A Rooftop Solution for Turin's Student Housing

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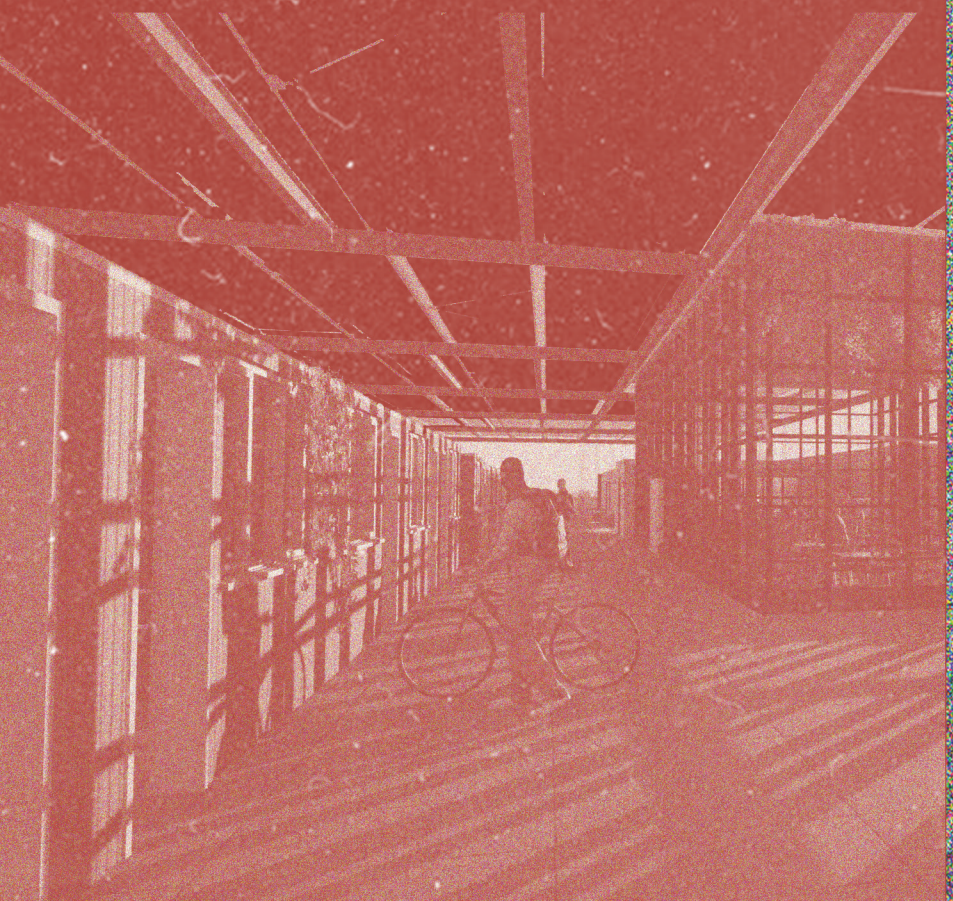

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Abstract

This thesis proposes a solution to the student housing crisis in Turin by adapting MVRDV's Rooftop Catalogue concept, initially developed for Rotterdam. As Turin's international student community continues to grow due to its renowned universities, housing shortages remain a major issue for newcomers.

Unused rooftop spaces in Turin give us new opportunities to add to the urban space. This solution provides us with more space while preserving the architectural heritage and the cultural identity of the city. The study focuses on San Salvario as a district popular for students and workers due to its central location that provides good accessibility and the number of campuses within the neighborhood. Also the diversity of the residents in San Salvario approves that the area is culturally prepared to host new changes.

By analyzing and selecting optimal blocks, this research develops a rooftop catalog tailored to Turin's context, providing modular housing and essential facilities for both international and Italian students from outside Piedmont.

This project demonstrates how innovative rooftop adaptations can alleviate housing shortages, enrich urban life, and respect the heritage of one of Italy's most dynamic cities.

KEYWORDS: STUDENT HOUSING - STUDENTIFICATION - PUBLIC HOUSING - CITY LAYERS- ROOF TOP PUBLIC SPACES - CO-HOUSING - VERTICAL GARDEN - DENSIFICATION

SECTION 1 : ISSUE

This section discusses the studentification and student housing issue, taking the city of Turin as a case study to review the history, university related concepts and the existing situation that leads to the housing issue. Chapter 1 is an introduction to the role of students in the urban context while chapter 2 goes through Turin's transition in time, leading to today's situation and challenges.

01

Studentification and Student Housing Issue

1.1.University and the city :

Universities have consistently played a significant role in driving urban transformation and influencing the distinct character of the cities they inhabit. Their presence affects spatial development, social dynamics, city identity, and both local and regional economies (Harris, 1997). Since World War II, the rapid increase in university students, alongside the expansion of higher education institutions and the democratization of access to university studies, has drawn significant numbers of young people to cities worldwide in recent decades (Gdansk, Gdynia and Sopot, 2015).
Existing studies highlight that universities differ significantly in their strengths and strategic approaches. Consequently, their engagement in forming partnerships with businesses also varies, resulting in diverse outcomes and advantages for the companies they collaborate with (Perkmann and Walsh, 2008).

In the context of knowledge-based urban development, these findings suggest that development opportunities are shaped and constrained by the universities that serve as anchors for the innovation system and the activities they undertake. For instance, innovation systems anchored by research-intensive universities involved in more robust entrepreneurial activities will create different opportunities compared to those supported by teaching-focused institutions offering more flexible support services. Consequently, the characteristics and strategies of the universities within the system play a critical role in determining the development trajectory. Therefore, policies and programs for knowledge-based urban development could benefit from a prior understanding of the strengths and resources of these universities (Johnston,
2019).

Across the world, universities have a great role in spreading knowledge and attracting new populations, which makes them a key economical partner alongside other institutional actors. Rather than serving as a resource, universities are catalysers for regional developments and cultural growth. Their political influence also re-shapes spatial dynamics at local, national, and international levels, underscoring their status as significant geopolitical players (Moisio, 2018).

The physical and spatial forms of universities around the world differ, and they might be influenced by many different factors. It is important to recognize that much of the existing research on the relationship between universities, students, and cities is conducted in contexts where universities differ significantly from those in the case study, particularly in terms of their physical structure, funding sources, and the legislative and institutional frameworks that shape them. In Italy, universities are predominantly publicly funded, and, like many other countries in continental Europe, traditional universities are typically located in densely built city centers. This gave rise to the idea of the “campus diffuso” (sprawled campus) (Del Nord et al., 2016), which stands in contrast to the more centralized campus model typically found in Anglo-Saxon countries, where such spread-out campuses are relatively rare.

The “sprawled campus” refers to a dispersed geography consisting of university facilities, student services, and housing scattered throughout the city. This close integration with the urban environment has led to the development of services for universities and students that are closely intertwined with the city (Del Nord et al., 2016).

Student housing has also adapted to this model, with most students continuing to live in privately rented flats shared with peers. This situation is partly due to long-standing student housing policies that resulted in limited public funding for such services. In recent years, however, new forms of student housing have started to emerge, which will be discussed further. At the same time, universities are continuing to grow within urban environments, often repurposing areas left empty by post-industrial decline or economic downturns. This local interaction between universities and cities can trigger substantial transformations—some of which may have problematic consequences. For example, Benneworth and colleagues observed that the expansion strategies of certain leading universities have had notable effects: MIT significantly influenced the availability of affordable housing in Cambridge, while Newcastle University's approach to student accommodation has created major disturbances in the city's housing market (Benneworth et al., 2010).

The rise in college and university enrollment is a global trend. From 2000 to 2021, university enrollments saw significant increases, including in the UK (up 53%), Canada (up 57%), France (up 71%), and Australia (up 129%) (Australian Department of Education, Training, and Youth Affairs, 2001, 2023; HESA, 2023; National Center for Education Statistics, 2022; Statista Research Department, 2024a, 2024b). Between 2014 and 2021, higher education enrollment in India increased significantly—from 34.2 million to 43.3 million students—marking a growth of over 9 million (Indian Ministry of Education, 2024). This rise is fueled by both a growing youth demographic and a heightened awareness of the long-term advantages of higher education in an economy increasingly reliant on advanced service sectors (Ehlenz, Mawhorter, Pendall, 2024).

Although some scholars consider international students to be economically privileged (Malet Calvo, 2018), this is not universally the case. Many depend on personal savings or student loans instead of full-time employment (Hall, 2010; Hordosy et al., 2018). These students often lack essential social and cultural capital—such as local contacts, familiarity with housing norms, or language proficiency—that can help secure accommodation (O'Connor, 2017; Boterman, 2012; Hochstenbach & Boterman, 2015). As a result, many face significant difficulties in arranging housing before arriving (O'Connor, 2017; Obeng-Odoom, 2012).

Additionally, online housing information is often inaccessible or unreliable, limiting their understanding of local markets (Maslova & Chiodelli, 2018). These factors create structural disadvantages for international students in the housing market.

1.2.Studentification

'Studentification' refers to urban changes caused by student concentrations in university towns (Hubbard, 2009; Chatterton, 2010a; Holton and Riley, 2014).Throughout the UK, long-term residents frequently perceive these developments in a negative light, often likening them to gentrification (Smith and Holt, 2007). The formation of the National HMO Lobby in 2002, comprising members from 33 towns, reflects organized resistance to these changes (Smith, 2008). This widespread resistance highlights the national scale of studentification and draws focus to its spatial consequences, which are the focus of analysis in this article.

The concentration of students living in rented apartments or houses in specific urban areas, such as inner-city districts or particular peripheral zones, often results in both a symbolic and tangible "takeover" of these spaces by the student population. This transformation is reflected in the evolution and accessibility of local services, marked by a growing presence of amenities tailored to students. Significant changes involve a rise in fast-food restaurants, alterations in the atmosphere and menus of local pubs and cafes, and a growing preference for retail options like small convenience stores offering essential groceries and alcohol outlets (Smith, 2005; Tallon, 2010, p. 213).

Studentification affects urban spaces in various ways. Economically, it often drives significant changes in real estate, including rising property prices, closing rental gaps, and the conversion of single-family homes into student housing. This shift in the resident structure typically reduces the proportion of longterm homeowners while increasing the prevalence of privately rented accommodations. Socially, studentification can result in the displacement or replacement of former residents with short-term tenants, often referred to as transitory urbanites (Haase, Grossmann, Steinführer, 2012). While triggering cultural transformations within the area, this process leads to emerging forms of spatial clustering and social division. Groups of young residents with similar tastes, daily habits, and cultural preferences begin to gather, driving demand for targeted commercial services, entertainment, and food offerings.

Studentification often contributes to the revitalization of the housing stock, particularly in its early stages, through renovations of apartments and enhancements to the general look and feel of the neighborhood. However, as the process progresses and is dominated by less demanding transitory tenants, further improvements become unlikely, and signs of degradation may appear (Smith, 2005, pp. 74–75). Thus, existing research highlights studentification as a complex process with both positive and negative impacts on urban spaces, both of which should be carefully considered by researchers and policymakers (Universities UK, 2006).

The characteristics of studentification have evolved over time. In its early phases in the UK, studentification was viewed as a form of neighborhood decline. Students often moved into subdivided former single-family homes or small rental properties that were poorly maintained by landlords, resulting in a drop in housing standards. Over time, the demographic makeup of these areas shifted—families, low-income non-student residents, and communities of color were gradually replaced by a predominantly student population. This transformation gave rise to a distinct "college town" character, reshaping the neighborhood's identity.

Recently, the concept of studentification has broadened to include various changes in neighborhood dynamics resulting from increasing concentrations of off-campus student housing. While initially

focused on the UK, studies have now expanded to include cases from Canada, the US, South America, Europe, South Africa, Asia, and other regions, with growing research exploring these shifts in diverse global contexts.

Many recent studies highlight the emergence of a new type of student neighborhood: the high-rent enclave. In these neighborhoods, real estate developers are increasingly targeting students who can afford premium accommodations, often supported by family income or student loans. This trend is reshaping the built environment near universities, where small, locally managed rentals—such as one- to four-unit buildings—are giving way to large-scale housing complexes with high-end features. These new residential developments typically fall into two main types: (a) privately operated purpose-built student accommodations (PBSAs), which resemble dormitories with individual leases aligned to the academic calendar, and (b) luxury multi-family buildings positioned to attract wealthier students with a wide array of upscale amenities (Ehlenz, Mawhorter, Pendall, 2024).

1.3.Benefits and disbenefits of studentification

Local residents often view studentification as a negative aspect for the housing market (Chatterton, 2010; Kinton et al., 2018; Munro & Livingston, 2011; Sage et al., 2012a, 2012b; Smith, 2005). The process has raised so many concerns, including disruptions to neighborhood balance, the decline of community-oriented services (Sage et al., 2012a, 2012b; Mulhearn & Franco, 2018), and increased social segregation of students from the broader population (Chatterton, 2010). Common complaints involve noise, litter, rising petty crime, and the deterioration of rental properties (Munro & Livingston, 2011; Kinton et al., 2016; Revington, 2022). Moreover, the voices of students themselves are frequently left out of public discourse (Whyte, 2019; Hubbard, 2009). Although studentification is mostly portrayed negatively by the media (Beech, 2018; Oliver, 2018), it offers lots of benefits. Students have a good effect on the local economy, by paying rent, tuition and consuming across retail and entertainment (Hubbard, 2008; Knight Frank, 2019; Ruiu, 2017). The student presence brings life and diversity to an urban area, promoting mixed-use communities (Munro et al., 2009) and encouraging investment in both housing and public infrastructure (Smith, 2005).

1.4.Housing Issue

One of the most common impacts of university presence is on the housing market. Rivar and colleagues (2019), in their study of U.S. housing, found that properties closer to a university tend to have higher sale prices and rents. Zip code data reveals that areas containing universities tend to have higher average home prices and rental rates compared to areas without universities (Rivar et al, 2019).

This increase in costs leads to greater competition for housing, resulting in the displacement or exclusion of both old and new residents. As Benneworth and colleagues (2010) pointed out, the physical presence of universities can also trigger spatial conflicts. Managing and addressing these conflicts should be a shared responsibility between local authorities and universities (Benneworth et al, 2010).

To gain a deeper understanding of the impact of students on cities, it is essential to consider both the socio-cultural geographies they belong to and the institutional and political dynamics that shape them. Russo and Capel Tatjer (2007) describe the “studentscape” as the spatial arrangement shaped

by the interaction between students and the spaces in which they live and work. However, it is equally important to consider the socio-political and institutional factors that influence this environment in any comprehensive analysis (Russo et al., 2007).

The mobility of tertiary education students is closely linked to specific policies. While many authors acknowledge that mobility is a key factor in the impact students have on cities, these effects are seldom attributed to student mobility policies or policymakers. From EU policies to universities' competitive strategies for attracting students, there is a small but growing discussion about the responsibility of key stakeholders in shaping student impact on cities. For example, when it comes to recognizing universities as contributors to the creation of socially exclusive geographies, higher education institutions are rarely aware of this role (Russo et al., 2007).

Understanding mobilities also involves examining them in the context of politics and power dynamics (Kleibert, 2021). The speed of one person's movement can be directly linked to another person's immobility, or one person's ability to move may depend on others inability to. Movement is inherently political, as it involves decisions about who moves, where they go, how fast, and how often. Additionally, the experience of mobility varies depending on who controls the meaning of mobility gaps, which ultimately ties into power and the capacity to resist (Mangione, 2022).

Since the late 1990s, with the initiation of the Bologna process, European countries have been implementing policies to reform university systems in ways that encourage both inbound and outbound student mobility. In 2018, 340,100 higher education students participated in the Erasmus+ program, up from 272,497 in 2014. Furthermore, in 2017, 1.7 million international students were pursuing tertiary education across the EU-28. Over a third of these students moved within Europe (37.8%), while about a third came from Asia (30.1%) and 13% from Africa. Student mobility is an expanding trend on various levels, encompassing subnational and international movements, short-term and long-term relocations, and a range of motivations and goals for students (Smith et al., 2014).

The growing influx and outflow of university students in cities have been recognized as driving forces behind significant socio-demographic, cultural, economic, and physical transformations. On one hand, research on student mobility has highlighted the selective nature of its socioeconomic aspects. According to Lipura and Collins, understanding student mobility requires a holistic approach that takes into account the growing complexity and varied nature of international students' experiences. It is essential to critically examine how privilege and precarity shape the experiences of mobile students (Lipura, Collins 2020).

University students are often viewed as "desirable migrants" (Raghuram, 2013), valued not only by academic institutions but also as members of the emerging urban creative class (Wesselmann, 2019) and as prospective knowledge workers (Sokołowicz, 2019). Nevertheless, the appealing assumption that students relocate solely because of effective recruitment efforts oversimplifies the issue of student mobility, as this dominant perspective overlooks the nuanced and multifaceted nature of their experiences (Lipura and Collins, 2020).

The growing demand for student housing, without a corresponding increase in dormitory availability, presents both challenges and opportunities. In areas with weak housing markets (or those where supply can quickly adjust to demand), student housing can help boost local tax revenues, stimulate commercial activity, and potentially grow the local workforce if students choose to stay after graduation. However, in high-demand cities with large student populations—such as Boston, New York,

San Francisco, Los Angeles, London, Paris, Toronto, and Sydney—the influx of students often exacerbates the housing crisis, driving up already high rents and making them even less affordable (Ehlenz, Mawhorter, Pendall, 2024).

1.5.Thesis Methodology

This thesis adopts a qualitative, design-led research methodology, combining case study analysis, contextual research, and architectural experimentation. The central aim is to address the issue of student housing shortages in Turin through the exploration of underutilized rooftop spaces. A key reference in this process is MVRDV's Rooftop Catalogue, which is examined not only as an inspirational precedent but also as a flexible prototype adaptable to Turin's specific urban and social conditions.

Research Phases

1. Context Analysis:
The initial phase investigates the broader context of student housing in Turin. This involved reviewing historical developments, current policies, and demographic trends related to university enrollment and student accommodation. Data was collected from institutional sources such as ISTAT, EDISU Piemonte, and the Ministry of University and Research (MIUR). Milan was selected as a comparative benchmark due to its similar status as a university hub and its comparable socio-economic landscape. The comparison aimed to highlight differences in housing provision and policy approaches.

2. Case Study Review:
A range of student housing and co-housing projects were studied, both locally and internationally. These case studies served to identify spatial, social, and economic strategies for affordable student living. Special attention was given to adaptive reuse and rooftop interventions. MVRDV's Rooftop Catalogue was analyzed in detail for its systematic classification of rooftop typologies, which informed the conceptual framework of this project.

3. Site Selection and Urban Analysis:
The Ex La Stampa building is the selected site for this project. The building is located in San Salvario, one of Turin's neighborhoods which has different university facilities and a diverse student population with good public transport access. The project takes place on the rooftop of this building which currently serves as a Unito campus. Site analysis was done through several site visits and urban mapping provided by the municipality of Turin. Also satellite images were used to access physical constraints and spatial potentials.

4. Design Experimentation:
A new Rooftop Catalog for student community housing was designed based on selected categories from the MVRDV model. The design phase went forward by applying the proposed categories on the selected rooftop by taking in consideration the student lifestyle and needs. The main principles in this level were, housing, community, greenery, social interaction and affordability. Through the process the architectural value of the existing building was respected by repeating its structural pattern in the intervention. Also the building is in good interaction with the neighborhood.

5. Structural Feasibility and Adaptation

Following the design concept and principles, a structural analysis was proposed. This process was carried out to test the feasibility of the intervention. The tools used in this step were the softwares REVIT and PRO_SAP. After testing the first proposal, adjustments were made according to the errors. The structural elements and materials were modified through this process. This step is important parallel to the design phase, for testing the technical aspects and the efficiency to have the highest maintenance through time.

Tools and Techniques:

A combination of digital tools was employed throughout the research and design process. For drafting and modeling, AutoCAD, Revit, and Rhino were used. Structural analysis was conducted using PRO_SAP. Diagramming and visual communication were carried out using Adobe Illustrator, Photoshop, and InDesign. Research was supported by academic databases, digital libraries, and institutional archives. All sources were critically evaluated to ensure relevance and accuracy.

02

Turin

2.1.Turin's History and Introduction

Turin, once famously known as a one-factory city dominated by the former automotive powerhouse FIAT (now Stellantis), has experienced a major shift in its urban economy since the early 1980s. This transition has emphasized the development of culture, creativity, innovation, and the service industries (Rossi, 2015; Vanolo, 2015; Gonzàles et al., 2018; Ponzini & Santangelo, 2018). Turin still has to fully recover from its economic decline while experiencing a surge of optimism during the 2006 Winter Olympics. This decline was further exacerbated by the 2008 financial crisis. The economic crisis caused a decrease in Turin's population with losing over 40,000 residents between 1998 and 2018. The city's population reached to 858,205 by 2020 (ISTAT).

The University of Turin and the Polytechnic of Turin have significant roles in the city's new urban planning strategies. This is a part of Turin's effort in transforming from its post-industrial economy. In the past two decades, they have shifted from serving merely as valuable institutions to acting as proactive collaborators in carrying out urban regeneration projects and strategic development plans (Zasina et al., 2021).

Initially, the universities' importance was tied to their role as knowledge hubs. However, in the last decade, attention has shifted toward their potential to enhance Turin's urban branding strategy and attract students and investments from other regions and countries (Cenere & Mangione, 2021).To address this transformation, the Municipality launched the Turin University City plan in 2012 (Mangione, 2019), aiming to capitalize on the universities' capacity to drive physical, social, and economic change as central actors in urban regeneration processes (Crivello, Pede, 2019).

Spatial transformations have impacted various parts of the city in different ways. The two universities have expanded through new campuses, several of which have become landmark features in their districts. Rising demand from out-of-town students has meanwhile reshaped nearby rental markets, prompting a wave of student-housing projects—initially public, and now increasingly private. Combined, these developments have created distinctive "studentscapes," where study, living, and leisure converge (Zasina et al., 2021). Through these dynamics, students actively shape urban spaces and contribute to Turin's transformation (Crivello, Pede, 2019).

2.2.Turin's Transformation

In the early 1990s, Turin faced the challenges of being a medium-sized city grappling with a clear industrial crisis. The once-dominant automotive giant Fiat, which had driven the city's growth throughout the previous century, had significantly downsized its workforce and shut down multiple facilities. In the 1980s, the company's restructuring triggered social unrest and altered residential patterns, resulting in abandoned industrial areas and deepening territorial fragmentation and social exclusion (Belligni, Ravazzi, 2013).

Addressing these pressing issues required stronger government intervention. However, public institutions, local and regional authorities, and the political forces that had historically governed the city struggled to develop a renewal plan or implement policies capable of addressing the city's growing challenges (Belligni, Ravazzi, 2013), Over the past forty years, Turin's transformation can be succinctly described: from a city defined by its reliance on the automotive industry as a "one-company town" to a dynamic and evolving urban center. It transitioned from the economic struggles of the

1980s to becoming a “creative,” lively, and entertaining city (Vanolo, 2015). Once known as the “grey” industrial city, Turin has reinvented itself as an increasingly attractive place where “passion lives.” These descriptions mirror the promotional slogans used by the city government to market the Olympic Programme and the 2006 Winter Olympics, such as “Turin always on the move” and “Passion lives here,” conveying a transformation through straightforward, yet somewhat cliché, messaging (Salone, Governa, 2023).

The changes made to the built environment have played a key role in fostering consensus and validating a specific vision of the city, while sidelining alternative perspectives, suppressing diversity, and avoiding conflict. This shift is partly attributed to the gradual decline in public discourse about the city’s future and the emergence of a leadership style centered on strong, individualistic political representation (Salone, Governa, 2023).

Turin is now facing the consequences of these oversights and omissions.After the 2006 Olympics, the construction sector started to contract (Rapporto Rota, 2016), a downturn that was worsened by the 2008 financial crisis. Economically, the Olympics placed a heavy strain on public finances: expenditures surpassed €3.3 billion, while the projected gains were just €2.5 billion, significantly affecting the city’s budget. The once-celebrated “happy” urban transformation is now shadowed by growing challenges, including fragmented and overlooked social issues, unmet demands, and neglected needs. These challenges manifest in segregated spaces occupied by immigrant communities, areas of consumption and leisure catering to a struggling middle class, and the coexistence of hubs of innovation with zones of poverty and neglect (Salone, Governa, 2023).

This sense of unease and intolerance gradually found political expression, particularly through changes in municipal leadership. Post-Olympic Turin exemplifies what Rodriguez-Pose (2017) refers to as “places that don’t matter,” illustrating how the discontent and difficulties faced by communities and individuals—who often feel, and sometimes genuinely are, left behind by globalization—tend to be expressed through political backing for sovereigntist and populist parties and movements (Salone, Governa, 2023).

The political landscape shifted in 2016 with the election of the Movimento 5 Stelle and Chiara Appendino as mayor, marking the end of a political era that began in 1993. This transition brought an end to a long period of center-left governance, which had already started to falter despite its earlier successes. The 2006 Winter Olympics represented both the pinnacle and the turning point of Turin’s transformation. Maintaining the same momentum became unsustainable, not only due to financial constraints but also other underlying factors (Salone, Governa, 2023).

While the early 2000s were characterized by optimism and a belief in boundless possibilities, the aftermath of the Olympic Games brought a significant slowdown. The data portrays a city in decline, marked by a decreasing population—now at 866,510 residents, representing a 4.4% drop between 2011 and 2020—an aging demographic, with an old-age index of 207.7 in 2016 compared to 169.8 in the wider North-West region, and rising poverty levels (Piedmont Region, CEP, 2018).

For over 20 years, Turin was governed by a narrow intellectual and professional elite composed of representatives from universities, entrepreneurial circles, professional sectors, banking foundations, and the Chamber of Commerce. This group maintained control with little opposition (Belligni and Ravazzi, 2013).

However, a turnover of elites never occurred. What could be seen as a generational issue is compounded by a rigid system incapable of fostering economic, cultural, and political diversity or moving beyond a hierarchical approach to power and urban governance. Turin's networks remain insular and simplistic, dominated by a small number of actors and characterized by closed decision-making processes that lack dynamism and inclusivity (Quarterly, 2022; Salone, Governa, 2023).

2.3.Fordism, Post-Fordism

Turin's industrial identity was highly affected by the economic downturn of the 1970s, especially for FIAT which began a major internal reorganization. Over time, much of its manufacturing was relocated to areas like Southern Italy, Eastern Europe, and Latin America. As a result of these actions, the city lost its position as FIAT's central operation hub, becoming just one of the locations in the global production network. This matter was the end of Turin's population growth and a shift towards service based employment. Still, the economy faced structural issues, such as a reliance on low-skilled labor and the dominance of small and medium-sized firms, which contributed to inefficiencies. Automation led to the loss of approximately 38,000 jobs between 1980 and 1982. During the same decade, many small local suppliers failed to stay competitive and either closed or were absorbed into larger companies, marking the beginning of a long-term decline in Turin's automotive industry (Colombino, Vanolo, 2017).

However, Turin's economic identity wasn't always centered on cars. Before 1865, when it briefly served as Italy's capital, the city had a service-based economy. With industrialization, it grew into a major manufacturing center, earning comparisons by Mumford (1938) to cities such as Lyon, Essen, and Pittsburgh. By the late 1800s, several auto and industrial companies were already present in Turin, though the 20th century saw FIAT become the dominant force shaping the city's trajectory (Gabert, 1964; Vanolo, 2015).

This period of growth was accompanied by waves of internal migration, particularly from the south and east of Italy. Many newcomers arrived seeking employment at FIAT, and by the early 1970s, the automotive sector employed about 80% of Turin's industrial workforce (Vanolo, 2015).

As such, Turin came to be viewed as a quintessential company town. Scholars have often compared it to Detroit (Pizzolato, 2008), given their parallel paths of industrial expansion and decline. FIAT's influence extended far beyond manufacturing; the company exercised control over financial operations and its suppliers, consolidating capital and embedding itself deeply in Turin's physical, institutional, and social fabric (Spriano, 1985; Grabher, 1993; Vanolo, 2015).

In the wake of the 1980s economic downturn, local authorities and cultural institutions—including Fondazione Agnelli, Ires Piemonte, and Compagnia San Paolo—began advocating for development strategies aimed at reducing dependence on the automotive sector. Between the late 1980s and early 1990s, four key proposals emerged in public debate: Mito, which promoted economic collaboration with Milan; Gemito, an extended version incorporating Genoa; Pianura Meccatronica, aimed at establishing a mechanical and electronic industrial corridor; and Torino Technocity, which envisioned the city as a hub for ICT innovation. All of these initiatives were part of a broader attempt to diversify the local economy (Vanolo, 2015).

In the late 1990s, Turin experienced another major economic setback, which accelerated its move

away from traditional manufacturing. In response, local actors began to emphasize the development of high-skilled service sectors, including research, information and communication technology (ICT), and the creative industries. At the same time, efforts were made to rebrand the city as a hub for culture and tourism. The turning point came in 2000, when Turin introduced Torino Internazionale, its first city-wide development plan. This marked a collective effort to reposition the city as a hub focused on knowledge, research, and innovation (Vanolo, 2015).

During this period of change, Turin showed a strong capacity to adapt. Instead of completely distancing itself from its industrial past, the city blended aspects of manufacturing with expanding fields like culture, innovation, and education. This mixed approach helped soften the blow of economic restructuring and temporarily held off the more severe consequences of the crisis (Vanolo, 2015).

Despite managing these shifts without major social unrest—evidenced by stable employment and moderate population decline—Turin has recently faced worsening conditions, including higher poverty rates, increased unemployment, and economic stagnation. This raises concerns about whether the city's resilience is diminishing, or whether it was only capable of managing stress up to a certain point before becoming overwhelmed. How this resilience is interpreted depends on the theoretical lens used in urban studies (Vanolo, 2015).

A major point of reflection on this transformation came in Arnaldo Bagnasco's 1990 book The City After Ford, which focused on Turin. The title itself captures the symbolic shift from an era of industrial dominance to an uncertain future. The main point, which is intense industrialization and the after deindustrialization is still relevant. As the city stepped into the post-Fordist era, there was a need to search for new urban models, while the exact direction is still undefined. "Post-Ford" is used to describe the era that was caused by mass production decline and helped standardize the labor system. The changes include more than economic restructuring, it also changed cities identity, governance and connections. Despite this, public conversations in Turin often remain focused inward, dwelling on themes of decline, nostalgia, and pessimism. In contrast, contemporary urban research encourages the city to look outward and integrate more actively into wider regional and global networks to shape its future development (Salone & Governa, 2022).

2.4.University City

Turin has experienced significant change, especially in how its universities interact with the surrounding urban landscape. The once distinct separation between academic campuses and the rest of the city has gradually faded, replaced by a more connected approach where universities take an active role in shaping and enhancing urban life (Urban Center Metropolitano, 2013).

Today, Turin identifies itself as a major hub for higher education, with Polytechnic of Turin and the University of Turin being among high ranking universities both in Italy and in the world. Turin continues to be a popular destination for students around the world. This rising demand in Turin's education facilities, has also been rising the increase in student housing development, both inside the city and the borders of the metropolitan area (Urban Center Metropolitano, 2013).

A pivotal moment in this shift came with the 2006 Winter Olympics, when the city repurposed Olympic villages for student accommodations. However, the current focus goes beyond merely increasing housing capacity. There is an emphasis on rethinking the design of student residences, ensuring

they are well-integrated into dynamic neighborhoods and connected to campuses via sustainable transport options (Urban Center Metropolitano, 2013).

The **Torino Città Universitaria** (2013) initiative offers a chance to reshape the role of student housing in the city. To explore its potential, the metropolitan area has been divided into seven distinct "districts," each associated with nearby university campuses. These districts are not just defined by geography—they are built around specific spatial and functional features that reflect a cohesive vision of student life embedded within the urban context (Urban Center Metropolitano, 2013).

Which presents an overview of the city's important features such as the river, the urban layout and the university infrastructure now and in the future. The master plan is organized into multiple layers, including:

1. Green and environmental networks
2. Public transport routes
3. Parking facilities
4. Bike lanes
5. University campuses
6. Student residences
7. Libraries
8. Zones of Urban Transformation (Z.U.T.)

Within this framework, the project identifies priority areas for redevelopment aimed at providing new student housing and academic services (Urban Center Metropolitano, 2013). These strategically chosen sites are notable for their accessibility and environmental quality, and include:

1. The former Italgas site
2. The old Tobacco Factory
3. V200 / Vanchiglia railway yards
4. City of Health area
5. The former Moi complex
6. The former Combi site
7. Mirafiori TNE zone

This comprehensive approach seeks to create a new standard for integrating university life into the broader urban ecosystem (Urban Center Metropolitano, 2013).

2.5.Turin and Student Life

For the 2024–25 academic year, Politecnico di Torino (PoliTo) has an enrollment of 38,800 students. Among these, 5,925 are newly admitted first-year students. The student body is divided across various academic tracks: 21,300 are pursuing Bachelor's degrees, 15,400 are enrolled in Master's programs, and 630 students are taking part in Specializing Master's degrees, continuing education, or corporate training. According to the research output of the university, it supports 1,785 candidates (polito).

The data demonstrates that women form 27.2% of the students, at the same time the international students form 21% of the total number. Meanwhile 50.6% of the students are from regions other than Piedmont (polito).

At the same time, the number of enrolled students at the University of Turin (UniTo) are 83,000. Of these, around 62% (approximately 51,460 students) are female, and 24% (roughly 19,920 students) come from outside Piedmont. Around 7% (about 5,810 students) are international. For the current academic year, UniTo welcomed around 24,200 new students, with international students making up 6% (roughly 1,450). UniTo also has about 1,800 students in first- and second-level Master's programs and around 1,500 Ph.D. students as of the end of 2024 (unito).

During the 2024–2025 academic year, the number of enrolled students in UniTo and Polito combined reached 121,800. With the number of international students varying from 7% at UniTo and 21% at Polito. New enrollments include 24,200 first-year students at UniTo and 5,925 at PoliTo. PoliTo also leads in doctoral education, with 1,785 Ph.D. candidates compared to UniTo's 1,500—underscoring its research-driven profile.

A large share of students comes from outside Piedmont: over 50% of PoliTo's Italian students and nearly 25% of UniTo's total enrollment. Together, the two institutions—supported by UniTo's accessibility programs and their broad academic offerings—contribute to Turin's standing as one of Italy's top academic and research cities.

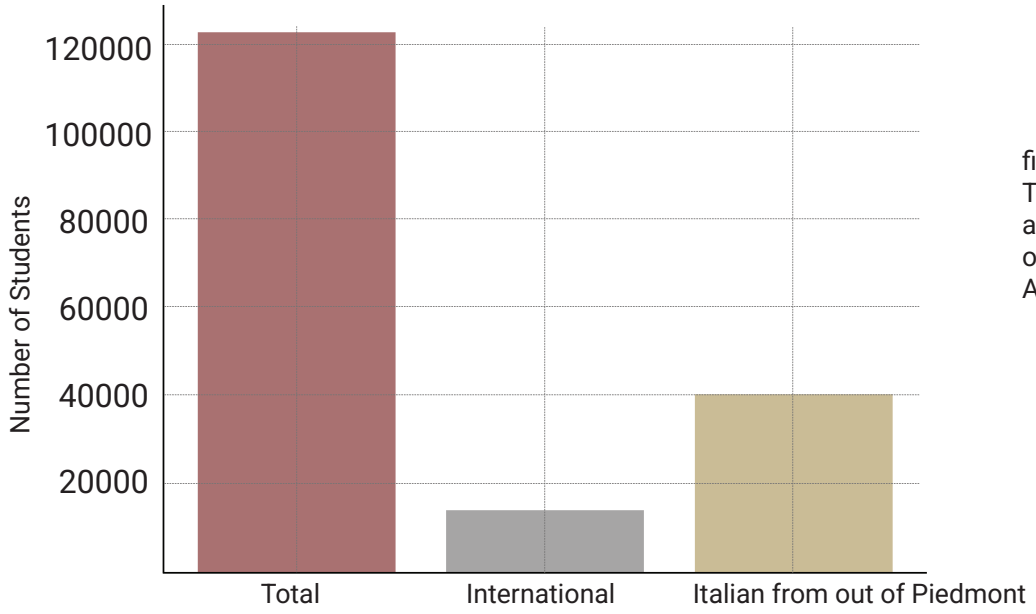


fig. 1- Student population in Turin; total, international and Italian students from outside of Piedmont, AY(2024-2025)

2.6.Turin and Student Accommodation

2.6.1. Students and Housing:

With the expansion of higher education and greater student mobility, Italian university cities—Turin included—have placed increasing importance on attracting students. From 2010 to 2020, the number of students living away from home in Turin grew significantly, largely driven by migration from southern to northern Italy. Off-site and international students now make up around 38% of the city's student population, amounting to about 36,000 individuals. This rising demand for housing has made students a prime focus for real estate investment (Cenere, Mangione, Servillo, 2020).

In 2016, the newly elected municipal administration of Turin declared student housing a matter of public interest, which aims to provide affordable housing for students. However the effort to realize this matter has been so little. An agreement between the city, the university and the regional student agency was signed in 2019 to develop Purpose-Built Student Accommodation (PBSA). The number of PBSAs established during the past 7 years has been four, marking a 30% raise in the number of dedicated student beds. The COVID-19 pandemic has not slowed the expansion plans of major providers like Camplus or international investors such as the Netherlands-based Student Hotel (Cenere, Mangione, Servillo, 2020).

2.6.2. Publicly Funded Housing:

Student accommodation in Turin has traditionally been offered through a mix of private, religious, and public entities. EDISU, the regional public agency supported by Piedmont's government, provides housing specifically for students from low-income backgrounds, offering about 2,100 beds. However, this falls far short of demand—leaving approximately 4,000 qualifying students without accommodation. The gap is largely due to insufficient national and regional funding. While some housing was developed as a legacy of the 2006 Winter Olympics, rental costs in the city remain high. Housing affordability continues to be a topic of debate in relation to events like the Universiade 2025 (Cenere, Mangione, Servillo, 2020).

2.6.3. Student Housing Trends:

Roughly 14% of off-site students in Turin live in dedicated student residences—well above Italy's national average of 3%, though still below the European benchmark of 18%. The majority (86%) rent shared apartments, with demand rising despite increasing rental prices. Many student apartments are privately owned—either inherited or managed by families—rather than by professional real estate companies. A growing trend is the conversion of multiple small flats into larger student accommodations, encouraged by tax incentives for landlords. These student rentals are mainly located near universities but are increasingly found in other areas connected by public transit (Cenere, Mangione, Servillo, 2020).

2.6.4. Campus Expansion and Infrastructure:

To support their expanding student bodies, the University of Turin and the Polytechnic have actively invested in real estate, reshaping the city's urban fabric. Since the early 2000s, over €380 million has been spent on 200,000 square meters of new university facilities. These investments have been

part of coordinated strategies, including the Polytechnic Masterplan and UniTo's sustainability plan. Major projects include the Palazzina Aldo Moro (a central urban campus) and the Campus Luigi Einaudi, which has revitalized the city's northern districts. Upcoming developments include the Città della Scienza, Parco della Salute, and a Competence Center for Industry 4.0 (Cenere, Mangione, Servillo, 2020).

2.6.5. EDISU Piemonte and Student Services:

International students at Turin's universities enjoy the same entitlements as Italian peers, including access to EDISU's scholarships, housing, and part-time employment programs (Laudisa, Musto, 2021).

Erasmus+ participants receive monthly mobility grants—funded by both the EU and national bodies—which vary by destination:

€350 for high-cost countries

€300 for medium-cost

€250 for low-cost

€700 for students from partner countries

Incoming Erasmus students do not receive additional financial support from Turin universities unless enrolled in programs outside the EU framework. However, both universities have dedicated mobility offices that assist international students before and during their stay, including welcome webinars and help with paperwork like residence permits. Italian language courses are also offered to help students integrate and succeed academically, given the limited number of English-taught classes (Laudisa, Musto, 2021).

For accommodation, students can consult university websites, which list options like EDISU dorms, Collegio Einaudi, and the "Cerco Alloggio" platform, connecting students with private rentals in Turin and nearby cities like Alessandria, Bra, Cuneo, and Novara. The universities also work with HousingAnywhere, a global rental platform (Laudisa, Musto, 2021).

Subsidized meals are available to all mobility students via EDISU, with meal prices ranging from €1.20 to €3 (2022/23 figures) (Laudisa, Musto, 2021).

According to Article 34 of the Italian Constitution, all students with academic merit—regardless of financial status—are entitled to pursue higher education. This right is supported through scholarships, housing, and food services. Financial aid is based on merit and income, and out-of-town students are eligible for additional housing support.Meal costs are scaled according to each student's ISEE, which reflects their financial situation (Laudisa, Musto, 2021).

Law 40/98 guarantees non-EU students with valid residence permits the same access to scholarships and services as Italian students—eliminating previous requirements for reciprocity and significantly expanding financial aid eligibility (Laudisa, Musto, 2021).

2.7.Studentification and Student Housing

student housing in Turin has gone through major development and improvements. This is as the result of the number of students in both universities growing to 115,00 with nearly 40,00 coming from other parts of Italy and the world.The increasing number of demand has caused both public and private institutions and developers to invest in student housing. There have been noticeable changes in neighborhoods like Vanchiglia and Aurora with 67% and 77% rising the number of students between 2010/11 and 2017/18. At the same time, the number of long-term residents has dropped, raising concerns about displacement and gentrification. High-cost Purpose-Built Student Accommodations (PBSAs), such as The Social Hub, charge rents nearly twice the city average, raising concerns about exclusion in districts like Aurora (Cenere, Mangione, Santangelo & Servillo, 2023).

1. Rising Demand from Studentification: Turin has identified itself as a hub for higher education since 2014, attracting more students and short term residents. Currently the number of enrolled students is around 100,000 with 30% from outside of the city. This intensifies the demand on the limited student housing and puts pressure on the private local rental market. (Cenere, Mangione, Santangelo & Servillo, 2023).

2. Gentrification's Housing Impact: San Salvario and Aurora, are the neighborhoods that have undergone major changes, which evolves them into trendy areas with higher rental cost, reducing their affordability. Urban policies aimed to revitalize Urban regeneration strategies centered on boosting culture and commerce tend to favor tourism and affluent short-term tenants, often overlooking the needs of permanent and lower-income residents—students among them (Cenere, Mangione, Santangelo & Servillo, 2023).

3. Housing Crisis and Policy Constraints: The financial strain left by the 2006 Winter Olympics significantly limited the city's capacity to fund affordable housing. Austerity measures and neoliberal strategies further deepened the housing shortage, forcing students into a highly competitive private rental sector (Cenere, Mangione, Santangelo & Servillo, 2023).

4. Short-Term Rentals and Displacement: The expansion of platforms like Airbnb has shifted housing availability toward short-term rentals, further squeezing the long-term rental market. This shift has coincided with a rise in formal evictions, which peaked in 2014, and a growing backlog of applicants for public housing—symptoms of increasing socio-economic inequality that affects the student population as well (Cenere, Mangione, Santangelo & Servillo, 2023).

5. Gentrification as an Urban Strategy: Turin's local government has increasingly treated gentrification as a tool for urban regeneration. However, this strategy often comes at the cost of accessible housing, leading to the displacement of vulnerable populations—including students—from central and near-central neighborhoods (Bolzoni, Semi; Cenere, Mangione, Santangelo & Servillo, 2023).

2.8.Student Housing Crisis in Turin

The understudy lodging deficiency in Turin is profoundly entwined with broader urban changes and the method of gentrification. Taking after the 2006 Winter Olympics, Turin experienced mounting monetary burdens and a decay in financial development (Cenere, Mangione, Santangelo & Servillo, 2023).

These challenges, compounded by the global financial crisis, contributed to rising joblessness and widening social inequality. In this context, local policymakers adopted neoliberal strategies, prioritizing private investment while reducing public intervention—especially in the area of housing (Mangione, 2022).

By 2014, Turin had entered a unused urban stage characterized by "platform urbanism," where studentification and short-term city utilize got to be central to urban improvement procedures. College understudies, along side visitors and brief inhabitants, started to play a key part in forming the city's socio-economic elements. By 2017, the city facilitated around 100,000 understudies, with about a third coming from exterior Turin—creating overwhelming request for private rental lodging (Mangione, 2022).

This developing request happened nearby gentrification in semi-central zones like San Salvario, Borgo Rossini, and Aurora—historically working-class neighborhoods. Genuine domain costs started rising, and neighborhood businesses moved toward understudy- and visitor-oriented administrations such as nightlife, eating, and amusement. In Aurora, where property values had dropped amid the money related downturn, modern urban improvements just like the Lavazza central station and the Cultivate + Partners-designed college campus activated a wave of reinvestment and reestablished lodging request (Mangione, 2022).

The entry of understudies and brief inhabitants pushed up rents, uprooted long-standing inhabitants, and made pressures between built up communities and newcomers. Upscale understudy lodging, just Like the Understudy Inn, have focused on wealthier universal understudies, assist extending lodging imbalance. These patterns reflect a broader commodification of urban space, where the requirements of temporal, financially advantaged bunches are prioritized over those of neighborhood and lower-income understudy populaces (Mangione, 2022).

In spite of the fact that these changes have revitalized certain parts of the city, they've too declined social and spatial imbalance. A developing number of understudies are finding it troublesome to secure reliable and sensibly estimated settlement (Cenere, Mangione, Santangelo & Servillo, 2023). The city's overwhelming reliance on private speculation and the commercialization of understudy settlement have essentially decreased get to to open or subsidized choices, forces the lodging emergency and underlining the pressing require for more evenhanded and comprehensive lodging approaches (Mangione, 2022).

2.9.Turin 2030 Masterplan

The Torino 2030 Ace Arrange presents a vital vision for changing Turin into a center of innovative progression and social movement. It prioritizes making urban redevelopment more proficient by cutting through ruddy tape and empowering the revitalization of neglected mechanical zones, whereas guaranteeing natural maintainability (Città di Torino, 2018).

A major component of the arrange is the bolster of college extension, logical advancement, and social activities, which specifically address issues like understudy lodging, shared spaces, and learning situations. The ace arrange moreover advances coordination between the College of Turin and the Polytechnic of Turin through joint advancement methodologies that adjust with broader urban recovery objectives (Città di Torino, 2018).

TO2030 traces a feasible advancement system that joins green framework, forward-thinking lodging arrangements, and community-oriented arranging to relieve issues related to gentrification and a need of reasonable homes. It combines the dreams of a "University City" and "Touristic Turin" beneath the umbrella of "Dynamic Turin," pointing to boost the city's offer to understudies. Central to this aspiration is the offered to have the 2025 Universiade, which incorporates modern plans for understudy accommodations—although concerns stay over long-standing time possession and openness of these properties (Cenere, Mangione, Servillo, 2020).

Open engagement and raising mindfulness are seen as vital to effectively coordination Nature-based Arrangements (NbS) into urban arranging. Drawing more youthful inhabitants is fundamental for this move. Be that as it may, as modern improvement drives up rents, it dangers uprooting understudies and long-term local people. To constrain backfire, urban approaches ought to prioritize community needs and guarantee that tourism regards the nearby environment and way of life (Dogan, Cuomo, Battisti, 2023).

2.10.Law 338/2000: State financing for student housing

Law 338/2000 introduced a public-private financing model for student housing in Italy, marking a departure from purely state-built residences. Milan and Lombardy served as key testing grounds for this approach (Bertoni 2025).

-Major Legislative Developments:

Proclaim 118/2001: Permitted up to 50% of venture costs to be freely financed, with subsidizing disavowed in the event that due dates weren't met.
Orders 42 & 43/2007: Extended financing qualification to incorporate doctoral and specialized understudies, presented unused space measures, and commanded shared kitchens.
Orders 26 & 27/2011: Set least room measure and quality guidelines, required think about and assembly ranges, and suggested relaxation offices.
Orders 936 & 937/2016: Encourage loose space prerequisites and permitted third-party engineers, centering more on taken a toll investment funds than communal living (Bertoni 2025).

-EU Recovery Fund and NRRP (2022–Present):

In response to the pandemic, Italy channeled EU Recovery Fund money into student housing under the National Recovery and Resilience Plan (NRRP). This increased public co-financing from 50% to 75% per bed, with a contribution of €25,000 per unit. New housing projects must rent at rates 15% below the local market average for at least nine years (Bertoni 2025).

While these policies aim to fulfill Article 34 of the Italian Constitution—which guarantees education access regardless of income—there are concerns. The fixed rent discount may not account for regional cost differences. For instance, in Turin, PBSA rents are almost twice the city average, making the 15% reduction insufficient. In contrast, rent variability in Milan could lead to more equitable outcomes (Bertoni 2025).

The NRRP dedicates nearly €2 billion to create 60,000 new student beds by 2026, expanding national capacity from 45,000 to 105,000. (Bertoni 2025)

SECTION 2: LEARNING

This section introduces different case studies. These case studies can be comparable to the situation of Turin, or examples to learn from. Throughout different chapters, concepts like student housing and social housing are reviewed, by bringing examples from Turin, Milan, Vienna and other parts of the world.
Also the section explains MVRDV's Rooftop Catalog as the main inspiration of the proposal, breaking down all the categories to analyse the structure of the program.

03

Milan and Students

3.1.Milan and Student Life

According to ISTAT's 2024 estimates, Milan counts 1,371,499 residents—704,519 women and 666,980 men—forming the metropolitan backdrop for one of Europe's largest student hubs. In the 2023/24 academic year, Politecnico di Milano enrolled 47,726 students, 8,482 of whom were international and 16,959 female, while the University of Milan hosted 57,771 students, including 4,944 internationals and 33,965 women. Altogether, Milan's higher-education ecosystem comprises 210,822 students, of whom 116,807 are female and 22,203 hail from abroad, underscoring the city's dual character as both an academic powerhouse and a magnet for global talent. Notably, 26,877 of these students are Italian nationals who moved to Milan from regions outside Lombardy, according to 2023/24 data from the Ministry of University and Research (MIUR – Anagrafe Nazionale Studenti).

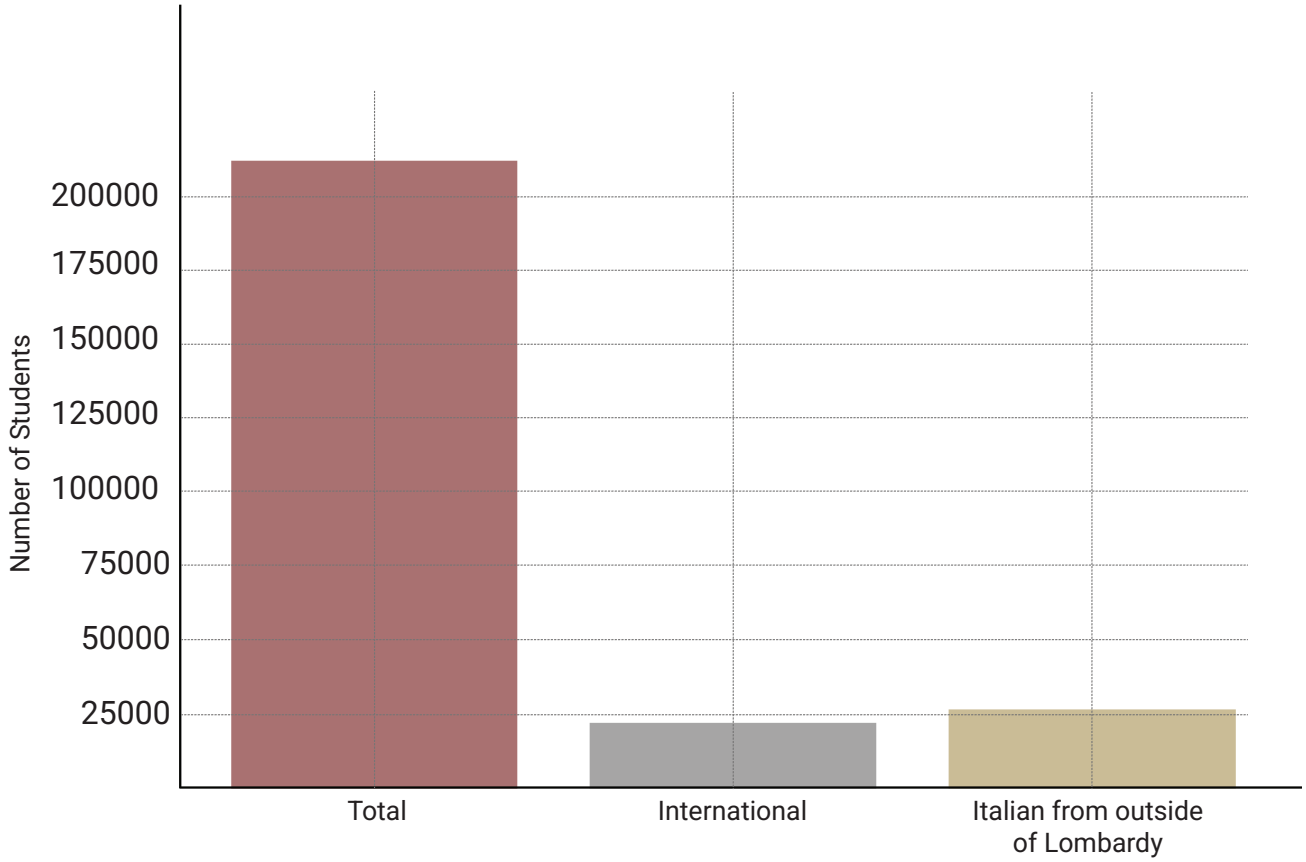


fig. 2- Student population in Milan; total, international and Italian students from outside of Lombardy, AY(2023/2024)

3.2. Student Accommodation in Milan

Milan—Italy's financial and industrial powerhouse—generates roughly 10 percent of national GDP and attracts a disproportionate share of Lombardy's enterprises. Although the city's population peaked at 1.7 million in 1971, post-industrial restructuring in the 1980s triggered decline and left large brownfield sites—such as the former Pirelli plant that became Bicocca University—ripe for adaptive reuse. Since Regional Law 12/2005, Lombardy's planning framework has encouraged inner-city regeneration over green-field expansion, enabling Milan to grow without sprawl (Bertoni, 2025).

This policy environment intersects with a demographic surge in students. Milan's universities draw talent nationwide and abroad, pushing up demand for centrally located accommodation.Recent figures confirm that Milan has become the priciest rental market in Italy (Bricocoli & Palvarini, 2024; Mugnano et al., 2021). Data from the February 2023 StudMiHome survey indicate that students pay an average of €637 per month for single rooms and €492 per person for double rooms—rates that are just slightly under market averages, likely due to the limited number of newly signed rental agreements among respondents (Costa, Frangioni, 2024).

Around 80 percent of students now share flats, a shift labeled "roomification." Large family apartments and former offices are subdivided into high-occupancy rentals, turning the individual room into the primary unit of supply and demand. Milan hosts 21.6 percent of all room listings in Italy, and between 2019-2024 this segment expanded by 367 percent, versus just 10 percent in Rome. Room rents run roughly 45 percent higher than standard leases, underscoring profit-driven extraction that disproportionately targets students and young professionals (Costa, Frangioni, 2024).

Student housing has the potential to go beyond simply serving as a place to sleep. When re-imagined as community hubs, purpose-built residences offer health, childcare, cultural, and recreational services to surrounding neighborhoods, blending "hardware" (flexible layouts, shared facilities) with "software" (students' linguistic, digital, and social capital). In this model, student residences become engines of socio-cultural regeneration—linking older adults, migrants, children, and people with disabilities to an engaged student body—while also mitigating some negative effects of studentification (Oscar, Bellini, Gambaro, Mocchi, 2020).

3.3. Future Plans For Student Housing in Milan

Between 2020 and 2030, the student housing capacity in the Bocconi University area is projected to double, primarily due to the development of three new purpose-built student accommodations (PBSA) by Aparto, a subsidiary of the global real estate firm Hines. Two of these—Giovenale and Ripamonti—are already operational, while the third will be delivered through the adaptive reuse of the 2026 Winter Olympic Village. These projects will add approximately 2,800 beds to the existing 2,000 Bocconi-managed units, significantly altering the demographic and spatial composition of the Sarfatti, Tabacchi, and Crema neighbourhoods (Oscar, Bellini, Gambaro, Mocchi, 2020) .

Rents in these PBSA facilities range from €652 to €1,600 per month, exceeding the area's average residential lease cost of approximately €720/month for comparable space (OMI data). Such price differentials, alongside a substantial influx of transient, high-turnover student populations, may act as a catalyst for urban studentification—a process long associated with cultural disruption and, more recently, with gentrification-like dynamics that displace long-term, non-student residents

(Mulhearn & Franco, 2018; Hospers, 2022).

While Italian policy initiatives such as Law 338/2000 and the 2024 National Recovery and Resilience Plan (NRRP) have sought to increase the national student housing supply to meet EU benchmarks, they have not established regulatory frameworks for private PBSA expansion. As such, scholars caution that without proactive urban planning and governance, intensified PBSA development may compromise both housing affordability and social cohesion in central districts (Cavicchia, 2018; Mulhearn & Franco, 2018).

3.4.Housing Affordability in Milan

Milan's developing lodging demand—driven by relocation, financial centralization, and its part as an instruction hub—has driven to rising property values and rental costs. In spite of this, lod ing reasonableness remains an underexplored point in Italian scholarly writing, with restricted approach center. Open lodging (ERS) in Milan is contracting as reasonable lodging ventures are progressively outsourced to social establishments instead of open organizations (Aler). This trend reflects the broader financialization of social housing. Most research on this issue comes from expert associations rather than traditional academia, including reports from Nomisma (2022), OCA (2023), and the Feltrinelli Foundation (2024) (Bertoni, 2025).

Housing affordability can be assessed in different ways:

1. **Cost-to-market average:** Housing is affordable if it is 20% below market price (UK policy).
2. **Location Affordability Index:** Includes commuting costs but is more relevant to spread-out cities.
3. **Cost-to-income:** Housing should not exceed 30% of income (Clapham et al., 2018).

OCA's data analysis highlights Milan's affordability crisis, showing that many workers cannot afford more than the legal minimum living space (28 sqm). Between 2015 and 2021, rent prices increased by 22%, while incomes rose only by 13%. The city's appeal drives cultural and economic growth, but rising costs pose social challenges. This discussion focuses on rental prices rather than homeownership, as renting is more relevant to the study of student housing, where affordability remains a pressing issue (Bertoni, 2025).

3.5.Future Plans for Student Accommodation in Italy

The future Student Housing supply in the main Italian cities will see over c.23,600 beds to be completed by 2027. Milan (12,400 beds) and Turin (3,300 beds) record the highest bed completion rate by 2027, followed by Rome (2,300 beds), Florence (around 2,300 beds) and Pavia (507 beds). Of these additional 23,600 beds by 2027, 32% of them are already under construction, and more than half are concentrated in Milan. The total Student Housing availability by 2027, across the main cities, will total nearly 61,000 beds assuming the planned ones complete as anticipated and construction commences without delay across the pipeline (PBSA ,2023).

Estimated beds to be added in the market by 2027

Milan	New beds	+12,409
Turin	New beds	+3,317

Compared to other EMEA countries, the Italian market is still nascent, with a long timeframe until it can be considered mature. There is significant opportunity for growth to satisfy the unmet demand; the Italian market in its entirety has a 25.5% level of satisfied demand, and still some 74.5% growth potential, to fulfil the unmet demand. At one side of the spectrum, Pavia has the highest satisfied demand ratio (42%), whilst at the other end, Bologna has the lowest fulfilment rate (17%) and Rome (19,5%), even lower than the Italian market average (PBSA ,2023).

04

Social Housing and Student Housing

4.1.What is Co-Housing?

A co-operative is a collective formed by individuals who voluntarily join forces to meet their common economic, social, and cultural goals through enterprises that are jointly owned and governed democratically. Historically, the concept of cooperation can be traced back to early self-sustaining communities that shared labor, resources, and knowledge (Evered). The modern co-operative movement began in the early 19th century in Britain, notably led by Robert Owen.An important turning point occurred in 1844 when the Rochdale Pioneers established the first retail cooperative (Evered).

Today, co-operatives are guided by seven foundational principles:

1. Open and voluntary membership
2. Democratic member control
3. Member economic participation
4. Independence and autonomy
5. Education and training
6. Cooperation among co-operatives
7. Commitment to community well-being

Sociologist Richard Sennett suggests that cooperative behavior is inherent in human evolution, particularly through the concept of exchange. Globally, co-operatives play a significant role in advancing both social and economic development. Anarchist thinker Colin Ward, in particular, advocates for cooperative housing, arguing that living spaces should be independent of state control (Evered).

Advantages of Cooperative Housing:

1. Reduced housing costs
2. Easier access to ownership-like living
3. Shared values and communal lifestyle
4. Profit-sharing or nonprofit structure
5. Enhanced social connections and knowledge exchange

Challenges of Cooperative Housing:

1. Uneven division of labor
2. Slow, consensus-based decision-making
3. High levels of personal responsibility
4. Social stigma (e.g., “hippie” labels)
5. Risk of organizational failure
6. Dependence on mutual trust (Evered).

4.1.1.Edinburgh Student Housing Co-operative (ESHC):

launched by student activist Frank, drawing influence from Colin Ward's ideas and previous student housing initiatives (Schwittay, 2023).

With the support of the University of Edinburgh, the City Council, and co-operative advocacy groups, the students secured a long-term lease from Castle Rock Edinvar. By using retroactive payments to finance the project, they were able to open the co-op in just nine months, launching in September 2014 (Schwittay, 2023).

fig. 3- Edinburgh Student Co-housing; https://www.eshc.coop

4.1.2.Birmingham Student Housing Co-operative (BSHC):

The Birmingham Student Housing Co-operative (BSHC), a co-op with nine bedrooms, was established around the same time as ESHC but encountered more challenges due to resistance from the university. Lacking official backing, founders John and Ben—motivated by both local and international cooperative movements—obtained financial support from the Phone Co-op and housing networks. They personally renovated and expanded the property, eventually winning a planning appeal to overcome initial objections. BSHC gained recognition for its Friday night dinners, which helped build a politically active student community (Schwittay, 2023).

fig. 4- Birmingham Student Co-housing; https://bshc.co.uk/apply

4.2.Co-Housing in Turin

4.2.1. La Tenda Housing Cooperative

Established in 1992 with backing from Caritas, La Tenda is a cooperative in northern Italy focused on offering affordable housing, especially for asylum seekers and those transitioning out of reception centers. It provides tenants with stable, fixed-rate rental housing and accompanying social support. Membership is available to both locals and non-locals (La Tenda Housing Co Operative Website).

The cooperative's main aim is to help people in need secure stable accommodation for one to two years, during which they receive both practical and social assistance to support their path toward independence (La Tenda Housing Co Operative Website).

Who benefits:

Primary beneficiaries are vulnerable individuals and families—especially asylum seekers—who are able to pay rent but face difficulties in the private rental market. The broader community also gains from increased social integration and cohesion, especially in small towns where La Tenda operates (La Tenda Housing Co Operative Website).

Structure and Functioning:

La Tenda has around 450 members, most of whom support the initiative without directly using the housing. The cooperative manages 43 housing units (40 in Cuneo, 3 in Ivrea), with about 160 members currently renting. These properties are either owned by the cooperative or provided through partnerships with the Church or private owners on a loan-for-use basis. Rents are set below market rates, governed by internal regulations. The cooperative collaborates with local social service networks to support residents, many of whom are international protection holders. A major challenge remains the shortage of paid staff for social and administrative duties, though collaborations with NGOs help bridge the gap (La Tenda Housing Co Operative Website).

Impact:

To date, over 100 people have found housing through La Tenda, 80% of whom are migrants. About 15–20% are single men from asylum programs, while the rest are families recommended by churches or social services. In 2022, a Ukrainian family also benefited. The average stay is one to two years, with a maximum of three (La Tenda Housing Co Operative Website).

fig. 5- La Tenda Co-housing, Turin; https://cooperativalatenda.it

4.2.2. To-Housing: LGBTQ+ Co-Housing Project in Turin (ASSOCIAZIONE QUORE):

To-Housing is Italy's first residential project dedicated to supporting vulnerable LGBTQ+ individuals. Launched in January 2019 in Turin, the initiative offers both safe housing and tailored support services (Associazione Quore, 2019).

Target Groups Include:

1. LGBTQ+ youth
2. LGBTQ+ refugees, asylum seekers, and migrants
3. Trans and non-binary individuals
4. LGBTQ+ seniors

Housing Details:

1. Location: Close to the University Campus in Turin
2. Capacity: Up to 24 residents

Duration:

1. Emergency accommodation for about 10 days
2. Extended stays of 8–10 months, guided by individualized development plans

Support Services Offered:

1. Personalized education and development planning
2. Employment guidance and skills training
3. Social integration activities
4. Awareness campaigns addressing homophobia and racism

Core Principles:

- Reciprocity: Residents are encouraged to offer mutual support
- Scalability: The project is designed to be replicated elsewhere
- Partnerships: Collaborative with both public and private entities
- Holistic Approach: Tackles challenges through interdisciplinary methods

To-Housing does more than offer shelter—it actively helps individuals improve their autonomy, well-being, and integration into society (Associazione Quore, 2019).

fig. 6- To-Housing, Turin; https://www.quore.org/en/to-housing-lgbtqi-hospitality/

4.3.The History of Student Co-Housing

Student housing cooperatives are primarily concentrated in North America, with approximately 140 in the United States and 10 in Canada, along with one in Sydney, Australia. Efforts to locate similar cooperatives in Europe or Asia, including inquiries to the International Co-operative Alliance and ICA Housing, have yielded no results. Although a 1977 initiative in Northern Ireland (SHAC) aimed to support student co-ops, it failed to launch any actual projects (URBED 2004).

The first student housing cooperative in the U.S. was founded in 1873 by a group of women in Illinois. The cooperative model gained traction during the Great Depression of the 1930s, driven by both financial hardship and ideals of shared living. Toyohiko Kagawa, a Japanese religious leader and co-op advocate, influenced the movement with his vision of cooperatives as tools for peace. By the 1940s, racially integrated student co-ops began to emerge, often evolving from communal dining arrangements into full-fledged housing solutions to lower student living costs. The co-op network grew organically, often founded by students inspired by existing models (URBED 2004).

In Canada, the University of Toronto saw the creation of its first student housing co-op in 1936, also shaped by Kagawa's philosophy. While many Canadian co-ops from the 1930s and 1940s dissolved, those that survived often owned their buildings, unlike others that leased space from universities or private landlords. A second wave of co-ops was supported by reforms to the National Housing Act and funding from the Canada Mortgage and Housing Corporation. Still, some were hampered by poor financial oversight. Recently, a new co-op emerged in Montreal in response to a booming student population (URBED 2004).

NASCO (North American Students of Co-operation), established in 1968, supports U.S. and Canadian co-ops with training, education, and funding. It helped form the Campus Co-operative Development Corporation (CCDC) in 1987 to provide early-stage support, financing, and project coordination for new student co-ops, often linking them with credit unions and established cooperative networks (URBED 2004).

Within the UK, the understudy housing cooperative development started within the 1970s. Sanford Lodging Co-operative, established in 1974, given shared lodging for both understudies and youthful grown-ups. Another outstanding case is Clays Path Lodging Co-operative, which opened in 1979 and obliged 450 individuals in co-living courses of action. In any case, it battled with separation, complex administration, and tall occupant turnover, driving to its closure. The Dennis Central Lodging Co-operative, propelled by College College London's understudy union in 1976, still oversees lodging beneath the London Borough of Tower Villas (URBED 2004).

While UK co-ops tend to be more affordable, most are not dedicated solely to students, limiting access. Long waiting lists and misalignment with university schedules further hinder student participation. Nevertheless, the cooperative model remains promising for students if systems can be developed to ensure housing is available at key points in the academic calendar (URBED 2004).

4.4.Student Co-Housing, A Timeline

KEY DEVELOPMENTS IN STUDENT HOUSING CO-OPERATIVES

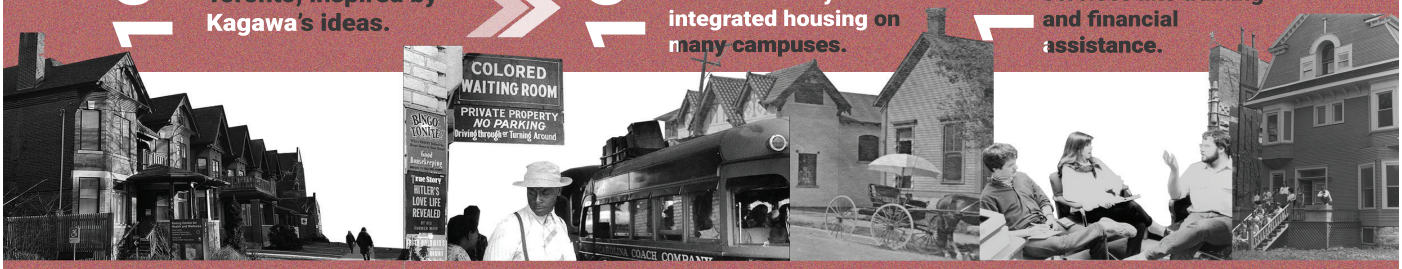
1873 First student housing co-op established in Illinois, USA by a group of women.

1930s
- Expansion of student housing co-ops in the U.S. due to the Great Depression, making low-cost housing essential.
- Co-op model influenced by Toyohiko Kagawa, a Japanese cleric advocating co-ops as a foundation for world peace.

1936 First student housing co-op in Canada established at the University of Toronto, inspired by Kagawa's ideas.

1940s Racially integrated student housing co-ops begin appearing on campuses, providing the first racially integrated housing on many campuses.

1968 NASCO (North American Students of Co-operation) founded to support the campus co-op movement with services like training and financial assistance.



1970s Student housing co-ops in the UK established, including Sanford Housing Co-operative in 1974 and Clays Lane Housing Co-operative in 1979.

1977 SHAC (Student Housing Association Co-operative) set up in Northern Ireland to support co-operatives, but no projects were initiated.

1987 CCDC (Campus Co-operative Development Corporation) created to provide financing, pre-development assistance, and organizational design for new student co-ops in America.

1990s 2000s Some Canadian co-ops thrive, while others face management issues.
New co-op formed in Montreal due to a 53% increase in student population since 1997.

2000s NOW Co-ops in the UK face issues with non-student residents, long waiting lists, and difficulties securing housing at crucial times for students.
Efforts to start new student housing co-ops continue in Canada and North America.

fig. 7- Student Co-Housing History Timeline

4.5.Student Co-Housing

Students and Housing Principals:

Residence life offers unique benefits that support student success by fostering a sense of belonging and encouraging interpersonal connections (Radder & Han, 2009; Clemons et al., 2004). Living on campus provides students with leadership opportunities, such as participating in House Committees and working with Resident Assistants (RAs), who are trained to manage academic and social programs aimed at student integration (Swartz, 2010).

At Ngunyeweni Residence, elected students (excluding first-years) form the House Committee, working with RAs to create action plans that address students' academic and social needs. Campus housing facilitates easier access to resources like libraries, computer labs, and evening tutorial classes, while reducing commuting time and costs. Continuous Wi-Fi, along with recreational, cultural, and spiritual activities, further enhances the student experience(Xulu-Gama, 2019). Campus living also promotes diversity and inclusivity, exposing students to peers from varied backgrounds. The convenience of living on campus saves time on travel and household chores, allowing more time for studying, relaxation, and socializing(Xulu-Gama, 2019).

Living in university residences often leads to both physical and emotional separation from students' families, encouraging them to build new support networks and adapt socially. Living in college homes frequently leads to both physical and passionate partition from students' families, empowering them to construct unused bolster systems and adjust socially. For numerous, the fellowships shaped in home gotten to be more important than familial connections, as peers tend to supply a non-judgmental space where understudies feel accepted—particularly when it comes
to touchy issues such as sexuality, way of life choices, or future goals (Xulu-Gama, 2019).

College homes play a key part in advancing social integration, supporting Tinto's hypothesis that solid peer associations contribute to scholarly accomplishment. Students commonly build friendships with roommates, floor mates, classmates, or peers with shared backgrounds, gaining both emotional and academic support. While many rely on these relationships for encouragement, some also turn to peers to access substances like cannabis or codeine as a way to manage stress (Xulu-Gama, 2019).

The consider advance uncovers the issue of nourishment uncertainty, noticing that understudies encountering starvation frequently depend on roommates to cautiously alarm Inhabitant Collab rators (RAs), making a difference them dodge the disgrace related with looking for formal help (Xulu-Gama, 2019).

Accommodation providers should prioritize student well-being by adopting design principles that promote health, such as pursuing WELL certification. Key recommendations include incorporating more communal spaces on each floor, clustering student rooms instead of linear layouts, maximizing natural light, connecting spaces to nature, and using bright colors for a welcoming environment(Worsley, Harrison, Corcoran, 2021).

Physical design elements that hinder social interaction—like breakfast bars facing walls and uncomfortable seating—should be replaced with communal dining tables and cozy, spacious common

areas to encourage socializing. Creating informal “bump spaces,” where students naturally encounter one another, and adding community gardens or allotments can also enhance connections (Worsley, Harrison, Corcoran, 2021).

Involving students in the co-design of accommodation fosters a sense of ownership and belonging, improving both comfort and social engagement. Regular post-occupancy evaluations can ensure that housing continues to meet student needs, creating spaces where students feel truly “at home”(Worsley, Harrison, Corcoran, 2021).

4.5.1.La Borda, Barcelona:

Found in Spain, La Borda may be a one of a kind agreeable lodging activity that developed through a grassroots prepare, drawing on strong community associations and proficient input to set up a socially evenhanded and fiscally feasible show. The 28-unit agreeable has advanced through associations with people and bunches inside the social economy segment. It presents a comprehensive show covering advancement and administration forms, inhabitant structures, communal living standards, partner parts, arrive get to, and reasonableness measures (Cabré, Arnau, 2017).

Worked as a non-profit agreeable, La Borda is administered by its individuals, who collectively make choices through a common get together. Diverse devoted committees are mindful for overseeing particular operational assignments. Inhabitants effectively take an interest within the development handle, advertising volunteer labor to diminish costs whereas getting help from experts to address specialized needs. This hands-on strategy not as it were brings down costs but too awards individuals more impact over the venture. Development started in 2017 with the objective of completion by the conclusion of the year (Cabré, Arnau, 2017).

The venture is driven by civic support and a shared vision—most individuals distinguish with dynamic values and back the thought that lodging ought to be treated as a right instead of a advertise resource. This shared belief system has made a difference cultivate smooth collaboration and resolve clashes inside the bunch (Cabré, Arnau, 2017).

La Borda sets itself separated from conventional lodging by prioritizing shared living and community interaction. It intentioned decreases private space in favor of shared offices to empower social interaction and effective asset utilize. These common regions moreover have exercises associated to the broader Can Batlló neighborhood development (Cabré, Arnau, 2017).

The extend places a solid accentuation on natural maintainability as a principal guideline. Eco-conscious materials and building procedures are utilized to keep the natural impression moo whereas keeping up reasonableness. Inhabitants are energized to lock in in economical living, and green plan components are coordinates with the assistance of natural specialists and modelers (Cabré, Arnau, 2017). Reasonableness at La Borda is kept up through a blend of budgetary methodologies, open arrive utilize directions, and effective administration. Coop57, one of the monetary accomplices, requires that 29% of the subsidizing be given straightforwardly by individuals as refundable beginning commitments (Cabré, Arnau, 2017).

fig. 8- La Borda Co-Housing, Barcelona; https://www.archdaily.com

4.5.2.R50 Co-Housing, Berlin:

R50 Cohousing in Berlin is a *Baugruppen* (building group) initiative where future residents collaboratively funded and designed their housing with support from architects and builders—one of whom eventually moved in. Situated in the lively and multicultural Kreuzberg district, the project consists of 19 personalized apartments, ranging in size from 80 to 132 square meters. At a cost of €2,150 per square meter—or €2,350 including shared spaces—R50 was notably more affordable than the market average of €2,950 at the time (ISSUU).

The building emphasizes collective living, offering shared gardens, a two-story winter garden, guest accommodations, and ample bike storage. Interior layouts are adaptable, with movable walls, and sustainable features include reinforced concrete construction, mesh balconies, and high-efficiency windows made in Germany. Notably, no car parking is provided, promoting environmentally friendly transportation (ISSUU).

While the project encourages community and sustainability, concerns persist about long-term cohesion, as German property law allows units to be sold freely, potentially altering the social fabric. Most residents are middle-class, raising issues around gentrification and limited social diversity. Nonetheless, despite some layout compromises, R50 serves as an innovative, affordable, and environmentally conscious housing model that could influence future urban housing strategies for diverse communities (ISSUU).

fig. 9- R50 Co-Housing, Berlin; https://www.archdaily.com

05

Learning From Vienna

5.1.Co-Housing in Austria and Vienna

There is no universally accepted terminology for co-housing projects, either internationally or in Austria. In German, the broad term Gemeinschaftliches Wohnprojekt corresponds to co-housing and includes various models, referring to both the building and the community. In Vienna, Baugruppe (building group) and Baugemeinschaft (building community) are commonly associated with co-housing, originally focusing on the planning phase but now encompassing both planning and living stages. However, shared apartments without collaboration among residents are excluded from this definition (Höpler, 2023).

Austria lacks a standardized classification for collaborative housing. IniGBW (Initiative Gemeinsam Bauen & Wohnen) categorizes projects inconsistently, using both housing typology (e.g., cluster apartments) and resident demographics (e.g., generational living). Brandl and Gruber (2014) propose a classification based on architectural ("hardware") and social ("software") aspects, identifying four types:

- Wohngemeinschaft (flat-sharing community)
- Wohngruppen (living community)
- Hausgemeinschaft (house community)
- Integrierte Nachbarschaft (integrated neighbourhood)

These types often overlap, creating synergies. For example, Wohnraum Künstlergasse is a house community, while Sargfabrik combines multiple categories (Höpler, 2023).

5.2.History of Co-Housing in Austria

Co-housing in Austria has a long history, with its roots tracing back to the cooperative movement of the 1920s, where self-organization was used to collectively address the urgent need for housing. In the 1980s and 1990s, co-housing models, inspired by the alternative housing models of the 1960s, evolved further (Höpler, 2023).

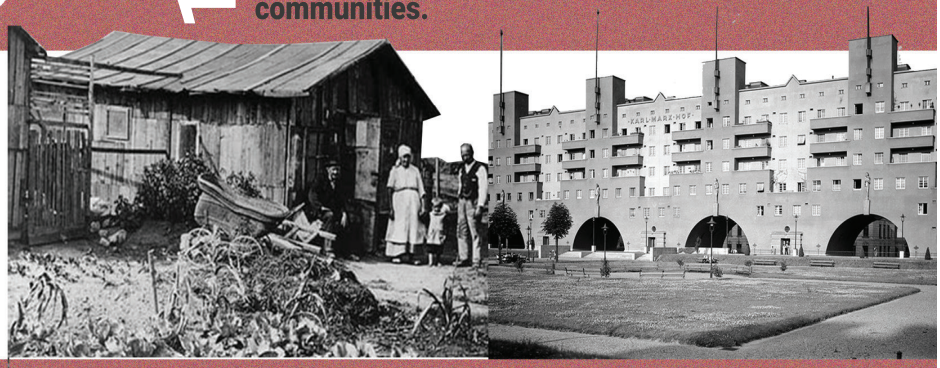
In any case, co-housing improvements moderated at the begin of the 21st century. It wasn't until 2009 that the development experienced a resurgence, driven by motivation from German co-housing models (Hendrich 2010). The Viennese agreeable development started after World War I, as individuals self-organized to construct lodging when the city couldn't give. Pioneers at first shaped cooperatives on hunched down arrive, making self-sufficient communities. These settlements were self-managed, with shared framework cultivating community, in spite of the fact that the development part politically in 1921, debilitating over time. Amid WWII, the agreeable show moved to communal lodging arrangement, and by the late 20th century, the center moved to large-scale ventures (Höpler, 2023).

The first wave of co-housing emerged in the late 1960s, influenced by alternative models. In Vienna, middle-class citizens initiated projects that emphasized participation and community living. Notable examples include the "Wohnen mit Kindern" project, where residents could influence the design, though the sense of community faded after people unrelated to the project moved in. In the 1980s, only a few co-housing projects like Sargfabrik and B.R.O.T were initiated, with a lack of affordability limiting participation (Höpler, 2023).

A second wave of co-housing began in 2009, inspired by Germany's developments. Newer projects, often in urban development areas, focus on integrating into local communities rather than detaching from them. The City of Vienna recognized co-housing potential, introducing criteria for social sustainability in land acquisition. However, despite interest, there has been stagnation in the movement, with fewer seekers for co-housing and more project initiators in recent years (Höpler, 2023).

History of Co-Housing in Vienna

1920s The cooperative movement in Austria begins, with people self-organizing to build housing to address the urgent need for shelter when the city couldn't provide. Settlers form cooperatives on squatted land, creating self-sufficient communities.



late 1960s The first wave of co-housing emerges, influenced by alternative housing models. In Vienna, middle-class citizens initiate projects emphasizing participation and community living.

1980s 1990s Co-housing models evolve further, though development slows as larger projects begin to take precedence. Notable projects like "Sargfabrik" and "B.R.O.T" are initiated, but affordability and participation remain challenges.

2009 The co-housing movement experiences a resurgence, inspired by developments in Germany. Newer projects begin to emerge, often in urban development areas, integrating into local communities.

NOW Fewer people seeking co-housing and more initiators trying to bring projects to life. The City of Vienna recognizes the potential of co-housing but faces challenges with resources and financial limitations.

fig. 10- Vienna Co-Housing History Timeline

5.3.Case Study: Wohnraum Künstlergasse

Positioned in the southern section of Vienna's 15th district, Rudolfsheim-Fünfhaus, the Wohnraum Künstlergasse project is situated close to the Gürtel, a key ring road that borders the city's inner districts. The surrounding urban fabric consists of tightly packed Gründerzeit-era buildings with varied heights and small interior courtyards, often separated by fences. The district offers limited access to green areas, with only a few tree-lined streets and modest parks scattered throughout (Höpler, 2023).

The project is close to Wienzeile, a major transport route for public transport, motorized traffic, and bicycles, which separates the 15th and 12th districts. Nearby, Sechshauser Straße connects the Gürtel to Schönbrunner Brücke, serving as a key traffic route. The area is bordered by significant infrastructure, such as railway and subway lines, with Wien Westbahnhof station serving as a hub for both regional and public transportation. The aboveground tracks divide the district, with only two bridges providing access across. The Gürtel also serves as a major route with the U6 underground line. The neighborhood has several small parks, but they are poorly connected, and the large Schloss Schönbrunn park is closed at night. Overall, the area has fewer green spaces compared to the city average. In terms of social infrastructure, the area includes childcare, schools, and public libraries, which are key for co-housing networks. The neighborhood is a small-scale mixed-use area, with a high percentage of residential buildings. Many historic blocks still house small businesses, such as carpentries (Höpler, 2023).

Wohnraum Künstlergasse is located in a mixed-use zone with buildings ranging from 9 to 16 meters in height. The area is densely populated, with 19,302 inhabitants per km², compared to Vienna's average of 4,656. The average living area is 31 m² per person, below the city's average of 35 m². The district's population is diverse, with 57% Austrian, 19% from other EU countries, and 24% from non-EU countries. The 15th district has grown slowly over the past decade, with a slight decrease in the most recent year (Höpler, 2023).

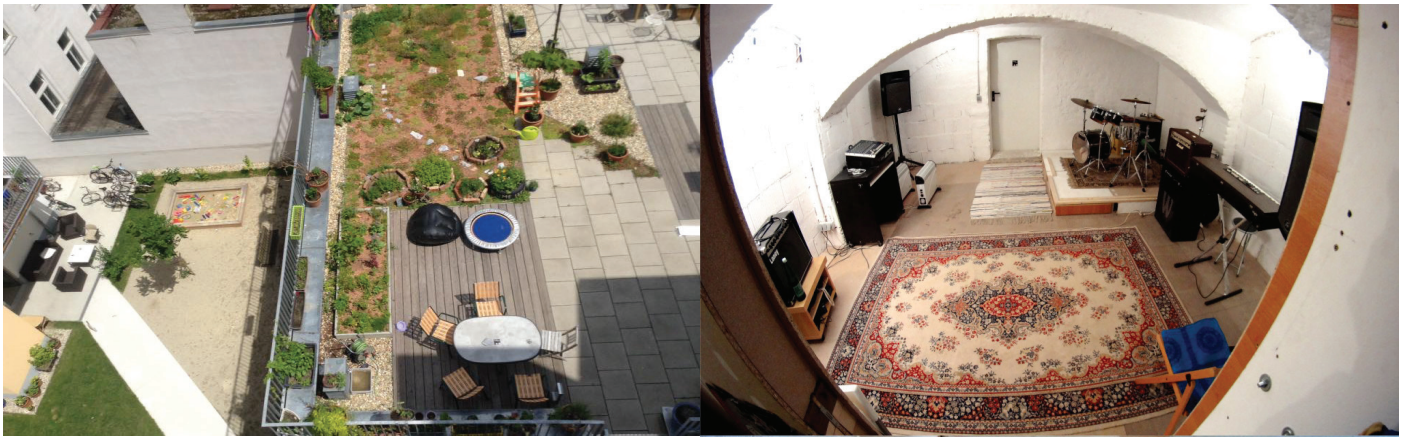


fig. 11- Wohnraum Kunstlergasse; https://www.kuenstlergasse.at

Institutional embedding

In 2008, the PUBA foundation acquired two adjacent buildings on Künstlergasse/Ullmannstraße, which underwent renovation as part of a subsidized Sockelsanierung project, with support from raum & kommunikation and architect Wolf Klerings. This collaboration, based on previous experience with the Grundsteingasse co-housing project, allowed for the creation of the Wohnraum Künstlergasse co-housing group (Höpler, 2023).

The PUBA foundation owns and manages the properties. The co-housing association, formed in 2011, was introduced to the renovation project through a networking event by the Initiative Collaborative Building & Living. GB neighborhood management provided ongoing support. The buildings, constructed in 1902, had historical commercial uses and were in poor condition before renovation. The project included demolishing some buildings, reducing others, and adding elevators for accessibility. The renovation created 29 housing units, with 14 leased to co-housing members. Shared spaces are collectively rented, while apartments are individually rented from the PUBA foundation. The project also involved the renovation of commercial spaces and the attic to provide additional housing (Höpler, 2023).

The community

The Wohnraum Künstlergasse co-housing extend was started in 2009 by youthful individuals with foundations in expressions, culture, and social work, pointing to form a community-based living environment. The project's originator, Domenika Badegruber, imagined a space for understudies to elude the city's namelessness and live in a steady community. A center bunch of seven proceeded the thought after delays in arranging, in the long run collaborating with the PUBA establishment and raum & kommunikation (Höpler, 2023).

Over time, the community has advanced, with a few individuals having children and others moving out. The gather centers on being great neighbors and living in a close-knit community, instead of locks in with the more extensive open. The co-housing gather, organized as an affiliation (Verein KulturLeben Künstlergasse), has parts for cashier, chairman, and secretary, and a few working bunches handle assignments such as planting, music room administration, and flat demands. Month to month gatherings with larger part voting direct decision-making (Höpler, 2023).

The community's boundaries are based on formal participation within the affiliation, but the lines are obscured due to shared spaces and casual connections with neighboring inhabitants. The co-housing gather has constrained control over inhabitant determination, but they can propose modern inhabitants and have a few say in empty lofts within the neighboring building. Be that as it may, the bunch does not oversee the property itself, as the PUBA establishment possesses and oversees the buildings (Höpler, 2023).

Socio-spatial relations – shared resource and collective governance

The concept of the neighborhood for residents of Wohnraum Künstlergasse is shaped by both spatial and social factors. A mental map created during a focus group discussion highlighted key boundaries, such as the Wienfluss, Wienzeile, Auer-Wels-Bach-Park, Mariahilfer Straße, and the Gürtel. These boundaries are subjective, influenced by personal relationships and collective activities, such as street parties and neighborhood events. Residents consider areas they frequently visit, like the subway or supermarket, as crucial parts of their neighborhood (Höpler, 2023).

The term “Grätzl” refers to the spatial neighborhood, while “Nachbarschaft” focuses on social conections. Neighbors can be those living in the same building or nearby, with social connections forming multiple layers. The neighborhood also involves shared spaces and common activities, like walking dogs or visiting parks. The residents emphasized that the neighborhood has a symbolic aspect shaped by social interactions, and compared to other areas like Gleis 21 or Sargfabrik, there is no distinct symbolic boundary in their neighborhood. The area’s identity is also shaped by its historical associations, including its past reputation as a red-light district (Höpler, 2023).

Shared resources

The Wohnraum Künstlergasse building has six floors, counting the storm cellar and housetop, with passages on Künstlergasse 14 and Ullmannstraße 37. Co-housing inhabitants utilize both passages, whereas inhabitants from the neighboring building basically utilize the Künstlergasse entrance. Shared spaces incorporate the bike room, litter room, green patio, and housetop patio. The patio is more open, whereas the porch is utilized by both inhabitants and outside clients like workers of neunerhaus or workshop members (Höpler, 2023).

Open air spaces are primarily utilized by the co-housing bunch for cultivating, grills, and unwinding. The open air areas—developed in association with TU Wien—comprise a 190 m² patio and a 170 m² porch. Interior, the building offers a multifunctional common range and a storm cellar music room, both overseen by the co-housing community. The shared space is utilized for occasions and classes, whereas the music room is open through the adjoining building (Höpler, 2023).

The private spaces comprise of 14 flats, extending from 55 to 104 m². Individuals of the co-housing community habitually utilize these ranges for get-togethers and communal exercises, counting cooking sessions and social occasions. Sharing assets expands past space, with inhabitants trading abilities, apparatuses, dress, and books. A food-sharing activity and incidental gather orders too cultivate a soul of sharing inside the community (Höpler, 2023).

Boundaries and threshold spaces

The building structure of Wohnraum Künstlergasse makes clear boundaries between private and open spaces, with a tall divider isolating the square from the encompassing neighborhood. Inside the piece, boundaries gotten to be more liquid, especially within the shared yard and open spaces, which are open to both inhabitants and non-residents amid extraordinary events or occasions. The co-housing bunch oversees the greening of these regions, with get to to the patio and patio changing by building segment (Höpler, 2023).

Shared spaces like the litter room, bicycle room, and laundry room are located on the ground floor and basement, with clear boundaries defined by doors. This spatial arrangement establishes a hierarchy of spaces ranging from private to public, with access and use depending on residency status or specific events. The music room and multifunctional shared space in the basement have clear physical and social boundaries, requiring keys for access. The co-housing group uses these spaces for both internal gatherings and public events such as yoga sessions or birthday celebrations. The room features windows that offer limited views of the street outside (Höpler, 2023).

The courtyard south of the building, shared with neighbors, is an important space for social interactions. The co-housing group rents a small area from the neighboring plot, and the gardens of maisonette apartments face this courtyard, where residents engage in activities like gardening. The courtyard is separated by a wire fence, encouraging spontaneous interactions, such as chatting with

neighbors or the building’s caretaker. A party organized by the co-housing group revealed that long-term neighbors did not know each other. Inside the building, the corridor acts as a threshold space between private and shared areas, fostering social interaction among immediate neighbors, and further defining the neighborhood socially and spatially

04

MVRDV's Rooftop Catalog

6.1.Challenges, Solutions, Benefits:

Rotterdam has 18.5 km² of level housetop zone, much of which is as of now undiscovered. Urban Arranging Head Mattijs van Ruijven, MVRDV co-founder Winy Maas, and Rotterdamse Dakendagen chief Léon van Geest highlight the potential of housetop spaces to cultivate a more bearable and comprehensive city. They emphasize the require for engagement from major players like genuine bequest engineers and lodging enterprises, nearby fundamental alterations in laws and directions. The center message: in the event that unused housetop advancements aren't effectively sought after, they won't materialize (MVRDV, 2021).

Urban Challenges and Housetop Arrangements:
Urban ranges have to be get prepared to confront up and coming challenges tied to climate alter, rising populaces, and the require for more noteworthy social consideration (MVRDV, 2021).
Housetops offer arrangements for:

• Climate Adjustment: Moderating warm stretch and giving water capacity.
• Vitality Move: Facilitating renewable vitality sources and improving building separator.
• Quality of Life: Including green spaces, advancing biodiversity, and cultivating more advantageous situations.
• Urban Development: Supporting densification through mixed-use neighborhoods.
• Inclusivity: Making differing, socially dynamic spaces for sports, community exercises, and open interaction.

Utilitarian and Monetary Benefits:
Including capacities to housetops meets urban needs. In zones missing green spaces, housetop gardens can be made. Where family lodging is rare, family flats can be included. Workplaces on housetops can make private regions more dynamic amid the day. This assortment can persuade inhabitants to stay in their neighborhoods for a longer period (MVRDV, 2021).

Fiscally, housetop improvements like green gardens increment property values and contribute to building upkeep reserves. Expanding commercial thickness can offer assistance finance maintainable building updates or improvements to the street-level environment. Homeowners' affiliations seem lease out housetops to businesses for employments such as sports exercises, creating extra sources of wage (MVRDV, 2021).

Evaluating Rotterdam's Housetop Potential:
Indeed with cautious gauges, Rotterdam's 18.5 km² of level housetop space has the potential to play a major part in giving lodging, green foundation, water maintenance, renewable vitality, and relaxation regions. Coordination a few capacities on the same housetops can improve proficiency, in spite of the fact that certain housetops may stay unused due to impediments in their reasonableness (MVRDV, 2021).

6.2.The Catalog

Inspiration and Purpose of the Rooftop Catalogue:

The Housetop Catalogue is planned to start inventiveness and motivate unused thoughts. It doesn't claim to present completely modern concepts but or maybe presents an diagram of existing conceivable outcomes. These are fair the beginning thoughts, as the potential for housetop utilize is endless and persistently extending. Whereas not all choices are as of now doable, the catalogue offers captivating visualizations that outline what can be accomplished (MVRDV, 2021).

It's critical to note that the catalogue doesn't give a cover endorsement to actualize housetop ventures without advance thought. Point by point investigation and on-site investigate stay fundamental steps some time recently any improvement. In any case, this direct serves as a viable apparatus to empower and back those fascinated by maximizing the potential of their housetops (MVRDV, 2021).

6.2.1.Sustainability and Greenery

While sustainability has been briefly addressed earlier, this section delves deeper into sustainable urban design, with a focus on greenery and biodiversity. Implementing green solutions requires careful attention to substrate layers for planting (MVRDV, 2021).

Green Spaces and Biodiversity Initiatives:

- Silent gardens
- Rooftop vineyards
- Parks with solar-powered trees
- Urban farming
- Private and communal gardens
- Rooftop vegetable patches
- Bee habitats
- Urban jungles
- Tiny forests
- Rooftop ponds
- Viewing gardens
- Green mazes
- Themed gardens (e.g., Japanese gardens)
- Butterfly sanctuaries
- Vertical parks
- Natural cemeteries
- Bird-watching spots (e.g., for peregrine falcons)
- Palm houses
- Green monuments

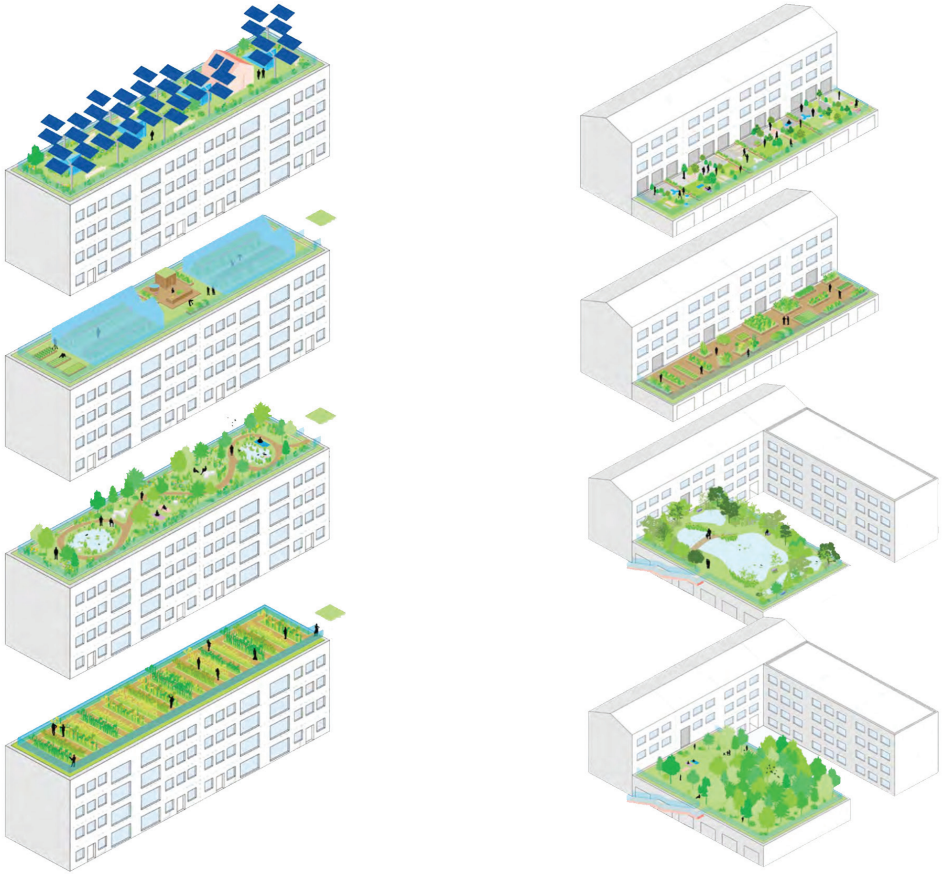


fig. 12- Green Spaces and Biodiversity; from MVRDV Rooftop Catalog, 2021

6.2.2.Densification

Densification involves adding new spaces for housing and other purposes, prioritizing sustainable construction methods that minimize environmental impact. Rooftop load-bearing capacity determines feasibility, and new rooftop additions should integrate green, blue (water), and yellow (solar) elements (MVRDV, 2021).

Densification Options:

- Private rooftop expansions
- Single-family homes
- Apartments with community gardens
- Bridge buildings
- Overhangs with shared spaces
- Dormers and outdoor rooms
- Winter gardens
- Conversions of pitched roofs
- Home offices and work units
- New residential neighborhoods
- Rooftop windows and “twist” designs
- Holiday homes and elevated apartments
- Office blocks and extensions
- Courtyard houses
- Start-up villages
- Hotel suites and terrace buildings
- Meeting spaces and artist residencies
- Care centers and tiny houses
- Classrooms and boardrooms

fig. 13- Densification Oprions; from MVRDV Rooftop Catalog, 2021

6.2.3.Sports Facilities

Healthy cities thrive on green spaces and opportunities for physical activity. Rooftops provide an innovative solution for sports facilities that require substantial space, especially in dense urban centers (MVRDV, 2021).

Sports on Rooftops:
- Outdoor and indoor fitness centers with gardens
- Golf courses and sprint tracks
- Urban skate parks and climbing walls
- Swimming pools and yoga fields
- BMX tracks and athletic fields
- Mountain biking trails and “bicycle mountains”
- Rooftop stadiums and baseball fields
- Rooftop ski slopes and bungee jump platforms

fig. 14- Sports on Rooftops; from MVRDV Rooftop Catalog, 2021

6.2.4.Recreation, Tourism, Culture, and Leisure

Urban pressure from housing and office demands limits space for recreation and cultural activities, yet rooftops present a viable solution (MVRDV, 2021).

Cultural and Recreational Rooftop Uses:
• Rooftop spas and tourist info centers
• Murals and indoor playgrounds
• City campsites and sculpture gardens
• Seasonal events and amusement arcades
• City beaches and pop-up museums
• Sky bars and rooftop galleries
• City branding installations
• Lookout points and observatories
• Ferris wheels and roller coasters
• Rooftop lighthouses and super hammocks
• Outdoor cinemas and rooftop restaurants
• Rooftop dance areas and beer gardens
• Sky clubs and city event plazas
• Tulip fields and rooftop car cinemas

fig. 15- Cultural and Recreational Rooftop Uses; from MVRDV Rooftop Catalog, 2021

6.2.5.Neighborhoods and Social Cohesion

In busy inner-city neighborhoods, rooftops can provide quieter community spaces for local residents, fostering social interaction away from crowded streets (MVRDV, 2021).
Community-Oriented Rooftop Spaces:

Community event spaces:
• Dog-walking areas
• Daycare centers
• Shared gardens and allotments
• Community workshops and guest rooms
• Rooftop playgrounds
• Block terraces and resident-specific rooftop areas

fig. 16- Community event spaces; from MVRDV Rooftop Catalog, 2021

6.2.6.Mobility, Energy, and Utility Services

Rooftops can house infrastructure that might otherwise disrupt street-level aesthetics, including mobility hubs, energy generation facilities, and utility services (MVRDV, 2021).

Utility and Mobility Solutions:

- Innovative energy generation systems
- Pergolas with integrated solar panels
- Wind turbines and windmills
- Pedestrian shortcuts
- Rooftop parking with green street integration
- Bicycle parking facilities
- Data centers and neighborhood batteries
- Zeppelin and hot air balloon stations
- Emergency rooftops and helicopter pads
- Parcel drone zones
- Sky car parking spaces
- Hyperloop stations

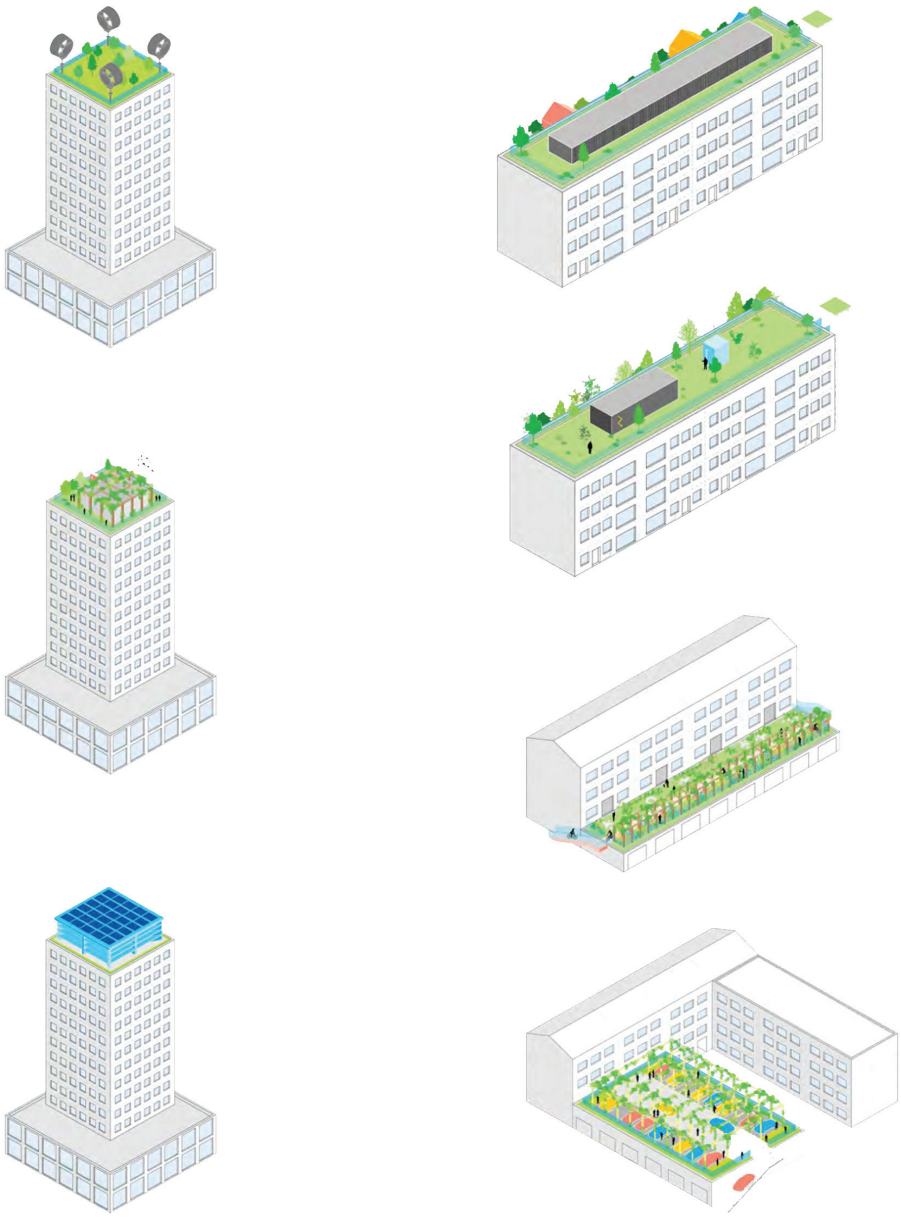


fig. 17- Utility and Mobility Solutions; from MVRDV Rooftop Catalog, 2021

6.3.Highlighting Useful Case Studies

Here we want to point out the sections that are important for our purpose:

• Apartments with community gardens:
The proposal features a rooftop extension to create additional apartments. To make up for the absence of large private gardens, a communal garden has been added, providing a space where current and future residents can meet and engage with one another (MVRDV, 2021).

• Dormers and outdoor rooms:
The outdoor room will be the most unique space in the house. It can serve as a study, guest room, or playroom—offering a tranquil view of the lush rooftop (MVRDV, 2021).

• New residential neighborhoods:
The lower rooftops offer opportunities to extend neighboring apartments, adding an extra room and garden to reduce the need for residents to relocate to larger homes. Multiple stacked apartments can also be expanded, incorporating terraces into the design (MVRDV, 2021).

• Home offices and work units:
Since the pandemic, blending living and working spaces has grown more important. Adding work units on rooftops enables people to work from home while maintaining physical separation from their living areas. These distinct spaces also provide a more convenient setting for meeting with clients or colleagues (MVRDV, 2021).

• Holiday homes:
The pandemic has led many of us to vacation within our own countries. While cities provide hotels and short-stay apartments, and rural areas have holiday parks, rooftops could be transformed into urban holiday parks, offering green, relaxing spaces right in the city center (MVRDV, 2021).

• Elevated apartments:
This approach raises the apartments to ensure ample sunlight reaches the interior of the building block while also providing residents with views over the rooftops. Beneath the elevated structure lies a publicly accessible community courtyard garden (MVRDV, 2021).

• Office blocks and extensions:
Additional functions can be integrated within the building block, enhancing its diversity and creating a more vibrant atmosphere throughout the day. A communal garden will also be located adjacent to the office area (MVRDV, 2021).

• Courtyard houses:
With sufficient housetop space, patio houses can be built. These homes are situated side by side, including shared yards between them (MVRDV, 2021).

• Start-up villages:
Urban space for start-up companies is limited, and many cannot afford steep commercial rents. Rooftop start-up villages can be created to address this, bringing a lively energy to the neighborhood during the day (MVRDV, 2021).

• **Hotel suites:**
Lodgings can make special housetop rooms, encompassed by greenery and advertising a unmistakable tasteful. This would change an overnight remain within the city into a really paramount involvement (MVRDV, 2021).

• **Terrace buildings:**
This concept reimagines the bridge building by linking two structures of varying heights, forming green terraces in between. The terrace building offers an ideal space for both living and working (MVRDV, 2021).

• **Meeting spaces:**
Many people enjoy meeting in natural settings. This option suggests converting a rooftop into a green social space, where people can also work outside at assigned tables during the summer months (MVRDV, 2021).

• **Tiny houses:**
As lodging deficiencies and rising costs continue, intrigued in Minor Houses proceeds to develop. In any case, reasonable areas for them are rare. Housetop spaces show an perfect arrangement for pleasing these homes (MVRDV, 2021).

• **Roof shed:**
The roof shed is a versatile structure that can be quickly enclosed to create a larger space when needed. It can also serve as a sheltered area for outdoor activities, such as Physical Education, during rainy weather (MVRDV, 2021).

SECTION 3 : PROPOSAL

This section offers a solution for Turin's student housing issue, focusing on densifying the neighborhoods by adding a rooftop layer to public or private buildings. In this proposal a new catalog will be discussed that was designed specifically according to the needs of Turin's students.

07

Densifying Turin's Roofs: A Proposal For New Student housing in San Salvario

7.1.Project Introduction

In this project, a tailored “Rooftop Catalog” was developed to address the specific needs of student housing in the city of Turin. The catalog includes a series of typological interventions designed to respond to diverse student lifestyles, social patterns, and spatial requirements. Each category within the catalog proposes a lightweight, adaptable structure that can be implemented as a vertical extension atop existing public or private buildings.

The process unfolds as follows: for each selected rooftop, a set of catalog categories is chosen in collaboration with building owners and stakeholders. These selected modules are then combined to form a residential complex that accommodates students, fostering both individual living and communal interaction.

To test this design strategy, a real case was selected: the Ex La Stampa building, currently housing part of a university campus in the San Salvario district of Turin. This site was chosen not only for its symbolic and functional relevance but also for its architectural and spatial potential to host vertical additions.

The design development began with the selection of catalog categories deemed most appropriate for the site and its context. The primary objective of the intervention is to offer community-oriented housing solutions that support affordability and social inclusion. To achieve this, the project emphasizes shared spaces and collective facilities—such as kitchens, study rooms, and terraces—which allow for cost reduction, encourage interaction, and promote a more resilient and supportive student lifestyle.

7.2.Project Goals

Throughout different eras, Turin has been a host to remarkable events, shaping its identity and urban landscape. From being an industrial powerhouse to hosting the Winter Olympics, the city has continuously adapted to new realities. Each defining moment brought structural and infrastructural transformations, reshaping Turin's urban fabric and reinforcing its role as a dynamic and evolving metropolis.

Turin is now widely hailed as a "university city," a recognition of its rising academic profile. Its long tradition of scholarship draws thousands of students from across Italy and abroad. Yet students who actually live and study here still feel a noticeable gap between the city's reputation and the reality of its facilities. The real task is to turn the label into substance—building an environment that fully and sustainably meets students' needs. That goal raises several pressing questions: How much can we reshape Turin's urban fabric without sacrificing its historic and cultural character? Which interventions can add student housing while keeping the city's everyday rhythms intact? And finally, how can these upgrades serve not only students but also the wider community, making the city more welcoming to newcomers and long-time residents alike?

A New Layer for a University City: Rooftop Community Housing in San Salvario
In response to these challenges, this project proposes a bold yet context-sensitive solution: utilizing the rooftops of existing buildings in neighborhoods that host university campuses. Instead of expanding outward, we propose building upwards—adding a new layer of student housing and communal spaces that integrate seamlessly into the existing urban fabric.

San Salvario has been recognized as the perfect area for this initiative among the neighborhoods of Turin. Renowned for its lively cultural atmosphere, significant student population, and closeness to various university campuses, it offers a chance to improve student housing options while maintaining the city's character.

The Benefits of Rooftop Community Housing
1. Inexpensive Housing for Students:
Increasing rental prices complicate students' search for affordable housing options. Society Rooftop housing can provide affordable living options while optimizing overlooked areas.

2. Improving the University Experience:
University life goes beyond lecture halls. Through the establishment of communal areas, students can participate in significant social exchanges, work together on tasks, and foster a feeling of community.

3. Reducing Interference in the City:
Conventional city growth frequently results in tensions between students and established residents. Utilizing rooftops for living and social areas enables students to become part of the city without vying for the current housing supply or changing the conventional streetscapes of the city.

4. Sustainable City Development:
Transforming rooftops encourages a vertical strategy for urban growth, decreasing the necessity

for new land utilization and controlling urban expansion. This approach adheres to environmentally friendly design concepts, enhancing the efficiency and sustainability of urban development.

Utilizing its current infrastructure, Turin can make a significant move toward evolving into a genuine university city—one that vigorously backs students, welcomes innovation, and improves urban living for each of its residents.

This initiative imagines a Turin where students are not merely transient visitors but essential participants. of the city's development, influencing and enhancing its cultural and educational environment. Through adjusting to the demands of its expanding student populace, Turin can reinforce its identity as a city that embraces, fosters, and gains from the presence of students, guaranteeing a more vibrant and successful prospects for everyone.

fig. 18- Project Goals

7.3.San Salvario Characteristics

San Salvario is structured around a 19th-century grid known as “il quadrilatero,” framed by Corso Vittorio Emanuele II, the railway, and the Po River. Most buildings are residential, between 4 and 6 stories tall, with occasional higher structures along Corso Marconi and Corso Massimo. Smaller, low-rise buildings are often found in internal courtyards (Somale, 2023).

The district lacks traditional public squares, with only Piazza Madama Cristina and Largo Saluzzo serving as gathering points. Spaces like Largo Marconi and the Porta Nuova forecourt have potential for future public use but are currently underdeveloped (Somale, 2023).

Street space is dominated by cars, with narrow roads, double parking, and limited sidewalks. Dedicated bike lanes exist only on major roads, while pedestrian areas are minimal and often obstructed. Despite strong public transport access (tram, metro, buses), private car use remains prevalent (Somale, 2023).

Green space is limited and fragmented, mostly consisting of street trees and private courtyard gardens. There’s no integrated green infrastructure, and many courtyards are underused (Somale, 2023).

The neighborhood has no unified center—commercial life is active during the day around Via Madama Cristina, while nightlife concentrates in Largo Saluzzo. This split leads to uneven usage of public space and highlights the need for a more cohesive urban strategy (Somale, 2023).

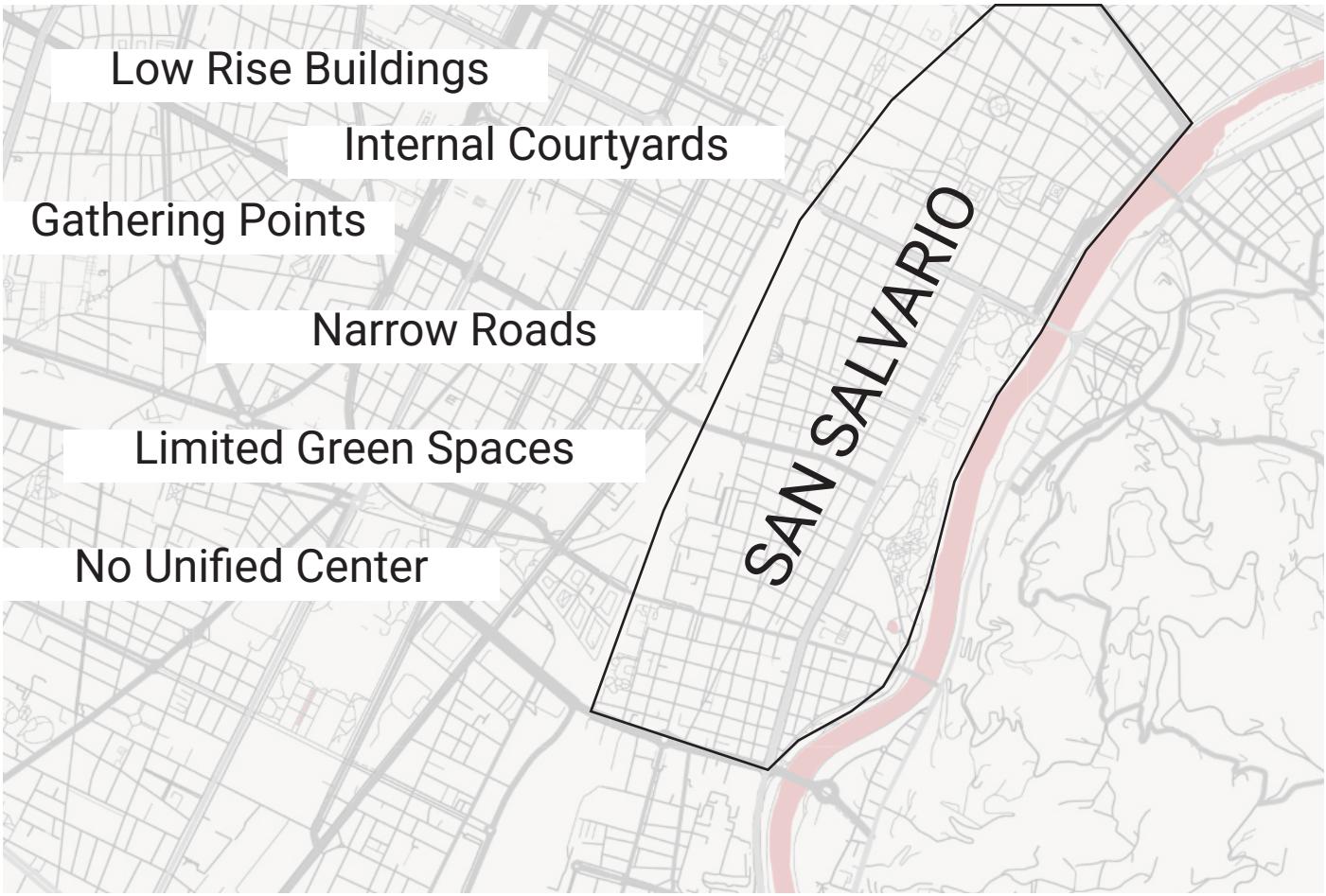


fig. 19- San Salvario - Characteristics

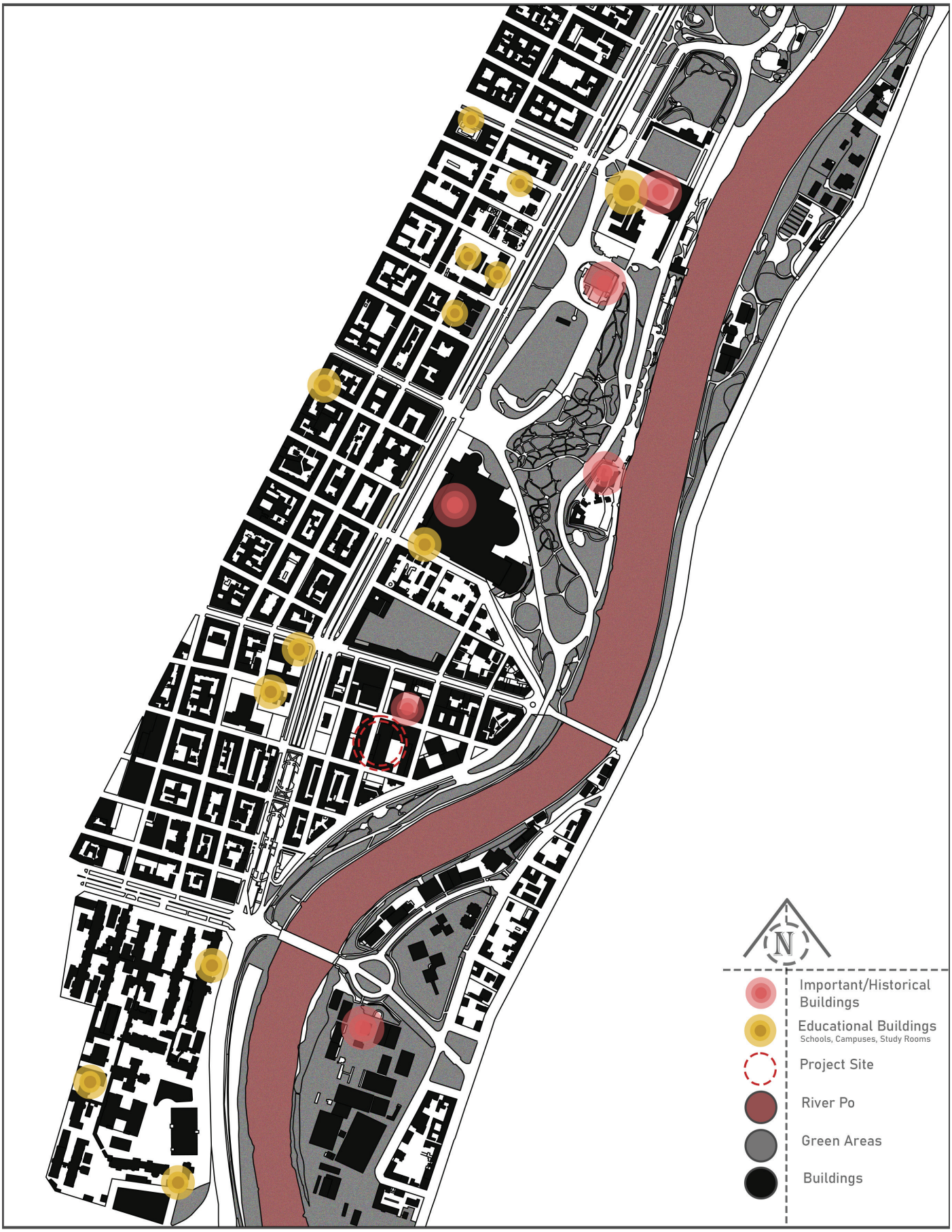


fig. 20- San Salvario campuses and notable buildings

7.4.Case Study: Ex La Stampa

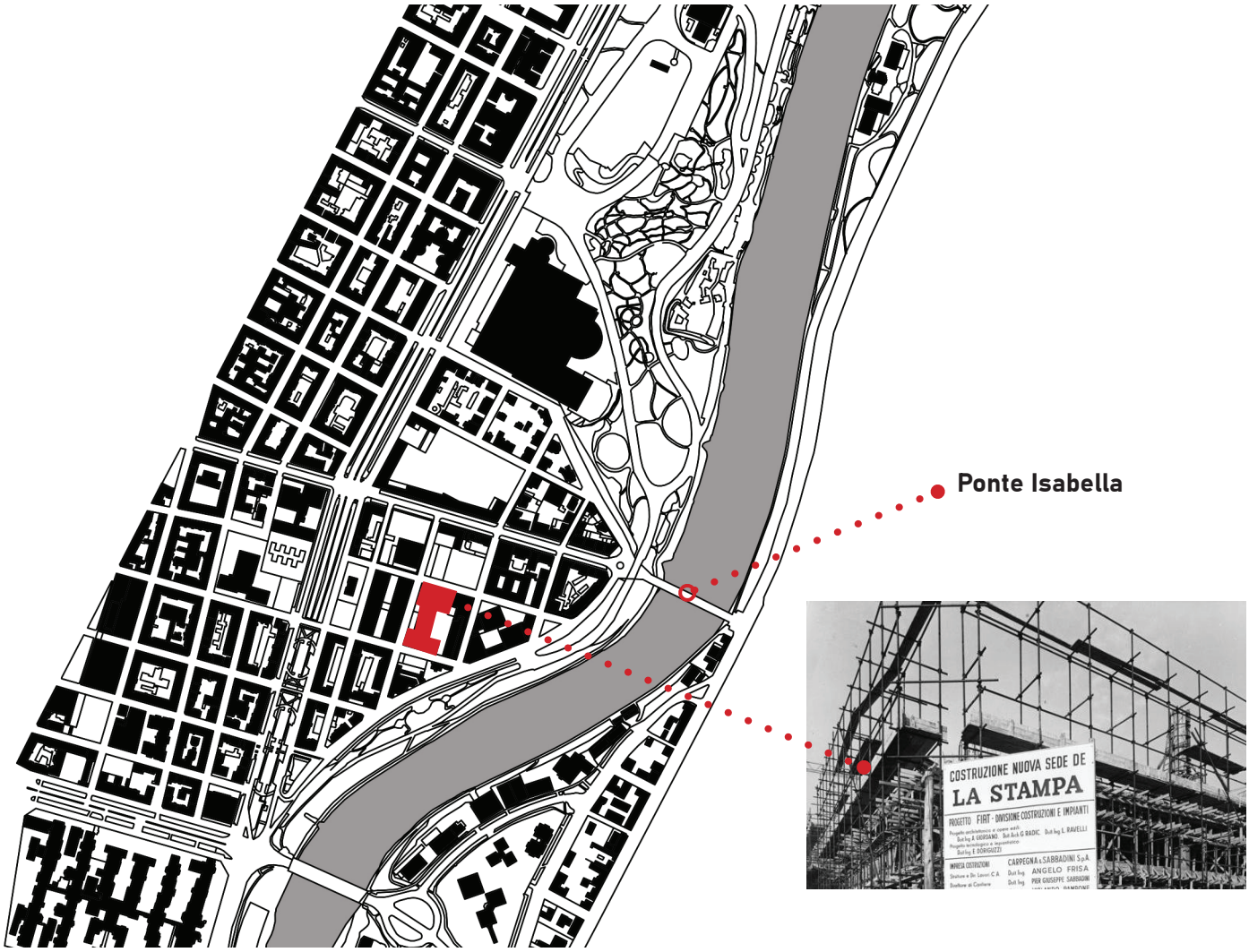


fig. 21- Ex La Stampa location - project site

Location & Connectivity:

- Located on the edge of Valentino, near Ponte Isabella, and close to the Po River with views of Superga.
- Well-connected to the city center (Porta Nuova) and major communication routes, including the Turin-Milan motorway, Caselle airport, and a future motorway to the sea.
- The headquarters occupies a 7,100 square meter plot bordered by streets Marenco (main entrance), Tiziano, Chiabrera, and Correggio.

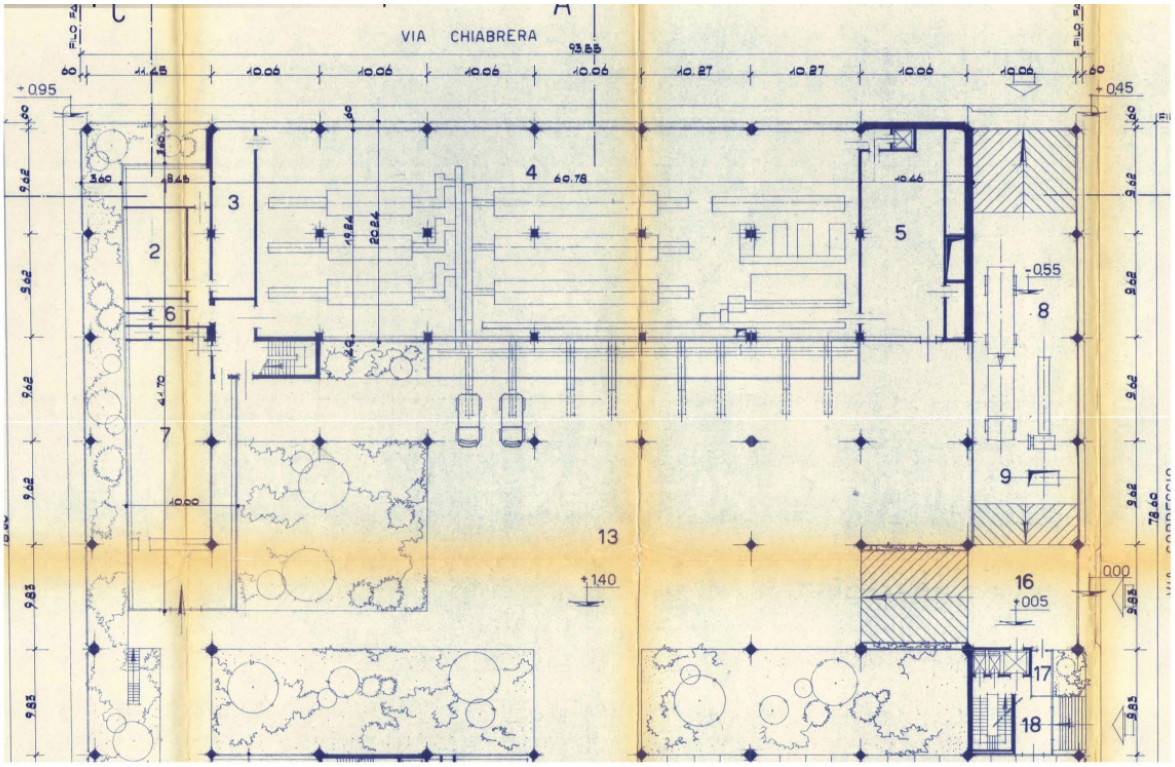
Building Design & Architecture:

The project building was constructed in 1965 by Fiat.

- The building has a modern style with the use of materials such as concrete, steel and glass.
- It inclued:

1. Underground floor to keep machines and storage.
2. Ground floor plus two floors above it for the editorial establishment.
3. A tower structure reaching 27 meters that was demolished later

7.4.1.Case Study: 1965 and Now



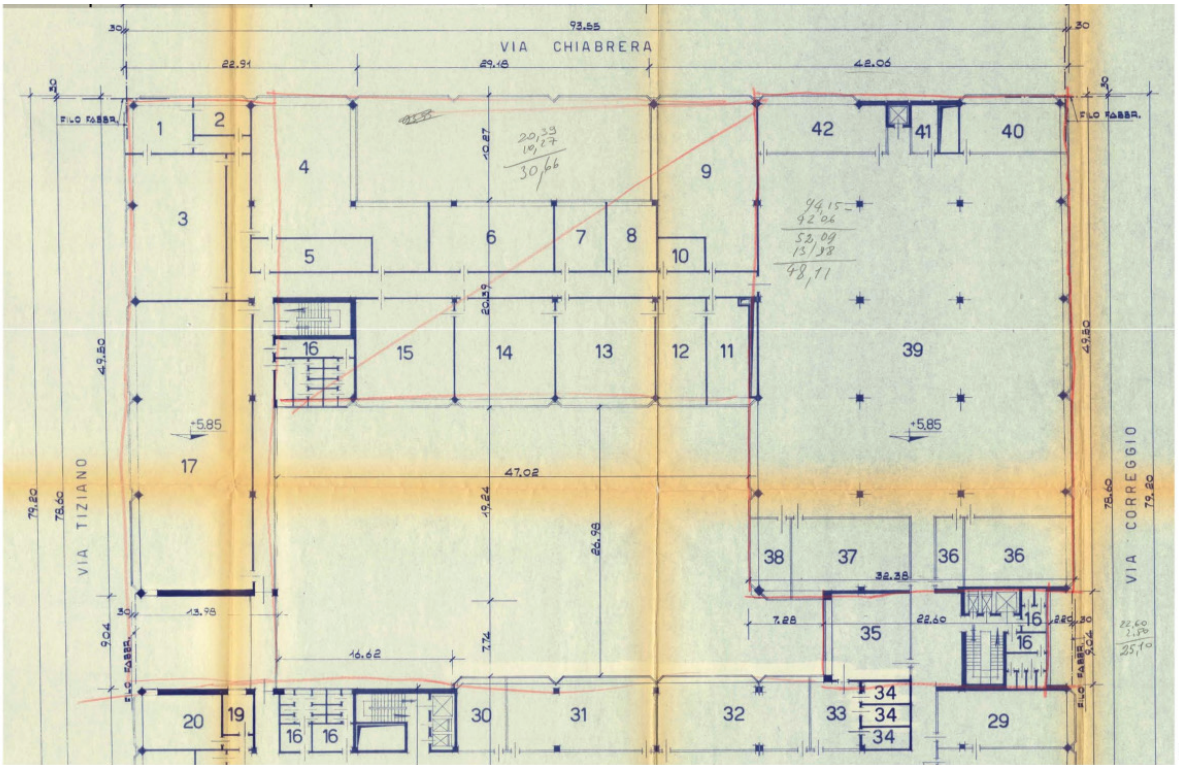
Ground Floor

1965: Pachaging and shipping offices

Now: 5 Classrooms - 1250 Students

fig. 22- Ex La Stampa ground floor, 1965 and now; from Unito website

7.4.1.Case Study: 1965 and Now



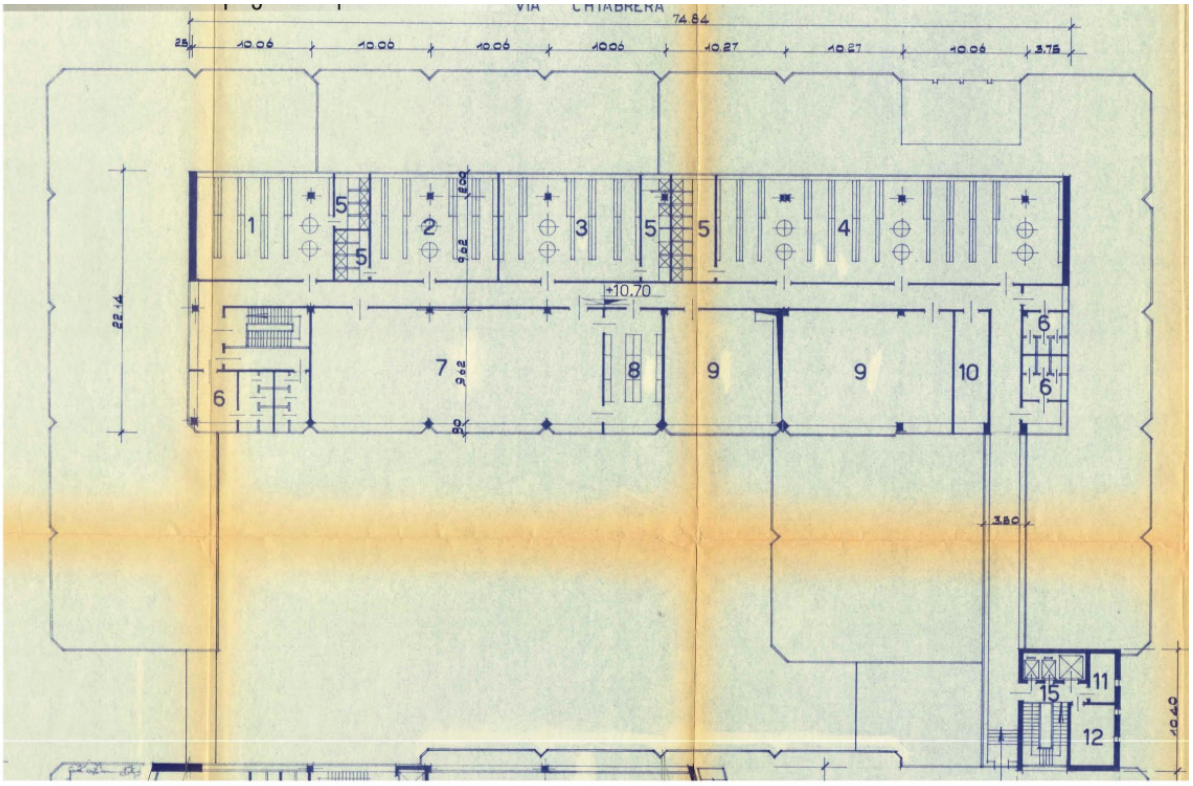
First Floor

1965: Printing Rooms

Now: 4 Classrooms - 1100 Students

fig. 23- Ex La Stampa first floor, 1965 and now; from Unito website

7.4.1.Case Study: 1965 and Now



Second Floor

1965: Mensa and dressing Rooms

Now: 4 Classrooms - 700 Students

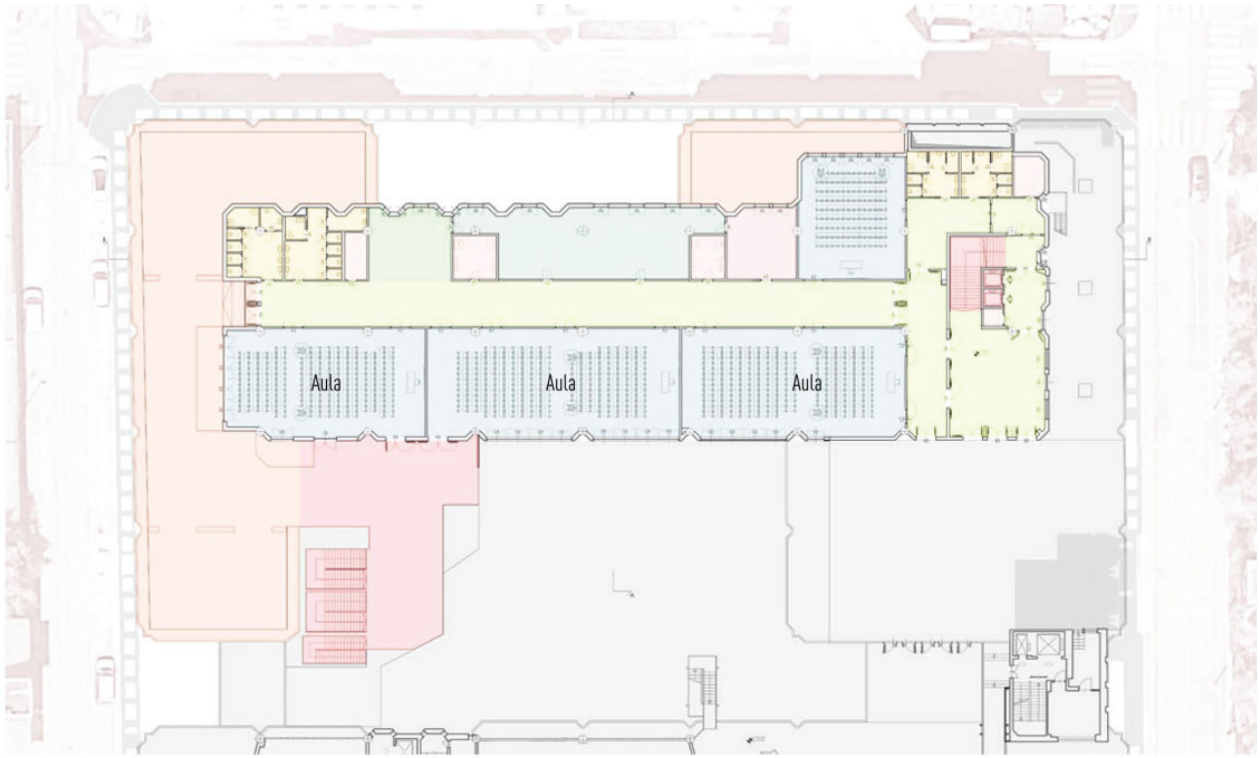
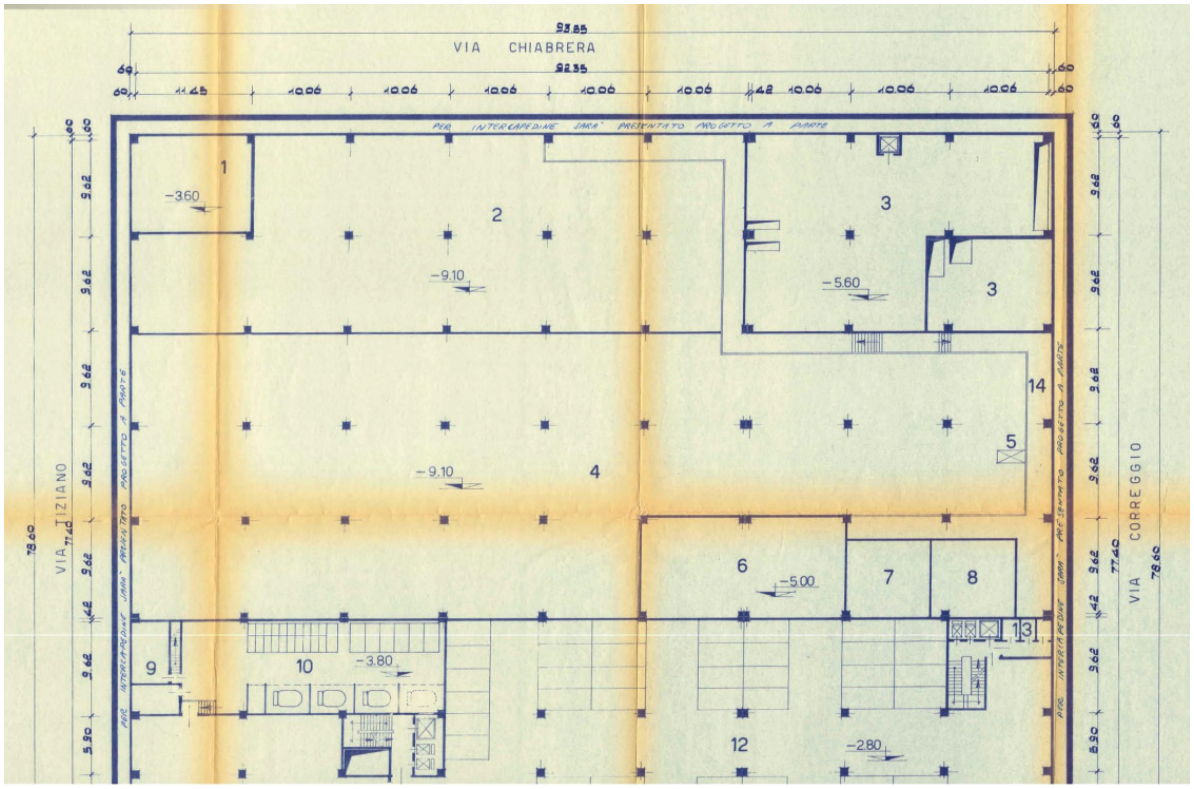


fig. 24- Ex La Stampa second floor, 1965 and now; from Unito website

7.4.1.Case Study: 1965 and Now



Underground

1965: Rotary Press Rooms

Now: Technical and Scientific archive of Unito

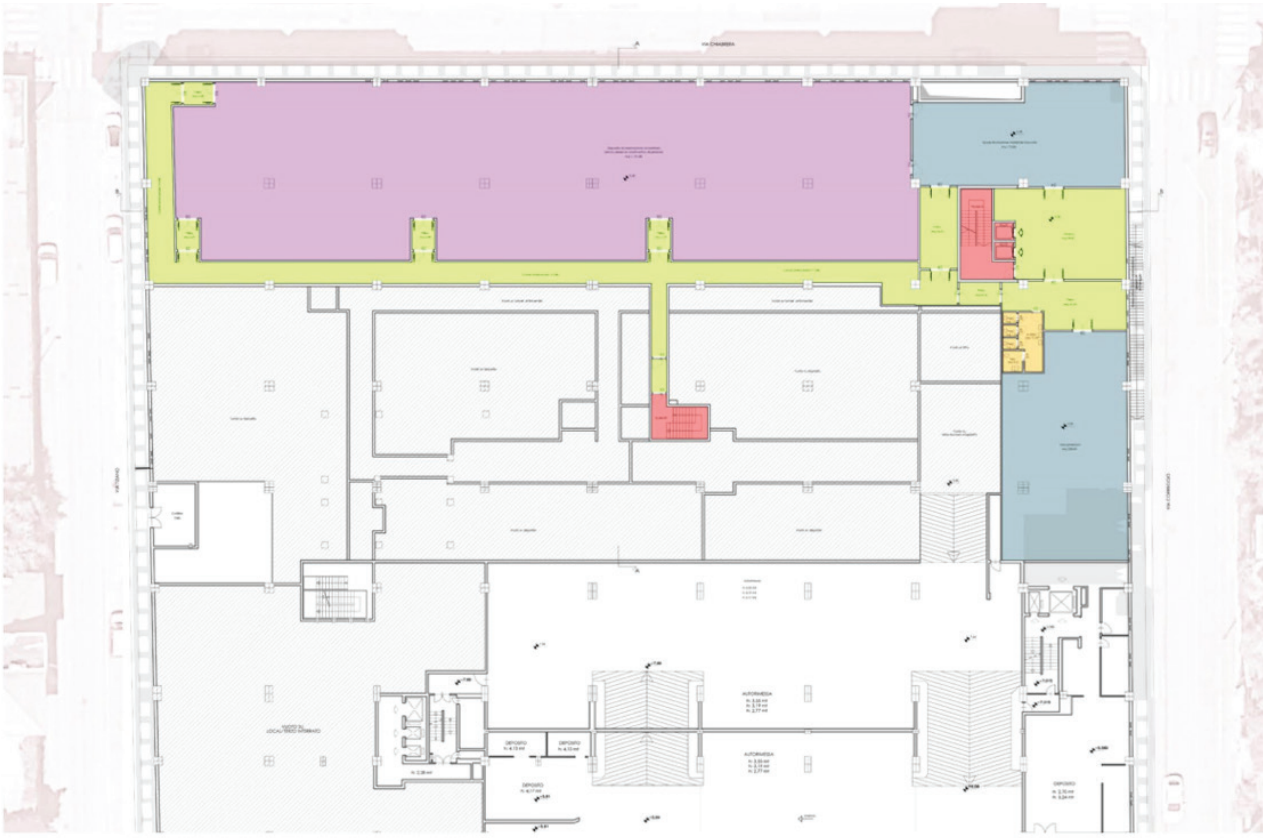


fig. 25- Ex La Stampa underground floor, 1965 and now; from Unito website

fig. 26- Ex La Stampa exterior view, 2025, photo taken by author

Now:

University Campus of UniTo.
Library of Medical sciences.
Archive of Science and Technology of the University of Turin.
3200 Students - 12 Classes.

fig. 27- Ex La Stampa interior view, 1965 and now; from Unito website

7.5.Rooftop Catalog for Students

This section presents a catalog inspired by MVRDV's "Rooftop Catalog," reimagined and adapted to address student housing challenges in Turin. The objective is to test whether a similar model can help solve part of the housing crisis affecting students in the city.
The new catalog is structured into five key categories, each contributing to an improved student experience.

1. Housing
Housing is the core principle of this project. As discussed earlier, Turin faces a housing crisis, particularly for students. Finding suitable accommodations is difficult and expensive, making it crucial to introduce affordable, diverse, and adaptable housing solutions.
This project incorporates a variety of housing typologies, catering to different student groups, needs, and budgets.

Housing Typologies:

1.Apartments – Traditional living spaces for students seeking privacy.
2.Units – Compact yet functional accommodations.
3.Pods – Minimalist, space-efficient micro-living units.
4.Modular Units – Flexible and prefabricated housing solutions.
5.Container Homes – Sustainable, cost-effective housing built from repurposed shipping containers.
6.Terraced Homes – Community-driven housing that balances privacy and shared living.

2. Education
Since this project is specifically designed for students, it is essential to integrate educational facilities within their living environment. Many students prefer to study outside their homes, choosing university study rooms, shared workspaces, or group meeting areas. This catalog provides accessible and well-equipped learning spaces near their residences.

Educational Facilities:

1.Study Rooms – Quiet, individual study spaces.
2.Labs – Equipped areas for scientific and technical research.
3.Workshop Spaces – Creative and practical environments for hands-on learning.
4.Group Study Areas – Collaborative spaces for teamwork and discussions.

3. Social Spaces
A well-rounded student experience requires more than just housing and study areas. Everyone needs a "third space"—a place to socialize, relax, and engage in activities beyond academics. Whether it's meeting friends for coffee, enjoying a community event, or having a meal together, these spaces foster a sense of community and well-being.

Social Space Typologies:

1.Bar/Restaurant – Gathering places for food, drinks, and socializing.
2.Showroom – Spaces for exhibitions, student projects, and cultural events.
3.Meeting/Community Space – Dedicated areas for student organizations and discussions.
4.Playground – Safe, engaging areas for students with children.
5.BBQ Area – Outdoor social spaces for casual gatherings.
6.Dining Hall – Shared meal spaces that promote a sense of community.

4. Greenery & Sustainability
Sustainability is a fundamental aspect of this project. The integration of green spaces and eco-friendly infrastructure significantly enhances quality of life while promoting environmentally responsible behavior.

By incorporating community gardens, students can actively participate in gardening and urban farming, fostering a deeper connection with nature. The inclusion of bike lanes, repair stations, and recycling centers encourages sustainable habits.

Sustainability & Green Space Typologies:

1.Park – Green public spaces for relaxation and recreation.
2.Community Garden – Spaces where students can grow their own plants.
3.Dog Park – Pet-friendly areas to accommodate students with pets.
4.Energy Infrastructure – Renewable energy sources integrated into the project.
5.Bike Parking/Repair Station – Facilities that encourage cycling as a primary mode of transportation.
6.Recycling Center – Dedicated waste management spaces to promote sustainability.

5. Services & Daily Life Amenities
Beyond housing and social spaces, students need essential services to support their daily lives. This project incorporates facilities that enhance convenience and well-being, ensuring that students have access to healthcare, fitness, childcare, and essential utilities within their residential complex.

Service Facilities:

1.Daycare – Support for students with children, allowing them to focus on their studies.
2.Gym – Fitness facilities to encourage physical well-being.
3.Offices (Therapy, Healthcare, etc.) – Spaces for mental health, counseling, and medical services.
4.Laundry Room – Essential on-site laundry services.
5.Equipment Storage – Secure spaces for storing shared tools, sports equipment, or other belongings.

This catalog serves as a comprehensive framework for reimagining student housing in Turin. By integrating diverse housing solutions, educational facilities, social spaces, sustainable infrastructure, and essential services, this project moves toward a functional, inclusive, and student-friendly urban environment.

By utilizing rooftops in key university neighborhoods, we not only address the student housing shortage but also enhance the overall student experience, reinforcing Turin’s identity as a true “university city.”

7.5.Rooftop Catalog for Students

#1 Housing:

- Apartments
- Units
- Pods
- Modular Units
- Container Homes
- Terraced Houses

#2 Education:

- Study Rooms
- Labs
- Workshop Spaces
- Group Study Area

#3 Social:

- Bar / Restaurant
- Show Rooms
- Meeting / Community Spaces
- Playgrounds
- BBQ Area
- Dining Hall

#4 Greenary & Sustainability:

- Parks
- Community Gardens
- Dog Parks
- Energy Infrastructure
- Bike Parking / Repair
- Recycling Center

#5 Services:

- Day Care
- Gym
- Some Offices (therapy)
- Laundry Room
- Equipment Storage

fig. 28- Turin's Student Co-Housing Rooftop Catalog

7.6.Rooftop Catalog: SWOT Analysis

S

Efficient Use of Space
- **Addresses Student Housing Crisis**
- **Enhances University Experience**
- **Sustainable & Eco-Friendly**
- **Reduces Pressure on Housing Market**

Creates a New Layer of Urban Development

W

High Initial Investment
- **Regulatory Challenges**
- **Weather & Climate Considerations**
- **Potential Resistance from Local Residents**

O

Growing Demand for Student Housing
- **Potential for Public-Private Partnerships**
- **Economic Growth & Job Creation**
- **Enhances Turin's Identity as a "University City"**

Encourages Sustainable Lifestyles

T

Legal & Bureaucratic Hurdles
- **Market Resistance from Property Owners**
- **Environmental Risks**
- **Economic Downturns**
- **Social Acceptance & Adaptability**

fig. 29- Catalog's SWOT analysis

7.7.Vertical Extention Examples

Case Study No.1: Vertical Extension of an Early 20th-Century Residential Building

Location: Corso Massimo D'Azeglio 20/A - Turin

Construction: 1900 - 1915

Report on the vertical extension of a residential building, of documentary interest, significant both in the relationship between the pre-existing structure and the new intervention, and in the technological solution of the metal structure.

Architect : Gino Becker

Year of Intervention: 1958

fig. 30- Corso Massimo D'Azeglio 20/A, Turin; from MuseoTorino

fig. 31- Corso Massimo D'Azeglio 20/A, Turin; photo taken by author

7.7.Vertical Extention Examples

Case Study No.2: Steel Frame Vertical Extension to an Existing Building – Sheffield

Location: 192 Shoreham Street - Sheffield

Construction: -

In this project, a light steel frame vertical extension was added on top of an existing building. The building was an industrial victorian brick structure. Other structural elements are steel/concrete floor decks and aluminum profile sheets. The steel frame supports the brick wall as well as the extension (Project Orange, 2012).

Architect : Project Orange

Year of Intervention: 2012

fig. 32- Shoreham Street building, Sheffield; from Project Orange Website

fig. 33- Shoreham Street building, Sheffield; from Project Orange Website

7.8.Design Development

7.8.1. Users and Their Needs:

This project is designed to cater to students who choose Turin as their academic destination, including both Italian students from other regions and international students.
To better understand their needs, we have categorized them into the following groups:

1.Single Students
These students are enrolled in one of Turin's universities and move to the city alone. Their stay typically ranges between 2 to 6 years.
2. Students with Families
Some students relocate to Turin with their families while pursuing their education. Their length of stay also varies between 2 to 6 years. This group is further divided into:
Couples with children
Couples without children
3. Erasmus Students
Erasmus students come to Turin for exchange programs, with their stay typically lasting between 6 months to 1 year.

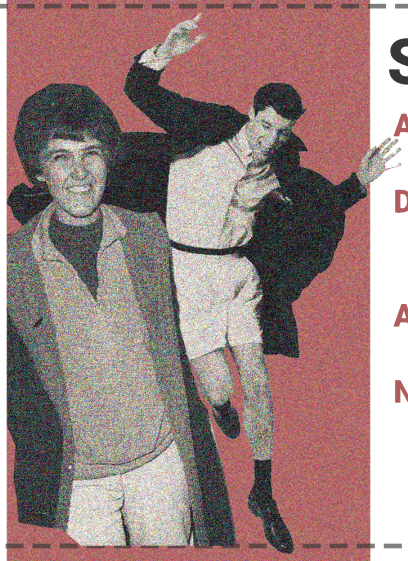
Each of these groups has distinct housing needs and expectations, which we have identified through questionnaires and interviews conducted specifically for this project. Students were asked to describe their current housing situations and share their accommodation preferences, allowing us to design living solutions that align with their unique requirements.

Students have a range of specific needs that must be considered when designing their living spaces:

1. Essential Private Spaces
At a fundamental level, students require:
Private living spaces for rest and personal activities
Quiet study areas to focus on their academic work
Basic facilities such as kitchens and bathrooms for daily use
2. Social & Recreational Spaces
Beyond their basic needs, students seek spaces for interaction and relaxation, including:
Common areas where they can read, study in groups, or invite friends
Lounge and gathering spaces for socializing, entertainment, and casual discussions
Flexible seating areas that encourage both individual and collective activities
3. Supportive Facilities for Daily Life
Students also benefit from spaces that assist them in managing their routines. For example:

Daycare services for students with children, allowing them to focus on their studies without concern
Recreational and cultural spaces such as parks, community centers, and exhibition areas, offering opportunities to explore interests beyond academics
Shared amenities that create a sense of community and encourage personal growth
By addressing these diverse needs, the project aims to enhance students' academic experience while supporting their social, personal, and cultural well-being.

Typology of Users



Single Students

Age: 19 - 30

Duration of Stay: Between 2 - 6 years depending on the type of program.

Affordable Rent: Between 350 - 600

Needs: Private Space- Studying Space- Community Space- Gym- Show Room- Green Space- Natural Light and Greenary

Students with Families

Age: 22 - 30

Duration of Stay: Between 2 - 6 years depending on the type of program.

Affordable Rent: Between 500 - 800

Needs: Private Space- Studying Space- Day Care- Playground- Gym- Show Room- Green Space- Natural Light and Greenary

Erasmus Students

Age: 19 - 30

Duration of Stay: Between 6 months to 1 year depending on the type of program.

Affordable Rent: Between 350 - 500

Needs: Private Space- Studying Space- Community Space- Gym- Show Room- Green Space- Natural Light and Greenary

fig. 34- Project users and their needs

7.8.2. Before and After

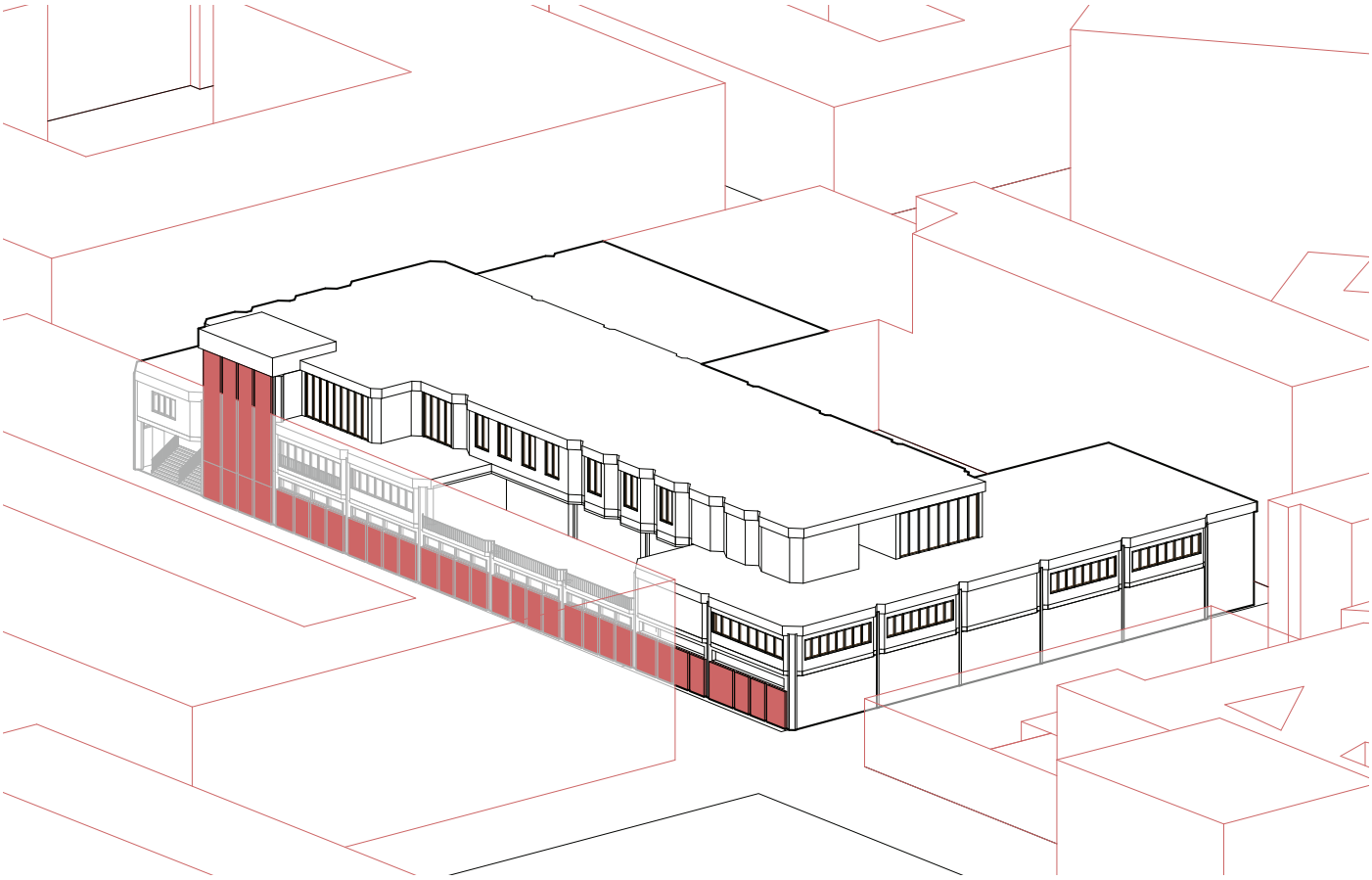


fig. 35- Project building before the intervention

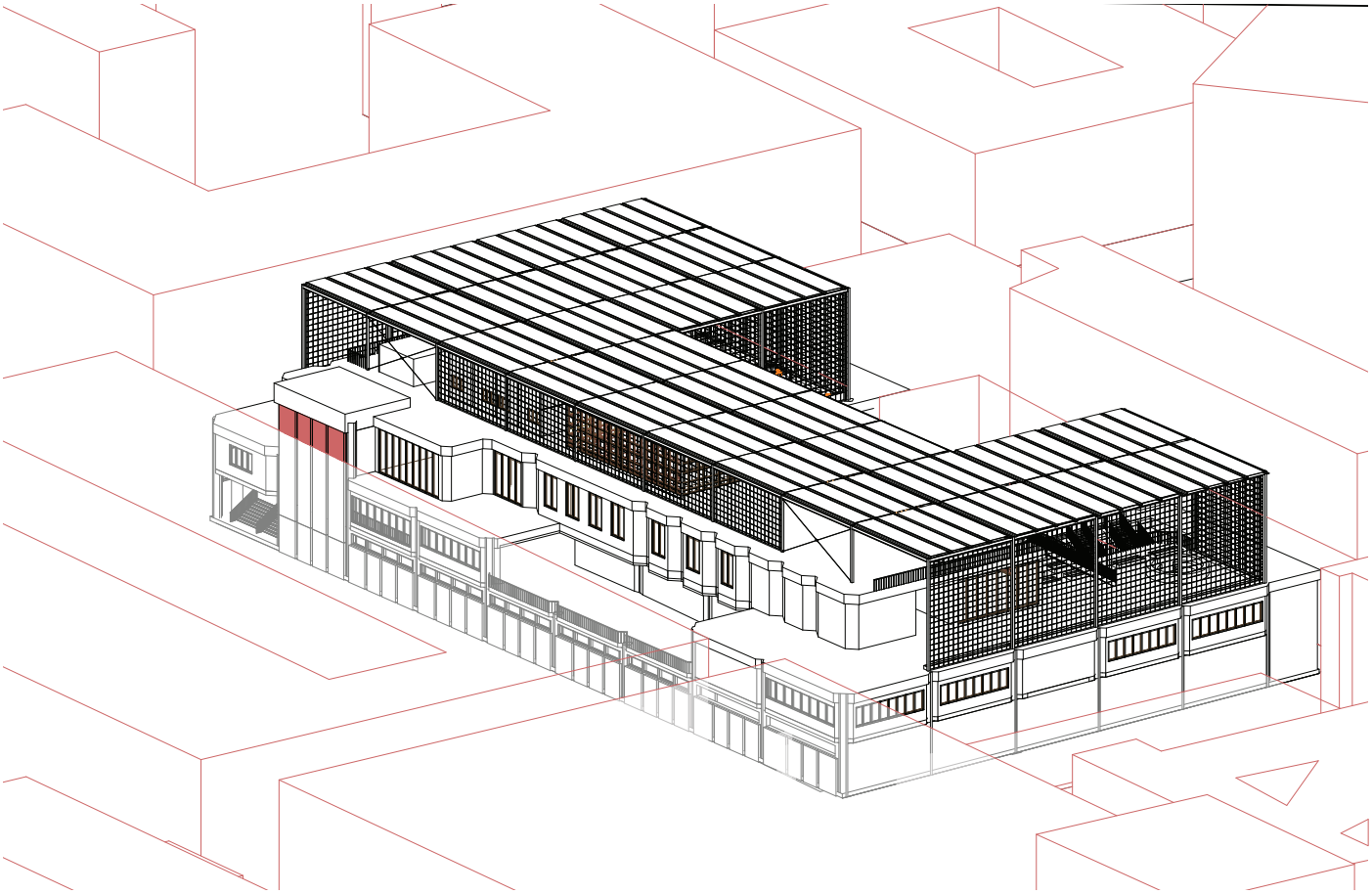


fig. 36- Project building after the intervention

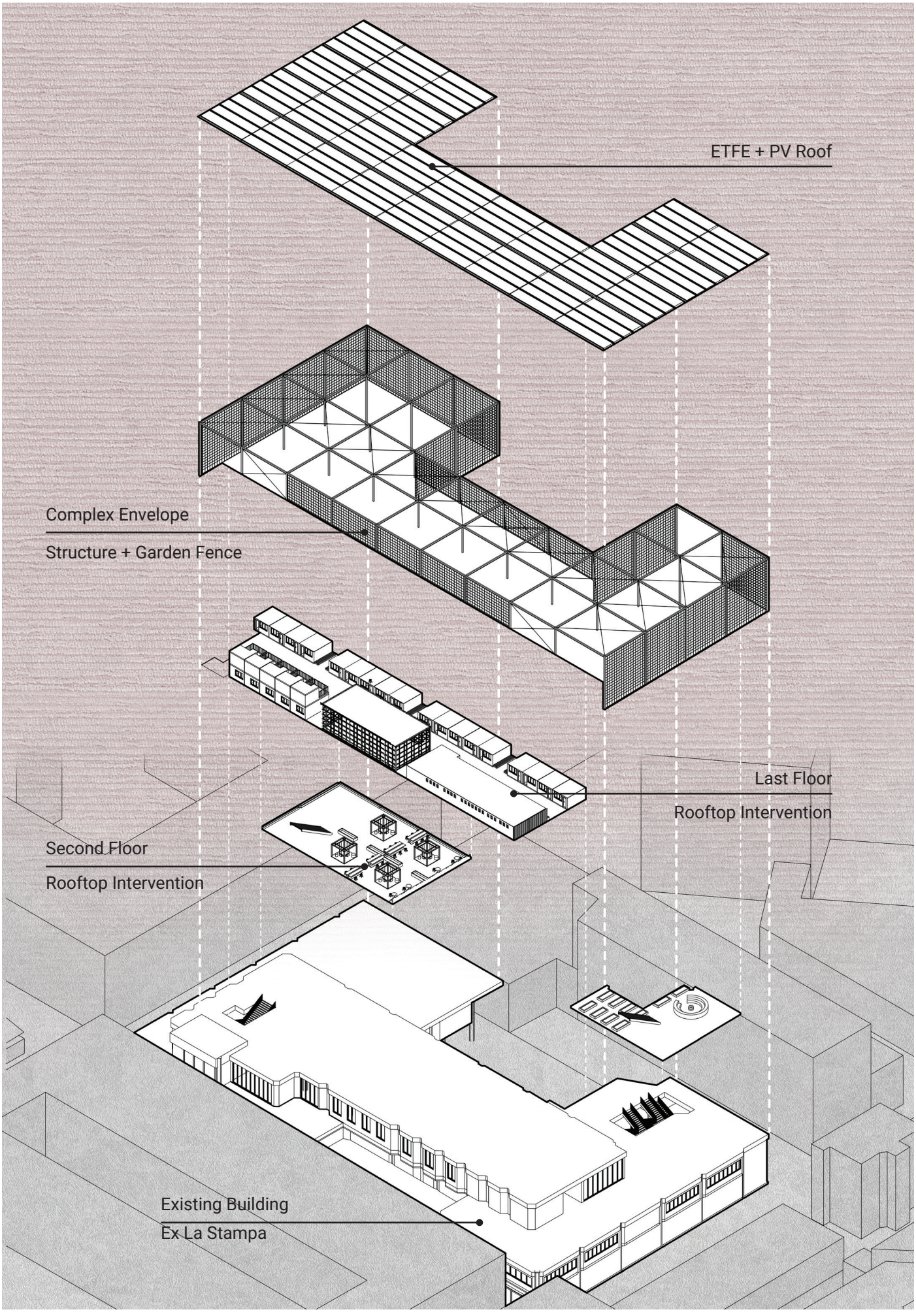


fig. 37- Exploded Axonometry Of The Intervention

7.8.3. Design Drawings

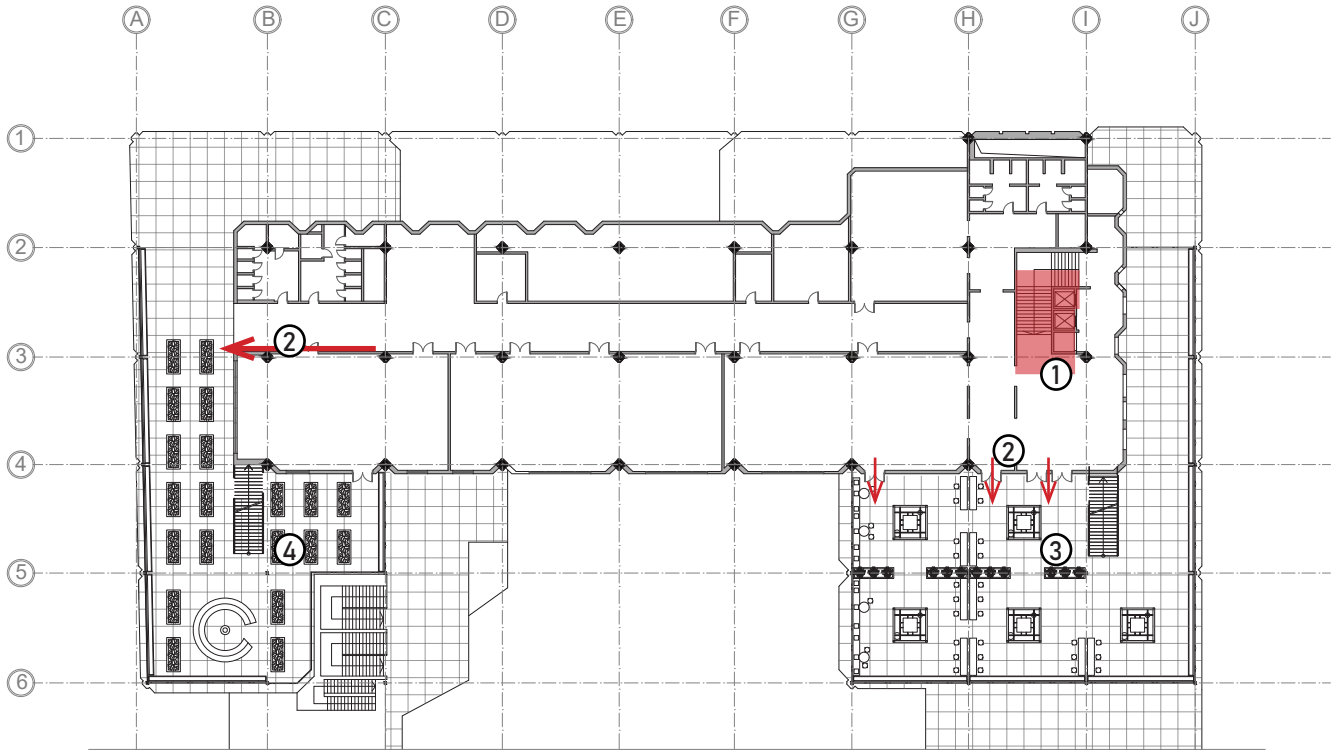


fig. 38- Second Floor Plan - Intervention

Legend
1. Entrance
2. Complex Accessibility
3. Public Study Room
4. Community Garden

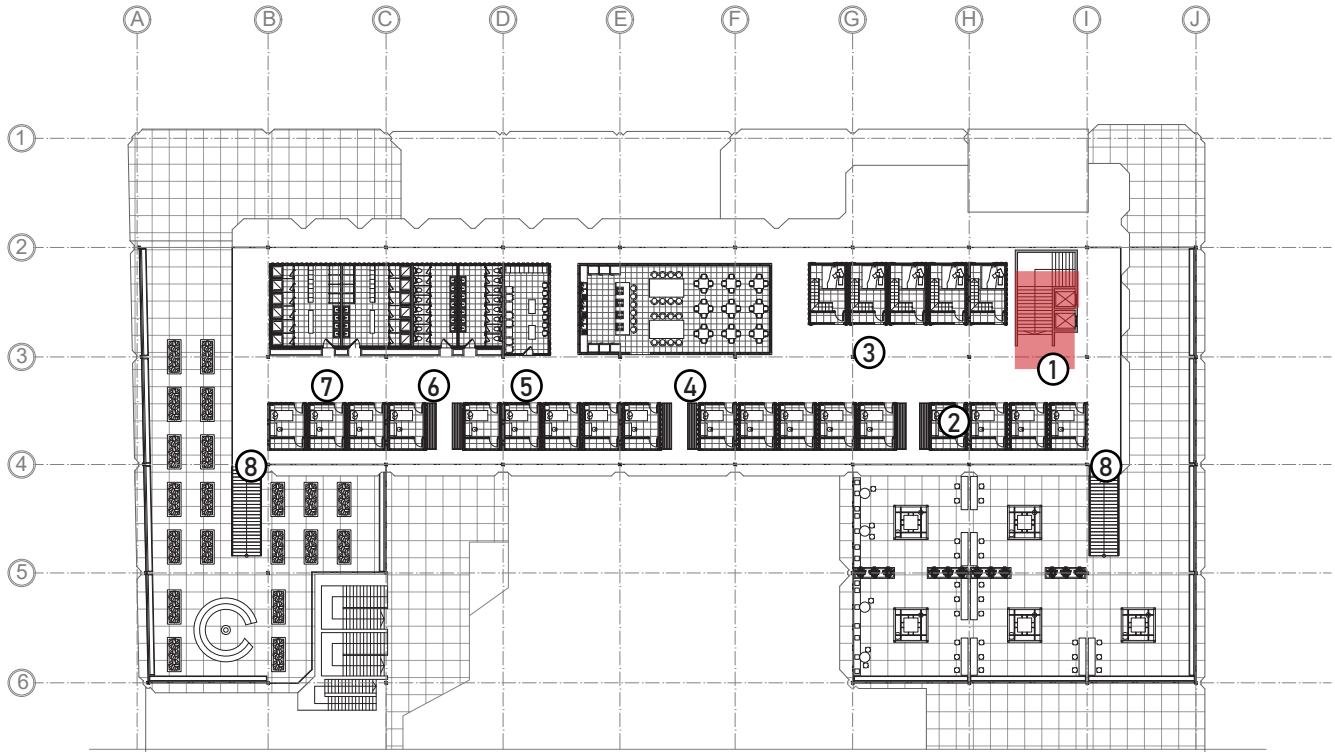


fig. 39- Rooftop Plan - Intervention

Legend
1. Entrance
2. Room Type 1
3. Room Type 2
4. Kitchen/Dining Room
5. Laundry Room
6. WC
7. Shower
8. Second Floor Accessibility

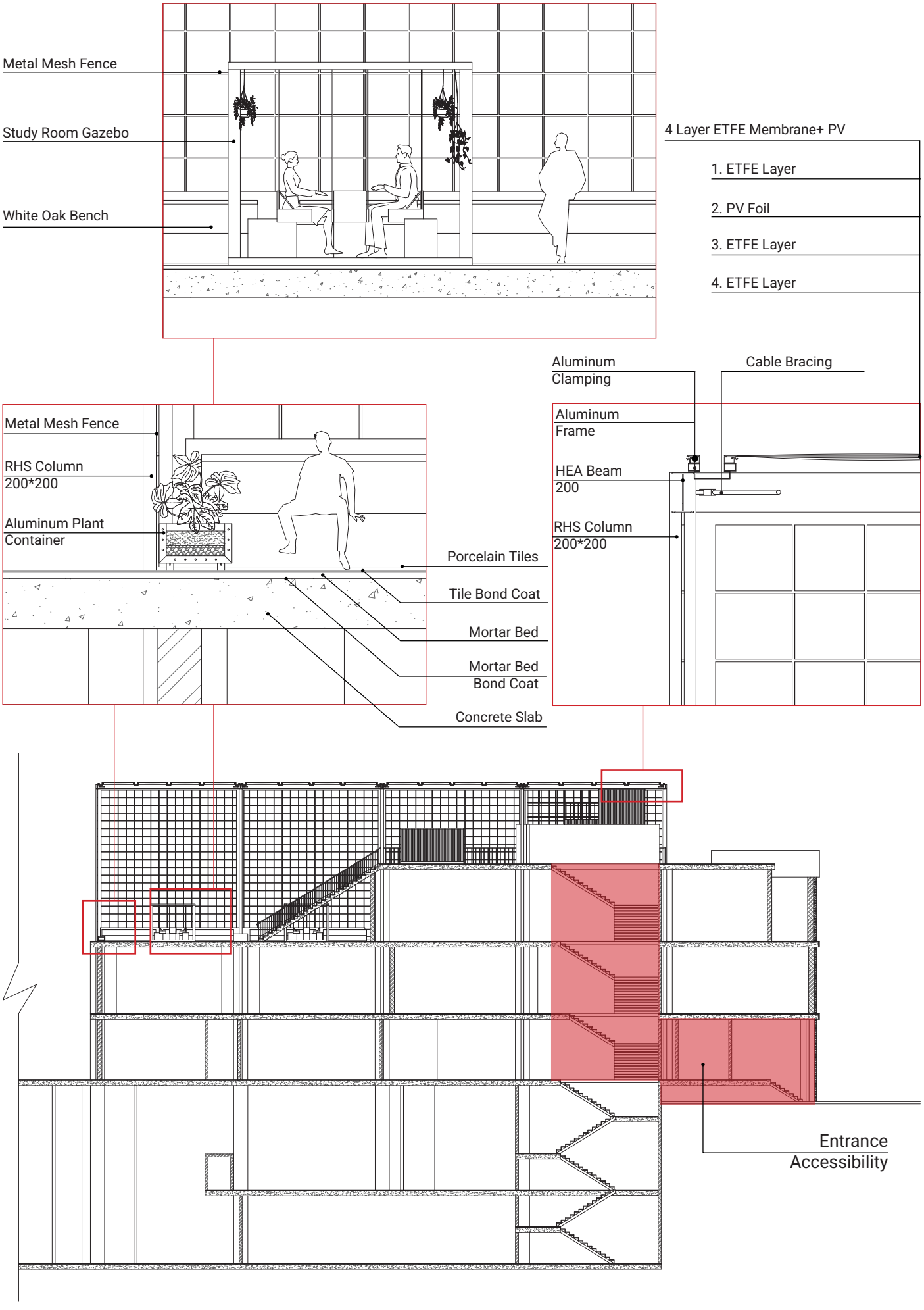


fig. 40- Intervention: Section and Details

fig. 41- Street View Of The Existing Situation - Photo Taken By Author

In fig. 41, we see the street view of the existing situation, showing the main entrance and the existing rooftop of the Ex La Stampa building. While in fig. 42, the intervention of the rooftop is visible from the street.

In the new intervention, the entrance to the complex remains the same. Both residents and students who want to use the public spaces such as the study room and the community garden, can use the same staircases and elevators already existing in the building.

fig. 42- Street View Of The Intervention

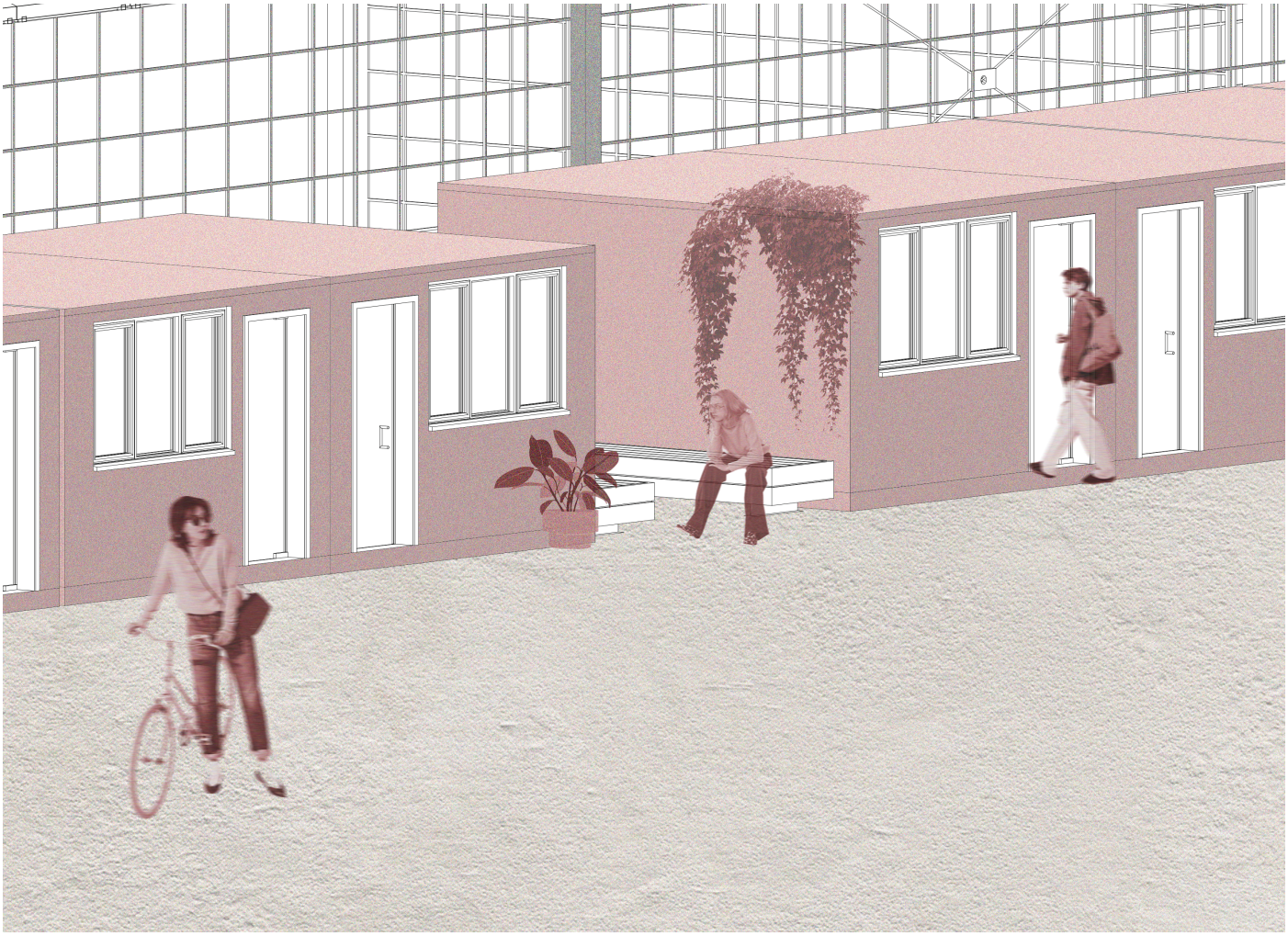


fig. 43- Intervention: Rooftop Living Containers

The common corridor is located on the last rooftop. This corridor connects the living units to the shared facilities. This floor is designed only for the residents.

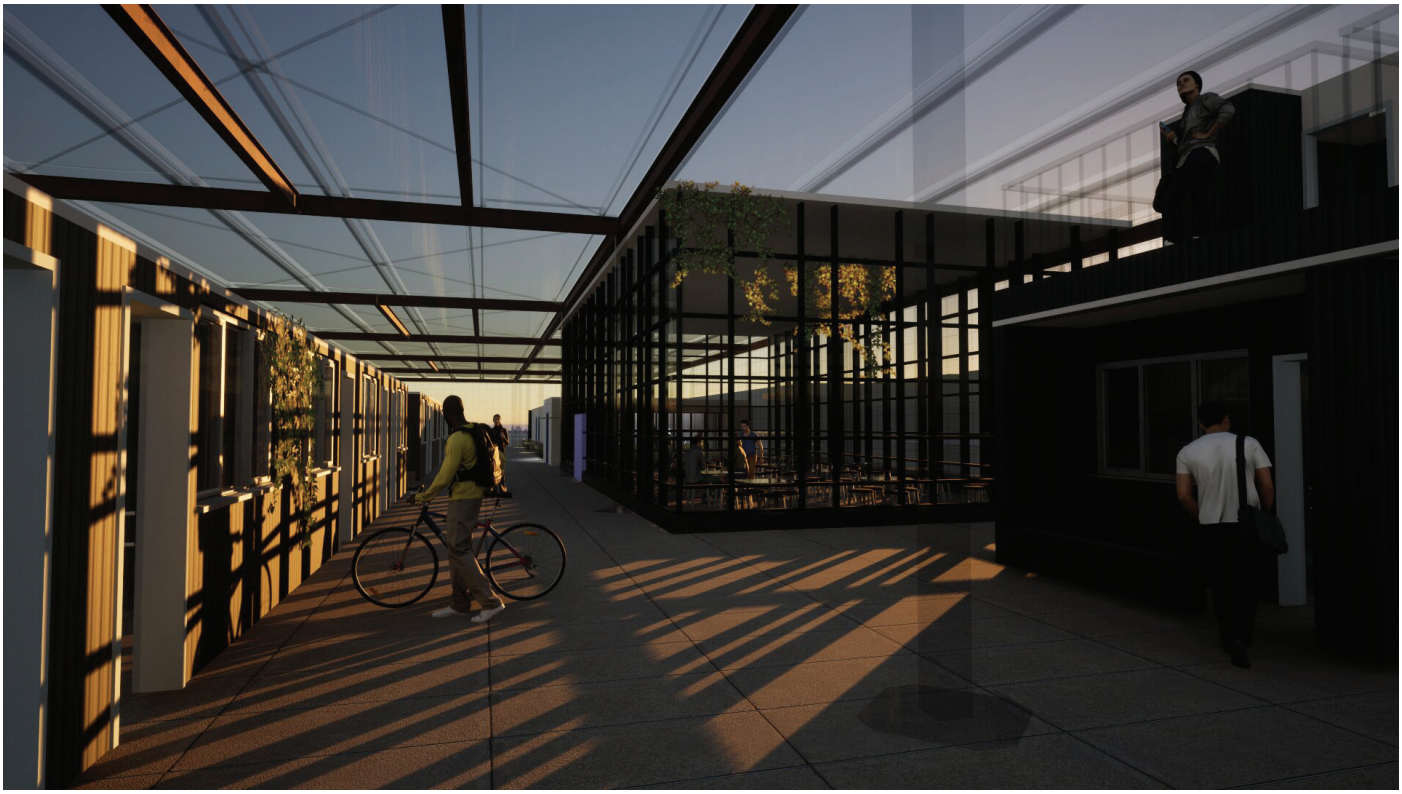


fig. 44- Intervention: Rooftop Living Containers and Common Spaces

fig. 45- Intervention: Living Unit Balconies and Common Area

Within the living spaces and other main facilities on the last floor, there are also some spaces designed just to sit around.

One of the goals of this project is to create community, and these spaces give the chance to the residents to sit around and connect in the middle of the daily activities.

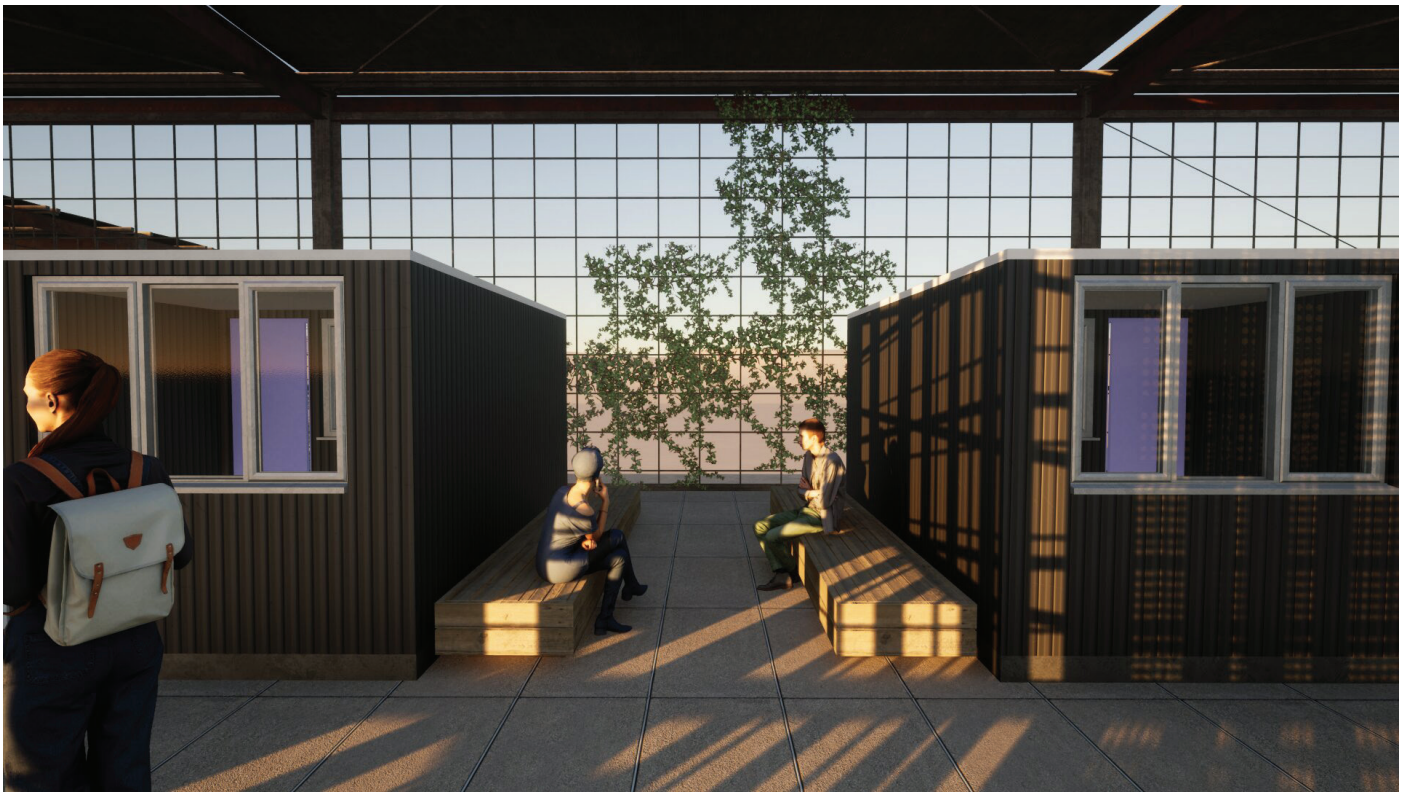


fig. 46- Intervention: Common Corridor

Container Room Type 1:

This Room was designed for single students who want a short term or long term accommodation. The room has one bed, a balcony, Studying space and closet.

In the construction of the room, light material was choen to make it suitable for the rooftop use. The main materials are wood and steel. Also sufficient insulation was used on all sides of the room.

All the necessary facilities such as bathrooms, laundry room, kitchen, dining room and study room can be found in the shared and common area.

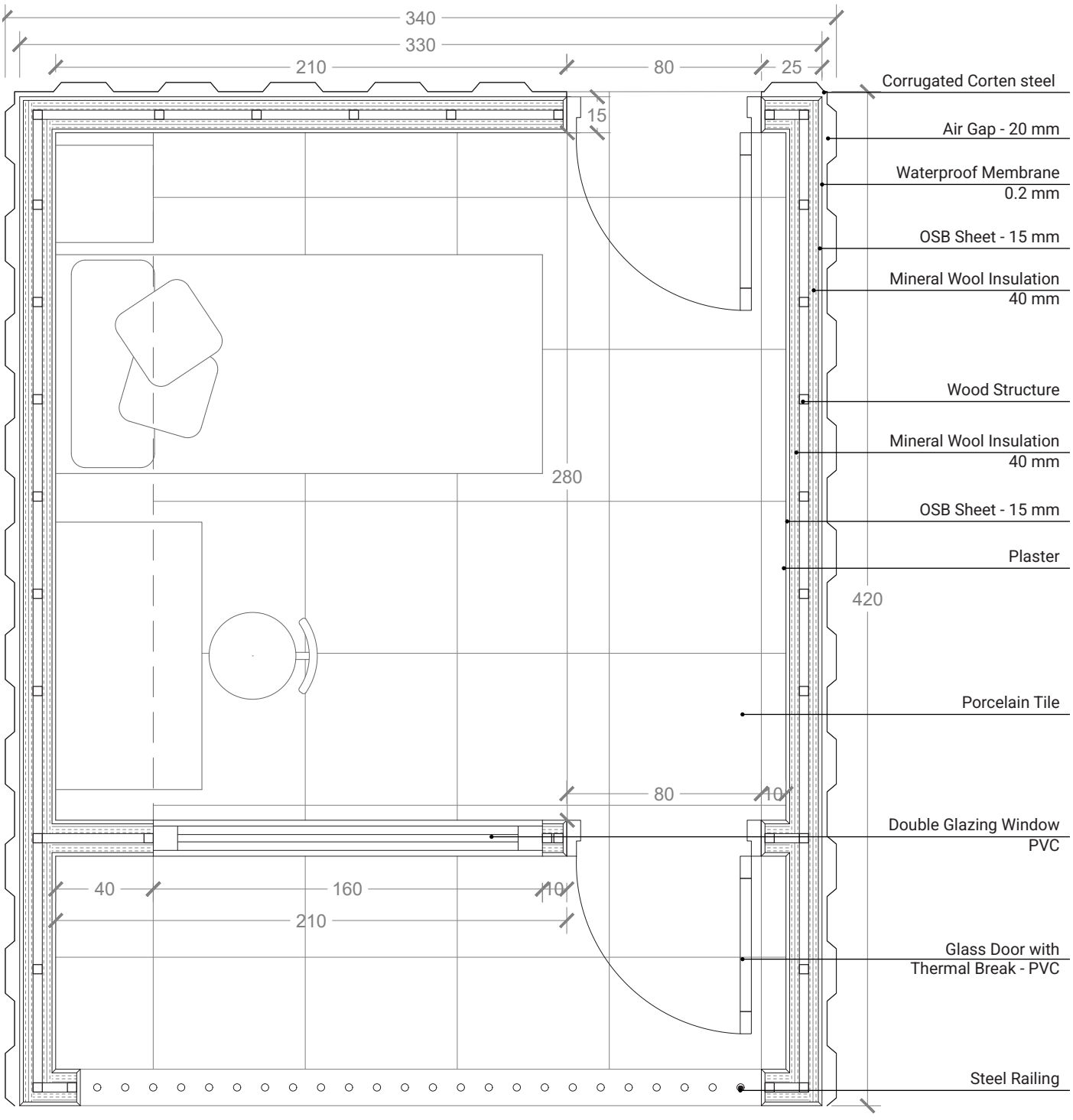


fig. 47- Intervention: Room Type 1, Single Bedroom Plan - Annotation in cm

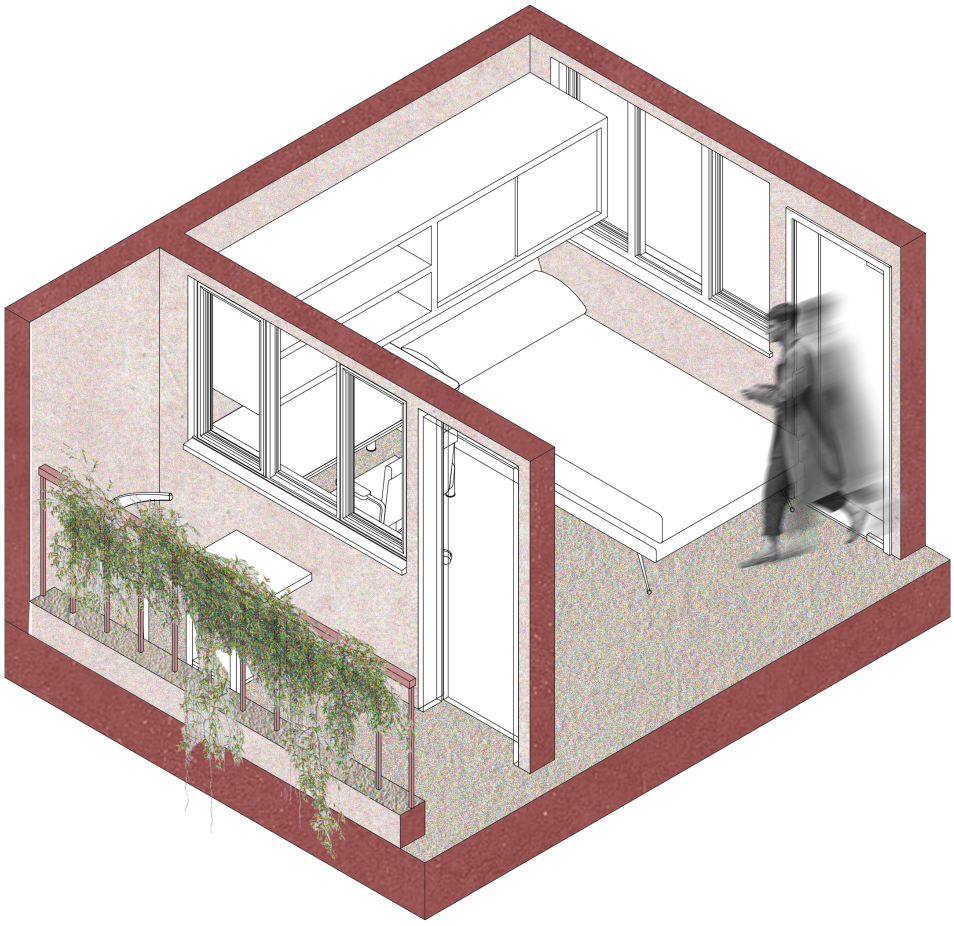


fig. 48- Intervention: Room Type 1, Single Bedroom 3D View

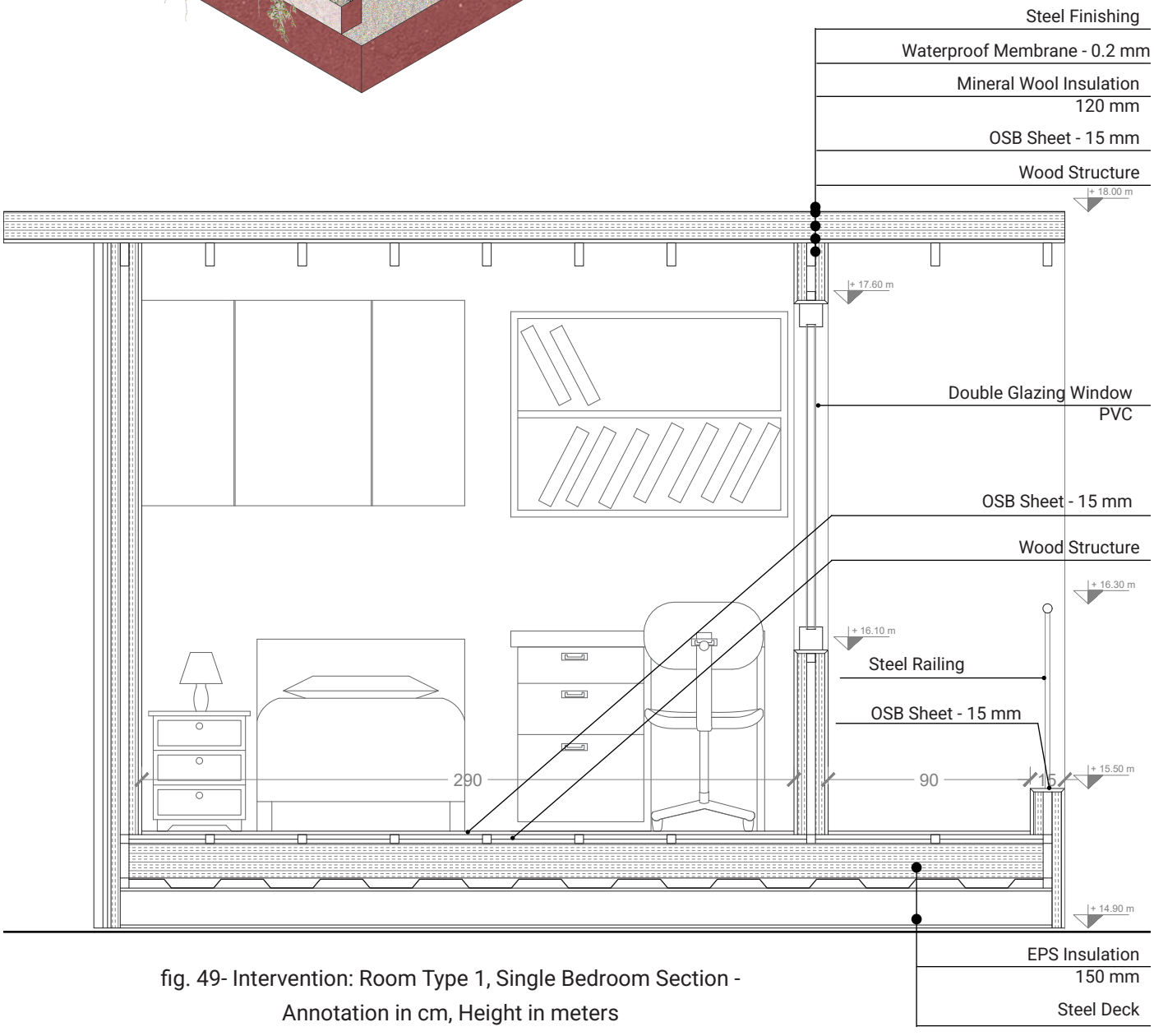


fig. 49- Intervention: Room Type 1, Single Bedroom Section - Annotation in cm, Height in meters

Container Room Type 2:

This Room was designed for students with families or students who want to share a room. This room type is only used as private sleeping space and it also has a rooftop balcony which is accessible through the second floor. The materials and details are the same as the container room type 1.

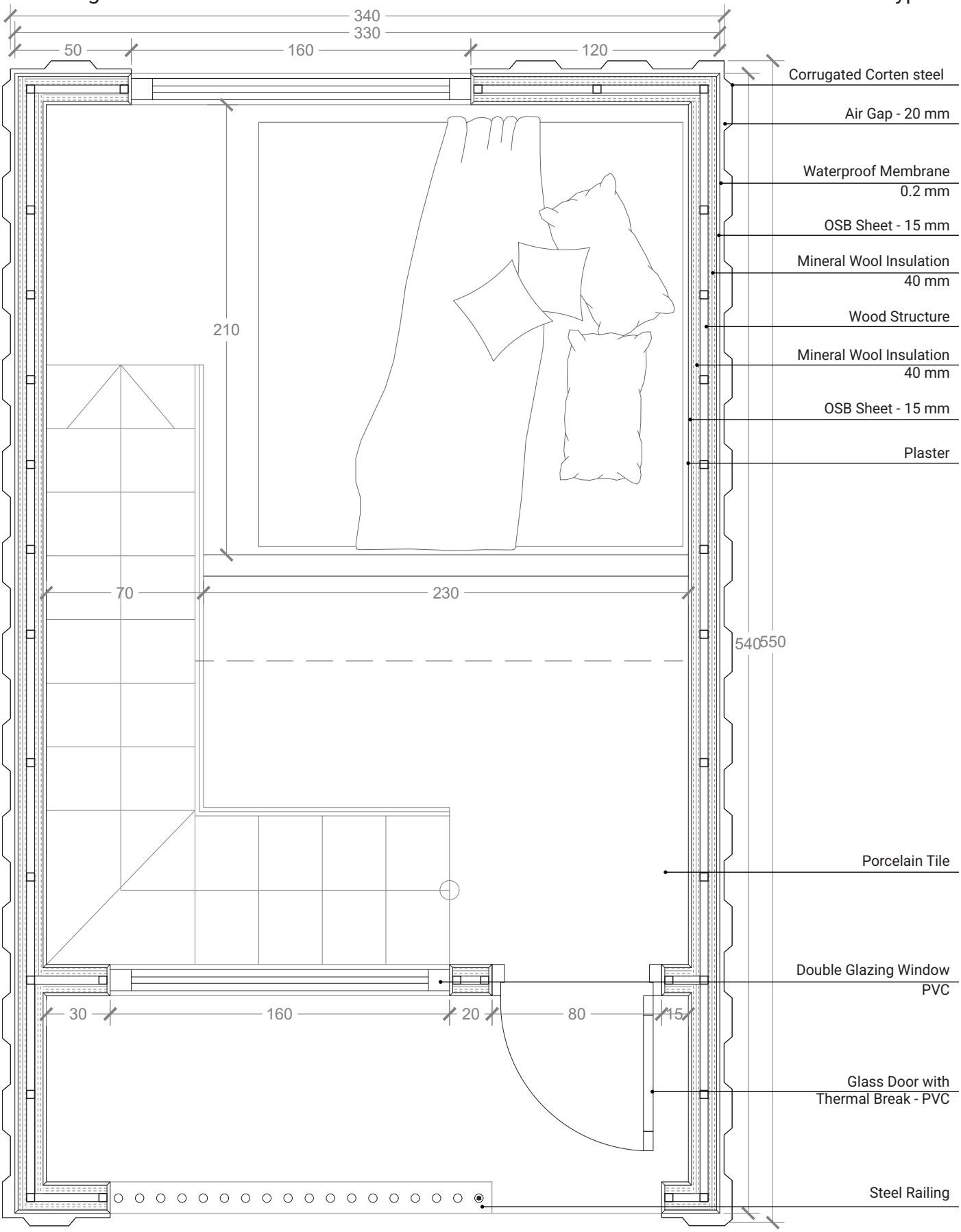


fig. 50- Intervention: Room Type 2, Bedroom for Families, 1st Floor Plan - Annotation in cm

Container Room Type 2:

The second floor includes a single bed and a balcony which is open to the common corridor of the complex. This floor can already be used as the private studying area for the resident.

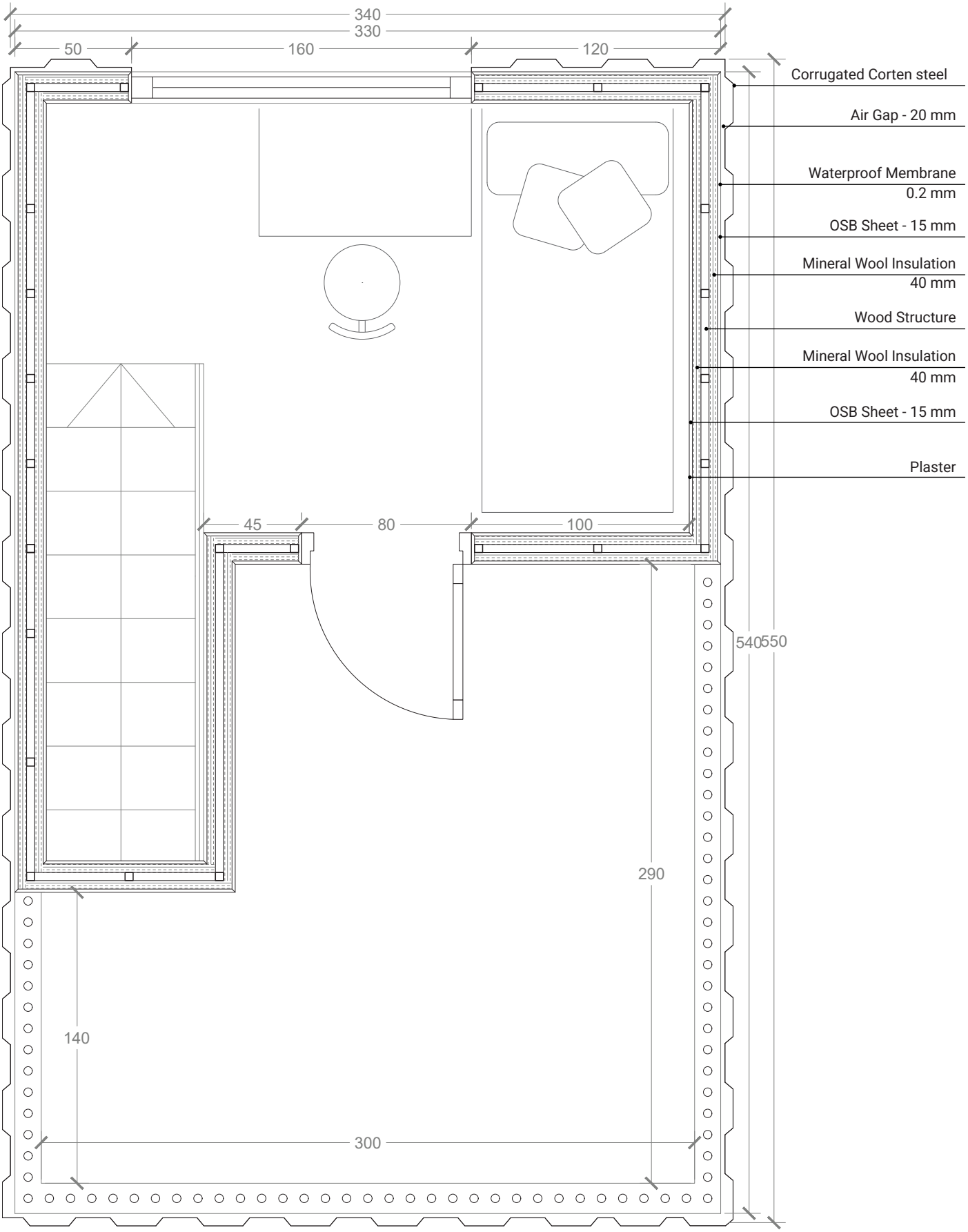


fig. 51- Intervention: Room Type 2, Bedroom for Families, 2nd Floor Plan - Annotation in cm

fig. 52- Intervention: Room Type 2, Bedroom for Families 3D View

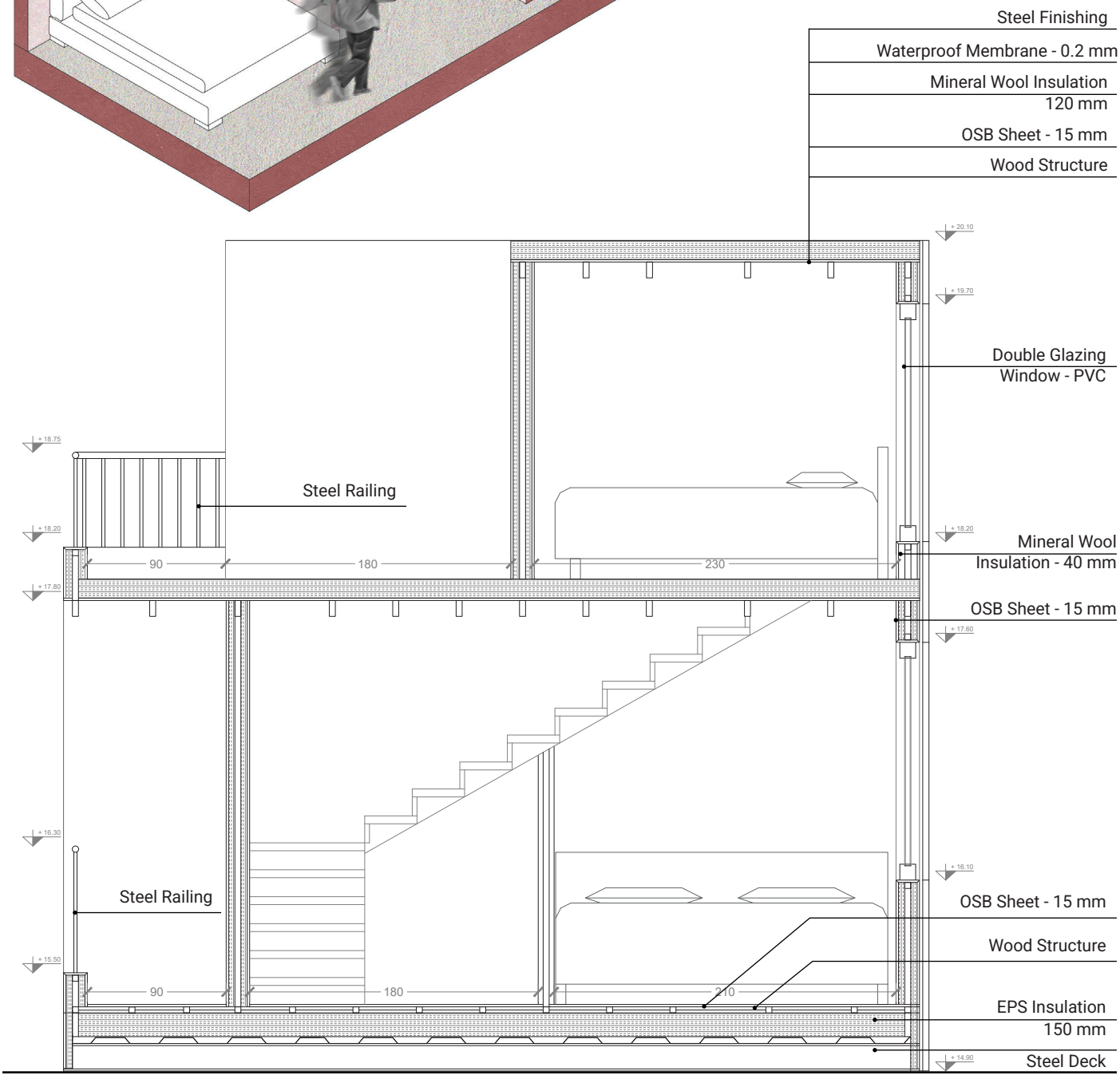


fig. 53- Intervention: Room Type 2, Bedroom for Families, 2nd Floor Section - Annotation in cm, Height in meters

fig. 54- Intervention: Rooftop Open-Air Study Room

The common study room, is one of the public spaces of this project. Both residents and other students can use this space for studying, group meeting and other social gatherings. It is located on the second floor and is accessible through the main staircase and elevator.

The study room is surrounded by vertical gardens, which also has other functions. While provideng a platform for the plantation to grow on, these metal fences define the project limits and also ensure the security for the usesrs.

fig. 55- Intervention: Rooftop Open-Air Study Room

fig. 56- Intervention: Rooftop Open-Air Study Room and the Living Units

fig. 57- Intervention: Common Roof Garden and Fire Place

Study Room Gazebo:

The gazebo was designed as one of the study room furnitures. It provides space for studying, group gatherings and meetings. The material used in the gazebo was Thermowood.

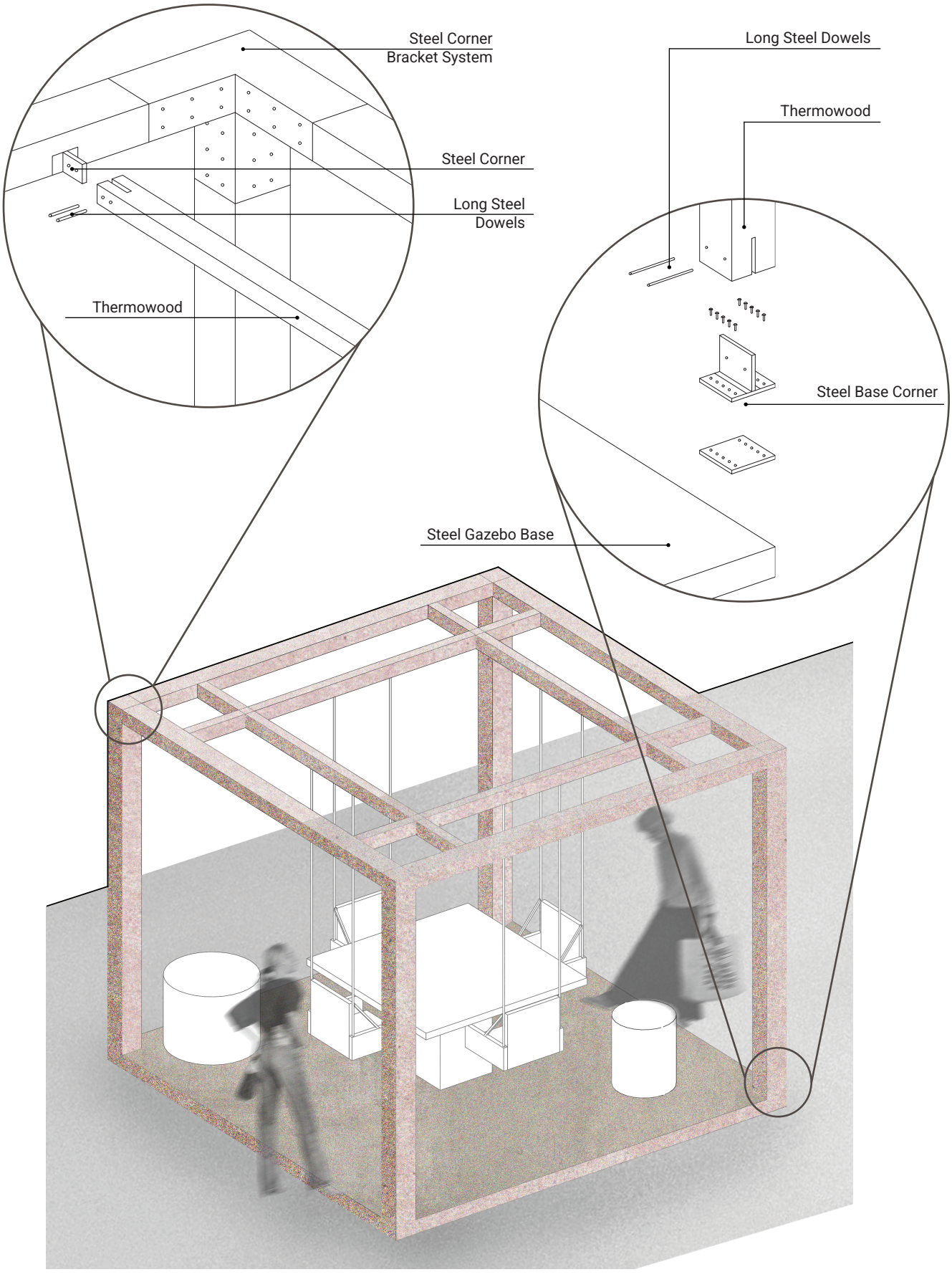


fig. 58- Intervention: Study Room Gazebo and Material Details

fig. 59- Intervention: Rooftop Study Room

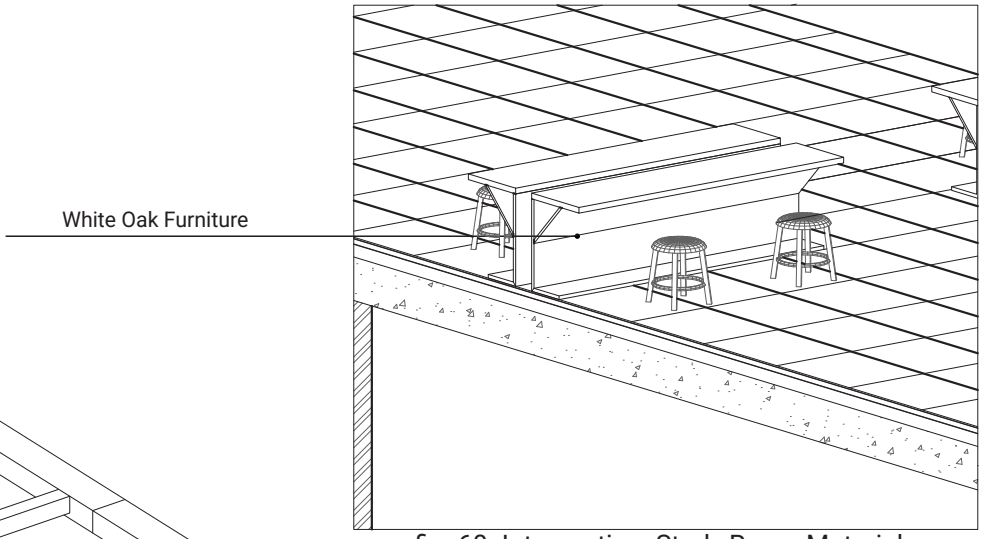


fig. 60- Intervention: Study Room Materials

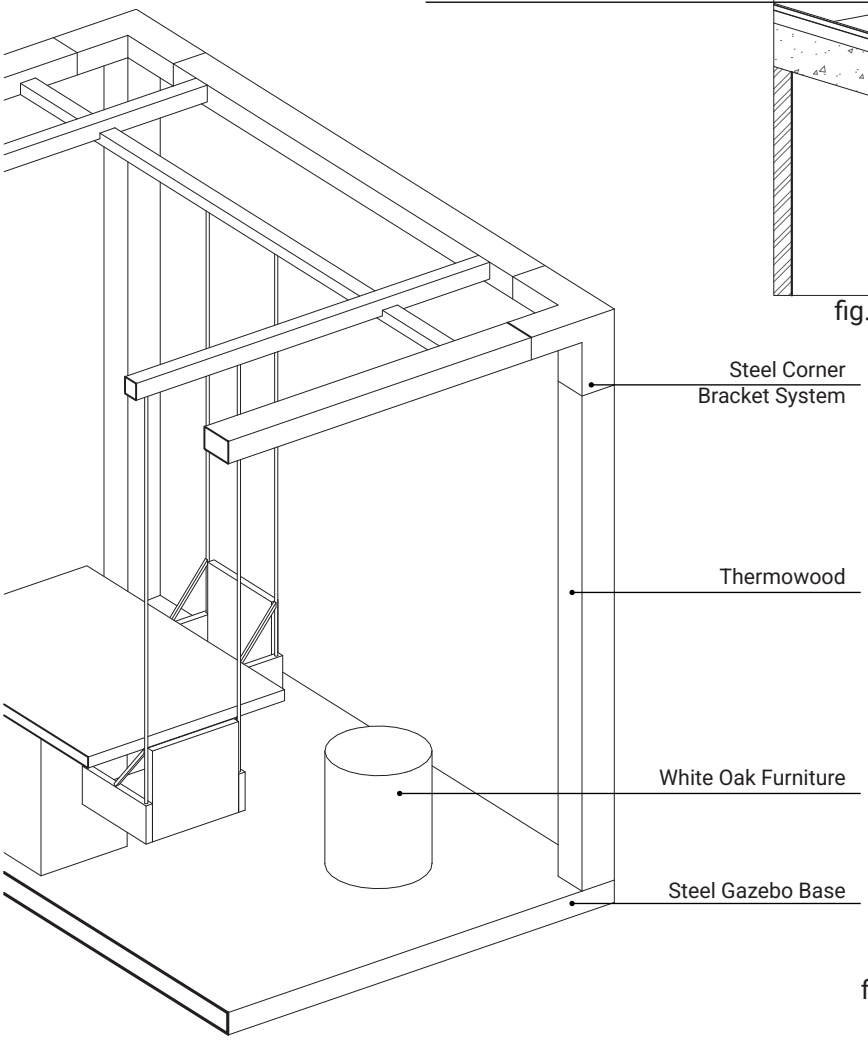


fig. 61- Intervention: Gazebo Materials

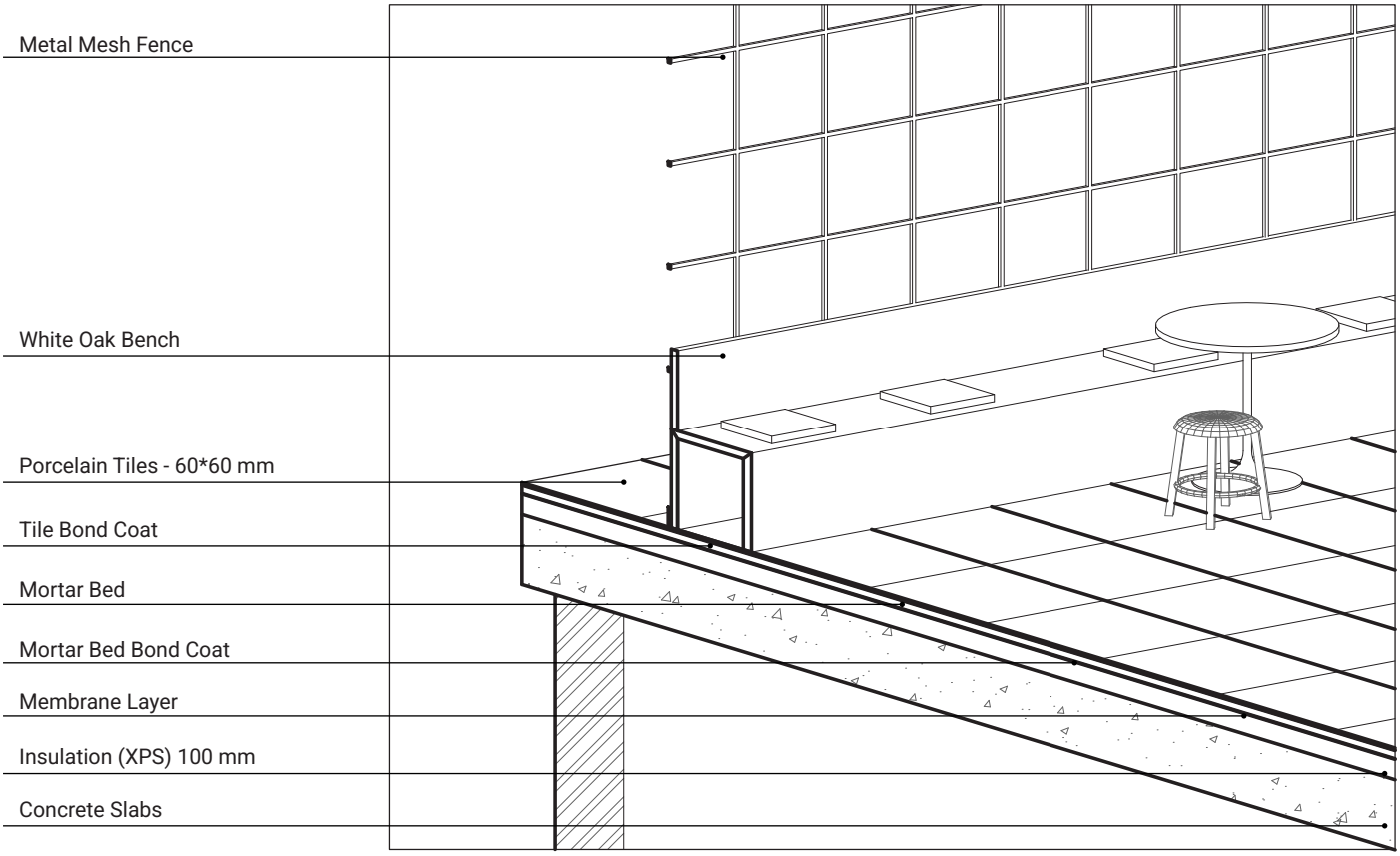
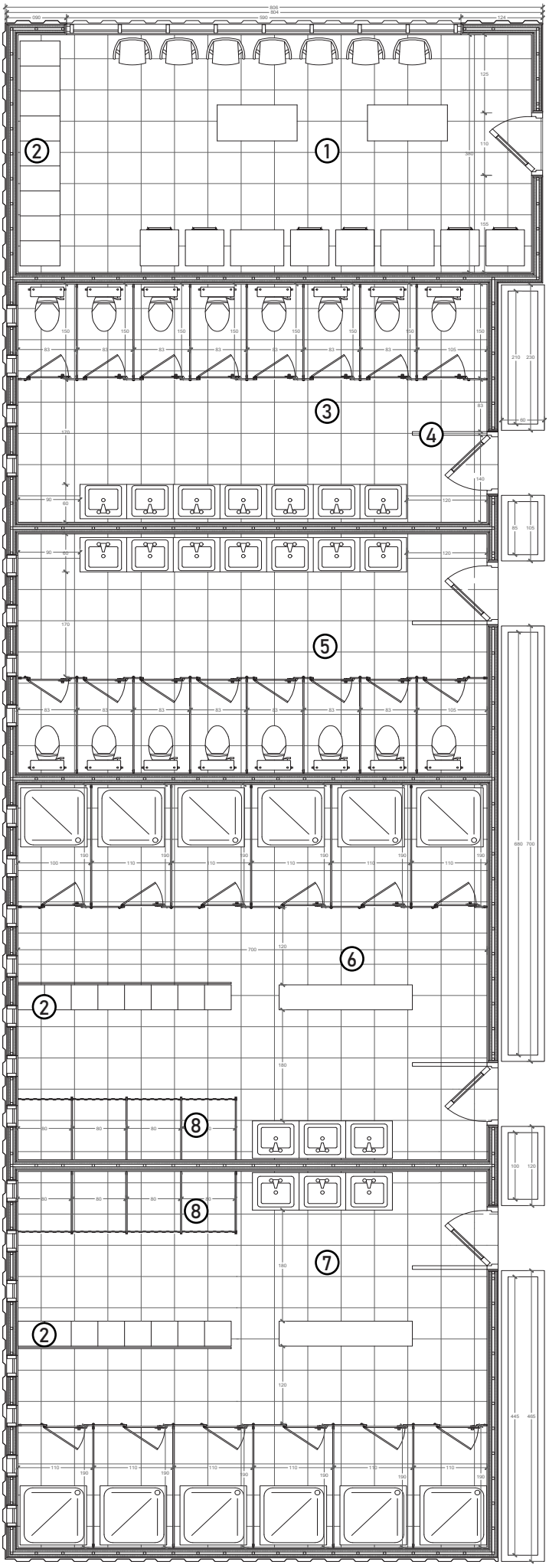


fig. 62- Intervention: Rooftop Study Room Materials and Furniture

All the materials chosen for this project, are light for the rooftop use. It was taken into consside-ration that the minimum weight has to be applied to the rooftop while also paying attention to the durability of the materials.

fig. 63- Intervention: Rooftop and Plant Container Details



Bathroom, WC and Laundry Room:

These services have been designed for shared use. The bathroom and WC are divided foe men and women and the laundry room is for all the residents.

The total number of the toilet stalls are 16 (which is 8 for men and 8 for women. While the total number of the bathrooms are 12 (of which 6 for men and 6 for women). The total number of the laundry machines are 6.

In the bathroom and the laundry room, there are lockers which can be also used as storage for the detergents.

Number of laundry machines: 6

Number of WC stalls: 16

Number of showers: 12

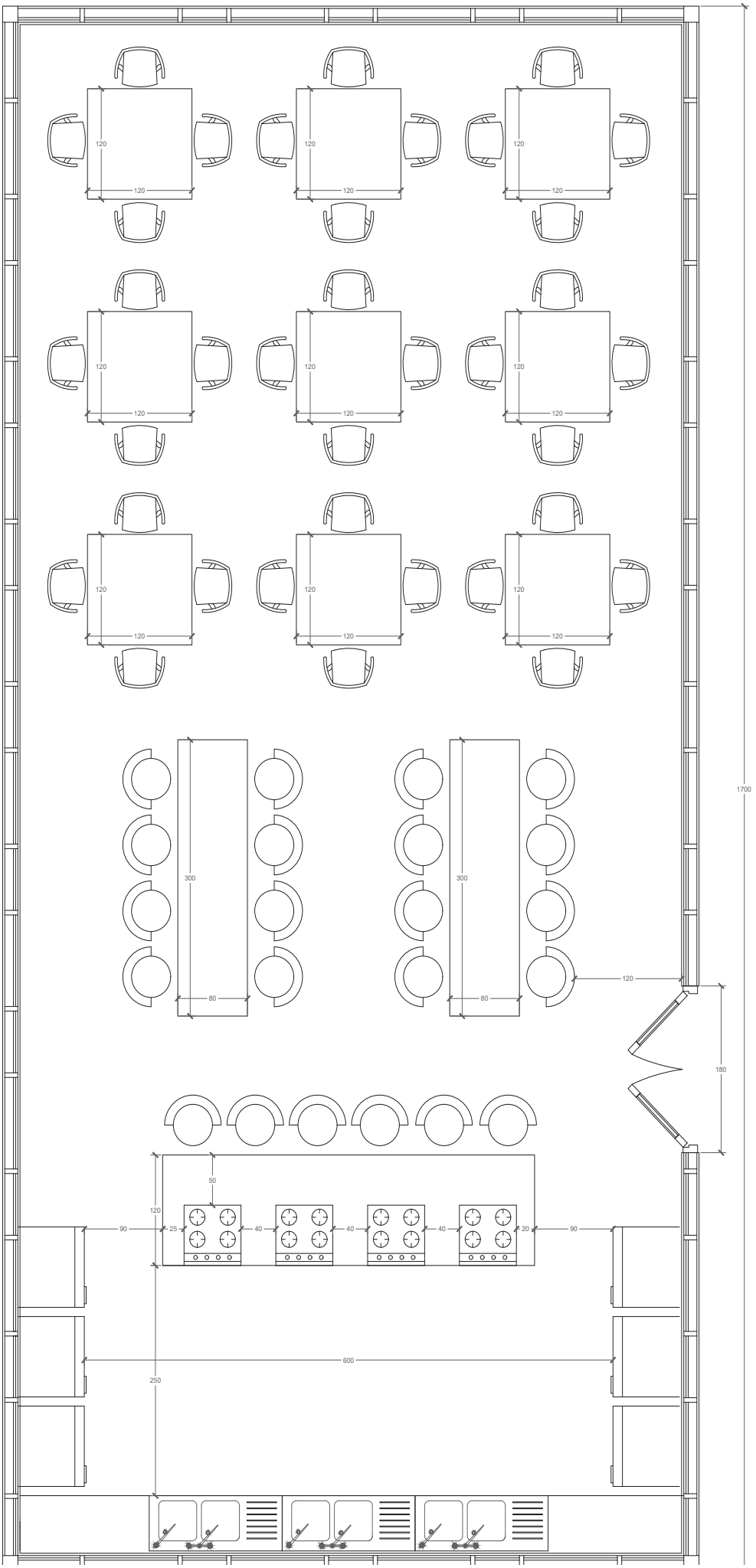
Legend

1. Laundry Room
2. Lockers
3. Women WC
4. Partition for Privacy
5. Men WC
6. Women Bathroom
7. Men Bathroom
8. Changing Room

fig. 64- Intervention: Bathroom, WC and Laundry Room

fig. 65- Intervention: Laundry Room

fig. 66- Intervention: Men WC



Kitchen and Dining Room

The kitchen and the Dining Room was designed to be shared by all the residents.

The Dining Room space can also be used as a study room and it is open to non-resident students as well. It can host 58 people at the same time. While the kitchen area is only for the use of the residents.

This space is meant to encourage the residents toward community. For this goal, there are big dining tables for multiple people to sit arround and communicate during meal time.

fig. 67- Intervention: Kitchen and Dining Room

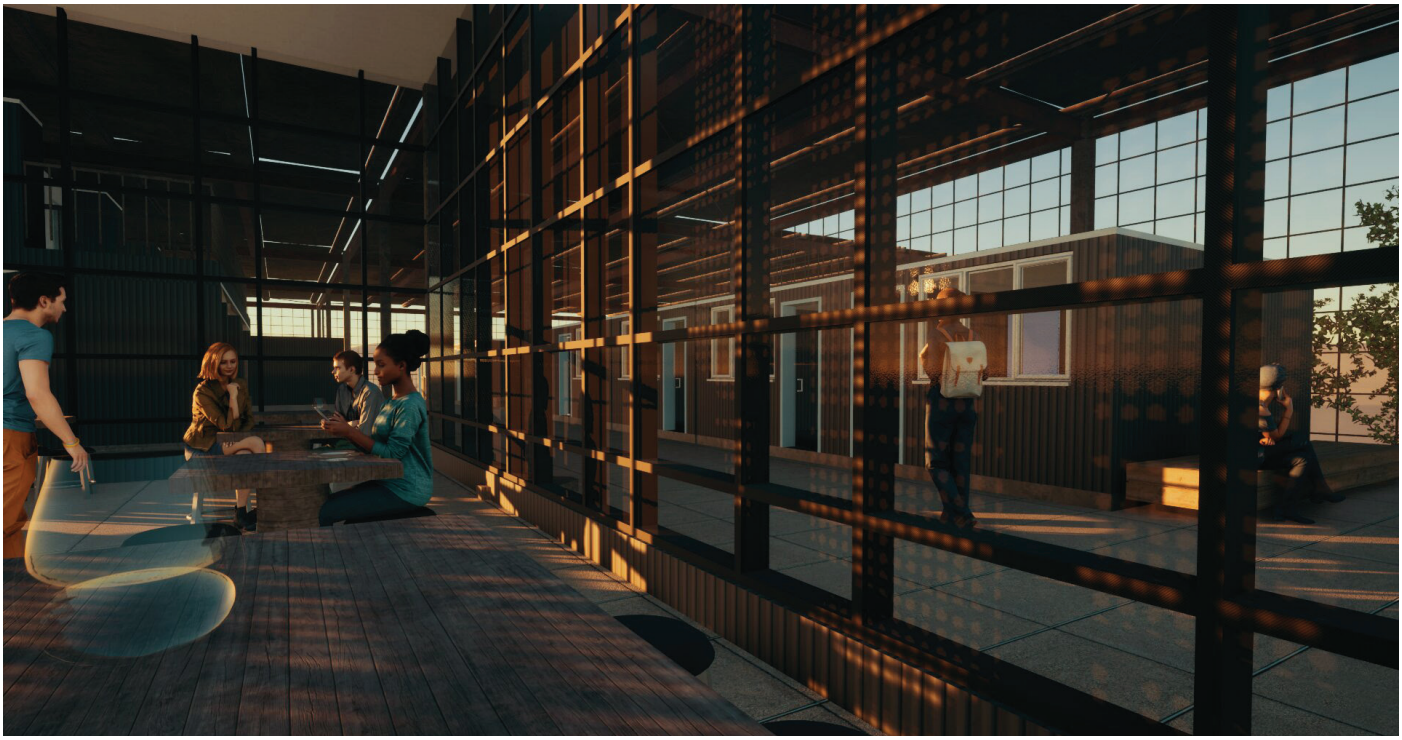


fig. 68- Intervention: Dining Room

08

Structure Analysis

8.1. Introduction and Workflow

This chapter outlines the process behind the structural development of the project, including material selection, modeling workflow, and load analysis. The approach was iterative and evolved in response to both technical challenges and feedback from experts. By shifting the perspective from architectural intent to structural functionality, the design process became an opportunity to test the coherence between spatial vision and real-world feasibility.

The structure was conceived as a container system, designed to support a lightweight ETFE membrane roof and integrate a vertical garden element. The idea was to create not just an enclosure, but a flexible frame that could accommodate sustainable strategies such as green façades and photovoltaic integration. The first model was developed in Revit, using BIM tools to define the geometry and assign initial materials.

As the design progressed, material choices were revised several times to adapt to structural and environmental needs. The input of Prof. Stefano Invernizzi was central in this phase. Following a discussion about the structural stability of the roofing frame, the decision was made to introduce bracing elements, particularly in response to the additional load introduced by solar panels.
At this point, the solar panels were reconsidered not as individual rigid modules but as an additional membrane layer integrated into the roofing system. The model was updated in Revit to reflect this strategy, including the revised structure, bracing, and material layers.

Once the design was consolidated, the model was exported in IFC format and imported into PRO_SAP. After acquiring the software license, the analytical model was cleaned and prepared for simulation. This included the insertion of geolocation data for seismic calculations and the definition of wind and snow load cases. Material properties were reassigned directly in PRO_SAP to match the new design decisions.

The final phase of the workflow consisted of running the structural analysis in PRO_SAP, which led to the identification of critical points in the structure. These results informed further revisions and contributed to a deeper understanding of how the architectural design interacts with forces, constraints, and stability requirements.

8.2. Structure Material

The structural concept is a lightweight metal frame that performs three concurrent roles: it contains the rooftop complex, it supports the ETFE roof, and it provides a lattice for a vertical garden. Because the frame is effectively a rooftop extension, every material decision had to satisfy two competing constraints:

1. Durability in a humid, plant-rich environment
2. Minimal self-weight so the existing building can safely carry the new loads.

8.2.1. Material Selection Process

Option	Advantages	Weak Points
Timber	• Very low density (≈5–6 kN/m³) • Familiar in agricultural structures	• Requires continuous protective coatings • Susceptible to fungal decay and dimensional change in high humidity
Steel (carbon steel, S355)	• High strength-to-weight ratio • Slim profiles minimise visual clutter • Straightforward bolted/welded connections • Natural patina (rust) acceptable—visual coherence with garden aesthetic	• Higher density than timber (≈78 kN/m³) • weight, but offset by smaller cross-sections

After consultation with Prof. Stefano Invernizzi, the team adopted steel. Although heavier than wood, it offers sharply lower maintenance and predictable long-term behaviour in a damp micro-climate. An intentional “weathering” finish allows any superficial oxidation to read as a deliberate aesthetic rather than a defect.

8.2.2. Frame Specification

Element	Section	Note
Columns	RHS 200*200*6.3 mm	Torsion-resistant, clean square geometry
Primary Beams	HEA 200	Span main grid, carry ETFE cushions
Secondary Beams	Aluminum Profile	Tie vertical-garden meshes
Lateral Bracing	Ø16 mm stainless-steel cables	Added after PV decision to resist out-of-plane wind / seismic drift

8.2.3. Roofing System

The initial roofing concept involved using rigid crystalline photovoltaic panels—specifically the Qcells Q.PEAK DUO XL-G11S model (dimensions: 2462 × 1134 × 35 mm; weight: ~32.3 kg per panel, ≈ 0.32 kN/m²). However, this solution quickly revealed critical drawbacks. The combined dead load of the panels and their substructure would significantly increase the stress on the existing rooftop slab, forcing the adoption of bulkier steel profiles and undermining the project's aim for a lightweight, reversible extension.
To address this, the design pivoted toward a more integrated and efficient system: a three-layer ETFE (ethylene tetrafluoroethylene) air cushion membrane, enhanced with flexible photovoltaic film. This solution drastically reduced the overall weight while offering architectural and environmental advantages.
The adopted roof system consists of:

ETFE 3-layer cushion: ~1.0–1.2 kg/m²
Flexible PV film (e.g. CIGS by Heliatek or Armor): ~2–3 kg/m²
Total roofing load: ~3.5–5.5 kg/m²
Total thickness: ~1–2 mm

This change not only reduced the weight by over 80% compared to rigid PV modules but also allowed for greater flexibility in geometry and light transmission—an essential feature considering the presence of a vertical garden beneath the canopy.

The ETFE cushions are fixed to the primary steel beams using an aluminium extrusion frame system, which ensures airtight sealing, accommodates thermal expansion, and integrates drainage channels for rainwater management. The ETFE's translucency supports plant growth below while also enhancing daylighting in the shared rooftop spaces.

From a maintenance perspective, the membrane requires only periodic cleaning and pressure checks, and the flexible PV films are laminated into the upper layer, avoiding the need for exposed wiring or frame-mounted modules.

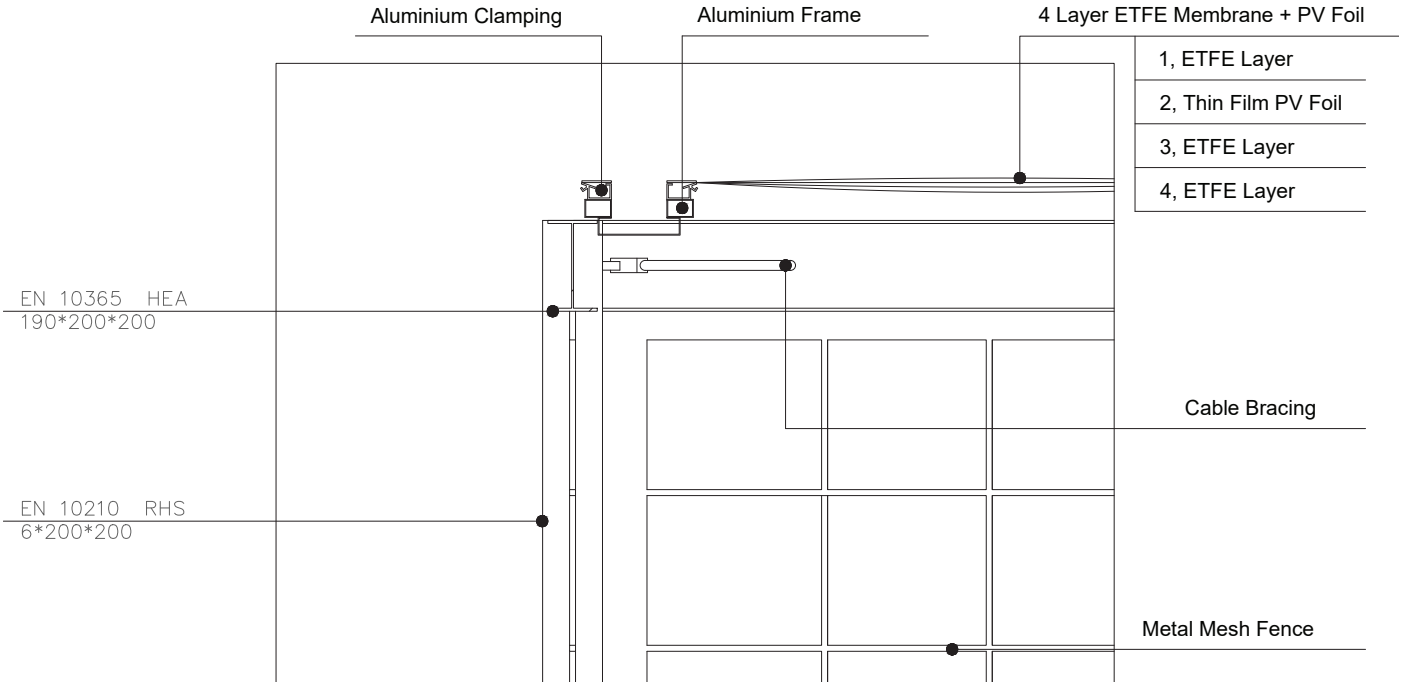


fig. 69- Roof Details and Materials

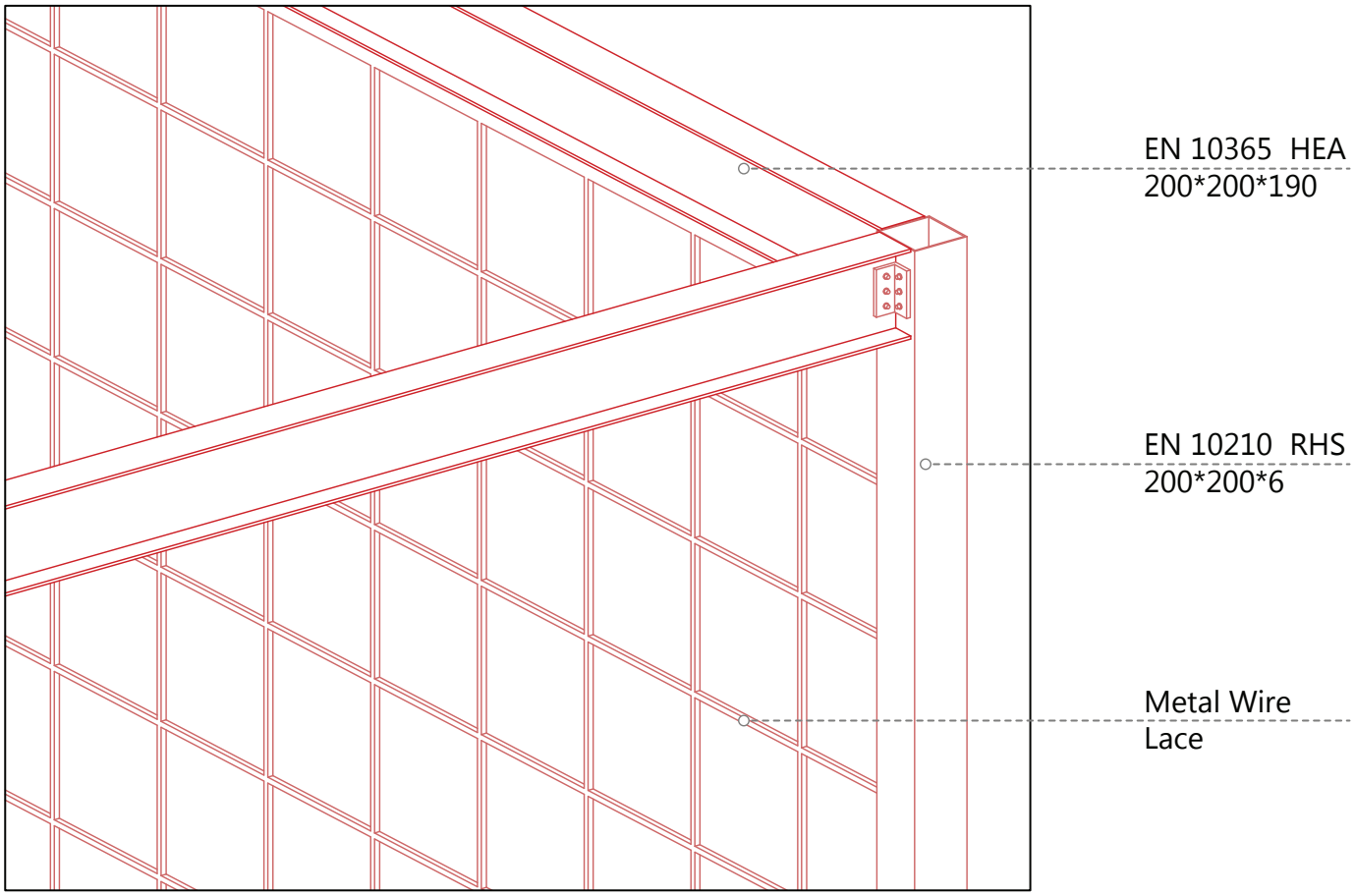


fig. 70- Structure Materials

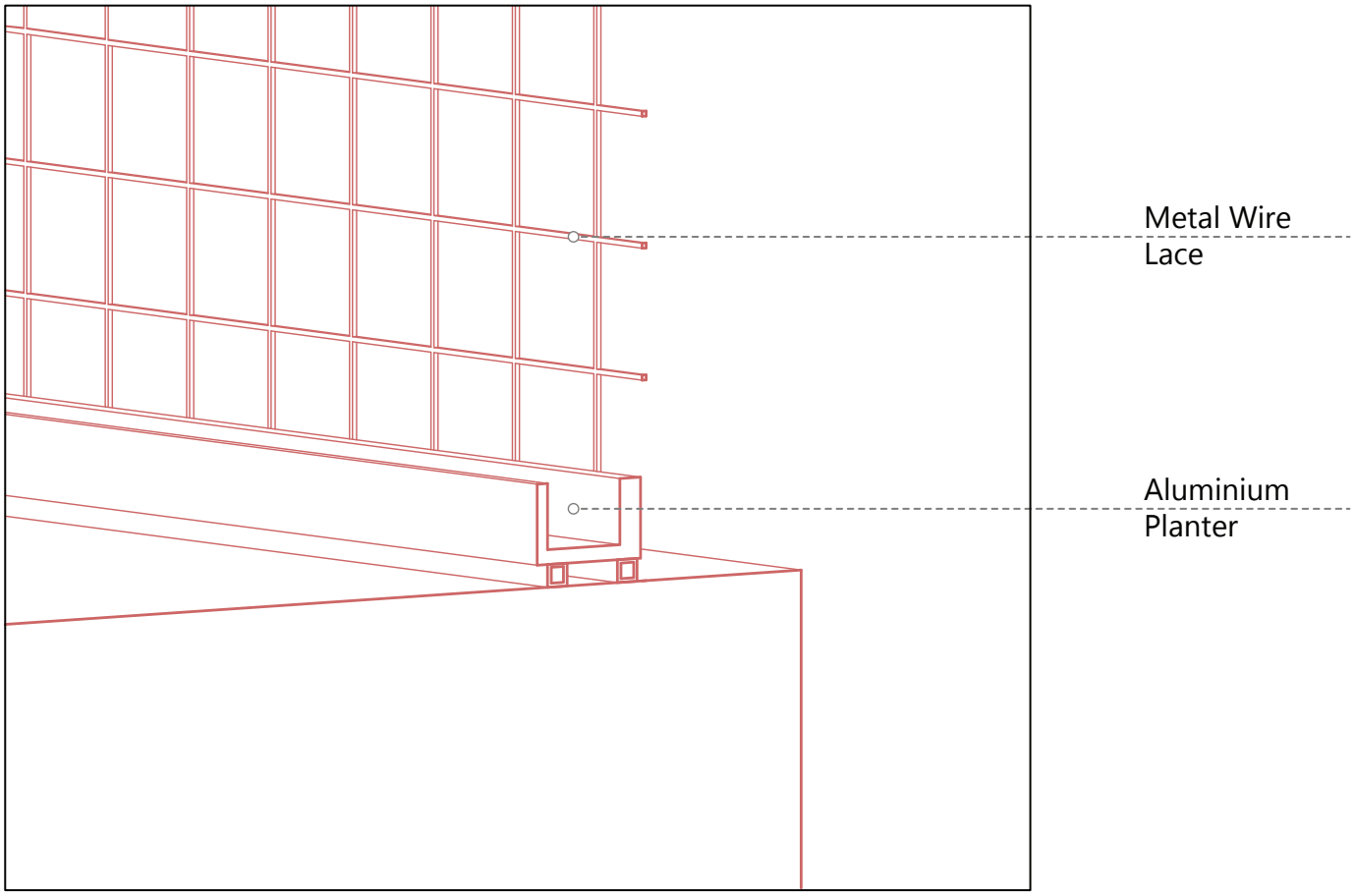


fig. 71- Planter and Vertical Garden Materials

8.3. Load Analysis Report

8.3.1.Current Building and Design Proposal:

Situated near Parco del Valentino, the building was originally constructed in 1965 by Fiat to accommodate the operations of La Stampa newspaper. Designed specifically to house heavy printing machinery and related functions, the structure features a robust concrete frame and rises to approximately 14 meters in height. Today, it serves as a campus for the University of Turin (UniTO), maintaining its modernist and utilitarian character.
The proposed intervention involves a lightweight steel extension built atop the existing volume. This new structure employs RHS 200x200 profiles and HEA 200 beams, reinforced with diagonal steel bracing for stability. The extension functions as a support system for a student housing complex: it holds the roof structure of the new residential layer and incorporates a vertical garden system, adding greenery and ecological value to the project. The roofing solution consists of a dual ETFE membrane—standard ETFE in most areas, and ETFE integrated with a photovoltaic layer in select zones to enhance environmental performance and energy efficiency.

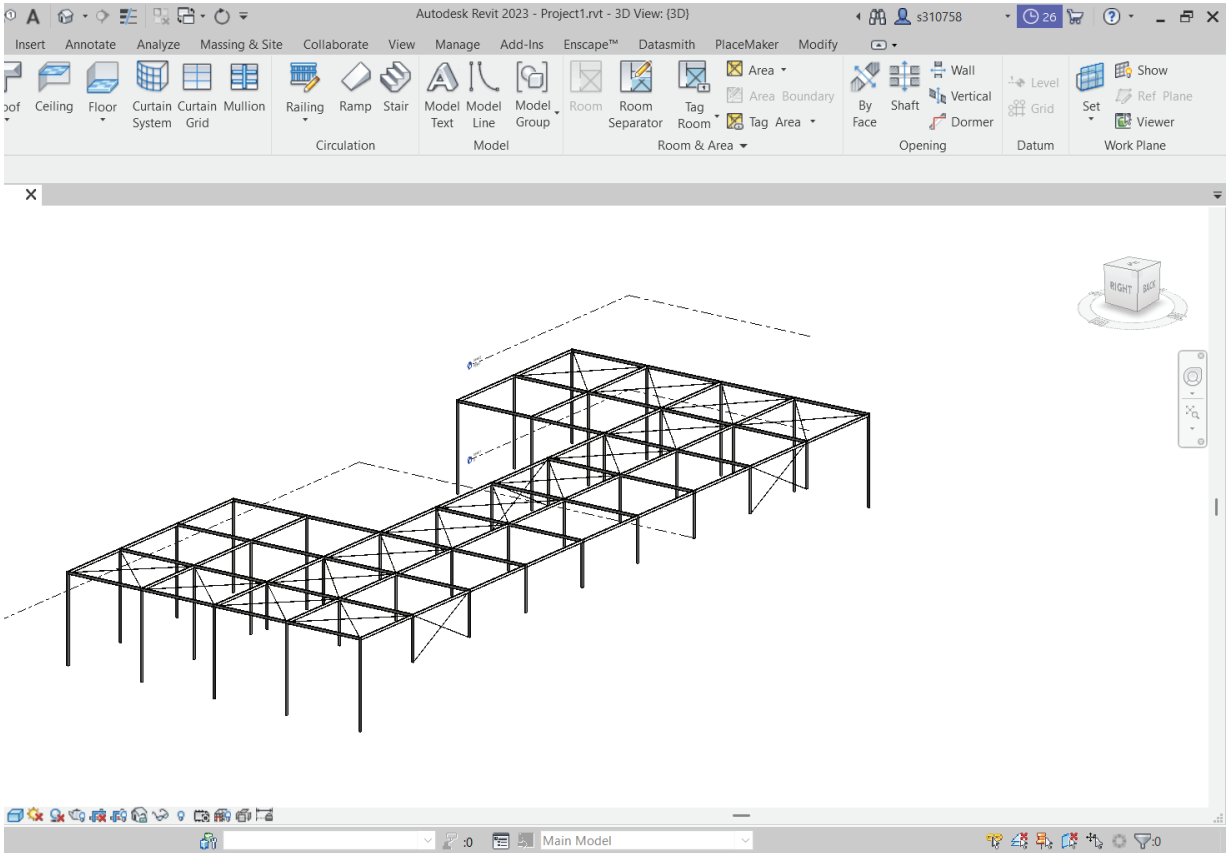


fig. 72- The Model Prepared on Revit

8.3.2.Software and Analysis:

This section focuses on evaluating the structural stability of the proposed extension, with particular attention to wind and snow loads. For this purpose, the analysis was carried out using PRO_SAP STARTER, a structural design software developed by 2SI – Software e Servizi per l'Ingegneria. A free academic license was requested and successfully activated, granting full access to the software for a period of 250 days. This allowed for the simulation and verification of load-bearing performance under environmental and structural stress conditions relevant to the proposed rooftop addition.

8.3.3.The Process:

8.3.3.1. Revit Model:

The design process began with a 3D model constructed in Autodesk Revit, which included all primary and secondary steel elements, excluding the roof. The exclusion of the roofing components was deliberate, as the membrane and associated systems were more efficiently modeled and parameterized directly within PRO_SAP.

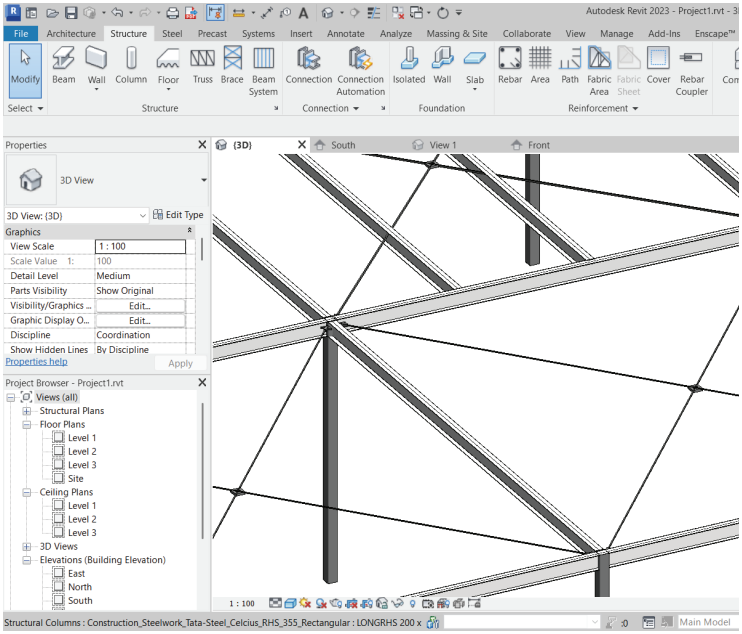


fig. 73- The Model Prepared on Revit with Material

8.3.3.2. IFC export/ import:

Revit has been used before PRO_SAP to make the process faster and easier. After finishing the process in Revit, with the help of IFC export the structure was exported then to be imported in PRO_SAP.

Since the export was IFC, the elements and materials are recognized by the software.

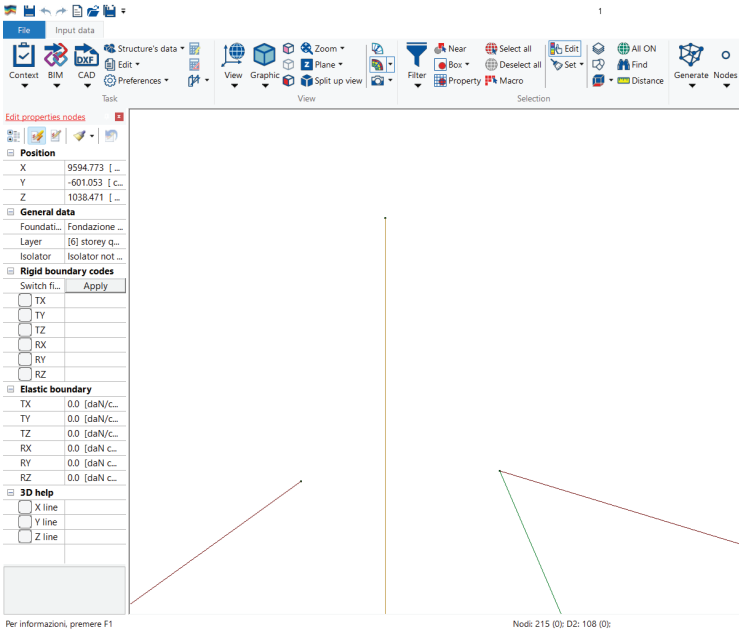


fig. 74- The Model on PRO_SAP with Detached Nodes

8.3.3.3.Model Preperation:

After importing the structure into the software, the model had to be prepared. The overlaping lines were checked and the nodes were connected. This step was done by the help of the 2D tools Provided by PRO_SAP.

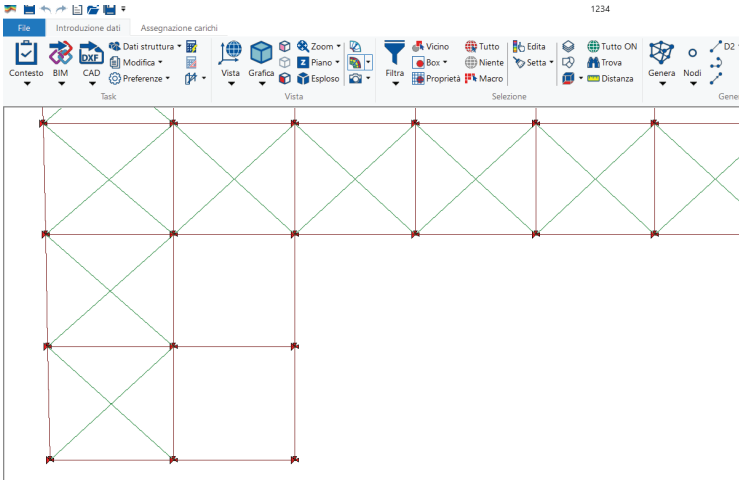


fig. 75- Prepared Model to Start the Process

8.3.3.4. Sections and Materials:

Subsequent to the correction phase, the structural components were reviewed for material and section accuracy. The following specifications were used throughout the extension:

-RHS 200×200 hollow sections for primary and secondary framing;

-HEA 200 profiles for major load-bearing spans;

-Steel bracing for increased lateral stability.

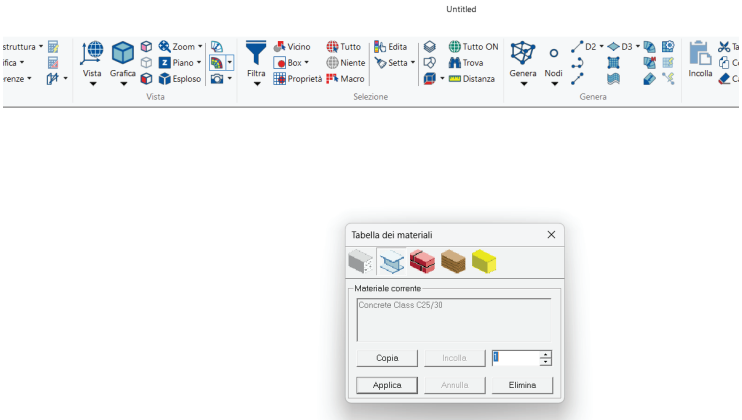


fig. 76- Choosing Section Materials

8.3.3.5. Adding Riggid Boundry:

Boundary conditions were then applied, with all vertical structural elements anchored using fixed-base (rigid) constraints to simulate realistic transfer to the existing slab.

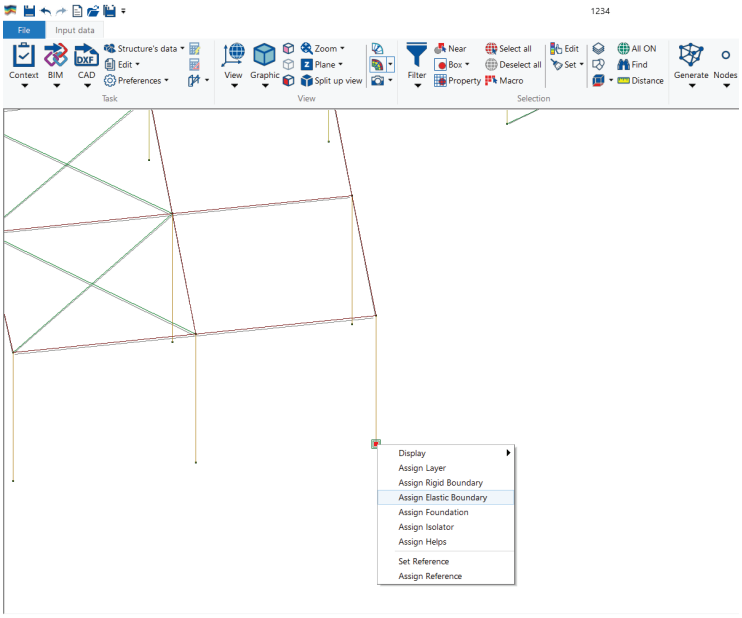


fig. 77- Adding Rigid Boundry to Each Column

8.3.3.6.Roof Generation:

The roof was generated first by defining ETFE material and it's load. Then with the help of the mesh tool the roof was generated. In some of the sections of this project the roof type is different. At this point, another roof type was generated with the added PV layer to the ETFE which changes the load.

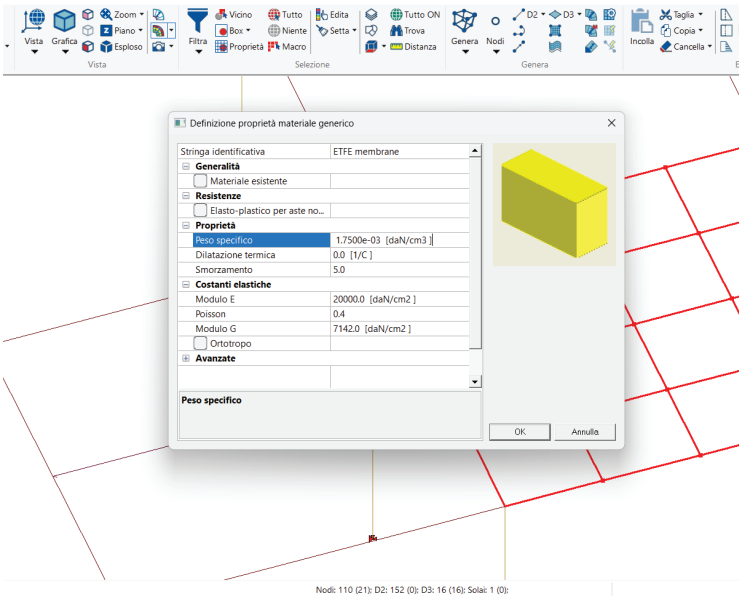


fig. 78- Creating the Roofing Material

8.3.3.6. Roof Generation:

Two roofing scenarios were implemented in the analysis:

-A conventional three-layer ETFE roof, applied across the majority of the extension;

-A variant including integrated photovoltaic (PV) film, which increased the distributed load and required separate material calibration.

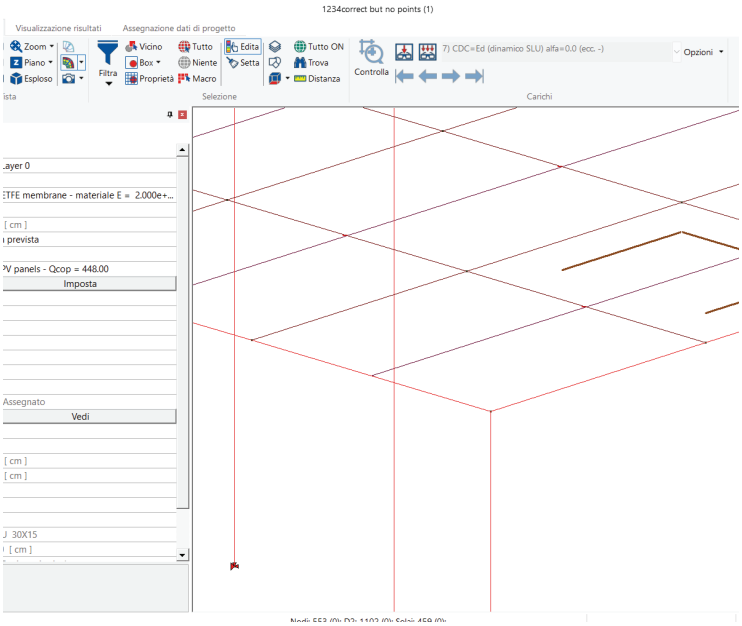


fig. 79- Creating Different Roof Types

8.3.3.7. Adding Environmental Conditions:

Environmental load conditions were established based on NTC 2018 standards and location-specific parameters for Turin. The input data included:

-Seismic classification: Zone 3;

-Soil type: Category C;

-Snow and wind actions: Calculated using regional maps and applied to the roof layers accordingly.

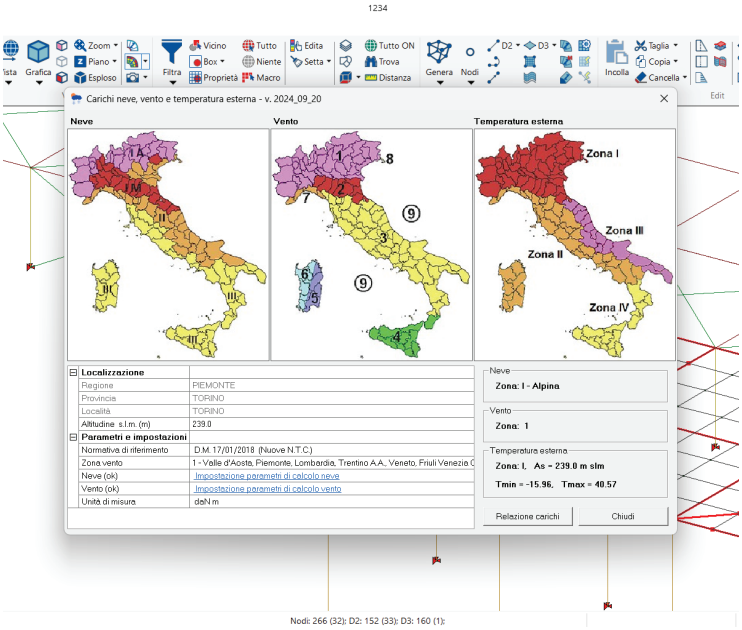


fig. 80- Adding Environmental conditions

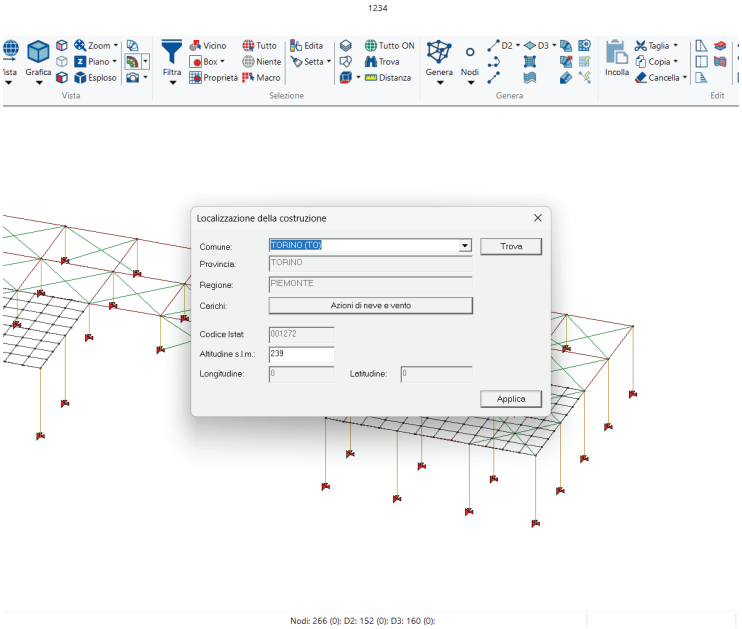


fig. 81- Adding Construction Location

8.3.3.8.Structure Verification:

The load analysis was done. First to check the stability of the structure and then for the added dead load. All the elements varrify in the software which approves the stability of the new added extension.

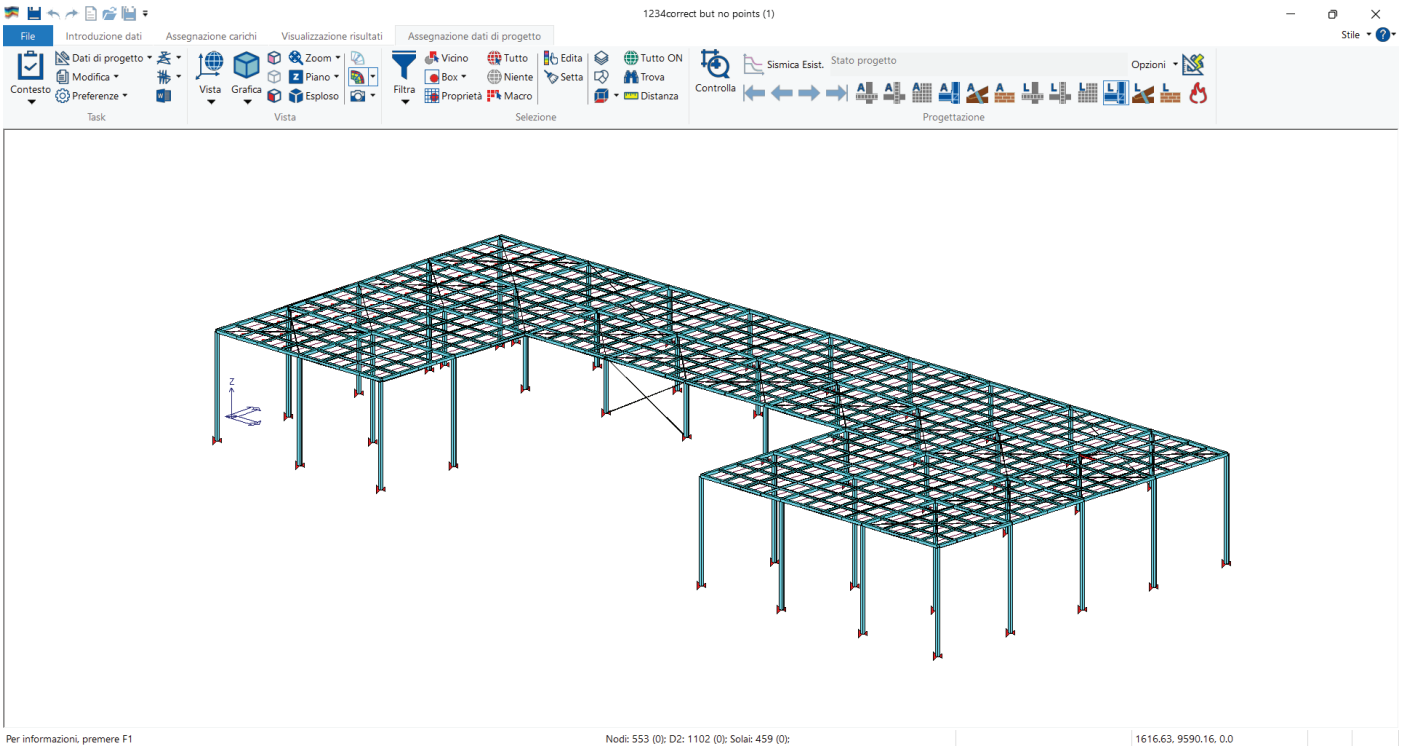


fig. 82- Structure Verrification Analysis

All the structural elements (columns, beams, braces) are varified as visible in the picture.

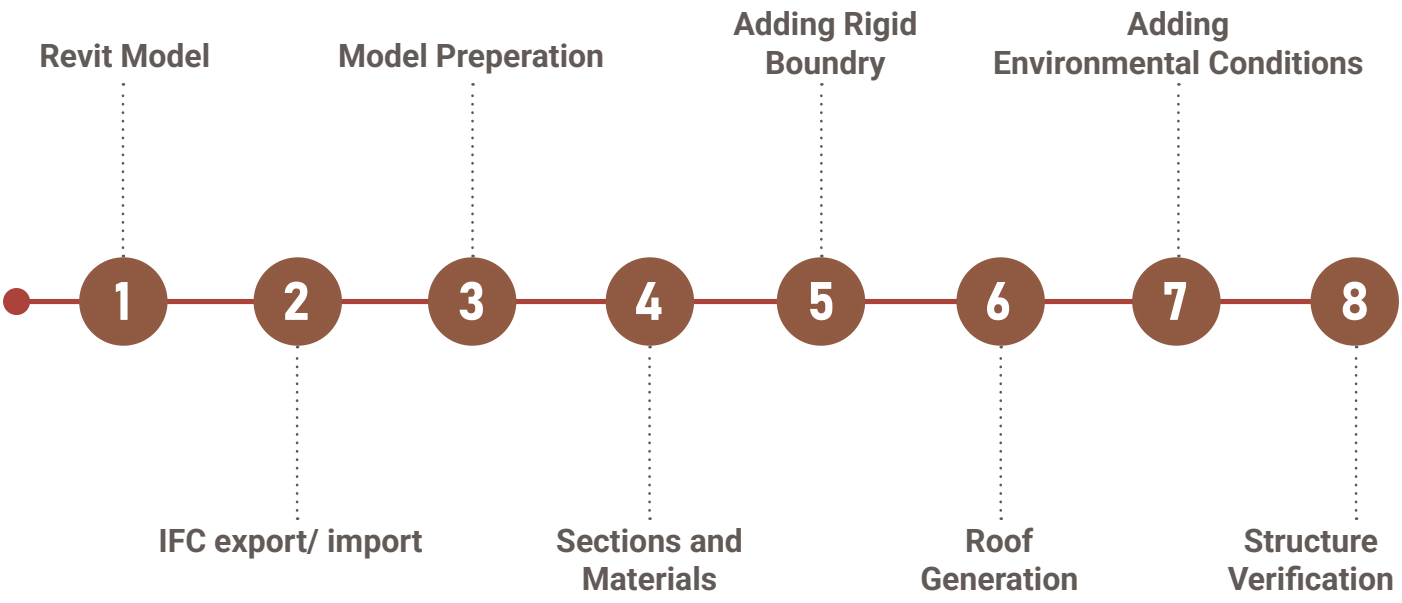


fig. 83- Structure Analysis Process

09

Conclusion

9.Conclusion

The number of students in Italy—and especially in Turin—has been steadily increasing, reflecting broader demographic and policy trends that position higher education as a central engine of urban development. This growth is not incidental: it is a direct outcome of Turin's long-term strategy to reposition itself as a "University City." Through targeted investments in academic infrastructure and the internationalization of programs, the city has succeeded in attracting a diverse student population. However, this success has also exposed a major weakness: the city's housing infrastructure has not evolved at the same pace. Many students still face serious challenges in securing adequate accommodation. Available options are either insufficient in number, economically inaccessible, or unsuited to the daily life and cultural needs of a global student population.

This thesis has analyzed the broader process of global studentification, linking local housing shortages to transnational flows of students, economic models of international education, and shifts in urban identity. Turin's academic boom, while economically promising, has placed mounting pressure on the local rental market and transformed neighborhoods near universities into contested spaces. Despite the economic and cultural contributions that students bring, their integration into the city has remained largely unplanned from a housing perspective. The lack of structural policies that recognize students as a resident class has led to the rise of short-term, expensive, and alienating accommodation options.

As a response, the thesis investigates community housing as a viable and sustainable alternative. Rooted in cooperative principles and shared resource economies, community housing offers both architectural flexibility and social cohesion. Case studies such as La Borda in Barcelona and several Viennese cooperative projects have shown how such models can provide not just shelter, but also a sense of belonging, economic accessibility, and environmental responsibility. These examples were not chosen arbitrarily—they were selected for their ability to demonstrate how grassroots models, embedded in collective decision-making and mutual aid, can fill the gaps left by market-driven housing.

Inspired by the MVRDV Rooftop Catalogue, originally developed to address horizontal sprawl in Rotterdam, the thesis develops a localized catalog for rooftop student housing in Turin. This catalog proposes different typologies that adapt to various roof conditions, student profiles, and communal needs. Unlike MVRDV's original concept, the student-focused catalog centers around residential function and shared educational, recreational, and domestic spaces. By reimagining rooftops as vertical extensions of the city's student infrastructure, it avoids the spatial and ecological costs of suburban expansion.

To test this methodology, the design project was applied to the Ex La Stampa building, a former newspaper headquarters now functioning as a UniTO campus in the San Salvario district. The intervention proposes modular housing units organized around shared kitchens, green roofs, and study areas. A vertical garden system softens the intervention, while ETFE membrane structures reduce weight and maximize daylight. Structural and seismic analyses were conducted using PRO_SAP, ensuring the proposal complies with engineering standards and safety requirements. The ETFE panels also serve as light-bearing elements capable of supporting photovoltaic layers, reinforcing the project's sustainable intent.

The final design is not meant as a one-off architectural solution, but as a prototype for scalable intervention. If integrated across Turin's underutilized rooftops, this model could provide immediate, distributed housing relief while contributing to the creation of micro-communities within the city. These interventions not only add square meters but offer a different way of inhabiting the urban space—one that embraces affordability, social interaction, and sustainability.

Turin's transition into a student city is far from complete. While its universities thrive, the city must do more to accommodate the people who give them life. Students inject the city with cultural vibrancy, economic energy, and global perspectives—but if housing remains unstable and exclusionary, this energy risks being transient and detached. Through investments in innovative urban strategies—such as community-based rooftop housing—Turin can build a more inclusive, resilient, and adaptive city that truly welcomes its student population. Only then can the vision of Turin as a thriving, knowledge-driven metropolis fully materialize.

10

Bibliography

10.Bibliography

References

1. Belligni, Silvano, & Ravazzi, Stefania. "*Policy Change without Metamorphosis. The 1993-2011 Urban Regime in Turin.*" Métropoles, 12 (1 May 2013). [https://doi.org/10.4000/metropoles.4642]

2. Bellini, Oscar E., Gambaro, Matteo, & Mocchi, Martino. "*Living and Learning: A New Identity for Student Housing in City Suburbs.*" In Regeneration of the Built Environment from a Circular Economy Perspective (pp. 99–109). Cham: Springer, 2020. [https://doi.org/10.1007/978-3-030-33256-3_11]

3. Benneworth, Paul, Charles, David, & Madanipour, Ali. "*Building Localized Interactions Between Universities and Cities Through University Spatial Development.*" European Planning Studies, 18 (10) (Oct 2010): 1611–1629. [https://doi.org/10.1080/09654313.2010.504345]

4. Bertoni, Francesco A. "*Student Housing in Italy: Historical Development and Policy Impact*". Politecnico di Milano, 2025.

5. Biancalana, Cecilia. "*Between Social Movements and the Constraints of Government: The Five-Star Movement in Turin.*" Contemporary Italian Politics, 11 (1) (2 Jan 2019): 63–79. [https://doi.org/10.1080/23248823.2019.1576992]

6. Bolzoni, Magda, & Semi, Giovanni. "*Adaptive Urbanism in Ordinary Cities: Gentrification and Temporalities in Turin (1993–2021).*" Cities, 134 (Mar 2023): 104144. [https://doi.org/10.1016/j.cities.2022.104144]

7. Brandl, Freya, Gruber, Ernst, "*Gemeinschaftliches Wohnen in Wien – Bedarf und Ausblick. Studie im Auftrag der Stadt Wien*", Magistratsabteilung 50 – Wohnbauforschung, Wien, (18 Dec 2014)

8. Bricocoli, Massimo, & Peverini, Marco. "*No City for Workers: Housing Affordability Trends and Public Policy Implications in Milan.*" Urban Planning, 9 (14 Nov 2024): 8654. [https://doi.org/10.17645/up.8654]

9. Cabré, Eduard, and Arnau Andrés. "*La Borda: A Case Study on the Implementation of Cooperative Housing in Catalonia.*" International Journal of Housing Policy, July 27, 2017. [https://doi.org/10.1080/19491247.2017.1331591].

10. Cenere, Samantha, Mangione, Erica, Santangelo, Marco, & Servillo, Loris. "*Setting up a University City: Geographies of Exclusion in North Turin.*" Tijdschrift voor Economische en Sociale Geografie, 114 (5) (Dec 2023): 400–414. [https://doi.org/10.1111/tesg.12550]

11. Cenere, Samantha, Mangione, Erica, & Servillo, Loris. "*IV Case Study: Turin – Exploration of Context, Trends of Social Exclusion, Coping Forms & Innovative Community Solutions.*" 2020.

12. Cenere, Samantha, & Servillo, Loris. "*Quantitative Analysis of Socio-Spatial Exclusion in Turin.*" 23 Sep 2021. [https://doi.org/10.5281/zenodo.7062323]

13. Chatterton, Paul. "*The Student City: An Ongoing Story of Neoliberalism, Gentrification and Commodification.*" Environment and Planning A: Economy and Space, 42 (3) (Mar 2010): 509–514. [https://doi.org/10.1068/a42293]

14. Clapham, D., Foye, C., & Christian, J. "*The concept of subjective well-being in housing research. Housing, Theory and Society*", 35(3), 261–280 — a study exploring how personal wellbeing intersects with housing quality and policy, (2018)

15. Clemons, S. A., Banning, J. H., & McKelfresh, D. A. "*Importance of Sense of Place and Sense of Self in Residence-Hall Room Design: A Qualitative Study of First-Year Students.*" Journal of College & University Student Housing, 33 (2) (2004): 38–46.

16. Colombino, Annalisa, & Vanolo, Alberto. "*Turin and Lingotto: Resilience, Forgetting and the Reinvention of Place.*" European Planning Studies, 25 (1) (2 Jan 2017): 10–28. [https://doi.org/10.1080/09654313.2016.1254598]

17. Crivello, Silvia, and Elena Pede. "*Ripensare spazi e luoghi del passato industriale. Una lettura tra identità e resilienza: il caso delle OGR a Torino.*" Atti e Rassegna Tecnica 73, no. 2 (2019): 125–130

18. Del Nord, Romano, Baratta, Adolfo F. L., & Piferi, Claudio. "*Residenze e Servizi per Studenti Universitari.*" Università degli Studi di Firenze, 2016.

19. Dogan, Evinc, Cuomo, Federico, & Battisti, Luca. "*Reviving Urban Greening in Post-Industrial Landscapes: The Case of Turin.*" Sustainability, 15 (17) (23 Aug 2023): 12760. [https://doi.org/10.3390/su151712760]

20. Ehlenz, Meagan M., Mawhorter, Sarah L., & Pendall, Rolf. "*The Complexities of Student Housing.*" Housing Policy Debate, 34 (5) (2 Sep 2024): 603–619. [https://doi.org/10.1080/10511482.2024.2372566]

21. Evered, Rosie. "*Sheffield Student Housing Co-Op.*" 2011.

22. Fang, Christian, & Van Liempt, Ilse. "*We Prefer Our Dutch': International Students' Housing Experiences in the Netherlands.*" Housing Studies, 36 (6) (3 Jul 2021): 822–842. [https://doi.org/10.1080/02673037.2020.1720618]

23. Fouberg, Erin Hogan, Murphy, Alexander B., & De Blij, Harm J. "*Human Geography: People, Place, and Culture.*" 10th ed. Hoboken, NJ: Wiley, 2012.

24. Grabher, G. "*The Weakness of Strong Ties: The Lock-in of Regional Development in the Ruhr Area.*" 1993.

25. Guazzo, Costanza. "*Un Quartiere Che Cambia: Abitare e Resistere nella San Salvario della Movida.*" Università di Torino, 2014.

26. Haase, Annegret, Grossmann, Katrin, & Steinführer, Annett. "*Transitory Urbanites: New Actors of Residential Change in Polish and Czech Inner Cities.*" Cities, 29 (5) (Oct 2012): 318–326. [https://doi.org/10.1016/j.cities.2011.11.006]

27. Harris, Richard I. D. "*The Impact of the University of Portsmouth on the Local Economy.*" Urban Studies, 34 (4) (Apr 1997): 605–626. [https://doi.org/10.1080/0042098975943]

28. He, Qiong, & He, Shenjing. "*Infrastructuring Mobility via State-Led School Franchising: Leveraging Public Educational Resources to Facilitate Middle-Class Residential (Im) Mobility.*" Annals of the American Association of Geographers, 115 (4) (21 Apr 2025): 836–853. [https://doi.org/10.1080/24694452.2025.2463523]

29. Holton, Mark, & Riley, Mark. "*Talking on the Move: Place-Based Interviewing with Undergraduate Students.*" Area, 46 (1) (Mar 2014): 59–65. [https://doi.org/10.1111/area.12070]

30. Höpler, Ruth. "*Co-Housing in the Urban Fabric: Socio-Spatial Relations and Shared Resources with the Neighbourhood.*" 2023, 171 pp. [https://doi.org/10.34726/HSS.2023.106921]

31. Hubbard, Phil. "*Geographies of Studentification and Purpose-Built Student Accommodation: Leading Separate Lives?*" Environment and Planning A: Economy and Space, 41 (8) (Aug 2009): 1903–1923. [https://doi.org/10.1068/a4149]

32. Johnston, Andrew. "*The Roles of Universities in Knowledge-Based Urban Development: A Critical Review.*" International Journal of Knowledge-Based Development, 10 (3) (2019): 213. [https://doi.org/10.1504/IJKBD.2019.103205]

33. Lipura, Sarah Jane, & Collins, Francis Leo. "*Towards an Integrative Understanding of Contemporary Educational Mobilities: A Critical Agenda for International Student Mobilities Research.*" Globalisation, Societies and Education, 18 (3) (26 May 2020): 343–359. [https://doi.org/10.1080/14767724.2020.1711710]

34. Malet Calvo, Daniel. "*Understanding International Students beyond Studentification: A New Class of Transnational Urban Consumers. The Example of Erasmus Students in Lisbon (Portugal).*" Urban Studies, 55 (10) (Aug 2018): 2142–2158. [https://doi.org/10.1177/0042098017708089]

35. Mangione, Erica. "*Housing the Student Population in the Post-Industrial University City.*" Politecnico di Torino, 2022. [https://iris.polito.it/retrieve/10b07854-1130-4691-b8ab-cda946e23782/conv_sintesi_mangione.pdf]

36. Mgd, Blz, & Semi, Giovanni. "*Adaptive Urbanism in Ordinary Cities: Gentrification and Temporalities in Turin (1993-2021).*" SSRN Electronic Journal, 2022. [https://doi.org/10.2139/ssrn.4084633]

37. Moisio, Sami. "*Geopolitics of the Knowledge-Based Economy.*" 1st ed. Chennai: Deanta, 2018.

38. Mulhearn, Chris, & Franco, Michael. "*If You Build It Will They Come? The Boom in Purpose-Built Student Accommodation in Central Liverpool: Destudentification, Studentification and the Future of the City.*" Local Economy, 33 (5) (Aug 2018): 477–495. [https://doi.org/10.1177/0269094218792740]

39. Mumford, Lewis, "*The Culture of Cities*" (New York: Harcourt, Brace and Company, 1938).

40. Murzyn-Kupisz, Monika, & Szmytkowska, Magdalena. "*Studentification in the Postsocialist Context: The Case of Cracow and the Tri-City (Gdansk, Gdynia and Sopot).*" Geografie, 120 (2) (2015): 188–209. [https://doi.org/10.37040/geografie2015120020188]

41. Obeng-Odoom, Franklin. "*Far Away from Home: The Housing Question and International Students in Australia.*" Journal of Higher Education Policy and Management, 34 (2) (Apr 2012): 201–216. [https://doi.org/10.1080/1360080X.2012.662744]

42. Perkmann, Markus, Salandra, Rossella, Tartari, Valentina, McKelvey, Maureen, & Hughes, Alan. "*Academic Engagement: A Review of the Literature 2011–2019.*" Research Policy, 50 (1) (Jan 2021): 104114. [https://doi.org/10.1016/j.respol.2020.104114]

43. Pizzolato, Nicola. "*Transnational Radicals: Labour Dissent and Political Activism in Detroit and Turin (1950–1970).*" International Review of Social History, 56 (1) (Apr 2011): 1–30. [https://doi.org/10.1017/S0020859010000696]

44. Radder, Laetitia, & Han, Xiliang. "*Service Quality of On-Campus Student Housing: A South African Experience.*" International Business & Economics Research Journal, 8 (11) (15 Feb 2011). [https://doi.org/10.19030/iber.v8i11.3190]

45. Raghuram, Parvati, & Sondhi, Gunjan. "*Gender and International Student Migration.*" In The Palgrave Handbook of Gender and Migration (pp. 221–235). Cham: Springer, 2021. [https://doi.org/10.1007/978-3-030-63347-9_14]

46. Rodríguez-Pose, Andrés. "*The Revenge of the Places That Don't Matter (and What to Do About It).*" Cambridge Journal of Regions, Economy and Society, 11 (1) (10 Mar 2018): 189–209. [https://doi.org/10.1093/cjres/rsx024]

47. Russo, Antonio Paolo, & Capel Tatjer, Laura. "*From Citadels of Education to Cartier Latins (and Back?): The Changing Landscapes of Student Populations in European Cities.*" Geography Compass, 1 (5) (Sep 2007): 1160–1189. [https://doi.org/10.1111/j.1749-8198.2007.00056.x]

48. Salone, Carlo, & Governa, Francesca. "*Lost in Transition: Turns and Twists of Turin's Post-Fordist Governance.*" IGLUS Quarterly, 8 (4) (2023): 6–14.

49. Schwittay, Anke. "*Students Take Over: Prefiguring Urban Commons in Student Housing Co-Operatives.*" Housing Studies, 40 (4) (3 Apr 2025): 966–987. [https://doi.org/10.1080/02673037.2024.2334816]

50. Smith, Darren P., Sage, Joanna, & Balsdon, Stacey. "*The Geographies of Studentification: 'Here, There and Everywhere'?*" Geography, 99 (3) (1 Nov 2014): 116–127. [https://doi.org/10.1080/00167487.2014.12094405]

51. Spriano, Giorgio, "*Technological Choices and Spatial Organization of Production in the Fiat System*", Geography Discussion Papers, no. 12 (London: London School of Economics, 1985)

52. Swartz, S. L. "*Create a Better Flow Through Sequencing Resident Assistant Training.*" Marshall University Libraries Working Paper, 2010.

53. Tulumello, Simone, & Caruso, Nadia. "*[La Casa] Non è Più Sexy in Italia.' The Absent Politicisation of Housing in Italy, Insights from Turin.*" University of Salento, 2021. [https://doi.org/10.1285/I20356609V14I2P870]

54. Vanolo, Alberto. "*The Fordist City and the Creative City: Evolution and Resilience in Turin, Italy*." City, Culture and Society, 6 (3) (Sep 2015): 69–74. [https://doi.org/10.1016/j.ccs.2015.01.003]

55. Wilkinson, Christopher, & Greenhalgh, Paul. "*Exploring Student Housing Demand, Supply-Side and Planning Policy Responses in a Small University City: Studentification in Durham, UK.*" Housing Policy Debate, 34 (5) (2 Sep 2024): 746–768. [https://doi.org/10.1080/10511482.2022.2137379]

56. Worsley, Joanne D., Harrison, Paula, & Corcoran, Rhiannon. "*The Role of Accommodation Environments in Student Mental Health and Wellbeing.*" BMC Public Health, 21 (1) (Dec 2021): 573. [https://doi.org/10.1186/s12889-021-10602-5]

57. Xulu-Gama, Nomkhosi. "*The Role of Student Housing in Student Success: An Ethnographic Account.*" Journal of Student Affairs in Africa, 7 (2) (18 Dec 2019). [https://doi.org/10.24085/jsaa.v7i2.3822]

58. Zasina, Jakub, Erica Mangione, and Marco Santangelo. 2021. "*Nuancing Student Geographies: Studentscapes in Post-Industrial Cities.*" Urban Geography 44 (1): 105–27. https://doi.org/10.1080/02723638.2021.1969142.

Reports

1. Cabodi, Cristiana, Nadia Caruso, Sara Mela, Elena Pede, Cristiana Rossignolo, and Silvia Saccomani. "Aurora: A Sud Di Torino Nord." Politecnico di Torino, 2017. www.auroralab.polito.it.

2. Laudisa, Federica, & Musto, Daniela. L'internazionalizzazione negli Atenei Piemontesi. IRES Piemonte, 2021. [http://www.ires.piemonte.it/]

3. OCA – Osservatorio Casa e Abitare. "Abitare in Transizione: Politiche e Pratiche tra Pubblico, Privato Sociale e Cooperazione." Milan, 2023.

4. Uni-Italia. "International Students in Italy: Main Features and Economic Impacts," 2023.

5. Urban Center Metropolitano. Torino Città Universitaria. 2013. [http://www.urbancenter.to.it]

6. URBED. A Co-Operative Future for Student Housing. 2004. [https://urbed.coop]

Online Sources

1. "ALER – Azienda Lombarda per l'Edilizia Residenziale." [https://aler.mi.it]

2. "Archivio La Stampa." [http://www.archiviolastampa.it]

3. "ASSOCIAZIONE QUORE, To Housing." [http://www.quore.org]

4. "Città di Torino, Torino 2030. 2018." [http://www.comune.torino.it]

5. "Comune di Milano." [https://www.comune.milano.it]

6. "Istat." [https://www.istat.it]

7. "La Stmpa. "[https://www.lastampa.it/torino/2020/06/18/news/nuovo-polo-universitario-nell-ex-sede-de-la-stampa-ospitera-3-mila-studenti-1.38981609/]

8. "La Tenda, Torino." [https://home-affairs.ec.europa.eu/policies/migration-and-asylum/migrant-integration/migrant-integration-hub_en]

9. "L'Università di Torino." [https://www.unito.it]

10. "Ministero dell'Istruzione e del Merito." [https://www.mim.gov.it]

11. "MVRDV. Rooftop Catalog, 2021." [https://mvrdv.com/publications/4081/rooftop-catalogue]

12. “Nomisma – Società di Studi Economici S.p.A.” [https://www.nomisma.it/]

13. “Politecnico di Torino.” [http://www.polito.it]

14. “Portale dei Dati dell’Istruzione Superiore.” [https://ustat.mur.gov.it]

15. “R50 Cohousing, Berlin.” [https://issuu.com/mch_master/docs/untagged_final_online_/s/23944408]