

THESIS PROJECT: SIMON CORTES

ŽIŽKOV STATION



Prague, Czech Republic
June 2023



"A ruin should always be protected but never repaired– thus may we witness full the lingering legacies of the past".

- Walter Scott

ABSTRACT

Greetings readers!

This document details my approach to turning an existing building called Žižkov Freight Railway Station into a multifunctional building. This complex is located in Prague, Czech Republic, and dates from the year 1936. It is an excellent example of functionalism from the time and region but, sadly the complex has partially been abandoned since 2002. Consequently, there are multiple signs of deterioration throughout the building.

The station was originally used to supply the city of Prague with goods. The property counts with approximately 4,6 hectares where a big part of the terrain is used by a central courtyard which is where the trains used to operate. The remaining hectares are being used by 3 volumes that form the complex. One is an administrative building facing the main street, and the other two are long warehouses that were used to store goods.

My intention with this project is to propose a reformation of this complex that could fulfill the necessities of the city. I also want to propose comfortable, suitable housing and social spaces, including multiple functions. All of this while maintaining the building's character and respecting its historical heritage as much as possible.

To better explain my approach I organized the chapters as follows:

- Thesis: This is where I state my intentions and methods for this project.
- Context: Here I tell the reader about Czech architecture and functionalism before diving into the history of the Žižkov Freight Railway Station.
- Project: Here I present you with the building in more detail, but before I do so, I explain the difficulties associated with this project as well as detailed geographical context of the site. In this chapter you can read about the composition, materials, structure, current state, value analysis of the complex and finally a restoration plan for it.
- Transformation: As the name suggests, this is where my proposal is displayed. Here you can read about my approach to solving the problems that repurposing this building could present. There is a strong emphasis on providing quality dwellings despite the limitations that exist when working with a building of this dimension and character. Apart from dwellings, my program includes multiple social spaces in the courtyard, the interior and even on the rooftops.
- Reflection: Here I discuss my approach, discuss the challenges and mention what I have learned.



LUND
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Žižkov station in Prague, Czech Republic
Thesis project in architecture

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INDEX

Introduction	7
1. Thesis	9
2. Context	10
2.1 Czech architecture	10
2.1.1 Cultural heritage policy	10
2.1.2 Main Station in Prague	11
2.2 Czech functionalism	12
2.3 Building's History	13
2.3.1 Construction	13
2.3.2 Service	15
2.4 The impact of the Žižkov freight railway station	17
3. Project	18
3.1 Prague	18
3.2 Žižkov	18
3.2.1 Connections to public transport	19
3.3 Past projects	20
3.4 Plans for the district	21
3.5 Affordable housing shortage in Prague	22
3.6 Original site plan	23
3.7 Drawings: Existing building	24
3.8 Drawings: Sections	32
3.9 Construction elements	38
3.10 Facade materials	40
3.11 Current condition	41
3.12 Value assessment	46
3.13 My restoration plan	46
3.13.1 Windows	47
3.13.2 Reinforced concrete	48
3.13.3 Clay bricks (filling)	49
4. Transformation	50
4.1 My program	52
4.2 Site plan	53
4.3 Project overview	54
4.4 Drawings: Floor plans	56
4.5 Drawings: Student apartments	66
4.6 Solar analysis	68
4.7 Drawings: Sections	70
4.8 Staircases	82
4.9 Courtyard	86
4.10 Apartment typologies	89
4.11 Column replacement	96
4.12 Facade openings	98
4.13 Technical detail	99
4.14 Isolation	100
4.15 New facade materials	100
4.16 Greenhouse	101
5. Reflections	102
6. References	103

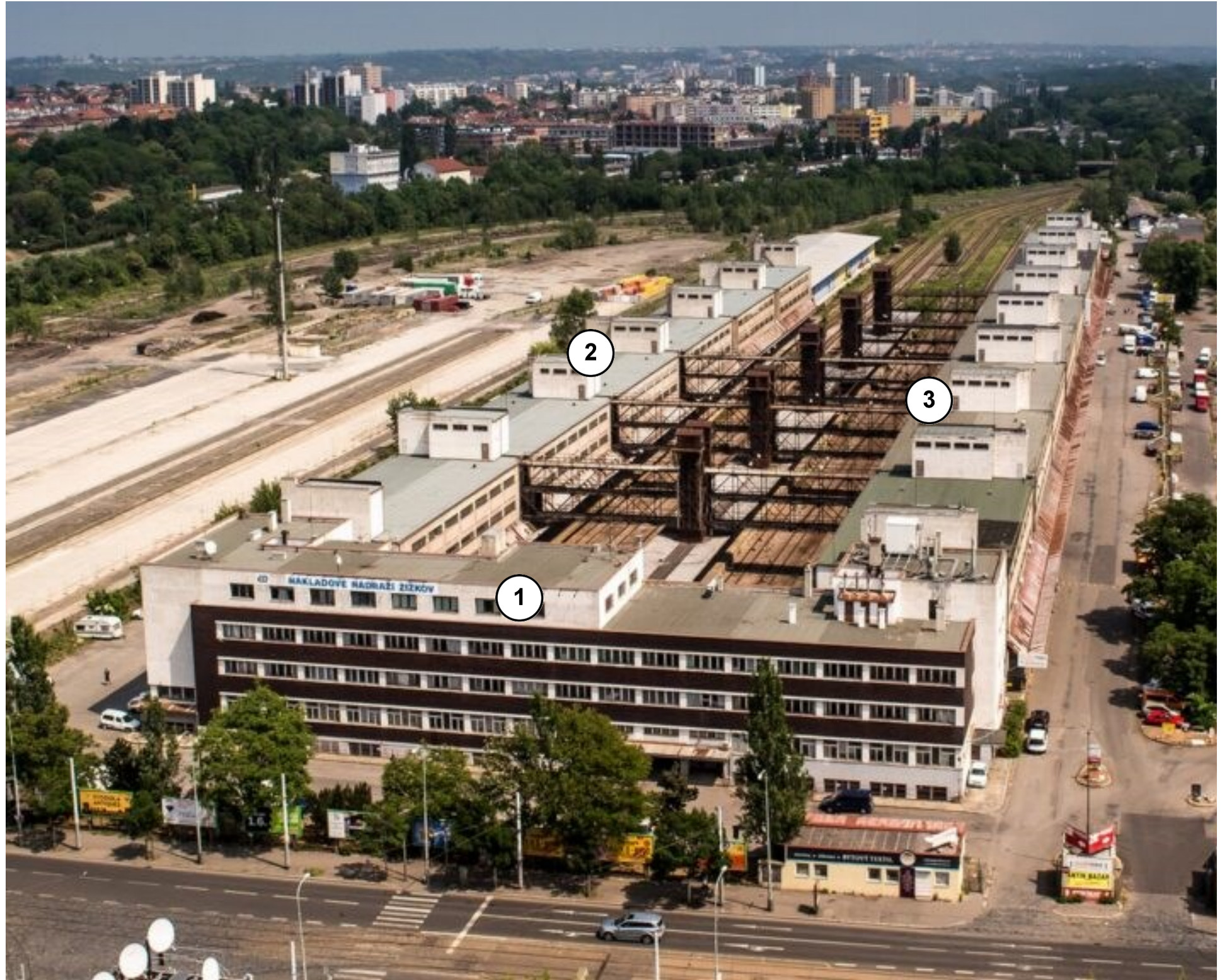


Image 1: Bird view (2013)

1: Administrative building

2: Northern warehouse

3: Southern warehouse

INTRODUCTION

My name is Simon Cortes and I present to you my final thesis project "Žižkov station".

My interest in this building emerged when I first saw it and imagined the potential it could have. I didn't find it necessarily pretty for its materials or massive scale, but I did see the building's beauty in its value as a modernistic architectural heritage and its functional rationality. The current shape of the building is very deteriorated on the outside and it has been semi-abandoned since 2002.

One of my biggest passions as an architect is the art of recycling buildings to give them a new purpose. This building presented me with the opportunity to work with industrial dimensions and a strong historical heritage. Here I could take my knowledge of architecture and urban recycling to my current limits while also learning in the process.

I decided that my project would include a restoration program followed by the repurposing of existing spaces. This aims to find a solution that grants new life to this building. After an intense investigation, I decided to focus on the design and proposal of apartments inside the two warehouses (see image 1) but also on social and cultural spaces throughout the complex.

Choosing the Žižkov freight railway station as my thesis project also feels like a professional challenge for me since an open competition held in 2016 aimed to find a solution to this building, but to the date, and among all the proposals none of them were carried out. Apparently, none of the proposals respected the historical heritage of the building highly enough (Institute of planning and development of the capital city of Prague, 2022) .

Throughout this project I try to propose a project that respects the historical heritage of the building while giving it a new purpose.



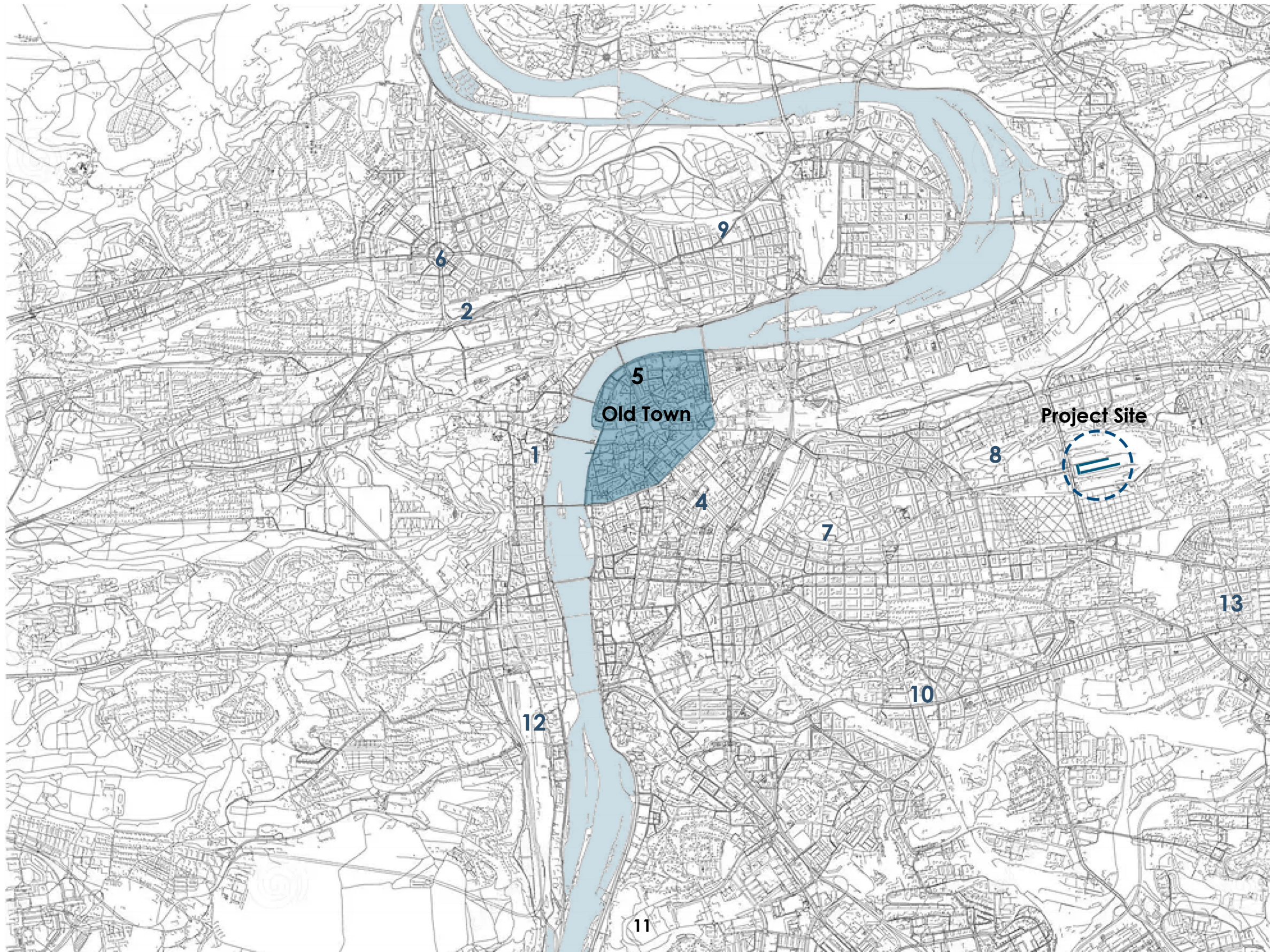


Image 2: Map of Prague

Scale: 1:30000

1. Lesser Town **2.** Prague Castle **4.** New Town **5.** Josefov **6.** Hradčany **7.** Vinohrady **8.** Žižkov **9.** Holešovice **10.** Vršovice
11. Vyšehrad **12.** Smíchov **13.** Strašnice

1. THESIS

BACKGROUND SUMMARY

The Žižkov Freight Railway Station was proposed to relieve the city center of Prague from freight train services. As the city grew in population new ways of supplying the citizens with goods needed to be found without saturating the center with more traffic. The project's location with easy access from the East of the city would ease the necessity for big supply lines across the city while providing an external connection.

In 1927, the station's construction project was approved. That same year the track infrastructure, designed by the engineer Miroslav Chlumecký, started to be put in place while the building complex was constructed later on. In 1930 the architects Karel Caivas and Vladimír Weiss jointly designed the buildings surrounding the tracks and the construction started immediately after.

The massive complex was a collaboration of many and as a result it was built in sections (see image 1 on page 6), as I will explain in the construction in chapter 2.3.1 on page 13.

Regular operations at the Žižkov freight railway station began on March 1, 1936. The complex fulfilled its purpose during its active years. Although the importance of it began to decline with the completion of a nearby warehouse in a district called Strašnice (number 13 on the map, image 2), approximately 3.3 km southeast from the site.

It wasn't until the year 2002 that the main purpose of the station was terminated. Since then, the complex has only been used for short train trips and hosting events like exhibitions and cultural events. Today the building is considered a cultural monument and it has gradually been sold to several companies by the same original owners, Czech Railways. These owners use or rent the installations to other companies that use them as warehouses or shops (Dvořáková, 2013).

GOAL

My main goal with this project is to learn during and after the process. I want to make a proposal for Žižkov freight railway station that is completely viable to build and that has a strong focus on urban recycling and sustainability. For my proposal to be viable I want to make a plan that can realistically be followed, showing how a restoration plan for this building would be carried out followed by a redesign proposal that is in accordance with the citizen's wishes. I think that there is a symbiotic relationship between urban recycling and sustainability and I want to explore that symbiosis during this project. I aim to reach this goal without compromising the historical heritage of the building. At the same time I want my proposal to result in affordable, comfortable housing with a strong sense of community, not only for the dwellers but also for the city of Prague.

HYPOTHESIS

My aim with this project is to transform this semi-abandoned building into a space that the city of Prague can appreciate. Formulated in the form of questions, they would be as follows:

- 1. How can I, to the best of my capabilities, propose a reformation project that best fits the necessities of the city?**
- 2. Is this complex fitted for housing apartments? If so, what can I do to preserve the building's industrial character while providing comfortable, sustainable housing?**
- 3. How can I propose a redistribution of spaces that provides functionality, sustainability and purpose for the dwellers and the city while still respecting the building's history?**

METHOD

To answer these questions, I started by collecting information from previous demographic studies that could tell me which public services are needed in the area. One of the very obvious ones is the shortage of housing close to the city center. Luckily the two warehouses forming the complex have a good disposition facing south, which is not ideal but it can still grant a very suitable situation for housing placement. The administrative building, on the other hand, is directly facing the street and an important avenue to the West which leads to the city center. This makes this part of the complex ideal to host the public/semipublic part of the project. I trust that these studies would grant a good solution to the project since they are made by experts and have been ongoing for years.

Before I could start redesigning, I needed to put the building in a historical context, that is as a part of Czech architectural functionalism. A better understanding of the building's history would help me make better decisions during the project, thus respecting the building's heritage. I knew that a big part of the project would require decision making as in how to decide what should be restored and what should be demolished, or how the new materials could change the character of the building. Therefore, before these decisions could be made a value assessment addressing all the features of the building was in order.

After studying the existing building and personally experiencing the space and character of the building I could finally think about how to restore the parts that I wanted to save and how to fit all my ideas into the project. I developed a detailed restoration plan and I decided that for the facade to keep their character as much as possible materials resembling the existing ones should be used. To design the interior spaces I had to base most of my decisions on natural light intake.

2. CONTEXT

2.1 CZECH ARCHITECTURE

Czech architecture has a rich history spanning several centuries. Due to the country's central location in Europe its architecture has been influenced by many styles and movements from all over the continent. In this chapter I want to introduce you to what I found to be most interesting and relevant for my project about how I perceive Czech architecture. But first, I want to give you a short introduction to some of the styles that can be found throughout the country, starting in chronological order:

Gothic architecture, dating from the 13th century and reaching its peak in the 14th and 15th centuries. One of the most notable examples includes Charles Bridge (built in 1402 and designed by Peter Parler) in Prague.

Renaissance architecture, dating from the late 16th century, was mainly influenced by Italian architects. One of the most notable examples includes the Queen Anne's Summer Palace (built in 1560 and designed by Paolo della Stella) in Prague.

Baroque architecture, dating from the 17th century and popularized in the 18th century. One of the most notable examples includes the Holy Trinity Column (built in 1754 and designed by Wenzel Rener) in Olomouc.

Art Nouveau architecture, dating from the 20th century, was heavily influenced by the work of Czech architect Jan Kotěra (1871-1923), who designed several buildings during his career. One of the most influential probably being the Municipal House (built in 1922) in Hradec Králové.

Functionalism, dating from the 1920s and 1930s, was characterized by a focus on function and practicality over form. One of the most notable examples includes the Villa Tugendhat (built in 1930 and designed by Ludwig Mies van der Rohe) in Brno.

Contemporary architecture, dating from the 2000s, is marked by a mix of styles and influences. This style emphasizes sustainability, innovation, and a focus on creating a sense of place and community. It often incorporates cutting-edge technology and a mix of materials such as glass, steel, and wood. One of the most notable examples includes the Dancing House (built in 1994 and designed by Frank Gehry & Vlado Milunić) in Prague (Hisour, 2012).

2.1.1 CULTURAL HERITAGE POLICY

During Czech Republic's history, the country has been submitted to several geopolitical situations. Where other countries have unfortunately failed to preserve their monuments, during wars for instance. In this aspect the Czech Republic has managed to preserve most of its architecture almost intact, for instance during the Nazi occupation in March 1939 had no major impact in the architecture of the cities. The Czech Republic is known for its well-preserved historical towns and cities, such as Prague, Český Krumlov, and Telč, which have been recognized as UNESCO World Heritage sites. This shows that there is a lot of respect for preservation

and therefore cities like the ones previously mentioned can be endless sources of inspiration for architects where the old styles can still be appreciated in good shape and in abundance.

The country has implemented various measures to protect and preserve its old architecture. One of the most significant ones being the Heritage Conservation Laws, which are laws and regulations to protect historical structures. These laws exist in every country in the European Union but are apparently stricter than usual in Czech Republic.

Another institution in charge of preservation is the Cultural Monuments Inventory, which keeps track of historical buildings and its shape. To support these incentives of restoration and conservation projects, the government provides financing helps to encourage preservation. There is also a whole sector of skilled craftsmen and restoration experts working to repair and maintain old buildings, using traditional techniques and materials to preserve their original character.

All these initiatives and efforts, together with educational programs and exhibitions, result in a high level of public awareness where people have in numerous occasions protested and have had an impact in questions at hand. This shows that the peoples' voices also have a weight in the decision making of a building's future, my project building Žižkov freight railway station, being an example of this as I will explain further on in the text (Němcová, 2023).

2.1.2 MAIN STATION IN PRAGUE

A good example of how the preservation of historical buildings is handled in Prague could be how the Main Station in Prague (Praha hlavní nádraží) was reconstructed. The station was built in the Art Nouveau style in 1901 and served as one of Prague's main transportation hubs for over a century. By the 21st century, however, the station was in need of extensive repairs and modernization to meet the needs of modern travelers. This restoration project has been widely praised for its careful attention to detail and commitment to preserving the station's historic character while modernizing its facilities for the contemporary modern use of the facility.

The restoration project began in 2007 and was completed in 2016. The project suffered some delays and unexpected budget changes, mostly due to internal corrosion of the supporting arcs. This issue could not be foreseen and the state of the load-bearing structures had to be re-produced instead of refurbished which raised the original budget drastically (Šubová, 2017). The restoration project involved a careful and detailed renovation of the station's historic facade, as well as the interior spaces, which were reconfigured to improve passenger flow and accessibility. New amenities were added, including shops, restaurants, and a tourist information center.

The restored station also includes several innovative features, such as a rainwater collection system, which help to improve the station's sustainability and reduce its environmental impact (Němcová, 2023)



Image 3: Station building (1895)



Image 4: Station building (2023)

2. CONTEXT

2.2 CZECH FUNCTIONALISM

Functionalism is a style of architecture characterized by a strong focus on efficiency, functionality, and modernity. It rejects traditional decorative elements in favor of clean, simple forms. Instead, it emphasizes the importance of light, space and movement. The importance of the design is on building something that was suited to their purpose and context. This description could easily be used to describe Žižkov Freight Railway Station.

The style in the Czech Republic was influenced by the ideas of the Bauhaus movement in Germany and the International Style of architecture that developed in the United States. One of the key figures in Czech functionalism was the Austrian architect, Adolf Loos, who believed that the purpose of architecture was to serve its function, rather than to be an object of beauty in itself. This principle was central to Czech functionalism as well, and renowned architects like Josef Gočár and Pavel Janák were influenced by Loos' philosophy in their pursuit of functionalist architecture. Loos was also the author of the prime example of Czech functionalism, Müller Villa. Built in 1930 in Prague, this villa features clean lines, a white facade, and an efficient use of space. The villa's interior is designed with functional simplicity and an emphasis on practicality.

Aside from his built works, Loos's theoretical writings and lectures were influential in shaping the intellectual foundation of Czech functionalism. His famously known essay "Ornament and Crime," in which he argued against the use of excessive ornamentation in architecture and design

and advocated the use of clean lines, simple geometric forms, and modern materials. This rejection of ornamentation and emphasis on functional design resonated strongly with Czech functionalists, who also embraced these principles.

Functionalism had its golden age during tough times, after and during the World Wars, and in the Czech Republic also during the communist regime (dating from 1948 to 1989). The correlation with prioritizing away unnecessary architectural elements in terms of function and concentrating the resources on functionalistic principles is therefore an understandable reaction for this time.

The legacy this thinking left behind can still be seen in modern designs, especially in factories, warehouses and other industrial areas. The most common designs in this style are residential buildings, offices, schools, and factories. Many of these buildings featured flat roofs, large windows, and open floor plans, which allowed for ample natural light and ventilation.

While at times in history building in a functionalistic style could be seen as just a way to use resources more efficiently. As the style developed and became popular, new trends were born. One of the most distinctive features of Czech functionalism is its integration with Czech Cubism, an art movement that originated in Prague. This fusion of functionalism and Cubism resulted in a unique architectural style known as "Cubist Functionalism." It featured geometric, angular shapes inspired by Cubist art, which gave Czech functionalism a visual identity not seen in other functionalist movements (Vondrova, 1978).

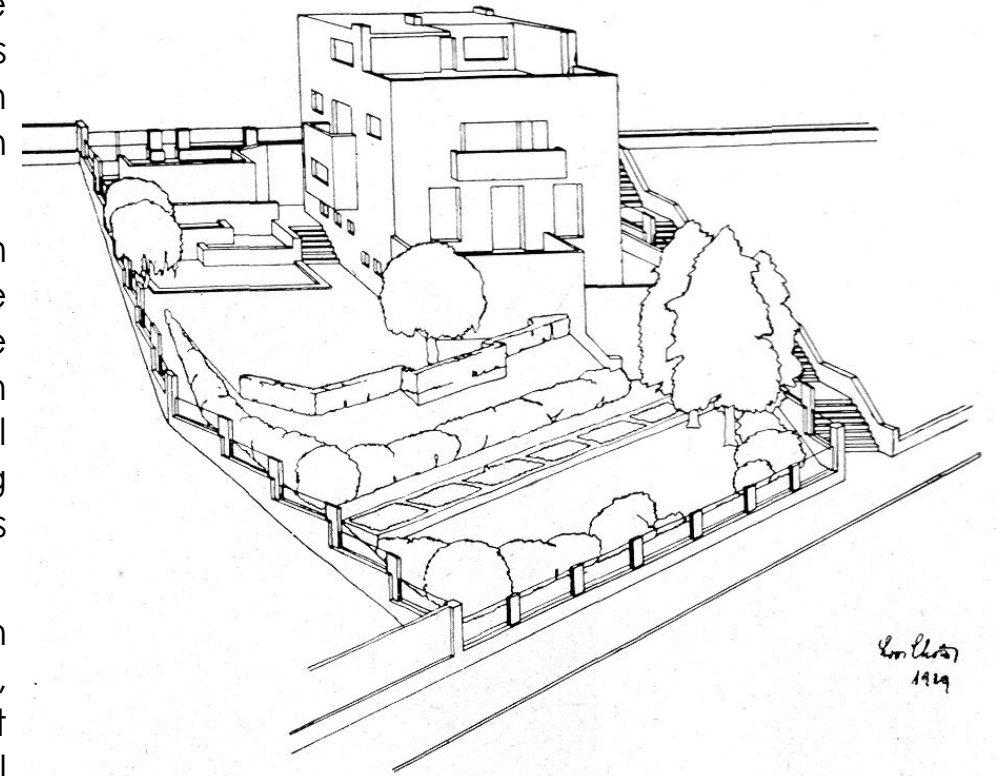


Image 5: Müller Villa

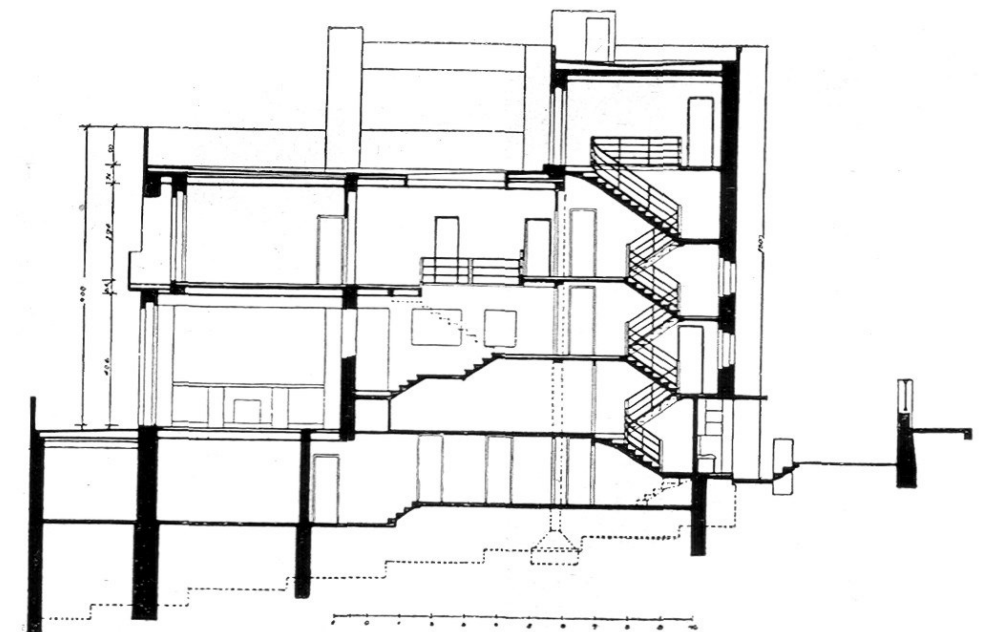


Image 6: Müller Villa, section

2.3 BUILDING'S HISTORY

At the time, one of the most modern transport structure of its kind in Czech Republic. It was characterized by the unique solution with multi-story warehouses on both sides of the track and the highest technical equipment at the time. The distribution of the buildings made it possible to combine the function of the warehouse of state railways and private warehouses with separate routes for handling goods. This can be appreciated on the ground floor drawing (page 26-27) where the platform in the center of the courtyard separates the two functions. The reinforced concrete constructions were additionally given a high-quality architectural rendering in the functionalist style, which was complemented by the industrial steel elements of the transport system.

The building, despite long-term neglect of maintenance, has been preserved in good condition and maintained many authentic details (Dvořáková, 2013).



Image 7:

Poster (1935)

"Visit

27./X -10./XI

Fr. 9am to 12pm

and fr. 1

to 4pm

New Cargo

Station Zizkov

Prague XI.

Mladonovicova street
of the electrical railway
line"

2.3.1 CONSTRUCTION

Construction work was ceremoniously started on 27 August 1928 in the presence of the Minister of Railways Josef Václav Najman, Mayor of Prague Karel Baxa and other representatives of the state administration, local government and representatives of the industry. In the same year, construction of a railway connection from Malešice began also to facilitate the transport of construction materials.

The design of the warehouses forming two reinforced concrete structures with connecting tunnels and a central transshipment platform was drawn up in a joint effort by the architects Karel Caivas (* 1897; † 1977) and Vladimír Weiss (* 1897; † 1989) in 1930. Unlike to the current state, the buildings were designed with a shorter length of four sections on the northern warehouse and six sections on the southern warehouse. Later, two extra sections were added to each end of the buildings and this is how we see it today. Here, one section is the equivalent of the space between two elevator shaft, which is approximately 44m.

Caivas and Weiss' design for the administrative building dates from January 1931 but was not approved until May 1932. Meanwhile, the construction of the southern warehouse started as early as April 1931. In July 1931, the railway company together with another company named Českomoravská-Kolben-Daněk (ČKD) completed the design with the steel towers that would function as the freight elevators, ramps and the connection bridges between the warehouses.

I should also mention that this station would not look the same without the collaboration of railway engineer Miroslav Chlumecký (* 1878; † 1957) author of the so-called Disposition Plan for future railway improvements in Prague. This plan helped develop the country's infrastructure and economy. The rational procedures of the architectural

authors' solution corresponded to the exact methods of Chlumecký, who based his design of the Prague railway system on a detailed analysis of station charts.

In 1934, the entire railway yard was completely constructed and the administrative building was not far from being complete. In February 1935, the northern warehouse was completed and the construction of a transformation station with seven transformers began in the basement of the administrative building. These plans were supplied by the electric companies of the Prague. The work was coming to an end and the warehouse could start operating with a limited dispatch authorization. Already in July 1935, the machinery in three sections of the northern warehouses' basement were completely operational.

Due to the importance of the new freight station for the supply of the city it was within of the regulatory plan of Prague to widen the roads leading from the nearby plots in the western direction towards Žižkov and Vinohrady. Then the Railways Administration financially participated in their implementation. Jan Želivský street (to the West, parallel to the the administrative building) was built along the station, and a new direct link connected to the main avenue leading to the city center. The station thus came closer to the center of Prague since 1935, a quarter of an hour's drive away (Dvořáková, 2013).

In autumn, the Railway Administration presented the freight station Žižkov to representatives of the press and then to the general public (image 6). The promotional event lasted from October 27 to November 10, 1935, and more than 1,800 visitors participated in the first two days. In addition to a tour of the railway's new buildings, they prepared examples of their fleet and an exhibition of plans, photos and paintings of the new railway station.

2. CONTEXT

The visitors' attention was particularly focused on the most modern technical equipment, like an automatic telephone switchboard, the electronic security system and the fire alarm system.

Railway cold stores and freezers intended for food storage were surprising with their size and machinery. The station also had an electric clock synchronized to the time given by the state observatory in Klementin, Prague, which was considered to be the most accurate clock in the country back then. After the completion of the administrative building, the final modification of the tracks and warehouses, regular operation began on March 1, 1936.

The list of private enterprises and companies that participated in the realization of the freight station was a very respectable display of coordinated work from the construction industry and the numerous companies that contributed with the project. This list of collaborators includes more than ten companies working together in different tasks. These companies were mainly local but also brought in from other parts of the country. Some collaborated with building the structures while smaller companies provided the steel windows or machinery inside the warehouses.

One of the most notorious collaborations was made by the ČKD company, the steel structures in the middle of the courtyard. The lifts inside the towers could lift 1.5 tons for the footbridges.

The implementation of the project was overseen by the Construction Administration and under the leadership of engineer Miroslav Chlumecký. After his retirement at the age of 57, engineer Jaromír Novák took over as head of the construction administration (Dvořáková, 2013).



Image 8: Construction of the warehouse (north wing), 1933

2.3.2 SERVICE

Žižkov freight railway station began to operate normally on March 1, 1936, after its completion, and it fulfilled its purpose successfully during its active years. Although the demand was gradually reduced at the station in 1966 due to the completion of the food warehouse in Strašnice (see location in image 2 on page 8). The station was also used as a warehouse and having another nearby diminished the usage and therefore the importance of the Žižkov freight railway station.

It wasn't until the year 2002 that the main purposes of the station building were terminated. Since then, it was no longer used as a supply line but rather as a warehouse, for hosting events like exhibitions and as a station used for short trains. In early 2011 only a few trains per week were scheduled to make the Prague – Hamburg route, with a daily connection to Přerov and occasional departures to Bratislava, Bremerhaven and Rotterdam (Dvořáková, 2013).



Image 9: Station being fully operational (1966).



Image 10: One of the last trains arriving to the station (2015).

2. CONTEXT

On Saturday, February 5, 2011, a train set to move 25 wagons suffered an accident and crashed one wagon into the administration building. This resulted in damages provisionally calculated at 1.7 million CZK. The initial investigation by the railway inspection suggested that the accident was caused by a poor estimate of the shift workers. In response, Ondřej Rut (Chairman of the Local Organization) indicated at the meeting of the council that the accident may not be just an accident. The responsibility for successfully carrying out the operations was Czech Railways, but they also had an eminent interest in demolishing the building, the internal platform and track, where the accident occurred, which were used rather exceptionally to the date. However, the spokesman of the company (Czech Railways) called the allegations absurd. Despite this, thanks to the insistence of the Ondřej Rut and the public opinion about the event the damages were poorly repaired and the case was closed.

On 31st December 2015 the last carrier using the station took the last wagons, and from 1 January 2016 the railway operation was stopped. Later on, on November 3, 2019, a freight train accident occurred at a nearby station called Prague-Malešice station. The railway administration decided not to restore the switch to Žižkov, and temporarily replaced the switch with a direct track, thus disconnecting the freight station from the railway network. As steps have already been taken to abolish the section of the national railway and the rest of the railway was not used by any carriers, the Railway Administration described this solution as the most efficient, safest and economical, and in view of the ongoing proceedings, this solution was left to a lasting effect.

According to a spokesman for the Ministry of Transport, the removal of the switch did not cause any problems and the Ministry of Transport did not have information that a carrier would make a request related to the intention to operate rail transport on the parts of the runway. However, the Railway Authority did not issue any decision to change the construction.

The capital city of Prague, as a party to the proceedings, did not agree with the cancellation and the Ministry of Transport therefore suspended

the proceedings on the cancellation of the section. The director of the municipal transport department, Libor Šíma, explained the position of the city by saying that the main reason is the planned construction of the city ring road, during which the city intends to use the railway to remove the land (Lidovky, 2011).



Image 11: Accident at the Žižkov freight railway station (2011).

2.4 THE IMPACT OF THE ŽIŽKOV FREIGHT RAILWAY STATION

After its construction in 1936 the Žižkov railways station in Prague became an inspiration for other architects in the country. Being the first massive construction in the old Czechoslovakia, done in the functionalistic style, the station in Žižkov had time to shine and set an example of how the purpose can shape the design. The construction itself was also cheap in correlation to its size, functional use and quality of the materials. This is because the aim on the design is to give purpose and not much more.

Žižkov railways station became an inspiration for other architects and inspired construction like the Jitex Comfort's textile factory, founded in 1949 as part of the industrialization of southern Bohemia. This factory employed two thousand employees in Písek, which had 30,000 inhabitants back then.

The factory was built and permanently supported by state authorities to strengthen the economy of the region (Javůrek, 2019).



Image 12: Jitex Comfort's textile factory (2018)

3. PROJECT

3.1 PRAGUE

Prague, the capital city of the Czech Republic, is renowned for its stunning architecture, rich history, and vibrant culture. Often referred to as the "City of a Hundred Spires," Prague is famous for its well-preserved medieval Old Town, stunning Gothic cathedrals, Baroque palaces, and Art Nouveau buildings. Prague's unique blend of historical charm, architectural splendor, and cultural richness attracts millions of visitors each year, making it one of the most popular destinations in Europe.

With a population of 1,323 million people (2023), the city has a rich cultural heritage, being home to a vibrant cultural scene with numerous theaters, music venues, art galleries, and museums. The high appreciation for culture brings artists and organizers together often to make the city home to multiple events during the whole year, making the city very alive.

Prague counts with an excellent public transport system, characterized by the iconic city trams that transit all around the city. Despite this the city's layout allows for easy exploration by foot, with many of the main attractions within walking distance of each other. The layout is characterized by a combination of architectural styles and a mix of narrow, winding streets, wide boulevards, and multiple parks and squares.

The city is divided into several districts, each with its own distinct character:

Old Town (Staré Město): The historic center of Prague, located on the right bank of the Vltava River. This district is a maze of narrow, winding streets that open up into charming squares. The main square is the Old Town Square (Staroměstské náměstí), where famous attractions like the Church of Our Lady and the Old Town Hall with its famous Astronomical Clock demand the visitor's attention.

Lesser Town (Malá Strana): Situated on the left bank of the Vltava River and characterized by its Baroque architecture and cobblestone streets. The district is also home to numerous palaces, gardens, and the striking St. Nicholas Church.

Prague Castle (Pražský hrad): Overlooking the city perched on a hill, Prague Castle is a dominant feature of the city's skyline. The castle complex includes its own cathedral, places, and various gardens. It is accessed through the grand entrance of the Prague Castle's First Courtyard.

New Town (Nové Město): Despite its name, New Town was established in the 14th century. It is characterized by a more spacious layout compared to the older parts of the city. The main artery of the New Town is Wenceslas Square (Václavské náměstí), a wide boulevard lined with shops, restaurants, and hotels. The district also houses important landmarks such as the National Museum and the State Opera.

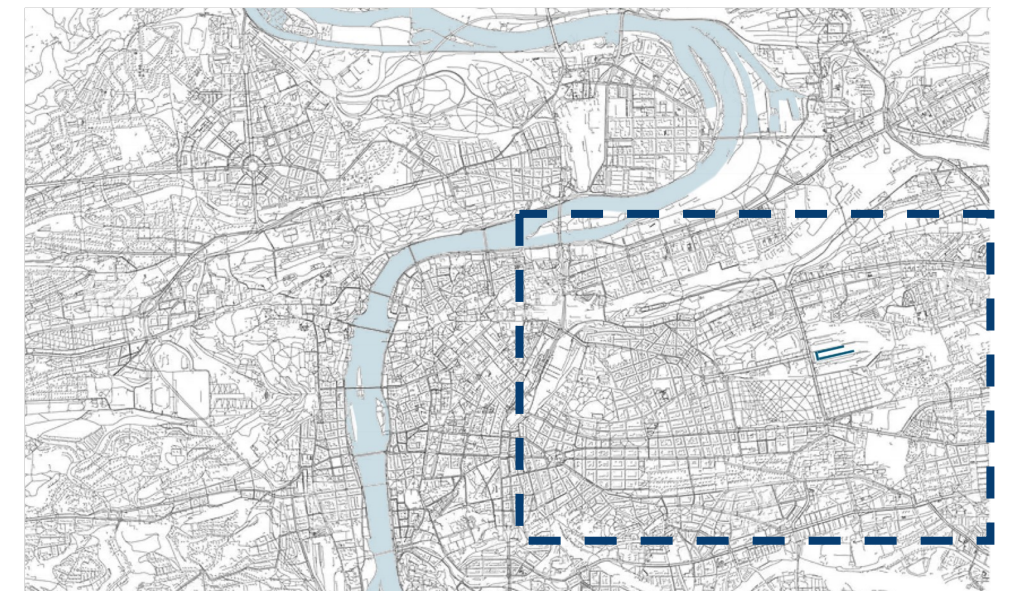
Josefov (Jewish Quarter): Located within the boundaries of the Old Town, it features a compact layout with narrow streets and historic synagogues. The Old Jewish Cemetery, one of the oldest in Europe, is also found here.

Hradčany: This district encompasses the area surrounding Prague Castle. It consists of picturesque streets, charming squares, and beautiful gardens.

Vinohrady: Known for its residential areas with grand Art Nouveau buildings, tree-lined streets, and parks (Carney, 2021).

3.2 ŽIŽKOV

Located on the east side of the city, this district has a more bohemian atmosphere. It has a rich history and distinctive characteristics that makes it a unique and vibrant part of the city. As Prague expanded and industrialized, Žižkov underwent a significant urban development in the 19th century. It became a densely populated working-class district, with factories, tenement buildings, and a burgeoning population of industrial workers. Therefore the district's architecture reflects its history with a variety of architectural styles, including Art Nouveau and functionalist buildings from the 19th and early 20th centuries. Žižkov has long been known for its vibrant and bohemian atmosphere. It attracted artists, writers and intellectuals. It has been a center of cultural and intellectual activity since the early 20th century. The district has a lively nightlife with numerous bars, pubs, and clubs. Therefore it's a popular destination for locals and tourists alike, especially among the younger crowd. Žižkov is also home to a diverse community, including both long-time residents and a growing expatriate population. Its unique and welcoming atmosphere is partly attributed to this diversity and the district's proximity to the rest of Prague via public transportation (Carney, 2021).



3.2.1 CONNECTIONS TO PUBLIC TRANSPORT

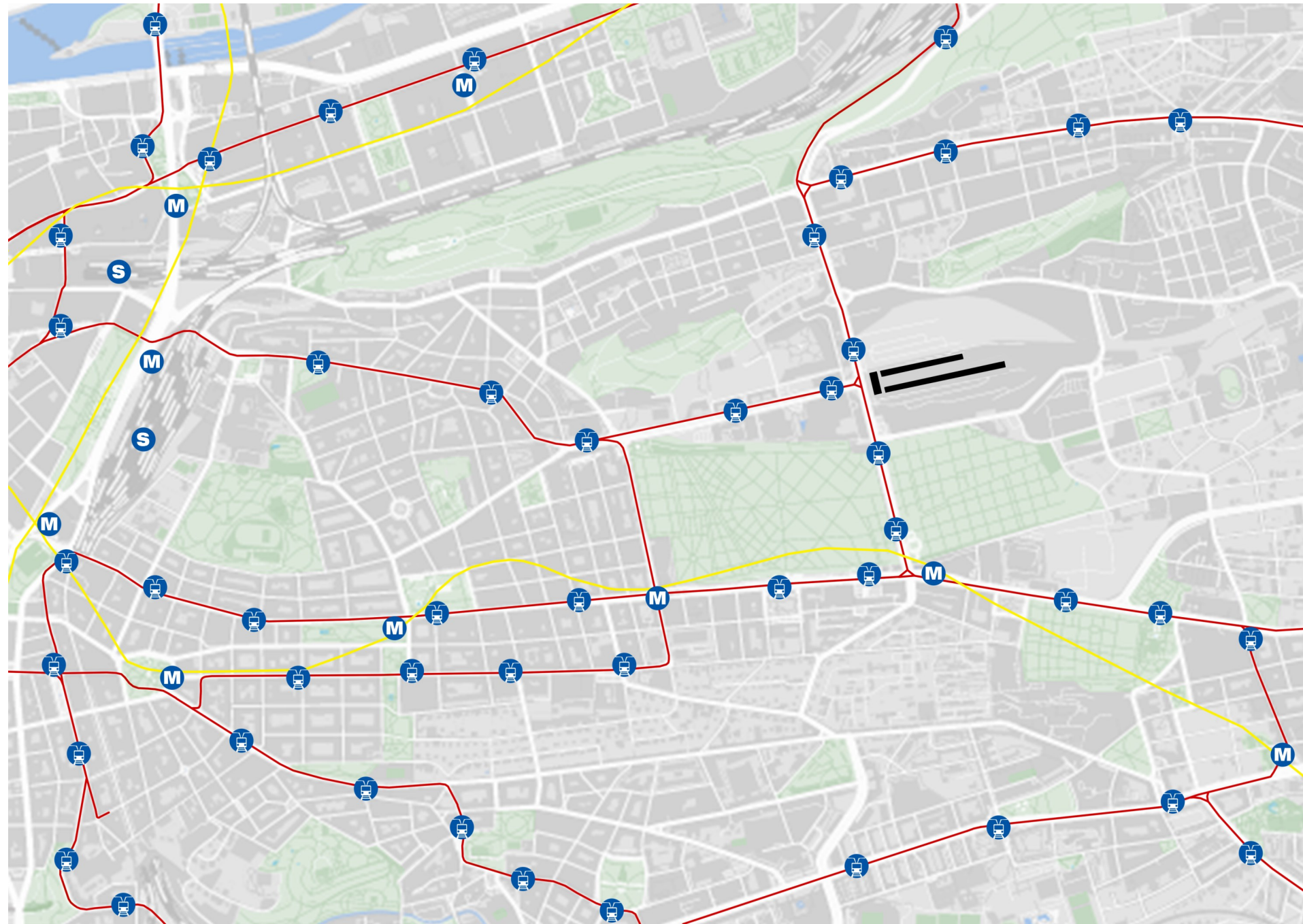


Image 13: Map of public transport in the area



3. PROJECT

3.3 PAST PROPOSALS

Before sinking further into the project, I think it is important to point out that since 2002, as the building gradually deteriorated, losing functionality and gaining historical importance. The public awareness about the future of Žižkov Freight Station grew as the uncertainty about the project was very present then. This uncertainty only grew stronger in 2011 when the previously mentioned accident brought the project back to the spotlight.

Finally, in 2016, architects were invited to take part in a competition to reshape Žižkov Freight Station, followed by a decision by the local council. The competition was carried out and local officials worked in conjunction with the Prague Institute of Planning and Development and the owners of the complex to form the jury (Willoughby, 2016).

My investigation led me to talk to a local architect working in the city hall in Prague 3 (where the district is located). His name is Zdeněk Völfl, and he explained to me that there were multiple proposals submitted to the jury but none of them was elected as a winner. Apparently the local council did not unanimously agree on a winner since all of the proposals presented a redesign of the complex too radical for the character of the building (Völfl, 2023).

One of the proposals was "Žižkov City" by the local firm named "Sekyra Group". This proposal aimed to repurpose the space to be the cultural and social center of the entire locality, with a square of truly generous dimensions. This public space could have been one of the largest squares in the whole city. Aside from the plaza the project included a large addition of apartment buildings that would have been built on top of the existing structures (Sekyra Group, 2016).



Image 14: Žižkov City, visualization (2016)

3.4 PLANS FOR THE DISTRICT

In my search to find the answer to why so many proposals for this project had failed, I decided to turn my attention to what the city of Prague really wanted for this district. To find this answer, once again turned to the city hall for answers. Ostensibly, after years of uncertainty about the project, on the 21st of October 2020, the city hall in charge of the Žižkov (Prague 3) released a full study of the area describing the future plans for the railway station and surroundings. Since 2006 experts have been studying the area trying to find the best option for its future development. After declining several options, the city hall decided to develop the neighboring area to the station, to the North, into high density housing. Meanwhile the railway station will be used for housing as well as for cultural purposes, such as the national film archive, galleries and an elementary school. The construction of the neighboring area to the north has been in process since 2022 while the solution for the railway station is currently still under discussion.

The council in charge decided that the goals of this project are:

- The emergence of a new city district
- A series of interconnected parks and public spaces.
- Preservation of a listed freight station building.
- A new tram line in the area.
- Green promenades for pedestrians and cyclists.
- New transport connections that will enable the public transport relation to the east of the city (Romanov, 2022).

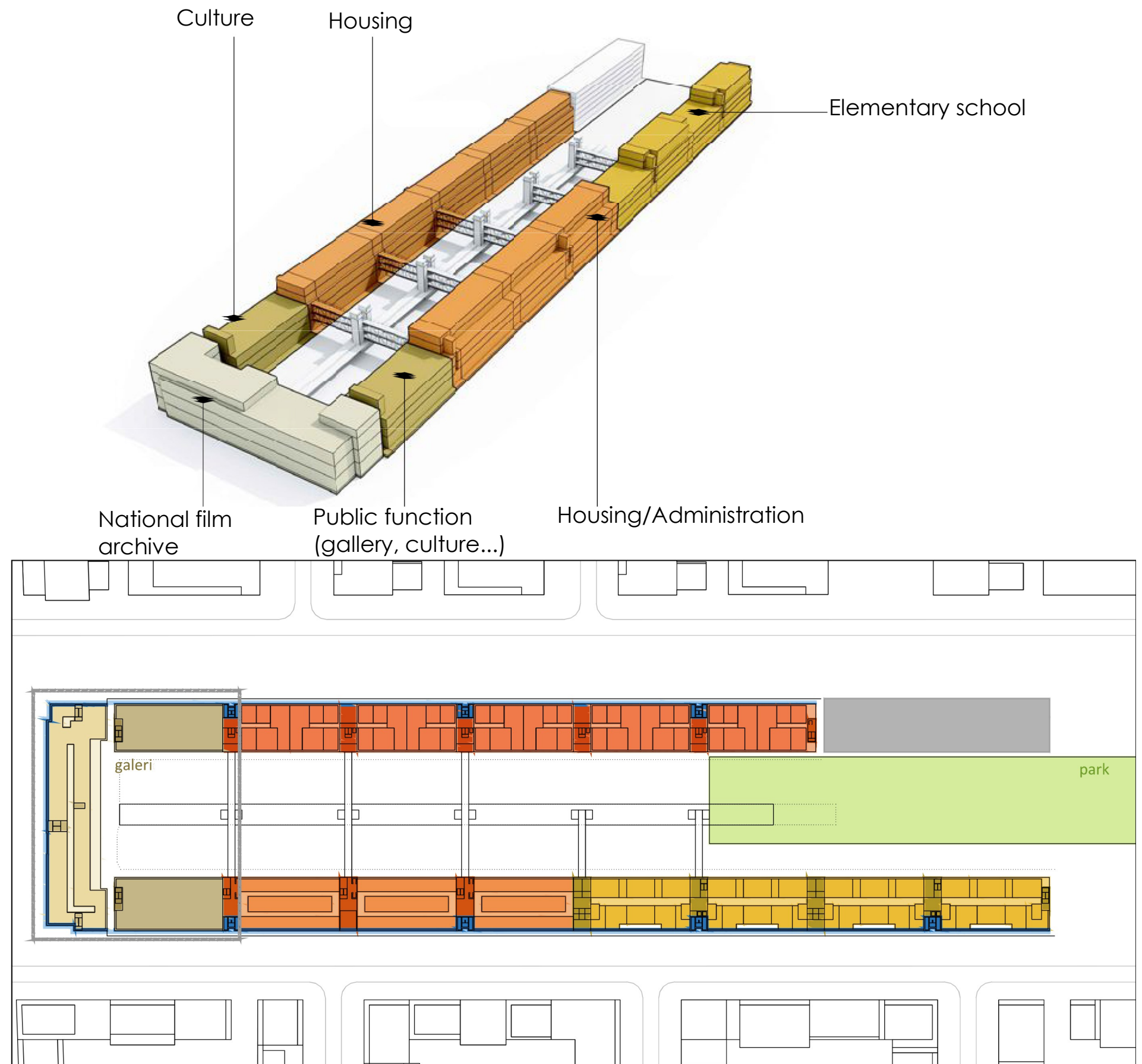


Image 15: Development diagrams

3. PROJECT

3.5 AFFORDABLE HOUSING SHORTAGE IN PRAGUE

The shortage of housing is a significant issue in many major cities around the world, including Prague. To better understand the city hall's plan of destining most of the available for housing, I decided to continue my investigation but this time focusing on the issue of housing shortages. Over the last few years, there has been a significant increase in rents in Prague, which is causing problems especially for students and other people with limited financial possibilities. Personally, I struggled a lot in August 2022, when I moved to the city. My faculty only had a few shared dorms left to offer, many landlords wouldn't rent to foreigners and the dwellings that were available were very costly. There are several factors contributing to this problem, but the major ones are population growth, limited new constructions and real estate speculation.

There are currently various projects and initiatives that are trying to improve the situation of student housing in Prague. However, most of the projects in Prague are built by developers aiming to gain future profits and the question is whether any of them will also target affordability in the future. In any case, trends from Western Europe suggest that builders' interest in students will grow since it seems like a profitable business too.

The analysis states that in the year 2022 alone, investment in special-purpose student accommodation facilities reached € 11.7 billion across Europe, a year-on-year increase of 130 percent. But the same can't be said about affordable housing for families, for instance (Němec, 2023).

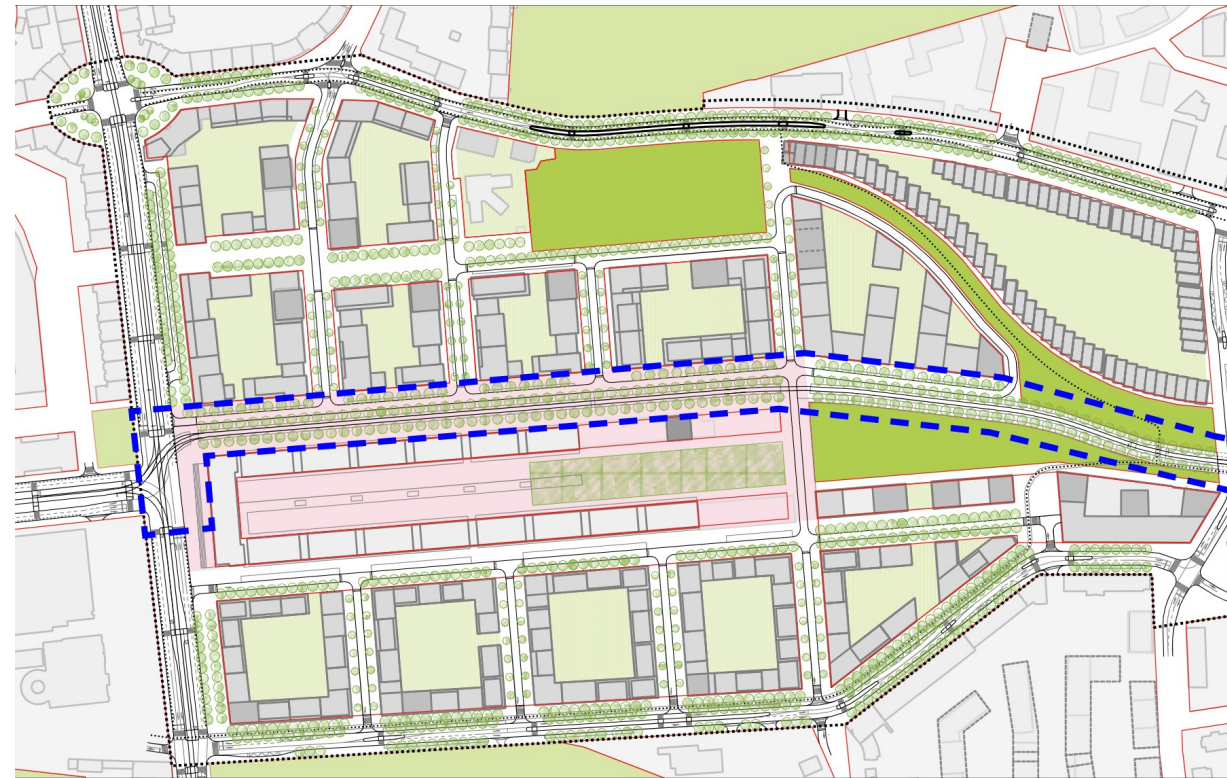


Image 16: Development siteplan.



Image 17: Project "New Žižkov Centre" by CENTRAL GROUP, a.s.

3.6 ORIGINAL SITE PLAN

Číslo projektu: 111 54
 Datum: 20. 10. 1953

1893 03 053

žst. PRAHA-ŽIŽKOV nákl.n.

1:1000

Československá státní dílny
 Ústav železnižské architektury
 111 54 Praha 1, Dlážděná 6
 22. 10. 1953

OV ČNV 3
 Útvar hlavního architekta
 hlavního města Prahy
 Tento výkres je nezávislou součástí
 projektu železnižského staništního
 nákladního výšného
 číslo 1893 03 053
 pod E 1 72 800 / 63-1
 Podpis: E. C. D. V. P. 1953

Legenda:

- Kabel 22 kV
- - - Kabel na 6 kV

6.

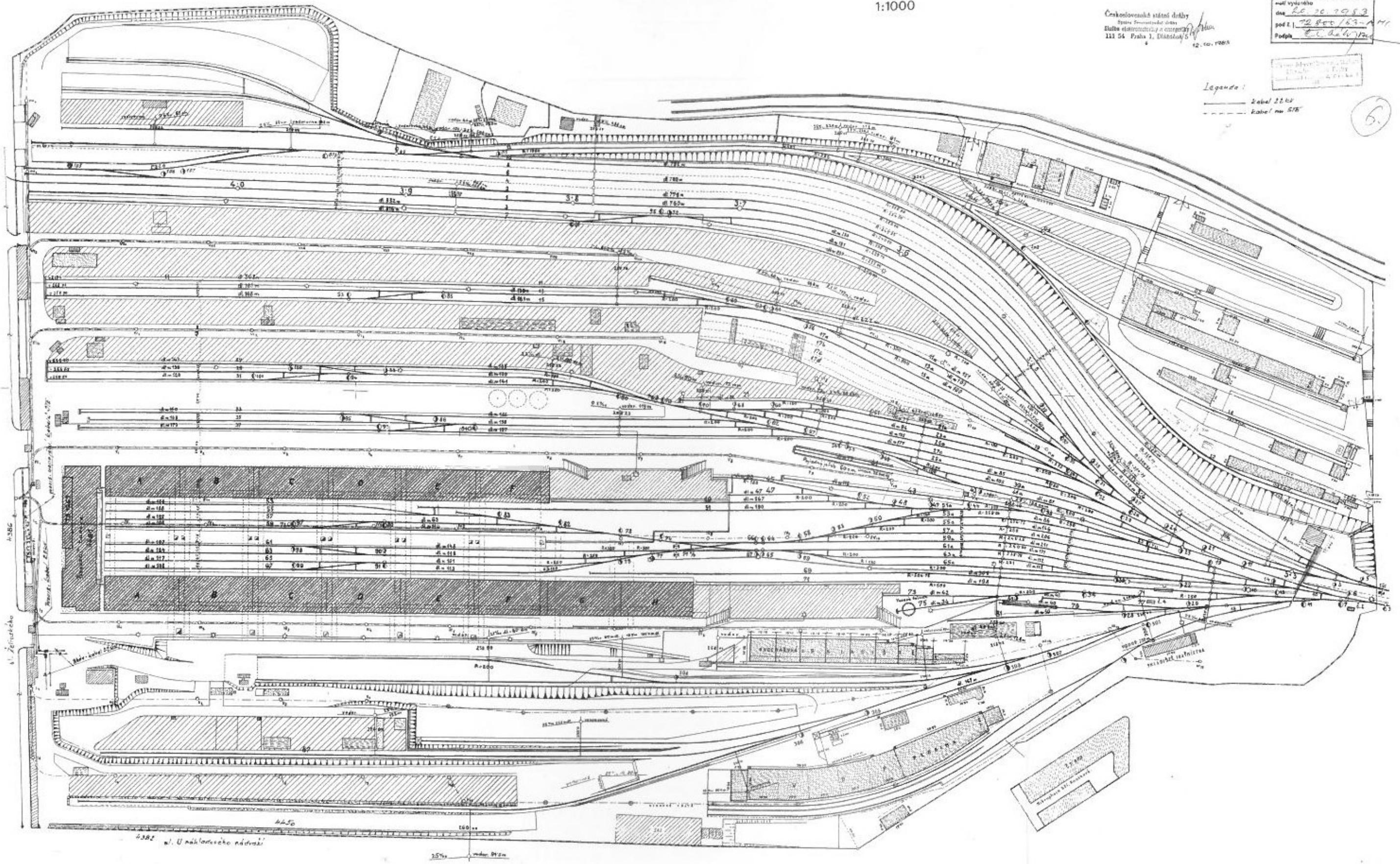
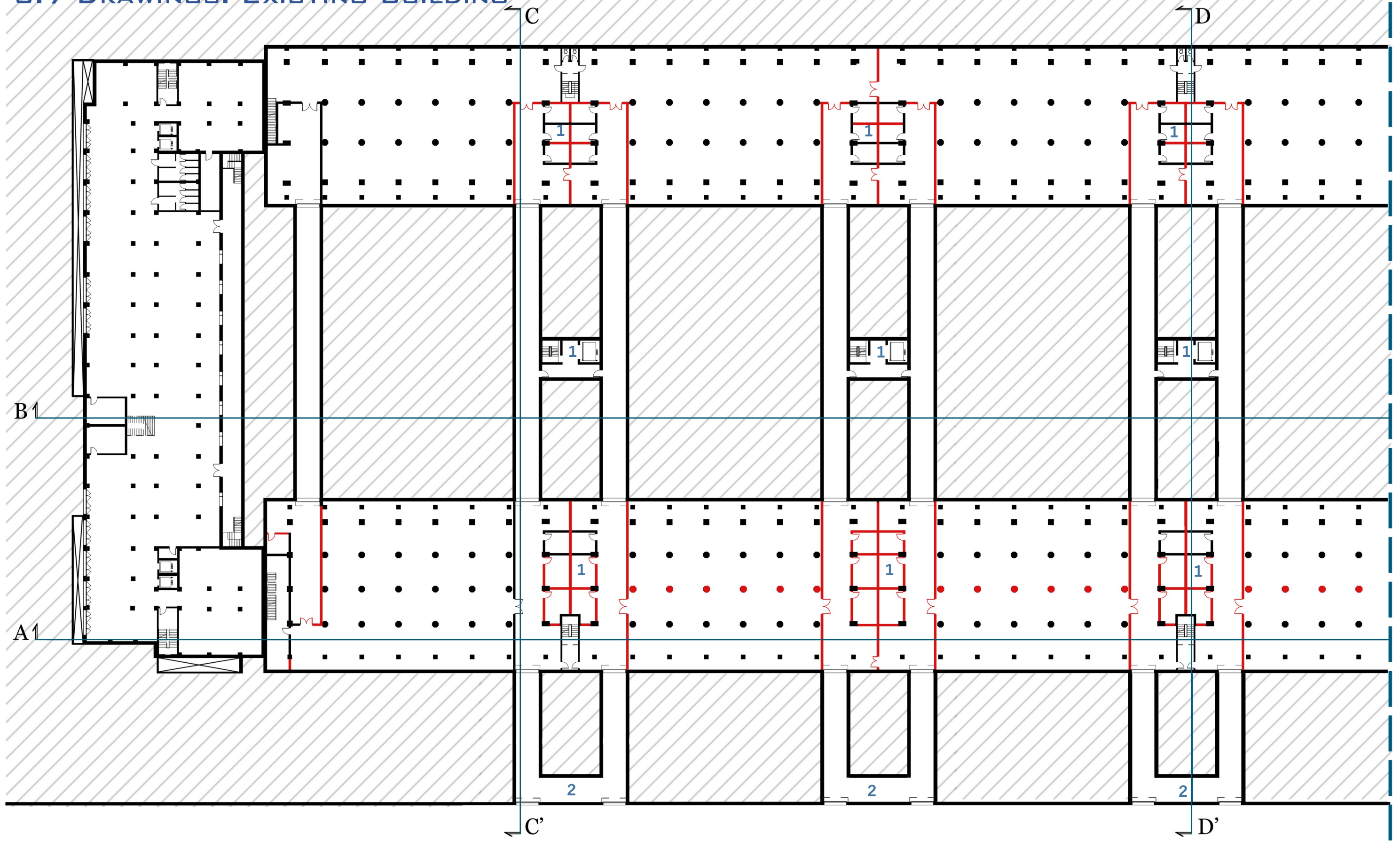
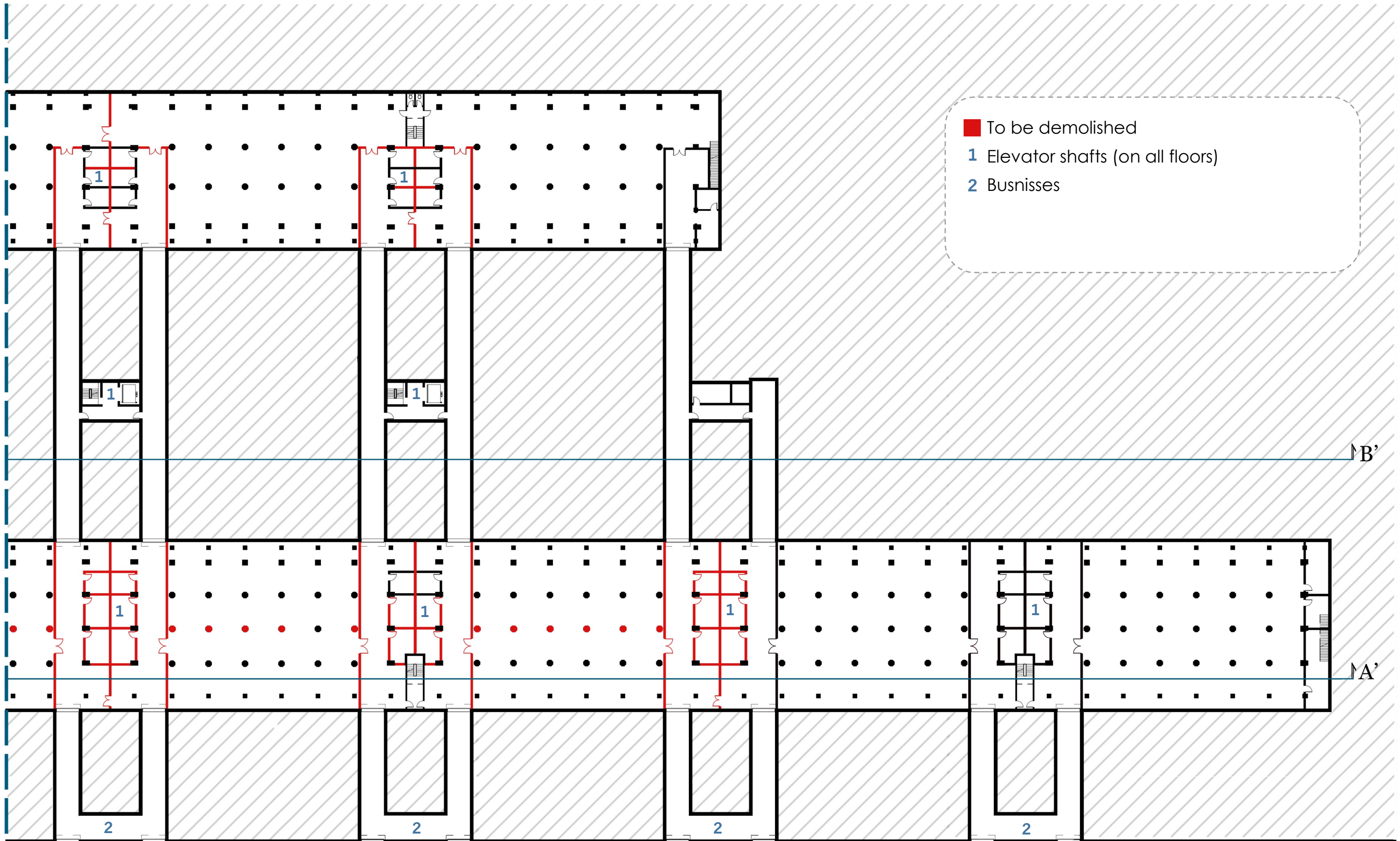


Image 18: Original historical site plan

3. PROJECT

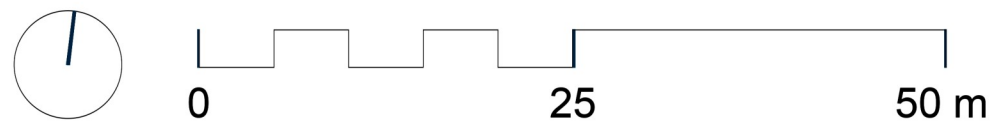
3.7 DRAWINGS: EXISTING BUILDING





- To be demolished
- 1 Elevator shafts (on all floors)
- 2 Busnisses

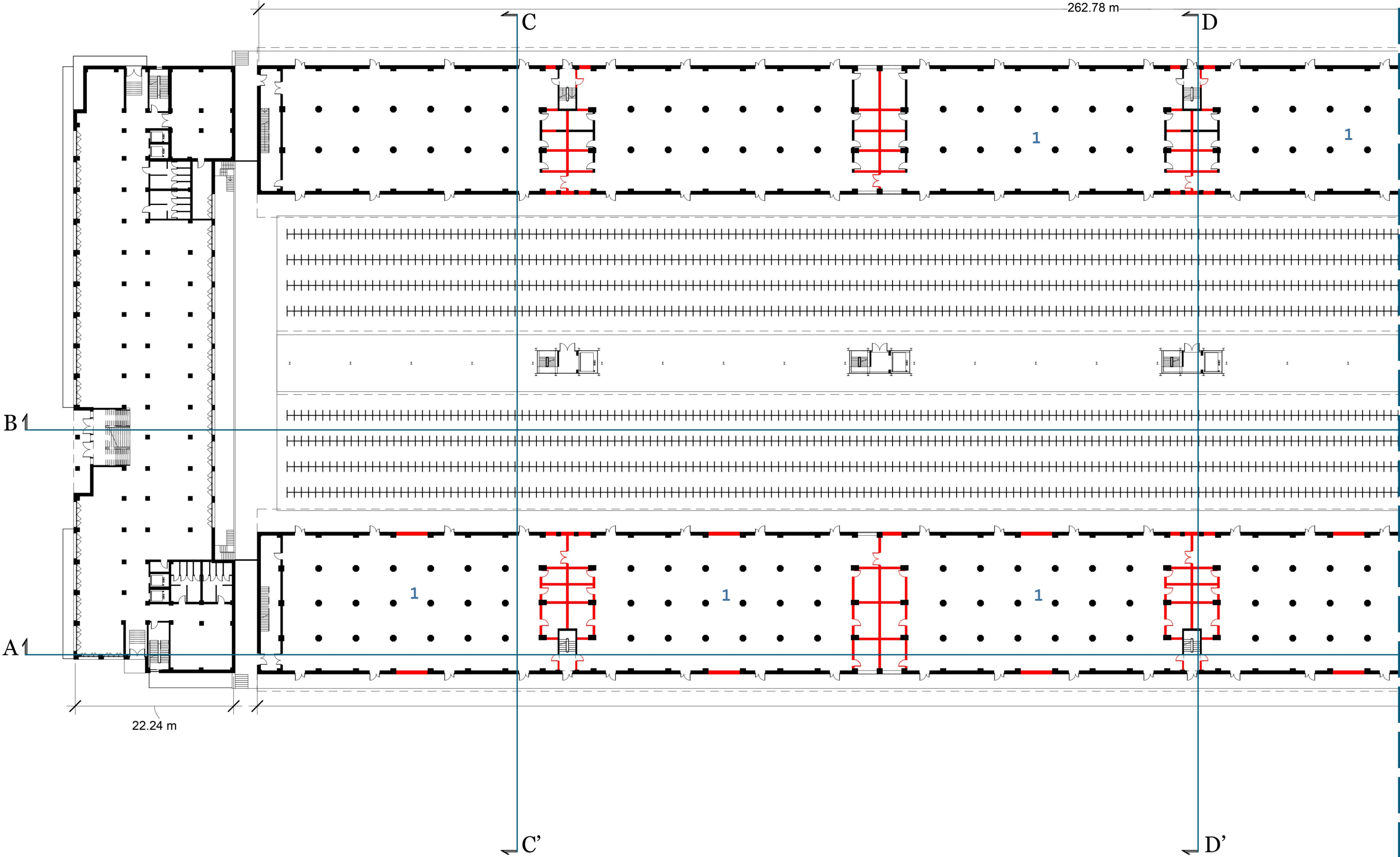
Underground Floor

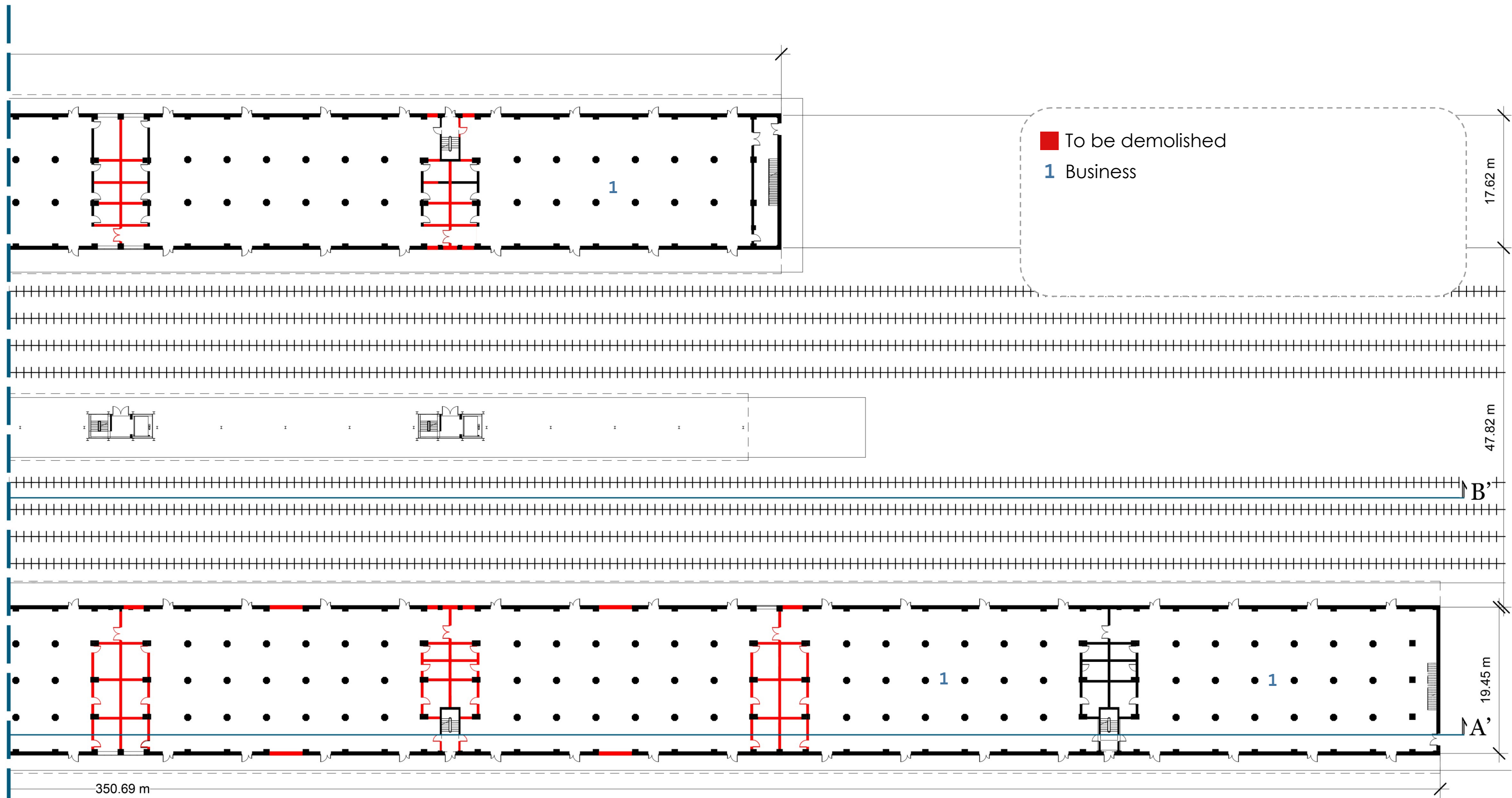


Scale (A3)

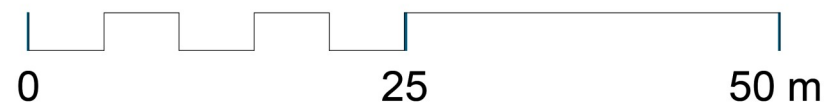
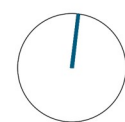
1 : 500

3. PROJECT





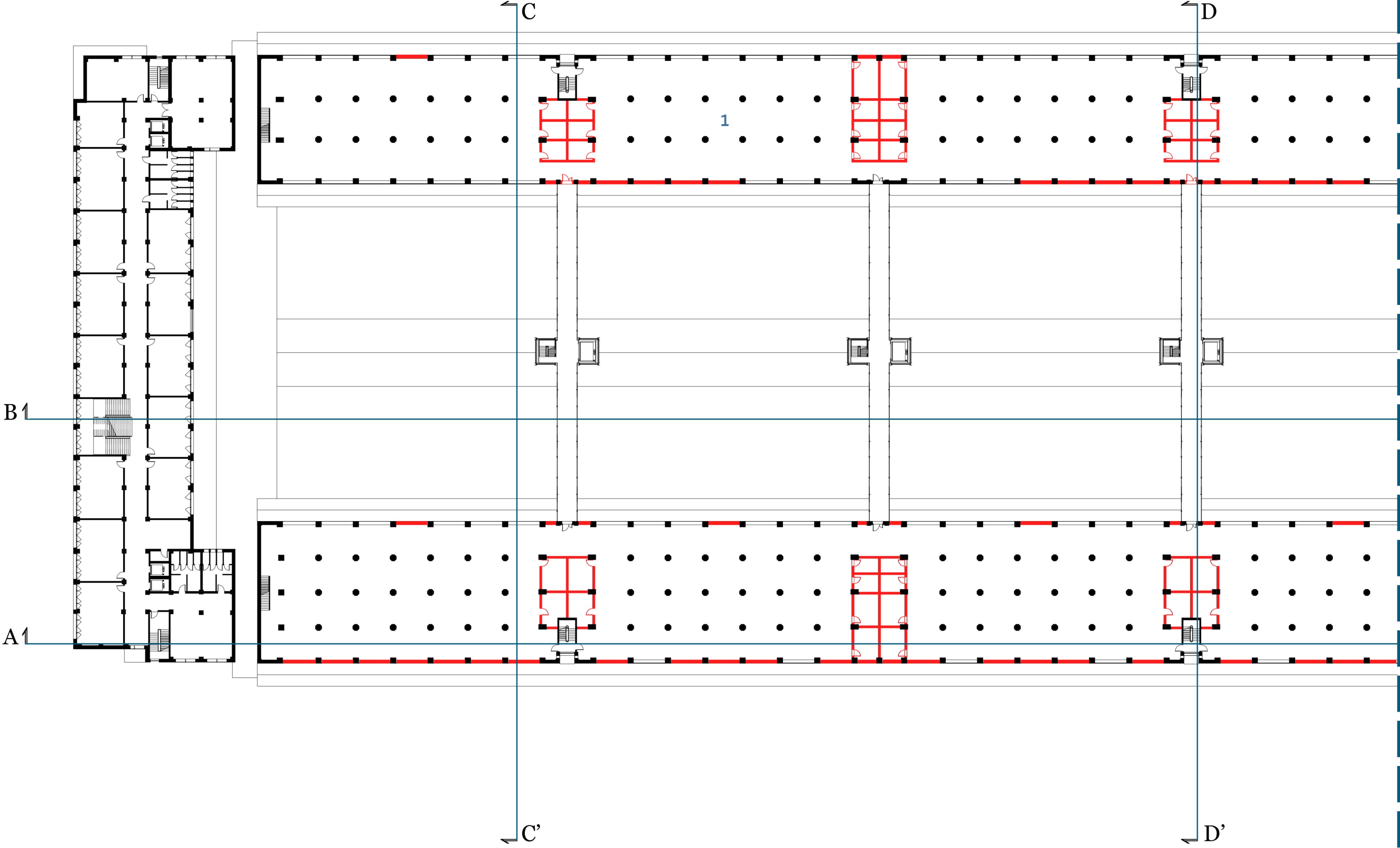
Ground Floor

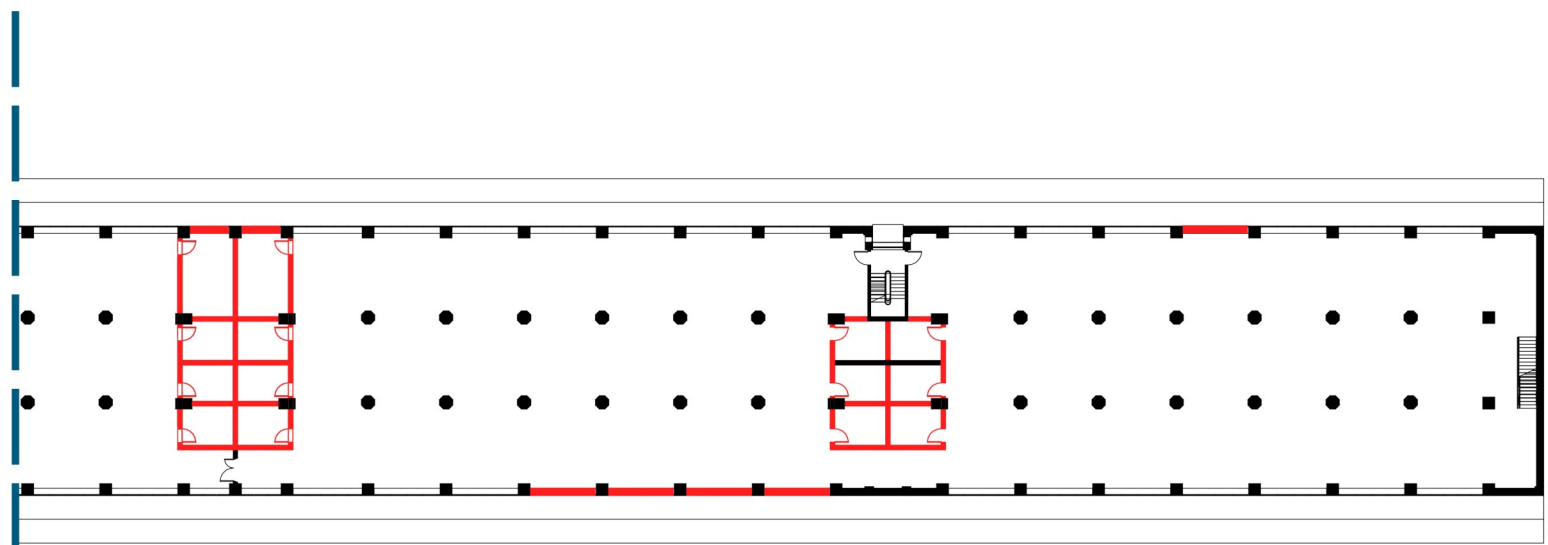


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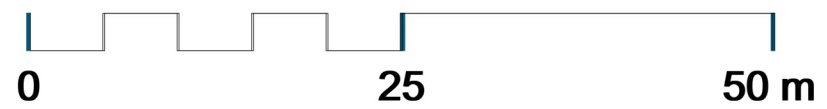
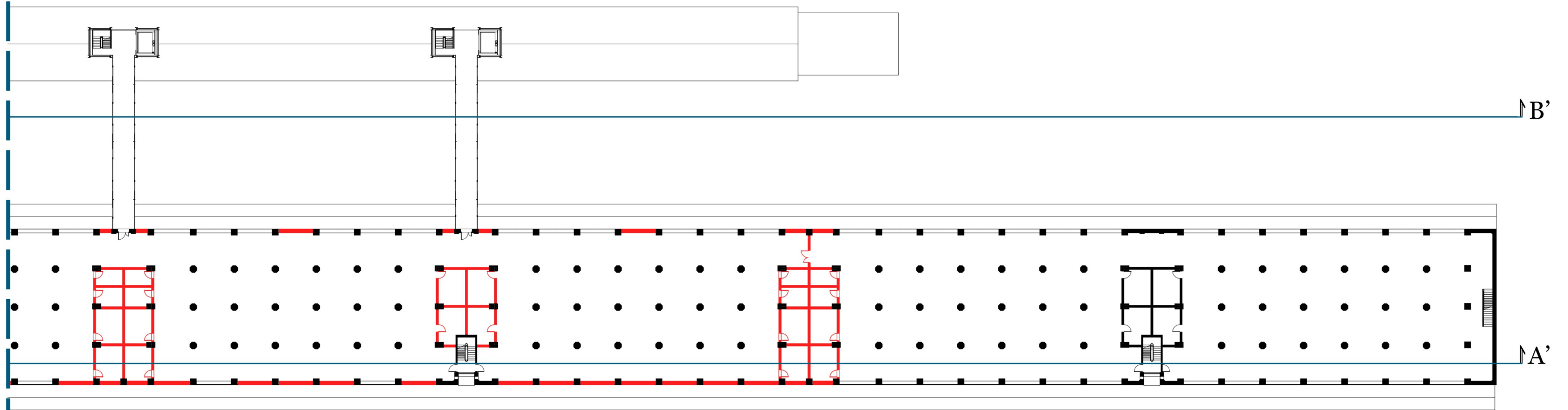
1 : 500

3. PROJECT





■ To be demolished
1 Business

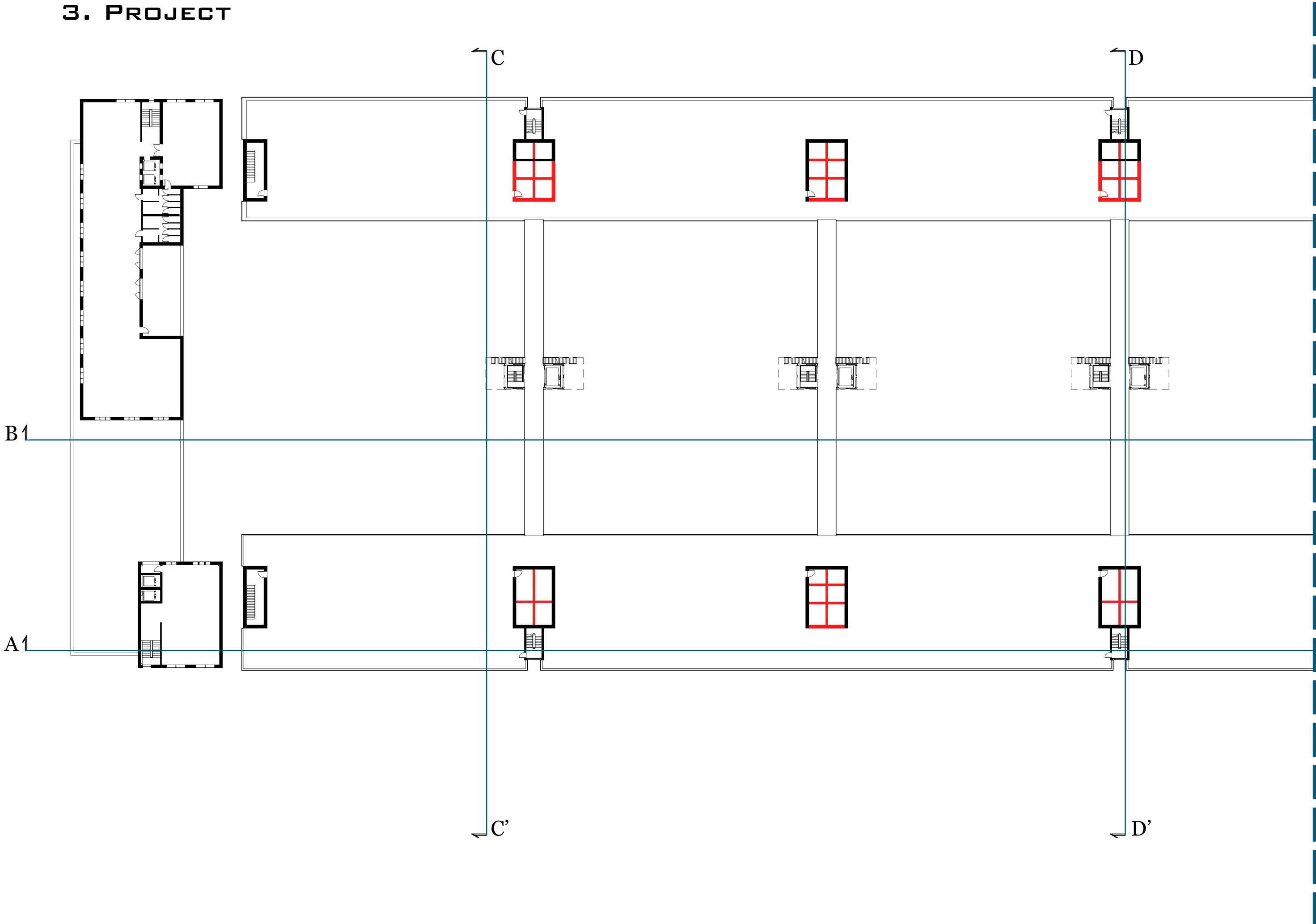


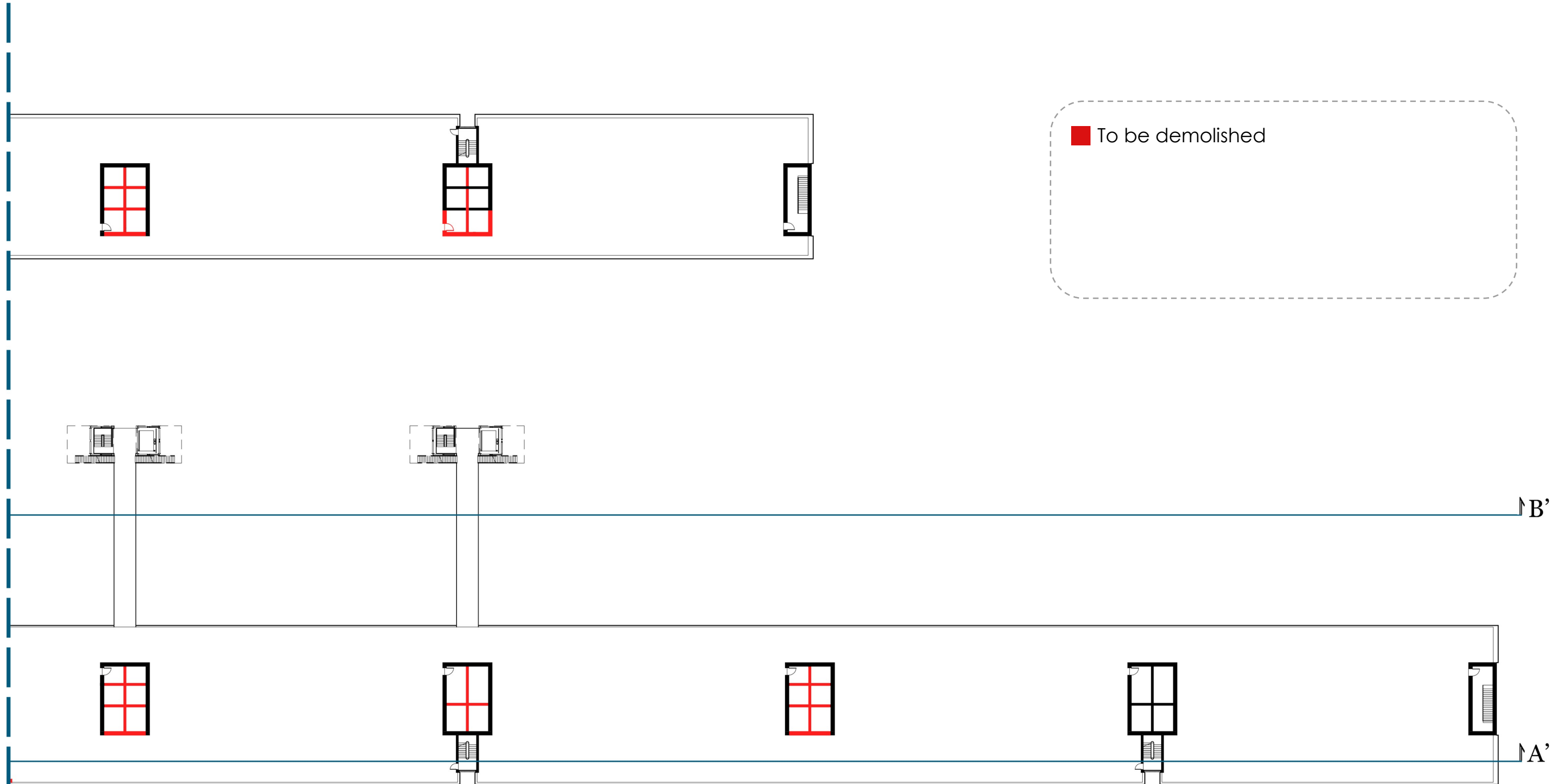
First Floor

Scale (A3)

1 : 500

3. PROJECT

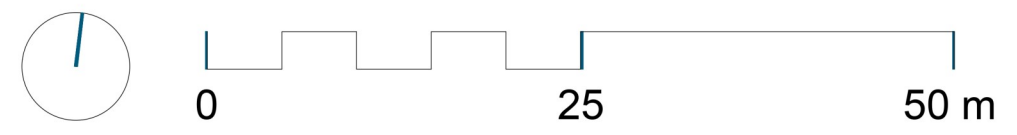




Third Floor

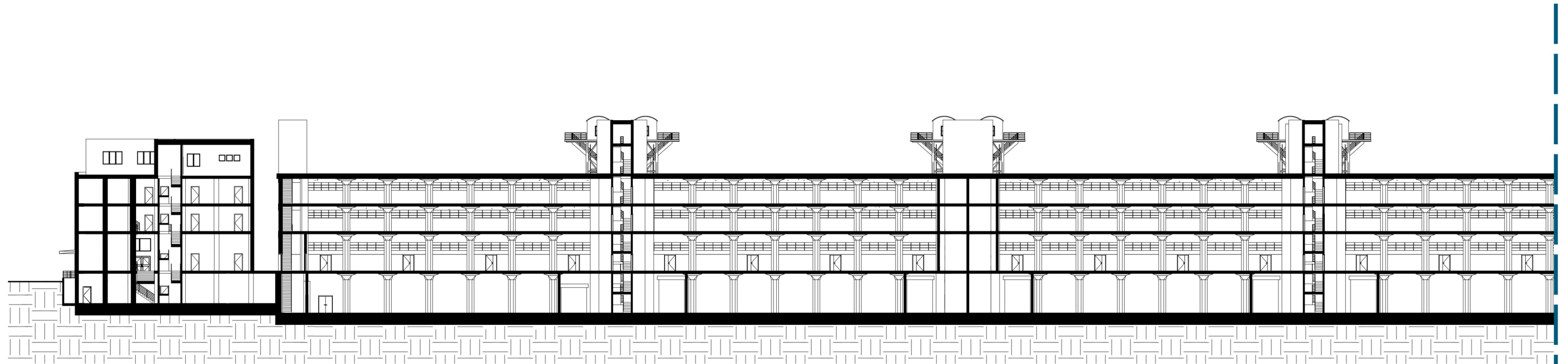
Scale (A3)

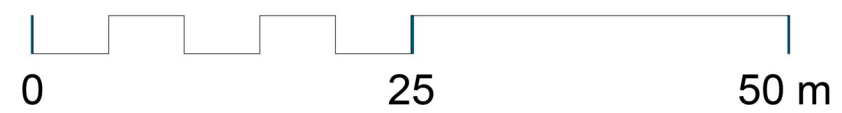
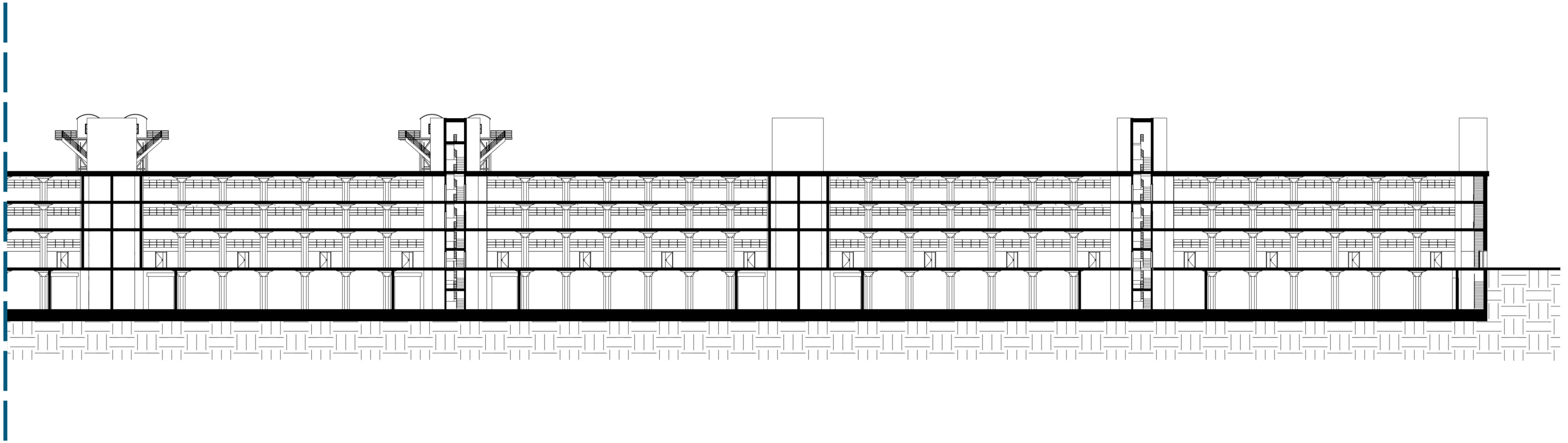
1 : 500



3. PROJECT

3.8 DRAWINGS: SECTIONS



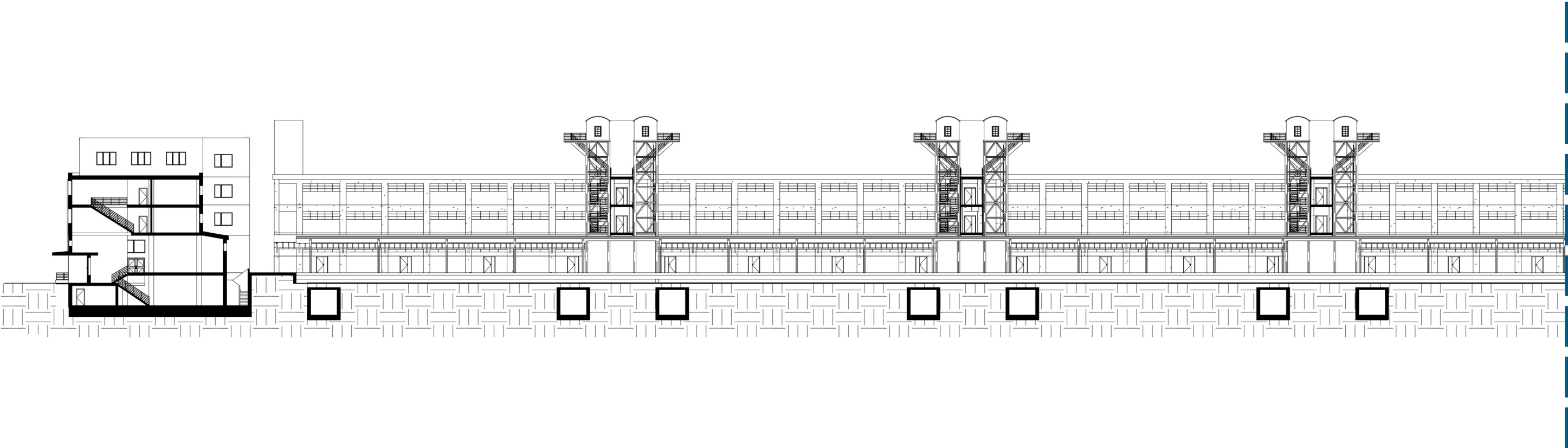


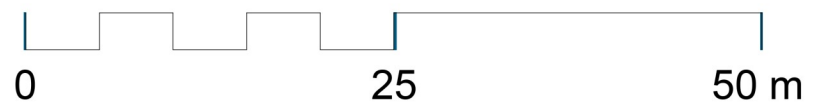
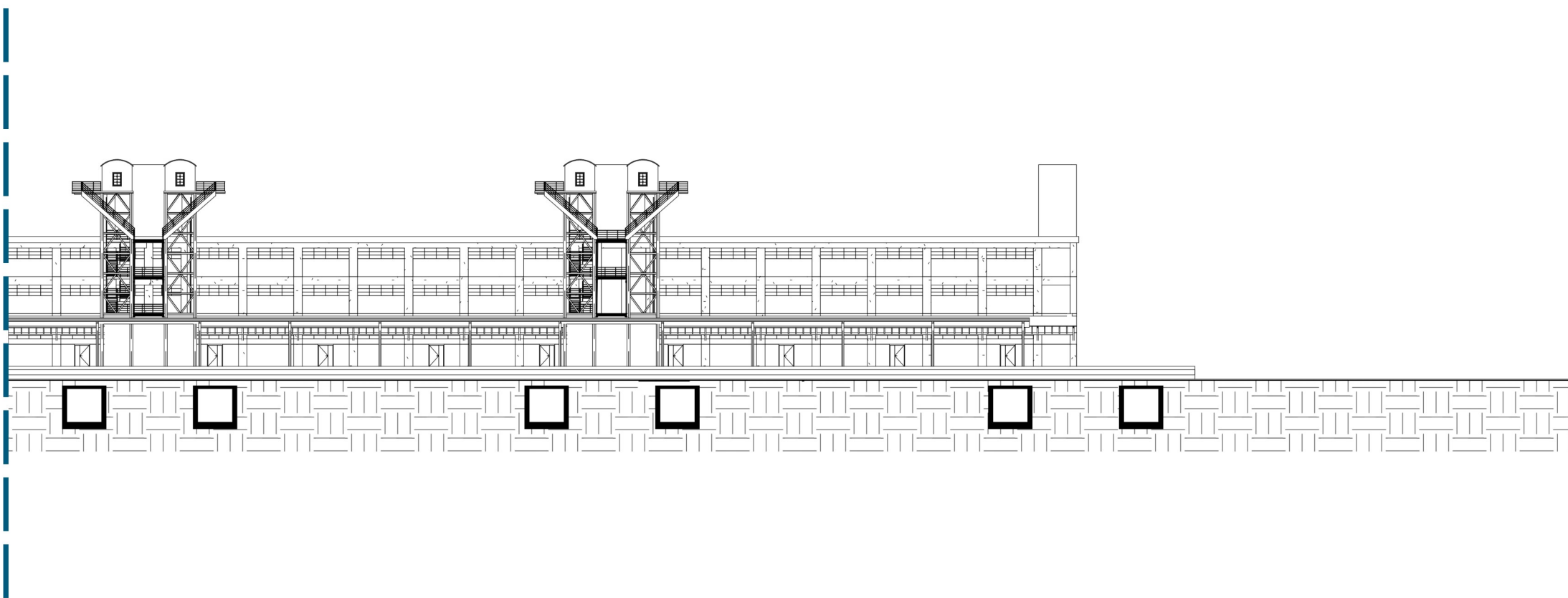
Section A-A'

Scale (A3)

1 : 500

3. PROJECT



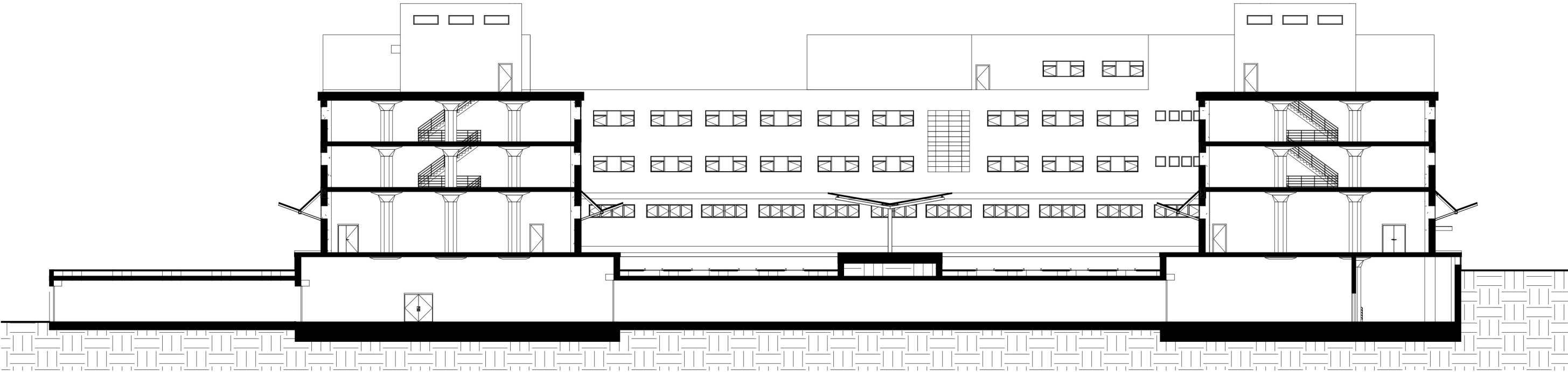


Section B-B'

Scale (A3)

1 : 500

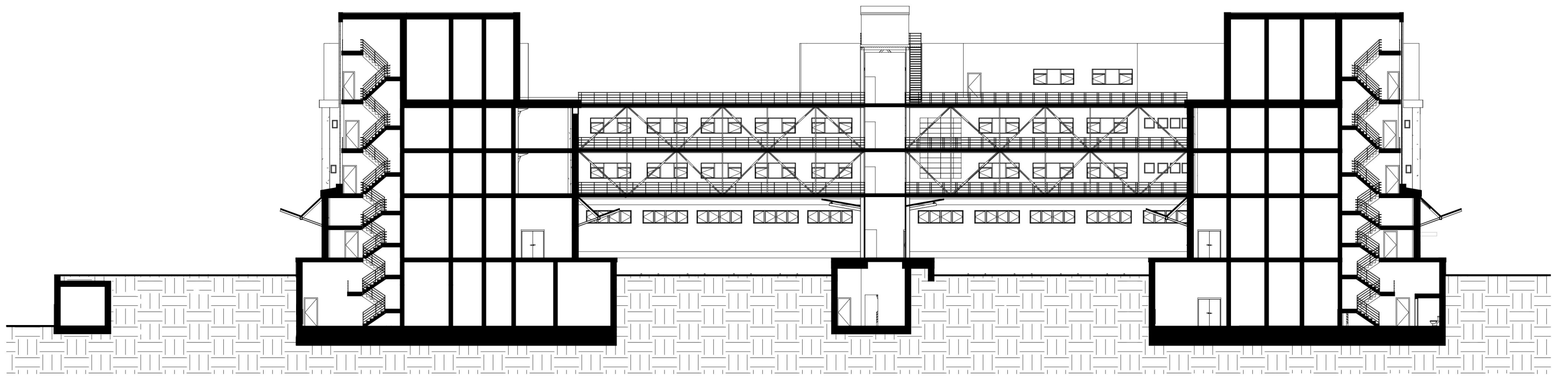
3. PROJECT



Section C-C'

Scale (A3)

1:300



Section D-D'

Scale (A3)

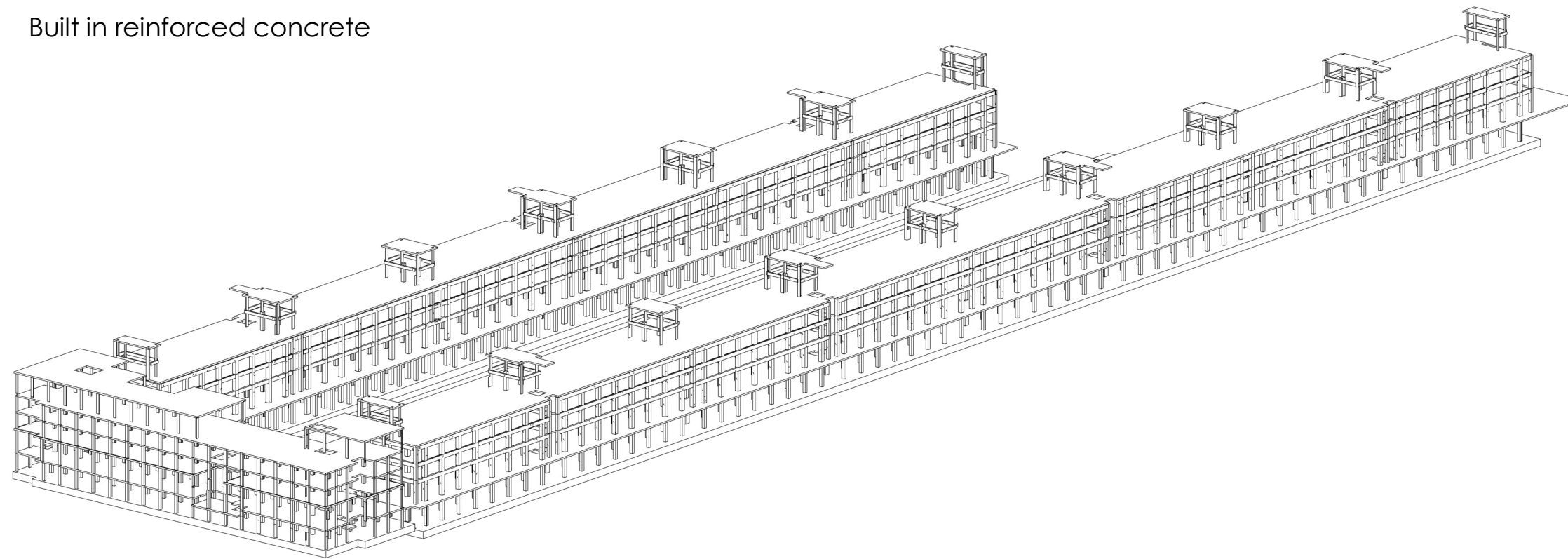
1 : 300

3. PROJECT

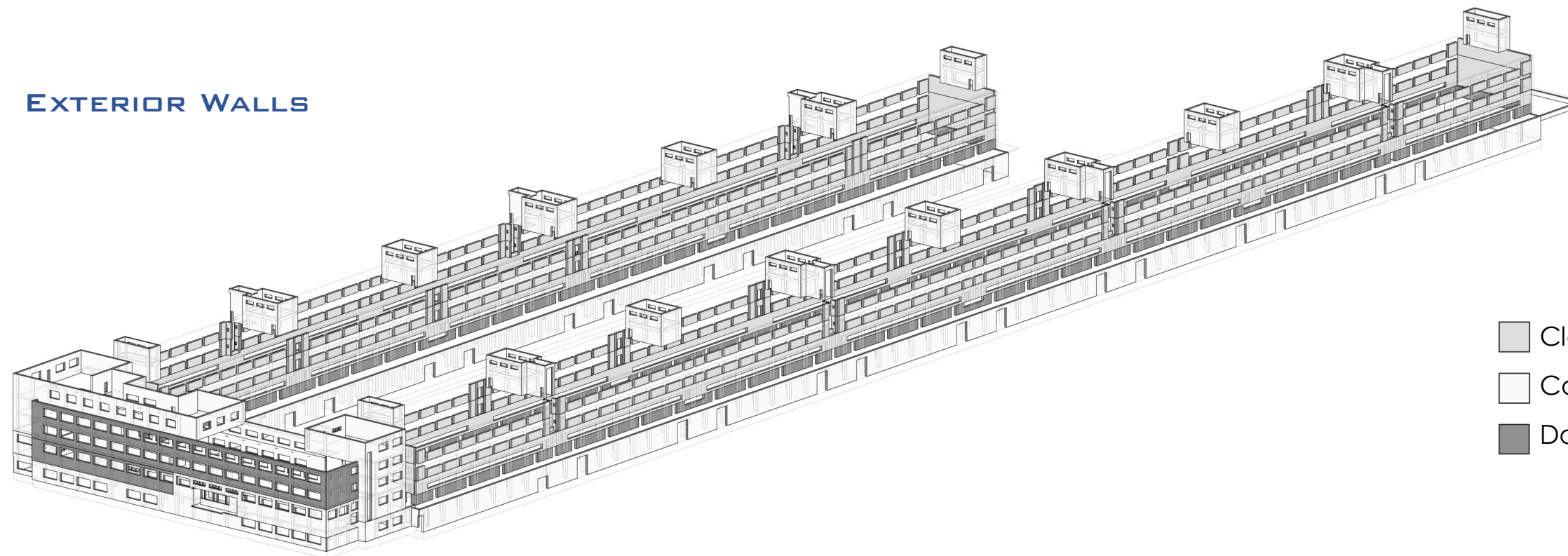
3.9 CONSTRUCTION ELEMENTS

BEARING STRUCTURE

Built in reinforced concrete

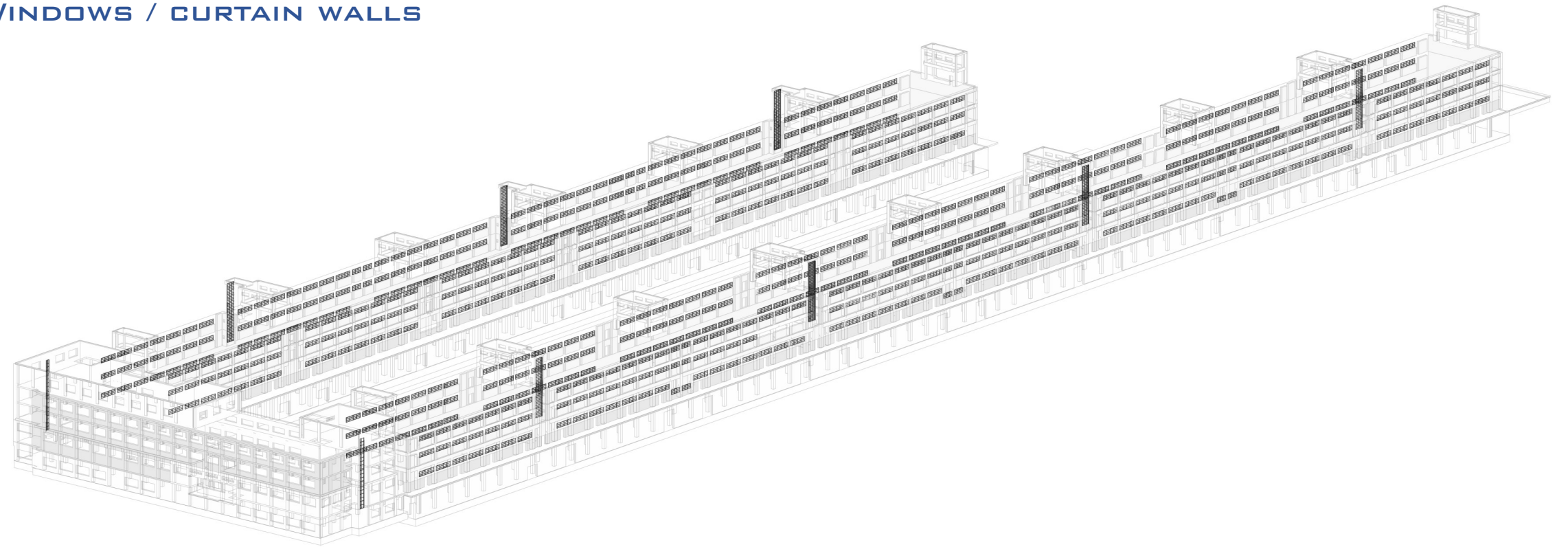


EXTERIOR WALLS

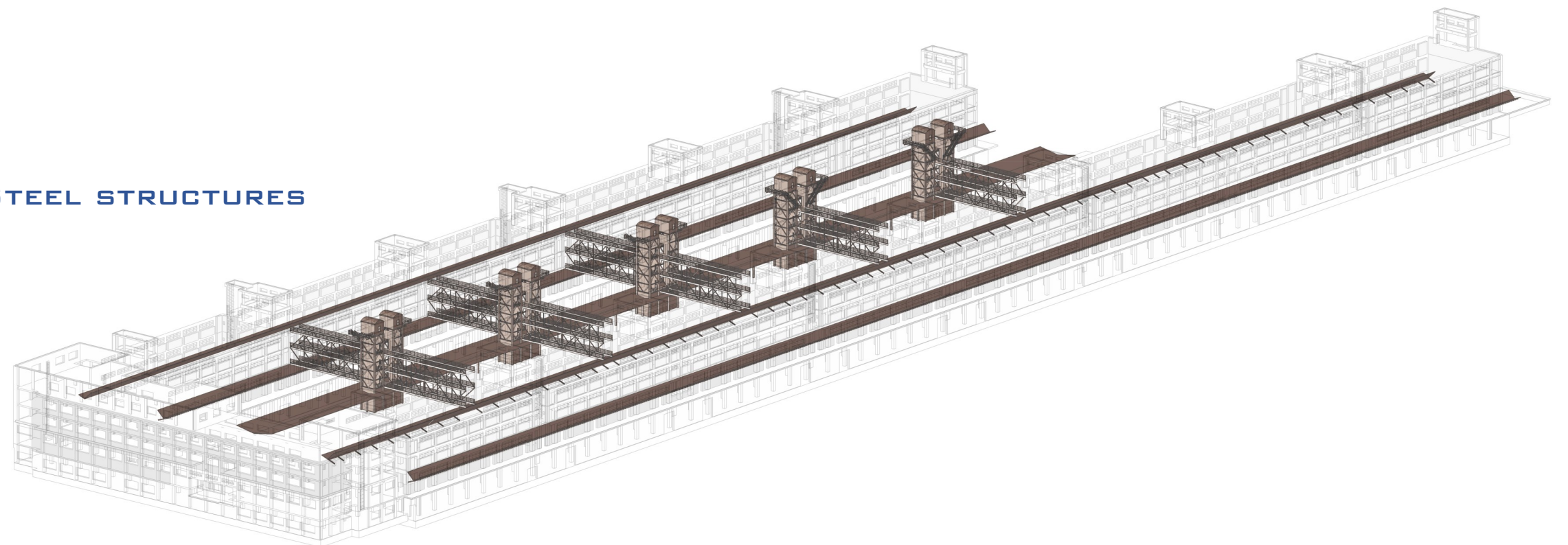


- Clay brick (filling)
- Concrete wall
- Dark brickwall

WINDOWS / CURTAIN WALLS



STEEL STRUCTURES

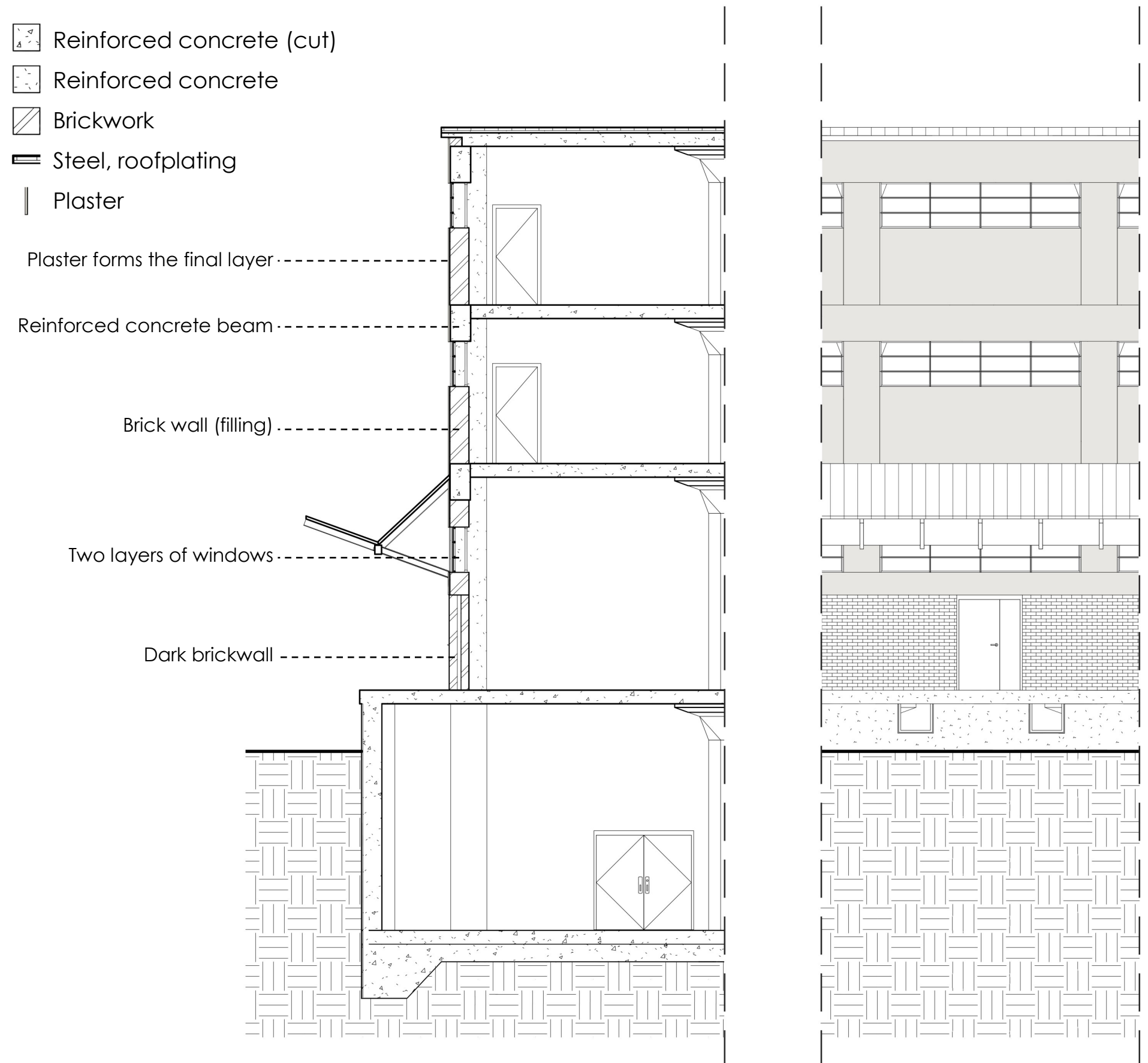


3. PROJECT

3.10 FACADE MATERIALS

This complex of buildings is primarily built with three materials. Reinforced concrete being the most abundant throughout the whole construction. This material has been cast on site to create the structures of all three buildings, including columns, floor slabs and bearing walls. Reinforced concrete was also used to build the roofs, staircases and facade walls of the administrative building. Both warehouses, unlike the administrative building, have a regular pattern in their composition. In each warehouse, the entirety of the facade is composed of sections, where the structure marks the rhythm with a series of columns inside. Each section is formed primarily from three materials: bricks (of two different types), reinforced concrete and a 4.4 m x 1 m window. The original frames of steel windows are single layered. Additional modern windows were added to the interior of each opening at some point to help maintain the temperature inside. Dark bricks form the base of the ground floor directly exposed to the outside, while lighter clay bricks are used to fill in the spaces between the columns and beams. Together with the windows, they complete the previously mentioned section that forms the facade wall.

The clay bricks and the reinforced concrete structure were originally completely covered by a layer of lime plaster, which today has peeled off in certain areas revealing the materials behind. Taking a closer look at the facade (image 18 or 33) we can see that the plaster detachment has primarily happened on concrete structures. This tells us that the two materials absorb and release moisture at different speeds. Concrete is rigid while plaster changes form more freely, resulting in poor adhesion of the two materials. The filling brickwalls, on the other hand, while also rigid, consist of porous bricks walled with lime mortar. This combination binds much better to the plaster finish and it therefore shows less damaged overall.



3.1 1 CURRENT CONDITION

The usage of the complex is reduced to small commercial uses. According to my investigation on site, I found a lot of daily movement of people in the area. Apparently the administrative building is being used for administrative purposes and twelve businesses are operating inside the warehouses, all of them working on the ground floor, except for one ski store on the first floor. Additionally, there are four stores on the underground floor, facing the parallel southern road and a small fabric shop near the complex's entrance. This constant activity in the area and the security service hired to protect the site is certainly helping the maintenance of the building.

The interiors of the buildings are in good condition, showing minor to no signs of damage. On the other hand, the exterior is in most need of repairs. While most of the courtyard has been taken over by nature, the warehouses' facades are in most need of restoration. Aside from the reparation done to the administrative building after the accident in 2011, there are no signs or records of any maintenance done to the construction.

The most noticeable damages are the detachment of the plaster which has gradually lost its adherence to the facade. This exposure caused some cracking of the clay bricks due to frost, and also corrosion in some parts of the exterior reinforcement inside the reinforced concrete. The tuffer dark bricks forming the base, with a much lower porosity, are in excellent condition and are in no need of restoration. The administrative building, as well, may only need to be newly painted, but which otherwise is in good shape.

Other elements forming the complex like the steel towers, bridges or even the windows show a lot of rust but no signs of structural instability, the structural integrity would had to be tested.



Image 18: North facade, staircase in the center.



Image 20: Steel towers.



Image 21: Entrance to the complex.



Image 22: Site view, administrative building in the center



Image 23: Staircases inside the administrative building



Image 24: View of the courtyard from a second floor, administrative building in the center.



Image 25: Southern entrance to patio



Image 26: Northern street



Image 27: Parallel street to the South. Direct access to the underground floor of the complex



Image 28: Courtyard



Image 29: Facade



Image 30: Curtain wall and ceiling. Picture taken from the staircase's inside



Image 31: Inside the Northern warehouse, second floor.

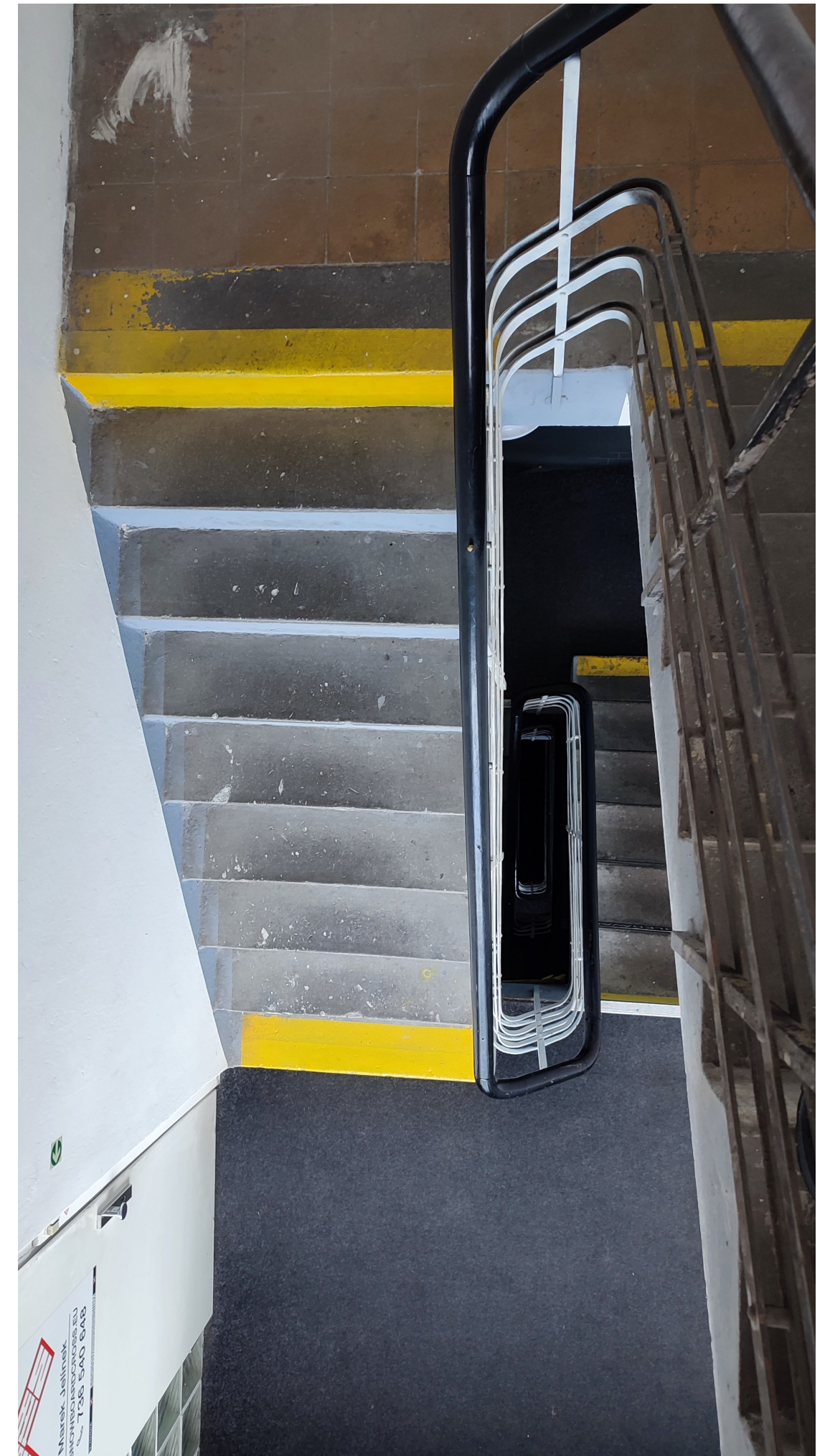


Image 32: Staircase, inside the Northern warehouse



Image 33: Facade to the North, highlighting damages.

3. PROJECT

3.1 2 VALUE ASSESSMENT

The architectural significance of the Žižkov freight railway station is notable for its history. This building is a relatively well preserved example of functionalistic architecture from the time, characterized by the emphasis on practicality, minimalism and functionality.

Like most functionalistic buildings, the facades of the warehouses show a noticeable pattern that is repeated throughout the whole length of both buildings. In this pattern we can see the importance of every element, as the columns mark the rhythm keeping the same dimensions in every section. These sections are dominated by the steel-framed windows that give an industrial character to the building.

Another feature of the complex that adds to the industrial feeling of the place are the steel towers that connect the complex together. These towers are one of the most characteristic elements of the station and are a landmark that, if given a new use, are worthy of preservation for their historical value.

The enormous amount of materials used for this construction are a clear sign of how this building was built to last in time. Modern standards could consider the building's solid thick walls and sturdy structure as overdimensioned. Having said that, we also know that the warehouses were used to support heavy supply transits, making them more than suitable for normal housing loads. While the 45cm thick solid walls result in less isolation material required to meet the housing standards, therefore lowering the costs if converted to housing.

Another relevant fact to take into consideration when assessing the value of this complex is the current state of the structure. Unfortunately, I could not find any technical details of the construction so I had to base my assessment on assumptions

and evidence visible on the facade. Even though seeing steel exposed to the exterior is a dangerous sign I assume that these steel rebars are not the main reinforcement of the structure. I made this assumption for several reasons. I measured 5mm of diameter on these visible steel rebars, while structural rebars are much thicker and buried further into the structure (see image 29). Aside from being too close to the outer face, these thin rebars are also placed in square order as if they were mesh, practice used to keep an outer face together. This is not how you place structural reinforcement. In light of these facts, as well as the fact that the floor slabs and columns are structurally thicker than needed, at respectively 900mm and 300mm, I assume that the warehouses are structurally sound.

Previous analyses of the area and land use policies are also factors to be considered. There is a strong real estate market in the area with high demand for housing and cultural spaces. The building's dimensions and location is well-suited for adaptive reuse. This versatility of the building highly influences its value which may explain why the authorities and owners have been so careful about the building's future for all these years. Multiple competitions and projects have been submitted as transformation proposals without ever being carried out.

According to my investigation, which led me to personally talk to one of the city architects, Martin Zitek, no one has ever presented a transformation proposal that respected the historical value of the building highly enough while presenting a use of the building truly viable.

3.1 3 MY RESTORATION PLAN

Firstly, and since this project is (at least for now) theoretical, I will consider the approval of the project and the foundations to be out of the equation.

Since the damages to the facades vary throughout the length of the buildings, the restoration process would require a different approach to every part of the facade. Despite this, a general plan can be made to establish the guidelines to be carried out during the process.

After evaluating the damages, **sanitation** would be the first step of the process. Firstly, every loose piece of material hanging from every surface (to be restored) shall be removed. This means, in the case of the warehouses' facades, removing all plaster, any piece of loose mortar or other materials. Or any loose rust or debris in the case of steel structures. With steel, using a wire brush or wire wheel attachment on a drill is an efficient way to remove loose rust or other materials. After the surfaces are sanitized and dust has been removed, **prevention** measures are an important next step to consider. In the case of metals chemicals or primer need to be applied. In the case of masonry walls, the surface needs to be smoothed again using mortar to fill the cracks and imperfections.

When the mortar is set the **reskin** process can begin. Healthy steel shall be repainted with rust protection.

The restoration plan need maintain detailed records of the restoration process. These records can be valuable for future reference and for meeting any historical preservation requirements.

3.1 3.1 WINDOWS

Steel frame: Fortunately, the old windows are in relatively good condition, the steel frame has aged well keeping its original shape. In the other hand, since the paint has peeled off over the years, the exposed steel shows signs of rust.

Since the steel frame cannot be removed to comfortably work on the windows restoration, without breaking the glass. I suggest that rust could be removed by scraping with a metal brush or steel wool. After cleaning off the oxidation the frame would be ready to be painted again with rust protection, keeping its historical character.

Windowpanes: Most of the windowpanes are dusted but in good conditions. By walking around the buildings, I could sight a maximum of 20 windowpanes that were broken. Since most of the glass can simply be cleaned for a successful restoration, I think the few windowpanes that are missing can be replaced by custom made windowpanes.



3. PROJECT

3.1 3.2 REINFORCED CONCRETE

The structural part of the facade shows corroded steel in the assembly's interior. This can be dangerous if sanitation is not carried out correctly. To have a better understanding of how I should approach this restoration my investigation led me to contact "Sika AG", a Swiss multinational specialty chemical company, suppliers of the building sector. After discussing the state of the building and hearing their professional opinion I decided to the procedure should be as follows:

As a first step, all the loose plaster or poorly adhered materials must be removed. The idea is to uncover the steel and clean it with a jet of sand. This process will remove oxidation and leave the reinforcement clean. After renzing the surface, a chemical product of choice should be applied to prevent future corrosion. I chose to use a bonding primer and corrosion protection in one to easy the process. I decided that Sika's "Monotop 910", a cementitious polymer modified one-component coating material containing silica fume, could be a good option. This should protect the material and ensure a long lasting life.

After the passivation process has been completed, we proceed with coating the surface using new mortar paste. Once the repair process is finished, the facade is ready for the desired finish.



3.1 3.3 CLAY BRICKS (FILLING)

Just like with the reinforced concrete, the first step here is to remove all loose plaster, mortar or poorly adhered materials. This can be done using a wire brush to ensure that the cracks are free of any loose material before proceeding to the next step. If the cracks are in the mortar joints and the mortar is deteriorating, a masonry chisel and hammer can be more useful to carefully remove any loose or deteriorated mortar.

The cracks need to be evaluated to determine their width and depth. If the cracks are too wide, they may require more extensive repairs or replacement.

After the removal of unwanted material is done, new mortar can be applied, making sure that the mortar matches the composition of the existing one as closely as possible. This mortar paste is meant to fill in the cracks and smooth the surface. Before the mortar fully hardens, it is possible to remove any excess mortar until the desired smooth surface is achieved. After, the desired finish can be installed.



4. TRANSFORMATION





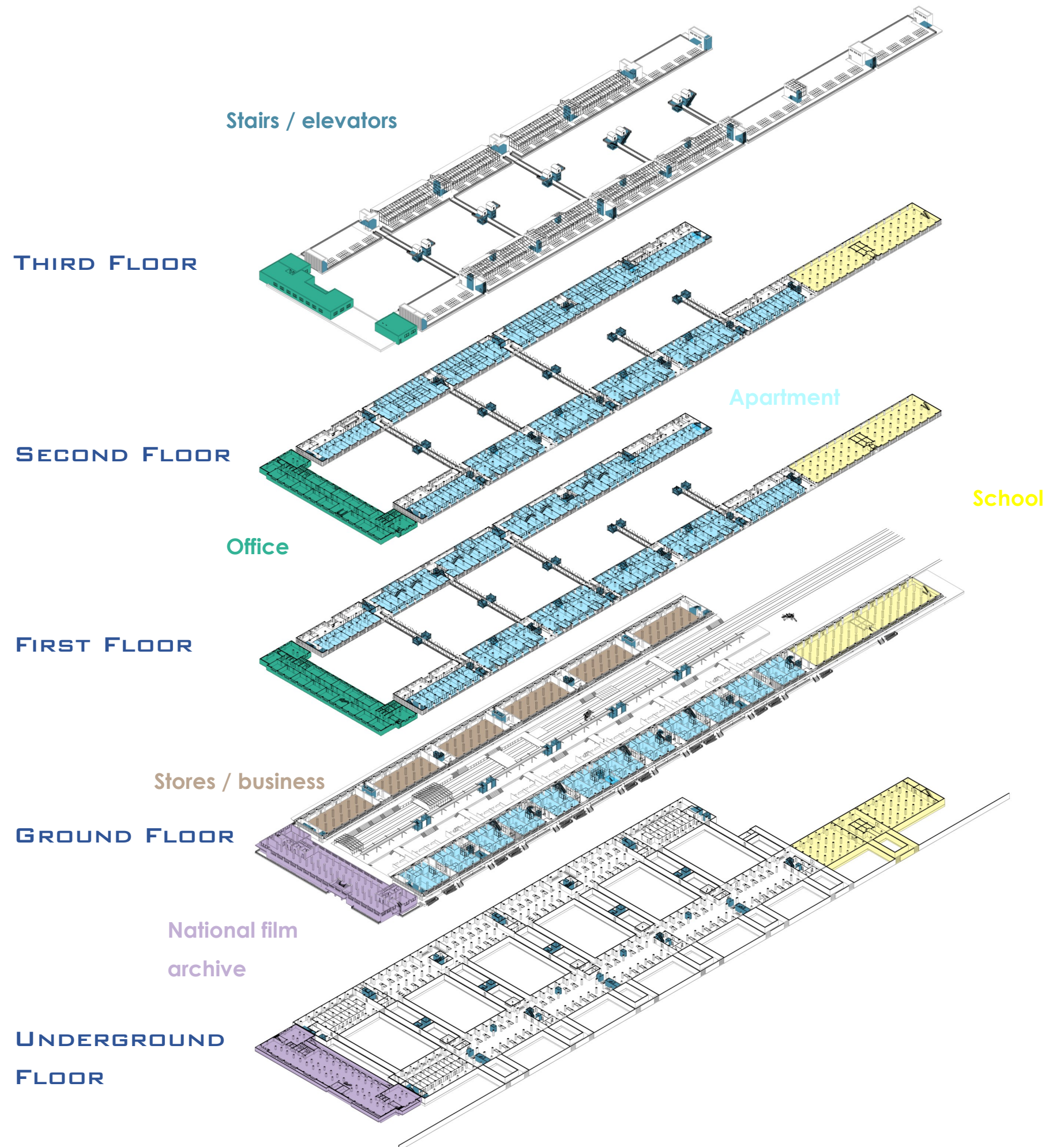
4. TRANSFORMATION

4.1 MY PROGRAM

This project strives to find a suitable reuse of the Žižkov freight railway station while respecting its history and particular industrial character. Within these frameworks, my proposal aims to create a unique atmosphere where sustainable and comfortable housing fits in. I also wanted to propose a solution to this complex that partly follows city hall's plan of creating a national film archive, an elementary school and offices. I modified their proposal and, without discarding their other plans for the building, I aimed most of my efforts at creating more apartments since I consider this to be the bigger problem in the area. I also reduced the usage of indoor space for cultural events and instead placed them in the courtyard of the complex. I propose to recycle the existing train tracks by placing a series of platforms that can provide different uses, and among these uses is hosting cultural events. There are also common and recreational spaces found inside the buildings and these can be accessed by all residents of the complex.

Since a lot of effort went into creating high quality apartments, it is worth mentioning that a major challenge to consider was how sunlight reaches the interior of the buildings. The warehouses have only one facade facing South, therefore I avoided designing a solution with central distribution or apartments that only face North. Instead, my design emphasizes on transparency, opening the South facades and making layouts as flexible as possible. There is a wide variety of apartment typologies following this principle, where apartments from 1 and up to 4 bedrooms can be found. This is to create diversity inside the complex.

I added greenhouses to the rooftops, partly to reuse the heat inside the building but mostly to emphasize the community and sustainable aspect of the complex. These greenhouses could be used as winter gardens or to grow vegetables.



4.2 SITUATION PLAN

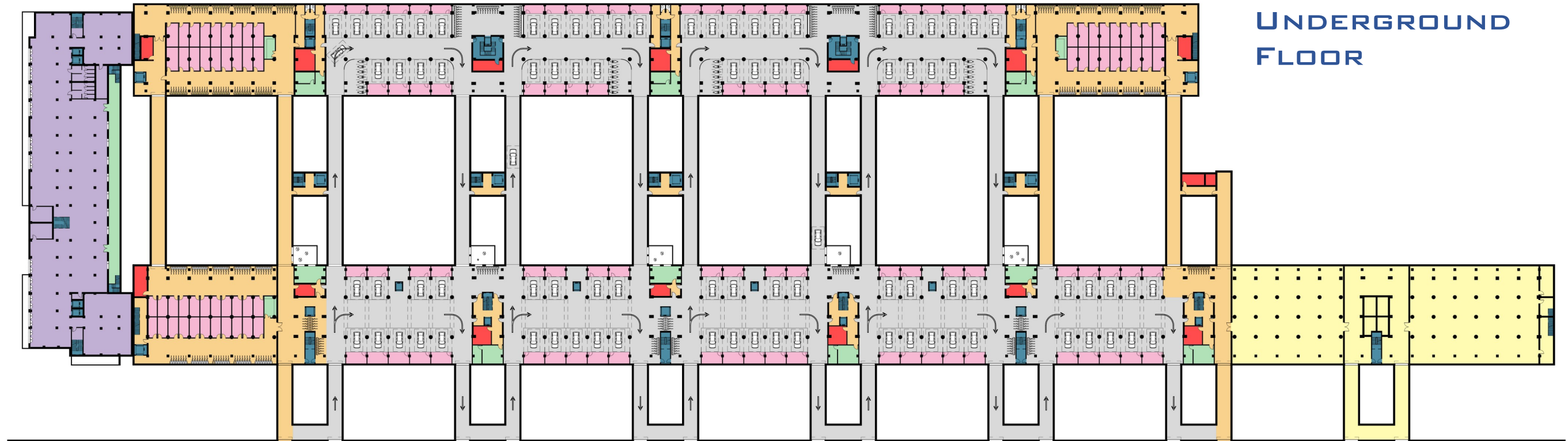


Scale (A3)

1 : 2000

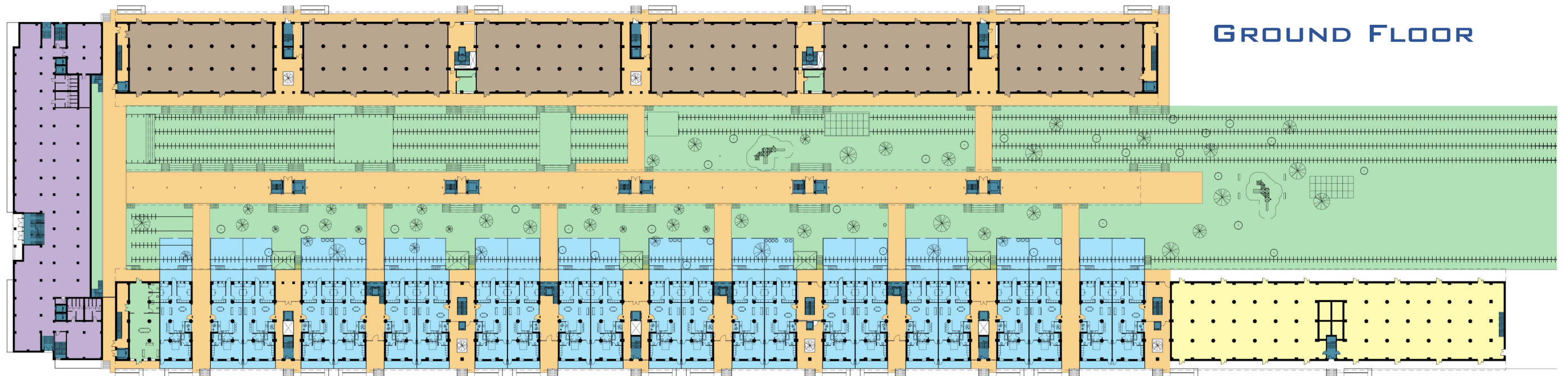
4. TRANSFORMATION

4.3 PROJECT OVERVIEW

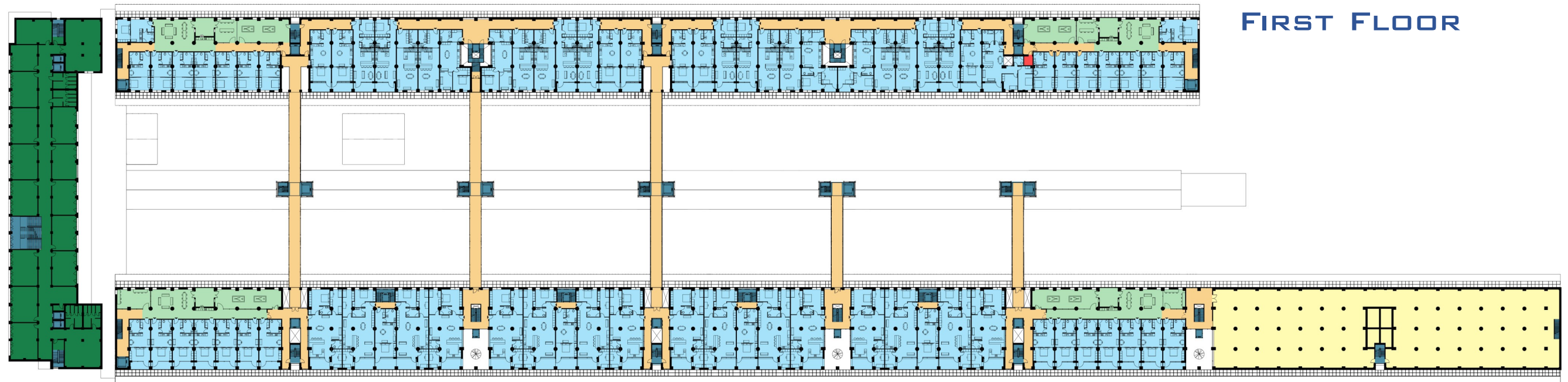


UNDERGROUND FLOOR

- Stairs / elevators
- Housing
- National film archive
- Stores / business
- Walkable connections
- Private storage
- Car trafficated areas
- Common recreational areas
- Technical room
- School

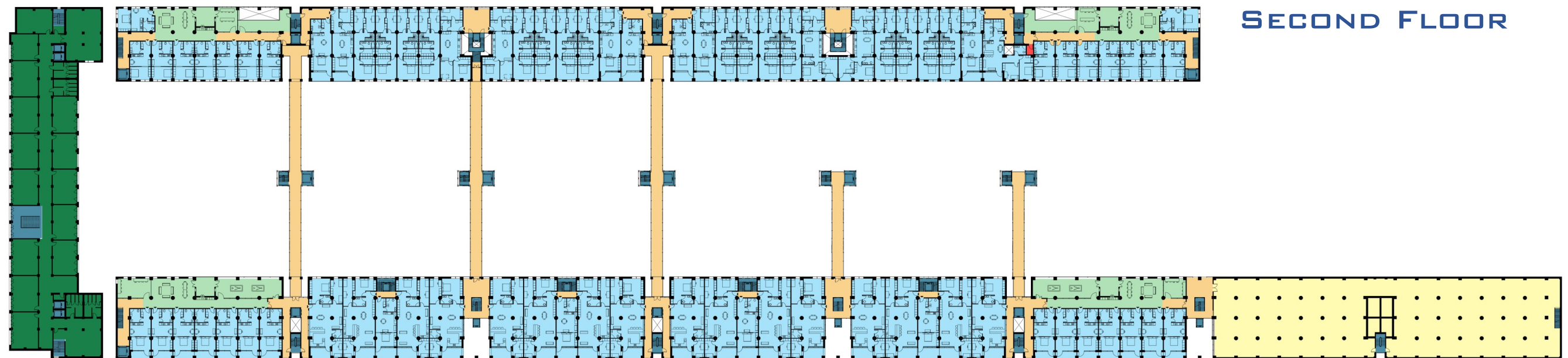


GROUND FLOOR



FIRST FLOOR

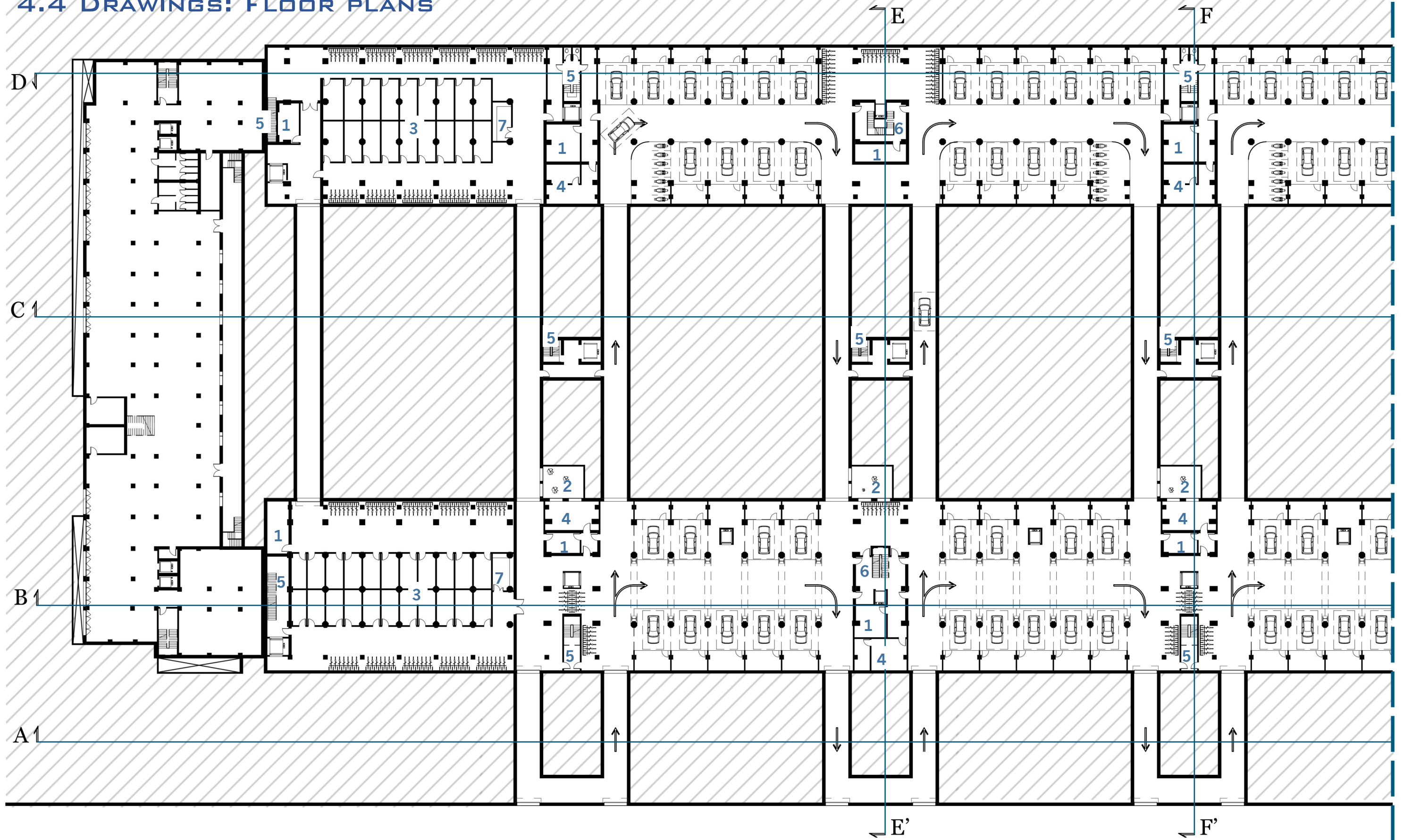
- Stairs / elevators
- Housing
- Walkable connections
- Common recreational areas
- Offices
- School

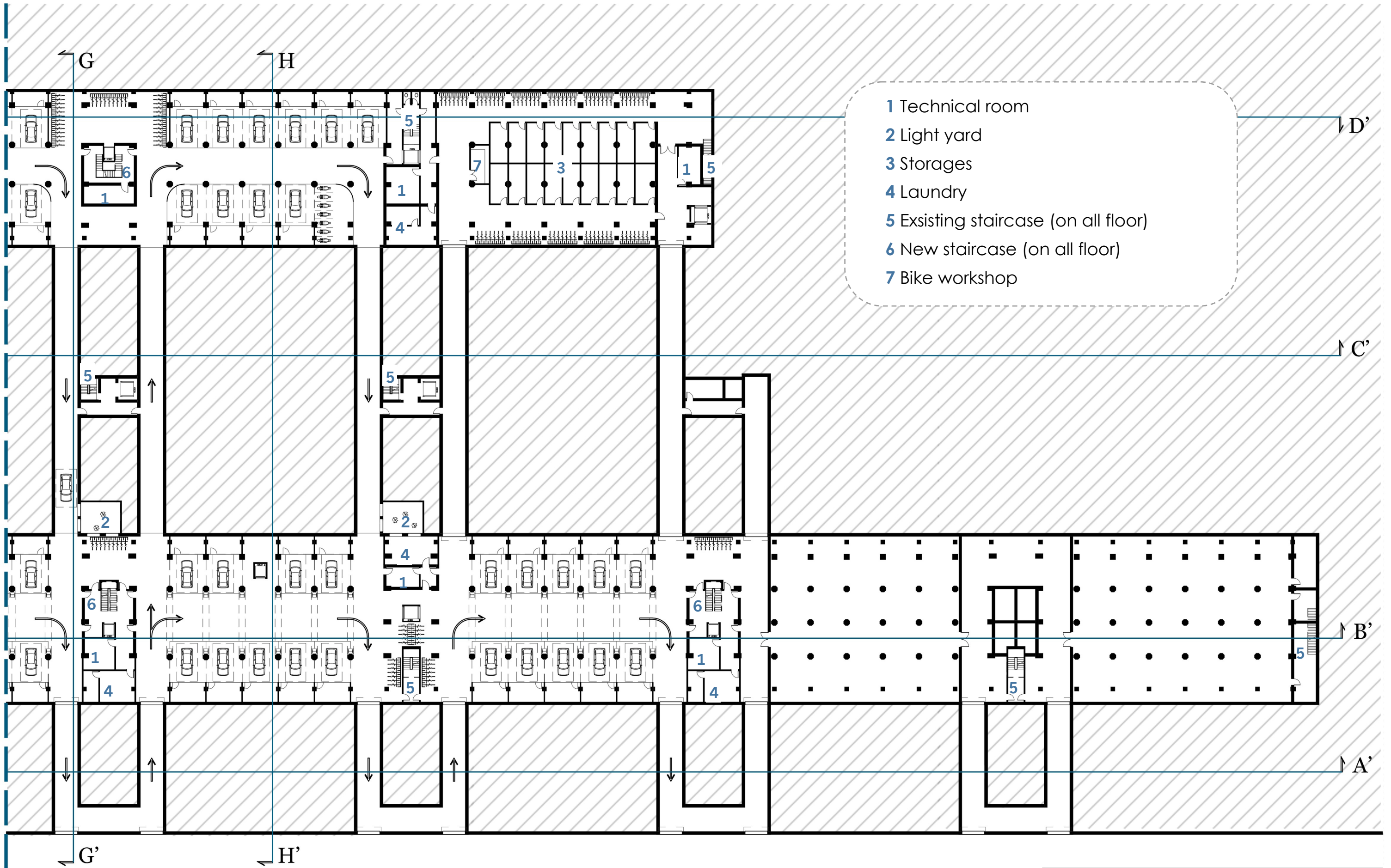


SECOND FLOOR

4. TRANSFORMATION

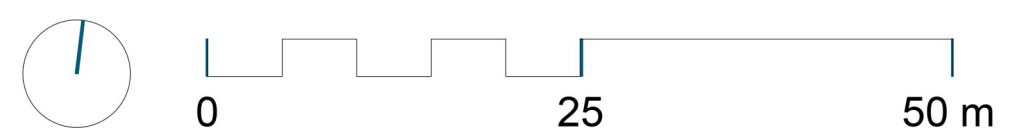
4.4 DRAWINGS: FLOOR PLANS





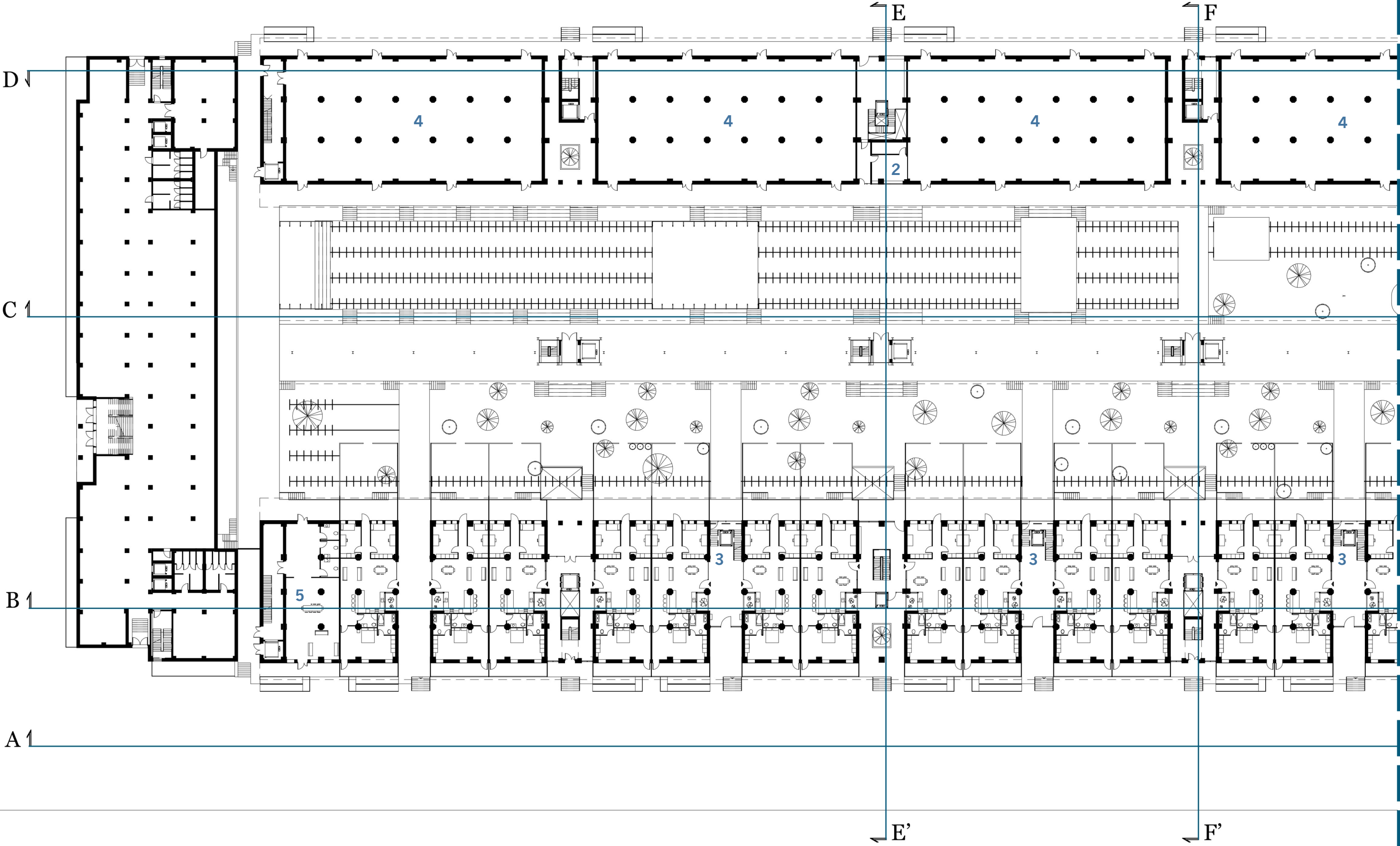
- 1 Technical room
- 2 Light yard
- 3 Storages
- 4 Laundry
- 5 Existing staircase (on all floor)
- 6 New staircase (on all floor)
- 7 Bike workshop

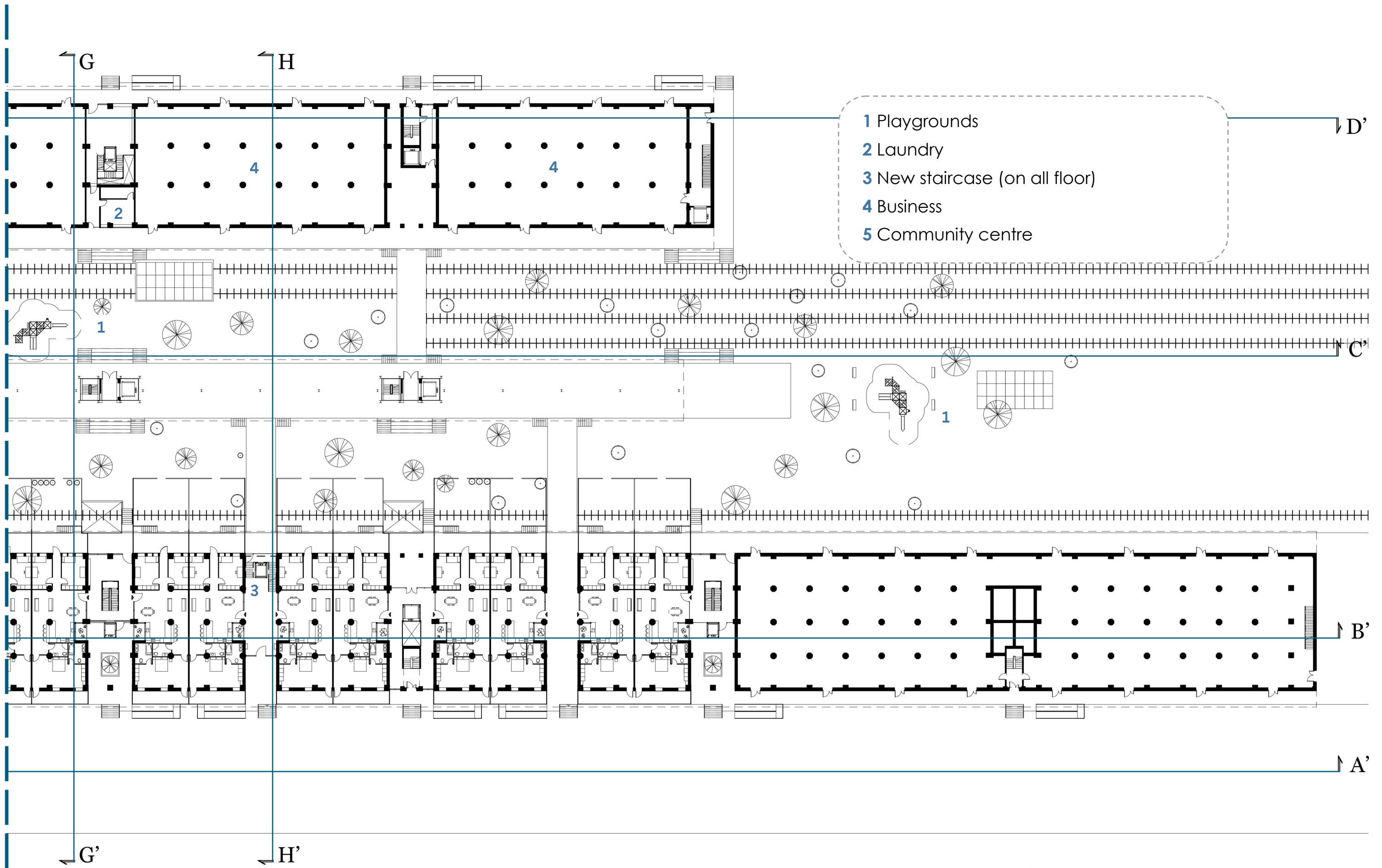
Underground Floor



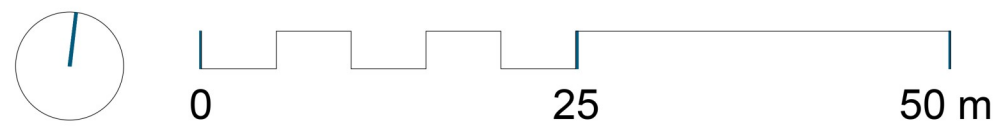
Scale 1 : 500

4. TRANSFORMATION





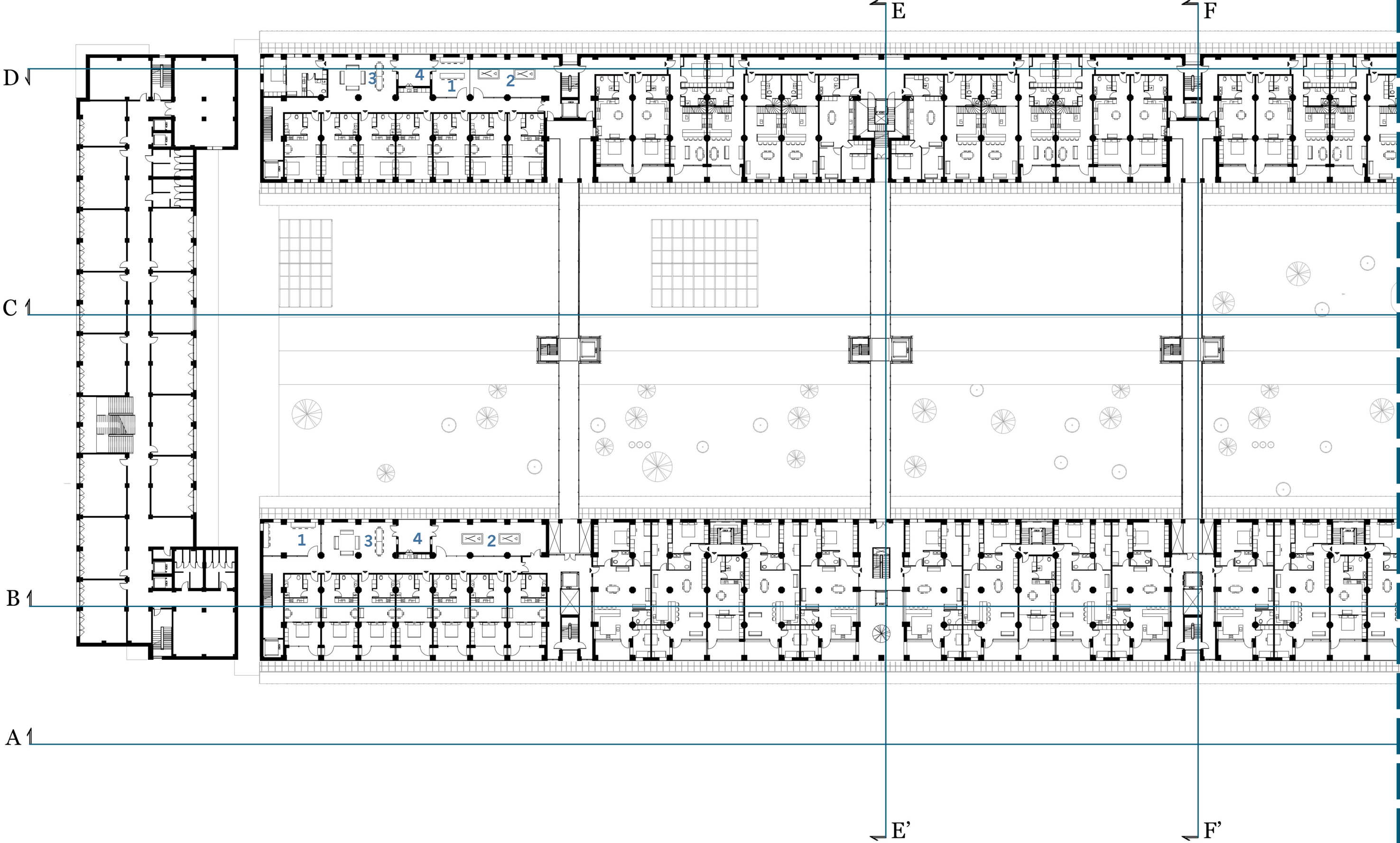
Ground Floor

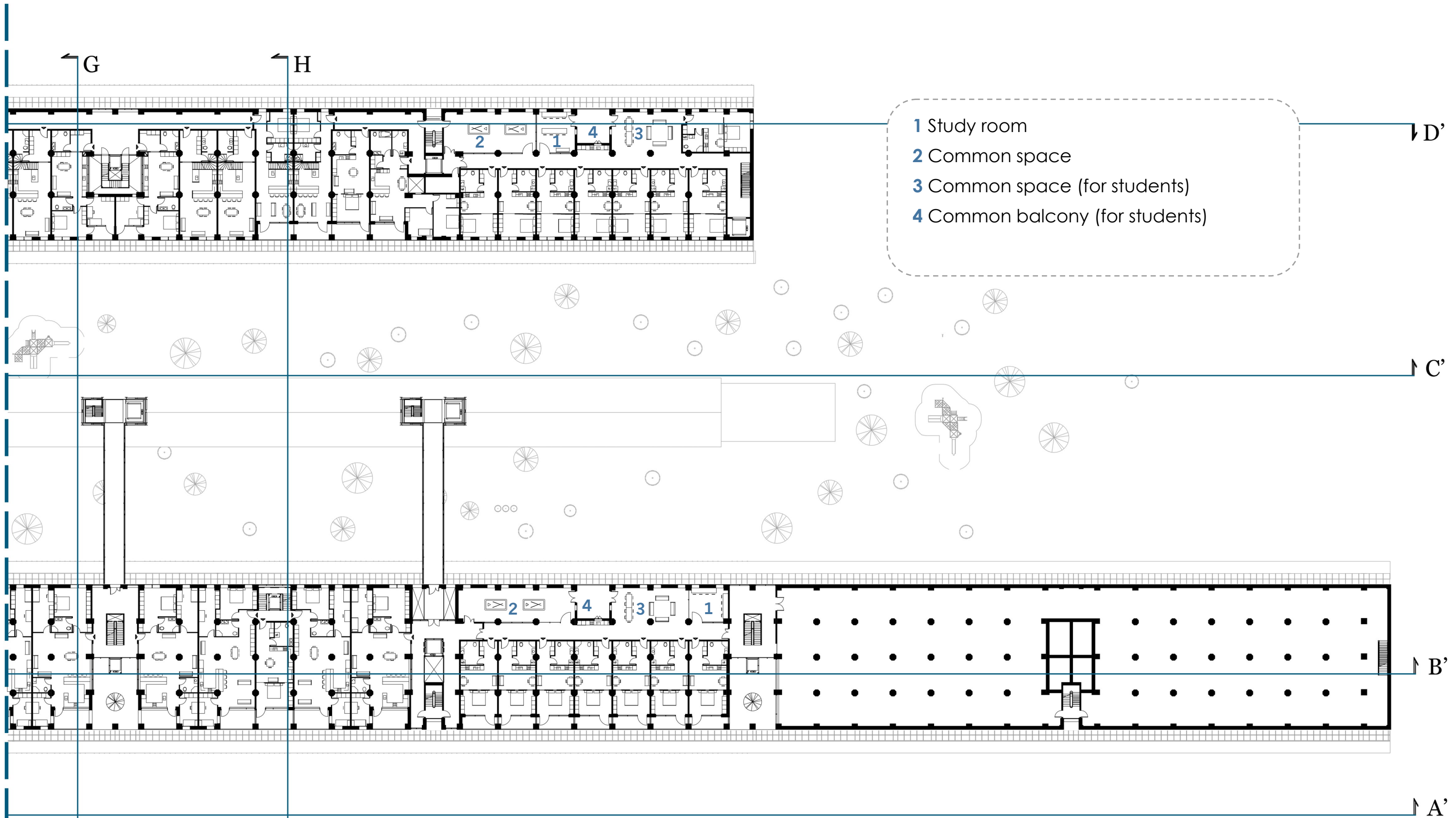


Scale

1 : 500

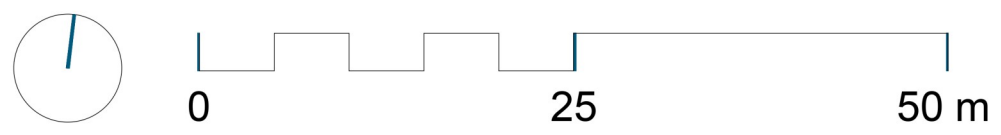
4. TRANSFORMATION





- 1 Study room
- 2 Common space
- 3 Common space (for students)
- 4 Common balcony (for students)

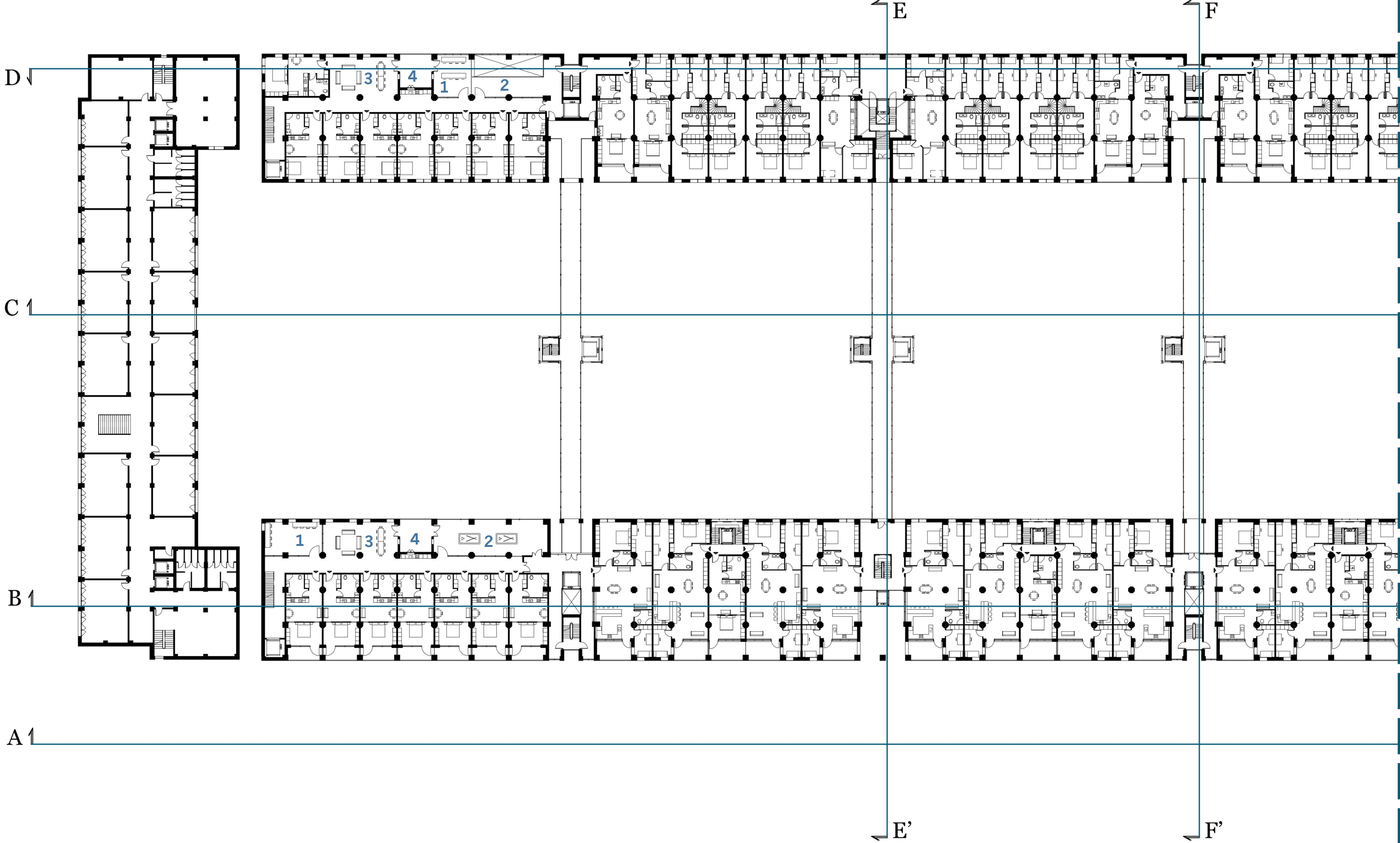
First Floor

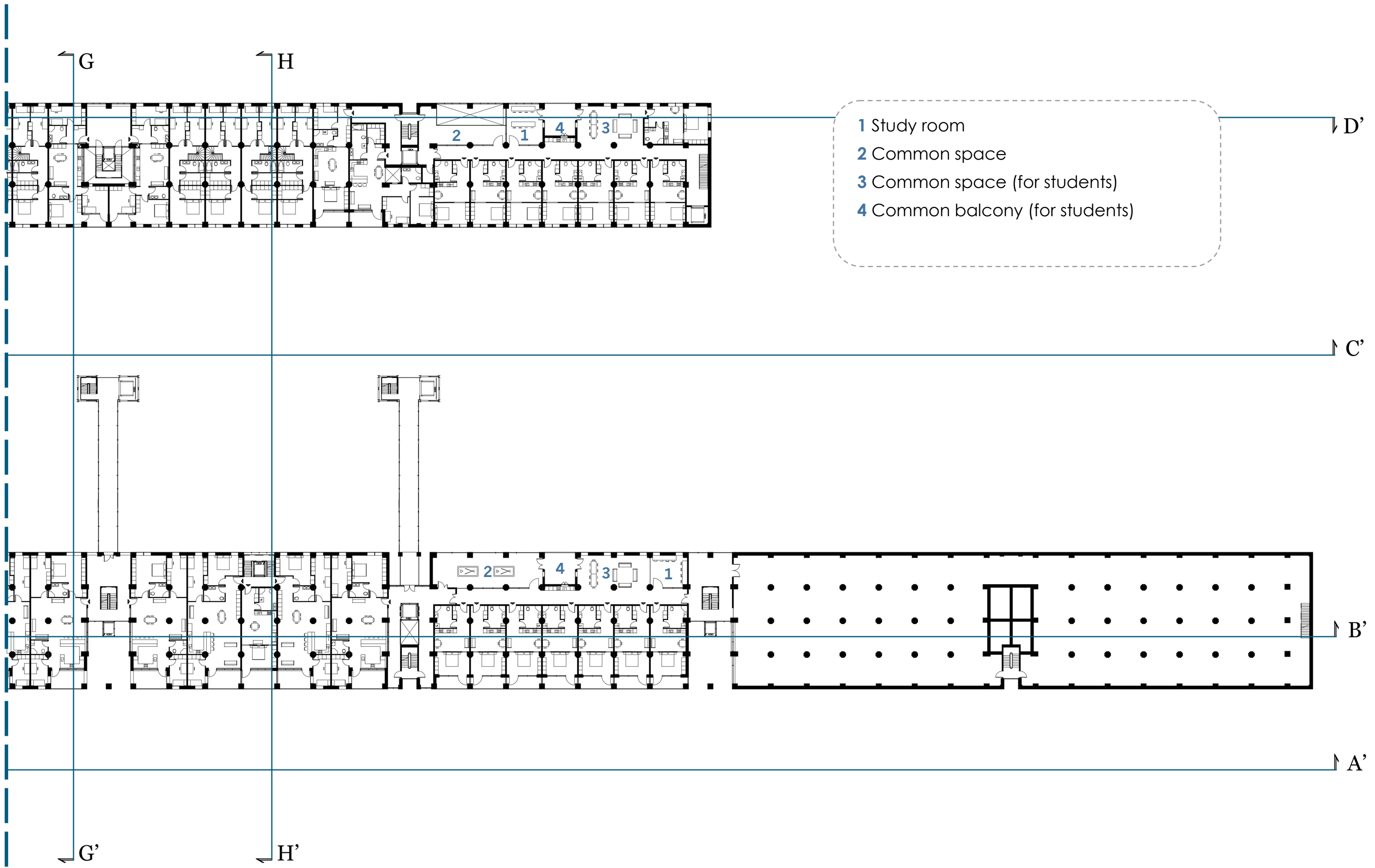


Scale

1 : 500

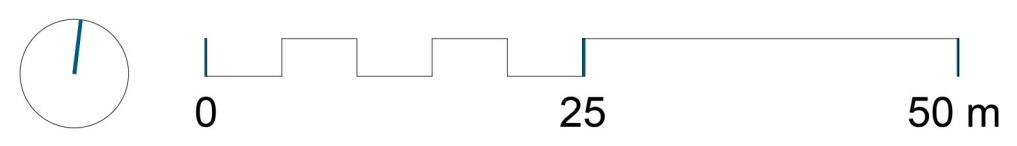
4. TRANSFORMATION





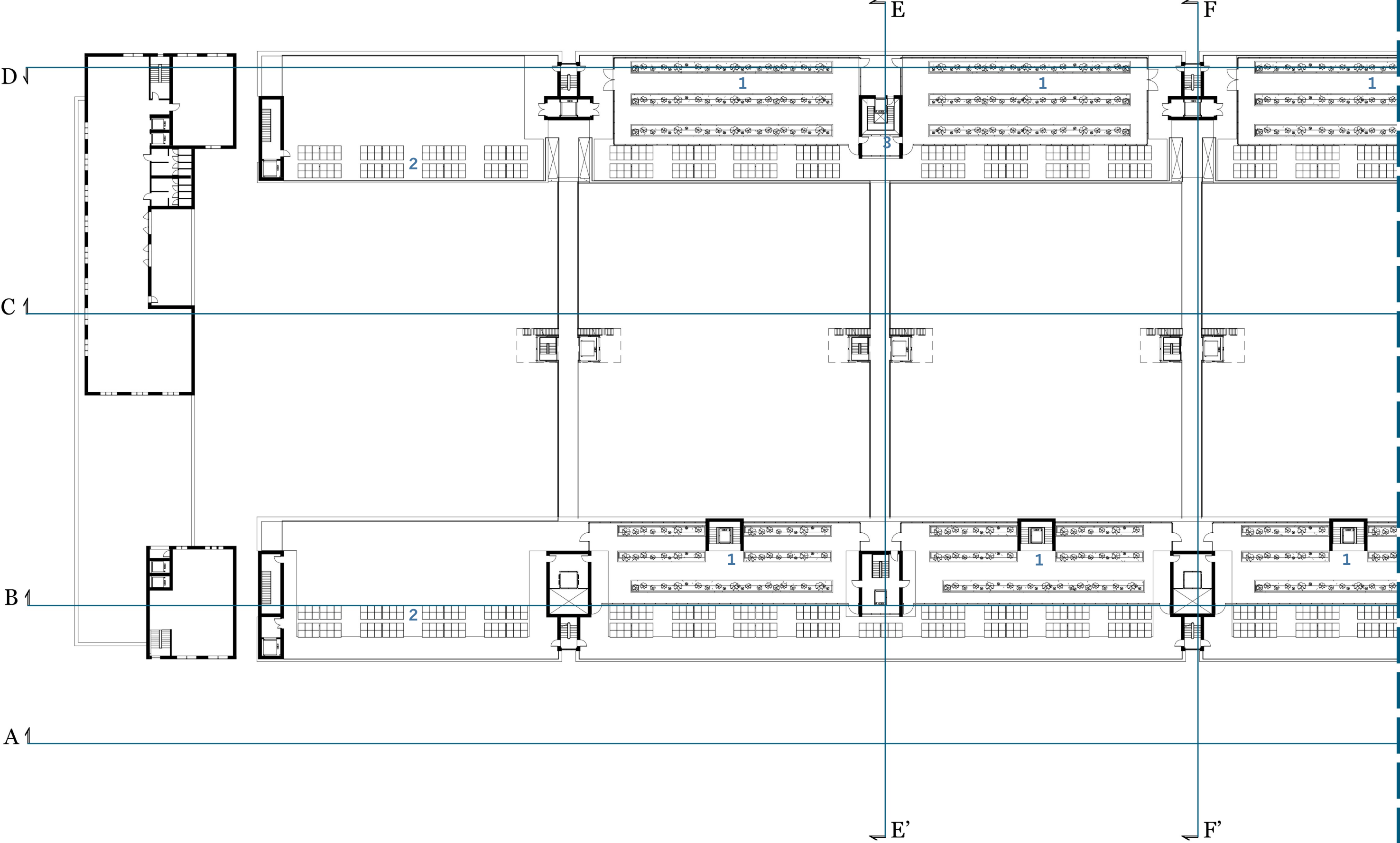
- 1 Study room
- 2 Common space
- 3 Common space (for students)
- 4 Common balcony (for students)

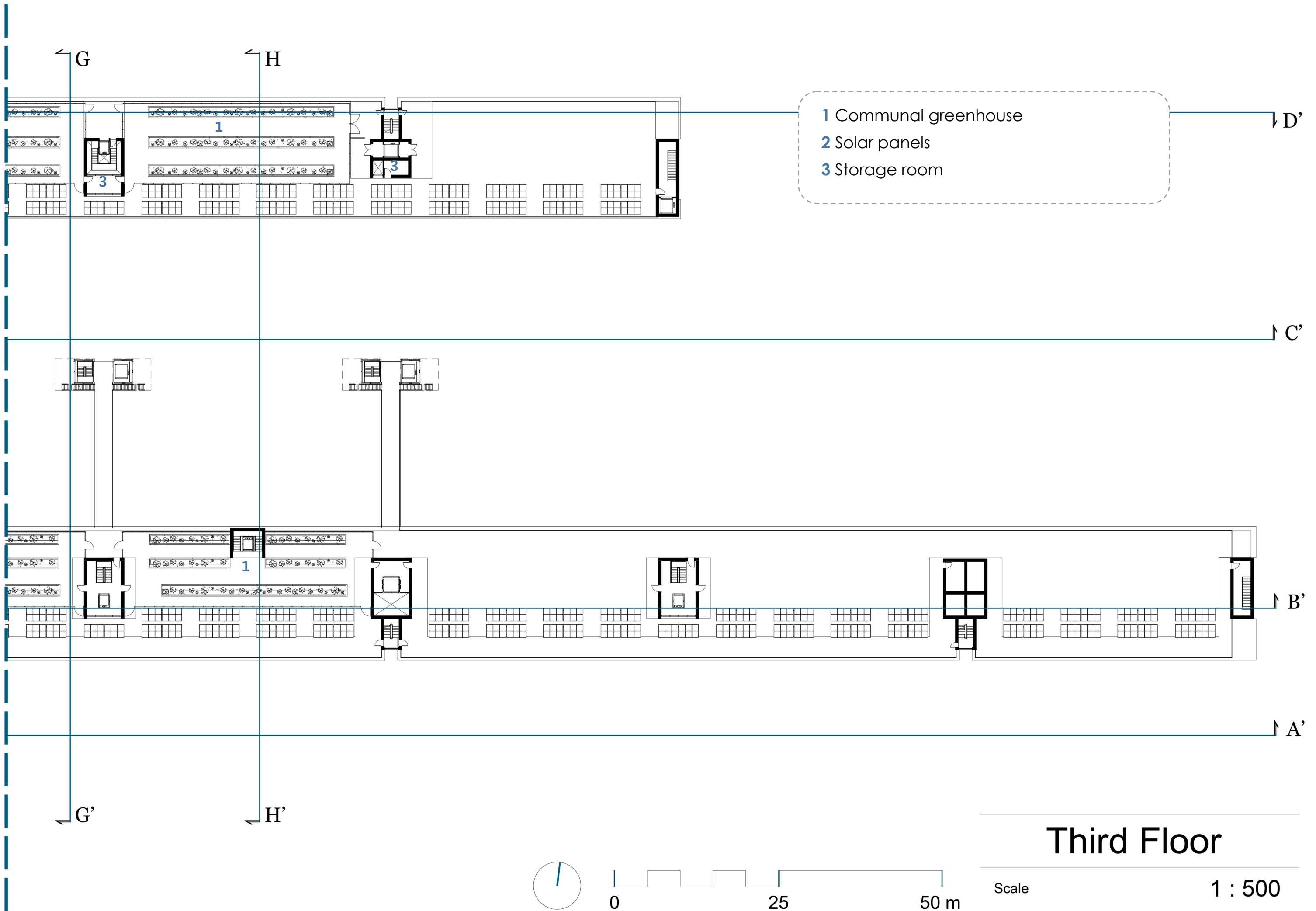
Second Floor



Scale 1 : 500

4. TRANSFORMATION





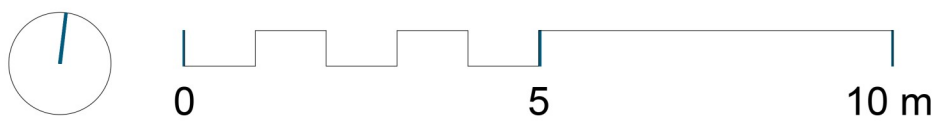
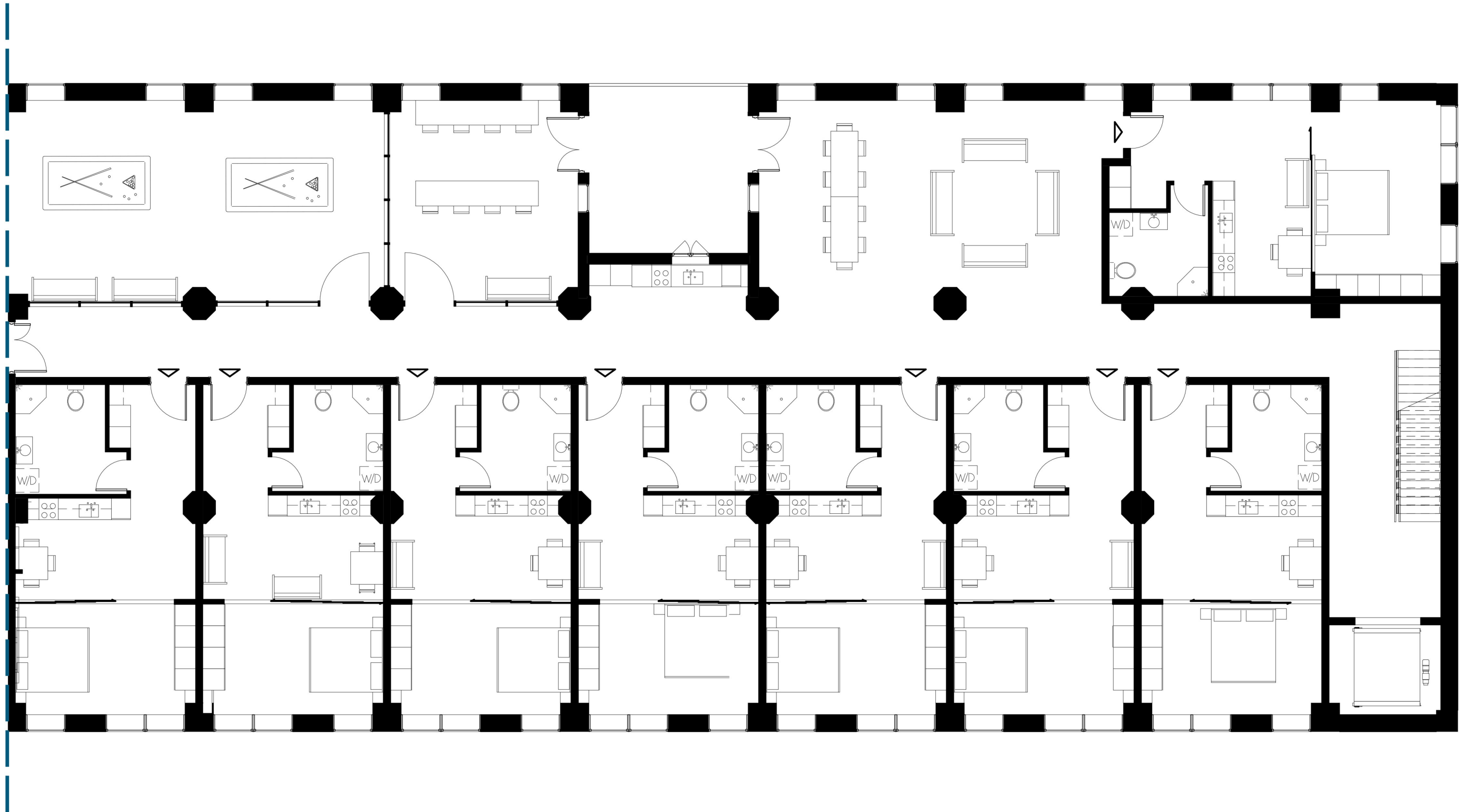
Third Floor

Scale

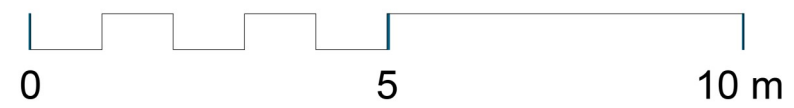
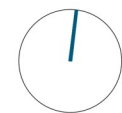
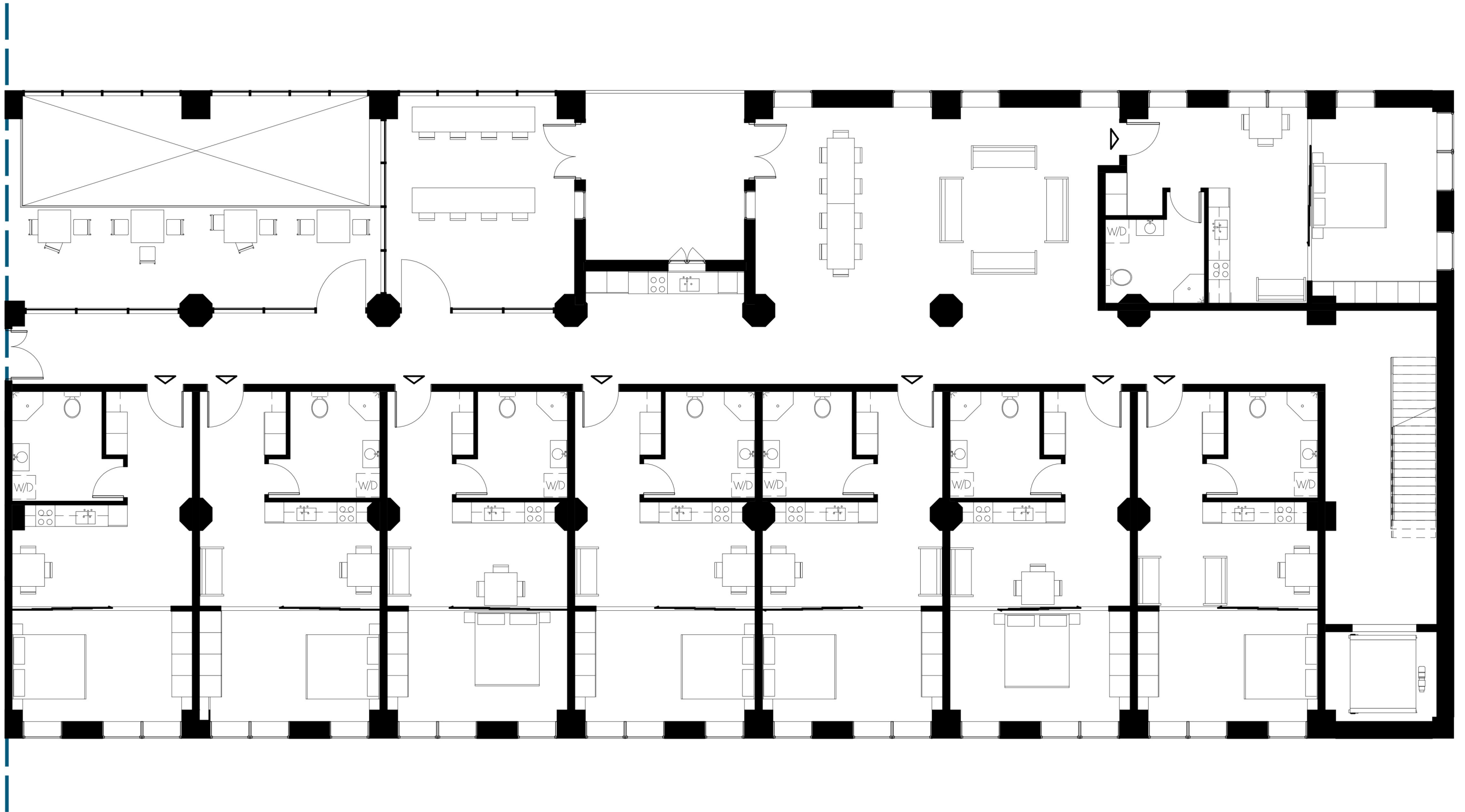
1 : 500

4. TRANSFORMATION

4.5 DRAWINGS: STUDENT APARTMENTS



Student Apartments
First Floor
Scale (A3) 1:100



Student Apartments
Second Floor

Scale (A3)

1 : 100

4. TRANSFORMATION

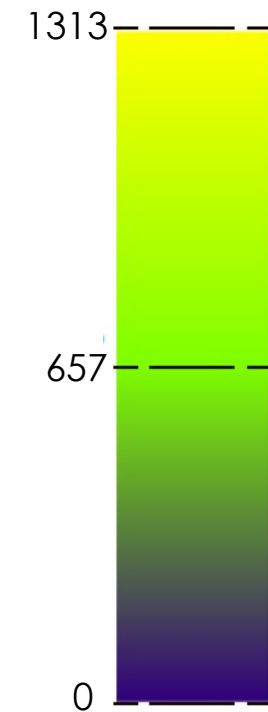
4.6 SOLAR ANALYSIS

This chapter shows a solar analysis based on the average natural sunlight the interior of the building receives during a year. The tool used to generate the simulation was "Insight".

As the images show, all the apartments receive natural sunlight into the common areas of the apartments while maintaining bedrooms with access to the exterior through windows or balconies. The simulation shows how balconies and staircases function as a natural light source that lets light further into the interior of the building. This way the light requirements for suitable living spaces are fulfilled.

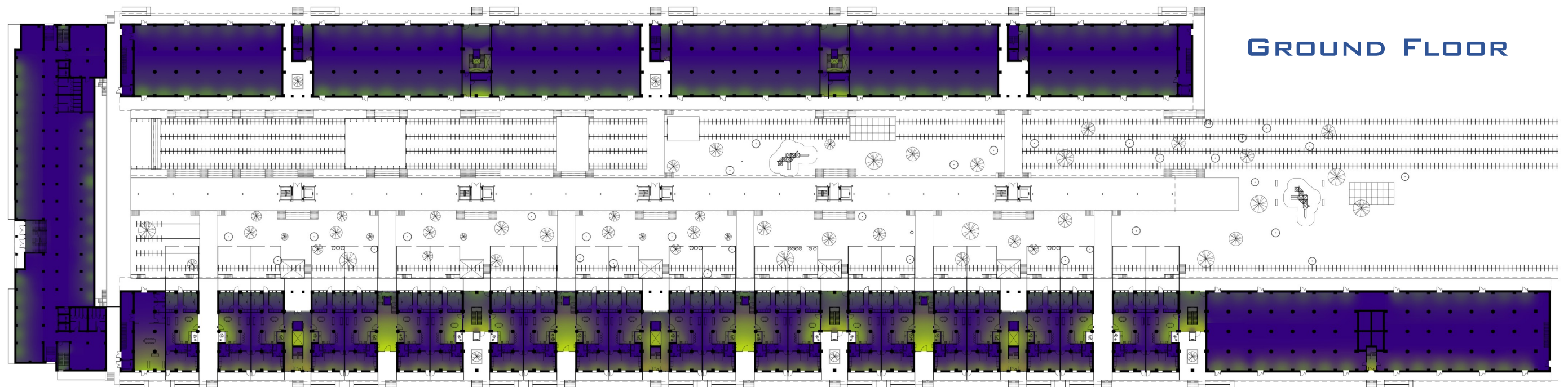
If we pay attention to the administrative building, the bottom floor of the Northern warehouse and the two most eastern sections of the Southern warehouse (where the school is planned to be built) we can see the current yearly daylight factor. These are three parts of my project where I'm not proposing any significant changes to the facade, like adding windows. This enables us to compare how the interior light changes according to my plan in relation to facade changes.

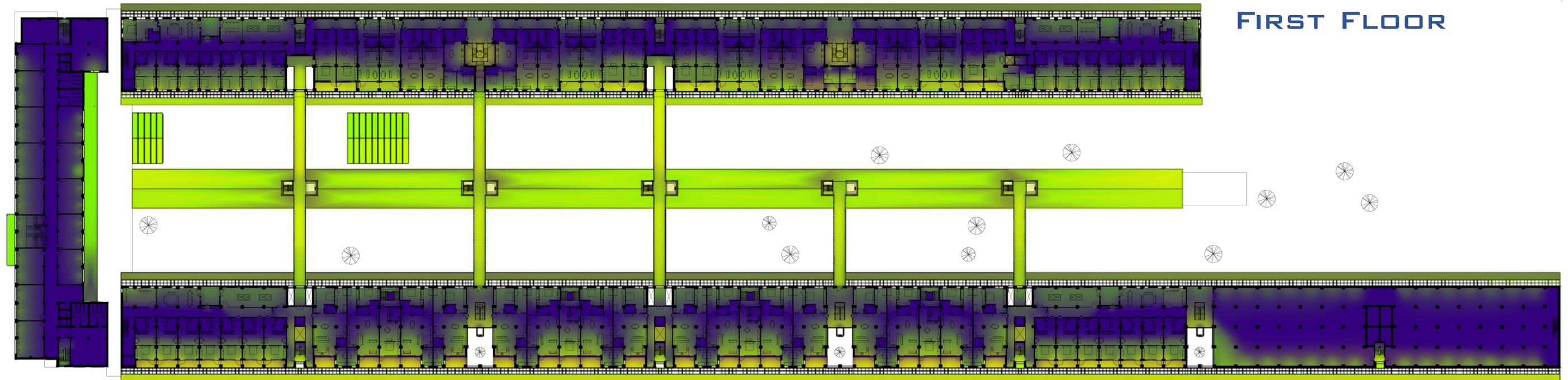
Lighting Scale (kWh/m²)



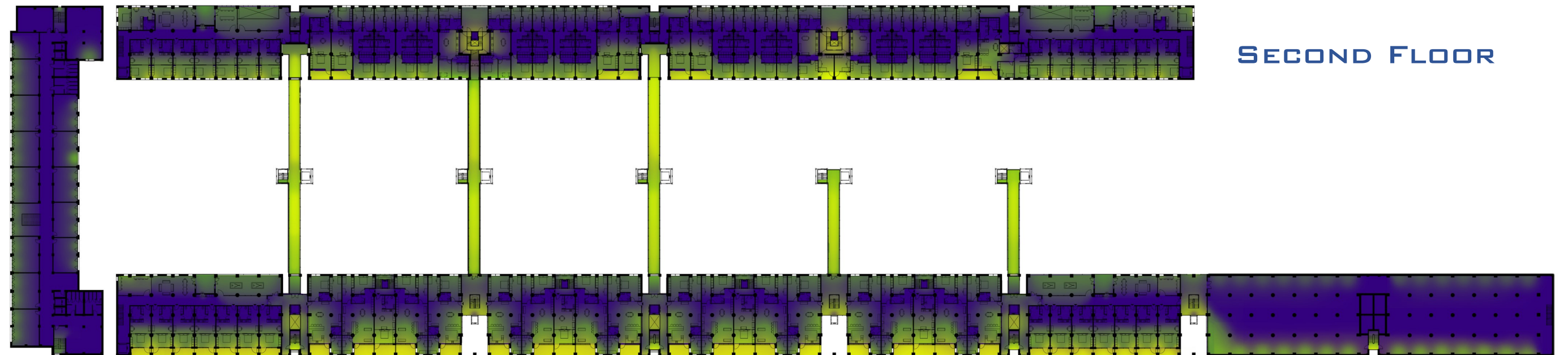
Project location: Prague, Czech Republic

Sun study: Annual average sunlight





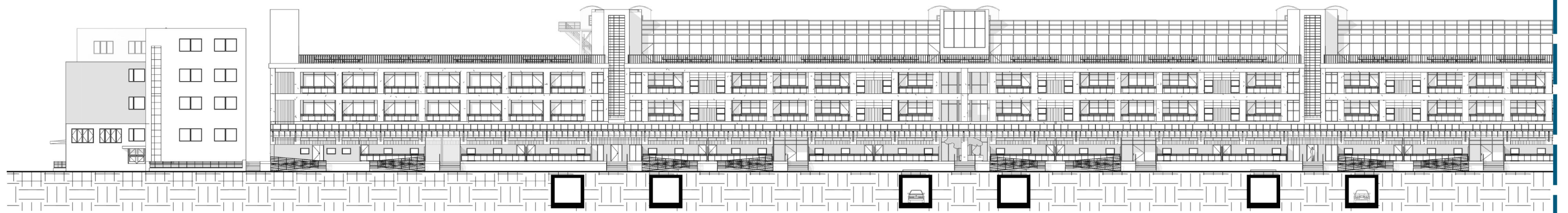
FIRST FLOOR

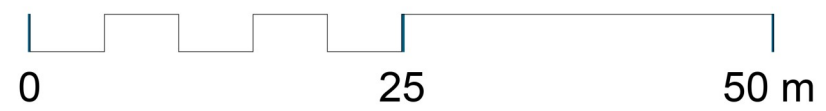
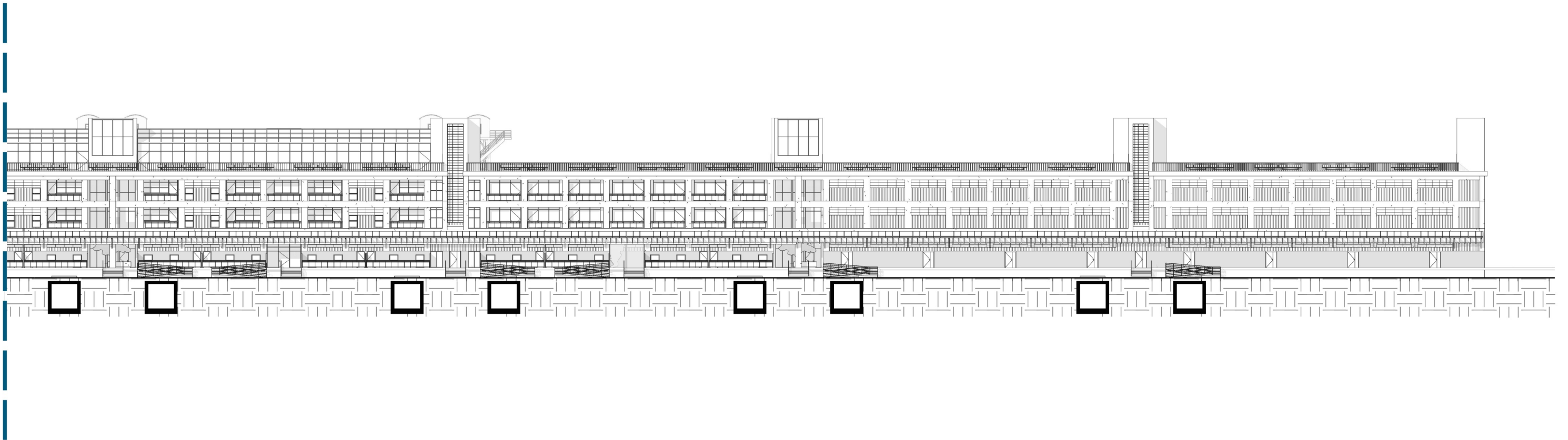


SECOND FLOOR

4. TRANSFORMATION

4.7 DRAWINGS: SECTIONS



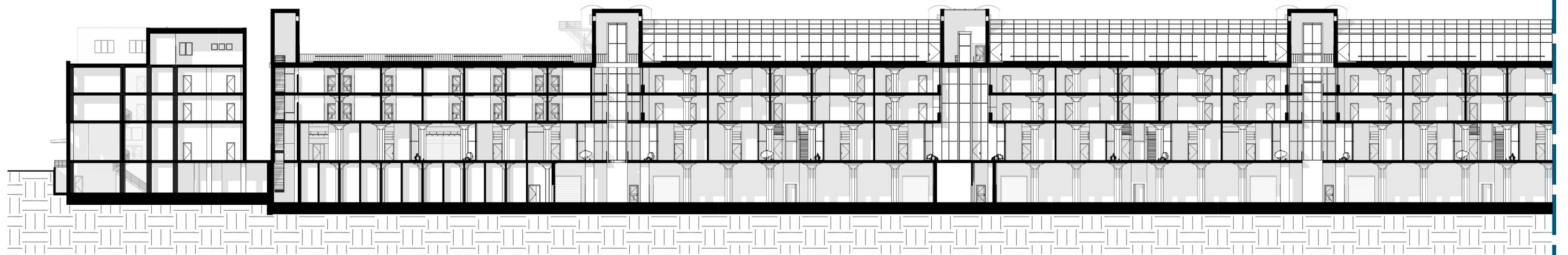


Section A-A'

Scale (A3)

1 : 500

4. TRANSFORMATION



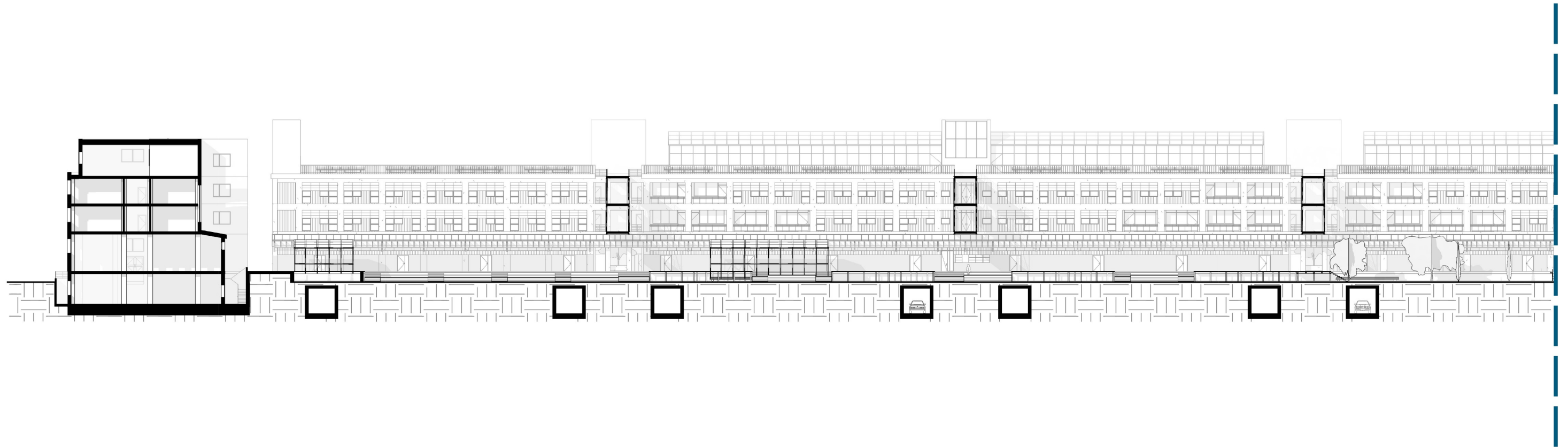


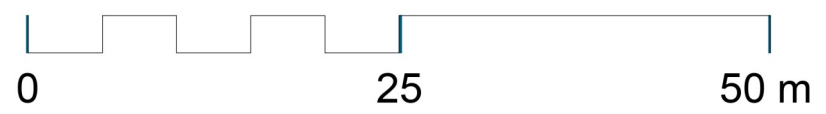
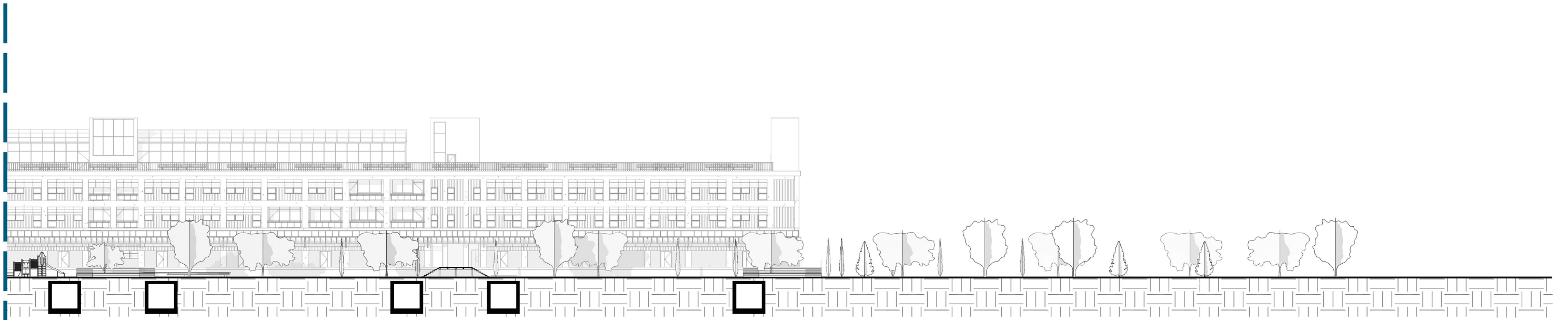
Section B-B'

Scale (A3)

1 : 500

4. TRANSFORMATION



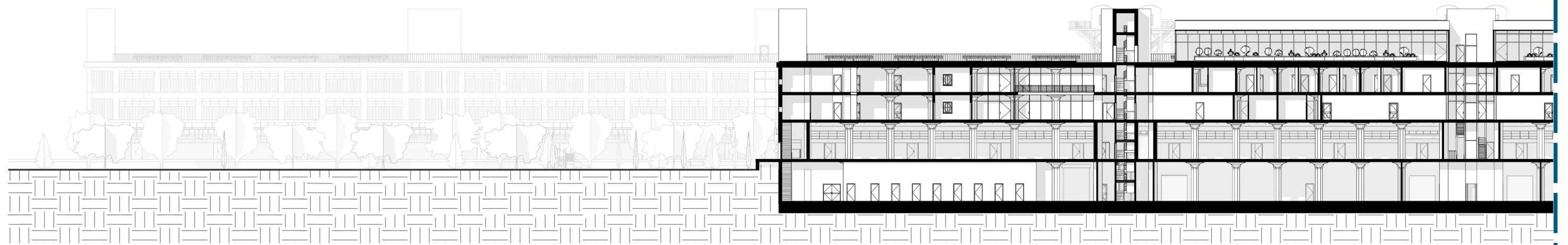


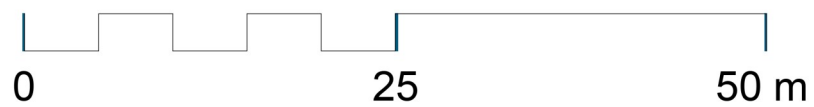
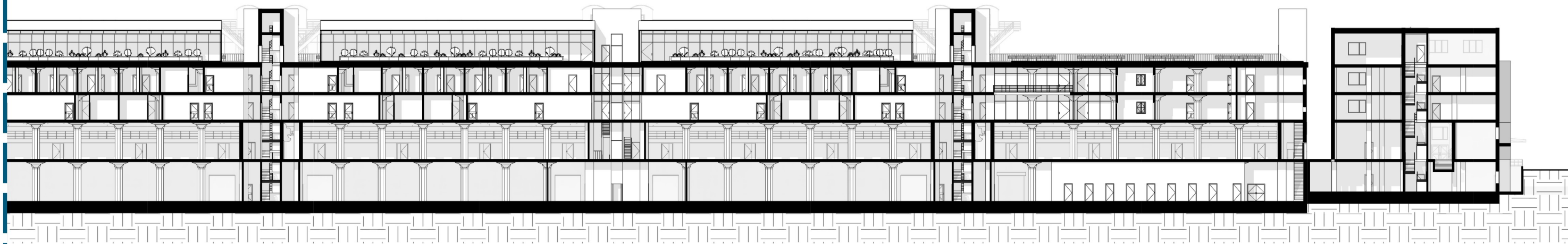
Section C-C'

Scale (A3)

1 : 500

4. TRANSFORMATION



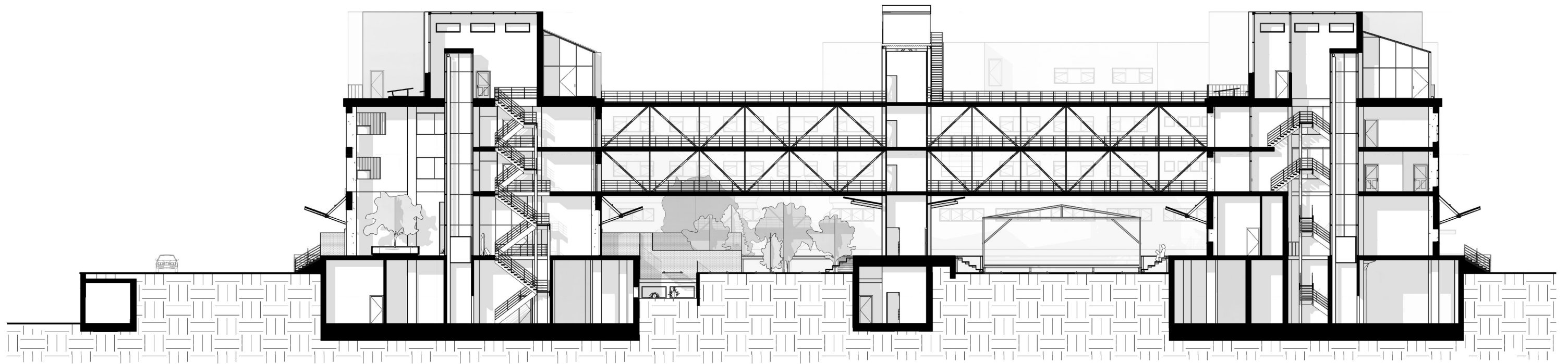


Section D-D'

Scale (A3)

1 : 500

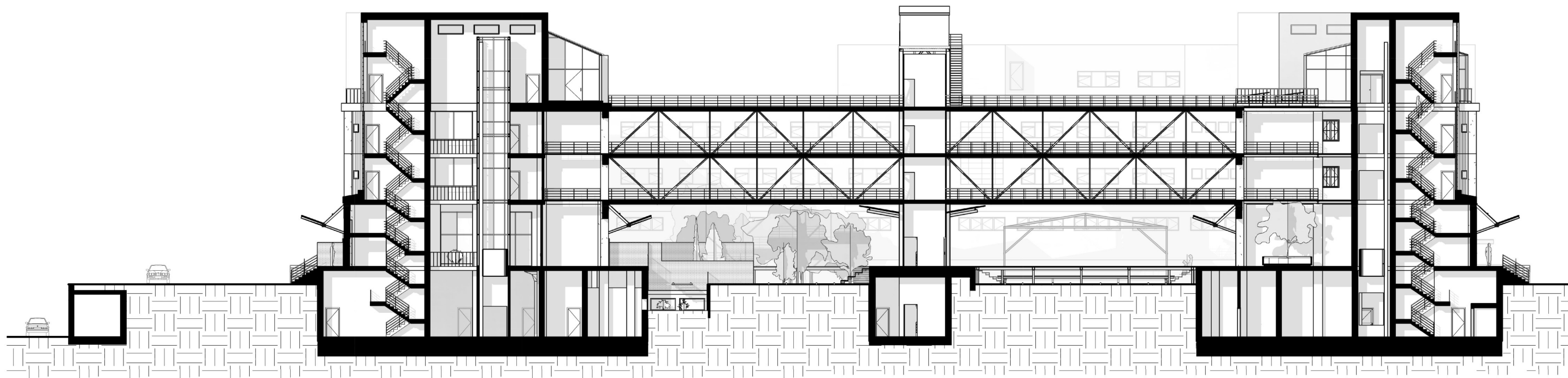
4. TRANSFORMATION



Section E-E'

Scale (A3)

1 : 300

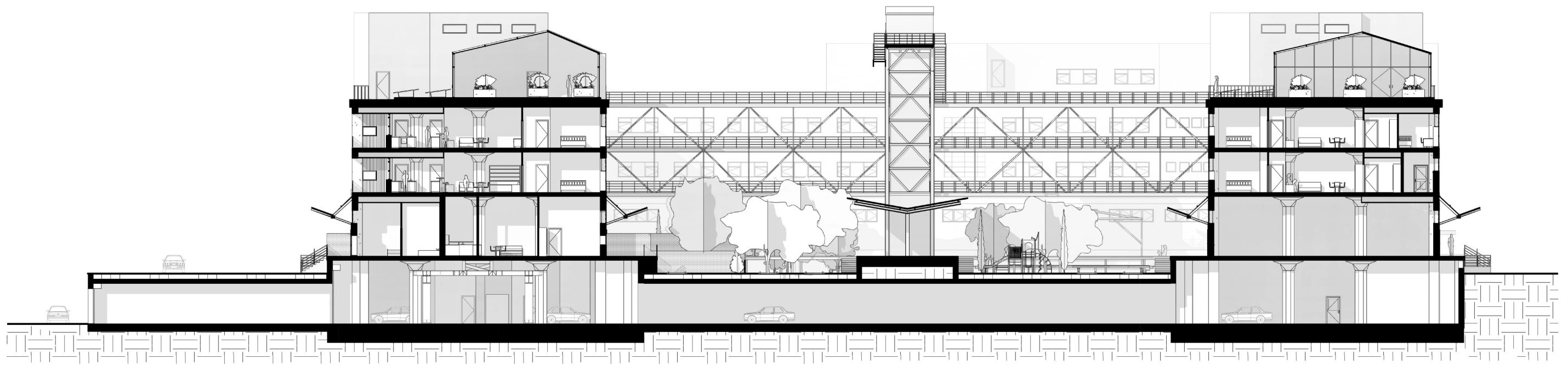


Section F-F'

Scale (A3)

1 : 300

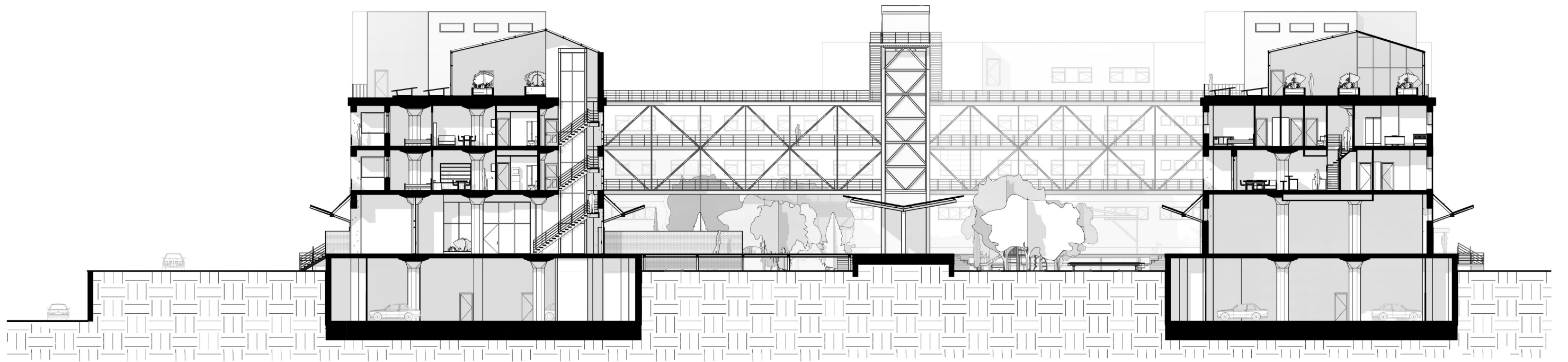
4. TRANSFORMATION



Section G-G'

Scale (A3)

1 : 300



Section H-H'

Scale (A3)

1 : 300

4. TRANSFORMATION

4.8 STAIRCASES

This chapter shows, in more detail, through visualizations and axonometric views how the existing staircases and the new ones would form part of the transformation project. By opening up the rooftops and replacing them with a glass roof, the existing elevator shaft inside the warehouse can be used as light shafts instead.

Image 36, on the next page, illustrates how existing staircases would be maintained while the elevator shaft on the Southern warehouse functions purely as a lightshaft. In image 35, you can see the new added staircases that use the elevator shaft for vertical movement. These staircases would be built in a semitransparent material such as metal grates to allow light to pass through.

Lastly I added another type of staircase (image 38, page 85) located in the Southern warehouse in the middle of each section. These staircases are facing North and therefore don't receive as much natural light but they provide another essential function. These staircases provide central distribution to the apartments on the first and second floors and also direct access to the greenhouses on the third floor.



Image 35: Staircase/lightshaft



Image 34: Entrance from the South to the Southern warehouse (also on image 37)

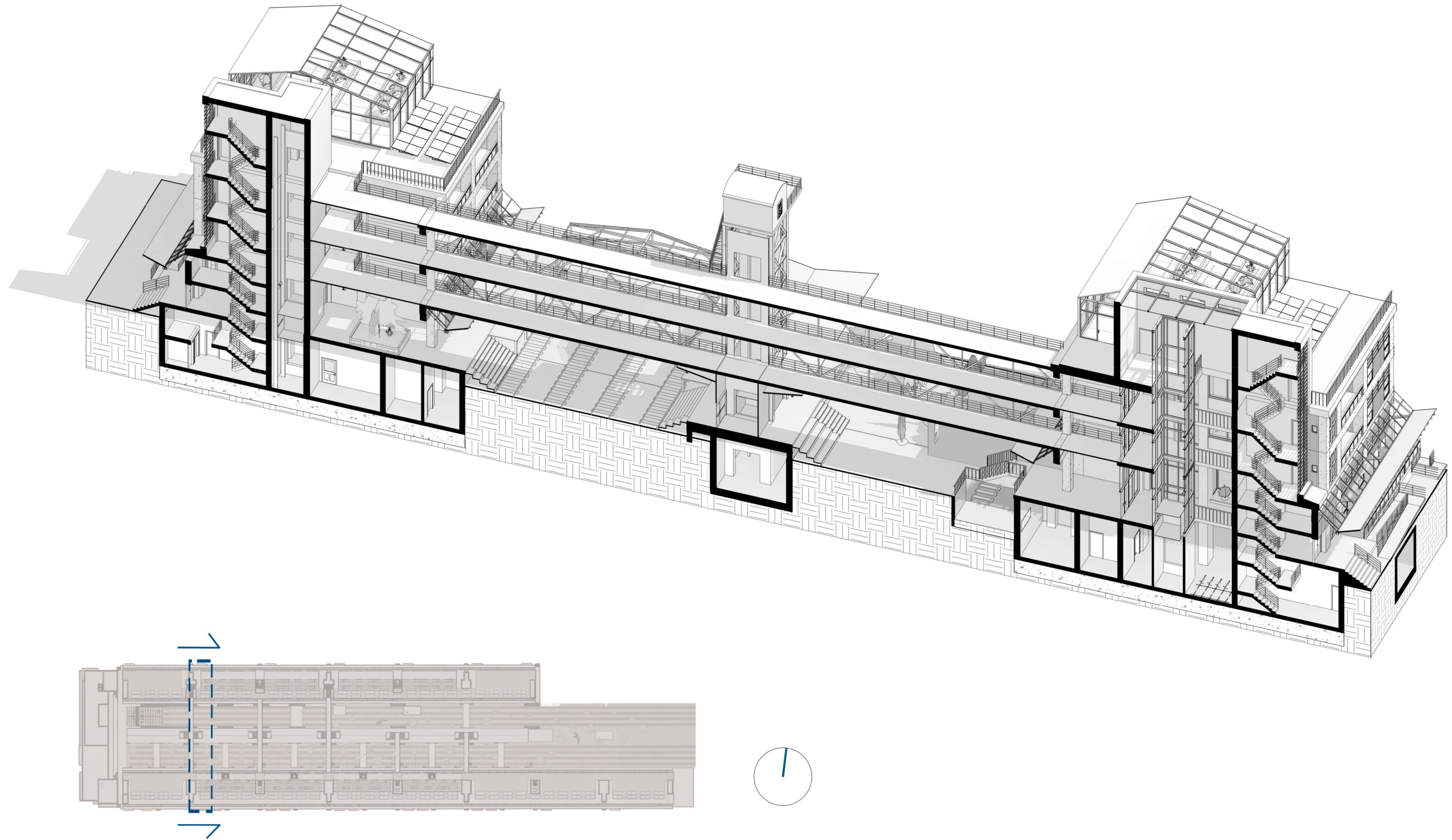


Image 36: Axonometric cut, existing staircases refurbished

4. TRANSFORMATION

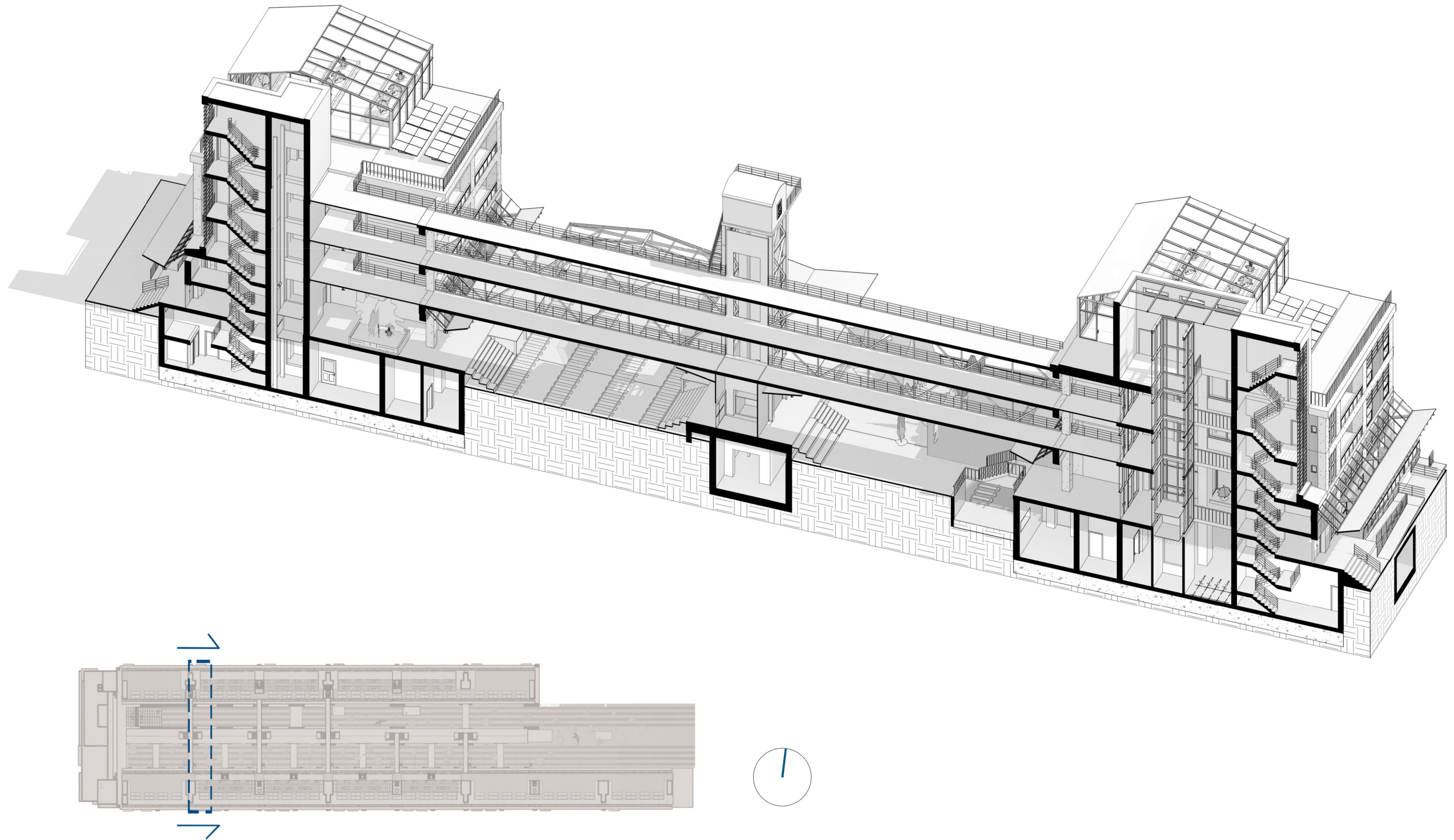


Image 37: Axonometric cut, staircases/lightshafts

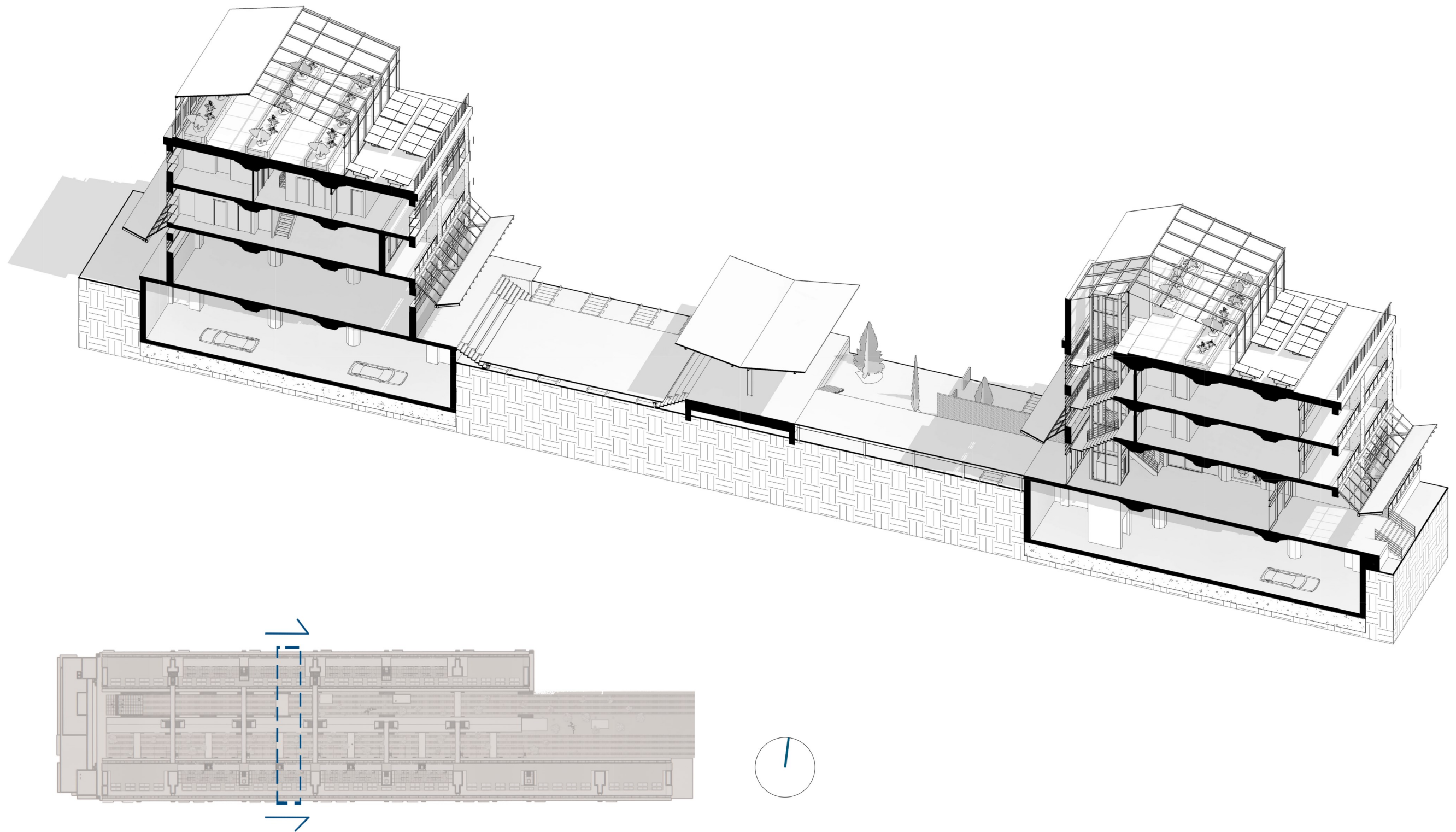


Image 38: Axonometric cut, central staircase in the Southern warehouse (to the right)

4. TRANSFORMATION

4.9 COURTYARD

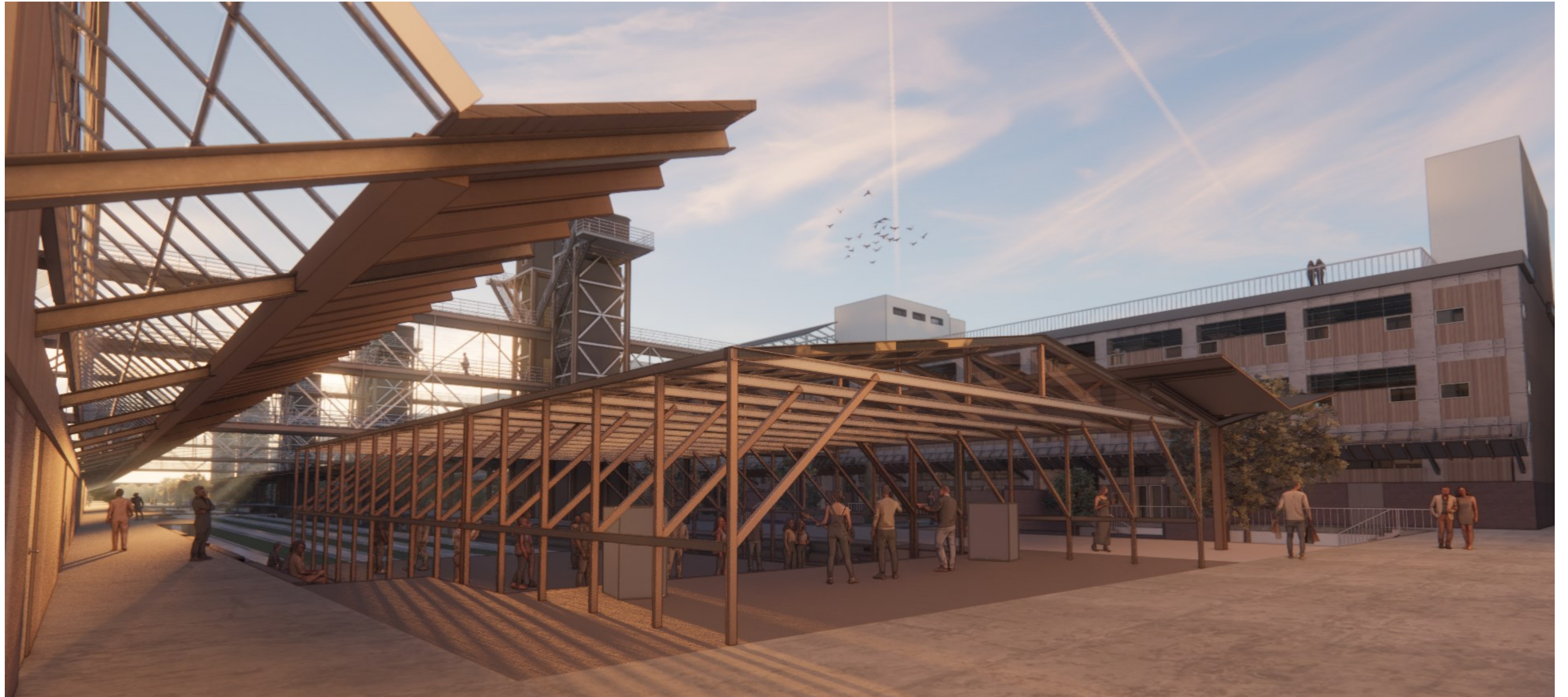


Image 39: Social event/concert being hosted at the courtyard



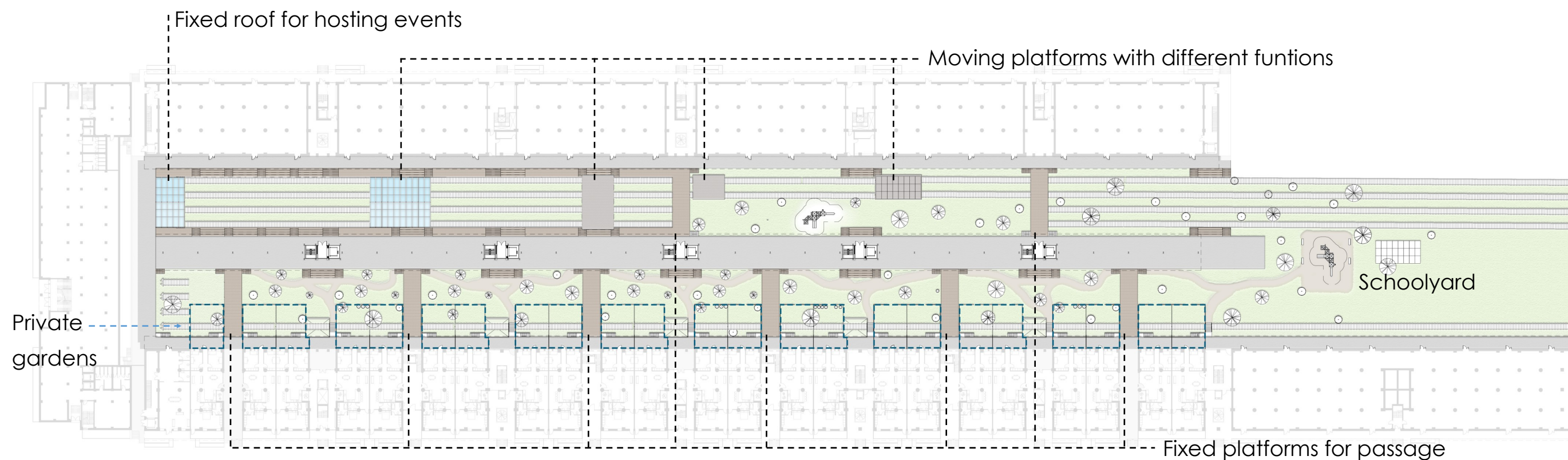
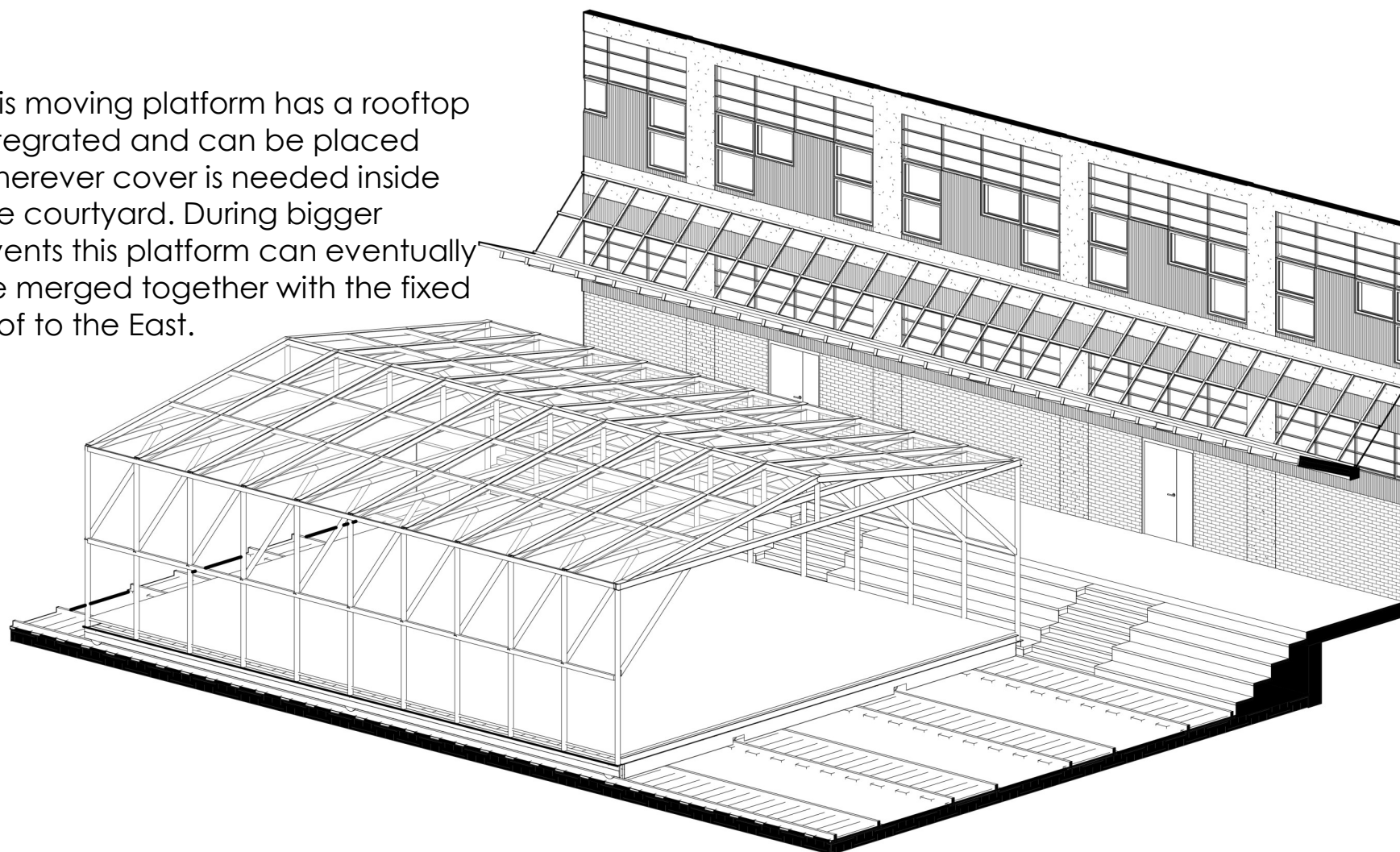
Image 40: Playground inside the courtyard

4. TRANSFORMATION

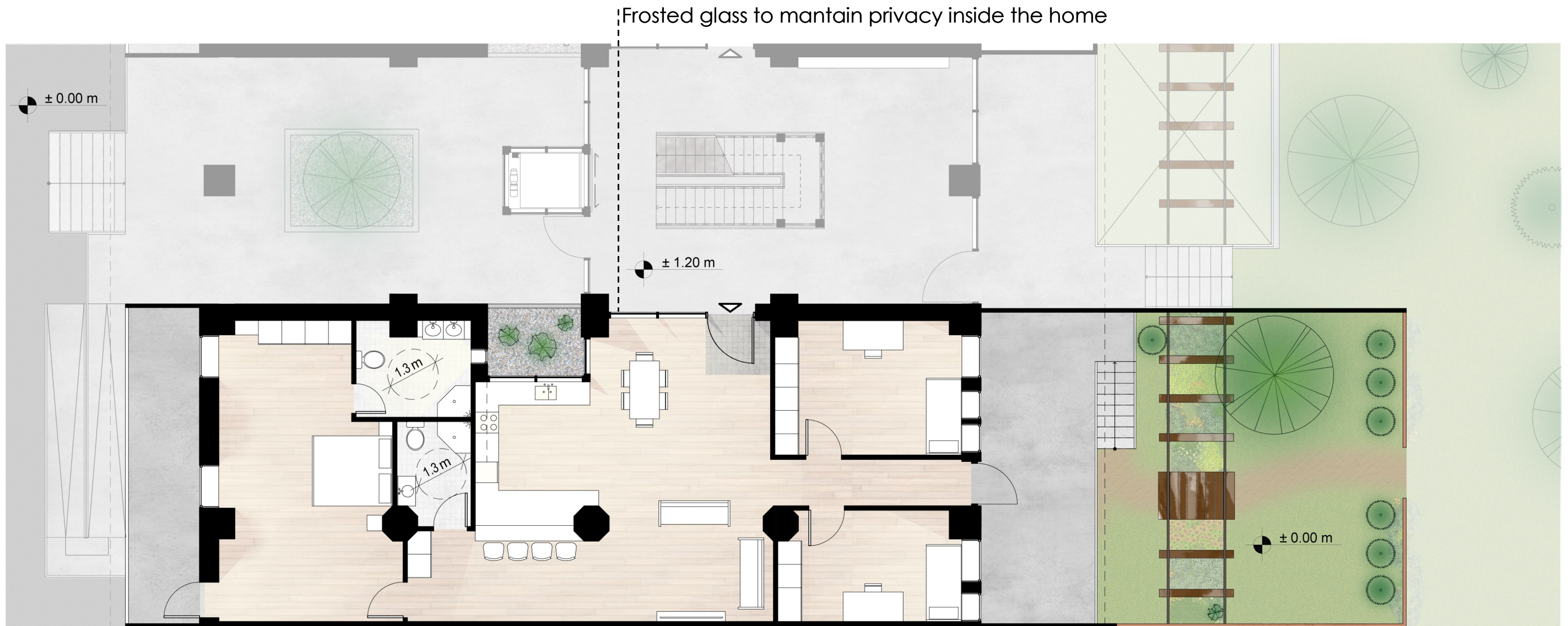
What used to be the train tracks that carried the trains to the interior of the complex is currently a space taken over by vegetation. Because of this, the planned growth of vegetation inside the courtyard will be easier. The tracks are in reasonably healthy shape and can still be used for light use.

The ground floor of the old northern warehouse will be the commercial part of the complex, while the southern side will be formed by private houses and a school. To connect the different areas while respecting the private residential gardens I decided to place a park separating the spaces with six fixed platforms crossing over to connect the complex together. On the northern side I converted the courtyard into a dynamic social space where moving platforms can be repositioned after need.

This moving platform has a rooftop integrated and can be placed wherever cover is needed inside the courtyard. During bigger events this platform can eventually be merged together with the fixed roof to the East.



4.10 APARTMENT TYPOLOGIES



Ground
Floor

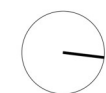


Family house (3 rooms)

Quantity: 23 units

Dimensions: 19m x 7,7m + 10,8m x 8m (garden)

Area: 146m² + 86m² (garden)



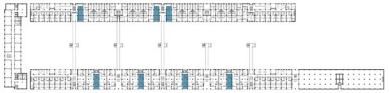
4. TRANSFORMATION



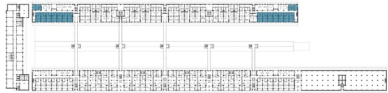
1st Floor:



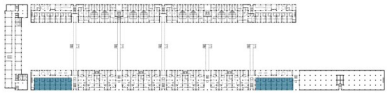
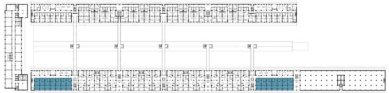
2nd Floor:



One-bedroom apartment
Quantity: 18 units
Dimensions: 14,4m x 5m
Area: 72,5m²



Student apartment
Quantity: 16 units
Dimensions: 9,3m x 5m
Area: 47m²

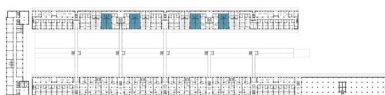


Student apartment w/ balcony
Quantity: 14 units
Dimensions: 11,7m x 5m
Area: 59m²

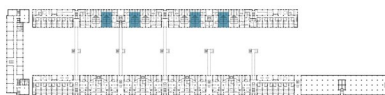




1st Floor:



2nd Floor:

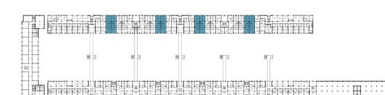
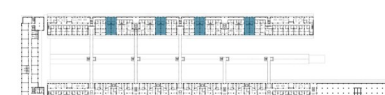


Duplex apartment (3 rooms)

Quantity: 8 units

Dimensions: 14,5m x 5m + 17,6m x 5m

Area: 160m²



Duplex apartment w/ balcony (4 rooms)

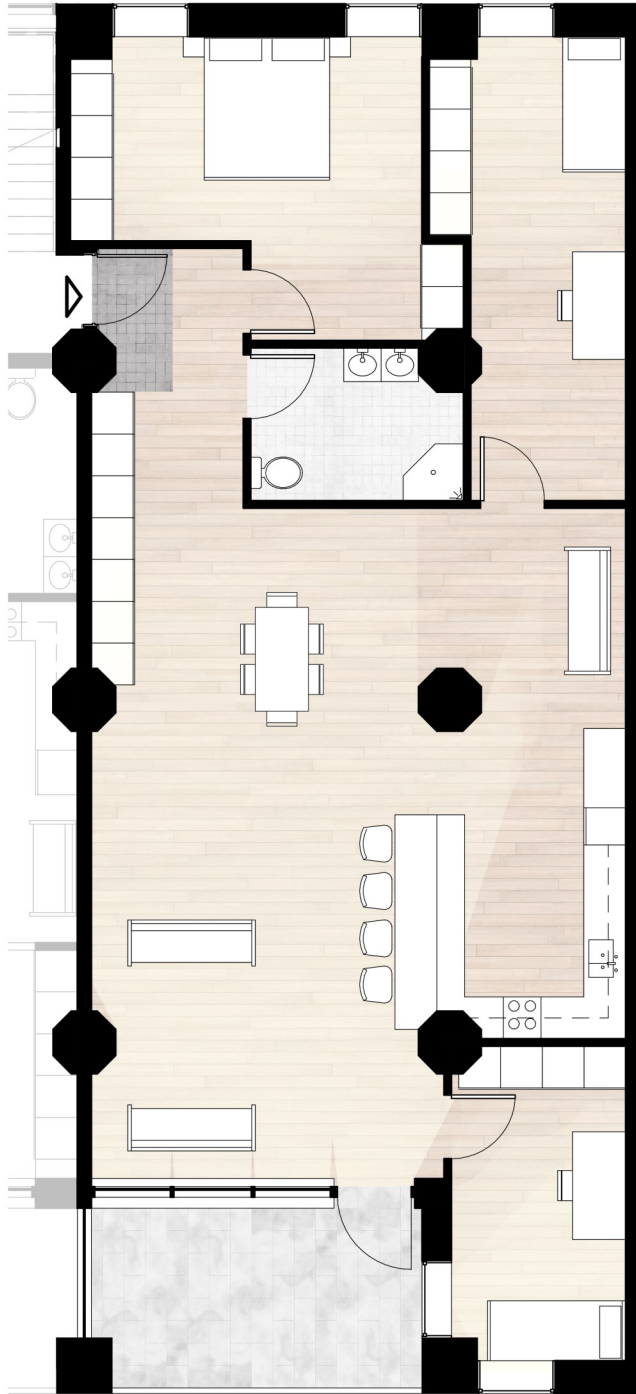
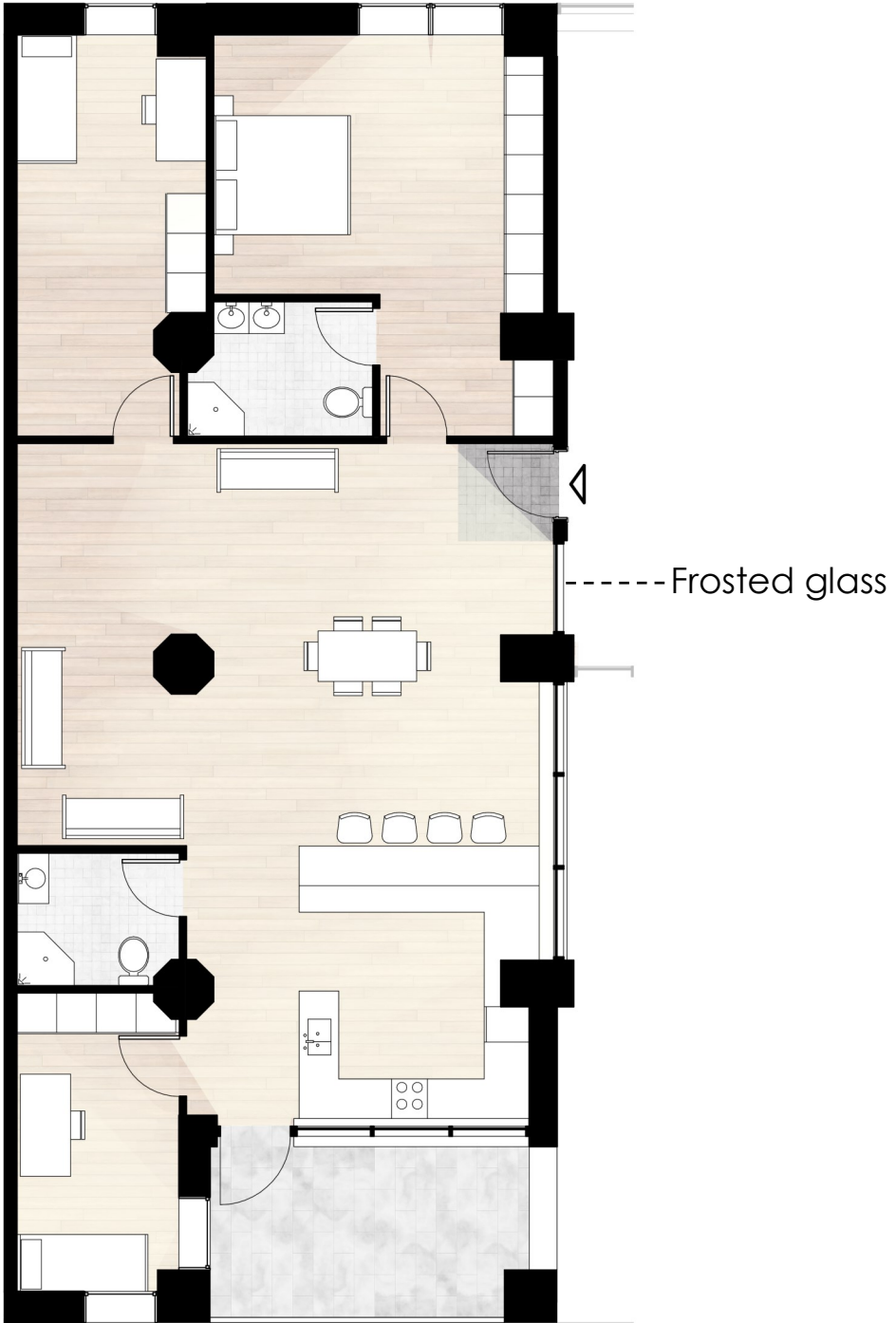
Quantity: 8 units

Dimensions: 17,1m x 5m x 2

Area: 171m²



4. TRANSFORMATION



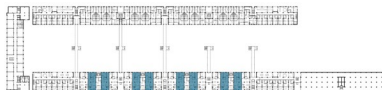
1st Floor:

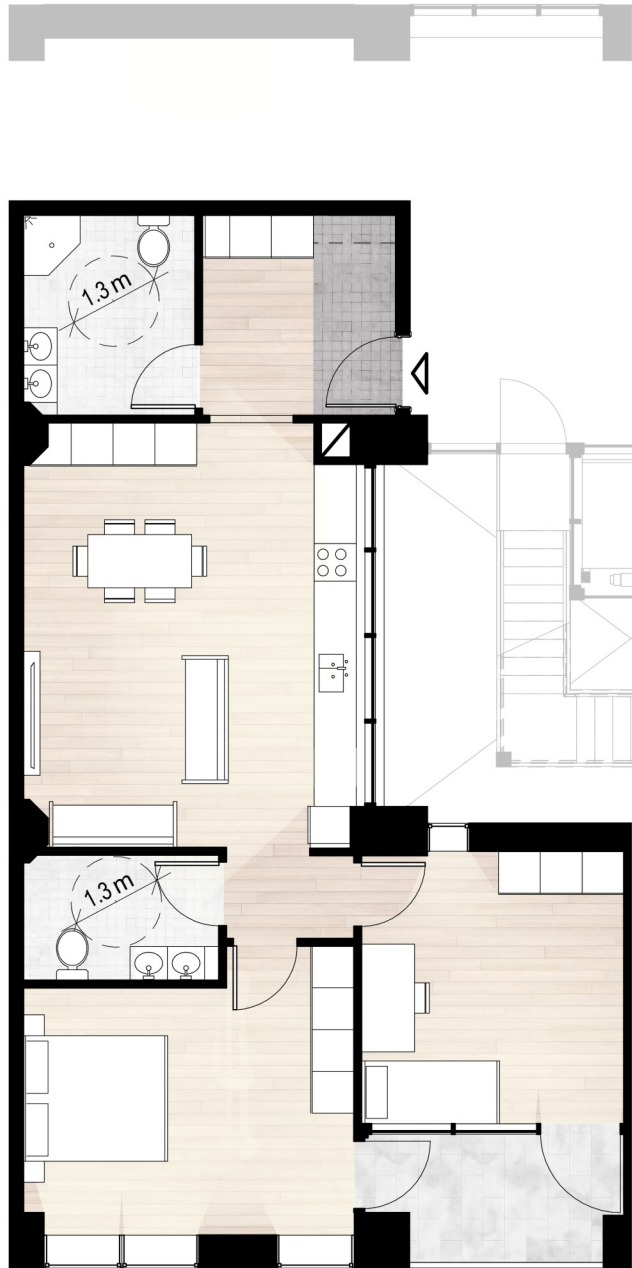


2nd Floor:



Family apartment
Quantity: 16 units
Dimensions: 19,2m x 8,1m
Area: 156m²





1st Floor:



2nd Floor:

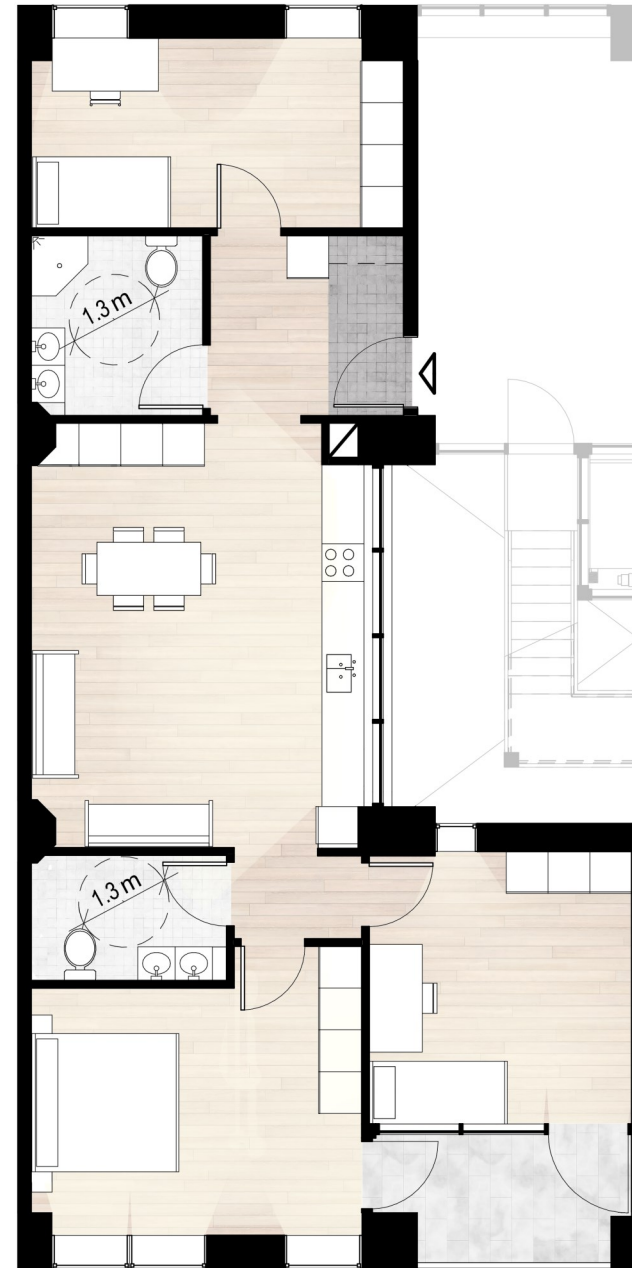


Two bedroom apartment

Quantity: 2 units

Dimensions: 14,5m x 5m + 3,6m x 5,9m

Area: 94m²



Three bedroom apartment

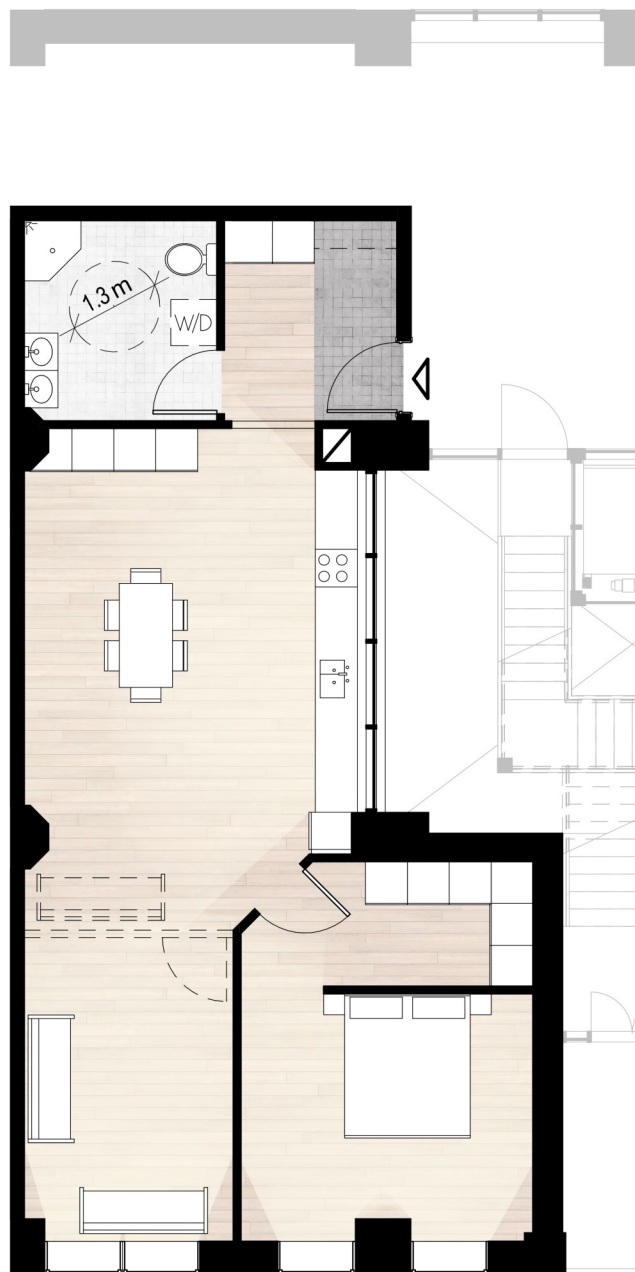
Quantity: 2 units

Dimensions: 17,1m x 5m + 3,6m x 5,9m

Area: 107m²



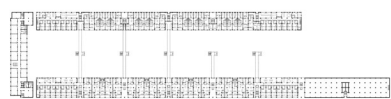
4. TRANSFORMATION



1st Floor:



2nd Floor:

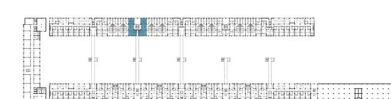
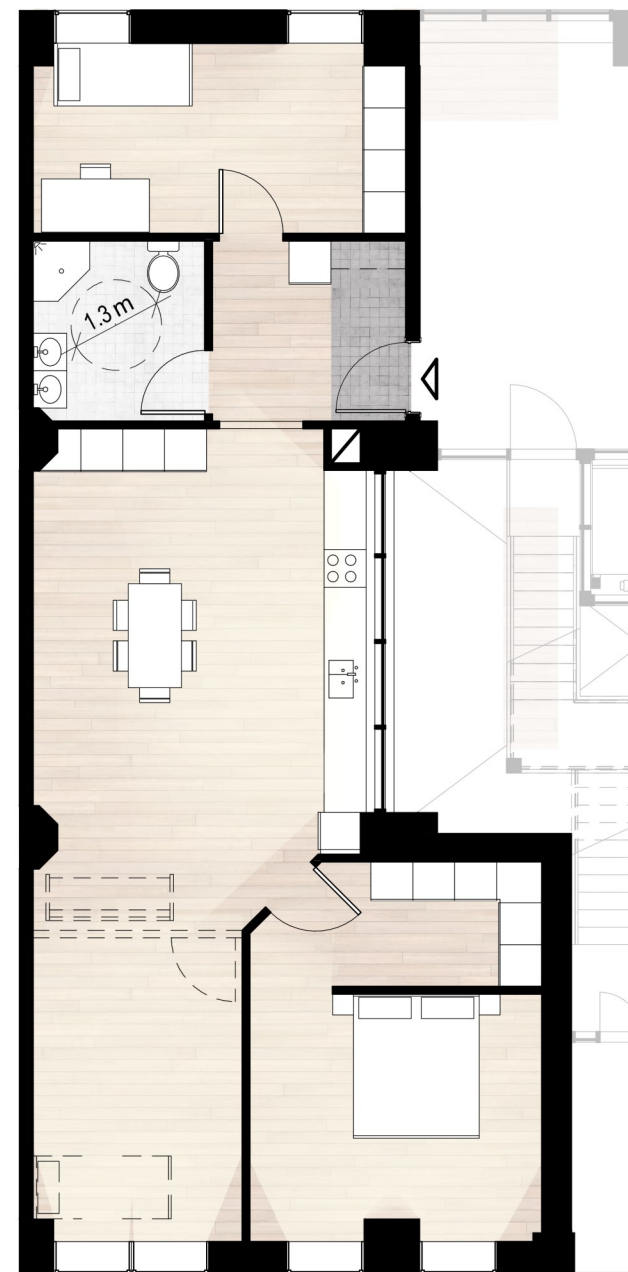


Flexible apartment (1 or 2 rooms)

Quantity: 2 units

Dimensions: 14,5m x 5m + 2,3m x 5,5m

Area: 85m²



Flexible apartment (2 or 3 rooms)

Quantity: 2 units

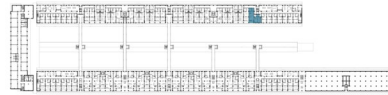
Dimensions: 17,1m x 5m + 2,3m x 5,5m

Area: 98m²

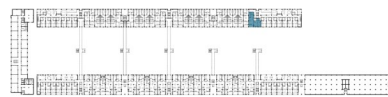




1st Floor:



2nd Floor:



Two bedroom apartment

Quantity: 2 units

Dimensions: 14,5m x 5m + 7,2m x 5,9m

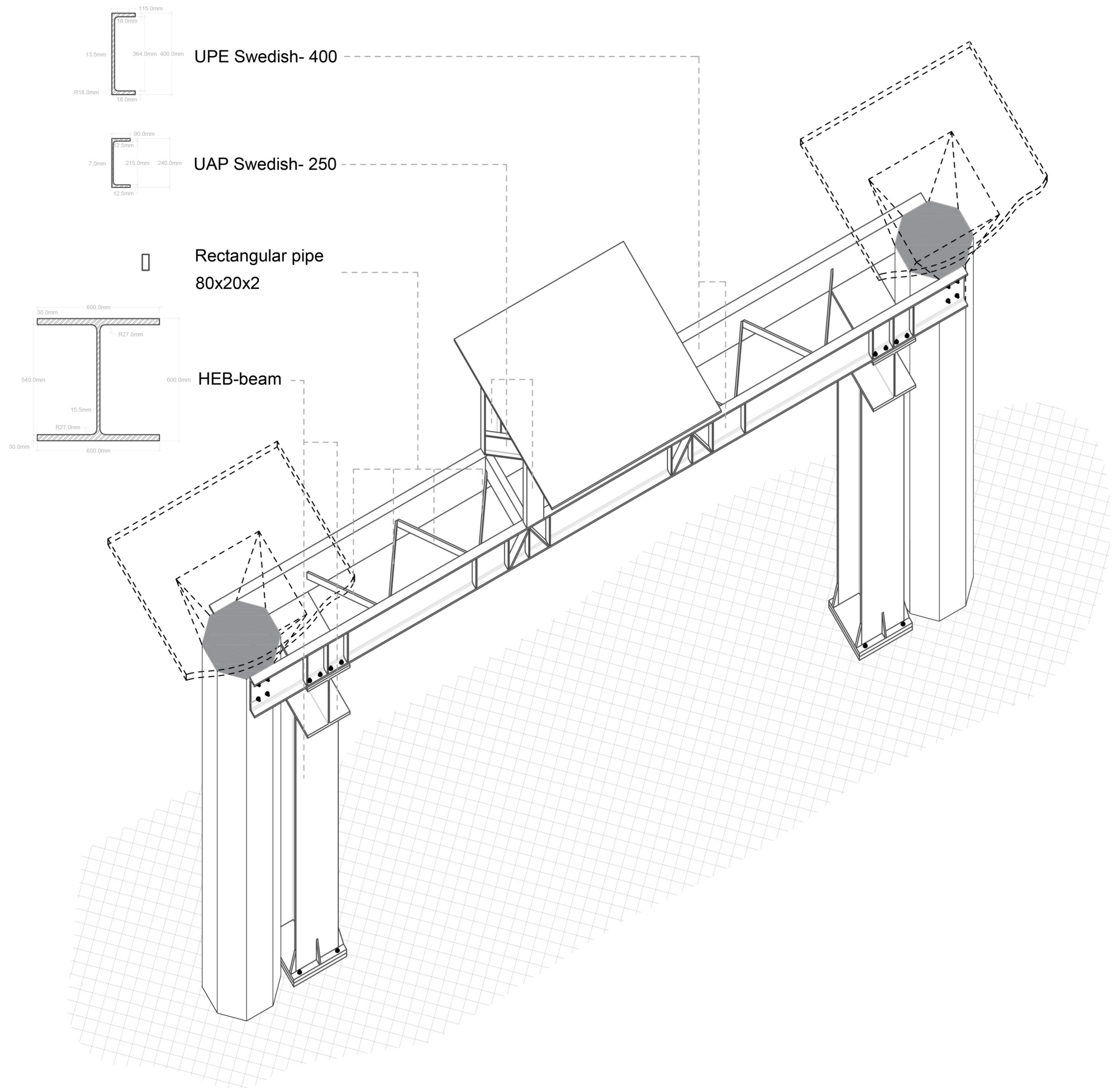
Area: 115m²



4. TRANSFORMATION

4.1 1 COLUMN REPLACEMENT

The underground floor of the Southern warehouse has an extra line of columns in the middle in comparison to the Northern warehouse. To create a suitable space for cars to transit and park comfortably a total of 30 structural columns have to be removed. By shoring the ceiling with temporary load struts the building would be safe from crumbling while the columns are being removed and replaced with a new structure. This new structure needs to distribute the load downwards from the center to the sides, landing very close to the existing columns. To construct the new bearing structure, and after doing the calculations, I listed the materials needed found on the Swedish market, as it is the one I know best. To secure the stability of the structure and distribute the weight more evenly, I decided to place two structural C-type beams resting on HEB beams. Also, I attached them to the side of the existing columns to add more stability without loading the columns. This method also serves as a wider base for a replacement capital to rest on.



Calculations:

Area enl. rapporten: $A = 24.417 \text{ }^2$

Bjälklag plan 4, tjocklek: $t_4 = 0.6$

Bjälklag plan 3, tjocklek: $t_3 = 0.3$

Bjälklag plan 2, tjocklek: $t_2 = 0.3$

Bjälklag plan 1, tjocklek: $t_1 = 0.3$

Egenvikt betong: $G_{bet} = 2.5 \frac{\text{t}}{\text{m}^3}$

Egenvikt bjälklag:

$$G_{bjälklag} = (A \cdot t_4 \cdot G_{bet}) + (A \cdot t_3 \cdot G_{bet}) + (A \cdot t_2 \cdot G_{bet}) + (A \cdot t_1 \cdot G_{bet}) = 91.564$$

Area pelare på plan 2:

$$A_{pelare2} = 0.9 \cdot 0.9 \cdot 3.9 + 1.8 \cdot 1.8 \cdot 0.8 = 5.751 \text{ }^3$$

Egenvikt pelare på plan 2:

$$G_{pelare2} = A_{pelare2} \cdot G_{bet} = 14.378$$

Area pelare på plan 3:

$$A_{pelare3} = 0.9 \cdot 0.9 \cdot 2.4 + 1.8 \cdot 1.8 \cdot 0.8 = 4.536 \text{ }^3$$

Egenvikt pelare på plan 3:

$$G_{pelare3} = A_{pelare3} \cdot G_{bet} = 11.34$$

Area pelare på plan 4:

$$A_{pelare4} = 0.9 \cdot 0.9 \cdot 2.4 + 1.8 \cdot 1.8 \cdot 0.8 = 4.536 \text{ }^3$$

Egenvikt pelare på plan 4:

$$G_{pelare4} = A_{pelare4} \cdot G_{bet} = 11.34$$

Egenvikt pelare total: $G_{pelareTOT} = G_{pelare2} + G_{pelare3} + G_{pelare4} = 37.058$

Total egenvikt pelare samt bjälklag:

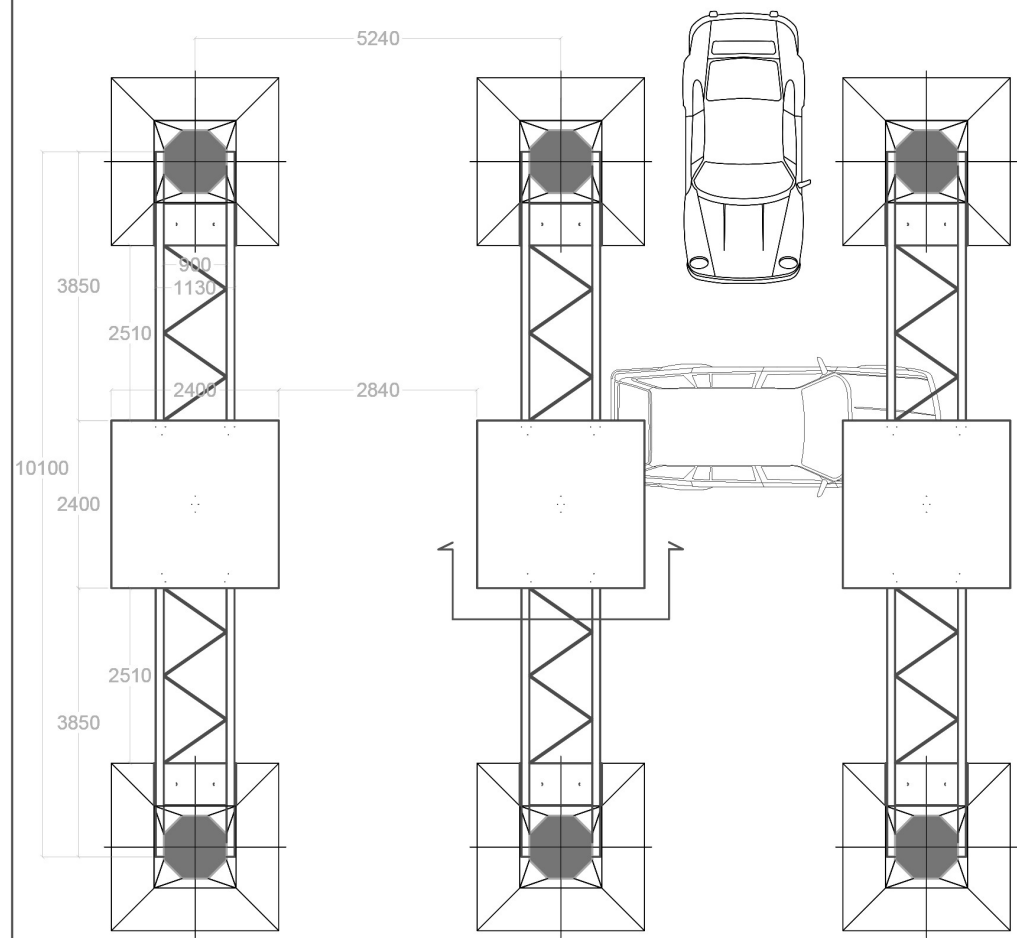
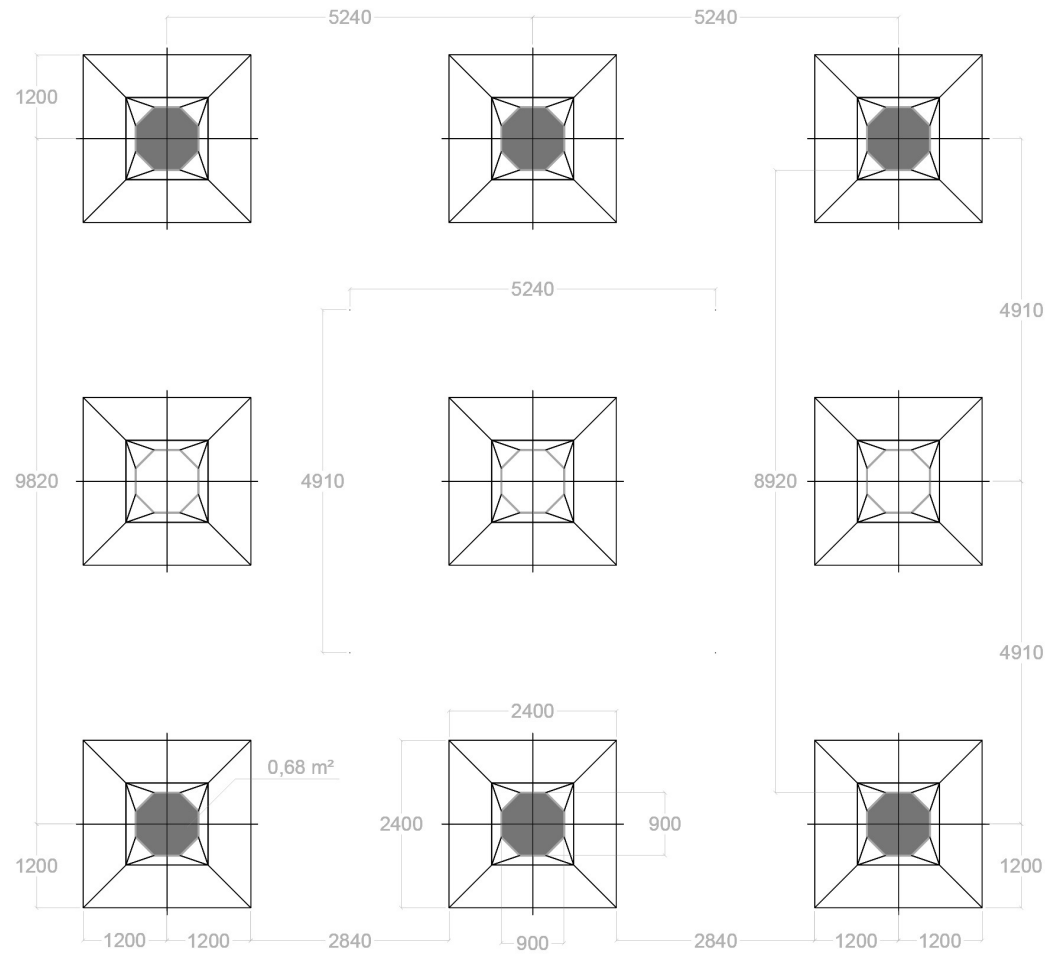
$$G_{TOT} = G_{pelareTOT} + G_{bjälklag} = 128.621 \text{ eller } Vikt = \left(\frac{G_{TOT} \cdot 1000}{9.81} \right) = (1.311 \cdot 10^7)$$

Lastarea:

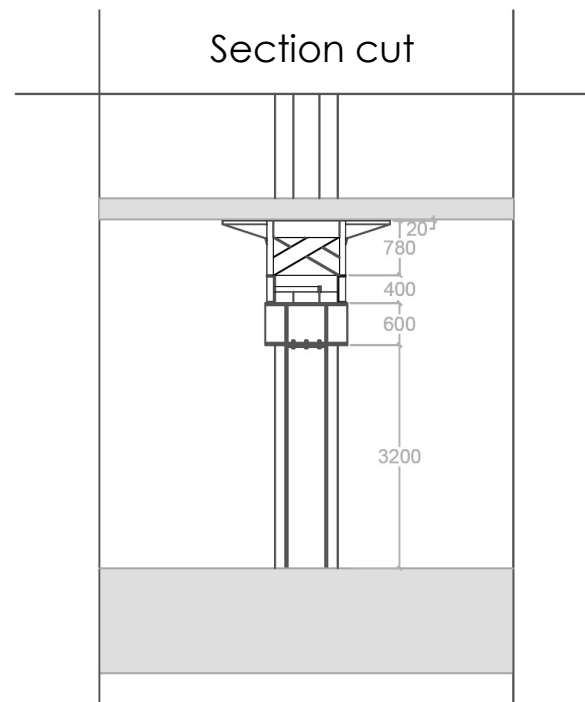
$$A_{last} = 2.4 \cdot 0.9 = 2.16 \text{ }^2$$

Belastad area:

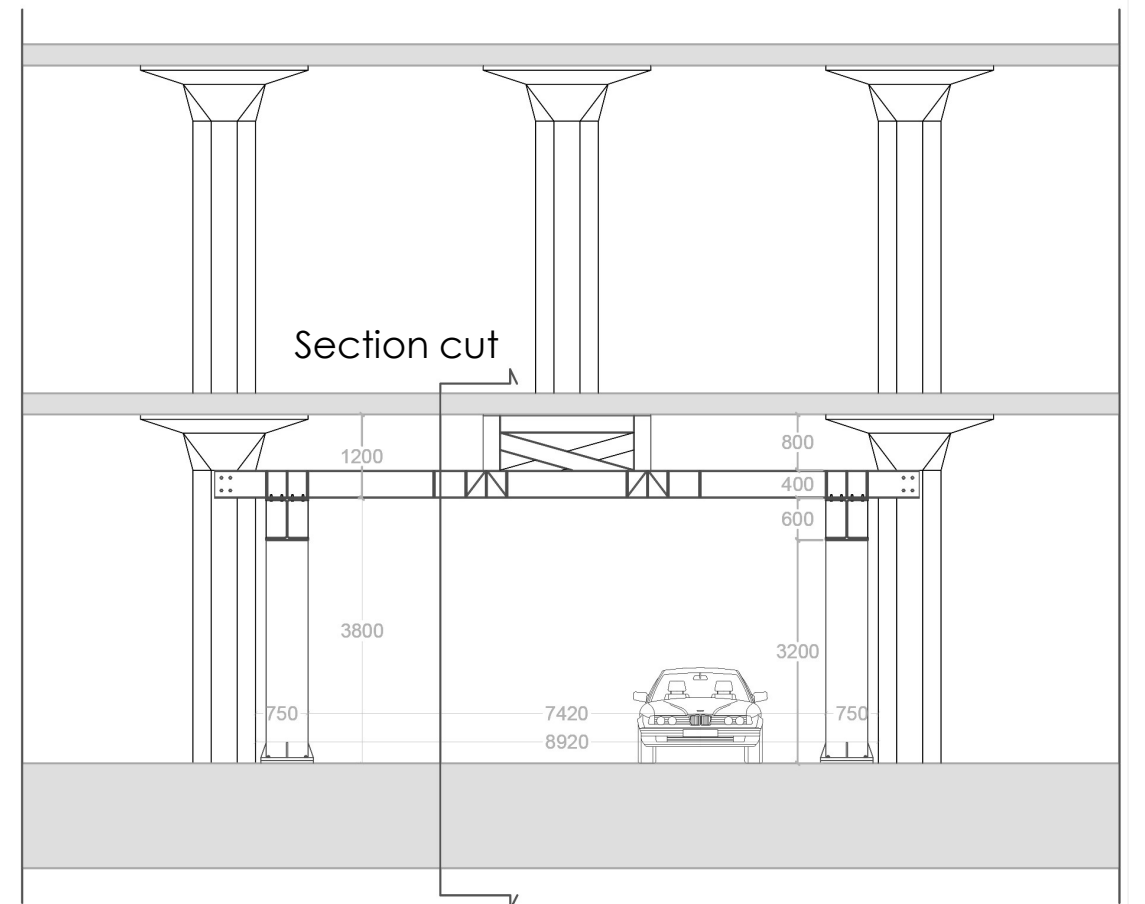
$$A_{belastad} = \frac{G_{TOT}}{A_{last}} = 59.547 \frac{\text{t}}{\text{m}^2}$$



Section cut



Section cut

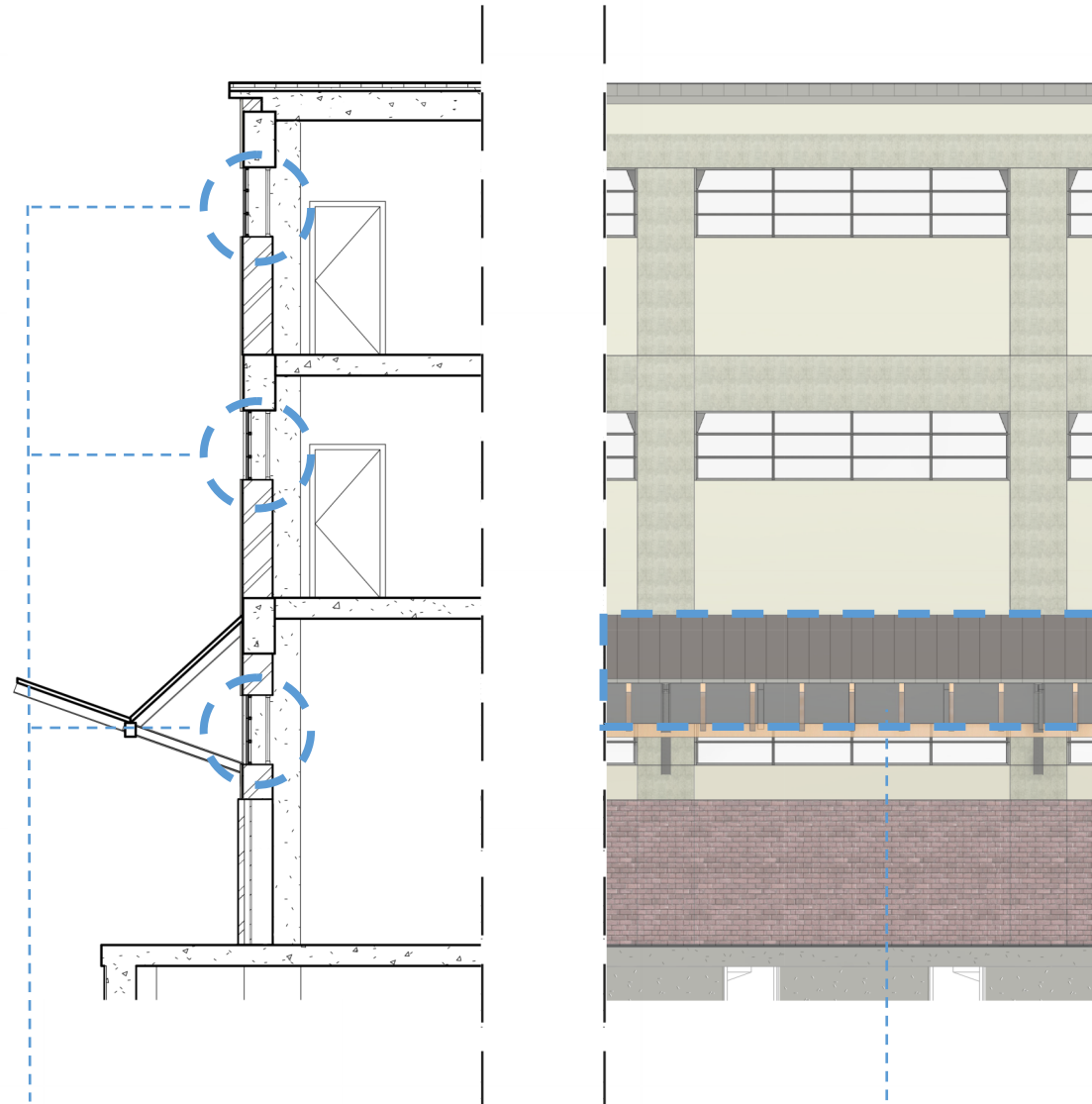


4. TRANSFORMATION

4.1.2 FACADE OPENINGS

Due to the nature of the structural system, where the bricks are not load-bearing, extracting bricks from the facade is structurally safe.

OLD

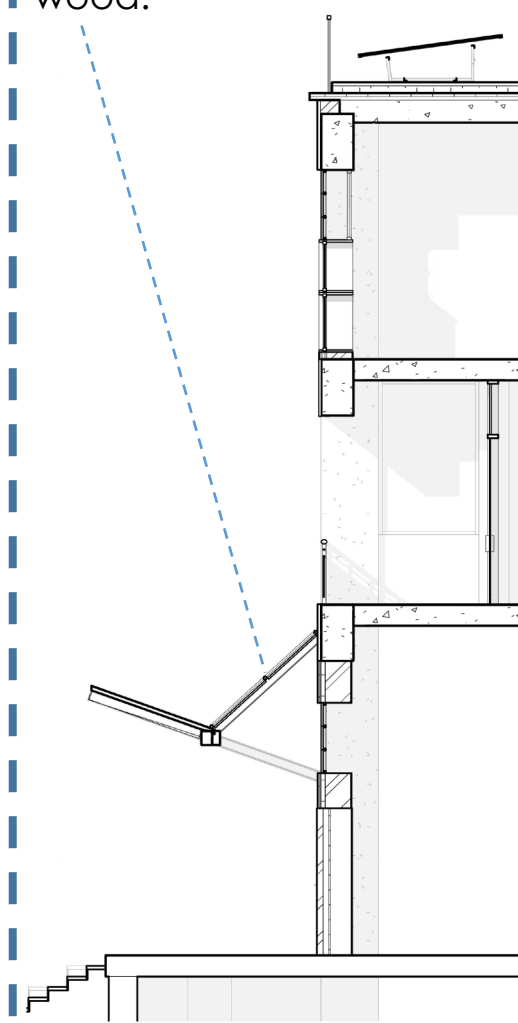


Windows are placed at 1,7m high, making them difficult to use.

The old wood roof provides cover from the rain but does not allow light to get through to the ground floor.

NEW

Part of the roof has been replaced with glazing, both to let light through and to replace the rotting wood.

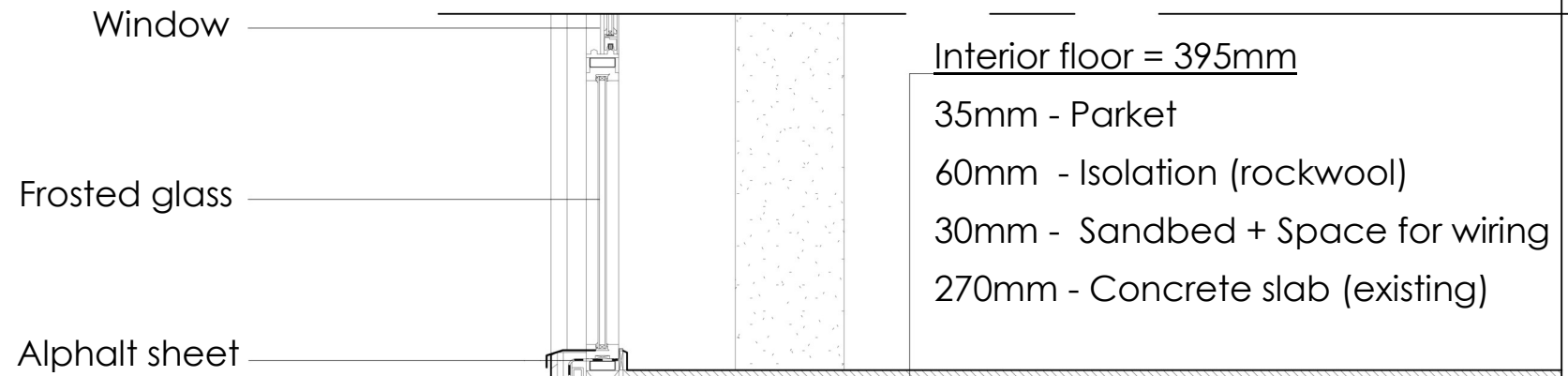


Balconies are installed by razing the brick wall and replacing it with glass railings. By adding this layer of transparency, the building can let more light into the interior while emphasizing its structural elements.



Extra windows with the same dimension as the old ones are installed under. The bottom ones being semi-transparent for privacy purposes.

4.13 TECHNICAL DETAIL

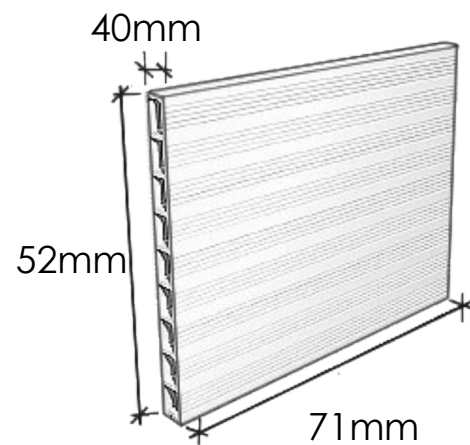


- Structural Facade = 568mm
- 8mm - Precast concrete panel
- 50mm - Airgap
- 40mm - *Large format bricks
- 10mm - Bonding mortar (lime based)
- 450mm - Reinforced concrete beam (existing)

- Balcony floor + Ceiling = 824mm
- 10mm - Ceramic tiles
- 10mm - Mortar
- 100mm - Isolation (high density)
- 0-53mm - Sandbed for inclination (1,5°)
- 5mm - Alphalt sheet
- 270mm - Concrete slab (existing)
- 378mm - Space gap for draining system
- 35mm - Acoustic plasterboard
- 16mm - Plasterboard

- Facade = 572mm
- 20mm - Wood panel
- 40mm - Airgap
- 40mm - Large format bricks
- 10mm - Bonding mortar (lime based)
- 450mm - Brick wall (existing)

*Large format bricks



Glasspanel

Scale (A3): 1:20

4. TRANSFORMATION

4.14 ISOLATION

Walls

I chose a semi-ventilated facade system because I think that in this particular case where the thermal mass is so high and a complete refurbishment after the sanitation is required anyway, it is the most efficient solution to create a buffer zone between the external and internal walls as well as a new outer skin. The spacing between the materials prevents heat transfer, helping maintain a more stable indoor temperature. The airflow between the cladding and the wall also helps control moisture levels, preventing condensation and reducing the risk of mold or mildew growth within the wall assembly.

Apart from these advantages a semi-ventilated facade also allows me to choose the aesthetics wanted for the project, has acoustic benefits, as well as flexible durability depending on the chosen material.

Floors

I chose to place most of the thermal isolation on top of the existing floor slabs for practical reasons, but to avoid thermal bridges, some isolation underneath needs to be installed in open areas like balconies. Once again, due to the thickness of the existing construction isolation costs can be reduced. I chose to add a sand bed to level the floor, but also to create space for electrical installations.

Since a lot of the apartments have kitchens and toilets in the interior I also added an extra ceiling which would create the gap needed to install the pipes. For the purpose of not covering the column's capital, these ceiling boxes containing the pipes would be installed only where needed and would have to be sound prove.

4.15 NEW FACADE MATERIALS

WOOD

Wood panels have a warm, natural, and timeless aesthetic that can enhance the overall appearance of the building. Aesthetically I chose wood panels because they can easily resemble the color that the original building and can easily adapt to the rhythm of the facade.

If brought from the right source wood is also a sustainable construction material and if properly maintained, wood can be a durable material that, over time, develops a patina that adds to its charm and character. In the event of damage, individual wood panels can often be replaced or repaired. The panels are also typically lighter and easier to work with than some other facade materials, which can make installation easier and cost-effective.

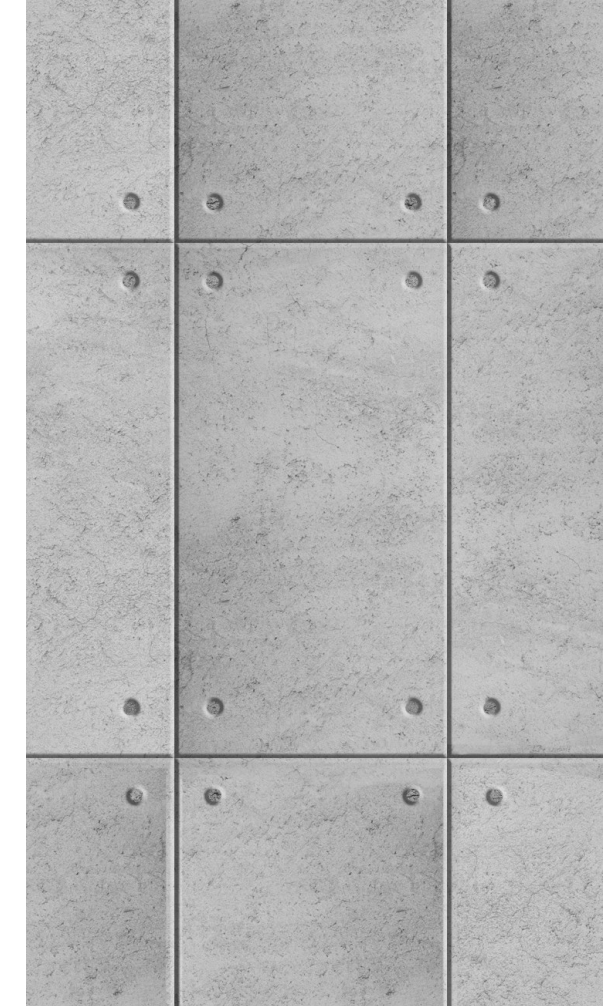


CONCRETE PANELS

Aesthetically I chose precast panels for a historical purpose. As with the structural system of the building, the panels are mostly made from the same material, this way projecting the structure behind to the visible facade.

These panels would make for excellent protection as it is a resilient material known for its durability and resistance. They typically require minimal maintenance over their lifespan and can be manufactured off-site to later be quickly installed, reducing construction time and labor costs.

From a sustainable aspect, precast concrete panels can incorporate recycled materials. Also, their thermal mass properties help regulate indoor temperatures, contributing to energy efficiency.



4.16 GREEN HOUSES

The purpose of these greenhouses on top of the warehouses is not only to provide a sheltered space to grow vegetables but also a sustainable way to retain heat from escaping the main body of the building below. These spaces would also provide a common activity for the dwellers where they could organize themselves and choose how to use the installations.

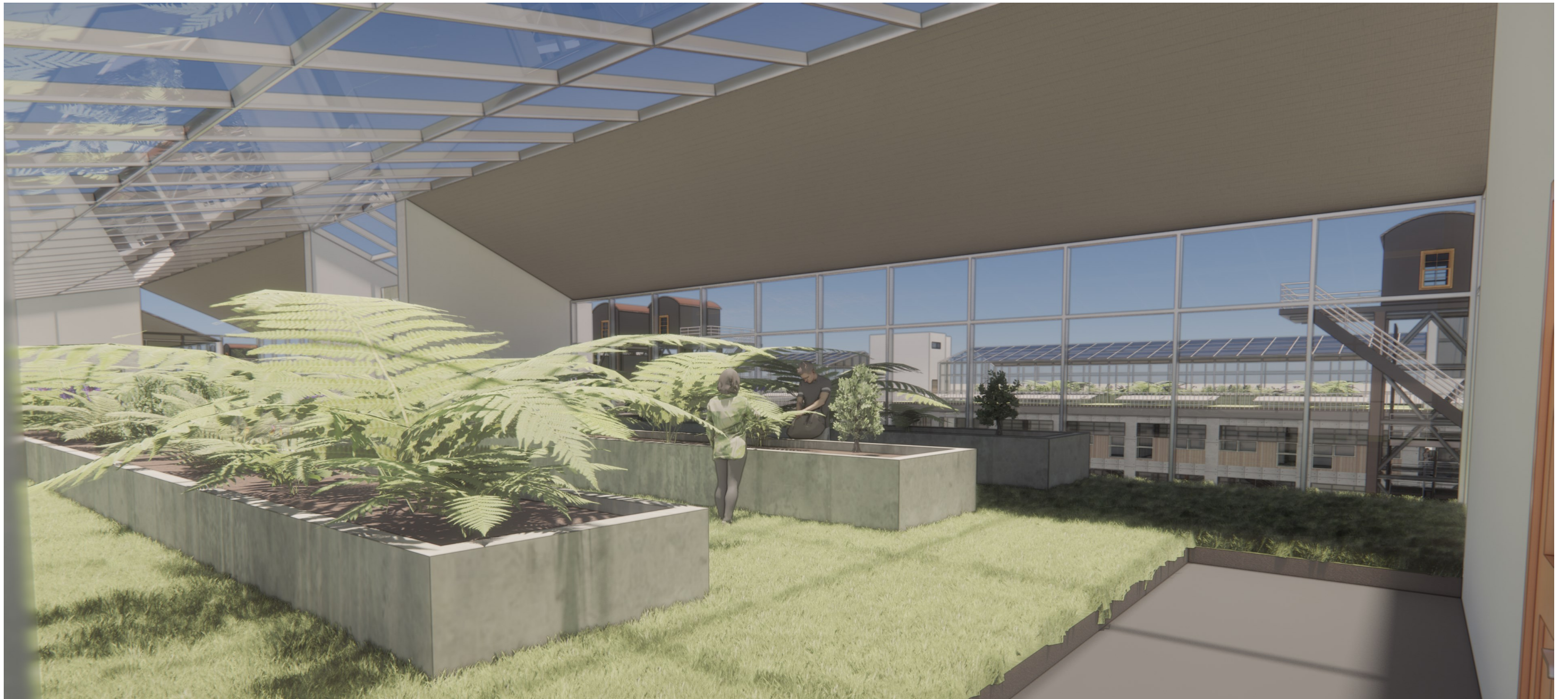


Image 41: Greenhouse on rooftop

5. REFELCTIONS

What this thesis tries to accomplish is a successful refurbishment of this urban space known as Žižkov Railway Station. My investigation really began after I established my goals for this thesis. I wanted to propose a reformation project that could fulfill the necessities of the city in this district. I also wanted to propose comfortable, suitable housing and social spaces, including multiple functions. All of this while maintaining the building's character and respecting its history. Trying to find the answer to how to do it was challenging but very instructive.

One of the biggest challenges of urban recycling, as in any project, is the decision-making. But when it comes to reusing an existing space, this does not only include deciding what needs to be demolished for something new to take its place but also what uses that you, as an architect, want to propose for that space. It is an added factor to think about. You have to constantly ask yourself "would this change make the space better or worse?". I came to the conclusion that when redesigning an existing building there are two aspects that are permanently trying to find balance between each other. One is the new purpose I want to propose for the project and the other one is the historical value of the building (this includes its character). One does not change without affecting the other, so the art of repurposing a historical building is about finding the perfect balance between these two aspects. In this

case I tried to keep the building's character by using materials that could resemble the existing ones and I respected the facade composition as much as I could by placing windows and materials that mimic the dimensions of the existing facade. But I think it is important to point out that I am not making a restoration project only, but I am rather redesigning a building. Therefore leaving the current character of the building intact is not a possible task. The part of my project that can be purely seen as a restoration plan is the intervention I proposed with the steel towers in the courtyard and the administrative building. I did this partly because they are elements in relatively good condition and relatively easy to restore compared to the warehouses, but also because I think that they are one of the most characteristic elements of the complex. Regarding the choice of functions inside the complex, I think that partly following the city hall's plan was the safest card to play. I trust that experts that have studied the area for years and have access to more information than I do would most definitely have a better judgment than me when deciding what is needed for the city. Nevertheless, I do not agree with their suggestion about placing apartments facing only north in the northern warehouse (image 13, page 21). Which leads me to my biggest challenge during this project, which was handling the natural light factor and ventilation inside the warehouses.

Trying to answer my second question was certainly the hardest one of all three. I think it is possible to fit in housing in the warehouses but it presents a lot of challenges. The placement of the complex was ideal for its primary function, extending its long wings from West to East to easily connect to the train line. As a consequence, the building has most of its surface facing South and North, which results in a lot of direct sunlight from one side but also in just as much surface without on the other side. This is not necessarily a problem until the established industrial dimensions come into play and present another big challenge. The width of the warehouses is around 17m on the Northern warehouse and 19m on the Southern warehouse. I think my solution of opening up the facade to the South and using the staircases as light shafts could work but they are for sure far from a perfect solution.

With this said I'm happy about everything I learned during this project and I'm taking with me an important professional experience. As I understand it, an architect will always have an almost infinite amount of knowledge and more to learn, and I hope that this project sets strong bases for what is coming during my career.

Image 42: Viewpoint from top on othe steel towers



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Images

Front cover image: Unknown photographer (unknown date) *IPR Praha*. https://iprpraha.cz/assets/section/fit2_800_800/sections-6140b0ed2b646-article-image.png

Image 1: Krejbichová, Hana (2013) *Nákladové nádraží Žižkov* <https://www.openhousepraha.cz/2022/09/21/otevrene-o-praze-nakladove-nadrazi-zizkov-nova-prazska-ctvrt/>

Image 3: Třísková, Nora & Zákostecká, Marie <https://praha.camp/magazin/detail/jezirko-s-vodopadem-nahradil-ruch-magistraly-proc-se-z-hlavniho-nadrazi-stala-zapomenuta-secesni-pamatka>

Image 5 & 6: Müller's villa <https://www.archiweb.cz/b/m-llerova-vila>

Image 7,8, 9, 10 & 18: Dvořáková, Dita (2013) *Nákladové Nádraží Žižkov*. 1, Městská část Praha 3.

Image 11: Lidovky.cz (2011) *It is said that the mysterious accident of the car at Žižkov railway station was not a coincidence* (translated) https://www.lidovky.cz/byznys/tajemna-nehoda-vagonu-na-zizkovskem-nadrazi-pry-nebyla-nahoda.A110207_115913_In-doprava_nev

Image 12: Hradská, Vladka (1973) *Jitex Písek at a time when he was doing well. Year 1973*. (translated) <https://www.ahaonline.cz/clanek/musite-vedet/157741/pletenina-do-kazde-rodiny-pred-70-lety-vznikl-jitex-pisek-oaza-v-sedi-nevkusu.html>

Image 14: Sekyra Group (2016) *zizkov city*, visualization. <https://sekyragroup.cz/pages/developersky-projekt-praha3-zizkov-city#>

Image 15 & 16: Petr Hlaváček (2022) *Žižkov Freight Railway Station* <https://www.petr-hlavacek.eu/projects/nakladove-nadrazi-zizkov>

Image 17: CENTRAL GROUP, a.s.(2021) *New Žižkov Centre*. https://iprpraha.cz/uploads/assets/dokumenty/CAMP/camp_pp_brozura_nove_ctvrti.pdf

Note* The images that are not listed are made/taken by me.