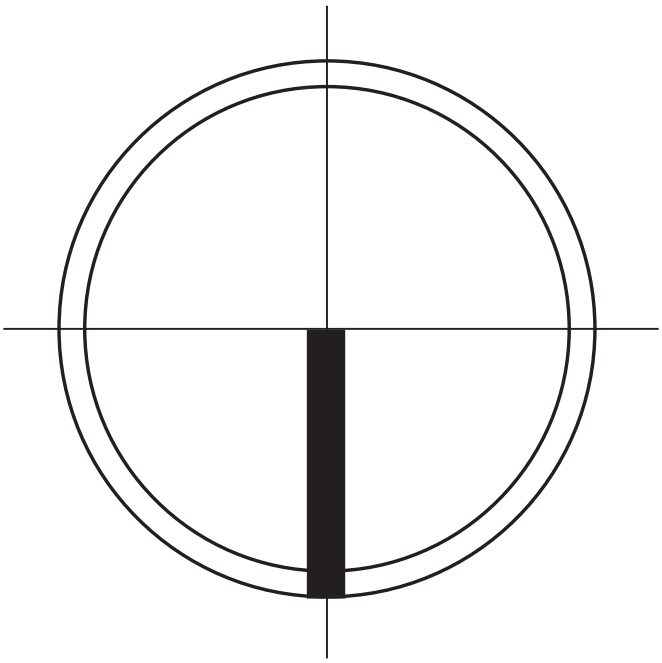


Social-driven redevelopment:

Inclusive community for marginalized people

Msc4 Graduation Design I Global Housing Studio

Main Mentor: Nelson Mota
Second Mentor: Stephan Verkuijlen
Third Mentor: Harald Mooij

Shi Zeng I 5534739

Content

01 **Background** 01

Historical Background 02
Housing in Brazil 04
Current situation 06
Spatial Inequality 18
Problem Statement 22
Design Goal 24
Research Question 30

02 **Research** 32

Methodology 34
Inspiration 38
Aspiration 48
Adaptation 66
Implementation 84
Conclusion 94

03 **Design Proposal** 96

Location 98
Site analysis 106
Design hypothesis 126
Dwelling level 134
Cluster level 210
Urban level 238

04 **Building Technology** 302

Materiality 304
Construction 310
Sun shading 330
Ventilation 336
Thermal analysis 340
Water management 342

05 **Managerial strategies** 352

Policy analysis 354
Social-driven redevelopment 364
Stakeholder analysis 376
Construction phases 384

06 **Synthesis** 404

Reflection 406
Global housing 410
Development 412

07 **Reference** 420

Bibliography 422
Image caption 423

01 Background

19th

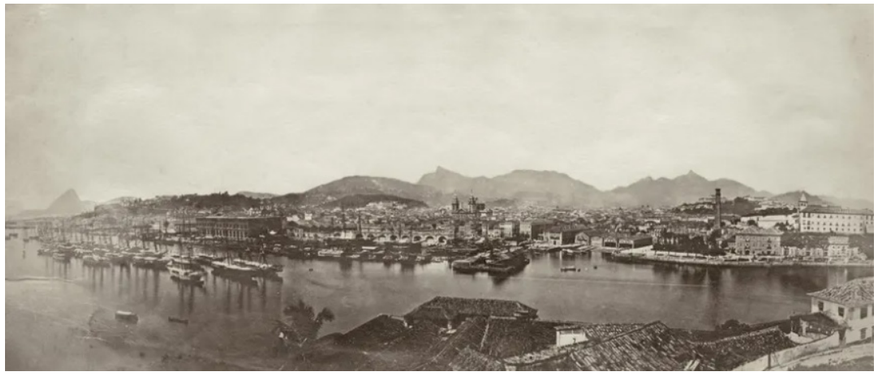
Rise of the first favela

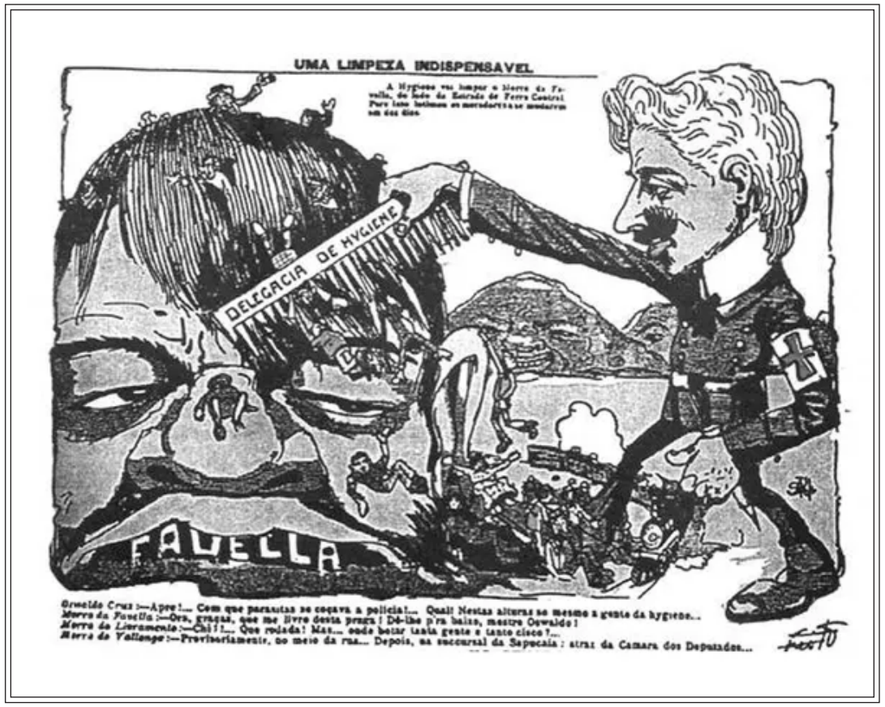
Following the abolition of slavery in Brazil in May 1888[1], numerous slaves came into major cities like Rio de Janeiro. Even though the latter's villas and estates in the city's heart were converted by the new administration into poor people's housing and schools, they were still in plentiful quantity.

When the government and the market could not provide enough housing, large numbers of jobless migrants began to build their own **self-built** houses, known as "favelas", on vacant suburban land. The households were mainly day labourers on the docks, quarry workers, construction and municipal service workers, etc. The housing was dark, damp, and overcrowded, and there was a lack of running water and sewage facilities. Many slum dwellers drank directly from the river, and sewage was simultaneously discharged directly into the river.

Relocation

Faced with the problem of housing in the urbanization process, Brazil has implemented mandatory decrees in the field of housing. However, this approach mainly serves the interests of a few groups of social strata, depriving the Brazilian people of their full citizenship rights(Klak & Holtzclaw, n.d.) The poor were forced to move in more disease-prone and unsanitary areas because of the forced demolition of informal housing, and their persistent requests for sidewalks and main roads went unmet. These complaints sparked social resistance and even violent confrontation. The government then launched a robust, violent crackdown in response to the forceful confrontation. Low-income groups' informal settlement was cleared, the original occupants became homeless and were relocated further out into the suburbs, and gradually the number of favela grew. Between 1880 and 1920, 24 favelas appeared in Rio de Janeiro(Xavier & Magalhães, n.d.).





Brazilian public health pioneer Oswaldo Cruz is removing slum dwellers out of Rio's 'ugly head'.

1 Brazilian Princess Isabel of Bragança signed the Lei urea (also known as the "Golden Act") on May 13, 1888. All forms of slavery were prohibited.

21th

Future of social housing

Financing

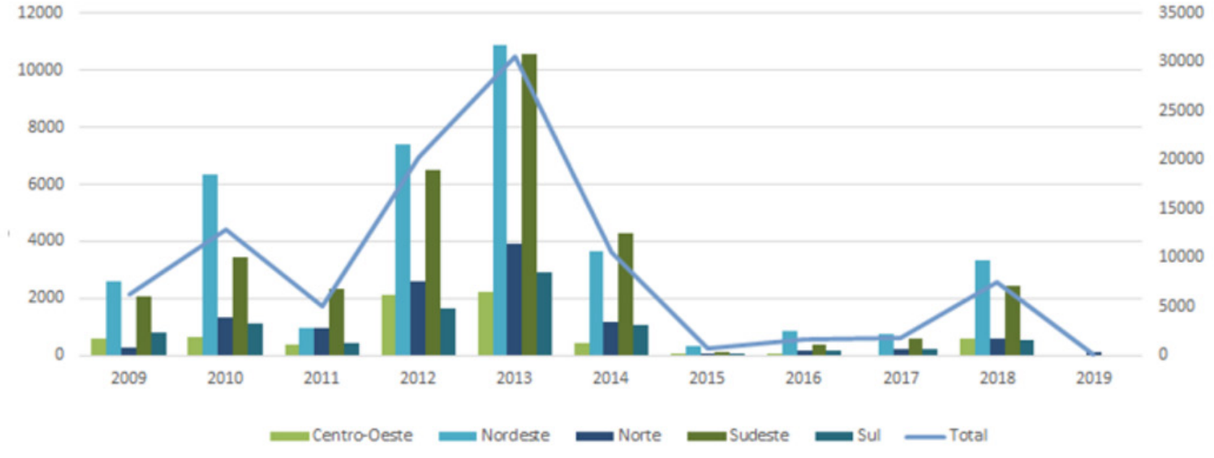
Without a nationwide social housing program for more than 20 years, in 2009, The Lula administration established the “Minha casa, Minha vida(MCMV)[2]” program to expand housing access while boosting Brazilian economy during the global recession. For families making up to R$9,000 per month, the program offers low financing rates and home purchase subsidies for low-income families. However, over time, the program has become less effective as financing, coverage, and regulations have changed.

Exclusion

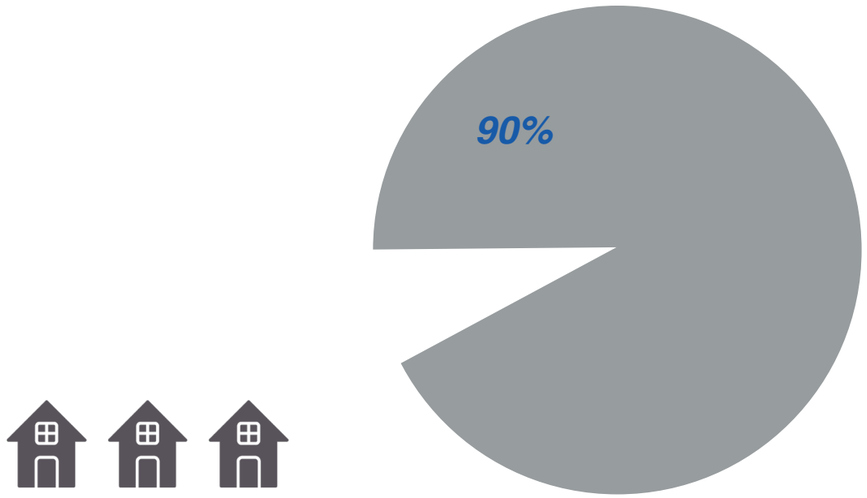
On an urban scale, In order to alleviate the housing deficit, the city of So Paulo has planned the ZEIS[3] map, which makes vacant and illegally occupied land in urban areas available for the construction of social housing. But the distribution of new social housing was dependent on household income, similar to the MCMV and the subsequent PCVA[4], which resulted in the exclusion of particular socio-economic groups.

Low-income

Nowadays, Brazil has a more than 6 million-unit housing shortfall. ***90%*** of this gap is composed of people making less than $1,000 per month. When the housing situation worsens, How can a big number of housing units be delivered with scarce resources? How can the residents be relocated in an adaptable way?



Distribution of resources (contracted value) Track 1 by region and year (R$ million)



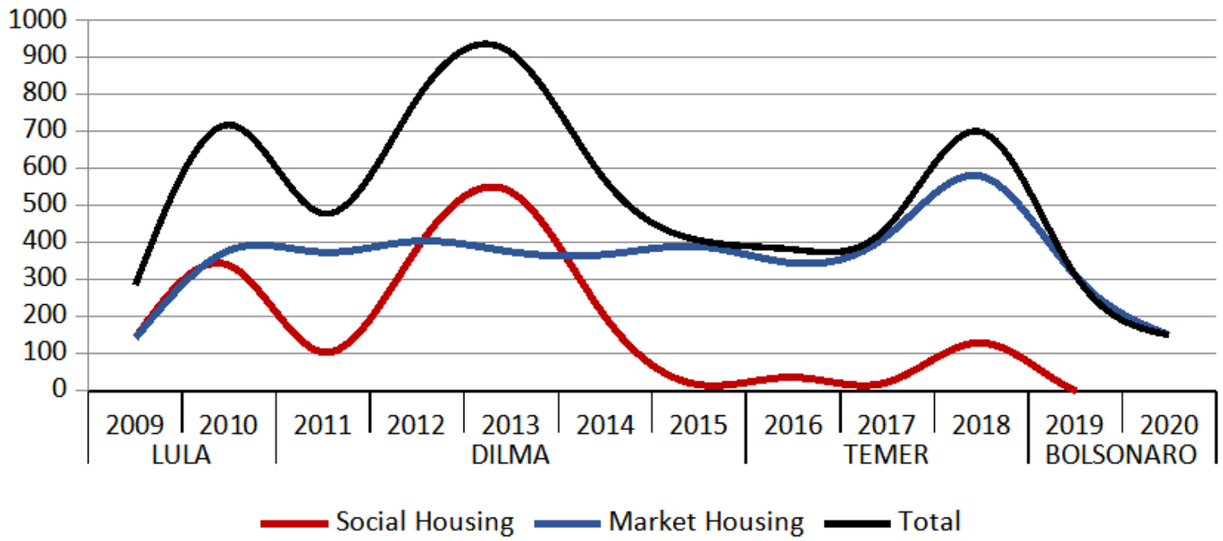
2 Minha Casa, Minha Vida - MCMV: My House, My Life
3 Zonas Especiais de Interesse Social – ZEIS: The Special Zones of Social Interest
4 Programa Casa Verde e Amarela – PCVA: The Green and Yellow House Programe

2009

Programa Minha Casa, Minha Vida (PMCMV)

In 2009, Luis Inácio Lula da Silva[5], the 35th president of Brazil, initiated the My House My Life Program, which has since exerted a profound influence on urban land development across numerous Brazilian cities. This program has ushered in a novel paradigm for urban development in the country.

Since 2013, there has been a noticeable decline in the availability of social housing. Between 2015 and 2020, there was a minimal increase in the development of social housing units. However, In 2018[6], under the pressure of housing movements, social housing initiatives represented only about **30%** of the total new housing constructions during this period. This is particularly striking given that the housing shortage primarily impacts low-income individuals, with approximately **91%** of those in need requiring access to affordable social housing.



Housing contracts by category, PMCMV, 2009–2020 (in thousands)



Housing shortage

5 The 39th and current president of Brazil. A member of the Workers' Party, he previously served as the 35th president of Brazil from 2003 to 2010
6 In 2018, as a response to the significant advocacy efforts of housing movements like The Homeless Workers Movement (MTST), there was a notable increase in social housing.

2020

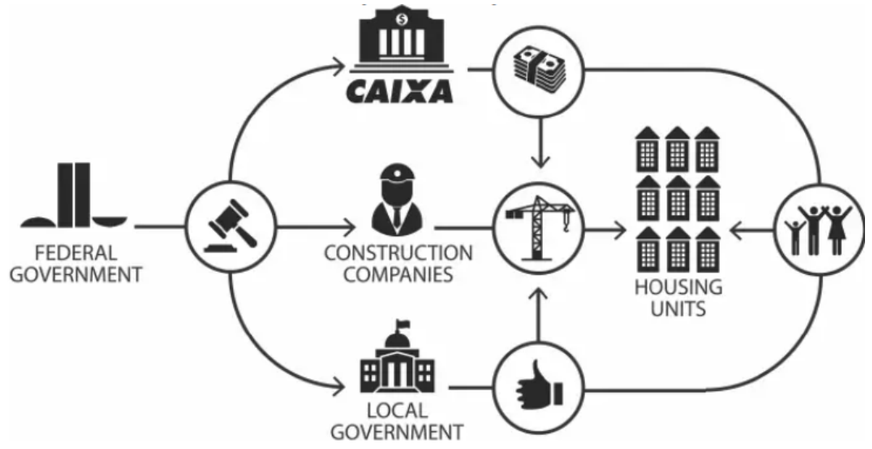
Programa Casa Verde e Amarela (PCVA)

The Green and Yellow Housing Program (PCVA) takes the place of PMCMV in 2020. Instead of offering low-income people subsidies to buy homes, the new program focuses on giving them **credit.** The present scheme offers lower subsidies to low-income families, ranging from R$30,000 to R$42,000 per year. While providing large, long-term interest-bearing loans, this situation may increase the indebtedness of low-income people. Additionally, relocating people to the urban periphery, where there is insufficient infrastructure, may further reduce the quality of life of residents.

Subsidies R$

↓

Credits



PMCMV agent

2023

Programa Minha Casa, Minha Vida (PMCMV)

On February 14,2023, the Minha Casa, Minha Vida (MCMV) program of the Brazilian federal government was restarted. The major improvement of the new program is that range 1 covers the new target audience of families with a gross monthly income of up to **R$ 2,640**, so that more people at that economic level can access the program. Now, the plan is to offer this demographic up to **50%** of subsidized housing.

~~R$ 1800~~



85% - 95%





Household income is employed as a key indicator in these social housing programs to categorize various households into various ranges, and the government offers various subsidies. In reality, these policies base housing supply on the high **profits** from real estate that are anticipated(Santoro, 2019), and the government subsidies will be given to private developers or contractors if the returns from household rents are insufficient.



2009

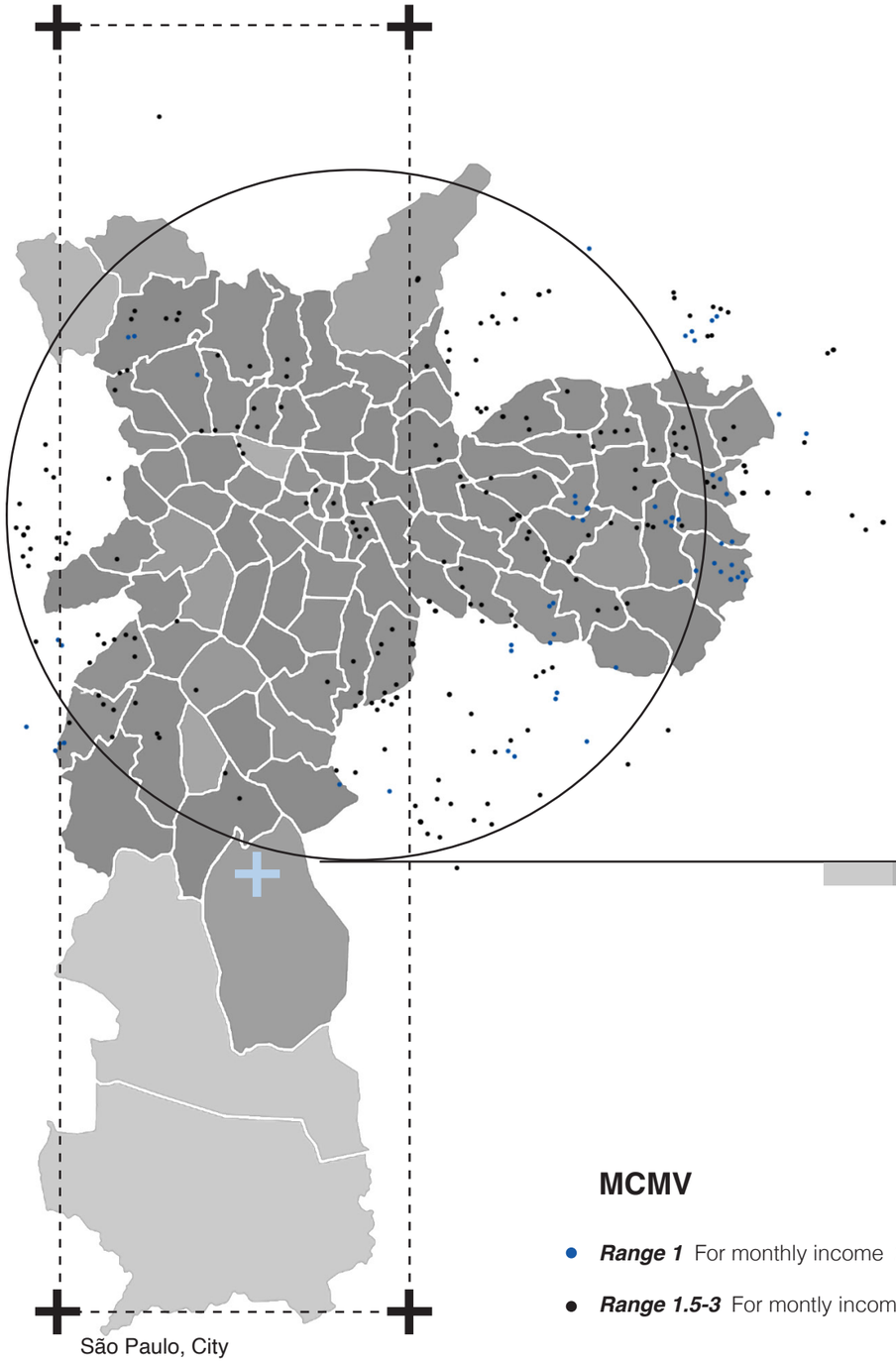
Programa Minha Casa, Minha Vida (PMCMV)

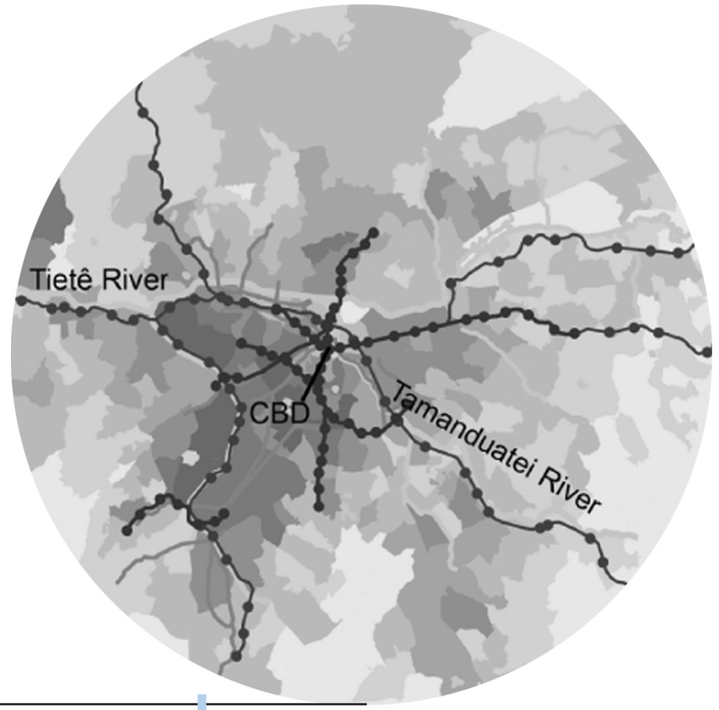
The My House My Life Program, often referred to as PMCMV (Programa Minha Casa Minha Vida), has been instrumental in reshaping the urban landscape. However, it is essential to note that PMCMV's social housing initiatives exhibit distinct characteristics. These include the **peripheral** placement of housing units, a tendency towards **uniform** architectural designs, and a notable absence of public and private **facilities** intended for collective use(Breda 2018).

In contrast, market-driven housing projects within Brazil showcase a more diverse array of architectural designs, boasting superior architectural quality. Furthermore, these market-driven projects tend to be strategically located in more central areas, enhancing their accessibility and appeal to residents.



Conjunto Viver Melhor, in Manaus-AM: inaugurated in 2012, some units have structural problems





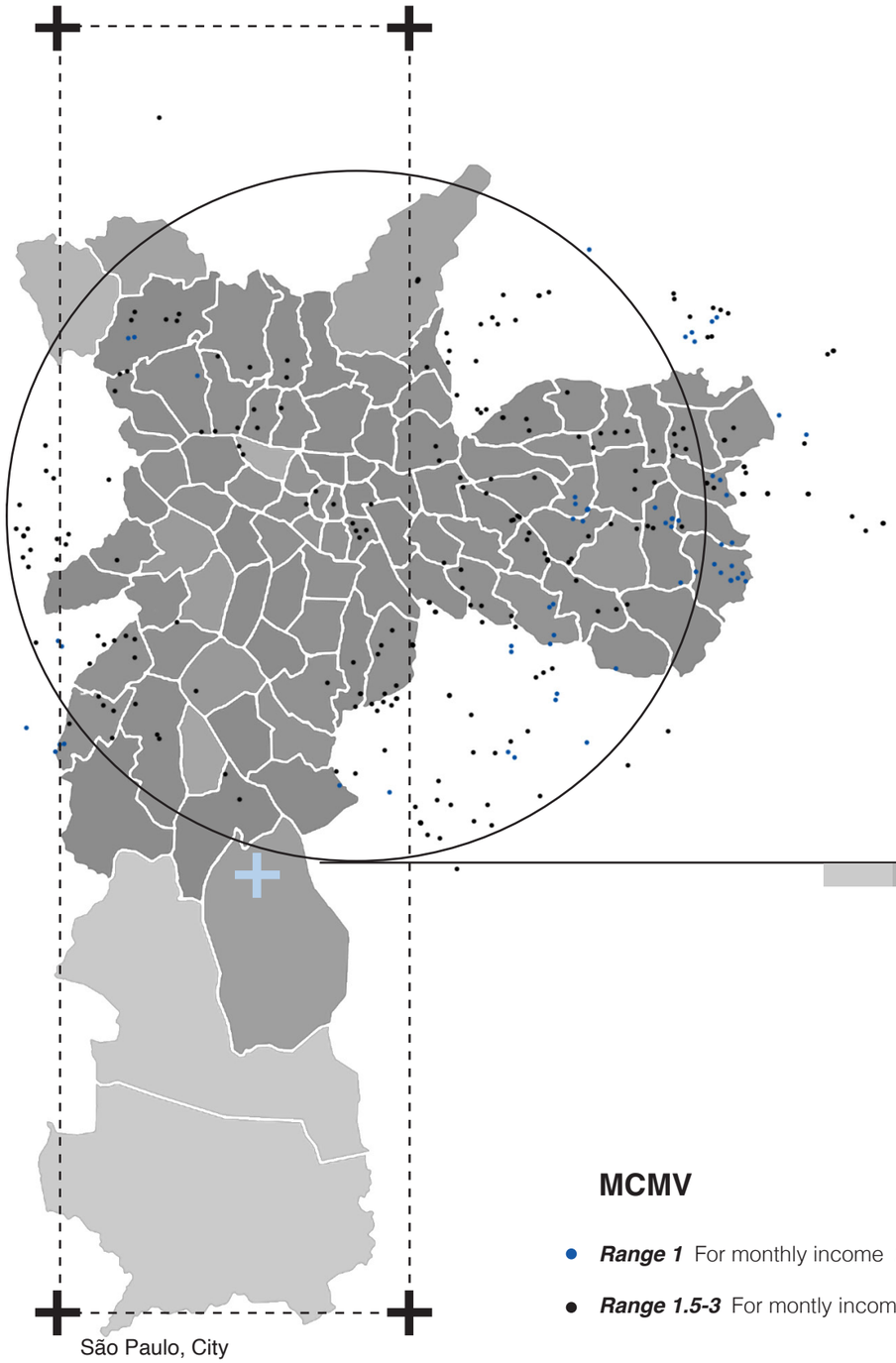
Average income

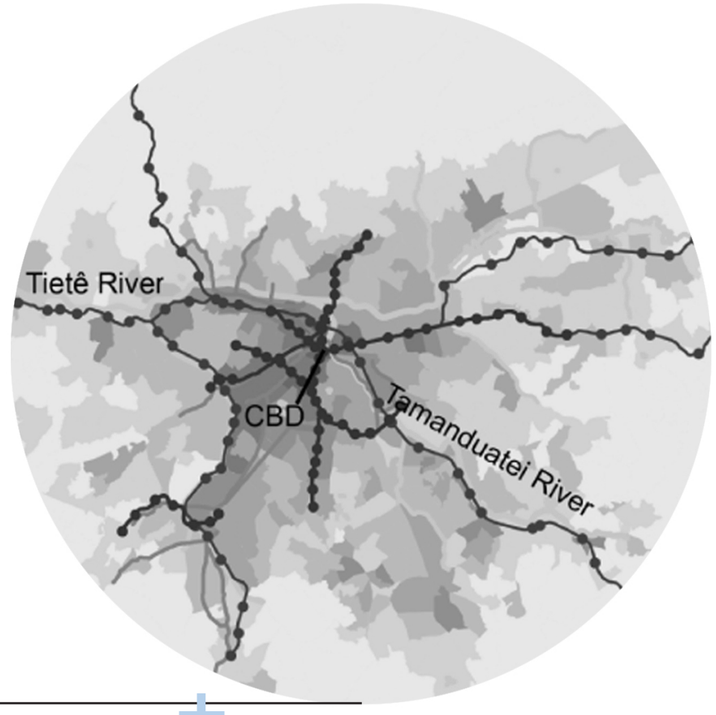
MCMV

- ***Range 1*** For monthly income 200-1800 R$
- ***Range 1.5-3*** For montly income 1800 - 7000 R$

In São Paulo, social housing projects designed for low-income communities are predominantly situated in the urban periphery. This placement is influenced by several factors, including the availability of land, lower land costs, and government policies. However, this distribution often gives rise to spatial injustice by positioning low-income residents at a considerable distance from economic opportunities, public services, and urban amenities in the city center.

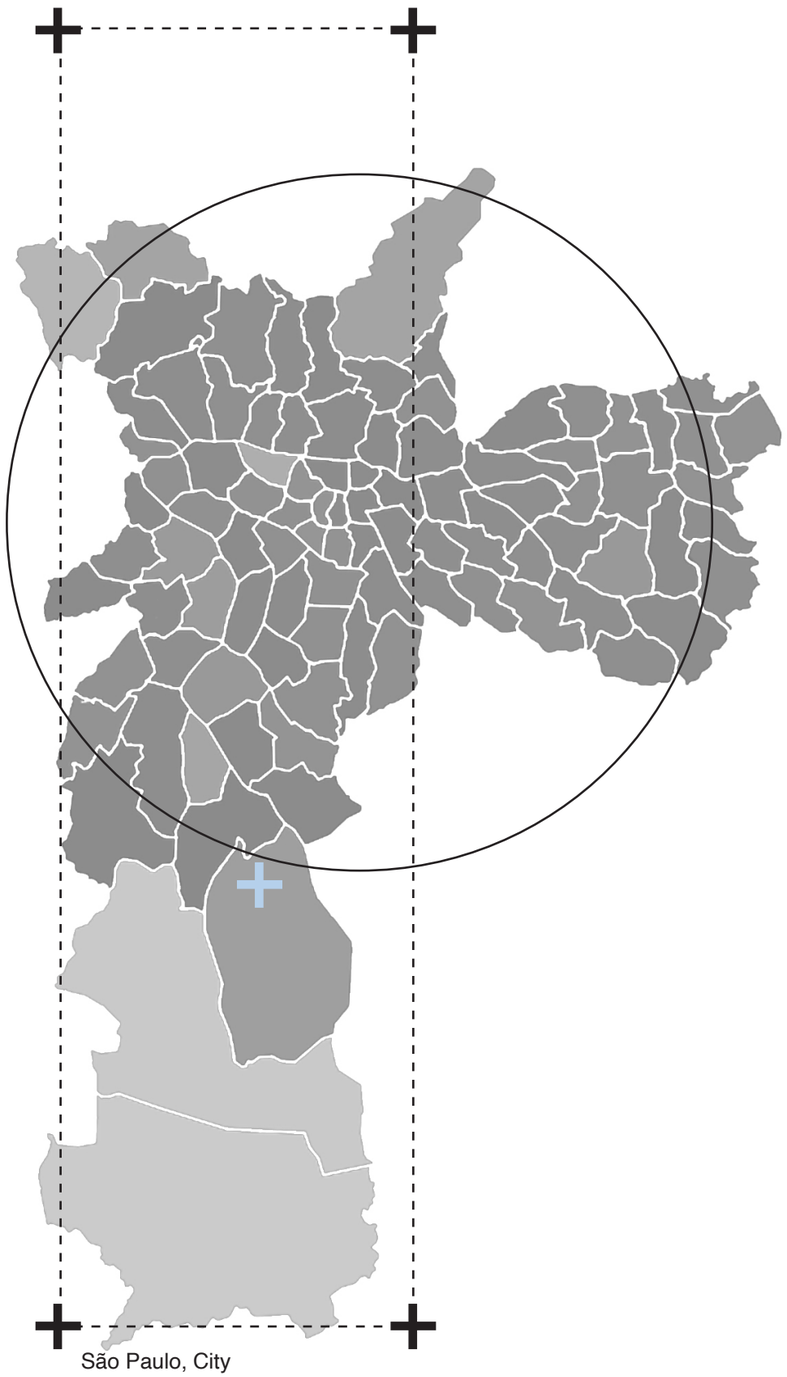
As social housing primarily occupies the urban periphery, the spatial segregation of low-income residents in these areas can lead to their social exclusion. These residents may face challenges in accessing quality education, healthcare, cultural activities, and employment opportunities. This situation can exacerbate inequalities and hinder social mobility.



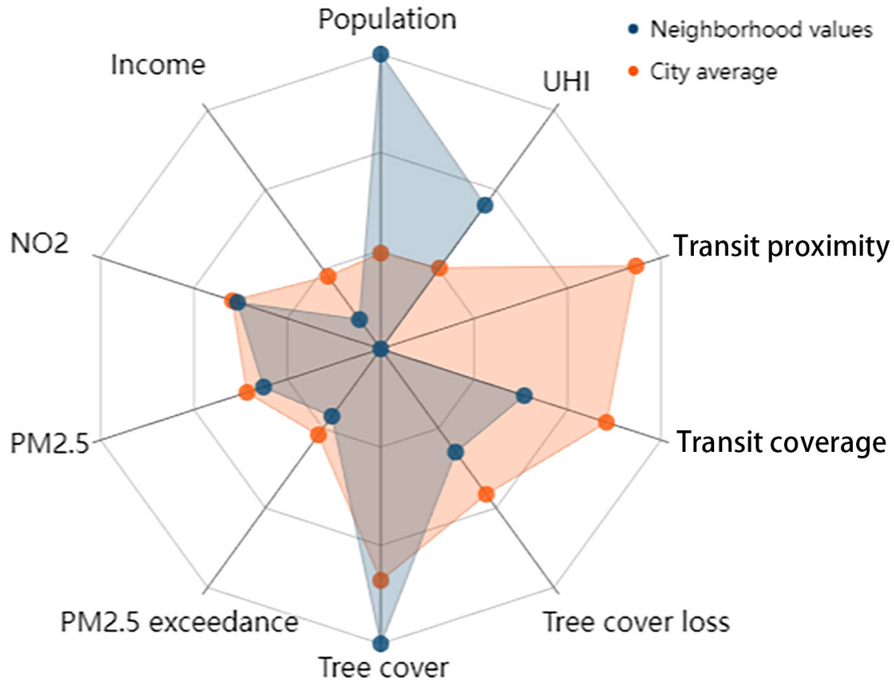


Furthermore, low-income residents living on the periphery of cities often face transportation-related challenges. They may need to allocate a substantial portion of their income and time to commute to work or access essential services in the city center. This can intensify income disparities and perpetuate cycles of poverty, as transportation costs and time constraints restrict economic mobility.

The spatial divide between low-income neighborhoods on the outskirts of cities and more affluent urban areas may also impede the ability of low-income individuals to establish social networks and connections that could provide improved employment prospects and resources for economic advancement.



Source: https://datadrivenlab.org/urban/cities/sao-paulo/



Situated on the urban periphery of São Paulo, this neighbourhood predominantly accommodates low-income communities, thus accentuating a profound socio-economic contrast with affluent districts located at the city's core. This disparity is manifested through limited access to essential resources such as healthcare, education, and employment opportunities, as well as a dearth of critical urban infrastructure, including transportation networks and green spaces, which collectively contribute to higher levels of urban heat island (UHI) effect. Moreover, the neighbourhood's comparatively denser population further underscores the challenges faced by its residents in securing a comfortable and sustainable urban living environment.

As I meander along São Paulo's bustling Avenue Paulista, I'm entranced by the urban panorama unfolding before my eyes. The city's skyline is punctuated by high-rises, such as the soaring Cásper Líbero TV tower, the avant-garde Museu de Arte de São Paulo (MASP), and major banks like Safra and Citibank building. These skyscrapers transcend the realm of mere construction, they are a testament to cutting-edge architectural innovation and the intertwining of urban development, history and culture.

Yet, within this enchanting cityscape, a stark duality emerges. Amid Avenue Paulista's glitz and vibrancy, I notice an obvious signs of division. Gated communities and vigilant security guard, serve as reminders of the persisting spatial inequities that cast a shadow over this otherwise vibrant scene. The stark contrast between richness and exclusion engages me to explore deep concerns about the nature of equitable urban development in São Paulo, inspiring an exploration of the obstacles I must overcome in our pursuit of a cityscape that represents fairness and inclusivity.





City of Walls



As I meander along São Paulo's bustling Avenue Paulista, I'm entranced by the urban panorama unfolding before my eyes. The city's skyline is punctuated by high-rises, such as the soaring Cásper Líbero TV tower, the avant-garde Museu de Arte de São Paulo (MASP), and major banks like Safra and Citibank building. These skyscrapers transcend the realm of mere construction, they are a testament to cutting-edge architectural innovation and the intertwining of urban development, history and culture.

Yet, within this enchanting cityscape, a stark duality emerges. Amid Avenue Paulista's glitz and vibrancy, I notice an obvious signs of division. Gated communities and vigilant security guard, serve as reminders of the persisting spatial inequities that cast a shadow over this otherwise vibrant scene. The stark contrast between richness and exclusion engages me to explore deep concerns about the nature of equitable urban development in São Paulo, inspiring an exploration of the obstacles I must overcome in our pursuit of a cityscape that represents fairness and inclusivity.









The striking juxtaposition of wealth and poverty in Brazil's vast urban and rural landscapes paints a stark picture of spatial inequality. On the one hand, luxury high-rise apartments and manicured neighborhoods are symbols of prosperity. On the other hand, millions of Brazilians face the stark reality of inadequate housing, informal settlements and homelessness. This vast disparity in living conditions highlights the persistent social injustices that have plagued the country for generations.

São Paulo, like many other urban centers worldwide, grapples with a stark contrast in living conditions and spatial inequity between various income groups. Nowhere is this divide more evident than in the sprawling favela areas, where marginalized individuals face numerous challenges in their daily lives. The existing housing in these areas often lack essential amenities, basic infrastructure, and a sense of community. This **spatial inequity** and **social injustice** perpetuate a cycle of poverty and exclusion.

In this context, there is a pressing need to explore innovative architectural design solutions that not only enhance living conditions but also foster **inclusive communities** within São Paulo's favela areas. The overarching goal is to bridge the gap between different income groups, create opportunities for marginalized individuals, and address the systemic issues that perpetuate this divide. This research aims to investigate how architecture can be leveraged as a tool for social change, aiming to improve the quality of life for residents in these underserved communities.

To achieve this, the research will delve into various aspects of **architectural design, urban planning, and community engagement** to identify strategies that can empower marginalized individuals, promote inclusivity, and create environments that are conducive to social and economic advancement. By addressing these challenges through architectural innovation, this research seeks to contribute to a more equitable and just urban landscape in Sao Paulo, offering valuable insights that can be applied to similar contexts worldwide.



Favelas are not always a problem.

Favelas can sometimes really be a solution.

Eduardo Paes[7]

There are NO beggars in favelas

Providência's Maurício Hora[8]

7 The mayor of the city of Rio de Janeiro from 2009 to 2012
8 A photographer and community leader born in the favelas of Rio de Janeiro, he is also an activist in defense of the rights of communities



Although the majority of the homes in favelas are densely populated, they are not vertically divided like condominiums are. Instead, low-rise building styles and human-scale street spaces encourage neighborhood interaction, and the people's cooperation and communication help to sustain beneficial community outcomes("A City Planner Responds," n.d.).



Inclusity

Whereas these catch-all programs have seen some success in addressing the housing deficit, it does not represent a viable alternative for very low-income families. Projects developed under this program are often located in the city periphery, far from services and amenities, as developers buy the cheapest available land to maximize profit . Furthermore, many families find it increasingly difficult to keep up with living expenses once they obtain their homes. Homeowner association fees can be higher than the mortgage itself. Adding to those the cost of formal connections to water and electricity makes success via this program simply unattainable for many families.



Quality

From the research, residents also face a reduction in the quality of place, specifically relative to the everyday interactions that inform sense of belonging, security, and general well-being. The security of paved and well-lighted streets, patterns of movement, and familiarity are important indicators of how public space is used, and maintained



Opportunity

These developer-lead programs favor a top down and opaque housing provision system, while showing no evidence that it can facilitate access to greater social and economic opportunities in the city by lower-income populations.

Research question

How can architecture design foster an **inclusive community**, while enhance living conditions, and explore opportunities for marginalized individuals?

Design

1.1 What is an effective solution to mitigate the neglect of marginalized individuals within social housing projects?

1.2 What specific considerations should be taken into account to enhance the quality of life for diverse income groups?

1.3 What are the potential challenges and barriers that may arise during the development of mixed-income housing, and what effective strategies can be employed to address them?

02 Research

Field observation

October, 2022

I physically immersed myself in the site of interest. During this process, I carefully observed and documented intricate details of the environment, the behaviours of the local people, their interactions, and any relevant phenomena. This allowed me to gain insights into the daily activities and routines of the community, as well as identify the specific needs of the buildings and the overall site

Community interview

October, 2022

With the support of the School of Architecture and Urbanism at the University of São Paulo (FAUUSP), I have had the opportunity to delve deeper into the sites and various social housing projects in São Paulo. I have actively engaged with local residents and stakeholders, conducting on-site surveys and interviews. These interactions have yielded valuable qualitative and quantitative data, shedding light on their perspectives, needs, and concerns.

Case Study

September 2022- July 2023

Before the field trip, I conducted a comparative analysis to build a foundational understanding of Brazilian social housing . During the field trip, I engaged in field observations that allowed me to experience and appreciate the quality of life at a human scale. Subsequently, I explored specific communities, neighbourhoods, or housing projects online, which had implemented strategies to enhance the quality of life for diverse income groups. These case studies provided valuable insights into successful approaches. As a result, I endeavored to incorporate key elements from Brazilian vernacular architectural attributes into my own design.

Spatial analysis

From November to December, 2022

With the data from Google map and Geographic Information Systems(GIS), I created maps to visually represent spatial data and relationships of the site. The resources from municipality's official website also help me to overlay various data layers, such as demographics, land use, and infrastructure, to gain insights into the context.

Policy analysis

January 2023- April 2023

I conducted an evaluation of existing policies and initiatives aimed at improving the quality of life for diverse income groups. I also delved into the issues addressed within various housing policies through a comprehensive literature review. My goal was to identify potential opportunities for managerial strategies and architectural design improvements within the field of mixed-income housing.

Literature review

January 2023- June 2023

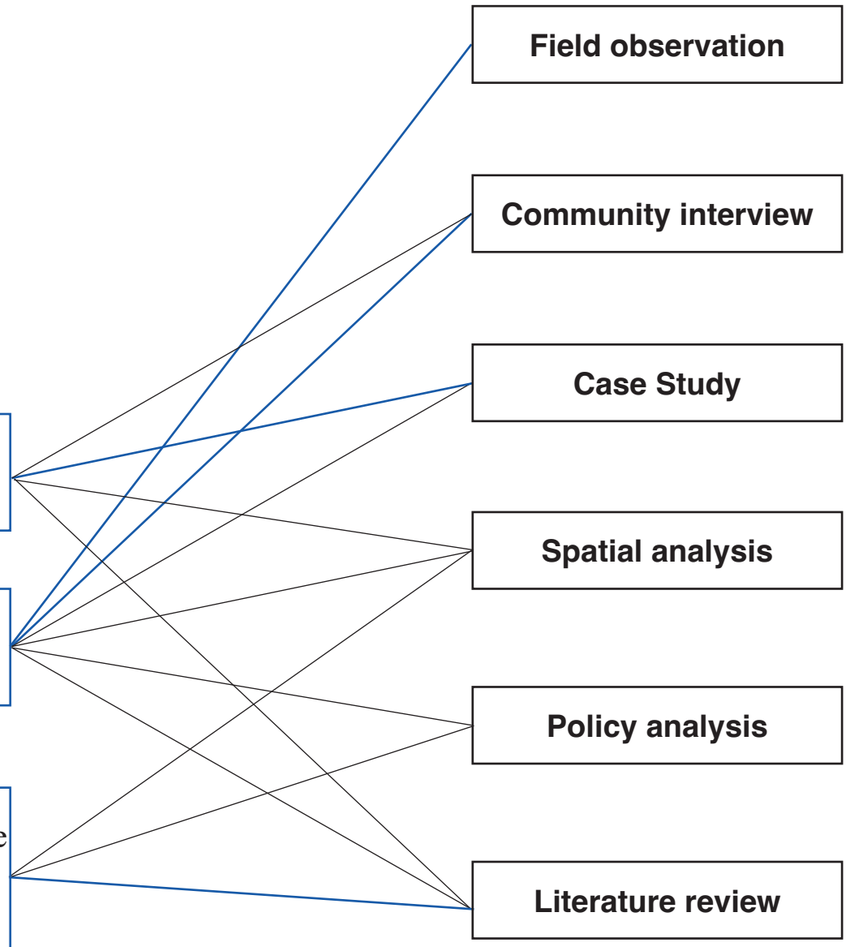
Through my literature review, I gathered valuable information and gained insights into the general context of social housing in São Paulo. After completing my site survey, I redirected my attention towards identifying variations in living conditions among various income groups. Literature research played a pivotal role in aiding me to delineate these differences. Moreover, my focus expanded to pinpointing the factors that exert an influence on the quality of life of diverse income groups. By taking into account the criteria established by scholars in this field, I was able to discern potential solutions at different design scales.

Design

1.1 What is an effective solution to mitigate the neglect of marginalized individuals within social housing projects?

1.2 What specific considerations should be taken into account to enhance the quality of life for diverse income groups?

1.3 What are the potential challenges and barriers that may arise during the development of mixed-income housing, and what effective strategies can be employed to address them?



Design

1.What is an effective solution to mitigate the neglect of **marginalized** individuals within social housing projects?

?

Urban planning

Why

Why

Social Justice

Considering the various aspirations of different income groups while designing mixed-income housing is paramount for several compelling reasons. Firstly, it promotes social equity by providing individuals from various income brackets with equal access to safe, well-designed housing. This inclusivity helps bridge socioeconomic divides and creates more diverse, vibrant communities where people from different backgrounds can interact, fostering empathy and understanding. For instance, the “Via Verde” project in the South Bronx, New York City, exemplifies this approach by integrating affordable and market-rate housing in a sustainable, aesthetically pleasing manner.



Via Verde, New York City



https://www.archdaily.com/468660/via-verde-dattner-architects-grimshaw-architects

Why

Economic Diversity

Secondly, mixed-income housing enhances economic diversity, ensuring that neighborhoods remain accessible to a broad spectrum of individuals, including teachers, healthcare workers, artists, and service industry professionals. This diversity enriches the social fabric of communities and prevents the concentration of poverty in specific areas. The “Jardim Edite Social Housing” project, which combines residential, retail, and commercial spaces, demonstrates how this concept can thrive.



Jardim Edite Social Housing



https://www.archdaily.com/416573/jardim-edite-social-housing-mmbb-arquitetos-h-f-arquitetos

Why

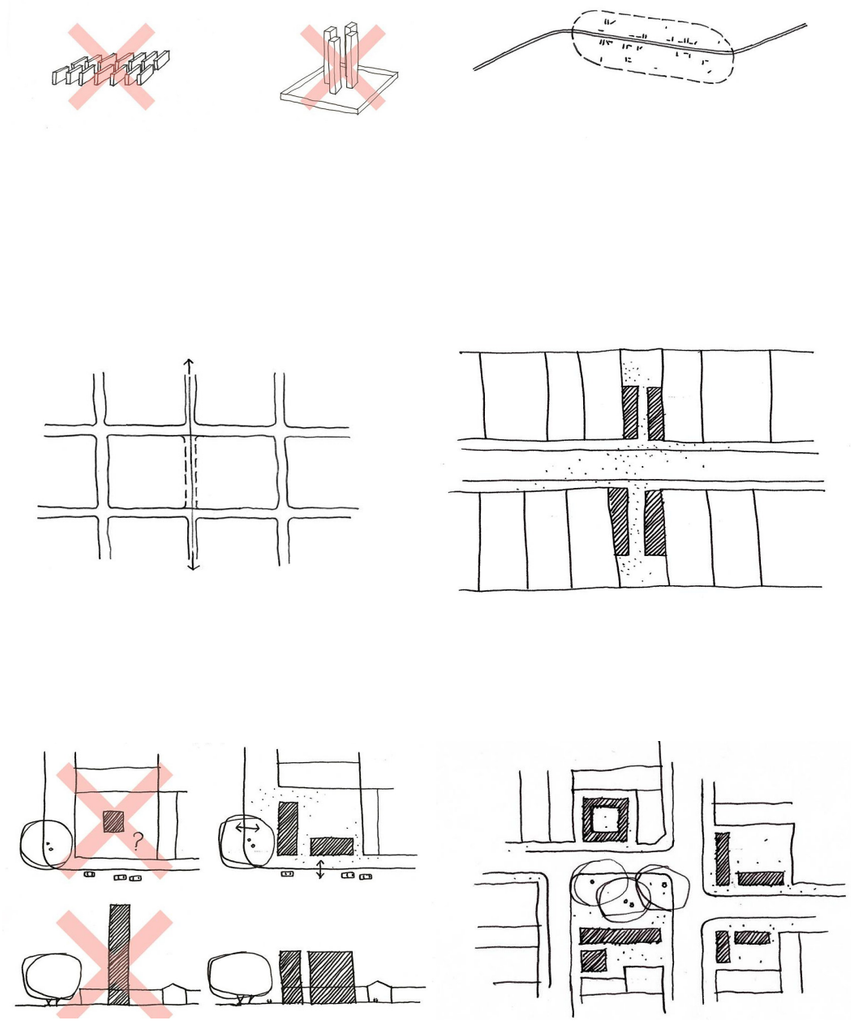
Urban resilience

Thirdly, catering to different income groups' aspirations improves residents' overall well-being. It allows for a more holistic approach to design, considering factors such as accessibility, safety, green spaces, and communal amenities that benefit all residents. An example of this principle is the "Casa Paulista" program in Sao Paulo, which provides affordable and market-rate units while prioritizing sustainable design and communal spaces to enhance residents' quality of life. In summary, designing mixed-income housing with an awareness of diverse aspirations promotes social integration, economic diversity, and residents' well-being, contributing to more inclusive and sustainable communities.



Casa Paulista, Sao Paulo

https://www.urbem.org.br/housing-ppp-sao-paulo-brazil



Design Principles

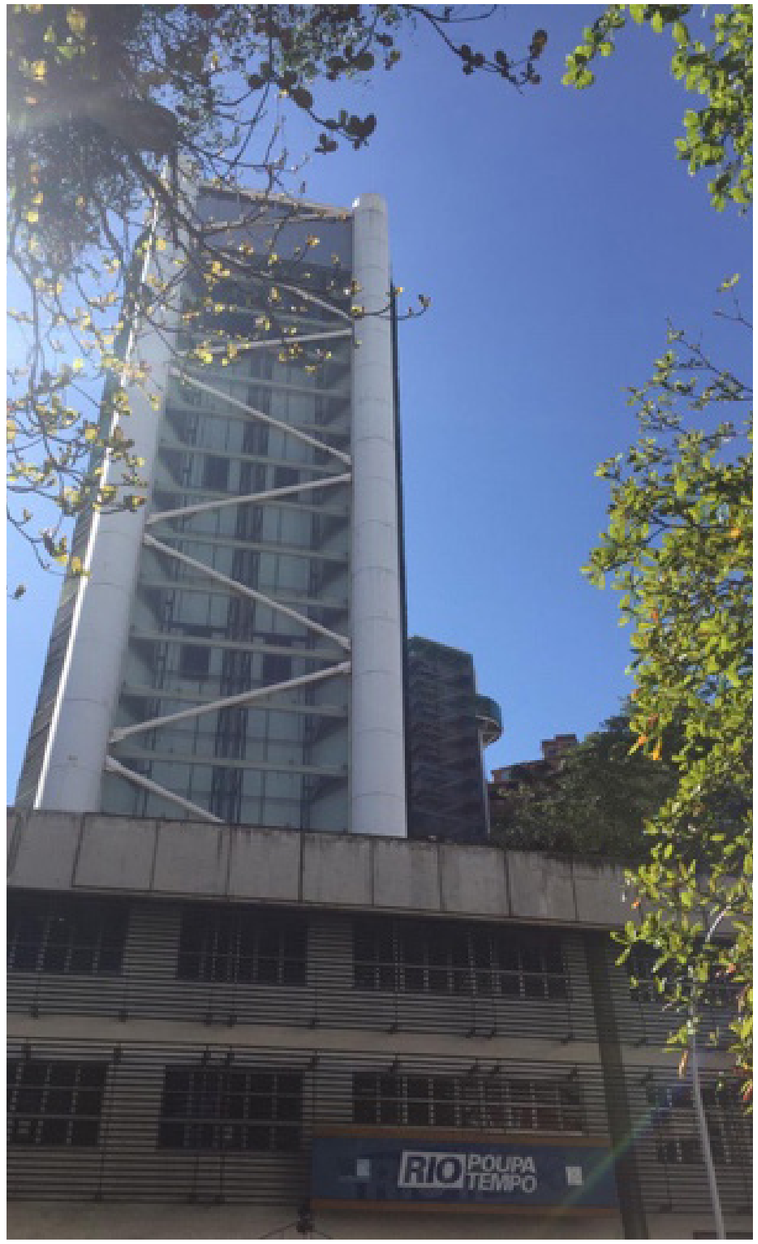
Why

Civic engagement

The Favela-Bairro program in Rio de Janeiro engaged residents in the development process by employing a multifaceted approach. It emphasized community-based planning, encouraged the formation of community associations, and held regular workshops and meetings where residents could voice their concerns and preferences. Needs assessments and surveys were conducted to prioritize projects based on actual community needs, and training programs were provided to empower residents with the skills needed for project implementation. Design charrettes allowed for collaborative design solutions, while smaller-scale community-driven projects were initiated to build trust. Transparency and accountability were maintained throughout, fostering a sense of ownership and pride among residents and contributing to the program's success in improving living conditions in the favelas.



Pavão-Pavãozinho Favela
Source: Fabio Costa, 2002.



The lift from the asfalto to Cantagalo Favela
Source: Stephen Buckman, 2019.

https://www.urbem.org.br/housing-ppp-sao-paulo-brazil

Design

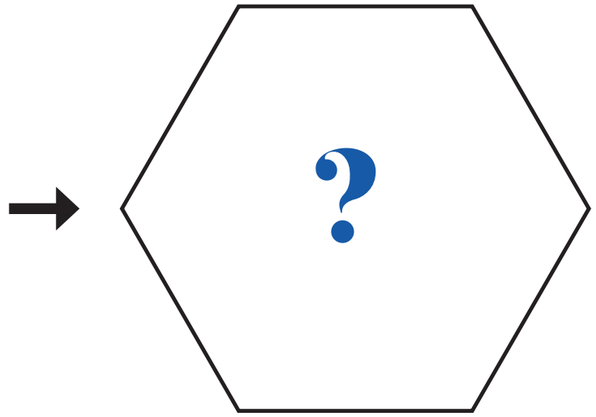
2.What specific **considerations** should be taken into account to enhance the quality of life for diverse income groups?

01 I Social justice

02 I Economic diversity

03 I Urban resilience

04 I Civic engagement



Urban planning

Why

What

01 I Affordability

The primary aspirations for the mixed-income housing project encompass the following goals for different income groups: Low-income housing clusters seek to offer affordable housing options, ensuring that rent or ownership costs are **manageable** for individuals and families with limited financial resources. Meanwhile, middle-low-income housing clusters aim to achieve a balance between affordability and **quality**, striving to provide decent living conditions within the means of this income group.

HIS 1







HIS 2







HMP



02 I Services

Essential services vary depending on income groups. For low-income individuals and families, access to affordable healthcare, basic education, **clean water, sanitation**, and **public transportation** is vital. They often rely on government assistance for housing and food security. In contrast, mid-low-income groups aspire to better housing conditions, improved educational opportunities, and increased **job prospects**, although access to private healthcare and transportation may still be limited. Middle-income individuals prioritize high-quality education, private healthcare options, and reliable public services, aiming for enhanced infrastructure, security, and access to cultural and recreational **facilities**, while also striving for an overall higher standard of living.

HIS 1







HIS 2





HMP





03 I Safety

The essential safety concerns for various income groups differ but often overlap. Low-income groups are particularly vulnerable to inadequate housing, crime, and health hazards in informal settlements. They face challenges related to access to clean water, sanitary conditions, and vulnerability to natural **disasters** like flooding and landslides. Mid-low-income groups share some of these concerns, especially in less developed urban areas, with a focus on housing quality and safety. Middle-income groups generally face fewer housing-related issues but may still be exposed to crime in certain urban neighbourhoods, they prioritize issues like **neighbourhood safety, property security**, and reliable public services.

In summary, safety concerns in Brazil range from basic infrastructure and housing for low-income groups to **crime** and housing quality for mid-low and middle-income groups, with all income groups potentially affected by natural disasters in vulnerable regions. Low-income groups primarily focus on housing and basic safety, and middle-income groups tend to emphasize personal and **property security.**

HIS 1







HIS 2







HMP







04 I Qualities of life

Affordable housing options in urban locations with good **transportation connections** are vital for low-income people. Their quality of life may also be improved by the incorporation of **green areas** and community areas in housing developments. The focus switches to **mixed-use developments** for mid-low-income groups, which offer a mix of residential, commercial, and recreational spaces and promote a sense of community and convenience. Middle-class groups often place a higher priority on having access to high-quality educational, medical, and recreational resources, making well-planned communities with attractive healthcare facilities and **schools desirable.** In conclusion, low-income groups require affordability and green spaces, middle-class groups profit from mixed-use areas, and high-income groups look for diverse communities with necessary **services and amenities.**

HIS 1







HIS 2







HMP





01 I Space efficiency

To optimize land utilization, low-income housing clusters may aim for **compact building footprints** while ensuring sufficient living space, and for middle-low income groups, efficient layouts and multi-purpose rooms can be incorporated to maximize available space. Middle-income groups may aspire to larger units and enhanced common areas to improve **comfort** and residents' overall quality of life. Considering the context in favela area, **flexibility and adaptability** are essential considerations, and in addition to room layouts, the inclusion of private balconies, public terraces, and gallery spaces can serve as potential solutions to foster social connections and enhance security control within the neighborhood.

HIS 1





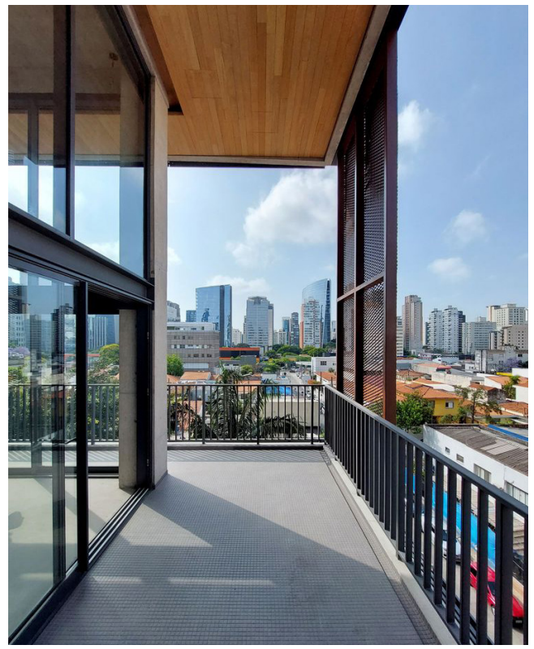
HIS 2







HMP





02 I Materiality

When designing mixed-income housing for residents in favela areas, it's important to acknowledge that different income groups have distinct material preferences for their dwelling units. Low-income groups prioritize affordable, **locally sourced, and durable materials**, with a particular emphasis on basic amenities and energy efficiency. Bricks, known for their cost-effectiveness and good bonding properties with concrete, are commonly used as both structural and infill materials in their housing. Additionally, concrete, including cast-in-place concrete, precast concrete slabs, and hollow concrete blocks, is often employed for middle-low income housing due to its efficiency and productivity. This group also aims for a balance between affordability and quality, showing a preference for **sustainable** materials. For middle-income groups with a larger budget, their aspirations extend to accessing a wide array of customizable, high-quality, and **aesthetically** pleasing materials. They also prioritize sustainability and energy efficiency in their housing choices. In conclusion, engaging with the community and exploring construction techniques that are both **cost-effective** and **quality-driven** are essential steps to accommodate these diverse material aspirations and promote inclusive housing in favela areas.

HIS 1







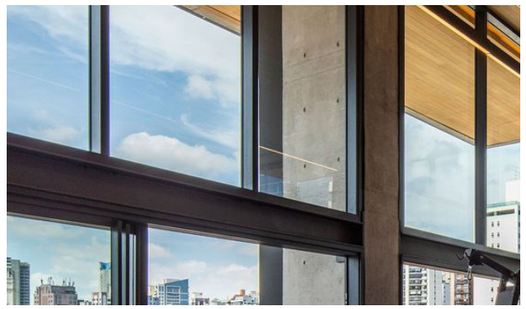
HIS 2

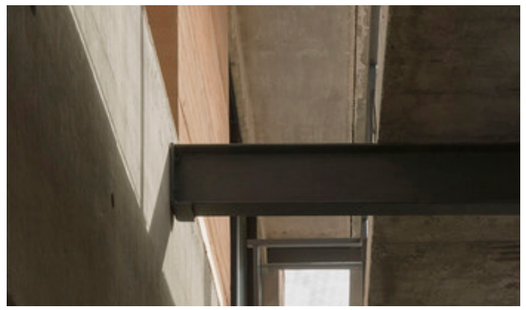




HMP







03 I Privacy

For low-income residents, who often face limited resources, architects may employ cost-effective strategies like simple partitions, curtains, or **temporary dividers** to offer basic privacy within their compact dwellings. Additionally, communal spaces within the housing complex can be strategically integrated to balance the need for individual privacy with opportunities for social interaction, thus fostering a sense of community. Middle-low income residents typically aspire to improved separation of living spaces, and architectural elements may include enhanced sound-proofing measures, adaptable interior layouts that allow for flexible usage, and the incorporation of shared green spaces for recreation and relaxation. These elements contribute to a more comfortable and versatile living environment that aligns with their aspirations. For middle-income groups, privacy aspirations may involve distinct and well-separated living spaces, and architects can achieve this by designing units with private bedrooms, bathrooms, and well-defined kitchen and living areas. Furthermore, higher-quality finishes, fixtures, and customization options can cater to their desire for aesthetically pleasing interiors. When feasible, incorporating private **outdoor spaces** like balconies or terraces provides an additional layer of privacy and relaxation.

Comparing to architectural elements akin to gated communities, such as controlled access points, security features, people tend to prioritize elements that align with Jane Jacobs' concept of 'eyes on the street.' This perspective underscores the significance of creating lively and active streetscapes, where natural surveillance occurs through the presence of residents in their **daily activities.** Additionally, well-planned communal gardens or courtyards play a pivotal role in ensuring that the privacy needs of residents are met while simultaneously promoting inclusivity and a sense of community within the development. Such spaces encourage social interaction and engagement, contributing to safer and more vibrant neighborhoods. To achieve this, architects should actively engage future residents in the design process, aligning privacy strategies and community-enhancing elements with the specific preferences and needs of each income group. This collaborative approach fosters the creation of socially inclusive and harmonious mixed-income housing complexes.

HIS 1

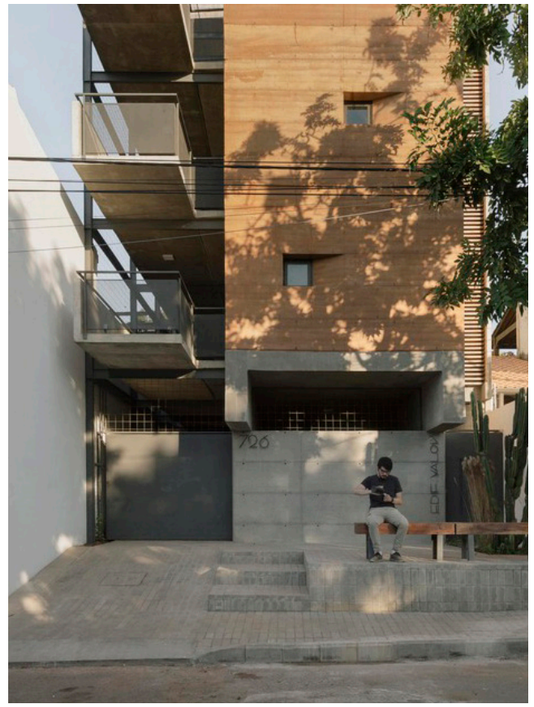


HIS 2





HMP



04 I Amenities

For low-income groups, the prioritization of fundamental amenities such as access to clean **water,** dependable safety features, and communal spaces not only enhances their daily lives but also significantly elevates their overall quality of life. These amenities create a safer and more comfortable living environment, fostering both a heightened sense of security and strengthened social cohesion. In contrast, middle-low income residents may aspire to enjoy amenities like **playgrounds** for children, tranquil green spaces for relaxation, and shared **laundry facilities**, all of which enhance their quality of life while nurturing community bonds. Meanwhile, middle-income residents often seek more upscale amenities, including fully equipped gyms, inviting swimming pools, private outdoor areas for **leisure,** and enhanced interior finishes, all of which contribute to a more luxurious and satisfying lifestyle. To establish an inclusive environment where residents from diverse income levels can interact, build connections, and cultivate a profound sense of belonging, it is imperative to ensure accessibility, sustainability, and other vital considerations. This comprehensive approach ultimately leads to a substantial improvement in the overall living conditions and well-being of residents within these mixed-income housing clusters.

HIS 1





HIS 2



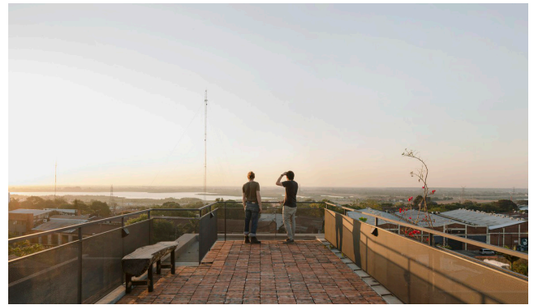




HMP

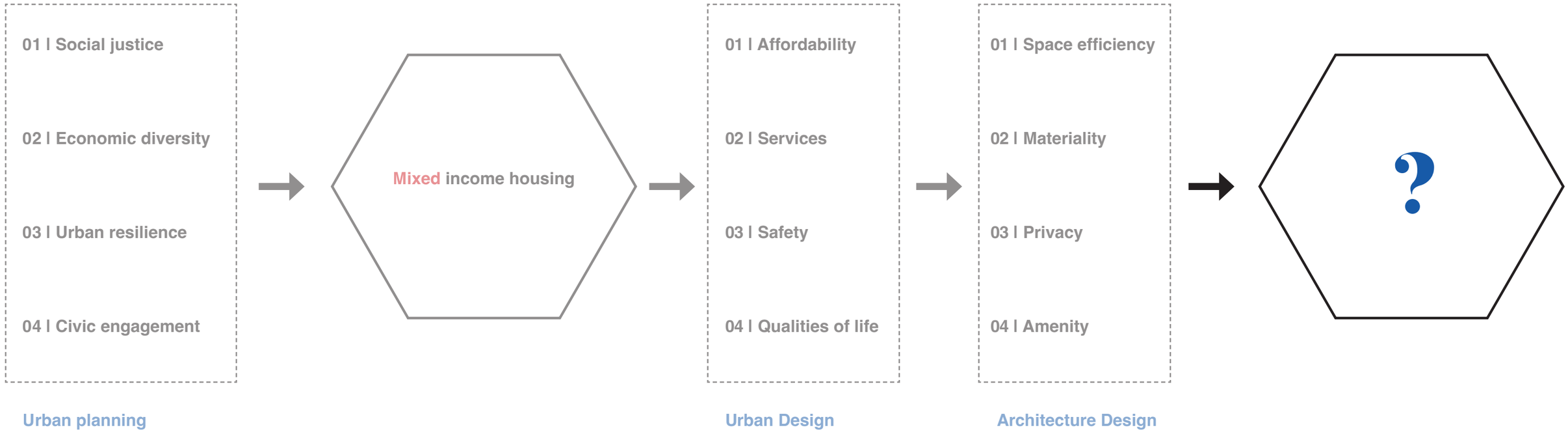






Design

3.What are the potential challenges and barriers that may arise during the development of **mixed-income housing**, and what effective strategies can be employed to address them?

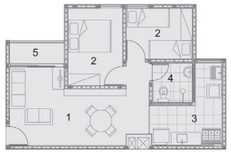


Why What How

Heliópolis Social Housing

São Paulo, Brazil

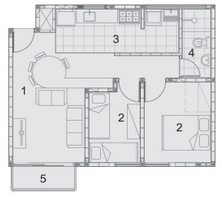




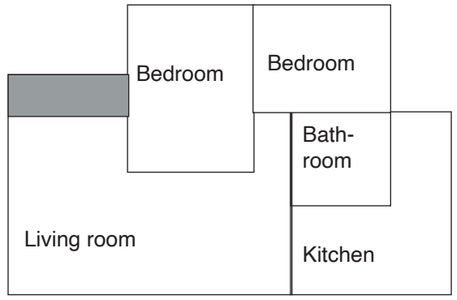
Unit A

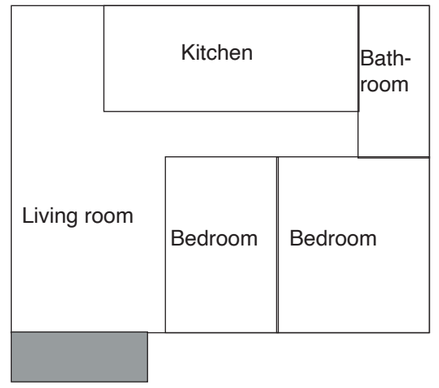


First Floor plan



Unit B





1) Large bays and short depth provide more opportunities of light and ventilation for the housing units.

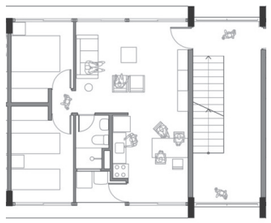
2) The location of the traffic space at the building's ends facilitates the arrangement of dwellings on both sides.

Jardim Edite Social Housing

São Paulo, Brazil



Heliópolis Social Housing, São Paulo, Brazil



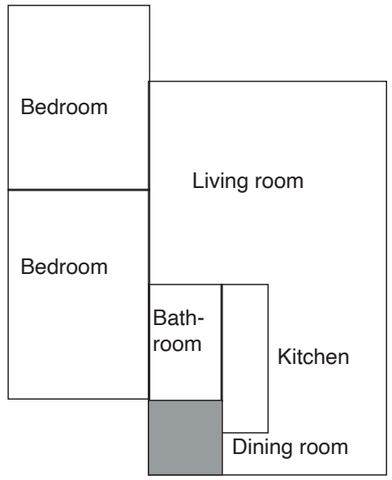
Unit A

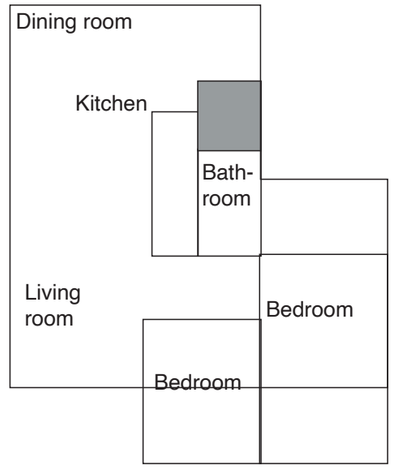


First Floor plan



Unit B

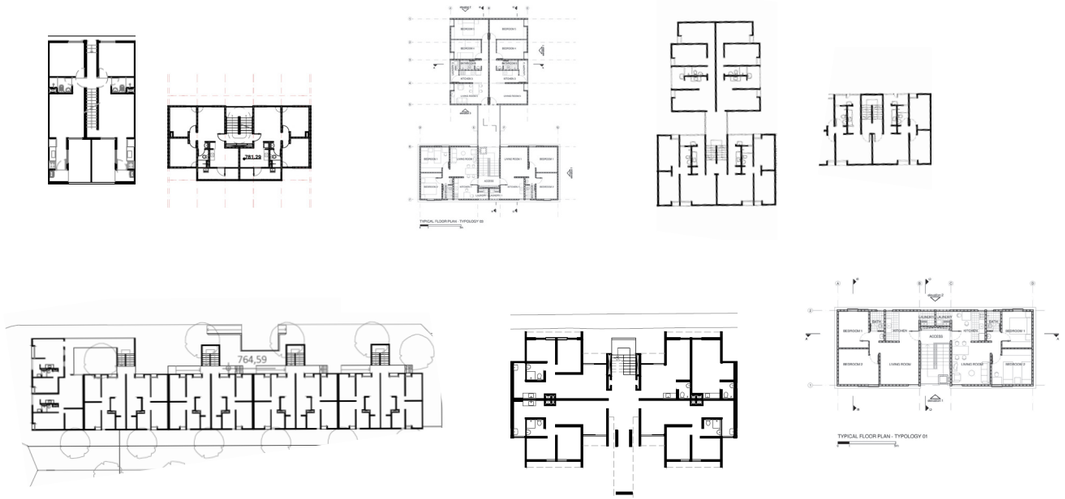




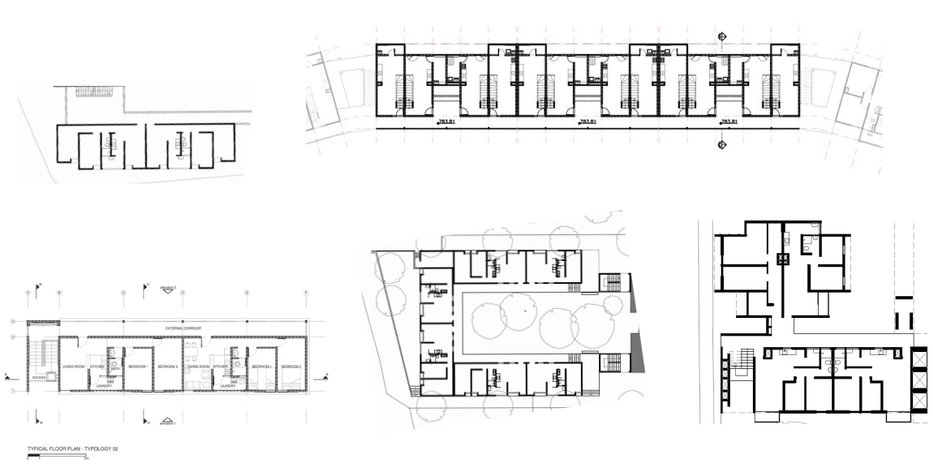
1) The combination of kitchen, bathroom and balcony increase the space efficiency and plumbing convenience.

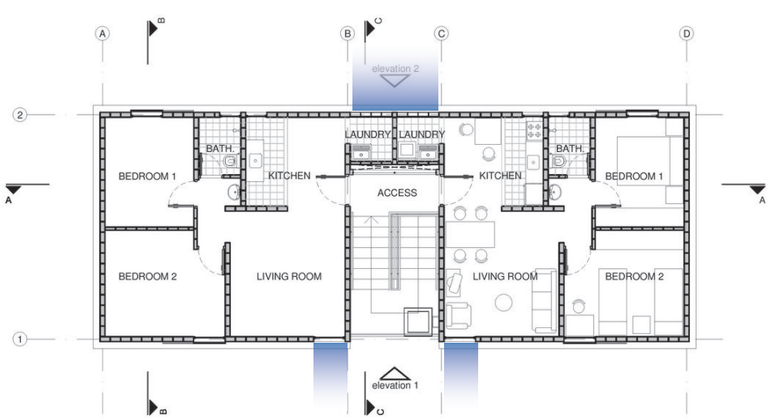
2) An L-shaped plan can be produced by inserting a circulation hub into the building blocks, so increasing the day-lighting surface of the unit.

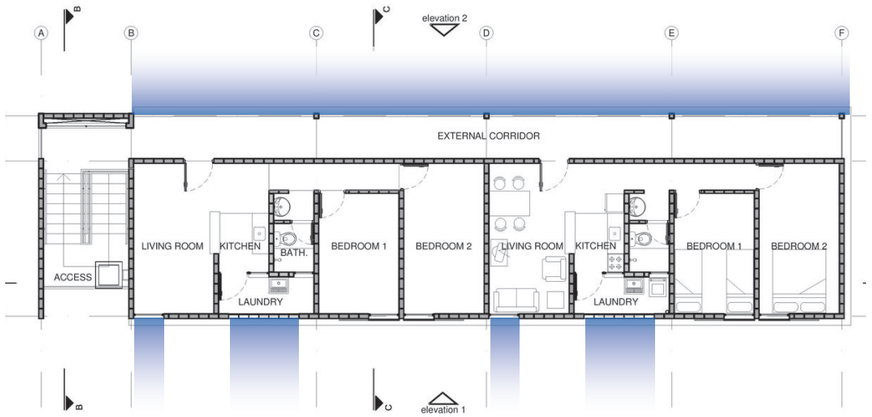
Slab house



Row house



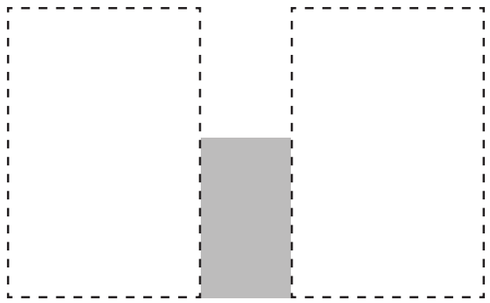




Privacy

Efficiency

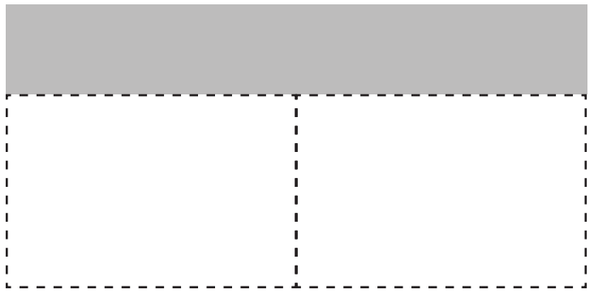
Flexibiliity



Security

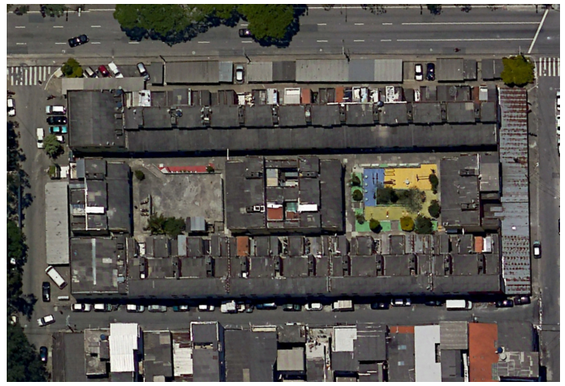
Amenity

Connectivity



Project name

Residencial Almirante Delamare (Heliopolis I)



Heliópolis Urbanization Glebe H

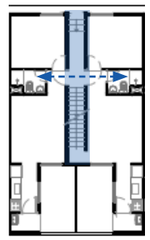


Conjunto Heliópolis Gleba G



Units/ Stairwell

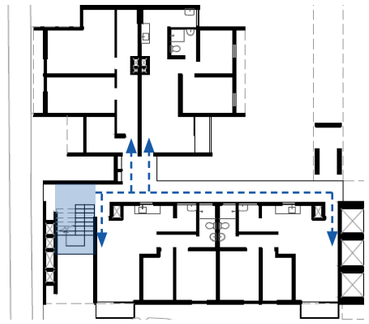
2/1



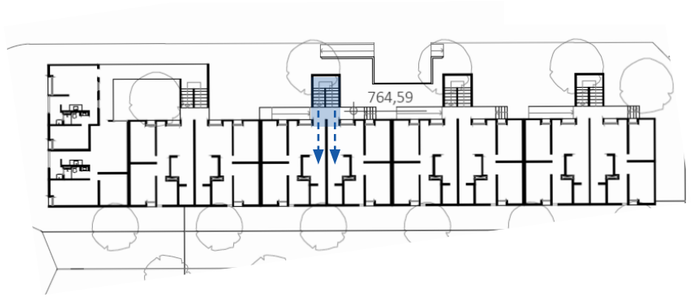
3/1



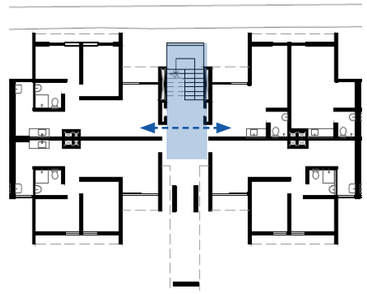
4/1



2/1



4/1



Natural Light and Safety: To create an inviting and secure environment, ensure stairwells and galleries receive abundant natural light through windows or skylights. Well-lit spaces encourage use while robust safety measures instill confidence in residents.

Green Spaces and Common Areas: If space allows, incorporate community gardens to foster interaction. Adjacent common areas or lounges provide designated spaces for residents to socialize, meet, or relax, enhancing community bonds.

Design Variation and Openness: Introduce design variation across floors to promote interaction between residents. Prioritize open, well-ventilated spaces in stairwells and galleries to encourage use and create a welcoming atmosphere.

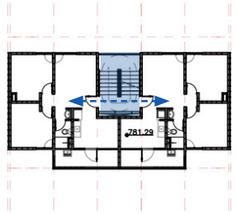
Project name

Units/ Stairwell

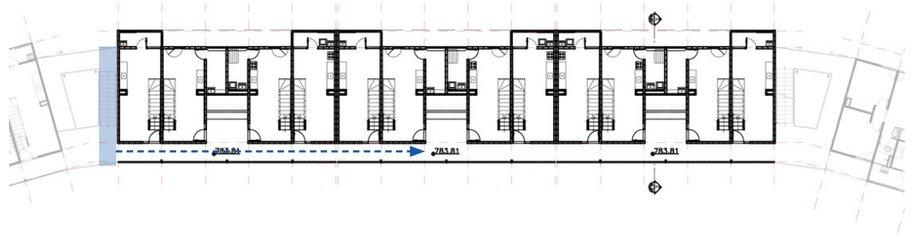
Parque Novo Santo Amaro V



2/1



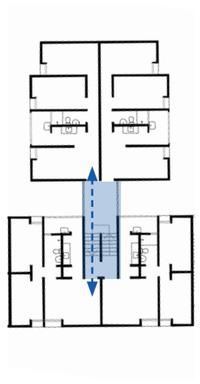
3/1



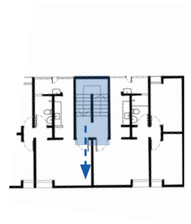
Gleba A



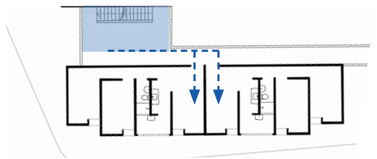
4/1



2/1



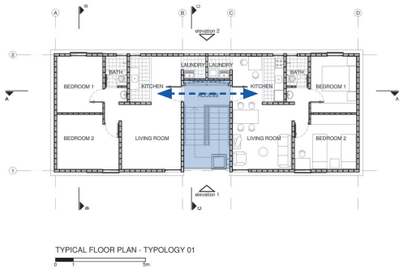
2/1



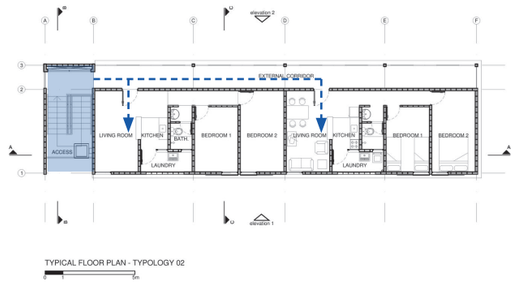
Jardim Vicentina Urbanization



2/1



4/1



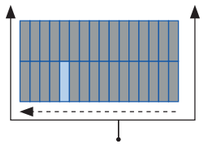
4/1





Parque Cocaia

São Paulo, Brazil



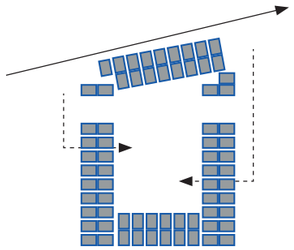




Doedijnstraat

Den Haag, Netherlands

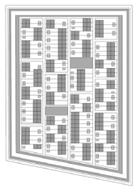


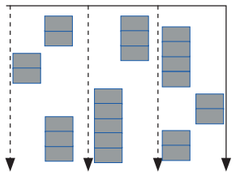




Waterdijk

Den Haag, Netherlands

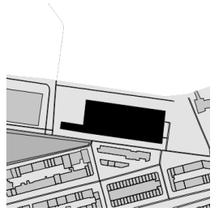


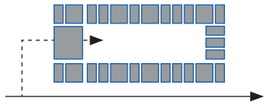




Fenix I

Rotterdam, Netherlands



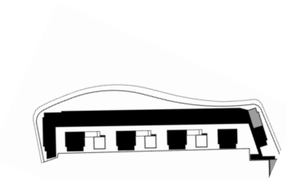


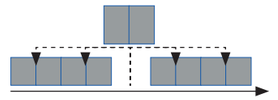
Street view **Site plan** **Circulation**



Gleba A

São Paulo, Brazil

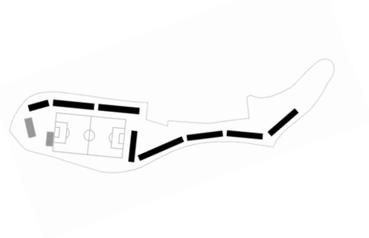


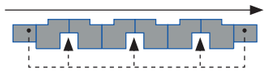




Parque Novo Santo Amaro

São Paulo, Brazil



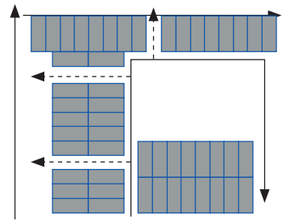




Jardim São Francisco

São Paulo, Brazil



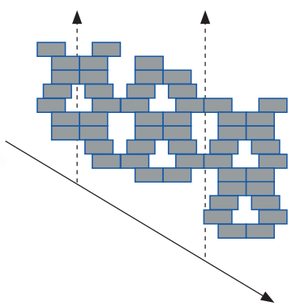




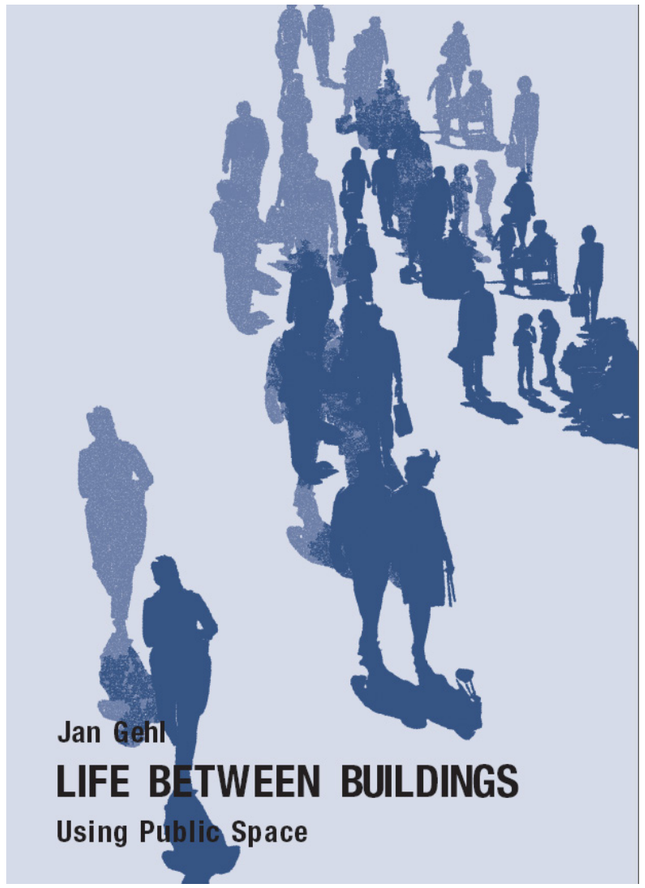
Comuna Dom Helder Camara

São Paulo, Brazil





Street view **Site plan** **Circulation**

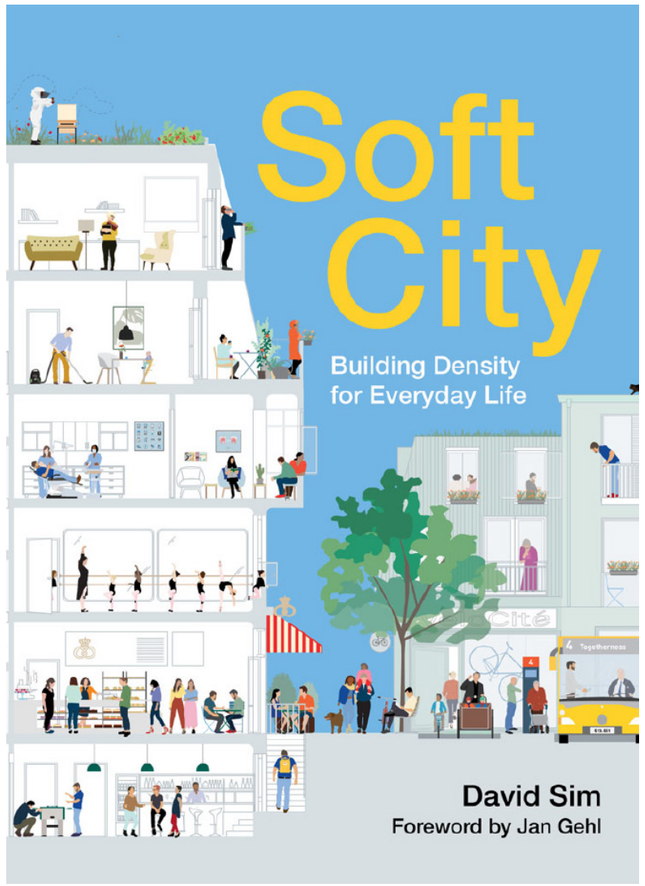


Observational Research: Gehl's approach is rooted in careful, systematic observations of how people use public spaces. He and his research team conducted extensive studies of public life in cities around the world, documenting how people move, gather, and interact in various urban settings.

Human Scale: The author emphasizes the importance of designing urban spaces at a human scale, where people feel comfortable and invited to walk, sit, and socialize. He argues that many cities have neglected this aspect, leading to environments dominated by cars and large buildings that can be unwelcoming to pedestrians.

Social Interaction: The book underscores the role of public spaces in facilitating social interaction and community life. Gehl's work emphasizes the need for urban planners and designers to create spaces that encourage people to come together and engage with one another. For instense, the revitalization of city centers and the transformation of underutilized urban plazas into vibrant public spaces.

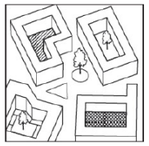
Accessibility and Inclusivity: Gehl advocates for creating inclusive and accessible public spaces that cater to people of all ages and abilities. He emphasizes the importance of universal design principles to ensure that public spaces are welcoming and functional for everyone. And it's necessary to prioritize pedestrians and cyclists in urban planning, promoting walkability, and reducing the dominance of automobiles in city centers.



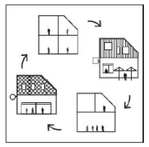
Based on the case studies of different cities around the world, the central premise of “Soft City” revolves around the idea of building density in urban areas to improve the quality of everyday life for residents. He argues that cities should prioritize creating environments that are responsive to the **needs of people**, promoting social interaction, well-being, and sustainability. He coined the term “soft city” to describe a city that prioritizes human experiences and relationships over rigid infrastructure and car-dominated spaces.



1. Diversity of Built Form



2. Diversity of Outdoor Spaces



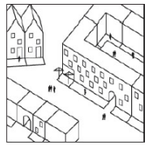
3. Flexibility



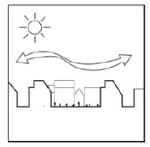
4. Human Scale



5. Walkability



6. Sense of Control and Identity



7. A Pleasant Microclimate



8. Smaller Carbon Footprint



9. Greater Biodiversity

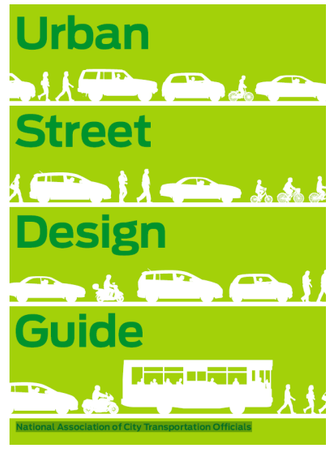
Nice criteria for livable urban density

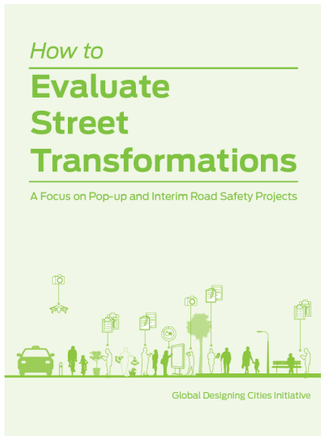


Contextual Design: The guide emphasizes the importance of designing streets that take into account the specific needs and characteristics of each urban context. It recognizes that one-size-fits-all approaches do not work for diverse urban environments.

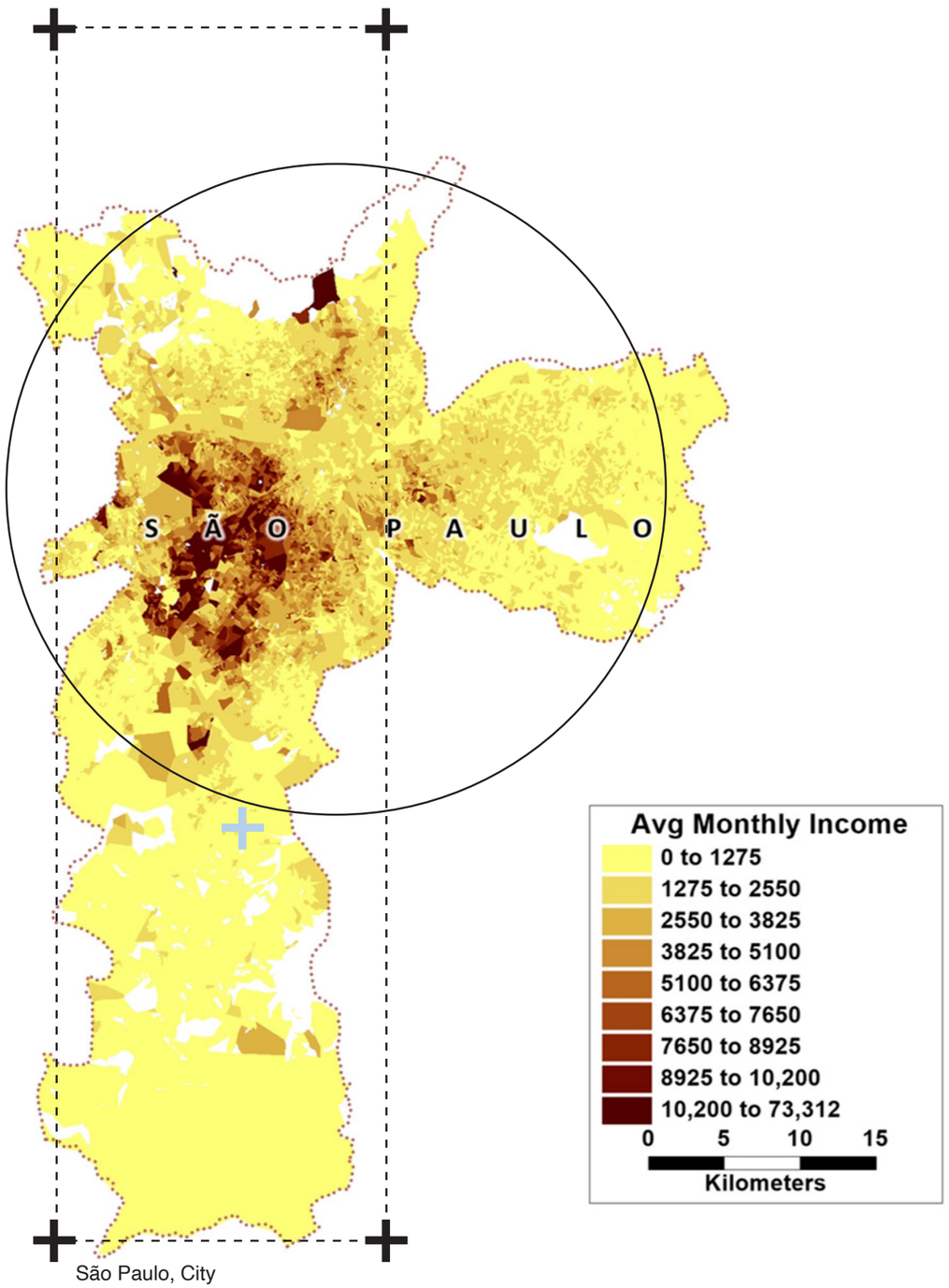
Complete Streets: The author advocates for the concept of "Complete Streets," which are streets designed to accommodate all users, including pedestrians, cyclists, public transit users, and drivers. Complete Streets prioritize safety and accessibility. It also showcase how to design streets that support multiple modes of transportation, such as walking, cycling, and public transit. It encourages a shift away from car-centric design.

Safety and Accessibility: This book prioritizes safety and accessibility for all users, including vulnerable road users like pedestrians and cyclists. It includes recommendations for features like crosswalks, bike lanes, and traffic calming measures.

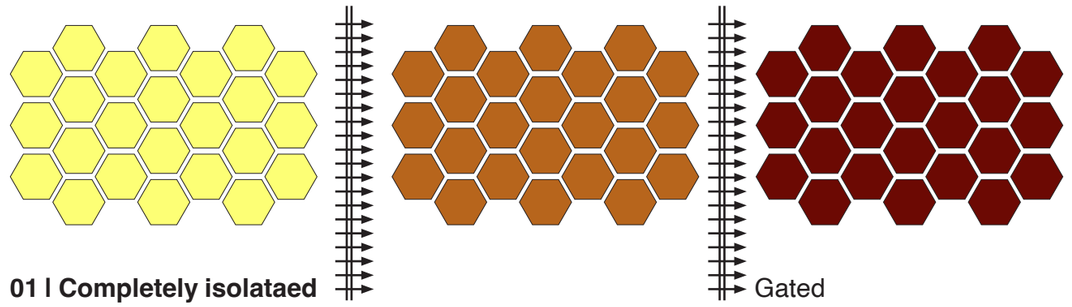


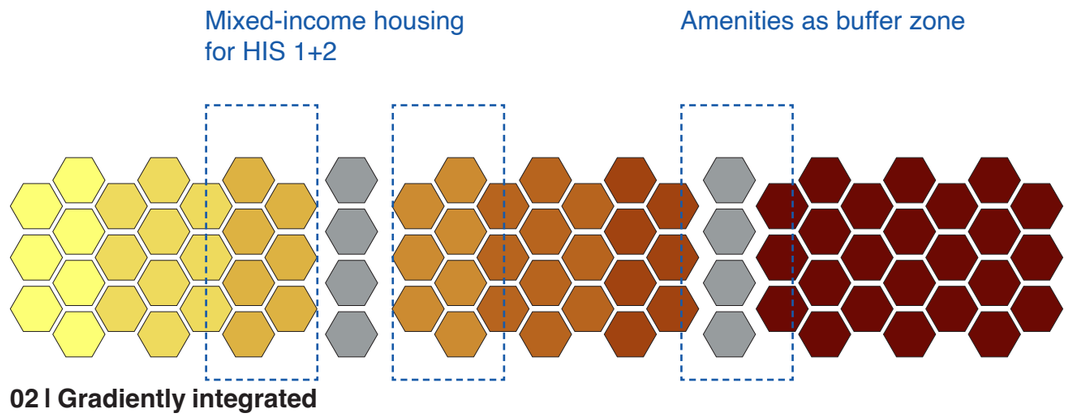


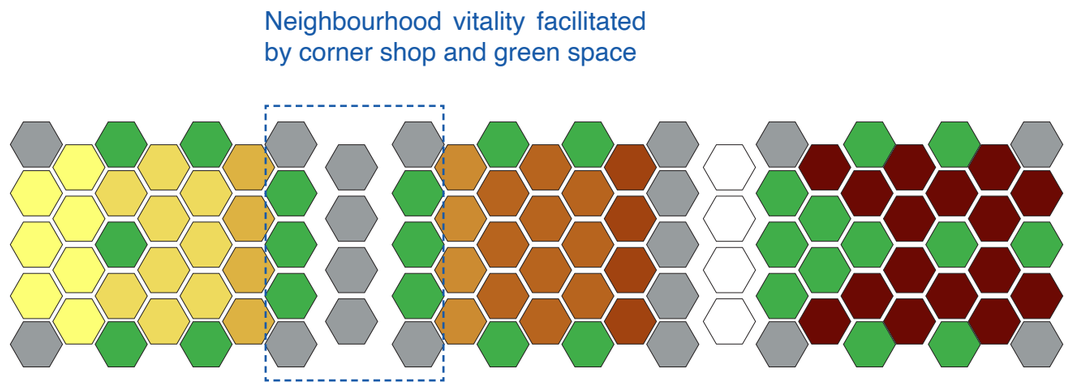
National Association of City Transportation Officials (NACTO)



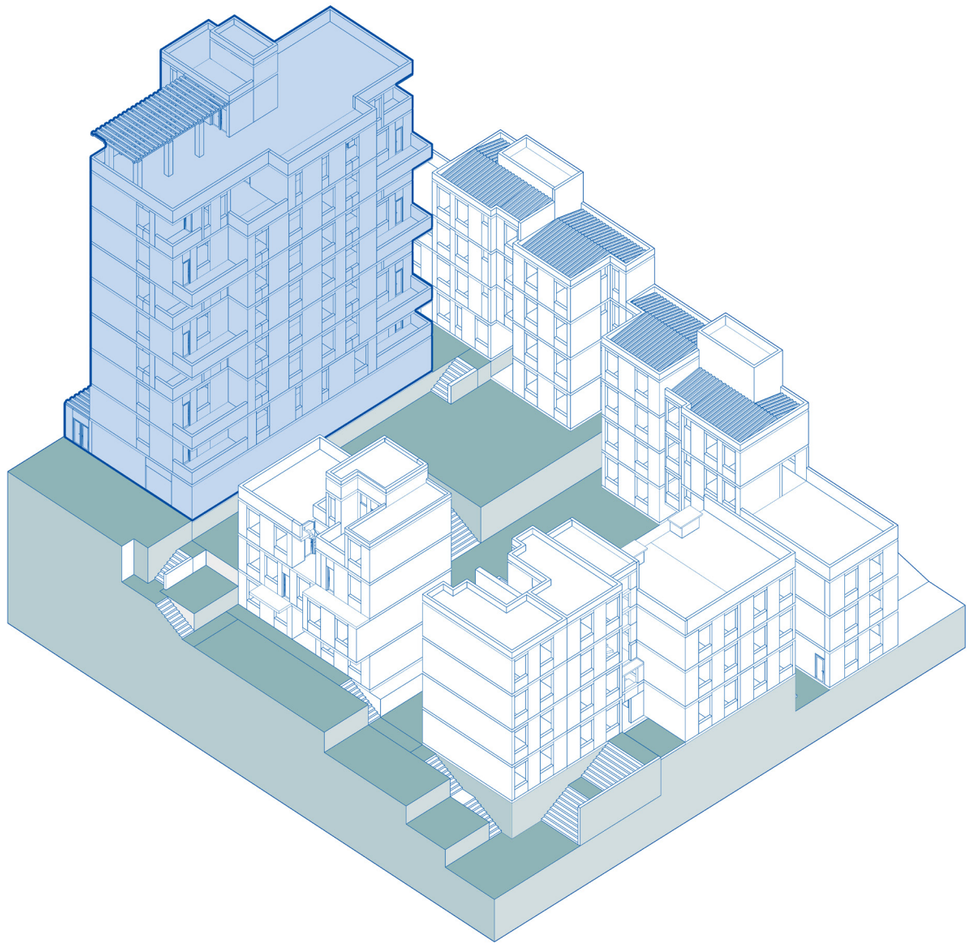
Source: https://www.mdpi.com/2071-1050/12/23/9968





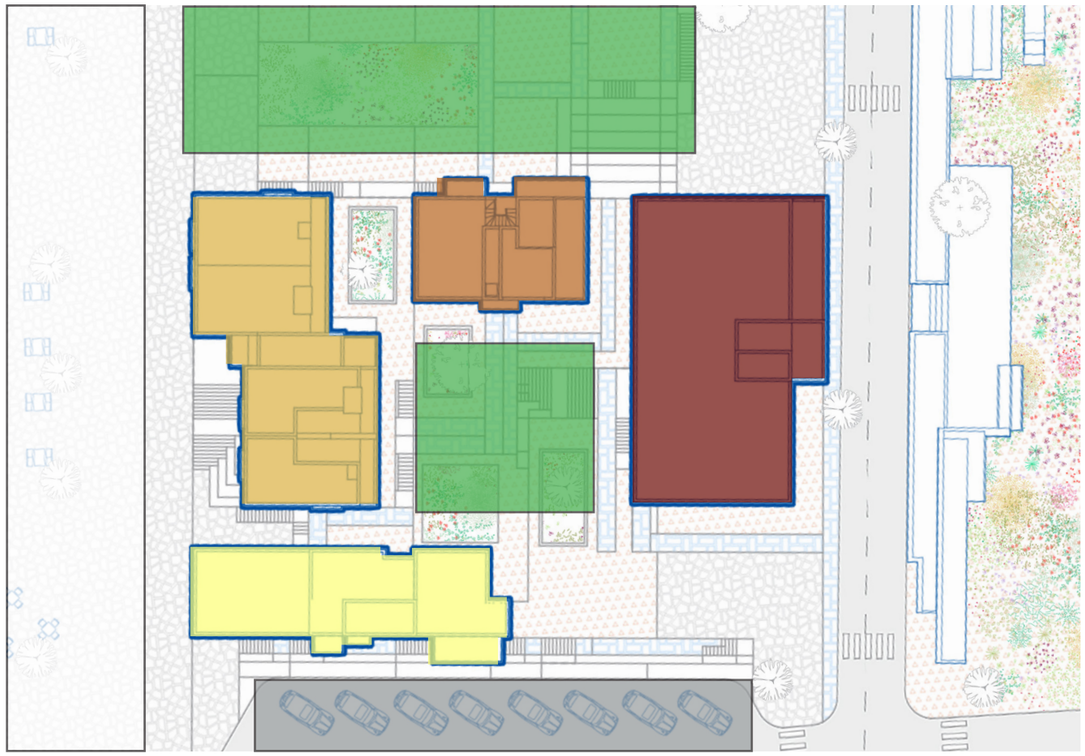


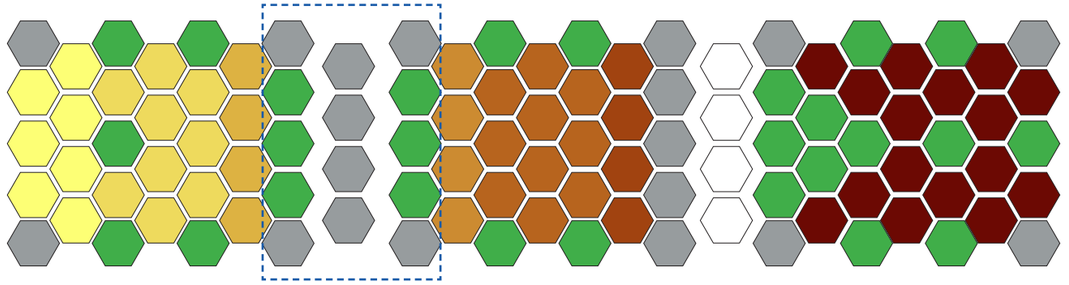




Class division	**Equity**	Spatial diversity
Gentrification	**Transition**	Ghettoization
Relaxation	**Cohesion**	Tension
Rigid policy	**Adaptation**	Dynamic segmentation

Balance





03 I Diversely clustered

- Amenities
- Green space
- Opportunities
- HIS 1 (0-3 minimum wages)
- HIS 2 (3-6 minimum wages)
- HMP (6-10 minimum wages)

1 I Equity

Class division ⟷ Spatial diversity

Balancing spatial diversity and class divisions in social housing for mixed-income groups requires a multifaceted approach that considers the general layout, public spaces, amenities and social dynamics within the housing community. In terms of design, it is important to create an inclusive building that avoids **visual** segregation and ensures that residents from different income groups **share** common entrances, lobbies and amenities. In addition, including a variety of sizes and types of housing units in the same building or development can meet the diverse needs of low-, middle-low, and middle-income households. At the same time, accessible design elements are critical to accommodating disabilities and senior citizens, thus creating a inclusive environment.

Meanwhile, **shared public spaces** play a key role in encouraging **interaction** and community cohesion. For example, community centers serve as hubs for events, meetings and activities, bringing together residents of all income levels and fostering a sense of unity. Play areas such as playgrounds and parks provide opportunities for children from different income backgrounds to interact and build friendships while enjoying the outdoors. Community gardens and shared green spaces provide additional ways for residents to connect through gardening and outdoor recreation.

What's more, Mixed-income housing should provide **amenities** that appeal to a wide range of interests, such as gyms or fitness centers, laundry facilities, corner shops and restaurants. These shared amenities not only meet a **practical need**, but also create **opportunities** for residents to interact and connect with their neighbors. Programs that promote social integration, such as community events, tutoring programs, and child care services, play an important role in breaking down social barriers and fostering greater understanding among residents of different income levels.

Ultimately, access to **support services** such as counseling, job placement assistance, or legal aid may be an important component of housing development. These services are particularly valuable to low-income residents, but also contribute to the overall inclusiveness of the community. Community input and **participation** in the decision-making process is critical to ensure that the balance between spatial diversity and stratification is consistent with residents' preferences and needs. Regular engagement and communication with residents during the design and management of housing developments can further enhance a sense of ownership and pride among residents of all income groups and foster a shared commitment to community well-being.

2 I Transition

Gentrification ⟷ Ghettoization

Balancing ghettoization and gentrification in the construction and development of mixed-income social housing is a multifaceted endeavour that requires a comprehensive strategy to ensure the creation of a diverse, inclusive and equitable community. In order to achieve this balance, a range of policies and practices must be implemented that prioritize the needs and rights of low-, middle-low, and middle-income residents, while addressing the risks of rapid community change.

Inclusionary zoning is an effective policy tool to encourage socioeconomic diversity in new housing developments. These policies establish the **percentage** of units that must be affordable to low- and moderate-income residents. Based on the current ZEIS policy, the number of HIS housing units is guaranteed to be no less than 80 percent and HIS-1 housing units are guaranteed to be no less than 40 percent, mandates that can help maintain a diverse population and prevent the displacement of low-income individuals and families due to rising property values. Inclusionary zoning is a key factor in preventing gentrification and creating mixed-income neighborhoods.

Phased development may be an effective way to mitigate upscaleization. By constructing affordable housing units at the same time as marketing housing units, it is possible to mitigate the rapid changes typically associated with middle-class gentrification. This approach ensures that affordable housing options are available from the outset.

Resident participation in the development process is critical because it allows individuals to have a say in construction and its impact on the community. Involving residents ensures that their needs, concerns, and perspectives are incorporated into the development plan. **Non-profit organizations** are another solution that can help increase affordability and community cohesion. In the organization, residents assist in the construction, allocation and management of housing, thus a sense of shared voice and pride develops among members, regardless of income.

Mixed-use developments that combine residential space with retail, commercial and community services can create jobs and reduce the risk of middle-classification by promoting economic diversity in the community. At the same time, equitable economic development, including job creation initiatives in the neighborhood, can provide better **employment** prospects for low-income residents. Partnering with local businesses, workforce development organizations and educational institutions can help foster economic growth and **upward mobility** for all residents.

In sum, balancing ghettoization and gentrification in the construction process requires a comprehensive approach that includes **housing policy, community engagement and economic development initiatives**. By proactively addressing these challenges, planners and developers can create more equitable and integrated neighborhoods where residents of all income levels can thrive. Such initiatives not only prevent socioeconomic segregation, but also promote inclusive, vibrant and sustainable urban environments.

Preparation

Construction

3 I Cohesion

Relaxation ⟷ Tension

Balancing tension and relaxation in the development of mixed-income communities is a multifaceted endeavor that requires a holistic approach to foster harmonious and cohesive neighborhoods. Through the organization of diverse **social events**, seminars, and cultural activities, communities can regularly convene to bridge disparities and fortify social **bonds**. These inclusive activities create opportunities for individuals hailing from a variety of backgrounds and income levels to engage with one another. It's worth emphasizing that these initiatives should be thoughtfully crafted to be **enticing and accessible** to all residents, ensuring that everyone can actively participate.

In the realm of design, **public spaces** within a community play a pivotal role in creating an inviting and inclusive environment. These spaces should prioritize safety, accessibility, and comfort. Well-illuminated walkways, easily accessible seating, and amenities catering to diverse interests can not only promote relaxation but also stimulate interaction and cultivate a sense of belonging. Public areas within the community, such as parks, gardens, and recreational facilities, should be meticulously designed with comfort and accessibility in mind. These spaces not only provide opportunities for relaxation but also serve as venues for residents from various income backgrounds to **come together** recreationally and share experiences.

Providing **community services** accessible to all resident also significantly contributes to social cohesion. Services such as childcare facilities, healthcare services, and educational support **alleviate stress** and bolster community well-being. These services underscore the notion that the community is an inclusive environment where everyone's needs are considered and met. Simultaneously, fostering local **employment opportunities**, including job placement programs and job fairs, empowers residents to attain economic stability within the community. Irrespective of income level, access to meaningful employment opportunities is paramount for residents' well-being and their ability to contribute to the **vibrancy** of the community.

The establishment of **regular feedback** and evaluation mechanisms ensures that community-building efforts remain effective and adaptive to the evolving needs of the community. By consistently collecting input from residents and conducting evaluations, adjustments can be made to sustain a harmonious and balanced community. This continuous feedback loop underscores the idea that the community **values the perspectives of all its residents.**

In summary, achieving the balance between tension and relaxation in the development of mixed-income communities entails a cohesive web of **interrelated strategies** that prioritize social cohesion, inclusiveness, and the overall well-being of residents. These endeavors not only mitigate potential tensions but also engender an environment where individuals from different income groups can prosper, relax, and experience a profound sense of unity and belonging within their community.

Development

4 I Adaptation

Rigid policy ⟷ Dynamic segmentation

In the development of mixed-income communities, it is essential to strike a delicate balance between a **structured set of guidelines** and **adaptability** of the community development process. This framework should remain attuned to the **ever-evolving** needs and demographics of the community, recognizing that flexibility is imperative to accommodate these changes without deviating from the fundamental goal of mixed-income housing.

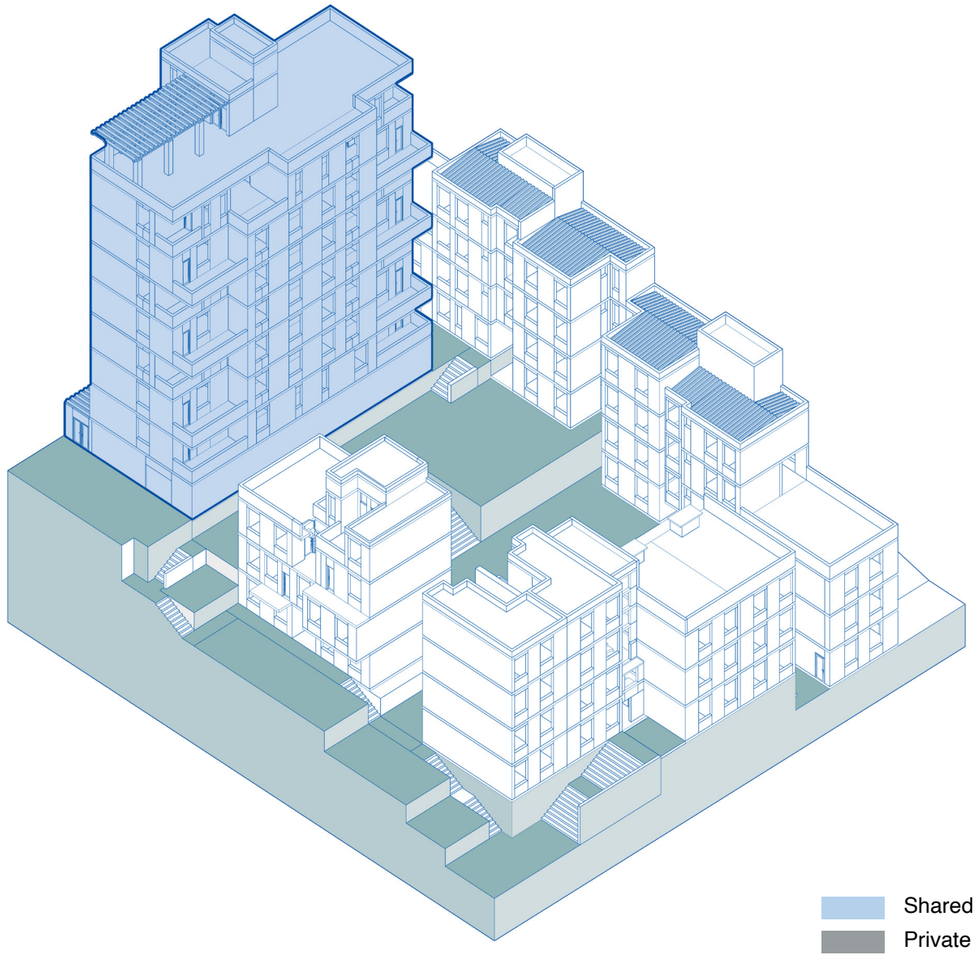
As a result, collaboration with local authorities on matters of zoning and land use planning emerges as a critical element. It is imperative that zoning and land use policies are thoughtfully designed to lay the groundwork for further **segmentation** of the target population. This segmentation should consider the unique needs of **minorities** and should offer the flexibility required to adapt the allocation of housing, further promoting social equity.

Phased development, when complemented by an adaptive master plan, paves the way for **incremental** growth, offering the flexibility to accommodate shifting demographics and income distribution. This approach ensures that existing residents benefit from neighborhood improvements and development while mitigating the risk of **displacement.** Furthermore, embracing flexible design standards that permit a **variety** of architectural styles and unit sizes allows the neighborhood's character to evolve organically while preserving its **essential mixed-income identity.**

The promotion of mixed-use zoning within the community presents a diverse, multifaceted environment replete with a broad spectrum of businesses and services. This approach not only enhances **economic** opportunities but also elevates the overall quality of life for residents. Importantly, it enhances the adaptability of neighborhood development as it evolves to meet the changing needs and preferences of the community.Additionally, encouraging the development of small businesses, offering support for local entrepreneurship, and creating **employment** opportunities for low-income groups play an integral role in enhancing the community's **resilience** and its ability to adapt to economic shifts.

In summary, achieving the intricate balance between rigid policies and dynamic segmentation in the development of mixed-income communities hinges on several key aspects: inclusive policy frameworks, collaboration with local authorities, and active civic engagement lay the foundation for adaptability. This, in conjunction with incentives, community involvement, phased development, mixed-use zoning, flexible design standards, social and cultural adaptation, and economic **diversification**, combines to fortify the community's resilience. This carefully orchestrated effort ensures that the community remains balanced and adaptable in the face of changing conditions while preserving its core values and **inclusiveness.**

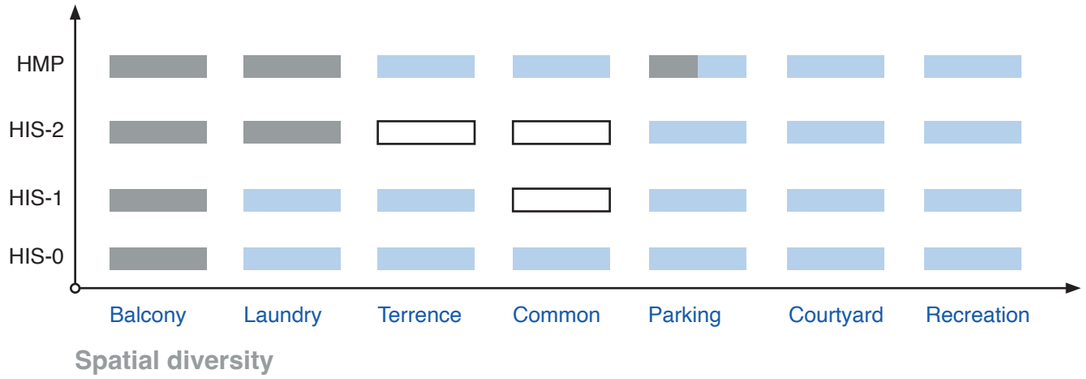
Resilience



Shared
Private
Omitted

1 I Equity

Class division



Spatial diversity

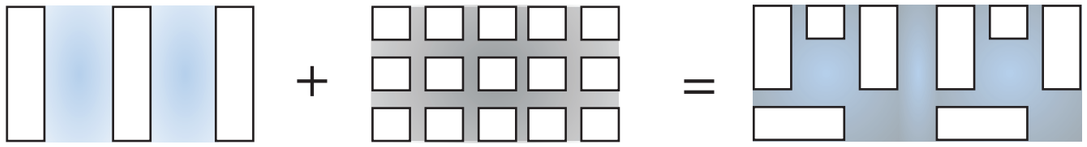
2 I Transition

Gentrification + Ghettoization =



3 I Cohesion

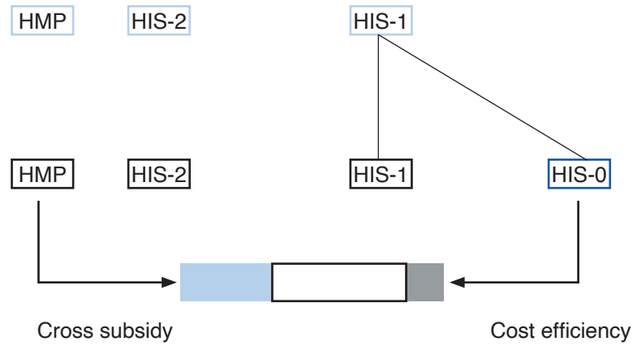
Relaxation + Tension =



4 I Adaptation

Rigid policy

Dynamic segmentation

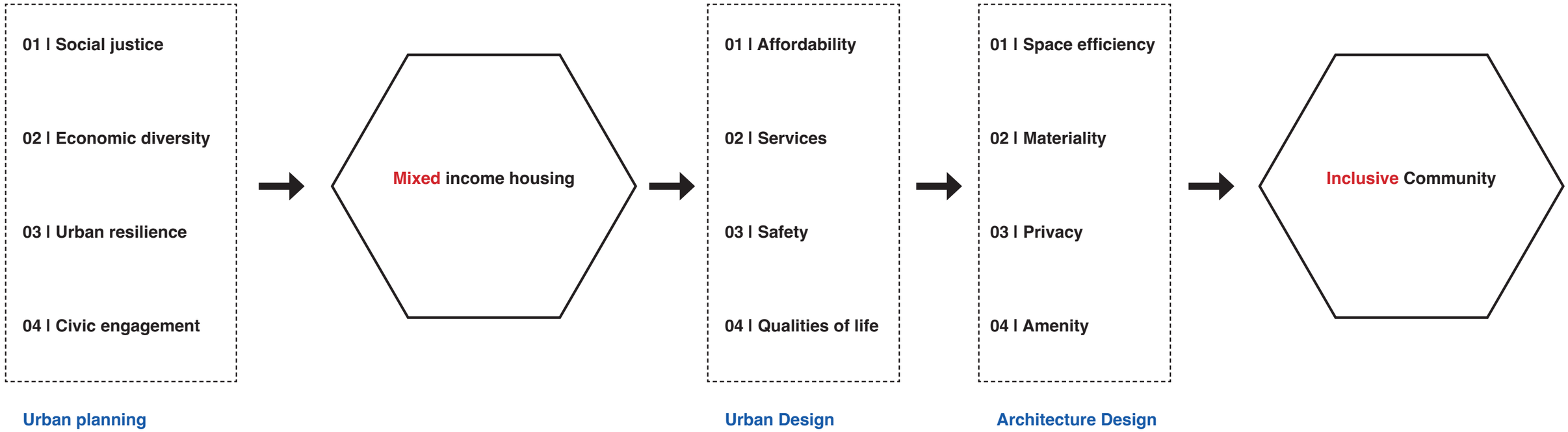


How can architecture design foster an inclusive community, while enhance living conditions, and explore opportunities for marginalized individuals?

1.1 What is an effective solution to mitigate the neglect of marginalized individuals within social housing projects?

1.2 What specific considerations should be taken into account to enhance the quality of life for diverse income groups?

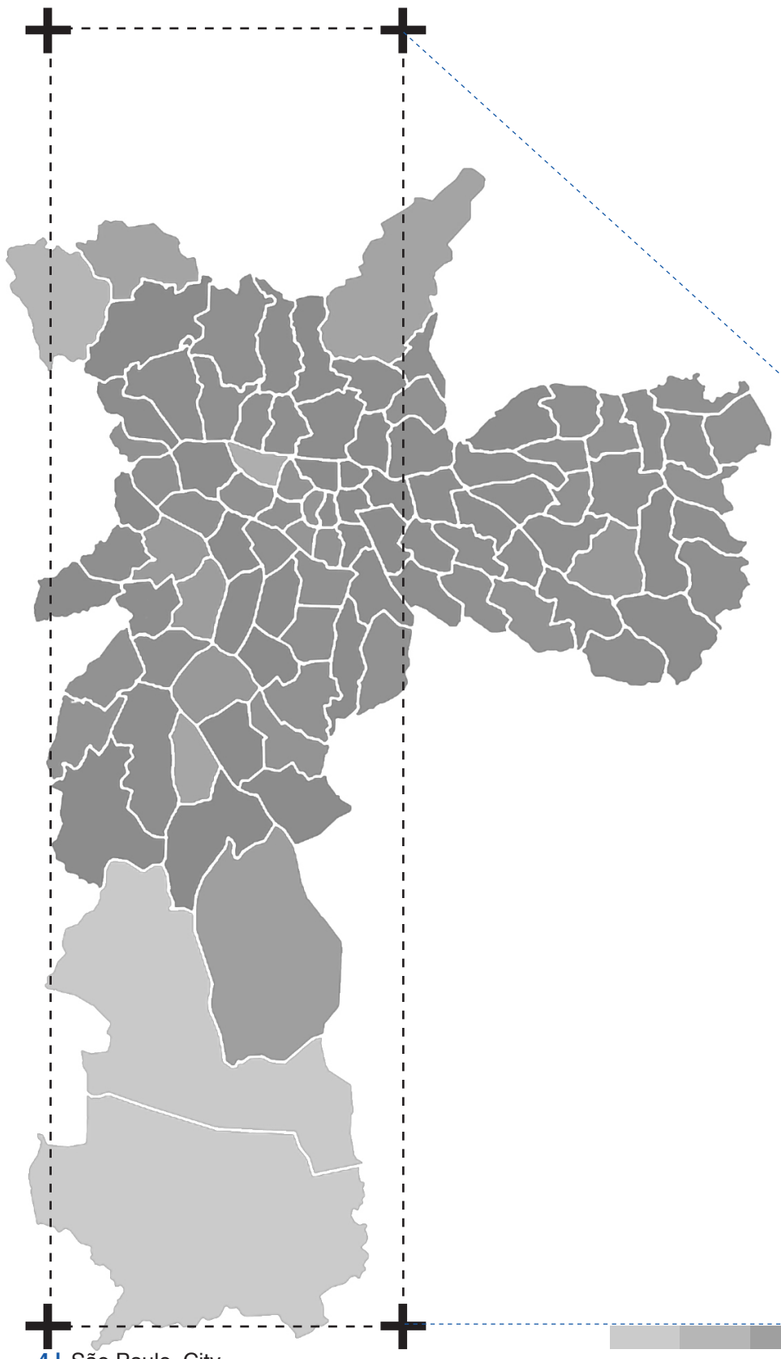
1.3 What are the potential challenges and barriers that may arise during the development of mixed-income housing, and what effective strategies can be employed to address them?



Why What How

03 Design

Blank Map from https://worldmapblank.com/blank-map-of-brazil/?utm_content=cmp-true



203,062,512 Population

8,510,418 km² Area

23.86/km² Population Density

0.52% Annual Population Change



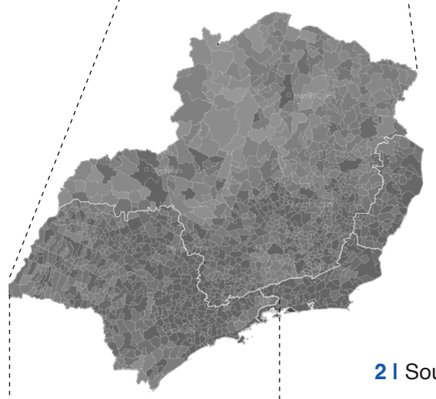
1 I Federative Republic of Brazil

89,012,240 Population

924,511km² Area

96.0/km² Population Density

0.59% Annual Population Change



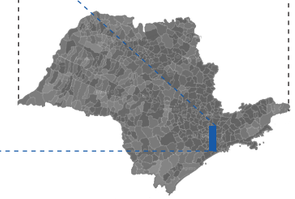
2 I Southeast **Region**

44,420,459 Population

248,219 km² Area

179.0/km² Population Density

0.62% Annual Population Change

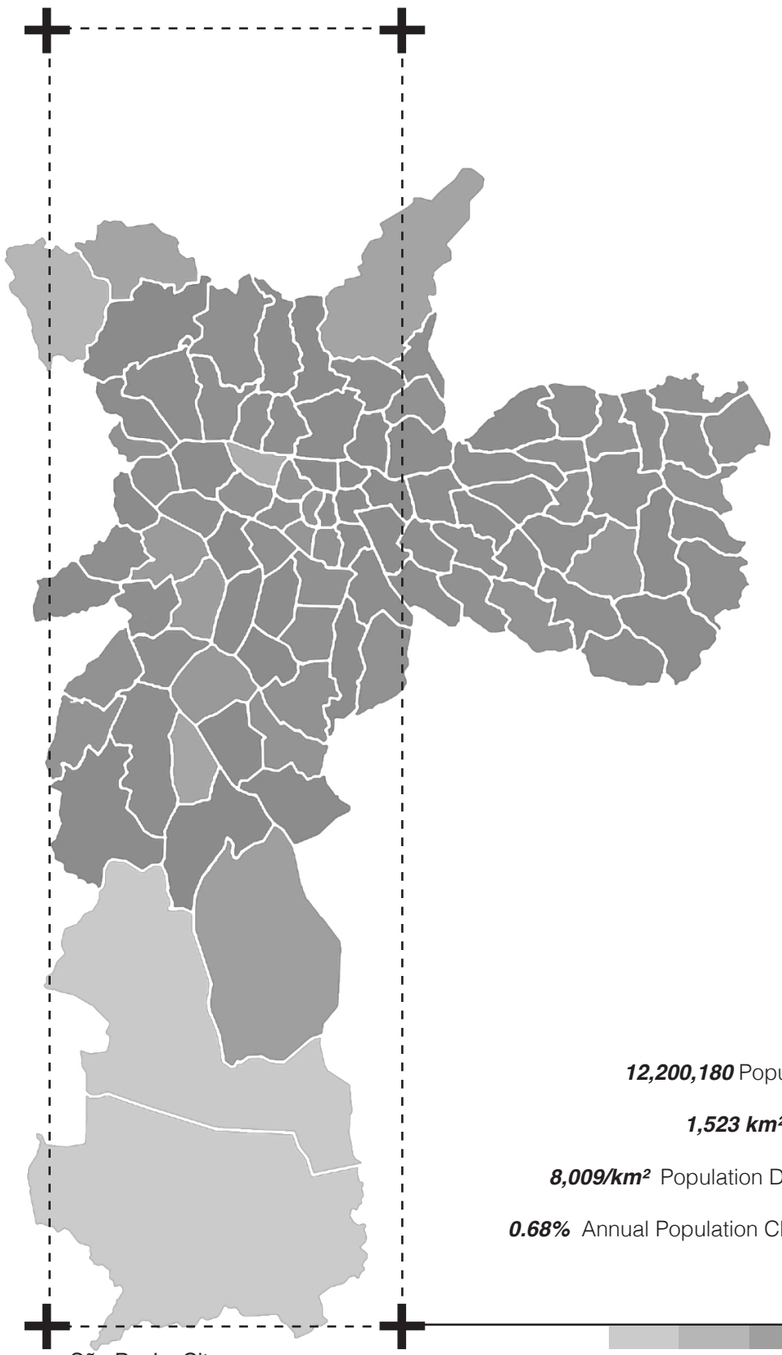


3 I São Paulo **State**

4 I São Paulo, City

Density

Data from https://www.citypopulation.de/en/brazil/regiaosudeste/admin/s%C3%A3o_paulo/3550308__s%C3%A3o_paulo/
Blank Map from https://worldmapblank.com/blank-map-of-brazil/?utm_content=cmp-true



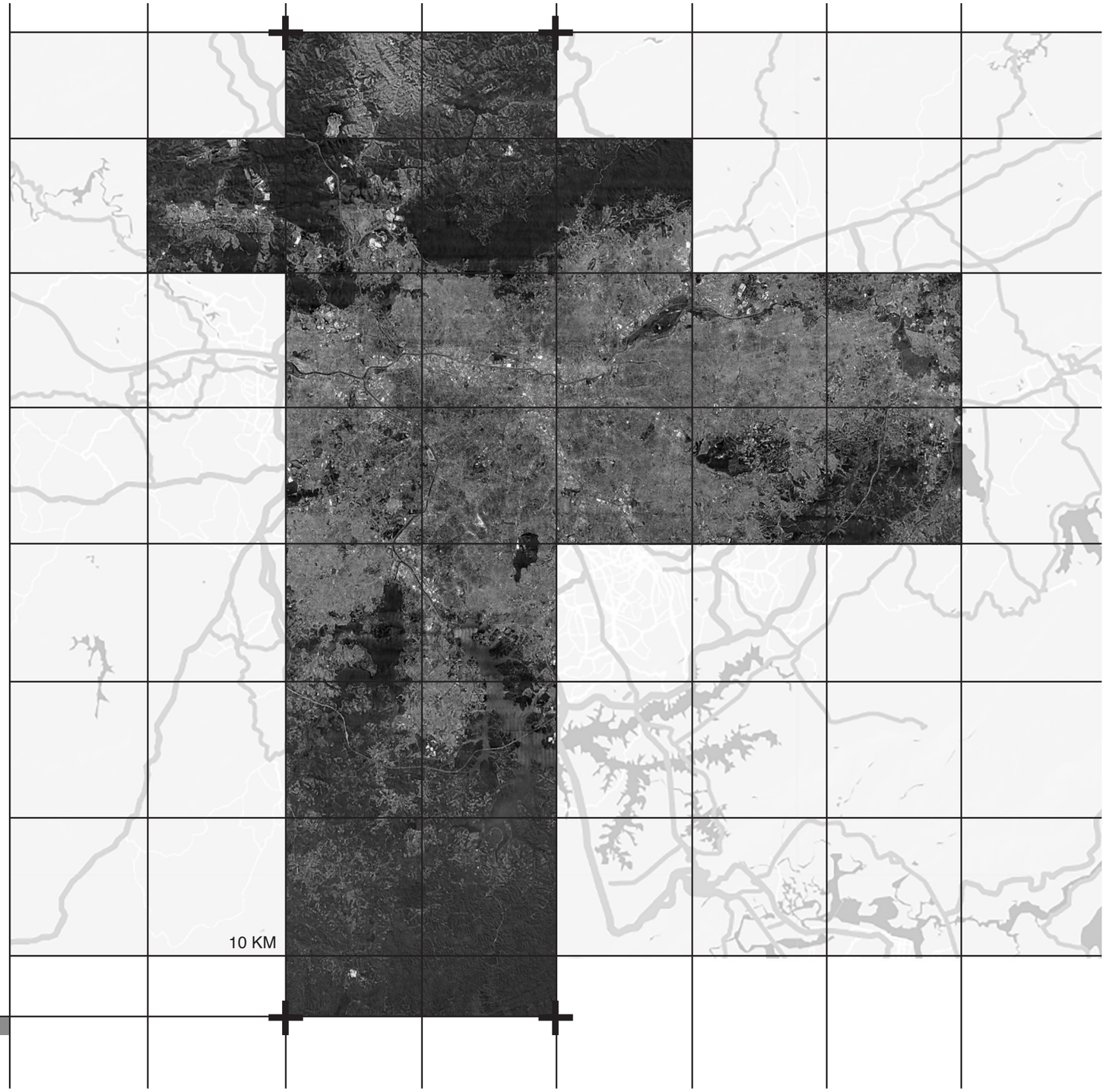
12,200,180 Population

1,523 km² Area

8,009/km² Population Density

0.68% Annual Population Change

Density



Data from https://www.citypopulation.de/en/brazil/regiaosudeste/admin/s%C3%A3o_paulo/3550308__s%C3%A3o_paulo/



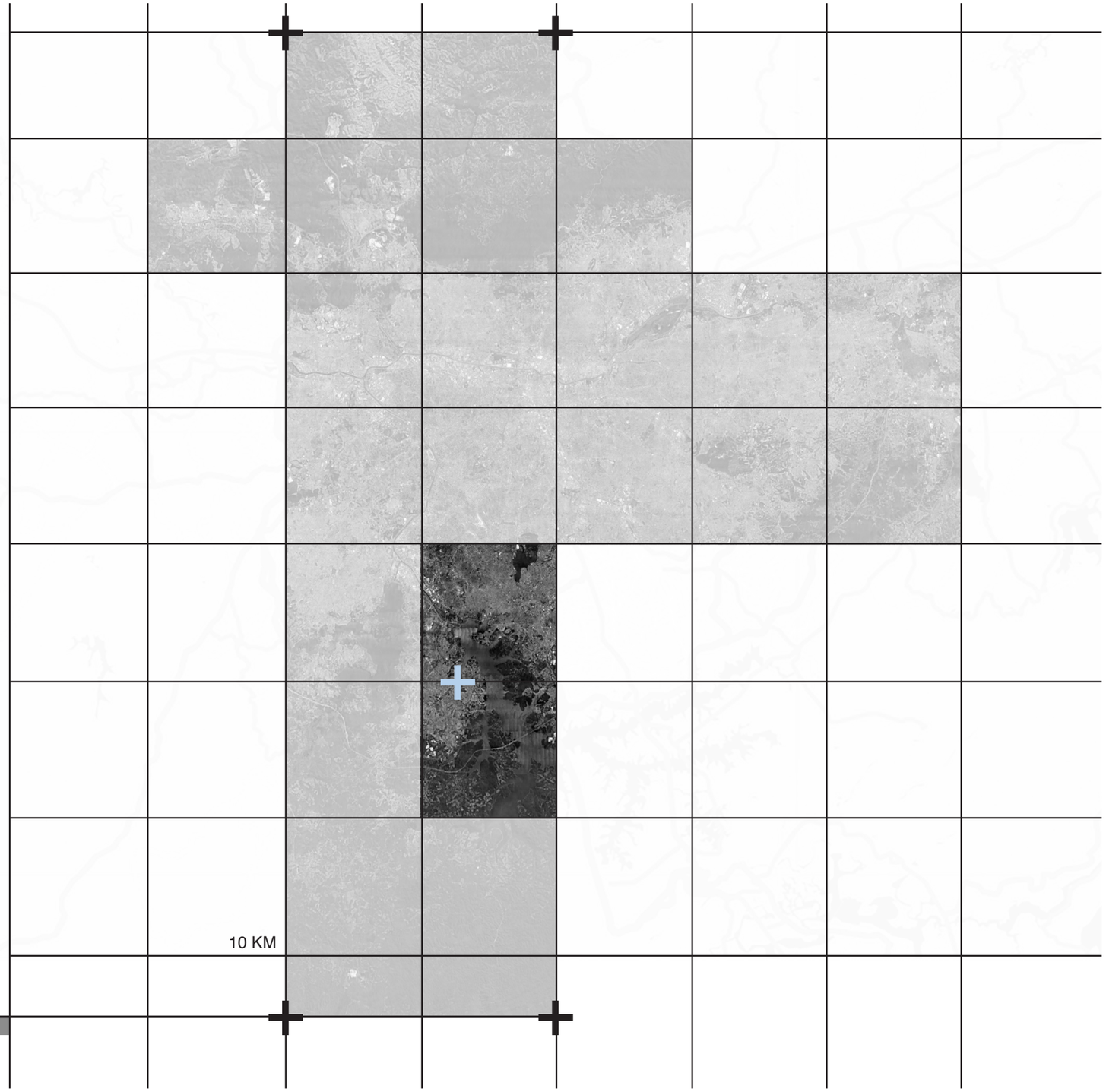
Grajaú, District

360,787 Population

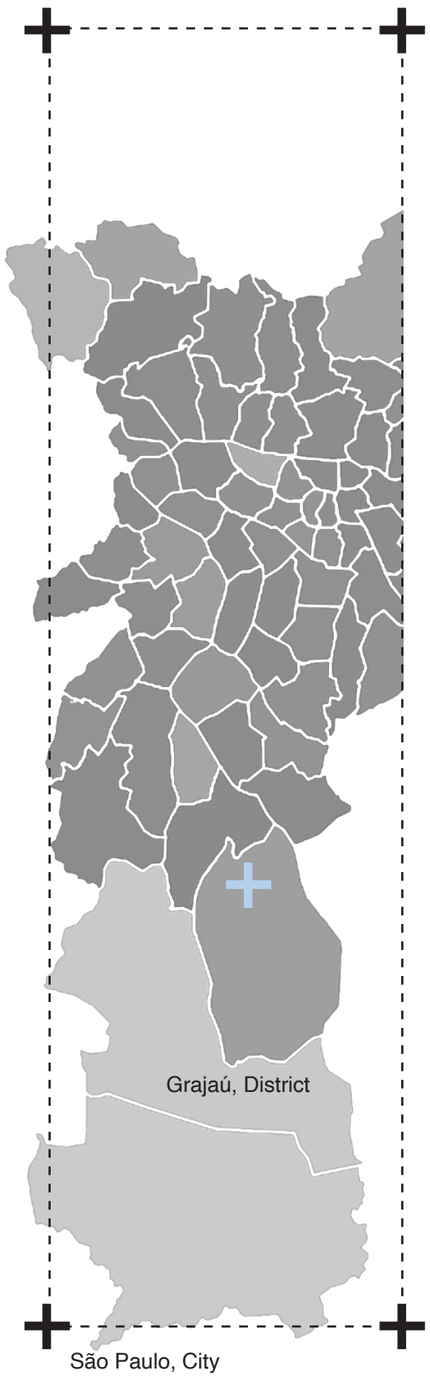
92.53 km² Area

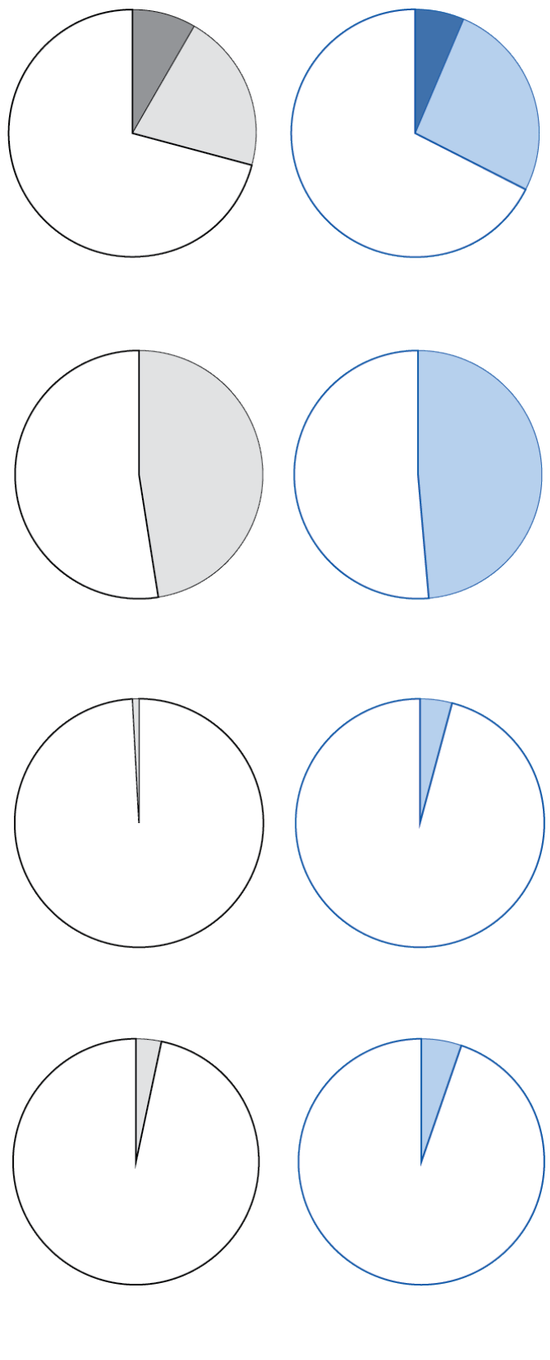
3,899/km² Population Density

0.79% Annual Population Change



Data from https://www.citypopulation.de/en/brazil/regiaosudeste/admin/s%C3%A3o_paulo/3550308__s%C3%A3o_paulo/



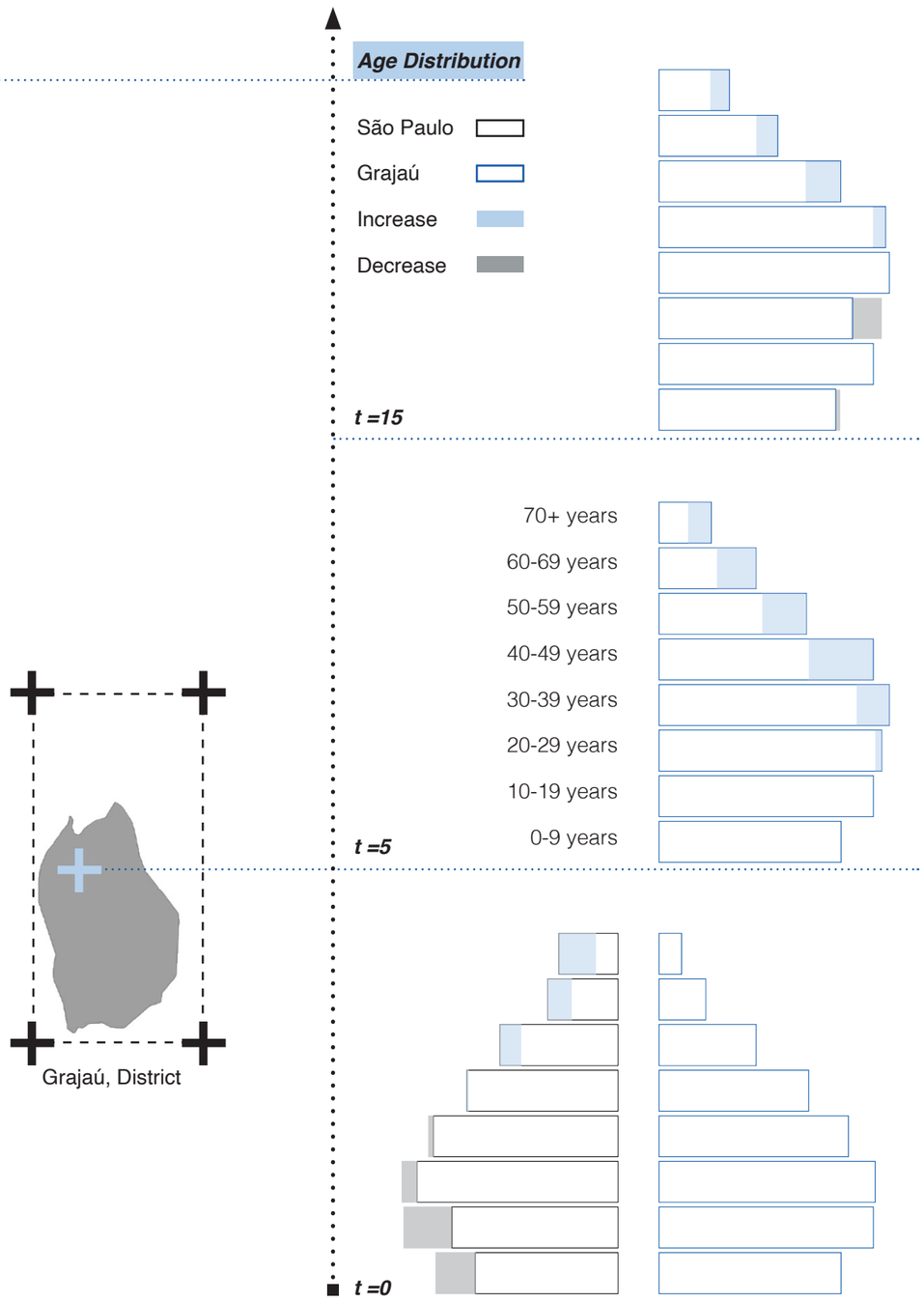


Age Groups
- 0-14 years
- 15-64 years
- 65+ years

Gender
- Male
- Female

Urbanization
- Rural
- Urban

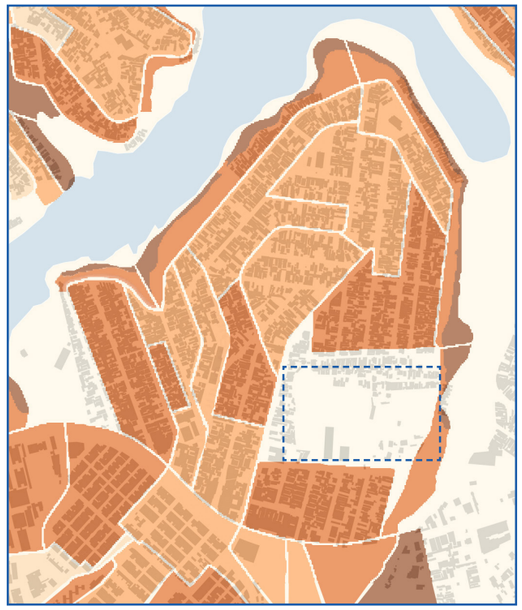
Literacy
- No
- Yes



Data from https://www.citypopulation.de/en/brazil/regiaosudeste/admin/s%C3%A3o_paulo/3550308__s%C3%A3o_paulo/

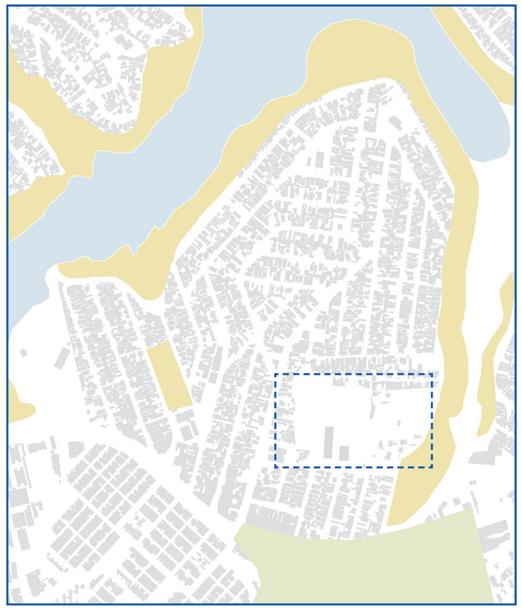
Quality of life: Life in Sao Paulo's favelas presents a complex tapestry of challenges and resilience. These communities often grapple with limited access to essential public services, including healthcare and education, and face overcrowded living conditions in homes constructed from makeshift materials. Transportation options can be limited, with many residents living on the periphery of the city, far from employment opportunities and central areas. While public services such as electricity and gas may be accessible to a significant portion of the population, there are substantial deficiencies, notably in the sewerage system. Despite these hardships, favela residents exhibit a remarkable sense of community and resourcefulness, striving to improve their living conditions and create a vibrant social fabric amidst adversity.

Population density



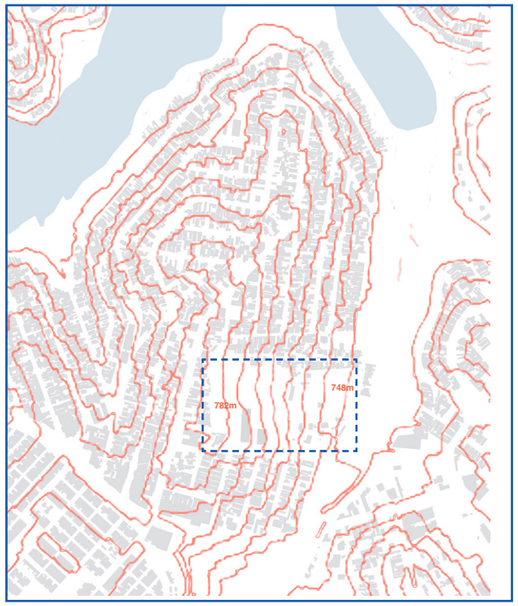
< 92 hab/ha
92-146 hab/ha
146-207 hab/ha
207-351 hab/ha
> 351 hab/ha

Family income



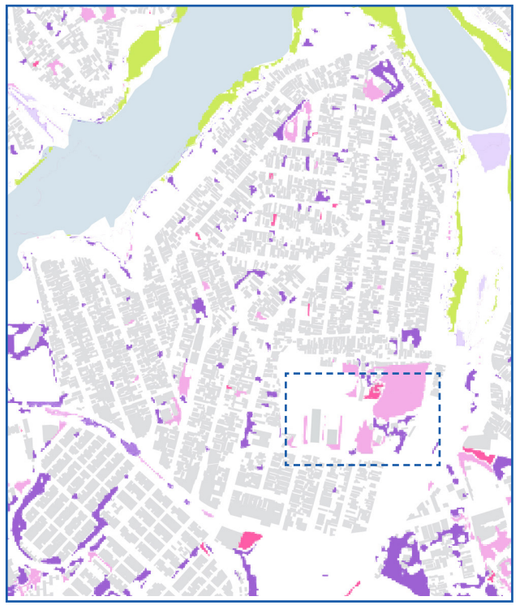
below 6 minimum wages
Favela

Contour plot



4.5m

Plant distribution

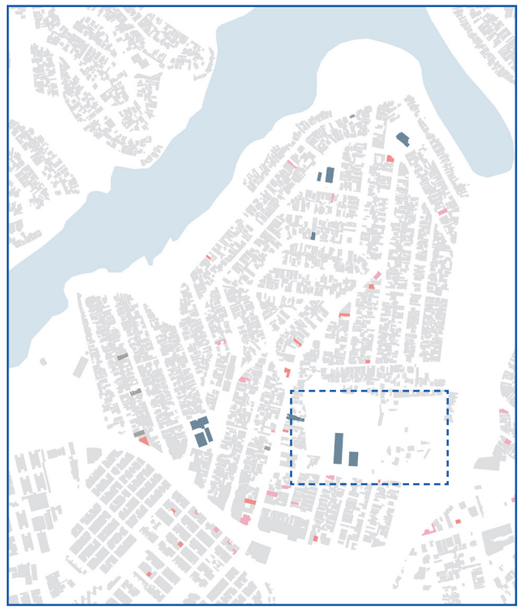


Field and aquatic vegetation
Herbaceous plants
Medium to high tree, shrub or bushy cover
Floodplain forests

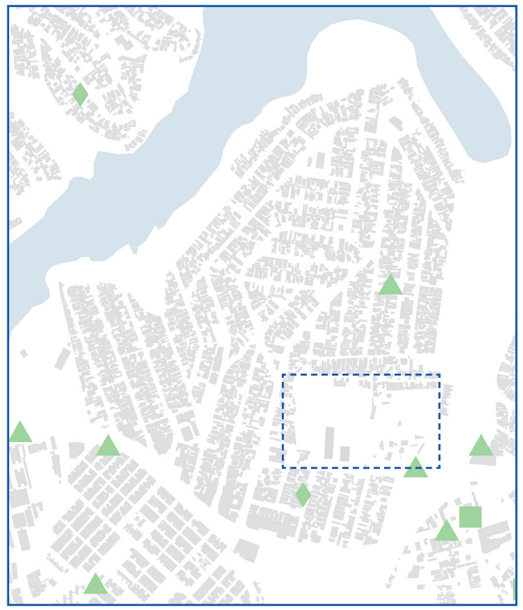
Data from https://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx

Informal settlement: often referred to as communities rather than favelas, have emerged from the collaborative efforts of their inhabitants within a complex economic environment. These neighborhoods were born from nothing, with many hands contributing to their creation. Consequently, the residents of these settlements have learned to coexist by offering mutual support, sharing resources, organizing communal activities, and assisting their neighbors with household tasks. Today, the urban landscape on the city's periphery is a juxtaposition of uniform housing projects and homes constructed by the residents themselves in informal subdivisions or favelas, which progressively encroach upon the city's remote areas, sometimes extending into environmentally protected water supply zones in the southern regions.

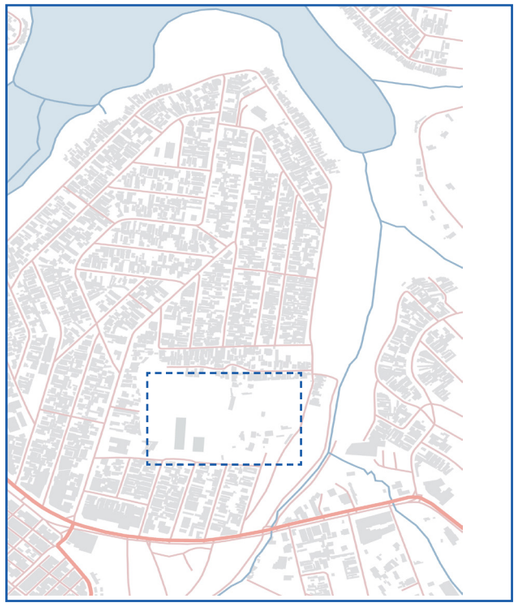
Basic functions



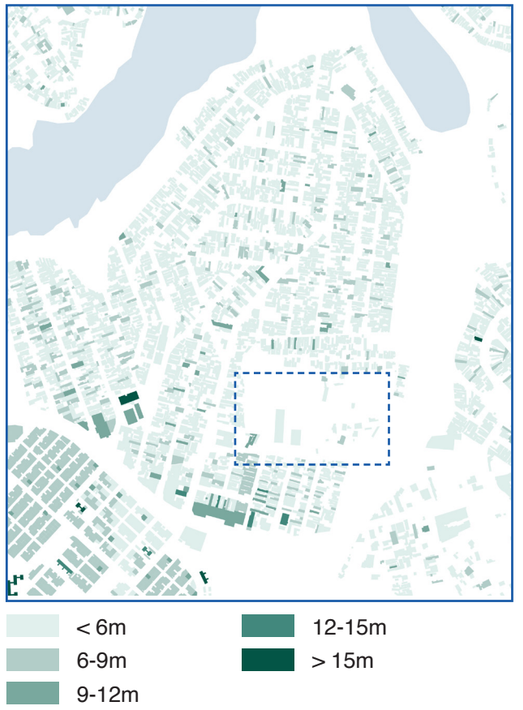
Public service



Transportation

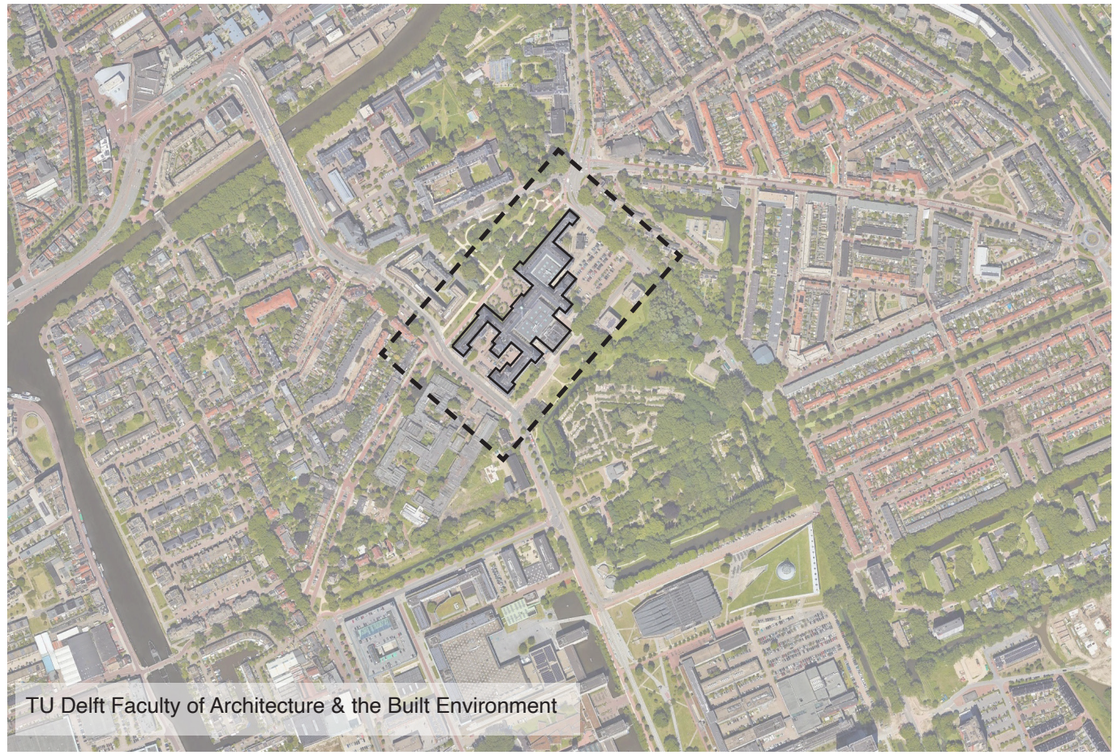


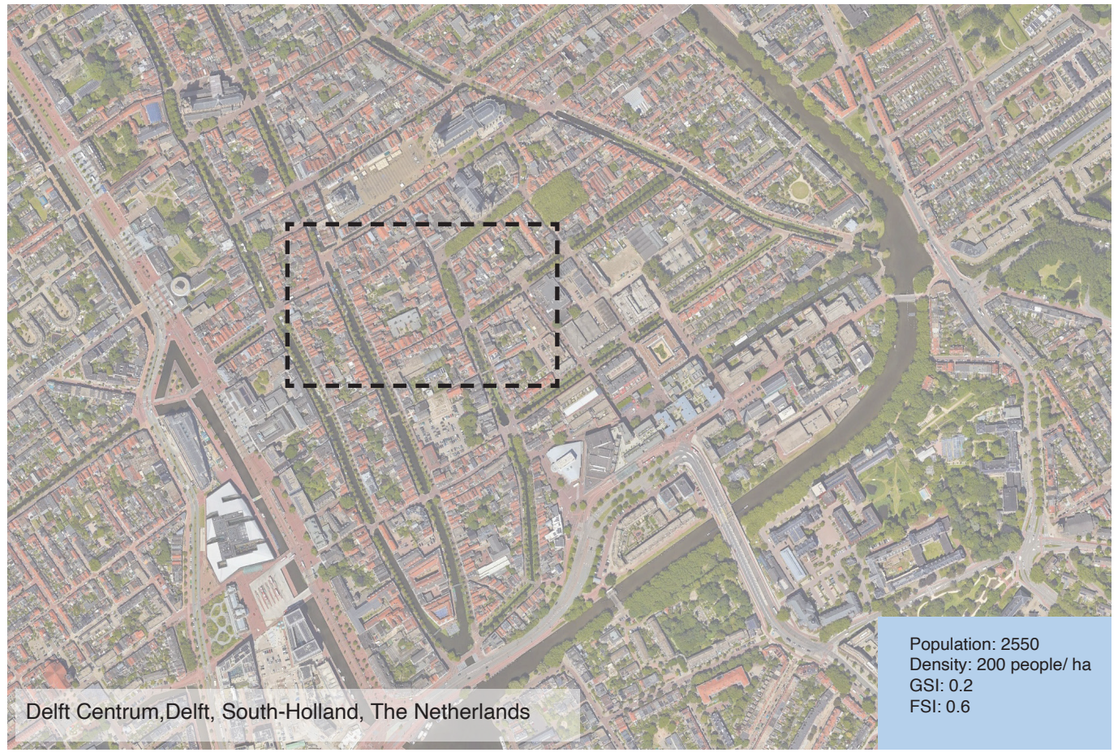
Building height



Data from https://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx




TU Delft Faculty of Architecture & the Built Environment

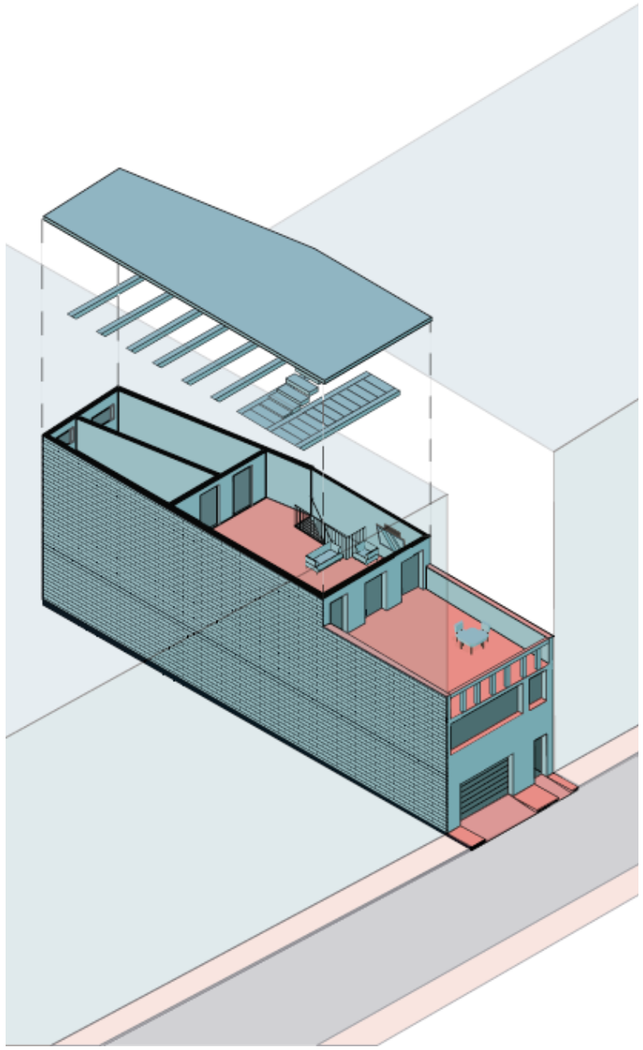


Delft Centrum,Delft, South-Holland, The Netherlands


Unit: 73 m²
Story:2
Density: 51dw/ ha
GSI: 0.31
FSI: 0.46

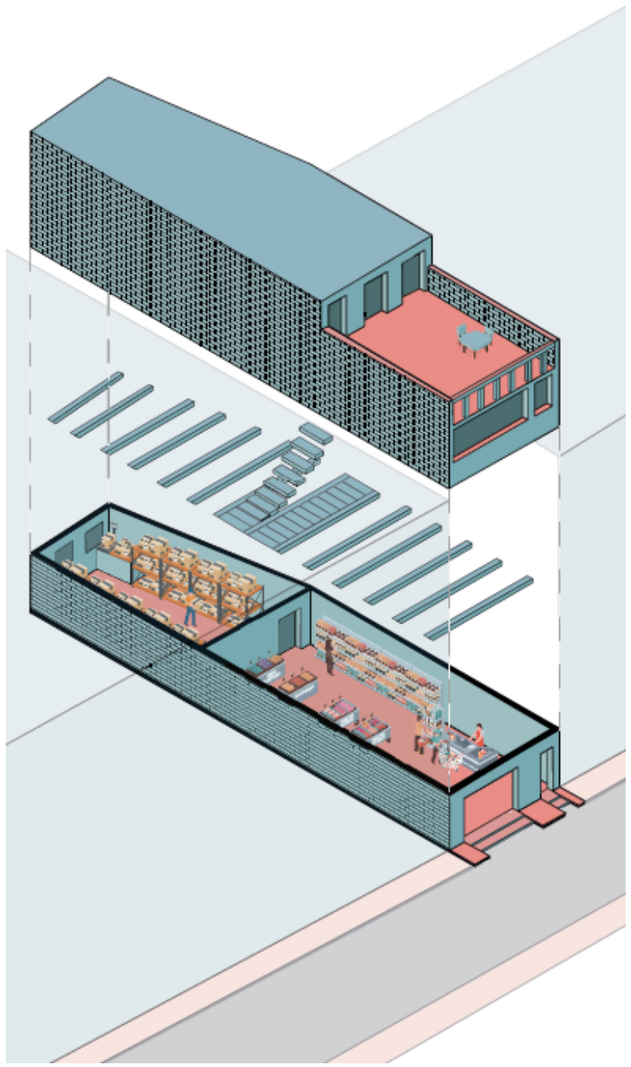






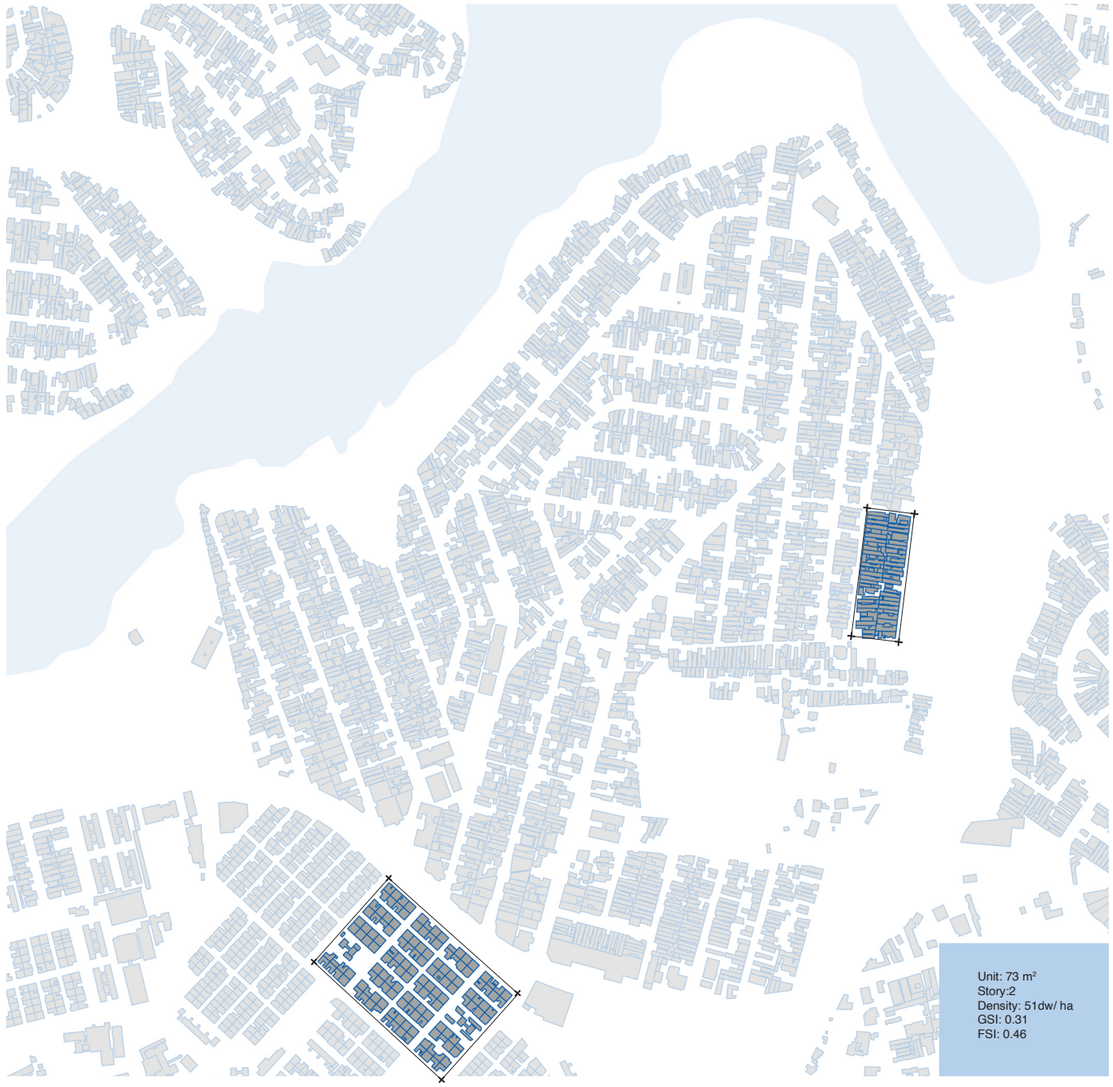
1 I Typical House

The typical Grajaú dwelling unit is a self constructed house of two to 4 stories, using common materials such as hollow brick and concrete beams and columns. An ever evolving structure that grows with the family and mirrors the dynamic life of its inhabitants.



2 I House + Shop

Bottom-up construction of neighborhood makes for a dynamic and ever changing use of streets, buildings and rooms. One of the most common examples is the way ground floors of housing units are often used for income generation.
Providing space for the local economy to grow.



1 I Row houses





Cost-Efficient Construction: Sharing common walls reduces the material and labour costs.

Efficient Land Use: Row houses make efficient use of land by maximizing the number of units in a given area. This is particularly beneficial in densely populated areas to accommodate more families.

Infrastructure and Service Efficiency: Row houses often share common infrastructure such as water, electricity, and sewage systems, which lead to more efficient utilization and lower maintenance costs.





2 I Cluster houses



Sense of Community: Cluster houses can foster a sense of community among residents because the close proximity of units within a cluster encourages social interaction, cooperation, and support among neighbours.

Enhanced Privacy: Compared to row houses, cluster houses often provide better privacy as units are grouped in smaller clusters. Each cluster typically consists of a few units, allowing for more separation and privacy between neighbouring households.

Shared Amenities: Cluster housing designs often incorporate shared amenities such as parks, playgrounds, or community centers within the cluster or nearby.





Throughfare

Street analysis



Neighbourhood main street

The main street connected Parque Cocaia area and the throughfare to the downtown, which comprises a 2.7-meter pedestrian area and a 4.2-meter multi-function area, which can be used for car parking or various community activities. While this street efficiently accommodates vehicular traffic and pedestrians, there's a notable lack of dedicated green space and public areas. While trees may be planted in some sections, the design primarily prioritizes vehicular, potentially missing opportunities for creating more vibrant, inviting, and environmentally-friendly public spaces.



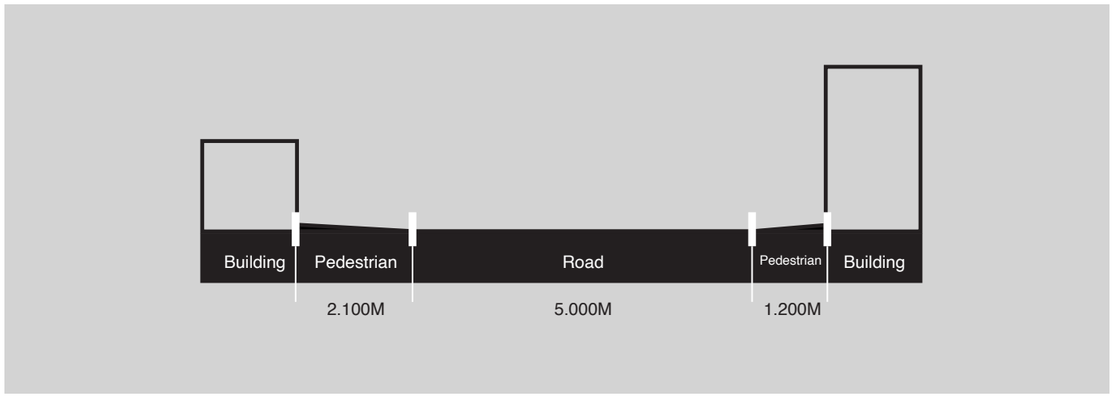


Street analysis



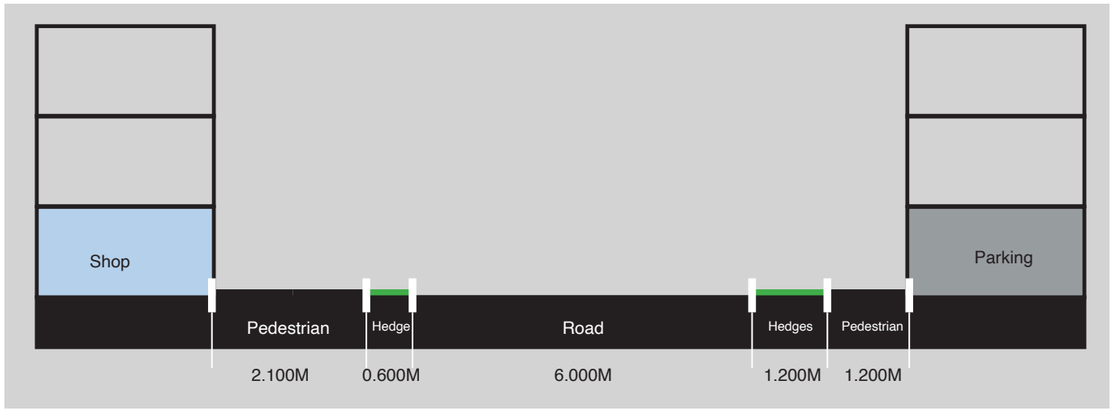
In the neighbourhood scale, this 8-meter wide street consists of a 5-meter wide main road, a 1.2-meter pedestrian area with plants on one side, and a 2.1-meter pedestrian area on the other side, which can double as car parking space. While this smaller street exudes a vibrant atmosphere, with residents adding greenery and community elements, the limited width of the roads can make it less pedestrian-friendly, especially for safe and comfortable walking, as the available space is constrained, potentially making it challenging for pedestrians to navigate the street safely.

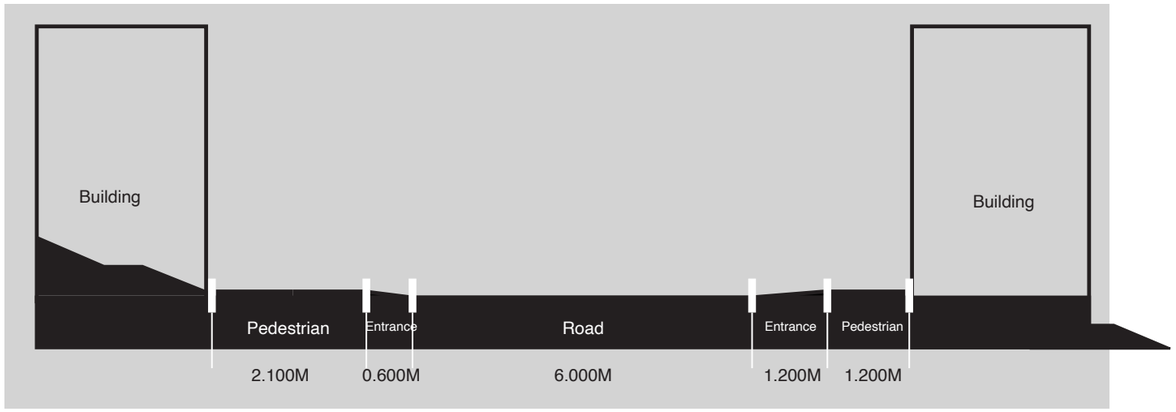
Residential shared street



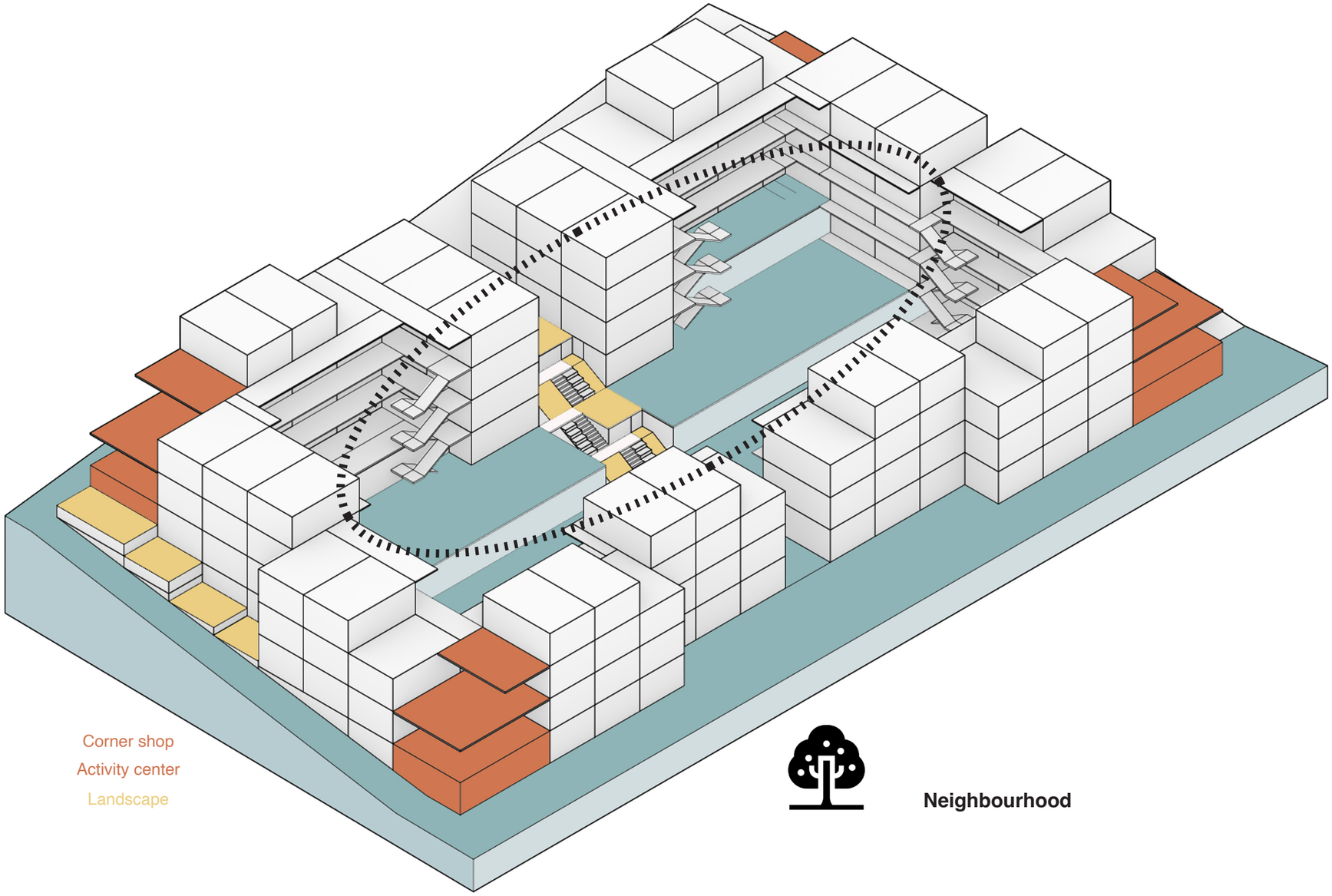






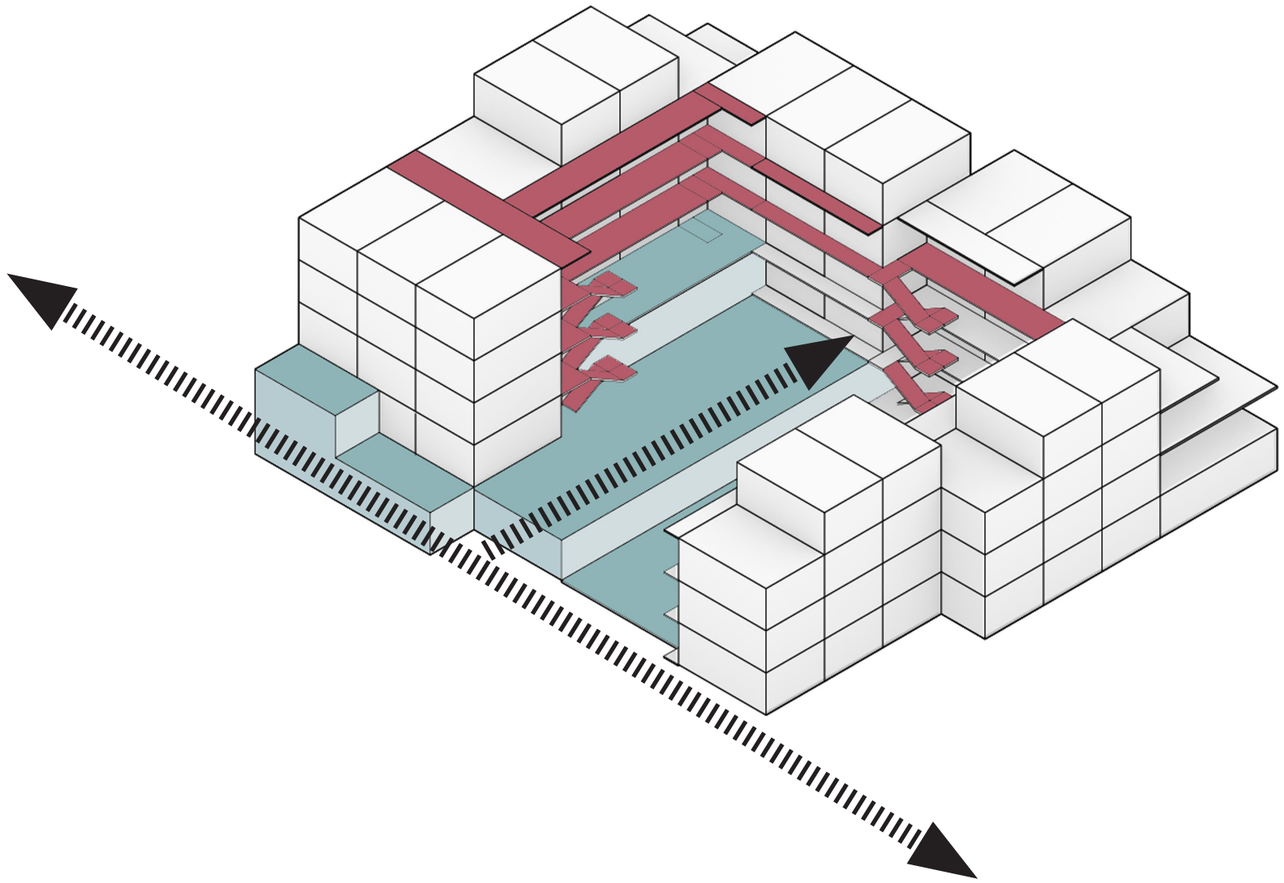


Street hypothesis



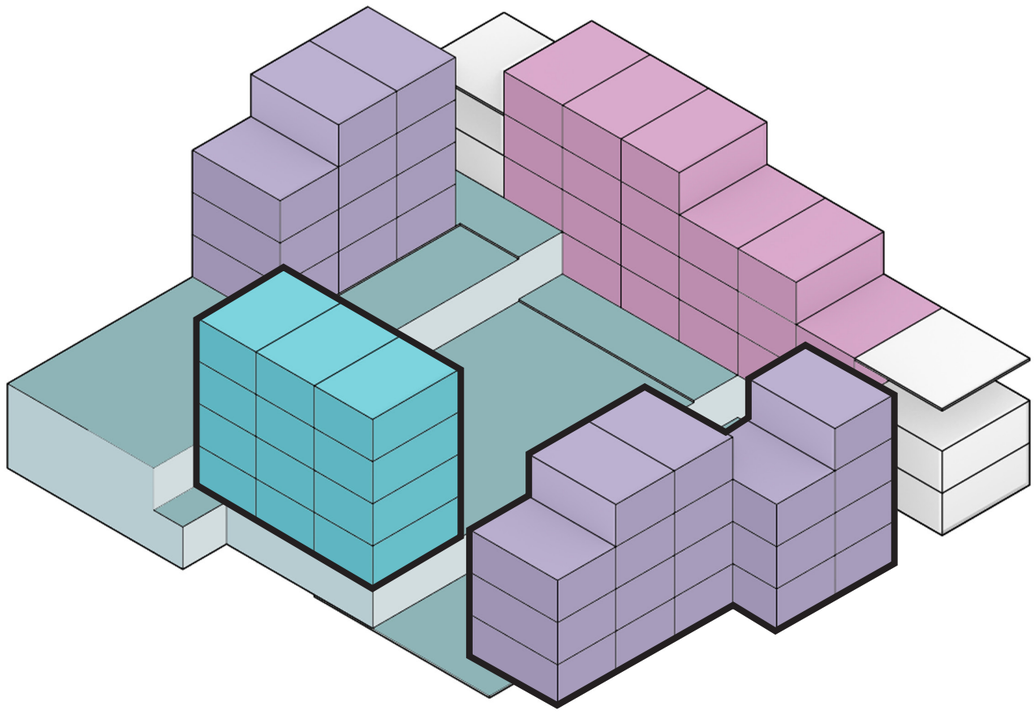
Corner shop
Activity center
Landscape

Neighbourhood

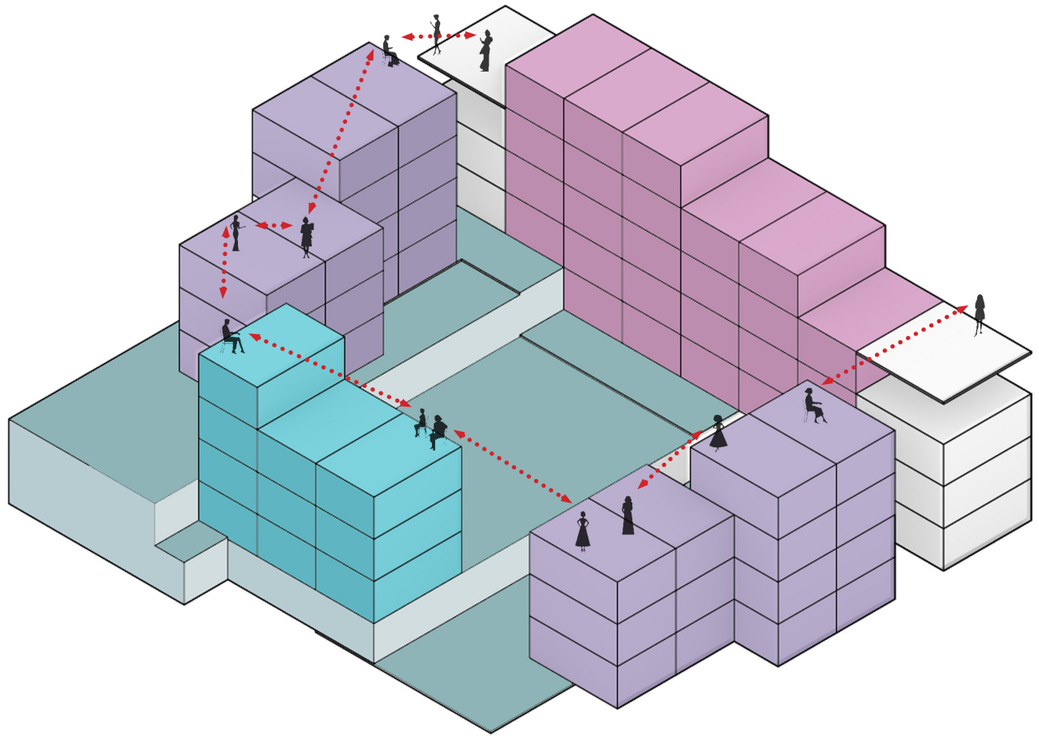




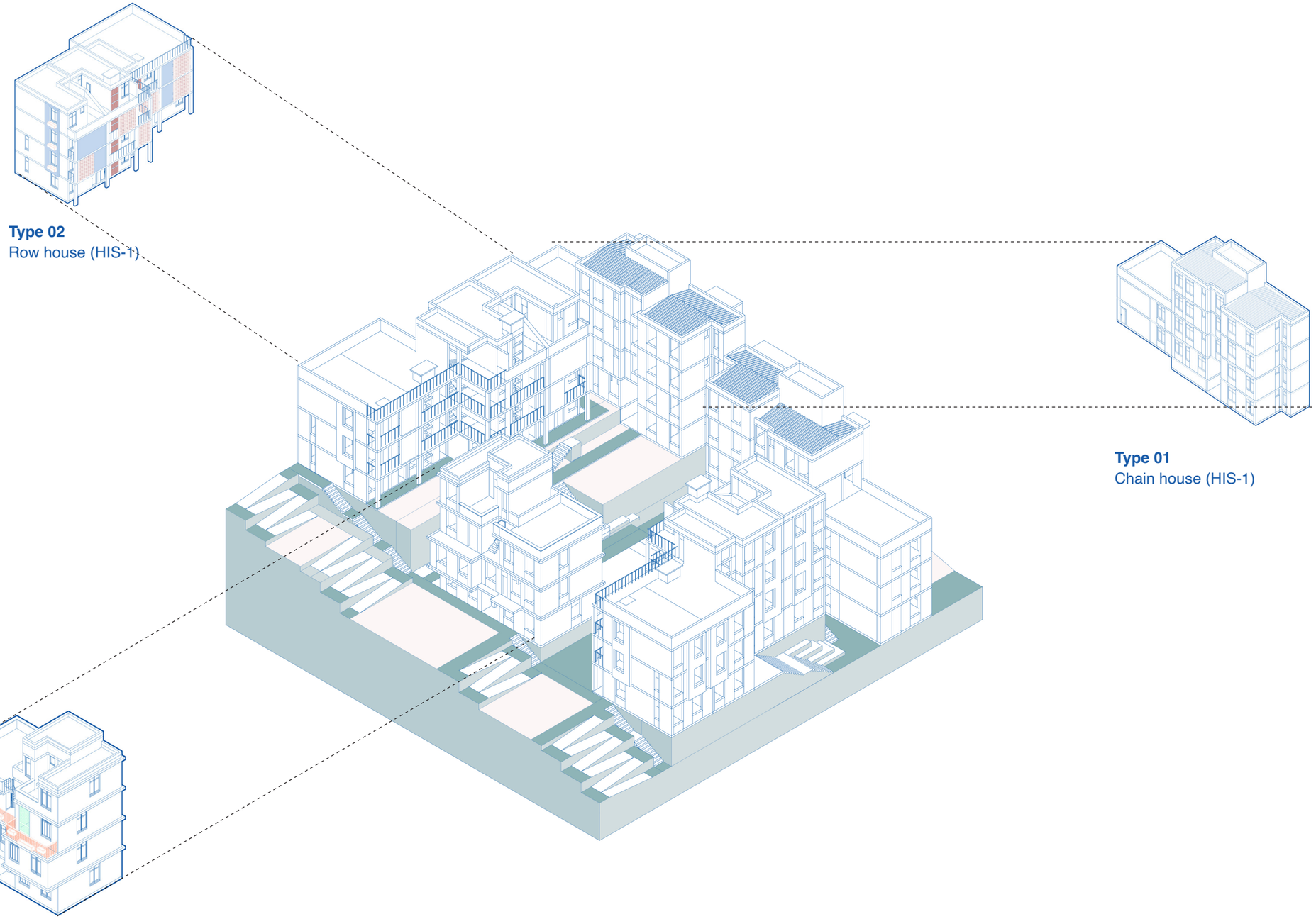
Accessibility



Segementation



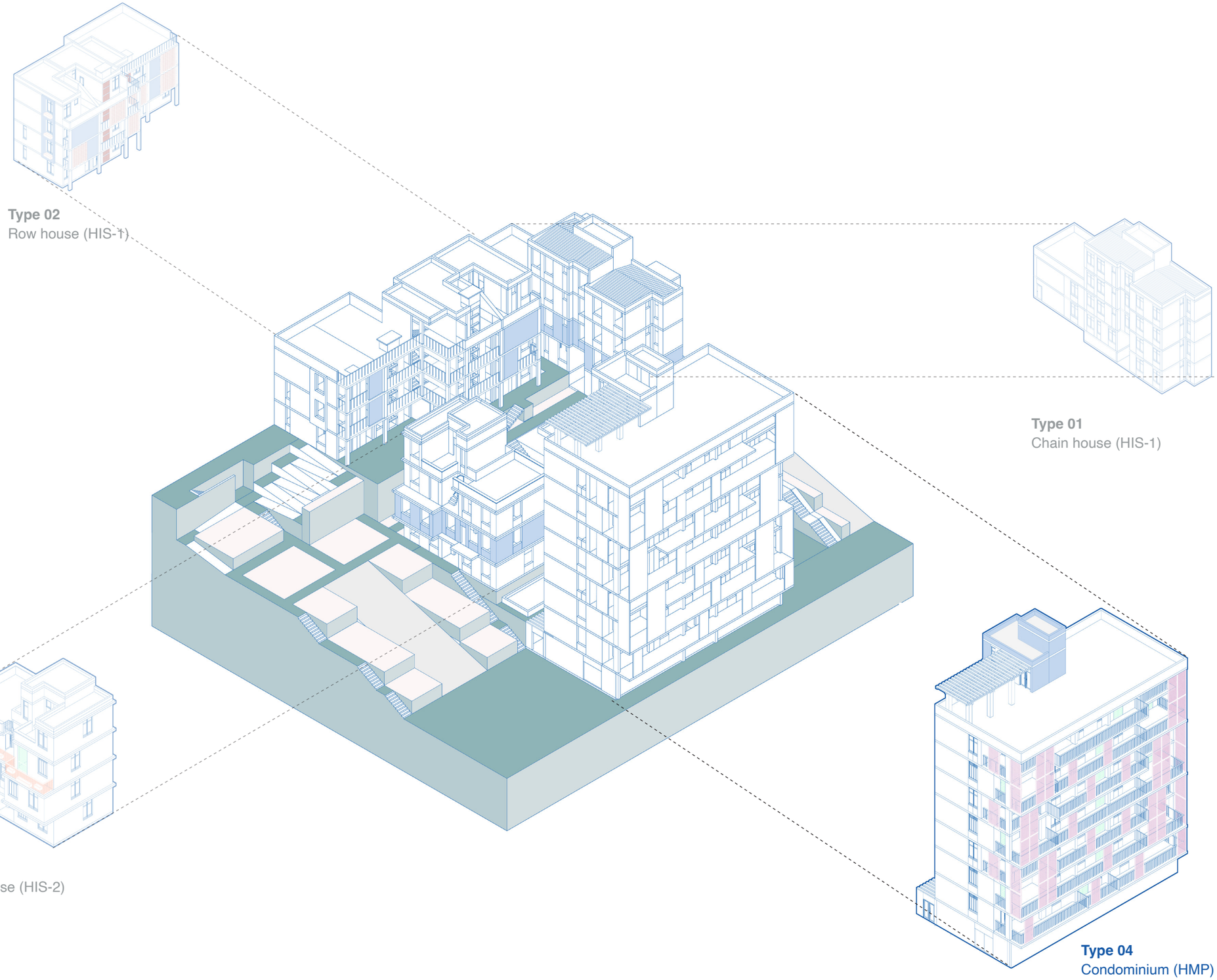
Connection



Type 02
Row house (HIS-1)

Type 01
Chain house (HIS-1)

Type 03
Slab house (HIS-2)

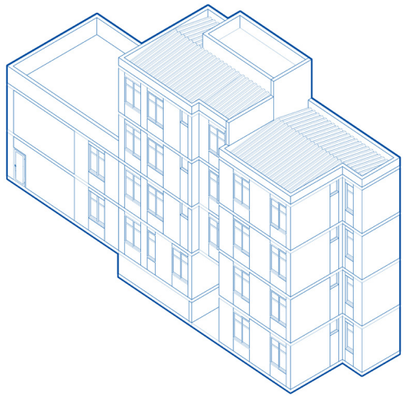


Type 02
Row house (HIS-1)

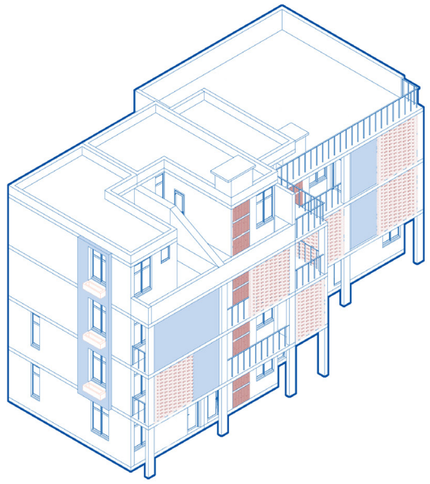
Type 01
Chain house (HIS-1)

Type 03
Slab house (HIS-2)

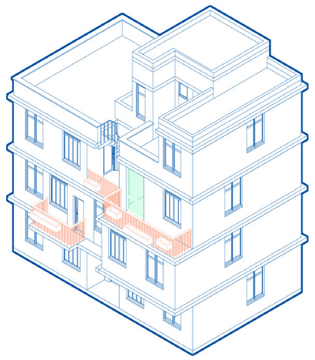
Type 04
Condominium (HMP)



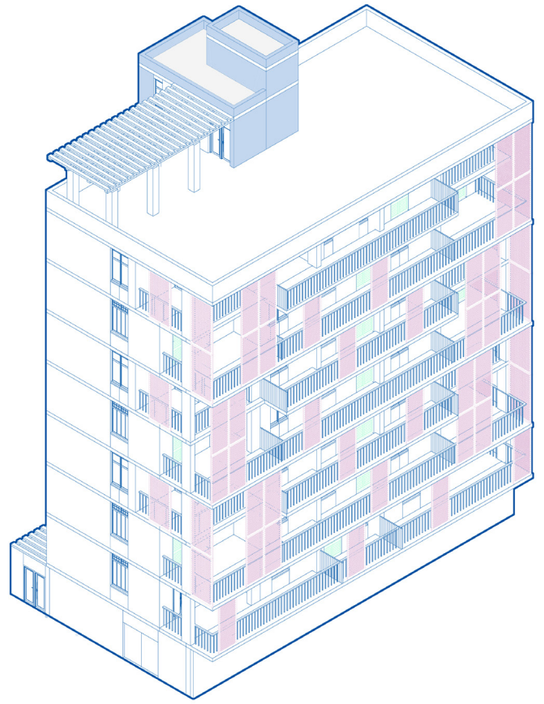
Type 01 - Chain house
HIS 1



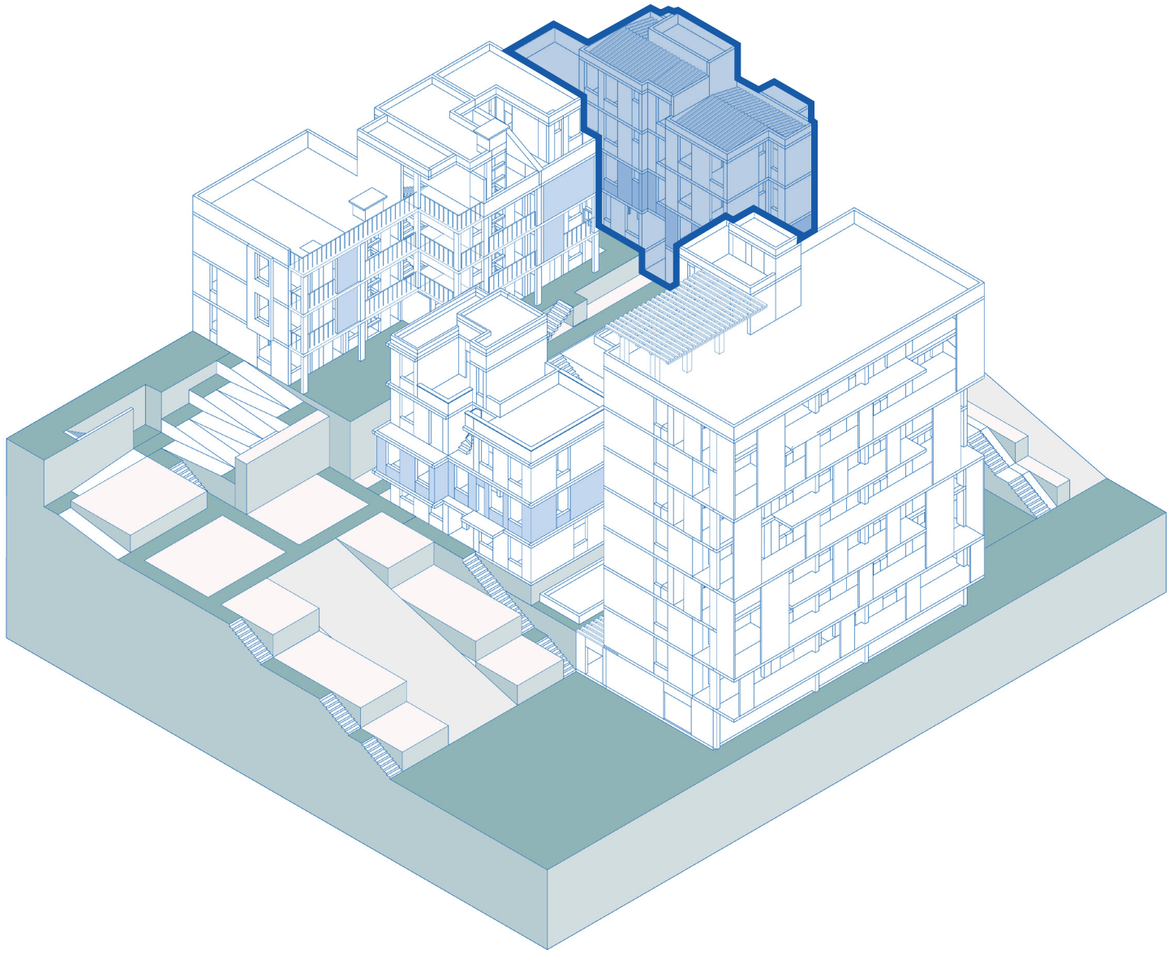
Type 02 - Row house
HIS 1

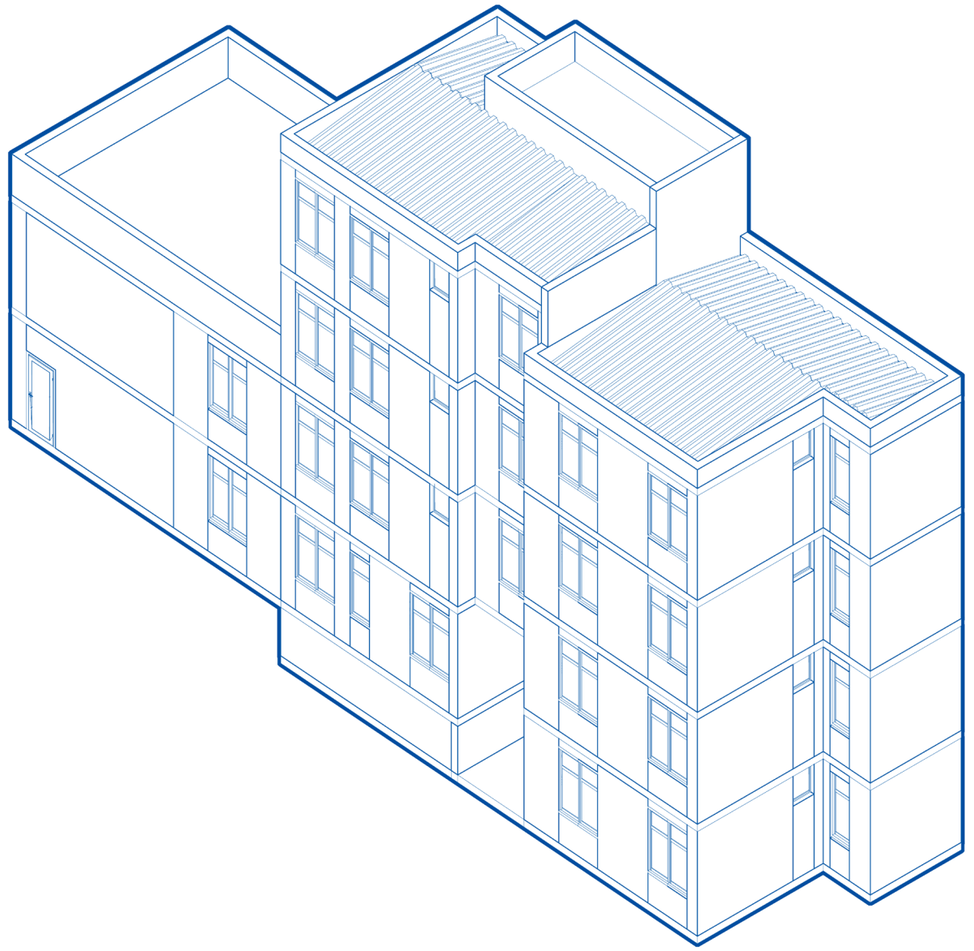


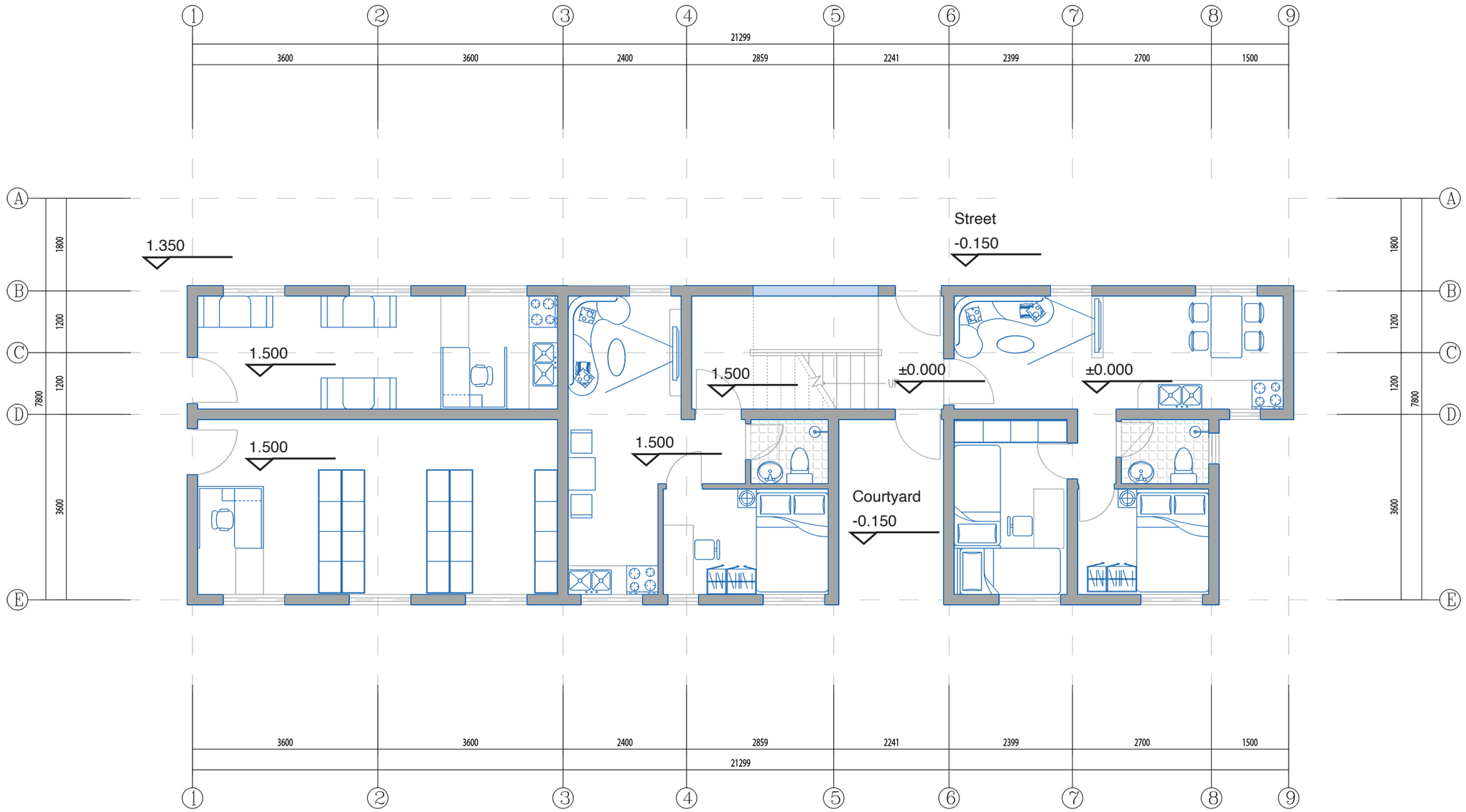
Type 03 - Slab house
HIS 2



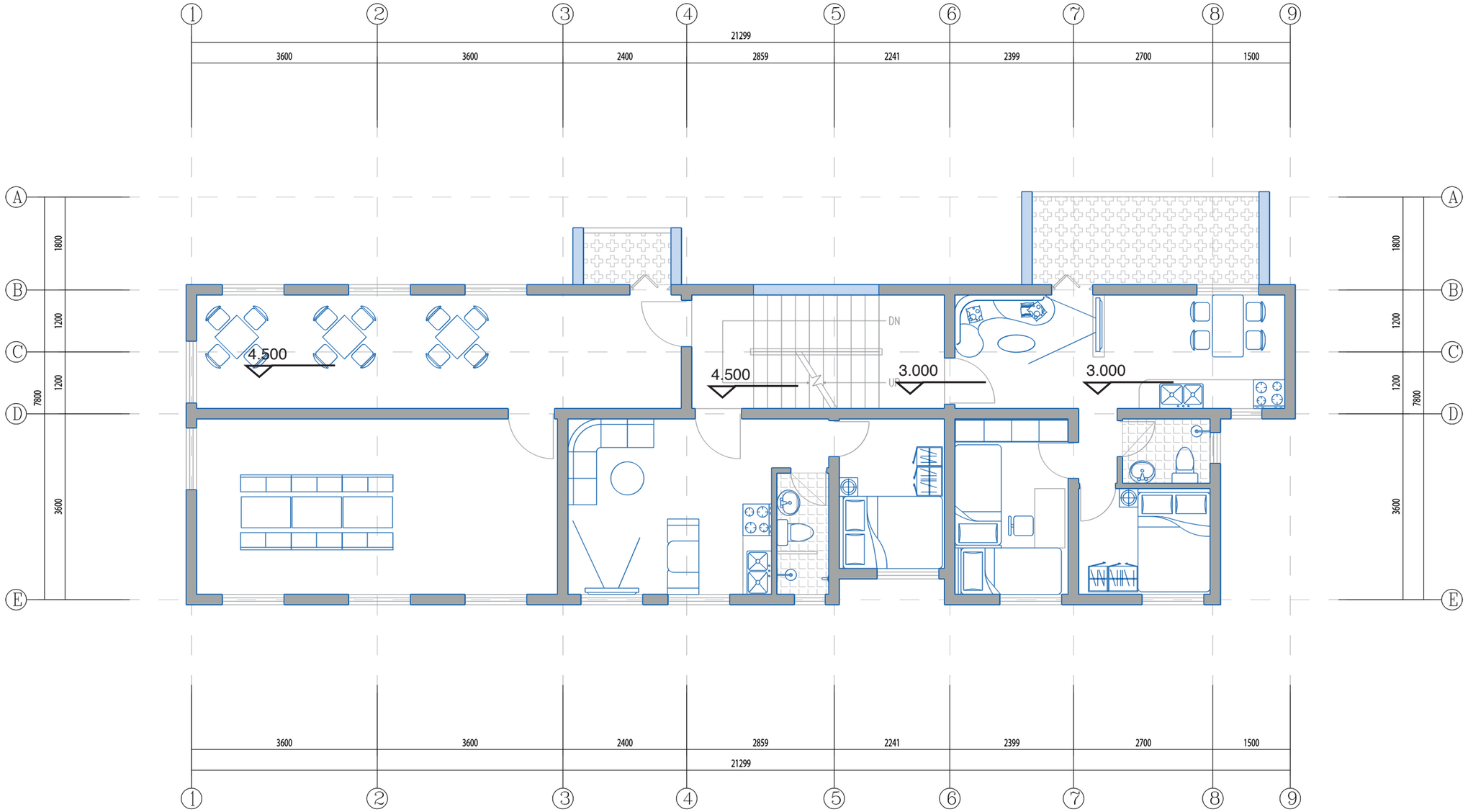
Type 04 - Condominium
HMP



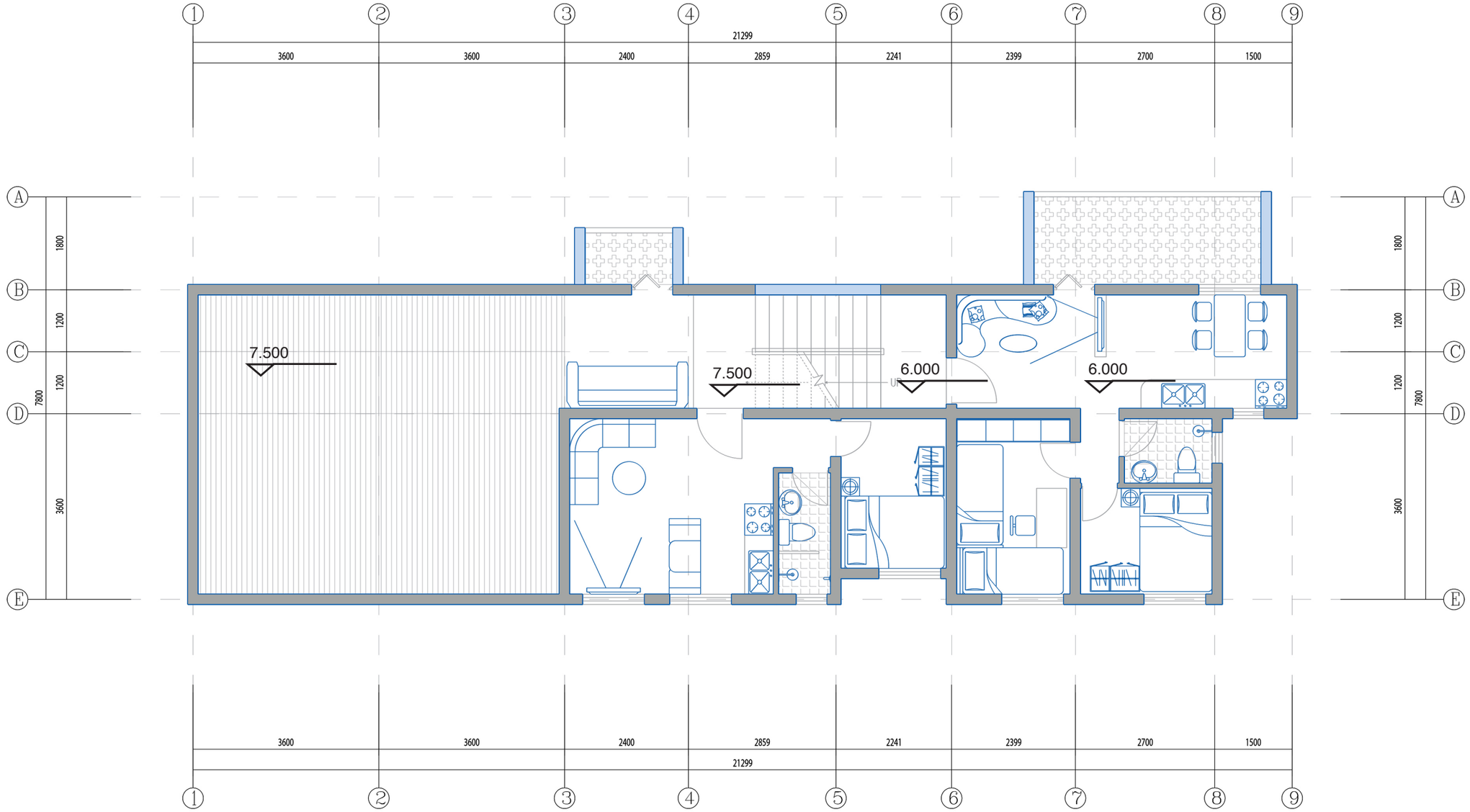




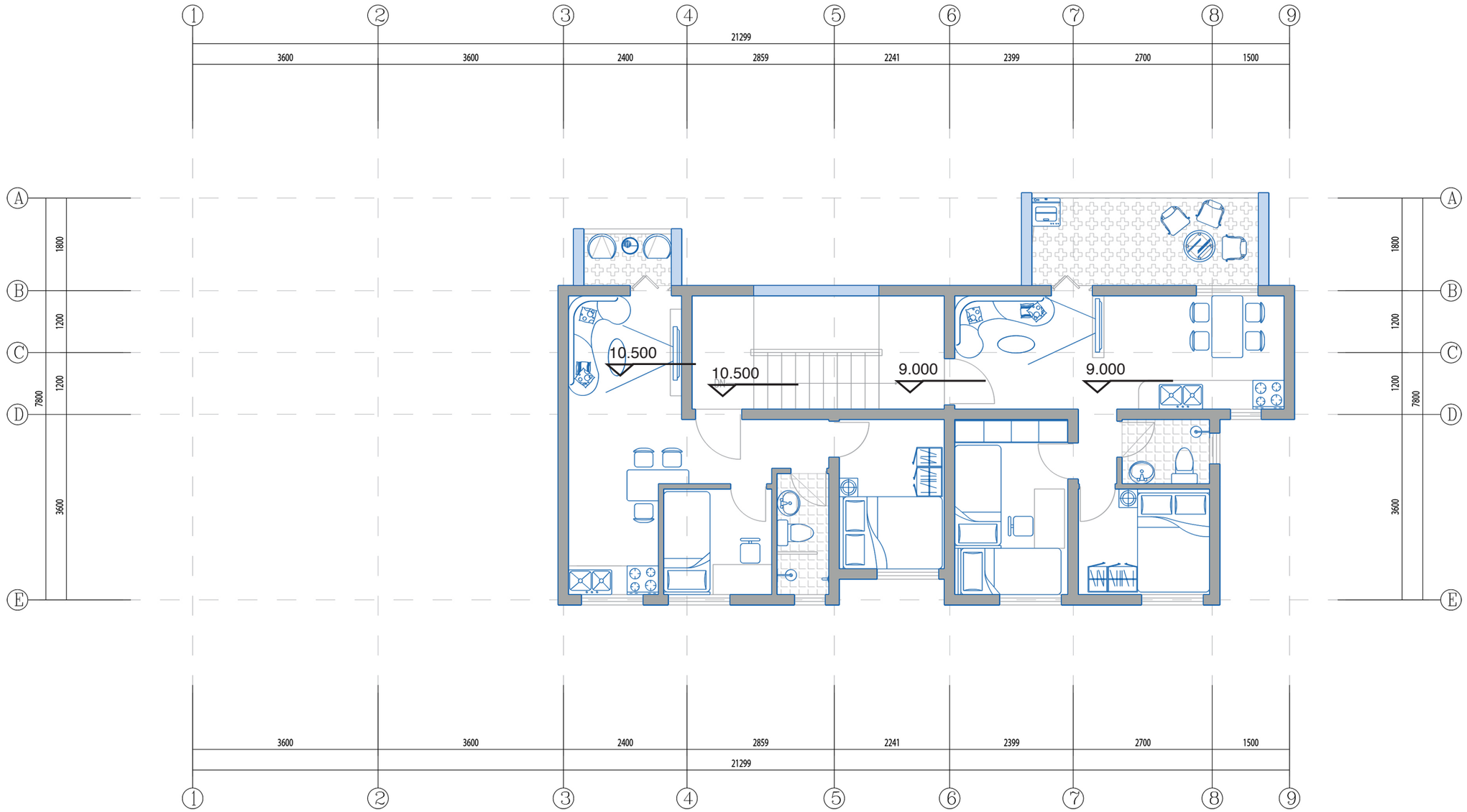
Ground floor plan



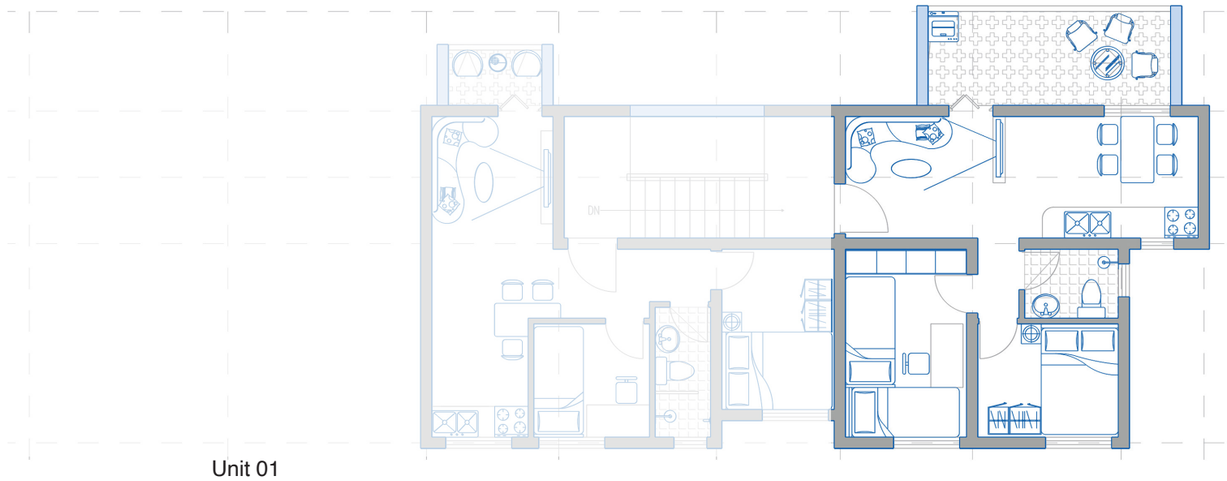
First floor plan



Second floor plan



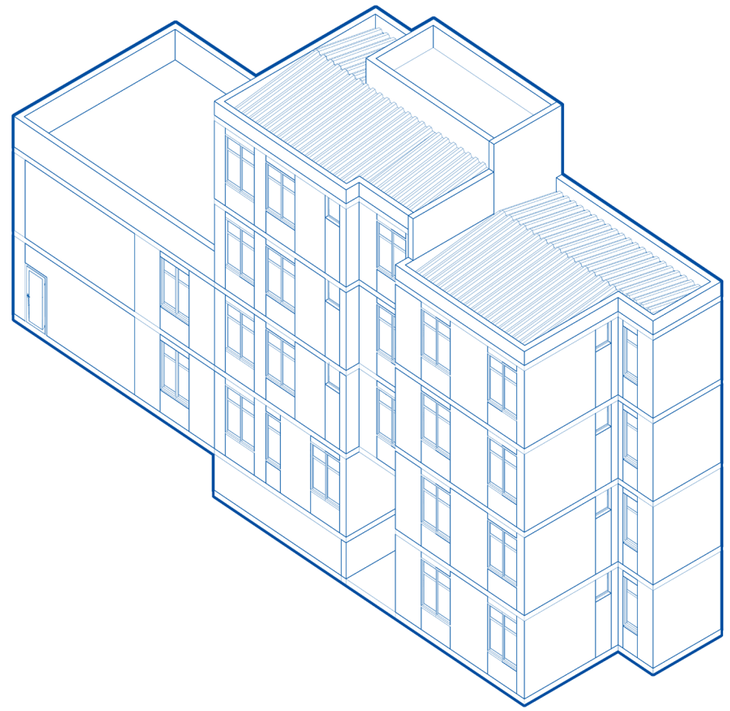
Third floor plan

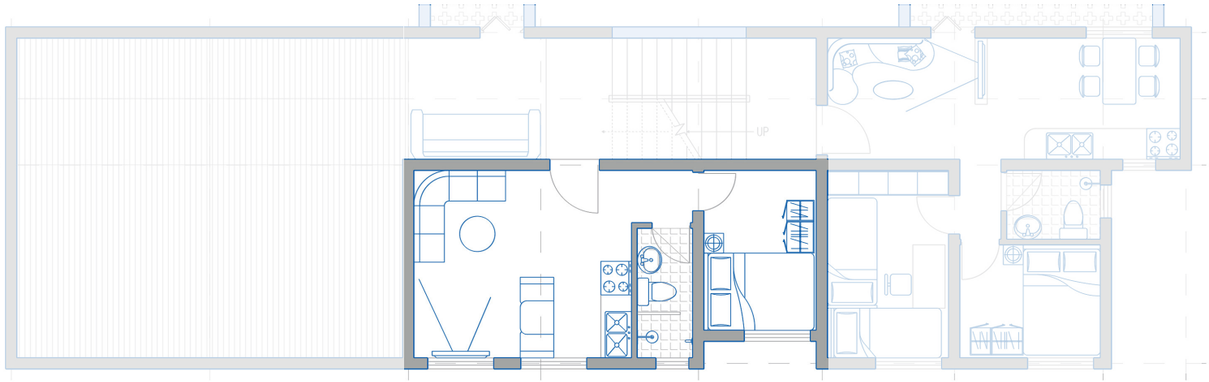


Unit 01

Unit 1-1
34.8 m²

3 Bedrooms
2 Bathroom
1 Dining room
1 Living room

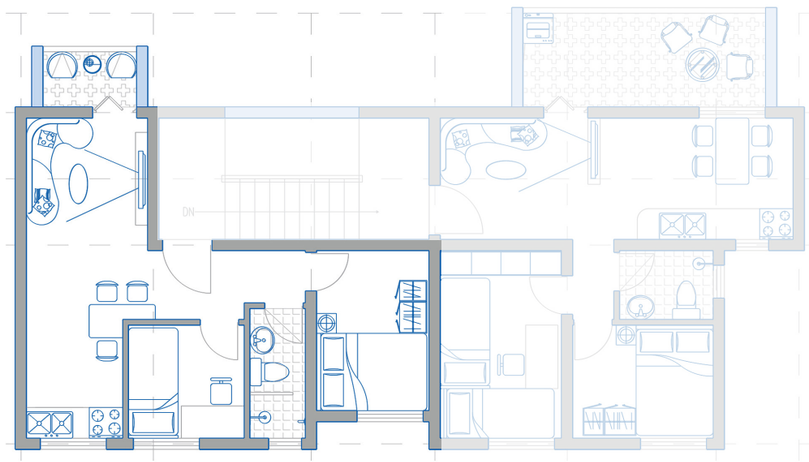




Unit 02

Unit 1-2
27.0 m²

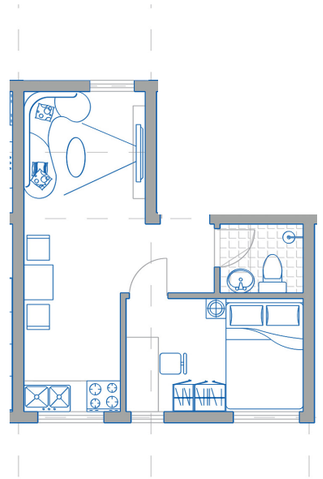
1 Bedrooms
1 Bathroom
1 Dining room
1 Living room



Variation 01

Unit 1-2
33.7 m²

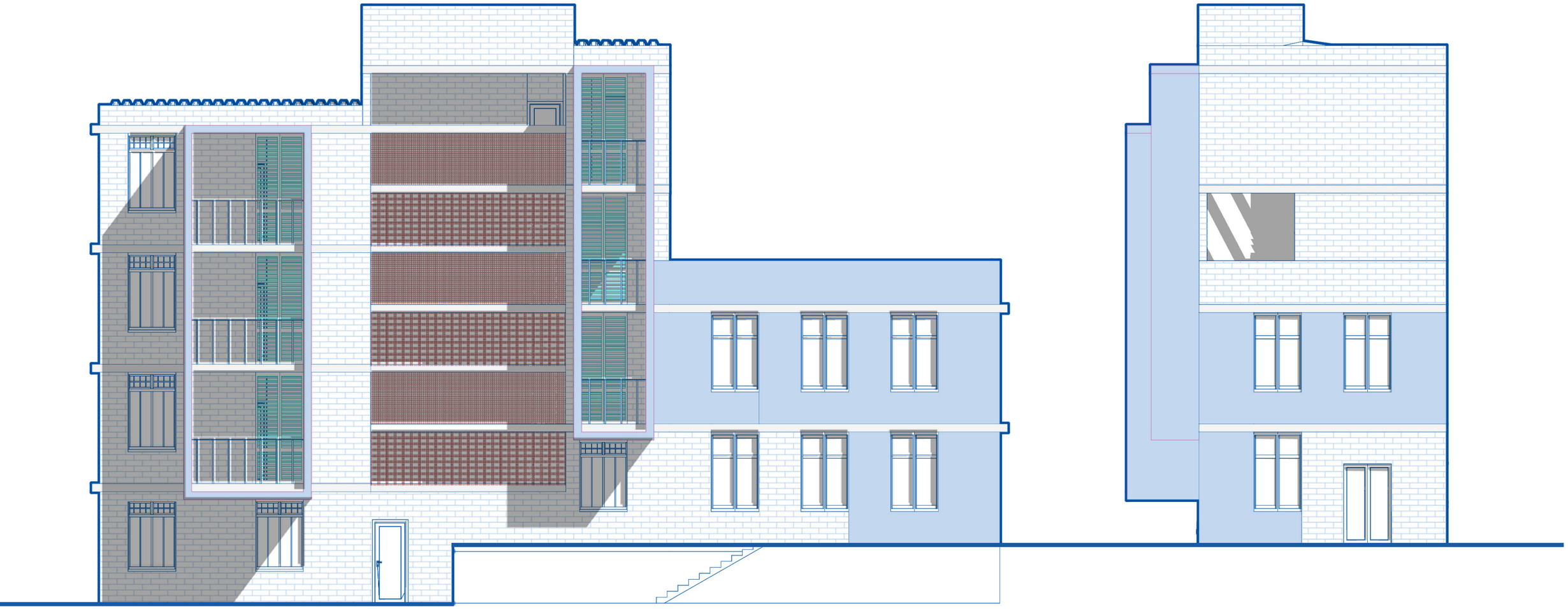
2 Bedrooms
1 Bathroom
1 Dining room
1 Living room



Variation 02

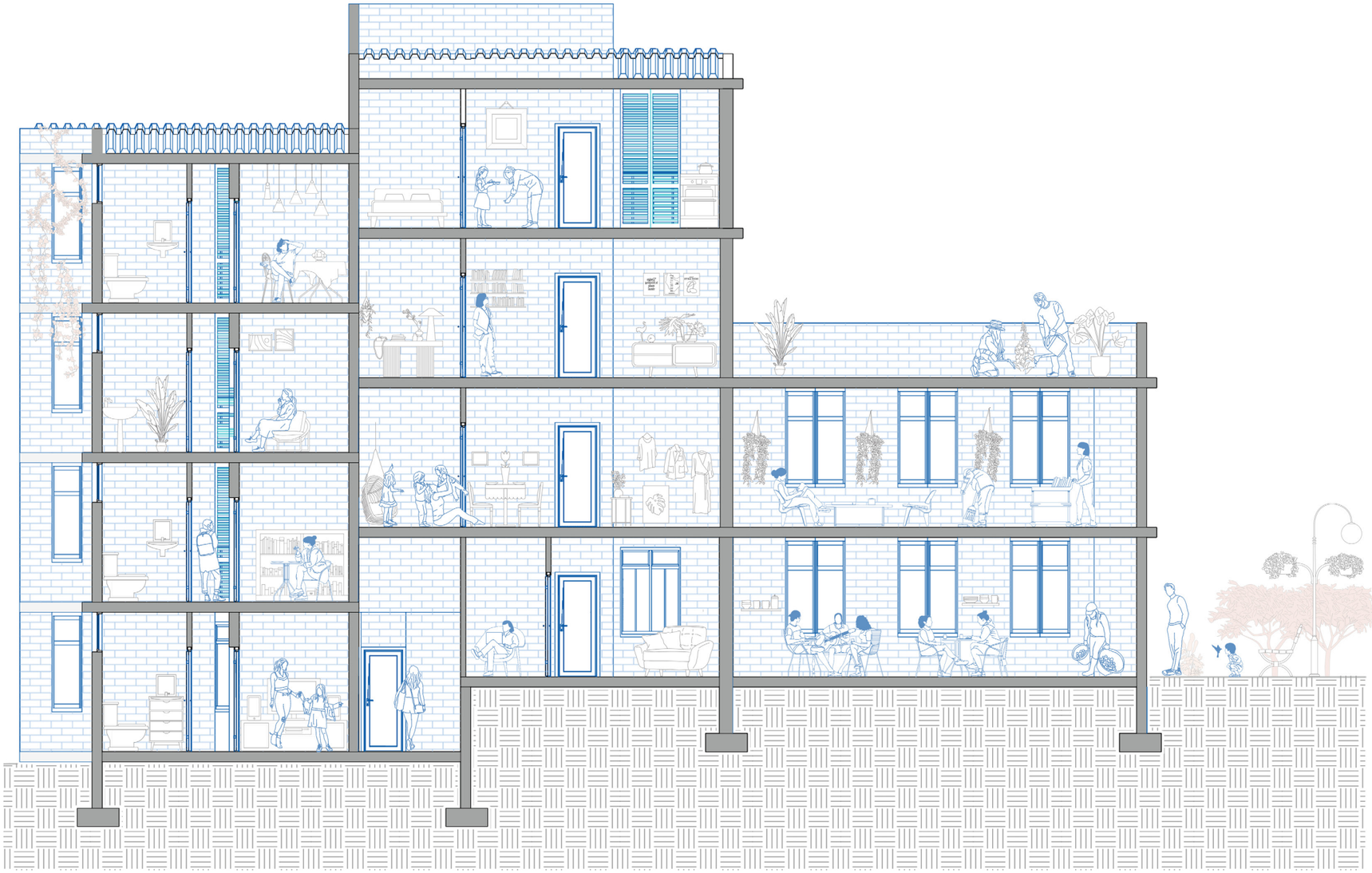
Unit 1-2
24.8 m²

1 Bedrooms
1 Bathroom
1 Dining room
1 Living room

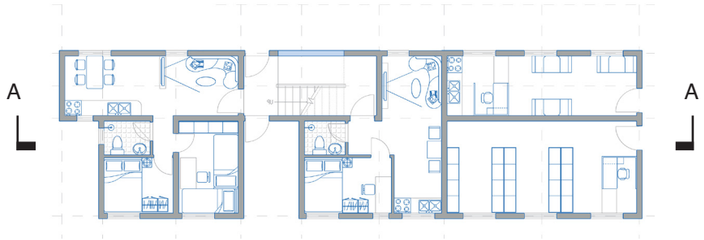


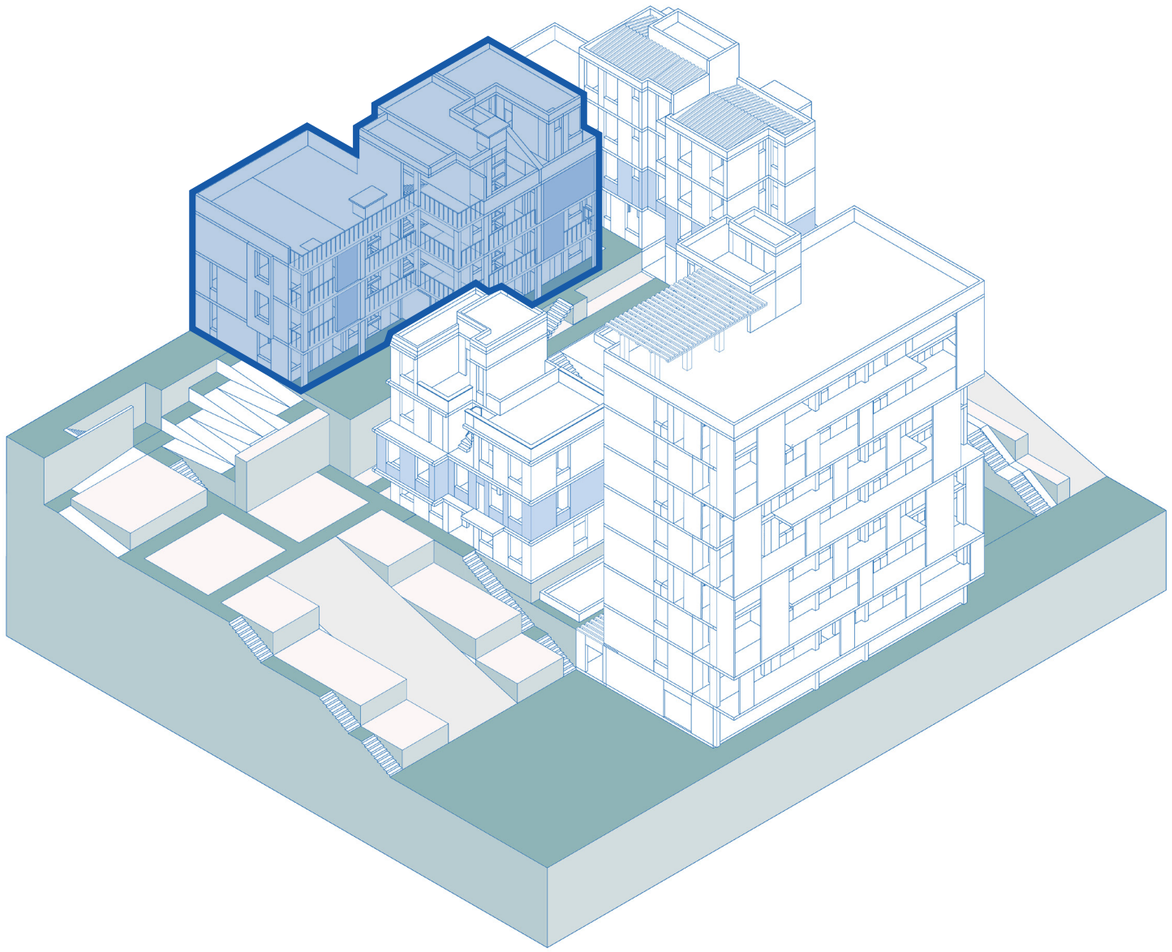
Elevation_ front

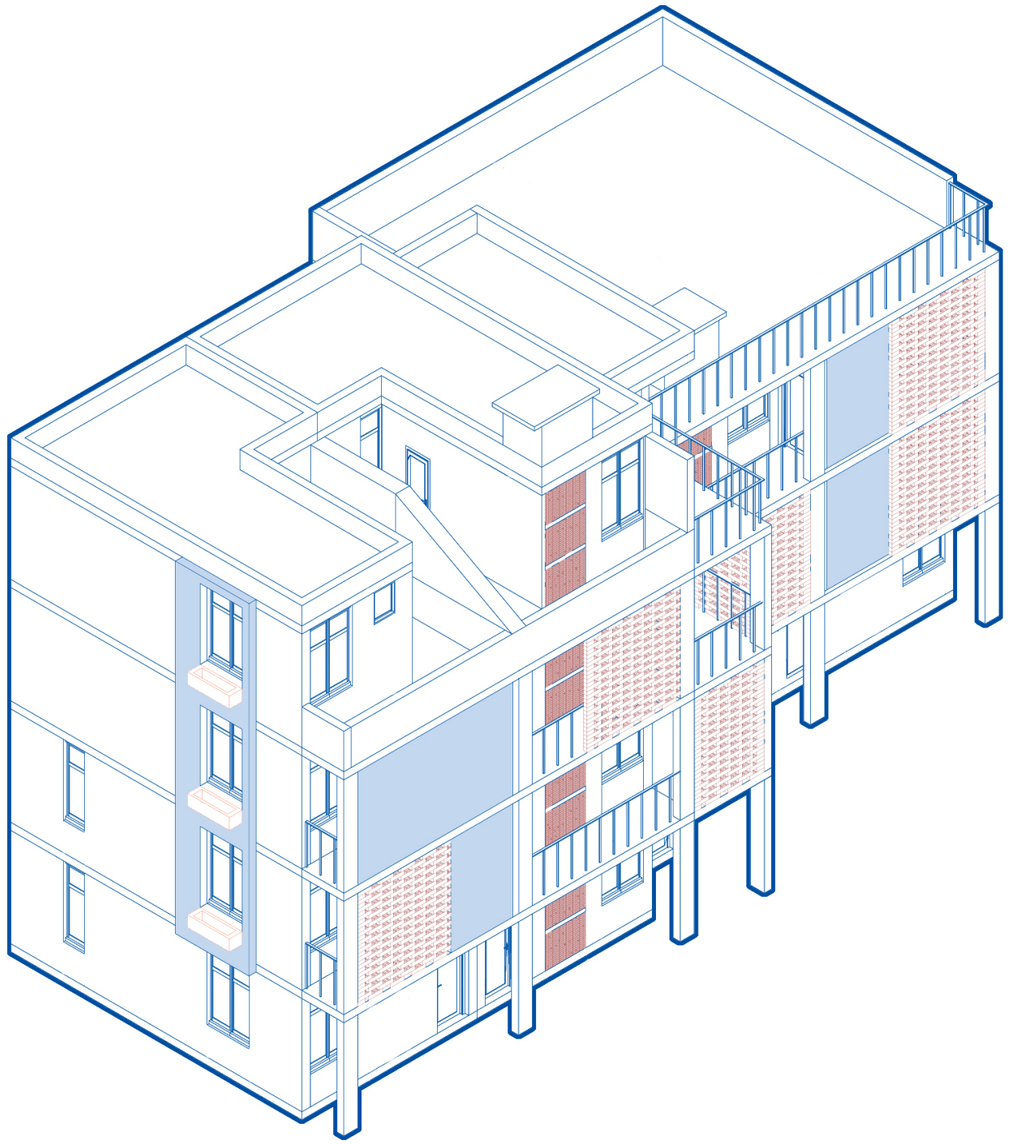
Elevation_ right

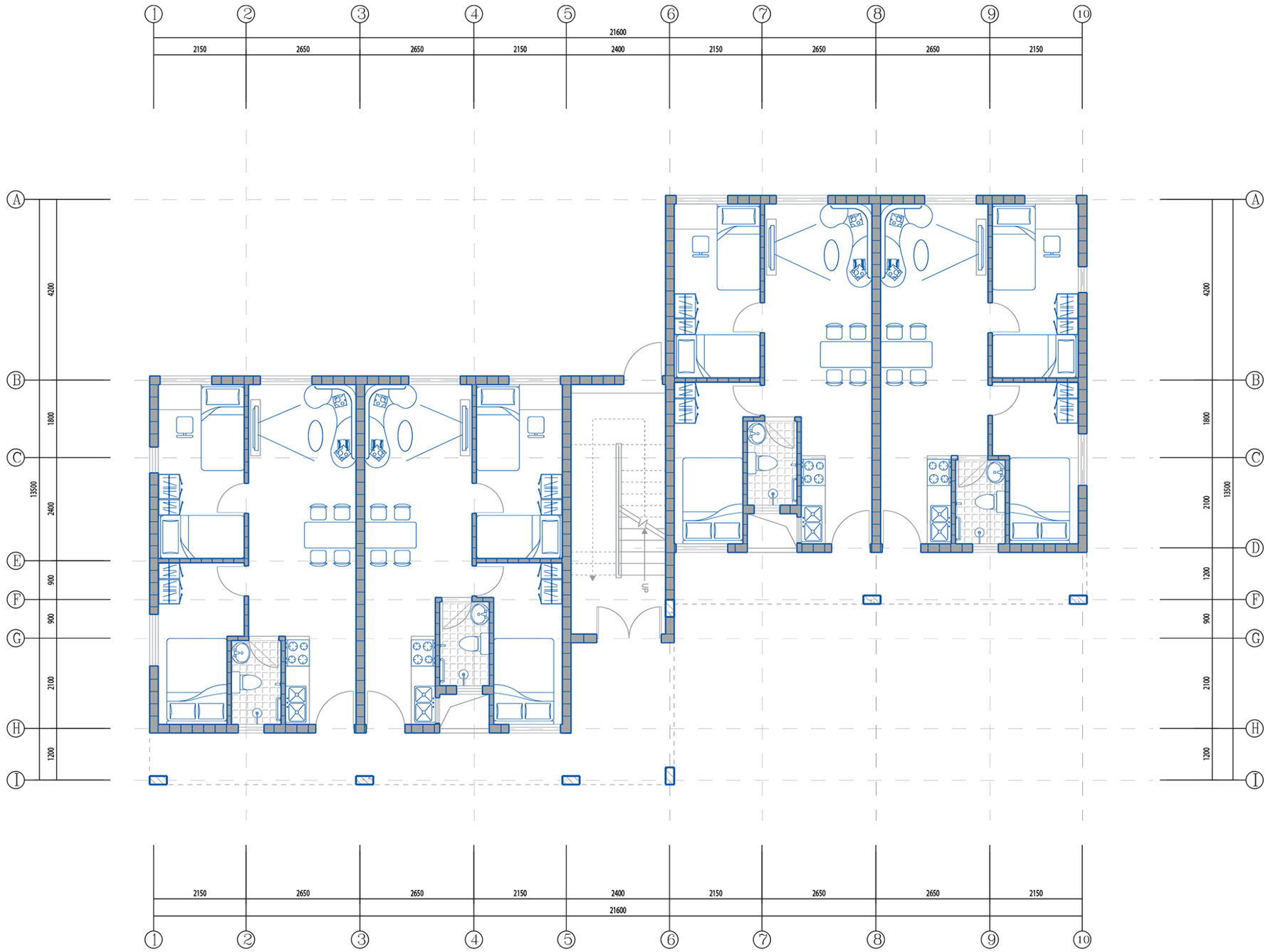


A-A Section

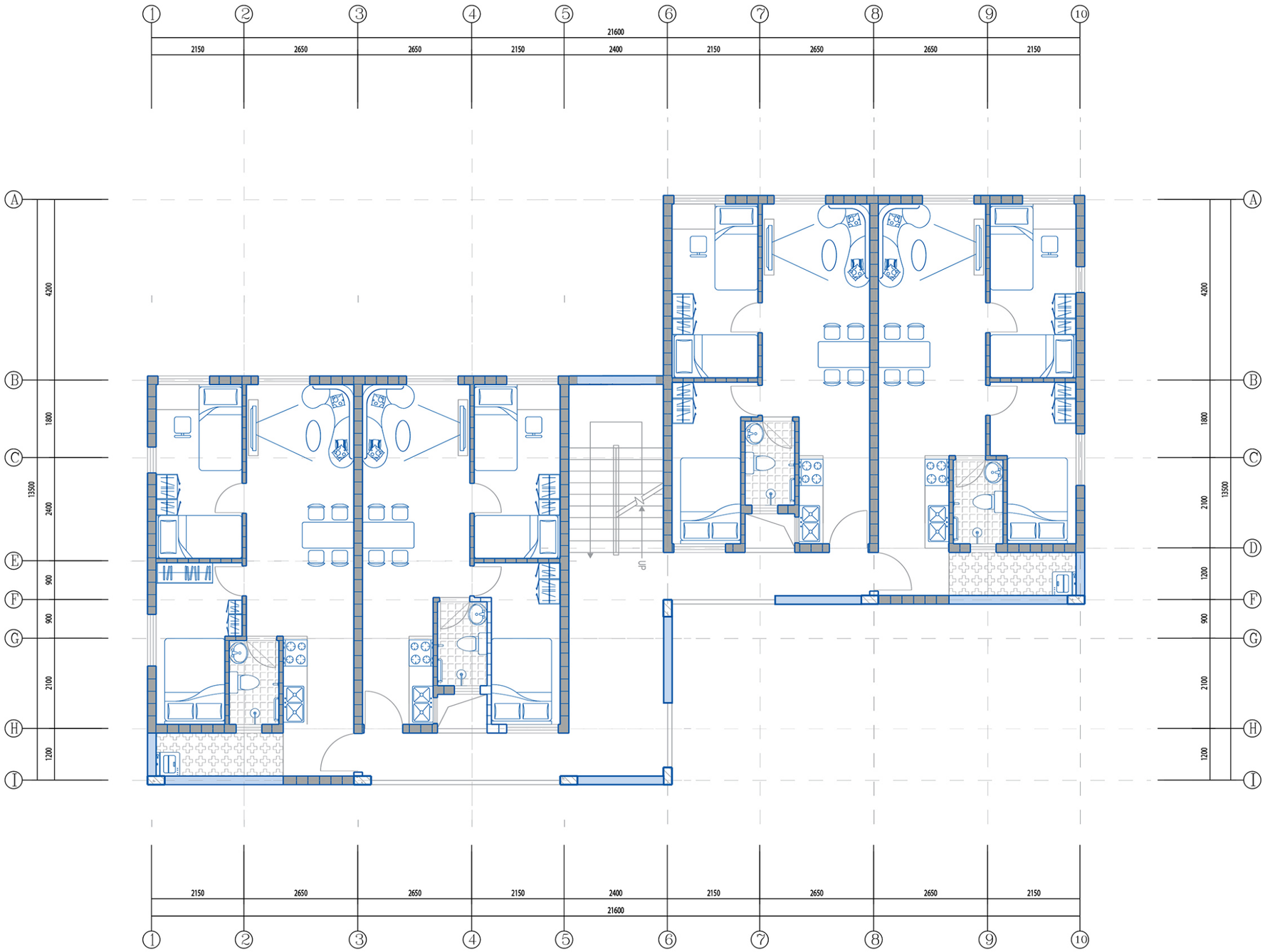




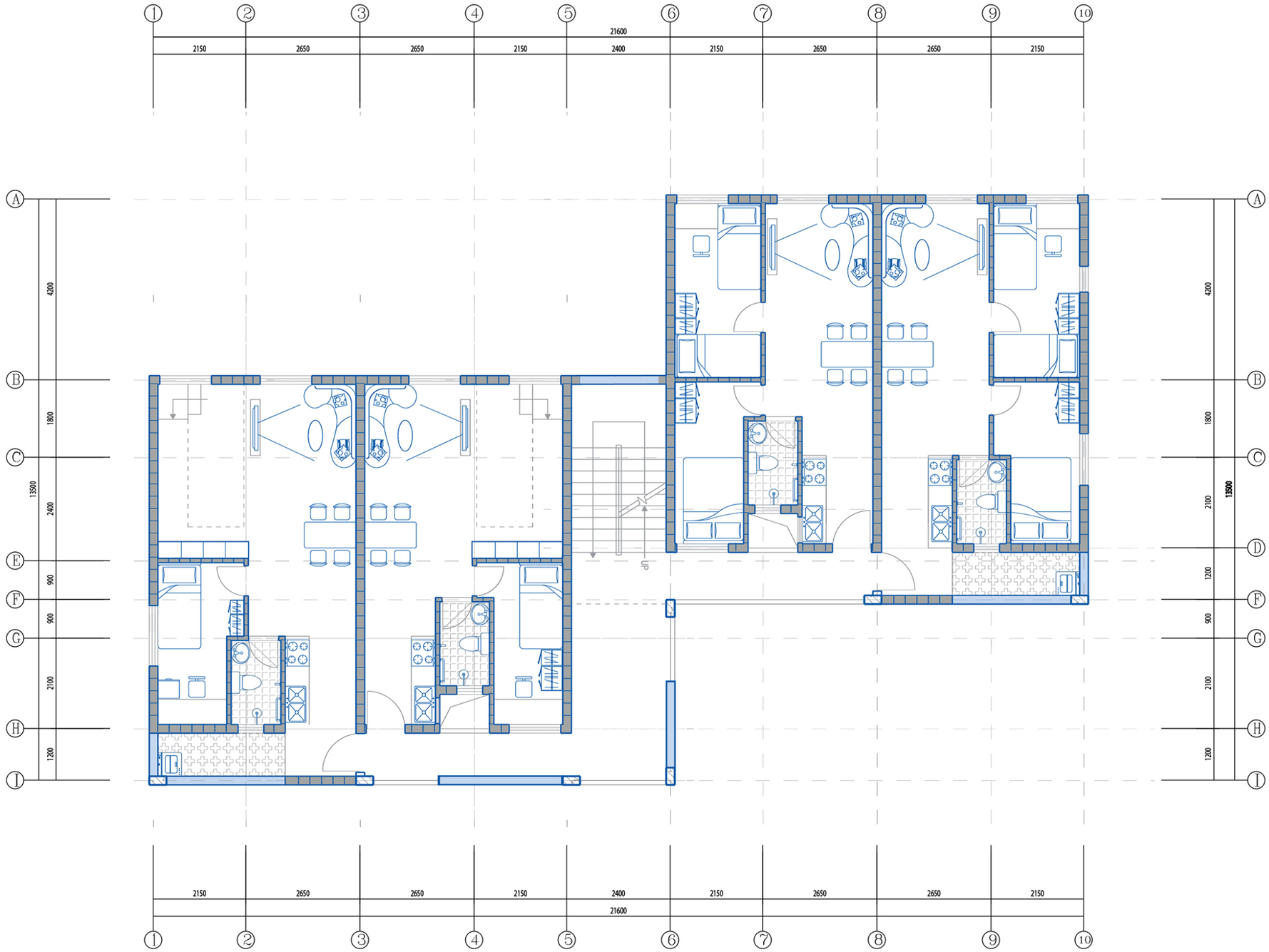




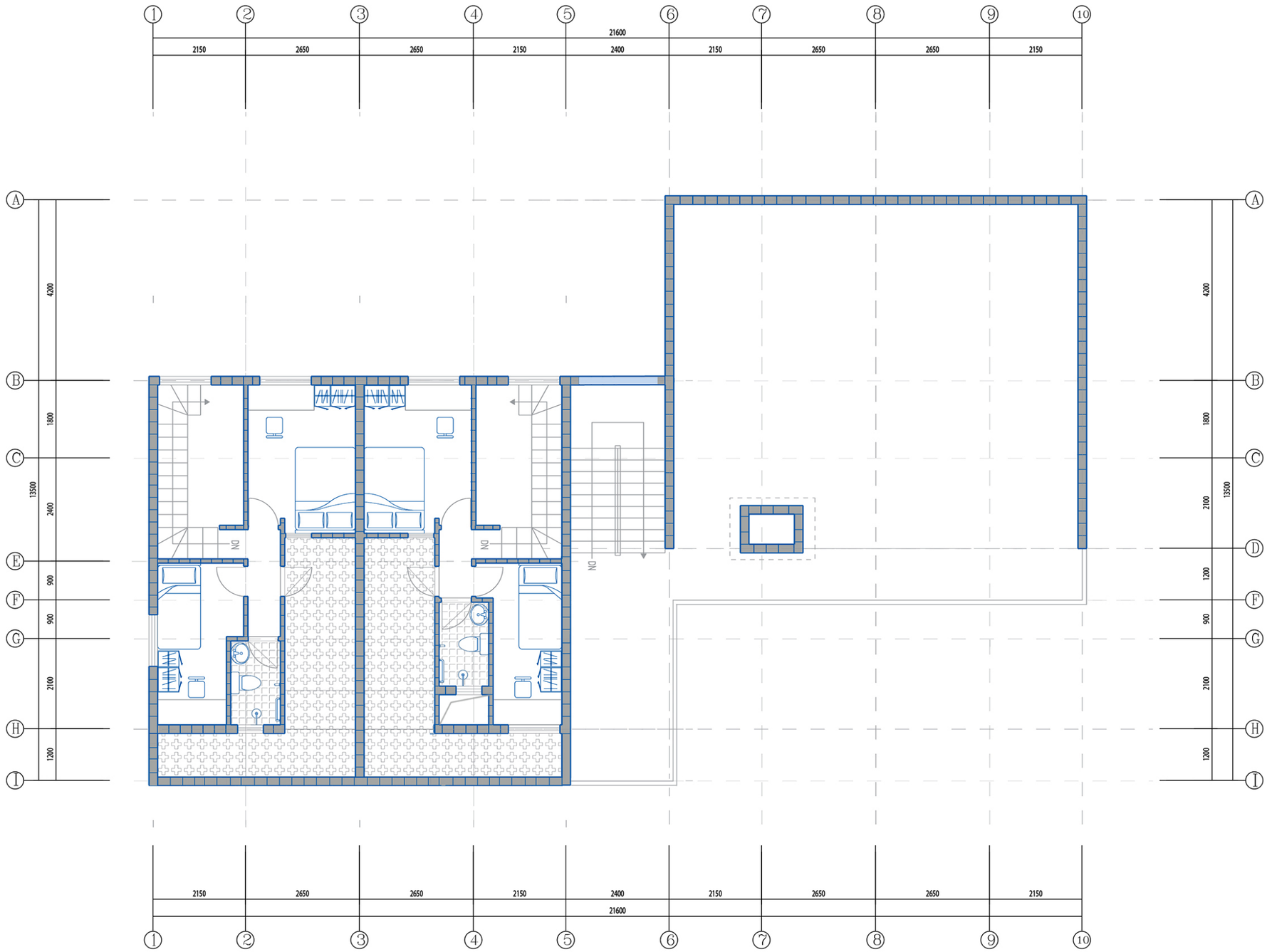
Ground floor plan



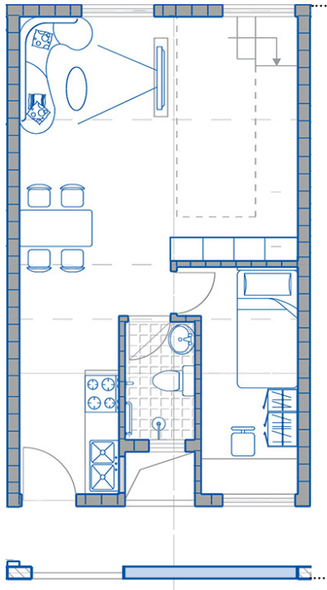
First floor plan



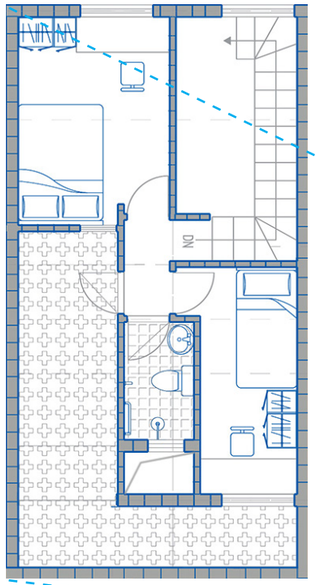
Second floor plan



Third floor plan



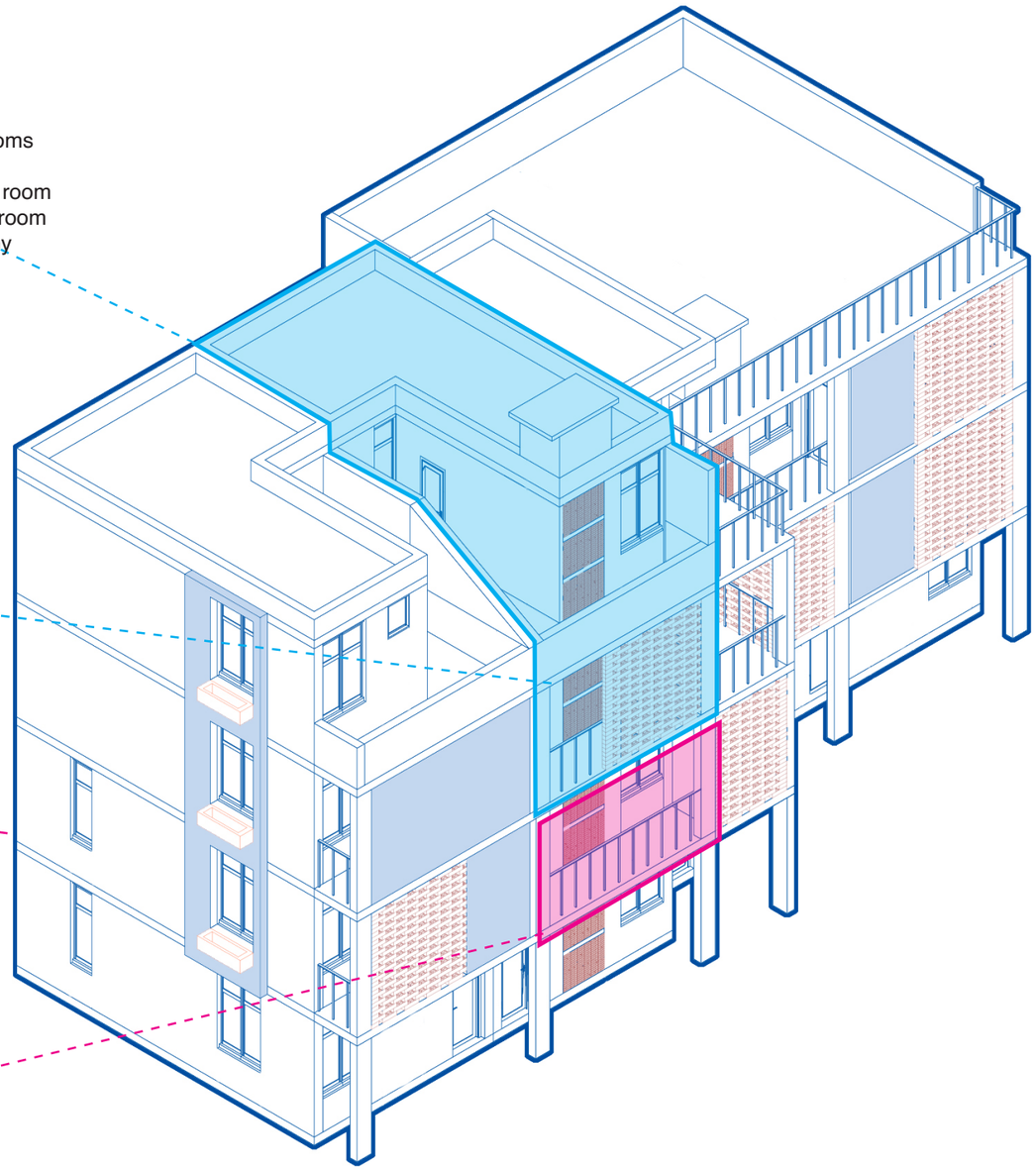
Unit 1 (lower level)

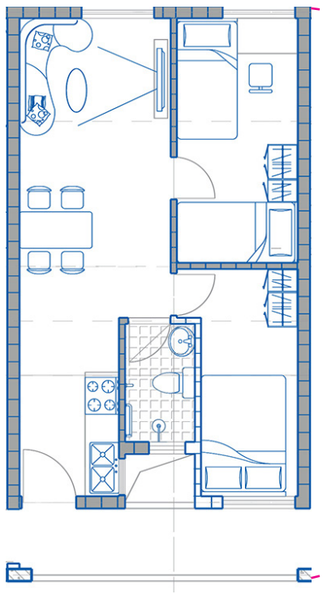


Unit 1 (upper level)

Unit 1-1
66.2 m²

3 Bedrooms
2 Toilets
1 Dining room
1 Living room
1 Balcony





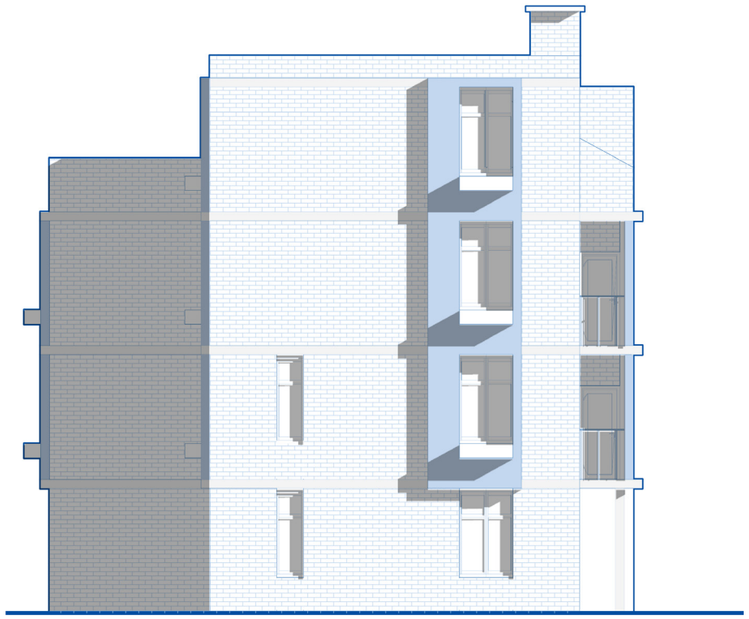
Unit 2

Unit 1-2
36.3 m²

2 Bedrooms
1 Bathroom
1 Dining room
1 Living room



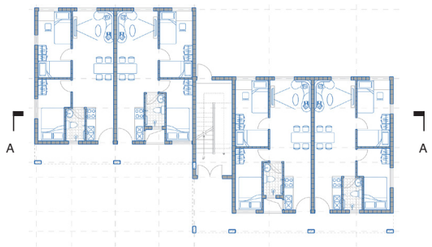
Elevation_front

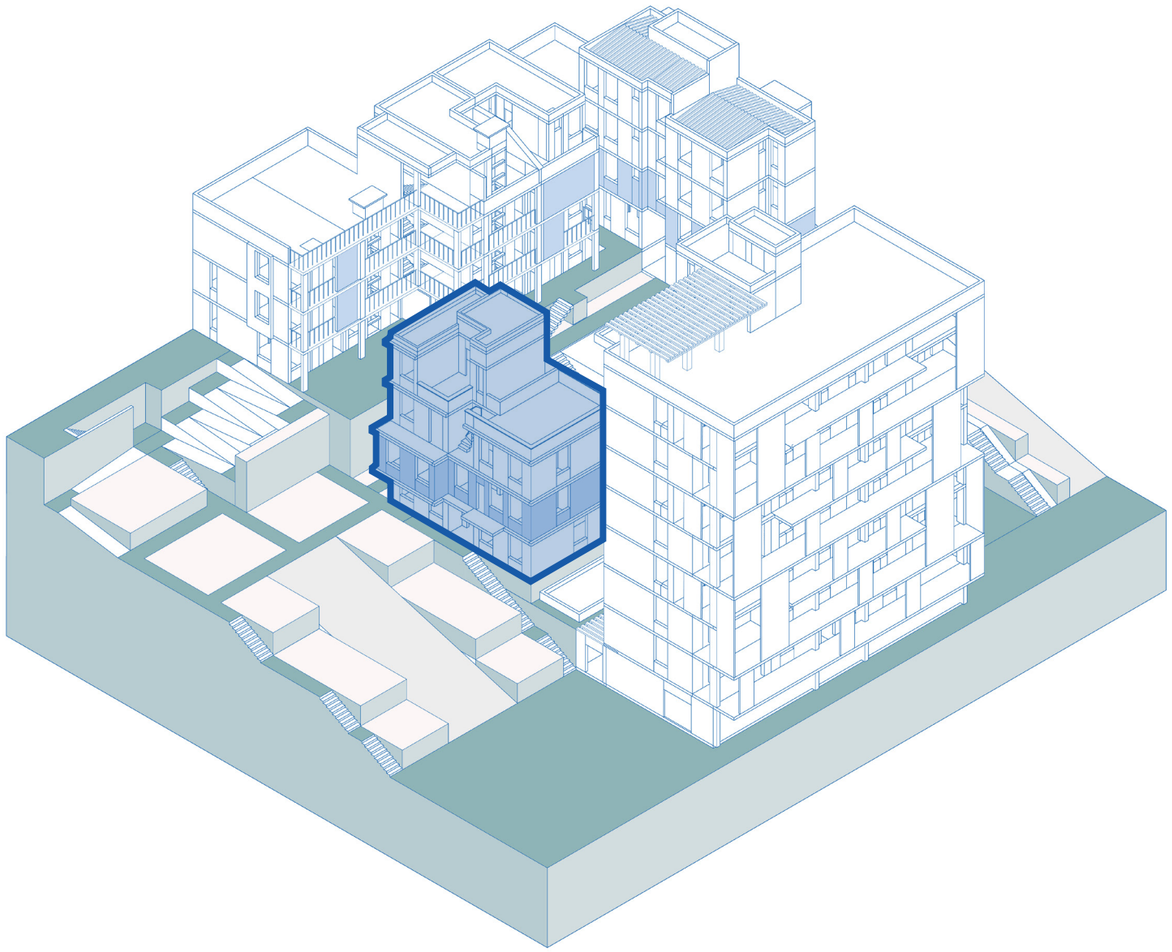


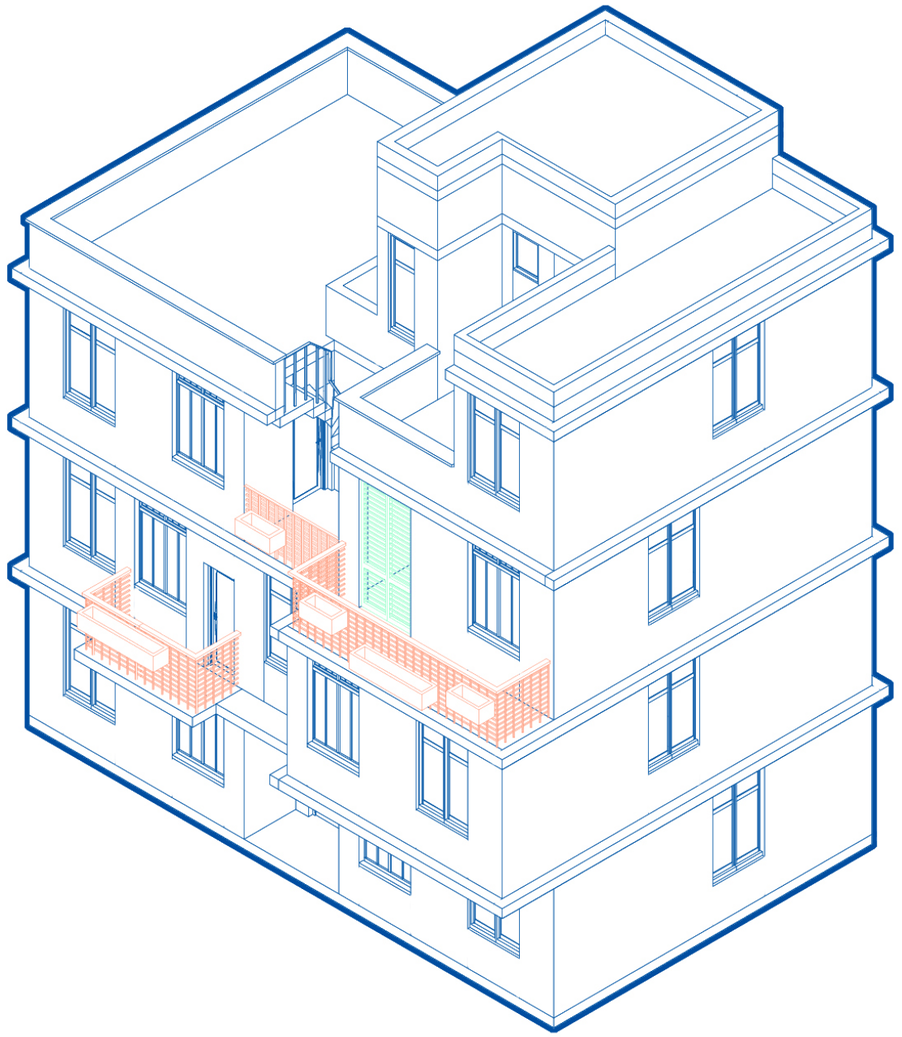
Elevation_right

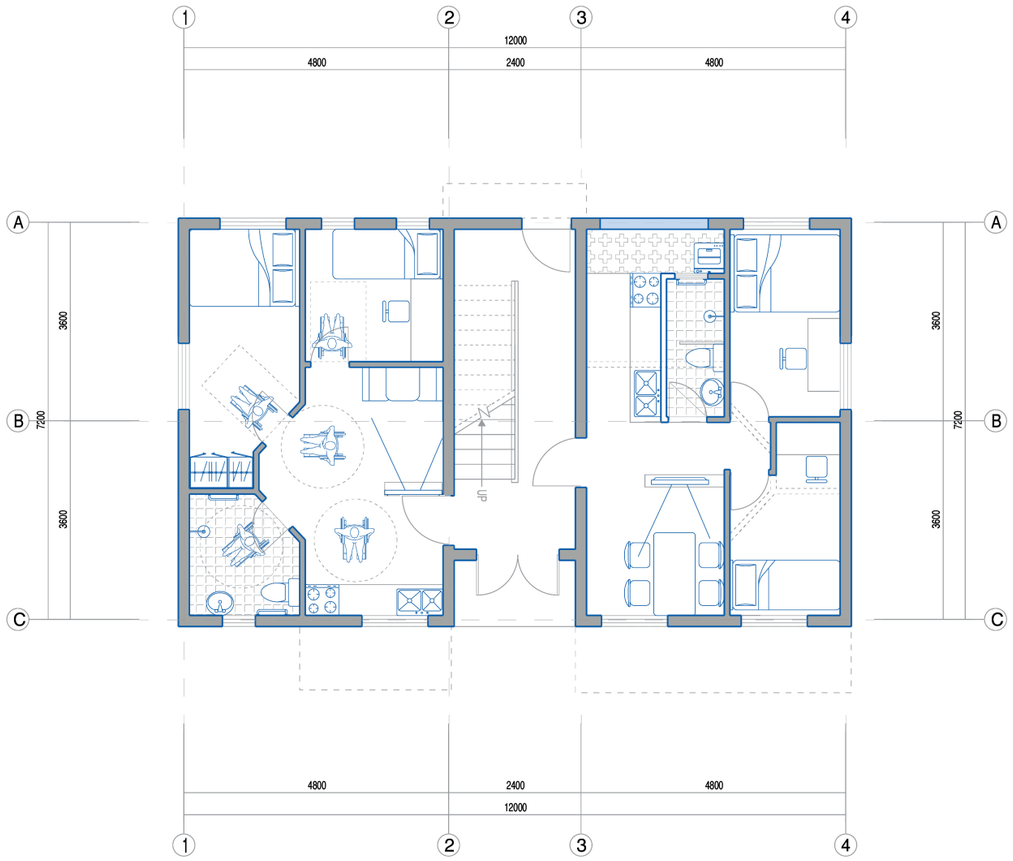


A-A Sectionn

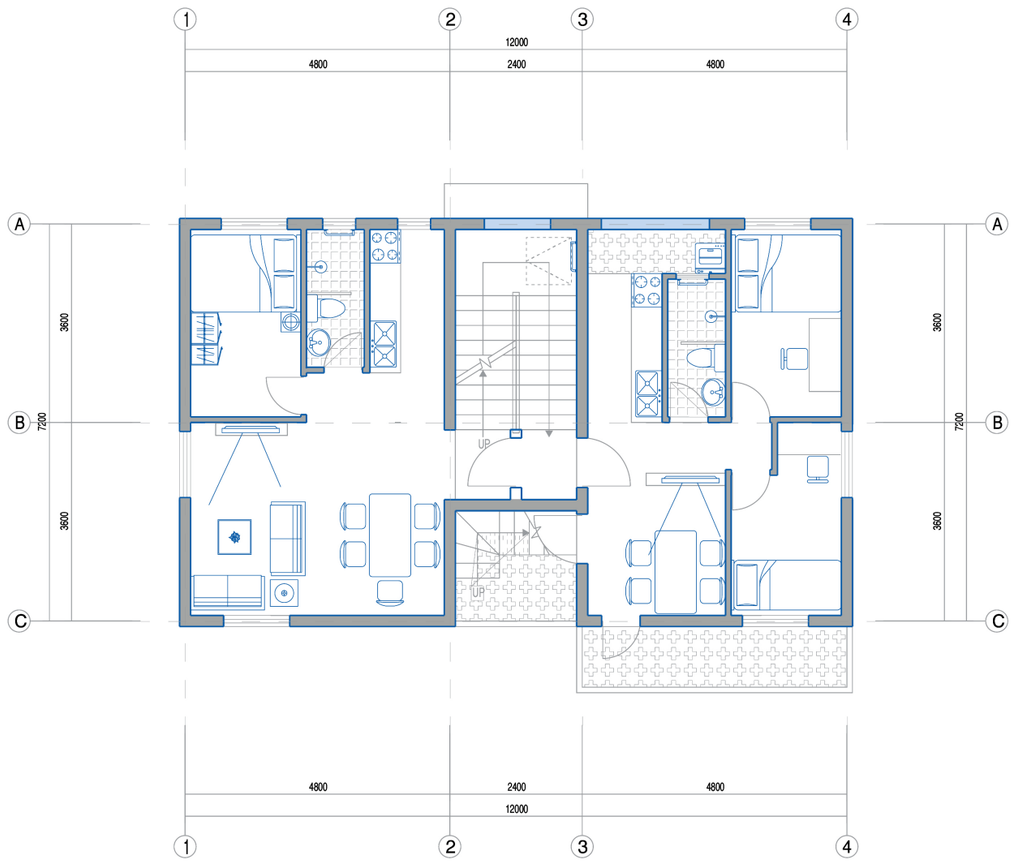








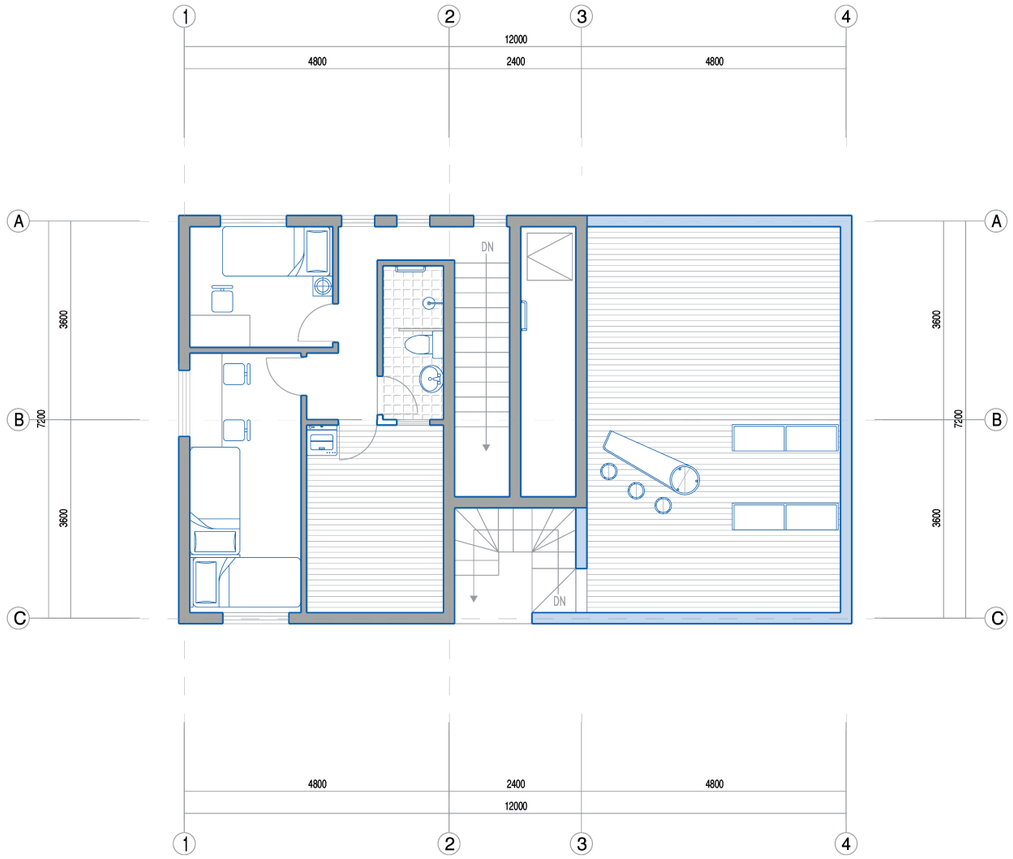
Ground floor plan



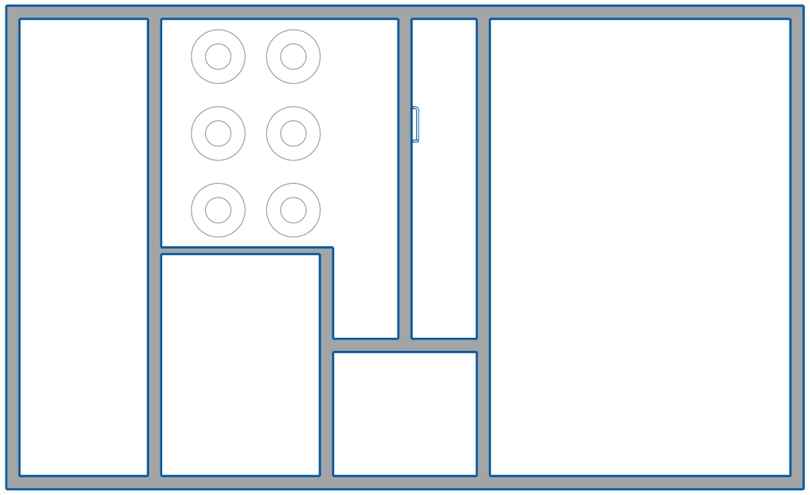
First floor plan



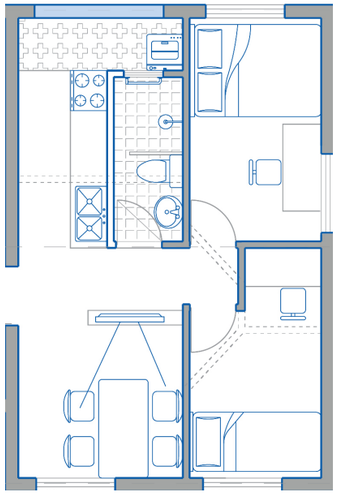
Second floor plan



Third floor plan



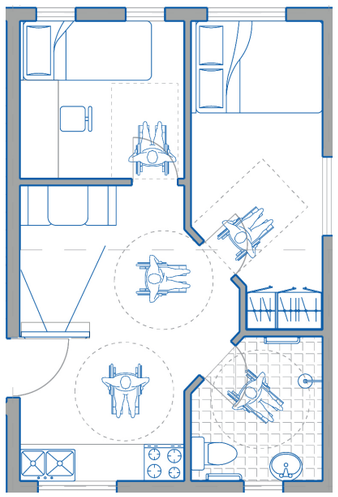
Roof top



Unit 01

Unit 3-1
36.3 m²

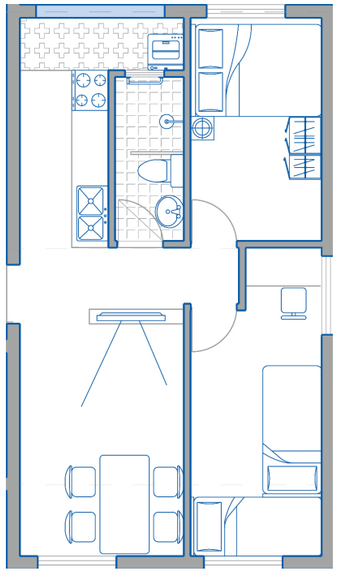
2 Bedrooms
1 Bathroom
1 Dining room



Variation 1

Unit 3-1
36.3 m²

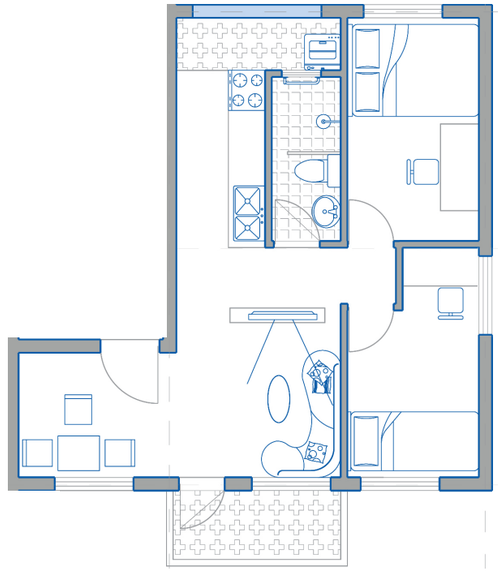
2 Bedrooms
1 Bathroom
1 Dining room



Variation 2

Unit 3-1
41.1 m²

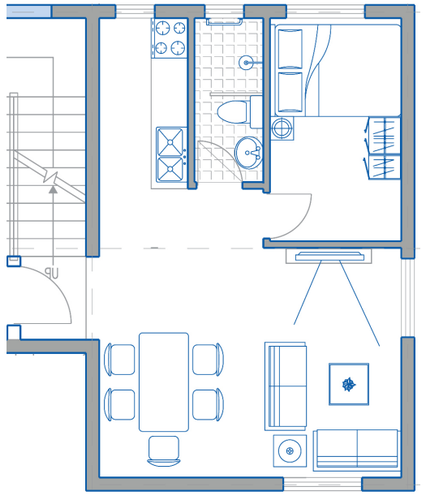
2 Bedrooms
1 Bathroom
1 Dining room

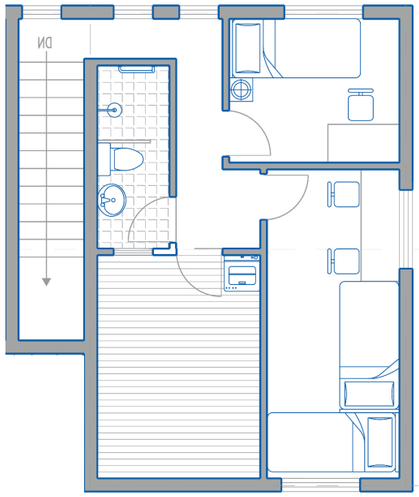


Variation 3

Unit 3-1
42.9 m²

2 Bedrooms
1 Bathroom
1 Dining room
1 Living room
1 Balcony

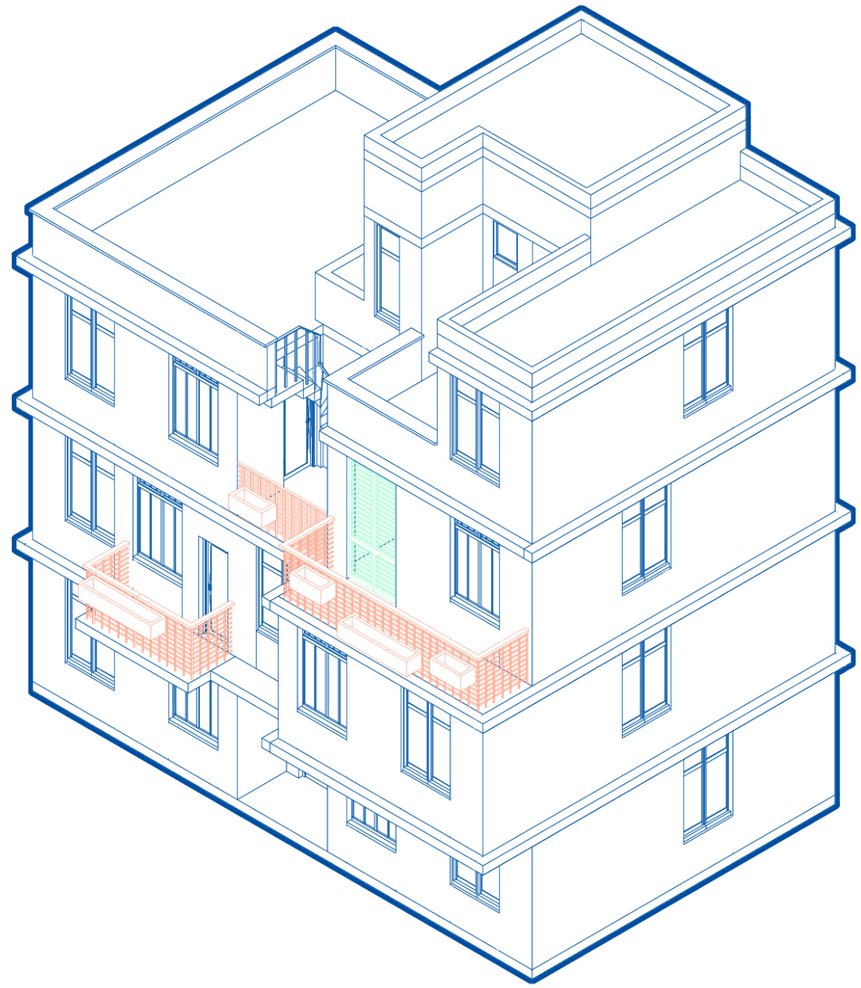


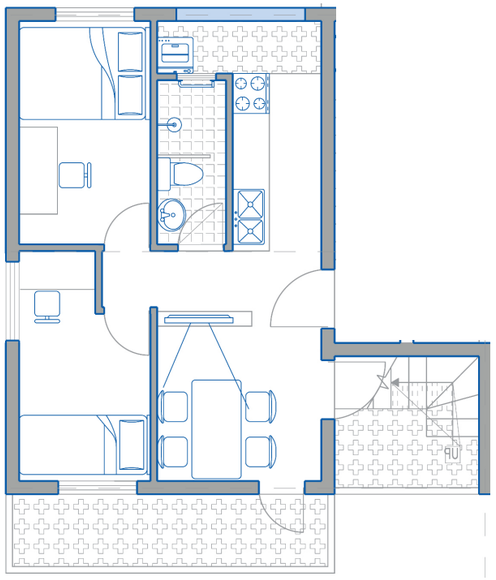


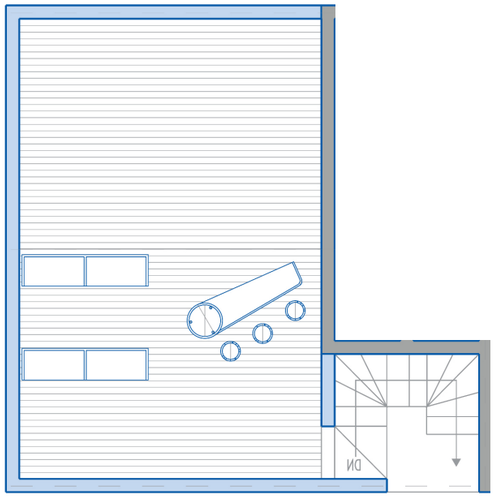
Unit 02

Unit 3-2
69.4 m²

3 Bedrooms
2 Bathroom
1 Dining room
1 Living room
1 Balcony



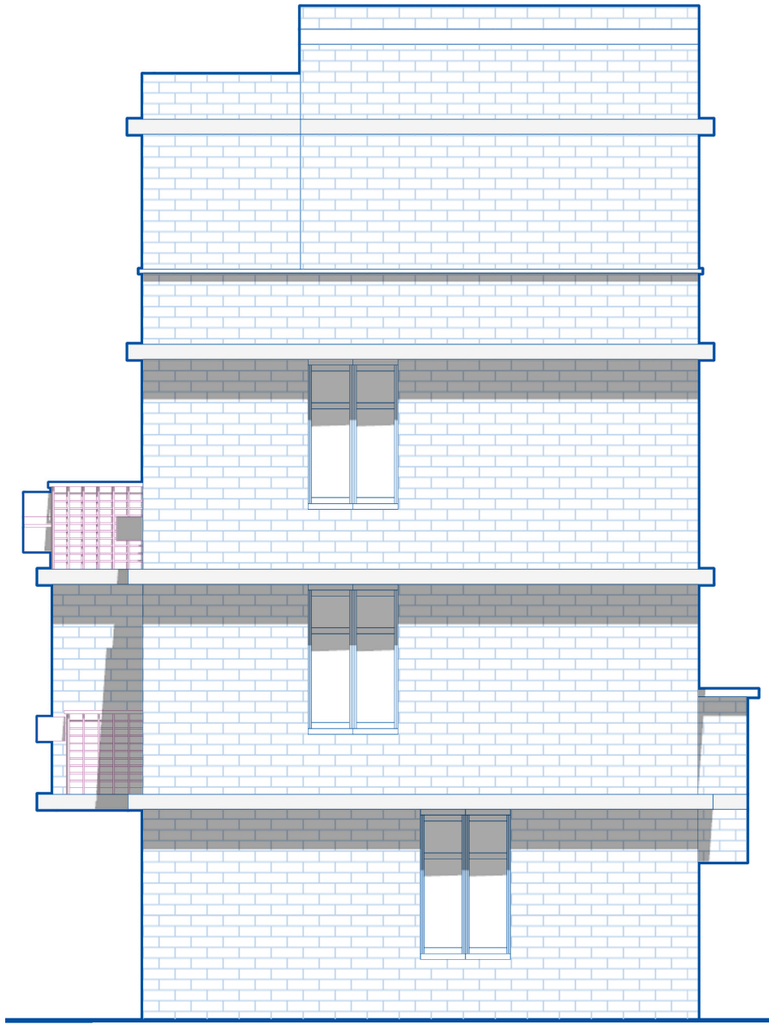




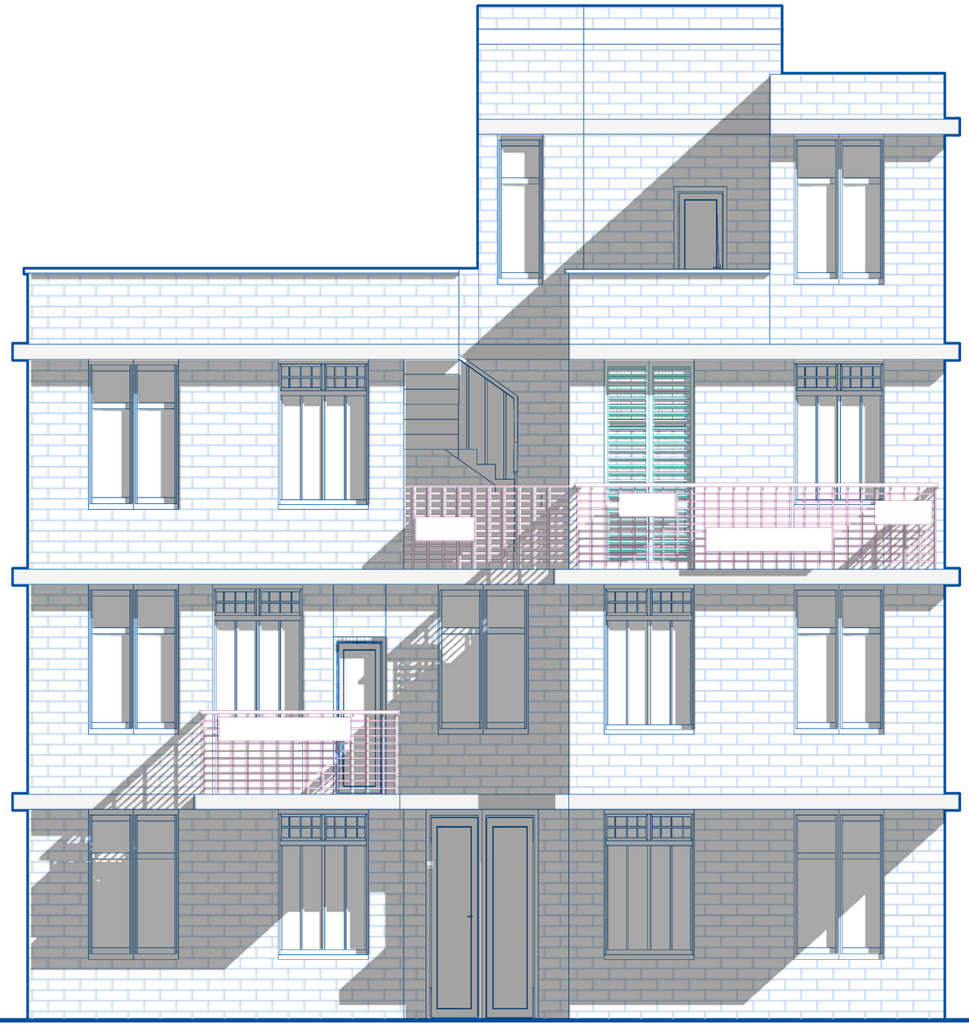
Unit 03

Unit 3-3
41.2 m²

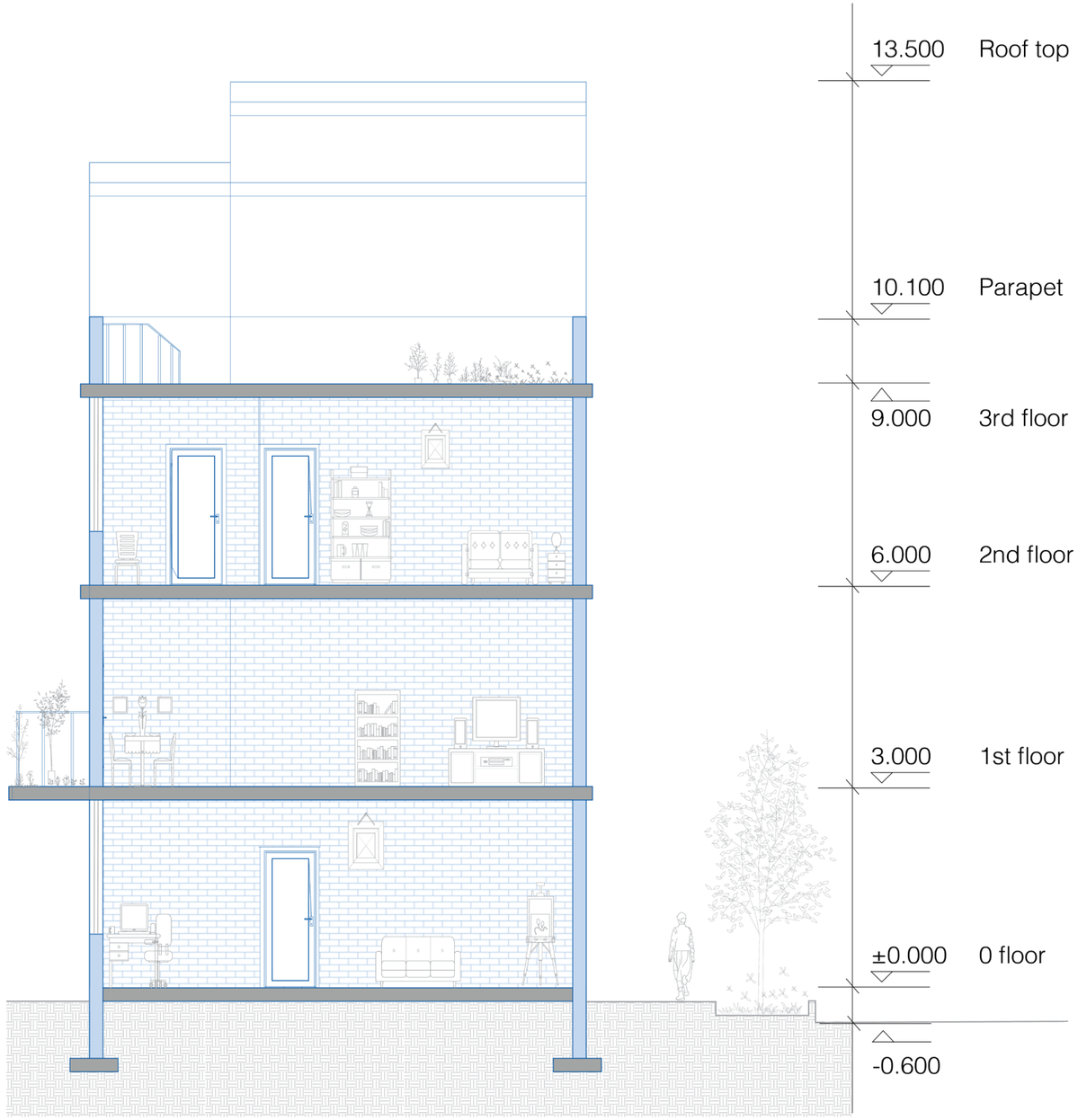
2 Bedrooms
1 Bathroom
1 Dining room
1 Living room
2 Balcony



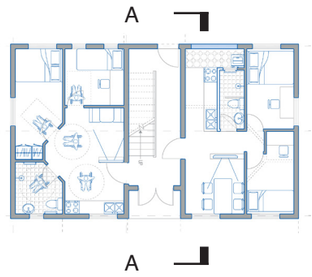
Elevation_left

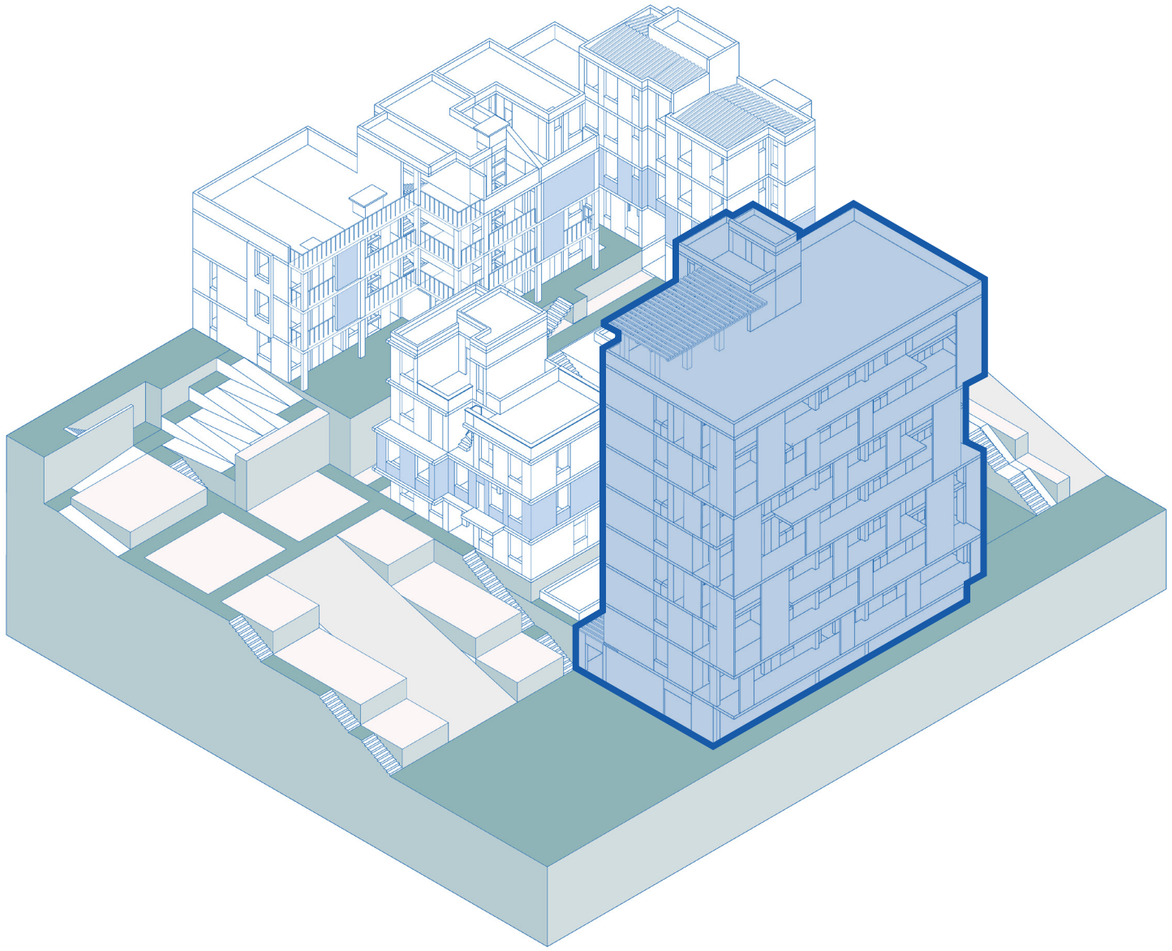


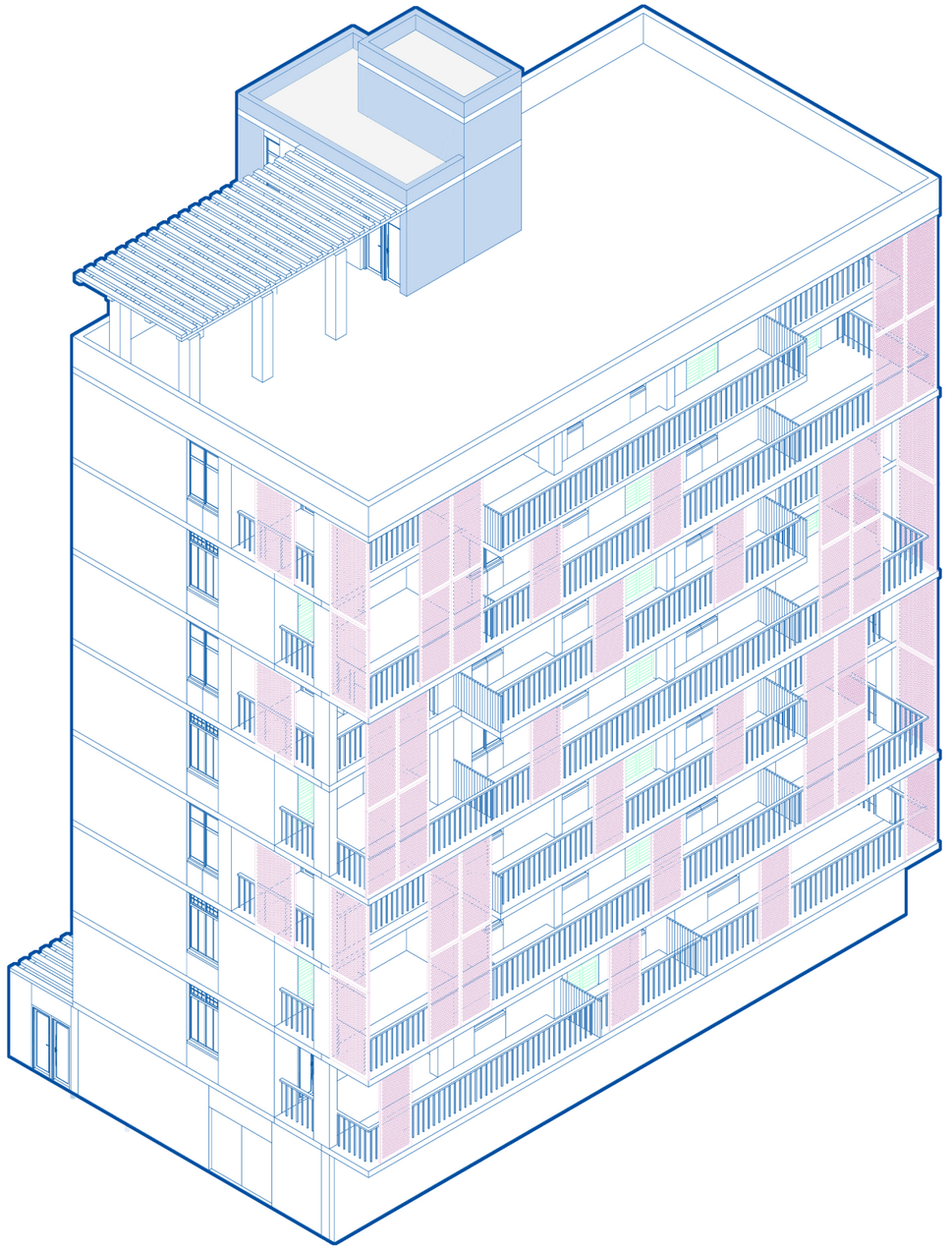
Elevation_ front

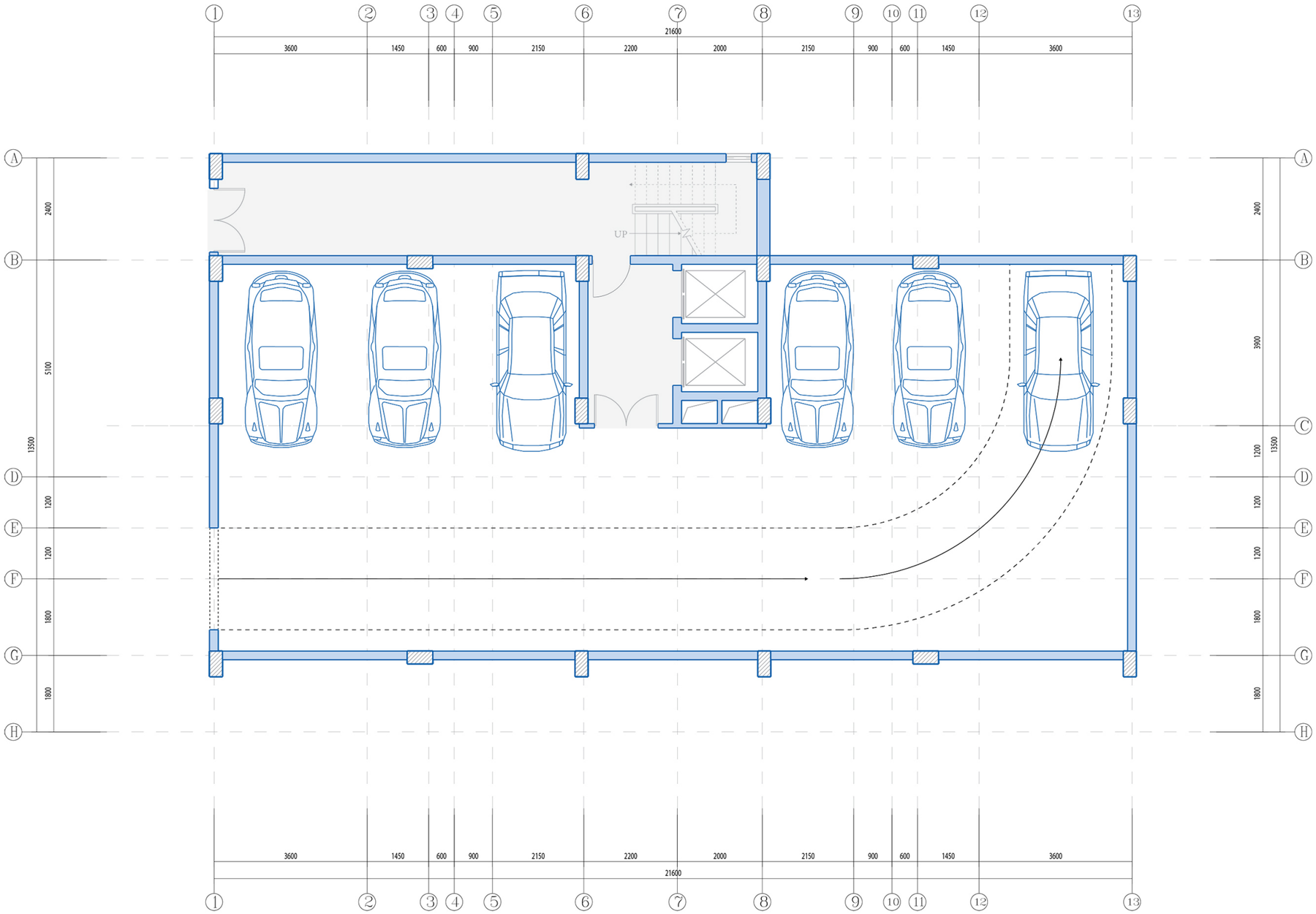

13.500
Roof top
10.100
Parapet
9.000
3rd floor
6.000
2nd floor
3.000
1st floor
±0.000
0 floor
-0.600

A-A section

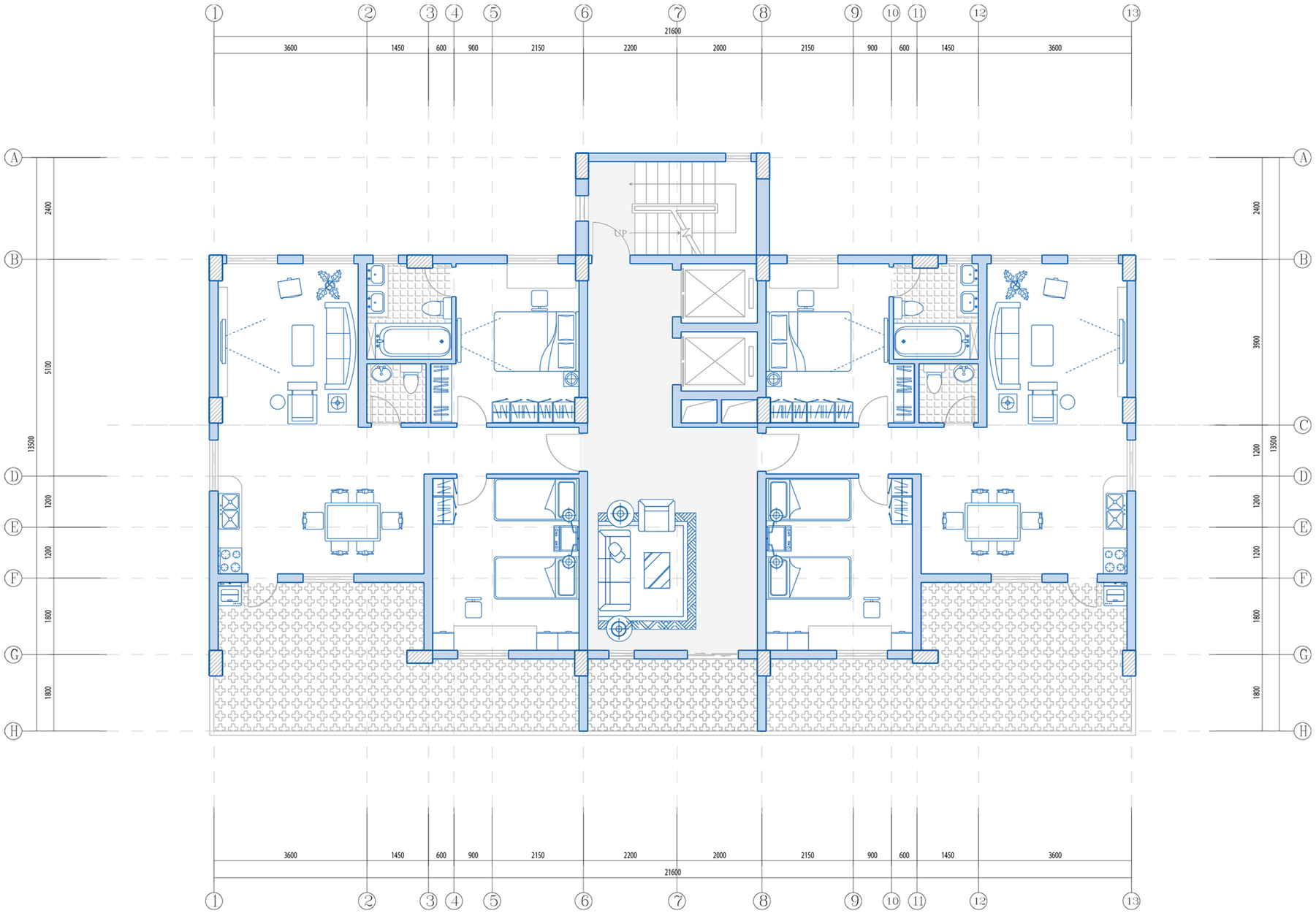

A
A



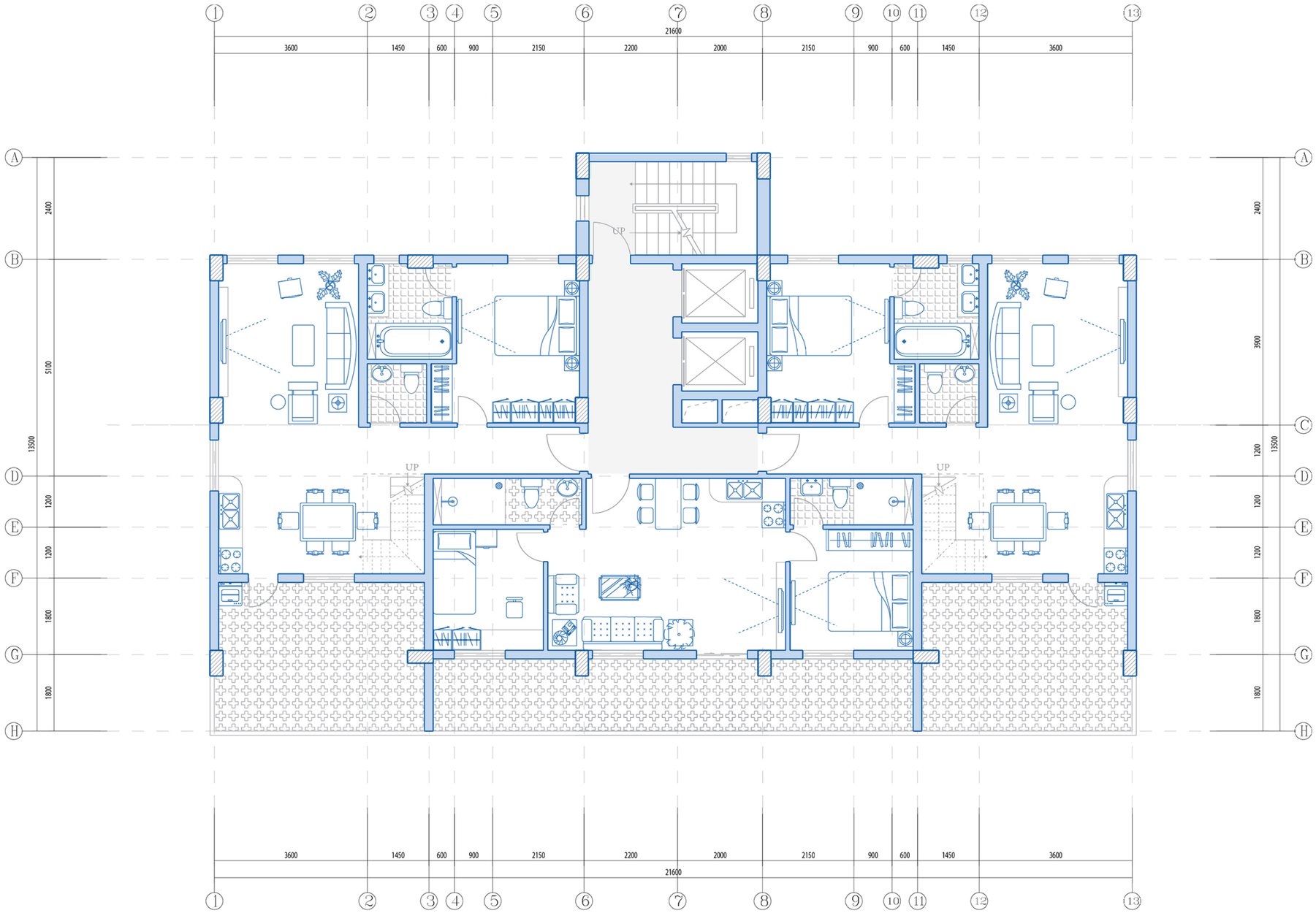




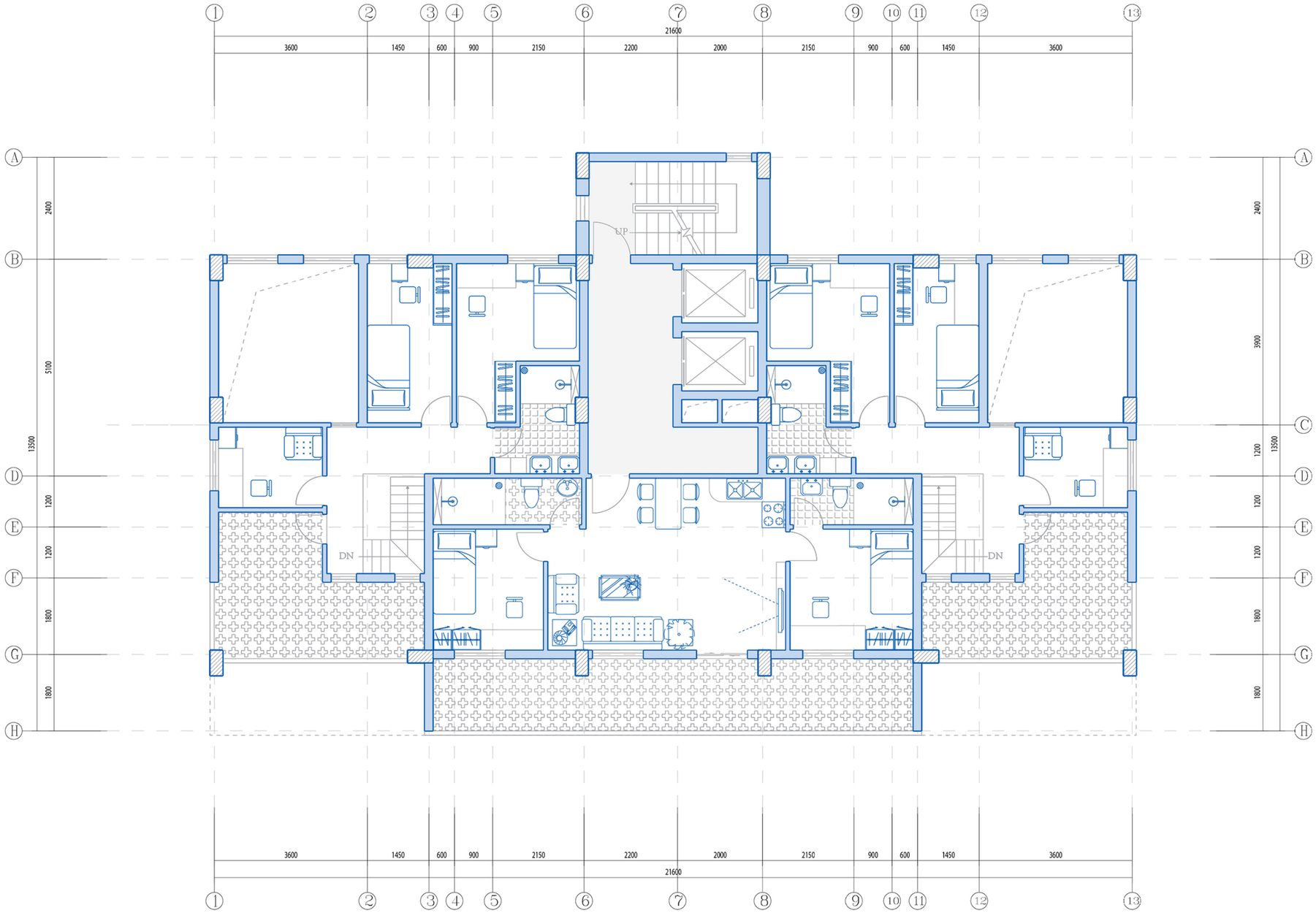
Ground floor plan



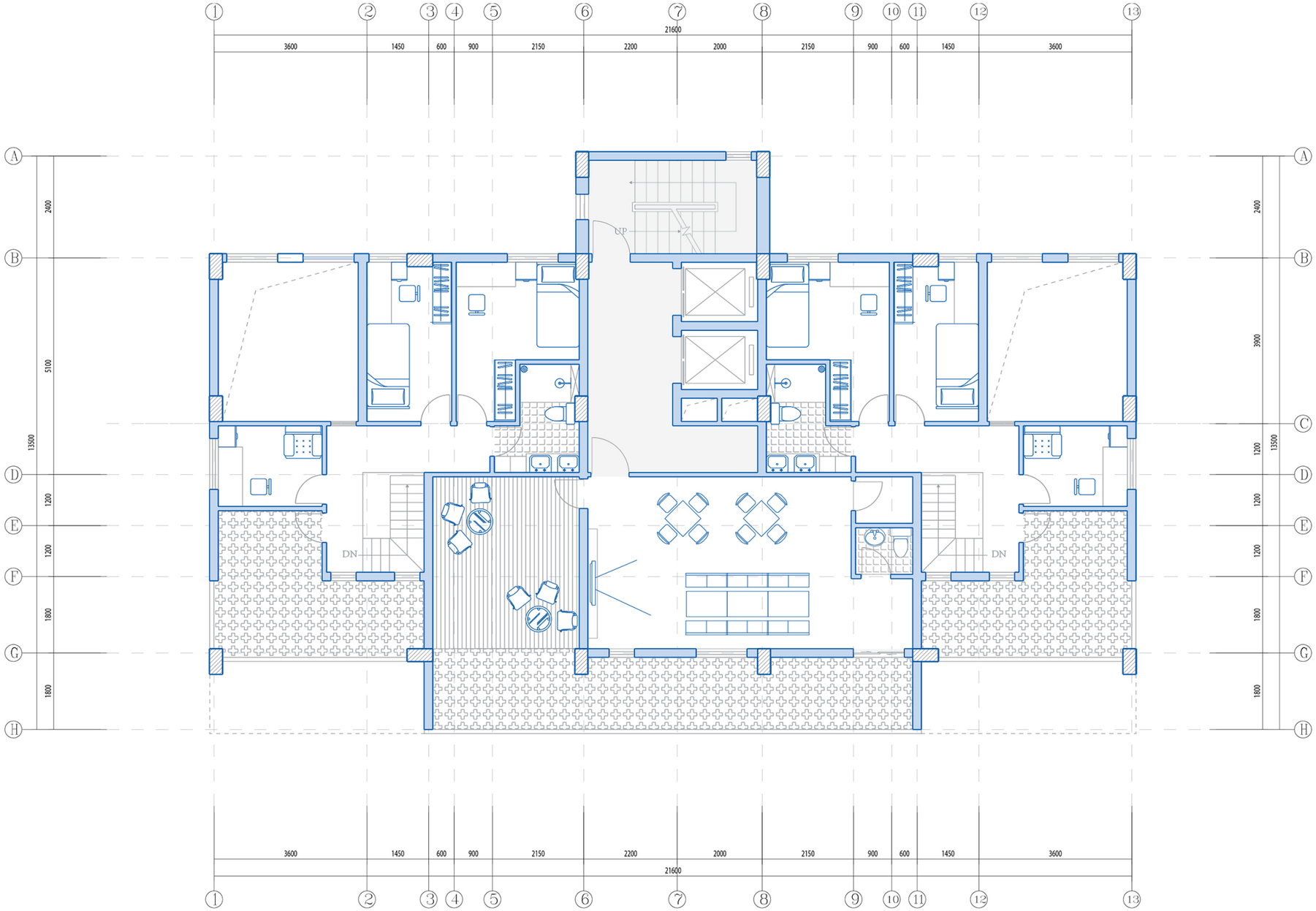
First floor plan



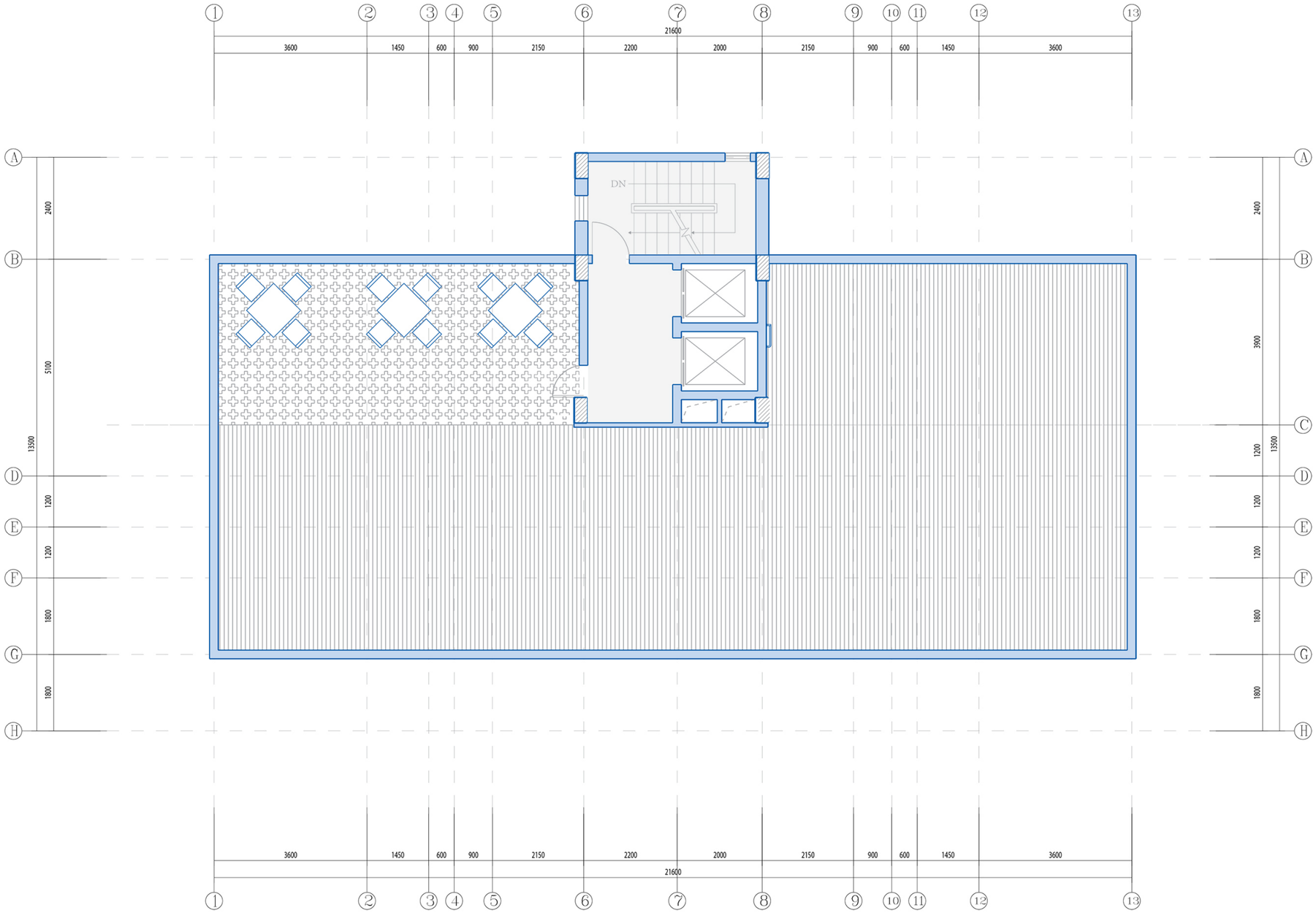
Standard floor plan
Lower floor



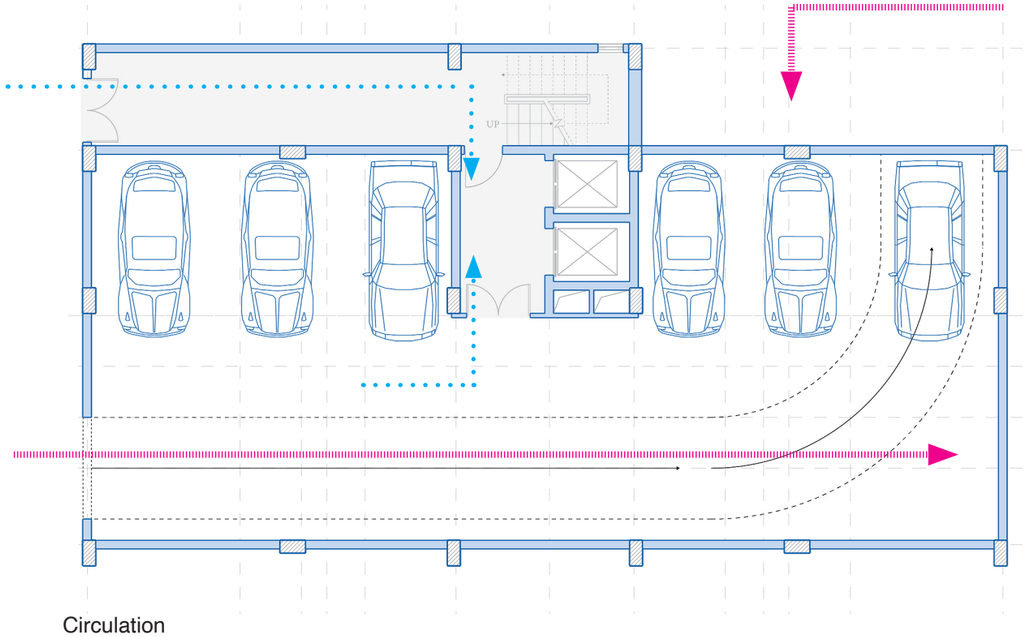
Standard floor plan
Upper floor



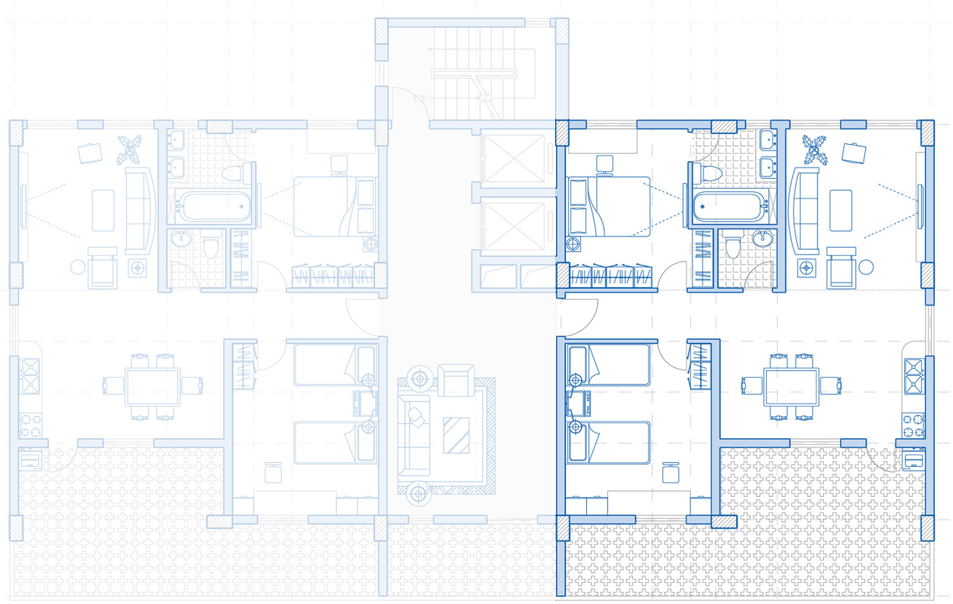
Seventh floor plan


1
2
3
4
5
6
7
8
9
10
11
12
13
3600
1450
600
900
2150
2200
2000
2150
900
600
1450
3600
21600
A
B
C
D
E
F
G
H
2400
5100
3900
13500
1200
1200
1800
1800
DN

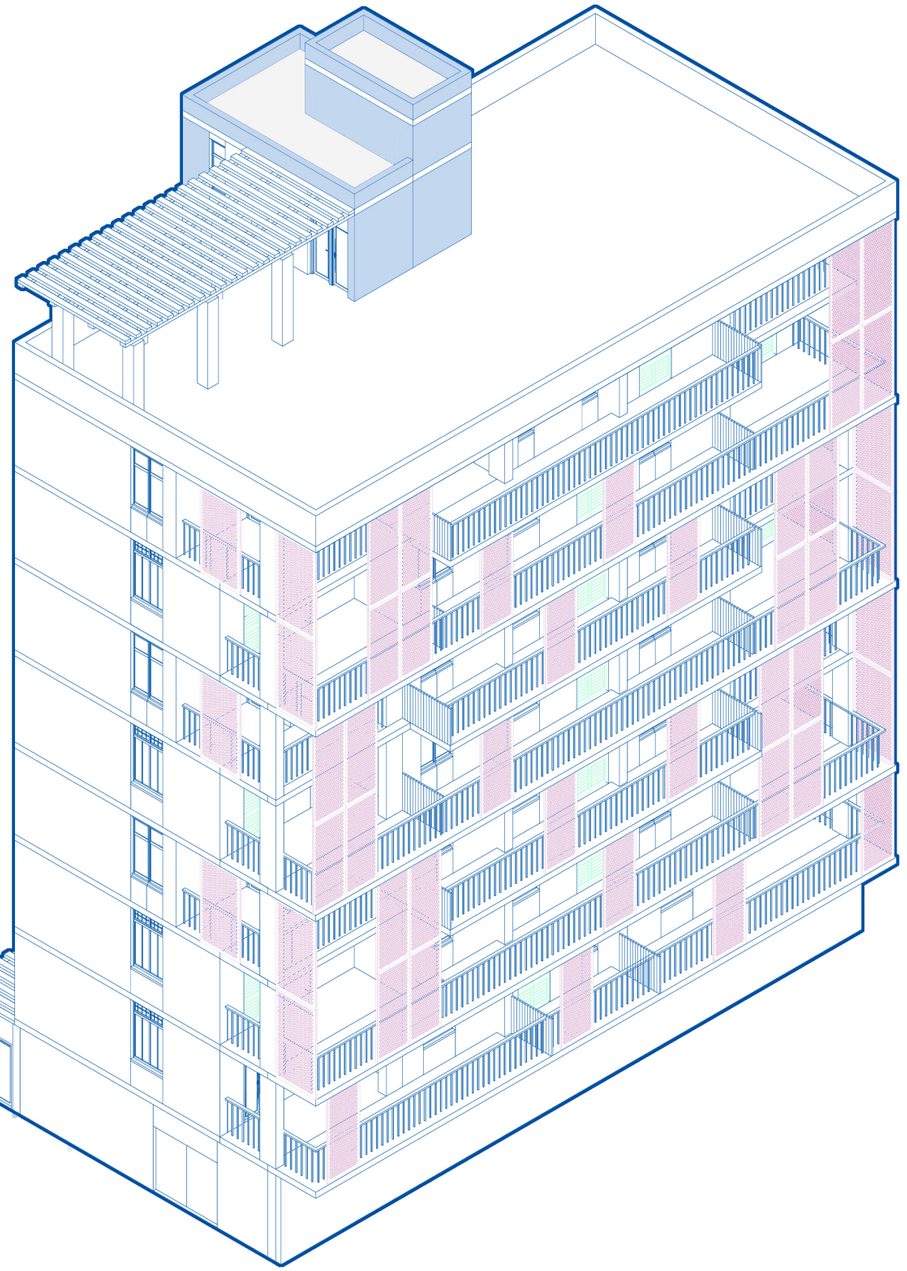
Roof top



Circulation

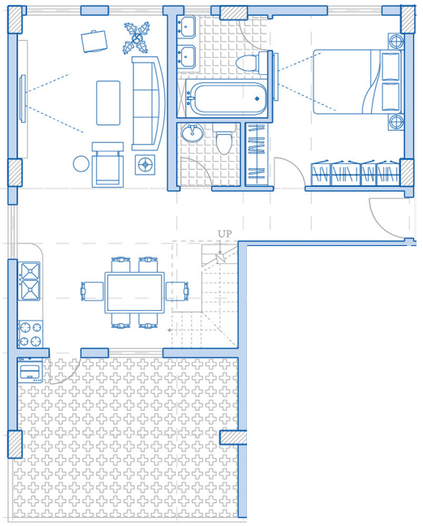


Unit plan

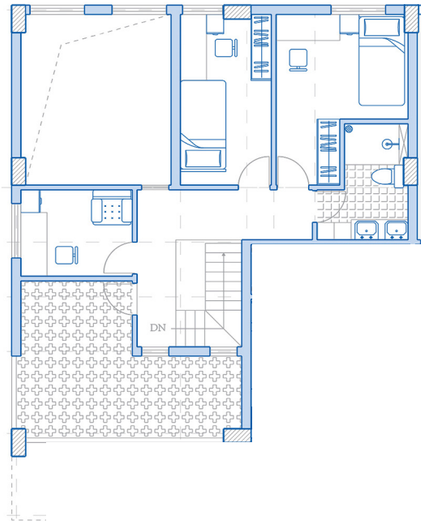


Unit 4-1
74.8 m²

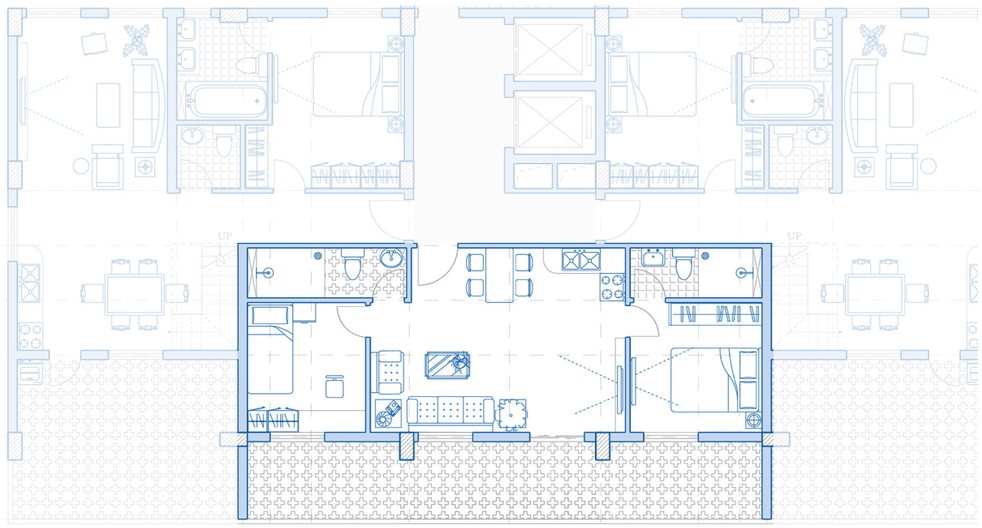
2 Bedrooms
2 Toilets
1 Dining room
1 Living room
1 Balcony



Standard unit plan (lower level)



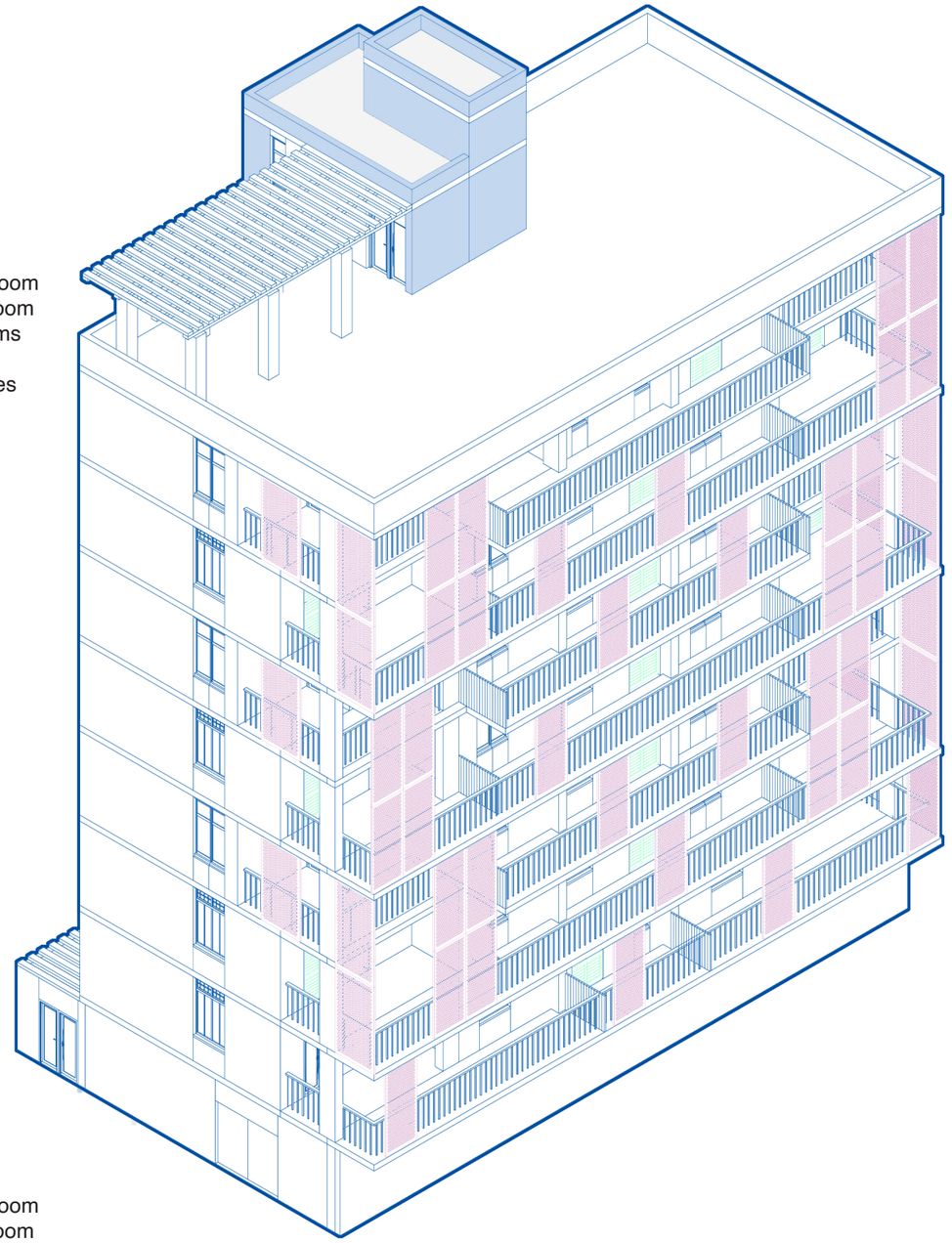
Standard unit plan (upper level)



Standard unit plan (middle unit)

Unit 4-2
89.9 m²

1 Dining room
1 Living room
3 Bedrooms
3 Toilets
2 Balconies
1 study



Unit 4-3
45.7 m²

1 Dining room
1 Living room
2 Bedrooms
2 Toilets

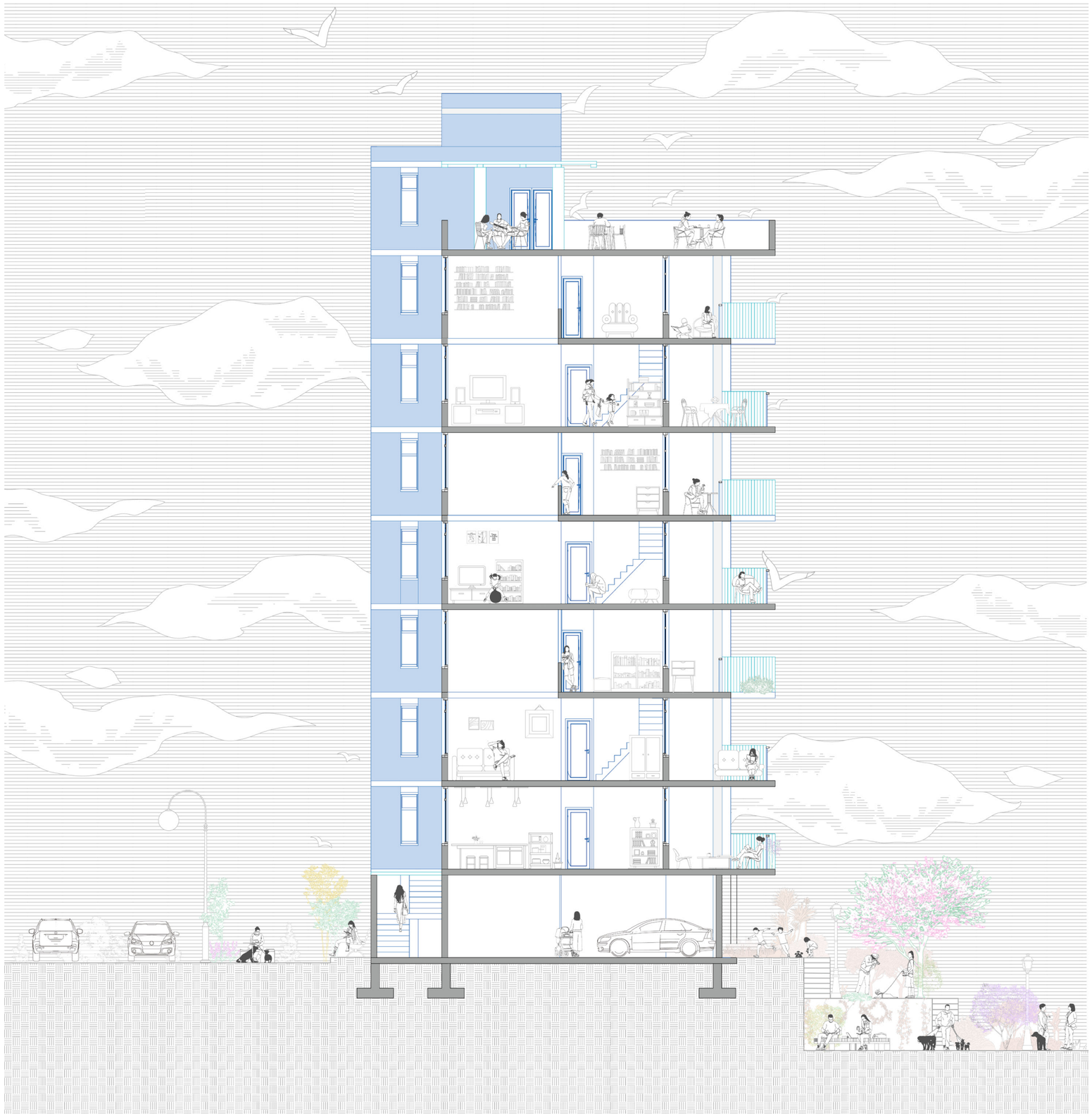


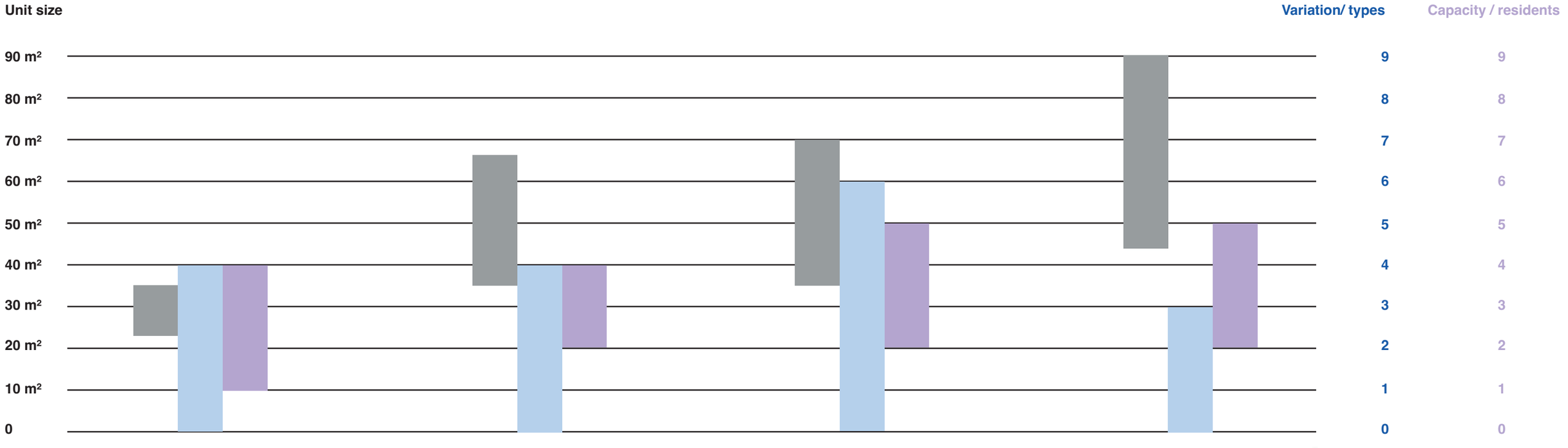
Elevation_right

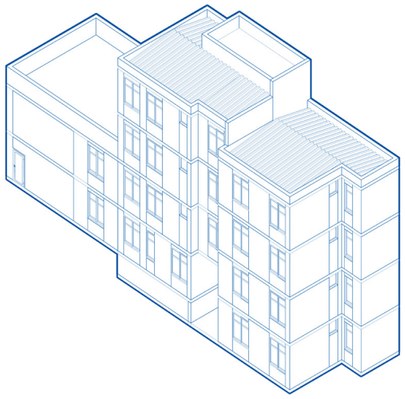


Elevation_front

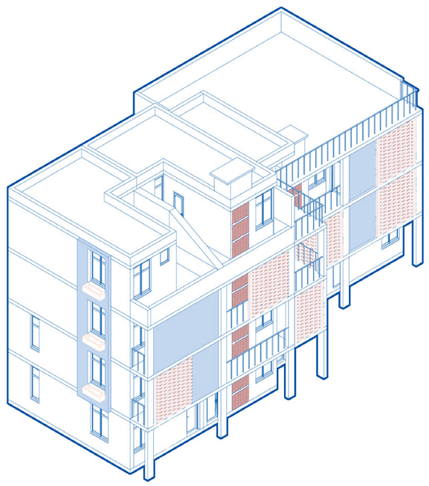
A-A section



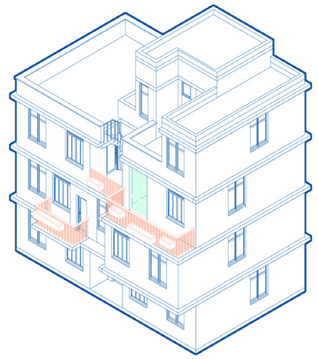




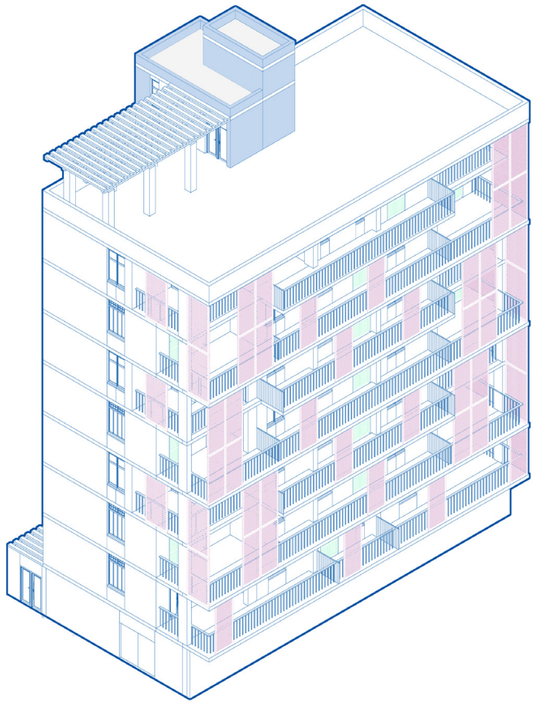
Type 03 - Chain house
HIS 1



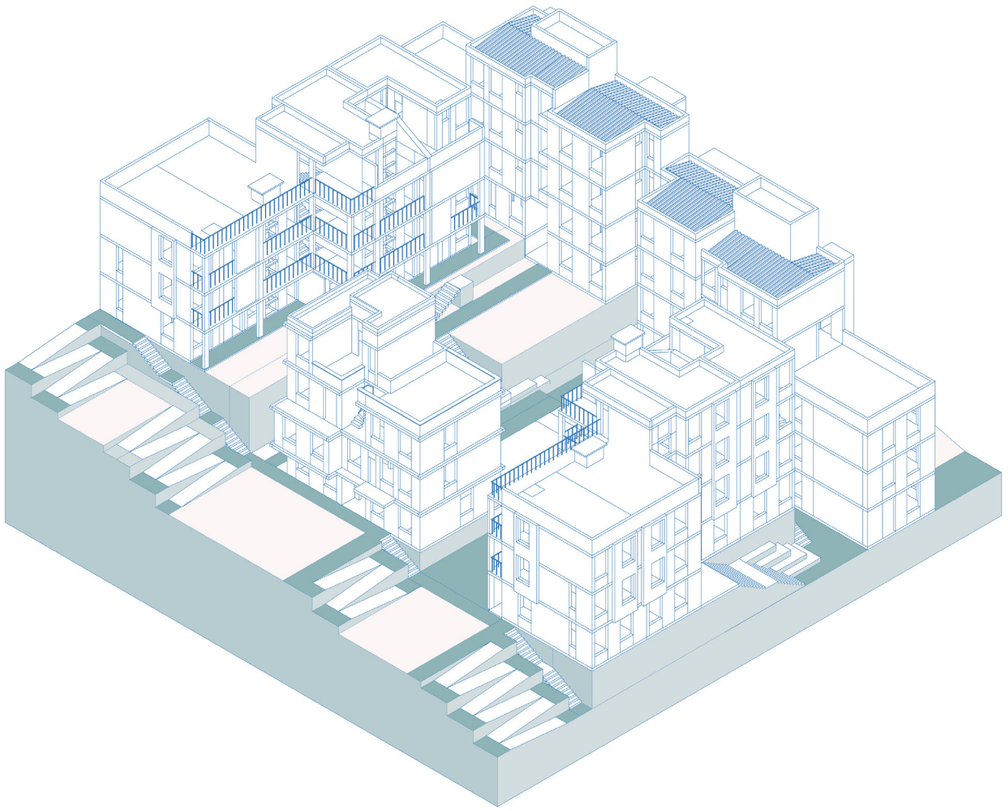
Type 02 - Row house
HIS 1

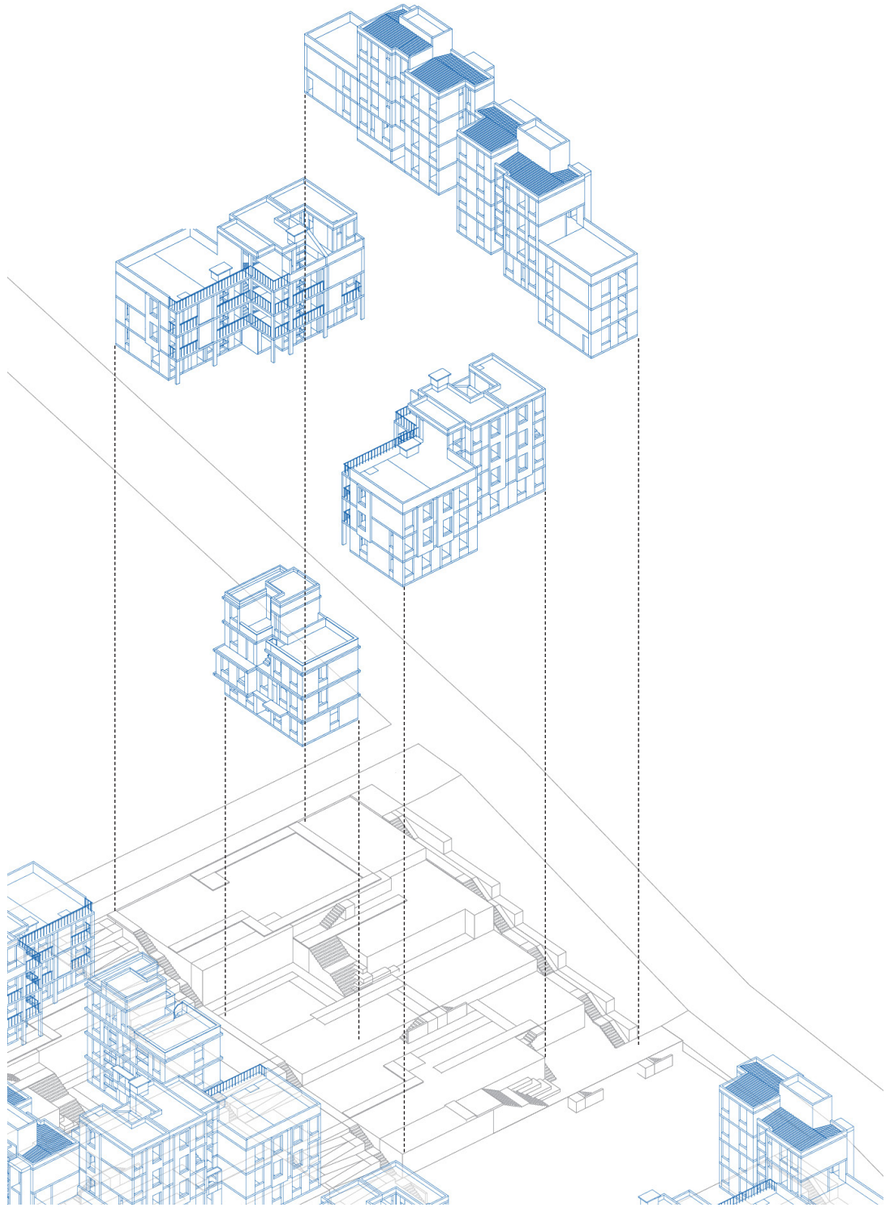


Type 02 - Slab house
HIS 2



Type 04 - Condominium
HMP

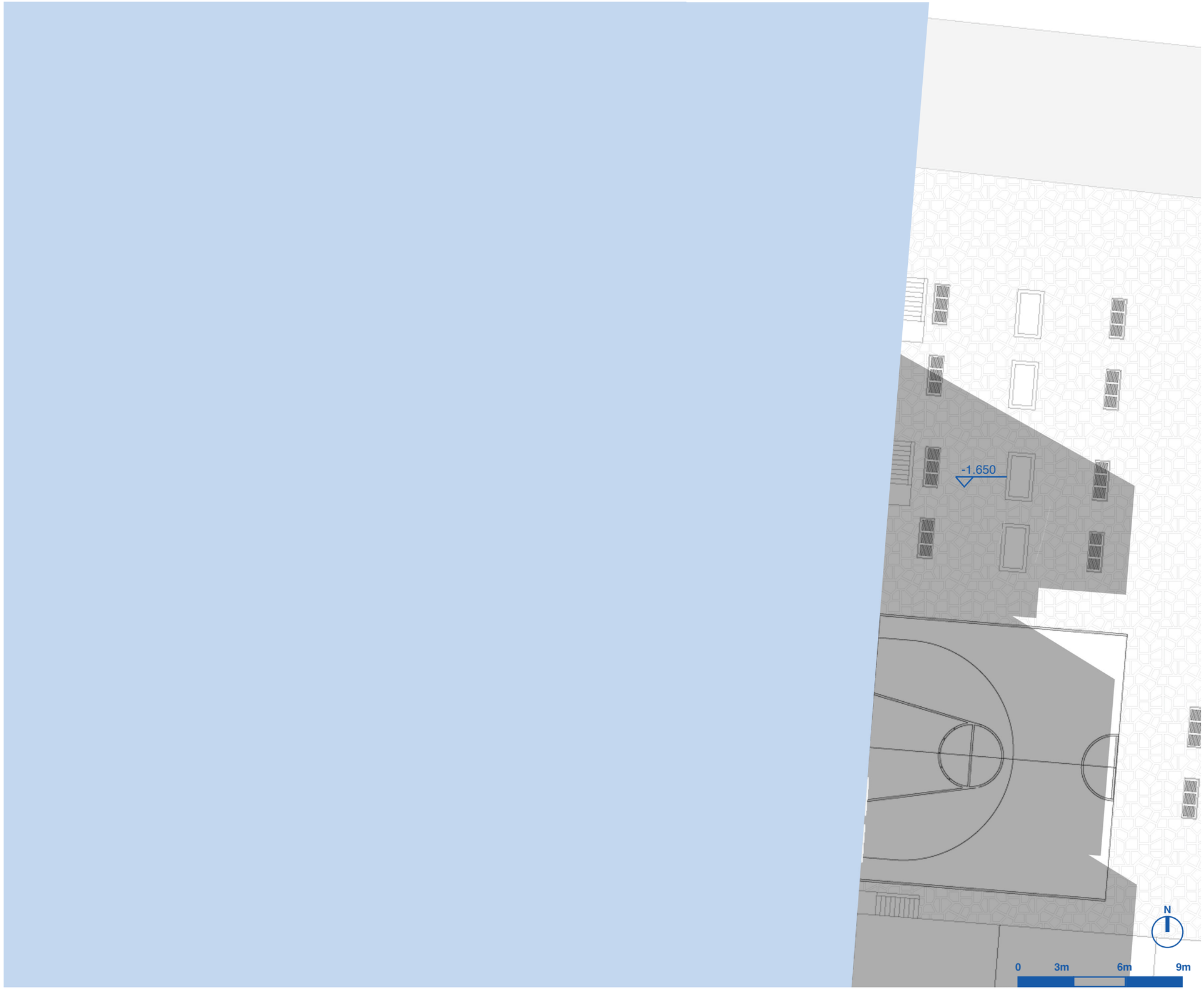




Cluster



Top view



Site height -1.650M



Site height -0.150M



Site height +2.850M



Site height +4.350M



Site height +5.850M



Ground floor plan



Accessibility



Circulation- Chain house



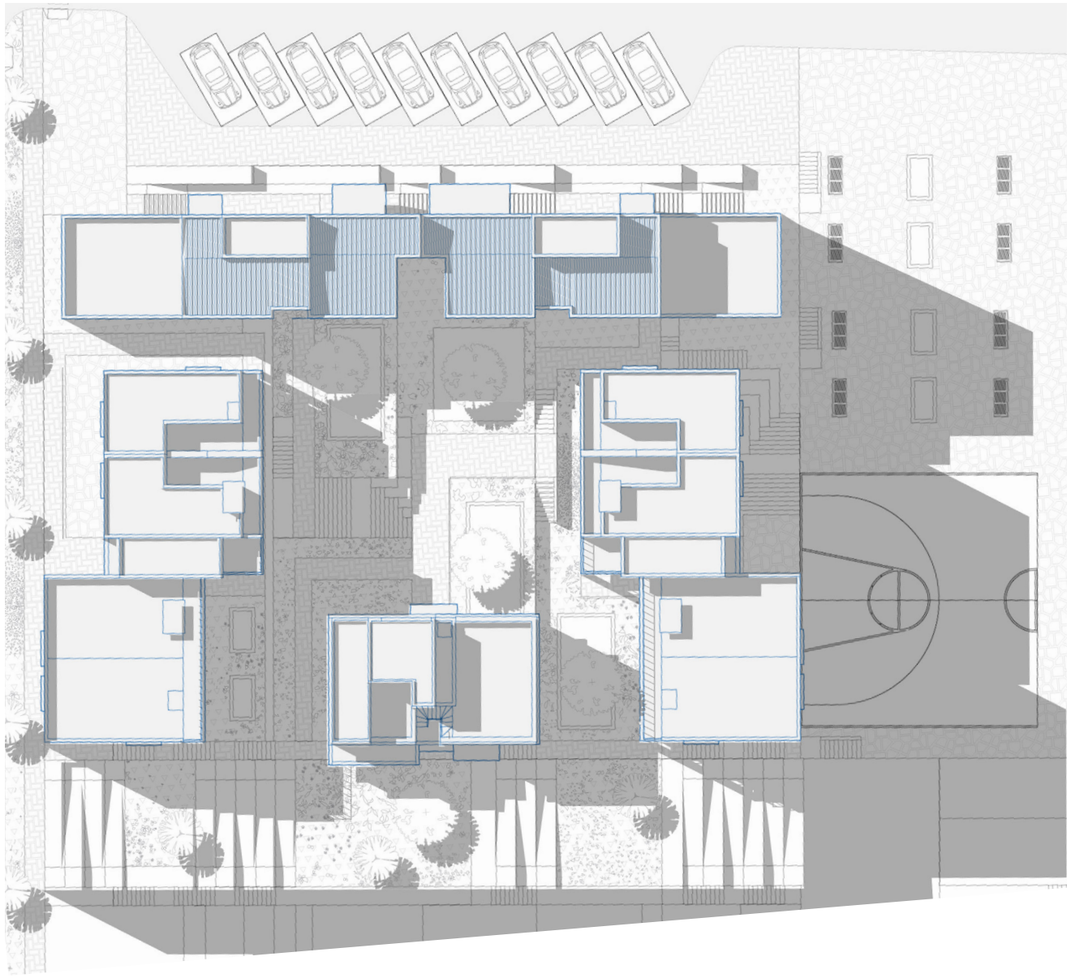
Circulation- Row house

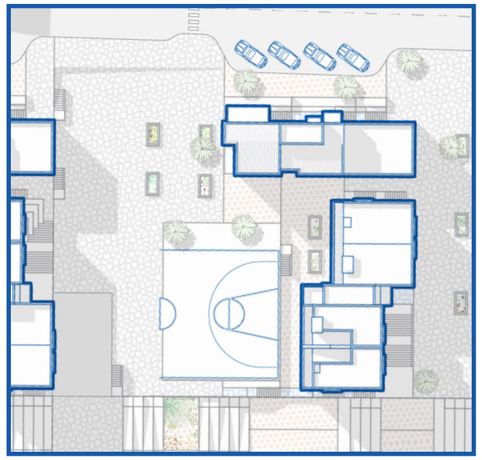


Circulation- Slab house

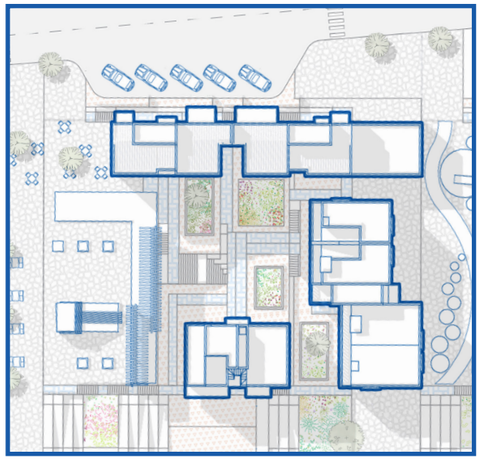


Wheelchair accessibility

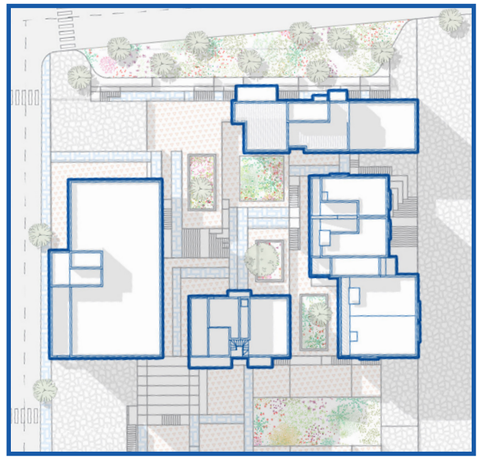




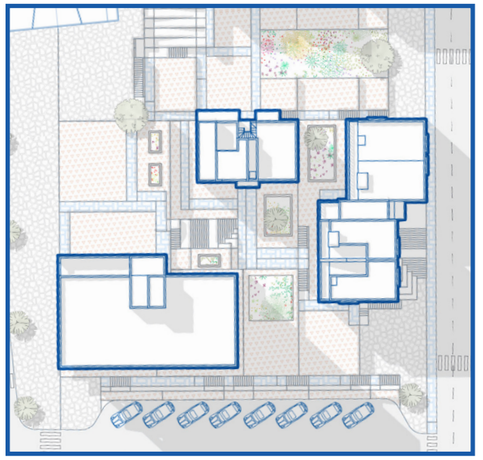
Cluster + **sport**



Cluster + **park**

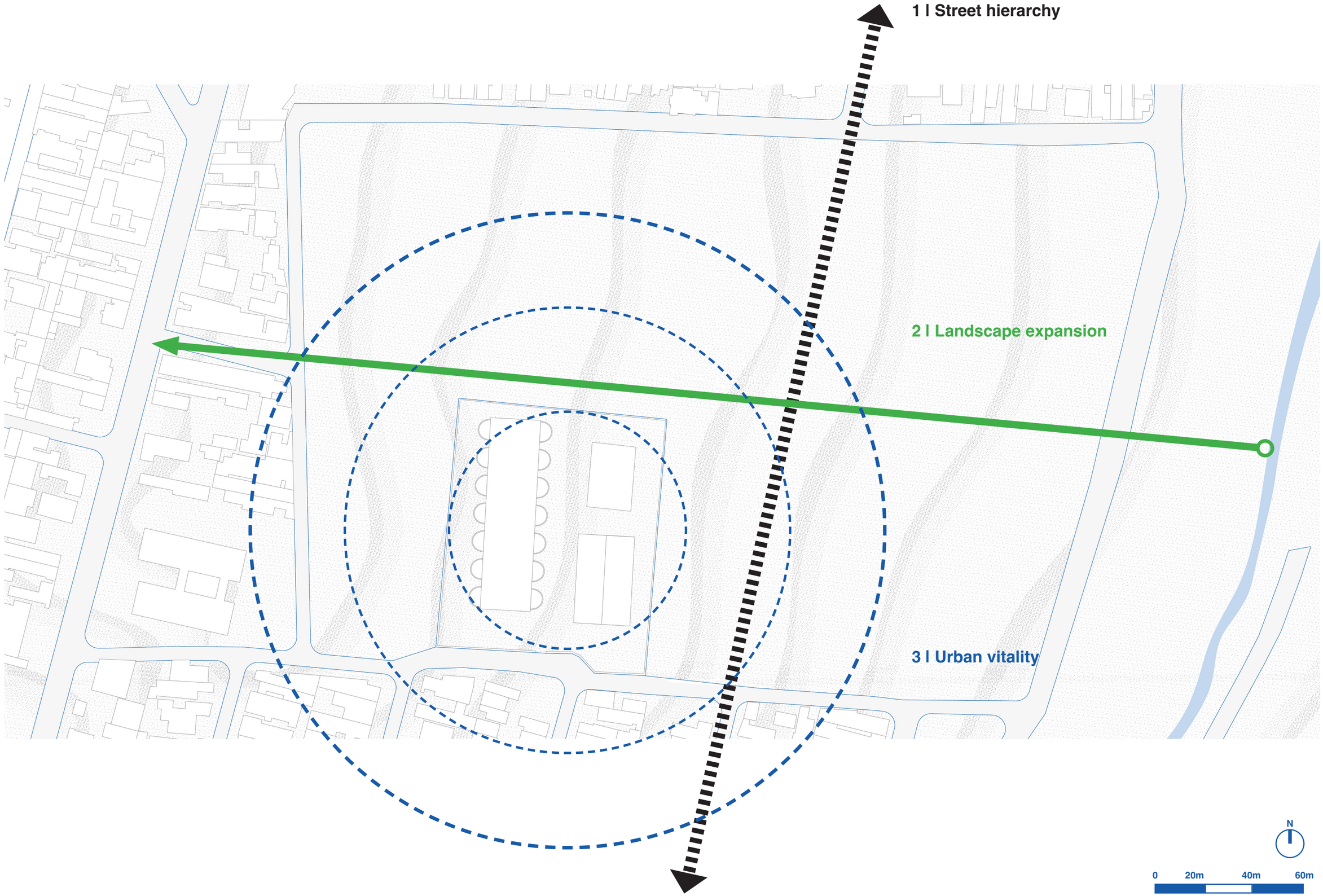


Cluster + **HMP housing**



Cluster + **opening**

Typical neighbourhood cluster

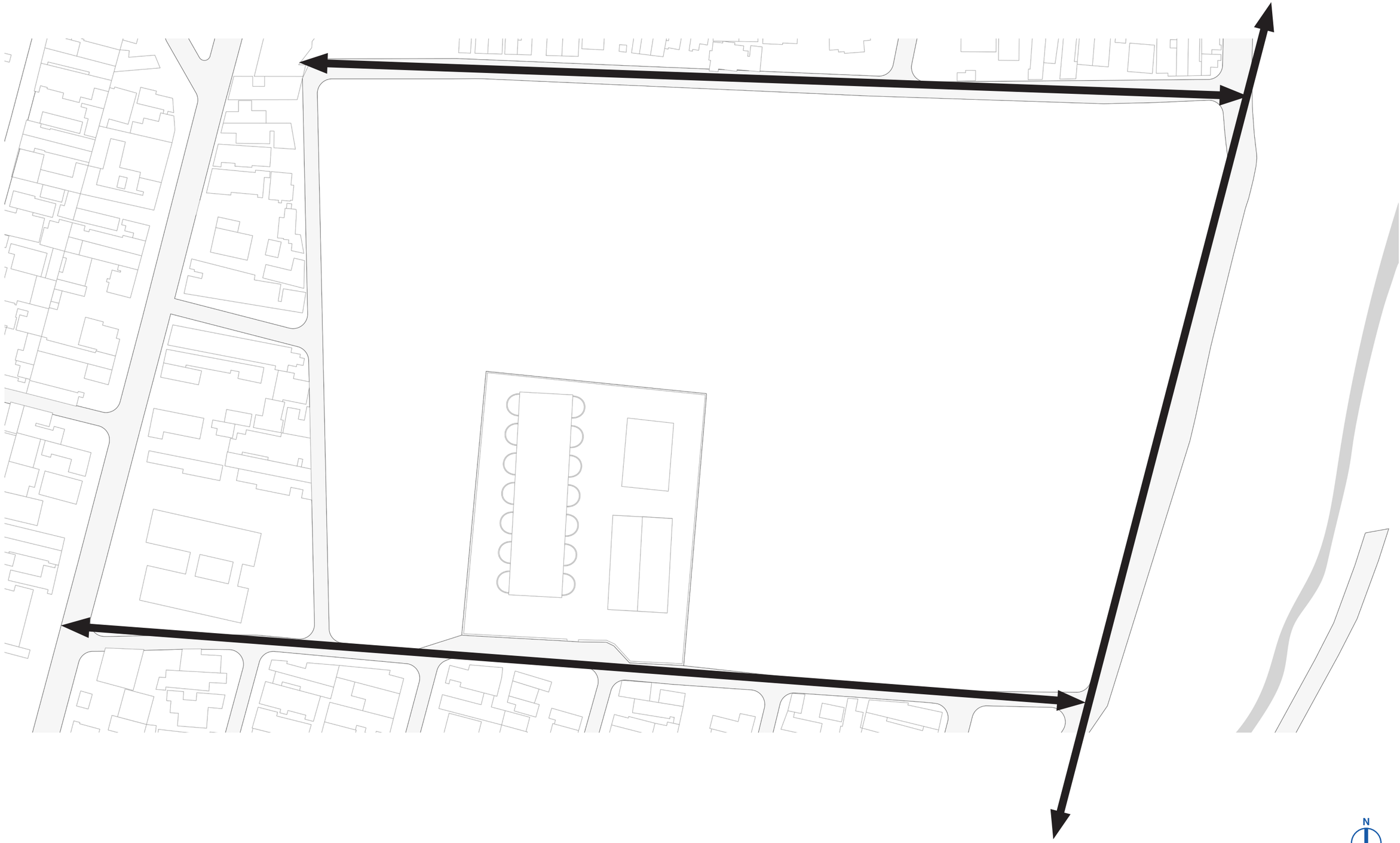

1 I Street hierarchy
2 I Landscape expansion
3 I Urban vitality
N
0
20m
40m
60m



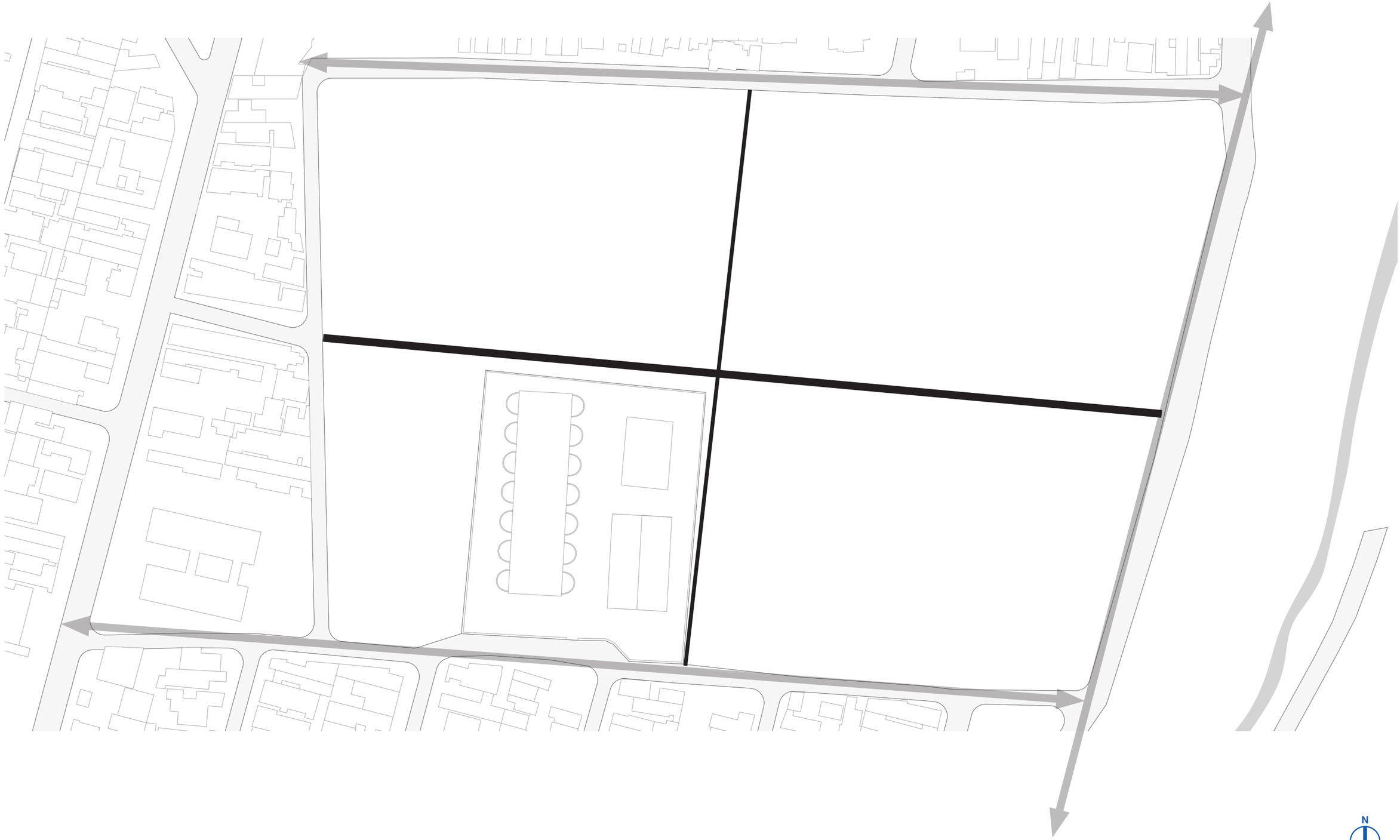
Topography

N

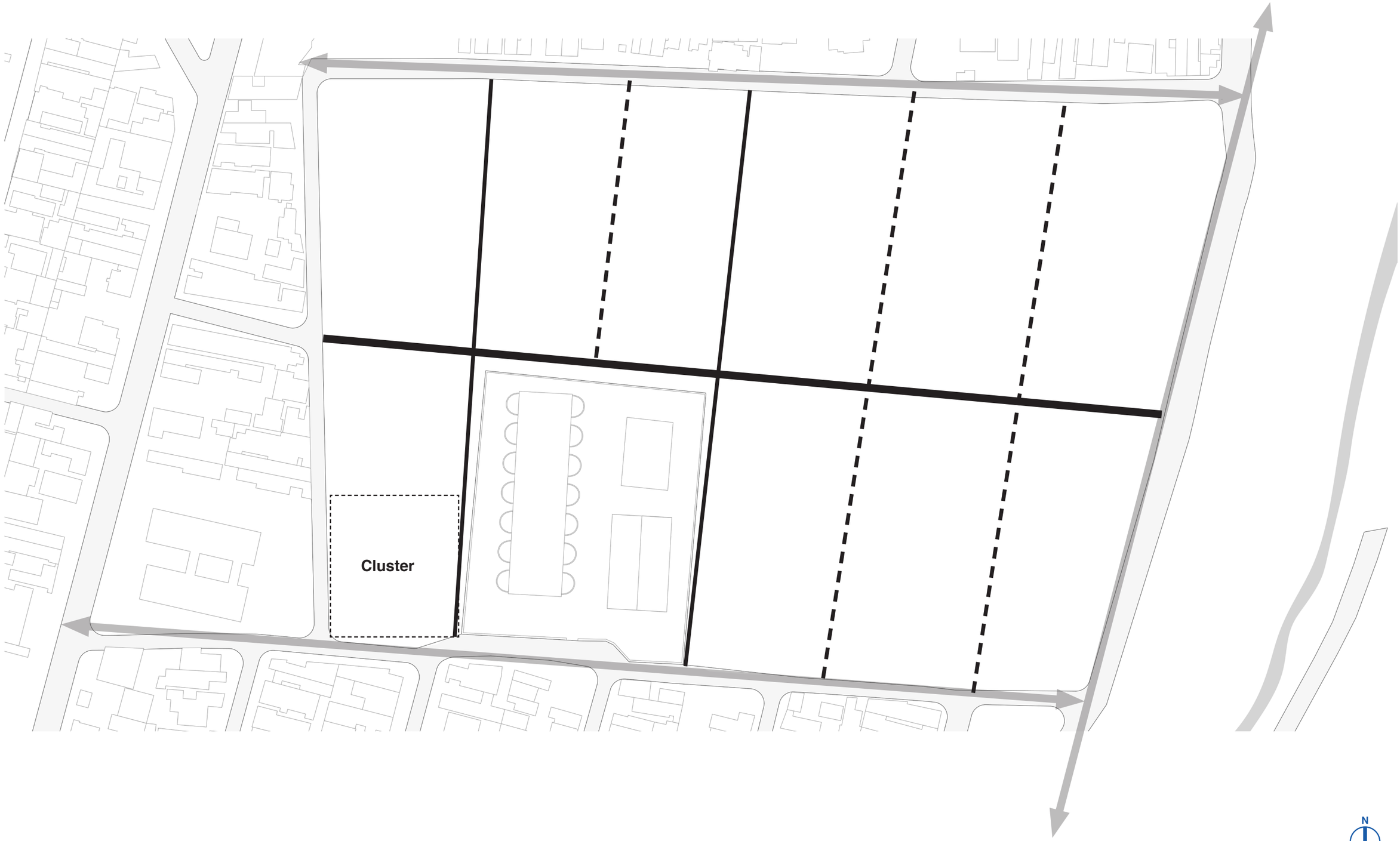
0 20m 40m 60m



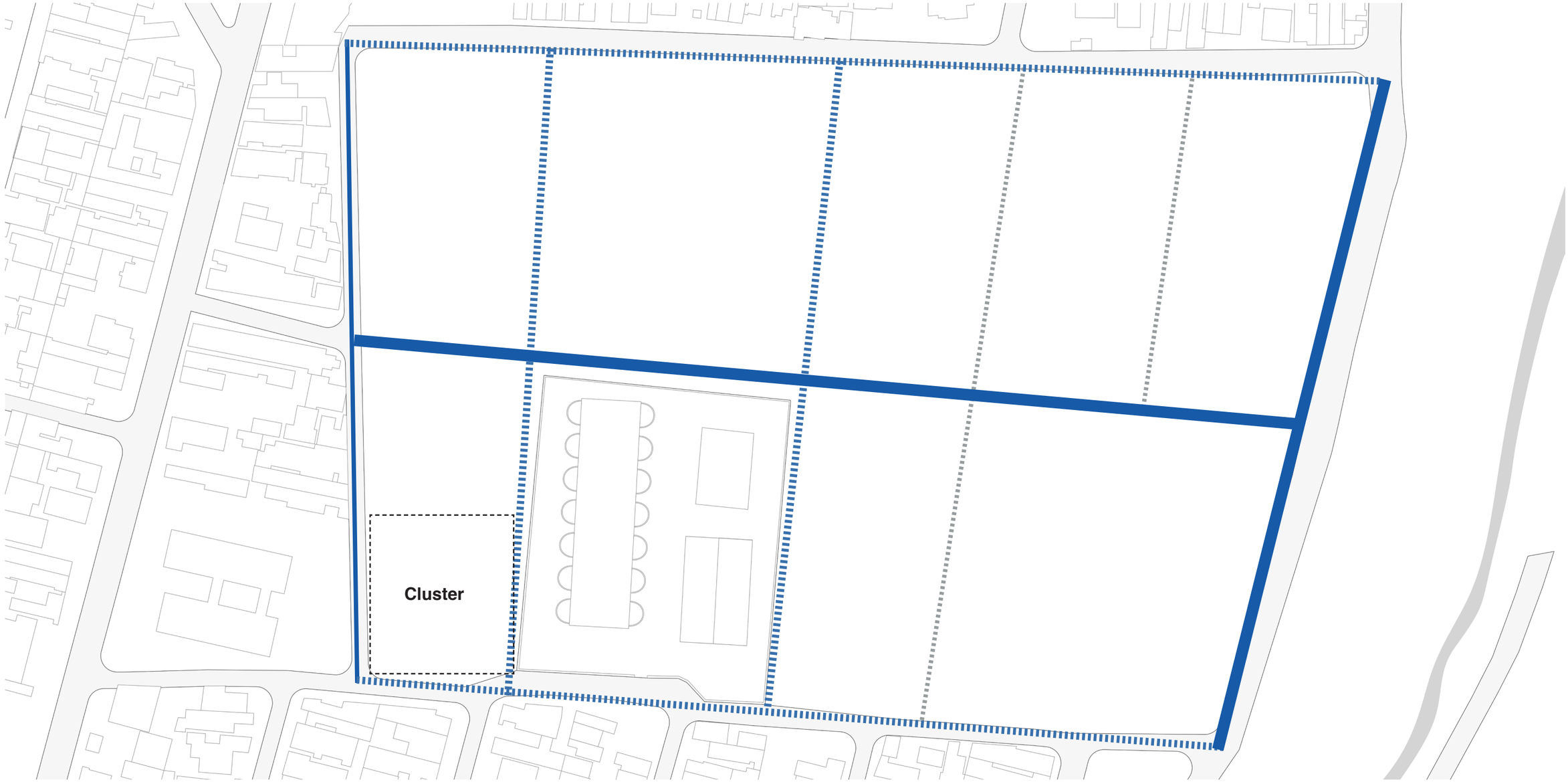
Current street system



Main connection



Neighbourhood street



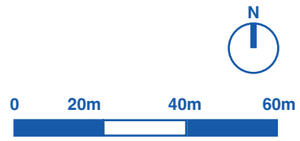
Street analysis

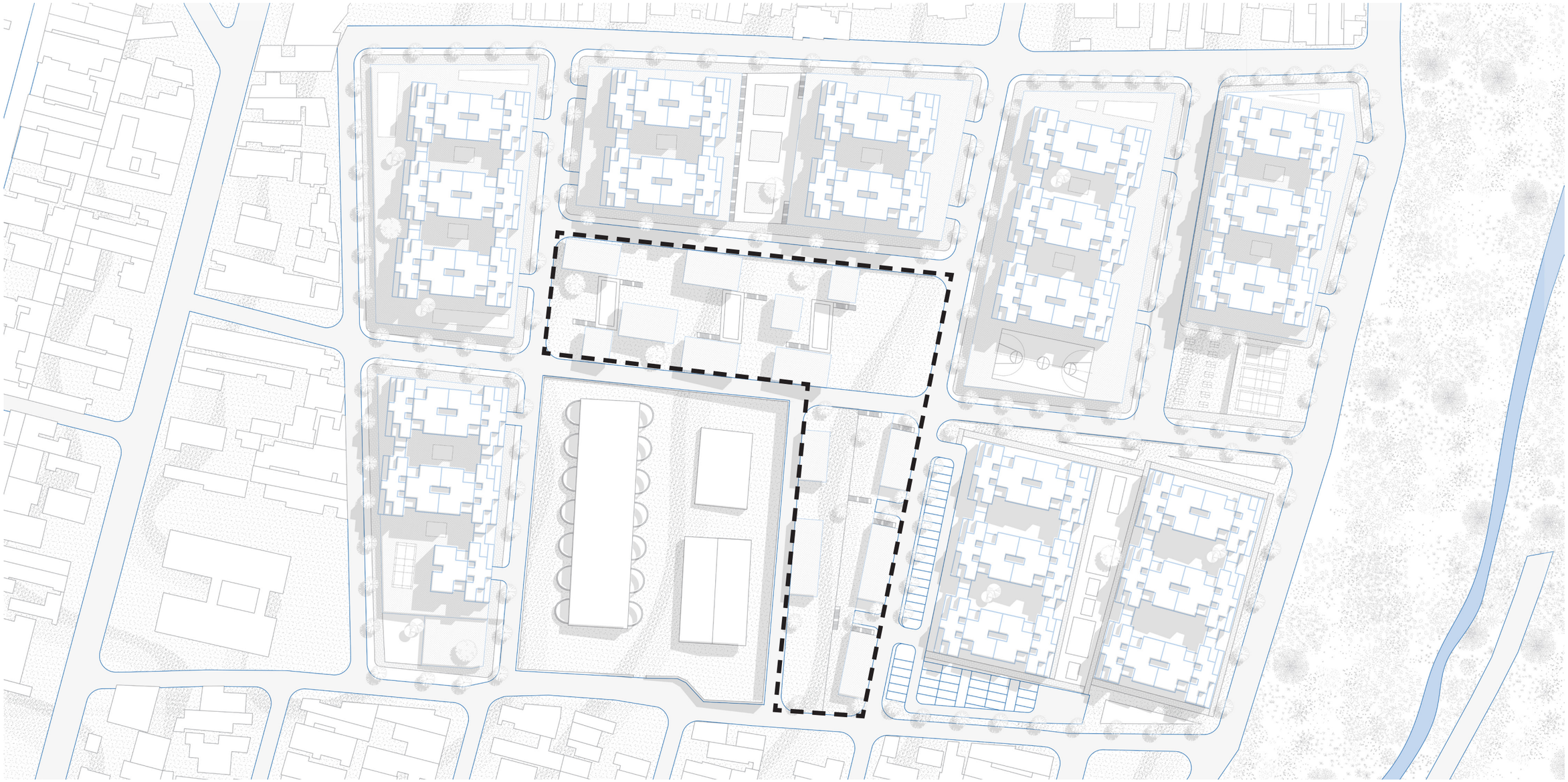


Landscape conncetion



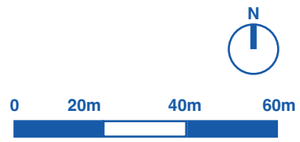
Green axis

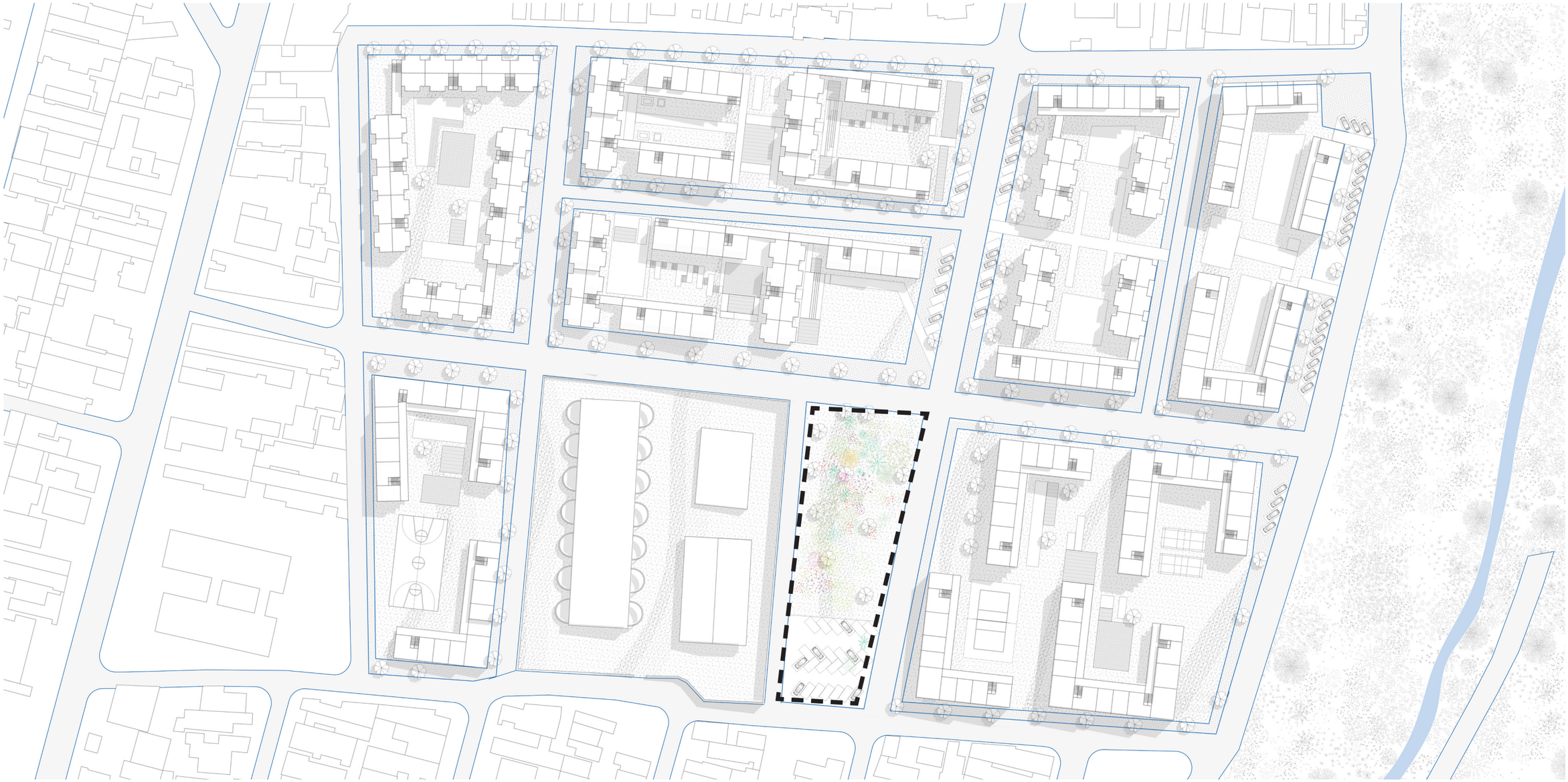




Previous master plan version 1.1 28-01-2023

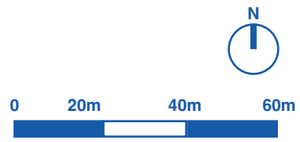
Spatial analysis





Previous master plan version 1.5 11-05-2023

Spatial analysis





Spatial analysis



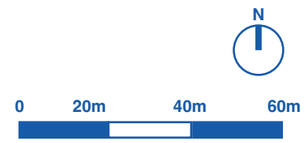
Public space

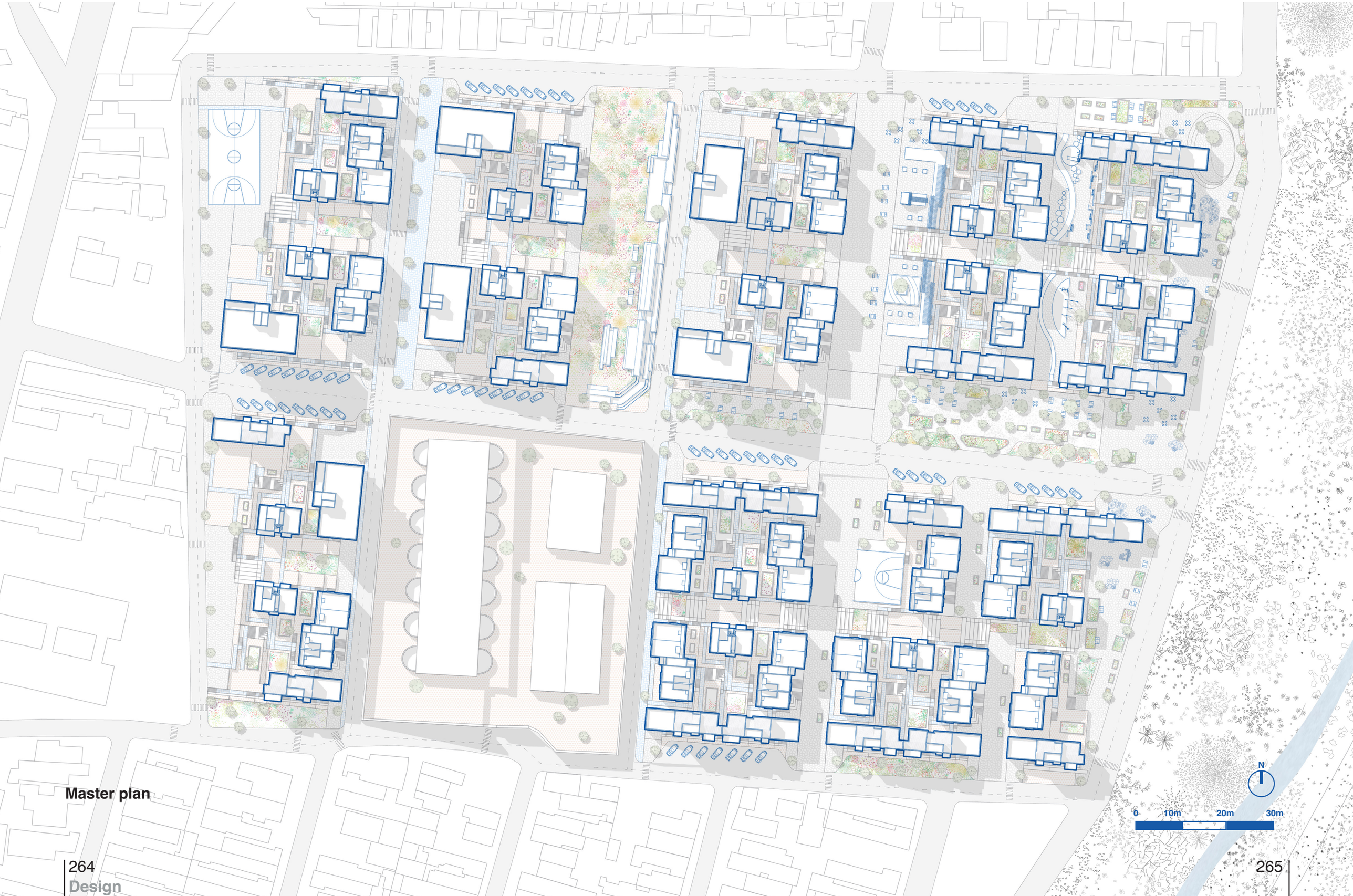
N

0 20m 40m 60m

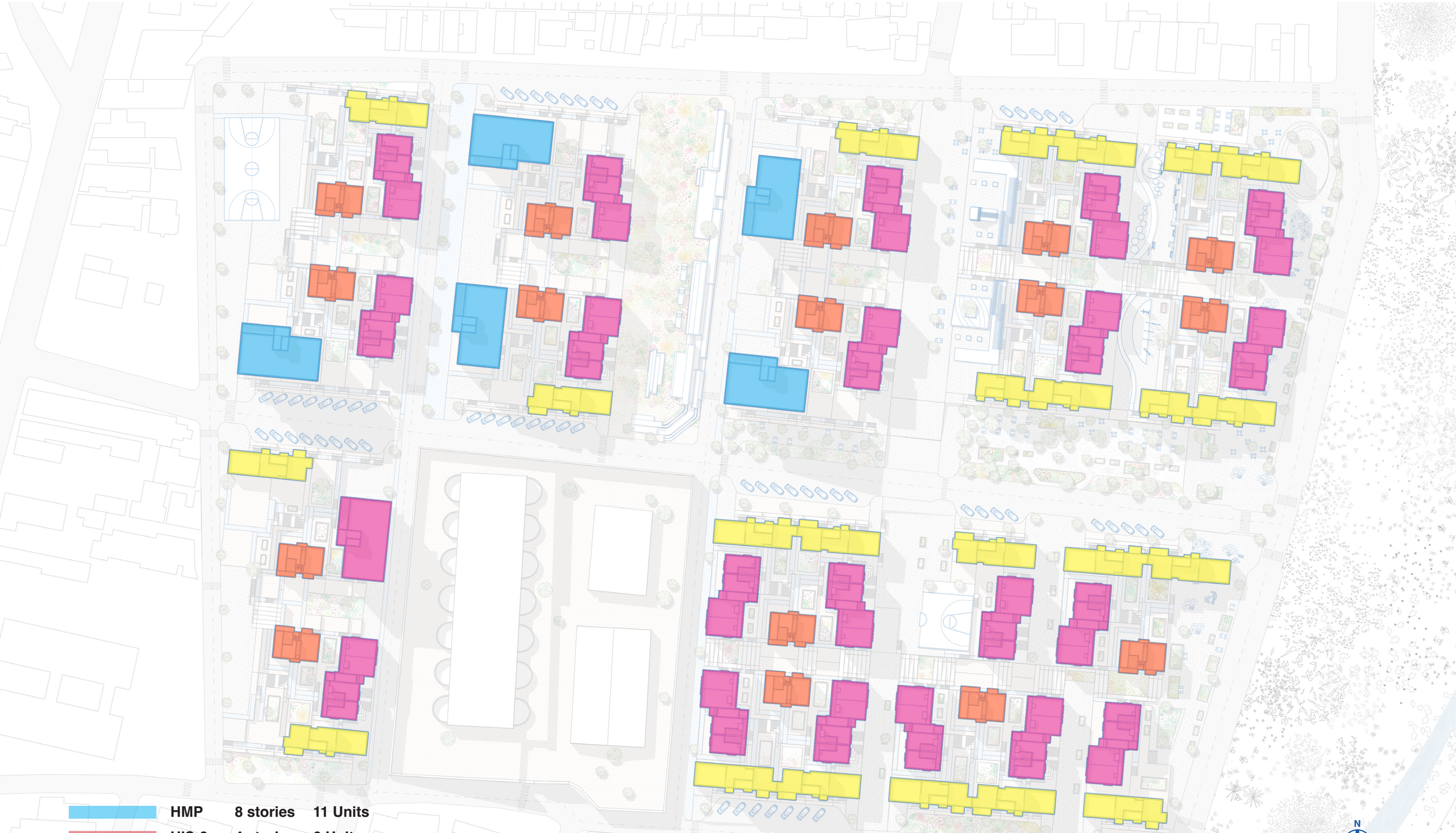


Spatial diversity





Master plan


HMP 8 stories 11 Units
HIS-2 4 stories 6 Units
HIS-1 4 stories 12 Units
HIS-1 4 stories 16 Units
N
0 10m 20m 30m

Area: 5452.08 m²
Units: 63
Density: 115units/ha

Area: 13447.81 m²
Units: 292
Density: 166 units/ha

HMP	8 stories	11 Units
HIS-2	4 stories	6 Units
HIS-1	4 stories	12 Units
HIS-1	4 stories	16 Units

N

0 10m 20m 30m

Area: 56276.04 m²
Units: 763
Density: 135 units/ha

Area: 5452.08 m²
Units: 63
Density: 115units/ha

Units: 74

Units: 74

Units: 192

Units: 68

Area: 13447.81 m²
Units: 292
Density: 166 units/ha

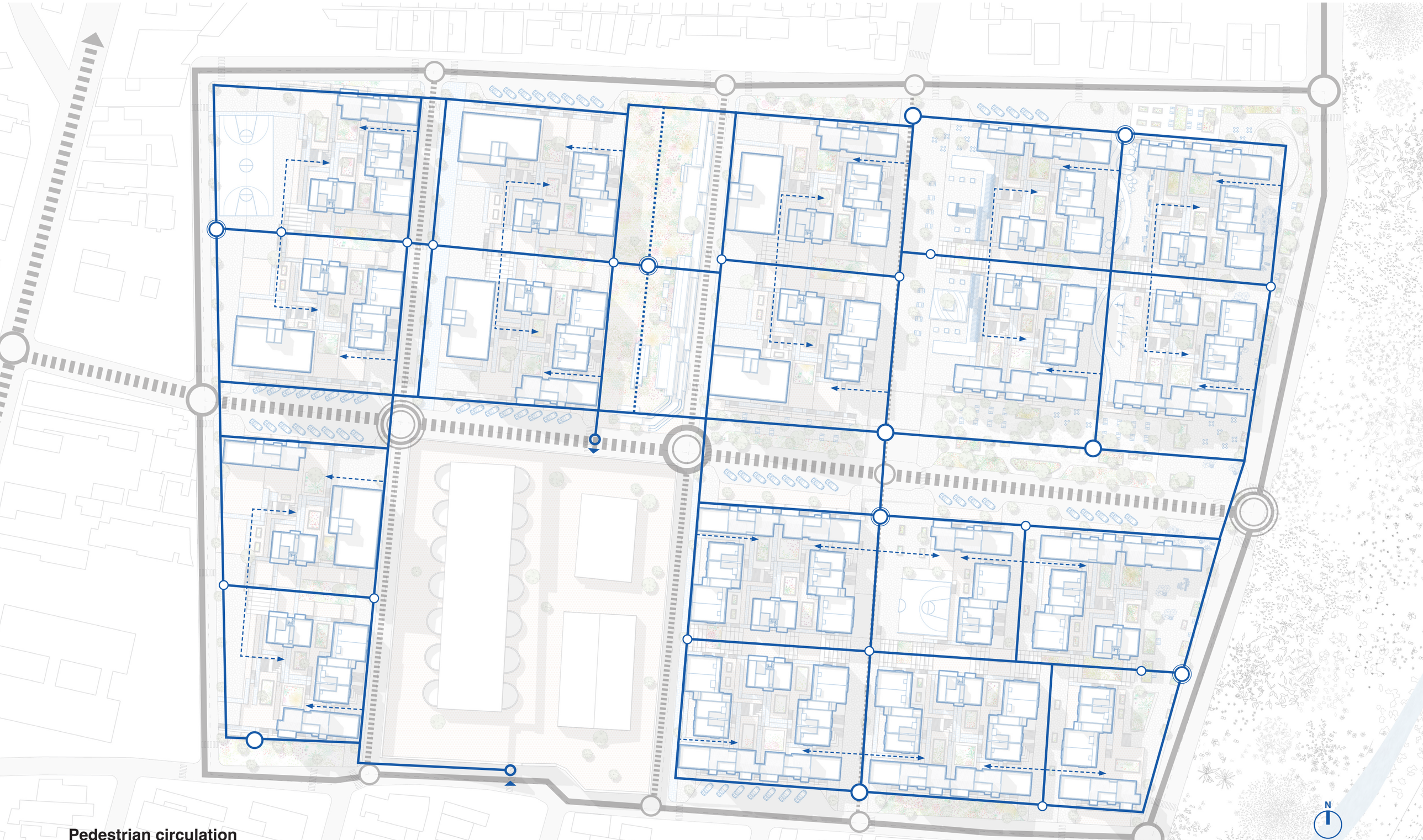
HMP	8 stories	11 Units
HIS-2	4 stories	6 Units
HIS-1	4 stories	12 Units
HIS-1	4 stories	16 Units

N

0 10m 20m 30m



Vehicle Circulation



Pedestrian circulation


Green Fitness Park
Elderly Oasis Park
Sports Haven Park
Kid's Adventure Playground
Primary school
Art and Culture Garden
N
0
10m
20m
30m

Amenity



Sports Haven Park

Green Fitness Park





Elderly Oasis Park



Kid's Adventure Playground



Primary school



Art and Culture Garden

N

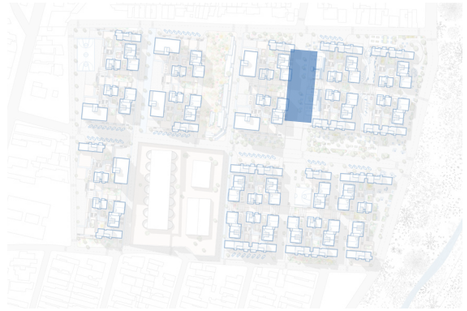
0 10m 20m 30m

Spatial quality





Elderly oasis park





Kid’s adventure playground





Green fitness park





Sports haven park



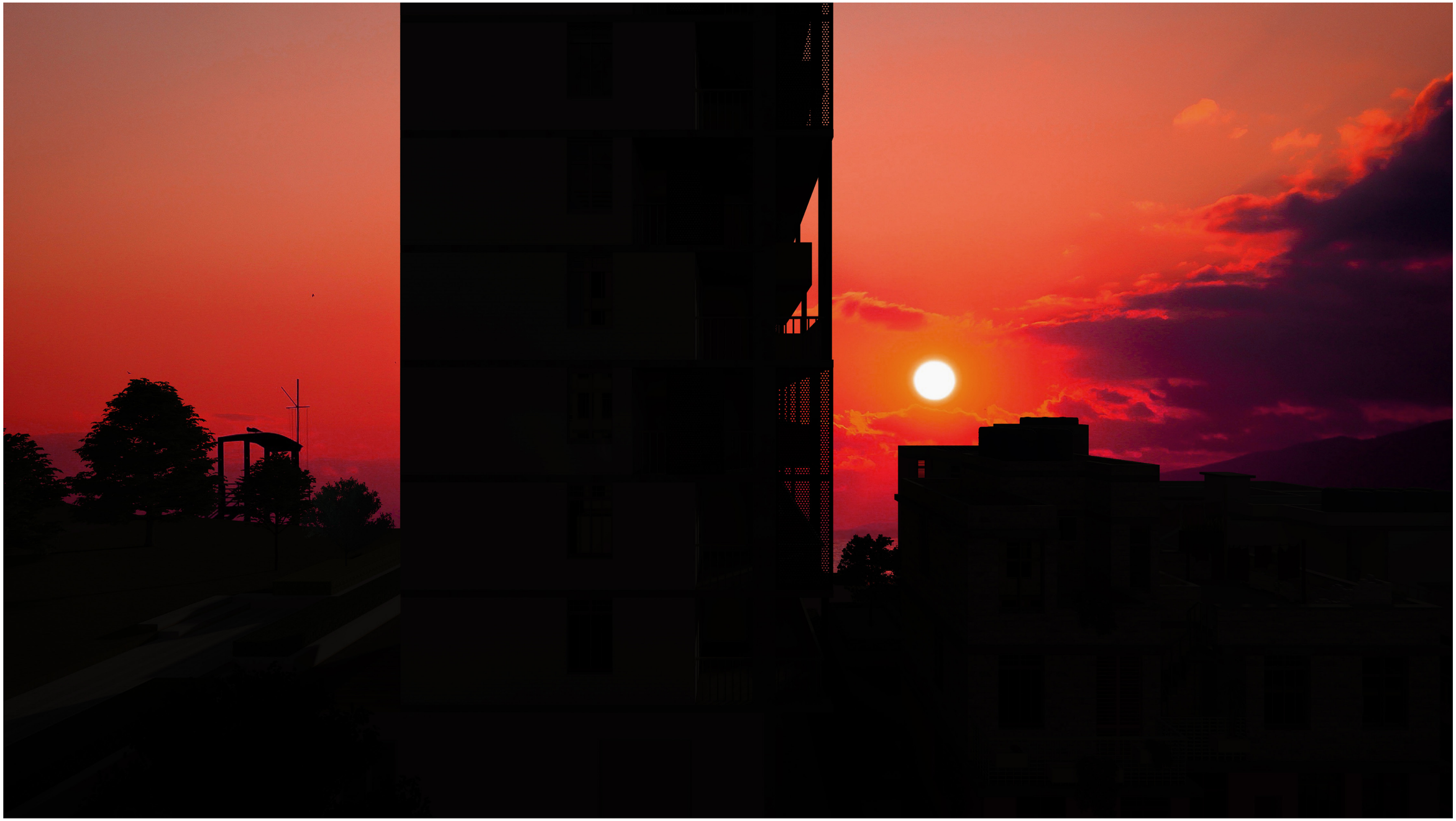


Active wellness park

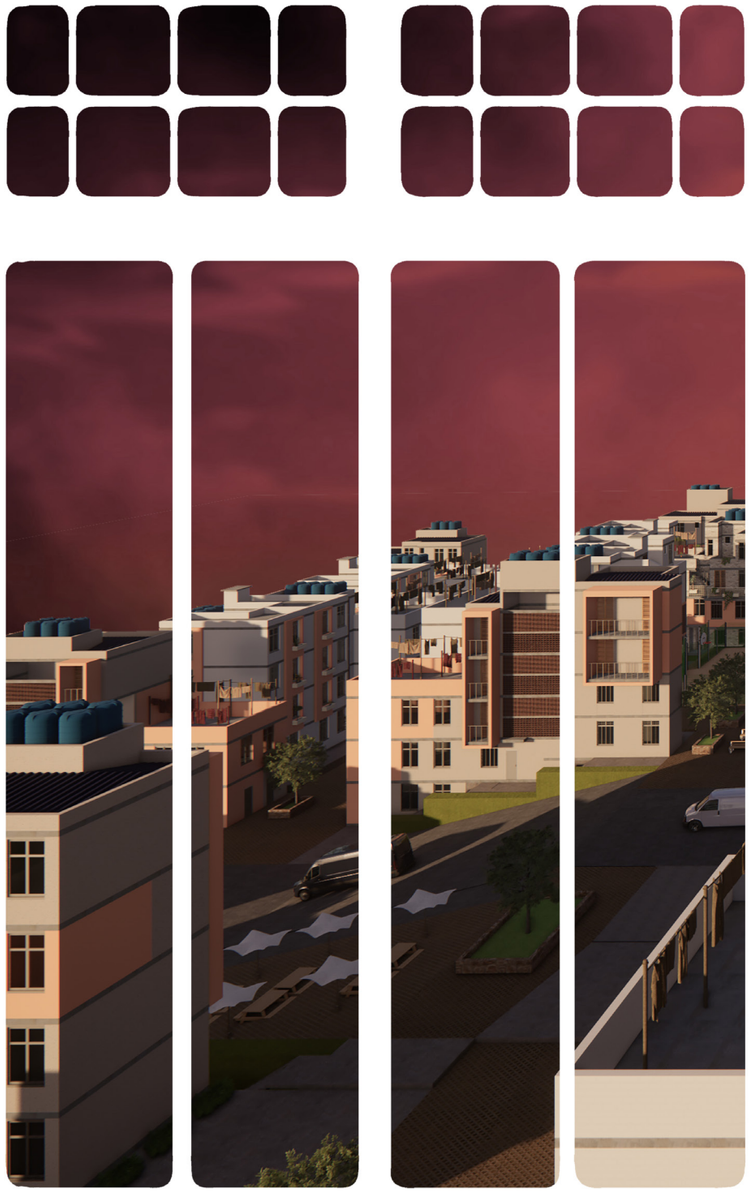




Riverfront



Crimson Urban Skyline





Bright Suburban Scene



Slab house view



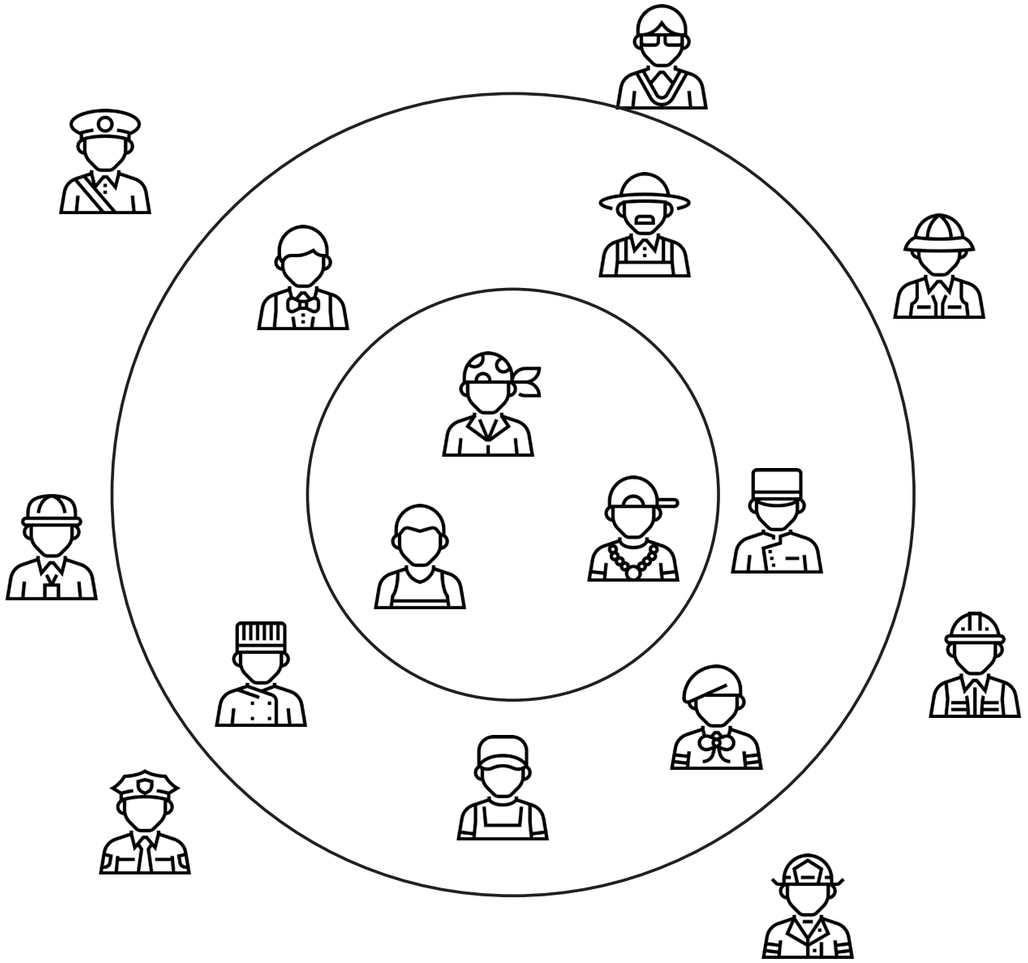
Row House Outlook



Community Center Streetscape



04 Building Technology

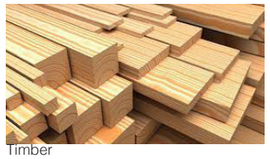


Exterior wall


Compressed stabilized earth blocks


Bricks


cellular concrete


Timber


Ramed earth


Concrete blocks

Interior wall


Cork


Gypsum board


hempcrete


Oriented stand board


Plywood


Mycelium-based materials

Finishing

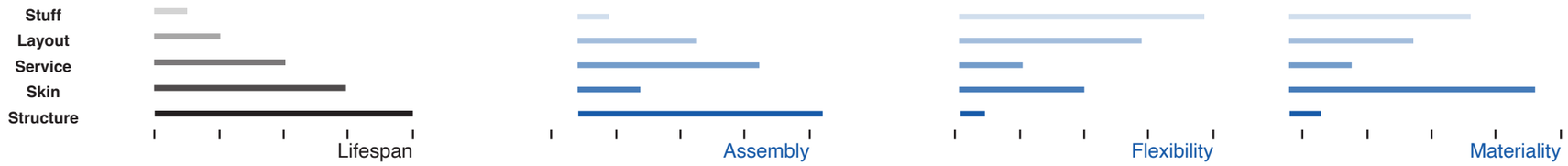

Brick veneer

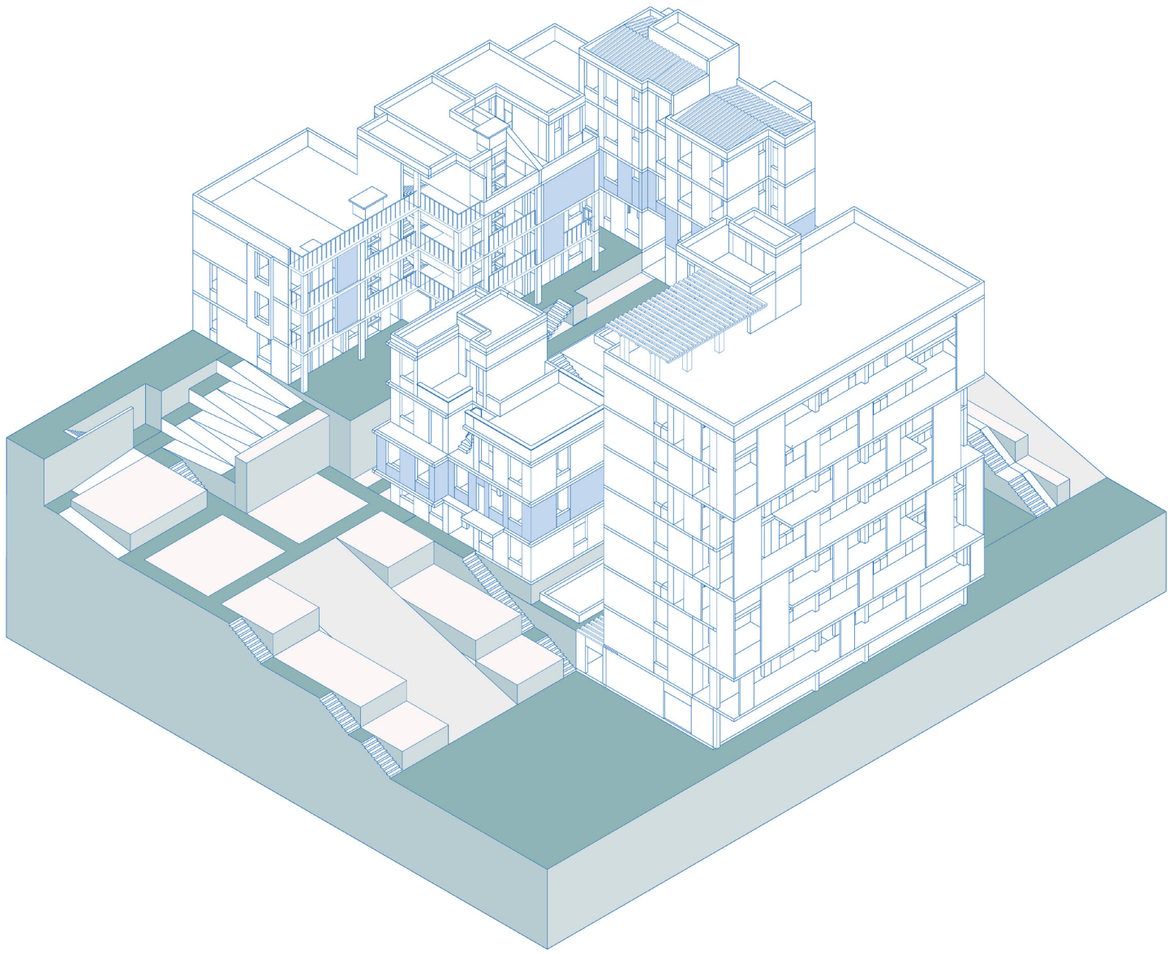

Fiber cement siding

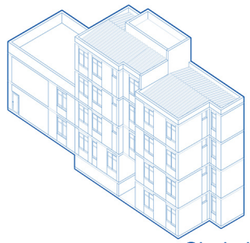

Stucco


Vinyl siding

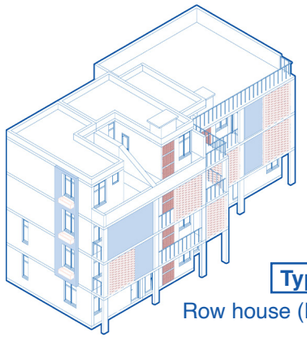




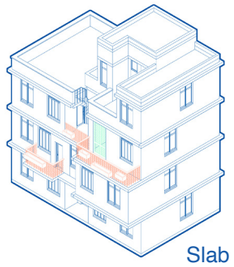




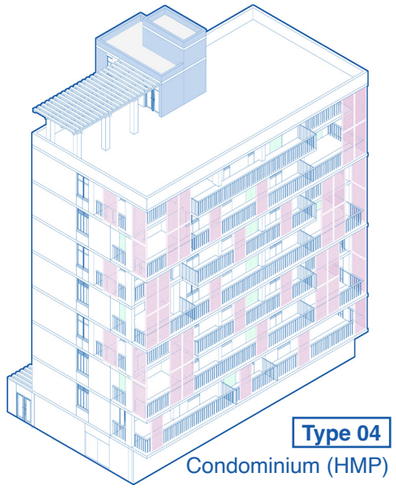
Type 01
Chain house (HIS-1)



Type 02
Row house (HIS-1)



Type 03
Slab house (HIS-2)



Type 04
Condominium (HMP)

Structure

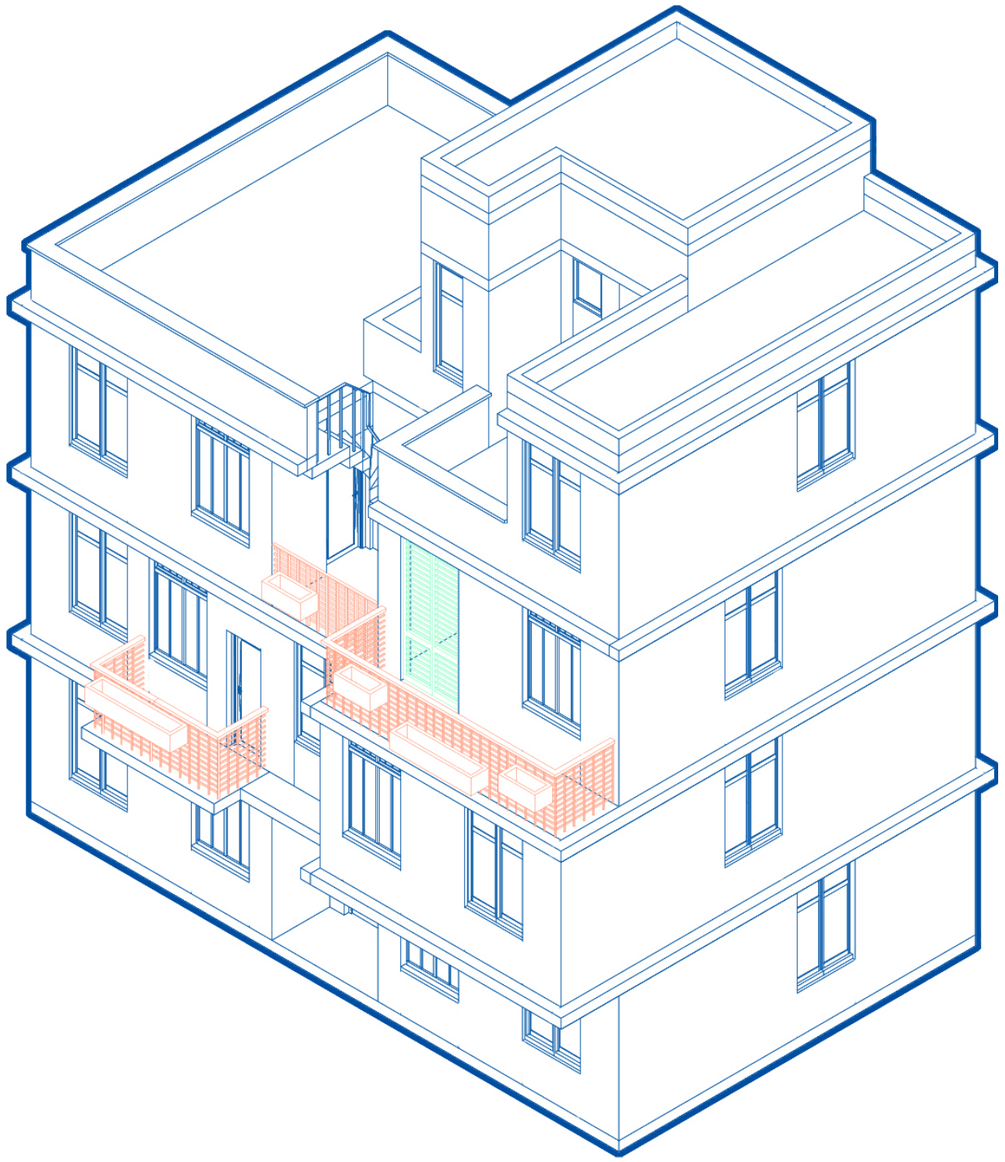
- Structural Block
- Concrete slab
- Cast-in-place concrete

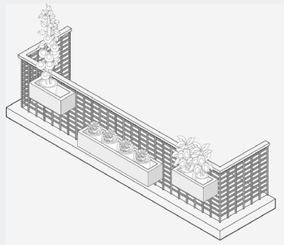
Infill

- Hollow concrete block
- Sealing Block

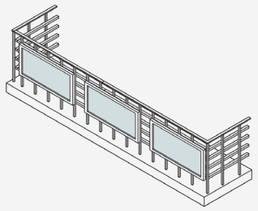
Facade

- Pigment
- Aerated concrete block
- Timber
- Steel

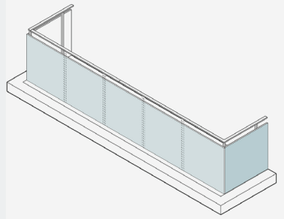




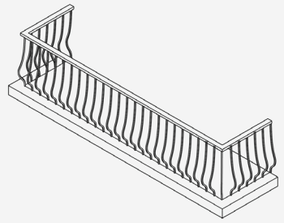
Flowerpot balustrade



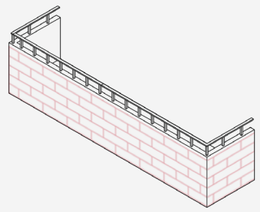
Framed glass balustrade



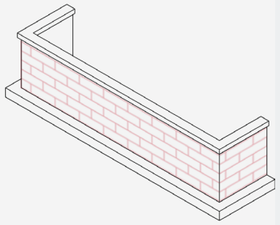
Semi-frameless glass balustrade



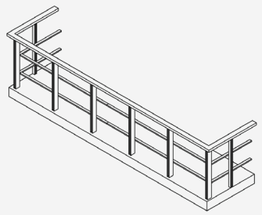
Art deco balustrade



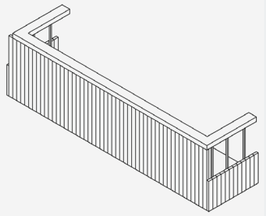
Contemporary brick balustrade



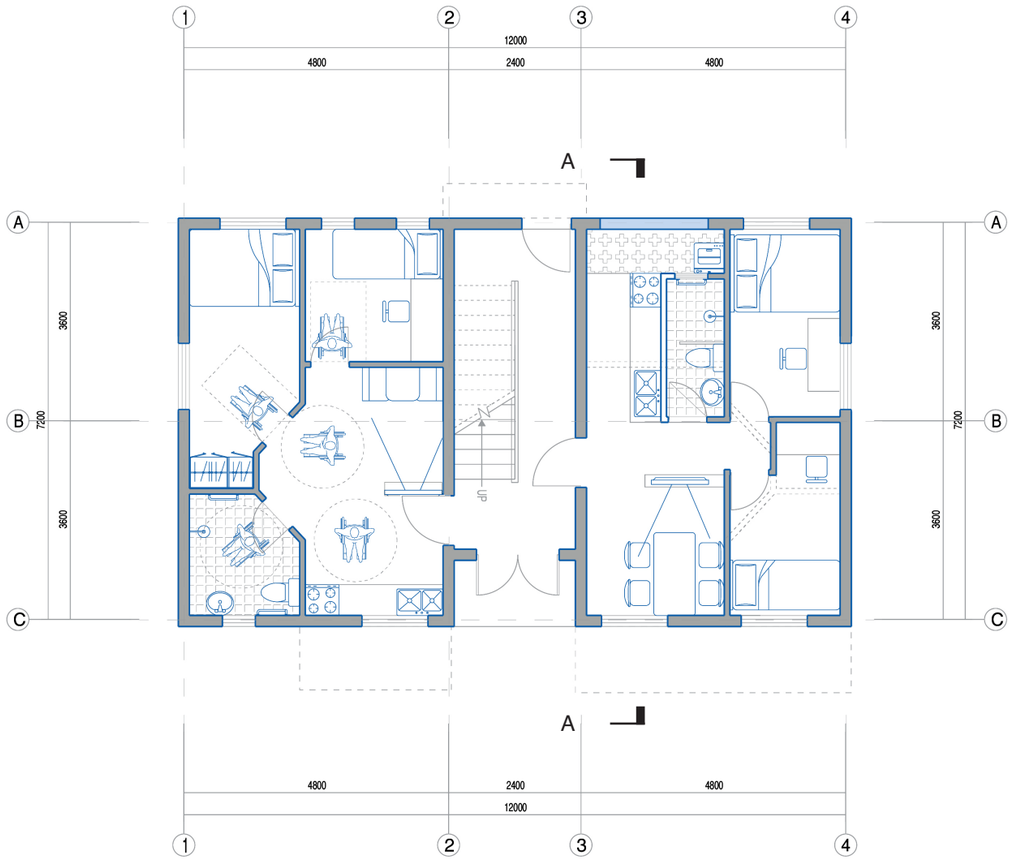
Traditional brick balustrade



Metal balustrade



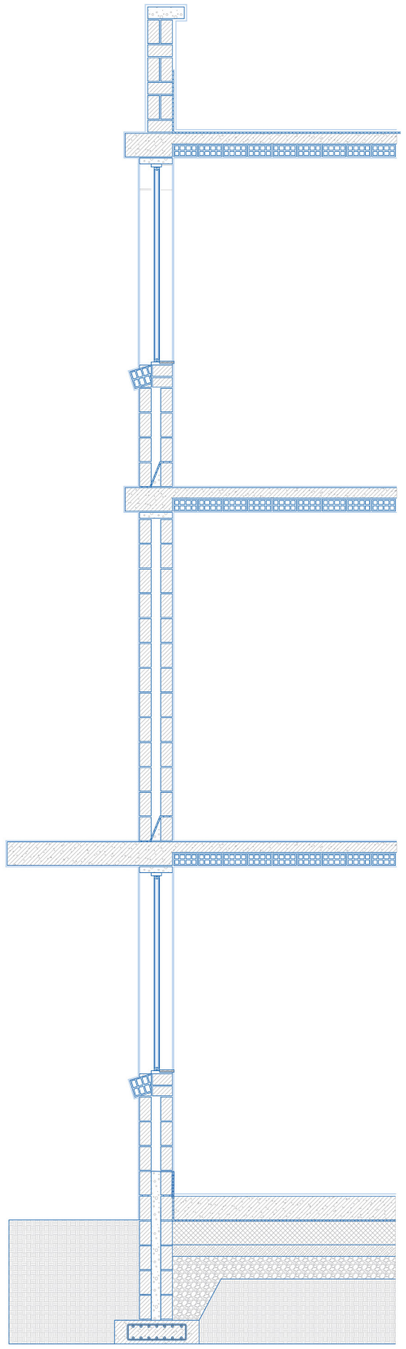
Wooden balustrade



Ground floor plan

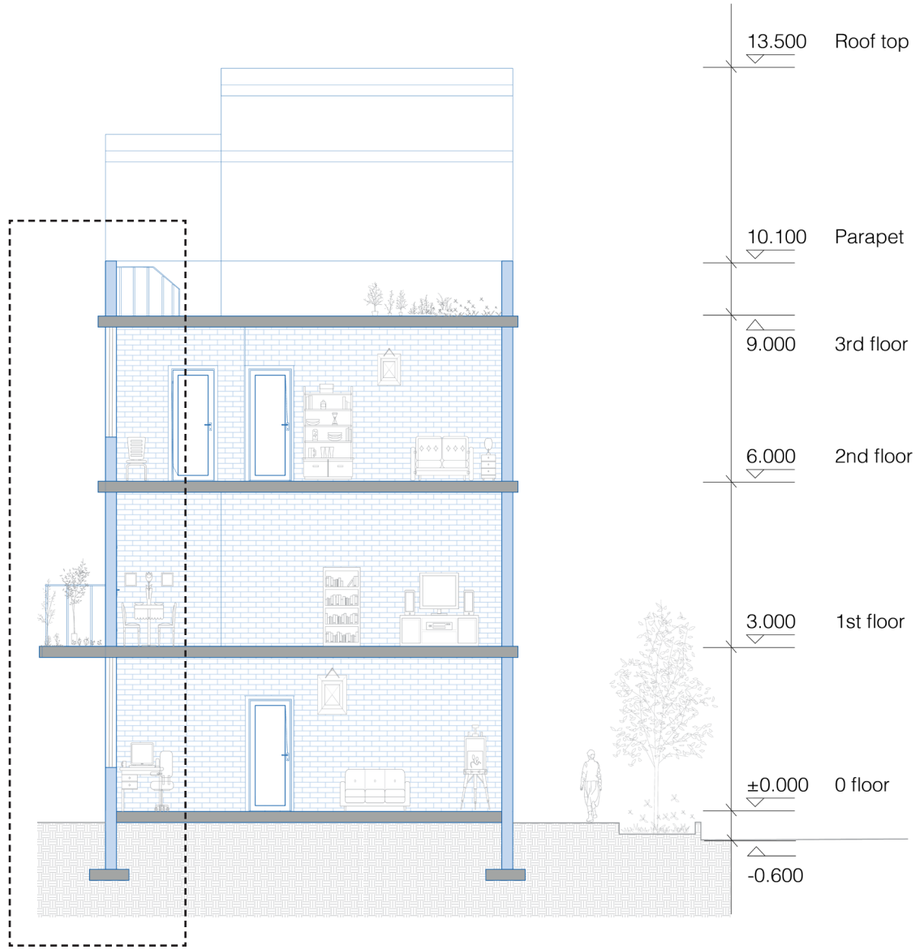


Elevation

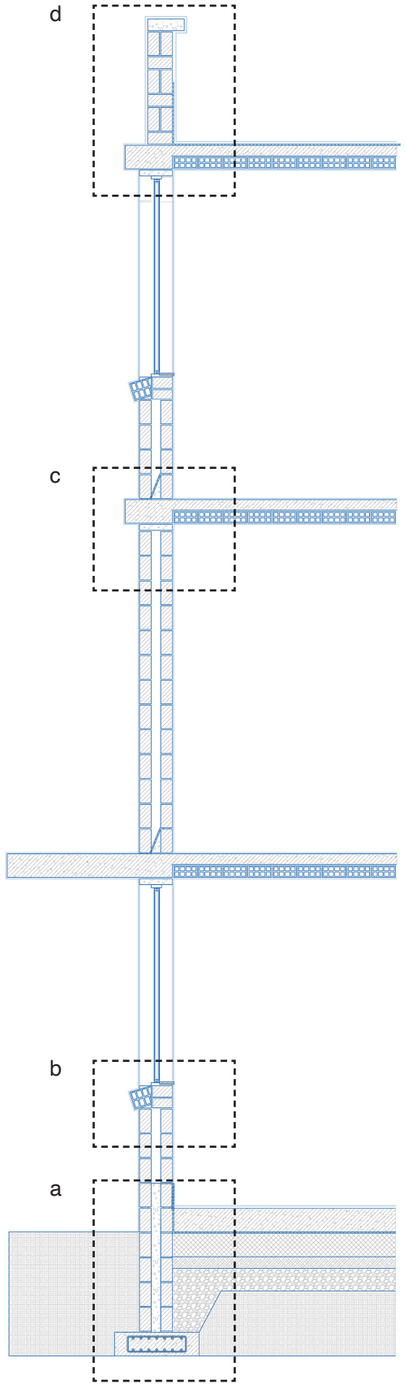


Section 1:50

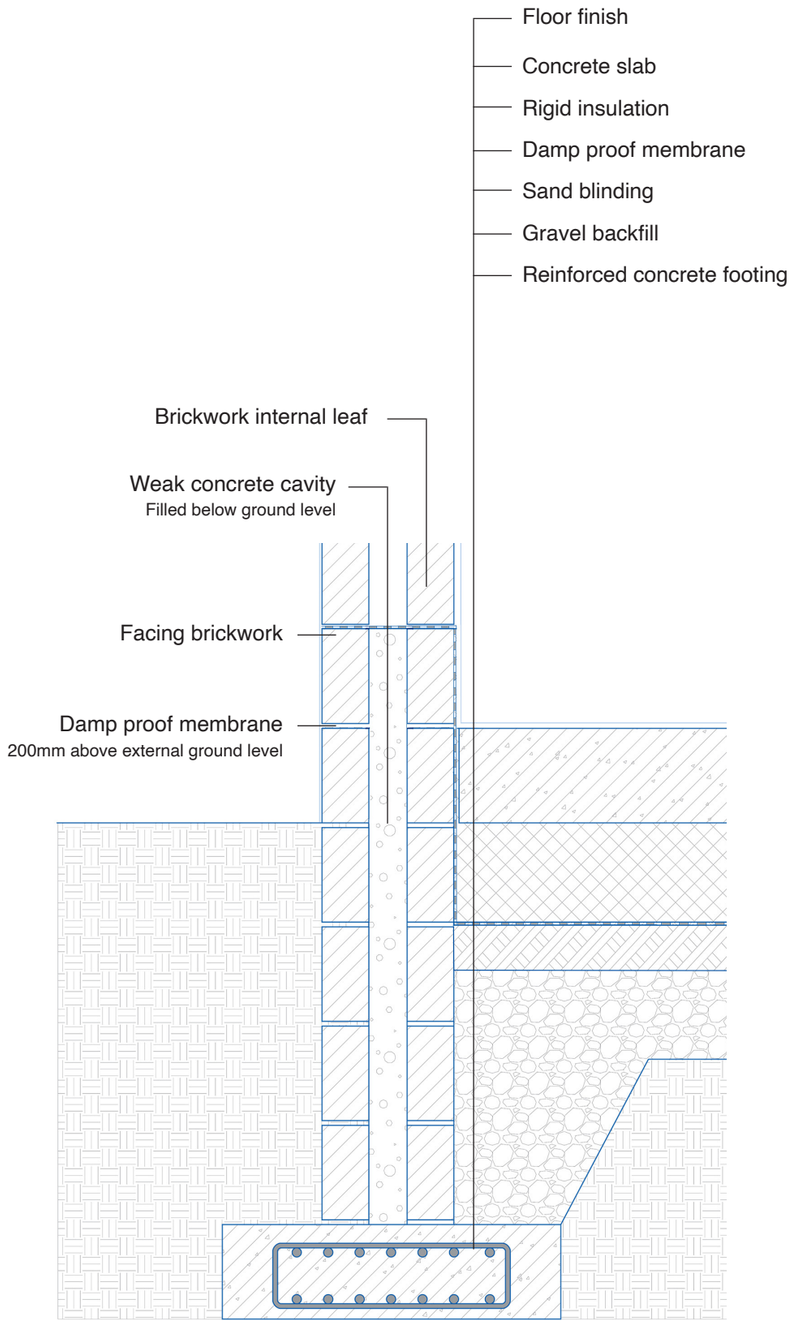




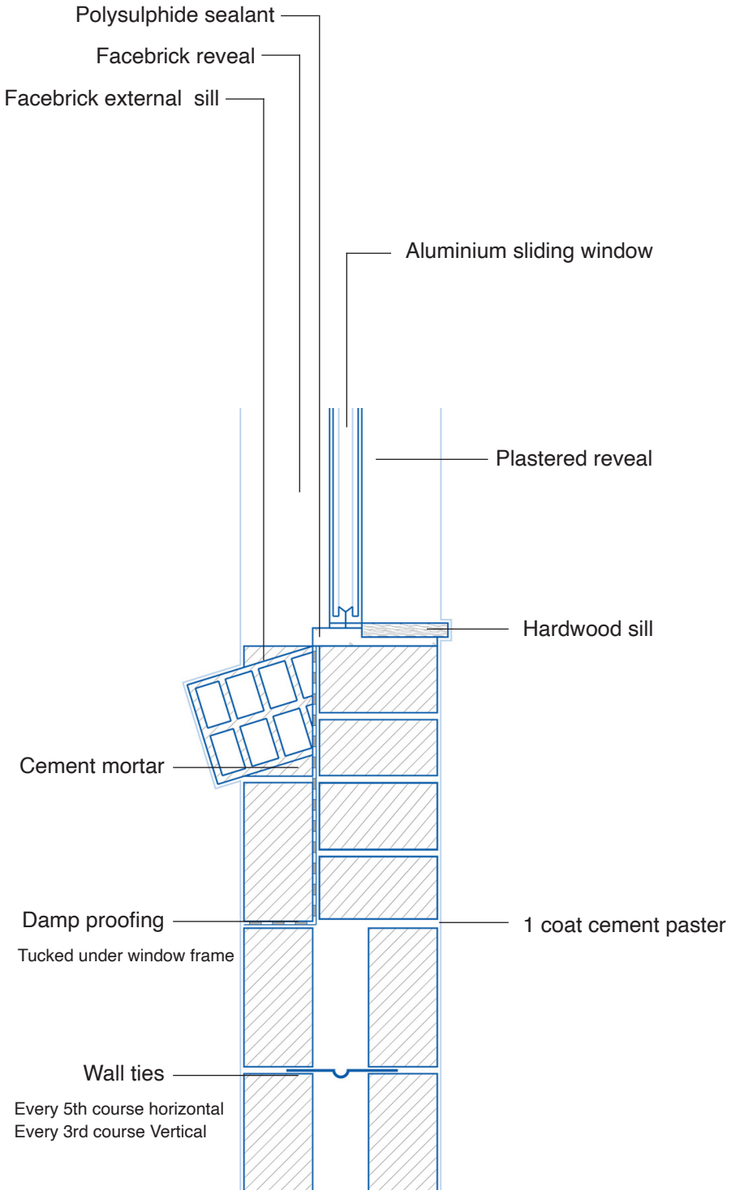
A-A Section 1:300



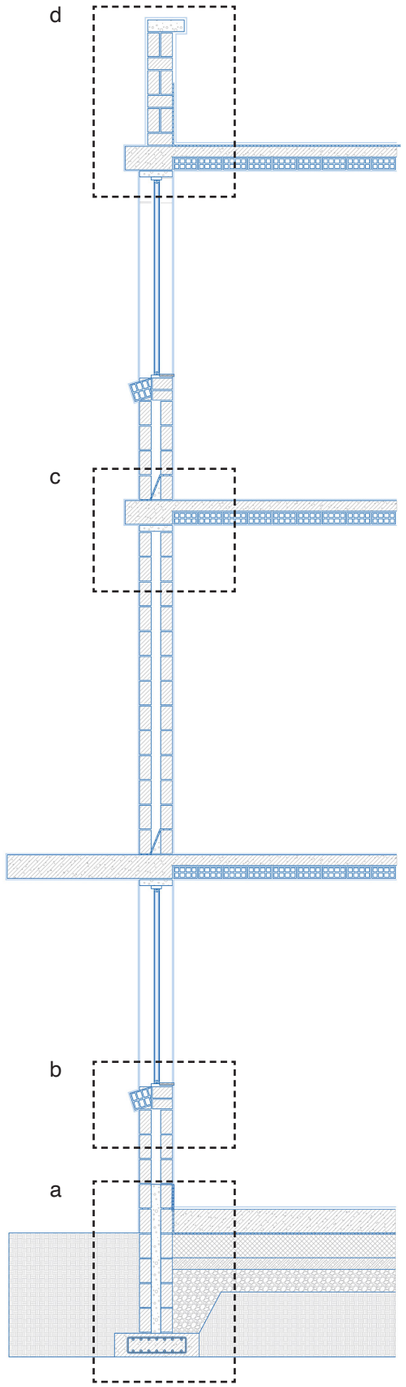
Section 1:50



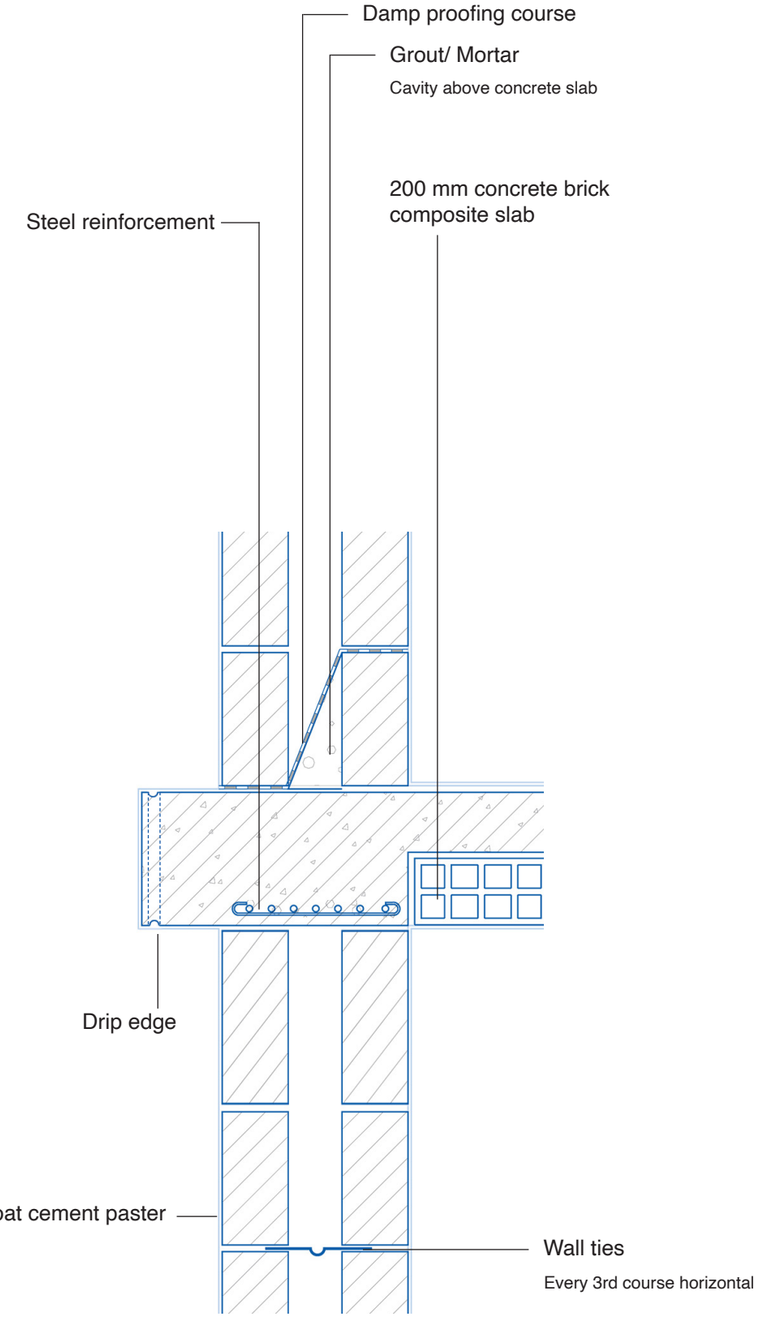
a | Foundation detail 1: 20



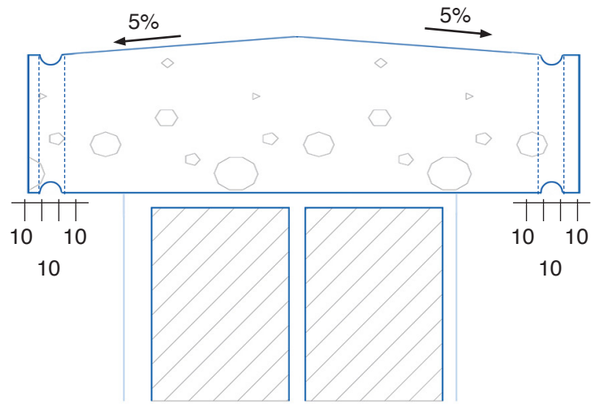
b | Window detail 1:10



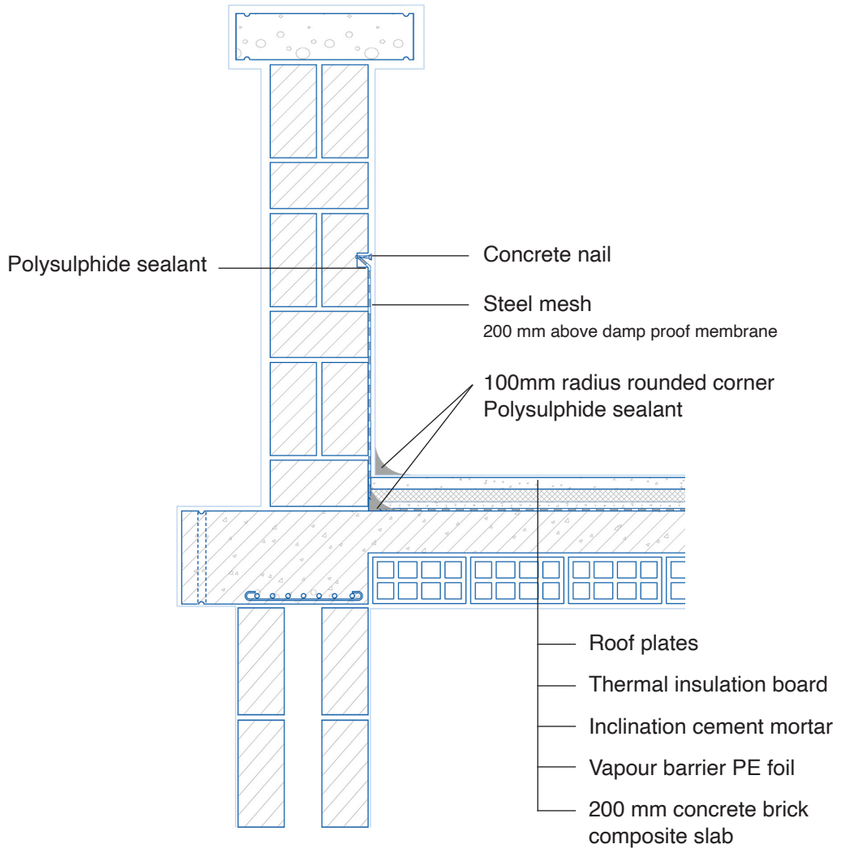
Section 1:50



c | Floor detail 1:10

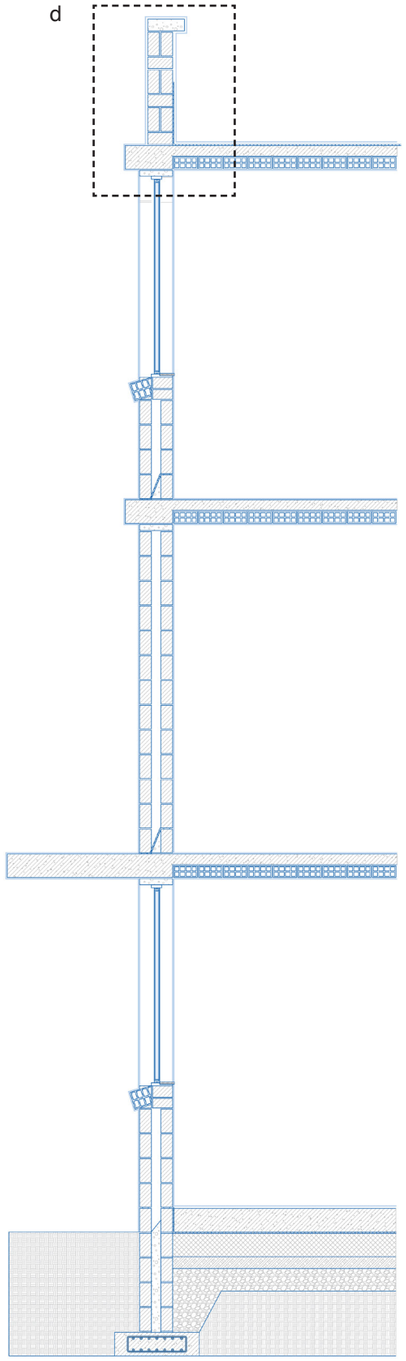


Parapet cap detail 1:5



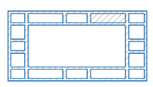
d | Parapet detail 1: 20

d



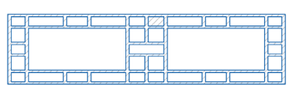
Section 1:50





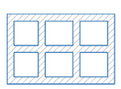
Structural Block
11.5/ 19/ 19mm





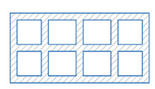
Structural Block
11.5/ 19/ 39mm



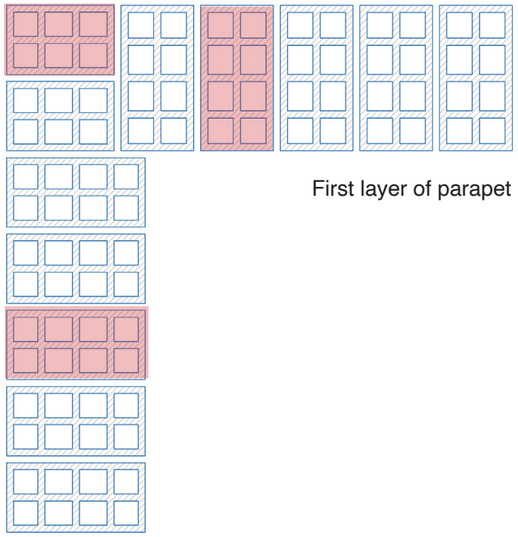


Sealing Block
9/ 14/ 19mm

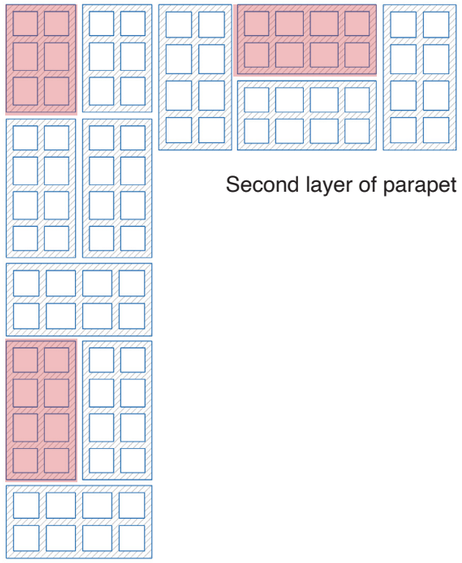




Sealing Block
9/ 19/ 19mm

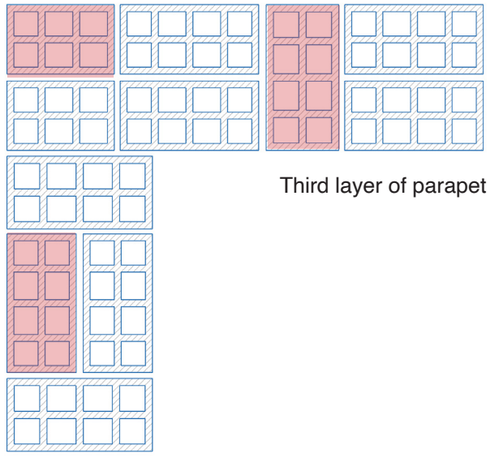


Masony methods



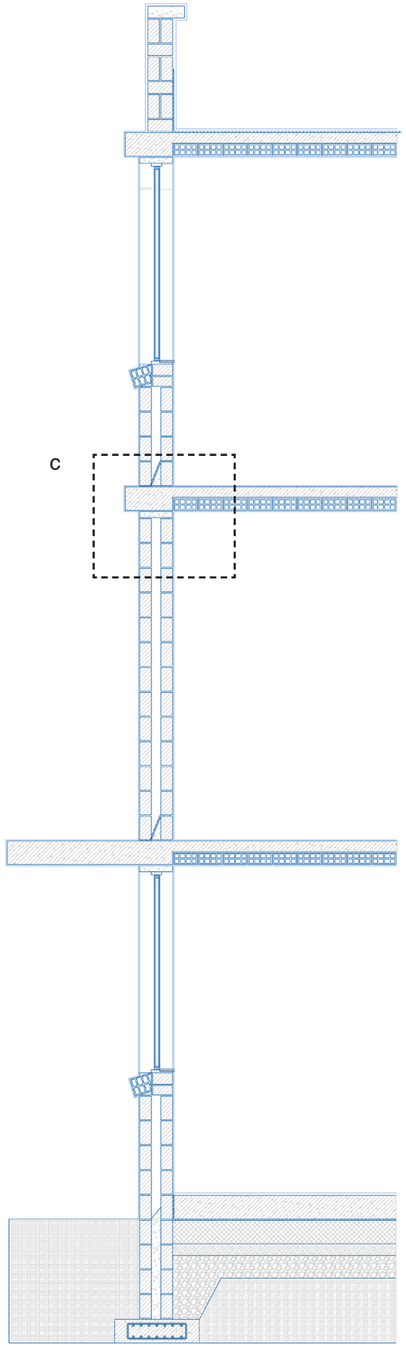
First layer of parapet

Second layer of parapet

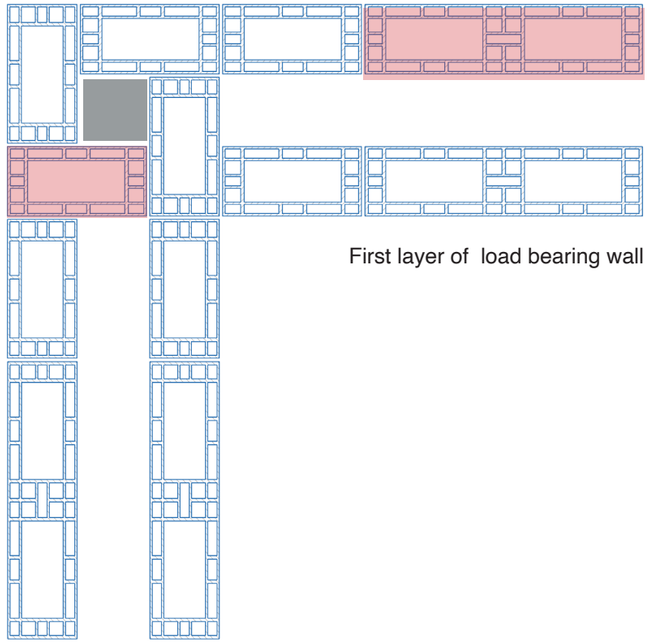


Third layer of parapet

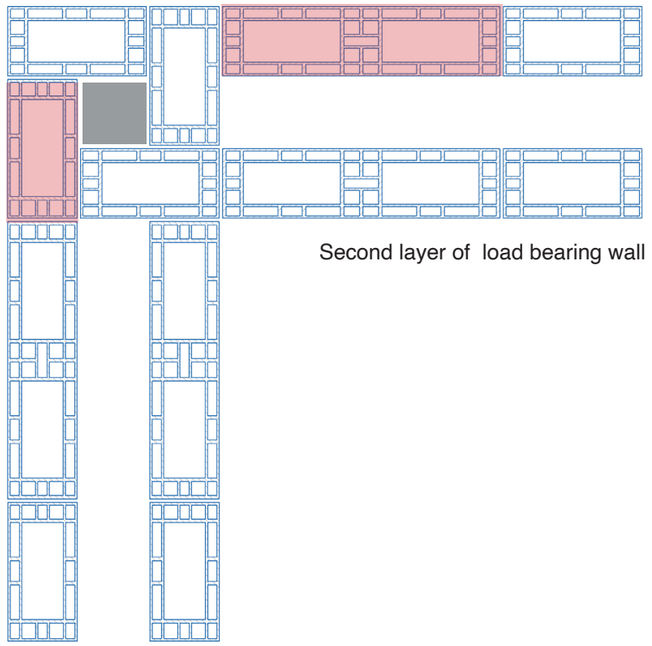
https://www.jorgeblocos.com.br/



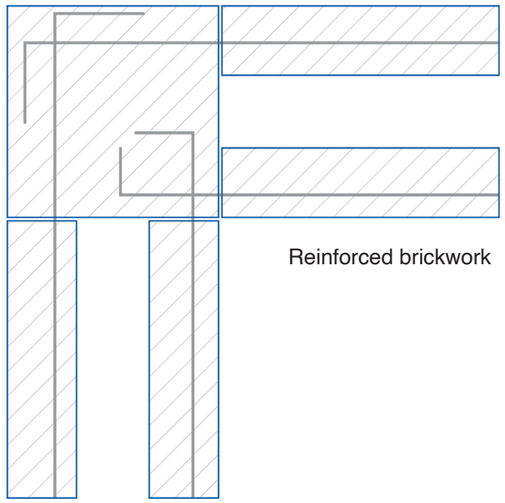
Section 1:50



First layer of load bearing wall

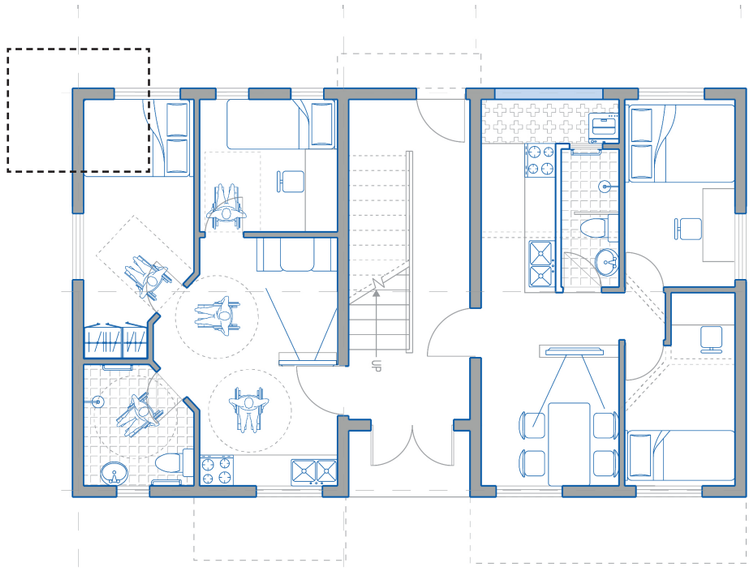


Second layer of load bearing wall



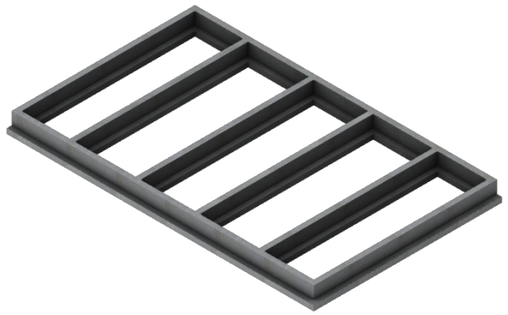
Reinforced brickwork

Masony methods



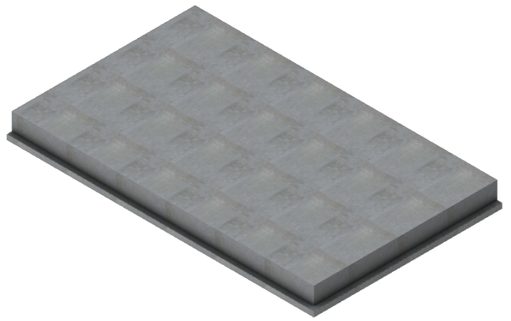
01 I Foundation

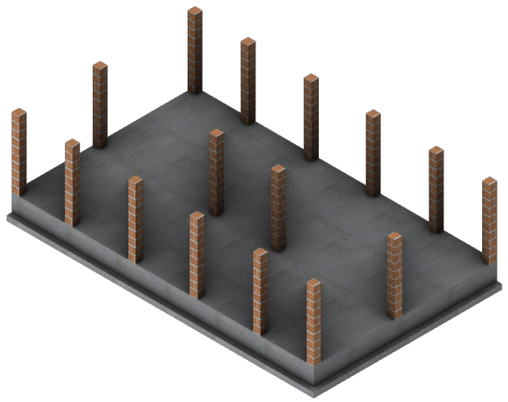
The foundation construction process begins with ground leveling to prepare the site, followed by the construction of wooden formwork to shape the foundation. Concrete is then poured into the formwork, with the incorporation of reinforcing steel bars (rebars) to enhance structural strength. In some cases, a layer of brick or masonry may be added for additional support. Concrete beams may also be installed where needed. After pouring, the concrete is cured, inspected, and quality-controlled to ensure it meets building codes and engineering specifications.



02 I Ground floor

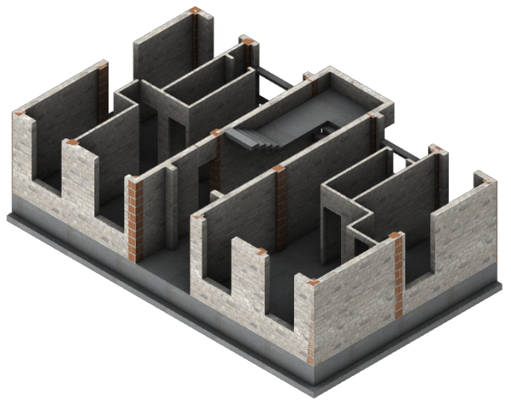
The construction process for the ground floor of a building involves several key steps. It begins with damp proofing, which includes excavating the ground, laying a damp proof membrane (DPM), and protecting it with a layer of sand. The stone foundation is then built on top of the DPM, comprising footings and stone masonry walls held together with mortar. Afterward, the excavated soil is backfilled against the foundation, compacted, and may include drainage measures. Finally, a cast-in-place concrete slab is constructed with formwork, steel reinforcement, and curing. Once the slab has cured, the ground floor is ready for further construction activities, such as erecting walls, installing utilities, and interior finishing. These steps are essential for ensuring the structural integrity and longevity of the building.





03 I Brick structure

For a brick column, bricks are stacked in courses, with each course offset from the one below to create a staggered pattern. Mortar is applied between each layer, and levels and plumb lines are used to maintain alignment. Lintels or bond beams may be installed for additional support over openings.



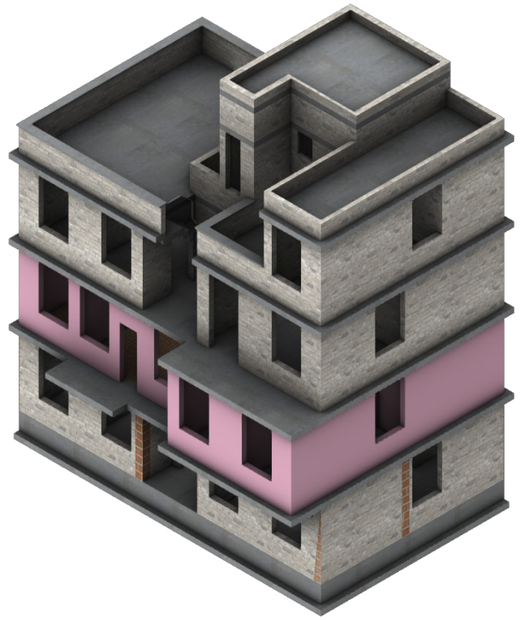
04 I In-fill walls

For brick cavity wall, two separate walls are constructed with an air gap (cavity) between them to provide insulation and prevent moisture penetration. Wall ties, typically made of metal, connect the inner and outer walls. The cavity wall construction requires careful attention to aligning and tying the two walls effectively.



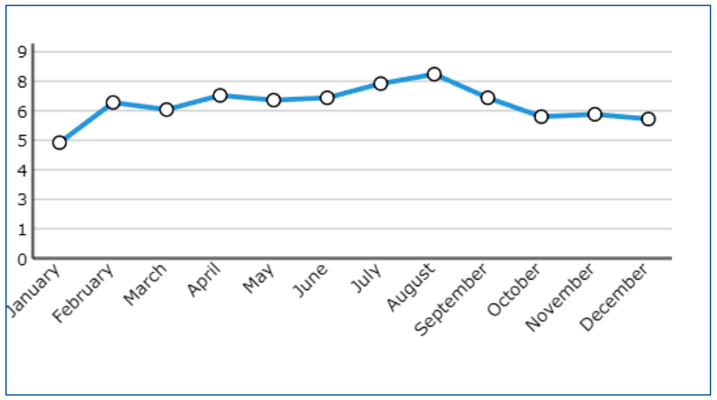
05 I First floor

The floor construction started with the installation of concrete beams, typically reinforced with steel bars, and shaped using wooden moulds. Bricks are meticulously laid within the wooden moulds, bonded together with mortar. After that, the cast-in-place slab construction is employed by pouring concrete into the moulds, forming a monolithic slab. Prior to concrete pouring, steel reinforcement is placed within the moulds to enhance structural strength. Subsequently, concrete is carefully poured to create the beams and slabs, followed by a curing and setting period to ensure strength development.



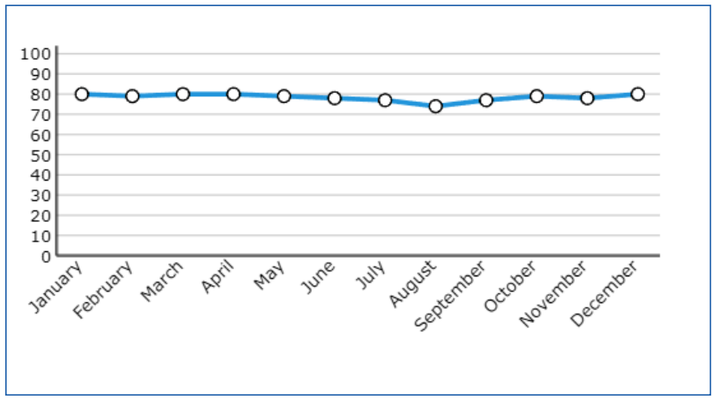
06 I Roof top

The construction process for the rooftop involves a systematic approach, starting with the inspection and repair of the existing roof structure. It begins with hot bitumen painting to create a waterproof membrane, followed by the application of lime concrete for insulation and drainage. Flashing is installed to prevent water infiltration at roof junctions and edges, and a layer of cement mortar is added for durability and load-bearing capacity. Additional roofing materials are applied to provide the final roof covering. A thorough inspection of the waterproofing and drainage systems is conducted, and routine maintenance is emphasized for long-term roof integrity.



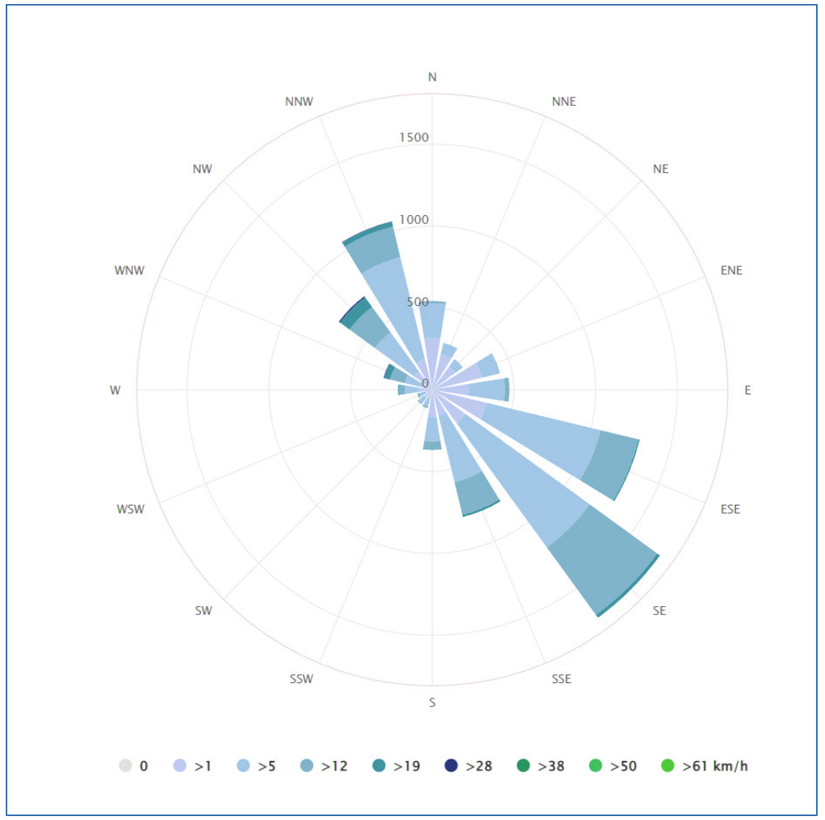
Sunny hours per day

With 8 hours per day, August is the sunniest month in the region of São Paulo. In January, the sun shines the least.



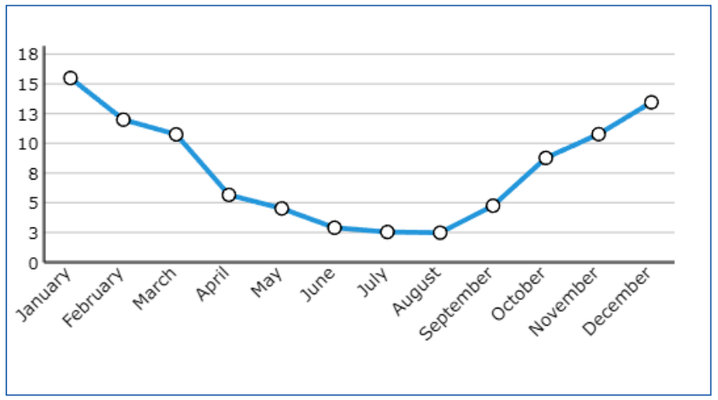
Relative humidity in %

In general, a relative humidity of 40-60% feels pleasant. With humidity averaging 80%, January is the most uncomfortable. In August, on the other hand, it is easier to endure.



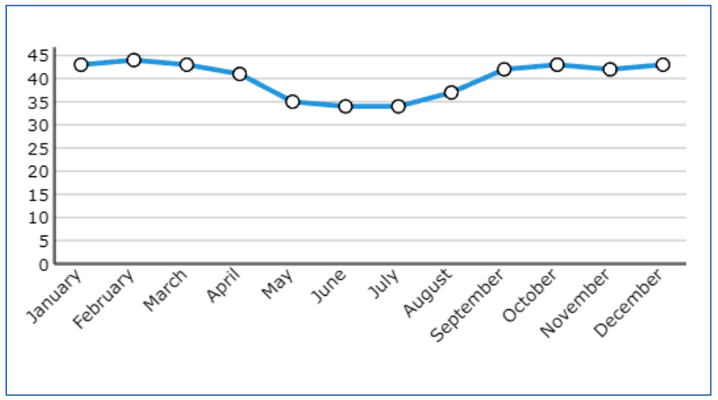
Wind rose

Cape Horn, the southernmost land point of South America, has a characteristic strong west-wind, which makes crossings from East to West very difficult



Rain days per month

With 16 rain days, January offers the most rain days, while August has the fewest.

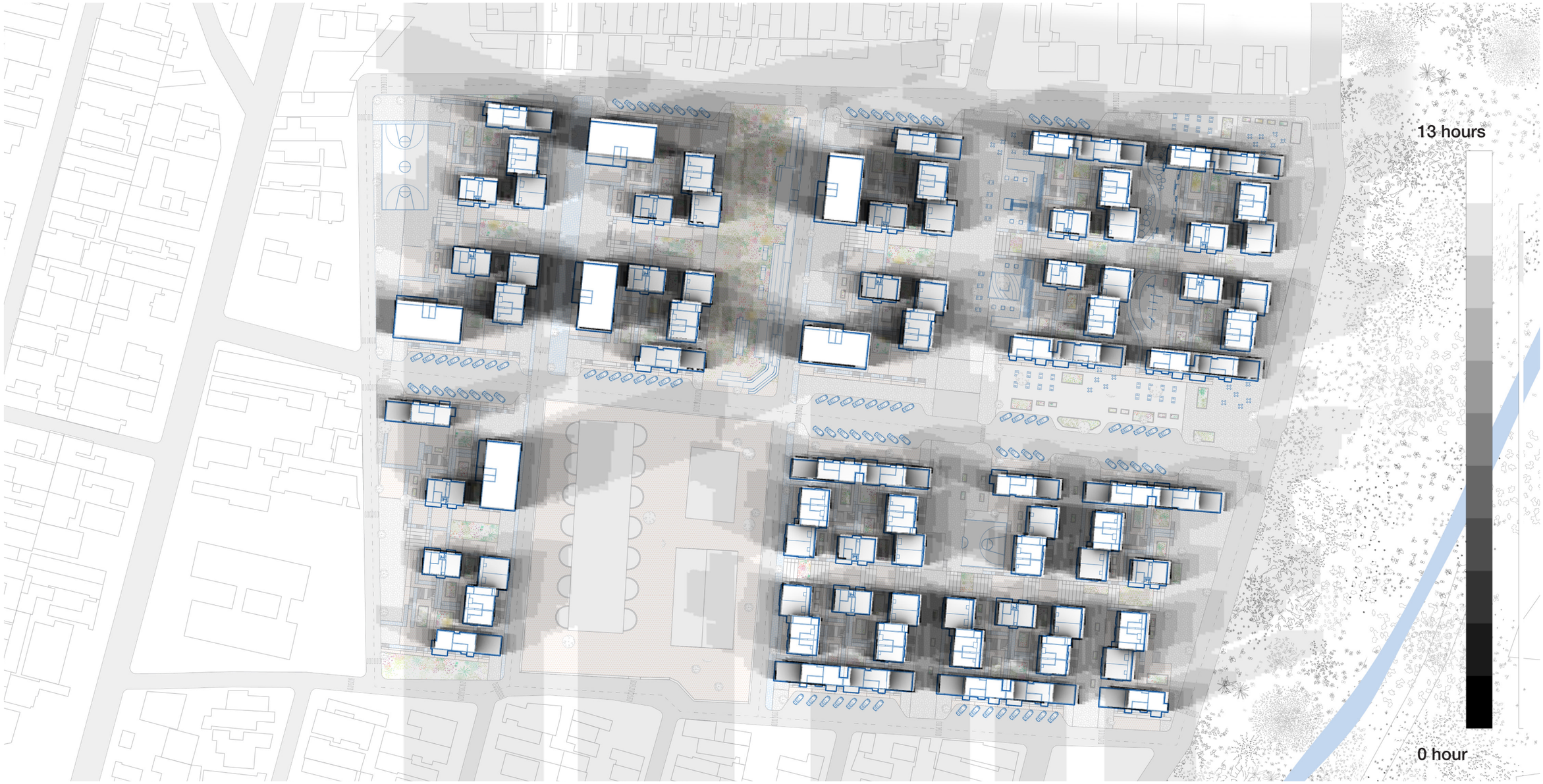


Humidex

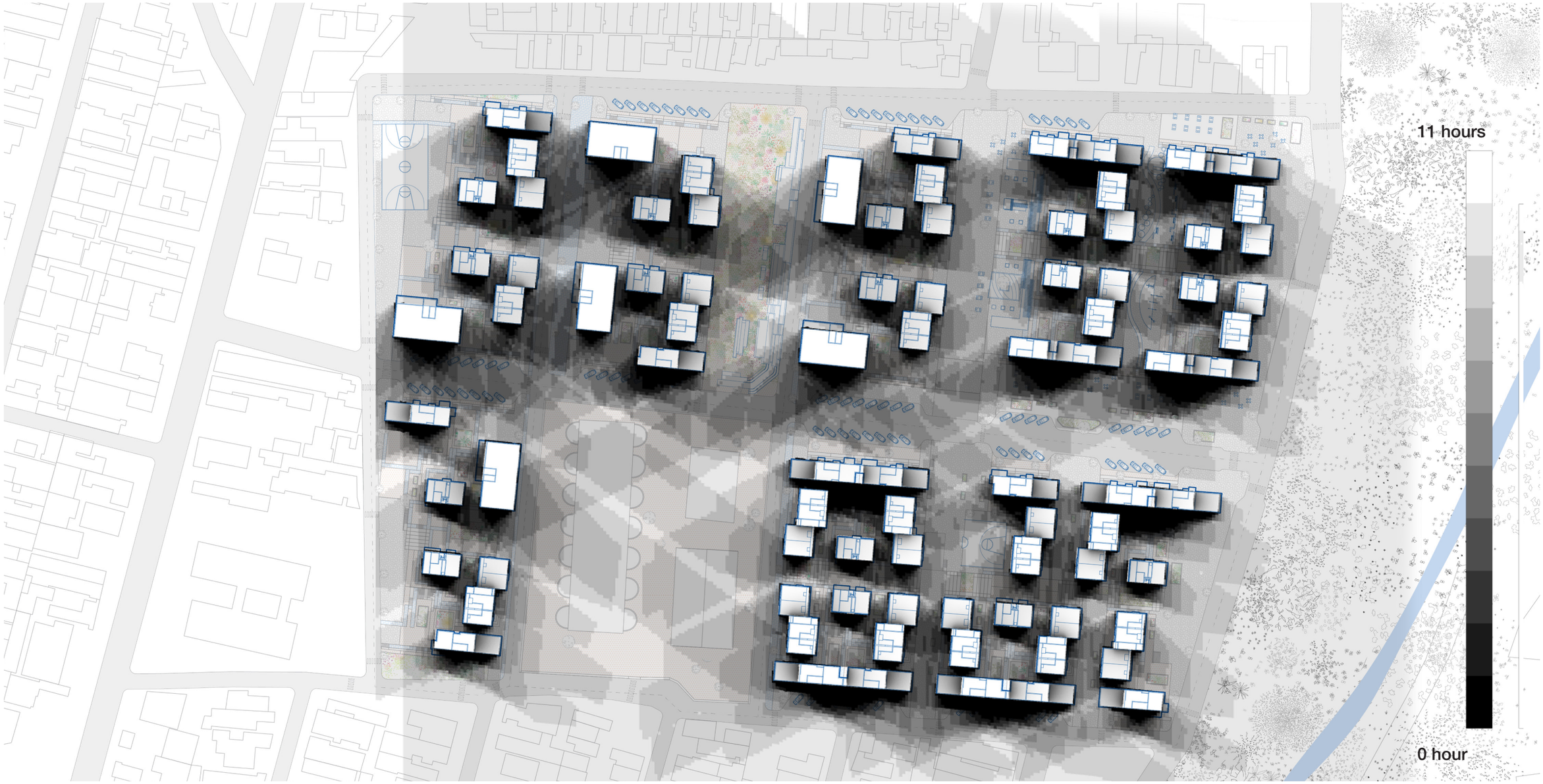
Up to 39, people perceive the air as slightly uncomfortable, and above 40, as very uncomfortable. Values above 45 are dangerous in the long run and often lead to heat stroke.



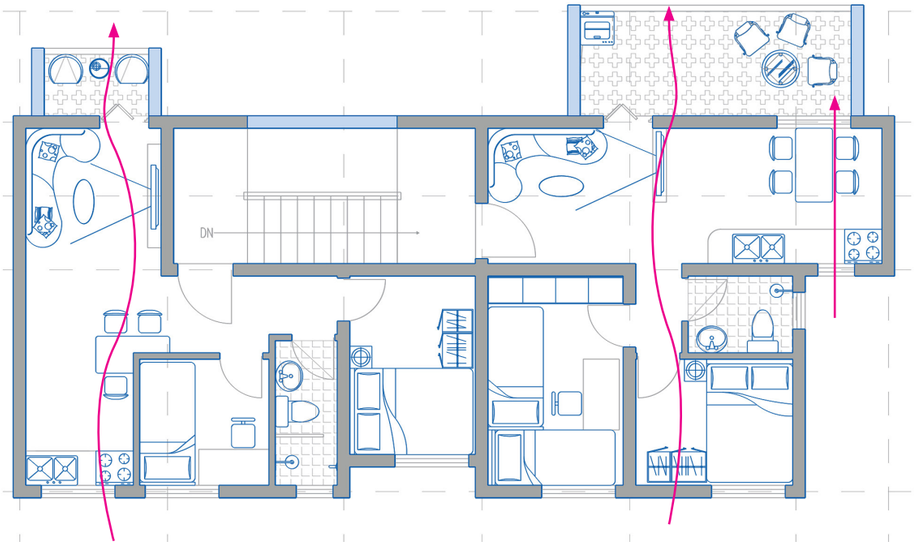
Sunpath+ Temperature

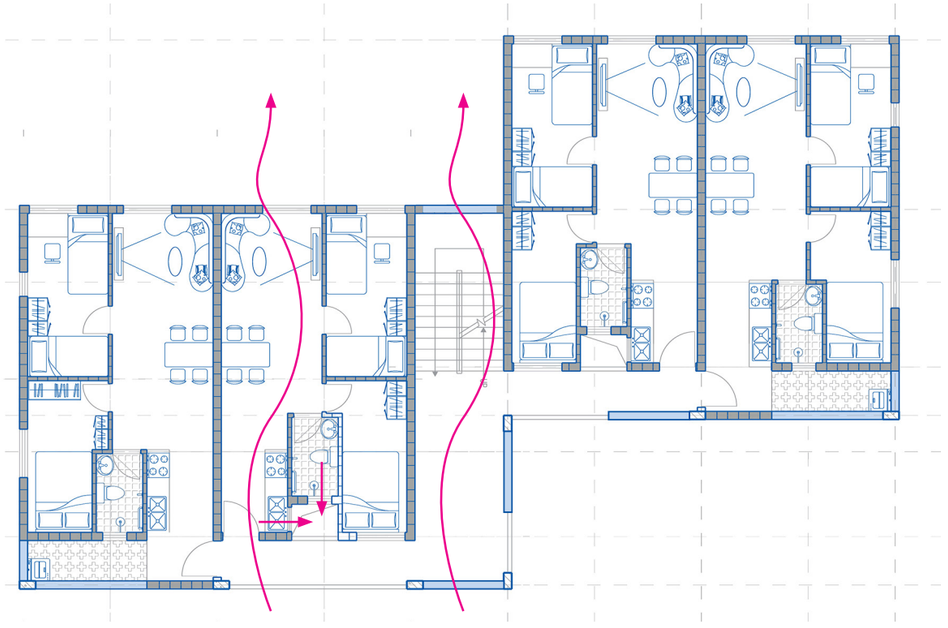


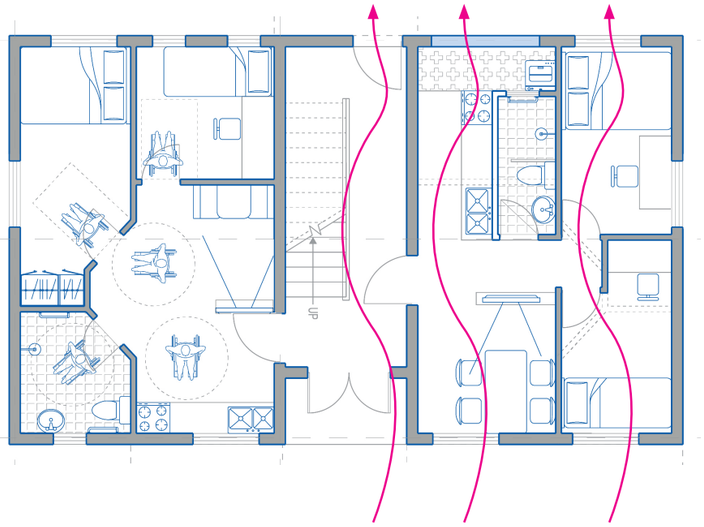
Direct daylight hours on summer solstice

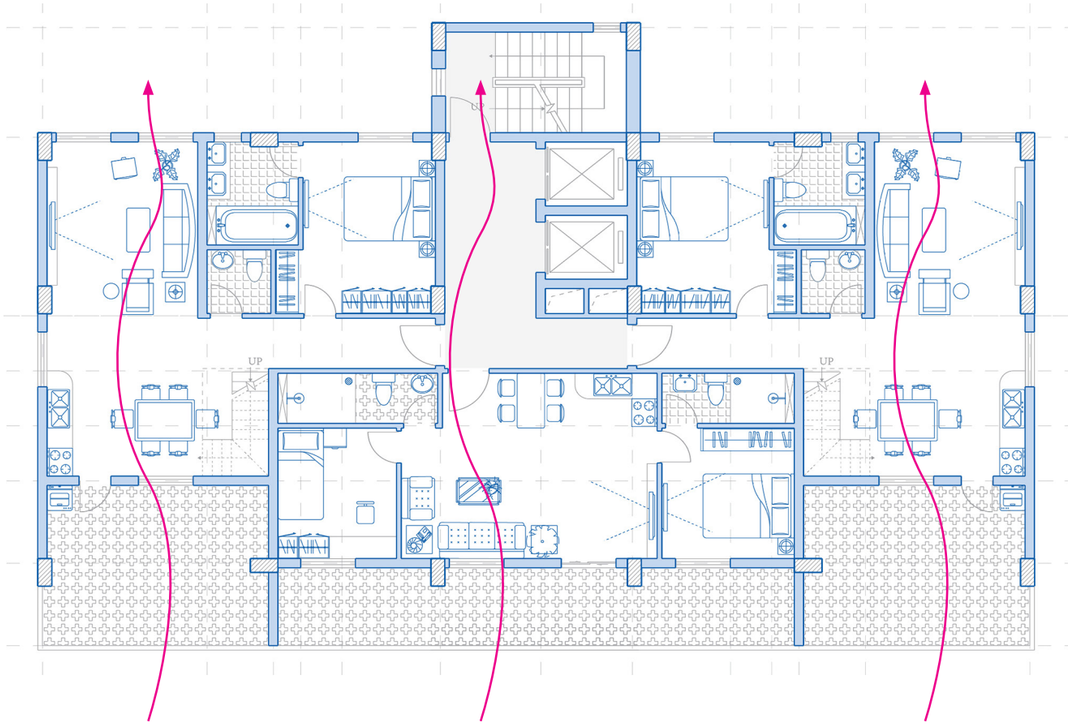


Direct daylight hours on winter solstice



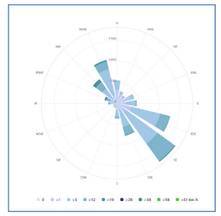




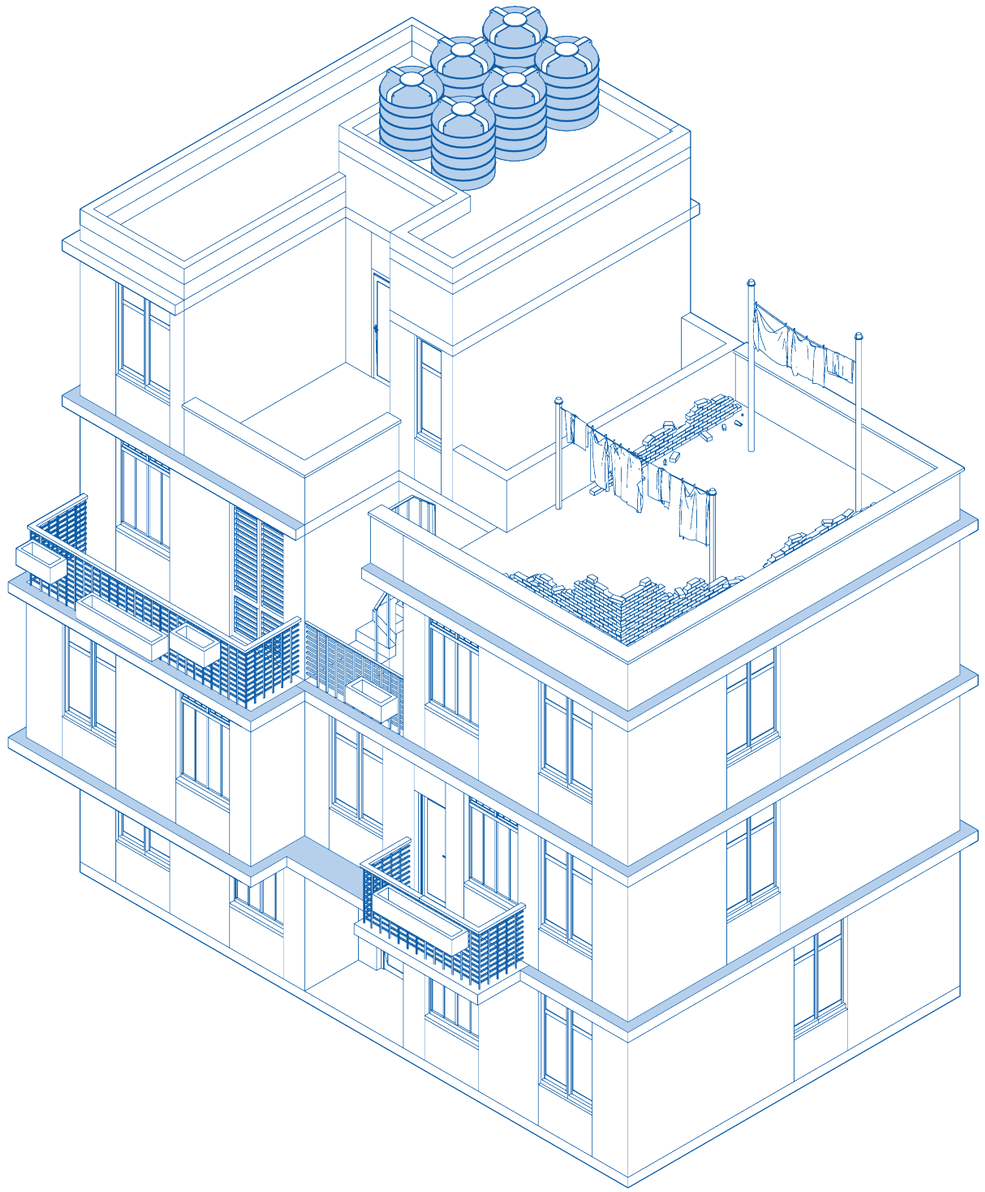


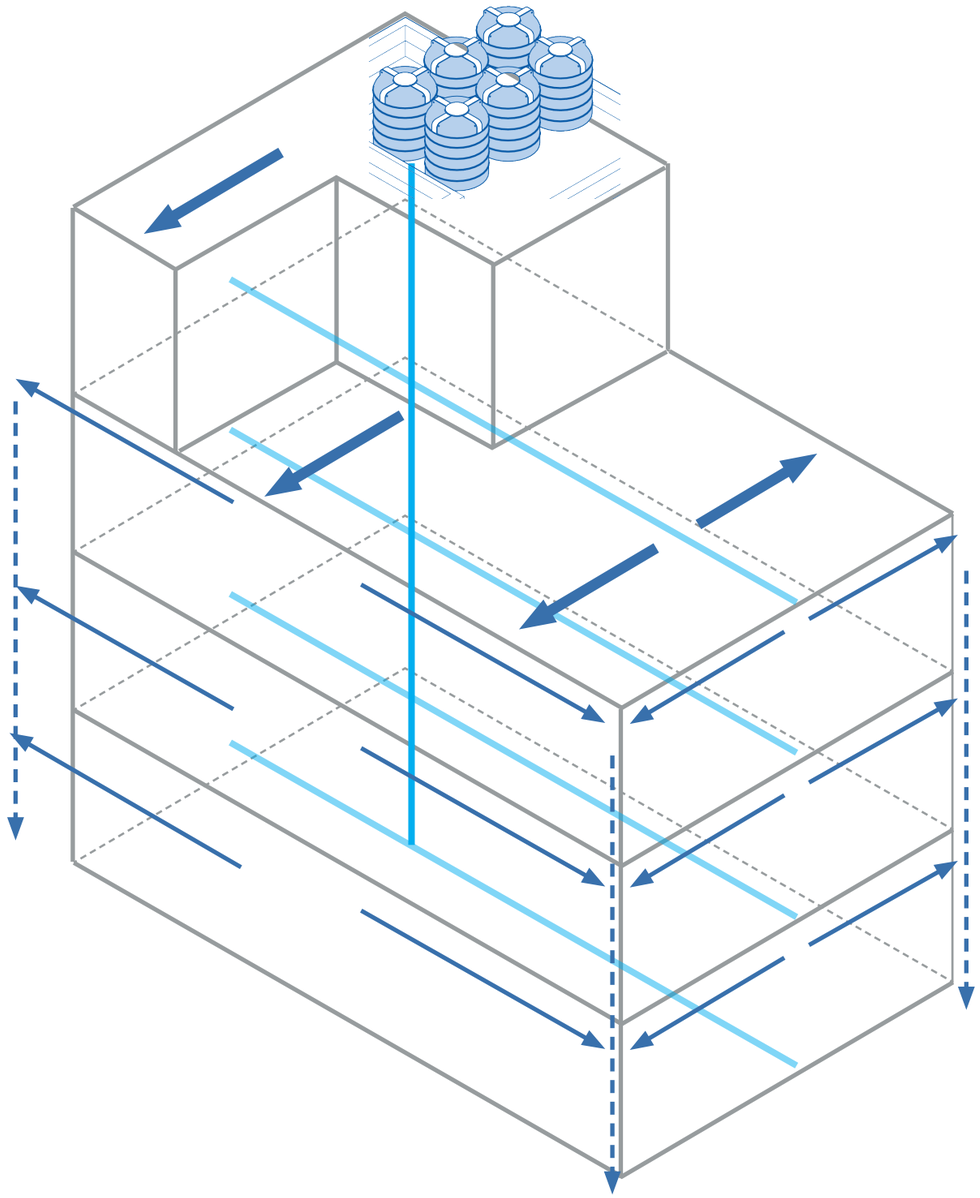
Unit scale











Rainwater drainage system

Rainwater collection system

Permeable pavers

Grass paver

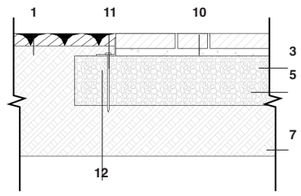
Rain garden

Flowerbed

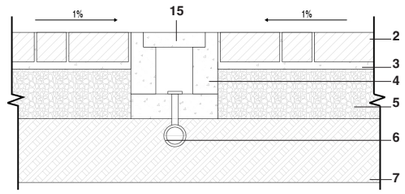


H

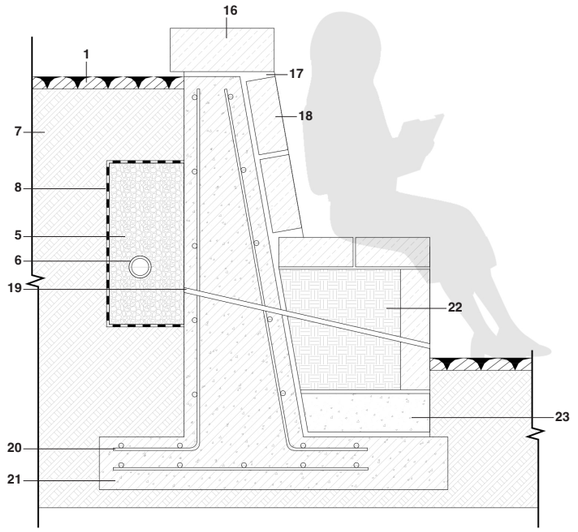
1Top soil
2 Block paving
3 Compacted sand blinding
4 Concrete edging
5 Compacted gravel base
6 Perforated pipe
7 Compacted native soil
8 Geotextile
9 Sand layer
10 Paver bricks
11 Spike
12 Paver edging
13 Filled-in soil
14 Tumbled Limestone
15 Steel drop Inlet
16 Cap rubble stone
17 Fill-in mortar
18 Rubble stone
19 Weep hole
20 Vertical and horizontal rebar
21 Reinforced concrete
22 Backfill native soil
23 Edge restraint concrete haunching
24 Hollow concrete blocks
25 Gabion baskets



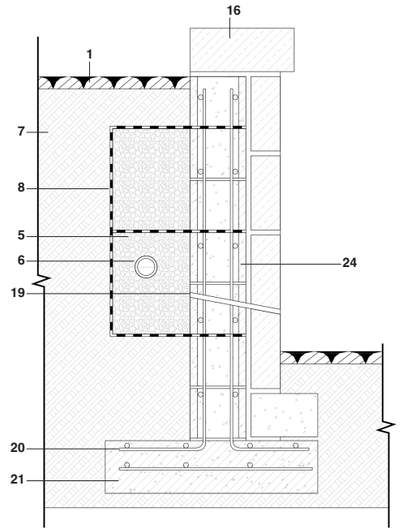
A I Path detail



B I Hard pavement drop

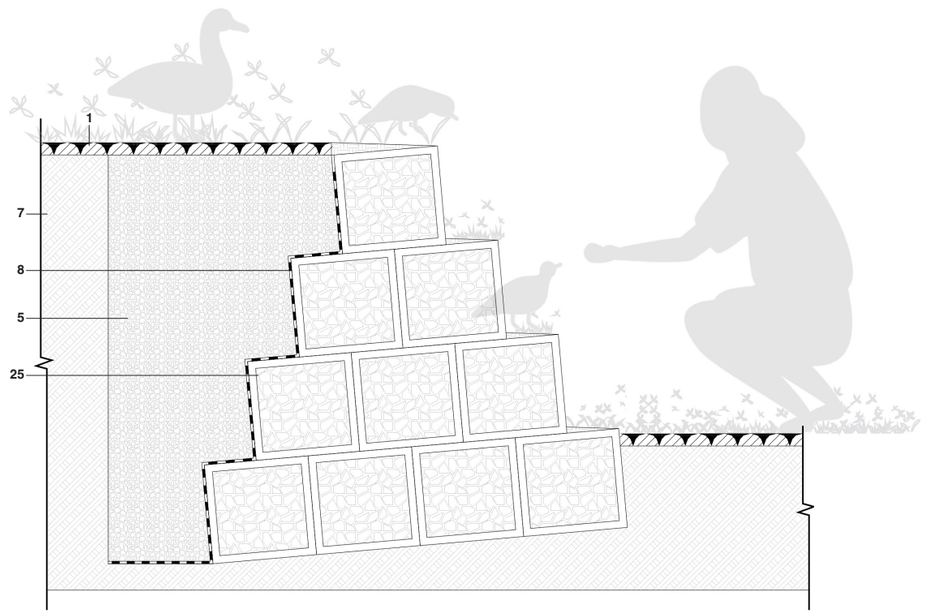


C I Landscape bench detail

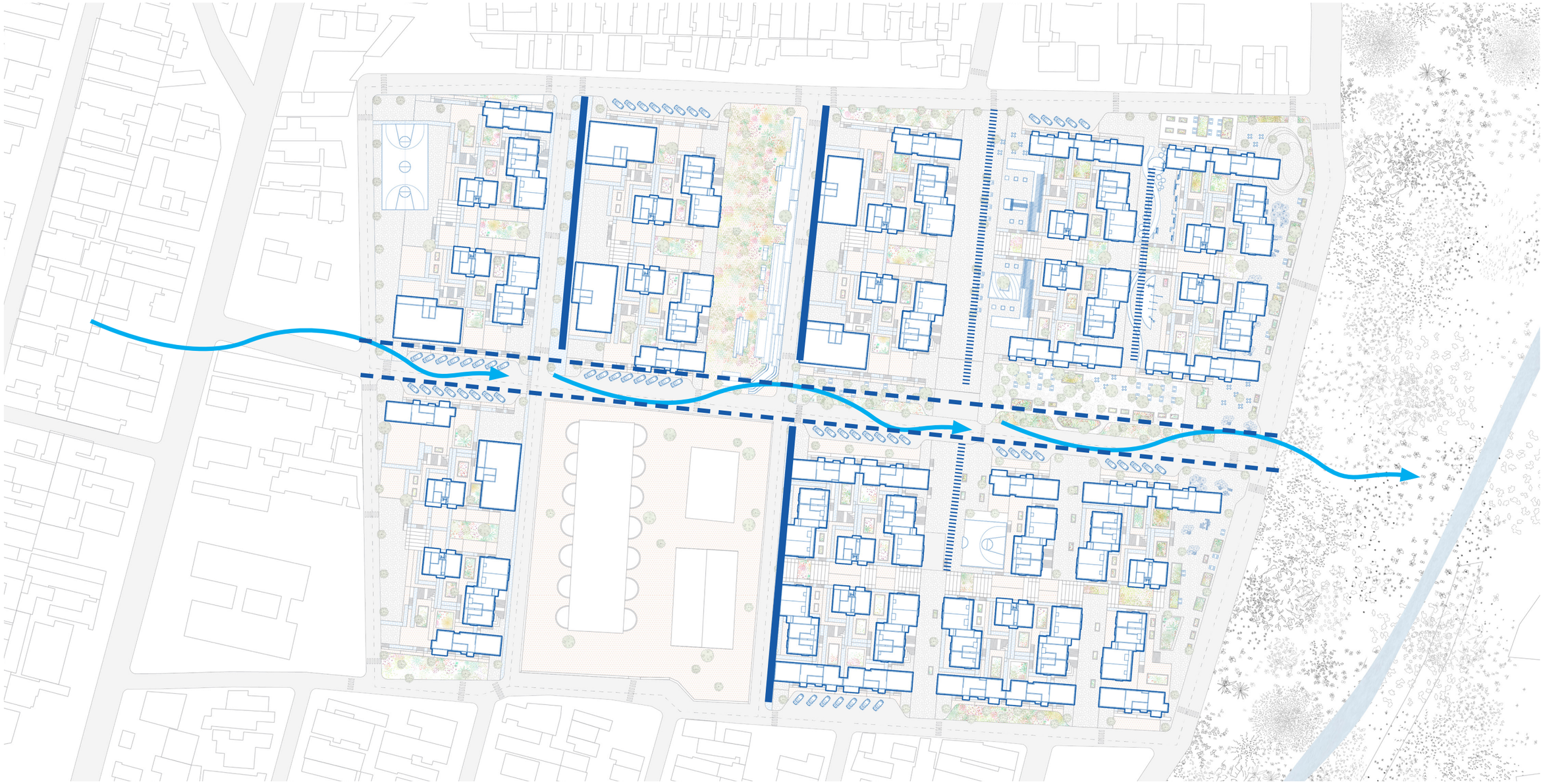


DI Concrete blocks retaining wall





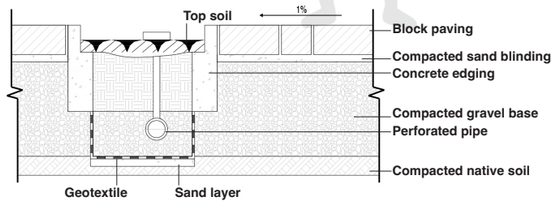
E I Landscape gabion



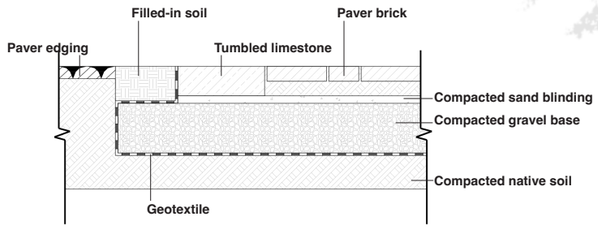
Biofilter

Permeable pavement

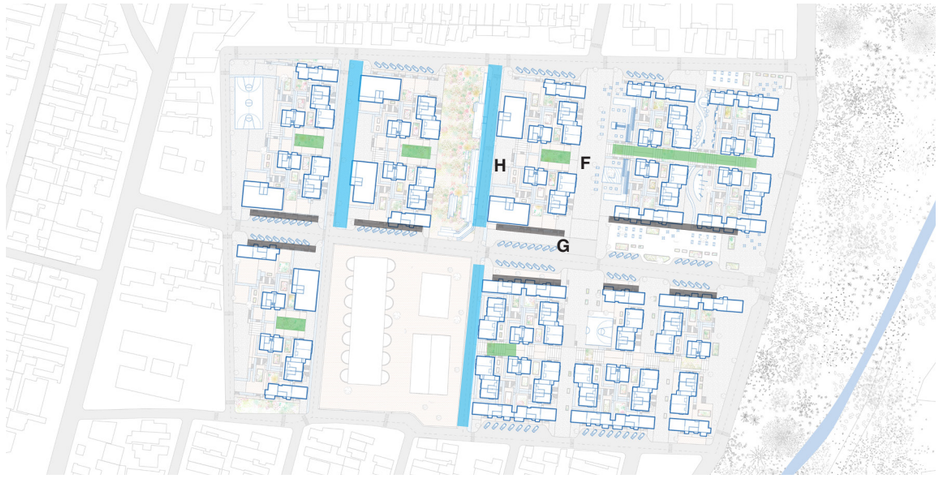
Biowales

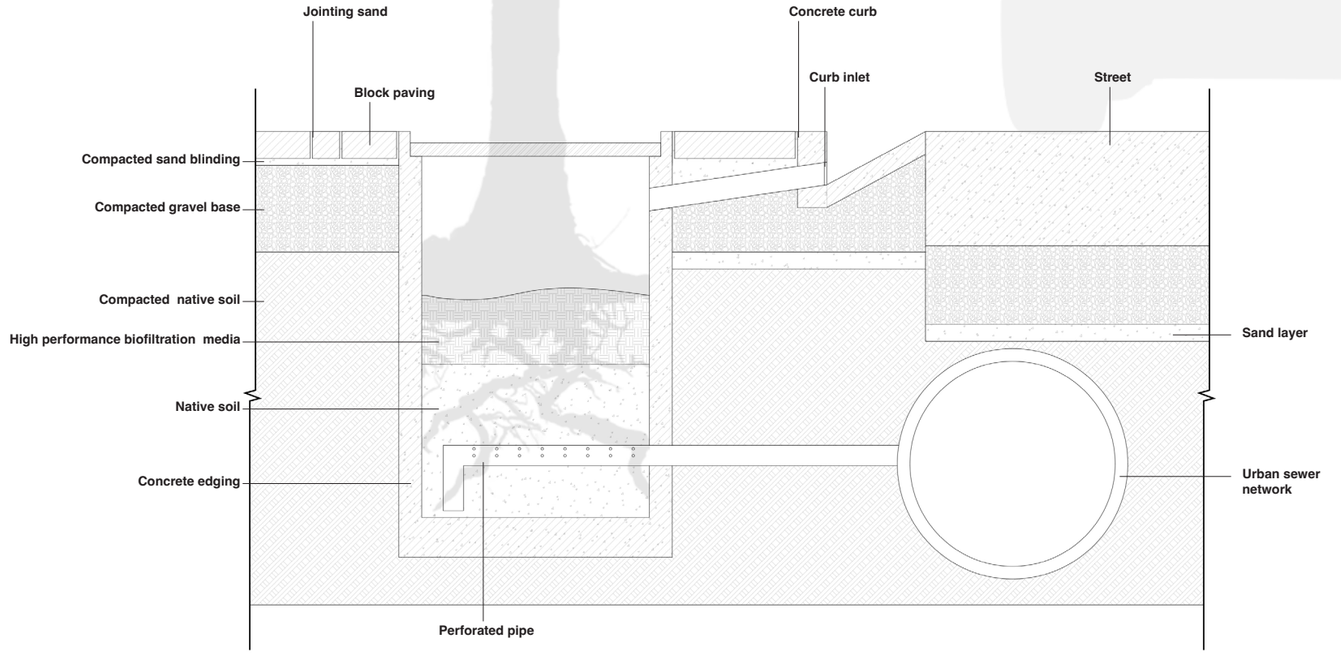


F I Landscape drop inlet



G I Pedestrian detail





H I Biofilter

05 Managerial Strategies

2009

Programa Minha Casa, Minha Vida (PMCMV)

10 years (2009-2019)
5.5 million viable homes,

HIS: Low-income
10% of property's value without interest over several years

HMP: Middle income
Smaller subsidies and interest rates 5%-9%

2020

Programa Casa Verde e Amarela (PCVA)

2 years (2020-2022)
1.2 million viable homes,
reaching around 1.5 million people.
benefiting 5 million people
384,000 units for socially vulnerable families

Gross income up to R$2000
Loads at low interest rates 4.75% with subsidy up to R$47.5 thousand

Gross income up to R$4000
Loads at low interest rates 5.25% with subsidy up to R$29 thousand

Gross income up to R$7000
Loads at low interest rates 7.66% without subsidy

2023

Programa Minha Casa, Minha Vida (PMCMV)

3 years (2023-2026)
2 million viable homes

Gross income up to R$8000
the nominal interest rates ranging from 4.50% to 8.16% associated with financing 50% of a property's value over a 35-year repayment period.

Source: https://www.gov.br/en/government-of-brazil/latest-news/2022/casa-verde-e-amarela-1

MCMV

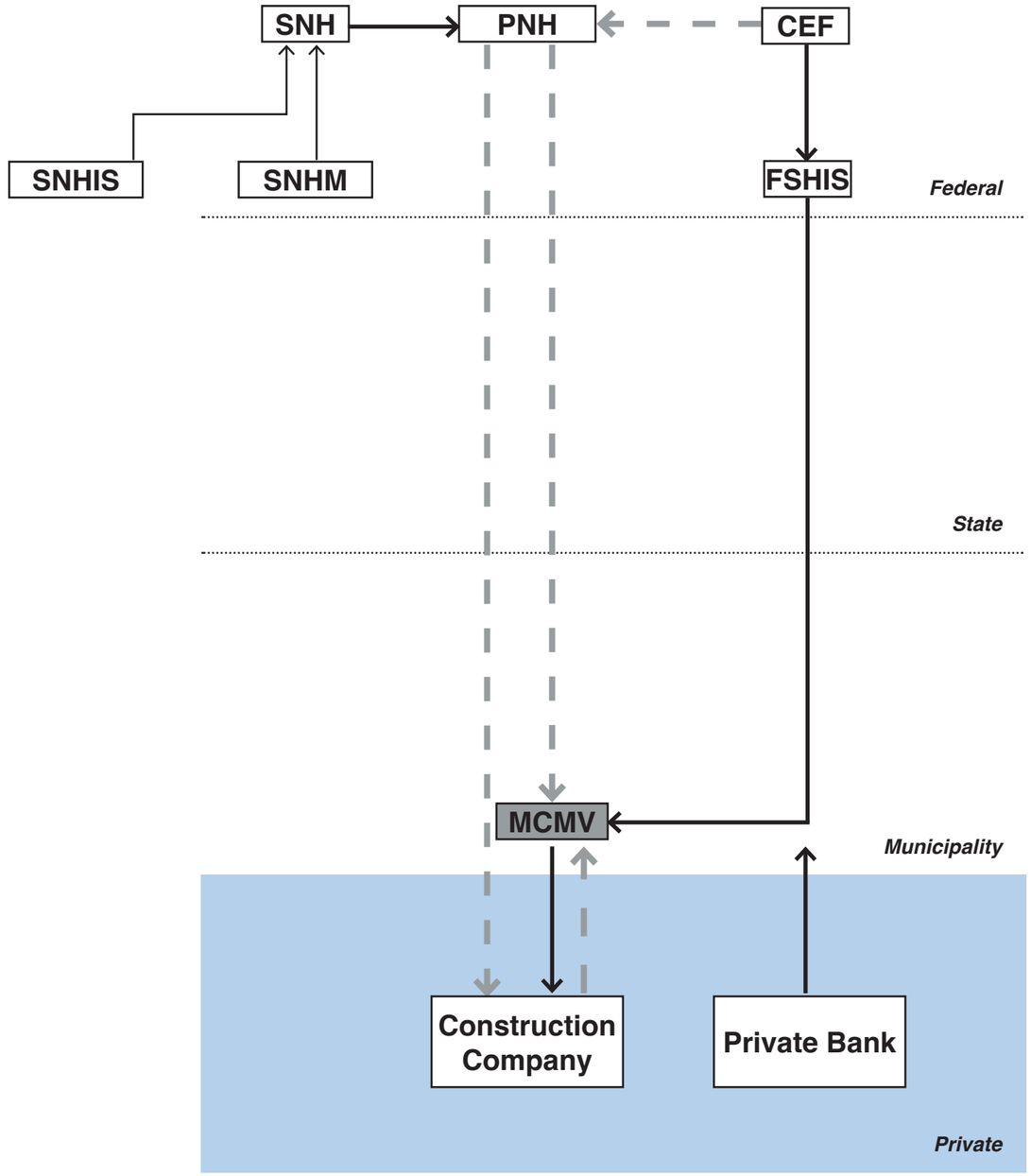
Focusing on the MCMV, it aims to implement the PNH, in SNHIS or SNHM aspect, receiving from the federal Treasury the funding to finance the MCMV. Thus, the later program made the PNH devoid of meaning because the MCMV has received resources from FSHIS, which should be directed to PNH. That way of conducing public policy has received some critics because the MCMV program does not require anything in return from the construction companies, which have only built the house without concern about urbanization.

In Rio, Over half of MCMV properties are located in the West Zone, a huge, largely underserviced region. These housing developments have been widely criticized by residents for lacking adequate infrastructure and transport links. Families accustomed to the intricate **social networks** and **mixed-use** properties in Rio's favelas have had trouble adjusting to the single-use and highly regulated MCMV complexes that offer little in the way of public or commercial space. Residents who work in the South Zone or North Zone must now accommodate significantly longer commutes, making continued employment in the city's commercial center difficult. Several MCMV properties have also been criticized for poor construction quality, the worst incident requiring demolition following the appearance of huge cracks in the R$19 million investment, and another notable case resulted in the evacuation of families from Bairro Carioca last year after apartments on the first floor were flooded.

Service

Adaptation

Qualities



PNH Housing National Policy.

SNH National System of Housing

SNHM Market National Housing System

SNHIS National System of Social Interest Housing

MCMV My House, My Life Program

CDHU Housing and Urban Development Company.

FSHIS Federal fund of Social Interest Housing

CEF Caixa Econômica Federal

Casa Paulista

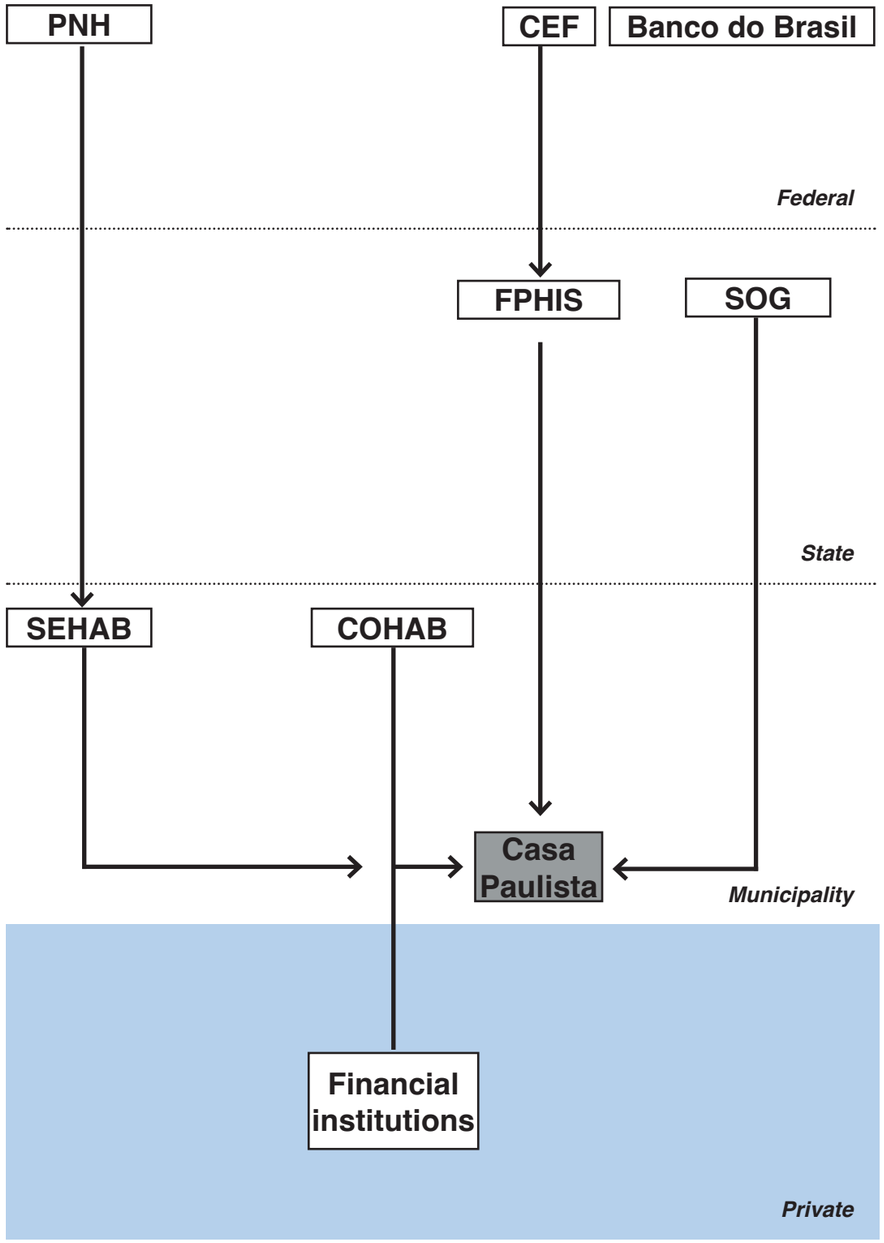
In line with the São Paulo State Housing Plan 2011-2023 (PEH-SP), a future housing deficit of 3.19 million units still persists. To combat this challenge, the state government introduced the Casa Paulista Program in 2013. This program's primary objective is to stimulate the construction of affordable housing and the regularization of land in areas inhabited by low-income communities. The program is overseen by the state's Department of Housing and funded through the São Paulo Housing Fund for Social Interest (FPHIS).

Since its creation, Casa Paulista has delivered a number of housing units across the state through **public-private partnerships** and in collaboration with the federal government through the Minha Casa, Minha Vida program. In addition, Casa Paulista has invested in land regularization, including legalizing land titles and guaranteeing access to basic services such as water, electricity and sewage.

PPP



http://www.estrategiasurbanas.com.br/portfolio-urban-interventions-projects/casa-paulista.html

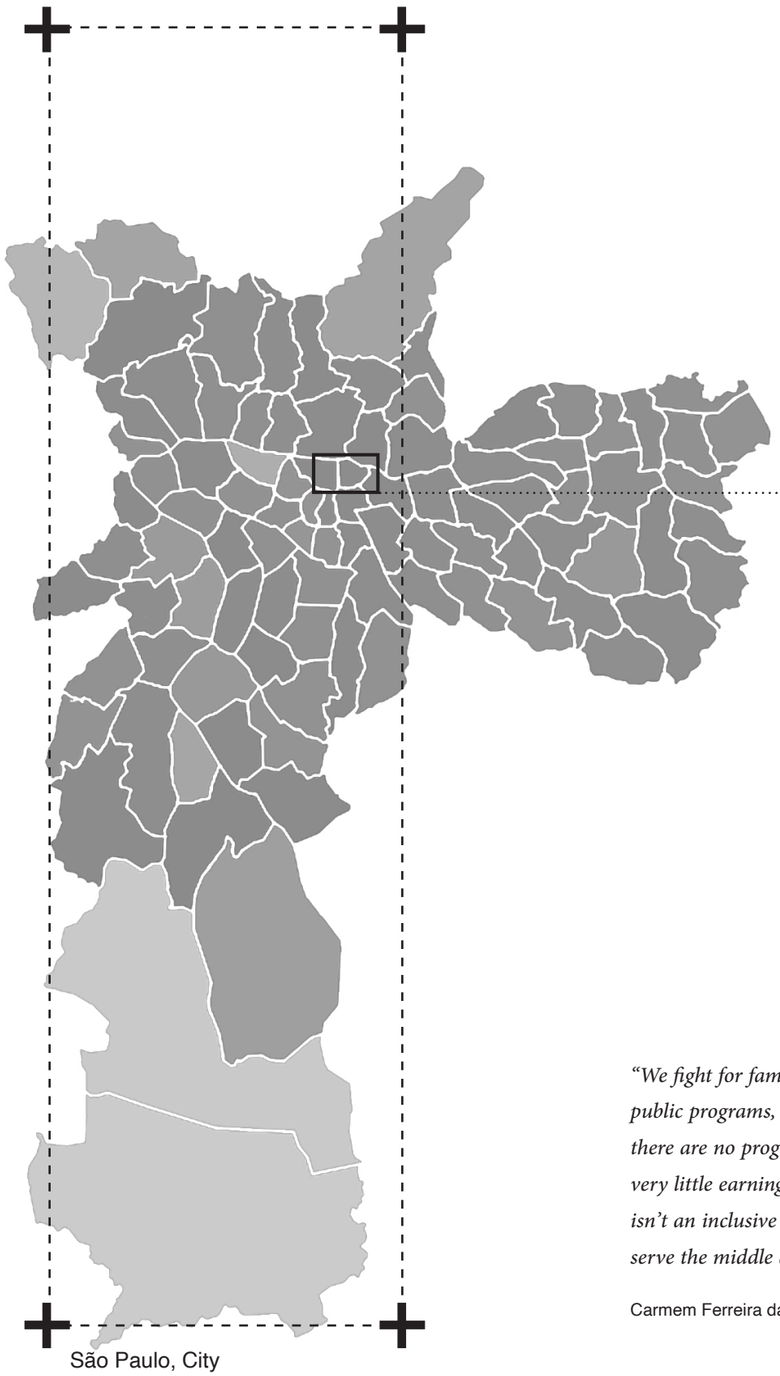


FPHIS Paulista Social Interest Housing Fund

COHAB Metropolitan Housing Company of São Paulo

SEHAB Municipal Housing Secretariat

SOG Planning & Management Secretariat of the State of São Paulo



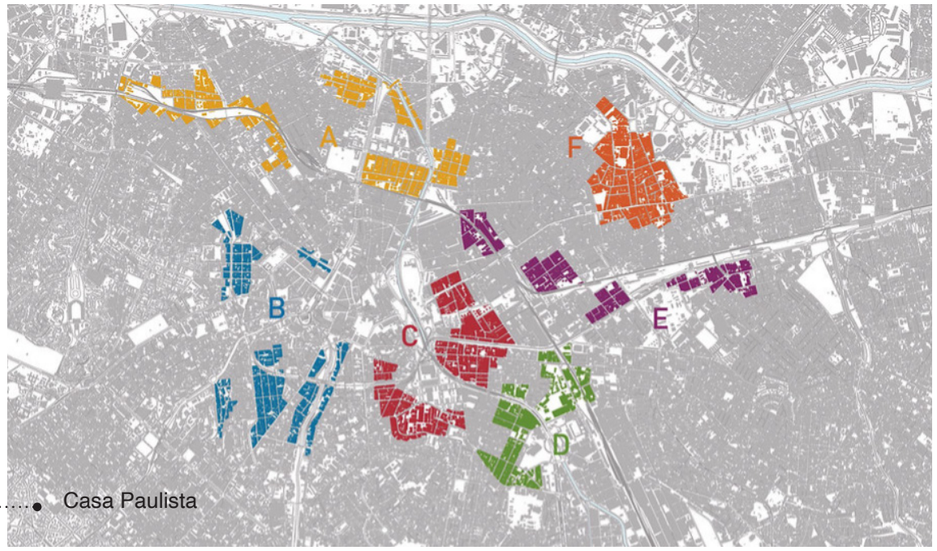


Table 1. Scope of Casa Paulista PPP in the different phases of the modeling process.

Eligible Mortgage Buyers Per Income Category (MMW)	Housing Category	Number of Housing Units per Modeling Phase							
		Public Notice		Original Model		Tender		Contract (*)	
		Units	%	Units	%	Units	%	Units	%
1 to 5	HIS	9,000	90	12,508	62	9,000	64	2,260	61
5 to 10	HMP	1,000	10	3,159	16	5,133	36	1,423	39
10 to 16	Market	-	-	4,554	23	-	-	-	-
Total		10,000		20,221		14,133		3,683	

Source: Author/(*) The final contract directed HIS units to population with earnings equivalent to between 1 and 6 MMW.

Selective

*"We fight for families **to be included** in available public programs, preferably in the city centre, but there are no programs available here for families with very little earnings ... . It is clear to us that the PPP isn't an inclusive program; it's selective. The PPP will serve the middle and high-income classes."*

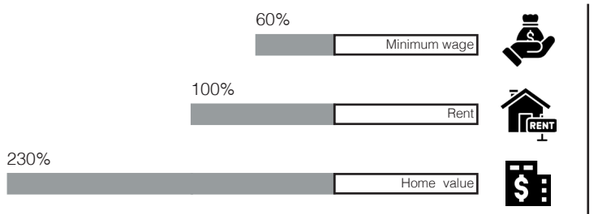
Carmem Ferreira da Silva, Social leader

Table 1: Conditions for HIS and HMP unit financing in São Paulo

São Paulo's PMH			
Categories	Values of family monthly income		Commitment of monthly income
	Reals (BRL)	Conversion in Dollars (USD)	
HIS	810.00 - 1,600.00	154.87 - 305.92	20%
	1,600.01 - 2,430.00	305.93 - 464.62	22%
	2,430.01 - 3,240.00	464.63 - 619.50	25%
	3,240.01 - 4,344.00	619.51 - 830.59	27%
HMP	4,344.01 - 5,792.00	830.60 - 1,107.45	FGTS Rules[1]
	5,792.01 - 8,100.00	1,107.46 - 1,548.75	FGTS Rules

Sources: São Paulo (2018a, 2018b), Exchange-rates.org (2020). Organized by the authors.





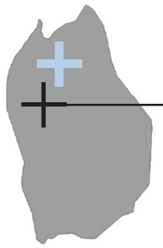
High rent

Job loss

Decreased salary

Growing family size

Better location



Low-income families

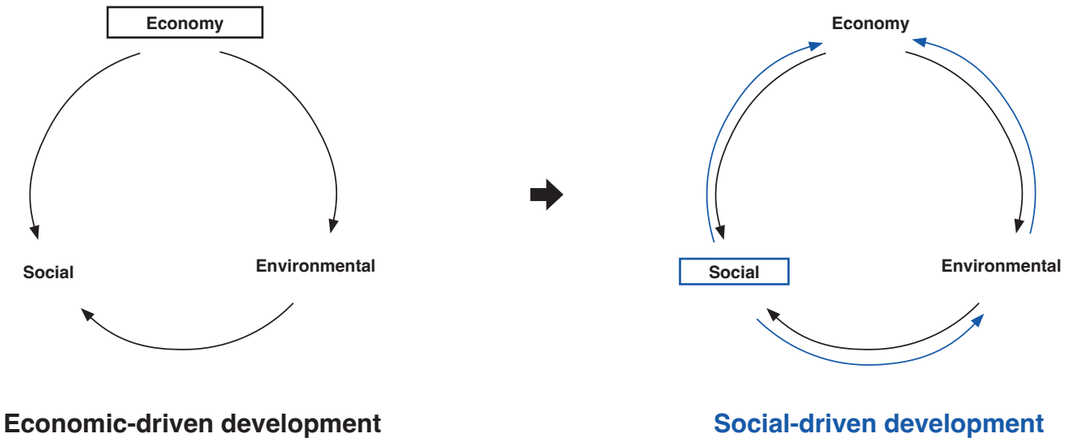
Ocupação Anchieta



		Monthly income	***Mortgage***	***Homeowners' association fees***	***Water& Electricity***
12.50%	***Range 0***	0 R$			With 65% discount
70.56%	***Range 1***	0 - 1800R$	80-270 R$	10 - 200R$	20+ R$
11.72%	***Range1.5***	1800 - 2600R$			
4.64%	***Range 2***	2600 - 4000R$			
0.58%	***Range 3***	4000 - 7000R$			

26%

Cost-burdened



Economic-driven development

Social-driven development

Goals and purposes

Economic-driven social housing projects primarily prioritize economic objectives, such as profit generation, cost efficiency, and return on investment. While they may still provide housing for low-income populations, the primary goal is financial gain.

Profit

Equity

The primary goal of a social-driven social housing project is to provide safe, affordable, and inclusive housing solutions for marginalized or low-income communities. The emphasis is on addressing social issues, such as homelessness, poverty, and inequality, by improving living conditions and fostering community well-being.

Rent and affordability

Economic-driven projects may focus on achieving a market-rate return on investment, potentially leading to higher rent levels. While they may still serve low-income populations, rent affordability might not be the primary concern.

Investment

Feasibility

Social-driven projects often prioritize keeping rent levels affordable for low-income individuals or families. They may involve government subsidies or non-profit organizations to ensure affordability and long-term stability for residents.

Design and features

Economic-driven projects may prioritize cost savings in design and construction, potentially leading to simpler or less aesthetically pleasing designs. Features that enhance the social aspects of housing may be secondary to cost considerations.

Productivity

Quality

These projects tend to prioritize architectural and design features that enhance the quality of life for residents. Considerations include communal spaces, accessibility, energy efficiency, and features that promote community engagement and social cohesion.

Community engagement

While community engagement is important in any housing project, economic-driven projects may prioritize efficiency and cost-effectiveness over extensive resident involvement in decision-making.

Efficiency

Empowerment

These projects typically involve extensive community engagement and input from residents and community organizations. The goal is to empower residents and incorporate their needs and preferences into the design and management of the housing.

Long-term social impact

Economic-driven projects may focus on short-term economic gains, such as property value appreciation or rental income, without necessarily considering the long-term social benefits of the housing development.

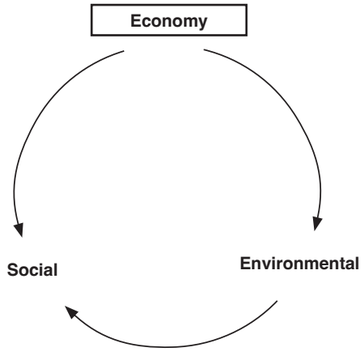
Property

Sustainability

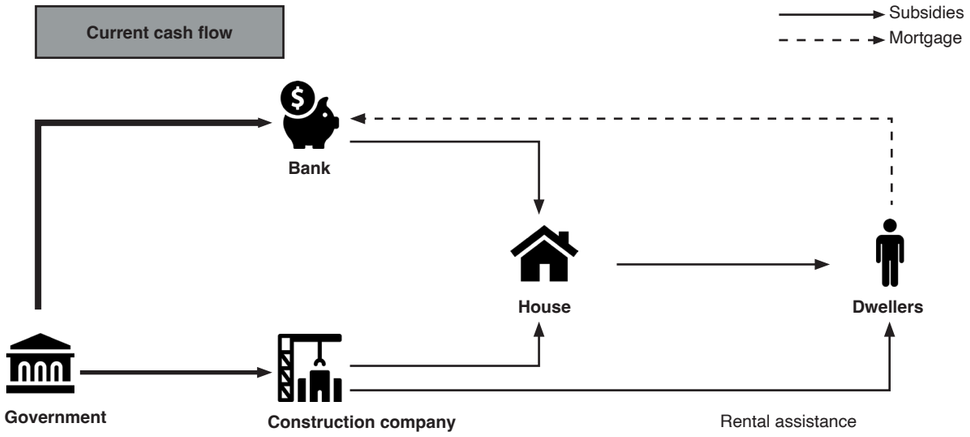
Social-driven projects often aim for long-term social impact, such as improved community well-being, reduced poverty, and increased social cohesion. They see housing as a means to achieve broader social objectives.

Management

In what ways can architecture provide **opportunities** for marginalized individuals to actively participate and engage within their community?

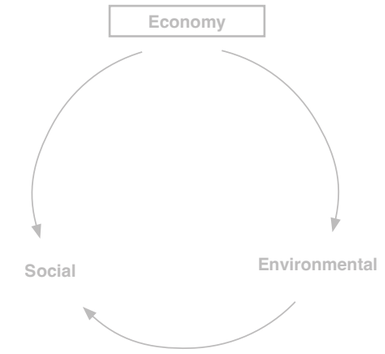


Economic-driven development

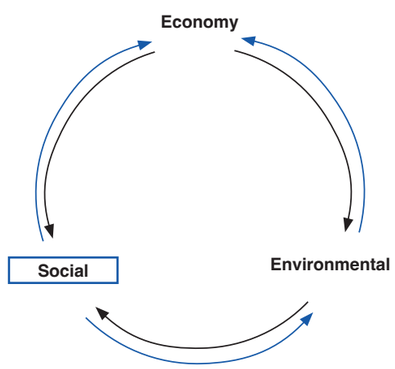


Management

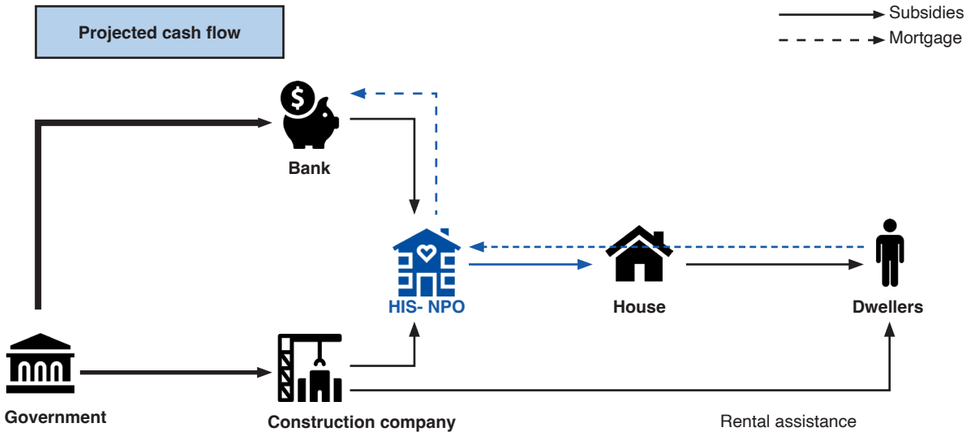
In what ways can architecture provide **opportunities** for marginalized individuals to actively participate and engage within their community?



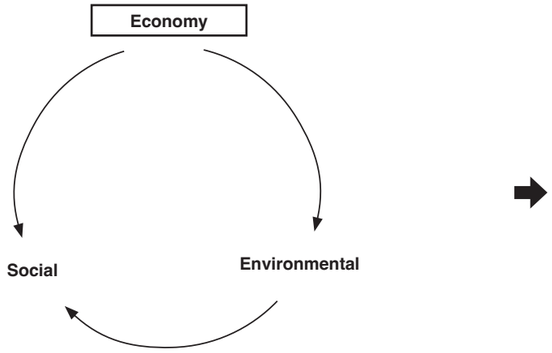
Economic-driven development

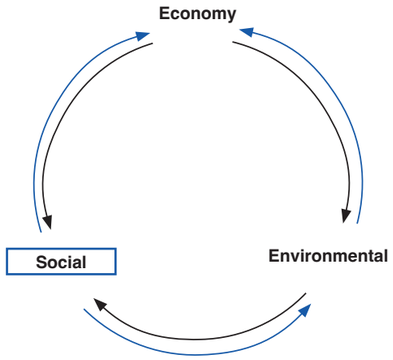


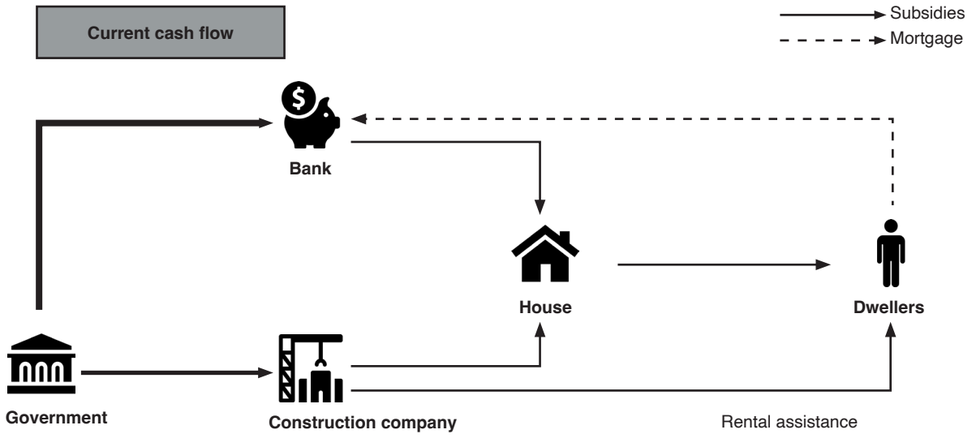
Social-driven development



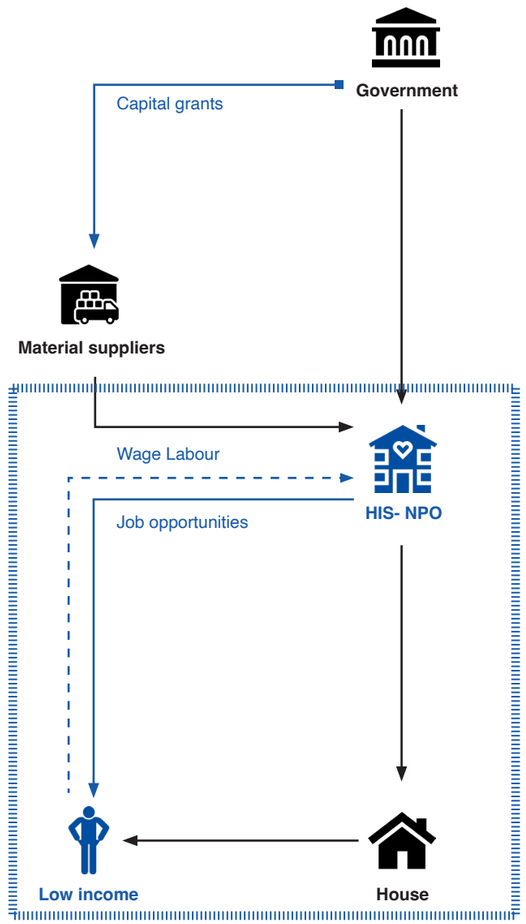
HIS-NPO Non-Profit Organization for Social Interest Housing



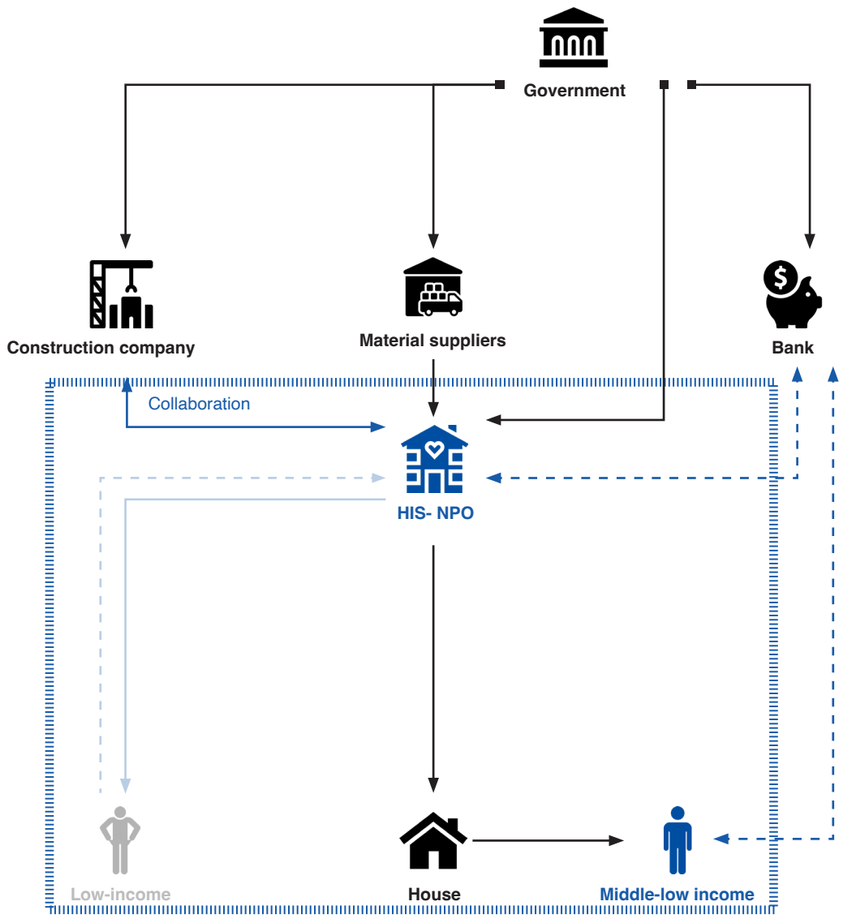




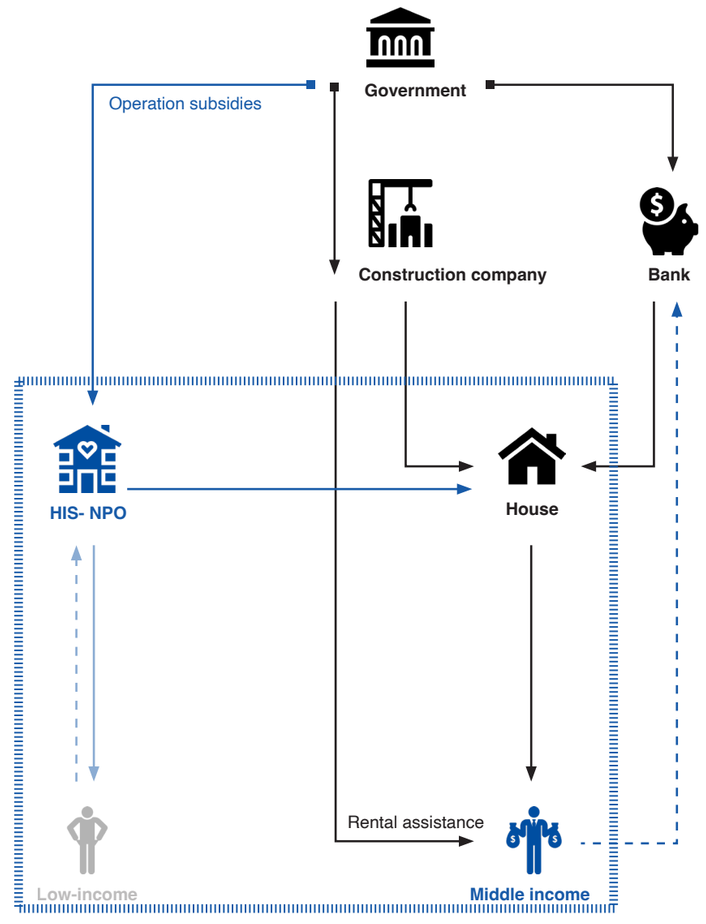
Low income groups ***HIS-1*** 0-3 minimum wage



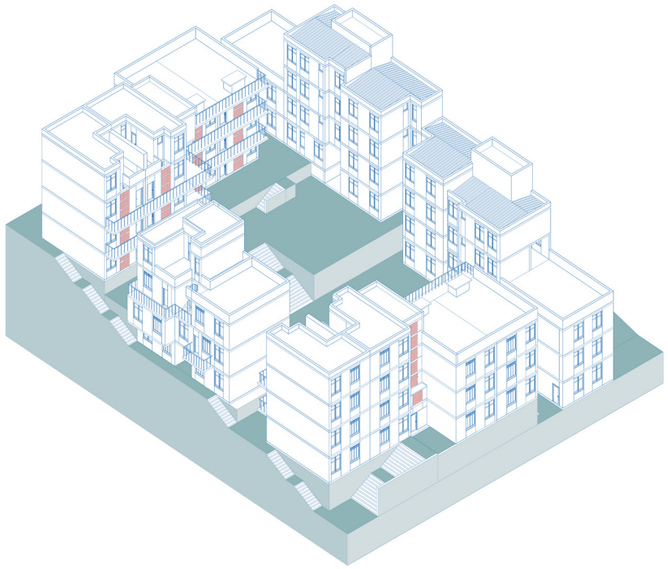
Middle-low income groups ***HIS-2*** 3-6 minimum wage



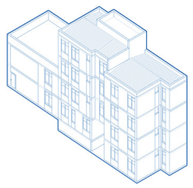
Middle income groups ***HMP*** 6-10 minimum wage



HIS-NPO Non-Profit Organization for Social Interest Housing



Chain house

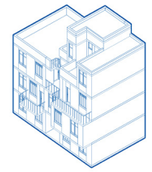


Facing brick

Purlins

Concrete foundation

Slab house

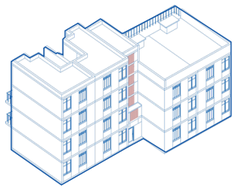


Insulation

Damp proofing course

Cavity brick wall

Row house

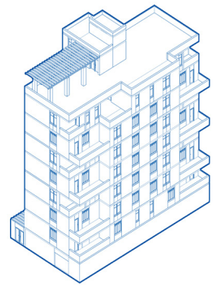


Water tank

Concrete slab

Brickworks

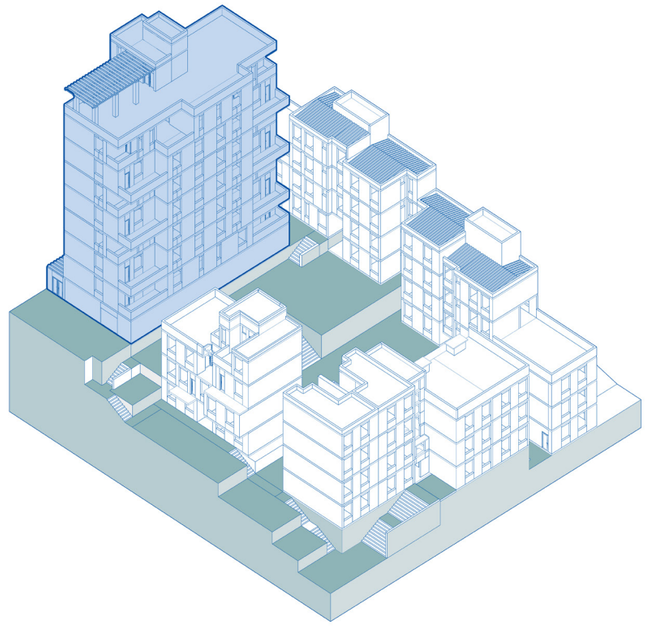
Condominium



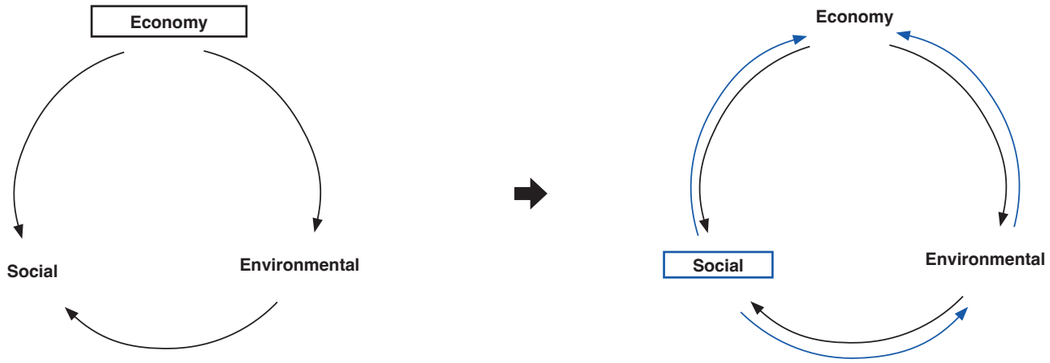
Timber joint

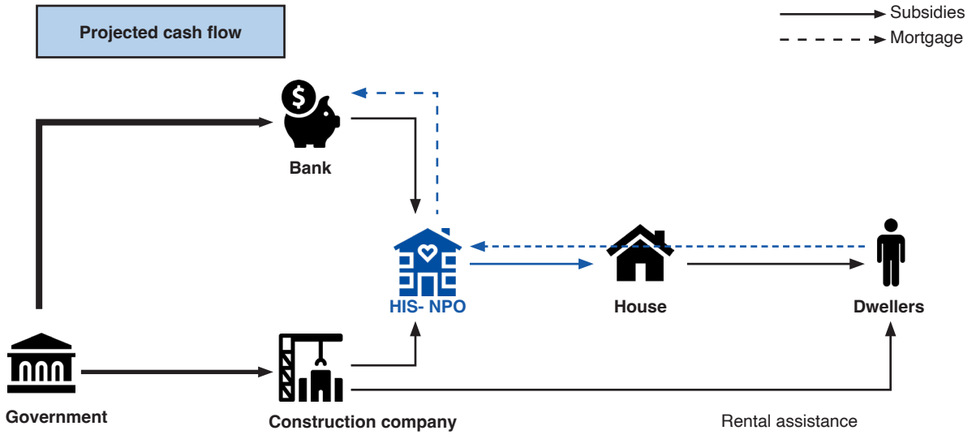
Concrete frame

Hollow concrete blocks



Training and Mastery

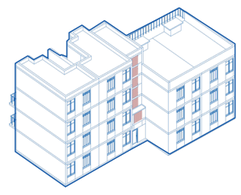


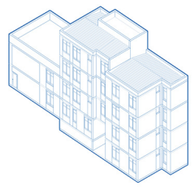


Expert-guided self-help Housing

Workers

Builders	Structure	Materiality
Workers	*Brick load bearring walls*	*Concrete*
	Brick infill walls	*Bricks*
	Concrete slabs	

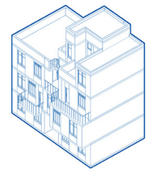




Collaborative affordable Housing

Collaborative

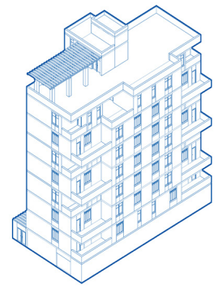
Builders	Structure	Materiality
Contractor	*Brick column*	*Concrete*
Workers	*Brick infill walls*	*Bricks*
	Concrete slab	



Market housing

Contractor

Builders	Structure	Materiality
Contractor	*Concrete frame*	*Concrete*
Workers	*Concrete interior walls*	*Metal*
	Facade	*Timber*



HIS-NPO Non-Profit Organization for Social Interest Housing

Public Entities

Land department - ***SEHAB***
Urban planning department - ***SOG***
Housing authority - ***COHAB***
Economic affairs - ***FPHIS***
Civil infrastructure manager

This group comprises government departments and agencies responsible for various aspects of the project. The Land Department manages land resources, the Urban Planning Department handles urban development and zoning, the Housing Authority is responsible for housing initiatives, the Economic Affairs department may provide funding and support, and the Civil Infrastructure Manager oversees critical infrastructure components.

Professional Advisor

Process Manager
Architects and Designers
Sustainability consultant

These are experts and consultants crucial to project planning and execution. Process Managers coordinate and manage project implementation, Architects and Designers design the housing units, and Sustainability Consultants focus on environmentally responsible practices to ensure a sustainable outcome.

Market Participants

Real estate developer
Private construction company
Supplier and manufacturers
Utility and Service Providers

This category includes private sector entities that actively participate in the construction and development of social housing projects. Real Estate Developers initiate and fund the projects, Private Construction Companies carry out the physical construction, Suppliers and Manufacturers provide necessary materials, and Utility and Service Providers ensure essential services are available to residents.

Community and Residents

Future residents
Locals from Grajaú
Relocated inhabitants from Parque Cocaia
Non-profit organizations - ***HIS-NPO***

These stakeholders directly experience the impact of the project and are its ultimate beneficiaries. Future Residents will live in the newly constructed housing units, Locals from Grajaú form the existing community, Relocated Inhabitants from Parque Cocaia may be affected by the project, and Nonprofit Organizations often represent community interests and provide support for development efforts.

SEHAB Municipal Housing Secretariat

SOG Planning & Management Secretariat of the State of São Paulo

COHAB Metropolitan Housing Company of São Paulo

FPHIS Paulista Social Interest Housing Fund

HIS-NPO Non-Profit Organization for Social Interest Housing

Who

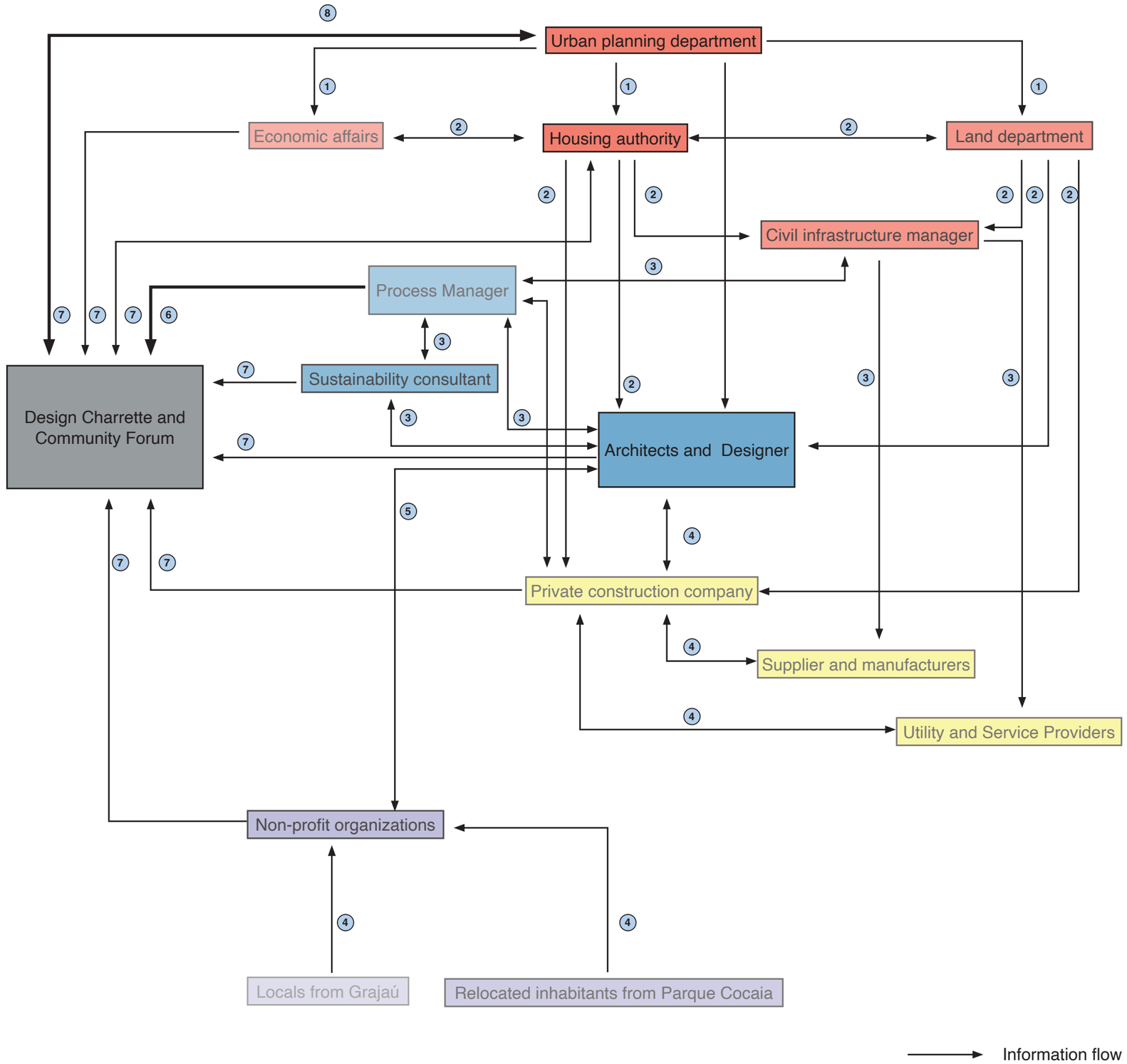
Public Entities	Social Interest	Environ-mental concern	Economic influence	Aspiration	Prioritization
Land department - ***SEHAB***	4	4	4	Optimize land use to create sustainable, well-planned housing developments that improve the environment and quality of life in favela areas.	4.0
Urban planning department - ***SOG***	5	5	4	Integrate environmental sustainability into urban design, promoting green spaces, efficient transportation, and resource-efficient infrastructure.	4.7
Housing authority - ***COHAB***	5	5	4	Provide safe, affordable, and environmentally friendly housing solutions that uplift communities and reduce the environmental impact of informal settlements.	4.7
Economic affairs - ***FPHIS***	3	3	5	Seek to stimulate economic growth through sustainable construction practices, creating job opportunities in eco-friendly sectors.	3.6
Civil infrastructure manager	4	4	4	Focuses on sustainable infrastructure development, including efficient utilities, waste management, and transportation, to support the well-being of residents.	4.0
Professional Advisor					
Process Manager	4	3	3	Streamline project development processes to reduce resource consumption, minimize waste, and enhance project efficiency while meeting sustainability goals.	3.5
Architects and Designers	5	4	4	Create environmentally responsible and culturally sensitive housing designs that incorporate green building techniques, energy efficiency, and community engagement.	4.5
Sustainability consultant	5	3	3	Provide expertise in sustainable building practices, energy efficiency, and green certifications to ensure the project aligns with best environmental practices.	4.0
Market Participants					
Real estate developer	3	4	5	Seek to balance profitability with environmental responsibility by integrating sustainable features that attract environmentally conscious buyers or renters.	3.8
Private construction company	3	4	5	Meet sustainability requirements efficiently and cost-effectively while adhering to environmental regulations and industry standards.	3.8
Supplier and manufacturers	3	3	4	Provide eco-friendly building materials and technologies that support sustainable construction practices.	3.3
Utility and Service Providers	3	4	4	Offer renewable energy, water-saving solutions, and eco-conscious service options to reduce the environmental footprint of the project.	3.5
Community and Residents					
Future residents	4	2	3	Live in safe, affordable, and sustainable housing that improves their quality of life and the environment in their neighborhood.	3.1
Locals from Grajaú	4	2	2	Seek improved living conditions, reduced pollution, and increased access to green spaces and amenities while preserving their community's cultural identity.	2.8
Relocated inhabitants from Parque Cocaia	4	3	2	Desire safe and sustainable housing options that allow them to rebuild their lives while minimizing environmental impacts.	3.0
Non-profit organizations - ***HIS-NPO***	5	3	4	Advocate for and support projects that enhance the environmental sustainability of favela areas, address social equity, and empower residents.	4.3

Prioritization Priority Score = Priority Score = (Social Interest Score * Weight for Social Interest) + (Environmental Concern Score * Weight for Environmental Concern) + (Economic Influence Score * Weight for Economic Influence)
Weight for Social Interest=0.5 Weight for Environmental Concern=0.2 Weight for Economic Influence=0.3

Planning and management

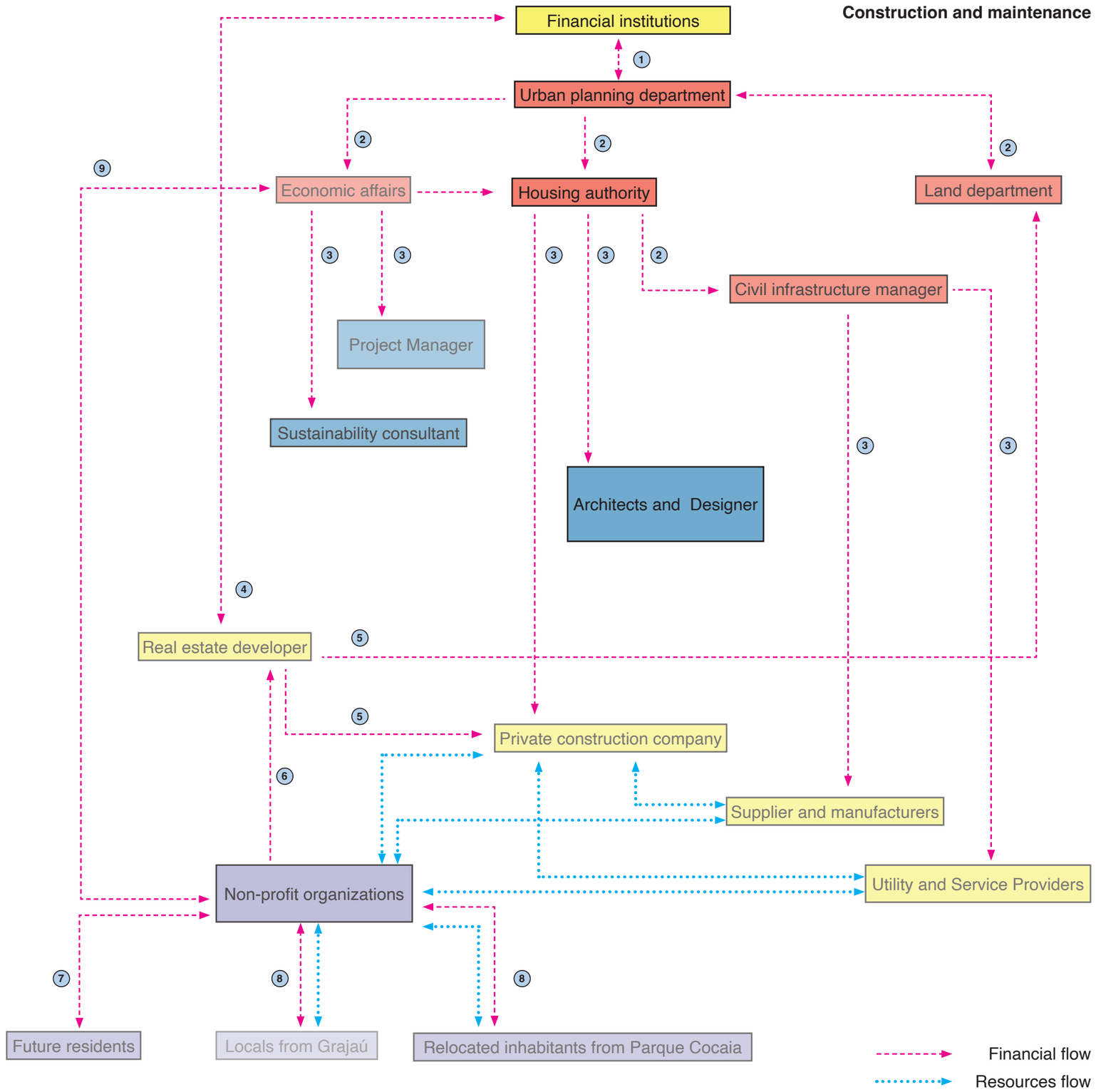
Information exchange

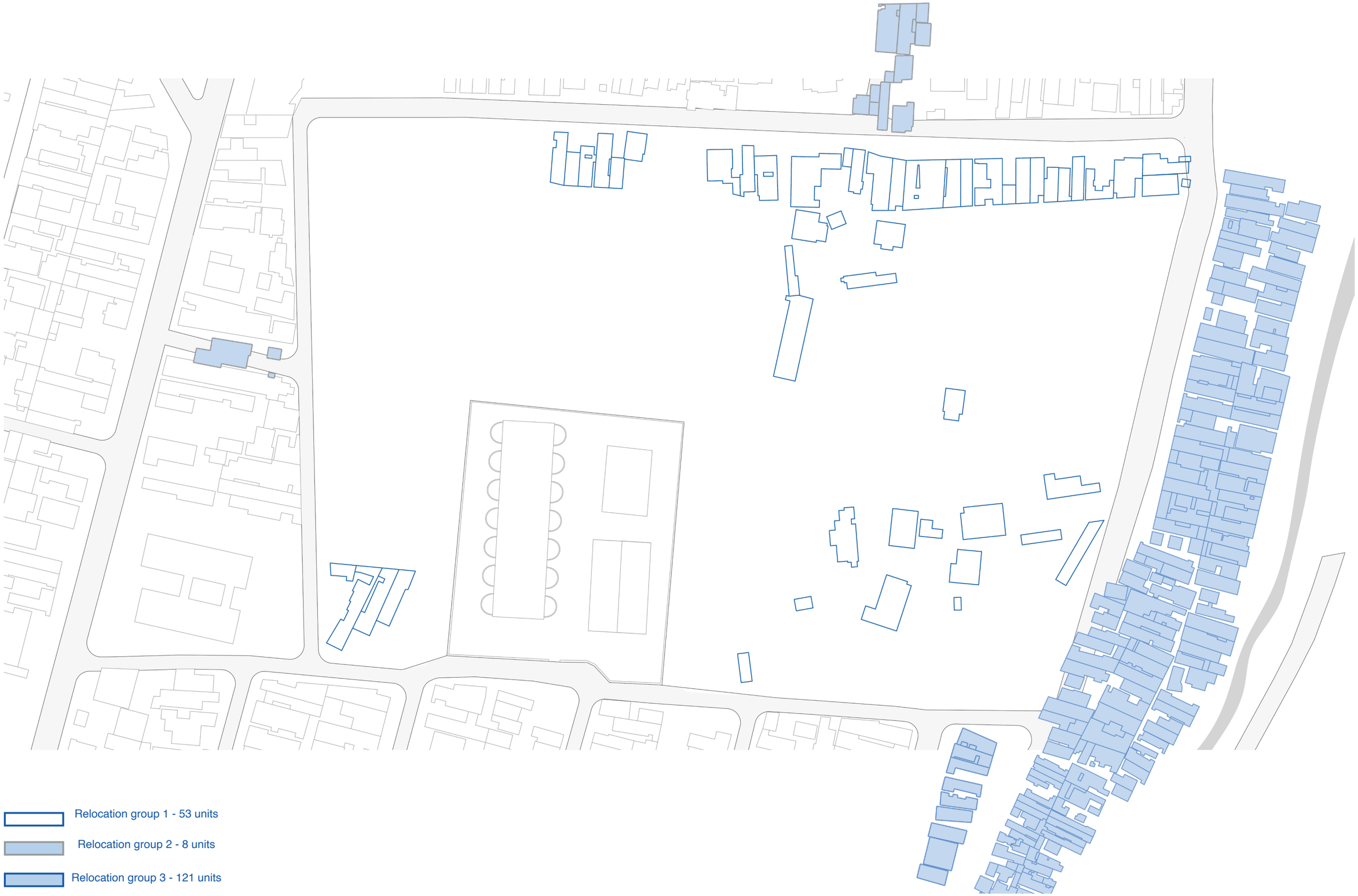
1. Establish Clear Points of Contact
2. Information sharing
3. Identify information needs
4. Feedback collection
5. Incorporate community input
6. Conflict resolution mechanism
7. Regular coordination meeting
8. Documentation and reporting

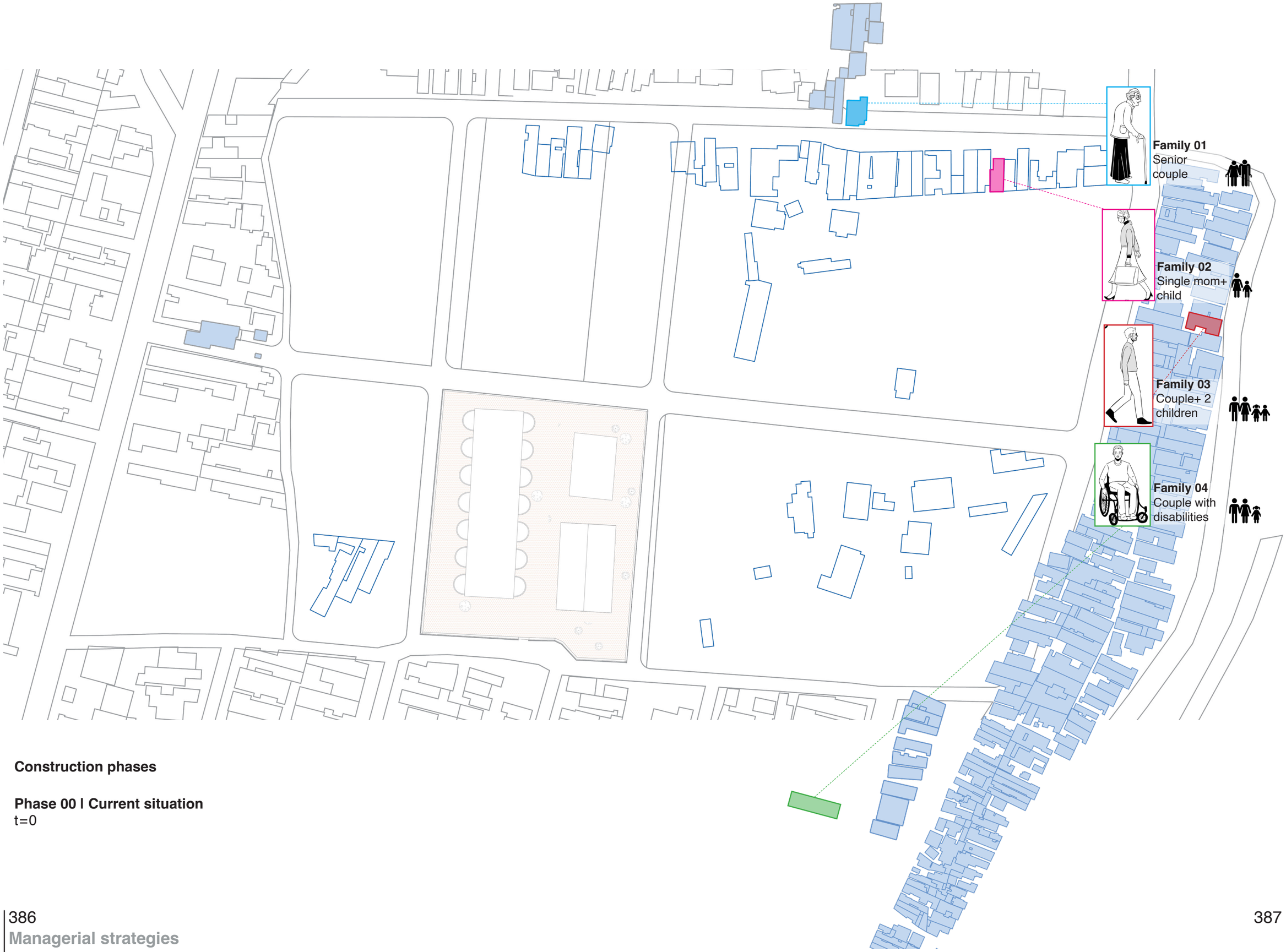


Financial transaction

1. Budgeting and funding allocation
2. Monitoring and disbursement
3. Budget tracking and reporting
4. Financial assistance
5. Private sector funding
6. Subsidized housing payment
7. Cross-subsidy from future residents
8. Income-based rent return
9. Grants and revenue

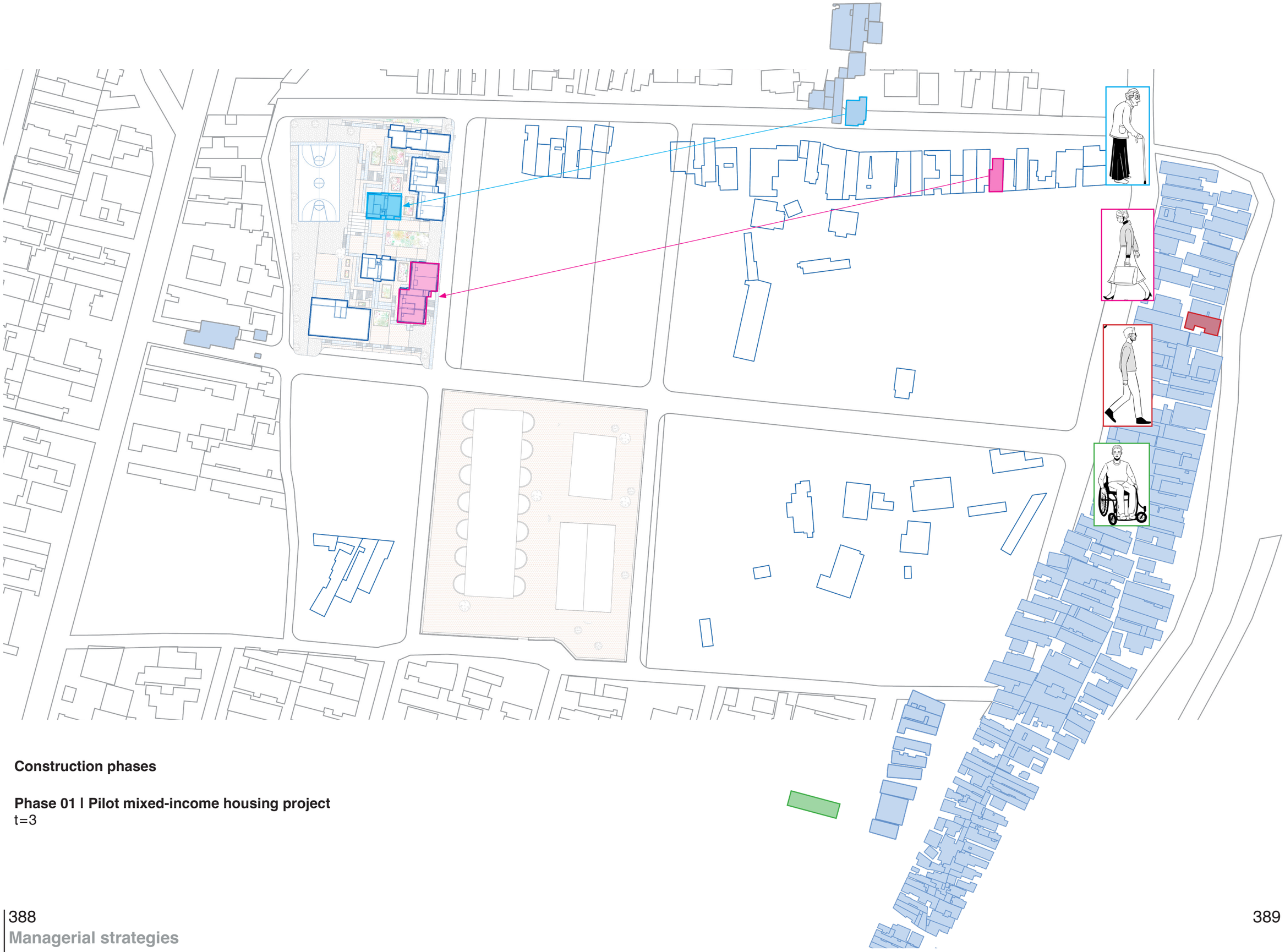



Relocation group 1 - 53 units
Relocation group 2 - 8 units
Relocation group 3 - 121 units



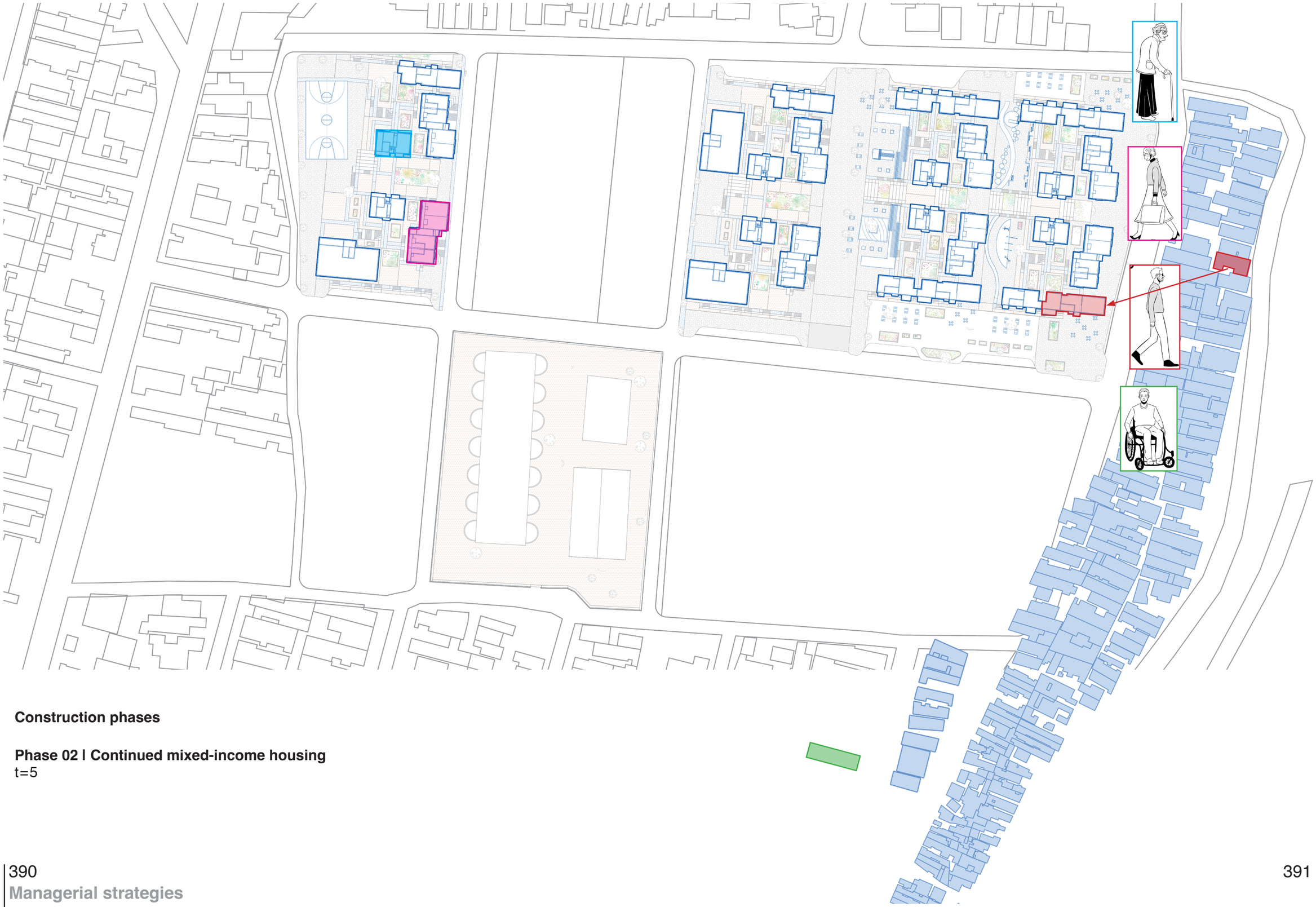
Construction phases

Phase 00 I Current situation
t=0



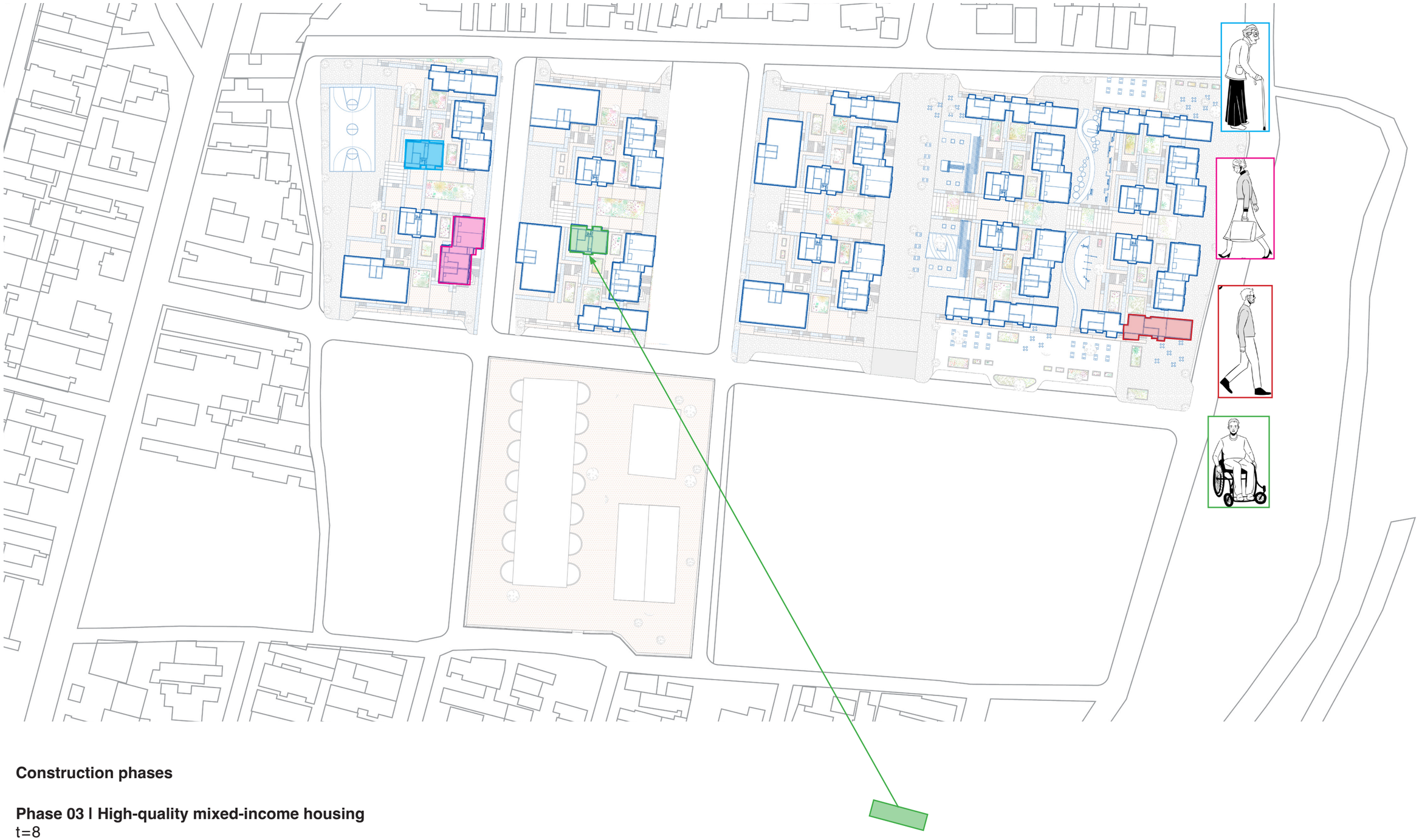
Construction phases

Phase 01 I Pilot mixed-income housing project
t=3



Construction phases

Phase 02 I Continued mixed-income housing
t=5



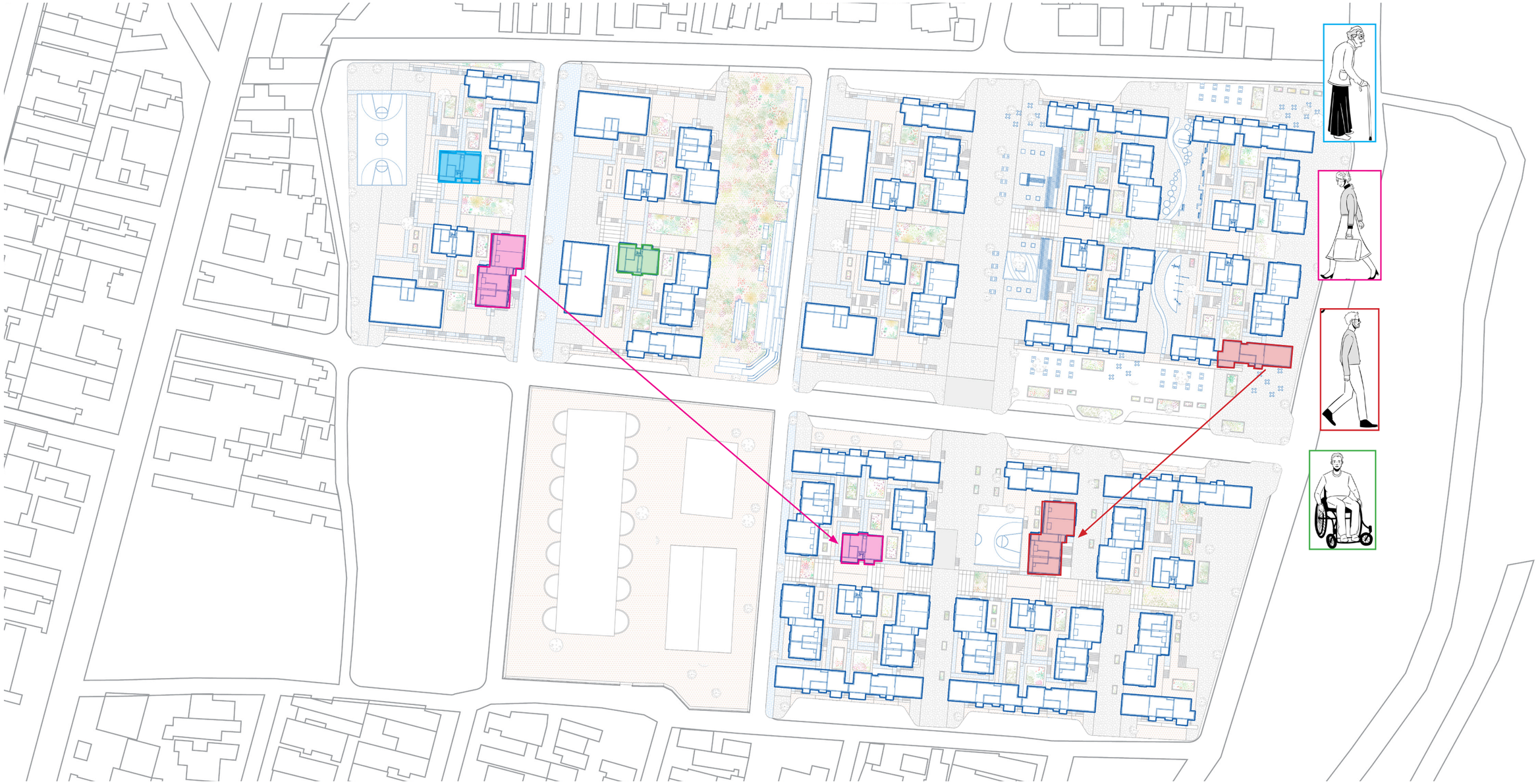
Construction phases

Phase 03 I High-quality mixed-income housing
t=8



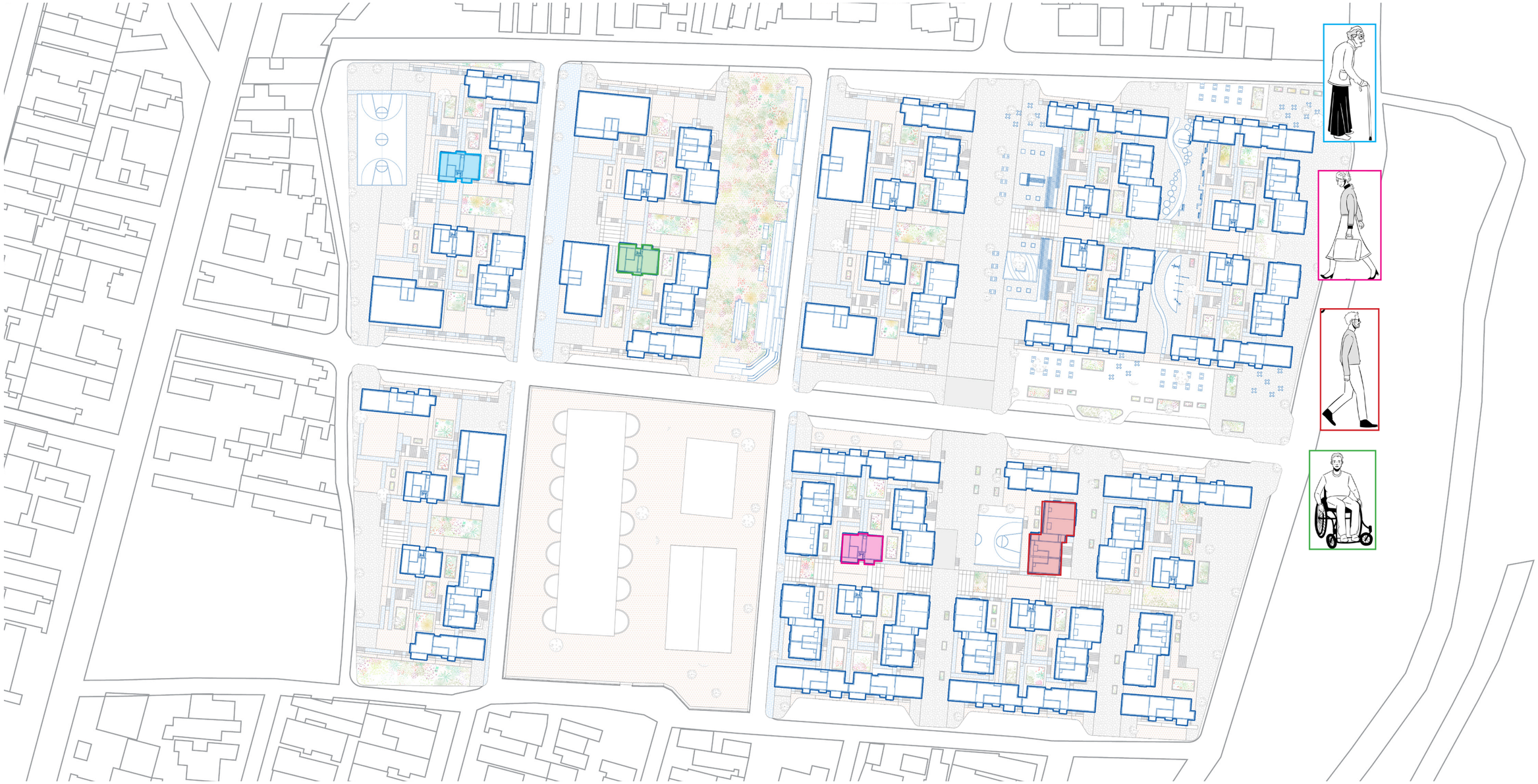
Construction phases

Phase 04 I Green axis
t=13



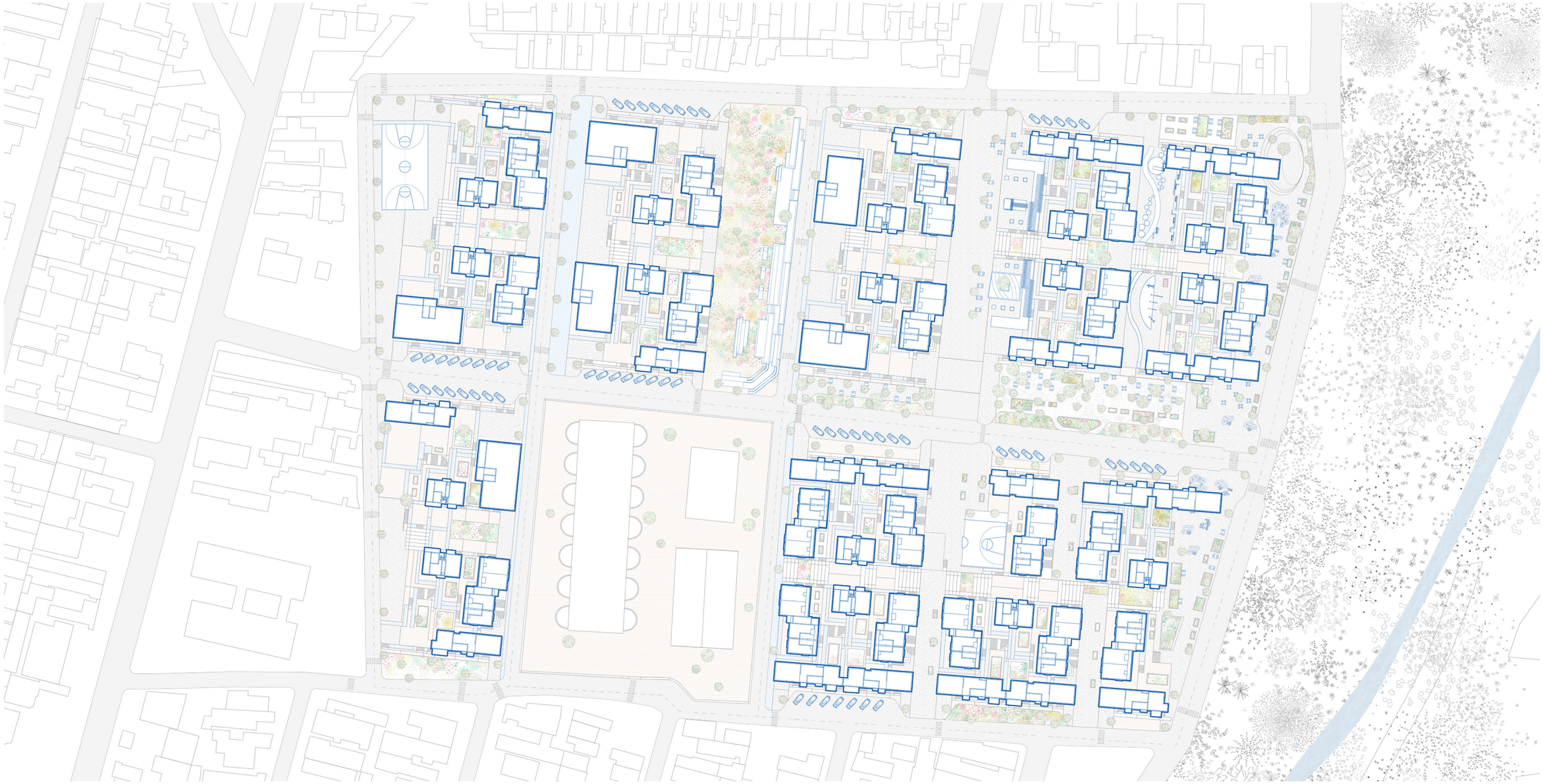
Construction phases

Phase 05 I Expansion of HIS housing
t=15



Construction phases

Phase 06 I Expansion of mixed-income housing
t=17



Construction phases

Phase 07 I Neighbourhood development
t=20



06 Synthesis

1 Aim

Recognizing this issue, there is a pressing need to explore innovative architectural design solutions to improve living conditions and foster **inclusive communities** within São Paulo's favelas. The overarching goal is to bridge income gaps, create opportunities for marginalized residents, and address systemic issues. This research investigates architecture's potential as a tool for social change, aiming to enhance residents' quality of life in underserved communities.

To achieve this, the research will delve into architectural design, urban planning, and community engagement, identifying strategies that empower marginalized individuals, promote inclusivity, and create environments conducive to social and economic progress. By addressing these challenges through architectural innovation, this research seeks to contribute to a more equitable and just urban landscape in São Paulo, offering insights applicable to similar contexts worldwide.

2 Research and design

To realize the aforementioned goals, I embark on an exploration of architectural design's transformative capacity within the urban context. This exploration centers on its potential to cultivate inclusive communities, enhance living conditions, and open doors to opportunities for marginalized individuals. My approach involves an in-depth examination of best practices, case studies, and the specific needs of residents, with the aim of uncovering the foundational principles guiding the creation of empowering architectural solutions. Ultimately, this endeavor seeks to bolster the quality of life for marginalized populations, serving as a catalyst for greater equity and justice within urban societies. To achieve this overarching objective, I have delineated my goals into the following areas.

2.1 Inspiration

What is an effective solution to mitigate the neglect of marginalized individuals within social housing projects?

Before the field trip, I conducted a comparative analysis to build a foundational understanding of Brazilian social housing . During the field trip, I engaged in field observations that allowed me to experience and appreciate the quality of life at a human scale. Subsequently, I explored specific communities, neighbourhoods, or housing projects online, which had implemented strategies to enhance the quality of life for diverse income groups. These **case studies** provided valuable insights into successful approaches. As a result, I endeavored to incorporate key elements from Brazilian vernacular architectural attributes into my own design.

Upon conducting the research, I have identified mixed-income housing as a potential solution to alleviate social segregation in newly developed areas. Additionally, I have drawn conclusions regarding essential qualities that should be assessed in a housing project from an **urban planning** perspective:

1) Social justice
2) Economic diversity
3) Urban resilience
4) Civic engagement

2.2 Aspiration

What specific considerations should be taken into account to enhance the quality of life for diverse income groups?

After learning from the paradigm established in the case study, my focus shifted towards the architectural scale. To better understand the genuine requirements of inhabitants, I embarked on **field observations**. During this process, I carefully observed and documented intricate details of the environment, the behaviours of the local people, their interactions, and any relevant phenomena. This allowed me to gain insights into the daily activities and routines of the community, as well as identify the specific needs of the buildings and the overall site.

With the support of the School of Architecture and Urbanism at the University of São Paulo (FAUUSP), I have had the opportunity to delve deeper into the sites and various social housing projects in São Paulo. I have actively engaged with local residents and stakeholders, conducting on-site surveys and **interviews**. These interactions have yielded valuable qualitative and quantitative data, shedding light on their perspectives, needs, and concerns.

The field trip to São Paulo offered a profound understanding of the diverse requirements of various income groups, particularly evident in the city's striking disparities in living conditions. I endeavored to comprehend the multifaceted needs of these distinct income groups from various perspectives and subsequently categorized them accordingly:

Urban design	**Architecture design**
1) Affordability	1) Space efficiency
2) Services	2) Materiality
3) Safety	3) Privacy
4) Qualities of life	4) Amenity

2.3 Adaptation

What are the potential challenges and barriers that may arise during the development of mixed-income housing, and what effective strategies can be employed to address them?

Following my site survey, I shifted my focus towards identifying disparities in living conditions among diverse income groups. **Literature review** played a pivotal role in helping me delineate these distinctions. Furthermore, my attention broadened to pinpoint the factors influencing the quality of life across income strata, drawing upon established criteria by scholars in this field to identify potential design solutions at various scales.

Utilizing data from Google Maps and Geographic Information Systems (GIS), I created visual maps to illustrate **spatial analyses** and relationships within the site. Additionally, resources from the municipality's official website aided in layering various data, including demographics, land use, and infrastructure, to gain contextual insights.

Drawing inspiration from social housing cases in São Paulo, I examined how they implemented these concepts in their designs and sought to incorporate similar ideas into my own design approach(Figure 2).

2.4 Engagement

In what ways can architecture provide opportunities for marginalized individuals to actively participate and engage within their community?

When it comes to managerial strategies, I conducted **analysis of existing policies** and initiatives aimed at enhancing the quality of life for diverse income groups at the federal, state, and municipal levels. Additionally, I conducted an in-depth review of the literature to explore the various aspects covered by housing policies. My objective was to pinpoint potential opportunities for managerial strategies and architectural enhancements in the realm of mixed-income housing.

During my analysis, a noteworthy observation emerged: the predominant focus of most social housing projects is profit-driven, primarily centered around financial gains. Consequently, my aspiration is to shift the paradigm towards a social-driven development approach(Figure 3). This entails providing secure, affordable, and inclusive housing solutions tailored to marginalized or low-income communities. The emphasis is on addressing social issues, such as homelessness, poverty, and inequality, by improving living conditions and fostering community well-being.

3 Ethical challenges and opportunities

Marginalized residents of these areas have long endured feelings of neglect, and this frustration is exacerbated by prolonged disengagement from the design and planning process. During the interview with community members, it became clear that while stakeholders occasionally sought information from them, they often failed to genuinely engage in the design process and often neglected to share in the final outcome. This disconnect contributed to a general sense of exploitation among these residents, further exacerbating their existing socioeconomic challenges. Therefore, designers must aware of these limitations (Bonacin et al., 2019),to address this systemic issue and cultivate a sense of empowerment and inclusion, fostering mutual communication is crucial, necessitating active engagement of these residents in the decision-making process.

While programs for social housing, rent, and credit are intended to help low-income individuals, many policies can inadvertently exclude them. My goal is to compensate for these exclusions through the construction process, thereby alleviating financial stress. The construction and development of the area will occur in phases, allowing the community to gradually adapt to the new environment and integrate into new job opportunities, fostering mutual growth.

Creating a sense of community among people of various income levels is crucial in mixed-income housing. To achieve this, I design shared spaces like parks and community centers where residents can come together and connect. However, bringing together individuals from diverse backgrounds can sometimes lead to challenges, which I aim to mitigate by promoting mutual respect and providing conflict resolution resources. Additionally, I ensure general consistency in building materials and facade while maintaining the cluster's character, so as to showcase the identity of the neighbourhood.

4 Relation

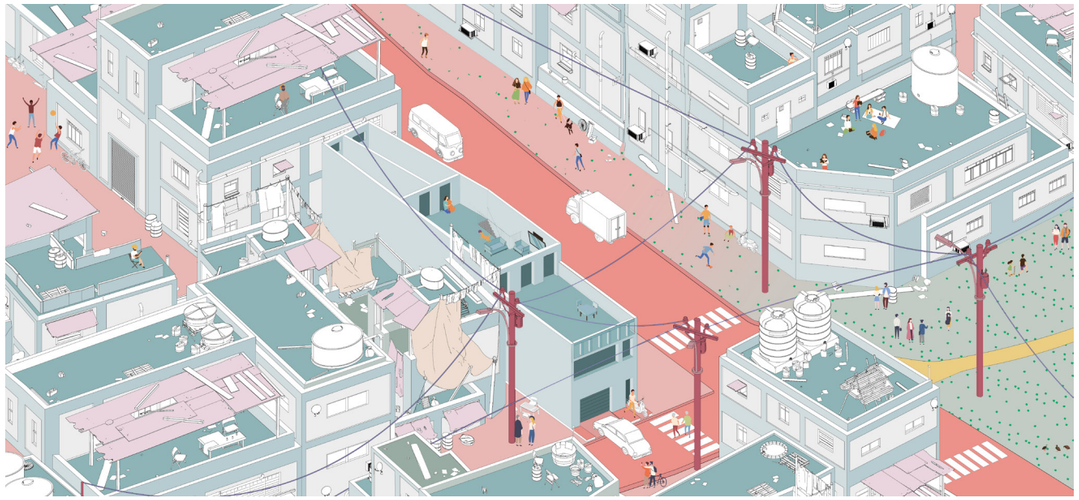
In São Paulo, much like in many other cities globally, there exists a stark divide in living conditions between various income groups. Nowhere is this division more pronounced than in the sprawling favela areas, where marginalized individuals confront daily challenges that stem from inadequate housing, a lack of essential amenities, and deficient infrastructure. This situation perpetuates a distressing cycle of poverty and exclusion that demands our attention and action.

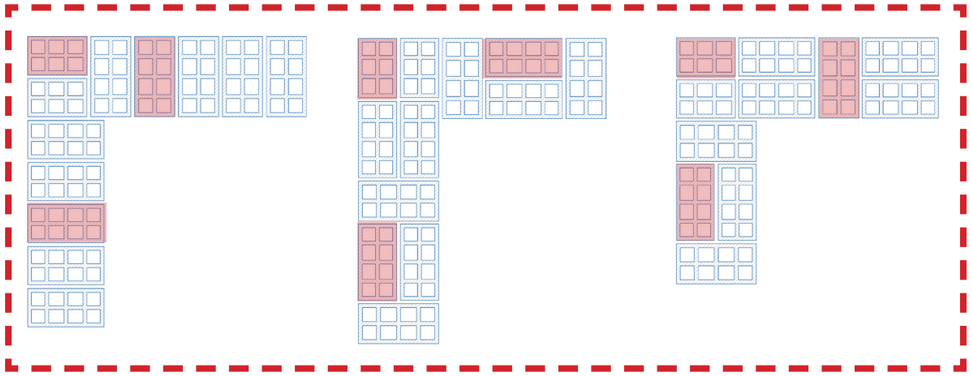
In this context, I believe "Master of Architecture, Urbanism, and Building Sciences" programme aim to equip students with the knowledge and skills needed to confront pressing building challenges. I find a deep resonance between my research and the objectives of these academic pursuits. My research is driven by a compelling goal: to address the spatial inequities and social injustices in housing that afflict urban centers. And my design centered on exploring innovative architectural design solutions that enhance living conditions and foster inclusive communities, aligns with these educational goals.

To be more specific, I seek to uncover how architecture can be a catalyst for social change, elevating the quality of life for residents in urban periphery(Figure 4). It delves into various aspects of architectural design, urban planning, and community engagement, all with the aim of identifying strategies that empower marginalized individuals, promote inclusivity, and create environments conducive to social and economic progress.

Moreover, my research touches upon specific challenges inherent to the development of mixed-income housing and proposes effective strategies to address them. It's this practical and solution-oriented approach that can enrich the broader objectives within the "Global Housing Graduation Studio".By adopting a bottom-up research methodology that incorporates the aspirations of inhabitants, we can engage more people in the social-driven development process, ultimately fostering an inclusive community.

In essence, my research stands as a bridge between academic exploration and real-world impact, offering insights and solutions for the complex and pressing issues of housing inequality and urban development and contribute to a more justice society.

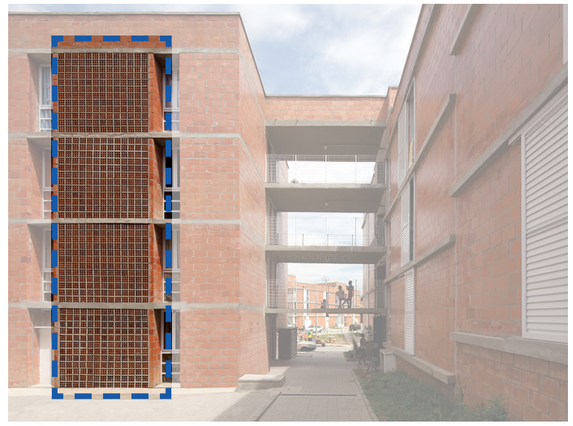




Masony methods
梅花丁砌筑法



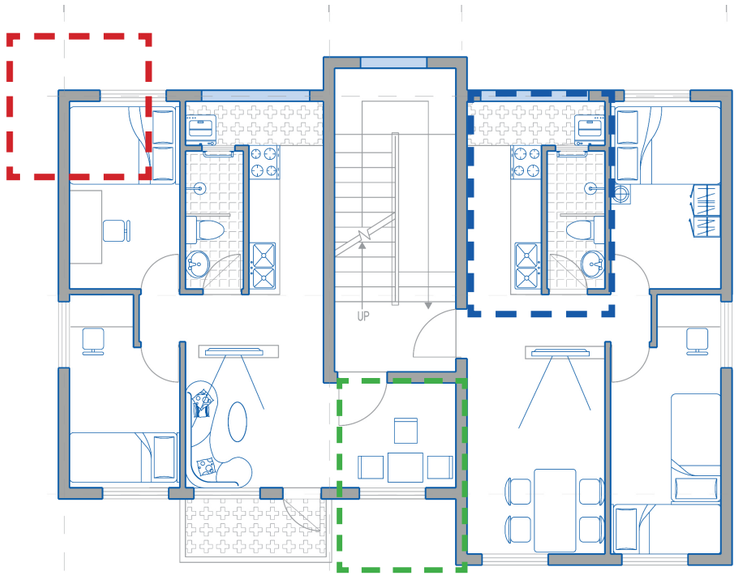
Layout



Jardim Vicentina Urbanization

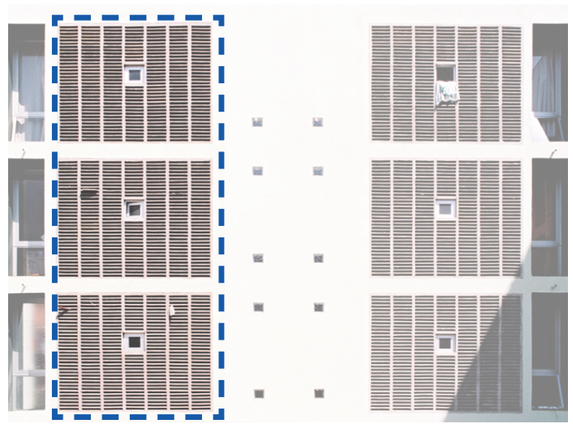


Parque Novo Santo Amaro V



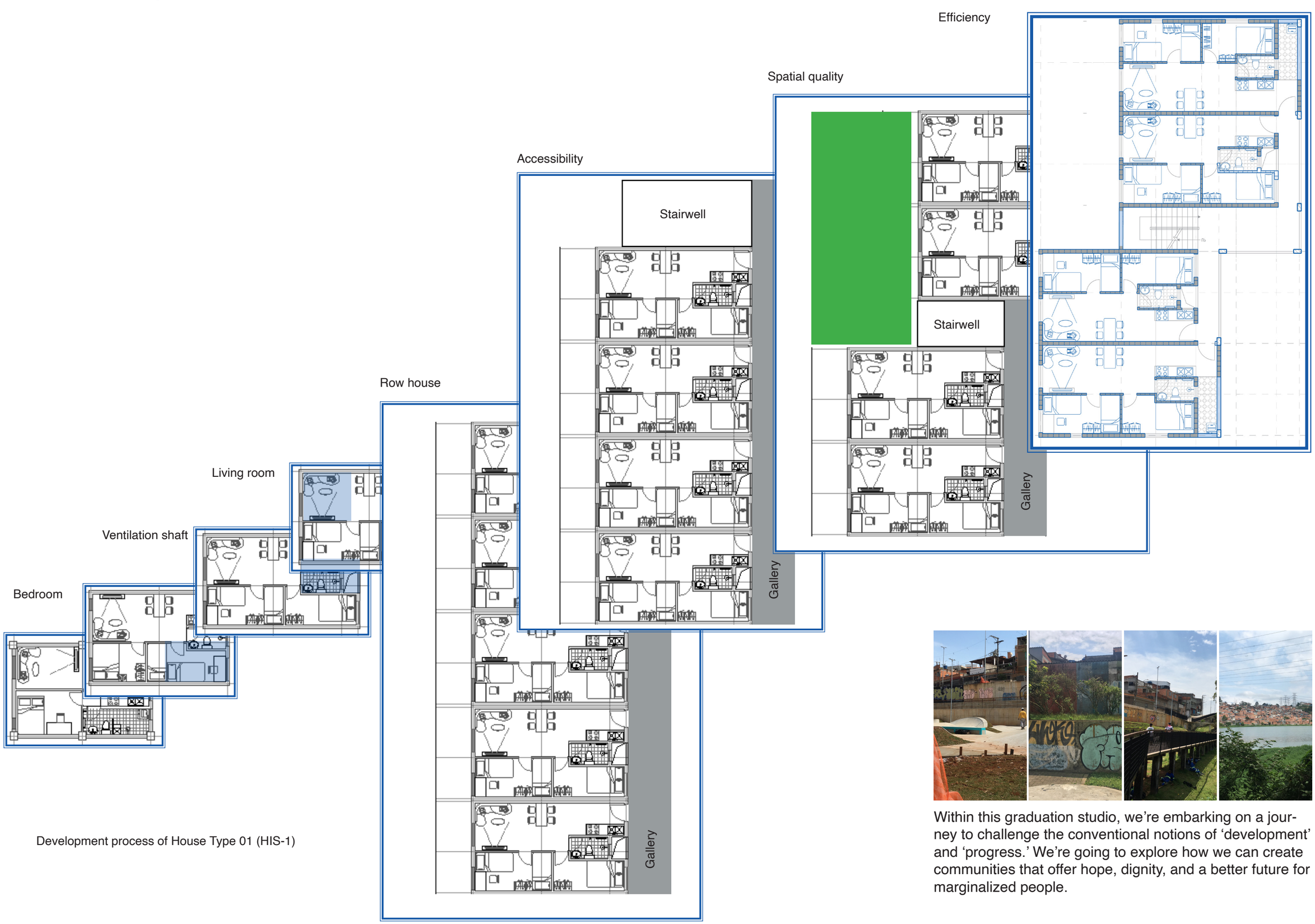


Spatial qualities
Ruimtelijke kwaliteiten



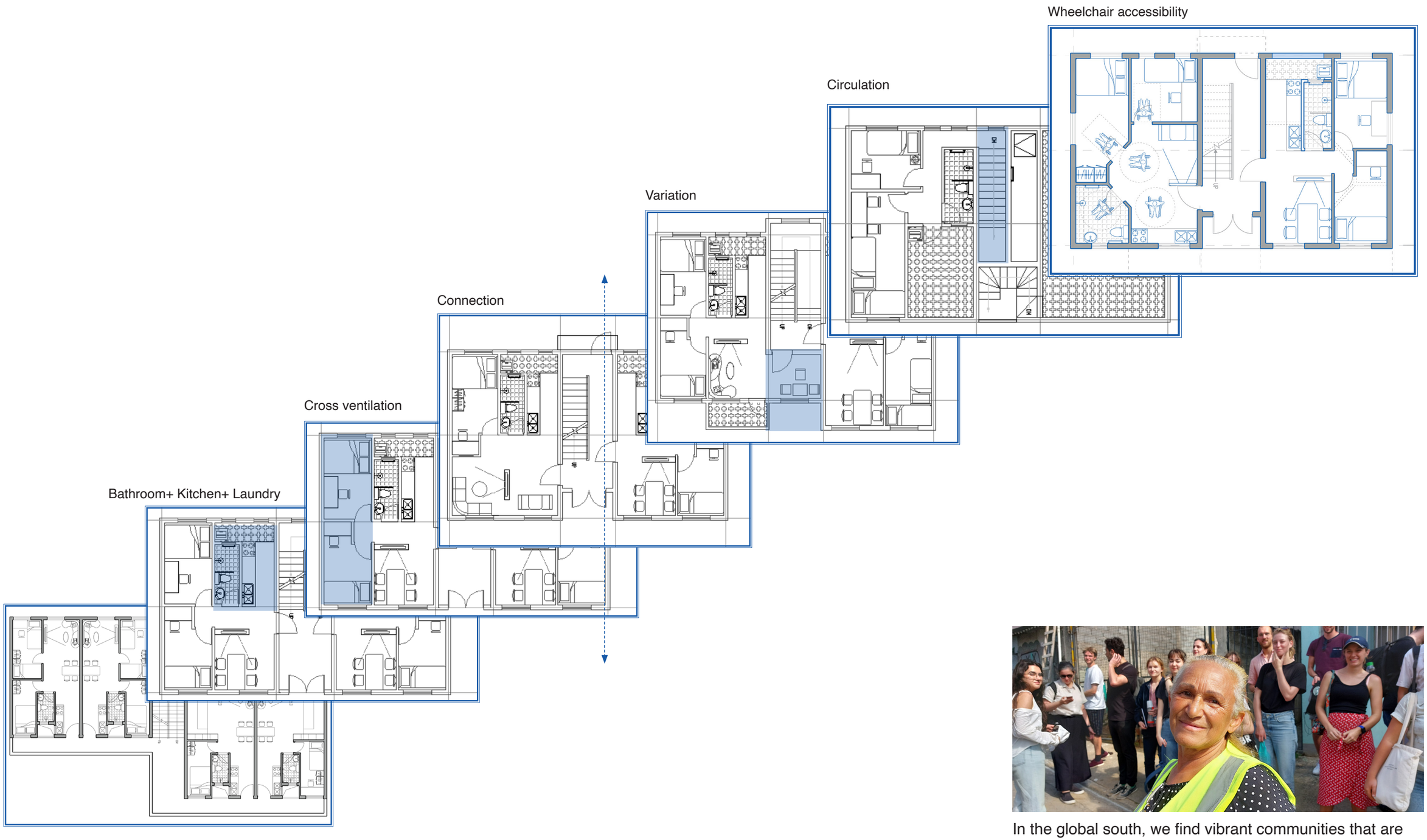
Gleba A

Facade
Fachada



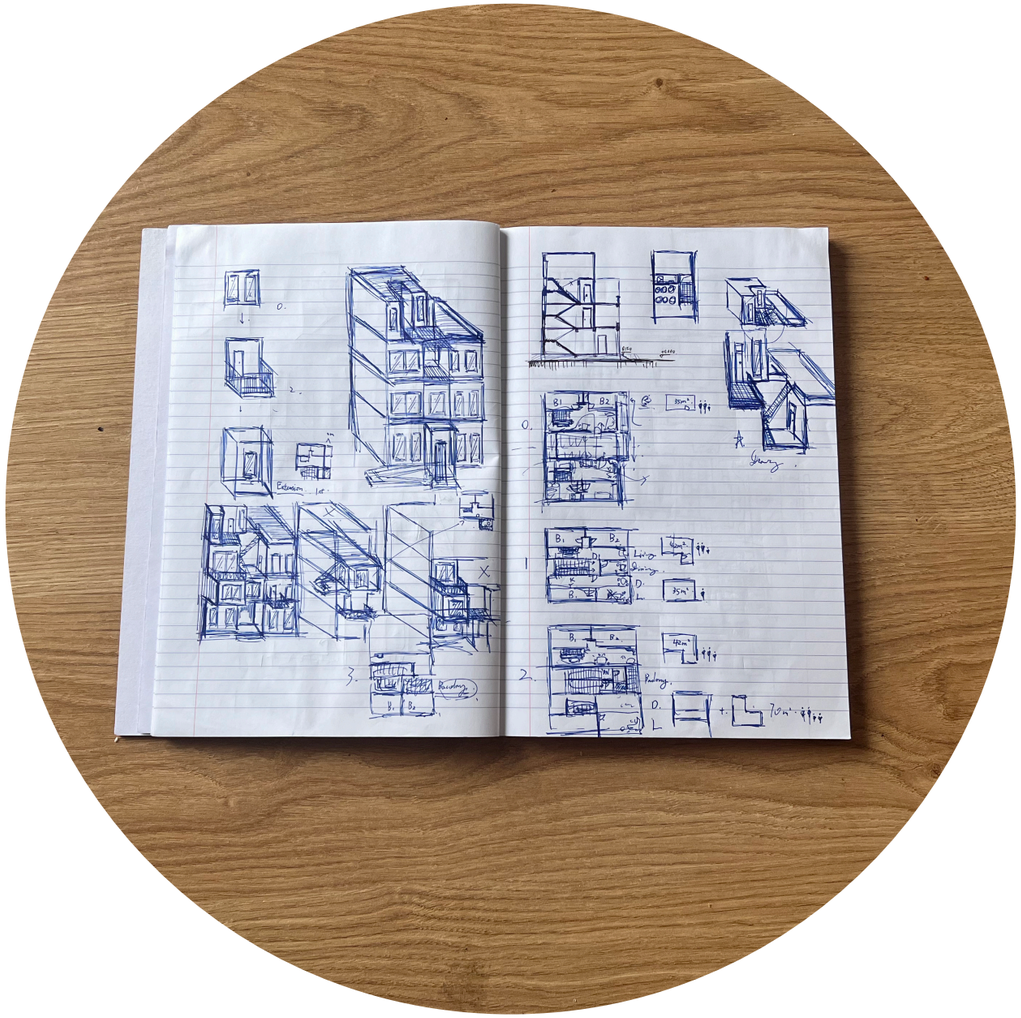
Development process of House Type 01 (HIS-1)

Within this graduation studio, we're embarking on a journey to challenge the conventional notions of 'development' and 'progress.' We're going to explore how we can create communities that offer hope, dignity, and a better future for marginalized people.



Development process of House Type 02 (HIS-2)

In the global south, we find vibrant communities that are incredibly resilient, despite the odds they face. They're looking for more than just bricks and mortar; they're seeking inclusive, equitable, and sustainable housing solutions that honor their dignity and provide a sense of belonging.



Architectural design



Urban design



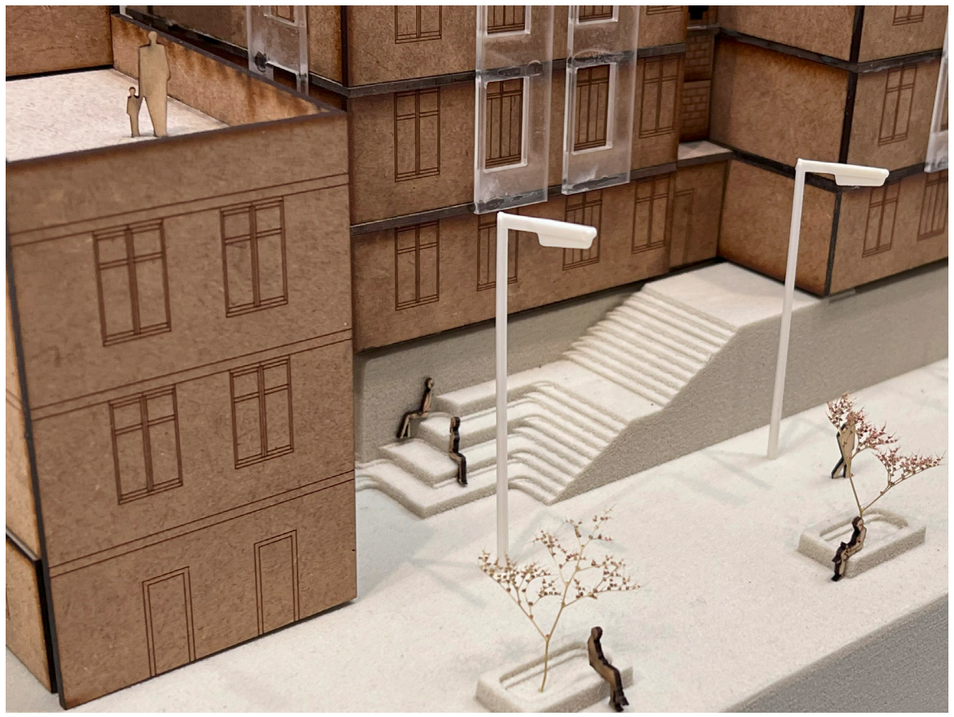






Physical model





Physical model





Physical model

07 Reference

Bibliography

Bonacin, R., Dos Reis, J. C., & Baranauskas, M. C. C. (2019). Universal Participatory Design: Achievements and Challenges. Journal on Interactive Systems, 10(1), 1. https://doi.org/10.5753/jis.2019.714

Giving Design a Local Touch: Yamazaki Ryo and Studio-L I Nippon.com. (n.d.). Retrieved November 10, 2022, from https://www.nippon.com/en/people/e00043/

Guild, E. (2003). The wall around the west: State borders and immigration controls in North America and Europe. Political Geography, 22(3), 341–343. https://doi.org/10.1016/S0962-6298(02)00032-X

Hertzum, M., & Simonsen, J. (2010). Effects-driven IT development: An instrument for supporting sustained participatory design. Proceedings of the 11th Biennial Participatory Design Conference on - PDC '10, 61. https://doi.org/10.1145/1900441.1900451

Laura Ramírez Galleguillos, M., & Coskun, A. (2020). How Do I matter? A Review of the Participatory Design Practice with Less Privileged Participants. Proceedings of the 16th Participatory Design Conference 2020 - Participation(s) Otherwise - Volume 1, 137–147. https://doi.org/10.1145/3385010.3385018

Klak, T., & Holtzclaw, M. (n.d.). The Housing, Geography, and Mobility of Latin American Urban zy Poor: The Prevailing Model and the Case of Quito, Ecuador.

Núñez, G. A. (n.d.). Citizen participation in a neoliberal context: 'Empty ritual or real power'1994.

Participation in Design Things I Design Things I Books Gateway I MIT Press. (n.d.). Retrieved November 14, 2022, from https://direct.mit.edu/books/book/2910/chapter-abstract/79007/Participation-in-Design-Things?redirectedFrom=fulltext

Pettit, B. (2004). Moving and Children's Social Connections: Neighborhood Context and the Consequences of Moving for Low-Income Families. Sociological Forum, 19(2), 285–311. https://doi.org/10.1023/B:SOFO.0000031983.93817.ff

Pimentel Walker, A., & Arquero de Alarcón, M. (2018). The Competing Social and Environmental Functions of Private Urban Land: The Case of an Informal Land Occupation in São Paulo's South Periphery. Sustainability, 10(11), 4160. https://doi.org/10.3390/su10114160

Population living in slums (% of urban population)—Brazil I Data. (n.d.). Retrieved November 9, 2022, from https://data.worldbank.org/indicator/EN.POP.SLUM.UR.ZS?end=2018&locations=BR&start=1990&view=chart

Refworld I Leaving No One Behind – The Imperative of Inclusive Development. (n.d.). Retrieved November 14, 2022, from https://www.refworld.org/docid/5840368e4.html

The Double Diamond: 15 years on—Design Council. (n.d.). Retrieved November 14, 2022, from https://www.designcouncil.org.uk/our-work/news-opinion/double-diamond-15-years/

Xavier, Helia Nacif and Fernanda Magalhães (2003.) The Case of Rio de Janeiro. IN: The Challenge of the Slums—Global Report on Human Settlements 2003. UN-Habitat (United Nations Human Settlement Programme.)

Image caption

Douglas, B. (2020) 'The story of cities #15: the rise and ruin of Rio de Janeiro's first favela,' The Guardian, 3 February. https://www.theguardian.com/cities/2016/apr/05/story-cities-15-rio-de-janeiro-first-favela-providencia-2016-olympic-games. p3

Ministério da Economia (n.d.). https://www.gov.br/economia/pt-br/acesso-a-informacao/participacao-social/conselhos-e-orgaos-colegiados/cmap/politicas/area/habitacao-e-saneamento/subsidios/pmcmv. p5

Breda, T.V. (n.d.) Changes in contemporary Brazilian housing policy: the dismantling of social housing and grassroots mobilization. https://metropolitics.org/Changes-in-Contemporary-Brazilian-Housing-Policy-The-Dismantling-of-Social.html. p7

Rosamônica Da Fonseca Lamounier (2019) Feasibility and Affordability in Brazilian Social Housing according to the Open Building Approach: An Architectural Prospection. https://research.tudelft.nl/en/publications/feasibility-and-affordability-in-brazilian-social-housing-accordi, p3. p9

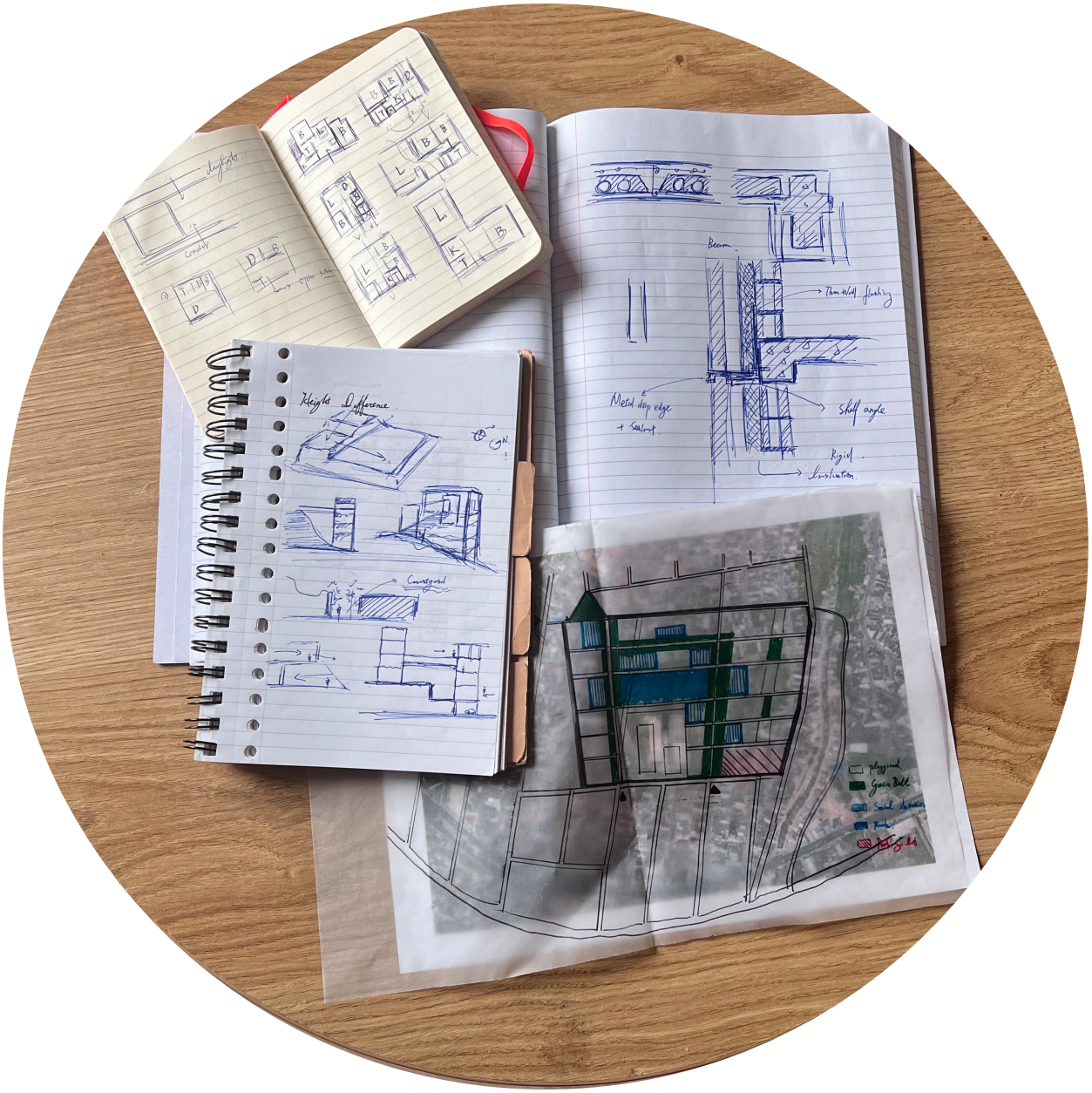
Itambé, C. and Itambé, C. (2017) Minha Casa Minha Vida faz 8 anos com acertos e erros I Cimento Itambé. https://www.cimentoitambe.com.br/massa-cinzenta/minha-casa-minha-vida-8-anos/. p11

Boisjoly, G., Moreno-Monroy, A.I. and El-Geneidy, A. (2017) 'Informality and accessibility to jobs by public transit: Evidence from the São Paulo Metropolitan Region,' Journal of Transport Geography, 64, pp. 89–96. https://doi.org/10.1016/j.jtrangeo.2017.08.005, p91. p13,15

Presentación ppp casa paulista ingles (n.d.). https://www.slideshare.net/Eraikune/presentacin-ppp-casa-paulista-ingles. p361

Coenda, V.M. (2020) 'Los rancheríos. Una aproximación a los discursos hegemónicos sobre la vivienda rural en el Uruguay del siglo XX,' Paranoá [Preprint], (28). https://doi.org/10.18830/issn.1679-0944.n28.2020.08, p7. p361

Izar, P. (2019) 'Can public–private partnerships help achieve the right to the city in Brazil? The case of Casa Paulista program in São Paulo,' Journal of Urban Affairs, 43(2), pp. 329–344. https://doi.org/10.1080/07352166.2019.1654895, p7. p361


daylight
Beam
Thin Wall flashing
Metal drip edge
+ Sealant
Shelf angle
Rigid
Insulation
Height Difference
Courtyard
Green Belt