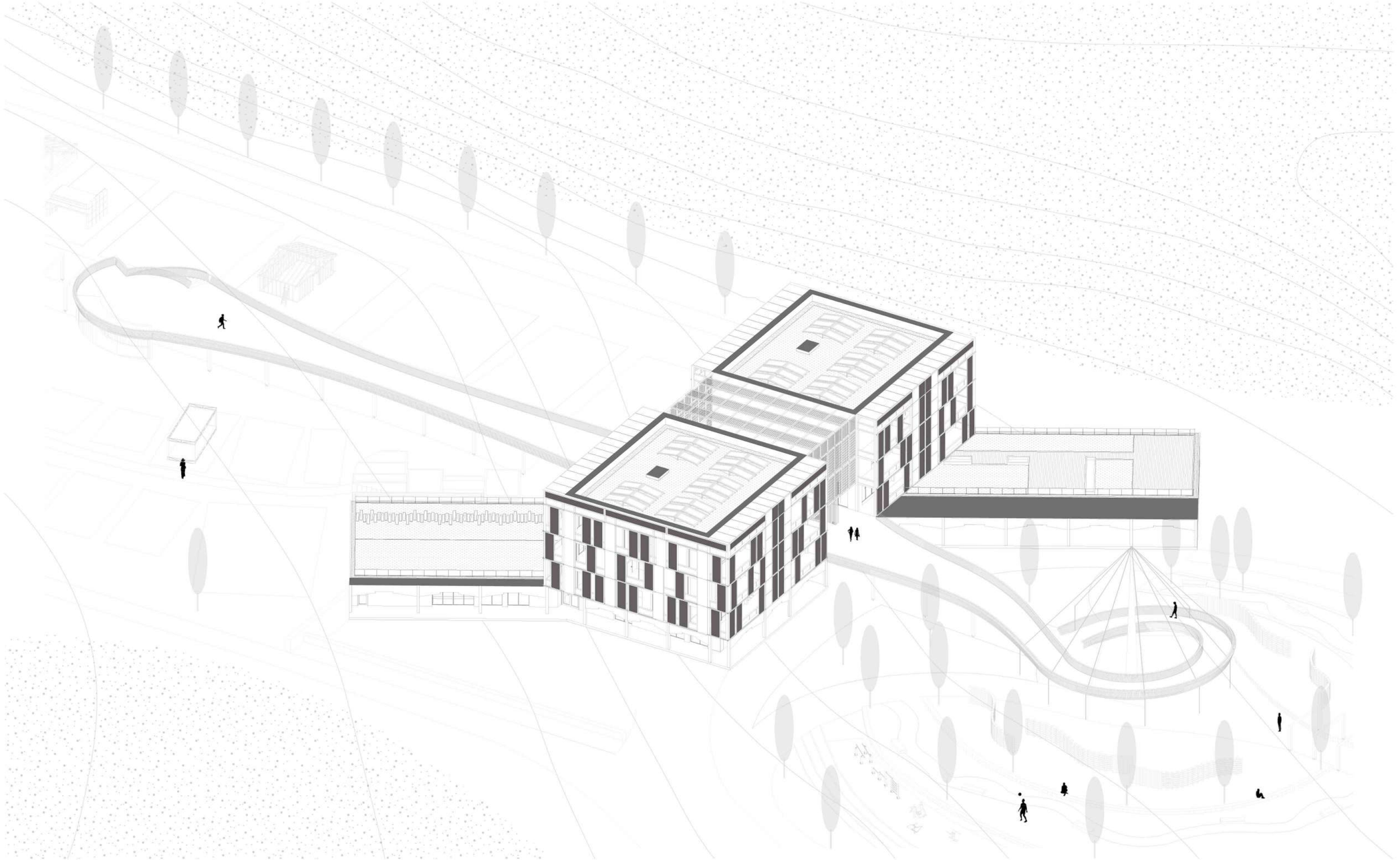
1:250

0 2,5 7,5 15 m

east and west elevations

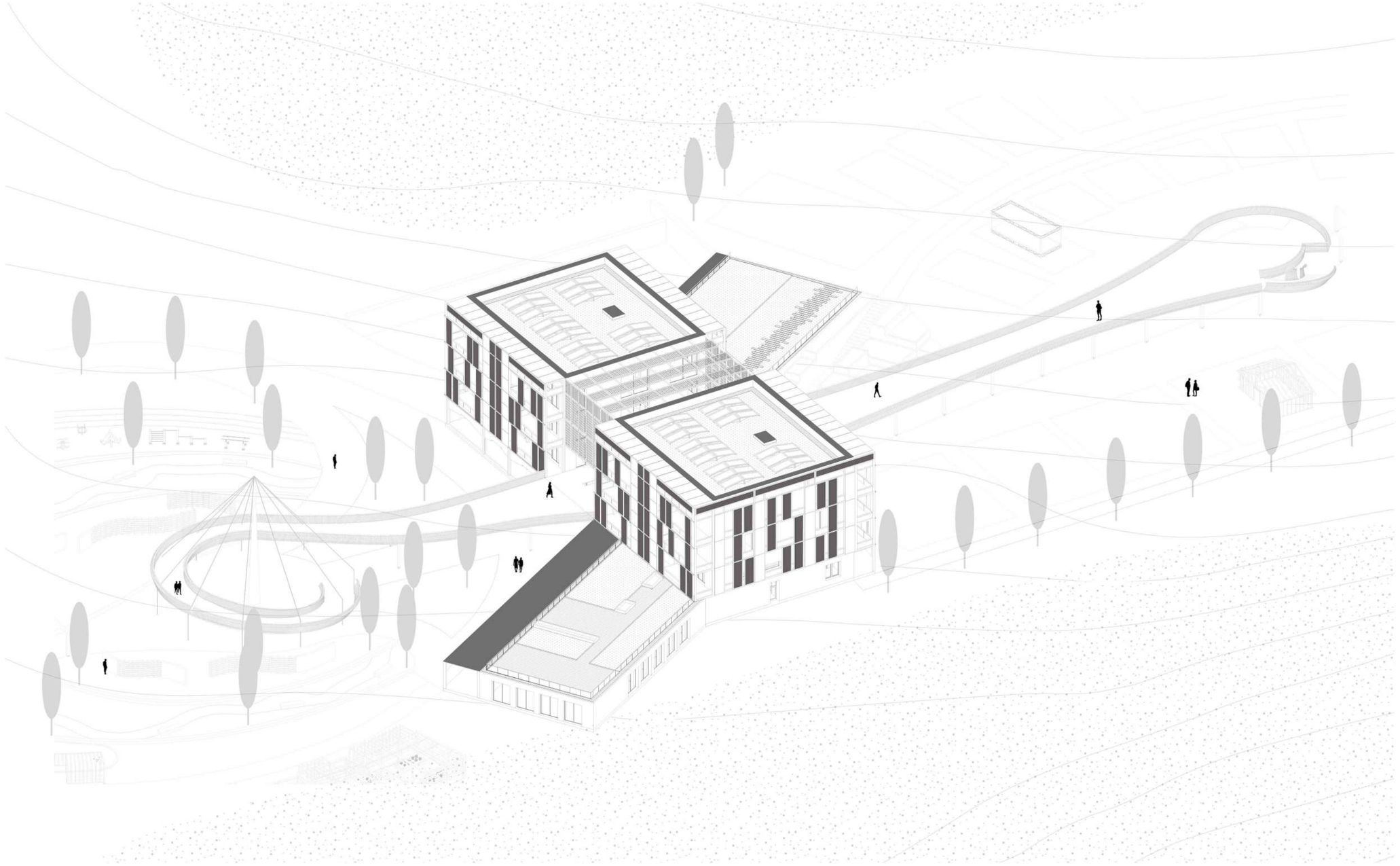
1:250

0 2,5 7,5 15 m



Residential area and the prototype village - Villefontaine, Nord-Iseré, France

axonometry of the residential building



Residential area and the prototype village - Villefontaine, Nord-Iseré, France

axonometry of the residential building

small PC rooms

single room

double room

lounge areas

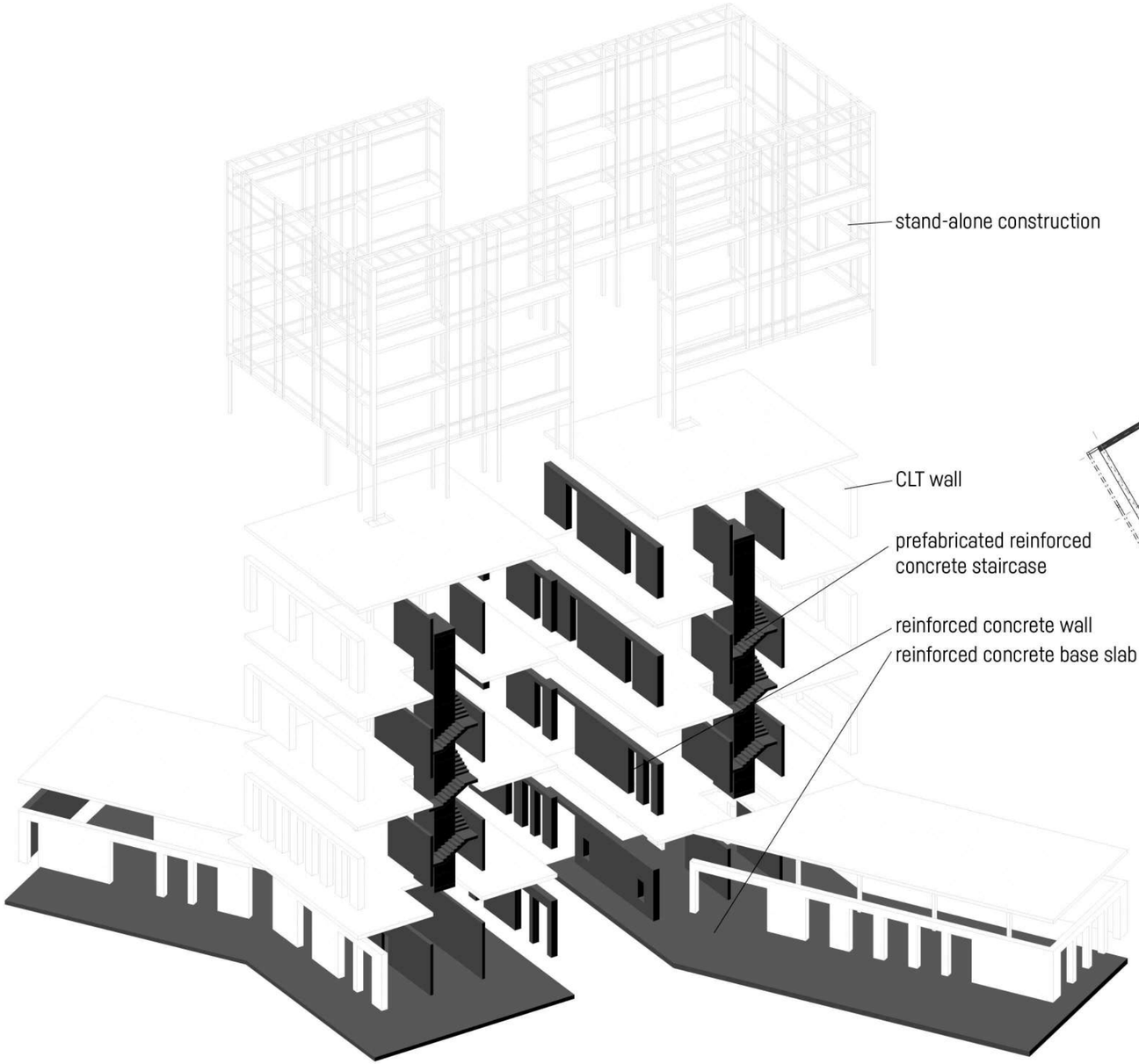
communal kitchen

pub

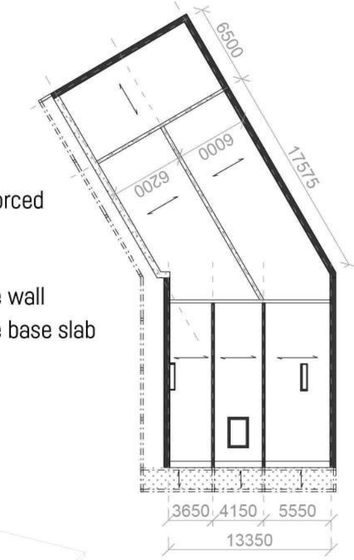
quiet study room

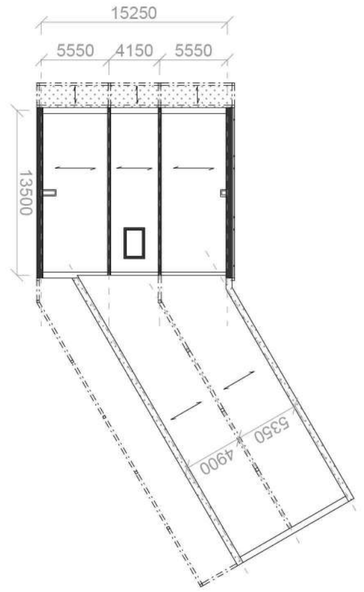
chill zone

residential building - technical part


stand-alone construction
CLT wall
prefabricated reinforced concrete staircase
reinforced concrete wall
reinforced concrete base slab


5550
4150
5550
15250
5550
4150
5550
15250


6500
17575
6200
6000
3650
4150
5550
13350


15250
5550
4150
5550
13500
6350
4900

COMPOSITIONS

St1 - ROOF - semi-intensive green

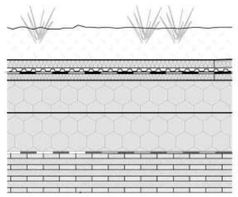
- semi-intensive greenery + PV panels
- mineral substrate for semi-intensive greenery th. 200 mm
- Isover Flora hydrophilic board, th. 50 mm
- filtration geotextile th. 3 mm
- dimpled membrane th. 20 mm
- protective geotextile th. 3 mm
- root penetration resistant waterproofing membrane th. 2 mm
- Isover EPS roof slopes th. 20+ mm
- thermal insulation th. 450 mm
  - Isover EPS 200
  - Isover EPS 240
- vapour barrier membrane and safety waterproofing th. 4 mm
- CLT panel th. 240 mm

total thickness 1020 mm

Calculation of heat transfer coefficient

- Isover EPS
  - $\lambda = 0,032$ W/mK
  - d = 0,44 m
  - $R_1 = d/\lambda = 13,75$ m²K/W
- CLT panel
  - $\lambda = 0,12$ W/mK
  - d = 0,24 m
  - $R_2 = d/\lambda = 2$ m²K/W

$U = 1/(R_1+R_2+R_{se}+R_{si}) = 1/(14,065+2+0,04+0,1)$
$U = 0,063$ W/m²K



S1 - WOODEN EXTERIOR WALL

- Weberpas extra clean active plaster
- base layer Webertherm elastik + R131
- Isover EPS Grey Wall Sun Protect thermal insulation th. 300 mm
- adhesive Webertherm technik applied all over
- penetration Weberpodklad A
- CLT panel in visual quality, th. 124 mm

total thickness 424 mm

Calculation of heat transfer coefficient

- Isover EPS Grey Wall Sun Protect th. 300 mm
  - $\lambda = 0,03$ W/mK
  - d = 0,3 m
  - $R_1 = d/\lambda = 10$ m²K/W
- CLT panel
  - $\lambda = 0,12$ W/mK
  - d = 0,124 m
  - $R_2 = d/\lambda = 1,03$ m²K/W

$U = 1/(R_1+R_2+R_{se}+R_{si}) = 1/(10+1,03+0,04+0,13)$
$U = 0,089$ W/m²K

S2 - REINFORCED CONCRETE EXTERIOR WALL

- Weberpas extra clean active plaster + Weberpas podklad UNI
- base layer webertherm elastik + R131
- thermal insulation Isover EPS Grey Wall Sun Protect th. 220 mm
- adhesive Webertherm klasik applied all over
- penetration Weberpodklad A
- reinforced concrete wall th. 200 mm
- Interior gypsum plaster Webermur rudin fine
- Weberdeco fresh

total thickness 450 mm

Calculation of heat transfer coefficient

- Isover EPS Grey Wall Sun Protect th. 220 mm
  - $\lambda = 0,03$ W/mK
  - d = 0,220 m
  - $R_1 = d/\lambda = 7,33$ m²K/W
- reinforced concrete wall
  - $\lambda = 1,43$ W/mK
  - d = 0,2 m
  - $R_2 = d/\lambda = 0,14$ m²K/W

$U = 1/(R_1+R_2+R_{se}+R_{si}) = 1/(7,33+0,14+0,04+0,13)$
$U = 0,131$ W/m²K

S3 - EXTERIOR WALL BELOW THE TERRAIN

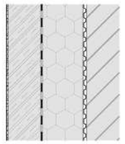
- soil
- dimpled membrane
- thermal insulation Isover EPS Ground Protect th. 240 mm
- adhesive Webertec 915
- SBS modified asphalt sheets fused to the base
- reinforced concrete wall th. 200 mm
- interior plaster Webermur rudin fine
- Weberdeco fresh

total thickness 490 mm

Calculation of heat transfer coefficient

- EPS Ground Protect
  - $\lambda = 0,029$ W/mK
  - d = 0,24 m
  - $R_1 = d/\lambda = 8,28$ m²K/W
- reinforced concrete wall
  - $\lambda = 1,43$ W/mK
  - d = 0,2 m
  - $R_2 = d/\lambda = 0,14$ m²K/W

$U = 1/(R_1+R_2+R_{si}) = 1/(8,28+0,14+0,13)$
$U = 0,117$ W/m$_2$K



P3 - FLOOR ON THE GROUND

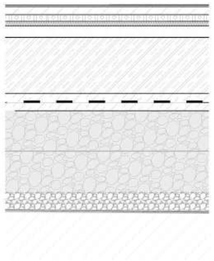
- surface layer according to room th. 10 mm
- adhesive
- concrete screed th. 50 mm
- system board with underfloor heating th. 40 mm
- Isover T-N acoustic insulation, th. 30 mm
- Liapor installation layer th. 70 mm
- reinforced concrete slab th. 400 mm
- protective concrete layer, th. 50 mm
- waterproofing asphalt membrane th. 4 mm (2x2mm)
- penetrating coating
- base concrete th. 50 mm
- separating geotextile
- foam glass gravel (compacted in two layers), th. 500 mm
- drainage layer, gravel fraction 32-64, th. 150 mm
- separating geotextile
- ground

total thickness 1374 mm

Calculation of heat transfer coefficient

- foam glass gravel
  - $\lambda = 0,036$ W/mK
  - d = 0,5 m
  - $R_1 = d/\lambda = 13,88$ m²K/W
- reinforced concrete slab
  - $\lambda = 1,43$ W/mK
  - d = 0,4 m
  - $R_2 = d/\lambda = 0,28$ m²K/W
- base concrete
  - $\lambda = 1,43$ W/mK
  - d = 0,05 m
  - $R_3 = d/\lambda = 0,035$ m²K/W
- protective concrete layer
  - $\lambda = 1,43$ W/mK
  - d = 0,05 m
  - $R_4 = d/\lambda = 0,035$ m²K/W
- Isover T-P acoustic insulation
  - $\lambda = 0,036$ W/mK
  - d = 0,03 m
  - $R_5 = d/\lambda = 0,83$ m²K/W

$U = 1/(R_1+R_2+R_3+R_4+R_5+R_{si})$
$U=1/(13,88+0,28+0,035+0,035+0,83+0,17)$
$U = 0,065$ W/m²K



P1 - FLOOR

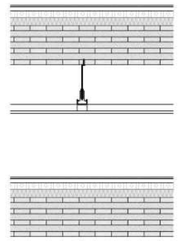
- surface layer according to room th. 10 mm
- adhesive
- Rigistabil th. 25 mm
- system board with underfloor heating th. 40 mm
- acoustic insulation Isover T-N th. 50 mm
- PVC foil separation layer
- CLT panel th. 240 mm
- Suspended acoustic ceiling with Ecophon Fade One Smooth plaster

total thickness 395 mm +300 mm soffit

P2 - FLOOR

- surface layer according to room th. 10 mm
- adhesive
- Rigistabil th. 25 mm
- system board with underfloor heating th. 40 mm
- acoustic insulation Isover T-N th. 50 mm
- PVC foil separation layer
- CLT panel th. 240 mm

total thickness 395 mm



APARTMENT PARTITION WALL 1

- 2x Rigips RF plasterboard th. 12.5 mm
- mineral insulation Isover Piano th. 60 mm
- Novatop Solid th. 84 mm
- mineral insulation Isover Piano th. 60 mm
- 2x plasterboard Rigips RF th. 12.5 mm

total thickness 254 mm

APARTMENT PARTITION WALL 2

- interior gypsum plaster Webermur 659
- reinforced concrete monolithic wall th. 200 mm
- interior gypsum plaster Webermur 659

total thickness 210 mm

APARTMENT PARTITION WALL 3

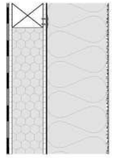
- 3x plasterboard Rigips RF th. 12.5 mm
- CW profile
- mineral insulation Isover Piano th. 100 mm
- 3x plasterboard Rigips RF th. 12.5 mm

total thickness 175 mm

PARAPET WALL

- Weberpas extra Clean active plaster + Weberpas podklad UNI
- base layer Webertherm Elastik + R131
- thermal insulation Isover EPS Grey Wall Sun Protect th. 300 mm
- adhesive Webertherm TECHNIK
- penetration Weberpodklad Haft
- parapet wall construction
  - -OSB cladding th. 22 mm
  - -filler of Isover TF thermal insulation th. 180 mm
  - -wooden frame
- waterproofing membrane th. 2 mm

total thickness 244 mm



P4 - BALCONY FLOOR

- larch planks th. 30 mm
- wooden grid
- mats th. 25 mm
- waterproofing layer (PVC foil)
- CLT panel th. 160 mm

- the slope of the balcony is provided by its construction

total thickness 300 mm

P5 - OUTDOOR PATH

- external concrete pavement with a layer of washed gravel
- sand layer th. 100 mm
- crushed aggregate fraction 4-16, th. 120 mm
- crushed aggregate fraction 16-32, th. 200 mm
- ground

total thickness 480 mm

rigips SAINT-GOBAIN

ecophon SAINT-GOBAIN

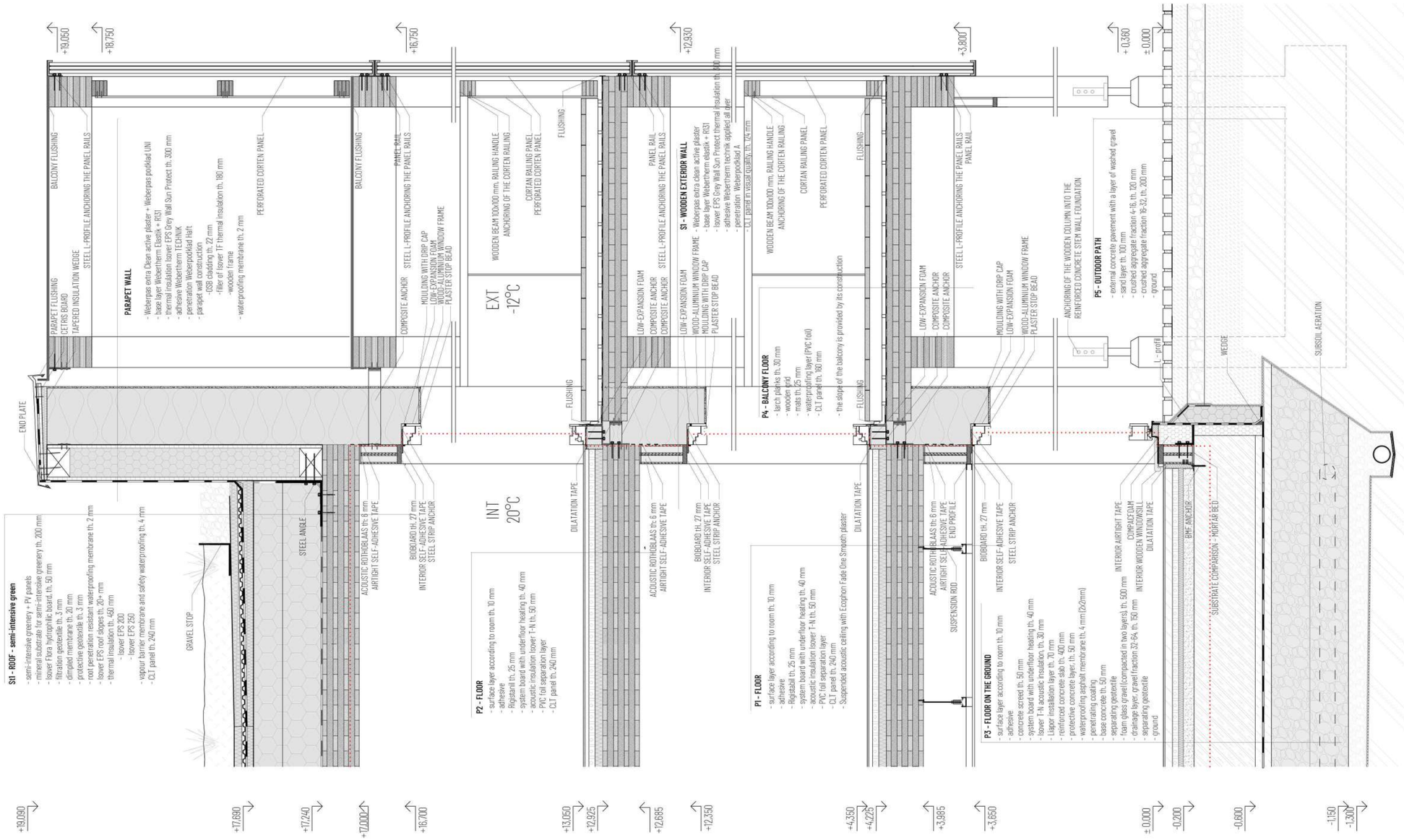
weber SAINT-GOBAIN

isover SAINT-GOBAIN

glassolutions SAINT-GOBAIN

list of compositions

authors: Jan Lefner & Marta Storkanova p.43



rigips SAINT-GOBAIN

ecophon SAINT-GOBAIN

weber SAINT-GOBAIN

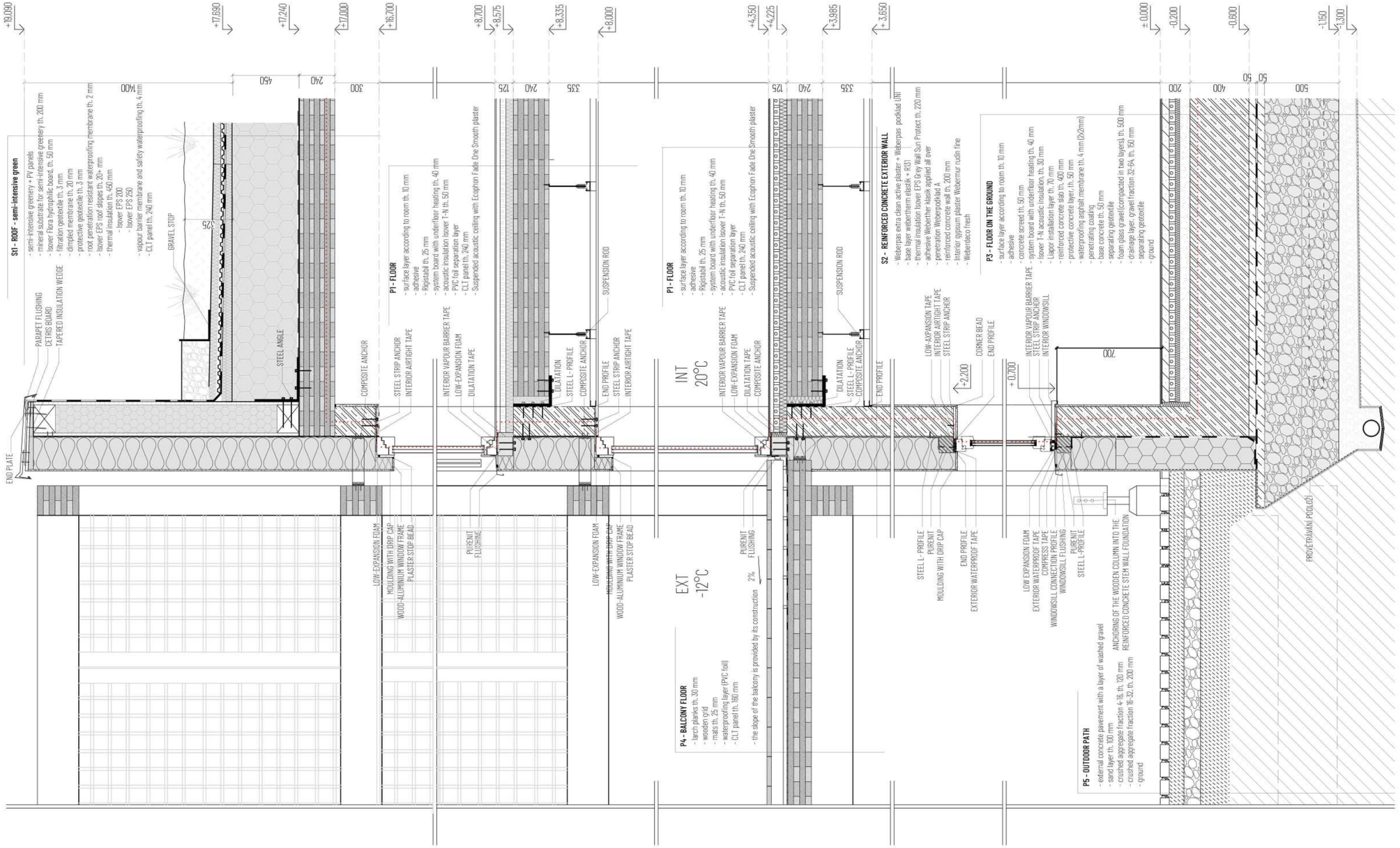
isover SAINT-GOBAIN

glassolutions SAINT-GOBAIN

complex section

1:20

0 0,2 0,6 1,2 m



rigips SAINT-GOBAIN

ecophon SAINT-GOBAIN

weber SAINT-GOBAIN

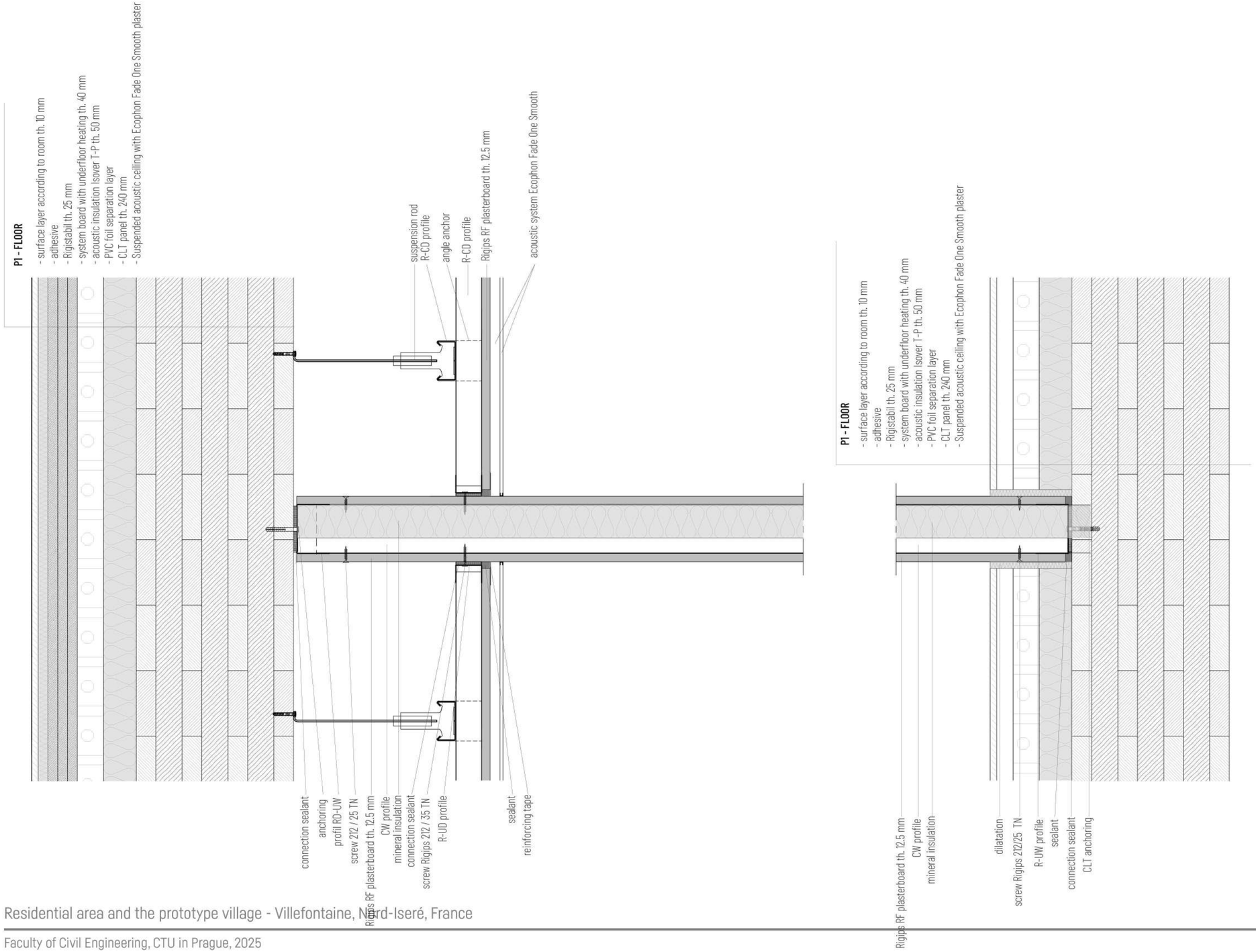
ISOVER SAINT-GOBAIN

glassolutions SAINT-GOBAIN

complex section

1:20

0 0,2 0,6 1,2 m



rigips SAINT-GOBAIN

ecophon SAINT-GOBAIN

weber SAINT-GOBAIN

isover SAINT-GOBAIN

detail of partition connection to ceiling and floor

1:5

0 0,05 0,15 0,3 m

P5 - OUTDOOR PATH
- external concrete pavement with a layer of washed gravel
- sand layer th. 100 mm
- crushed aggregate fraction 4-16, th. 120 mm
- crushed aggregate fraction 16-32, th. 200 mm
- ground

ANCHORING OF THE WOODEN COLUMN INTO THE REINFORCED CONCRETE STEM WALL FOUNDATION

L-PROFILE

WEDGE

SUBSOIL AERATION

ŽELEZOBETONOVÝ PAS

DRENÁŽNÍ POTRUBÍ DN100

Ø100

COMPACFOAM

INTERIOR AIRTIGHT TAPE

INTERIOR WOODEN WINDOWSILL

P3 - FLOOR ON THE GROUND
- surface layer according to room th. 10 mm
- adhesive
- concrete screed th. 50 mm
- system board with underfloor heating th. 40 mm
- Isover T-P acoustic insulation, th. 30 mm
- Liapor installation layer th. 70 mm
- reinforced concrete slab th. 400 mm
- protective concrete layer, th. 50 mm
- waterproofing asphalt membrane th. 4 mm (2x2mm)
- penetrating coating
- base concrete th. 50 mm
- separating geotextile
- foam glass gravel (compacted in two layers), th. 500 mm
- drainage layer, gravel fraction 32-64, th. 150 mm
- separating geotextile
- ground

DILATATION TAPE

SUBSTRATE COMPARISON - MORTAR BED

BMF ANCHOR

10 | 50 | 40 | 30 | 70 | 400 | 50 | 50 | 10 | 500

5 | 4 | 4

rigips SAINT-GOBAIN

ecophon SAINT-GOBAIN

weber SAINT-GOBAIN

isover SAINT-GOBAIN

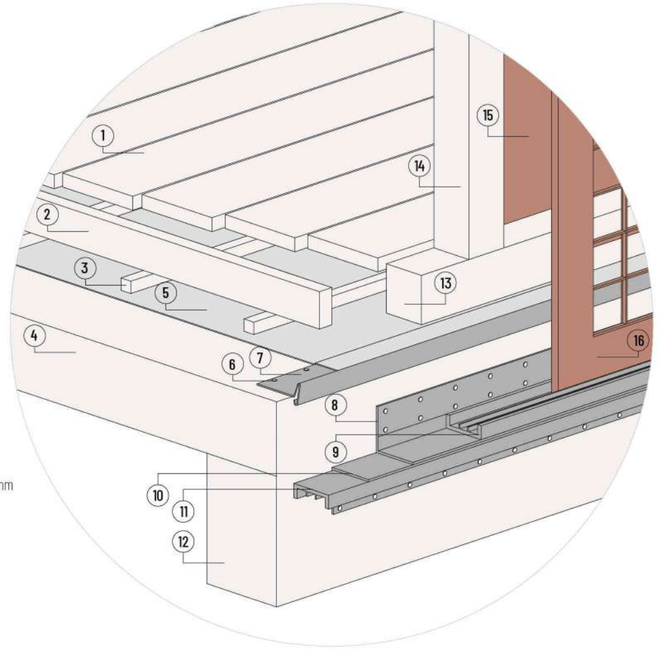
glassolutions SAINT-GOBAIN

foundation detail

1:5

0 | 0,05 | 0,15 | 0,3 m

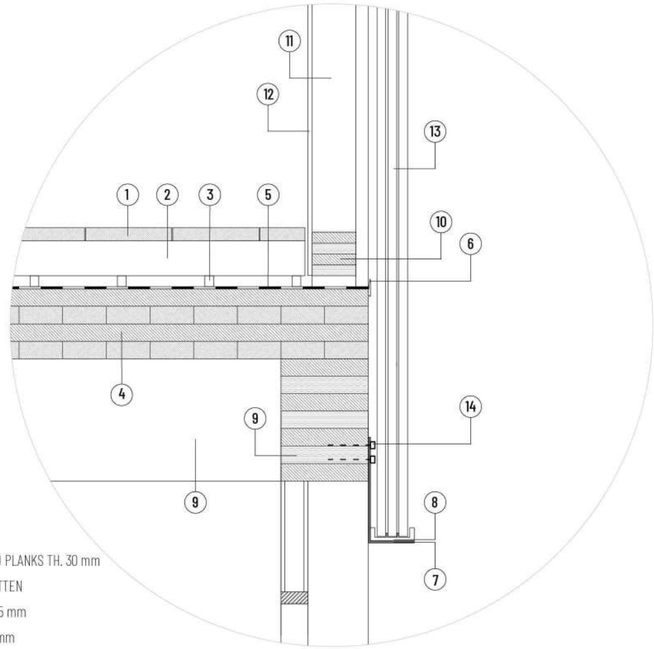
authors: Jan Lefner & Marta Storkanova p.47



LEGEND:

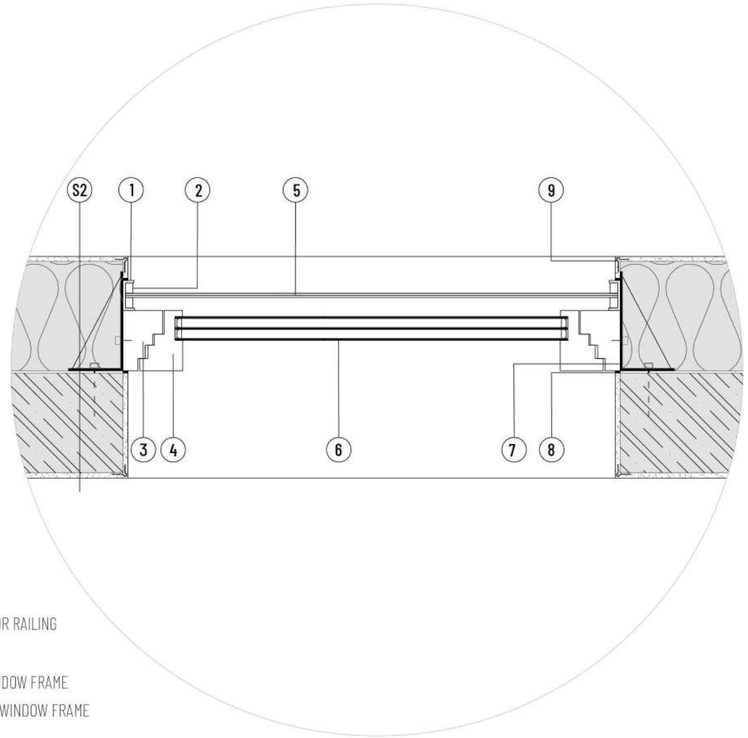
1. LARCH WOOD PLANKS TH. 30 mm
2. WOODEN BATTEN
3. MATS TH. 25 mm
4. CLT TH. 160 mm
5. WATERPROOFING - PVC FOIL
6. FLASHING ANCHORING
7. METAL FLASHING
8. STEEL L-PROFILE ANCHORING THE PANEL TRACK
9. RAILS FOR PANEL TRAVEL
10. STEEL L-PROFILE ANCHORING THE PANEL TRACK
11. RAILS FOR PANEL MOVEMENT
12. CLT BEAM
13. WOODEN RAILING BEAM
14. WOODEN RAILING POST
15. CORTEN RAILING PANEL
16. CORTEN PERFORATED SHADING PANEL

the slope of the balcony is provided by its construction



LEGEND:

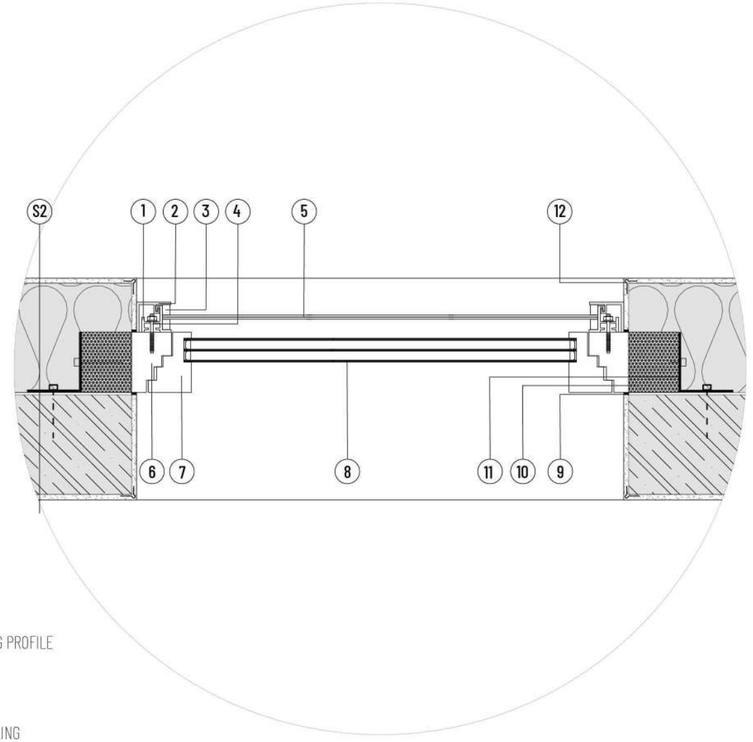
1. LARCH WOOD PLANKS TH. 30 mm
2. WOODEN BATTEN
3. MATHS TH. 25 mm
4. CLT TH. 160 mm
5. WATERPROOFING - PVC FOIL
6. METAL FLUSHING
7. STEEL L-PROFILE ANCHORING THE PANEL TRACK
8. RAILS FOR PANEL TRAVEL
9. CLT BEAM
10. WOODEN RAILING BEAM
11. WOODEN RAILING POST
12. CORTEN RAILING PANEL
13. CORTEN PERFORATED SHADING PANEL
14. ANCHORING OF THE L-PROFILE INTO THE CLT BEAM



LEGEND:

1. ANCHORING PROFILE FOR RAILING
2. SEALANT
3. FIXED PART OF THE WINDOW FRAME
4. OPENING PART OF THE WINDOW FRAME
5. GLASS RAILING
6. WINDOW GLASS
7. COMPOSITE ANCHOR
8. END PROFILE
9. CORNER BEAD

S2 COMPOSITION OF REINFORCED CONCRETE WALL



LEGEND:

1. COVERING
2. ANCHORING PROFILE
3. SEALANT
4. SCREW
5. GLASS RAILING
6. FIXED PART OF THE WINDOW FRAME
7. OPENING PART OF THE WINDOW FRAME
8. WINDOW GLASS
9. END PROFILE
10. PURENIT
11. STEEL L-PROFILE
12. CORNER BEAD

S2 COMPOSITION OF REINFORCED CONCRETE WALL

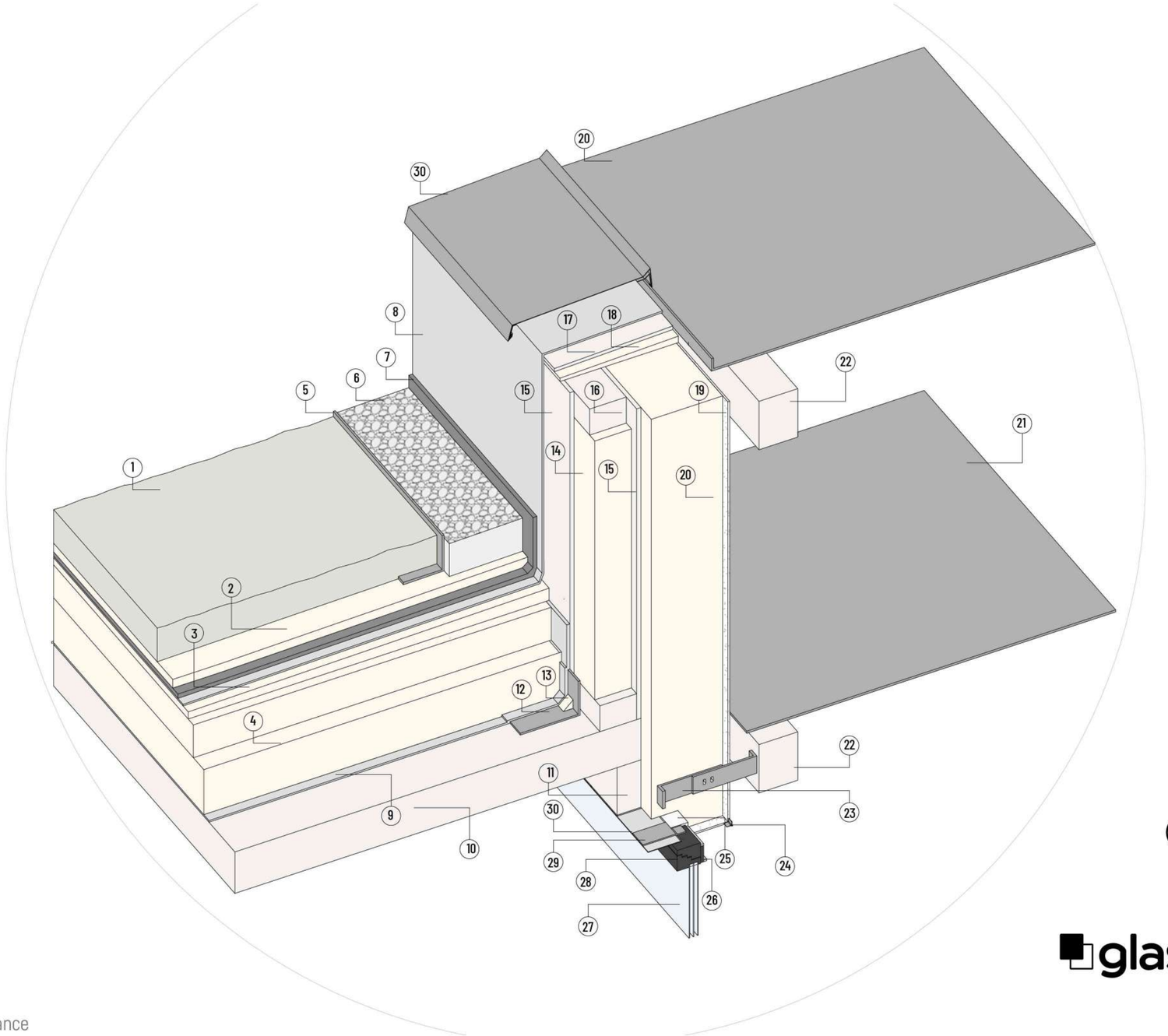
weber SAINT-GOBAIN

isover SAINT-GOBAIN

glassolutions SAINT-GOBAIN

LEGEND:

1. VEGETATION
2. HYDROPHILIC LAYER ISOVER FLORA TH. 50 mm
3. TAPERED THERMAL INSULATION
4. THERMAL INSULATION ISOVER EPS TH. 440 mm
5. GRAVEL STOP
6. GRAVEL
7. DIMPLED MEMBRANE TH. 20 mm
8. ROOT PENETRATION RESISTANT WATERPROOF MAMBRANE
9. VAPOUR BARRIER
10. CLT TH. 240 mm
11. CLT TH. 124 mm
12. L-PROFILE
13. WEDGE
14. PARAPET FILLING FROM MINERAL INSULATION
15. OSB BOARD
16. WOODEN BEAM
17. CETRIS BOARD
18. TAPERED WEDGE
19. PLASTER
20. INSULATION ISOVER GRAYWALL SP TH. 300 mm
21. METAL FLUSHING
22. BEAM OF STAND-ALONE STRUCTURE
23. COMPOSITE ANCHOR
24. CORNER BEAD
25. PU FOAM
26. END PROFILE
27. WINDOW GLASS
28. WINDOW FRAME
29. STEEL STRIP ANCHOR
30. INTERIOR AIRTIGHT TAPE



rigips SAINT-GOBAIN

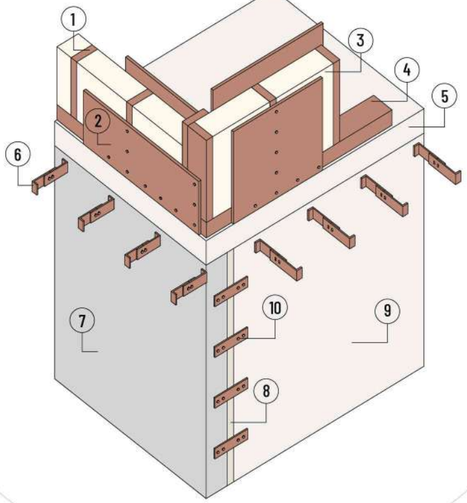
ecophon SAINT-GOBAIN

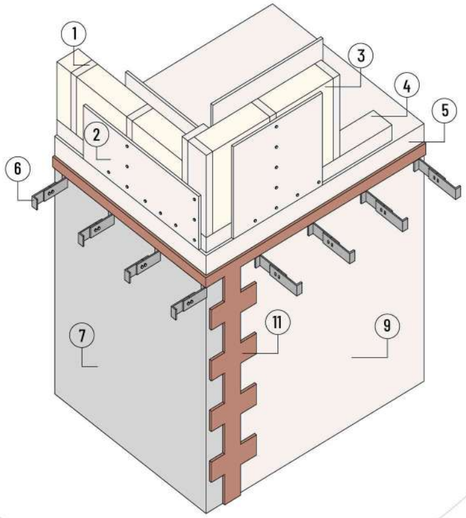
weber SAINT-GOBAIN

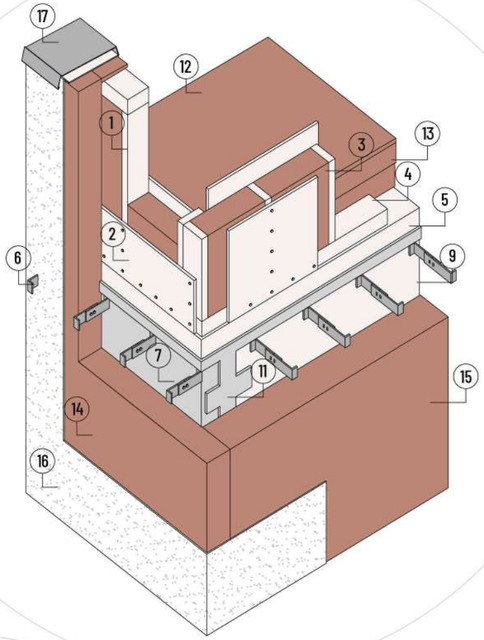
isover SAINT-GOBAIN

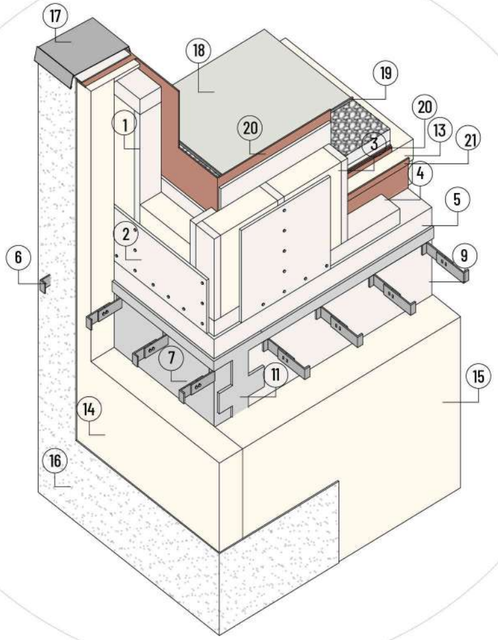
glassolutions SAINT-GOBAIN

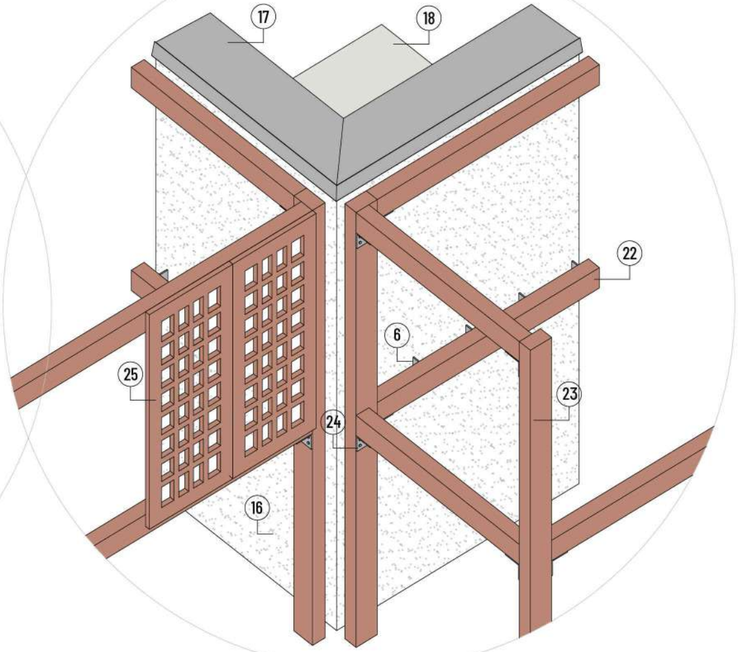
parapet detail











LEGEND:

1. WOODEN COLUMN
2. OSB BOARD
3. FILLING FROM MINERAL INSULATION
4. WOODEN BEAM
5. CLT PANEL th. 240 mm
6. COMPOSITE ANCHOR
7. REINFORCED CONCRETE WALL
8. DILATATION
9. CLT th. 124 mm
10. ANCHORING CONNECTION OF RC WALL AND CLT WALL
11. AIRTIGHT TAPE
12. TAPERED LAYER MADE OF INSULATION
13. INSULATION ISOVER EPS th. 440 mm
14. INSULATION ISOVER GRAYWALL SP TL. 220 mm
15. INSULATION ISOVER GRAWALL SP TL. 300 mm
16. WEBERPAS EXTRA ACTIVE CLEAN PLASTER
17. PARAPET FLUSHING
18. SEMI-INTENSIVE GREEN ROOF
19. GRAVEL STOP
20. HYDROINSULATION
21. VAPOUR BARRIER LAYER
22. BEAM OF STAND-ALONE STRUCTURE
23. COLUMN OF STAND-ALONE STRUCTURE
24. ANCHORING OF STAND-ALONE STRUCTURE
25. PERFORATED CORTEN PANEL

weber SAINT-GOBAIN

isover SAINT-GOBAIN

glassolutions SAINT-GOBAIN

corner detail

authors: Jan Lefner & Marta Storkanova p.51

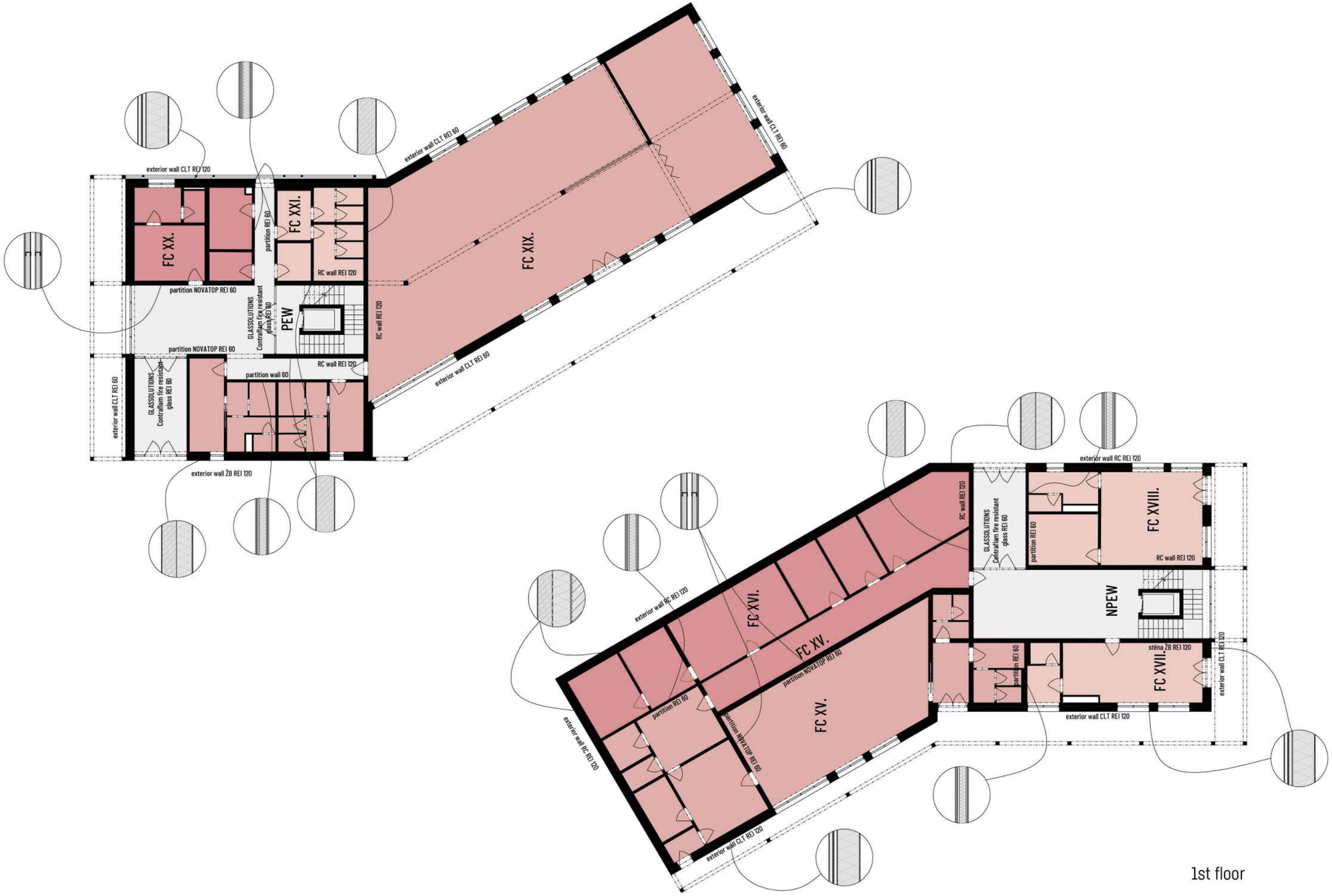
rigips SAINT-GOBAIN

glassolutions SAINT-GOBAIN

fire safety solution

1:200

0 2 6 12m



1st floor

rigips SAINT-GOBAIN

glassolutions SAINT-GOBAIN

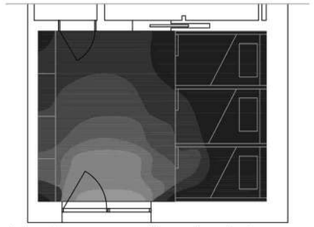
fire safety solution

1:200

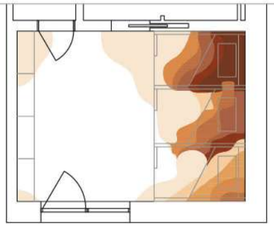
0 2 6 12m

6-bed room north - unshaded

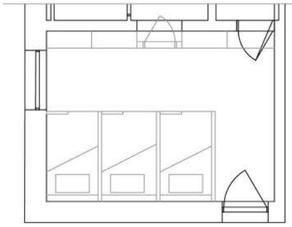
daylight



autonomy - avg. 79,9 %

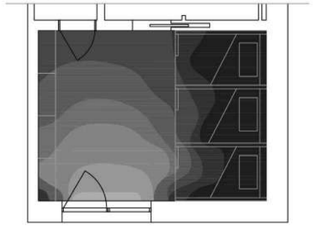


6-bed room south

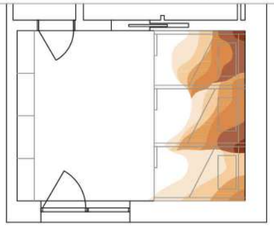


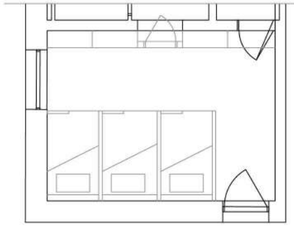
6-bed room north - shaded

daylight



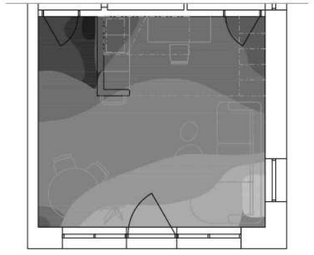
autonomy - avg. 73,4 %



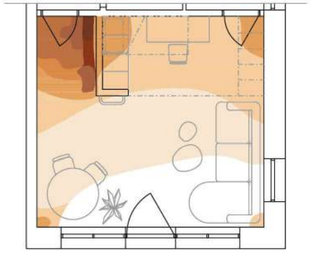


single room north - unshaded

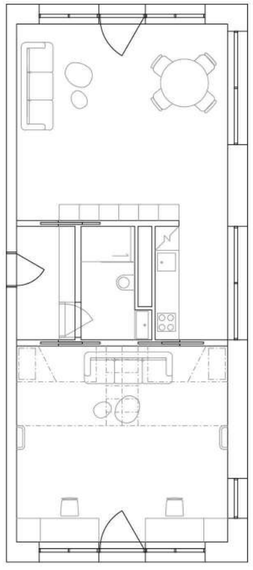
daylight



autonomy - avg. 72,3 %

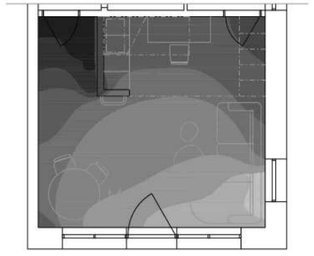


double room south

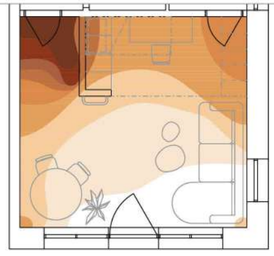


single room north - shaded

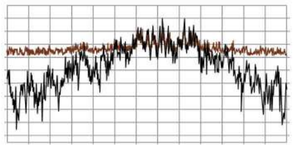
daylight



autonomy - avg. 65,3 %

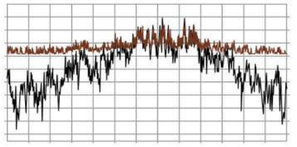


shaded



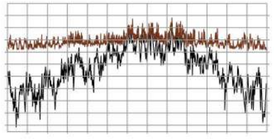
673 h | 25,3 kWh/m2 | 0 kWh/m2

unshaded



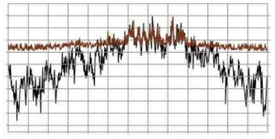
783 h | 24,8 kWh/m2 | 0 kWh/m2

shaded



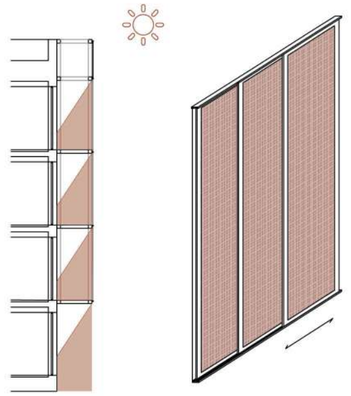
648 h | 33,7 kWh/m2 | 0 kWh/m2

unshaded



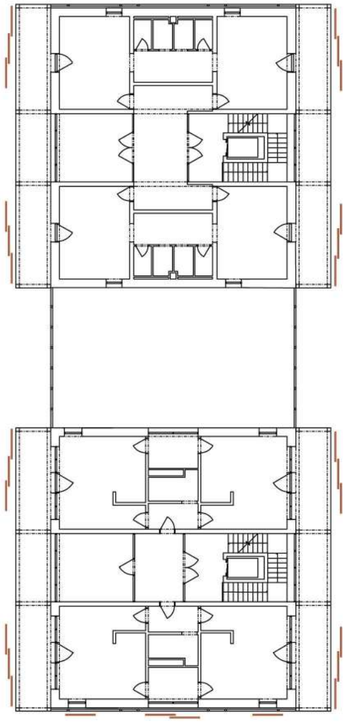
916 h | 31,7 kWh/m2 | 0 kWh/m2

unshaded option is not suitable



schematic section
- shading with balconies

3D diagram of the panels
- variable shading by sliding panels



position of sliding panels in the floor plan

comparison of the effect of facade shading on daylight and summer overheating in selected rooms

photovoltaics
- photovoltaic panels on the walls and in the form of facade panels

grey water
- grey water is recycled and then used for other purposes

greenery
- greenery in the area regulates the temperature of the public space

thermal bridges
- the stand-alone structure reduces the formation of thermal bridges

rainwater
- water is collected for irrigation of greenery

large capacity housing

U_{em} = 0,19 W/[m²K]

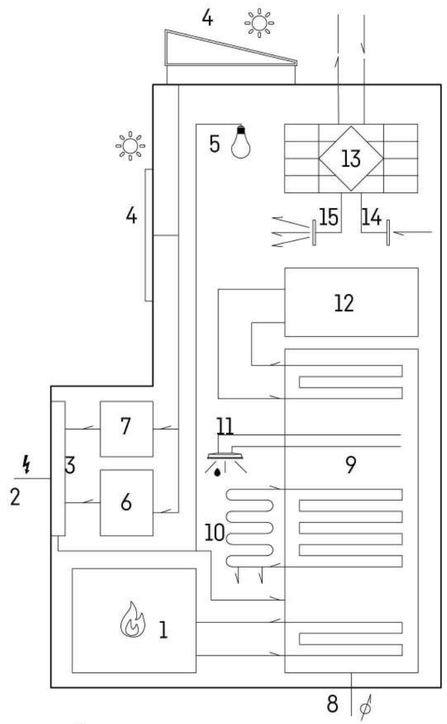
specific heat demand for heating = 11,81 kWh/m²a

private housing

U_{em} = 0,22 W/[m²K]

specific heat demand for heating = 13,27 kWh/m²a

sustainability diagram



energy diagram

1/ wood-fired boiler with heat exchanger
2/ electrical wiring
3/ main switchboard
4/ photovoltaic panels
5/ lighting
6/ inverter
7/ battery
8/ water supply line
9/ hot water tank
10/ underfloor heating
11/ appliances
12/ storage tank
13/ air handling unit
14/ negative pressure ventilation
15/ equal pressure ventilation

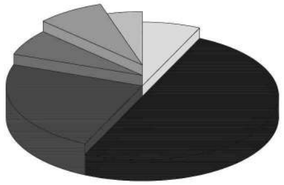
shading concept

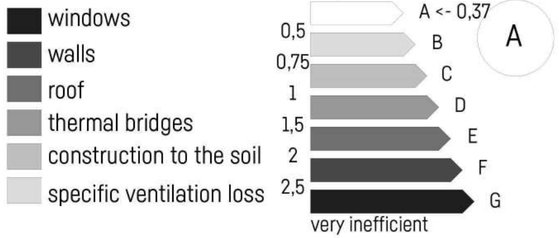
	construction	evaluated building				reference building	
		A_j [m²]	b [-]	U_j [W/(m²K)]	H_{Tj} [W/K]	$U_{N,j}$ [W/(m²K)]	$H_{T,ref,j}$ [W/K]
1	windows	366,2	1	0,62	227,0	1,5	549,3
2	exterior wall	863,08	1	0,11	84,9	0,3	258,9
3	floor on the ground	489,	0,8	0,07	27,4	0,45	176,0
4	roof	485,3	1	0,065	31,5	0,24	116,5
5	thermal bridges	2203,6	1	0,02	44,1	0,02	44,1
		2203,6			414,9		1144,8

Average heat transfer coefficient - evaluated building $U_{em} = H_{Tj}/A$ = 414,9/2203,6 = 0,19 W/[m²K]

Average heat transfer coefficient - reference building $U_{em,N} = H_{Tj,ref,j}/A$ = 1144,8/2203,6 = 0,52 W/[m2K]

CI = Uem/Uem,N = 0,19/0,52 = 0,365





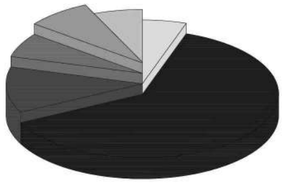
large capacity housing

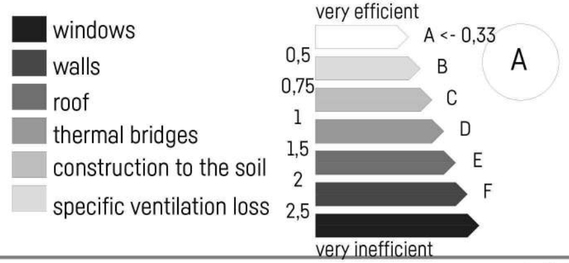
	construction	evaluated building				reference building	
		A_j [m²]	b [-]	U_j [W/(m²K)]	H_{Tj} [W/K]	$U_{N,j}$ [W/(m²K)]	$H_{T,ref,j}$ [W/K]
1	windows	485,2	1	0,62	300,8	1,5	549,3
2	exterior walls	562,3	1	0,11	56,7	0,3	168,7
3	ground wall	161,0	0,8	0,123	15,8	1,5	193,2
4	ground floor	493,0	0,8	0,07	27,6	0,45	177,5
5	roof	520,5	1	0,065	33,8	0,24	124,9
6	thermal bridges	2222	1	0,02	44,4	0,02	44,4
		2222			479,2		1436,6

Average heat transfer coefficient - evaluated building $U_{em} = H_{Tj}/A$ = 479,2/2222 = 0,21 W/[m²K]

Average heat transfer coefficient - reference building $U_{em,N} = H_{Tj,ref,j}/A$ = 1436,6/2222 = 0,65 W/[m2K]

CI = Uem/Uem,N = 0,2/0,65 = 0,331





private housing

calculation of HVAC pipe dimensions

input data:

- indoor temperature: 20 °C
- supply air quantity
  - residential rooms: 25 m^3
  - bathrooms: 90 m^3

Private housing:

Supply air

- $V_p = n \times V = 50 \times 25 = 1250\ m^3$

  V (supply air quantity) = 25 m^3
  n (amount of persons) = 50 persons

Air supply per 1 shaft

- $V_{pd} = V_p/n_s = 1250/2 = 625\ m^3$

  ns (amount of shafts) = 2

Air exhaust from sanitary facilities

- $V_k = a \times V_o = 6 \times 90 = 540\ m^3$

  a (amount of sanitary facilities) = 6
  V_o (amount of exhaust air) = 90 m^3

Air discharge from sanitary facilities per 1 shaft

- $V_{kd} = V_o/n_s = 540/2 = 270\ m^3$

  n_s (amount of shafts) = 2

Pipe dimensions

- $S = V/v = 625/(3600 \times 4{,}5) = 0{,}038\ m^2$
- $\pi r^2 = 0{,}038\ m^2$ -----> $r = 110{,}81$ mm

-----> we propose a pipe with a diameter of 225 mm

Commercial spaces - pub, retail:

HVAC for commercial spaces on the ground floor of the building HVAC for private housing will be designed separately and will have its own air handling unit. The piping will be installed in the ceilings.

Large-capacity housing:

Supply air

- $V_p = n \times V = 60 \times 25 = 1500\ m^3$

  V (supply air quantity) = 25 m^3
  n (amount of persons) = 60 persons

Air supply per 1 shaft

- $V_{pd} = V_p/n_s = 1500/2 = 750\ m^3$

  ns (amount of shafts) = 2

Air exhaust from sanitary facilities

- $V_k = a \times V_o = 9 \times 90 = 810\ m^3$

  a (amount of sanitary facilities) = 9
  V_o (amount of exhaust air) = 90 m^3

Air discharge from sanitary facilities per 1 shaft

- $V_{kd} = V_o/n_s = 810/2 = 405\ m^3$

  n_s (amount of shafts) = 2

Pipe dimensions

- $S = V/v = 750/(3600 \times 4{,}5) = 0{,}046\ m^2$
- $\pi r^2 = 0{,}046\ m^2$ -----> $r = 121{,}4$ mm

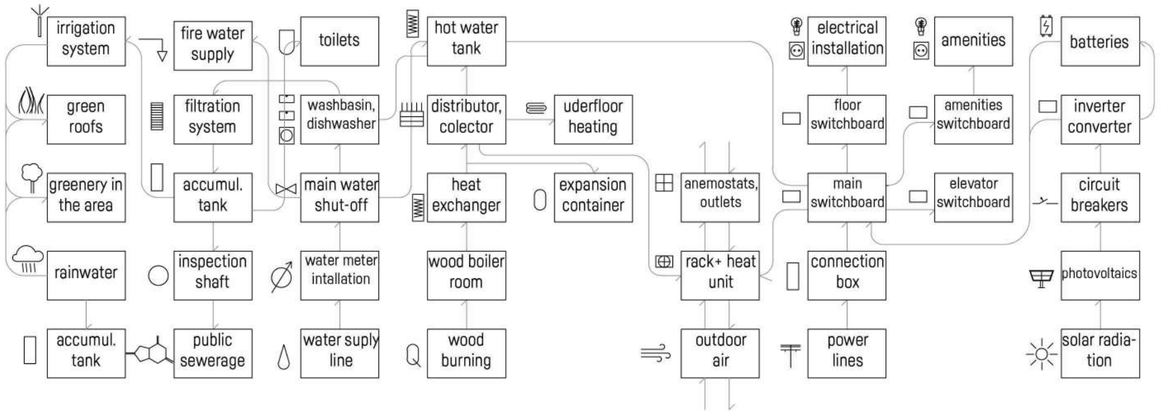
-----> we propose a pipe with a diameter of 250 mm

Collision:

As part of the design stage, we have proposed shafts in the capacity housing building that would not meet the space requirements for the HVAC and other utilities. Following this and more precise calculations of the dimensions of the HVAC pipes, we would proportionally enlarge the shafts so as not to compromise the layout principles, but also to achieve the necessary dimensions for the technical networks.

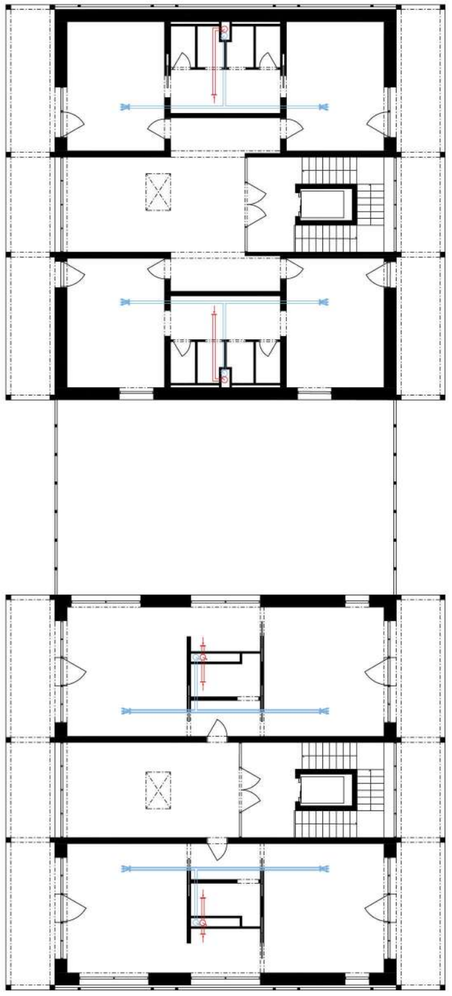
Fitness and reception

The spaces in the 1st floor of the large-capacity housing building will be designed in the same manner as the commercial spaces in the private housing building in terms of HVAC.
The 1st floor will have its own HVAC unit and the pipes will also be installed in the ceilings.

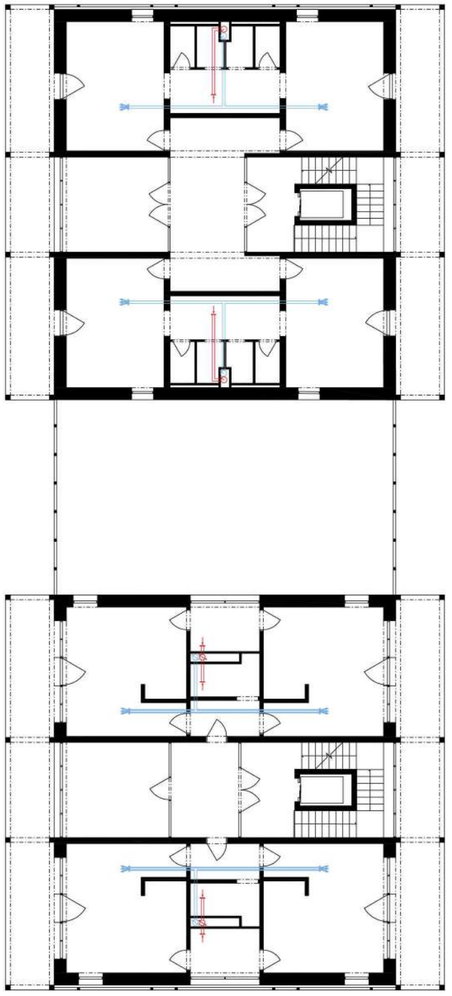


TBE diagram

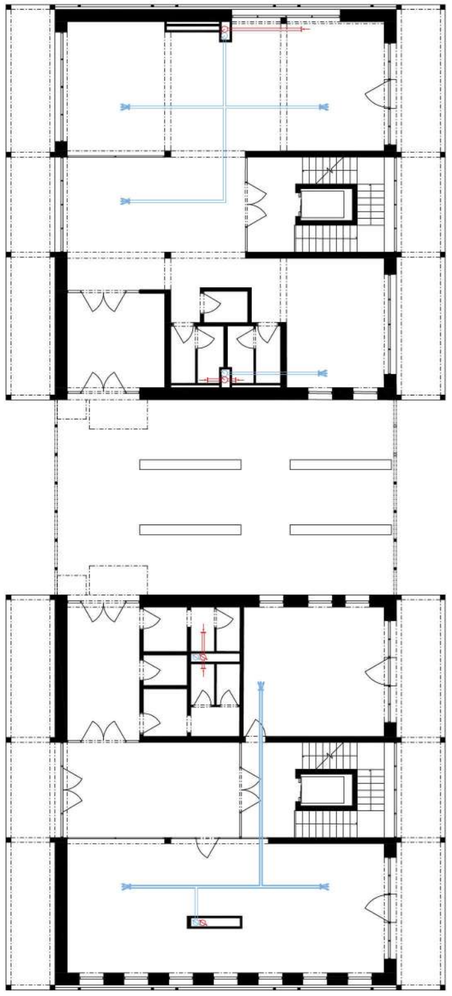
ENERGY SYSTEMS



4th floor



3rd floor



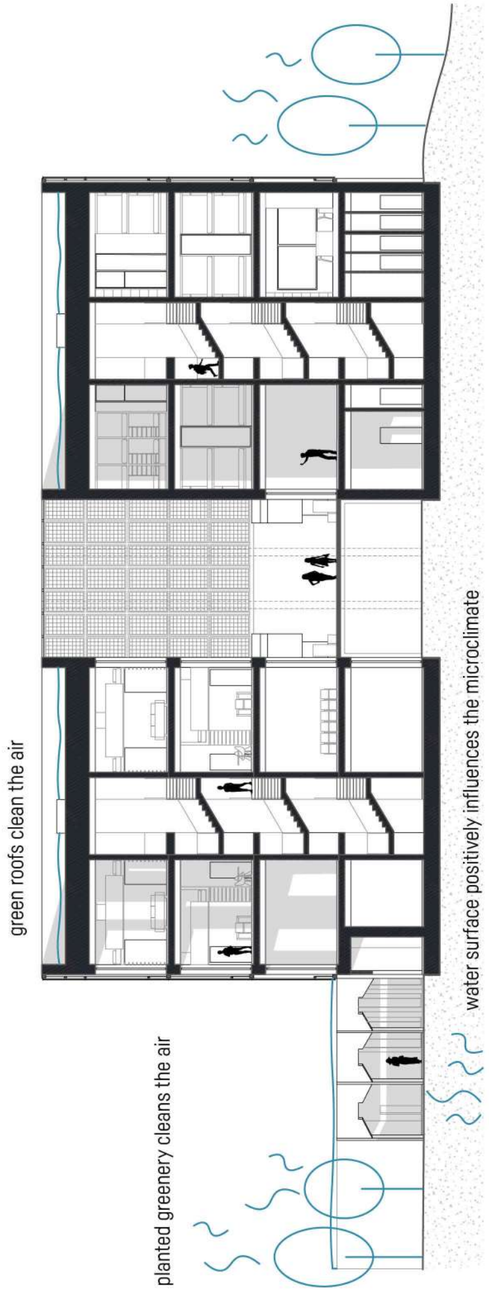
2nd floor

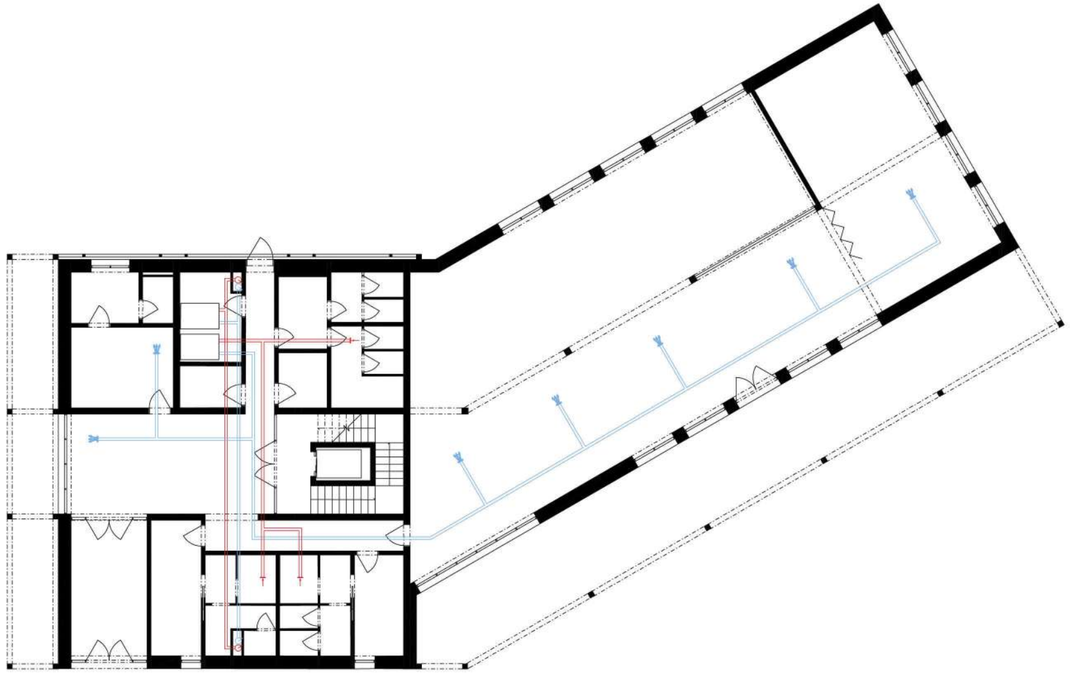
ENERGY SYSTEMS

HVAC routing diagram

1:200

0 2 6 12m





ENERGY SYSTEMS

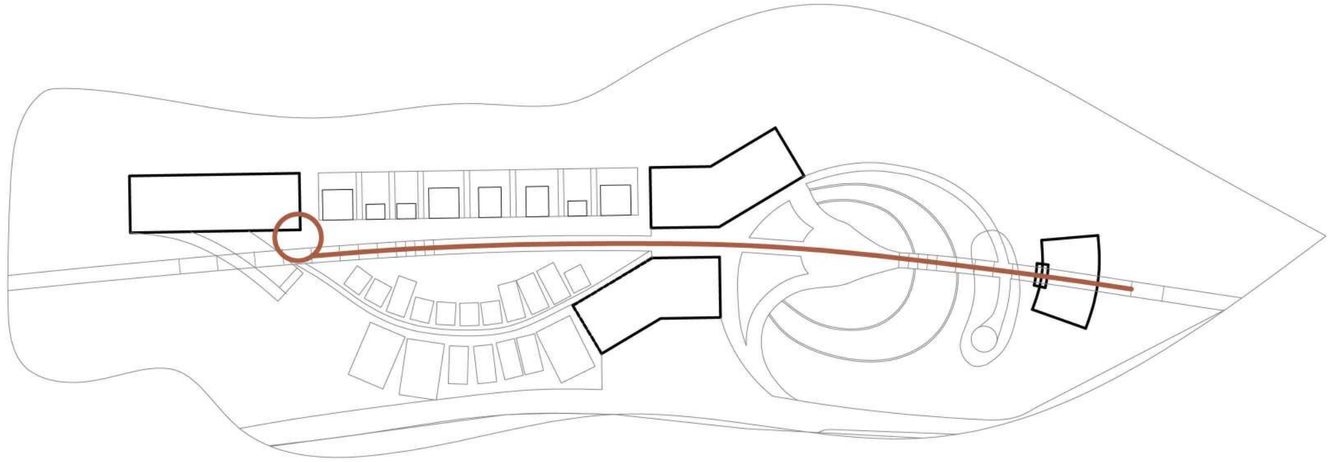
HVAC routing diagram

1:200

0 2 6 12m

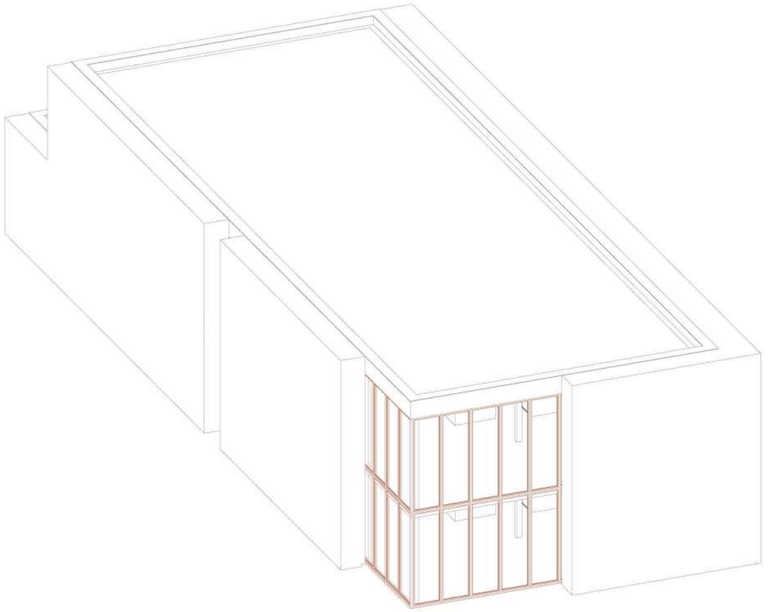
Residential area and the prototype village - Villefontaine, Nord-Iseré, France

the laboratory



closing of the compositional axis

- together with the substructure, it creates a ''funnel'' and visually closes the main pedestrian route
- the substructure supports the secondary urban axis, which is given by the expo sites
- the mass of the laboratory supports the main pedestrian route



landmark

- the corner of the laboratory is massively glazed to emphasise the orientation point on the main route
- the same façade material is used to maintain continuity in the area

building programme - laboratory:

1st underground floor

- technical facilities

- utility room	-	57,49 m²
- clean linen	-	33,34 m²
- dirty linen	-	33,34 m²
- storage	-	33,34 m²
- cleaning	-	26,85 m²

- zázemí campu

- corridor	-	80,08 m²
- staircase hall	-	20,69 m²
- restroom men	-	41,27 m²
- restroom women	-	41,27 m²

1st floor

- administration

- open space	-	170,78 m²
- small meeting room	-	16,74 m²
- large meeting room	-	20,79 m²
- office	-	11,57 m²

- entrance

- entrance	-	8,04 m²
- reception	-	61,48 m²
- reception facilities	-	11,58m²
- restroom men	-	15,16 m²
- restroom women	-	18,10 m²
- restroom for the disabled	-	5,96 m²
- cleaning	-	5,70 m²
- staircase hall	-	20,69 m²

- laboratory

- men's changing room	-	7,34 m²
- women's changing room	-	7,34 m²
- prototype area	-	89,98 m²
- laboratory	-	111,63 m²
- machine room	-	4,93 m² (4x)

2NP

- administration

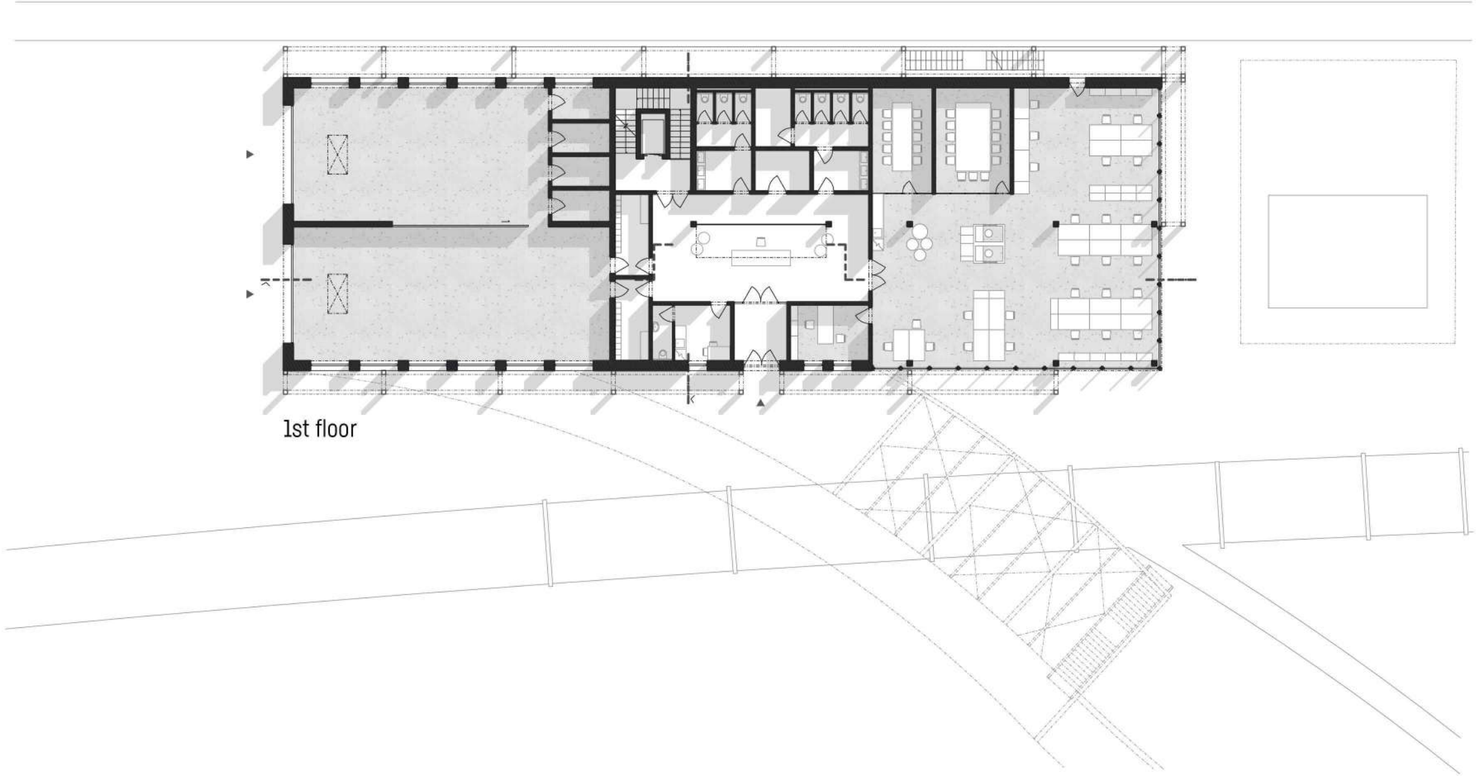
- open space	-	170,78 m²
- small meeting room	-	16,74 m²
- large meeting room	-	20,79 m²
- office	-	11,57 m²

- lounge area

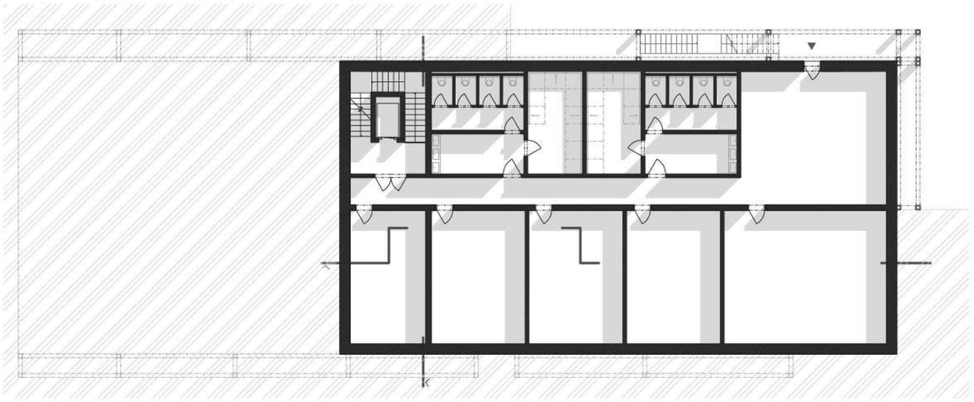
- atrium	-	60,70 m²
- kitchen area	-	26,63 m²
- men's restroom	-	15,16 m²
- women's restroom	-	18,10 m²
- restroom for the disabled	-	5,96 m²
- cleaning	-	5,70 m²
- staircase hall	-	20,69 m²

- multifunctional hall

- flexible space	-	146,33 m²
- audio control room	-	7,76 m²
- storage	-	7,69 m²



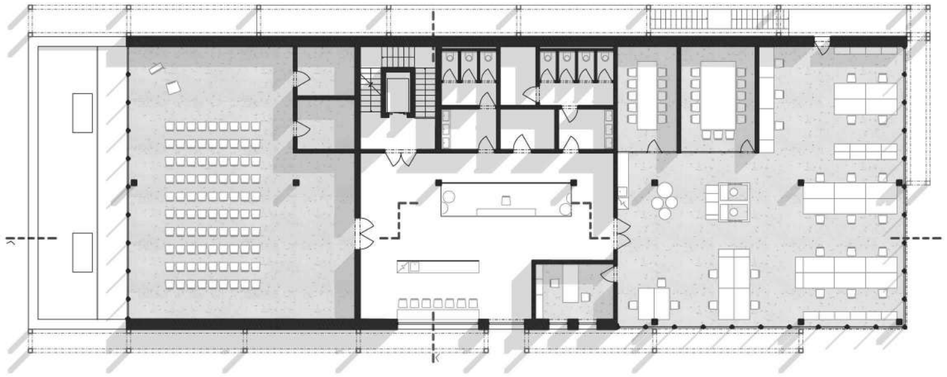
1st floor



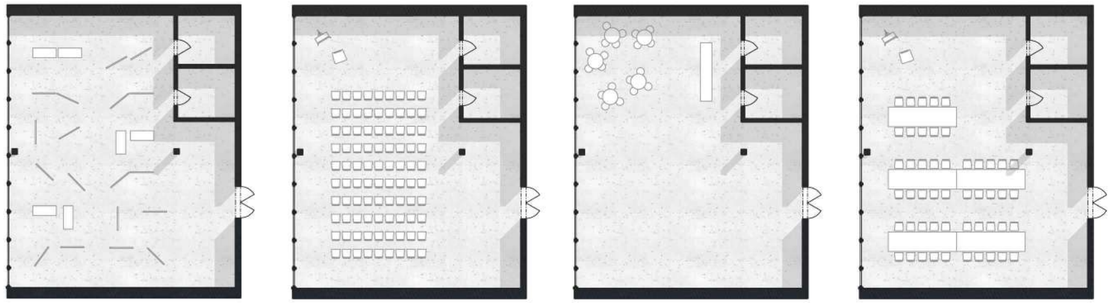
1st underground floor

1:250

0 2,5 7,5 15 m



2nd floor

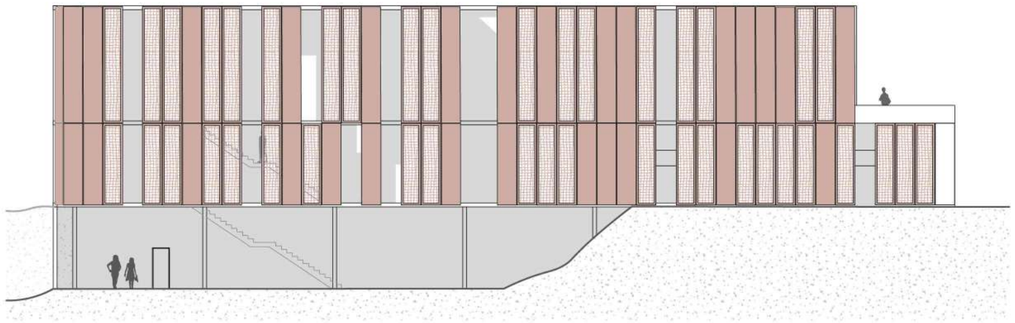


options of the multipurpose hall

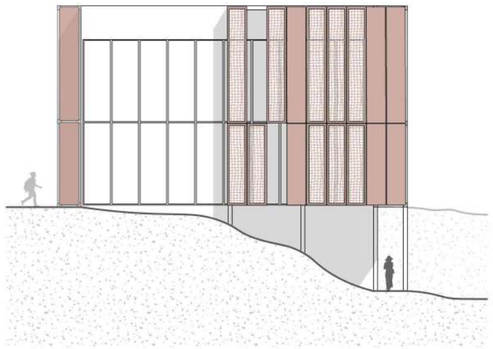
2nd floor and optionst of the multipurpose room

1:250

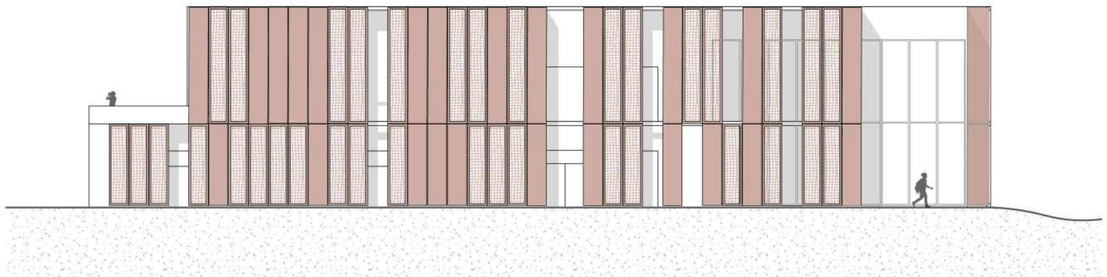
0 2,5 7,5 15 m



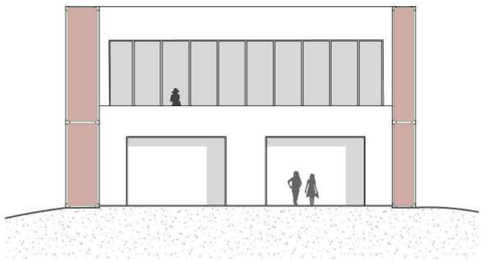
elevation north



elevation east



elevation south

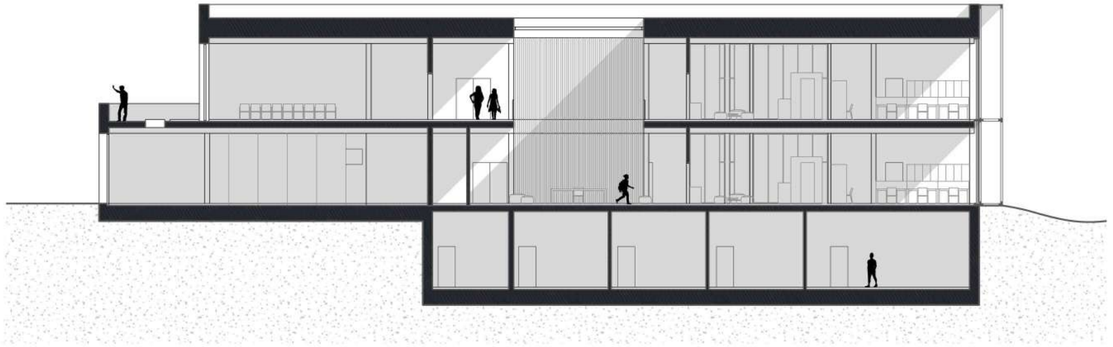


elevation west

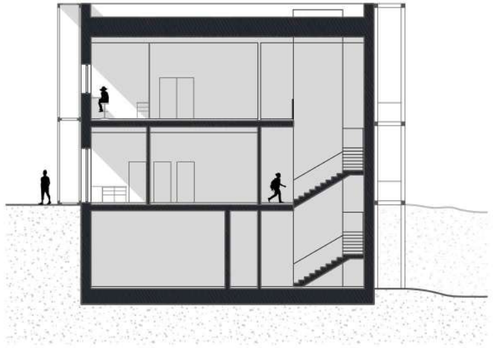
elevations

1:250

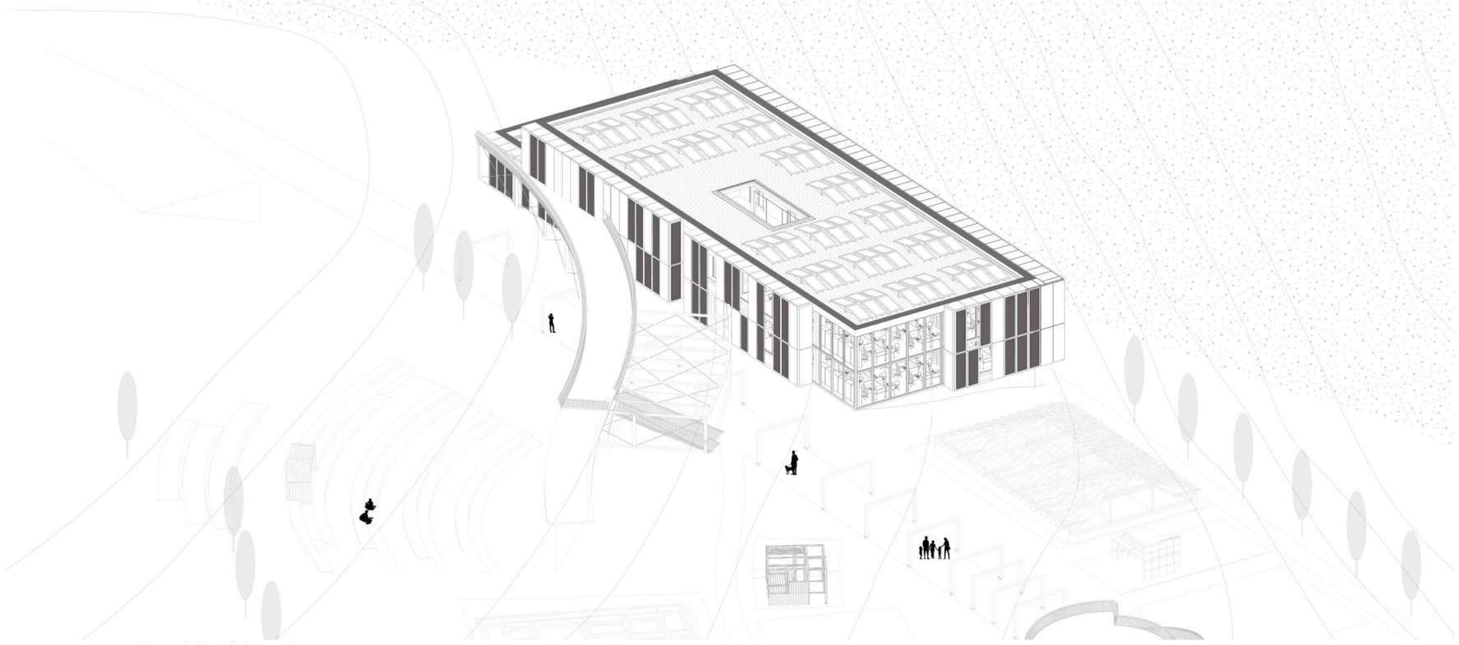
0 2,5 7,5 15 m



section A-A‘



section B-B’

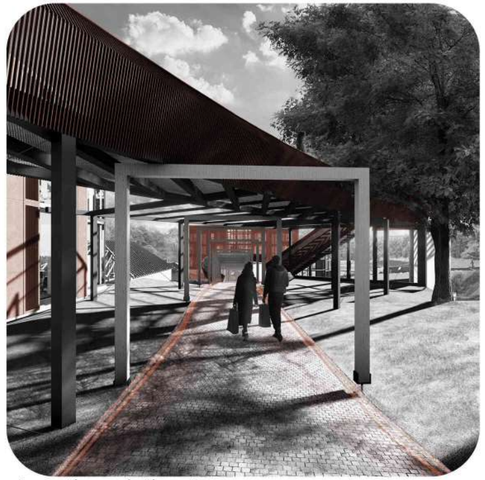


axonometry of the laboratory

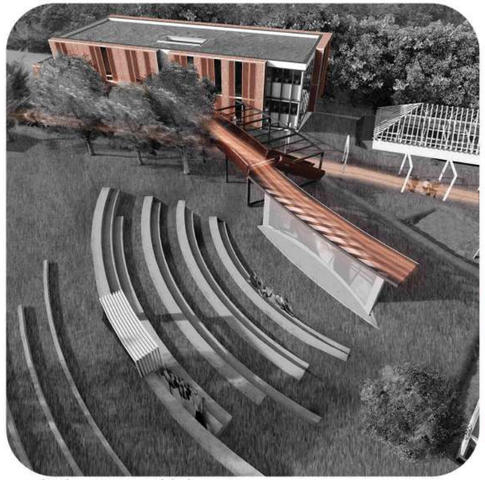
sections

1:250

0 2,5 7,5 15 m



viwes through the site



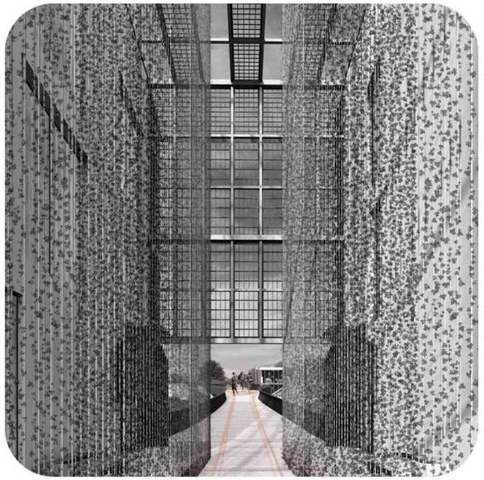
amphitheatre and laboratory

observation deck

residential building

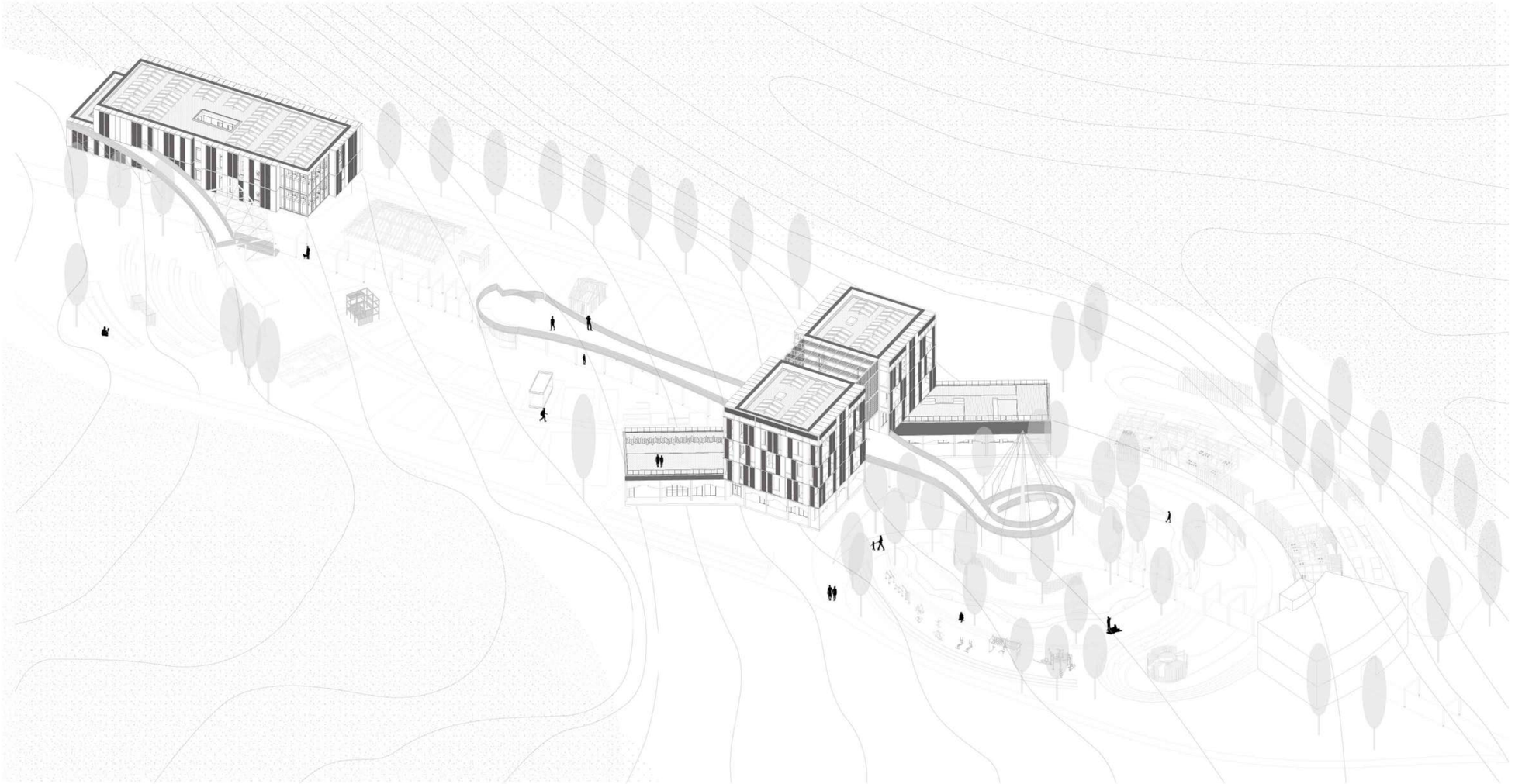
tranquil route

pylon - dominant feature



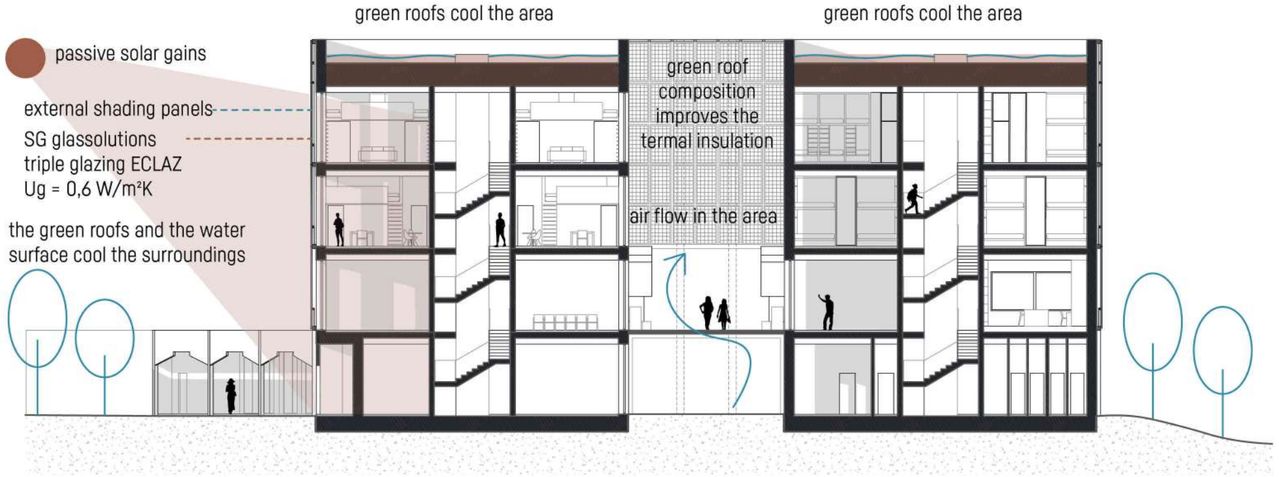
atrium

greenhouse



Residential area and the prototype village - Villefontaine, Nord-Iseré, France

strategies - Villefontaine



large capacity housing

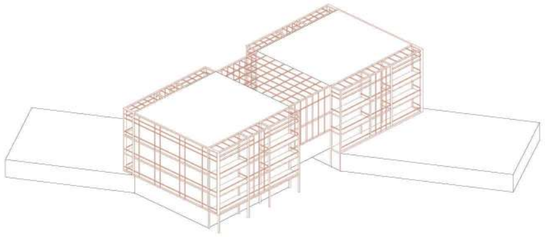
U_{em} = 0,19 W/[m²K]

specific heat demand for heating = 11,81 kWh/m²a

private housing

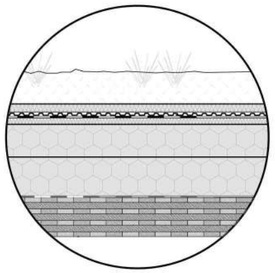
U_{em} = 0,22 W/[m²K]

specific heat demand for heating = 13,27 kWh/m²a



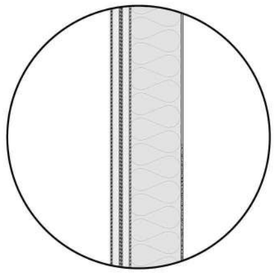
achieving the passive standard values

reducing linear thermal bridges through the use of stand-alone balcony construction



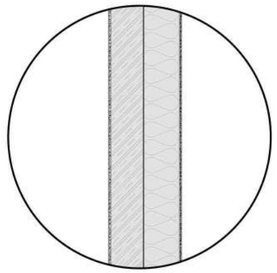
roof

U = 0,065 W/[m²K]



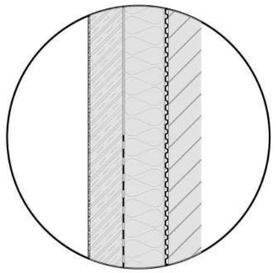
exterior wall 1

U = 0,089 W/[m²K]



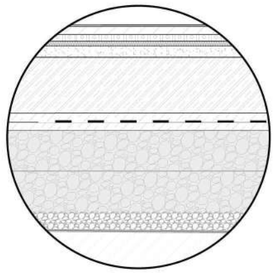
exterior wall 2

U = 0,131 W/[m²K]



ground wall

U = 0,123 W/[m²K]



ground floor

U = 0,07 W/[m²K]

isover SAINT-GOBAIN

glassolutions SAINT-GOBAIN

strategies to achieve the thermal comfort

SGG STADIP® SILENCE
for interior glass
partitions

Acoustic ceilings
Ecophon Focus™
Ecophon Solo™
supplemented with
ISOVER mineral
insulation

Exterior wall
Isover EPS Grey Wall Sun
Protect mineral insulation, CLT
Rw = 51 dB

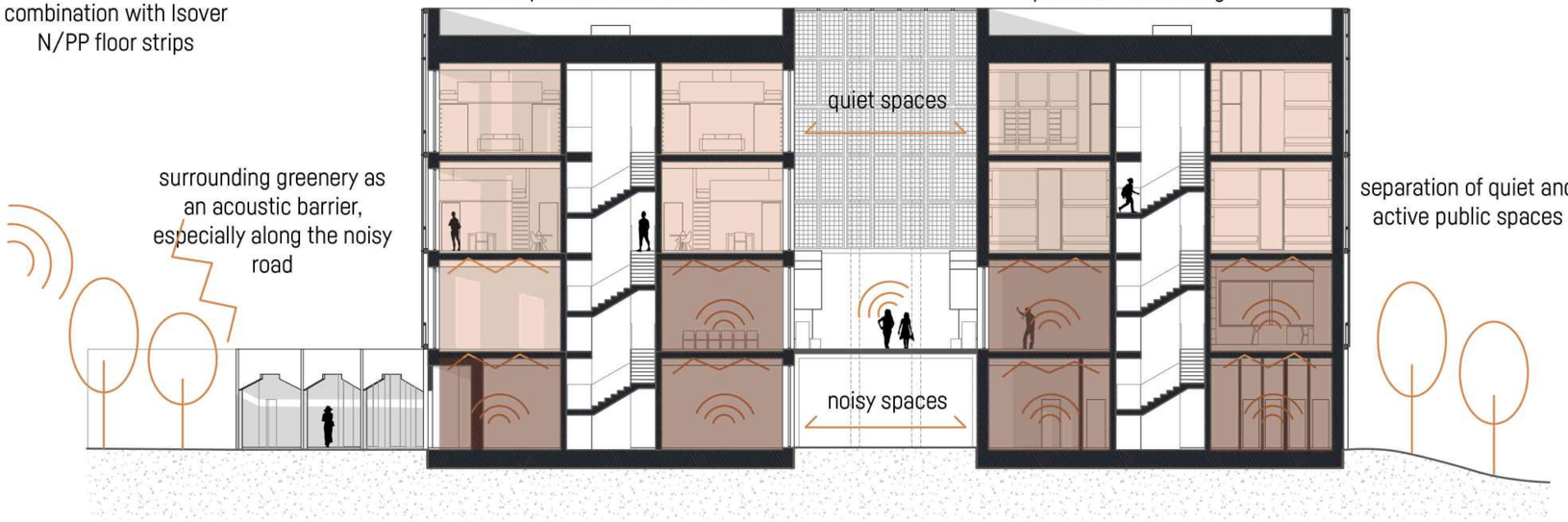
Apartment partitions
CLT, Rigips RF SDK, ISOVER
PIANO mineral insulation
Rw = 60 dB

Soundproofing in stairwell areas with
Schöck Tronsole products,
soundproofing is ensured by reinforced
concrete walls

Soundproofing with 50
mm Isover T-P boards in
combination with Isover
N/PP floor strips

separation of large-capacity rooms
and private acomodations

separation of quiet and noisy
spaces in the building



surrounding greenery as
an acoustic barrier,
especially along the noisy
road

separation of quiet and
active public spaces

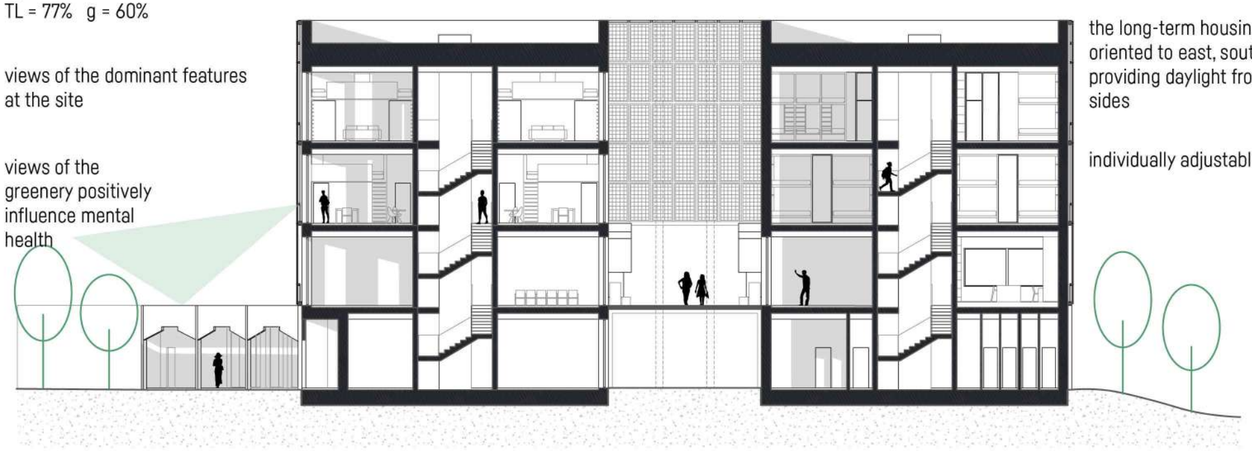
rigips
SAINT-GOBAIN

ecophon
SAINT-GOBAIN

SG glassolutions
triple glazing ECLAZ with high
light transmition
TL = 77% g = 60%

views of the dominant features
at the site

views of the
greenery positively
influence mental
health

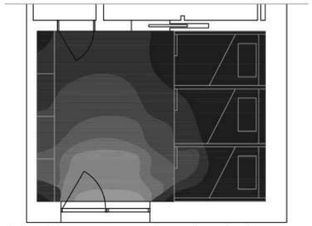


the long-term housing is
oriented to east, south & west,
providing daylight from three
sides

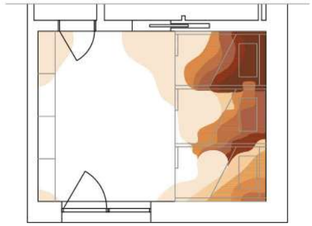
individually adjustable shading

6-bed room north - unshaded

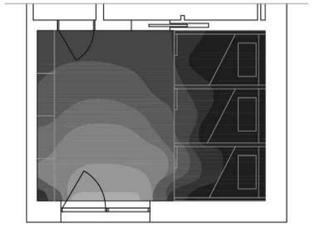
daylight



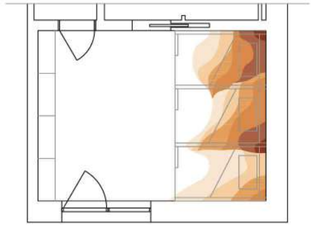
autonomy - avg. 79,9 %



6-bed room north - shaded
daylight

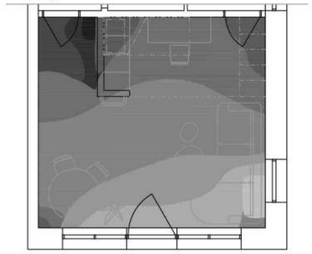


autonomy - avg. 73,4 %

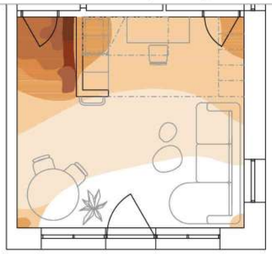


single room north - unshaded

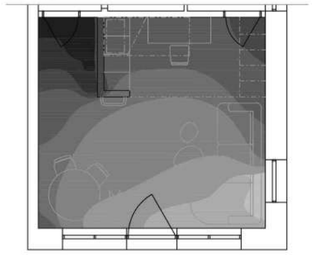
daylight



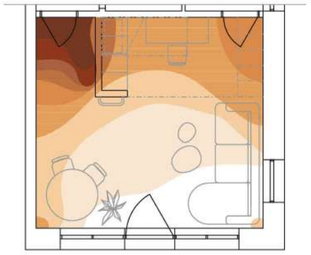
autonomy - avg. 72,3 %

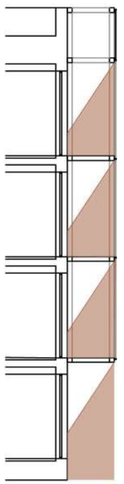


single room north - shaded
daylight

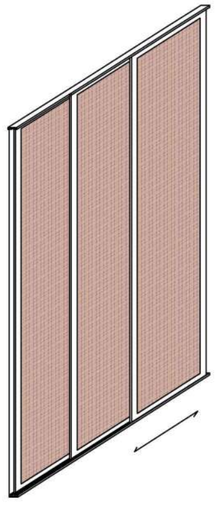


autonomy - avg. 65,3 %



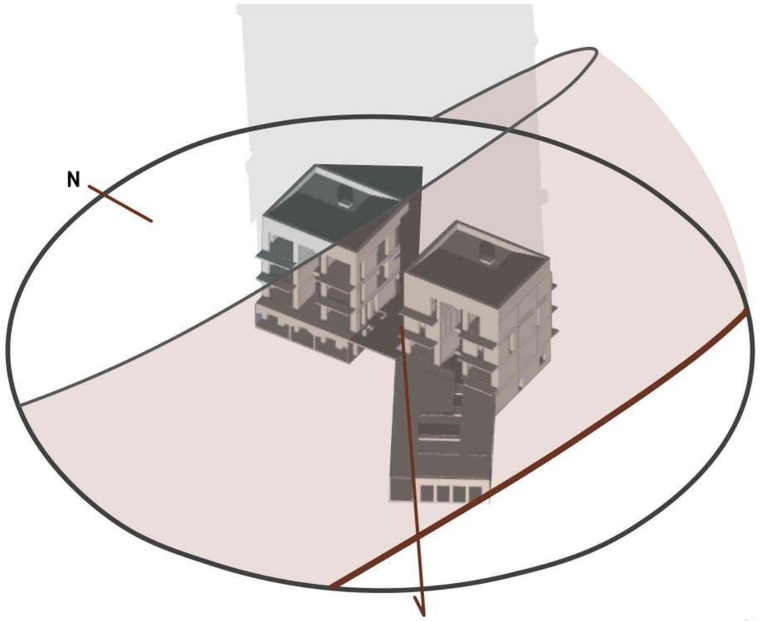


schématický řez
- stínění balkóny



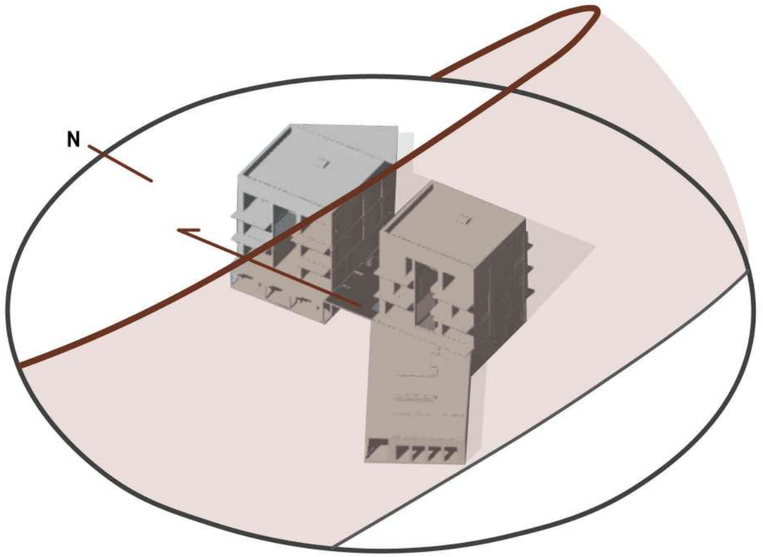
3D schéma panelů
- variabilní stínění posuvnými panely

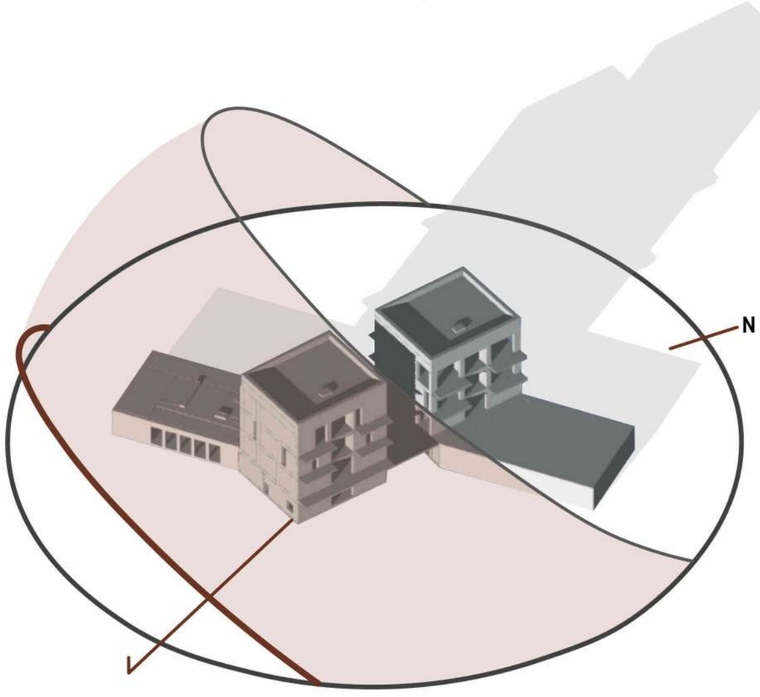
glassolutions
SAINT-GOBAIN



winter solstice

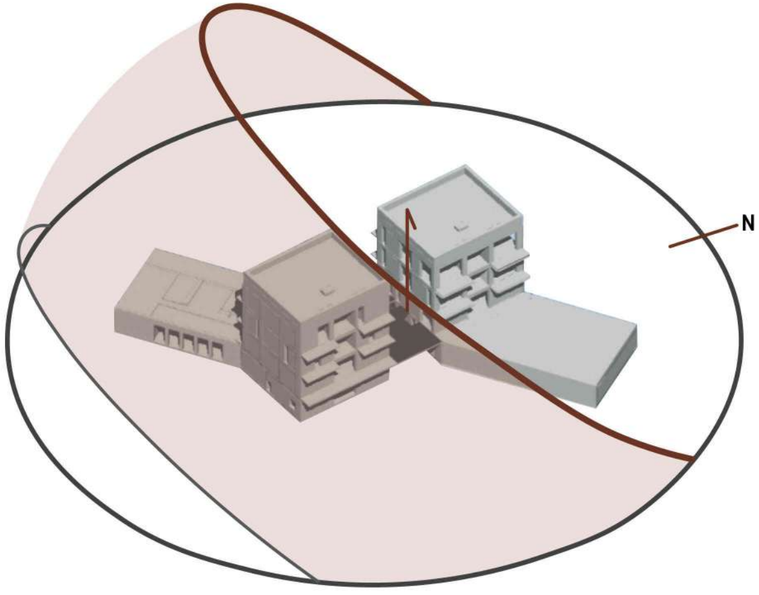
9:00 15:00





summer solstice

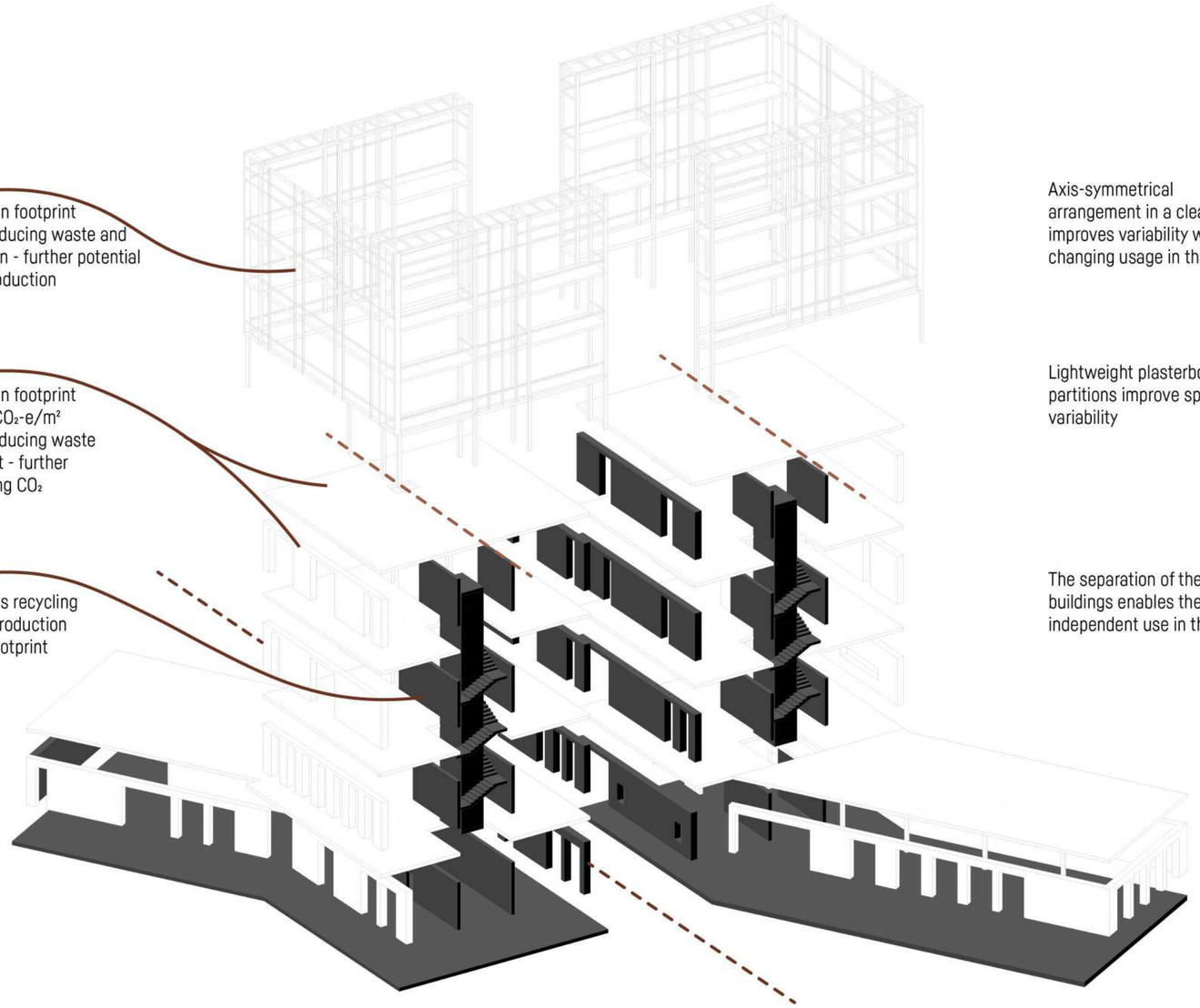
9:00 15:00



GLULAM beams
- timber - low carbon footprint
- prefabrication - reducing waste and easier transportation - further potential for reducing CO_2 production

CLT panels
- timber - low carbon footprint
- Stora Enso 19 kg CO_2-e/m²
- prefabrication - reducing waste and easier transport - further potential for reducing CO_2 production

REBETONG
- construction debris recycling
- reduction of CO_2 production
- reduced carbon footprint



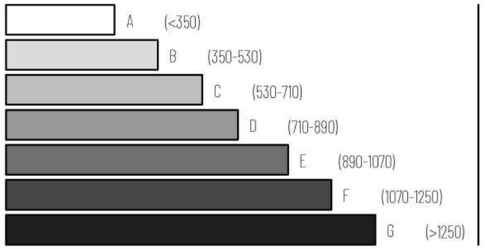
Axis-symmetrical arrangement in a clear grid improves variability when changing usage in the future

Lightweight plasterboard partitions improve space variability

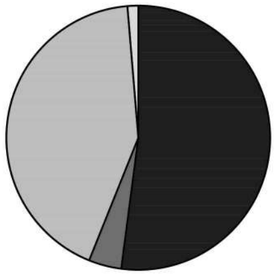
The separation of the buildings enables their independent use in the future

Cradle to grave

kg CO_2e/m^2

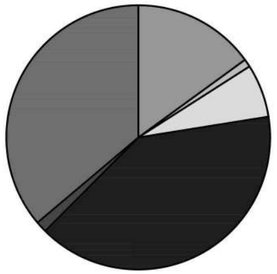


Množství zabudovaného uhlíku

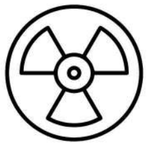


A1 - A3 Materiály	-	52%
A4 Transport	-	4%
B4-B5 Výměna	-	43%
C2 Odvoz odpadu	-	1%

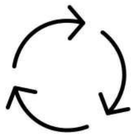
Množství uhlíku v průběhu životního cyklu stavby



B4 - B5 Výměna	-	40%
C1 Demolice	-	1%
C3 Zpracování bioodpadu	-	36%
A1 - A3 Materiály	-	15%
A4 Doprava	-	1%
A5 Výstavba	-	7%



no hazardous materials

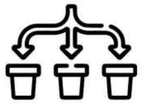


recycled & recyclable materials

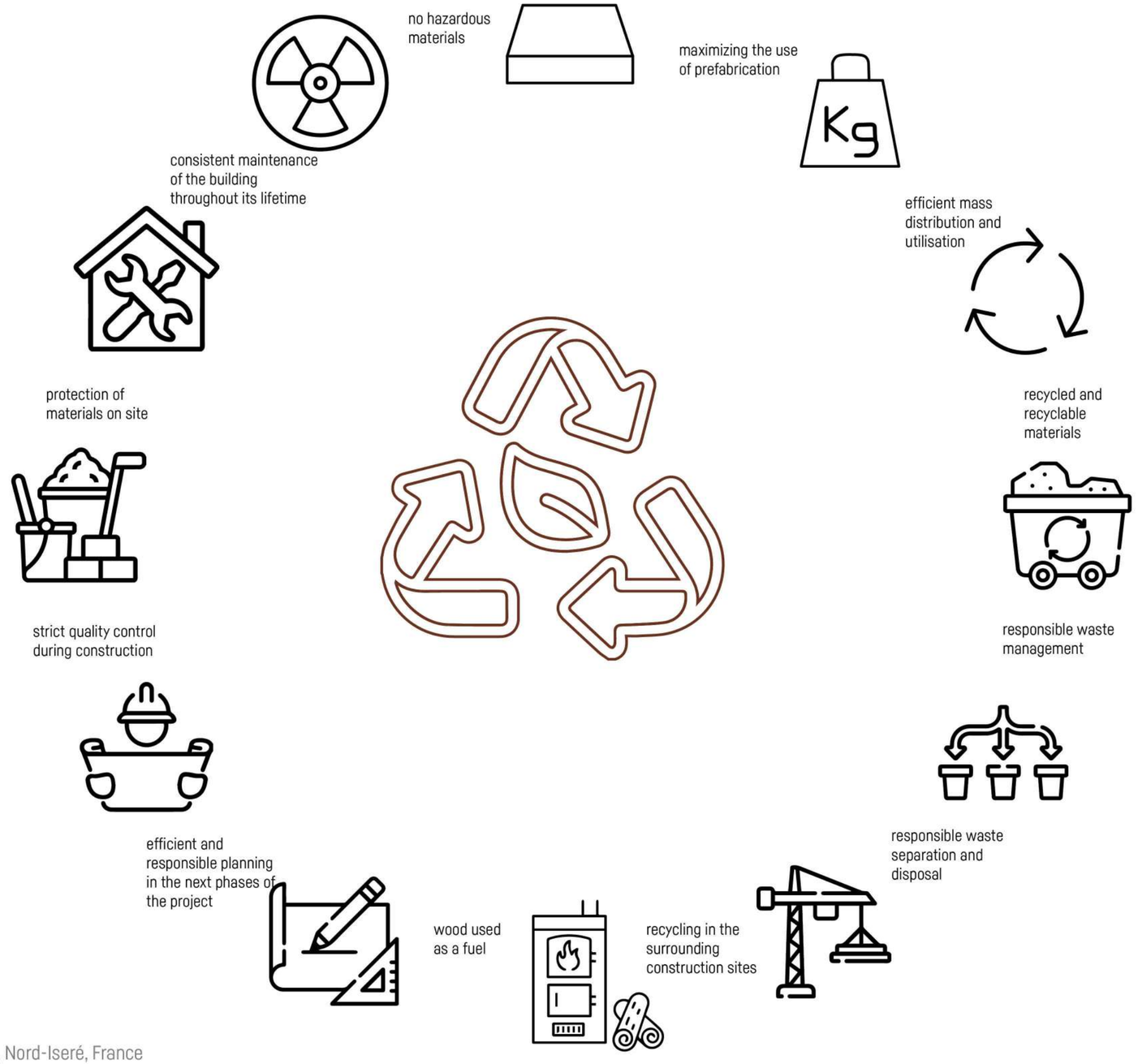
responsible waste management

recycling in the surrounding construction sites

responsible waste separation and disposal



wood reused as a fuel



strategies to minimise construction waste

ISOVER FLORA
global warming potential **4,01** kg CO_2equiv/FU

ISOVER AKU
global warming potential **4,97** kg CO_2equiv/FU
consumption of non-renewable resources **42,49** MJ/FU
energy consumption **57,67** MJ/FU
water consumption **0,015** m^3/FU
waste generation **5,28** kg/FU

ISOVER N
global warming potential **2,66** kg CO_2equiv/FU

ISOVER EPS 200
global warming potential **8,67** kg CO_2equiv/FU
consumption of non-renewable resources **241,77** MJ/FU
energy consumption **263** MJ/FU
water consumption **0,00** m^3/FU
waste generation **0,31** kg/FU

RIGIPS RF
global warming potential **3,66** kg CO_2equiv/FU
consumption of non-renewable resources **51** MJ/FU
energy consumption **57** MJ/FU
water consumption **0,025** m^3/FU
waste generation **12,3** kg/FU

EPD VERIFIED

ISOVER TF
global warming potential **24,11** kg CO_2equiv/FU
consumption of non-renewable resources **225,55** MJ/FU
energy consumption **291,55** MJ/FU
water consumption **0,077** m^3/FU
waste generation **25,29** kg/FU

ISOVER EPS GREYWALL SUN PROTECT
global warming potential **9,45** kg CO_2equiv/FU
consumption of non-renewable resources **203,57** MJ/FU
energy consumption **226,42** MJ/FU
water consumption **0,0** m^3/FU
waste generation **0,23** kg/FU

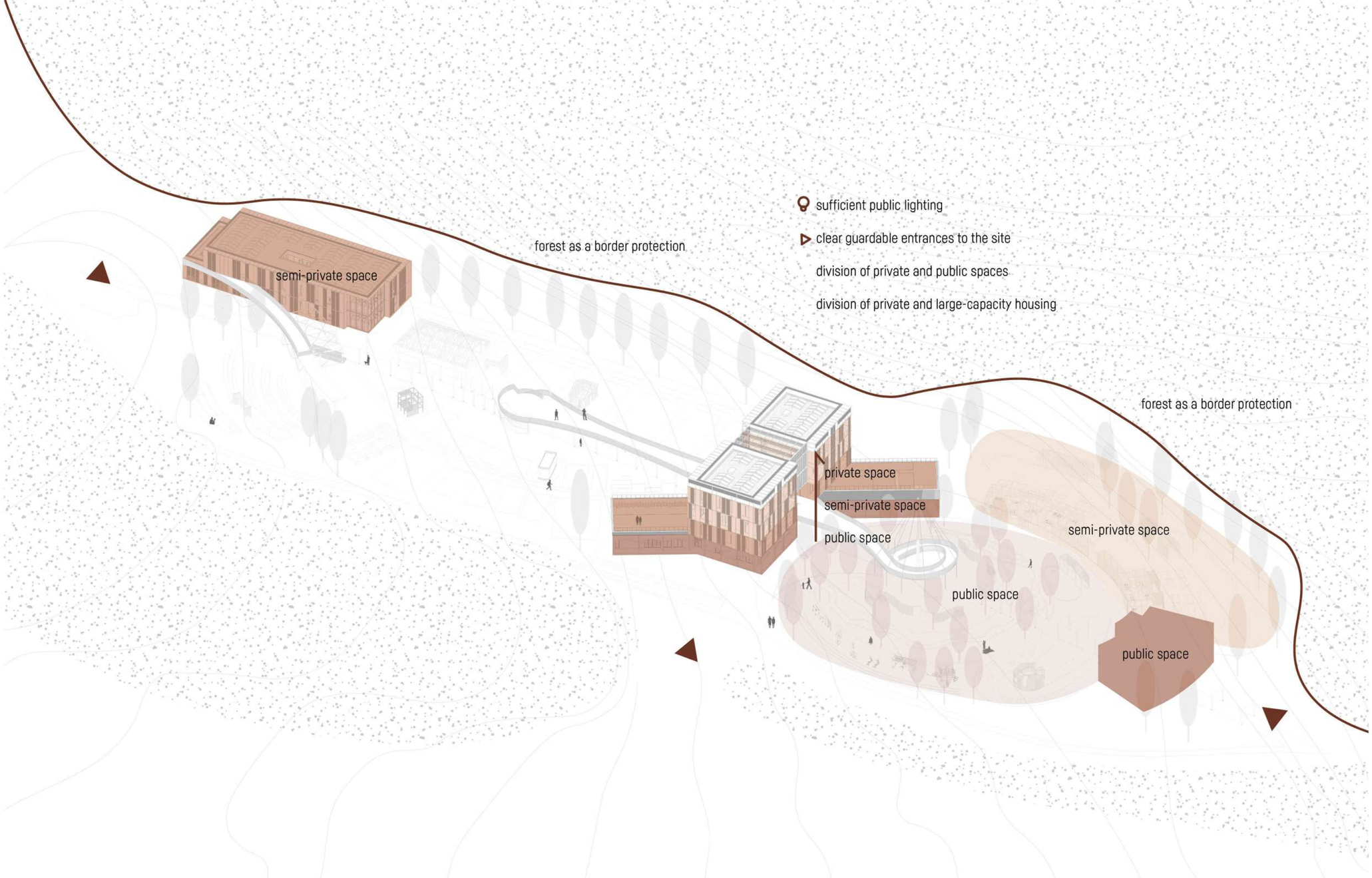
ISOVER EPS GREYWALL SUN PROTECT
global warming potential **9,45** kg CO_2equiv/FU
consumption of non-renewable resources **203,57** MJ/FU
energy consumption **226,42** MJ/FU
water consumption **0,0** m^3/FU
waste generation **0,23** kg/FU

REBETONG
STORA ENSO CLT
STORA ENSO LVL
NOVATOP SOLID

glassolutions SAINT-GOBAIN
rigips SAINT-GOBAIN
ecophon SAINT-GOBAIN
isover SAINT-GOBAIN
weber SAINT-GOBAIN

ENERGY SYSTEMS

EPD documents



Residential area and the prototype village - Villefontaine, Nord-Iseré, France

strategies for security, social comfort and privacy

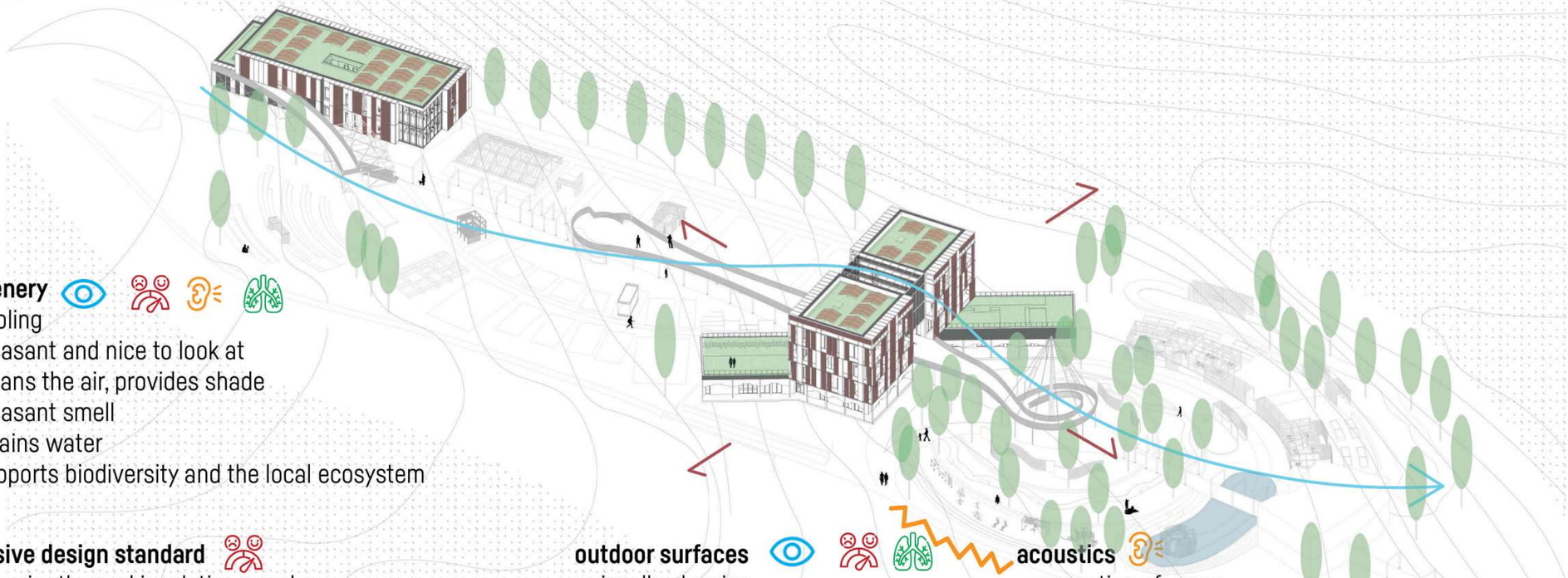
complex design with attention to the details

SEE - FEEL - HEAR - BREATHE | Saint-Gobain multi-comfort building

fight against overheating
- shading with variable panels
- shading with balconies
- greenery
- thermal accumulation of reinforced concrete
- corridor for ventilation of the area
- green roofs
- water

technical solution
- solar energy - PV (use of facade and roof for the installation),
- use of heat from the school's timber waste
- reuse of grey and rain water
- HVAC with heat recovery
- energy saving lighting

materials
- wood where possible
  - visually pleasing
  - prefabrication
  - eco-friendly
  - pleasant to the touch
  - reusable
- concrete
  - recycled aggregate
  - recyclable material



greenery
- cooling
- pleasant and nice to look at
- cleans the air, provides shade
- pleasant smell
- retains water
- supports biodiversity and the local ecosystem

passive design standard
- superior thermal insulation envelope,
- thermal accumulation
- green roofs
- passive solar gains in winter
- reduction of thermal bridges (stand-alone constructions)
- optimised window openings and variable shading
- orientation to the cardinal points

outdoor surfaces
- visually pleasing
- water permeable
- no heat build-up
- no dust

acoustics
- separation of zones
- soundproofing
- acoustic insulation
- road noise reduction

glassolutions SAINT-GOBAIN

rigips SAINT-GOBAIN

ecophon SAINT-GOBAIN

isover SAINT-GOBAIN

weber SAINT-GOBAIN

ENERGY SYSTEMS

sustainability

authors: Jan Lefner & Marta Storkanova p.78

renovation in Chimilin

building program - Chimilin:

1st underground floor

- archive	-	67,6 m²

1st floor

- entrance hall	-	17,13 m²
- women's restroom	-	6,78 m²
- common room	-	41,93 m²
- common room	-	52,00 m²
- common room	-	52,00 m²
- outdoor screening room	-	29,60 m²
- vertical communication	-	19,68 m²

2nd floor

- footbridge	-	38,35 m²
- vestibule	-	52,00 m²
- hall	-	11,33 m²
- restroom	-	12,03 m²
- multipurpose room	-	41,93 m²
- common room	-	52,00 m²
- balcony	-	11,92 m²

attic

- playground	-	57,72 m²
- club room	-	36,32 m²

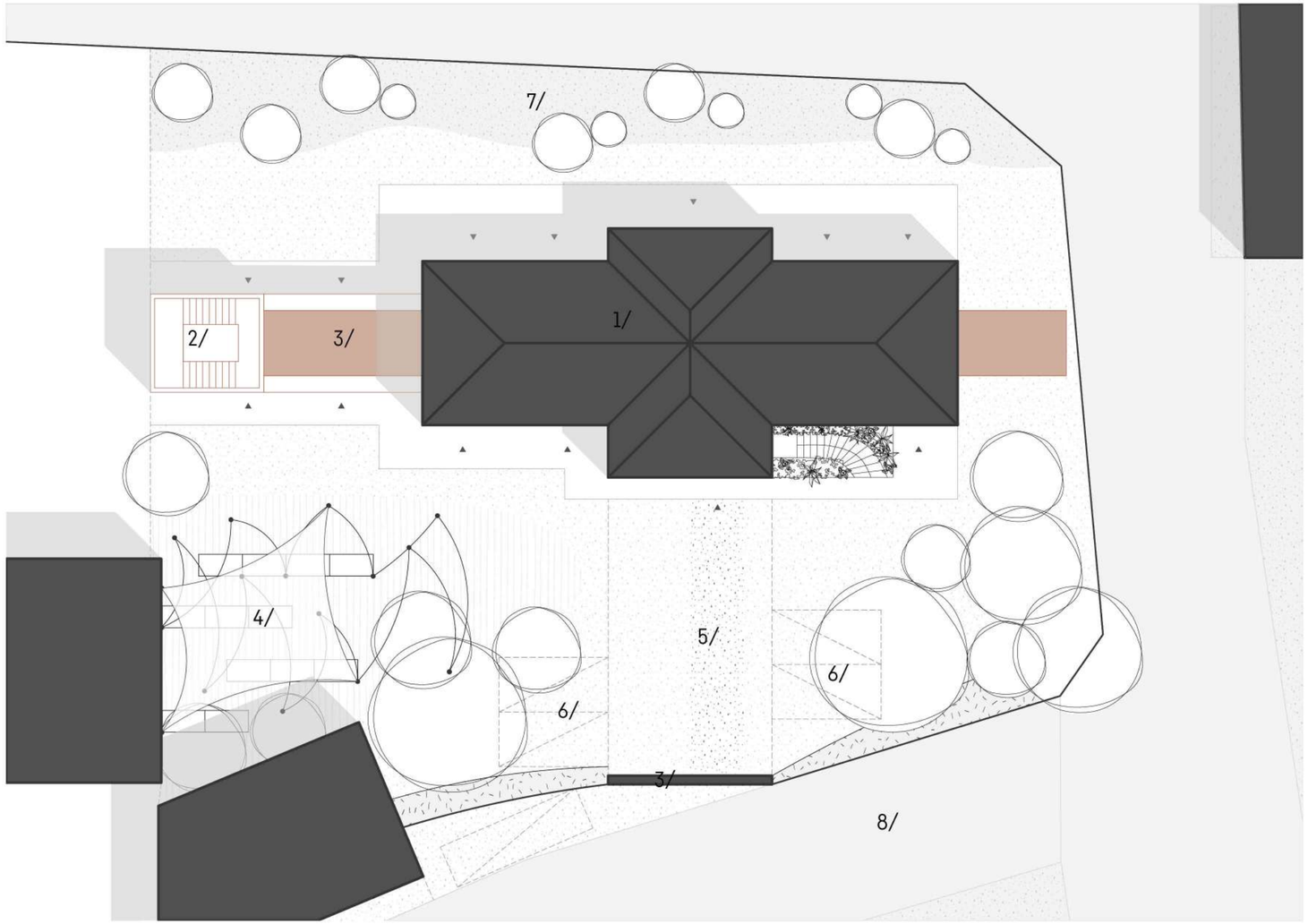
site analysis

1:1500

0 15 45 90 m

Renovation of the old school building - Chimilin, Nord-Iseré, France

Faculty of Civil Engineering, CTU in Prague 2025



1/ existing school building
2/ vertical communication
3/ footbridge
4/ outdoor seating
5/ access road
6/ parking
7/ garden
8/ asphalt road

masterplan

1:200

0 2 6 12 m

support for compositional sightlines

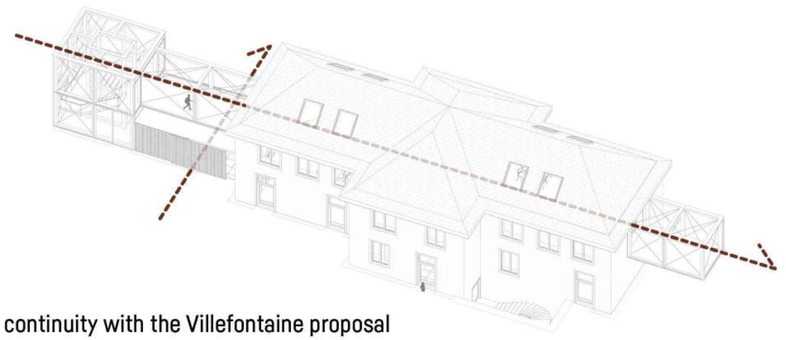
- as in Villefontaine, we support sightlines using frames across the entire building

operational independence

- replacement of non-compliant veritcal communication
- uninterrupted operations on different floors
- dominant feature of the site

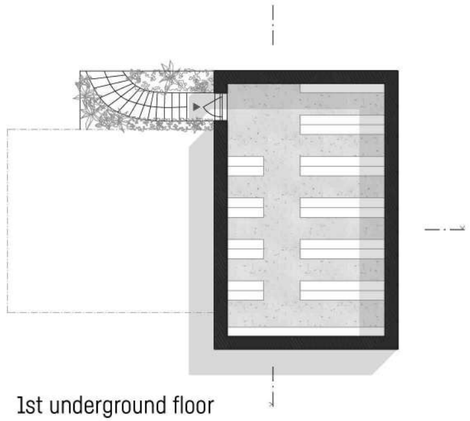
views of the landscape

- the glass footbridge provides a view of the chimilin skyline

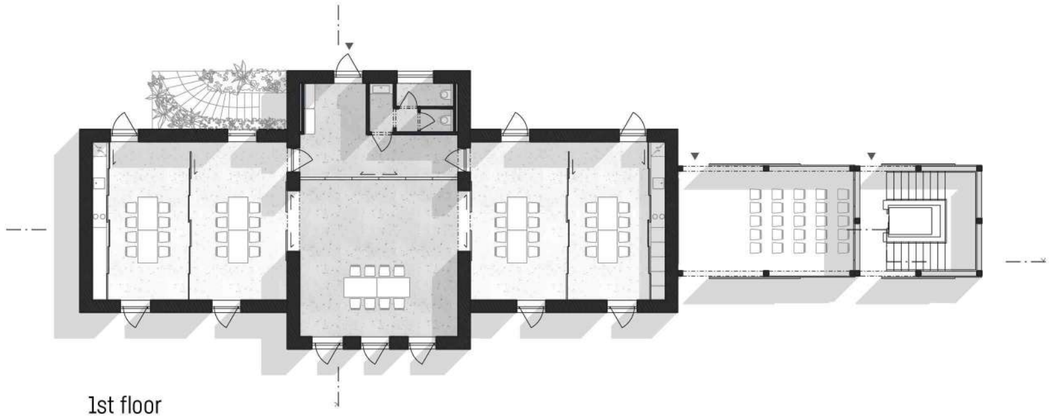


continuity with the Villefontaine proposal

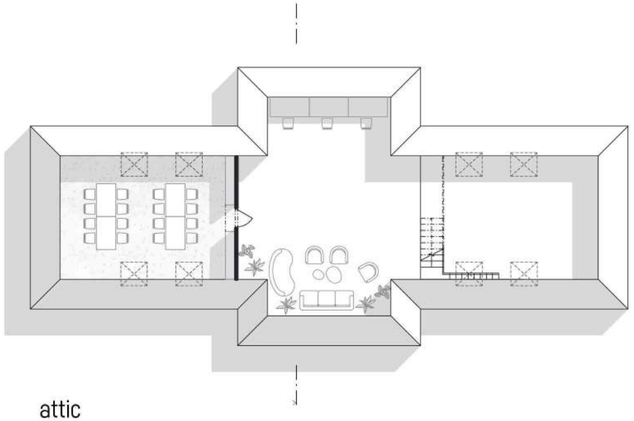
- the compositional sightlines through the building are a link to the Villefontaine's urban design concept



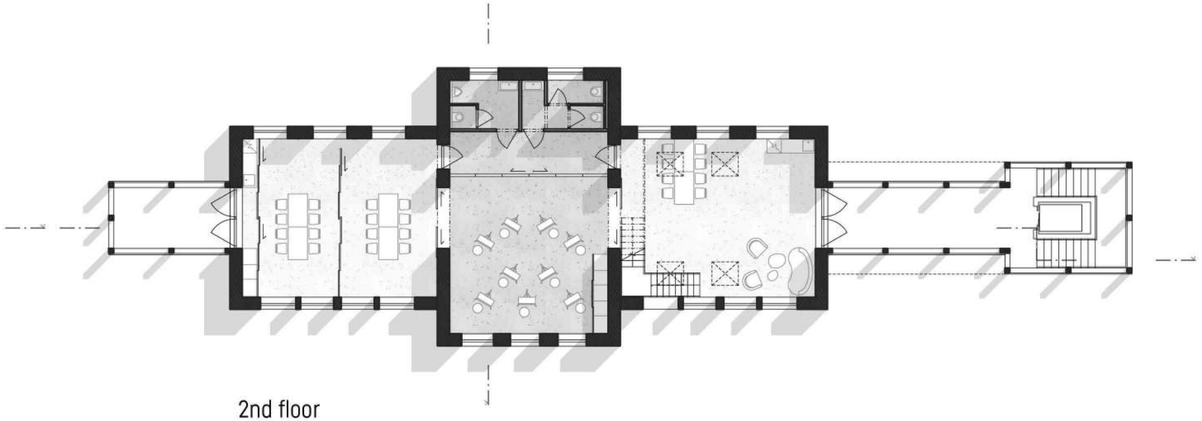
1st underground floor



1st floor



attic



2nd floor

floor plans

1:200

0 2 6 12 m

section B-B'

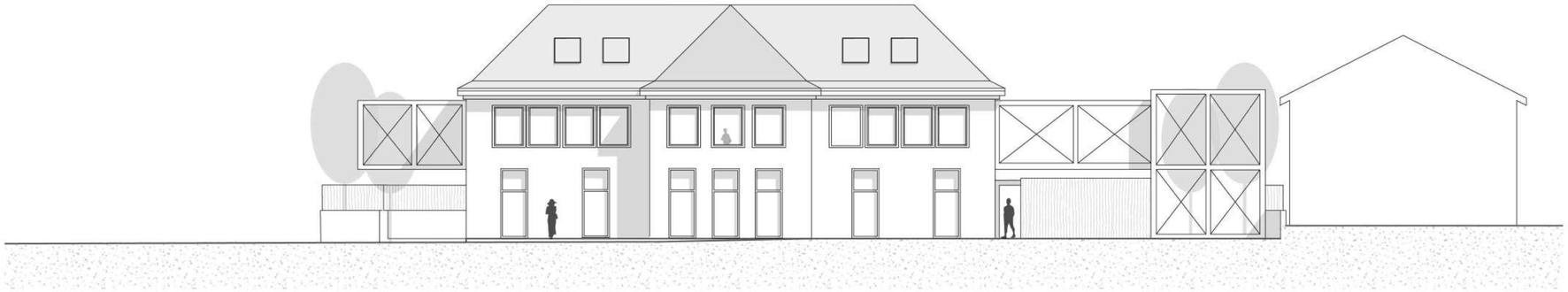
section A-A'

sections

1:200

0 2 6 12 m

elevation south

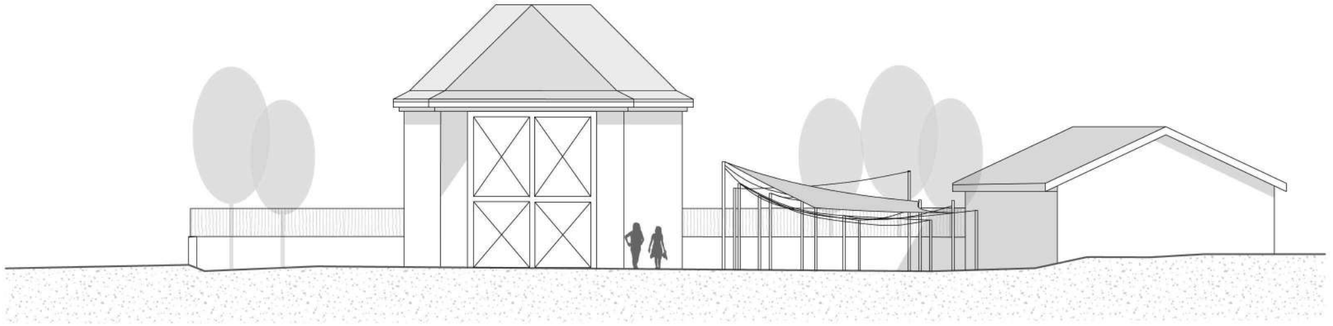


elevation north

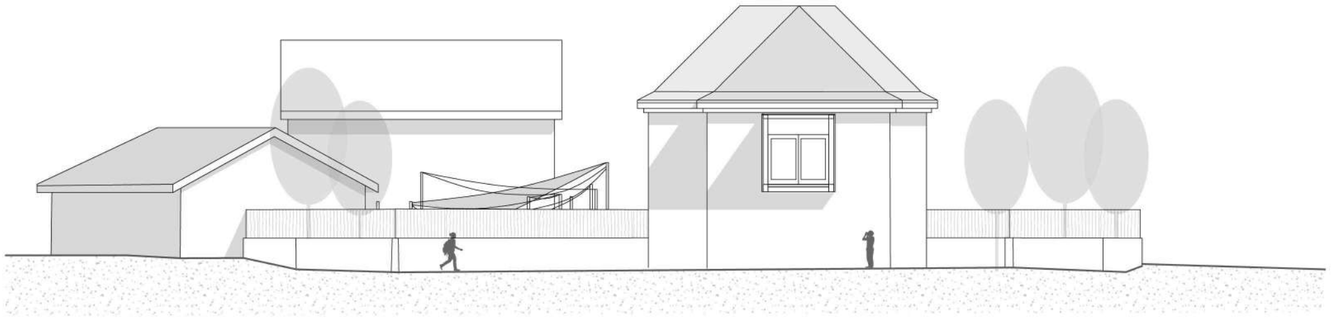
elevations

1:200

0 2 6 12 m



elevation west

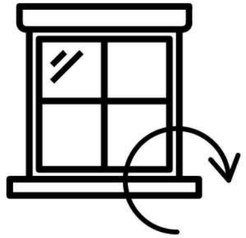


elevation east

elevations

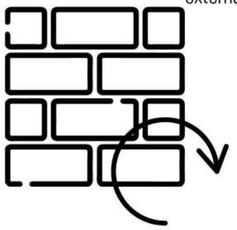
1:200

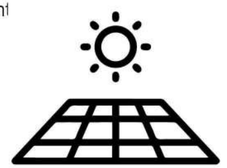
0 2 6 12 m



Construction waste usage
- grinding of waste masonry and tiles and using them for external surfaces

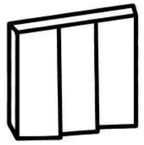
reduction of energy consumption
- windows replacement





construction waste usage
- use of waste timber for fuel

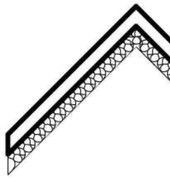
renewable energy
- photovoltaic roof tiles



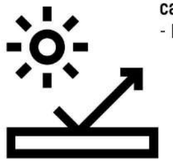
use of materials with a low carbon footprint
- sliding wooden partitions

reduction of energy consumption
- insulating the roof

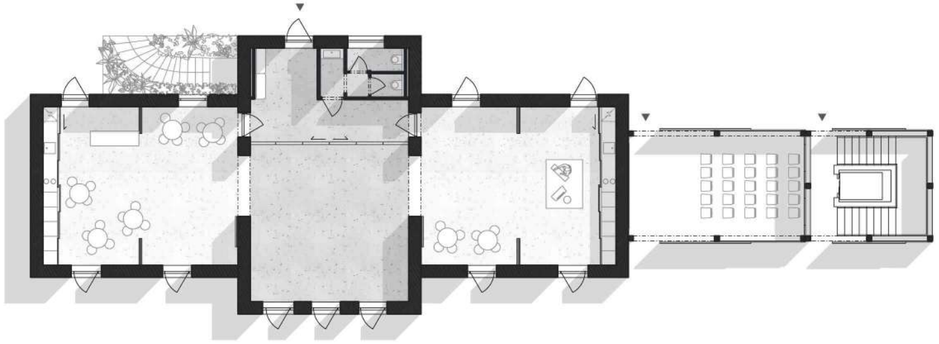
use of materials with a low carbon footprint
- EPD certified materials



reduction of energy consumption
- insulating the building



SageGlass glazing on the tunnel
- blocking the heat gain from the sun with electrochromatic glazing

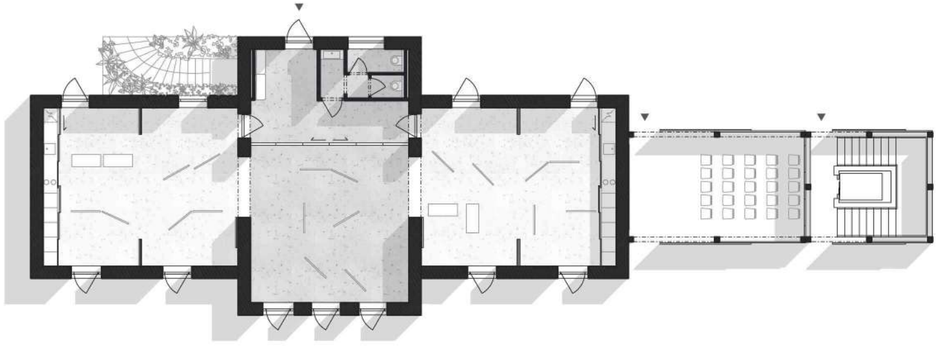


dance hall,
concerts,
weddings

separate access to each floor
- independent operation

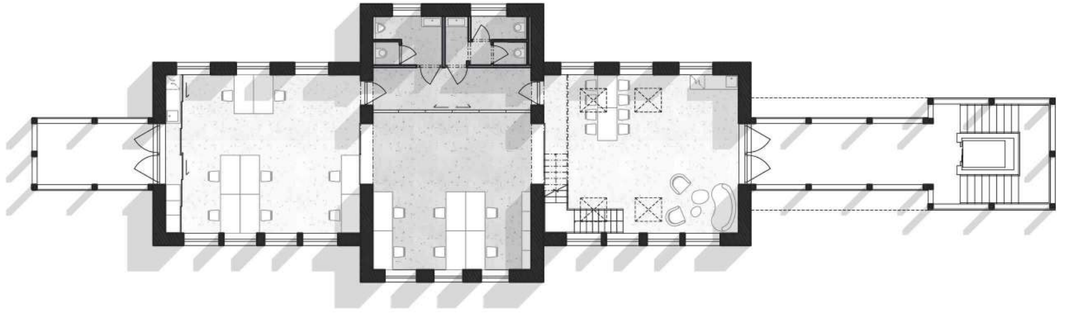
freeing up and connecting the internal layout
- easy conversion of the building's use

wooden sliding walls for flexible space division

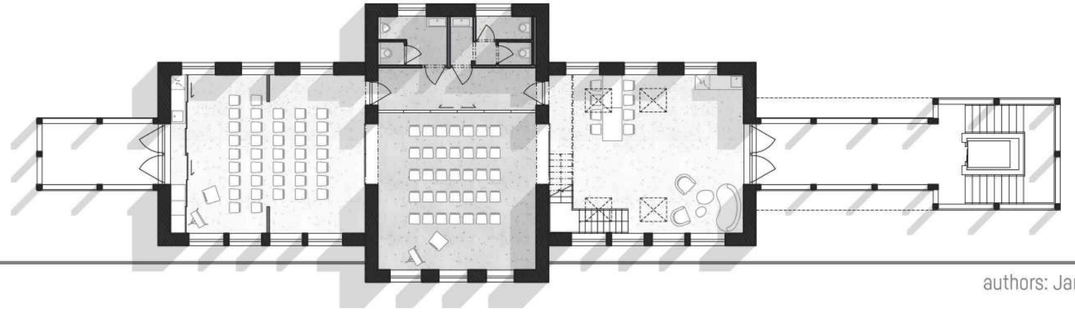


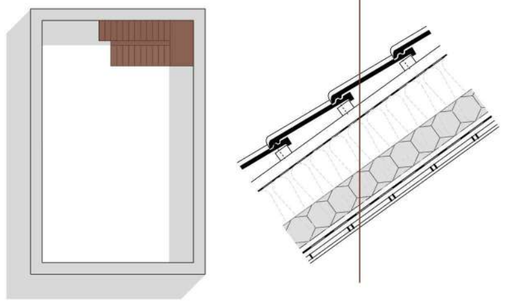
exhibition space

offices for rent



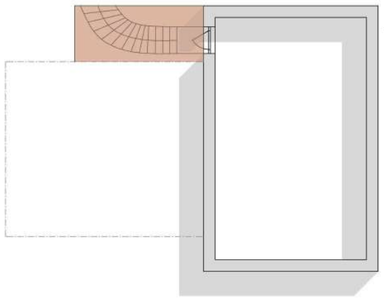
lectures, workshops

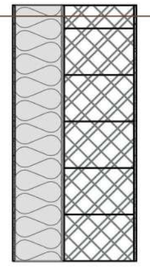




St1 - Photovoltaic roofing

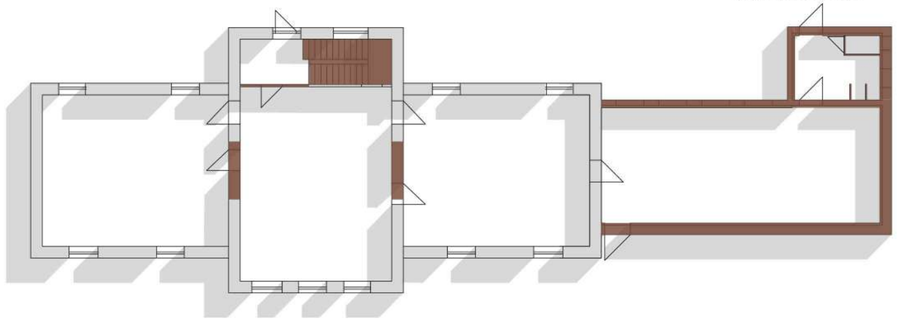
- photovoltaic roofing
- 40x60 mm battens
- 50x60 mm counter battens
- safety waterproofing
- rafters - filled with thermal insulation made of mineral insulation Isover Unirol Profi
- Isover Tram EPS - filled with Isover Unirol Profi mineral thermal insulation
- anchoring board
- vapour barrier
- Rigips system grid
- Rigips plasterboard

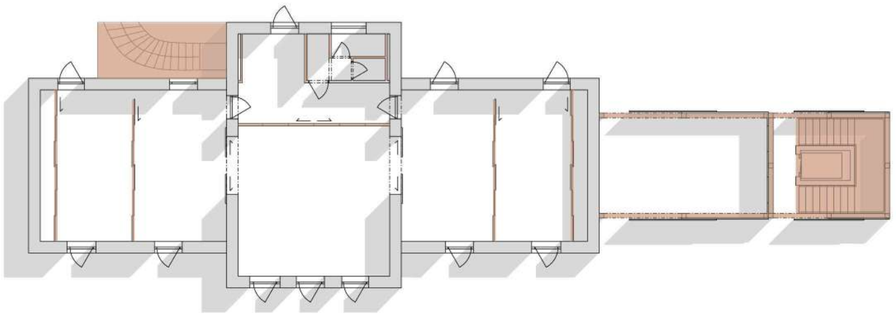


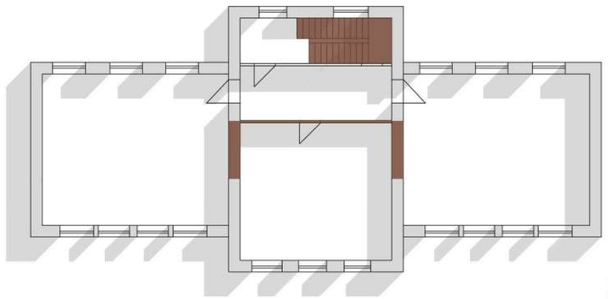


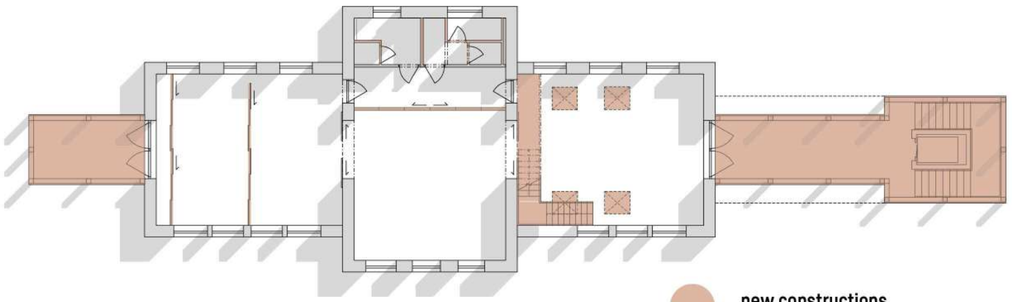
S1 - Exterior wall

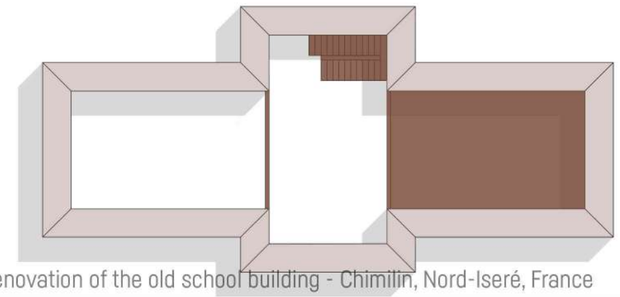
- Plaster Weberpas extraClean active + Weberpas base UNI
- base layer Webertherm elastik + R131
- Thermal insulation Isover TF-Profi
- Adhesive Webertherm klasik
- penetration Weberpodklad A
- Original load-bearing masonry
- Webersan underlay
- Internal plaster Webersan MONO

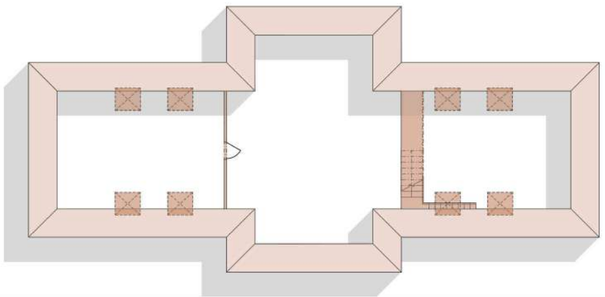












demolitions
removal of internal walls in places that the design wanted to open up more, creating an opening in the middle part for greater variability in the use of space, removal of the inadequate staircase, removal of the extension, removal of the ceiling above part of the 2nd floor, removal of the original roofing during the renovation of the attic

new constructions
new sliding partitions to support the multifunctionality of the building and future change of use, new skylights to provide more natural light in the attic and 2NP, a new external staircase with the possibility of adding a lift to ensure accessibility, replacement of the old inadequate roofing with photovoltaic roofing to make the building more sustainable while respecting the mass

glassolutions SAINT-GOBAIN

weber SAINT-GOBAIN

rigips SAINT-GOBAIN

isover SAINT-GOBAIN

SageGlass SAINT-GOBAIN

ENERGY SYSTEMS

reconstruction concept

Version 1 - anchored to two ceiling slabs using anchors

The upper anchor will be subjected to a tensile force of approx. 30kN (60kN for both anchors), while this is a lot, it can be achieved. Ideally, since according to the photos of the attic the ceiling above the 2nd floor is not in the best condition, a new, monolithic reinforced concrete ceiling should be built - then the anchor can certainly be dimensioned and implemented well.

The disadvantage of this option is that the thermal bridges created by the steel anchors are more difficult to solve.

Version 2 - steel cables (at the top) connecting the steel structure on both sides of the building and anchors to the bottom slab

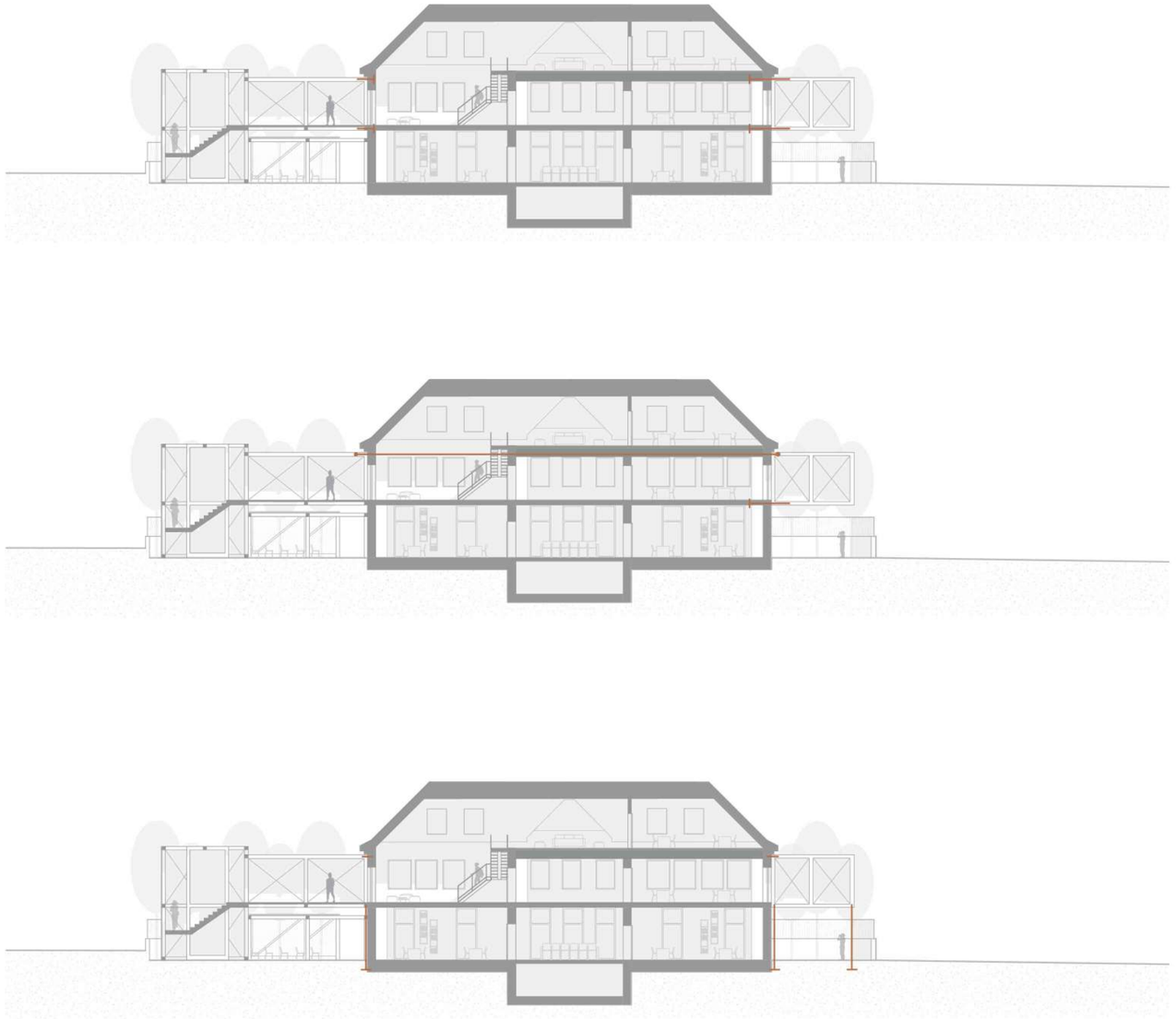
In this case, the attic staircase will need to be moved in order to maintain sufficient head clearance on the staircase.

The thermal bridges in this version are smaller thanks to the usage of cables, but still pose a challenge.

Version 3 - stand-alone construction

The tunnel is supported by columns - ones near the facade and ones attached to the fence, thus not interfering as much with the original intent of the cantilever.

The thermal bridges are almost eliminated - local anchoring with composite anchors.



The final selection of the alternative should be based on the results of a detailed structural and technical survey of the building, which has not been provided.

ECOPHON FADE ONE SMOOTH

ECOPHON FOCUS

RIGIPS RF

ISOVER TF PROFI

SAINT-GOBAIN

SG GLASSOLUTIONS TRIPLE GLAZING ECLAZ

SGG STADIP SILENCE

SAGEGLASS CLASSIC FOR THE TUNNEL GLAZING

WEBERPAS EXTRACLEAN

WEBERTHERM ELASTIK

WEBERSAN MONO

WEBERTHERM KLASIK

WEBERPAS PODKLAD UNI

WEBERPODKLAD A