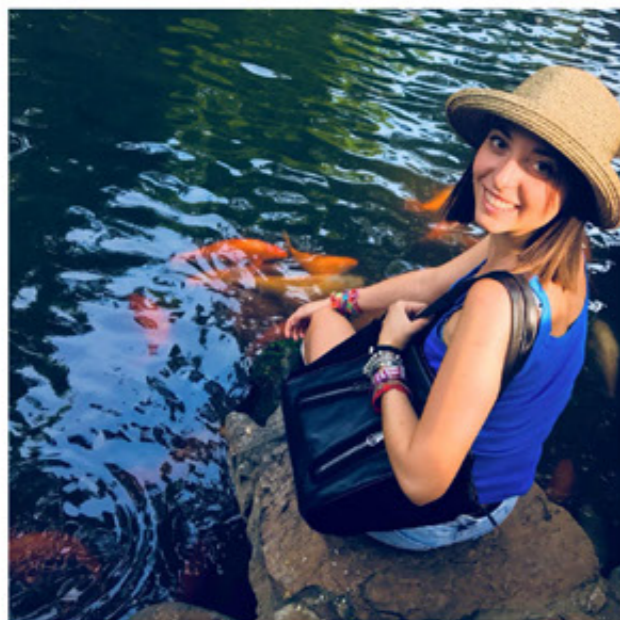


PORTFOLIO  
CATERINA PIETRA



LEARNING IS A TREASURE  
THAT WILL FOLLOW ITS  
OWNER EVERYWHERE  
CHINESE PROVERB

## ABOUT ME



你好! My name is Caterina Pietra. In June 2018, I have achieved my Master Double-Degree in Architecture from Tongji University in Shanghai and in Building-Engineering and Architecture from Pavia University in Italy. Living in China during my last year of studies it has been a great opportunity and a big challenge at the same time. As life experience, it has enriched me in several aspects making me understand even more the immense power that comes from architecture and people who work with it. Since October 2018, I'm a PhD Candidate in Urban Planning at Pavia University. This has been a complete new and stimulating reality that I'm sure it will be very rewarding.

Italian, 26 years old

ID WeChat Cate\_Pietra

+39 3928052114

caterina.pietra@unipv.it

caterinapietra@me.com

<https://www.linkedin.com/in/caterina-pietra/>

Cooperative

Friendly

Teamwork

Perfectionist

Productive

Responsible



## CURRICULUM VITAE

### Education

From 12.10.2019 to 18.12.2019

PhD Exchange Period

Tutor: Professor Tiziano Cattaneo

College of Design and Innovation – D&I

Location: Shanghai – Tongji University, P.R. China

July 2019

Graduation to Professional Engineer

Location: Pavia – University of Pavia, Italy

January 2019

Graduation to Professional Architect

Location: Parma – University of Parma, Italy

Since October 2018

PhD Candidate XXXIV Cycle

Research course in Design, Modeling and Simulation in Engineering

Urban Project Laboratory – UPLab

Tutor: Professor Roberto De Lotto

Department of Civil Engineering and Architecture

Location: Pavia – University of Pavia, Italy

2 years enrolled

September 2017 - June 2018

Dual Master Degree Student in Architecture at Tongji University, Shanghai, PR of China

Department CAUP – College of Architecture and Urban Planning

October 2013 - June 2018

Single Cycle 5 degree - Combined Bachelor and Master in Building Engineering and Architecture

Department of Civil Engineering and Architecture, University of Pavia, Italy

### Organisational skills

March 2017 - September 2017

Part-time job at Department of Civil Engineering and Architecture of Pavia University

Help desk in libraries, museums and archives, and structures in the didactic,

scientific and students' assistance structures



# CURRICULUM VITAE




## Languages


Italian (native) ● English ● Spanish  Chinese 

## Computer skills

Operating systems: Windows OS ● Macintosh Apple OS X ●

Softwares for graphics and design: Autodesk AutoCAD ● SketchUP  Adobe Photoshop ●

Adobe Illustrator  Adobe Indesign  Lumion 3D 

Softwares for architectural survey: Cyclone  Agisoft Photoscan 

## Workshops

August 2018

Tongji CAUP International Summer School

Rehabilitation of Built Heritage in Urban Transformation - 城市转型中的建成遗产再生

November 2016

Rocca San Silvestro Work camp - Restoration and fruition of archaeological sites

University of Pavia and Florence

April 2015

Laboratory Landscape, Survey and Design \_ Workshop of architectural survey

Integrated detection systems of the sanctuary of La Verna (Arezzo)

University of Pavia, Florence and Bologna

## Competitions

November 2018

Taihu Cultural Heritage Rehabilitation Competition

3rd Prize money – Project: "Community Condenser" elaborated during

Tongji CAUP International Summer School

September 2018

TICCIH Chile 2018 Congress

Patrimonio Industrial: Entendiendo el Pasado, Haciendo el Futuro Sostenible

Industrial Heritage: Understanding the Past, Making the Future Sustainable

# CONTENTS

## Composition

Multipurpose center - Milan 2

Villamaggiore railway station - Milan 12

Gap in the city - Shanghai 18

## Relief and Restoration

Integrated detection systems - Sanctuary of La Verna, Arezzo 28

Restoration and use of archaeological sites - Rocca San Silvestro, Livorno 34

## City planning

Master Thesis - Double Degree Program

遗产保护与城市复兴——上海东外滩工业遗产带再生研究

Heritage Conservation and Urban Regeneration:

New Challenges in Industrial Context along the East Bund of Shanghai 40

Community Condenser - Lianshi Town

Tongji CAUP International Summer School

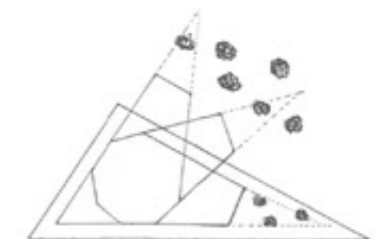
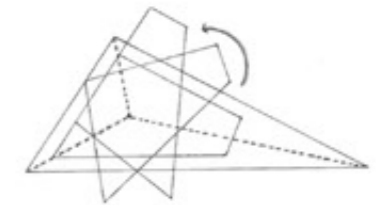
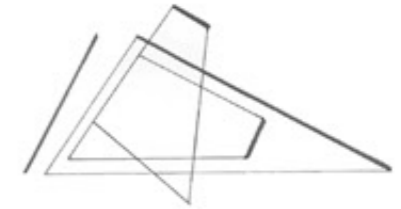
Rehabilitation of Built Heritage in Urban Transformation - 城市转型中的建成遗产再生 50



# MULTIPURPOSE CENTER - MILAN

Academic Project 2016

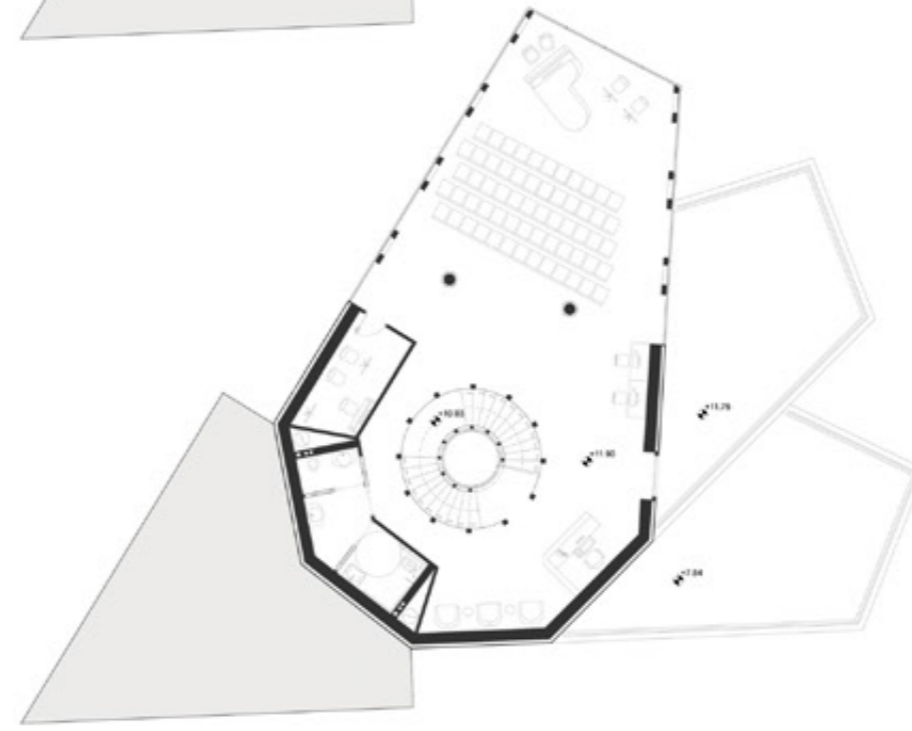
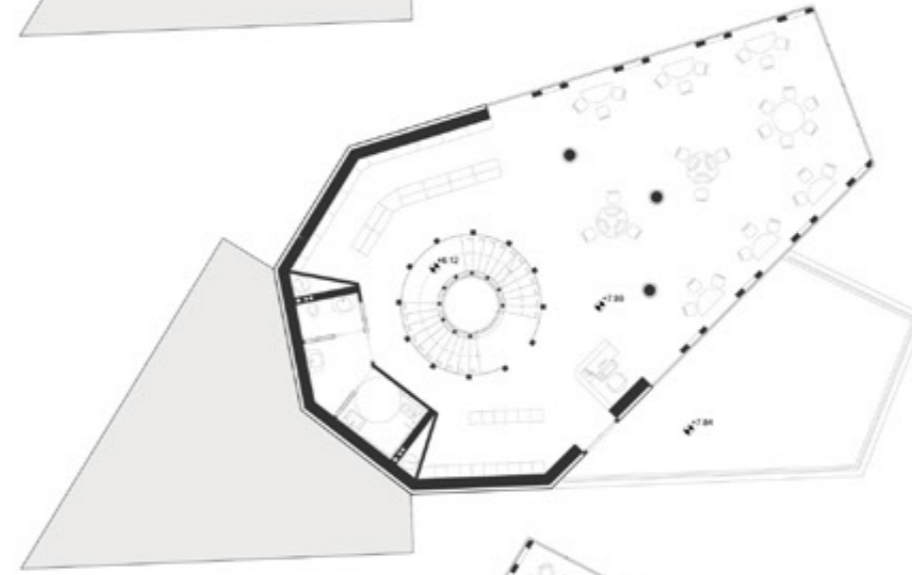
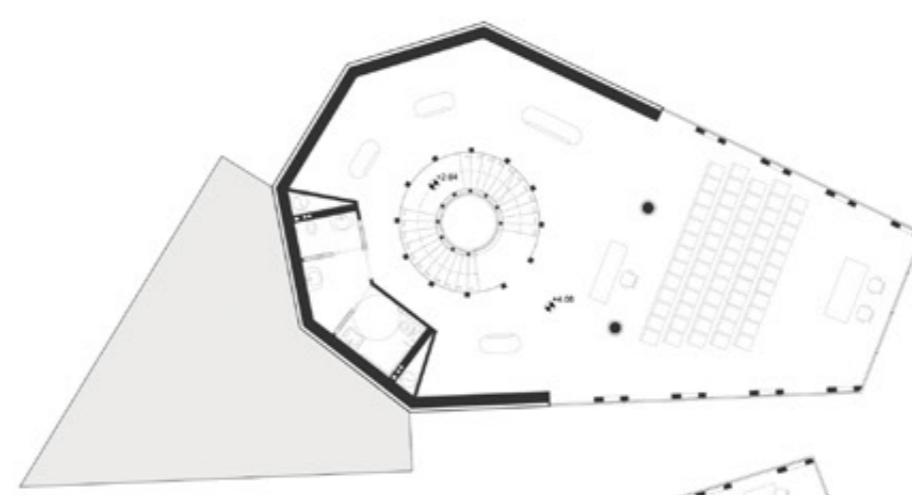
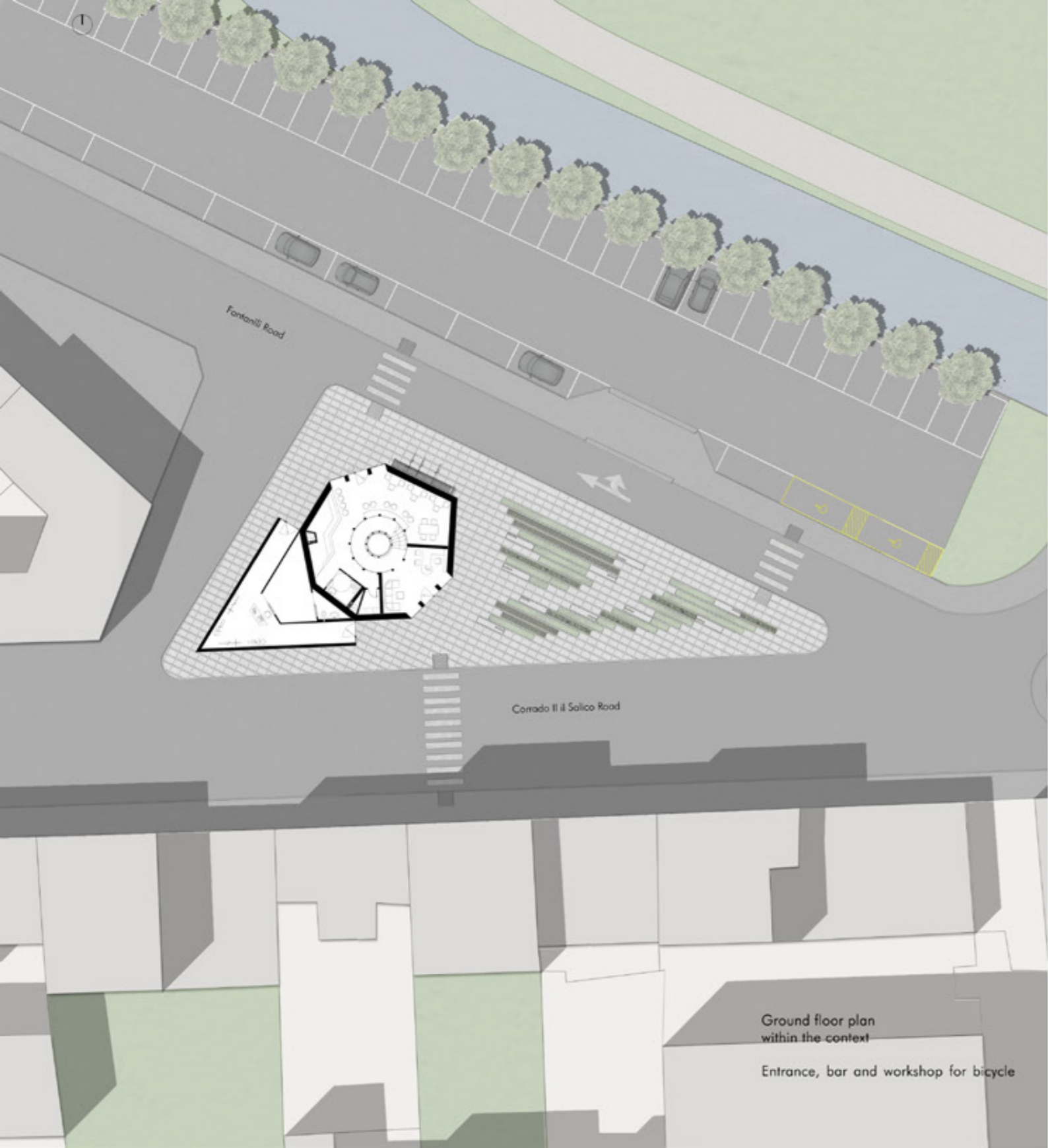
Pavia University



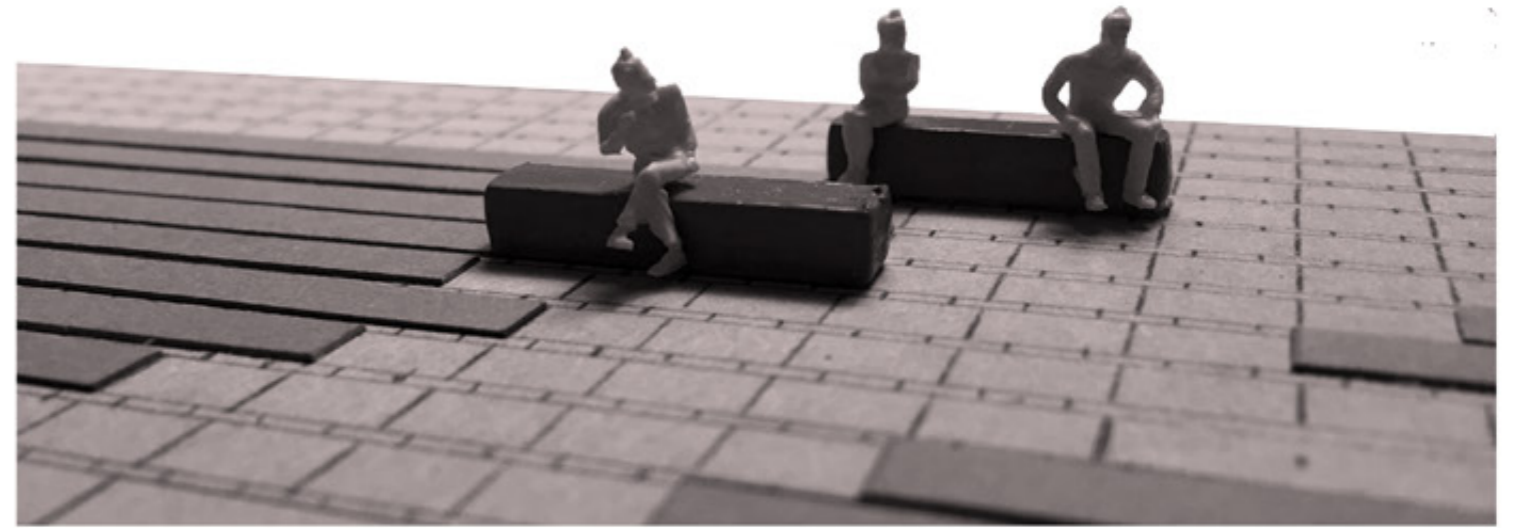
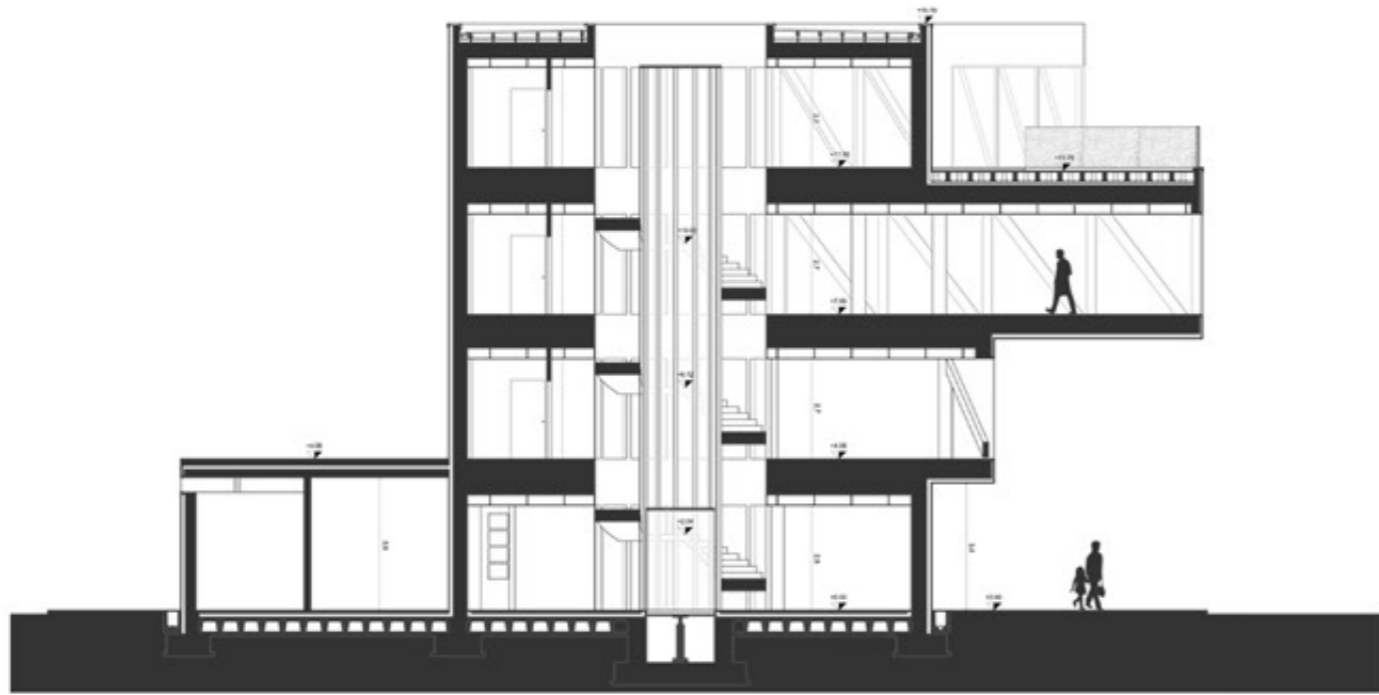
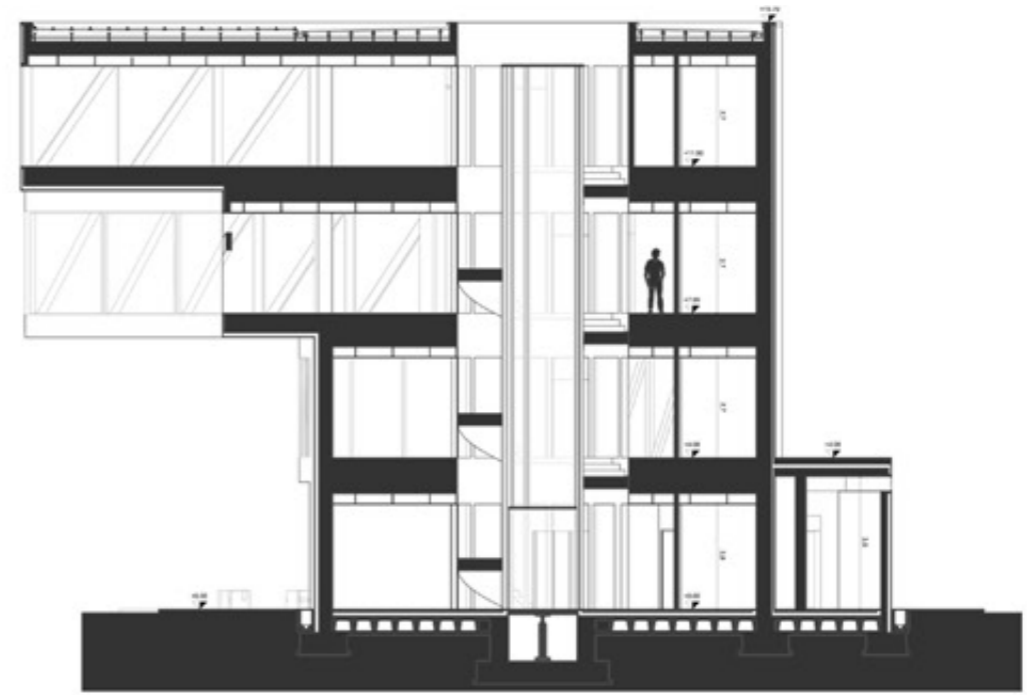
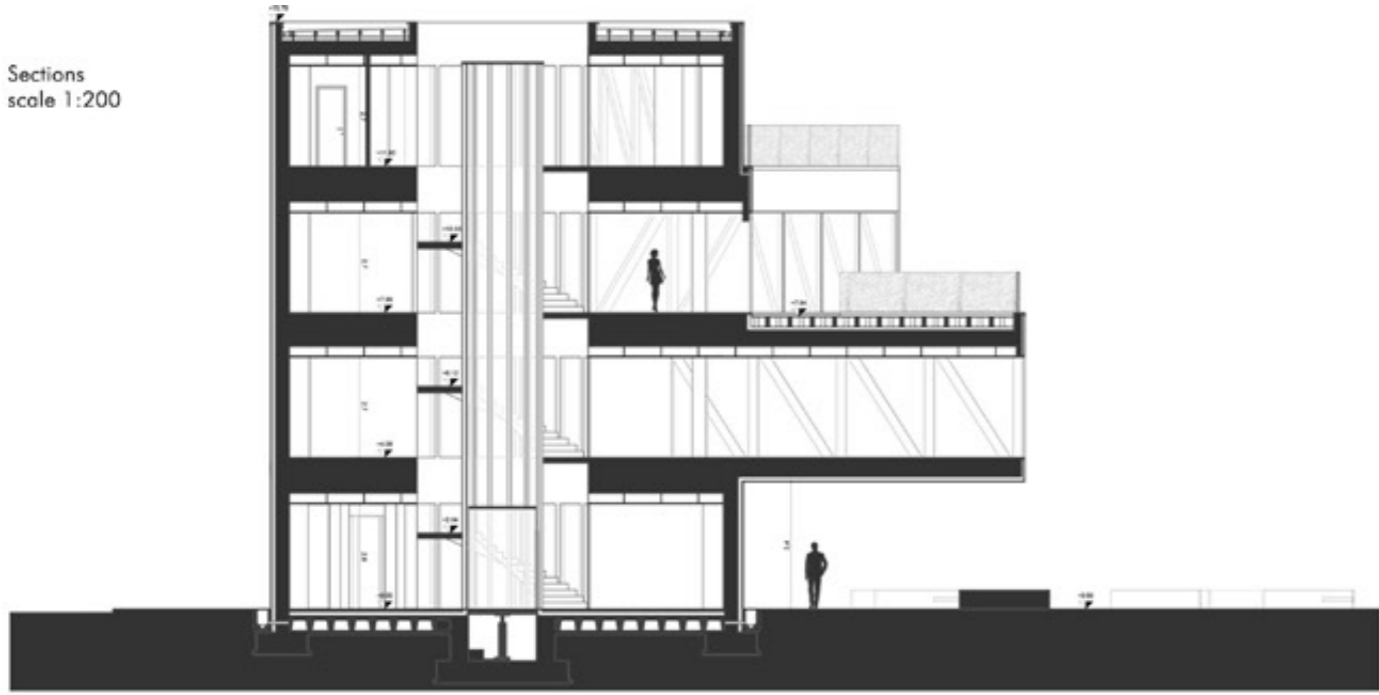
The project idea is based on the analysis of the triangular shape of the assigned lot. It was decided, in fact, to characterize the new building with a further and different geometric composition. It has been considered first an initial trapezoidal shape which arises from the triangular one, then this has been aligned with the façade of the building on the west side and with Fontanili Road on the north side. Later it was thought about the rotation of the basic trapezoidal geometric shape with respect to the triangle's center of gravity. This rotation generates an irregular octagonal geometric matrix that also becomes the structural matrix of the building: it represents the supporting structure and its center accommodates the helical staircase.

Thanks to this composition, made of cantilevered structures, panoramic visual cones are created overlooking the park. They confer a different directionality for each floor, generating visual tension. Inside the spaces were managed and adapted to the particular type of construction satisfying the request for the development of a multi-purpose center that could involve different types of people and give new character to the surrounding neighborhood.

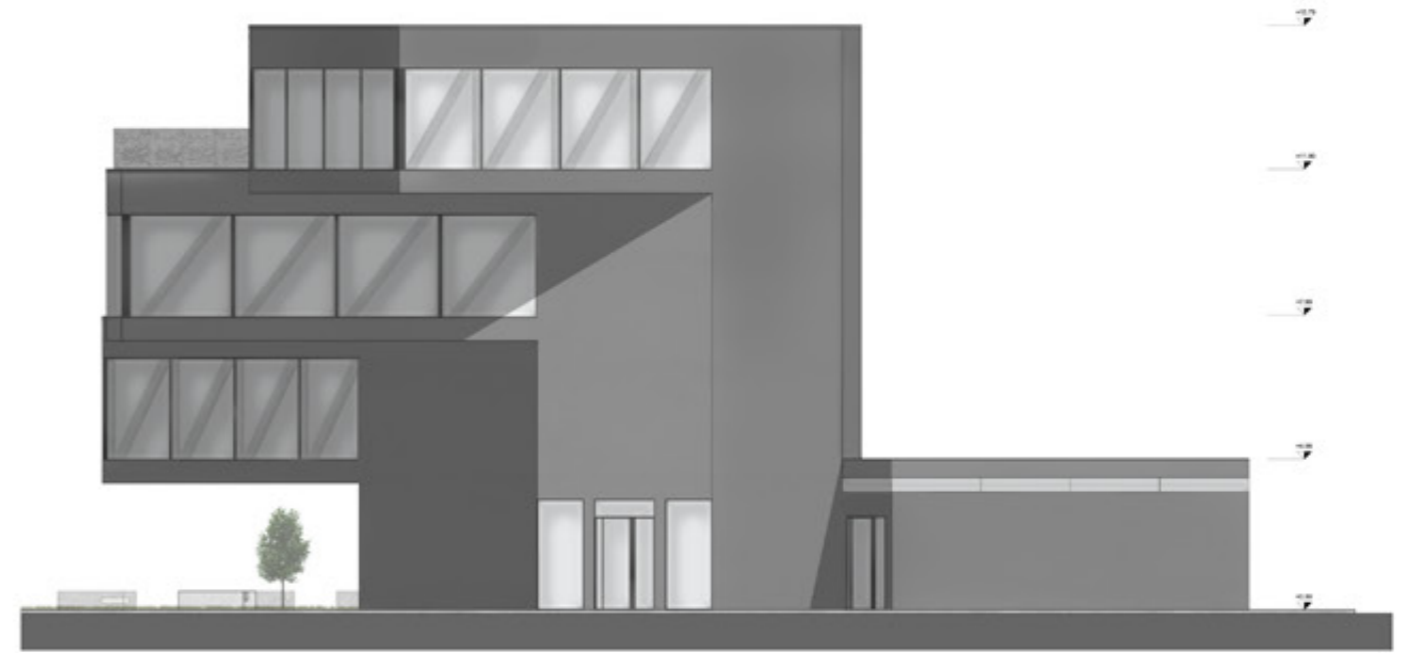
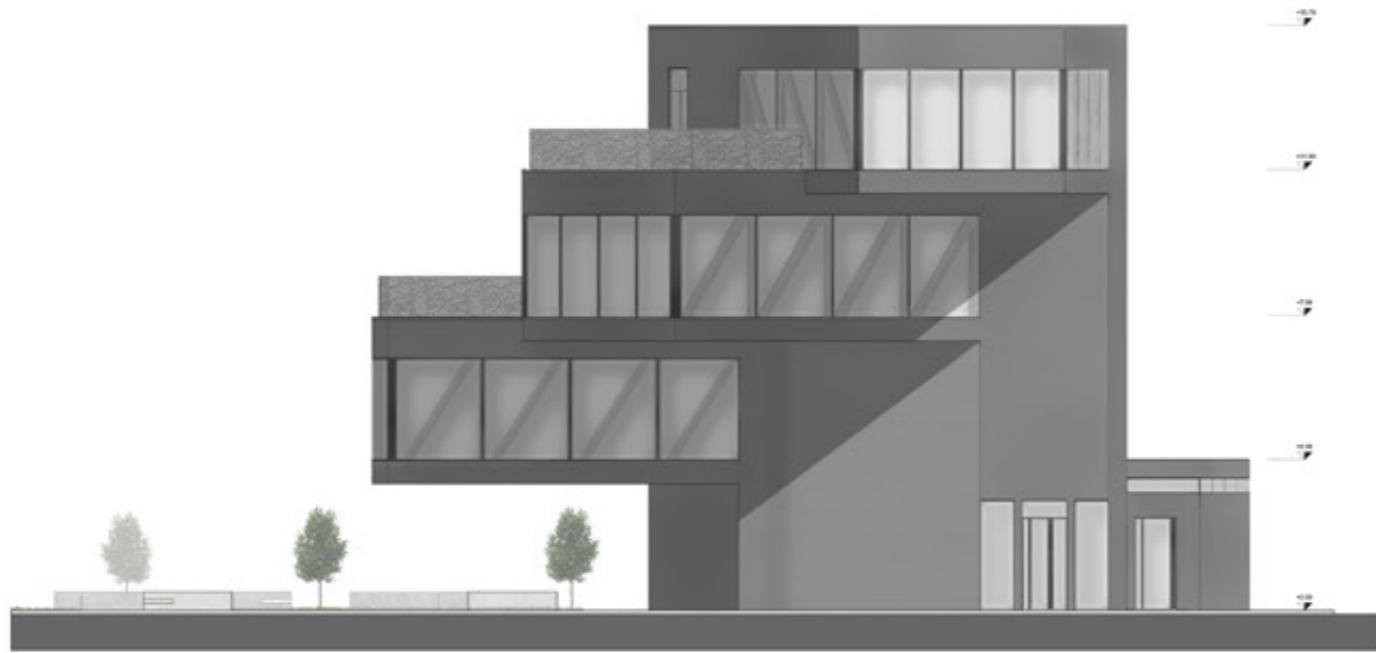




Sections  
scale 1:200

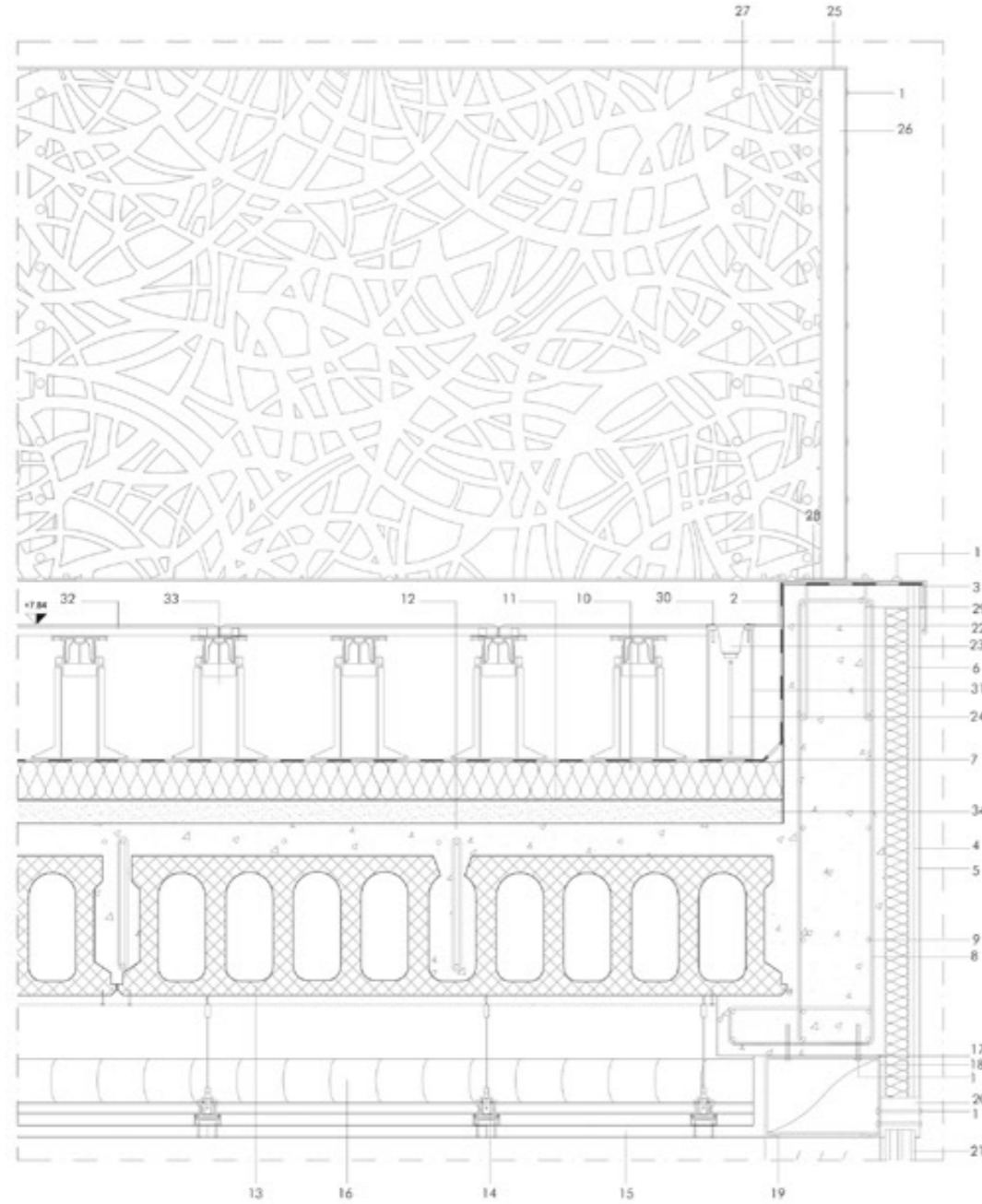


Elevations  
scale 1:200





Terrace detail  
scale 1:15



Stratigraphy

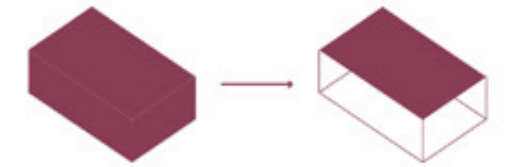
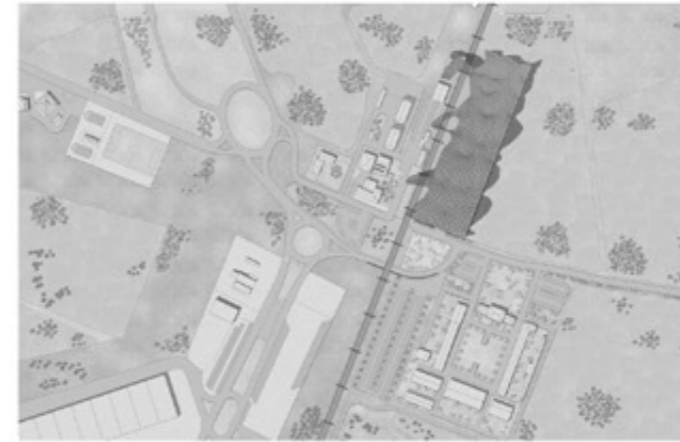
- 1 - Anchor bolts,  $\varnothing$  20 mm
- 2 - Protective galvanized plate, d. 5 mm
- 3 - EPDM waterproof sheath, d. 5 mm
- 4 - Plaster mesh
- 5 - Civil plaster (RAL 7016 anthracite gray), d. 25 mm
- 6 - "Povatherm" wood fiber thermal insulation (Naturalia BAU), d. 50 mm
- 7 - Triangular wooden strip for the waterproofing, 40x40 mm
- 8 - Reinforcement rods,  $\varnothing$  5 mm
- 9 - Reinforcement rods,  $\varnothing$  10 mm
- 10 - "Povatherm" wood fiber thermal insulation (Naturalia BAU), 100 mm
- 11 - Vapour barrier
- 12 - Concrete filling jet, d. 70 mm, with reinforcing rods,  $\varnothing$  10 mm
- 13 - Supporting slab made of prefabricated elements in alveolar concrete, d. 300 mm
- 14 - Double frame with adjustable height profile for supporting the false ceiling, d. 2 mm
- 15 - Panels for acoustic ceiling in wood wool "Herodesign fine" (Knauf), 60x120 mm, d. 20 mm
- 16 - Steel pipe for the air conditioning system,  $\varnothing$  100 mm
- 17 - L-shaped aluminum profile, d. 2 mm
- 18 - L-shaped aluminum profile, d. 5 mm
- 19 - Aluminum grid for air
- 20 - Aluminum window frame
- 21 - Double glazing
- 22 - Laminated glass, d. 4 mm
- 23 - Lamp
- 24 - Electric cable
- 25 - Support in galvanized steel for the parapet slabs, 50x50 mm
- 26 - Parapet plates in galvanized steel, 150x110 cm
- 27 - Anchor bolts,  $\varnothing$  10 mm
- 28 - Galvanized steel plate, d. 5 mm
- 29 - Tie rods,  $\varnothing$  5 mm
- 30 - Screw for fixing the glass,  $\varnothing$  8 mm
- 31 - U-shaped steel profile, thickness 4 mm
- 32 - Porcelain stoneware tiles for floating floors, 600x600 mm, d. 25 mm
- 33 - Support for height-adjustable plastic tiles
- 34 - Screed for creating the slope (2%)



# VILLAMAGGIORE RAILWAY STATION - MILAN

Academic Project 2017

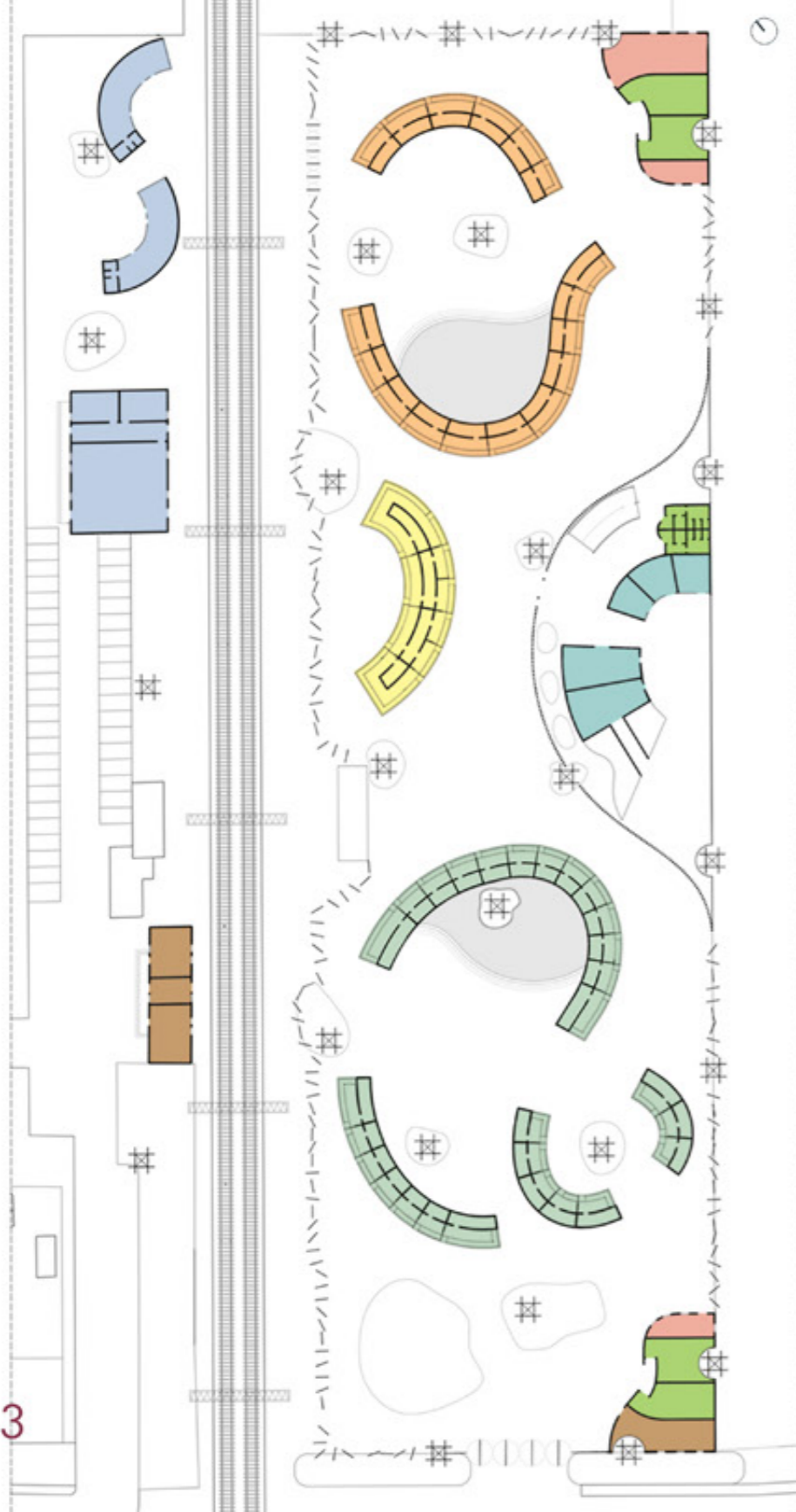
Pavia University



The project area develops along the Milan-Genoa railway line. This is an undeveloped area with deficiencies under various points of view; the will was therefore to try to give a new character to the surrounding environment so as to enhance the architectural elements already present (in this case the station).

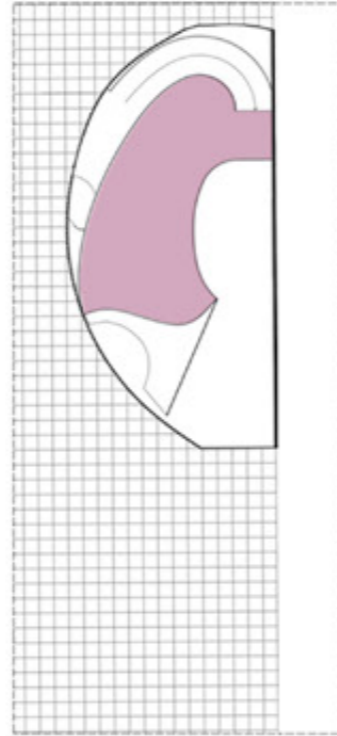
Then, it was decided to develop the project through the creation of a market that sells local products. It is organized on both sides of the tracks and is marked by sinuous forms that interact in a very organic way. These forms contain the kiosks from which visitors can buy the goods. These buildings are protected by a particular wooden roof that is intended to distinguish itself as a sort of landmark. The resulting structure comes first of all from a critique of the current situation which is characterized by simple shapes. However only the roof was considered, creating an open but protected environment. The particularity of the roof is given by the alternation of domes generating movement while reacting to the surrounding space. The solution adopted is very unique, with the aim of developing in this context a new and interesting type of activity thanks to the architecture chosen.





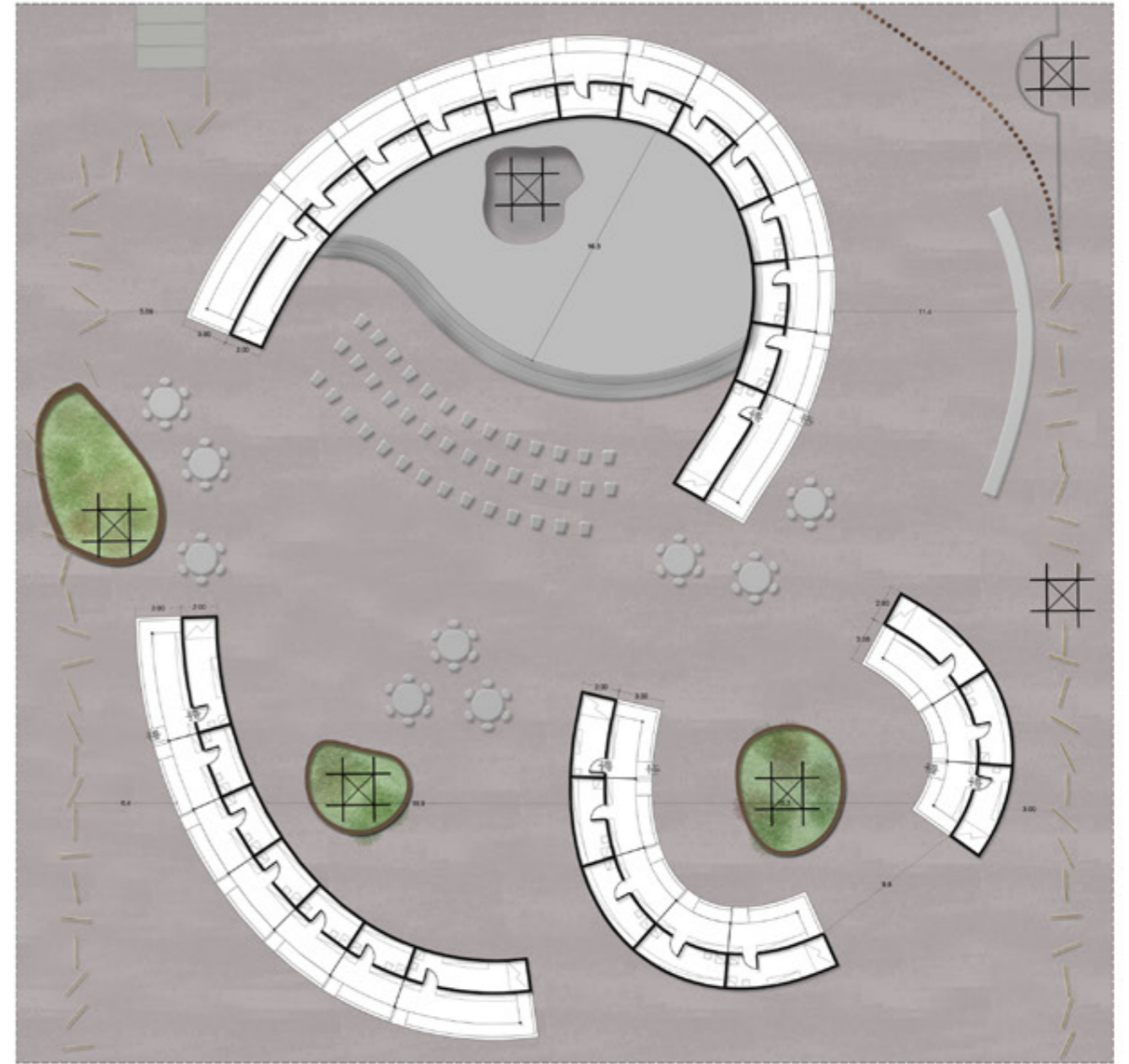
Legend:

- organic food
- cheese
- meat
- education area
- toilets
- machinery
- exhibit & bar
- train station ticket office & info-point
- stage for exhibition
- library



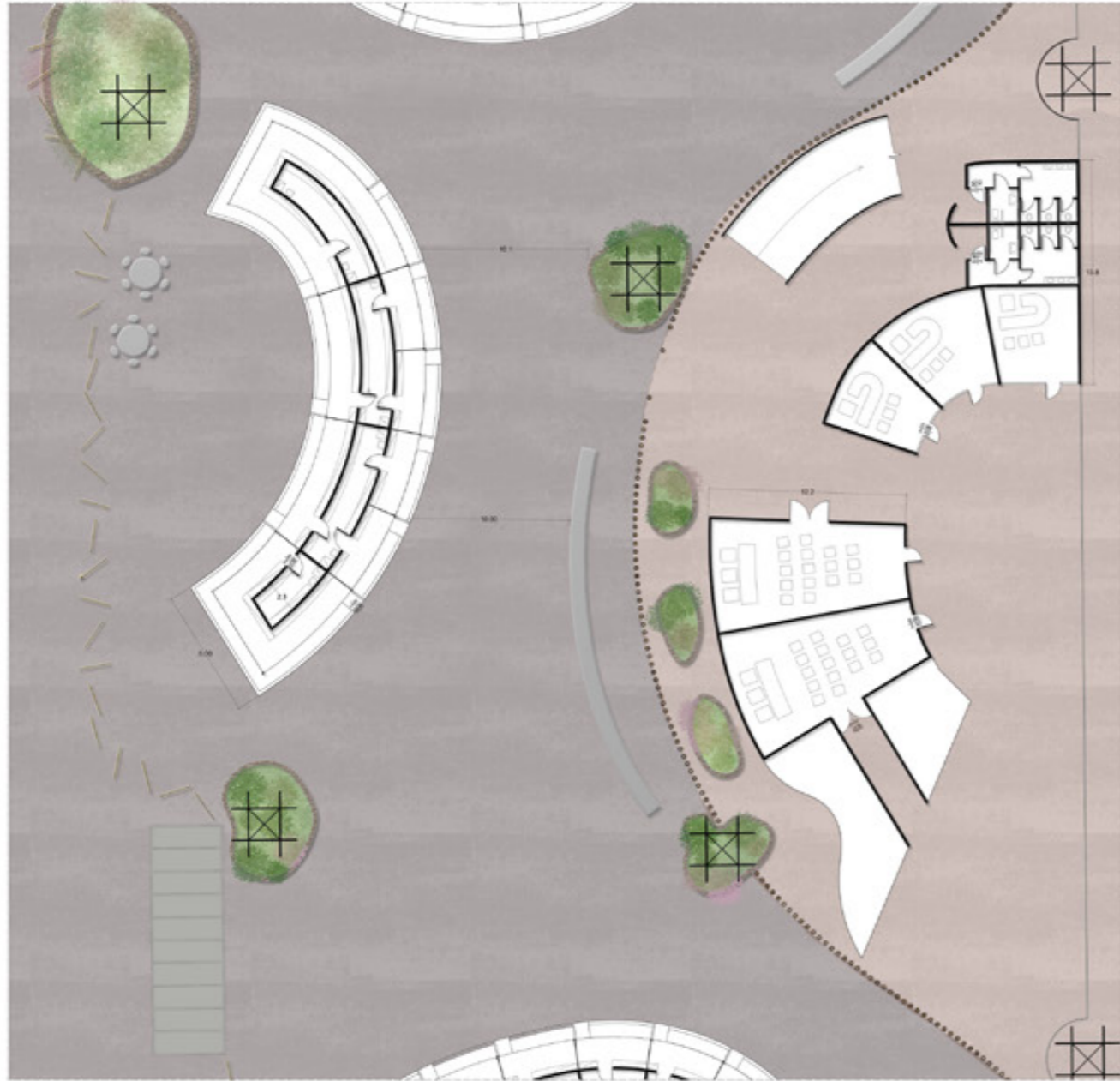
Zoom first floor plan  
scale 1:1000

Ground floor plan  
scale 1:1000

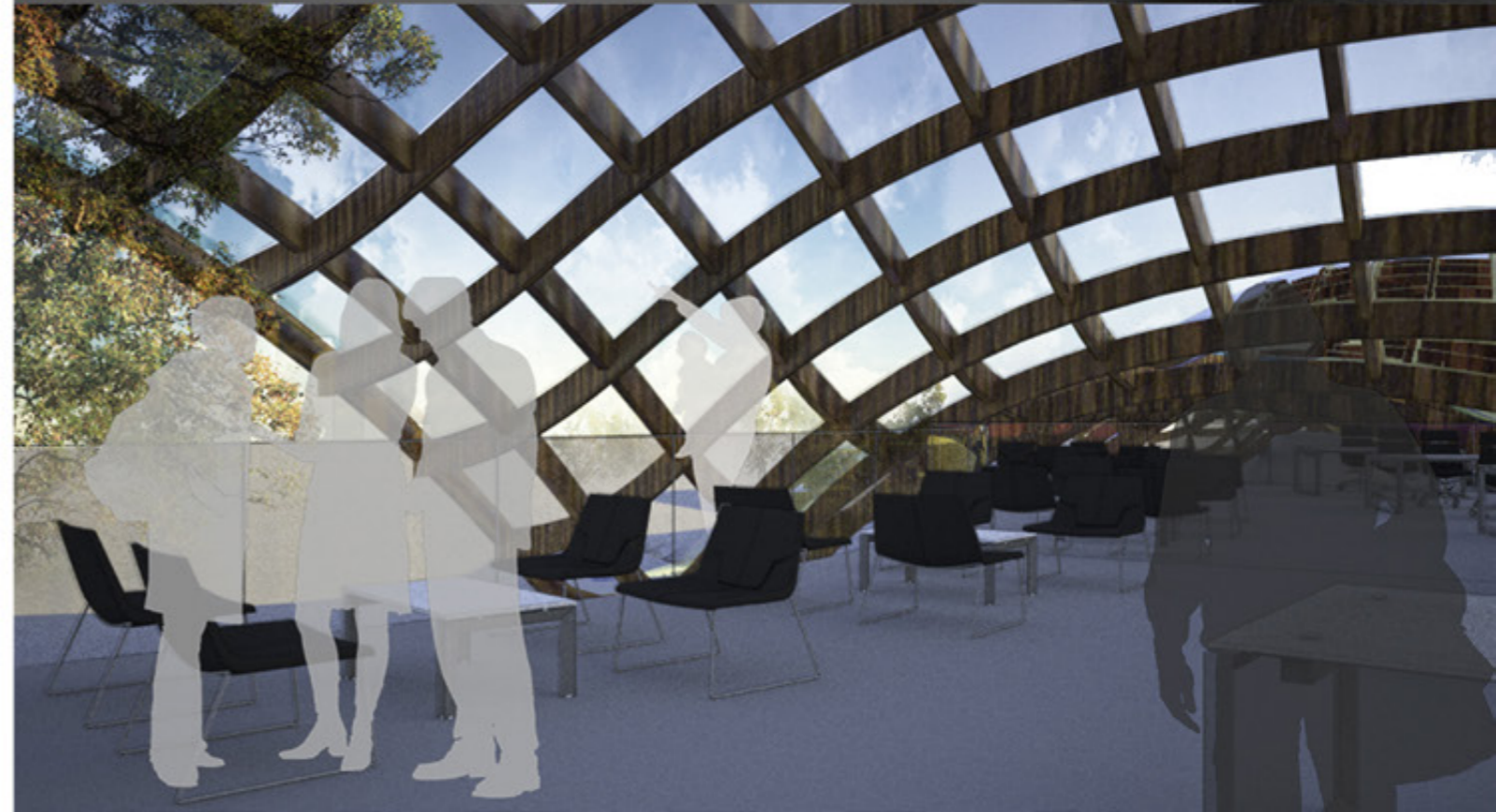
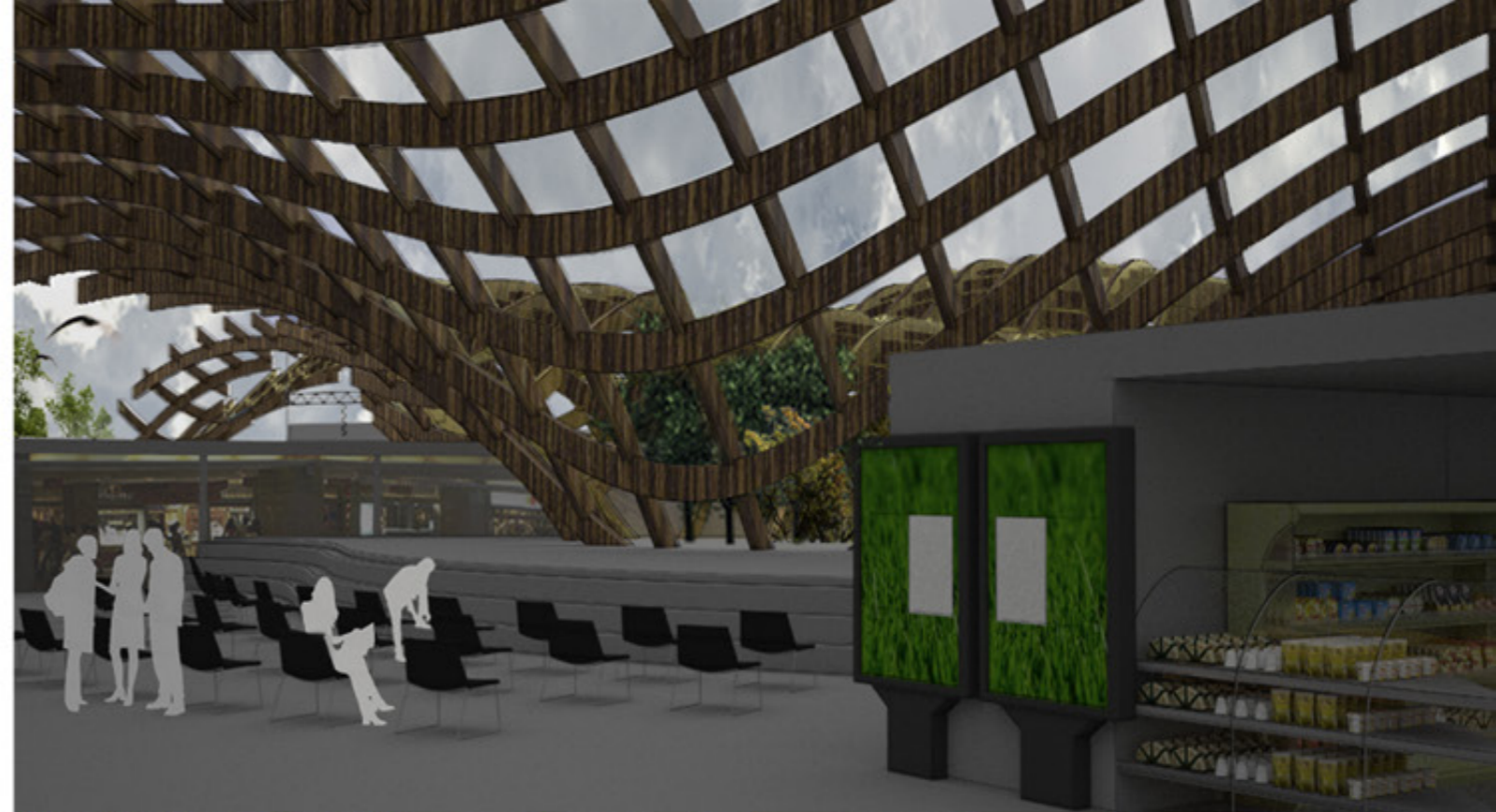


Plan zoom  
scale 1:400





Plan zoom  
scale 1:400

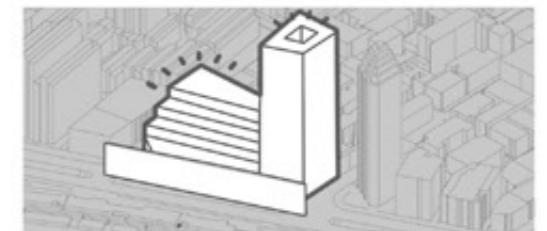
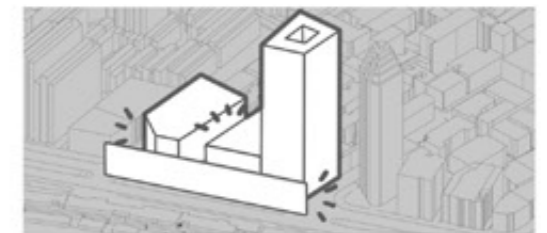
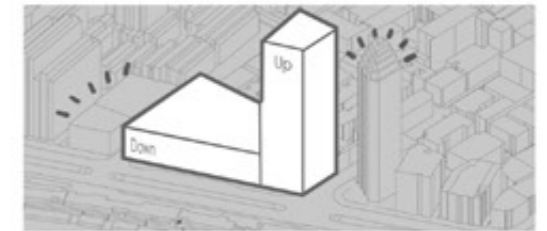
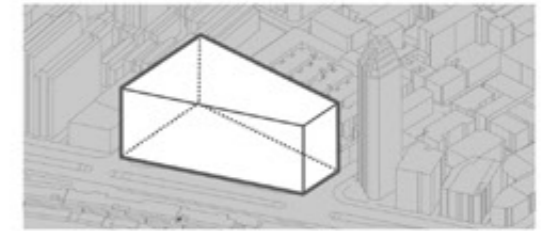
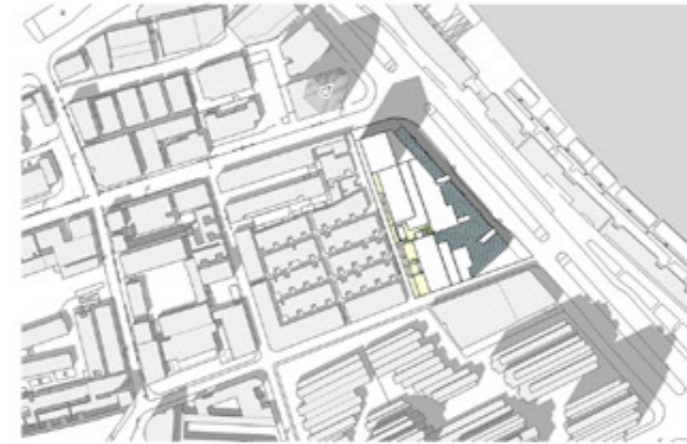




# GAP IN THE CITY - SHANGHAI

Academic Project 2018

Tongji University



This project is located in Jinling East Road on the Bund in Shanghai, in between of modern buildings and the previous traditional Chinese town. It faces Lujiazui CBD across the Huangpu River. The district belongs to the historic cultural reservation area in the city. The site was intended to be planned and developed for commercial and public buildings.

The starting point for the design was how to activate the vitality of the venue and attract different groups of people to enjoy it. Through field researches has been found that there are many crowds around the site and traffic congestion. The residents in the west part of the area live in relatively poor conditions and they do not have many space for public activities. Moreover, the vitality along the east main streets is not enough, and the intimacy of the urban interfaces lacks.

Starting from the usual human activities, the focus has been mainly on creating a positive and dynamic public space for everyone. With the introduction of the "Wall of The Bund" and the "urban gaps", people will be more attracted making the site really active.





The Bund



Yong'an Mill



Bund SOHO

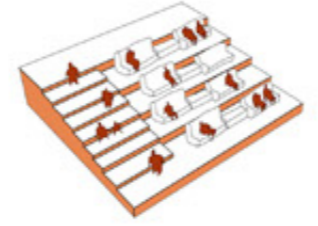
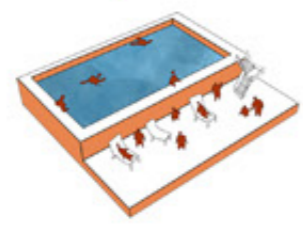
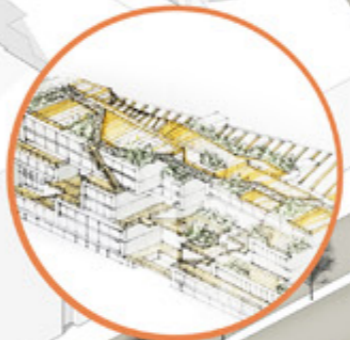
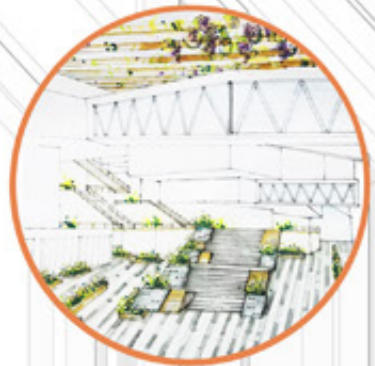
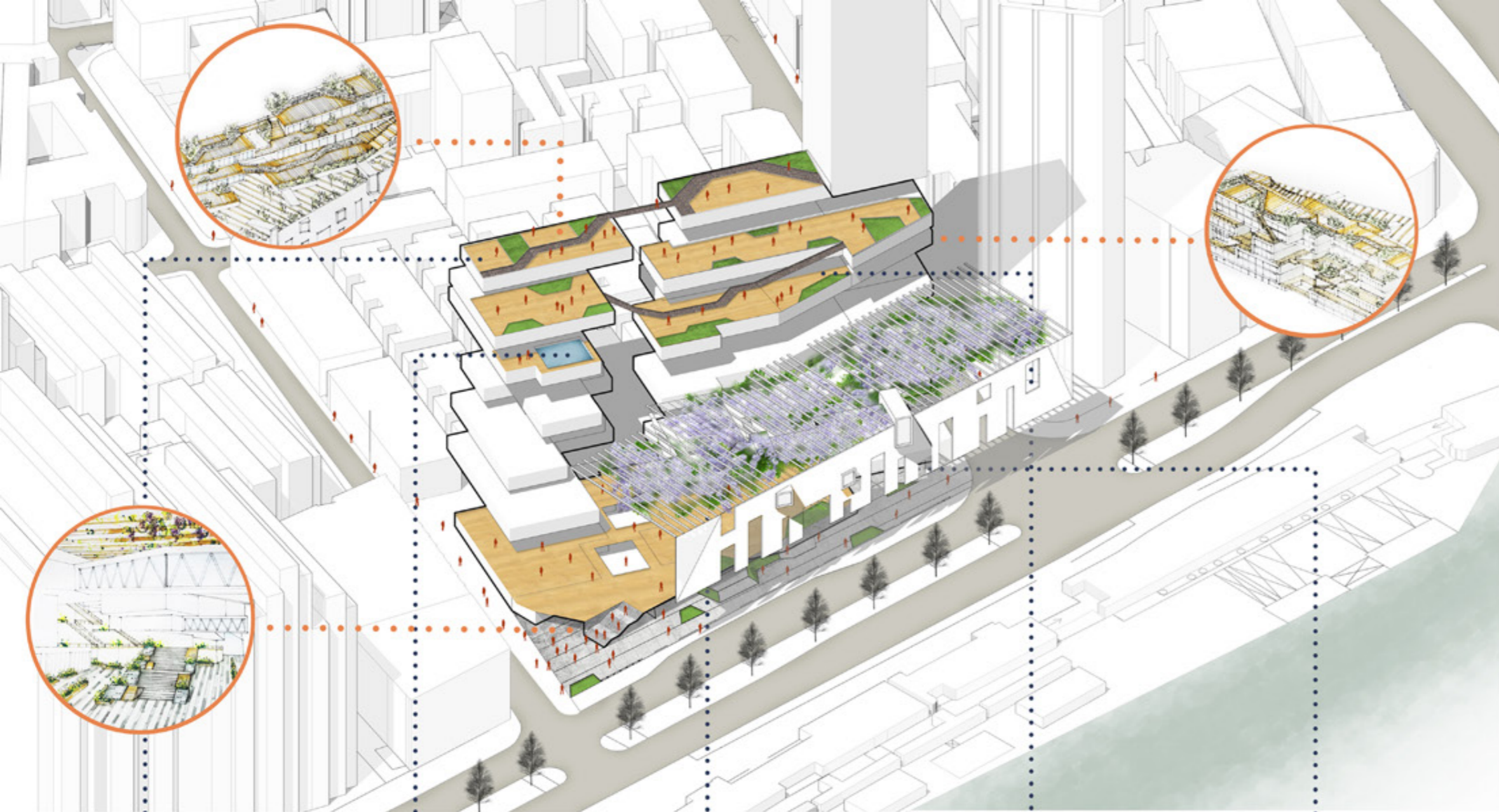


Main functions

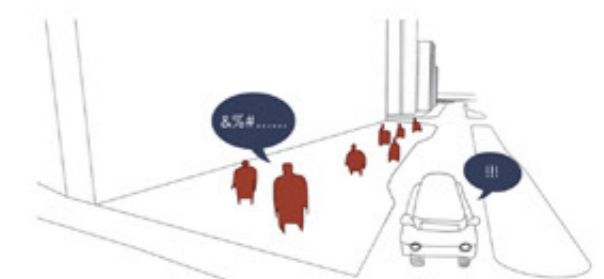
- Commerce
- Hotels
- Offices
- Sports centre
- Education
- Public interaction spaces
- Culture



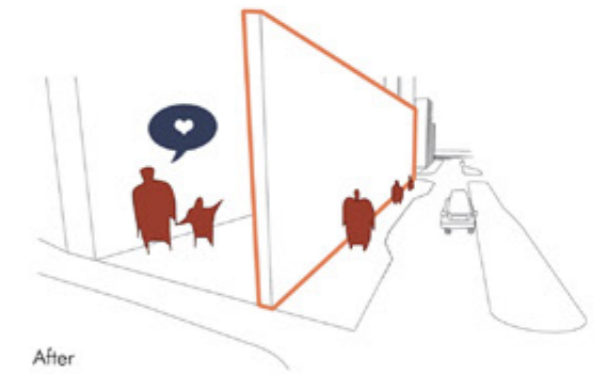




Generation of the "Wall of The Bund"



Before



After



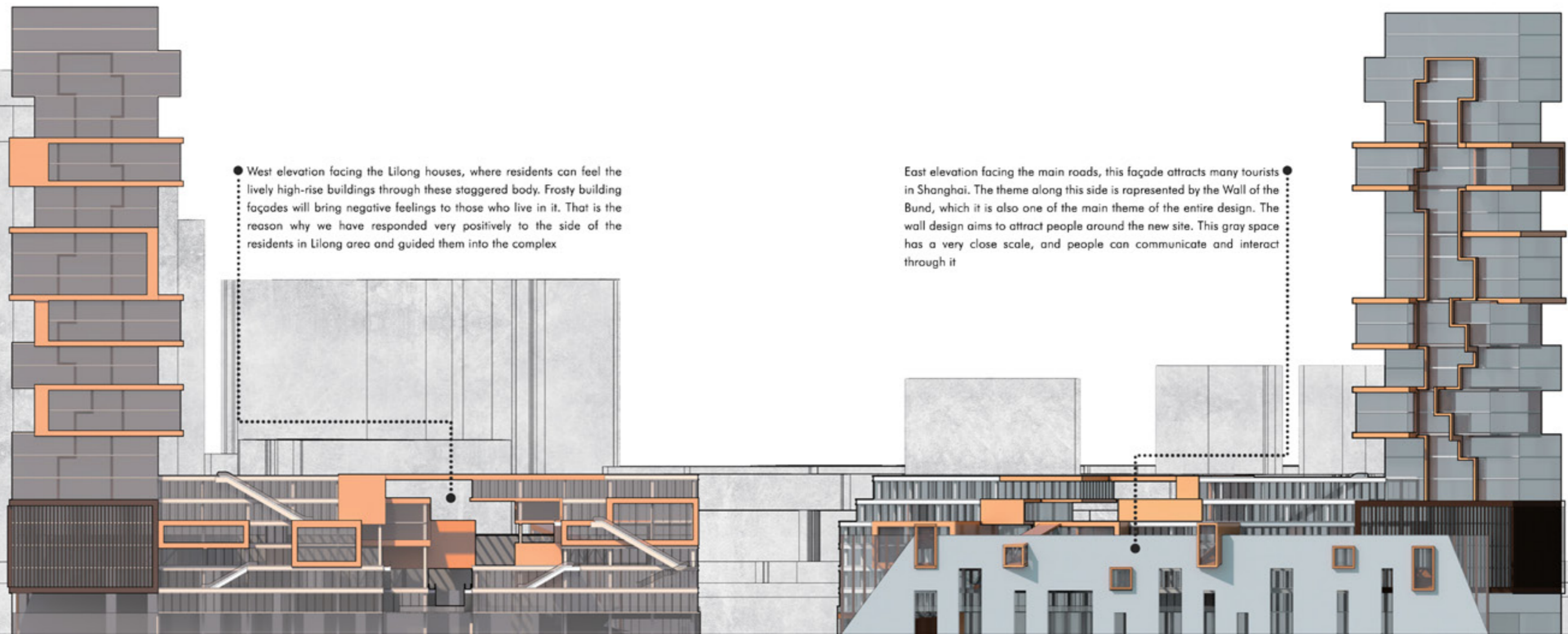
Improve



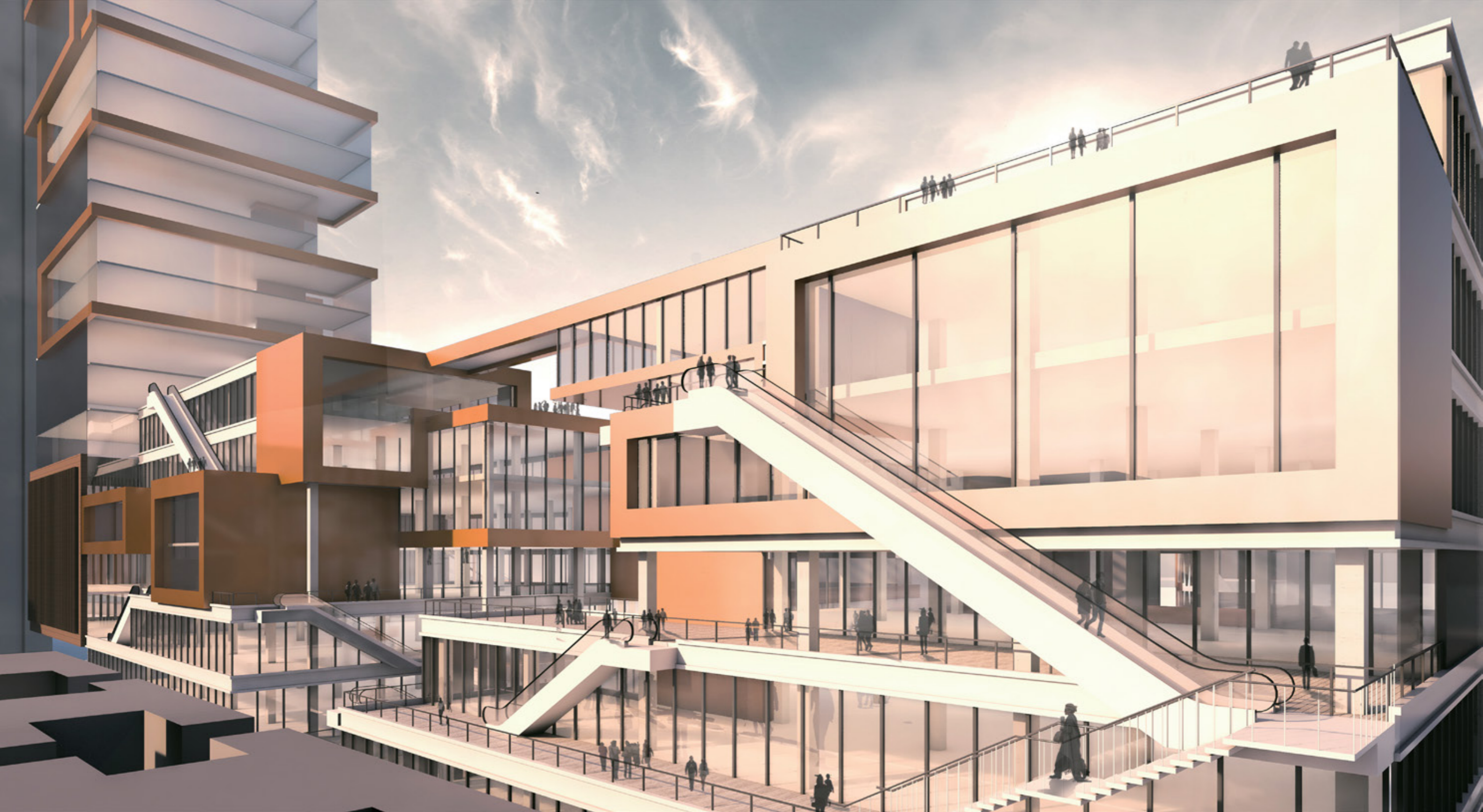


● West elevation facing the Lilong houses, where residents can feel the lively high-rise buildings through these staggered body. Frosty building façades will bring negative feelings to those who live in it. That is the reason why we have responded very positively to the side of the residents in Lilong area and guided them into the complex

● East elevation facing the main roads, this façade attracts many tourists in Shanghai. The theme along this side is represented by the Wall of the Bund, which it is also one of the main theme of the entire design. The wall design aims to attract people around the new site. This gray space has a very close scale, and people can communicate and interact through it









# INTEGRATED DETECTION SYSTEMS SANCTUARY OF LA VERNA, AREZZO

Academic Project 2015

Pavia, Florence, Bologna University



The Franciscan Sanctuary of La Verna located a few kilometers from Chiusi della Verna (province of Arezzo, Tuscany, Italy), is famous for being the place where St. Francis of Assisi (1181-1226) received the stigmata on September 17th, 1224. Built in the southern part of Mount Penna at 1128 meters above sea level, the Sanctuary is a complex architectural and religious variously articulated. It stands on a rocky outcrop, dominated by Monte Penna (1284 m) and surrounded by a large forest. The relief activity involved the "Chapel of the beech". At the time of Blessed John (early '300), instead of the chapel, there was a large beech. The Franciscan friar, he used to come at this large tree, where he placed a crucifix for his moments of prayer. One day, Jesus met him there. Thus, this miraculous event brought great devotion to the tree. Thanks to the numerous information collected directly on field, it has been possible to obtain an accurate survey of the chapel. It has been analyzed with the attempt to return all the data in the most precise way. This it was possible thanks also to the photogrammetric software used for the realization of 3D models.



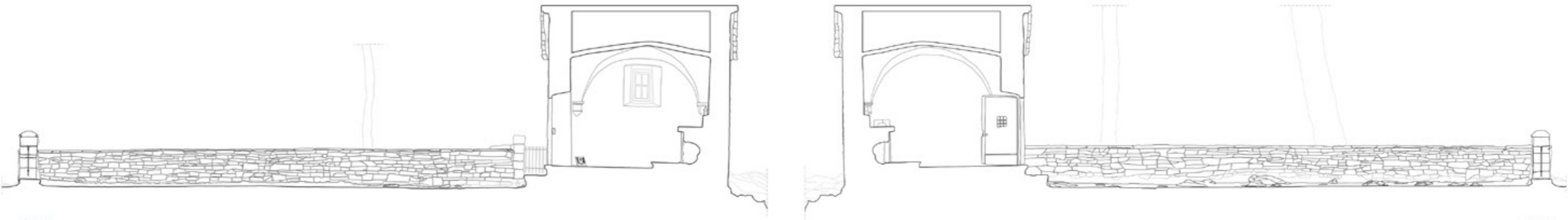


①



Study of the longitudinal sections  
through photogrammetry results  
scale 1:100

Tracing  
scale 1:100







①

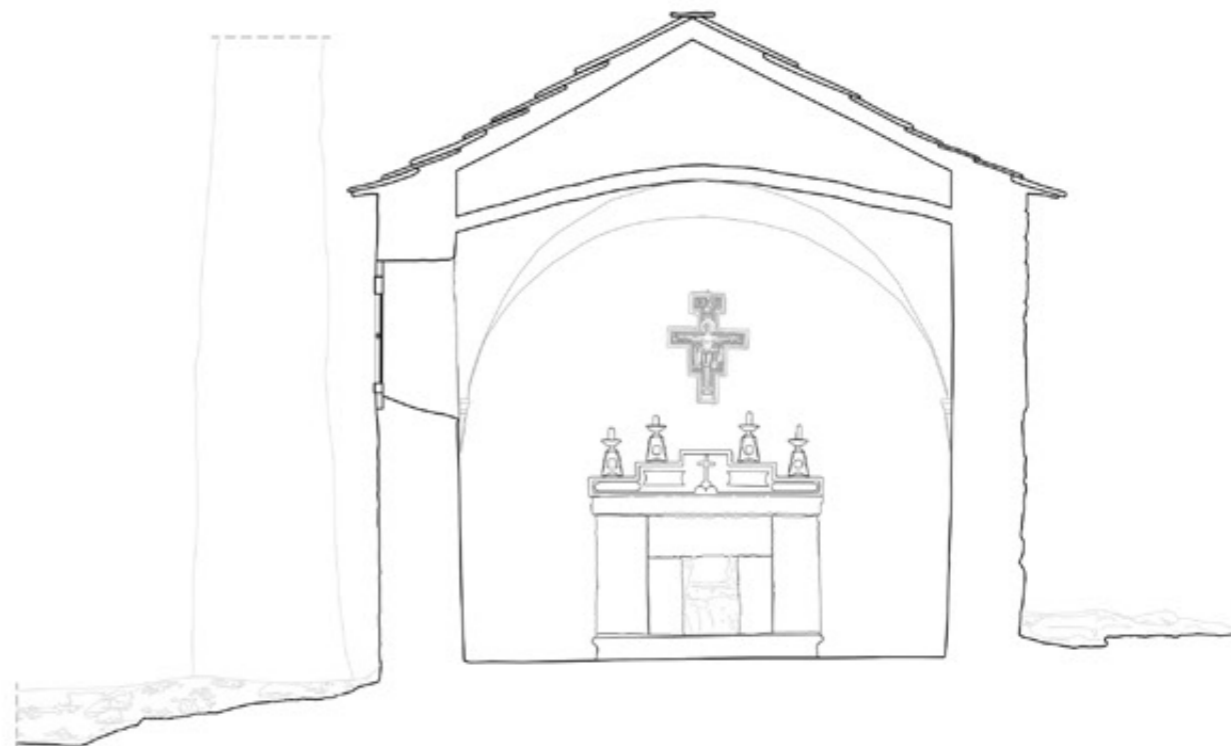


Study of the transversal section through photogrammetry results scale 1:50

Tracing scale 1:50



Reconstruction of the interior of the chapel through software that performs photogrammetric processing of digital images and generates 3D spatial data



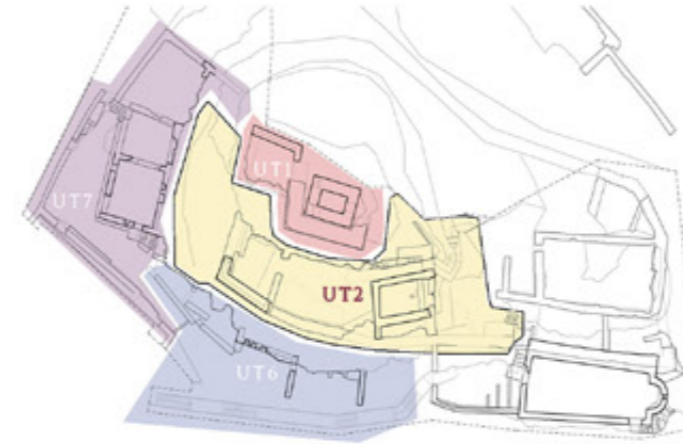




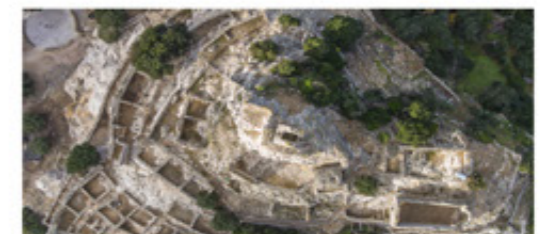
# RESTORATION AND USE OF ARCHAEOLOGICAL SITES ROCCA SAN SILVESTRO, LIVORNO

Academic Project 2016

Pavia, Florence University



Rocca San Silvestro is a village of miners and metal founders built between the X and XI centuries for a noble initiative, aimed at the exploitation of the rich local deposits of copper and silver plumb. Metals were destined for monetary production. The archaeological research campaigns in the castle of Rocca San Silvestro were started in 1984 by the Department of Archeology and History of Arts of the University of Siena, in collaboration with numerous European University Departments. The excavation highlighted the complex "urban planning" of the village and made it possible to identify its functional organization. This particular restoration work involved the entire manor of the complex which is formed by two concentric and fortified plateaus. A ring of considerable thickness separates the entire area from the rest of the settlement. This area was once a mansion, deliberately positioned at the highest point of the castle to enjoy a better view and more protection. At the lower level it is developed with open spaces, tanks, warehouse, stables, servants and soldiers houses with support function. The whole complex lost its original defensive function in the first half of the XIV century disappearing all traces of permanent settlement.

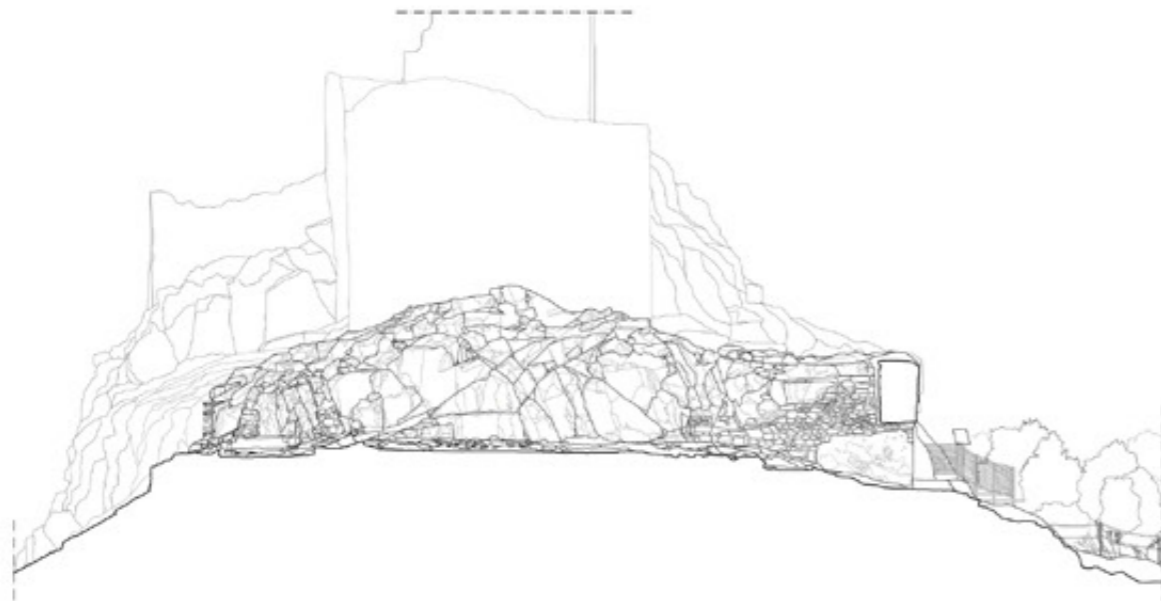






Orthophoto  
West wall  
scale 1:200

West wall tracing  
scale 1:200



Mortar analysis of the plan through  
orthophoto  
scale 1:200

Plan tracing  
scale 1:200

**GOOD**

The mortar does not need additional action, as it was subjected to recent intervention



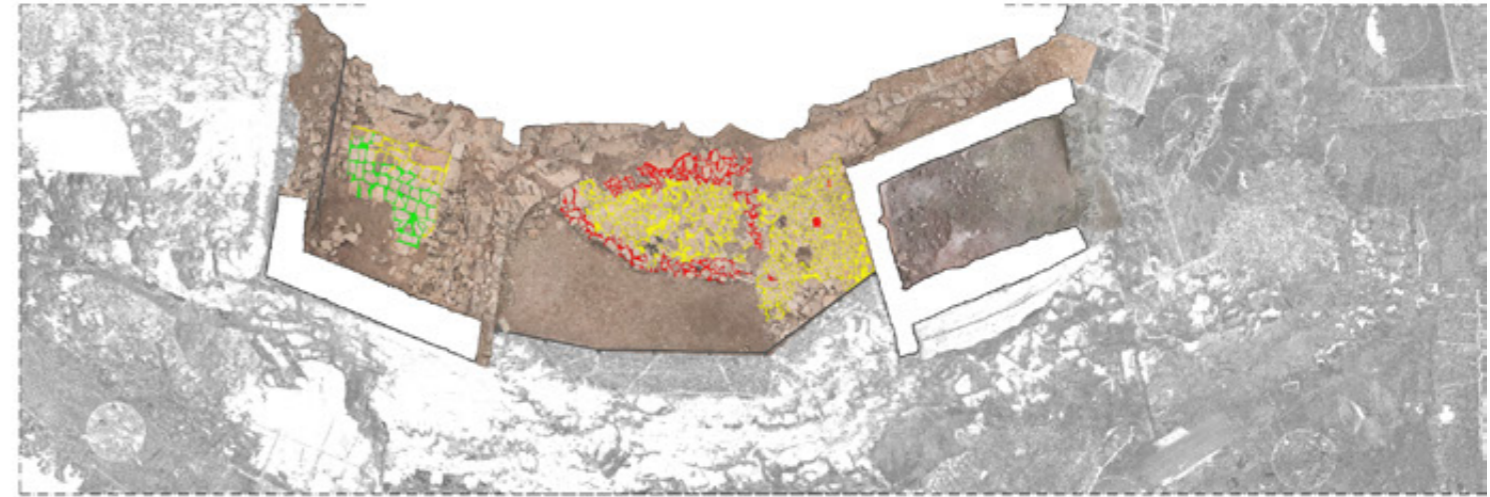
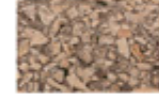
**BAD**

The mortar is completely missing and needs to be restored



**QUITE GOOD**

The mortar needs intervention because of several decays, such as alveolization and fracturing







Lighting project  
Illumination distribution system

1. Enhancement of the archaeological site



2. Transformation of Rocca San Silvestro into an open air museum



3. Creation of a path of architectural light



4. Integration among the elements designed



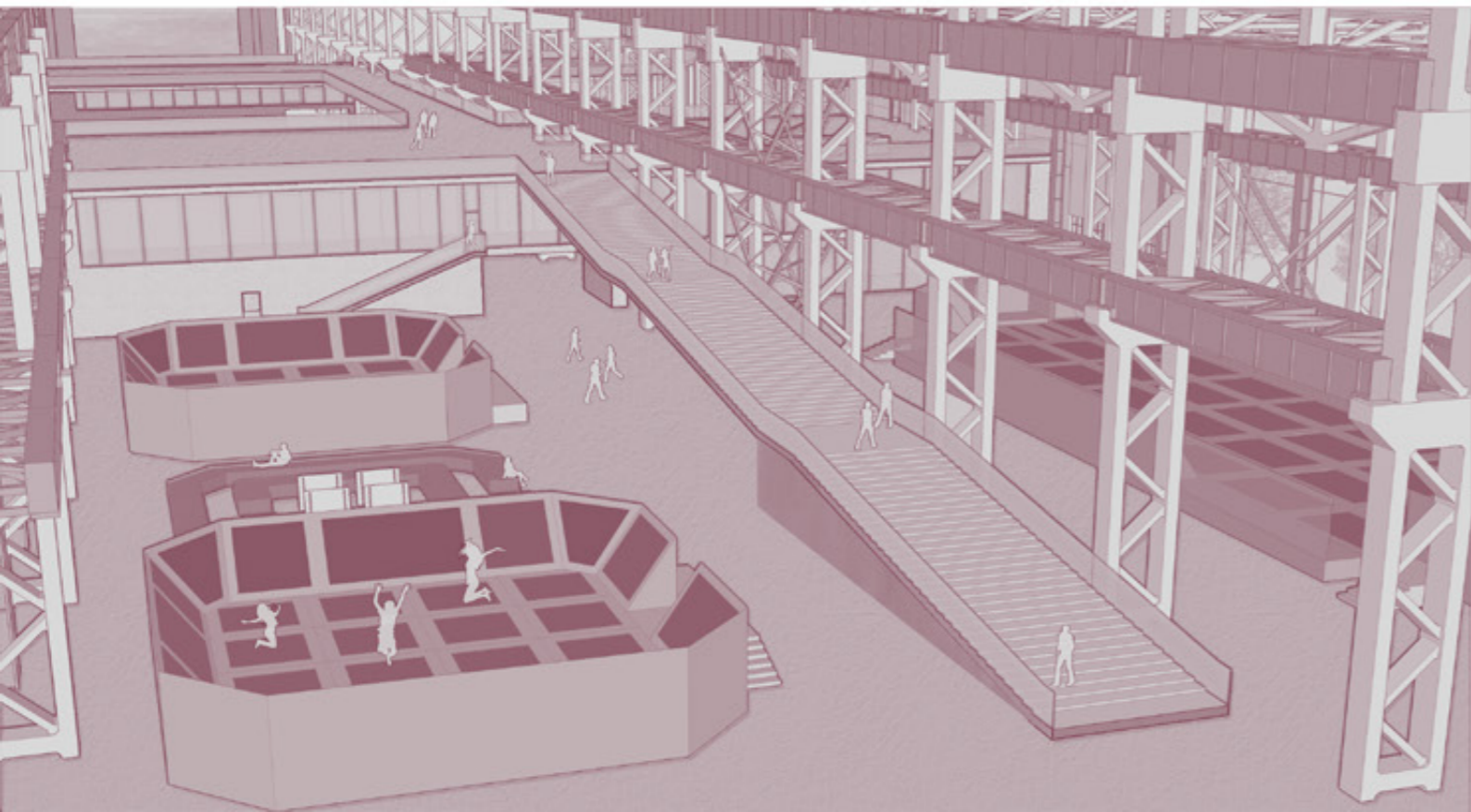
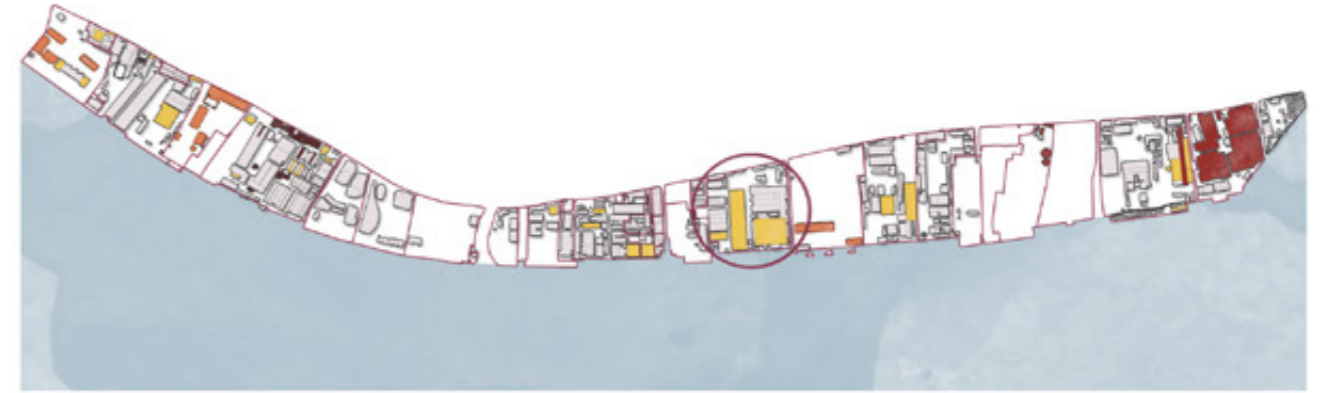


# 遗产保护与城市复兴——上海东外滩工业遗产带再生研究

## Heritage Conservation and Urban Regeneration: New Challenges in Industrial Context along the East Bund of Shanghai

### Master Thesis - Double Degree Program 2018

#### Tongji, Pavia University

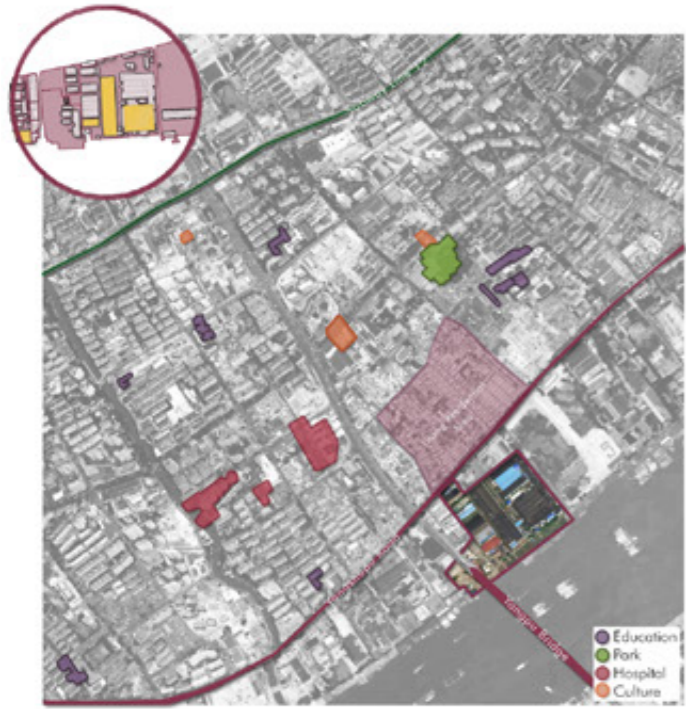


The East Bund, i.e. the Yangshupu Industrial area on the north bank of Huangpu River, has witnessed the history of the modern industrial development in Shanghai and the deep historical and cultural accumulation of this place represents a precious heritage of the city. Today the global significance of this industrial belt together with its remains are beginning to be rediscovered and used. However many difficulties still exist: Huangpu riverside landscape value is ignored, the historical, practical and social value of the buildings are not fully utilized, traffic is not well organized and living conditions are insufficient. Moreover, the economic potentiality of the lot is difficult to evaluate due to the decline of the surrounding industry.

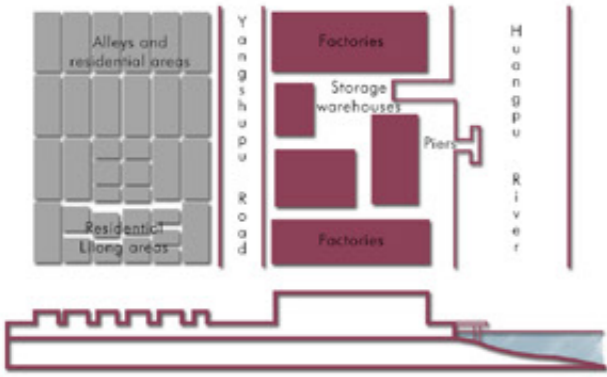
Therefore, through an urban regeneration project, the research has found a meeting point between the context characterized by the presence of industries with a certain cultural value, and the community developed around them. Within this area, the Shanghai power station auxiliary equipment factory (west) has been selected for further studies. The plant owns a great history related not only to events, but also to architecture.







Context analysis



Spatial relations



Example of space distribution inside one characteristic Lilong residential unit

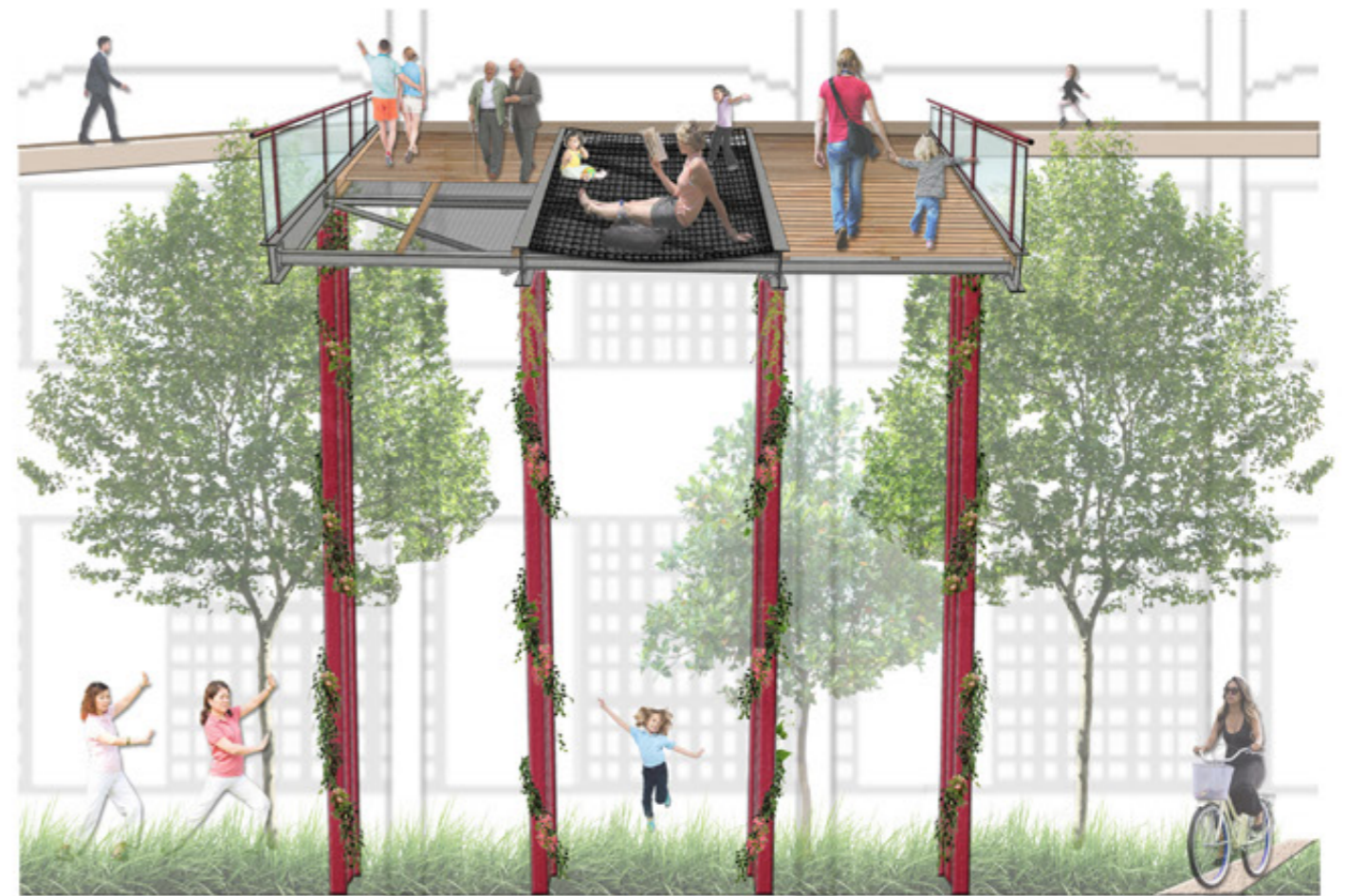


Masterplan  
scale 1:2500



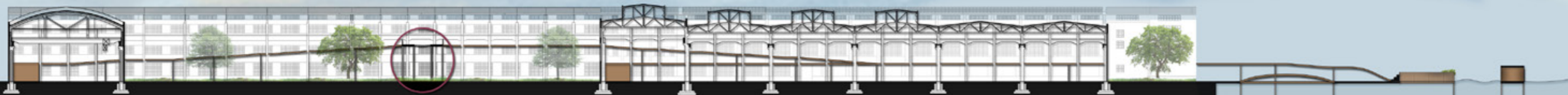


Ground floor plan  
scale 1:1500

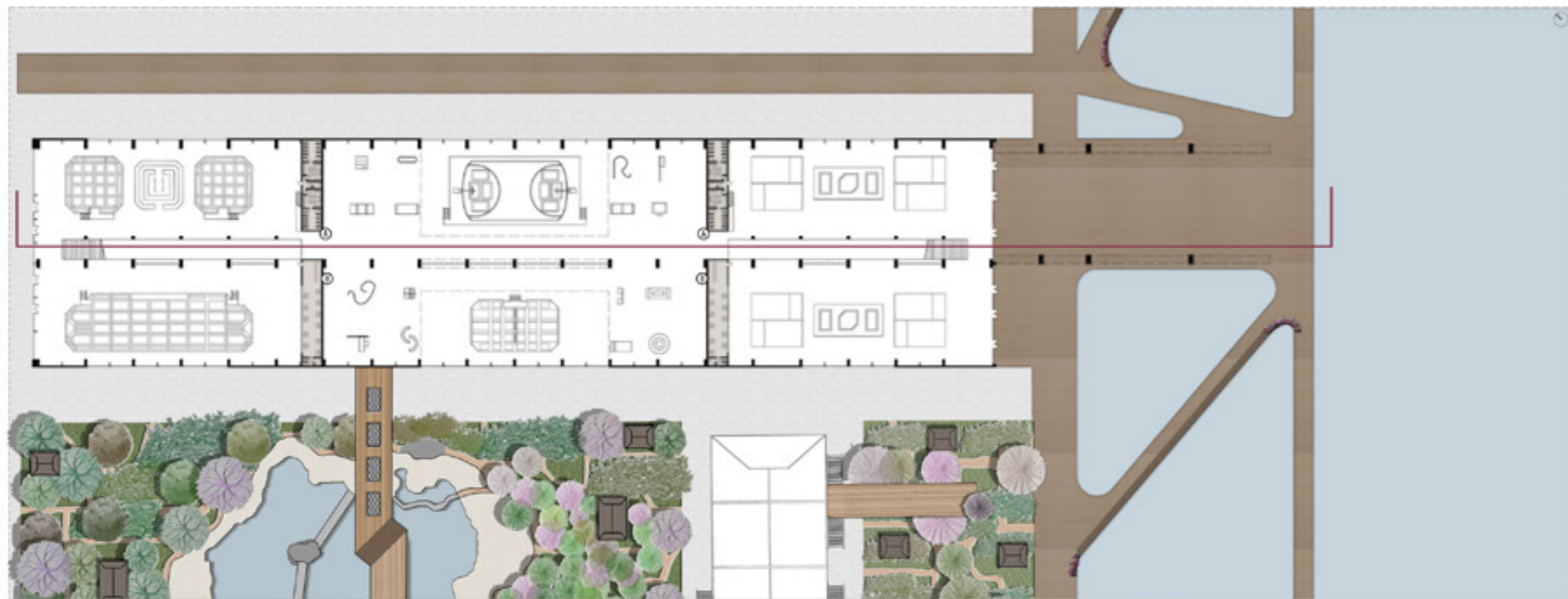


Visual proposal and structure analysis  
of the walkway

Longitudinal section  
Main walkway



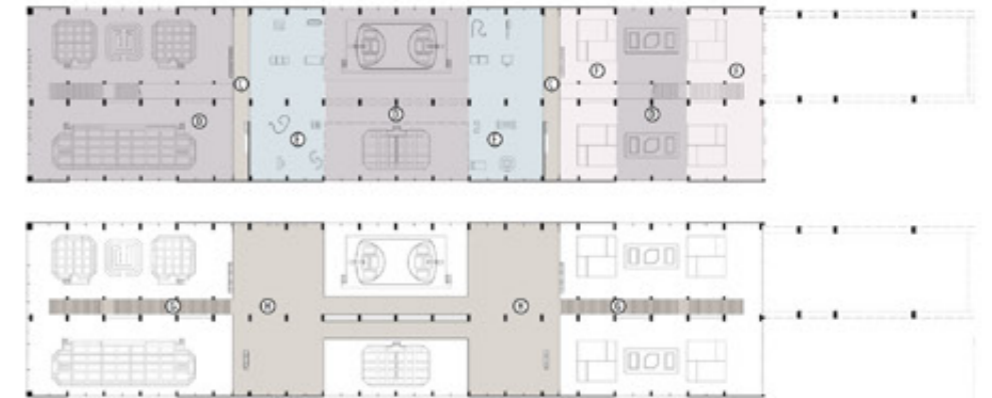




Ground floor plan  
scale 1:1500

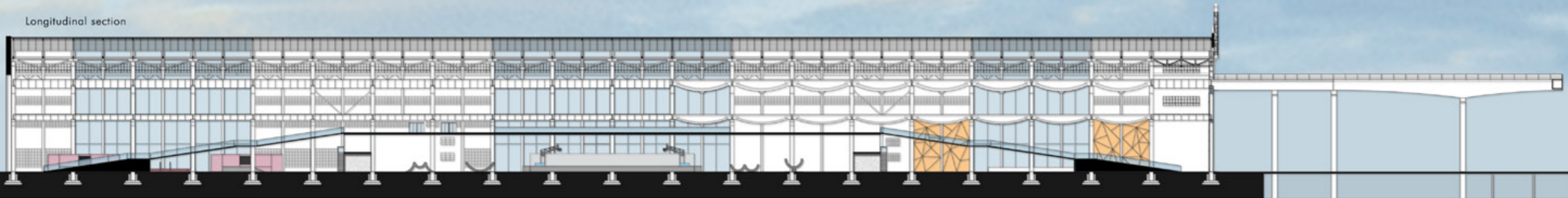
Legend:

- |                    |                         |  |  |
|--------------------|-------------------------|--|--|
| A_Locker rooms     | B_Bar                   | C_View point and passage to the second floor                       | D_Performance trampolines and slamball court |
| E_Indoor skatepark | F_Indoor climbing walls | G_Big stairs which connects ground floor and second floor directly | H_Second view point                          |



First and second floor plan

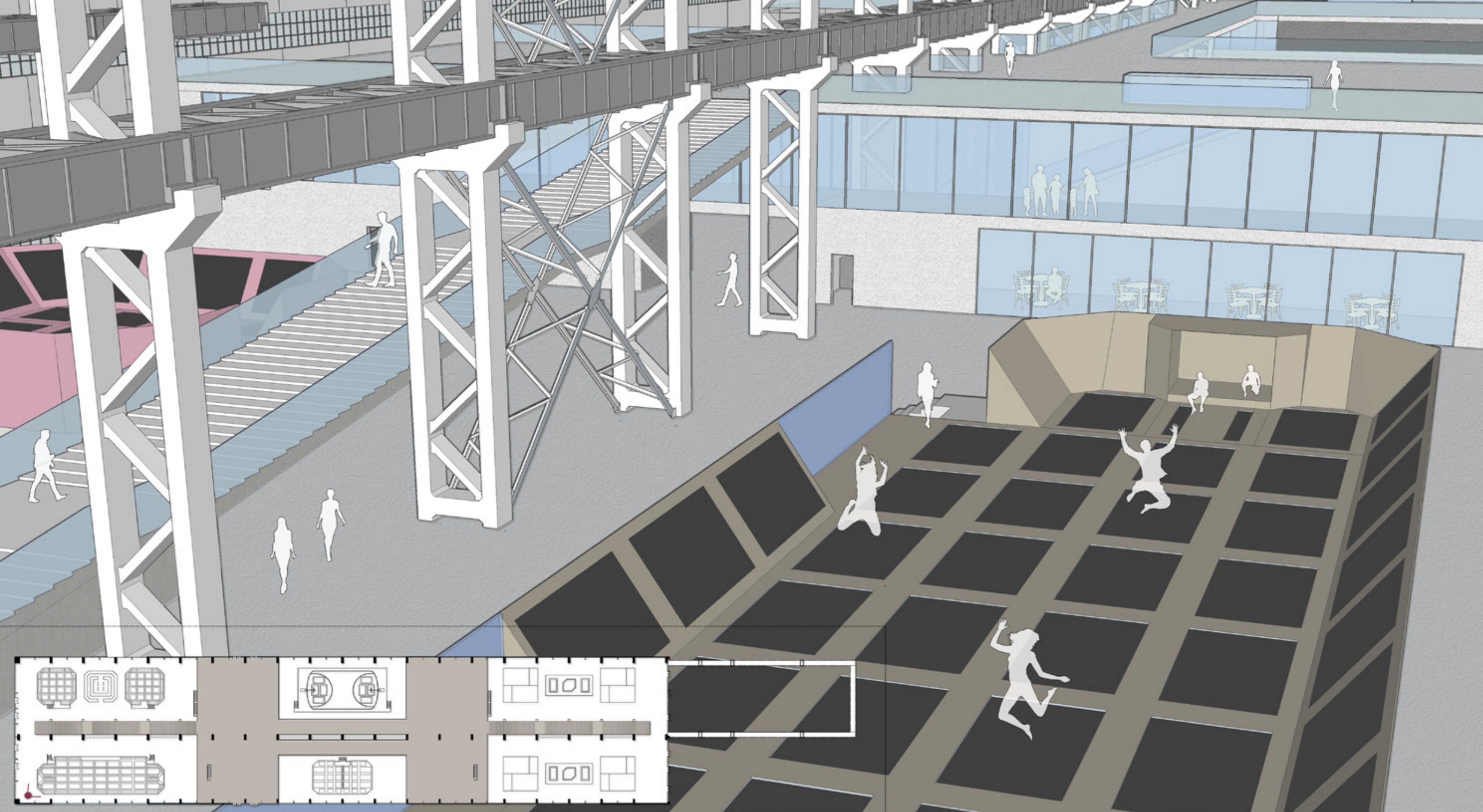
Longitudinal section



South façade









# COMMUNITY CONDENSER - LIANSHI TOWN

Tongji CAUP International Summer School 2018

Rehabilitation of Built Heritage in Urban Transformation

城市转型中的建成遗产再生

Tongji University



The site is located in Lianshi Town. It is part of Nanxun District, which is a district in the prefecture-level city of Huzhou, Zhejiang province. Lianshi Town is divided in two zones which refer to Zaixing Community and Wanxing Community. The first one corresponds to the modern part of the town while the second one, where the site is located, is mostly populated by old people (20% +60 years old). These data have influenced the work, orienting the design choices with the aim of satisfying the requests of the local population. The site constitutes a part of the built heritage. In fact, it was born around the 1950s as a granary for the collection and trade of rice. Its evolution then depended on the various historical events that characterized China in general (following the foundation of the PR of China). Here the granaries represent the most characteristic and expressive element of the cultural heritage of that period. Thus the will for this project has been to demonstrate how the heritage can be revived in our current cities, in order to show how the time dimension that lies in memory can be part of our future urban lives.







LOCATION



THE STREET GRID



FACILITIES DISTRIBUTION

Current



- new residential
- heritage
- commercial
- public buildings
- industrial

PRESERVATION



- main vehicle streamline
- main pedestrian line
- streamline branch

CONNECTIVITY



- green space
- public space
- parking lot

ACTIVATION

Proposed



- new residential
- park
- designated historic district
- commercial



- main vehicle streamline
- proposed pathways
- potential pathways



- green space
- public space
- parking lot

What does the community think?



What would you like to see happen at the granary?  
你希望在粮仓里看到什么?

我希望它被美化并用作公园。  
I would like it to be landscaped and used as a park.

What does your community need?  
您的社区需要什么?

我们需要更多的公共空间来聚集。  
We need more public space to gather in.

What are your ideas about the granary?  
你对粮仓有什么看法?

它需要得到保护。  
It needs to be protected.

We need a place to play with our kids.  
我们需要一个与孩子们玩耍的地方。

你想要它被开发吗?  
Would you like it to be developed?

What should the space be used for?  
该空间应该用于什么?

一个文化中心。  
A cultural center.

Do you have any memories about the place?  
对这个地方有任何记忆吗?

我们曾经像孩子一样在那里玩耍。  
We used to play there as children.





In order to create better connectivity, consistency of architectural style, more open space and circulation inside and outside the granary, we evaluated which buildings we should keep, and buildings should be removed



Keep



Unique architectural style, cultural importance to the history of the site, important landmark



Important for the site history, landmark, it can help in order to create consistency among adjacent buildings



Unique roof structure made of bamboo, spacious and flexible use



Connection with canal and main road, strong heritage value, similar in style to adjacent buildings

Remove



The architectural style conflicts with adjacent buildings, it should be created larger entrances to the site

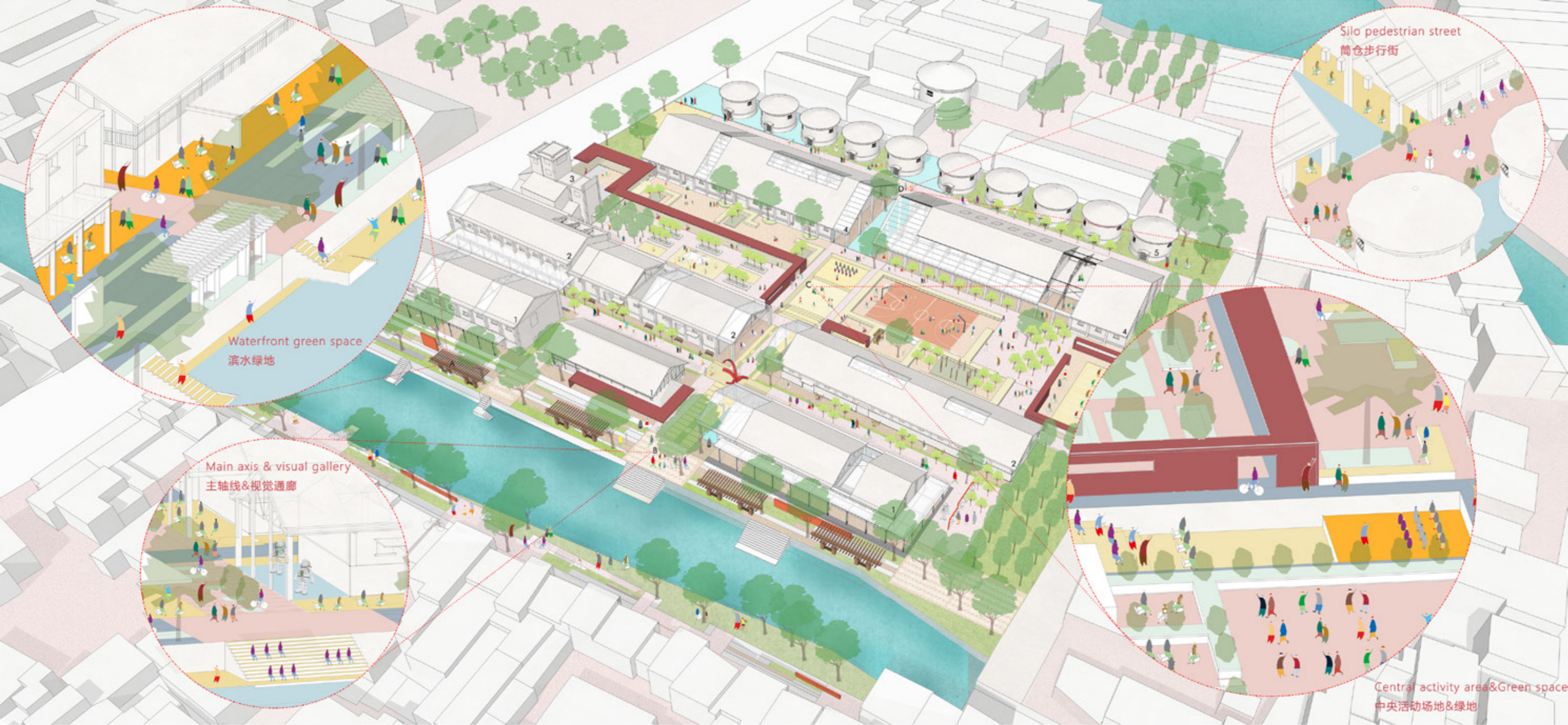


Generate more open green space along the canal, promote better interactions with the surrounding neighborhood



Masterplan scale:1000





Main functions

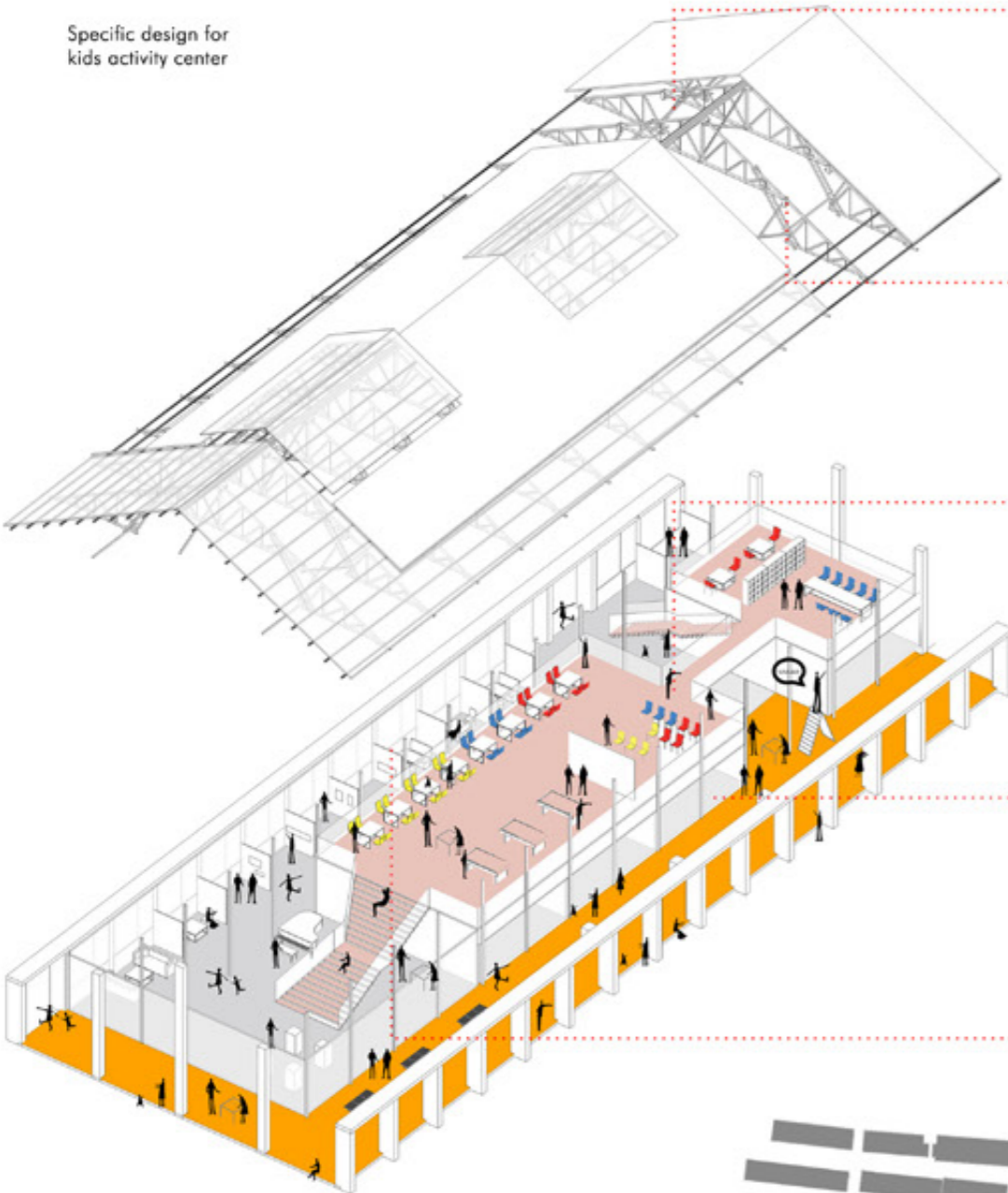
1\_Food court 2\_Shopping area 3\_View point 4\_Community center for kids and elderly people 5\_Granaries used as activity spaces

Views

A\_Interactions along the canal B\_Main entrance C\_New public space D\_Walk through the granaries



Specific design for kids activity center



Removing of some roofs to create balconies partially covered with glass ceiling to increase indoor lighting

Retain wooden structure that becomes the ornamental element of the interior space

Functional spaces for the different classrooms

Demolition of granary enclosure walls and creation of semi outdoor activities under the portico

Movable panels generate changeable spaces to accommodate functions such as communication, art and reading



SINGLE SPACE

Exhibition  
Activity space  
Cinema  
Library



MULTI-USE SPACE

Houses  
SOHO Studio





[caterina.pietra@unipv.it](mailto:caterina.pietra@unipv.it)  
[caterinapietra@me.com](mailto:caterinapietra@me.com)

