K N O T

Renovation project of the former market of Torre Spaccata in ROME

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FINAL REPORT

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00. **ACKNOWLEDGMENT**

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Many thanks for their encouragement, support and guidance until the project work was completed.

01. **ABSTRACT**

This paper scrutinises in detail how old buildings in and around cities can be redesigned and planned and transformed into new buildings and new urban plans that are low-carbon, sustainable, adaptive, inclusive, more compact, multifunctional and fit for the future. The cities of the future will be flexible, diverse, innovative and full of dynamic change, and the architecture and planning in cities will change to accommodate future urban development.

This paper will focus on the Ex-Mercato building and its surroundings in the Torre Spaccata area of Rome as an example of how to preserve its historical traces while transforming its form and structure into a new, more innovative and inclusive building, and the urban planning around the new building. The Ex-Mercato building is a community gathering point for local residents and plays a role of connectivity and communication in the overall residential community space. In order to better adapt the building and its surroundings to future urban transformations, the authors ensured that the building would be multifunctional and reversible by introducing new types of employment, developing new service models, innovating in master planning and space use, and adding sustainable design, and that the new perimeter plan would enhance direct community connections and be able to keep pace with future changes in urban lifestyles and demand for innovative products .

02. **INTRODUCTION**

The site is located in the municipality VII (previous municipality VI until october 2021) of Rome , Italy, in the Torre Spaccata area, which is far from the city center, with a large population and an underdeveloped economy.

Through the "KNOT—Renovation project of the former market of Torre Spaccata in ROME" project, this thesis uses sustainable design techniques to replanned the area on the basis of maintaining the historicity of the building, so that it can better adapt to the needs of future urban development, form a new type of resilient community, and Contribute to local economic growth, increase employment opportunities, enrich the cultural and entertainment needs of local residents.

This paper is divided into three parts: urban planning, renovation and technology. Starting from the entire planning, on public greenery, we have the following goals:

Short-term goal: a green space plan that can grow over time. During the first two years of the project, the green space around the building will be planted with easier-to-grow green plants to activate soil activity. In the fifth year of the project, it will start to plant greenery that represent local characteristics. As time goes by, the local landscape green plants grow in good condition. By the tenth year of the project, a very representative green plant landscape belt can be formed to create microscopic landscapes and biodiversity.

Social goals: pay attention to the life experience of community residents. After a series of data surveys, the population of local residents is increasing year by year, mostly young and old, showing a trend of polarization. Correspondingly, there is a lack of local living facilities, represented by cultural facilities such as libraries and auditorium. The lack of squares makes local residents lack a place for emotional communication, which is not conducive to the long-term development of the local area.

Landscape goal: by connecting the city and nature, adding green space, forming a new ecological community, continuous sustainable public open space, and reducing the urban heat island effect.

Urban development goals: extend the space to the outside of the house, create an urban knot, and better connect the surrounding areas, such as strengthening the close connection between Viale dei Romanisti and Torre Spaccata, and radiating functions to the entire Torre Spaccata area, contributing to the revitalization of local development.

In terms of renovation, due to the high historical value of the building itself, local residents have a deep affection for it. Therefore, in the design, we added architectural functions on the premise of maintaining the historical nature of the building to complement the life of local residents. The interior space of the building is flexible and changeable, such as adding a auditorium, library, restaurant, etc. In order to meet the economic needs and increase the employment rate, we have added new co-working. We added a square and a number of steps in front of the building. The seats on the square and steps can make residents communicate more closely and provide a space for emotional communication.

Technically, the overall use of sustainable materials reduces carbon emissions and facilitates recycling. Install a large number of solar panels on the roof to store electricity by absorbing sunlight to supply the electricity needed by the building. A rainwater

collection system is introduced on the roof, and the collected rainwater is supplied to the surrounding rain garden. Increase the roof green plant system to increase the diversity of green plants.

Through the above design, it is committed to awakening the neighborhood and strengthening the connection between the community and Torre Spaccata, thereby reinvigorating the local area.

03. **PROJECT BACKGROUND**

03.1 History of INA-Casa

03.1.1 INA-Casa in Italy

Ex-Mercato building is a product of the Italian INA-Casa program in the 1950s. The INA-Casa program has a profound impact on the Italian city of Rome and the Torre Spaccata region.

Since the immediate post-war period, on the one hand there was a country to rebuild and thousands of people without decent housing, on the other hand the town planners were strongly asking the government for a national plan and a central body able to coordinate the reconstruction.

We owe to Amintore Fanfani a first reflection that addresses the problem of poverty in its various social aspects, emphasizing the centrality of the degradation of housing conditions in determining conditions of misery.

From this reflection comes the parliamentary process of the bill, presented by Fanfani himself, at the time Minister of Labour and Social Security, which began in July 1948.

A few years after the end of the Second World War and a little more than a month after the establishment of the Fifth De Gasperi Government, with this initiative the Minister intended to address the problem of unemployment, through the development of the construction sector, considered an area capable of promoting the economic revival of post-war Italy. With the law of February 28, 1949, n. 43 the Parliament approved the "Bill to increase workers' employment, facilitating the construction of houses for workers", which was almost immediately called "Fanfani Plan".

Initially the plan provided for a seven-year duration, but later it was extended until 1963.

The intervention, managed by INA-Casa, wanted to encourage not only the revival of construction activity, but also the absorption of a considerable number of unemployed people and the construction of housing for low-income families.

The plan was financed through a mixed system involving the state, employers and employees. The latter, through a deduction from the monthly salary - the equivalent of one cigarette a day, as the propaganda of the time said - were thus able to help the most needy comrades.

Fears that a slow, heavy and expensive apparatus was being set up were soon disproved by the establishment of a centralized and streamlined entity managed by INA-Casa, which was structured on a fundamental diarchy.

First of all, the Plan Implementation Committee, a body that carried out general supervision, issued regulations, distributed funds and assignments, directed by engineer Filiberto Guala. While in its architectural and urbanistic aspects, the plan was coordinated by the architect Arnaldo Foschini, a leading exponent of the 'Roman school', dean of the Faculty of Architecture of the capital, director of architects' associations.

The majority of the best architects of the time will participate in the projects: from Irenio Diotallevi, Mario Ridolfi, Michele Valori, Carlo Aymonino, Franco Albini, BBPR studio in Castiglioni, Ignazio Gardella and Daneri, Figini and Pollini, Ettore Sottsass and Enea Manfredini.

03.1 **History of INA-Casa**

The plan followed precise directives, which reconnected and made their own, first of all, the architectural trend prevailing in that period in Italy, which was that of architectural Neorealism, that is, a close link with tradition, which led to a reinterpretation of rationalist themes based on the compositional coherence of materials, technological choices, architectural details, sociological and psychological interpretations of the built environment and the existing and historical architectural space. Secondly, in order to guarantee a return to employment, it was planned to use local businesses and small entrepreneurs in the various phases of construction. On April 1, 1949, what the architect and town planner Giuseppe Samonà then called a "grandiose machine for housing" was ready to go.

At full capacity, this "great machine" produced 2,800 rooms a week, giving a home to about 560 families a week. Until 1962, the 20,000 construction sites spread throughout Italy, in large cities as well as in small towns, will offer a job every year to more than 40,000 construction workers, constituting a employment equal to 10% of the days-worker of the time.

Thanks to the approximately two million rooms built in the fourteen years of activity, with this plan over 350,000 Italian families improved their living conditions. According to a survey promoted by the institution among the assignees, 40% of the families, before moving to new housing, lived in cellars, caves, shacks, under stairs and 17% in cohabitation with other families. There were many immigrants from the countryside, from the South, and many refugees from Istria and Dalmatia.

Some of the neighborhoods created with the plan now make up the pages of the history of architecture and urban planning of the twentieth century Italian and are articulated between different ideas of city, space, community. But what deserves attention are not only the best known interventions, those designed by renowned architects. Anyone who visits today the realizations of that time can notice the effort made to raise and spread the quality of design in these places of daily living. A result achieved thanks to a series of choices made by INA-Casa and aimed at controlling and coordinating the design of interventions. Initially, competitions for the selection of designers played a decisive role. It aimed at the formation of a special register of 'INA-Casa designers'. Consistently with the 'anti- industrial' approach and the exclusion of recourse to prefabrication, the way chosen for the design of the neighborhoods had excluded the centralized drafting of model projects, providing rather the broad involvement of Italian designers and thus also promoting the revival of the liberal professions in the construction sector.

A guide and coordination of the design was carried out through small manuals published by INA-Casa, two in the first seven-year period and two in the second: dossiers that collected suggestions, recommendations, guidelines, schemes, examples, to 'guide' rather than to codify the design of housing, buildings, nuclei and neighborhoods, in an attempt to give all the interventions a certain technological, architectural and urban quality, while avoiding, at the same time, an excessive homologation of the achievements of the plan. The examples provided, in fact, were proposed not as a standard to be applied, but as models to be interpreted and reworked, following the needs and conditions of different local contexts.

After two seven years of activity, with the approval of Law No. 60 of February 14, 1963, "Liquidation of the building stock of the INA-Casa Management"

03.1 **History of INA-Casa**

and the establishment of a ten-year program of construction of housing for workers, the experience of INA-Casa, between light and shadow, closed definitively. Other bodies (Gescal - Management Houses for Workers, Municipalities), other regulations and other instruments (e.g., Law n. 167 of April 18, 1962, which promoted municipal plans for economic and social housing) will take its place in the planning, financing and construction of social housing.

A singular feature of the project was to affix, on all the buildings realized, a polychrome ceramic plaque (some of them made by great artists such as Alberto Burri, Duilio Cambellotti, Tommaso Cascella, Pietro De Laurentiis, Piero Dorazio) alluding either to the theme of the project or, more generally, to the theme of the house as a happy place.

The application of the plates on the buildings, for which the measurements, the location and the maximum prices were established, was one of the conditions for the issue of the test certificate.

Italian art and architecture were influenced by neorealism. After the war, the overall atmosphere of Italy was in a downturn. The country suffered from economic mass damage due to the war, resulting in unemployment, poverty and other problems. In this context, Neorealism adopts the concept of "reality" to redefine and focus the social
gaze in order to address the protagonists of post-World War II reconstruction in Italy - poor classes and rural migrants. Therefore, neorealist design focuses on "the reality of everyday cities", it is not communicated through government manifestos. In the post-war years, people collectively wanted to forget about dictatorships.

So avoid all references to regimes and focus on the "reality" of the common man, which is what Neorealist art and architecture tend to do.

INA-Casa, on the other hand, in order to ensure the employment and return of the unemployed, the plan utilizes local large and small entrepreneurs during the construction process.

03.1.2 INA-Casa in Rome

The INA-Casa program is very important for Rome, which has seen many complex interventions during these 14 years. There were a lot of shanty towns and socially backward areas in Rome after World War II, as the program led to the emergence of new buildings and detached houses in many parts of the city, as well as some wider urban settlements. These are shown in "Mamma Roma", a film record the neorealism of Rome.

Mamma Roma
Pier Paolo
Pasolini, 1962

03.1 **History of INA-Casa**

03.1.3.1 INA-Casa in Torre Spaccata

Originally created in the 60th within the Piano INA-Casa, Torre Spaccata district provides a significant testimony of the Twentieth century in Rome, maintaining a specific character and identity. The urban context is characterized by a low-intensity distribution of (mainly) three or four-storey buildings – but there are also 7-storey towers -, open courtyards structured on tree-lined streets and flower beds. Originally, the project included the creation of small public and private services which have never been implemented.

The plan, launched in 1949 and implemented for 14 years, was one of the most significant experiences in the field of social housing, and constitutes a significant stage of economic development in the Italian post-war period. The implemented buildings, planned to guarantee the wellbeing of residents and in line with modern urban settlement schemes, offered thousands of families the chance to improve their housing status, and were the first real opportunity for Italian planners and architects to shape the rapid and fragmented expansion that Italian cities were already undergoing.

In Rome, in particular, the INA-Casa plan became something extremely familiar in the post-war period. Coordinated, in the architectural aspect, by Arnaldo Foschini (Academic Professor at the Faculty of Architecture in Rome) he entrusted the new INA-Casa neighborhoods to some of the best Roman architects, such as Libera, De Renzi, Ridolfi, flanked by Ludovico Quaroni and Saverio Muratori and the younger Mario Fiorentino, Carlo Aymonino, Carlo Melograni.
In the span of two seven years of achievements Rome witnessed a complex number of interventions: many districts of the city admired the birth of new buildings, individual houses, but also extensive settlements. Without forgetting also the cancellation of various areas full of shacks and housing and social degradation.

List of neighborhoods INA-Casa in Rome [in brackets the dates of design and construction]:
Valco San Paolo [1949-52], Tiburtino [1949-52], Tuscolano [1949-52], Villa Gordiani [1949-52], Ponte Mammolo [1957-62], Acilia [1958-60], Colle di Mezzo [1958-60], and finally, Torre Spaccata.

Flanked by Via Casilina, a few hundred meters beyond the Mausoleum of St. Helena and the archaeological park of Centocelle (km 9,200), stands the district of Torre Spaccata, which takes its name from the medieval tower of the same name, now in a state of ruins, built on the remains of a tomb of Roman times. Built during the second seven years, the complex was designed by Plinio Marconi, coordinator of ten groups of designers.

The thick vegetation now existing in the common areas, consisting mainly of maritime pines, as well as the use of the brick curtain, often treated to form perforated surfaces and alternating with structural elements in exposed reinforced concrete, give the whole unitary character, although in the wide variety and autonomy of the solutions proposed, which required the commitment of fifty designers for the definition of the seventy-four buildings in the program. The lack of attention that historiography has paid to the intervention, confirmed by the limited number of publications on the individual projects and accentuated by the partial dispersion of the original documentation, leaves for now unknowns regarding the attribution of some of the buildings.

03.1 **History of INA-Casa**

Furrowed by Viale dei Romanisti, which drastically split in two, the neighborhood unfolds on flat ground, allocating the central area, already marked by the deep intrusion of the Army Barracks "Vincenzo Piccinnini", to the common services: church (G. Nicolosi), school (P. Marconi), kindergarten, market, offices of the neighborhood. The residential buildings, for the most part in good condition, do not deviate from the schemes issued by INA-Casa with regard to the planimetric solutions of the housing. Generally, within the individual lots, buildings designed by other groups are accommodated, thus encouraging a more organic integration between the different sets. The buildings, placed in a way that almost never coincides with the street line, are inspired by previous Scandinavian experiences and respond to tower and in-line types, three, five and up to seven floors, arranged to form, in the heart of the blocks, large protected green courtyards.

Walking along Viale dei Romanisti coming from Viale Palmiro Togliatti, you can see on the left a first homogeneous complex of buildings characterized by the load-bearing structure in exposed reinforced concrete, placed in accentuated undercuts with respect to the brick curtain wall: at the south corner between Via Cassioli and Via Lupi, three-storey in-line lodgings, arranged in an L shape, detach from the street line to give space to strips of greenery. The whole, referable to the Paniconi group, finds continuity on the opposite side of Viale dei Romanisti and integrates, in the solution of the finishes, with the core designed by the Pediconi team, which closes this path. It is possible to notice both the brick open-worked equipment, placed to signal the presence of the clotheslines as a crowning frieze, and the suture between the two bodies, not perfectly perpendicular to each other, entrusted to a series of overlapping loggias, today inexorably closed by verandas. The small one-storey building on the corner with Via Marforio, originally used as a store, which presents the particular alternating weaving of bricks in the corners and, next to it, the 7-storey tower that shows the corner pillars with tapered section and intersperses on the elevations the presence of balconies and loggias from the parapet in brick curtain worked in free pattern.

Moving in the southern sector of the neighborhood, on Viale dei Romanisti, you can discover a set of buildings in line recognizable by the unique solution adopted, in the side elevation, for the clotheslines, closed entirely by canneled panels, while, continuing on Via Rugantino, you reach the tower signed by Castellazzi. To characterize it, with a touch of flirtatiousness, are the very protruding balconies, a sort of drawbridge projecting from the compact wall mass of the building block, whose elevations appear variegated thanks to the use of perforated weavings, placed to screen the loggias of the clotheslines.

A remarkable originality can be recognized to the complex designed by Plinio Marconi, overlooking the services area (market, school). A series of houses in line show rather unusual façade solutions: frontal 3 or 5-storey brick curtain plates are framed by a single frame, consisting of the side pillars in exposed reinforced concrete and a crowning shaped by a protruding eaves that encloses the individual housing units, entrusting the overlapping loggias with the suture between the various building bodies, sometimes arranged in staggered sequence. On the sides emerges on the surface the structure of the

03.1 **History of INA-Casa**

horizons that mark, unlike the main elevations, large surfaces finished with plaster.

On the adjacent block rises, by the same author, the 7-storey tower, with a very compact propeller-shaped plan, raised from the ground by means of a base and covered by a four-pitch roof, detached from the body of the building by the continuous cut of the crowning loggia.

Following, to complete our tour of the neighborhood, the building made of staggered blocks that stands on Via Pellini, recognizable by the sharp canopies placed to indicate the presence of triangular volumes, according to a model already proposed by Mario Ridolfi in Terni and Rome, in the Tiburtino district: an element that, with its breaking force, seems to activate vibrant stretch marks in the brick curtain, also proposed at the end corners of the buildings.

Back again in Viale dei Romanisti, the itinerary closes with the set of buildings signed by the Pediconi group: as in other cases, the buildings go forward with an offshoot on the opposite side of Viale di Romanisti, integrating harmoniously with those made by Paniconi, both for the choice of materials and for the adoption of a common vocabulary, experimented by the two designers in the common professional practice, although here offered with nuances that distinguish the two different sectors. Note the brick equipment in the surfaces that mask the loggias and the drying racks in the attic of the towers, as well as the unique solution of the showy cement tympanums erected to profil the volume of the drying racks, in the buildings that wind between Viale dei Romanisti and Via Marforio.

Torre Spaccata in 1960s

03.1 **History of INA-Casa**

03.1.3.2 Historical development of Torre Spaccata district

Urban Planning Project: Plinio Marconi
Architectural Projects – Plinio Marconi-Group Leader
+ Serena Boselli (group leader), Gino Cancellotti, Massimo Castellazzi (group leader), Eugenio Montuori , Vittorio Ballio Morpurgo (group leader), Giuseppe Nicolosi (group leader), Mario Paniconi (group leader), Vincenzo Passarelli (group leader) with Fabrizio Falchetti, Lucio Passarelli, Fausto Passarelli, Giulio Pediconi (group leader)

Promoting subjects: Istituto Autonomo Case Popolari (IACP), Istituto Nazionale per l'Assicurazione
contro gli Infortuni sul Lavoro (INAIL), Istituto Nazionale Case Impiegati dello Stato (INCIS), National Social Security Institute (INPS).

Design year: 1958
Year of realization: 1960
Surface area 31.2 ha
Inhabitants 11.200

03.1 **History of INA-Casa**

03.1.3.3 Passarelli Studio

The Passarelli studio was one of the most important architectural firm in Rome, it closed a few years ago and its archives were handed over to the MAXXI museum. The members of this team worked a lot in Rome and continuously for more than 100 years, but not many books have been written about these works.The founders of Passarelli Studio were Tullio Passarelli, his sons Vincenzo, Fausto and Lucio and his nephews of the previous generation, Tullio Leonori, Tullio and Maria Passarelli. The number of projects developed by this company is high and the work produced by Passarelli Studio, although unknown in the field of historical research in Rome, must somehow "reposition" itself in the development and evolution of the city in order to raise the level of cultural awareness.

Three generations of the studio's architects have met with Pope Paul VI, the so-called papal architect, and these photos bear witness to the strong relationship that the studio has maintained throughout its years of activity, accepting small commissions for churches and houses, as well as important commissions. These cartoons were used to highlight Vincenzo and Fausto's political exposure. In particular, in the 1960s they were involved in the definition of the master plan for Rome.

Tullio Passarelli began his career by crowning classical architecture with metal mansard roofs that, on a smaller scale, also recalled the roofs of Roman synagogues.
Here it is clear that inspiration was drawn from the surroundings as well as from the architecture of Rome and Paris. We should note the proximity to the French Academy of Artists and the area formerly known as the Place de France, now named after the more famous Place de España.

The Roman Stock Exchange has a stronger focus on the context, and Tullio saw the need to insert the remains of Hadrian's Temple to create a Roman portico with columns and arches. This renovation (as described by Muratore) underwent further modifications before adopting the current configuration. The first proposal featured a steel structure, followed by another solution with a continuous structure characterized by large bays with considerable openings in the glass blocks, providing top light to the large spaces behind the façade along the street, leading to the square, the great bays of the huge order, the dimensions of the colonnade along the piazza di Pietra, using strong accents of light and dark contrast with the attic above and the portico below The large dimensions of the piazza di Pietra are in dialogue with the huge dimensions of the attic above and the portico below, anticipating the rough classicism of the portico around the vast interior space.

Tullio Passarelli used many styles throughout his life, even though he showed a preference for Romanesque, brick and decorative finishes through sculpture.
In 1964 Passarelli Studio realized its most famous masterpiece: the multifunctional building of Via Campania. Here again the relationship with the context is important, but this time not only with the historical context represented by the walls of Aurelian, but also with the church designed by Tullio Passarelli, three different languages that can communicate together.

As Giorgio Muratore affirms: "The building takes this idea of layering and context and makes it its own, measuring itself against the memory of a site marked by a thousand years of history, located on the

03.1 **History of INA-Casa**

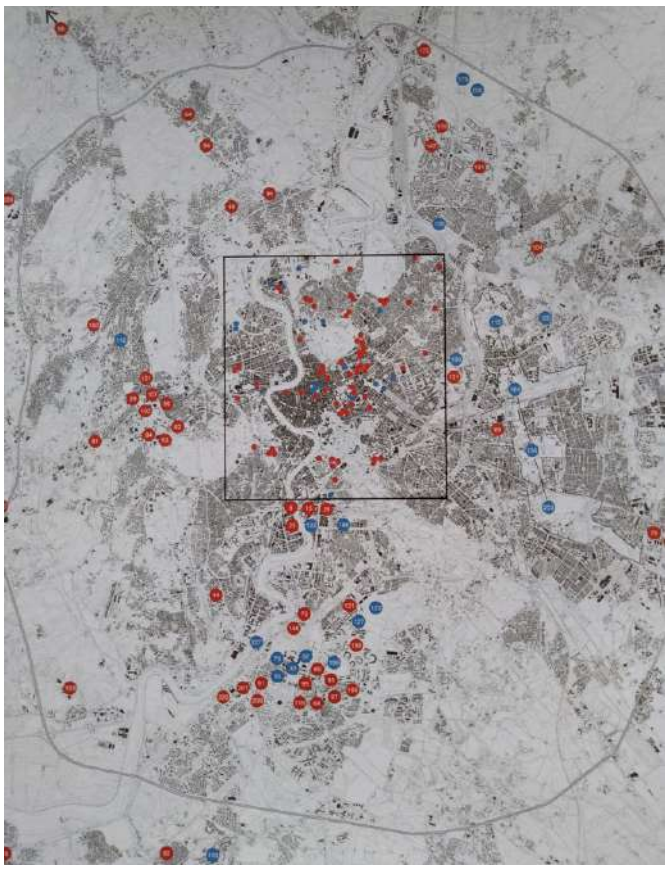
perimeter of the Aurelian walls, successfully in dialogue with the route, the axes, the materials and the signs of a complex urban environment, and in the same way with the values of a dynamic and sophisticated contemporary design experimentalism. It is a dialogue with other exemplary works that also seek and find ways to exorcise the theme of stratification, such as Ridolfi's haunting work in via Paisiello. Muratore defines it as an unforgettable aesthetic experience that offers a real and magnificent lesson in architecture.

The project is based on the juxtaposition of two buildings: a lower glazed brown glass, mirrored curtain wall replicating the Aurelian wall; the glass body containing the office space features cantilevered elements along the site's trapezoidal perimeter. The superstructure is based on a grid of four columns and double beams and contains single and duplex apartments. It features a series of sky gardens, sunshades and horizontal lines that give the building the appearance of a complex mechanical component.

We can define some restraint throughout the studio's work: experimentalism (they used exterior installations at the Pompidou Center 8 years ago), a mixture of languages (from eclectic to expressionist, from romantic to high-tech, from Roman barocchetto to the), a dialogue with historical context, religion, housing and directed mixed-use projects.

Lucio, Vincenzo e Fausto Passarelli. Nel quadro il padre Tullio.
Lucio, Vincenzo and Fausto Passarelli. In the painting their father Tullio.

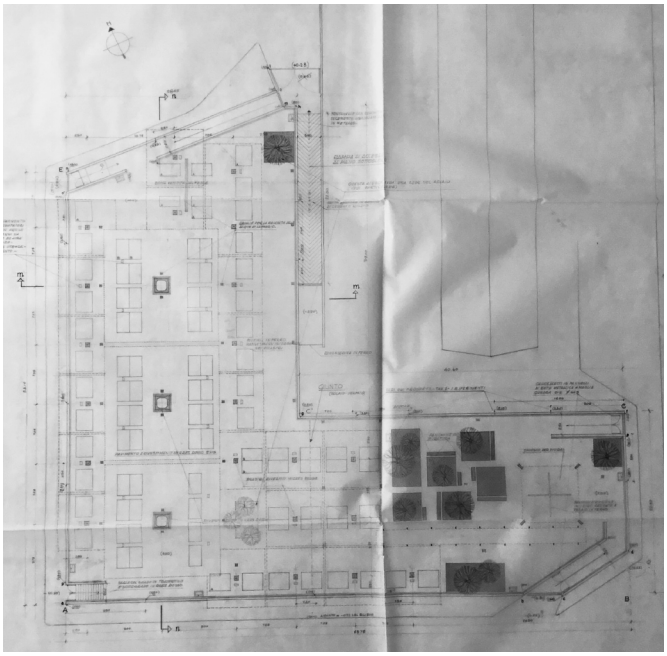
Lucio e Vincenzo Passarelli espongono il progetto dei Musei Vaticani a Paolo VI
Lucio and Vincenzo Passarelli exposing the Vatican Museums design to Paolo VI



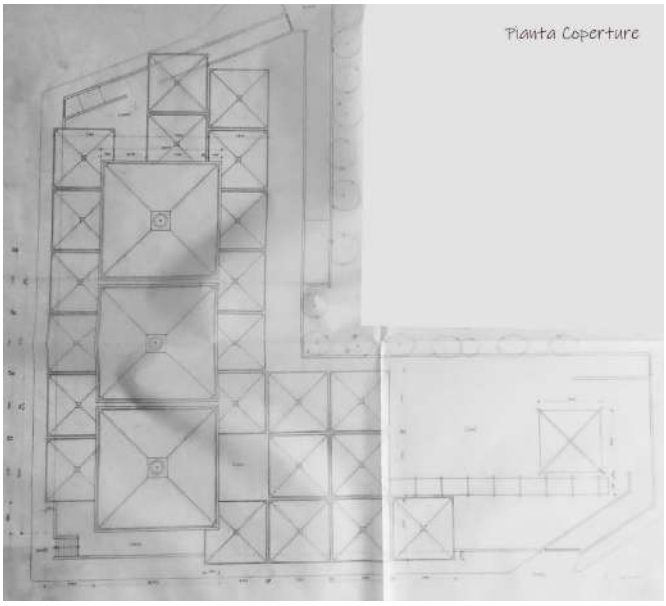
03.2 **Ex-Mercato building status**

The Ex Mercato (former market) designed by Vincenzo (team leader), Fausto e Lucio Passarelli (1959-60) is located in the Eastern part of the city, in the Torre Spaccata district, inside the GRA (Grande Raccordo Anulare), within the Piano INA-Casa zone, a residential and social housing district originally created in the Sixties.The urban context is characterized by densely populated housing complexes and a large green space, called Pratone di Torre Spaccata, connected to the Centocelle archaeological park.

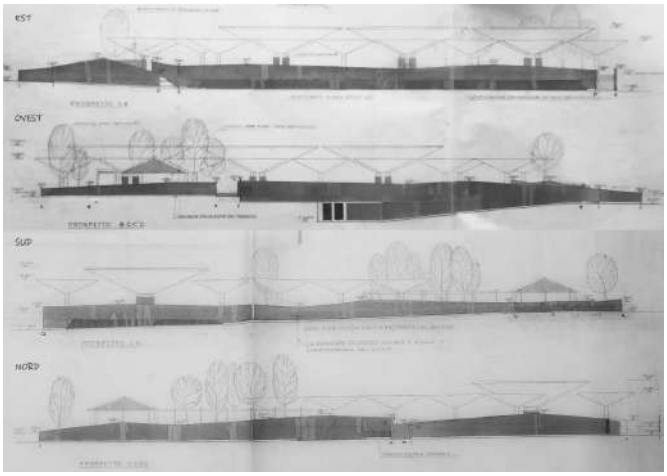
The original building consists of a reinforced concrete structure and is divided into basement and 0 floor space. Each pillar in the building supports the inverted pyramid structure above. The entire building has two different sets of modules: the large square section columns are 6.3m high with a 14m by 14m top, while the smaller square section columns are 6m high with a 7m by 7m top. The rest is enclosed by a continuous glass wall. After more than 50 years, the building is well preserved.



Ex Mercato Floor Plan (1960) by Studio Passarelli



Ex Mercato Roof Plan (1960) by Studio Passarelli



Ex Mercato Prospects (1960) by Studio Passarelli

Ex Mercato in 1960s

Ex Mercato neighborhood

The main road of Torre Spaccata district: Viale dei Romanisti that connects Via di Torre Spaccata with Viale Palmiro Togliatti.
In the background (on the left side) is visible the former market

Ex Mercato nowadays

The market structure has been in disuse since the end of the 90s, when, following the new market plan of the Municipality of Rome, a new building was built along Viale dei Romanisti.
The buidingis actually is used by a no-profit cultural association.

Ex Mercato interior

04. **ANALYSIS**

04.1 Data Analysis

04.1.1 Roma population

The Ex-Mercato is located in the Torre Spaccata area of the city of Rome VII (ex VI), 8A. Population data, population density and distribution in the area, as well as local income, surrounding services, green space coverage and traffic, etc. all affect the use and development of the building. A detailed data analysis of these factors is provided below.

This figure shows the comparison of the total population of various municipalities in Rome in 2020. Municipality VI is one of the most populous municipalities in Rome, with a population of 254379. The total population of Rome in 2020 is 2822981.

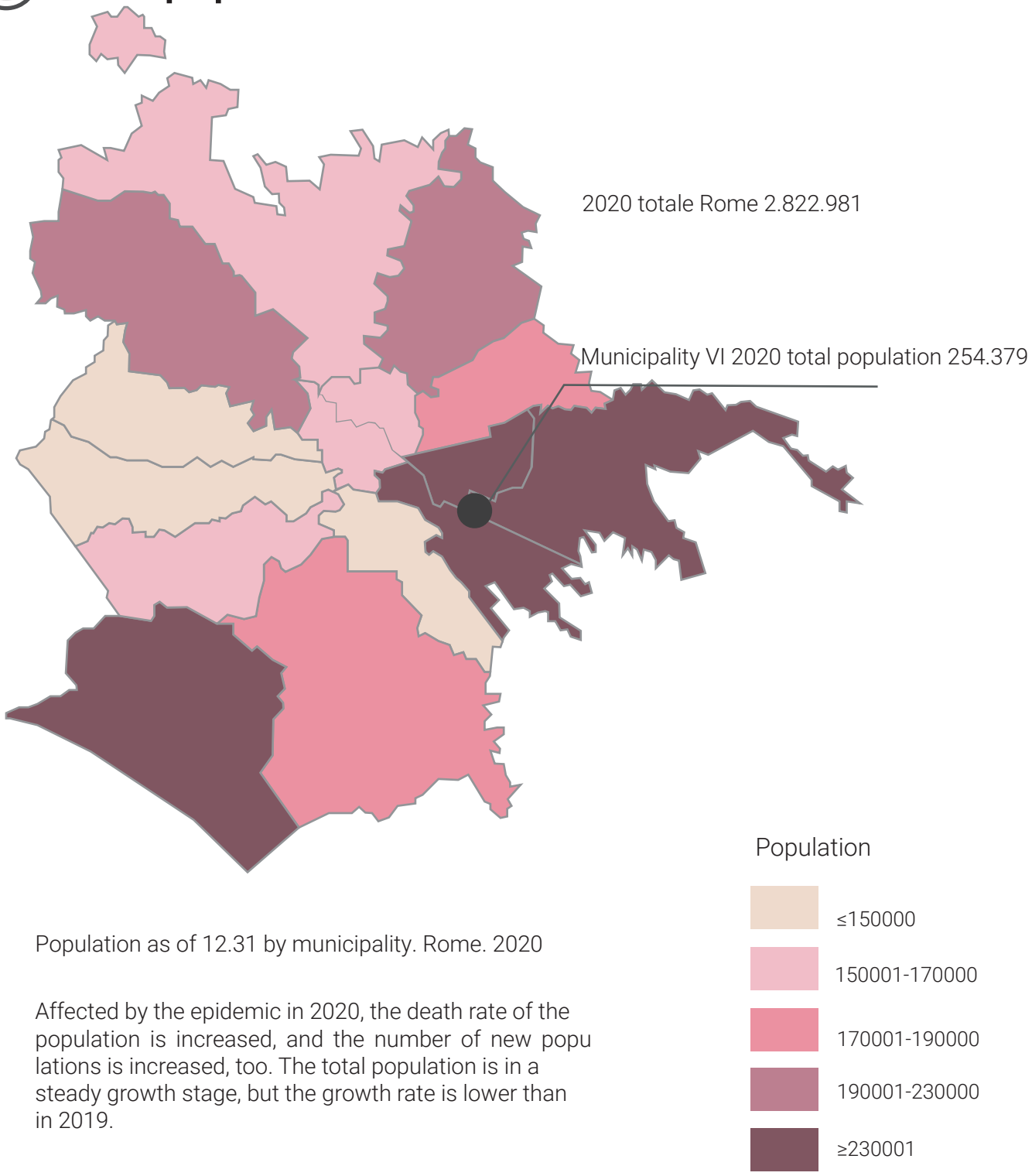
The line graph compares that the total population of Municipality VII in Rome has been increasing in the past ten years, and the total population has always been the second in all municipalities in Rome.

Affected by the epidemic in 2020, the mortality rate of the population will increase, and the number of new population will increase relatively. The total population is in a stage of steady growth, but the growth rate is lower than in 2019.

The line chart shows that the Torre Spaccata area has a relatively large population in Municipality VII. From 2013 to 2014, the population increased rapidly due to the increase in the foreign population. After 2014, the total population increased steadily.

04.1 **Data Analysis**

Rome population in 2020



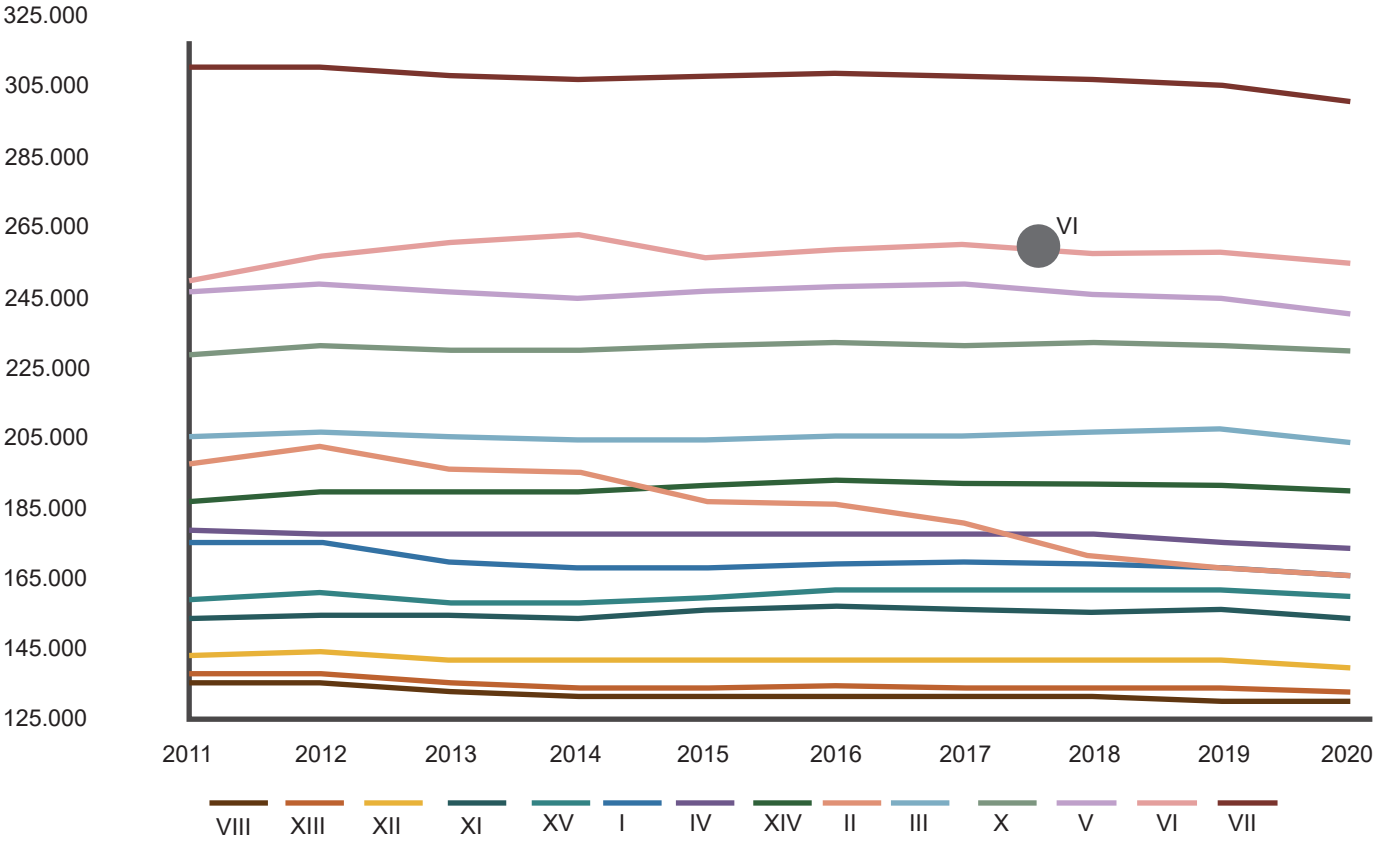
Population as of 12.31 by municipality. Rome. 2020

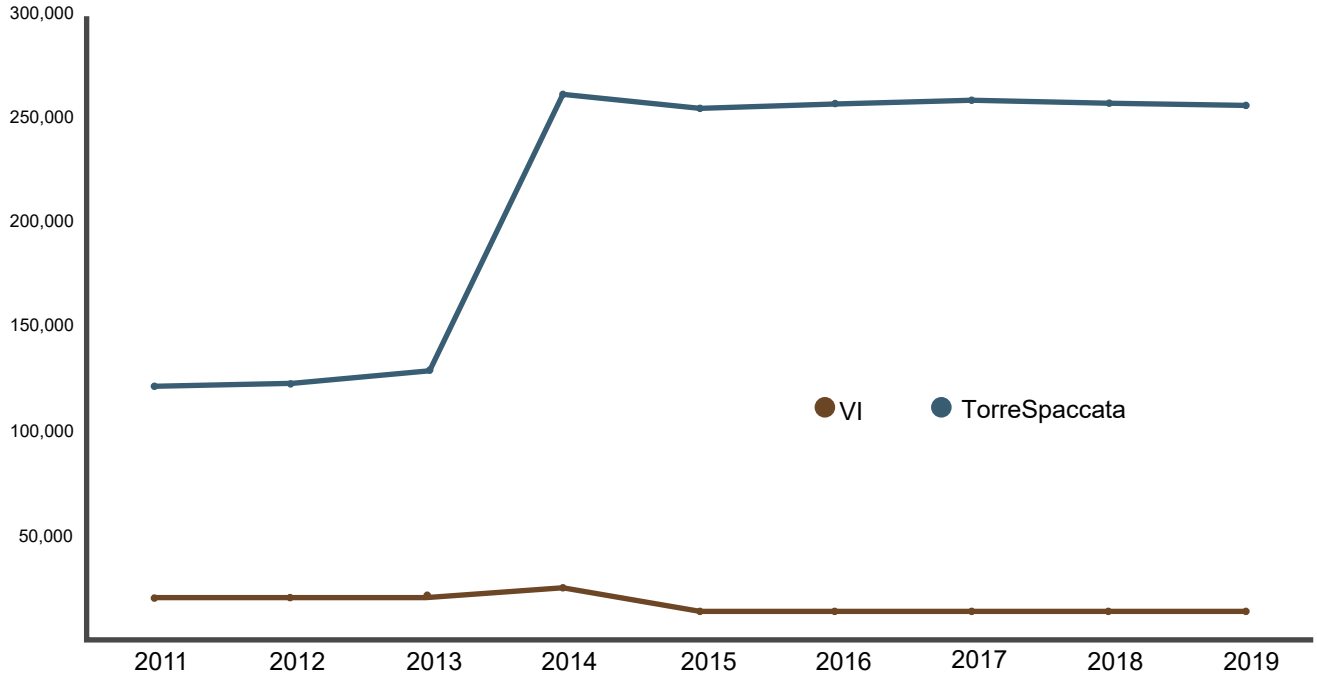
Affected by the epidemic in 2020, the death rate of the population is increased, and the number of new popu lations is increased, too. The total population is in a steady growth stage, but the growth rate is lower than in 2019.

04.1 **Data Analysis**

Demographic trends

Population registered in the registry as of 31 December by municipality. Rome. 20 11-2020 years





2011-2019 population trends in the municipio and TorreSpaccata

04.1 **Data Analysis**

04.1.2 Roma density

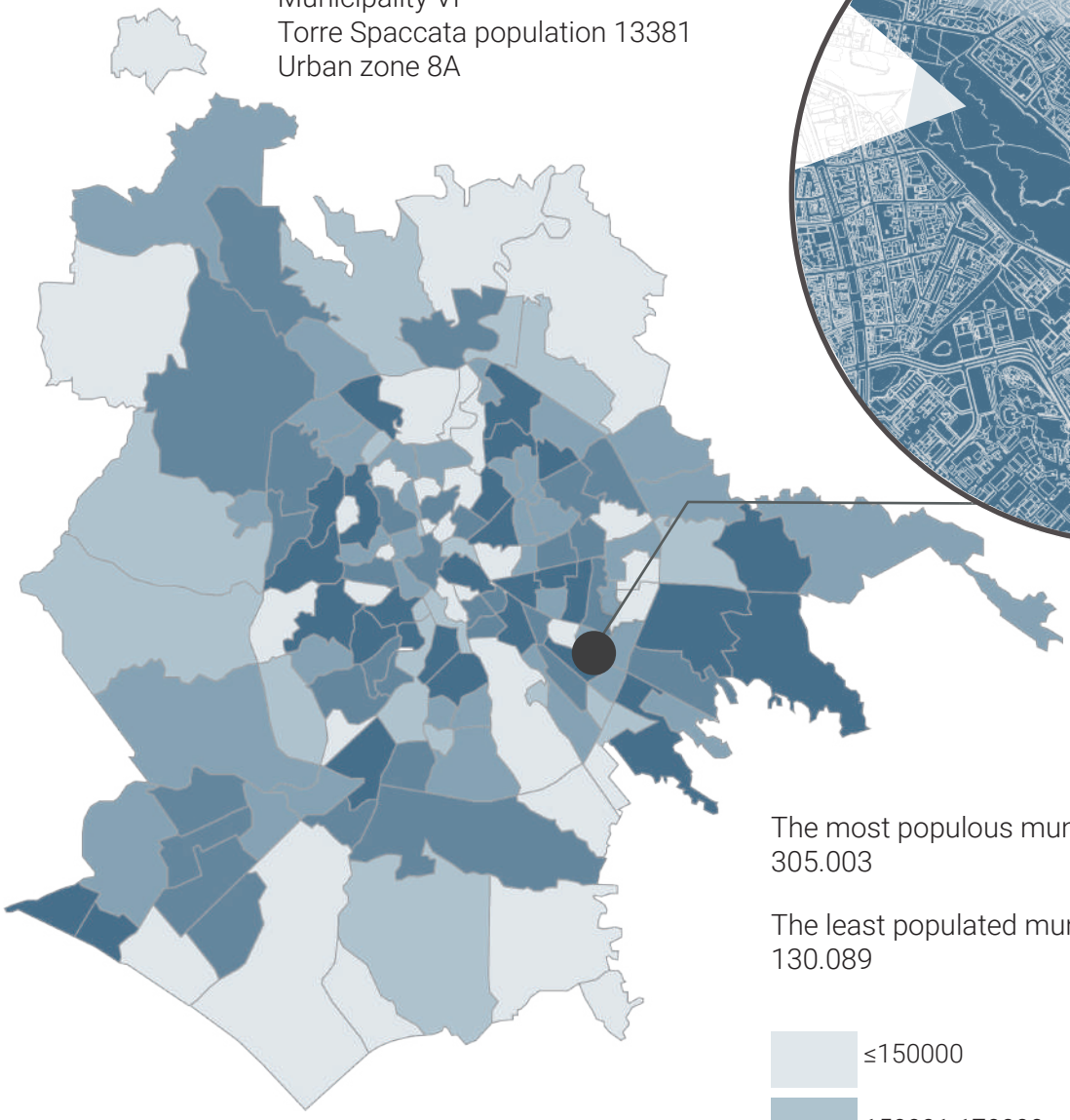
The graph shows that the population of Torre Spaccata is 13381, the population density of Torre Spaccata is 7 646.29 inhabitants/km², and the average population density is about 2,213 people per square kilometer. The Torre Spaccata area is densely populated.

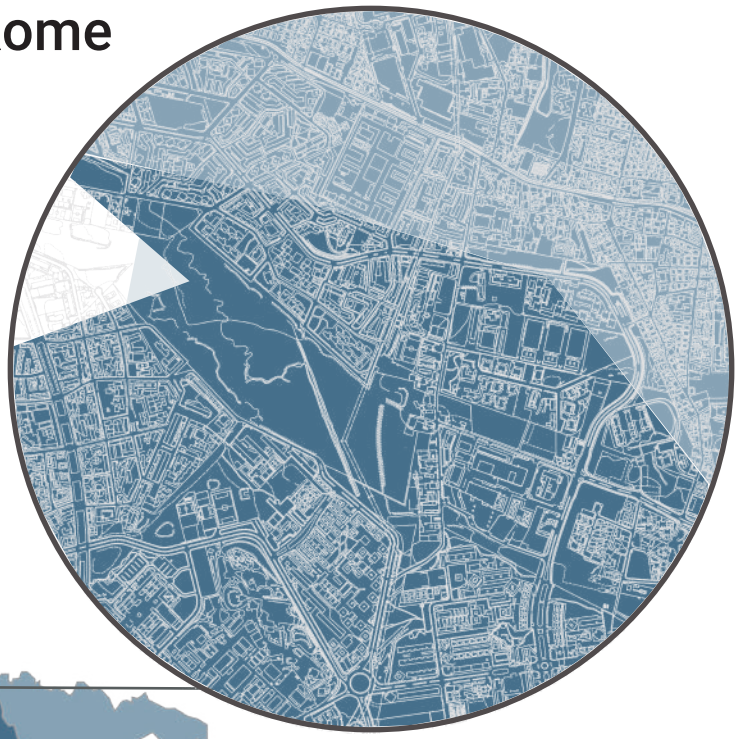
For the Torre Spacca area, due to the annual increase in population, there will be some problems with regard to residence, community, etc.

04.1 **Data Analysis**

Population of the city of Rome

Municipality VI
Torre Spaccata population 13381
Urban zone 8A





The most populous municipality is VII
305.003

The least populated municipality is VIII
130.089

≤150000
150001-170000
170001-190000
190001-230000
≥230001

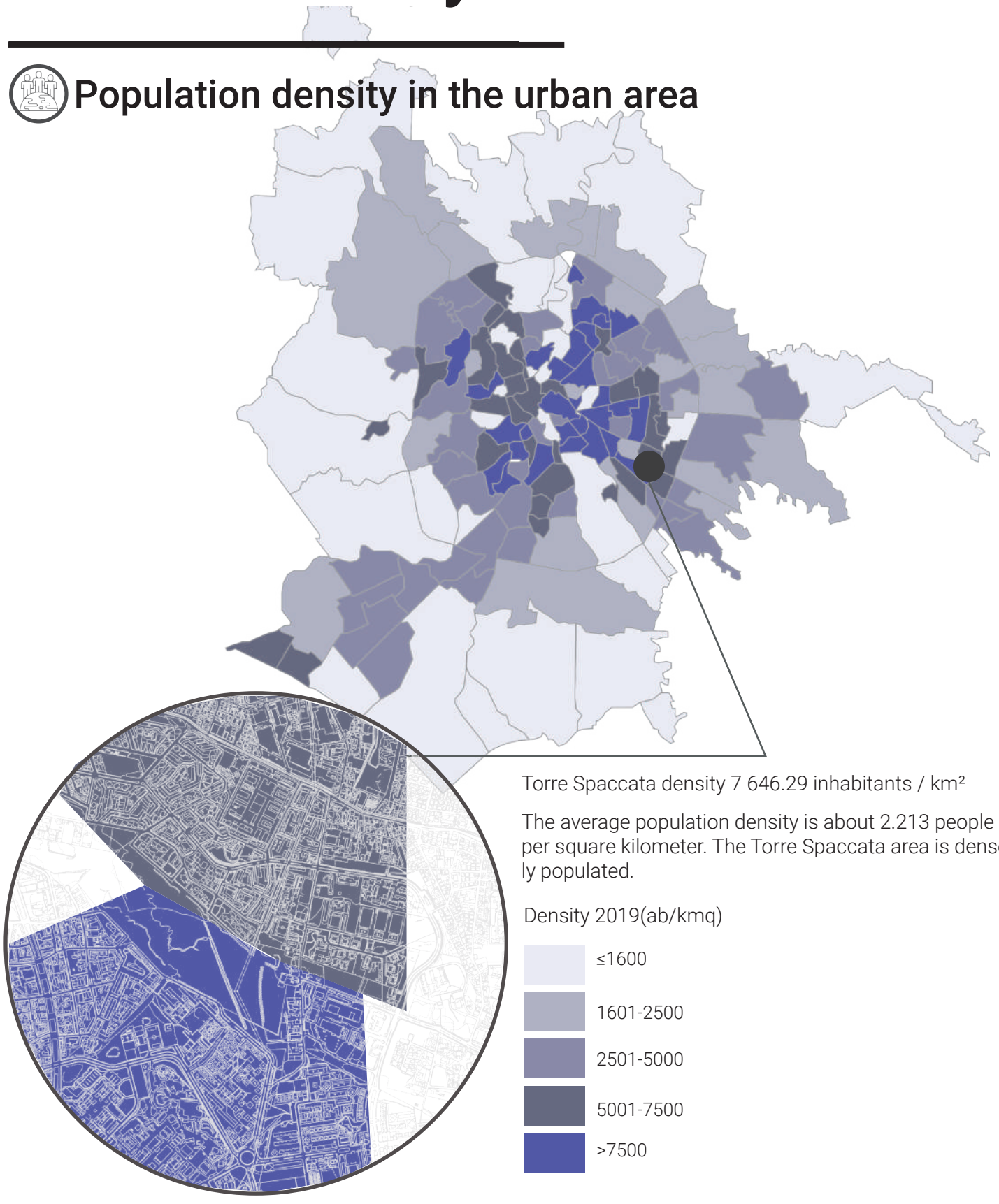
Population as of 31.12 .2019

The average population size of the city of Rome is approximately 190.000 inhabitants

Source: Statistical Office of Roma Capitale elaborations on registry data

04.1 **Data Analysis**

Population density in the urban area



Torre Spaccata density 7 646.29 inhabitants / km²

The average population density is about 2.213 people per square kilometer. The Torre Spaccata area is densely populated.

Density 2019(ab/kmq)

- ≤1600
- 1601-2500
- 2501-5000
- 5001-7500
- >7500

04.1 **Data Analysis**

04.1.3 Population Age Analysis

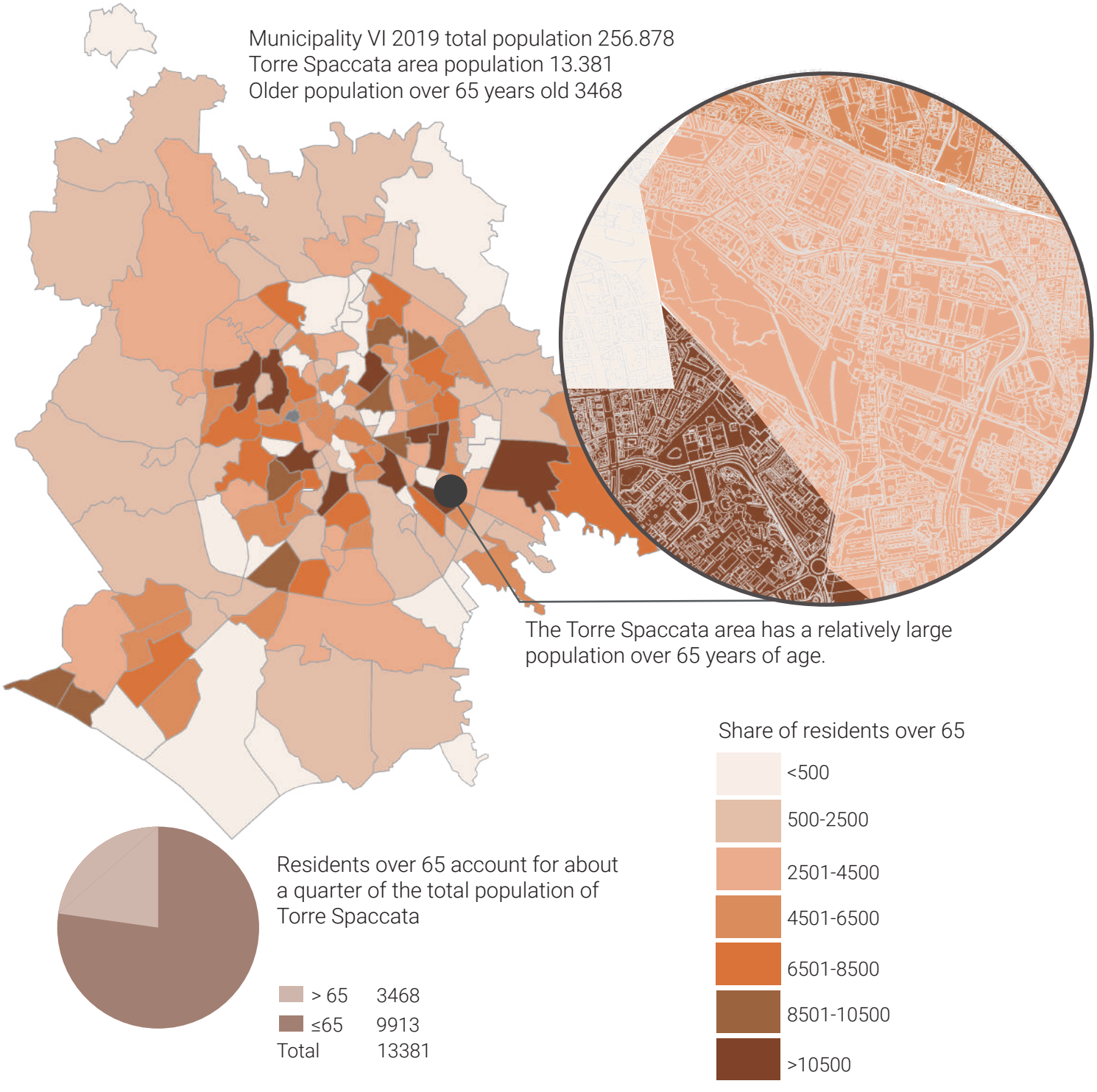
The figure shows that the population of the Torre Spaccata area is 13381, and the elderly population over 65 years old is 3468. It accounts for 25% of the total local population.

The chart shows that the number of youths under the age of 30 in the area is 3426, accounting for 25% of the total local population.

The population age of Torre Spaccata shows a trend of two-level differentiation. There are more young and old people, and most of the old people are local residents. The increase in the youth population is mainly due to the gradual decrease in the building index and population density of Rome with increasing distance from the center, with a higher proportion of young people in the outermost suburbs. Young people are likely to be unemployed or precarious due to the high cost of buying and renting a home, so they choose to stay away from the city center.

04.1 **Data Analysis**

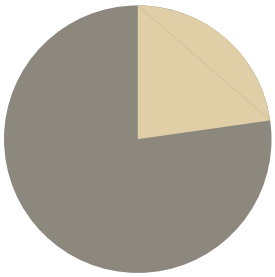
Proportion of elderly population



Source: processing of Istat data -2019 Census

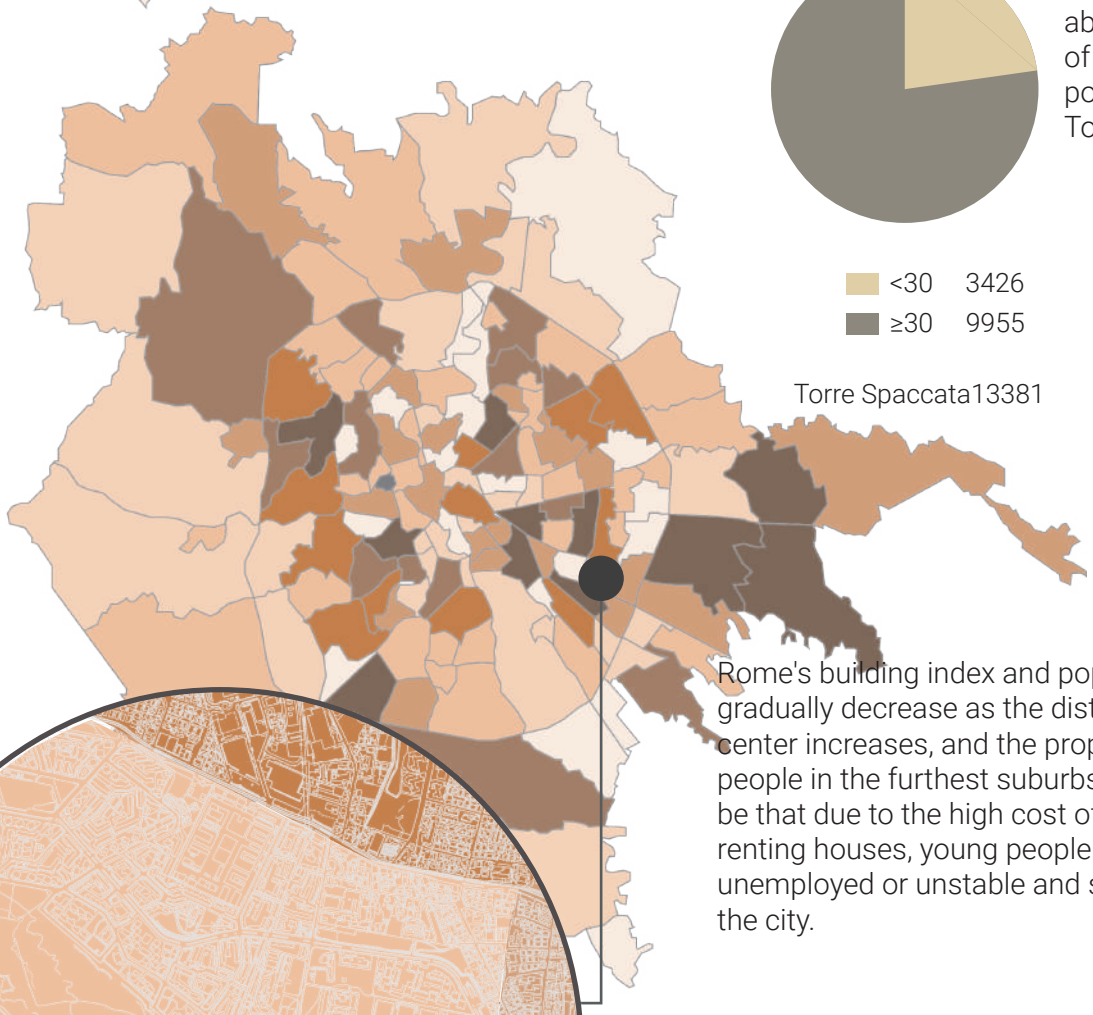
04.1 **Data Analysis**

Proportion of youth population



Residents under 30 account for about a quarter of the total population of Torre Spaccata

<30 3426
≥30 9955



Rome's building index and population density gradually decrease as the distance from the center increases, and the proportion of young people in the furthest suburbs is high. It may be that due to the high cost of buying and renting houses, young people may become unemployed or unstable and stay away from the city.

The Torre Spaccata area has more young people

TorreSpaccata share of residents <30 3426

Share of residents <30

04.1 **Data Analysis**

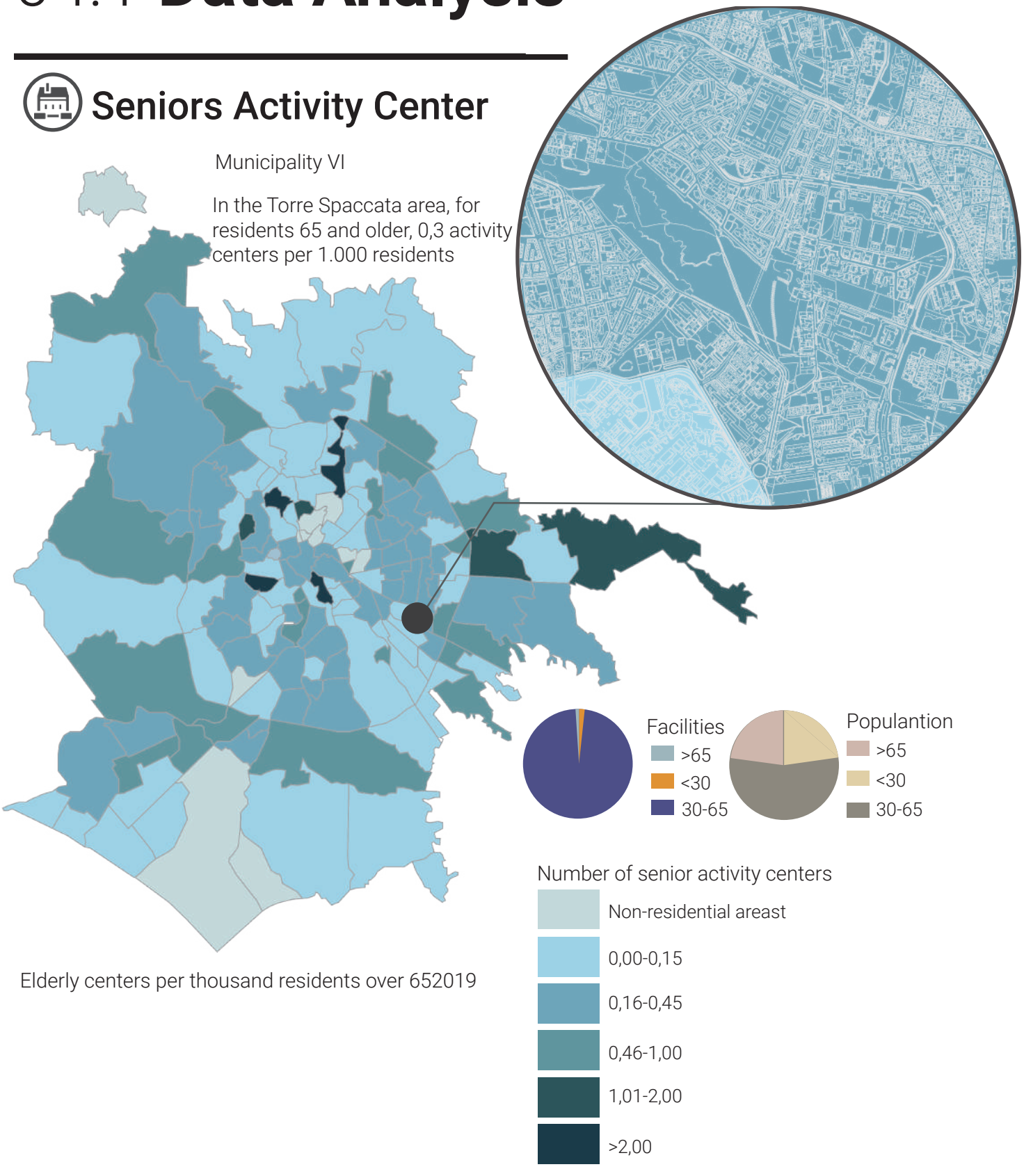
04.1.4 Service facilities

The older population in the Torre Spaccata area accounts for 25% of the local population, with a larger proportion of the elderly population, and the graph shows that in the Torre Spaccata area there are 0.3 activity centers per 1,000 inhabitants for residents aged 65 and over. The local community has a large number of residents ,the data shows that there are few activity centers for the local elderly population, and the lack of activity centers for the local elderly affects the local community activities of the elderly to a certain extent.

The Torre Spaccata area also has a relatively high proportion of youth under the age of 30. The data shows that there are 8 sports facilities in the Torre Spaccata area, with an average of 0.6 per 1,000 inhabitants. The number is gradually increasing, and in the future urban development, it may be difficult for sports facilities to meet the needs of local young residents.

04.1 **Data Analysis**

Seniors Activity Center

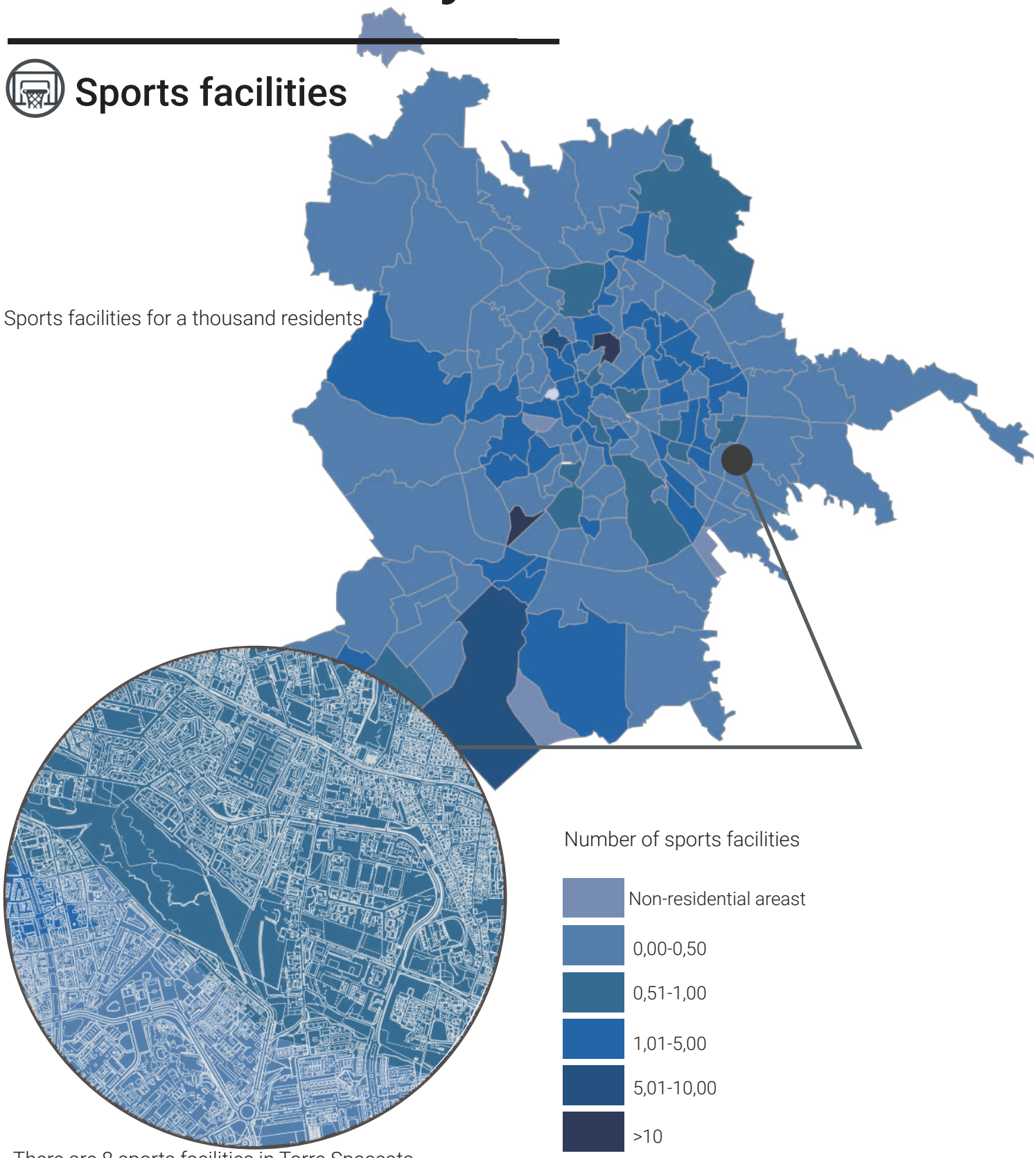


Source: https://www.mapparoma.info/mappe/mapparoma16-sport-salute-sicurezza-e-centri-anziani-nei-quartieri-di-roma/

04.1 **Data Analysis**

Sports facilities

Sports facilities for a thousand residents



There are 8 sports facilities in Torre Spaccata,
an average of 0,6 per 1.000 inhabitants

04.1 **Data Analysis**

04.1.5 Local income

In Rome, there is a large income gap between different regions, and most of the areas with higher income are concentrated in the city center. Income affects inequalities in health, education, employment and opportunity between the center and suburbs.

The graph shows the income comparison between the municipalities of the entire city of Rome, with income in municipality VI at a lower level in the city of Rome.

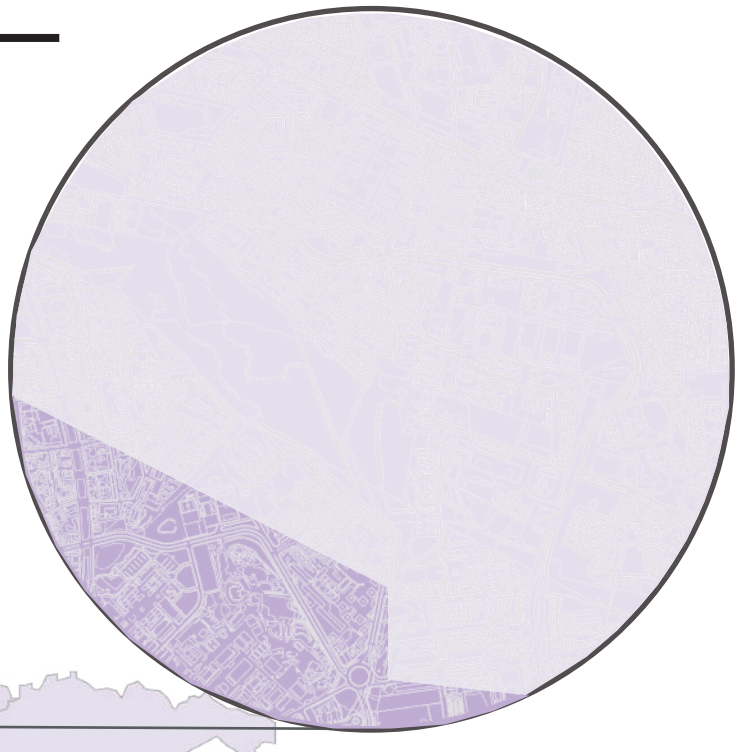
Meanwhile, the data below shows a Torre Spaccata Social Difficulty Index of 4.3, which indicates that the region is poorer in unemployment, employment, youth concentration and education.

04.1 **Data Analysis**

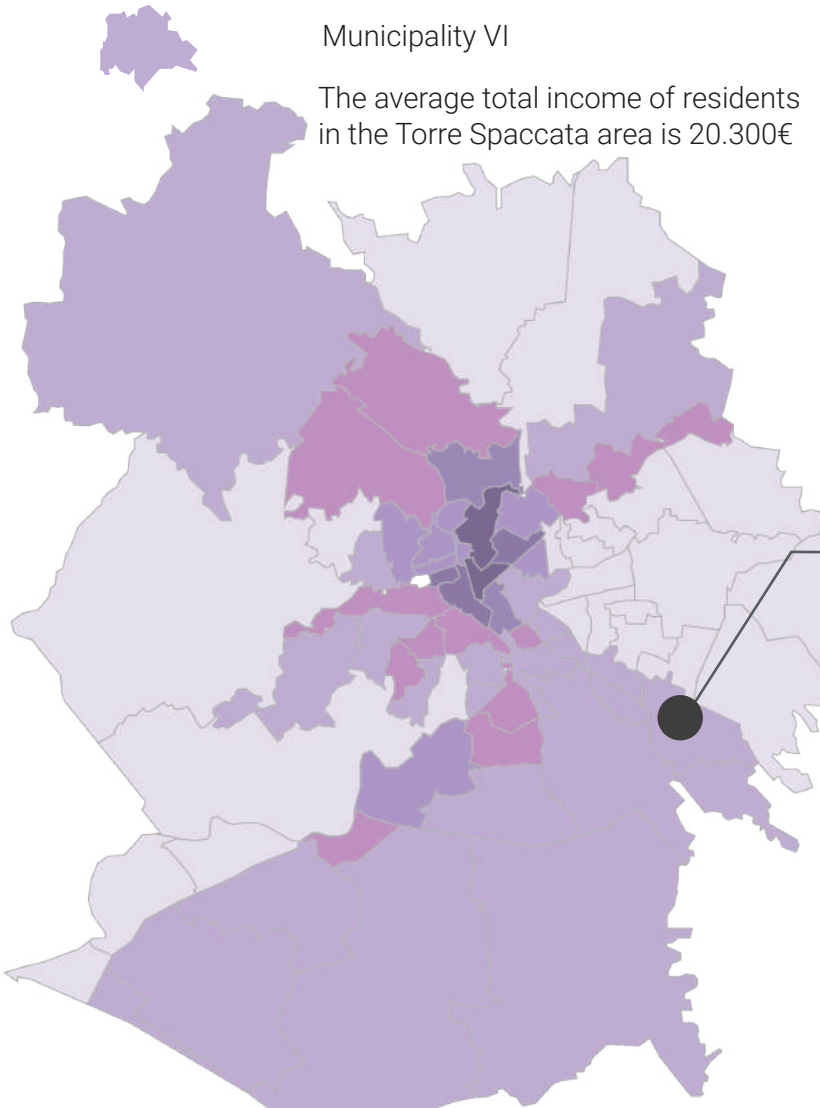
Average gross income

Municipality VI

The average total income of residents in the Torre Spaccata area is 20.300€



The lowest average income is typical of difficult cities with public housing and former illegal village groups covering most of VI Municipio



The income gap in Rome is large, and the higher-income areas are mostly concentrated in the city center. Income confirms and strengthens the inequality of health, education, employment, and opportunity between the center and the suburbs.

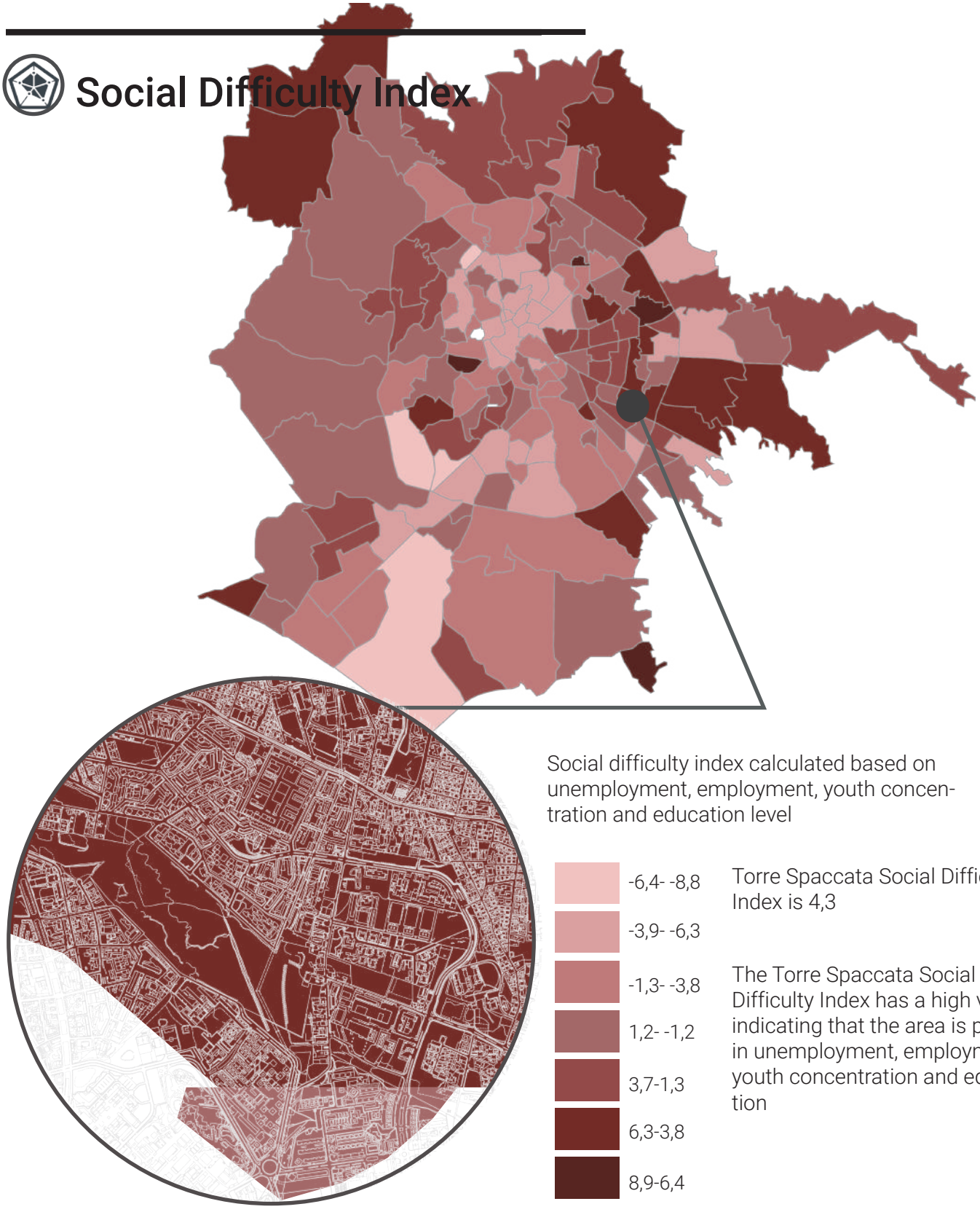
Average total income of residents in 2019

- 23.700€-16.200€
- 31.000€-24.000€
- 38.200€-31.100€
- 45.100€-40.600€
- 48.800€-46.200€
- 57.900€-55.400€
- 68.260€-6700€

Source: processing of MEF 2021 data (2019 income)i v

04.1 **Data Analysis**

Social Difficulty Index



Social difficulty index calculated based on unemployment, employment, youth concentration and education level

-6,4- -8,8
-3,9- -6,3
-1,3- -3,8
1,2- -1,2
3,7-1,3
6,3-3,8
8,9-6,4

Torre Spaccata Social Difficulty Index is 4,3

The Torre Spaccata Social Difficulty Index has a high value, indicating that the area is poor in unemployment, employment, youth concentration and education

Source: processing of Istat data - 2011 Census; for the index of social hardship elaborated by Roma Capitale on the 2011 Census

04.1 **Data Analysis**

04.1.6 Cultural facilities

At the same time, in terms of cultural facilities, the number of cinemas and theaters in Torre Spaccata is zero, and there is only one library. The number of cultural facilities is very small, which affects the spiritual and cultural life of local residents.

The square is a very important facility in community life, it can enhance the communication between residents, and even it exists as a social place.

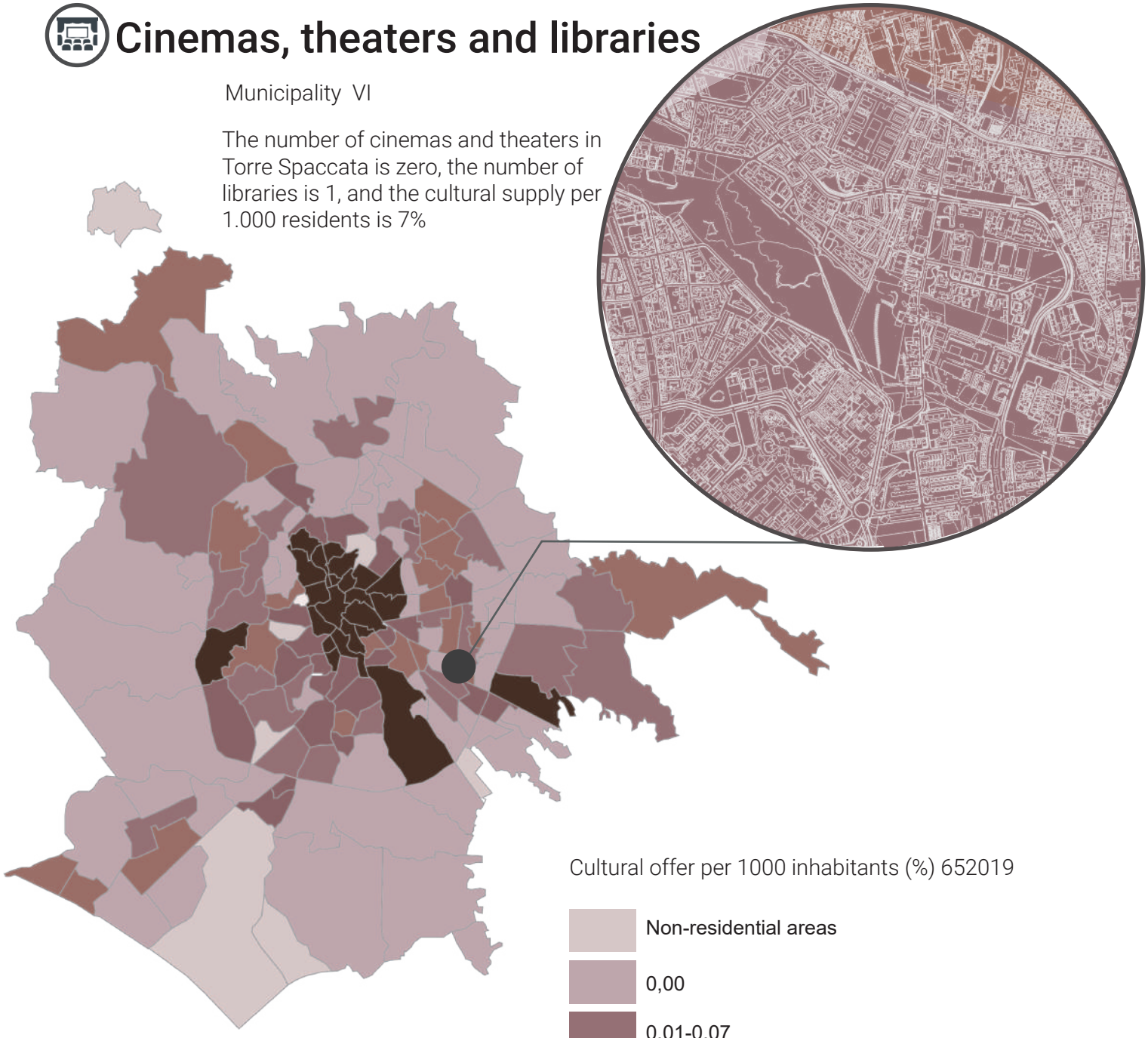
The number of squares per 1,000 hectares in Torre-Spaccata is about 11.4, which is average for the city as a whole.

04.1 **Data Analysis**

Cinemas, theaters and libraries

Municipality VI

The number of cinemas and theaters in Torre Spaccata is zero, the number of libraries is 1, and the cultural supply per 1.000 residents is 7%



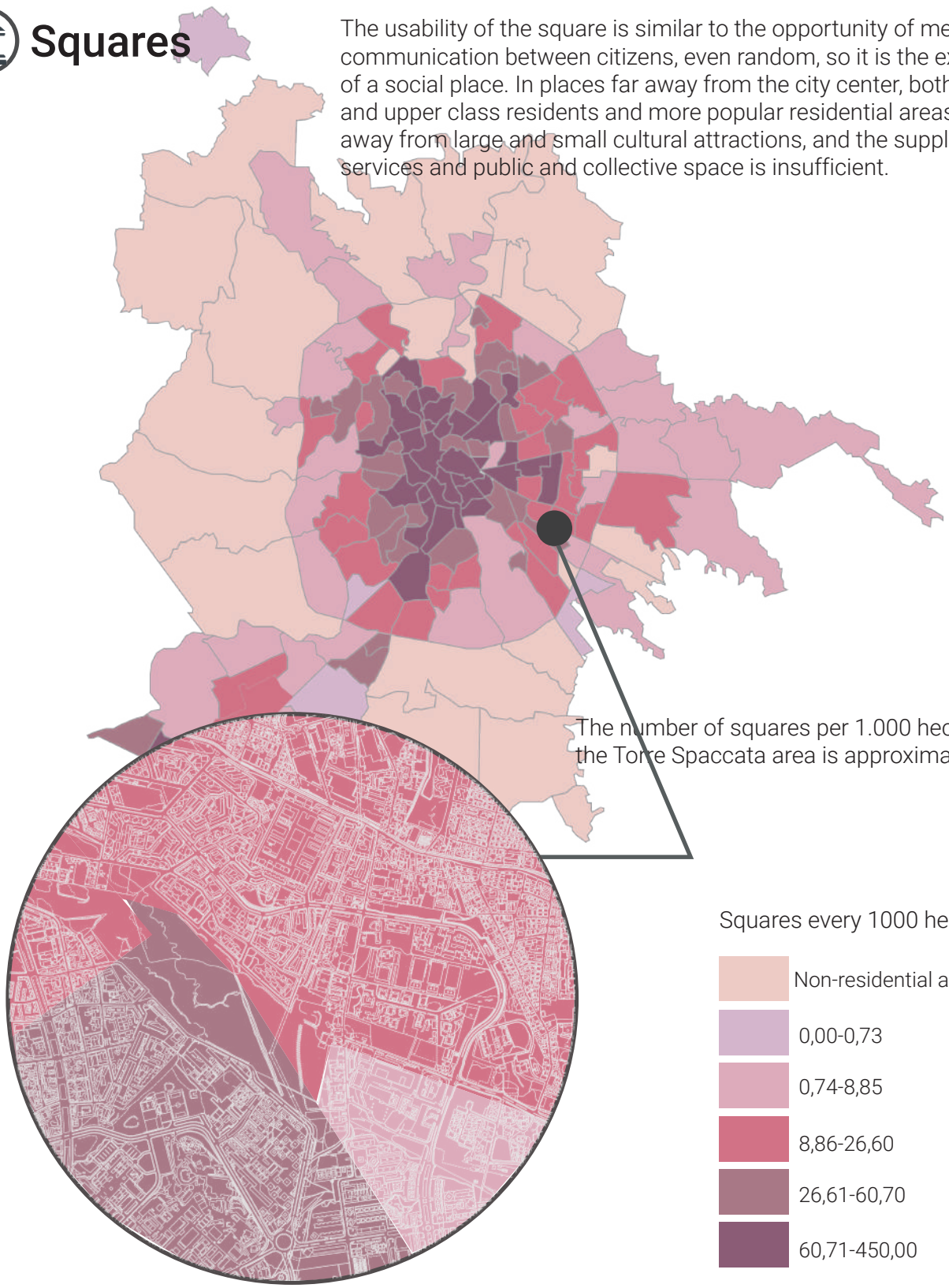
Also in this case, non-residential areas, excluding large urban villas, have the highest supply rates in many central areas.

Source: Ielo-monni-tomassi 2019

04.1 **Data Analysis**

Squares

The usability of the square is similar to the opportunity of meeting and communication between citizens, even random, so it is the existence of a social place. In places far away from the city center, both middle and upper class residents and more popular residential areas are far away from large and small cultural attractions, and the supply of basic services and public and collective space is insufficient.



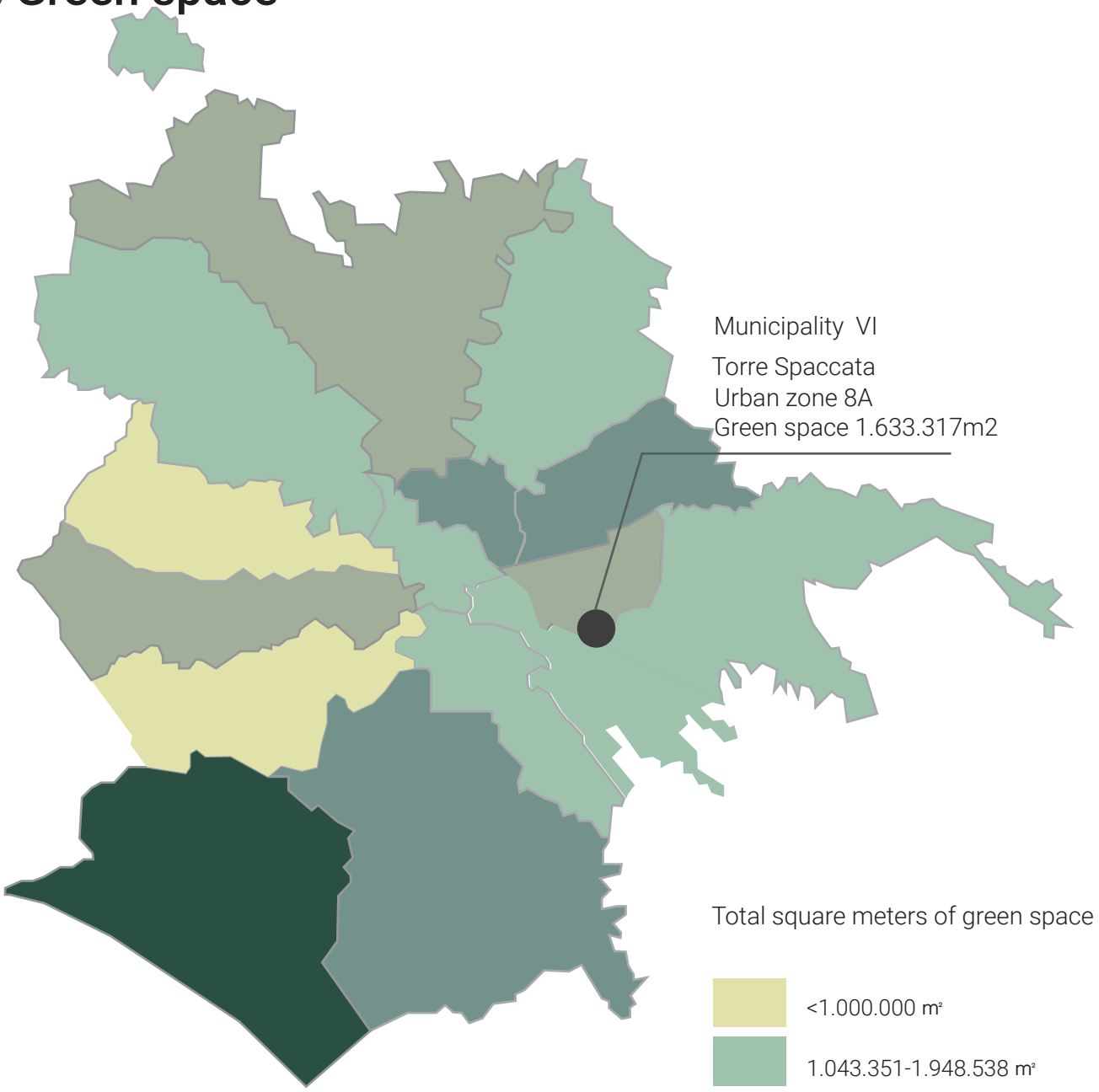
04.1 **Data Analysis**

04.1.7 Urban green space analysis

The data shows that among the municipalities in the entire city of Rome, the area and quantity of green space in municipality VI are not high, and there are fewer green spaces in this area.

04.1 **Data Analysis**

Green space

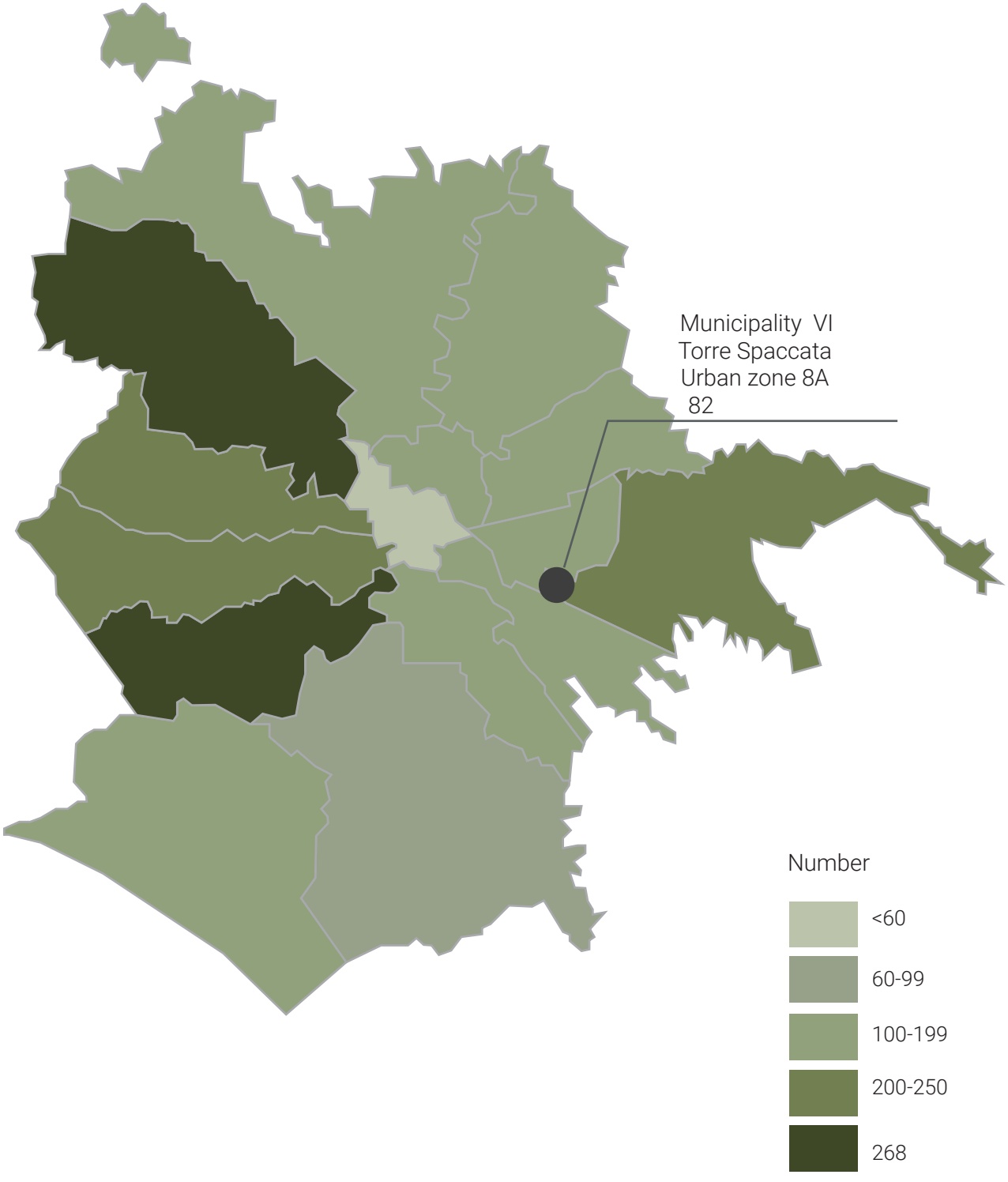


The largest urban green space is in Zone X, which is highlighted by the standard of 53,1 Mq/ab, because of the existence of the Castel Fusano City Park, followed by Zone II, which contains many of the most important historical villas.

Source: Statistical Office of Roma Capitale based on data from the Environmental Protection Department - Territorial Environmental Management and Green Area.

04.1 **Data Analysis**

Number of green areas



04.1 **Data Analysis**

04.1.8 PRG(Piano Regolatore Generale)

The urban plan for the Torre Spaccata region includes environmental systems, service infrastructure and the history of the city. It can be seen that the future environmental development will be the core of the successful development of the city.

04.1 **Data Analysis**

PRG (Piano Regolatore Generale)

Historical city
- Archaeological site
- Military
- Industrial
- Religious

City to be restored
- Residential
- Building
- Office company
- School
- Shop
- Healthcare

Environmental system
- Green area
- Airport

This includes urban planning content such as environmental systems, service infrastructure, and urban history. It can be seen from the plan that the government hopes to present a future plan for environmental protection. The environment part has become the center of the reform plan. We need to define and regulate urban transformation.

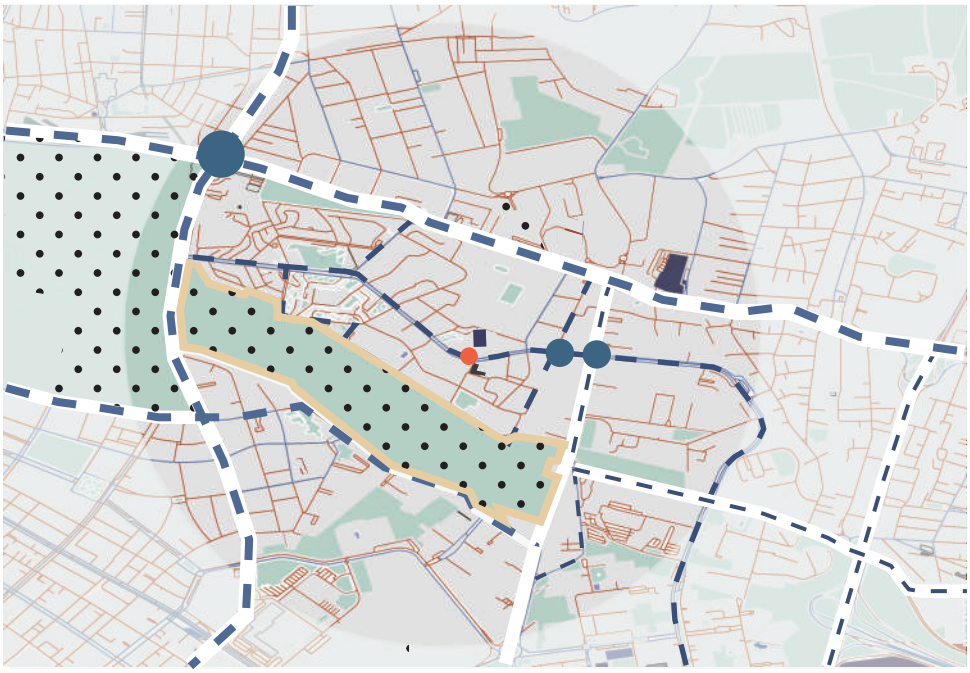
04.1 **Data Analysis**

04.1.9 Surrounding situation analysis

Analyzing the surroundings of the Torre Spaccata area, there is a main road Via Romanisti near Ex-Mercato, which connects Ex-Mercato with the surrounding traffic, green areas as borders around the building, and some landmarks, the building surroundings are complex and diverse.

04.1 **Data Analysis**

Surrounding Situation Analysis



Scale 1:20000

Municipalities

This area is connected by streets to form continuity, but due to some divisions, the continuity between the building itself and the area is weakened

Landmarks

Pratone di Torre Spaccata

Pratone is located in an outlying area where services and community spaces are insufficient. Future design and planning can make it a major place that can accommodate the function of revitalizing the neighbor-hood.

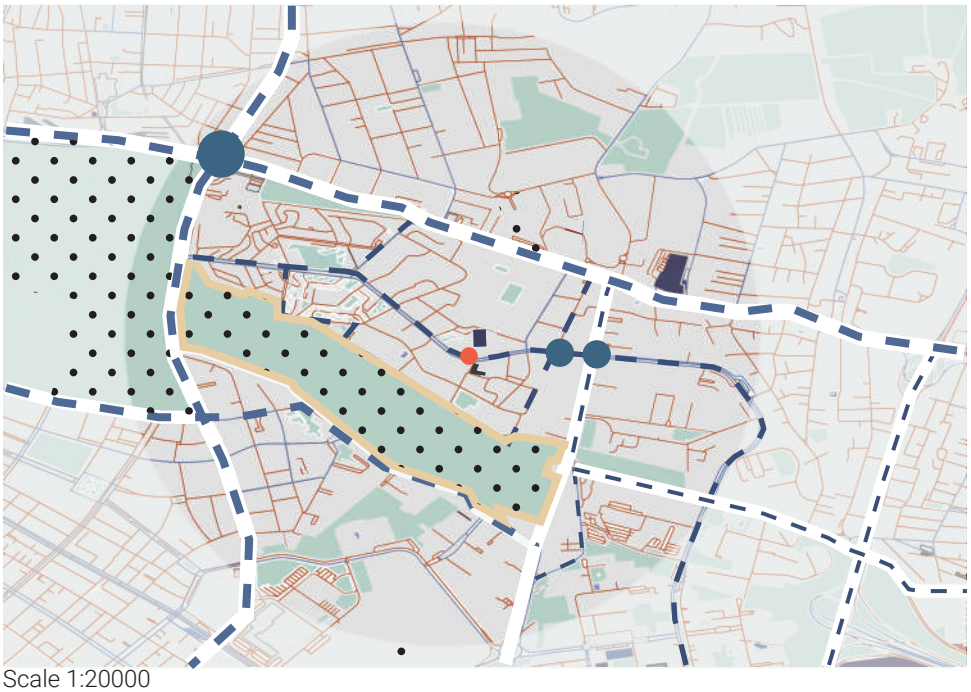
Cinecitta studies

It is a film school and the building are separated from each other, but they are related to each other.

Centro Commerciale Casilino

A large commercial center near the building, a certain distance from the building.

04.1 **Data Analysis**



Scale 1:20000

Boundaries

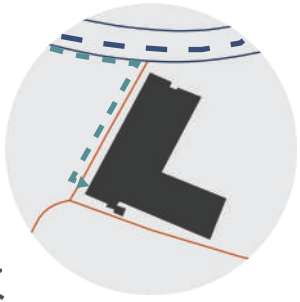
This open space is equivalent to the boundar of Ex Mercato di Torre Spaccata, which separates the area from the surrounding area to a certain extent, with a sense of separation, but this open space also serves as a barrier for the building.

Paths

Main road

Viale dei romanisti is one of the main streets of Torre Spaccata, but the street pavement has always been problematic, and the road surface is unequal with potholes. This street is closer to the building

Viale dei Romanisti



Walking route Scale:1:1000

Neighborhood streets

As two neighborhood streets around the building, they lead to surrounding schools, shops, restaurants, etc. respectively. The road is wide, with sidewalks and zebra crossings on both sides, the road is relatively safe, and they are all close to the different entrances of the building.

Nodes

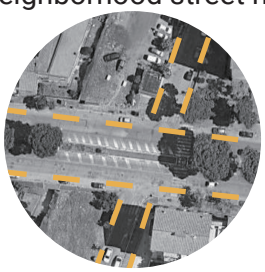
Main road node

The intersection of two-lane and three-lane roads is Ex Mercato di Torre Spaccata, the largest road interchange nearby, with more pedestrians and vehicles.

Secondary road node

Crossroads of the second road, closer to Ex Mercato di Torre Spaccata, more traffic and people use

Neighborhood street node



Mainly at the intersection of neighboring streets and roads, connected by zebra crossings.

04.2 **Urban Analysis**

04.2.1 Facilities

Meanwhile, the basic facilities in Torre Spaccata include schools, church, hospitals, shops, restaurants, etc. There are more local schools close to the Ex-Mercato building area.

04.2.2 Greenery

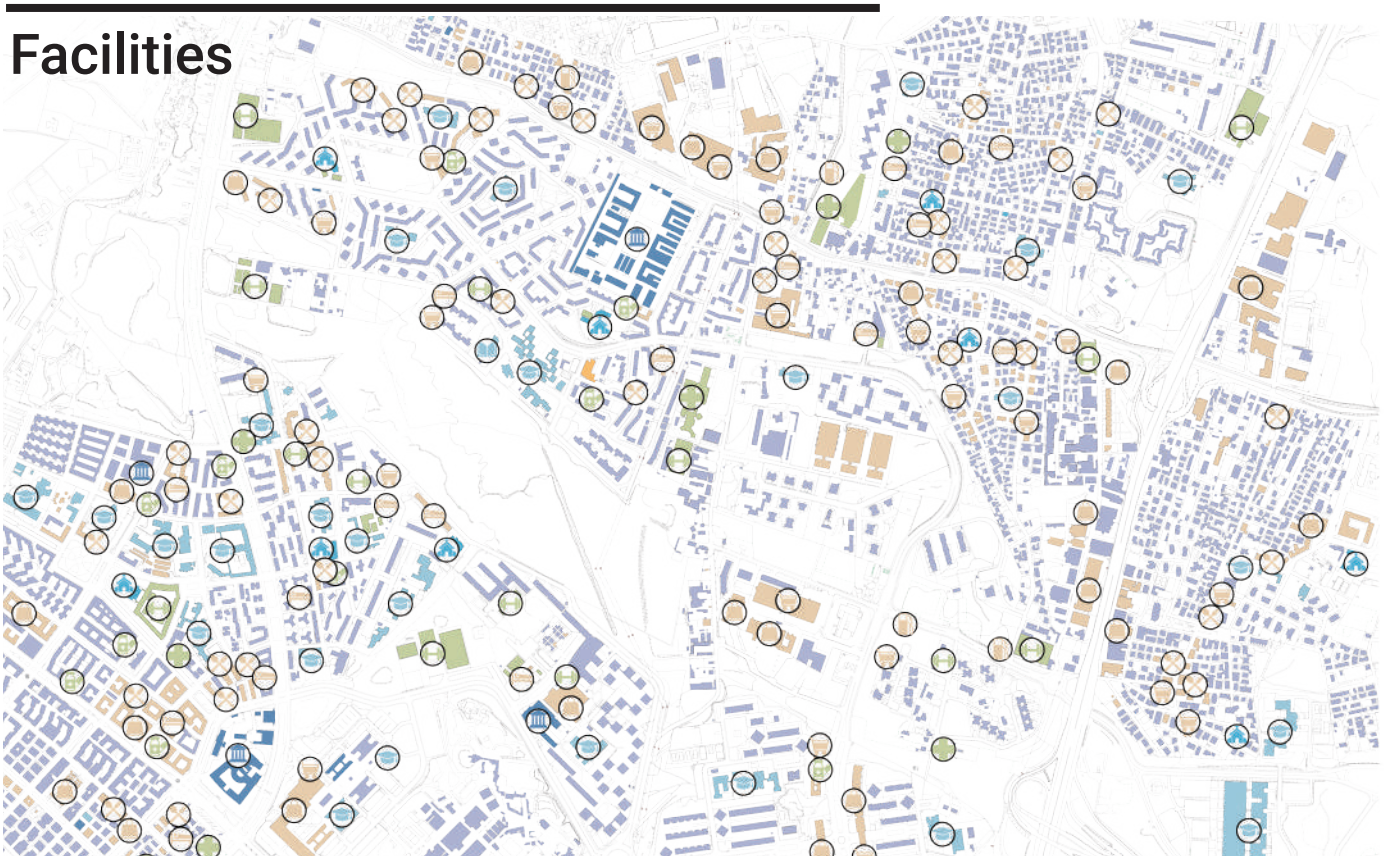
For the Torre Spaccata area, the green areas are scattered and sparse, especially near the Ex-Mercato building , where they are mostly private and the public green areas are small and of low continuity.

04.2.3 Mobility

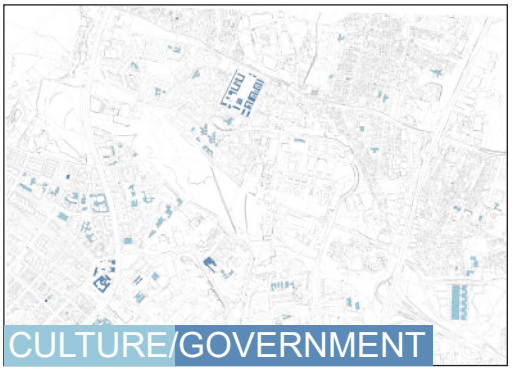
The Torre Spaccata area is within 2,000 meters of the metro station and several bus stops, and the Ex-Mercato building area is easily accessible due to its proximity to Via Romanisti. However, the overall pedestrian and bicycle paths are small and there are few bicycle docking points.

04.2 **Urban Analysis**

Facilities



Scale: 1:20000

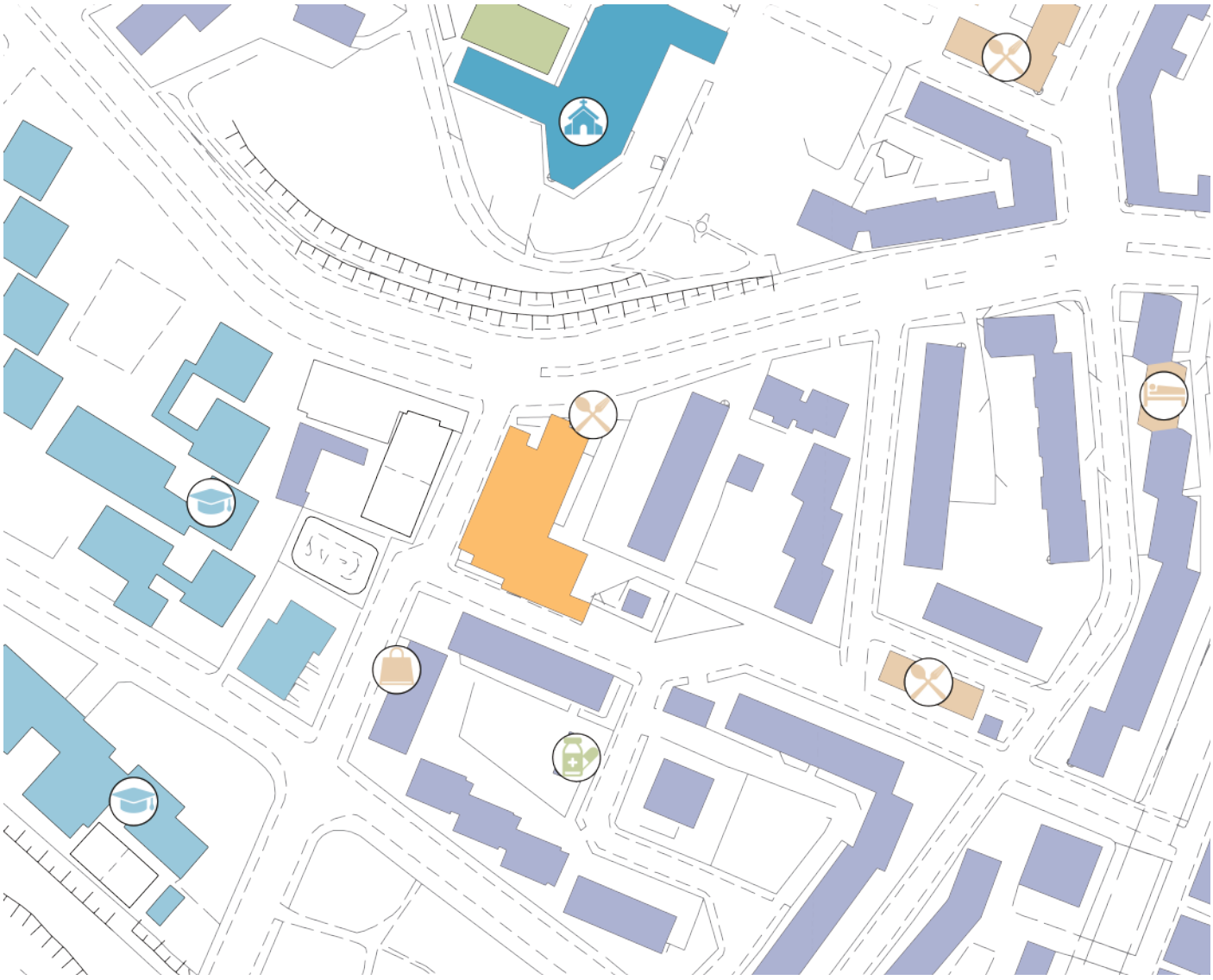


Legends

- Market
- Shop
- Hotel
- Gas Station
- Restaurant
- School
- Library
- Government
- Church
- Hospital
- Pharmacy
- Sports

04.2 **Urban Analysis**

Facilities



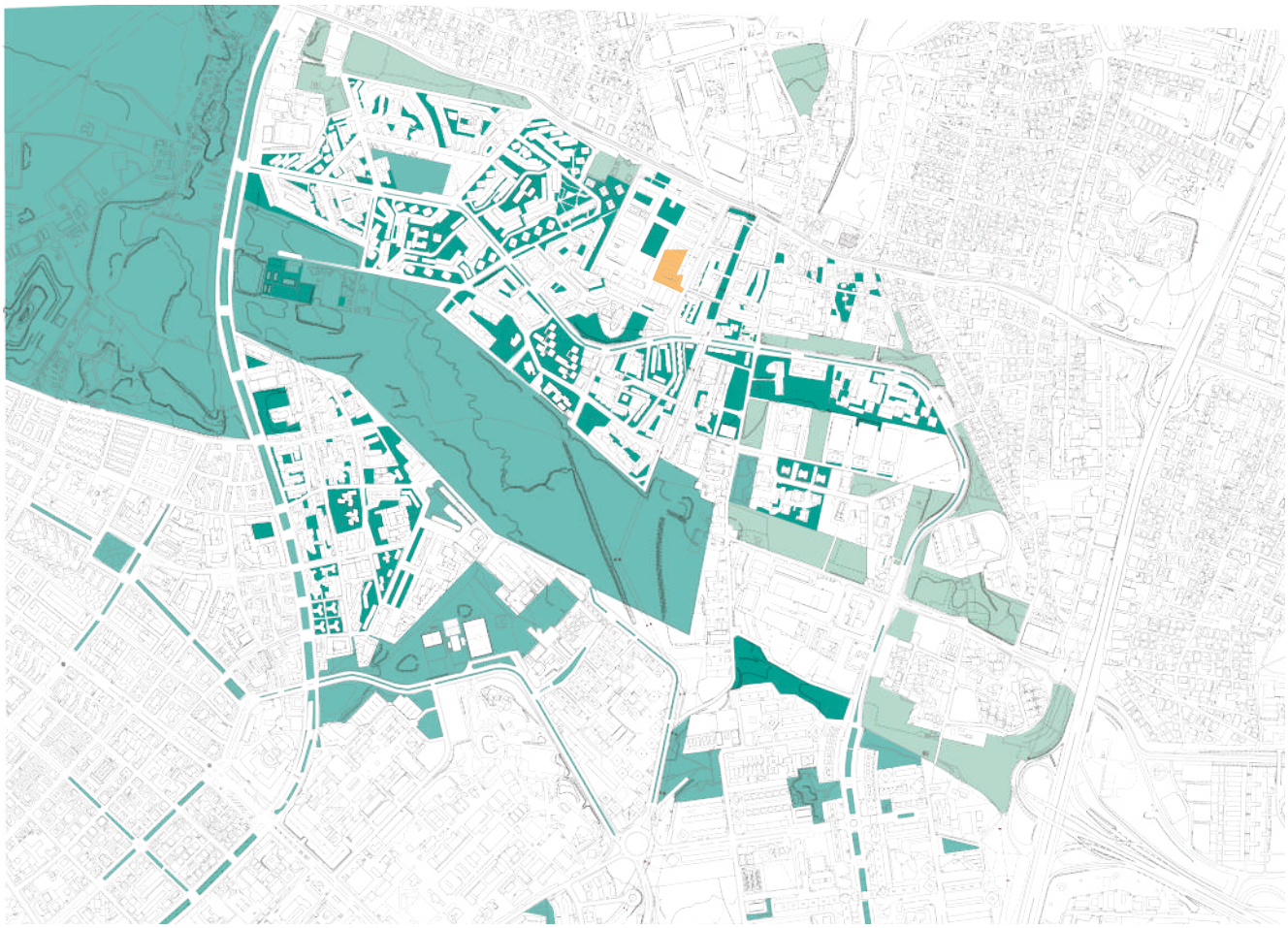
Legends

Scale: 1:2000

- Shop
- School
- Hospital
- Restaurant
- Church
- Pharmacy
- Hotel

04.2 **Urban Analysis**

Greenery



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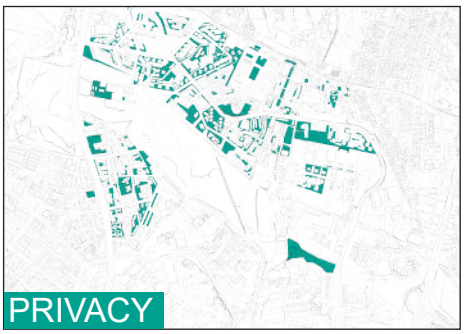


Private greenery: green space for residents to use or owned by the other buildings.

Public greenery: parks and urban greening, such as green plants on the street.

Unused greenery: Large area of vacant land without any facilities.

04.2 **Urban Analysis**

Greenery

Scale: 1:2000

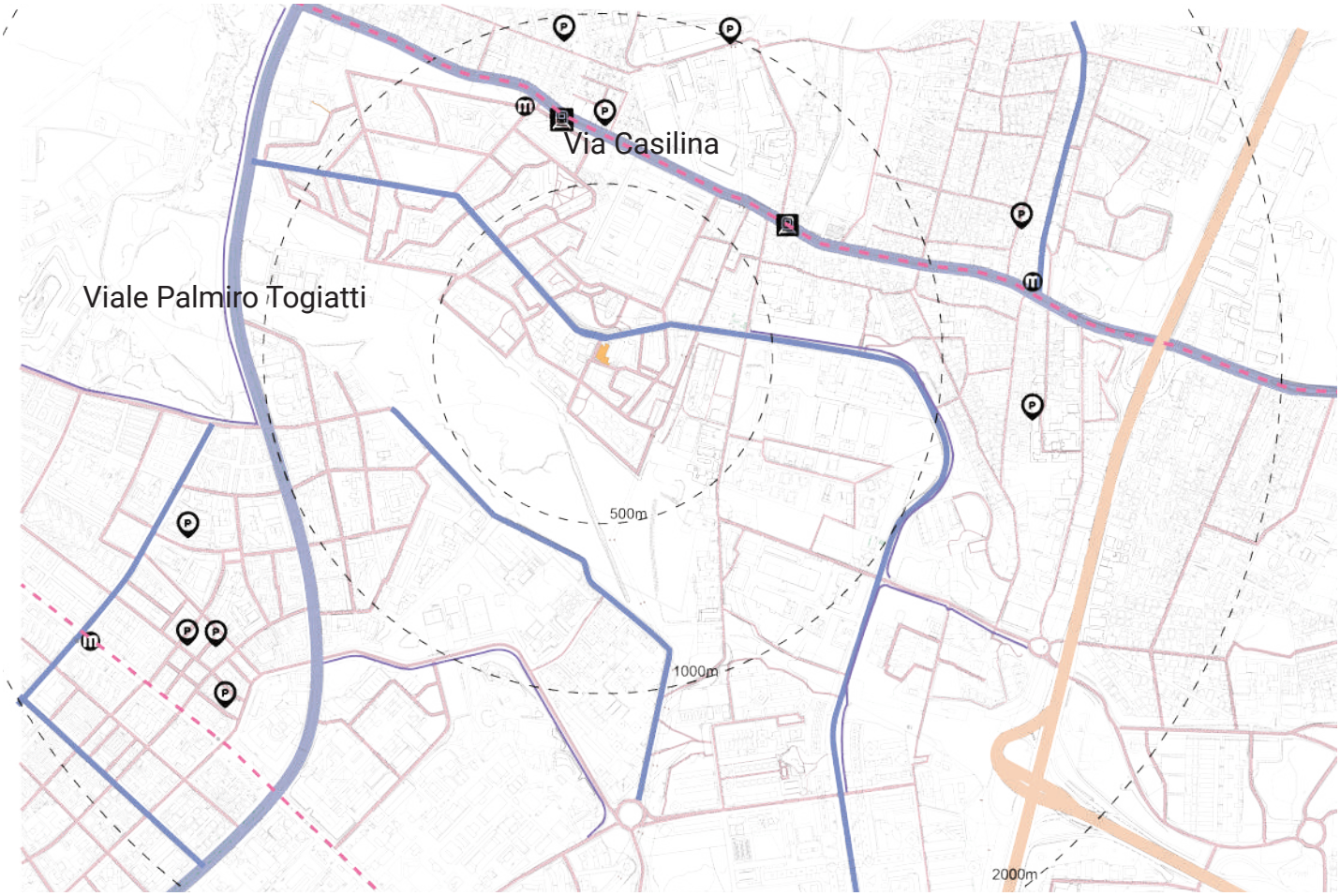
Privacy

Public

Unused

04.2 **Urban Analysis**

Mobility



Scale: 1:20000

Highway

Main Road

Main District Road

Secondary Road

Metro Line

Bike Line

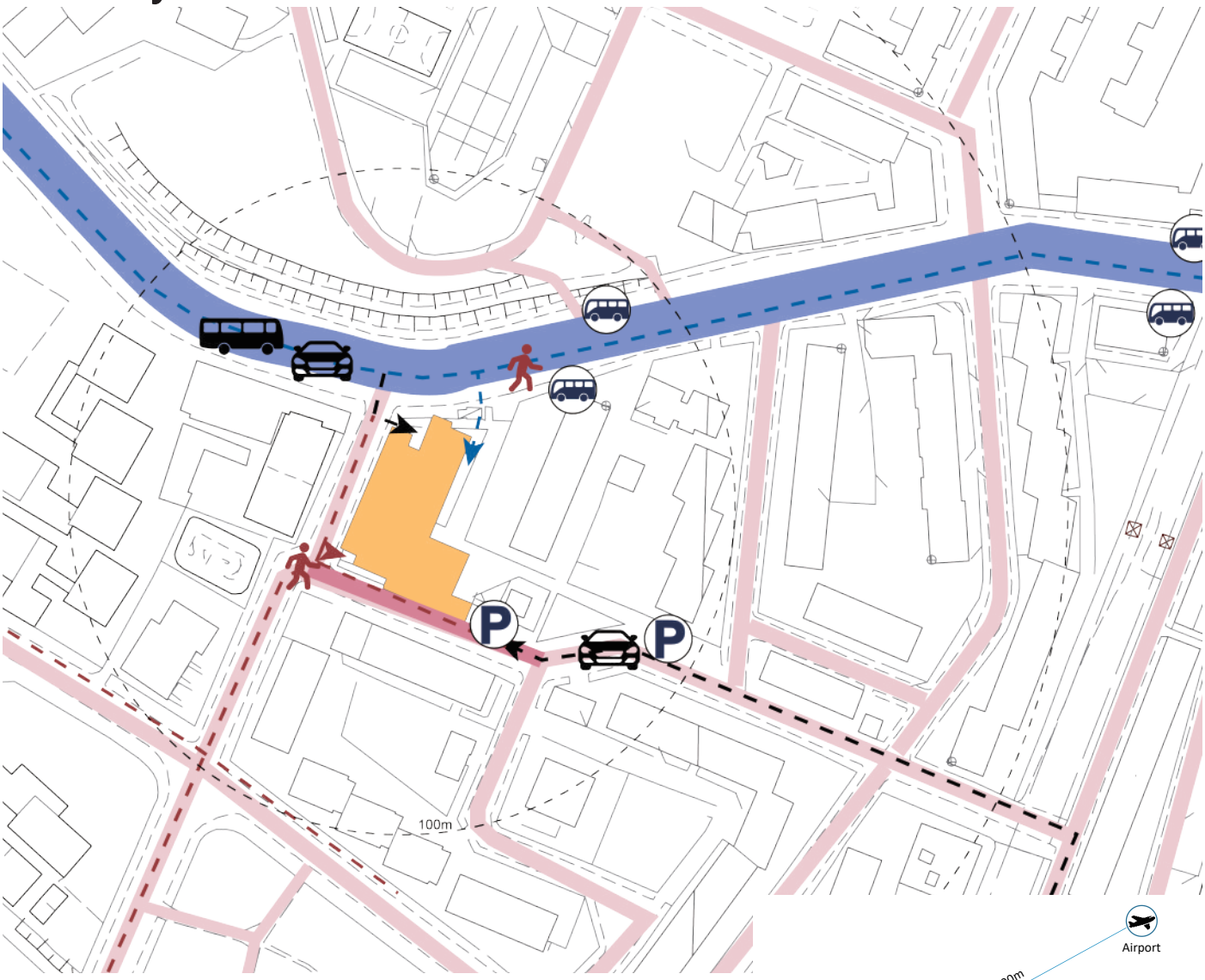
Train Station

Parking Lot

Metro Station

04.2 **Urban Analysis**

Mobility



Scale: 1:2000

Main District Road

Secondary Road

Neighborhood Street

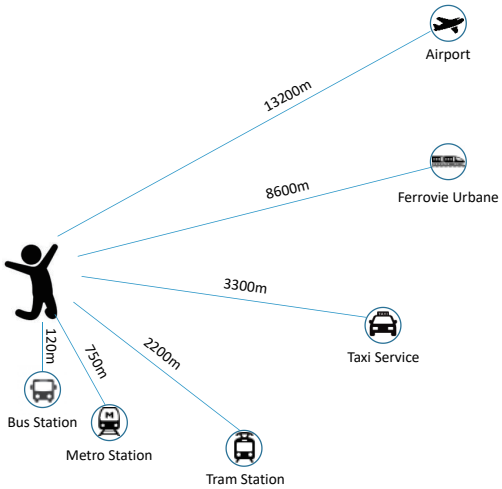
Pedestrian Line

Bus Line

Car Line

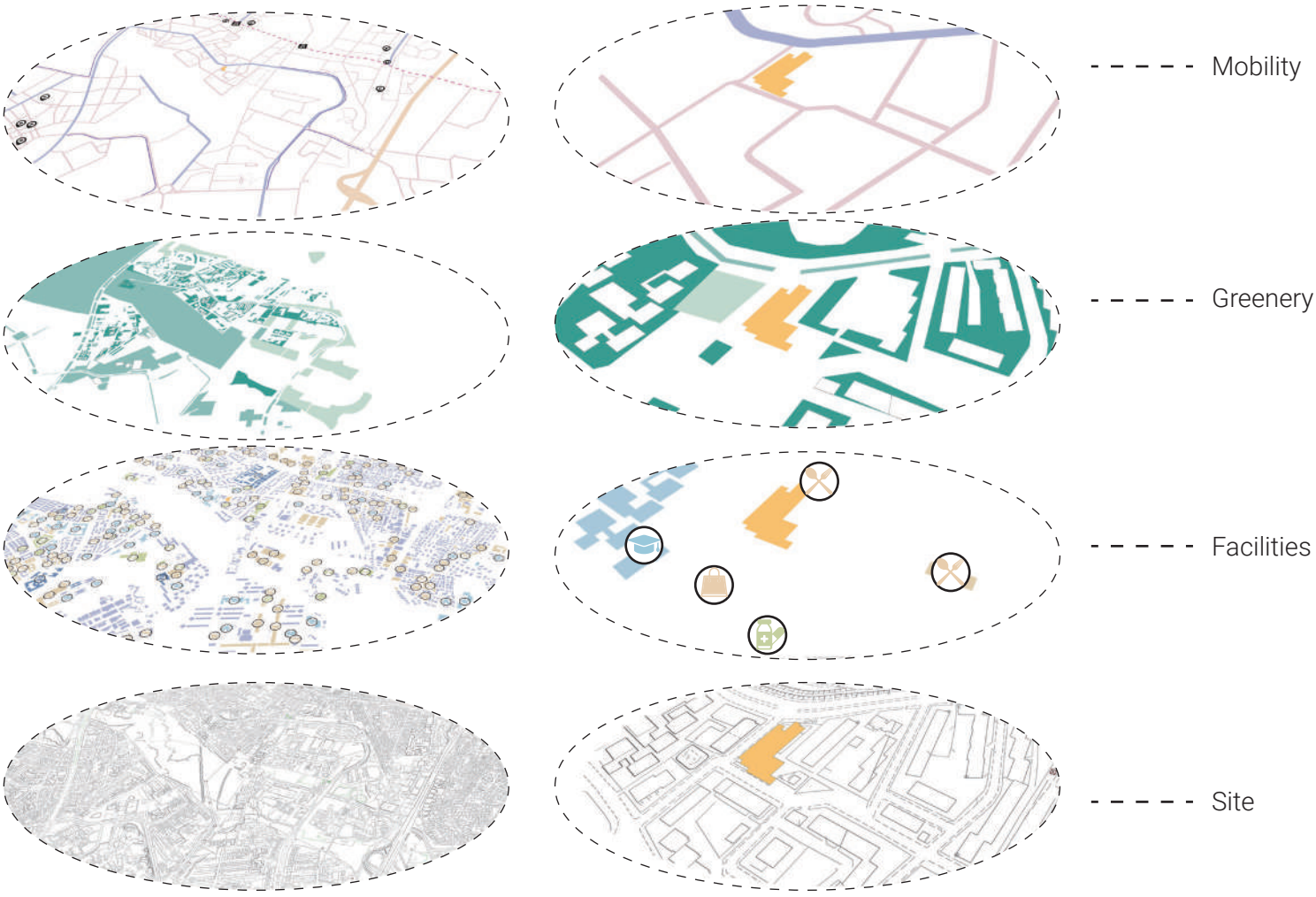
Bus Station

Parking



04.2 **Urban Analysis**

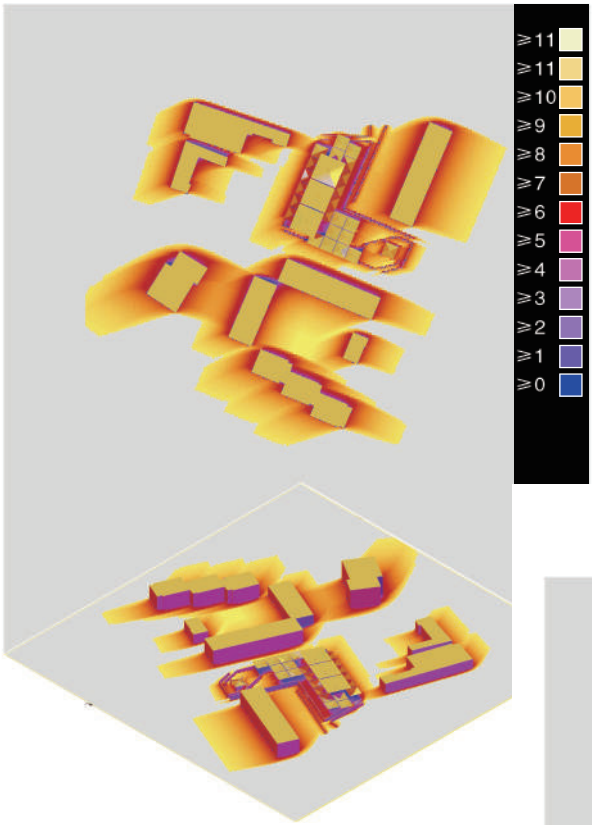
Overlapping



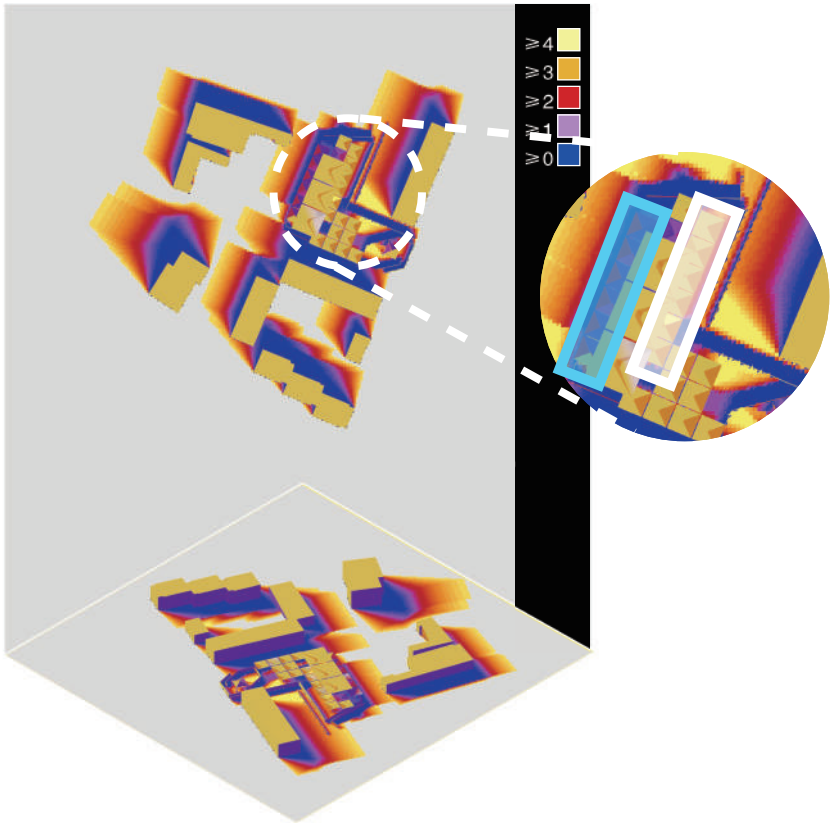
04.2 **Urban Analysis**

Solar Radiation Analysis

Summer (21st June)



Winter (21st December)



05. **URBAN PROPOSAL**

10 Challenges

Challenge 1 - Energy efficiency and low-carbon energy consumption
-Added solar panels, maximized use of daylight
-Reduced thermal bridging

Challenge 2 - Sustainable building and infra-structure design
-Using Top membrane and Expanded polystynene EPS material to achieve the effect of environmental protection and energy saving

Challenge 3 - Low-carbon mobility
-Creating new walking and cycling infrastructure
-New park and greenery

Challenge 4 - Climate resilience and adaptation
-Presence of a biodiverse roof
-Presence of a rainwater storage and solar panels

Challenge 5 - Ecological services for the neigh-bourhood and green jobs
-New greenery park
-Providing co-working, flexible and green workspace

Challenge 6 - Sustainable water management
-Roof water collection system
-Rain garden

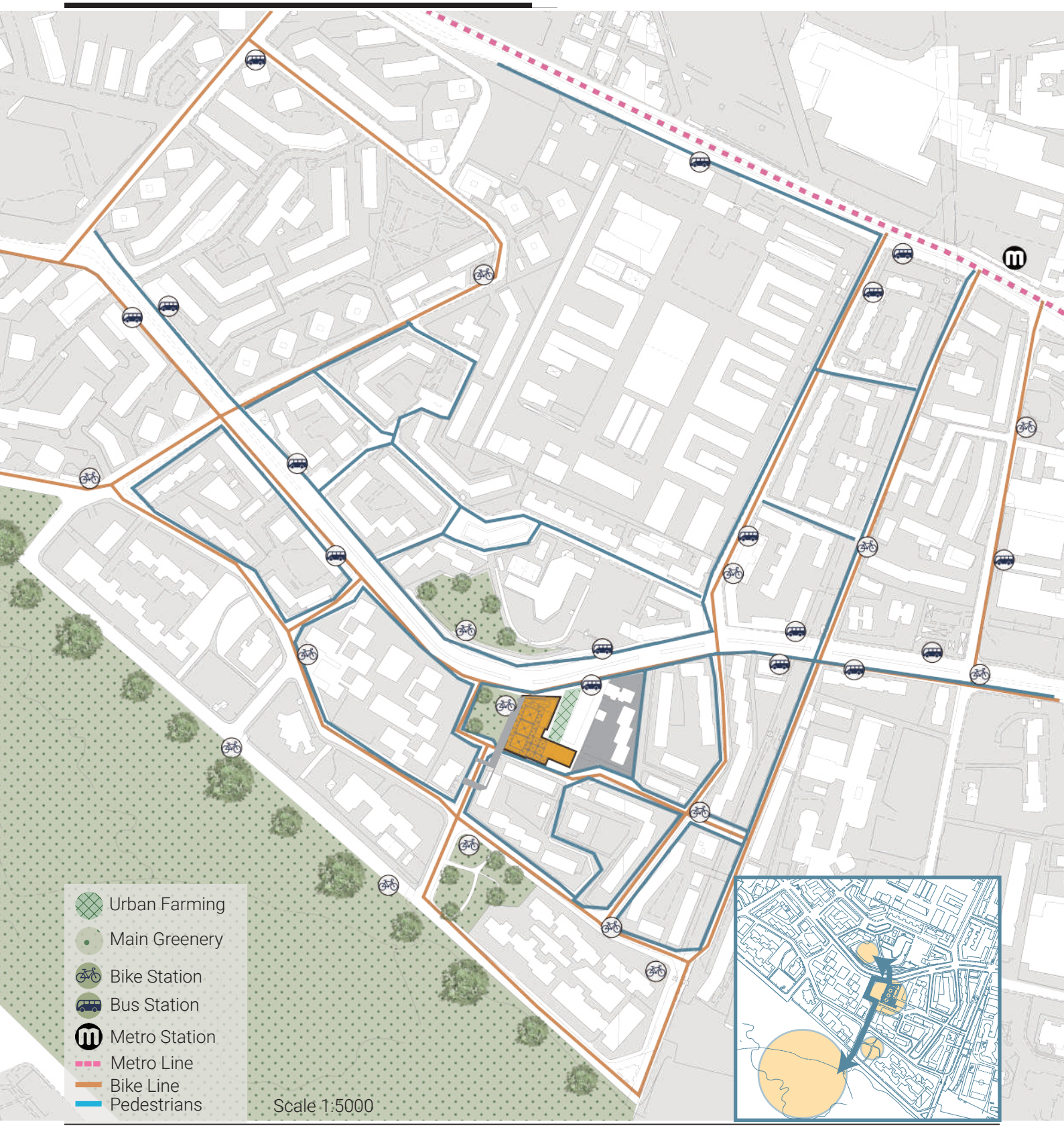
Challenge 8 - Biodiversity, urban re-vegetation and agriculture
-Increasing in public green space

Challenge 9 - Inclusive actions, social benefits and community engagement
-Creating new greenery park for kids, the old and young people
-New public space, fostering sport and leisure acti-vities

Challenge 10 - Innovative architecture and urban design
-Useing low-carbon, recycling materials
-Respect of cultural heritage, continuity of walking and cycling routes and public space across the site itself
-make best use of all available spaces to foster out-door activities and connectedness

05.1 **Axonometry**

05.2 **Masterplan**



05.3 **Greenery Proposal**

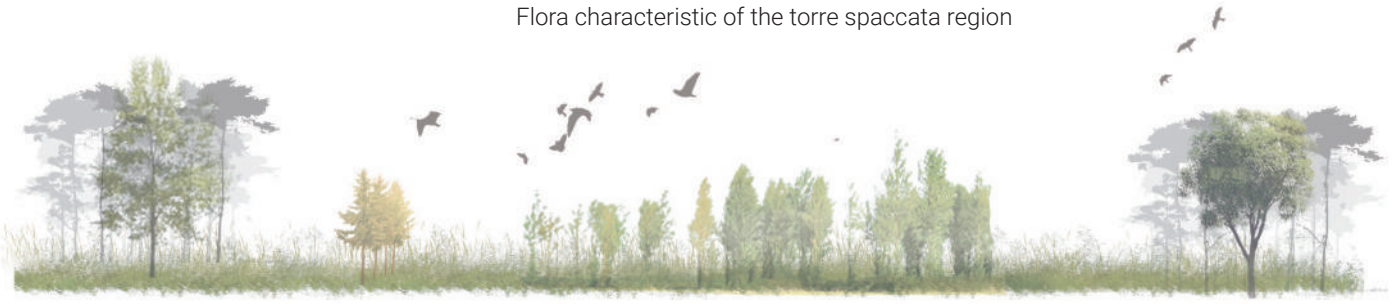
Surrounding green space planning and design

2 Years

Remove objects from surrounding waste land, loosen the soil, and plant tolerant and adaptable plants.

5 Years

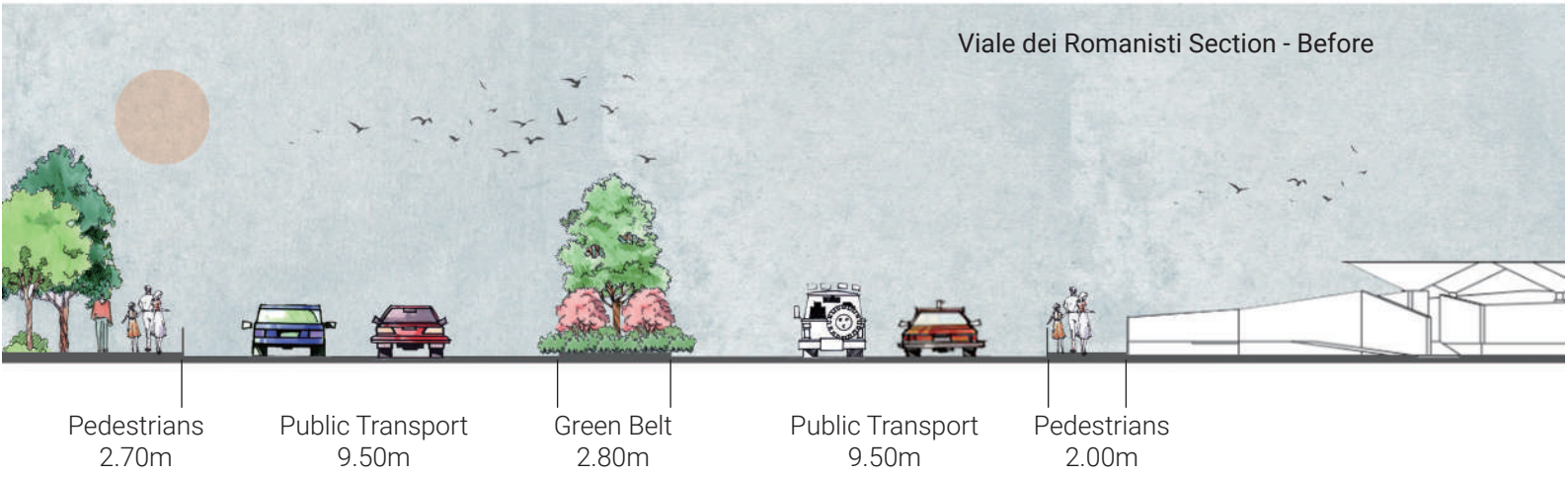
The landscape begins to mature, some large and pioneer tree species are arranged, and the local flora is visited.

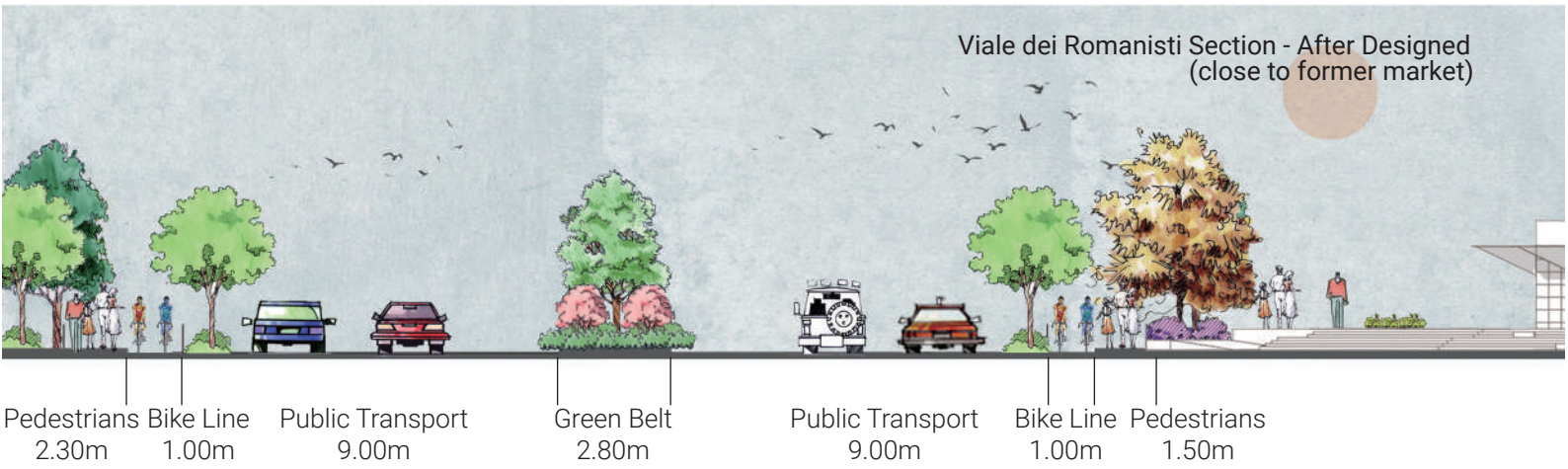


10 Years

During this period, the green space around the building has matured, and the landscape features can represent the local plant community. The early withered trees provide nutrients for the site.

05.4 **Road Section**





06. **PLOT DESIGN**

The main goal of our design was to make the renovated and reimagined EX-Mercato building and make surroundings more resilient and flexible, strengthening the connection between the site and surroundings. In order to achieve this goal, we implemented four concepts: continuity of open spaces, multifunctionality of spaces, connectivity, and environmental technologies. These four concepts led to different design perspective view of design.

In order to create continuity of open space, we designed the interior of the building with a picket design and an atrium in the middle of the building to increase the openness of the space and minimize the enclosed nature of the space. A new public green roof space was added to the roof section. We used glass in the building to eliminate the boundary between the building block and the surrounding area.

Regarding the concept of multifunctionality, we tried to add more functions to the site without conflicting with the function of the building, in order to increase the flexibility and resilience of the building in use, in response to the paralysis of some functions caused by the urban crisis.
Multifunctional spaces were added to the building to allow flexibility in the event of increased demand for the building in the future.

Regarding the connection of the building to the surrounding plan, we designed grand staircases and ramps to connect the building's exterior plaza to the surrounding area. We wanted the plaza outside the building to be a landmark that would enhance the building's connection to the surrounding neighborhoods and roads. In terms of planning, the surrounding abandoned land was transformed into a green space plaza, and new bike lanes, bike stations and sidewalk designs were added. Through these plans and designs, we hope to better connect with the surrounding area, making the former Market building a knot for the entire area.

As for the environmental technology part, we wanted the overall design to be more sustainable and low-carbon, so we added a rainwater harvesting system, photovoltaic panels and green paving on the roof to save energy and increase the recycling rate. For the choice of building materials, we mainly use more environmentally friendly and sustainable materials.

We will focus on building renovation as well as new perimeter planning, hoping to make the area a new socio-economic center through design and planning.

06.1 **Former Market**

1960s

Mamma Roma 1962

Activities in Ex-Mercato

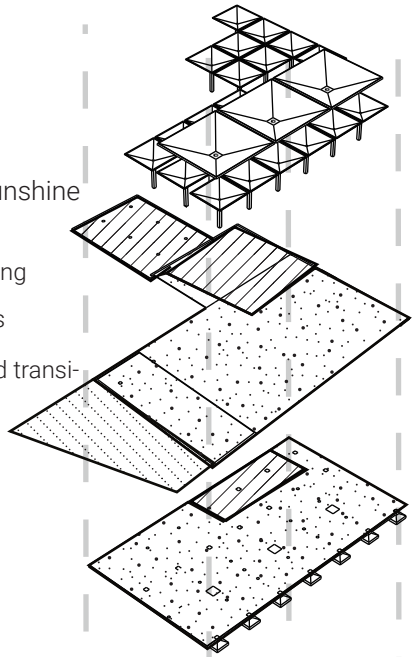
Around 2010

Nowedays

Nowedays

Designed

06.2.1 **Concept**



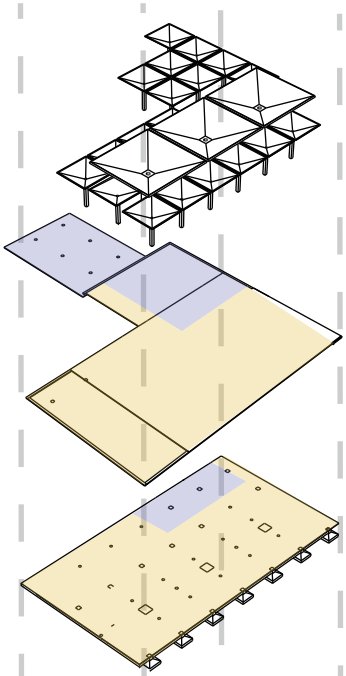
• Social strategy

Layout according to sunshine and building location

Working and Learning

Open area-activities

Multi-functional and transition

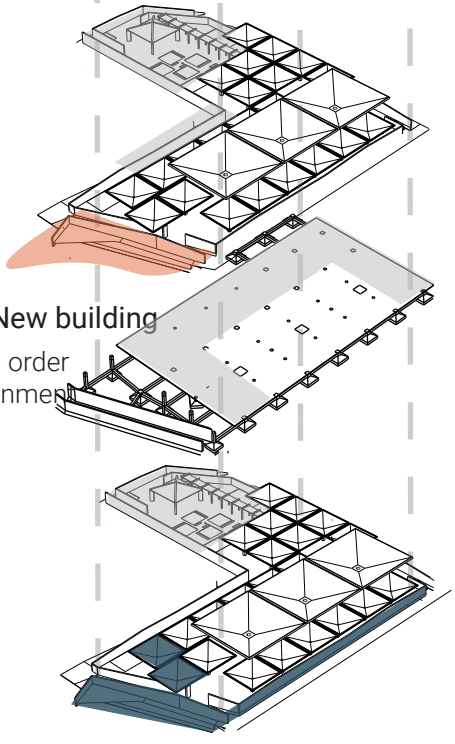


• Social strategy

Divide the whole into static and dynamic spaces

Static space

Dynamic space



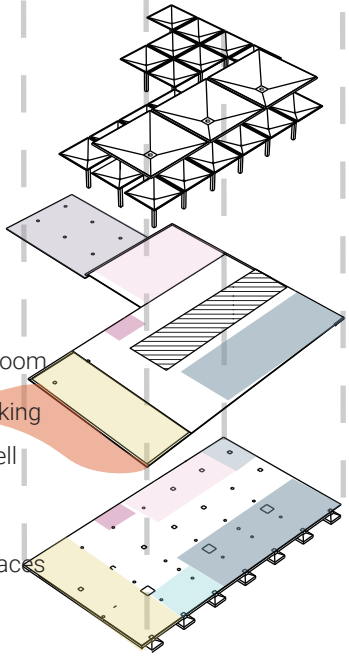
•Demolishing and New building

Building demolition in order to increase the environment of public space.

Demolishing

New area

New building



•Social strategy

Courtyard

Study room

Open area

Co-working

Auditorium

Stairwell

Commerce

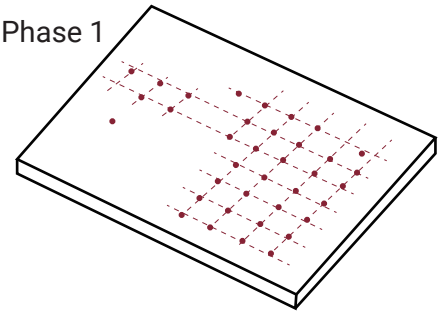
Toilet

Corridors and flexible spaces

06.2.2 **Concept**

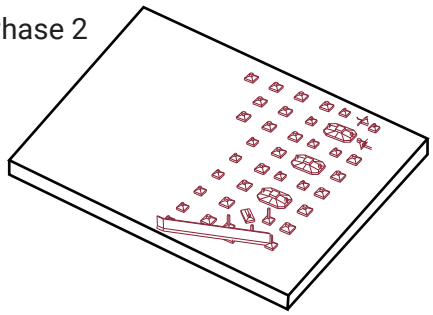
Construction Process

Phase 1



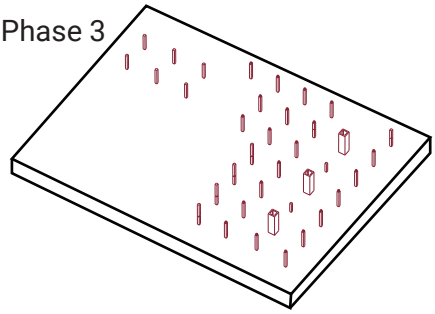
Positioning

Phase 2



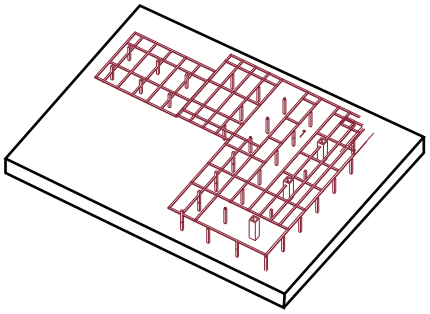
Build the fundation

Phase 3



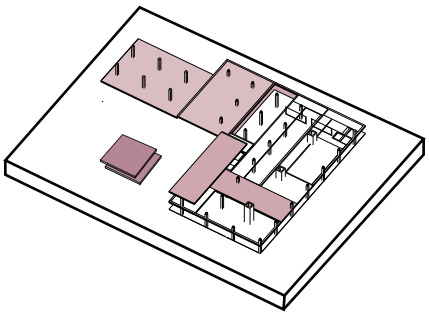
Build and add new columns

Phase 4



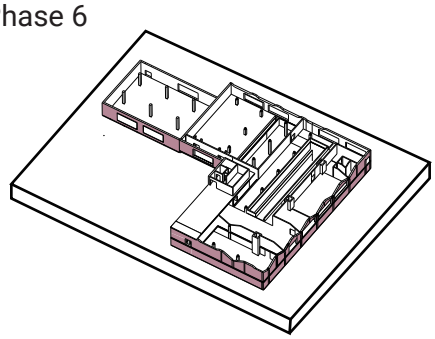
Central structure frames assembly

Phase 5



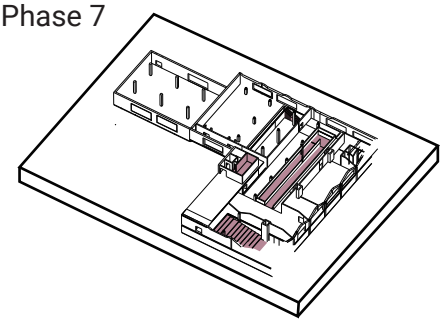
Floor panel assembly

Phase 6



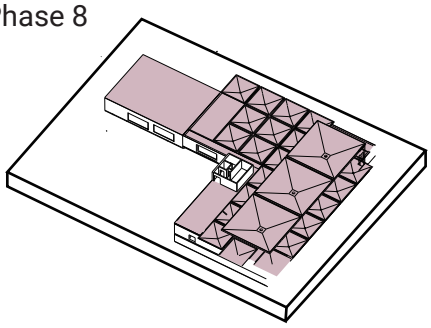
Add interior walls and facades

Phase 7



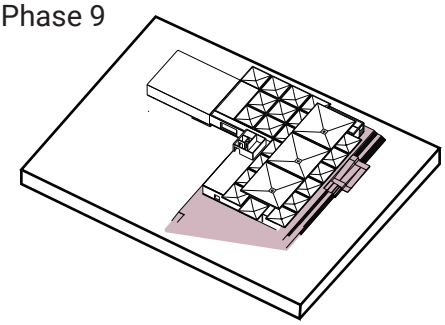
Add stairs and stairwells

Phase 8



Create new inverted pyramid roofs and roof connections

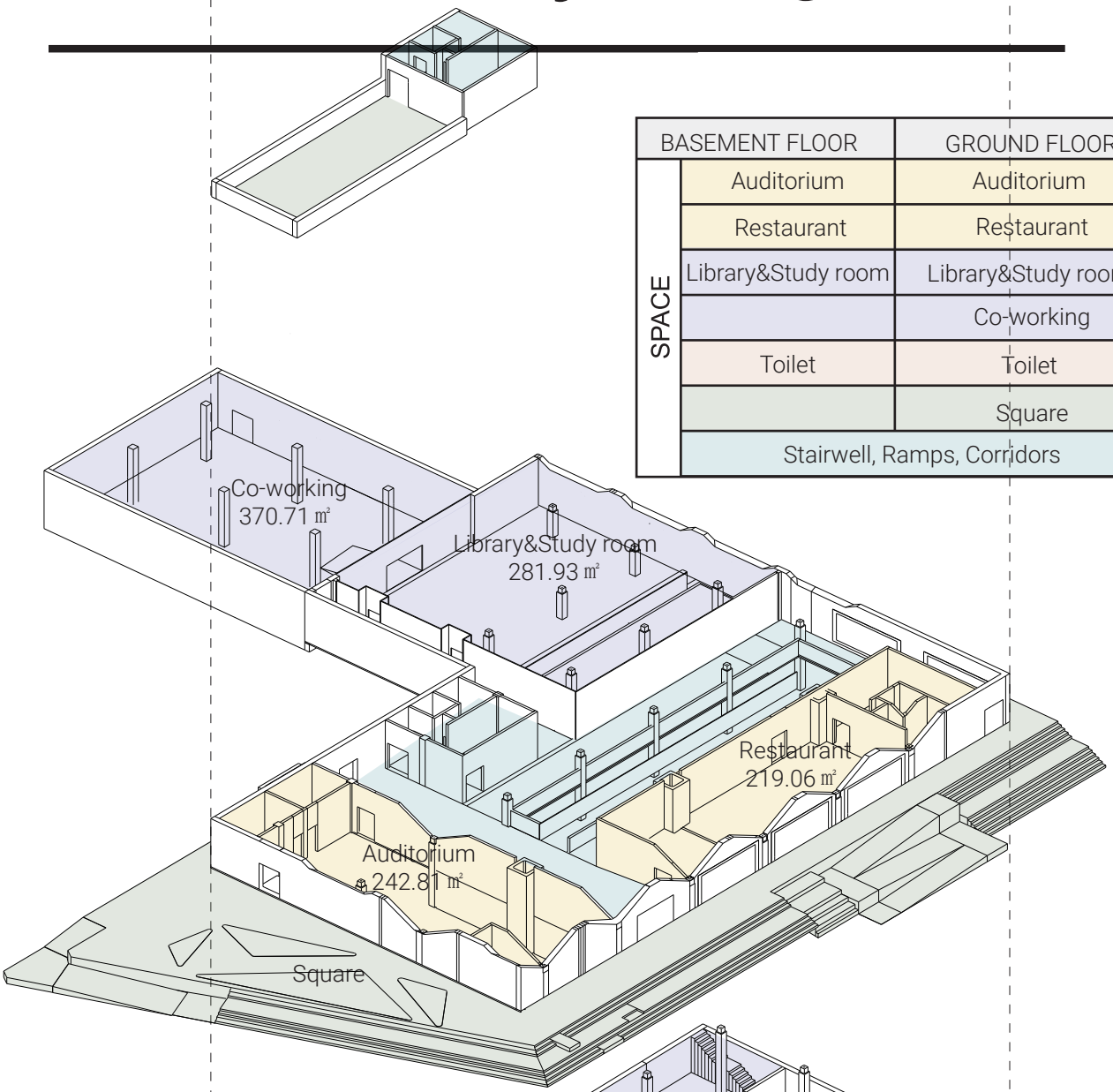
Phase 9



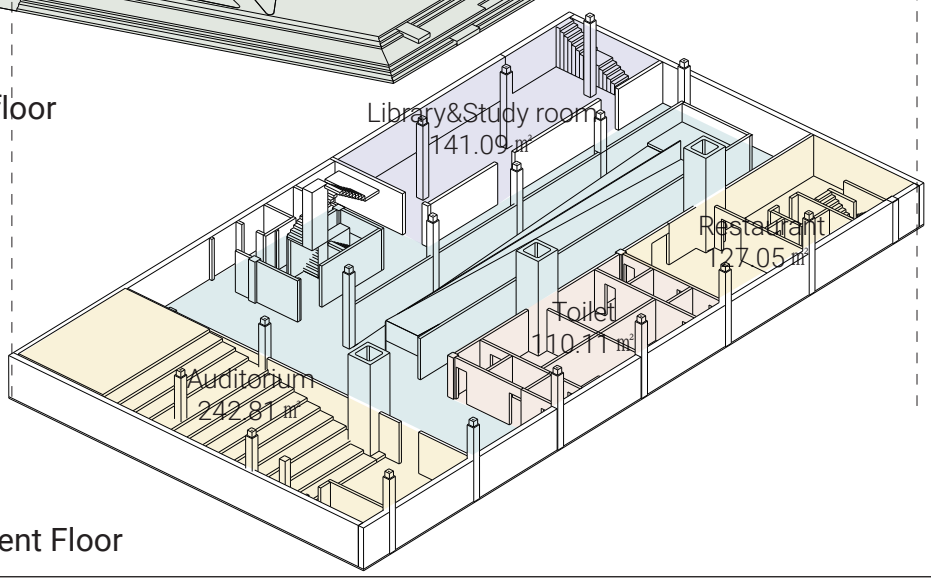
Build external stair plazas and green spaces

06.3 **Functional Programme**

	BASEMENT FLOOR	GROUND FLOOR	
SPACE	Auditorium	Auditorium	Dynamic space
	Restaurant	Restaurant	
	Library&Study room	Library&Study room	Static space
		Co-working	
	Toilet	Toilet	Services
		Square	Outdoor
	Stairwell, Ramps, Corridors		Circulations



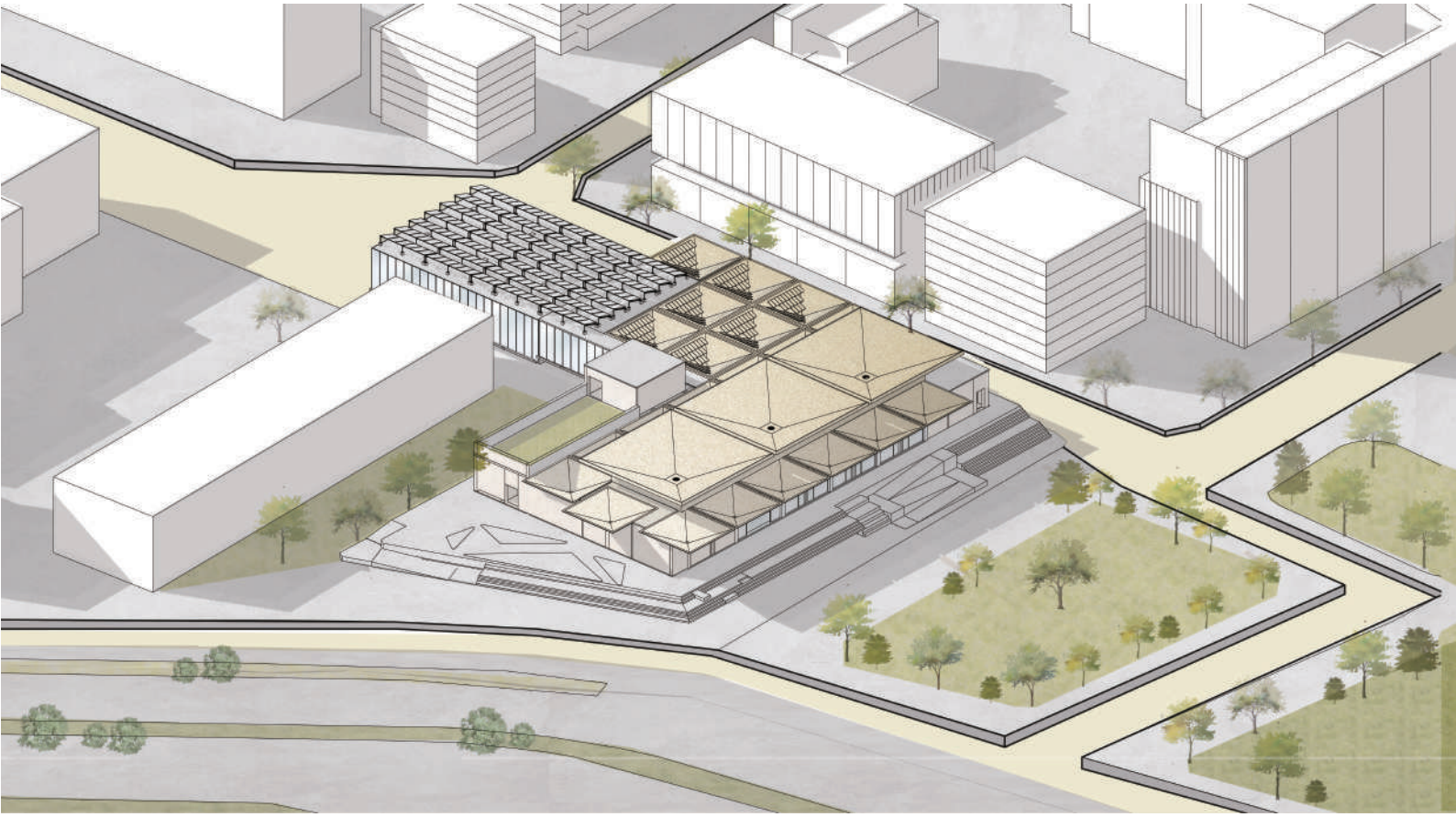
Ground floor



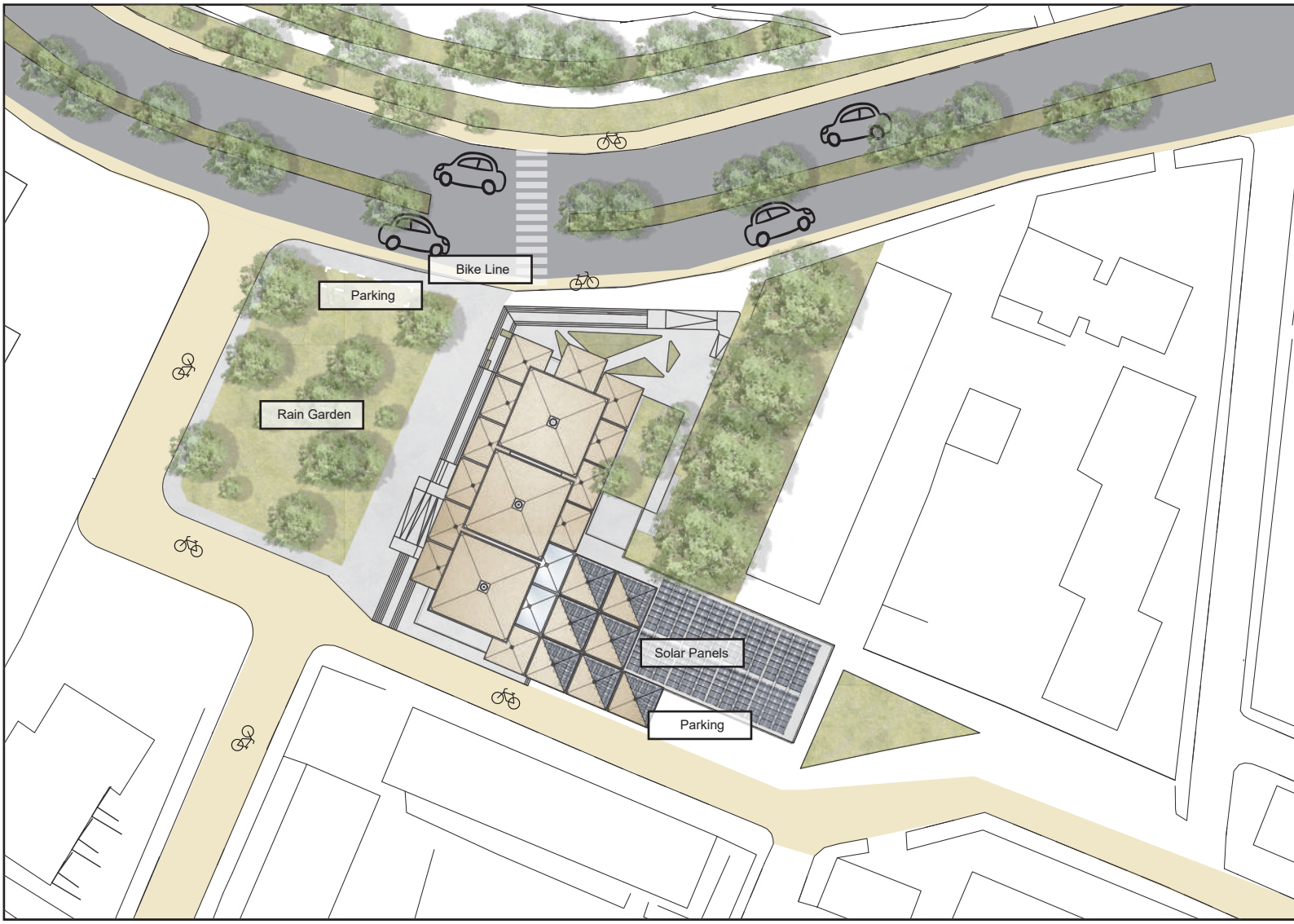
Basement Floor

06.4 **The project**

Axonometry

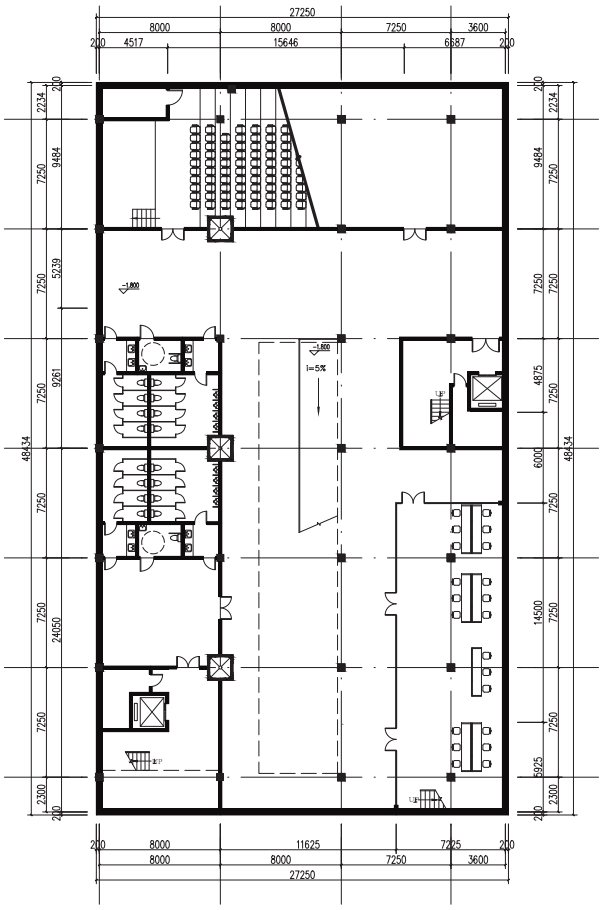


06.5 **Masterplan**



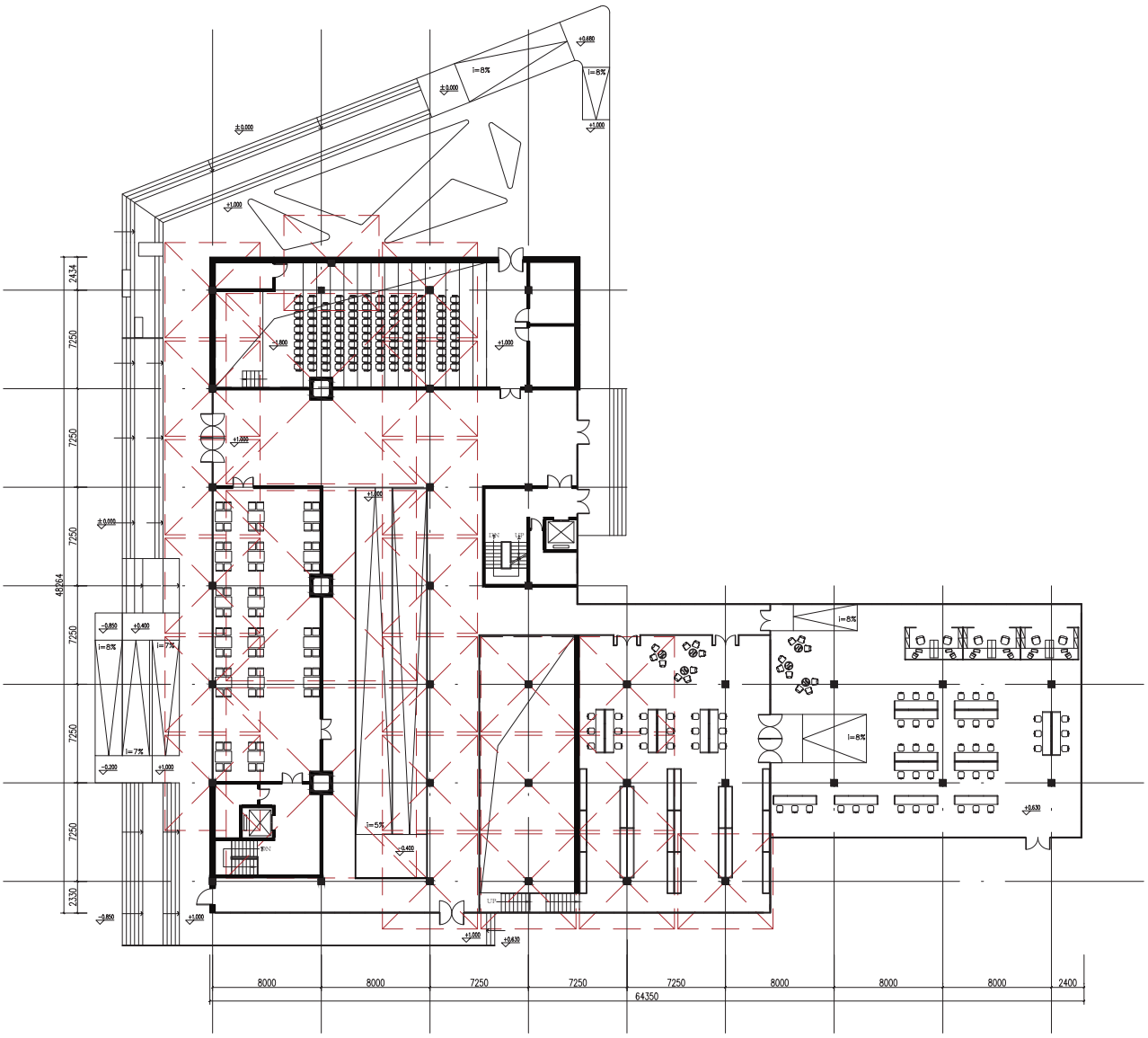
Scale 1:1000

06.6.1 **Plan**



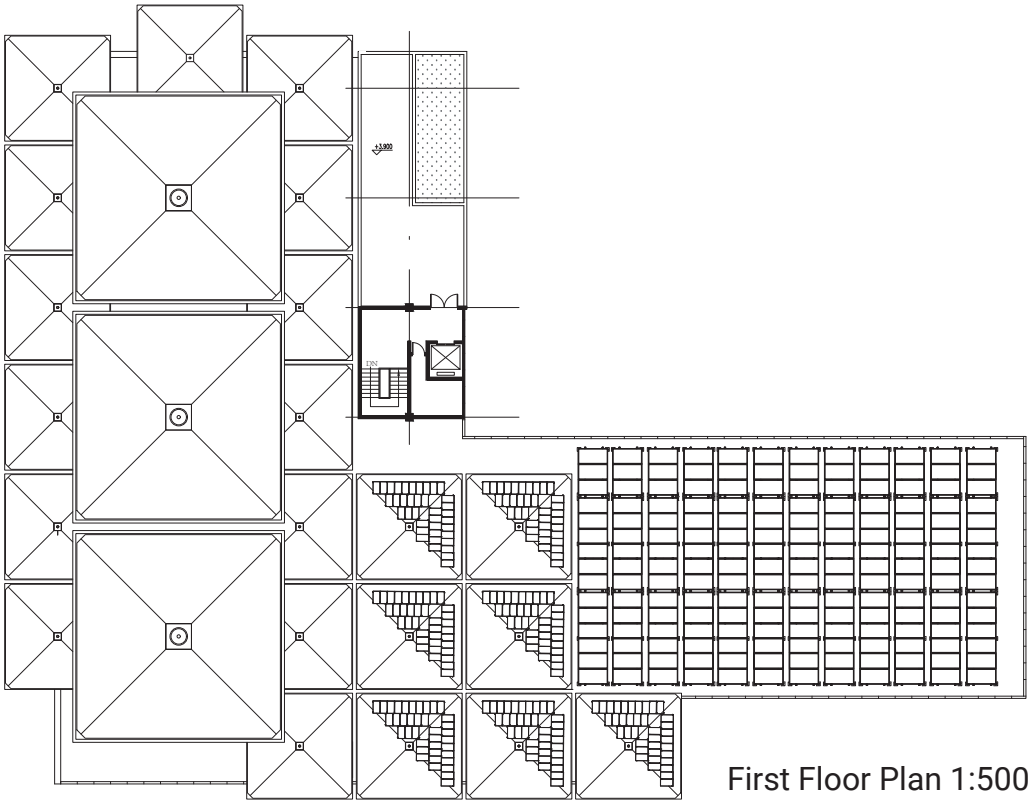
Basement Plan 1:500

06.6.2 **Plan**

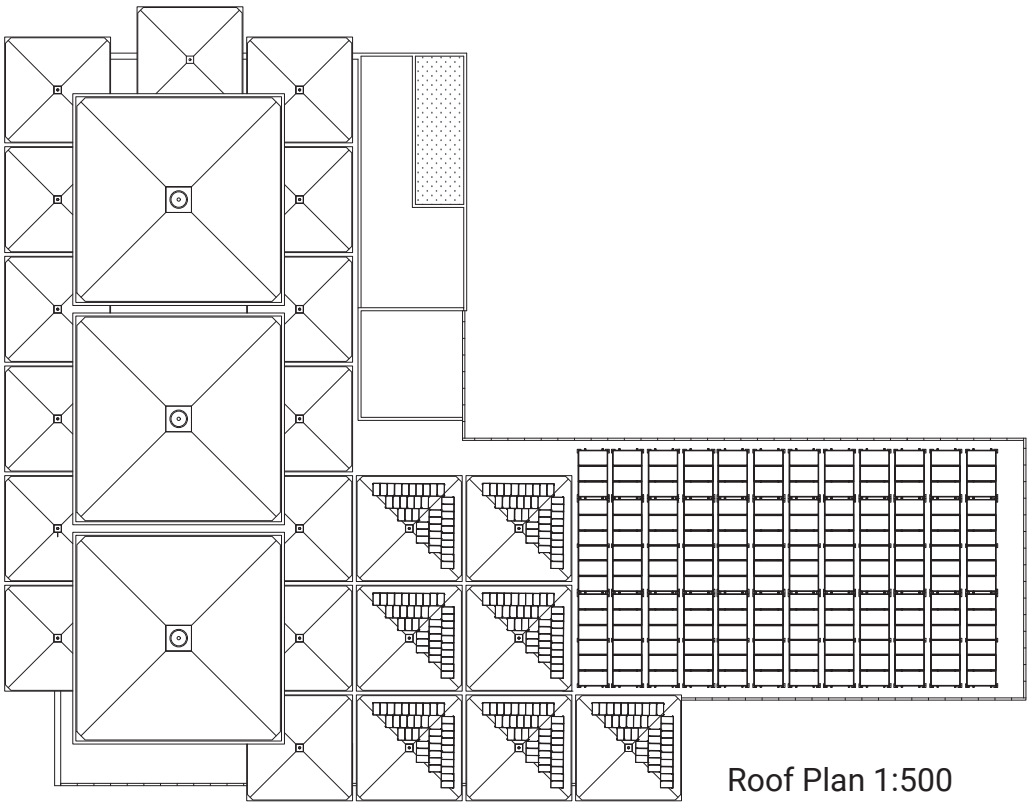


Ground Floor Plan 1:500

06.6.3 **Plan**

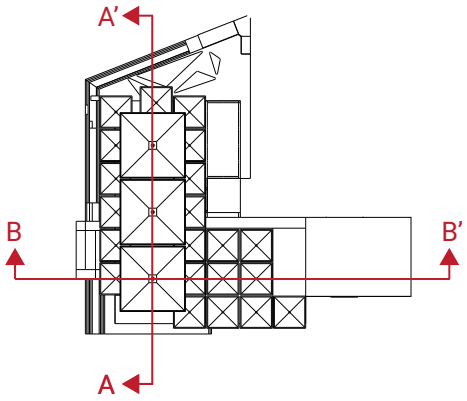


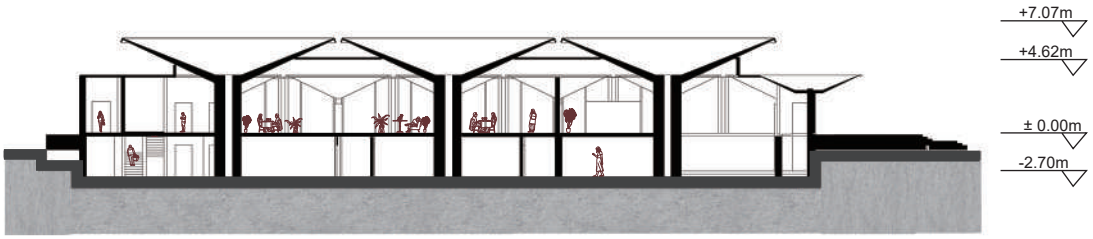
First Floor Plan 1:500



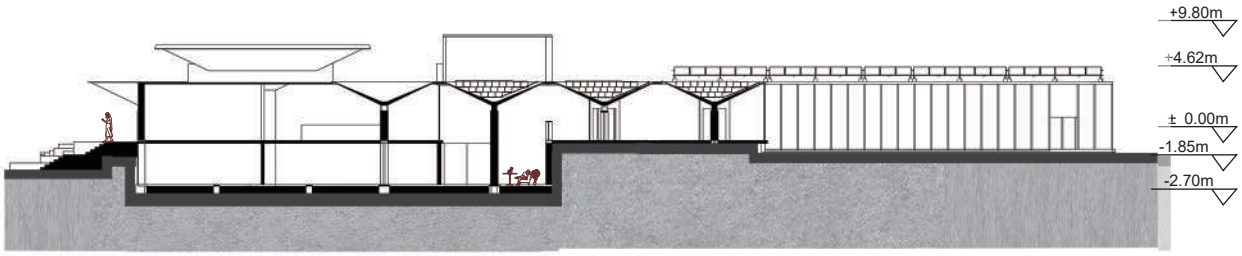
Roof Plan 1:500

06.7 **Sections**

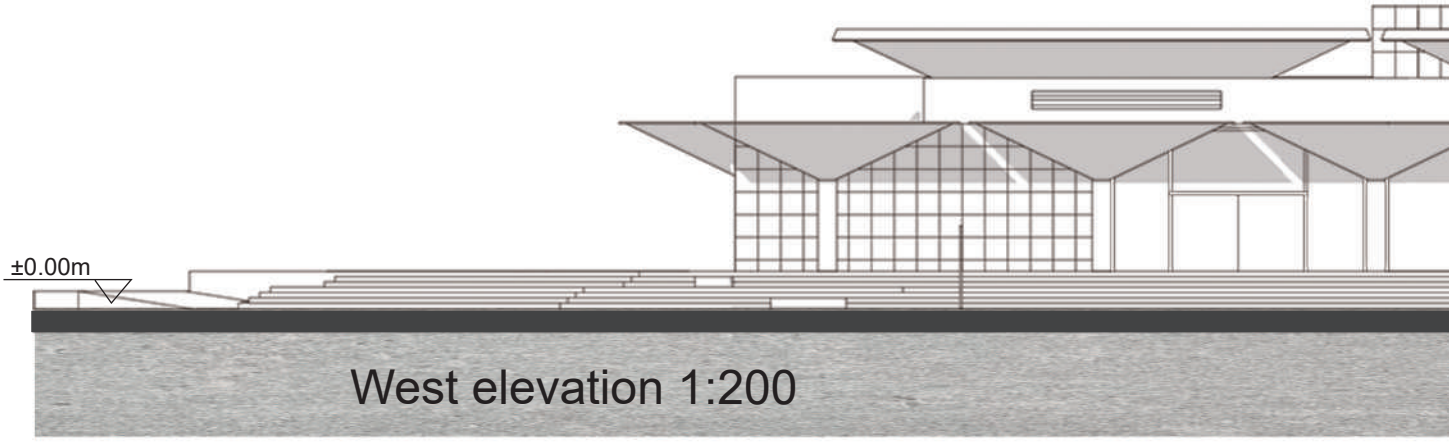




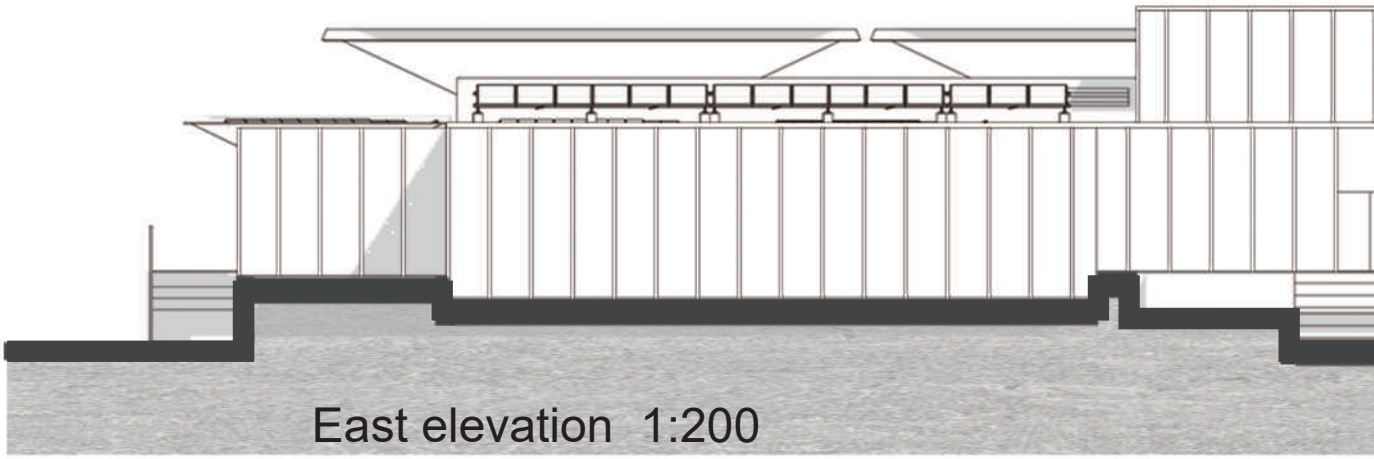
Section A-A'



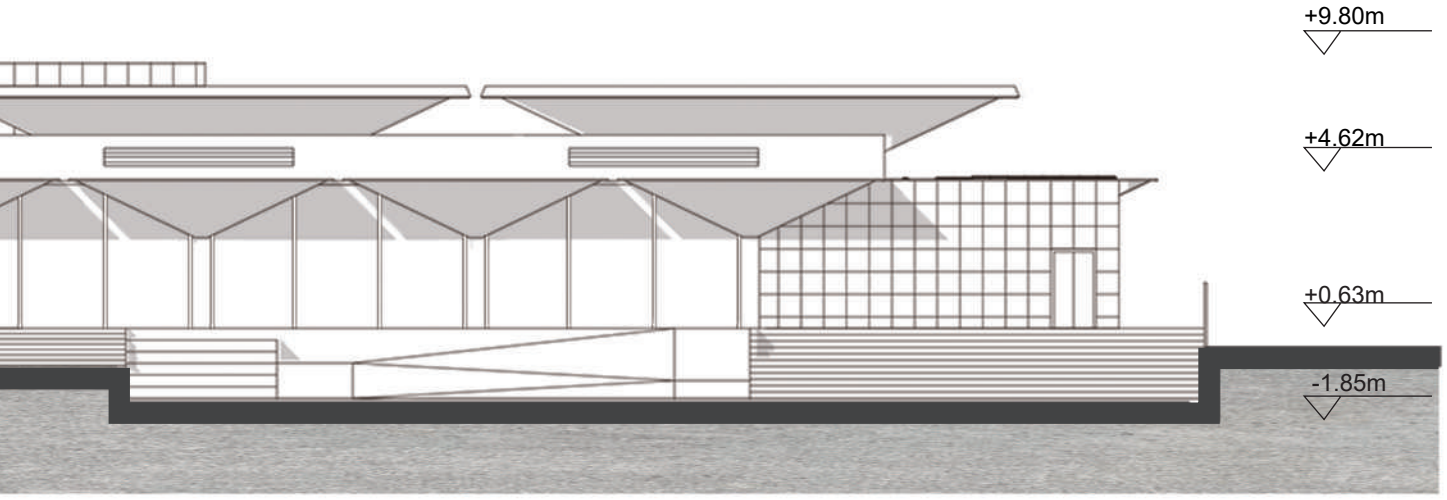
06.8.1 **Elevations**

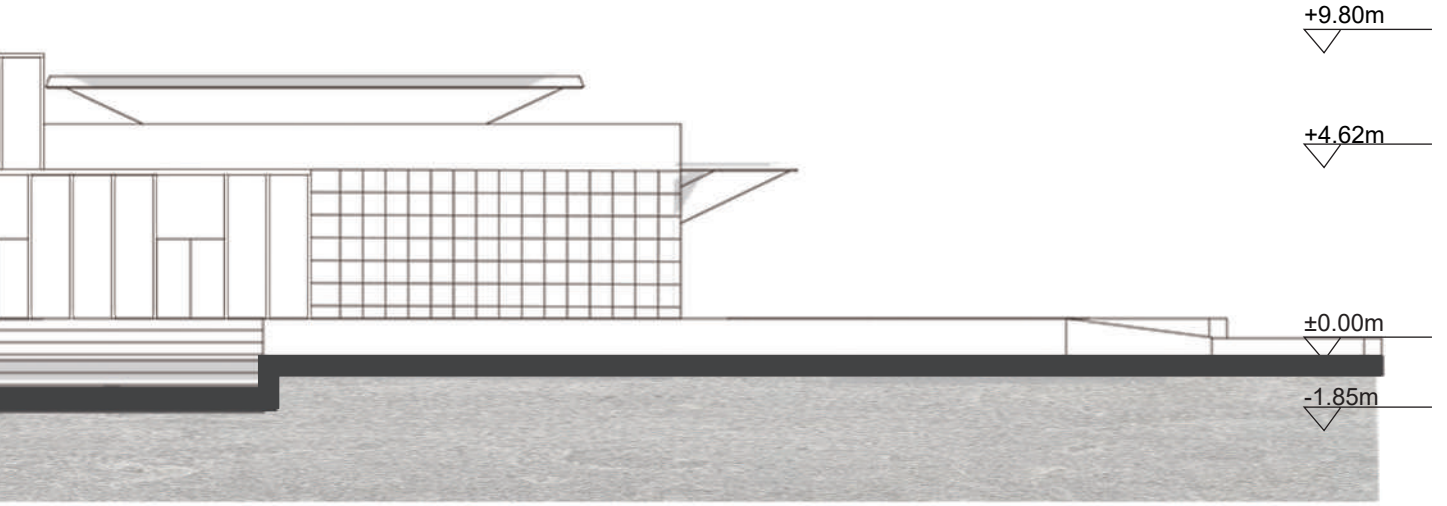


West elevation 1:200

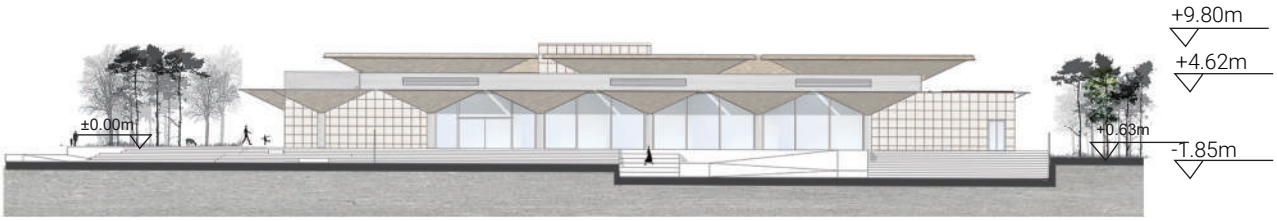


East elevation 1:200


+9.80m
+4.62m
+0.63m
-1.85m


+9.80m
+4.62m
±0.00m
-1.85m

06.8.2 **Elevations**



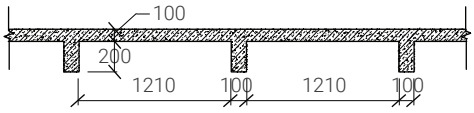
West elevation

East elevation

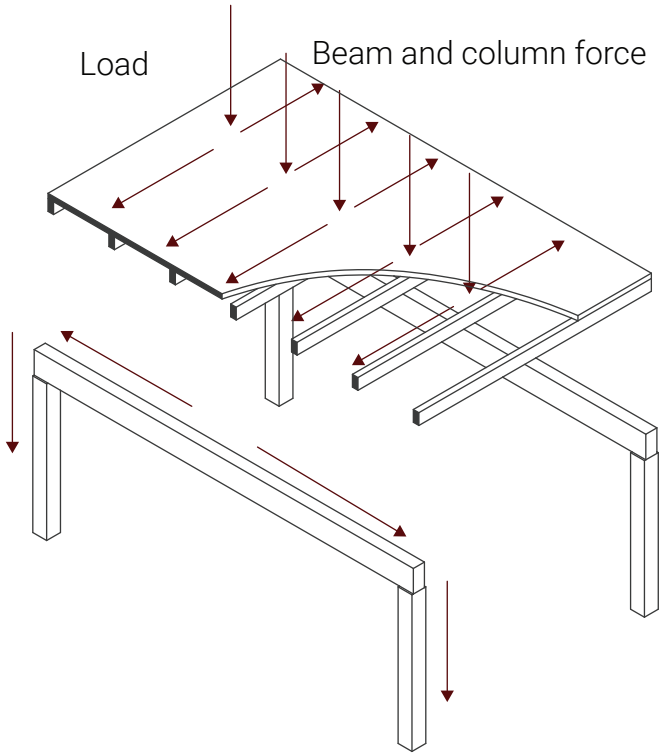
07.1 **STRUCTURAL SCHEME**

Reinforced concrete frame structure

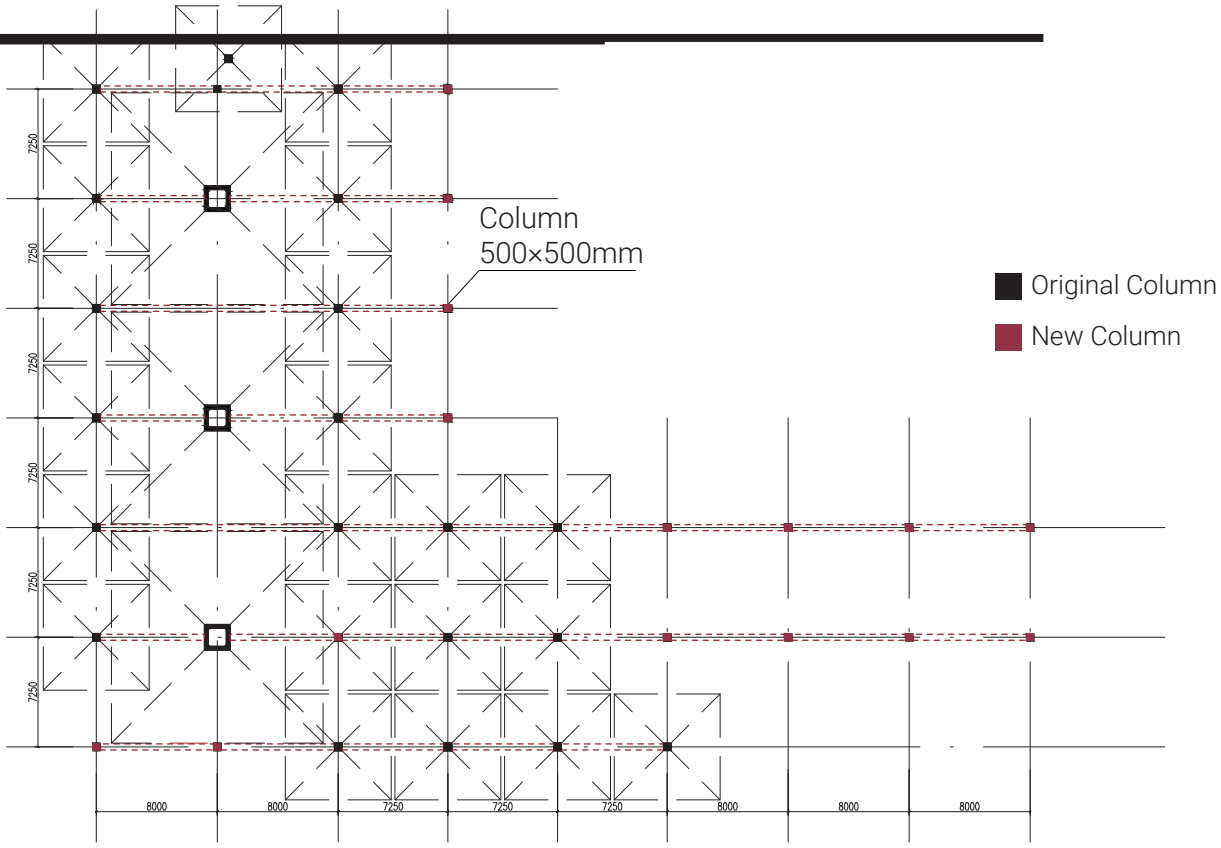
The structure consistes of pillars, primary beams and ribbed slabs. Use ribbed slab to replace the secondary beam to reduce the height of the beam and increase the indoor height



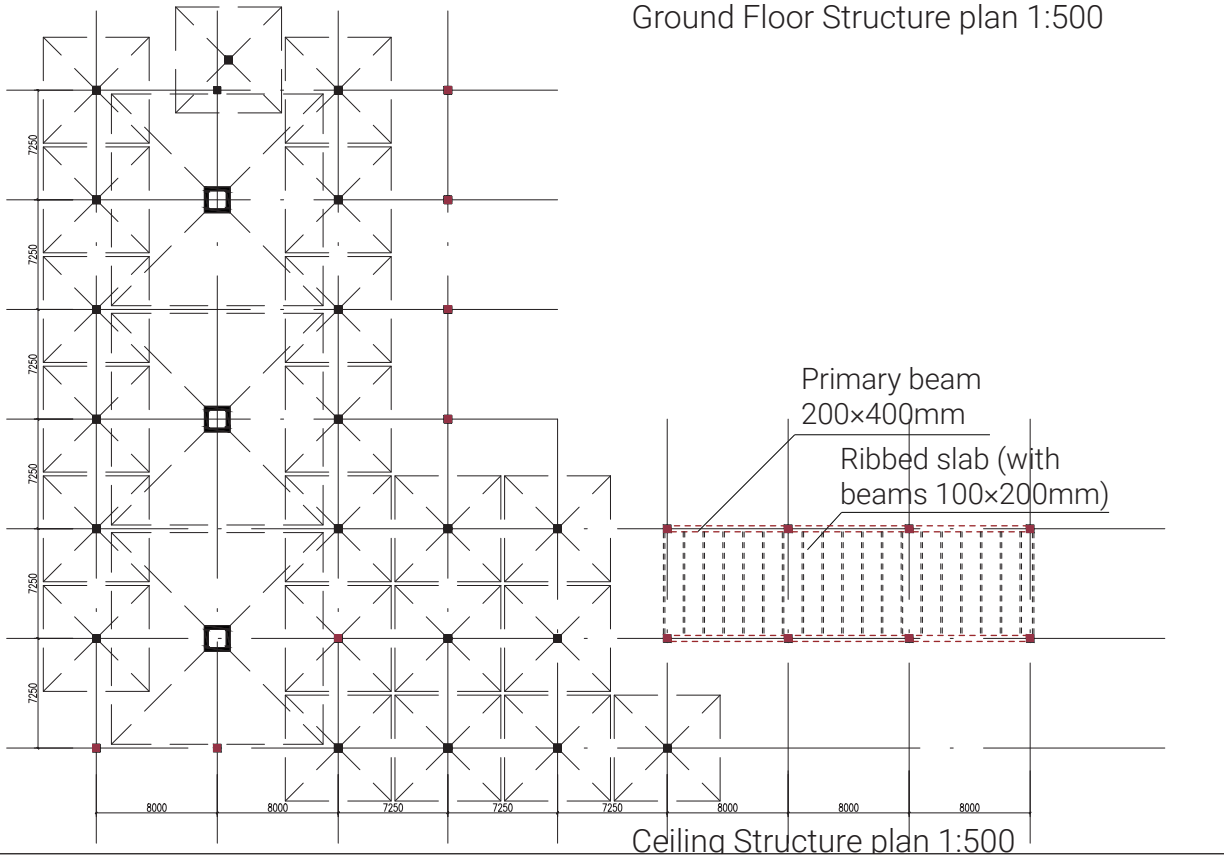
Ribbed slab section



07.2 **STRUCTURAL SCHEME**

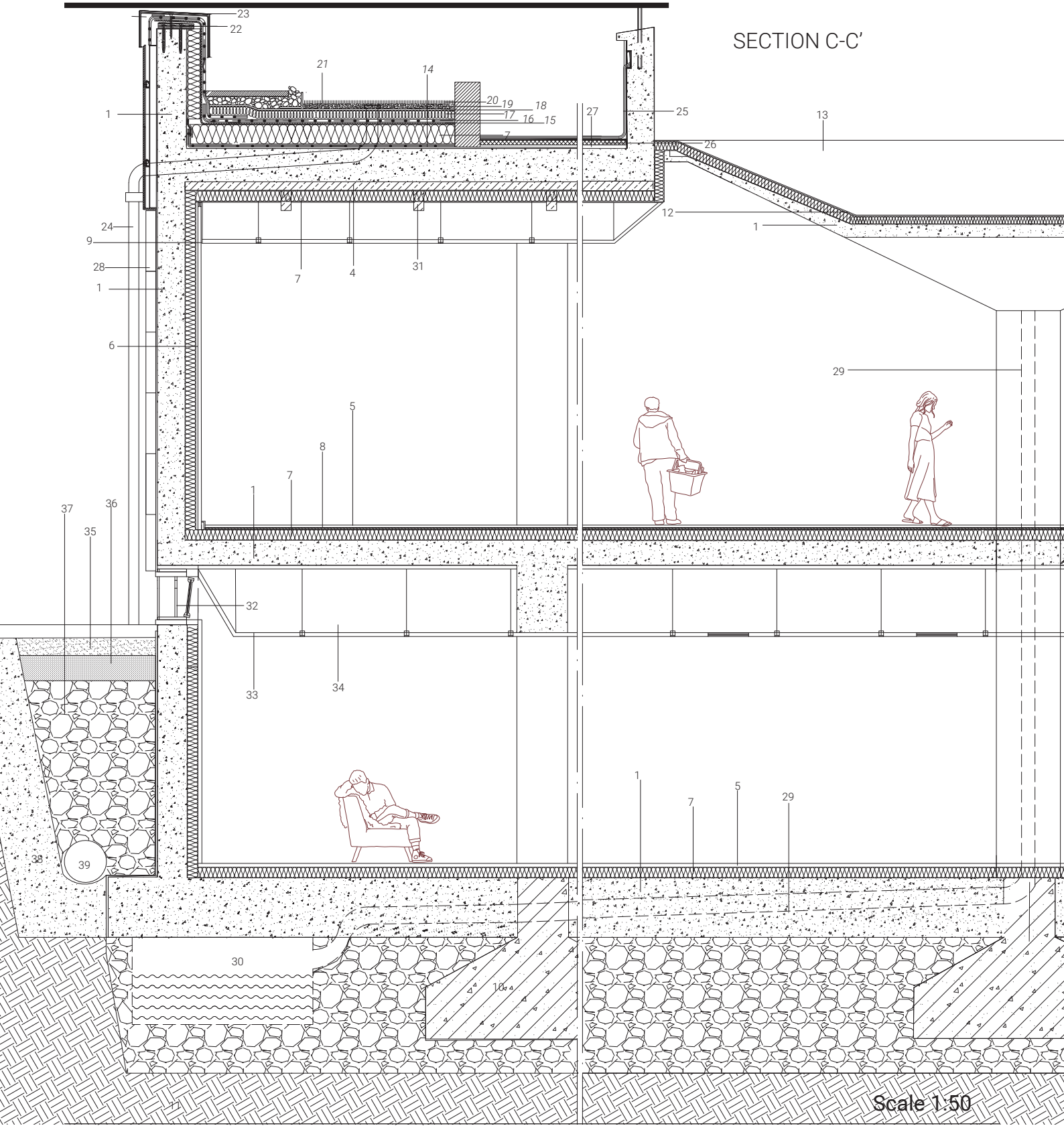


Ground Floor Structure plan 1:500



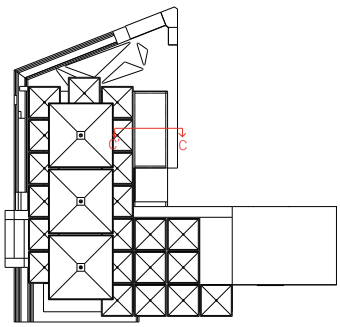
Ceiling Structure plan 1:500

08.1 **TECHNOLOGY**

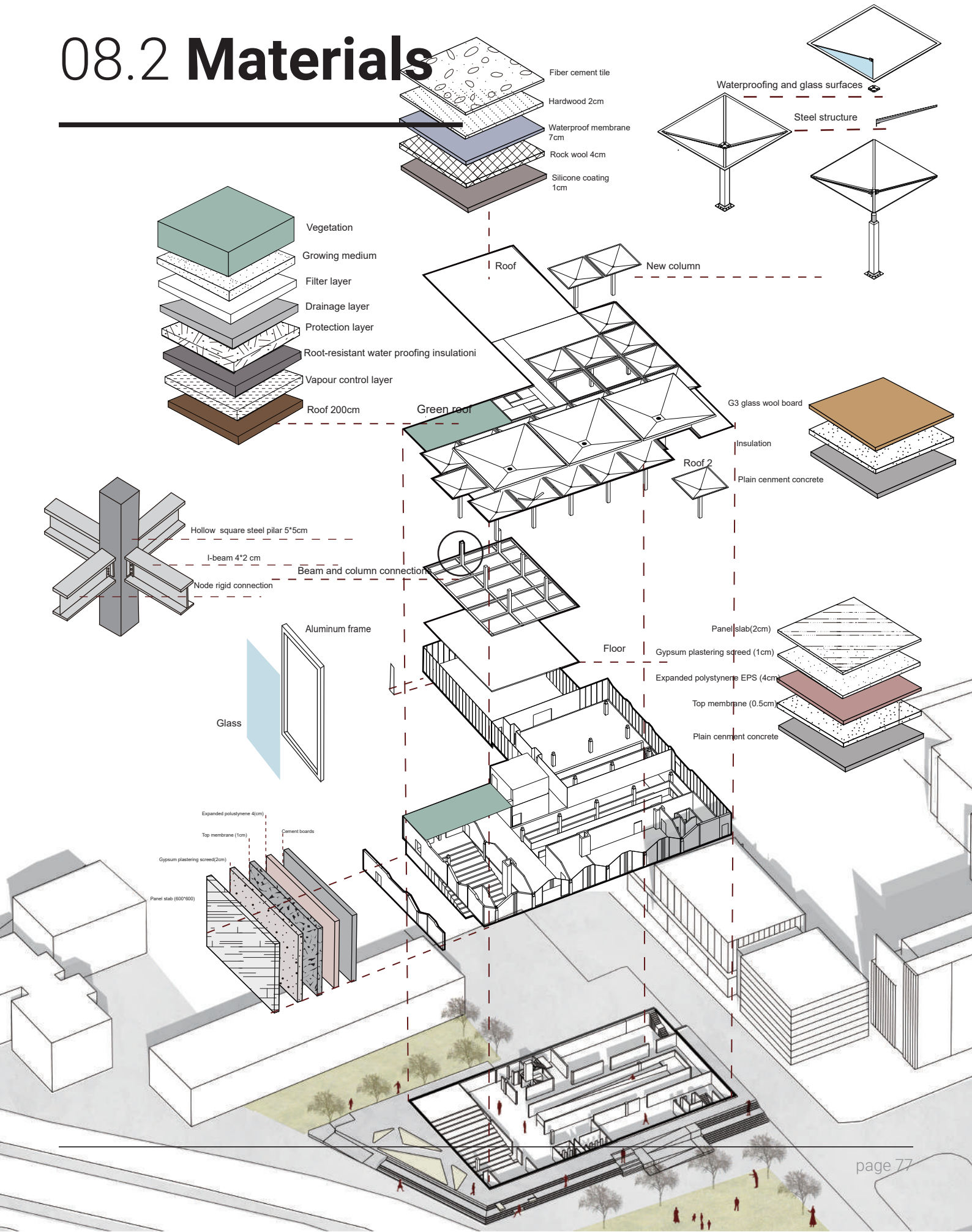


08.1 **TECHNOLOGY**

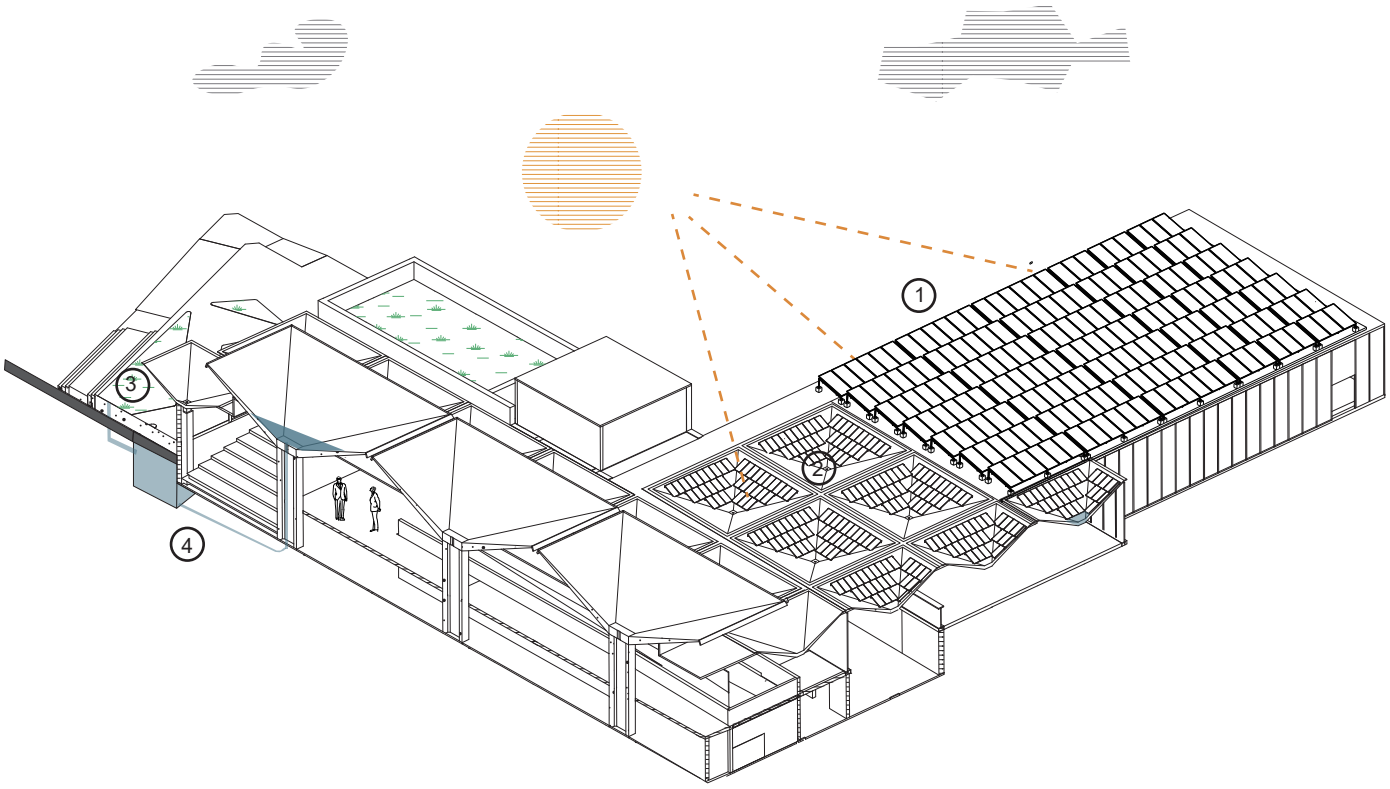
1 C20 plain concrete
2 Ointment caulking
3 Waterproof and moisture-proof coating
4 10*20 Beam
5 Thick multi-layer board
6 Expanded polystynene EPS
7 Heat insulation
8 Gypsum palstering screed 0.5cm
9 Ceiling
10 Elevation concrete
11 Compacted soil layer
12 G3 glass wool board
13 Collection nozzle
14 Vapour control layer
15 Root-resistant water proofing insulation
16 Protection layer
17 Drainaga layer
18 Filter layer
19 Growing medium
20 Vegetation
21 Dry natural stone
22 Stone cover
23 L-shaped steel connecting concrete
24 Water pipe
25 Rigid waterproof layer
26 screed concrete
27 Slope lay
28 Plywood
29 Collection pipe
30 Collection tank
31 Secondary beam
32 Ventilation
33 Ceiling ventilation window
34 Ventilation system exhaust fan
35 Fine sand
36 Coarse sand
37 Gravel
38 Protective wall
39 Pipe
40 Glass parapet



08.2 **Materials**



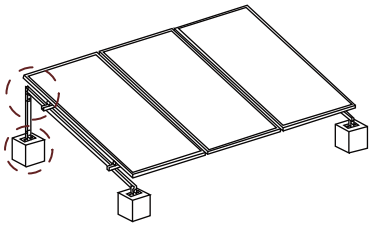
08.3.1 **Detailed Analysis**



08.3.2 **Detailed Analysis**

① PV panel: BAPV

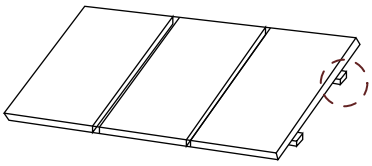
Pannello Solaree policristallino 330W 72 cellule just solar TIER1
Size: 1997×1000×37mm



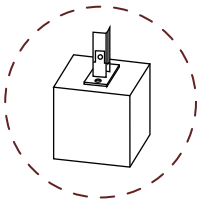
PV panel bracing structure

② PV panel: BIPV

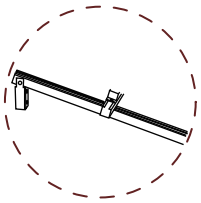
Pannello Solaree policristallino 330W 72 cellule just solar TIER1
Size: 1020×670×30mm



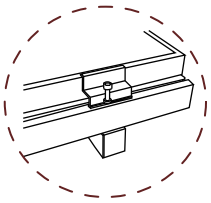
PV panel bracing structure



Bottom connection fixed foundation

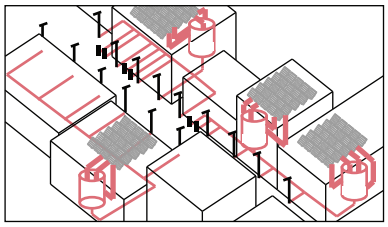


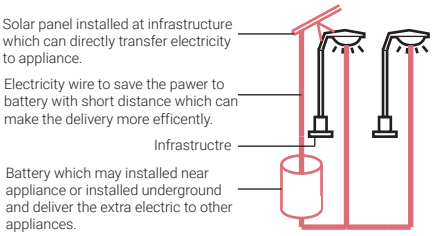
Bracket structure fixed

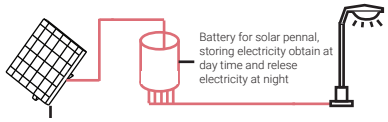


Bracket fixing structure, mainly connected by nuts

Solar Panel



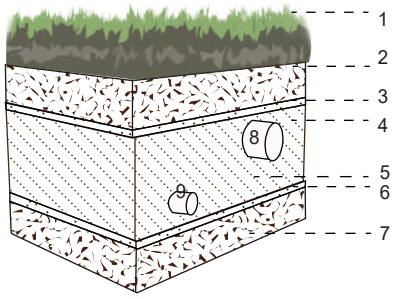




Integrated solar pennal group instelled at top roof in order to make sure the efficency of obsurb solar radiation

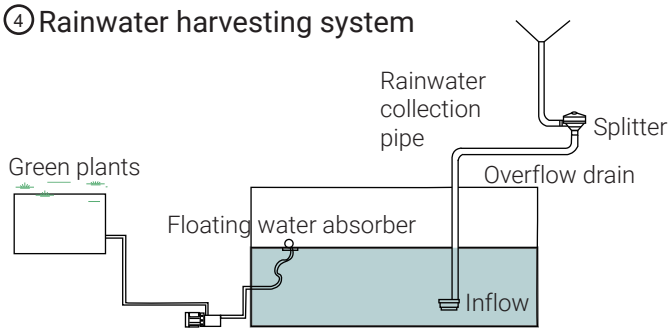
Advantage of this system is that solar pennal group allowed this system to increase the solar absorbing efficiency. Disadvantage is that electricity delivery might cast a lot.

③ Rainwater collection for road green plants



1 Vegetation
2 Original soil
3 Sand
4 Geomembrane wrapped rainwater collection box
5 Rainwater collection tank
6 Sand
7 Original soil
8 water inlet
9 Outlet

④ Rainwater harvesting system



09. **CONCLUSIONS**

The paper has aimed to highlight the sustainability and adaptability of the site from three perspectives: urban planning, building renovation, and technology.

Urban planning perspective, new plans and additional bike lanes and sidewalks, renovated green spaces, and buildings strengthen the connections to the surrounding neighborhoods and public spaces. This makes the Ex-Mercato area more connected to the city and provides better spaces for people to live and work.

From the perspective of building renovation, the renovated square in front of the building and the greenery on the roof provide continuity and openness, such that the open space provides a pleasant space for the local community to stroll and communicate outdoors. The increase in public space helps people counteract urban isolation and increases opportunities for conversation and gathering. The building was designed to be renovated with a diverse range of functions, making it more adaptable to different urban conditions. The newly added functions of the renovated building, such as a concert hall, can satisfy the spiritual and cultural life of the local community.

As for the new Co-working function that we are concerned about, it provides a large amount of shared space and at the same time can bring job opportunities to young people, which will help revitalize the local economy to a certain extent.

In terms of environment, by comparing the results of two sunlight analyses, we can see that the southwest direction of the building has better light conditions, so the roof in this direction is designed with PV panels. Considering the exterior characteristics of the building, we add a rainwater collection system, and the collected rainwater is used for irrigation of the surrounding green areas to enhance the overall sustainable cycle. The windows on the façade are selected with double glazing, which can absorb radiation and better reduce the temperature in summer. As for the façade walls, only new environmentally friendly materials are used, which can be fireproof, durable, decorative, less toxic and polluting, comfortable, recyclable, etc. Make the building more low carbon and environmental protection.

With all these considerations, the project becomes more adoptable and sustainable to withstand the crisis. The large outdoor space not only provides a comfortable environment for the people living in Torre Spaccata, but also provides a large gathering point for the new community of neighbors.

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