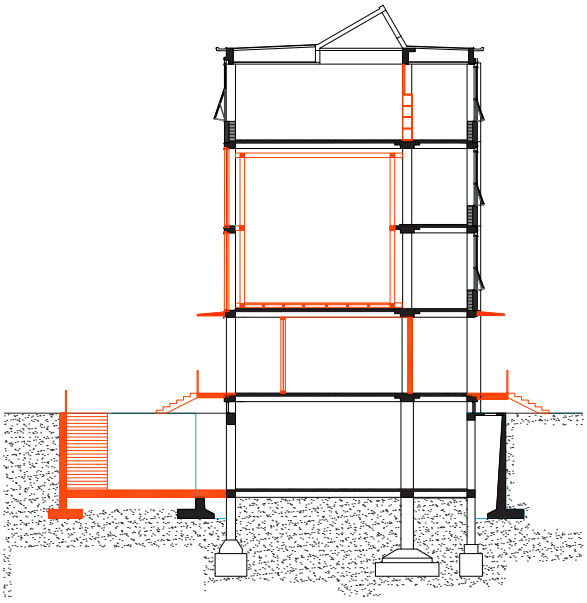
A BOX IN THE BOX

Putting a new space in Milan post-war modernist architecture



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POLITECNICO DI MILANO - SCHOOL OF ARCHITECTURE URBAN PLANNING CONSTRUCTION ENGINEERING

ARCHITECTURAL DESIGN STUDIO FOR RESTORATION OF COMPLEX CONSTRUCTION

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LIGHT MACHINERY LABORATORY

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Abstract

The light machine lab is a concrete building designed and built in Milan during the post-war period. It is an important part of the history of modern architecture in Milan, bearing the memory of the development of Società Umanitaria. But with the change of social lifestyle, the space of the building no longer meets the needs of modern use. Therefore, the direction of our design is: 1. Repair the parts of the building that need to be protected. 2. While preserving the historical value of the building, transform the space form to meet the new needs of current teaching activities.

About conservation work: The structure uses a small-span column grid, and the design of the facade (walls, windows) also follows the rules of the structural grid, using a uniform size. In terms of building conservation, the concrete column structure system is the core of the entire building. We hope to use appropriate methods to strengthen weak structures through structural safety analysis. In other elements of the building, repair and reinforcement of materials that can continue to be used (for example, the walls of the facade).

In terms of transformation, our concept is by stripping-out and re-use of the structural skeleton to place a stepped space. The original space of the building is a multi-store horizontal space, and each floor is only connected by escape stairs at both ends of the corridor. Now, with the development of social lifestyles, students' learning style is no longer a single classroom teaching, but more space for display and communication is needed. Therefore, we insert a new stepped space as a box which is a shared exhibition and communication space to activate the spatial vitality of the entire building.

Key words

Restoration of contemporary building, Transformation, Public space, Harmony

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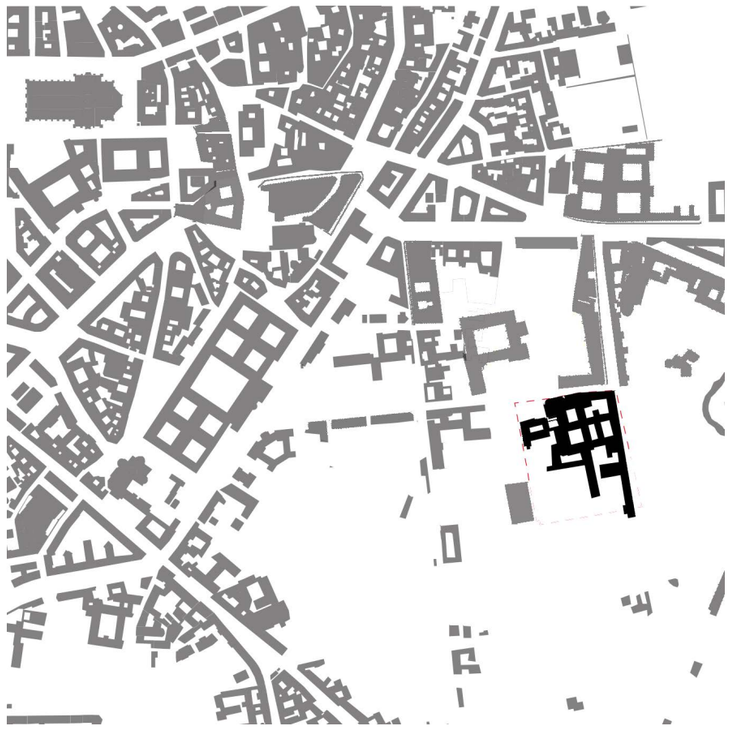
BACKGROUND

Milan map in 1884

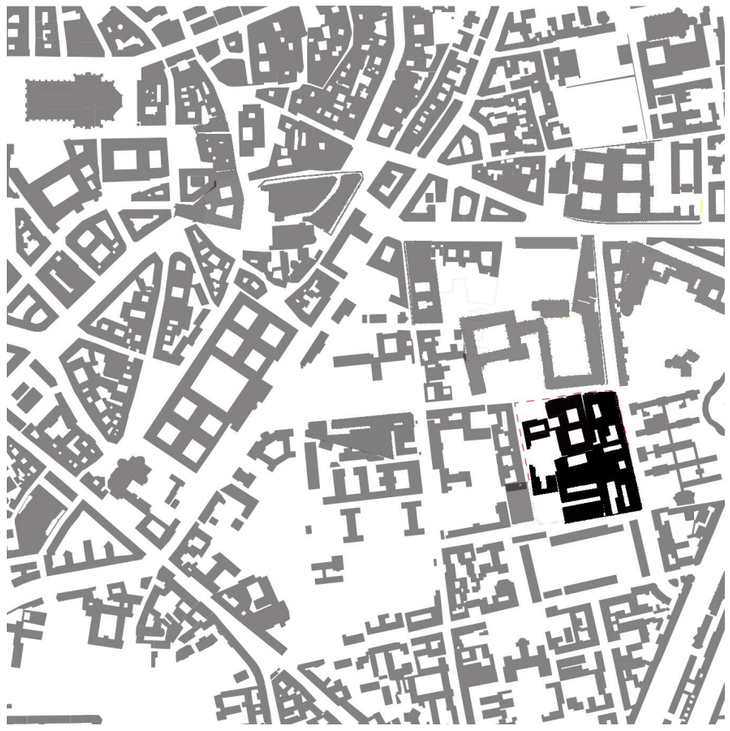


Società Umanitaria

Milanese is that of a city in strong demographic expansion production, which already shows the signs of considerable industrial development. Milan, like many other European cities, looks colossal social laboratory, subjected to very strong tensions: on the one hand one new industrial activity, with industries and workshops sprouting like mushrooms, on the other a fourth state adrift, with roads that overflowing with unemployed, simple people, almost illiterate, in part arrived from the neighboring countryside (“driven out by hunger, by the horrendous hunger that brutalizes, the pariahs of the countryside move towards the great city ”, wrote the newspaper Il Secolo since 12 November 1890).

The Societa Umanitaria was founded in 1893. The under privileged will be provided with the instruments that would help people improve on their condition by receiving work and education instead of just a temporary support. Education was the Society's earliest concern. Based on the concept that "developing the worker's professional skills means protecting them from the threat of unemployment and increasing their economic wealth", it established a whole range of primary and secondary schools, all of them free of charge and more importantly, professional training schools.

Milan map in 1910



1902
The Board of Directors elects Giovan Battista Alessi as President, reconstituting the five operational Sections (Presidency and Administration, Workplace, Arts and Crafts, Cooperatives, Social Assistance and employment offices).

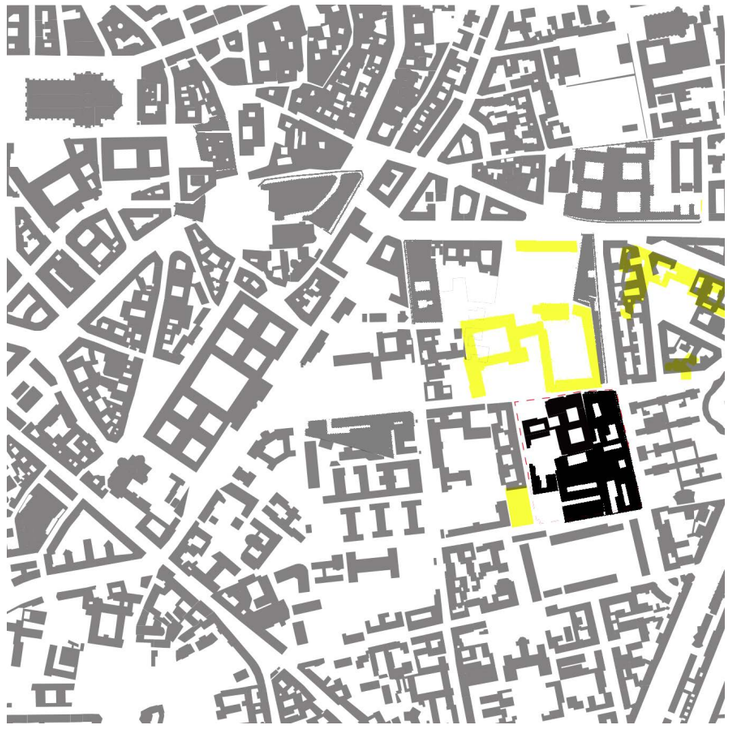
1903
The first Laboratory-Schools are established: that of Electrical Engineering for workers, that of Applied Art to Industry (cabinet making, wrought iron, goldsmithing) and the School of Books.

1906
L'Umanitaria organizes the 1st International Congress for the fight against unemployment. Organization of the First International Congress of Adult Education, from which the Italian Union of Popular Culture was born and organization of the Italian Federation of Popular Libraries.

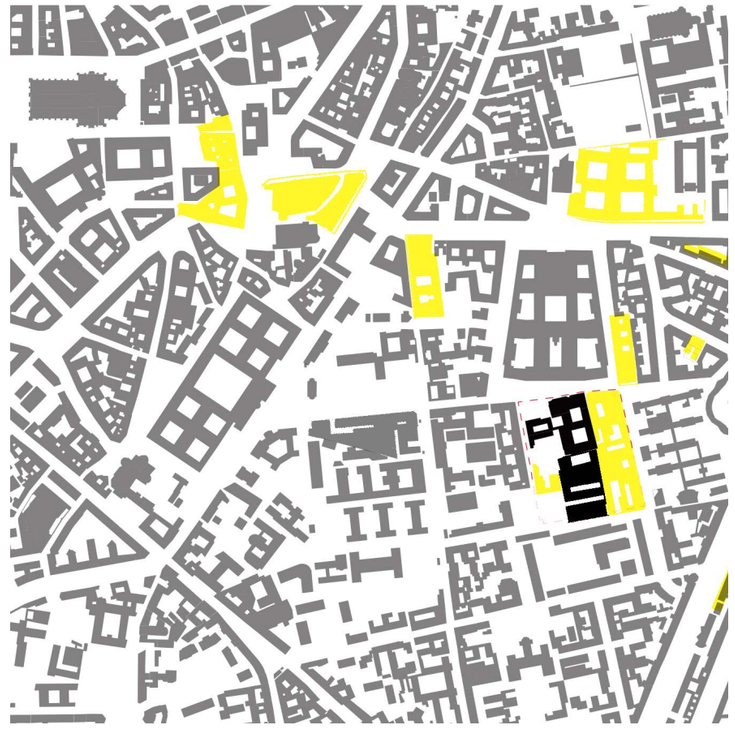
1908
Under the aegis of Maria Montessori, the first Children's House in Milan was born, in the Solari working-class district.

1911
The Teatro del Popolo is inaugurated.

Milan map in 1930



Milan map in 1946

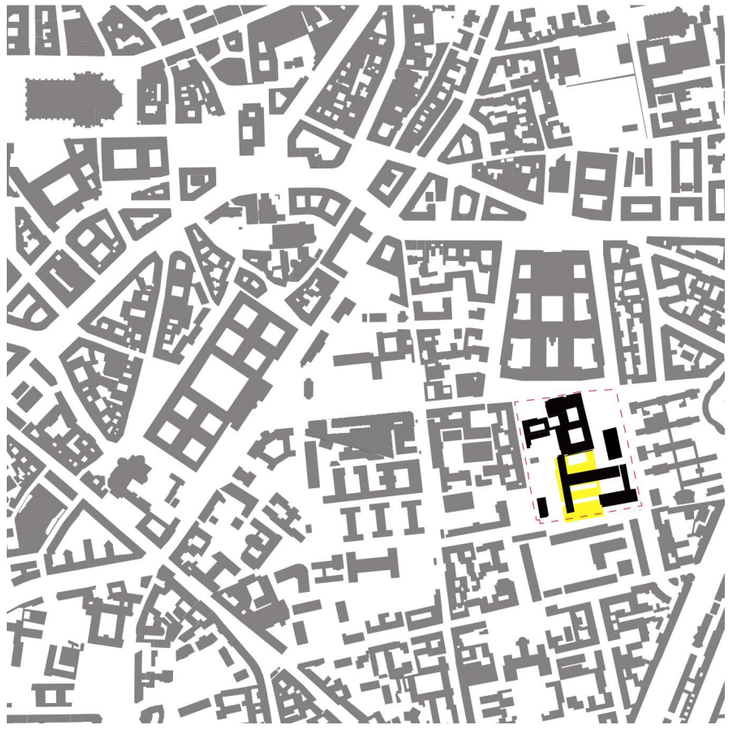


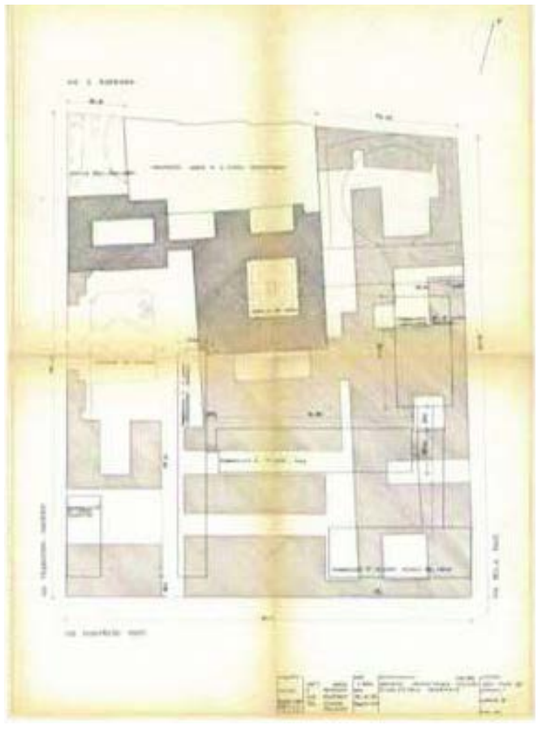
1923
The Biennali d'Arte come to life, which brought together artists from all over Europe to Monza, highlighting renowned creative realities, proposing curated installations and valuable works (furnishings, wrought iron, ceramics, designer glass, goldsmiths, weaving and embroidery, plastic and painting works).

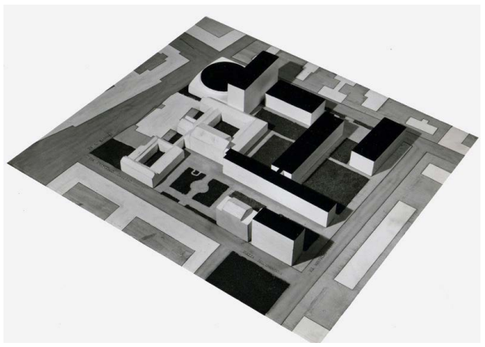
1943-1944
Allied bombings severely damage the site: over 80% of the buildings are destroyed.

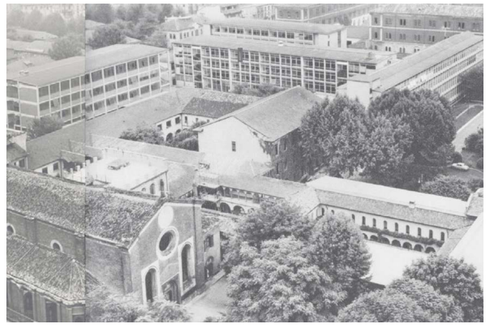
1946
Based on a project by the architect Giovanni Romano, he presents the definitive project for the reconstruction of the institution: the imposing work will last almost a decade.

Milan map in 1956



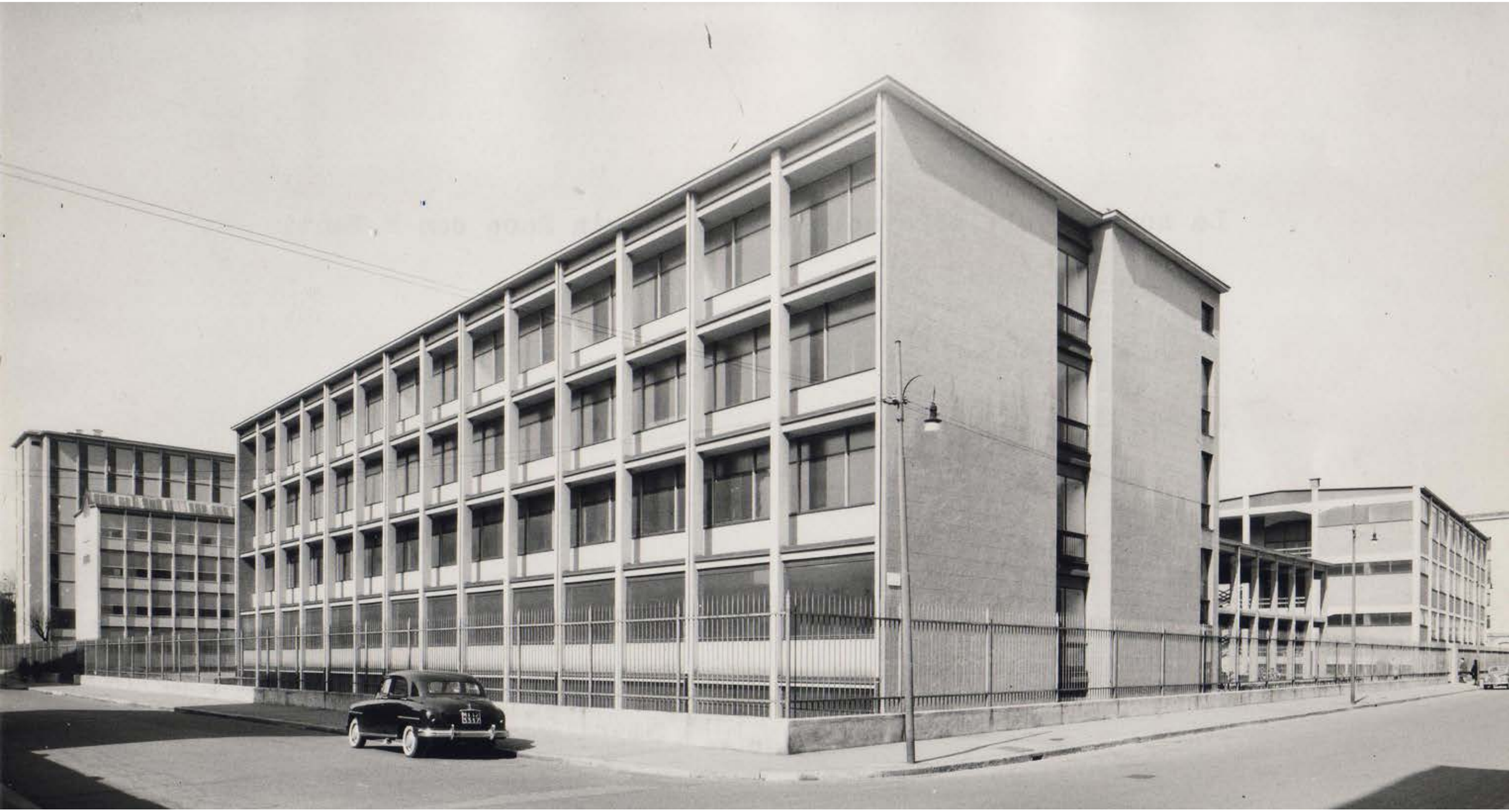




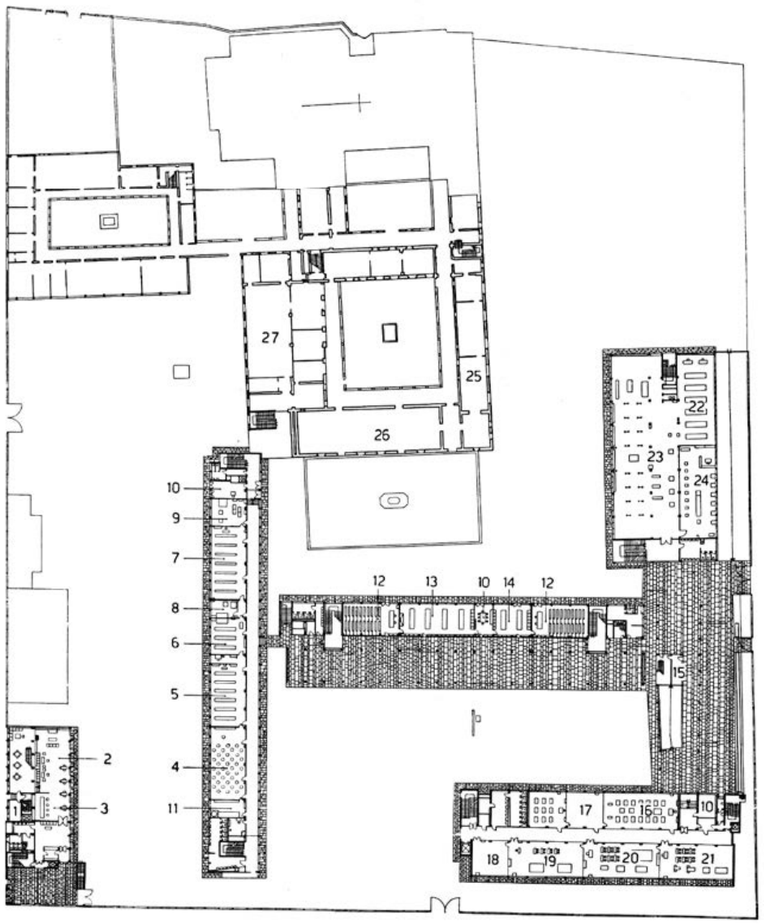


The new headquarters of the Societa Umanitaria designed by Giovanni Romano, had been completed in 1957, reconstructed on the site of the old facility destroyed by bombing in 1943. The "Società Umanitaria" was configured as a large facility composed of parts that divided up the area. An entire block with a regular form in which the new buildings were clearly identified as part of a complex: classrooms, heavy laboratories, light laboratories, the scuola del libro, the administration and the boarding facilities, along with reconstructed surviving cloisters and the Chiesa della Pace, outside the property.

The buildings, separated but connected by porticos and passages on the ground level, subdivided the proportions of the lot, gauging them in relation to the elements facing them. Thus the surviving refectory, the "hall of frescos" – the representative center of the Umanitaria in the life of the city, given the lack of the Teatro del Popolo – was framed by "heavy" and "light" workshops, facing the elevation of the classrooms and forming the monumental core of the block. An "open construction" that did not fail to measure the space of the block, attempting to clearly mark its corners. Corners that were not indifferent to the form of the city: the tower of the boarding school overlooks Piazza Umanitaria and the Teatro del Popolo that was never built would have polemically challenged the gray bulk of Piacentini's Palazzo di Giustizia (courthouse).

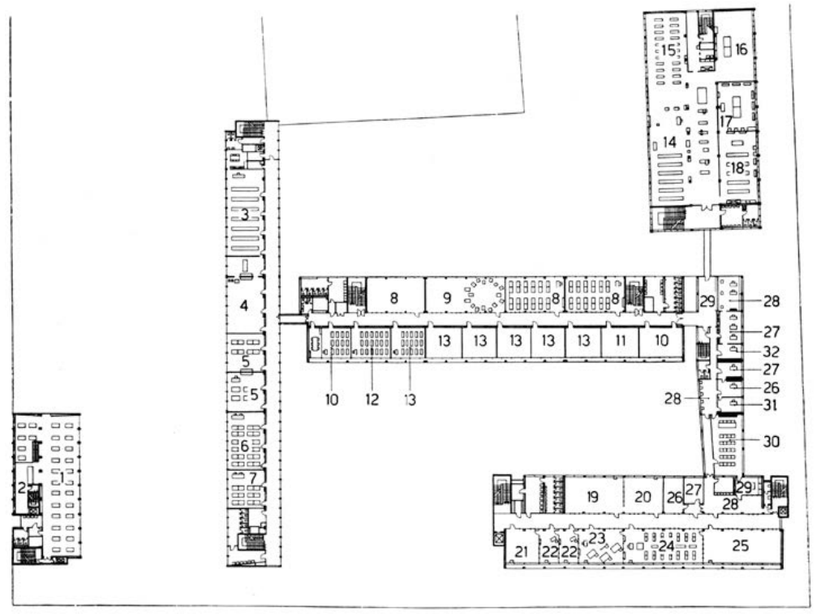


The conception of the school as a set of specific functions, asserted by Romano in relation to the tradition of the Modern Movement, shaped the space between old and new, city and architecture. This concrete character of space – which we might call urban, a characteristic of the Milanese reconstruction – makes use of two tools typical of the rationalist ideological equipment: the device of orientation and the functional organization through which to identify the contents and specify their architectural characteristics.



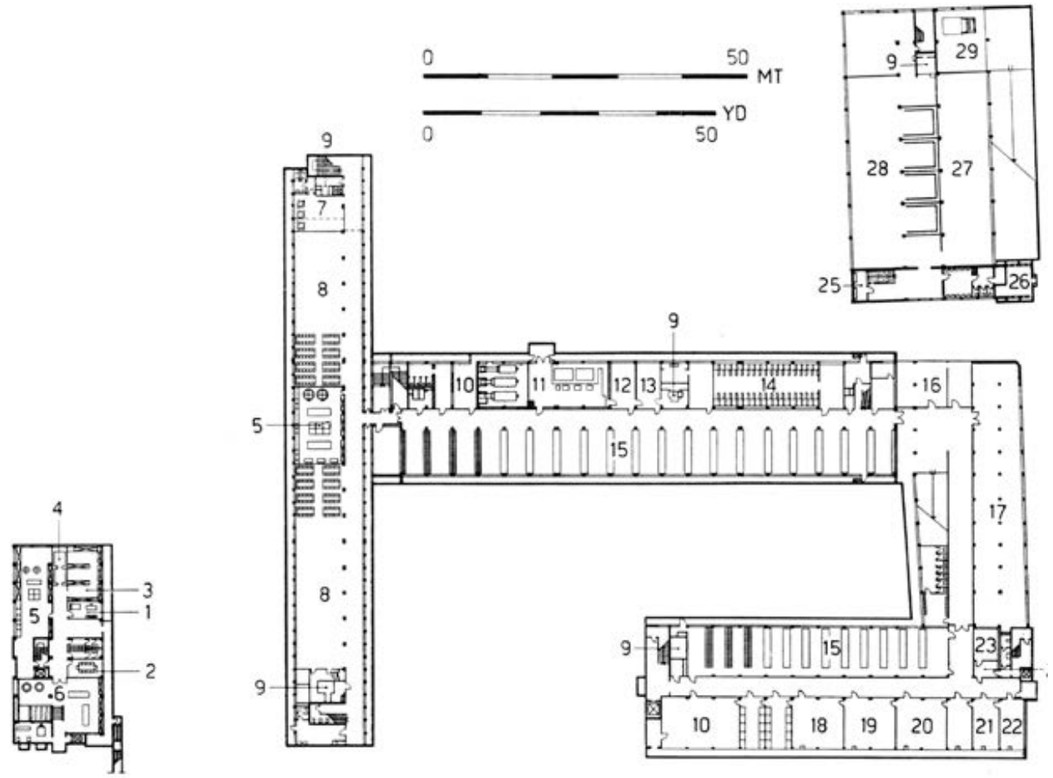
Ground floor plan

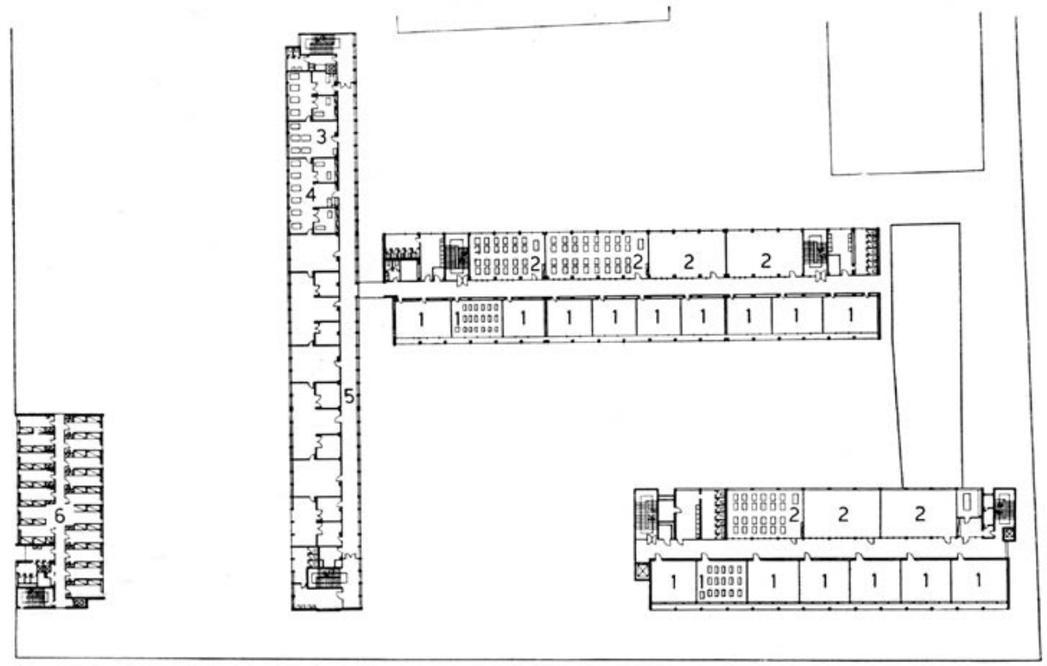
1 boarding-school direction
2 living room
3 bar
4 plastic art school
5 decorative drawing classroom
6 decorations
7 plastic art workshop
8 furnaces
9 preparing room
10 teachers
11 forms
12 classrooms
13 chemistry laboratory
14 physics workshop
15 lodge
16 artistic binding
17 industrial binding
18 rotogravure
19 litho
20 2nd make-up
21 1st make-up
22 1st blacksmith workshop
23 2nd blacksmith workshop
24 welder workshop
25 cultural club
26 frescoes hall
27 gymnasium



First floor plan

1 boarder refectory
2 service
3 goldsmith
4 repoussé work school
4 goldsmith superior courses
5 1st drawing course
6 2nd drawing course
7 drawing classrooms
8 copy from nature
9 classroom for24
10 classroom for36
11 classrooms
12 classroom for30
13 workshop
14 mechanical turners' workshop
15 mechanicals' workshop
16 plate turners
17 tinsmith
18 pre-technical school
19 physical-chemical proofs
20 stereogalvanotypy
21 monotype
22 linotype
23 1st hand composition course
24 2nd hand composition course
25 directors
27 secretaries
28 anteroom
29 teachers' room
30 teachers' meeting room
31 social assistant



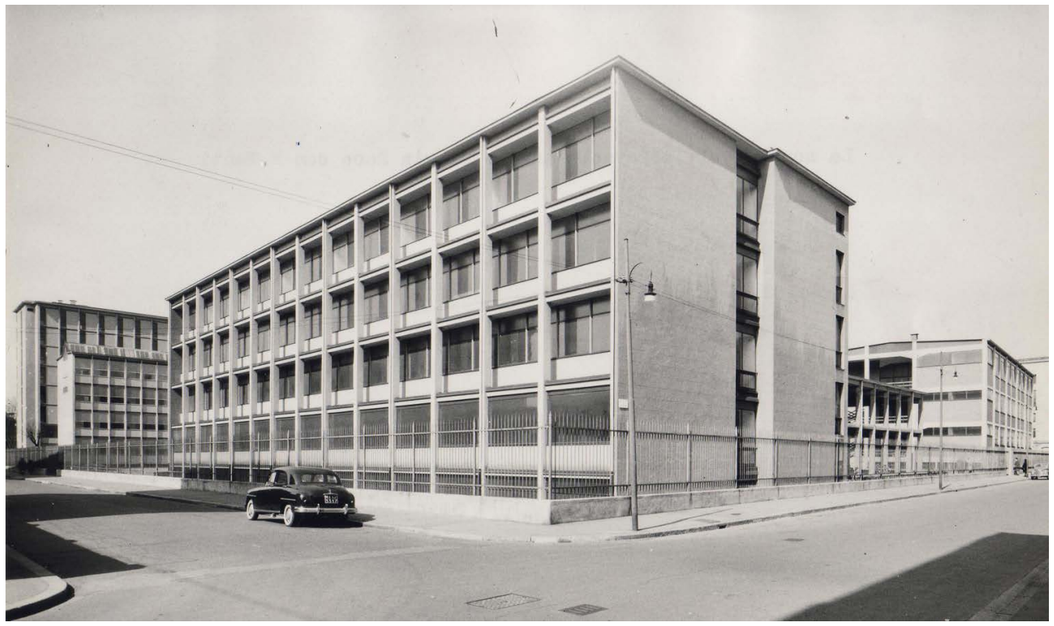


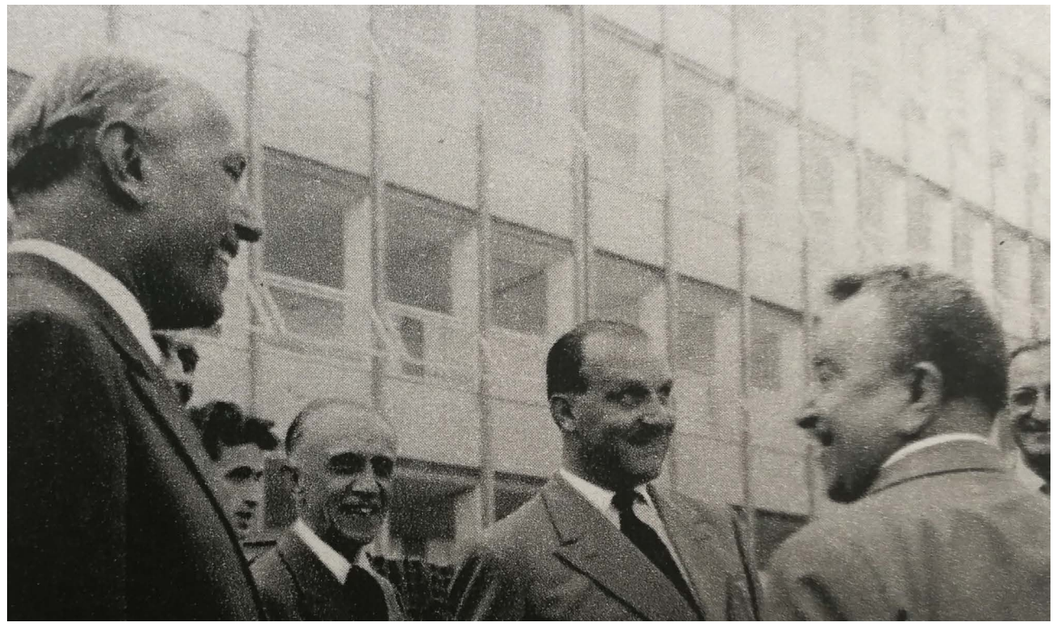
Basement plan

1 steward
2 personal refectory
3 food storage
4 refrigerator
5 kitchen
6 laundry
7 teachers' dining room
8 refectory
9 air conditioning
10 storage
11 heating
12 hydraulic station
13 electric boards
14 showers
15 dressing rooms
16 maintenance workshop
17 material storage
18 paper converting
19 boxes production
20 cases working
21 aniline print
22 hollow punch preparing
23 teachers
24 attendant
25 general electric board
26 400 KW transforming station
27 varnishes' school
28 electricians' school
29 garage

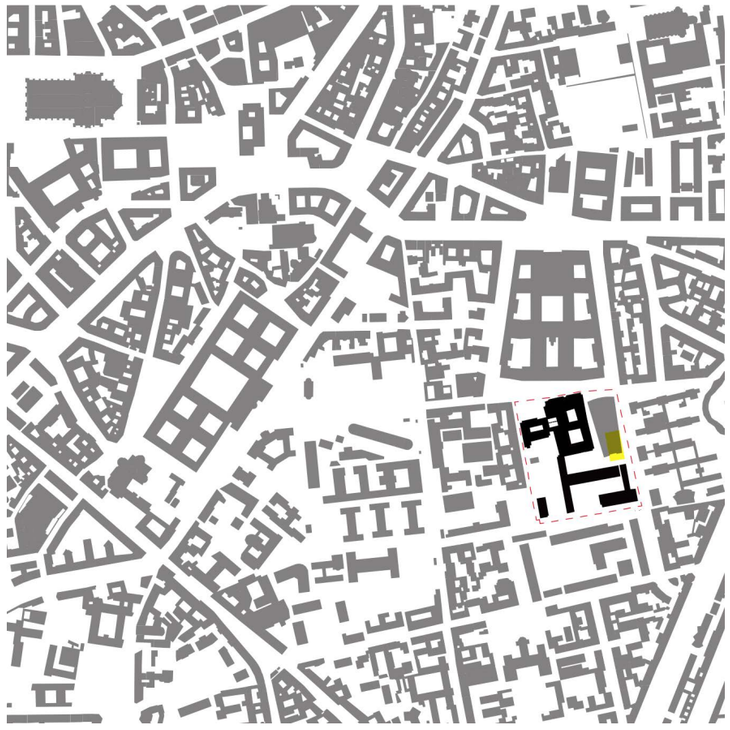
Third floor plan

1 classrooms
2 drawing classrooms
3 pupils' study room
4 teachers' study room
4 sboarders' study rooms
6 dormitory





Milan map in 2020



We can think of the current site as a renovation project, a renovation project in terms of the whole site. At the same time, the design needs to consider the existing relationship between the building and the new building, and also needs to consider the relationship between the new building and the surrounding environment. Whether to open to the inside or to the outside needs to be decided according to the functional requirements.

At that time, as a function of this kind, the building itself needed to be more open to the interior, and the buildings also needed to be connected by this internal courtyard.In the north and south directions, there are the main entrance squares to the site, so the continuity between the north and the south is even more important.Therefore, the building facing east and west needs the ground floor to be open to connect the north and south square.

Typology

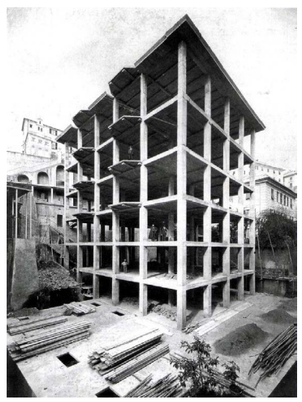
Modern architecture has long been accepted worldwide. Meanwhile, the framework system of beams and pillars patented by Hennebique for the building industry at the end of the XIX century, was brought up to standard in the early 1900s and spread the reinforced concrete frame in the construction of the European city by integrating the load-bearing masonry or replacing the wooden frames of the houses. The structure is no longer hidden inside the building, but exposed as part of the facade.

While maintaining the introduction of world architectural ideas, Italian architects are also actively thinking about the relationship between modern architecture and local traditional architecture. For the reconstruction after the war, many architects of the time actively used new materials and new structures to solve the current problems. The new aesthetic taste and architectural form are gradually accepted by the public.

As art of building, modern architecture is being shaped in the context of a contradictory craft contained in the architect/engineer split, virtually as characters impersonating the recalled terms of design/construction. Its debut can be found in the voice of Quatremere de Quincy's Dictionnare Historique de l'Architecture (1832), in which construction is defined as "the art of making everything that is part of the composition of a building".

Exploration of the relationship between structure and architecture has become a feature of modern architecture. At the beginning of this structure design, it was to solve the problem of insufficient prestress of single material.When it is combined with architectural design, it solves not only structural problems, but also inspires designers to explore the diversity of architecture.

Rue Danton is between 1889 and 1892 that a turning point emerged, it is especially the patent filed in 1892 by engineer Francois Hennebique that will revolutionize the use of this material, and will make him one of the inventors of reinforced concrete construction.

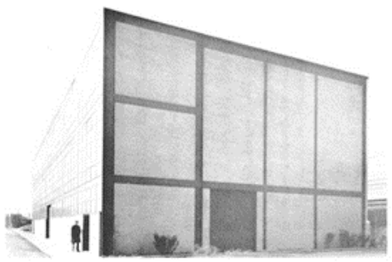


1, rue Danton, Paris

After 30 years of development and practice, the means of transforming reinforced concrete structures into architectural expressions has long been accepted and used by architects around the world. Gradually, technical methods are transformed into aesthetic methods. The relationship between the various parts of the building is constantly being studied and discussed. The Illinois Institute of Technology, which was planned and designed by Mies in 1939, adopted a modern architectural flow space planning method, using modulus to unify the whole. The building is filled with exposed steel frames and brick walls, presenting a modular balance and rhythm on the flat facade. Pillars, beams, walls, window frames, which are usually regarded as secondary elements, appear together in the building. When facing, it turns into an element with high artistic value.

This frame structure allows the building to be more free in the plan and facade. The functional division of the plan does not need to consider the position of the structural wall. The interior space is no longer limited to small compartments, but can become more spacious, and even can be divided only by the placement of furniture. Both the frame and the filled walls can be seen on the facade, and the filled walls and structures form a specific module that satisfies traditional architecture and aesthetics.

Therefore, it can be found that frame structure is not only ideological liberation, but also a breakthrough and liberation of design for designers. Design can give more consideration to the relationship between space and function, as well as the relationship between aesthetics and architecture.



After the war, for the Italian architects, the way to renovate the broken urban texture is the most important issue. ”Continuity” become a one of the key words of the Italian postwar period. The twentieth century brings with it a condition of complexity that intertwines – in the modification of urban and suburban space – collective and individual actions and very varied economic, political, social, cultural and technical values. Isolated objects which, nevertheless, belong to more extensive systems (public buildings, places of worship, school buildings and high density housing estates), the outcome of lengthy processes for the modification of the territory and the landscape and the environment (not only physical) often still in the process of evolution and development, «are the bestowal of attempted, institutional, bureaucratic, technical and artistic rationality; they testify to the stratification of ever renewed politics and social idealism» (Olmo, 2010). New construction fills urban texture in the form of industrial technology, social needs and artistic aesthetics.

Therefore, in the 1920s and 1930s, Italy began to develop a trend of rationalist architecture. Follow logic and reason, and solve various problems in the real world in a reasonable way in a science that can be rationally understood. One of the most representative cases of rationalist architecture is the Trani Palace (also known as the Palace of Fascism, Casa del Fascio) designed by Giseppe Terragni. The building occupies only a rectangular plot, and the other part is reserved for the city square in front. The concrete frame structure has no additional decoration on the four facades, and has different openings and divisions according to the surrounding urban environment, which shows the beauty of the column and beam structure to the greatest extent. The concrete frame is in a simple and abstract form, which satisfies the modern architecture's display of structural features, while at the same time showing the influence of traditional proportions. In the end, it represents the fusion of the traditional architectural texture of the city and the reinforced concrete structure of the modern building.

From the perspective of urban mechanism, traditional architecture and modern architecture can coexist. They carry people's memory and understanding of architecture in different periods, and also convey the change of time and the change of people's thoughts.

New modern buildings not only coexist with the existing traditional buildings in such an independent posture, but in the face of the urban texture that was broken after the explosion, repair and new construction are equally important. The construction of any period carries the social memory of that period, and the restoration and expansion of the city with new methods and new constructions is finally reflected in the architecture as time that can be read. In 1950, the Marquis Ponti in Via Bigli, which was renovated by BBPR, was a late 15th-century building that survived the Bombing.

The new extension part faces the facade of the garden. Its horizontal organization follows the progress of the historical building floors, but is composed of thick grids. The dialectical relationship between the infill wall and the column beam frame is strengthened by different color treatments. On Palazzo Ponti's internal facade, unlike in other BBPR projects (such as the Post Office in Rome and the building on Via Borgonuovo), the design is strictly symmetrical and reinforced by an arcade as wide as the courtyard, cropped at the level of the piano noble. The result is a facade with a classical style, unquestionably in keeping with the theme of noble buildings, but very far from the experimental work done by BBPR in that period (such as the incomplete design for the Palazzo Venier dei Leoni in Venice).

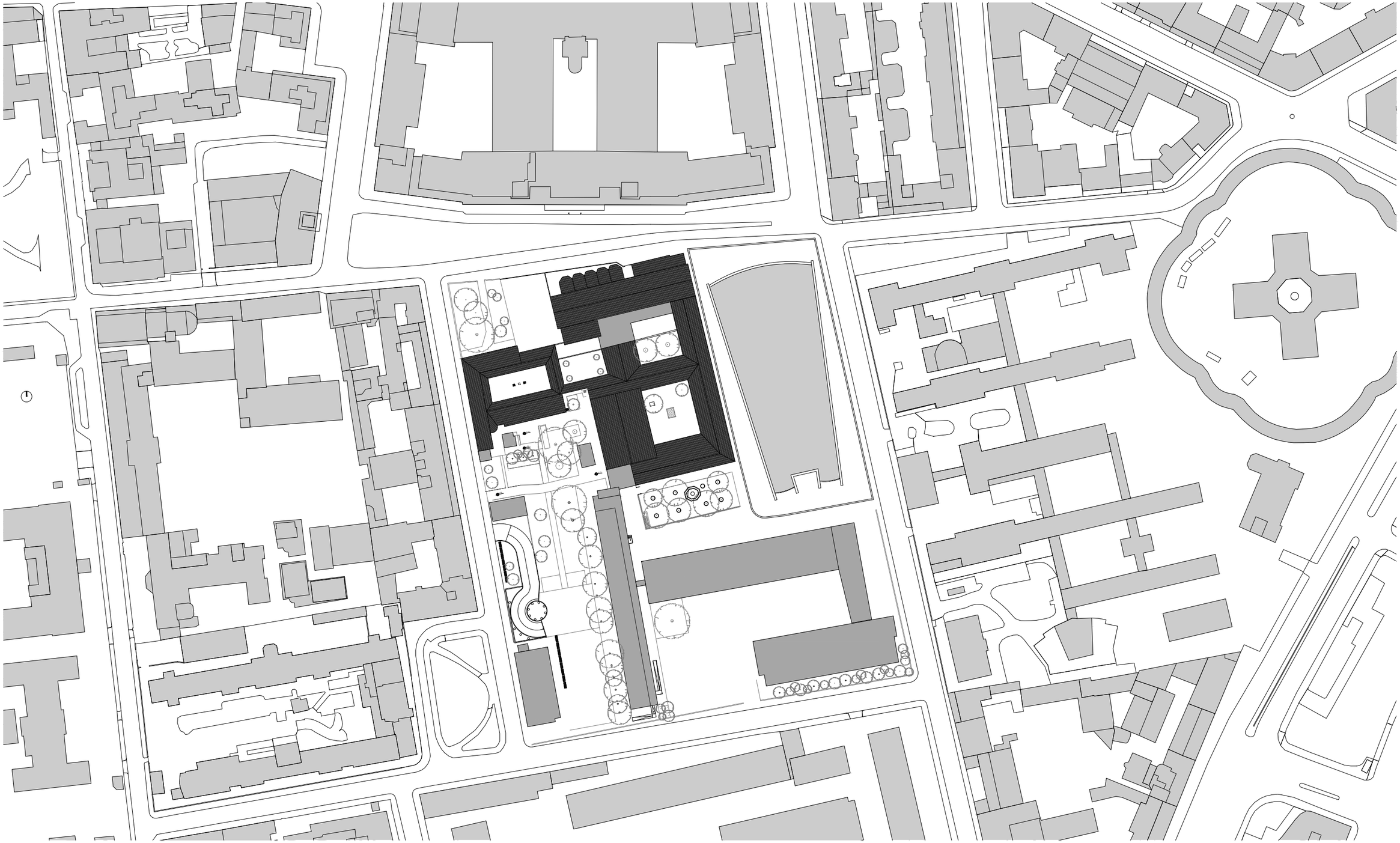
The process developed here, however, did allow us to completely understand the meaning of critical design based on a relationship with the existing environment in which constraints (consistency and shape of the volumes, height between floors, existence of monument fragments) were turned into architectural solutions that strove to re-establish the spaces' authenticity. (Paolo Brambilla)

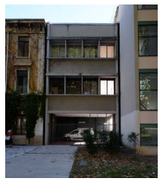
Although the restored part and the original part belong to different periods, we can find that there is a connection between them. In terms of the moduli of the facades, they are almost the same moduli and the spacing of the columns in the new part of the structure is similar to the previous one. At the same time, we can also find that the form and style of the window also adopts the horizontal window which is divided into two parts vertically.

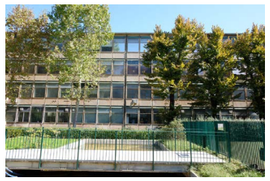
As The Societa Umanitaria, which was also partially destroyed in the Bombing, Giovanni Romano used the design concept of modern architecture in the 1950s to plan and build the new campus of The Societa Umanitaria with modern design techniques, new structural forms and construction relationships. Adapting the new campus to the urban life of Milanese after the war. Finally, looking at this site now, buildings from different periods tell the history here in fragmented architectural language.

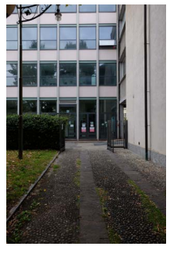
When we stretch the timeline and look at the modern buildings of the 20th century from the present point of view, they carry the social memory of the 20th century just like older historical buildings. In the 1930s, architects discussed the continuity between modern architecture and historical architecture. Do we now also need to think about the continuity of contemporary architecture? Any fragment of history is worth remembering and preserving. Modern buildings also have the value of historical protection. Of course, with the progress of social industrialization and the development of art, architecture, as a cultural product with a life cycle far beyond the times, faces new social lifestyles and needs to make appropriate changes to adapt to new needs. Modern architects need to go ahead and anticipate the understanding of the public to establish a new type of life profile. In repair and update to adapt to current and future needs.

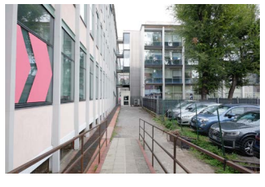
SURVEY

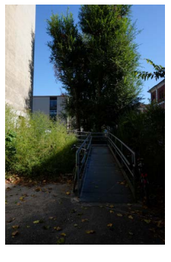


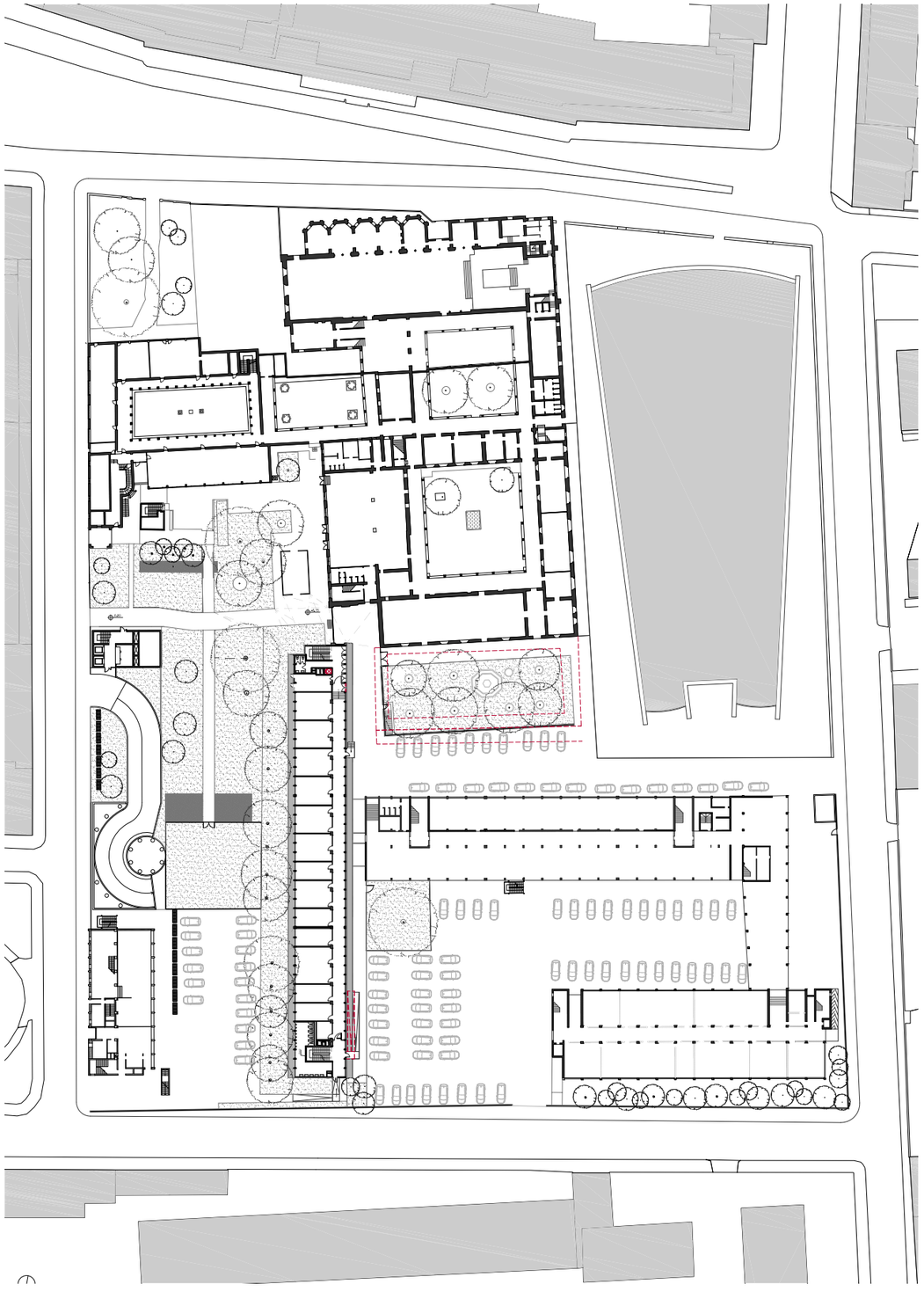


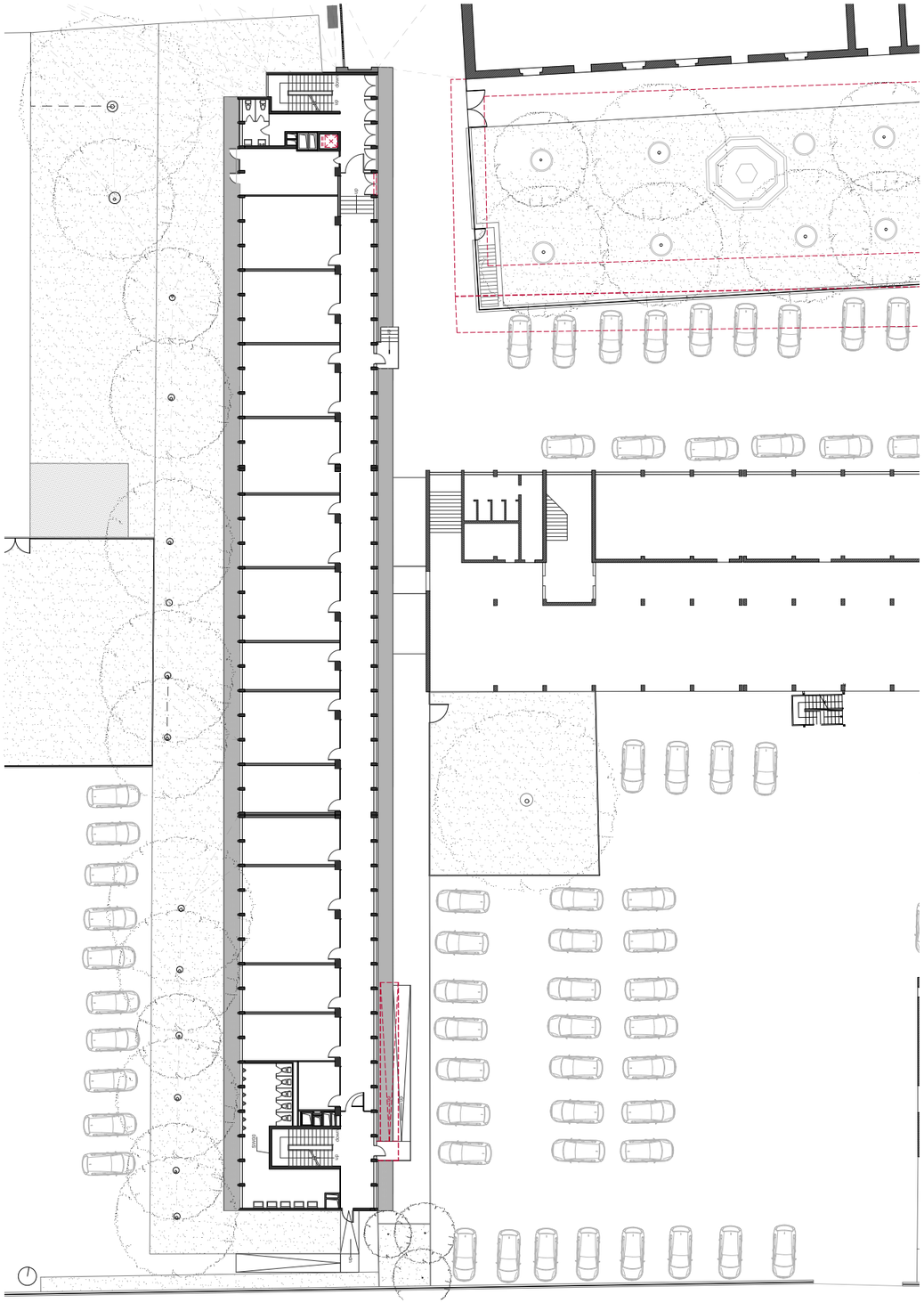


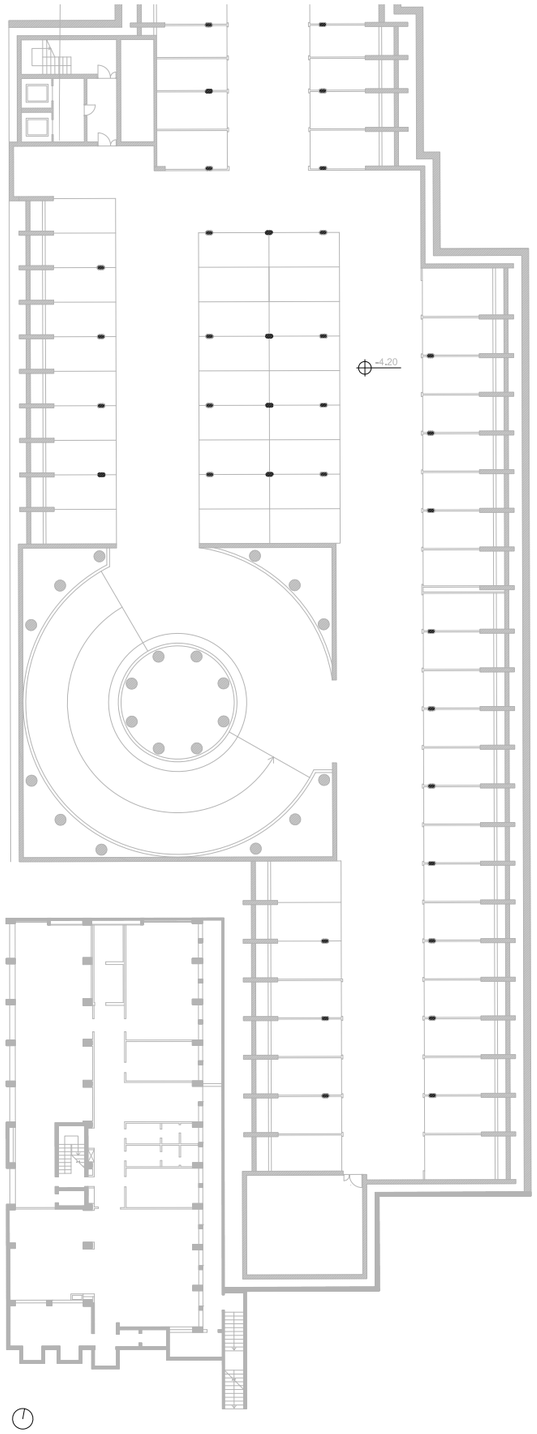








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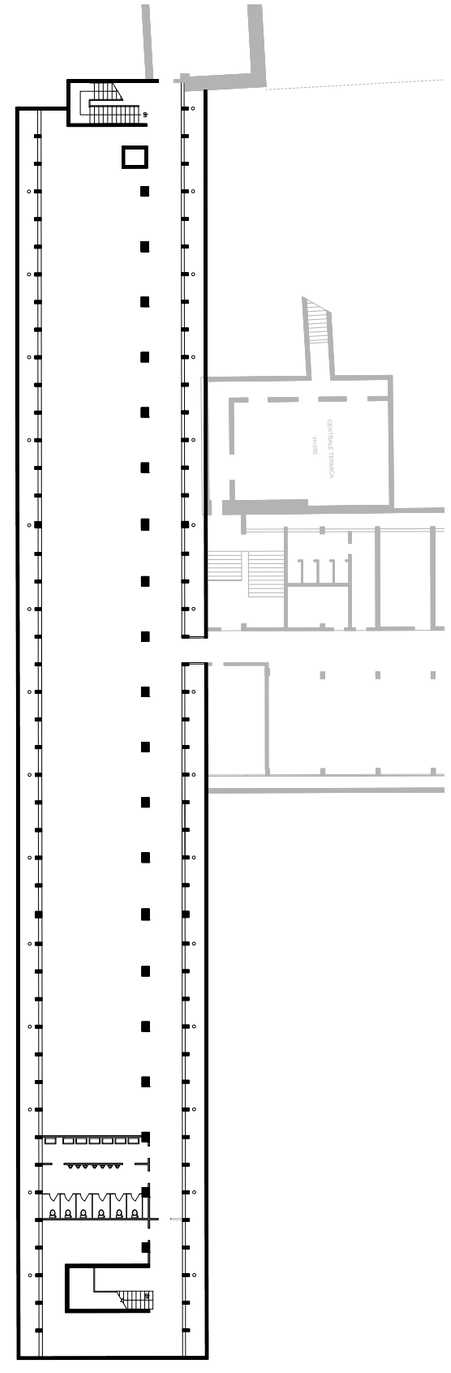

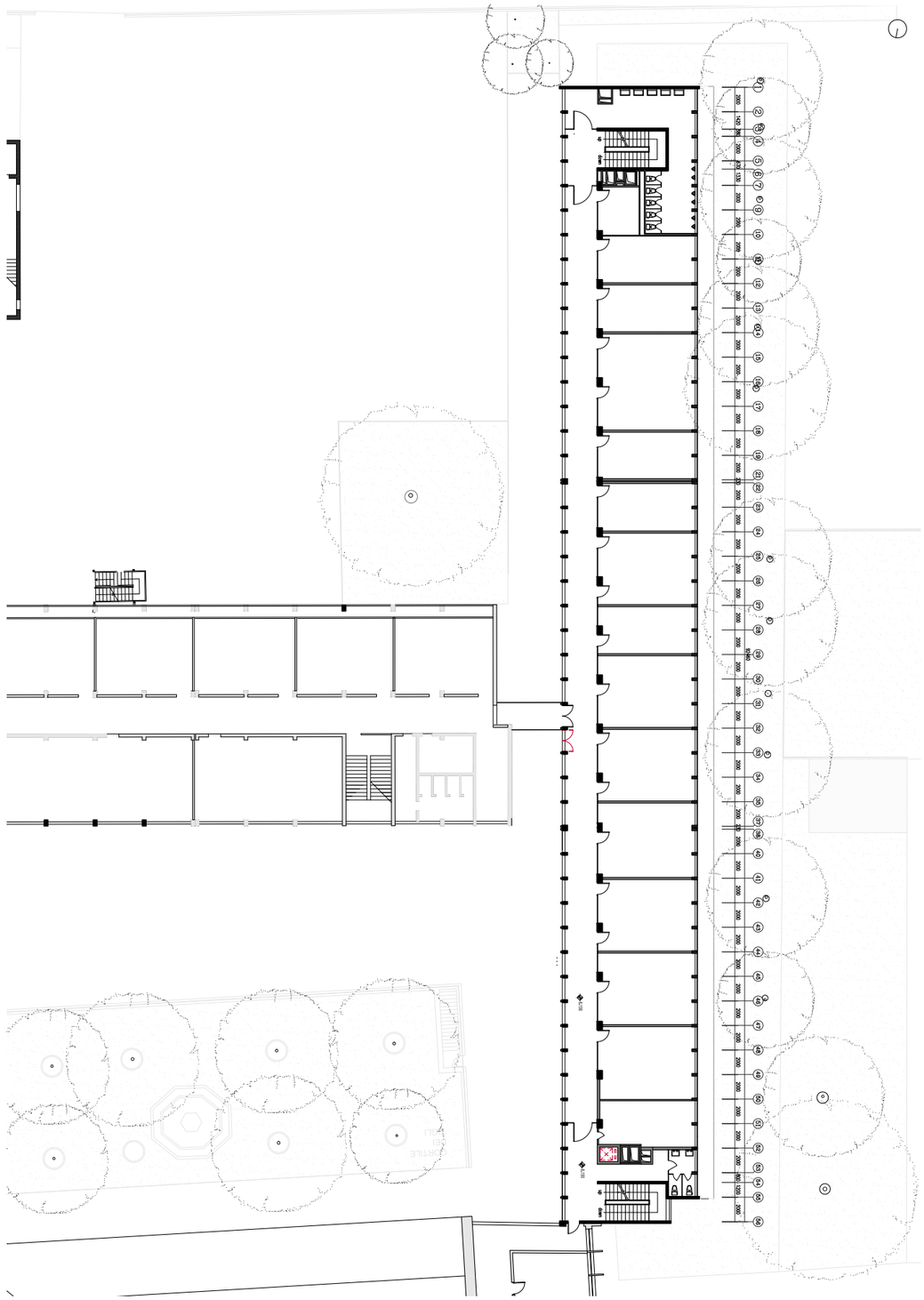

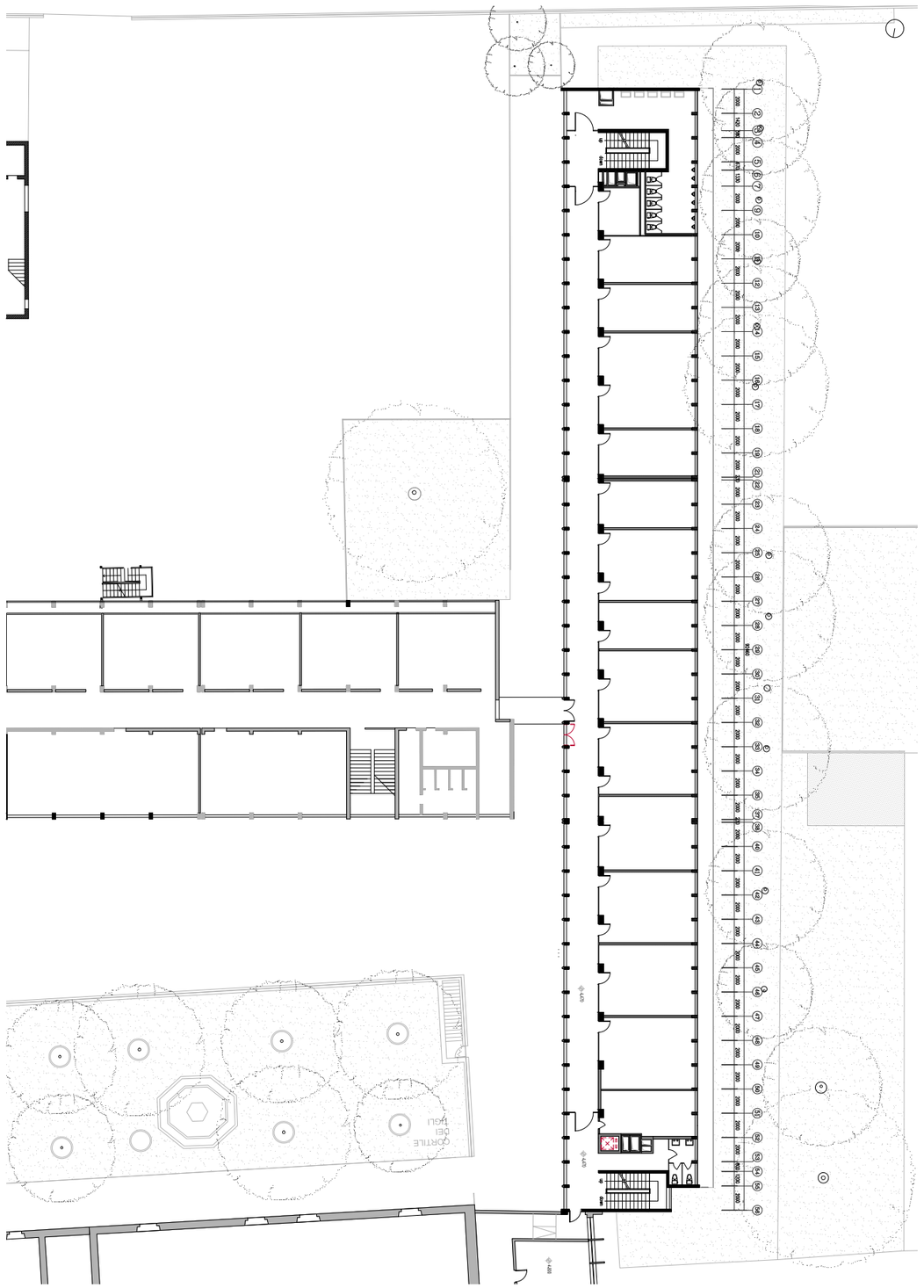

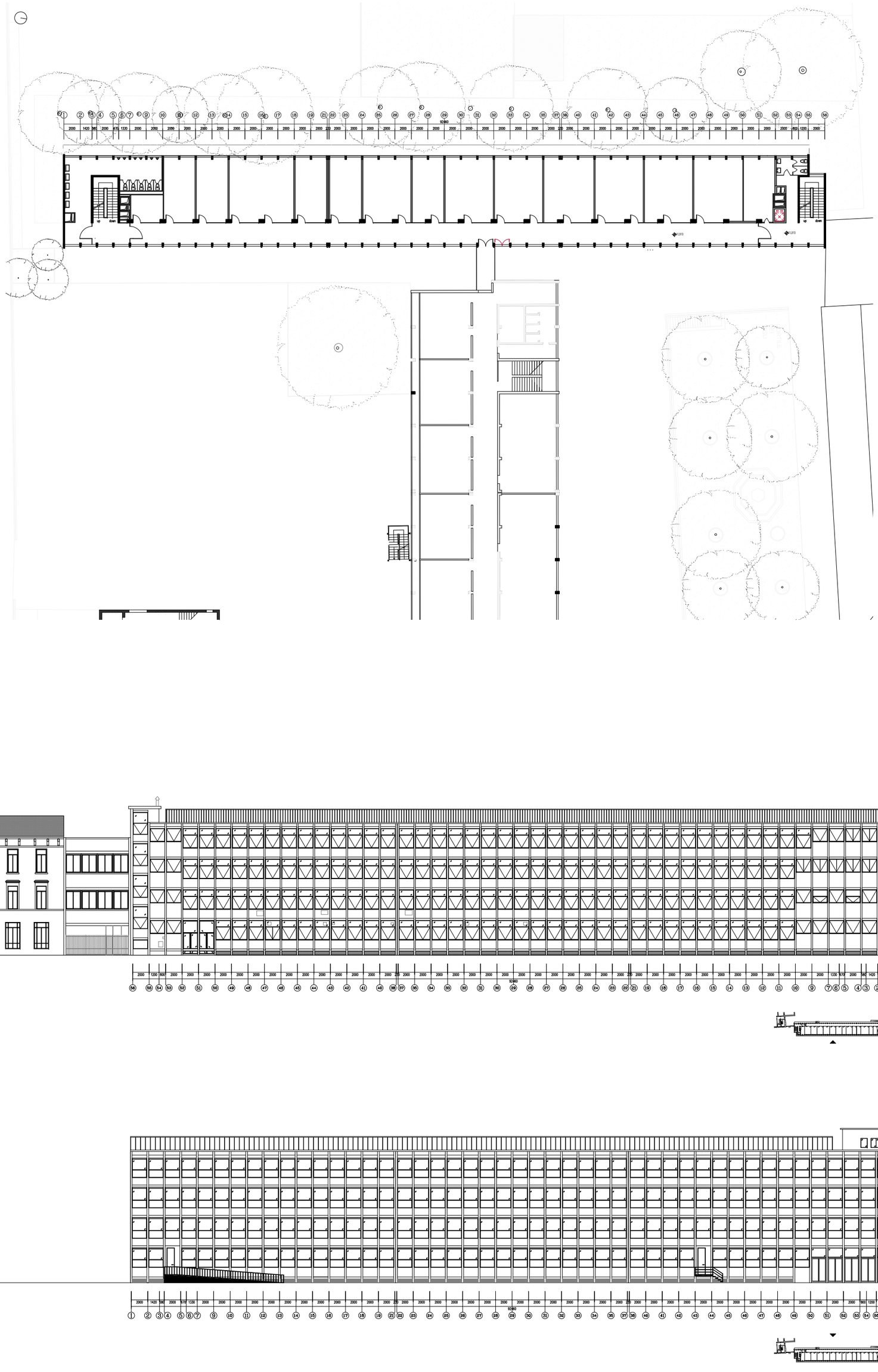

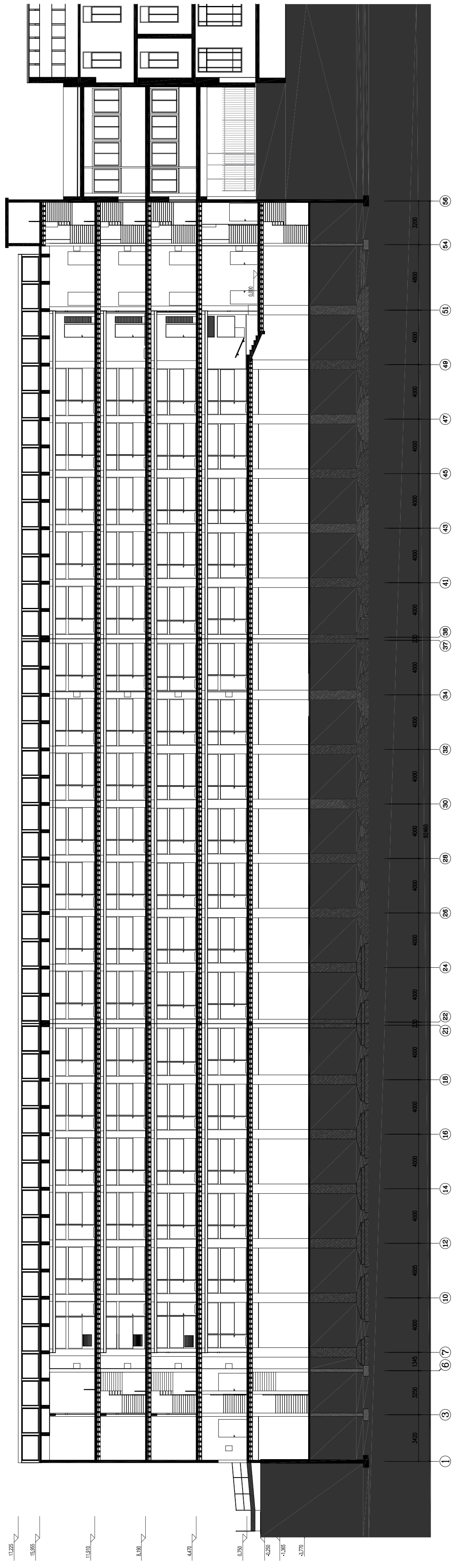

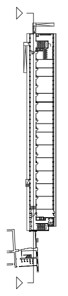

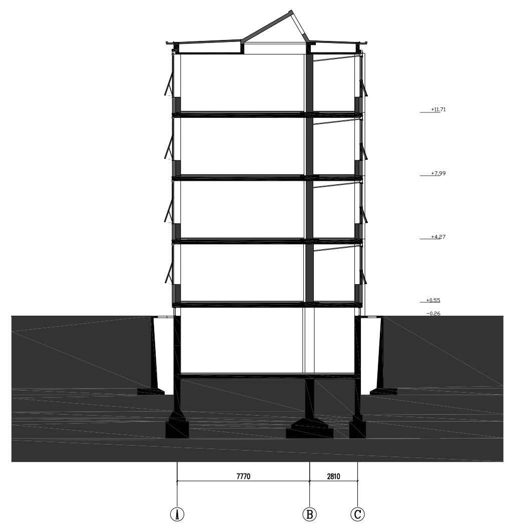
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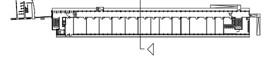
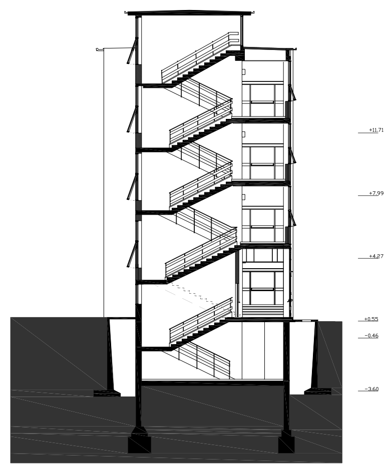
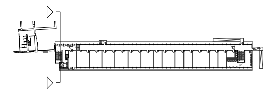
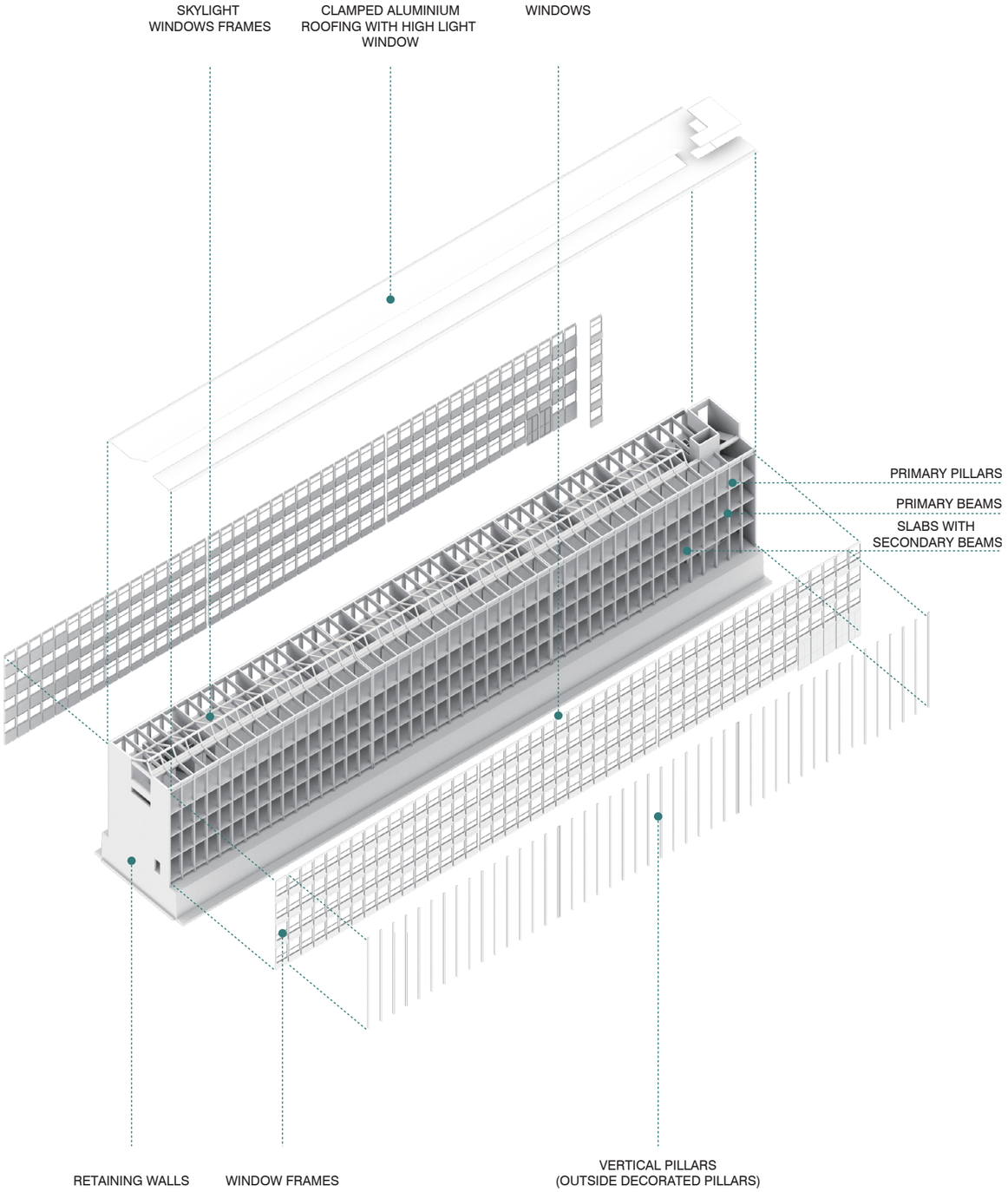
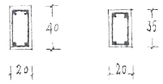




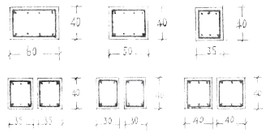




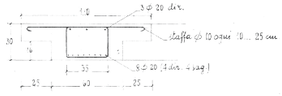
1. Side pillars



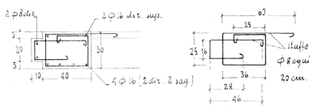
2. Central pillars



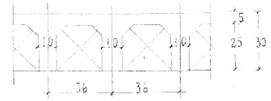
3. Beam in the center



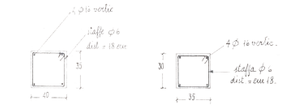
4. Beam on the side



5. Slab



6. Foundation pillars



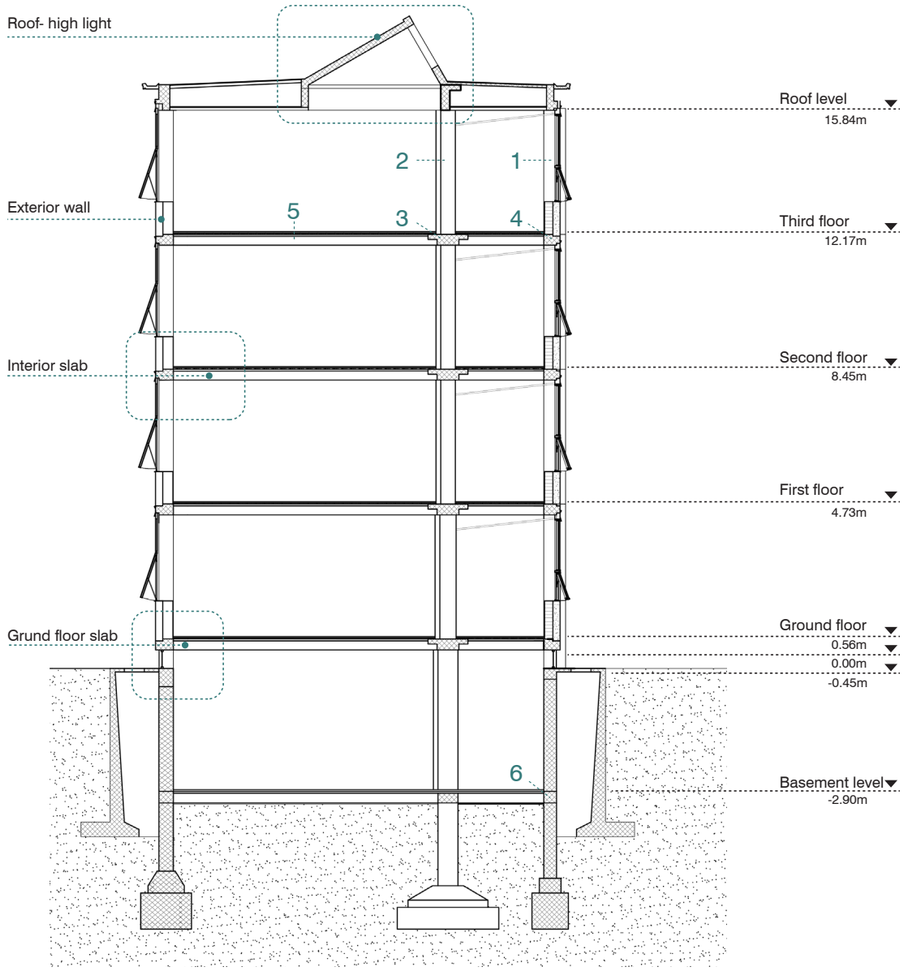
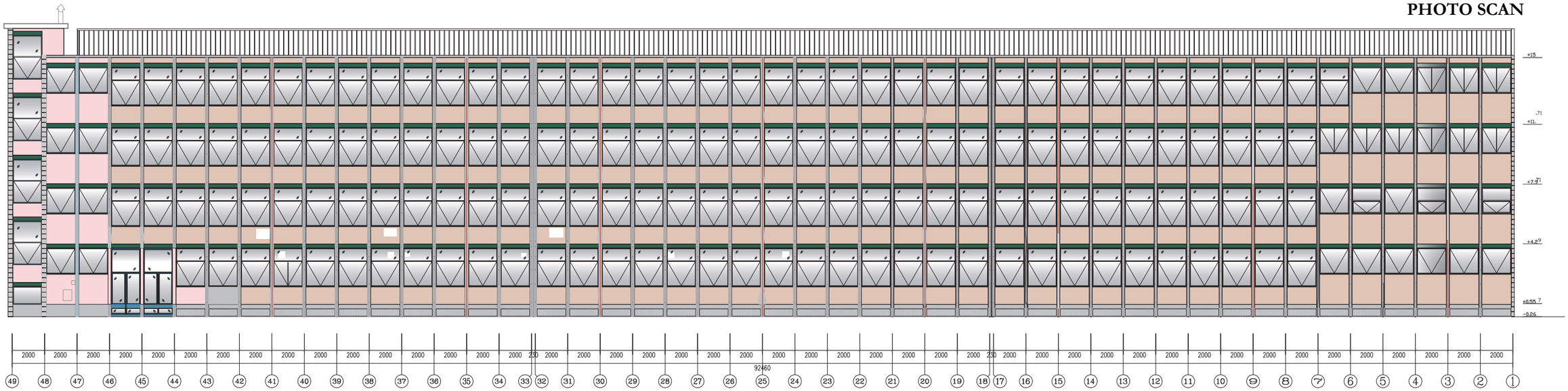


PHOTO SCAN



MATERIAL MAPPING

WALL

P01 Plaster with pink painting

P02 Plaster with new pink painting

C03 Cement

B01 Red brick

WINDOW AND DOOR

CO-01 Copper

Gl-01 Glass

IR-01 Iron window frame with light gray paint

IR-02 Iron window frame with dark gray paint

IR-03 Iron window frame with gray paint

PL-01 Plastic window frame

PILLAR

C01 Concrete Large aggregate

C02 Concrete plaster Small aggregate

G01 Graniglia

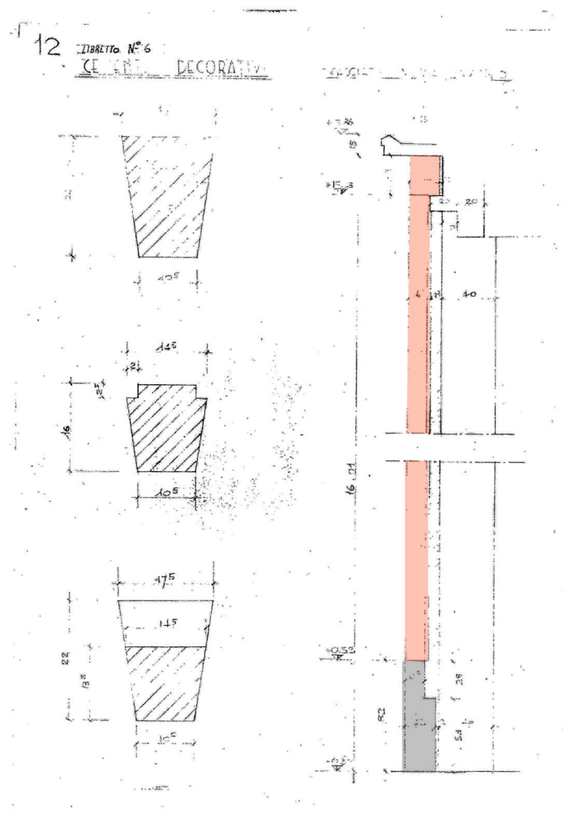
A01 Aluminum metal components

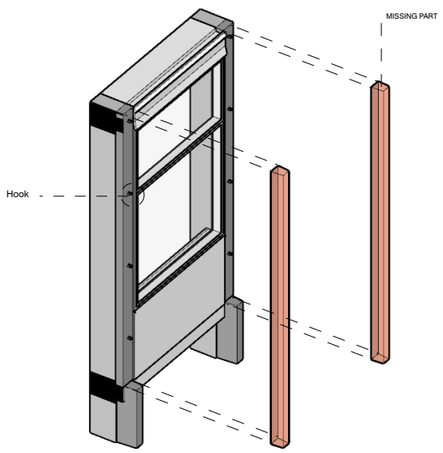
ADDITIONAL MATERIAL

IR-04 Iron hook

PL-02 Orange plastic pipe

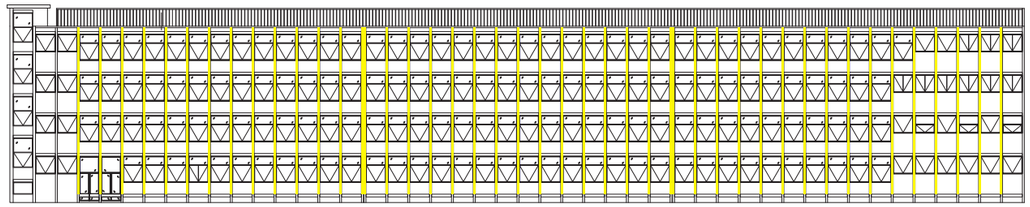
PL-03 Plastic pipe





PILLAR

Most of the decorative and protective pillar components on the facade have been lost, leaving exposed iron metal hooks. These metal components are directly exposed to the outdoors and directly react with rain and air, resulting in a lot of rust and chemical reactions. The internal force generated also caused the concrete around the component to begin to fall off

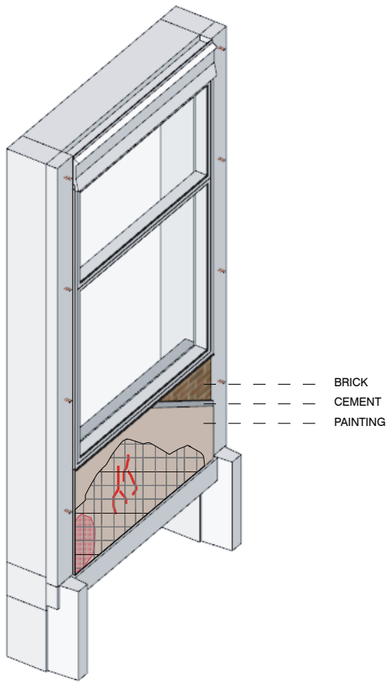


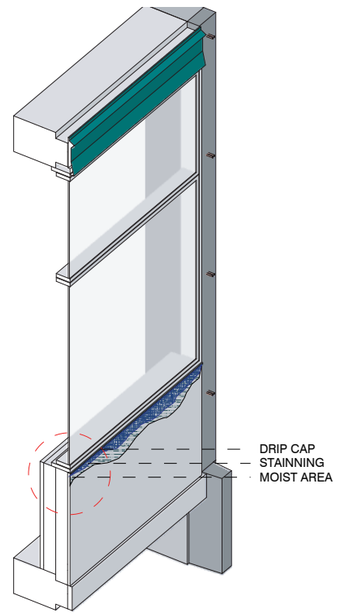
FEATURES INDUCED BY MATERIAL LOSS - MISSING PART

The decorative columns on the exterior of the building's façade columns are missing, leaving only the bottom part, where can see the exposed iron hooks

DETACHMENT - BURSTING

Due to the loss of external decoration materials, the iron hooks in the concrete pillars are exposed to the air, and the rust spreads, cracking the concrete and losing the bonding force between the steel bar and the concrete.





WALL - PLASTER

Because the wall has been washed by rain for a long time, high temperature in summer and severe cold in winter, the surface coating structure is destroyed, first cracks occur, and then the paint part begins to peel off. At the place where water vapor accumulates seriously, the entire paint layer begins to bulge and peel off in a large area.

CRACK & DEFORMATION - CRACK

The surface of the coated wall has cracks visible to the naked eye

DETACHMENT - PEELING

The pink coating on the exterior wall is peeling off

DETACHMENT - BLISTERING

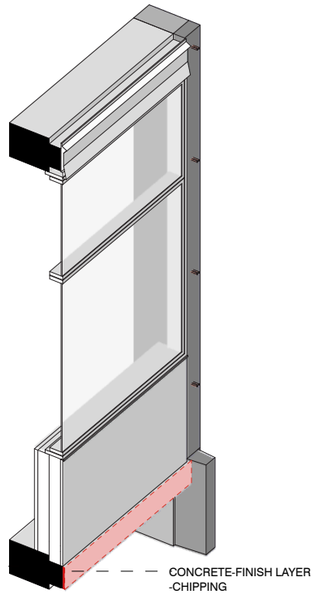
The paint layer is blistering because of the damp wall

DISCOLORATION & DEPOSIT - STAINING

The metal materials on the façade have been exposed to rain and air for a long time to produce rust, and the mixed rain color remains on the wall

DISCOLORATION & DEPOSIT - DISCOLOURATION - MOIST AREA

The lower part of the outer wall windo-w frame and part of the wall are wet



BEAM

Fragmentation of side beams at the bottom of the building

DETACHMENT - FRAGMENTATION - CHIPPING

Fragmentation of side beams at the bottom of the building

WINDOW

The water-removing components of the copper window frame turn green due to oxidation, and the rain washes away some of the rust, forming a water flow mark on the metal surface

DISCOLORATION & DEPOSIT - PATINA

The metal materials on the facade have been exposed to rain and air for a long time, causing rust

DISCOLORATION & DEPOSIT - PATINA

The metal materials on the facade have been exposed to rain and air for a long time, causing rust

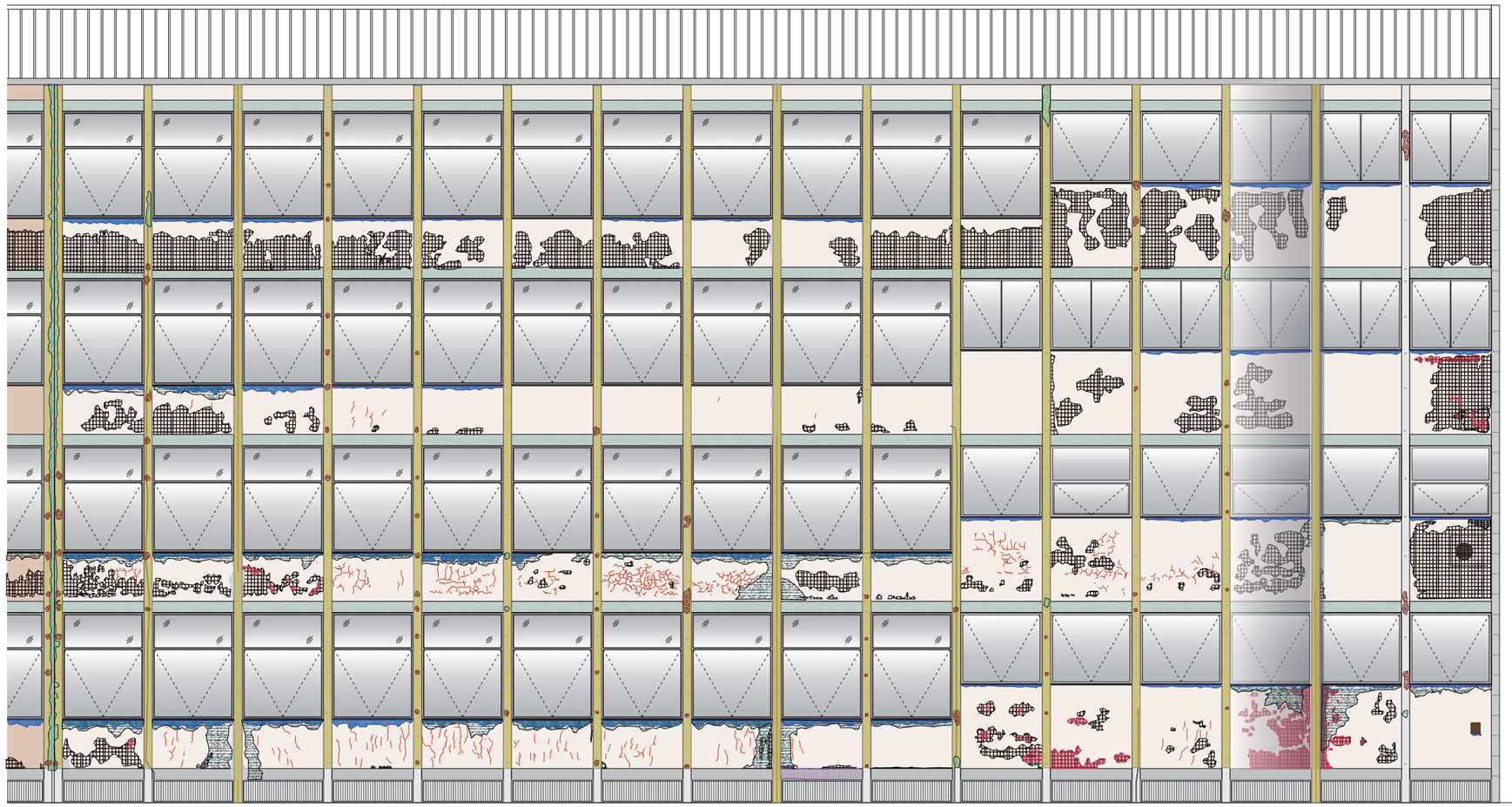
DISCOLORATION & DEPOSIT - DISCOLOURATION - STAINING

The rain water washes away some rust of the metal surface, the water flow marked on the cooper window drip cap.

DETACHMENT - PEELING

Due to the rust on the metal , the painting later is peelig

DETERIORATION PATTERNS MAPPING



CRACK & DEFORMATION
- CRACK

DETACHMENT
- PEELING

DETACHMENT
- BLISTERING

DETACHMENT
- FRAGMENTATION - CHIPPING

DETACHMENT
- BURSTING

FEATURES INDUCED BY
MATERIAL LOSS- MISSING PART

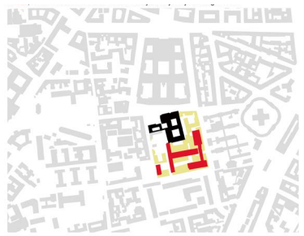
FEATURES INDUCED BY
MATERIAL LOSS
- MECHANICAL DAMAGE

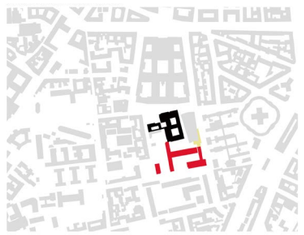
DISCOLORATION & DEPOSIT
- DISCOLOURATION
- STAINING & SOILING

DISCOLORATION & DEPOSIT
- DISCOLOURATION
- MOIST AREA

DISCOLORATION & DEPOSIT
- PATINA

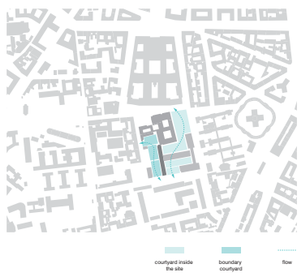
TRANSFORMATION





Over time, the volume of the buildings on the site has changed.The small building at the far north was replaced by a large theatre, blocking the flow of people into the site from the northern entrance square.

We can know the advantages of the site, the disadvantages that can be developed and the parts that need to be improved. There are serious defects in the streamline of the site. Since the site is now facing more public services, we need to combine the building with the site, so that people can reach the site and use the building more conveniently and directly.

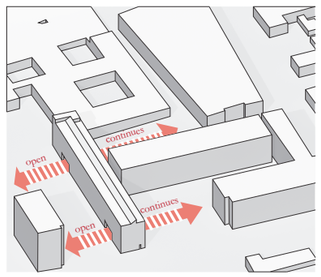


From the history, we infer that the main entrance of the site at that time was in the south and north, and our building is also a north-south rectangular volume, so the province of the building is like the boundary of a site, which separates the site from the west part, and the whole site has no east-west connection. The current situation is that there is an entrance to the west and there is a parking structure, which leads to the need to create an east-west connection. We chose to use landscape connections to achieve this purpose, while distinguishing people's flow lines according to the distribution of landscape.

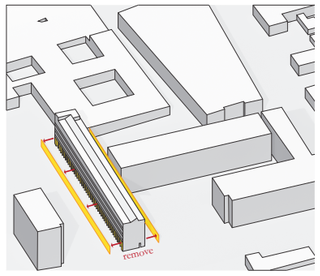
Design approach

Open ground floor

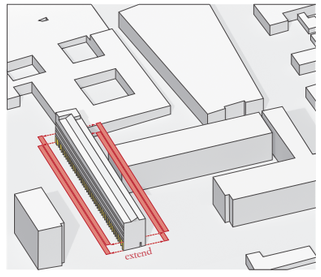
open ground floor



remove ground floor facade



extend ground floor slab

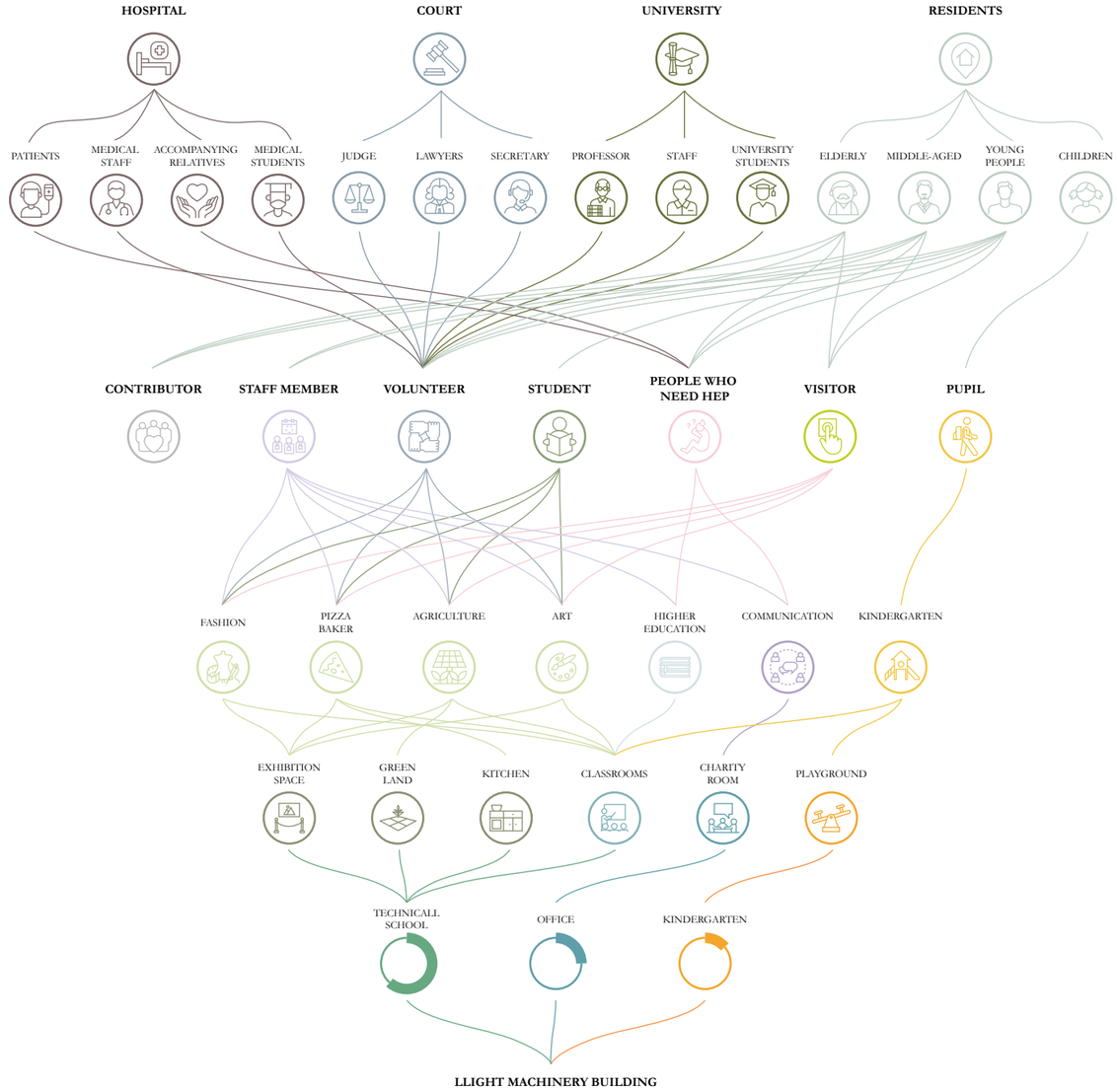


According to the analysis, we need to open up the ground floor space. We open two passages through the building and the site on the ground floor.At the same time, we wanted the ground floor of the building to be more closely connected with the surrounding environment. We removed the facade of the ground floor to form a vague colonnade space. At the same time, in order to enhance this spatial effect, we extended the ground floor and added shelters.

The surrounding area is mainly used for living, as well as schools and medical institutions. As a place to serve the neighborhood, the building needs to be open to the public.
Starting from the crowd around the site, it can be divided into four categories, and the people in each category can be specific to a certain occupation or a certain age group. If these people are going to come to our site, they can do a secondary sorting. There are seven main types of people on the ground: contributor, staff member, volunteer, students, people who need help, visitor, pupil.
These people can be differentiated into the functions of our buildings, down to a classroom and a specific curriculum. These courses are based on the courses currently held here. We have retained the existing courses and added exhibition space on this basis, which can provide some display places for each course.It can attract more people to study here and at the same time revitalize the whole site.

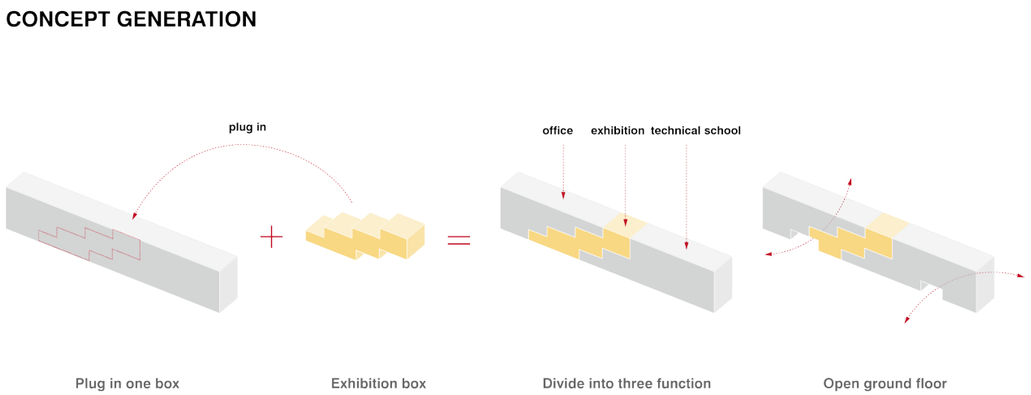
Current space analysis

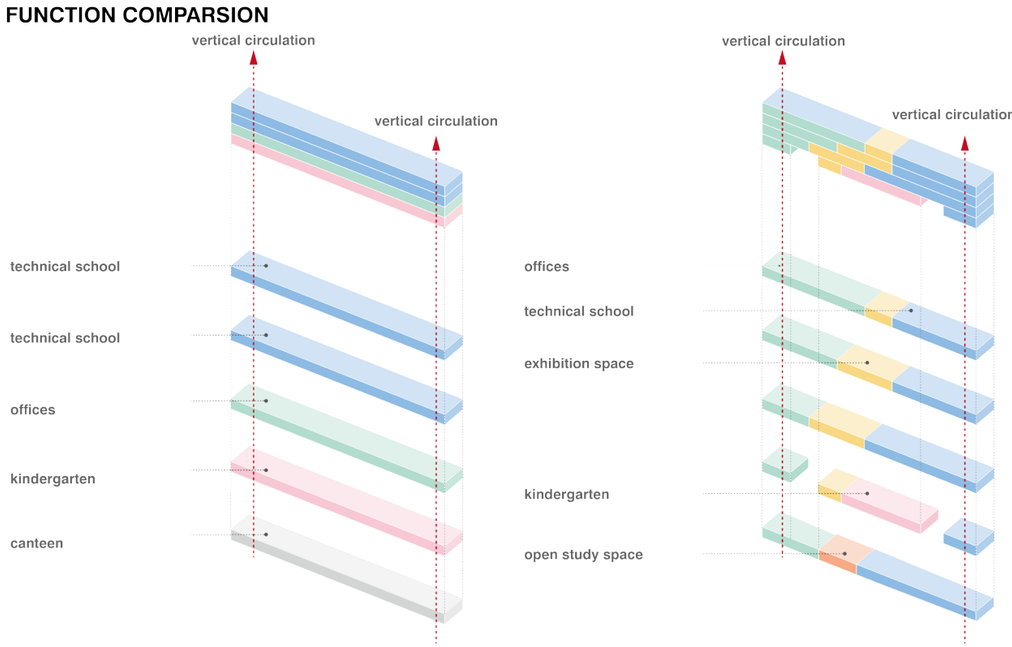
Functional analysis



Design approach

Insert box





According to the functional analysis, we added a complete exhibition space into the original architectural space, which is presented in the form of a staircase and has the attributes of a hall and traffic.This space connects the different functional parts of the building: technical school, office and kindergarten. Finally, this space can also be divided into different entrances for different functions.

We connected the originally disconnected functions of each floor vertically, integrated these functions, identified the vertical circulation entrances , and connected them into a whole building with exhibition space.

Old function distribution

roof

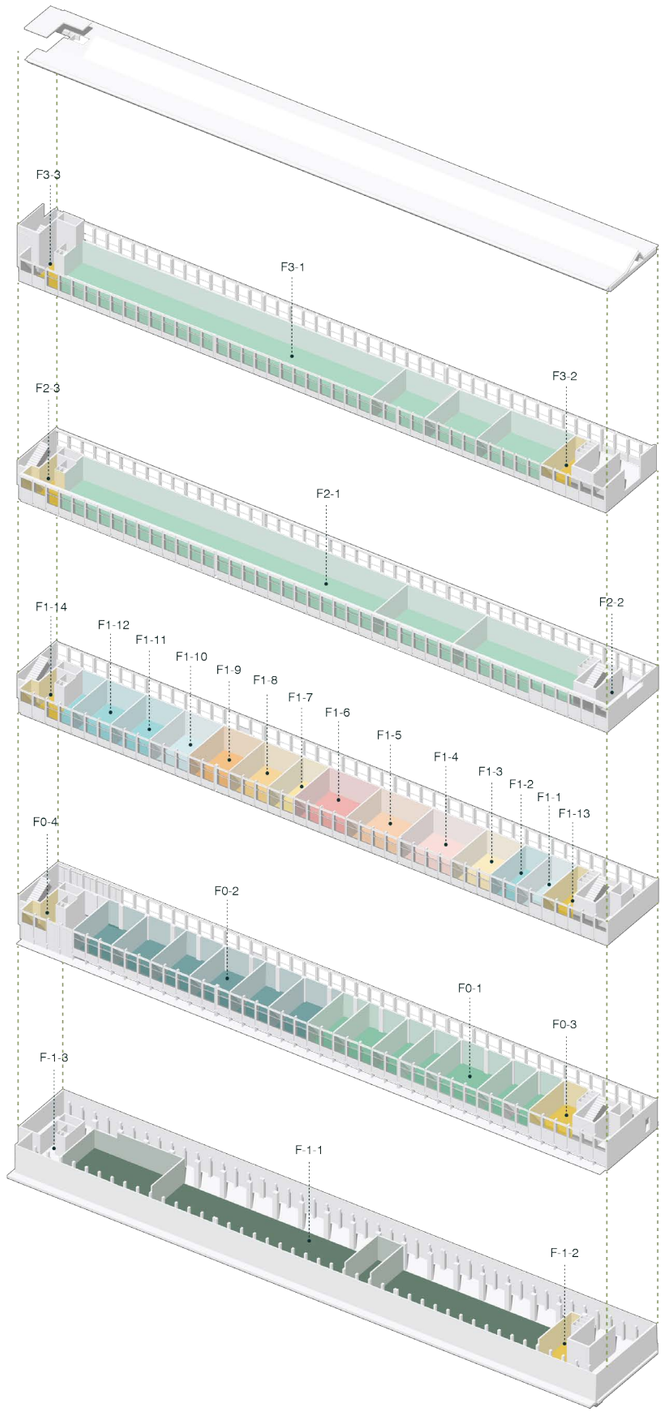
3rd floor
- technical school
- toilet

2nd floor
- technical school
- toilet

1st floor
- offices
- empty room
- toilet

grond floor
- kindergarten
- classrooms
- toilet

basement
- canteen
- toilet



New function distribution

roof

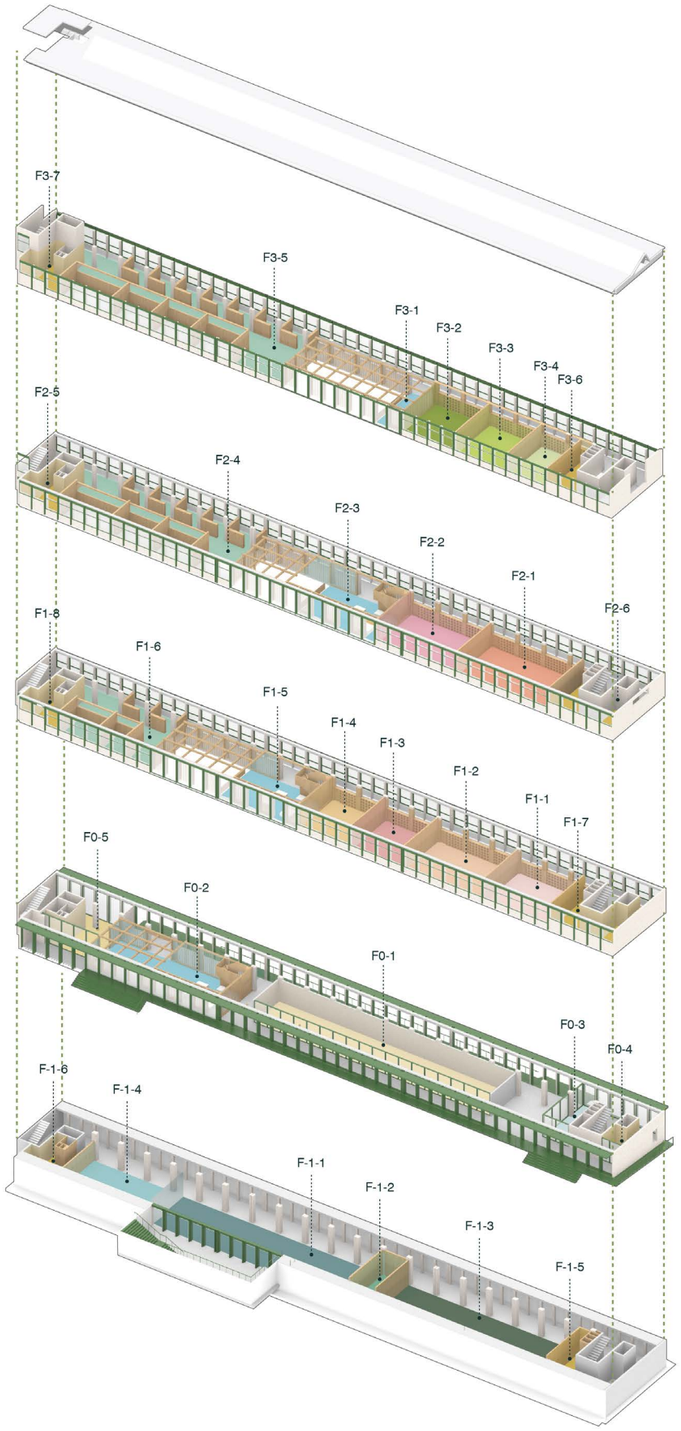
3rd floor
- classroom
- exhibition hall
- offices
- toilet

2nd floor
- classroom
- exhibition hall
- offices
- toilet

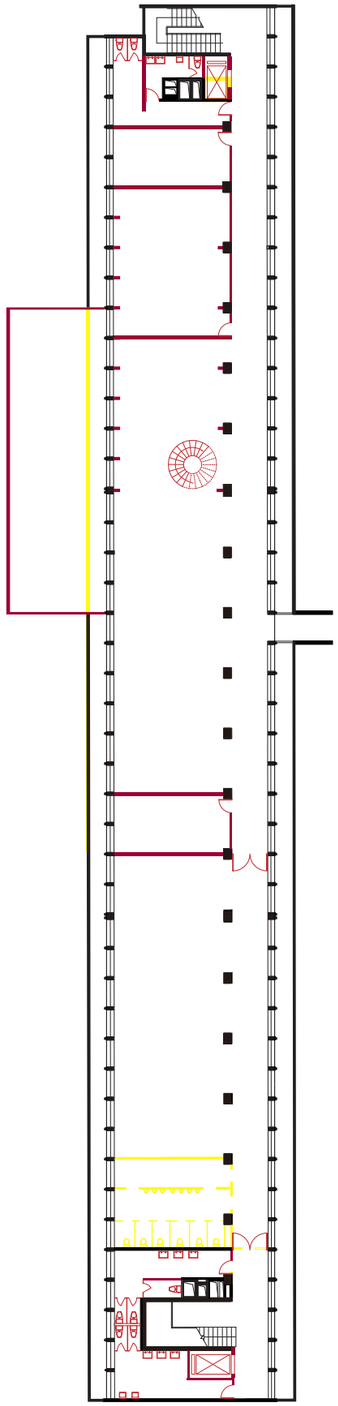
1st floor
- classroom
- exhibition hall
- offices
- toilet

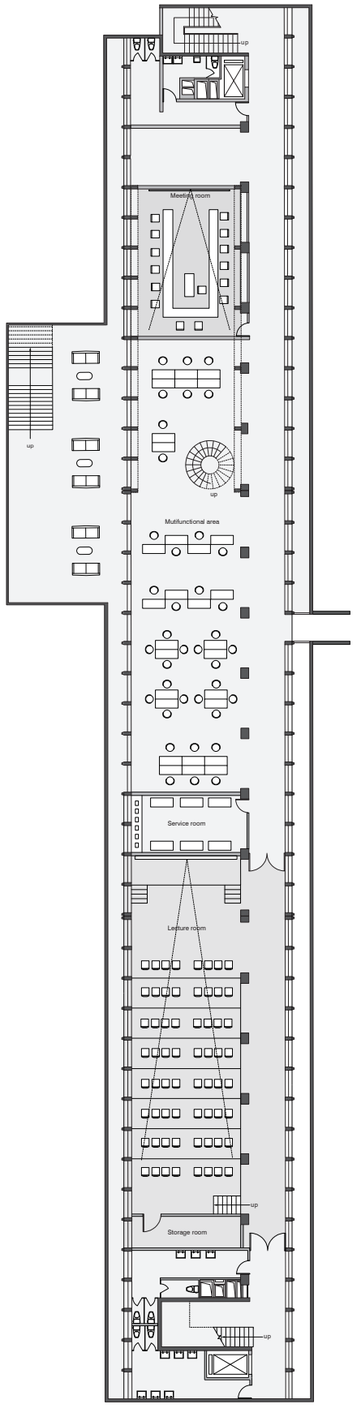
grond floor
- kindergarten
- technical school hall
- exhibition hall
- office hall
- toilet

basement
- lecture room
- office room
- free study space
- service room
- toilet

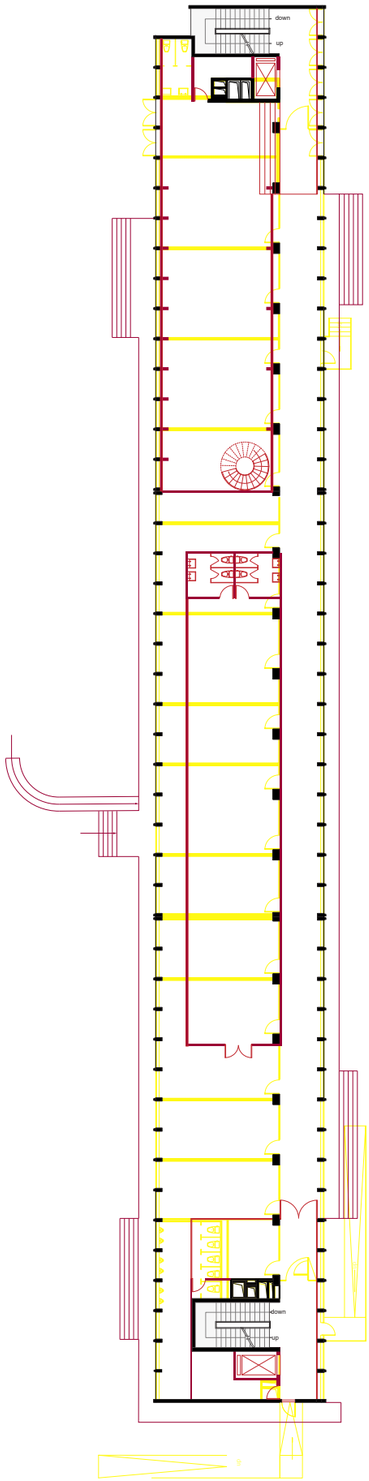


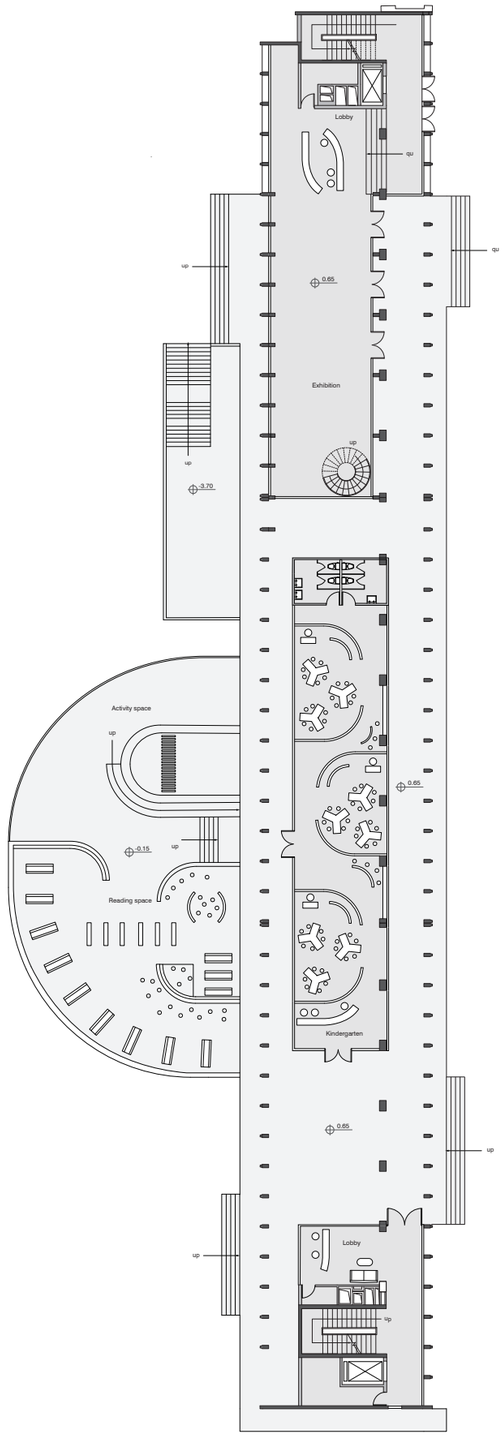
Basement plan



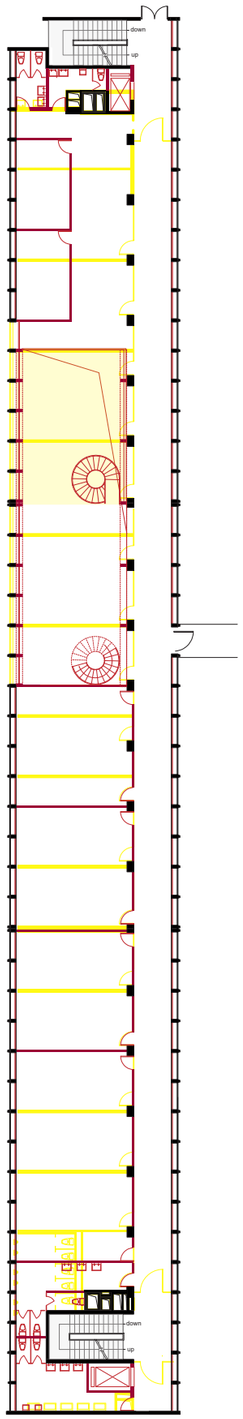


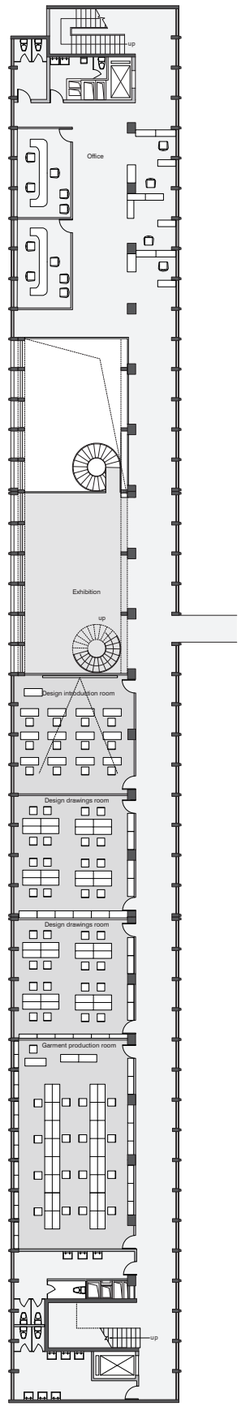
Ground floor plan



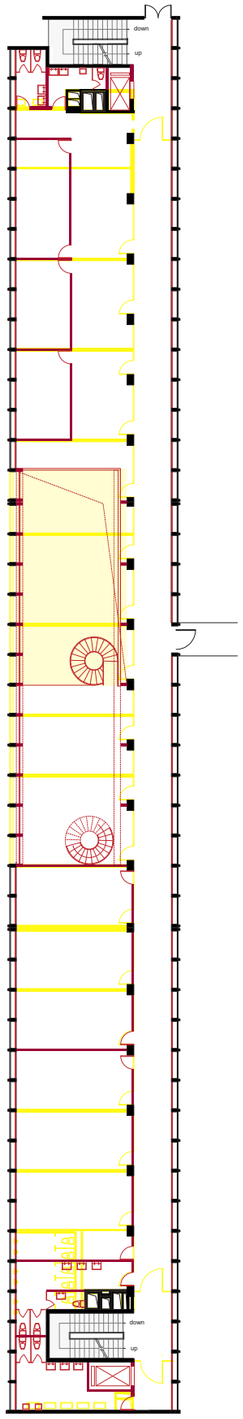


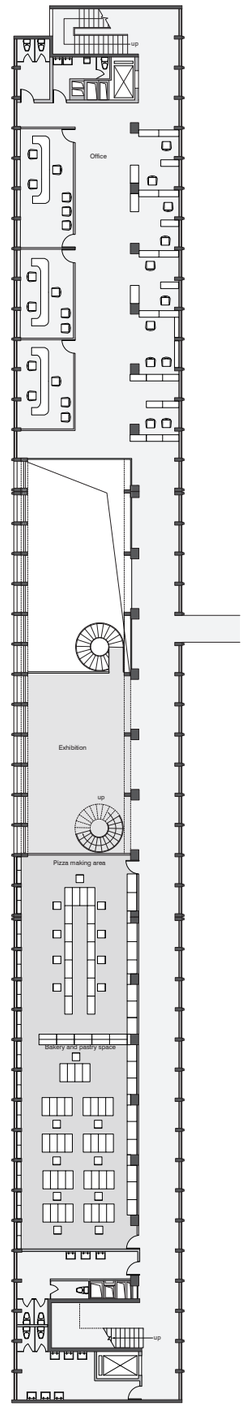
First foor plan



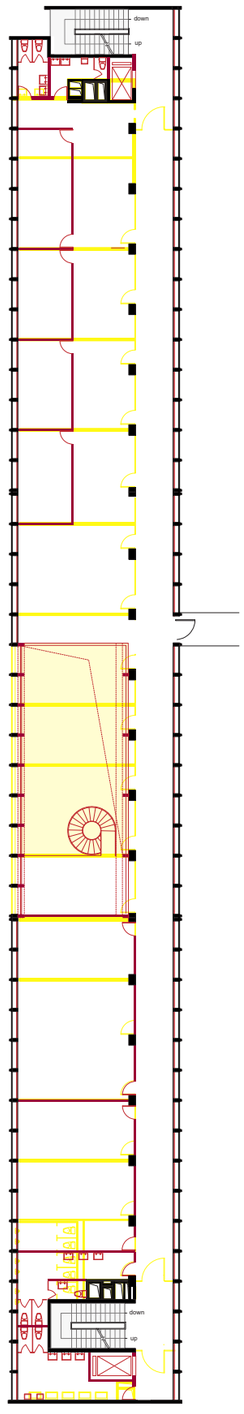


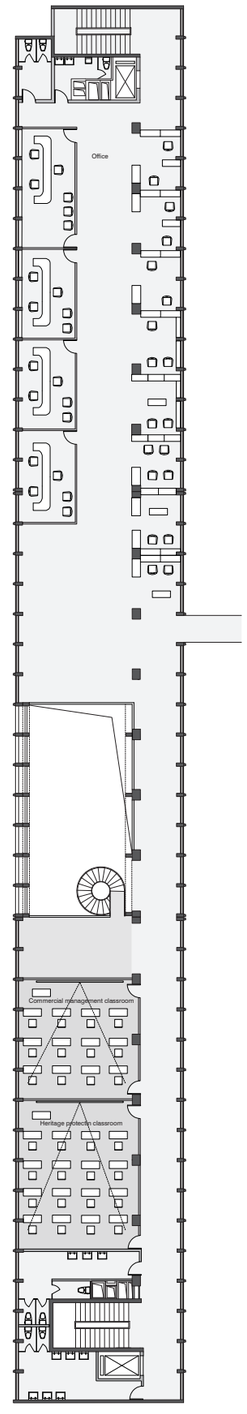
Second floor plan

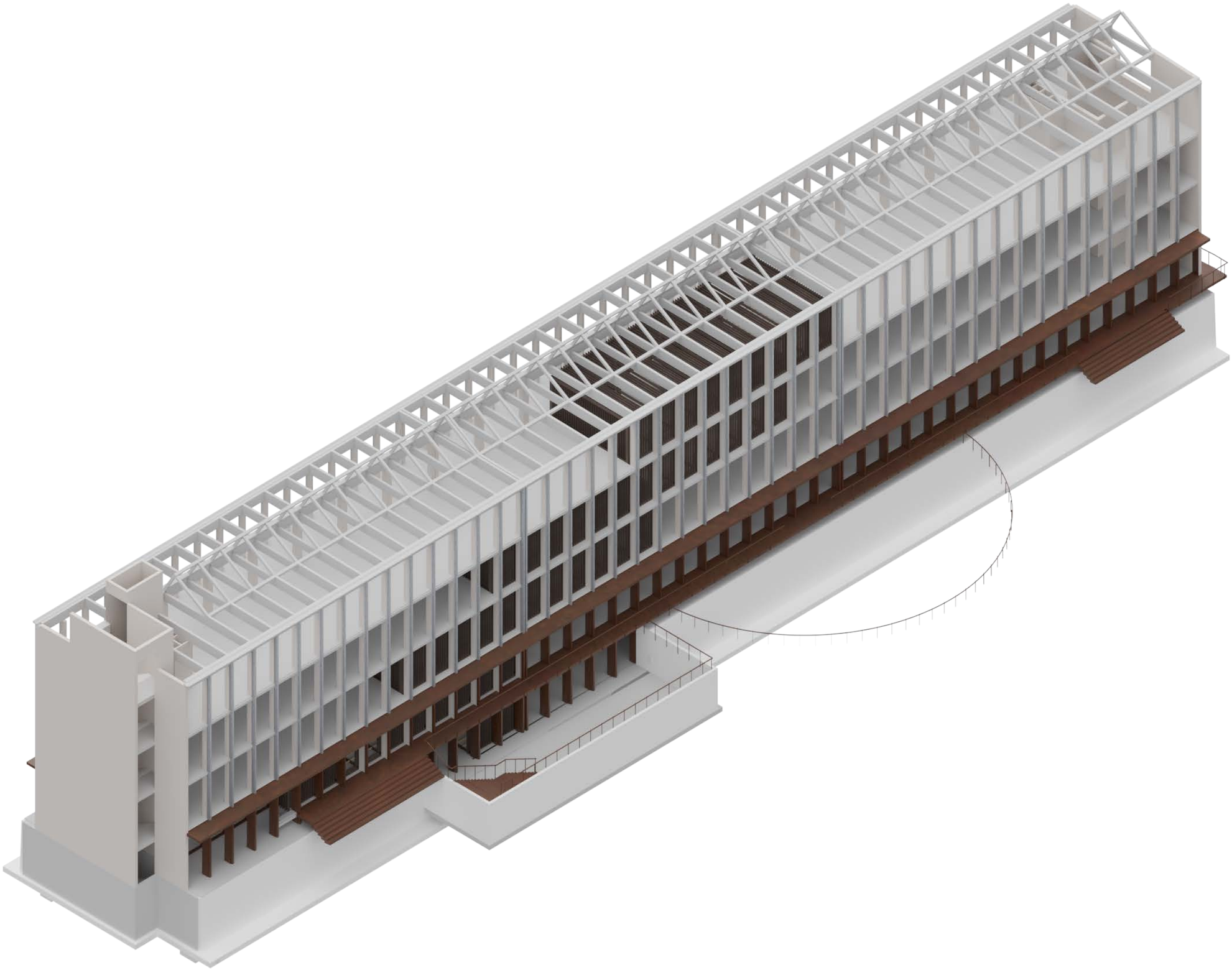


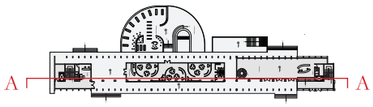


Third foor plan

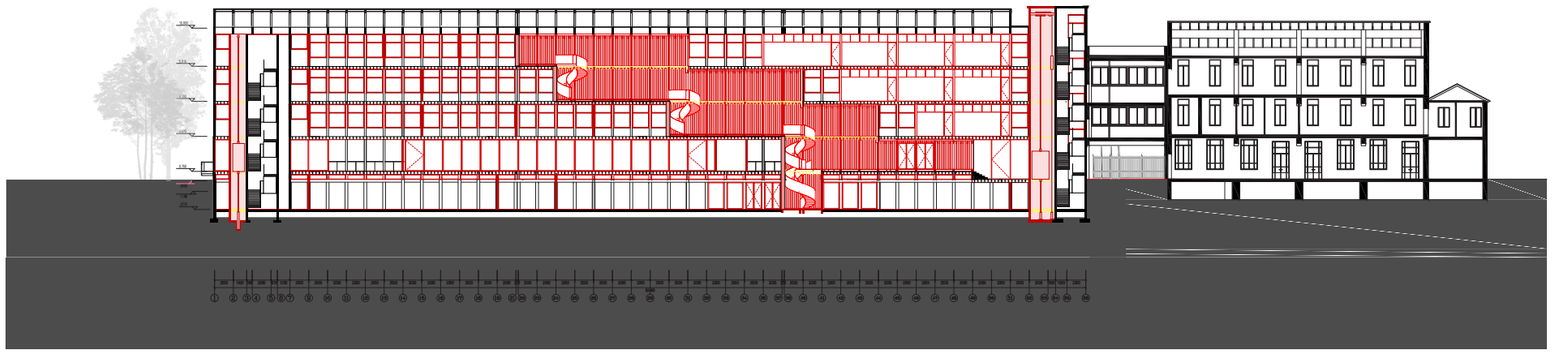


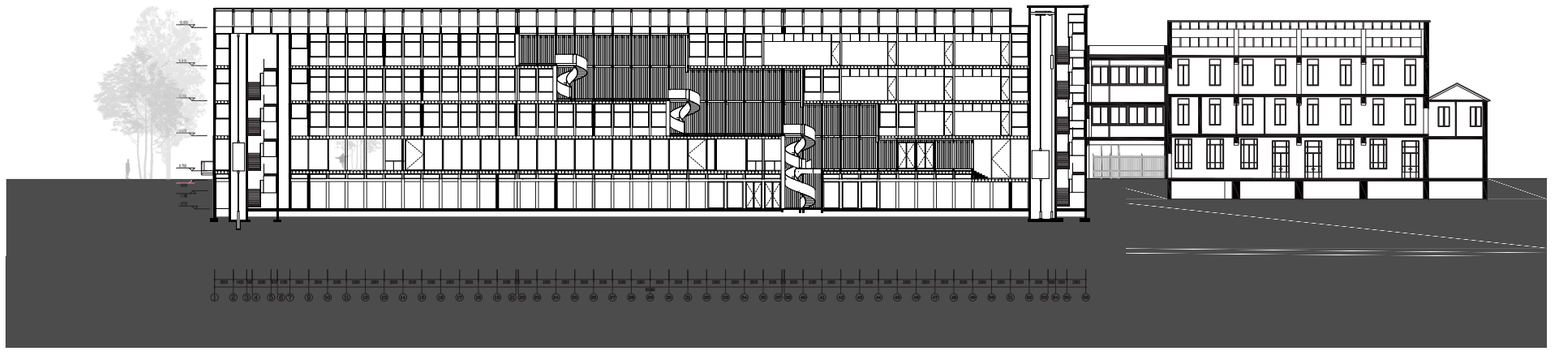


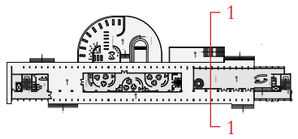




Section A-A







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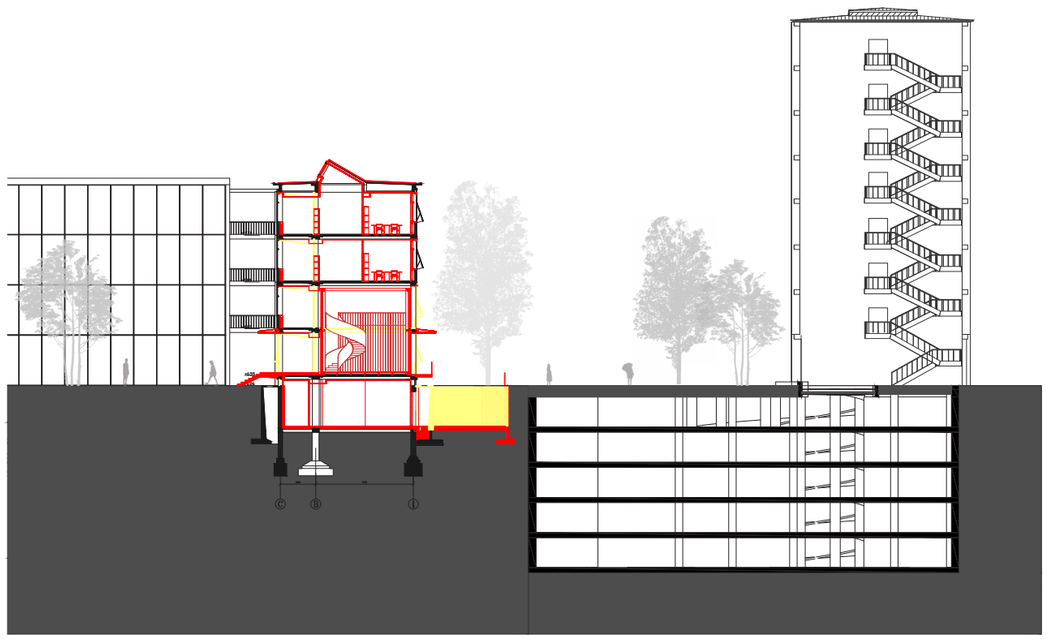

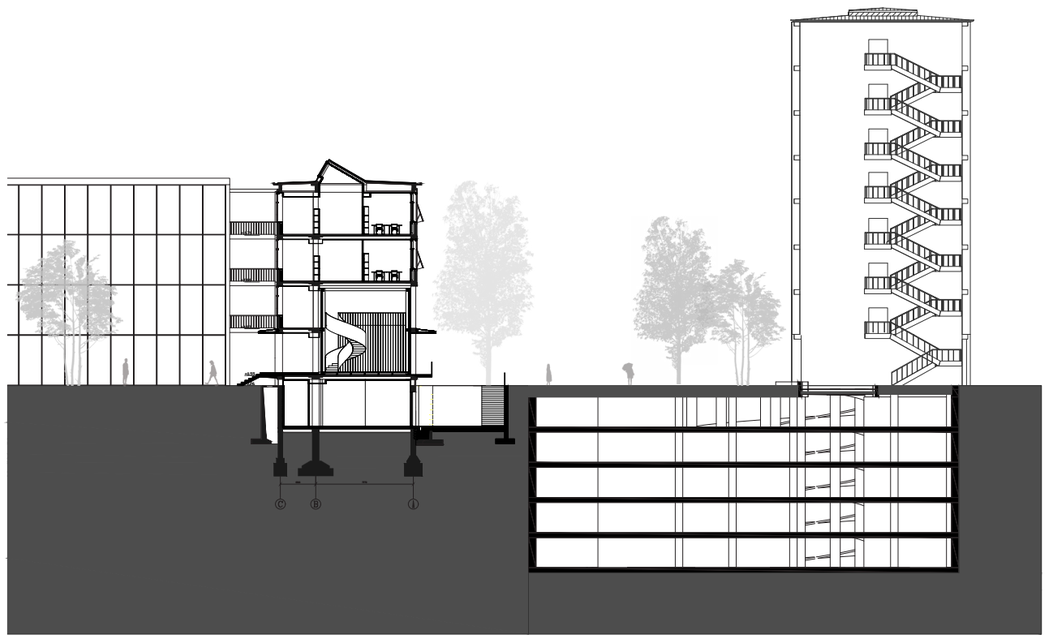

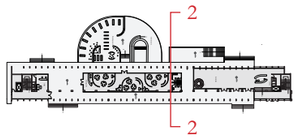

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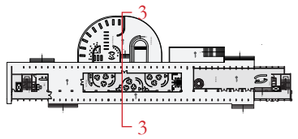

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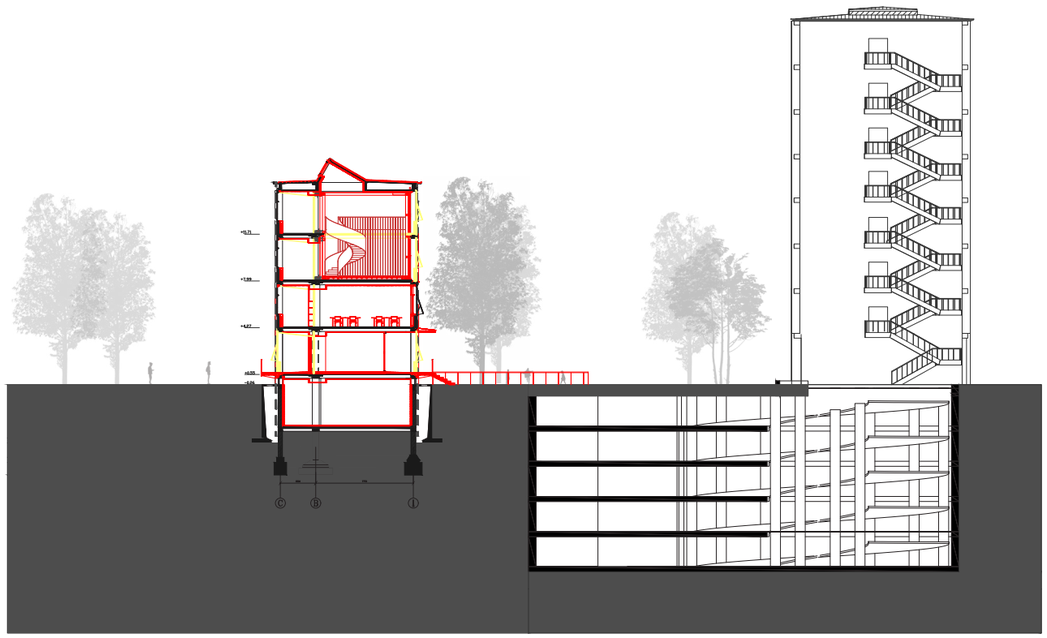

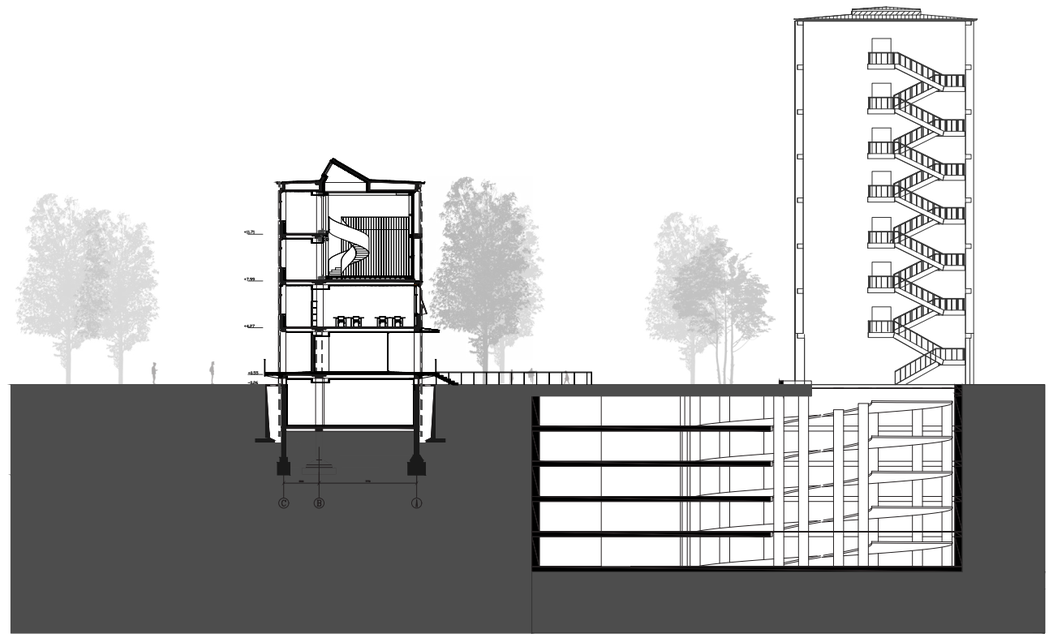

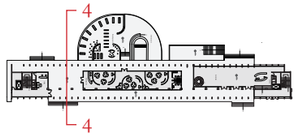

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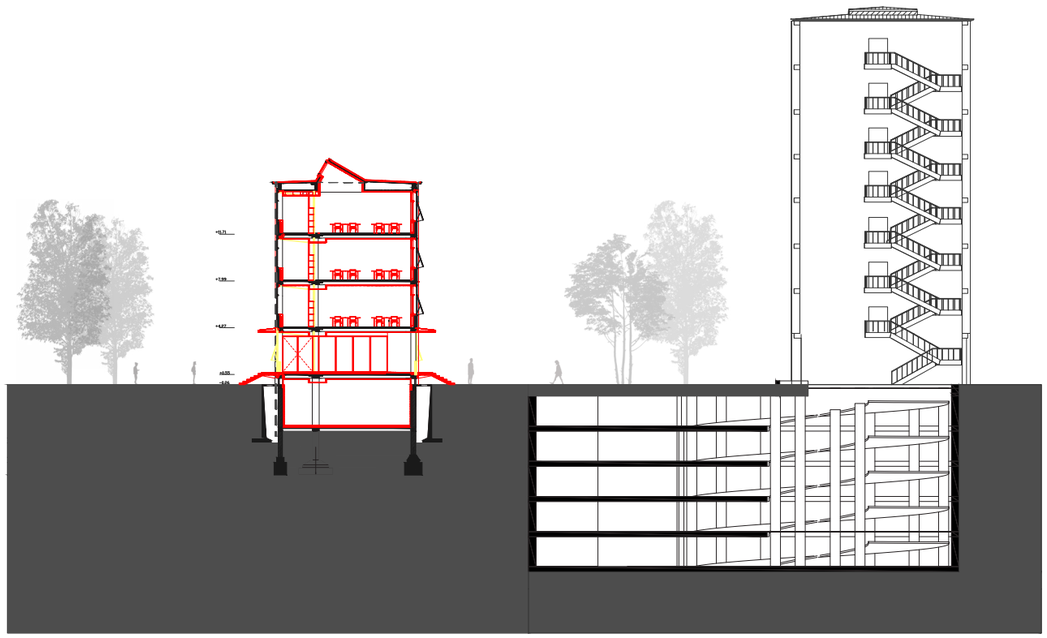
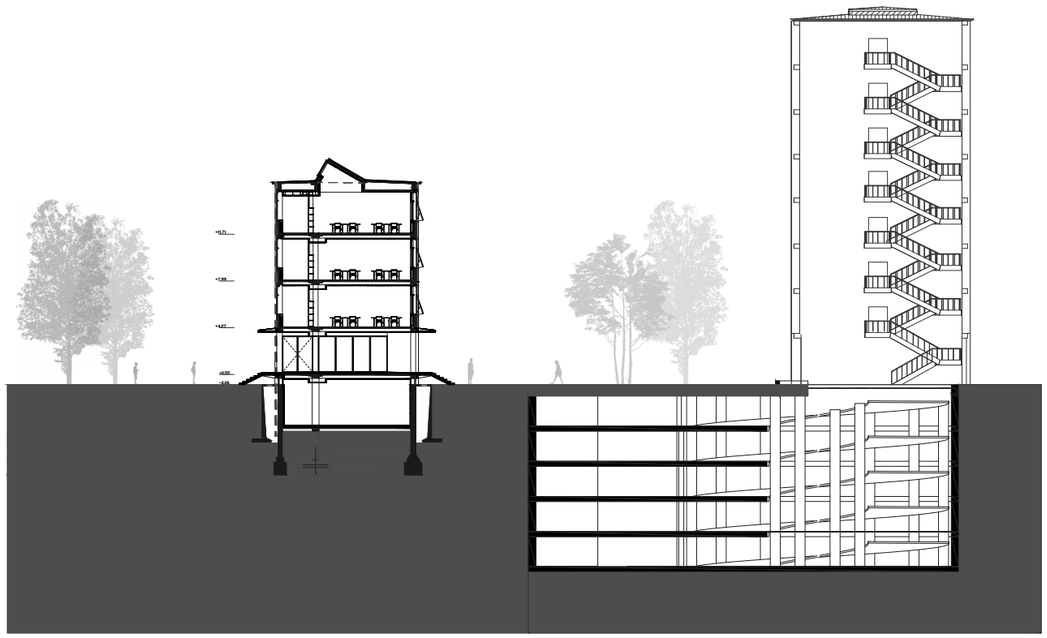
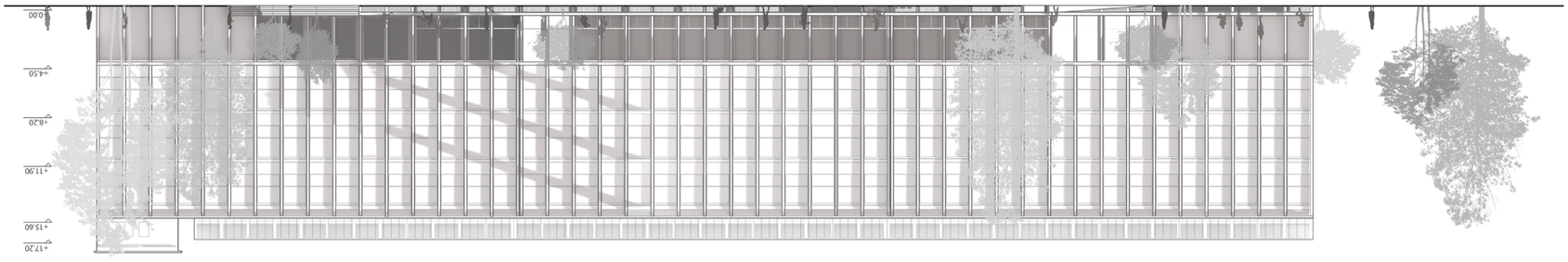




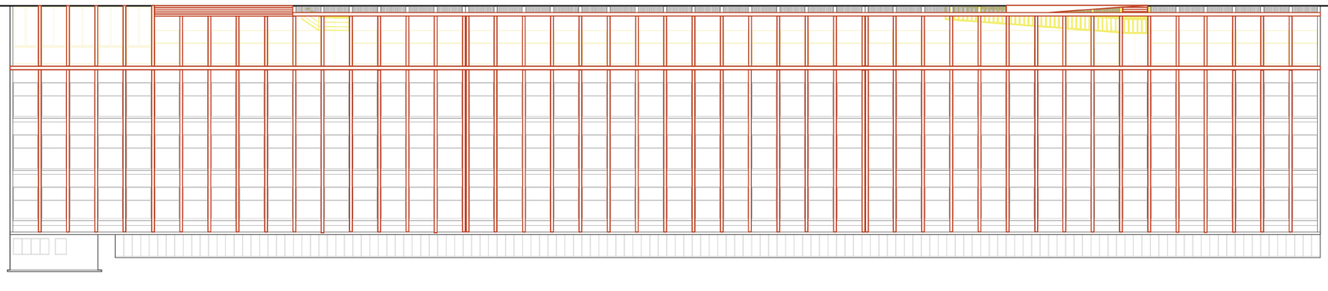
1:200 EAST FACADE



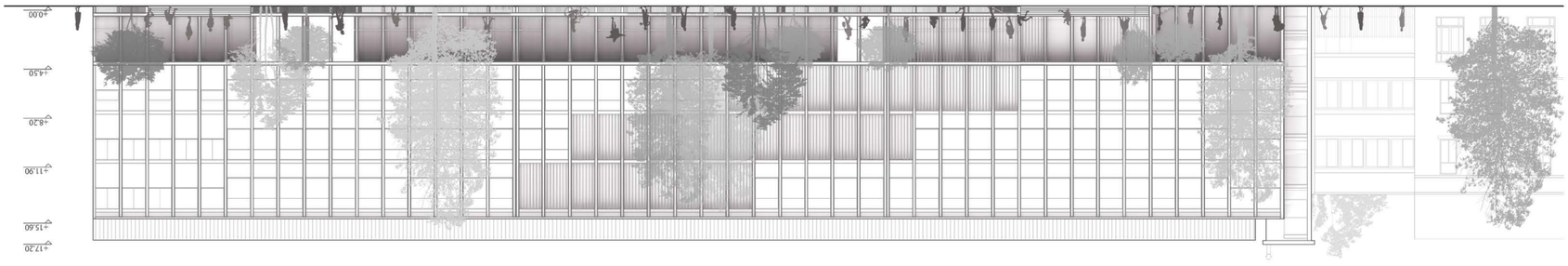
new added glass

removed part

1:200 EAST FACADE



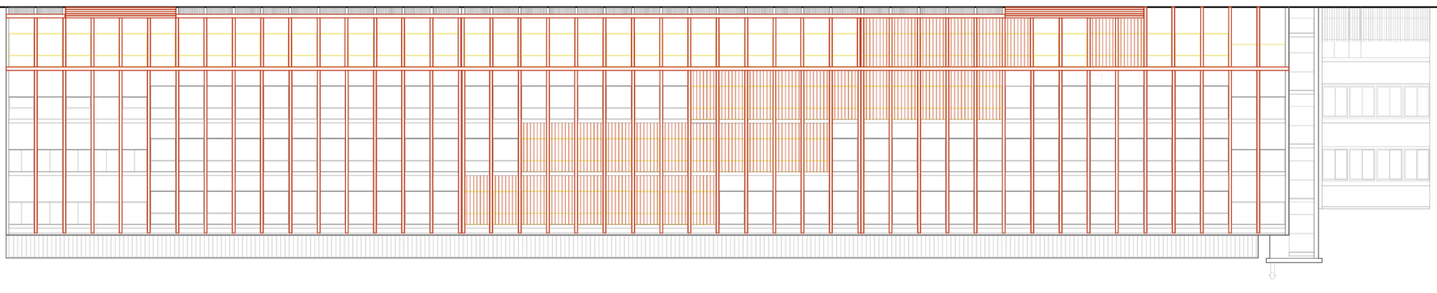
1:200 WEST FACADE



new added glass

removed part

1:200 WEST FACADE



CONSERVATION

NEW
INSERTTING INDOOR LIGHT WOOD STRUCTURE

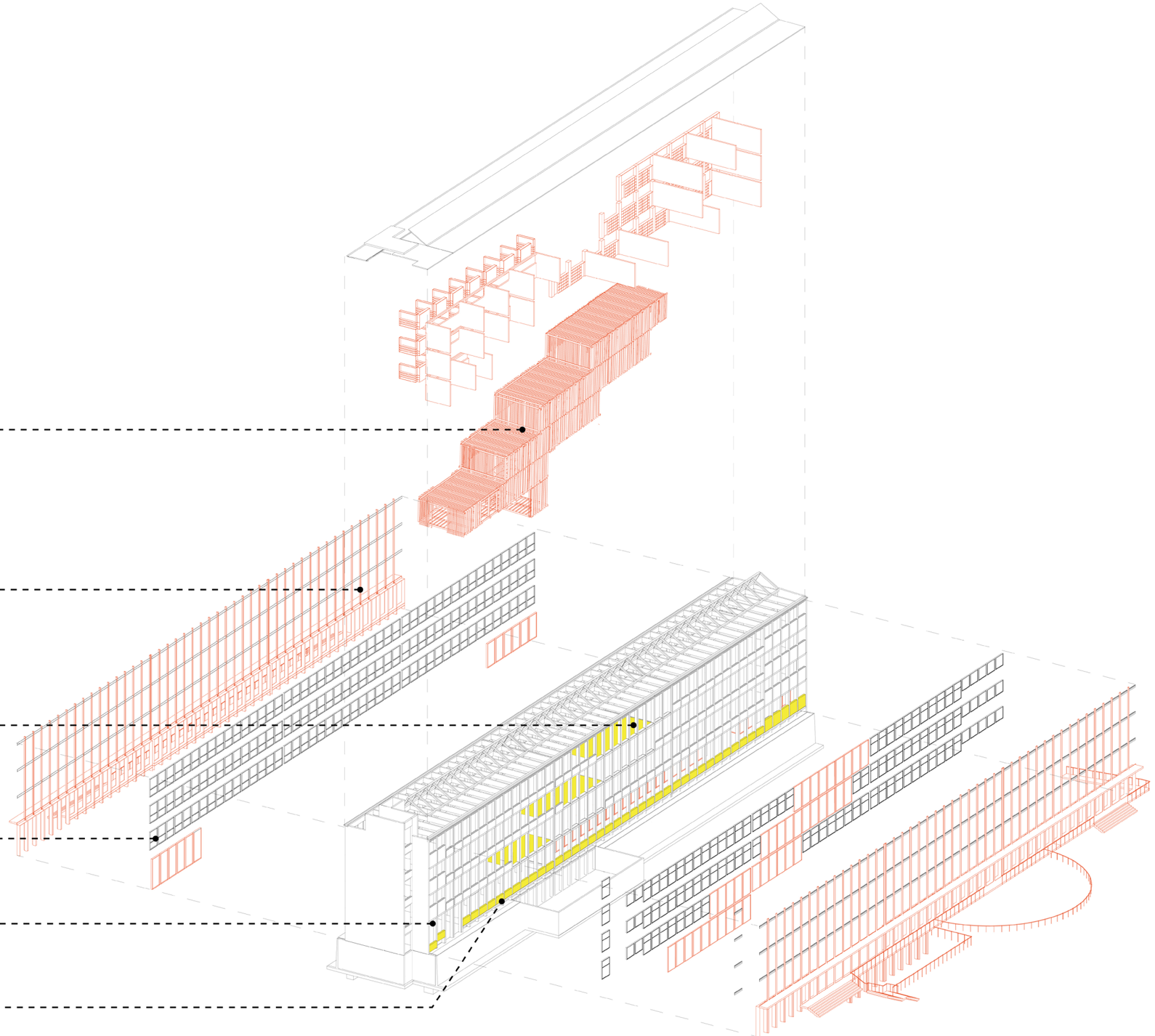
NEW
ADDING OUTDOOR ENCLOSURE METAL STRUCTURE

REMOVE
REMOVE PARTILY FLOOR SLAB

PRESERVE
PRESERVE EXISTING WINDOW
ADDING NEW WINDOW INSIDE

PRESERVE
KEEPPING REFORCED-CONCRETE STRUCTURE

REMOVE
REMOVE GROUND FLOOR EVEVATION ELEMENTS



Conservation analysis

Walls

WHAT IS THE PROBLEM?	WHAT CAN WE DO?	STEP BY STEP
GRAFFITI: There is graffiti on the coating surface of the wall, but it does not damage the coating, it just adheres to the surface.	First of all, we need to clean up the wall, where there are color changes or graffiti, and keep a clean exterior wall. Secondly, due to the serious peeling off of the outer coating, we need to clean it and apply a new coating again to protect the internal brick wall. Because only the outer layer of is damaged by cracks, we only need to clean it and add a new protective layer. Aslo the infill cement should be removed, after remove them, we could consodilation them again.	R.01 REMOVAL OF PLASTER STRONGLY DETACHED • Beating of the plaster to verify any area of detachment in addition to those indicated on the graphic layouts. • Removal of plaster detached by manual instruments (chisels), making a light pressure and taking care not to damage the brick wall. • Removal of the dust and of theincoherent residuals by cleaning clothes and brushes. • Afterwards, the surface should be prepared to apply the new plaster or the whitewashes. R.02 REMOVING OF FILLING WITH CEMENT MORTAR • Protection of the areas near to the element to be removed with masking tape. • Removal of the filling with cement mortar by manual instruments (chisels, hammers and so on), taking care not to damage the plaster in the area and the underlying brick wall.The execution must be done on small areas, from top to bottom. • Cleaning of the surface with brushes and compressed air. • Execution of the new sealing of the crack or refilling of laying of lime plaster and surface finishing by adding surkhi or blue pigments in relation to the area to be treated according to the indication of the Work Director. Pl.01 DRY CLEANING Pl.02 HYDRO CLEANING WITH DEIONIZED WATER (by spray) • Removal of consistent deposits and dry cleaning by manual instruments (such as scrapers,brushes) and with the help of extractor fan, to obtain a surface completely free of dust and rubble. • Repeated washes until the complete extraction of salts by of deionized water by spray with brushing. • Final drying and removal of the salts crystallized on the surface by soft brushes. • Controlling of the intervention by conductivity measurements of the washing water. Co.01 GROUTING OF JOINTS WITH INJECTIONS OF LIME MORTAR Pr.01 LAYING OF LIME PLASTER • After cleaning the surfaces as sheet Pl.02; • Wetting surfaces; • To lay a plaster made by aerial lime mortar. The final thickness would be the same as existing plaster, but we have to see the edge profile of the integration without any cracks, irregularities in alignment and also in the corners or other defects Pr.02 LAYING OF LIGHT PLASTER WITH PIGMENTS • Protection of the lower parts to avoid the fall of mortar, water and so on the underlying painting. • After cleaning the surfaces as sheet Pl 01 or Pl.02
STAINING: Affected by the water, the metal rain shields and metal window frames rusted, and the rust flowed down to the wall.		
MOIST AREA: Darkened areas in different shapes, according to pipe leakage, rising damp, hygroscopic behaviour due to the presence of salts, condensation.		
CRAQUELE: The surface of the coating showed network cracks and did not damage the internal brick wall.		
BLISTERING: The coating is affected by the internal air, forming a bubble-like surface, and in some places the surface layer falls off due to pressure.		
PEELING: In some places, the outer painted plaster was peeled off, and some parts the inside cement was also peeled off.		
FILLING WITH CEMENT MORTAR: There is a large area of new cement coating under the windows, which may because of the old damaged wall that eroded by water and rust.		

Windows

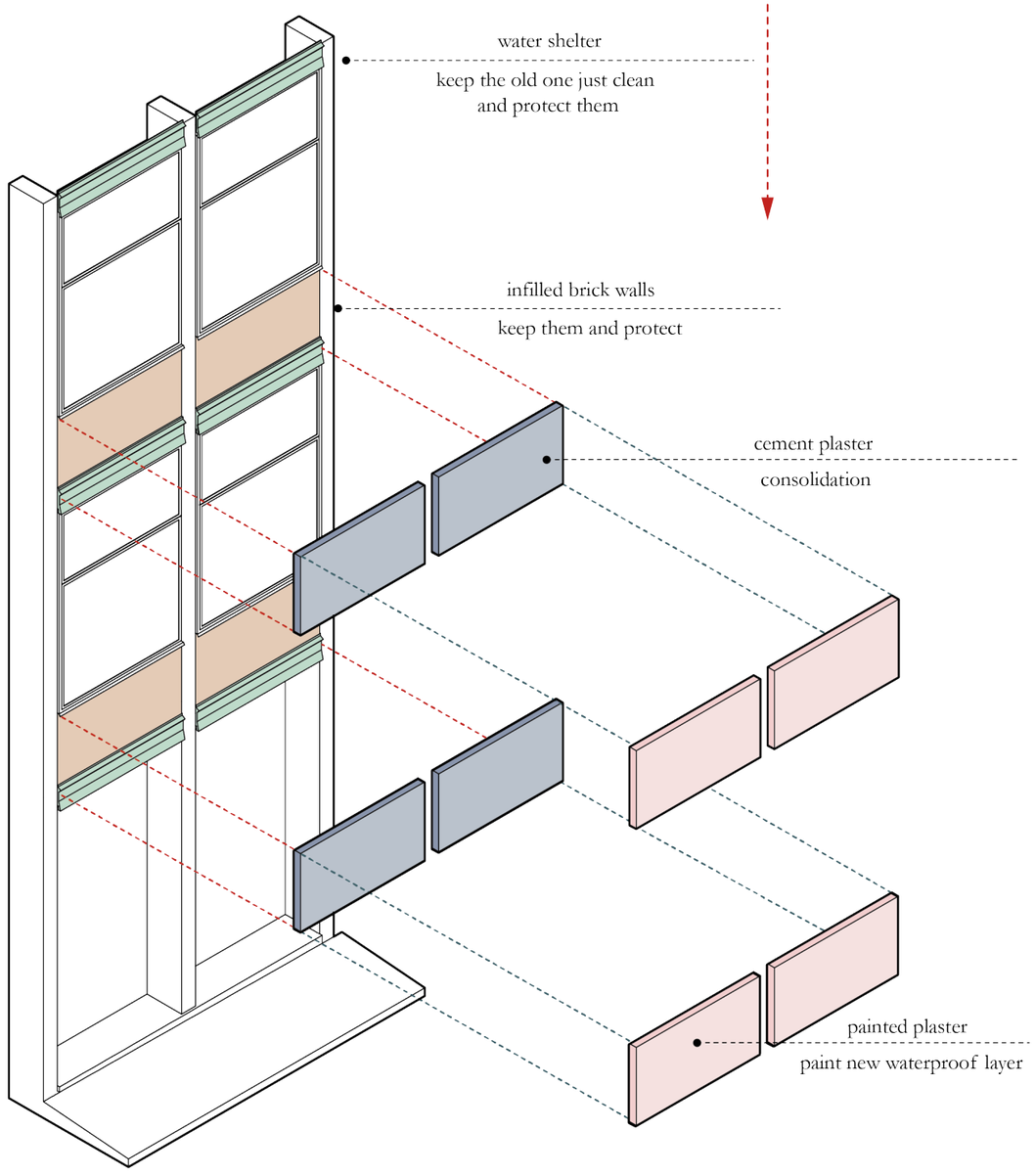
WHAT IS THE PROBLEM?	WHAT CAN WE DO?	STEP BY STEP
STAINING: The metal rain shield is affected by water, causes stains on the glass.	First of all, we need to clean the glass. Second, we need to clean up the rust on the rain shield. If it is seriously damaged, it needs to be replaced. The window frame needs to be cleaned of the peeling paint coating, and then powdered new paint which will protect the metal window frame after cleaning.	Pl.01 DRY CLEANING • Dry cleaning by dusting with brushes, cleaning clothes and brooms. The cleaning must remove the deposit of atmospheric particles, soluble salts and incoherent residues of plasters. • The execution will take place from top to bottom for horizontal fields. Pl.02 HYDRO CLEANING WITH DEIONIZED WATER (by spray) • Removal of consistent deposits and dry cleaning by manual instruments (such as scrapers,brushes) and with the help of extractor fan, to obtain a surface completely free of dust andrubble. • Repeated washes until the complete extraction of salts by of deionized water by spray with brushing. • Final drying and removal of the salts crystallized on the surface by soft brushes. • Controlling of the intervention by conductivity measurements of the washing water. Pr.01 LAYING OF PAINTING PLASTER • Protect metal window frame
PATINA: Iron rich patina		
PEELING: In some places, the outer painted plaster of window frames was peeled off.		

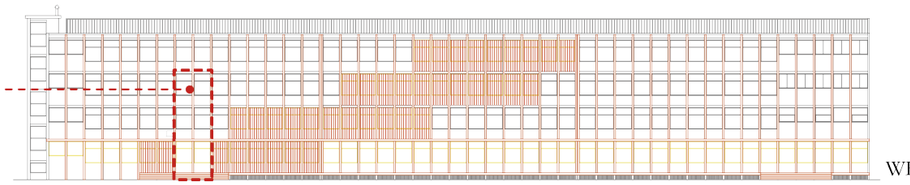
Pillars

WHAT IS THE PROBLEM?	WHAT CAN WE DO?	STEP BY STEP
CRACK: There are some cracks between the structural pillars and the decorative pillars, and the cracks on the decorative pillars are more serious.	First, we need to clean the surface, fill in the missing places, and replace some of the old cement with new ones. At the same time, the metal bolts also need to be cleaned and reinforced. Then we need to refill the missing decorative pillars. Finally, a metal shellneeds to be added to protect the decorative pillars outside. For the parts that are not lost, we need to clean the metal and apply a new paint coating to prevent the metal from being corroded by water again.	R.01 REMOVING OF FILLING WITH CEMENT MORTAR • Protection of the areas near to the element to be removed with masking tape. • Removal of the filling with cement mortar by manual instruments (chisels, hammers and so on), taking care not to damage the plaster in the area and the underlying brick wall.The execution must be done on small areas, from top to bottom. • Cleaning of the surface with brushes and compressed air. • Execution of the new sealing of the crack or refilling of laying of lime plaster and surface finishing by adding surkhi or blue pigments in relation to the area to be treated according to the indication of the Work Director. Pl.01 DRY CLEANING • Dry cleaning by dusting with brushes, cleaning clothes and brooms. The cleaning must remove the deposit of atmospheric particles, soluble salts and incoherent residues of plasters. • The execution will take place from top to bottom for horizontal fields. Pl.02 HYDRO CLEANING WITH DEIONIZE -D WATER (by spray) • Removal of consistent deposits and dry cleaning by manual instruments (such as scrapers,brushes) and with the help of extractor fan, to obtain a surface completely free of dust and rubble. • Repeated washes until the complete extraction of salts by of deionized water by spray with brushing. • Final drying and removal of the salts crystallized on the surface by soft brushes. • Controlling of the intervention by conductivity measurements of the washing water. Co.01 SEALING OF CRACKS WITH INJECTI -ONS OF HYDRAULIC LIME MORTAR • Protection of surfaces with masking tape; • Cleaning the cracks with compressed air; • Deep injection of hydraulic lime mortar; the Works Director should verify the necessity of insertion of brick fragments, according to the size of crack. • Finish with lime mortar and sieved sand (inert-binder ratio 1:1) with burnt bricks powder; the Works Director should choose the color according to the surrounding surface. • The finish should be realized 5 mm undercut for the exterior front (layout CO4, side G) . Co.02 FILLING OF MISSING PARTS • Cleaning of the cavity by compressed air; • After wetting the surface, filling of missing parts with natural hydraulic lime mortar , taking care to seal any interruption; • Finishing with lime mortar and natural riddled sand with the addition of powder burnt bricks. Pr.01 ADDING STEEL TO PROTECT DECORATED PILLARS
PEELING: Many of the metal -protecting paints have peeled off on the metal skin that was originally used to protect the decorative pillars.		
SCALING: Detached contour scaling on beams.		
FILLING WITH CEMENT MORTAR: In order to protect the structural pillars from further damage, the surface of the missing decorative pillars was smoothed with cement.		
MACHENICAL DAMAGE: The metal used to fix the decorative pillar is now exposed, and the pillar is damaged by the metal bolt. There was a missing part around the metal bolt.		
MISSING PART: Very few parts of the pillars are missing, leaving the materials inside exposed to the outside.		

EXPLORATION OF MATERIAL ANALYSIS

Walls and windows





WEST FACADE

Water shelter

The material of shelters is copper

We want to keep the patina part and try to protect and cliean it.

dry cleaning with brush

hydro cleaning

color the shelter

Brick walls

Infilled walls need to be protect and consolidation

The brick walls are a part of the facade, it's protected by the outer cement layer and painting layer.

remove detached plaster

dry cleaning with brush

hydro cleaning

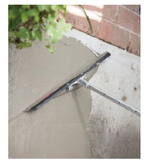
Cement layer

Give a new cemnet layer to the brick wall

After consolidation the brick wall, we needto prepare the surface for next step laying the cement layer.

prepare the surface

laying cement layer

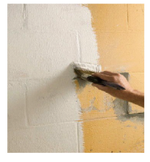


Painted layer

Laying a new waterproof painting layer

After laying the cement layer we give a new waterproof layer.

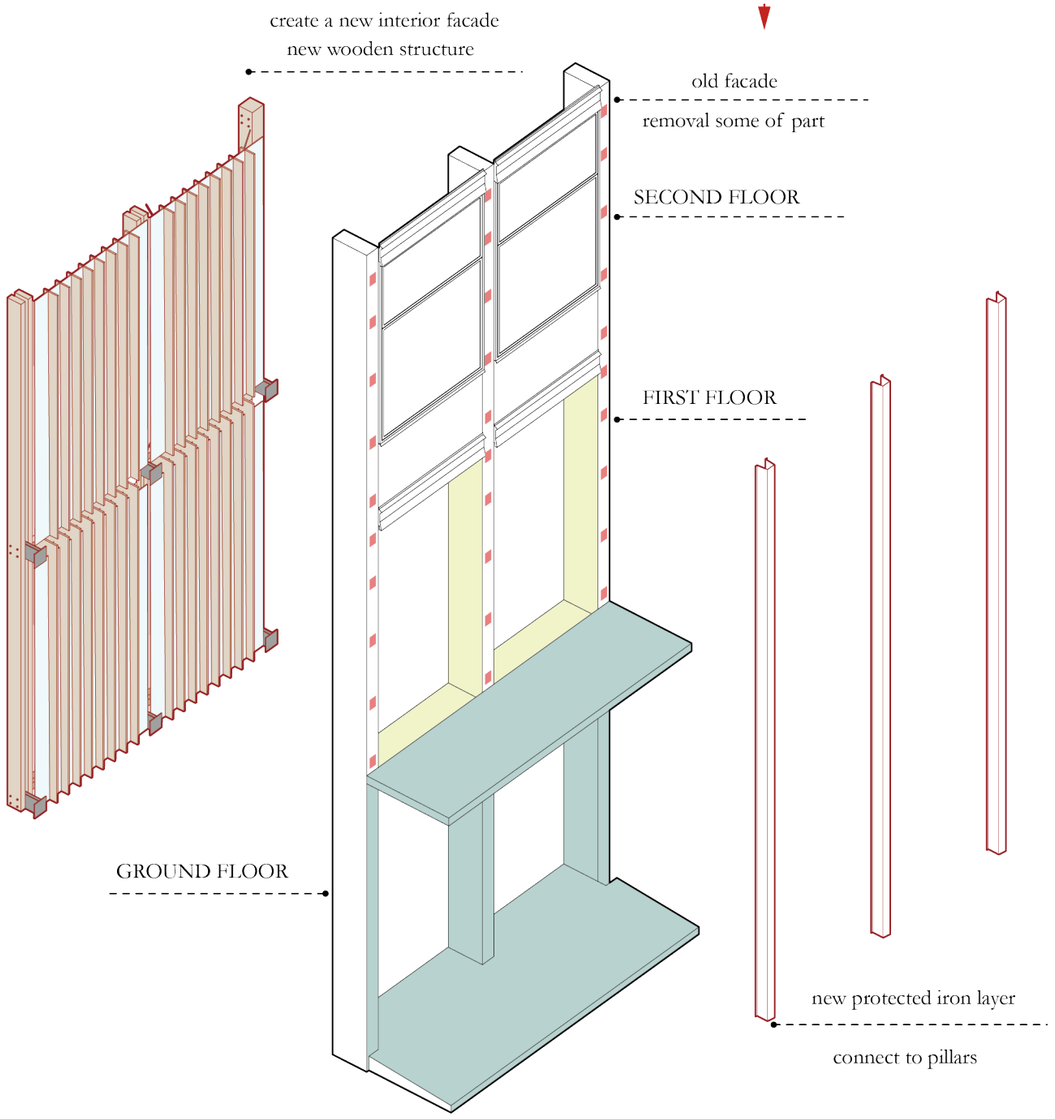
new painting plaster

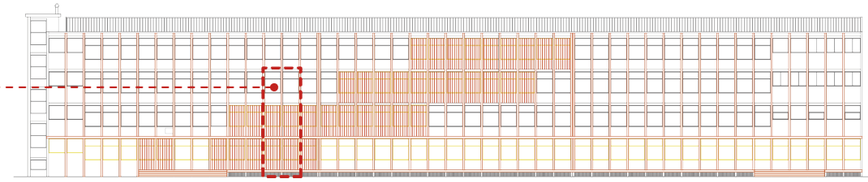


waterproofing

EXPLORATION OF MATERIAL ANALYSIS

Pillars





WEST FACADE

Protected part 1
The part we demolished but not on the ground floor

After consolidation the demolished part, we thought that we could use waterproof painting to protect thses prats.

Protected part 2
The part which is on the ground floor

After consolidation, we try to create a more open ground floor, so we use same material for both canopy and floor.

Protected part 3
Exposed joints effected facade

Cause the missing of the decorated pillars exposed iron joints rusted and affected surrounding cement surface.

clean

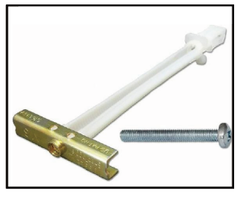
consolidation

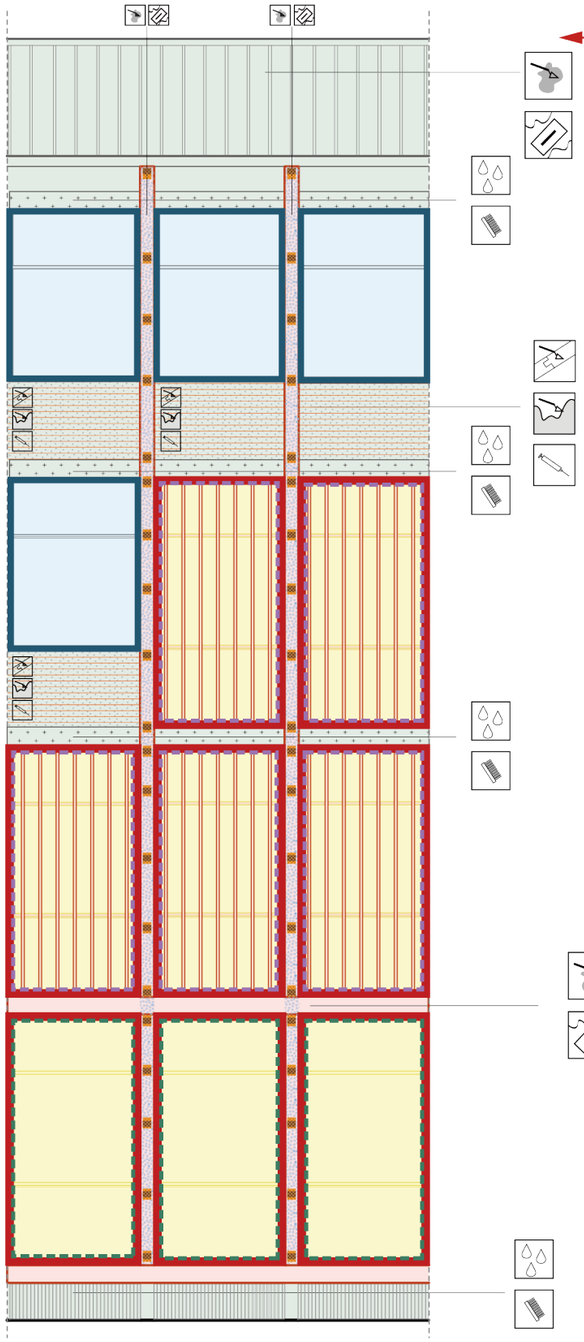
smooth surface

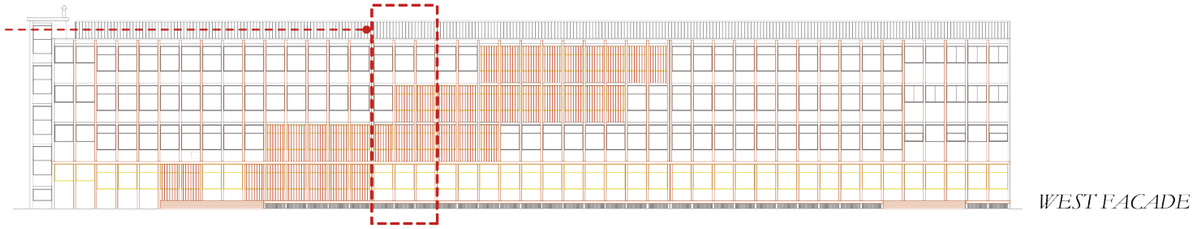
waterproof painting

steel covering

new joints







WEST FACADE

Protected part

Most of the in fill wall

Adding part

Pillars and interior facade

Cleaned part

Old windows

WALL

R.01

REMOVAL OF PLASTER STRONGLY DETACHED

R.02

REMOVING OF FILLING WITH CEMENT MOTAR

Co.01

GROUTING OF JOINTS WITH INJECTIONS OF LIME MORTAR

Pr.01

LAYING OF LIME PLASTER

Pr.02

LAYING OF LIGHT PLASTER

PATINA

Pl.01

DRY CLEANING

Pl.02

HYDRO CLEANING WITH DEIONIZED WATER

Pr.01

LAYER OF PAINTING PLASTER

PILLARS

Pl.01

CLEANNING THE STAINING PART

Co.01

FILLING IN THE MISSING PART WITH CEMENT

Co.02

REINFORCED AND FILLED T HE SURFACE WITH CEMENT

Pr.01

CUT OFF THE EXTERNALLY EXPOSED JOINTS

Pr.02

APPLY A WATERPROOF LAYER TO THE SURFACE

Pr.03

ADDING A NEW IRON LAYER TO PROTECT THE PILLARS

WINDOWS

Pl.01

CAUSE OF THE THERMAL PROBLEM SO WE ADD NEW WINDOW SINSIDE

Demolished part

Ground floor facade

FACADE

Co.01

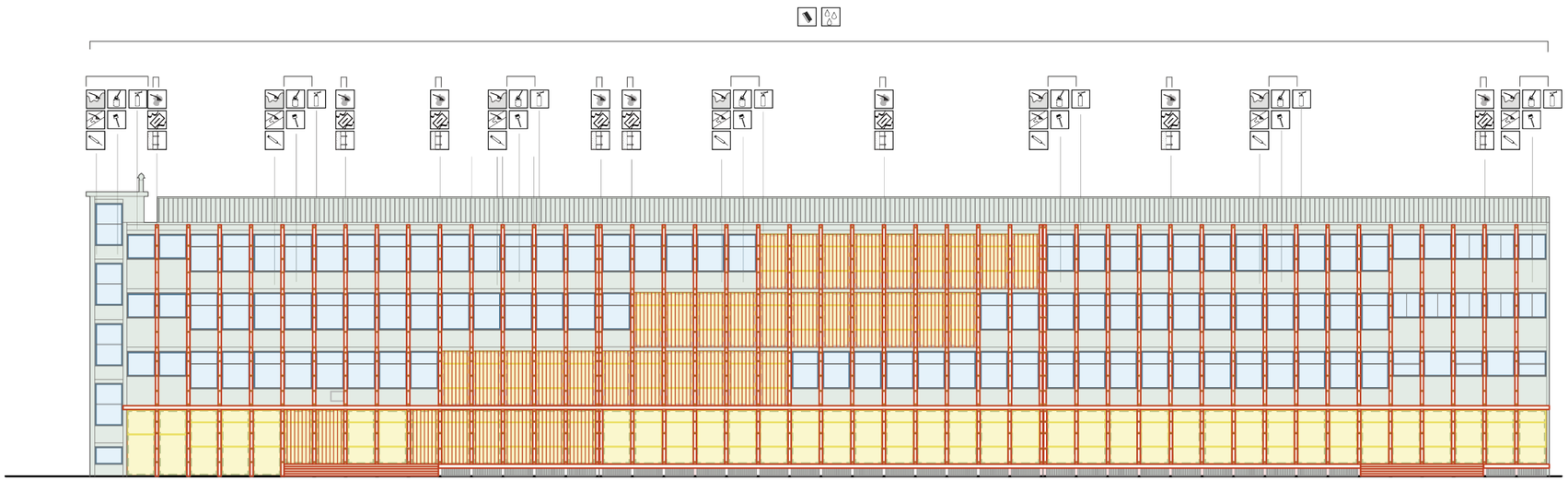
REINFORCED THE SURFACE WITH CEMENT

Pr.01

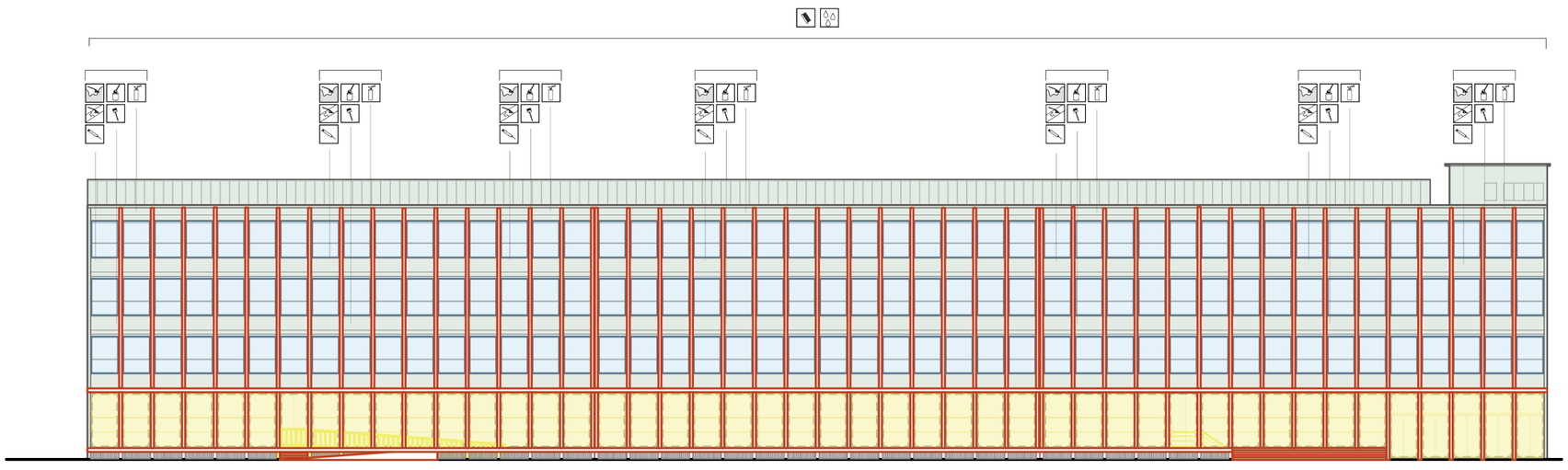
APPLYING A WATERPROOF MATERIAL TO THE SURFACE

Pr.02

USING METAL TO COVER THE EXPOSED PARTS



WEST FACADE



EAST FACADE

Protected part
Most of the in fill wall

R.01
REMOVAL OF PLASTER STRONGLY DETACHED

R.02
REMOVING OF FILLING WITH CEMENT MOTAR

Co.01
GROUTING OF JOINTS WITH INJECTIONS OF LIME MORTAR

Pl.02
HYDRO CLEANING WITH DEIONIZED WATER

Pr.01
LAYING OF LIME PLASTER

Pr.02
LAYING OF LIGHT PLASTER

Pl.01
DRY CLEANING

Pr.01
LAYER OF PAINTING PLASTER

Adding part
Pillars and interior facade

Pl.01
CLEANNING THE STAINING PART

Co.01
FILLING IN THE MISSING PART WITH CEMENT

Co.02
REINFORCED AND FILLED T HE SURFACE WITH CEMENT

Pr.01
CUT OFF THE EXTERNALLY EXPOSED JOINTS

Pr.02
APPLY A WATERPROOF LAYER TO THE SURFACE

Pr.03
ADDING A NEW IRON LAYER TO PROTECT THE PILLARS

Cleaned part
Old windows

Pl.01
CAUSE OF THE THERMAL PROBLEM SO WE ADD NEW WINDOWS INSIDE

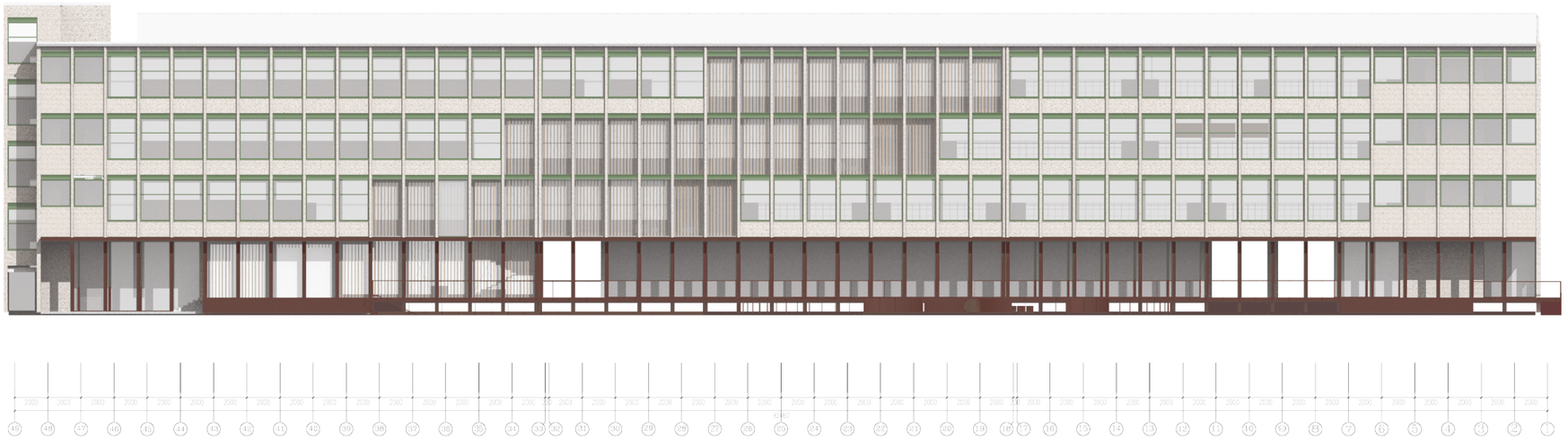
Demolished part
Ground floor facade

Co.01
REINFORCED THE SURFACE WITH CEMENT

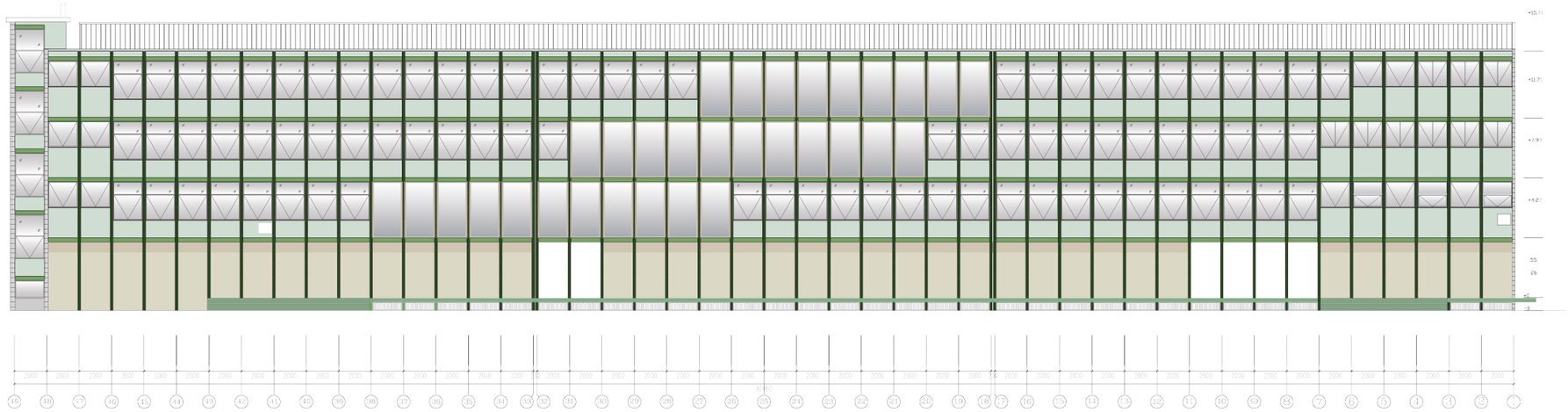
Pr.01
APPLYING A WATERPROOF MATERIAL TO THE SURFACE

Pr.02
USING METAL TO COVER THE EXPOSED PARTS

New material map



WEST FACADE VIEW



MATERIAL MAPPING

WALL

P01 Light grey painting plaster

C03 Cement

WINDOW AND DOOR

CO-01 Copper

Gl-01 Insulation glass

Gl-02 Insulation glass (behind the facade)

IR-01 Iron window frame with light grey paint

PILLAR

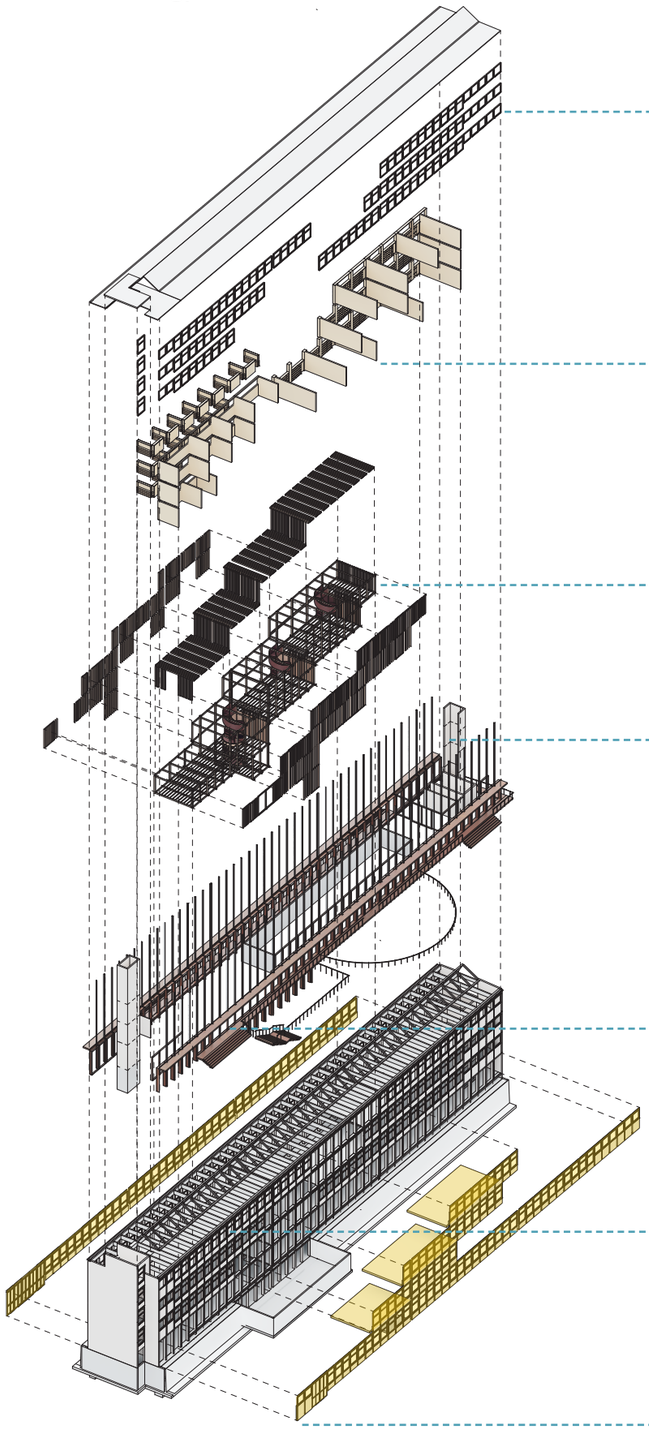
ST-01 Weathering steel

CANTILEVER PLATFORM

ST-01 Weathering steel

TECHNOLOGY

Structure strategy



DOUBLE WINDOW SYSTEM
For the west façade of the building, the original iron window frames are retained, and windows with better thermal insulation properties are added along the walls of the interior.

WOODEN S TRUCTURE INDOOR PARTITION SYSTEM AND FURNITURE SYSTEM
For the For the separation of indoor spaces, the partition wall system of wood structure and the design of furniture fittings are used to distinguish different functional spaces.

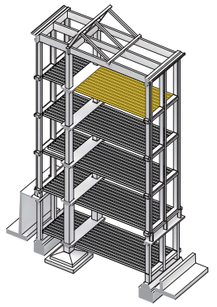
WOODEN BOX
The newly installed wooden box containing three spiral staircases uses the wooden frame as the load-bearing structure, and the skin is a wooden grille. On the side close to the facade of the building, the skin is a double-layer grille with glass windows in the middle. .

ELEVATOR
At both ends of the building, two new concrete elevator shafts are placed along the side of the original stairwell, equipped with modern elevators of appropriate size.

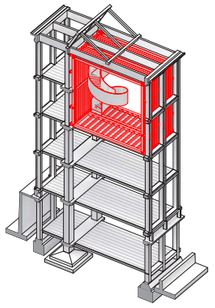
FACADE METAL ELEMENTS
On the ground floor, new steel balconies and stairs have been added. As for the decorative pillars that once existed and are now missing, they are now replaced by new metal pillars to protect the existing concrete pillars.

RESTORATION
After demolishing part of the facade and indoor non-load-bearing partition walls, repair the remaining concrete structure. The façade that needs to be preserved shall be repaired accordingly.

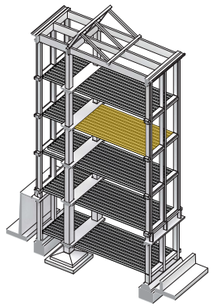
DEMOLITION
The floor slab and part of the facade that need to be removed



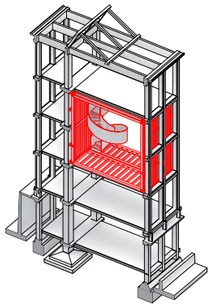
4a. Remove the third floor slab



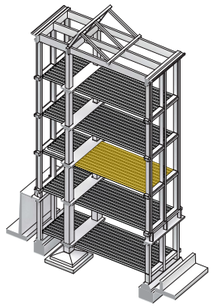
4b. Put wooden boxes in the second and third floors



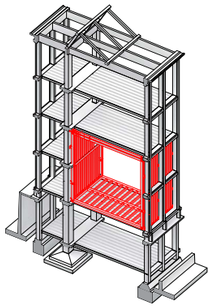
3a. Remove the second floor slab



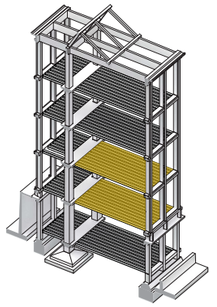
3b. Put wooden boxes in the first and second floors



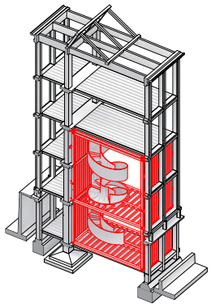
2a. Remove the first floor slab



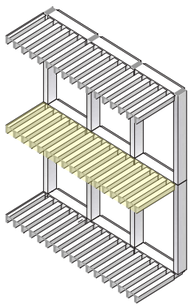
2b. Put wooden boxes in the ground floor and flirst floors

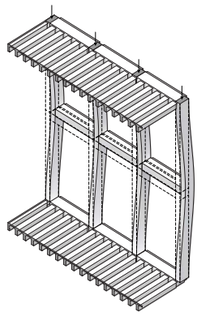


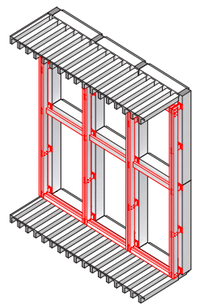
1a. Remove the ground floor and first floor slab



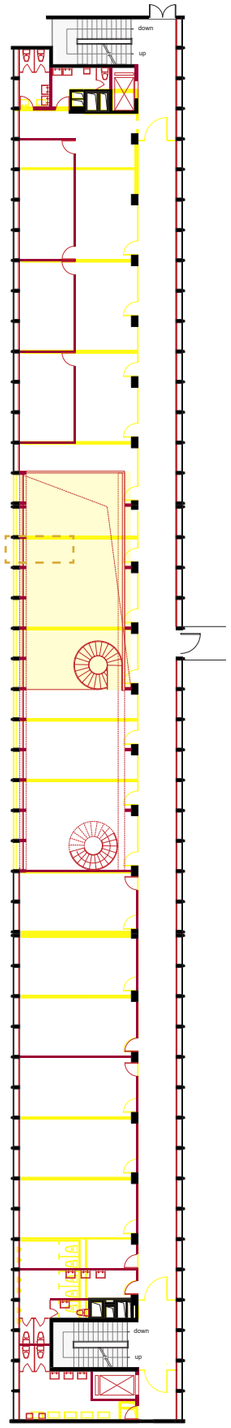
1b.A wooden box is placed in the basement and ground floor as well as the first floor. Because the original concrete floor was a one-way slab, the ground floor slab was rebuilt after the placement of the new spiral staircase

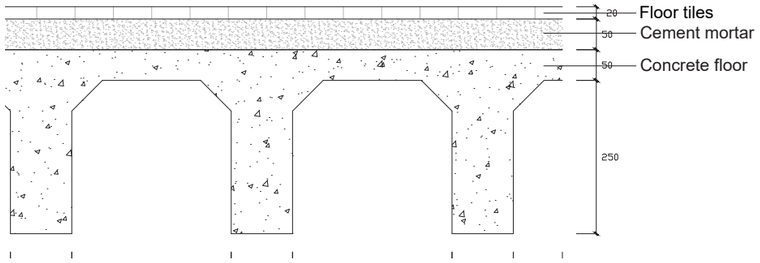


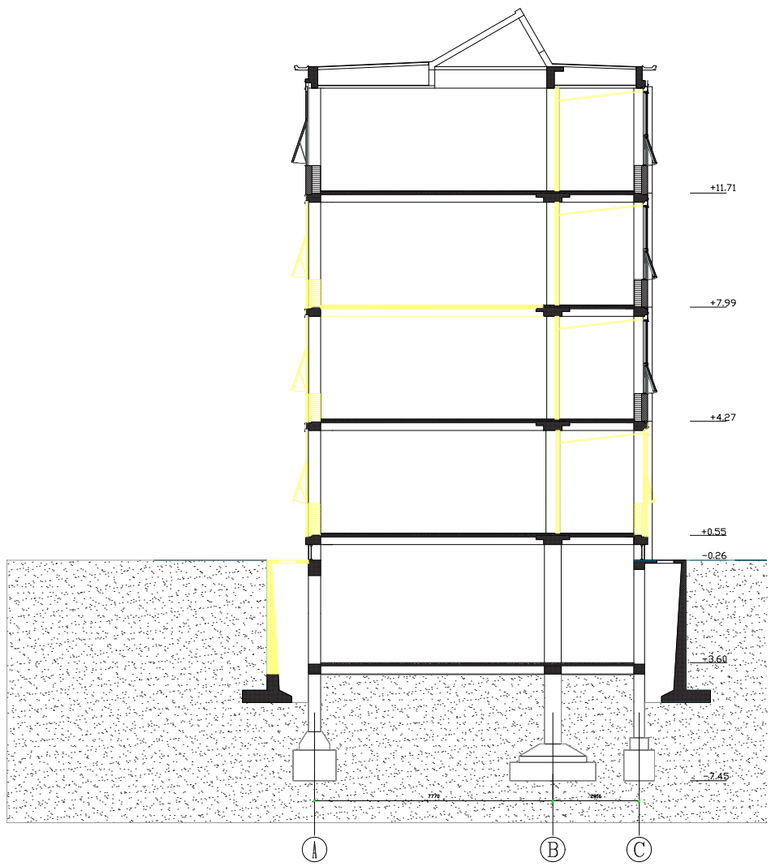




According to the new intervention strategy, we will remove part of the concrete floor to achieve a double-height space effect. For this reason, the existing concrete pillars will face the problem of weakened rigidity. Our structural strategy is to add wooden structural columns to support the heightened concrete columns. At the node, the new wooden structure column is connected with the concrete column, and the top and bottom do not touch the floor slab. The load brought by the overall new structure will be transferred to the concrete column through the node. After calculation, the load of the new structure will be less than the load of the removed concrete floor. Therefore, the overall structural plan is feasible







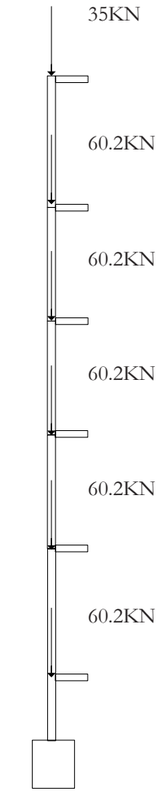
STRUCTURE REMOVAL LOAD

In the entire building structure system, take a structural unit as an example: it is possible to remove the floor slab on the ground floor, first floor, second floor, and third floor of the building. Because it involves removing and adding new structures, calculations are made for changes in the load on the foundation of the building.

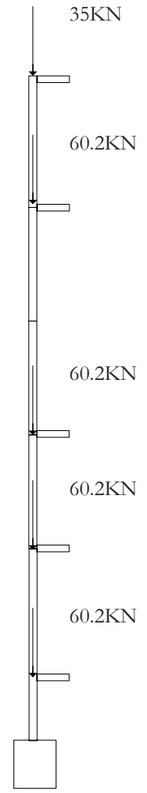
The yellow area is the area where the floor slab needs to be removed.The original building floor is a concrete one-way corrugated floor slab, and the self-weight load per square meter of the floor slab is 4.6KN/m2. The function of the building is a classroom, and the activity load is taken as 4 KN/m2.

Layer	Length		Width		Height		Volumetric weight		Weight	
Floor tiles	1.0	m	1.0	m	0.02	m	20	kN/m3	0.4	kN/m2
Cement mortar layer	1.0	m	1.0	m	0.05	m	24	kN/m3	1.2	kN/m2
Concrete floor	1.0	m	1.0	m	0.05	m	24.3	kN/m3	1.2	kN/m2
Concrete floor beam	1.0	m	0.3	m	0.25	m	24.3	kN/m3	1.8	kN/m2
Area load G2									4.6	kN/m2

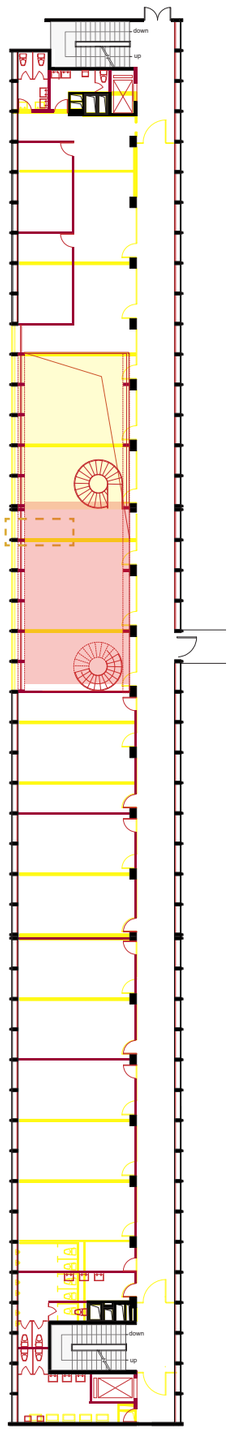
For the pillar X, the support area is 7m2. So, each floor, the load is 60.2KN/m2. For the overall force of the foundation, it is 336KN. After the floor slab is removed, the load on the foundation is 275.8KN.

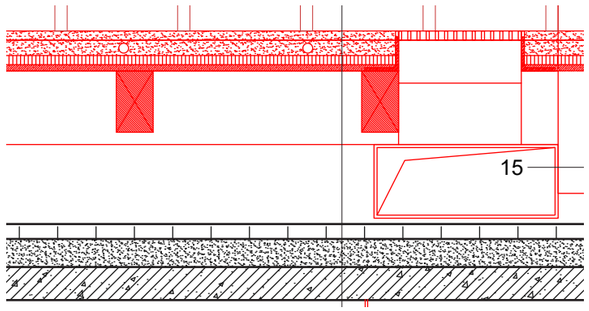


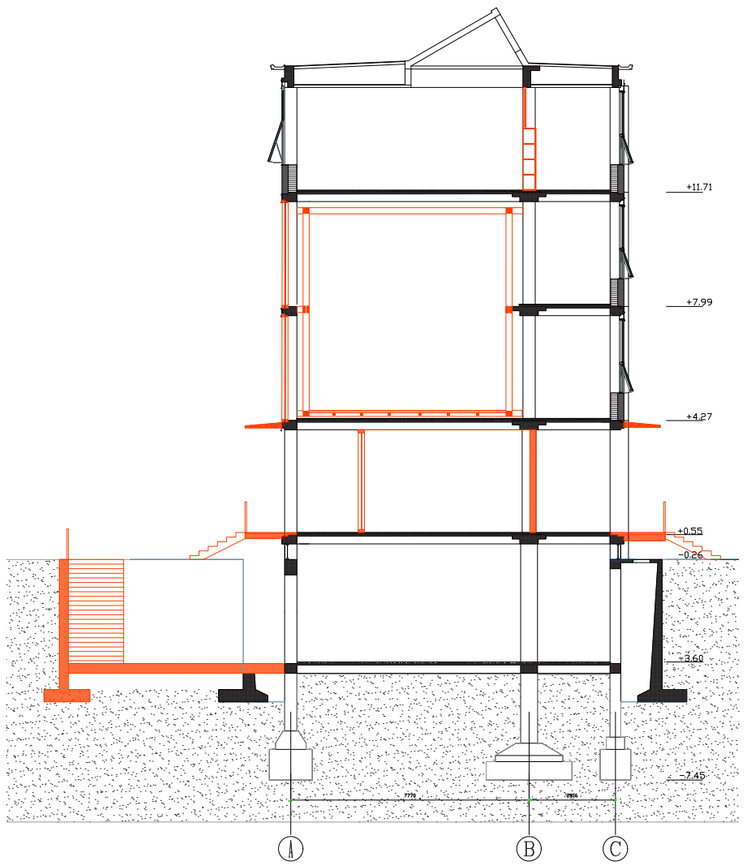
336KN.



275.8KN.



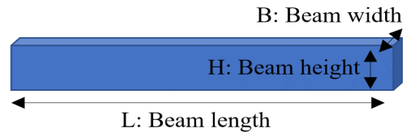




Layer	Length		Width		Height		Volumetric weight	Weight	
Cement	1.0	m	1.0	m	0.05	m	24 kN/m3	1.2	kN/m2
Wooden floor pavement	1.0	m	1.0	m	0.015	m	9 kN/m3	0.1	kN/m2
Wooden floor base layer	1.0	m	1.0	m	0.015	m	8 kN/m3	0.1	kN/m2
Cement panel	1.0	m	1.0	m	0.01	m	8 kN/m3	0.1	kN/m2
Wooden floor keel	1.0	m	0.12	m	0.2	m	9 kN/m3	0.2	kN/m2
Area load G2								**1.8**	**kN/m2**

wood rectangular beam

B	20	cm	0.2	m
H	20	cm	0.2	m
Material density	900	kg/m3	9	kN/m3
Linear load G1			**0.4**	**kN/m**



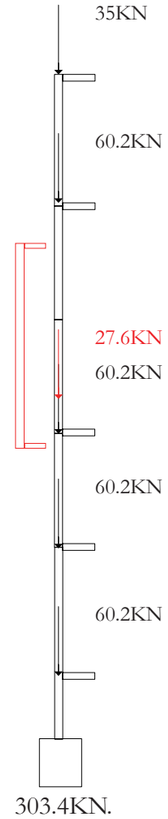
NEW STRUCTURE

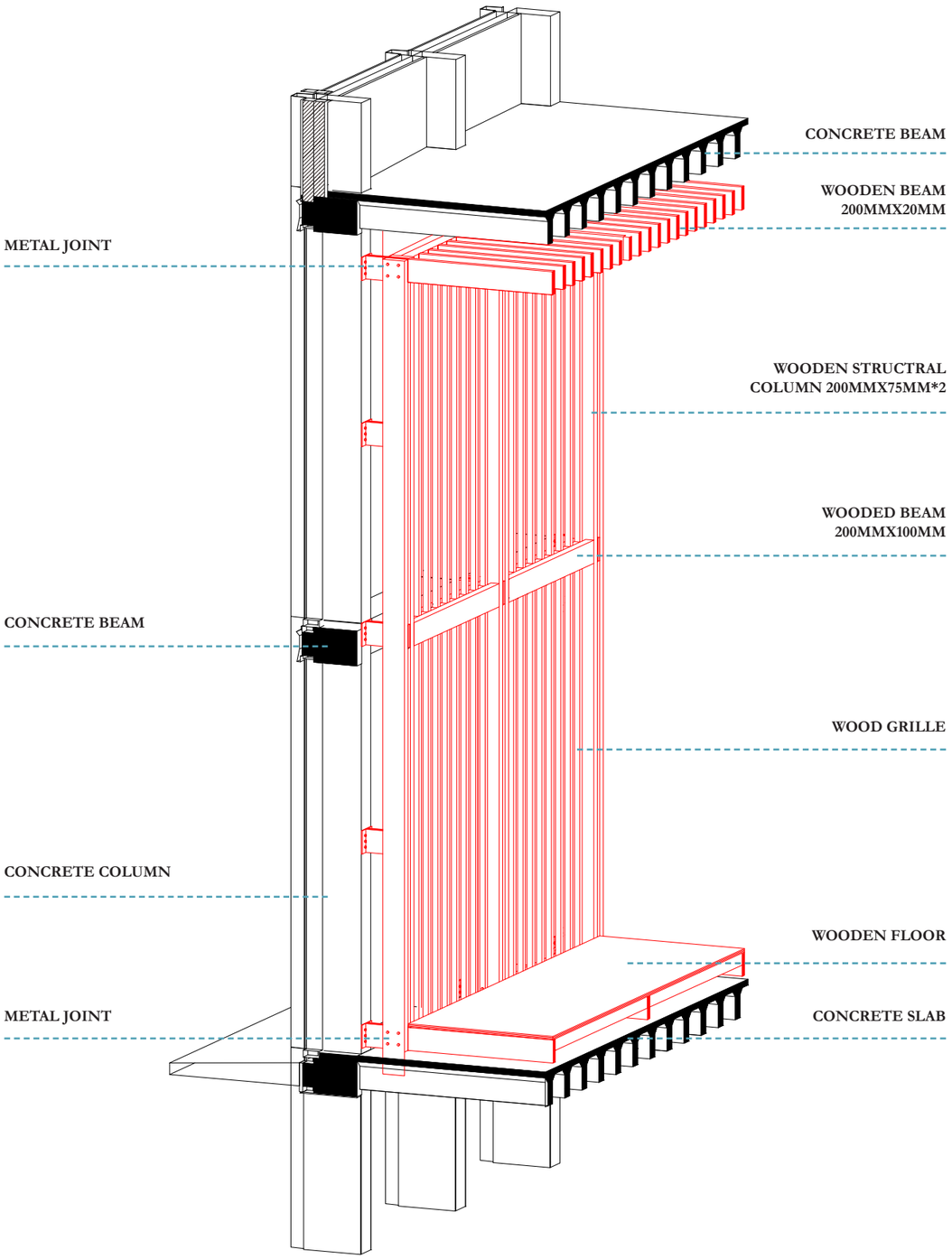
For the newly added structure, the unit area load of the new wood structure floor slab is 1.8KN/m2.The same column, the supporting area is 7m2. Therefore, the newly added floor load is 12.6KN.

The loads of new wooden structure is 0.4KN/m. The length of new wooden column is 7.2m. The length of new wooden beam is 3.5m. In addition to the weight of other grilles and glass windows, the load of the newly added structure is around 15KN.

Therefore, for the column, the load of the newly added structure is 27.6KN. For the foundation, the total load received is 303.4KN. Less than the original load on the foundation.

Therefore, as long as the weight of the newly added structure is controlled to be less than the weight of the removed floor slab, there is no need to strengthen the building foundation.




CONCRETE BEAM
WOODEN BEAM
200MMX20MM
METAL JOINT
WOODEN STRUCTRAL
COLUMN 200MMX75MM*2
WOODED BEAM
200MMX100MM
CONCRETE BEAM
WOOD GRILLE
CONCRETE COLUMN
WOODEN FLOOR
METAL JOINT
CONCRETE SLAB

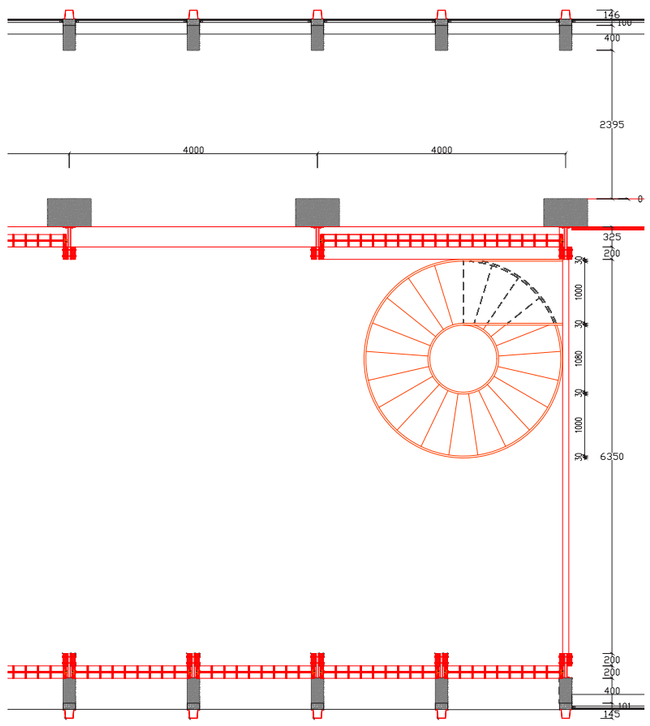
SPIRAL STAIRCASE LOAD

The newly added spiral staircase is a weather-resistant steel structure. The staircase is self-supporting as a whole. The load of the staircase will be transferred to the newly built wooden beams and then to the concrete columns connected by the wooden beams. Therefore, the load of the stairs needs to be calculated first.

Thickness of iron plate: 20mm
Area of surface in all stairs:35.8M^2
Weight of stairs: 5620kg
Dead load of strirs: 55.1KN

Live load of stairs: 2KN/m^2
Area of stairs: 6.72m^2
Total live load of type b stair: 13.44KN

Total load : 68.5KN



Underground part
Thickness of iron plate: 20mm
Area of surface in all stairs: 31.1M2
Weight of stairs: 4890kg
Dead load of strirs: 47.9Kn

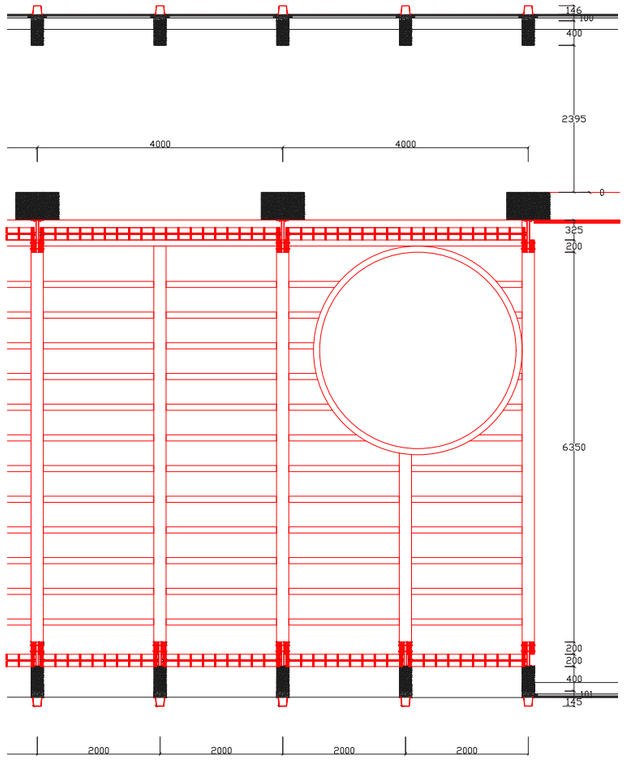
Live load of stairs: 2kn/m2
Area of stairs: 6.72M2
Total live load of type b stair: 13.44Kn

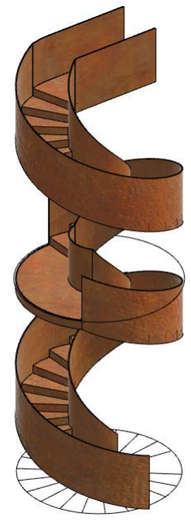
Total load : 61.4Kn

Upper part
Thickness of iron plate: 20mm
Area of surface in all stairs:35.8M2
Weight of stairs: 5620kg
Dead load of strirs: 55.1Kn

Live load of stairs: 2kn/m2
Area of stairs: 6.72M2
Total live load of type b stair: 13.44Kn

Total load : 68.5Kn



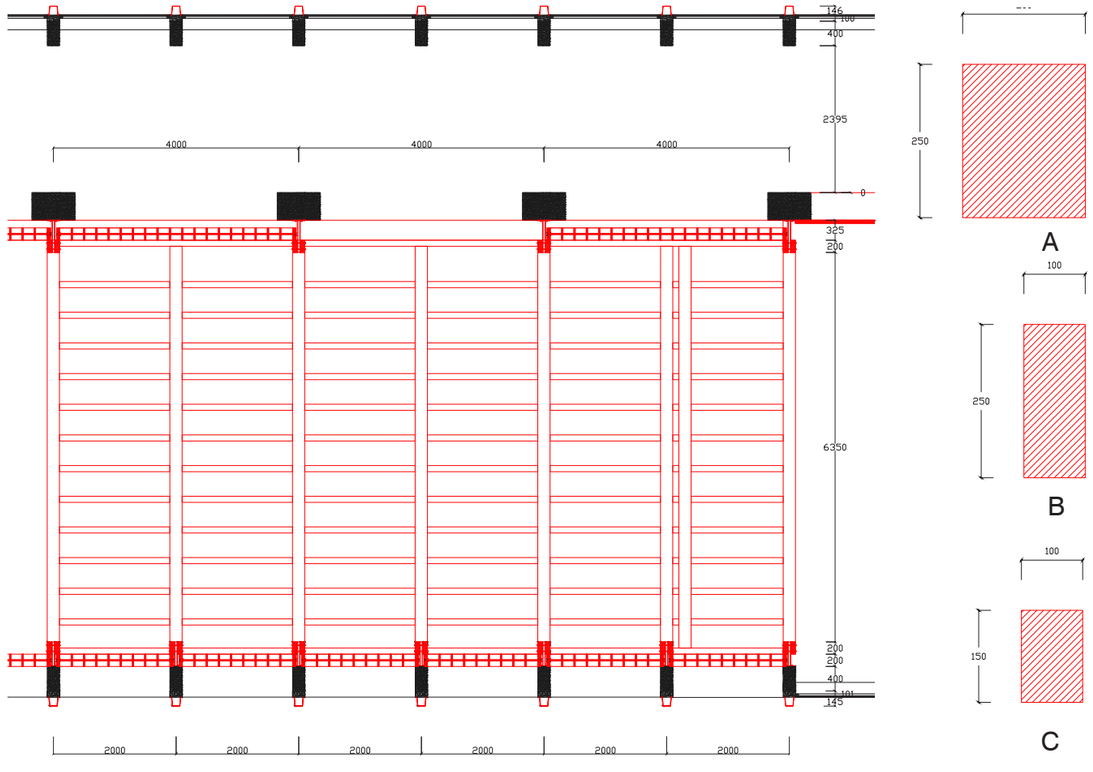


FORCE ANALYSIS OF ADDED TIMBER STRUCTURE FLOOR SLAB

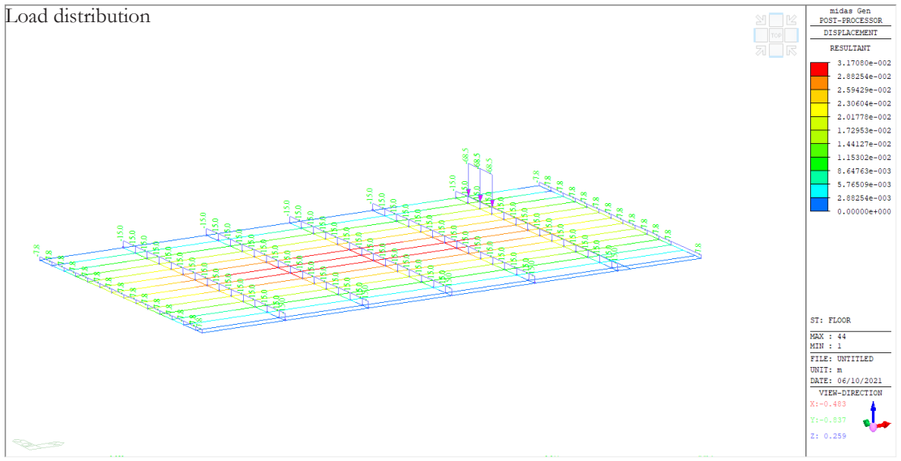
The beams of the wooden floor slab are distributed according to the positions of the original concrete columns. The main beam between the concrete columns has a cross-sectional dimension of 200mm*250mm (A). The size of the side beam is 100mm*200mm(B). A main beam is added at the position of the spiral staircase, and local reinforcement is carried out according to the load of the spiral staircase calculated above. On the right, the load distribution of the entire wooden structure floor and the structural deformation of wooden beams are shown.

Influence area width I	2.0	m
Linear load G1	0.6	kN/m
Area load G2	1.0	kN/m2
Linear load G2	2.0	kN/m
Area load Q1	4.0	kN/m2
Linear load Q1	8.0	kN/m

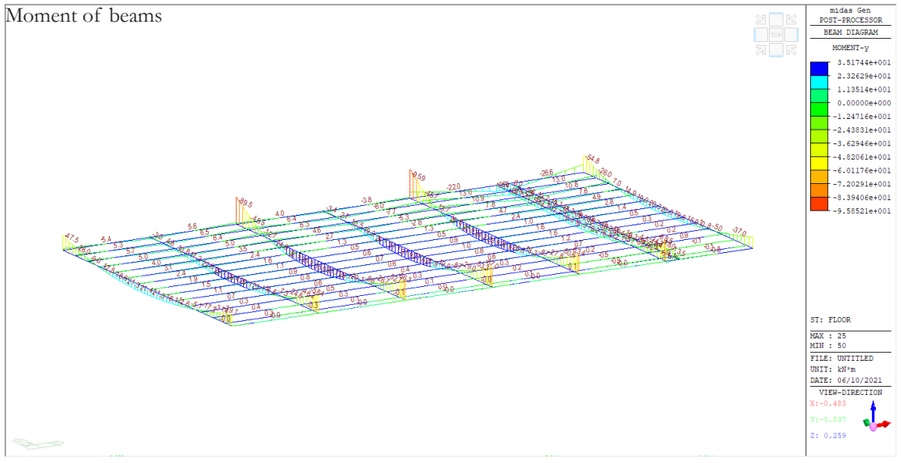
Linear load G1	0.6	kN/m
Linear load G2	2.0	kN/m
Linear load Q1	8.0	kN/m
Coefficient for G1	1.35	-
Coefficient for G2	1.35	-
Coefficient for Q1	1.50	-
TOTAL BEAM LOAD Quls	15.5	kN/m



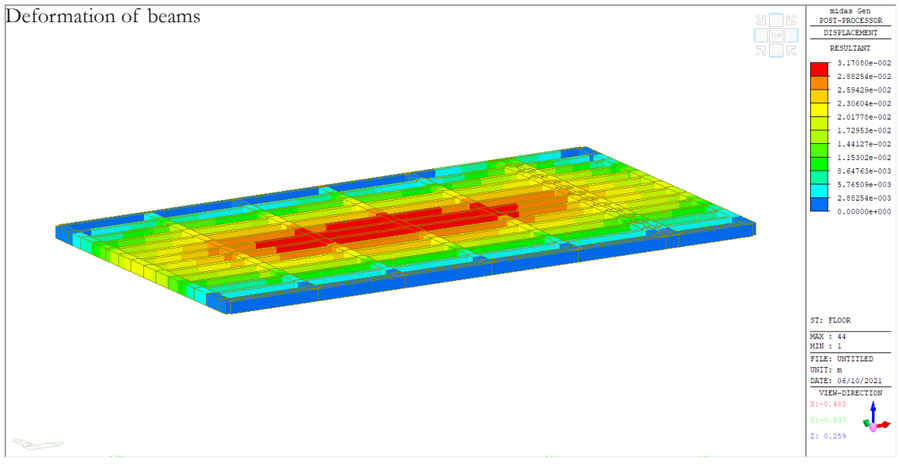
Load distribution

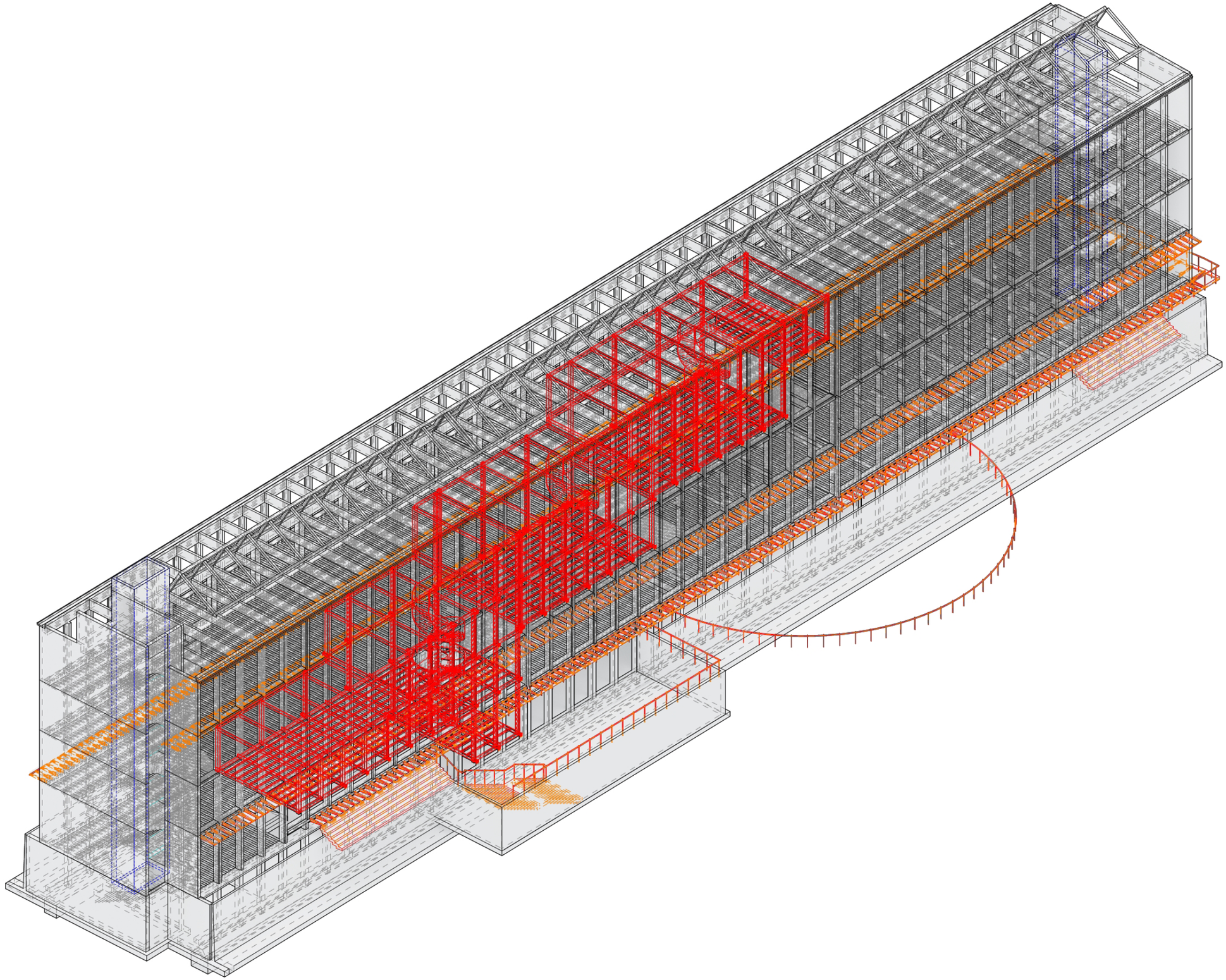


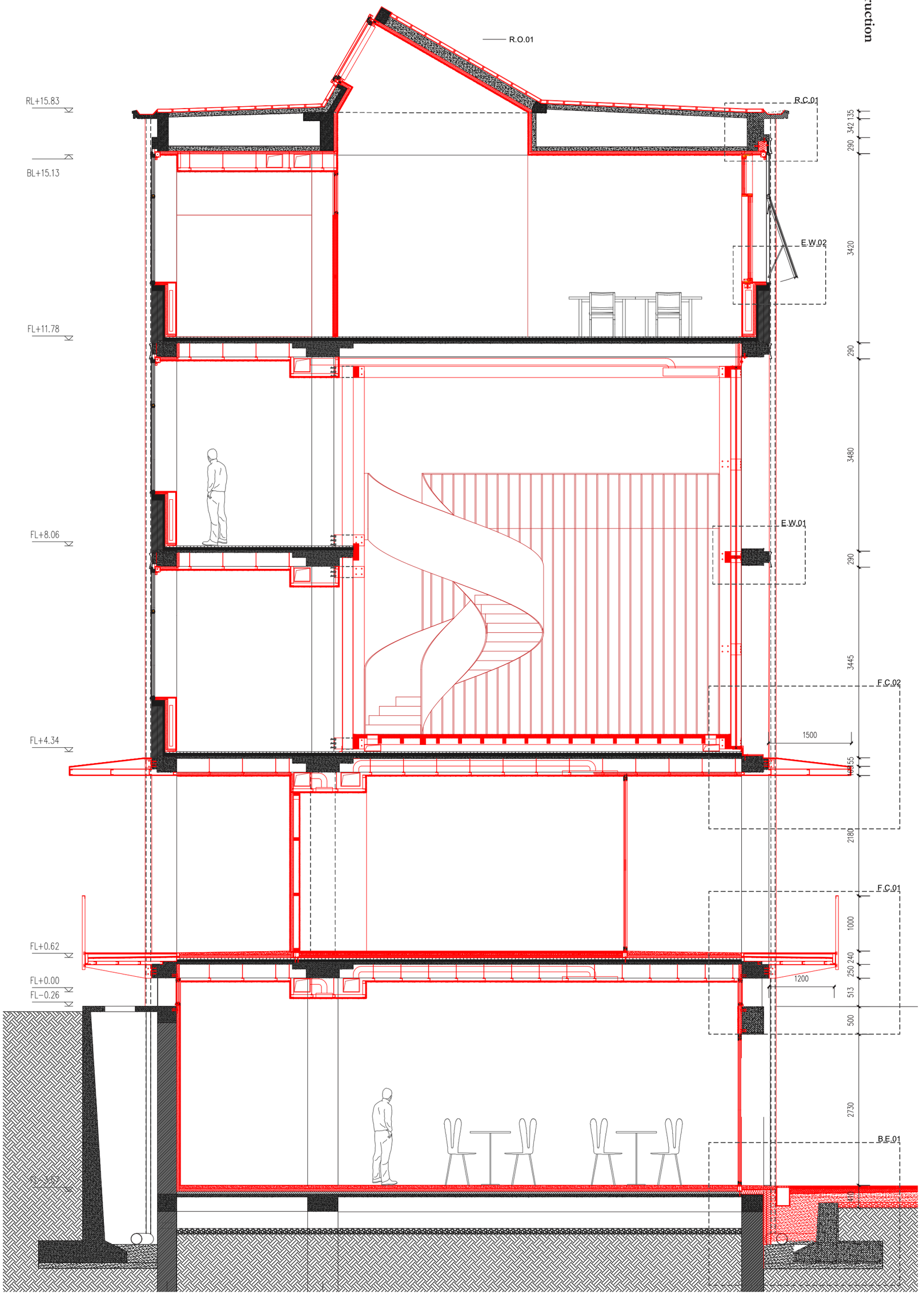
Moment of beams



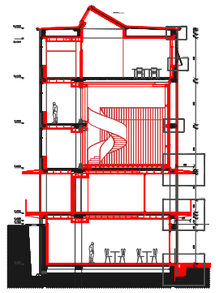
Deformation of beams



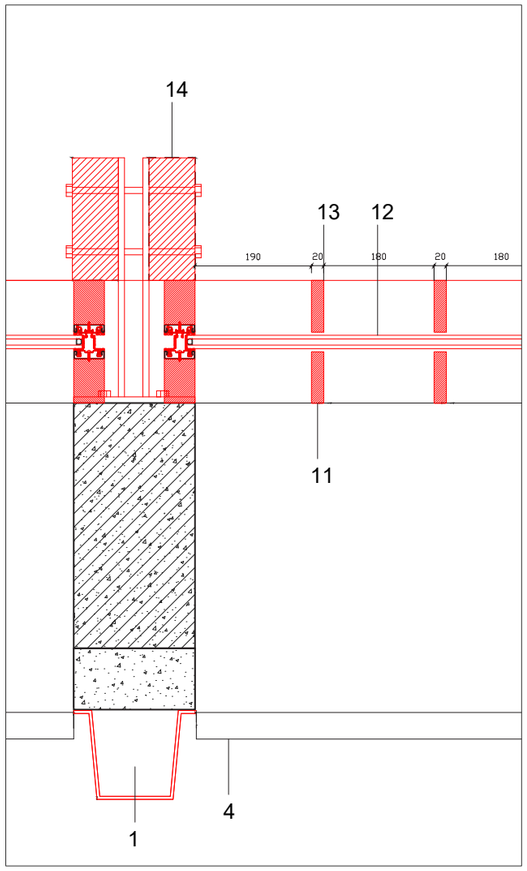


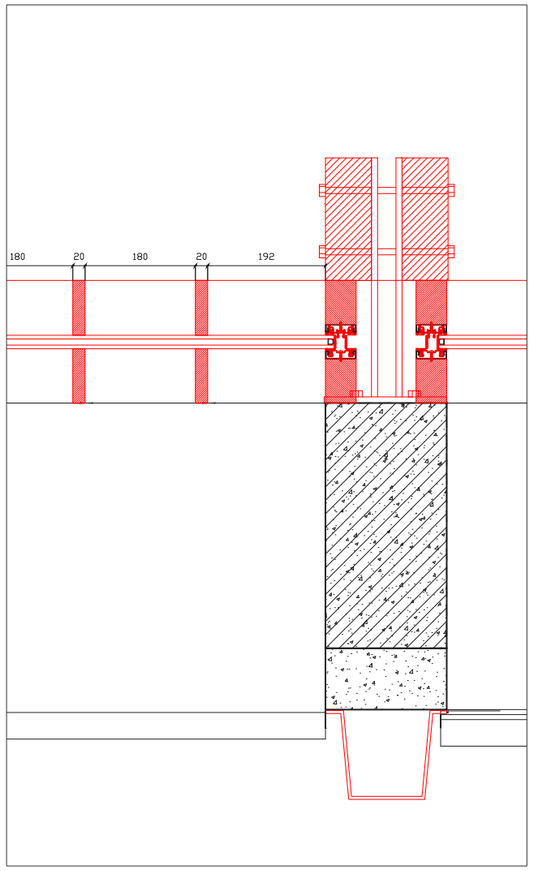

R.O.01
R.C.01
E.W.02
E.W.01
F.C.02
F.C.01
B.E.01
RL+15.83
BL+15.13
FL+11.78
FL+8.06
FL+4.34
FL+0.62
FL+0.00
FL−0.26
1500
1200
290
342
135
3420
290
3480
290
3445
155
2180
1000
240
250
513
500
2730

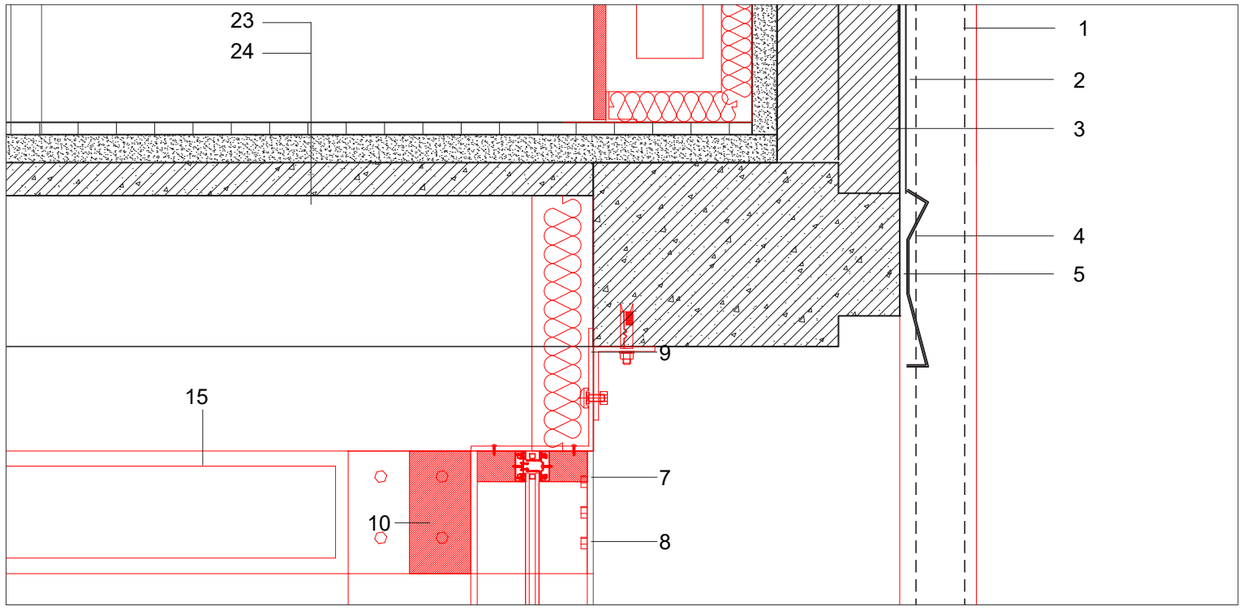
E.W.01

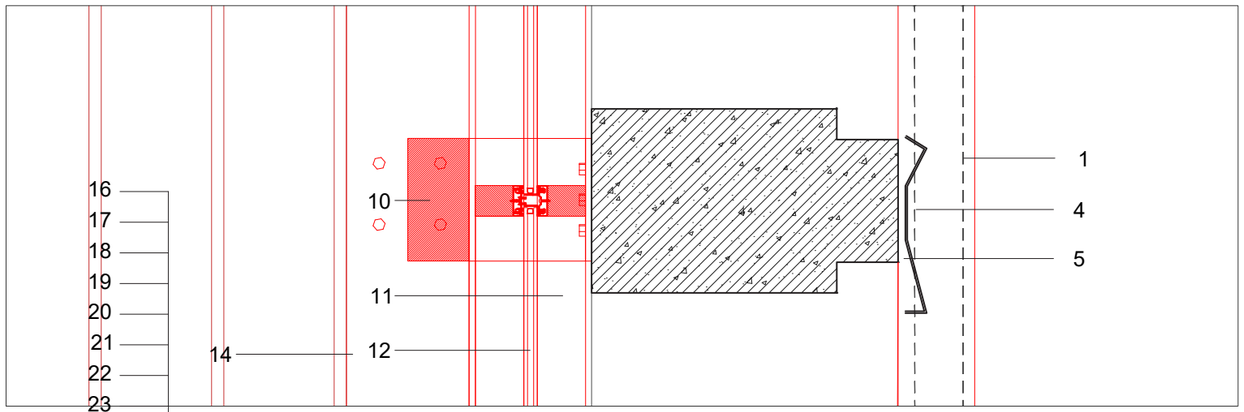


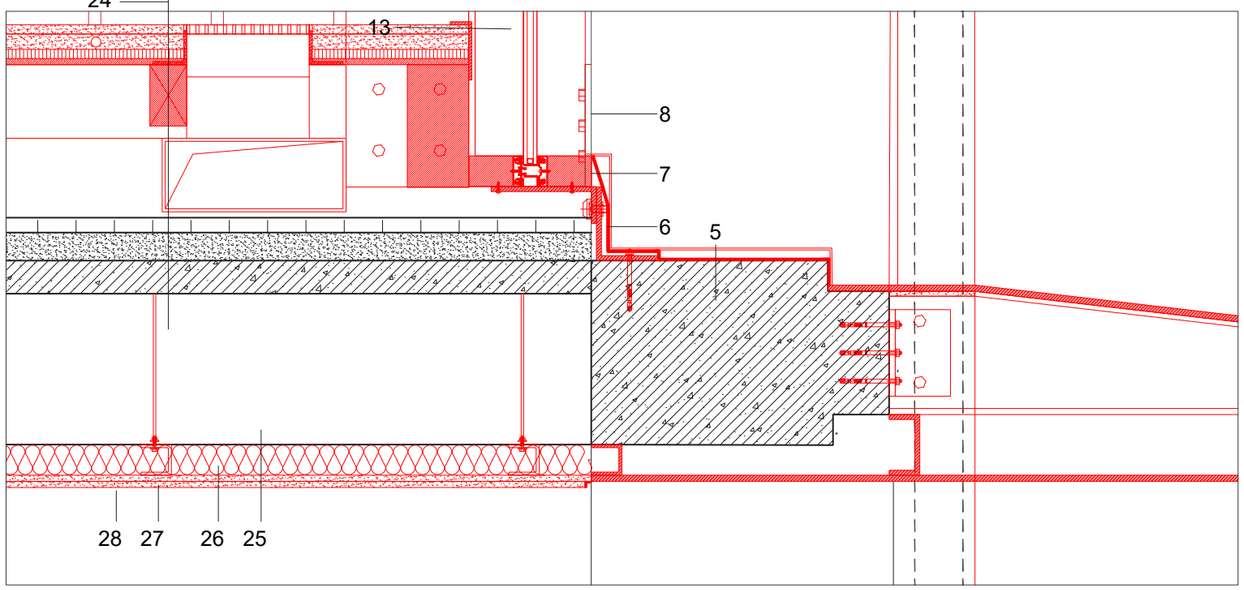
1 Steel Covering
2 Plastic layer
3 Brick wall
4 Rainwater gutter
5 Concrete Beam
6 L shape steel 100mm x 100mm
7 Wooden window frame
8 Steel Joint connected with concrete clumn
9 L shape steel 200mm 50mm
10 Wooden Beams 100mm x 200mm
11 Wooden grill 90mmx20mm
12 Double layer glass
13 Wooden grill 90mm x 20mm
14 Wooden column 200mm x 200mm
15 Air condition 200mm x 1000mmX100mm
16 Wood floor 10mm
17 Sand layer 25mm with 16mm Pex-a or PE-RT heating pipes
18 Sound insulation 15mm
19 Cement panel 10mm
20 Wood beams 100mm x 60mm
21 Insulation 50mm
22 Cement floor 50mm
23 Concrete slab 50mm - 300mm
24 Cement floor 50mm
25 Concrete slab 50mm - 300mm
26 Insulation 50mm
27 Cement panel 10mm
28 Cement panel 10mm



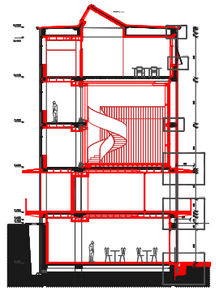




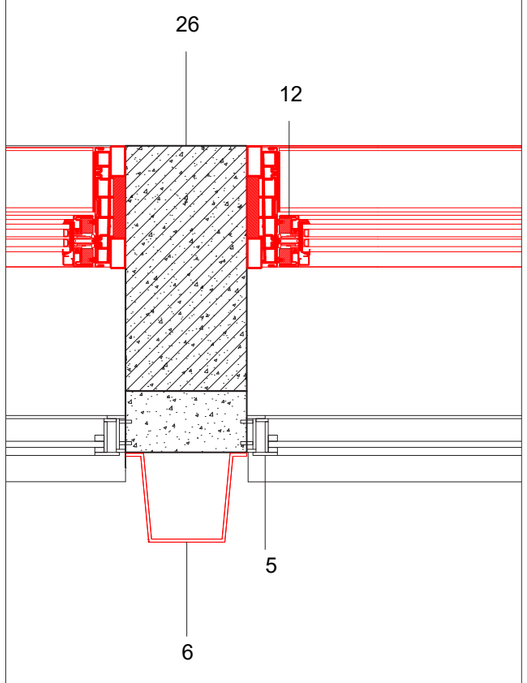


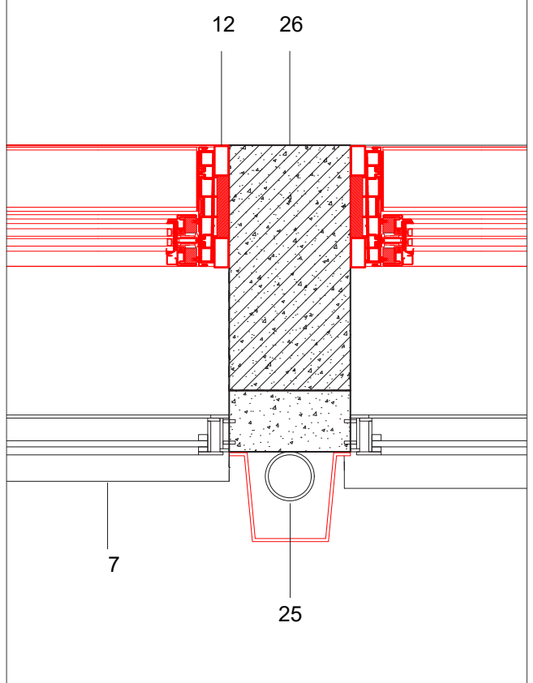


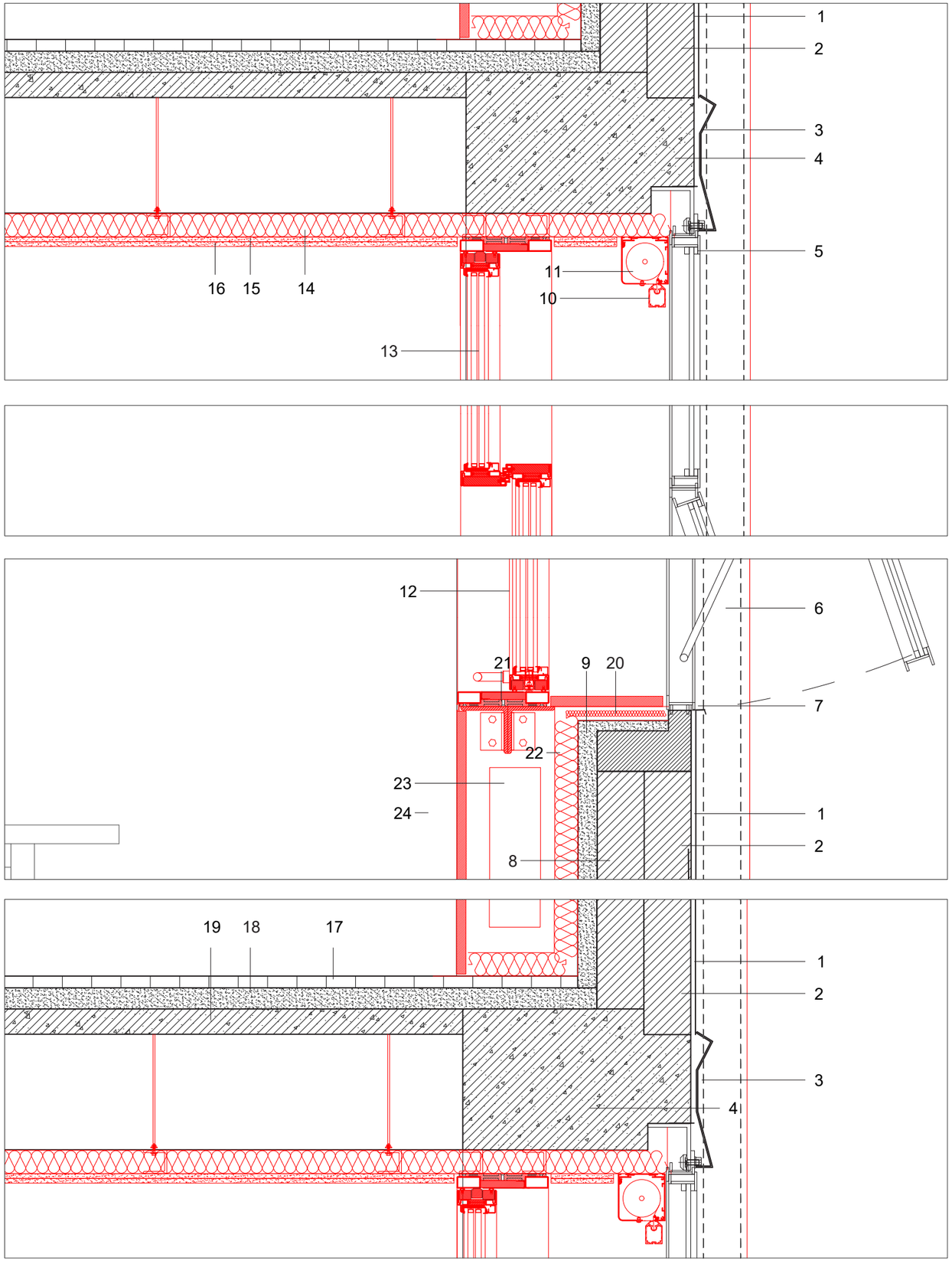
E.W.02



1 Plastic layer 10mm
2 Brick wall100mm
3 Window copper flashing
4 Concrete Beam
5 Window Frame,Iron
6 Flashing metal sheet
7 Window Flashing metal sheet
8 Brick wall 100mm
9 Cement layer 40mm
10 Blackout curtain
11 Curtain Box 130mm*130mm
12 Sliding window , SECCO, OS275
with Double silver Low-E coated glass 10mm, 10mm,10mm
13 Fixed window , SECCO, OS275
with Double silver Low-E coated glass 10mm, 10mm,10mm
14 XPS Foam Insulation Boards 50mm
15 Aquapanel Cement Board Indoor , 12.5mm
16 White paint layer 10mm
17 Floor tiles 20mm
18 Sand layer 30mm
19 Concrete slab 50mm-300mm
20 XPS Foam Insulation Boards 30mm
21 Wooden panel 20mm
22 XPS Foam Insulation Boards 50mm
23 Basics 25 rad by TUBES
24 Wooden panel 20mm
25 Roof rainwater drainage pipe d=80mm
26 Concrete column



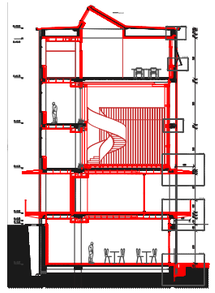


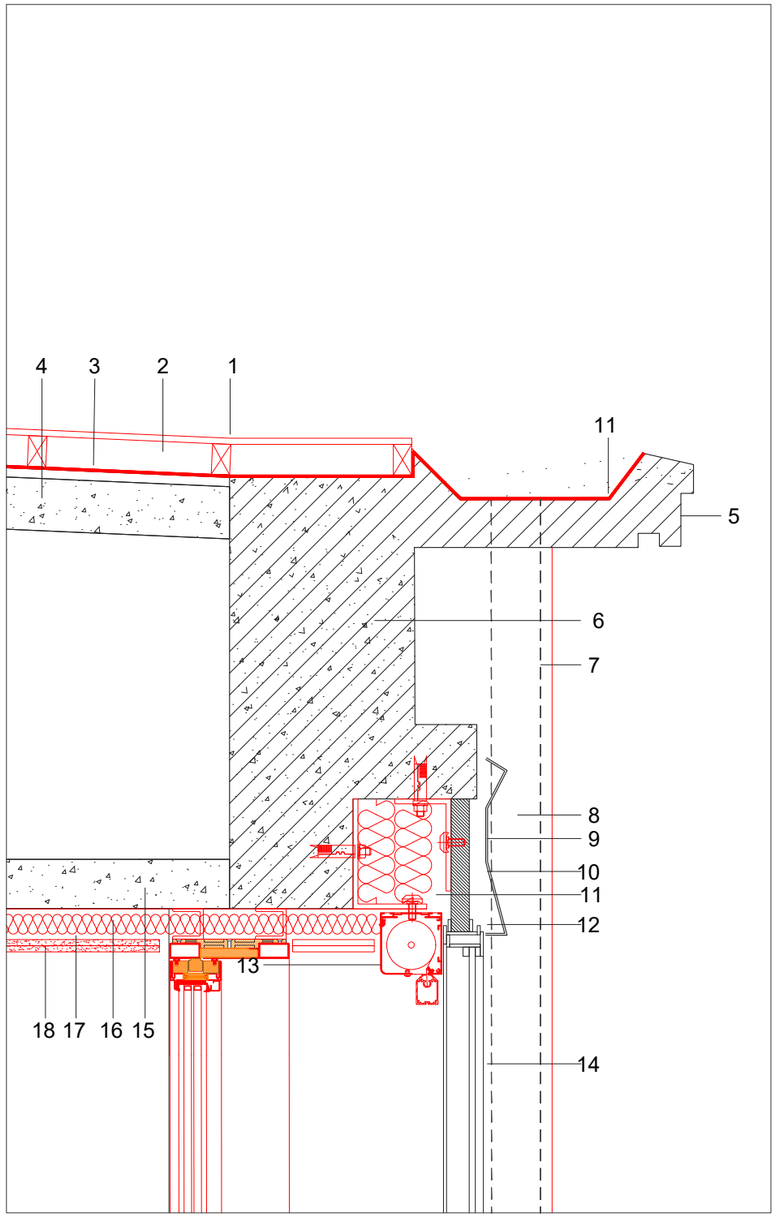


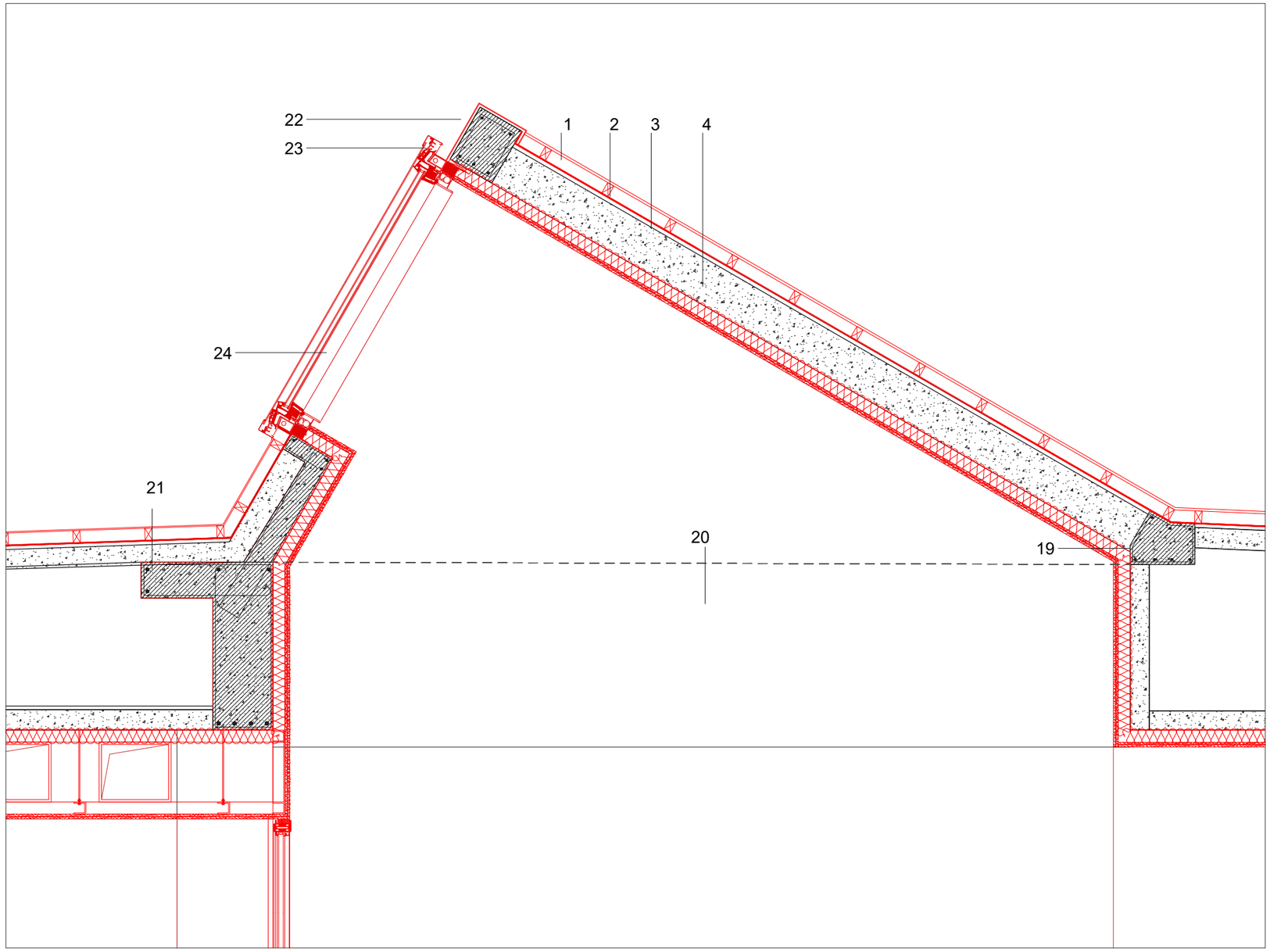
R.O.02

1 Metal Roofing Flashing and Cap 5mm
2 Wooden Keel 30mm * 40mm
3 Water-proof layer
4 Concrete slop slab 100mm
5 Concrete cornice
6 Concrete Beams
7 Flashing metal covering
8 Rainwater Drainage pipe
9 Flashing metal covering for window
10 L shape Steel 100mm * 50mm
11 XPS Foam Insulation Boards 50mm, 3 layers
12 Window Frame, Secco, EB65
13 Curtain Box 130mm*130mm
14 Double silver Low-E coated glass 10mm, 10mm,10mm
15 Concrete Slab 100mm
16 XPS Foam Insulation Boards 50mm, 3 layers
17 Aquapanel Cement Board Indoor , 12.5mm
18 White paint layer 10mm
19 Concrete Beam
20 Concrete Beam
21 Concrete Beam
22 Concrete Beam
23 Flashing metal sheet
24 Skylight Velux Commercial

R.C.02

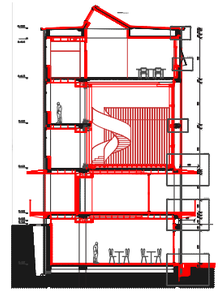


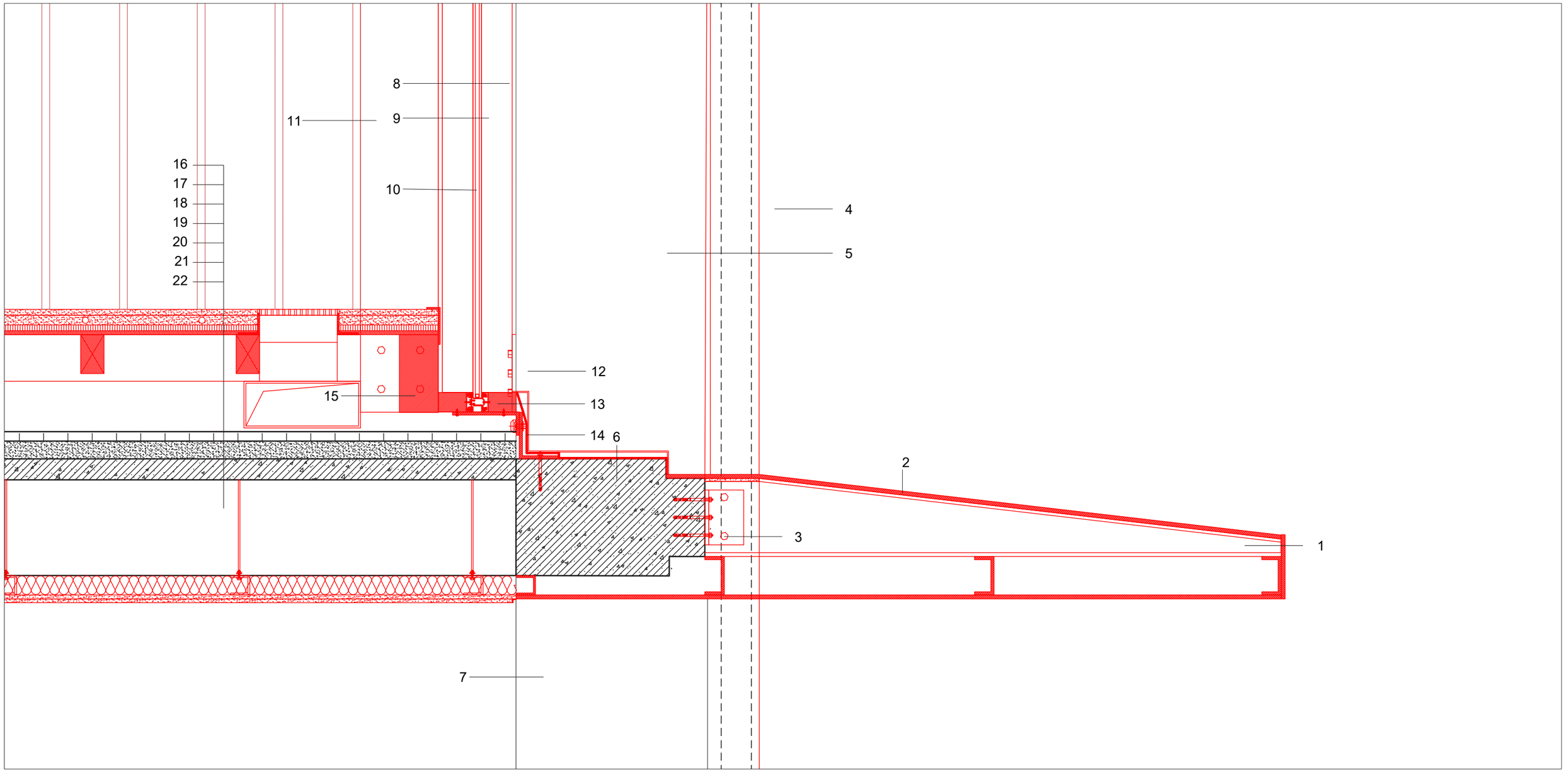




F.C.02

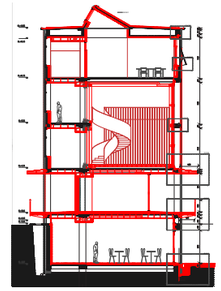
1 I shape Steel Beam
2 Steel Panel
3 L shape Steel 50mmx100mm
4 Steel Covering
5 Concrete column
6 Concrete Beam
7 Steel covering column
8 Wooden grill 90mmx20mm
9 Double layer glass
10 Wooden grill 90mmx20mm
11 Wooden column 200mmx200mm
12 Steel Joint connecting with Concrete column
13 Window frame
14 L shape steel 100mm x 100mm
15 Wooded beam
16 Wood floor 10mm
17 Sound insulation layer 10mm
18 Cement panel 10mm
19 Wood beams 100mm x 60mm
20 Insulation 50mm
21 Cement floor 50mm
22 Concrete slab 50mm - 300mm

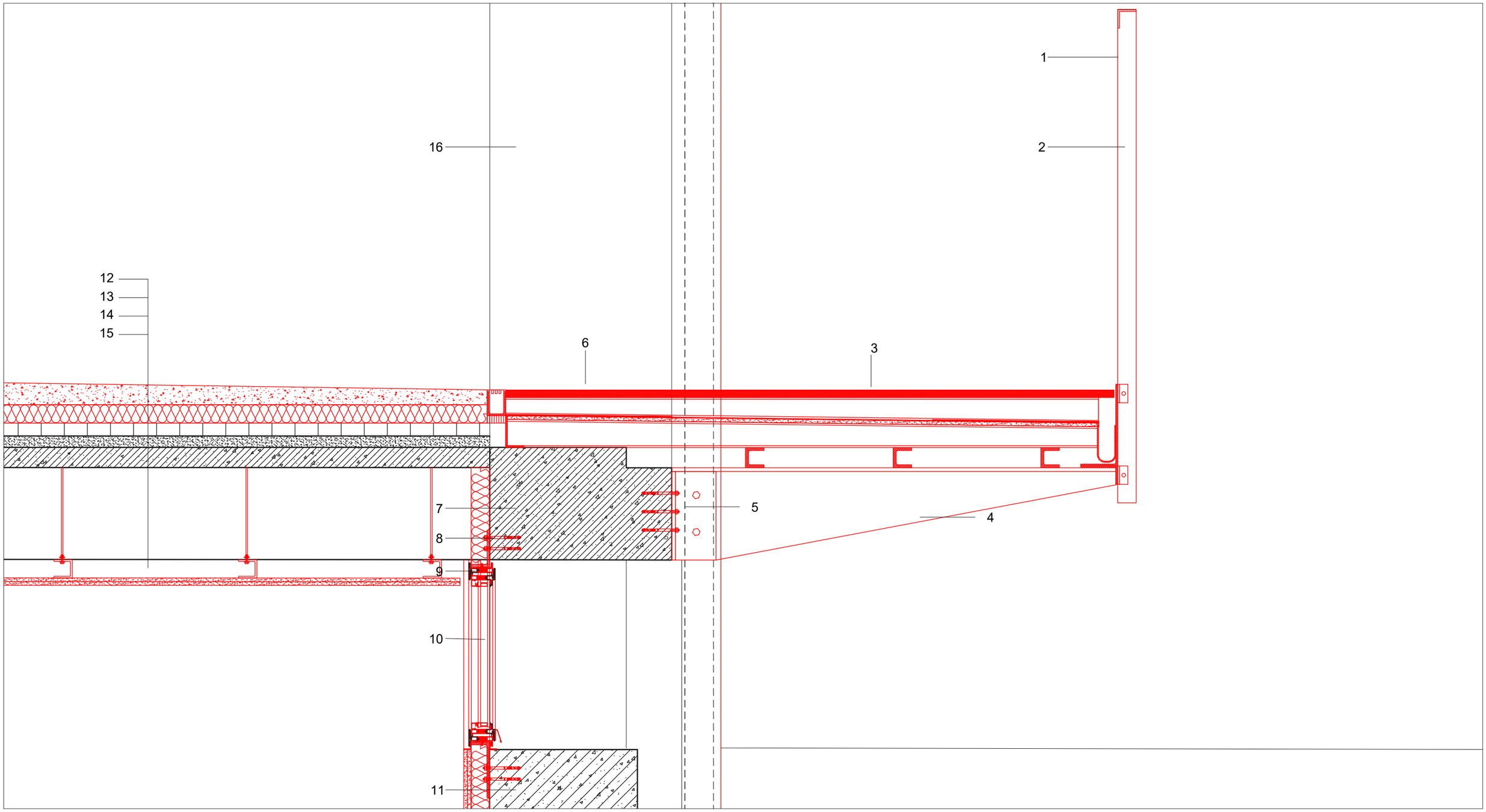


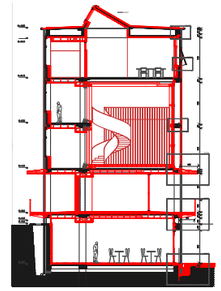


F.C.01

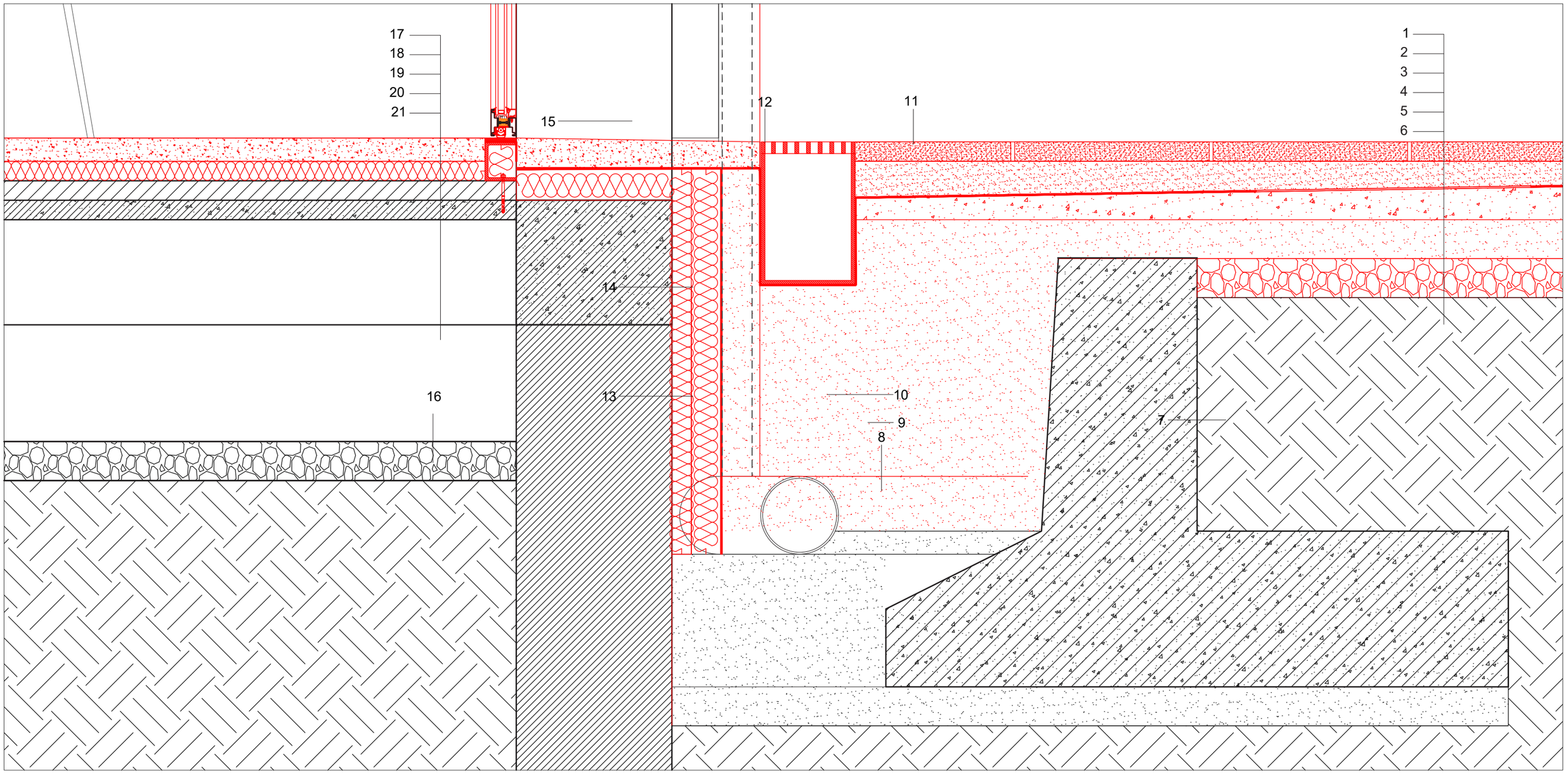
1 L shape Steel 50mmx50mm
2 I shape Steel 50mmx10mm
3 U shape Steel
4 Steel Beam
5 Steel Joint Connected with Concrete Beam
6 Steel panel
7 Concrete Beam
8 L shape steel 100mmx50mm
9 Window Frame - Steel
10 Double layer glass
11 Concrete Beam
12 Self-leveling concrete floor 60mm
13 Insulation layer 50mm
14 Cement floor 50mm
15 Concrete slab 50mm-300mm
16 Steel covering column

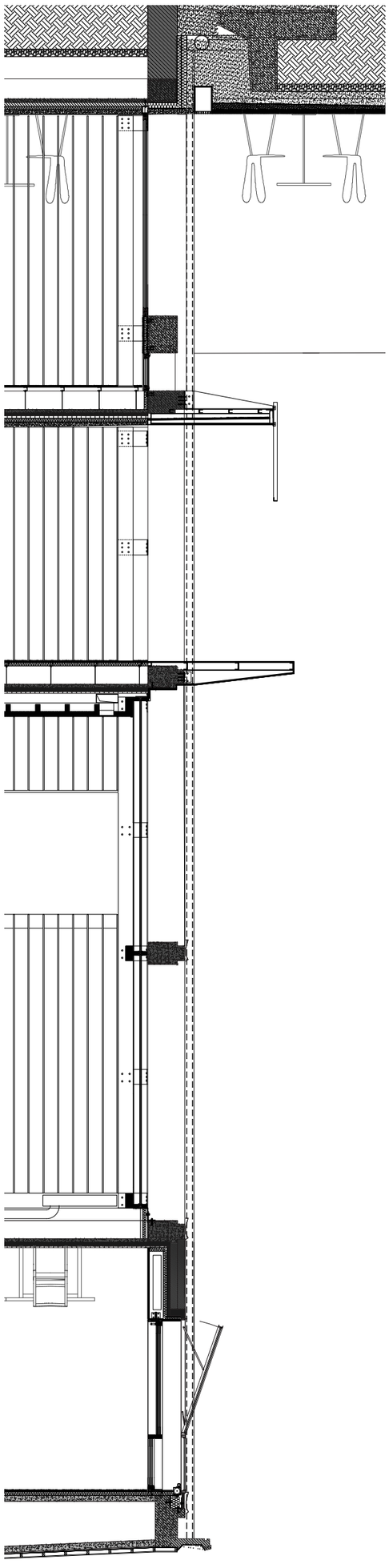






1 outdoor Brick layer 50mm
2 Sand layer 50mm-100mm
3 Water-proof layer
4 Concrete slop slab 50mm-100mm
5 Sand layer
6 Soil layer
7 Retaining wall Concrete
8 Rainwater Drainage pipe
9 Waterproof layer
10 Insulation 100mm
11 Steel Drainage
12 Cement Bricks
13 Foundation Wall
14 Concrete beam
15 Glass door Frame , Copper Secco
16 Gravel layer
17 Self-leveling concrete floor 60mm
18 Insulation layer 50mm
19 Cement floor 50mm
20 Concrete slab 50mm-300mm
21 Ventilation and moisture-proof layer





CONCLUSION

Although time is constantly passing and people's memories are slowly fading, architecture can be said to be eternal. This kind of eternity is not an invariable fixed frame, but evolves with the development of time, the continuous updating of technology and the change of people's thoughts.

Our site has changed from a traditional building at the beginning, to a reconstruction after the explosion of the war, and then to the current state of use. This site shows us the influence of usage requirements and ideas on architecture, and we can see from it that architecture of different periods can exist simultaneously, and their existence does not affect and conflict with each other.

The reconstruction respects the proportions of the historic building and introduces a new frame structure to meet the new needs of the space. At that time, this approach solved the relationship between the site and the city, it restored the texture of the city and achieved the effect of opening the site to the city.

However, in the face of the current urban environment, it is obvious that the current state of the site can no longer meet the requirements, so we open the ground floor, change the traffic flow, place new blocks, add new functions and add new structural systems, and respect the existing architectural elements of the building to show the characteristics of buildings in different periods: On the facade, people can see not only the original building, but also the new elements of the grating on the facade and the open colonnade space on the ground floor. While traveling in the building, you can feel the influence of time change on the building, enjoy the sunlight through the grating, and also see the concrete columns.

Architecture is just like the carrier of time,as designers, what we need to do is to keep it alive in the constantly changing environment and make architecture a work that shows time.

BIBLIOGRAPHY

1. *Headquarters and schools of the Società Umanitaria* 18000 bb Giovanni Romano Milan, Via Daverio 7, Via Pace 2 1936–1956 Giulio Barazzetta

2. *Architettura contemporanea in contesti storici*: per un sistema di valori , Giovanna Franco, Dipartimento DSA Scuola Politecnica, Università degli Studi di Genova, Italia
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DOI: 10.13128/Techne-19351

3. *Space, Time and Architecture*: *The Growth of a New Tradition* Copertina rigida – 1 luglio 1974

4. 2G 15.2000 POSTWAR ITALIAN ARCHITECTURE 1940_1960

5. https://www.archiposition.com/items/adf6bd518b

6. https://www.ordinearchitetti.mi.it/en/mappe/itinerari/edificio/2025/28-the-bbpr-studio-and-milan/galleria

7. https://www.hisour.com/zh/italian-rationalism-33592/

8. *BASEL KH C&G CB863-864* GB

9. *COLMAR HdM CB862 GB*

10. *FIRENZE IPOSTUDIO CB865 GB*

11. *GB 2012 ARCHITETTURA DEL 900 I° Costruzione-Cantiere*

12. *GB 20201126 LABC2 FRAMEWORK 02*

13. *GB 20201209 IND BLD & PROD FACILITIES*

14. *GB 20201209 PHILADELPIA RICHARDS LAS KAHN GB*

15. *Italy Builds _ L'Italia Costruisce_ G. E. Kidder Smith*

16. *PLN 1956 structures*