# The (In)-Between

Creating Careful Boundaries and Porous
Thresholds Between Social Housing and the
Grajaú Neighbourhood in São Paulo

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CHAPTER 1

# Introduction

Since the introduction of neoliberalism in the 1980s, housing has transformed from Since the introduction of neoliberalism in the 1980s, housing has transformed from a social good to a market commodity, resulting in housing policies' focus shifting from resilience to efficiency.[1] The shift greatly affected the Global South, where an overwhelming amount of housing was, and still is, required.[2] Several initiatives aimed to counter the issue through approaches solely focused on resilience. These projects were, however, unable to produce the amount of housing needed.[3] Subsequently, several housing experts recently argued that a trade-off between efficiency and resilience is required to challenge this global phenomenon. [4]

The project investigates the balance between resilience and efficiency through a social housing development in São Paulo, Brazil's largest city. Despite São Paulo not being a poor city, it has one of the world's most inequitable distributions of wealth. One of the main symptoms of this inequality is a lack of sufficient housing.[5] The project is in Grajau, one of the city's periphery neighbourhoods. Heterogenous communities, called favelas or irregular settlements, populate the district. Favelas often consist of dwellings that do not meet adequate housing standards according to Brazilian law. Still, these neighbourhoods provide an opportunity for impoverished families to have a house, presenting somewhat of a solution towards the Brazilian housing crisis.[6]

The research concluded that Brazil's large socio-economic gap and complicated political history are two of the primary catalyst for the country's significant housing crisis. The *Estatuto da Cidade* (City Statute), developed after the fall of the dictatorship, acts as a legal framework to manage and improve the urban development of heterogeneous neighbourhoods. The City Statute includes the *Zones Especias de Interesse Social*' (ZEIS, Special Zones of Social

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1  Nelson Mota and Allweil Yael, "The Architecture of Housing after the Neoliberal Turn", Footprint 24, no 13 (2019).
2  Robin King, Mariana Orloff, Terra Virsilas and Tejas Pande, "Confronting the urban Housing Crisis in the Global South: Adequate, Secure and Affordable Housing," *World Resource Institute*, (2017)
3  Marie Huchzermeyer, "The Struggle for In Situ Upgrading of Informal Settlements: A Reflection on Cases in Gauteng" 26, no 1: 59-73,  https://doi. org/10.1080/03768350802640099.
4  Peer Smets, Jan Bredenoord and Oaul van Lindert, "Governance, Sustainability, and Affordability of Low-Income Housing," *Affordable Housing in the Urban Global South: Seeking Sustainable Solutions* (2014): 1-14.
5  Teresa Caldeira, "Fortified Enclaves: The New Urban Segregation " *D Society and Space* 8, (2016): 304-305
6  Marques, Eduardo, and Camila Saraiva, "Urban Integration or Reconfigured Inequalities? Analyzing Housing Precarity in São Paulo, Brazil" *Habitat International* 69 (November 2017): 18–26. https://doi. org/10.1016/j.habitatint.2017.08.004.

Figure 1: São Paulo Urban Comparison. Source: BOLDARINI ARQUITETOS ASSOCIADOS - Cantinho Do Céu Presentation

Interest). ZEIS identifies areas where infrastructure and degraded properties can be improved, allocates space for public amenities and dedicates unused land for Social Interest Housing (HIS) and Low-Income Market Housing (HMP).[7]

The central concern of the project is the need for more urban integration between Social Housing developments and their surrounding heterogeneous neighbourhoods (favelas and irregular settlements). A combination of fieldwork, theoretical research and comparative analysis, discussed throughout the report, was used to identify the problem. The project confronts the urban segregation between favelas and Social Housing through porous thresholds and careful boundaries. The approach is derived mainly from the work of German philosopher Walter Benjamin, Dutch architect Aldo van Eyck and Brazilian architect Hector Viglecca. The design applies porous thresholds and careful boundaries throughout all design scales, continuously considering the project's socio-economic, managerial, and environmental impact.

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7 Falcão Pessoa, Denise. " Estudo da produção de HIS (Habitação de interesse social) e HMP (Habitação de mercado popular) nas ZEIS (zonas especiais de interesse social) da subprefeitura da Lapa, município de São Paulo, a partir do PDE (Plano diretor estratégico) de 2002." *Pós. Revista do Programa de Pós-Graduação em Arquitetura e Urbanismo da FAUUSP* 26, (2009): 50-60.

# Problem Statement

*How does the current approach towards social housing in São Paulo create boundaries that intensify urban segregation?*

*"One of the central themes of discussion concerning government housing policies in the Global South is the subject of urban integration. Although each country has a unique situation, the common element that characterises this debate is the urban and social consequences of the deployment of mass housing. "*

Eduardo Meireles, 2015

2.1 My House My Life?

The issue of urban inequality is common within Brazil. The country's sizeable socio-economic gap and complicated political climate have exacerbated the problem.[9] One main contributing factor is the constant transitions of right-wing governments at both local and federal levels that cause inconsistent social housing policies and strategies.

During the country's dictatorship (1979-1988), the government attempted to improve favela conditions by forcefully removing residents and replacing the informal dwellings with unremarkable mass housing blocks. After the dictatorship's downfall in 1988, Brazil adopted a more democratic approach to the lack of adequate housing.[10] In 2001 the *Estatuto da Cidade* (City Statute), a federal law (Law no. 10.257 of 10 July 2001), was created as a legal framework to tackle the country's spatial segregation and manage the urban development of favelas. The City Statute represented a new approach that emphasised the importance of active citizenship as a fundamental right of the city.[11]

The City Statute established the *Zones Especias de Interesse Social'* (ZEIS, Special Zones of Social Interest) that focused on regulating and legalising informal neighbourhoods instead of removing them. Accordingly, ZEIS aims to improve established favelas' infrastructure, regenerate degraded properties, provide public space and dedicate unused land to Social Interest Housing (HIS) and Low-Income Market Housing (HMP).[12] The new approach led to experimental and innovative projects on a design and managerial level. Some examples discussed in later chapters are Gleba A, Parque Novo Santo Amaro V, Comuna Dom Helder Camara and Jardim Sao Francisco.

9 In Brazil in 1989, the proportion of income in the hands of the poorest 50 % of the population was only 10.4%. At the same time, the richest 1% had 17.3% of the income. Data is from the National Research by Domicile Sample (PNAD) undertaken by the Census Bureau. The distribution of wealth has become more inequitable since the early 1980s (Lopes 1993; Rocha 1991).
10 Silvia Stefani, "Building Mistrust: 'Minha Casa Minha Vida' and its Political Effects in Rio de Janeiro", Journal of the Society for Latin American Studies, (2021): 4.
11 David Gaston Robles, "The Social Function of Private Property," in Building Brazil: The Proactive Urban Renewal of Informal Settlements, ed. Marc Angelil and Rainer Helh (Berlin: Ruby Press, 2011), 36-37.
12 ZEIS were established through Law no 13.43. There are four Zones of Social Interest (ZEIS): ZEIS 1 is areas with existing slum that need to be upgraded, ZEIS 2 is empty public land allocated for social housing, ZEIS 3 is dilapidated central buildings that need to be fixed, and ZEIS 4 is open areas landmarked for social housing for families that will be removed from risk areas.
Freire Santoro, "Urban Planning Instruments For Promoting Social interest Housing: from zoning to obligatory percentages in São Paulo", Revista Brasileira de Estudos Urbanos e Regionais 17, no 2: 99-117.

Additionally, ZEIS does not solely focus on the most economically fragile (minimum wage bracket one to six) but also includes up to minimum wage bracket 16. This strategy was boosted in 2002 when *Partido Dos Trabalhadores* (Worker's Party, PT), led by Lula da Silva, won the national elections.[13]

After the 2008 financial crisis, the Brazilian economy started to crumble, and by 2010 the Worker's Party redirected the HIS and HMP housing challenges into the *Minha Casa, Minha Vida* (My House My Life, MCMV) program.[14] MCMV aims to build 6.8 million residences, with 1.7 million dwellings already realised. According to the *Instituto Lula* website,

> "This is the government providing housing for those in need — while at the same time helping drive commerce and industry, generating jobs and income, turning what was a dream into citizens' rights, development and dignity." [15]

However, journalists and researchers have described Miha Casa Miha Vida as a "policy of spreadsheets".[16] The MCMV centralised management made a significant break from previous policies that motivated the involvement of civil society and local municipalities. The program adopted a neoliberal approach that transferred social housing responsibility onto the country's largest construction firms.[17] Compared to previous methods, the standards for the location of sites, the construction techniques and urban quality have dropped, creating mediocre projects that increase the density on the urban periphery (figure 2).[18] MCMV is repeatedly criticised for repeating existing typologies, known as fortified enclaves, that produce urban segregation.[19] The essay "The Brazilian Housing Program Miha Casa Miha

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13 Jeff Wallenfeldt, "Luiz Inácio Lula da Silva: President of Brazil", Britannica, Last modifies October 31, 2022, https://www.britannica.com/biography/Luiz-Inacio-Lula-da-Silva#ref791753

14 Stefani, "Building Mistrust," 5.

15 "Minha Casa Minha Vida", Last Modified June 8, 2022, https://www.gov.br/mdr/pt-br/assuntos/habitacao/minha-casa-minha-vida.

16 "Minha Casa Minha Vida", Last Modified June 8, 2022, https://www.gov.br/mdr/pt-br/assuntos/habitacao/minha-casa-minha-vida.

17 Fernando Serapião, "Linking Formal and Informal: Favela Urbanisation and Social Housing in Sao Paulo," *Architectural Design* 86, no. 3 (May/June 2016): 79.

18 Stefani, "Building Mistrust," 8.

19 Teresa Caldeira, "Fortified Enclaves: The New Urban Segregation " 8, (2016): 303
Fortified enclaves are privatised, enclosed, and monitored spaces for residence, consumption, leisure, and work.

Figure 2: My House, My Life Project, Source:https://www.ape11.com.br/wp-content/uploads/2021/08/casa_
verde_amarela_03.jpg

Effect on Urban Sprawl," also notes that MCMV's private developers easily surpassed the deficit for 3-10 minimum-income houses to generate a more significant profit.[20]

Since the introduction of MCMV, social housing in Brazil has mostly transformed from pioneering architecture to cookie-cutter designs that follow the standards of the private real estate market. Previously, local government involvement allowed for more consideration of urban conditions, while current profit-driven MCMV projects often reproduce existing architectural models that exaggerate social inequalities. Accordingly, the thesis Problem Statement asks: *How does the current approach towards social housing in Brazil create boundaries that intensify urban segregation?*

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20 Ciro Biderman, Martha H. Hiromoto and Federico R. Ramos, "The Brazlian Housing Program Minha Casa Minha Vida: Effect on Urban Sprawl", *Lincoln Institute of Land Policy*, (2018): 3

Figure3: "*Paraisópolis (Paradise City)*" by Tuca Vieira (2004). Source: https://www.theguardian.com/cities/2017/nov/29/sao-paulo-injustice-tuca-vieira-inequality-photograph-paraisopolis

2.2 São Paulo: City of Walls

São Paulo, located in South-East Brazil, is the largest city in the Southern Hemisphere and is responsible for approximately one-third of the country's GDP.[21] The city experienced rapid growth when São Paulo's economic focus shifted from the industry sector to the service sector at the beginning of the 20th century.[22] The change was accompanied by an influx of people and, due to the lack of sufficient housing, the establishment of informal neighbourhoods on the city's periphery. Despite São Paulo not being a poor city, it has one of the world's most inequitable distributions of wealth. The Brazilian anthropologist Teresa P. R. Caldeira notes that spatial segregation in São Paulo is,

> "...visible, expressed without disguise or subtlety... its high walls and fences, armed guards, technologies of surveillance, and contrasts of ostentatious wealth and extreme poverty, contemporary São Paulo reveal with clarity a new pattern of segregation which is widespread in cities throughout the world, although generally in less severe and explicit forms...rightfully earns its name as the City of Walls..."[23]

One example that undoubtedly showcases segregation in São Paulo is the famous photograph taken in the Paraisópolis (Paradise City) neighbourhood, near the city centre, by Brazilian photographer Tuca Vieira (figure 3). The picture shows a luxury apartment block that looks upon an informal area. The image is a clear illustration of the two extreme polarities existing in São Paulo.

Due to its locality, Paraisópolis is high on the São Paulo Municipal Housing Secretariat (SEHAB) list of priorities. The municipality continuously attempts to integrate the two contrasting through a top-down approach. One example is the introduction of several condominiums on the border between Paraisópolis and Morumbi, an upper-class neighbourhood (figure 4).[24]

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21 Aureliano Leite, Ronald Schneider and C.W. MInkel, "São Paulo", Last modified February 13, 2023, https://www.britannica.com/place/Sao-Paulo-Brazil
22 Georgios Alexandrou, "Favela, Inc. Micro-production: An alternative approach to favela upgrades," in *Building Brazil: The Proactive Urban Renewal of Informal Settlements*, ed. Marc Angelil and Rainer Helh (Berlin: Ruby Press, 2011), 24
23 Teresa Caldeira, "Fortified Enclaves: The New Urban Segregation " 8, (2016): 304-305
24 Dani Revekka Laskari, " Urbanisation Strategies for Informal Settlements: New Urban Borders in Paraisópolis," in *Building Brazil: The Proactive Urban Renewal of Informal Settlements*, ed. Marc Angelil and Rainer Helh (Berlin: Ruby Press, 2011), 30-31.

Figure 4: "*Paraisópolis Housing*" by Fabio Knoll (2011), Source: https://divisare.com/projects/221586-elito-arquitetos-fabio-knoll-paraisopolis-housing

Condominium projects are generally well accepted in Brazil since citizens generally agree that moving into a social housing complex constitutes a move up the class ladder.[25] However, the floor plan shows isolated units lacking semi-public spaces, such as balconies and terraces commonly found in favelas (figure 5). The elevated buildings' orientation alienates them from the surroundings. The compressed compositions of the buildings leave little room for public space, which is fenced off.[26]

During a lecture, one of the previous SEHAB project manager Vanessa Padia noted that even though social housing amenities are often designed as public spaces, resident associations repeatedly request that condominiums be fenced off. The dwellers want the condominiums to mimic the upper-class apartment blocks in the photograph. However, these aspirations' values are problematic. In his book about trade work, sociologist Terry Clark writes,

"the inventions most easily imitated are similar to those already institutionalised, and imitation tends to descend from social superior to social inferior."[27]

Consequently, the "higher" real estate market shapes the aspirations of the lower class by branding fortified enclaves as superior.[28] Fortified enclaves, however, increase urban segregation since they undermine entirely the openness of space embodied by modern cities. This approach causes projects like the Paraisópolis condominiums to be ultimately segregated from the formal and informal city. Since the organising principle is based on differences rather than similarities, the projects fenced off public space run the risk of transforming into a ghetto within a ghetto.[29]

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25 Sarah Bridges, "Social Mobility in the City of Walls: Setting the Benchmarks for Urban Upgrades," in B*uilding Brazil: The Proactive Urban Renewal of Informal Settlements,* ed. Marc Angelil and Rainer Helh (Berlin: Ruby Press, 2011), 34-35.
26 Laskari, " Urbanisation Strategies for Informal Settlements: New Urban Borders in Paraisópolis," 30-31
27 Bridges, "Social Mobility in the City of Walls: Setting the Benchmarks for Urban Upgrades," 34
28 Bridges, "Social Mobility in the City of Walls: Setting the Benchmarks for Urban Upgrades," 34-35
29 Laskari, " Urbanisation Strategies for Informal Settlements: New Urban Borders in Paraisópolis," 30-31
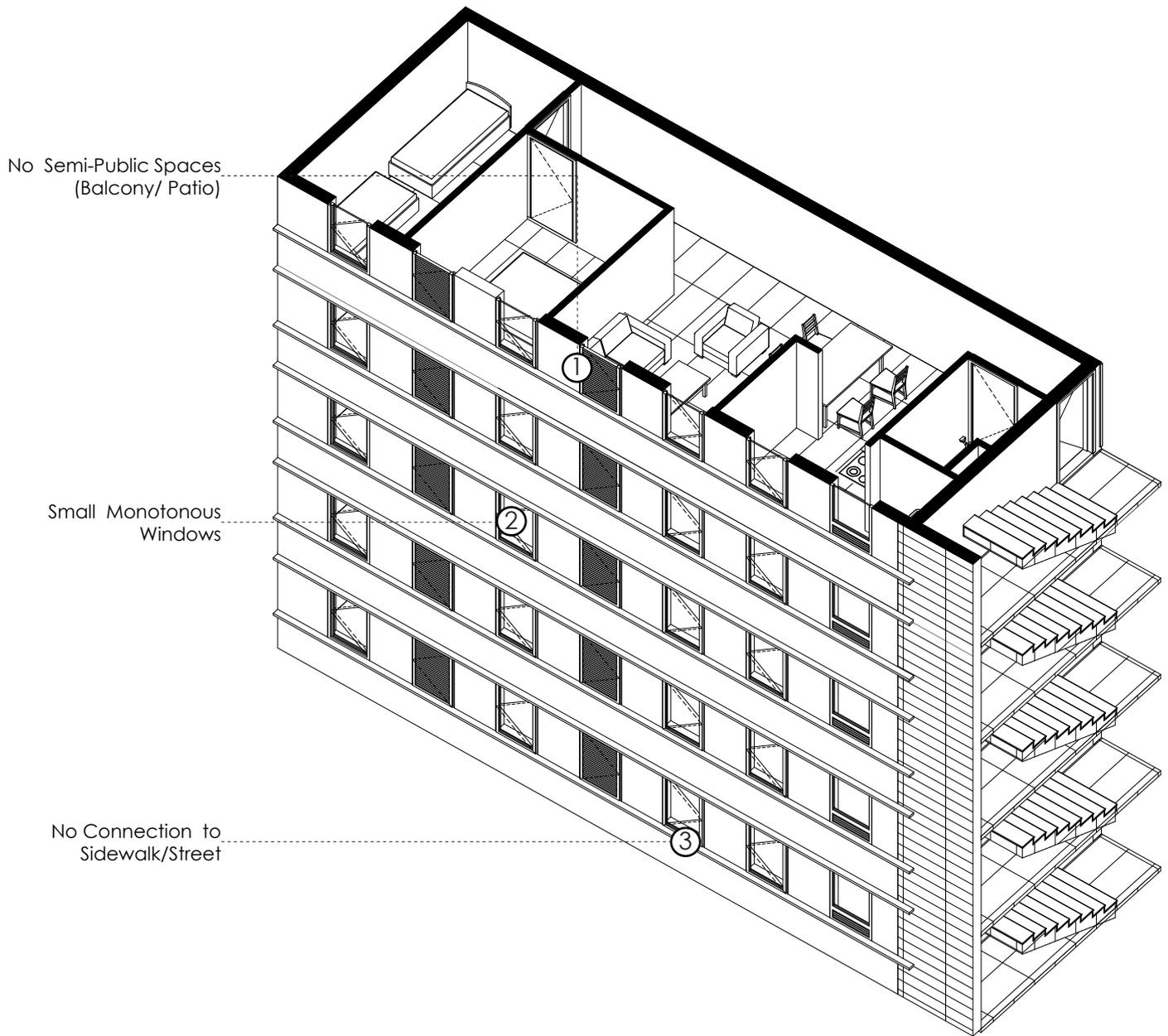
No Semi-Public Spaces
(Balcony/ Patio)

Small Monotonous
Windows

No Connection to
Sidewalk/Street

① ② ③

Figure 5: "*Paraisópolis* Condominium by ETELITO ARQUITETOS(2011), Source: Author, 2023

The project shows the results of a clash between the desire for private and protected space and the need for public space in cities. Accordingly, there is a need for a new urban model that addresses favela dwellers' desire for security and privacy while simultaneously challenging segregation caused by boundaries. The new urban model can become a signifier of social mobility that creates meaningful spatial relationships and forces the City of Walls to find a new name.[30]

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30 Bridges, "Social Mobility in the City of Walls: Setting the Benchmarks for Urban Upgrades," 34-35

Figure 4: *Paraisópolis Condominium* by ETELITO ARQUITETOS(2011), Source: Author 2020
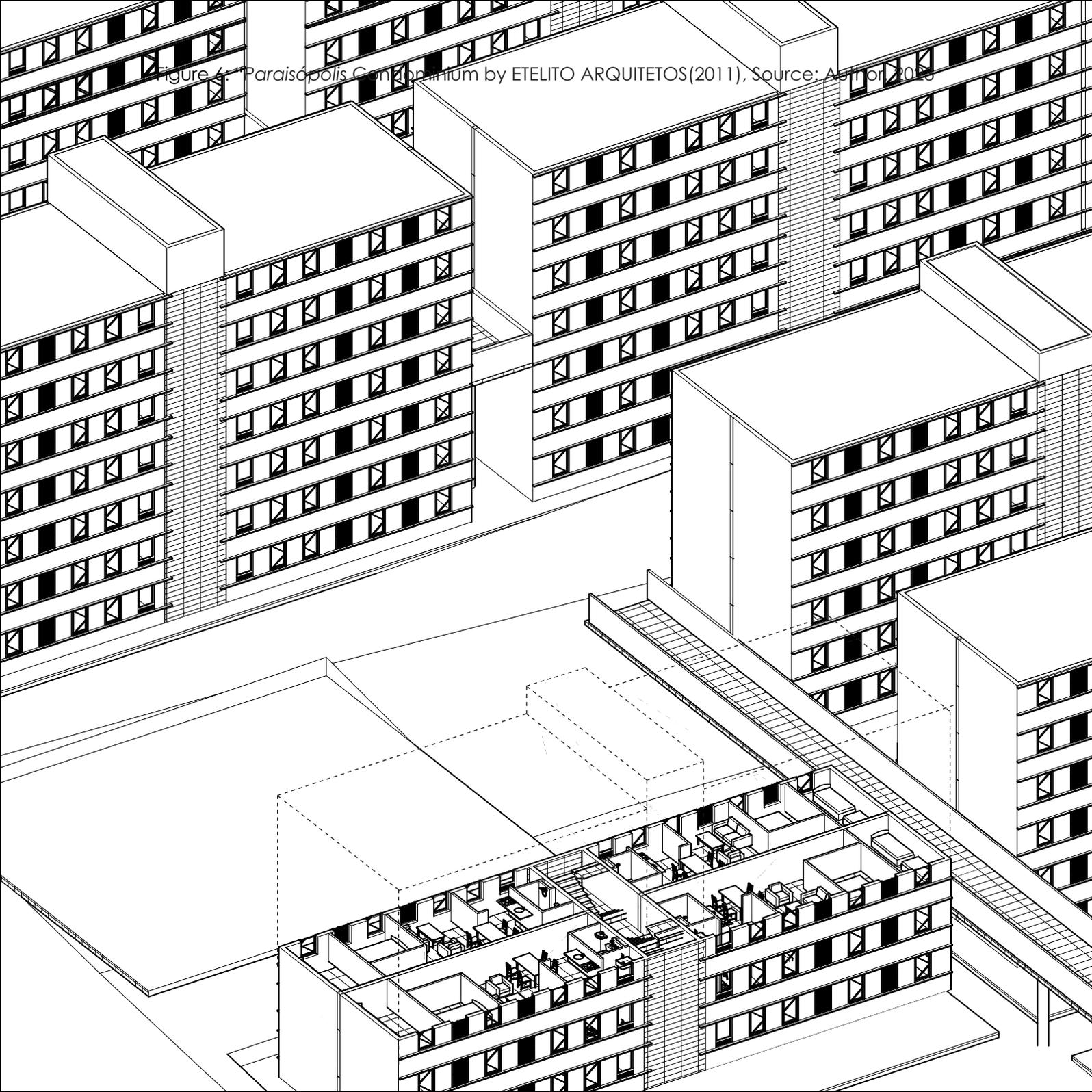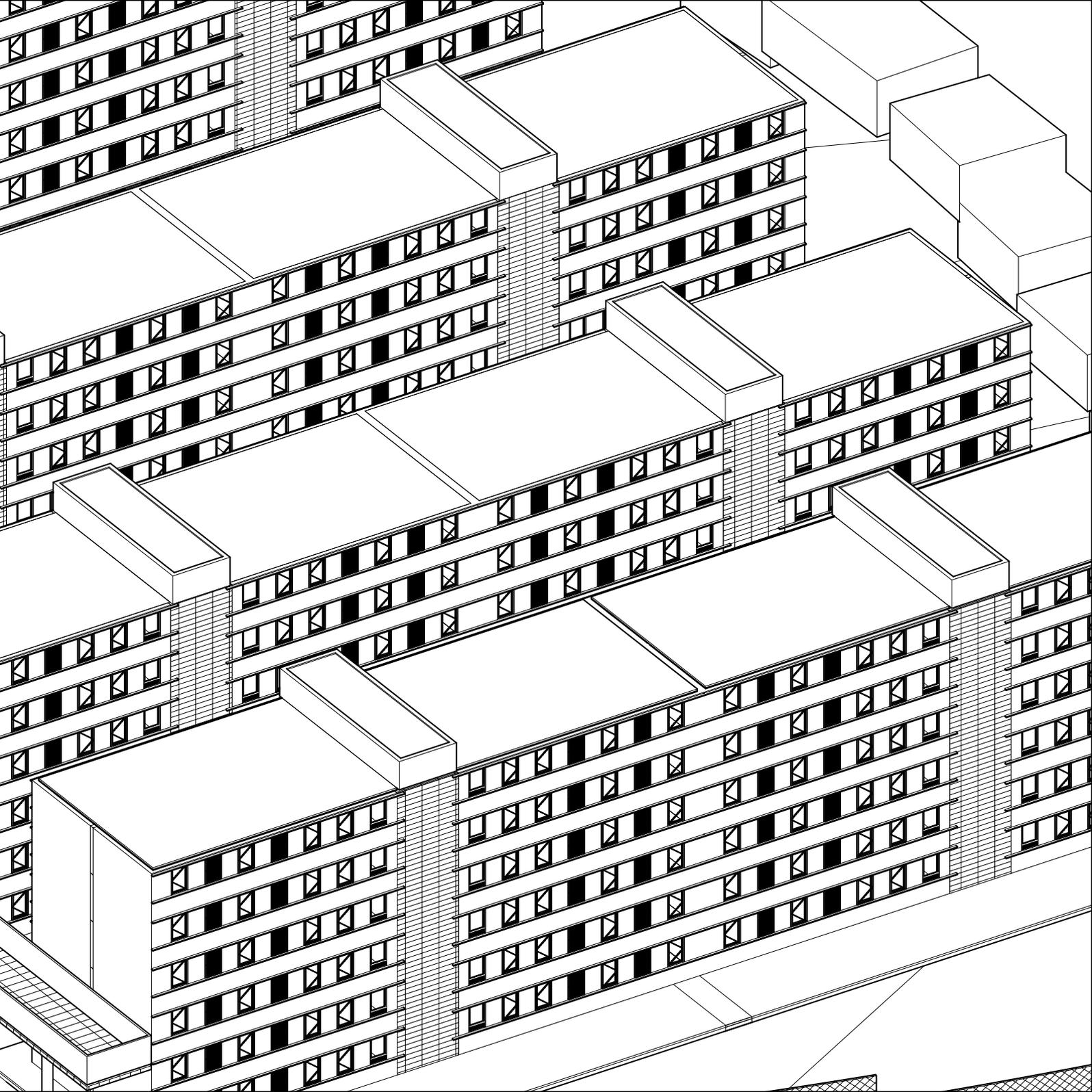
# Research Question

*How can careful boundaries and porous thresholds consolidate the connection and co-existence between a new social housing project and the Grajaú neighbourhood?*

"Every wall is a door."

- Ralph Emerson

Figure 7: Carnival on Canvas, Rogerio Reis, Source: https://www.rogerioreis.com.br/oncanvas

Figure 8:Carnival on Canvas, Rogerio Reis, Source: https://www.rogerioreis.com.br/on-canvas

## 3.1. Boundaries

The Merriam-Webster Dictionary defines a boundary (noun) as "something that indicates or fixes a limit or extent" and links it to words like 'confine' and 'termination.'[31] By definition, boundaries are tools that exclude and restrict - words that come to mind when considering the urban composition of São Paulo.

One of the tools used to create porosity within boundaries is thresholds. In the book Threshold Spaces, architectural researcher Till Boettiger notes that thresholds are spatial conditions that create openings in boundaries to allow for movement and transition in space. Thus, Boettiger expresses that thresholds can unlock boundaries while simultaneously noting that a boundary is required to activate the threshold. [32]

## 3.2. Thresholds

### 3.2.1 Schwellenzauber: Threshold Magic

The online Merriam-Webster Dictionary's first definition of threshold (noun) is "the plank, stone, or piece of timber that lies under a door."[33] These physical manifestations of thresholds indicate and influence psychological, emotional, social, ceremonial and economic territories and borders.[34] Accordingly, a threshold is "the point at which a physiological or psychological effect begins to be produced."[35] Consequently, a bare strip of wood under a door frame can announce and interact with the metaphysical world.

Walter Benjamin developed the phrase der Schwellenzauber (threshold magic), where he often tells the reader about the enchanting effect of thresholds. He notes:

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31 Merriam-Webster.com Dictionary, s.v. "boundary," accessed November 15, 2022, https://www.merriam-webster.com/dictionary/threshold
32 Till Boettger, Threshold Space: Transition in Architecture (Berlin Walter de Gruyter GmbH, 2014): 10-11
33 Merriam-Webster.com Dictionary, s.v. "threshold," accessed November 15, 2022, https://www.merriam-webster.com/dictionary/threshold.
34 Ebru Alakavuk, "Threshold Approaches to Architectural Design Studio", SHS Web Conference 2018: 1-2
35 Merriam-Webster.com Dictionary, s.v. "threshold," accessed November 15, 2022, https://www.merriam-webster.com/dictionary/threshold.

Figure 9: Carnival on Canvas, Rogerio Reis, Source: https://www.rogerioreis.com.br/on-canvas

"The threshold must be carefully distinguished from the boundary. A Schwelle (threshold) is a zone. Transformation, passage, and wave action are in the word schwellen and swell, and the etymology ought not to overlook these senses. On the other hand, it is necessary to keep in mind the immediate tectonic and ceremonial context which has brought the word its current meaning."

Benjamin describes a threshold as a magical zone formed by precise tectonic lines. The threshold does not merely create a permeable boundary. It creates an intermediate zone. It is an interval between things in space and time. A medium that allows entry and opens the possibility of being in between two worlds at once.[36]

### 3.2.2. In-Between: Carnival, Rogerio Reis

Brazilian photojournalist Rogerio Reis captures this idea of being in-between worlds in his series Carnival Na Lona (Carnival on Canvas). In 1987 Reis decided to abandon Rio's sanctioned Carnival and venture into the streets to capture the 'real' Carnival. When the project started, Reis documented the name and occupation of every person he photographed. Once, he asked a man dressed as a tree what his profession was, and the man simply answered, "I am a tree!" before walking away. At that moment, the photographer realised that at Carnival, a person's social status or occupation does not matter; what matters is who or what the person is trying to be.[37] This idea is further re-iterated by Julian Holloway and James Kneale in the essay "Dialogic of Space", where they articulate that carinval allows,

" a second world and a second life outside officialdom…Carnival celebrated temporary liberation from the prevailing truth and the established order: it marked the suspension of all hierarchical rank, privileges, norms and prohibitions…the feast of becoming, change and renewal."[38]

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36 Georges Teyssot, "Dream House," in A Topology of Everyday Constellations, ed. Georges Teyssot (Massachusetts: MIT Press, 2013), 84-90
37 Mariana Vasconcellos, "Showcase: Surreal Selves in Rio," February 16, 2010, h ttps://archive.nytimes.com/lens.blogs.nytimes.com/2010/02/16/showcase-123/
38 Julian Holloway and James Kneale, "Mikhail Bakhtin: Dialogics of Space," in Thinking Space, ed. Mike Crang and Nigel Thrift, (London: Routledge, 2000), 79-80.

Figure 10: Carnival on Canvas, Rogerio Reis, Source: https://www.rogerioreis.com.br/on-canvas

Thus, a person's carnival costume is a threshold that allows them to co-exist in between two worlds. Similarly, a new urban model (carnival costume) that embraces careful boundaries and porous thresholds could allow for a better co-existence between the Grajau Neighbourhood and the new social housing complex. Consequently, the projects research question asks: *How can careful boundaries and porous thresholds consolidate the connection and co-existence between a new social housing project and the Grajaú neighbourhood?*

Sub-Questions:

How can **careful boundaries** and **porous thresholds** consolidate the **balance** between *efficiency* and *resilience* in a new *social housing project* in *Grajaú*?

3.3. Architectural Thresholds

3.3.1 Aldo van Eyck: The In-Between

The limitations of the Modernist approach resulted in several movements that perceived and reconsidered the neglected aspects of the architectural style. The research focused on four factors: space, time, environment and humans.
One of the core groups involved in this research was CIAM's (Congrès internationaux d'architecture modern) Team 10.[39] Among that team was the renowned Dutch Architect Aldo van Eyck with his concept of the in-between. Van Eyck adopted the German philosopher Martin Buber philosophy on the in-between which stated,

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39 The Congrès Internationaux d'architecture moderne (CIAM), or International Congresses of Modern Architecture, was an organization founded in 1928 and disbanded in 1959, responsible for a series of events and congresses arranged across Europe by the most prominent architects of the time, with the objective of spreading the principles of the Modern Movement focusing in all the main domains of architecture (such as landscape, urbanism, industrial design, and many others).

Figure 11: Aldo van Eyck Buurthuis  Source: https://www.unstudio.com/en/page/10776/uns-talks-about-playgrounds

"The fundamental condition of being human is a man with his fellow man. It is rooted in the fact that a being considers another as another, so as to be able to communicate with him in a sphere which is common to both and which transcends the individual spheres of both… I call the sphere of the in-between. It is a primary category of human reality. It will be the starting point for the real third."[40]

During the 11th (1959), CIAM meeting Van Eyck quoted the Buberian slogan "Das Gestalt Gewonrdene Zwischen" ("the in-between that has taken shape"). He promoted architects to "define in-between spaces, which induce simultaneous awareness of what is significant on either side to provide a neutral space where two opposing polarities could act as a twin phenomenon (Zwiefalt)."[41]

In the twin phenomena, opposites remain identifiable as counterparts but do not contradict each other. It is based on the idea that two different poles are part of the same entity (co-exist). Van Eyck argued that the ambivilance of the in-between is achieved by: allowing two poles to overlap, the continuity of two elements into each other, articulation of elements to create a gap as a third space, the repetition of units to create a whole, fragmentation of elements for a more integrated relation, or fusion of different patterns or spaces. Accordingly, the twin phenomena (in-between) offered a fundamental theory for an architecture that reconciles through thresholds. [42]

*Van Eycks In-Between theory developed 'factors' to translate his ideas into architecture. These factors are:*
*(1) Space:* The space factor expresses the ambivalence of the in-between and has a certain layered quality which that can be explored through transparency, colour, or materials such as water, light, shadow, wind and greenery. *(2)Time:* The Time factor can directly describe the physical transition elements or indirectly express the notion of spiritual transition.
*(3) Human:* The dimension expresses the intersection of various human activities or the multi-functionality of a singular space to generate a non-physical ambivalence concentrated on the human usage of space.

40 Marayam Farhady and Jeehyun Nam, "The comparison of the In-Between Concepts by Aldo van Eyck and Kisho Kurokawa: Through Theories of Twin Phenomena and Symbiosis," Journal of Asian Architecture and Building Engineering 8, no. 1: 17-23, (2009): 17
41 Marayam Farhady and Jeehyun Nam, "The comparison of the In-Between Concepts by Aldo van Eyck and Kisho Kurokawa," 19
42 Marayam Farhady and Jeehyun Nam, "The comparison of the In-Between Concepts by Aldo van Eyck and Kisho Kurokawa," 22-23

Figure 12: Hector Viglecca  Source: https:https://www.archdaily.com.br/br/01-183917/aula-inaugural-na-puc-rio-com-hector-vigliecca/5329a9c0c07a80c8660000a7

### 3.3.1 Hector Viglecca: The Third Territory

The Uruguay-Brazil architect Hector Viglecca has been responsible for designing several social housing projects in São Paulo. Vigliecca trained in Uruguay, where he emerged from a post-modern debate that re-evaluated the virtues of the traditional city. The training gave Viglecca a unique perspective on the city and encouraged him to develop a concept he calls The Third Territory.[43]

The Third Territory maintains that there are three territories: irregular housing, social housing and the space in-between (the threshold). Viglecca aims to consolidate irregular housing with structured social housing rather than imposing on or removing it. Thus, his projects do not try to imitate or reinterpret what is there; instead, it recognises what is built but offer a new way to live, which one can still relate to. Viglecca is convinced that integrating social housing into an existing neighbourhood is essential to achieve spatial, economic and social success.[44]

Two projects that clearly showcases Viglecca's concept of The Third Territory is Gleba A and Parque Novo Santo Amaro V. Both projects are located in an informal area and were part of a re-housing project for houses located too close to the edge of the water. Viglecca uses several methods to create 'the third territory'. is The projects are shaped around the favelas to ensure as few people as possible are re-housed. For instance, as a 'gesture' to embrace the irregular construction, the architect did not design the building as a single mass; instead, it is a composition of seven parts connected by walkways. Parque Nova also introduces a pedestrian route to reconnect the two sides of the valleys.[45]

The concept of Viglecca and the projects presented contributed greatly towards the development of the project. The projects will be re-introduced throughout the booklet as the project progresses.

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43 Viglecca and Associates, "The Third Territory [excerpt]," Issuu, 8 December 2015, https://issuu.com/viglieccaeassociados/docs/issu_terceiro_territorio

44 Gustavo Marcondes Massimino, "Habitcao Coletiva de Interesse Social em Heliopolis: A visao de quatro arquitetos," (Master dissertation, University of São Paulo, 2018), 128-140.

45 Viglecca and Associates, s.v. Parque Nova and Gleba A, accessed 02 January 2023, w ww.vigliecca.com.br

CHAPTER 4

# Research Methodology

The Research Methodology is a combination of Quantitative, Qualitative and Mixed Methods.

*Literature Review*
Since the field trip was only two weeks, literature sources will be used to 'fill' the knowledge gap. Accordingly, dependable essays, journal articles, news articles, and books about the history and development of social housing in Brazil will be used to understand why the current social housing policies and approaches are in place.

The rest of the literature will focus on the implication of porous thresholds and careful boundaries. The literature on thresholds and boundaries will be divided into two sections. Firstly, the general definition and vocabulary associated with the words thresholds and boundary. The second section will focus on existing concepts, applications and experimentations of architectural thresholds and boundaries.

*Analysis*
To better understand the pre-existing conditions of social housing in the Grajau neighbourhood, an in-depth group analysis of Chácara do Conde Grajau (2018) will be conducted. The analysis will document the residential building's materiality, construction methods, unit typologies, typical layouts, facades, GSI,FSI, density and connectivity.

Several case studies that implemented porous thresholds will be analysed and compared. During the analysis, threshold devices will be collected and combined into a "design toolbox." The toolbox will guide and inspire the design process.

*Interviews*
During the field trip, interviews with the residents of Grajau will enable a better understanding of the political and social situations within the neighbourhood. The interviews will significantly contribute towards the development of the research theme.

As part of the Chácara do Conde analysis, the group will have a zoom interview with Secretaria Municpal de Habitacao de Sao Paulo (Municipal Housing Department of Sao Paulo) to verify and discuss the accuracy of the analysis. Furthermore, this interview will also be an opportunity to ask questions about the findings and consequently form a complete understanding of the project—for instance, asking questions about the motivation for using specific materials.

*Field Work*
Fieldwork is an intrinsic part of architectural education because it confronts the designer with the existing environments in real life. During the field trip, the physical, social and political conditions of the Grajau neighbourhood will be documented through a series of videos, photographs, sketches and interviews. Furthermore, the group will visit several social housing case studies in Sao Paulo to get a in-person understanding of the spaces.

*Definitions*
The main problem identified during the research is the transition between public and private. Accordingly, thresholds will be used as catalyst within these transitions space to allow for better urban integration.

Accordingly, the definition of threshold was considered. I noticed that it is connected to words like doorway, portal and window. The quality of each of these thresholds was explored and connected to possible design opportunity. For instance, "The Door" – "Restricts or Permits Movement" – "Zones of Transition".

# Grajaú, São Paulo

*Considering the Climate, Topography, Environmental Protection Laws
and Typologies of Grajaú*

The project is in Grajaú, a neighbourhood in the southern periphery of São Paulo (figure 13). Grajaú has a dense population of approximately 3900 people/km2 (nearly half a million inhabitants).[43] The neighbourhood was occupied in the 1960s when the capital of São Paulo experienced economic growth. Since most of the district was developed outside conventional legal frameworks large, parts of Grajaú consist of favelas or irregular settlements.[44] Accordingly, Grajaú primarily consists of ZEIS 1 and ZEIS 4 areas. SEHAB is continuously developing the neighbourhood within the legal framework set by the city statute. [45]

## 4.1. Climate and Topography

São Paulo is a subtropical climate with high temperatures and humidity throughout the year. The city has a predominant South-East wind from the ocean. The area experiences rainfall throughout the year, peaking during the summer period (October to March). The city is on a plateau inland from the coastal region. It is part of the large region known as the Brazilian Highlands, with an average elevation of 799m above sea level (figure 14).[46]

*Architectural Considerations:*

• Little insulation needed
• Shading is crucial
• Buffer rainwater, Stimulate drainage subsoil, and Flood-proof construction
• Fauna as a water and sun buffer.
• Ventilation possibilities crucial due to high tempratures

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43 *GeoSampa*, s,v, "Grajaú Cenus (2010)", accessed January 15, 2023, https://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx
44 Raul P Lejano and Corinna Del Bianco. "The Logic of Informality: Pattern and Process in a São Paulo Favela". *Geoforum* 9, May 2018: 195–205. https://doi.org/10.1016/j.geoforum.2018.03.005.
45 *GeoSampa*, s,v, "ZEIS 1 and ZEIS 4," accessed January 15, 2023, https://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx
46 Aureliano Schneider and Ronald Milton. "São Paulo: Climate" *Encyclopedia Britannica*, Last modiefied February 22, 2023. https://www.britannica.com/place/Sao-Paulo-Brazil.

# Grajaú, São Paulo



State of São Paulo

Project Site
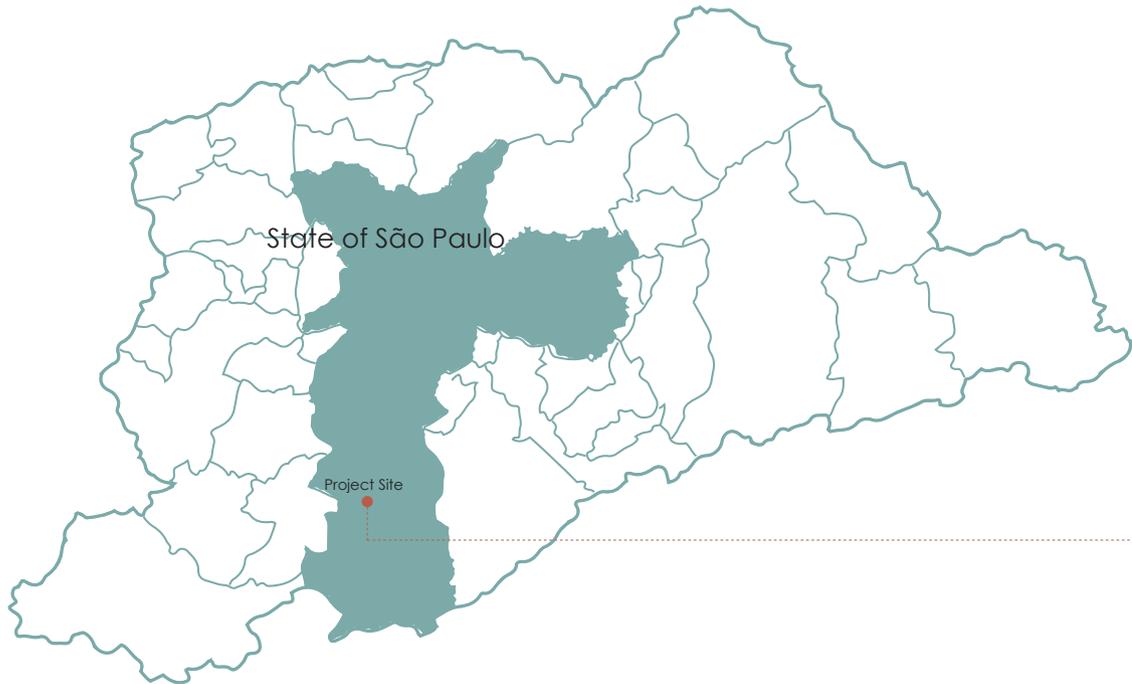
Figure 13: State of Paulo São to Grajaú Source: Winnie Goldsteen, adapted by author (2023)

São Paulo Metropolitan

Grajaú

Project Site

Rural São Paulo
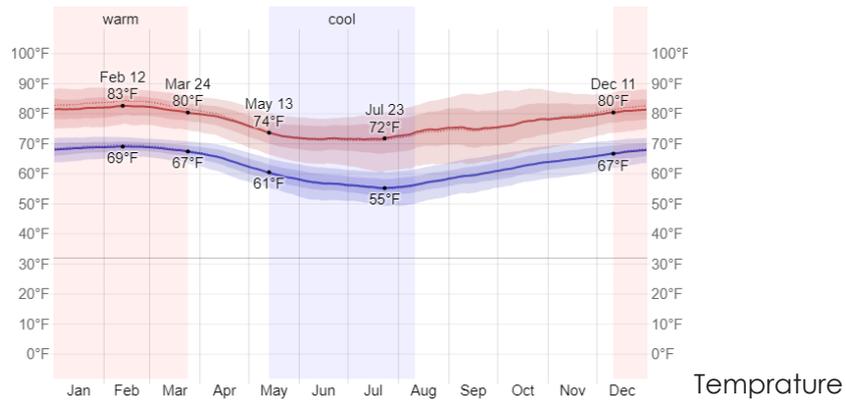
Temprature
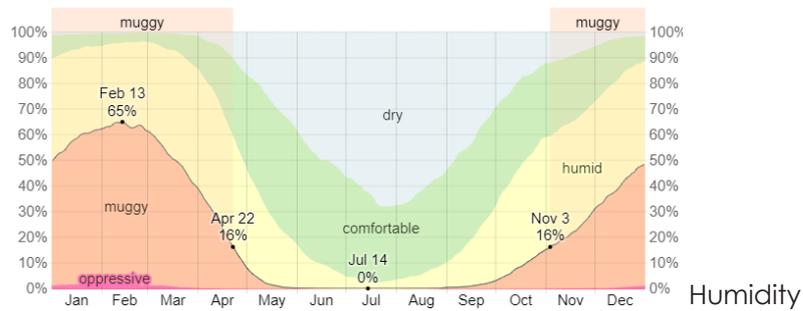
Humidity
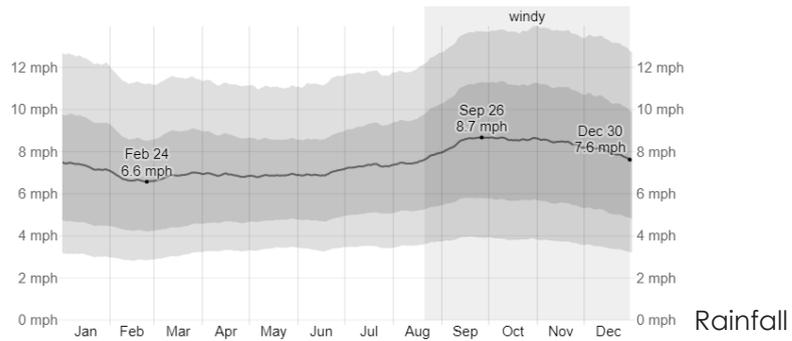
Rainfall
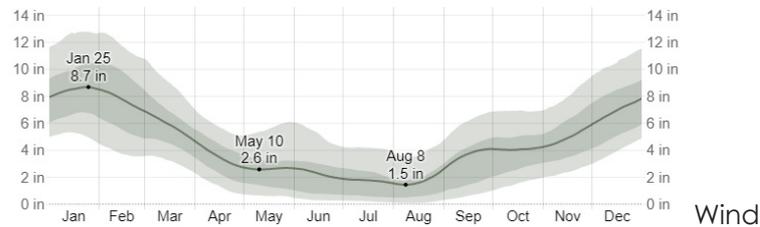
Wind

Figure 14: São Paulo Climate Source: https://weatherspark.com/y/30268/Average-Weather-in-S%C3%A3o-Paulo-Brazil-Year-Round#Figures-Temperature

4.2. Guarapiranga e Bilings Reservoirs and the Atlantic Forest

*Guarapiranga e Bilings Reservoirs* shape the edges of the district. In addition, several brooks from the reservoir extend throughout Grajaú. Due to the informal initiation of the neighbourhood, several irregular houses are situated in the dangerous flooding area of the water body.[47] This not only endangers the lives of the people living there but also affects the preservation of the water quality and the remaining regions of the Atlantic Forest.[48]

To manage the preservation and rehabilitation of these space the *Lei de Proteção e Recuperação dos Mananciais* (Head-waters Protection and Recovery Law) and *Programma Manaciais* (Springs Program) was established. Programma Manaciais is responsible for rehousing families living too close to the waterbody in ZEIS 4 sites and replacing the removed houses with Linear Parks (figure 15).[49] The Linear Parks have the dual purpose of preserving the remaining Atlantic Forest Ecosystem while introducing much-needed public space in the favelas.

Architectural Considerations:
• Can't Build 15m from the edge of the waterbody
• Atlantic forest needs to be protected
• Areas close to the water edge need to be developed to avoid occupation
• Linear parks are located along the different sites

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47 Irregular dwellings include: Favelas (shanty towns), tenements, clandestine developments, invasion of risk areas and riverbanks.
48 Instituto Socioambiental (ISA), "Programa Manaciais da Regiao Metropolitana de São Paulos," 2008 http://projects.mcrit.com/tiete/index.php/casos-estudo/casos-de-estudo/280-programa-mananciais-da-regiao-metropolitana-de-sao-paulo
49 Maria Lúcia Refinetti Martins, *Moradia e Mananciais: Tensão e Diálogo Na Metrópole*, (São Paulo: FAUUSP), 2006.
Programa Mananciais da Região Metropolitana de São Paulo is a collaboration between the state and municipal government (SEHAB and CDHU). The program mainly rehouses families living in dangerous flooding areas and manages the environmental preservation of natural water sources and the Atlantic forest.

Figure 15: 'São Paulo Enviromental Water Network and System of Protected Green Areas and Open Space' (2015) Source: https://gestaourbana.prefeitura.sp.gov.br/wp-content/uploads/2015/01/Plano-Diretor-Estrat%C3%A9gico-Lei-n%C2%BA-16.050-de-31-de-julho-de-2014-Texto-da-lei-ilustrado.pdf.

MAUÁ

RIBEIRÃO PIRES

RIO GRANDE DA SERRA

SANTO ANDRÉ
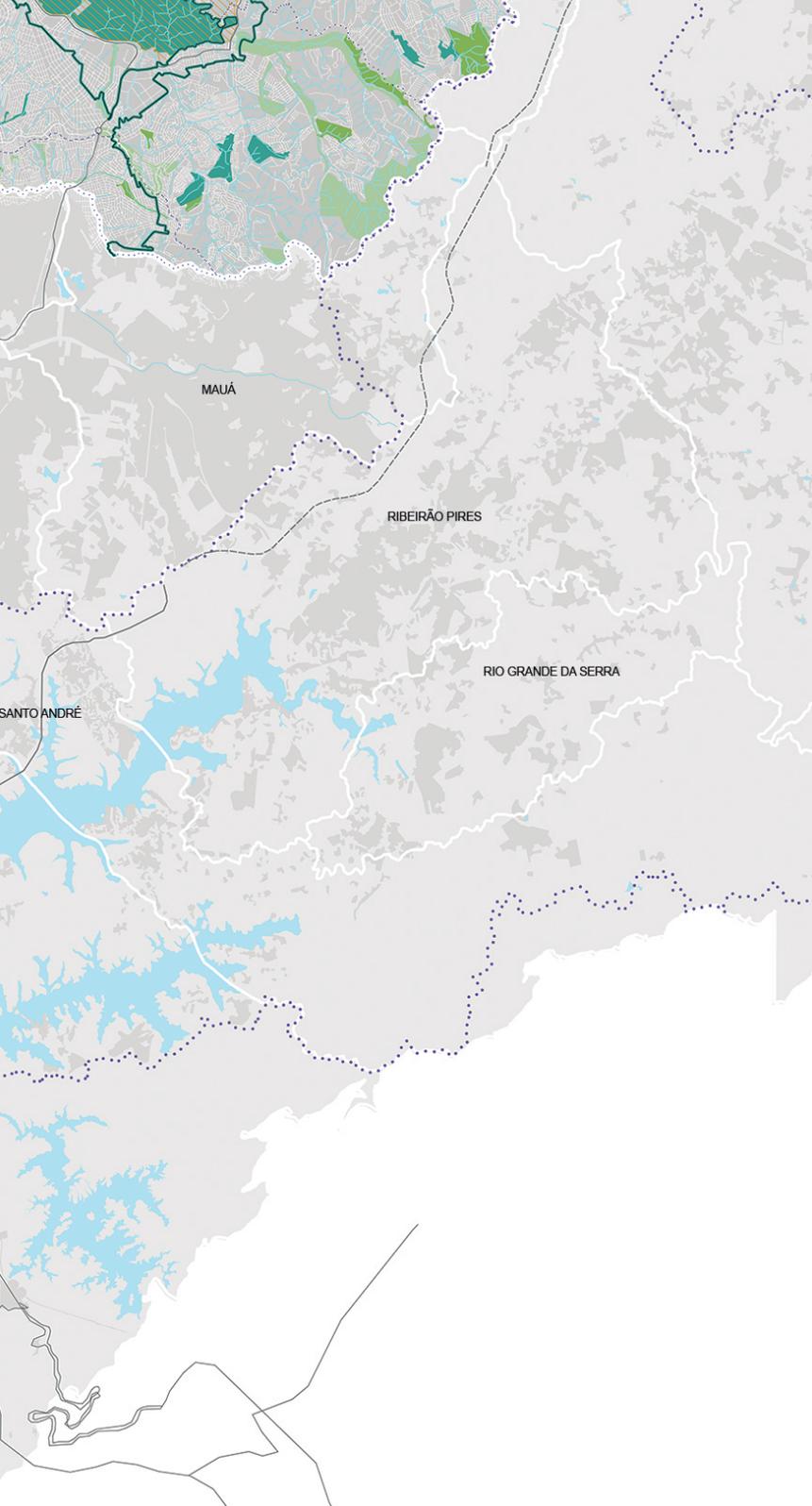
Existing Municipal Park

Municipal Park Proposed Under Implementation

Municipal Park Proposed in Planning

Integral Protection State Park

urban state park

Private Natural Heritage Reserve

Bororé Colonia Environmental Protection Area

Capivari Monos Environmental Protection Area

State Environmental Protection Area

Indigenous Land under Homologation

Existing Indigenous Land

Hydrographic Basins

Hydrography

Level 1 Structural Road

Planned Rodoanel

Limit of Macrozones

Spring Protection and Recovery Area

Boundary of Subprefectures of the Municipality of São Paulo
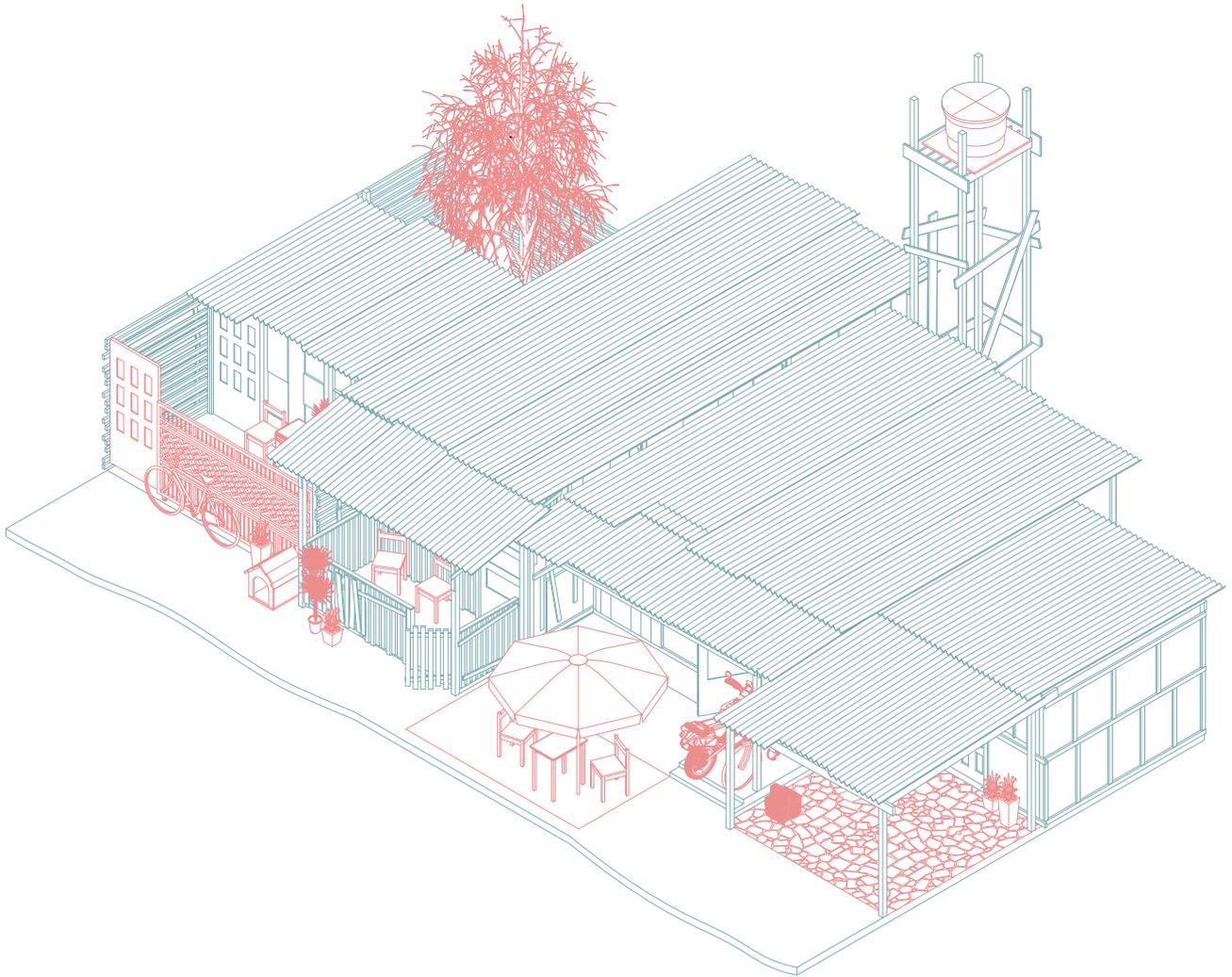
Figure 16: "Anchieta Informal Shack" Source: Angeline Torbica, Alexandra, Be Kostelijk (2023)

4.3. Typologies

Grajaú primarily consists of ZEIS 1 and ZEIS 4 areas (figure x ).

4.3.1 ZEIS 1

ZEIS 1: areas occupied by low-income families.Favelas, irregular settlements and social housing developments populate these zones. The government intends to preserve the pre-existing population of ZEIS 1 areas by legalising the neighbourhoods and promoting urban upgrading that enables economic growth, environmental recovery and safe living conditions.[50]

ZEIS 1 consist of vibrant and diverse neighbourhoods with several typologies. Some of the most common housing typologies are shacks (figure 16), favelas with a shop on the ground floor (figure 17) and corner shops with an attached dwelling (figure 18). These different types contribute towards the

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47 Irregular dwellings include: Favelas (shanty towns), tenements, clandestine developments, invasion of risk areas and riverbanks.
48 Instituto Socioambiental (ISA), "Programa Manaciais da Regiao Metropolitana de São Paulos," 2008 http://projects.mcrit.com/tiete/index.php/casos-estudo/casos-de-estudo/280-programa-mananciais-da-regiao-metropolitana-de-sao-paulo
49 Maria Lúcia Refinetti Martins, *Moradia e Mananciais: Tensão e Diálogo Na Metrópole*, (São Paulo: FAUUSP), 2006.
Programa Mananciais da Região Metropolitana de São Paulo is a collaboration between the state and municipal government (SEHAB and CDHU). The program mainly rehouses families living in dangerous flooding areas and manages the environmental preservation of natural water sources and the Atlantic forest.
50 Silvio Cesar Lima Ribeiro, Marcelo Nakano Daniel, and Alex Abiko. 'ZEIS Maps: Comparing Areas to Be Earmarked Exclusively for Social Housing in São Paulo City'. *Land Use Policy* 58 (December,2016): 449. https://doi.org/10.1016/j.landusepol.2016.08.010.
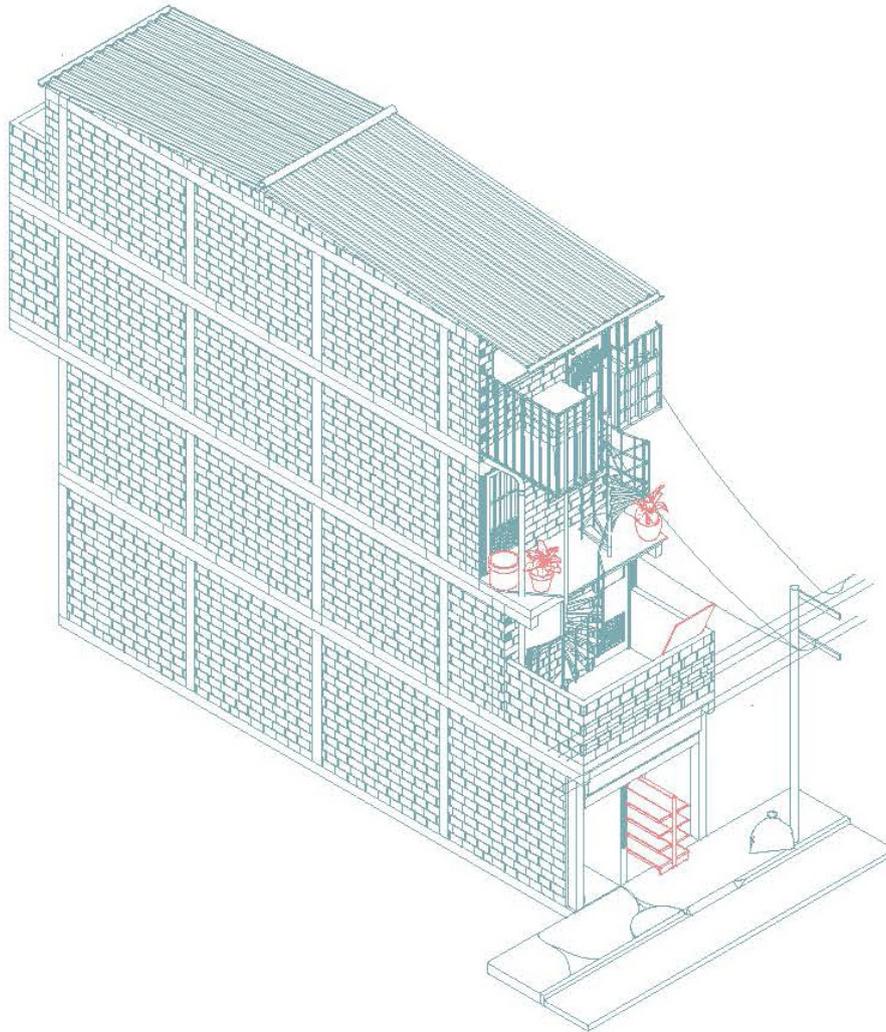
# Favela Dwelling



Figure 17: "Favela Dwelling" Source: RobbertLaan, HuubFenten and SanetteSchreurs (2023)

A small balcony can be used to hang clothes to dry

The top apartment has recently been built by the dwelling owner to earn money from rent

A separate bedroom still has to be built for the children

There is no space for a separate kitchen or laundry space

An outdoor staircase leads to the apartment on the top floor

The two children share a bedroom in the small apartment

Left-over building materials are stored on the balcony

The two upper apartments share their staircase from GF to 1F

A small part of the ground floor is rented by a shop owner, who sells building materials here

The sides of the building are left undecorated

The bathroom is equipped with a shower, sink, and toilet

The bedroom of the parents is on the more quiet backside

Different windows used during the extension of the building

On the backside of the building, the owner and his family has their two-storey apartment

A small hallway leads to the entrance of the GF apartment and the two apartments above

The favela dwelling typically has a shop on the ground floor with residential spaces on top. Since it has an immediate connection with the vibrant street, most favelas sacrifice their ground floor level for small commercial space—for instance, a grocery store, a mechanic company, a café etc.

Most favela dwellings have more than one family living in them. The person that initially bought the plot 'sells' their roof area to another family. The area is transformed into an additional house that is entered through an external staircase. This process is part of the unofficial real estate market in informal neighbourhoods.

# Cornershop



Figure 18: "Cornershop" Source: RobbertLaan, HuubFenten and SanetteSchreurs (2023)

Storage room shop inside apartment

Shop owner's apartment

Air conditioning

Entrance to the apartment

Corrugated steel overhang for protection against the sun

Different windows used during the extension of the building

Half-painted wall reveal that the building has been extended over time

The shop sells everyday supplies to citizens living nearby

CCTV security cameras watching over the sidewalks

Large entrances on both streets lure by-passers into the shop

Shop entrance that can be barricaded at night

Virtually every corner plot has a substantial commercial space on the ground floor due to the buildings' good connection to the street. These are often desirable plots since they can easily become a good and consistent source of additional income due to the high level of pedestrian movement.a

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

Lot Area: 10,4 Ha
FSI: 68500/104000 = 0,66
GSI: 13700/104000 = 0,132
Dwellings: 1290
Density: 124 ha/ha

Figure 19: "Chácara do Conde " (2022) Source: https://arquiteturajaa.com.br/

### 4.3.2 ZEIS 4

ZEIS 4 are vacant plots in headwater or environmental protection areas suitable for developing Social Interest Housing (HIS) and Low-Income Market Housing (HMP)(Figure 20). The project aims to promote ecological preservation and meet the housing needs of families rehoused from dangerous areas or families relocated from overly dense ZEIS 1 areas. São Paulo's Strategic Plan (PDE, 2014) defined a legal framework that must be considered when building in a ZEIS 4 to ensure the plots are adequately developed.[51]

Architectural Considerations:[52]
- A maximum FSI of 2
- A minimum of 60% HIS families
- A maximum of 20% HMP families

One of the most recent examples of a ZEIS 4 project is Chácara do Conde, completed at the end of 2022. Since the project was completed so recently, Chácara do Conde will act as a benchmark to compare the design. Additionally it will be used to further understand the approach towards social housing in recent years.

### 4.3.2.1 Chácara do Conde

Chácara do Conde is a ZEIS 4 social interest housing project completed at the end of 2022 (figure 19). The city of São Paulo's Programa Mananciais (Water Source/ Spring Program) commissioned Chácara do Conde to rehouse families living in dangerous conditions close

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51 Silvio Cesar Lima Ribeiro, Marcelo Nakano Daniel, and Alex Abiko. 'ZEIS Maps: Comparing Areas to Be Earmarked Exclusively for Social Housing in São Paulo City'. *Land Use Policy* 58 (December,2016): 449. https://doi.org/10.1016/j.landusepol.2016.08.010.
ZEIS were established through Law no 13.43. There are four Zones of Social Interest (ZEIS): ZEIS 1 is areas with existing slum that need to be upgraded, ZEIS 2 is empty public land allocated for social housing, ZEIS 3 is dilapidated central buildings that need to be fixed, and ZEIS 4 is open areas landmarked for social housing for families that will be removed from risk areas.
Freire Santoro, "Urban Planning Instruments For Promoting Social interest Housing: from zoning to obligatory percentages in São Paulo", Revista Brasileira de Estudos Urbanos e Regionais 17, no 2: 100-103.
52 Prefeitura de São Paulo, *Plano Diretor Estratégico do Município de São Paulo,* 2014 https://gestaourbana.prefeitura.sp.gov.br/wp-content/uploads/2015/01/Plano-Diretor-Estratégico-Lei-n°-16.050-de-31-de-julho-de-2014-Texto-da-lei-ilustrado.pdf
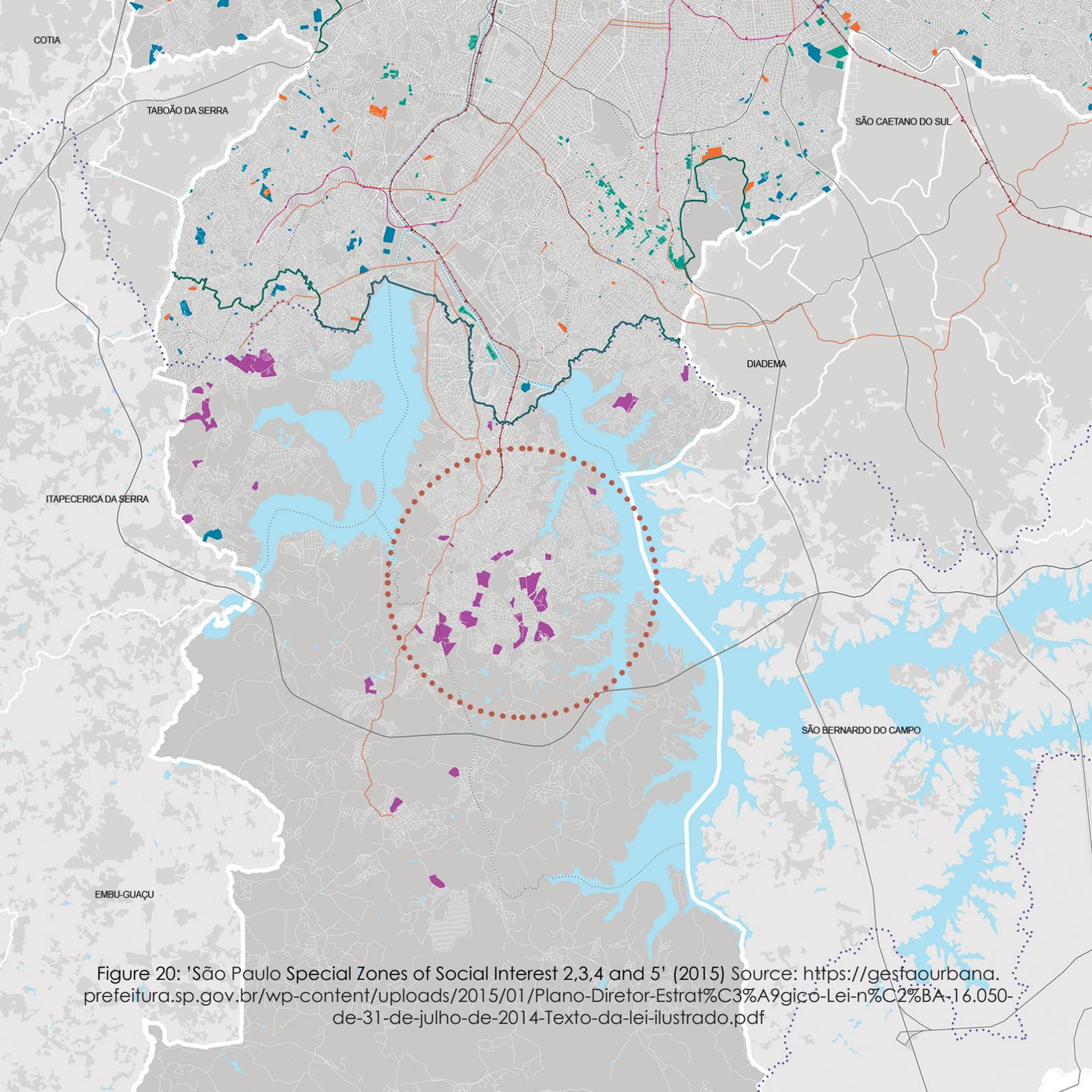
Figure 20: 'São Paulo Special Zones of Social Interest 2,3,4 and 5' (2015) Source: https://gestaourbana.
prefeitura.sp.gov.br/wp-content/uploads/2015/01/Plano-Diretor-Estrat%C3%A9gico-Lei-n%C2%BA-16.050-
de-31-de-julho-de-2014-Texto-da-lei-ilustrado.pdf

MAUÁ

RIBEIRÃO PIRES

RIO GRANDE DA SERRA

SANTO ANDRÉ

| | ZEIS 2 |
| | ZEIS 3 |
| | ZEIS 4 |
| | ZEIS 5 |
| • | Trem: Estação Existente |
| | Trem: Linha Existente |
| • | Metrô: Estação Existente |
| | Metrô: Linha Existente |
| | Corredor de Ônibus Municipal Existente |
| | Viário Estrutural de Nível 1 |
| | Rodoanel Planejado |
| | Limite das Macrozonas |
| | Área de Proteção e Recuperação de Mananciais |
| | Limite das Subprefeituras do Município de São Paulo |
| | Região Metropolitana de São Paulo (RMSP) |

Stucco has been applied to the walls and tiles have been installed upon delivery ① 

Shower, sink, toilet, and a basic kitchen are included

Small windows are placed regularly in the facade to provide daylight but prevent overheating ③

② 

A small foggia laundry space is included ④

Furniture is not included in the apartment ⑤

One variant of the apartment has three bedrooms, the other has two ⑥

The apartments are entered through a shared staircase, two apartments per floor ⑦

The outside of the apartment offers little possibilities for appropiation ⑧

Figure 21: "Chacara do Conde" Source: RobbertLaan, HuubFenten and SanetteSchreurs (2023)

to the *Guarapiranga e Bilings* reservoirs, which provide water to the Metropolitan region of São Paulo.[53] Designed by JAA Architects, the 34 buildings contain 1290 straightforward housing units (figure 21).

However, similar to the Parapolis condominiums, the project's design tells a story of segregation and disconnect (figure 22). The repetitive linear building blocks strongly contrast the complex urban fabric of the surrounding Grajaú area. Additionally, elements like the fences around the condominium and each urban block directly disconnects the housing from the sidewalks and the isolated units lacking semi-public spaces, such as balconies and terraces commonly found in favelas.

In the essay, "Building Mistrust", Silvia Stefani notes how current social housing projects often follow the fortified enclave model regularly found in São Paulo's wealthier areas.[54] In the article "Fortified Enclaves: The New Urban Segregation" Teresa P. R. Caldeira characterised enclaves as "a new model of spatial segregation." Calderia lists design tools that Architects and property developers have developed to achieve this spatial segregation, some of which are present in Chácara do Conde.

Firstly, physical dividers and empty spaces separate the building from the surrounding public space. Secondly, the building facades don't have a connection to the public street. Finally, access to the building is limited by decreasing and enclosing entry points (figure 22).[55]

Considering the abovementioned, Chácara do Conde follows the "higher" real estate market model, similar to the Paraisópolis condominium. This is problematic since this model undermines the principles of an open modern city. This model causes the project to become an isolated island physically and socially segregated from Grajau.

Thus, projects like Chácara do Conde show the need for a new urban model to consolidate better the spatial relationship between social housing projects and irregular neighbourhoods. Through careful boundaries and porous thresholds, the project aims to become a tool that can create spatial justice in Grajaú.

53 "Governo do Estado e Prefeitura entregam 412 apartamentos na zona sul de SP," São Paulo Governo do Estado, published: 22 December, 2022, https://www.saopaulo.sp.gov.br/ultimas-noticias/governo-do-estado-e-prefeitura-entregam-412-apartamentos-na-zona-sul-de-sp-2/
54 Stefani, "Building Mistrust," 8
55 Teresa Caldeira, "Fortified Enclaves: The New Urban Segregation " 8, (2016): 314-316

Figure 22: "Chacará do Conde vs Grajaú" Source: RobbertLaan, HuubFenten and SanetteSchreurs (2023)
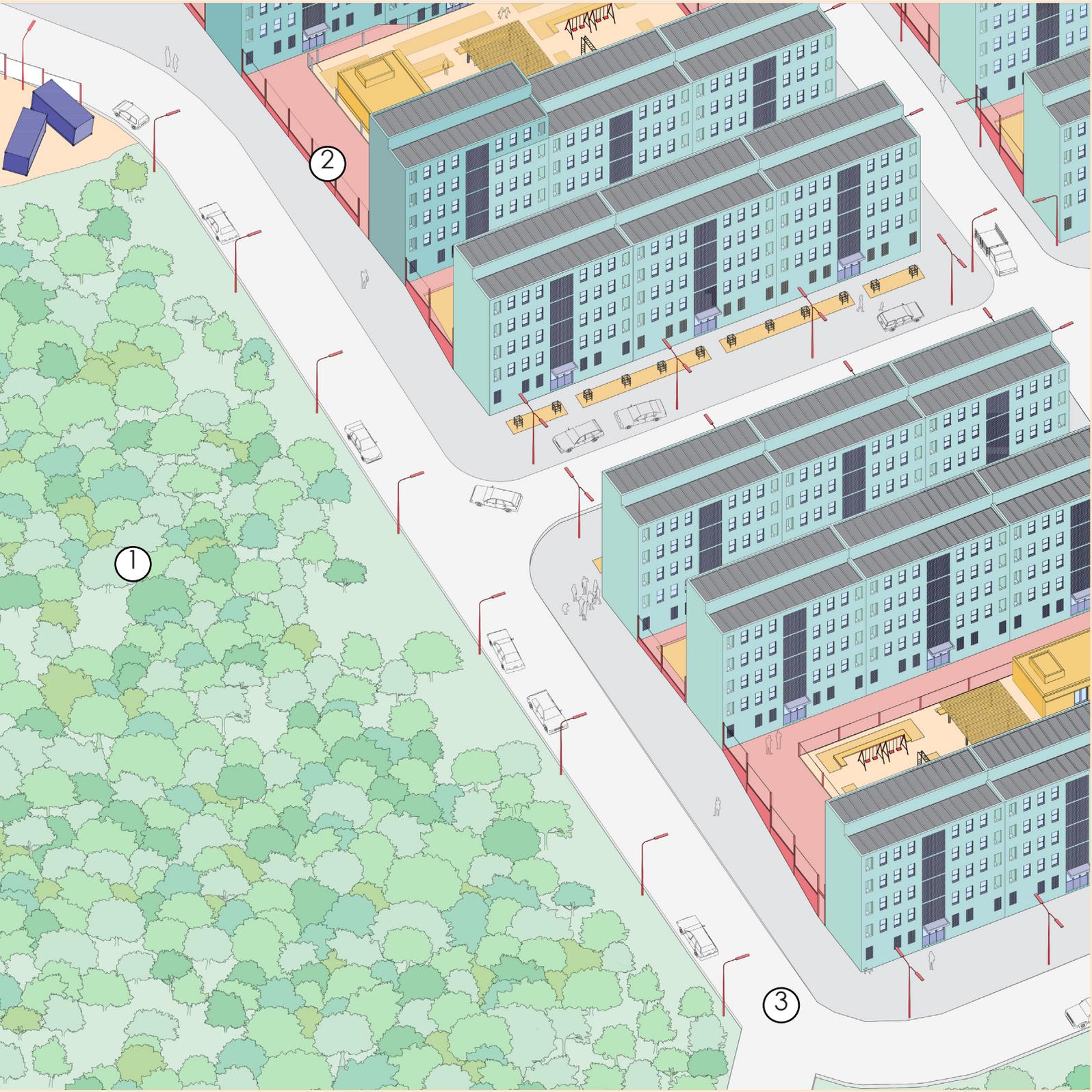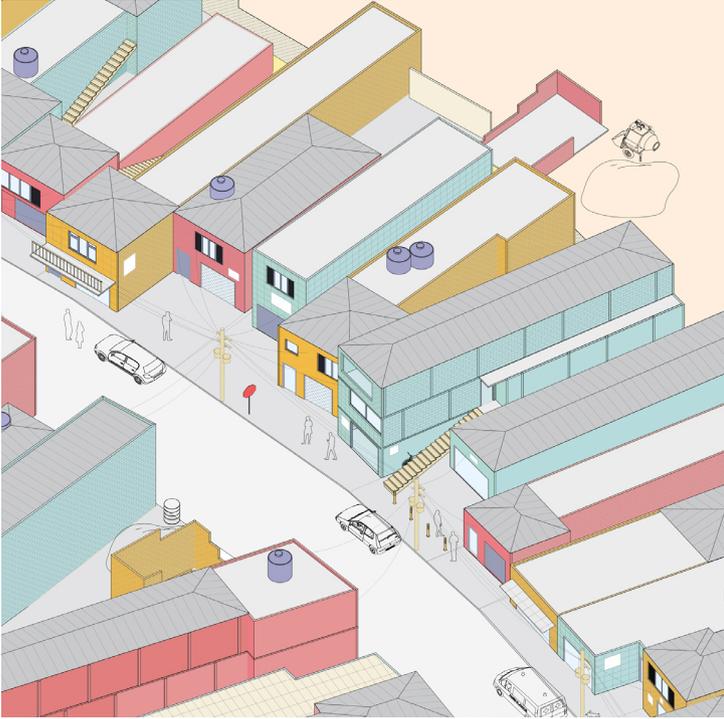
*Favelas' small footprint allows the dwellings to follow the rolling topography and have a direct connection with the street allowing Garage spaces to be transformed into shops*



*Physical Borders Isolate Urban blocks form Chácara do Conde and Grajaú*

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
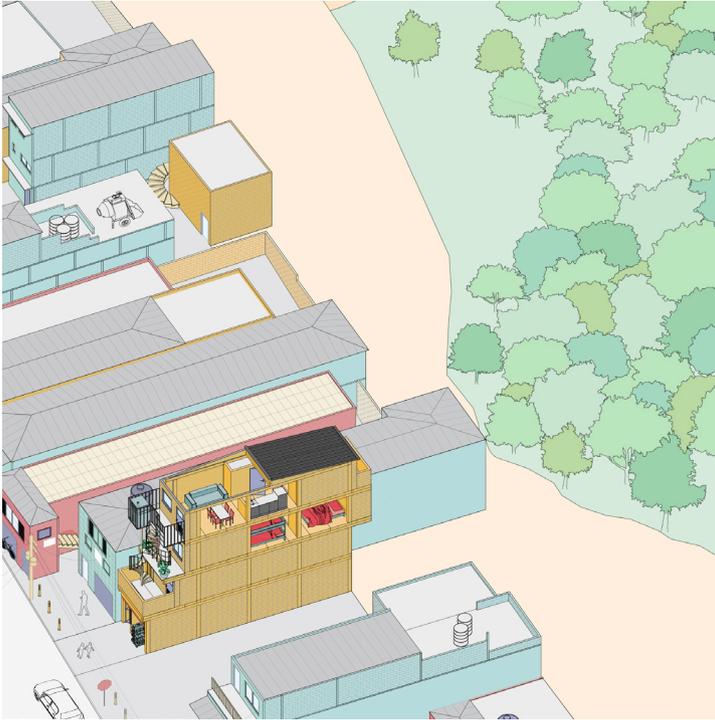
*The space between the favelas and Chácara do Conde is left vacant*
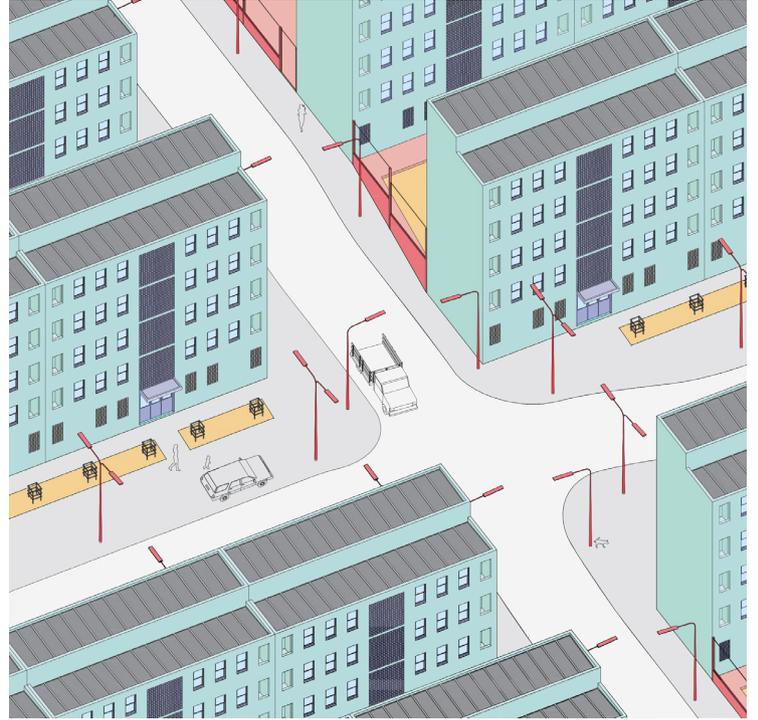


*The strong geometry of the Chácara do Conde blocks cause strongly contrast the urban fabric of Grajaú and causes a disconnect between the different blocks Chácara do Conde*

# ZEIS 1

# ZEIS 4

*Resillience*

*Efficency*

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

Resillience

Efficency
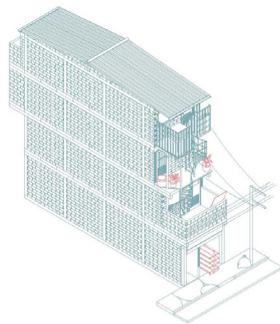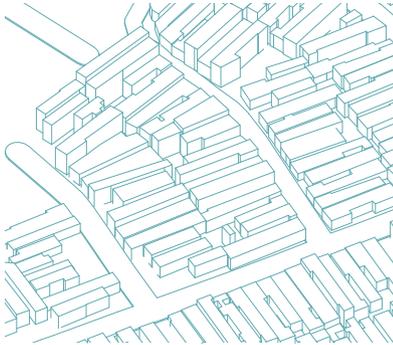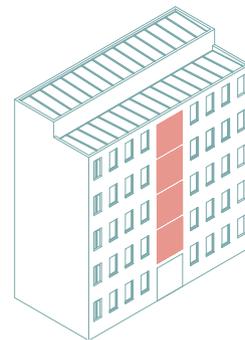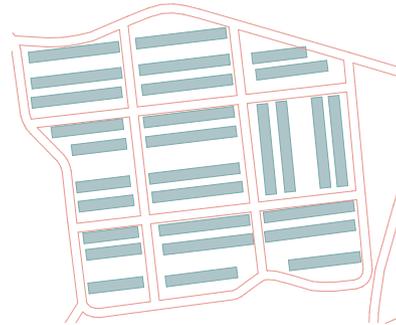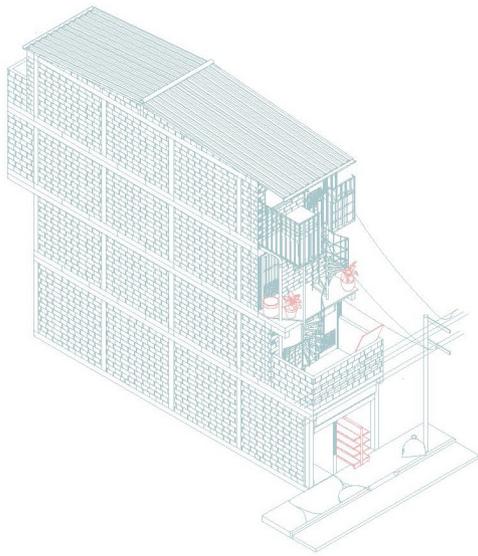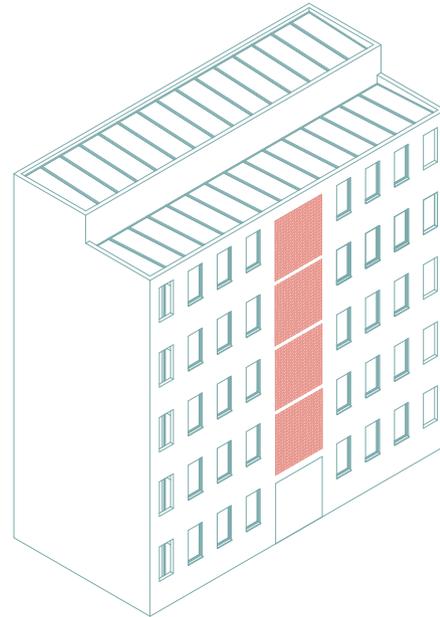
# Hamada Farm

## 5.1 Hamada Farm

The design brief asks for the development of a social-interest housing complex on a ZEIS 4 site in Grajau. The brief presented five possible locations. Considering the focus of the project, integrating social housing with its surrounding informal neighbourhoods, Hamada Farm was selected as the project site for two main reasons. Firstly, the site is located 550m from Chacara do Conde, making it simple to compare the two projects. Secondly, the project site is surrounded by an established and vibrant area of Grajau, making the challenge of integrating the design with the surroundings sufficient.

Similar to the analysis of the Grajau neighbourhood, the research will consider the surrounding typologies, environmental risk areas and climate and topography of the site.



Figure 23: GeoSampa, s,v, "ZEIS 1 and ZEIS 4," accessed January 15, 2023, https://geosampa.
prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx

Figure 24: Hamada Farm Source: Author, 2022

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
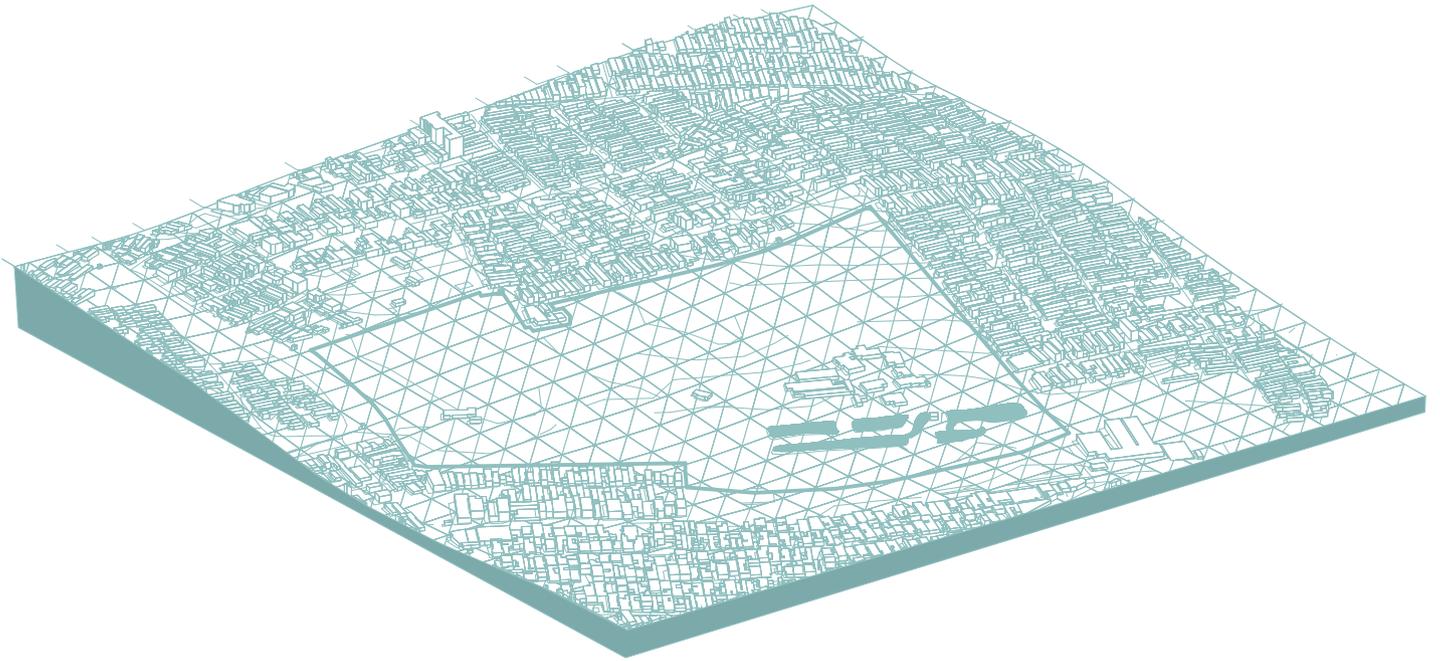
Figure 25: Site Overview Source: CADMapper, Adapted by author (2023)

The group contextual analysis of Hamada farm discovered that the eastern side of the plot houses an established informal market space and a popular linear park. Accordingly, the site's eastern side is a point of orientation within the neighbourhood.
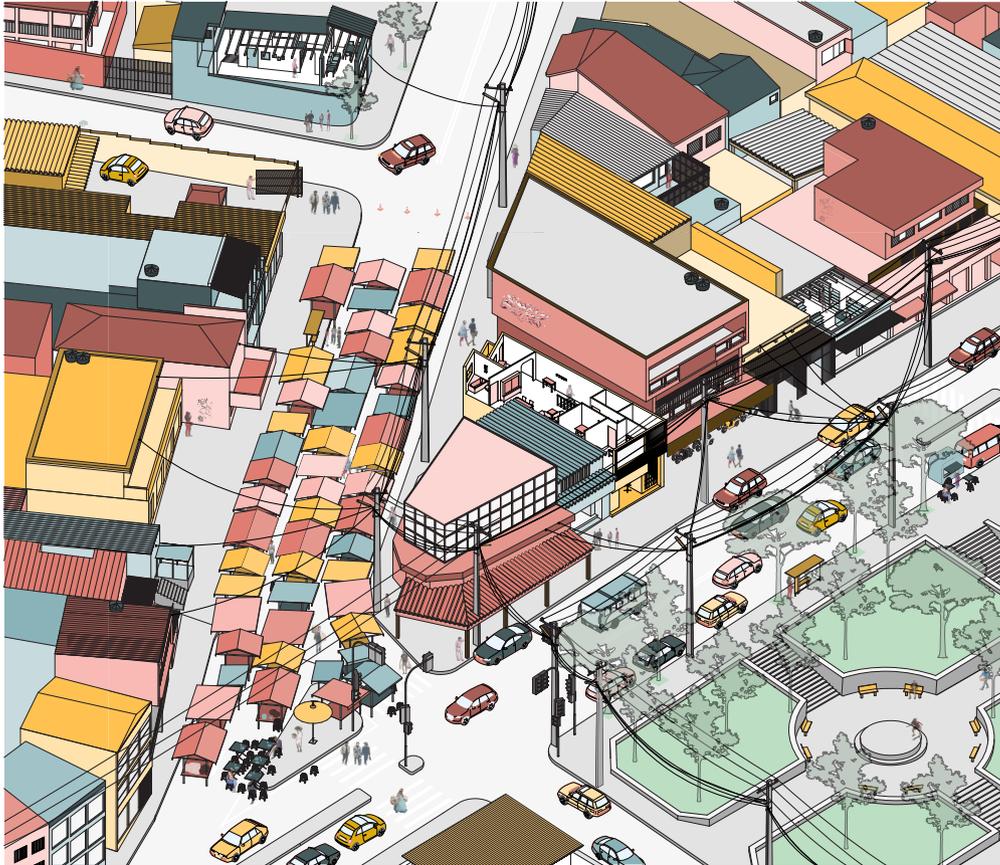


Figure 26: Atmospheric Synthesis, Source: Winnie Goldsteen & Genevieve Shymanski (2022)

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
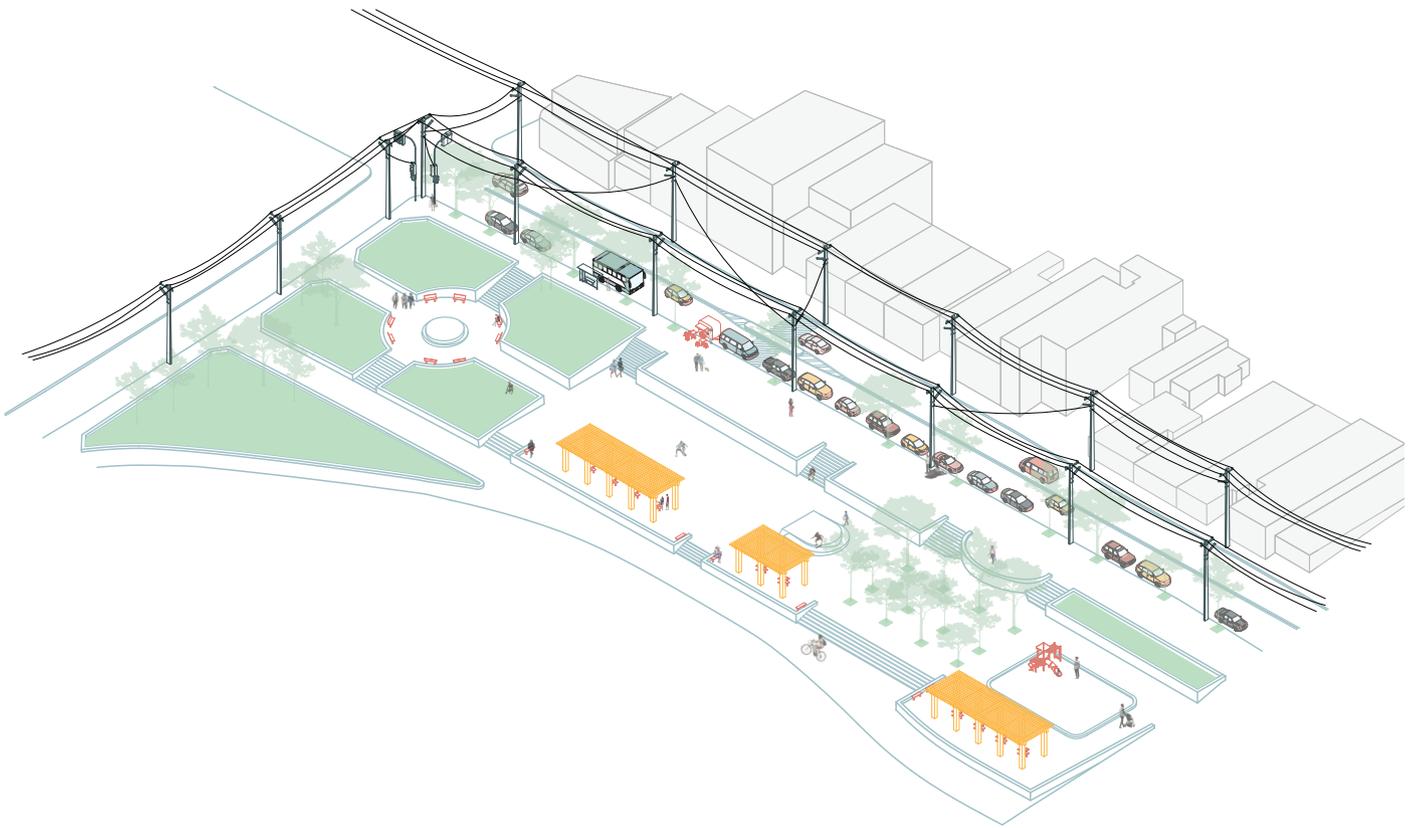
Figure 27: Atmospheric Synthesis, Source: Winnie Goldsteen & Genevieve Shymanski (2022)
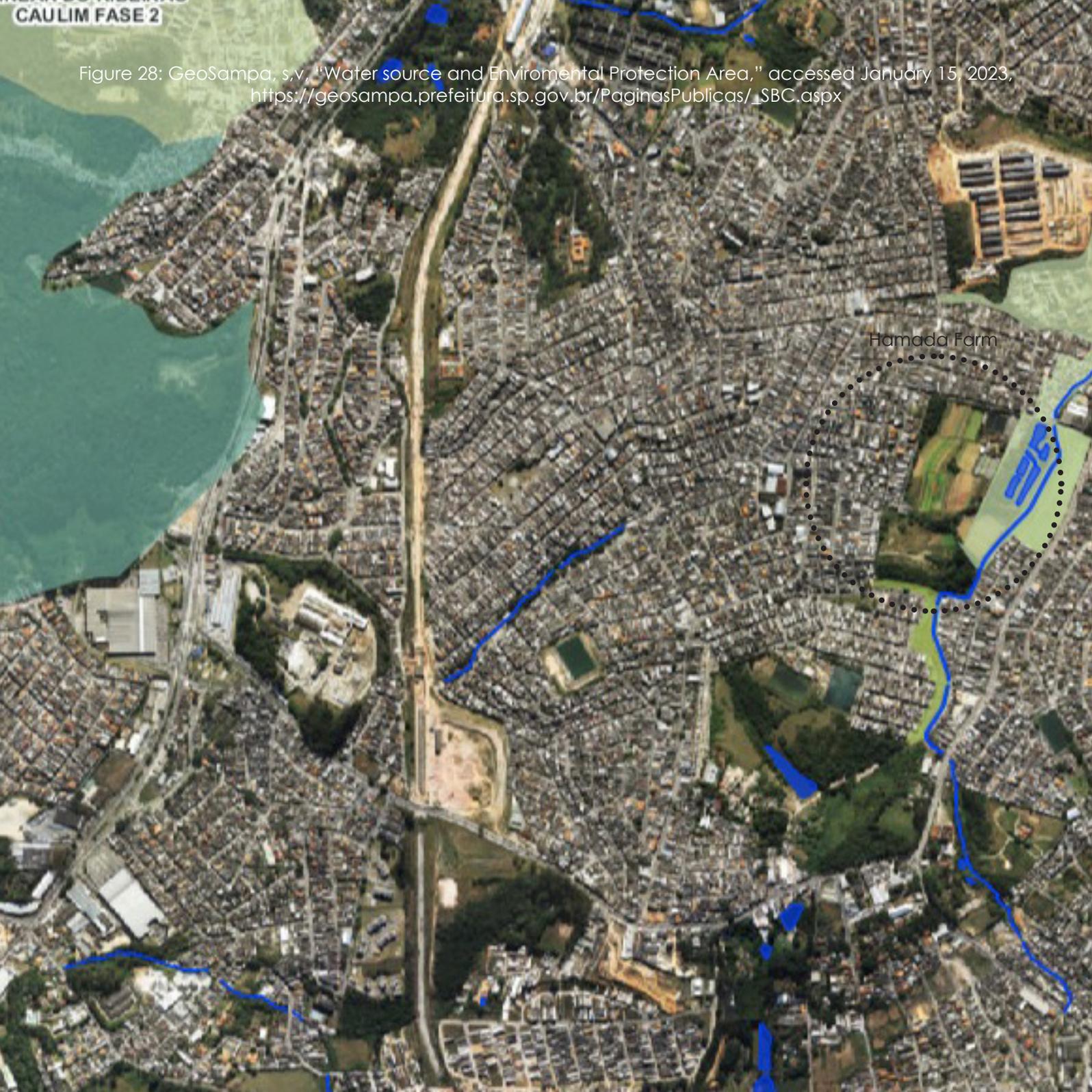
LINEAR RIBEIRÃO
COCAIA

VARZEA DO COCAIA 1
FASE

ARISTOCRATAS

LINEAR RIBEIRÃO
COCAIA - CHACARA
TANAY

Figure 29: Hamada Farm Analysis Source: Robbert Laan (2022) Adapted by author 2023

According to Brazilian law, non buildings can be constructed 15m from the water. Since a stream of the Billings Resivior a large portion (the blue section) needs to be developed without housing.

Additionally, the site contains remains of the endangered Atlantic Rain Forest. These areas need to be preserved as much as possible.

ENVIROMENTAL CONSIDERATION

Buildable Area

Atlantic Forest

Water Area

*The (In)-Between: Careful Boundaries and Porous Thresholds*
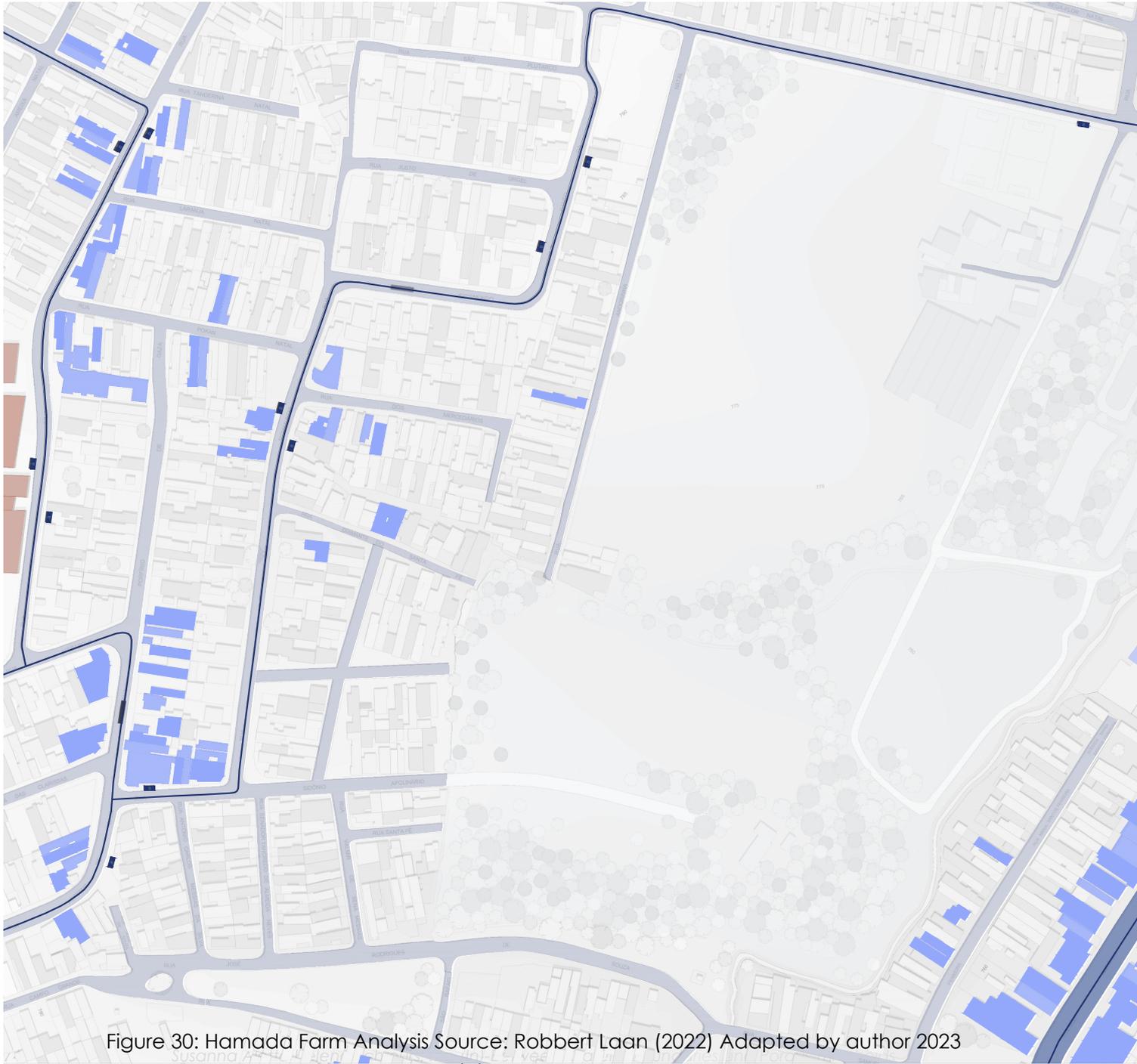
Figure 30: Hamada Farm Analysis Source: Robbert Laan (2022) Adapted by author 2023

Hamada Farm is surrounded by a well developed ZEIS1 area. The site is mostly surrounded by irregular dwellings. Several of the houses house commercial spaces (marked in blue) on the ground floor.

A large portion of these commercial spaces are connected to the popular Linear Park on the East of the site.

There are two schools close to the site.

The site is surrounded by an established bus route and is directly accross a busstop.

TYPOLOGIES

Linear Park

Bus Stop

Schools

Commercial Spaces

Bus Route

# Design Exploration

3 Thresholds x 3 Cities

## 6.1. Three Thresholds

During the typological analysis of Grajaú, three repetitive thresholds of the favelas were identified. These thresholds are external staircases, garage doors and balconies. During the study I noticed that each threshold has a certain quality that can be translated into the design.

The external staircases directly connect the public and private spaces since it is a transitional space that causes the threshold to be temporal.

The garage door directly connects to the street and is often converted into a shop - inserting itself into the public realm. Thus, the threshold controls the connection between public and private. Accordingly, the garage door has an adaptable quality.

The balcony is a threshold that mediates the connection between public and private. This threshold allows for the public and private spheres to co-exist. Accordingly, the balcony has a layered quality.

Since the definitions and qualities of thresholds are so substaintial the study helped to narrow down my research into the types of thresholds I want to introduced in my project.
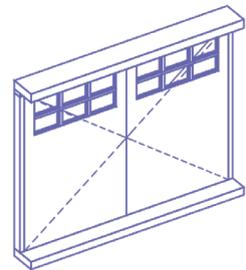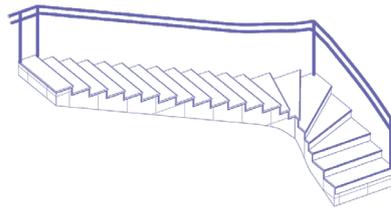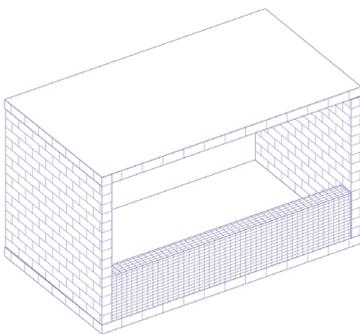
Figure 29: Thresholds found in Irregular Housing Source: Author (2022)

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
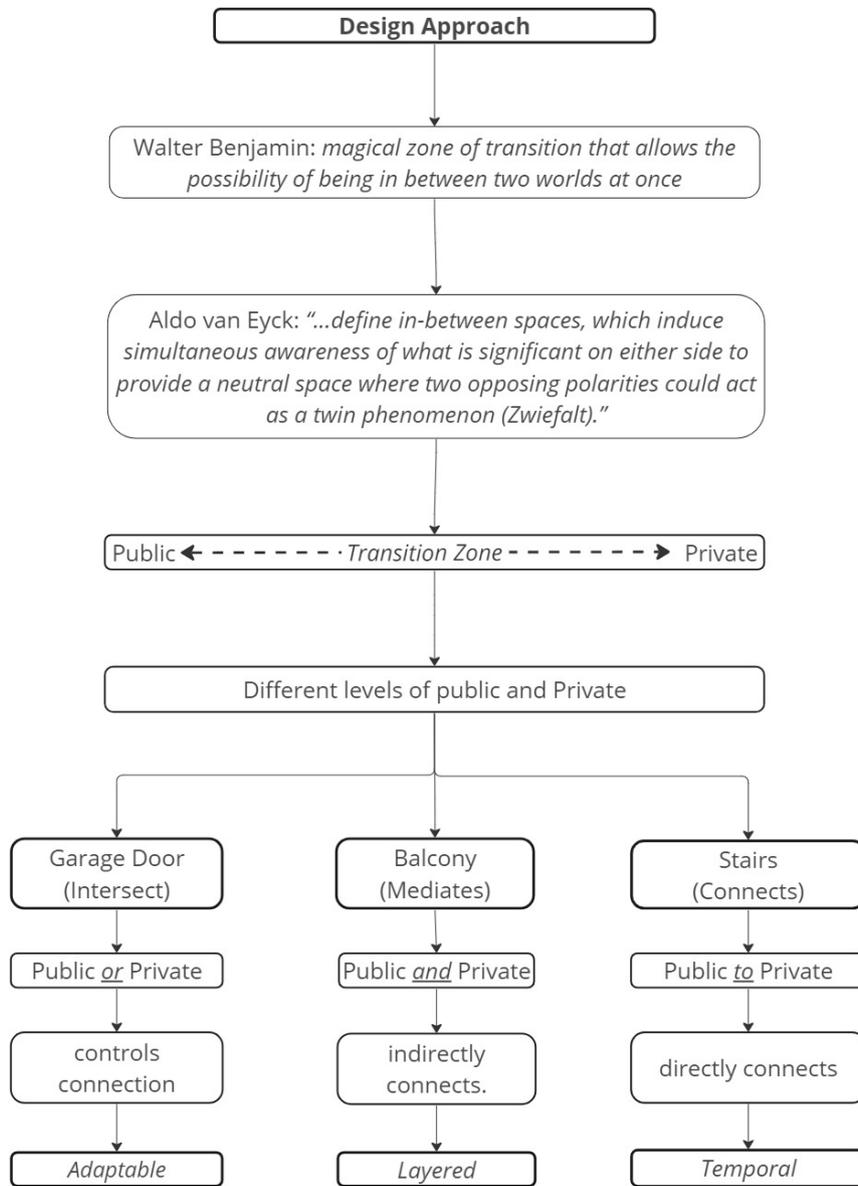
Figure 30: Diagram unfolding the qualities of the three thresholds identified, Source: Author (2022)

| Sao Paulo | Copenhagen | Tokyo |
|---|---|---|
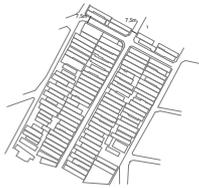


1 Density - Small narrow sites
2 Diversity - multi-purpose spaces
3 Flexibility - small buildings follow the contours and house are continously changing
4 Experiences - variation of textures and colours
5 Community - house has connection to the street - through balcony and/or commercial space
6 Low density allows for an appropriate scale
7 External stairs become a intermediate space/feature of the building - seat, bench etc.
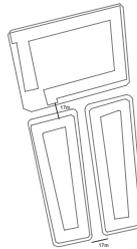
1 More points of entry and marking entries
2 Diversity - programming the threshold zones
3 Safety and comfort - interaction:
building - urban space
4 Experiences - variation
5 Community - to see and meet other users - eye contact
6 Flexibility - freedom to shape surroundings and change functions
7 Opportunities to sit, rest - to stay longer
8 The need for privacy - zoning the landscape
9 Opportunities to share

1 Critical Mass that eases morphological conflict + provides urban flexibility.
2 Compartmentalization - smaller plots with compact network of streets + passageways
3 Density - clusters of diverse buildings (size, age, standard)
4 Proximity - density = amount of people in a specific area.
5 Quality - smaller but high quality
6 Flexibility - to achieve above need flexibility
7 Understanding the city as fragmented, condensed, adaptive, temporal and collective.

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

One of my project's main sources of inspiration was the book "GROUNDFLOOR INTERFACE: Interactions Between Public and Private Spheres" by Wüstenrot Stiftung (2014). Two chapters of the book discuss thresholds in cities and use Tokyo and Copenhagen as examples of 'porous cities.' Thus, I decided to do a comparative analysis of Grajaú and a neighbourhood in Copenhagen and Tokyo to establish the repetitive porous qualities of each of these three cities. From the analysis, I developed four design principles or goals that acted as the design guidelines throughout the various scales (neighbourhood, block and dwelling).

**Design Principles**

1.Defined Compartmentalization
*(Compacted Passage Network with Defined Entrances)*
2. Diversity x Density x Proximity
*(Diverse Clusters with programmed thresholds)*
3. Flexibility
*(Enables Diversity)*
4. Zoning x Private x Public
*(Giving ownership to thresholds)*

# Social and Economic Sustainability

Stakeholder Analysis x Managerial Stretegy

## 7.1 Socio and Economic Sustainability

Part 7 focuses on the social and economic sustainability of the design. Accordingly, a managerial strategy that aims to understand how porous thresholds and careful boundaries can be achieved between different social-economic groups and top-down organisations was developed to accomplish this. A stakeholder analysis helped to identify the various parties required for the managerial strategy.

The stakeholder analysis considers the government agents responsible for producing Social Interest Housing for Brazil. The overview of the federal, state and municipal housing policymakers is used to understand the workings of the two primary benefactors of the design COHAB and Programa Mananciais da Região, the program responsible for initiating Chácara do Conde.

The project considers 3 income groups: below HIS1, HIS 1 and HIS 2. The managerial strategy also



| HIS 1 | HIS 2 | HMP |
|---|---|---|
| 1-3 min. wage | 3-6 min. wage | 6-12 min. wage |
| R$1.302 - | R$5.208 | R$9.114 |
| R$3.906 | -R$7.812 | -R$14.322 |

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

# Stakeholder Analysis



| Level of Government | Public agents with policies integrated in the housing policy | Agent responsible for preparation of the policy | Agent responsible for operation of the policy | Management and planning instruments |
|---|---|---|---|---|
| **Federal** | | ***Minister of Cities National Housing Secretariat*** | Main Program: *Minha Casa Minha Vida* <br> ***CAIXA*** - Federal Savings Bank | ***NHIS*** - National Social Interest Housing System <br> ***FNHIS*** - National Social Interest Housing Fund <br> ***PLANHAB*** - National Housing Plan |
| **State** | ***SABESP*** - Basic Sanitation Company of São Paulo <br> ***SEMA*** - State Secretariat of the Environment | ***State Housing Secretariat*** | ***CDHU*** - Housing and Urban Development Company of the State of São Paulo <br> ***Casa Paulista*** - São Paulo Social Housing Agency <br> ***PPP*** - Public-Private Housing Partnership | ***Housing Guarantee Fund*** - Legal Aid <br> ***CEH*** - State Housing Council |
| **Municipal** | ***SIURB*** - Municipal Secretariat for Urban Infrastructure <br> ***SMADS*** - Municipal Secretariat for Assistance and Social Development <br> ***SMSP*** - Municipal Secretariat for Administrative Subdistricts <br> ***SVMA*** - Municipal Secretariat for Green Space and the Environment <br> ***SMPP*** - Municipal Secretariat for Participation and Partnership <br> ***SMTRAB*** - Municipal Secretariat for Labor | ***SEHAB*** - Municipal Housing Secretariat <br> ***HABI*** - Social Housing Authority <br> ***RESOLO*** - Department of Regularization of Informal Land Subdivisions | ***COHAB*** - Metropolitan Housing Company of São Paulo | ***FMH*** - Municipal Housing Fund <br> ***CMH*** - Municipal Housing Council <br> ***PMH*** - Municipal Housing Plan |

Figure x: 'Federal, State and Municipal Stakeholder responsible for the development of Social Housing in Brazil" Source: Adapted by Author (2023) https://documents1.worldbank.org/curated/zh/207751468226171061/pdf/624840PUB0Soci-00Box0361484B0PUBLIC0.pdf

**COHAB x Social Housing**

**COHAB -** Metropolitan Housing Company of São Paulo

→ Public company created by the **Government of São Paulo** (1965)

→ *Purpose:*
provide affordable housing for people who would otherwise be unable to afford a home of their own.

*How:*
Low-interest loans,

Construction of social housing developments

Facilitates partnerships between private and public

1. PPP COHAB *(Private-Public Relationships)*
2. Programa Pode Entrar *(Manages access to the Social Housing - with **MCMV**)*
3. Espaco do Sindico *(Liquidates the assets)*

Also assist with the development and deployment of municipal urban planning.

Manage public spaces, provide basic infrastructure where needed and promote sustainable development practices.

miro

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*Chácara do Conde x Programa Mananciais da Região*

*Socio-Environmental Institute (2008)*

**Programa Mananciais da Região Metropolitana de São Paulo**

Collaboration: *State x Municipal* Government of São Paulo

***PPP** - Public-Private Housing Partnership*

**SVMA** Expropriates the area around the Billings reservoir

CDHU and SEHAB (Property Owner) subsidizes 100% of the project.

Appoints JAA Architects and Marcos Carrilho Architects to develop the complex.

Allocate Dwellings and Establish the *Rent to Buy* System

Social Workers: educates residents and establishes a self-management structure.

Home Owners Association Manages Property

*Responsible for merge the risk area around condominium (approximately 120400 m2) into Parque Linear Ribeirão Cocaia*

*Phase 1:*
Subsidized by **CDHU**
562 Houses

Delivered all by October 2021 *(Planned for 2020)*

*Phase 2:*
Subsidized by **SEHAB**
728 Houses (Families removed from risk area - received rent assistance)

Delivered 316 May 2022 and 412 December 2022

*Agents Included:*

*Building Contractor:* Environmental Consortium

*Engineers:* Modus Structural Engineering

*Landscaping:* Raul Pereira

20% of family monthly income is Morgage - paid into common fund

Educates new residents on how to live and manage a social housing block.

10% of the Families did not qualify

Families without a job was allocated one.

2019 - Allocated 89 mil R$ (48.8 **SEHAB** and 39.2 **CDHU**)

2022 - 156.4 mil R$ used

miro

Source: https://cohab.sp.gov.br/

The Springs program owns the property and is responsible for infrastructure and amenities. They are also responsible for providing a large portion of housing for displaced families on a rent-to-buy system. The Large stakeholder's main concern is efficiency and to accommodate as many HIS 1 families with a subsidised rent-to-buy ownership structure.

The medium stakeholder is COHAB, which is responsible for developing HIS 1 and HIS 2 housing on 40% of the plots. COHAB aims to empower families with low-interest loans and thus finds a balance between efficiency and resilience.

In order to accommodate HIS2 families, 10% of the plots are sold to a private developer that focuses on establishing resilient dwellings that can be bought through the private real estate market.

*Managerial Structure x Construction Phasing*

**Municipality (L) (Transition)** ⟷ **Co-Operative (M) (Mediate)** ⟷ **Individual Investor (S) (Intersect)**

| Owns the plot and is responsible for dividing the plots, infrastructure and mass housing. | Co-Operation transforms several plots or urban blocks. | Personal House or Real Estate Investment |

*Works with Parque Linear Ribeirão Cocaia- responsible for merge the risk area around condominium*

Sell 40% of Plots for Development

Developer Compensation is 25% of COHAB's Plots

**Programa Mananciais** for the São Paulo Metropolitan *HIS 1* — **COHAB -** Metropolitan Housing Company São Paulo *HIS 1 and 2* — COHAB PPP — **COHAB x Private Developer** from Programa Pode Entrar *HIS 2*

*Accommodate (Temporal)* — *Empower (Layered)* — *Promote (Adaptable)*

| **Efficiency** Expert Contractor x Local Support *Local Material and Techniques* | **Efficiency/ Resilience** Expert Support x Local Contractor(s) *Sustainable and Local Material and Techniques* | **Resilience** Local Contractor(S) *Sustainable Materials and Techniques* |

Dependent — Dependent

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*Managerial Structure x Ownership x Cost Recovery*

```
┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│   Municipality (L)  │◄····►│  Co-Operative (M)   │◄····►│ Individual Investor  │
│    (Transition)     │      │     (Mediate)       │      │   (S) (Intersect)    │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
```

| Programa Mananciais for the São Paulo Metropolitan *HIS 1* | COHAB - Metropolitan Housing Company São Paulo *HIS 1 and 2* | COHAB x Private Developer from Programa Pode Entrar *HIS 2* |
|---|---|---|

COHAB PPP

| Resilience | ◄── Dependent ──► Efficiency/ Resilience ◄── Dependent ──► | Efficiency |
|---|---|---|

| *Accommodate (Temporal)* | *Empower (Layered)* | *Promote (Adaptable)* |
|---|---|---|

| *Subsidized x Rent to Buy* | *Low Interest Loan* | *Personal Investment* |
|---|---|---|

| Morgage is 20% of the family income | R$ with low interest | Personal Funds or Bank Loan |
|---|---|---|

Paid into a common fund

Developer Rent and/or Sell properties.

Social Workers educates residents and establishes a self-management structure.

Municipality/COHAB manages fund with the helop of the Home Owners Association

# Program of Requirements

Chácara do Conde x Hamada Farm

## 8.1. Program of requirements

Chácara do Conde's Program of Requirements is considered since it is the benchmark for the design. Although the analysis revealed that the POR was sufficient to provide what was needed, it disregarded predominant functions in the favelas like commercial spaces, churches, clinics and pedestrian passages. Additionally, unlike the favelas, the amenities are all detached from housing blocks. Accordingly, 10% of the amenities are integrated into the housing blocks.

Case Study: *Chácara do Conde x Program of Requirements*
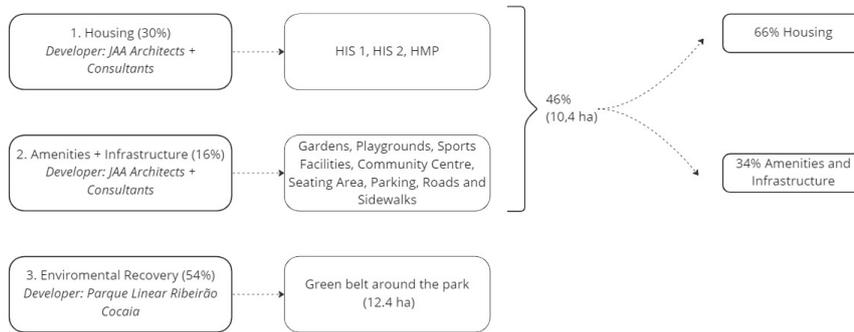
*Site Division*



*Hamada Farm x Program of Requirements*

*Site Division*
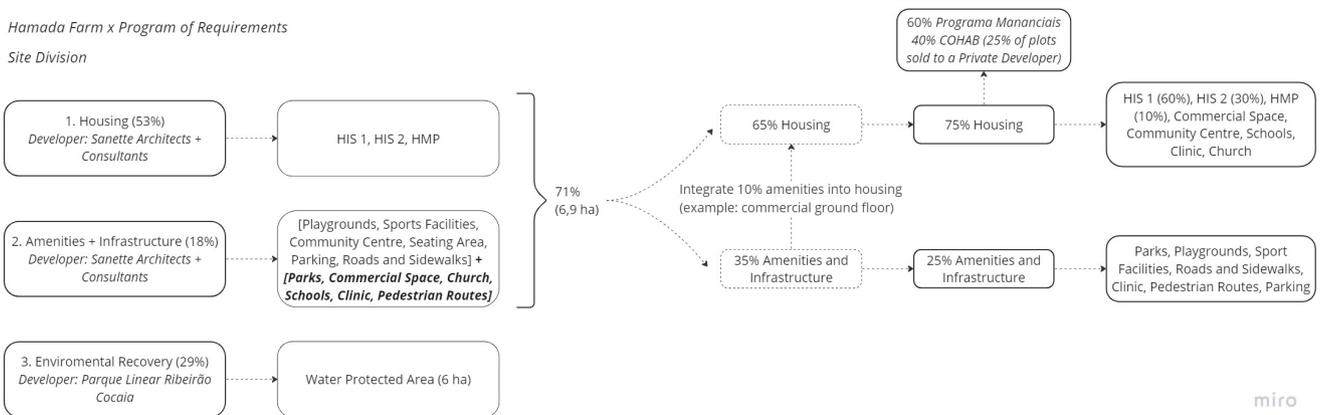
# Case Study Analysis

In preparation for the São Paulo field trip, the class analysed 5 Dutch and 5 Brazilian case studies. During the exercise, the Neighbourhood, Block and Unit scales were considered.

I was assigned the Gleba A project by Hector Viglecca. Gleba A was one of Vigleccas first explorations of The Third Territory. Viglecca uses two distinctive methods to create 'the third territory' in Gleba Firstly, the project is shaped around the favelas to ensure as few people as possible are re-housed. Secondly, as a 'gesture' to embrace the irregular construction, the architect did not design the building as a single mass; instead, it is a composition of seven parts connected by walkways.

Although the analysis was done before visiting São Paulo it greatly influenced the way I interpreted the social housing projects we visited.
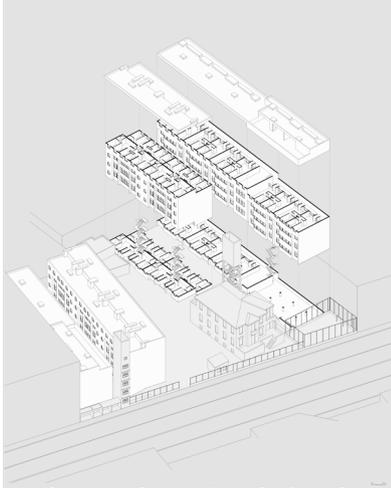


Figure: Casarão Celso Garcia
Source: Robbert Laan (2022)

Figure:Jardim Sao Francisco
Source: Alexandra Jodłowska
(2022)
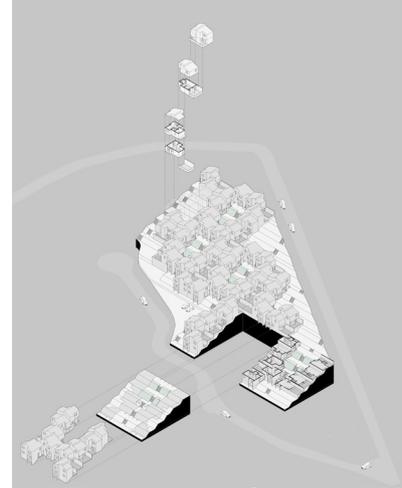
Figure:
ComunaDomHelderCamara
AngelinaTorbica (2022)

Josahna Alena Helena Schreurs: The [In] Between: Careful Boundaries and Porous Thresholds
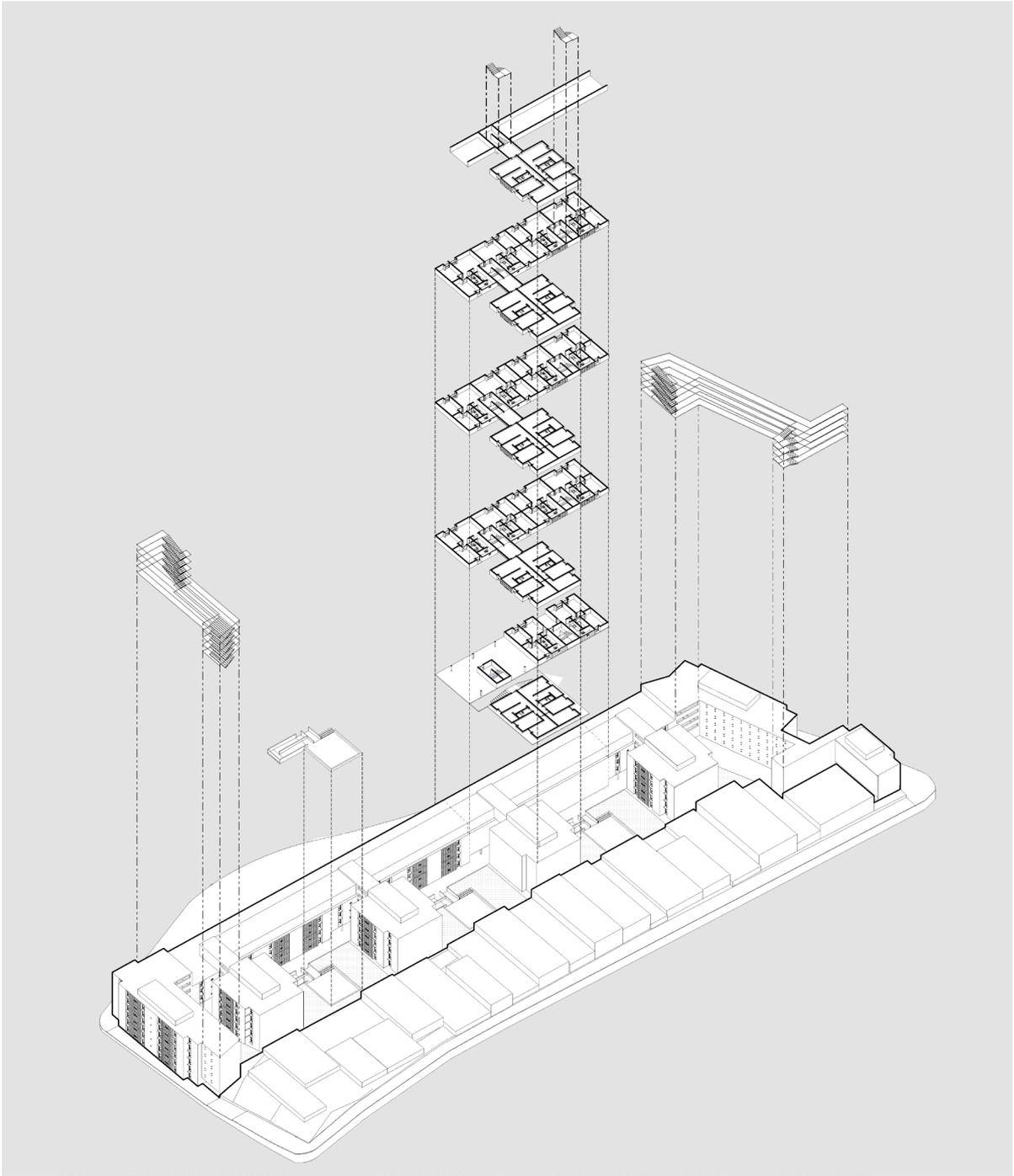
# Neighbourhood
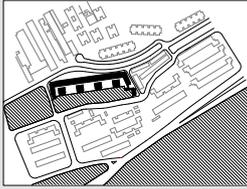


**Plot**
Area: 4.40 Ha
Dwelling Units: 537

0    45 m
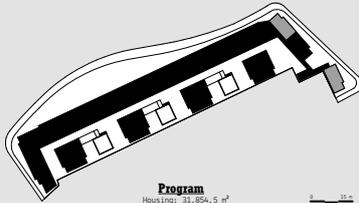


**Program**
Housing: 31.854,5 m²

0    15 m



**FSI/FAR**
0.72

0    25 m



**GSI**
0.16
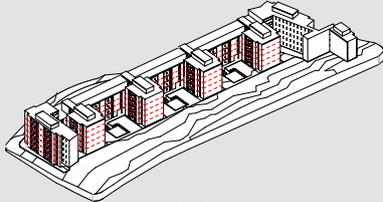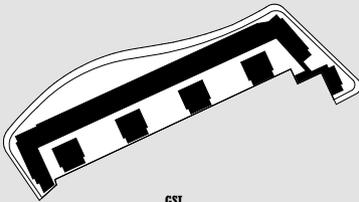
0    25 m
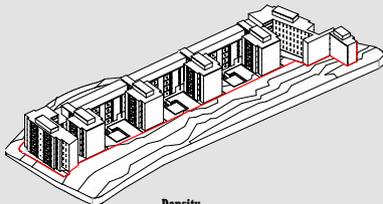


**Density**
124,3 dwelling/hectare & 716,5 people/hectare

0    25 m

# Block
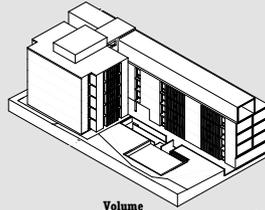


**Volume**
Ground Floor + 4

0    5m
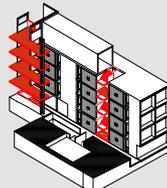


**Connectivity**
Acess and Circulation System

0    15 m
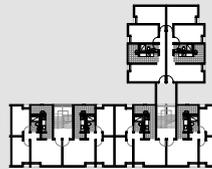


**Typical Floor Plan**
Dwelling Type Variations

0    5 m
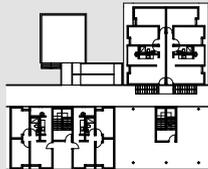


**Ground Floor Plan**
Access Points

0    5 m



**Section**
Dwelling Types

0    4 m

# Unit
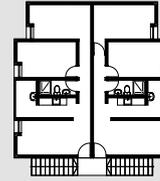


**Dwelling Type 1**
Area: 54m2

0    2m
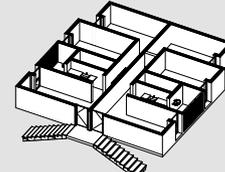


**Dwelling Type 1**
Area: 54m2

0    2 m
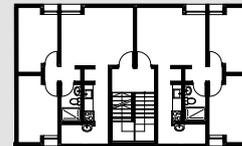


**Dwelling Type 2**
Area: 55,5m2

0    2 m
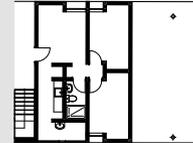


**Dwelling Type 3**
Area: 51m2

0    2 m



**Dwelling Type 3**
Area: 51m2

0    2 m
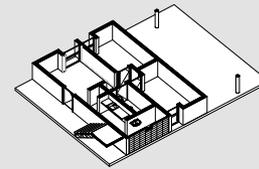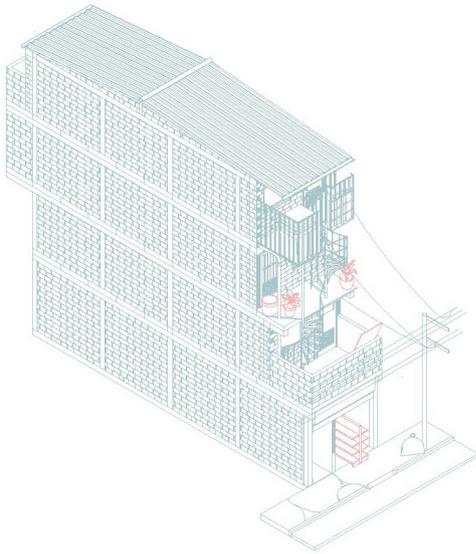
# Design

Resillience
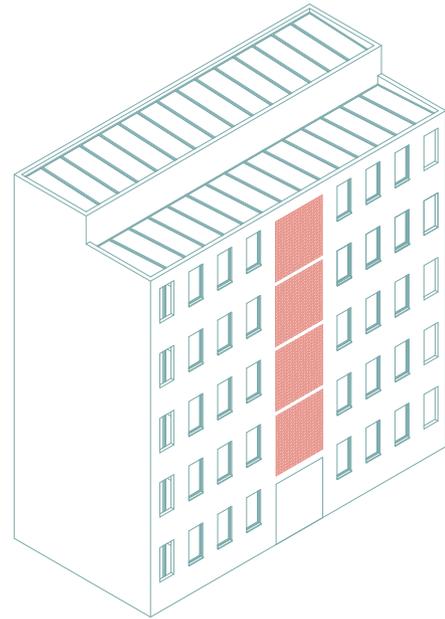
Efficency

The main goal of the design is to integrate the project into the existing urban fabric. To achieve this, I established that the existing urban edges need to be considered, the design needs to invite people into the project by extending points of orientation across the plot and finally, the different edges need to be connected with each other and the surrounding urban area.



*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

# 1. Road Network

Considering the design principle Defined Compartmentalization (Compacted Passage Network with Defined Entrances) I developed 3 scales of car roads and pedestrian routes, each promoting a different level of temporality. These routes are the main organising principle of my masterplan

## Car Roads

| Large | Medium | Small |
|---|---|---|
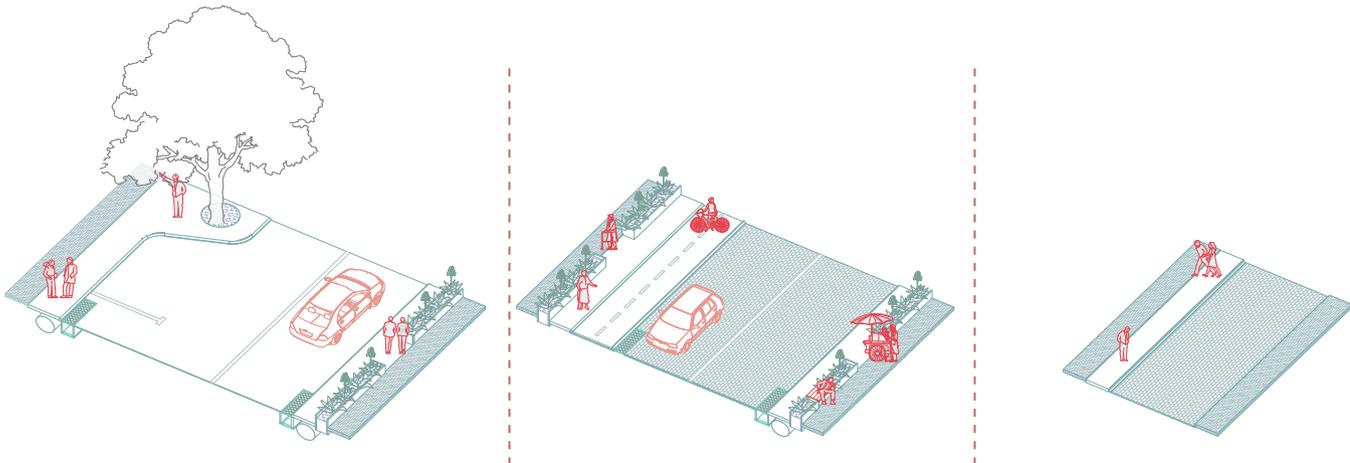


*Temporality Scale*

The large car road has an asphalt surface and is placed on the edges, of the site. The road aims to promote a quick car-focused movement from one edge to the other.

The medium roads cut through the site and provide more space for pedestrians through a rougher brick surface that slows down the cars, a bike lane and green space next to the sidewalk.

The small road is a single-lane road that primarily allows the residents access to the buildings.

Large
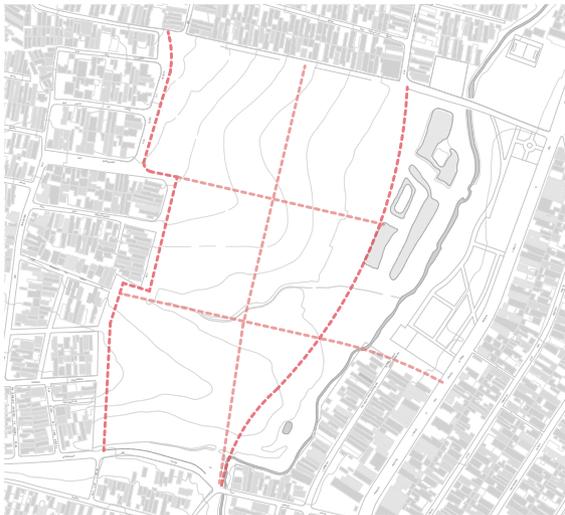


Medium
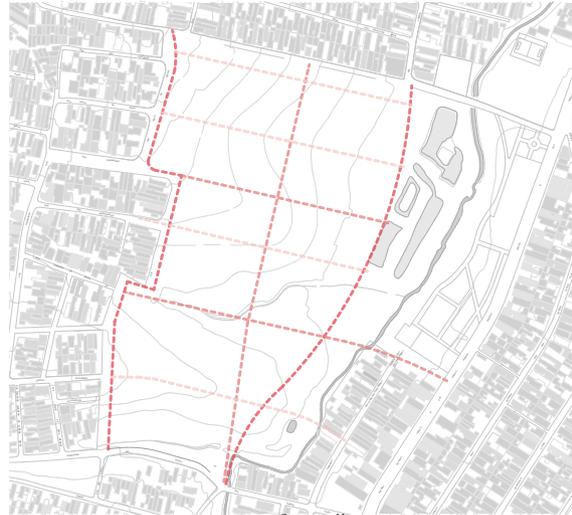


Small

# Pedestrian Routes

| Large | Medium | Small |
|---|---|---|
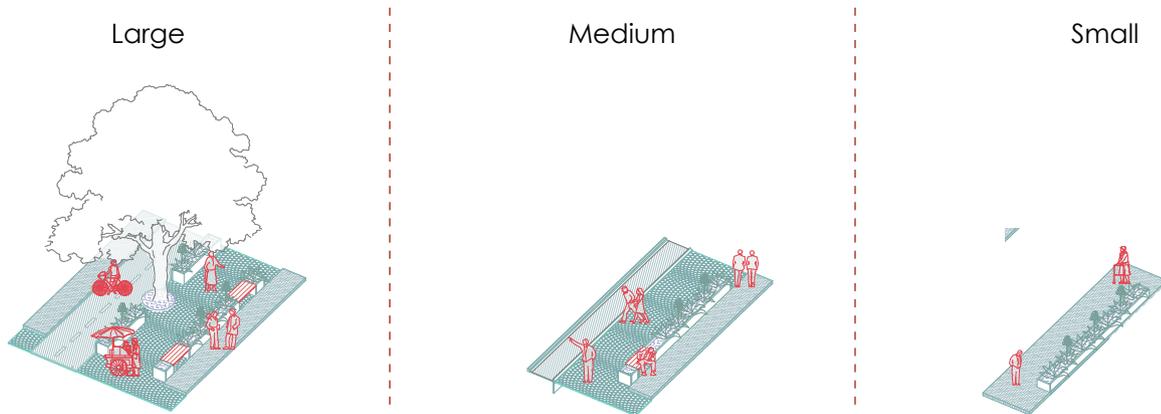


*Temporality Scale*

The pedestrian route focuses on inviting people into the project. The first large pedestrian makes a noticeable insertion across the site and becomes a resilient route that allows the user to linger through the site. The medium route still invites the user in by providing shortcuts through the site but is less resilient and instead follows the pattern of the car roads. The small pedestrian road is found in between the different building blocks and has a specific laid-on brick texture to distinguishit from the sidewalks.

Large                                    Medium

Next I will look at the component that populate the urban blocks. The three components are the Row-House Typology, the Courtyard Typology and the Linear Park extention
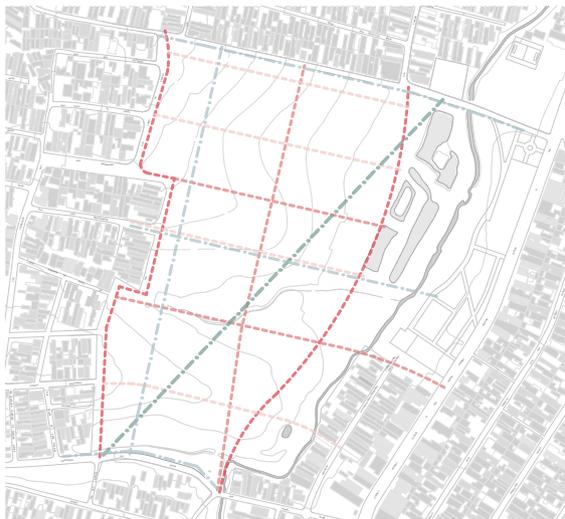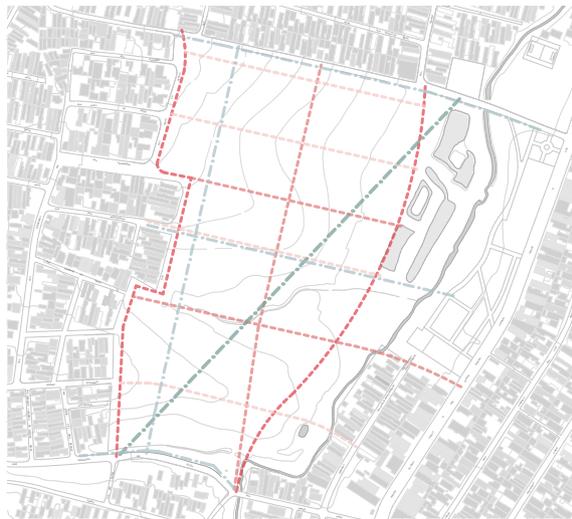
# 2. Row House Typology
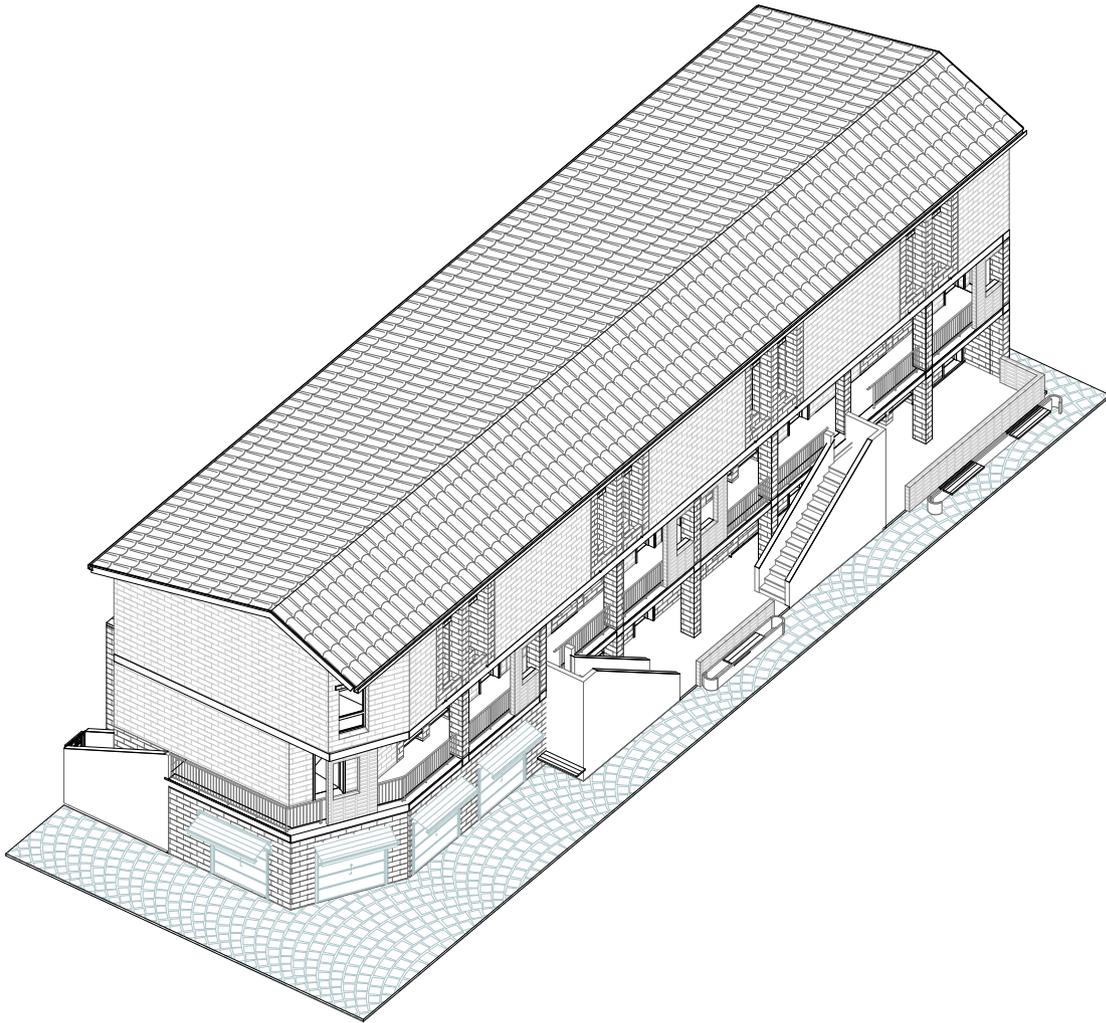
The Row House typology is developed by the COHAB and Private Developer. The typology is a duplex apartment mix, promoting a more private and resilient lifestyle related to the surrounding irregular houses.



*Resillience*

*Efficency*

RUA SÃO PITUMANGO

RUA JUSTO DE URIEL

RUA SÃO SIGISMUNDO

RUA DOS MERCADORES

RUA DIAMANTE DO SANTA FÉ

RUA BRÔNIO APOLINÁRIO

RUA SANTA FÉ

JOSÉ RODRIGUES

SOUZA

BARRO

BRANCO

AVENIDA SANTOS
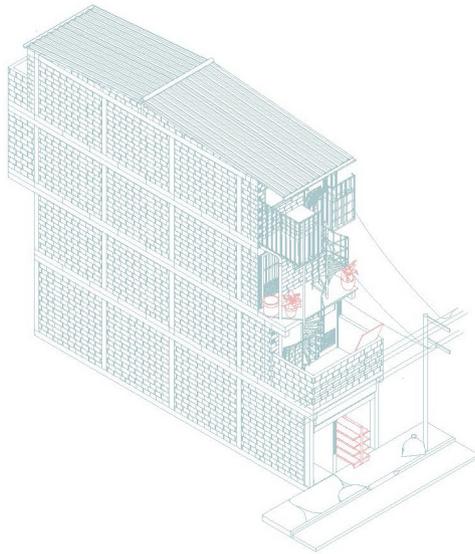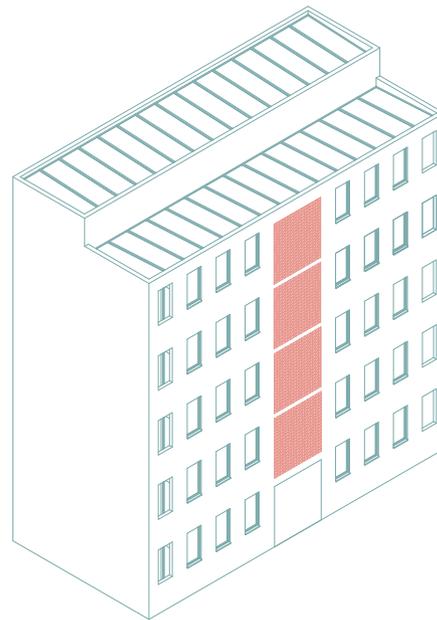
Once the routes are established, the row house is introduced next to the large and medium pedestrian roads for two reasons. Firstly, the row house lives towards the street and helps to activate the pedestrian route. Secondly, the smaller structural grid enables the modules to step more frequently, allowing them to follow the topography of the more resilient pedestrian route.

# Apartment-Duplex Modules
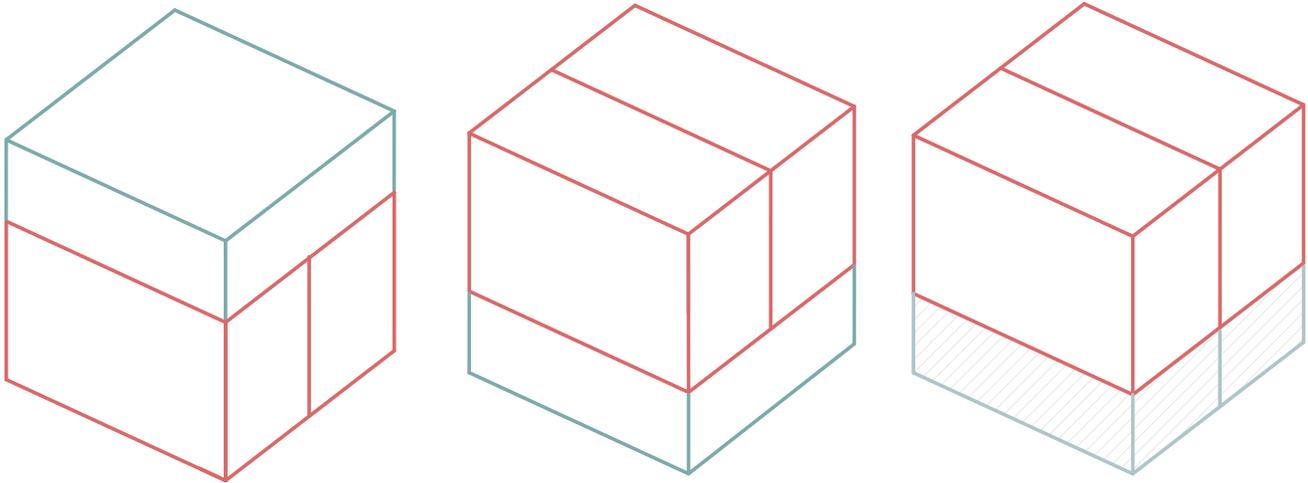


Duplex
Apartment
Amenity

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The row typology has a 3.6m structural grid walls.
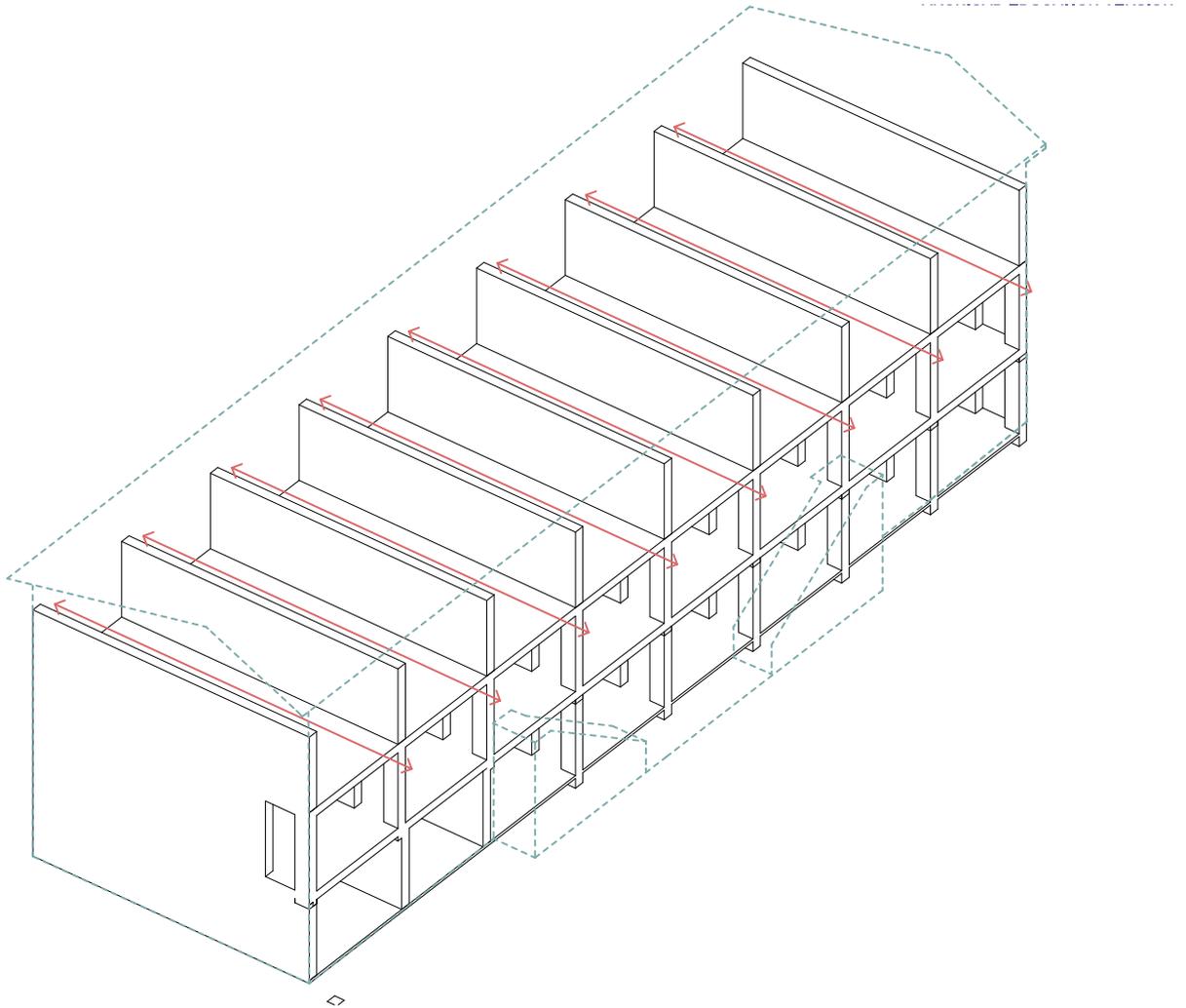
# Apartment Types

The typology has four apartment types. Firstly, a duplex with street access is allocated to HIS 1 families. Secondly, a slightly bigger three-bedroom duplex, accessed from the gallery, is for both HIS 1 and HIS 2 families. w
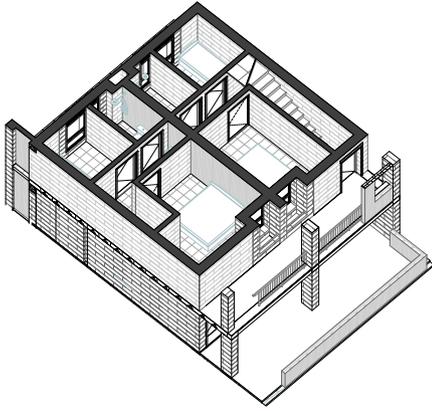


51m² 

Street Access

HIS 1



51m²

Gallery Access

HIS 1 or 2

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
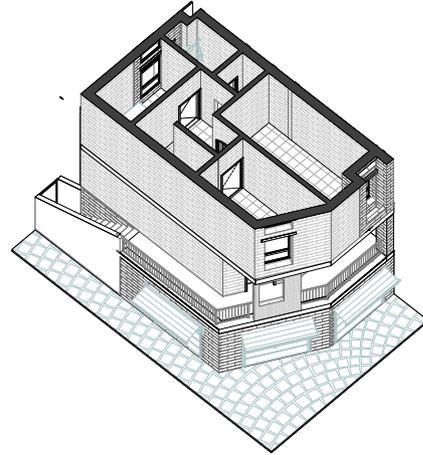
Thirdly, a ground floor apartment, with a small front yard and more private entrance, is for HIS 2 families. And finally, a second-floor apartment with a high roof which allows the opportunity to add a mezzanine level.
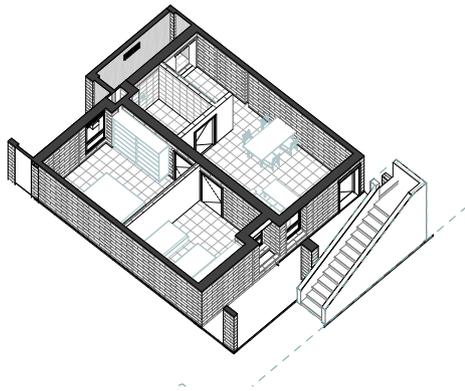


51m$^2$

Street Access

HIS 2
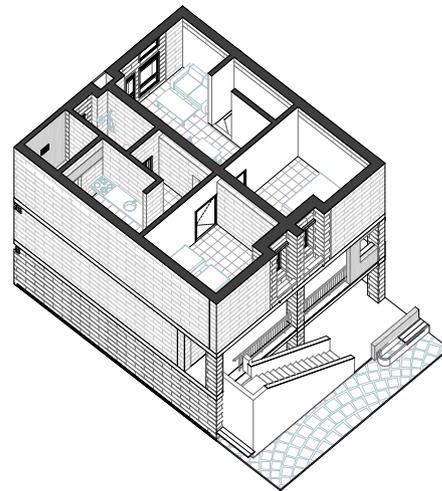
51m$^2$

Gallery Access

HIS 2
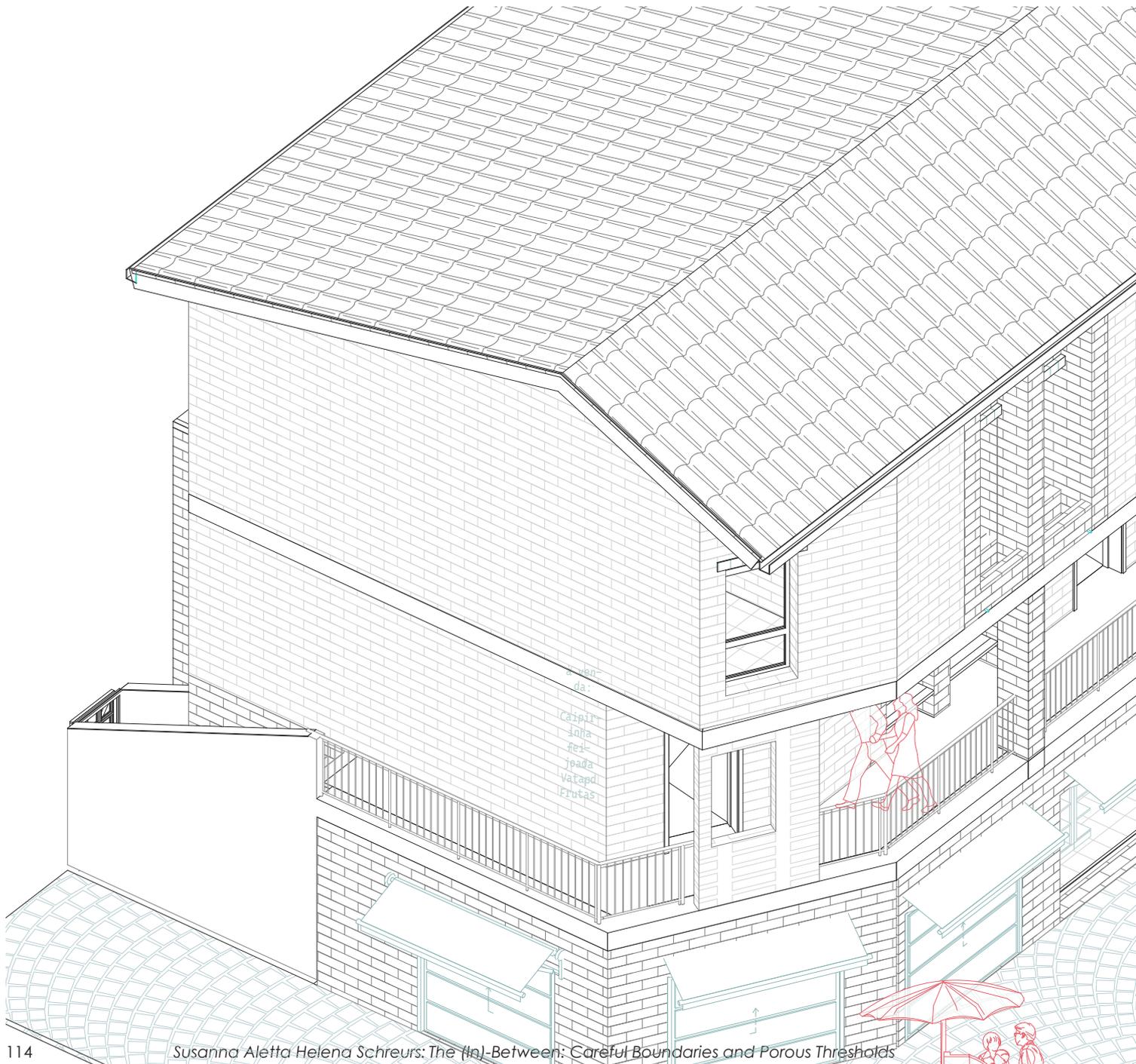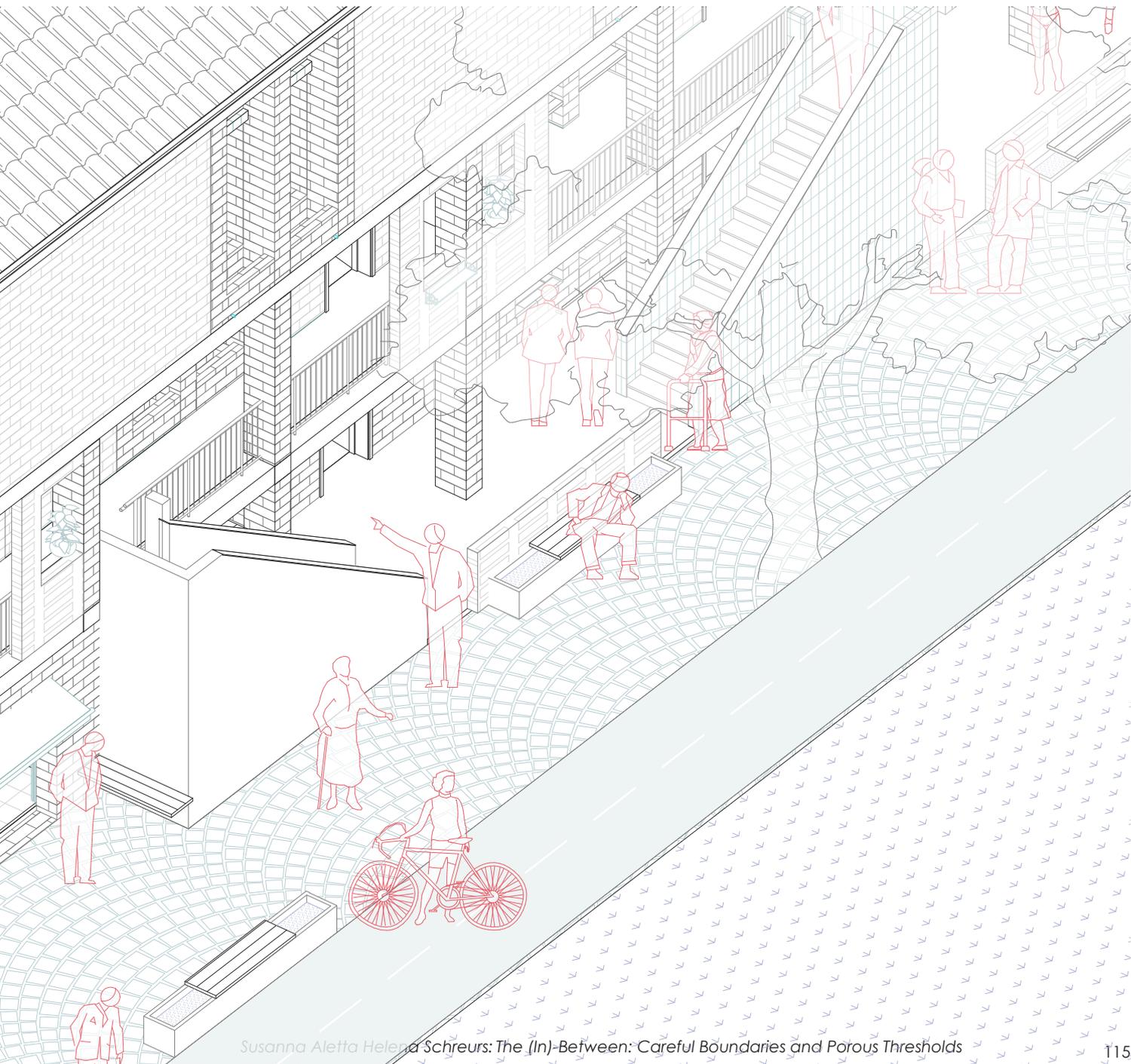
Inspired by Doshi's Aranya Low Cosy Housing, the stairs, which allow access to the circulation gallery, are used to create a communal balcony space that mediates the connection to the street. Additionally, the stair wall defines the edge of the amenity spaces and allows space to introduce a bench, wall mural or even advertisement.



ceramic roof tiles on 38x38 timber battens

Ceramic Ridge Tile

Ventilation Roof Tile

0.6 Galvanised Corrugated Steel Sheetng Attached to the Wall with Cold-pressed Steel Section

150mm Timber Rafter

Thermal Insulation

6.4 Gypsum Board Ceiling

Compressed Earth Blocks

Concrete Ringbeam

Hollow Copogo Blocks

Concrete Screed poured onto a Hollow Ceramic Block and pre-cast concrete beam.

900x2100 Wooden Brazilian Pine Window

Hollow Copogo Blocks

Ceramic Facebricks

Ceramic Tile Floor Finish, Concrete Screed on a 80 In Situ Concrete Surface Bed with 0,25Polyolefin Membrane

600x200 In Situ Concrete Strip Foundation

Brickpavement
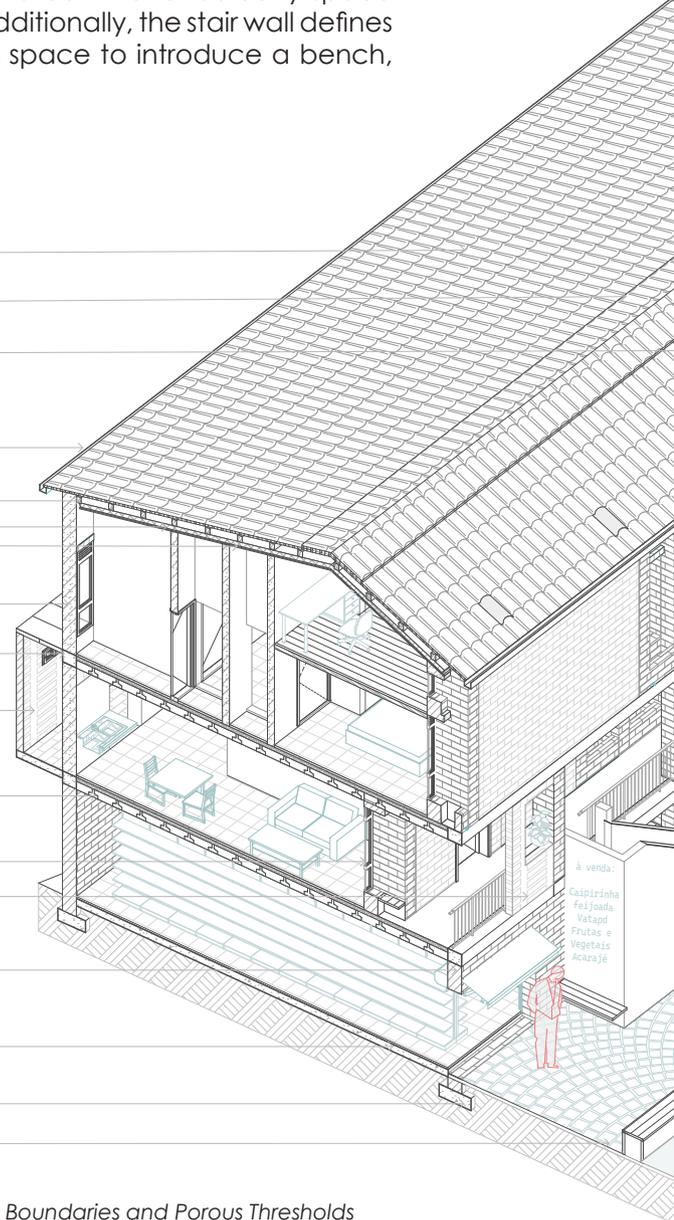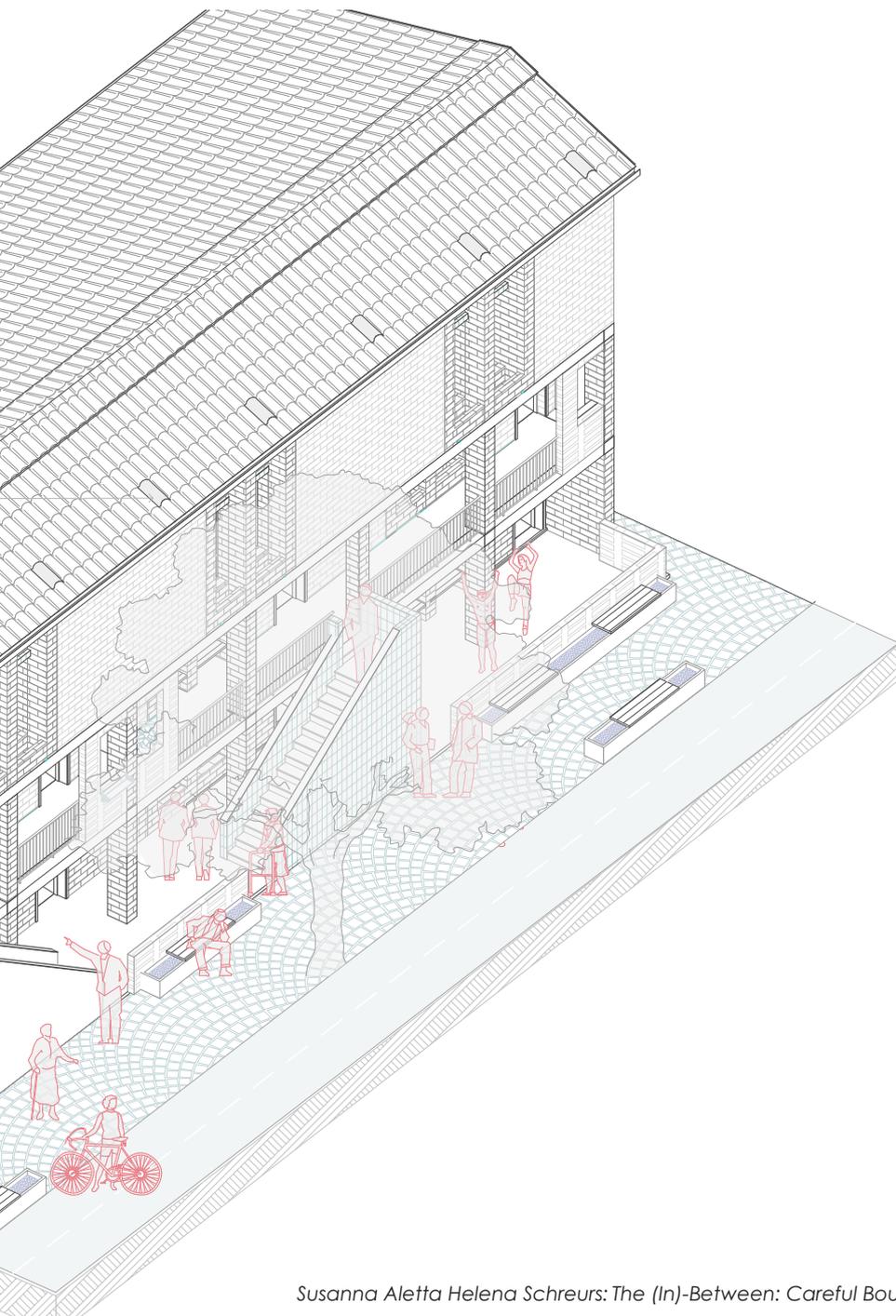
Row House typology Elevation

Atmospheric Impression of two Row houses facing each other.



*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
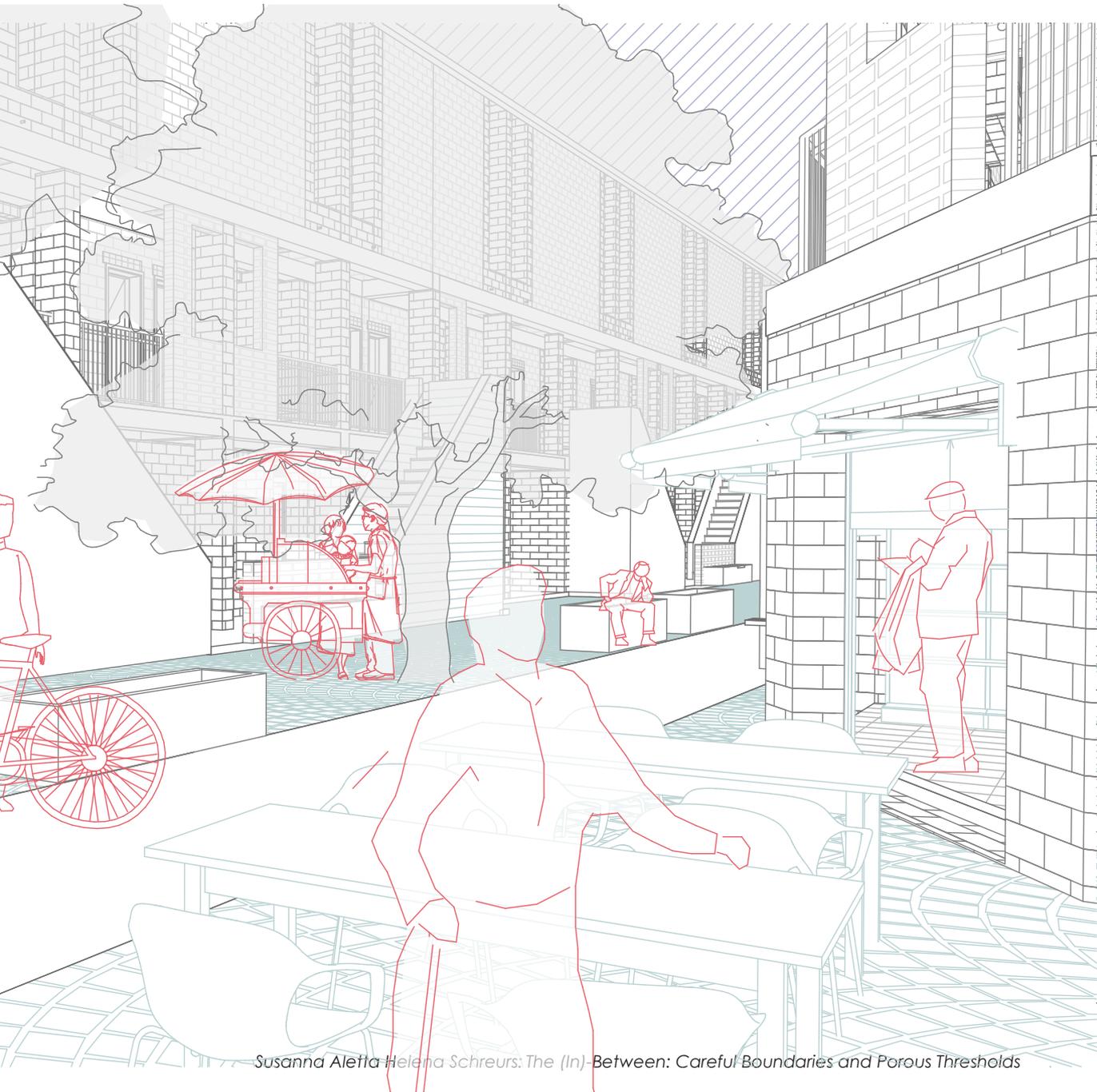
*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

# 3. Courtyard Typology

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
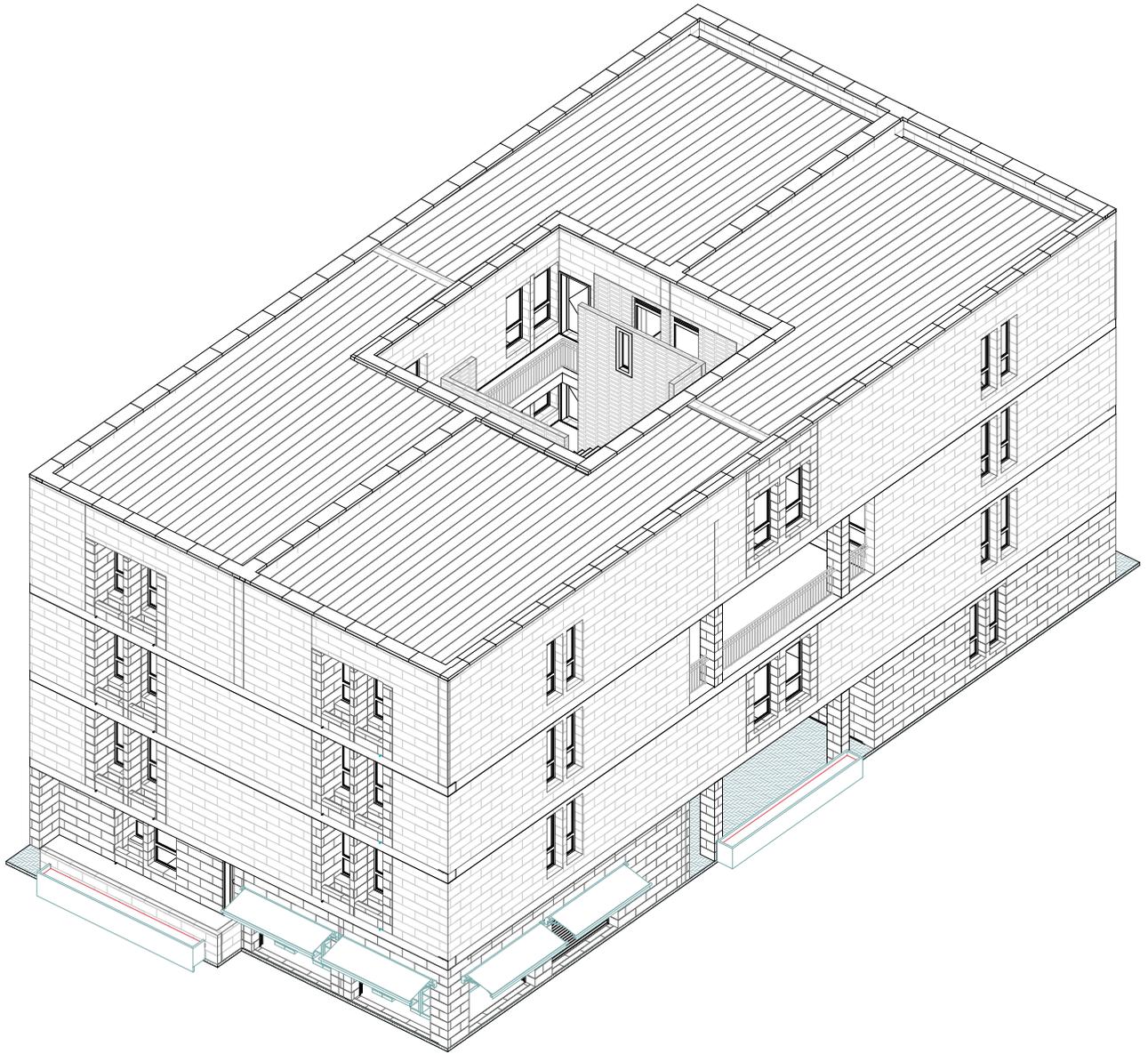
The Springs Program's courtyard block aims to rehouse as many displaced HIS families as possible and focuses on efficiency and density. This means that the project provides a more communal/community based lifestyle.



*Resillience*

*Efficency*

The higher and more dense courtyard blocks are introduced next to large and medium car roads. Since the blocks have a bigger footprint, the buildings are orientated according to the slope.
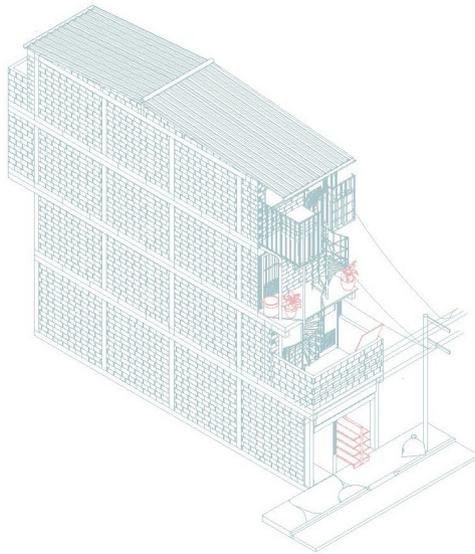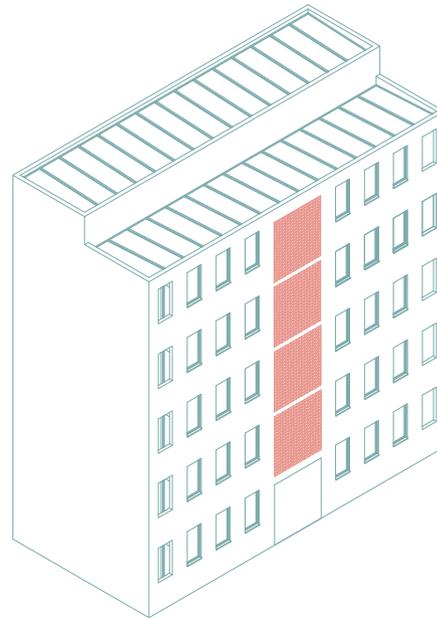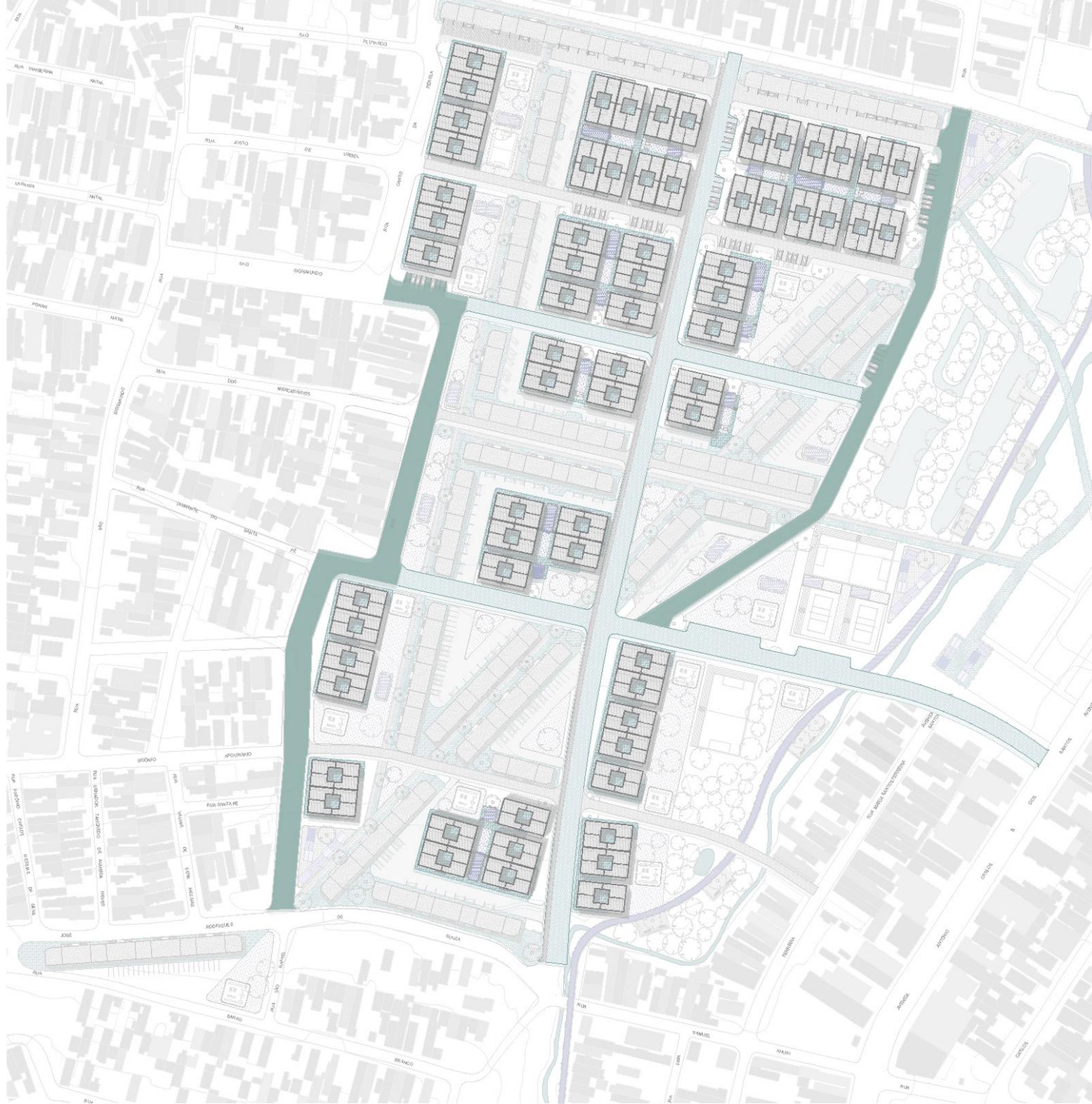
# Apartment Types

## Ground Floor

### 2 Bedroom Apartment
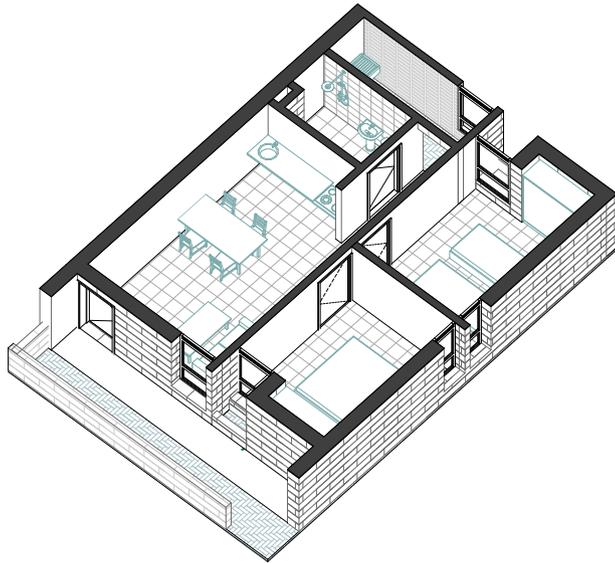


### Garage Space



51m$^2$

Street Access

*HIS 1*

51m$^2$

Street Access

*HIS 1/HIS 2*

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
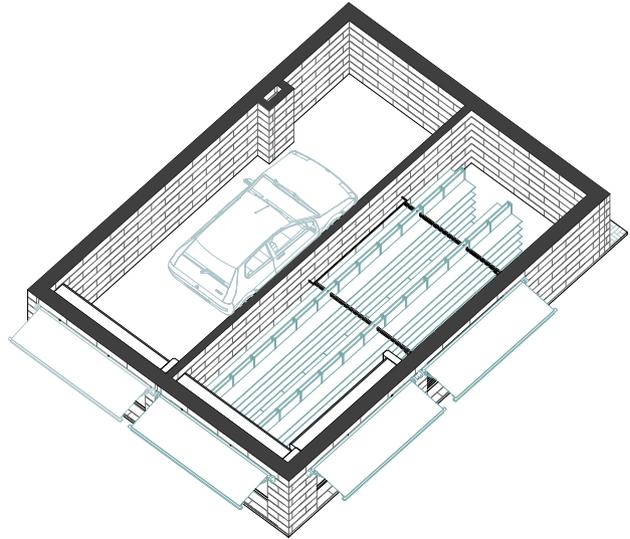
# Upper Floors

*Three Bedroom Apartment*

*Two Bedroom Apartment*
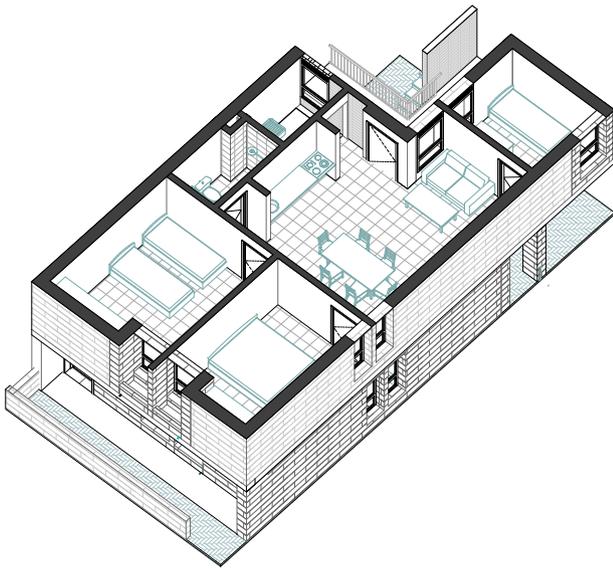


62m$^2$

Courtyard Access
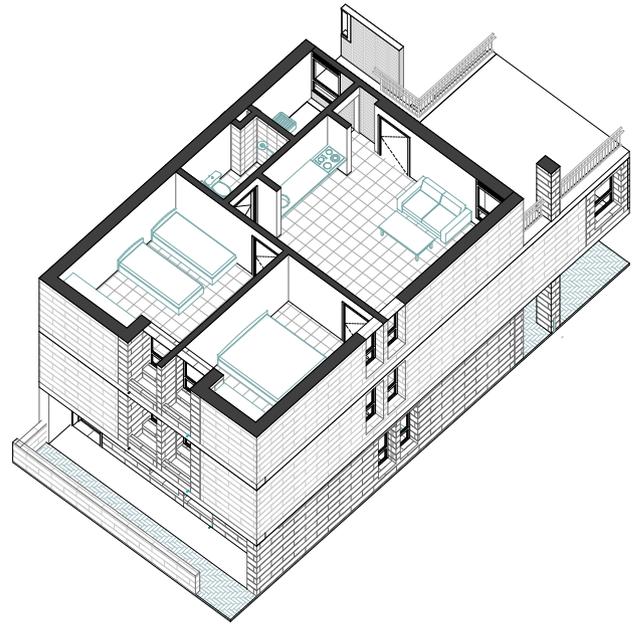
*HIS 1*

55m$^2$

Courtyard Access

*HIS 1*

The typology is a four-storey building with four apartments on every level that surrounds an inner courtyard which houses the building's circulation and acts as a communal space.
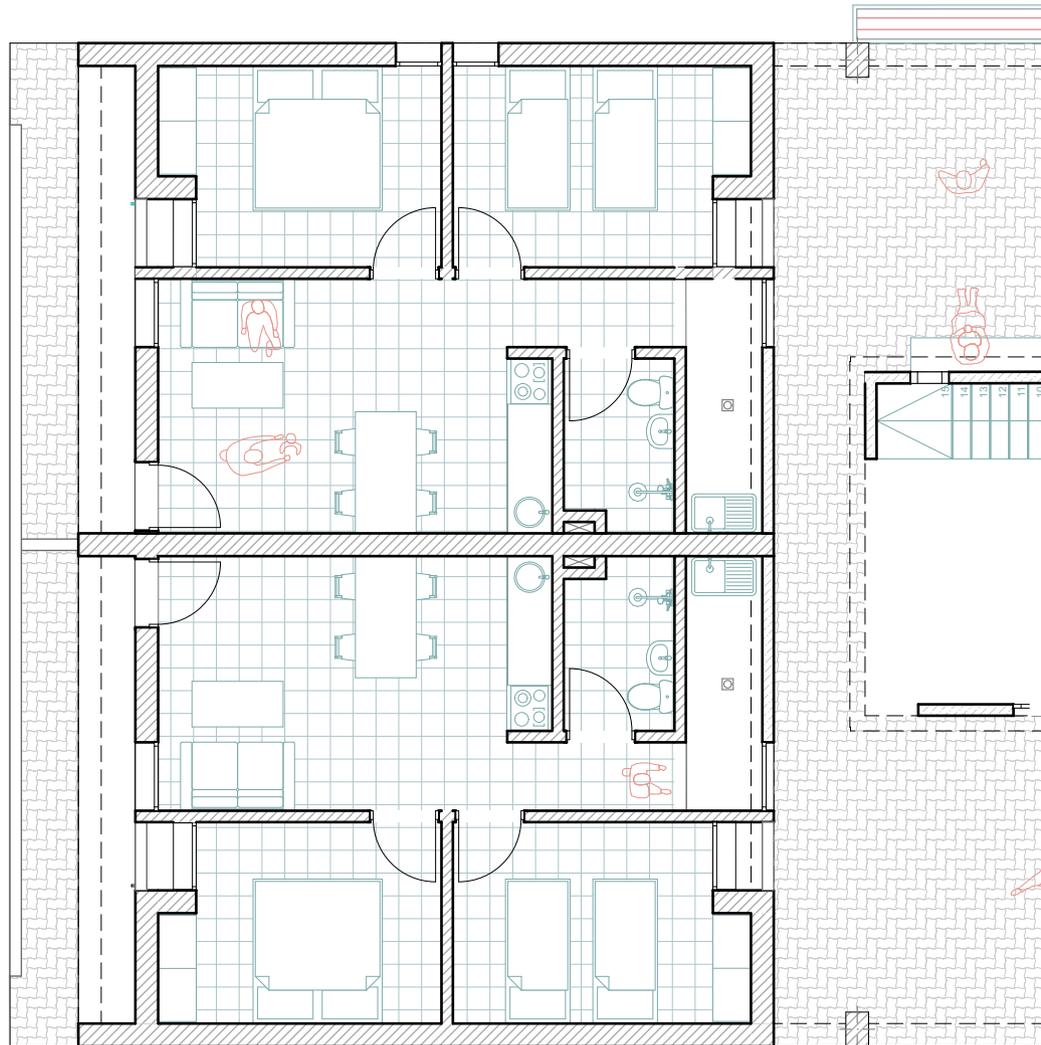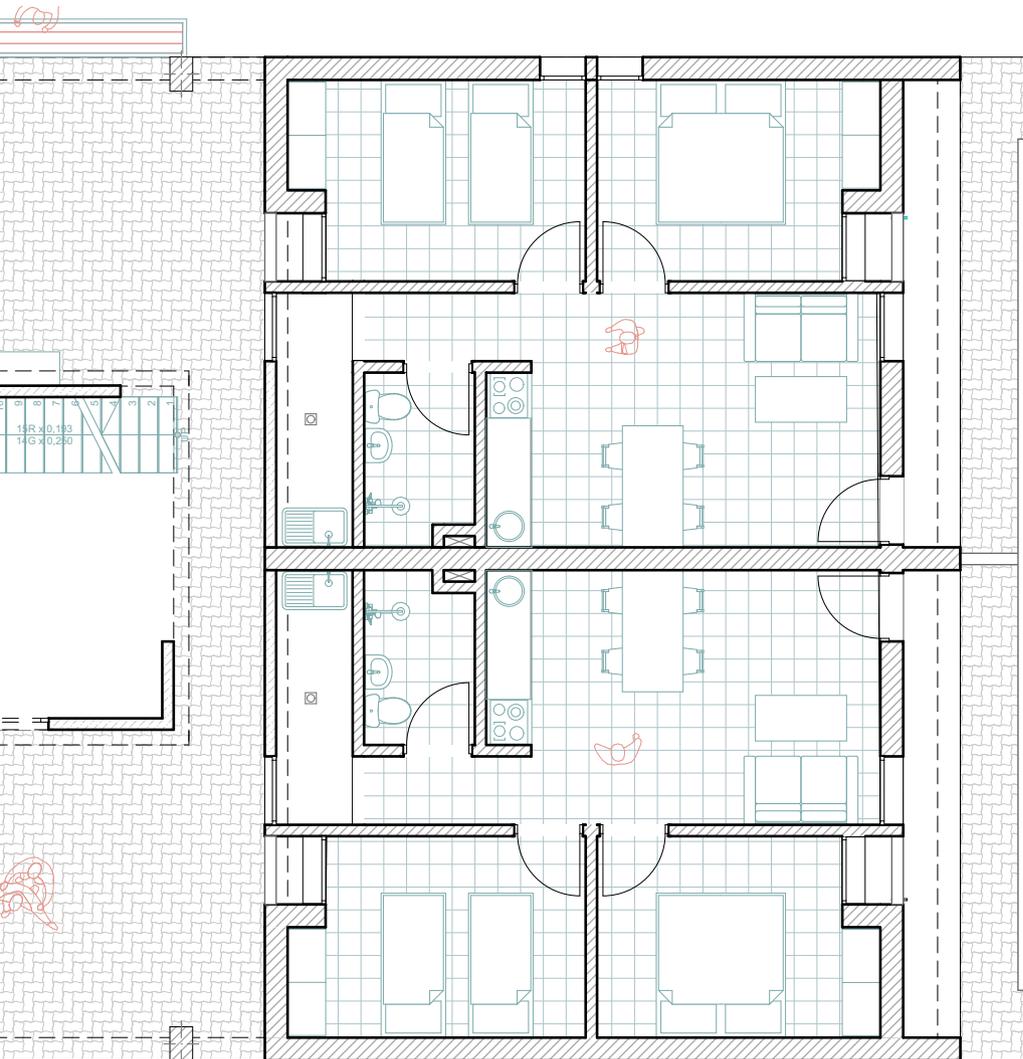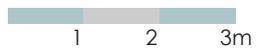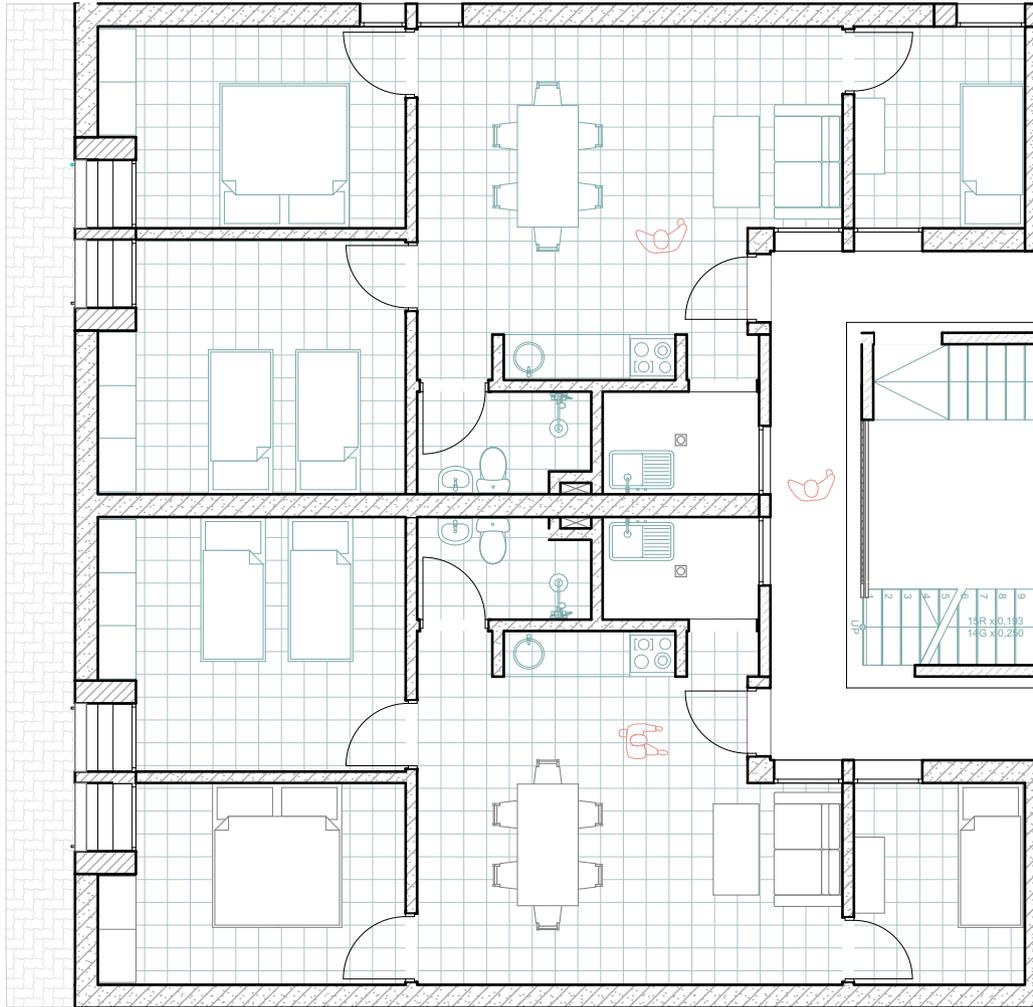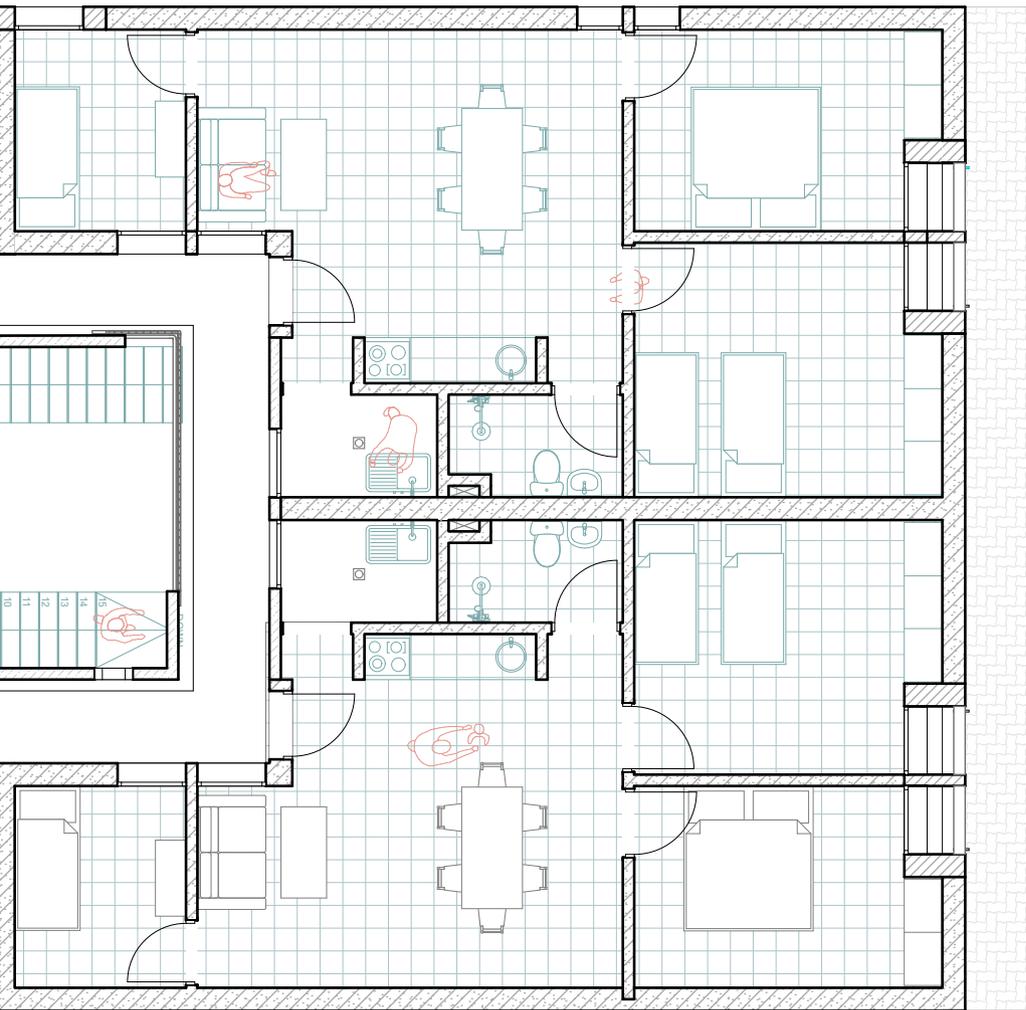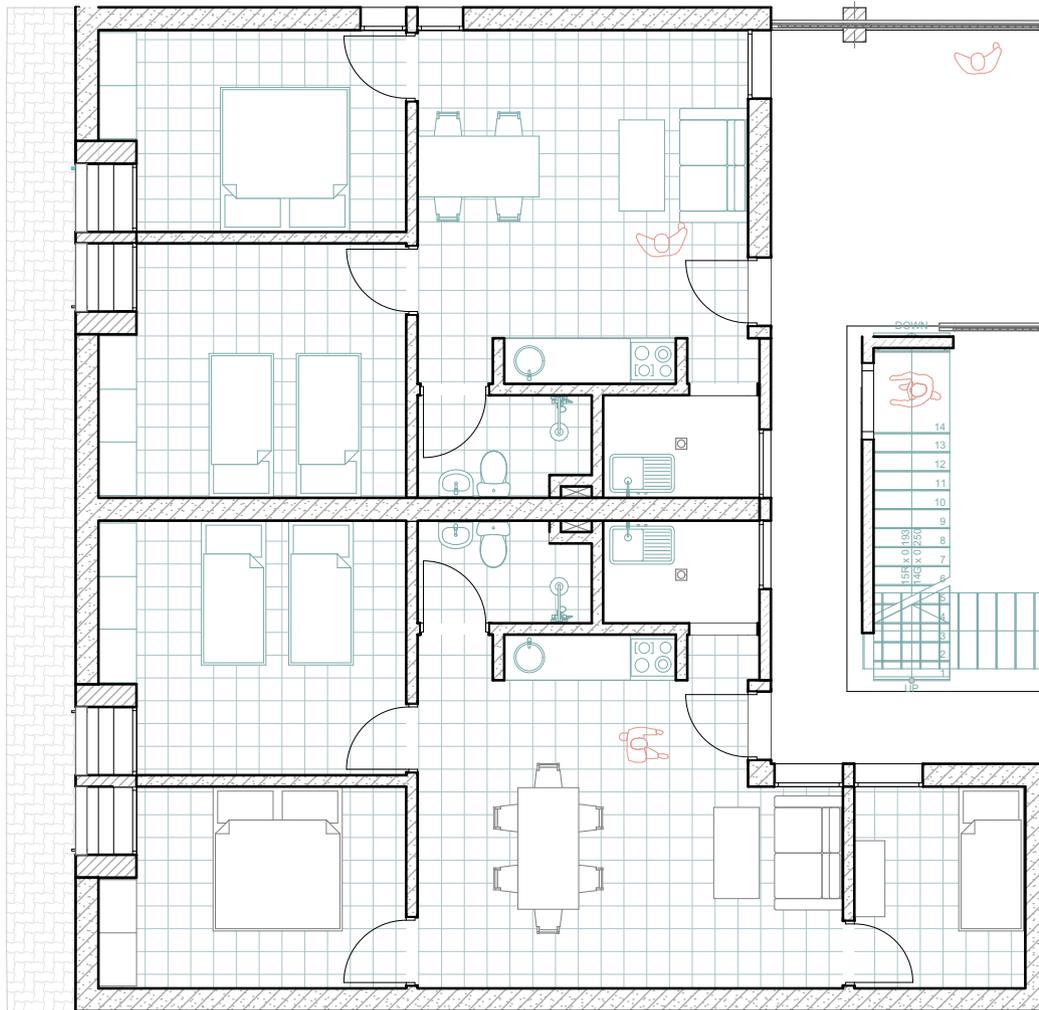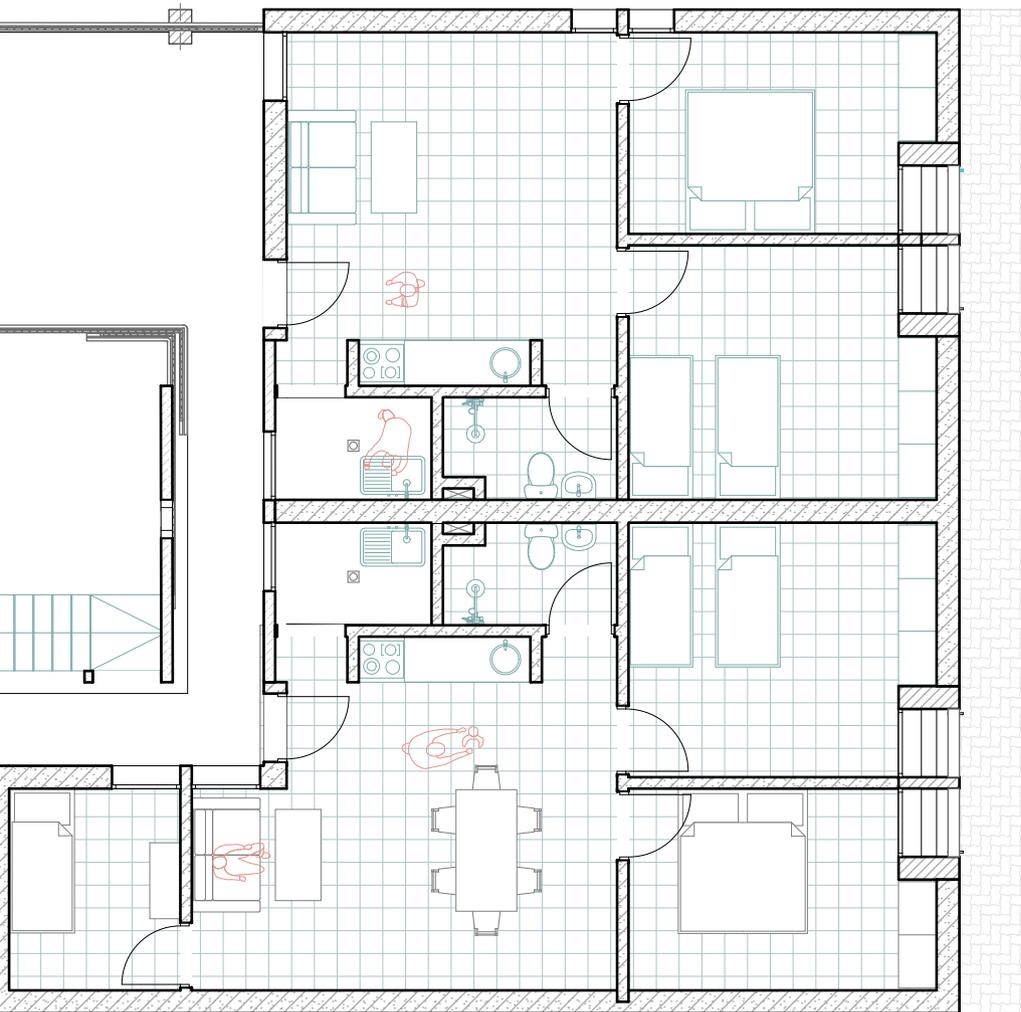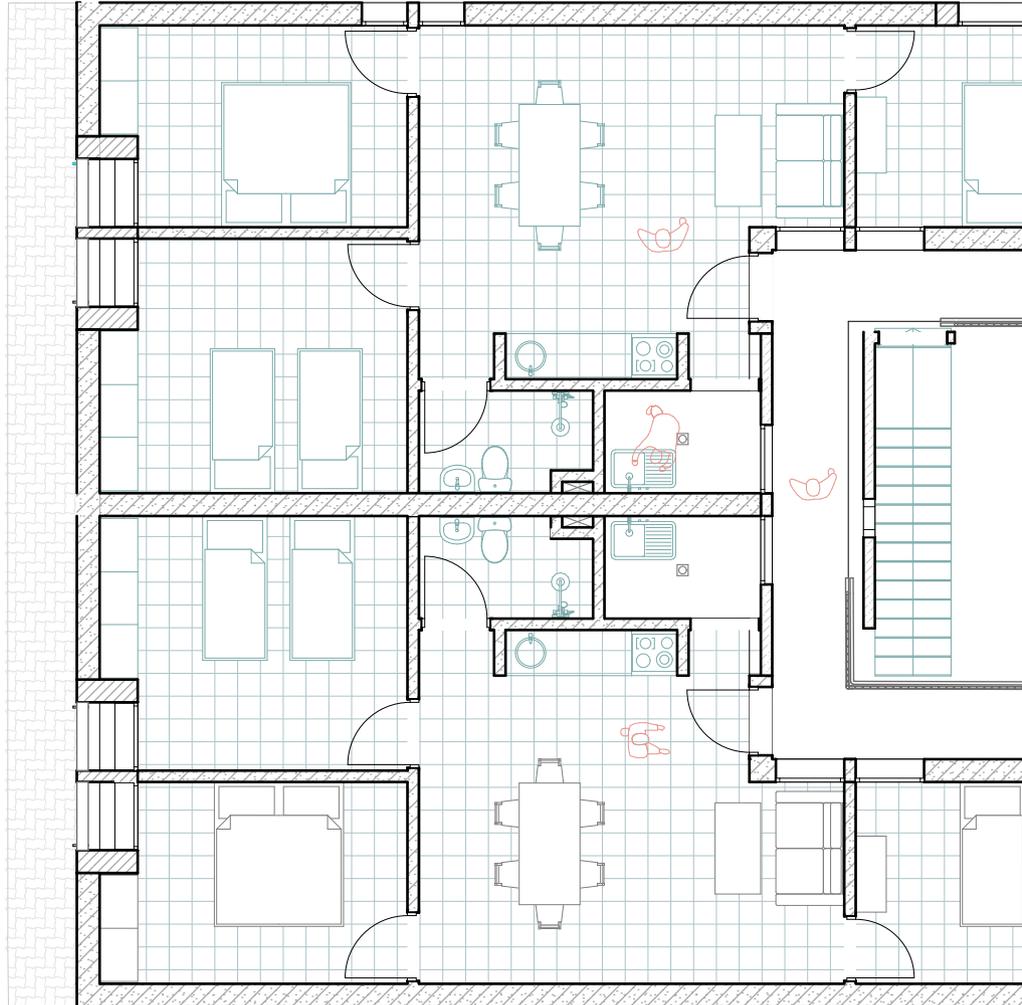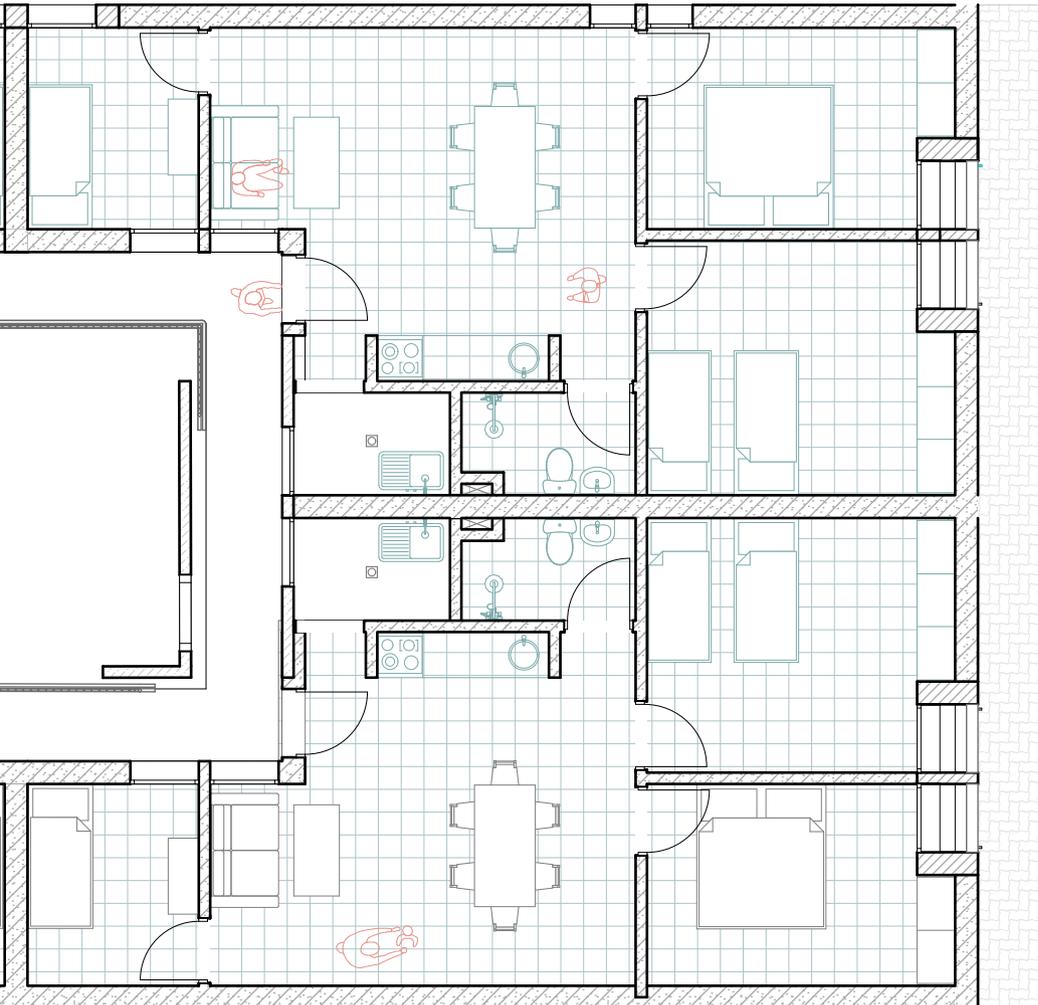


*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

## Ground Floor

1    2    3m

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

First Floor

1    2    3m

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

Second Floor

1    2    3m

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

Third Floor

1   2   3m

The typology is a four-storey building with four apartments on every level that surrounds an inn One of the key features of the typology is the courtyard space. Perforated Copogo walls partly enclose the space. These walls act as the structure that holds up the floor and becomes a threshold between the houses that allows for privacy. The walls also limit the view into the courtyard space for people walking by. Additionally, the staircase is placed next to the wall which protects residents in case of a fire.
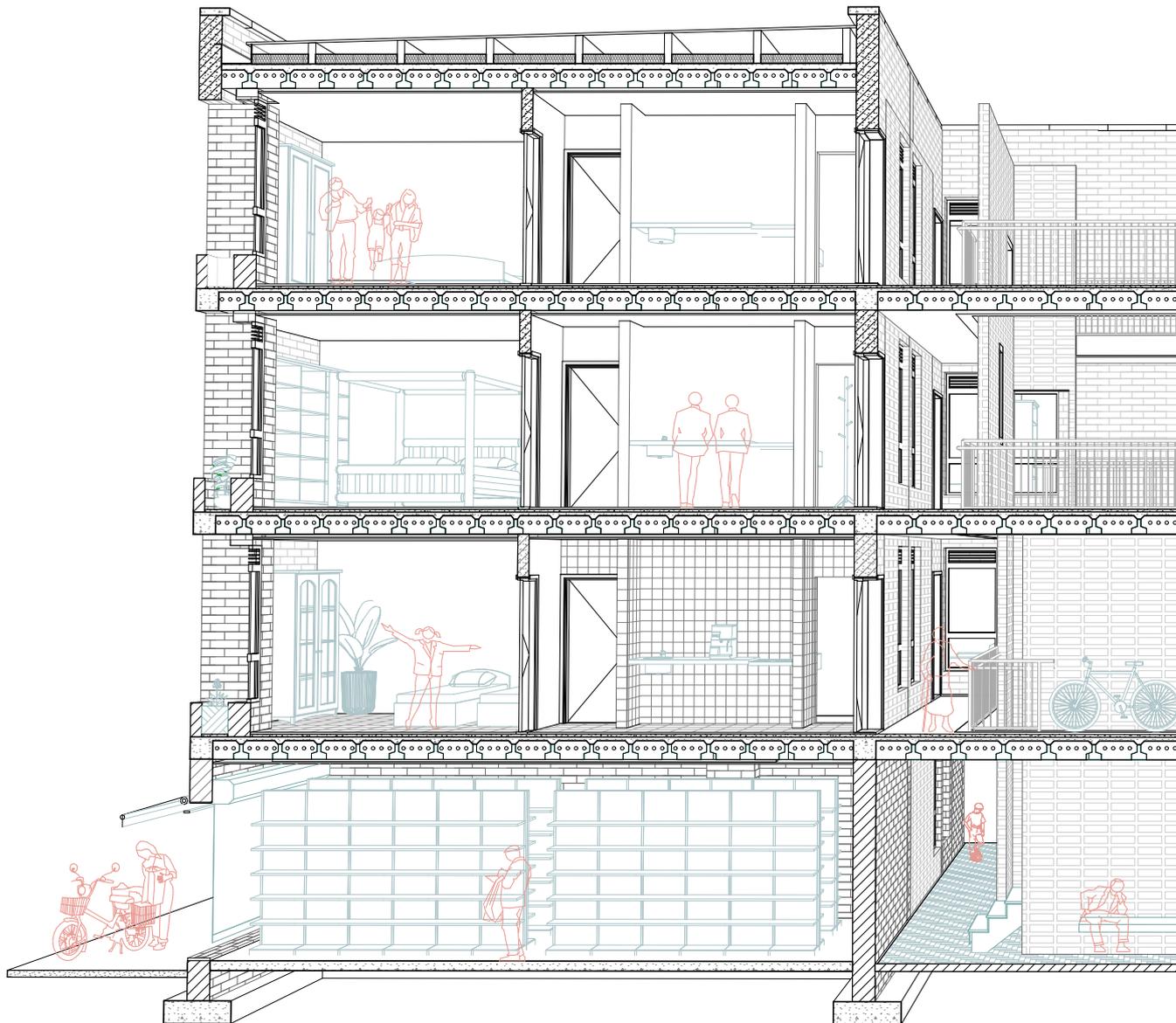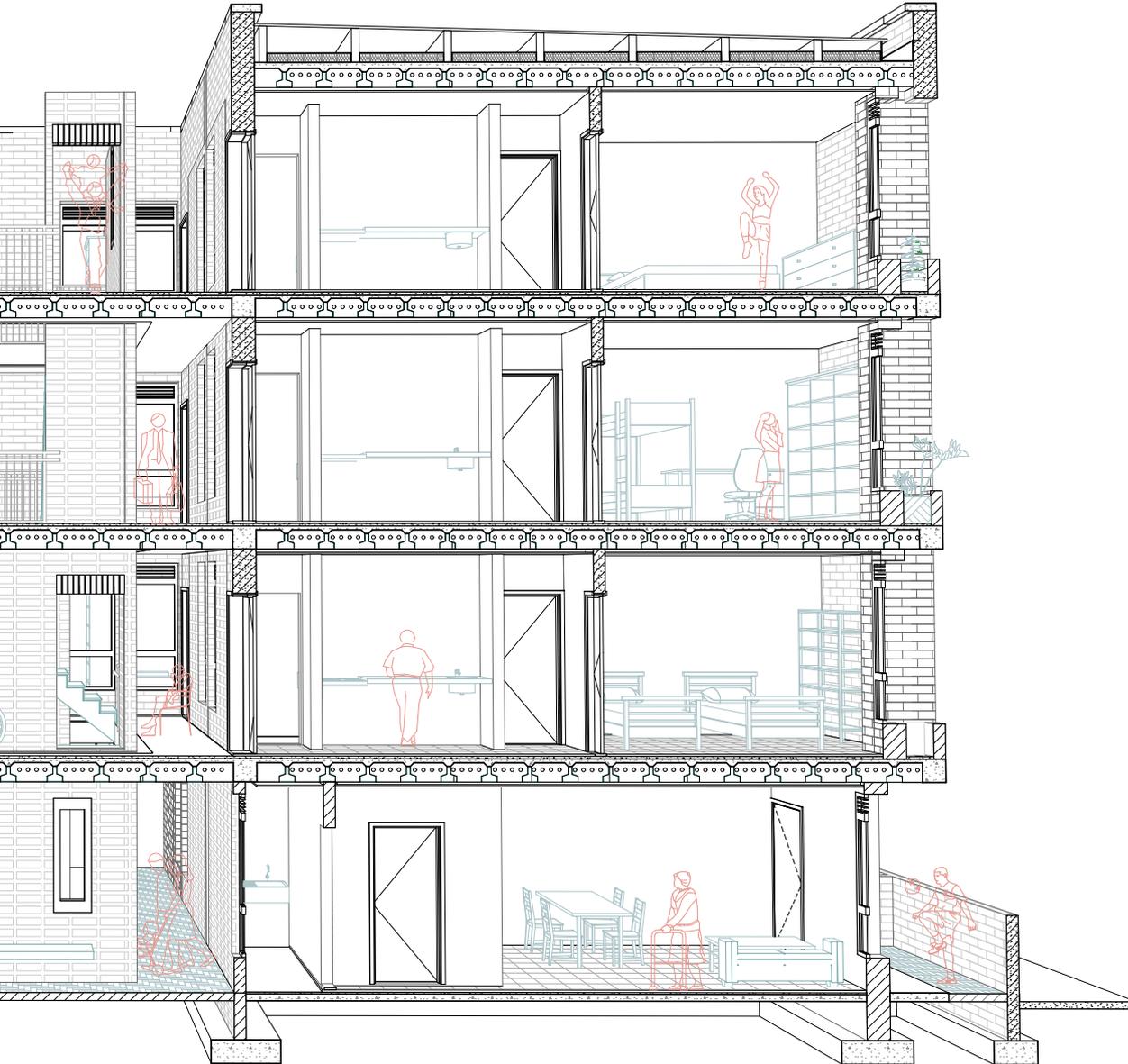
*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

The long edges of the design are blind walls and allow the projects to be linked together whilst simultaneously stepping with the slope. The is interpreted from by the Comuna Dom Helder project visited during the field trip.

6300

6300

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
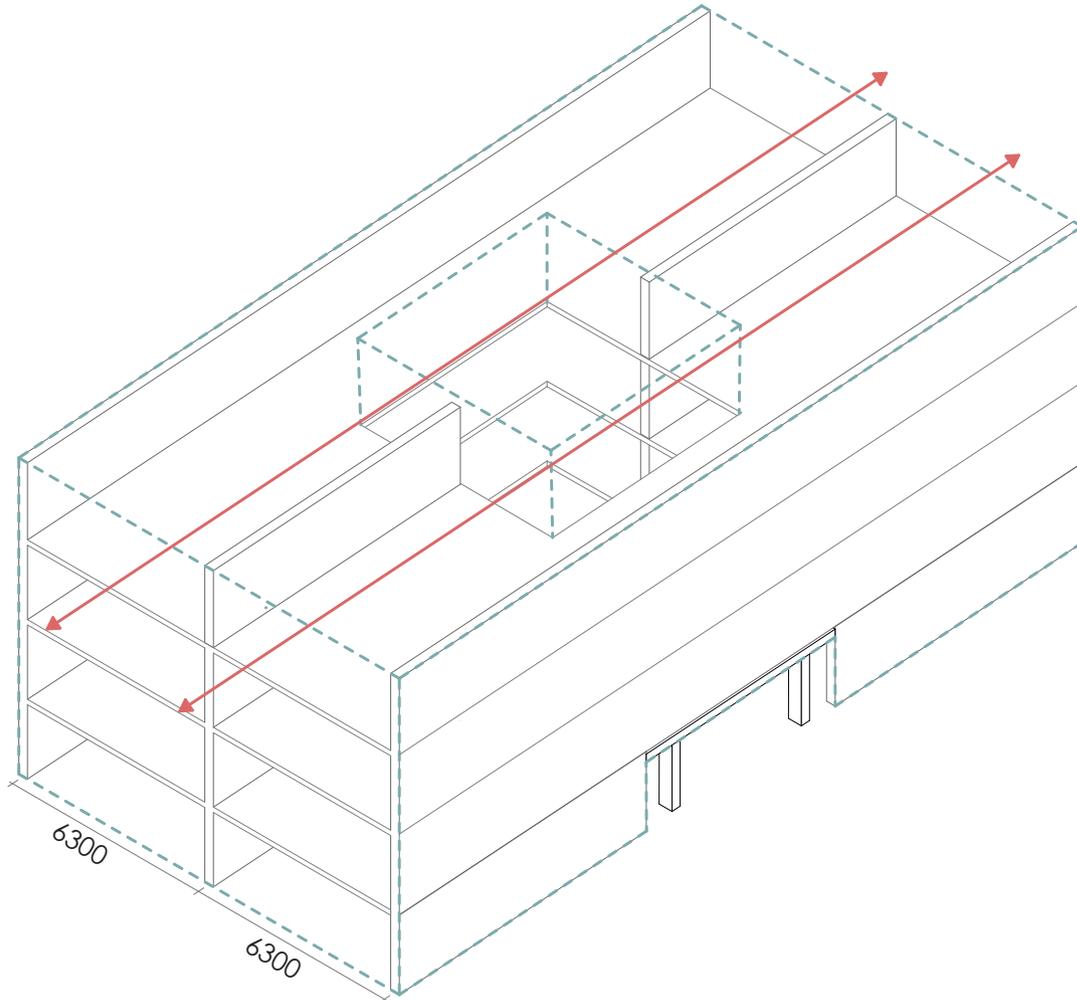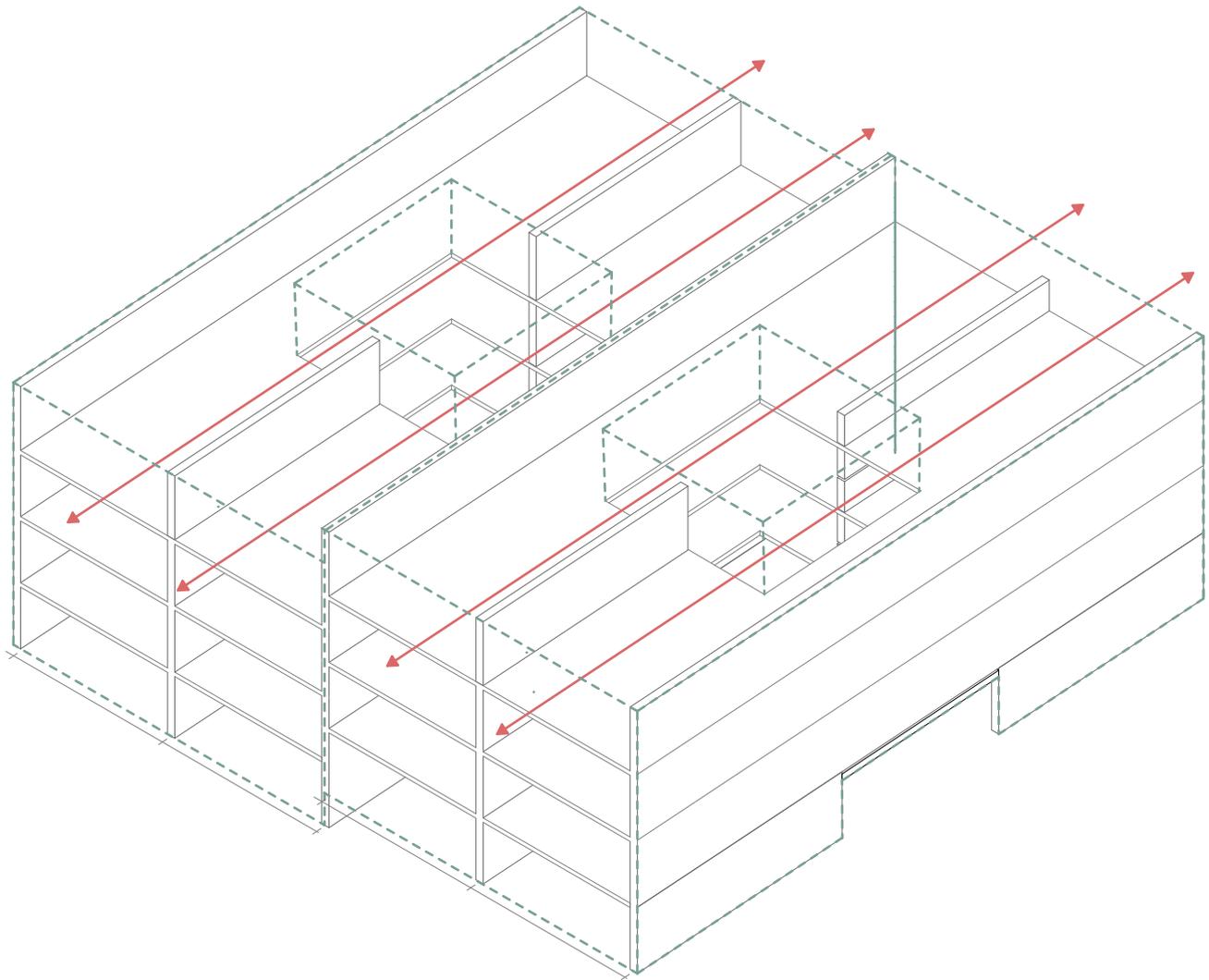
The buildings form a cluster of 4,6 or 8  blocks that step according to the topography. A pedestrian route is left between the long edge of the blocks, which are optional for cross ventilation or light, while a large opening with green space is left between the main facades.
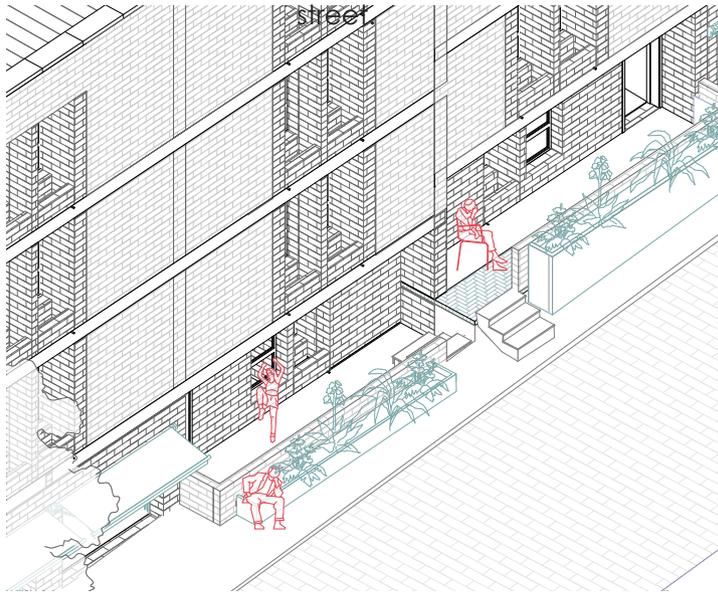


*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
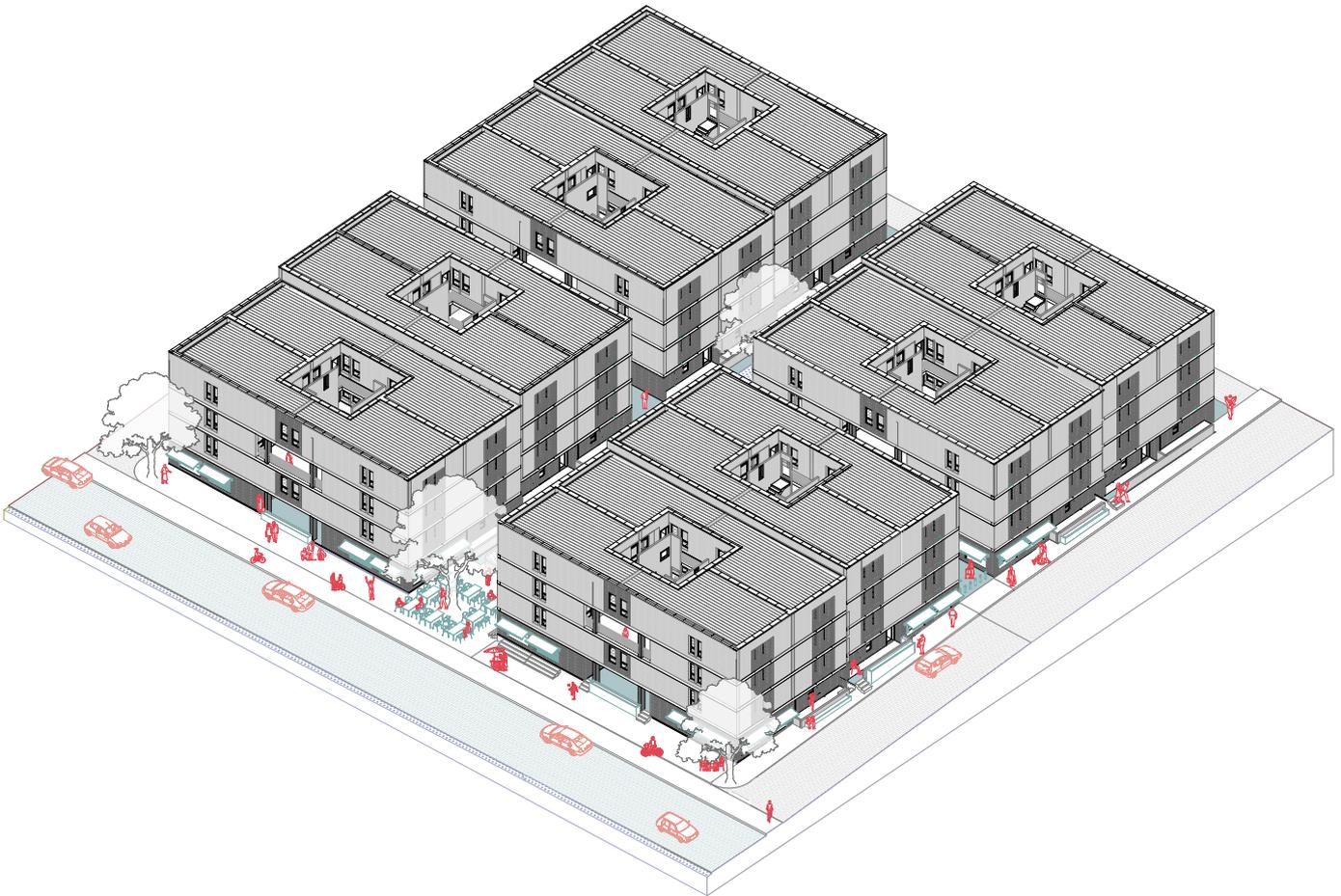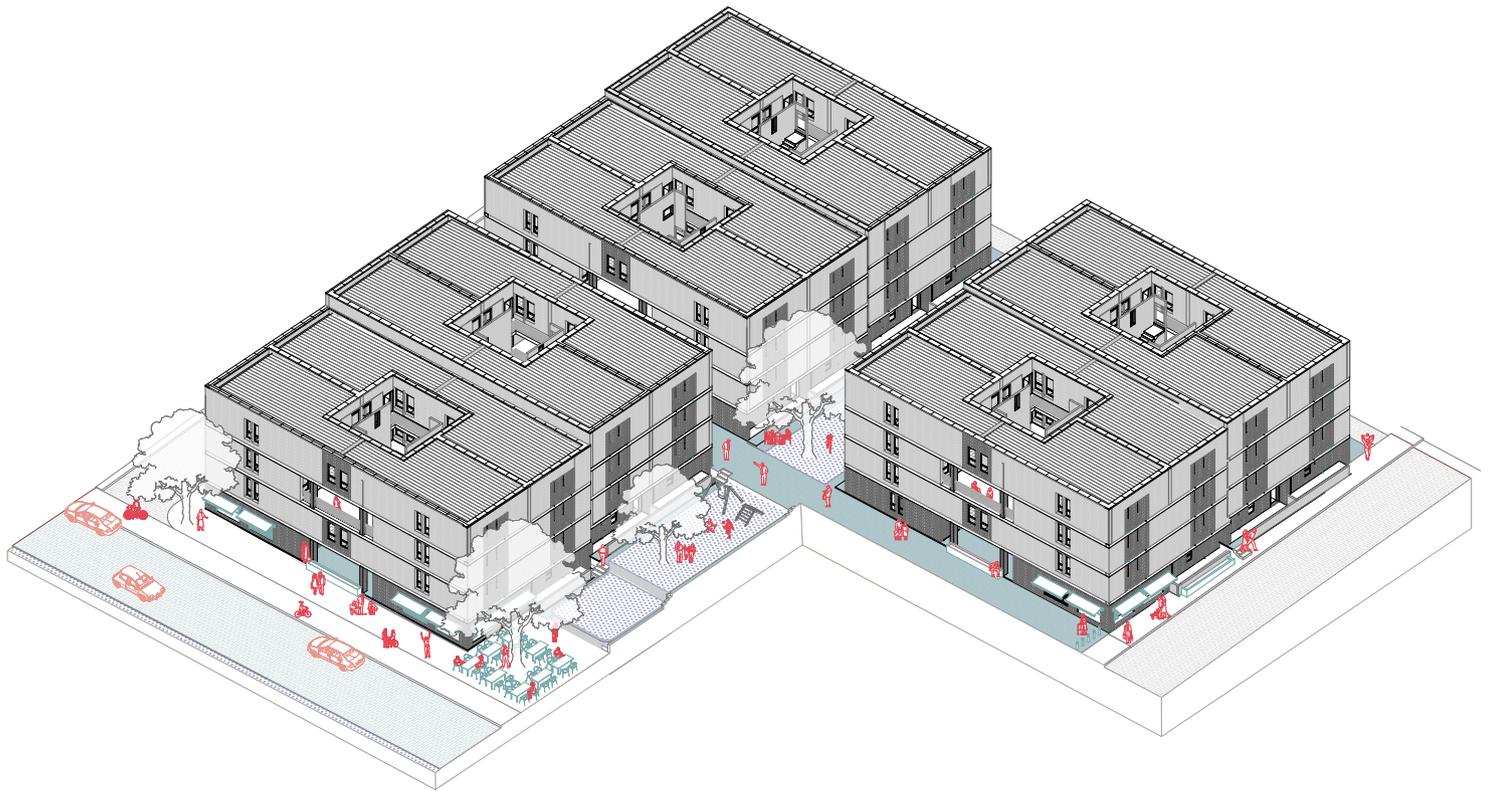
The cluster introduces several devices to control access into the space.

Amenities/Shops 'guard' the entrances





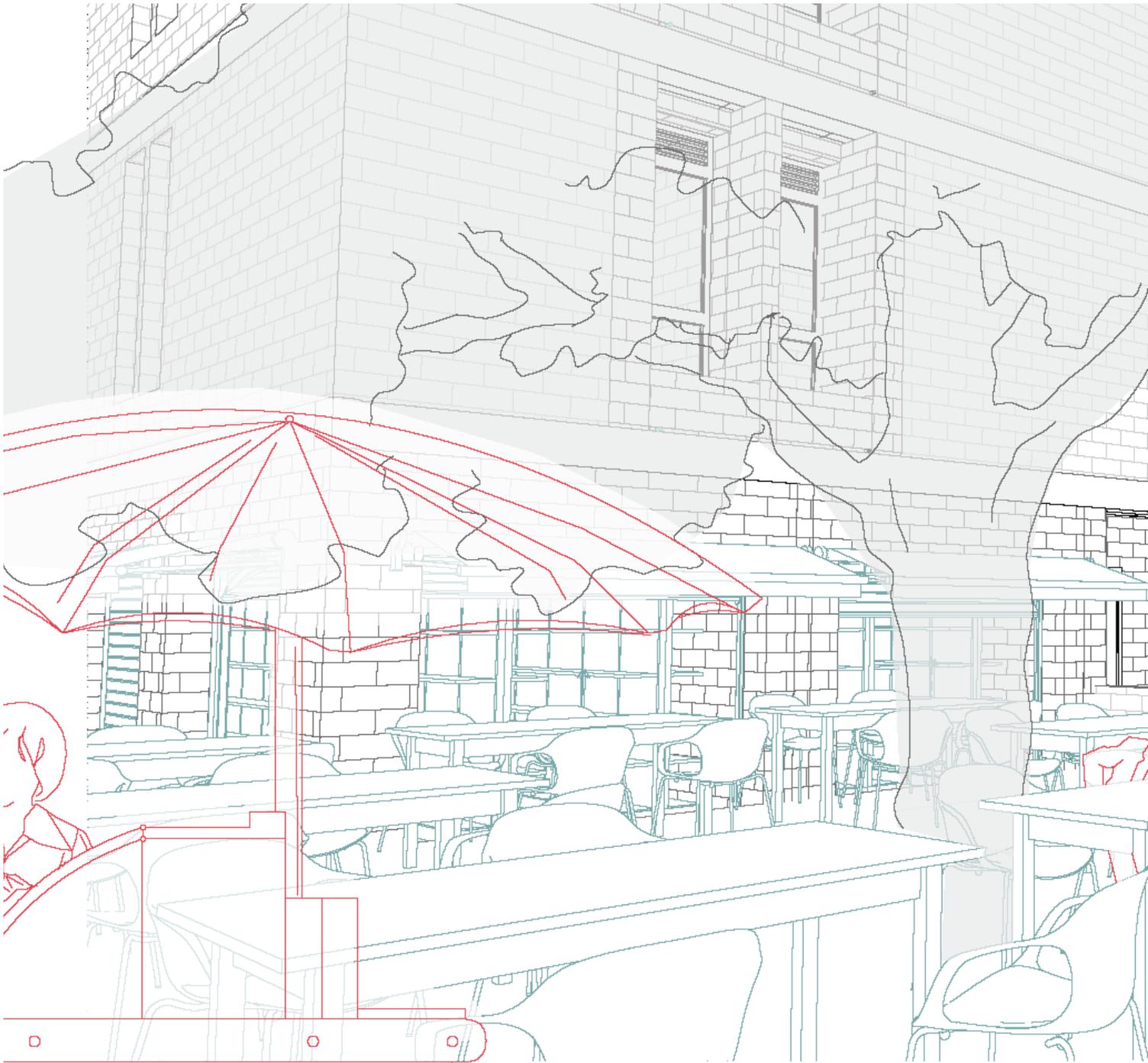*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
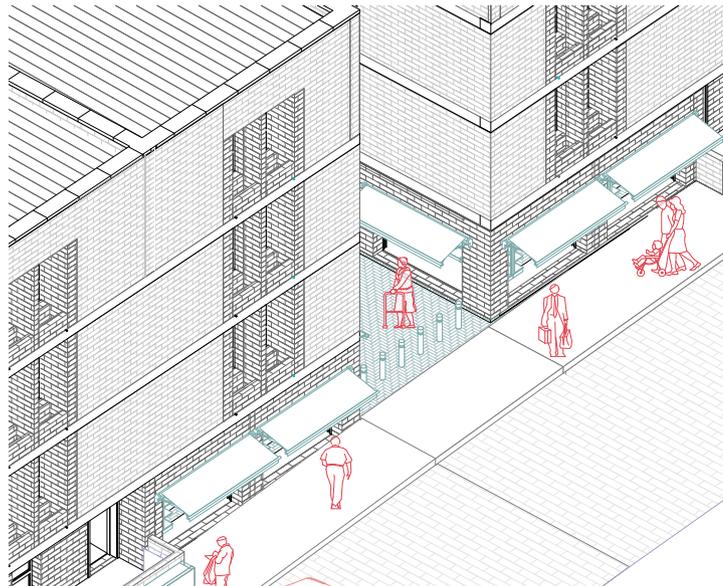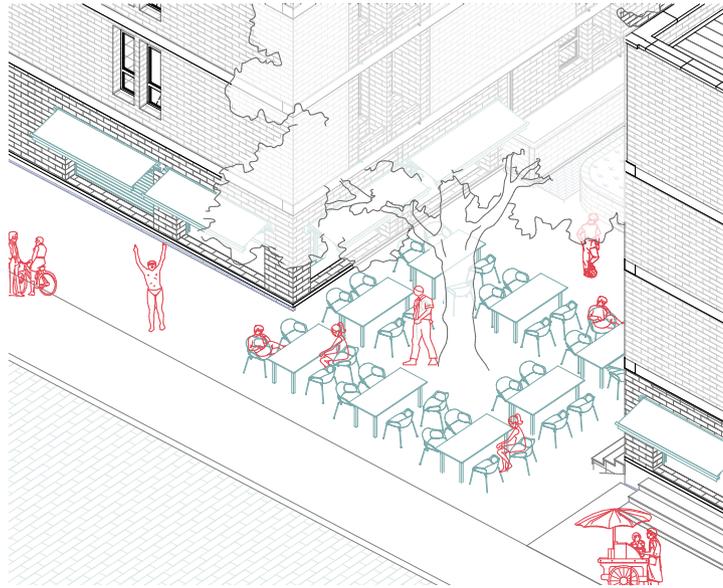
Green boundaries, different floor textures, and 1m
high walls are used to separate the spaces from the
street

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

# 4. Linear Park Extention



LINEAR DO RIBEIRAO
CAULIM FASE 2

LINEAR DO RIBEIRAO
CAULIM FASE 1

ZEIS-4

ZEIS-4

ZEIS-4

ZEIS-4

ZEIS-4

ZEIS

ZEIS-4

ZEIS-4

LINEAR RIBEIRAO
COCAIA

LINEAR RIBEIRAO
COCAIA - CHACARA
TANAY

ZEIS-4

ZEIS-4

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

ZEIS-4

VARZEA DO COCAIA 1.
FASE
ZEIS-4

ZEIS-4

ARISTOCRATAS

ZEIS-4

ZEIS-4

ZEIS-4

ZEIS-4

ZEIS-4

ZEIS-4

Linear Park extention

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
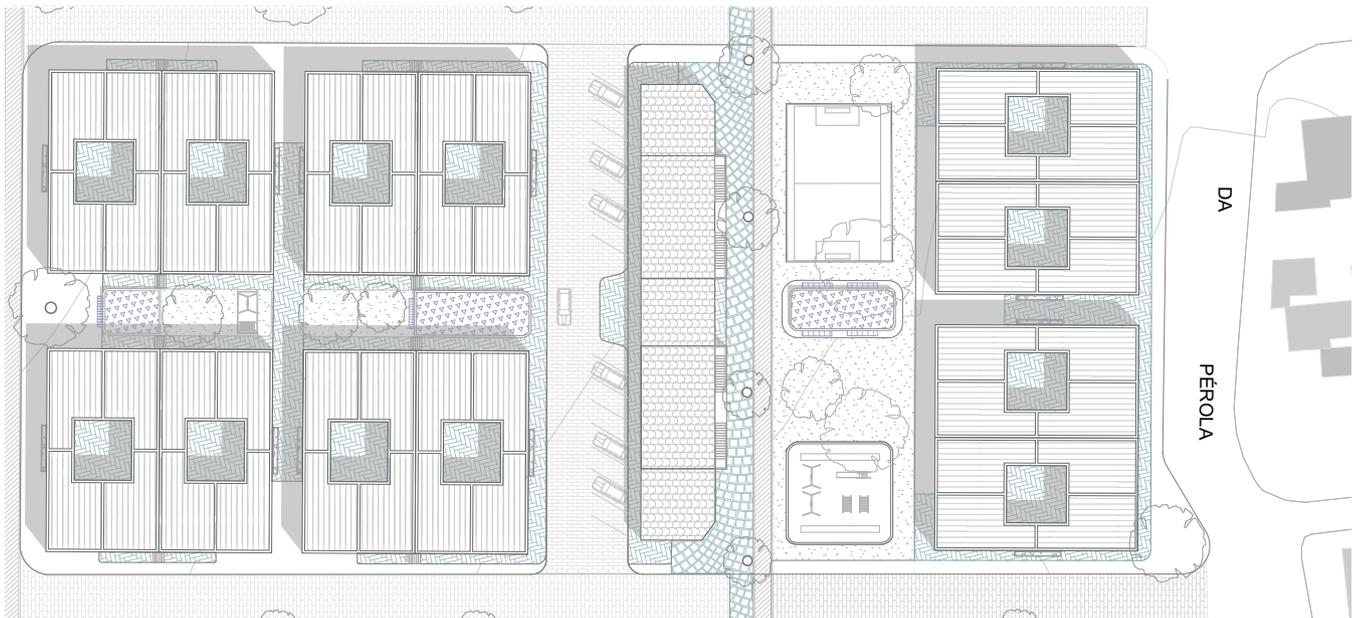
*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
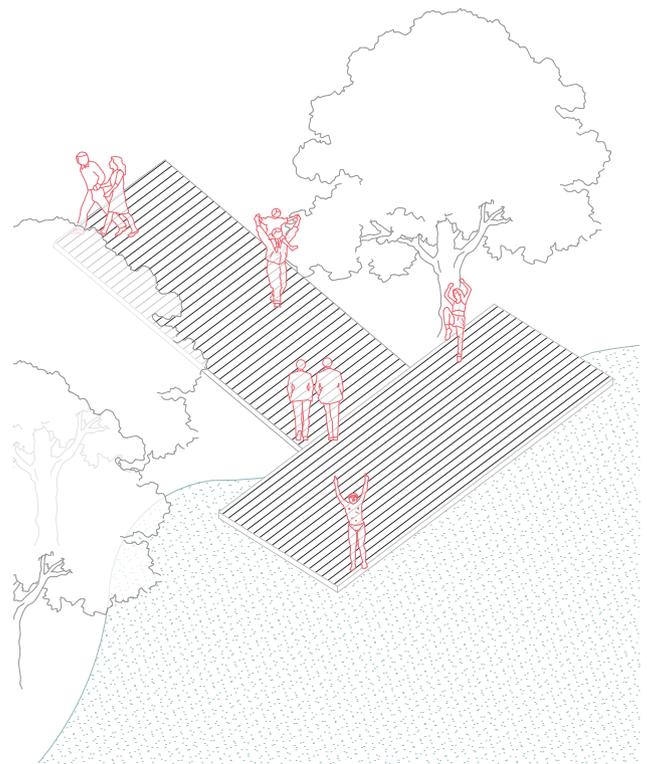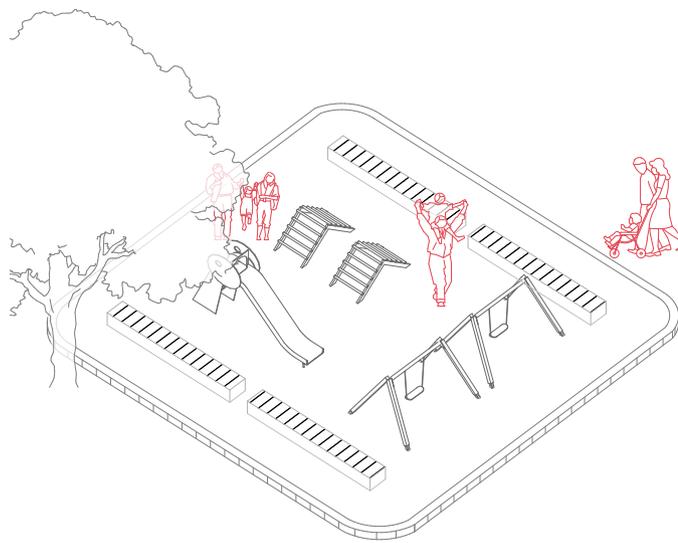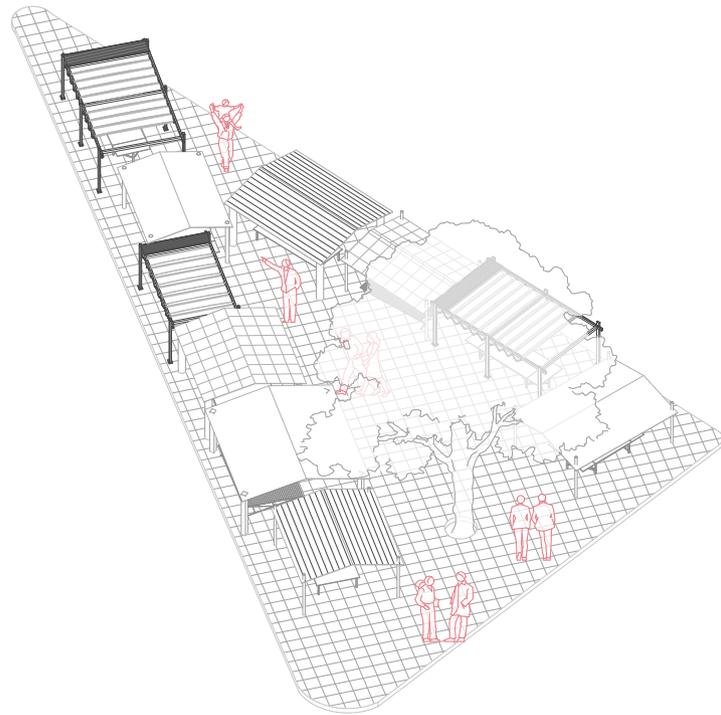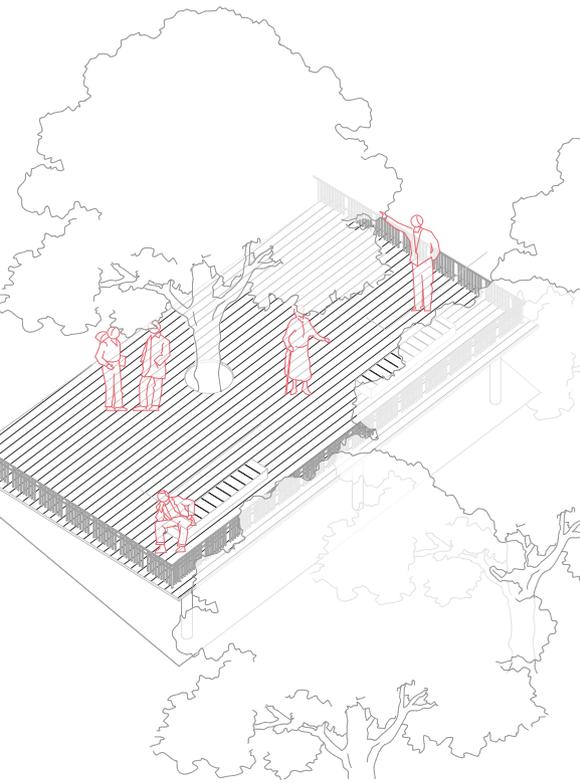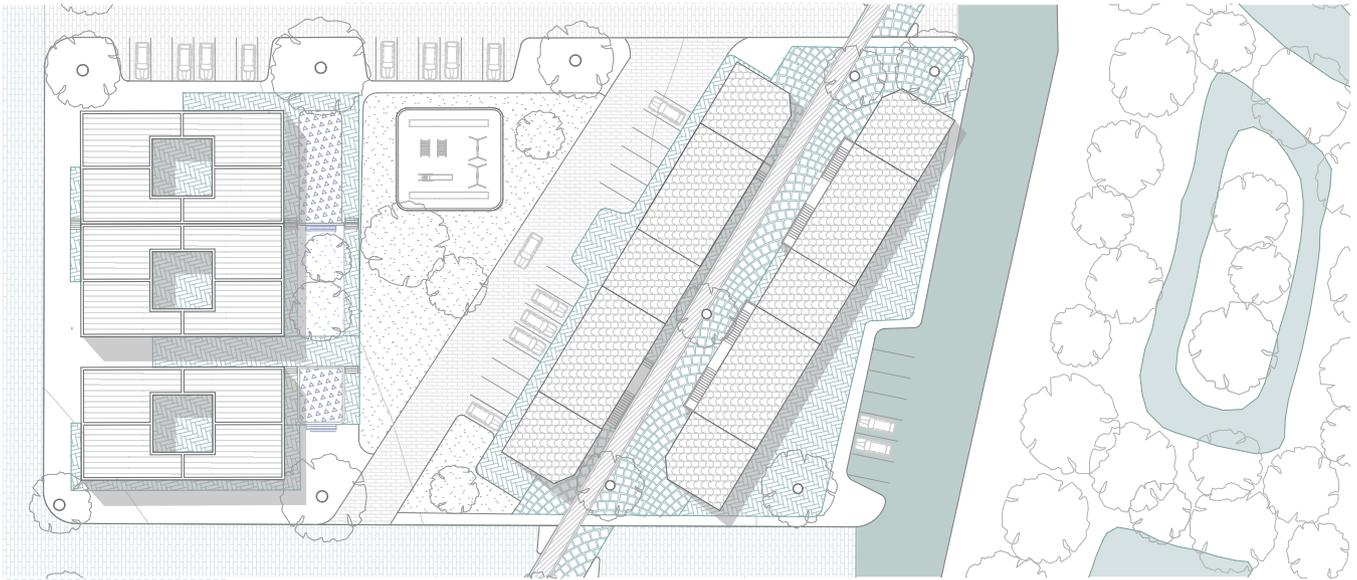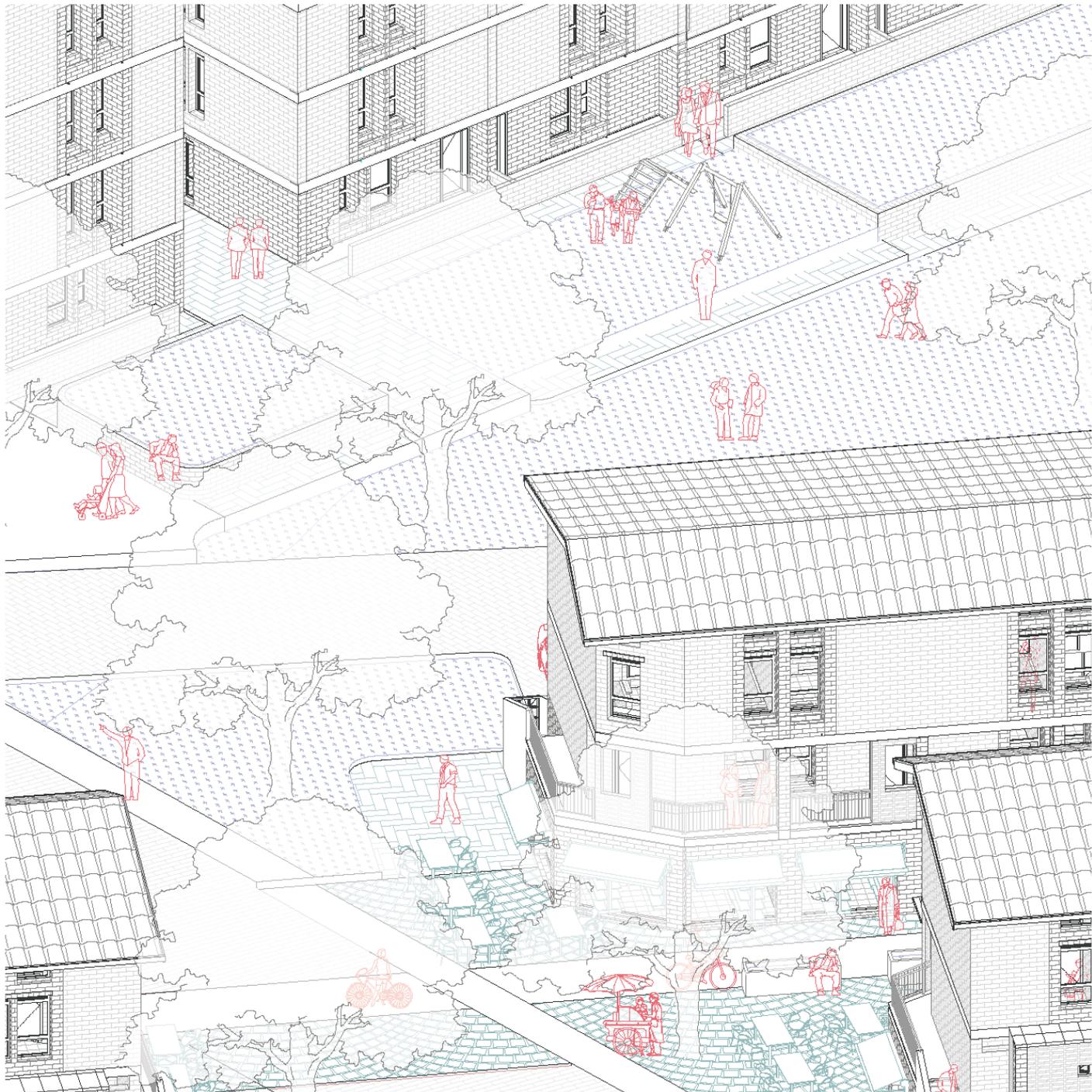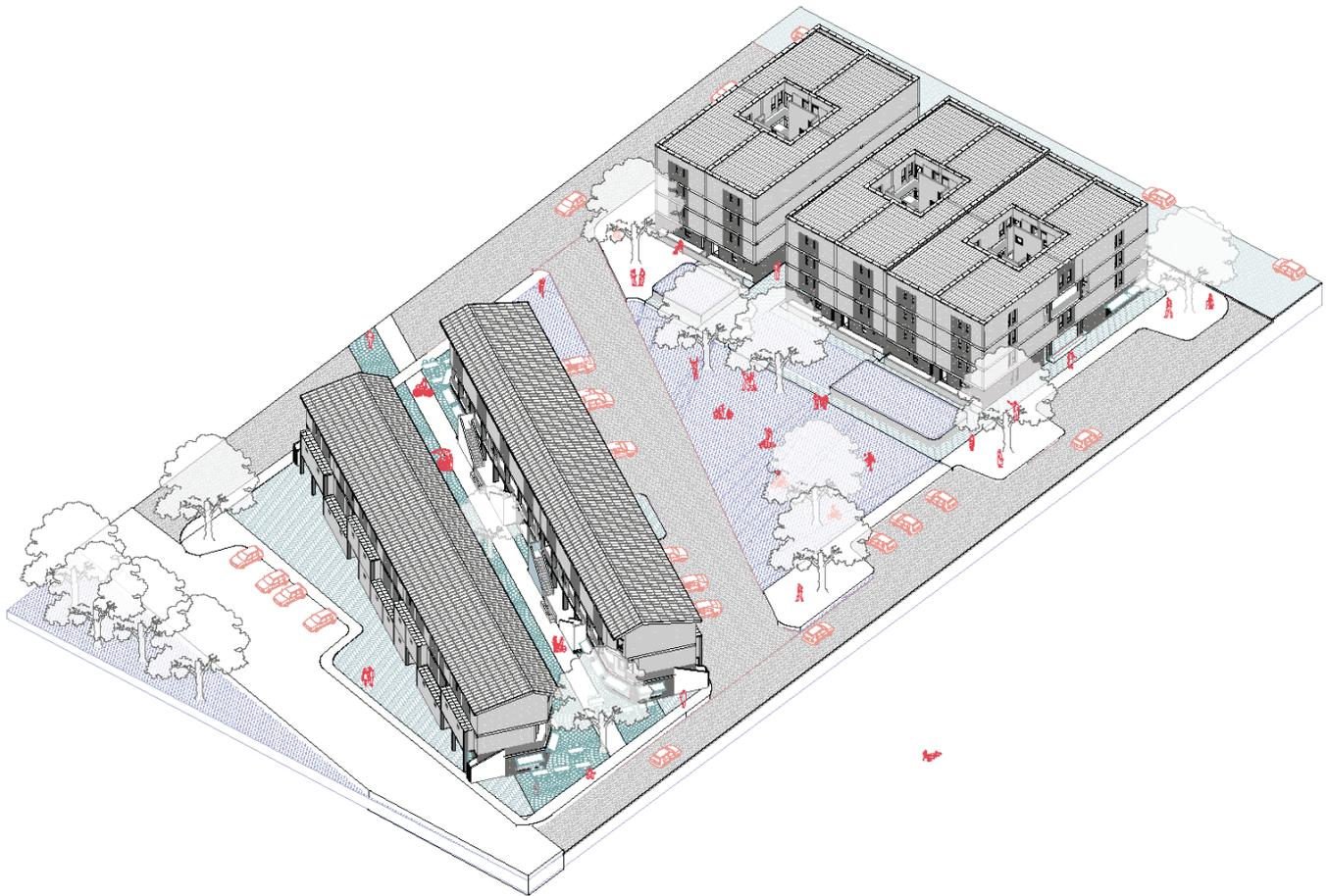
# 5. Urban Blocks

The masterplan presents two types of Urban Blocks. A block that connects to the surrounding urban fabric and a block that connects to the linear park.



*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
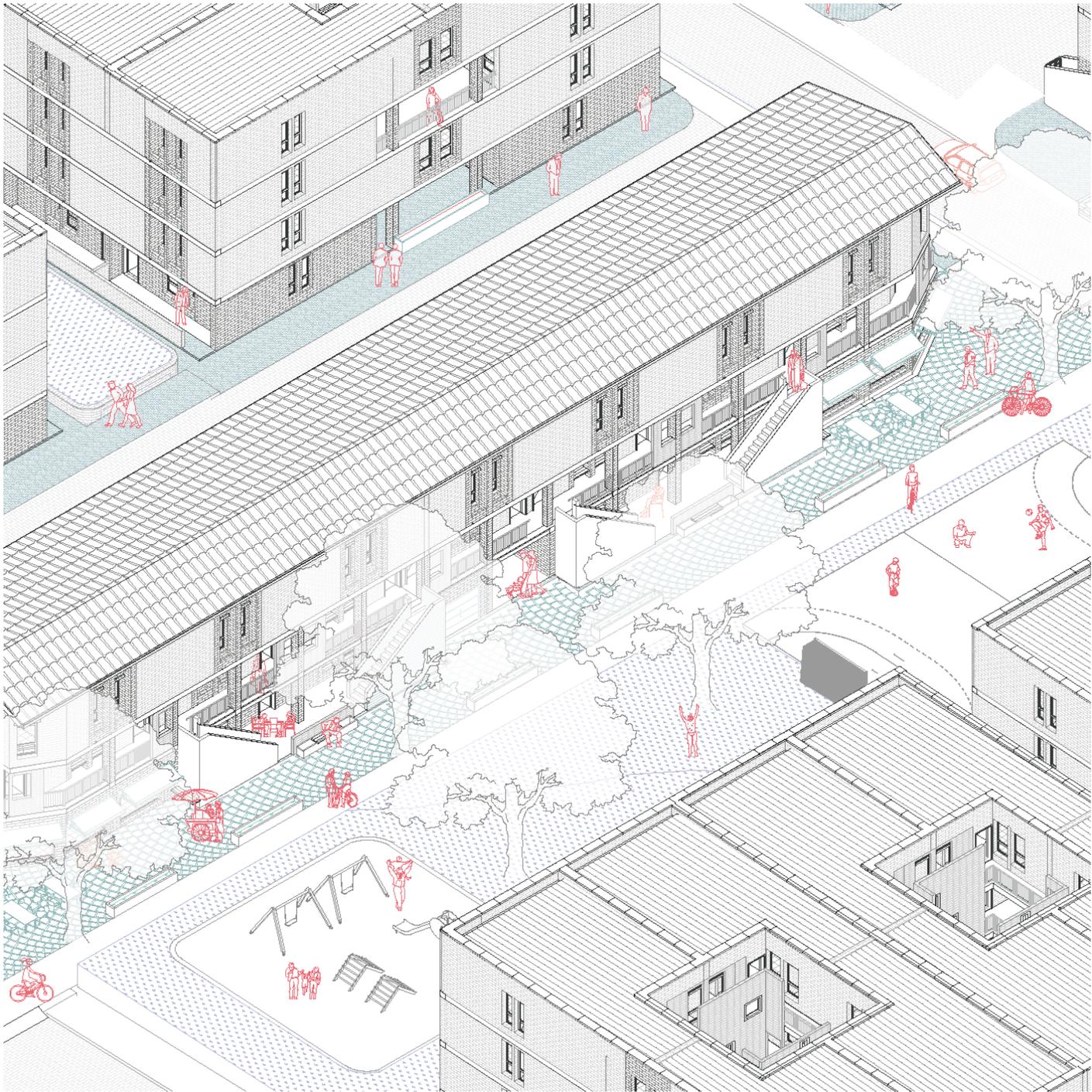
The urban blocks connected to the linear park house the diagonal pedestrian route. Accordingly, the space creates more resilient spaces—for instance, the triangular park seen in the image.

The urban block connected to the existing urban fabric showcases a more prototypical result of the design system. It clearly showcases how the different routes and typologies come together.
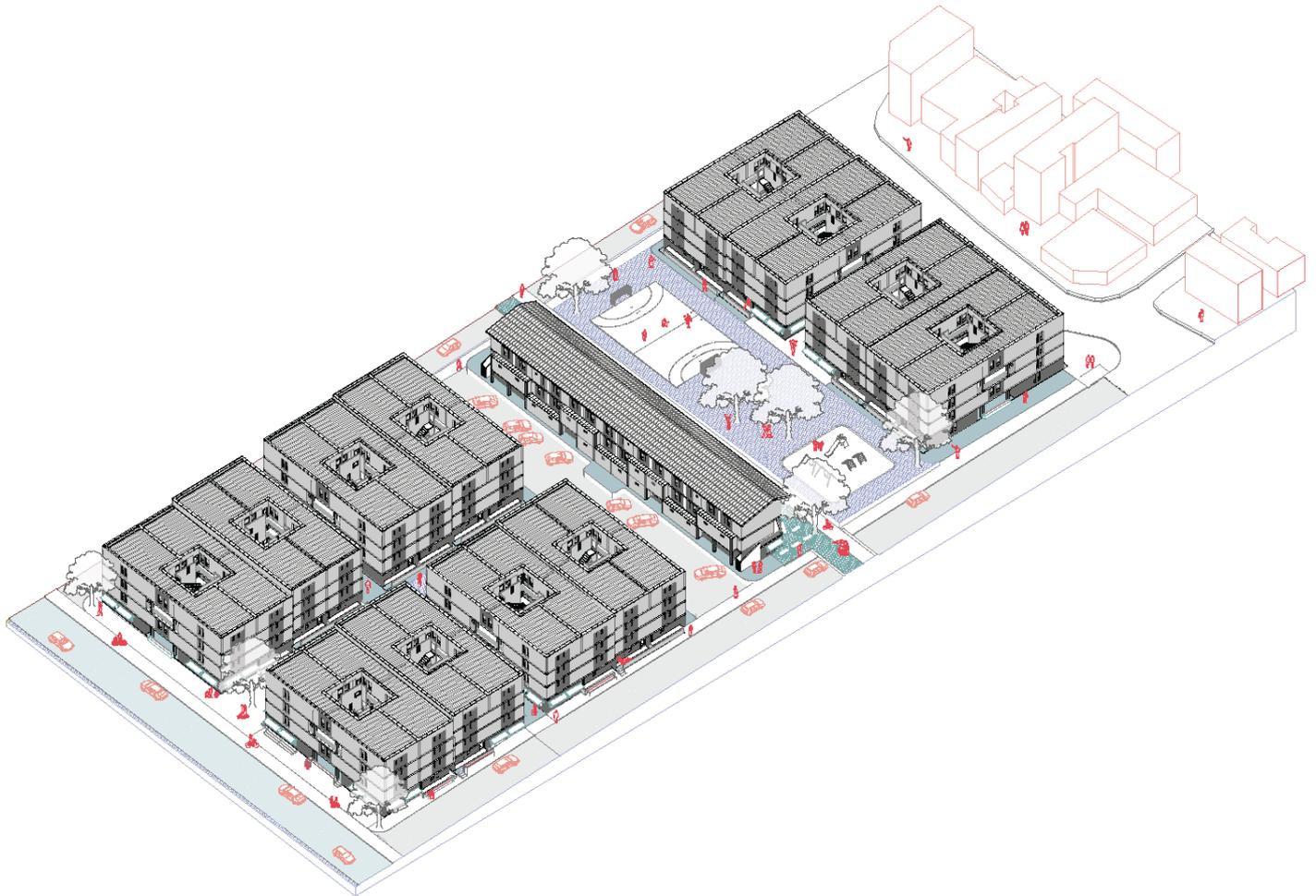
# Enviromental Sustainibility

Materiality

# Materiality

To decide the primary materiality of the project, I mainly referred to a study Study of Alternatives for the Design of Sustainable Low-Income Housing in Brazil by Pollyanna Fernandes Bianchi and Víctor Yepes. The study concluded that the most sustainable structural material is steel. However, realised that in order to be socially sustainable, I also need to consider local labour.

| Project | Cost (US/m2) | Thermal Transmittance (W/m2k) | Construction Time (days/m2) | CO2 (Kg/m2) | Cultural Acceptance |
|---|---|---|---|---|---|
| Structural Concrete (Project 1) | 223,24 | 2,48 | 1,98 | 417,73 | **0,4051** |
| Structural Masonry | **220,15** | 2,86 | 1,52 | 319,06 | 0,2804 |
| Light Steel Frame | 651,65 | **0,45** | **1,34** | **246,23** | 0,3145 |

Source: *Study of Alternatives for the Design of Sustainable Low-Income Housing in Brazil,*
(Bianchi, Yepes, Vitorio & Kripka, 23 April 2021)

| Product | Specific heat capacity | Density | Effectiveness |
|---|---|---|---|
| Concrete | 1000 | 2300 | High |
| Concrete Brick | 1000 | 600 | Medium |
| Clay Brick | 800 | 1700 | High |
| Steel | 480 | 7800 | Low |

Source: GreenSpec: Thermal Performance: Thermal Mass in Buildings



*Compressed Earth Bricks*
*290x140x90*



*Ceramic Bricks*
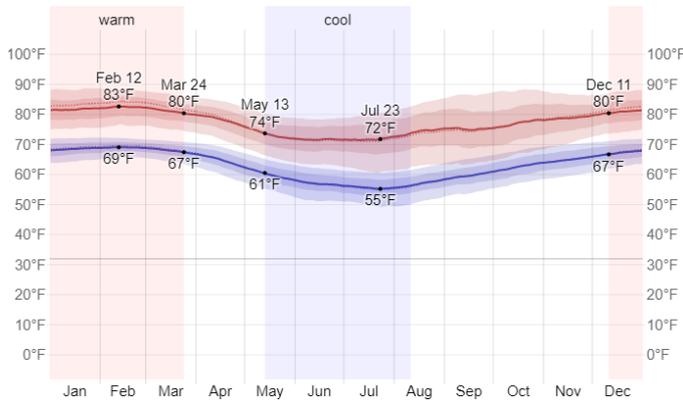*290x140x90*

*ous Thresholds*

Roof Construction: 0.6 Galvanished Corrugated Sheeting on 50 Timber Purlins and Timber Roof Trusses. 50 Thermal Insulation between the trusses. 50 Timber Battens attached to a 6.4 Gypsum Board Ceiling

0.6 Galvanised Corrugated Steel Sheetng Attached to the Wall with Cold-pressed Steel Section

1800X900 Aluminium Window

Ceramic Tile Floor Finish and Concrete Screed on 200 Pre-Stressed Hollow Core Slabs.

180 Compressed Earth Brick (90x140x240) Wall with Intertior Motar and Paint finish

1500x1500 Aluminium Window

Hallow Concrete Blocks

1000mm Aliminium Balustrade

180 Clay Face Brick (90x140x240) Wall with Intertior Motar and Paint finish

In-Situ Concrete Stairs

Ceramic Tile Floor Finish, Concrete Screed on a 80 In Situ Concrete Surface Bed with 0.25Polyolefin Membrane

Brick Paving on Ground Fill

600x200 In Situ Concrete Strip Foundation

Bedroom

Bathroom

Store Room

Bedroom

Laundry Room

Living Room and Kitchen

Laundry Room

Living Room and Kitchen

Bedroom

Roof Construction: 0.6 Galvanished Corrugated Sheeting on 150 Timber Rafters and Timber Roof Trusses. 50 Thermal Insulation between the Rafters with a 6.4 Gypsum Board Ceiling attached to it.

0.6 Galvanised Corrugated Steel Sheetng Attached to the wooden truss with 50 Timber Purlins and a Roofing Felt

1800X900 Aluminium Window

Ceramic Tile Floor Finish and Concrete Screed on 300 Reinforced one-way joists with hollow block in-fill

180 Compressed Earth Brick (90x140x240) Wall with Intertior Motar and Paint finish

1500x1500 Aluminium Window

Perforated Brick Wall

1000mm Aliminium Balustrade

In-Situ Concrete Stairs

Ceramic Tile Floor Finish, Concrete Screed on a 80 In Situ Concrete Surface Bed with 0,25Polyolefin Membrane

180 Clay Face Brick (90x140x240) Wall with Intertior Motar and Paint finish

Brick Paving on Ground Fill

600x200 In Situ Concrete Strip Foundation

Bedroom
Bathroom
Store Room
Bedroom
Laundry Room
Kitchen
Living Room
Laundry Room
Living Room and Kitchen
Bedroom

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*

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# Local Tecniques



Figure : "Chácara do Conde " (2022) Source: https://arquiteturajaa.com.br/



Figure: Hollow
Ceramic Block and pre-cast concrete beam floor system. Source: https://www.archdaily.com/531253/case-study-the-unspoken-rules-of-favela-construction

# Climate

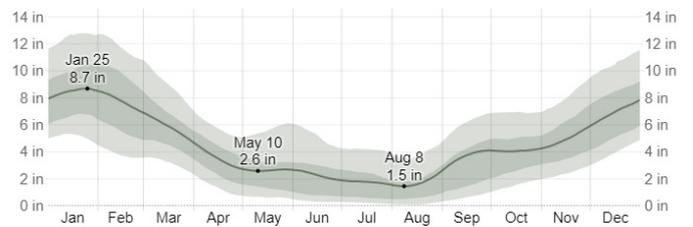Due to São Paulo's subtropical climate ventilation, sun shading and watermangement is crucial



Temprature



Rainfall



Humidity



Wind

Figure: São Paulo Climate Source: https://weatherspark.com/y/30268/Average-Weather-in-S%C3%A3o-Paulo-Brazil-Year-Round#Figures-Temperature

# Ventilation

Due to São Paulo's subtropical climate with high temperatures and excessive humidity, all the apartments allow for cross-ventilation. Accordingly, each apartment has 2 facades and all the rooms are connected to the facades.



*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
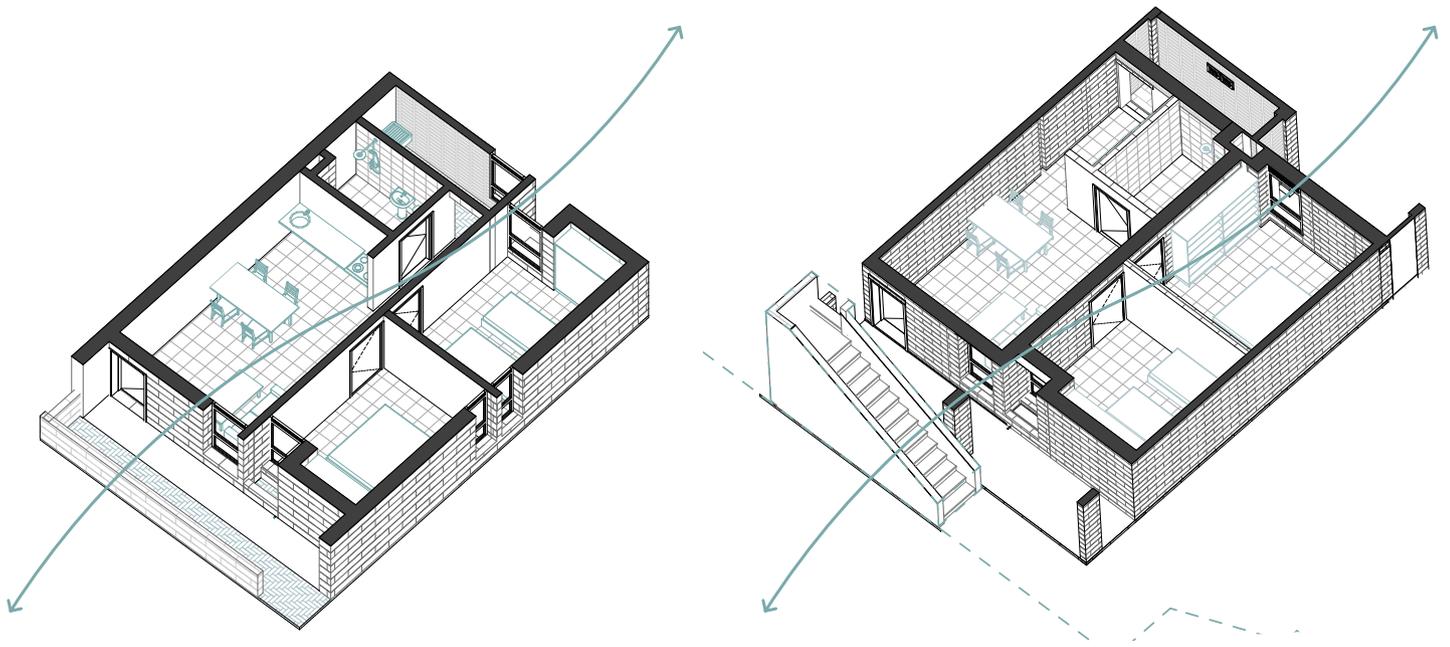
Additionally, the courtyard typology allows for an opening on the second floor to ensure sufficient airflow into the courtyard space.
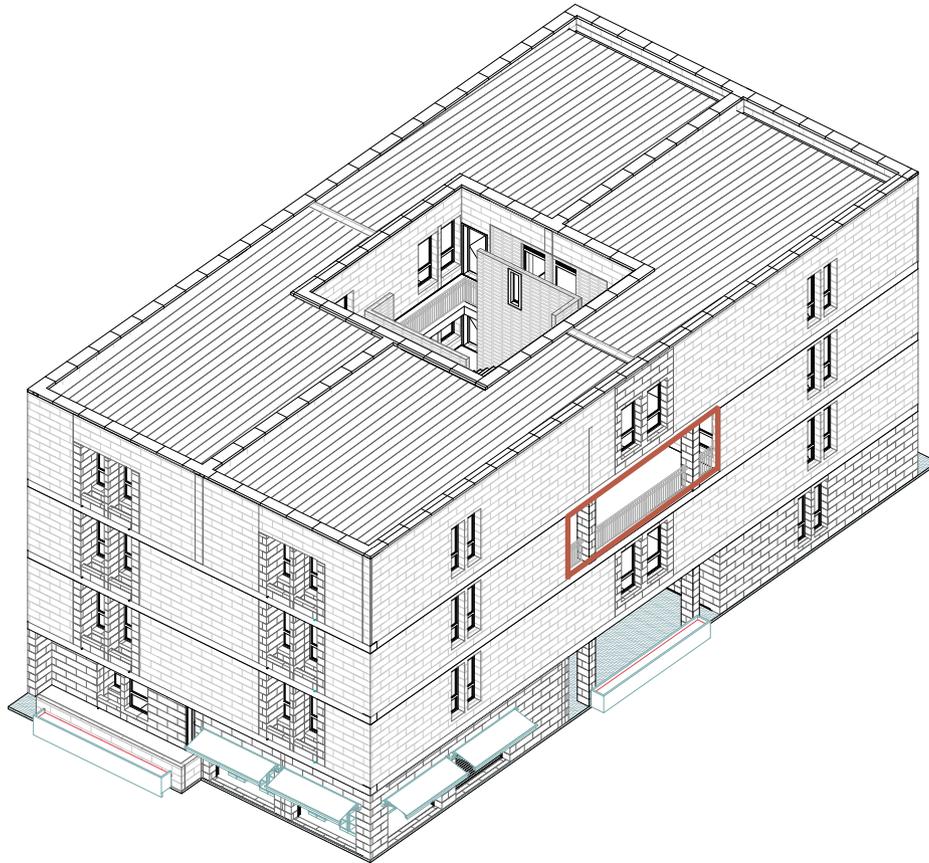
All the wet spaces are grouped together to save on building costs and be as efficient as possible. The layout of the wet spaces is interpreted from Gleba A. The bathroom space ventilates through a grill into the generous laundry space, which has a wall made of Copogo blocks (perforated blocks).
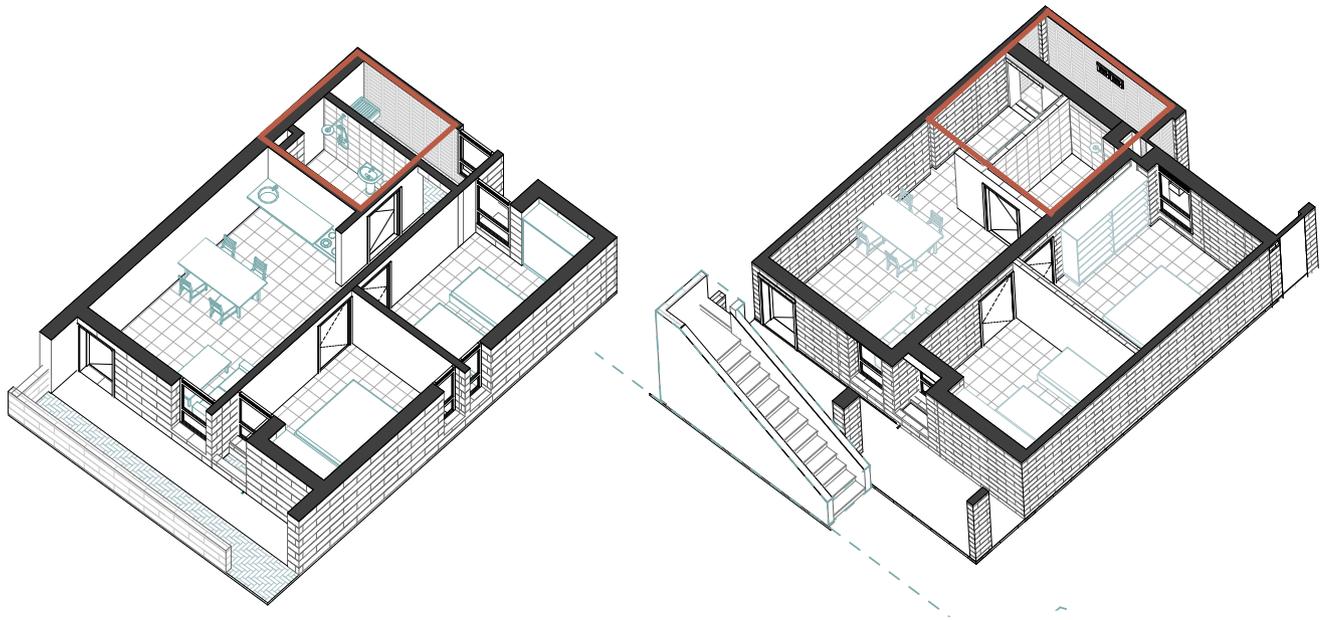


*Ground Floor*

The windows have wooden frames that can easily be constructed by a local carpenter. The top of the window is a fixed louvre that lets the hot air out. The middle is a solid glass pane  that can be covered with a sticker in spaces like the bathroom. And the bottom is a tilt turn window to let cold air in.

450x2100mm

900x2100mm
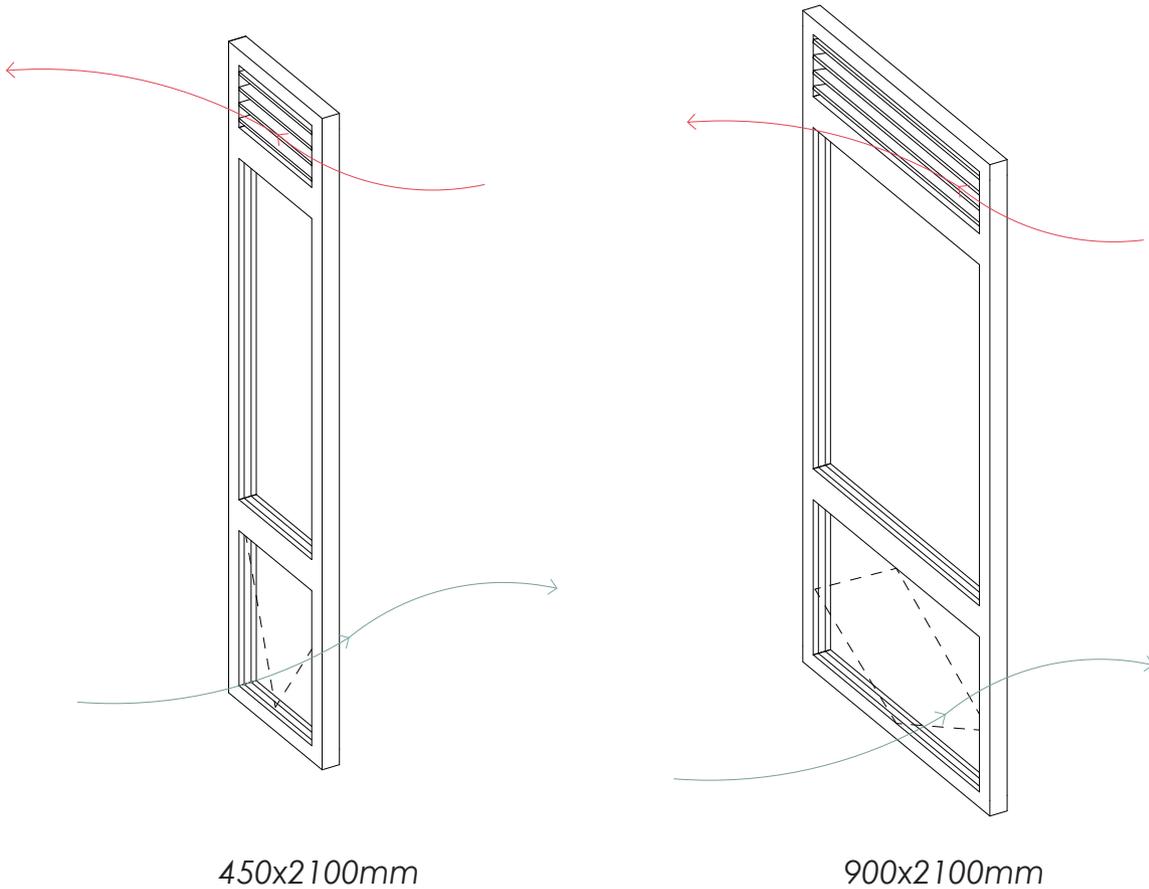
# Sun Shade

Inspired by Hector Vigleccas Gleba A project the window steps back slightly to provide sun shade while simultaneously becoming a small balcony space or planter. The window is 5 bricks high and steps back with 4 bricks. The brickwork around the window is done with in a soldier bond ceramic bricks to highlight the feature and also to ensure accuracy around the windows, since there isn't always a guarantee that the CEB blocks will be perfect.
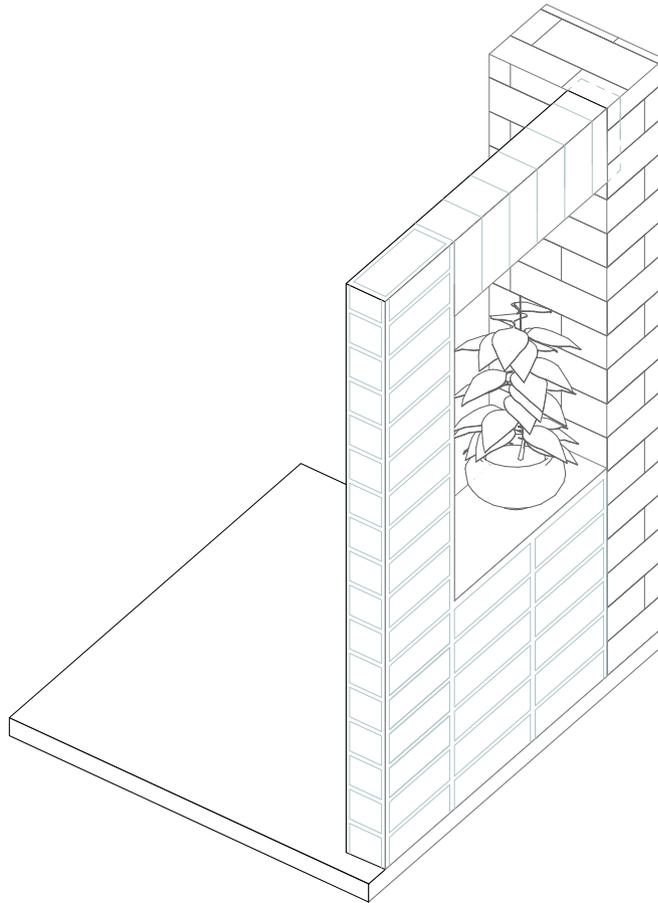
1
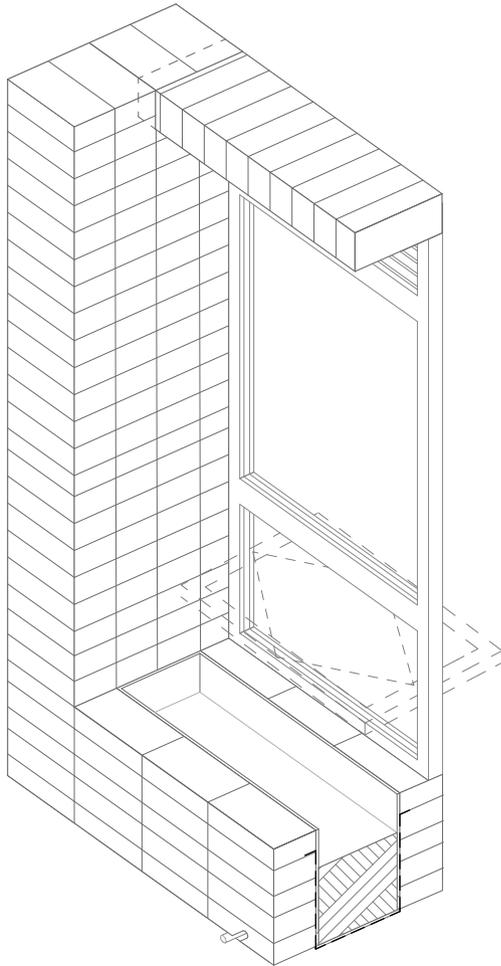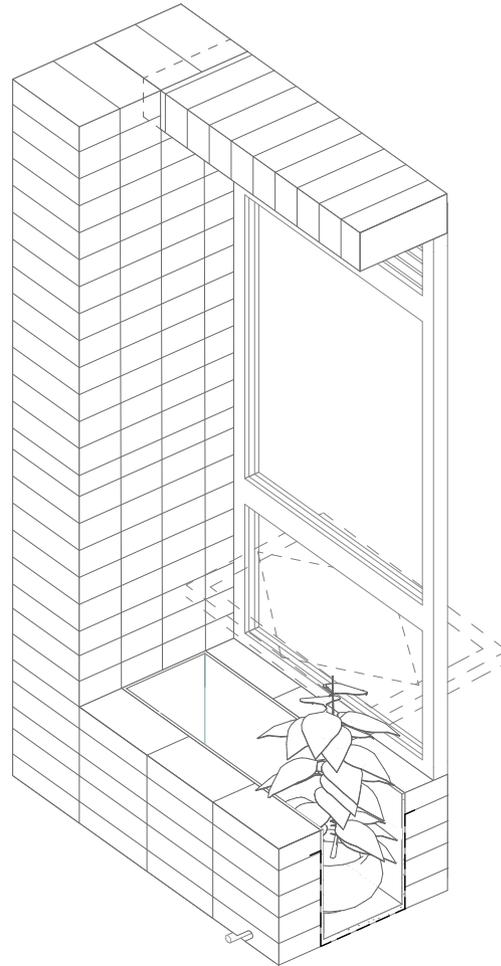
*Planter*                                                    *French Blacony*

To accommodate fire regulations, the project uses a continuous gallery space that is supported by 300x450mm deep columns. A Copogo wall is attached to the column to add a layer of privacy, provide a space for a house number and act as a small balcony for a plant or decoration.
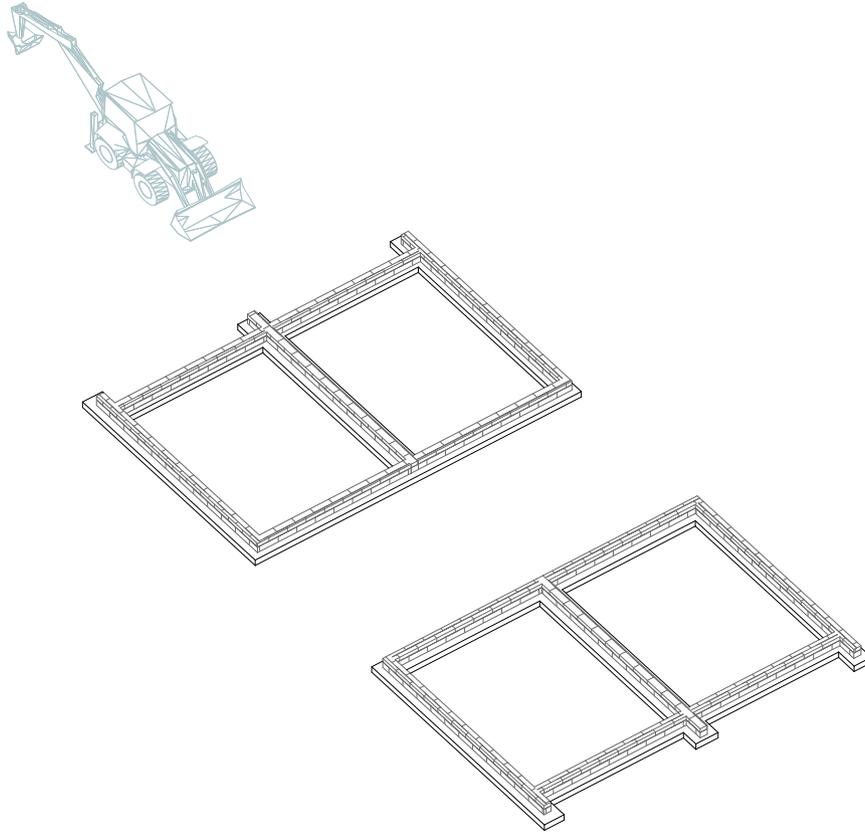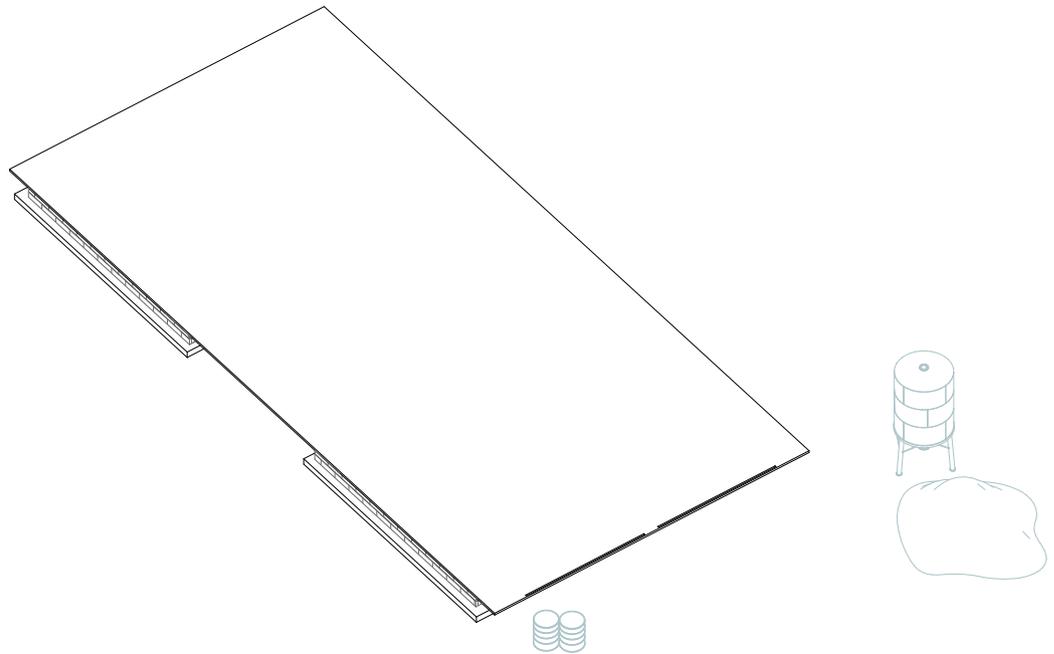
# Construction Phasing
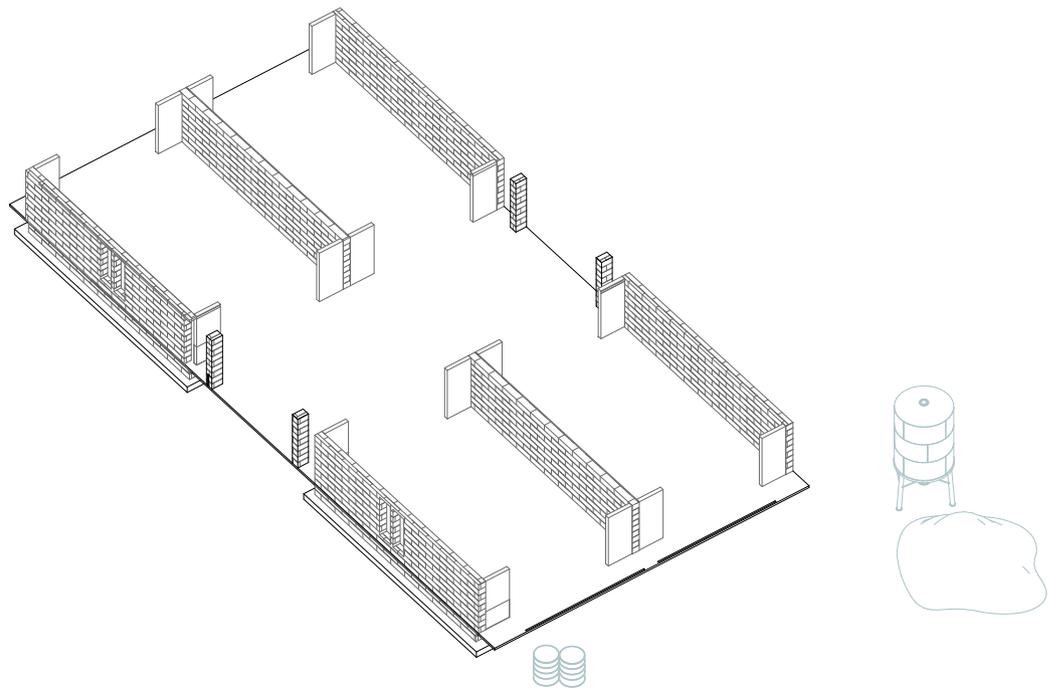
# Construction Phasing: Typologies

The ground is excavated and the contineous insitu concrete strip foundation
and foundation walls are erected.

A 80mm Isitu Concrete Surface bed with 0,25 Polyolefin Membrane is introduced.

*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
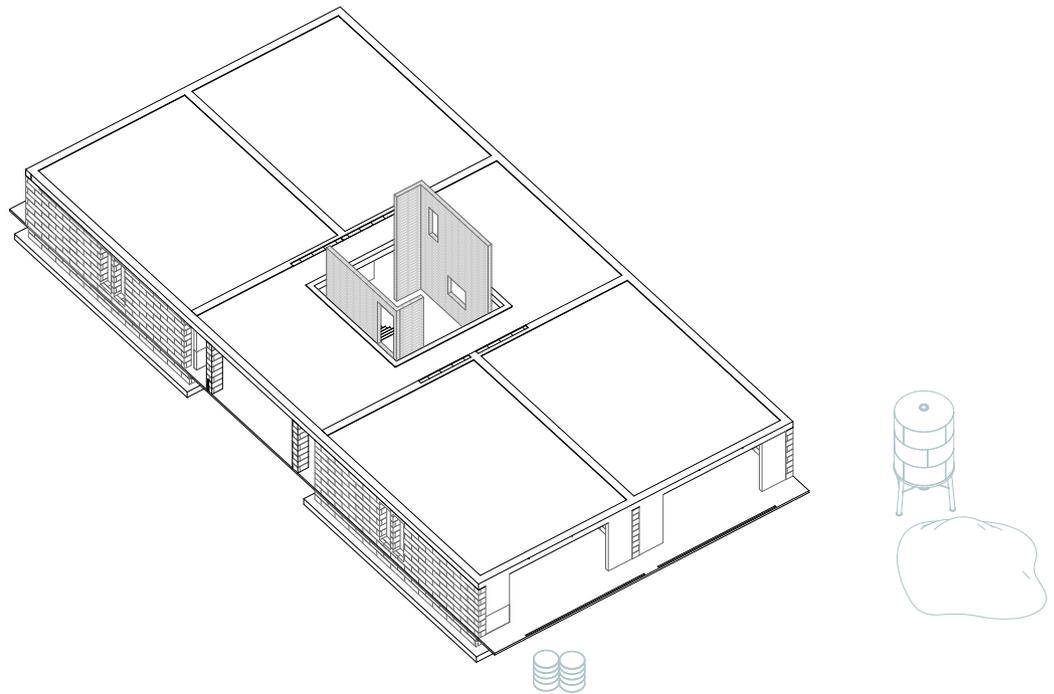
The ground floor's structural walls and temporary stability walls are constructed.

The stairs and pre-cast concrete beams and ring beams are erected.

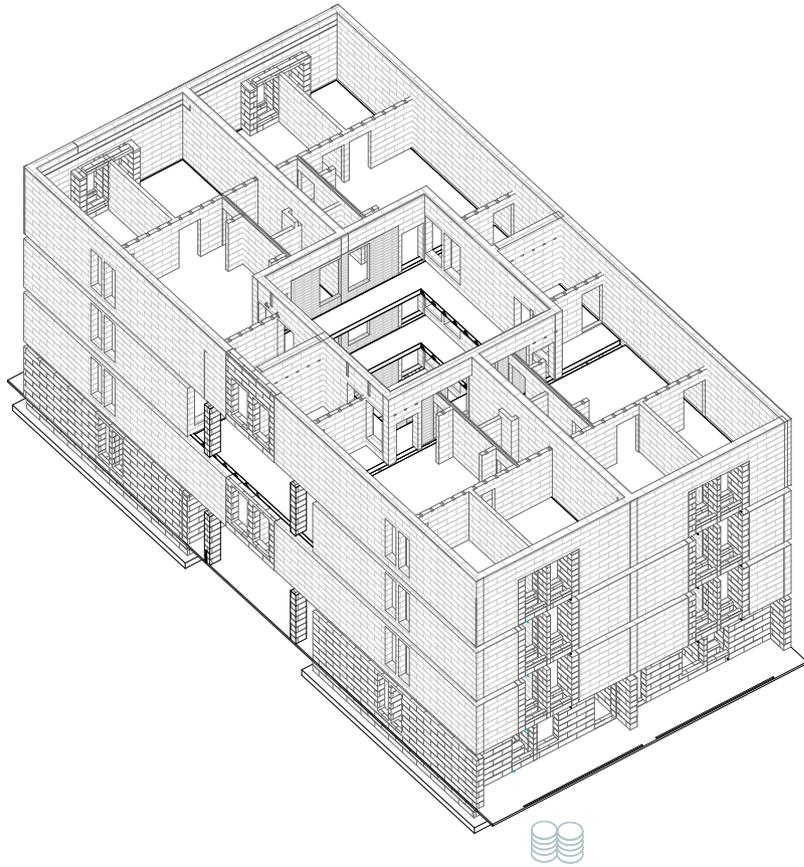*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
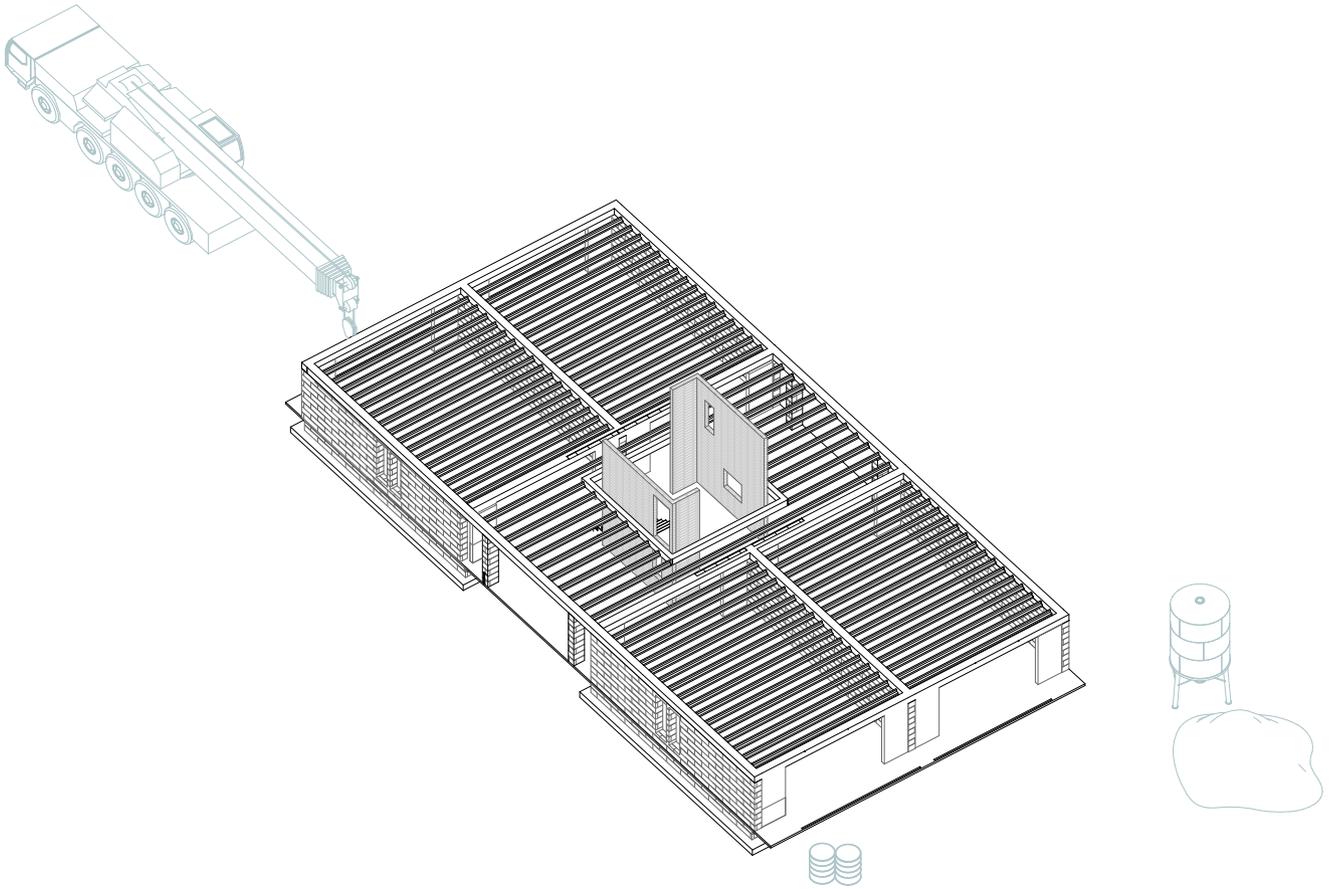
The concrete screed is pourd ontop of the pre-cast beams.

The remaing structural walls, floors and stairs are constructed



*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
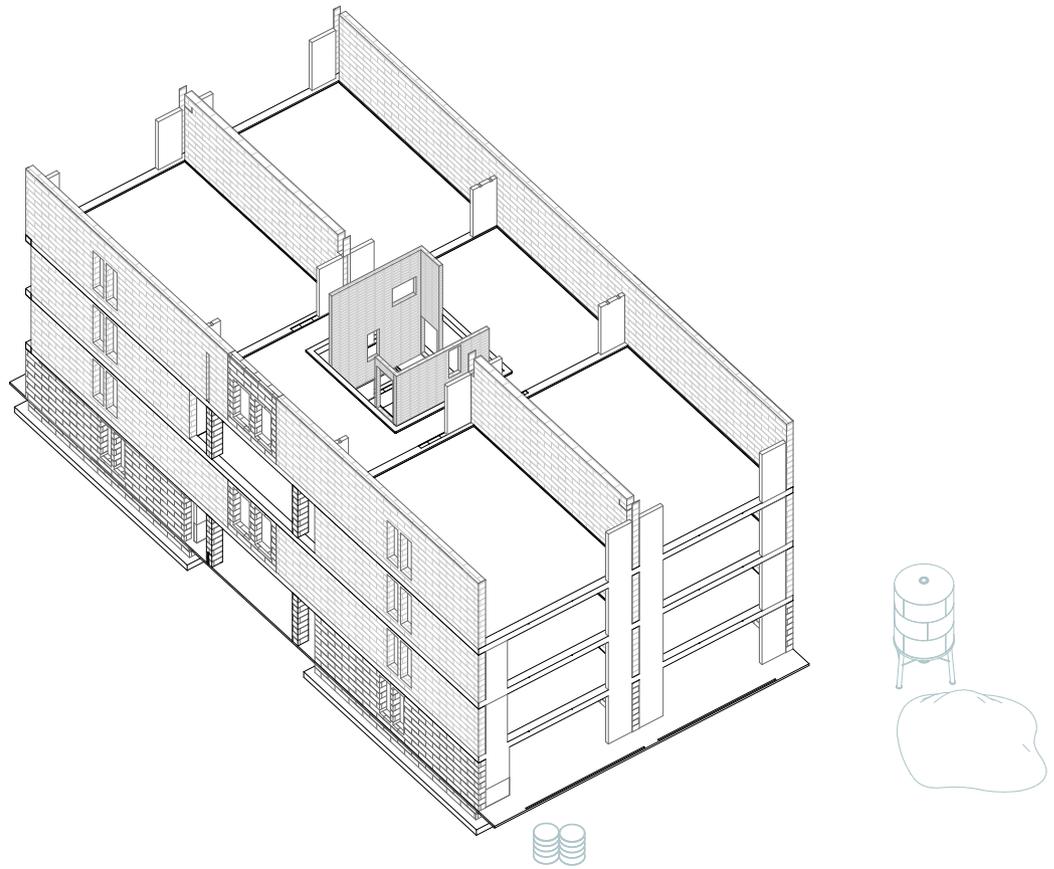
The infill wals are introduced

The roof slab is constructed



*Susanna Aletta Helena Schreurs: The (In)-Between: Careful Boundaries and Porous Thresholds*
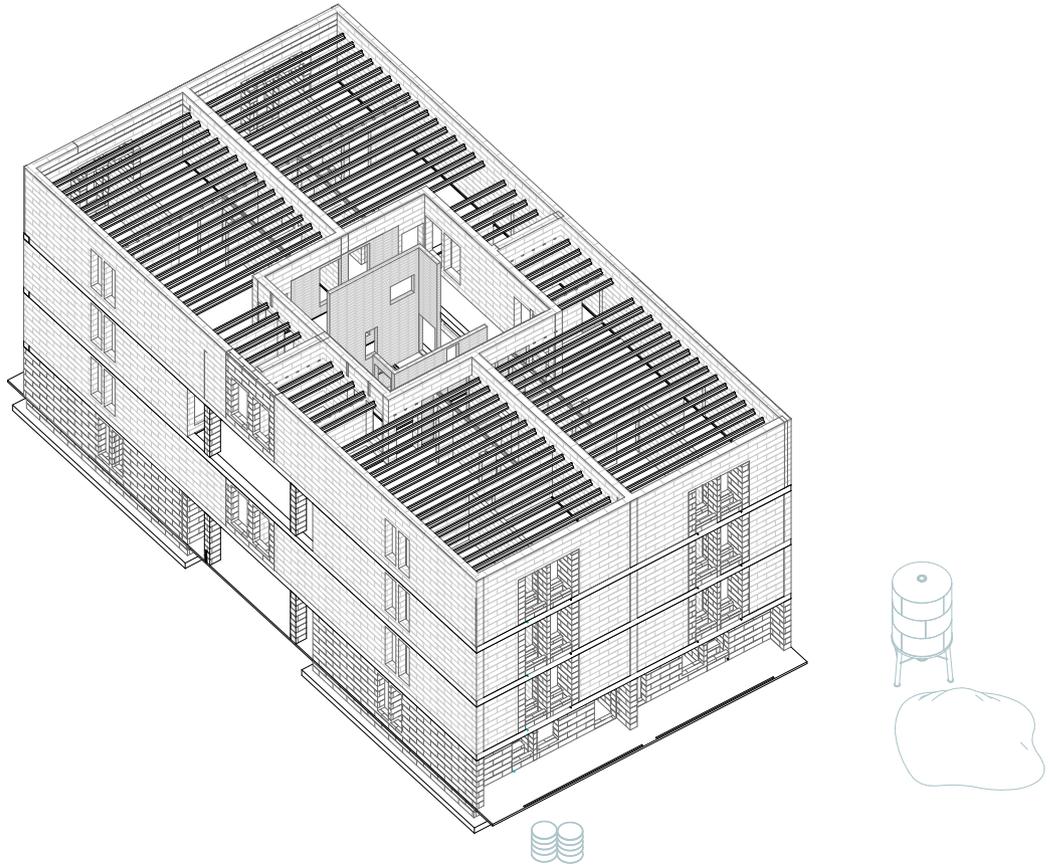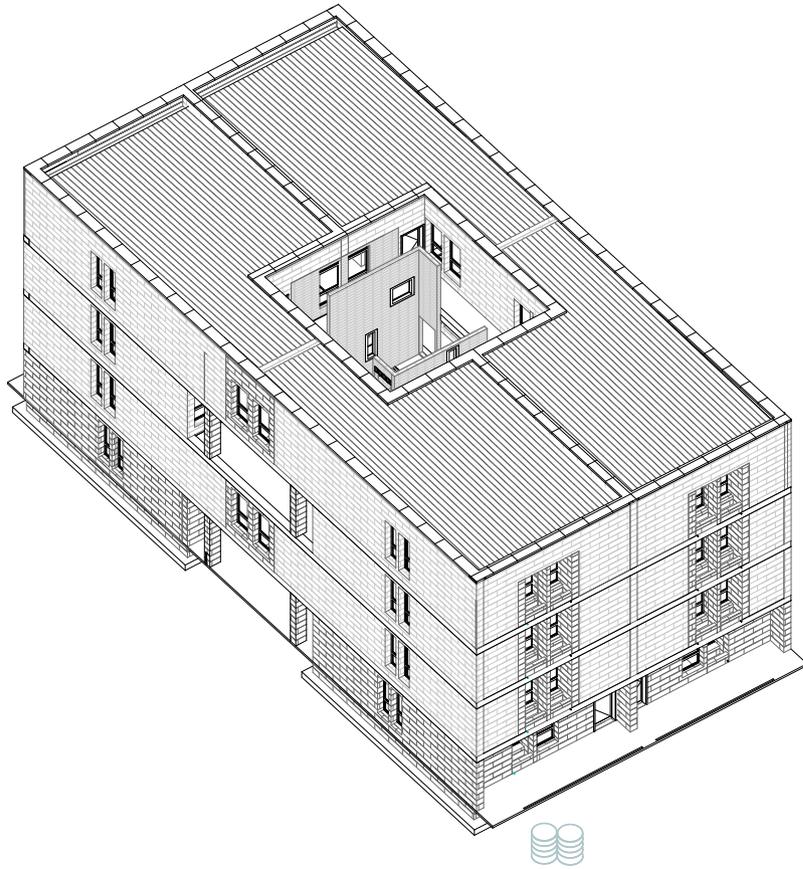
The corrugated metal sheets are placed ontop of the wooden structure.
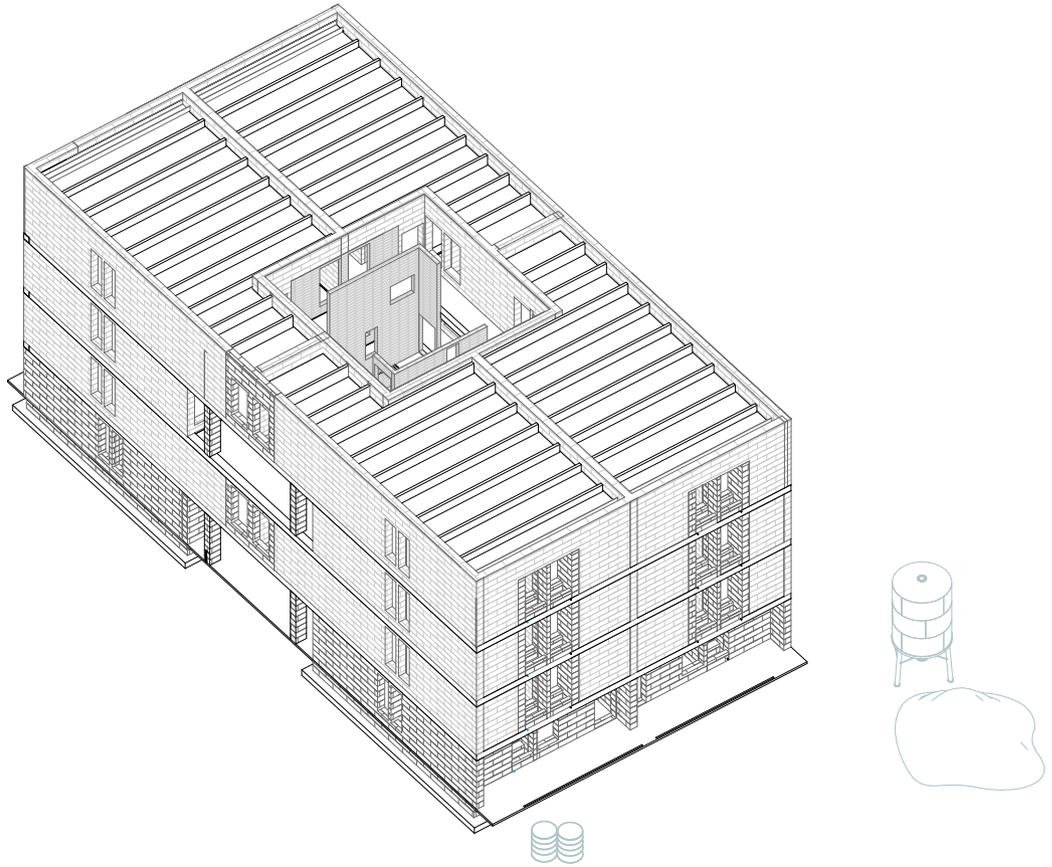
Windows and Doors are put in place

Final finishes are completed
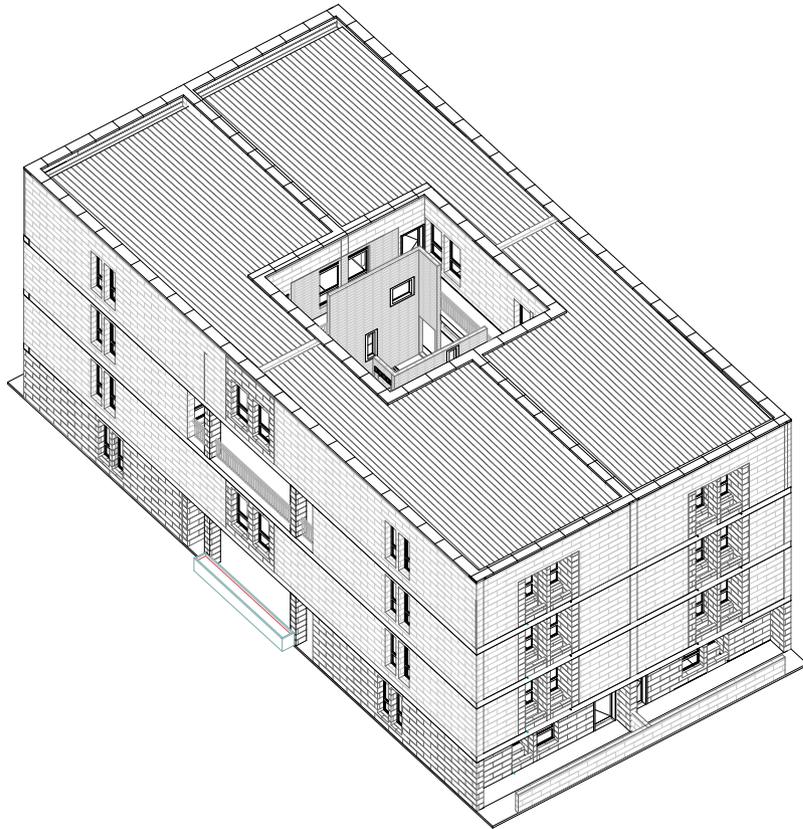
# Construction Phasing: Masterplan



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The site is cleared. This includes the farm structures and several houses
which disrupt the design aims

The large and medium roads are introduced by the Springs Program. This is constructed in on go since these roads play an important role in the watermanagement of the site.

A third of the pedestrian route and the COHAB Row Houses are introduced.

The profit from the COHAB housing is used to fund the construction of the
Springs Program Courtyard blocks



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The smaller ammenities between the typologies are introduced

The process is repeated 2 more times

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The remaining profit is used to construct the linear park



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PART 5

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