



## SHARING KNOWLEDGE

ADAPTIVE RE-USE FOR FUTURE GENERATIONS

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**ARK626 //**

ARCHITECTURAL TRANSFORMATION  
& ENVIRONMENTAL CARE

**CHALMERS**  
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Abstract

The Present project was realized in the studio of " Architectural Transformation and Environmental Care". In this studio we aim to investigate various transformation approaches, relating to the project's specific context. During spring 2022, the course was working on a case of an old Court of Appeal for West Sweden in Gothenburg. The studio started with understanding and analyzing the current situation on site, but also investigating local context and the historical background. After that, the concepts were created in groups related to the same design approaches and priorities.

The courthouse was built in 1948 and till 1994 was a place for the Court of Appeal for West Sweden. After that time that building was used for education purposes as a part of Gothenburg University but in 2020 the academic department left the building. Courthouse is now in lack of interest in any other university and is staying empty.

The main focus of our project was the aspect of preservation of the cultural heritage in relation to new quality of the spaces and new possibilities for future users. The functions that we've proposed are focusing on students and their development. We named the building - 'Center of Knowledge', because the main goal of that space is collaboration and sharing knowledge between students but also to inspire younger generations.

The booklet collects the most important stages of our work and finalized it with the final proposal. Presented concept was made for academic purposes and we do not exclude technical issues and understatement that we may have overlooked or didn't have time to investigate further.

KEYWORDS:

Transformation  
Courthouse  
Center  
Knowledge  
Students

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Case study 2021/2022

Urban Context - Gothenburg, Sweden  
Court of Appeal for West Sweden, 1948  
Hakon Ahlberg, prominent 20th century Swedish Architect

This course combines architectural transformation projects with theory and practices of sustainability and “environmental care”. Transformation and working with existing buildings is considered to be an important aspect of sustainable development. Transformation can include diverse interventions including conservation work, adaptive re-use, retrofitting as well as major restructuring or planned decay. While transformation design is considered to be one of the most important expertise of architects, it has many approaches and components that can be investigated. In this studio we aimed to investigate a various transformation approaches, relating to the projects specific context. This investigation will relate to different scales, from the material detail, the room, the building, its direct surroundings and the embeddedness in the physicals and socio-cultural context. This also includes (objective) technical components (how & what?) and (subjective) socio-cultural components (why & who?)

[ Course Book-ARK626-2021 ]

## Methods

### Introduction

The project began with a week study visit in the old building of Court of Appeal in Gothenburg. During that week we had an opportunity to meet closer the case that we will be working on and prepare materials for analysis. To broad our perspective further we had a great occasion to participate in study trips through Gothenburg and Copenhagen. The main focus of those trips was to look deeper into existing examples of different buildings' transformations and to get inspiration for our work. To help us understand the context but also to increase our knowledge about environmental care, the studio provided different seminars and workshops related to these topics.

### Studio work

After photo documentation, measurements, creating damage report and collection all of necessary materials from site, we started to work in groups divided on the five analytical topics: Story & Use, Urban & Region, Shape & Use, Technology & Resources and Atmosphere & Nature. In that way we prepared a base of different subjects that give us better understanding for the context of our building.

### Project team work

In the next stage we created new groups depend on what type of intervention we want to work on and what are our priorities fot that case study. The design work started with workshop that allow us to better formulate our design ambitions. In that phase we were using sketching, modeling and discussing as a design method. It was helpful for that early stage to build a base for further concept.

Going further, we were very often using reference projects and books to investigate different solutions and doubts that we were struggling with. Weekly tutorials but also small-talks with other groups in the studio helped us to get new ideas and to push our project further. The whole design process consisted of 3 stages that were always sum up with the presentation, review and constructive feedback. The project ended with the final review and the public presentation combined with exhibition.

## ANALYSIS



Historical context

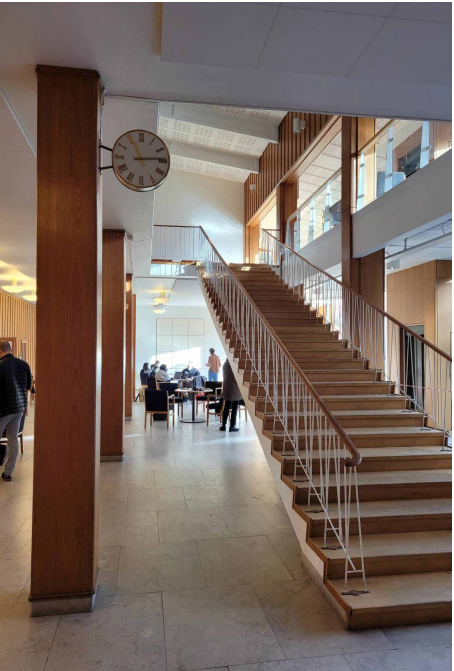
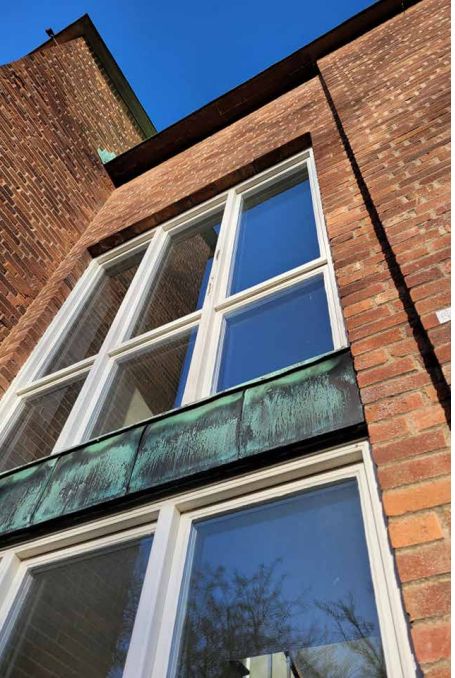
The courthouse was built in 1948 and till 1994 was a place for the Court of Appeal for West Sweden. It was designed by Hakon Ahlberg, a famous Swedish architect. Eight years after construction there started to be discussions about potential extension of the building. After studying different architects and presenting three proposals, in 1962 the building board gave the opinion that none of the proposals could be accepted. In 1994 the Court of Appeal moved to another object situated near the city center. In that time Akademiska Hus got hold of the courthouse and intended to use it for academic purposes as a part of GU. A year later, the extension to the courtyard was made that provided equal access for people with reduced mobility.

Due to the cultural and historical value of the courthouse, in 2000 it was added to the conservation program of Gothenburg. But 10 years later the idea of Campus Näckrosen started to grow. 2013 was the year in which the fate of the building's future was at stake. The official announcement about the Campus Näckrosen project and demolition of the courthouse has been released.

After that there was a lot of disagreement from the public and a protest group was formed to contest the proposal. Many articles were published, stating quite contradictory responses. People raised the question of officially recognizing the court as a monument, in order to preserve it. In January 2015 the country administrative board rejected the declaration of that building as a listed monument, but Akademiska Hus issued an official statement, that they will not demolish it. In 2020 the archeologist department from GU moves out of the building, leaving the building empty without any future plans from Akademiska Hus.



Atmosphere





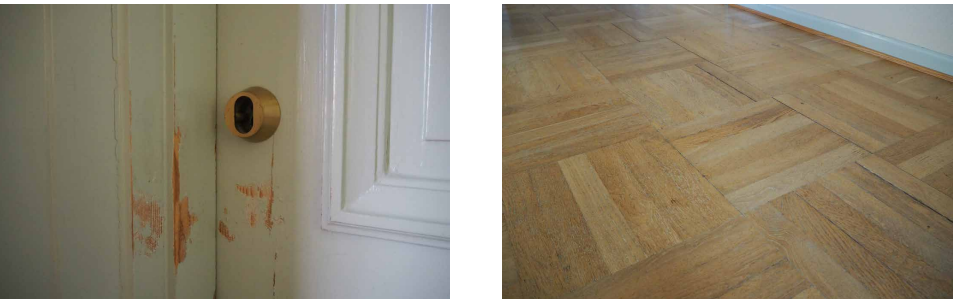
## Damage report

The condition of the building allows for almost immediate use. The overall damages are minor, we noticed some of the elements that needed to be repaired or maintained. We didn't observe bigger damages in the outside facades and inside the courtyard. All of them are in a good condition but they need to be cleaned in some parts (mainly because of the moss) and maintained. All of the wooden windows or other wooden elements are not damaged, but to preserve them they need to be impregnated and covered with fresh paint. The copper roof is generally in good condition but estimating its life expectancy it will need to be changed in the near future.

The majority of the damage in the basement is caused by water leakages. Most of the damages are now superficial, they are minimal or minor. The results of the water getting into the building for now is just flaking paint or little parts of crumbling walls. This water damage is not major yet but could be a real problem in the future.

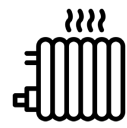
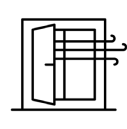
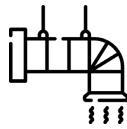
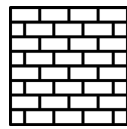
Most of the damages in the first and the second floor are defined as minor. Generally they are a result of long-term usage of the building. They are visible as scratches, cracked materials or holes in the walls. Majority of them can be easily fixed during the repair process.

As a group of students without big experience in creating damage reports and collecting inventory material, we haven't excluded the possibility of other damages, which we might have overlooked.



## TECHNICAL FACTS

- Current energy efficiency of the building is bad
- There is no insulation but the brick walls are around 50cm thick
- Old wooden windows - elements to maintain
- Mechanical ventilation is implemented only in one part of the building
- Passive ventilation system in the offices and corridors
- Old radiators need a replacement
- Copper roof is in a good condition but it is from 1948
- Potential drainage problems in the yard



## Stakeholder interview



### Johan Öberg

Göteborgs Univeritet, Project manager for Campus Näckrosen, University of Gothenburg

"The proposals show that our artistic activities can be brought together in a very exciting environment. This could also be the first step towards a unique and creative meeting place for art, culture and the humanities in Gothenburg."

### Eva Wiberg

Göteborgs Universitet, Principal of the University of Gothenburg

"What we really want to do here is to push forward the positions to meet tomorrow's students, who are not as dependent on having physical facilities as they were 30 years ago."

### Caroline Arehult

Akademiska hus, CEO

"We want the proposals to show Campus Näckrosen as a modern and innovative environment for Gothenburg City University. The proposals should reflect the humanistic and artistic content while opening up to the city and its citizens. Great emphasis will also be placed on making use of and further developing the existing buildings and the park environment."

### Karolina Ganhammar

Akademiska hus, Real Estate Strategist

"By describing, together with our property owners Akademiska Hus and Higab, what we want to contribute to urban life and the cityscape, we want to help the city's politicians and officials to prioritise and make decisions. Long-term planning and continued good dialogue are needed if we are to continue to contribute to the development of Gothenburg as a city of knowledge in the future."

SWOT

- Location of the building (near the city center, in the park, closeness to the public transportation)
- High historical, architectural and cultural values for preservation.
- The building has been well maintained in the twentieth century

S

STRENGTHS

- Strengthen local identity of the building and the surrounded area (timeline of the different buildings)
- Opportunity for implementation of different sustainable systems
- Change in the regulation for the detailed plan (opportunities for different function than academic)

O

OPPORTUNITIES

- Low energy classification of the building
- Some of the technical problems might have been overlooked.
- No clear use

W

WEAKNESSES

- Akademiska Hus and its lack of interest in saving the building
- Change in the regulation for the detailed plan (plan that will allow for radical changes - even demolishing the building)
- Climate change issues

T

THREATS

FINDINGS

PRESERVATION & DEVELOPMENT

- Due to the historical value and the personal believe in environmental care we want to preserve the building and making it important in that area again
- To consider the various cultural, archaeological and historical factors against each other and against allowing better use of the building

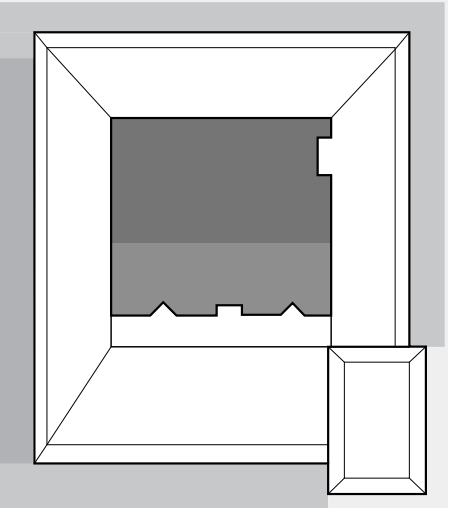
FUNCTION AND USE

- Finding a proper function and a tenant
- Giving the building function that allow more people from public to come, will strengthen the relationship with the neighborhood.

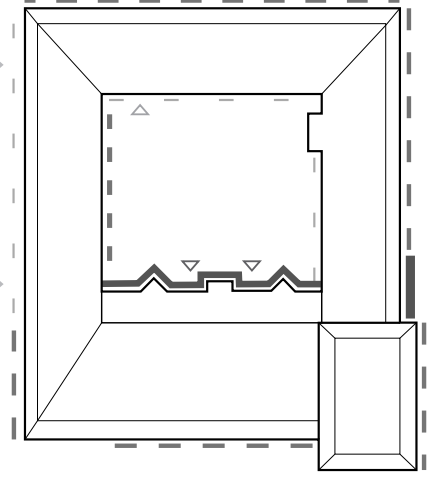
ADAPTATION FOR SUSTAINABILITY

- The project would be a way to prove that not only new buildings can be sustainable, and what does it really mean to be sustainable
- The technical adaptations and improvements could show that it is worthy to reuse the building.

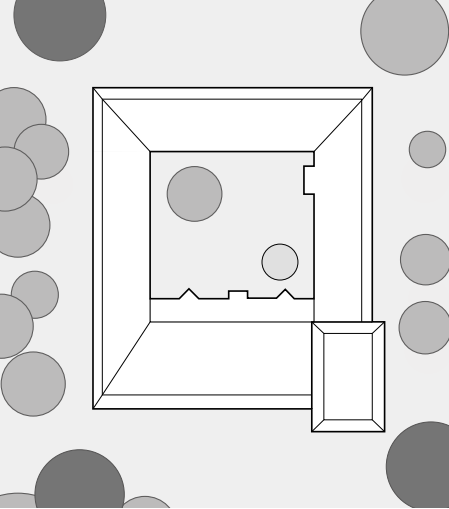
Diagrammatic interpretation of the building



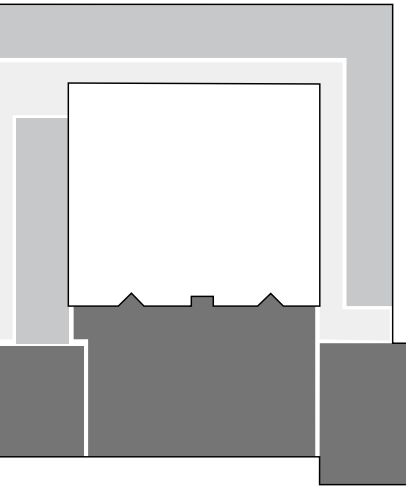
PUBLIC - PRIVATE



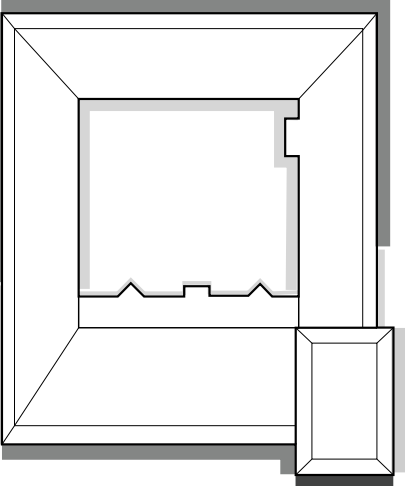
INSIDE - OUTSIDE



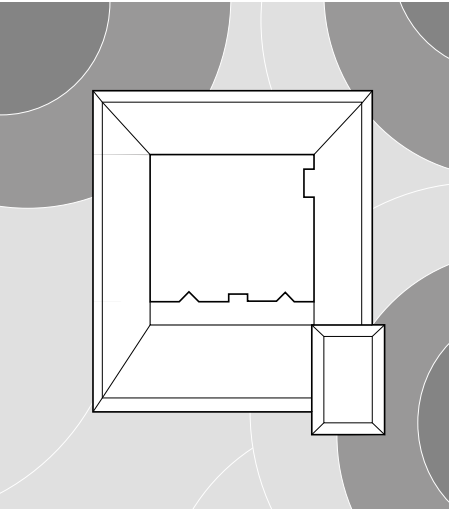
NATURE



PROGRAM



TRANSPARENCY



INSIDE - OUTSIDE

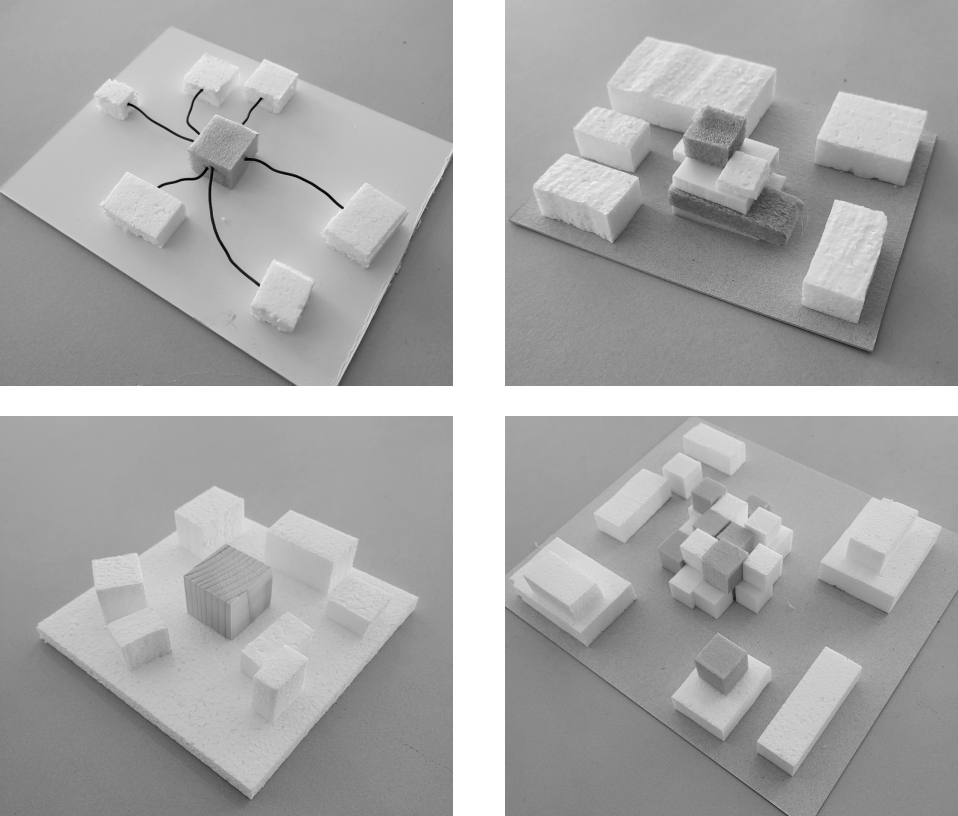
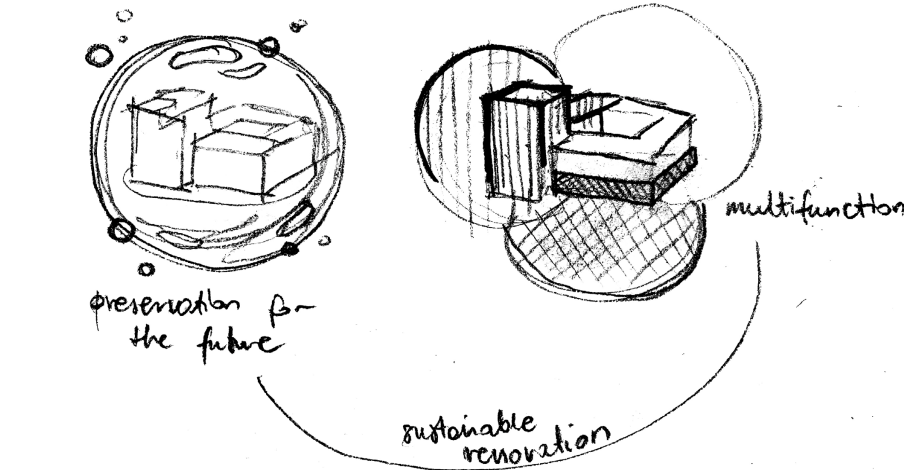
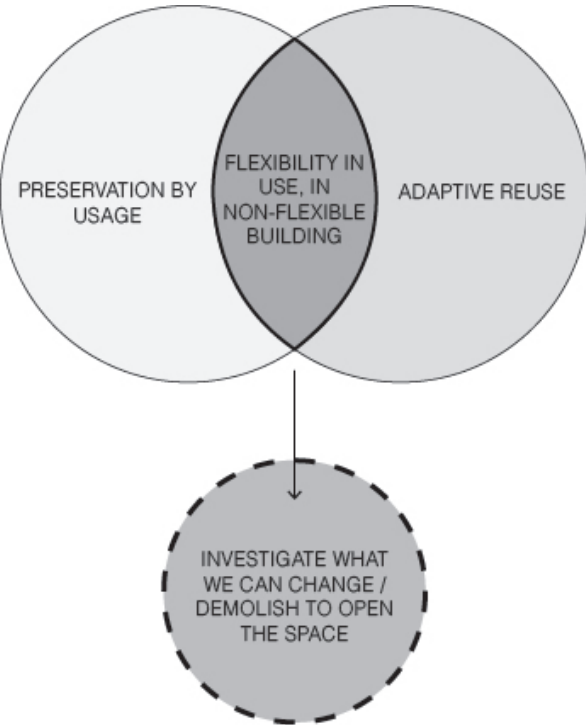
CONCEPT



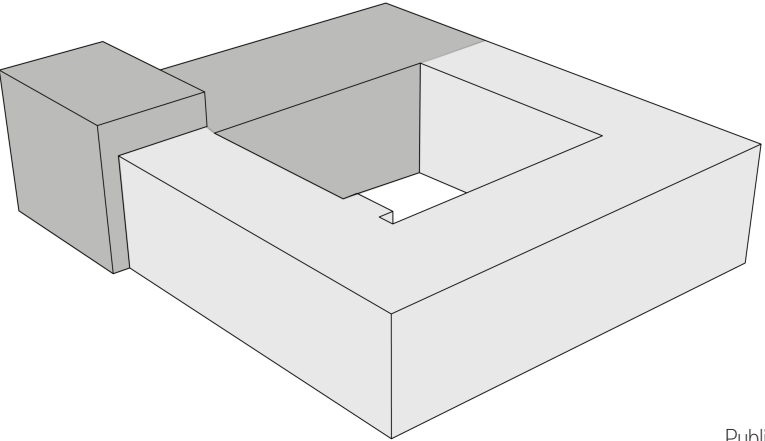
# Reflection after anlysis

The first weeks allowed us to better understand the history of the building and its current condition. After stakeholder interviews we decided that the function of the old courthouse will stay educational/academic but we saw the potential to broaden the context of "academic purpose". During the concept workshop we were developing our first ideas about the concept that gave a base for our design. The topics summarizing workshop for us were: flexible spaces, preservation for the future, sustainable transformation.

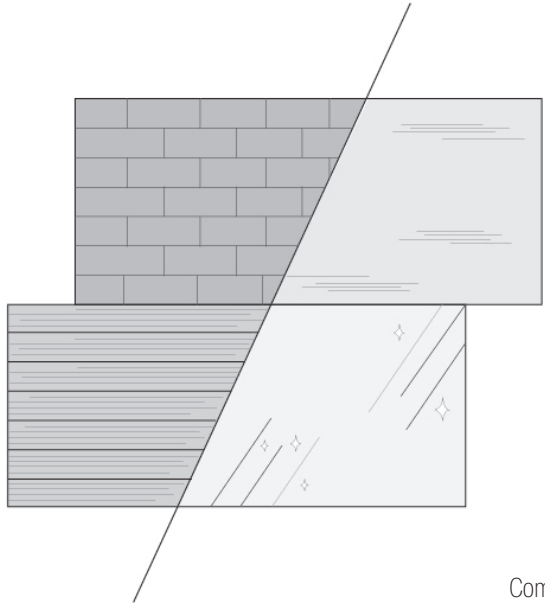
Our team wanted to focus more on the aspect of cultural heritage and its preservation but at the same time we wanted to propose solutions that are not only strict renovation. The idea that we wanted to develop was to give a building a refreshment with highlighted elements of cultural heritage.



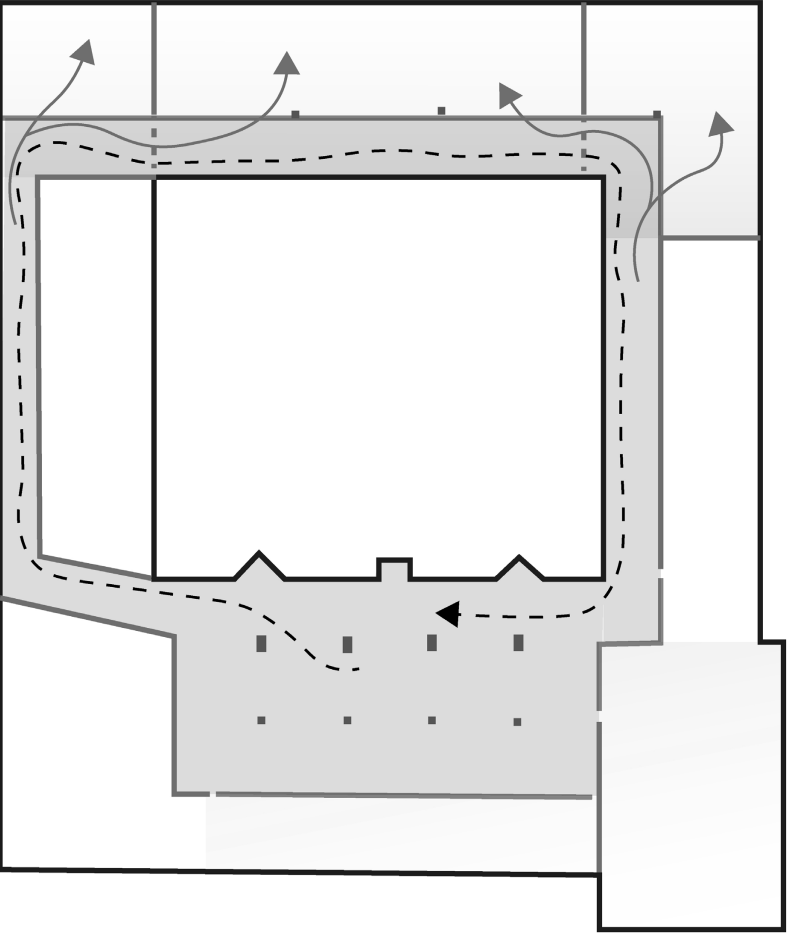
# First concepts



Public - private



Combining old and new materials



Opening the circulations



Surroundings



Mapping educational buildings



Surroundings



Local context and movement



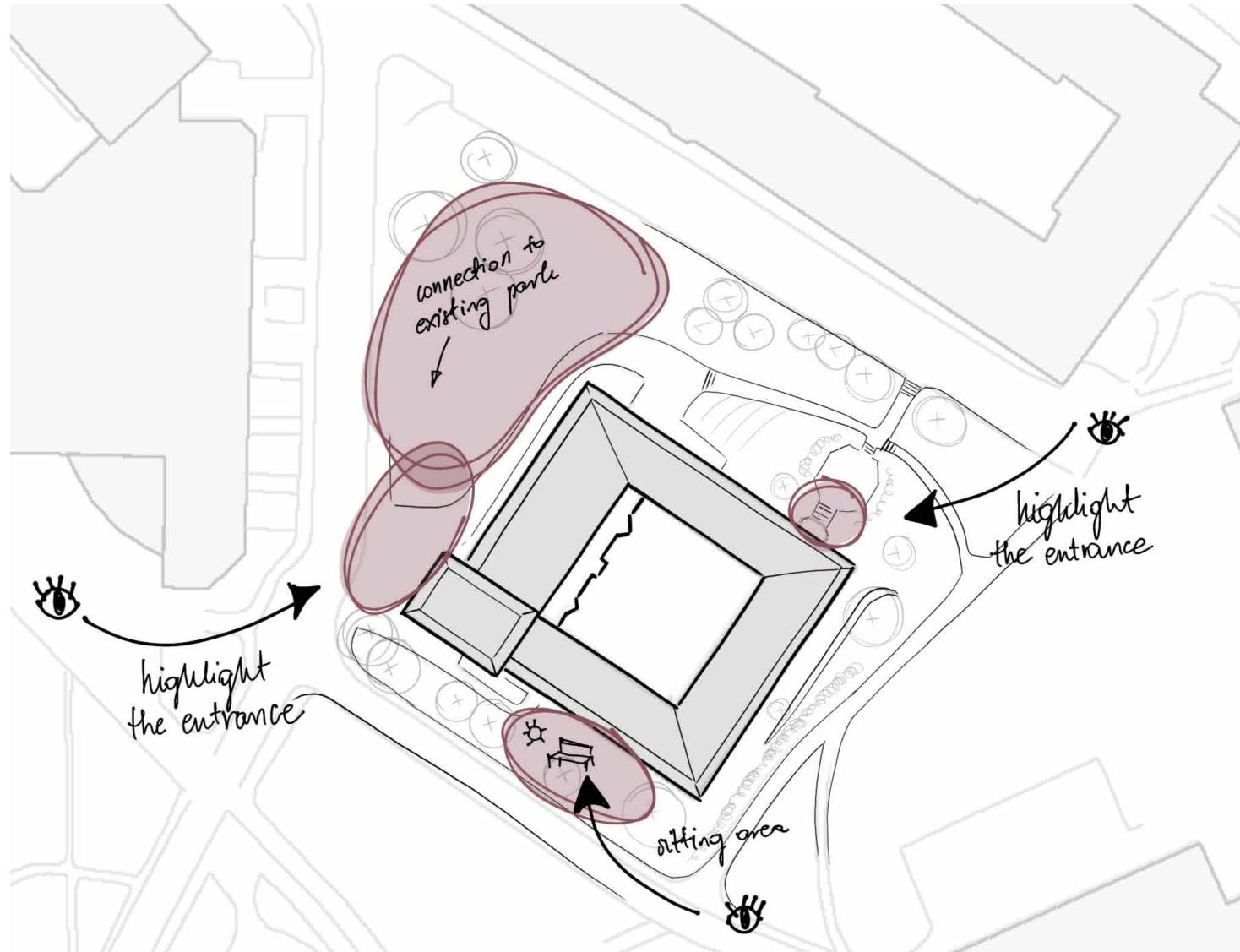


## Intervention areas - Site scale

We described the area around the courthouse as well-organized and well-kept with walking paths and greenery. After analyzing the movement of people in the area near the building, we pointed out 4 zones for potential changes that we see as the most important. With our intervention we want to highlight some of the elements and make the building more visible.

One of our proposals is to add urban furniture in the south facade. That intervention will create a great space to sit during sunny days and will encourage people to come closer to the building.

The north corner of the property is covered with greenery. After organizing it with paths and benches that space will gain a park character and will be more connected to the nearby Renström Park. Other zones for changes are two of the entrances of the building. We saw there a problem of accessibility and visibility.



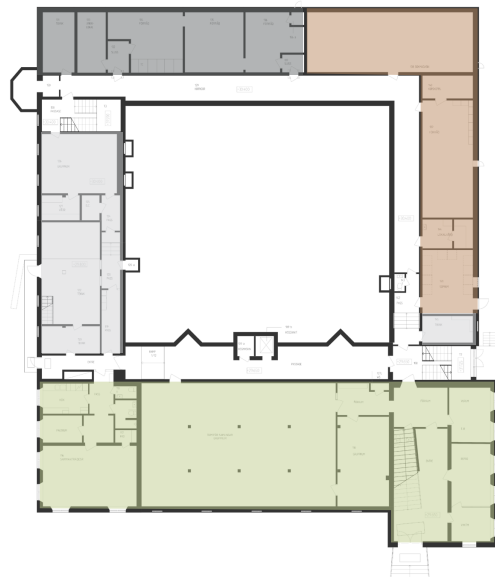
## Intervention areas - Site scale



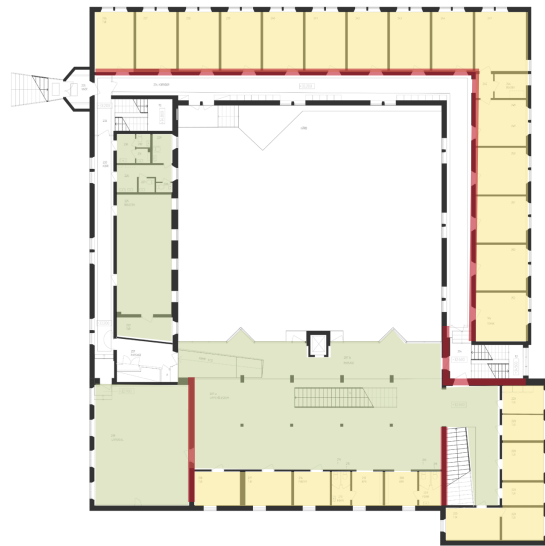


# Intervention areas - Building scale

In the first stage of analyzing the building's interiors and structure we map the areas due to their possibility to change. We decided that we will try not to demolish the walls when it's not necessary and try to adjust the new function. We saw in the beginning that we will not change most of the rooms in the basement. We left the technical rooms, existing bunker and storage spaces as they are. In the rest part, the division of the spaces allows for proposing new functions without major changes. In the first and the second floor the situation was different. Most of the spaces were divided into small office rooms. We marked that area for potential to open with the respect for existing walls of the corridor as a bearing structure.



Plan level 1



Plan level 2

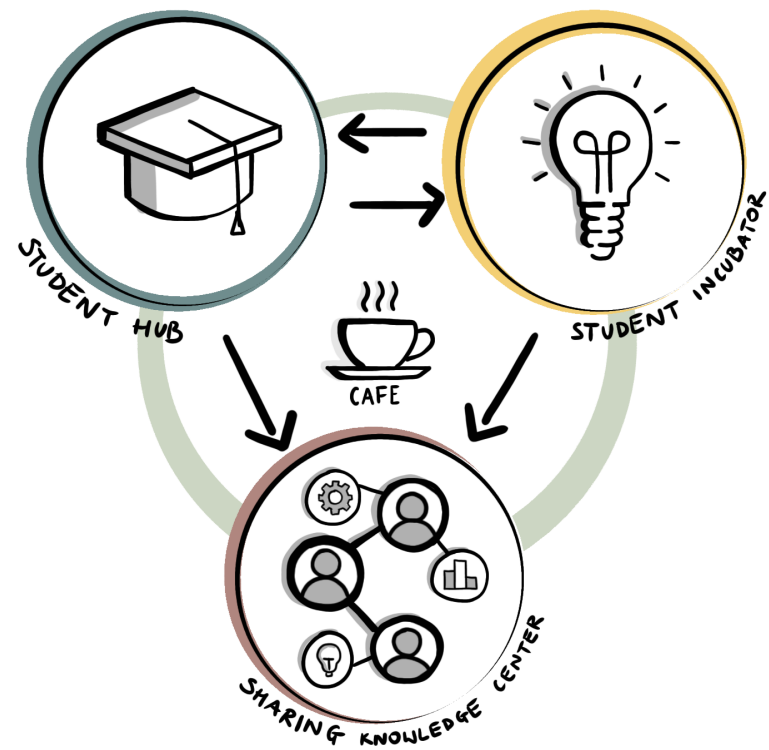
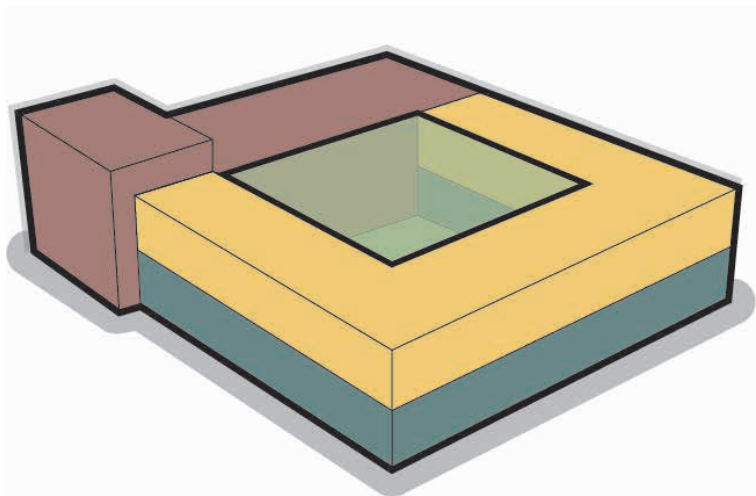


Plan level 3

# Center of knowledge

Our concept for the building's function is based on education. Because that object originally was designed as a courthouse, the floor plan was clearly divided into public and private spaces. Proposed new functions are based on that zoning.

In the first floor, in the place of old offices we are located a student hub. Our idea is that students from nearby universities will have space there to work together on their projects. They will find co-working spaces and group rooms. The second floor in that sector will be intended for a student incubator. After finishing their academic degrees, graduates will have an opportunity to start their own small business and develop their ideas from academic times. On that floor there will be offices of different sizes and also common kitchen areas.

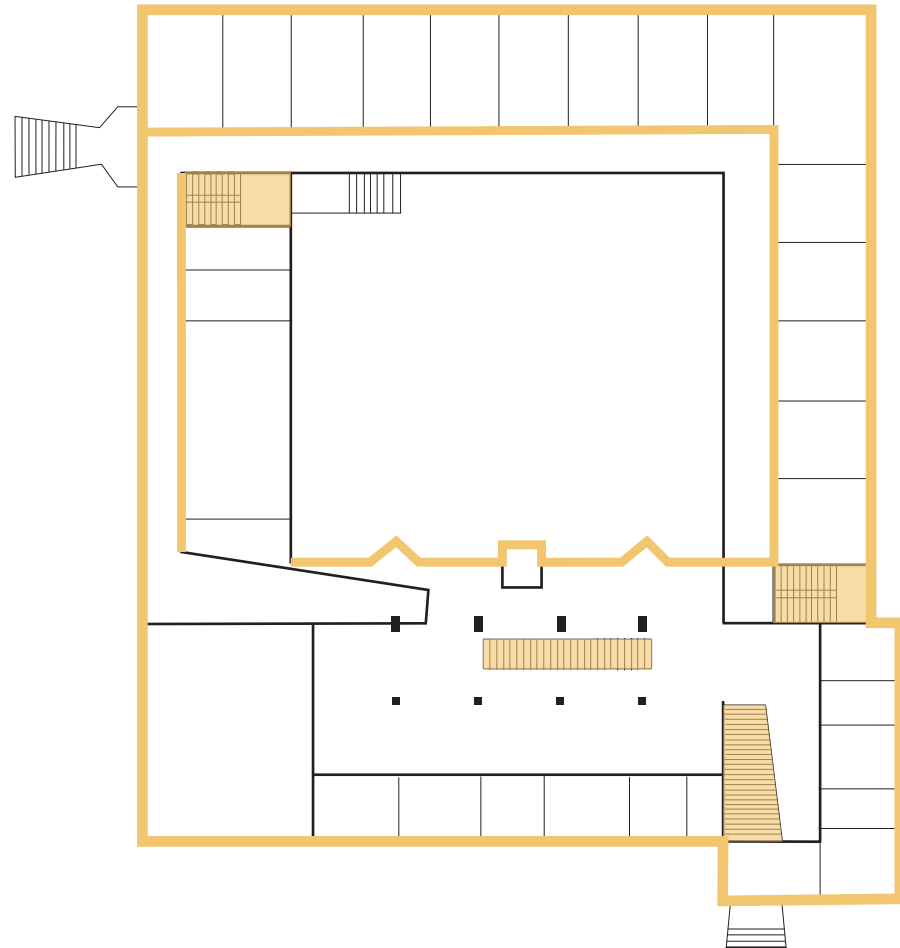
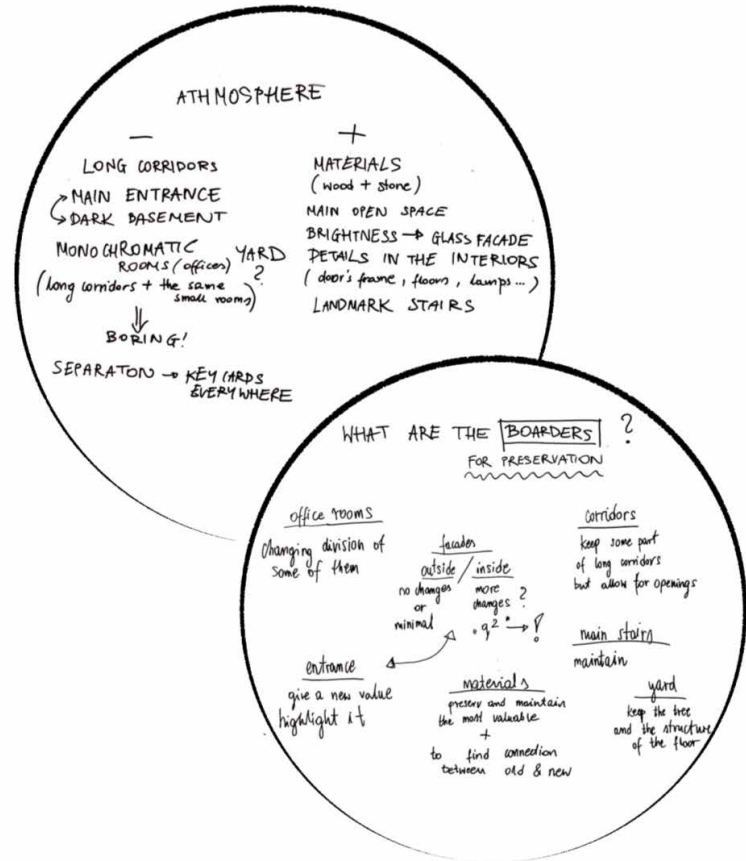


We want to encourage young people to collaborate and spend time together. That is why these two floors are accessible for both of the groups. In the public part of the building we decided to create a center of knowledge - a place where students can exhibit their work but also inspire younger generations. We see the potential for school trips visiting that place for workshops or lectures, that can help children to find their future interest and the path they would like to develop. To bring more people from outside to visit the building and exhibition space we suggested creating a café in the courtyard. Thanks to that, this place will play an important role as a connector of these three functions.



# Cultural heritage - preservation

In the first stages of our concept work we were discussing the atmosphere that we felt during inventory week. That helped us to understand what we like in the building that we want to preserve and what we don't like that has potential to be improved by us. We were trying to set boundaries on what we wanted to do for the preservation. Our main priority was to keep the stairs, corridors and the outside facades in the original shape. In the same time we allowed for more changes in the partition of the rooms, inside facades with the courtyard and the entrances.

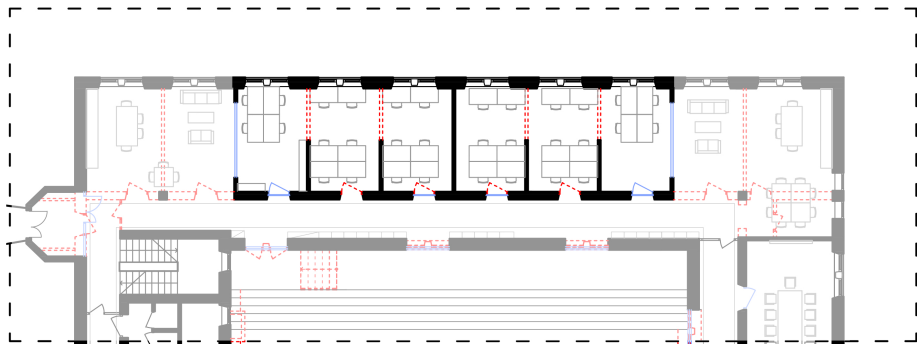
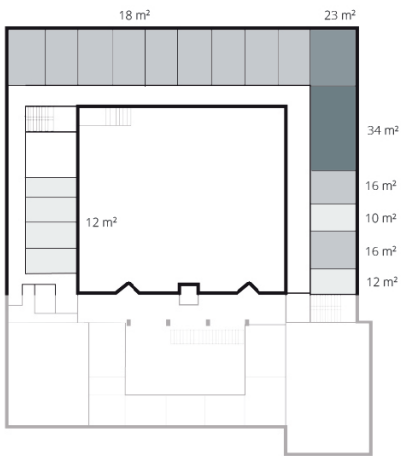
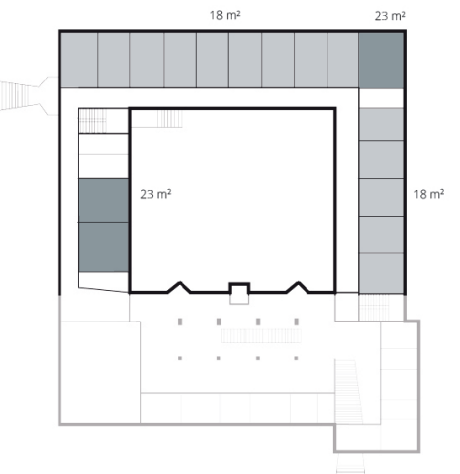
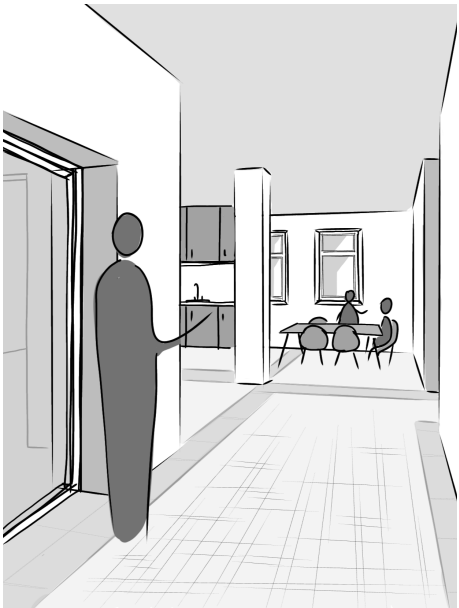


Preservation elements

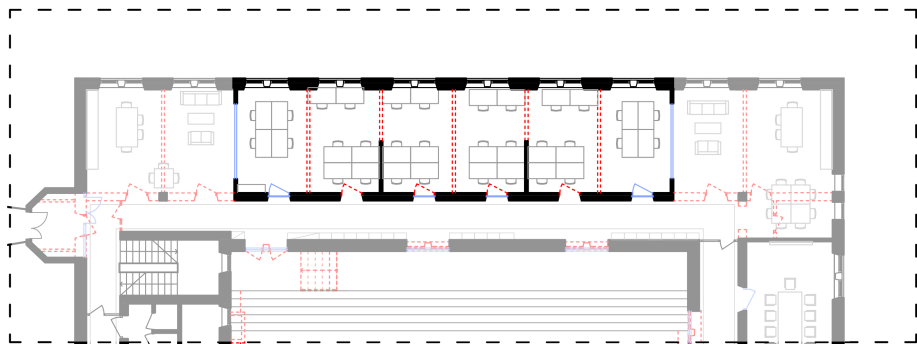
# Cultural heritage - preservation

Originally the building was divided into "public" parts with courtrooms and 'private' - with equally divided small offices. During our design process we were investigating different combinations for opening the spaces in the office part. The aim was to create places that will generate more social interactions and will allow for more flexibility.

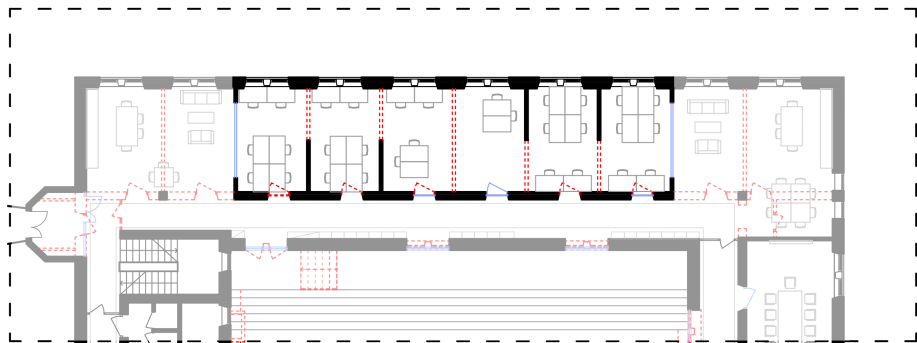
In our concept, even if we want to demolish some of the walls, we want to highlight the original partition with the materials of the floor and in some parts of the walls. In that way we preserve the cultural heritage of the building but we are creating new possibilities for future users.



2 rooms = 16 places in each (32 all)

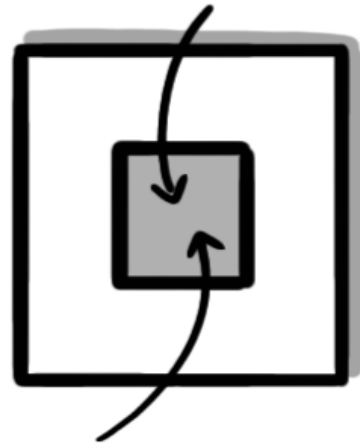


1 open space = 28 places



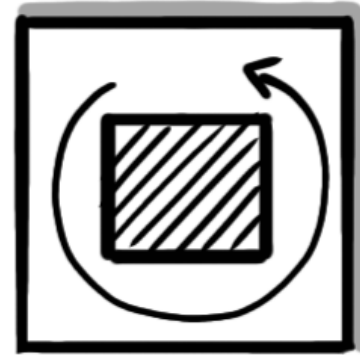
1 open space = 30 places

## Closing for opening



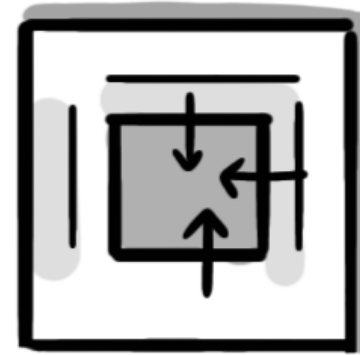
GATHERING  
SPACE

One of the biggest interventions that we are proposing is closing the yard with the glass roof. We see there a possibility of using that space more efficiently. The building will gain more space and therefore will become a connector between student hub/incubator and public exhibition spaces. The café located there is a vector for increasing social interaction.



MICROCLIMATE

Another aspect for closing the yard was the microclimate and potential drainage problem. Since the building is not insulated we wanted to reduce the possibility of heat leakage from the building.



OPENING  
CORRIDORS

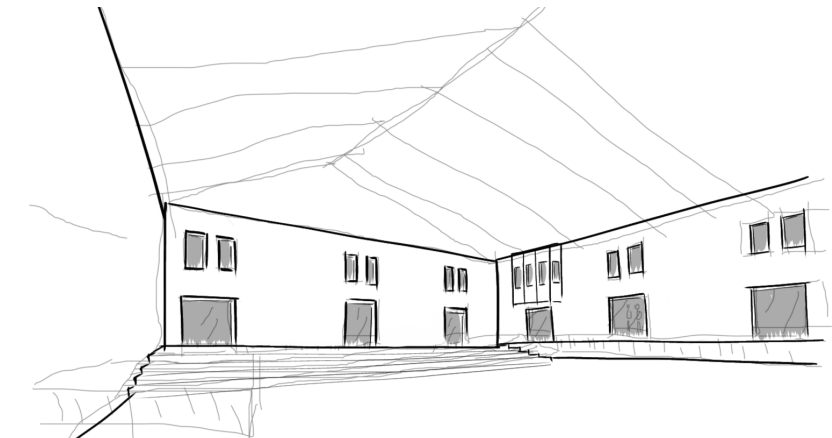
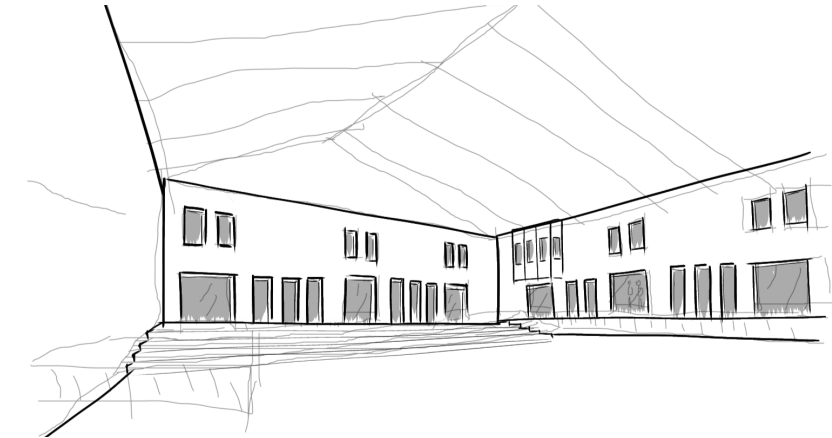
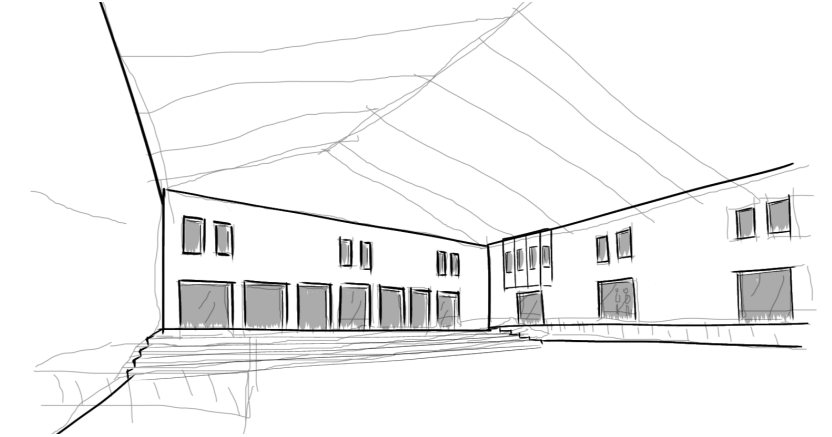
That concept is also related with the idea of “opening” corridors. The closed yard can be a visual extension for them to make them more spacious and brighter which will have a positive impact on the atmosphere inside.

## Closing for opening

After closing the yard with glass-roof, that space will gain a new character and will be used more than it was before, because of the weather conditions. With our concept we wanted to provide more visual connection to the yard from long and dark corridors. After draft proposals that we've made with sketching perspectives, we decided to stay with the original rhythm of windows but we extended the below part. That intervention will put more light to the corridors but also will strengthen the relation "inside-outside" with closed yards.



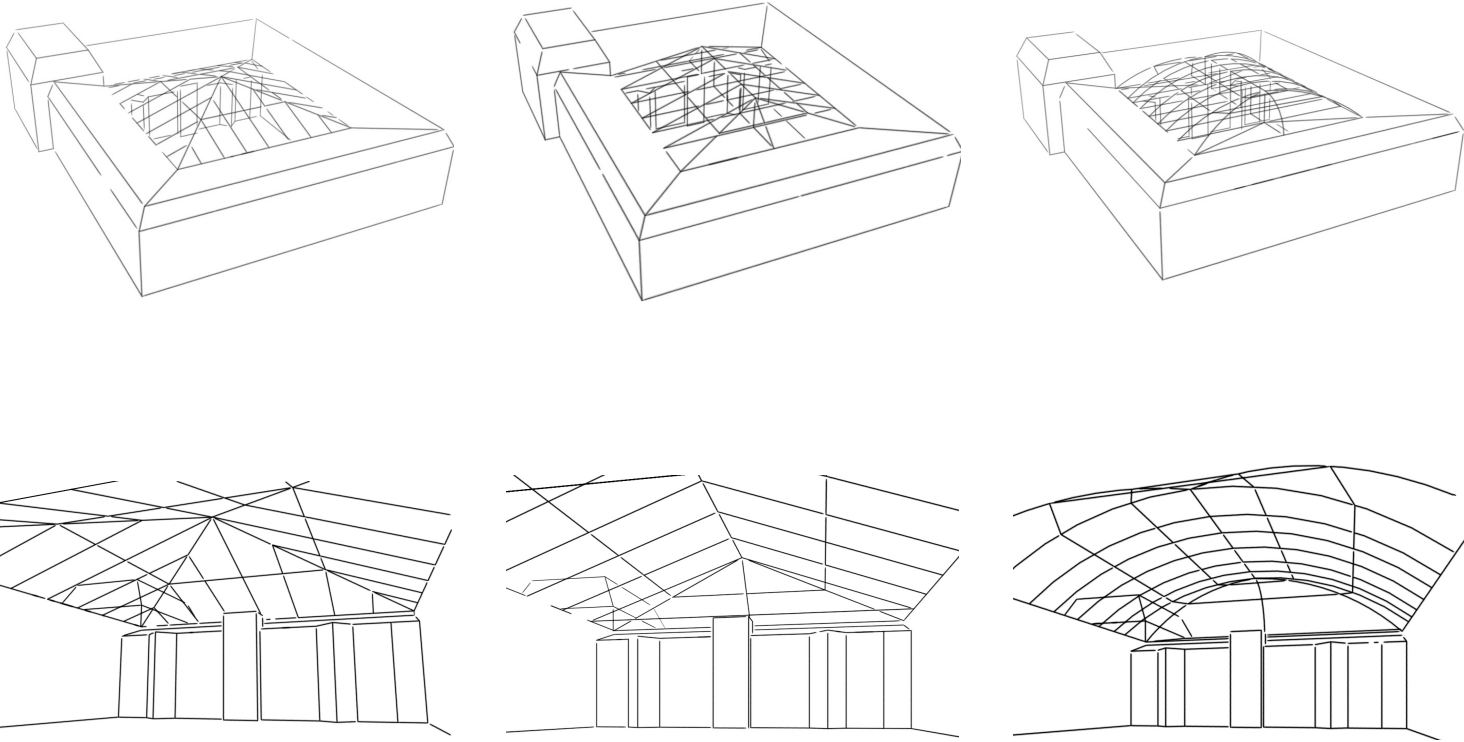
The original division of the windows



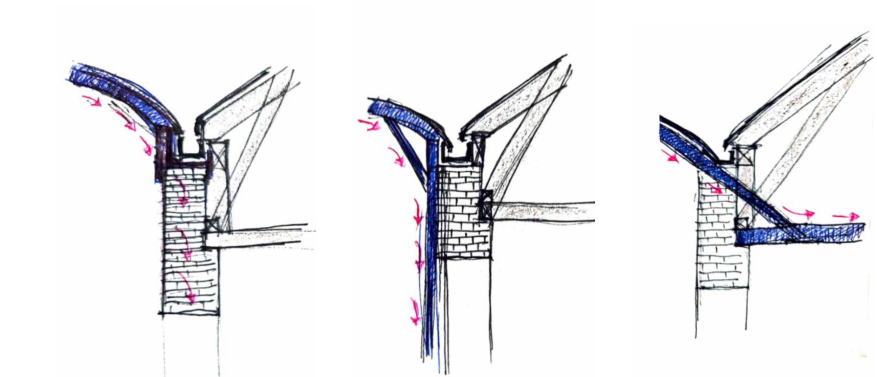
Choosing a new division through perspective

# Closing for opening

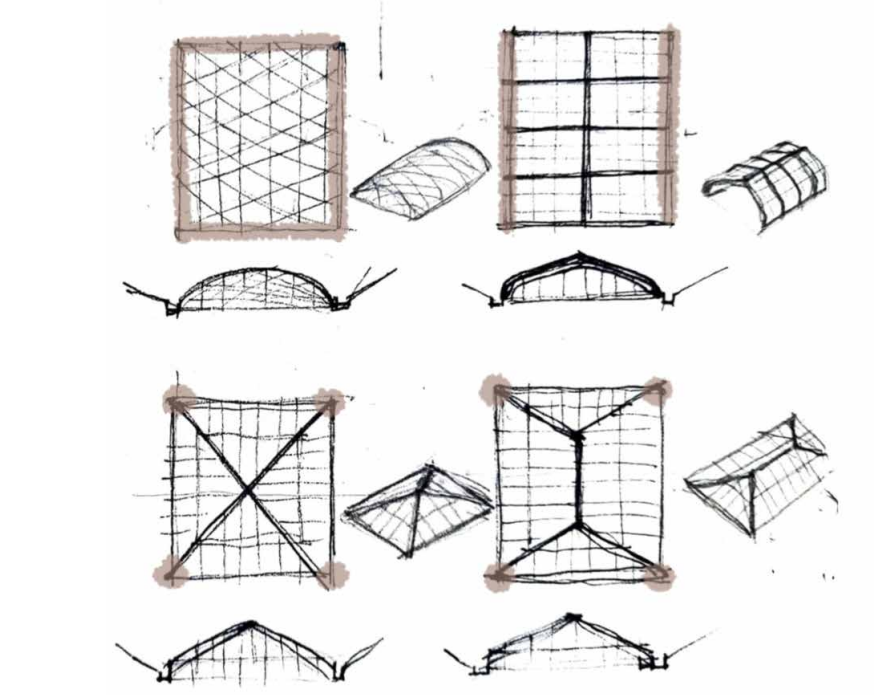
We were discussing the shape for the new roof in relation to quick 3D models. The main point of our focus was the atmosphere that we wanted to create inside. We were looking into different reference projects to get inspiration and to understand potential problems. The existing roof directs rainwater to the inner courtyard. That means that when the yard will be closed with the glass roof, we have to provide an efficient gutter system at the junction of two roofs. All of the work and research were done by us ourselves, without the involvement of the constructor. Therefore, we do not exclude design errors or errors in details that have been overlooked. Our proposal is only a concept that if would be realized, should be discussed with relevant personnel.



# Closing for opening

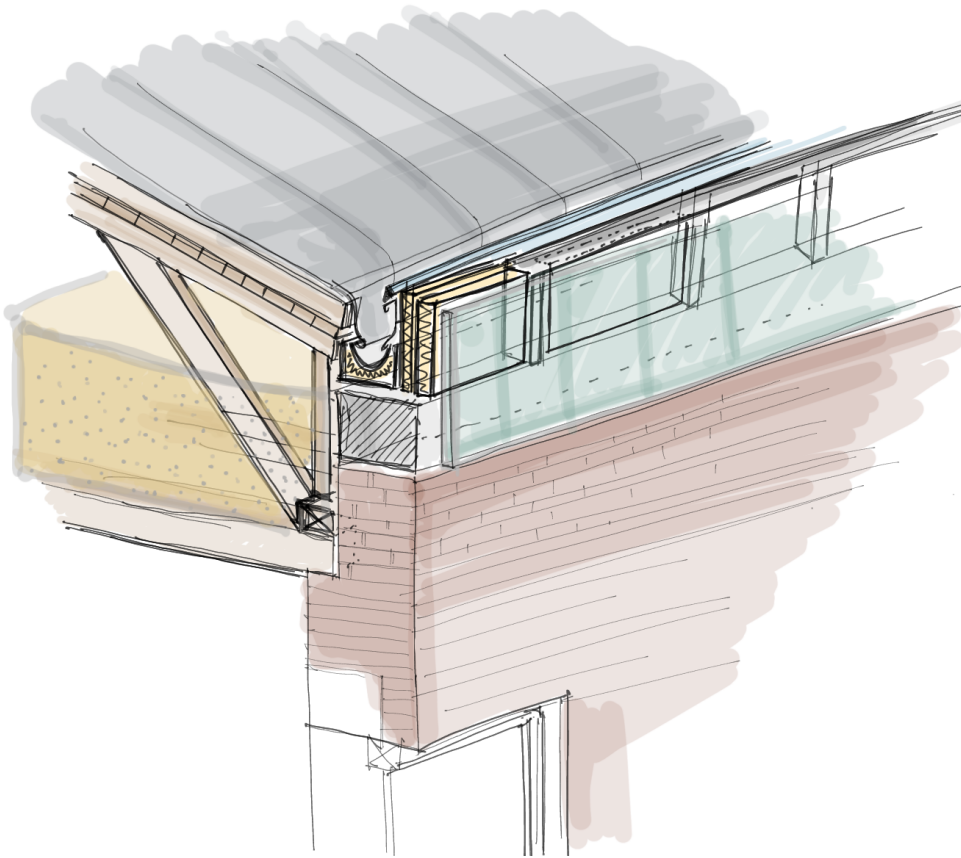


Distribution of forces due to the roof junction



Distribution of forces due to the shape of the roof

The original copper roof is in a good condition now but because of its life expectancy we are speculating that in the near future it will have to be changed due to the leakage problems. With that potential scenario and a concept of covering the courtyard we decided to change a copper layer for a steel plate and reuse removed copper in some elements of our project. With that idea, an old cooper will stay for a longer time in the building giving it new aesthetic values and preserving the building's soul.

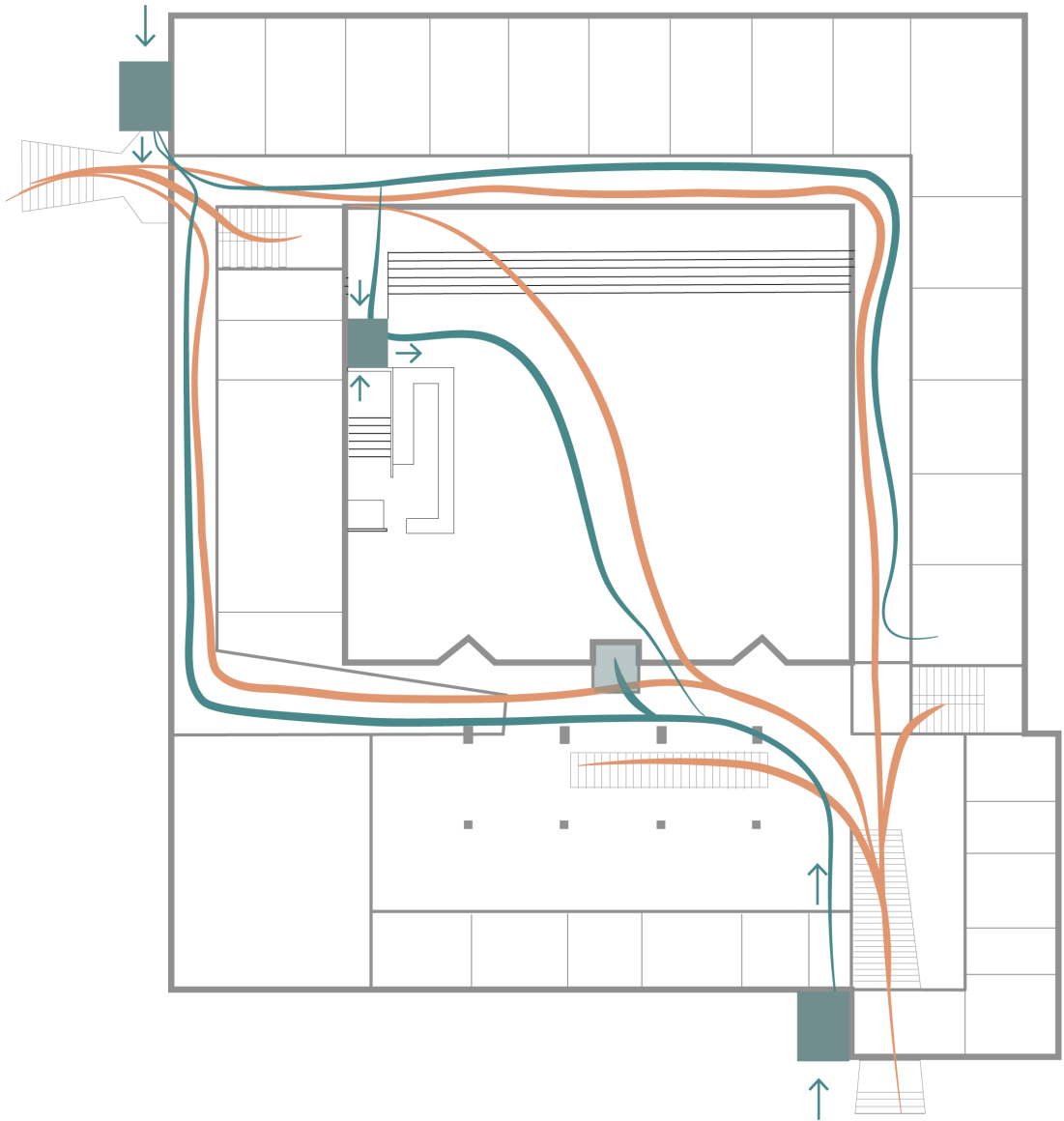
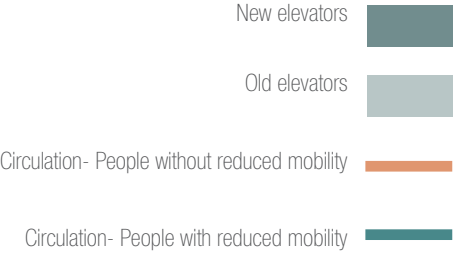


Roof detail sketch



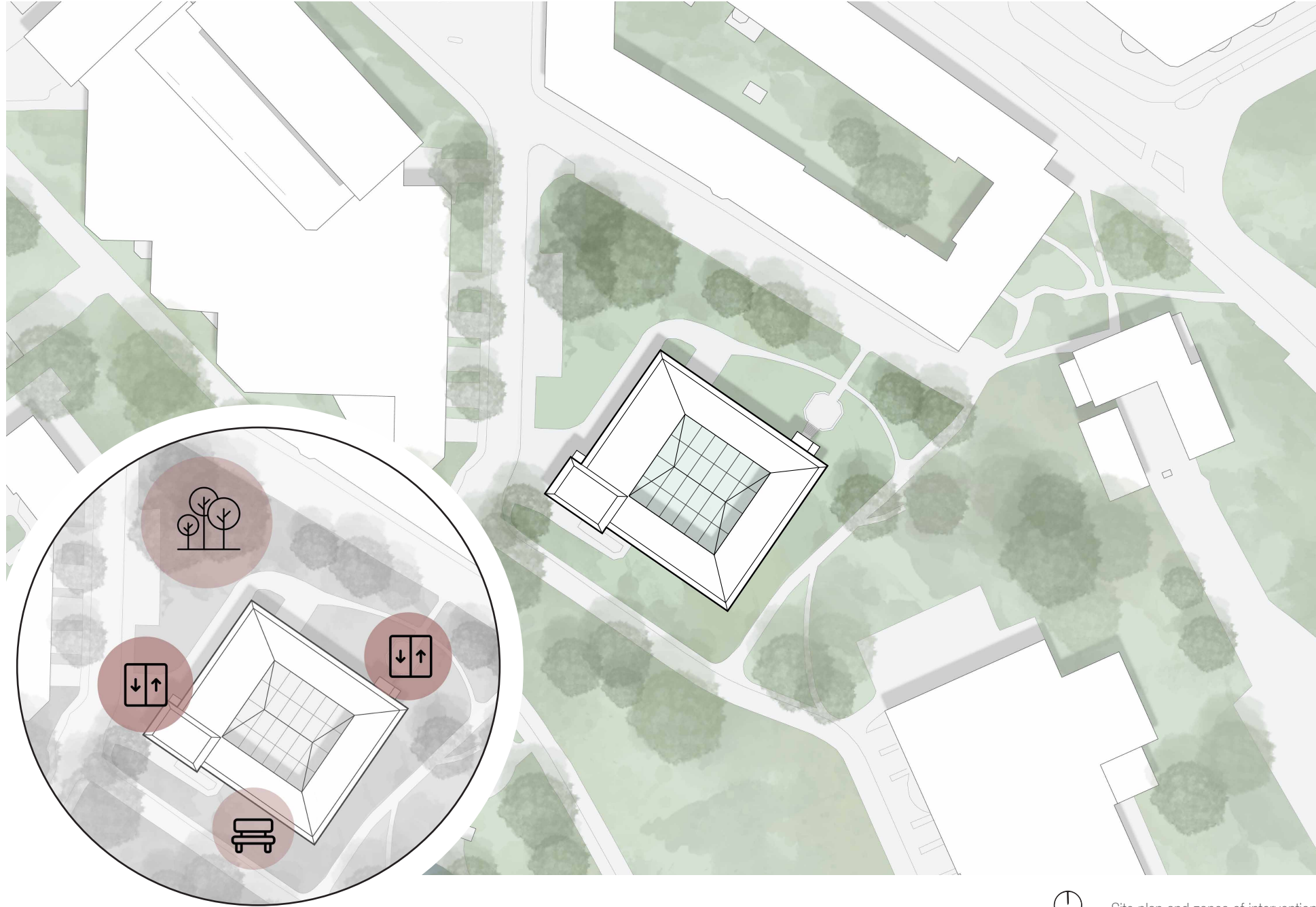
Circulation and accessibility

In 1995 the building got an extension to the yard and it was possible to add one elevator and a ramp to improve accessibility but it hasn't solved the entire problem. When we were analyzing the current situation we saw the potential to add two external elevators. That will allow for equal access directly to the inside of the building in both of the entrances. To close the difference between the level of the corridor and the yard we are proposing to install a platform that will also service the stairs to the backroom of the café.

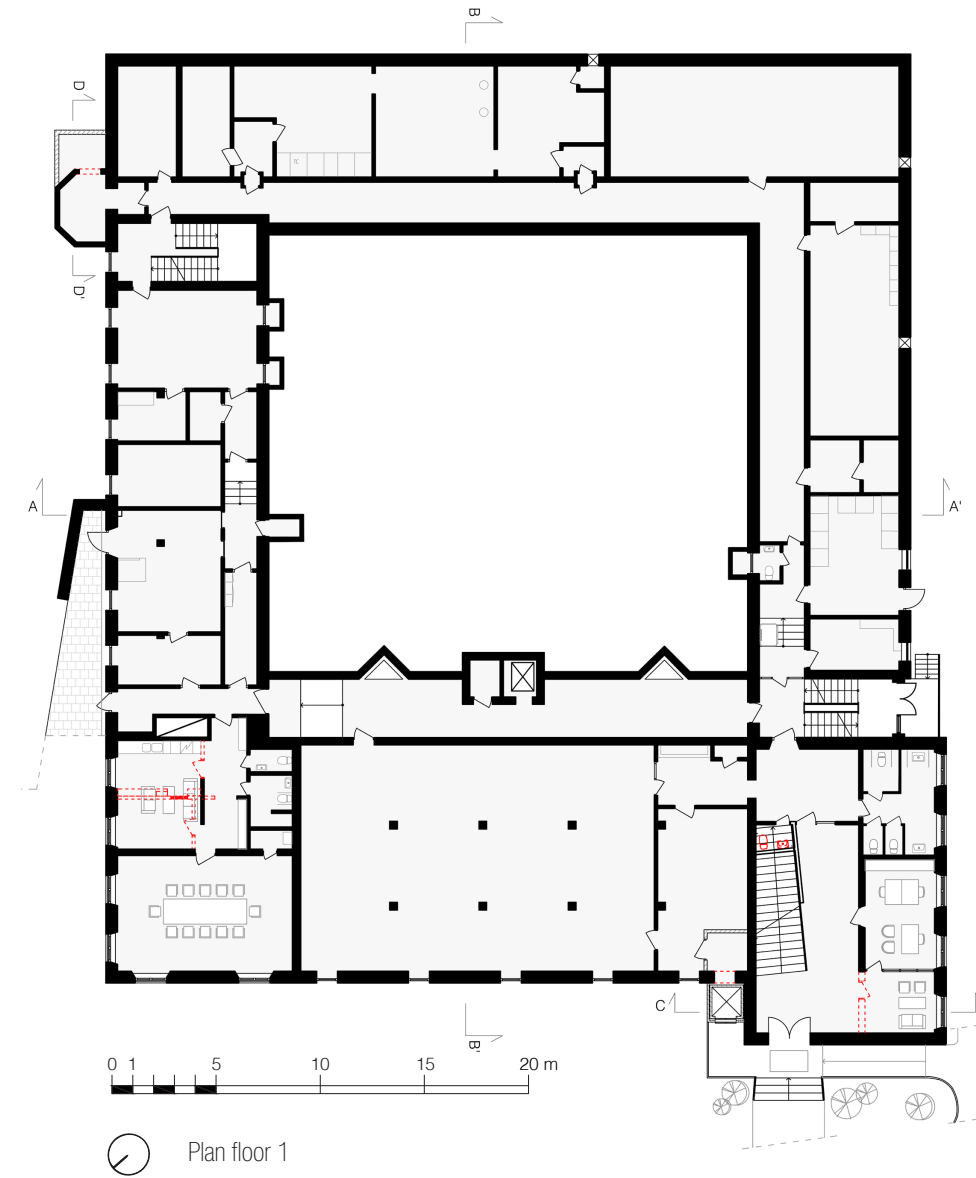


PROPOSAL





Site plan and zones of intervention



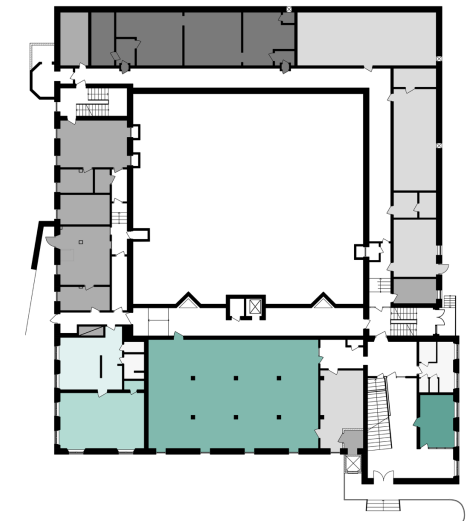
Plan floor 1

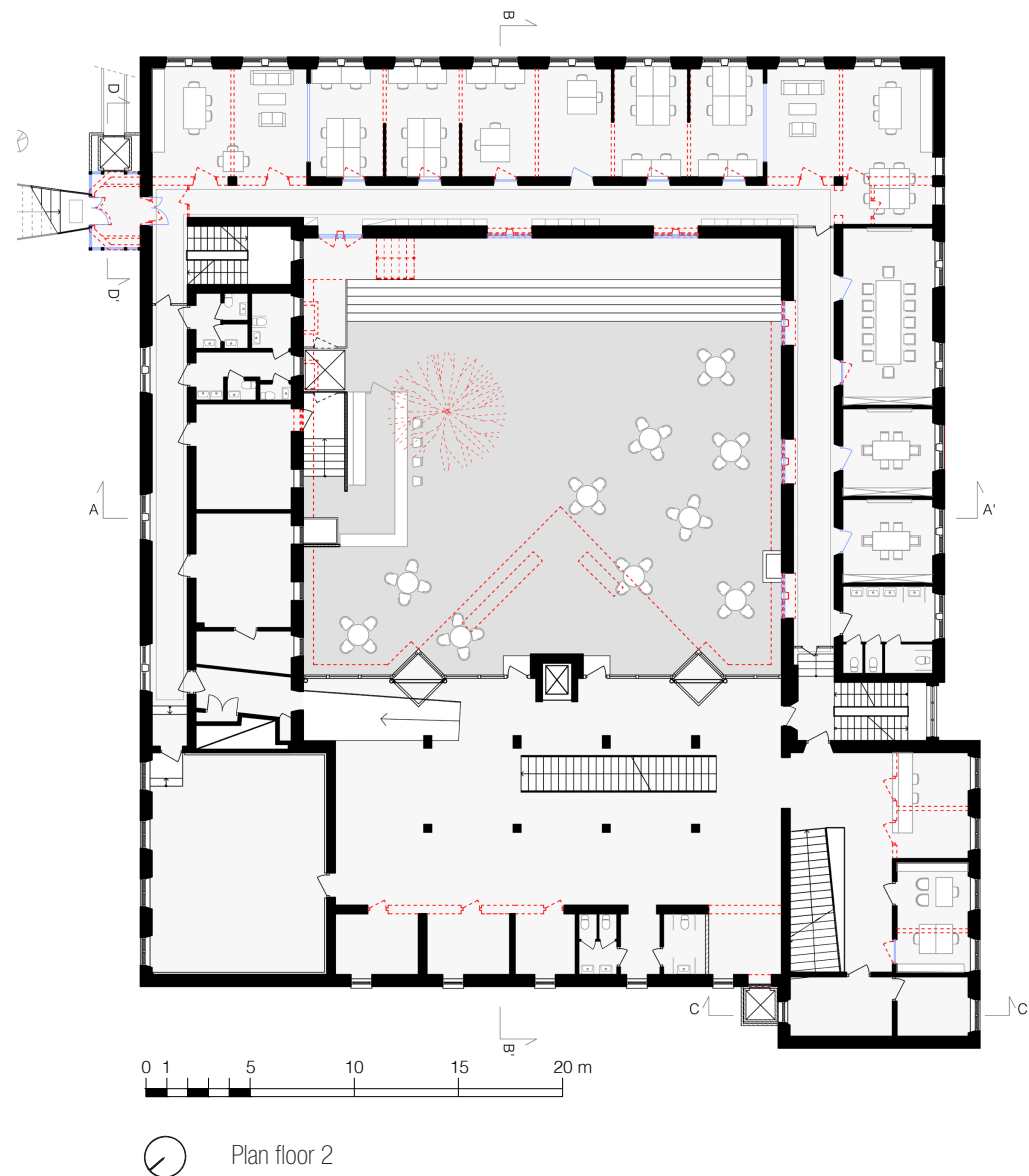
#### Student Union:

Kitchen / relax space	34 m <sup>2</sup>
Meeting room	46,5 m <sup>2</sup>
Bathroom	7,4 m <sup>2</sup>
Event room	183 m <sup>2</sup>
Student union office	17,4 m <sup>2</sup>

#### General:

Bathroom	17 m <sup>2</sup>
Storage	194,6 m <sup>2</sup>
Bunker	107 m <sup>2</sup>
Technical rooms	225,8 m <sup>2</sup>





#### Student hub:

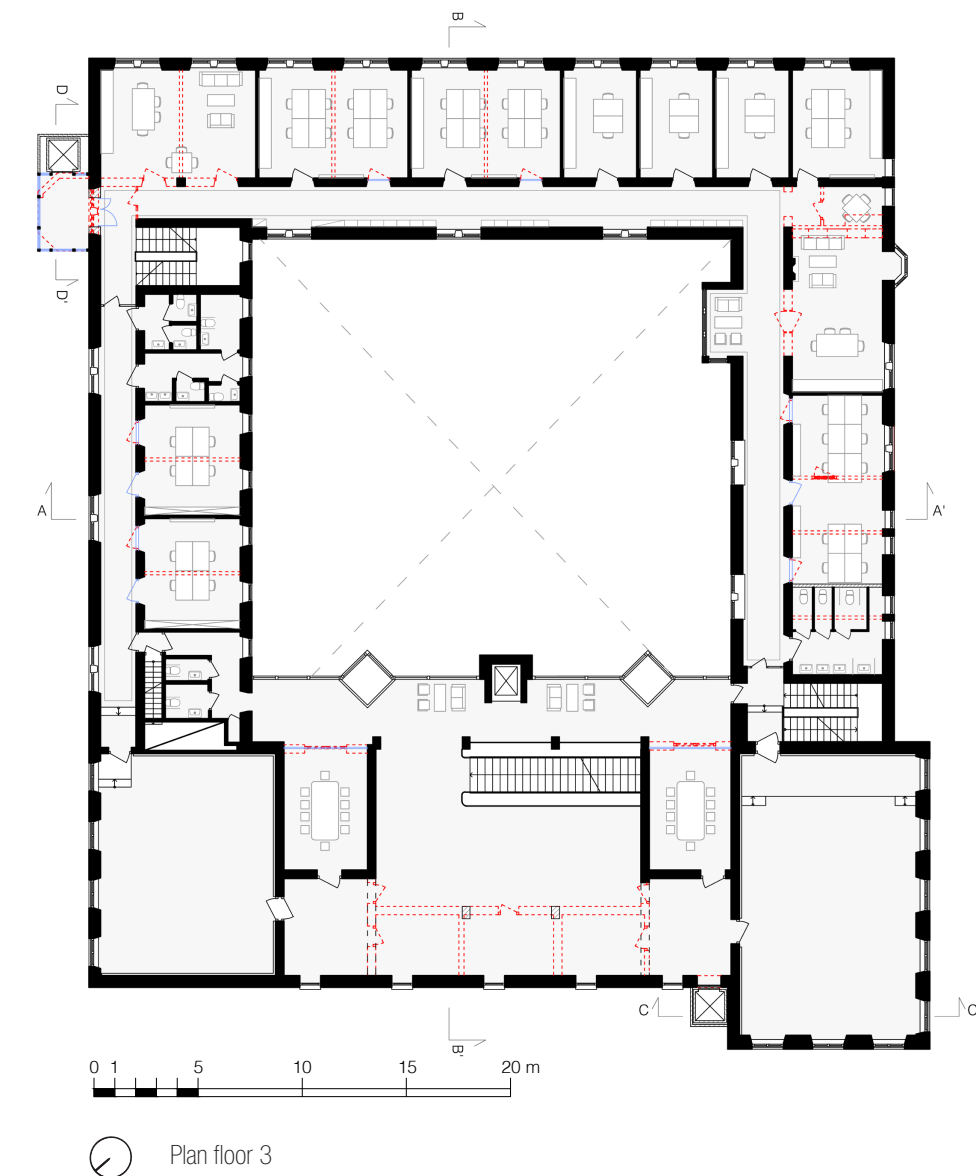
Group room (1 to 4 pers)	34 m <sup>2</sup>
Group room (4 to 8 pers)	36,84 m <sup>2</sup>
Open workspace (24 pers):	112,48 m <sup>2</sup>
Lunch/ relax area:	79,84 m <sup>2</sup>
Bathrooms:	41,83 m <sup>2</sup>

#### Centre of knowledge:

Exhibition	314 m <sup>2</sup>
Administration	58 m <sup>2</sup>
Bathroom:	25,32 m <sup>2</sup>

#### Cafeteria/ Atrium:

Open space	437,35 m <sup>2</sup>
Services	48,44 m <sup>2</sup>

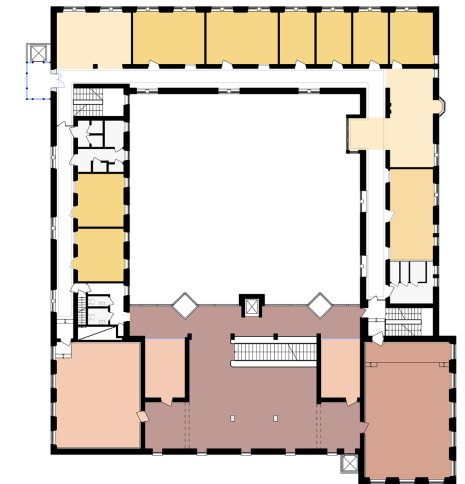


#### Business incubator:

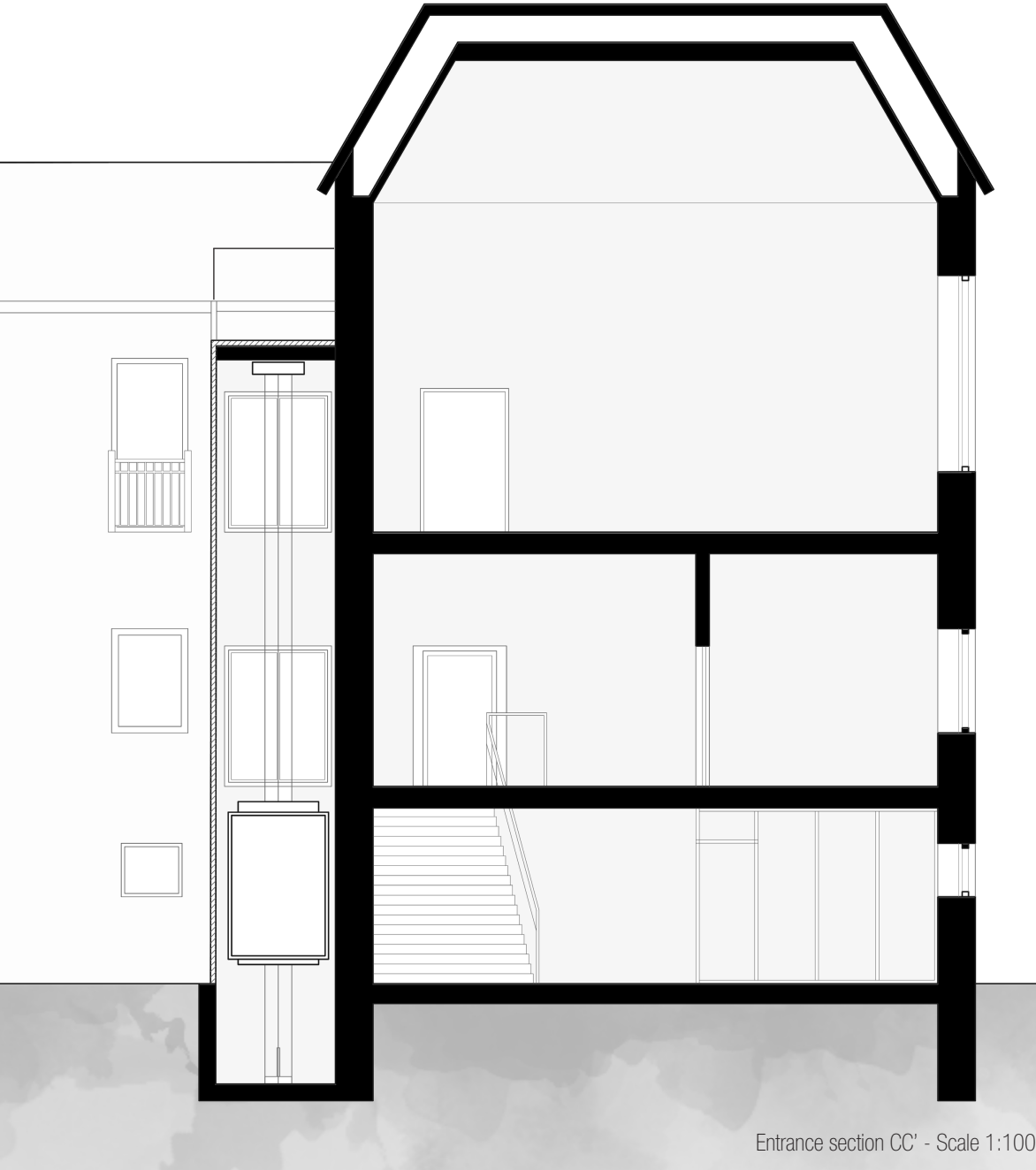
Co-working space (15 pers)	39m <sup>2</sup>
Freelancers spaces (2 pers)	54 m <sup>2</sup>
Start-up (4 to 8 people)	122,68 m <sup>2</sup>
Lunch/ relax area	81,05 m <sup>2</sup>
Bathrooms:	41,83 m <sup>2</sup>

#### Centre of knowledge:

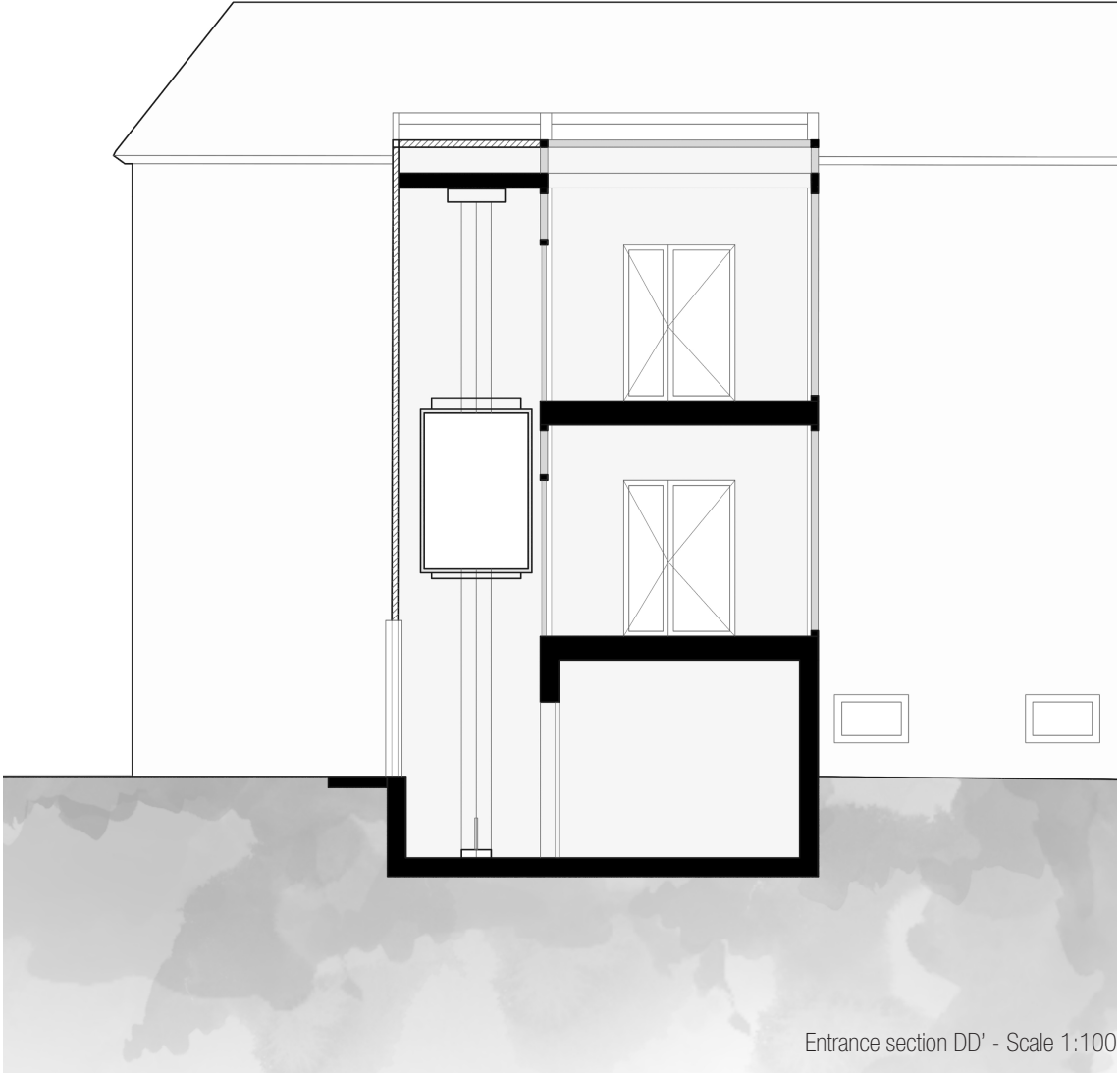
Workshop spaces	133 m <sup>2</sup>
Exhibition	220 m <sup>2</sup>
Conference	112 m <sup>2</sup>
Bathroom	5,93 m <sup>2</sup>



Accessibility - Entrance 1

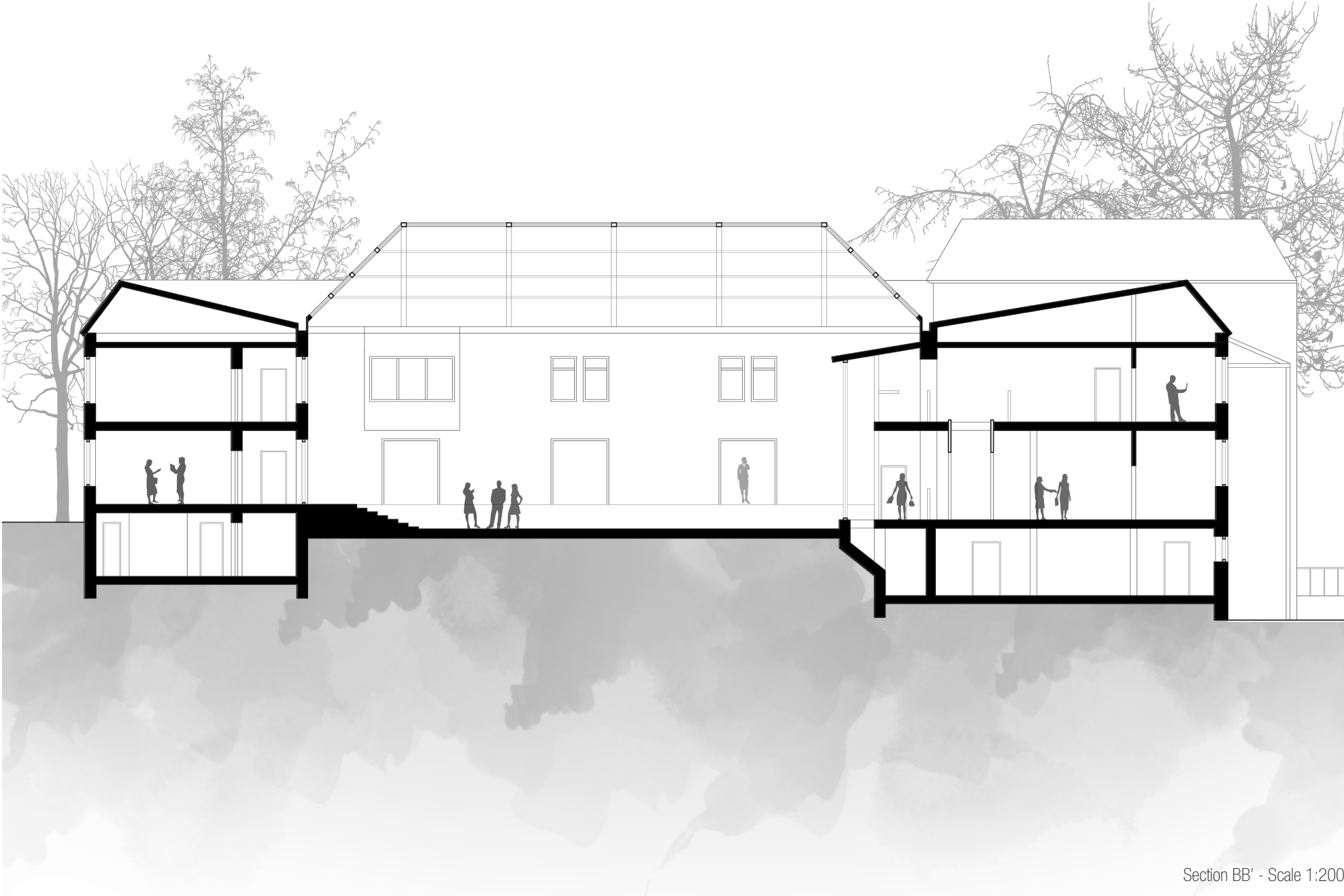
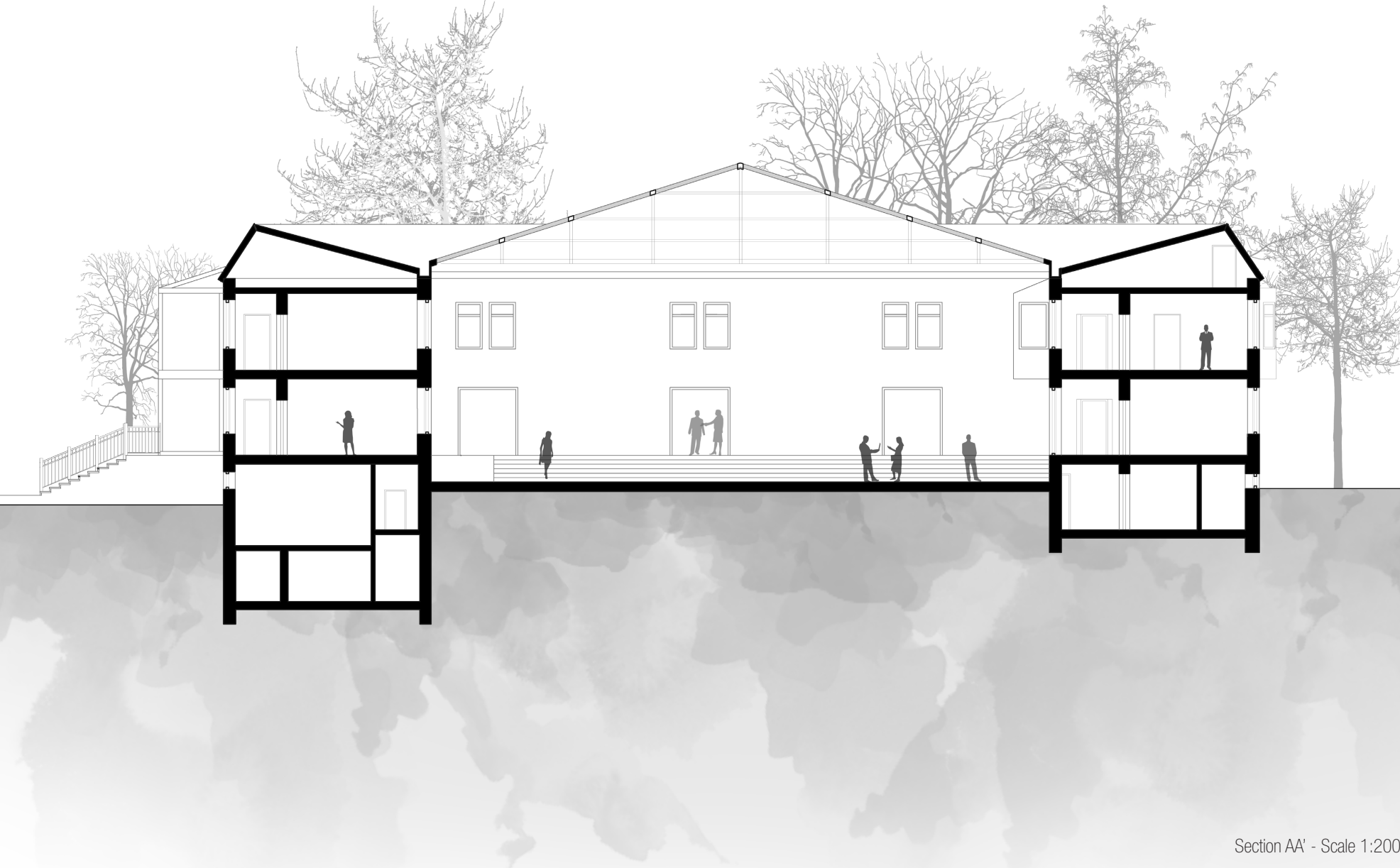


Accessibility - Entrance 2



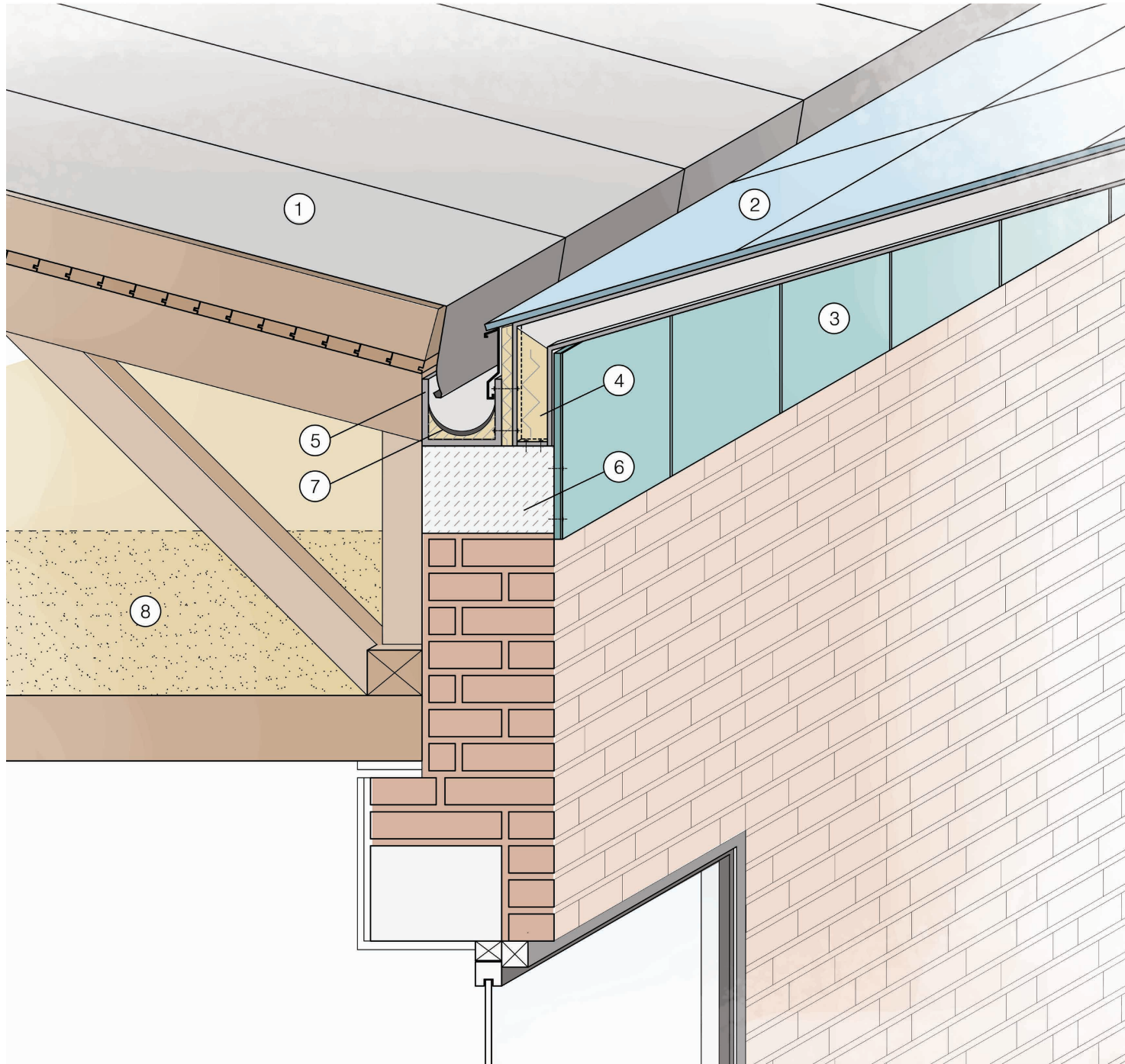


Closing the yard





Roof detail

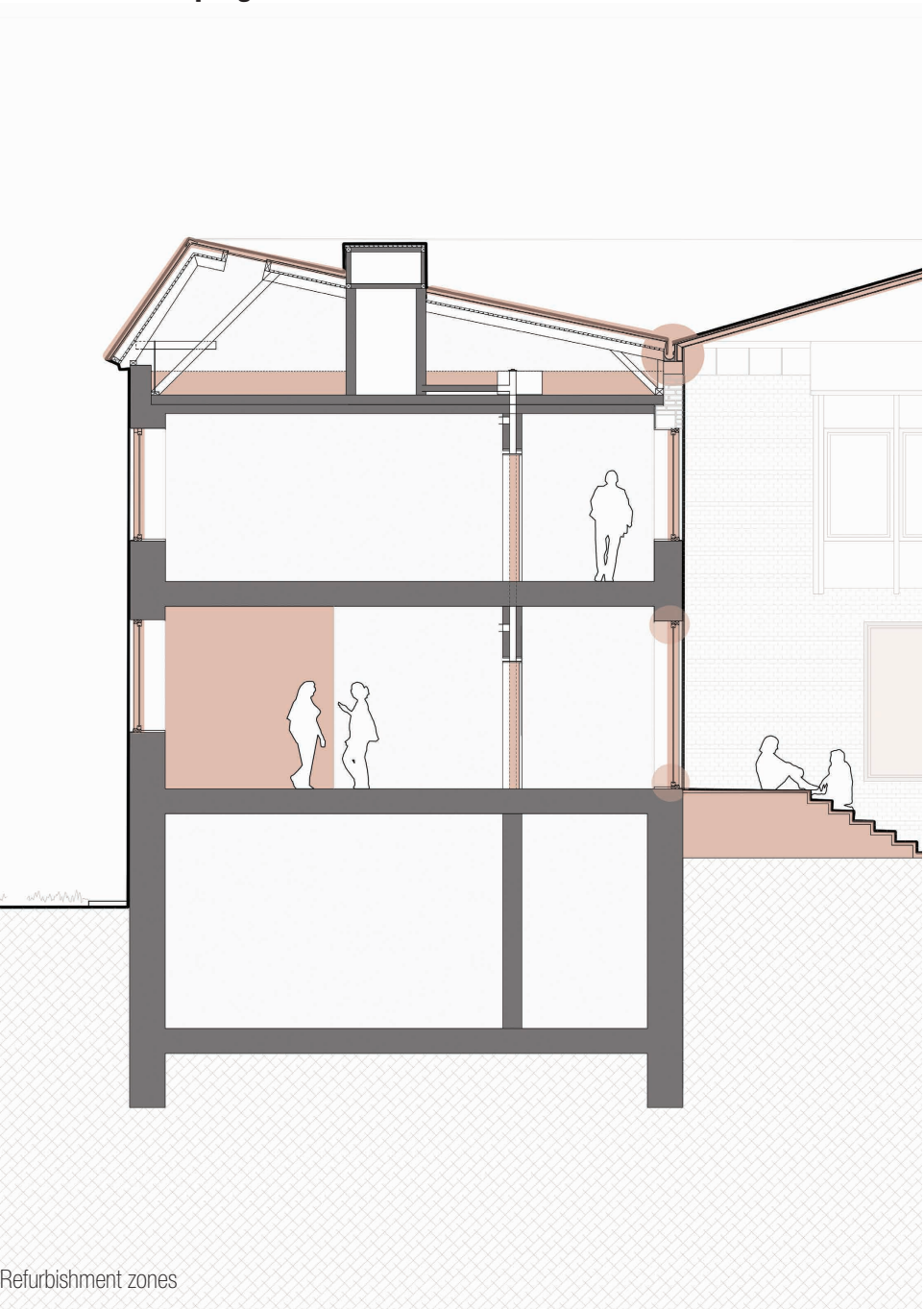


Roof detail:

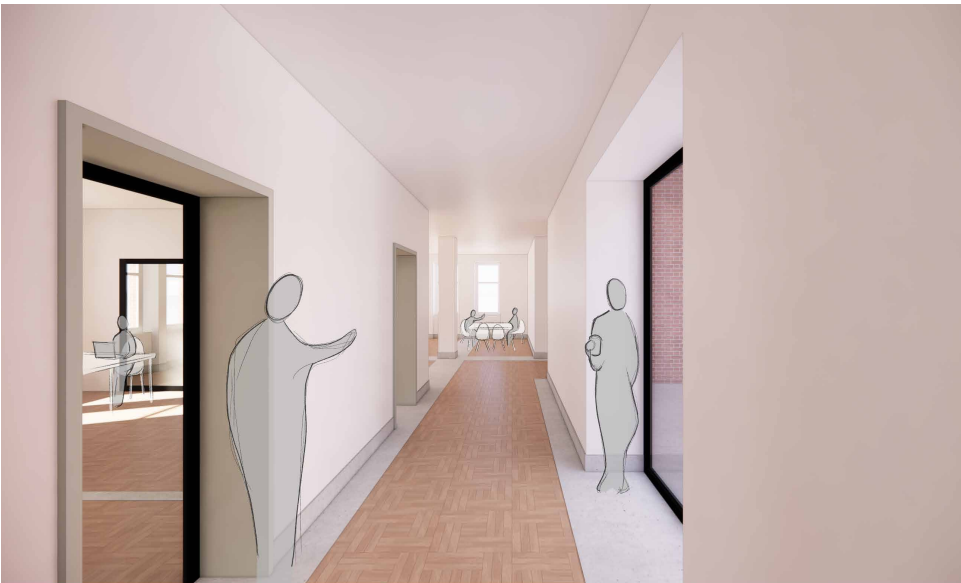
- 1- Roof panels - coated steel sheet
- 2- System safety tempered glass
- 3- Reused cooper panels
- 4- Steel frame - structure for the glass roof
- 5- Steel channel
- 6- Reinforced concrete beam
- 7- Gutter system
- 8- New insulation from cellulose and sawdust

\* The dimensions in the detail drawing are approximate

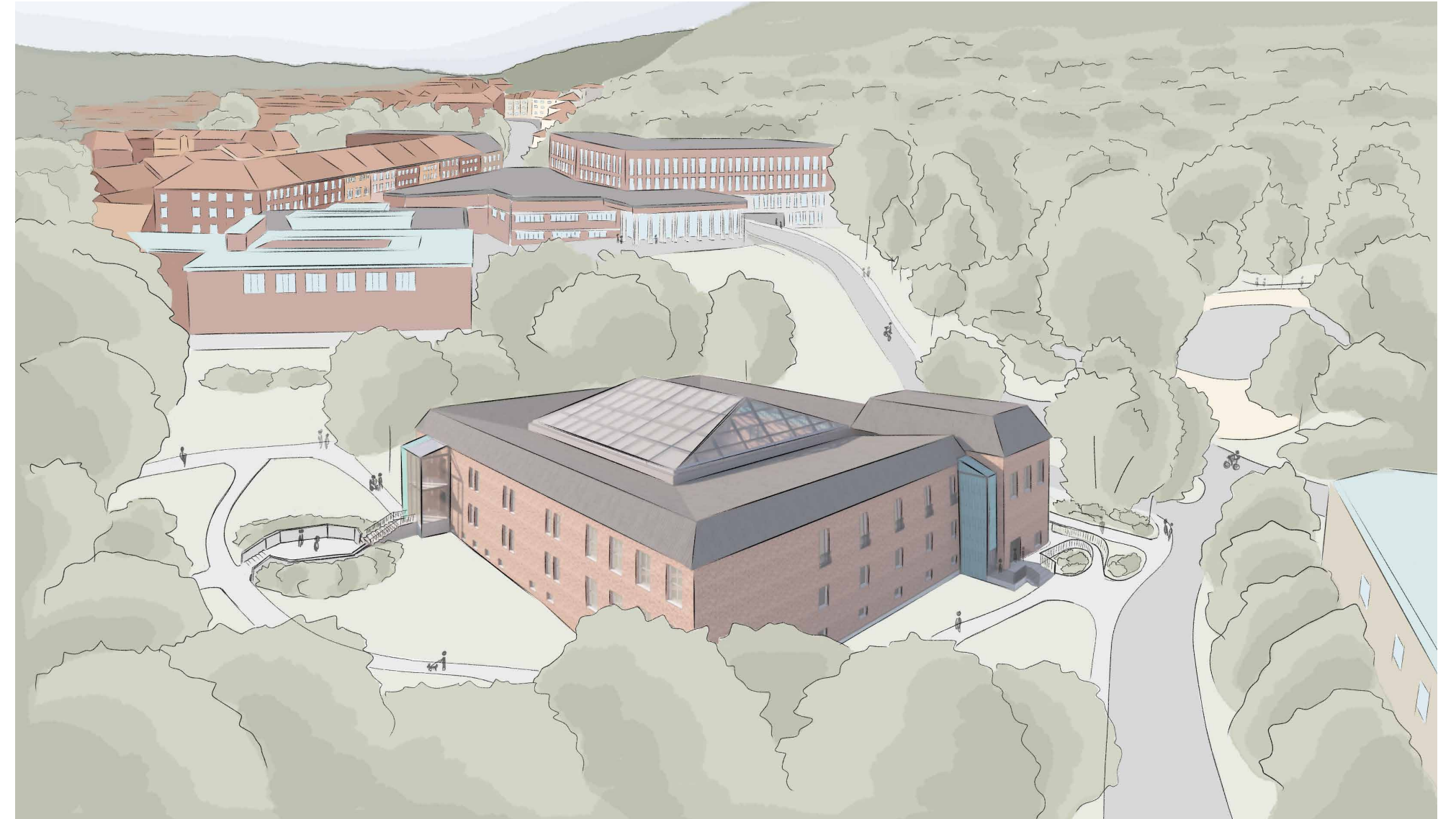
Refurbishment program



Refurbishment zones







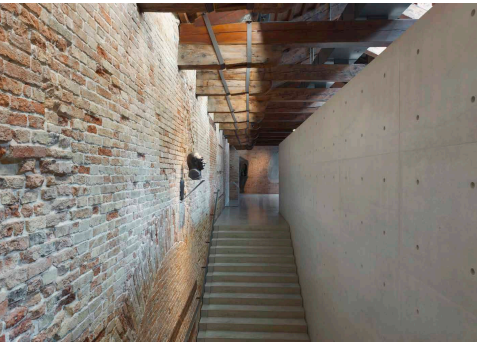
## REFERENCES



Project references

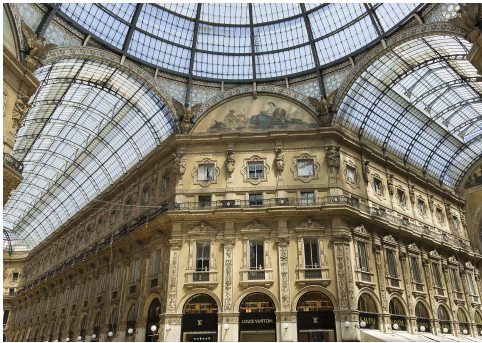
Punta Della Dogana Museum

Architect: Tadao Ando  
Date: 2009  
Location: Venice, Italy



The Roof of the Gallery Vittorio Emanuele II

Architect: Giuseppe Mengoni  
Date: 1878  
Location: Milan, Italy



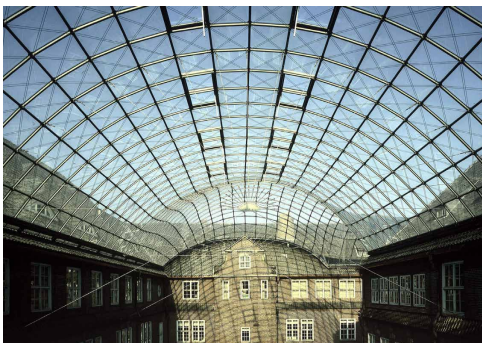
Villa Heike

Architect: Christof Schubert Architekten  
Date: 2018  
Location: Berlin, Germany



The cover of Hamburg's museum

Architect: Von Gerkan, Marg + Partner  
Structural engineers: Schlaich Bergermann + Partner, Stuttgart  
Date: 1989  
Location: Hamburg, Germany



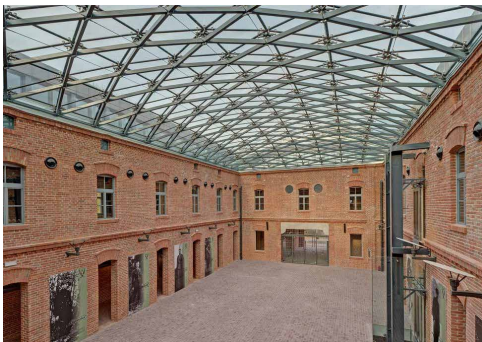
Cour Marly, Le Louvre

Structural engineer: Peter Rice RFR, Ove Arup, Yan Ritchie  
Date: 1992  
Location: Paris, France

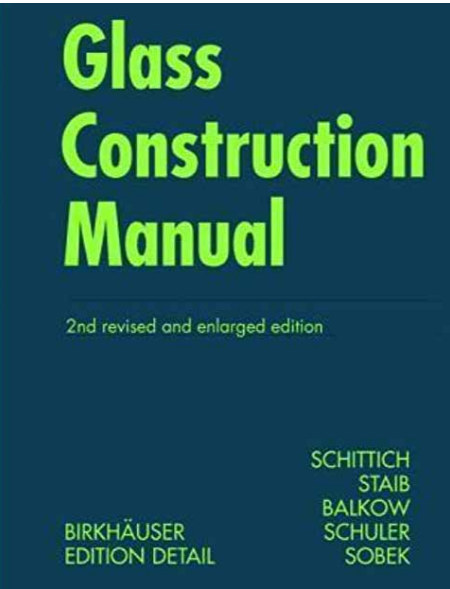


The Home Army Museum in Cracow

Architects: Ryszard Jurkowski, Lukasz Niewiara, Marek Gawron, Anna Jurkowska  
Date: 2011  
Location: Krakow, Poland

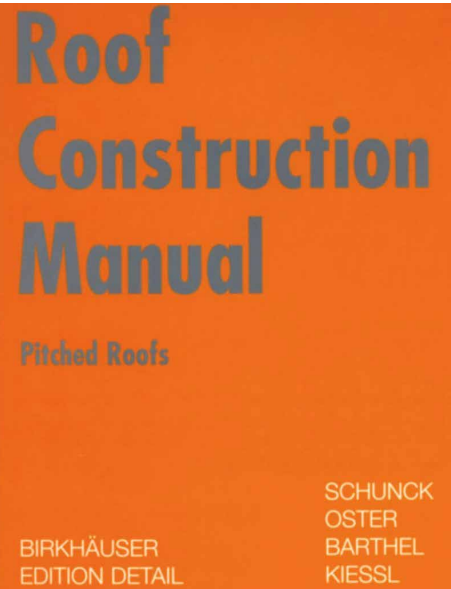


Book references



Glass Construction Manual

Christian Schittich, Gerald Staib, Dieter Balkow, Matthias Schuler, and Werner Sobek  
Edited by Walter de Gruyter GmbH  
Date: 2007-06-08



Roof construction Manual: Pitched Roofs

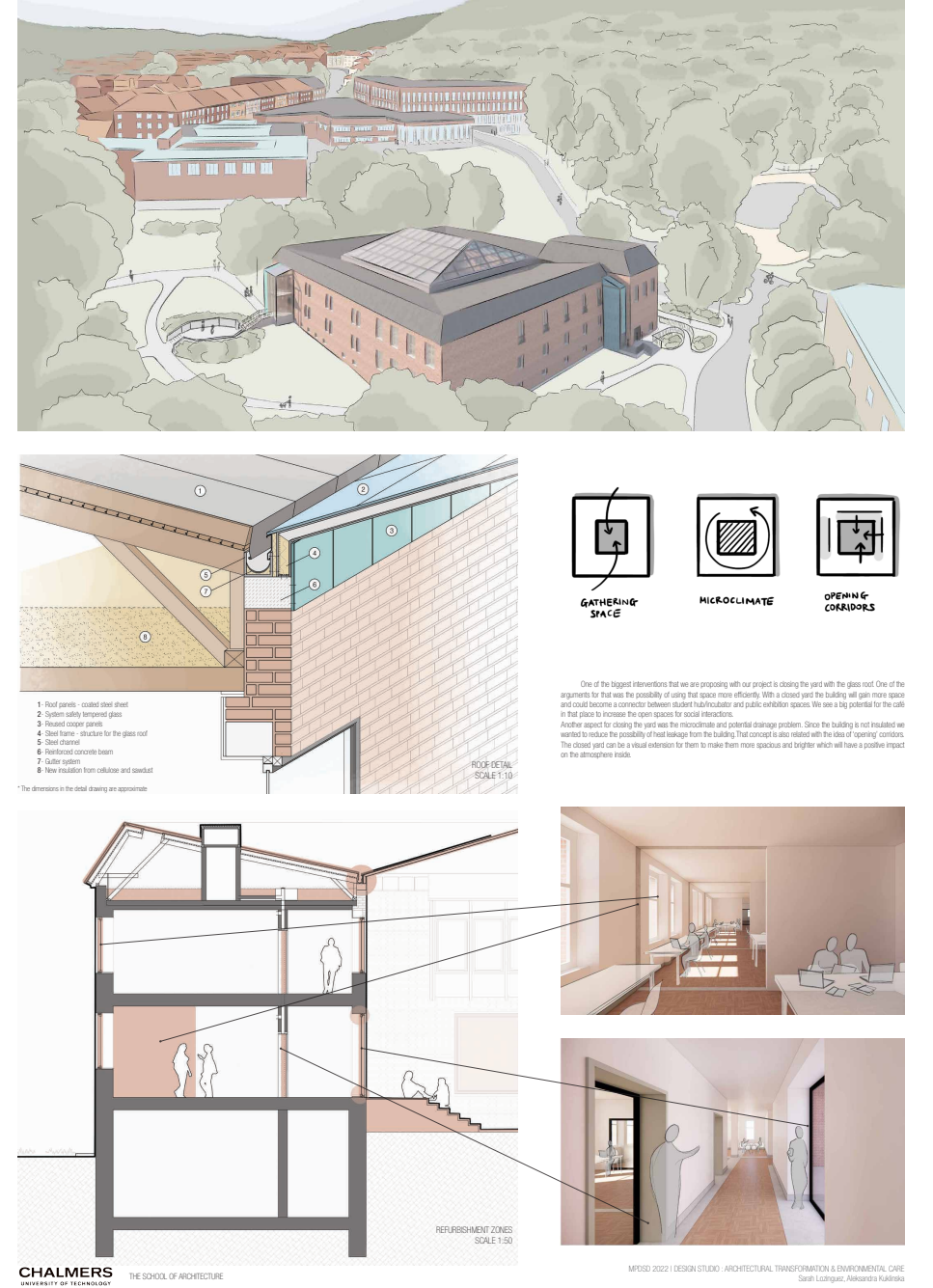
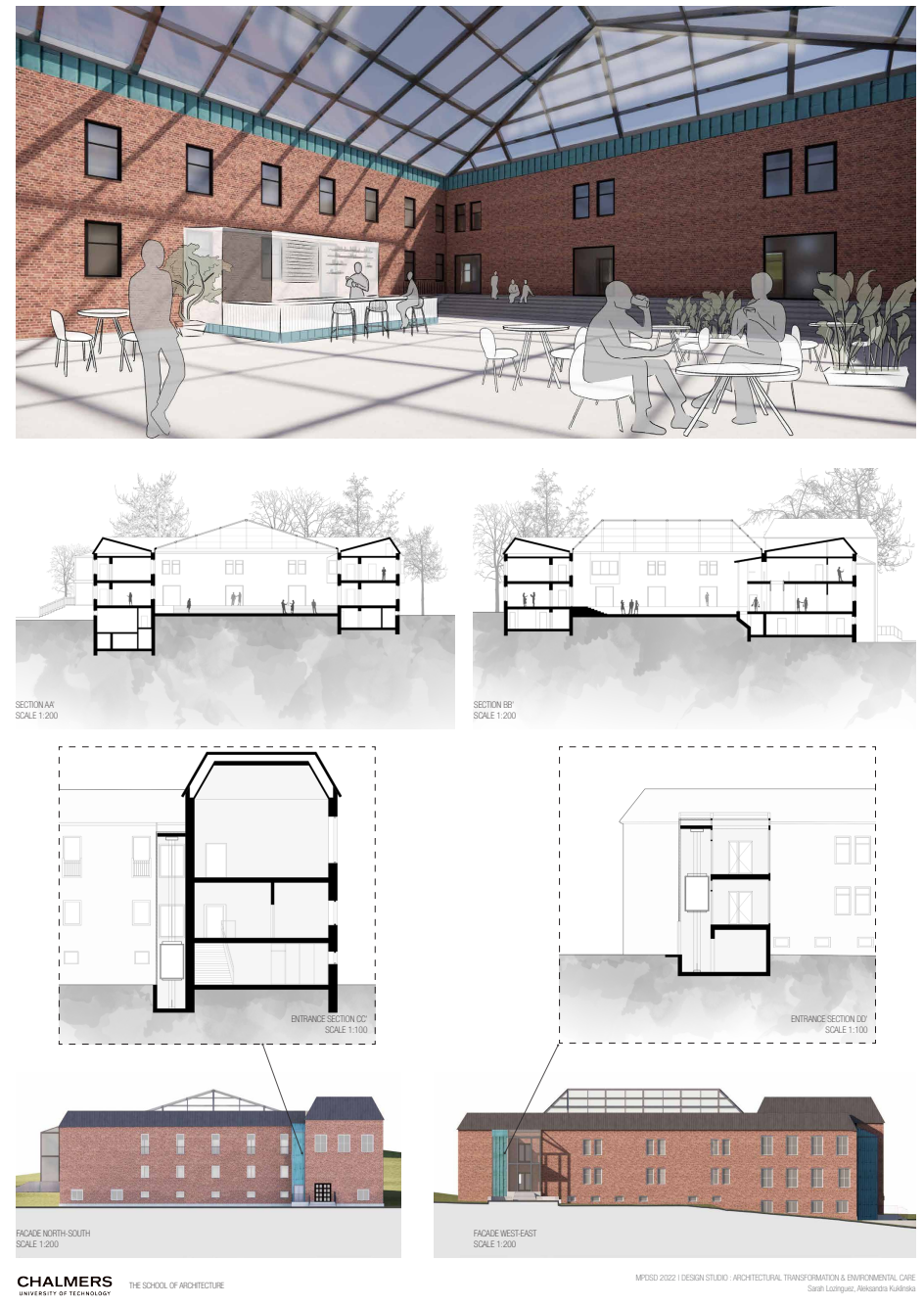
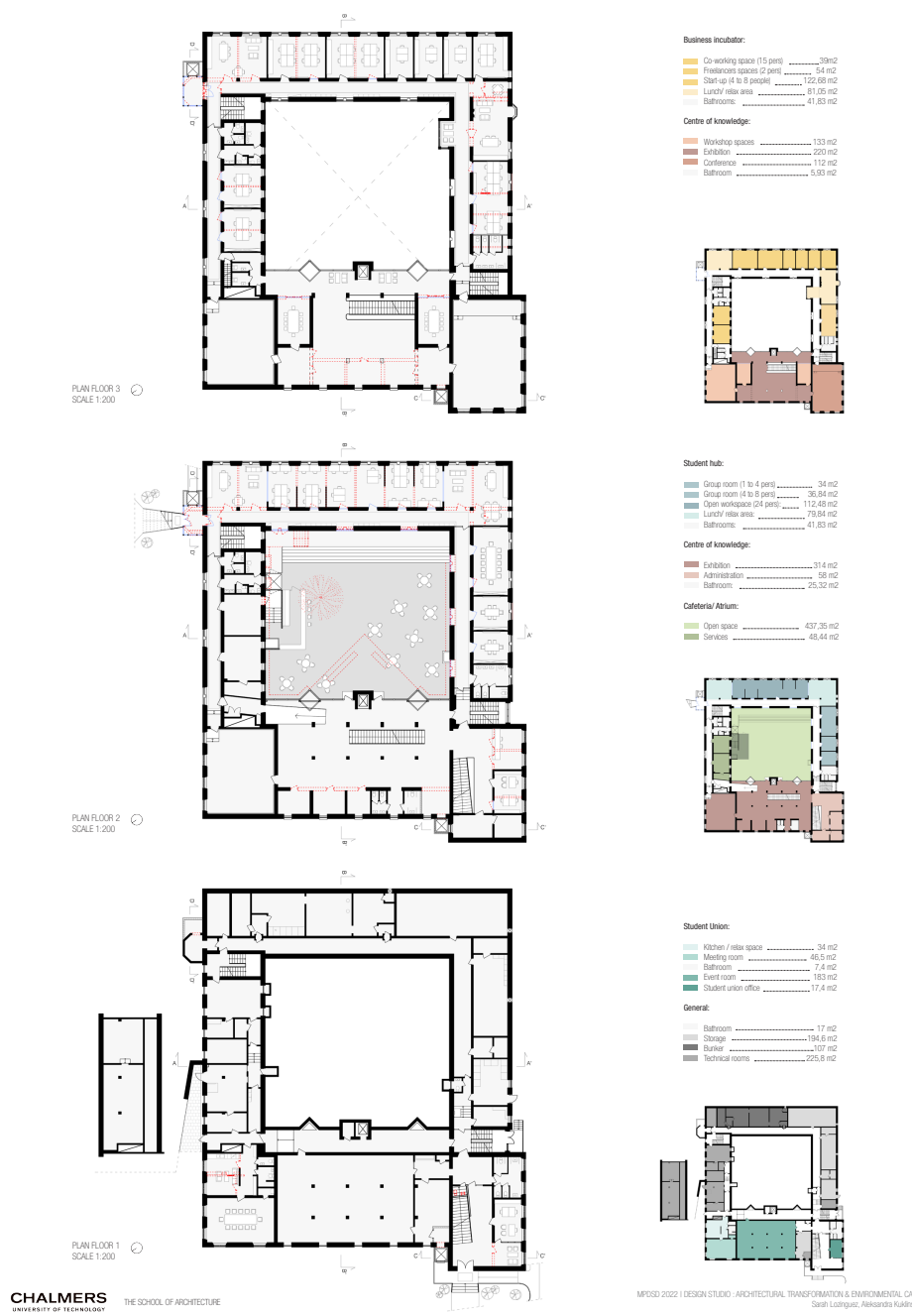
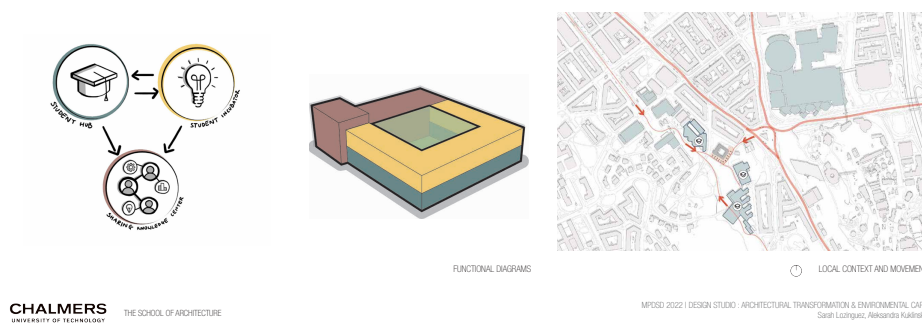
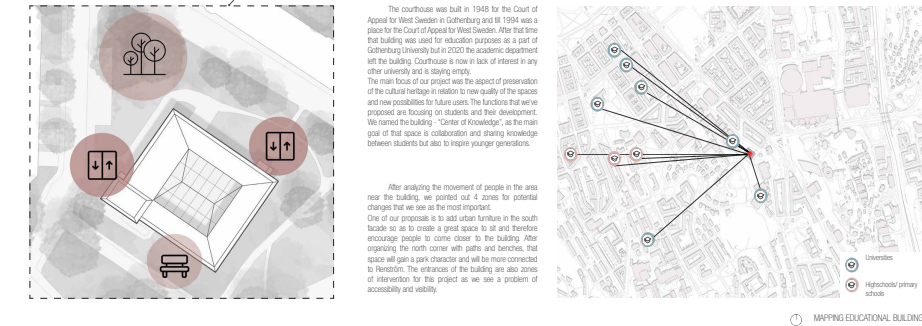
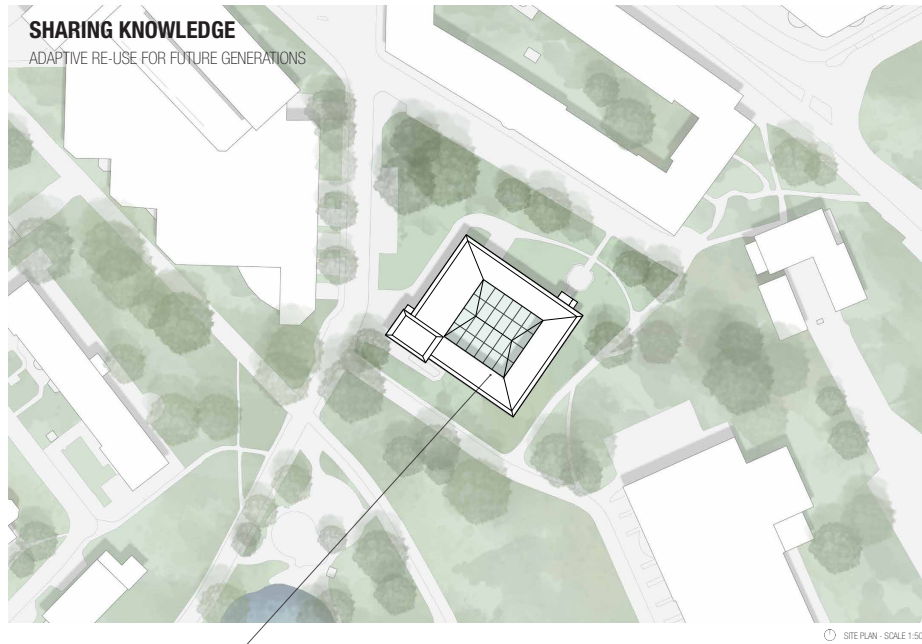
By Eberhard Schunck, Hans Jochen Oster, Rainer Barthel, Kurt Kiebl and Kurt Kiebl  
Edited by: Birkhauser  
Date: 2003-08-25



The Handbook of Sustainable Refurbishment: Non-Domestic Buildings

By Baker Nick  
Publisher: CRC Press LLC  
Date: 2009-08-28











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UNIVERSITY OF TECHNOLOGY

Authors: Sarah Loziquez, Aleksandra Kuklinska  
Architecture and planning beyond sustainability, Msc  
Architectural transformation & environmental care  
Spring 2022