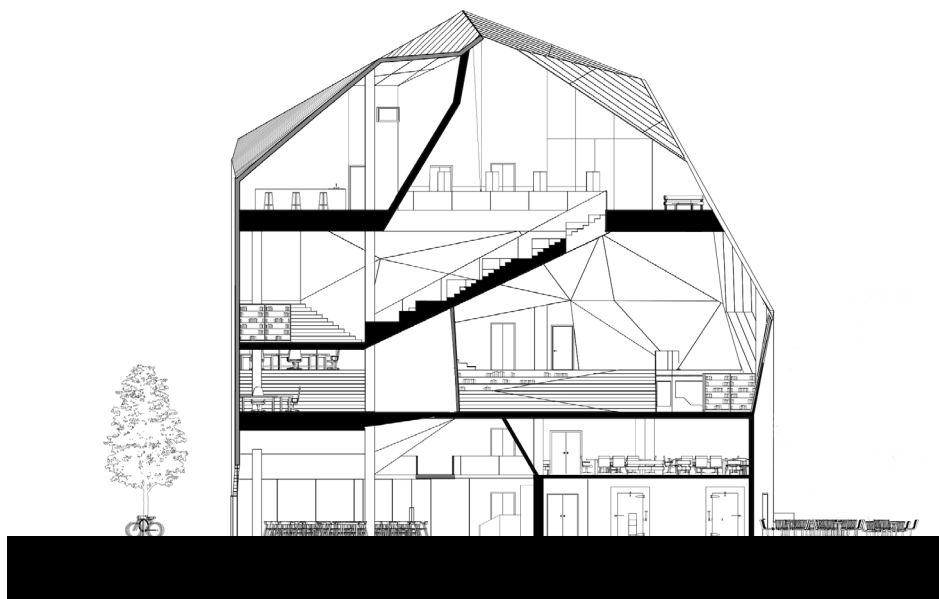


KNOWLEDGE INCUBATOR



An alternative model of a 21st century high school for
the Bubný-Zatorý district

CONTENT

Acknowledgement

I wish to express my deepest gratitude to my parents - Yuriy and Ksenia Ryntovt, who are my role models, inspiration and who supported me all the time. Without them none of this would be possible.

I wish to express my sincere appreciation to my studio leaders Jaroslav Wertig and Jakub Kopecky, who convincingly guided and encouraged me to be more creative and hard working. Without their persistent help, the goal of this project would not have been realized.

I would like to pay my special regards to my friends for the help, support and love. They kept me going on and this work would not have been possible without their input.

I wish to thank all the people whose assistance was a milestone in the completion of this project.

PART I – RESEARCH

1 Thesis proposition

2 Typology

Project-Based Learning
Sharing facilities

3 Site Background

Location
Historical development
Recent development
Morphology
Transportation
Activities in new Master plan
Facilities in Holěšovice

4 Site analysis

Project site
Current condition
Context
Stakeholders
Street character

5 Design Framework

Spatial Program
Design Strategies
Location
Target group

6 Case studies

Architecture projects
School visit

PART II – PROJECT

7 Spatial concept

Main idea
Volumetric exploration
References

8 Design evolution

Sketch design
Design development I
Design development II
Pre-final

9 Final Portfolio

Functional Relationships
Key elements
Use through out the time
Site plan
Exterior visualizations
South-West axonometry
Elevations
Floor plans
Sections
Interior visualizations

10 Technical Report

Cover Report
Structure
Building Technology
Architecture Detail

11 References

Bibliography
List of figures

12 Conclusion

PART I

RESEARCH

This part introduces the thesis topic, the site, the typology of 'school, the detailed building program. It also reviews a design framework and strategies used for 'shared facilities' and goes over case studies which served as inspiration and example for the project.

About:

The initial goal of the project was to look into the traditional educational system and come up with a possible new way how to approach architecture for education. A high school and programs which could be connected to it were taken as the subject of the project. The hypothesis of this thesis project is that the architectural intervention of a re-imagined type of school can make an improvement to the educational process and influence community in the area.

The Master's Thesis is preferably read from cover to cover, but for those who want to read something specific, this is facilitated by having a number of chapters dedicated to each part in the project process. The report is divided into two parts: research and project.

As the thesis began with a general idea on education, the book first introduces a review of the chosen approach (of 'shared facilities'),

followed by an explanation of the selection of this specific site.

Part I of the book will review the detailed explanation of the project based learning school typology and its associated academic approach, broad and detailed analysis of the site and how it influences school program. The reader can find a detailed description of the criteria for the choice of location, target group, design strategies and detailed program description. Successful projects undertaken around the world have been studied, and the learning from these projects has been implemented in the undertaken thesis project. In the end of Part I case studies which have inspired design process are shown. These analyses of theory and place contributed to a design framework which generated a spatial concept for the building.

Part two contains the project. This part presents how research and analysis were turned into a result

“EDUCATION IS AT THE CENTER OF BUILDING HUMAN CAPITAL. DELIVERED WELL, EDUCATION – ALONG WITH THE HUMAN CAPITAL IT GENERATES – BENEFITS INDIVIDUALS AND SOCIETIES.”



1 Collage by WISE

Location: Bubny-Zatory master plan, intersection of Rajska and Plynarni Street

Capacity 500 students + 50 teachers + 15 staff

Parcel footprint: 2,000 m2

Building volume 30,000 m3

Height: 25 meters

Number of stories 5

Typology: Educational

Target group: Students (15-19 years old)
Teachers
Researchers
People in the new neighborhood

Thesis focus: Project-based learning
Community development
Connection of education and technology

Program: High school
Research Centre
Community centre

1 THESIS PROPOSITION

Introduction

Our world is changing radically, but schools as a place which should prepare us for it are not keeping up with contemporary needs. This thesis is connected with looking into a new system, where school is an active element in the city and community and closely connected with modern technologies and industries.

The thesis seeks for a creation of a “high school for the future” that gives importance to personal interests and aspirations of the students and makes them part of the community. The aim of the project was to come up with an architectural design of a high school building- the main function of which would be a space for self-education and development with the environment that considers the individual needs of pupils, while being very collaborative in nature. The goal of the new school is to be a place where students don’t have to be, but want to be.

Having a connection to the problems of the ‘real world’ is one of the programmatic criteria of the school. This is why the building program includes not just spaces for students, but also research center facilities for professionals of different spheres.

Hypothesis 1 The proposed architectural intervention will act as a social agent and a means for the connection of education, community and industry. An educational hub of this nature will serve as a catalyst for change in the traditional approach to education and at the same time influence its users on a personal level by helping them with future career choices and facilitated adaptation into the professional world.

Context 2 The site of the project will be located in the new master plan of Bubny-Zatory district. This specific location was chosen as it is a newly developing neighborhood’s need of a new school (which is already confirmed by the land use plan) as a big influx of residents is expected in the future. More details on the choice of the location can be found in chapter 5 Design Framework under subchapter “Location choice criteria”

Proposal 3 The proposed project is a mixed use integrated educational development which seeks to, with the insertion of appropriate program and the creation of meaningful spaces, produce a safe educational and cultural space to connect community, students and professionals, with opportunities for new

2 TYPOLOGY

Introduction to the definition of the program

About /

85% of the time schools are underused or only partly used, that is why one of the main tasks of the project was the creation of a program and organization of the building in a way that maximizes its use throughout the day and the year. This could be achieved by providing in school facilities which will be bigger and more equipped, so that other companies could rent them out at a lower price. Students will have

...in a way that maximizes its use throughout the day and the year.

lectures and use these labs for their projects, possibly in relation to the external companies. Such an approach would allow the building to be used more and at the same time give students the opportunity to understand better the spheres they want to study/

work in later, as they will have direct access to new technologies, complex equipment and contact with professionals operating periodically within their own school environment.

Similarly to schools, as schools a lot of public facilities in the city are underused (such as galleries, churches, events halls, historic buildings, etc.). Another way to maximize the sustainable use of the building is using public facilities for leading lectures that do not have special space requirements (or have those which could be found in the area). This will give students opportunities to get closer to the community, get familiar with the surroundings and at the same time provide the school with the space to have laboratories and workshops, which could be rented as described above.

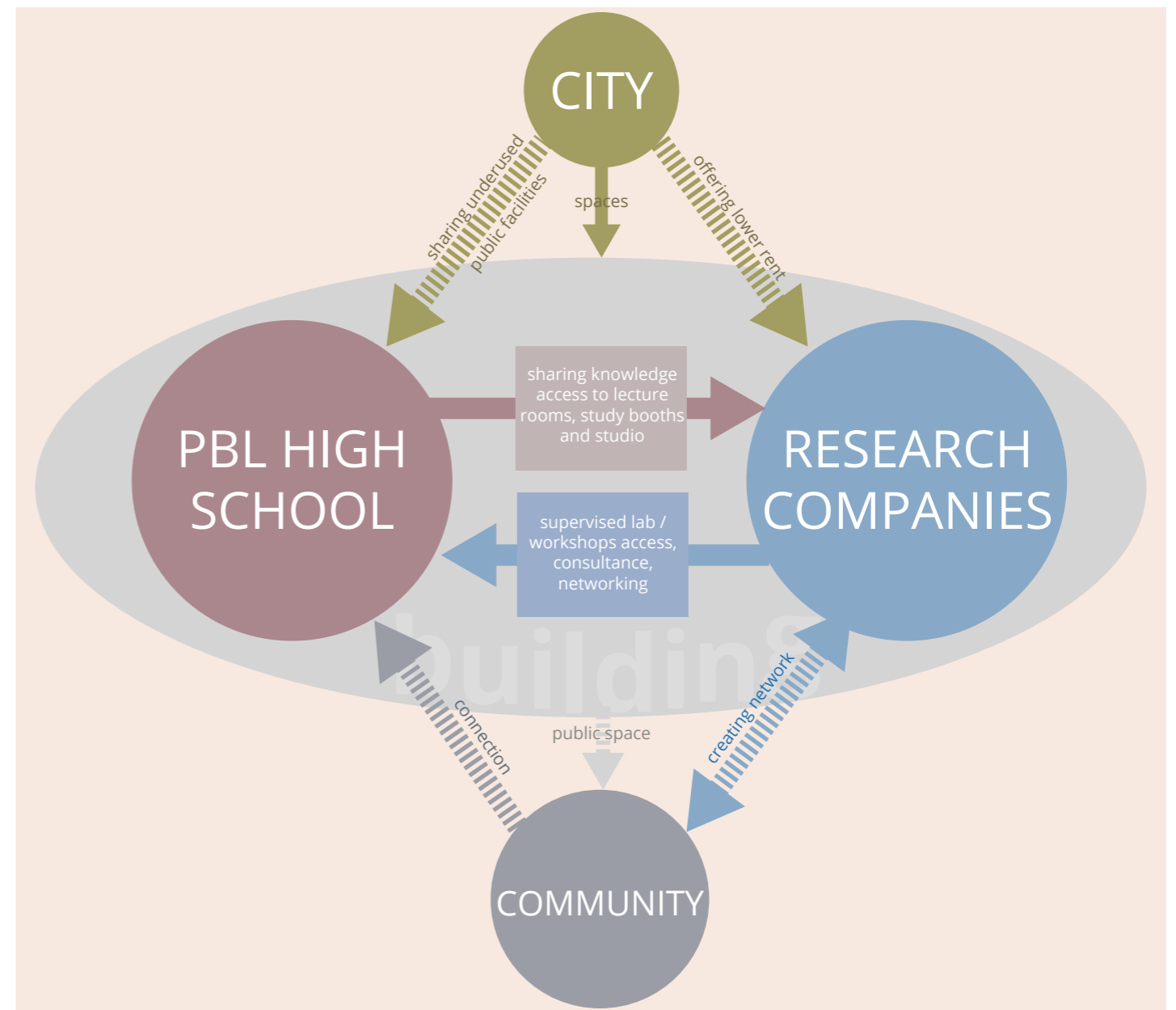
This school will qualify as non-compulsory secondary education - gymnasium (ISCED 3A) and will provide general academic education with the Practice Based Learning program. Its main aim will be to prepare students for university studies via concentrating their studies on the practical application of theoretical knowledge. The duration of such a program is 4 years after 9 years of basic school and a typical age of a student is from 15 to 19 years old.

Project-based learning (PBL) is a student-centered pedagogical model that involves a dynamic classroom approach in which it is believed that students acquire a deeper knowledge through active exploration of real-world challenges and problems and get to study theory through applying it on practical tasks. Student task is to design a school so it fits the described above program, in other words - to equip it with classroom spaces for PBS, taking examples from already realized projects which have similar or the same program.

Following, project includes four interconnected elements:

- school facilities oriented on project-based learning which are shared with research center
- research center with laboratories and workshops which will be rented by other companies and be partly accessible to students
- indoor and outdoor public space with program shared by community, students and researchers
- underused neighborhood facilities providing students with spaces for classes

Vision diagram



2.1 PROJECT-BASED LEARNING



2 Project _Based Learning Diagram by MagnifyLearning

3 Photo from Škoda School

4 Wicked Soap Company advertisement poster

5 FIDS Diagram with information from Design for change

6 Multiple Intelligences — Howard Gardner. Diagram by WISE

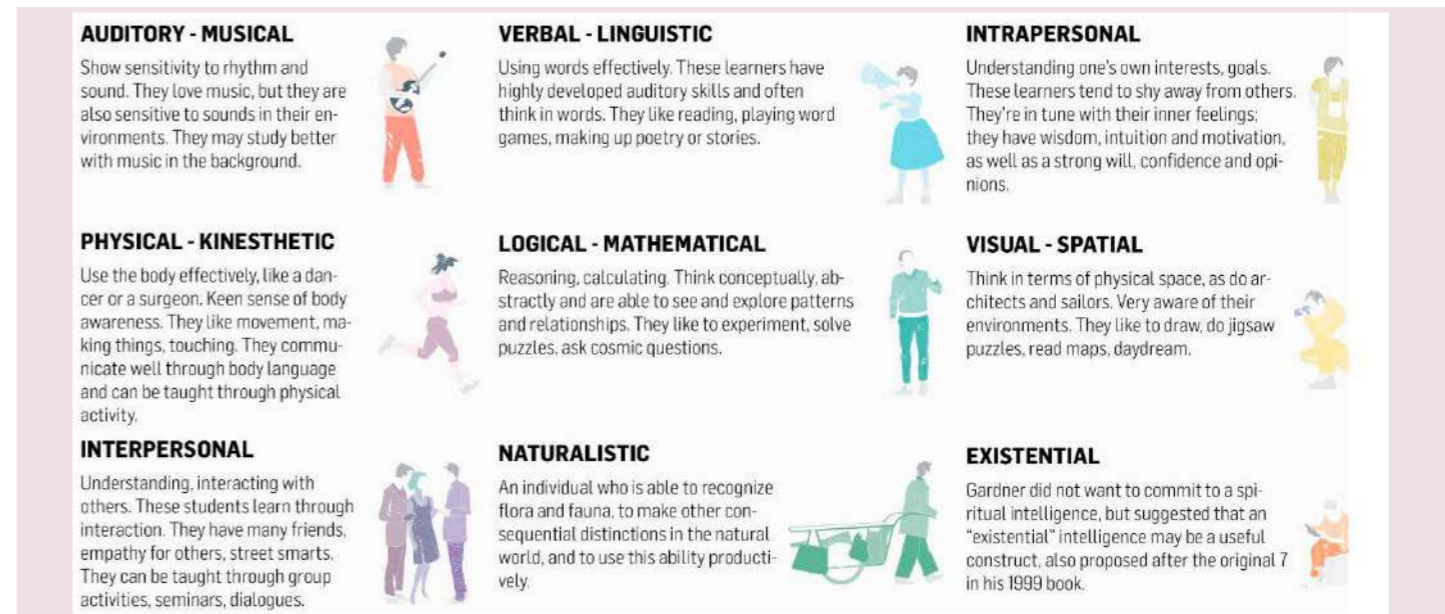


Summary of WISE "Work at School"

The concept that students work at school has already been around for a while and has been successfully used by many educational programs such as Montessori school. Perhaps nowadays the biggest revolution in education is called Project-Based Learning. The program where students learn about things by doing real-world projects and solving practical problems is growing in popularity around the world. In Finland, for example, now it is mandatory to introduce PBL in all schools (specifically called phenomenon-based learning). This way of learning is based on principals of design thinking and goes under different types of acronyms. Another good example of PBL would be FIDS - Design for change program.

There are many reasons why PBL is becoming a new norm, here are two of the most important:

1) PBL engages different types of intelligences into the learning process: Since it is based on project work, children that are good at researching will have the possibility to enhance their skills, but so will the ones that are creative and imaginative — both the makers and the talented speakers have mutually contributive parts. An active learning model like PBL contributes to the whole spectrum of multiple intelligences. (Image 6)



2) PBL makes learning more relevant and meaningful by actually providing solutions to real problems: through PBL, children will learn about something when they will need to use it for a particular purpose or activity in a project. In this way, they will associate information and tools with a problem and therefore enhance their learning experience.

It is no surprise that some of the most interesting project-based programs have ended up creating successful companies like the Wicked Soap Co. at High Tech High. From a classroom activity to a student-run business of handcrafted soap, the company is inspiring students and teachers all over the world. And even in Czech Republic there is already a school which we can relate to PBL, such as Škoda Vocational School, where students get collaborate with professionals on their tasks and prepare for their future career.

2.2 SHARING FACILITIES



This part is composed using materials from 00 Architects' video of the project Scale free school



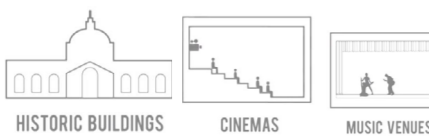
What is a school? Is it a building, a uniform, a group of teachers, a body of students, a collection of facilities, a collection of books or a timetable of classes?

create is a place for mass learning. Typically, when thinking of new architecture of schools this concentrated arrangement of functions is wrapped in a brand new institutional building, constructed in a single one-off investment. Of course, that requires a huge amount of upfront costs, both in terms of finance and carbon footprint, while the final outcome often doesn't meet its full potential.



RELIGIOUS BUILDINGS

Whatever school is, we know that what schools do is changing. Shifting global market, new skills for knowledge economy, new skills for new social needs, and the Internet – all of these things are ensuring that how, what and why we learn in 21st century is going to be very different from what we were used to in the 20th. Teachers, voters, educators and policy makers will need to innovate, to think of new models for education, to make us smarter by making education smarter. What might all this changes mean for the design of schools of the future? Since the 19th century our approach to architecture of learning has been almost industrial. All the various activities associated with learning are subdivided in the designated functions: libraries, dining halls, assembly halls, classrooms, labs, sport facilities and compressed onto a single site. This model of the school has been arising for centuries. By compressing all the processes of exchanging knowledge together in one space what we



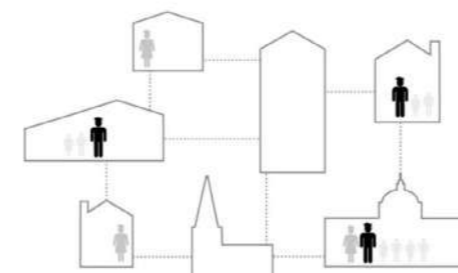
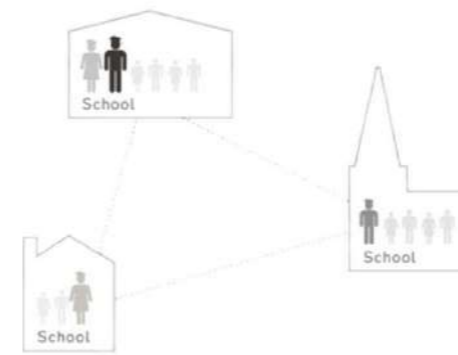
HISTORIC BUILDINGS CINEMAS MUSIC VENUES



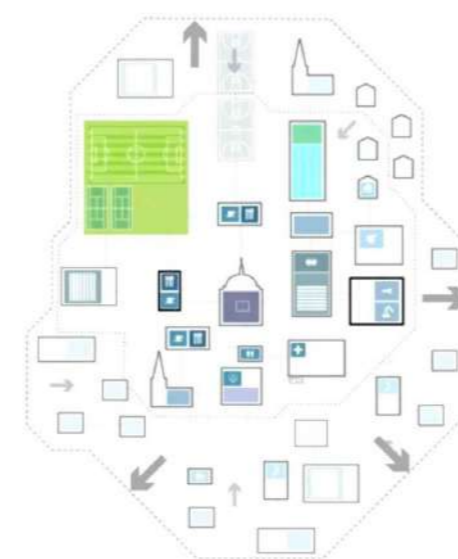
PUBLIC PARKS

7

Scale free school concept diagram by 00 Architects



PART OF THE LIFE OF THE TOWN CENTRE



...we would no longer think of the school as a single building, but as a civic institution embedded into the community...

embedded into the community, as part of the life of the town or neighborhood center, designed as changing, responsive architecture, which can adapt and change according to how its teachers and students want/need to use it. The town becomes the school. [00 Architects, 2011]

On the other hand, there is already a tendency for school facilities to be rented privately, which forbids students access to use it after-hours, forcing them to go elsewhere to study or spend their free time [Prague 7, 2020]. But what if schools could provide facilities for the community, and at the same time give students an opportunity for self-development in the school at their free time? A good example for it would be some scientific or technological laboratory, which could be rented (out while it is not being used for classes) by start-ups and young initiatives at a lower price, with the condition of taking students as interns or allowing them to use the spaces for self or shared education on agreed before-hand terms. This would benefit the local economy by supporting local businesses.

An even bigger advantage is the change this model brings into educational processes. One of the challenges for high school students is the decision of what they want to do in future and which profession they should choose. Even though schools currently provide a lot of theoretical knowledge, it is really hard for student to realize how different spheres are operating, what is the specificity of different professions and how they are inter-related. Having real life examples and opportunity for practical experiences would help them better understand what they are interested in and maybe even be able to have some works or experience for their application to universities with an increased chance of getting in. Such strategy would directly connect students to the community and make school not just elements of the city, but its crucial part.

3 DESIGN FRAMEWORK

Research process and influence of its outcomes on the project definition

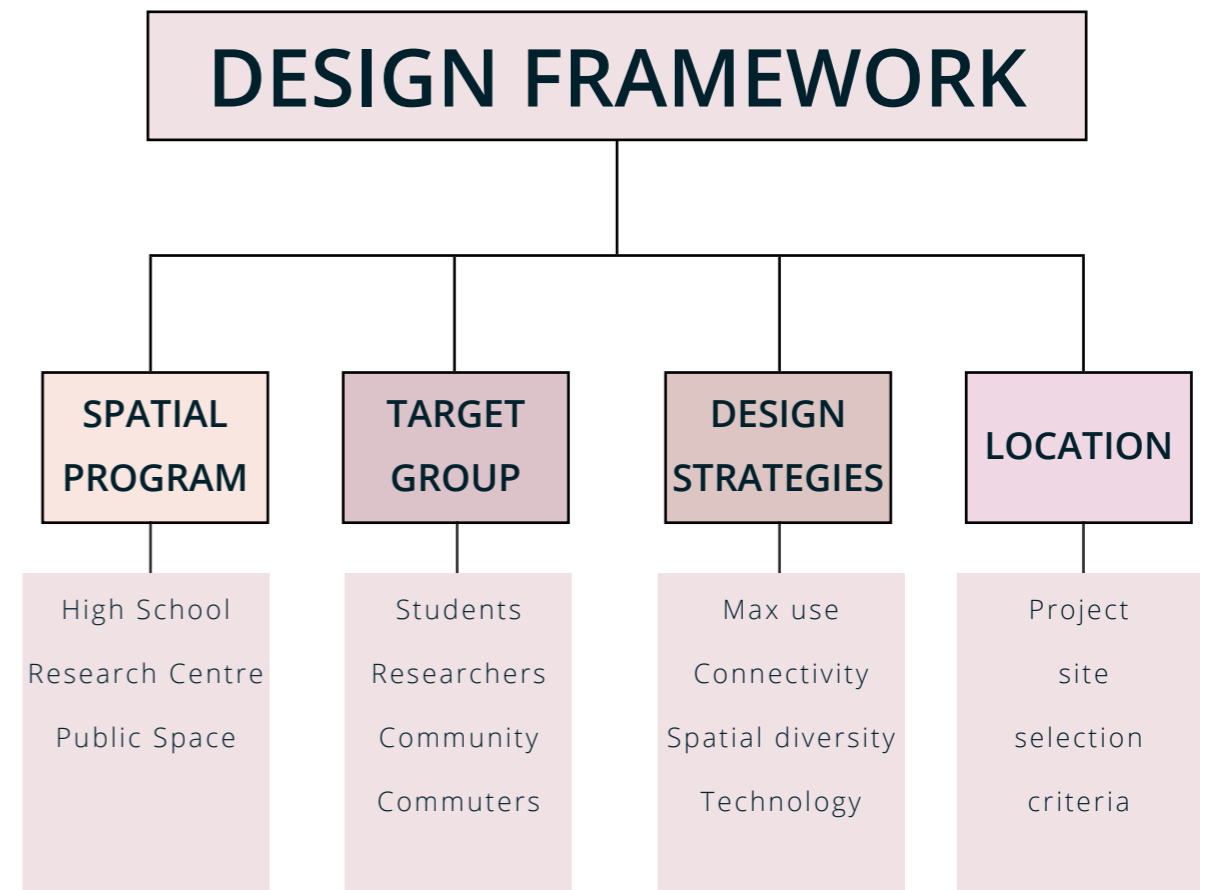
Process /

For the development of the project, the design framework had to be created. This section of the book will overview what conceptual factors had to be considered before moving to the architectural design of the building.

After establishing a vision and model of how this type of school would function within the city (see page 9), the research moved to the definition of the program and its space relations. Firstly analyses of building footprint and height regulation were done to define maximum area available and then subdivide on the main programs and their parts, including technical facilities needed for building functioning.

At the same time main target groups were set for better understanding of how the building should serve its users and what qualities it should have. From the vision and spatial program were formed general design strategies for project development.

Finally, after defining all of the future project programmatic elements, and the criteria for its location were set, the building would benefit the surrounding as much as possible and at the same time function perfectly within itself.




3.1 PROGRAM

These programs were defined according to exploratory and empirical research during this thesis. The aim is to meet the needs of all users and try to work from inside-out. Space selection has been done with the consideration of using facilities of other surrounding facilities.




LIBRARY
As a space which makes knowledge available and spreads, as well as represents different spheres. Library is a perfect place for uniting people. At the same time space should provide plenty of spaces for self-development in a comfortable atmosphere.




FOOD COURT
For the food break of the students and researchers and for the visitors of the center events or workshop the canteen which could cook lunches, provide food for events and have coffee for users and visitors is necessary.




COMMUNITY SPACE
As one of the required function of the building is its connection with community and neighborhood, the space which could have exhibition, movie screening or lecture is needed. If there would be events to visit, people wouldn't hesitate to enter and in future might come back collaboration.



LABORATORIES
Physics, Chemistry and Biological laboratories will be under the control of the research groups and provide only partial access for students. Nevertheless, they should be fully interwoven into the school fabric.




WORKSHOP
Workshop like Prusalab or FAB lab should have various spaces for machinery of different types. As the workshop is also accessible for public, it should have separate entrance, but at the same time be connected with school spaces.



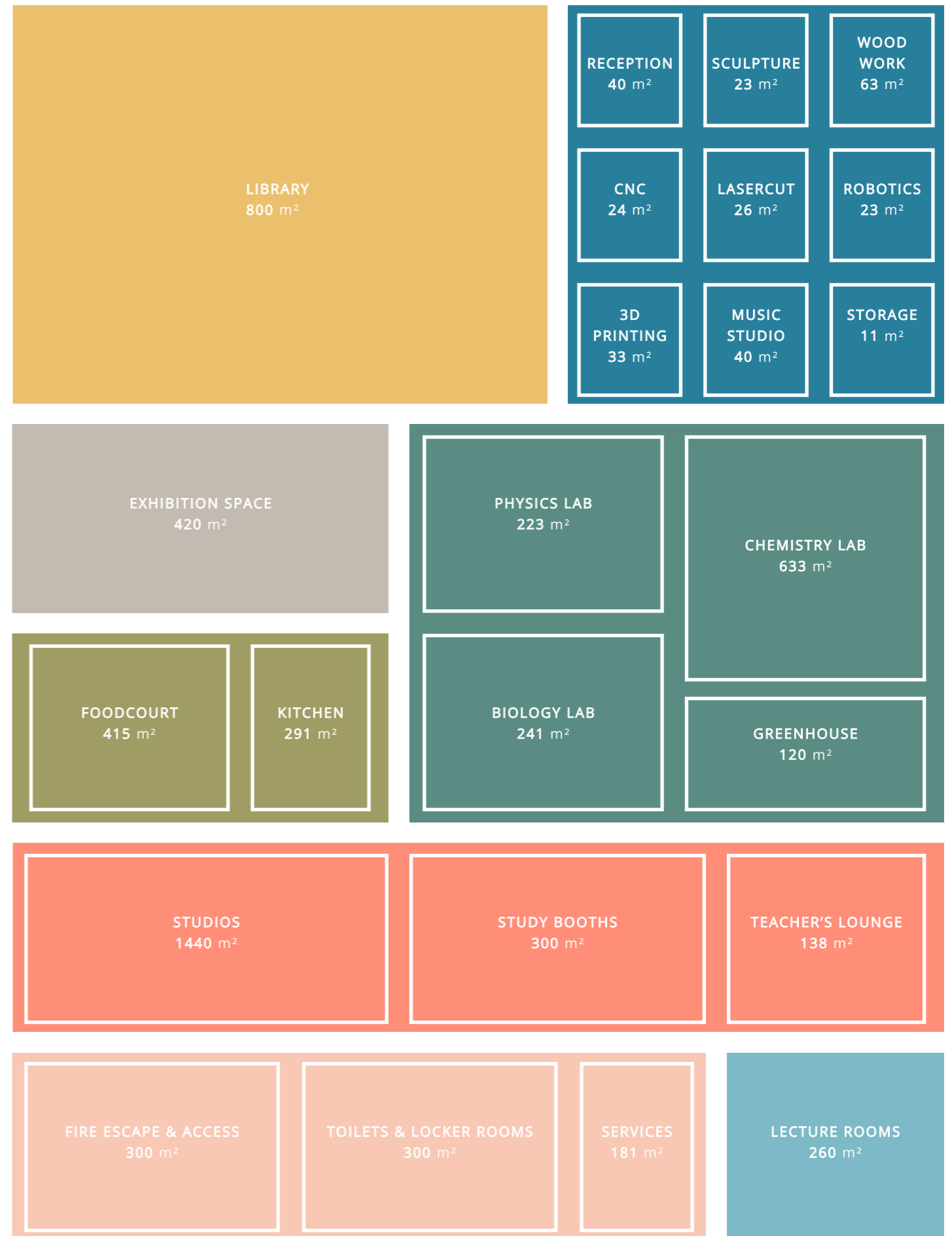
STUDENTS STUDIO
As school has Project-Based Learning, it is required for students have plenty of spaces for development of their project individually and in groups. These should include open floor plan studios and more enclosed study booths for team work or meeting with professors.



LECTURE ROOMS
Lecture rooms will be mainly used for school needs, but also available for booking by researchers and after hours for public lecture. They should be of different size and the bigger one should have close proximity to the public space.

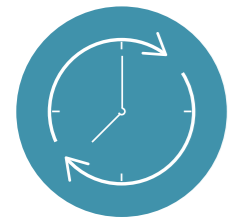


TECHNICAL FACILITIES
Technical facilities include spaces required for successful and safe functioning of the building and institution, that is maintains, services, storages, fire escapes, security rooms, reception, locker rooms, and rest rooms.



3.2 DESIGN STRATEGIES

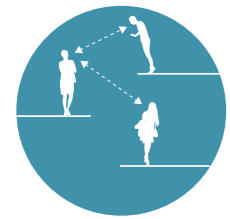
The design strategies will help with defining physical aspects of the building in order to integrate the building within the built environment and to reach the objectives and aim of the project.



MAXIMIZING USE
The maximization of the physical use of the building is the main reason for the selected mix of the program. It is necessary to realize the maximal potential of the building. In other words, each space should be used through out the day during all seasons as much as possible.



CONNECTION TO THE COMMUNITY
The design shell be welcoming for the people from the neighborhood to explore.



VISUAL CONNECTION
For inspiration and the sharing of knowledge, visual connection between different spaces is needed. This will help to create connections and a more safe environment.



FLEXIBILITY
Flexibility of some spaces can help in the increase of building use at different time. It is also required as there are many different users.



SHARING FACILITIES
As school will share its facilities with the city, these have to be reflected in the design and spatial arrangement of the building. The transition and legibility between public and private spaces is necessary.



TEACHING BUILDING
Having some of the building elements exposed, such as its structure and maintains systems (HVAC, drainage), so students can also understand how it stands and functions.

3.2 TARGET GROUP

Target groups are meant to make some of the building requirements more specific, so it is not limited to one group.



STUDENTS

The project should offer a meaningful, creative and innovative atmosphere, in order for young people to develop themselves. They should be provided with spaces for socialization as well as self-development.



RESEARCHERS

It is necessary to provide private spaces for each laboratory, but at the same time allow sharing of the facilities. Space for social networking is necessary.



COMMUNITY

The needs of different social and age groups should be considered. These firstly should be seen in the barrier-free option of circulation and in variety of spaces, which can be used by kids, elderly or families.



COMMUTERS

As the school will be located above the metro station, the entrance has to be comfortable for the commuters to transfer between tram and metro.

3.4 LOCATION CRITERIA

The placement of the building is decided according to a number of criteria. These criteria define the most suitable location for this building and highlight several design challenges which should be considered during the design phase.

SUPPORT LOCAL ACTOR

Should invite diverse potential target groups. Place should feel and give the impression that it is yours and you belong here.

VISIBILITY

The importance of the institution should be highlighted by its location and its visibility in the surrounding, so it can be easily described, found and maybe even serve as local landmark. Also have visible activities to the outside and spilled out into the urban space.

HIGH ACCESSIBILITY

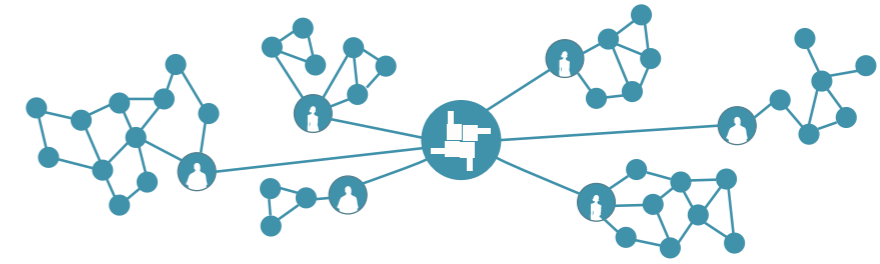
It should be easy to reach by public and private transportation from other city parts and can have easy access through the neighborhood for students to be able to travel to their classes in the outside facilities.

NEW DEVELOPMENT

As the school presents absolutely new typology and program it is important not just be in location where there is need for it, but in the new one, so the growth of the new neighborhood can go along with the growth of a new generation and new type of thinking and connecting. The construction in the developing area also allows bigger freedom with architecture design.

FACILITIES & ACTIVITIES NEARBY

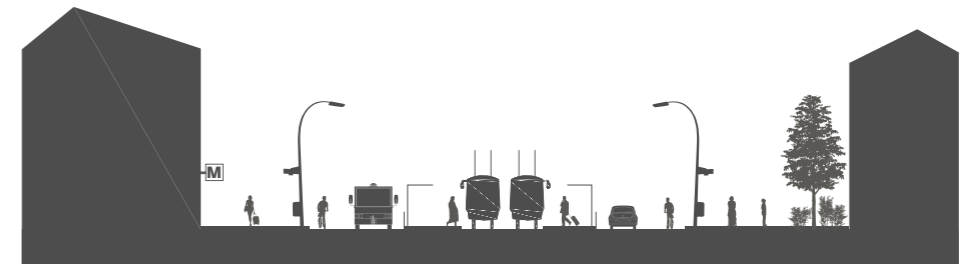
Following concept of scale-free school it is important that in the surrounding the recreation (as parks and water), cultural (as galleries, churches, museums) and education facilities can be found.



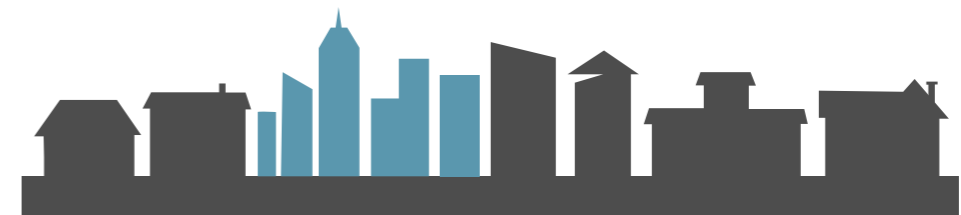
SUPPORT LOCAL ACTOR



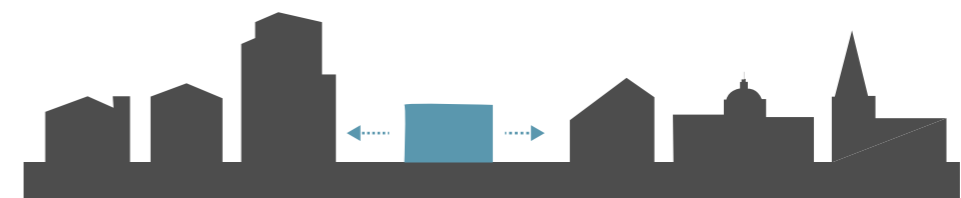
VISIBILITY



HIGH ACCESSIBILITY



NEW DEVELOPMENT



FACILITIES & ACTIVITIES NEARBY



8 Satellite image of Holešovice with highlighted site area

4 SITE BACKGROUND

General information

About /

After identifying the project typology and the mechanisms through which the school could be operated, the research has been done on what is the most appropriate site for such a school.

As the thesis looks to create a new type of school or "school of the future" it was thus needed to choose a neighborhood which not only requires an educational facility, but would be open for new possibilities and views.

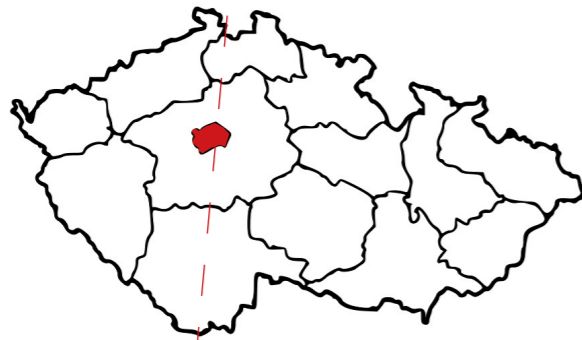
Bubny-Zatory became a perfect option. As there will be a large increase of residents in the area the need for school is obvious. Additionally, it is going to be an absolutely new future

neighborhood where new architectural forms and approaches can be tried out.

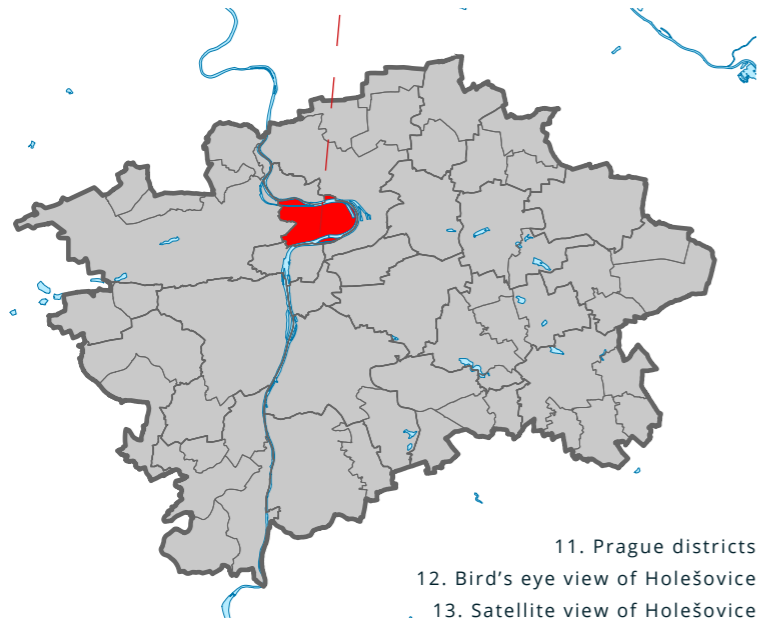
In this chapter of the book will be reviewed general information about the context in which the project will be located; its historical development and how it changed in past years as well as how the future master plan will work; public and private transportation and planned activities. All of this has direct influence on the way the project is designed as one of the main topics of the thesis is how schools can be more connected with their context and community.



9. Europe



10. Czech Republic



11. Prague districts

12. Bird's eye view of Holešovice

13. Satellite view of Holešovice

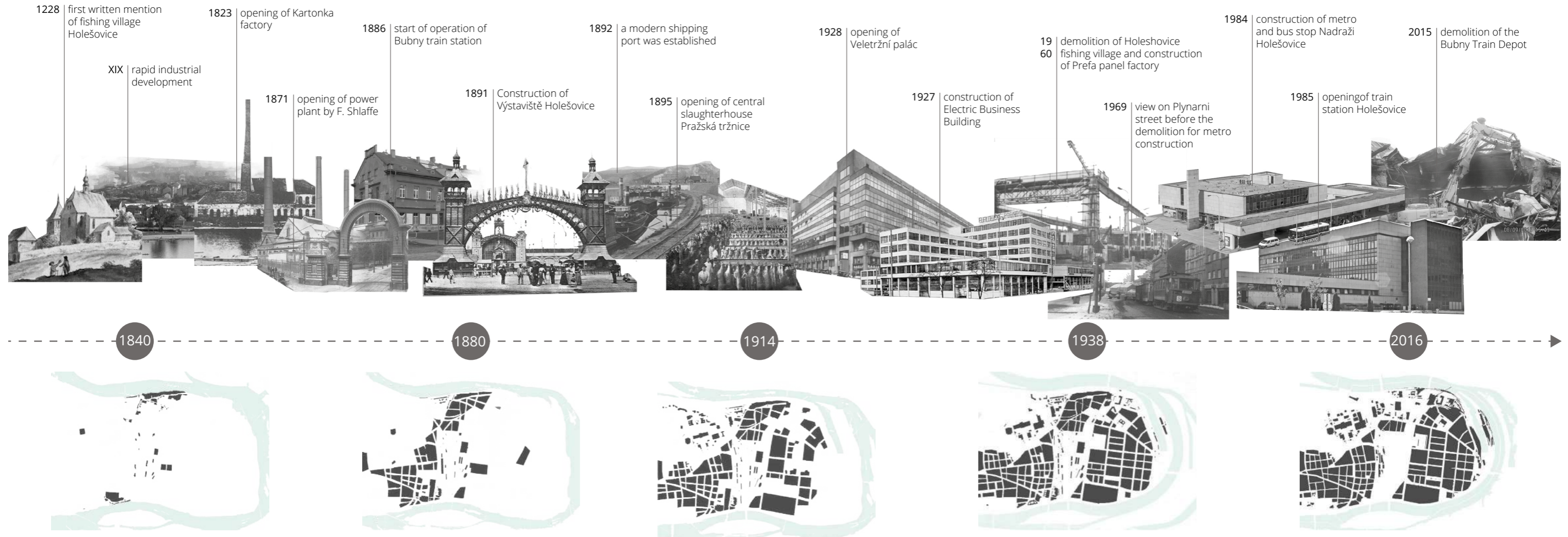


4.1 LOCATION

Prague, capital city of the Czech Republic, is traversed by the Vltava River. The population Prague is about 1.3 million people, while its metropolitan area is estimated to have a population of 2.7 million.[7] The city has a temperate oceanic climate, with relatively warm summers and chilly winters. Prague is a political, cultural and economic centre of central Europe complete with a rich history.

The project site is located in the Prague 7 district, which is currently undergoing development of its Bubny-Zatory neighborhood. This area is surrounded from 3 sides by the Vltava river, has good connection to the city center, main public amenities and has in it 2 train stations with the connection to other Czech cities as well other countries.

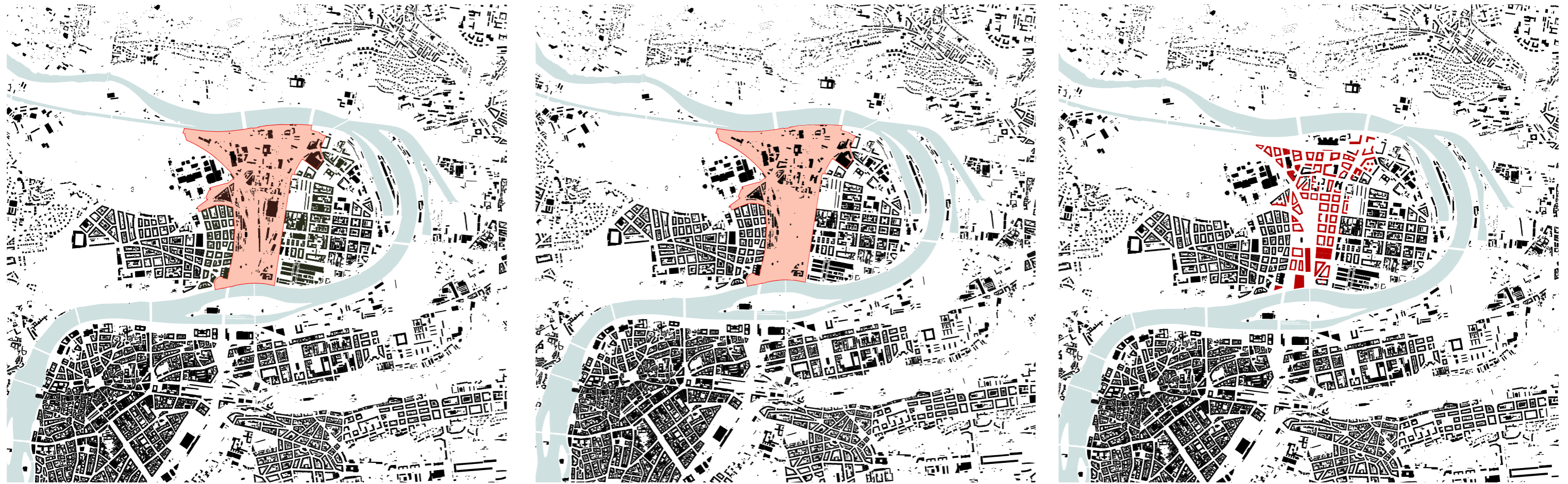
4.2 HISTORICAL DEVELOPMENT



The area we know today as Prague 7 was two villages by the river. At the middle of the 19th century the villages Holešovice (north) and Bubny (south) had a population of 830 and 291 inhabitants respectively. Building the textile factory west of Holešovice was the start of industrial growth. The Area saw a massive industrial boom in the 19th century, with the two villages joined as Holešovice-Bubny. Large industrial blocks were built and more proposed. There were 32 factories at the time and the population rose to 11000 residents. Around 1915, the complete de-industrialisation of Letna took place and its area was divided into smaller residential blocks, while many of the buildings in the previously built blocks were destroyed. The population grew to 44000 inhabitants.

By the middle of 20th century can be noticed change in the urban pattern of Holesovice and Letna, population growth to 59150 inhabitants, the highest it ever been in the area. The old Holesovice village is partially intact with its past traces remaining and Letna and Holesovice have 2 different types of city blocks. Finally in 1989 with the complete de-industrialisation of the area Holešovice becomes a residential area. The population has been steadily lowering since the late 80s, stabilizing at 15262 inhabitants in 2011. With the building of new bridges and the train station, the area became more connected to the rest of the Prague as well as becoming a transportation hub. In 2016 The Bubny Train Depot has been demolished making the previous train yard a huge empty brown field.

4.3 RECENT BUBNY-ZATORY DEVELOPMENT



The future of the Bubny brownfield has been questioned for many years. Many studies and tenders have been done and the need to integrate unused areas into urban structures has been discussed since the 1990s, but the urban designs that arose from this interest were of alternating quality. Some were strictly traffic-engineering and did not offer space to create a truly full-fledged neighborhood [8]. In September 2015, a major part of the identity of the area was the Bubny Train Depot, which was however demolished in 2016 to clear way for a more morphologically homogenous new plan [11]. In November 2016, the City Council asked IPR to start work on the territorial study of area. In 2017 IPR prepares a public contract for Holešovice Bubny-Zátory and by 2018 conducted expert opinions on the territory and prepared the assignment for a new territorial study with an emphasis on public spaces, transport, equipment and clearer composition of the territory as a distinct district. In the May of the same year Prague has announced a tender for a territorial study that will lead to the revitalization of the brownfield.

The authors of the territorial study are Pelčák and partner architects and ThomasMüllerIvanReinmann architekten GmbH from Berlin. The study was focused on “stitching” the existing urban

structures of Letná and Holešovice. The “patch” in the form of a new urban district thus repeats in a modern way the grid of house blocks adapted to the natural conditions (in which the Depot was removed) and continuous transport routes. [10]

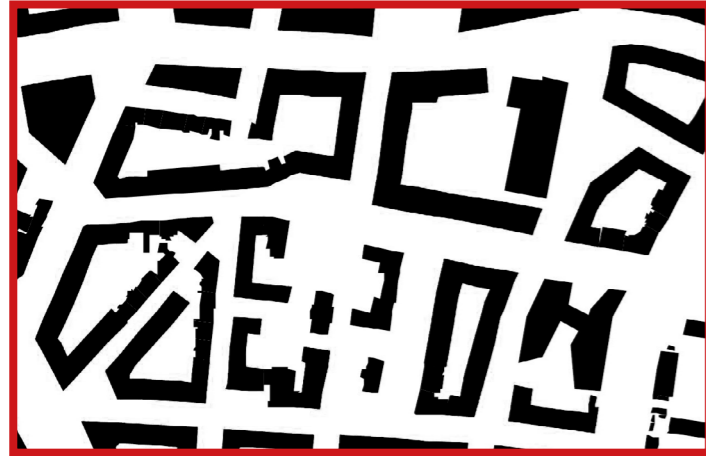
By October 15, 2019, citizens were able to comment on the study and now all suggestions will be evaluated and processed. By 2021 the change in zoning plan should be approved and construction is planned to begin in 5 years.

New development is planned to include: 25 000 inhabitants, 11 000 apartments, 29 000 jobs, 5,000 places for pupils in schools. [9]

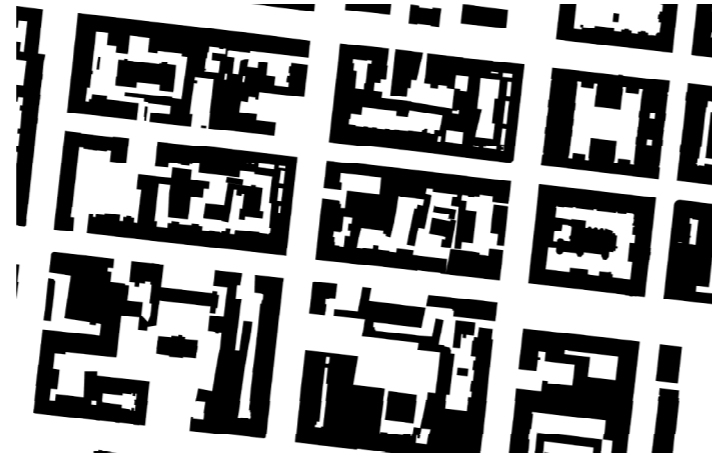
The territorial study contractor, cooperating with THOMAS MÜLLER IVAN REIMANN ARCHITEKTEN and Pelčák and partner, focused on “stitching” the existing urban structures of Letná and Holešovice. The “patch” in the form of a new urban district thus repeats in a modern way the grid of house blocks adapted to the natural conditions and continuous transport routes.

14 Condition 5 years ago
15 Current condition
16 Winning proposal

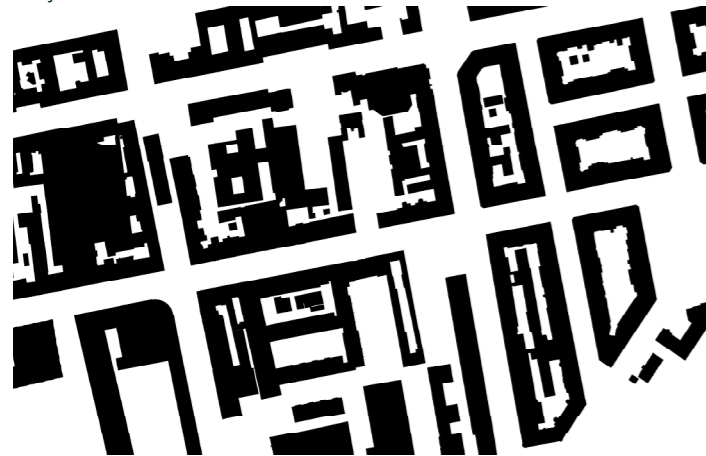
4.4 MORPHOLOGY



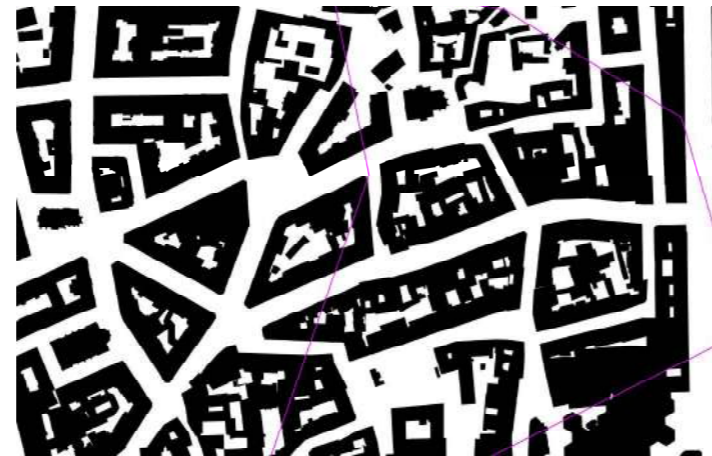
Project site



Holešovice



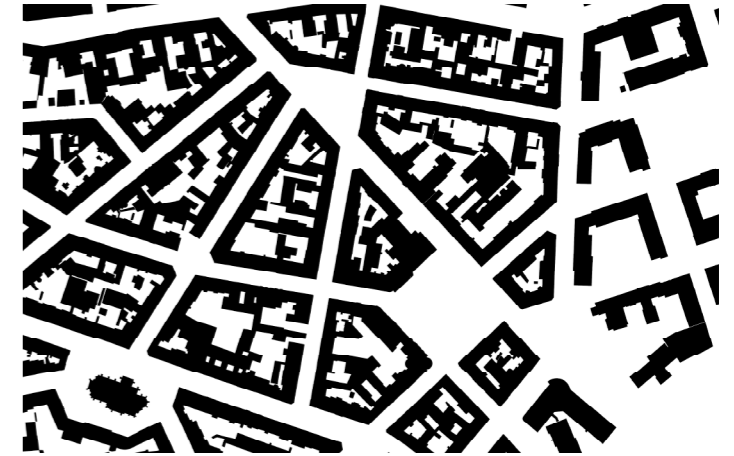
Karlín



Old town



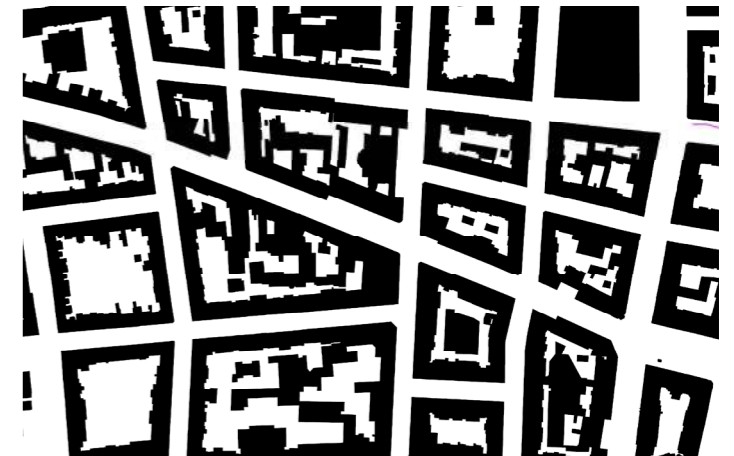
Vinohrady



Žizkov



Smichov



Letná

17

For better understanding of the site and its scale above are shown different morphologies from other Prague districts. As most of the buildings in the surrounding project site area will be new, it can be seen how the block structure, by its scale and formation, is different from other areas with similar historical backgrounds such as Holešovice, Karlín, Letná and Smichov. This morphological difference can be explained by the planned full cleaning of the area (preserving only some functioning historical buildings), whereas other districts with industrial background have changed gradually and have absolutely different density within each block, so such block structure can be more easily compared to Vinohrady. Streets are very wide and inside of the blocks is planned to have common/open space with some recreation.

4.5 TRANSPORTATION

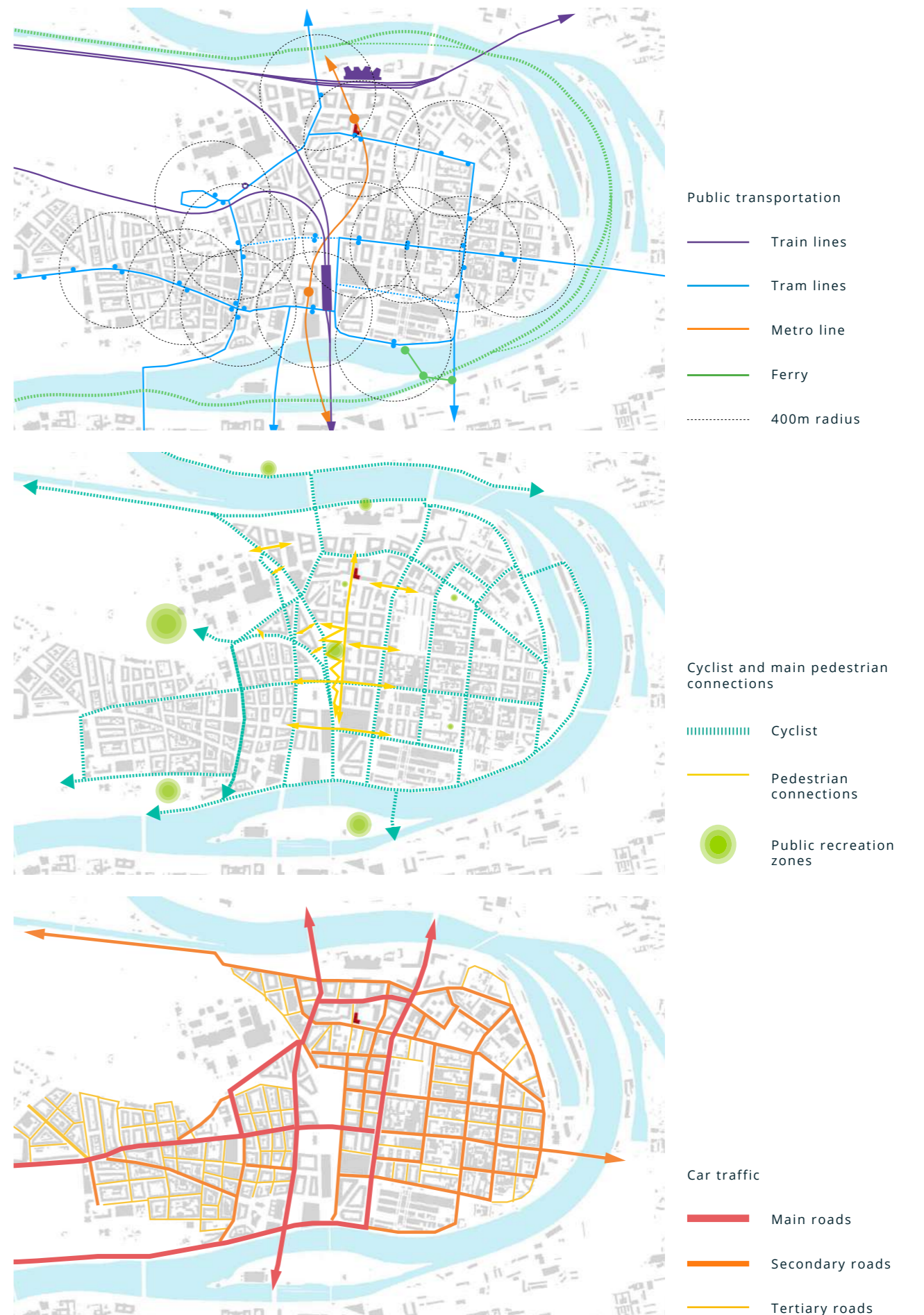


Overall Prague 7 has a very good transportation connection to the rest of the city and within itself, but the brownfield separates the district's urban block structure as well as its infrastructural connections. Due to the closed and unavailable area in the middle, Holešovice has only two connection points with Letna. Though out the whole district cycling paths are missing and the highway around Holešovice train station makes the place segregated from the rest of the city and unpleasant to get to or be in.

Although the area around Vltava is likely to remain a busy road, the authors of the study propose several changes in the hierarchy of transport modes to return the urban environment to these places. It is planned to bring the streets around the former Electric Enterprises to one level, so that there even though it will remain busy, the environment is going to be more human scale. .

Car traffic is to be taken along the waterfront and then to Argentinská Street, whose appearance is also to undergo major changes. It is now to become an urban street with tree alleys, where the necessity of passing cars is well balanced by respect for pedestrians and cyclists. (2 + 2 lanes, cycle path, tree line, wide sidewalks).[10] Bubenská streets performs the transport function of connecting the Hlávěk and Troja bridges, but the traffic is designed with a lower capacity (1 + 1 lane) and thus allows the use of the street as residential.

The tram lines and bus routes are going to be extended to include Bubny-Zatory area, creating more connections with Letna. New roads through the new district are going to be added as well, which will decrease the amount of cars on Bubenske nadrazi and Prazsky okruh roads.



4.6 ACTIVITIES IN&AROUND NEW MASTER PLAN



19
Master plan Holešovice-Bubny-
Zatory by Muller Reinmann
architekten

20
Activities in Prague 7

The main public space of the newly designed development is the central park, which is connected to the main urban axis leading north-south through the territory and connecting the Vltavská and Holešovice railway stations. The square is designed in front of the Hlávěk Bridge, around the monument of silence and at the Holešovice railway station. Pedestrian zones in Jateční and Dělňická / Veletřní streets are proposed. Revitalization of both embankments (northern and southern) is proposed.





4.7 FACILITIES IN HOLEŠOVICE

One of the reasons why the master plan of Bubny-Zatory was chosen for the school site is that in even though it is going to be an absolutely new neighborhood, it has a great connection to the older districts of Letna and Holešovice.

As can be seen from the collage map on the left, many public activities can be found in the surrounding districts which the school can use to minimize its inner program and take advantage of the neighborhood.

The map highlights 3 subcategories that relates to school activities:
 Sport - as there are many form of sport facilities in Prague 7 which can be used, not even including the nearby schools, the sport program within building has been eliminated;
 Cultural - facilities include city and privately owned places with which the school could collaborate in leading events or having lectures which do not need special requirements.
 Educational - highlights all schools and university in the area where facilities can be exchanged. These also applies to theoretical subjects which do not have specific requirements for space or equipment.

Facilities in and around Bubny - Zatory neighborhood

- Sport
- Cultural
- Education

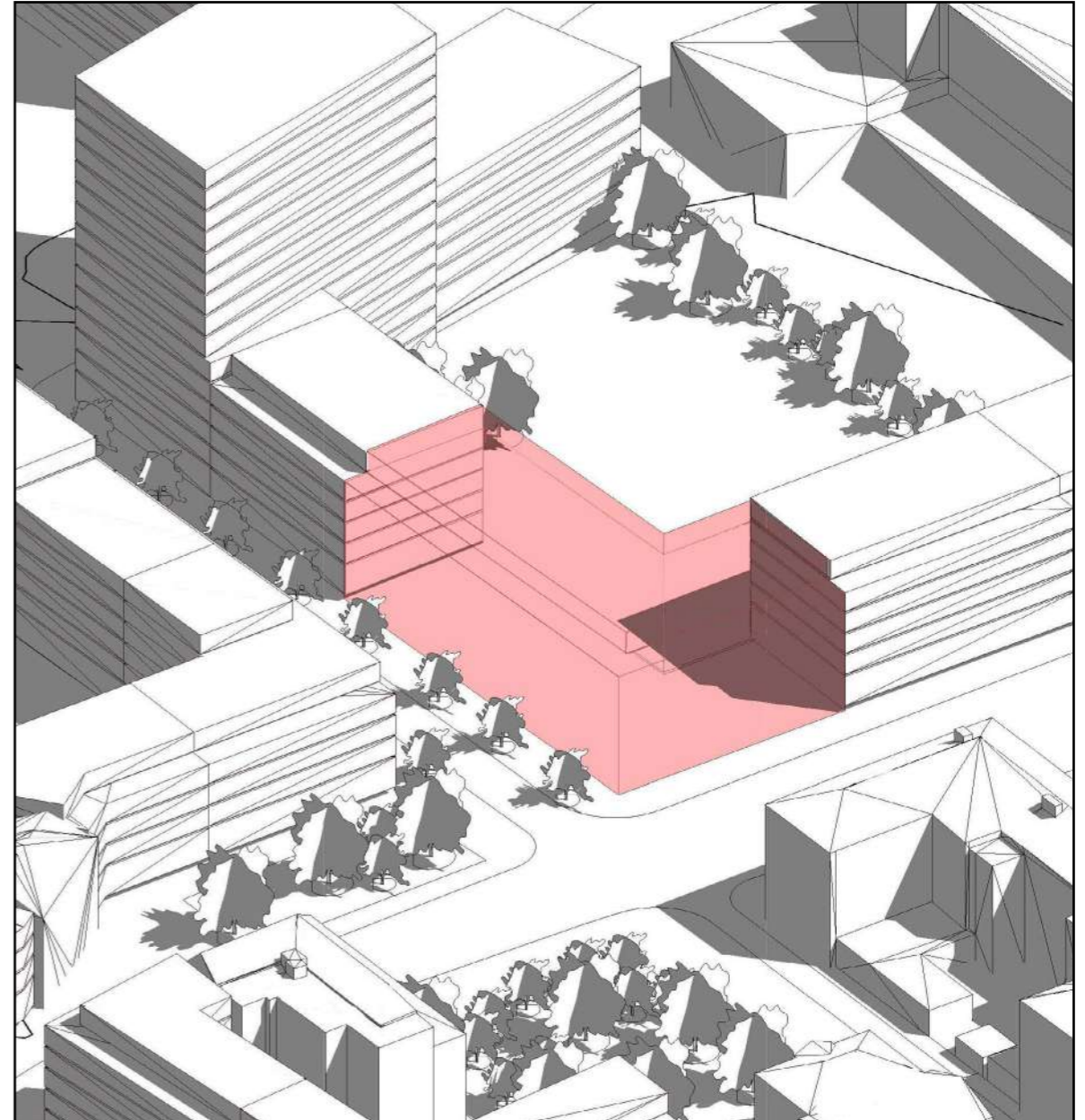
5 SITE ANALYSIS

Local /

This chapter will be an overview of the project in a closer context, using analyses for better understanding of the project scope.

For the school building, the chosen plot is on the intersection of Plynarni and Rajska street, where school building is planned to be in the zoning of Master plan. This plot meets all of the requirements needed for the project described in the chapter before.

Owing to its proximity to 4 different districts (Letna, Bubny, Holešovice and Troja) it can invite diverse social groups. As it is on the corner of the block and has public space in front of its west facade, it is highly visible from several streets and it has a great connection to the public transportation -metro, trams, buses and even trains.





5.1 PROJECT SITE

As can be seen from the cut out of the Bubny-Zatory master plan above, the plot is part of a newly created block with a football field in the courtyard. Its west side will be facing the primary school building and the quiet lane Rajská street with trees on it. As the primary school building has a slightly shifted facade on the south, a small square with trees is created. This opening highlights the corner dedicated to the project and makes it an active atmosphere in the street.

At the south-west intersection of Plynární streets and Rajská, the existing park area with a playground and old trees remains intact. Across the south facade the Holešovice Business Academy building built in 1884 is located. It has a very classical envelope and surrounded by active vegetation. On the northern corner of the block, there is an office building with 15 floors. Behind it across the Prazsky okruh street and in front of the

Holešovice train station, a planned public space with small park will be developed. Following the Masterplan regulations, the project should not be higher than 21 metres and have approximately 5-6 floors. It can be concluded that considering educational buildings and active vegetation around the plot makes a perfect location for a high school, providing that there will be opportunities to collaborate with other facilities in the area.

20 Master plan visualization from South-West

21 Master plan visualization from North-West

22 Master plan with highlighted project site



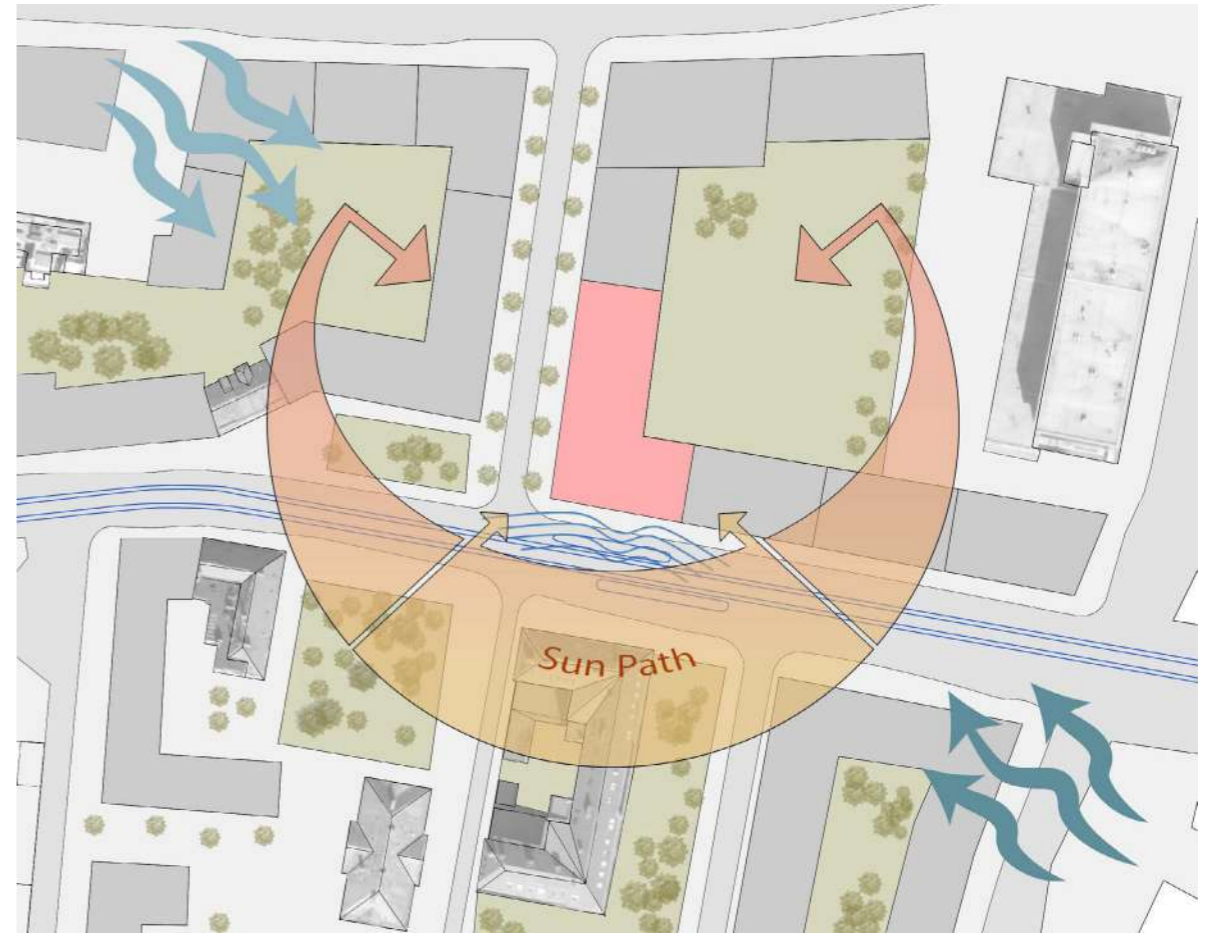
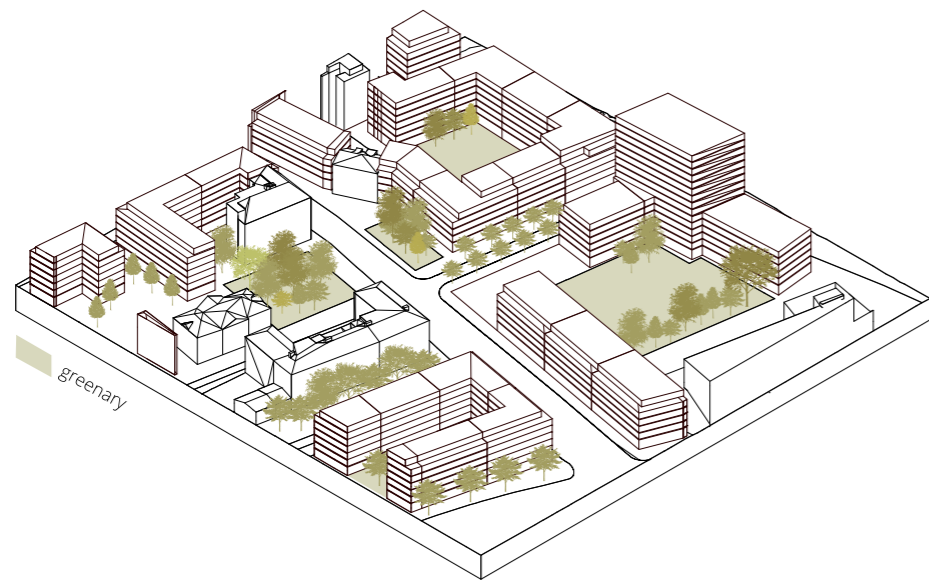
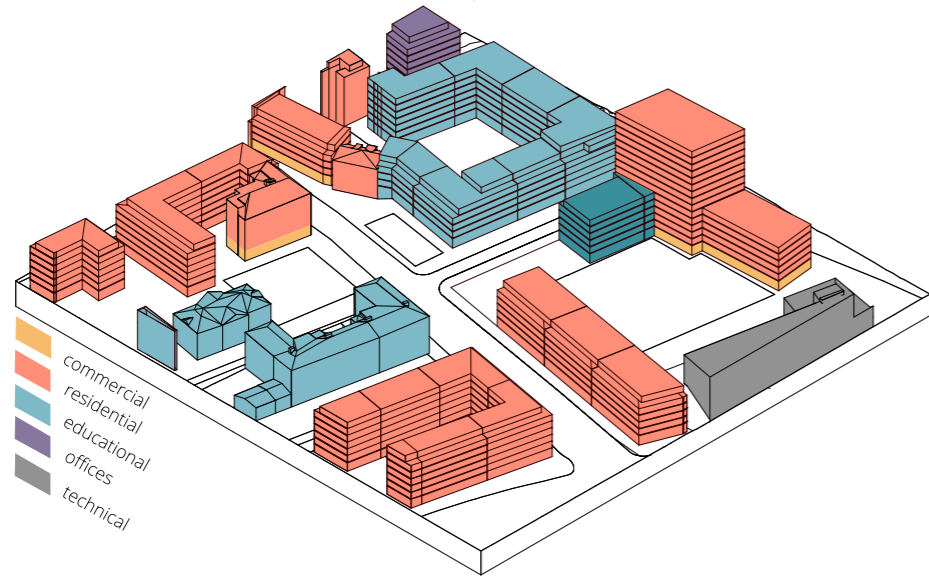
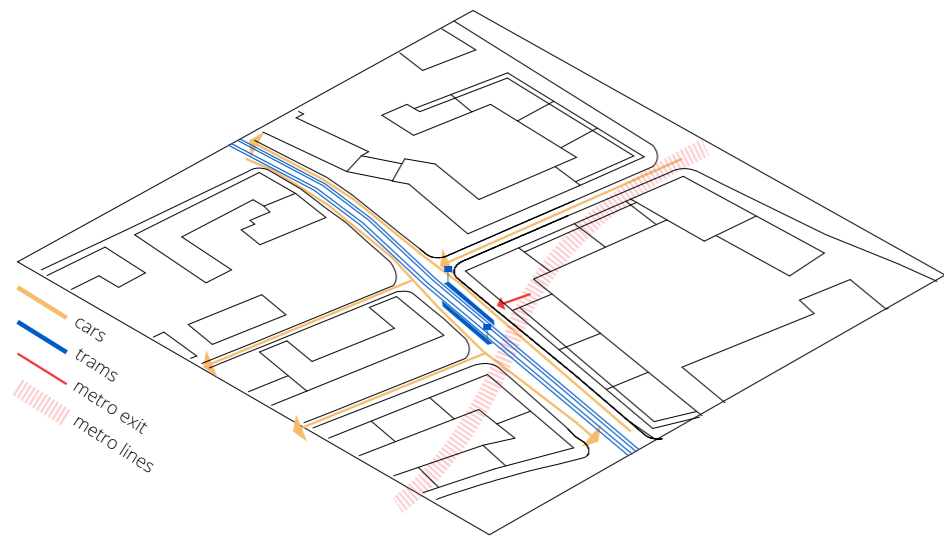
5.2 CURRENT CONDITION

The current condition of the site is very disrupted. While it has a great transport connection to the center, it gives a character of a rural-urban fringe, with the amount of junk spaces and underdeveloped plots. The density in the area is very low, which in combination with many open empty public spaces imbue an unsafe and desolate feeling. While there seems to be a number of public or green areas, they either have barriers around or simply no practical use. The current condition can be summed as space only used for transition.

24
Bird eye view of metro station Nadrazi Holešovice

Photo documentation of the site at the current state

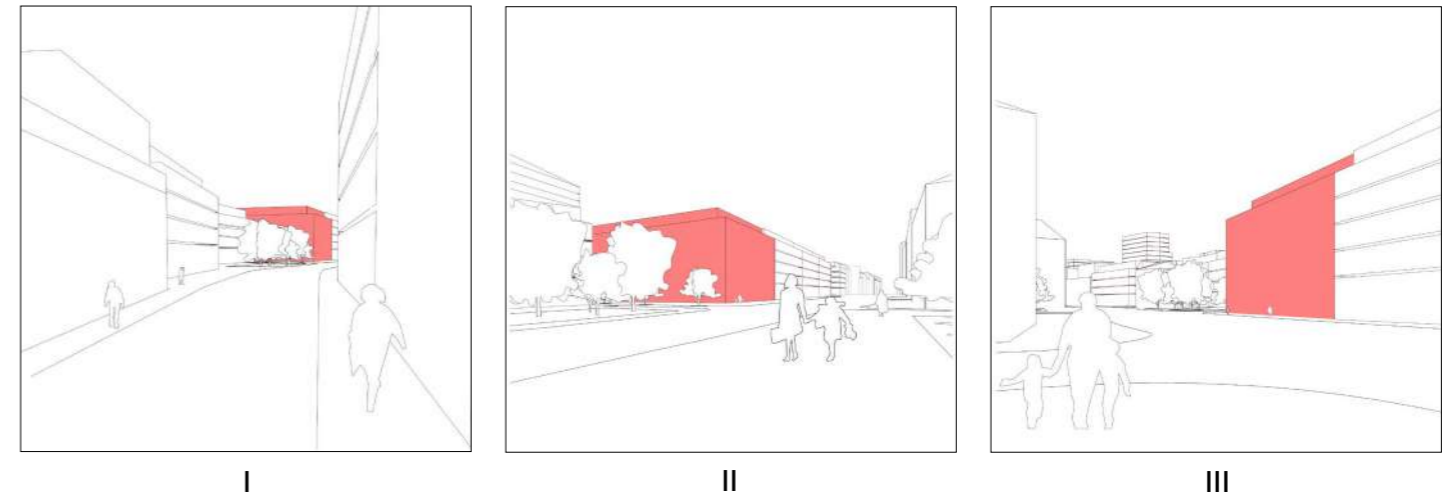
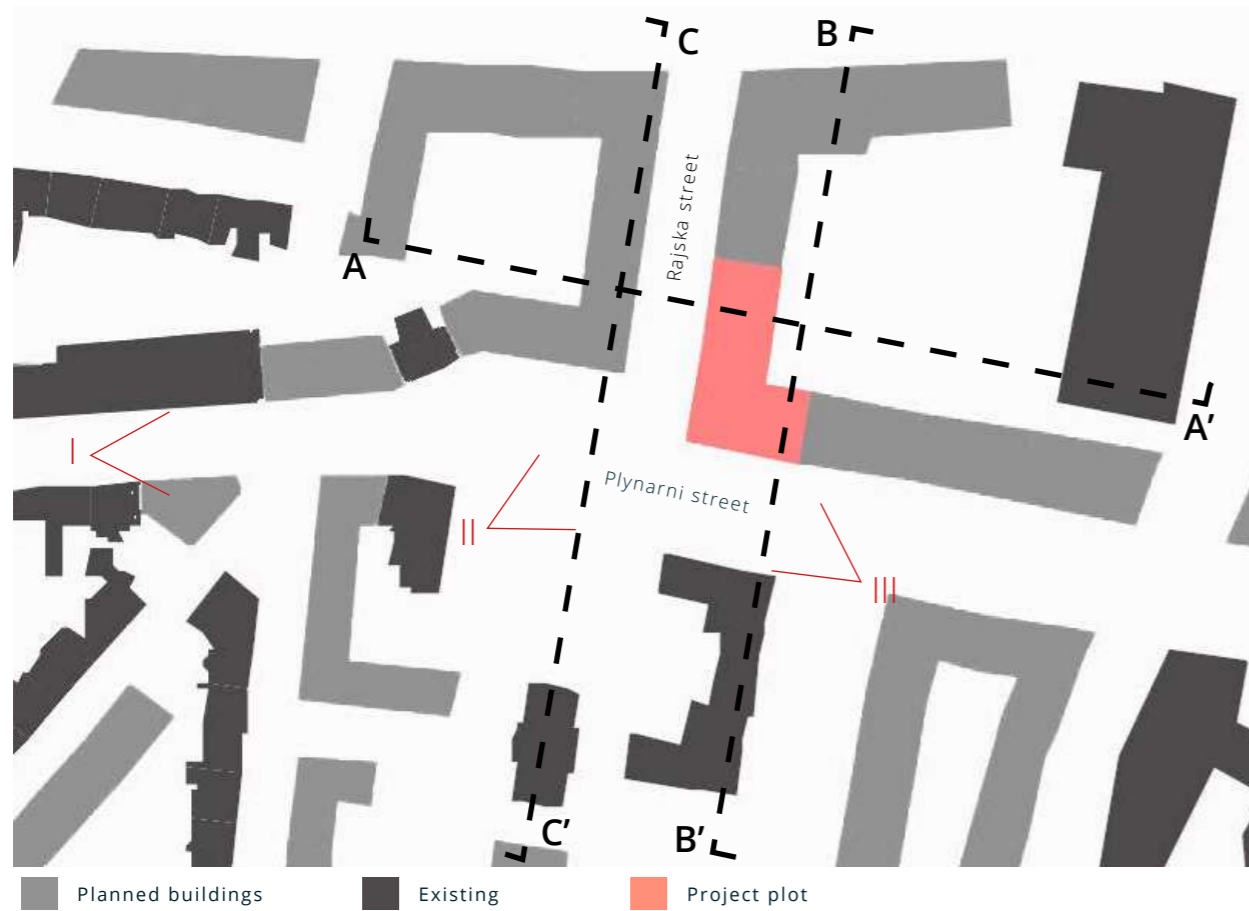
25
Satellite view of the project site



5.3 LOCAL SITE ANALYSIS

The site is located in Holešovice, above the Nadrazi Holešovice metro station. The building is located at the corner of a block in the proposed masterplan. The building's east facade, which faces the block courtyard, welcomes the summer sun rising from the east. This moment can be advantageous when openings are implemented in this facade, illuminating the interiors of the building. The south and West facades, which

face the streets, will receive the most sunlight. Reducing the amount of opening ensures a comfortable studying space. While the dominant North-Westerly winds and the South-Easterly winds do not contribute towards the form, the location of the school itself is an advantage. The courtyard is protected from both sides and the corner of the building will not be subject to strong direct winds.



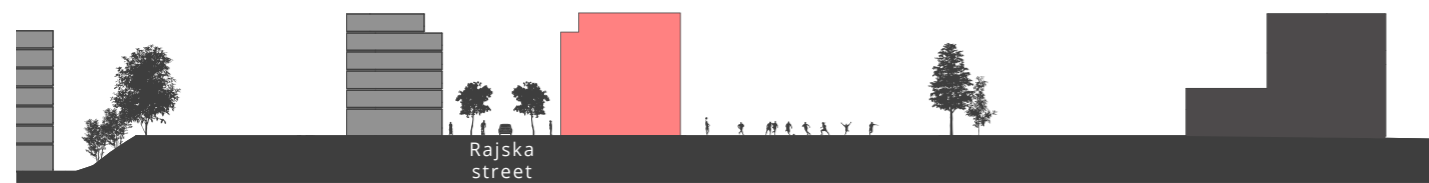
5.4 STREET CHARACTER

By looking at the sections on the left it can be seen that the project site has a very different street character in each side. On the AA' sections, the scale and calm character of the Rajska street is visible, with one way road and spaces for pedestrian, cyclists and trees. From the same section the radical difference is noticeable in the scale between street and wide school courtyard with football pitch in it and transformer station across it.

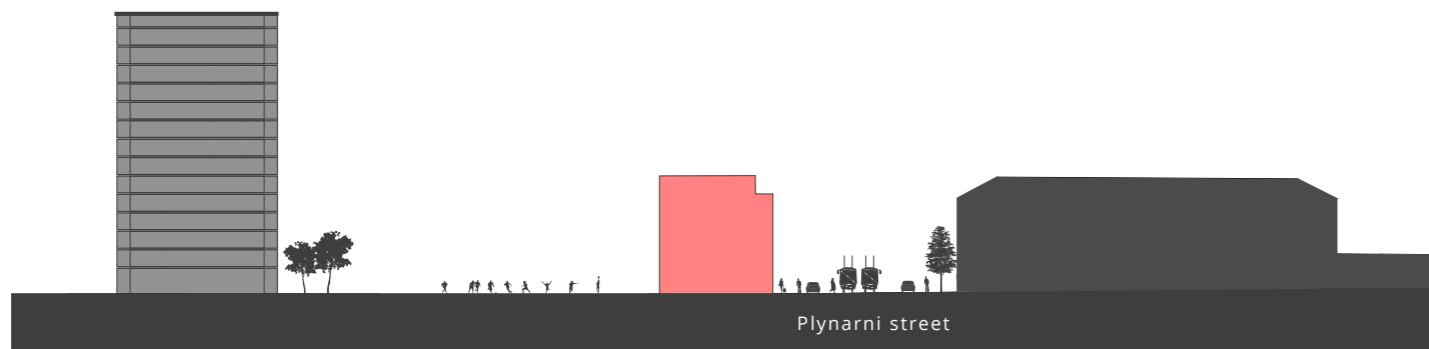
Section BB' shows the other cut of the courtyard highlighting the difference in height of the two block corners. Here is also shown Plynarni street section with the relation to the Business Academy building across the street and public transportation with it.

On the third section, the difference in street widths and the scale of new open space as well as small park on intersection of Rajska and Plynarni street are shown.

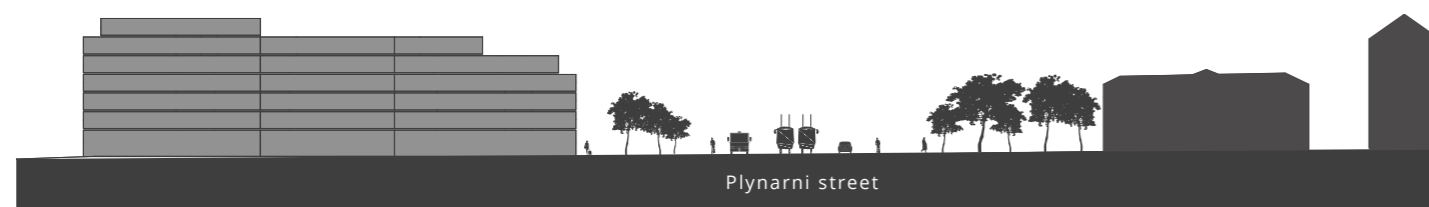
As can be seen from sketches, the building is located on the very dominant and important corner in the area and that is why it should be treated with respect to the old building in the context as well urban grid, but at the same time highlighting the function and inviting people inside.



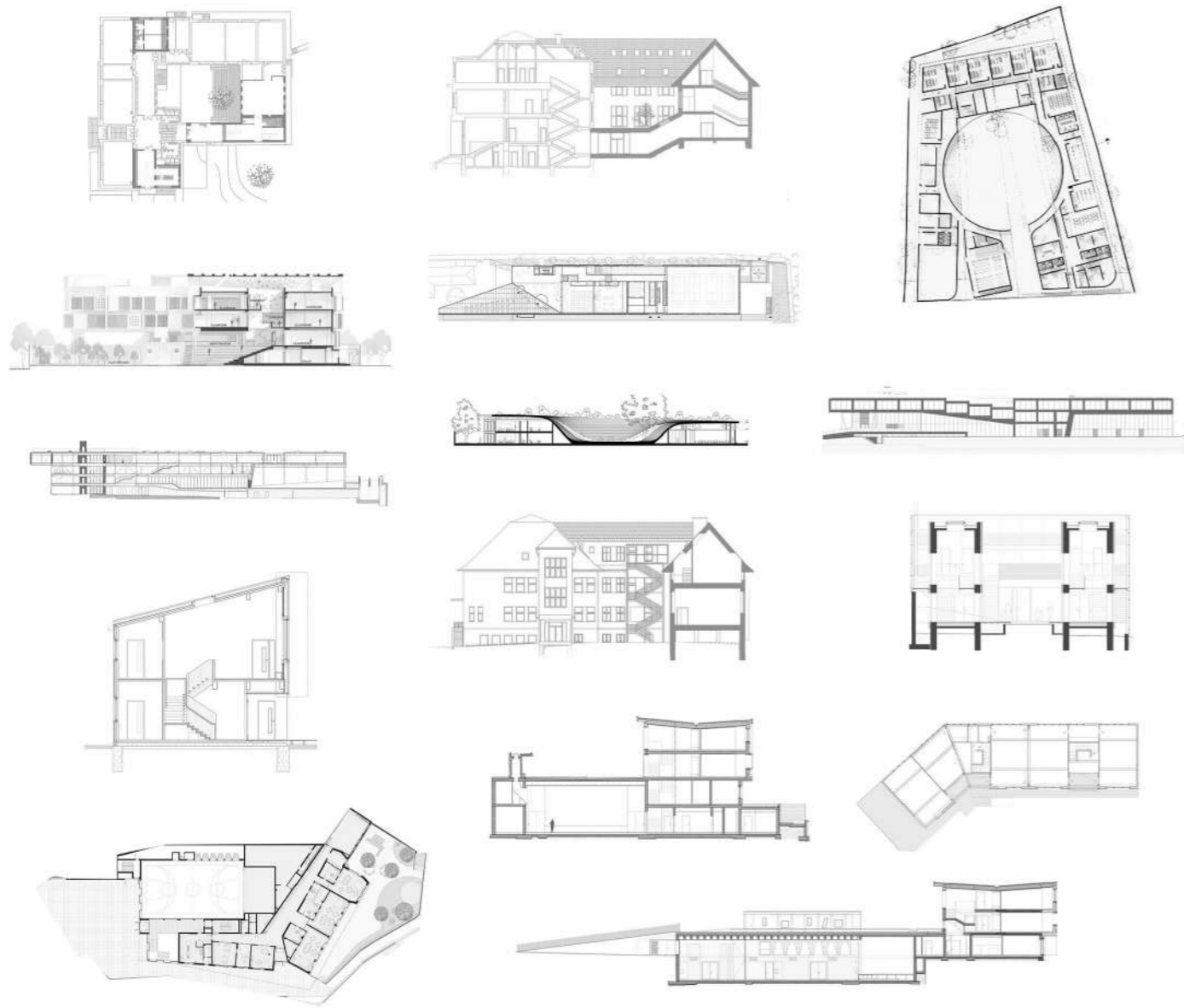
Section AA'



Section BB'



Section CC'



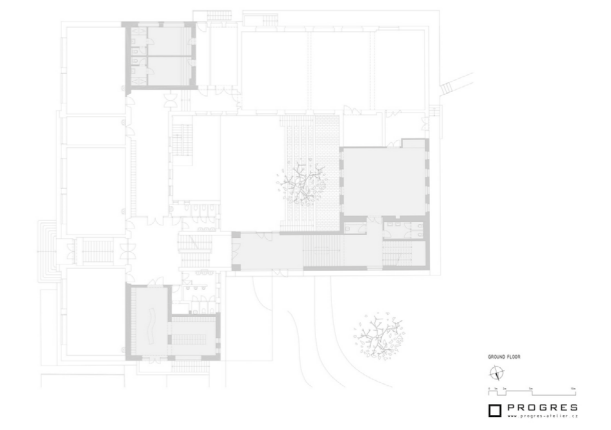
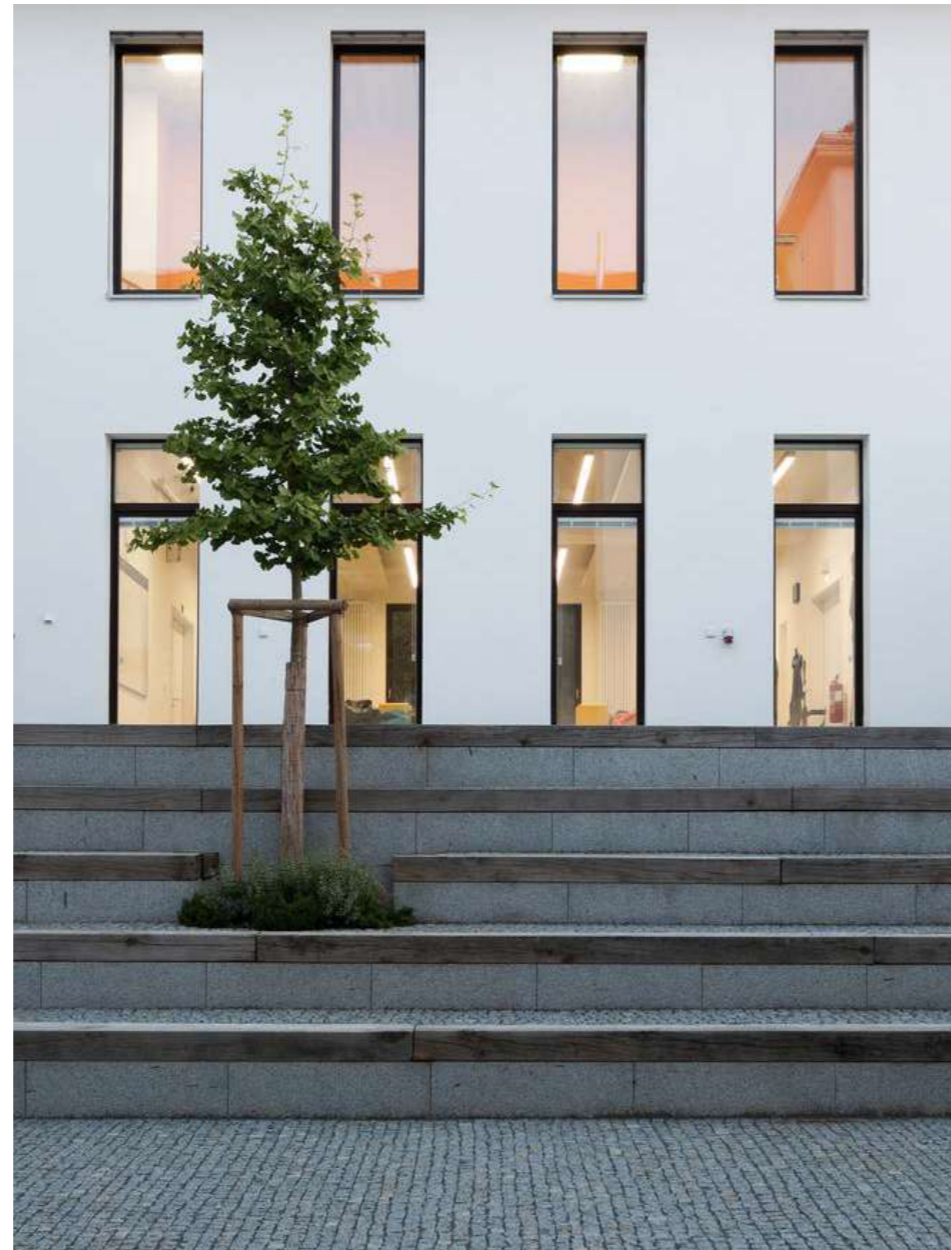
6 CASE STUDIES

This section presents the core research done to arrive at a holistic understanding of the project, its implication and implementation.

- Extension of Jara Cimrman School
- Kamyaran School -to-city Facility
- Monte School Complex
- CMR EKYA School
- Brighton College School
- Khan Lab School
- School visit

6.1 EXTENSION OF JARA CIMRMAN SCHOOL

Type: Educational building
 Place: Prague-Lysolaje, Czech Republic
 Architects: Progres Atelier
 Area: 1124
 Year: 2018



Site visit

The school is a great example of quality classrooms and at the same time a diversity of spaces which can be created within the educational facilities. During the site visit I have noticed exceptional atmosphere in all of the renovated spaces. These were achieved by giving each spaces specific feeling improved by the use of appropriate and different materials. These can be seen in the second image where installed acoustic panels perfectly work with interior design and at the same time provide perfect sound in the space, so that at any point students can hear the teacher.

The most interesting part and at the same the one which relates to my thesis topic is the courtyard in the centre of the facility. It is easily accessible from the schools classrooms and corridors as well as from street through the newly added circulation space. These additions are needed for school security and at the same time openness to the outside. As the school is located on the hill, the courtyard has a height difference, which was successfully used by architects as public seating for school events and kids to play.

Architects

“The original building of the elementary school was completed in 1934 according to the design of the architects V. Vondrášek and J.Kubín. Over the course of its existence, it has gone through several modifications of various technical and architectural quality.

We propose a new extension above the existing gym. Large span steel frames form double height attic spaces for art, chemistry and physics classrooms and after school activities. Specialized classrooms are generously stretched to the seven and half meters high rooftop. Pleasant study environment is supported by daylight coming from two directions and acoustic paneling made of wood-fiber boards.

The largest 75m2 classroom of the school club is located on the ground floor and is connected to the paved area of the inner atrium with an amphitheater. This courtyard serves as a multi functional space for various school and after school activities (seminars, workshops, meetings etc.)”

6.2 KAMYARAN SCHOOL-TO-CITY FACILITY

Type: Educational building/Public space
 Place: Kamyaran, Iran
 Architects: CAAT Studio
 Area: 3000 m²
 Unrealized

Analysis

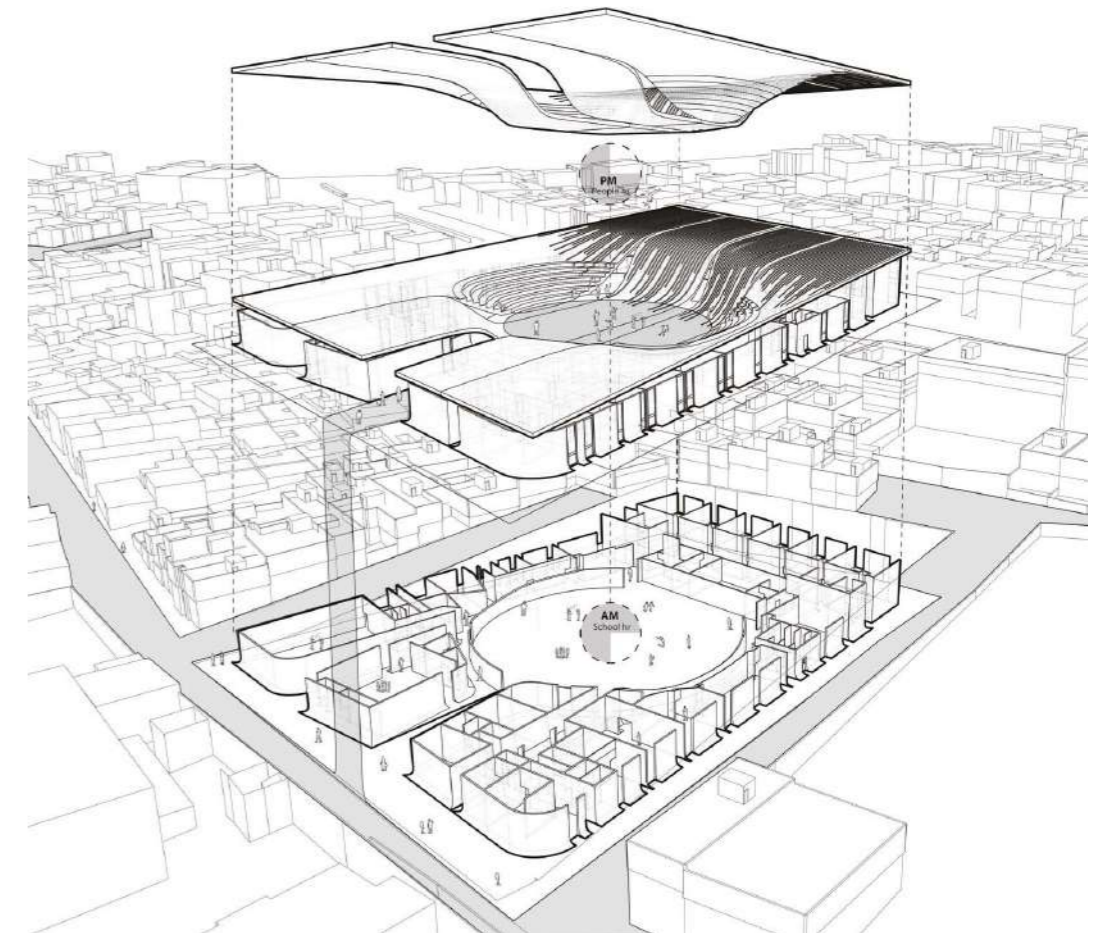
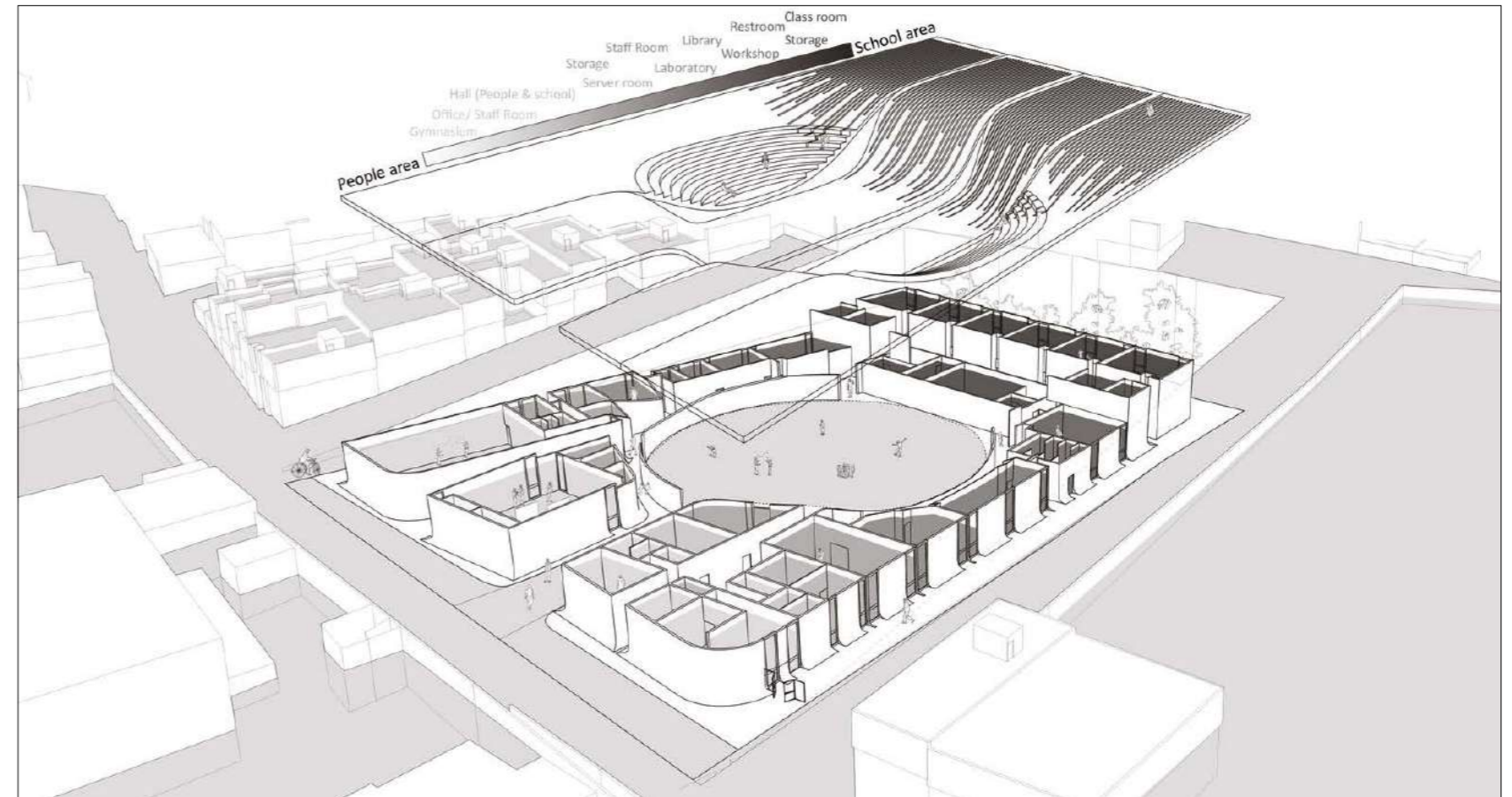
After the earthquake in the Kurdish city of Kamyaran, the city needed to realize several public projects to improve city's condition with relatively limited resources. With these limitations, CAAT Studio suggested a new concept by merging an elementary school and a public space into one large facility. This solution would eliminate the need for the construction of two different projects on two different sites and would thus improve the social and cultural life of its residents.

From the diagrams on the right it can be seen how the building was designed to serve different programs and serve different users throughout the day. In the first half of the day, the project serves as a school, with a courtyard and a playground for students, separated from the city by a threshold. In the second half of the day, the courtyard serves as a space for meetings of local entrepreneurs, a space for ceremonies, or a public park open to all residents. The way spaces are designed to meet different needs is remarkable not just because it would greatly reduce the cost and land use, but transform the project from a temporary function, which is active only half a day, to a vibrant and dynamic urban space.

From the architecture point of view it is important to notice how the arrangement of spaces throughout the building support its active public activity and provides needed for school privacy.

Architects

"Our studio has achieved the important thing in the face of these two issues, that instead of designing two different projects on two separate sites, according to the city dwellers behavior in this district, it could be possible to merge these two, and with the combining them they will become a reason for developing each other. In addition, it would be possible to propound a new concept of school-to-city or city-to-school communication"

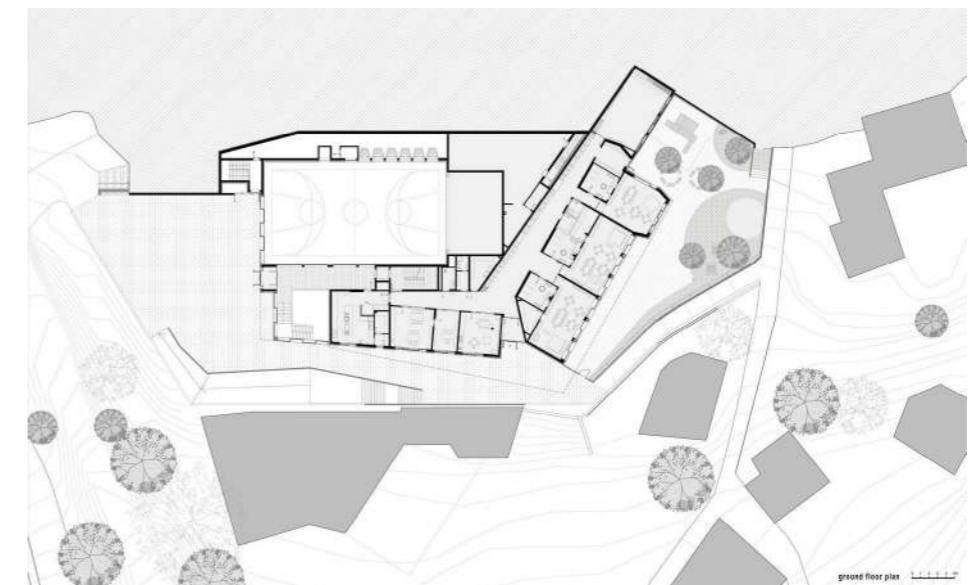
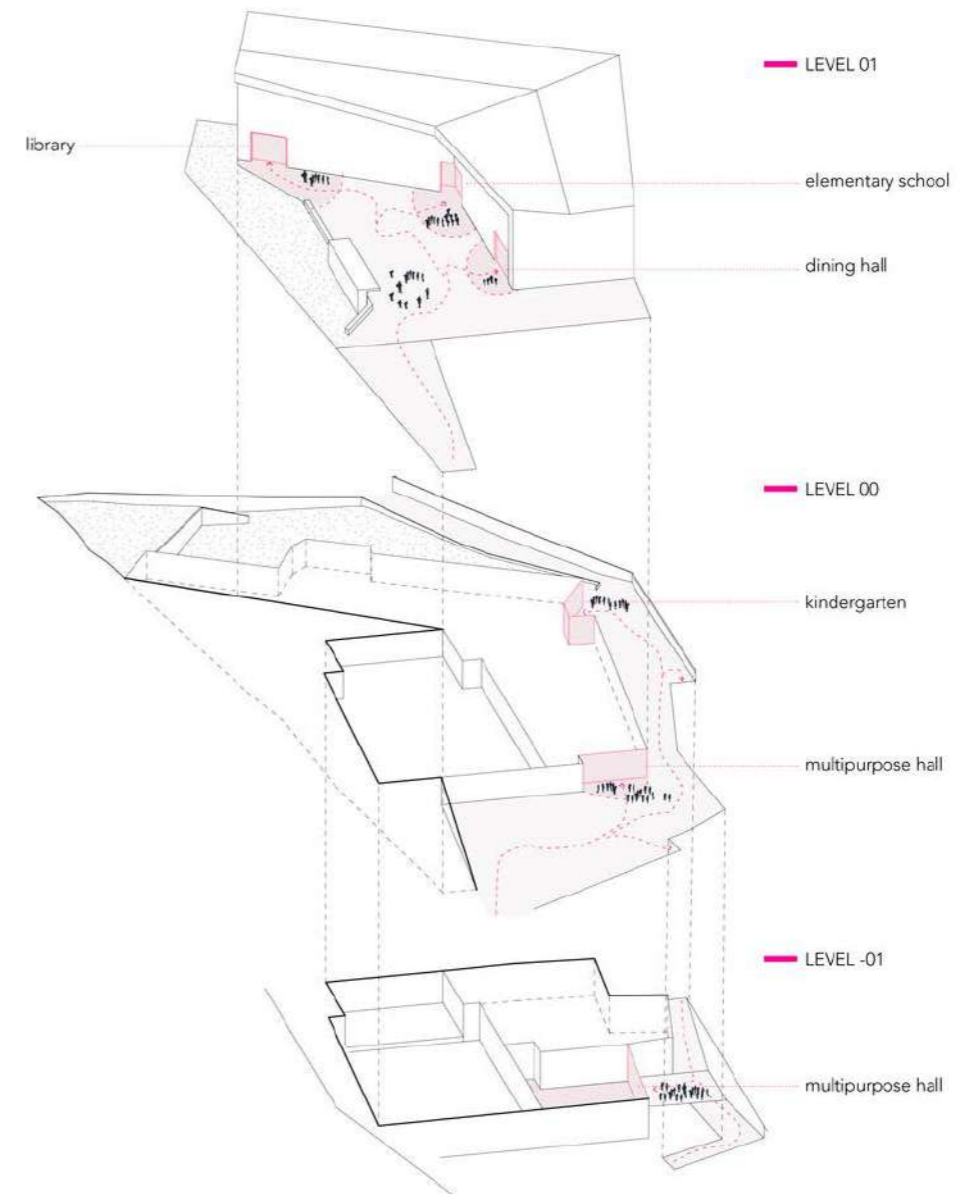


6.3 SCHOOL COMPLEX AND MULTIPURPOSE HALL

Type: Educational building
 Place: Sant'andrea In Monte, Italy
 Architects: MoDusArchitects
 Area: 4995.0 m²
 Year: 2016

Analysis / The addition of the school complex and multipurpose hall engages the urban fabric in the township of S. Andrea, redefining the community through several activities that is not entirely dependent on the school's primary function.

Analysis / "Social events, festivals, local choral and theatre associations, the book club and many more events, people and initiatives are galvanized together in a building so much more than simply a school."



6.4 CMR EKYA SCHOOL

Type: Educational building
 Place: Bengaluru, India
 Architects: Mindspace
 Area: 8020 m²
 Year: 2016



Analysis

A child's energetic and curious mind is portrayed in the Ekya School's concept, form and material use, as to complement each other and provide a safe and exciting space for the students, further improving their psychological and physical wellbeing. This school, designed in India by Mindspace, advocates the spirit of exploration. Clearly a contradiction of generic form, the playful shapes allows light and shadow to seep into the building, formal and informal spaces for children and students to wander and find a spot for them to enjoy. Truly, a dynamic building breeds freedom in a child's mind.

Architects

"While designing for children, an image of children exploring a space with no boundaries can be very inspiring- where they have the chance to touch and feel materials, respond to them. Eye levels can also be exploited and be made exciting for children. There are also different kinds of needs and curiosities that have to be met - to allow the young child to try and catch a ray of sunlight in their hands, for older children to have space for studying alone or in group, spaces for individual teaching."

6.5 BRIGHTON COLLEGE SCHOOL OF SCIENCE AND SPORT

Type: Educational building
 Place: Brighton, England
 Architects: OMA, Ellen van Loon
 Area: 7 425m²

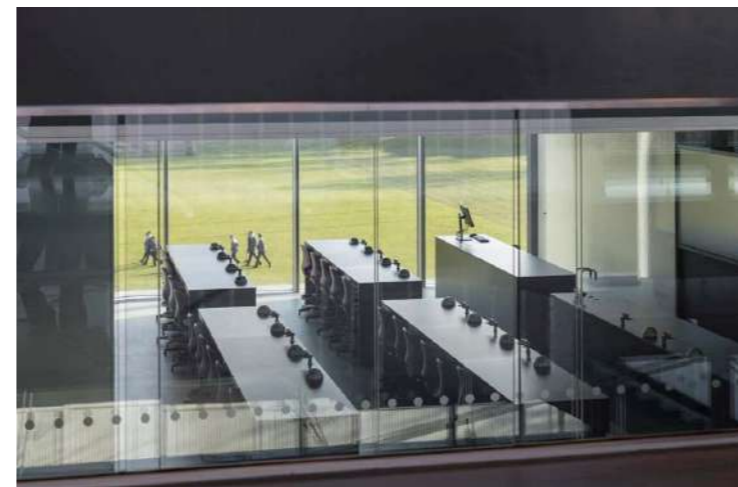
Analysis

Transparency in architecture is usually perceived as a double edged sword, on one end, it detracts privacy and the building's own identity, on the other, it opens up and provide a sense of freedom and wonder. The Brighton College School of Science and Sport, designed by Rotterdam based OMA, is on the latter end of the sword. Its openness towards the sea and the city is further augmented by the openness in the classrooms and circulation space of the building itself.

The glass walls is a clear departure from the traditional solid walls that otherwise separate classrooms along a school's corridors. The bright, illuminated spaces contradicts the school's setting where more gothic historical schools would be found. The social and student circle shies away from the typical hierarchy, encouraging a more open interactivity between one student and another.

Architects

The School of Science and Sports at Brighton College defies the conventional character of educational buildings – one of endless empty hallways and imposed silence – and instead combines the two departments to create a vibrant building with lively spaces where activities are not necessarily dictated by a school timetable. Observing that processes of learning take place outside as much as inside of the classroom, the design articulates a new idea of educational space bolstering interaction and exchange.



6.5 KHAN LAB SCHOOL

Type: Educational building
Place: Mountain View, California
Architects: Kurani Architects



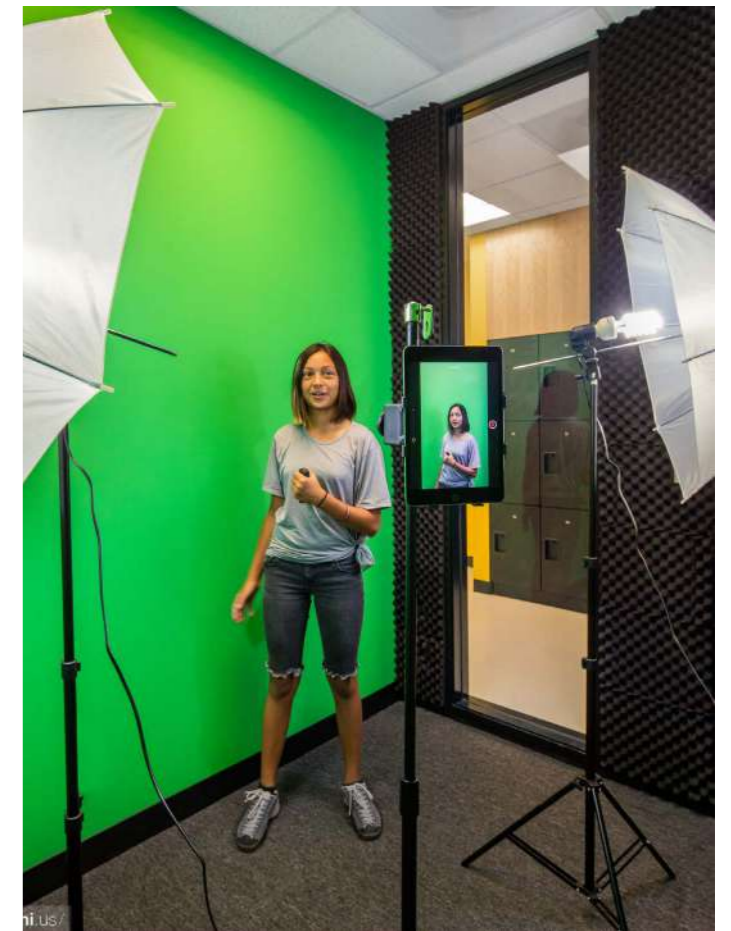
Analysis

Khan Lab School is a non-profit in Mountain View, California, started by Sal Khan, founder of online learning platform Khan Academy. It is a testing ground for new learning designs and practices. Teachers here take an open-source approach to education and share their findings with the broader education community.

How the design works

This campus may be the first of its kind — a hybrid mix of school and laboratory. It is a place where education and experimentation happen simultaneously. Classrooms are uniquely designed zones to support different modes of working and learning. The diverse environments encourage faculty to test different learning experiences.

Large interior windows allow everyone to see the educational experiments live. The breakout rooms, commons, and cafe give people places to convene and discuss. And just like a lab where scientists are expected to share the results of their testing, the school is equipped with displays for student and faculty work. Nearly everything is mobile and adaptable. The campus is designed with change, evolution, and experimentation in mind.



Architects

“each of these ‘zones’ supports a different mode of working or learning. So, there’s a Chat Lab for when the learning is happening through discussion, dialogue, presentation, and interpersonal exchange; an Ideate Lab for brainstorming; a Make Lab for designing, building, prototyping; and a variety of other specialty areas. Given how frequently schools change curriculum and personnel, this classroom model makes sense for the future of education. For now, all we can bet on is that students will continue learning through dialogue, brainstorming, making, presenting.”

6.7 SCHOOL VISIT

Riverside School - Senior High and Arts Centre
 Prague, Czech Republic
 Floor area: aprx. 3500
 Capacity: aprx. 100 students and 30 staff

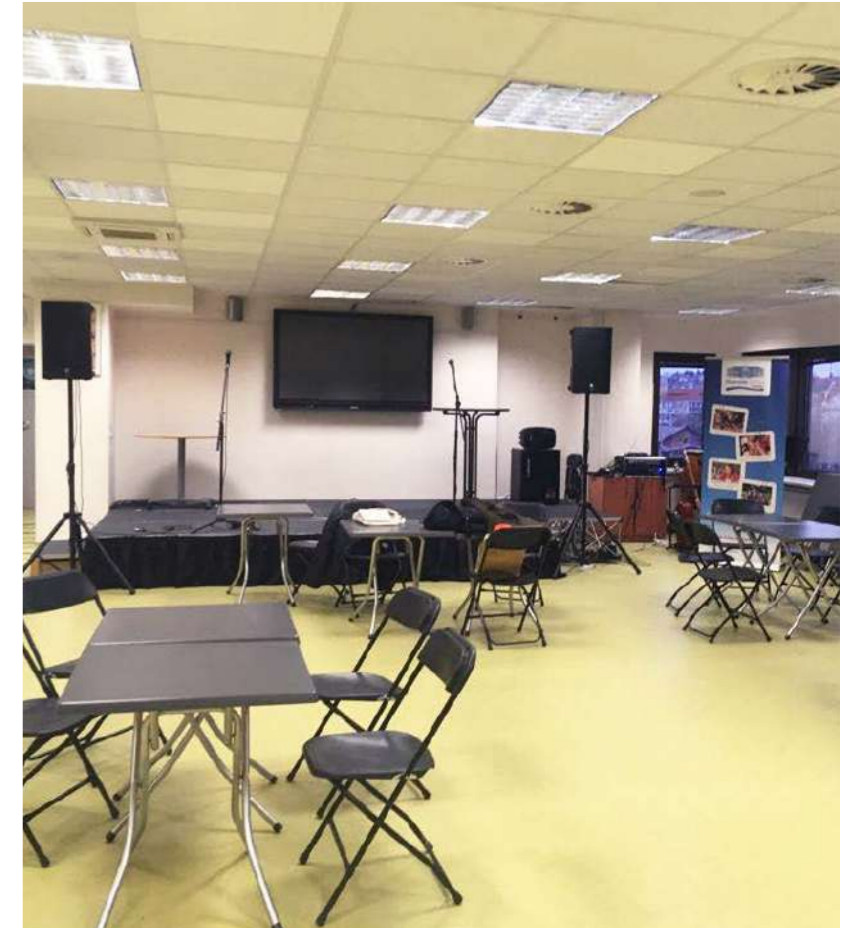
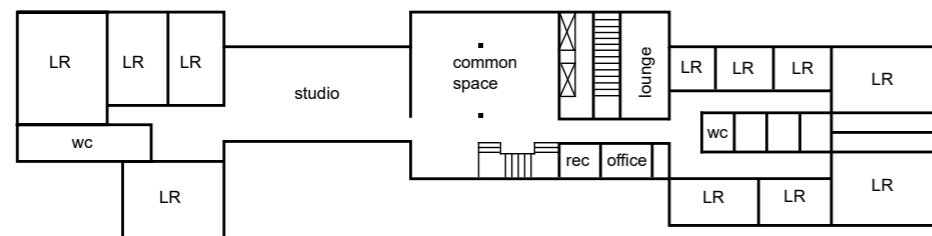
Analyzes /

For the better understanding of how school functions, the Riverside School has been visited as it has similar capacity, location and partly uses Project-Based Learning in its program.

The school has lecture rooms of different scale dedicated to different subjects. The art studios were of the special interest as they have a lot of space for students freedom in the way they want it be arranged, there are places for the creative and exhibition of students work. It was obvious that such space is needed, as even though visit was a few hours after school day end, students were still in there working on their own projects.

In the center of longitudinal layout can be found common space where students spend their free time and every week they have school event. At the same place they have kitchen with appliances for cooking classes or catering of the events.

School is located next to Hradčanská metro on the 3rd and 4th floor of office building. To ensure students security the card system to enter the building is used.



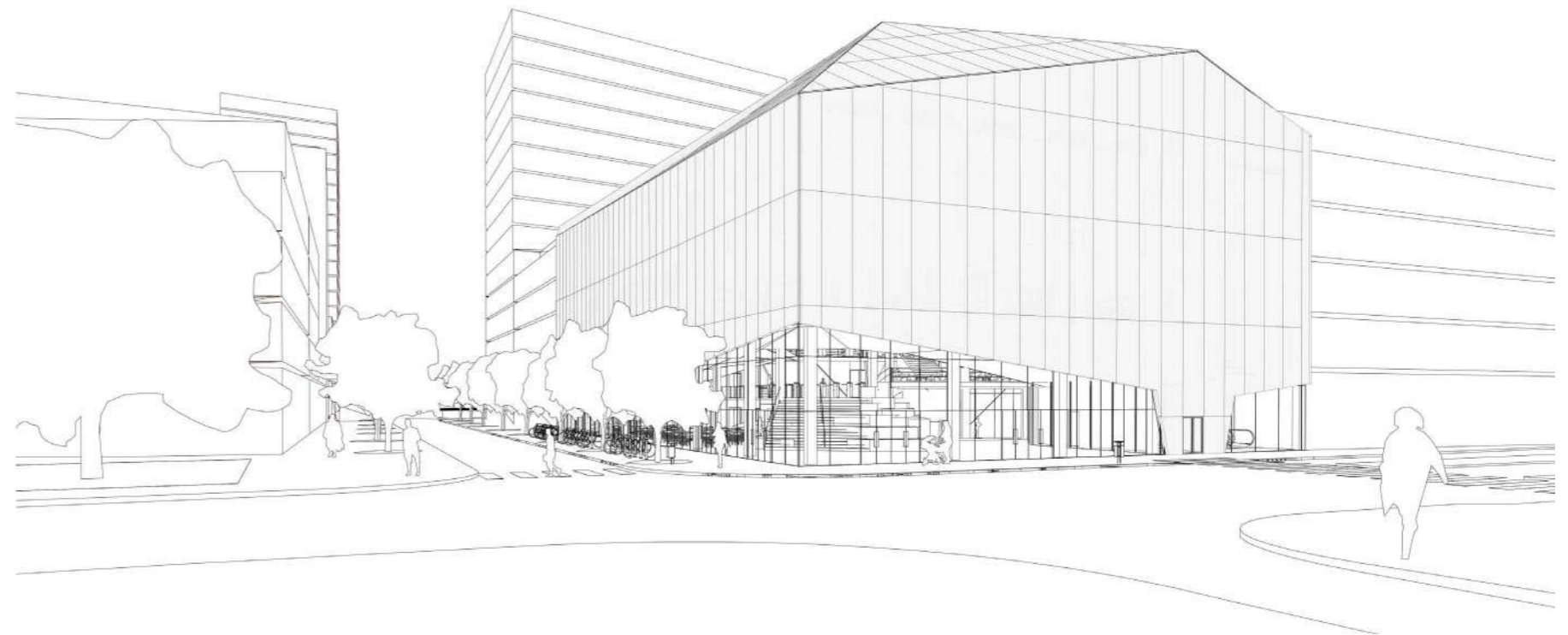
PART II

DESIGN

This section presents the implementation of the research outcome, design process and the final result of the project.

After the research on the typology and site analysis is done, the project moves into the design stage. Due to the neighboring new blocks and full refurbishment of the area, certain design freedom was allowed. At the same time, the location of the project has a big influence on the urban fabric as it has a public space in front and it is located on the open corner, influencing the surrounding and taking place in many view points. Additionally, it is an active part of the city functions, as the metro exit is located directly underneath the building and a tram stop by the street.

One of the goal of the project was creating an open and welcoming internal public space for the community and to express diversity and connectivity of the program through the design. On the other side as it is part of the block, located next to historical buildings and is important focal point, the preservation of external calm street face was chosen. In this part of the book will be reviewed the design process of realizing mention above tasks, the main special concept of the project and the outcome - final design with the explanation of the structure, building technology and examples of architecture detail of public space within it.





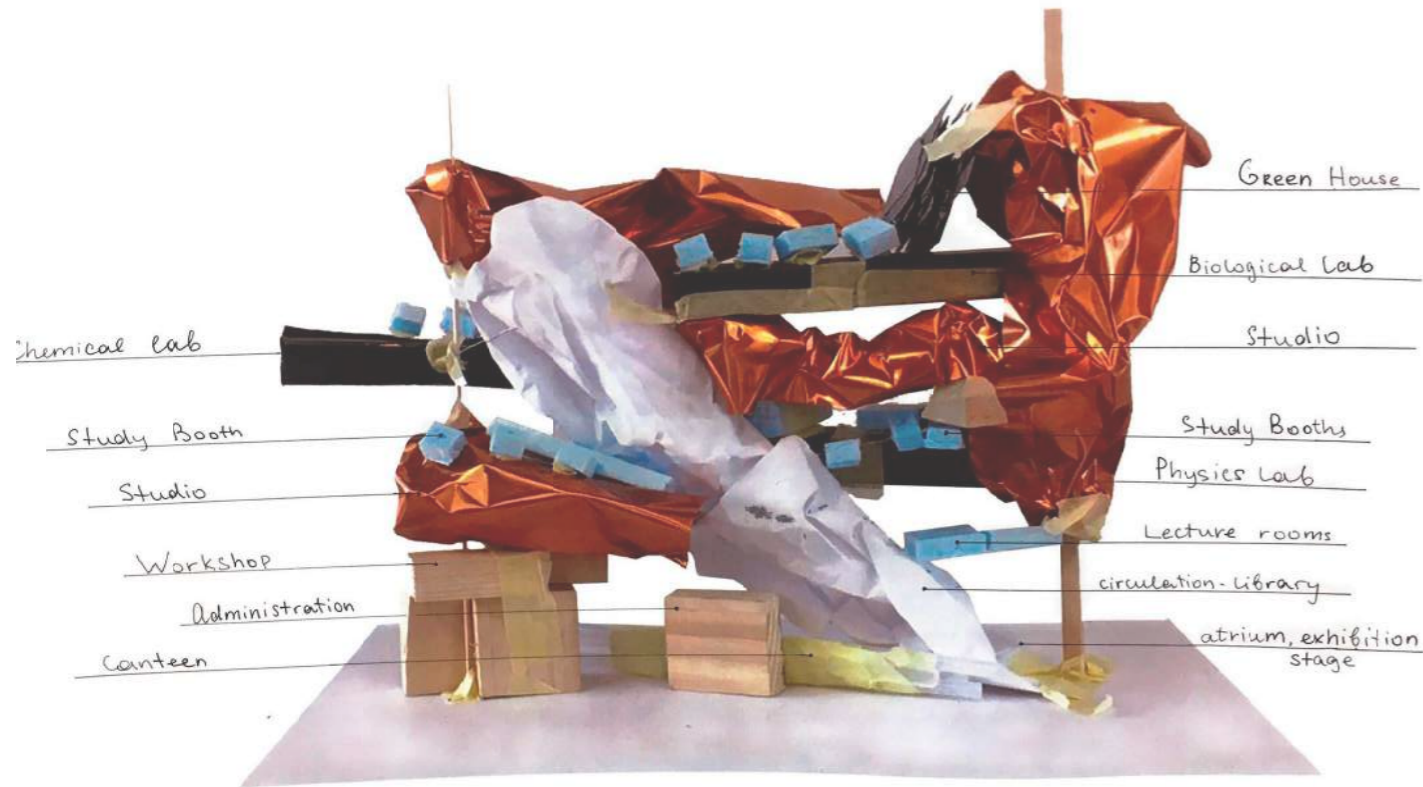
7 SPATIAL CONCEPT

Main idea /

As the building is meant to accommodate many different programs and target groups, the challenge of space formation was to create a building that would not only be an envelope to those program, but unite them and help people of different ages and backgrounds to collaborate and network. Despite many different spheres are included into the program, there is a uniting element with the mission to develop, educate and share knowledge. That is why it was decided to create a spatially uniting element reflecting the values of the facility, serving as a needed connection and become a functional element.

This element was chosen to be the library, which would interweave throughout the whole building, connecting different laboratories between each other, making it easy to share facilities and create a space for meeting and networking. The library would serve as a circulation core and a uniting element, with programs and spaces that ascertain various atmospheres.

7.1 VOLUMETRIC EXPLORATION



Library

As can be seen from the conceptual sketch model, the library/main circulation core flows diagonally through the whole building. Staircases will provide a variety of different atmospheres: cozy individual spaces for studying, bridges for circulation, or public sitting to watch performance and communicate.



Labs and classes

The project from the start was developed through section view, where a lot of attention is placed on how different building elements meet, the visual connection between them and the different feelings which could be created in between. From the programmatic sketch collage above can be seen the diversity and connectivity of planned space and how staircase / library is supposed fit within it.

7.2 REFERENCES



Library

The design of the library space arrived using reference from different libraries over the world. The idea is to create a space which is not connected with one singular element, but rather united system of elements, which would be connected by its function and materiality, but different in atmosphere and use. All of the library staircases will be covered with timber and just as in provided above examples some would include shelving systems within risers, others would just serve as a seating area.

27, 28,
29, 30, 31

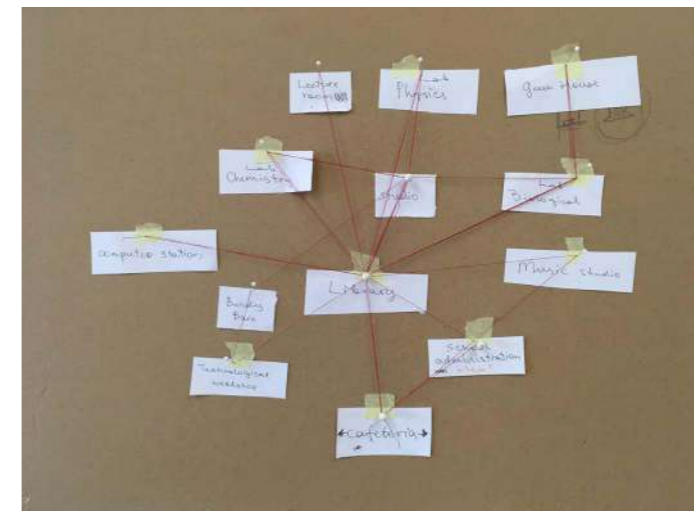
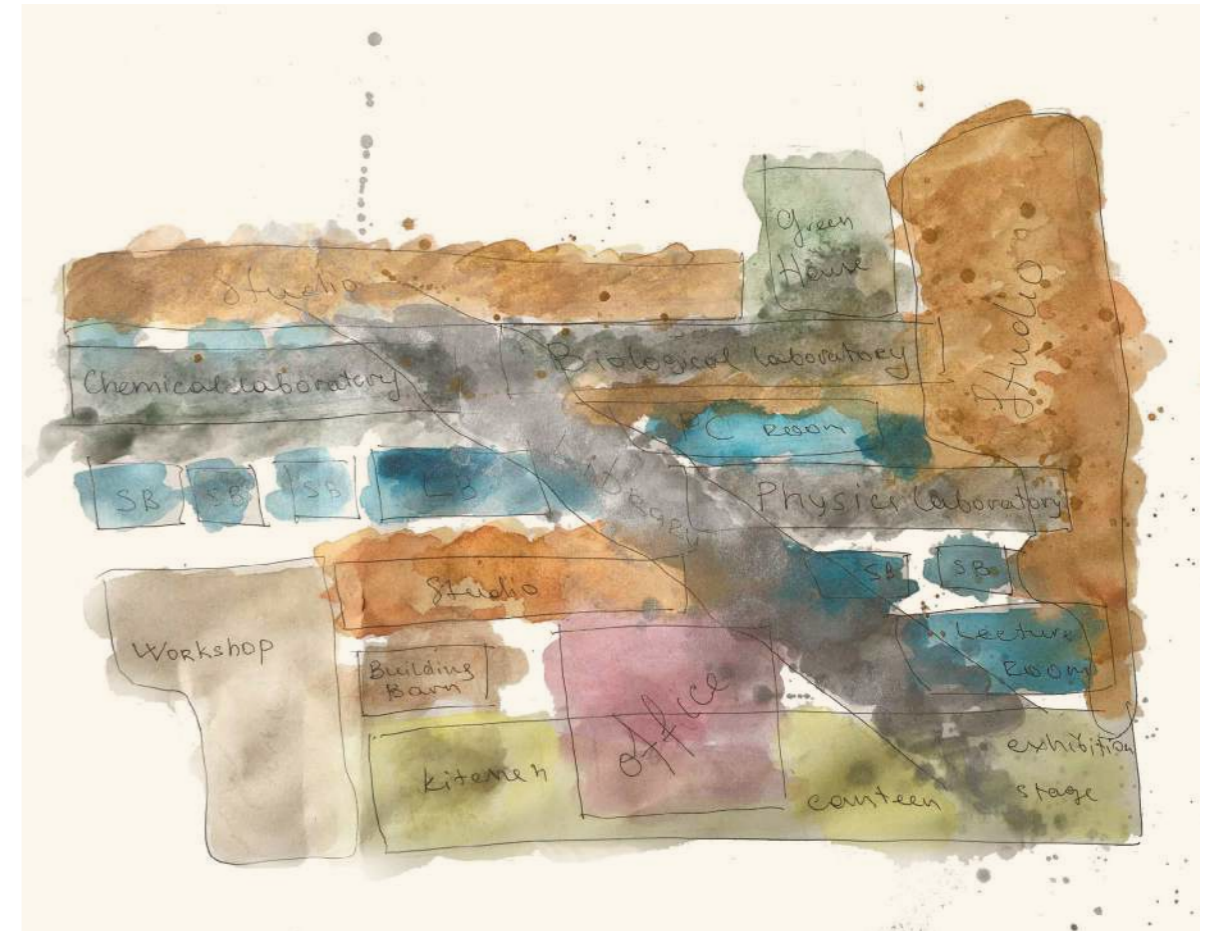
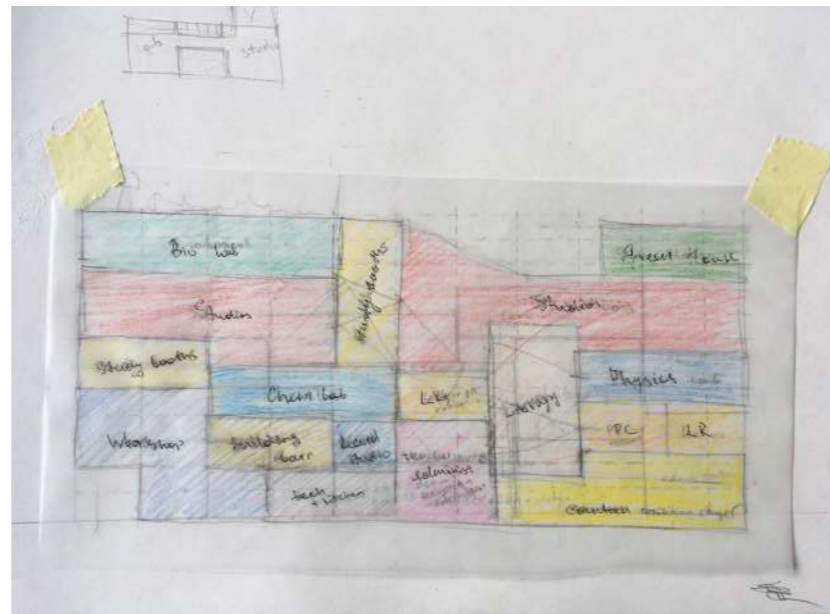
32, 33, 34, 35,
36

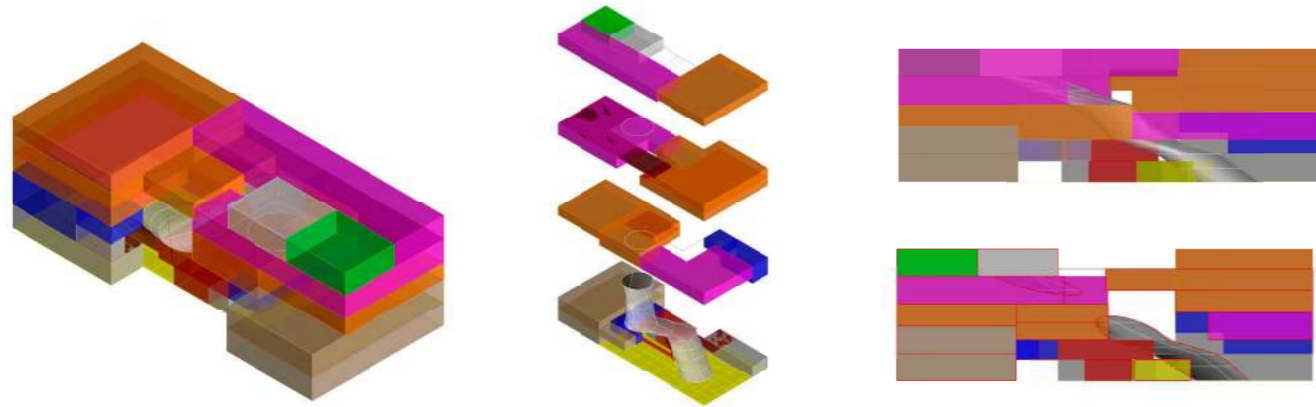
8 DESIGN EVOLUTION

STAGES: Sketch design
 Design development I
 Design development II
 Pre-final

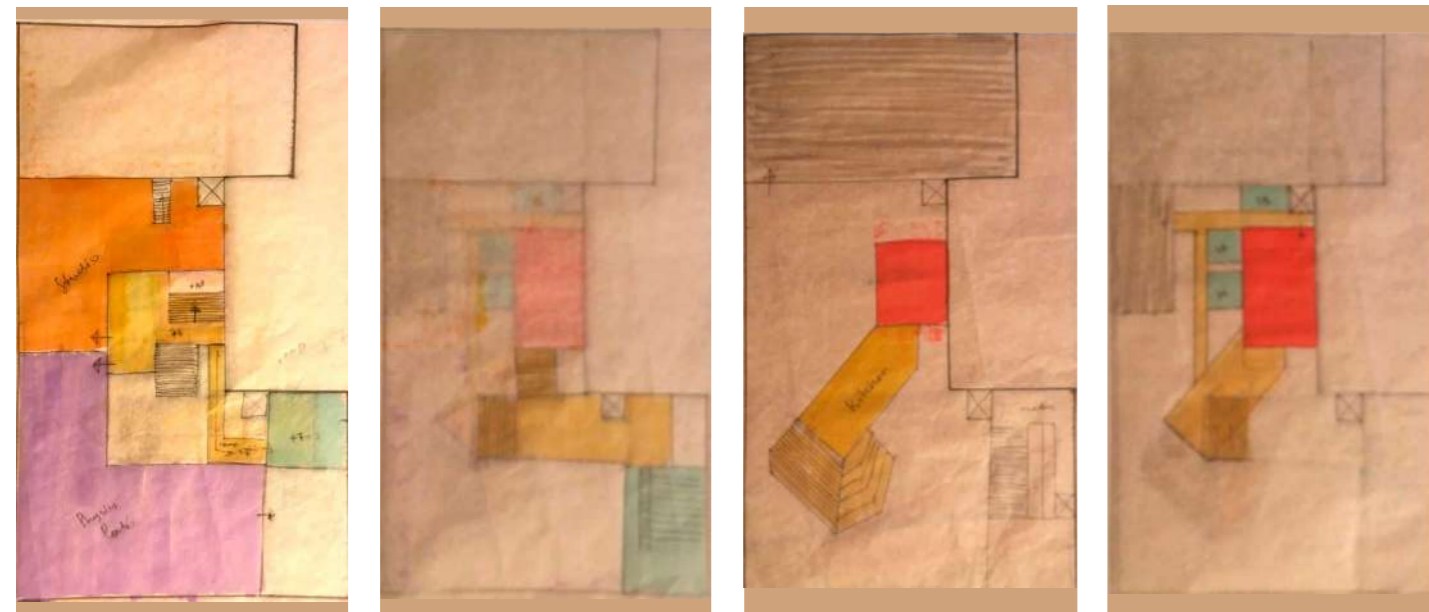
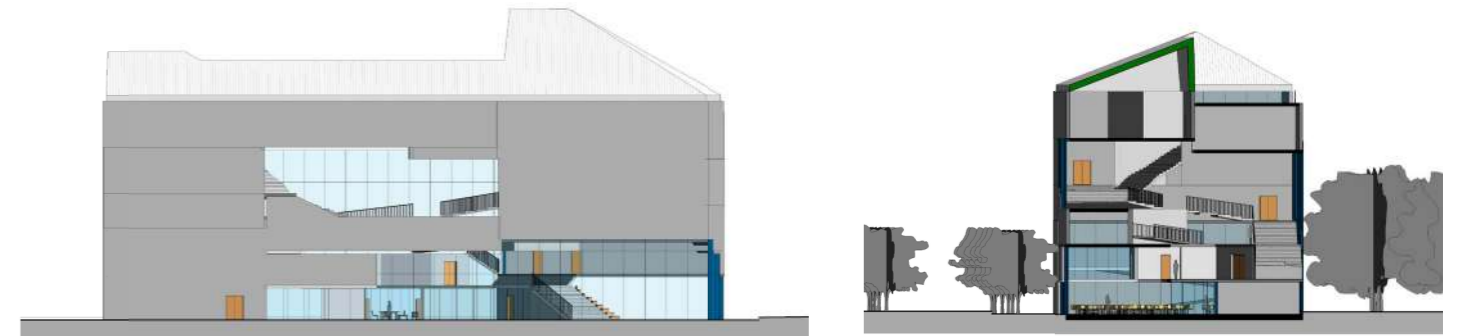
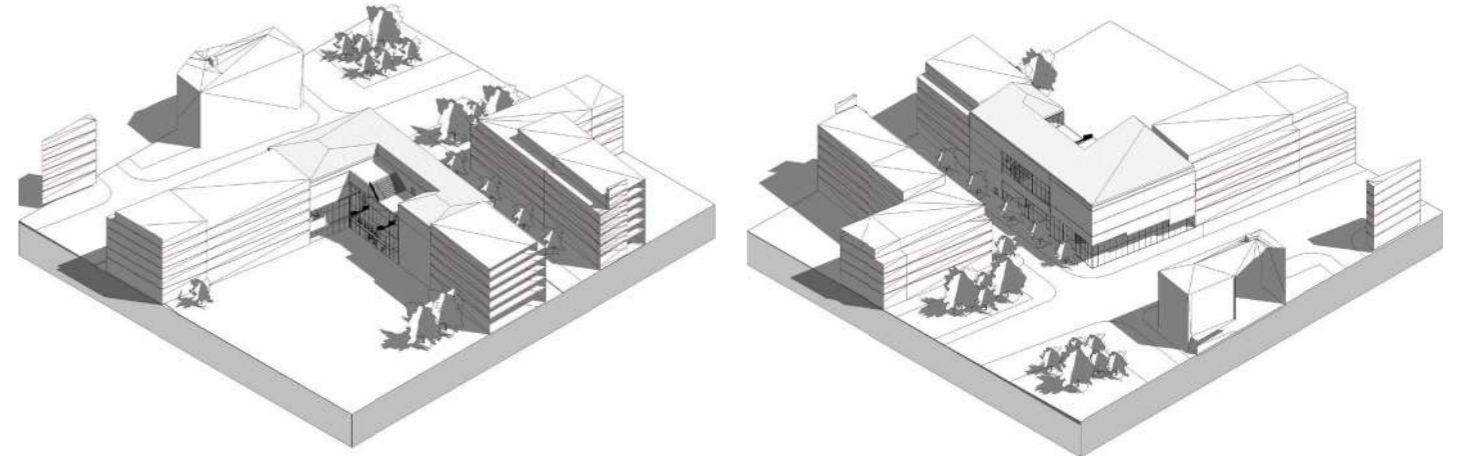
Over all the project took 2 semesters - 8 months. The first semester was dedicated to the definition of the brief, typology and site, as well detailed analysis of it. In the beginning of the second semester final program was defined and works on design have started.

As can be seen on the left diagrams, the design of the building started inside-out by working in the connections between different programs. On this stage library as a main element has been identified.



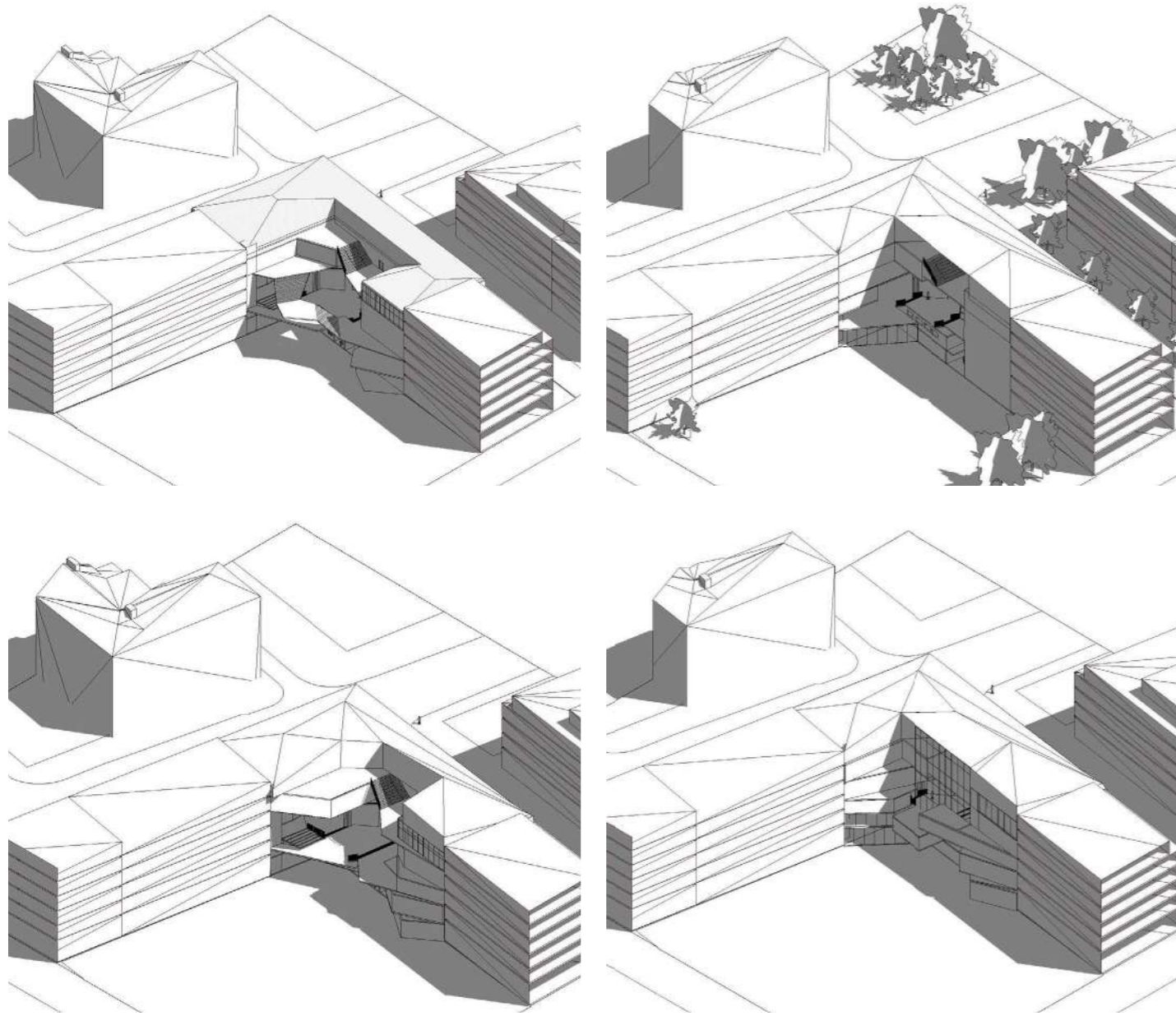


Sketch design After the definition of the main programmatic connection the volumetric exploration started with the 3d modeling of the big spaces working with the void and solid space within the building. In this sketch silver tube represents library space /circulation.

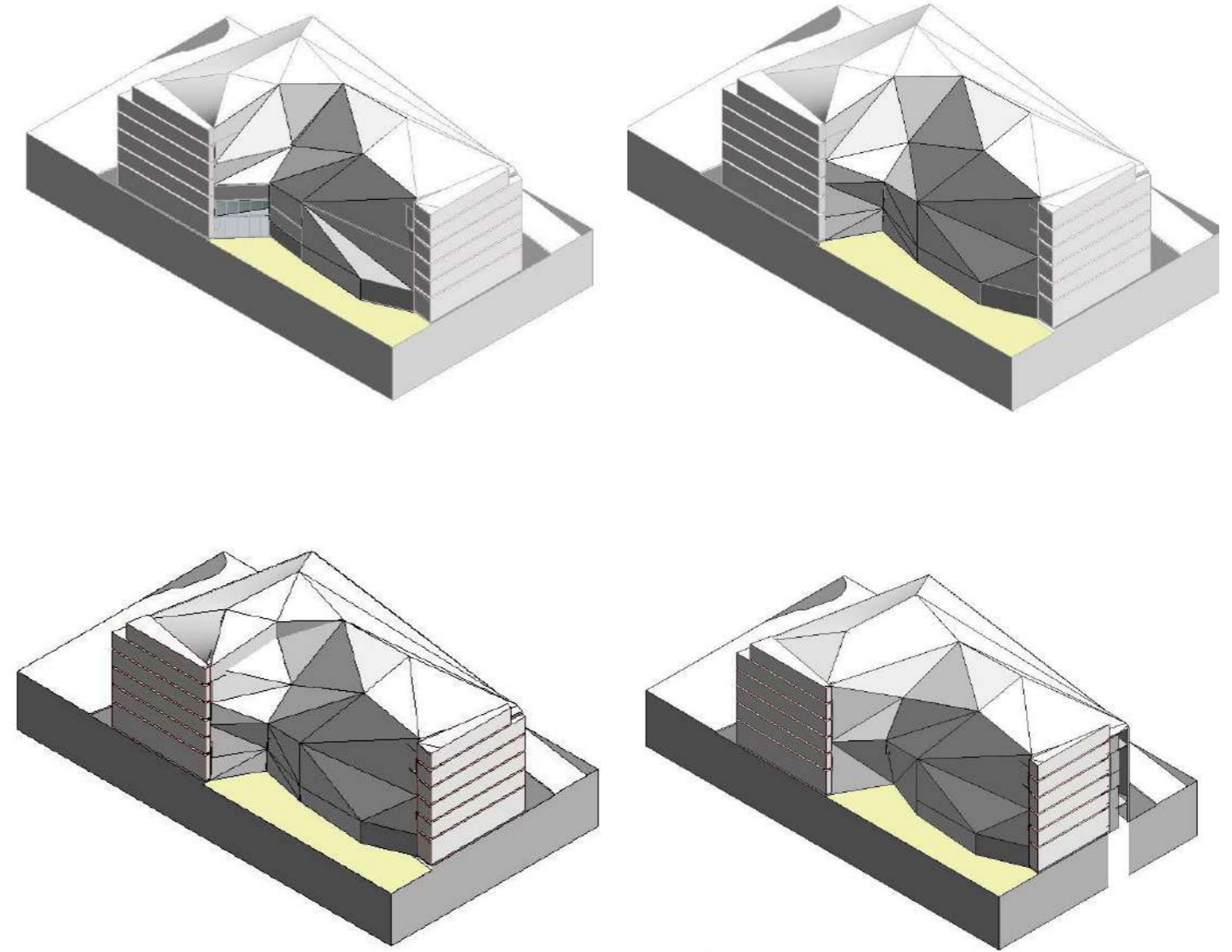


1 Design development The sketch design was developed through manual sketches and modeling. From this stage the main circulation became more clear. The design though was still to be corrected, as the struct orthogonal layout didn't represent the fluid and active program of the institution.

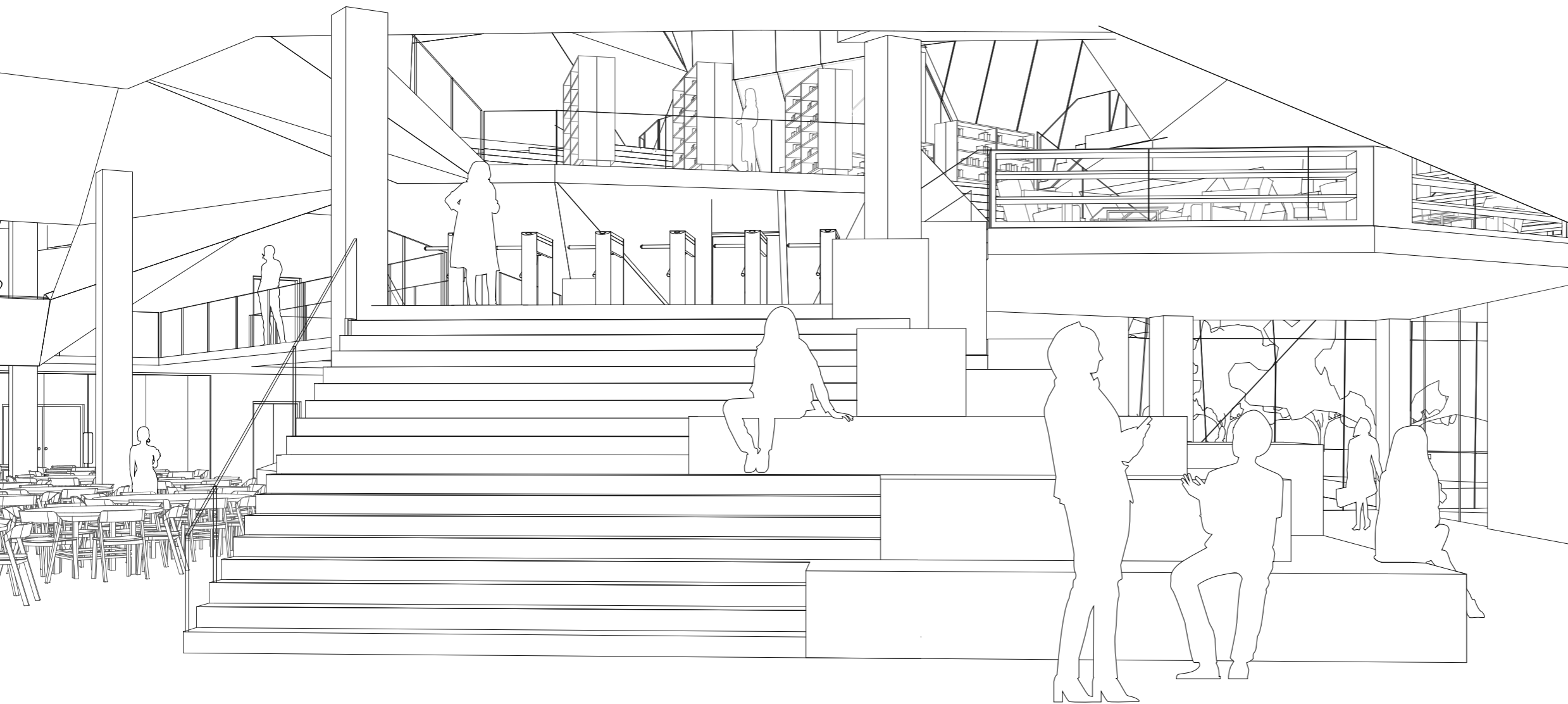
2 Design development BIM 3d modeling moved design into the real scale and helped understand building relationship to the surrounding. The pitched roof was introduced related to the existing context across the street, but it seemed to traditional and facade opening weren't proportional.



3 Design development The work continued with many trial of the connection between the exterior volume placed at the corner of the block and the multilevel and irregular interior.



V Pre-final As in previous design open interior circulation, roof and exterior volume haven't been working together, it was decided to create a facade which would fit within the block on the stretre facade and unrape its interior atmosphere from the courtyard. For this the triangulation technique has been used.



10 FINAL PROJECT

Functional Relationships

Key elements

Use through out the time

Site plan

Exterior visualizations

South-West axonometry

Elevations

Floor plans

Sections

Interior serial vision

10.1 FUNCTIONAL RELATIONSHIP

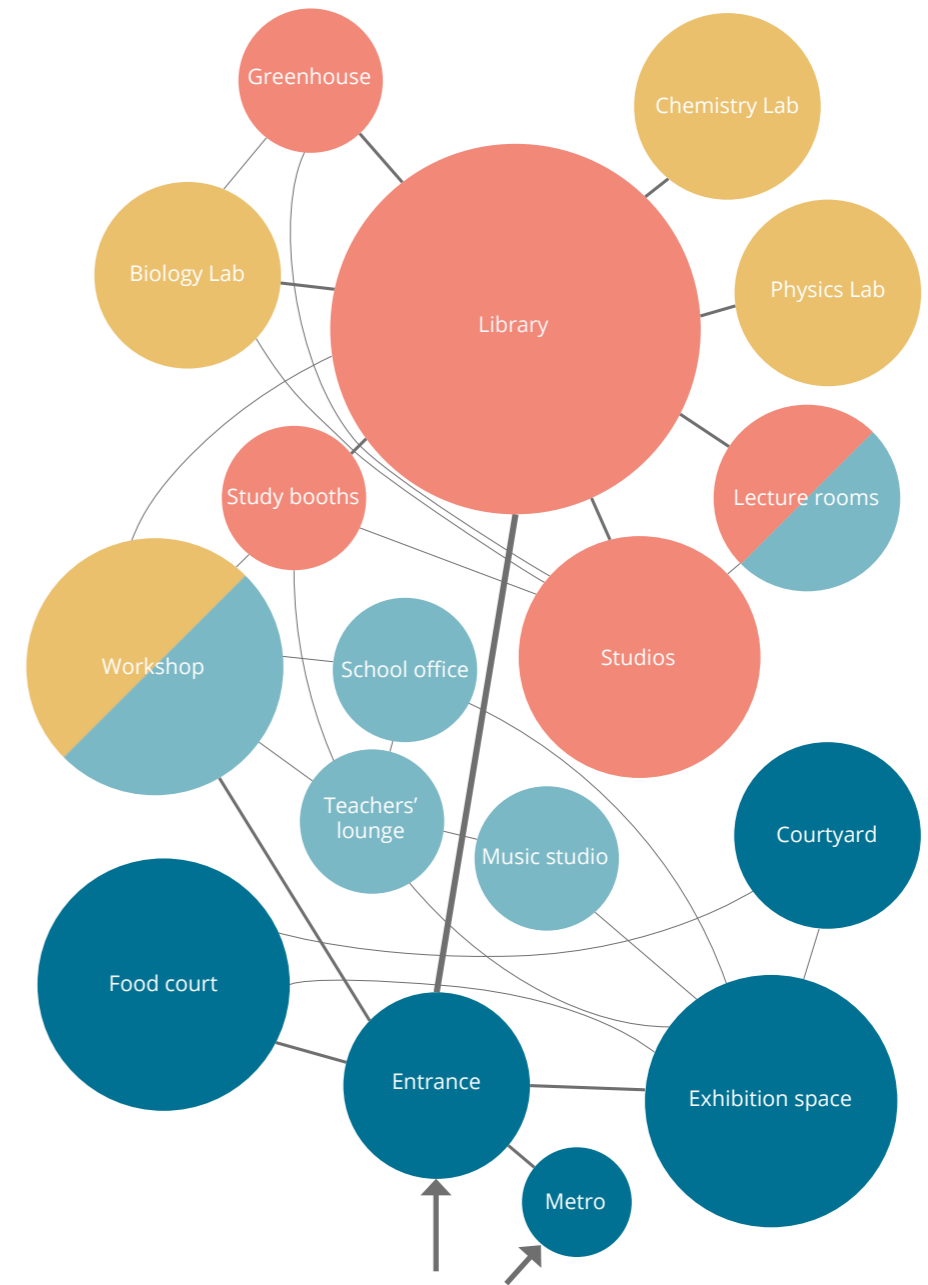
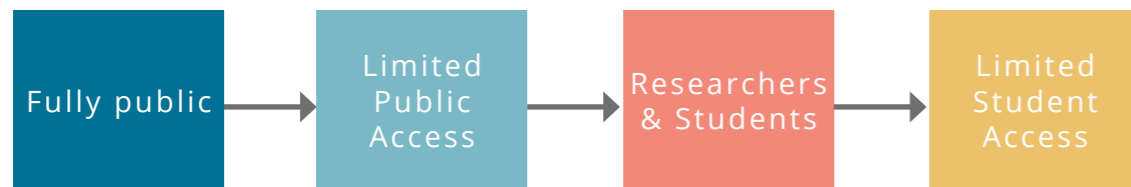
From the diagram on the right can be see final connections between the different programs and its relationship to the privacy levels.

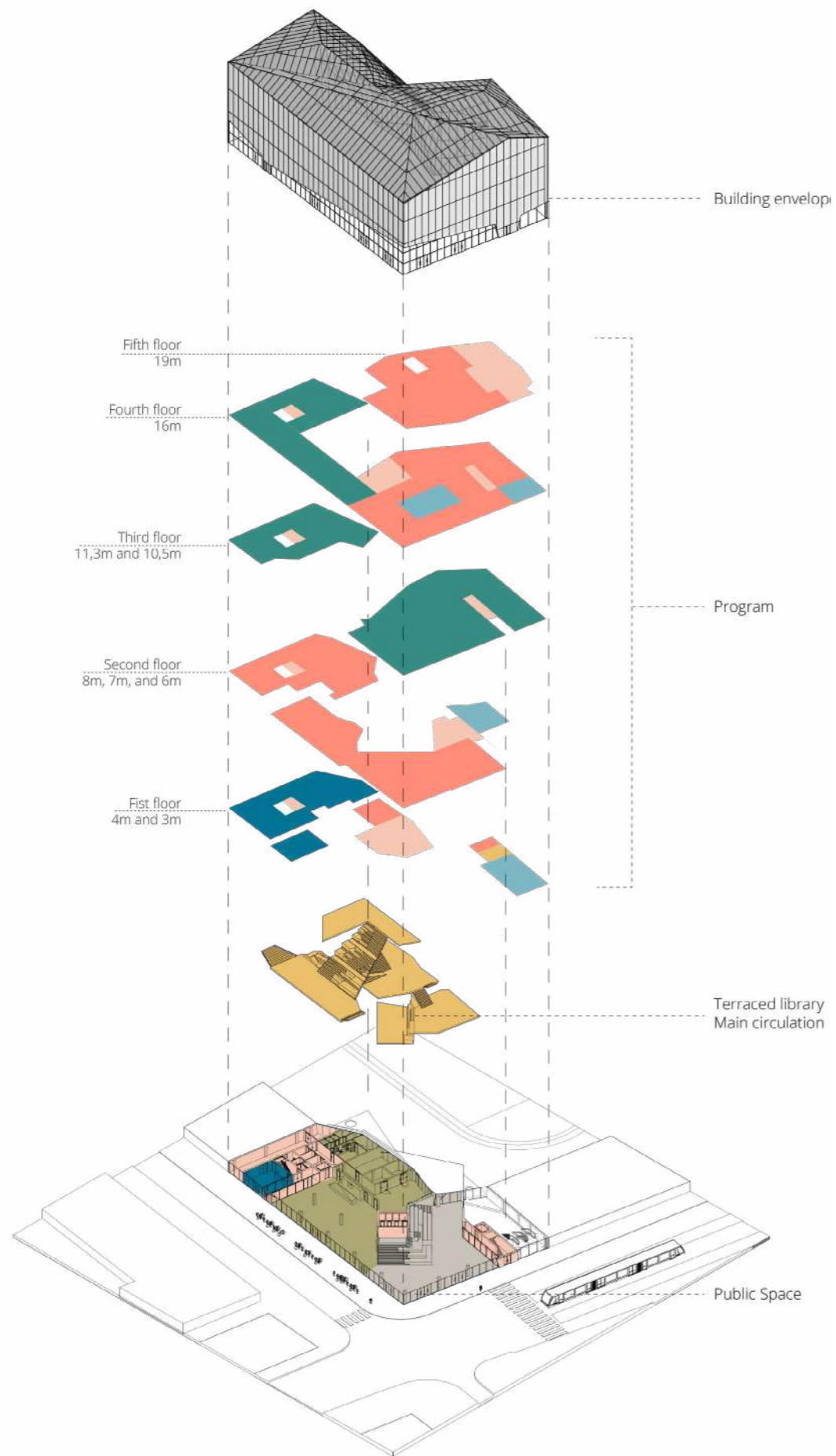
Building has 4 privacy levels:

Fully public zones include public space and food court on the ground floor, which is open to the community and neighbors at all times. There they can enjoy the meal in the dynamic atmosphere of the building, check the ongoing exhibition, come for to watch screenings or just seat and relax.

Limited Public Access are those which are behind the security gate and would need some verification such as membership or a ticket to an event if it is in the lecture room Library, lecture rooms and studios are available only to school and research center. They are open at all times and free to use, but people from outside can't get in.

The laboratories and workshop have limited access to student for the safety reasons. As there are dangerous machinery and chemicals, students can be in this spaces only with the supervision.





10.2 KEY ELEMENTS

Project can be subdivided on the development of four interconnected elements:

Public space of the ground which connects community in the neighborhood and the institution. Here people can come to look at works of the students in the exhibition space, visit public event or have some food at the food court.

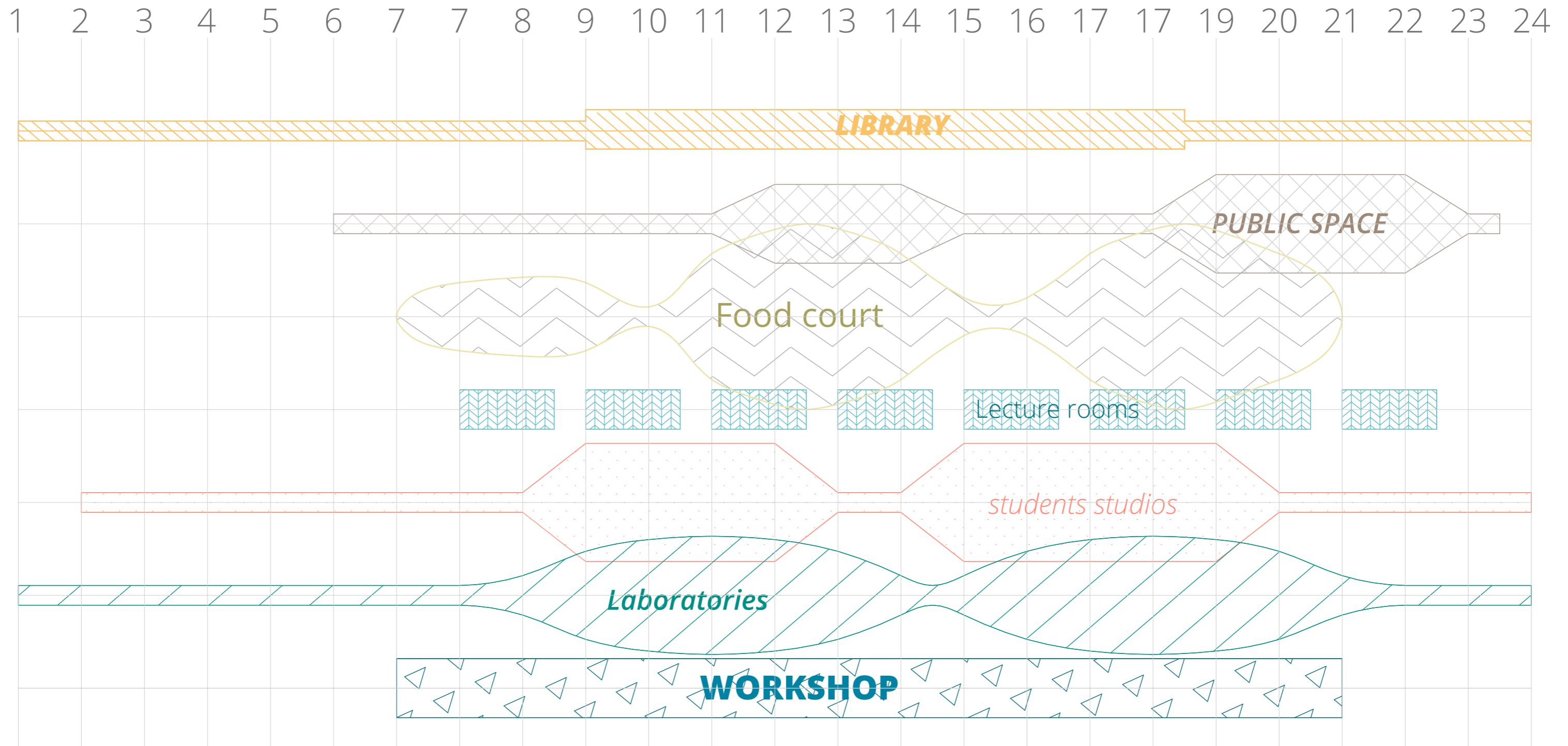
Library integrated into the main circulation space, which goes from 1st floor to the green house under the roof.

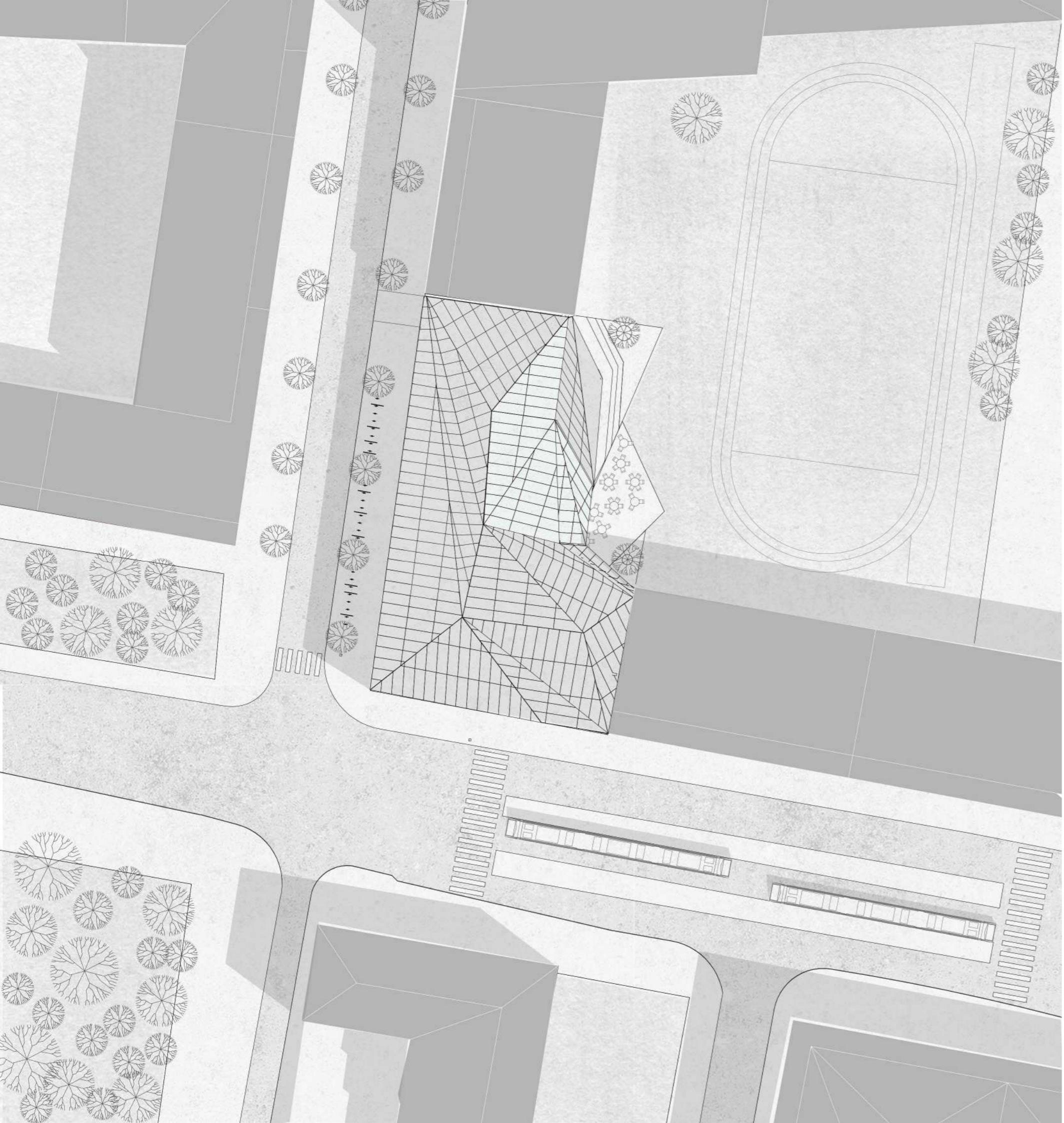
Mixed program of laboratories and school, which is spread on different level giving building more dynamics and organically connecting to the staircases.

Polycarbonate building envelope, which as whole elements manages to relates to the urban grid on the street facades and reflect diverse and active building program on the courtyard.



10.3 USE THROUGH TIME





10.4 SITE PLAN

1:500

From the top view of the project the connection to the neighboring buildings and public space can be seen. A particular highlight is the flat facade which faces Rajska and Plynarni streets, following the urban grid and the exploded courtyard facade and reflecting the inner structure of the project and connects the middle school building at the top and the residential block on the left by wrapping them together to the courtyard.

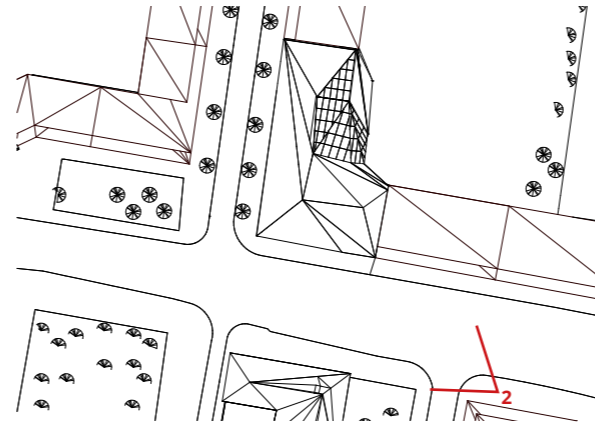
10.5 STREET VIEWS

Plynarni street from pedestrian paths



From the street view the opening of the street facing facade at the ground floor can be seen. This was meant to welcome people inside and give a hint of what is happening in the public spaces, while the solid part above covers the private programs such as laboratories and students studios.

Even though building volume is divided on a solid and void parts, during the night time blurred silhouettes of the activities inside become visible to the pedestrians - due to the slightly translucent polycarbonate facade material. This contributes to the communication of the building with the context.



1
West Plynarni street view

2.
East Plynarni street view

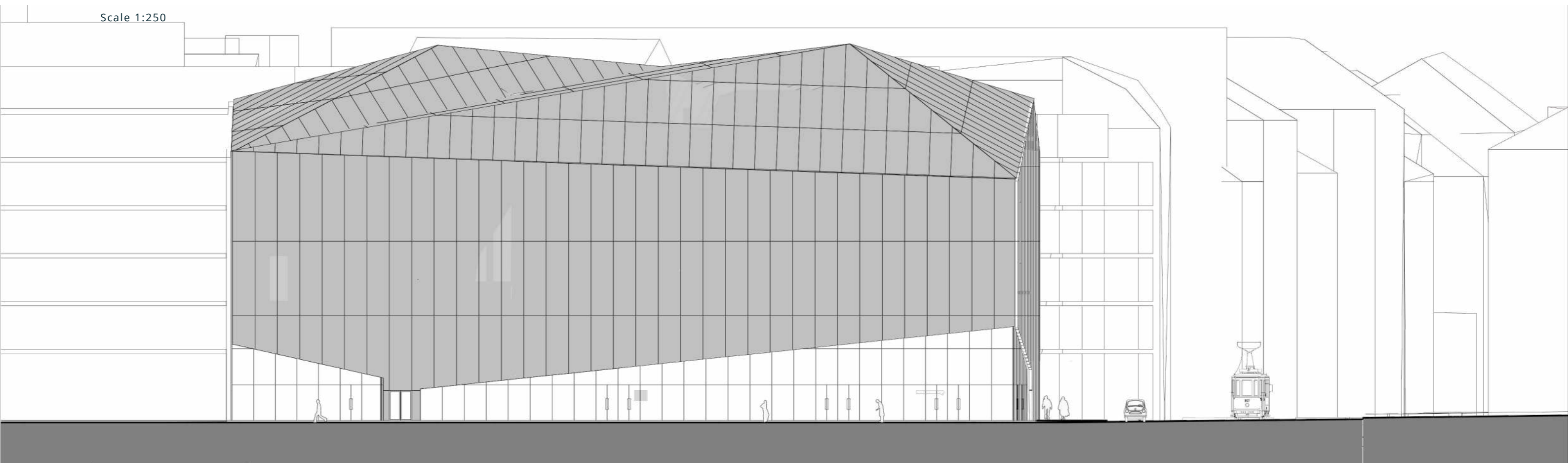
3
Site plan 1:2500
with marked view points



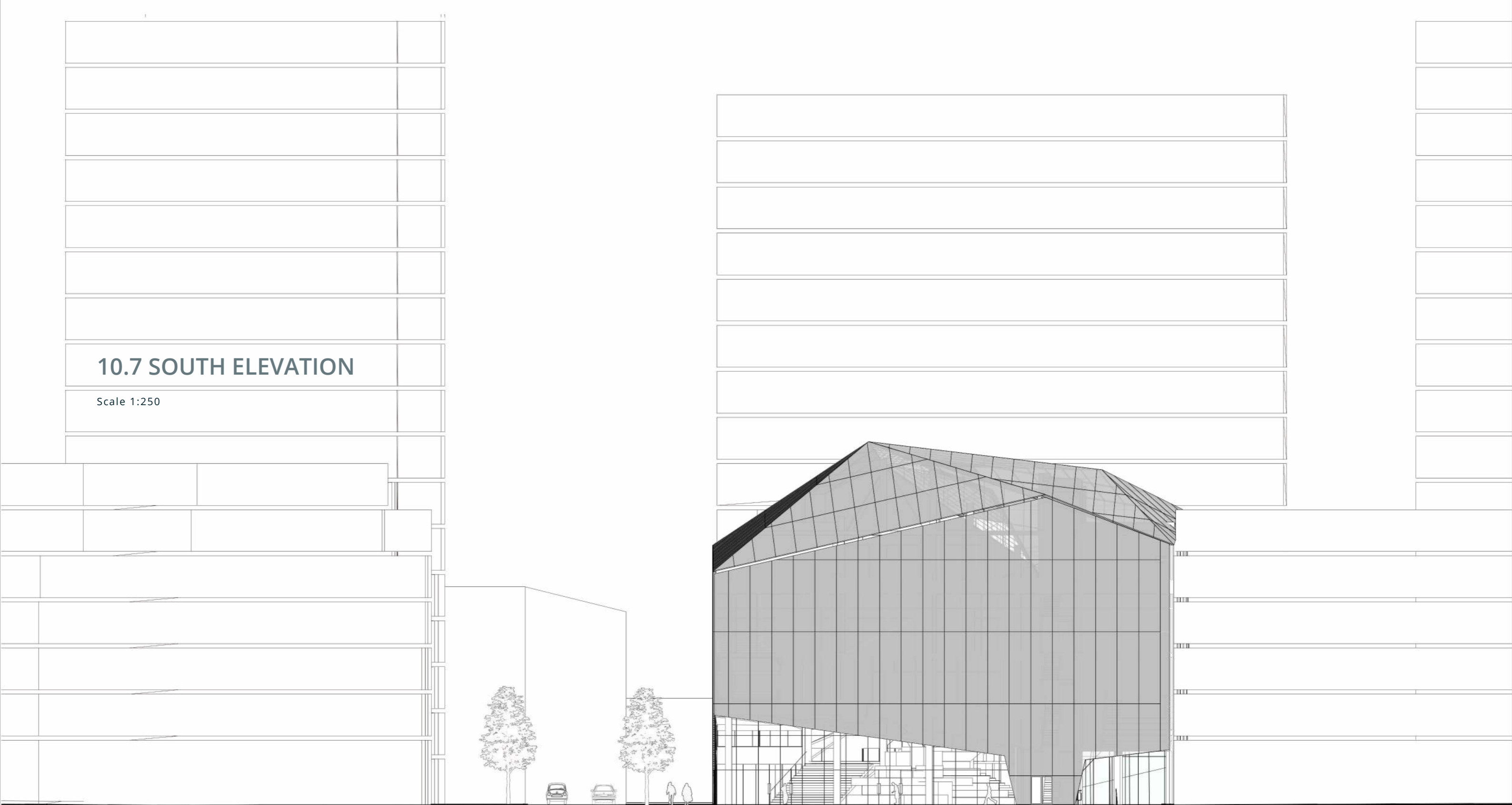


10.7 WEST ELEVATION

Scale 1:250



The flat facade follows the urban grid and continues to the sloped roof, made from the same material. The slope respects the historical building of the middle school across the street by how the highest point on the south-west meet and highlights the corner and the sides, thus organically fitting in with the buildings on both sides.



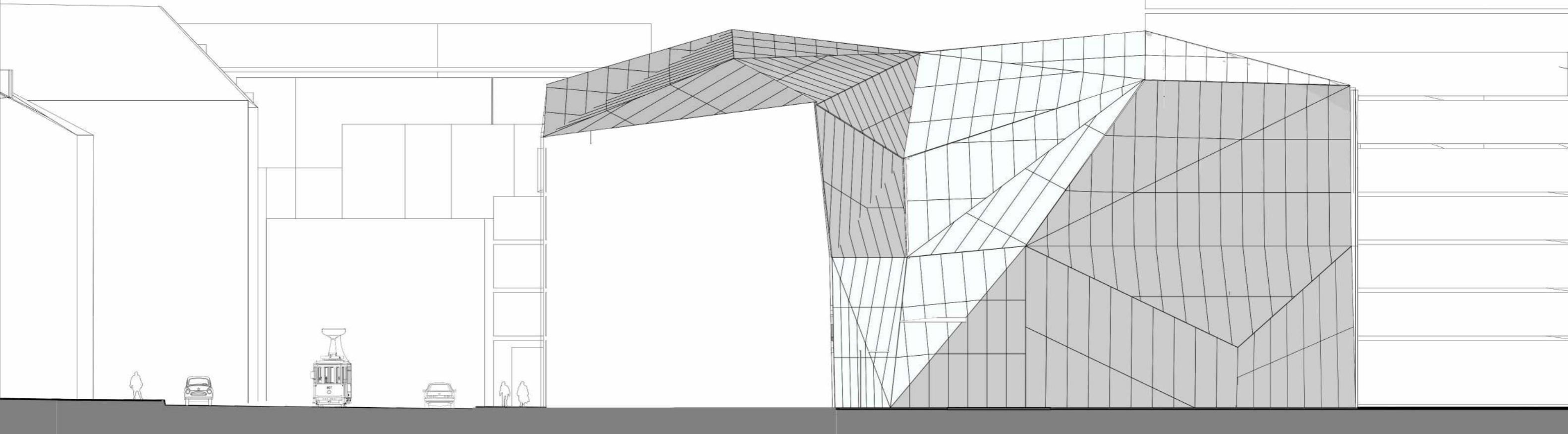
10.7 SOUTH ELEVATION

Scale 1:250

On the south facade there are two openings: the bigger one open towards the school public space and main circulation core and the smaller on the right is an entrance to the metro station.

10.7 EAST ELEVATION

Scale 1:250



The material seen from the street facade overflows towards the courtyard facade and while the form undergoes a triangulation, a glass material cascades from the roof line, revealing the interweaving circulation and communications spaces.



10.8 GROUND FLOOR PLAN

Scale 1:250
Level 0

On the ground floor is publicly available. Main entrance to the building is from the corner. On the right can be found the exhibition space where can be shown students or researchers projects and different public events as movies screening and presentation take place, and direct access to the courtyard. On the left is food court and coffee bar. Directly across the corner entrance is staircase leading up to institution facilities. At the northern side of the building is separate entrance to the workshop reception and after is it drive-in for deliveries of supplies and waste pick up.

- | | | | |
|---------------------|-----------------|---------------------------|-----------------|
| 1 Metro entrance | 7 Food court | 13 Kitchen staff lounge | 19 Drive-in |
| 2 Fire escape | 8 Coffee bar | 14 Kitchen office | 20 Waste |
| 3 Exhibition space | 9 Kitchen | 15 Staff locker rooms | 21 Water tank |
| 4 Courtyard | 10 Refrigerator | 16 Workshop reception | 22 Bike parking |
| 5 School office | 11 Freezer | 17 Laboratories' storages | |
| 6 Public rest rooms | 12 Food storage | 18 Surveillance room | |



10.8 FIRST FLOOR PLAN

Scale 1:250
3 and 4 metres above the ground

From the first floor school facilities be only accessed by passing through turnstiles or elevator with the ID card or an invitation in case of public lecture in the bigger lecture room. Here are also located main space of the workshop, music studio and teachers lounge.

- | | | | |
|--------------------------|-------------------------|-------------------|---------------|
| 1 Big lecture room | 6 Security turnstiles | 11 Ceramic studio | 16 CNC |
| 2 Fire escape | 7 Teachers lounge | 12 3d printing | 17 CNC |
| 3 Study Booth | 8 Deans office | 13 Robotics lab | 18 Storage |
| 4 Library technical room | 9 Workshop locker rooms | 14 Laser cut | 19 Spray room |
| 5 Library | 10 Recording studio | 15 Wood working | 20 Dust room |

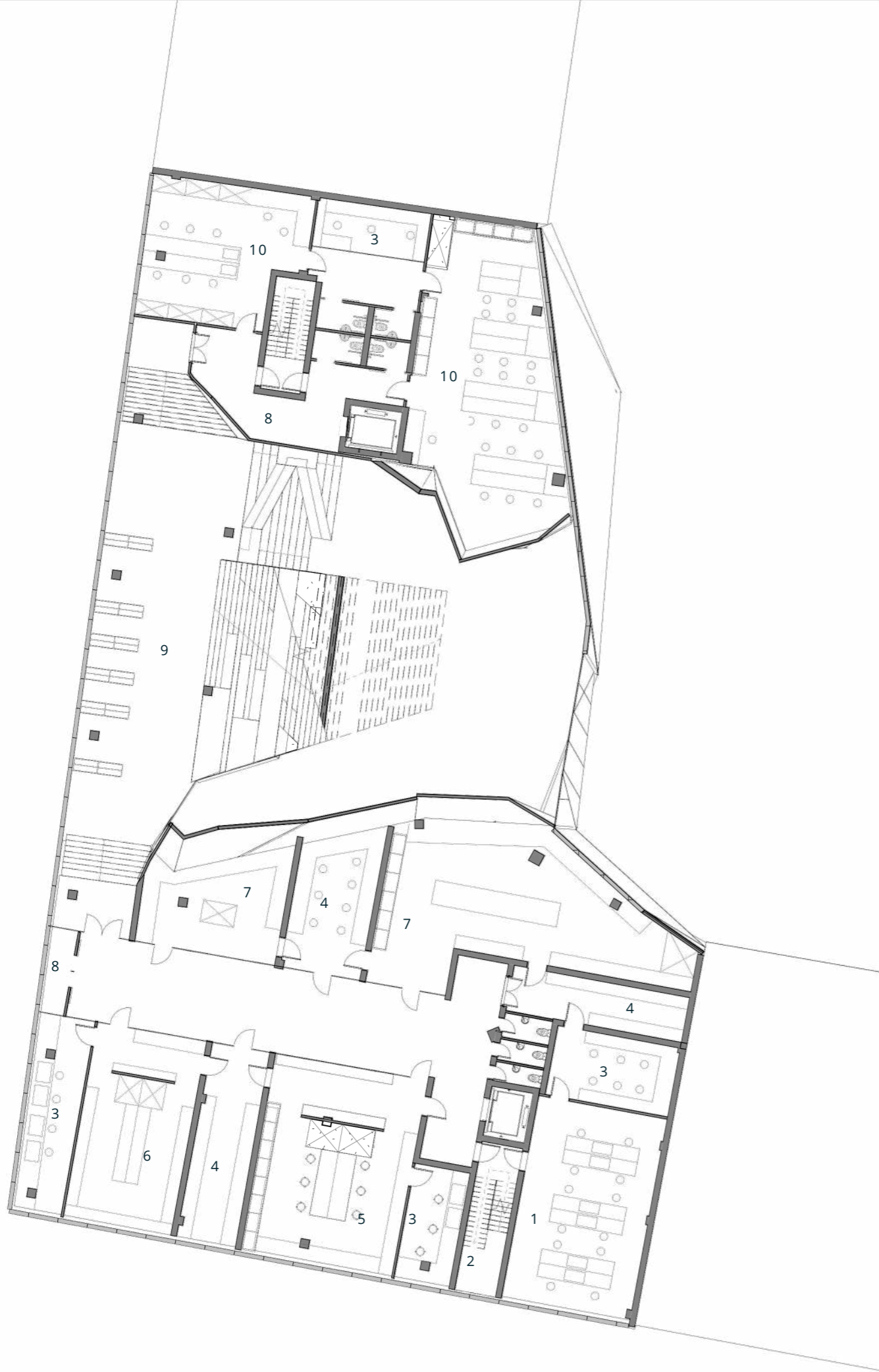


10.8 SECOND FLOOR PLAN

Scale 1:250
6, 6.8 and 8 metres above the ground

On the second floor circulation space unwraps into big library atrium with shelving systems in the open spaces as well as in and below the staircases. Even though spaces have height difference in up to two meters, they are connected between each other with ramps allowing free movement for physically challenged people.

- 1 Big lecture room
- 2 Fire escape
- 3 Medium lecture room
- 4 Students locker room
- 5 Studio
- 6 Study booths
- 7 Computer booth
- 8 Library



10.8 THIRD FLOOR PLAN

Scale 1:250
8, 9, 10.5, and 11.3 metres above the ground

Library space continues to the third floor where there more book shelf and a big staircase with the seatings of different scale for individuals and groups. As staircase leads up to the green house, from this level the greenery can be already seen.

- 1 Chemical analysis laboratory
- 2 Fire escape
- 3 Preparatory
- 4 Storage
- 5 Analytical chemical laboratory
- 6 Organic chemistry laboratory
- 7 Physical chemistry laboratory
- 8 Cloakroom
- 9 Library
- 10. Physics laboratory

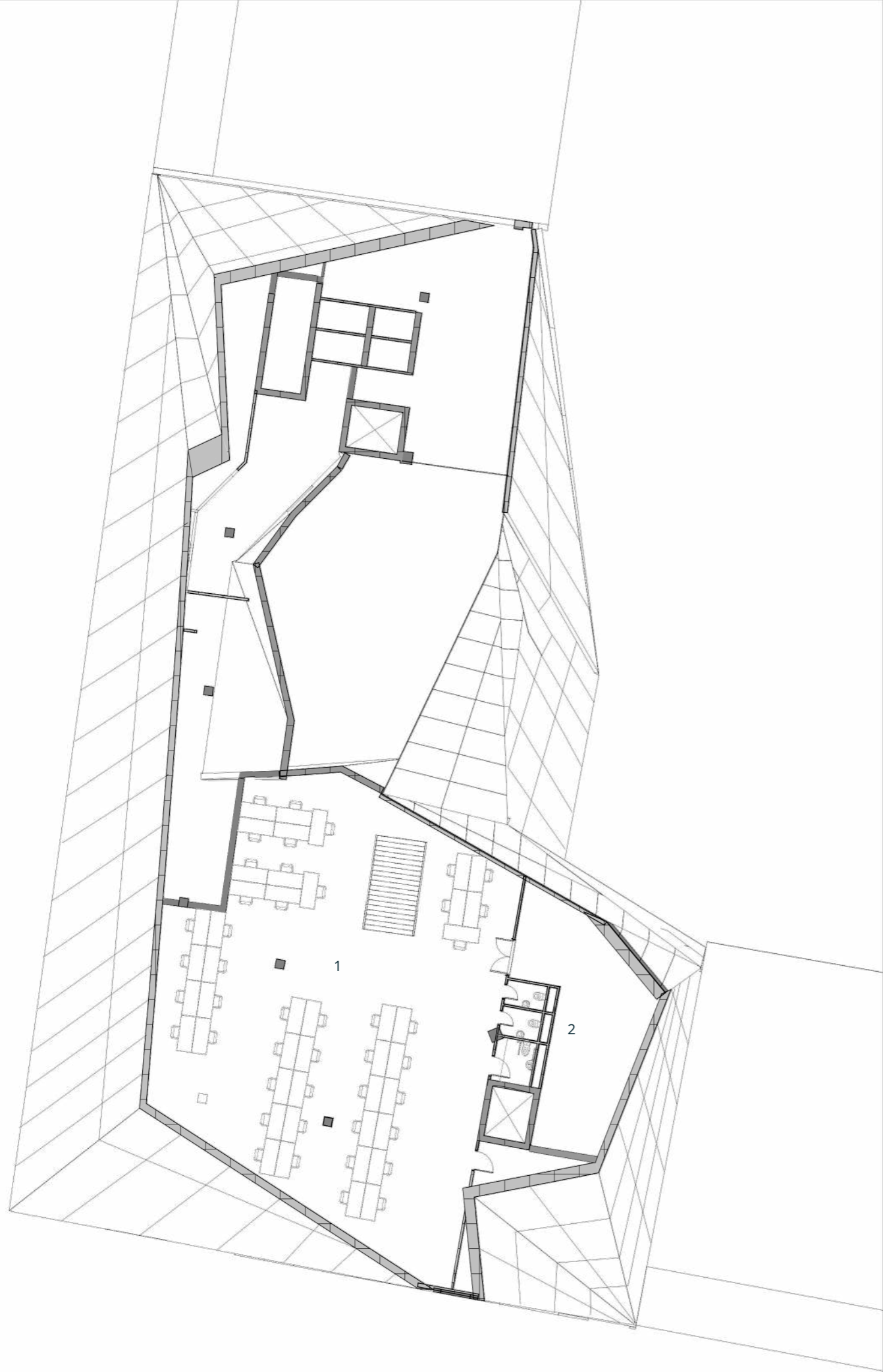


10.8 FOURTH FLOOR PLAN

Scale 1:250
15.6 metres above the ground

This floor can be seen as a final destination of the circulation due to green house and very sunny light atmosphere with couches between plants.

- 1 Small lecture room
- 2 Fire escape
- 3 Study booth
- 4 Studio
- 5 PC room
- 6 Cloakroom
- 7 Biological laboratory
- 8 Refrigerator
- 9 Green house
- 10 Biological waste compost
- 11 Library



10.8 FIFTH FLOOR PLAN

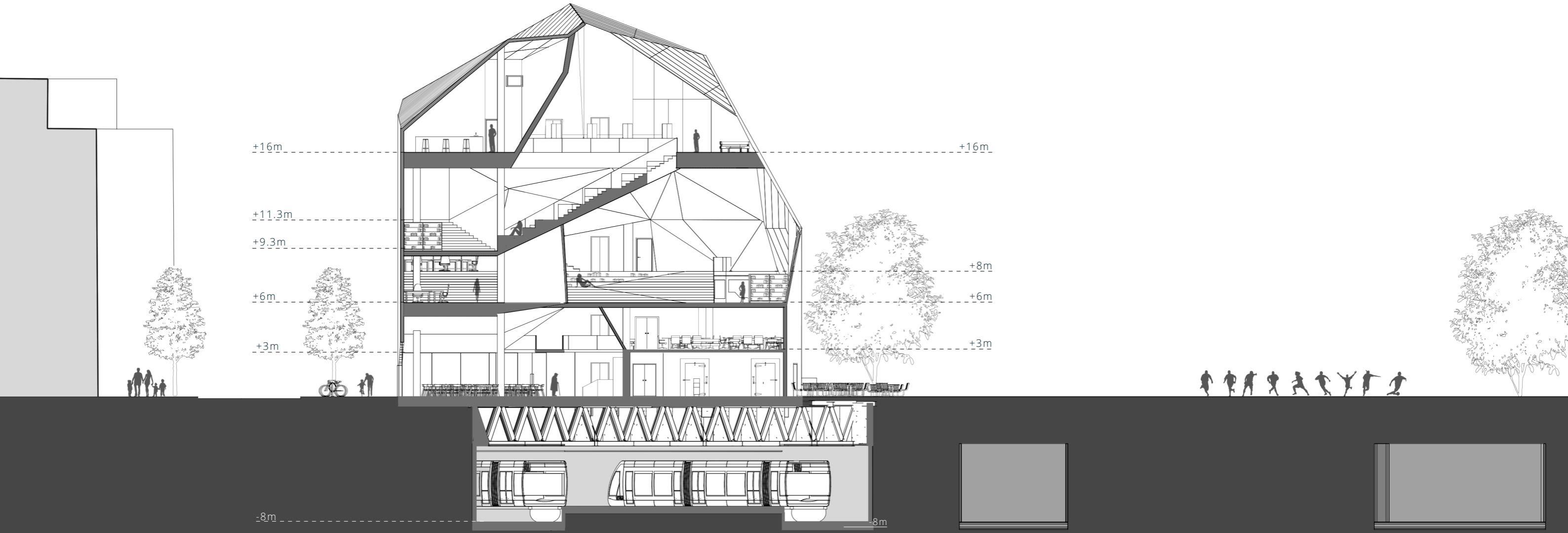
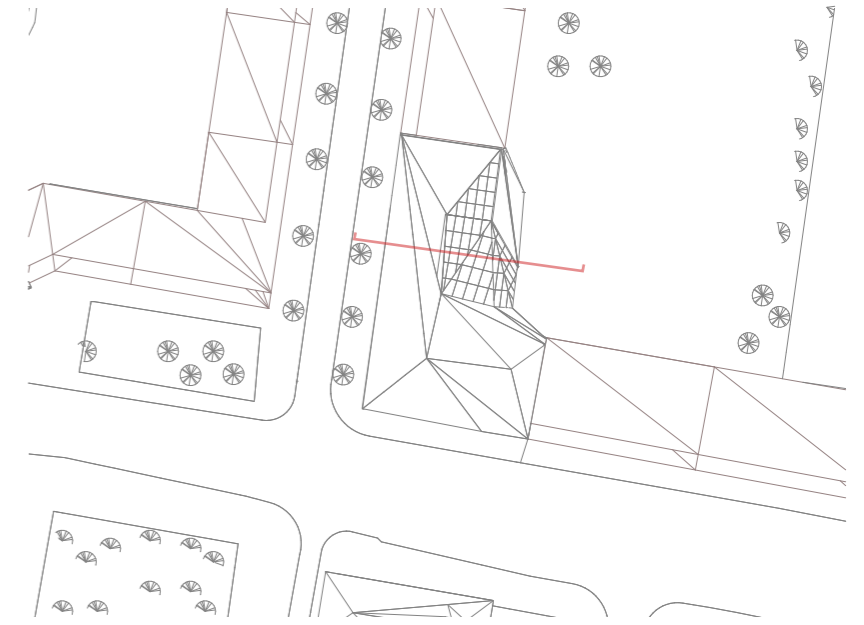
Scale 1:250
19 metres above the ground

On the attic floor is located very light and airy studio space for big team projects and technical facilities for the functioning and maintains of the building.

1 Studio
2 Tecgnical facilities

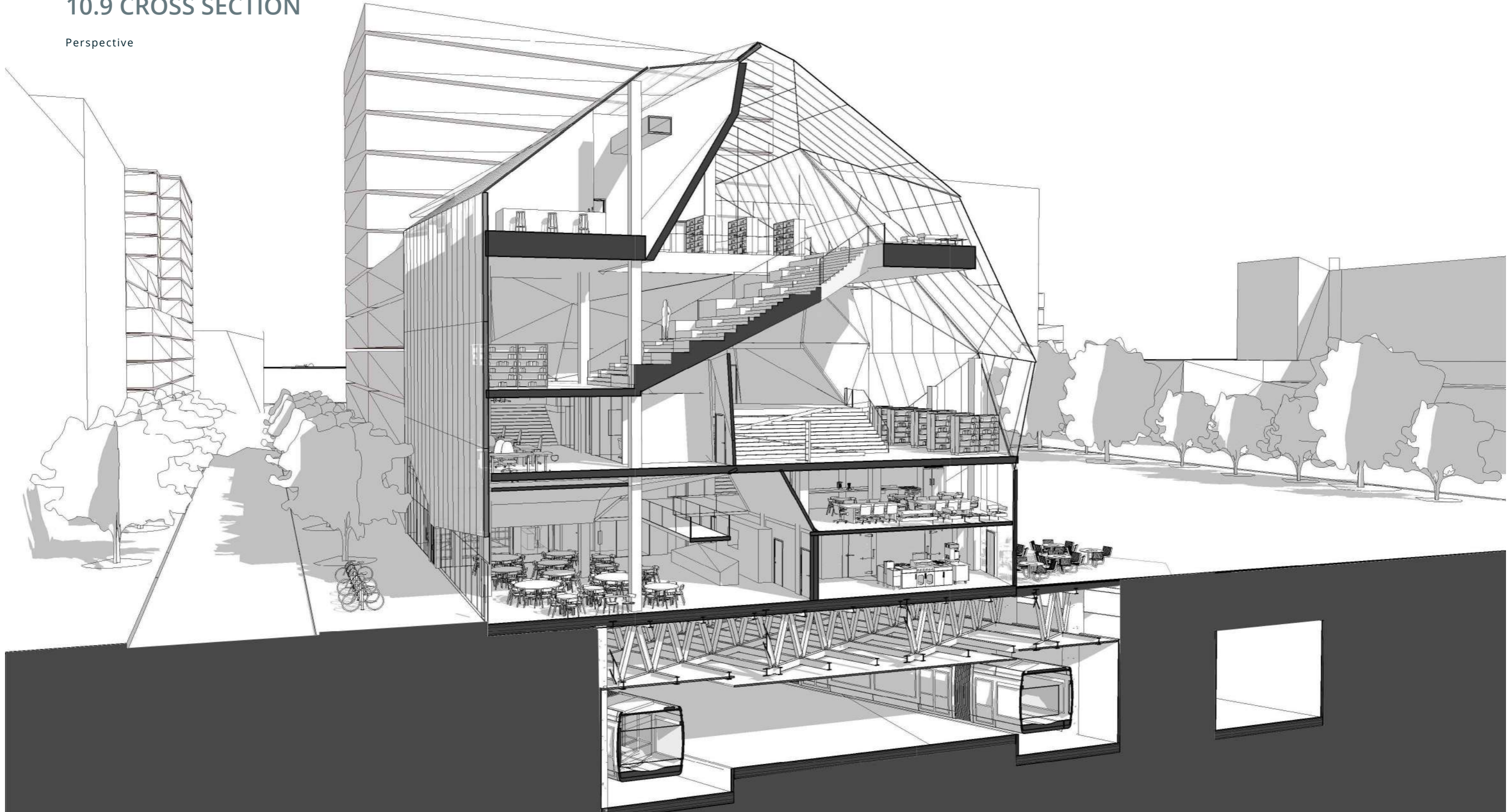
10.9 CROSS SECTION

Scale 1:250



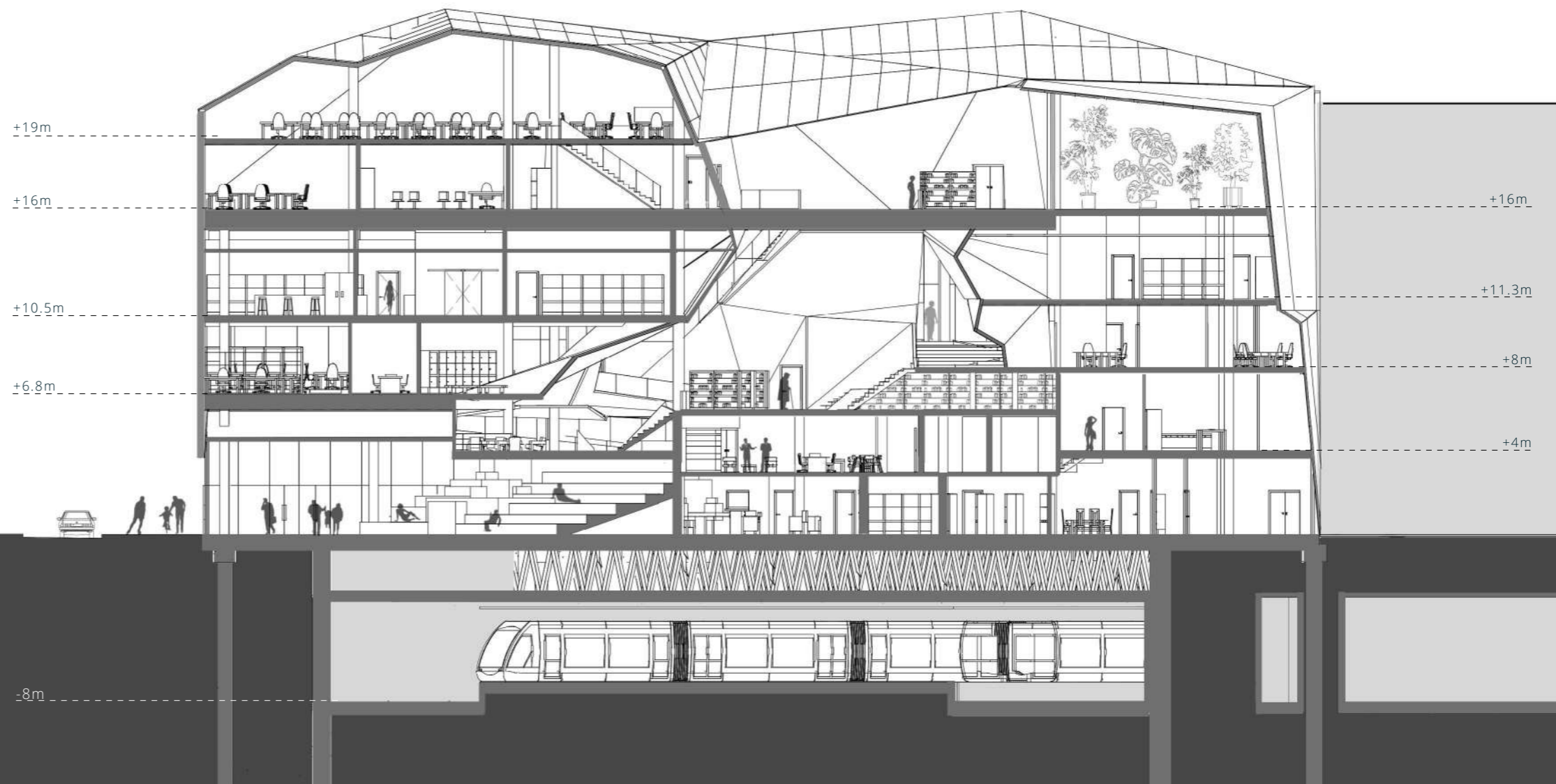
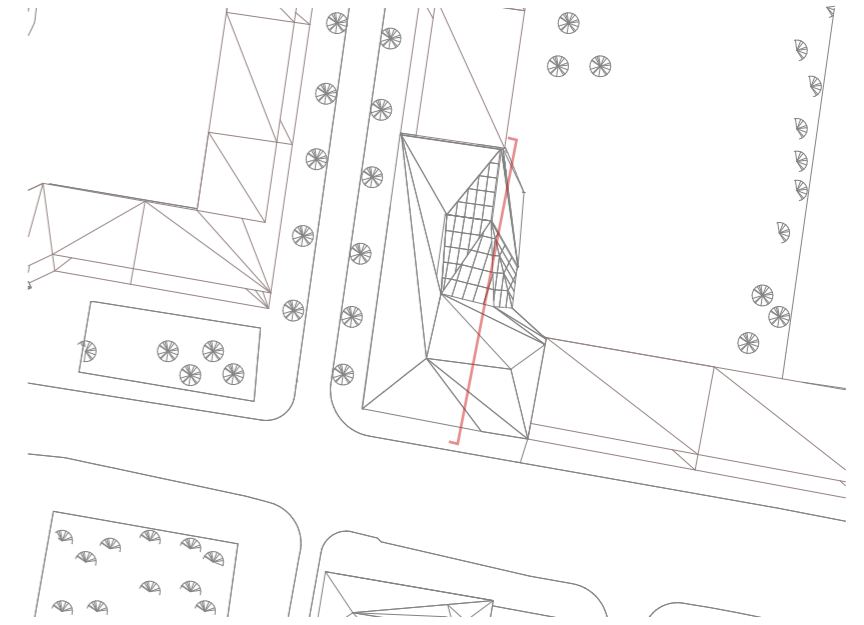
10.9 CROSS SECTION

Perspective



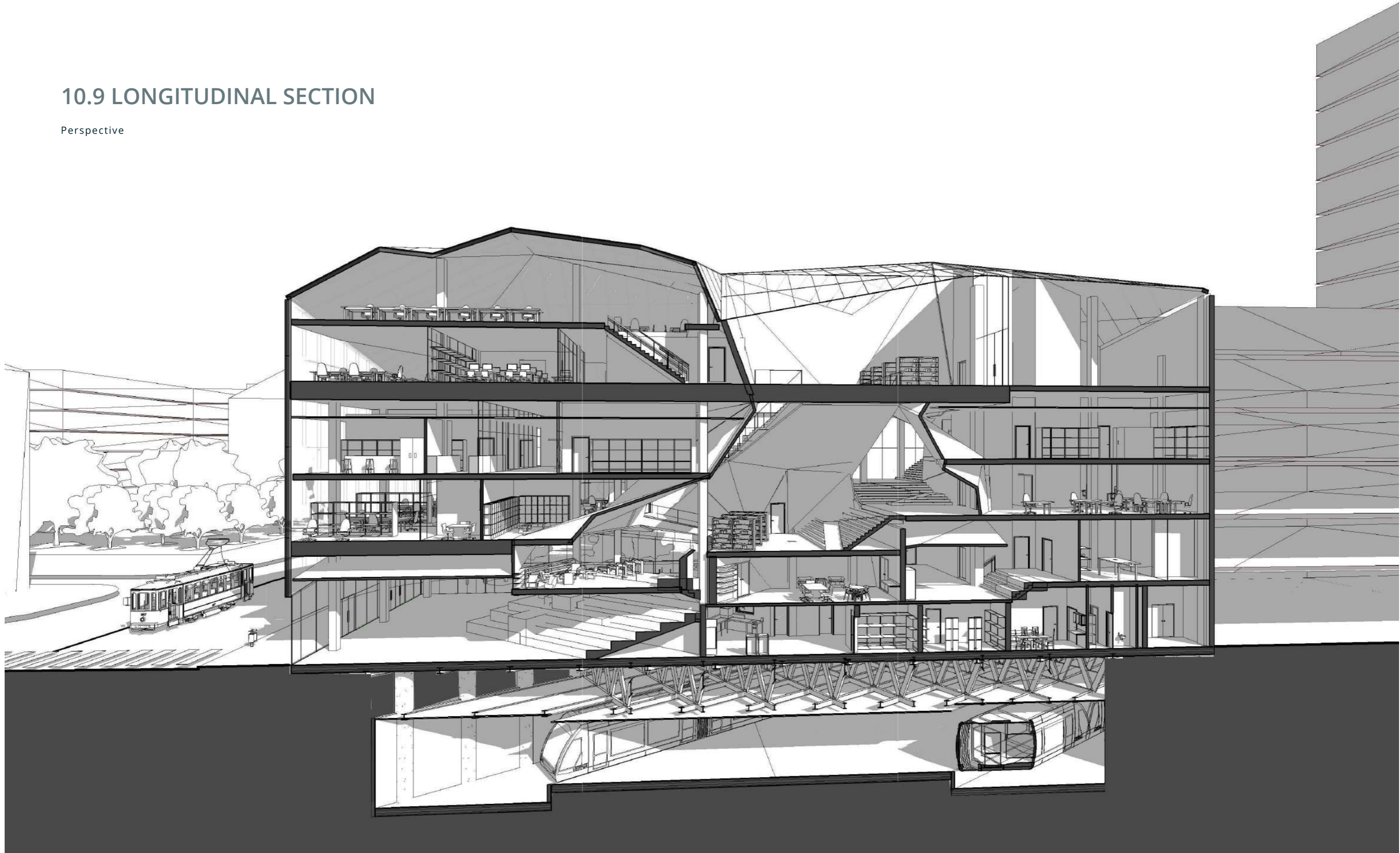
10.9 LONGITUDINAL SECTION

Scale 1:250

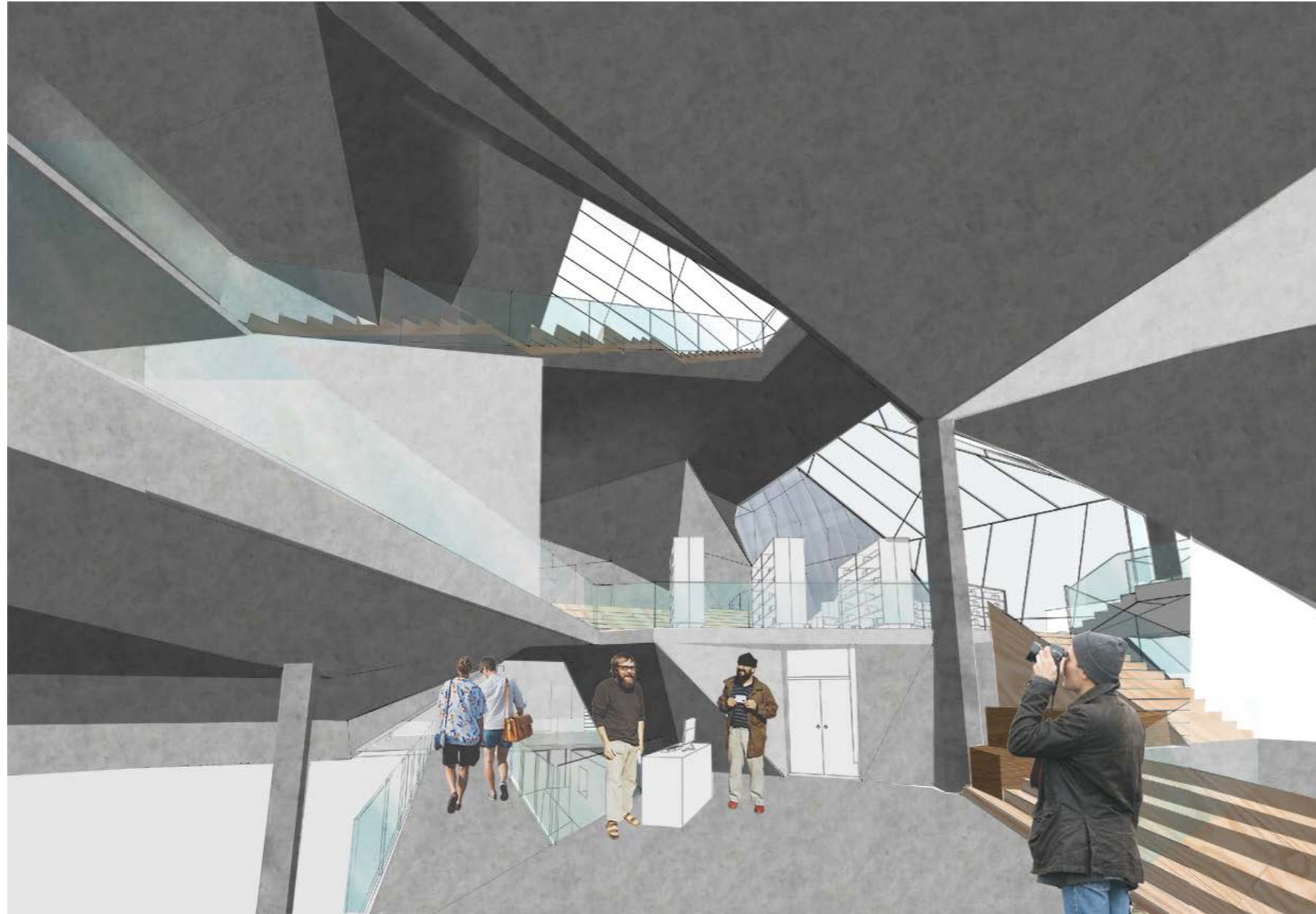


10.9 LONGITUDINAL SECTION

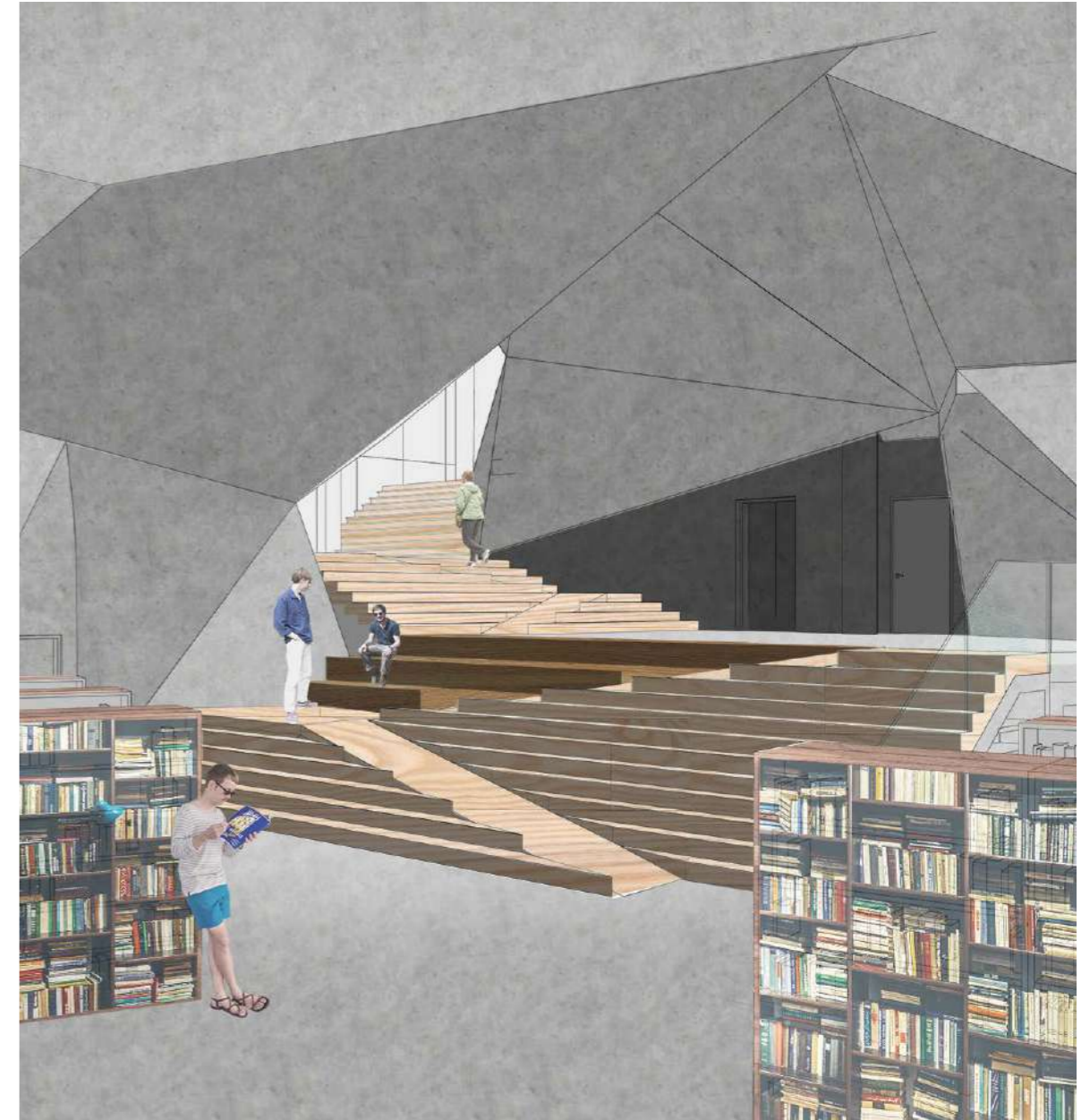
Perspective



10.10 INTERIOR VISUALIZATION



Perspective view - first floor

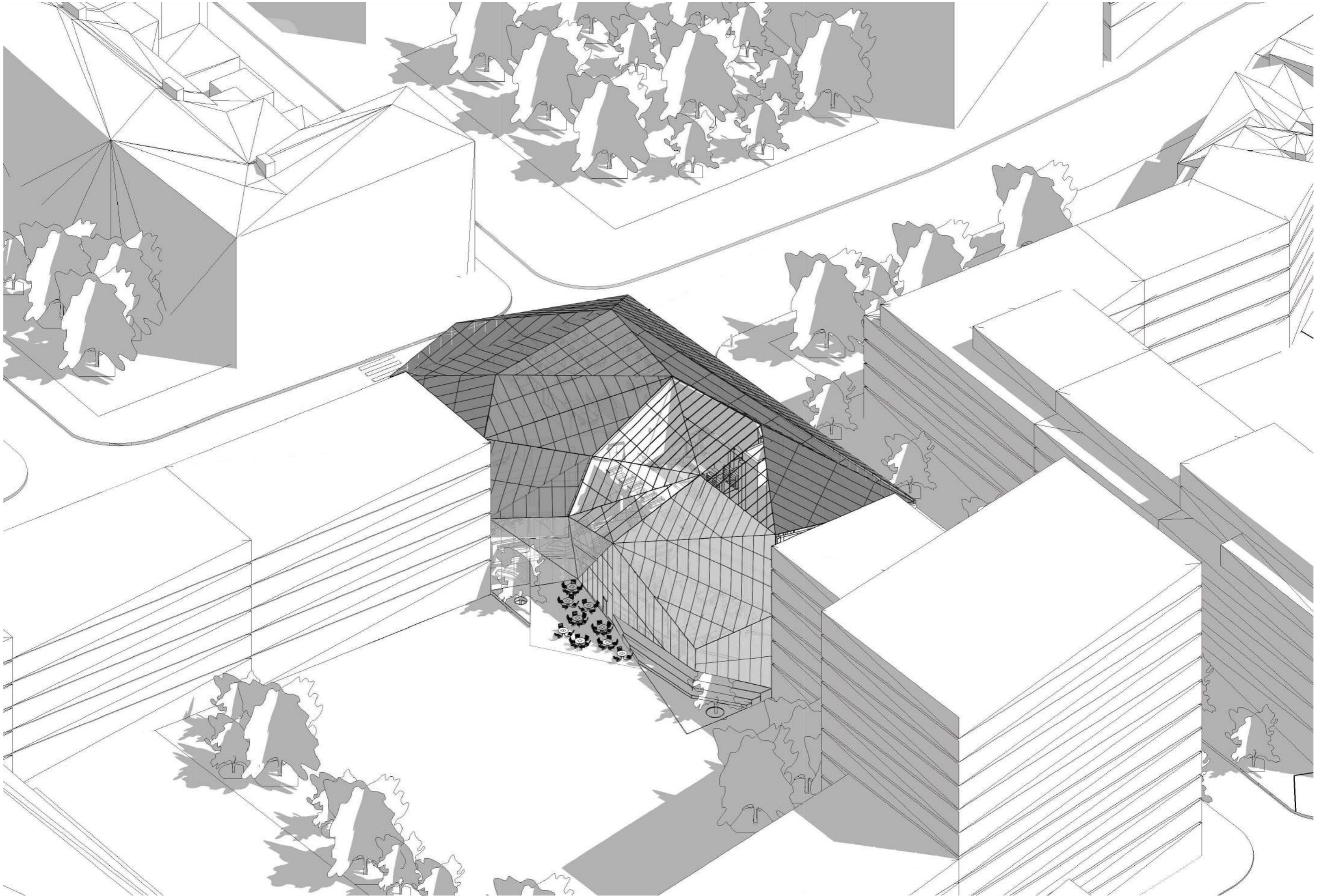


Perspective view - second floor

10.10 INTERIOR VISUALIZATION

Perspective view - third floor





11 TECHNICAL REPORT

18 December 1953 (age 61)
London, England

Cover Report

Identification data

Name: Knowledge incubator
Program: Educational
Location: Prague, Czechia
Client: ARCHIP
Architect: Alex Yeloyeva
Studio: Wertig - Kopecky
Year: 2020

Context & Project

Project site is a part of a approved in September 2019 Master plan for Bubny-Zatory district designed by Muller Reinmann architekten. The site is located inside the new block at the north-east of the intersection of the Rajská and Plynární streets. It is a corner building on the primary north-south axis. On the northern facade building is connected to middle school, on the eastern to the residential. Across Rajska street on the west is planned to be a primary school. Across Plynarni street on the south is located Business Academy building built in 1884.

Project site is located on top of the metro station Nádraží Holešovice and has metro exit incorporated into the design at the south-east corner with stairs and escalators leading to the southern side of the platform.

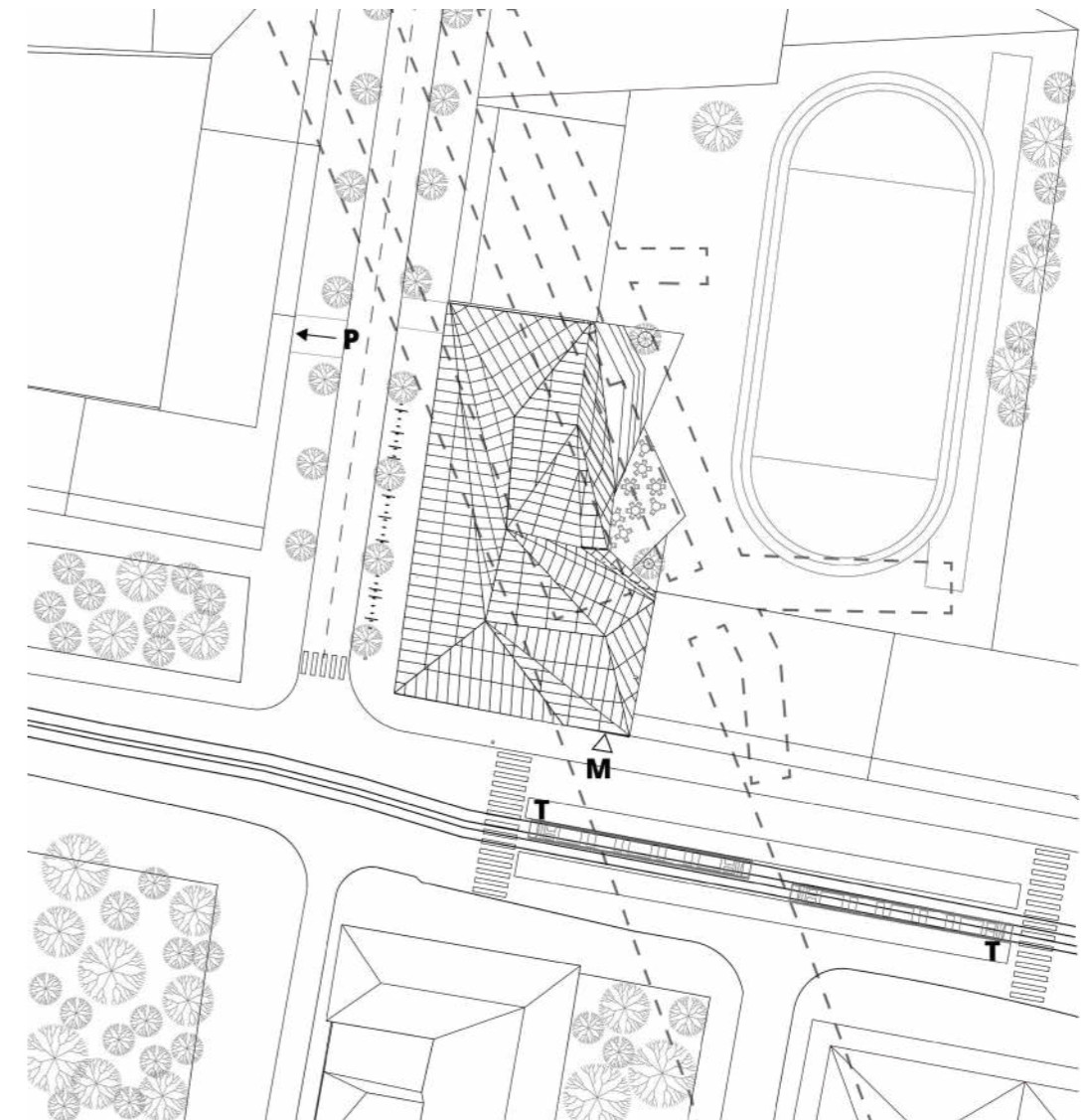
Building is on the side of two street categories [Public Space Design Manuel]. On the west is quite and traffic calm 20m wide Rajska street with two-way movement, bike lane, average sidewalks, trees on both sides and bike/car parking between them. On the south is 32 m wide important traffic - calmed Plynarni street with two-way movement and tram lines. Right by the building Nádraží Holešovice tram stop is located.

As project seats right above the metro tunnels any underground parking wouldn't be possible. For this reason school staff and research center employes will be sharing underground parking with the primary school across the Rajska street. Bike parking is located between trees on the pavement of Rajks stret. Deliveries to the laboratories and kitchen as well as waste pick up will be done using the drive-in at the ground floor on the northern side of the building from the same street.

Building footprint is 1200 m². As has been described in design framework chapter building has 8 major programs, the square meter area for these is (for further details please refer p. 17):

- library - 800 m²
- workshop - 283 m²
- food court & kitchen - 706 m²
- public space - 420 m²
- laboratories & green house- 1218 m²
- students studio - 1878 m²
- technical facilities- 781 m²
- lecture rooms- 260 m²

Main circulation is realized through the staircase combined with terraces atrium / library leading from ground floor entrance to the fourth floor green house.



Scale 1:1000

11.1 STRUCTURE

Substructure

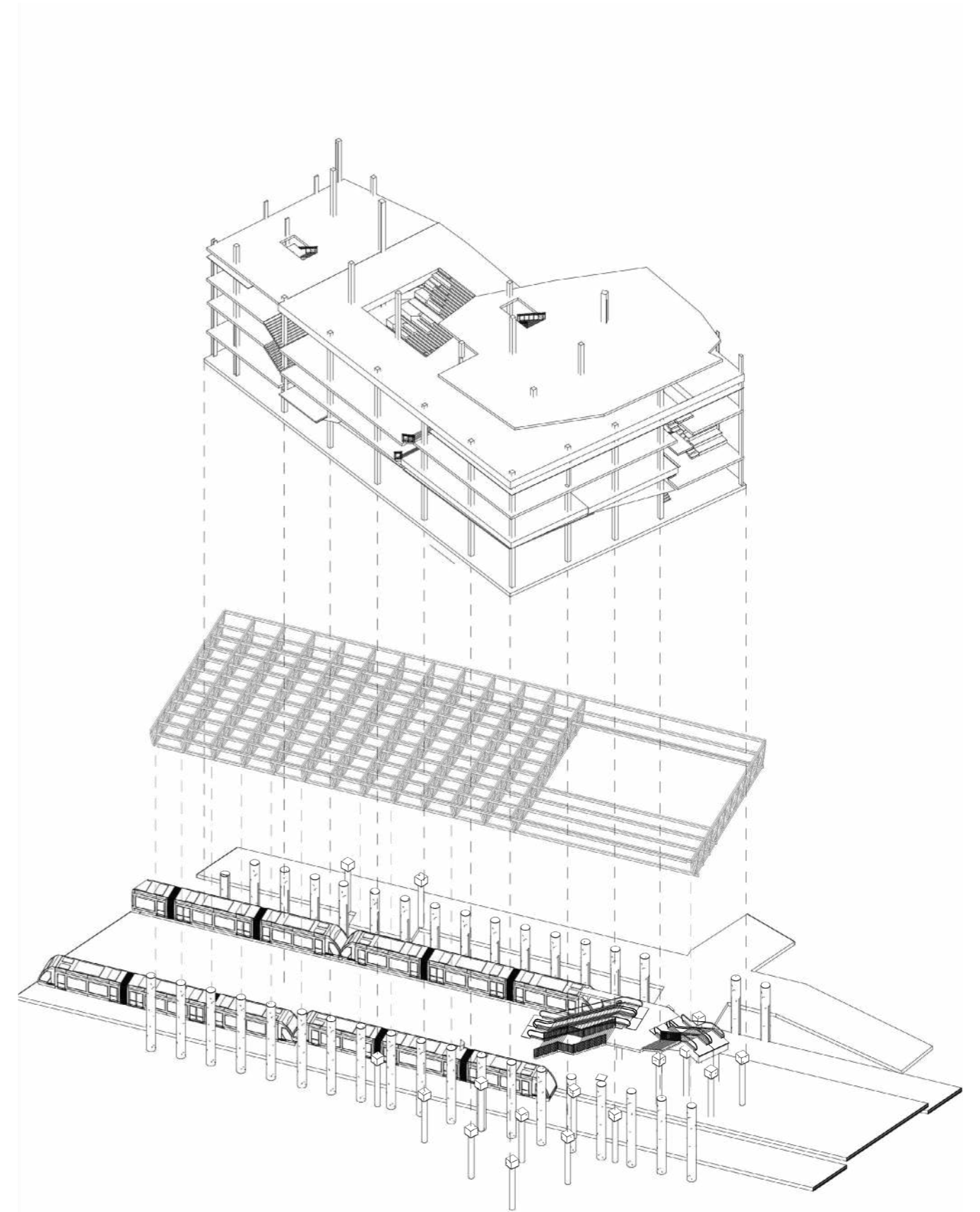
The main difficulty during the design was the presence of metro tunnel below as 75% of the building is standing right above it and metro station is only 7 meters below the ground floor level.

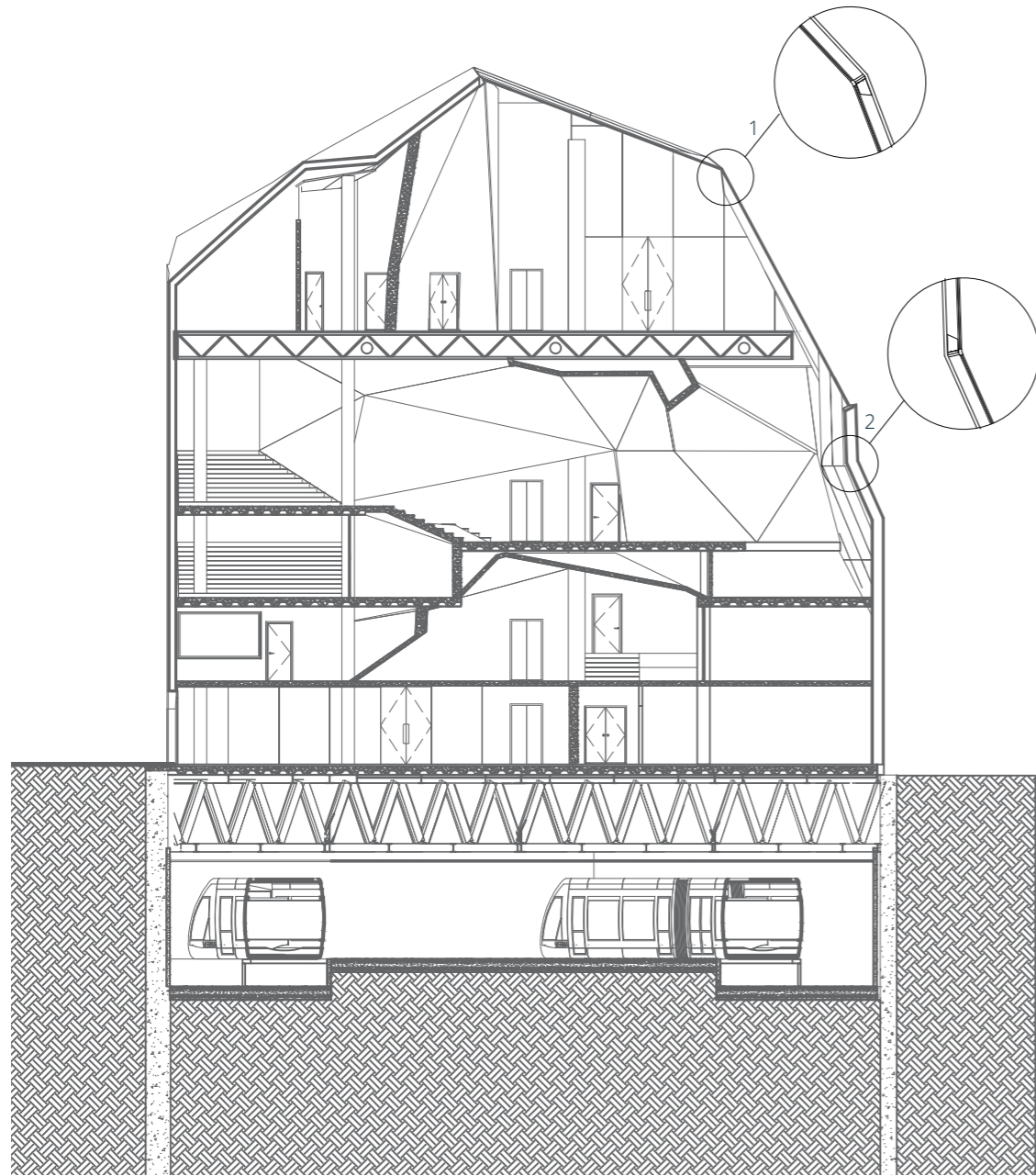
It is assumed that currently above the metro station every 7 meters there are steel trusses to support existing building of the metro and bus station. As the building will be demolished and metro station will go through renovation, the structural proposal for the building is to strengthen metro station trusses by placing between them additional every 7 meters. In this case there will be 2.7 metre high trusses every 3,5 meter spanning over the 22 metre wide tunnel to support the building.

The deep foundation with large diameter piles will be used to transfer the loading to a deeper strata. In addition to the structural support, piles are also used to anchor the structure against uplifting forces and to assist structures in resisting lateral and overturning forces.

Superstructure

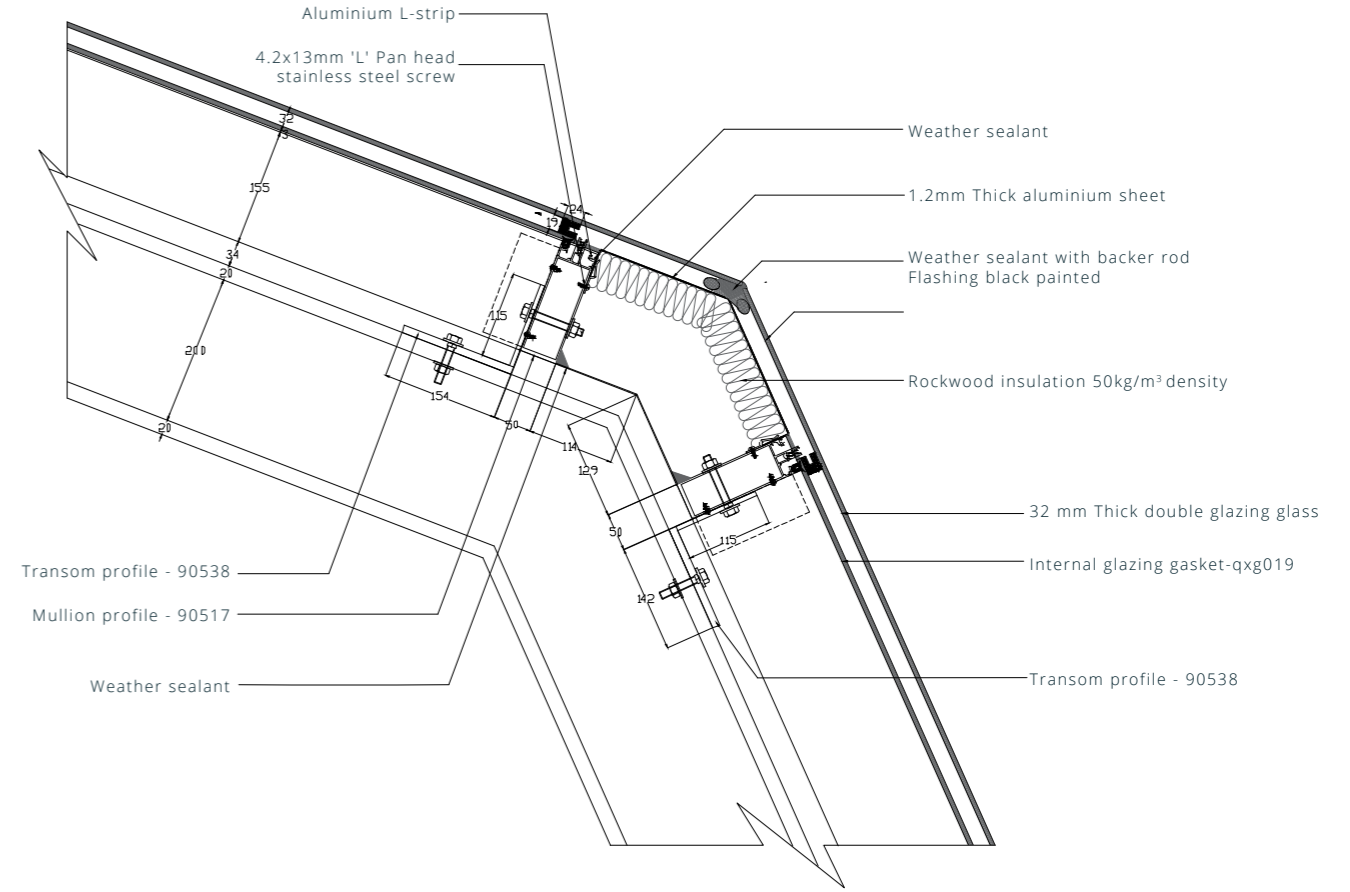
To reduce permanent load of the building steel frame structure will be used. Steel columns will be supporting rib-deck concrete floor (where metal decking is corrugated to increase its stiffness and spanning capability). The cellular decking will serve as acoustic ceiling by filling in perforated cells with glass fiber. Above open spaces (as ground floor entrance and library space as ground floor entrance and library space on the second floor) will be used span system with trusses. For prevention of lateral movement of joists chords horizontal bridging will be used. Open web steel joists will be supported by beams. Some of mechanical services will be incorporated within it. In the laboratory spaces the ceiling will be suspended on one meter allowing additional space for ventilation and other needed services.



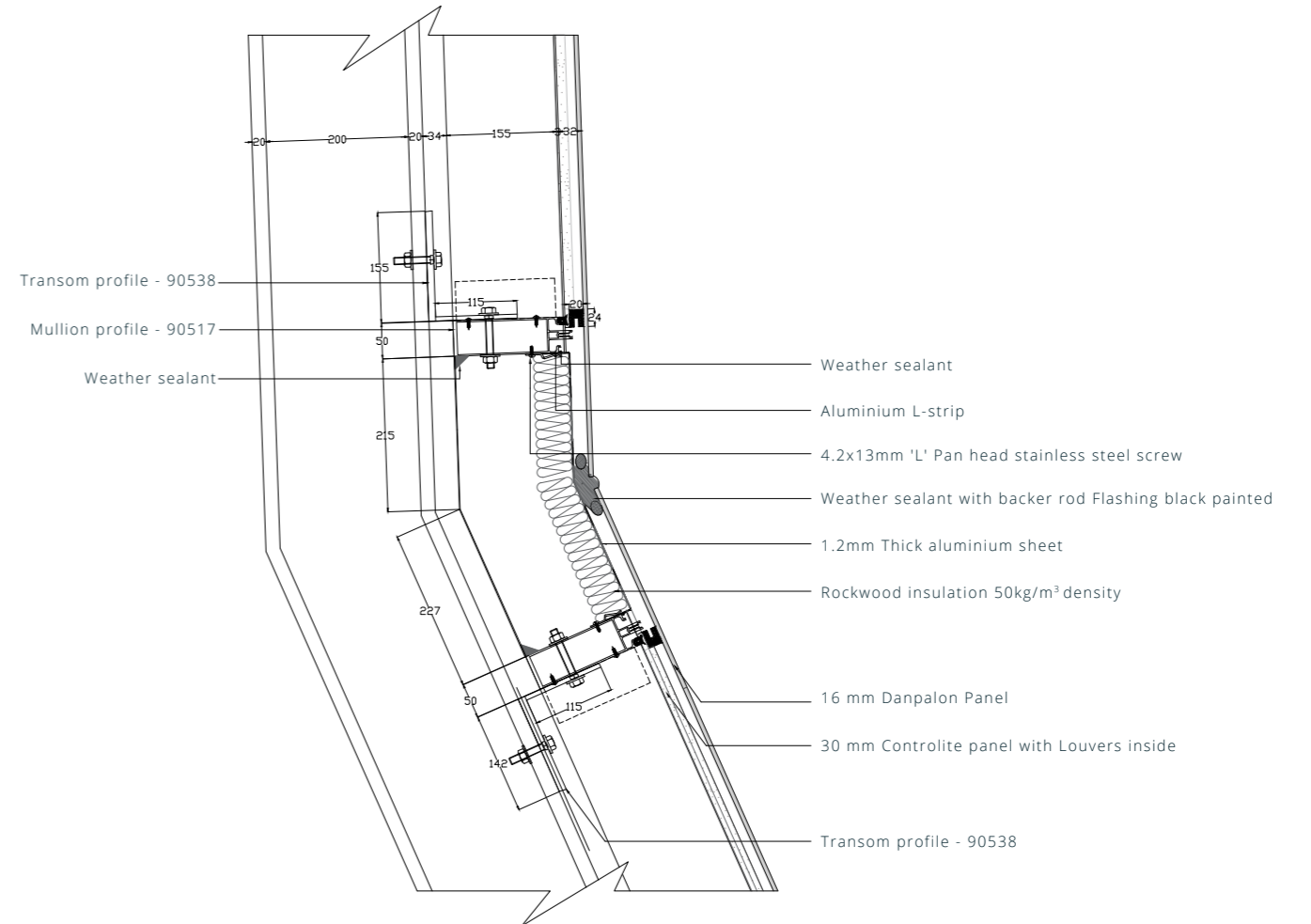


Technical section 1:250

Detail 1 - Glass facade connection - 1:10



Detail 2 - Polycarbonate facade connection - 1:10



11.2 BUILDING TECHNOLOGIES

1
Electricity/Water/Gas

The piping for electricity, water and gas have two systems of travelling; vertically and horizontally. The pipes and cables are guided through the entire building using pre planned shafts that are integrated into the wall and structural system. They are then transported horizontally through the suspended ceilings and drywalls, which are not structural due to a columns system used instead. Due to the sustainable aspect of the building, most of the gas consumption is reduced to a minimum. The hot water supply comes from the municipal water supplies, since a on site variant would be less efficient for such a large scale project.

2
Precipitation management

Part of the aim of this project was to reduce the water consumption in general for black and for grey water. To achieve this, the precipitation downfall is lead from all the roofs to the tank on the ground floor which stores and filters the water captured. This water is then used mainly as black water, but also to water the greenery in the green house. The Tank consists of two parts - a warm and a cold water tank.

3
Waste Management

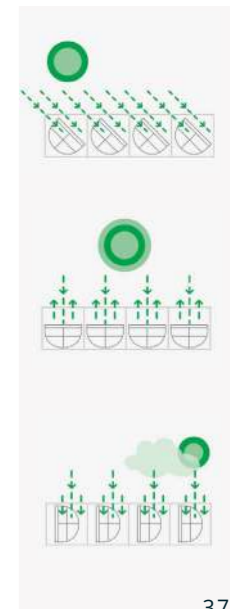
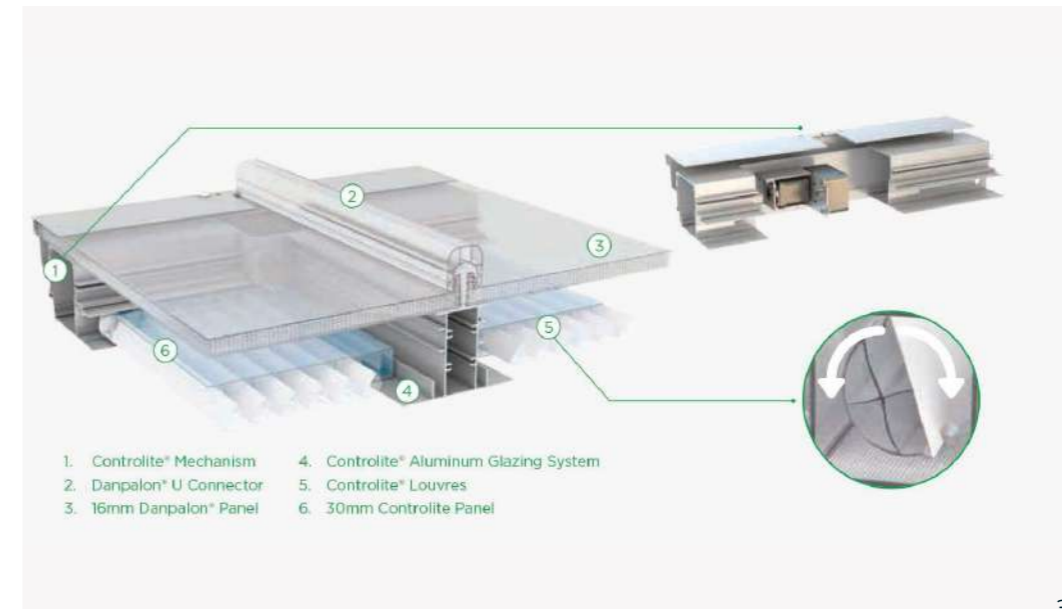
At the north side of the ground floor can be found waste storage which is emptied by the municipal waste agency when full using drive in from the Rajska street. In the green house area for composting of organic material is planned and after it is used as organic fertilizer and soil for plants. Due to the universal recycling area, no area will be polluted by freestanding litter.

4
HVAC

The ventilation is mainly driven by a HVAC system, which is placed under the roofs on the fifth floor. The suspended ceiling is depending on the spaces requirement is introduced so that all the necessary functions of the HVAC systems can be backed in it. The HVAC system is once again powered by the energy supply company.

5
Circulation

Main circulation of the building is managed by the set of big staircases going through the project and intercorporating in itself library and seating places. Nevertheless, 90% of the spaces are accessible to disabled people due to elevators located in the northern and south-eastern parts of the building. Where levels between floor are changing up to 2 m - ramps are present.



36

37

6
Fire safety

The fire safety management is handled by the municipal department of Prague 7 and the fleet. Due to the last floor height of 24 meters, the fire department will still have the possibility to access each floor with their ladders. The fire safety inside the building is ensured by the staircases, regulating the air flow. In addition to that, sprinklers are montages where needed, and fed by the municipal water supply and the water tank in the ground floor.

Egress system was designed in accordance with egress requirement of the model building codes. Building will have two enclosed exit stairways and elevators in a smoke proof shaft for the disabled persons. Both fire escapes at the ground floor will have enclosed protected corridors leading to the street. The distance between them is more than one-half of the diagonal measurement of the building. All of the places in the building have travel distance to the nearest exit below the maximum permitted (76m) for educational facility, measuring from the most remote point in the room. All of the spaces are equipped with mechanical smoke extractors and sprinkler systems, which get activated by the smoke detectors and the placed T30 doors regulate the spread of smoke around the buildings.

7
Facade

The building envelope includes two structural facade - glazed and polycarbonate. The polycarbonates facade covers approximately 75% and as it doesn't have opening a Danpal polycarbonate with Controlite system is used. It adapts to changing light conditions throughout the day for effective control of indoor light, shade and solar heat gain. It significantly reduces energy use from air-conditioning, heating, and artificial lighting. (See images above)

8
Security & Safety

For the security of the building several measures have been introduced. The school facilities above the ground floor can be accessed only through the turnstiles and elevators, both have card access. On the ground floor provided surveillance room for security guard and by the turnstiles receptionist controlling entering people can be found.

For students safety, the access to the laboratories and workshops with dangerous equipment allowed only with supervision of the supervisors.

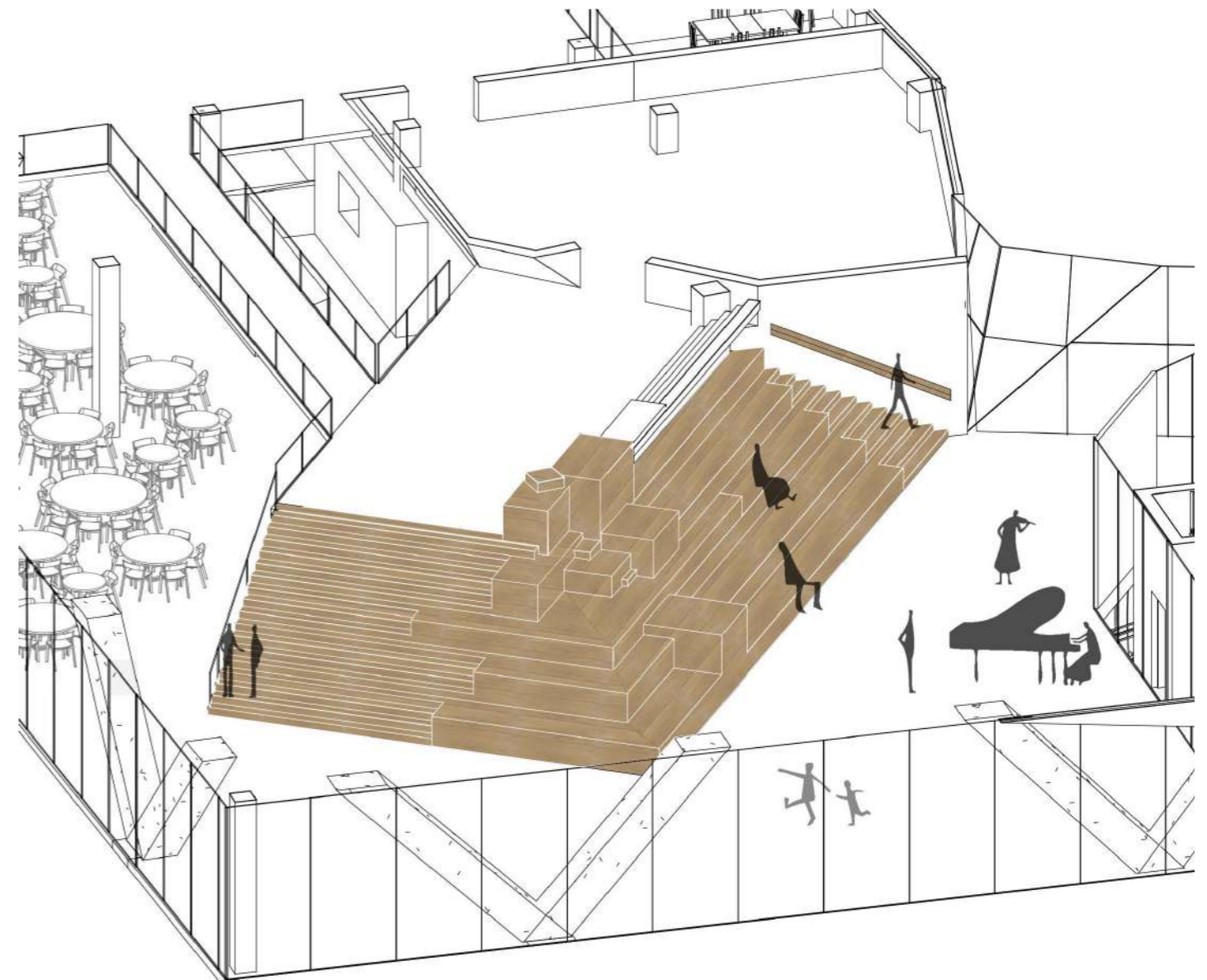
11.3 ARCHITECTURE DETAIL

For the subject of Architecture Detail we were asked to develop detailed drawings of the some part of the building which would be related to the building concept and reflect the atmosphere. The focus in this work was on the esthetic of the object and it doesn't include details needed for the construction of the structure.

For this detail was chosen staircase with the seating at the ground floor of the building. Three drawings were created to explain the details of the element:

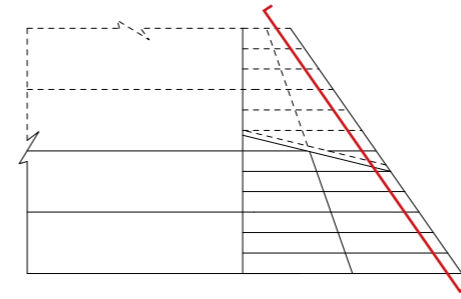
1. Section AA' with the detail of the railing
2. Section BB' through the staircases on the side of the seating
3. Section CC' through the public seating

All made from reinforced concrete structure with timber finish which attached with the glue. The uniting element is the atmosphere lightening added to the bottom of the riser in the seatings and staircase, and to the railing which implemented into the wall. Drawing show how LED light strip fit and the important visible joints. After the drawings material and atmosphere references can be found.

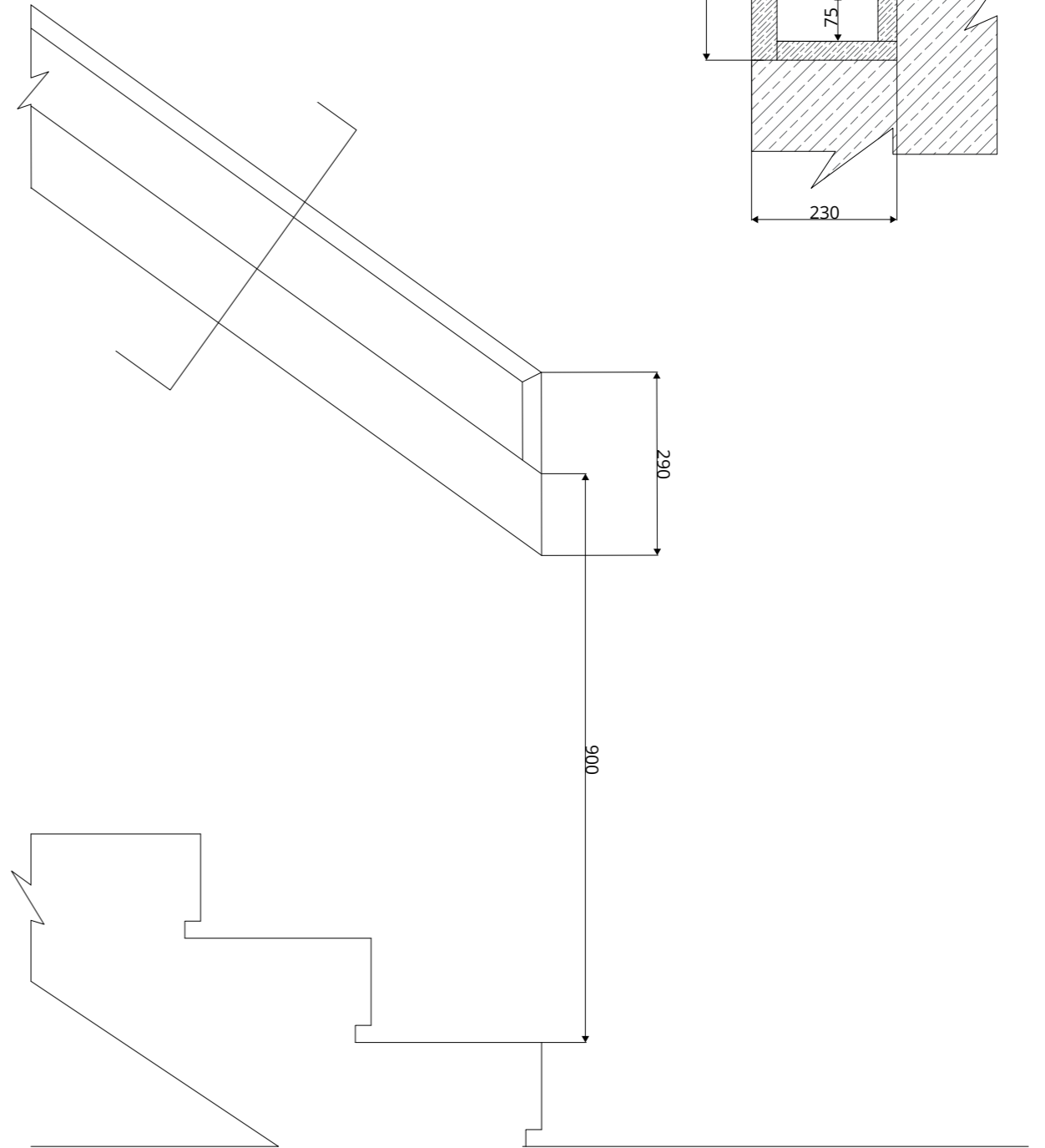
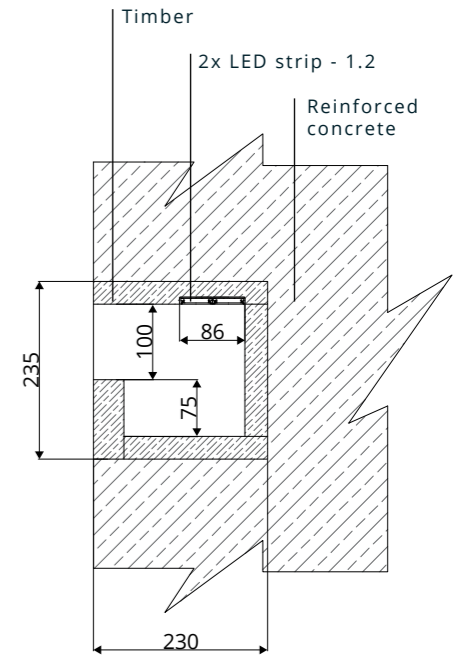




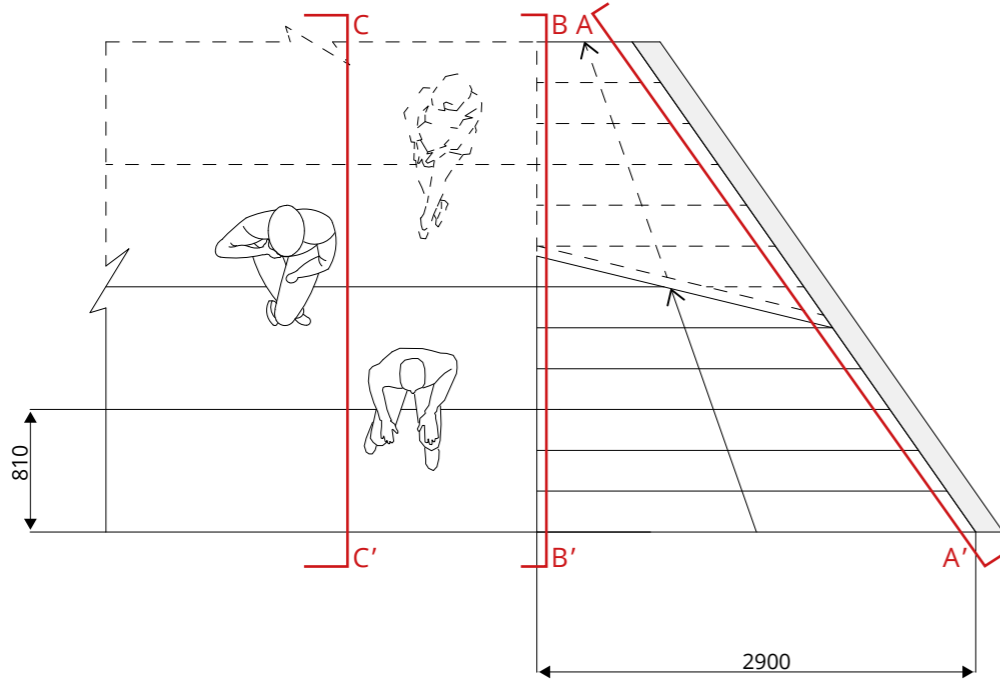
Ground floor plan 1:500



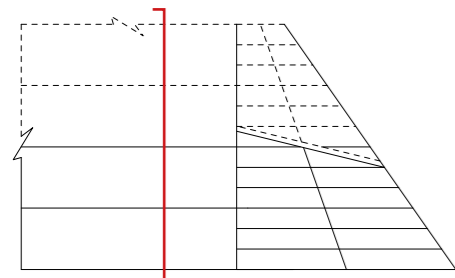
Plan 1:100



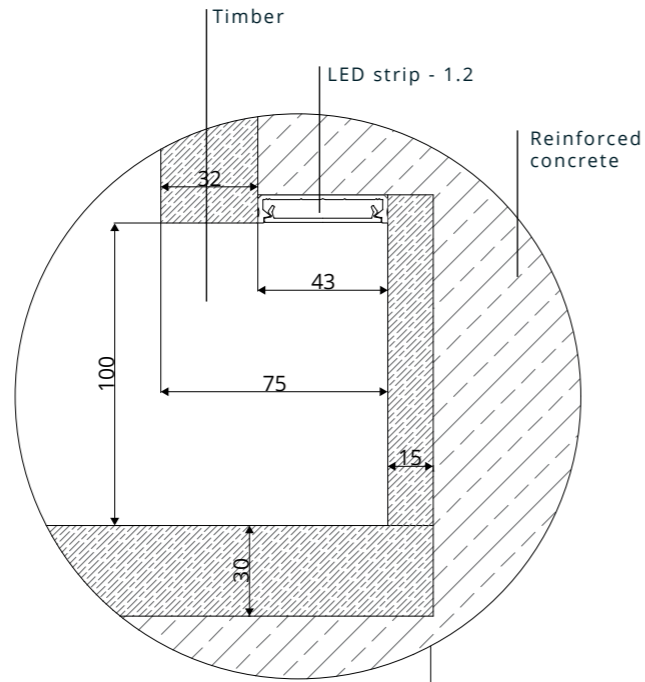
Section AA' 1:10



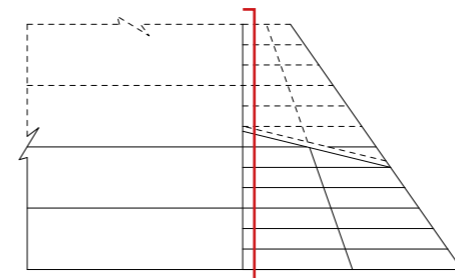
Plan 1:50



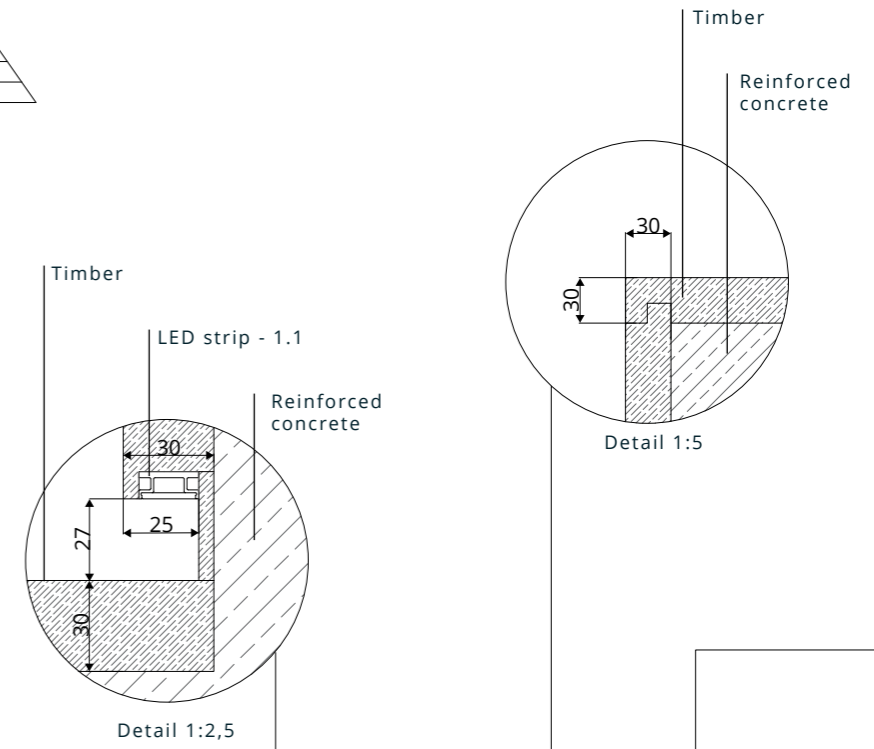
Plan 1:100



Detail 1:2,5

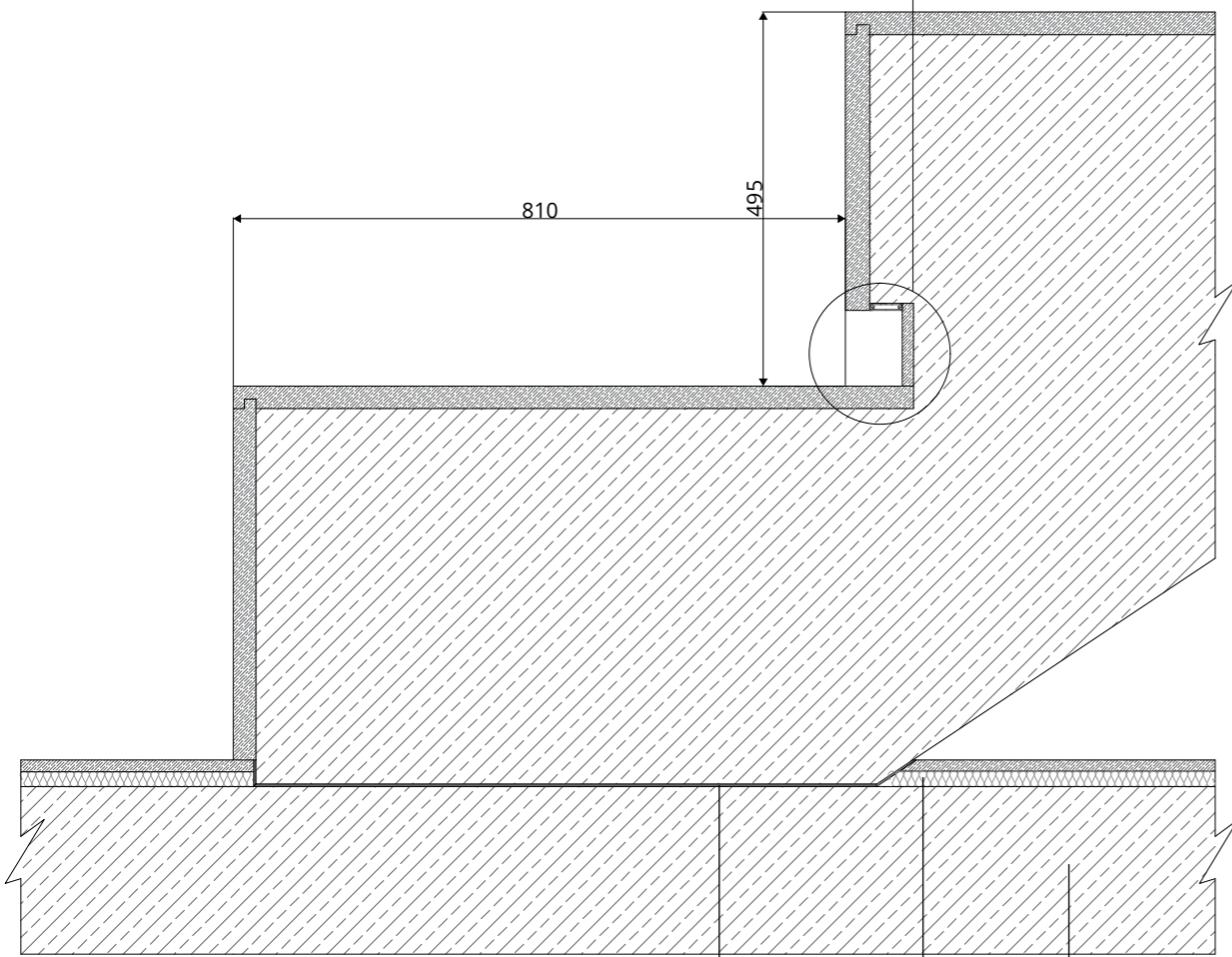


Plan 1:100



Detail 1:2,5

Detail 1:5

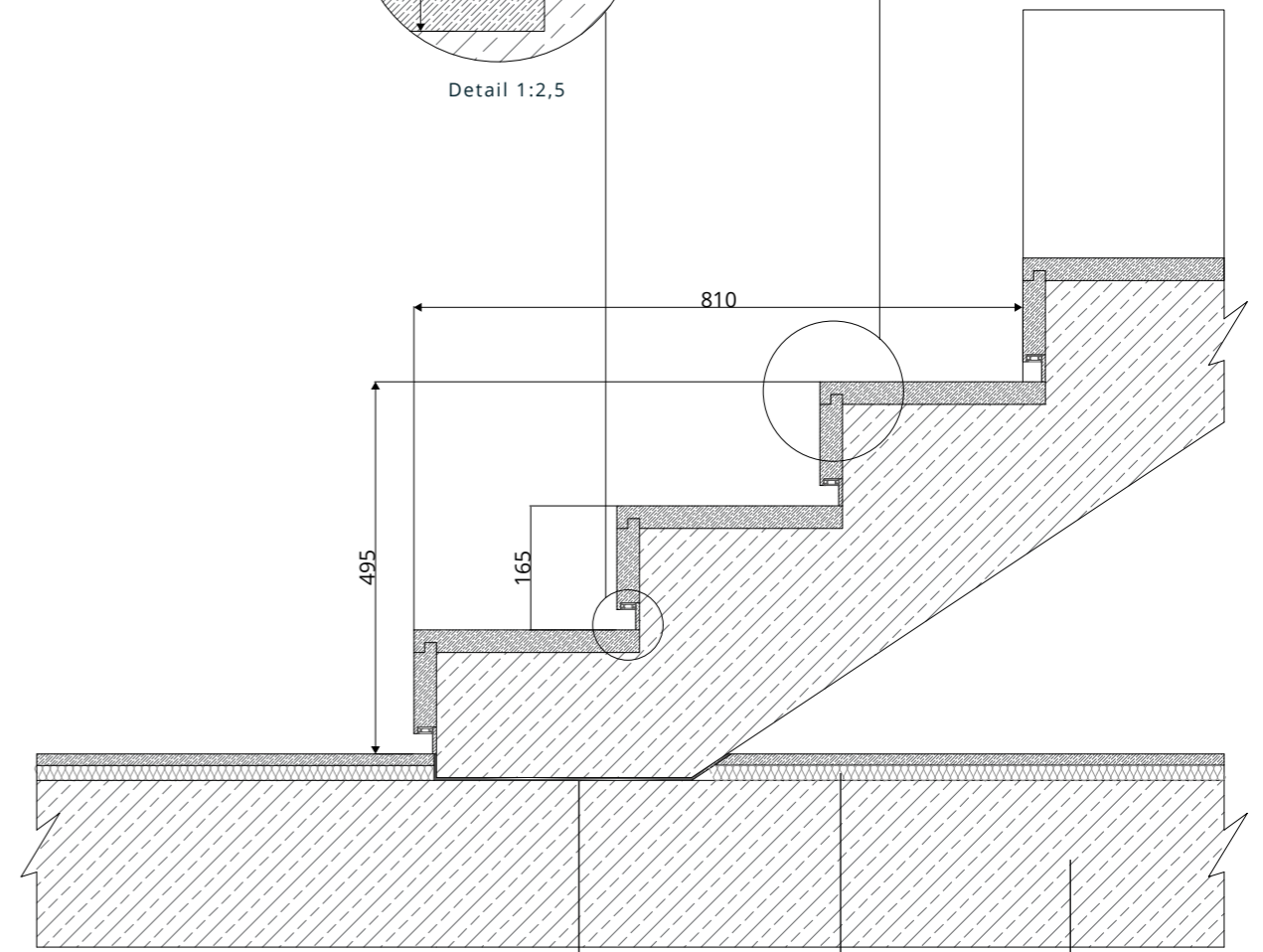


Section BB' 1:10

Sound insulation

Thermal insulation

Reinforced concrete

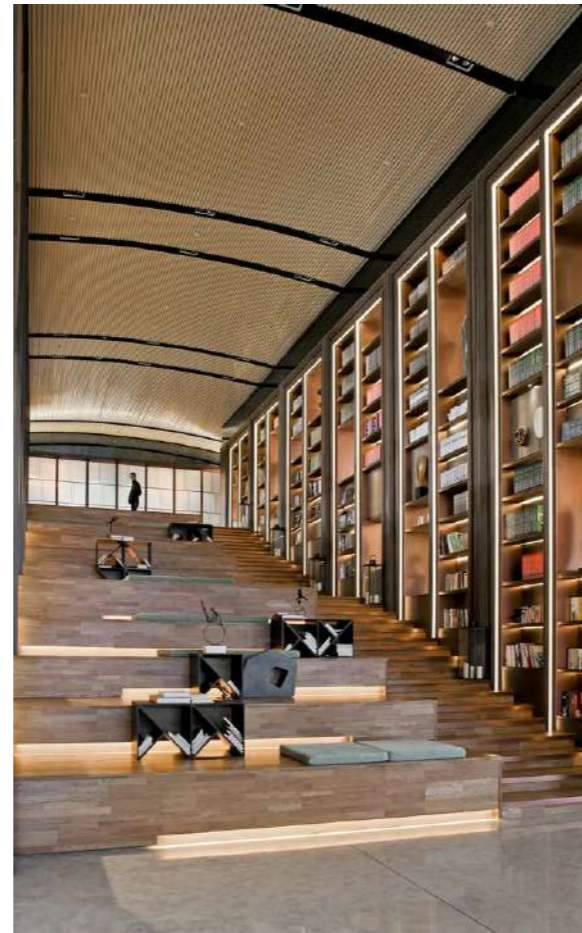


Section CC' 1:10

Sound insulation

Thermal insulation

Reinforced concrete



39
Example of atmosphere of railing

40
Example of the seating steps lightning

41
Example of the walking steps lightning

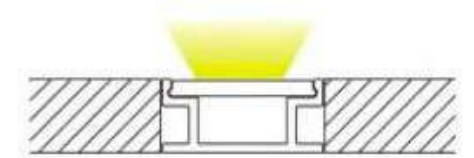
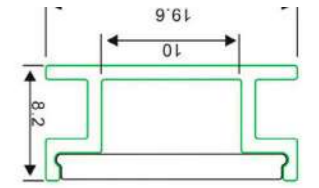


LED light strip

As can be seen from the drawing for the atmosphere lightening will be used LED strips of 2 thicknesses. First one is 17 mm wide and will be implemented at the bottom of the rises in the walking stairs. The aluminium profile of this strip will come in different length and will have to be cut on site as staircase is changing its getting narrower upwards. Another one is 43 mm wide and will be used in the railing and at the bottom of the seating staircase's riser. While in the small stairs it is used continuously, at the bigger ones it is on each level, but changes its location by the horizontal axis.

Wide LED strip uses three parallel located LED strips what gives a stronger lighting effect . It would have milky translucent diffuser (cover) which makes lightening more gentle. The profile is sold in standard lengths of 1000 mm. On the right is shown assembly scheme for the elements of the lighting system using SOLIS profile and (1) a WIDE cover, (2) three LED strips, (3) end cap without hole (3a) end cap with hole.

43 LED strip - 1.1 - Flat RGB LED Strip Aluminium



44 LED strip - 1.2 - SOLIS Aluminium 43mm Wide Architectural Profile



12 REFERENCES

No.	IMAGE NAME	PAGE	SOURCE
01	Collage	05	WISE
02	Project_Based Learning Diagram	10	MagnifyLearning
03	Photo	11	Škoda School
04	Wicked Soap Company advertisement poster	11	Wicked Soap Company
05	FIDS Diagram with information from Design for change	11	FIDS
06	Multiple Intelligences — Howard Gardner	11	WISE
07	Scale free school concept diagram	12-13	00 Architects
08	Satellite image of Holešovice	22	Google Earth
09	Europe	24	Google Images
10	Czech Republic	24	Google Images
11	Prague districts	24	Google Images
12	Bird's eye view of Holešovice	24-25	Google Earth
13	Satellite view of Holešovice	24-25	Google Earth
14	Condition 5 years ago	28	Muller Reinmann architekten
15	Current condition	28-29	Muller Reinmann architekten
16	Winning proposal	29	Muller Reinmann architekten
17	Morphology	30-31	Prague geoportal
18	Existing transport situation	32	Sherin Sunny Varikkatt
19	Master plan Holešovice-Bubny-Zatory	34	Muller Reinmann architekten
20	Activities in Prague 7	35	Google Images
21	Master plan visualization from South-West	40	Muller Reinmann architekten
22	Master plan visualization from North-West	40	Muller Reinmann architekten
23	Master plan with highlighted project site	41	Muller Reinmann architekten
24	Bird eye view of metro station Nadrazi Holešovice	42	Google Images
25	Satellite view of the project site	43	Google Earth
26	Plans of case studies	48	Archdaily
	Extension of Jara Cimrman School	50-51	Archdaily
	Kamyaran School-to-City Facility	52-53	Archdaily
	School Complex and multipurpose hall	54-55	Archdaily
	CMR Eky school	56-57	Archdaily
	Brighton College School of Science and Sport	58-59	Archdaily
	Khan Lab School	60-61	Kurani Architects
27	BBC Scotland headquarters - David Chipperfield Architects	72	Archdaily
28	Musashino Art University Museum & Library / Sou Fujimoto	72	Archdaily
29	WE Architecture Pixelated Pop-Up Architecture Office	72	Archdaily
30	Studio Malmö - SHL	72	Archdaily
31	LiYuan Library / Li Xiaodong Atelier	72	e-Architect
32	Allwetterzoo Münster - Zoo	73	Google Images
33	Final Wooden House / Sou Fujimoto Architects	73	Archdaily
34	Indoor Slide	73	Google Images
35	LiYuan Library / Li Xiaodong Atelier	73	e-Architect
36	HF & VUC fyn education center for adaptive learning/ CEBRA	73	designboom
37	Controlite facade component diagram	129	Danpal
38	Light optimization with Controlite solution diagram	129	Danpal
39	Example of atmosphere of railing	136	Google Images
40	Example of the seating steps lightening	136	Google Images
41	Example of the walking steps lightning	136	Archdaily
42	LED strip - 1.1 - Flat RGB LED Strip Aluminium	137	MKshop
43	LED strip - 1.2 - SOLIS Aluminium 43mm Wide Architectural Profile	137	Ledbe

BIBLIOGRAPHY

1. Teaching hours - OECD Data
2. Work at School / Learn at Work, WISE, Medium, Jun 2019
3. The Wicked Soap Company, <https://www.hightechhigh.org/hthma/project/wicked-soap-company/>
4. ŠKODA AUTO Vocational School, <https://www.skoda-storyboard.com/en/press-releases/skoda-auto-vocational-school-offers-exemplary-training-programmes-for-up-and-coming-young-talent/>
5. Design for Change <https://www.dfcworld.com/SITE>
6. Public rentals of school premises Praha 7, <https://www.praha7.cz/verejne-pronajmy-skolnich-prostor/>
7. "Population on 1 January by five-year age group, sex and metropolitan regions". Eurostat. Retrieved 21 February 2020.
8. "Holešovice Bubny – Zátory", <http://www.iprpraha.cz/bubny>
9. "From today, citizens can influence the future shape of the new Bubny-Zátory district" 15 August 2019, <http://www.iprpraha.cz/bubnyverejneprojednani>
10. Holešovice Bubny-Zátory: New district in brownfield, 30 Sep 2019, <https://www.asb-portal.cz/architektura/urbanismus/holesovice-bubny-zatory-nova-ctvrt-na-brownfieldu>
11. "What will the Holešovice Bubny-Zátory area look like? Prague commissioned a study" 17 Nov 2016, <https://www.blesk.cz/clanek/regiony-praha-praha-zpravy/431029/jak-bude-vypadat-oblast-holesovice-bubny-zatory-praha-si-nechava-vypracovat-studii.html>
12. <http://www.architecture00.net/news/840>
13. <https://www.geoportalpraha.cz/>
14. Prague Public Space Design Manual - IPR

12 CONCLUSION

The goal of this project was to create a space where education meets innovation and people meeting each other moving both forward, and by the creation of the space which was presented in this portfolio I believe this could be possible.

I have decided exactly on this program as it is where I see myself working in future and through research and design of the topic, I have learned a lot. For me, the main output from this work can be that there are no limits to how education can look or work, and that our responsibility as architects is to move it forward through thorough research, innovation and design.

