

Building new cycles

नए चक्रों का निर्माण

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LET'S DESIGN FEARLESSLY.

BUILDING NEW CYCLES

*Empowering women and communities in Navi Mumbai
by addressing gender-based violence through architecture.*

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Global Housing graduation studio: Mixing Navi Mumbai
AR3AD105 | Academic Year 2021/2022

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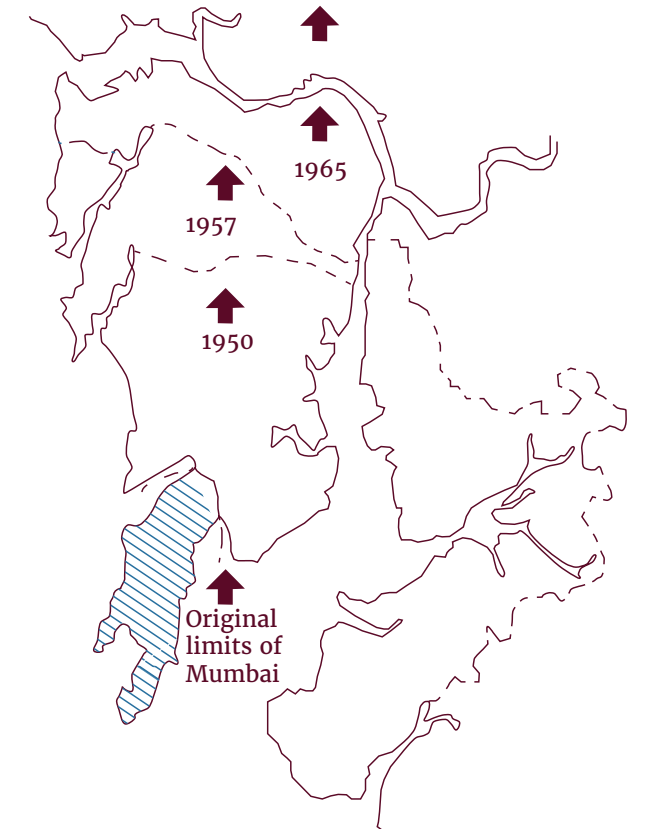
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Navi Mumbai

The emergence of Navi Mumbai

As India's largest metropolitan area, Mumbai is one of the most populated cities in the country. Navi Mumbai, formerly known as New Bombay, was developed as a result of this expansion of Bombay's suburbs. CIDCO (City Industrial Development Corporation) was established by the Maharashtra government in 1971. The area set aside for the project was 343.7 m2, containing 95 villages.

Mumbai's growing population prompted the creation of the project. With Navi Mumbai, people would have access to similar amenities without the commute. To the northeast of Mumbai, the initial development consisted of approximately 16,000 hectares of land divided into 14 nodes. The draft development plan was approved in August 1979 and was implemented in March 1980 (Dolan, O., Spoon, S. 2021).



The commute

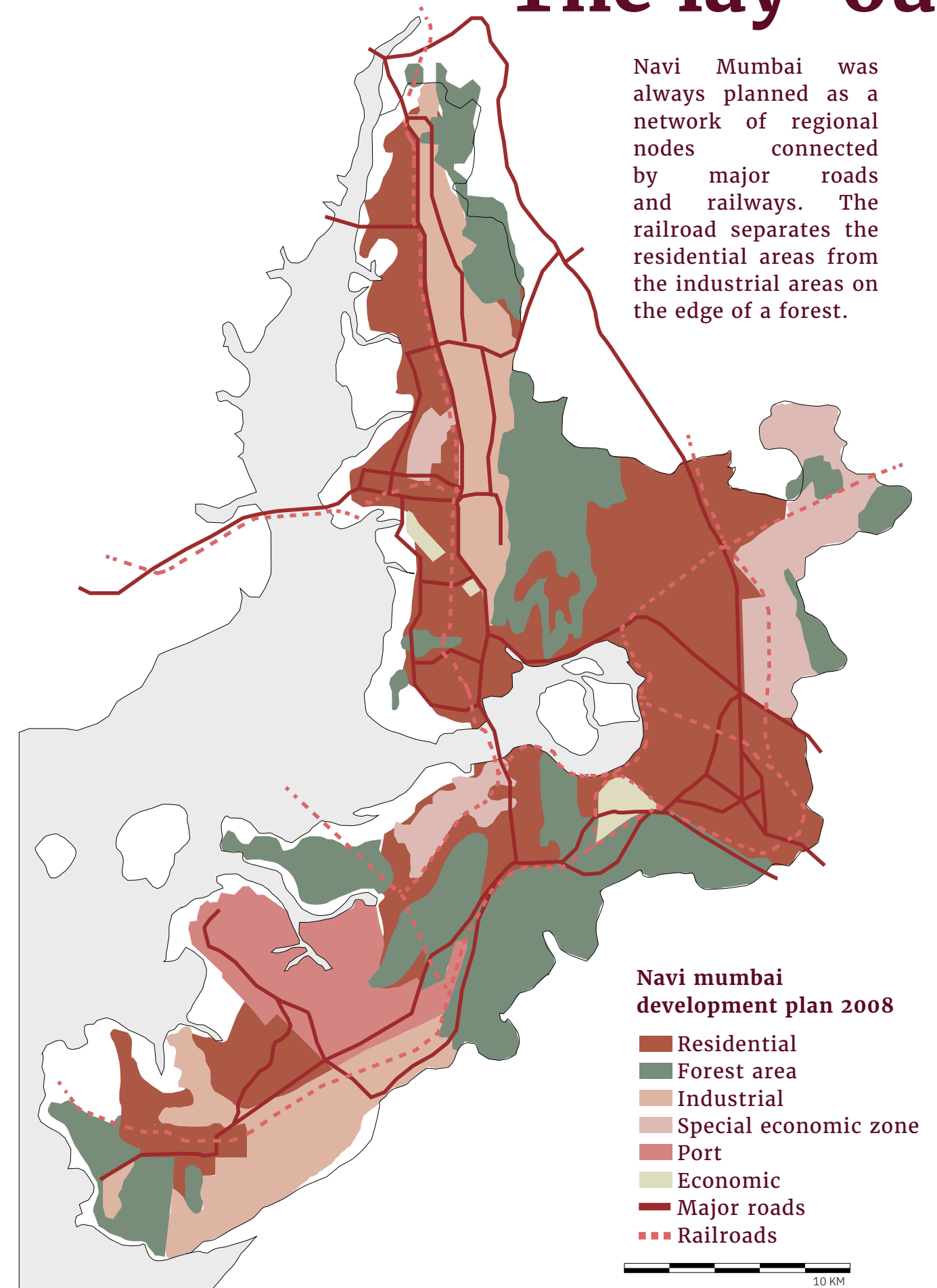
Originally, Navi Mumbai was supposed to extend Mumbai's urbanization to the mainland and reduce traffic congestion there. Until 1997, commuters had to travel north and south through the congested traffic of Mumbai in order to get between the two cities by traveling around Thane Creek. With the completion of the Vashi bridge in 1997, these travel times were significantly reduced. Additionally, both routes emphasize public transportation, such as trains, instead of just cars (Dolan, O., Spoon, S. 2021).



Fig. 0.2 Navi Mumbai's East-West connection with Mumbai

The lay-out

Navi Mumbai was always planned as a network of regional nodes connected by major roads and railways. The railroad separates the residential areas from the industrial areas on the edge of a forest.



Livability

This scheme shows the Ground Space Index versus the Floor Space Index of six projects in Navi Mumbai. They all have different spatial qualities and urban contexts, but all house the mass. When looking at the Hudco&Cidco housing, the Fsi is low compared with the GSI. These numbers represent the large open public space in between the buildings compared with low-rise buildings. CIDCO housing for all shows the opposite, a lack of public space compared with a high rise.

This shows that to accomplish an inclusive, save and healthy neighborhood, we need a middle point in FSI and GSI.

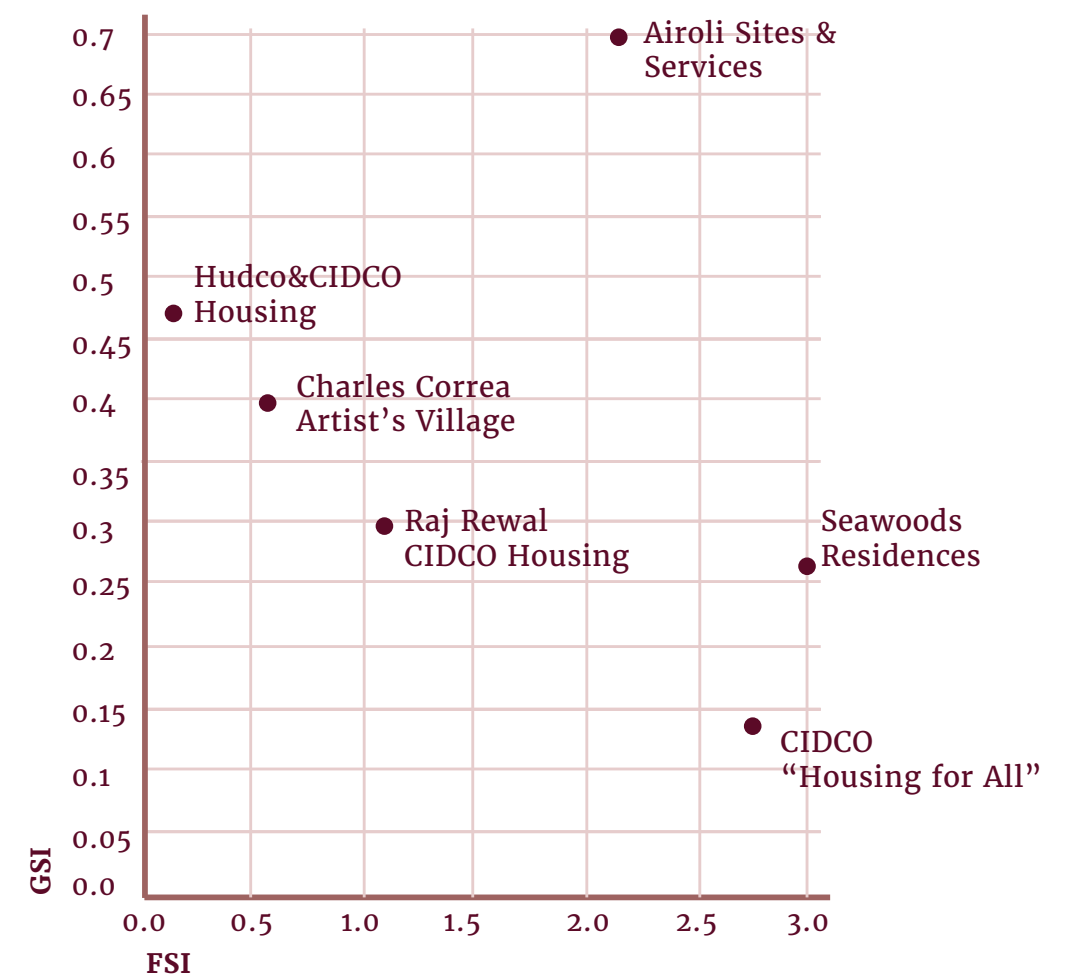


Fig. 0.6.

CIDCO

Navi Mumbai was planned and developed by the City and Industrial Development Corporation (CIDCO) in 1971. Most development in the city is overseen by the corporation, which often hires architects and city planners such as Charles Correa, Pravina Mehta, and Shirish Patel. These architects help plan and design the city.

In 1989, CIDCO realized 65,068 residential units throughout the city, the majority (53) of which were aimed at serving lower-income households. Despite this, early low-cost housing schemes offered poor standards of living, with few amenities nearby, and were often criticized for being constructed with little regard for privacy or space. A rising amount of repetition in the designs and layouts of the buildings, along with a monotonous appearance of the buildings, led to CIDCO involving other agencies in building housing in the city more often (Dolan, O., Spoon, S. 2021).



Fig. 0.3. Low income housing which was recently build by CIDCO

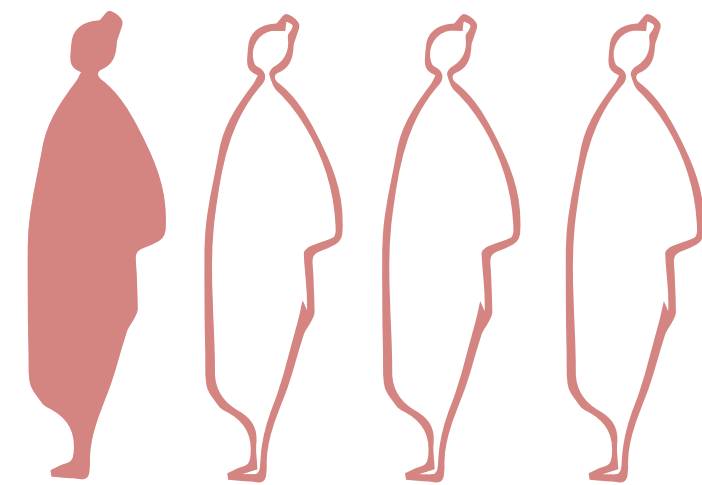


Fig. 0.4. Mass housing blocks with poor public space and architectural design.



Fig. 0.5. Mass housing blocks still under construction

Problem statement



**More than 1 out of 4 Indian women have
experienced gender-based violence.**

The cycle

Woman's life choices in India are very often dependent on the men in their lives. In their natal home, it is their father and brothers, in their marriage home her husband. This translates into their economic dependence where a woman's salary often goes to the man. This dependency together with cultural acceptance and psychological abuse leads to almost inescapable situations (Desai, 2005).

When looking into the risk factors that contribute to gender-based violence constructed by the ecological model by The Centers for Disease Control and Prevention (2004), four different levels of life can be unpacked (Fig. 1). The Individual level represents the personal history where the factor is biological which raises the possibility that someone will become a victim or

accuser of violence. Factors can be norms and values and personal history with violence. The second influence is The relationship where the closest members of one life are physically and/or mentally aggressive, are emotionally unstable, or actively patriarchal. Influences in The community can be a general acceptance of violence and too little or no protection from law enforcement. The community consists of the relationships a person has with the neighborhood such as their work or educational spaces. The last influence is societal, where larger forces can control inequality which leads to an increase in violence. Cultural values, political restrictions, and a patriarchal society can cause a division between people, where discrimination can evolve towards a pandemic.

The cycle of violence goes much deeper than just one household, one community, or one city, it is rooted in a country's cultural and political acceptance of the victim, accuser, and bystander.

(Neogi, 2013)

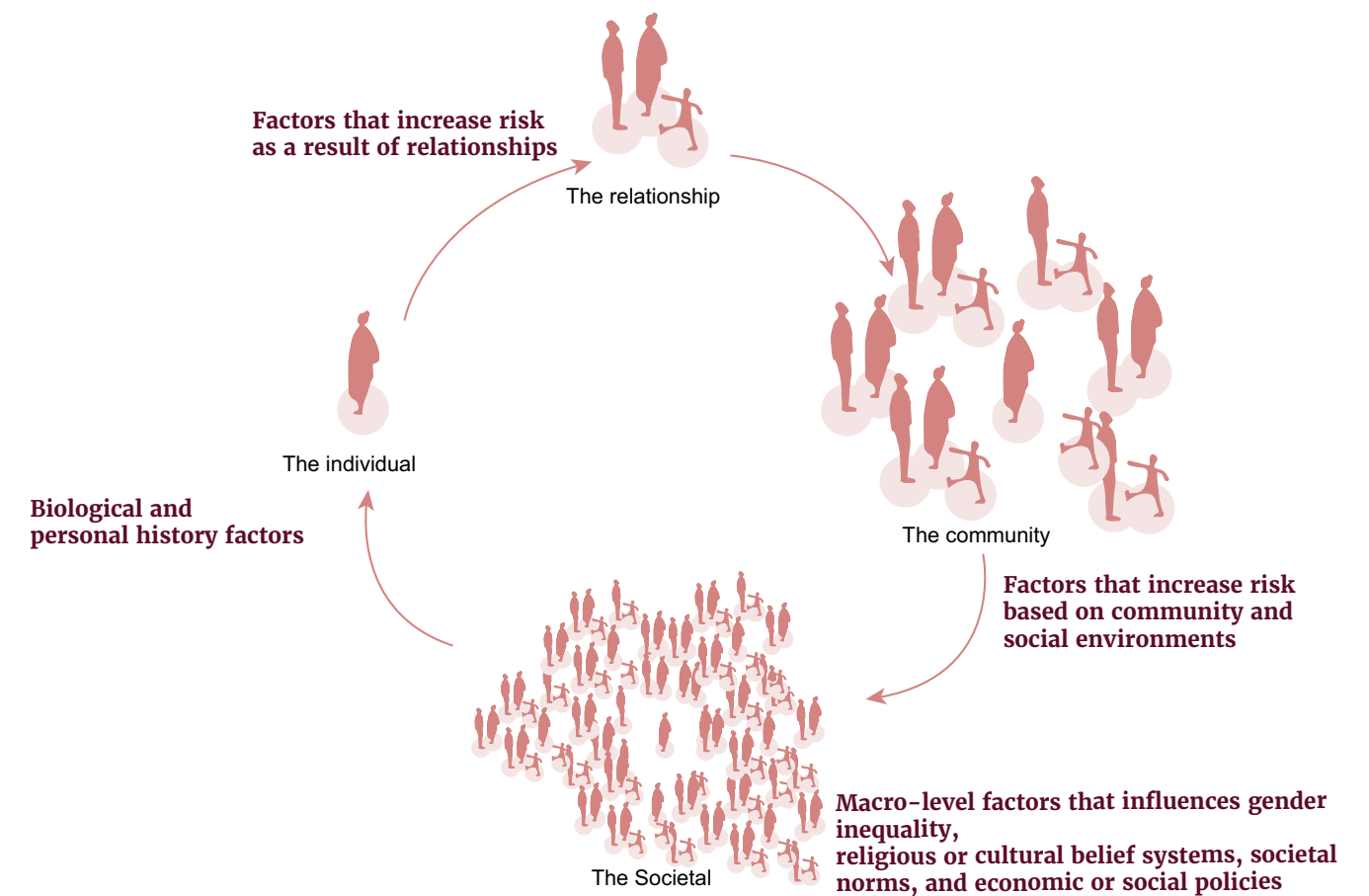
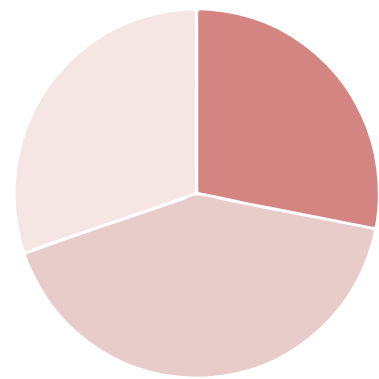


Fig. 1.1 Influences that contribute to risk factors for stimulation of gender-based violence

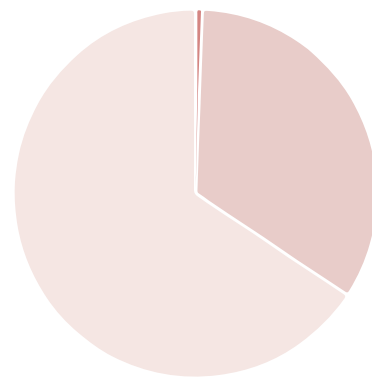
Indian women vs. violence



■ Rape ■ Molestation ■ Dowry harassment

Fig 1.2. Crimes against women in Navi Mumbai (2019)

Of all the reported crimes in Navi Mumbai, the crimes against women grew from 9% in 2018 to 10.78% in 2019



■ Unknown ■ Spous ■ Family or friend

Fig 1.3. The accuser in the rape crimes

India, the country where experiences with violence are so common that it is often stated as 'from the womb to the tomb'. There is a historical and cultural acceptance of gender-based violence. Almost 40% of the women in India have experienced domestic violence. Factors associated with domestic violence in India are age, education, castes, working status, income, culturally justified wife-beating, husbands' use of alcohol, and religion (Mahapatro, 2012). When looking

at the site location of Navi Mumbai, of all the reported crimes, the crimes against women grew from 9% in 2018 to 10.78% in 2019. Rape is almost one-third of these reported crimes (Fig. 2) of which more than 99% of the time the accuser is the husband, a family member, or a friend (Fig. 3) (Assainar, 2020). In many cases, these rape victims commit suicide in the patriarchal society they live in where women's lives are determined by men (Ahmed-Ghosh, 2004).

India is one of the most difficult countries to be a woman in, it ranked number 140 out of 157 countries on the global gender gap index of 2021.

(Desai, 2016), (World Economic Forum, 2021)



Breaking the cycle

The cultural, political, and social cycle of gender-based violence has been around for a long time, but research and evidence state that it can be broken. Utilizing prevention and support, a lot of progress can be made. The Centers for Disease Control and Prevention (2004) noted that prevention of sexual violence has three prevention moments related to when the intervention occurs (Fig. 4). The primary prevention happens in the interval when sexual violence has not yet happened. Therefore this moment can be captured to prevent that the accuser and victim from ever existing in the first place. The secondary prevention happens right after the sexual violence takes place, in this scenario the victim can get help for short-term effects. Tertiary

prevention starts long after the violence has happened, in these cases the lasting consequences are being tackled.

Society for Nutrition, Education & Health Action (2017) showcased their socio-ecologic model for the prevention of gender-based violence (Fig. 5), which can be seen as the sequent for Fig. 1 where the Influences that contribute to risk factors for stimulation of gender-based violence are explained. There are five levels showcased in the model for prevention. Firstly, The individual can generate prevention by changing the behavior and values of the victim and abuser to prevent violence. The relationship level looks into situations in the Secondary prevention or Tertiary

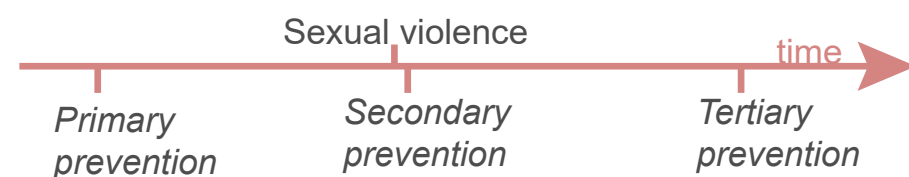


Fig 1.4. Sexual violence interventions

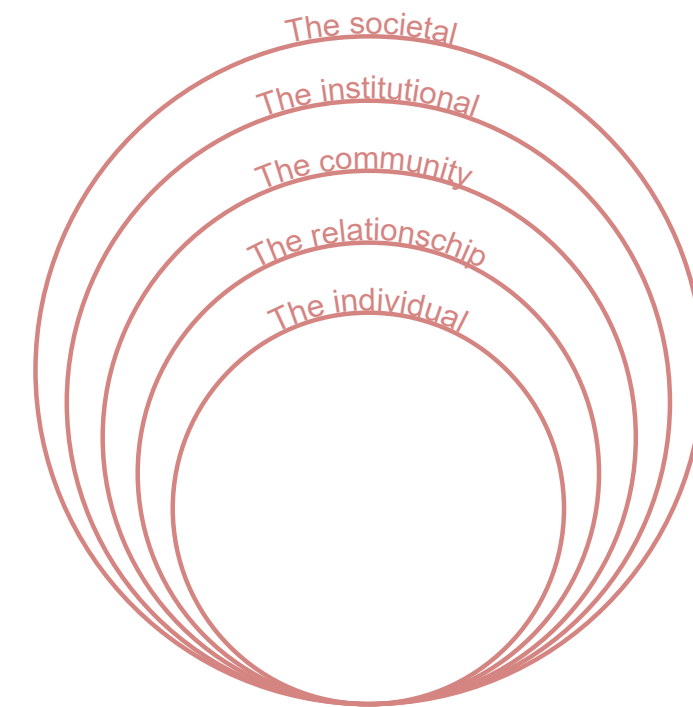


Fig 1.5. The socio-ecologic model for prevention

prevention (Fig. 4), where if the victim chooses to stay in a relationship with the abuser, she can heal and sustain a healthy relationship. Thirdly The community, the place of social life and relationships where educational and cultural events can be held to promote equality to harvest a healthy and safe environment. Fourthly The institution outgrades the individual and its nearby relationships. Public institutions such as law enforcement can be trained to act on gender-based violence and acknowledge it as a public health responsibility. By working on a broader scale with various communities The societal level can be used to prevent gender-based violence on a social level.

The gang rape and murder of Jyoti Singh in Delhi in 2012 shocked India in a way that hadn't happened before. Political leaders, media stations and law enforcement couldn't look away this time, too many people demanded change. The development towards gender equality that has happened in the last decade is big on a day-to-day level for women. "Gender sensitization" is the new phrase for this new evolution: altering rooted values and behavior towards male and female roles where daughters are experiencing a safer India than their mothers ever did (Chamberlain, 2018).

Empowerment through architecture

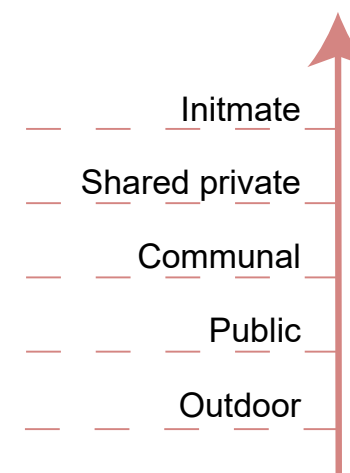


Fig 1.6. Ideal levels of privacy in a women shelter

Gender-based violence is not only a problem in India but a global one. We live in a time where women are feeling more empowered to leave toxic and unhealthy situations. This has led to a demand for women's shelters. Through existing shelters all over the world, user experience has been harvested and investigated. This led to an overall conclusion which states that shelter architecture can have a significant effect on gender-based violence victims, it represents the start of a new phase of emotional and psychological healing (Joshi, 2017).

Entering a women's shelter as a victim

for the first time signifies closing a chapter of life. It takes a lot of strength to make this step, and the recovery will not be easy. Therefore as many factors as possible should be encouraging the healing process. Design strategies can influence health outcomes (Matijevic et al, 2014) and that is why architecture should be empowering. Joshi (2014) investigated the ideal levels of privacy in a women's shelter (Fig. 6). Architectural design can produce a new archetype that can lead towards an environment of growth, stability, and rehabilitation in cases of gender-based violence (Matijevic et al, 2014).

PROBLEM STATEMENT

India has a cultural acceptance of gender-based violence which leads to unsafe situations for women. The cycle of violence is an ongoing phenomenon that has not given much room for improvement or prevention. But when a woman does get a chance to escape, the possibilities of a better life are minimal.

RESEARCH QUESTION

Neighborhood design
as a social catalyst

Cultural, and
behavioural change

How can architecture empower women and communities who suffer from gender-based violence in Navi Mumbai?

Gender equality

Sub-Questions

The research question can be answered by breaking it down into these sub-questions:

The cycle

- 1.1 How does a gender-based violence cycle look like?
- 1.2 What are the historical factors that kept the cycle of violence alive in India?

Indian women versus violence

- 2.1 What is Navi Mumbai's relationship with gender-based violence?

Breaking the cycle

- 3.1 Which interventions have led to improvements to reduce gender-based violence?

Empowerment through architecture

- 4.1 How can a safe Indian community for gender-based violence victims be translated into empowering architecture?
- 4.2 How can a safe Indian community for gender-based violence victims be combined with prevention and educational systems?

Theoretical framework

Gender-based violence is defined by Hughes et al (2015) as violence against women in public or in private life that results in physical, sexual, or psychological damage, including threats, intimidation, or deprivation of liberty. Ahmed-Ghosh (2004) states that the status of Indian women is determined primarily by patriarchy and therefore unequal roles are retained. By looking at the ecological model by The Centers for Disease Control and Prevention (2004), it shows that the cycle of violence is deeply rooted in the behavior and acceptance in India. Neogi (2013) states that to improve gender equity, changes must be comprehensive. The Society for Nutrition, Education & Health Action (2017) showcased their socio-ecologic model for the prevention of gender-based violence, this model is very comprehensive for every layer of society.

Methodology

A literature review is a suitable approach to answering most of the sub-questions due to the secondary data that will be used. This data will be utilizing quantitative data and qualitative data. Ethical considerations will need to be thought of during the interpretation of the secondary data as fieldwork will perhaps not happen due to Covid-19. If fieldwork by going to India will not happen, the Indian culture cannot be experienced in real life.

Sub questions 1.1, 1.2, 2.1, and 2.2 will be researched with this method.

Ethnographic research will be used in the case of sub-questions 2.2, 4.1, and 4.2. By researching the social environment in Navi Mumbai, sub-question 2.2 could be partly researched through primary data. In case of the possibility of traveling to India, existing shelters and prevention programs will be visited to answer sub-question 4.1 and 4.2.

Through case studies, thematic analysis and discourse analysis can be used to have an insight into existing shelters and their use. This will be done by qualitative research to answer sub-question 3.1, 4.1, and 4.2. The same sub-questions will be explained by using quantitative research in cases of using completed surveys by (former) shelter users.

Research through design will use primary data by investigating additional architectural designs by sketching. Sub questions 4.1 and 4.2 will be researched with this method.

Relevance

Social relevance

Gender-based violence is a public health problem that affects one in three women on a global level, this leads to millions of victims (SNEHA, 2018). Cultural accepted gender-based violence against women needs to end to achieve more gender equality, it is violating human rights and is deeply based on gender inequality (Krishnamoorthy et al., 2020). Therefore this topic can be applied in several urban situations. This research will not only focus on helping women on finding a new and safe home but also on prevention and education on how to break the cycle and build a new one.

Present relevance

The Delhi gang rape in 2012 caused noise in the country which led to new possibilities regarding women empowerment. Actively operating feminist movements are working to a less unequal India, men are listening and kids are creating the new future. This is why now is the time to act on empowering architecture for women who suffer from gender-based violence.

Case studies

LIC Township

AHMEDABAD (INDIA), BV DOSHI, 1973-76

Pritzker prize winner Doshi strives for a design where various income groups and social structures can live together. To accommodate this he turns the typical layout upside down by placing the largest unit on the ground floor and the smallest on the top floor providing a terrace. It is fascinating how the order and rhythm that Doshi designed for this plan that divines the street view have evolved over the years. Owners have used the available outdoor space to cover it in order to create more indoor space. The plot does not have covered space for amenities but provides communal outside spaces for leisure, as well as parking spaces and a cricket ground.

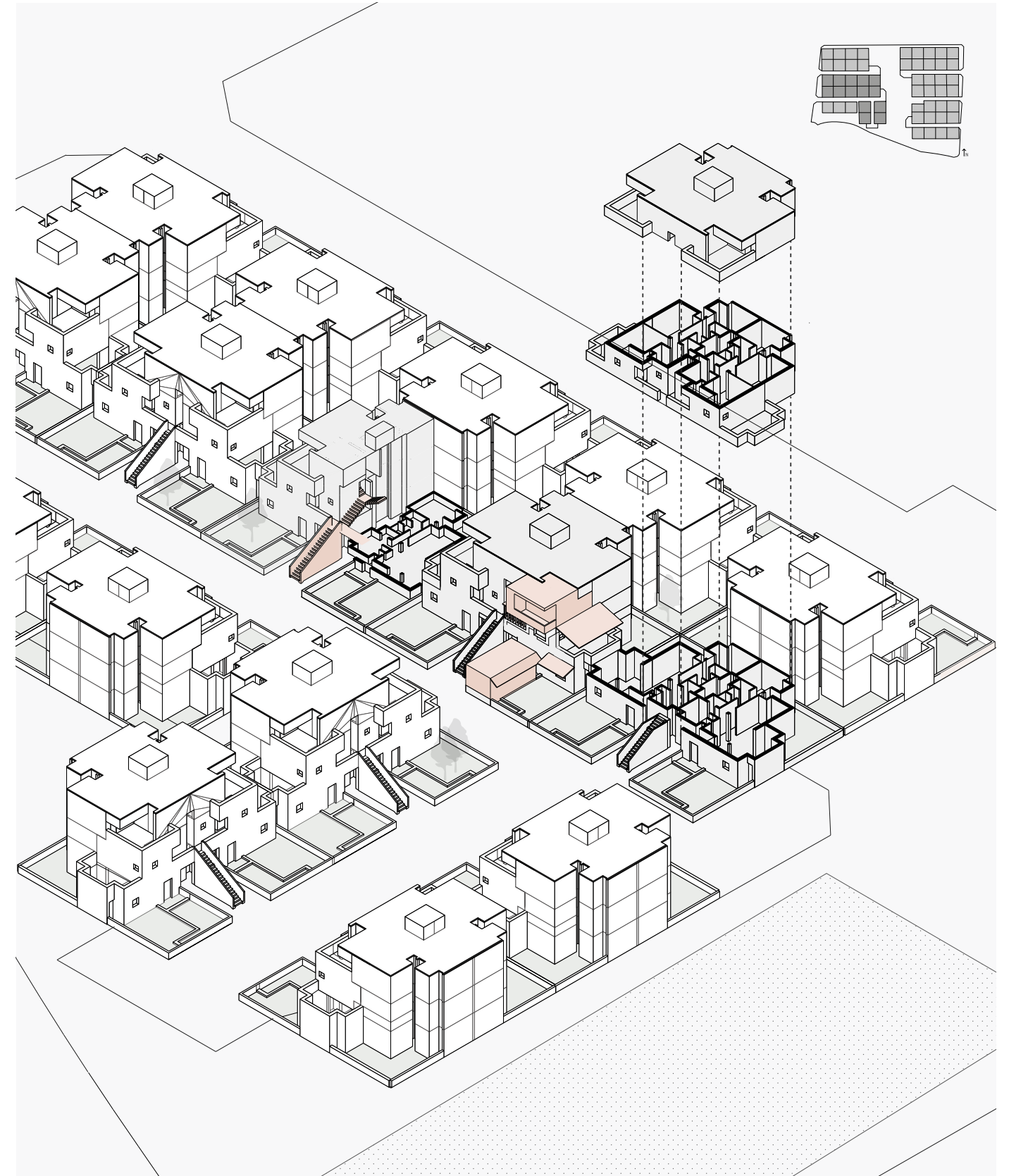


Fig 2.1 Axonometric neighborhood

CIDCO Housing

NAVI MUMBAI (INDIA), RAJ REWAL, 1988-93

The units in this low-rise, high-density neighborhood range in size and are suitable for different income levels. Divided horizontally, these clusters are established according to the unit sizes (20 m² to 100 m²). The design accommodates public and communal open spaces. Such as the pedestrian friendly streets and roof terraces. The different dwelling units have been arranged in such a way that courtyards and narrow shaded streets are created at various levels. This creates social interaction and spaces for leisure (Varma, 2016).



Fig 2.2 Intimate street design with human scale

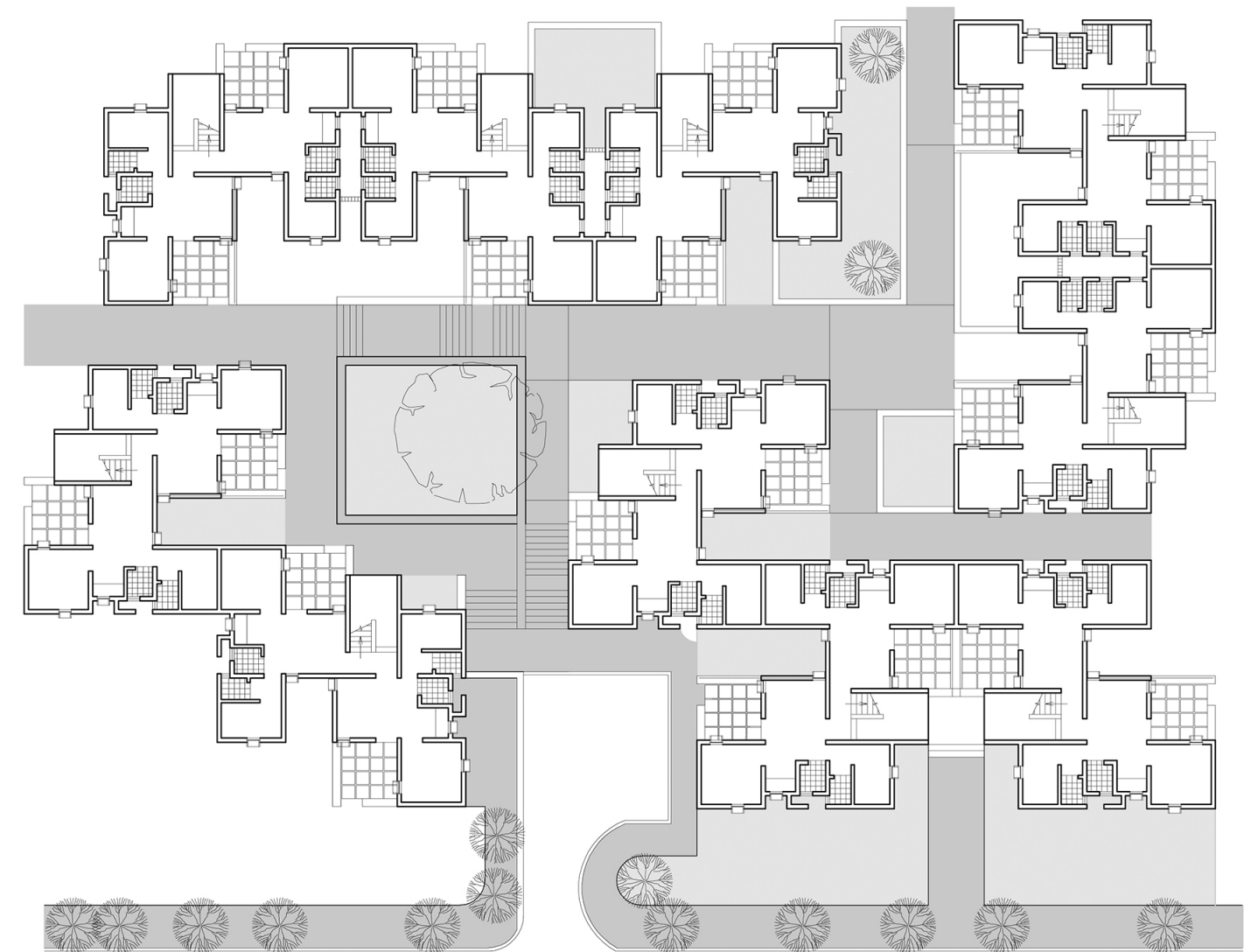


Fig 2.3 Urban layout that captures the pedestrian routes.

Artist village

MUMBAI (INDIA), CHARLES CORREA, 1970

In order to accommodate a variety of income levels, the scheme was designed to meet the needs of lower, middle, and upper income groups. Separate plots are provided for each dwelling, allowing for incremental development. The result is a sense of self-expression for every homeowner. A communal courtyard is at the core of all the dwellings. This layout is copied in creating the different public spaces. The circulation is entirely pedestrian which enhances the village feeling (Chapekar, 2022).

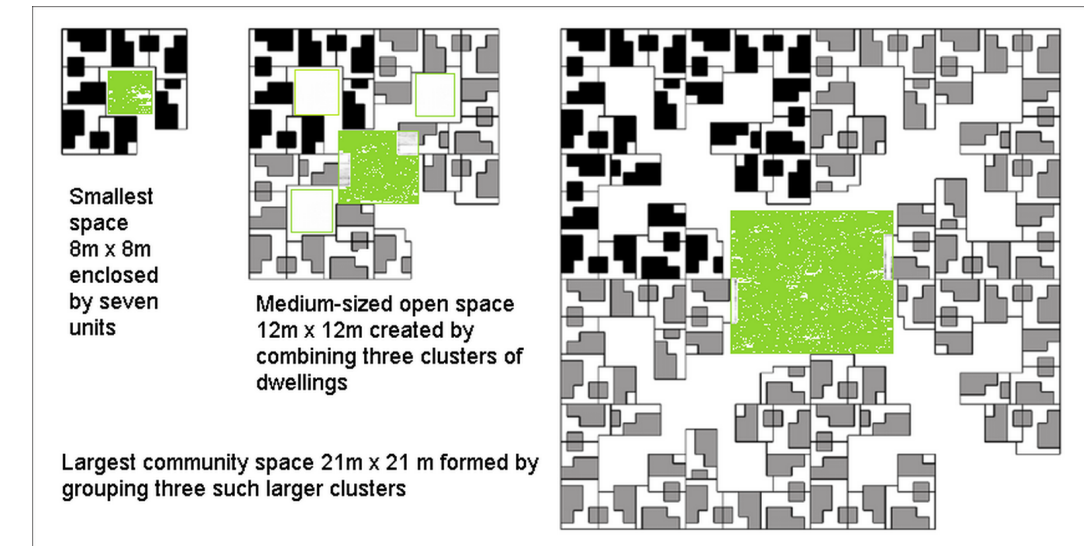
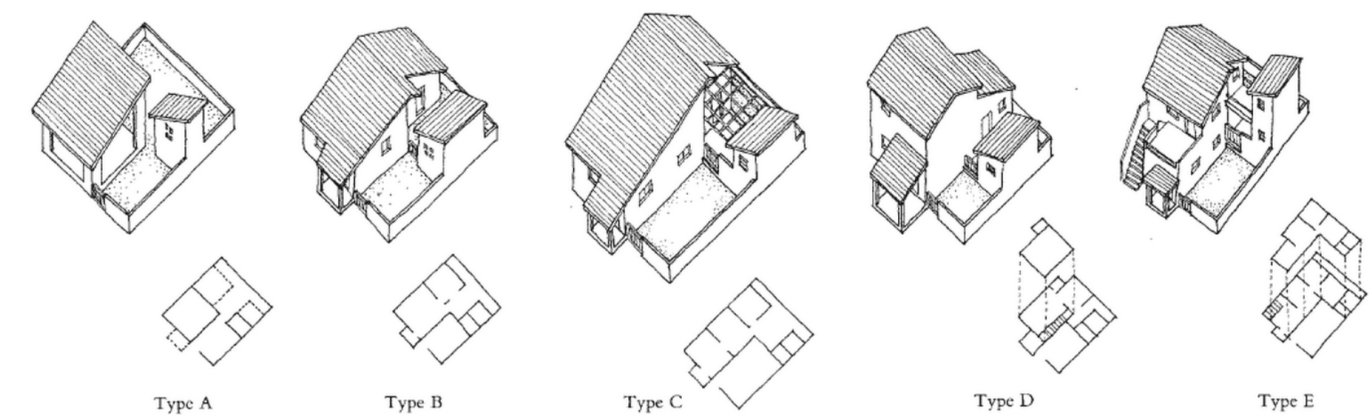


Fig 2.5 Urban strategy to cluster neighborhoods



Fig 2.4 Urban villa in communal courtyard



Plans and axonometric drawings of the five house types proposed to the residents of the first phase.

Fig 2.6 The different dwelling types and lay-outs

Bezuidenhout Oost

DEN HAAG (THE NETHERLANDS), BERLAGE, 1915-1940

During the interdisciplinary workshop Healthy Housing, an assessment of this hectare in Den Haag was carried out. The neighborhood design uses a building height of three floors with wide pedestrian walkways combined with enough parking places. Every floor has different dwelling units which leads to a range of different income groups. The lower ground floor residences have a private garden, while the upper floors have private balconies. Furthermore, the circulation passes through a semi-outdoor staircase, improving residence health.

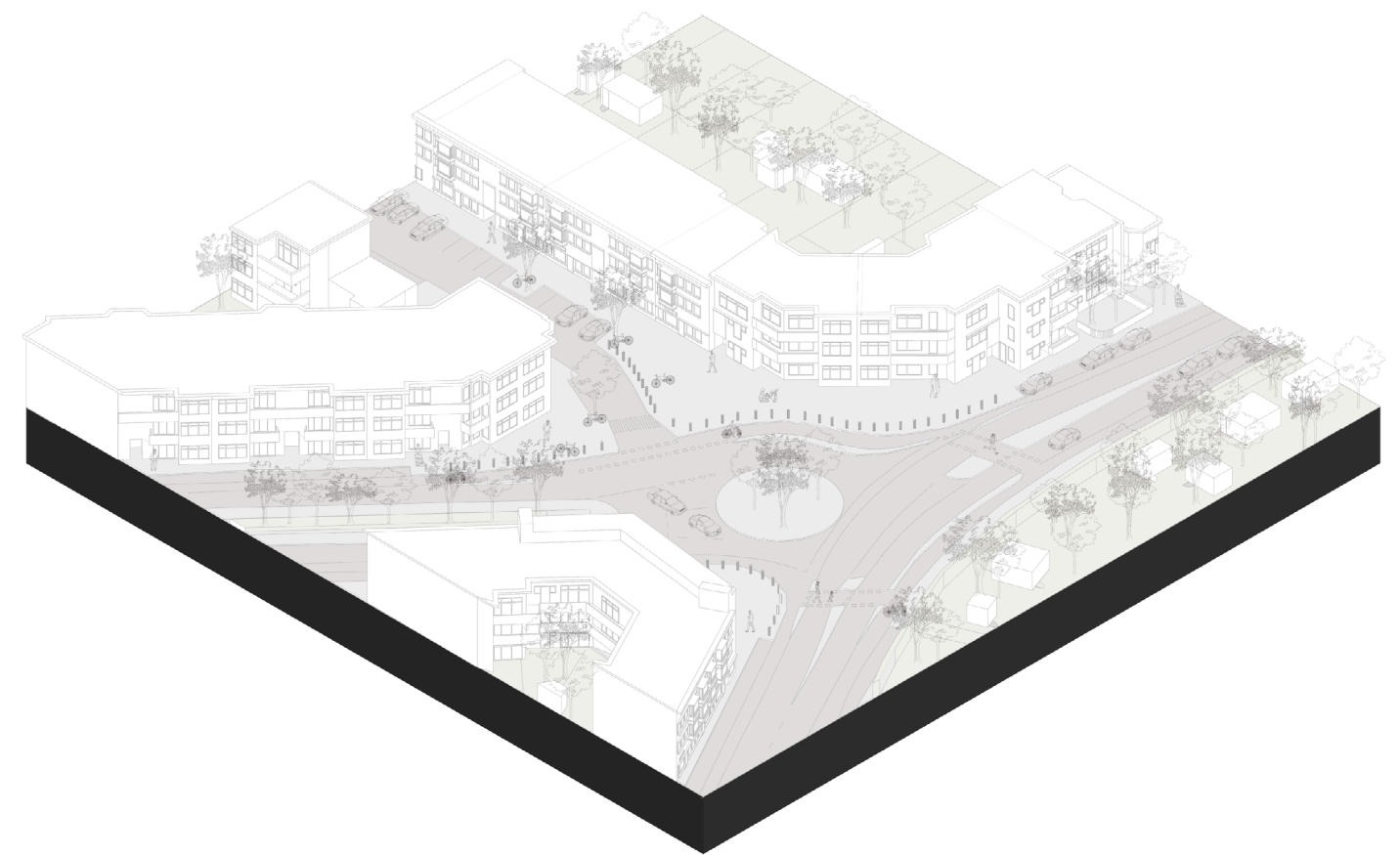


Fig 2.7 Axonometric Bezuidenhout Oost 1 Ha

Shelter for victims of domestic violence

TEL AVIV-YAFO (ISRAEL), AMOS GOLDREICH
ARCHITECTURE & JACOBS YANIV ARCHITECTS,
2018

The two contrasting tectonics of the facade reflect the secure and protective outside, and the inner façade, which opens onto the central garden, the therapeutic heart of the shelter. When a new family arrives at the shelter, they are given their own small home that is part of the bigger structure, in order to allow the households to conduct a normal daily routine in the shelter. The community functions are isolated from the 'dwellings,' which are joined by an internal corridor (Sagredo, 2021).



Fig 2.10 Ground floor

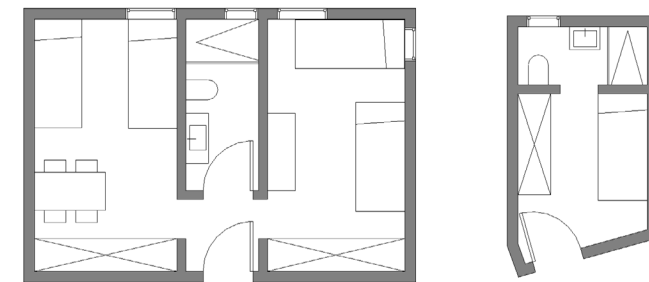


Fig 2.11 Private and communal bedrooms floor plans



Fig 2.8 Private courtyard that connects all the building functions

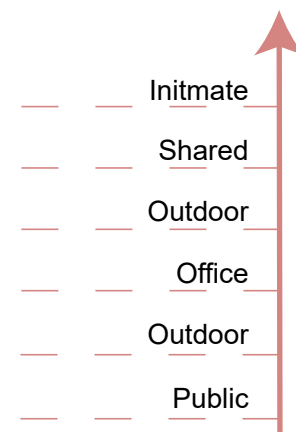


Fig 2.9 Levels of functions before entering the bedroom

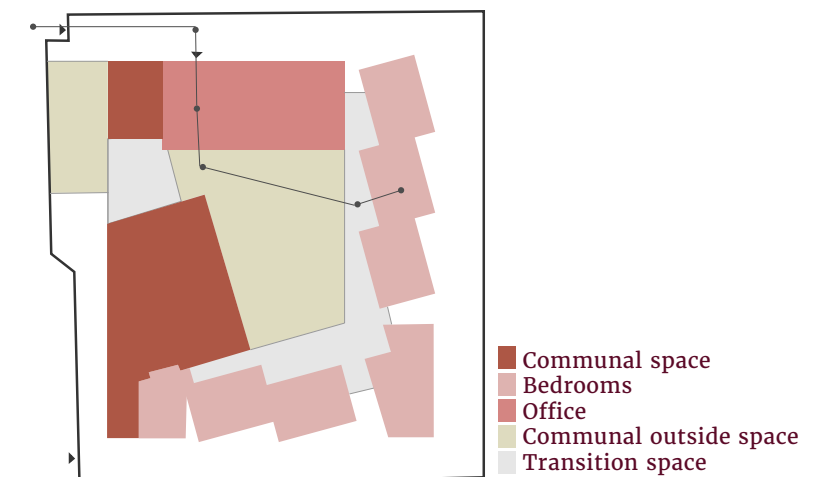


Fig 2.12 Ground floor function distribution

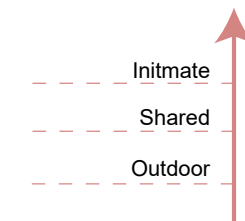
Repos maternal woman's shelter extension

GRADIGNAN (FRANCE), MARJAN HESSAMFAR & JOE VÉRONS ARCHITECTES ASSOCIÉS, 2019

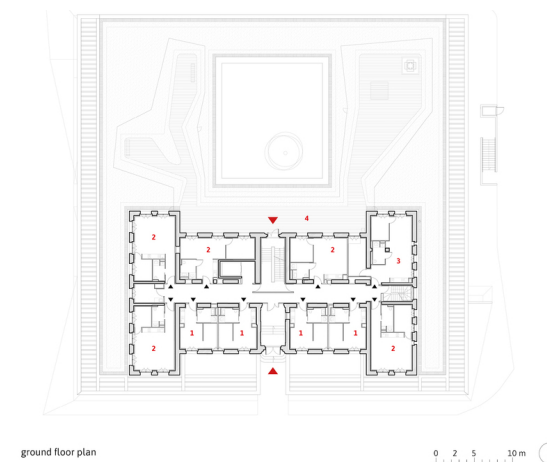
The Repos Maternel is a refuge for pregnant women and young mothers aged 18 and up who are caring for one or more children who are isolated from their family as well as socially and financially struggling. Secondary services have been accommodated in a sunken expansion that extends from the original basement level, enclosing an open patio that achieve a balance between discreetness and overall appearance. The bedrooms varies in size and bedrooms and they are mostly placed in the chateau making a division in privacy levels (Silva, 2021).



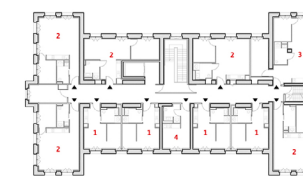
Fig 2.13 Private courtyard that connects all the building functions



- 1 lobby
- 2 offices
- 3 staff areas
- 4 rooms for games and activities
- 5 patio
- 6 lounge - dining room
- 7 kitchens - deliveries
- 8 multimedia area
- 9 boiler room - maintenance rooms
- 10 laundry
- 11 luggage room
- 12 studio flat with sleeping area
- 13 three-bedroom flat
- 14 treatment area



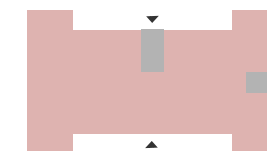
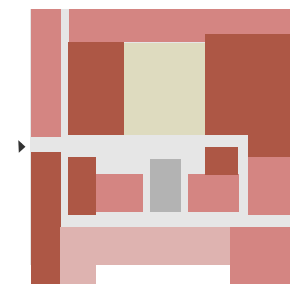
- 1 studio flat with sleeping area
- 2 one-bedroom flat
- 3 two-bedroom flat
- 4 terrace



first floor plan

- 1 studio flat
- 2 one-bedroom flat
- 3 two-bedroom flat
- 4 emergency bedroom

Fig 2.14 Floorplans



- Communal space
- Bedrooms
- Office
- Communal outside space
- Transition space

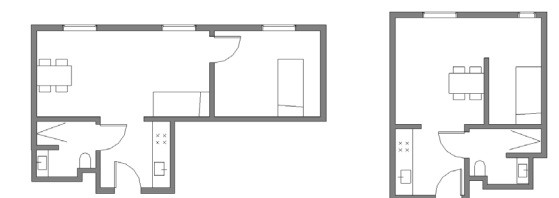
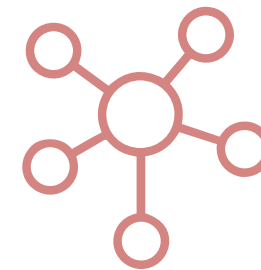


Fig 2.15 Levels of functions before entering the bedroom, function distribution, bedroom lay-out

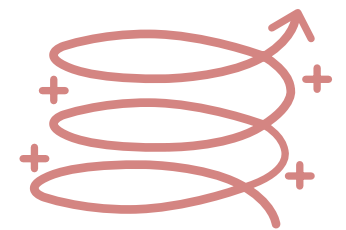
Concept



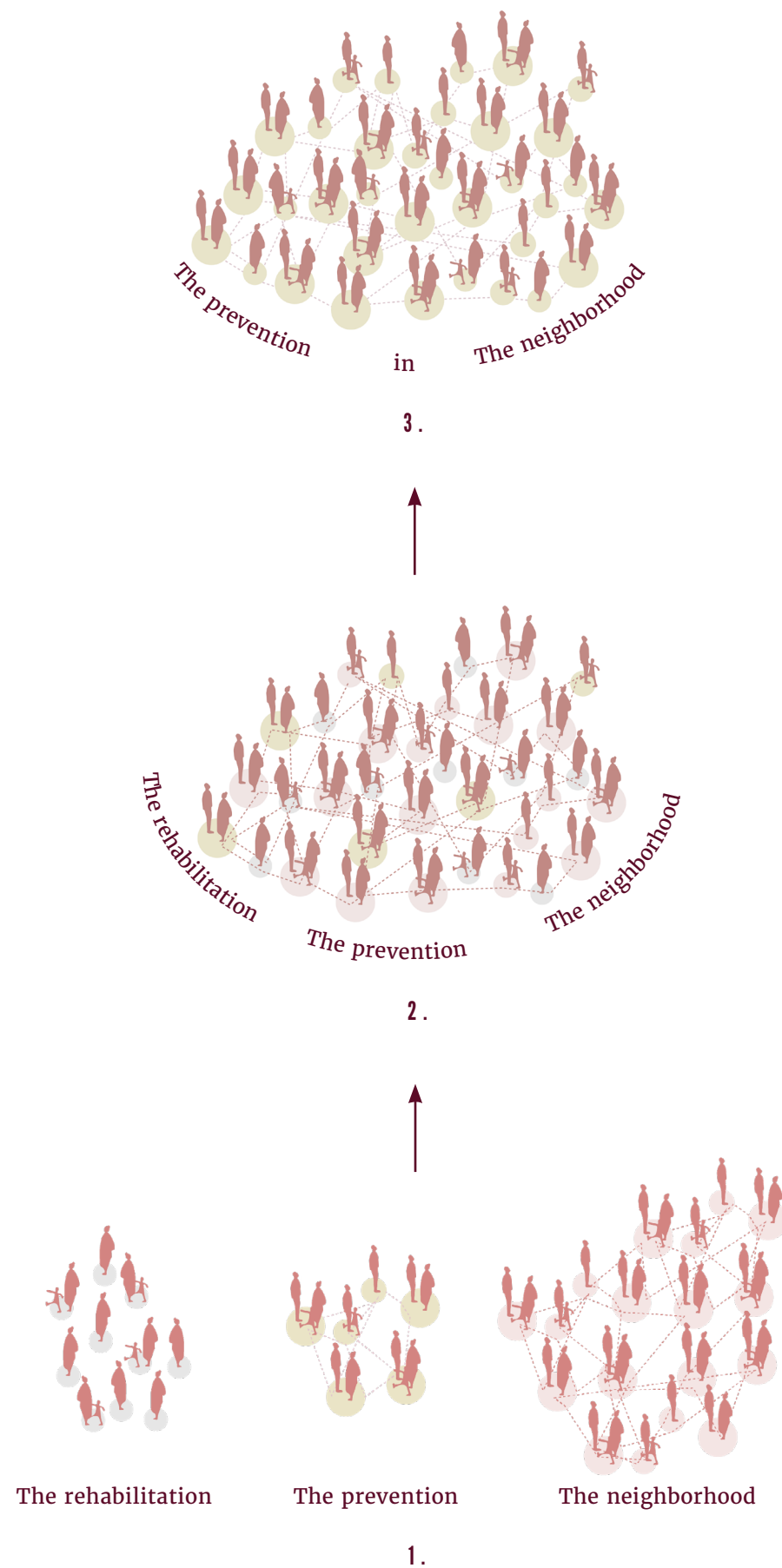
AWARENESS



CONNECT



HEALING



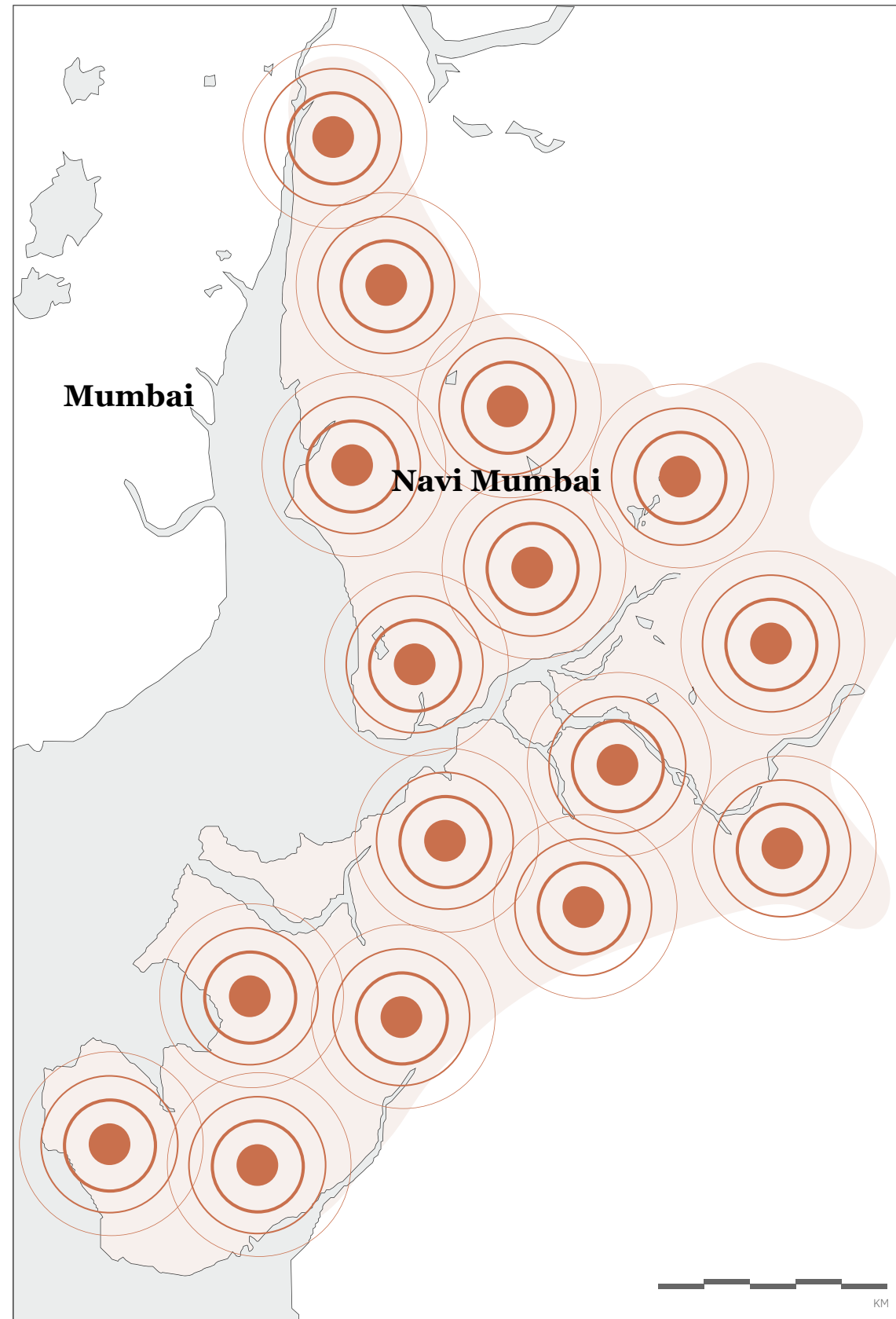
Concept

MIXING FOR PREVENTION

In India, more than one out of four Indian women are victims of gender-based violence, which can result in severe health issues. However, rehabilitation for these women is limited. Rehabilitation can take many forms, such as support groups, counseling, moving into a shelter, or simply talking with loved ones. But in many cases, the cultural acceptance of gender-based violence prevents this conversation from happening. People prefer to ignore the issue out of fear or habit to not bring shame upon the family or individual. In many cases, the

neighborhood can play an important role by for example exercising social control or addressing worrying behaviors.

At the moment these three factors: Rehabilitation, Prevention, and Neighborhood are not in contact with each other (1.). Building New Cycles wants to change this by mixing these three (2). Through the combination of these three, awareness will be raised and behavior will change, resulting in Prevention (3.)



Urban scale

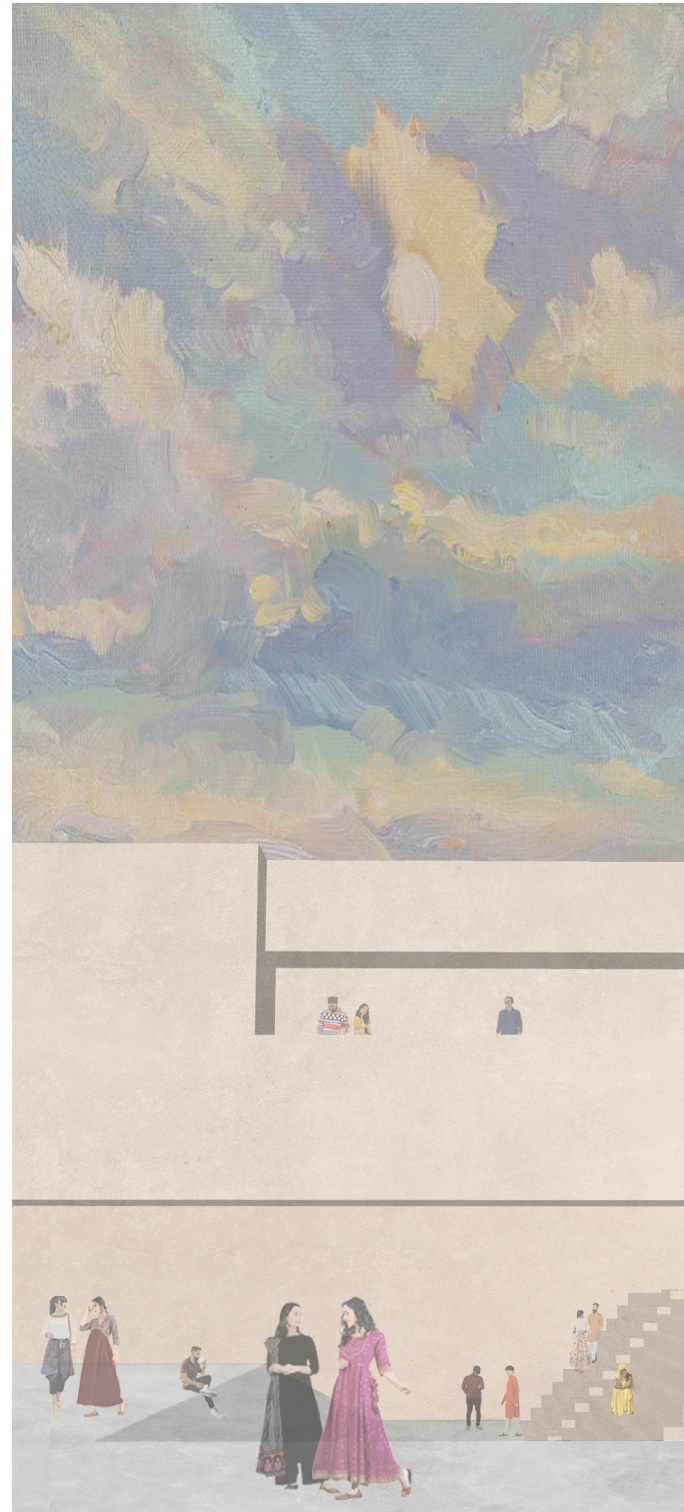
SOCIAL CATALYST

Navi Mumbai's development has a tendency for social inequality, spatial injustice, and environmental degradation. The goal of the project is to provide solutions to the negative consequences that arise from the understanding of the problem statement. This is based on the social and historical background of the issue. Building New Cycles will be able to be used as a toolbox to repeat at multiple places in the city. The main goal is to change behavior through neighborhood designs as a social catalyst. By thinking on an urban scale we empower the individual.

Themes



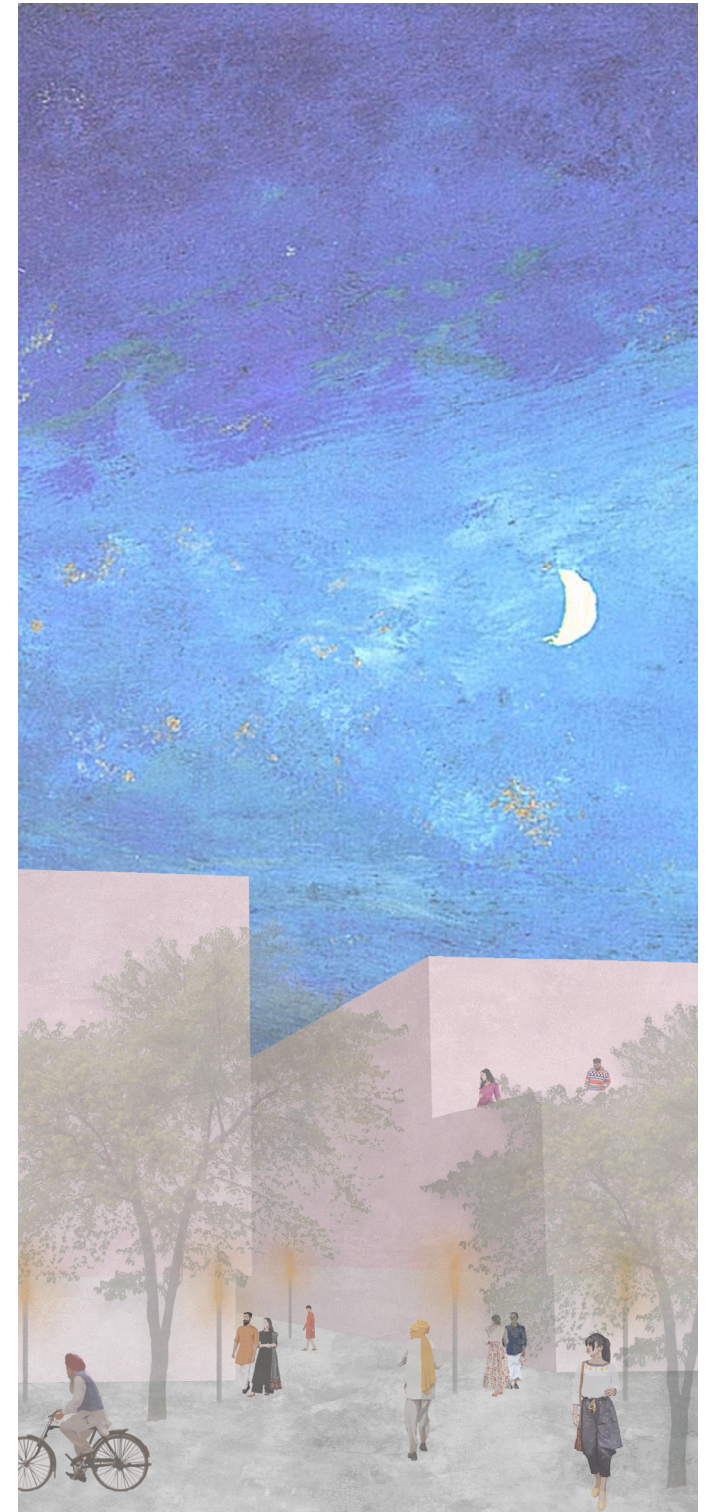
The residential



The prevention

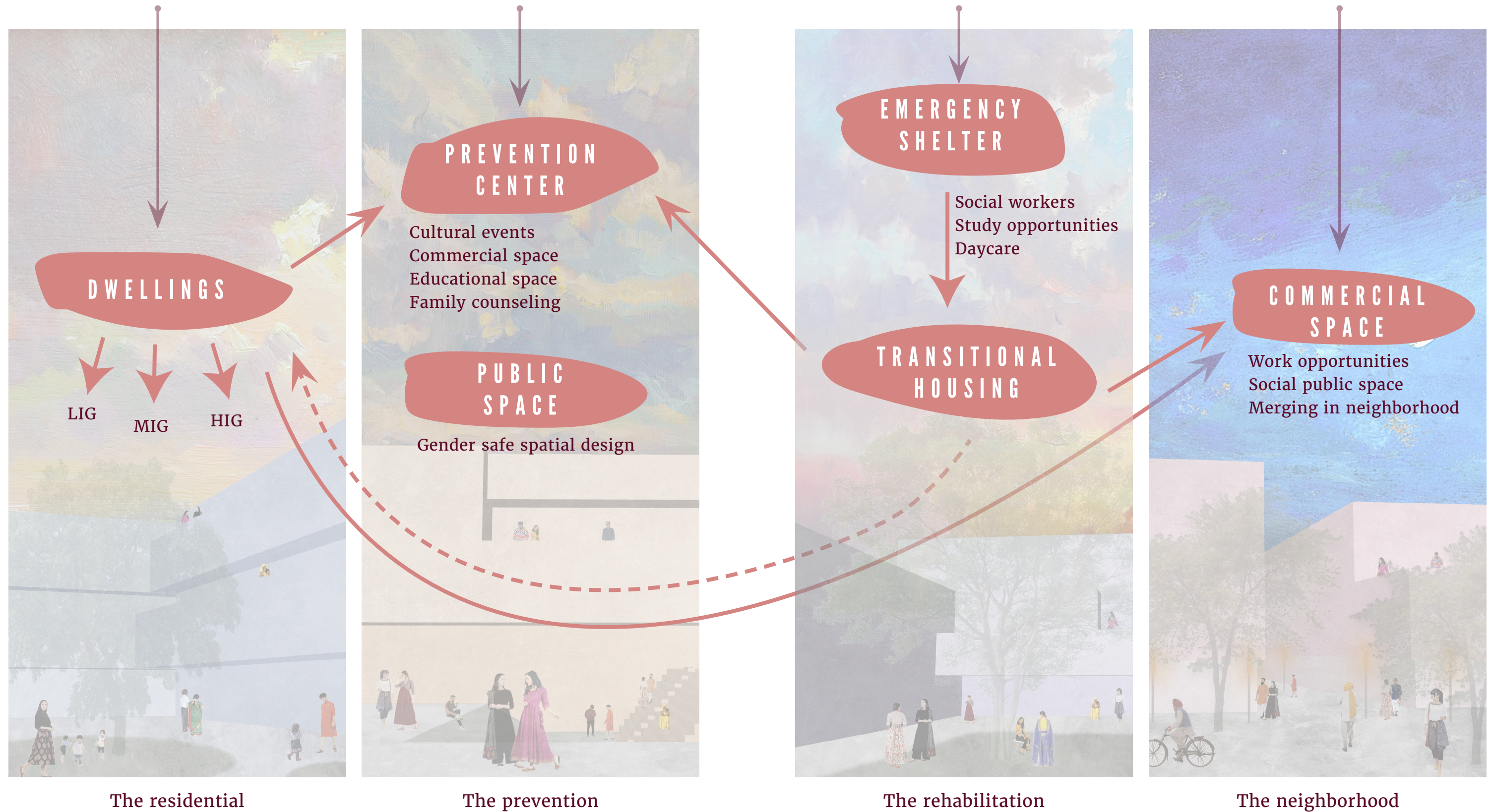


The rehabilitation



The neighborhood

Relation scheme





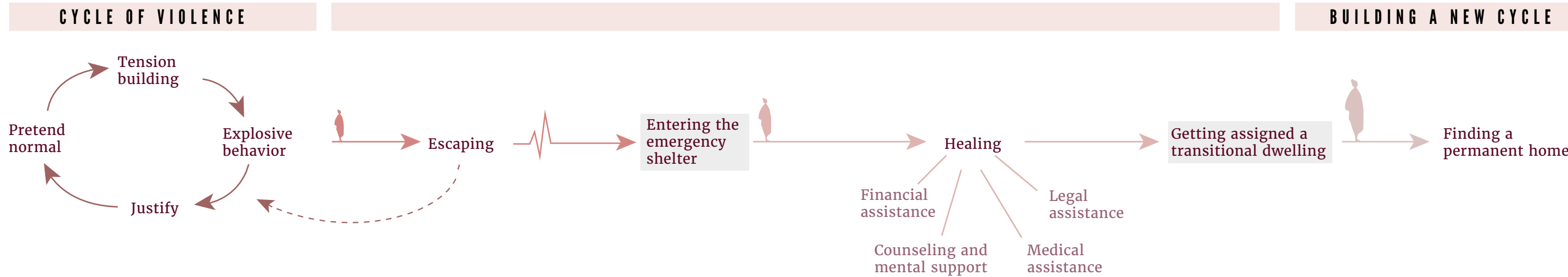
Levels of privacy

VERTICAL MIX

The four themes in this project: Residential, Prevention, Rehabilitation, and Neighborhood, create their building functions to realize the concept. The program consists of five building functions with each a different requirement of privacy. As a result, the program is vertically mixed to acquire privacy on an elevated level while keeping the ground floor open for public and social functions.

Timeline

GENDER-BASED VIOLENCE VICTIM

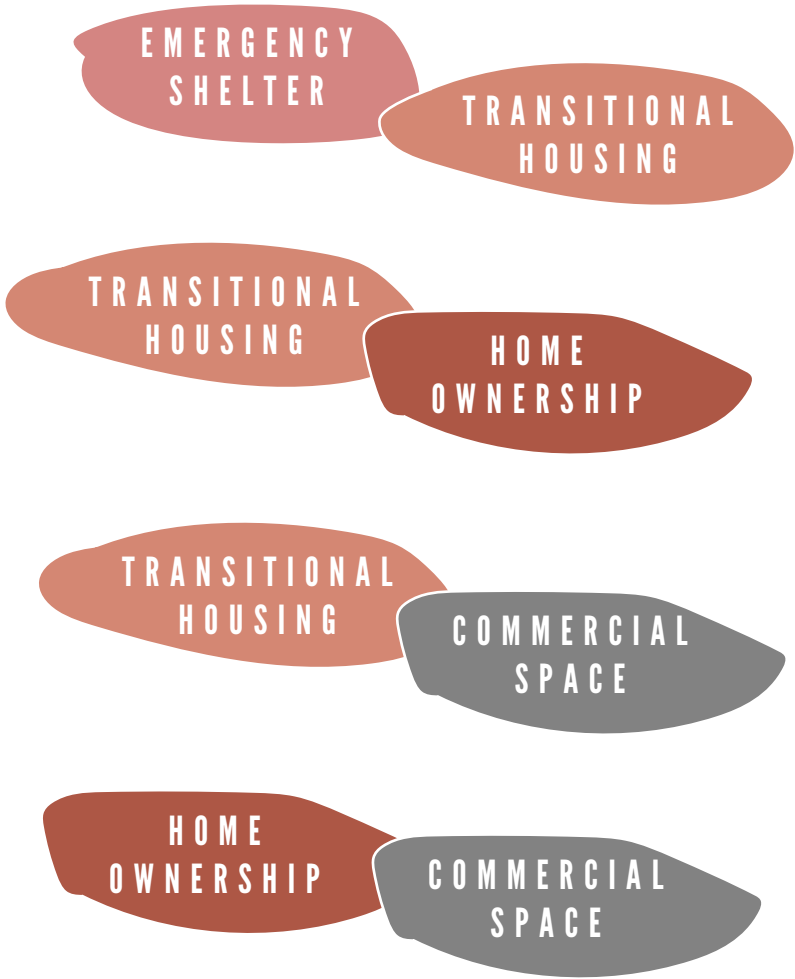


Dwelling requirements

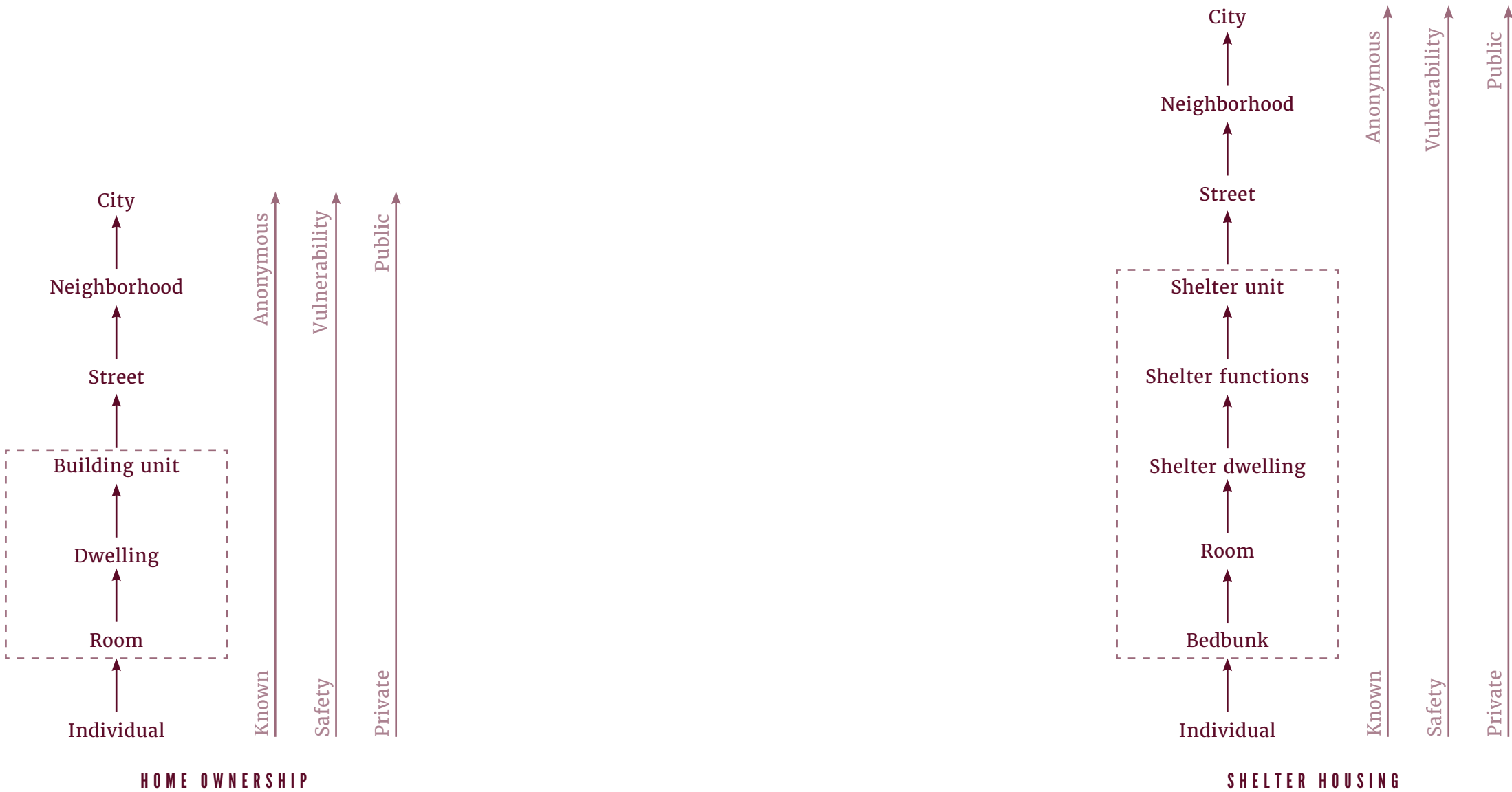


(Shelters for victims of domestic violence, 2022)

Mixed building units



Levels of privacy



Design strategies

OUTSIDE SPACE

Every dwelling consists of private and communal outside space.

GENDER SAFE DESIGN

Trough different levels of design the gender safety will be assured.

MIXED INCOME

1bhk to 3bhk dwellings are designed to welcome different income groups.

RECREATIONAL PUBLIC SPACE

Women's ownership in recreational public spaces can be achieved through gender-sensitive urban design.

PEDESTRIAN FRIENDLY

The inner neighborhood is pedestrian friendly and the vehicular traffic lies on the borders.

HIGHER GSI

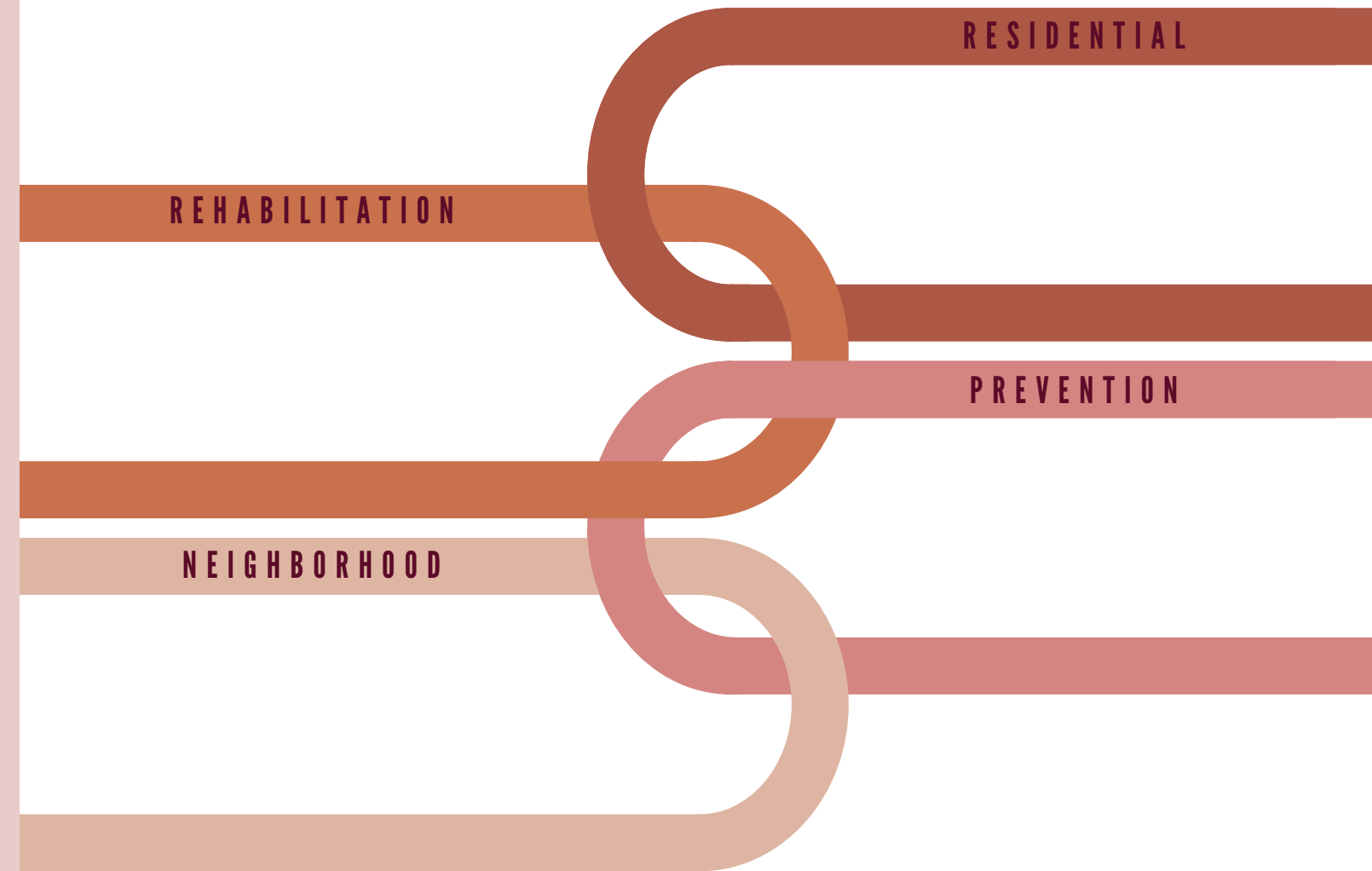
To avoid high towers and large open public space, a higher GSI will be used in order to assure a human scale.

Gender safety levels



The design will provide safety for women on various levels. This consists of three layers; facilities, public space, and architecture.

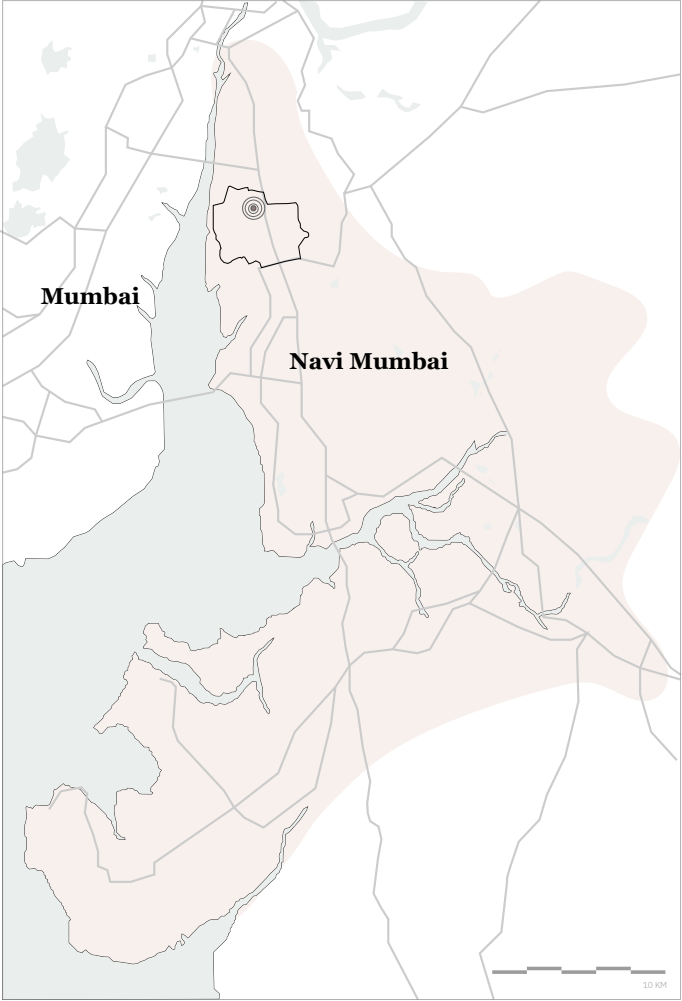
Urban strategy



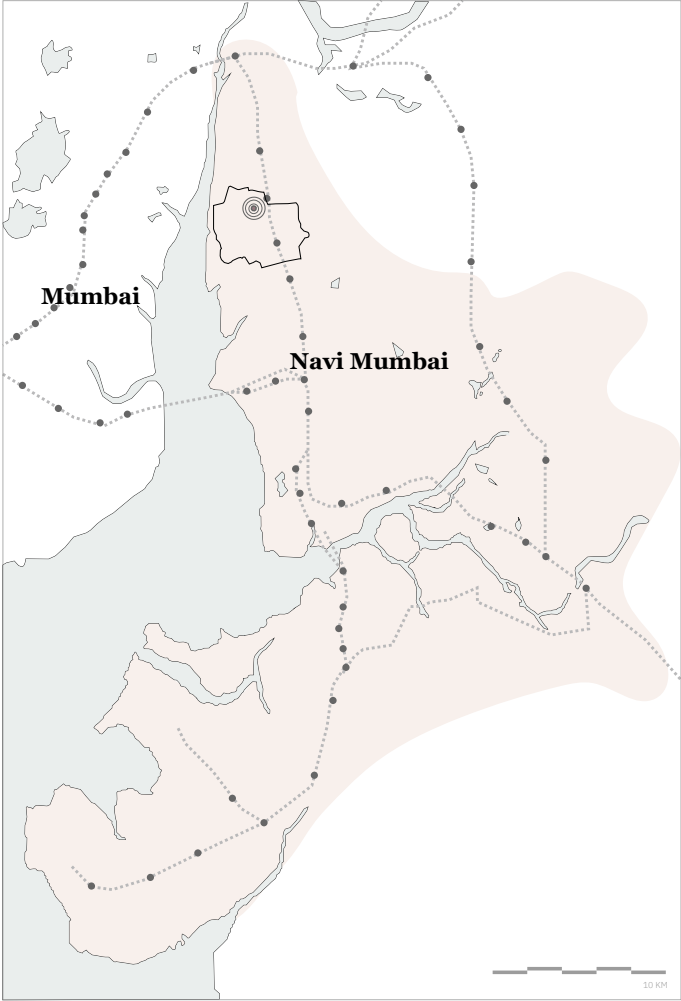
Location



Relief



Infrastructure



Railway nodes



Satelite

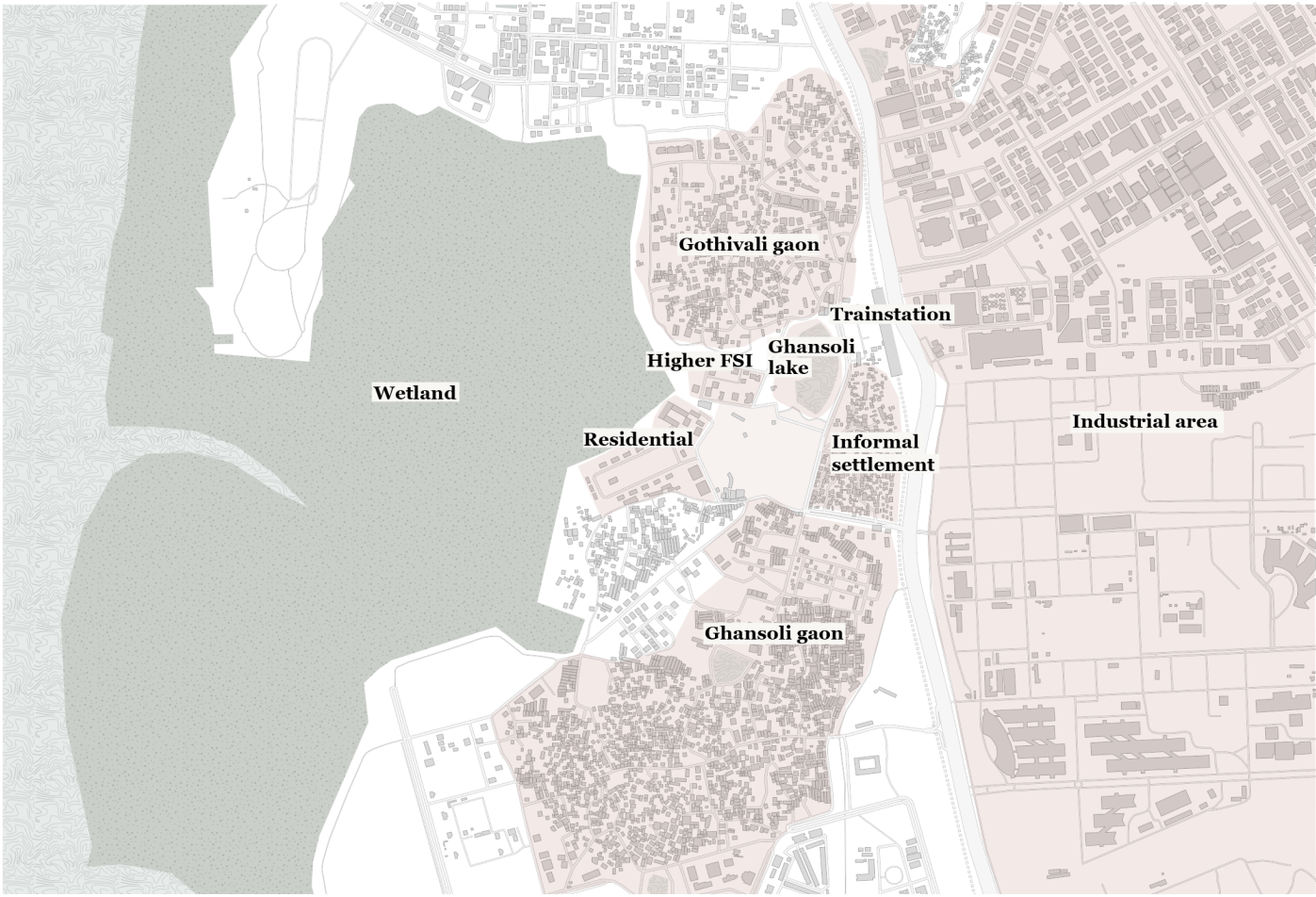


Location





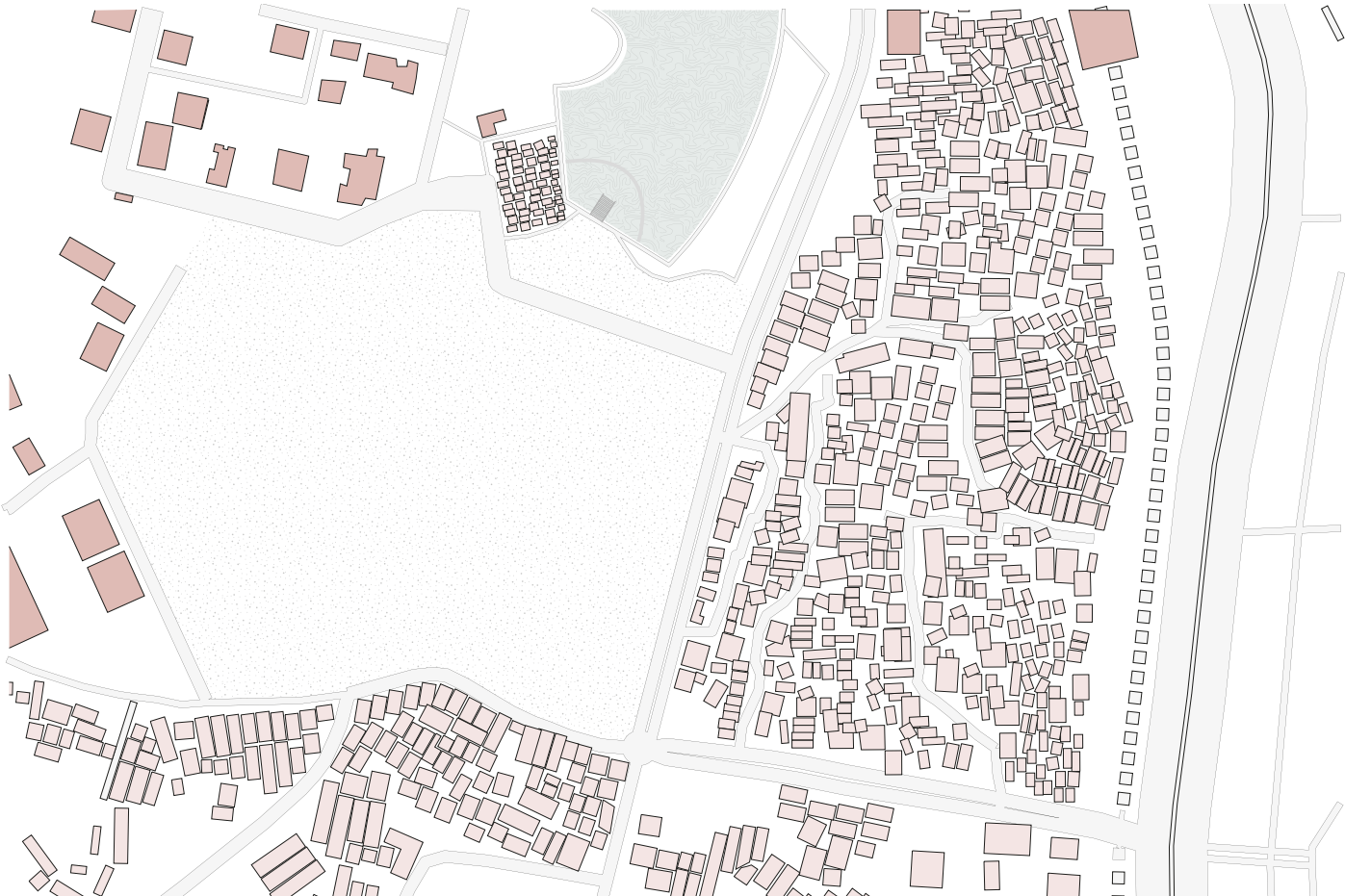
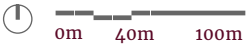
Connectivity



Functions



Satellite



Informal settlement
Formal settlement

Surrounding buildings



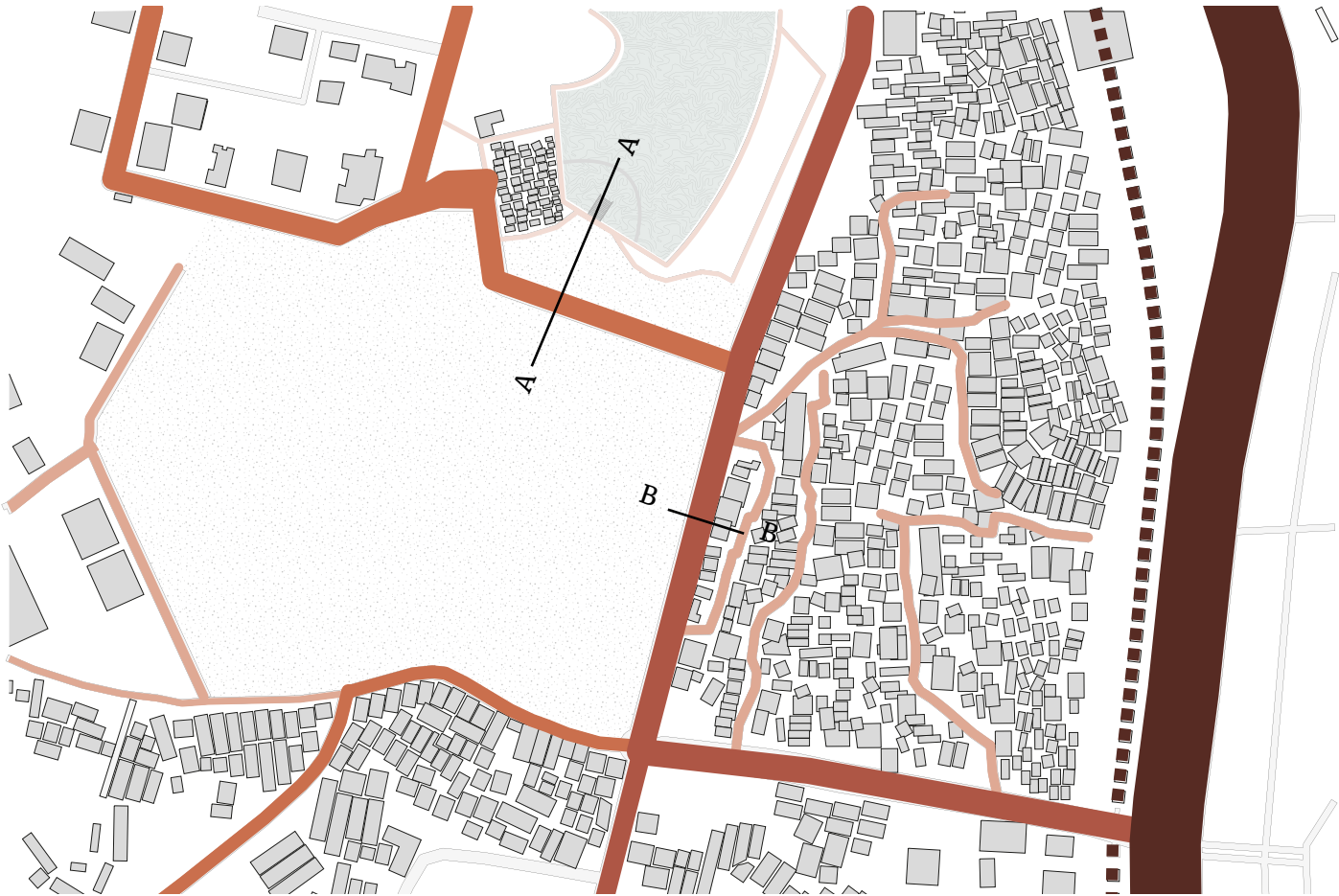


Street section A-A

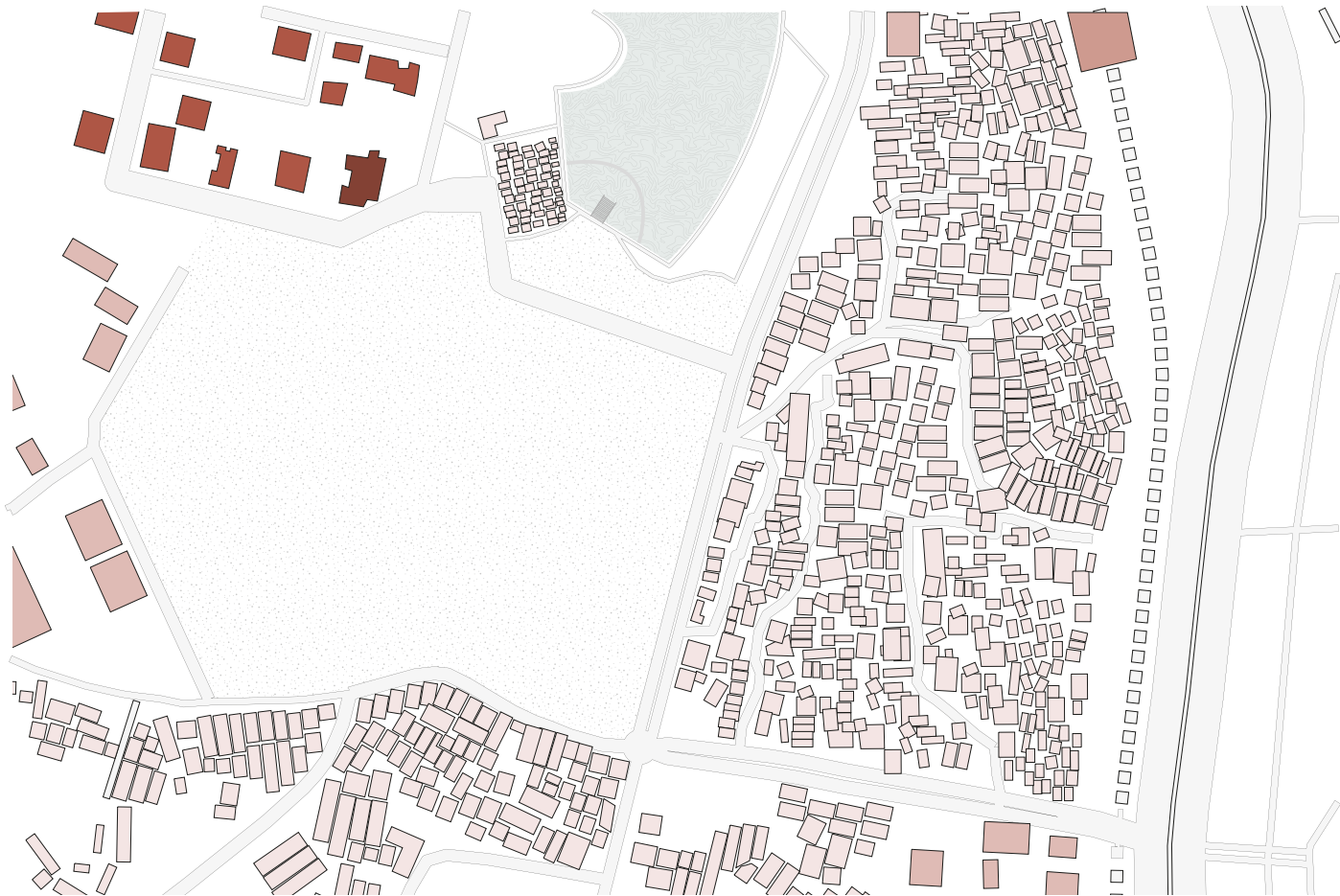


Street section B-B

Urban sections



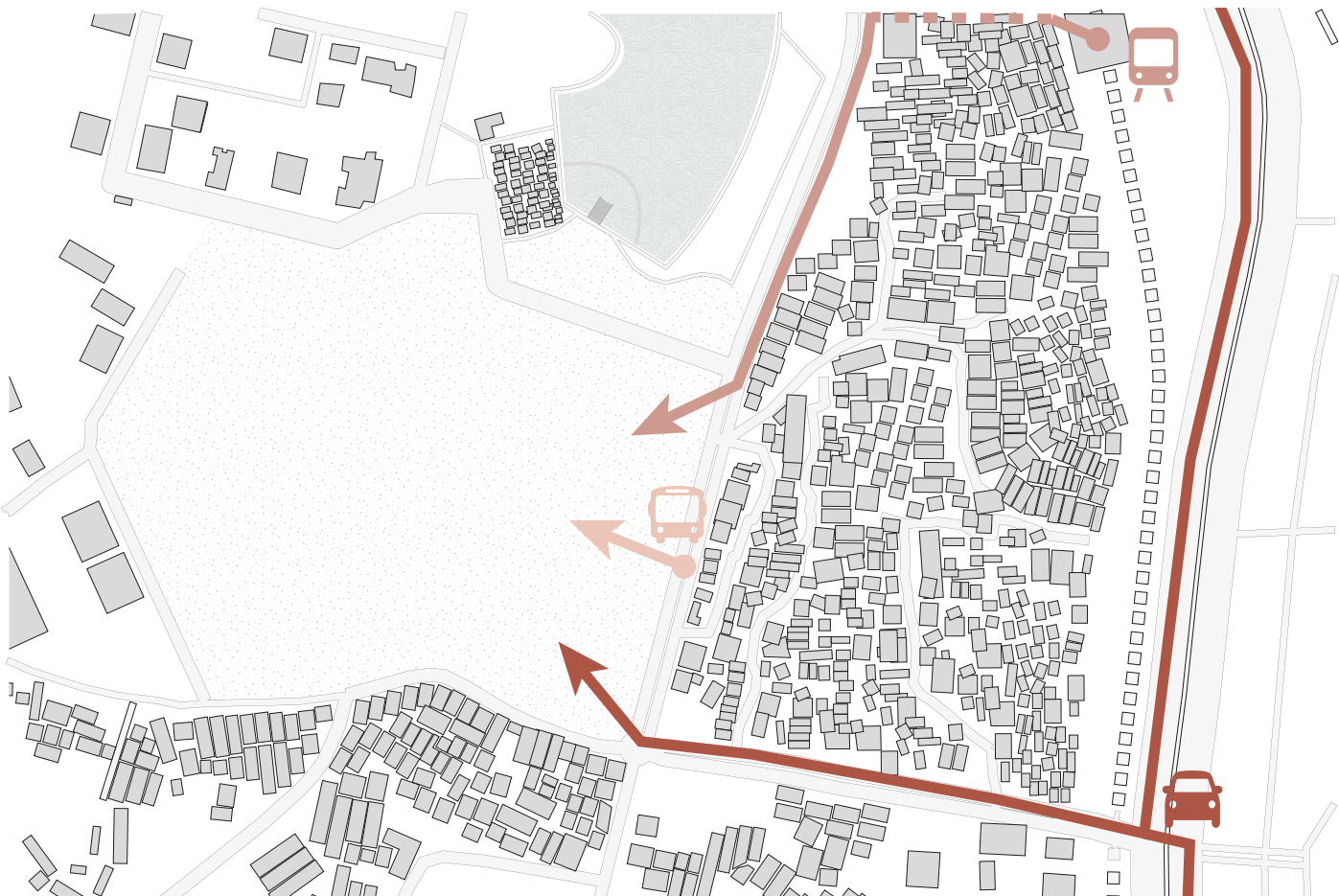
Roads intensity



Building heights



- 1 floor
- 2 floors
- 3 floors
- 10 floors
- 12 floors



Connectivity





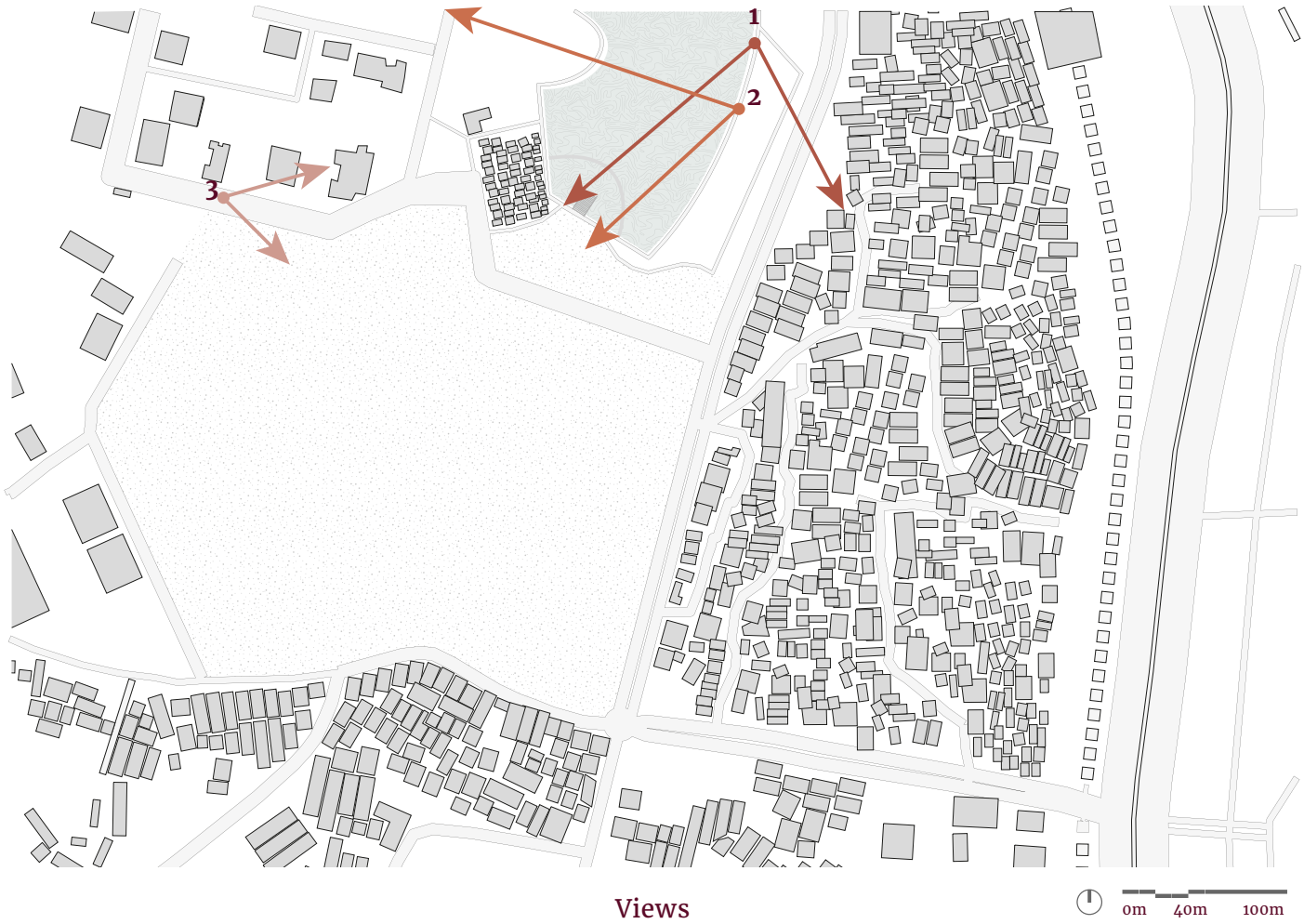
View 1 - Fig. 3.1



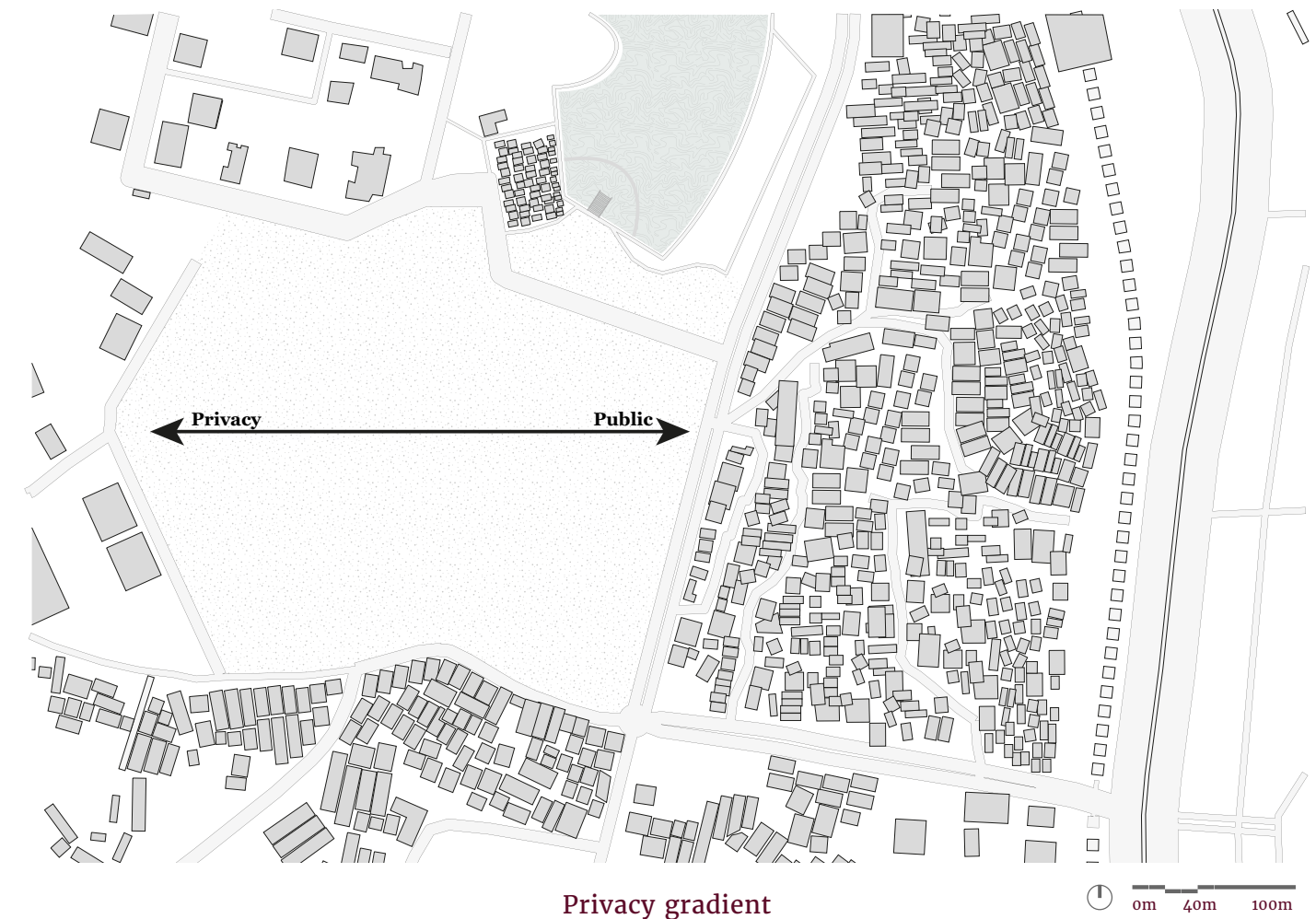
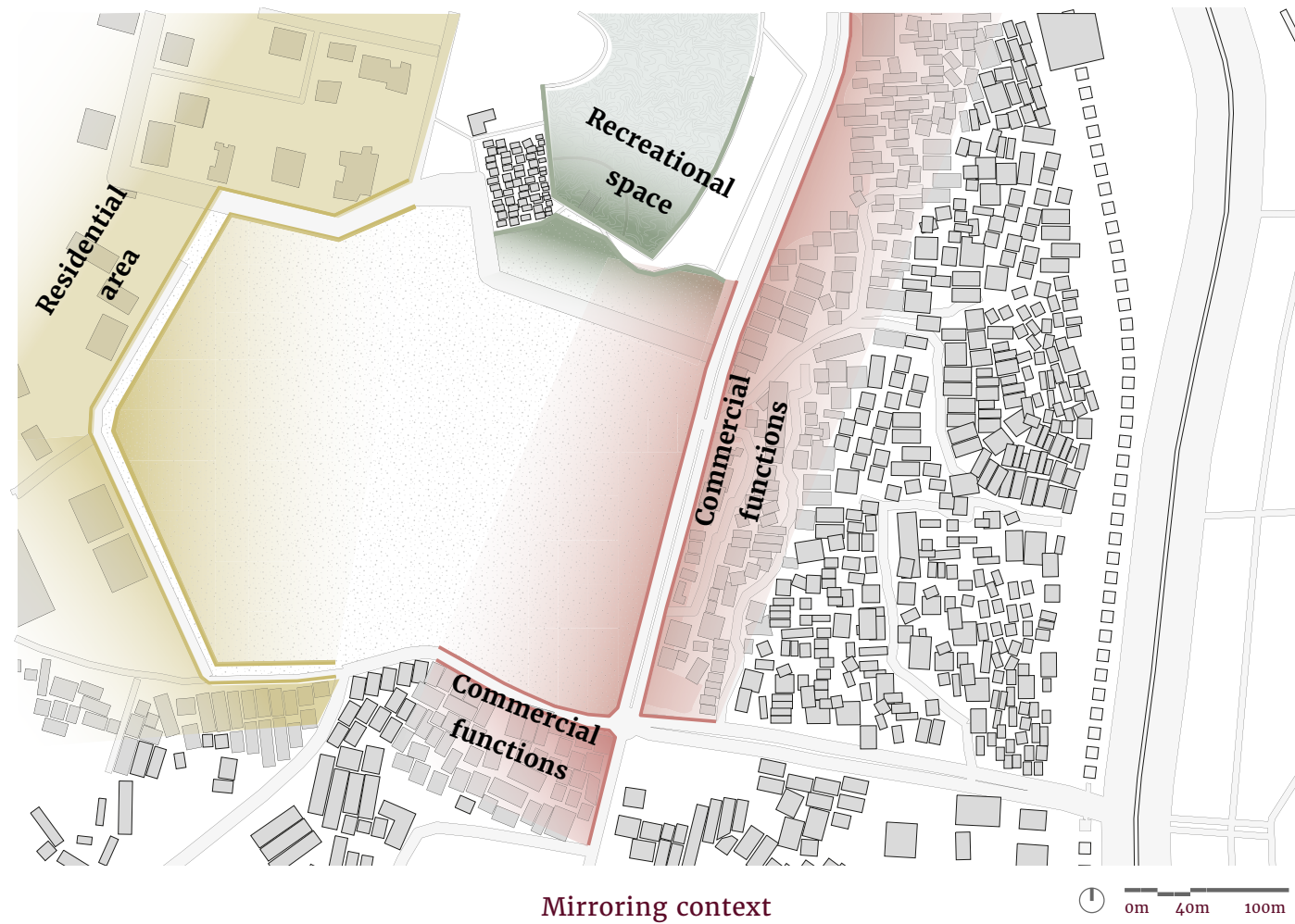
View 2 - Fig. 3.2



View 3 - Fig. 3.3



Urban strategy





Conceptual exposure



9

SURFACE
Hectares

0.27

GSI
Ground Space Index

1.3

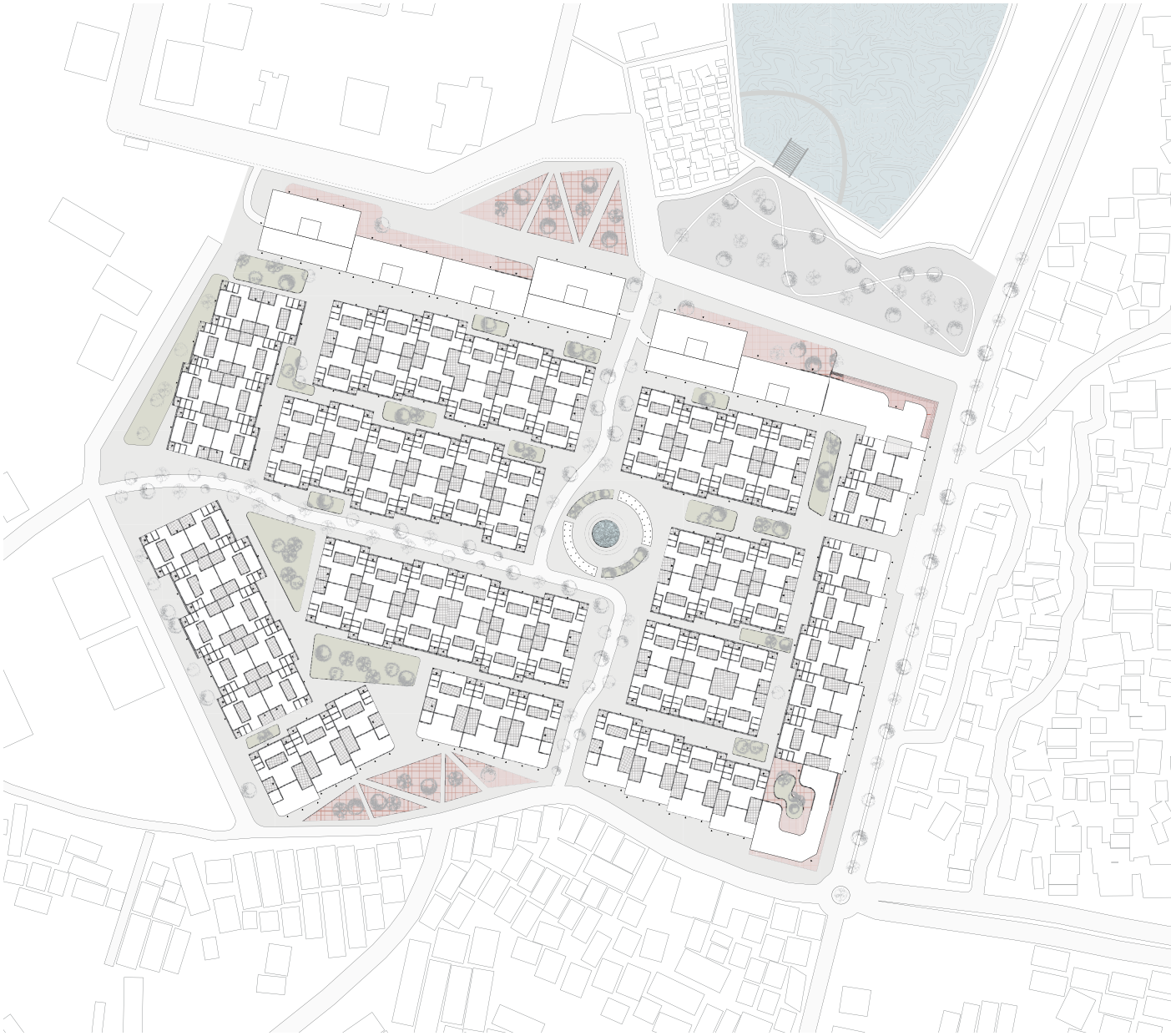
FSI
Floor Space Index

148

DENSITY
Dwellings / Hectare

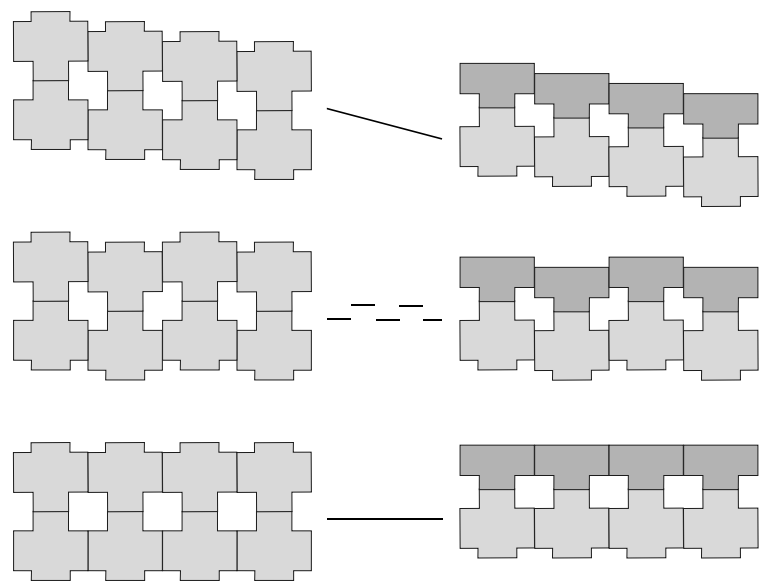
15

Dwelling types
Floorplans

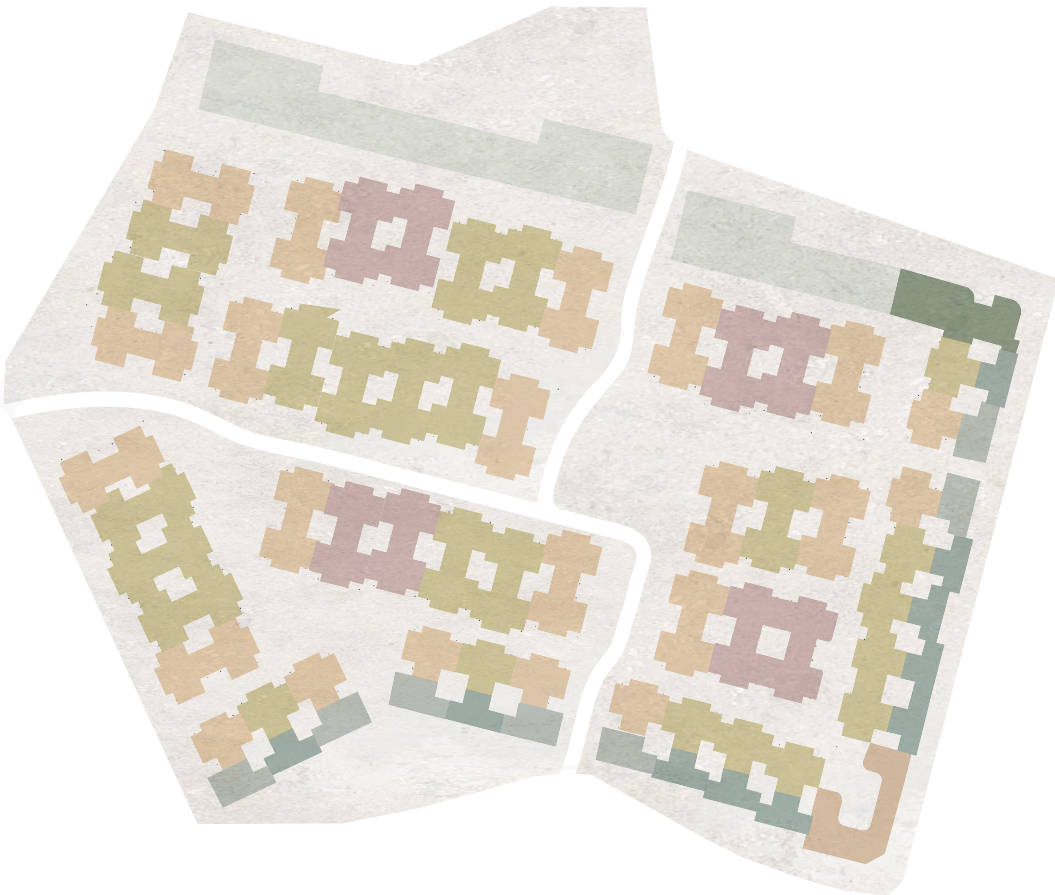


Masterplan



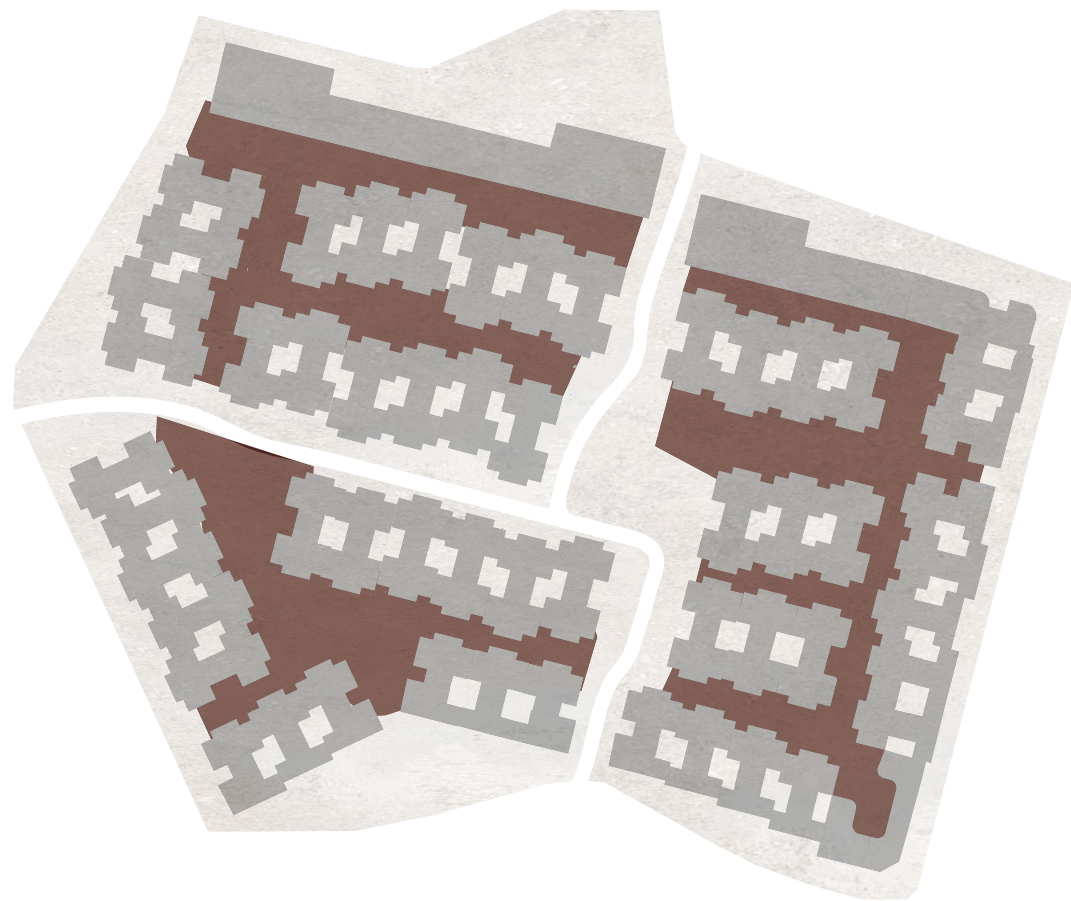


Cluster combinations that lead to different street integrations

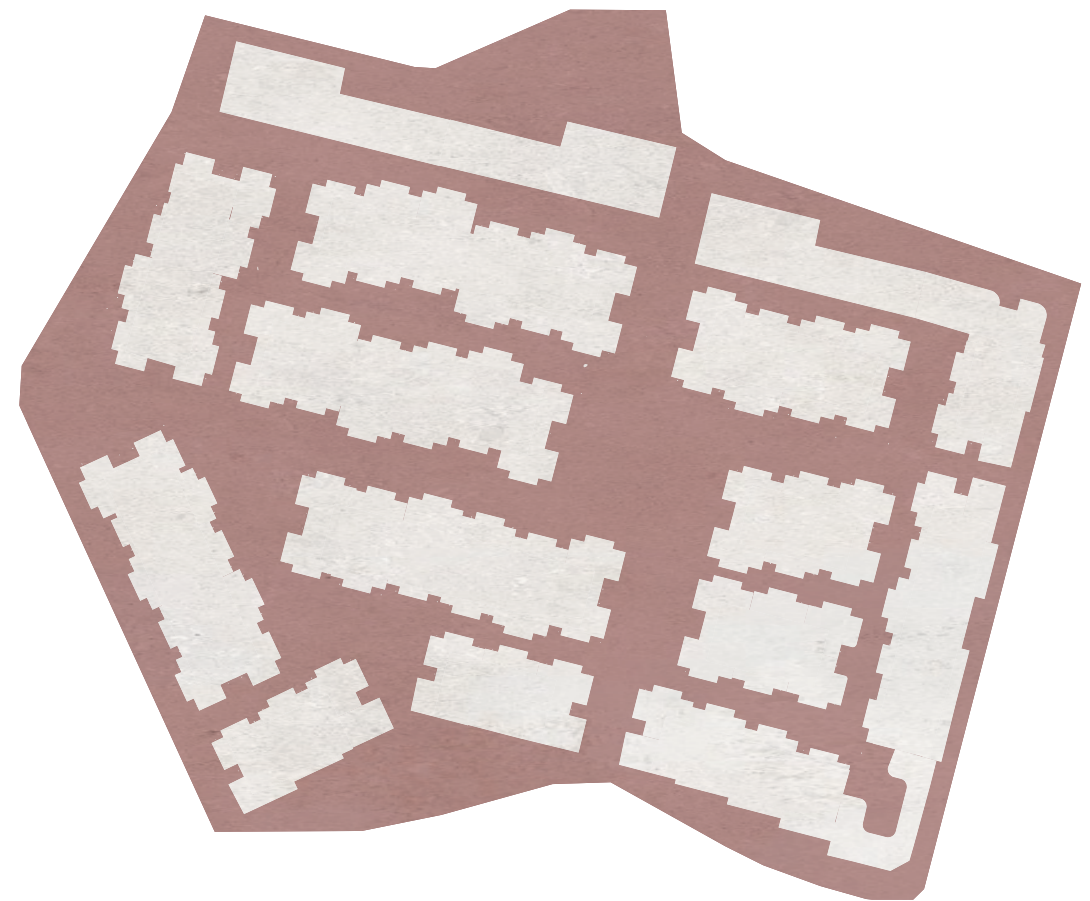


Building typologies

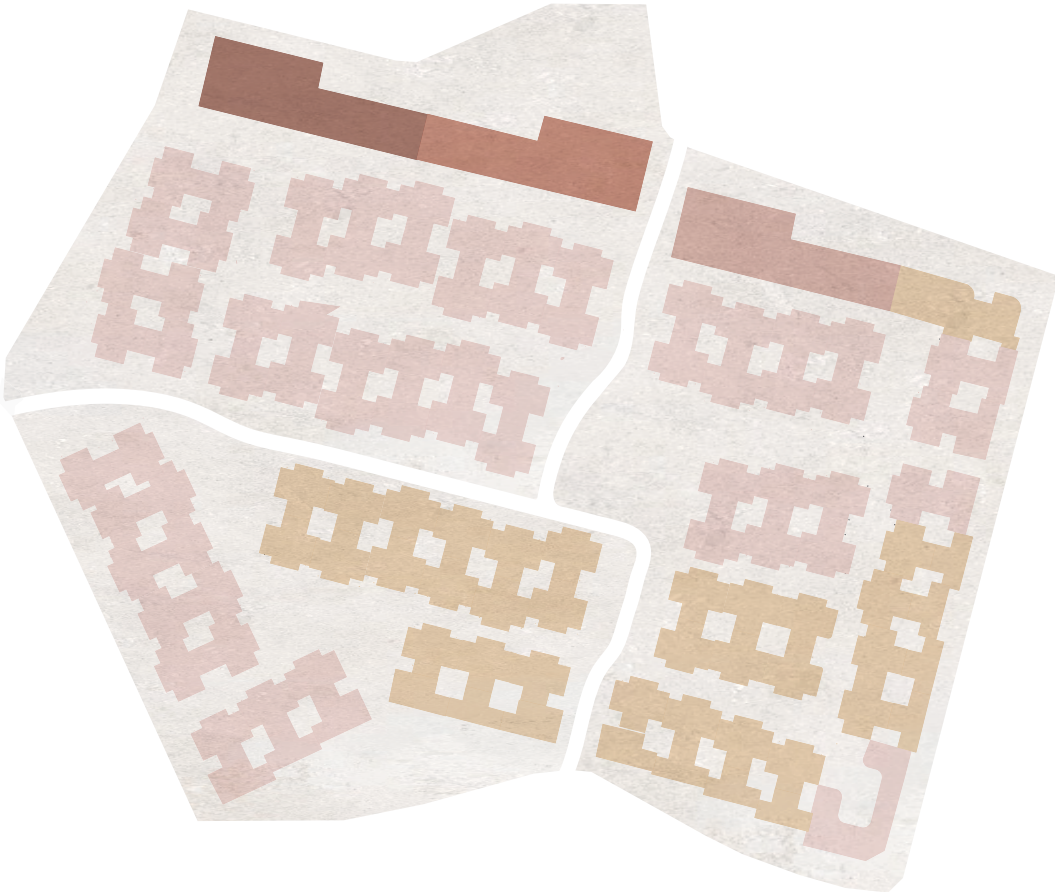
- Shelter module
- Middle module
- Corner module
- Gallery module
- Corner module
- Tower module
- Public module
- School school



Pedestrian streets



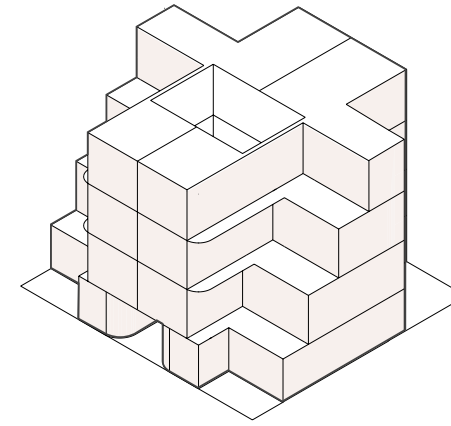
Public vs. Private space



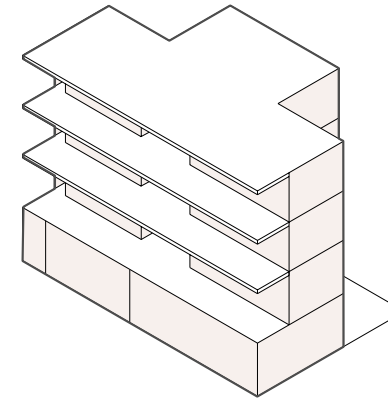
Building height

- 8 floors
- 7 floors
- 6 floors
- 4 floors
- 3 floors

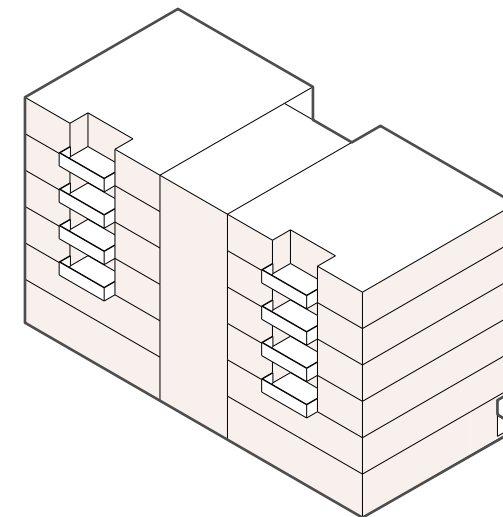
Architectural design



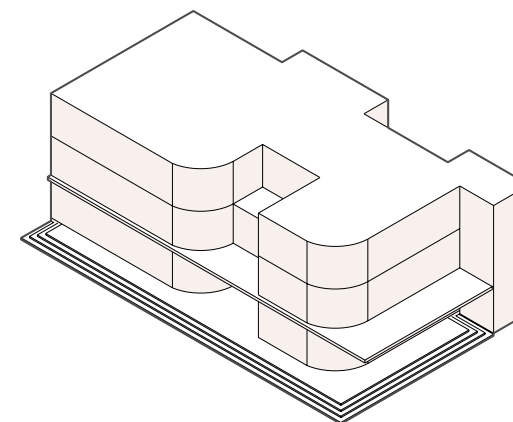
BACK TO BACK
TYPOLOGY



GALLERY
TYPOLOGY

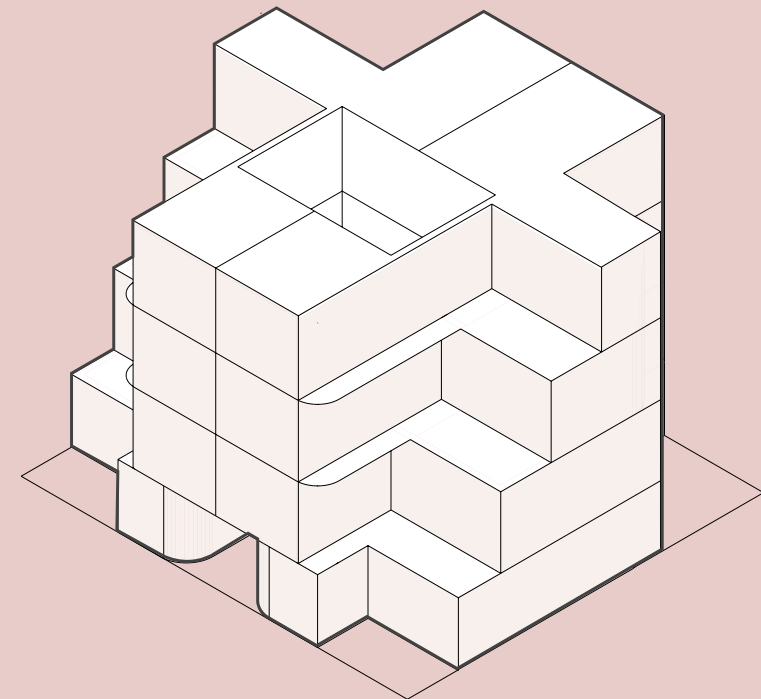


HIG
TYPOLOGY

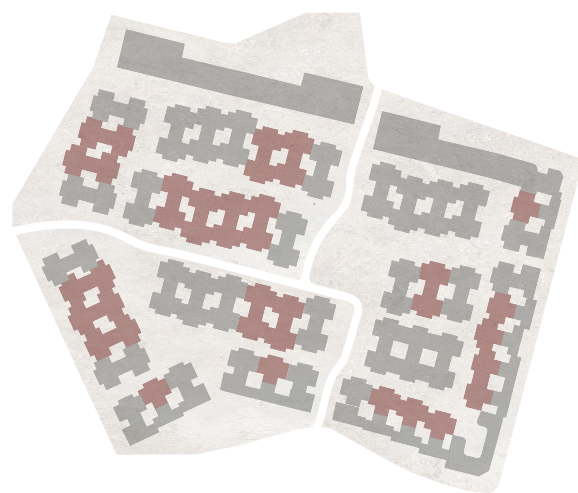


PUBLIC BUILDING
TYPOLOGY

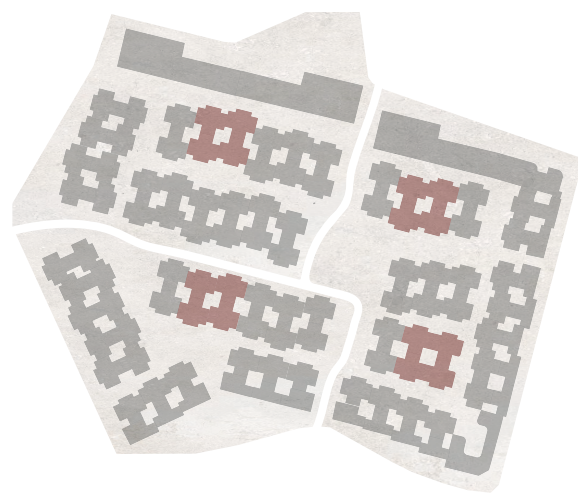
URBAN VILLA TYPOLOGY



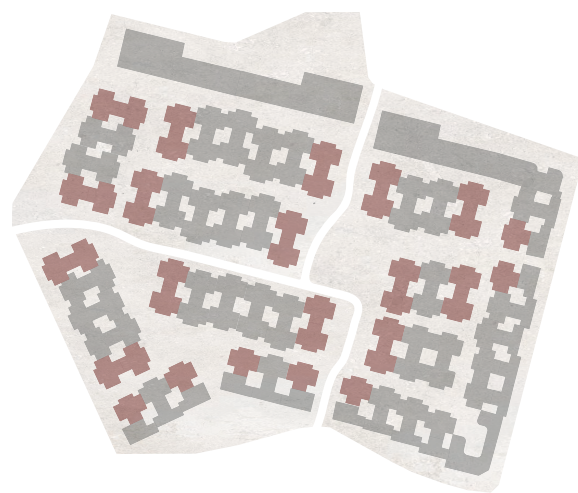
- Middle module
- Shelter module
- Corner module



MIDDLE MODULE



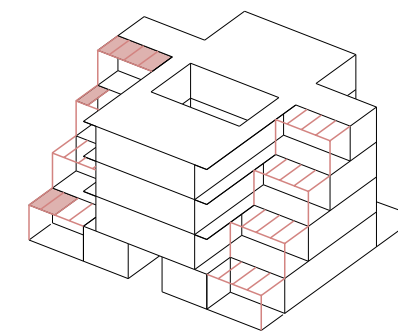
SHELTER MODULE



CORNER MODULE

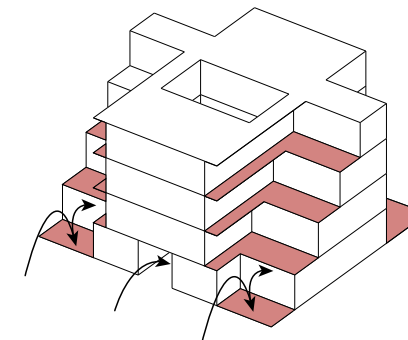
Urban villa

The urban villa typology is created from the mass to create human scale design on architectural and urban level, with different dwelling floorplans that can household a wide variety of income groups and family structures.



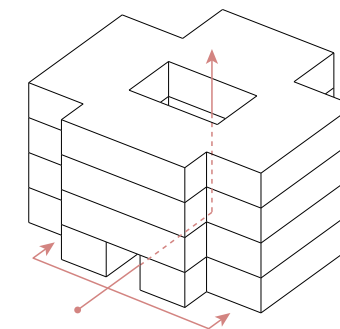
Covered outside space

To accommodate the Mumbai weather, there will be a pergola above the terraces with an integrated sliding roof. In case of heavy rainfall, or when it's too hot, the roof can be closed.



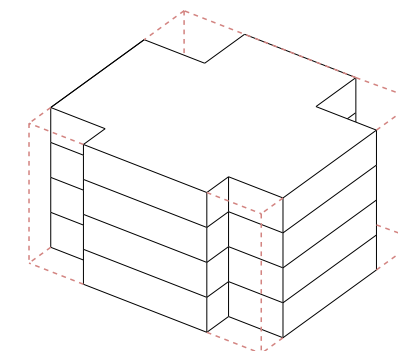
Setback

Setbacks allow a greater amount of daylight to enter the street, as well as create private outdoor spaces. Additionally, the circulation balcony will be extra wide to serve as a functional front yard.



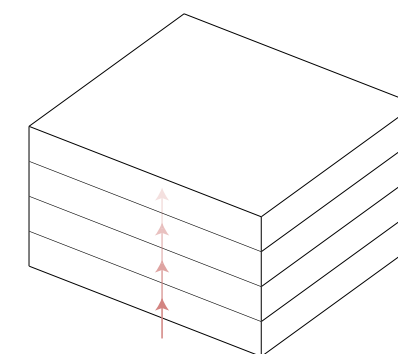
Circulation

Assuring social control through having 'eyes on the street', the entrances are all located on the same facade. Through a healthy ventilated open staircase or via the street, each floor offers two home entrances.



Shaping

Shaping the mass allows for more cross ventilation in the dwellings such as the creation of the backyard. As well as a stamp that can be copied to keep the human scale in the pedestrian streets.

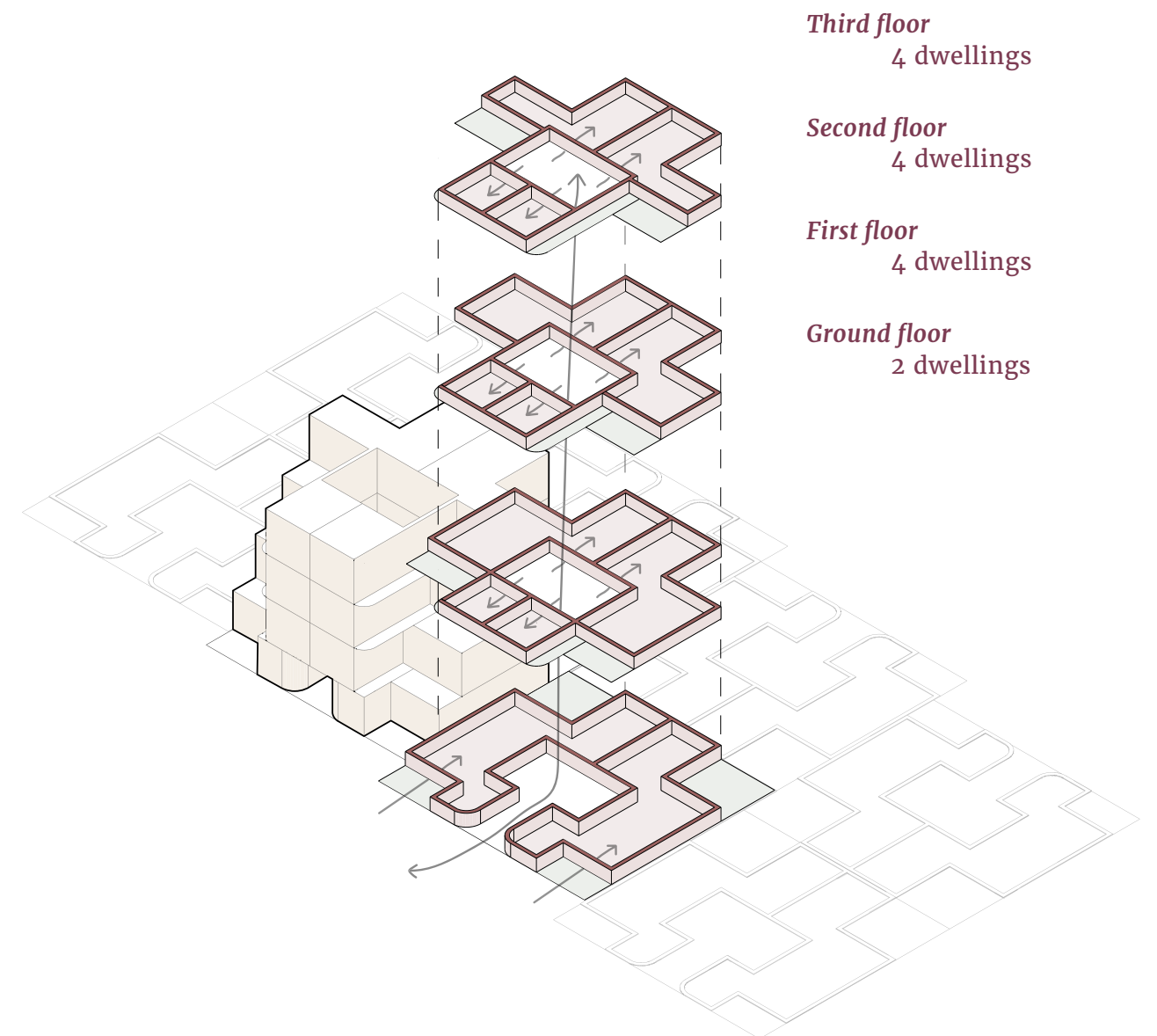
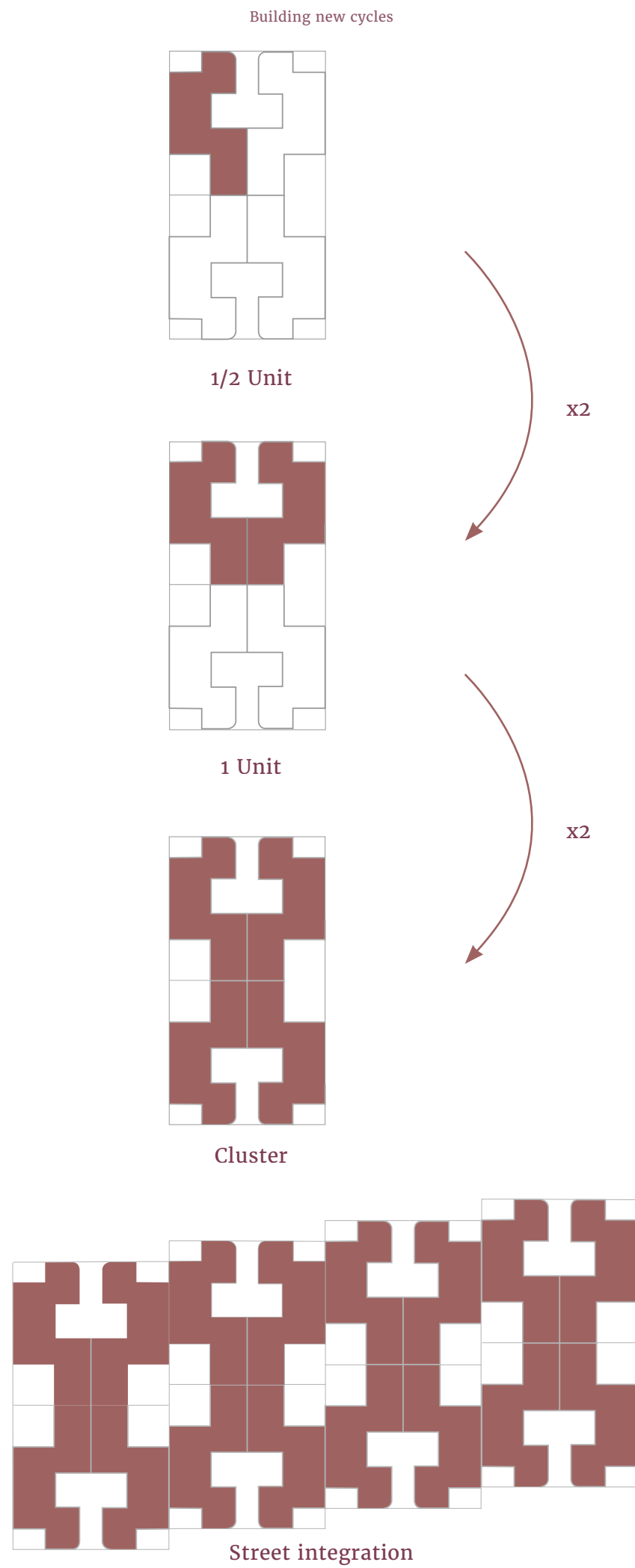


Vertical division of the income groups

Four floors will ensure a vibrant and personal community in the urban villas. Eleven dwellings per unit are created, thereby enhancing the sense of community. The division of income groups will happen vertically.

Middle module

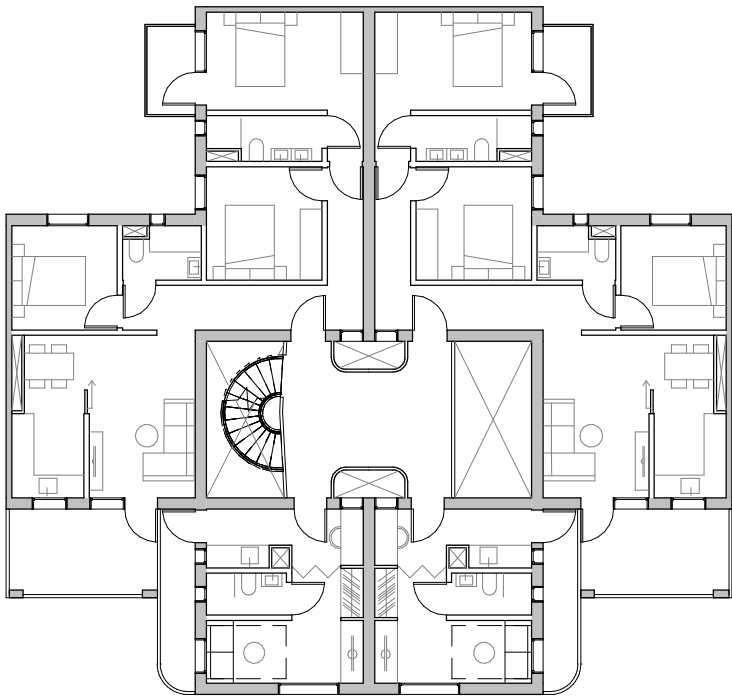
THE MULTIPLICATION OF THE 1/2 UNIT



TYPICAL FLOORPLANS

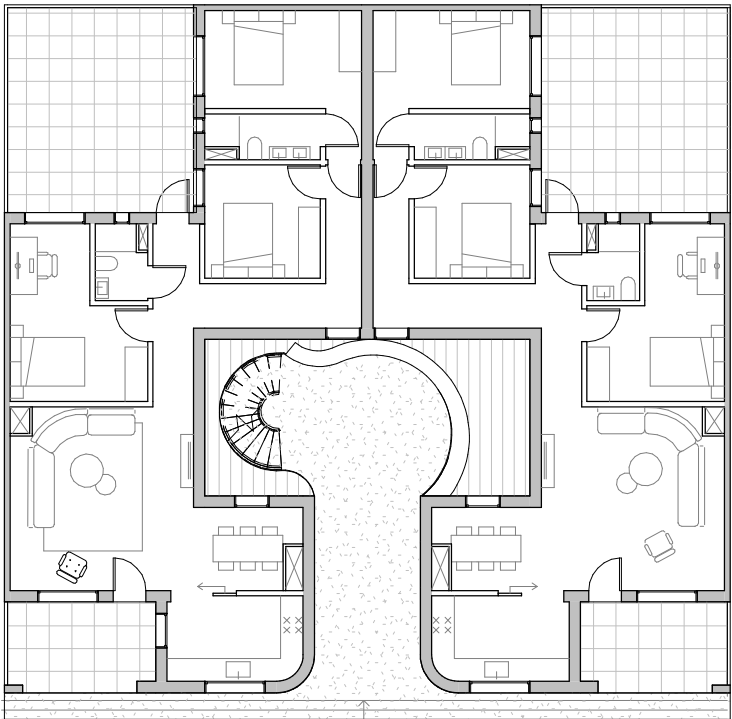
1x MIG
2 BHK
60m²

2x MIG
3 BHK
82m²



First floor

2x HIG 3
BHK
132m²



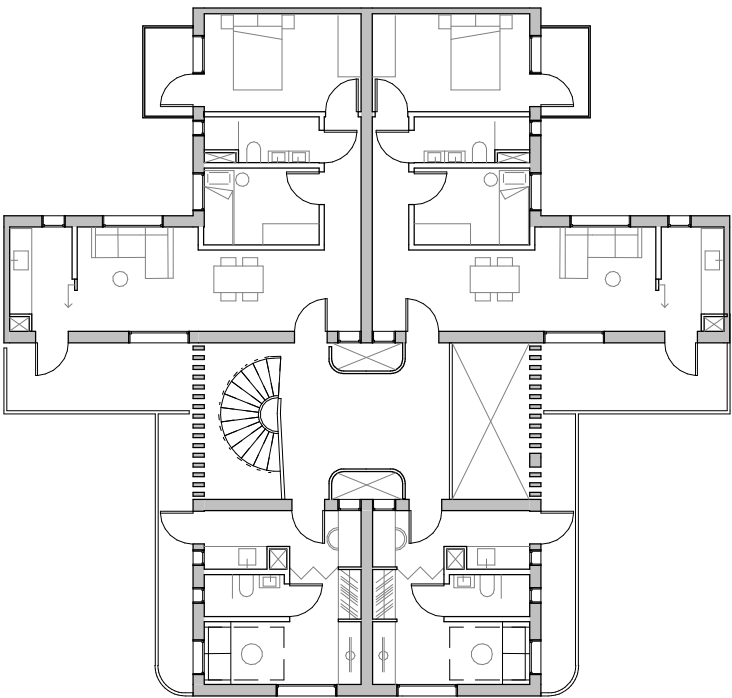
Ground floor



TYPICAL FLOORPLANS

2x LIG
1 BHK
28m²

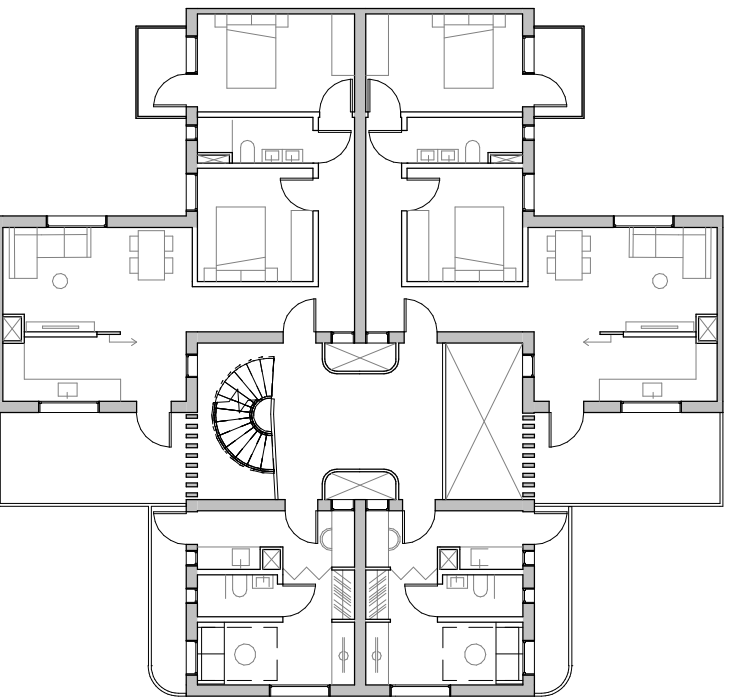
2x LIG
1 BHK
35m²



Third floor

2x LIG
1 BHK
28m²

2x MIG
2 BHK
63m²



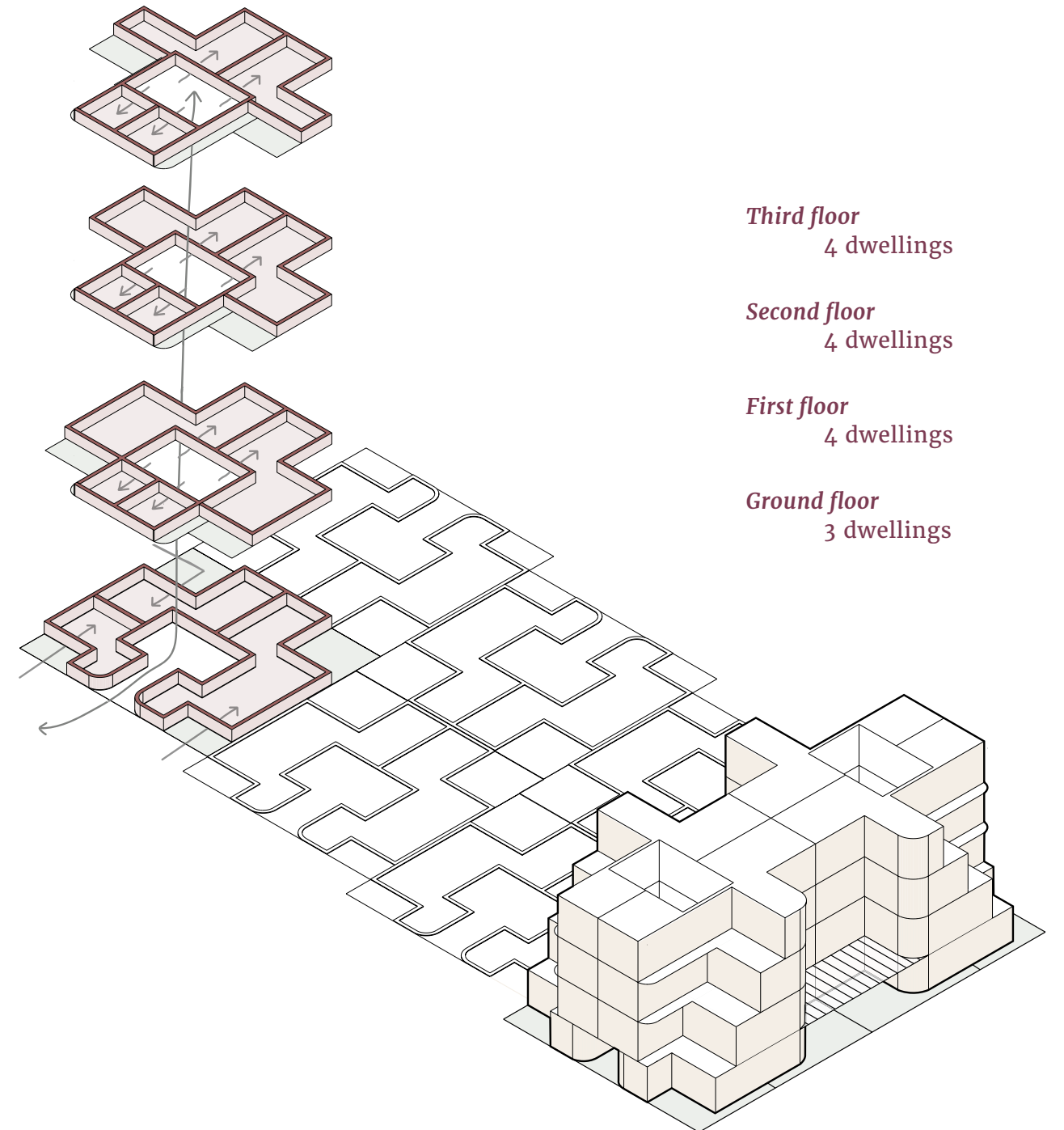
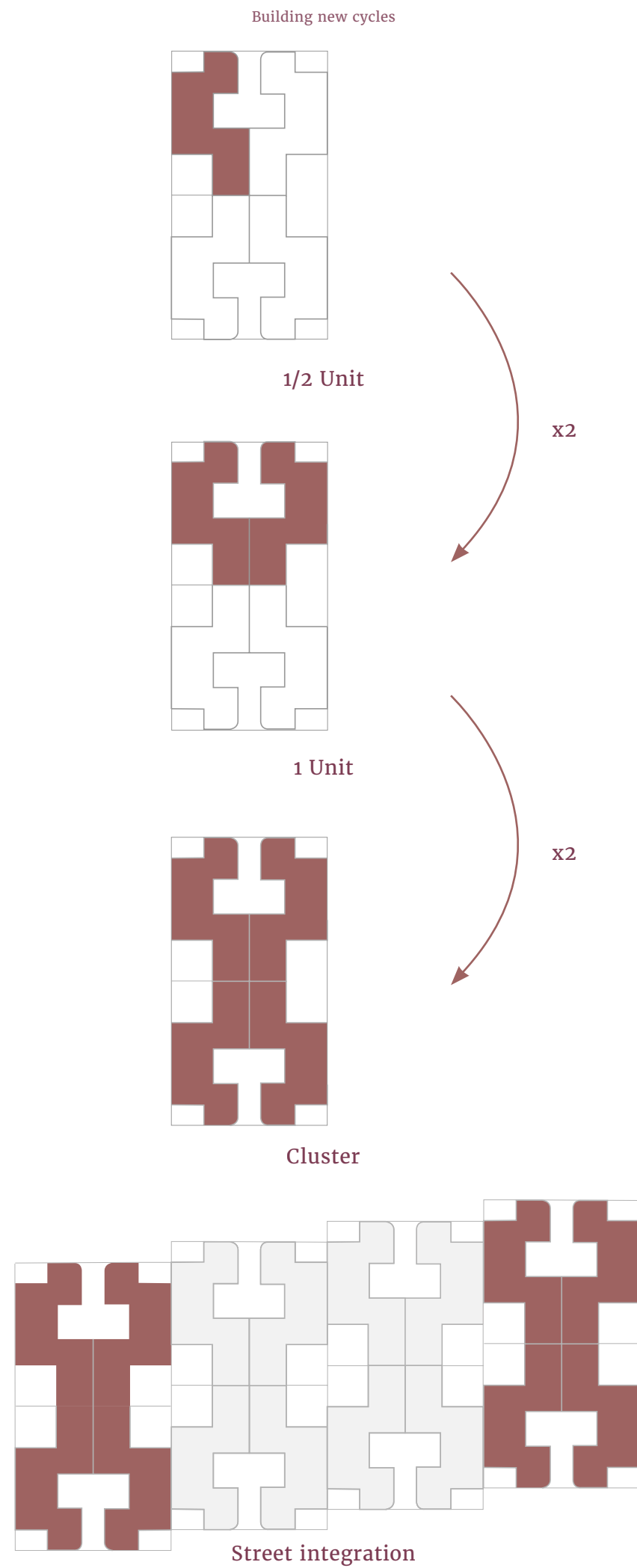
Second floor





Corner module

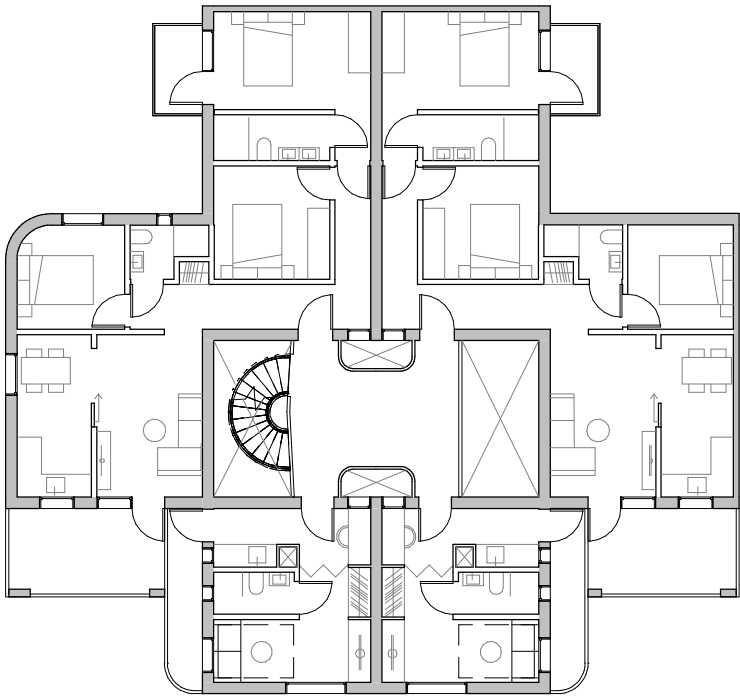
THE MULTIPLICATION OF THE 1/2 UNIT



TYPICAL FLOORPLANS

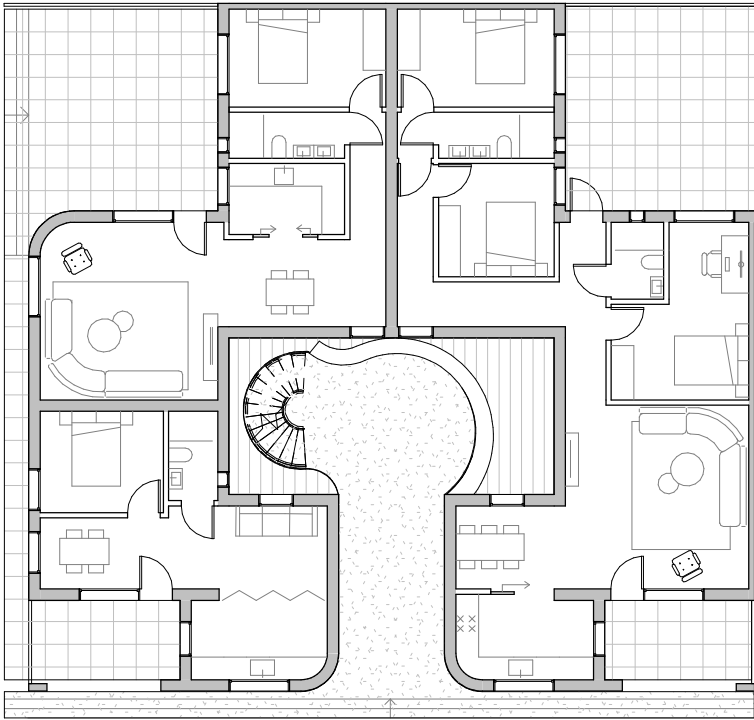
1x MIG
2 BHK
60m²

2x MIG
3 BHK
82m²



First floor

2x HIG 3
BHK
132m²



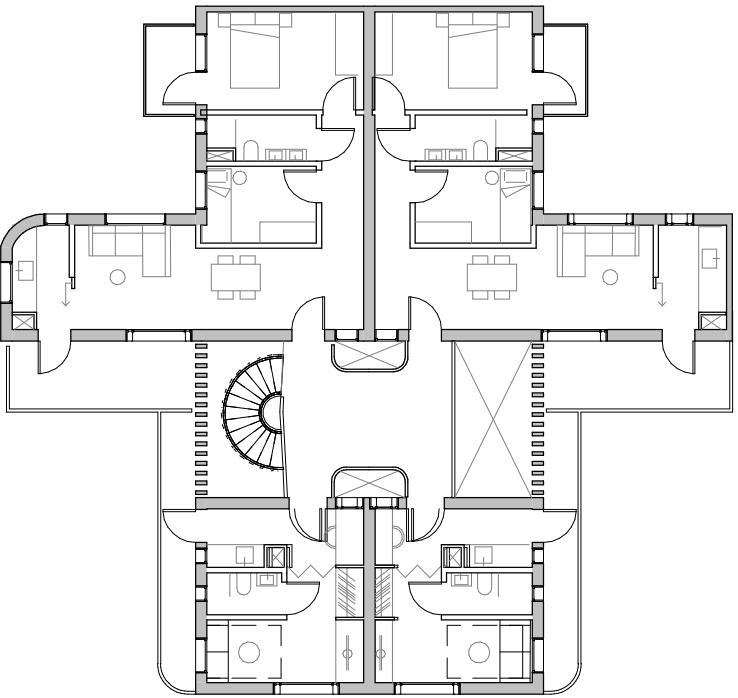
Ground floor



TYPICAL FLOORPLANS

2x LIG
1 BHK
28m²

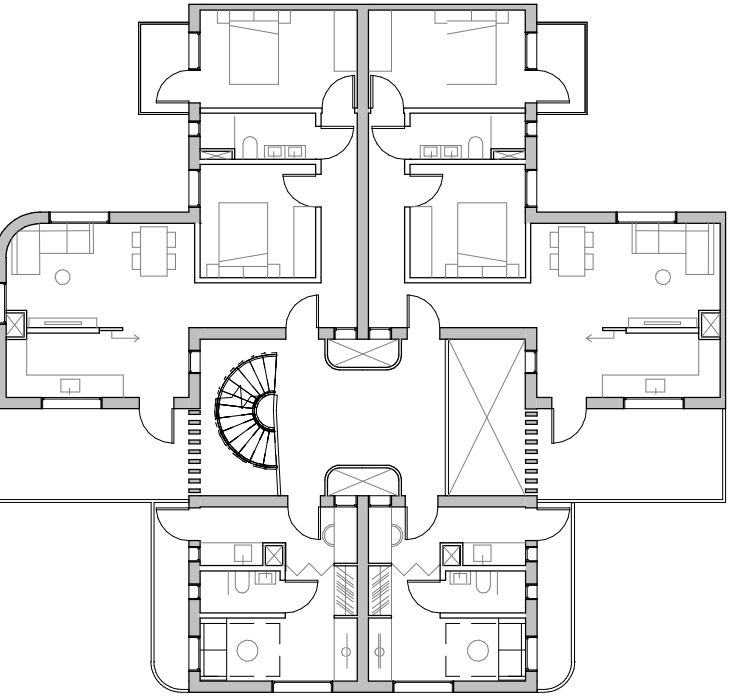
2x LIG
1 BHK
35m²



Third floor

2x LIG
1 BHK
28m²

2x MIG
2 BHK
63m²



Second floor

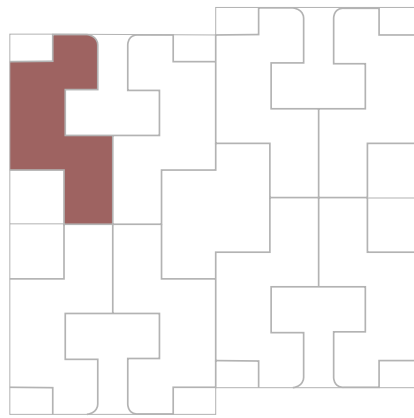




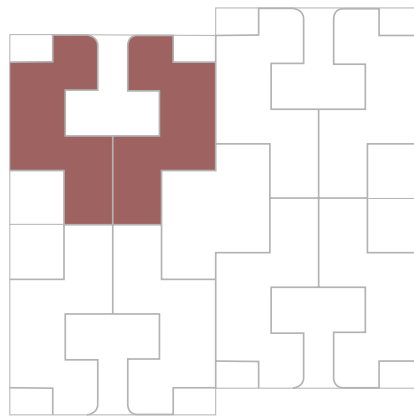
Shelter module

THE MULTIPLICATION OF THE 1/2 UNIT

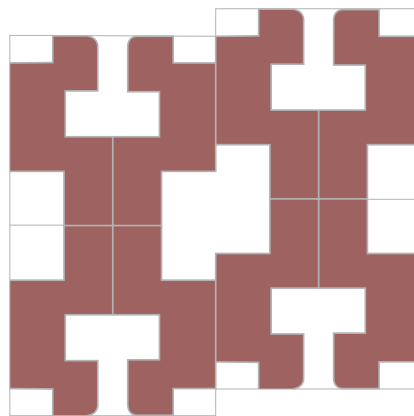
Building new cycles



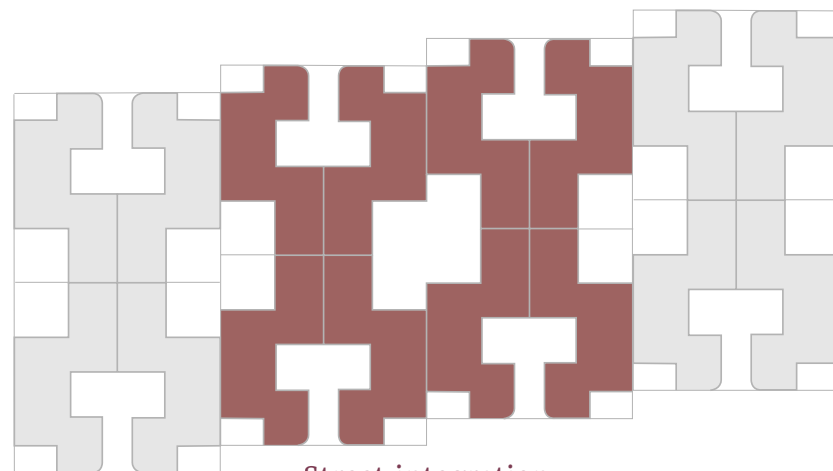
1/2 Unit



1 Unit



Cluster



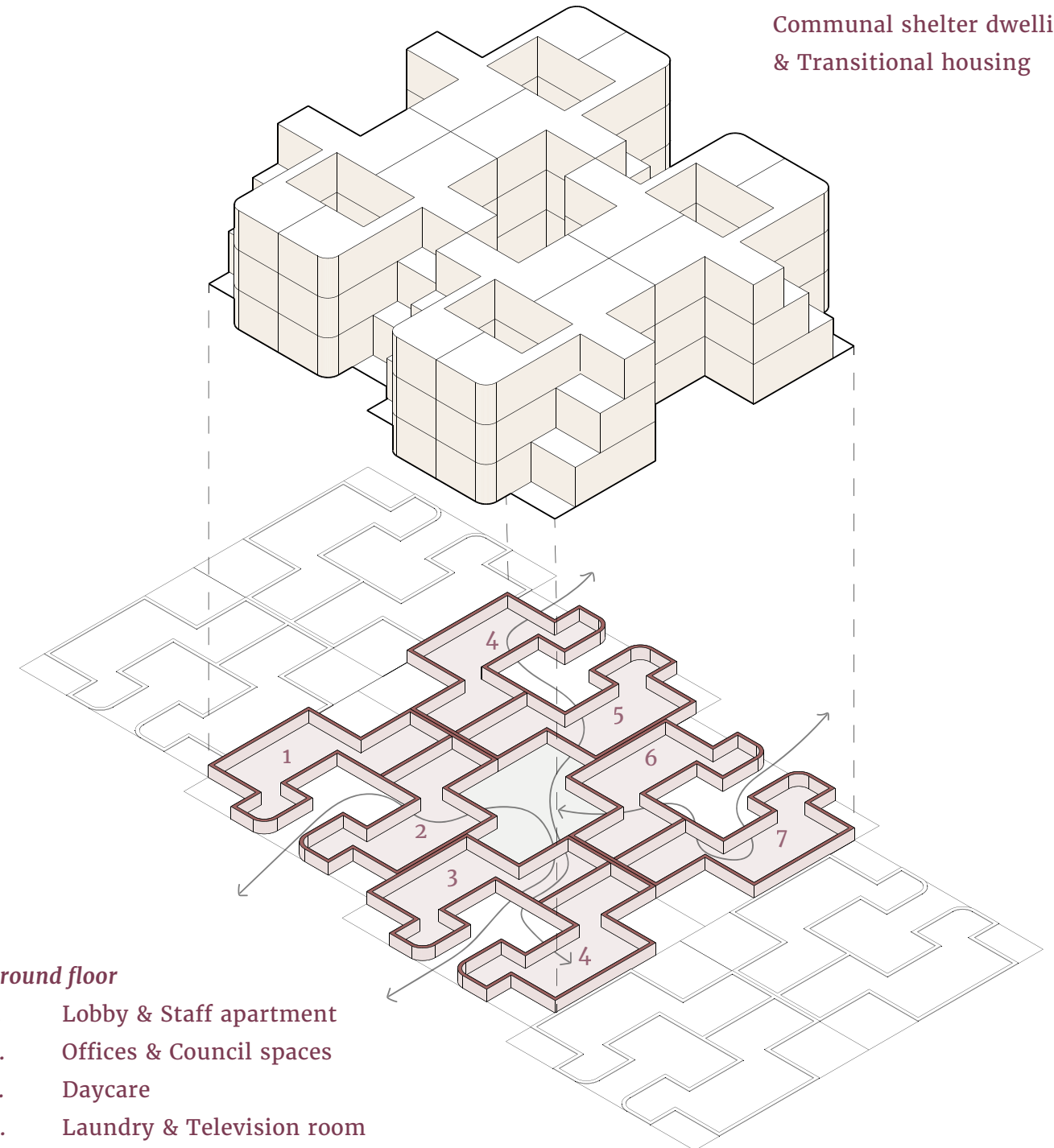
Street integration

x2

x4

-0111

First floor, Second floor, Third floor
Communal shelter dwellings
& Transitional housing



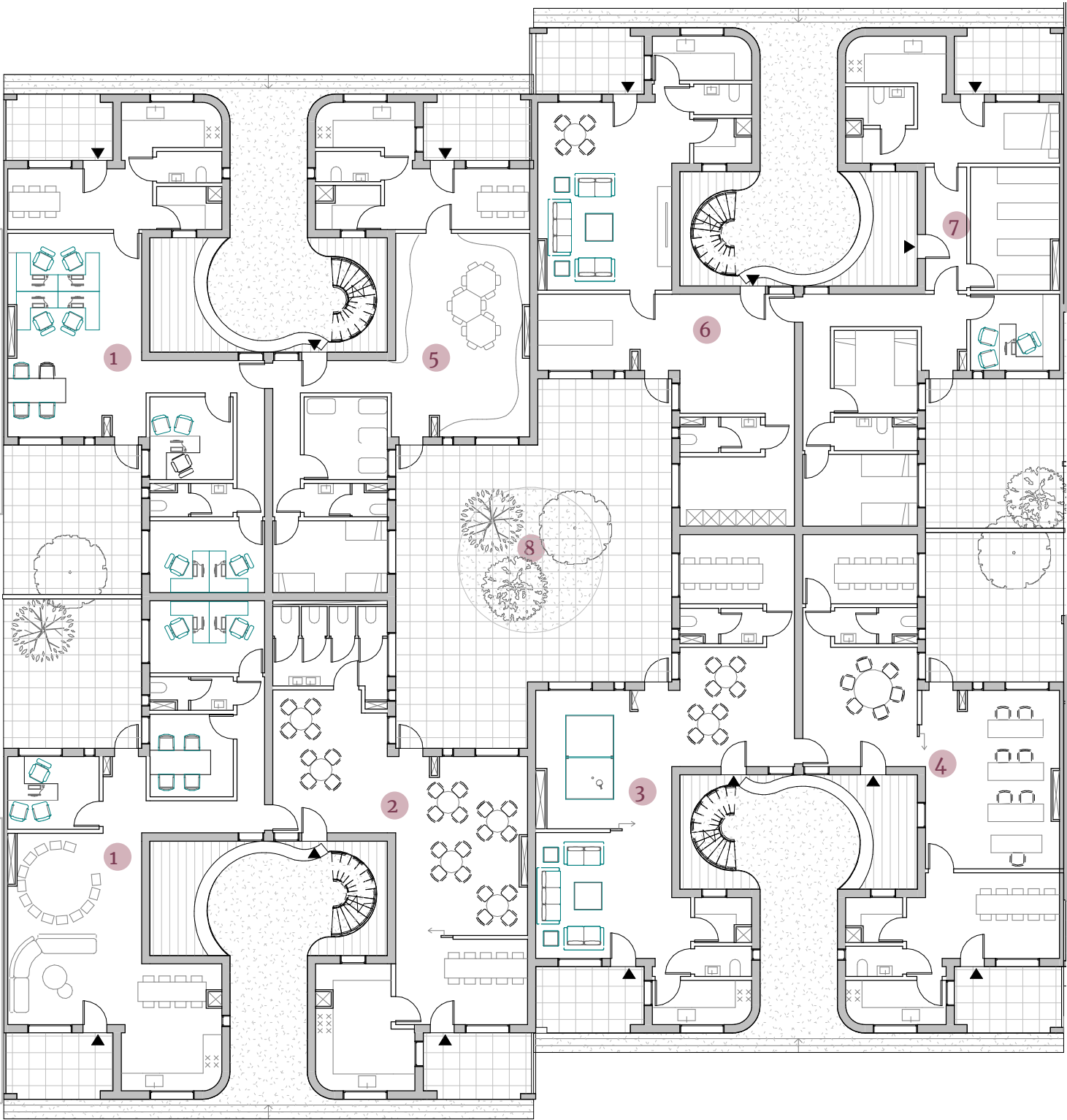
Ground floor

1. Lobby & Staff apartment
2. Offices & Council spaces
3. Daycare
4. Laundry & Television room
5. Games and Activities
6. Dining hall & Council spaces
7. Multimedia room & Class rooms



Ground floor

- 1. Offices & Council spaces
- 2. Dining hall
- 3. Games and Activities
- 4. Multimedia room & Class rooms
- 5. Daycare
- 6. Laundry & Television room
- 7. Lobby & Staff apartment
- 8. Private courtyard

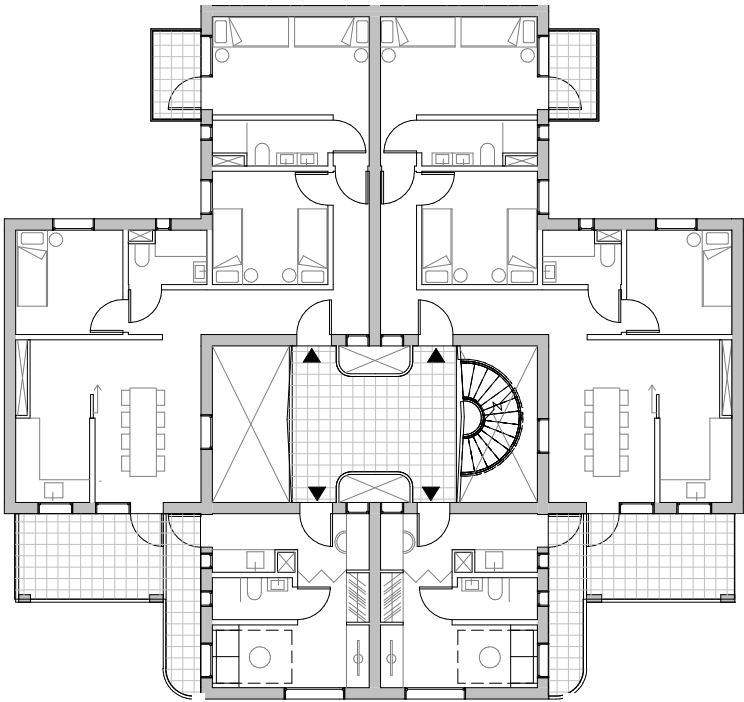


TYPICAL FLOORPLANS

TYPICAL FLOORPLANS

1x MIG
2 BHK
60m²

2x MIG
3 BHK
82m²

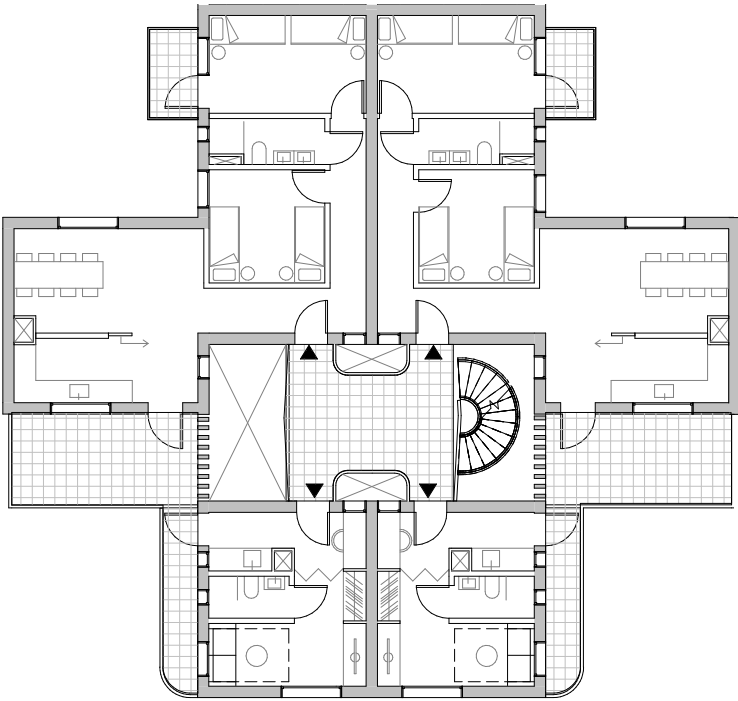


First floor



2x LIG
1 BHK
28m²

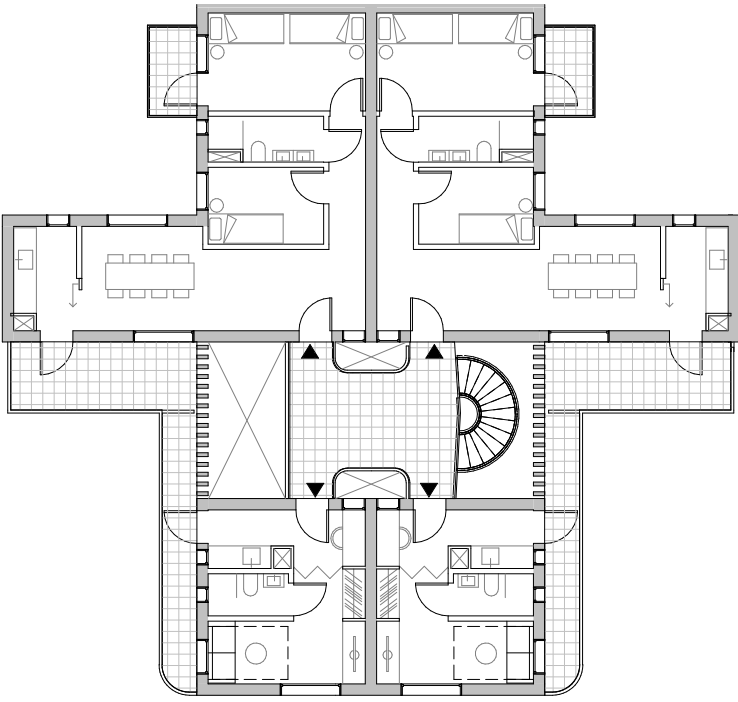
2x LIG
1 BHK
35m²



Third floor

2x LIG
1 BHK
28m²

2x MIG
2 BHK
63m²

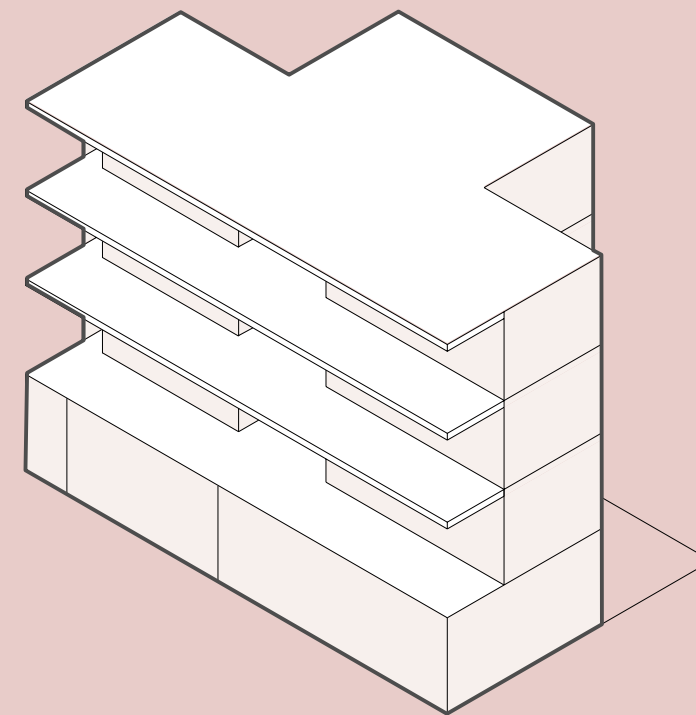


Second floor





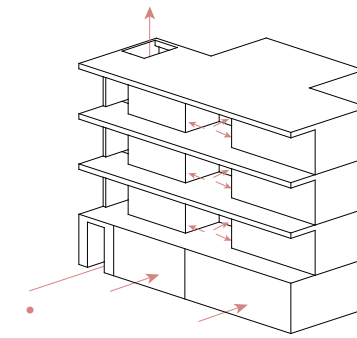
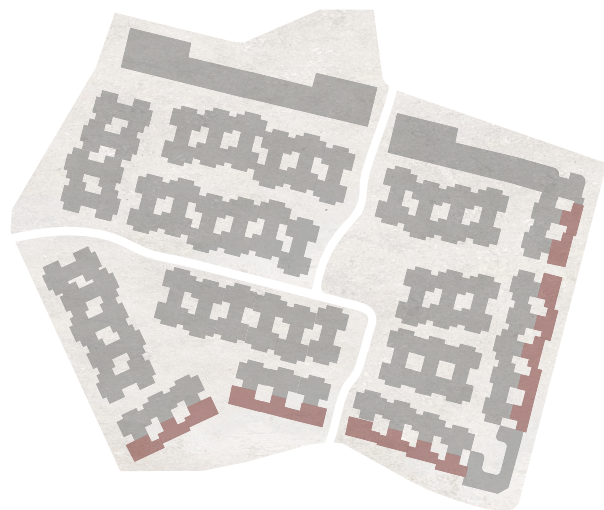
GALLERY TYPOLOGY



- Transitional dwellings
- Corner dwellings
- Commercial space

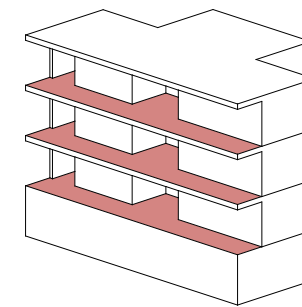
Gallery

The gallery typology is one of the three border solutions. With the commercial space in the plinth and the transitional housing on top, the building creates a multi functional solution for a street.



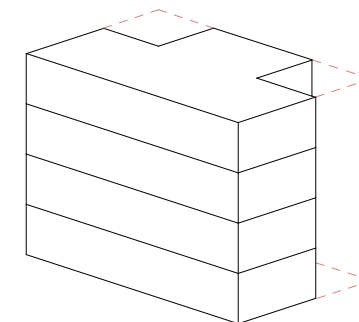
Circulation

Trough the covered and secure stairwell, the floors can be accessed.



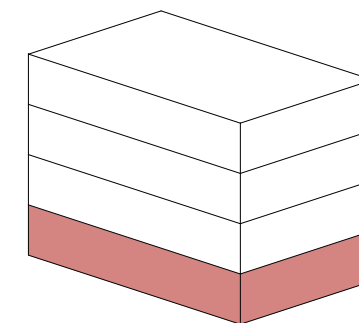
Covered outside space

The circulation gallery will be extra wide to serve as a functional front yard, in addition a communal elevated front yard will serve as the place to enter the dwellings.



Shaping

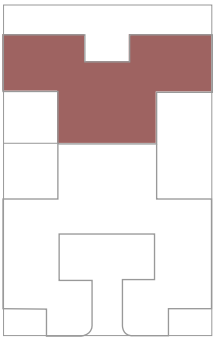
Shaping the mass allows for more cross ventilation in the dwellings. As well as the possibility to place it back to back with the Urban villa typology.



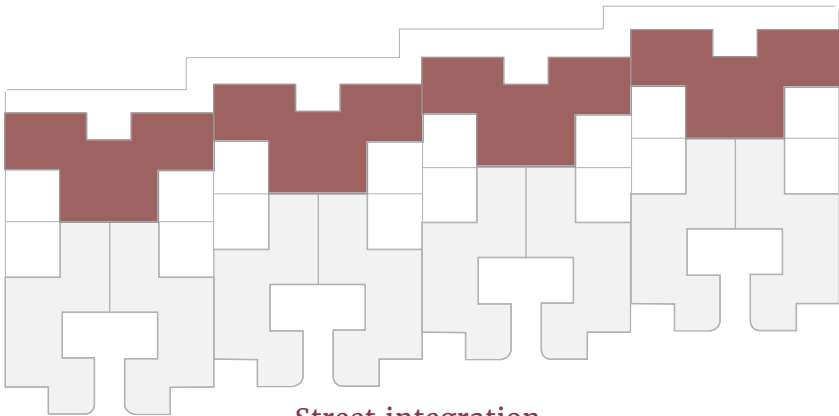
Function separation

Small commercial spaces will occupy the ground floor, while the upper floors will serve as communal transitional housing.

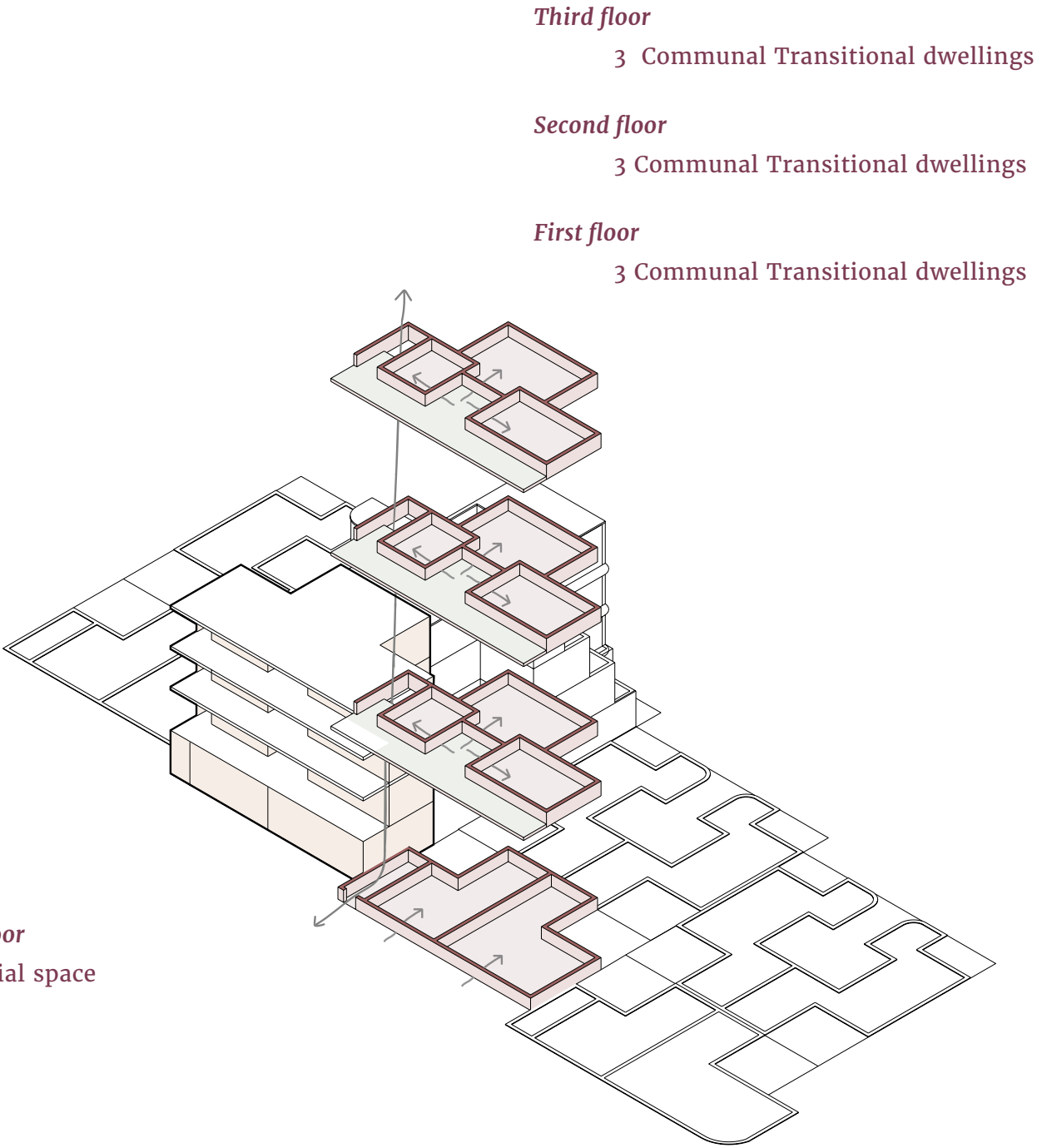
Gallery module
THE MULTIPLICATION OF THE 1/2 UNIT



1 Unit



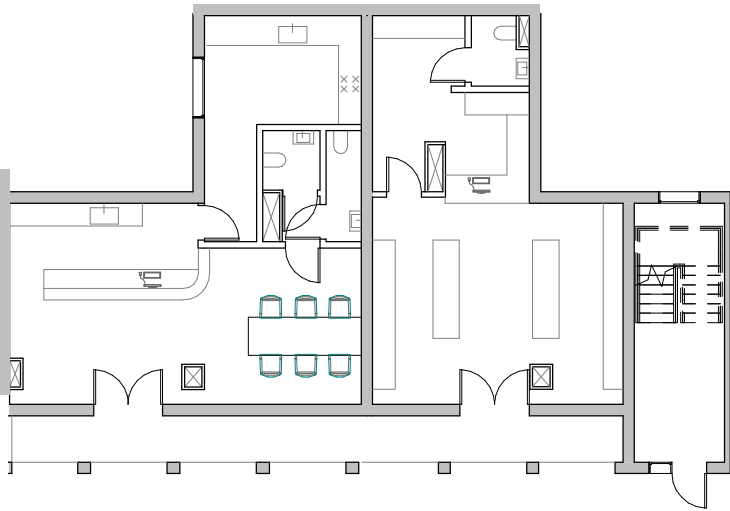
Street integration



Basic module

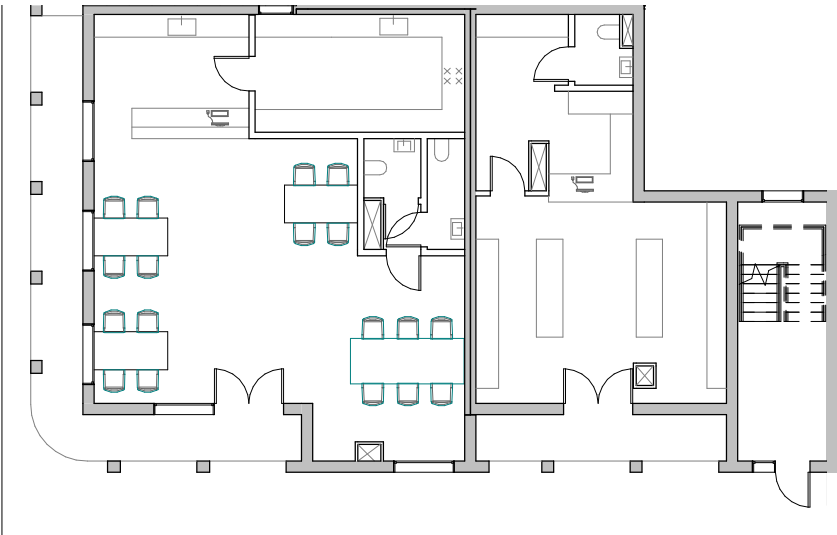
Corner module

2x Commerical
space
75m²



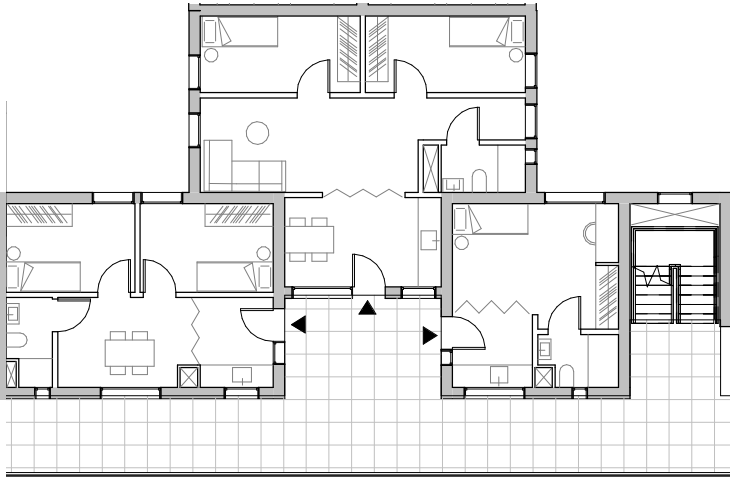
Ground floor

2x Commerical
space
100m²



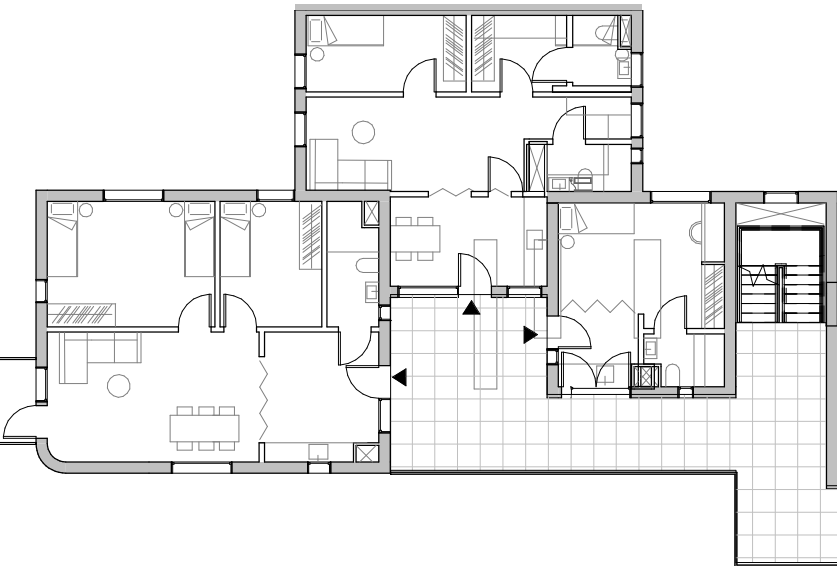
Ground floor

1x Transitional
dwelling
2 BHK
32m²



First floor

1x Transitional
dwelling
2 BHK
32m²



First floor

1x Transitional
dwelling
2 BHK
49m²

1x Transitional
dwelling
Studio
21m²



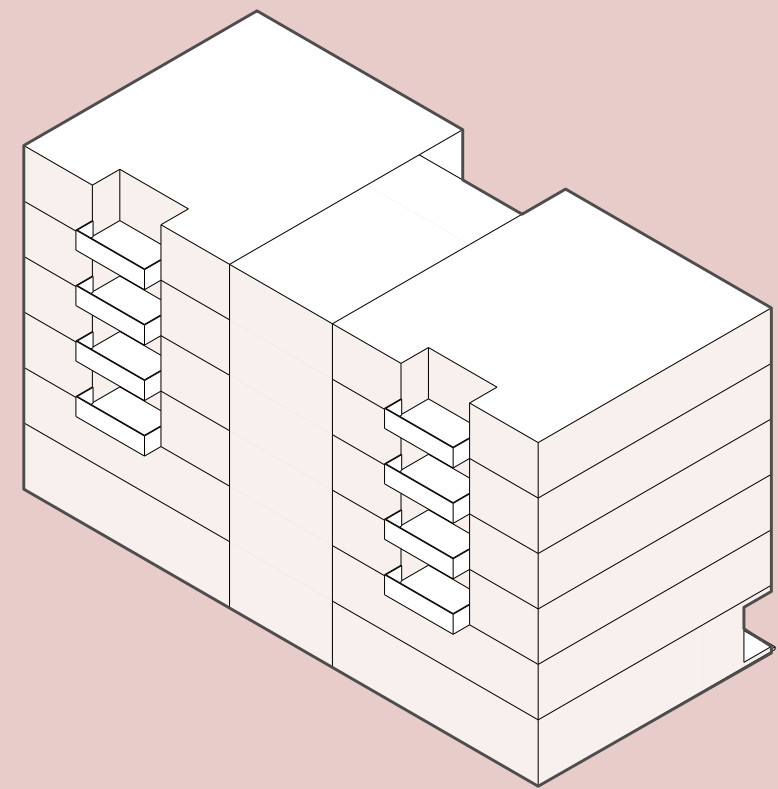
1x Transitional
dwelling
2 BHK
59m²

1x Transitional
dwelling
Studio
21m²





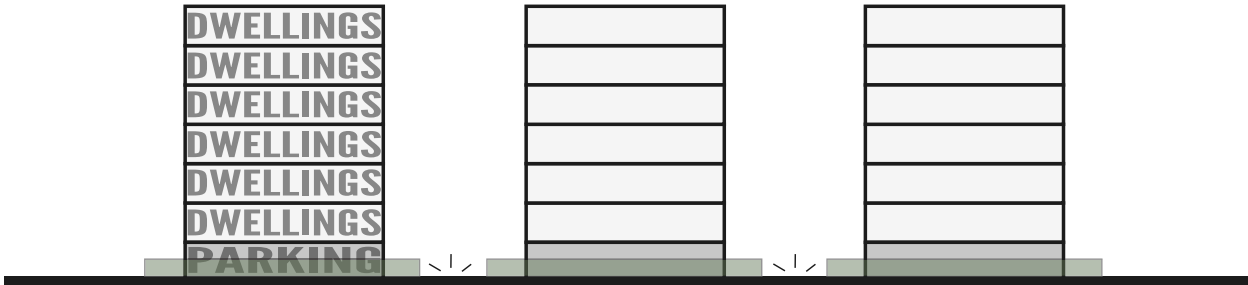
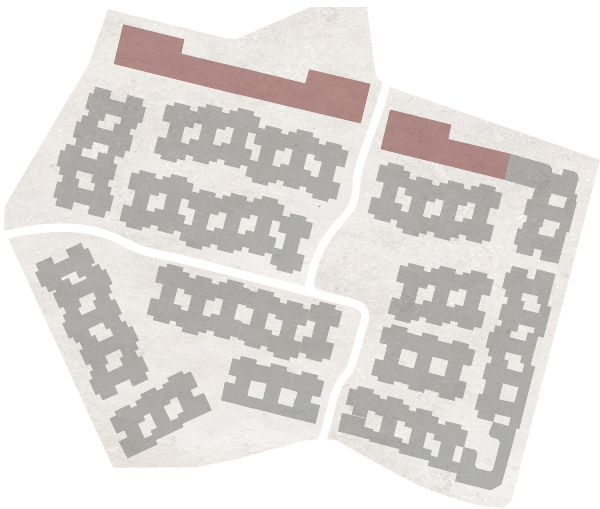
TOWER TYPOLOGY



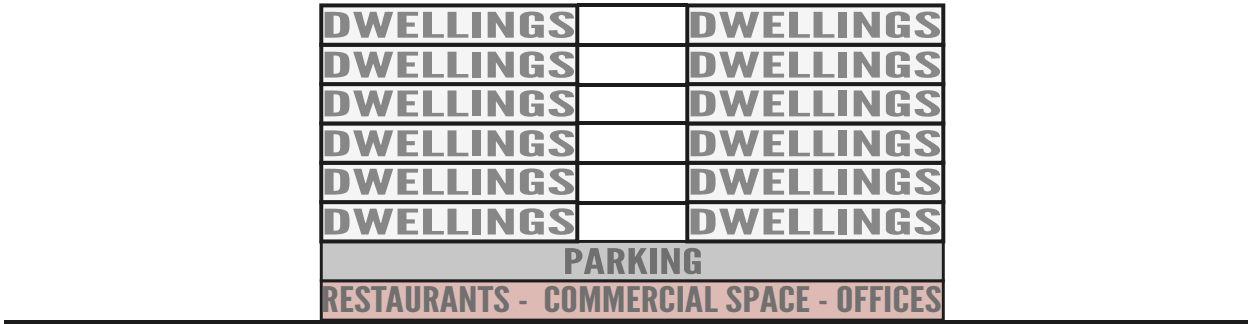
- HIG dwellings
- Commercial space

Tower

The current situation in India for High Income group towers provides unsafe spaces regarding the plinth by placing the parking on the ground floor and the dwellings on top of it. As a responds to this, the tower design places the parking spaces on the first floor which ensures free space in the plinth. This is used for commercial space and studio dwellings.

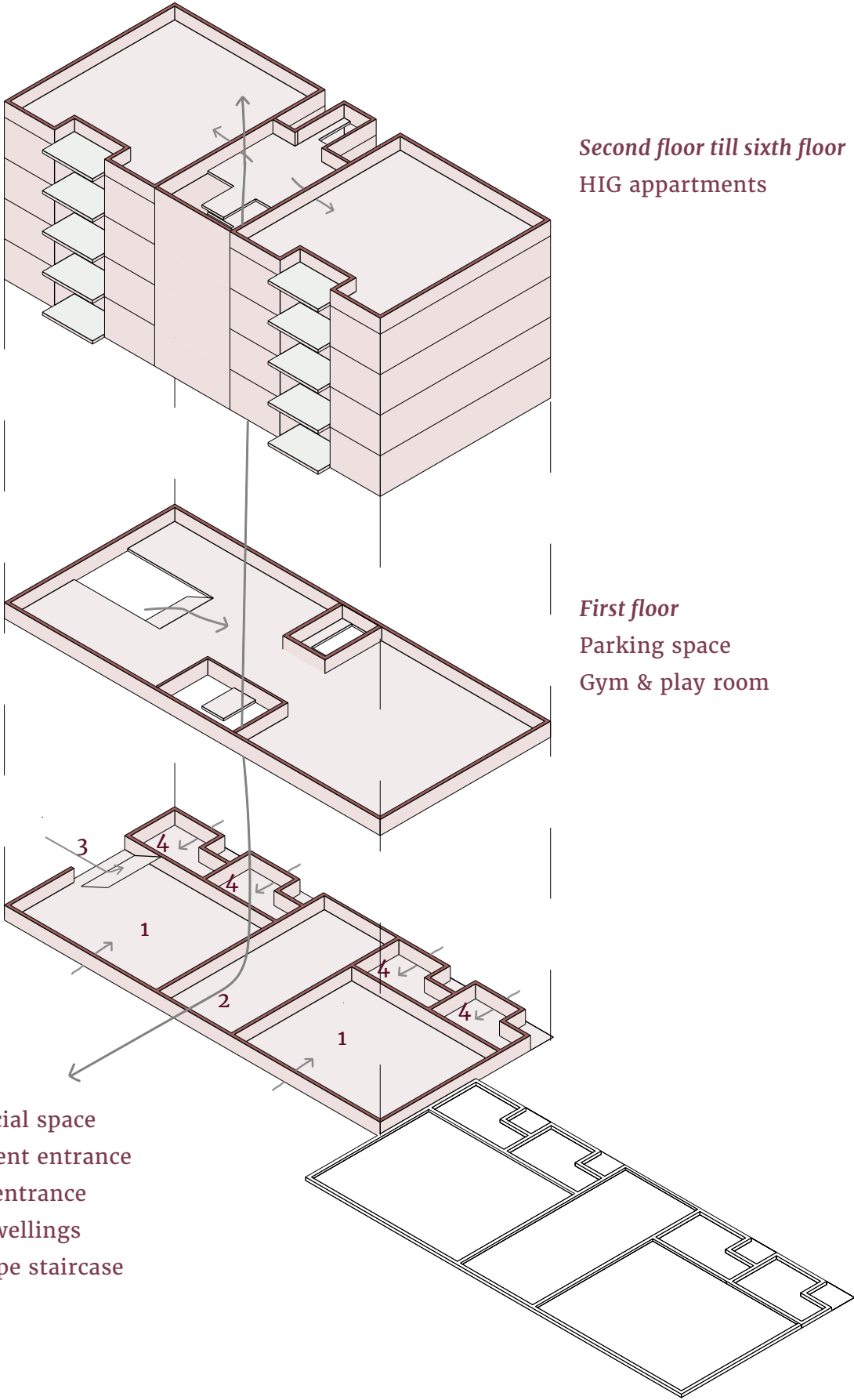
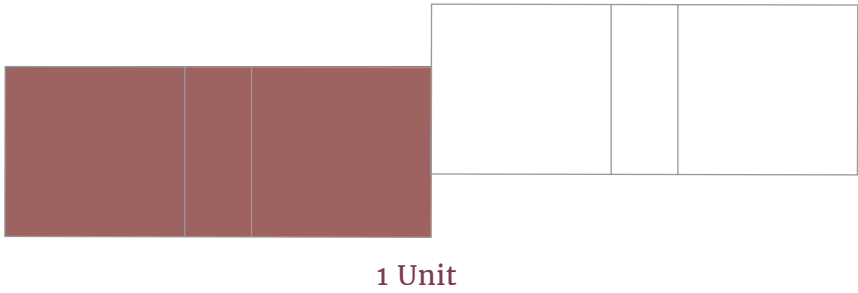


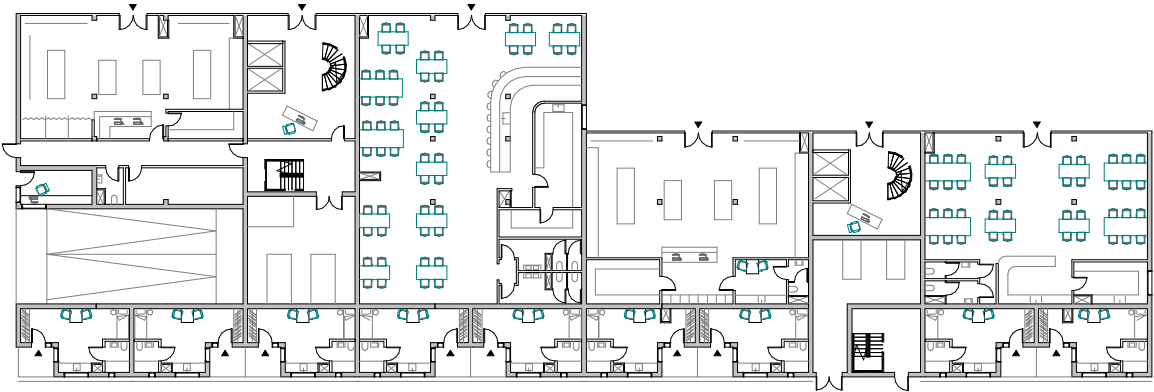
CURRENT SITUATION
PRIVATE CLOSED BORDERS WITH PARKING SPACES IN THE PLINTH
UNSAFE STREET CONDITIONS WITH NO SOCIAL CONTROLE OR FUNCTIONS IN THE PLINTH



NEW SITUATION

Gallery module
THE MULTIPLICATION OF THE 1/2 UNIT

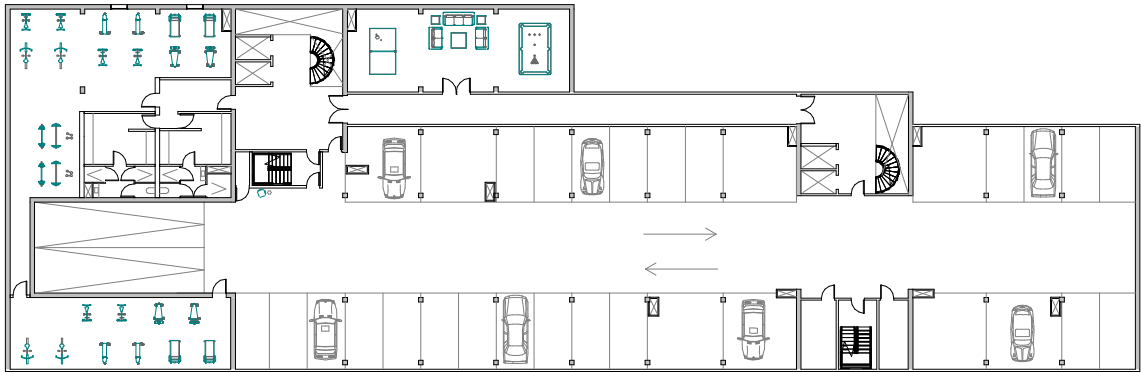




Ground floor

- 3x Commercial space
150m²

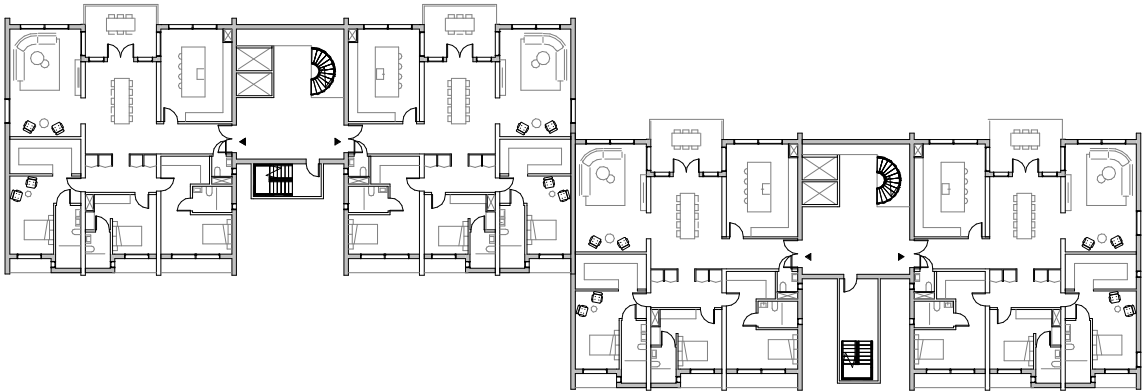
1x Commercial space
230m²
- 9x LIG
0 BHK
20m²



First floor

- 1x Gym
150m²

1x Play and game room
75m²
- 33 Parkingspaces
Valet, carcleaning and
securty office

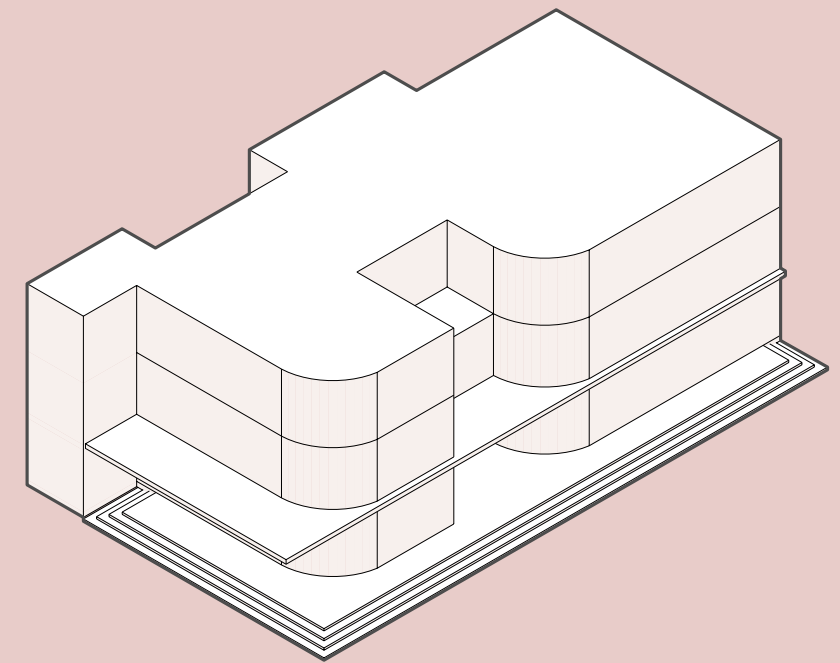


Second floor and up

- 2x HIG
3 BHK
200m²

2x HIG
3 BHK
200m²

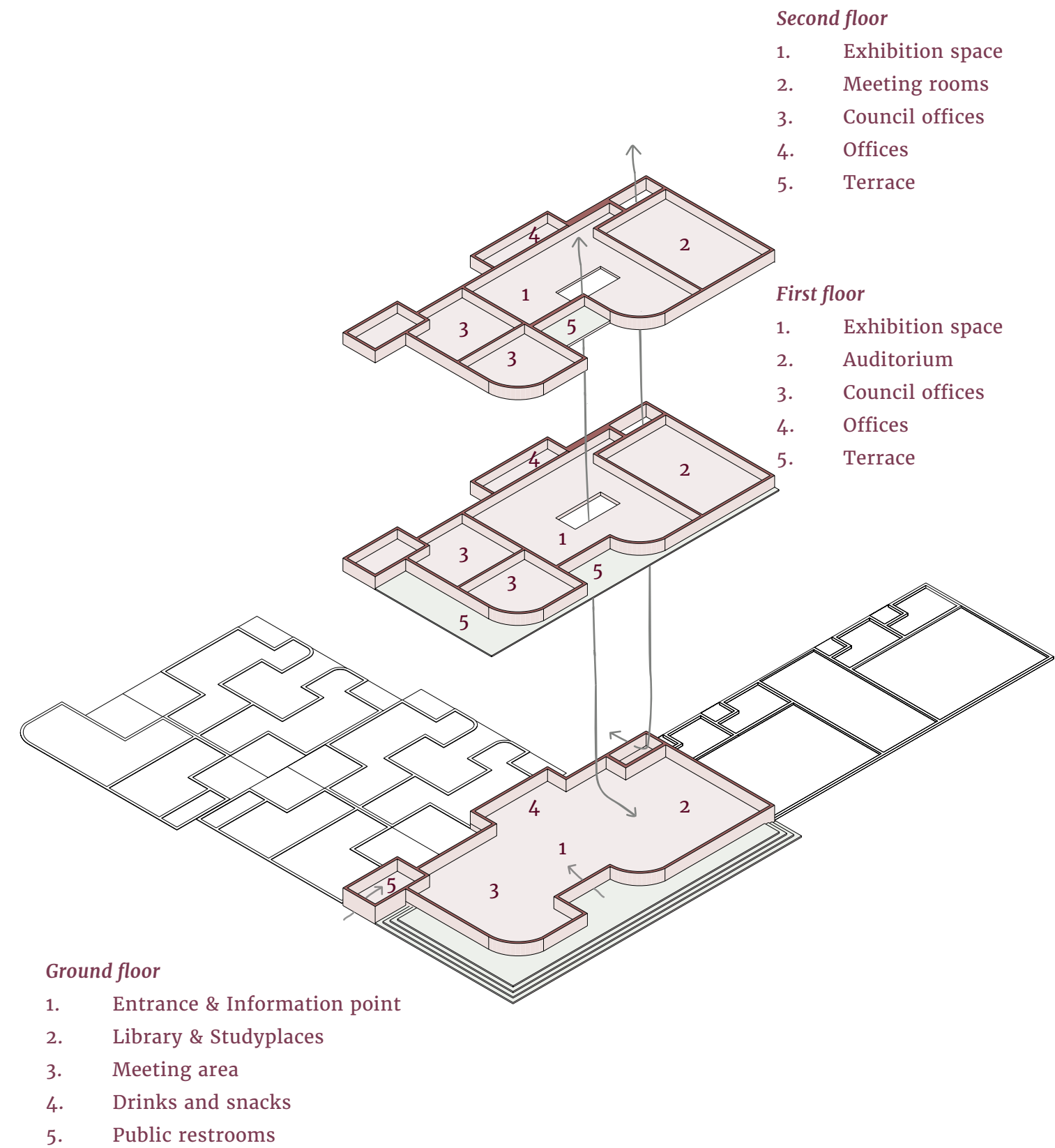
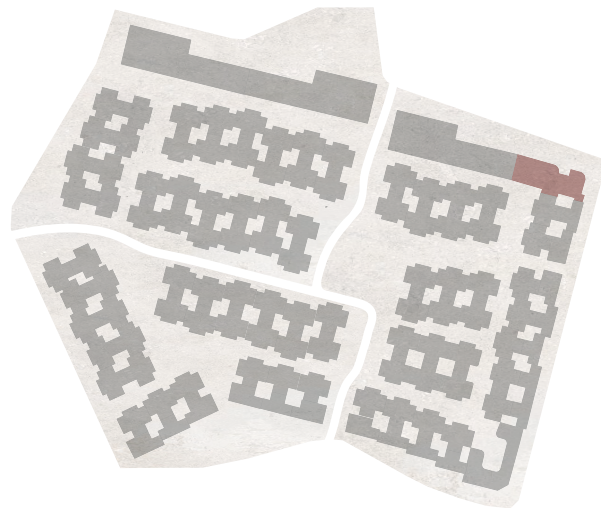
PUBLIC BUILDING TYPOLOGY

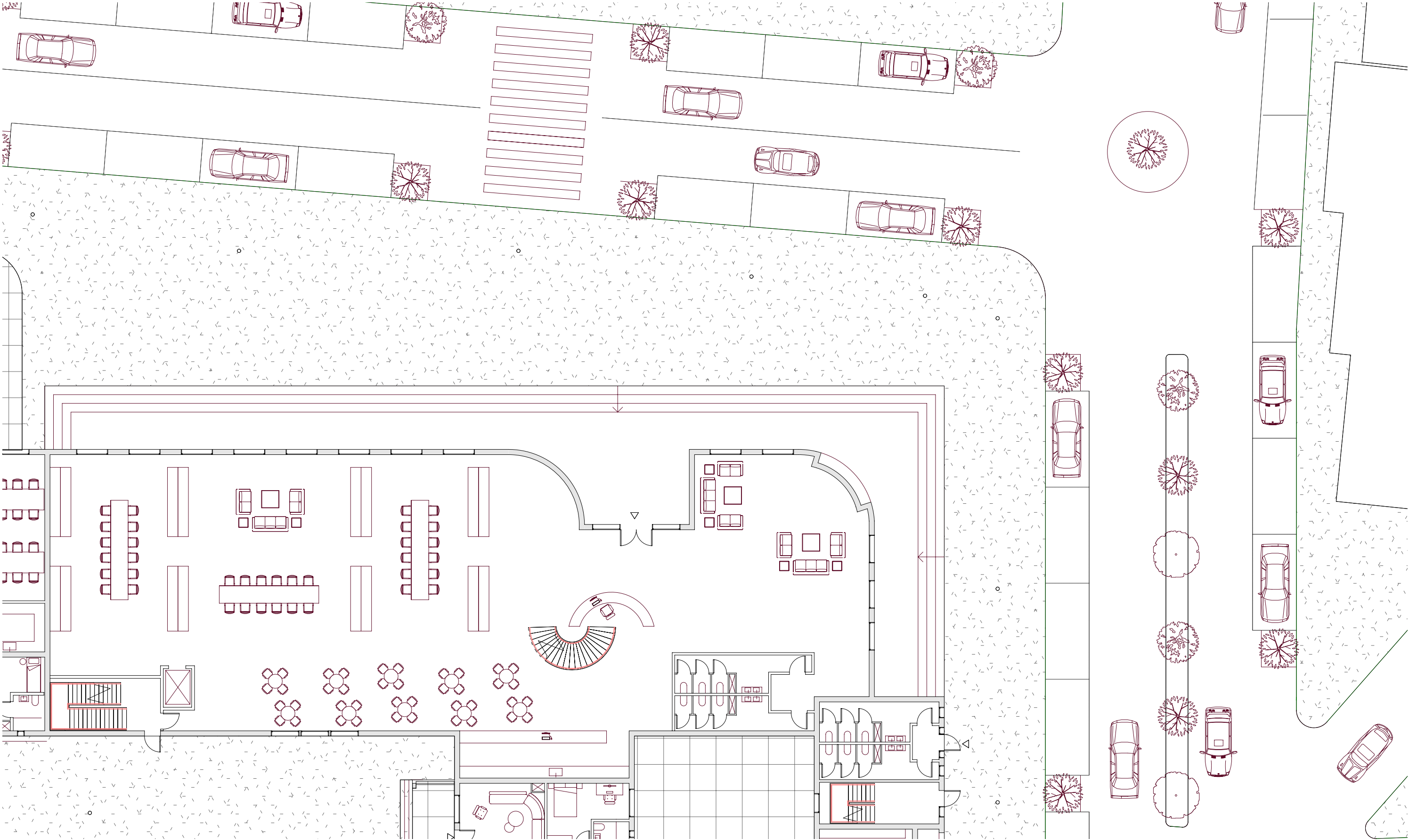


- Community centre
- Prevention centre

Public building

Prevention is one of the main topics of the concept. In addition to being a community center, the public building would serve as a prevention center for the whole neighborhood.





Ground floor

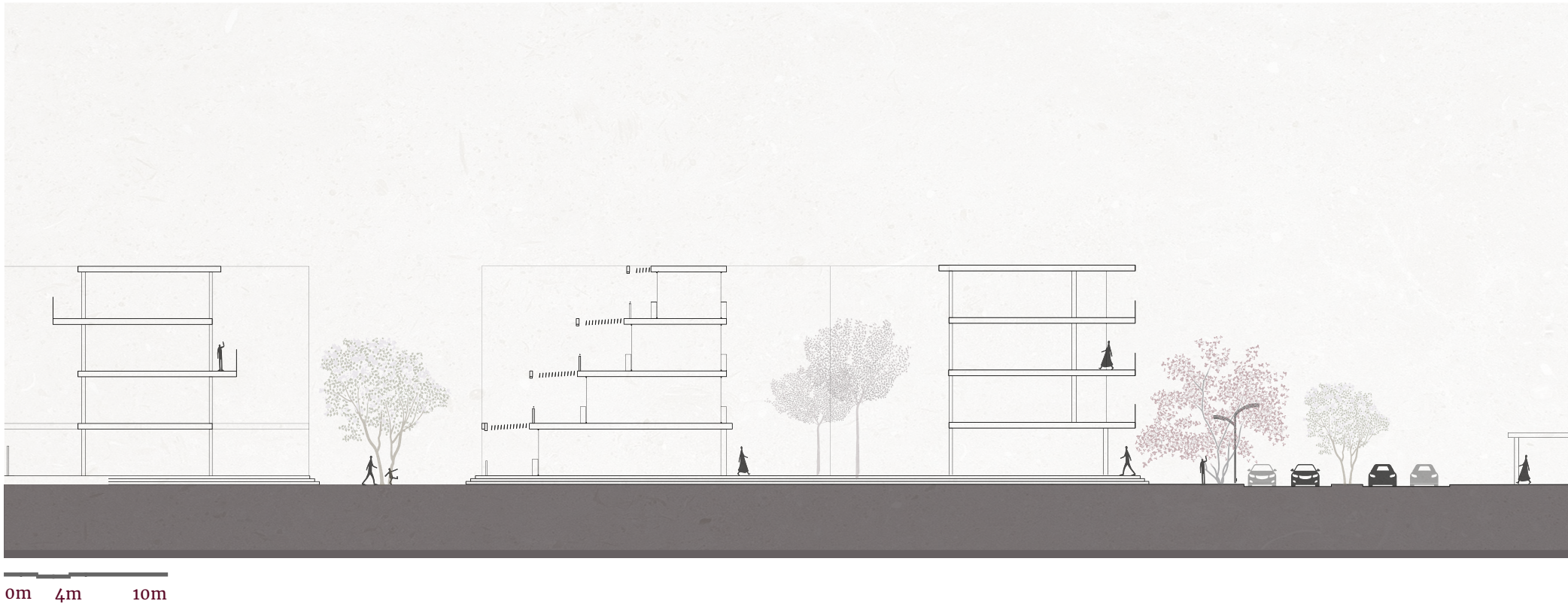
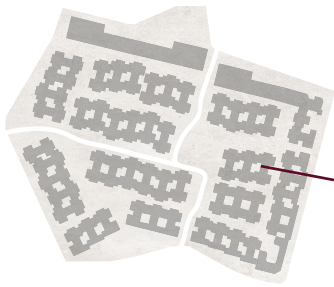
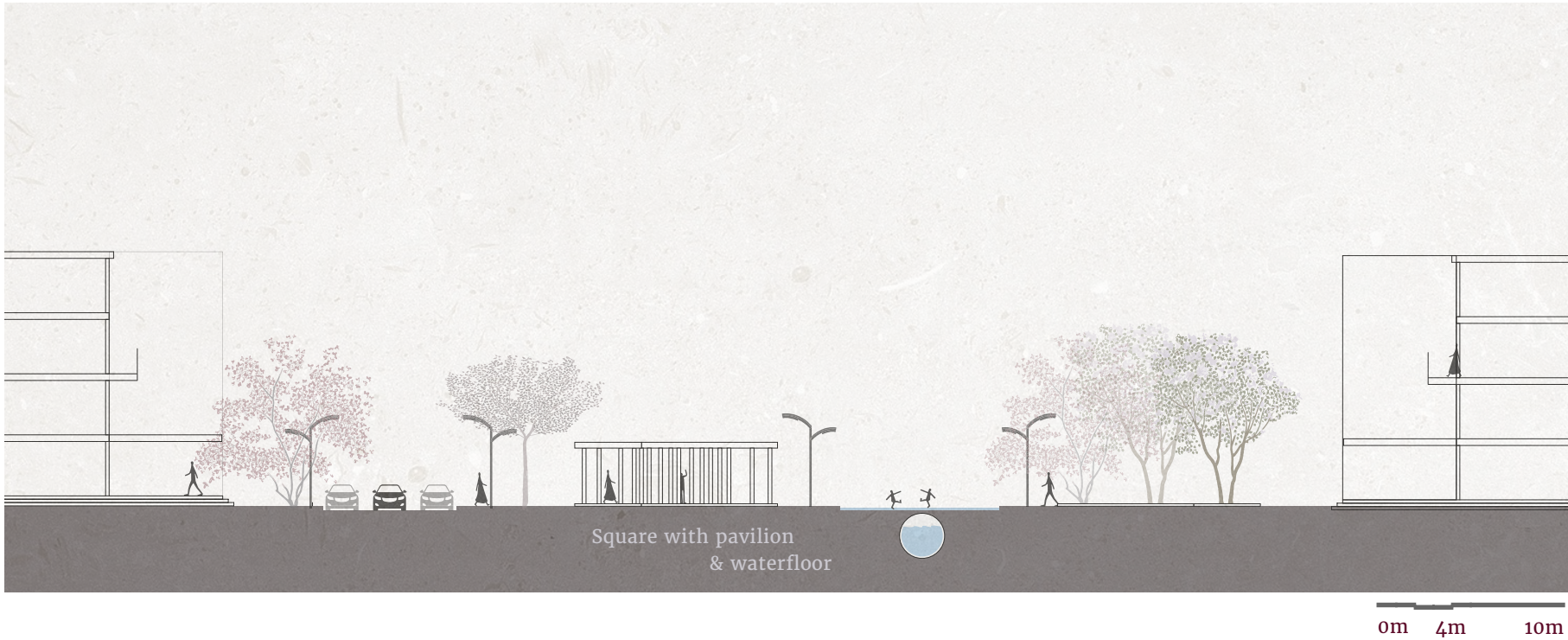
500 m²



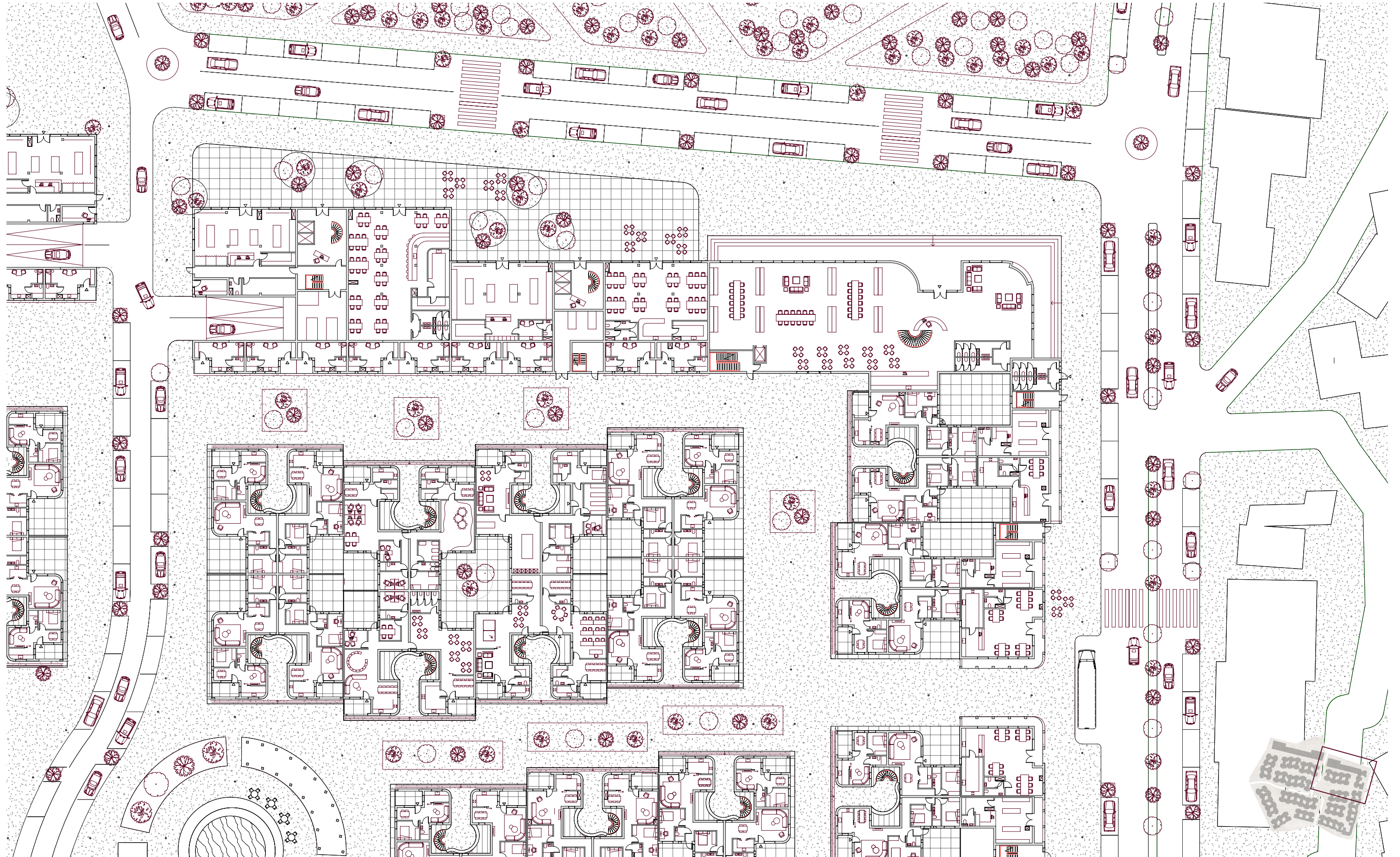
Urban section



Urban section

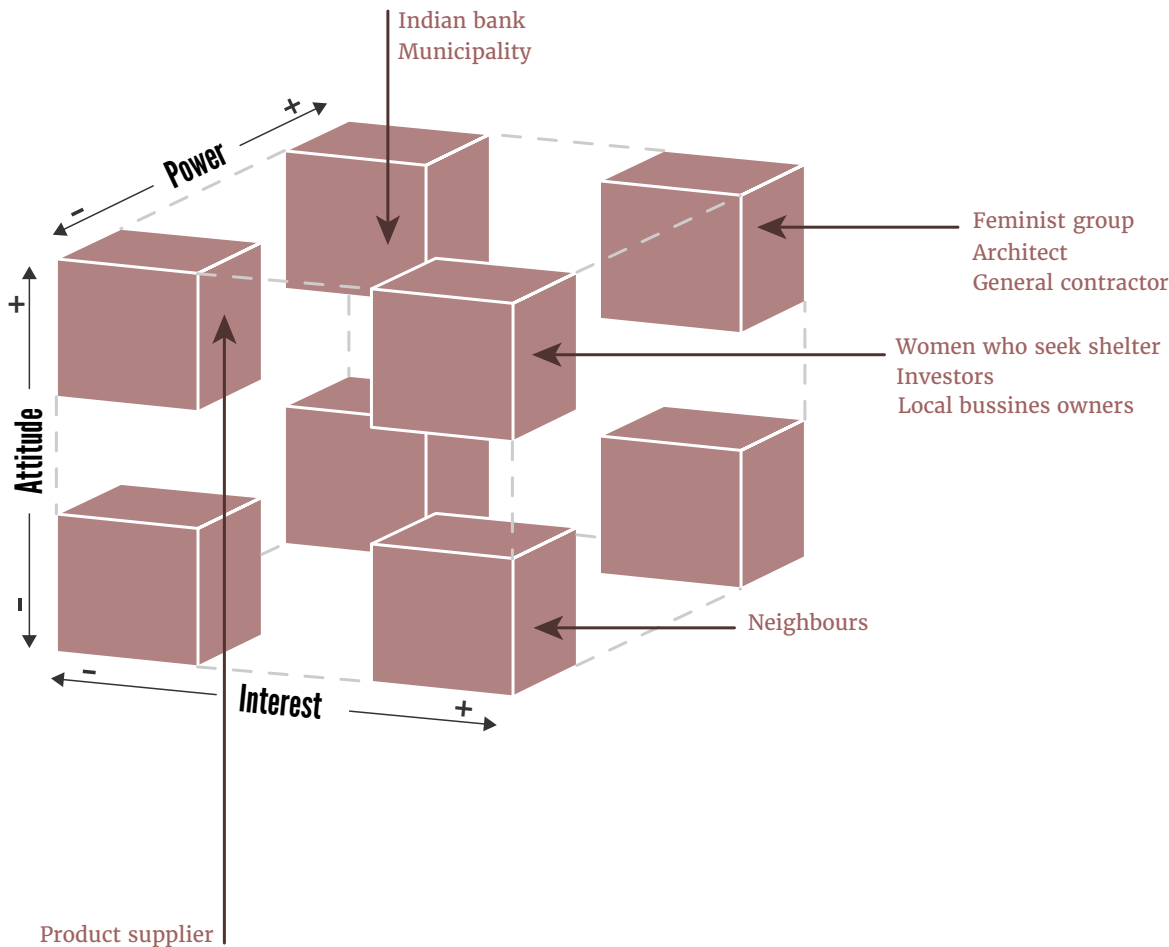
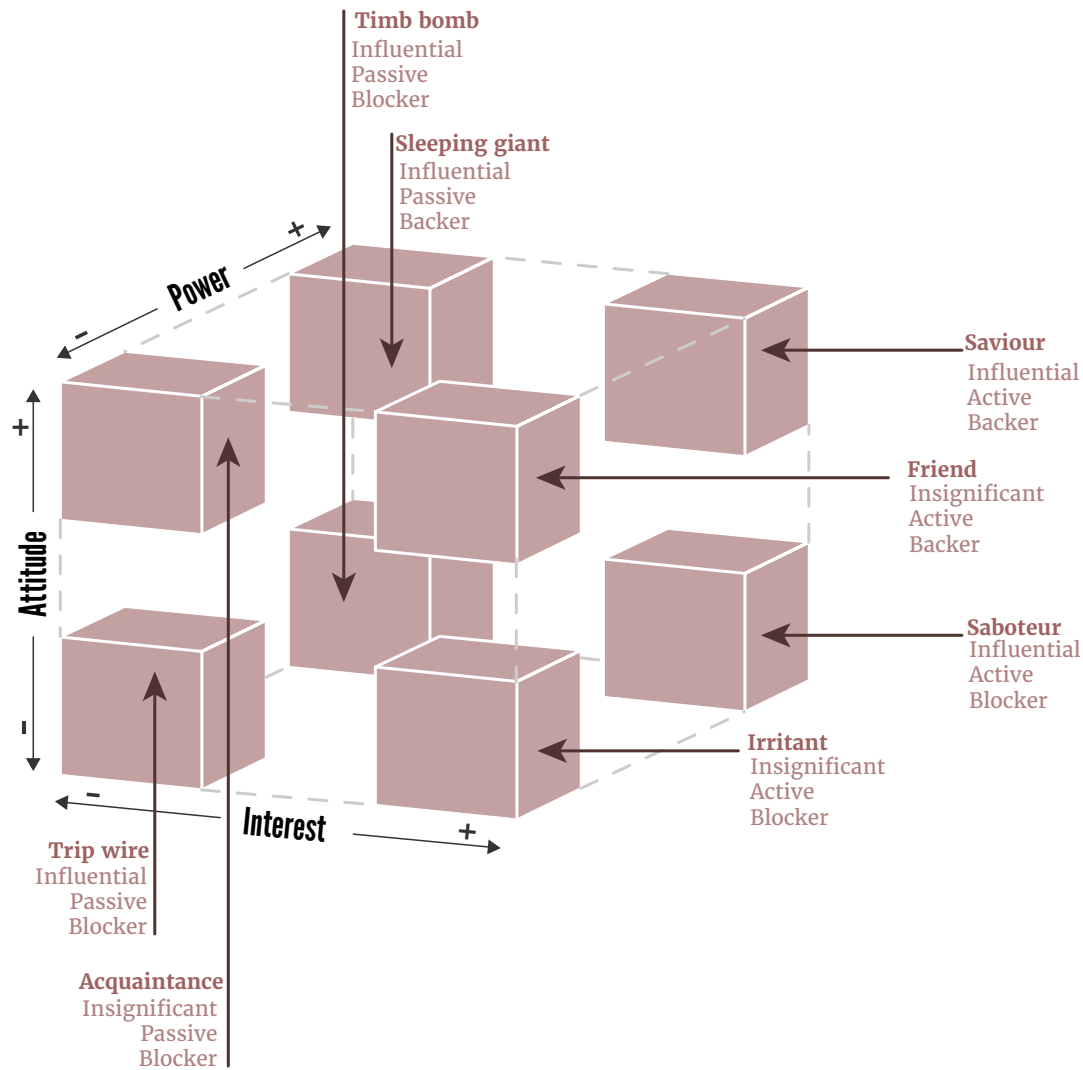


Street life



Maneagerial strategy

Stakeholder analysis



NGO'S



SNEHA is an organization in Mumbai that supports women through all stages of their lives. Fighting domestic violence is the key to improving women's health and ending cyclical poverty. Their goal is to prevent violence against women and to remove the stigma associated with reporting it. Furthermore, they strive to ensure that government agencies, police, and health care officials are properly trained to deal with domestic violence (Sachdev, 2020).

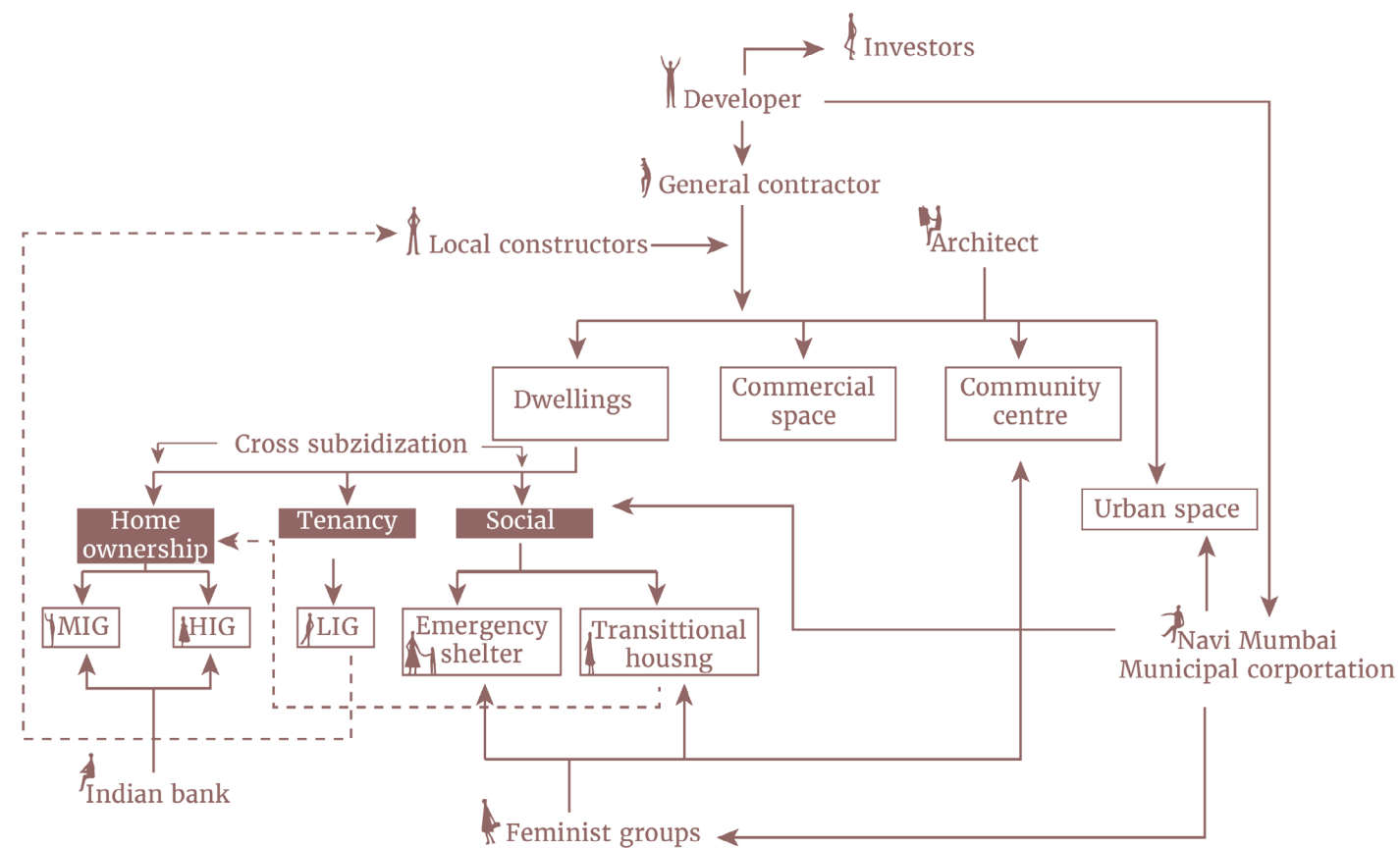


Founded in Mumbai, the Urja Trust aims to protect rights and rehabilitate young women in unfortunate circumstances. A shelter for women fleeing domestic violence or who are homeless. They are initially housed in a shelter home until they become economically independent, and then they are moved into group homes. The Foundation's non-formal education program teaches the basics of math and English to these girls, who are later enrolled in mainstream schools (Sachdev, 2020).

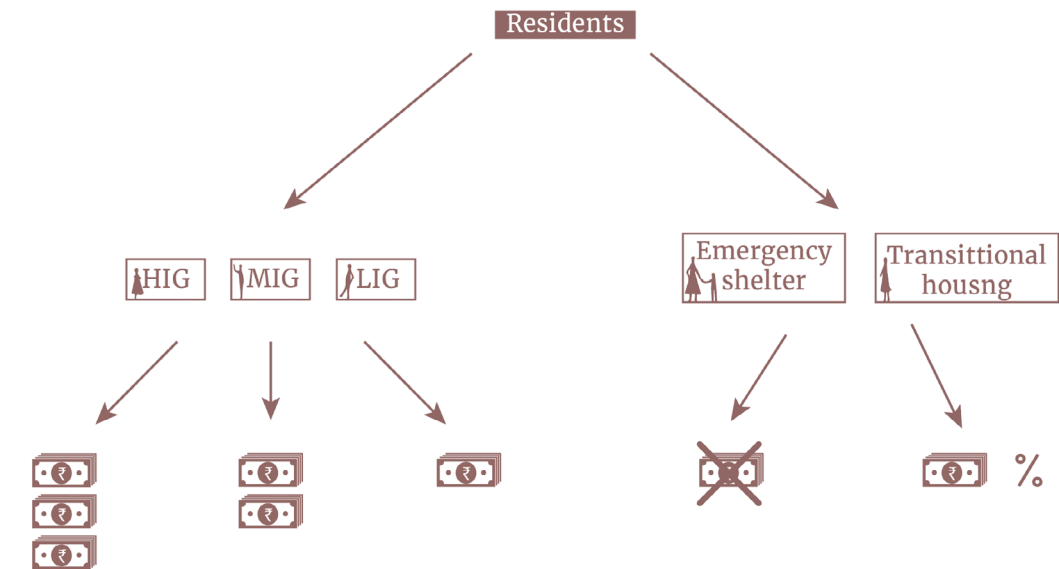


With Spark, thousands of households threatened with evictions/demolitions are equipped with the tools necessary to engage the city and the state to reach a permanent housing solution. In addition to providing individual and community toilets, the Alliance supports Indian communities by implementing a wide range of solutions that improve quality of life (Sparc, 2022).

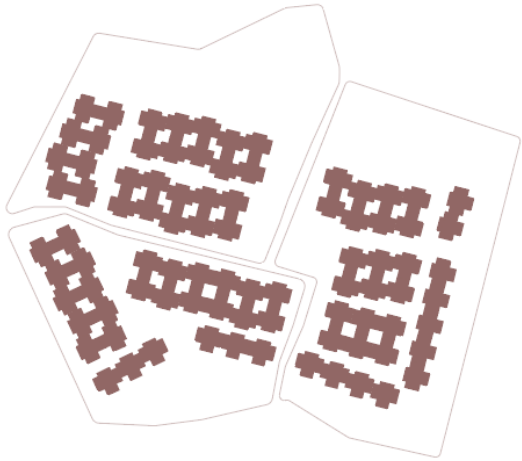
Stakeholder relationships



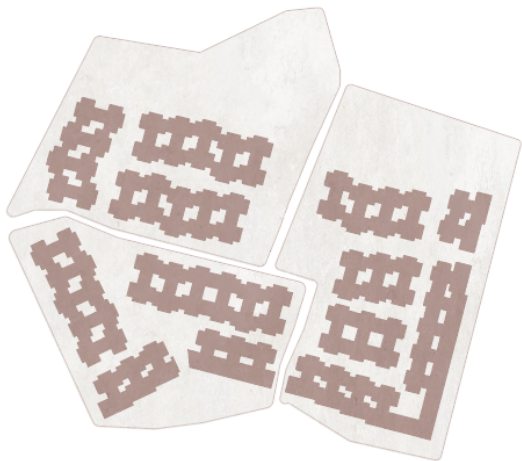
Finanziation



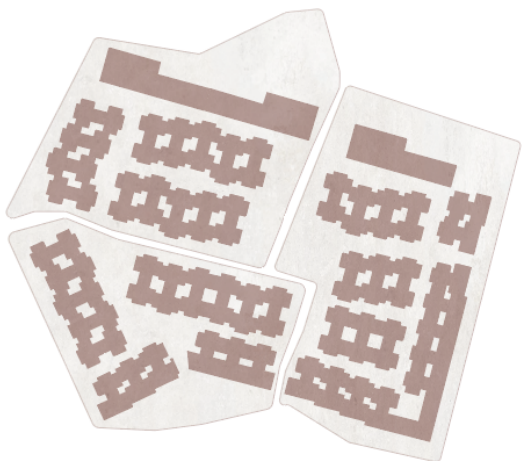
Construction phasing



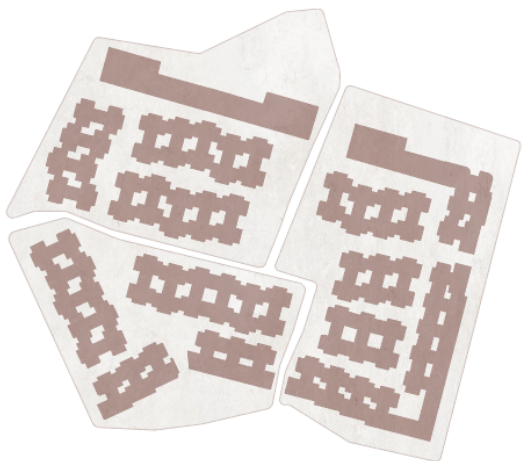
1. The construction of the Urban villa typologie.



2. In this fase the construction of the gallery typology leads for commercial space in the plinth together, as well as with the completion of the urban infrastructure within the neighborhood.



3. In the third phase, the HIG with commercial space is added to the neighborhood.



4. Lastly the construction of the Community and prevention center.

URBAN VILLA
Home ownership
MIG 474 dwellings

URBAN VILLA
Tenancy / home ownerhsip
LIG 474 dwellings

URBAN VILLA
Shelter
Communal housing 160 dwellings

GALLERY
Transitional housing
Communal housing 126 dwellings

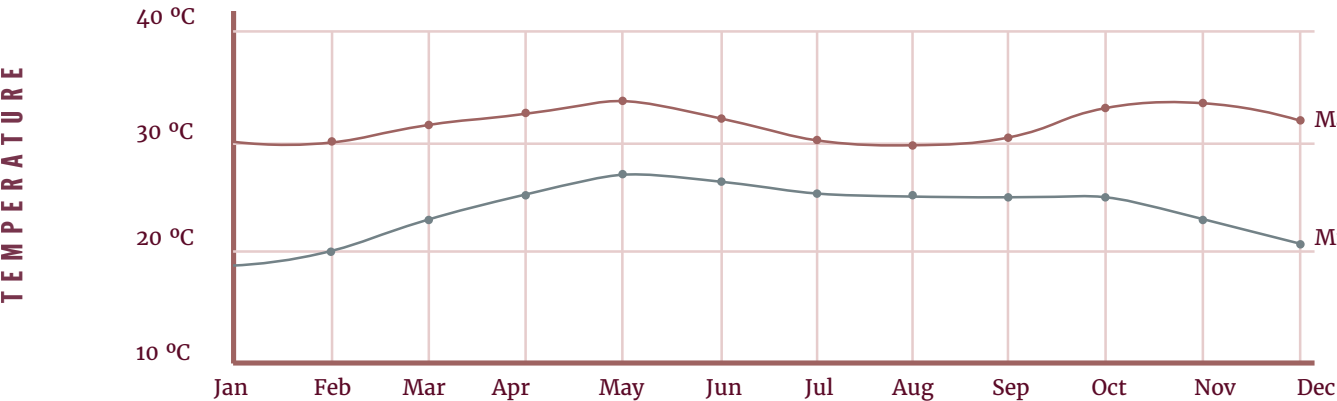
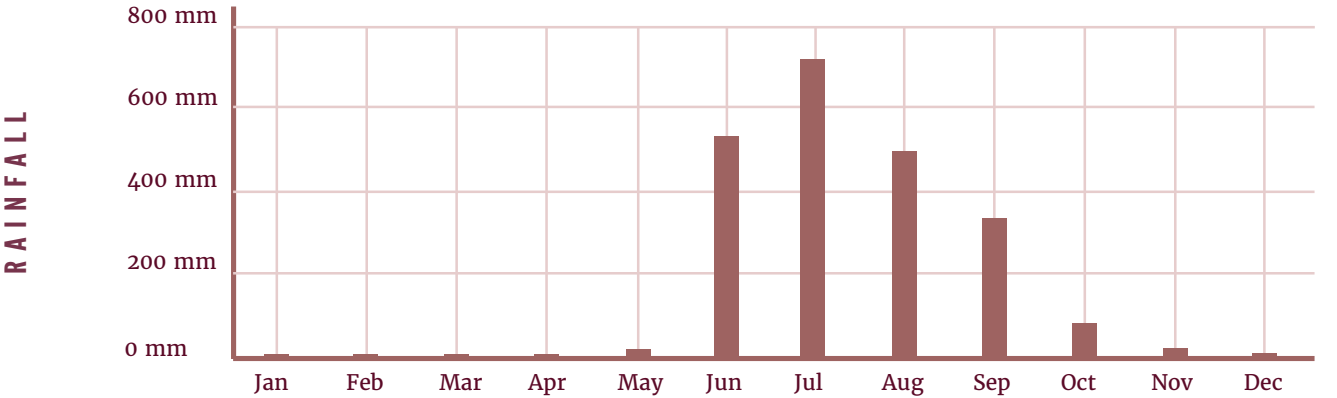
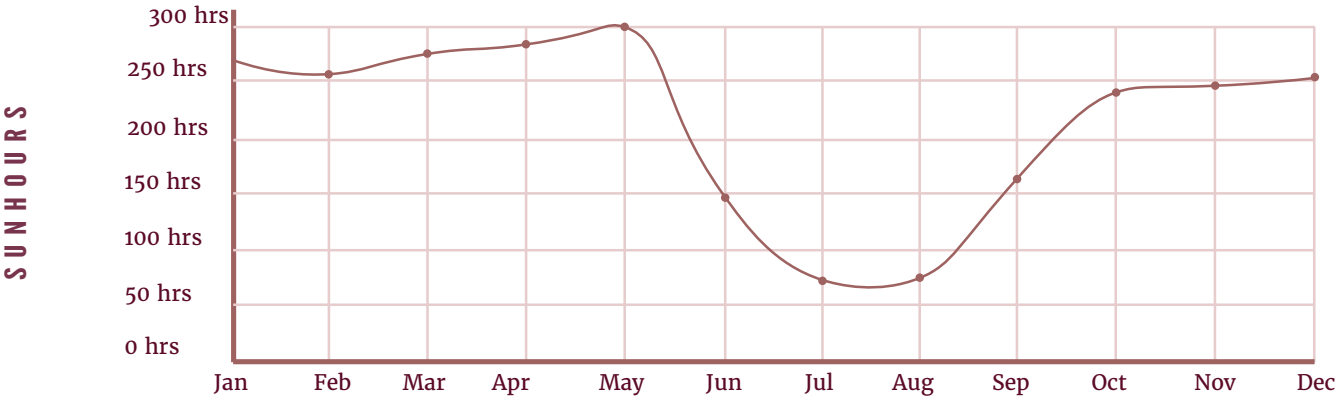
TOWER
Home owernship
HIG 72 dwellings

TOWER
Tenancy
LIG 27 dwellings

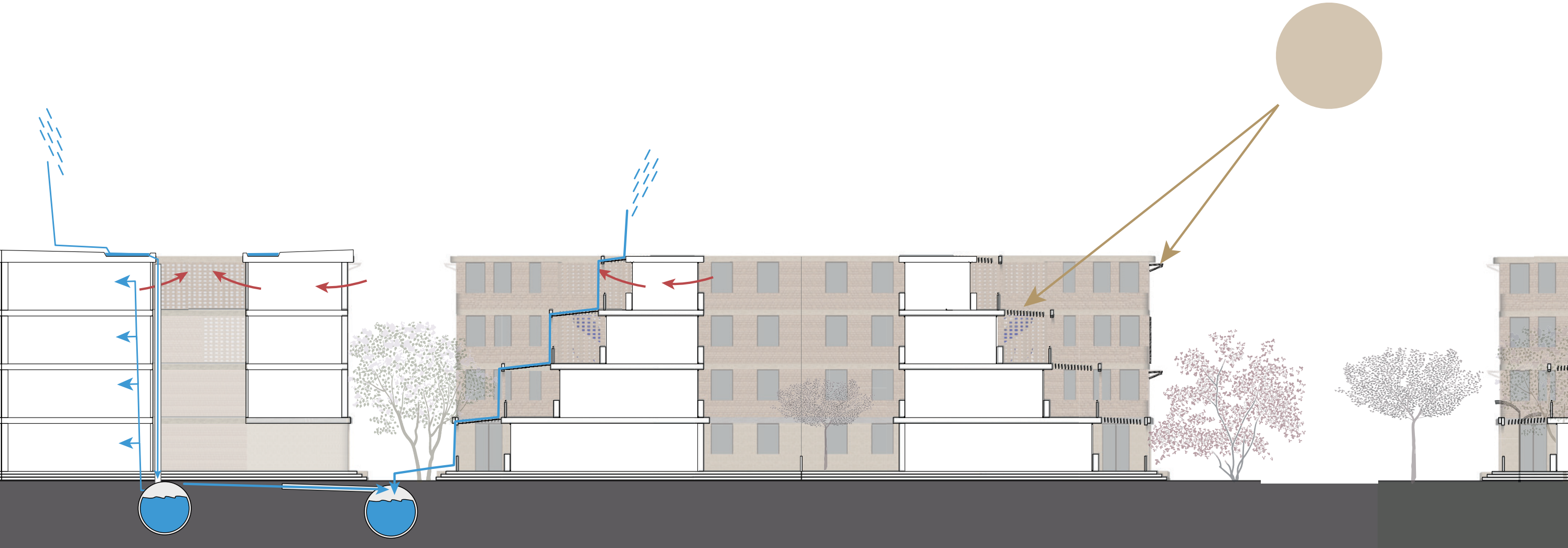
————— +
1330 dwellings

Building technology

Climate in Navi Mumbai



Climate section



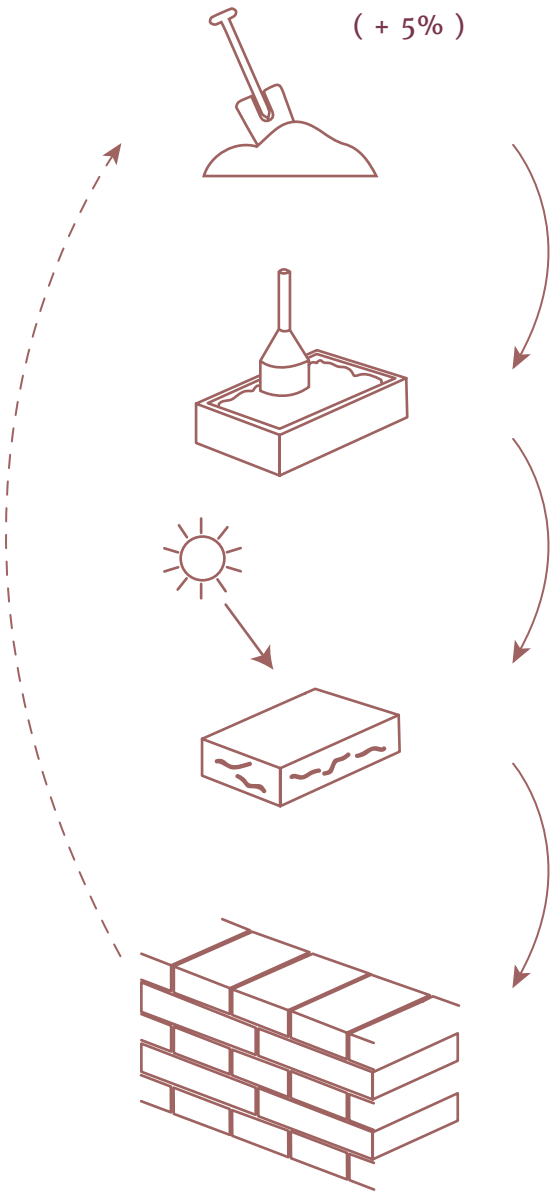
Water collection on roof
Underground water basin
Water drainage in street

Natural ventilation
Covered hybrid outside spaces

Comported sun shading

Materialization

(STABALIZED) COMPRESSED EARTH BLOCKS



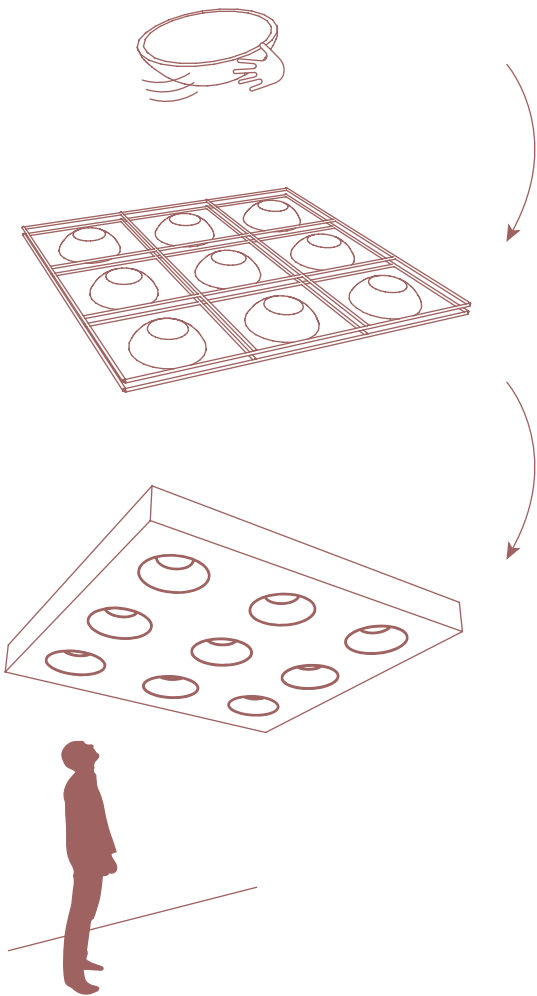
Local Materials, Local Workers

Stamp

Dry

Stack

CLAY POT FILLER SLAB & BAMBOO REINFORCED CONCRETE



Local Materials, Local Workers

Fill within the bamboo

Pour concrete

STABALIZED COMPRESSED EARTH BLOCKS

Local material	● ● ● ●
Local labor	● ● ● ● ●
Time efficiency	●
Sustainable	● ● ●

COMPRESSED EARTH BLOCKS

Local material	● ● ● ● ●
Local labor	● ● ● ● ●
Time efficiency	●
Sustainable	● ● ● ● ●

CLAY POTS

Local material	● ● ● ● ●
Local labor	● ● ● ● ●
Time efficiency	●
Sustainable	● ● ● ● ●

BAMBOO

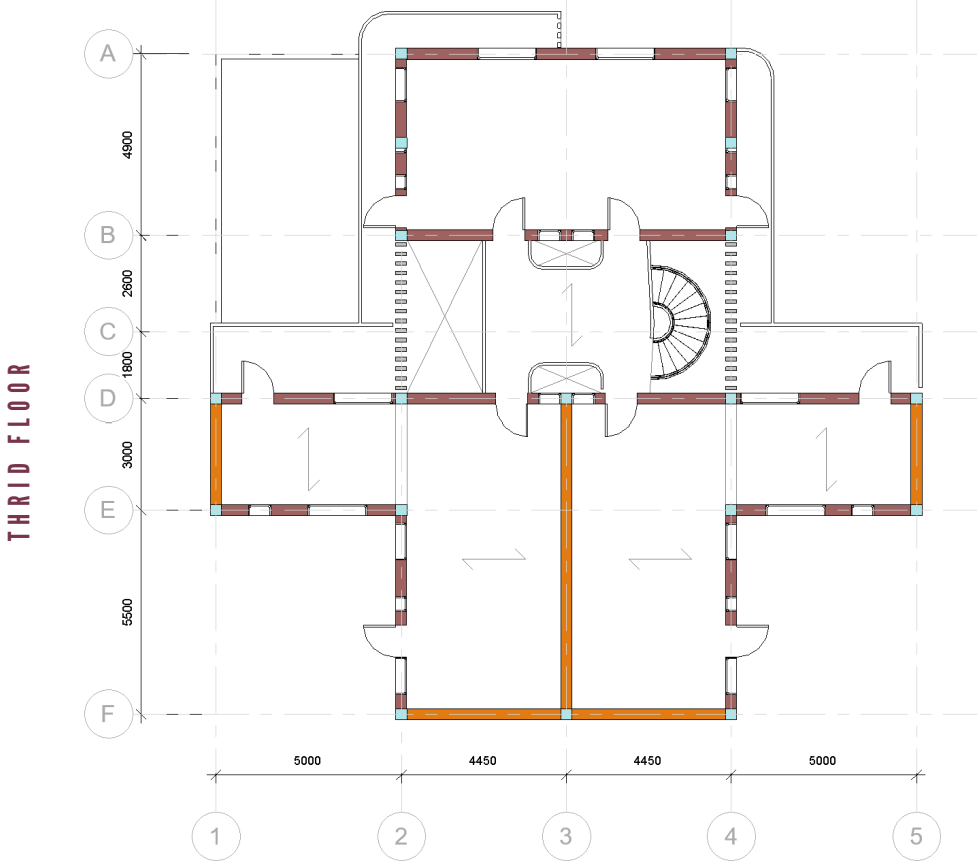
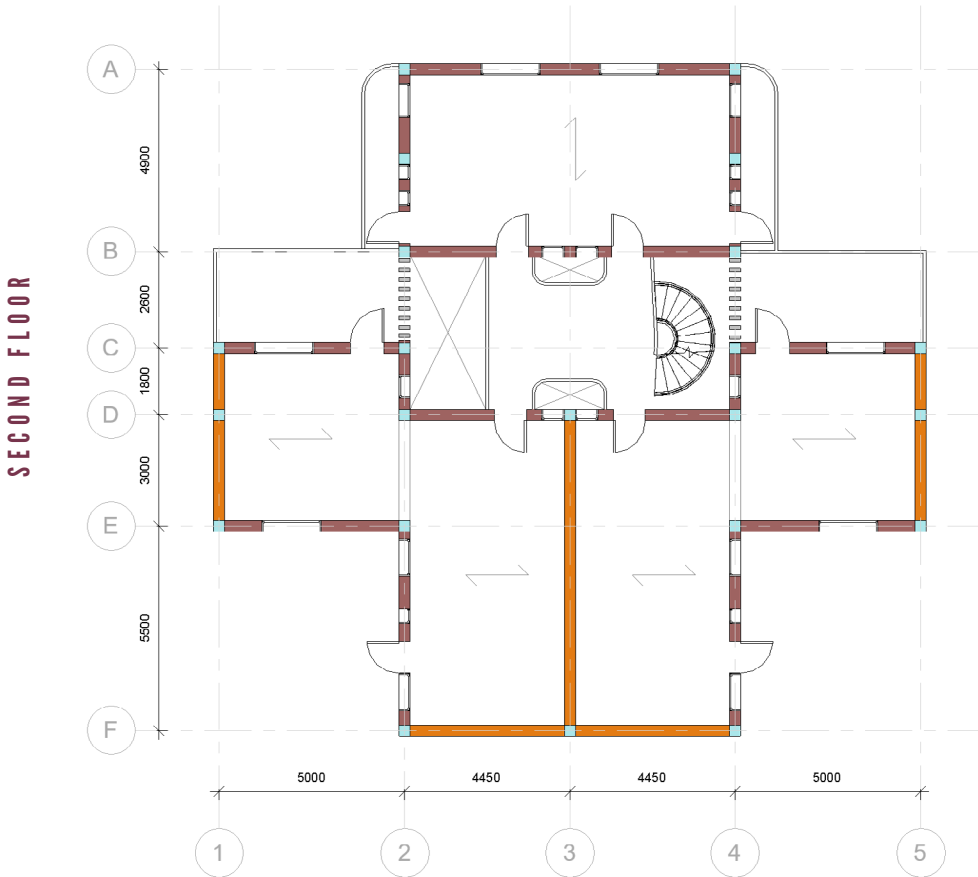
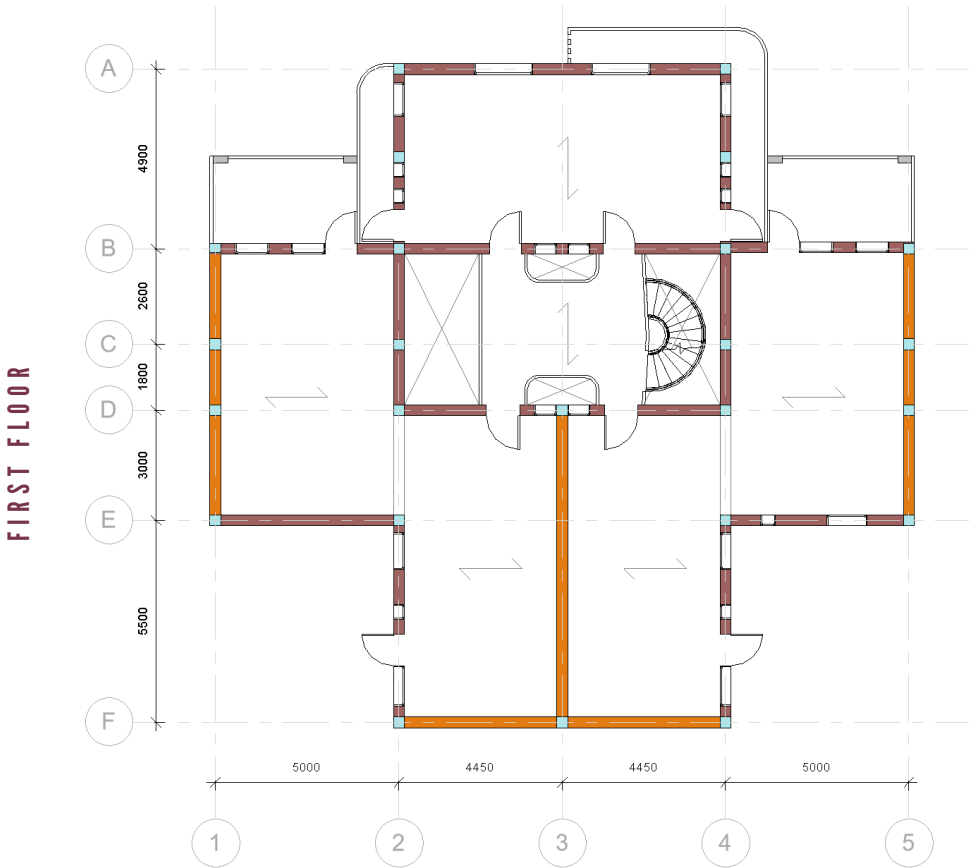
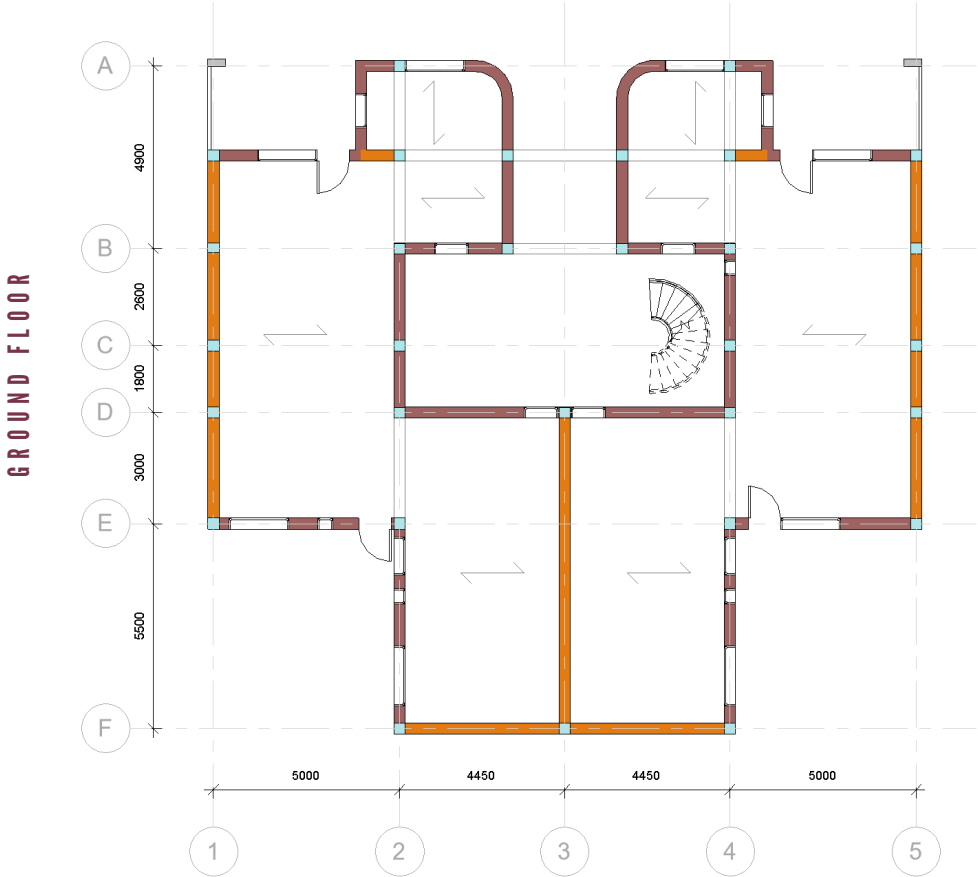
Local material	● ● ● ● ●
Local labor	● ● ●
Time efficiency	● ●
Sustainable	● ● ● ● ●

CONCRETE

Local material	●
Local labor	●
Time efficiency	● ● ● ● ●
Sustainable	●

Construction

- Concrete columns and beams
- Stabalized compressed earth blocks
- Compressed earth blocks

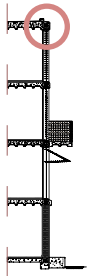
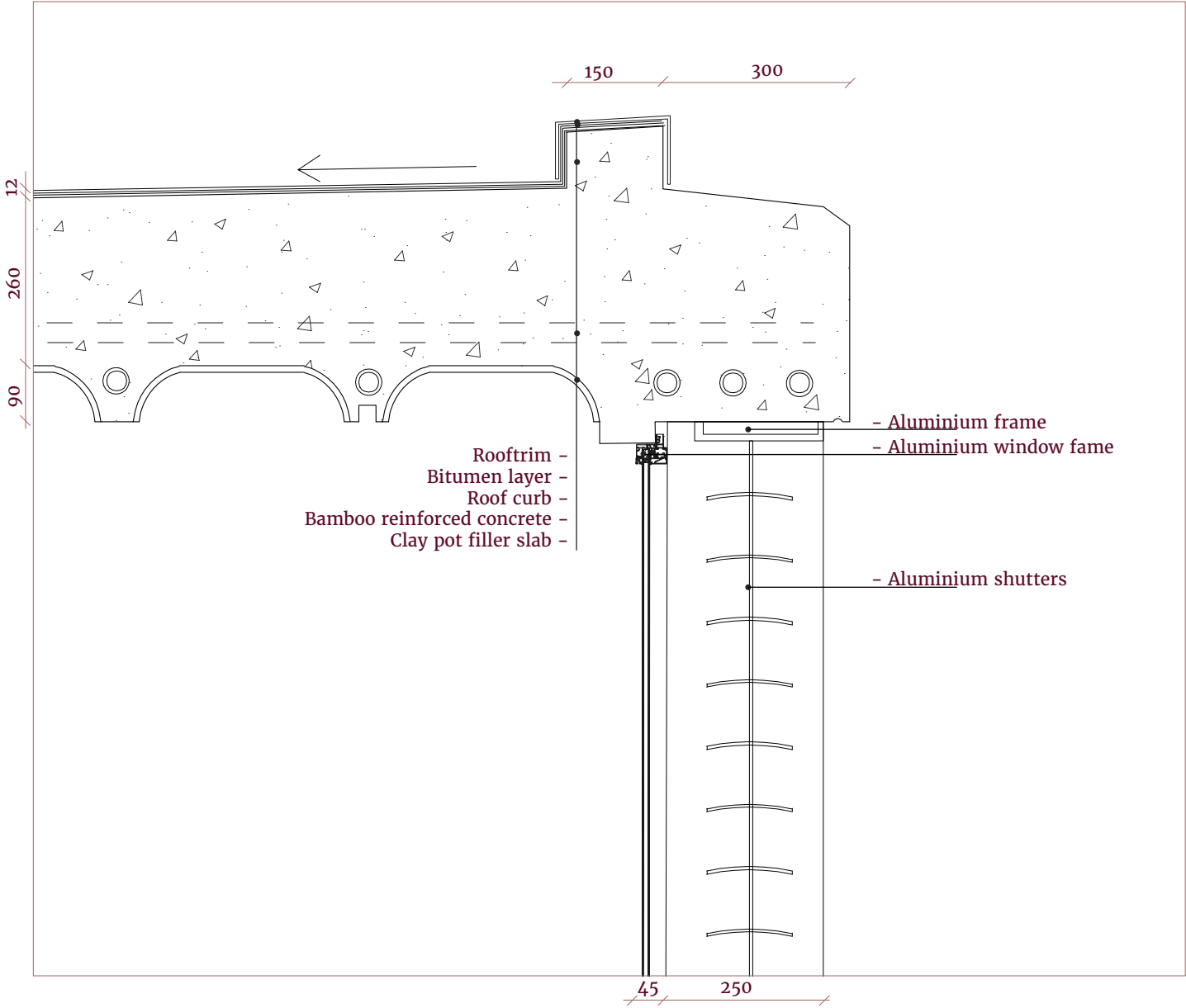


Facade fragment



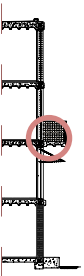
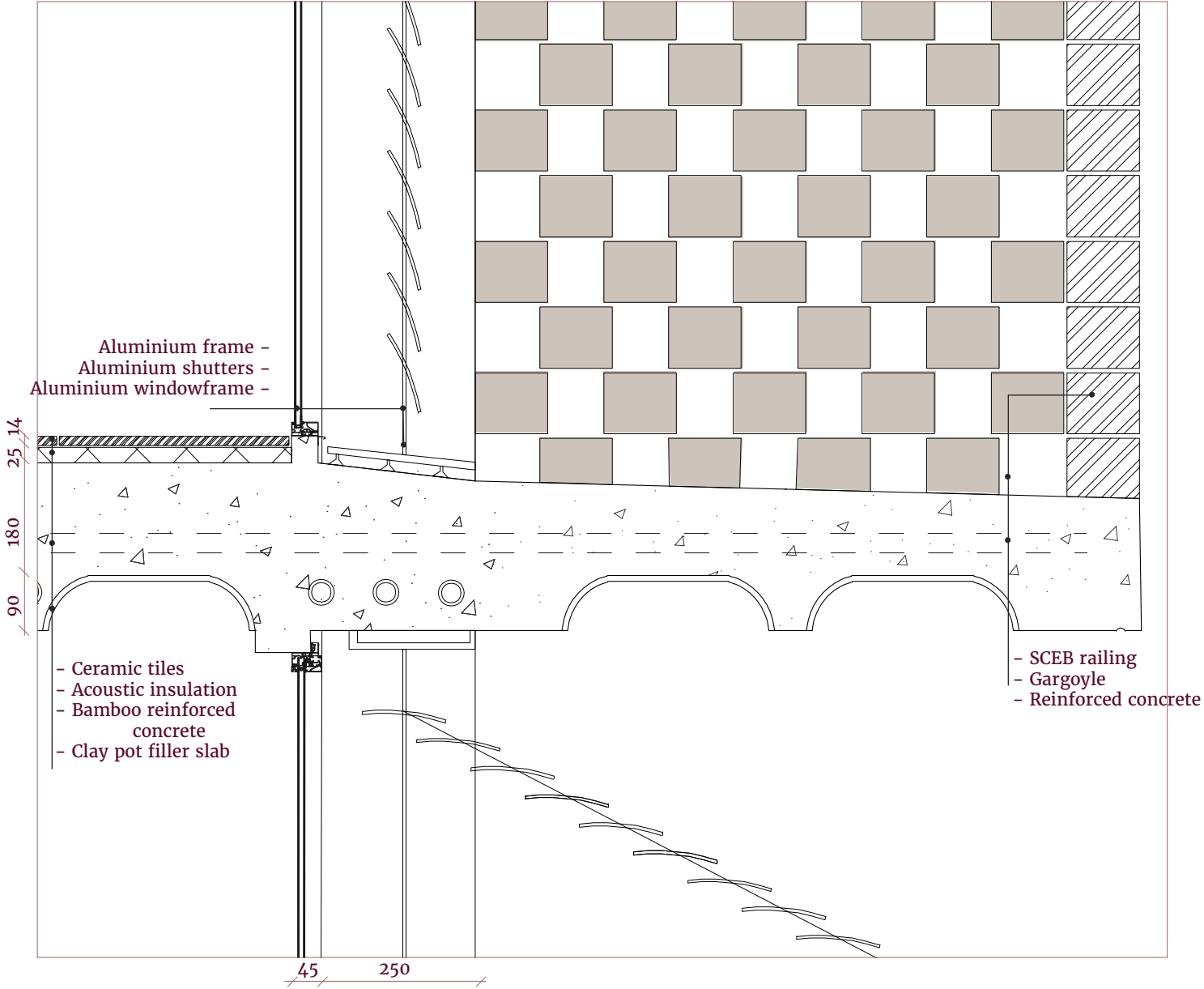
Roof detail

1:10



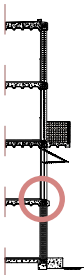
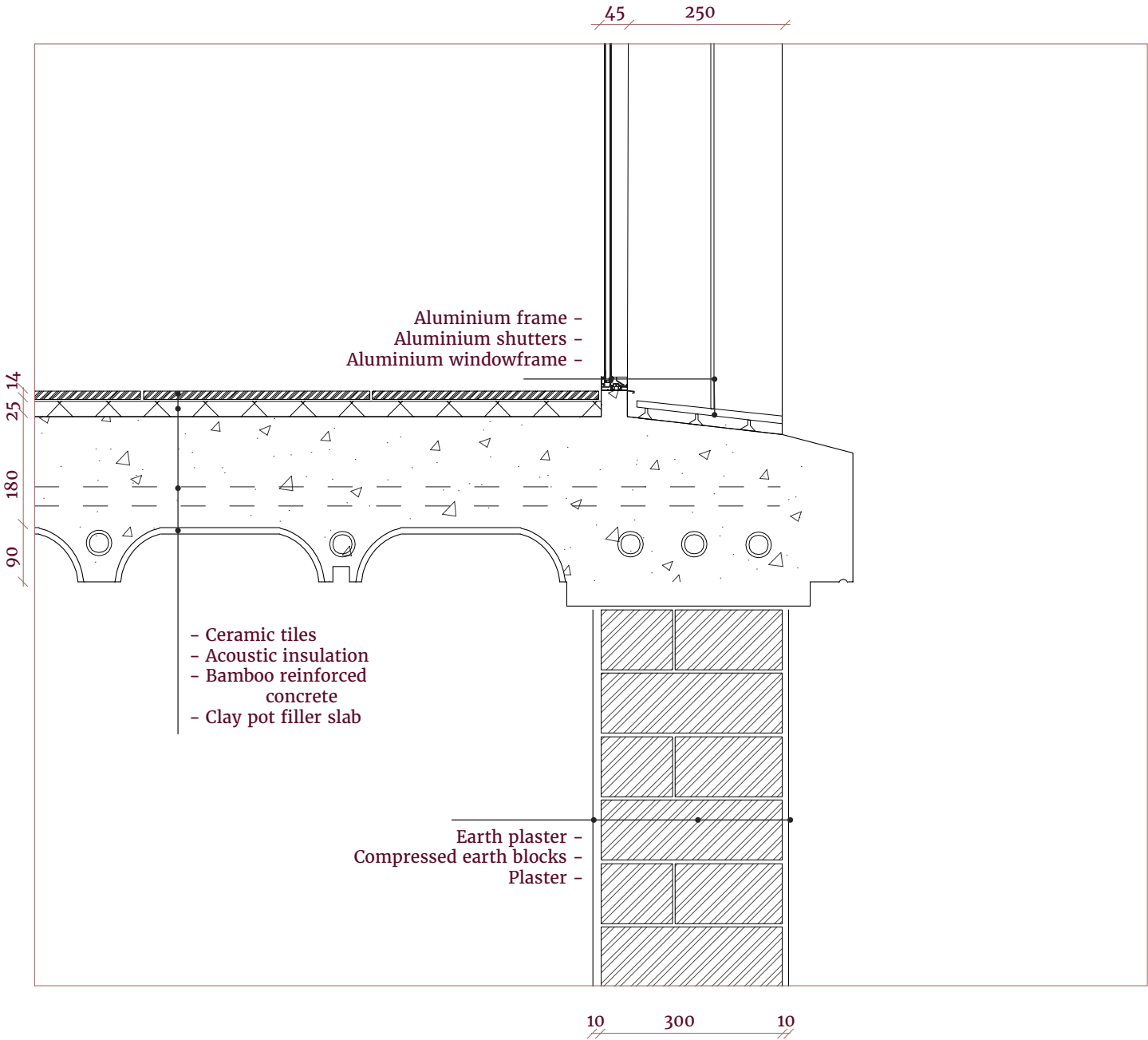
Balcony - Facade detail

1:10



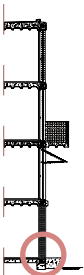
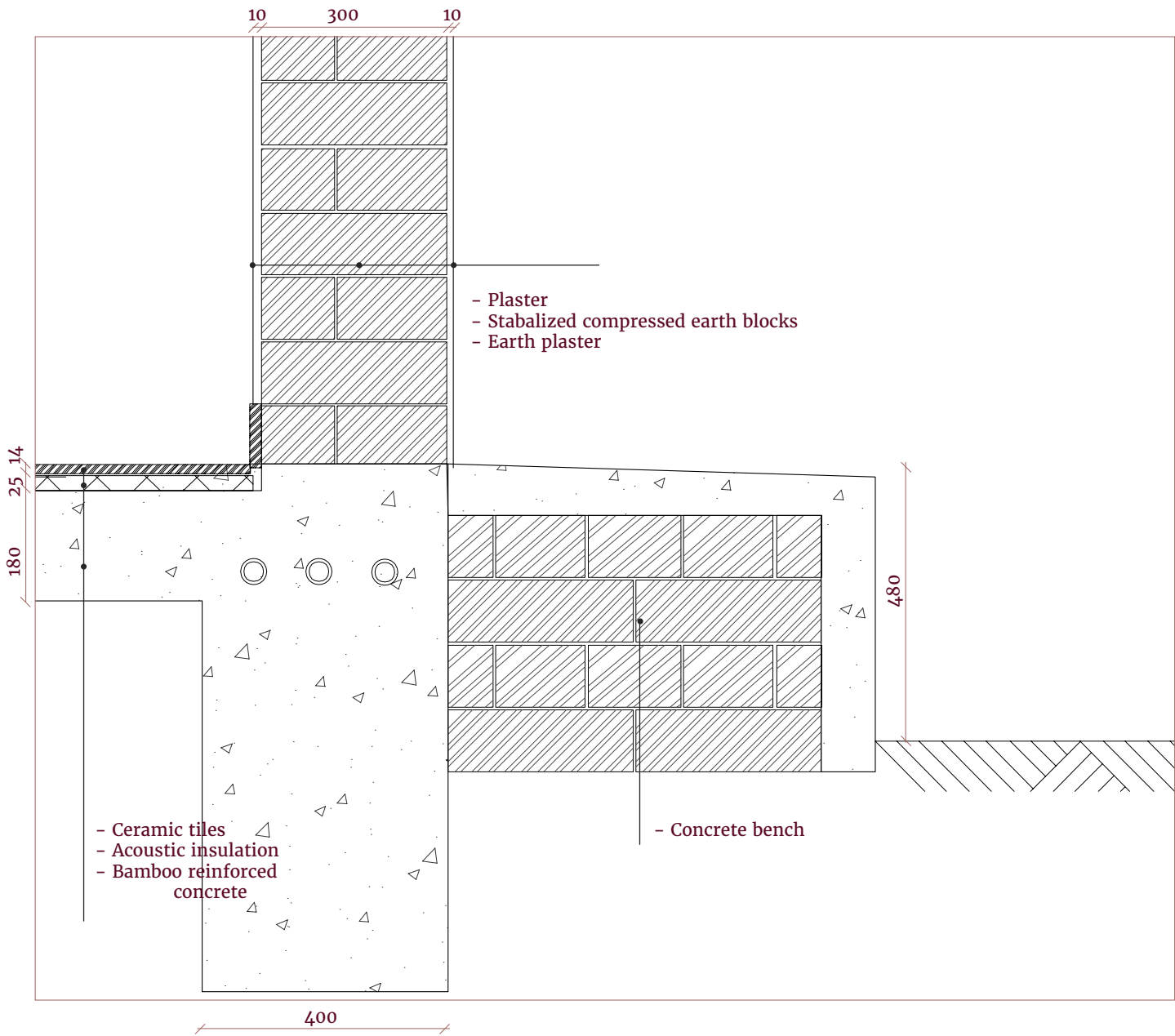
Floor – Facade detail

1:10



foundation detail

1:10



Reflection

Research & Design

The relationship between the research and the design has shifted during the process. In the first stage, the literature review was a suitable approach to answering most of the sub-questions due to the secondary data that was used. This data was utilized as quantitative data and qualitative data. Based on this stage of the research, my research question and problem statement got more specific about what led to the first steps of the design.

Due to Covid-19, the fieldwork could not happen and therefore the trip to Mumbai was canceled. This research gap meant a different understanding of India and the project site. Ethnographic research is best when emerged in the context, this leads to a real awareness and perhaps a more sensitive response in the design phase. The Global Housing board did not add any other activities to get a better understanding of the Indian culture and its customs, regarding the

compensation for the loss of the field trip. This meant that all the observations and interviews that followed from ethnographic research were limited on our contacts outside the university. Reflecting on this, I could have searched for more contacts and interviews with Indian people living in The Netherlands.

In the second stage ethnographic research was used by researching the social environment in Navi Mumbai. Case studies, thematic analysis, and discourse analysis gave me an insight into existing shelters and their use, the different lifestyles of the different income groups, and cultural urban qualities.

During the third and last stage, research got more intertwined in the project through using design as primary data by investigating architectural designs by sketching, massing, and modeling.

Architectural relevance

In the Global Housing studio, we seek to contribute solutions to the detrimental consequences of Navi Mumbai's development as a breeding ground for social inequality, spatial injustice, and environmental degradation. With Building New Cycles, I explore housing beyond its physical and spatial characteristics and design from the understanding of the problem statement, which I derive from the social and historical context of the problem. My goal is to rethink housing as a resource for a more equitable city by using architecture to develop affordable and adequate housing for women that seek shelter from gender-based violence, by designing a neighborhood that households different income groups and family structures.

Relevance

Social relevance

Gender-based violence is a public health problem that affects one in three women on a global level, this leads to millions of victims. Cultural accepted gender-based violence against women needs to end to achieve more gender equality, it is violating human rights and is deeply based on gender inequality. Therefore this topic can be applied in several urban situations. This research will not only focus on helping women on finding a new and safe home but also on prevention and education on how to break the cycle and build a new one.

Present relevance

The Delhi gang rape in 2012 caused noise in the country which led to new possibilities regarding women empowerment. Actively operating feminist movements are working toward a less unequal India, men are listening and kids are creating a new future. This is why now is the time to act on empowering architecture for women who suffer from gender-based violence.

Professional relevance

We live in a time when women are feeling more empowered to leave toxic and unhealthy situations. This has led to a demand for women's shelters. Shelter architecture can have a significant effect on gender-based violence victims, it represents the start of a new phase of emotional and psychological healing. Architectural design can produce a new archetype that can lead toward an environment of growth, stability, and rehabilitation in cases of gender-based violence

Transferability

Navi Mumbai's development has a tendency for social inequality, spatial injustice, and environmental degradation. The goal of the design is to provide solutions to the negative consequences that arise from the understanding of the problem statement. This is based on the social and historical background of the issue. Building New Cycles will be able to be used as a toolbox to repeat at multiple places in the city. The replicability is mainly defined by the different building typologies that answer to diverse urban situations. As well as the managerial strategy that focusses on the financial replicability of the project.

Ethicality

Researching a foreign context than your own has to be tackled with a fragile approach to eliminate prejudices, fetishizing, and discrimination. Working on this graduation studio in this unique COVID-19 situation has led to an insecure feeling regarding the fear of acting through biases rather than realistic contextual knowledge. Ethical considerations were constantly present during the research and design process. If further research will be done on this project, my recommendation would be to collaborate with a local architect to make sure the design decisions are realistic in the context of Navi Mumbai.

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Fig. 0.2 Dolan, O., & Spoon, S. (2021a). A map showing the major connections between Mumbai and Navi Mumbai [Illustration]. TU delft.

Fig. 0.3 Khan, A. (2022). CIDCO mass housing scheme [Photo]. pmmodiyojanaa. <https://pmmodiyojanaa.in/mass-housing-scheme-cidco/>

Fig. 0.4 Navi Mumbai Highlights. (2020). CIDCO Mass Housing Scheme, Ghansoli project current position, Navi Mumbai [Screenshot of video 0:05]. YouTube. <https://www.youtube.com/watch?v=fDAJQtIZCes>

Fig. 0.5 Singh, V. (2019). Affordable homes [Photo]. DNA India. <https://www.dnaindia.com/mumbai/report-cidco-to-construct-budget-homes-in-navi-mumbai-for-lig-and-ews-2787711>

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Fig. 1.2 Assainar, R. (2020, Januari 17). Fewer crimes in Navi Mumbai, but women still unsafe at home. The Hindu. <https://www.thehindu.com/news/cities/mumbai/fewer-crimes-in-navi-mumbai-but-women-still-unsafe-at-home/article30580007.ece>. By author

Fig. 1. 3 Assainar, R. (2020, Januari 17). Fewer crimes in Navi Mumbai, but women still unsafe at home. The Hindu. <https://www.thehindu.com/news/cities/mumbai/fewer-crimes-in-navi-mumbai-but-women-still-unsafe-at-home/article30580007.ece>. By author

Fig. 1. 4 Centers for Disease Control and Prevention. (2004). Sexual violence prevention: beginning the dialogue. <https://www.cdc.gov/violenceprevention/pdf/SVPrevention-a.pdf>. By author

Fig. 1. 5 SHEHA. (2017). Gender Matters– Intersection of Violence against Women and Mental

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Fig. 1. 6 Rutali, J. (2017). Understanding the Built Environment of Shelter Homes for Survivors of Domestic Violence. All Theses. https://tigerprints.clemson.edu/all_theses/2642. By author

Fig. 2.1 By author

Fig. 2.2 Varma, R. (2016). View of CIDCO Housing Navi, Mumbai (IN). DASH, Global Housing: Affordable Dwellings for Growing Cities(12/13). <https://journals.open.tudelft.nl/dash/article/view/5029/4599>

Fig. 2.3 Ibid.

Fig. 2.4 Chapekar, P. (2022, January 19). Belapur Housing by Charles Correa: A sense of home and community. RTF | Rethinking The Future. Retrieved 24 January 2022, from <https://www.re-thinkingthefuture.com/case-studies/a3735-belapur-housing-by-charles-correa-a-sense-of-home-and-community/>

Fig. 2.4 Chapekar, P. (2022, January 19). Belapur Housing by Charles Correa: A sense of home and community. RTF | Rethinking The Future. Retrieved 24 January 2022, from <https://www.re-thinkingthefuture.com/case-studies/a3735-belapur-housing-by-charles-correa-a-sense-of-home-and-community/>

Fig. 2.5 Ibid.

Fig. 2.6 Ibid.

Fig. 2.7 By author

Fig. 2.8 Sagredo, R. (2021, October 13). Shelter For Victims Of Domestic Violence / Amos Goldreich Architecture + Jacobs Yaniv Architects. ArchDaily. Retrieved 24 January 2022, from <https://www.archdaily.com/894042/shelter-for-victims-of-domestic-violence-amos-goldreich-architecture-plus-jacobs-yaniv-architects>

Fig. 2.9 By author

Fig. 2.10 Sagredo, R. (2021, October 13). Shelter For Victims Of Domestic Violence / Amos Goldreich Architecture + Jacobs Yaniv Architects. ArchDaily. Retrieved 24 January 2022, from <https://www>.

archdaily.com/894042/shelter-for-victims-of-domestic-violence-amos-goldreich-architecture-plus-jacobs-yaniv-architects

Fig. 2.11 By author

Fig. 2.12 By author

Fig. 2.13 Silva, V. (2021, March 3). Repos Maternel Woman's Shelter Extension / Marjan Hessamfar & Joe Vérons architectes associés. ArchDaily. Retrieved 24 January 2022, from <https://www.archdaily.com/938669/repos-maternel-womans-shelter-extension-marjan-hessamfar-and-joe-verons-architectes-associes>

Fig. 2.14 Ibid.

Fig. 2.15 By author

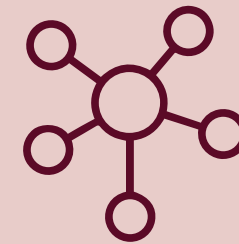
Fig. 3.1 Rabale Airoli vlogs video Mumbai. (2021, 11 augustus). [Video]. YouTube. https://www.youtube.com/watch?v=bQ6EBAYz__SE

Fig. 3.2 Rabale Airoli vlogs video Mumbai. (2021, 11 augustus). [Video]. YouTube. https://www.youtube.com/watch?v=bQ6EBAYz__SE

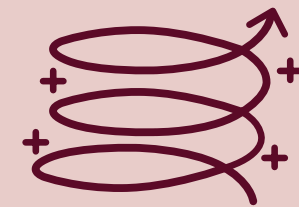
Fig. 3.3 Google Maps. (2018, May). Street view-sector 23 Navi Mumbai [Photo]. https://www.google.com/maps/@19.1346834,72.9982095,3a,90y,98.95h,98.81t/data=!3m8!1e1!3m6!1sAF1QipOIcnWsAbQC2Csp5tk-hxaJZqk8yY4hIsc_lf4-!2e10!3e11!6shhttps:%2F%2Flh5.googleusercontent.com%2Fp%2FAF1QipOIcnWsAbQC2Csp5tk-hxaJZqk8yY4hIsc_lf4-%3Dw203-h100-k-no-pio-ya341.98413-ro-o-fo100!7i8704!8i4352



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