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DIPLOMA PROJECT

PRIMARY SCHOOL IN VLASTINA

FA CTU | SS 2023/2024  
Studio - STEMPEL BENES  
SAVE KIROVA

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Master's thesis

Faculty of Architecture  
Czech Technical University in Prague

SS 2023/2024

Autor  
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Assistant professor: Ing. arch. TOMÁŠ KLANC

## PROJECT BRIEF

The Primary School in Vlastina, nestled in the heart of one of Europe's most culturally vibrant cities, stands poised for transformation. With a commitment to fostering academic brilliance, holistic development, and cultural enrichment, our endeavor embarks on the journey of reconstructing this esteemed institution. The essence of this project lies in recognizing the profound impact of learning environments on young mind and to seamlessly blend modern amenities with timeless educational philosophies, fostering an environment where students thrive academically, socially, and emotionally.

Moreover, the reconstruction presents an opportunity to embrace cultural diversity and celebrate the unique heritage of Prague. By infusing elements of Czech culture into the fabric of the school, we aim to cultivate a sense of belonging and foster cross-cultural understanding among our diverse student body.

Reconstructing a school such as the Prague British International School (PBIS) could offer several potential benefits:

**Modernization of Facilities:** Reconstruction would allow for the modernization of school facilities, including classrooms, laboratories, libraries, and recreational areas. Upgrading these facilities can enhance the learning environment and provide students with access to state-of-the-art resources.

**Improved Safety and Security:** Reconstruction presents an opportunity to enhance safety and security measures within the school premises. This may include installing advanced security systems, implementing safety protocols, and ensuring compliance with building codes and regulations.

**Enhanced Learning Spaces:** Reconstructing the school provides the chance to design and create optimal learning spaces tailored to modern educational practices. This could involve flexible classroom layouts, collaborative areas, and technology integration to support innovative teaching and learning methods.

**Energy Efficiency and Sustainability:** A reconstructed school can incorporate energy-efficient features and sustainable building practices, such as solar panels, efficient heating and cooling systems, and environmentally friendly materials. This not only reduces operating costs but also promotes environmental responsibility and sustainability education.

**Increased Capacity and Accessibility:** Reconstruction may involve expanding the school's capacity to accommodate more students or improving accessibility for students with disabilities. This ensures that the school can serve a broader community and provide equitable access to education for all students.

**Enhanced Community Engagement:** The process of reconstruction can involve stakeholders, including parents, students, teachers, and the local community. Engaging these groups in the planning and design process fosters a sense of ownership and pride in the school, leading to stronger community relationships and support.

**Competitive Advantage:** A reconstructed school with modern facilities and resources can enhance its reputation and attractiveness to prospective students and families. This competitive advantage may lead to increased enrollment, retention of qualified staff, and overall academic excellence.

Overall, reconstruction presents an opportunity to create a conducive and inspiring learning environment that meets the needs of students, staff, and the wider community, ensuring the long-term success and sustainability of the school.

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## INTRODUCTION

## EDUCATION SYSTEM IN CZECH REPUBLIC

Elementary school is a crucial stage in a child's education, providing the foundational building blocks for their academic journey. The ages of children in elementary school can vary slightly depending on the country or educational system.

In the Czech Republic, elementary education typically spans a period of nine years, beginning at the age of six or seven and concluding around the age of fifteen or sixteen. This educational stage is commonly divided into two main cycles: the lower and upper elementary levels.

### Lower Elementary School (1st to 5th Grade):

Age Range: Approximately 6 to 11 years old.

Duration: Five years.

Focus: During these initial years, students are introduced to fundamental subjects such as mathematics, Czech language and literature, science, social studies, arts, and physical education. Emphasis is placed on developing basic literacy and numeracy skills, as well as fostering social and emotional growth.

### Upper Elementary School (6th to 9th Grade):

Age Range: Approximately 12 to 15 years old.

Duration: Four years.

Focus: In the upper elementary level, students build upon the foundational knowledge acquired in the lower grades. They delve deeper into subjects like mathematics, sciences (including biology, chemistry, and physics), history, geography, and foreign languages (often English or German). Additionally, there is a continued emphasis on developing critical thinking skills, problem-solving abilities, and preparing for further education.

Overall, the elementary education system in the Czech Republic aims to provide a comprehensive learning experience that not only equips students with academic knowledge but also fosters personal and social development. It serves as a crucial foundation for their future academic pursuits and prepares them for the challenges of higher education or vocational training.

## SPACE REQUIREMENTS

Nowadays, it is often considered normal for offices to be open plan. This sometimes influences school architecture.

The two have similar requirements regarding size of room lighting, ventilation, acoustics, floor and ceiling finishes furniture, and colour.

The space requirements for schools can vary depending on factors such as the number of students, grade levels served, educational programs offered, and local regulations. However, certain standards and guidelines exist to ensure that schools provide adequate facilities to support teaching and learning. Here are some common space requirements for different areas within a school:

General-purpose teaching area includes standard classrooms, supplementary classrooms, extra-large classrooms, rooms for special courses, rooms for teaching languages and social studies, language labs, rooms for teaching material, maps and other ancillary rooms.

Space requirements: classroom for traditional teaching 2.00 m<sup>2</sup>/pupil; for teaching in sets 3.00 m<sup>2</sup>/pupil, for open plan teaching 4.50 m<sup>2</sup>/place including ancillary areas needed for each subject.

Standard room shape: rectangular or square (12 × 20, 12 × 16, 12 × 12, 12 × 10); with a max. room depth of 7.20 m it is possible to have windows on one side only.

Floor areas are: traditional classroom, 1.80-2.00 m<sup>2</sup>/pupil; open plan 3.00-5.00 m<sup>2</sup>/pupil. The clear height should be 2.70-3.40 m.

Language labs should be within or directly related to the general-purpose teaching area, and close to media centre and library. Approximately 30 language lab. places per 1000 pupils will be needed. The size of LT (listen/talk) and LSR (listen/talk/record) labs is approx.

80 m<sup>2</sup>: booths 1x2m, number of places/lab. 24-30, i.e.

48-60 m<sup>2</sup>, plus ancillary spaces (e.g. studio, recording room, archive for teachers' and pupils' tapes). Artificially-lit internal language labs with an environmental control system are also possible

## IMPORTANCE OF SCHOOL FACILITIES IN EDUCATION

When choosing a school for their children, parents should consider the facilities provided by each school in order to select the best school for their children's development. The facilities of a school impact overall learning process as well as the mental and physical growth of the students. These also affect the academic performance of the student to some extent. So, parents must consider the school's facilities.

Basically, facilities offered by a school affect the health, behavior, engagement, learning, and growth of the students. The physical and emotional health of students and teachers also depends on the facilities they are getting in school. So, every school should be equipped with proper facilities for the students and teachers, such that an environment conducive to learning is created.

Six basic facilities that every school should provide to the students are:

### 1. Acoustics And Noise

A classroom should be a quiet place where the students can have mental satisfaction, peace and are able to concentrate without any outer distractions. Noisy classrooms have negative effects on the learning of the students. Students get distracted and can never perform satisfactorily in a noisy environment.

### 2. Ventilation And Air Quality

In schools, maintaining proper ventilation in each classroom is imperative. Students suffering from respiratory conditions find it hard to stay in the classrooms for long. On top of that, inadequate ventilation can cause discomfort to the student thereby hindering the learning process. The students are unable to focus in such classroom.

Bacteria, viruses and many other pathogens breed at places where there is improper air passage. Thus, it impacts the health of the students. So, in order to provide top-notch quality of education to the students, it is equally important to provide healthy environment with proper ventilation.

### 3. Lighting

According to a study, students that receive maximum exposure to natural daylight in the classroom, grab the classroom learnings in a much better way. Natural light boosts the morale of the students as well as teachers thereby resulting in good quality of education. So, schools should have access to natural light and use less amount of artificial light.

### 4. Temperature Control

The temperature at which students learn affects their engagement levels and the overall outcome. If students feel too hot or too cold in the classrooms, it results in low concentration. Proper temperature management is crucial in order to enable the students to focus on classroom learnings without worrying about weather conditions.

### 5. Space And Size Of Classrooms

Overcrowded classrooms lead to minimum student engagement and improper learning. Teachers also find it uncomfortable to handle a class that is overcrowded. They usually fail to focus on every student when classrooms are overcrowded. So, the number of students in the classroom should be moderate. The classrooms should be spacious in order to provide adequate space for the students to study and for the teachers to give demonstrations.

### 6. Accessible Infrastructure

Accessible facilities play a vital role in creating an inclusive and barrier-free environment for all students, regardless of their physical abilities. In recent years, there has been a growing recognition of the importance of designing schools with inclusive features that accommodate diverse needs and promote equal opportunities for learning.

One key aspect of accessible infrastructure is the incorporation of inclusive design principles. Inclusive design goes beyond meeting minimum accessibility standards; it aims to create environments that are usable by everyone, irrespective of their age, size, or ability. By adopting inclusive design principles in school facilities, educational institutions

In conclusion, the importance of school facilities in the realm of education cannot be overstated. School facilities play a multi-faceted role in shaping the learning experience, safety, and inclusivity within educational institutions. The optimal design and equipping of these facilities create an environment conducive to academic growth, creativity, physical well-being, and community engagement.

Enhancing the learning environment through aesthetics, comfort, and technology integration positively impacts students' engagement and cognitive function. Aesthetic appeal not only beautifies spaces but also stimulates motivation and interest in learning. Comfortable and well-designed areas contribute to students' overall well-being, aiding in concentration and focus during lessons. Technology integration empowers educators to adopt innovative teaching methods, making learning more engaging and accessible.

Ensuring safety and security is paramount in educational institutions. Comprehensive emergency preparedness plans and surveillance systems create a secure environment, instilling confidence in students and staff. Community engagement and inclusivity are achieved through multipurpose community spaces and accessible infrastructure. These spaces serve as gathering points, encouraging interaction and collaboration among diverse individuals.

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## REFERENCES

# 1. Jacques Chirac School & Gymnasium / BPA ARCHITECTURE

Architects: BPA Architecture

Area: 5045 m<sup>2</sup>

Year: 2023

Location: Castelnau-Le-Lez, France



The ambition is to create an educational building rooted in its environment, comfortable, and pleasant, and that fully integrates the environmental preoccupations set in the brief. Accessible to all, it will provide a generous space to teach and a powerful tool for attentive and inventive pedagogy.

The project is drawn up from the geometry of the site in order to offer a compact and low-rise building that integrates perfectly into its environment.

The basement of the building matches the boundaries of the site in order to form a protective envelope that sanctifies the internal spaces of the school. Blending the totality of the programs it bounds them easily and comfortably, allowing its center to contain the generous outdoor courts that ensure a kind and convenient visibility as well as appropriate sun exposure, freshness, and sun shade.

Therefore, the project resumes the concept of microclimatic envelope applied to the characteristics of the Mediterranean climate: an efficient concept that preserves freshness. The technical and constructive solutions that have been developed were intended to optimize the financial envelope and reduce maintenance costs.



## 2. The Lawrenceville School Tsai Commons and Field House

Architects: Sasaki

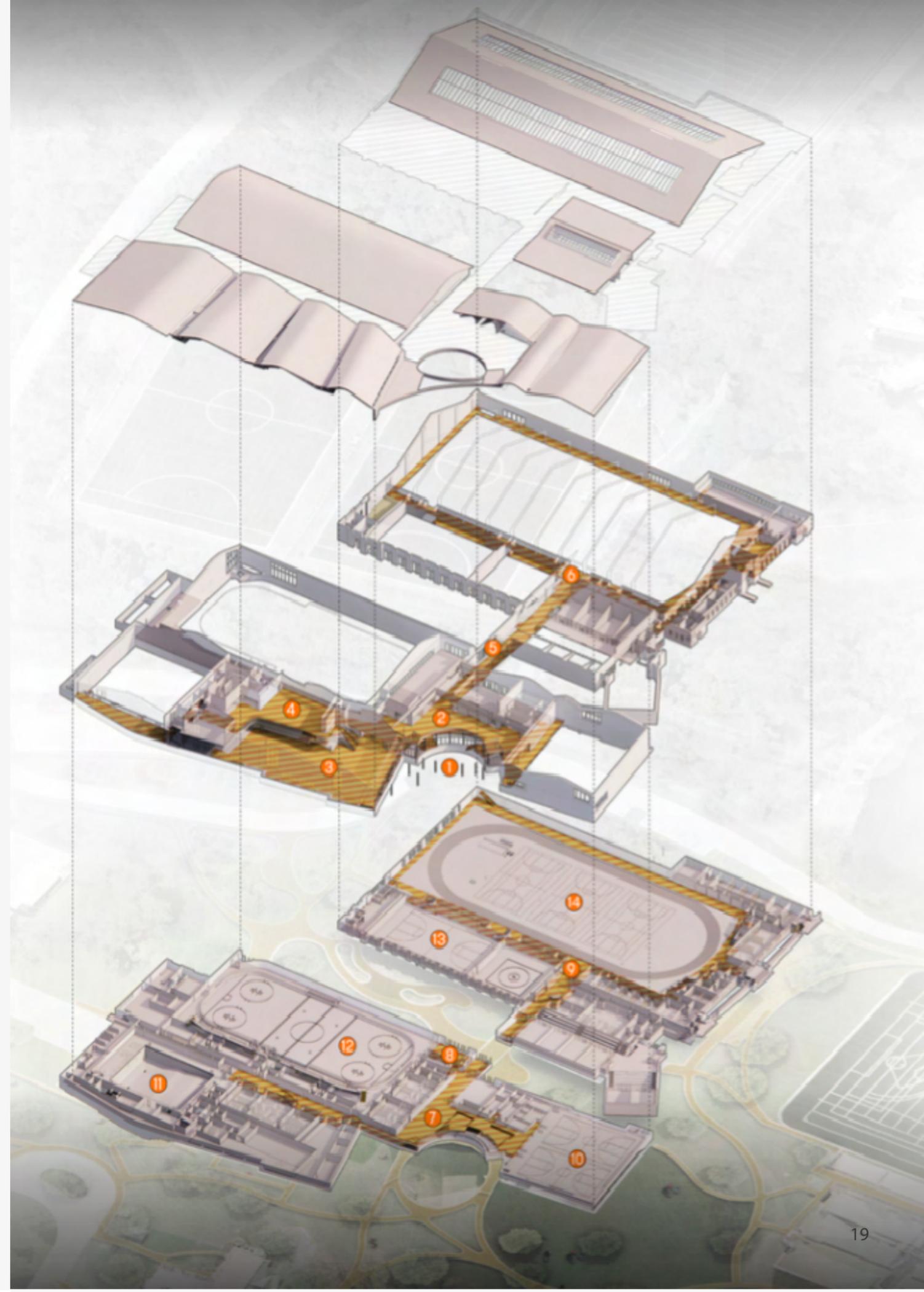
Area: 23504 m<sup>2</sup>

Year: 2022

Location: United States



Anchoring the second phase of implementation of the Lawrenceville School master plan, the Tsai Field House repositions student life for the school by bringing together recreation, wellness, athletics, and dining into one interconnected environment. Sasaki has just recently completed Phase I, which encompasses the new dining room, pool, ice rink, and fitness center, along with the back of house and locker rooms associated with these programs. Phase II will include the lobby and the basketball courts, two multipurpose rooms, and all the renovations to the existing historic Fieldhouse, to be completed in 2024.



3. England Elementary School / modus studio

Architects: modus studio

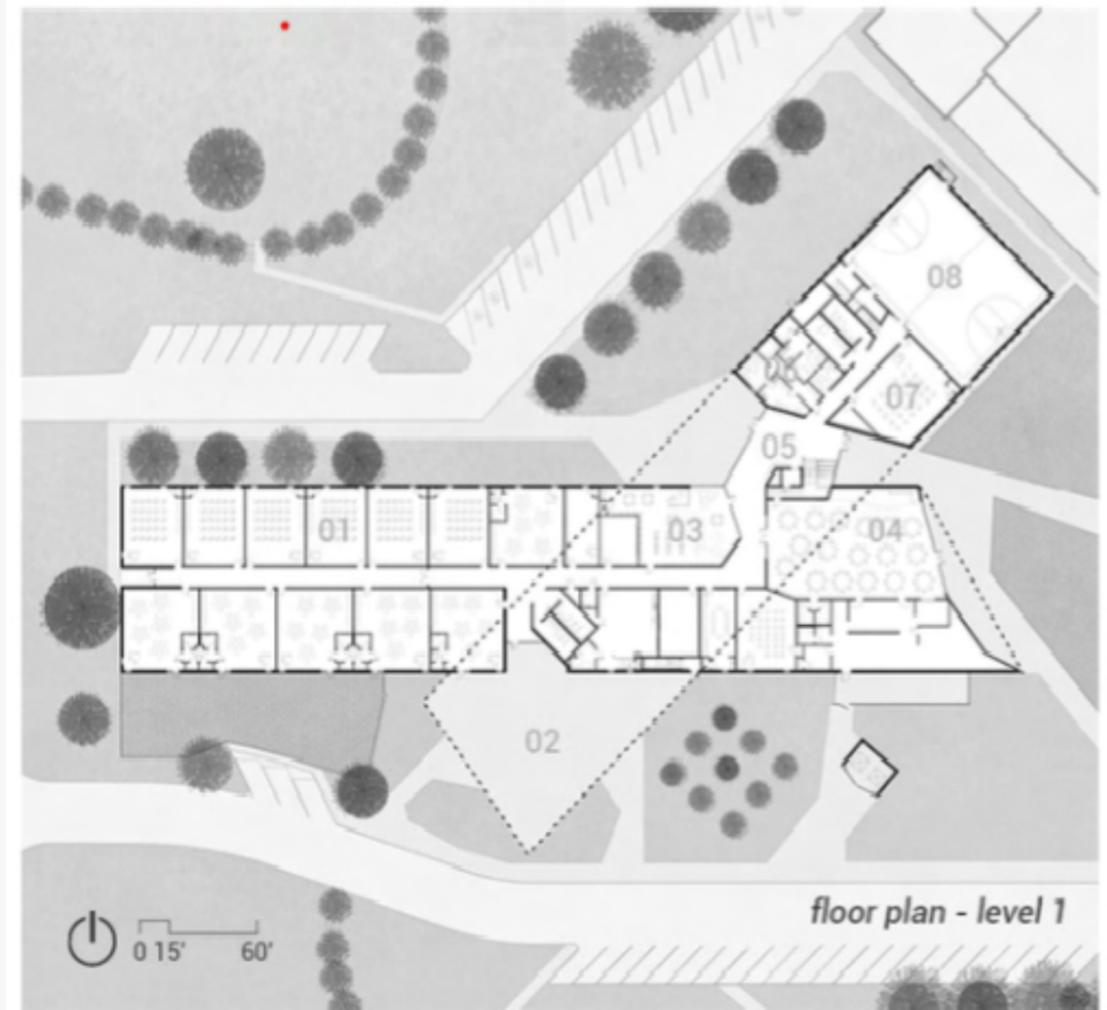
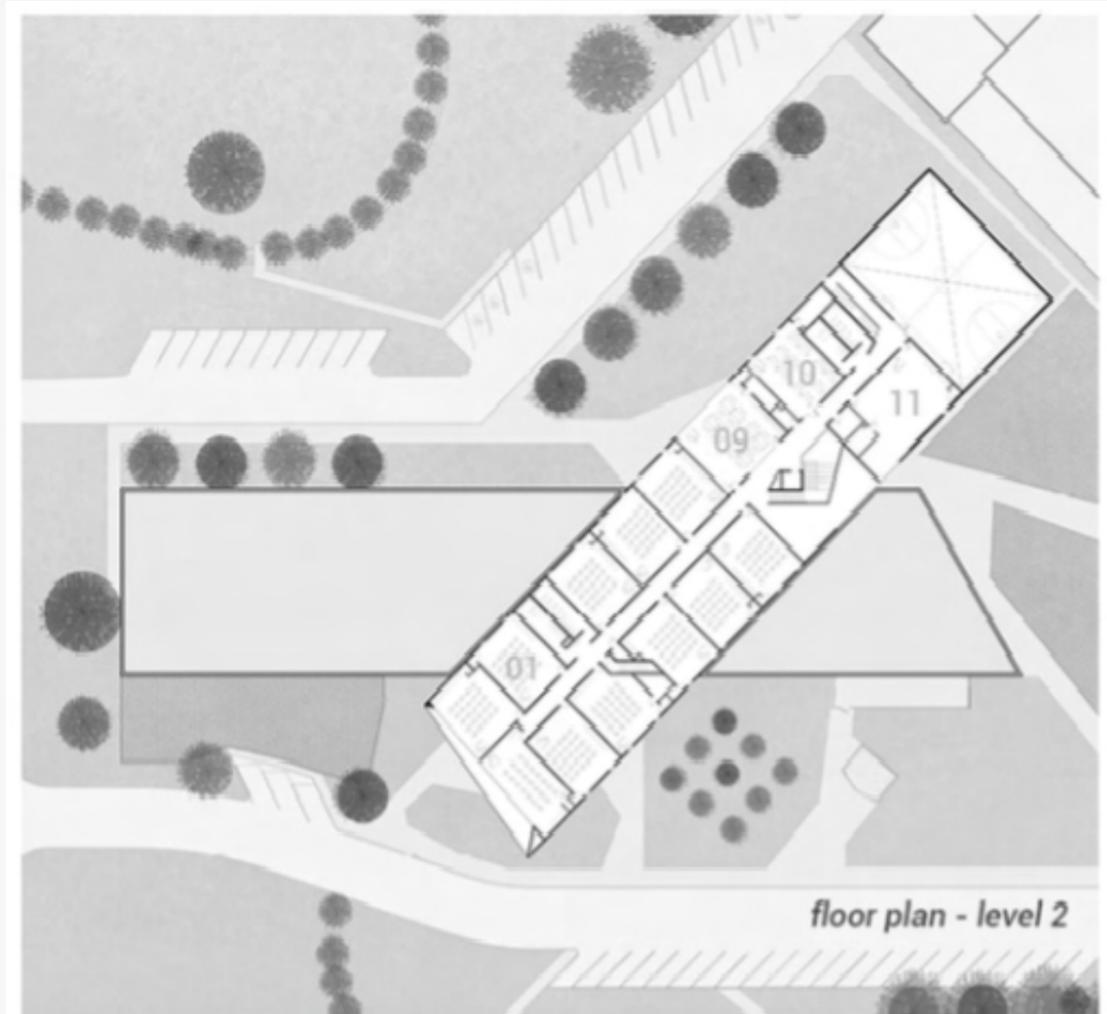
Area: 5969 m<sup>2</sup>

Year: 2021

Location: England, United States



England Elementary School, nestled in the small farming community of England, Arkansas, a town boasting a population of 2,445 residents, is a design intended for student inspiration that seamlessly integrates its surroundings and addresses the needs of the community. This new elementary school facility embodies the essence of its location, represents the spirit of an agricultural-based community, and overcomes various challenges, thereby setting new benchmarks in educational infrastructure. With a focus on sustainability, functionality, and student encouragement, England Elementary School emerges as a testament to the symbiotic relationship between educational architecture and contextual environments. It not only fulfills its educational purpose but also serves as a focal point of the community.

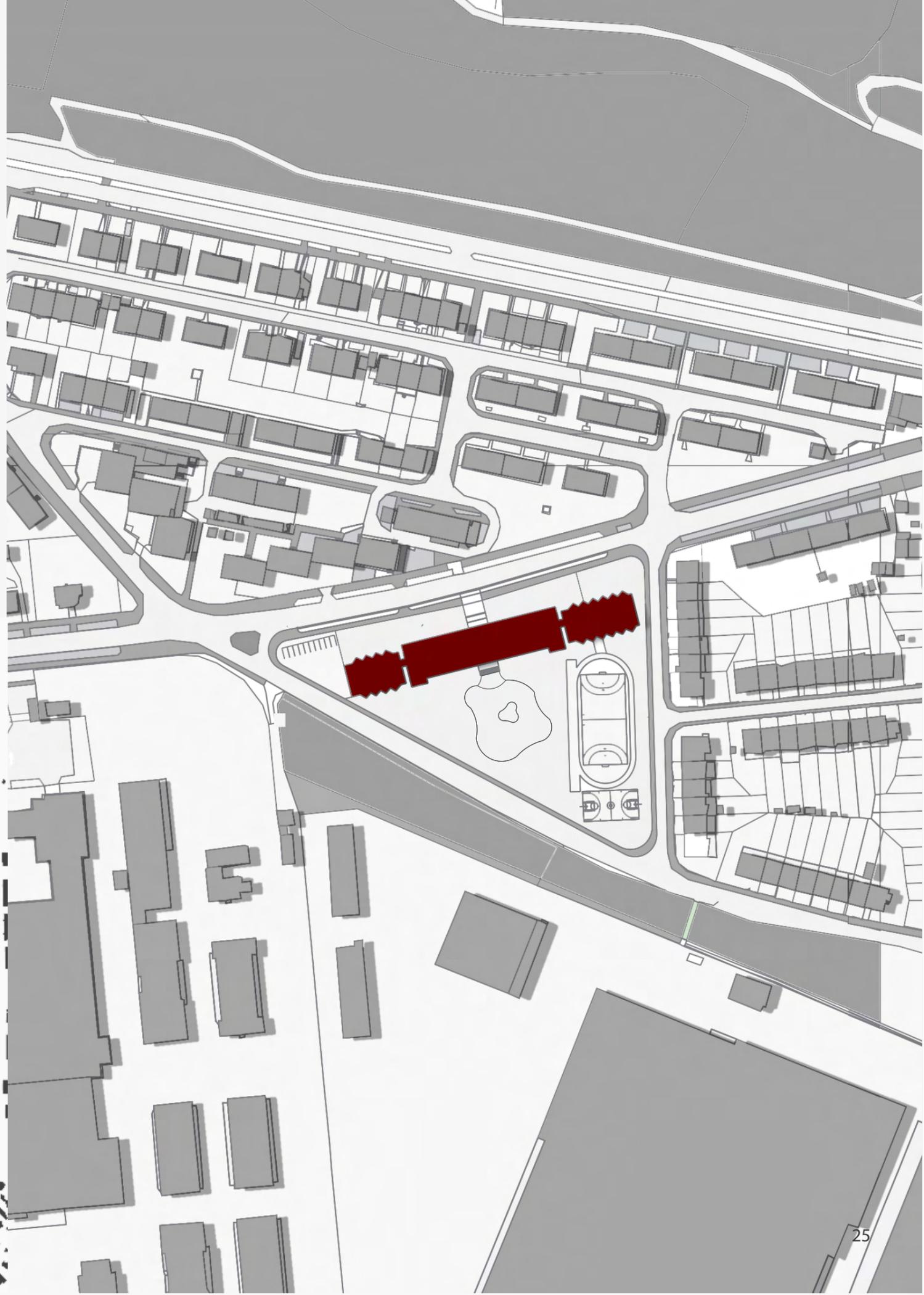
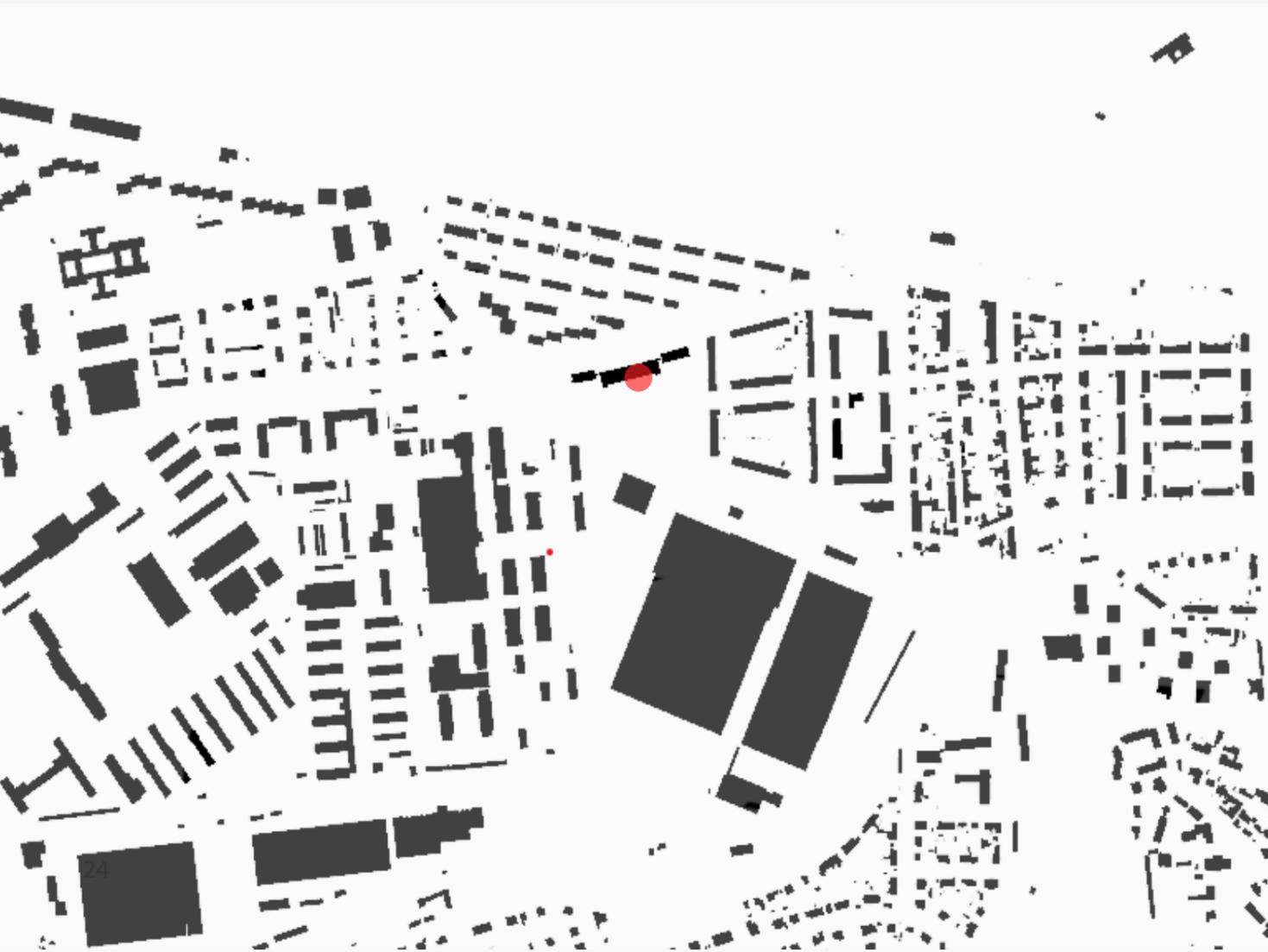


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LOCATION

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The Prague's Primery school is located in Prague 6, on the street Vlastina, it is a regular 13.680m<sup>2</sup> urban field which has been planned to be reconstructed.





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## SITE ANALYSIS

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## HISTORICAL CONTEXT

From 1920 to the present, Prague 6, one of the city's districts, has experienced substantial urbanistic expansion. This evolution can be followed through different phases of population increase, expansion of architecture, and improvement of infrastructure.

### 1920s–1940s

Prague 6 started to change from a collection of tiny settlements to a more integrated area of the expanding city of Prague in the 1920s. During this time, garden suburb-style residential developments were established. Because of their closeness to the city center and plenty of greenery, these neighborhoods became more and more popular places to reside, which in turn caused the population to increase.

### 1950s–1970s

Prague's population increased significantly after World War II as a result of Czechoslovakia's general urbanization trends. Large housing estates in the socialist realism style, with practical and utilitarian apartment buildings, were built during the 1950s and 1960s. To handle the increasing population. During this time, crucial infrastructure including hospitals, schools, and public transit systems were built, which made it easier for residents to travel within the neighborhood and to other areas of Prague.

**The** school was built in the 1960s, and it was built in a social realism style. Until now, the school has been rented by a private company, and the school belongs to the municipality of Prague 6. Due to the increase in the neighborhood, the school requires reconstruction in order to accommodate more students.

Plan Prague 1920



Plan Prague 1938



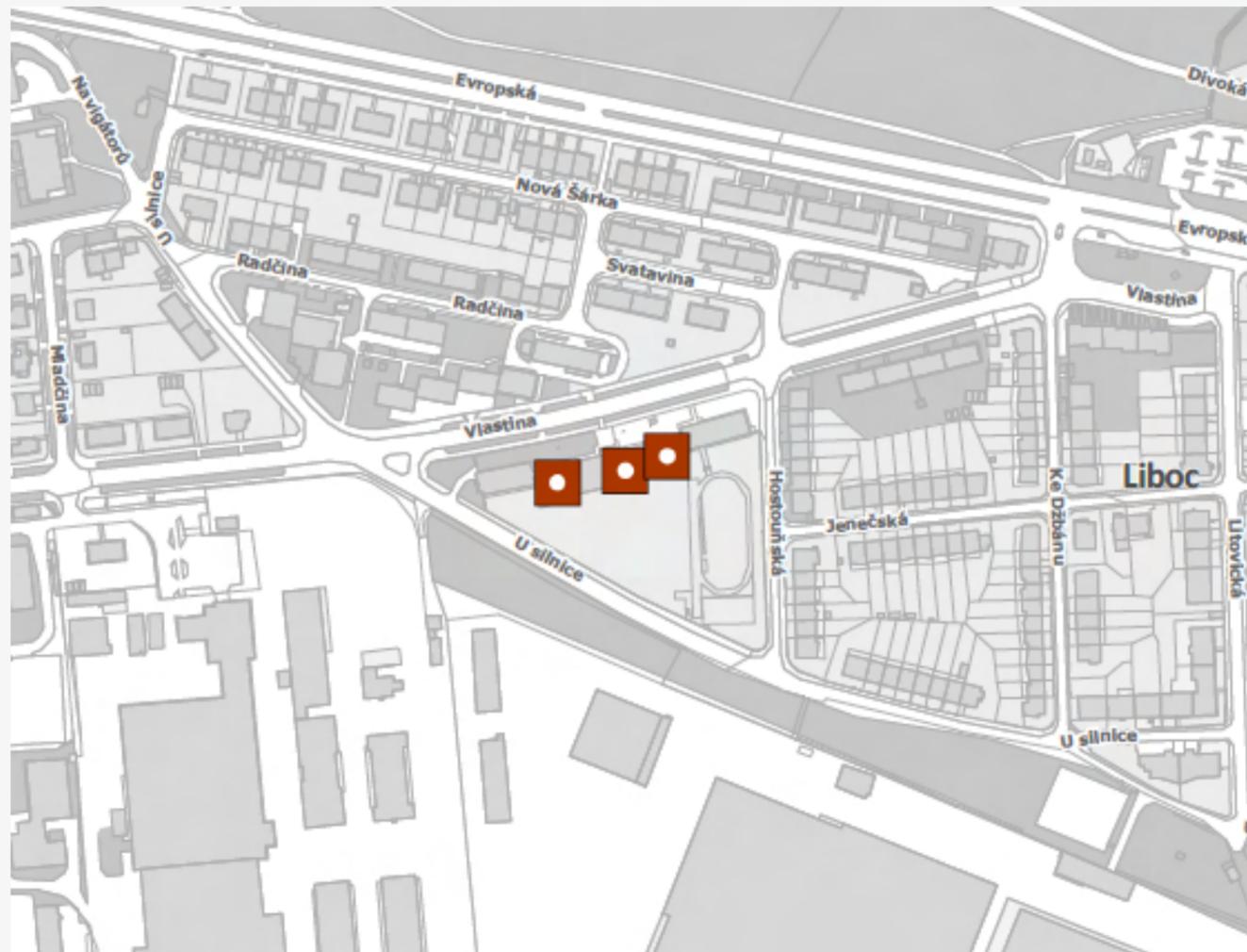
Plan Prague 1945



Plan Prague 1966



## SHELTERS



-  In the whole neighborhood there are only the shelters that are located inside the school

## LAND OWNERSHIP



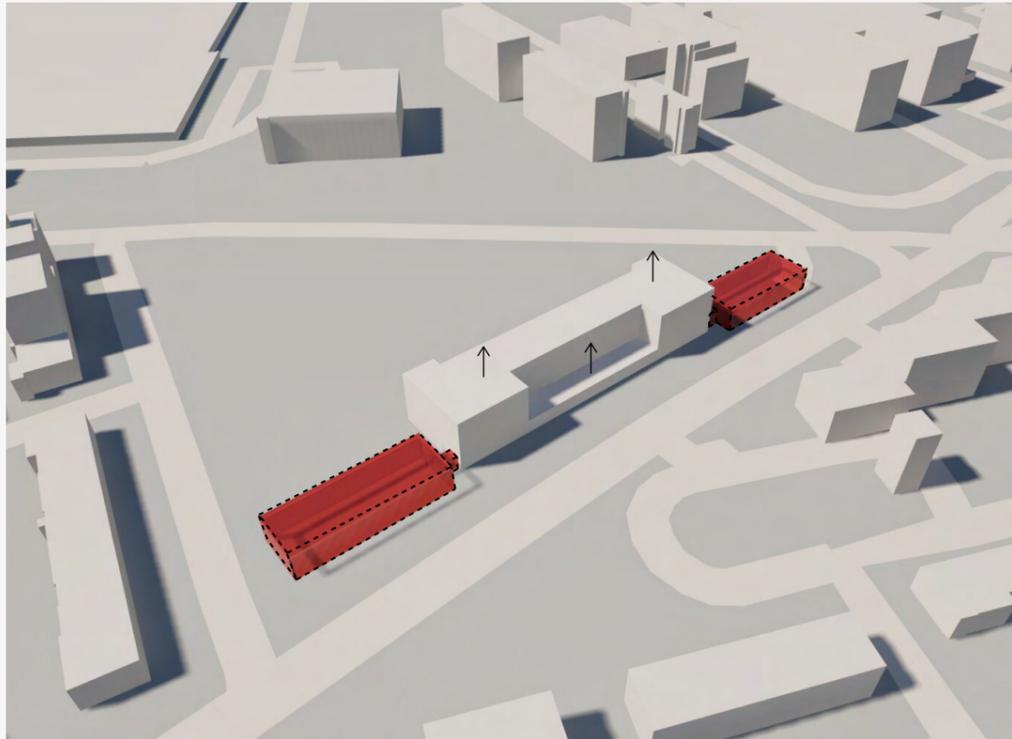
-  The Czech Republic, including state controlled entities
-  Hl.m.Prague, including entites controlled by it, without the City of Prague
-  Municipal districts of the capital city of Prague, including entites controlled by them
-  Regions of the Czech Republic outside the capital Prague, including entites controlled by them
-  Municipalities of the Czech Republic outside the capital Prague, Including entites controlled by them
-  The remaining domestic legal entites
-  Individuals
-  Identified and classified foreign entites
-  Subjects not classified in other groups
-  Partnership of two or more entites of different groups
-  Subject from CN not identified

LOCATION PHOTOGRAPHY

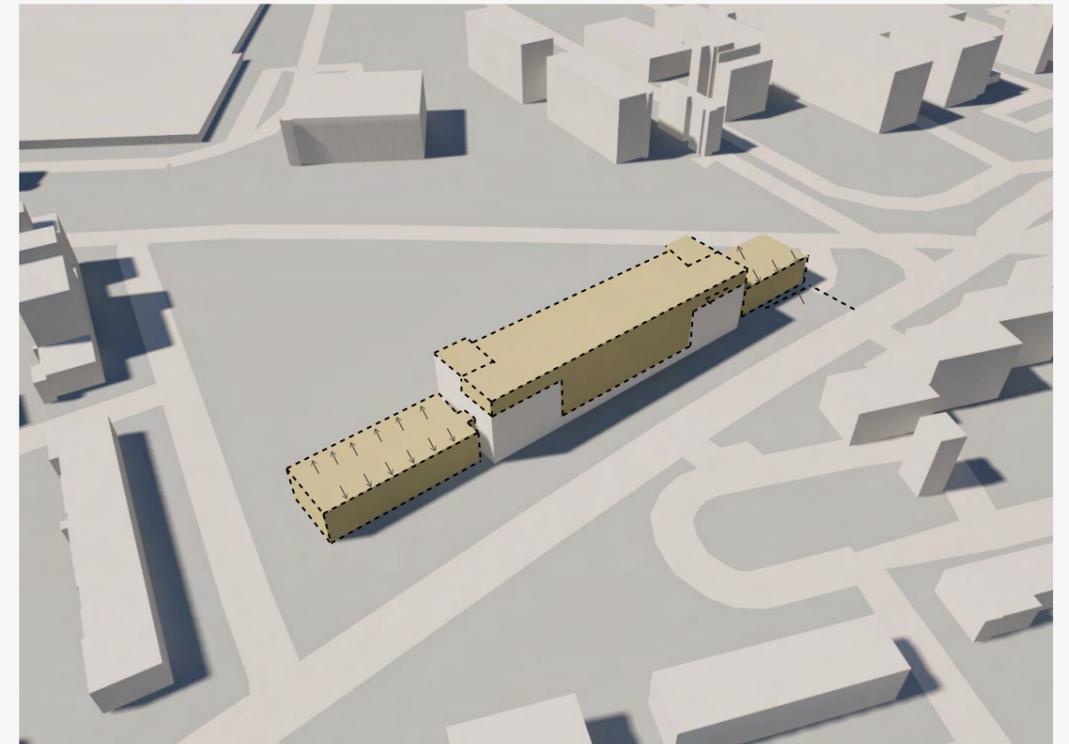


DESIGN CONCEPT

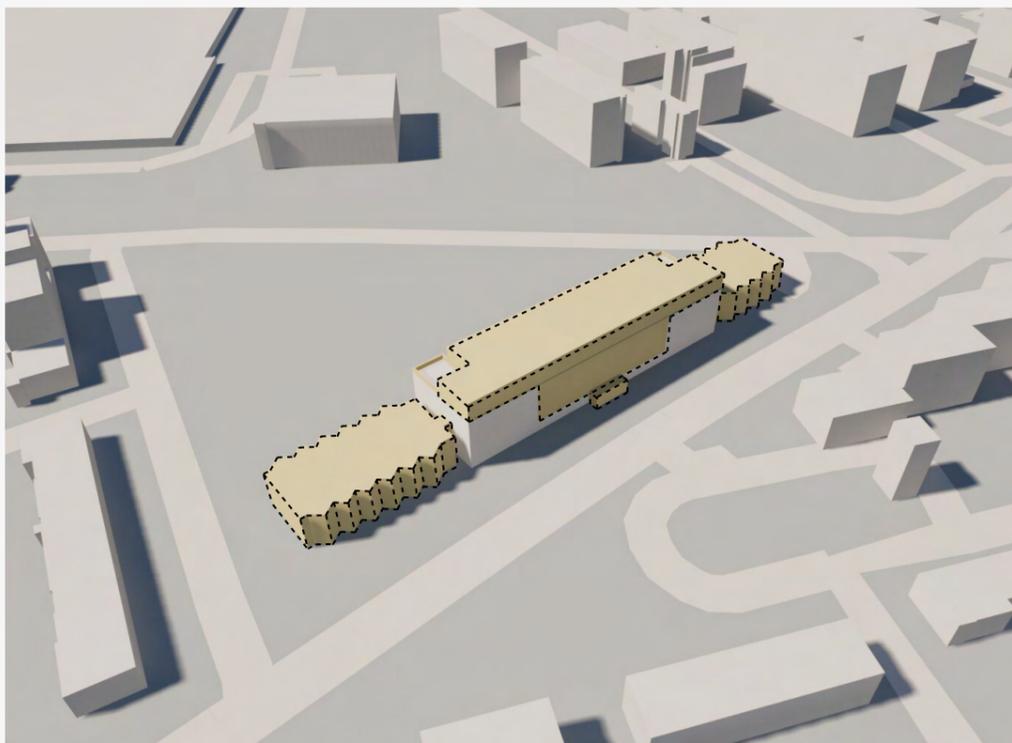




In the main site, there was a structure which was not really compatible with the final goals. With saving the structure, the roofs has been removed and it prepared for the final form



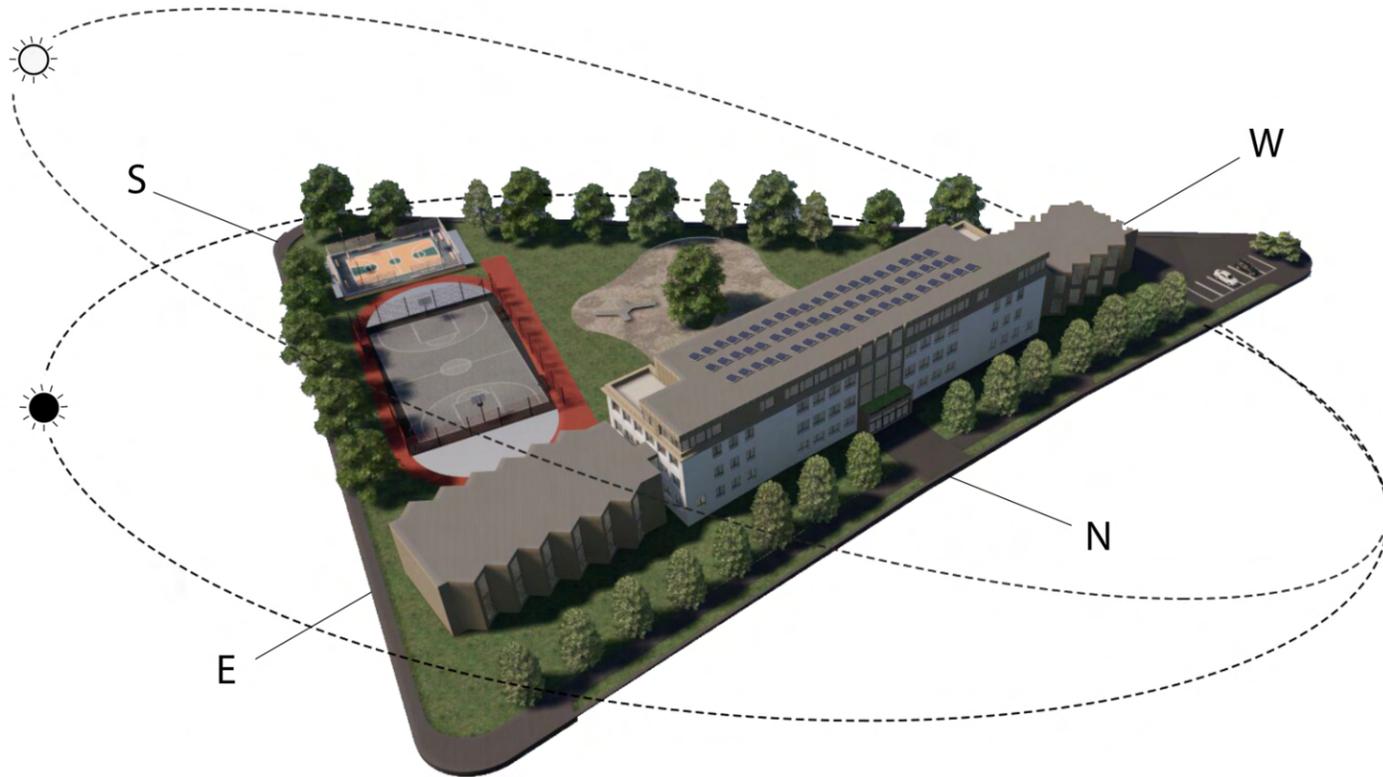
Part of the structure has been saved and part has been changed and expanded due to the project's needs. Also an elevator was added to the planning for another vertical circulation



The main goal was to make visible difference between the part that has been lit and preserved and the new part that will be added to define it with new modenist forms



The final form is a combination of a 4 level volume, the new added floor and volumes is being made of aluminium panels to visually separate of the rest of the building



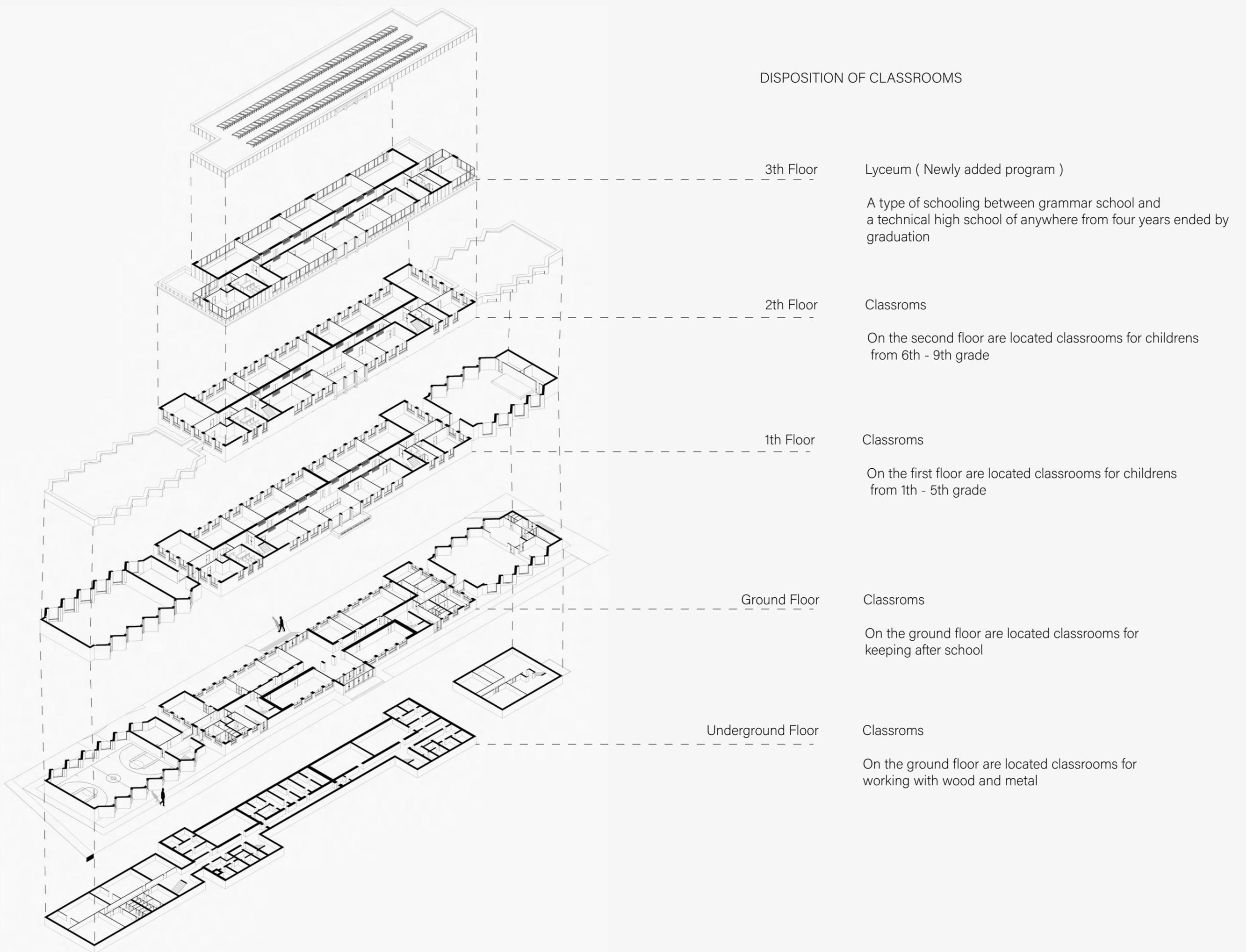
## SUN STUDY

A sun study analyzes the movement of the sun over a specific location throughout the year. This study is crucial for optimizing the placement and efficiency of photovoltaic (PV) panels.

Installing photovoltaic (PV) panels in schools can significantly reduce electricity bills for schools by generating a portion of their energy needs from the sun. Over time, the savings on energy costs can be redirected towards educational resources and programs.

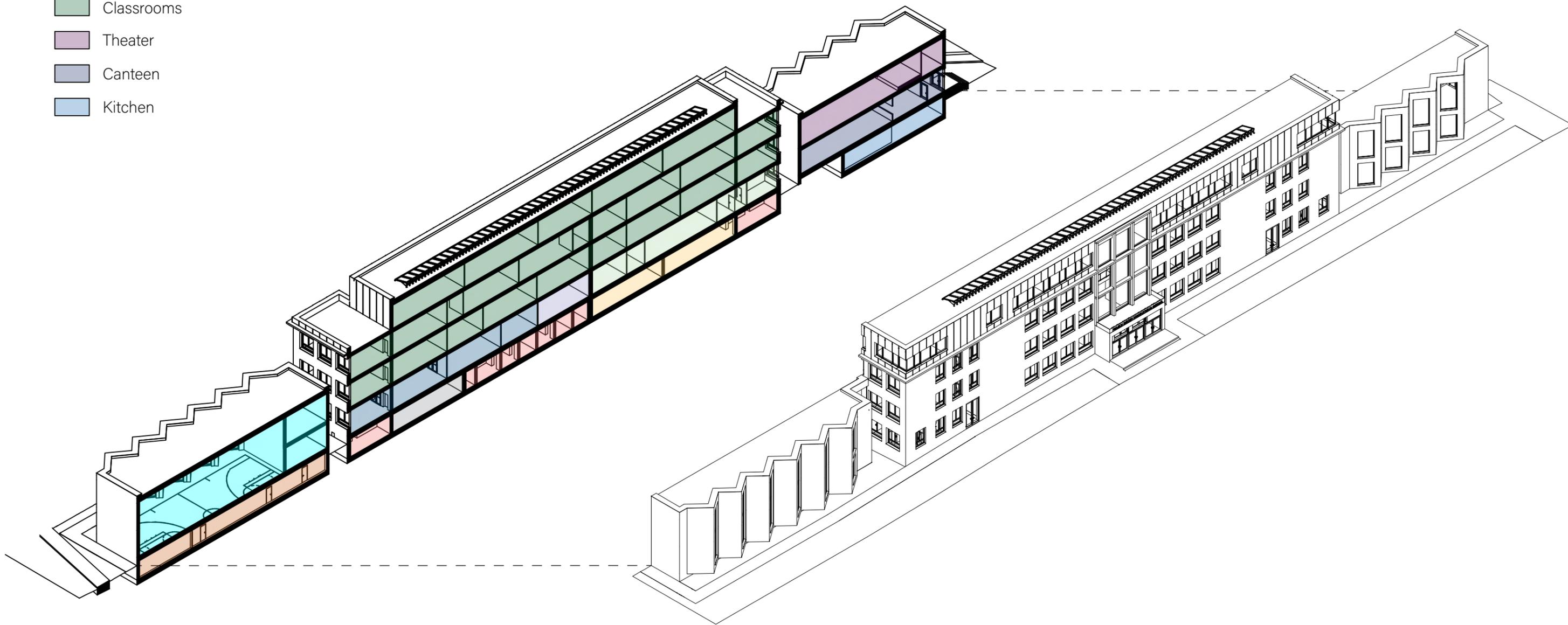
PV panels are typically rotated to the south to maximize their exposure to sunlight. In the northern hemisphere, the sun travels across the southern part of the sky. By facing south, panels receive the most direct and consistent sunlight throughout the day, enhancing their efficiency and energy output. Proper orientation is crucial to ensure that the panels capture as much solar energy as possible, thereby optimizing their performance and the benefits they provide.

## DISPOSITION OF CLASSROOMS



# FUNCTIONS

- Gym
- Classroom for working with wood and metal
- Shelters
- Technical room
- Administration
- Classrooms
- Theater
- Canteen
- Kitchen









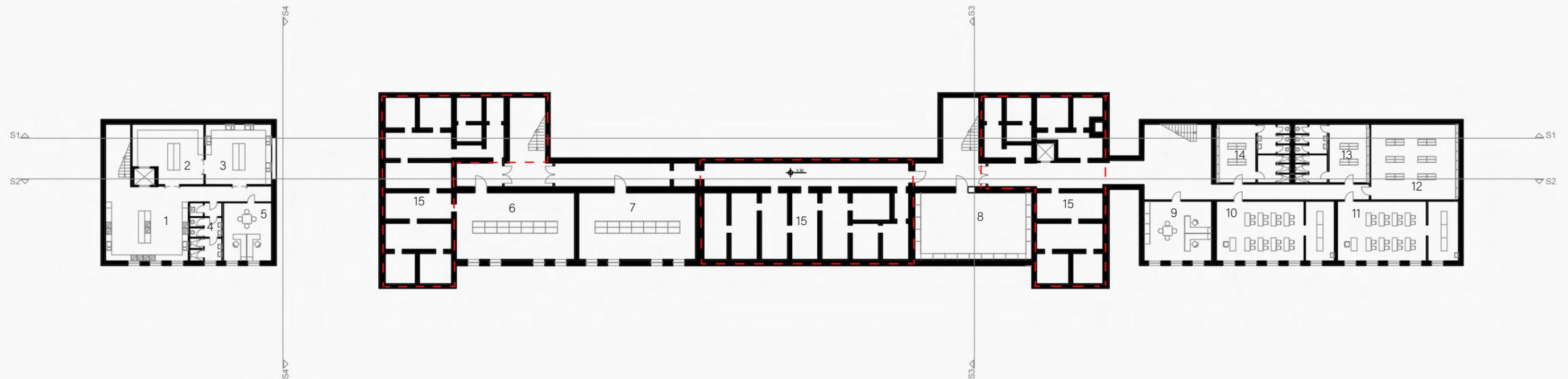


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## FLOOR PLANS

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# UNDERGROUND FLOOR PLAN

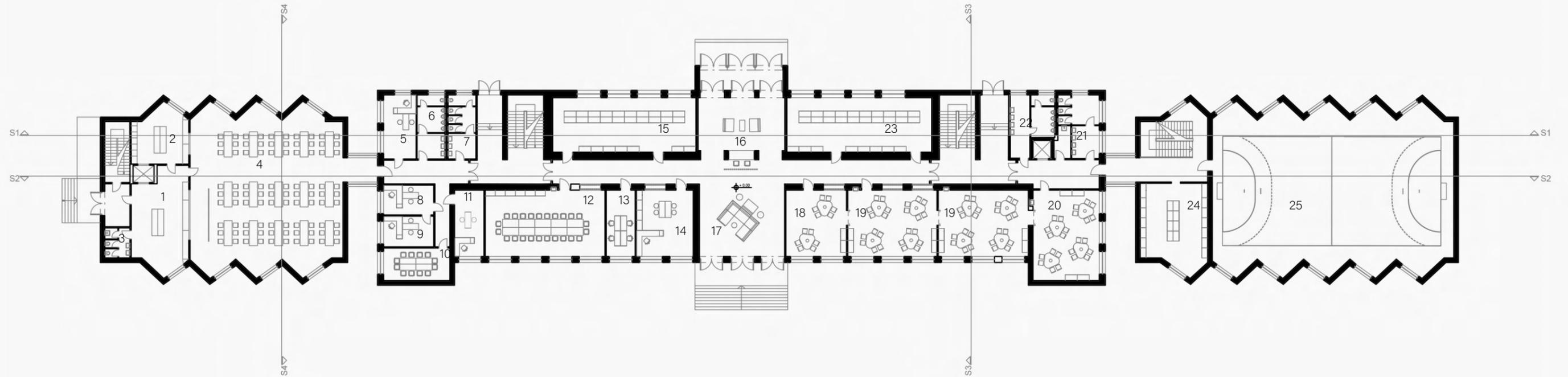


1 Meal cooking	46 m2	9 Teacher's cabinet	39 m2
2 Storage/Receiving	36 m2	10 Classroom for working with wood	70 m2
3 Food preparation	40 m2	11 Classroom for working with metal	70 m2
4 Toilets and shower for workers	18 m2	12 Archive	65 m2
5 Office	28 m2	13 Changing room with toilets for girls	42 m2
6 Clothing room for boys ( Lyceum )	76 m2	14 Changing room with toilets for boys	42 m2
7 Clothing room for girls ( Lyceum )	76 m2		
8 Technical room	76 m2		



SCALE 1:400

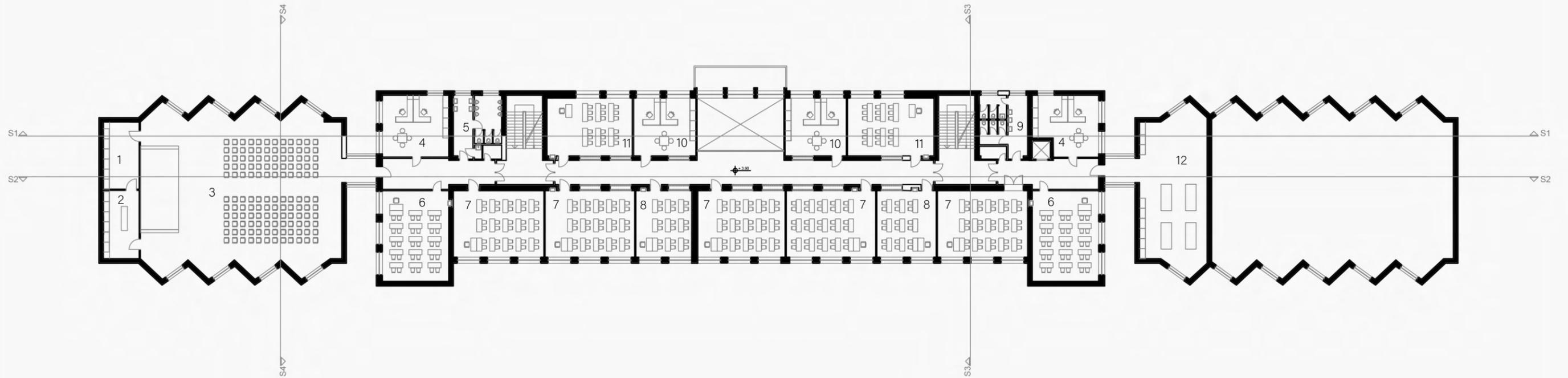
# GROUND FLOOR PLAN



1 Food serving	53 m2	11 Technical employee	19 m2	21 Toilet for girls	26 m2
2 Cleaning / Dirty dishes	29 m2	12 Common big room for teachers	78 m2	22 Toilet for boys	23 m2
3 Toilets for workers	8 m2	13 Finance office	19 m2	23 Cloathing room for girls	67 m2
4 Canteen	238 m2	14 Contact with parents	37 m2	24 Storage room for the gym	56 m2
5 Administration	19 m2	15 Cloathing room for boys	67 m2	25 Gym	328 m2
6 Toilet for boys	17 m2	16 Reception	10 m2		
7 Toilets for girls	17 m2	17 Common area	61 m2		
8 Secretary of director	4 m2	18 Keeping after school	37 m2		
9 Vise director's office	14 m2	19 Keeping after school	57 m2		
10 Meeting room	21 m2	20 Keeping after school	59 m2		



# 1 ST FLOOR PLAN

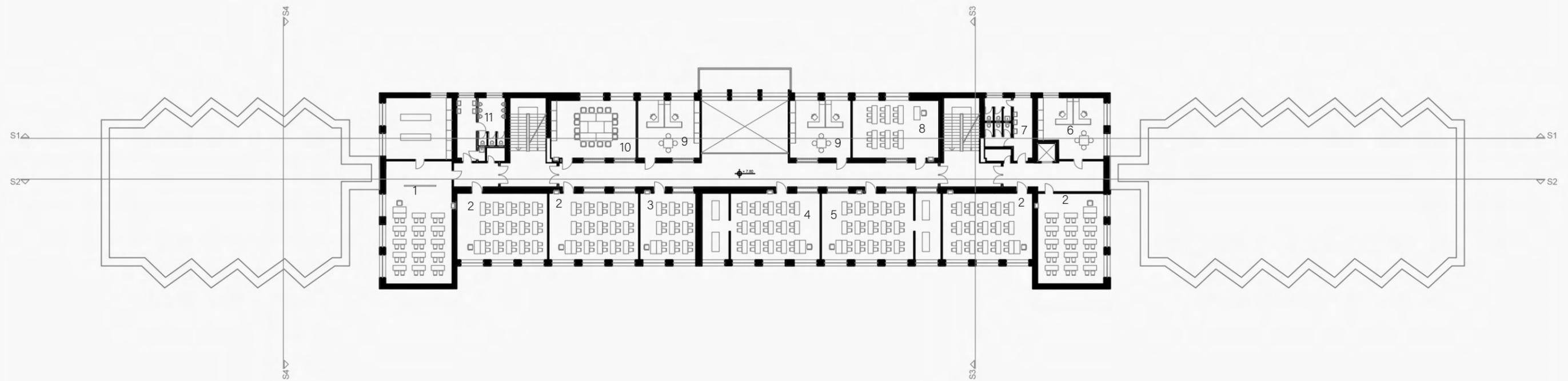


1 Storage for the theatre	23 m2	7 Classroom	59 m2
2 Changing room	23 m2	8 Language classroom	36 m2
3 Theatre	311 m2	9 Toilets for girls	30 m2
4 Teacher's cabinet	40 m2	10 Teacher's cabinet	36 m2
5 Toilets for boys	30 m2	11 Language classroom	51 m2
6 PC classroom	59 m2	12 Ballet classes	95 m2



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# 2 ND FLOOR PLAN

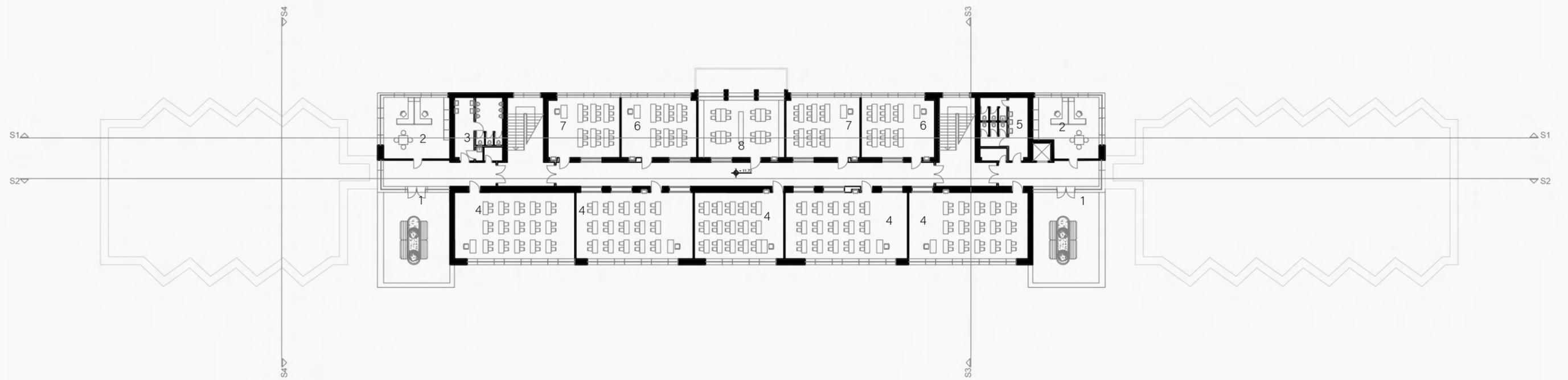


1 Classroom for art and ceramic workshop with storage	120 m <sup>2</sup>	7 Toilets for girls	30 m <sup>2</sup>
2 Classroom	59 m <sup>2</sup>	8 Language classroom	51 m <sup>2</sup>
3 Language classroom	36 m <sup>2</sup>	9 Teacher's cabinet	36 m <sup>2</sup>
4 Classroom for chemistry with laboratory	76 m <sup>2</sup>	10 Meeting room	51 m <sup>2</sup>
5 Classroom for physics with laboratory	76 m <sup>2</sup>	11 Toilets for boys	30 m <sup>2</sup>
6 Teacher's cabinet	33 m <sup>2</sup>		



SCALE 1:400

# 3 TH FLOOR PLAN



1 Roof Terrace	59 m2	5 Toilets for girls	30 m2
2 Teacher's cabinet	40 m2	6 Language classroom	43 m2
3 Toilets for boys	30 m2	7 PC classroom	43 m2
4 Classroom	79 m2	8 Library	51 m2



SCALE 1:400







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## SECTIONS

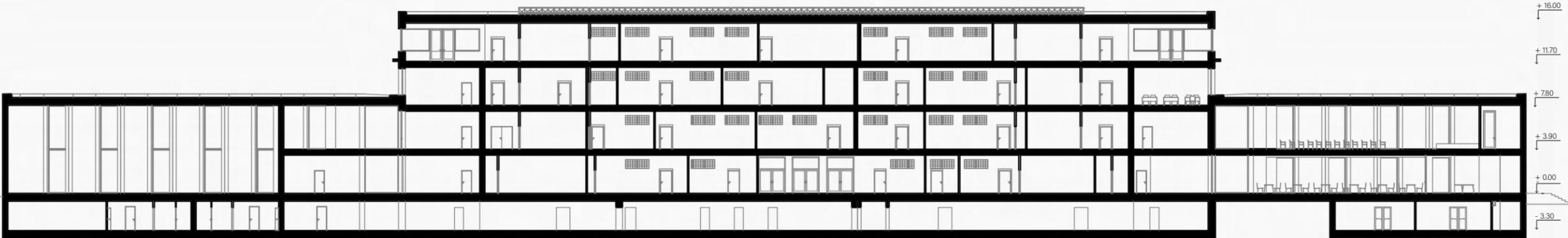
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SECTION 1-1

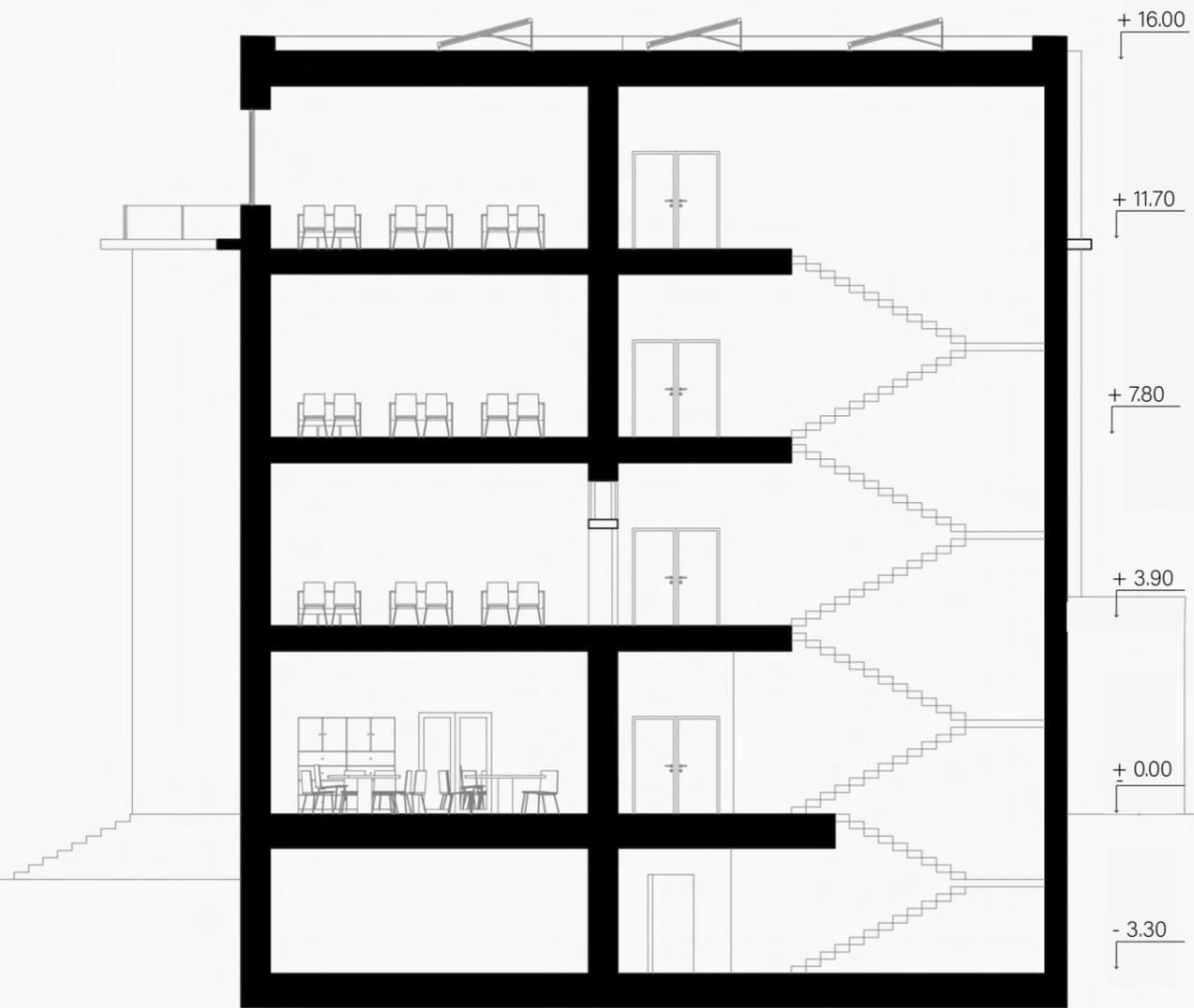


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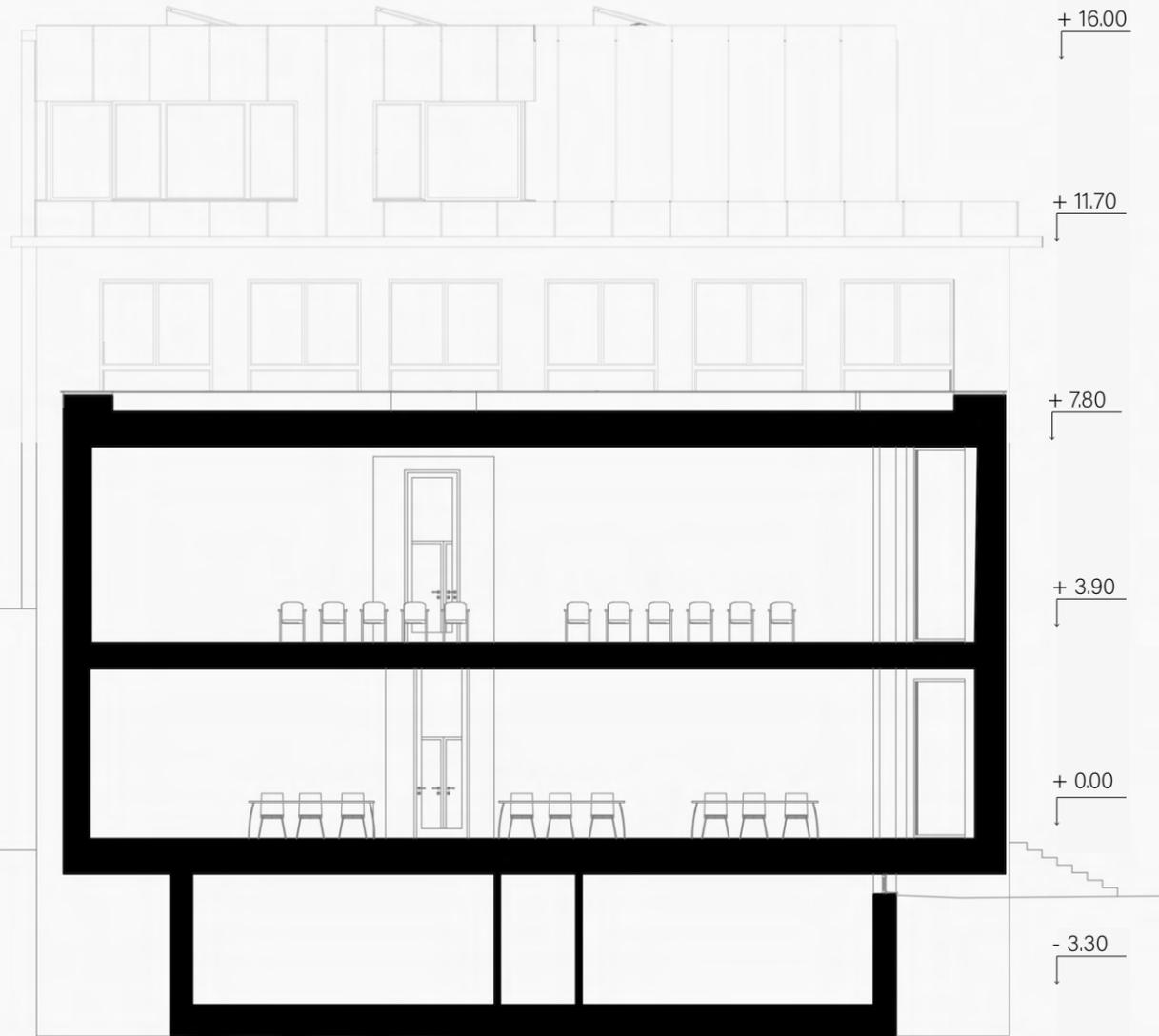
SECTION 2-2



SCALE 1:400



SCALE 1:100



SCALE 1:100

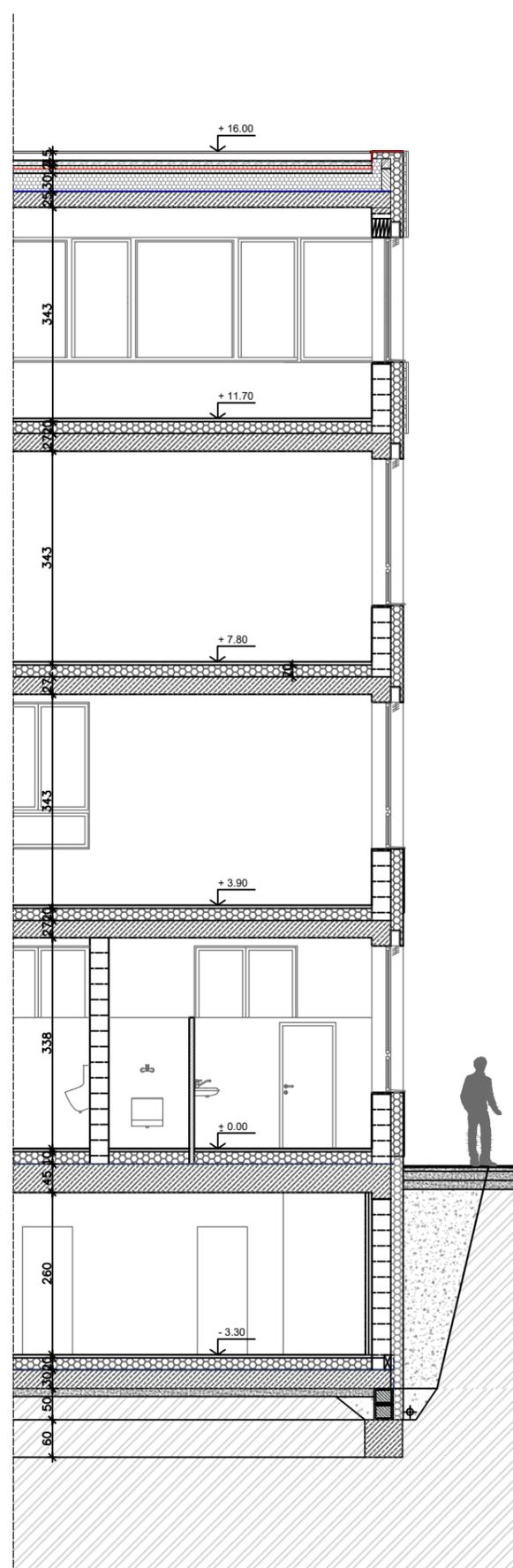
ELEVATIONS



SCALE 1:400



SCALE 1:400



SCALE 1:100

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RESOURCES  
AND  
DOCUMENTS

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Czech Technical University in Prague, Faculty of Architecture

**DIPLOMA PROJECT APPLICATION FORM**

Name and Surname: Šave Kirova

Date of Birth: 27.05.2001

Academic Year / Semester: 2nd year of Master's studies / 10th semester

Department Number / Name: Studio Stempel-Beneš

Diploma Work / Diploma Project Supervisor: Stempel-Beneš, Klanc

Diploma Work / Diploma Project Theme – title in English language:

Stempel / Primary school in Vlastina

Signature of the Diploma Work / Diploma Project Supervisor:

The Student's Declaration:

I declare that I have fulfilled all the diploma work / diploma project initiation requirements stipulated by the "Study Plan" and "Study Rules" at the Faculty of Architecture, CTU in Prague.

In Prague on 19.02.2024

Signature of the Student [Signature]



Czech Technical University in Prague, Faculty of Architecture

**ASSIGNMENT of the Diploma project**

Master degree

Date of Birth: 27.05.2001

Academic Year / Semester: 2nd year of Master studies / 10th semester

Department Number / Name: Studio Stempel - Beneš

Diploma Project Leader: J. Stempel, O. Beneš, T. Klanc

Diploma Project Theme:

See the Application Form for DP

Assignment of the Diploma Project:

1/description of the project assignment and the expected solution objective

2/description of the final result, outputs and elaboration scales

3/list of further agreed-upon parts of the project (model)

To this list further attachments can be added according if necessary.

1. reconstruction and redesign of an existing Primary school in Vlastina, Prague 6.

2. floor plans, elevations, details, situation, visualisation

3. model, posters, portfolios.

Date and Signature of the Student: [Signature]

Date and Signature of the Diploma Project Leader: [Signature]

Date and Signature of the Dean of FA CTU: [Signature]

## RESOURCES

1. [https://commission.europa.eu/system/files/2023-01/the\\_impact\\_of\\_demographic\\_change\\_in\\_a\\_changing\\_environment\\_2023.PDF](https://commission.europa.eu/system/files/2023-01/the_impact_of_demographic_change_in_a_changing_environment_2023.PDF)
2. <https://edexec.co.uk/population-problems-dealing-with-school-demographics-2/>
3. <https://www.ceicdata.com/en/indicator/czech-republic/population>
4. <https://www.mitgurukul.com/Importance-of-School-Facilities-in-Education.php>
5. <https://www.eschoolnews.com/it-leadership/2023/12/11/current-trends-in-education/>
6. <https://www.prarch.com/wp-content/uploads/2018/08/trends-in-elementary-school-design.pdf>
7. <https://cainz.org/11210/>
8. [https://en.wikipedia.org/wiki/History\\_of\\_education](https://en.wikipedia.org/wiki/History_of_education)
9. <https://www.britannica.com/topic/education>
10. <https://www.findlaw.com/education/education-options/types-of-schools.html>
11. <https://www.archdaily.com/1007804/jacques-chirac-school-and-gymnasium-bpa-architecture>
12. <https://www.archdaily.com/1005590/the-lawrenceville-school-tsai-commons-and-field-house-sasaki/64de629ffbc658017a49a6d9-the-lawrenceville-school-tsai-commons-and-field-house-sasaki-model>
13. <https://www.archdaily.com/1002813/england-elementary-school-modus-studio>
14. <https://app.iprpraha.cz/apl/app/atlas-prahy/>
15. [https://www.msmt.cz/uploads/Areas\\_of\\_work/legislation/IM\\_novelizovanyzakon561rijen2008a.pdf](https://www.msmt.cz/uploads/Areas_of_work/legislation/IM_novelizovanyzakon561rijen2008a.pdf)
16. NEUFERT - Third Edition " Edited by Bousmaha Baiche and Nicholas Walliman "

