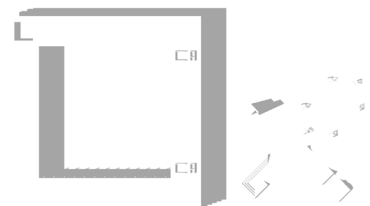
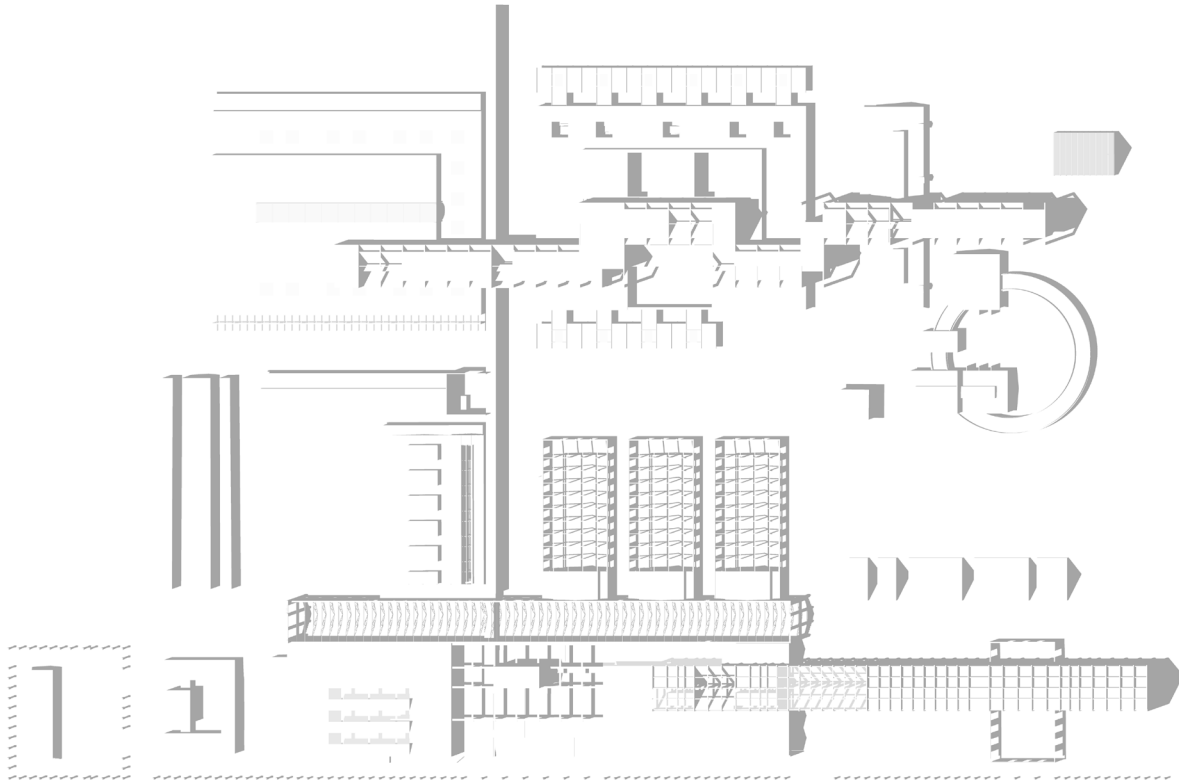


Transformation of Industrial Heritage in Post-Industrial Society:  
A Design Proposal Ex-Macello Milan





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2022



**POLITECNICO**  
MILANO 1863

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# ABSTRACT (ENG.)

Since the middle of the 20th century, the transformation of the industry-centered economy into a service-centered economy has had a great impact on urban life and form. The increasing population of the city and globalization targets has pushed the industry out of the city completely. Industrial areas in the city remained idle.

Global warming, which is a result of the industrial revolution, has begun to change architectural practice as well as in many areas of our lives. The preservation and transformation of these idle areas is the biggest proof of the sustainability of architecture, both economically and ecologically. Considering its place in the collective memory and the aesthetics of the buildings, such transformation projects should be considered as an urban-scale planning projects rather than just a neighborhood-scale rehabilitation.

Milan is one of the global cultural capitals of the world since the beginning of the 21st century. When we look at the trans-

tion in the last 50 years, we see that the image of the city has been constantly renewed and the biggest contribution to this is the transformed industrial areas. The Ex-Macello transformation project, which forms the body of this thesis, is a proposal for a new urban image that adapts to multicultural urban life in post-industrial era.

# ABSTRACT (ITA.)

Dalla metà del XX secolo, la trasformazione dell'economia incentrata sull'industria in un'economia incentrata sui servizi ha avuto un grande impatto sulla vita e sulla forma urbana. L'aumento della popolazione della città e gli obiettivi della globalizzazione hanno spinto completamente l'industria fuori città. Le aree industriali della città sono rimaste inattive.

Il riscaldamento globale, che è il risultato della rivoluzione industriale, ha iniziato a cambiare la pratica architettonica così come in molti settori della nostra vita. La conservazione e la trasformazione di queste aree inattive è la più grande prova della sostenibilità dell'architettura, sia economicamente che ecologicamente. Considerando il suo posto nella memoria collettiva e nell'estetica degli edifici, tali progetti di trasformazione dovrebbero essere considerati un progetto di pianificazione a scala urbana piuttosto che una semplice riabilitazione a scala di quartiere.

Milano è una delle capitali culturali mondiali dall'inizio del 21° secolo. Quando osserviamo la trasformazione degli ultimi 50 anni, vediamo che l'immagine della città è stata costantemente rinnovata e il contributo più grande a ciò sono le aree industriali trasformate. Il progetto di trasformazione Ex-Macello, che costituisce il corpo di questa tesi, è una proposta per una nuova immagine urbana che si adatti alla vita urbana multiculturale in epoca postindustriale.

# CHAPTER 1.

## PRESERVATION IN POST-INDUSTRIAL SOCIETY

1.0.  
Introduction

1.1.  
Culture

1.2.  
Heritage

1.3.  
Industrial Heritage

1.4.  
Adaptive Re-use





## 1.0. Introduction

The first part of the thesis deals with the practice of conservation and transformation from a general perspective. This perspective narrows as the chapters progress and talks about the advantages and techniques of industrial heritage preservation. It also includes case studies during this detailing.

Source: Auhtor

## 1.1.

### Culture

Today, the term postindustrial society is widely used. The theory of postindustrial society was developed in the 1960s and early 1970s (Kumar, 2005). However, aside from the usual speculation focusing on the decline of manufacturing industries and the shift to service industries, there is often little further elaboration on the implications of "postindustrial" society. With the transition from industrial society, however, a mix of theories and definitions of the new society emerged.

Daniel Bell (1999) was the first to define the information society, emphasizing the importance of (theoretical) knowledge as the main source of value and characteristic of the new society. Thus, if labor and capital were the central variables of industrial society, they are now replaced by information and knowledge as the central variables of post-industrial society. Accordingly, the focus shifted from the commodity-producing factories of the industrial era to the cultural and educational institutions as the information-producing factories of the postindustrial era<sup>1</sup>.

Cities evolved into new forms of concentrated space that triggered the entrances and exits of capital and encouraged production and consumption. From a modernist perspective, a city is a functional and economic entity "whose spatial form is dominated by the grid-iron layout and high-rise modernist architecture – both give way to the postmodern city which marks a return to culture, style and decoration, but within a confines of a 'nonplace space' in which traditional senses of culture are de-contextualized, simulated, reduplicated and continually renewed and restyled"<sup>2</sup>.

From an architectural point of view, a postmodern city is characterized by eclecticism and pluralism, characterized by a playful fusion of traditions and styles. Although postmodernism, according to Kumar (2005) postmodernism represents a "capitulation to kitsch and commercialism" (p. 129), it "seeks to break down modernist distinctions between 'high' and 'low' culture, 'elite' and 'mass' art", "(...) it accepts a diversity of 'taste cultures', whose needs it tries to meet by offering a plurality of styles"<sup>3</sup>.

The term "culture" has a wide range of meanings, so it is important to define it to avoid misunderstandings. According to Featherstone (1995), "the term 'culture' is often used to apply to the totality encompassing social and cultural life (...)" (p. 136). At the same time, he narrowed down the definition to the two main perceptions of culture: "culture as 'the process of the spiritual and intellectual development' of the person and culture as 'the products of artistic and intellectual practices'"<sup>4</sup>.

In brief, culture is a combination of elements within the general pattern of a socio-spatial organization.

Playfulness and a stylistic promiscuity that favors eclecticism and the mixing of codes-the second image of culture discussed by Featherstone (1995)-can easily be seen in the way some of the former production spaces are being revived and re-adapted to new uses.

A clear example of this tendency is the exhibition space of the former Giovanni Montemartini Thermolectric Center - the first public electricity plant in Rome, built in 1912, located in the former industrial area of Ostiense. The Centrale Montemartini houses part of the collection of Roman sculptures of the Capitoline Museums - a group of art and archaeological museums (Musei Capitolini) and exhibits them under the title "The Gods and the Machines"

The prevailing postindustrial (or post-modern) social and cultural dynamic is certainly reinforced by the variety of commodities and services appropriate to the contemporary, postindustrial urban lifestyle. In particular, the cultural sphere - a realm in which meanings and expressive ideas are foregrounded - is exploited the most. "The omnivorous cultural preferences of the new urban class of post-industrial professionals sit behind the development of "the city as an entertainment machine", generating a range of cultural amenities"<sup>5</sup>.

Figure2: Exhibition Giovanni Montemartini Thermolectric Center

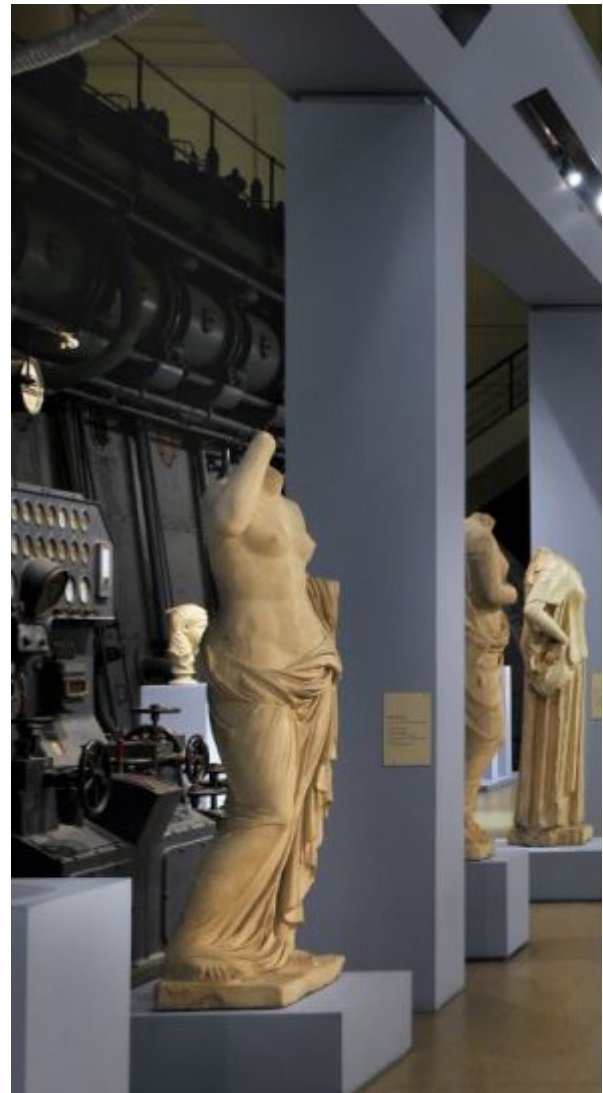


Image resource: <https://aia-study.com/students/program-and-activities/unl-interior-design-in-rome/>

Figure3: Exhibition Giovanni Montemartini Thermolectric Center



Image resource: <https://aia-study.com/students/program-and-activities/unl-interior-design-in-rome/>

In the fields of architecture and urban planning, especially in Western countries, the management of industrial heritage is now an integral part of urban planning and urban development processes. Popular forms of industrial heritage management-adaptive re-use and sustainable preservation-are postindustrial solutions to reuse abandoned industrial structures. These approaches also emphasize some of the trends identified in the postindustrial social structure - the increasing importance of an image and the shift away in emphasis from the production of goods to the production of experiences.

## 1.2.

### Haritage

Defining (and managing) the concept of cultural heritage is no easy task, especially because it is composed of complex and interrelated tangible and intangible attributes. In *The Economics of Cultural Policy* (2010), Throsby distinguishes three types of cultural heritage:

- Built or immovable heritage, such as buildings, monuments, sites or locations, including groups of buildings and sites



found in historic city centres;

- Moveable heritage, such as artworks, archives, artefacts, or other objects of cultural significance; and

- Intangible heritage, existing as works of music or literature handed down to us from the past, or as inherited practices, language, rituals, skills or traditional knowledge that communities and groups recognize as culturally important. (p. 106)

Various charters or guidelines, recommendations, resolutions, and declarations around the world aimed at protecting cultural property and managing architectural conservation and restoration define the scope and definition of heritage.

But why do we preserve? One of the main reasons is, first of all, collective memory. Preservation of the built environment is the physical equivalent of collective memory. We preserve out of a need and desire for a psychological connection to the past. Kevin Lynch explains that “..the past is known, familiar, a possession in which we may feel secure.”<sup>6</sup>. A connection to the past not only provides a sense of security, but also shows where we have come from, informs the present, and gives direction to the future.

Lynch argues that such a detached past “..moves people only momentarily, at a point remote from their vital concerns.”<sup>7</sup>. Instead, reminders of the past should be recent and personal resulting in stronger personal ties to the world around us. These reminders must change with the inhabitants in order to provide a humane environment with images “.. that celebrates

and enlarges the present while making connections with the past and future. The image must be flexible, consonant with external reality, and, above all, in tune with our own biological nature.”<sup>8</sup>.

In this context, German parliament house renovation project fits perfectly as a case study to understand the points of preserving the collective memory.

After the fall of the Berlin Wall, it was decided that the united German parliament should move back into the Reichstag. At that point, the Reichstag was just a pile of scrap metal due to the fire of 1933, the World War II and the Soviet occupation.

If one had desired, the Reichstag could have been restored to its original appearance. The dome could have been replaced, the bullet holes patched and the graffiti covered over. One could have forgotten the slate clean, forgetting the history of the last hundred years. If one wanted to remember the history, one could have put a commemorative plaque somewhere in the building.

Instead, a conscious decision was made to leave the scars of the past. The shell was cleaned and repaired to create a general appearance of order, but upon closer inspection, the wounds of the past are still visible. The bullet holes are still visible and a new, modern, transparent dome tops the building. Inside, the graffiti of Russian and German soldiers remains visible, a poignant reminder of the past. There is no need for a commemorative plaque; the building speaks for itself.<sup>9</sup> (Fig....)

Figur4: Reichstag, New German Parliament Fosters and Partners



Image resource: <https://architizer.com/projects/reichstag-new-german-parliament/>

Beside the collective memory and the accumulation of layers of culture and history, economy and ecology are the two notions of preservation under the greater context which is sustainability.

First notion, humans are part of the ecosystem and have always had and will always have a significant impact on it. The need to move from an exploitative approach to one that seeks to harmonize with natural processes is essential to long-term sustainability. The built environment can better respond to the natural environment if it works in concert with natural energy flows rather than functioning independently of them.

A holistic design approach considers a variety of aspects, from the materials used in construction to minimizing the building's impact on the site to the well-being of the occupants. Society must consider the total cost of manufacturing products or buildings.

In construction, this has implications for the choice of materials used. Issues of recyclability and the release of chemicals through off-gassing address the impact on current occupants and the impact on future generations. The idea of conserving material resources can be applied to the reuse of existing structures rather than new construction<sup>10</sup>.

Another aspect of the relationship between heritage and economy can be summarised into three main strategies, according to Graham, Ashwoth, and Tunbridge (2000);

First, heritage is itself an economic activity, an industry that commodifies past structures, associations, and cultural productivity in exchange for economic gain that can be measured in jobs, profits, or income.

Second, heritage sites can be treated as locations for economic activity and evaluated according to their ability to attract, host, or repel economic functions. Third, and most indirectly, heritage sites in various manifestations can be used to create and promote sense of place images for primarily economic purposes. ( pp. 156-157)

Second notion is the ecological aspect. Environmental sustainability is a fundamental issue in today's planning discussion. Although economic, social and cultural aspects have to be considered, the basic issue is ecological, because "(...) there will be little room for economic and social policies once the Earth has become uninhabitable"<sup>11</sup>.

Referring to Albers (2006), "sustainability means conserving resources, limiting consumption of nonrenewable energy, reducing detrimental influences upon the environment caused by sealing the ground through buildings and roads as well as by the production of noxious gases. This leads to the goal of limiting the expansion of settlements by satisfying new needs for buildings within the builtup area – by directing new uses to derelict industrial land, by densifying sparsely settled areas, by conversion of former military establishments" (p.62).

In addition, Albers (2006) refers to the preservation and reuse of existing buildings to conserve resources as "urban maintenance' (Stadterhaltung), pointing out that "urban maintenance' is an ecologically responsible treatment of the city and its durable values that reside in buildings and infrastructure, which does not indicate an antithesis to 'urban development.

### 1.3.

## Industrial Heritage

Industrial heritage and its preservation in the context of urban development. Industrial heritage is not only about identity and memory, traditions and workers' movements, but also about cities, locations and their transformations. Industrial heritage is not only a cultural heritage, but also a planning issue. The recognition and management of industrial heritage sites - protection, re-uses, or partial demolition - goes hand in hand with conflicts in planning practice.

Cultural institutions such as museums or events such as the European Capital of Culture are now used as tools to improve a city's image, enhance urban spaces and providing a vibrant urban environment. The concept of culture-led development refers to these approaches. Heritage and heritage sites have become assets for urban development, often referred to as heritage-led development.

Heritage conservation is based on the intrinsic values of material heritage-whether objects, buildings, or sites, their authentic-

ty and integrity must be preserved. Preservation therefore requires careful and minimal architectural intervention. However, urban development often uses architecture as a symbol of structural change, a new image, and urban brands. Cities use iconic architecture to promote themselves and attract both talent and investment.<sup>12</sup>

The transformation of the Zollverein Coal Mine industrial complex is perhaps one of the best examples of how the preservation or transformation of industrial facilities affects city image and its brand.

Zollverein coal mine is located in the city of Essen. It was declared a World Heritage Site in 2001 by UNESCO and is known as

known as the “most beautiful mine in the world.” The colliery was opened in 1932 and was one of the most famous symbols of German mining industry until its closure in 1986. Since the beginning of the IBA project, it has become one of the focal points of the “Route of Industrial Heritage”<sup>13</sup>. The complex extends over 100 hectares and consists of three parts: Shasf XII, Shafts 1/2/8 and Coking Plant.

Zollverein attracts a large number of tourists, according to some estimates about 1 500 000 visitors per year<sup>14</sup>. Once the largest colliery in Europe, it now combines culture, gastronomy, design, architecture, and arts and crafts. The buildings of the complex were built in the Bauhaus style<sup>15</sup>.



Figure5: Zollverien Coal Mine Complex

. The symbol of the whole complex is a winding tower at the entrance to the shaft XII.

The main attractions of the Zollverein complex include: the Ruhr Museum, the Portal of Industrial Heritage, the Zollverein Memorial Trail, the Palace of Projects (former salt warehouse, now a building with 16 rooms and 65 projects representing the utopias of our time), the Sun Wheel (solar-powered Ferris wheel that overlooks the entire Zollverein complex and the city of Essen), an installation that is both a swimming pool and a work of art, an ice skating rink, etc.

In 2010, the Metropole Ruhr was chosen as the European Capital of Culture alongside Istanbul in Turkey and Pecs in Hungary, which contributed to the number of tourists visiting Zollverein reaching a new high of 2.2 million<sup>16</sup>.

By preserving built infrastructure, a certain identity or character of a place is maintained, even if it is obviously changed to meet new demands. On the one hand, this understanding reinforces the value of sustainability, which, as Mieg and Töpfer (2013) point out, is important from the perspective of both innovation-oriented urban development and heritage conservation (cf. Petzet & Hassler, 1996). On the other hand, identity is an important factor for (urban) innovation and of particular importance for urban development in terms of attracting cultural and creative industries<sup>17</sup>.

Image resource: Jochen Tack / Zollverein Foundation  
<https://visitworldheritage.com/en/eu/zollverein-coal-mine-industrial-complex-germany/b0b631c5-ea55-4717-9141-dcf745ee052d>

## 1.4.

### Adaptive Re-use

*Cities need old buildings so badly it is probably impossible for vigorous streets and districts to grow without them. By old buildings I mean not museum-piece old buildings, not old buildings in an excellent and expensive state of rehabilitation—although these make fine ingredients—but also a good lot of plain, ordinary, low-value old buildings, including some rundown old buildings.*

*The Death and Life of Great American Cities, Jane Jacobs*

Adaptive reuse is the act of finding a new use for a building. It is often described as a “process by which structurally sound older buildings are developed for economically viable new uses.”<sup>18</sup> The recycling of buildings has long been an important and effective historic preservation tool. It initially developed as a method of protecting historically significant buildings from demolition.<sup>19</sup>

The Urban Land Institute defines rehabilitation as “a variety of repairs or alterations to an existing building that allow it to be used for contemporary purposes while preserving the features of the past.”<sup>20</sup> Adaptive reuse is the term used to describe the process of rehabilitating a building. Adaptive reuse is often referred to as adaptive use, indicating the redundancy of the term “reuse.”

Adaptive reuse came into common usage among architects in the 1960s and 1970s as concern for the environment increased. During this time, environmental concerns were growing and fuel and material costs were extremely high.<sup>8</sup> The prohibitive costs and associated difficulties in obtaining building permits led adaptive reuse to become a viable alternative to new construction and land clearing as part of urban renewal.

Preserving these industrial icons is an important part of maintaining the historic industrial character of a community. Industrial practices have changed so dramatically over the last century that different regions have played prominent roles at different times, and today only a few regions dominate as industry has shifted around the world. The industrial complexes and buildings are architecturally impressive, both for their size and their understated decoration. They were built with practicality in mind - production, efficiency, and sometimes employee safety. While the factories designed by Frank Lloyd Wright, Walter Gropius, and Albert Kahn may be exceptions, the factories of the 19th century, designed and built by

craftsmen, are the ones most in need of protection and new life. Because of their lack of famous associations and their functional design, many industrial buildings have been historically ignored, unlike country houses, castles, and palaces, which early preservationists valued for their associations with famous people.

When factory architecture is saved, it is from a belief in its potential for transformation or in its rich architectural fabric. The anonymous lives of the thousands of workers who were subjected to the harsh working conditions in the factory are rarely appreciated.

The social benefits of adaptive reuse include connecting to the past and revitalizing a neighborhood. Rather than trying to fix a neighborhood's problems by tearing down buildings, there has been a recognition that existing buildings make up a neighborhood's “sense of place.”

Thus, the question “What was this building?” and “What could become of this building?” leads to reuse that does not obscure the building's past.<sup>21</sup> The redevelopment of old urban industrial neighborhoods or structures is an issue at the forefront of contemporary urban development around the world.





# **CHAPTER 2.**

## **MILAN**

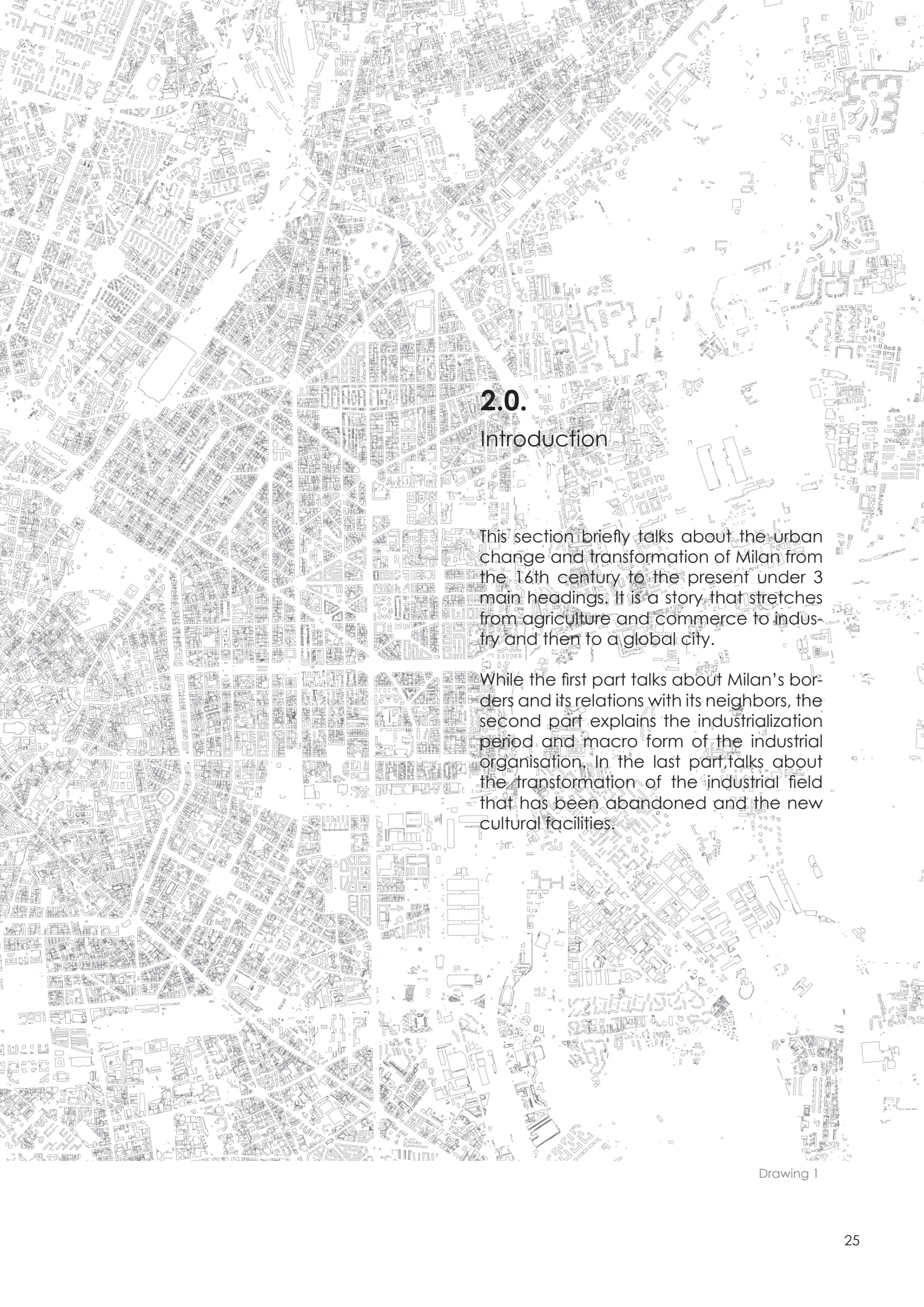
**2.0.**  
Introduction

**2.1.**  
Corpi Santi Milan

**2.2.**  
Industrial Milan

**2.3.**  
De-Industrial Milan





## 2.0. Introduction

This section briefly talks about the urban change and transformation of Milan from the 16th century to the present under 3 main headings. It is a story that stretches from agriculture and commerce to industry and then to a global city.

While the first part talks about Milan's borders and its relations with its neighbors, the second part explains the industrialization period and macro form of the industrial organisation. In the last part, talks about the transformation of the industrial field that has been abandoned and the new cultural facilities.

I confini del Comune di Milano dopo l'aggregazione dei Corpi Santi (8 giugno 1873).

Figure6: Milano City Plan, 1931

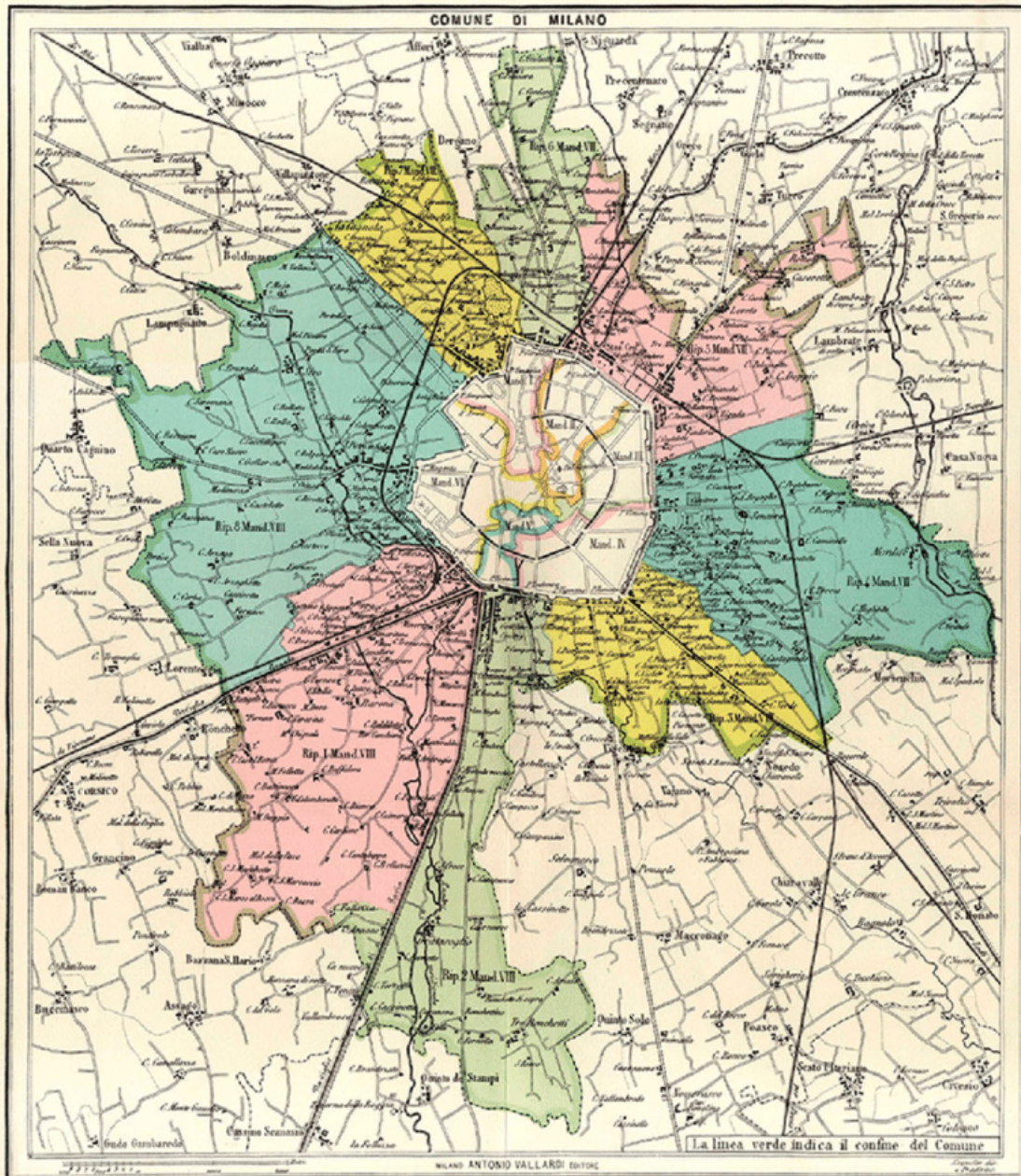


Image source: Civiche Raccolte Grafiche e Fotografiche del Comune di Milano [Municipality of Milan, Historical Photographs and Prints Collections], 1931

## 2.1.

### Corpi Santi Milan

The evolution of the city's form and structure can be seen as an almost organic process, with the pattern of urban expansion determined by long-term factors. Milan, in fact, developed radially and in the early modern period consisted of three distinct zones: a "hypercenter" within the "cerchia dei navigli", a second "belt" between the "navigli" and the 16th century Spanish walls, and a third "belt" between the "navigli" and the so-called Corpi santi.

The largest part of the city, both in terms of population and property, was located on the 264 hectares inside the "cerchia dei navigli". At the beginning of the 19th century, three quarters of the buildings and two thirds of the inhabitants of Milan were located in this area. Between the "cerchia" and the "bastioni", the Spanish walls built between 1548 and 1560, there were about 560 hectares. These walls created for the first time a clear separation between the city and the suburbs. This area had numerous green areas adjacent to built-up areas, mainly around the radial highways leading to the six main gates of the city<sup>22</sup>.

Finally, outside the walls were the Corpi santi, an area of about 63 square kilometres within a "ring of about two miles" around the city. Here there were fairly densely populated residential groups next to scattered houses that were obviously rural in character. These detached houses included dozens of farms, and most of them belonged either to the city's landed gentry, monasteries, or charities. This remote area was inevitably a point of contact between different economic realities and fulfilled a number of functions due to its diverse regulations<sup>23</sup>.

The law of July 24, 1802 strengthened the existing independence of the Corpi santi, making it an autonomous municipality of the first rank. For the first time, Milan was deprived of the fiscal contribution of the entire provincial territory, and with it the traditional supremacy of the city over the surrounding countryside was also lost. This, of course, did not please the city authorities, who immediately proposed to incorporate the Corpi santi into the city.

In the 1870s, Milan's determined expansion could no longer tolerate the autonomy of the Corpi santi. It became an insurmountable obstacle to effective planning of the city's territorial development, as more and more important services - from railroad stations to cemeteries and gasometers - were located outside Milan's urban area and were under a different administration. Then, in 1873, the provincial capital managed to force the amalgamation by means of a decree that allowed the merger of two municipalities without mutual consent<sup>24</sup>.



Drawing 2: industrial zones in milan 1953  
Image resource: centro studi archivio cartografico

## 2.2.

### Industrial Milan

The Corpi santi not only experienced dynamic demographic change, but also had to deal with radical economic changes as their traditional dependence on agriculture dwindled and was replaced by major industrial plants. For centuries, the outer ring had been an important area for supplying food to the walled city, as proximity brought the advantage of lower transportation costs.

In the nineteenth century, and especially in the second half of that century, the manufacturing industry gained importance in terms of the overall industrial growth of the Milan area. This was accompanied, as we have seen, by an unprecedented demographic expansion of the Corpi santi. From 1840, when most of the production was still located within the city walls<sup>25</sup>, the situation changed rapidly. Carlo Cattaneo noted that in the early 1860s only a small part of the population of the outer ring was actually engaged in agriculture, while the majority depended on “the great carts, shipping, railroads, large workshops for metals, machinery, porcelain, gas, oils, tallow candles, fertilizers, chemicals, and trade in cheese, cattle, grain, wine, lime, bricks, stone, lumber, peat, and other fossil fuels”<sup>26</sup>.

Later, the industrial presence in the former Corpi santi continued to increase, especially as far as larger industrial plants were concerned, since the available land within the walled city was rapidly dwindling and becoming increasingly costly. The development of the new industrial sites was largely determined by the construction of the railroads, which redrew the map of industrial locations starting in the 1840s. It was the lowland cities that offered the easiest logistical access to this revolutionary new means of transportation. Even in the case of Milan, industries were no longer scattered randomly over the territory, but were located around the railroad lines and stations.

The overall result was the consolidation of three development paths within the city, which quickly led to a redrawing of the map of industrial Milan. The first, oriented to the northeast, saw on the outskirts of the city and towards Sesto San Giovanni a large concentration of iron and steel works and mechanical industries, centered on the plants of Breda (1904) and Falck (1906) and flanked by companies working on the technological frontier, such as Pirelli and Ercole Marelli.

The second axis of development, along the northwestern line towards Gallarate and Varese, is the area where the mechanical-textile industry predominated, especially the cotton industry. The third axis, north towards Bovisa and Dergano, became the main settlement area for the developing chemical industry, where the Montecatini factory, among others, was located<sup>27</sup>.



Drawing3: Natural Open Space, 2012  
Image resource: Citta Metropolitana di Milano, Parco Agricolo Sud Milano

It was precisely during this phase at the turn of the century that the foundations were laid for greater industrial and demographic growth in the outer ring to the north of the city. This process was reinforced immediately after the First World War, when Milan's railroad lines were reorganised with the construction of a new central station. The functional balance between the centre and the outer districts entered a crisis, as development outside the city drastically affected the population inside the Spanish city walls.

A new era began in which the final demolition of the bastions removed the last physical evidence of a barrier or dichotomy between the inner and outer zones, or even of the existence of two distinct zones. Milan, which was on its way to becoming a metropolis and had overcome the turbulence of the earlier phases of growth to absorb the *Corpi santi*, was now ready to engulf even cities that had been peaceful land oases only a few decades before. This happened in 1923, when no less than twelve localities became part of the city (Affori, Baggio, Chiaravalle, Crescenzago, Gorla, Greco, Lambrate, Musocco, Niguarda, Precotto, Trenno, Vigentino). This affected a total of about 105,000 inhabitants<sup>28</sup>.

Thus, in the period between the two wars, the north of the city was clearly defined. It was an increasingly urbanised and industrialised area (eight of the twelve towns incorporated in 1923 were in the north), in marked contrast to the southern zone, where traditional agricultural activity was reinforced rather than replaced and

where the settlement pattern was much more irregular.

## 2.3.

### De-industrial Milan

Since the early 1970s, Milan has experienced further radical demographic, economic and social changes, beginning with a steady decline in population. This profound change in demography and ethnic diversity was accompanied by an even more significant change in the socio-professional sphere. This was the result of the overwhelming transformation of the local economy into a service economy and the rapid decline in the number of industrial workers. This revolution took place rapidly and changed not only the inhabitants but also the organic structure of the city. While the rapid deindustrialization process destroyed tens of thousands of jobs, it also led to the rededication of some seven million square metres of land previously occupied by industries of all sizes.

Abandoned industrial sites are the clearest signs of the transformations and economic, social and functional changes of a city. Many industrial buildings in major European cities were abandoned due to the economic crisis that hit the mechanical and manufacturing industries in the



Drawing4: Industrial to cultural transformation map 2018  
Image resource: VVPR Master of architecture thesis Polimi, October 2018



late 1970s. Other large production sites in urban areas have been closed because the increasingly rapid and efficient handling of goods has meant that these areas are no longer strategically suitable for production and are no longer connected to the highway and logistics network<sup>29</sup>.

The presence of these large abandoned areas within the city is also due to the constant change of urban areas, which is a consequence of the complex historical, economic, social and political processes that characterize the relationship between each human group and the inhabited territory. As cities evolve and change form, often incorporating areas previously separated from the residential environment, the changes affect the morphological characteristics of human flows, the distribution of goods and services, and, not least, the functions and value of spaces within the urban structure<sup>30</sup>.

From the mid-1970s onward, Milan experienced a gradual decentralization of the large manufacturing plants that had previously been located within the urban structure. This phenomenon led to the emergence of wide abandoned areas located in the northeast and northwest of the city, to which is added a belt of medium-large abandoned areas in the area southeast of the center along the disused railroad tracks. In addition, there are many individual cases of small and medium-sized abandoned areas scattered throughout the urban structure, characterized by completely different after-use dynamics and processes. In the mid-1990s, the total abandoned industrial area was estimated at about 6 million square meters<sup>31</sup>.

These areas, located within the city of Milan, stood empty for a long time, "disconnected," without functions or connections with the historic city and sharing the common characteristic of lacking regulation and order. They appeared as spaces outside the city, areas of "exclusion" and "separation" that sometimes played the separation and isolation of one part of the city from another<sup>32</sup>.

However, the last decade of the 20th century and the first decade of the 2000s were characterized by a multitude of redevelopment and reuse projects as Milan's urban economy transitioned from the production of goods to the provision of modern services. A new urban plan adopted by the Milan City Council in 2012, in which entire neighborhoods were earmarked for renovation, provided an important incentive for construction investment and led to large-scale real estate projects, most of which were financed with private capital<sup>33</sup>.

However, the way in which these actions were carried out varied and depended on the size and location of the areas that were the subject of the actions, on the planning goals that supported the redevelopment, and also on the physical condition of the structures located in these areas. The values of these zones were diverse and often greater than the economic value of the land itself: They were also "remnants" of the long process of transformation of the city and physical elements of change, and thus permanent symbols of the continuous evolution of urban space<sup>34</sup>.



# **CHAPTER 3.**

## **EX-MACELLO PROJECT SITE**

**3.0.**  
Introduction

**3.1.**  
Ex-Macello

**3.2.**  
Urban Context

**3.3.**  
Existing Situation



### 3.0. Introduction

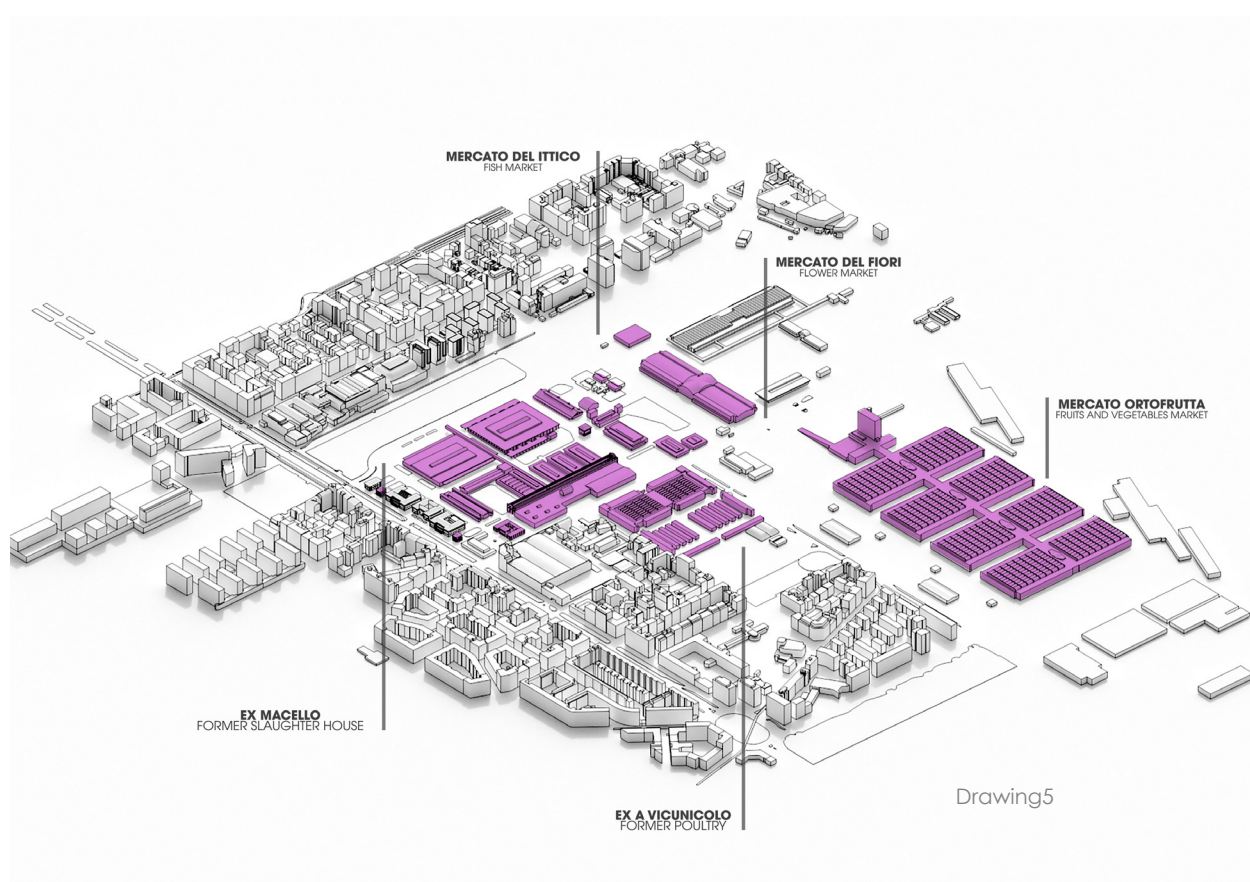
This section discusses the detailed analysis and history of the industrial area where the design proposal is located. It begins with a brief history of Ex-Macello. It then details its place in the urban context. Analyzes the infrastructure and superstructure systems to which it is connected. This section, which includes the parameters that will directly affect the design process, finally gives information about the building systems, materials and scales of the buildings in Ex-Macello.

Figure7 : Satellite view of Ex-Macello Image source: googlemaps

### 3.1.

#### Ex-Macello

In ancient times, meat was a prized food, families who could afford to go to the butcher and buy meat was a luxury reserved for a few wealthy people. Over the years, things have changed and Milan has become one of the most important centers for trade, either because of its geographical position, or because of the "entrepreneurial" spirit of the Milanese, the city has become a point of reference for selling and to buy goods and products, including meat, which was the most coveted and sold.



Since the Middle Ages the development of the city has passed through trade, which has been made prolific by the happy position of the town, located in the middle of a plain, at the intersection of various roads, and therefore a nerve center and obligatory crossing for those wishing to buy, or selling goods and meat was one of the best-selling products<sup>35</sup>.

The continuous increase in sales, the constant demand for the product and the search for greater safety from the health point of view, led to the birth in 1863 of the first Milanese municipal slaughterhouse located between via Calco and via Olona. A structure that in terms of themes was one of the most avant-garde places in all of Europe<sup>36</sup>.

Outside the Spanish walls, right next to the slaughterhouse, in the current Parco Solari there was the so-called "Scalo del Bestiame" : here the meats arrived via the railway, were introduced into the slaughterhouse by way of a corridor created in the walls themselves.

In 1929 the slaughterhouse was moved to Viale Molise 62 , where today all the abandoned buildings remain. At the beginning, live animals were sold and in fact it was called the Livestock Market, then the sale of only slaughtered cattle was passed with the change of the name in the Meat Market: cattle, horses and sheep were slaughtered, with attention also to techniques of slaughter related to various religions.<sup>37</sup>

The construction took place between 1912 and 1914 by Giannino Ferrini and Giovanni Filippini, engineers of the municipal technical office. A "ration city" was created in the heart of Milan, in fact the fruit and vegetable market (today Largo Marinai d'Italia), the fish and poultry market and the Milanese refrigerators were established in the surrounding area.<sup>38</sup>

Thanks to the increase in industrialization and advanced technology, and in 2005 dismantling operations ceased. Since then, what remains of it is an immense infrastructure in a state of total abandonment and the use of some areas for summer concerts , the occupation by Macao of an Art Nouveau building, to restore luster and importance to an area is of little use.

After many years, in the name of the redevelopment of the area, a group called C40 (a group made up of 97 world megacities, including Milan) launches "Reinventing Cities" and presents the project that outlines the future of the former slaughterhouse space. A very ambitious project on the whole area that includes 15 hectares of abandoned buildings, with the aim of creating a cultural and residential center for over 15,000 people between families and students. An investment of 500 million euros to transform a run-down area into a place of culture and events inside a green lung.<sup>39</sup>

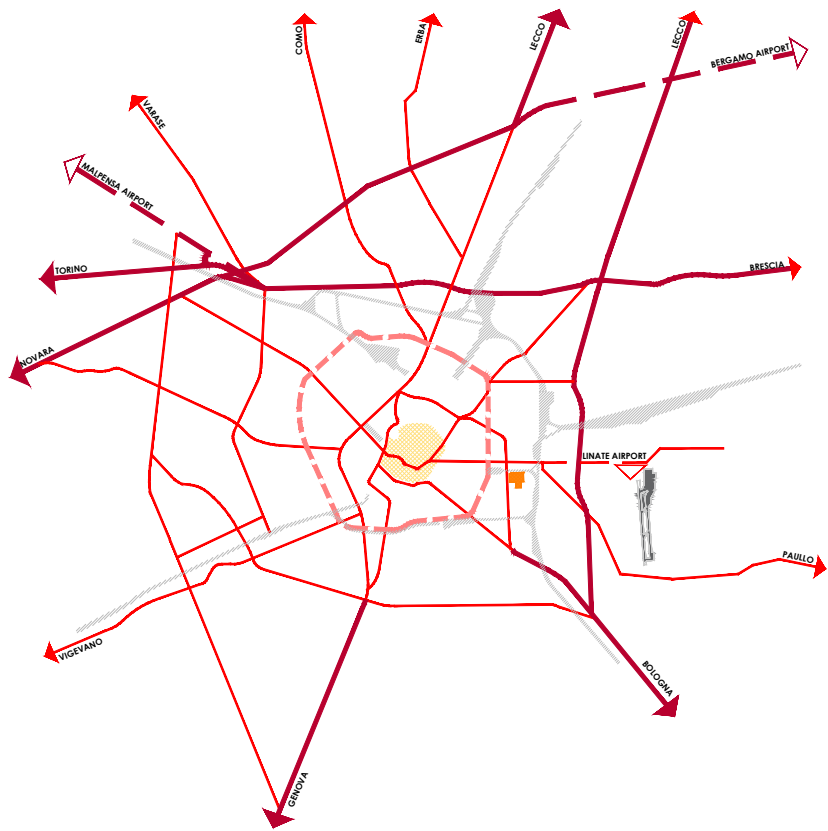
## 3.2.

### Urban Context and Analysis

#### City Structure

The wall that defined the boundaries of the city in its time has turned into a ring where all the roads connecting the Milan city to the Milan metropolitan area meet. We can say that the city wall has been replaced by the railway lines today and the stations on this railway lines are the new gates of city of Milan. Porta Romana is one of them. IEx macello complex has a huge potential after its transformation to mark this city gate, like Piazza Gae Aulenti in Garibaldi station

Drawing6









## Main Connections

Ex-Macello complex located eastern part of the city in a neighborhood called Calvatire. The strategic location of the area is clearly showed on the diagram above. In macro form of Milan the area can be seen as a bridge between the outer city and the center. It has connections to railway, highway, main city boulevard and Linate airport which makes sense since this complex used to be the one of the biggest infrastructure of Milan .

Drawing7

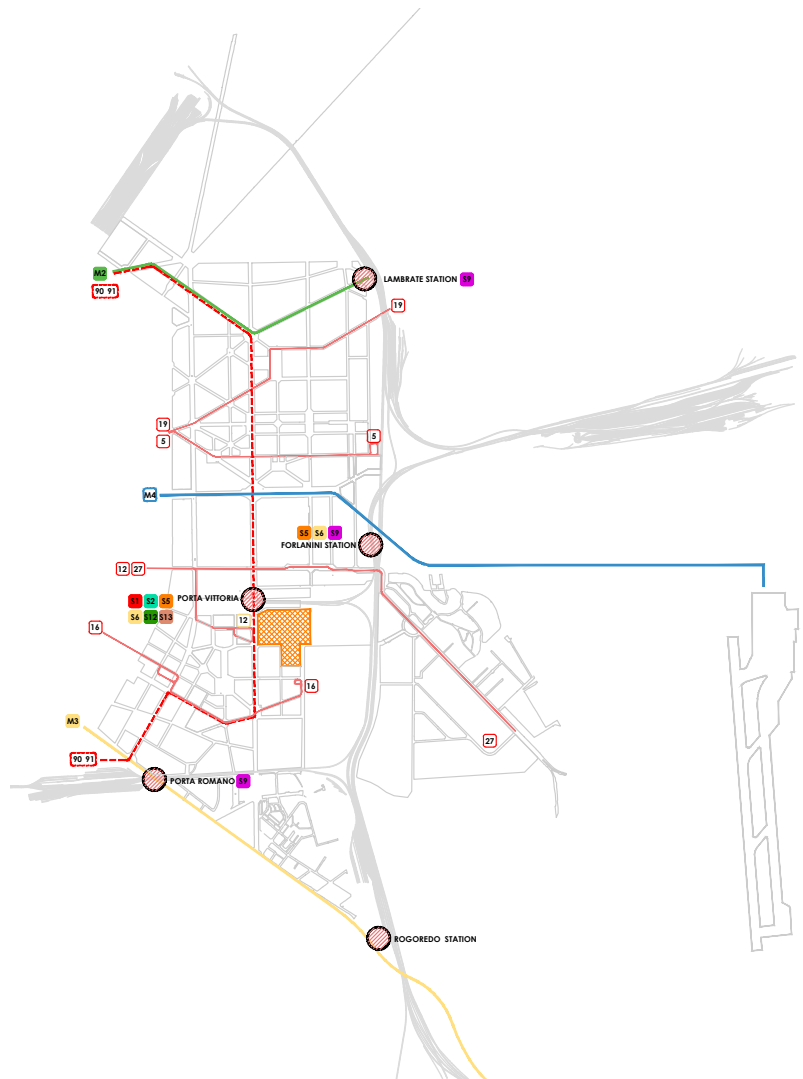
- - - BIKE ROADS
- MAIN CONNECTIONS
- MAIN AXIS
- = HIGHWAY
- PROJECT SITE

-  TRAIN STATIONS
-  CIRCOLARE 90 - 91
-  TRAM
-  PROJECT SITE

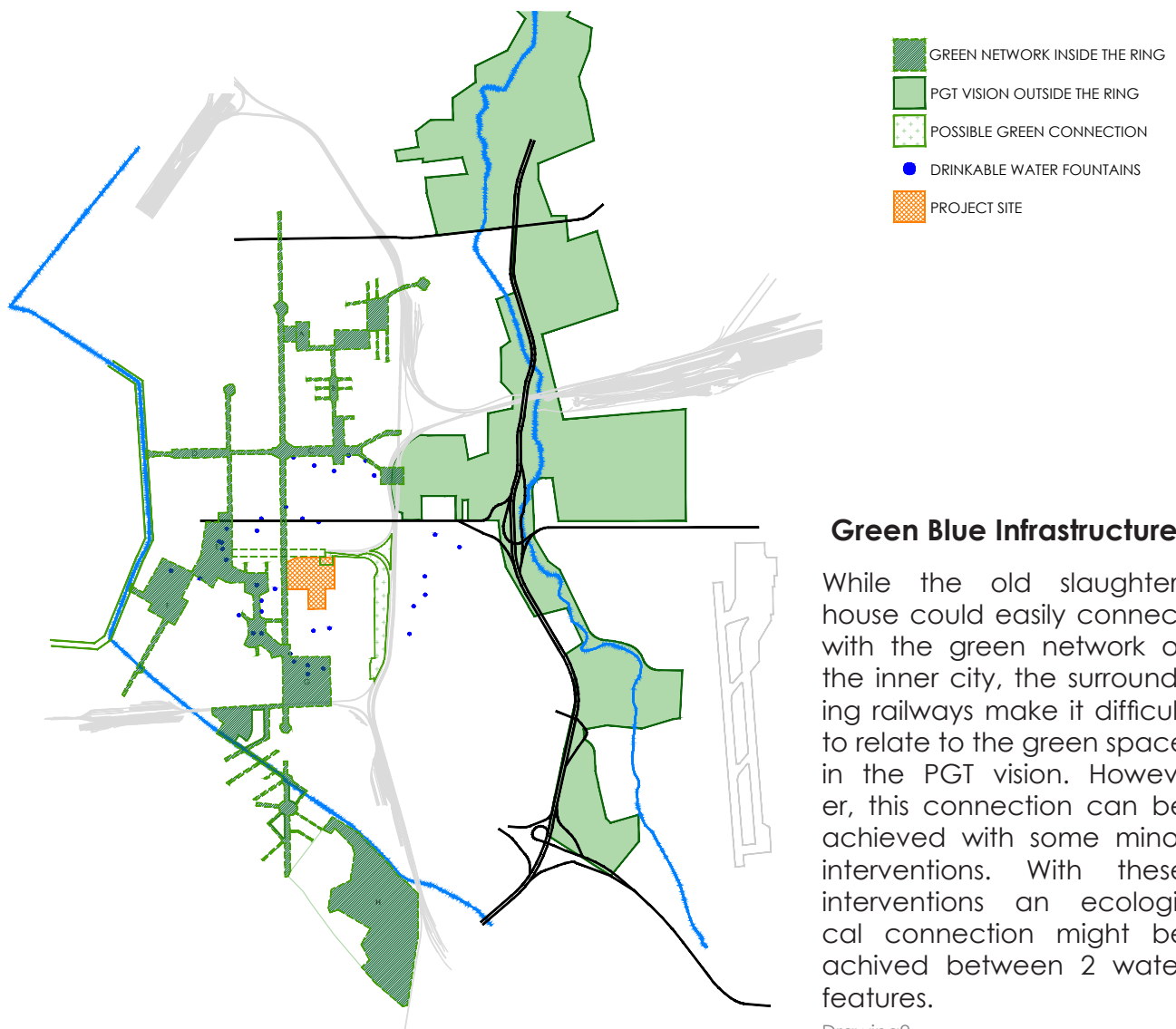
## Public Transportation

Ex Macello area is located on the edge of the city. However it is linked with city center and milano metropolitan area by numerous public transportation options, the highway and even the airport

Drawing8







### Green Blue Infrastructure

While the old slaughterhouse could easily connect with the green network of the inner city, the surrounding railways make it difficult to relate to the green space in the PGT vision. However, this connection can be achieved with some minor interventions. With these interventions an ecological connection might be achieved between 2 water features.

Drawing9

## Site Surrounding Analysis

### Landuse and Soft Scape

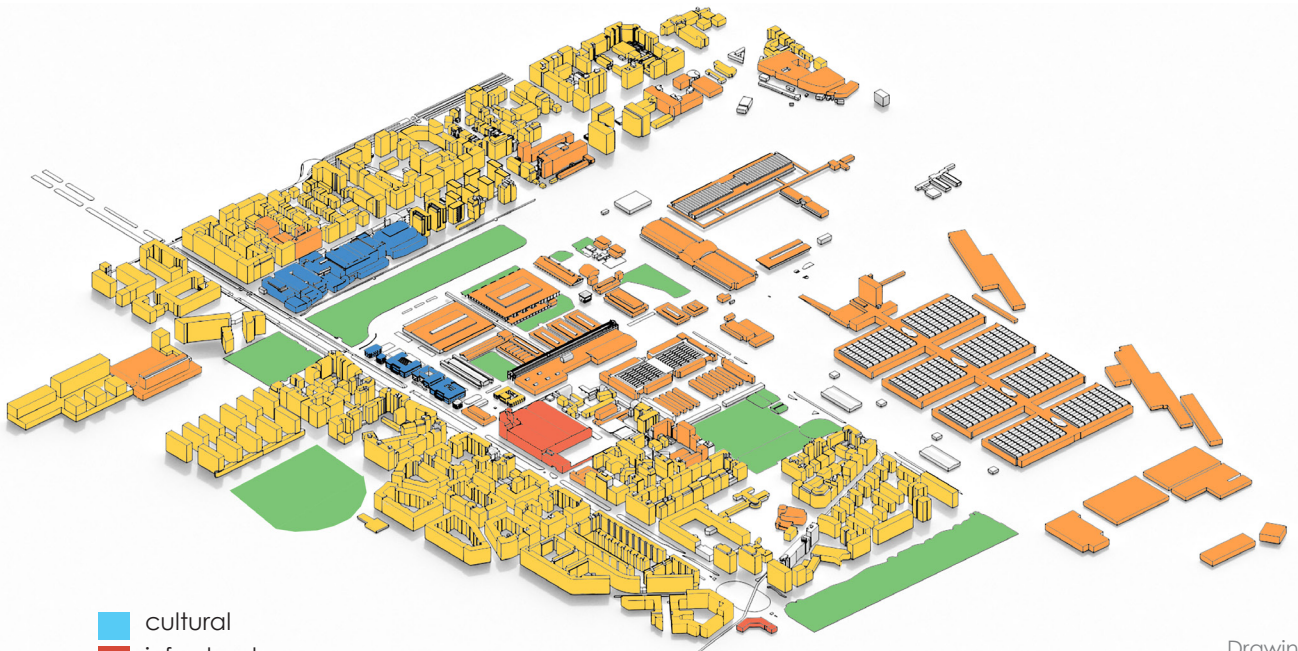
Looking at this analysis, it seems that the footprint of industrial and residential buildings is almost the same. Although they are the same in area, they cannot be compared in terms of density. This may cause the area to overheat during the day and security problems at night.

Examining industrial buildings is an important point to understand the movement in the immediate vicinity of the project area. The programs, working rhythms and morphology of these buildings are the main categories studied. In addition, while re-functionalizing the buildings in the project area, understanding the typology of these structures was another important step.

Last building cluster in landuse analysis is cultural buildings, As it indicated by electric blue, small one which is creating the Via Molise facade of ExMacello is accommodating the free artist collective called Macao. However, while I am writing these letters, the city council is busy to kicking out them and killing the collective memory of the space and neighbourhood. Second cluster which is located on the north side of the Ex Macello complex are organised by private sector and accommodates some exhibition and co working spaces. It is one of the hottest spots during the fashion and design weeks in Milan.

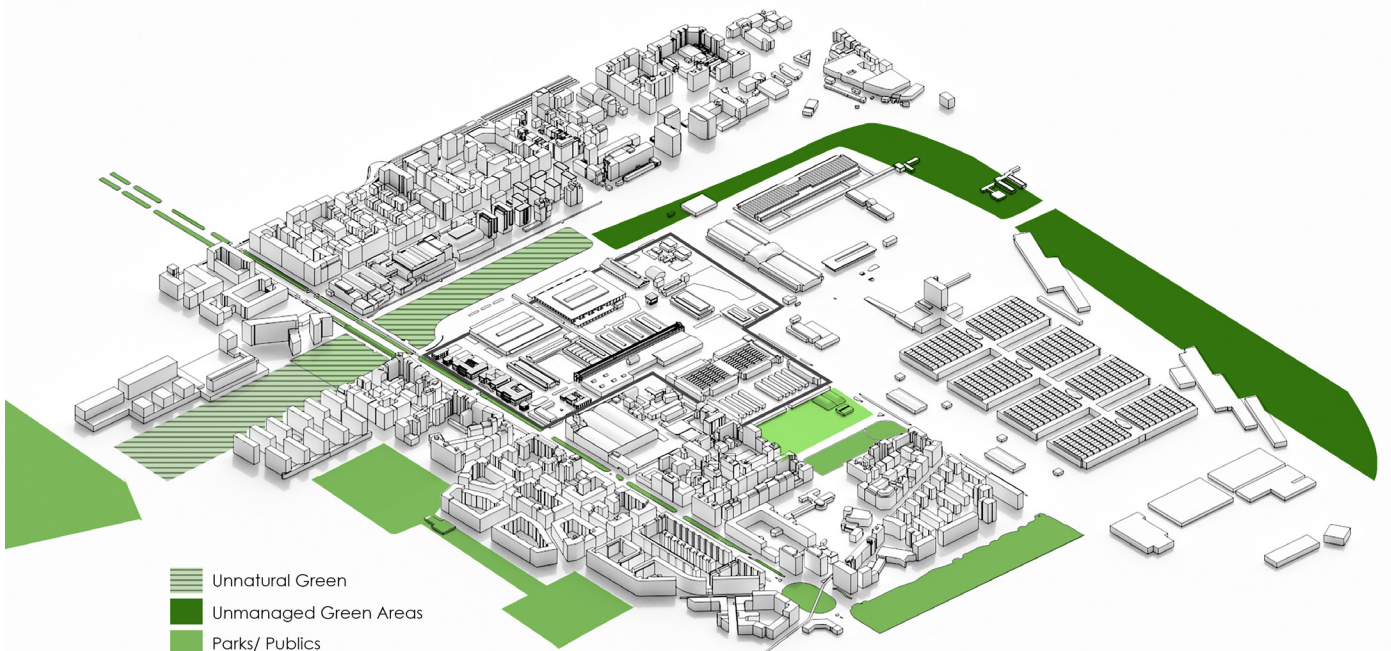
of the space and neighbourhood. Second cluster which is located on the north side of the Ex Macello complex are organised by private sector and accommodates some exhibition and co working spaces. It is one of the hottest spots during the fashion and design weeks in Milan.

In large-scale analysis, green areas were gathered under one roof. In this analysis, the types of green areas around the project area and what kind of connections they can provide are examined.



- cultural
- infrastructure
- residential

Drawing10



- ▨ Unnatural Green
- Unmanaged Green Areas
- Parks/ Publics
- Sport Facility

Drawing11

## Site Analysis

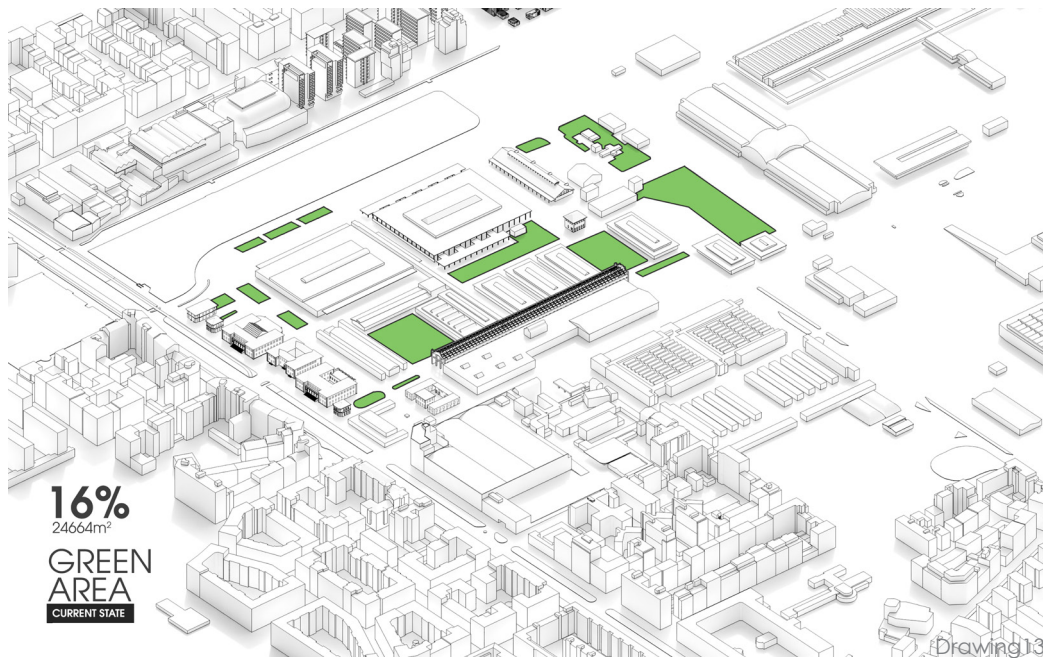
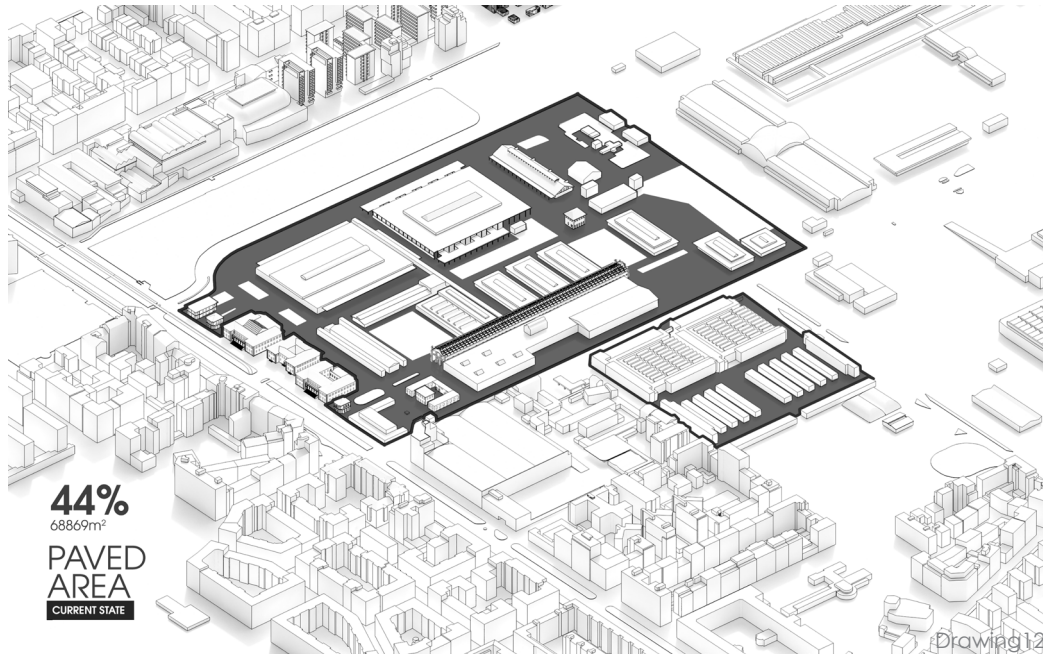
possible, both in terms of functionality and sustainability. Inside the project area 6 buildings are listed and the rest can be demolished. To secure the collective memory of the place, selecting process to demolish buildings must be handled carefully and pragmatically. In order to increase the open space ratio and quality some of the existing structures demolished and replaced by new extensions or green/open public spaces.

### Hard Scape and Soft Scape

Fragmented green areas make up 16 percent of the project area (Fig13). Since the complex is abandoned more than a decade each of these green plots accommodates wild urban flora. This is the movement that preservation of an industrial area is not only about the structures, also the landscape. However, in order to create a sustainable ecosystem these fragmented areas must be linked each other. While protecting the existing green, this continuous green landscape becomes a place for animal and humans. It decreases the temperature and helps rain water collection.

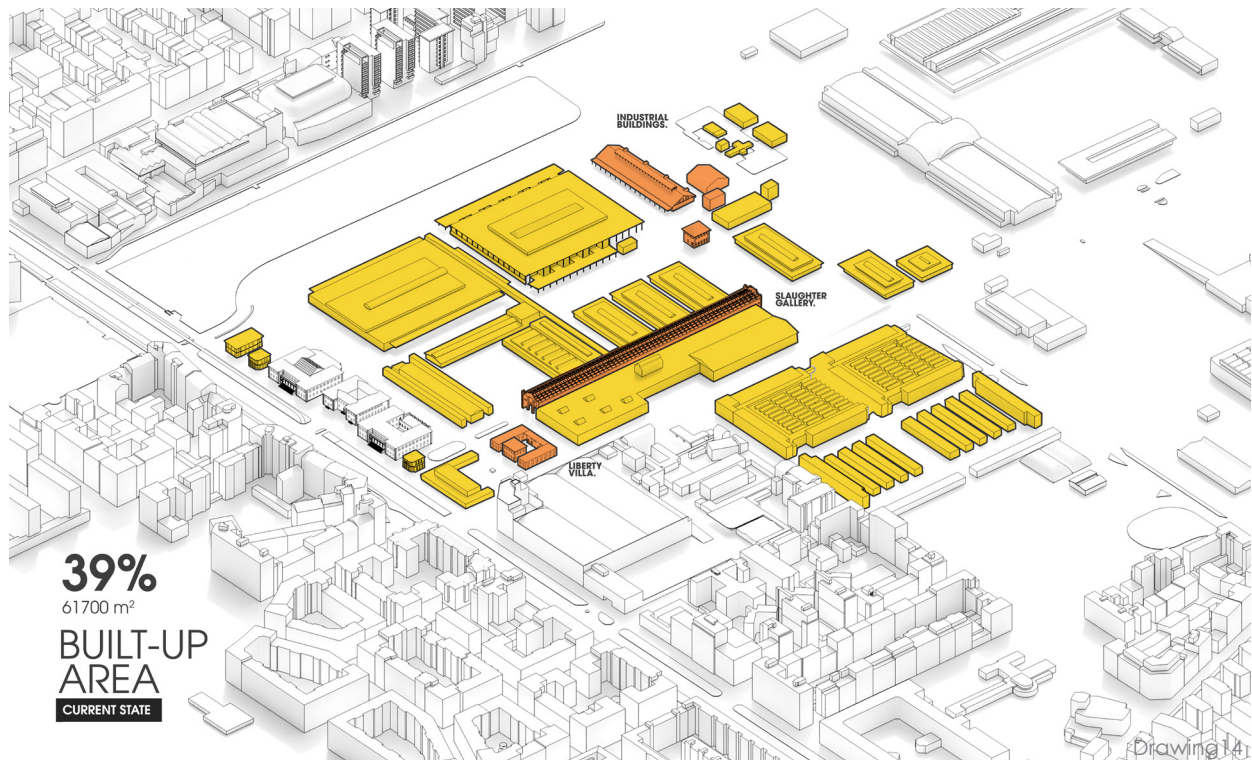
The paved ground constitutes 44 percent of the project area which is visible on the diagram (Fig12). To reach the continuous green landscape the paved areas must be minimized. Since vehicle traffic will be used only for services of new function, the whole paved area can be replaced by permeable surface materials.

It was decided that the existing building stock should be preserved as much as



### 3.3.

#### Existing Situation



#### Functional Schema and Structural Element of Buildings

The area crossed by the Milan-Rogoredo railway is divided into two portions, so as to set aside the western sector of the railway line that is about 165,000 square meters to the “first execution project” in which gives availability for the eastern side that is about 140,000 square meters for the subsequent expansions. The project area is in sequence longitudinally into two different areas. One is the Market with the railway station to the north and the other is

the Slaughterhouse to the south. The fabric for general services are placed along Viale Molise, where in the large square is planned. In front of the entrance,<sup>40</sup>

the greenery should have satisfied the principle of Vorwärtsbewegung (forward movement) driven by the German plants, according to which “the animals from the point of arrival, which is the stopover, must proceed [...] up to ‘last destination represented by the refrigerator by the most direct or shortest way, without returns or tortuous turns and without promiscuity”<sup>41</sup>.

Strictly on the principle of Vorwärtsbewegung, the final project envisaged an expenditure of 8,500,000 lire for the “first execution works” and the completion of the works by the end of 1917, with the arrangement of the buildings corresponding to the different phases of the matting process. The marshaling yard was to occupy an area of 22,700 square meters on the northern boundary of the site and include a wagon takeover bund, an unloading bund and a cleaning and disinfection bund. The outermost docks provided for underpasses to prevent animals from crossing the tracks.

The lower area contained the livestock market, which covered 43,200 square feet. This included a huge gallery for the exhibition of livestock, equivalent to 8,800 square meters, and there were several stalls for resting and staying out and also a shed for the carts of the businessmen. The barn level with the exhibition gallery had to have a similar structural framework to allow for future expansion of the gallery and to ensure the relocation of the stables to the vacated area beyond the railroad line. The slaughterhouse, with a total area of 70,000 square feet, was located in the southern portion of the building and was separated from the small houses by a curtain wall. This area originally included five slaughter tunnels (1 for pigs, 3 for cattle and sheep, 1 for horses) connected to a manure pile and tripe and linked to refrigerated department 21 by a covered connecting road. The latter was finally located on the southern boundary of the property overlooking the new Via Cesare Lombroso, which was just opened in view

of the requirements of the new plant. On Viale Molise, where the separate entrances to the market and the slaughterhouse were located, the administrative and management services (now united), the health offices and the livestock exchange were located, housed in three different but interconnected buildings.

The 1914 project had established the planimetric organization of the whole complex, contemplating the possibility of future extensions to make the system adequate to meet the needs of a city of two million inhabitants<sup>42</sup>.

### First Lot,

relating to the general services overlooking Viale Molise, was started in October 1914 together with the approval of the project and was contracted out to the Lavoranti Muratori Cooperative. Based on the design drawings by Giovanni Filippini, two porters were provided here

Figure8: Via Molise Street view



Image resource: <https://blog.urbanfile.org/2019/12/09/milano-calvairate-lex-macello-di-viale-molise-una-citta-in-abbandono/>

at the entrances, with living quarters for the custodians, two identical two-storey buildings on the façade but with different internal articulations (one for the livestock exchange, the another for the health offices) and a building slightly set back from the road, intended for administration services.

the Borsa building stands out for the entrance loggia with a large portico (also re-proposed in the health offices) and for the vast trading room, which has a perimeter loggia and is illuminated by a large skylight in the center of the flat ceiling. While the façade on viale Molise highlights the use of decorative moldings in Liberty style, including the faux ashlar base, the coupled windows on the upper floor, the bands of colored ceramic tiles in frieze on the windows and the ornamental details with a floral imprint<sup>43</sup>.

## Second Lot

Mercato and Scalo cattle, were resumed in 1924 and finished four years later, for a total cost of 11,500,000 lire. Many different buildings were constructed partly in load-bearing masonry (especially the pavilions of the cattle market) and partly in reinforced concrete. In the foremost place, at the level of the entrance on Viale Molise, the exhibition hall for the sale of adult livestock was built (with an area of 8,700 square meters and space for about 2,000 large heads), originally with a massive tower structure in the center of the facade. The building was divided into bays of different heights, interspersed with pillars, covered by a slab supported by lattice beams in reinforced concrete,

and was illuminated by zenith. The interior was paved with ceramic tiles of stone-ware and equipped with sturdy iron pipe bars to hold the cattle. A similar structure was the adjacent horse stable, built in anticipation of future expansions.



Figure9: Pavilion of horse market  
Image resource: <https://blog.urbanfile.org/2019/12/09/milano-calvairate-lex-macello-di-viale-molise-una-citta-in-abbandono/>



Figure10: Pavilion of cattle market  
Image resource: <https://www.c40reinventingcities.org/en/professionals/winning-projects/ex-macello-1370.html>





Figure11: Slaughter tunnel  
 Image resource: <https://blog.urbanfile.org/2019/12/09/milano-calvairste-lex-macello-di-viale-molise-una-citta-in-abbandono/>



Figure12: Butcher market  
 Image source: Author

### Third Lot

The third lot, relating to the slaughterhouse, was begun in 1925 and completed at the end of 1929 under the direction of engineer Antonio Cecchi, who had replaced Filippini since March 1929. By this time, six slaughter tunnels had been built (1 for large cattle, 1 for calves, 2 with mixed system for large cattle, calves and sheep, 1 for pigs and 1 for horses), four of which were arranged in a comb shape in relation to the covered road facing the entrance, which guaranteed easy transport of the meat to the cooling department (agricultural and exhibition hall). The slaughter tunnels, built with a reinforced concrete structure and a concrete roof, were directly connected to the pavilions, allowing the collection and sorting of the by-products (casings, tripe, etc.), and were also equipped with overhead conveyors for the transport of the slaughtered meat.

The covered road, 15 meters wide, had a mixed structure with metal trusses supporting the roof made of wooden panels and glass plates. Behind the covered road was erected the building that housed the meat market, the thermal power plant and the cold store, which, in relation to the number of butchers working, had about 600 people (meat market)<sup>44</sup>.

# CHAPTER 4.

## DESIGN PROPOSAL

4.1.  
Main Strategy and Masterplan

4.2.  
Public Spaces

4.3.  
Tre Zoni

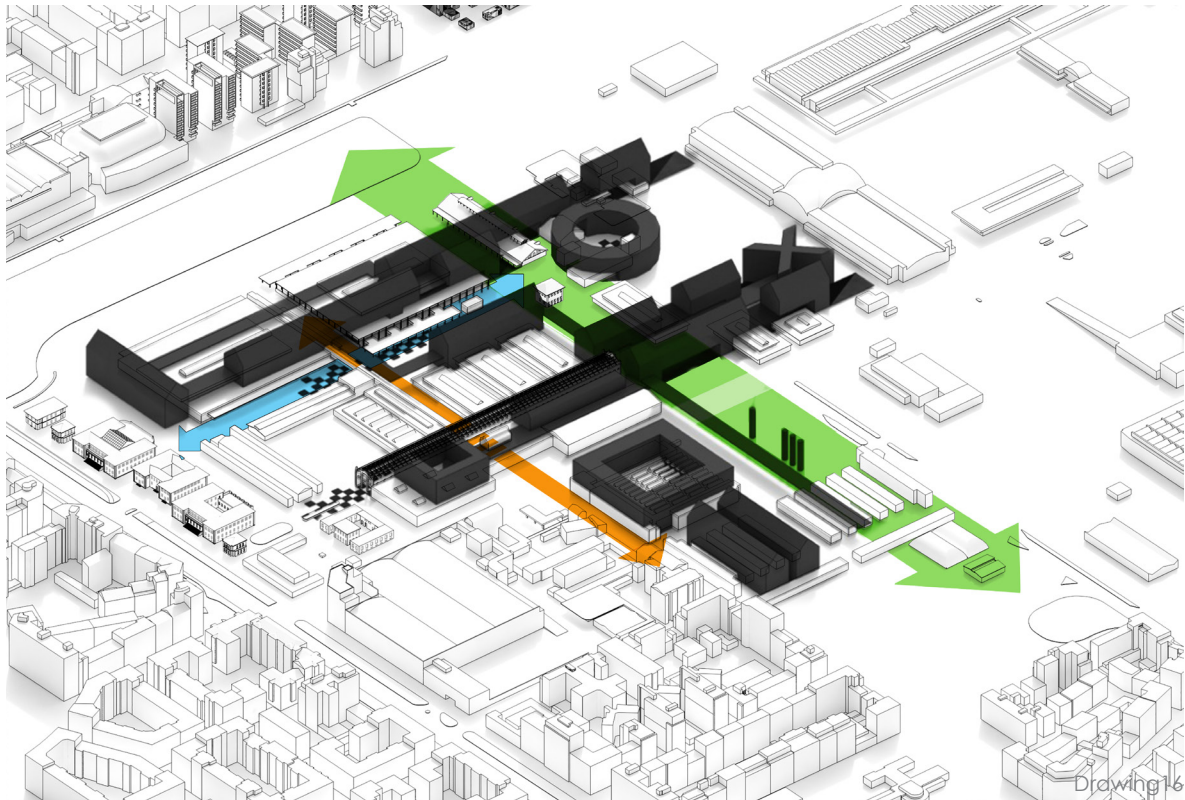


Eye level view **perspective** shows the new extension of two concrete hanger to accommodate the student housing and study hall



## 4.1.

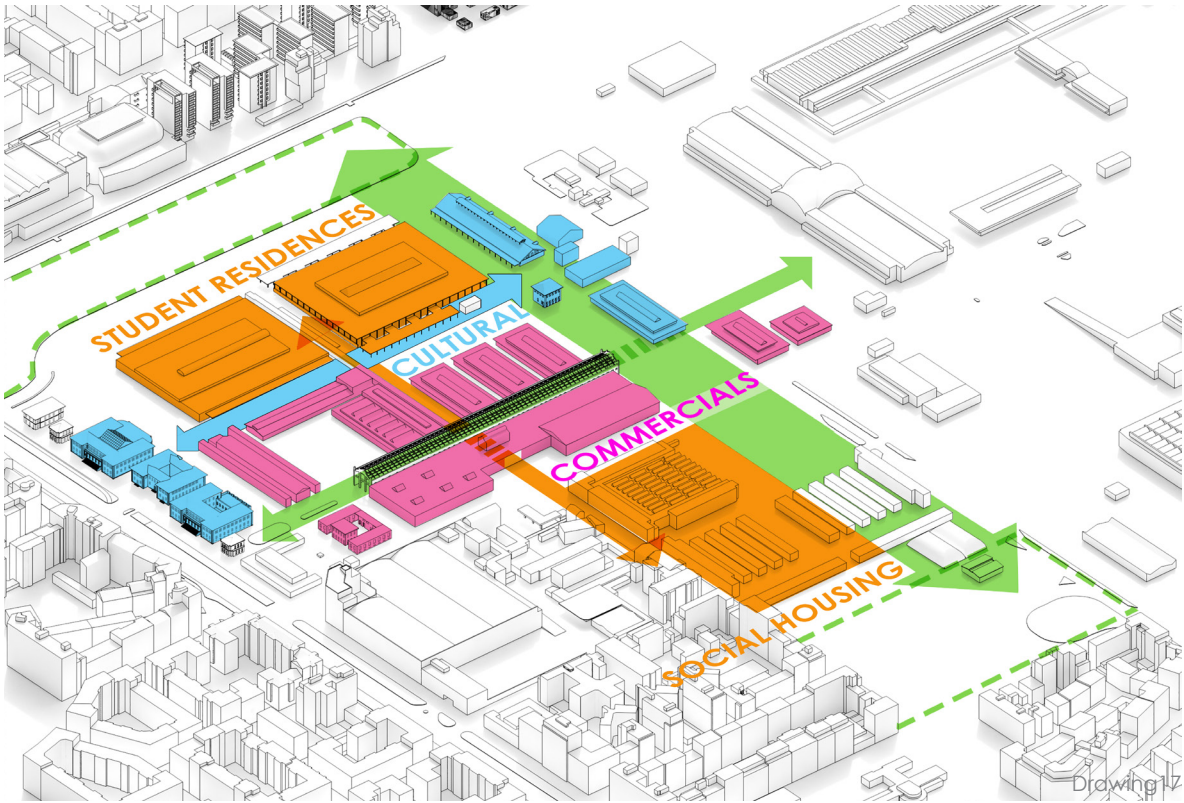
### Main Strategies and Masterplan



## EXTENTIONS

### Secondlevel Strategy

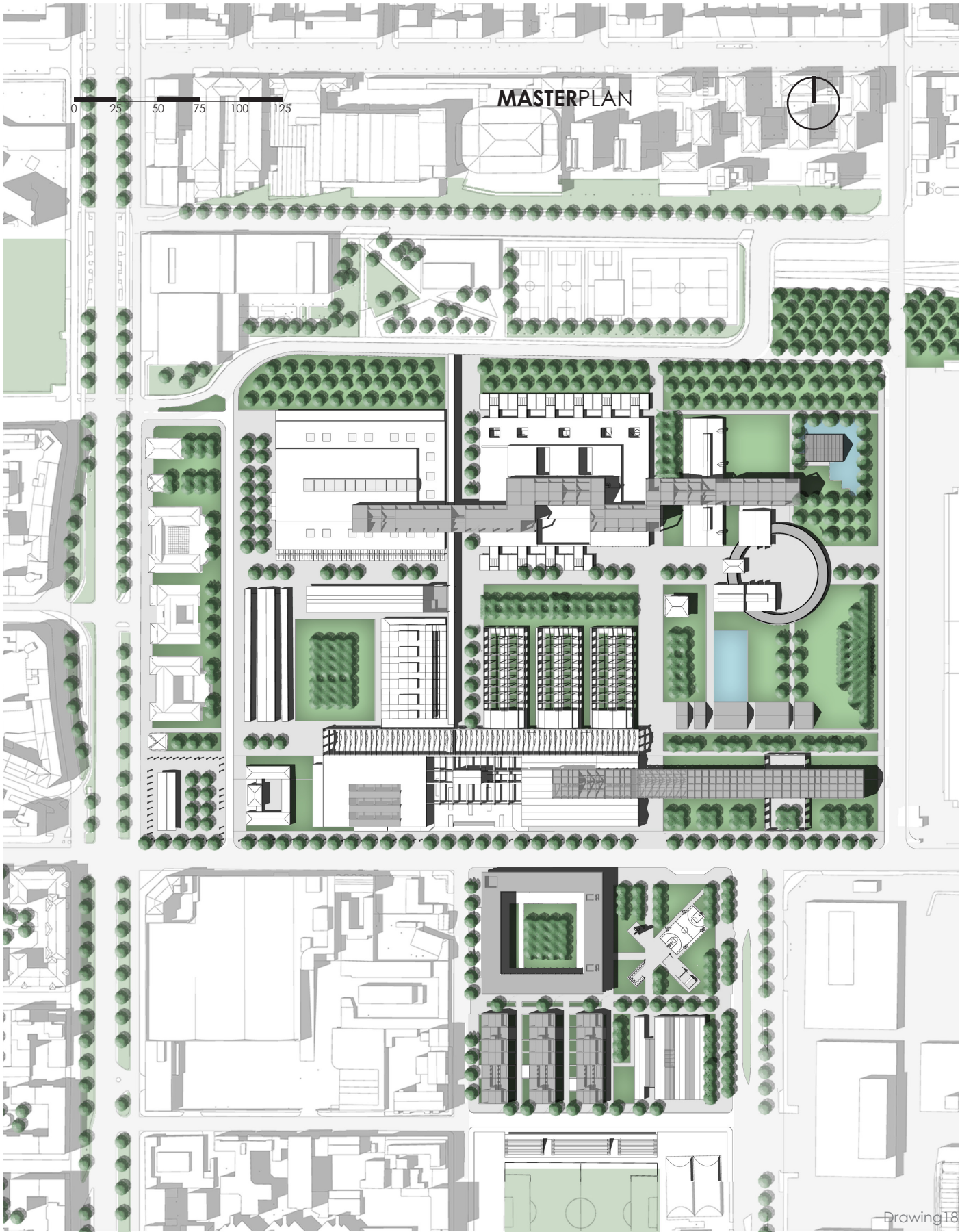
The extension idea came up after the critical researchs and field trip. The architectural aestetch and functionality of the complex must be preserve in order to save the collective memory of the city and reaching the sustainability goal. 60.000 sqm public programs are adapt in to the interior space of the existing buildings. Relatively more private programs like offices and residentails are elevated to increase the open space ratio. Since the owner of the Ex-Macello Complex area is municipality, for public interest ground level should be free as much as possible.

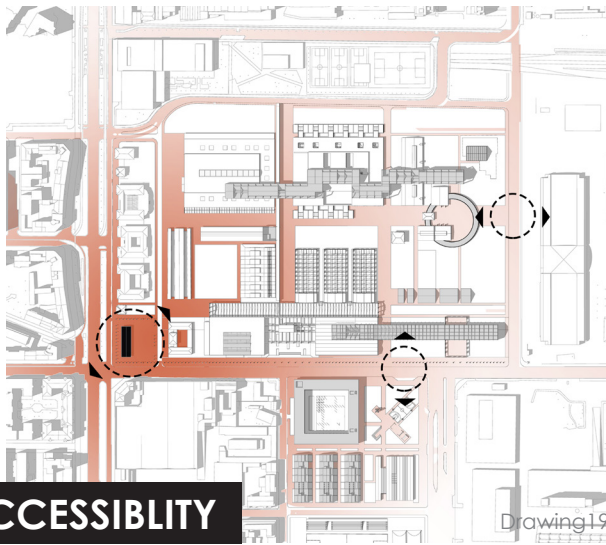


## ADAPTIVE RE-USE

### Groundlevel Strategy

The groundlevel strategy is planned to create the maximum public space on the ground floor. Commercial spaces are positioned in the middle of the project area in order to serve their surroundings (shown in purple). Cultural buildings are located at both ends of the area (shown in blue). The residential is divided into two main programs and located in the north and south as student housing and social housing (showed in orange). All programs have been combined with green infrastructure.



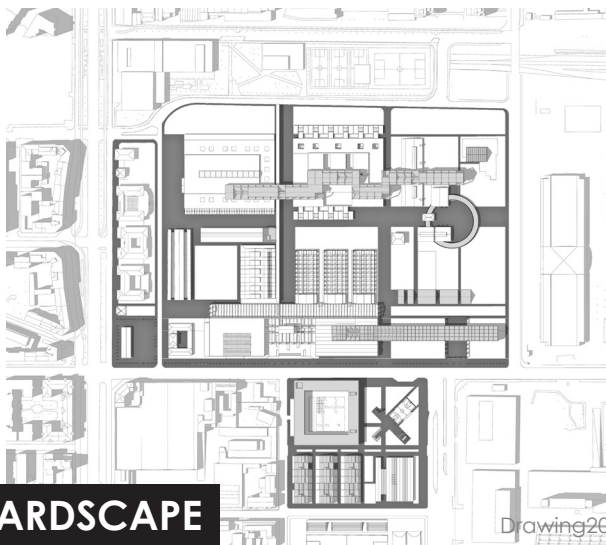


**ACCESSIBILITY**

Drawing19

The first main accessibility connection that proposed is adding another intersection point to improve the accessibility of the area in 4 corners. The extension of Via Azzo Carbonnera to Via Cesare Lambroso is not only a connection in neighborhood scale but also in city scale. Via Azzo Carbonnera is an avenue starting with Politecnico di Milano, intersects with parco Aquabella and new metro line, ends up with Ex Macello.

Ex Macello used to be an infrastructure. The function of the area inevitably effect the road structure of the complex. It was designed to work like a machine. What project proposes is keeping the road structure as it is but restricting the veichle traffic other than emergency transport and services.

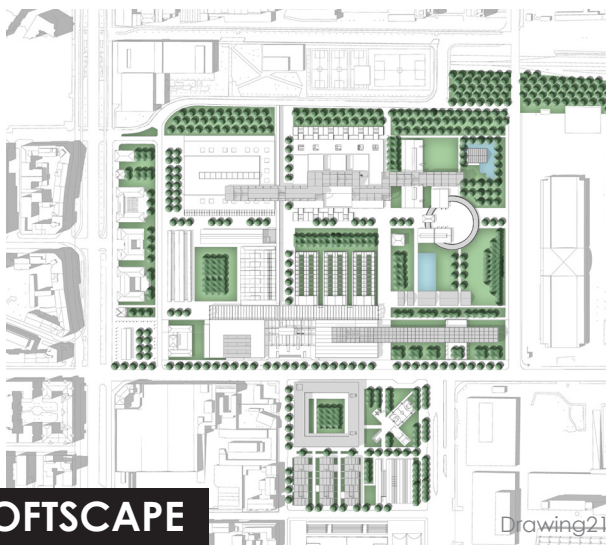


**HARDSCAPE**

Drawing20

An underground car park with an entrance through Via Azzo has been added in order to serve public amenities and residences in the northern side of the project area. A secondary underground car parking area added under the social housing units in the southern part of the project area.

**39%** 61143 m<sup>2</sup>



**SOFTSCAPE**

Drawing21

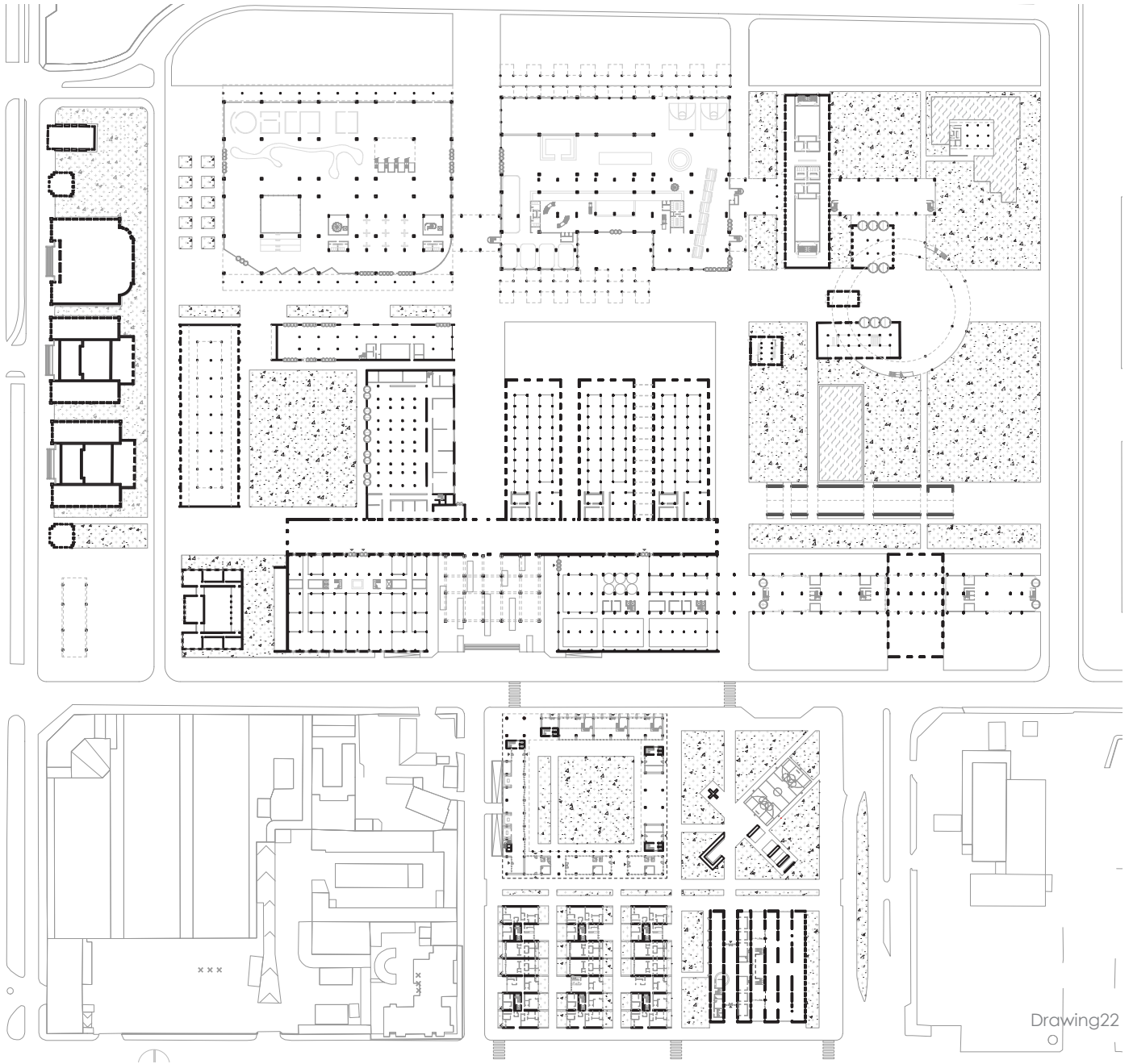
During the project area analysis, the ratio of green areas to total land area was found to be 19 percent. While this ratio is acceptable considering the vehicle transportation, parking lot and open spaces required for a meat production center, it cannot be accepted as an urban space.

The proposal of the project is to increase this percentage as much as possible by transforming the unnecessary hardscape into softsoft. In addition to the soft areas articulated by adhering to the green space strategy, unnecessary vehicle parks have been taken underground. The rest of the hardscape areas transformed to small piazzas. Each piazza has a unique relationship with surrounding buildings and functions.

**30%** 44613 m<sup>2</sup>



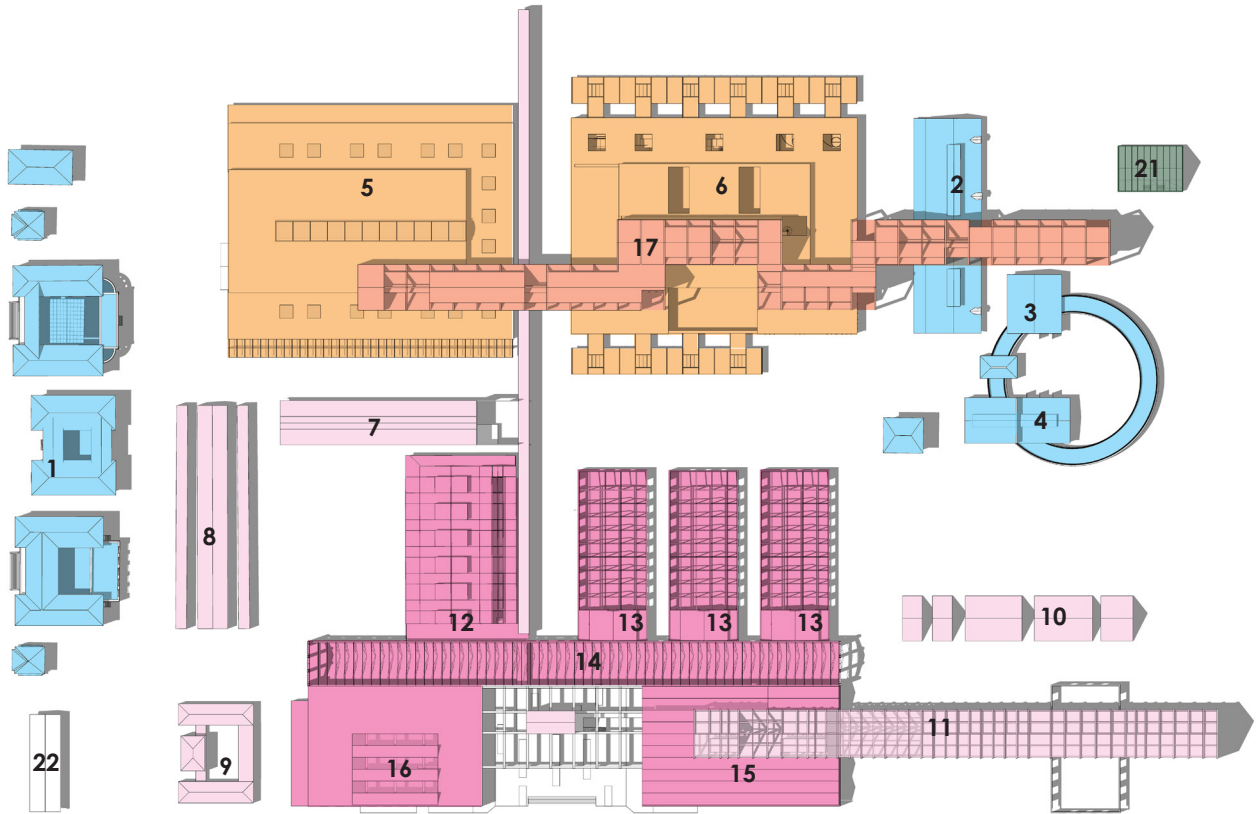
# GROUND FLOOR PLAN



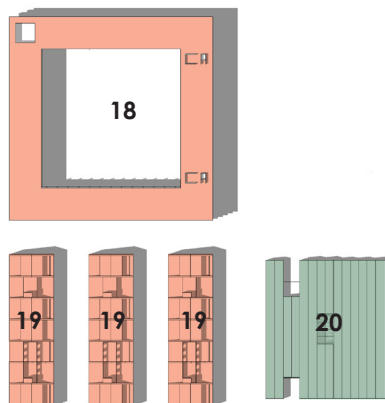
Drawing22



# PROGRAM DIAGRAM



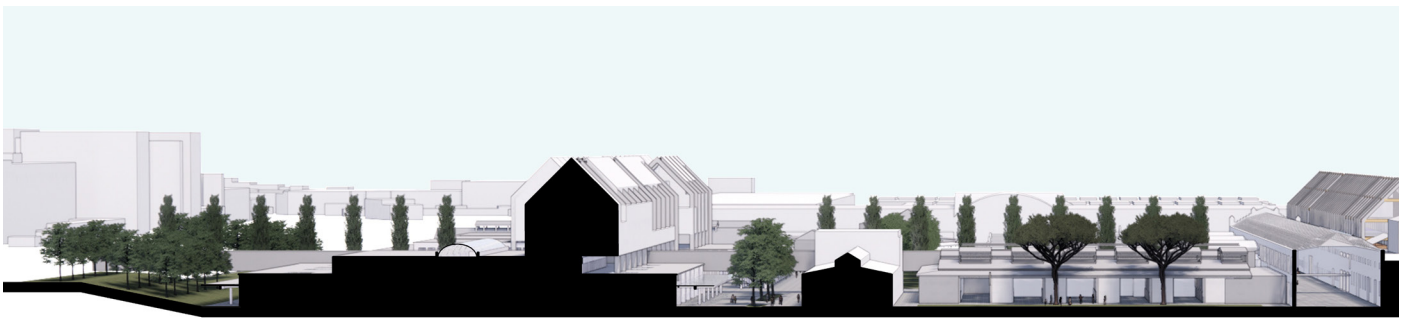
- Cultural Builings:** 1-MACAO, 2-Cinema, 3-Music shop, 4-Bookshop
- For Students:** 5-Study Hall, 6-Commun Space Dormitory Entrances
- Commercials:** 7-Restaurant/ Cafe, 8-retails, 9-Ex-MacelloMuseum/ Memorial, 10-Park Services, 11- Start-Up/ Office Spaces
- Productions:** 12-Exhibitions Hall, 13-Agriculture Greenhouses, 14-Flea Market, 15- Urbanfarming, 16-Craft Workshops/ Artist Studios
- Housing:** 17-Student/Dormitory, 18-Court-yard, 19-Linear Block
- Sport:** 20-Sport Center, 21-Public Pool
- 22-Public Transportation Canopy



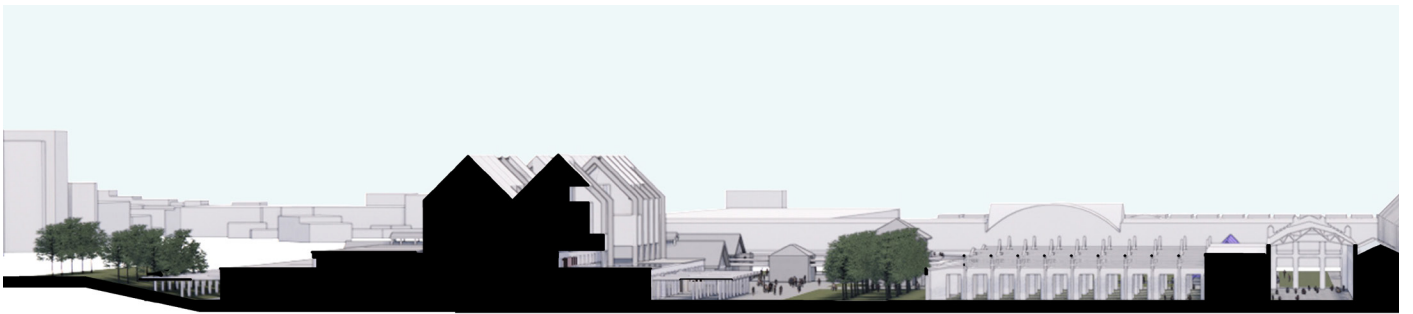
Drawing23



# URBAN SECTIONS



Drawing24



Drawing25



## 4.2.

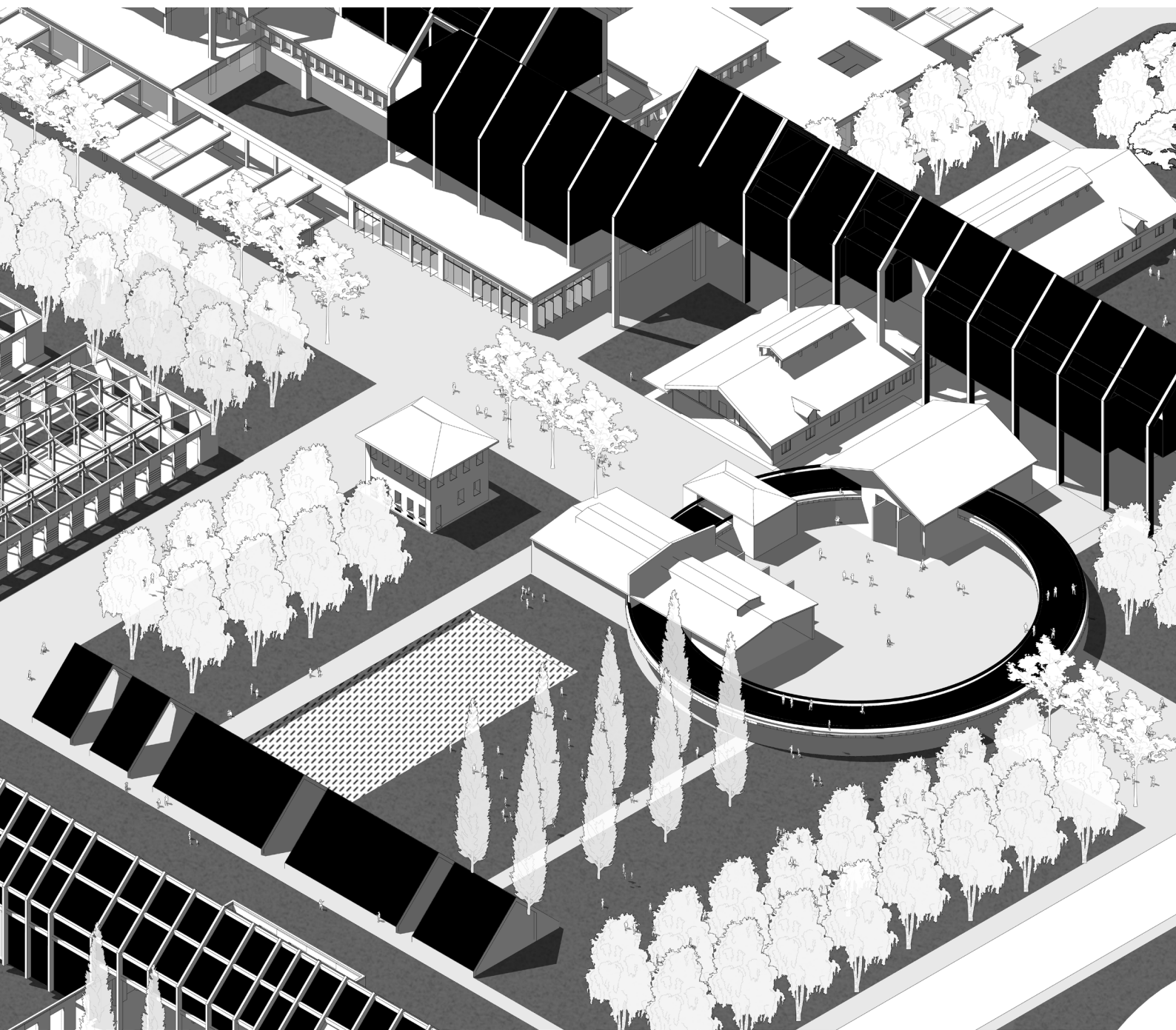
### Public Spaces



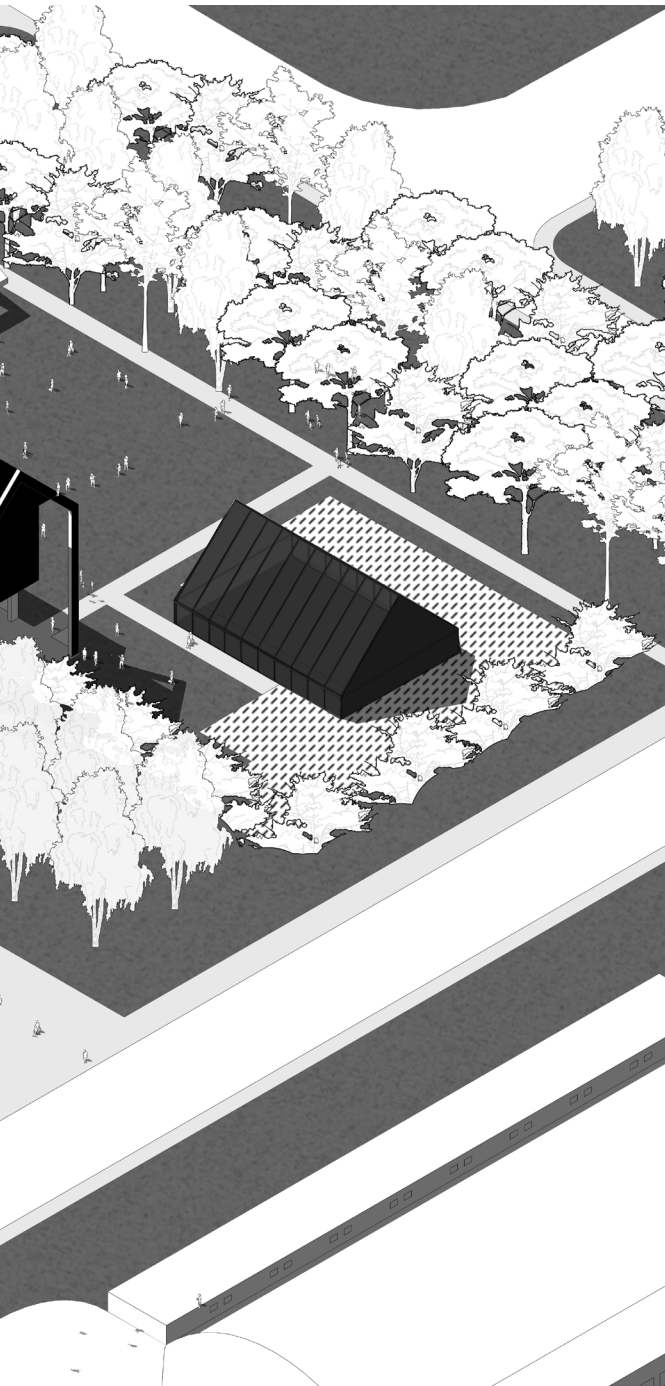
Eye level view **perspective** from basketball court in sport park .



Drawing26



## ENTERTAINMENT PARK

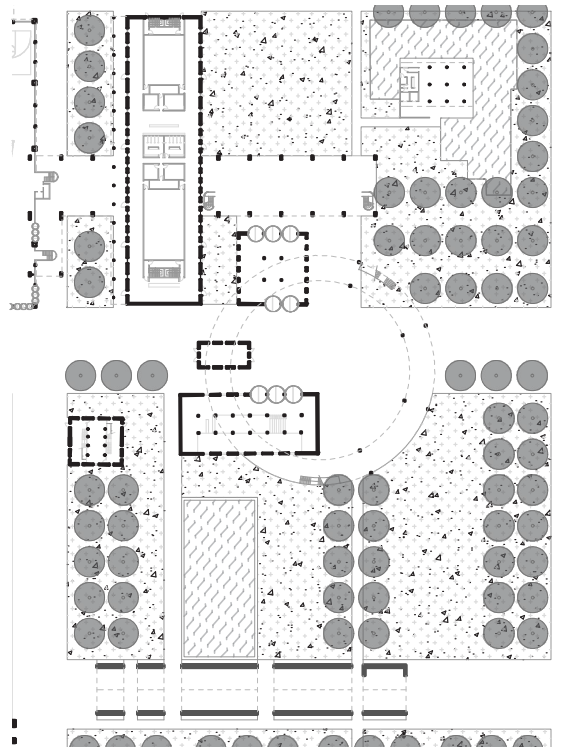


Drawing27

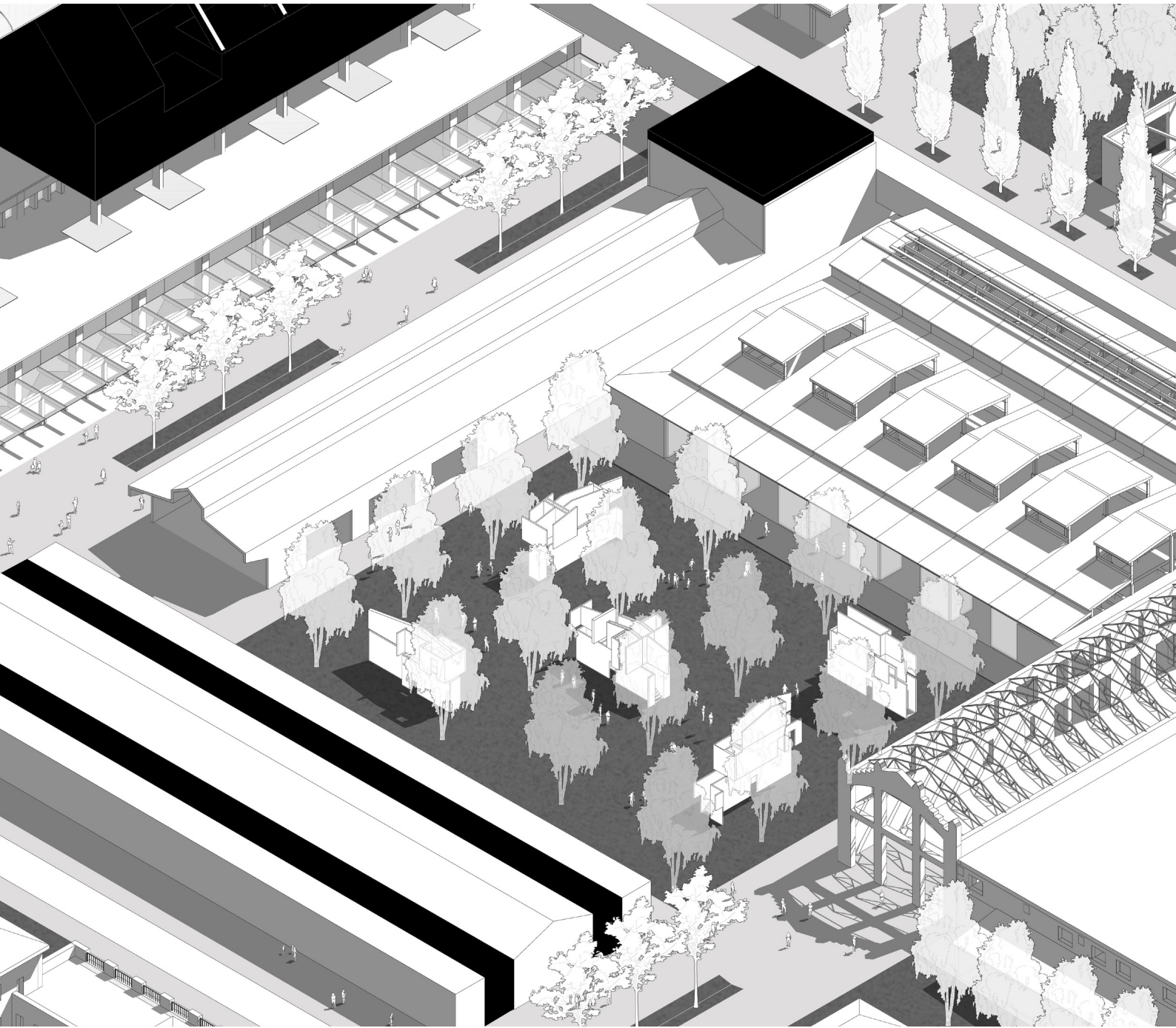
It is the biggest one space in Ex-Macello interm of squaremeter. 3 sub-zones are organised around the circular elevated path. 3 existing buildings hosting cultural programmes like music shop, book shop and their services.

Northern part of the ring, there is an event space shaded by dormitory extension and public pool located the existing traces of sanitation facility of Ex-Macello.

Southern part of the ring, a wide open space with a pond following the existing butcher house which is bordered by a tent-like structure accomadating all kinds of park services like toilets, snack bars...

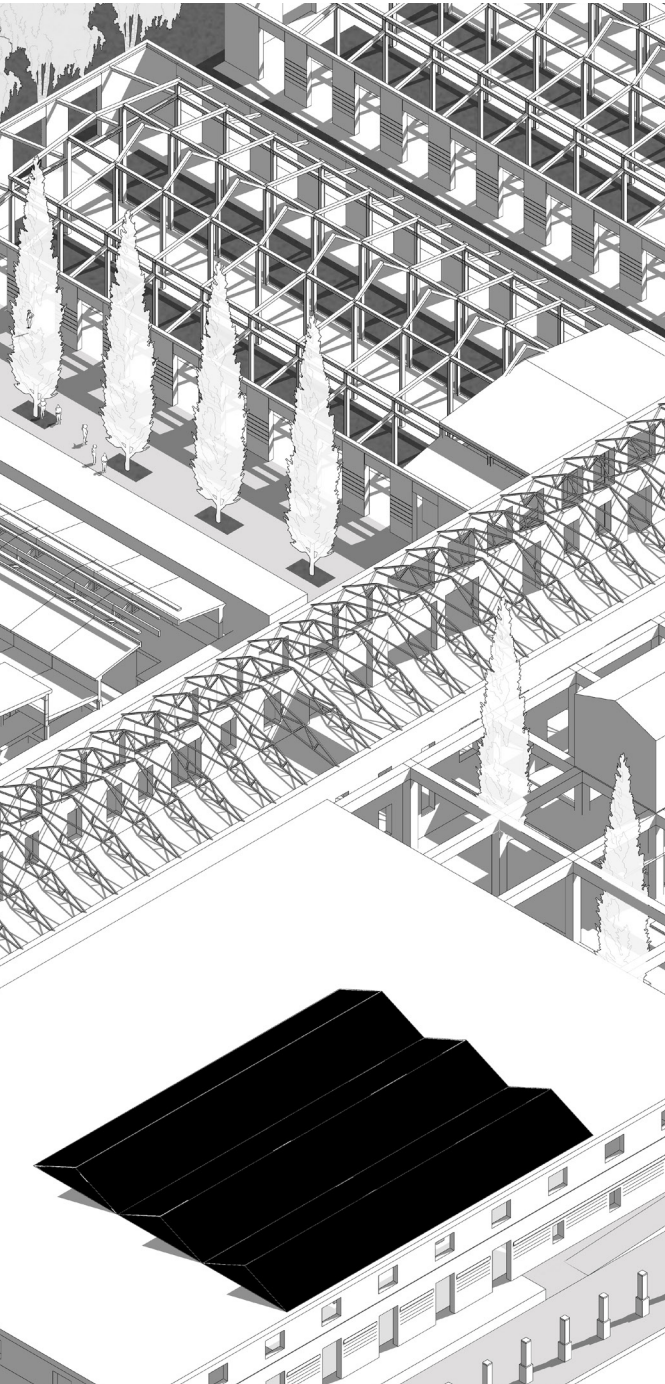


Drawing28





## EXHIBITION PARK

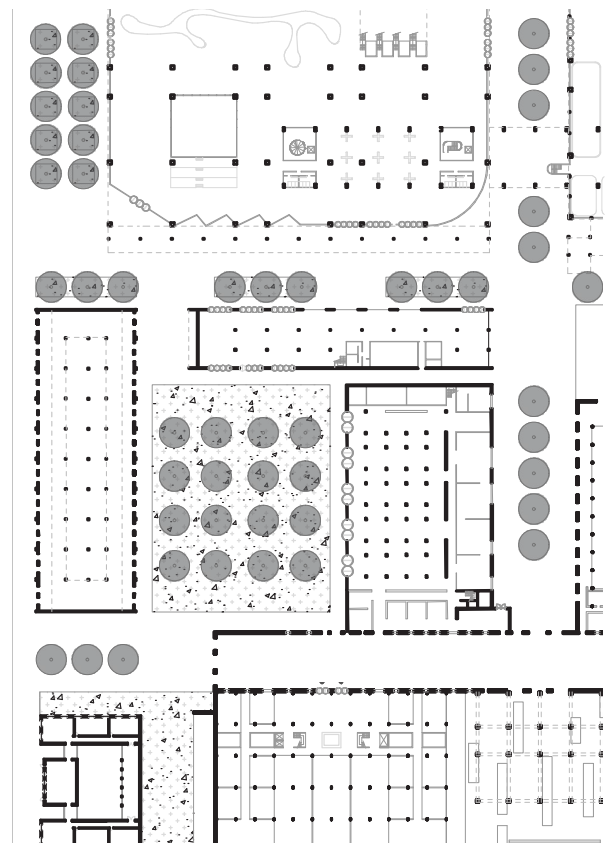


Drawing29

It is an existing 'untouched' green/open space in the middle of four Ex-Macello structures. After the transformation process this green space can host different activities .

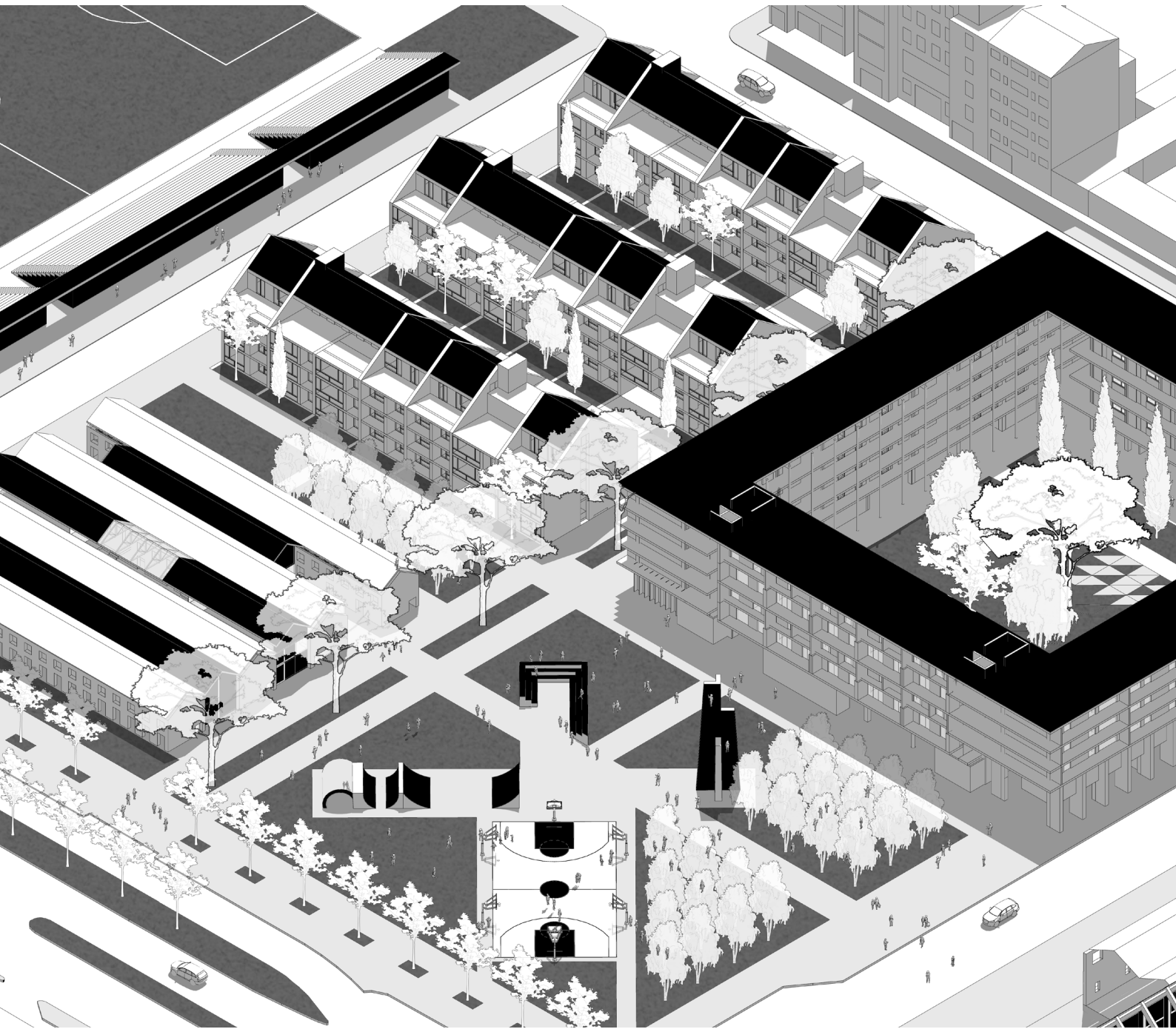
It can be use as an extension of closed exhibition hall like a sculpture garden.

Where there is no exhibition food court house can occupy the area as an beer garden and retails can use it as an open showroom.

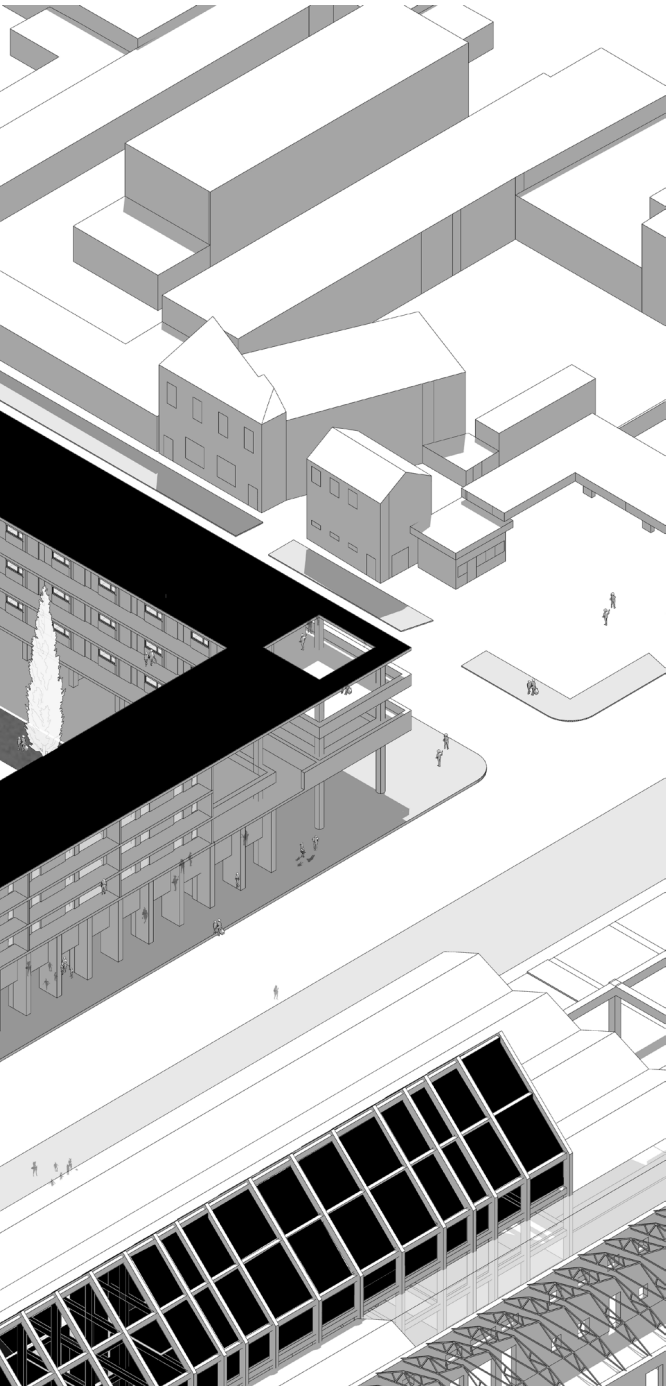


0 15 30 45 60

Drawing30



# SPORT PARK

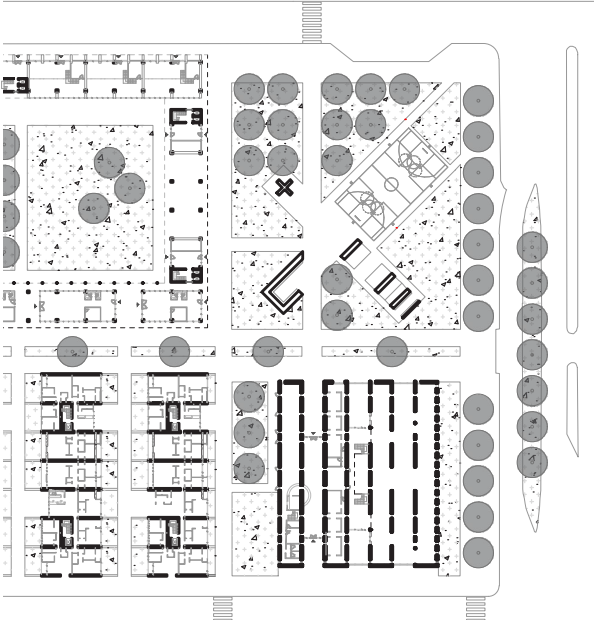


Drawing31

Sport Park is located upper right corner of residential area to host several sport activities. A generous open space will be occupied by the residents of the neighbourhood and city dwellers. It is a intersection zone between northern part of Ex-Macello and football club at the bottom of the residential area.

Park it-self has a giant skate park, a real size basketball court and 16m tall climbing wall. Beside these sport activities a U-shaped auditorium is added for resting, socialising and some small acting performances.

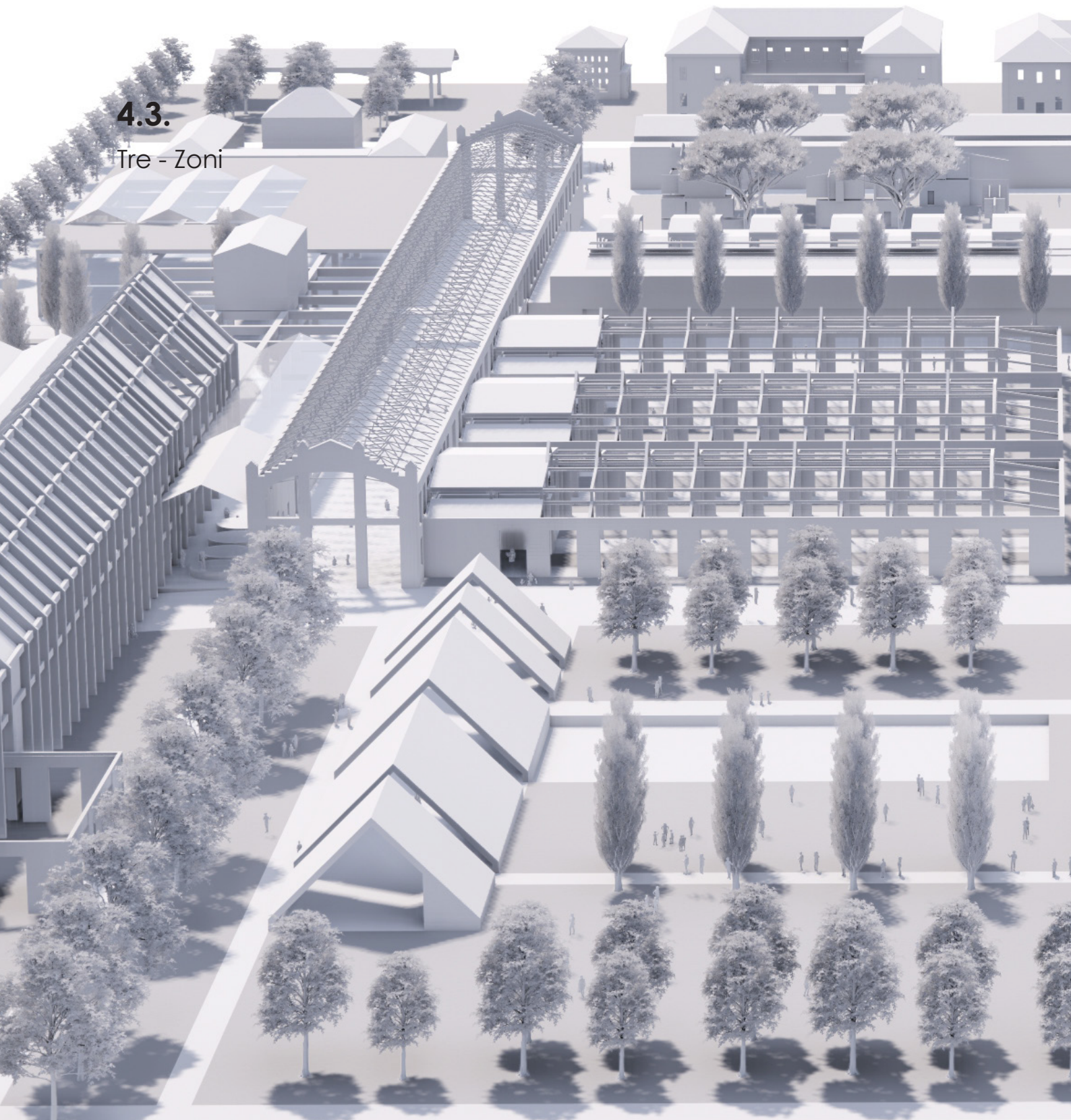
The Sport Park is facing to a Sport Center which is transformed from poultry facility. It accomodates indoor sport activities while the Sport Park is hosting the outdoor ones.

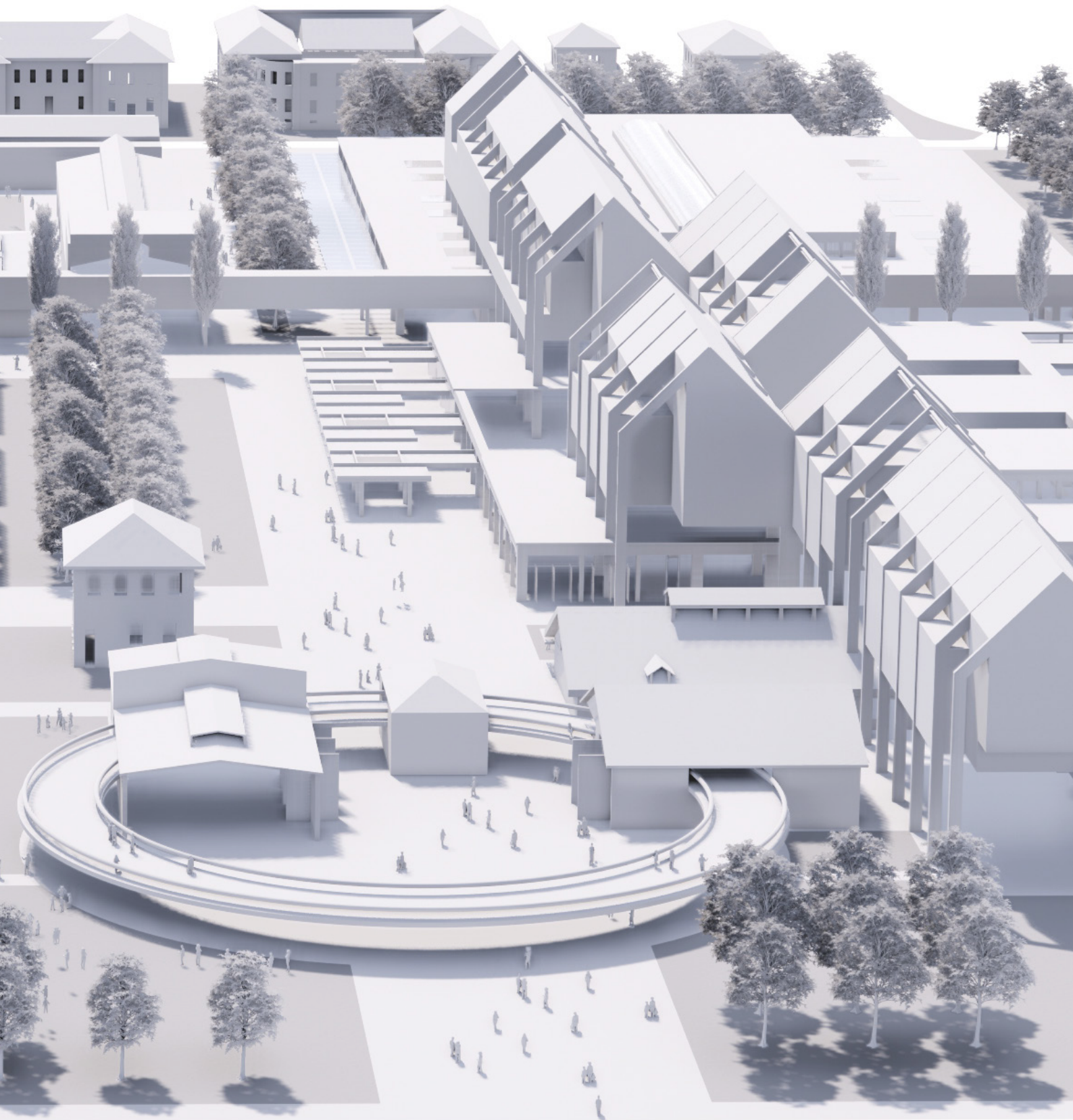


Drawing32

### 4.3.

### Tre - Zoni





Drawing33

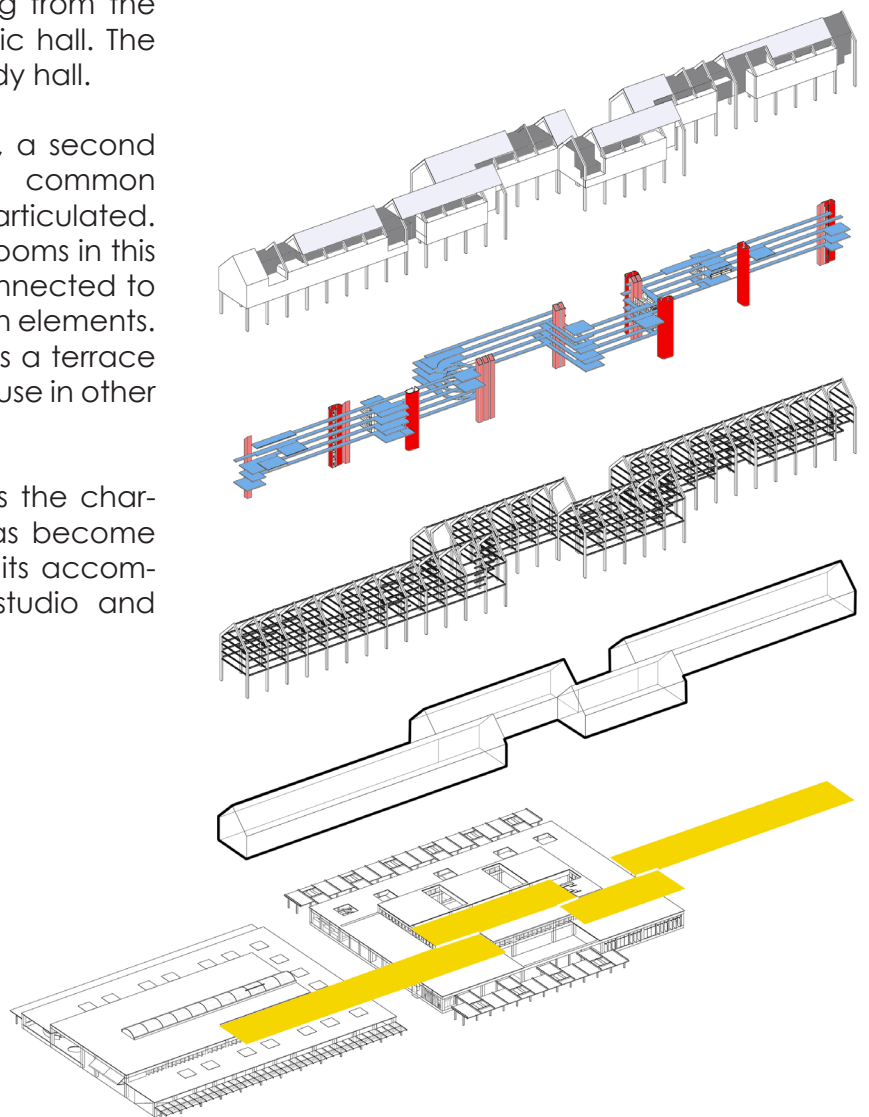
# YOUTH CENTER

## STUDENT HOUSING & STUDY AREA

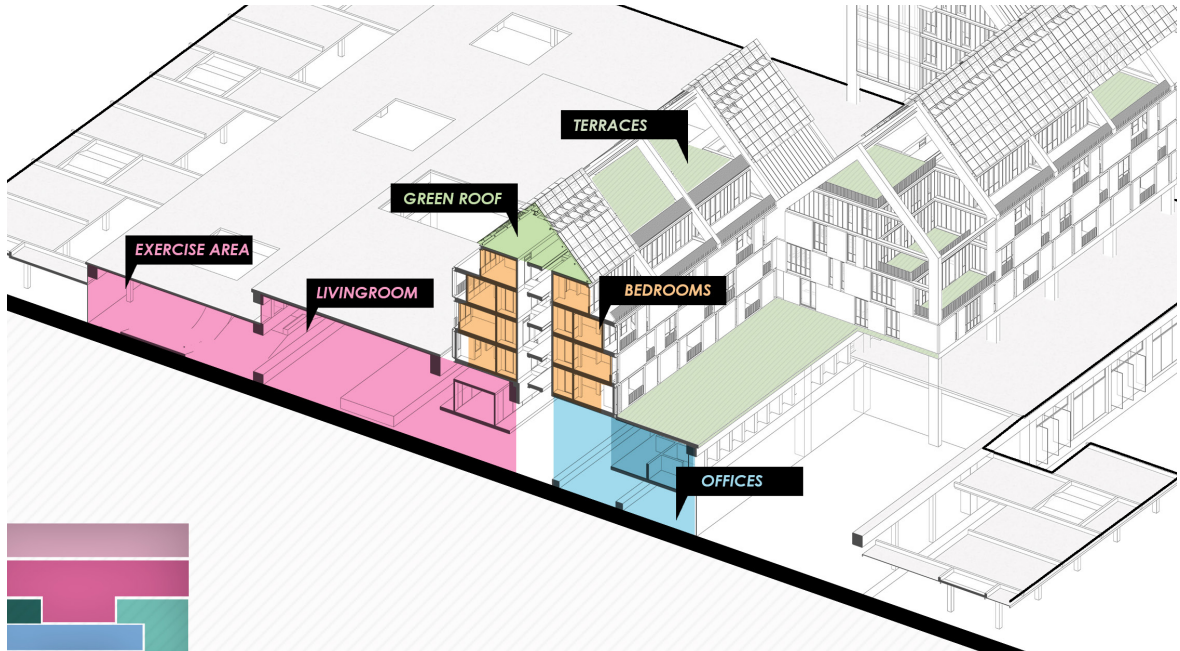
The dormitory building is the transformation project of 2 hangar buildings on the north side of the Ex-Macello campus. It is the entrance of the building from the hangars and serves as a public hall. The other is functionalized as a study hall.

On top of these two hangars, a second mass with dormitory rooms, common kitchens and areas has been articulated. There are 7 different types of rooms in this vertical extension, which is connected to the floor with vertical circulation elements. The roof of the building acts as a terrace in some places and a greenhouse in other places.

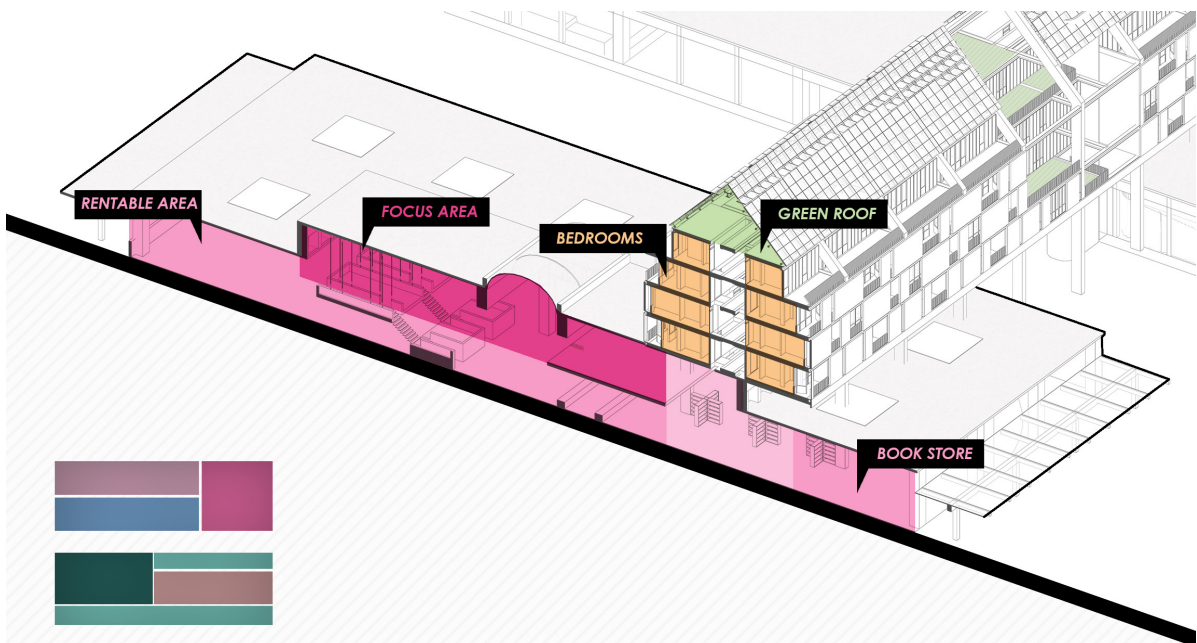
The dormitory building creates the character of the youth zone. It has become a new center for youth with its accompanying cinema, recording studio and event spaces.



Drawing34



Drawing35



Drawing36



- Thick

Compo

the roo  
the gro  
the h  
floor, an

**perspective**, student housing



## ROOF

### Glass Roof Steel Construction System

- Primary Structure RHS Steel Profile
- Secondary Structure CHS Steel Profile
- Stainless Steel Glass Holder
- Stainless Steel Glass Frame
- Tempered Glass/ Photovoltaic Panel

## FLOOR

### Composite Steel Deck Concrete Floor System

- Primary Structure IPE 450 I Beam
- Secondary Structure IPE 300 I Beam
  - Steel Deck
  - Welded Wire Fabric
  - Concrete Slab
  - Heating Isolation
  - Finishing Material

## SECOND FACADE

### Expanded Metal Facade System

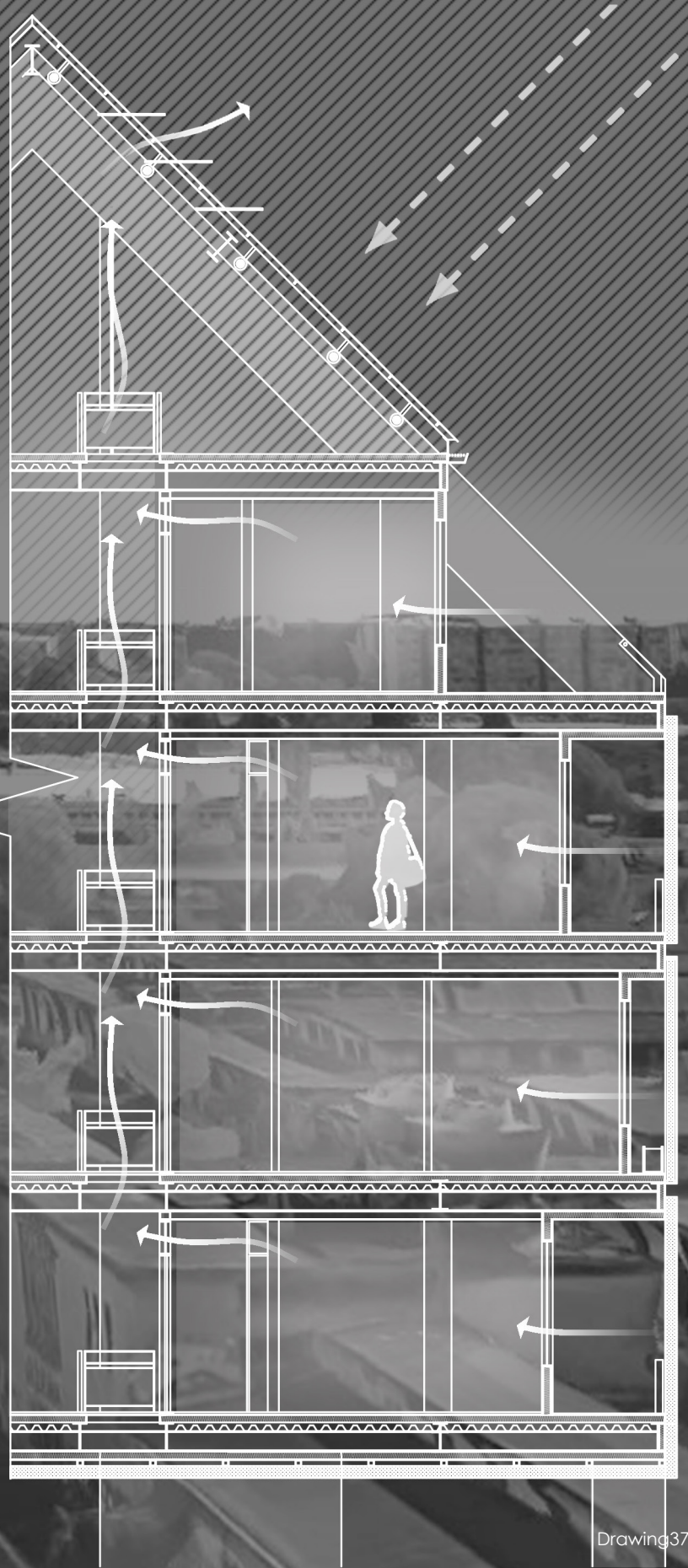
- Expanded Perforated Metal Sheet
- U section Steel Frame Structure
- L Shape Joint Elements

### **Passive Ventilation System**

The detachment of the corridor from the rooms caused a gap in the building from ground floor to the roof. This space allows heated air to be transferred to the attic and from there to be exported via operable windows.

### **Active Solar Heating System**

Designed as a roof garden, the rooftop has turned into a recreation area that produces energy with the PV panels added to the south face.



Drawing37

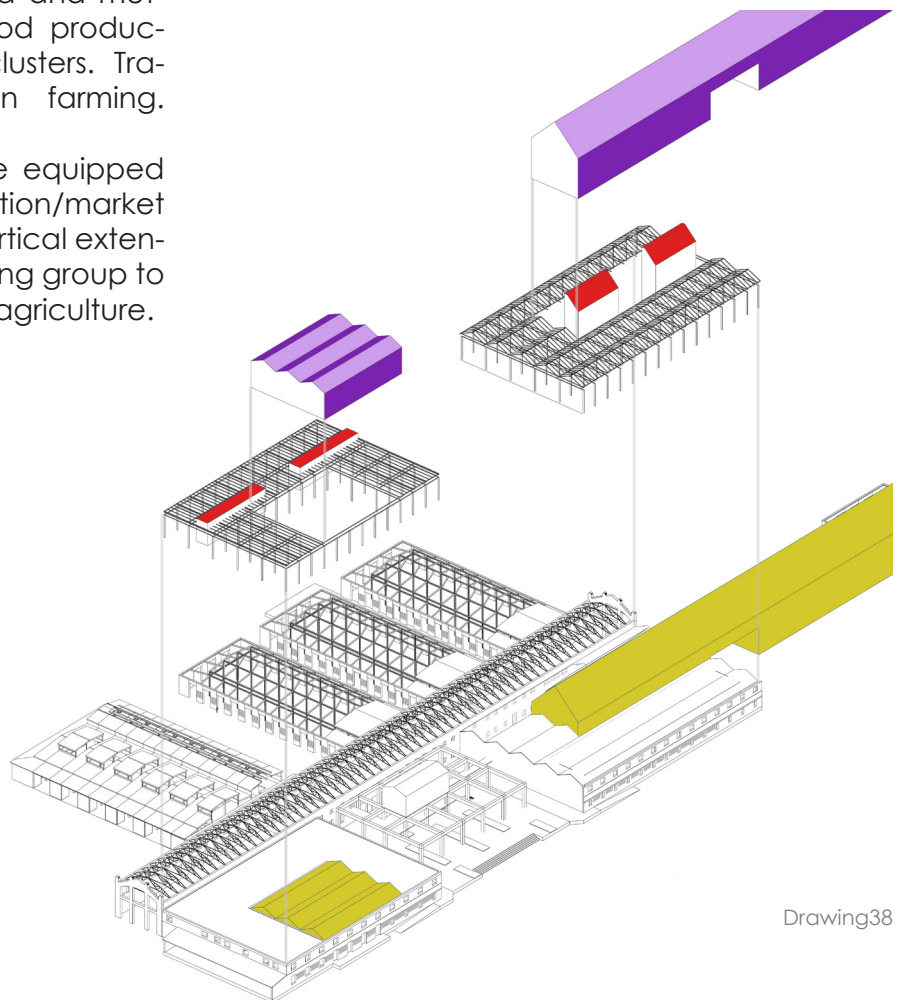
# SPACE FOR PRODUCTION

## URBANFARM & WORKSHOPS

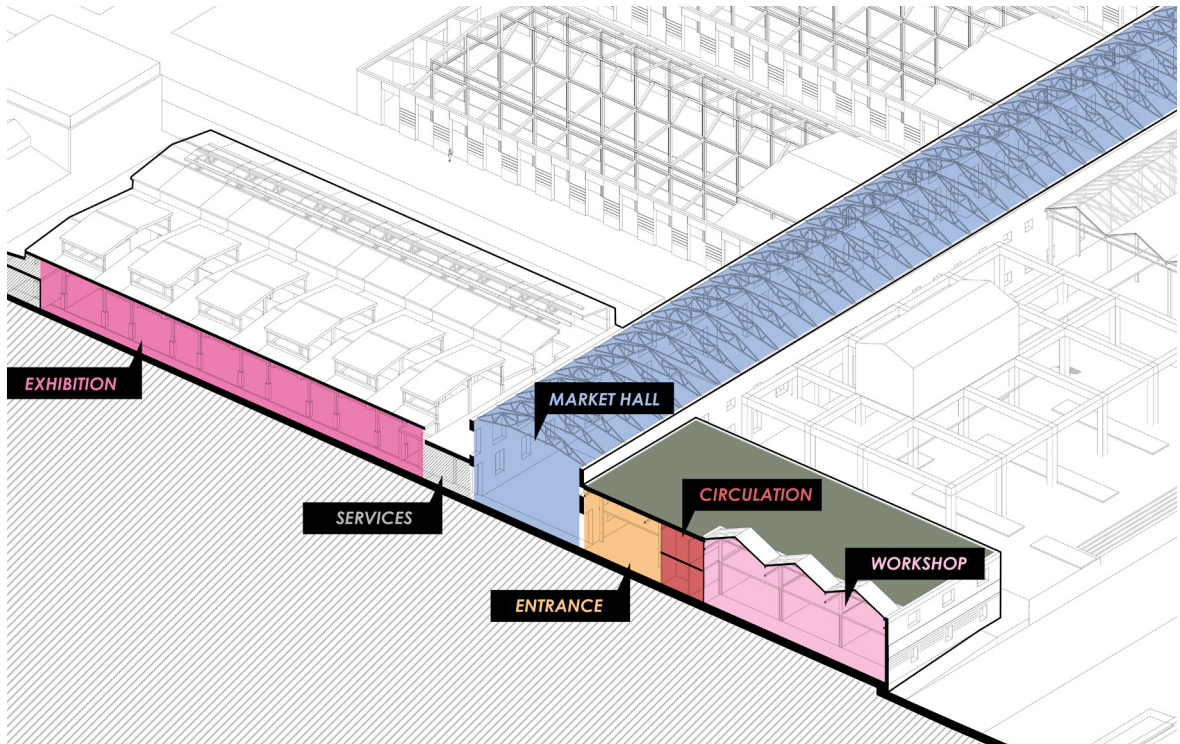
The production areas, which are the largest building group in the project area, were used for slaughtering animals and storing cut meat. Considering this feature of the spaces during the re-functioning; meat production has been replaced by art and food production.

In addition to the places that artists can rent; workshops such as wood and metal have been allocated. Food production is considered as two clusters. Traditional farming and urban farming.

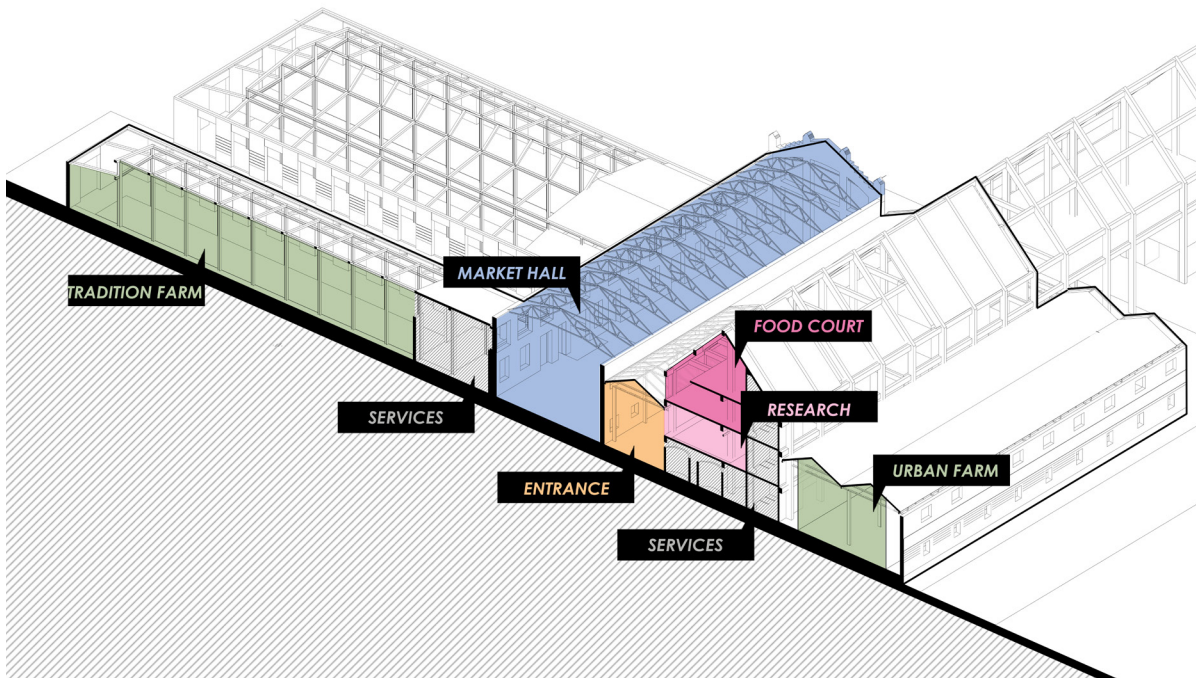
While the existing spaces are equipped with production and exhibition/market programs, office spaces as vertical extensions are included in this building group to research and develop urban agriculture.



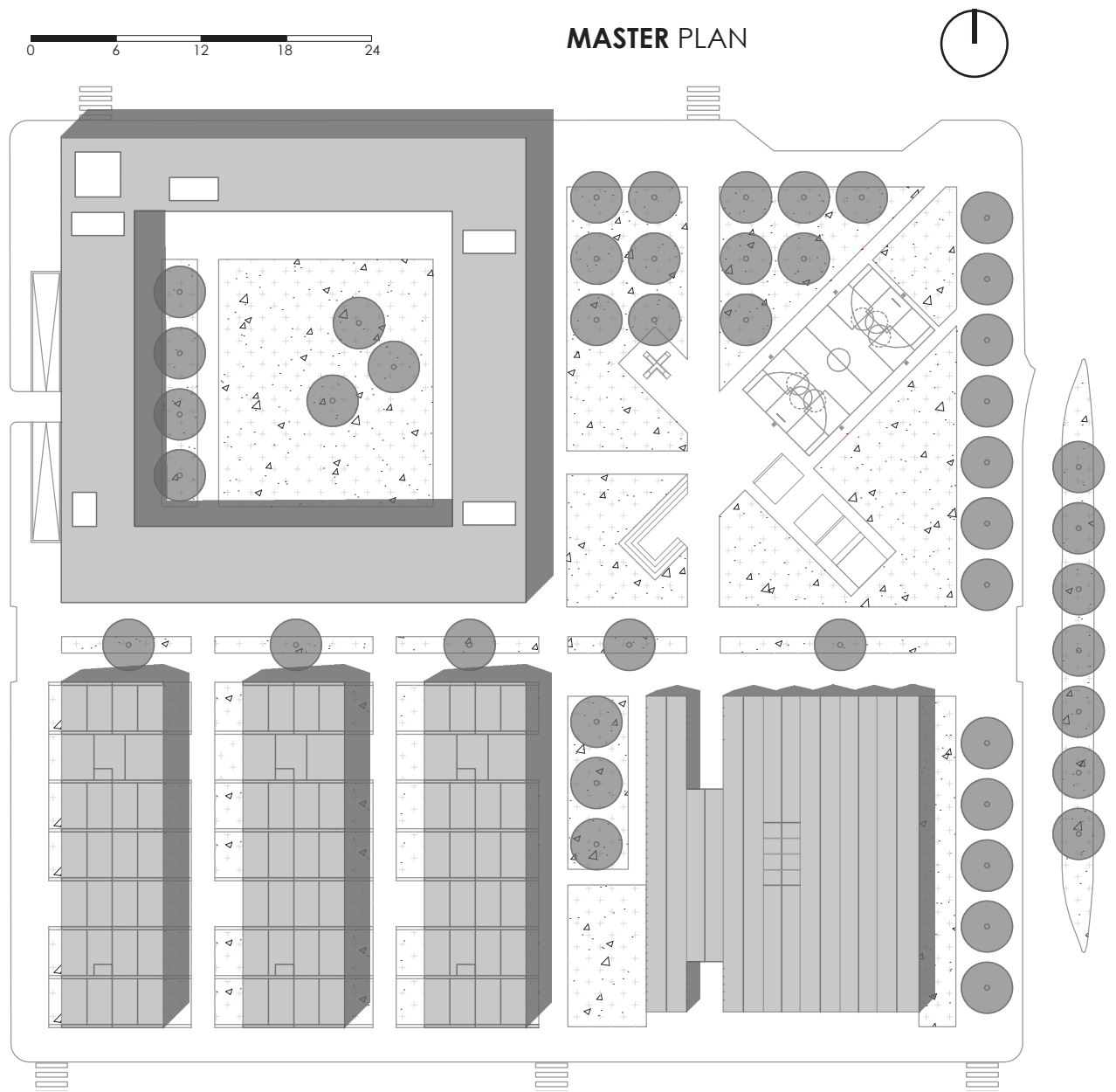
Drawing38



Drawing39

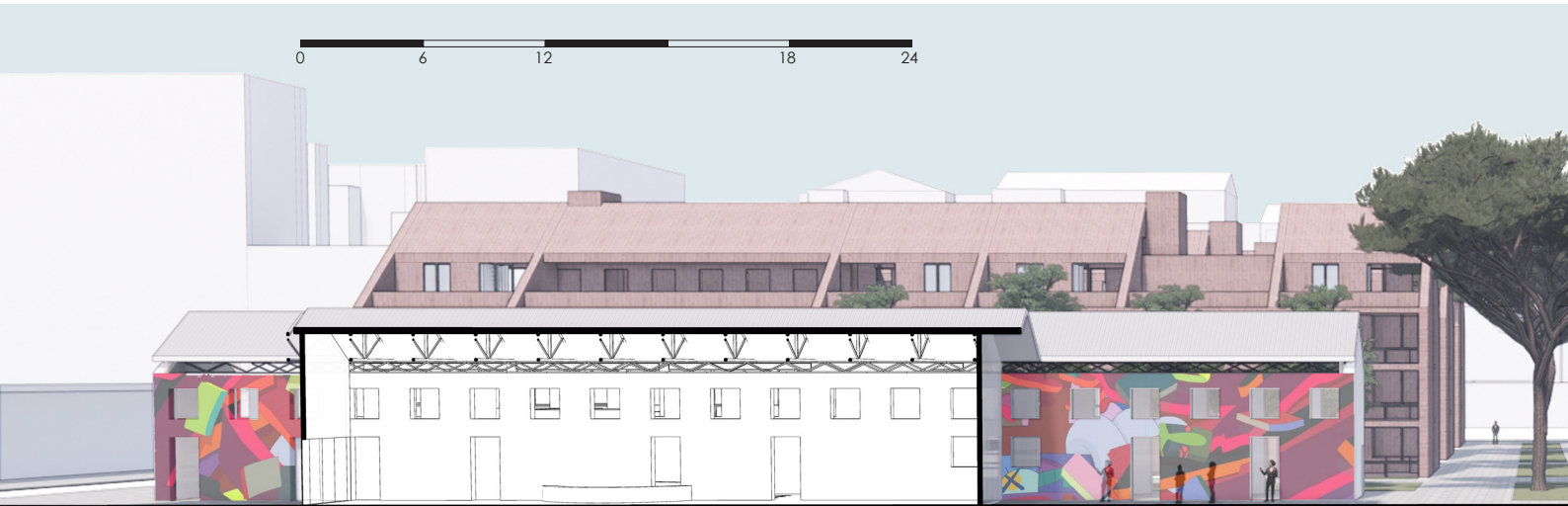


Drawing40



MASTER PLAN

Drawing41



## RESIDENTIAL URBAN BLOCK

The residential area was formerly used for poultry farming. The scale and material of the existing building stock is therefore different from the main Ex-macello complex. For this reason and to increase the open area ratio, most of the buildings in this building block were demolished. In place of the demolished buildings, 2 different typologies of residential buildings and a park were added. The 4 protected cattle shelters were combined and converted into a sports hall.

The building block is divided into two axes on the north-south, east-west lines. In the area, which is completely closed to vehicle traffic except in emergencies, the parking lot has been solved in the basement of the courtyard-type residential building. There are two public transport stops, one each on the northern and eastern facades of the building block.

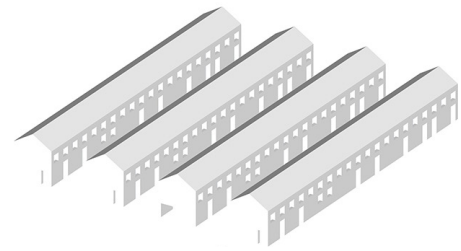
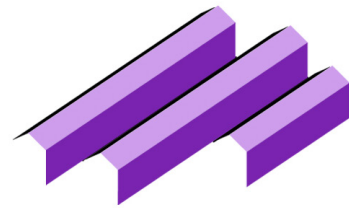
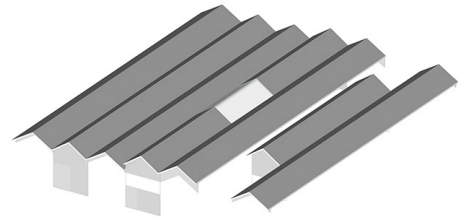
Drawing42



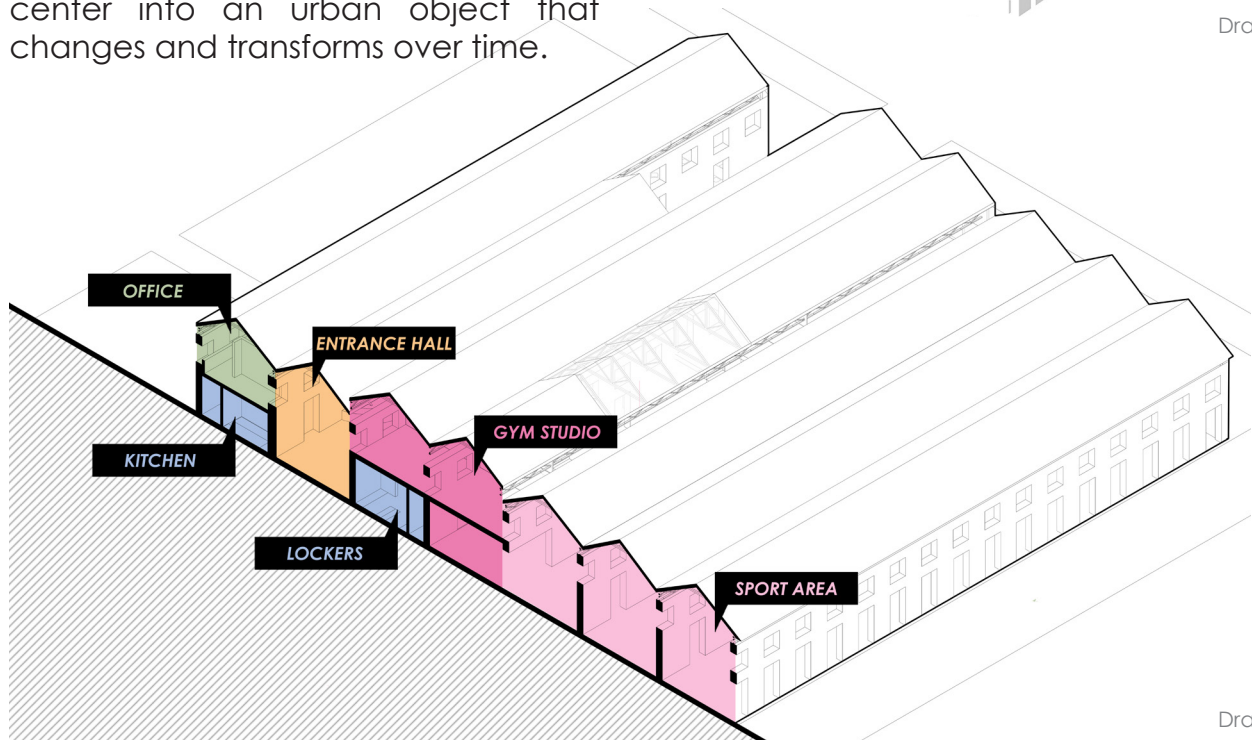
## SPORT CENTER

The structure consists of 7 similar prisms. 4 of them were currently used as animal shelters. The method used at this time created a rhythm inspired by the existing structure morphology. With the 3 newly added prisms, the building has transformed from a long and narrow plan scheme to a central square scheme.

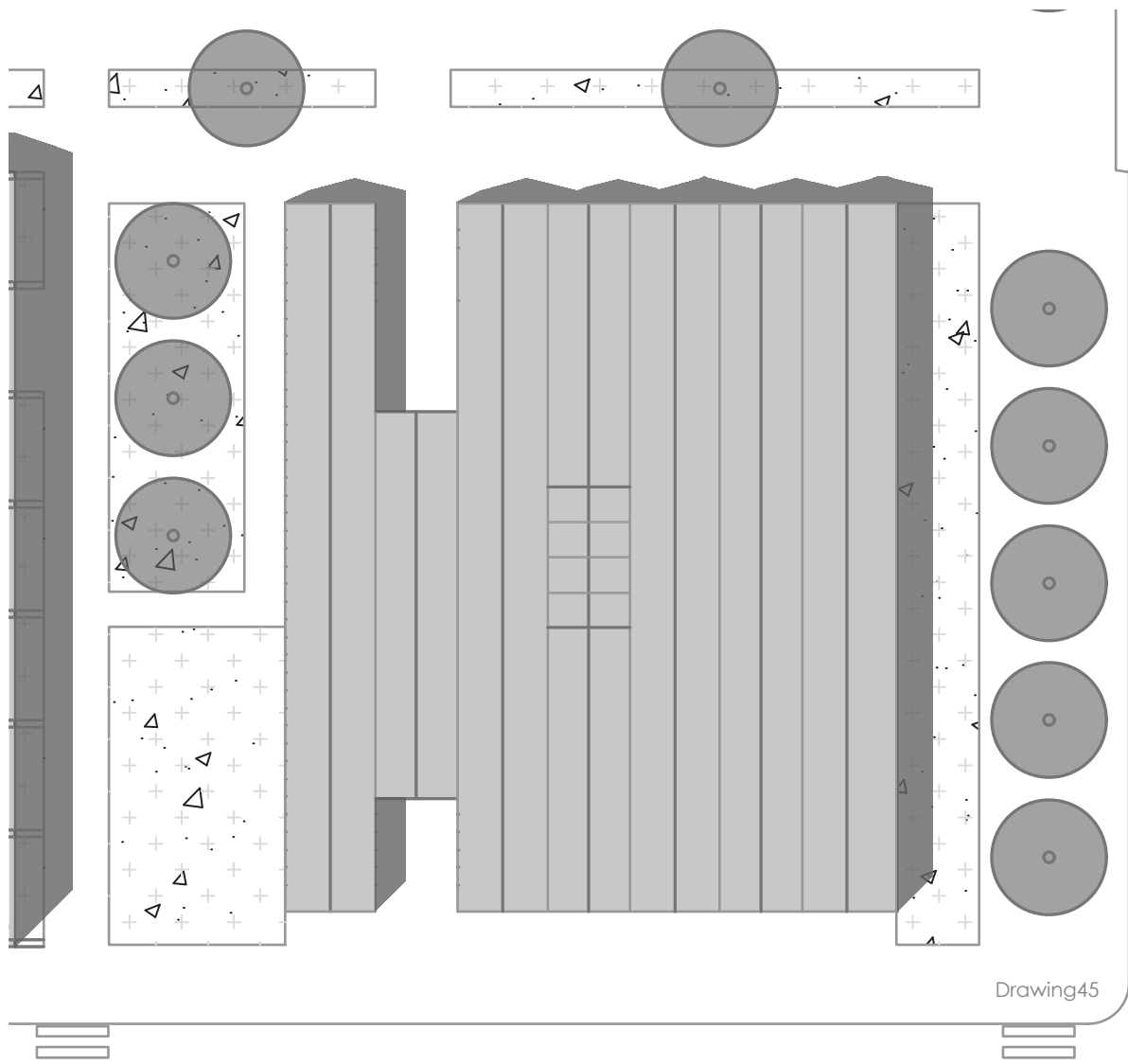
The structural elements of the existing buildings are masonry load-bearing walls, traditional roof and white plaster. After the roofs were removed, a new roof system was designed to cover all the buildings. The white plaster walls are handled like a canvas. While serving as a canvas for street artists, it transformed the façade of the sports center into an urban object that changes and transforms over time.



Drawing43

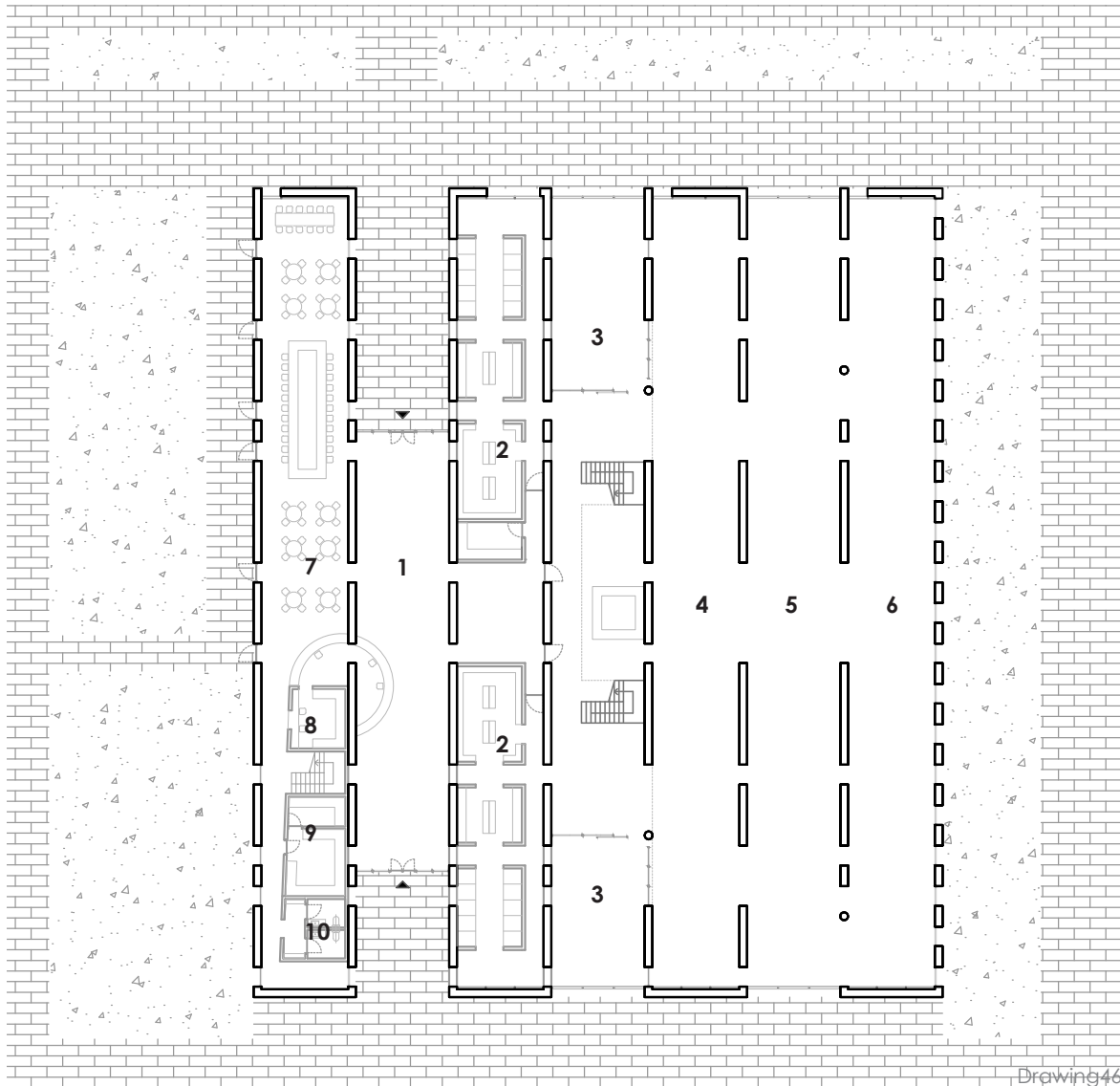


Drawing44



TOP VIEW





Drawing46

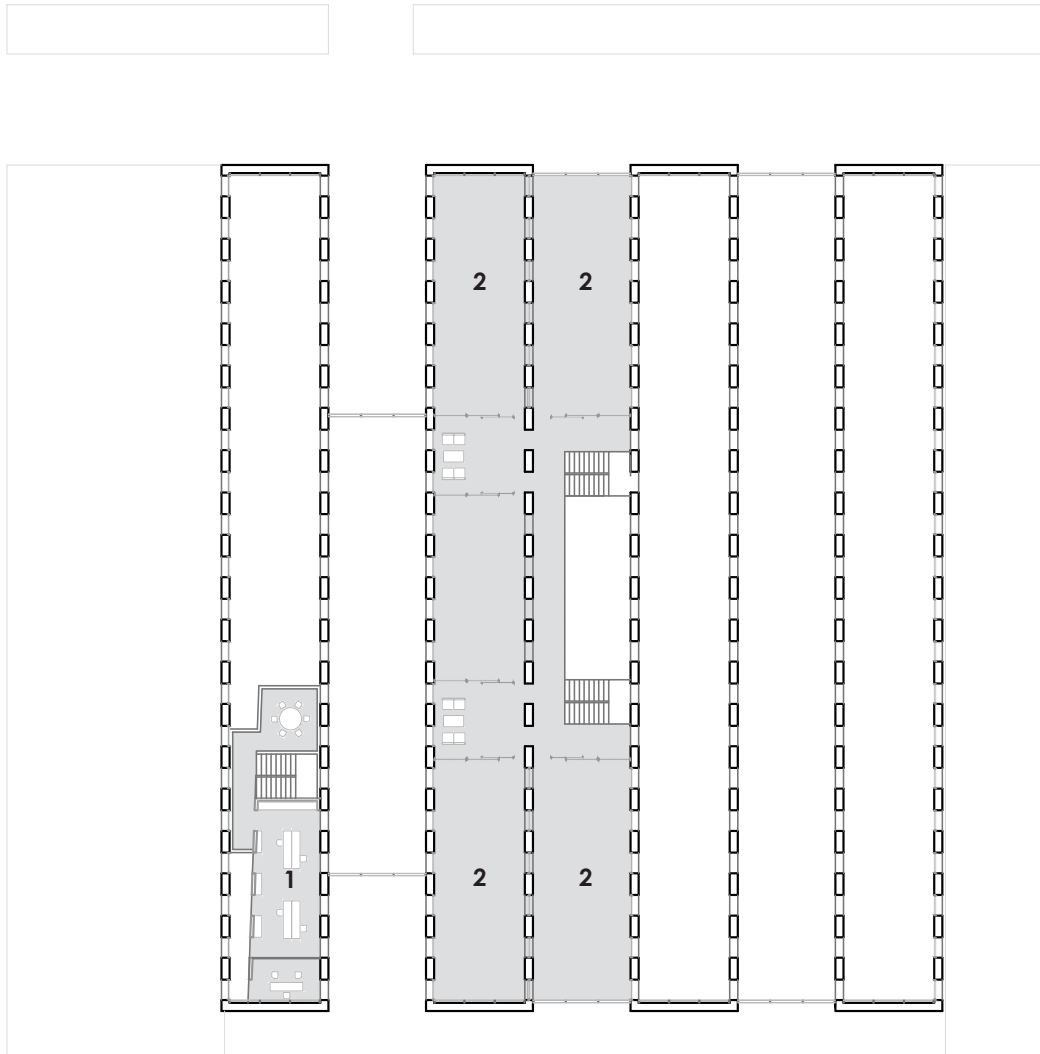


### GROUND FLOOR PLAN



1-Entrance Hall 2-Lockers 3-Studio 4-Cross Fit Zone 5-Fitness Zone 6-Cardio Zone 7-Sport Cafe 8-Info Desk 9-Kitchrn 10-Toilets





Drawing47



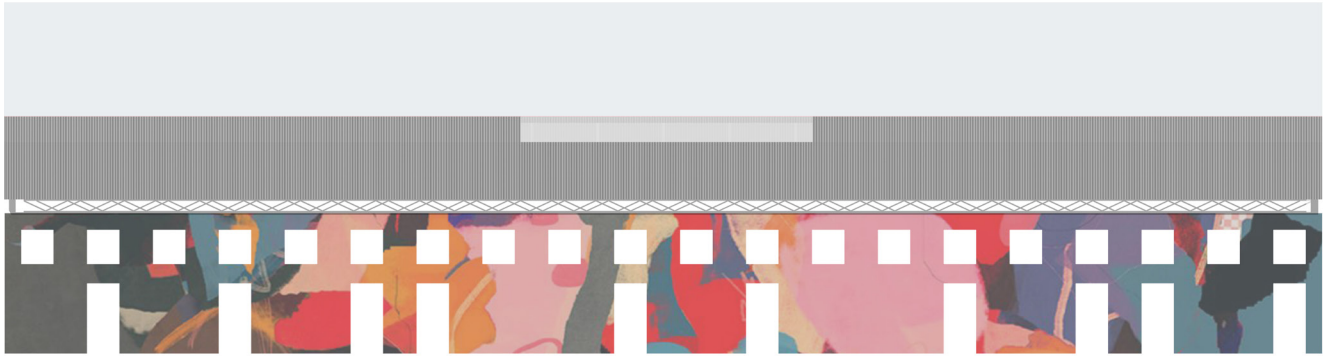
### 1st FLOOR PLAN



1-Offices 2-Studios



Eye level view **perspective** from one of the GYM Studio .



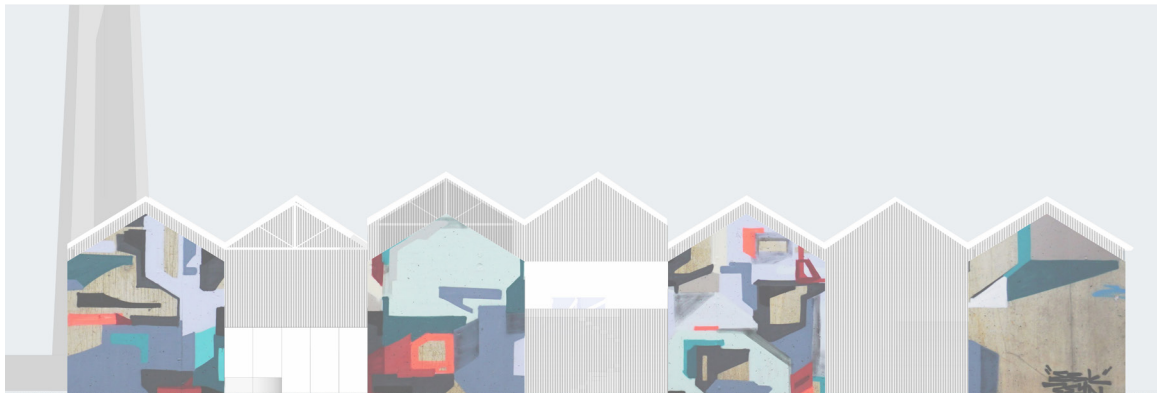
**WEST FAÇADE**

Drawing49



**EAST FAÇADE**

Drawing50



**SOUTH FAÇADE**

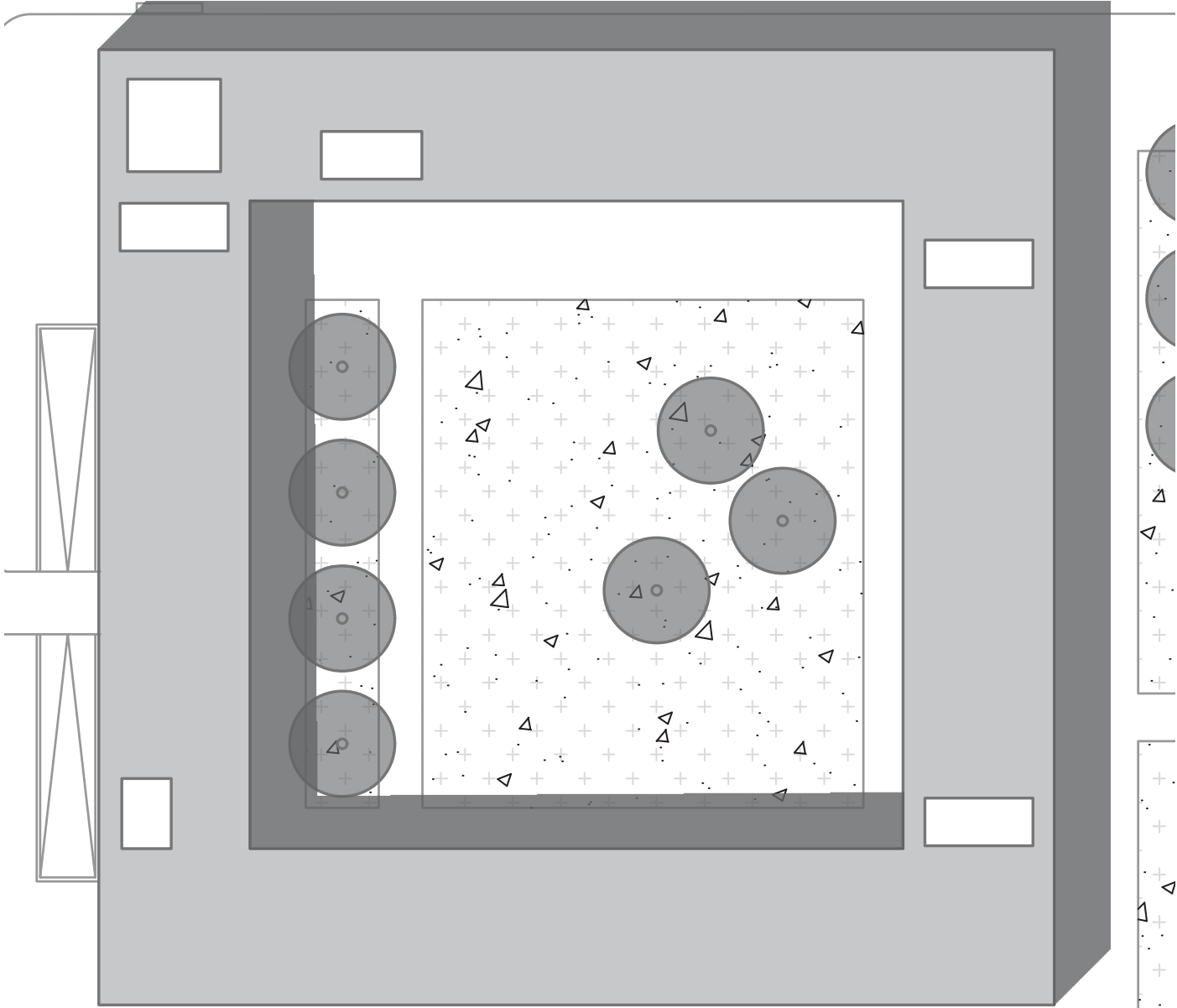
Drawing51



**NORTH FAÇADE**

Drawing52

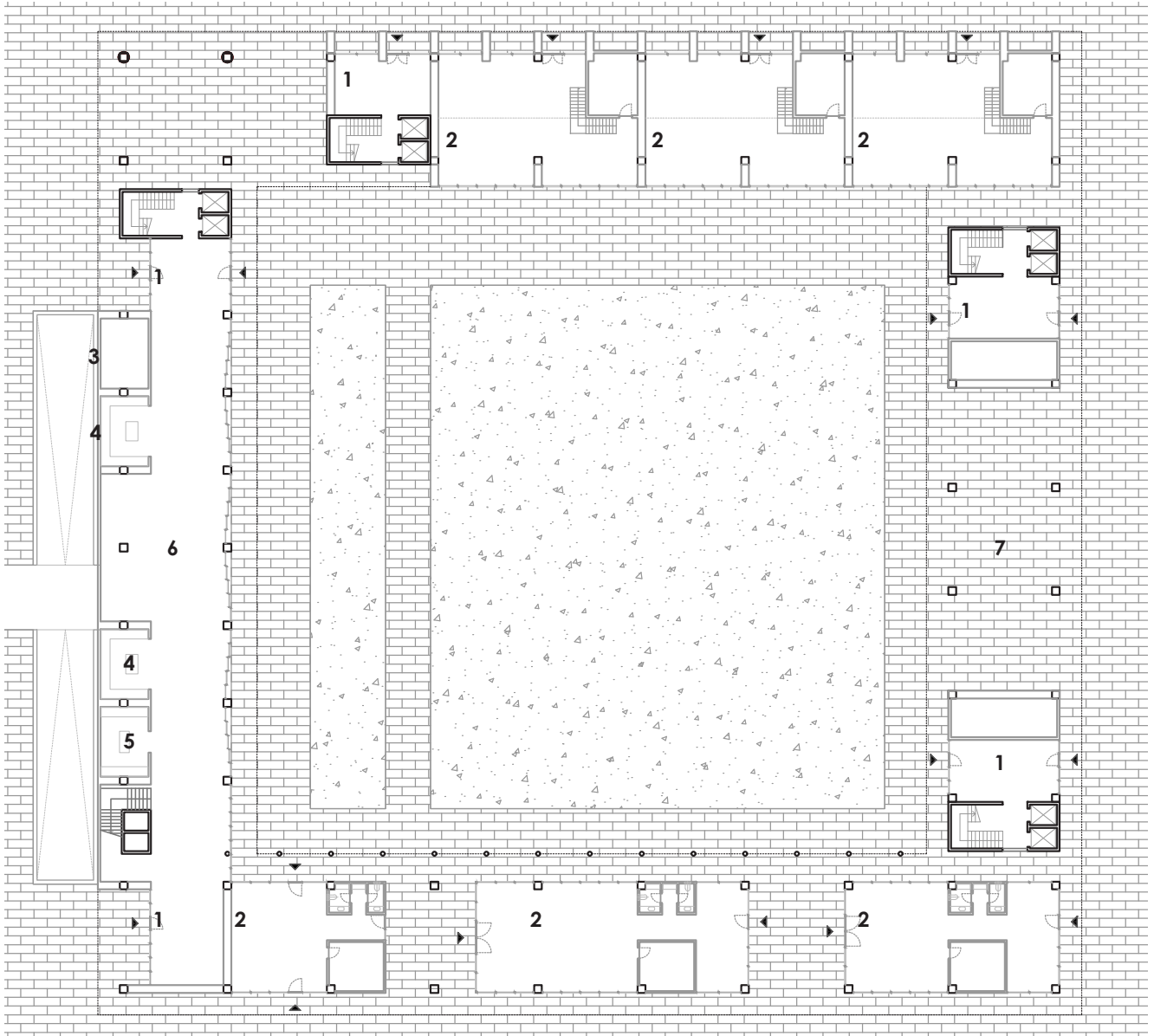
# COURTYARD HOUSING



TOP VIEW



Drawing53

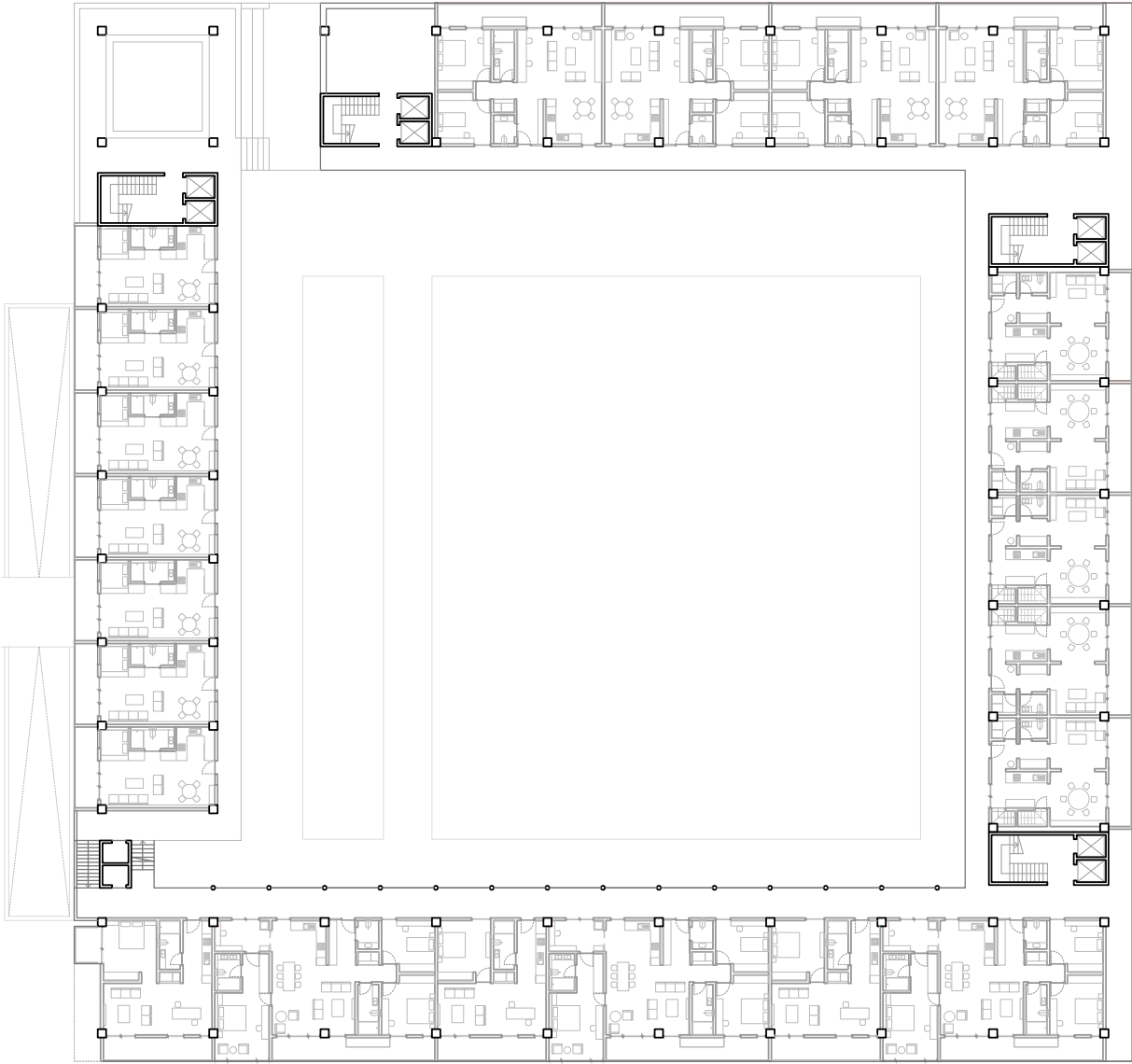


**GROUND FLOOR PLAN**



Drawing54

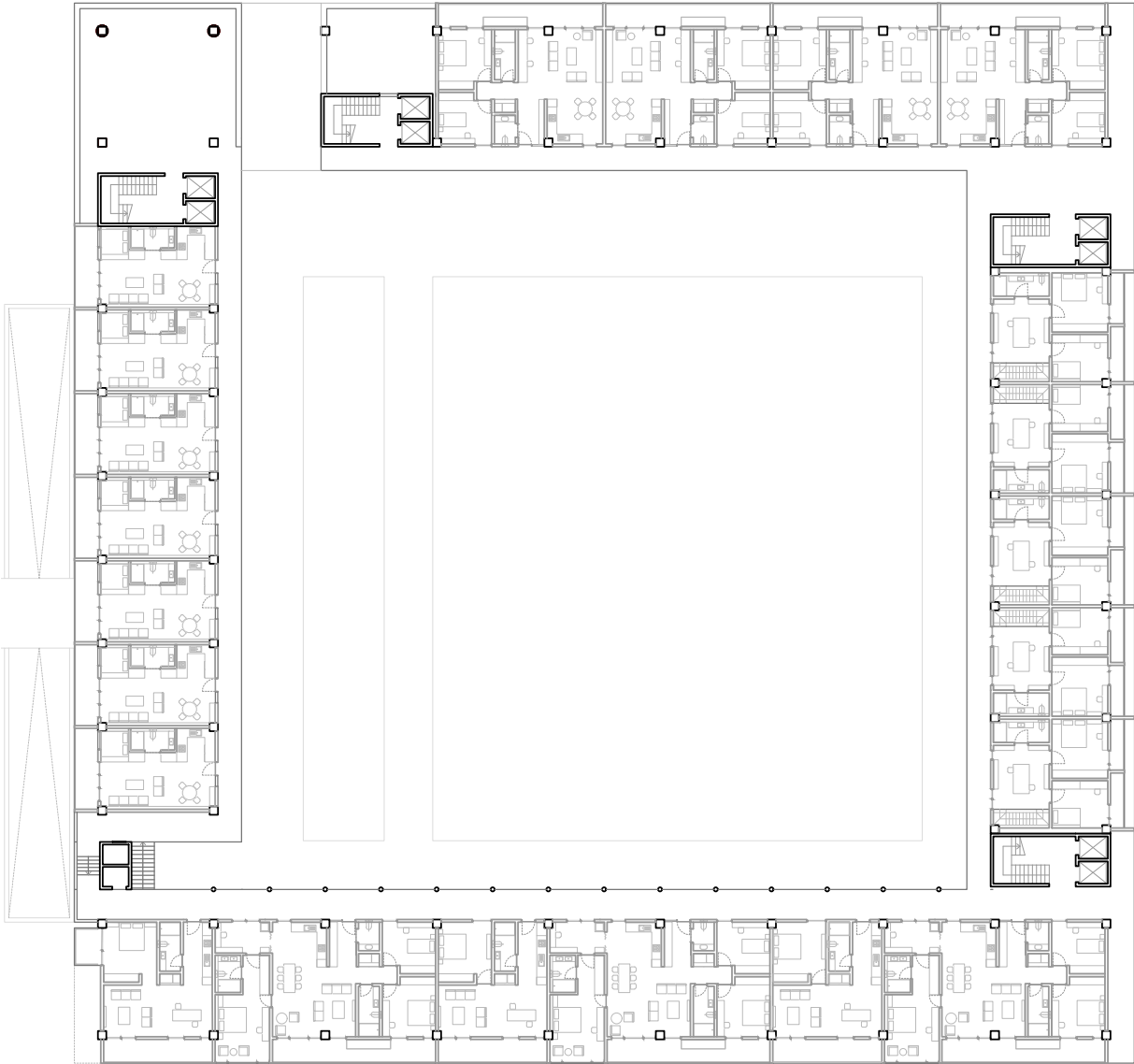
1-Apartment Entrances 2-Retails 3-Storage 4-Commun Kitchen 5-Laundry 6-Commun Space 7-Bike Park



**1st FLOOR PLAN**



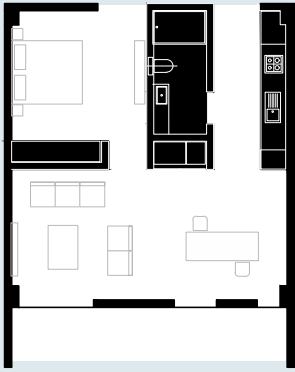
Drawing55



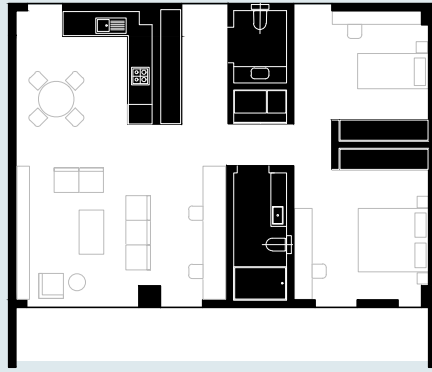
2nd FLOOR PLAN



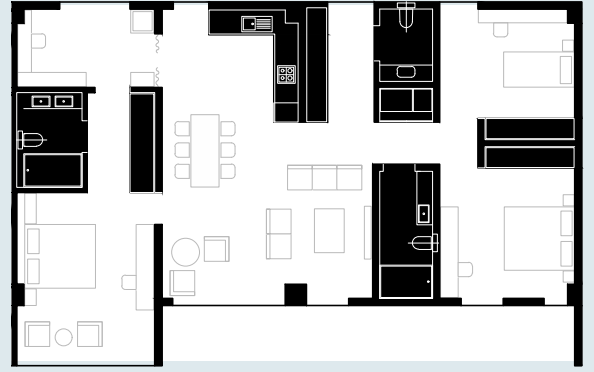
Drawing56



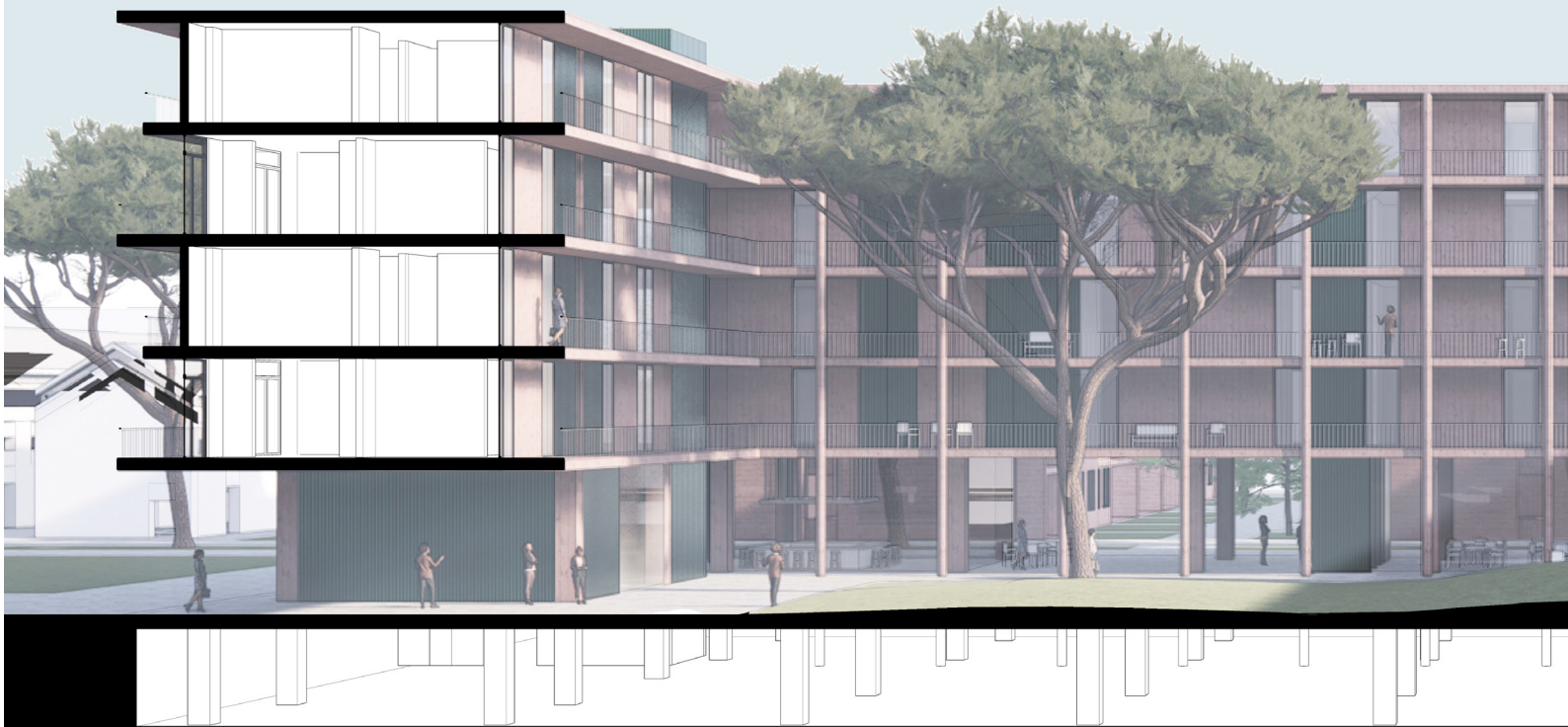
**YOUNG COUPLE**



**FAMILY with KIDS**

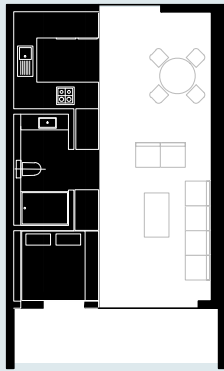


**FAMILY with ELDERLY**

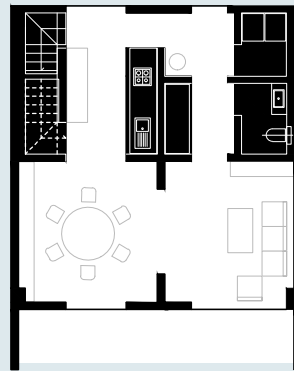


Frontal view **perspective section** of courtyard housing.

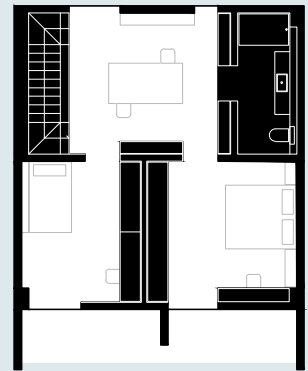




**SINGLE**



**FAMILY with KIDS DUBLEX**



## EXTERIOR FAÇADES



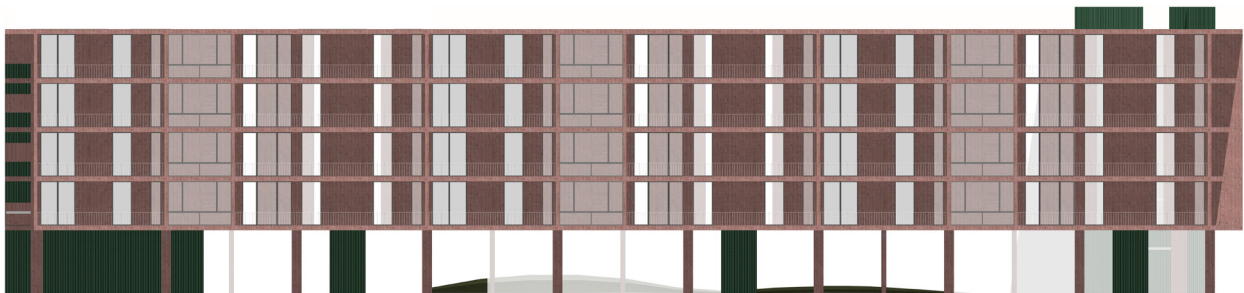
**NORTH FAÇADE**

Drawing59



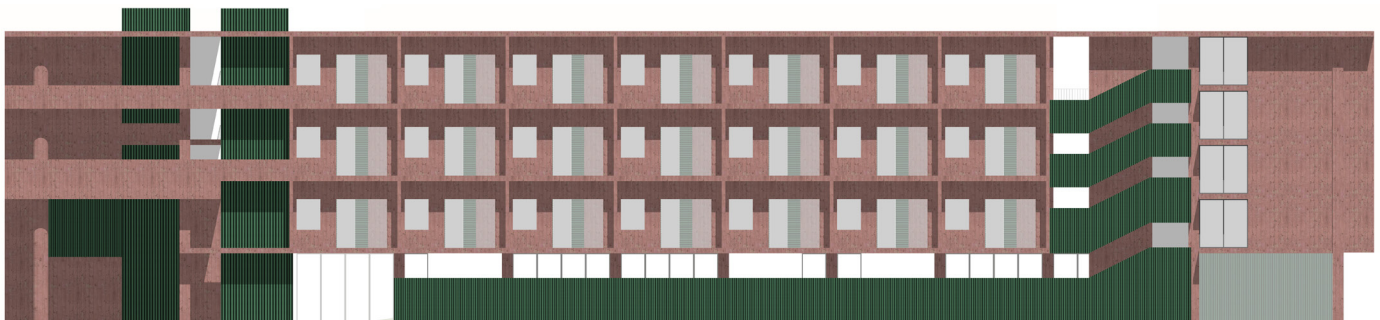
**EAST FAÇADE**

Drawing60



**SOUTH FAÇADE**

Drawing61



**WEST FAÇADE**

Drawing62

## INTERIOR FAÇADES



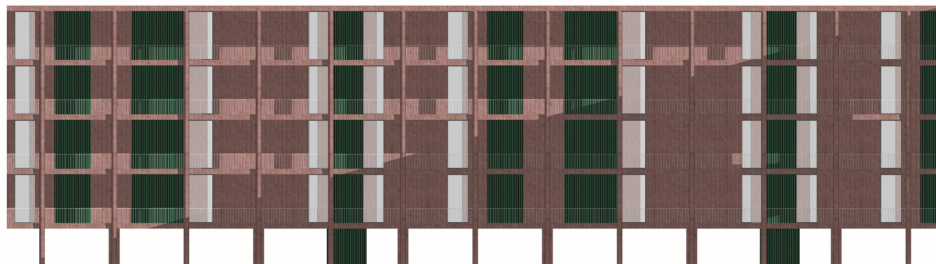
**SOUTH FAÇADE**

Drawing63



**WEST FAÇADE**

Drawing64



**NORTH FAÇADE**

Drawing65



**EAST FAÇADE**

Drawing66

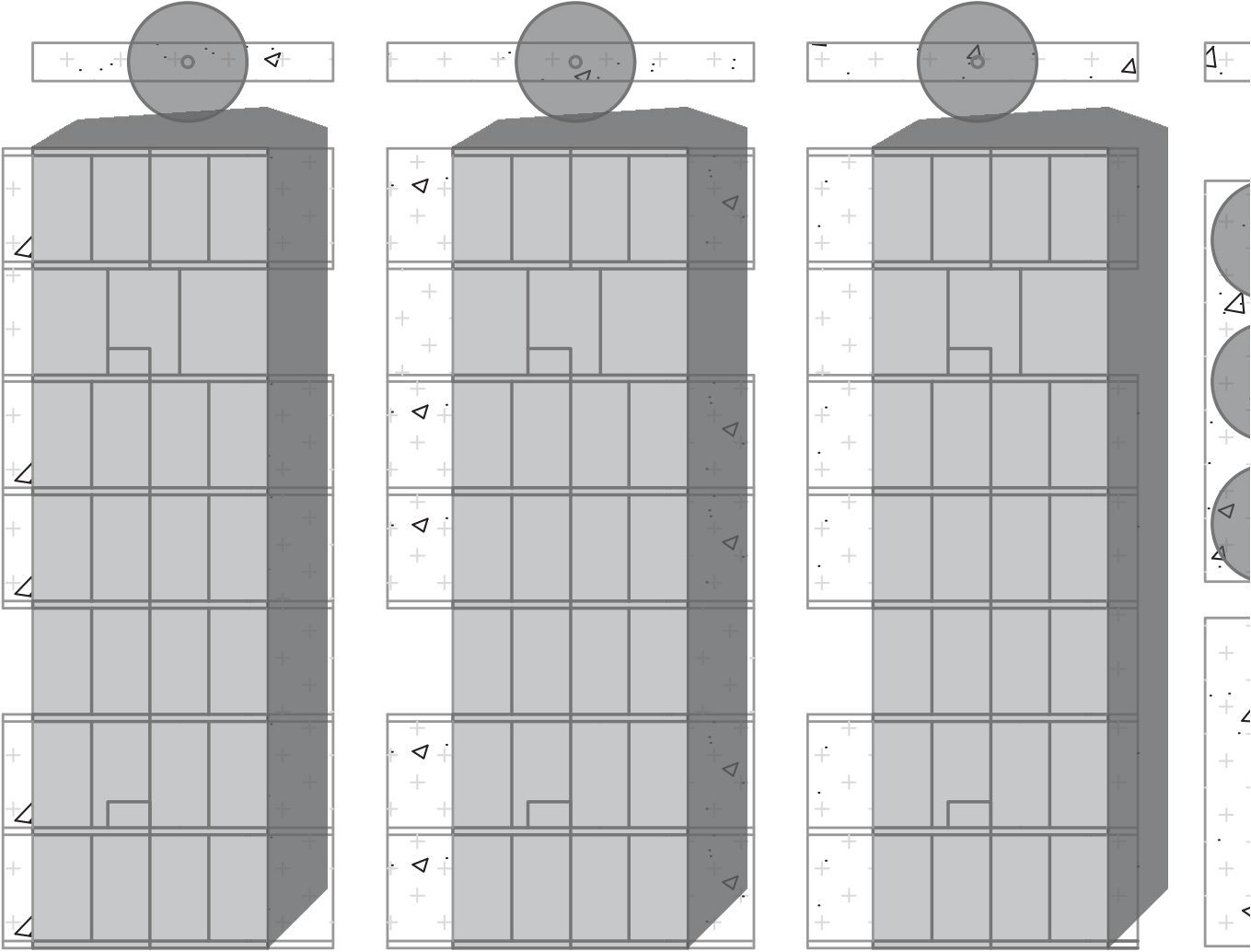


Eye level view **perspective**, looking from steps to courtyard building.



Drawing67

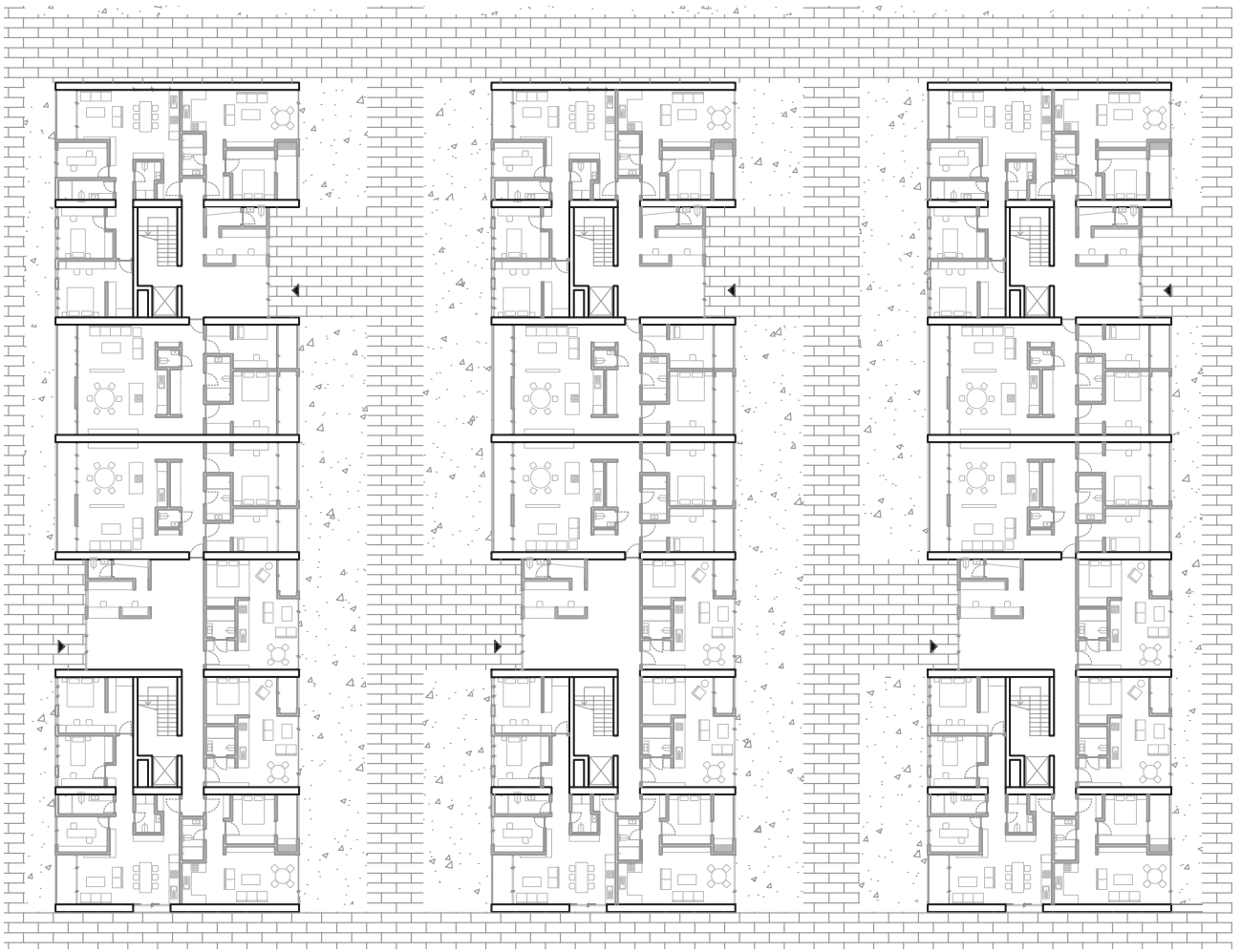
# LINEAR BLOCK HOUSING



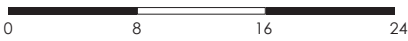
TOP VIEW



Drawing68



Drawing69

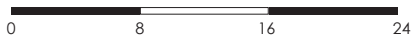


# GROUND FLOOR PLAN





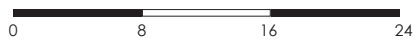
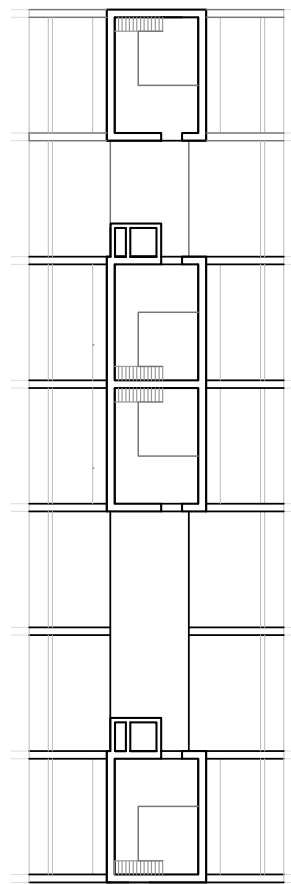
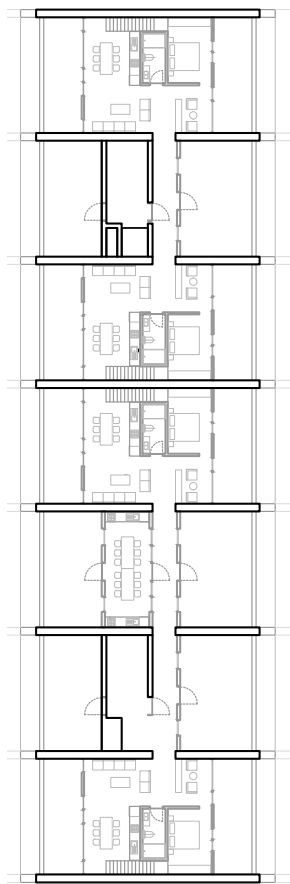
Drawing70



### TYPICAL FLOOR PLAN



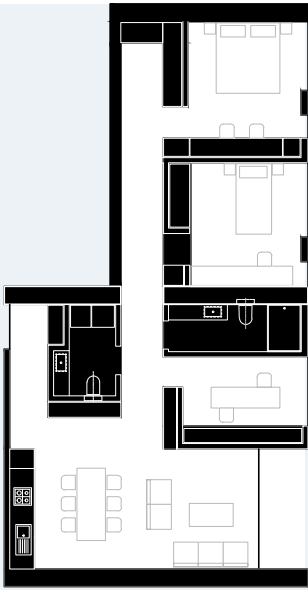




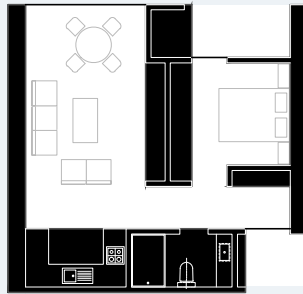
**ARTIC FLOOR PLAN**

Drawing71

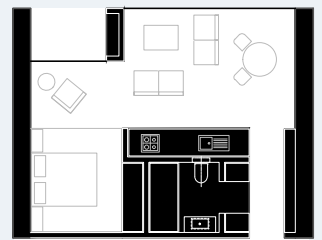




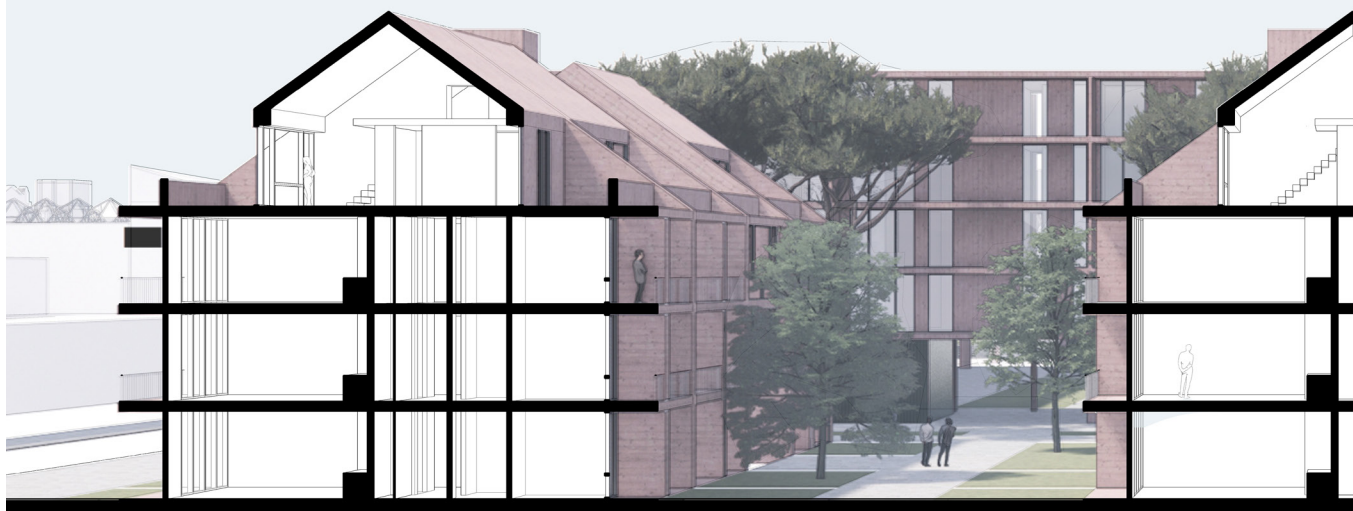
**FAMILY** with KIDS



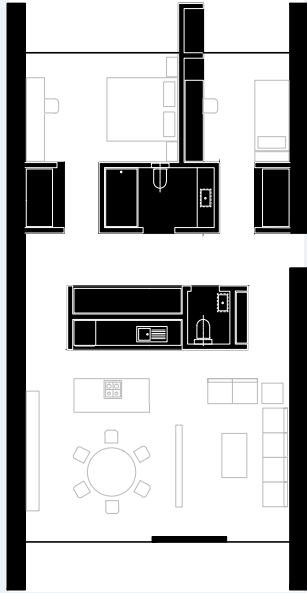
**SINGLE**



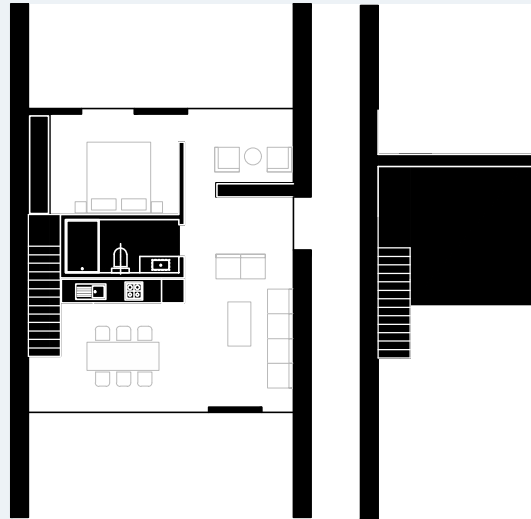
**STUDIO**



Frontal view **perspective section** of three linear housing and public space in-between.

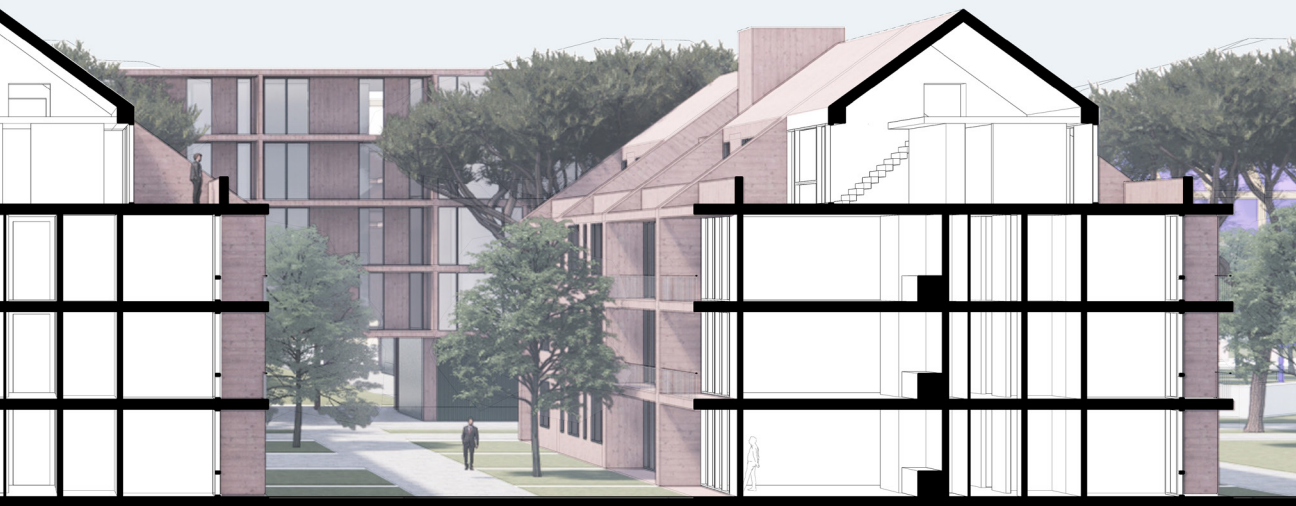


**FAMILY** with KIDS



**YOUNG COUPLE DUBLEX**

Drawing72



Drawing73



Eye level view **perspective** showing the public space between two linear housing.



Drawing74

# CONCLUSION

The failure of the tabula rasa type transformation projects, of which we have seen many examples in the modern architectural period, has caused the architects to bring new urban transformation practices to light in the post-industrial society. With in the new dynamics of culture, the shift at the accumulation of capital, and more the notion of sustainability as the center of our habitats, the concept of transforming by preserving the existing rather than demolishing has come to the fore.

In the frame of the boundaries of this thesis, it was aimed to emphasize the importance of protecting and transforming industrial areas among urban transformation projects. In this transformation approach; parameters such as economic sustainability and ecological sustainability, preservation of collective memory and suitability for multicultural urban life have been underlined. The public interest should not be over-looked during the transformation of such publicly owned industrial superstructure areas such as Ex-Macello. The idea

behind the strategy of preserving the existing as much as possible, which is one of the two main strategies of the design proposal, lies not only in architectural, artistic or urban terms, but also that the so-called economic trust between public and administration. The destruction of the investments made by the social state for the society should only be considered as a last resort.

Today, unfortunately, many functional structures belonging to modern movement are under threat and are being removed for arbitrary reasons. If architecture has a role to create the memory of the city, it should be our practise's duty to protect this heritage against those who try to erase the traces of this period. The sole purpose of this thesis is to articulate all kinds of conservation and transformation works that have been done so far. While doing this, it tries to represent *zeitgeist* with and playful method.

# CONCLUSIONE

Il fallimento dei progetti di trasformazione del tipo *tabula rasa*, di cui abbiamo visto molti esempi nel periodo dell'architettura moderna, ha indotto gli architetti a portare alla luce nuove pratiche di trasformazione urbana nella società post-industriale. Con le nuove dinamiche della cultura, il passaggio all'accumulazione del capitale e la nozione di sostenibilità come centro dei nostri habitat, è emerso il concetto di trasformare preservando l'esistente piuttosto che demolendo.

Nell'ambito dei confini di questa tesi, si è voluto sottolineare l'importanza della tutela e della trasformazione delle aree industriali tra i progetti di trasformazione urbana. In questo approccio alla trasformazione, sono stati sottolineati parametri come la sostenibilità economica ed ecologica, la conservazione della memoria collettiva e l'idoneità alla vita urbana multiculturale. L'interesse pubblico non dovrebbe essere trascurato durante la trasformazione di queste aree industriali sovrastrutturali di proprietà pubblica

come l'Ex-Macello. L'idea alla base della strategia di preservare il più possibile l'esistente, che è una delle due strategie principali della proposta progettuale, non risiede solo in termini architettonici, artistici o urbanistici, ma anche nella fiducia socio-economica tra pubblico e Stato. La distruzione degli investimenti fatti dallo Stato sociale per la società dovrebbe essere considerata solo come ultima risorsa.

Oggi, purtroppo, molte strutture funzionali appartenenti al movimento moderno sono minacciate e vengono rimosse per motivi arbitrari. Se l'architettura ha il ruolo di creare la memoria della città, dovrebbe essere nostro compito proteggere questo patrimonio da coloro che cercano di cancellare le tracce di questo periodo. L'unico scopo di questa tesi è quello di articolare tutti i tipi di lavori di conservazione e trasformazione che sono stati fatti finora. Nel farlo, cerca di rappresentare lo *Zeitgeist* con un metodo ludico.

# BIBLIOGRAPHY

- 1- Chilingaryan, Naira. n.d. "INDUSTRIAL HERITAGE: IN-between MEMORY and TRANSFORMATION Exploratory Research into Transformation Processes of Former Industrial Complexes of Leipziger Baumwollspinnerei (Leipzig) and Mattatoio Di Testaccio (Rome); New Meanings of Industrial Heritage." Accessed June 12, 2022. [https://e-pub.uni-weimar.de/opus4/frontdoor/deliver/index/docId/2229/file/Doctoral+Thesis\\_Naira+Chilingaryan\\_16.05.14\\_druck\\_pdfa.pdf](https://e-pub.uni-weimar.de/opus4/frontdoor/deliver/index/docId/2229/file/Doctoral+Thesis_Naira+Chilingaryan_16.05.14_druck_pdfa.pdf).
- 2- Featherstone, M. (2007). *Consumer culture and postmodernism* (2nd ed.). Los Angeles: SAGE, 197 Publications.
- 3- Kumar, K. (2005). *From post-industrial to post-modern society: New theories of the contemporary world* (2nd ed.). Malden, MA: Blackwell.
- 4 - Featherstone, M. (2007). *Consumer culture and postmodernism* (2nd ed.). Los Angeles: SAGE, 127 Publications.
- 5 - Lloyd, R. D. (2006). *Neo-bohemia: Art and commerce in the postindustrial city*. New York: Routledge.
- 6 - Lynch, Kevin. *What Time is This Place?* Cambridge, Massachusetts: MIT Press, 1972. 29 pp.
- 7 - Lynch, Kevin. *What Time is This Place?* Cambridge, Massachusetts: MIT Press, 1972. 61 pp.
- 8 - Lynch, Kevin. *What Time is This Place?* Cambridge, Massachusetts: MIT Press, 1972. 61 pp.
- 9- GA Document "Norman Foster: New German Parliament" (July 1999) 98-113.
- 10- Snyder, G. H. 2005. "SUSTAINABILITY through ADAPTIVE REUSE: THE CONVERSION of INDUSTRIAL BUILDINGS." Undefined. <https://www.semanticscholar.org/paper/SUSTAINABILITY-THROUGH-ADAPTIVE-REUSE%3A-THE-OF-Snyder/2f0fd90b12a18f09b59ce29638b169088286474d>.
- 11- Albers, G. (2006). Urban development, maintenance and conservation: planning in Germany – values in transition. *Planning Perspectives*, 21(1), 45–65. doi:10.1080/02665430500397295
- 12- Oevermann, Heike, and Harald A Mieg. 2017. *Industrial Heritage Sites in Transformation : Clash of Discourses*. New York [U.A.] Routledge.
- 13/14- Prosek, A. 2006. Culture through transformation – transformation through culture. *Industrial Heritage in the Ruhr Region – the example of Zeche Zollverein. Heritage and Media in Europe*, 3, 239- 248.



15- LaBelle, M. J. 2001. Emscher Park, Germany – Expanding the Definition of a „Park“. *The George Wright Society Forum*, 18, 3.

16- Lane, B., Kastenholz, E., Lima, J., Majewski, J. 2013. *Industrial Heritage and Agri/Rural Tourism in Europe*. European Parliament, Brussels, 141 pp.

17- Chilingaryan, Naira. n.d. "INDUSTRIAL HERITAGE: IN-between MEMORY and TRANSFORMATION Exploratory Research into Transformation Processes of Former Industrial Complexes of Leipziger Baumwollspinnerei (Leipzig) and Mattatoio Di

18 - Austin, Richard L. *Adaptive Reuse: Issues and Case Studies in Building Preservation*. David G. Woodcock, W. Cecil Steward, and R. Alan Forrester, editors. New York: Van Nostrand Reinhold Company, 1988. 49 pp.

19 - Sophie Francesca Cantell. 2005. "The Adaptive Reuse of Historic Industrial Buildings: Regulation Barriers, Best Practices and Case Studies." 2 pp. [http://sig.urbanismosevilla.org/sevilla.art/sevlab/r001us2\\_files/r001\\_us\\_1.pdf](http://sig.urbanismosevilla.org/sevilla.art/sevlab/r001us2_files/r001_us_1.pdf).

20 - Bookout, Lloyd W., Jr. *Residential Development Handbook*. Second Edition. Washington, D.C.: Urban Land Institute, 1990.

21 - Bunnell, Gene. *Built to Last: A Handbook on Recycling Old Buildings*. Washington, DC: Preservation Press, 1977.

22 - Compare Faron (1997, 9-12), for the calculated surface area and layout of the city, with Pillepich (2001, 23-24) for the amount of buildings and population.

23 - Carozzi 1976, Milano, in *Storia d'Italia*, vol. VI, Atlante, Einaudi, Torino, 244-261.

24 - Ranzini 1972, 1873: *Milano si espande*, Comune di Milano, Milano.

25 - Employees within the city walls numbered 11,897, whilst in the Corpi Santi there were only 12 large factories, and half of the workers recorded there were working in the Cavalli cotton printing plant (Bigatti 2000, 181-182).

26 - Cattaneo 1956, *Sui dazj suburbani di Milano*, in Id., *Scritti economici*, a cura di A. Bertolino, Le Monnier, Firenze, vol. III, 418-439.

27 - Mocarelli, Luca. 2015. "The Long-Term Evolution of the Suburbs of Milan." *Popolazione E Storia* 16 (1): 135–56. <https://doi.org/10.4424/658>.

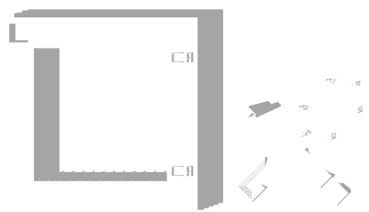
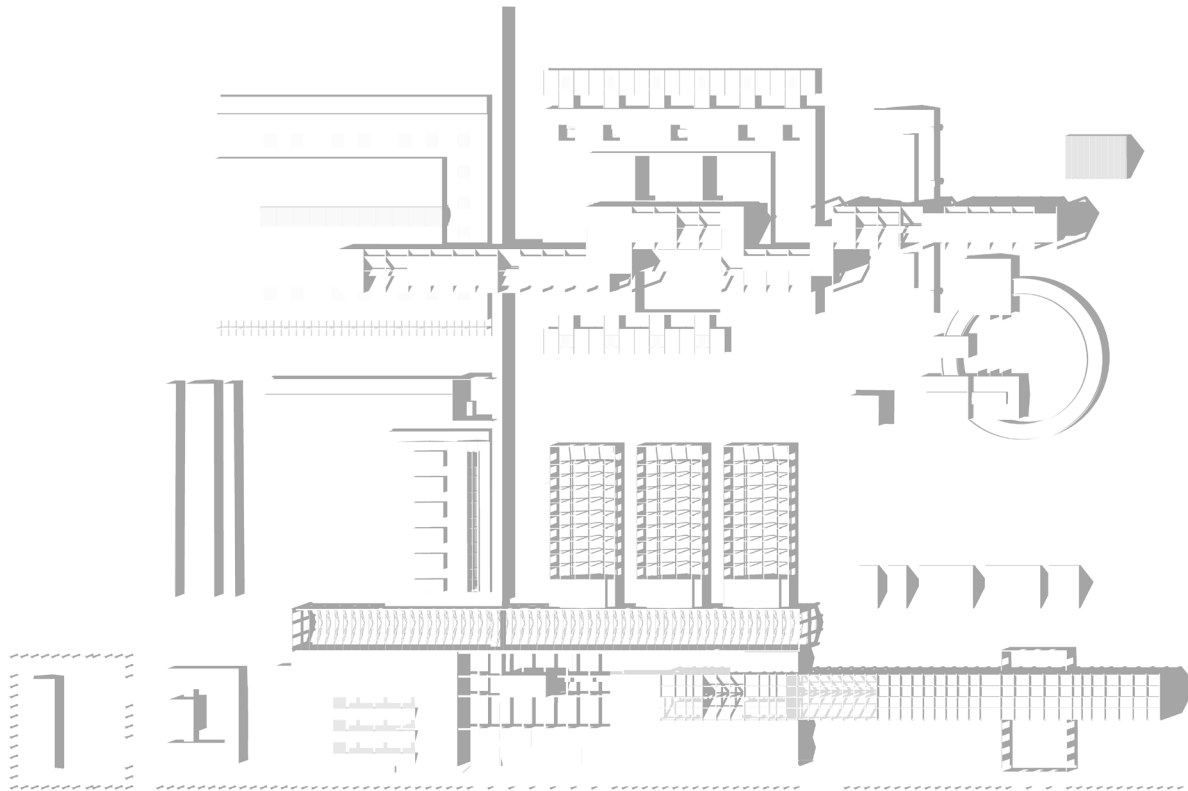
- 28 - Buzzi Donato 1969, Note sullo sviluppo di Milano negli ultimi cento anni, Servizio statistica del Comune di Milano, Milano (Quaderni di documentazione e di studio, I).
- 29 - Bergaglio, Maristella. 2019. "Inhabit Utopia: A New Outcome for Large Regenerated Industrial Areas in Milan." *Altre Modernità*, September, 14–31. <https://doi.org/10.13130/2035-7680/12134>.
- 30 - Sassen, Saskia. *The Global City : New York, London, Tokyo*. Princeton University Press, 2013.
- 31 - Trono, Anna, and Maria Chiara Zerbi. "Milan : The City of Constant Renewal." *GeoJournal*, vol. 58, 2003, pp. 65–72.
- 32 - Barron, Patrick, and Manuela Mariani. *Terrain Vague: Interstices at the Edge of the Pale*. Routledge, 2013.
- 33 - Armondi, Simonetta, and Stefano Di Vita. *Milan. Production, Spatial Patterns and Urban Change*. Routledge, 2018.
- 34 - Sennett, Richard. *Usi Del Disordine. Identità Personale e Vita Nella Metropoli*. Costa & Nolan, 1999.
- 35 - Fabio Marcomin-12/09/2020  
La STORIA del MERCATO del macello, quando era un'avanguardia in Europa  
<https://www.milanocittastato.it/featured/la-storia-del-mercato-del-macello/>
- 36 - MICHELE LAROTONDA 28/10/2021  
SPAZIO EX MACELLO, la nuova sede dello IED  
<https://www.milanocittastato.it/rinasci-milano/spazio-ex-macello-la-nuova-sede-dello-ied/>
- 37 - Fabio Marcomin-12/09/2020  
La STORIA del MERCATO del macello, quando era un'avanguardia in Europa  
<https://www.milanocittastato.it/featured/la-storia-del-mercato-del-macello/>
- 38-<https://fondoambiente.it/luoghi/ex-macello-di-porta-vittoria?ldc#section2>
- 39 - 36 - MICHELE LAROTONDA 28/10/2021  
SPAZIO EX MACELLO, la nuova sede dello IED  
<https://www.milanocittastato.it/rinasci-milano/spazio-ex-macello-la-nuova-sede-dello-ied/>
- 40 - Il progetto preliminare del 1910 è pubblicato in Aleni, Redaelli, 2013, p. 48.
- 41 - Filippini G., 1917, «I nuovi impianti di Macello, Mercato e Scalo bestiame per la città di Milano», *L'edilizia moderna*, maggio-giugno, pp. 28-31 (e tav. XXI).
- 42 - Amia, Giovanna. n.d. "Il Macello Di Porta Vittoria: Un'attrezzatura Urbana Nella Milano Del Primo Novecento." Accessed June 12, 2022.

[https://re.public.polimi.it/retrieve/handle/11311/978510/427322/Il%20Macello%20di%20Porta%20Vittoria\\_11311-978510\\_D%27Amia.pdf](https://re.public.polimi.it/retrieve/handle/11311/978510/427322/Il%20Macello%20di%20Porta%20Vittoria_11311-978510_D%27Amia.pdf).

43 - La bibliografia sul liberty milanese è vasta e trascende gli obiettivi di questo lavoro. Per un quadro generale si veda comunque Bossaglia, Terraroli, 2003. Sono evidenti le affinità di gusto con la Palazzina Liberty di largo Marinai d'Italia, contemporanea alla realizzazione dei fabbricati per i servizi generali del complesso di viale Molise.

44- Amia, Giovanna. n.d. "Il Macello Di Porta Vittoria: Un'attrezzatura Urbana Nella Milano Del Primo Novecento." Accessed June 12, 2022. [https://re.public.polimi.it/retrieve/handle/11311/978510/427322/Il%20Macello%20di%20Porta%20Vittoria\\_11311-978510\\_D%27Amia.pdf](https://re.public.polimi.it/retrieve/handle/11311/978510/427322/Il%20Macello%20di%20Porta%20Vittoria_11311-978510_D%27Amia.pdf).





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