Introduction

Argumentation of Choice of the Studio

The main reason that made me choose the Global Housing Studio is the challenge involved in it. I believe that the topic of affordable housing deals with some of the most sensitive issues of architecture: it can cater for social mobility and integration, and give answers to migrants and newcomers, being rural-urban migration a global phenomenon. Moreover, being located in Mumbai, the Studio offers me the possibility to be in contact with a new reality, and learn how architecture and society are conceived in other parts of the world.

Even though I do not think I can provide a complete answer that would solve the housing shortage in India, I am positive that the discussion between people from different backgrounds, focused on creating proposals from a humble but critical approach can be a magnificent tool to find new solutions to the problem.

Picture following page:
City of Buenos Aires: separation between the business neighbourhood of Retiro and the Villa 31 through the railway lines and the highway.



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The City of Mumbai
History and Development Through Time
Current Situation
Demographics
Urban Configuration

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The Settlement of Nalasopara
History and Development Through Time
The Railway as the Catalist of the Growth
The Separation Between West and East
Features of an Arrival City in Mumbai

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Visual Etnography
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Problem Statement
Research Question

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Research Framework
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Planning, integration and public space aspects
Architectural References:
Clustering, dwelling, collective space and social aspects
Managerial References:
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Response to the Integration of Nalasopara

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Formation and Integration of Communities
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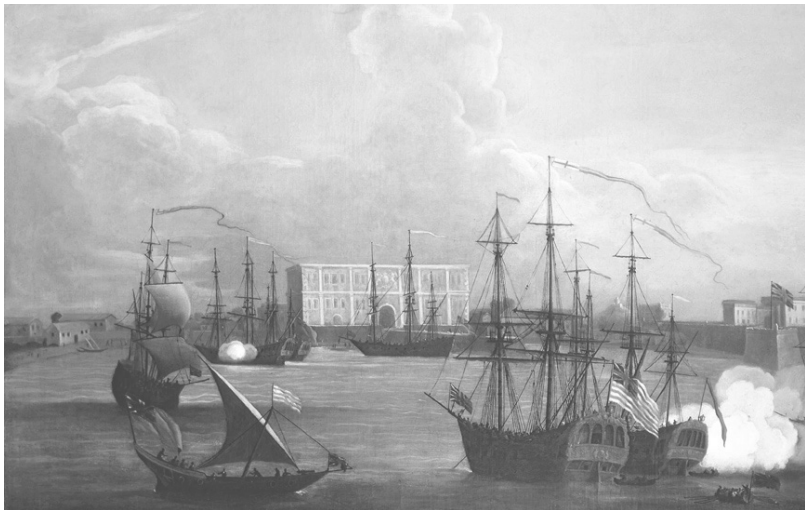
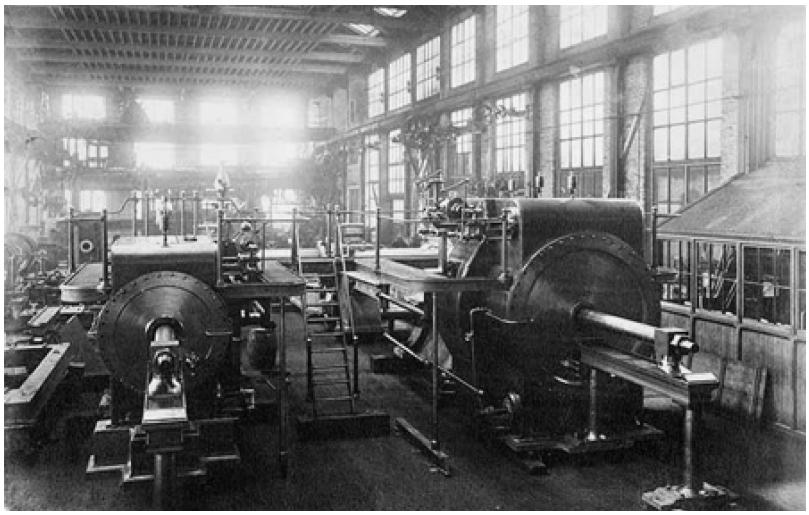
Bibliography
Theoretical Framework, Contemprary Situation of Mumbai
Local and International Reference Projects

The City of Mumbai





1500-1850
Foundation of the city by the Portuguese empire
The land was given to the British Crown in 1661
The archipelago was filled in with land and connected in 1838
Population growth:
From 10.000h in 1661 to 556.000h in 1848



1850-1920
The American Civil War creates the possibility for Bombay to supply the British Empire with cotton.
The mill industry flourishes. The port is consolidated and the railway system is widely expanded
Population growth:
From 800.000h in 1860 to 1.200.000h in 1920

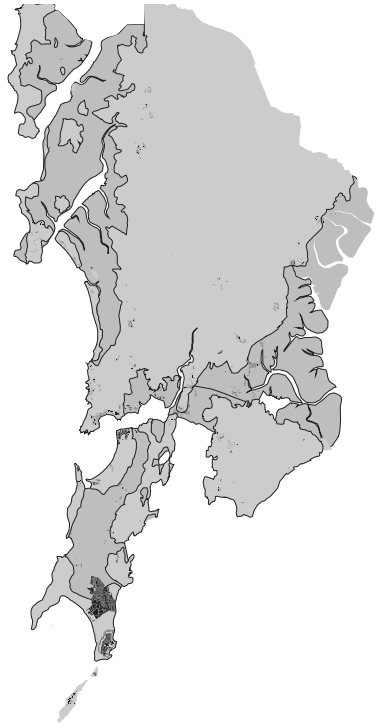


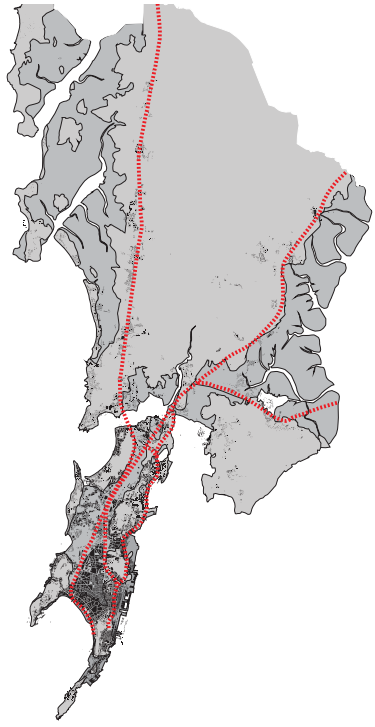
1920-1950
Mahatma Gandhi becomes the leader of the movement of civil desobedience against the British Regime.
The transportation system in the city is improved and the city continues to expand.
Population growth:
From 1.200.000h in 1920 to 3.000.000h in 1950

Mumbai
1600

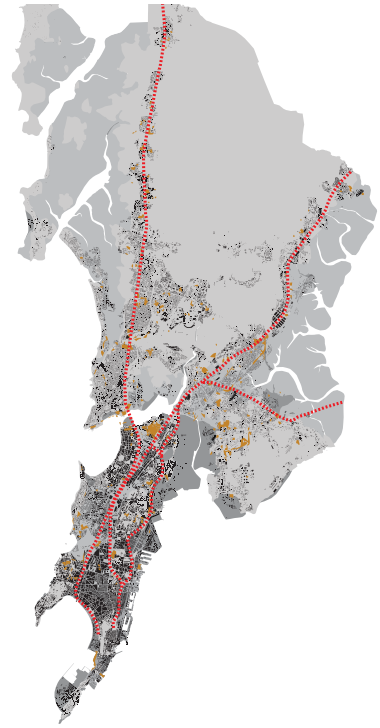


Mumbai
1812



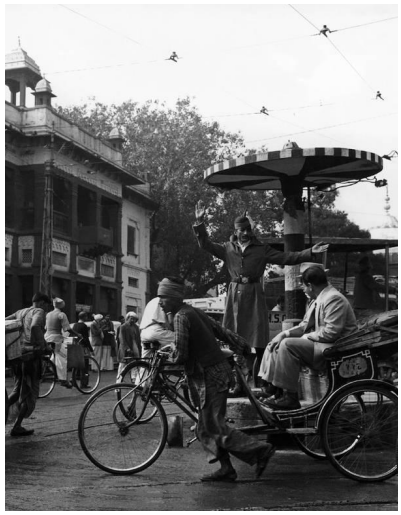


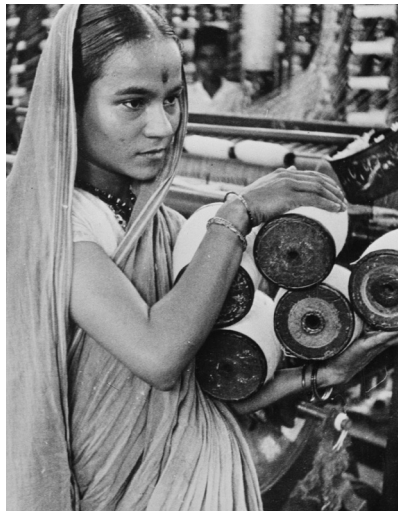
Mumbai
1909



Mumbai
1964

1950-1970
The country becomes independent. The 5-yeras plan is launched to develop agriculture, industry and education among the country.
The suburbs of Bombay become official part of the 'Greater Bombay District'
Population growth:
From 3.000.000h in 1950 to 6.000.000h in 1970

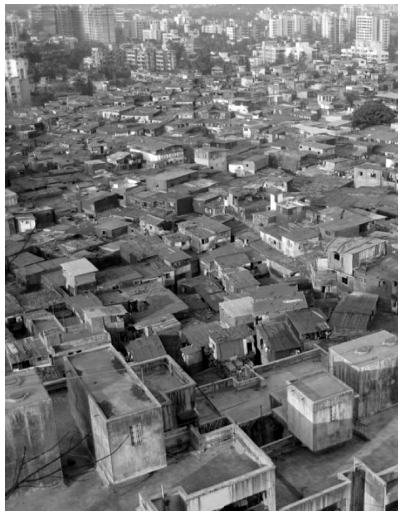




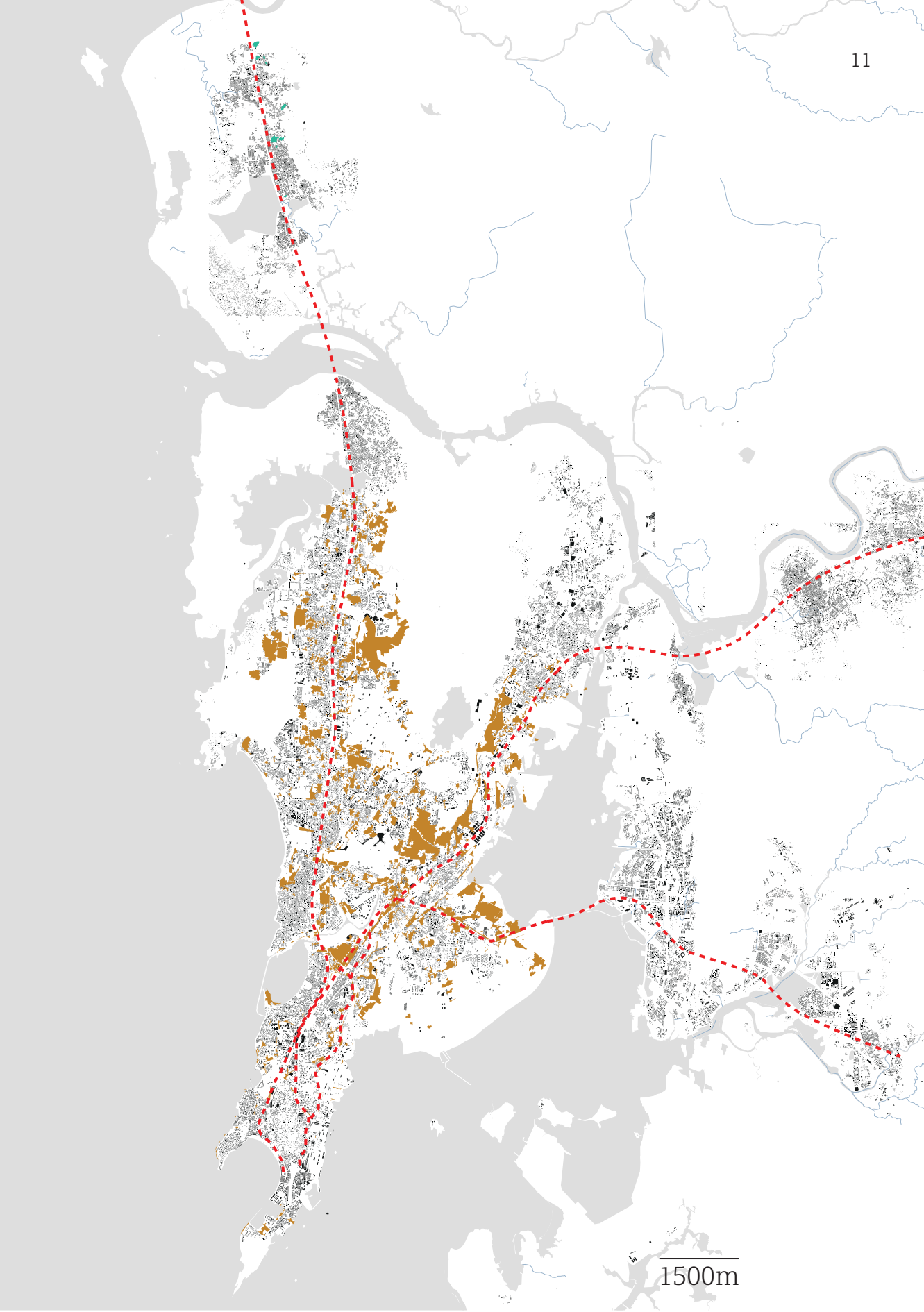
1970-1990
The Shiv Sena party is created. The city moves to a service+industry based economy.
There is a substantial rural-urban migration and a rapid urbanisation of Mumbai.
Population growth:
From 6.000.000h in 1970 to 12.500.000h in 1990

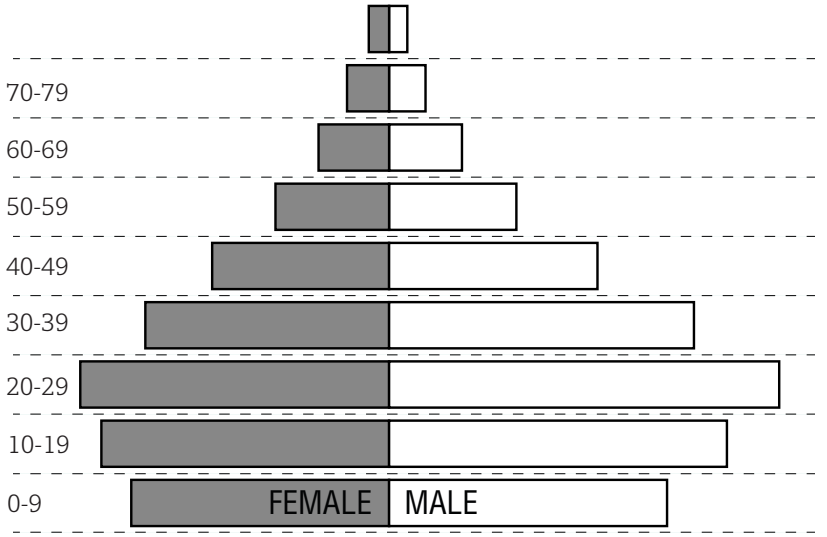


1990-2010
The city growth is marked by the interests of the private market.
Slum redevelopment schemes are designed to relocate people from the slums in central Mumbai.
Population growth:
From 12.500.000h in 1990 to 16.300.000h in 2010



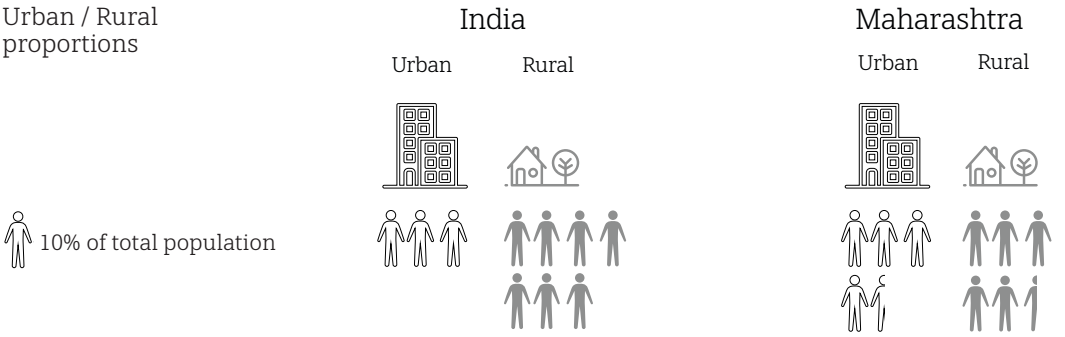



1500m



Age Pyramid
Mumbai Metropolitan Region

Urban / Rural proportions

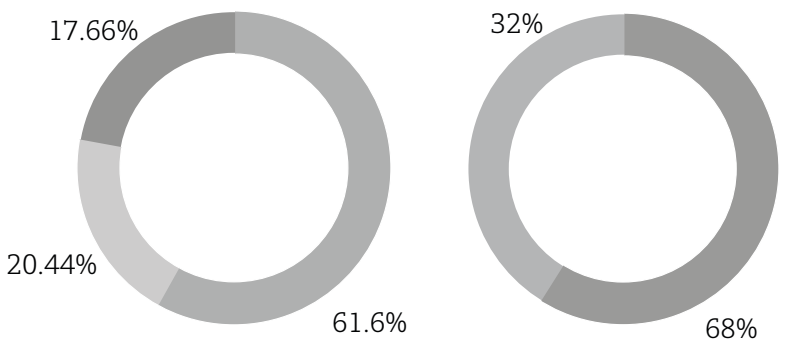


Left: Income Groups Mumbai

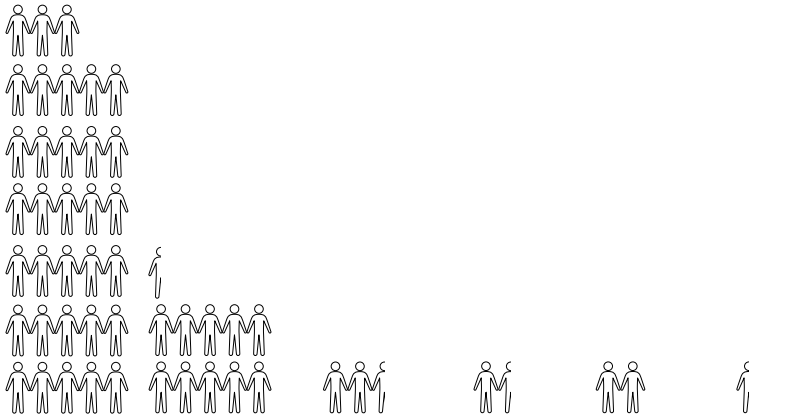
- HIG
- MIG
- LIG

Right: Mumbai Market

- Informal Sector
- Formal Sector

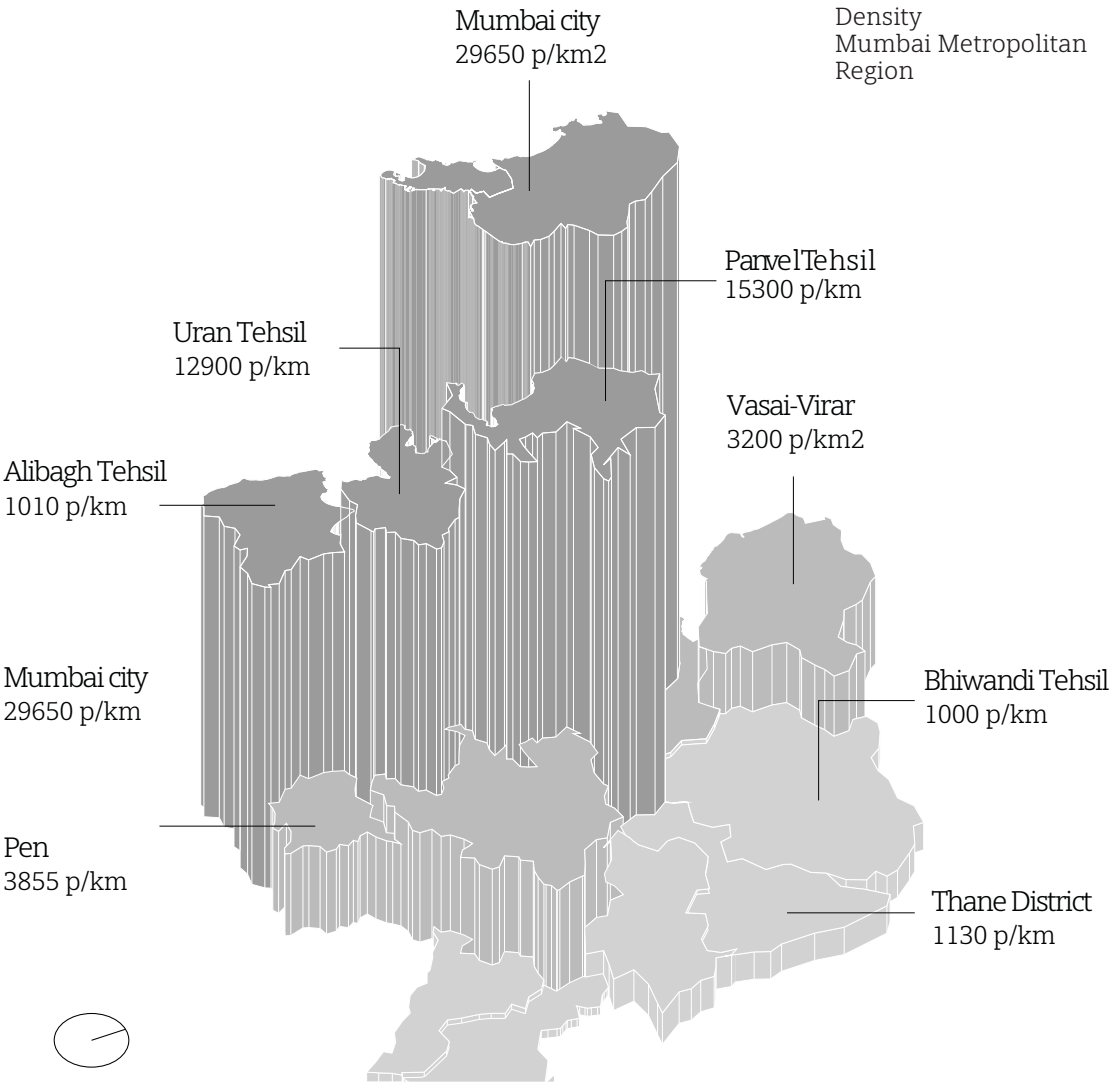


Demographics and Density



Religion
Mumbai Metropolitan Region

Density
Mumbai Metropolitan Region



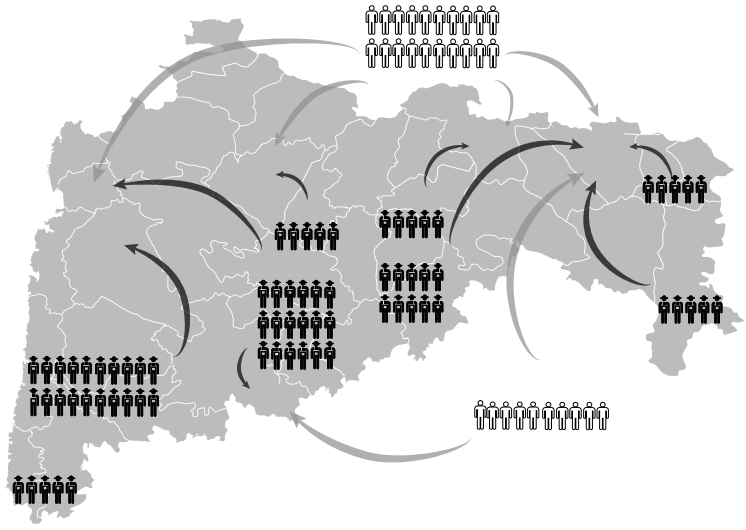


International emigration



International immigration

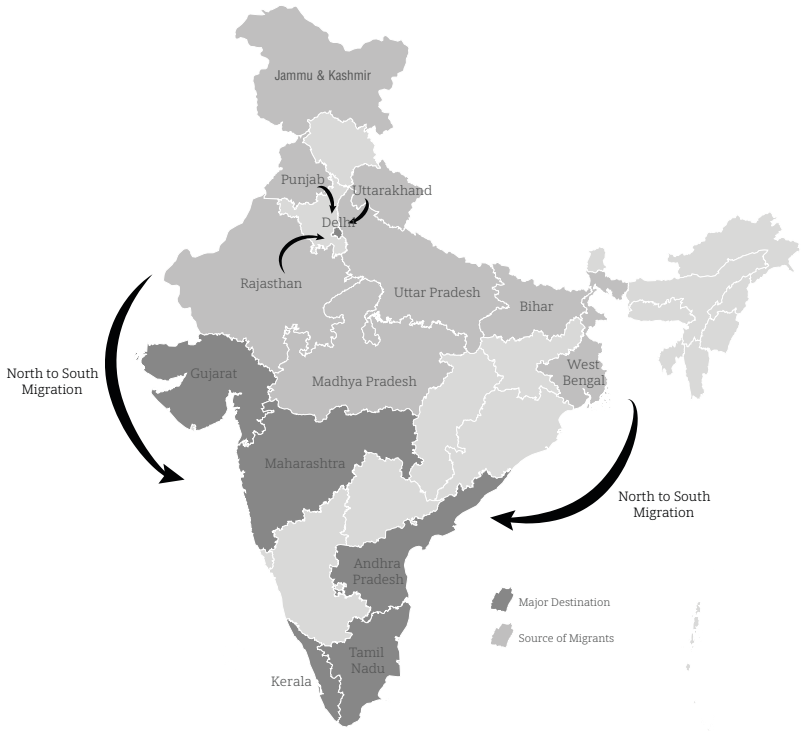
Maharashtra inner migration



70% Migrants from rural areas within Maharashtra

30% Migrants from cities and villages outside Maharashtra

Migration



Major sources and destinatons of internal migrants



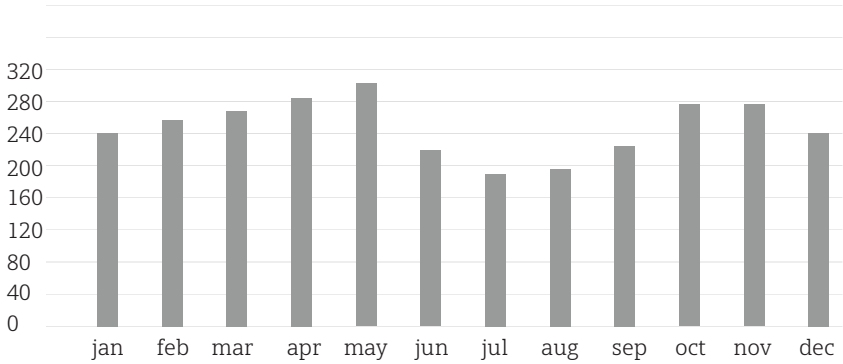
Major sources of emigrants to ECR countries

- >100.000
- 40.000-100.000
- 10.000-40.000
- <10.000

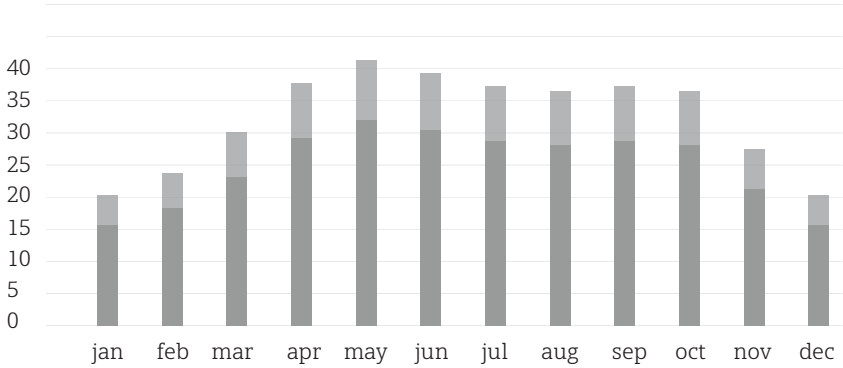
Climate

Response to climate is a main task for the architecture around the world. In the case of Mumbai, responsive to climate architecture can not only create more comfortable spaces, but also cater for less energy and water consumption. The wind is predominant from the west and very strong during monsoon. The precipitations are as well very high during monsoon season and almost inexistent the rest of the year. The sun, during the warmer months, reaches an angle of almost 90°. These elements provide parameters and also tools to design ventilated and shaded spaces with high climatic quality, and a sustainable use of water.

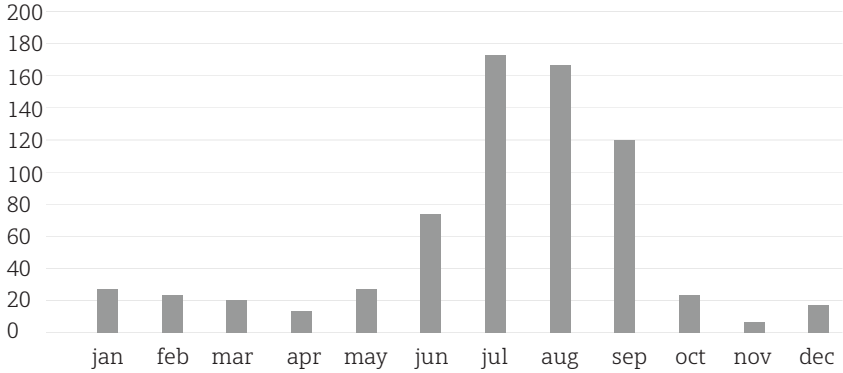
Hours of sunlight per month (hrs)

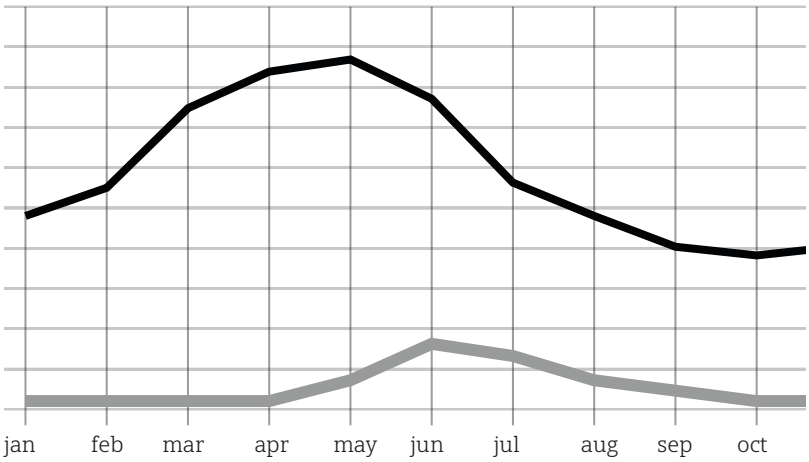


Max and min temperatures (°C)

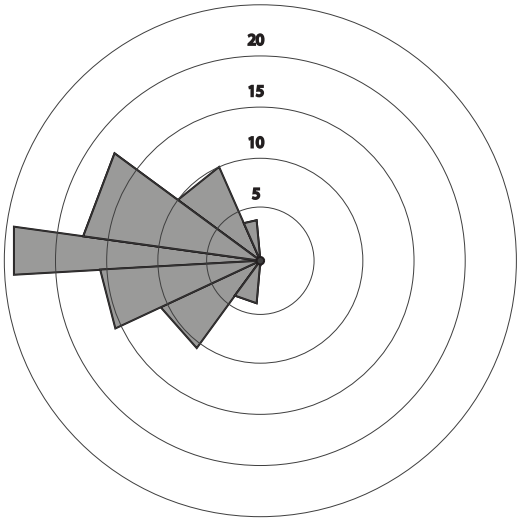


Precipitation per month (mm)

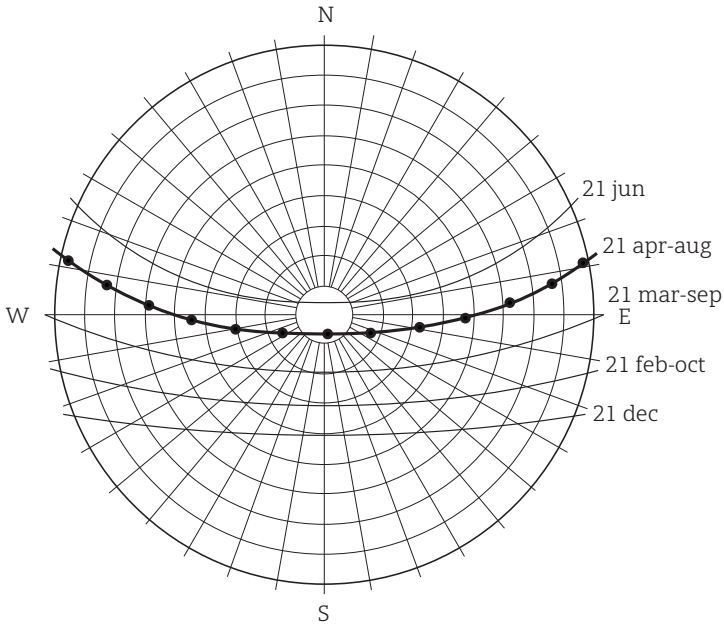




Wind speeds per month



Wind diagram
The predominant winds, that reach very high speeds during monsoon season (may to october) come from the West.



Solar diagram
It can be observed that during the summer months, the sun goes to almost a 90° angle in the warmest hours.

The Settlement of Nalasopara


WB

India

Surface
3,287,259km^2

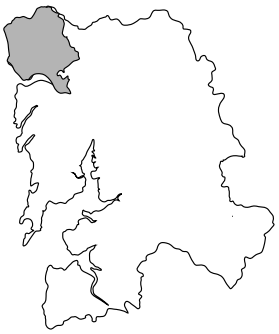
Population:
1,339 million



Mumbai MR

Surface
4,355km^2

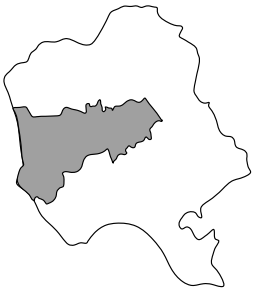
Population:
20.87 million



Vasai Virar

Surface
311km^2

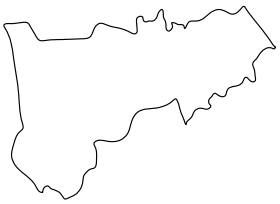
Population:
1,221,233

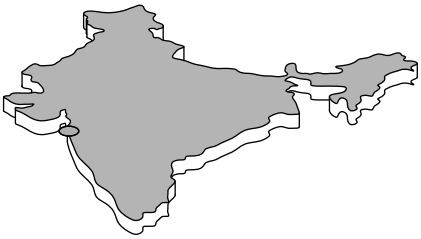


Nalasopara

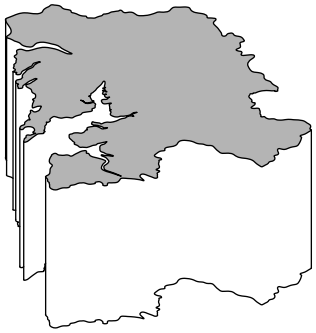
Surface
43km^2

Population:
564,664

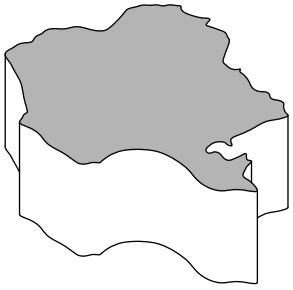




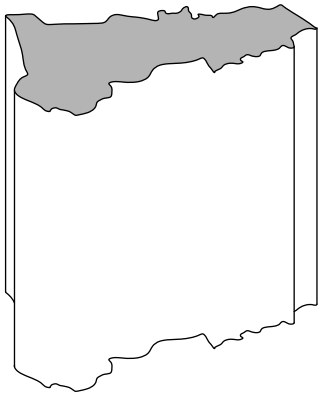
Density
385,4 h/km^2



Density
4.793 h/km^2



Density
3.200 h/km^2



Density
10.700 h/km^2

Urban Fabric

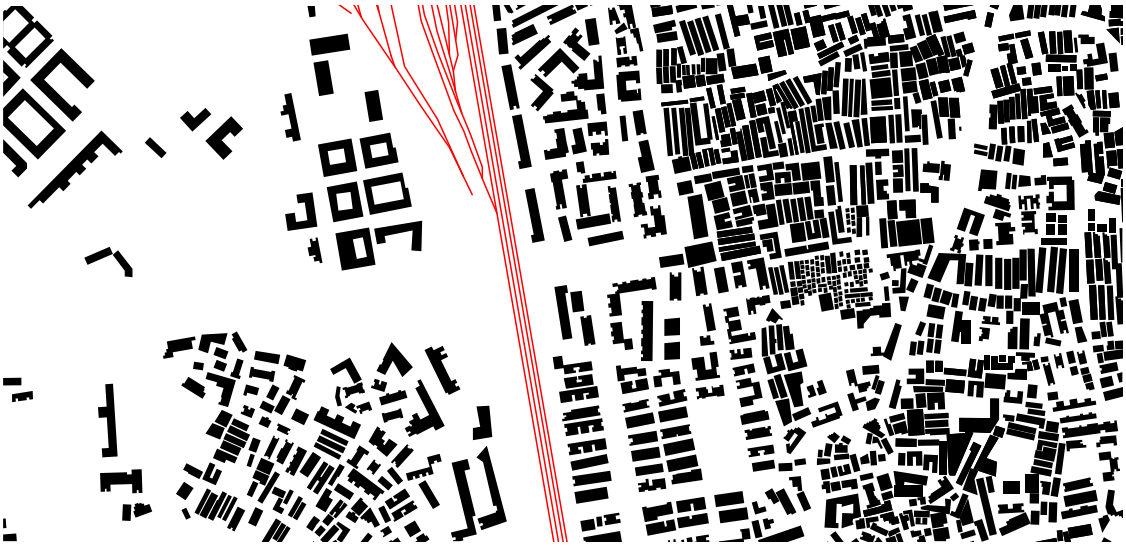
The area of Nalasopara exists thanks to the train system, which connects it to Central Mumbai in less than an hour. As a result, despite the distance, people can commute to work in the centre of the city.

As a piece of infrastructure, the train provides great opportunities for the dwellers of Nalasopara: for a considerably lower rent price in relation to Central Mumbai, they can maintain their jobs. However, as a physical element, the railway creates a non-porous boundary that separates the west and the east of Nalasopara. The two sides grew among time with very different characteristics.



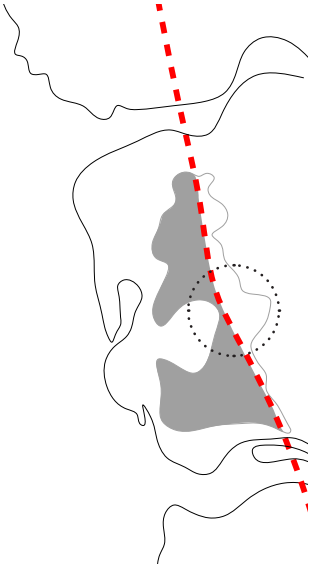
Towards the west, dwellings for the middle income groups were (and are being) built by private developers. Even though the infrastructure of roads and services is not complete, and there is a lack of communal spaces, the buildings have accurate sanitary conditions and sustainable densities.

In the east, however, the existing fabric of baithi chawls is continuously being replaced for 5-storey slabs. These slabs are very close to each other, sometimes with distances of 30cm between buildings. This creates unsanitary conditions of light and ventilation, lacking proper infrastructure and public spaces.



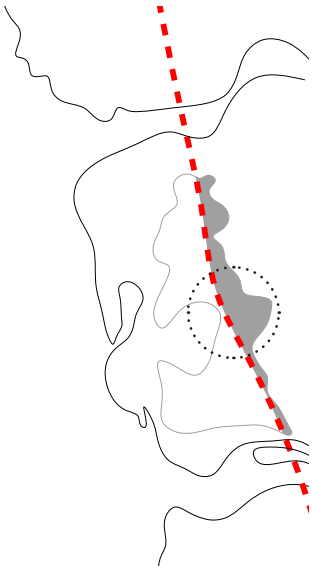
0 50 100 200

Nalasopara West



The area of Nalasopara West is being developed mainly by private developers and MHADA. The buildings cater for the low and middle income groups, and even though the sanitary conditions are accurate, the are lacks defined public spaces as well as a general infrastructure of roads and amenities.

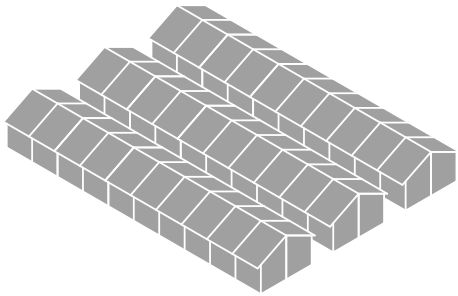






The area of Nalasopara East is being developed entirely by private groups. The dwellings are destinated to the economically weaker sector and low income groups. The level of density (FSI 4.0) is not sustainable and the dwellings lack proper conditions of light and ventilation. The area has a complex and developed scope of educational, health and commercial facilities.

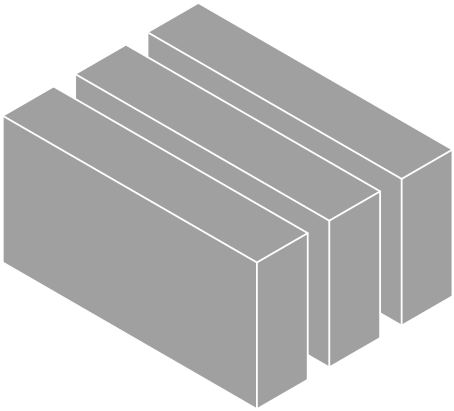
Baithi chawls fabric



A typical alley in the baithi chawl neighbourhood of Nalasopara East. The street is used as a gathering space, as well as an extension of the otherwise very reduced dwellings. However, the area lacks infrastructure, and its low density fails to accomodate the high number of newcomers.



Handshake chawls fabric



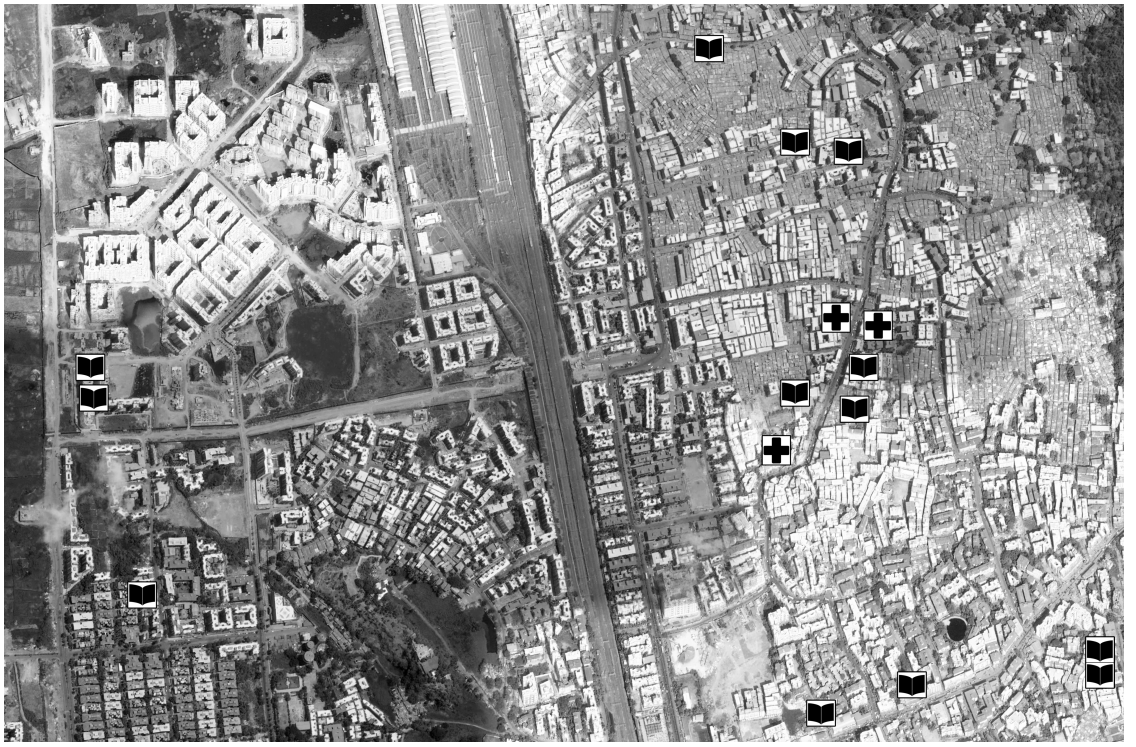


A common perspective of the streets of Rahmat Nagar, in Nalasopara East. The ground floors are mainly used for workshops and storage, and the public space becomes dark, anonymous and repetitive.

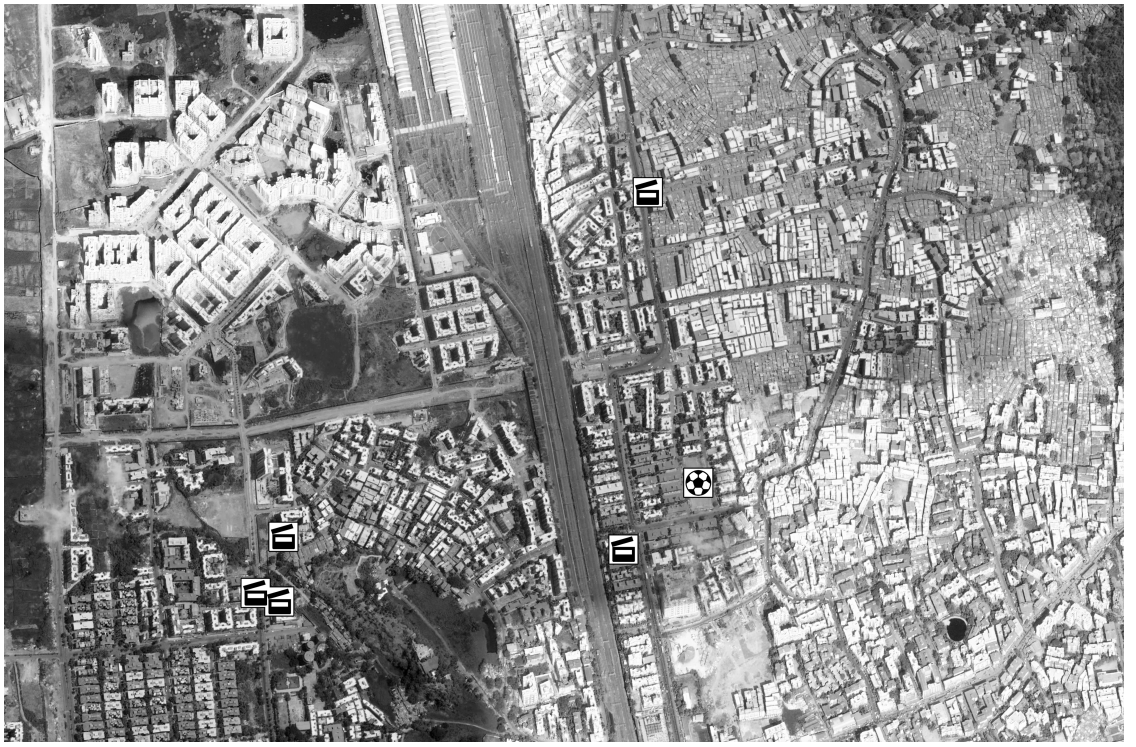
Amenities in Nalasopara

Whilst the east has a more consistent offer of education and health facilities, the west has a higher density of leisure places.

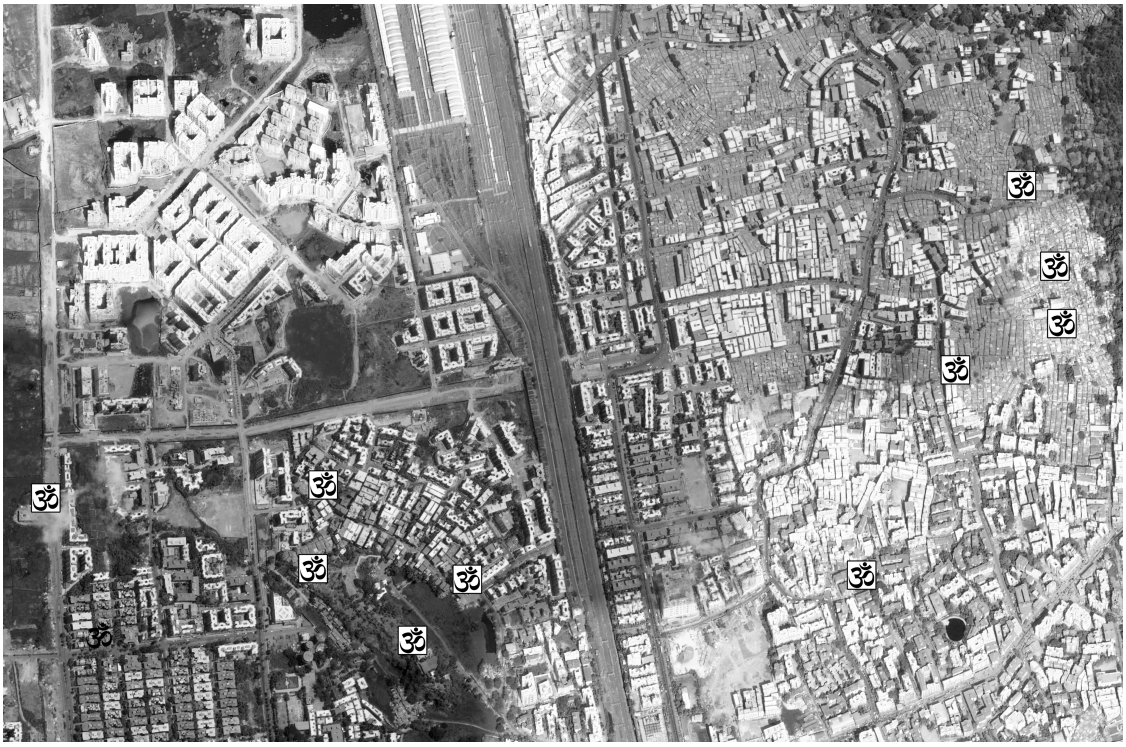
Education and health



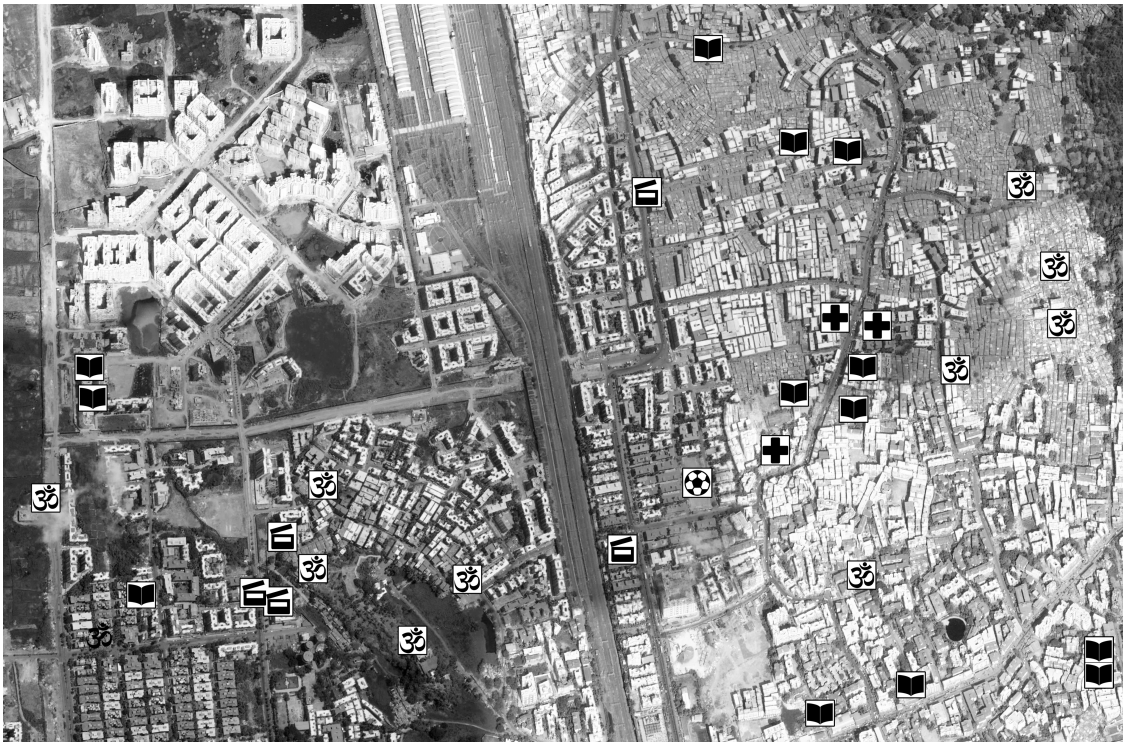
Leisure



Religion



All amenities



Many dwellers of Nalasopara are former inhabitants from the rural areas of the state of Maharashtra. As Doug Sanders explains, the 'winners' of the rural-urban migration phenomenon are the ones who, after decades of seasonal migration, finally settle with their families in the city.[1]

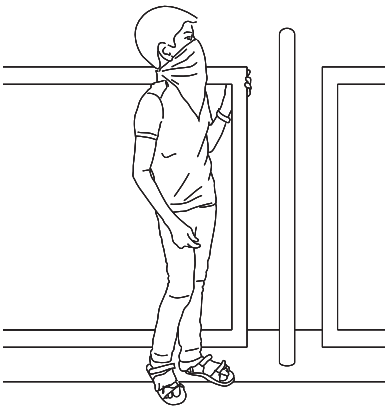


It is common to find in Nalasopara former dwellers of Central Mumbai. The recent abrupt rise in rental prices in the city makes families resettle in the outskirts of the city, in neighbourhoods from which they can still commute to their jobs.



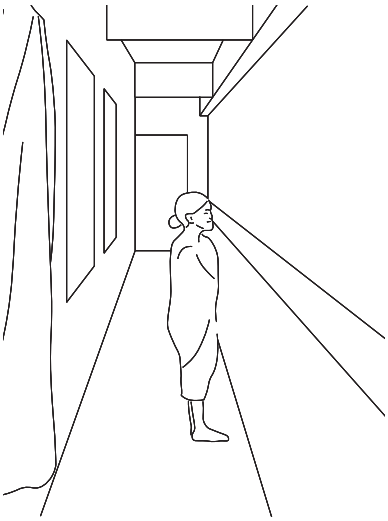
The community of families from Uttar Pradesh is very strong in Nalasopara. Both in the baithi chawl and in the handshake chawl areas, some sectors are inhabited in a high proportion by Uttar Pradesh migrants.





Mohammed

Inner Maharashtra



Geeta

Central Mumbai /
Rajasthan



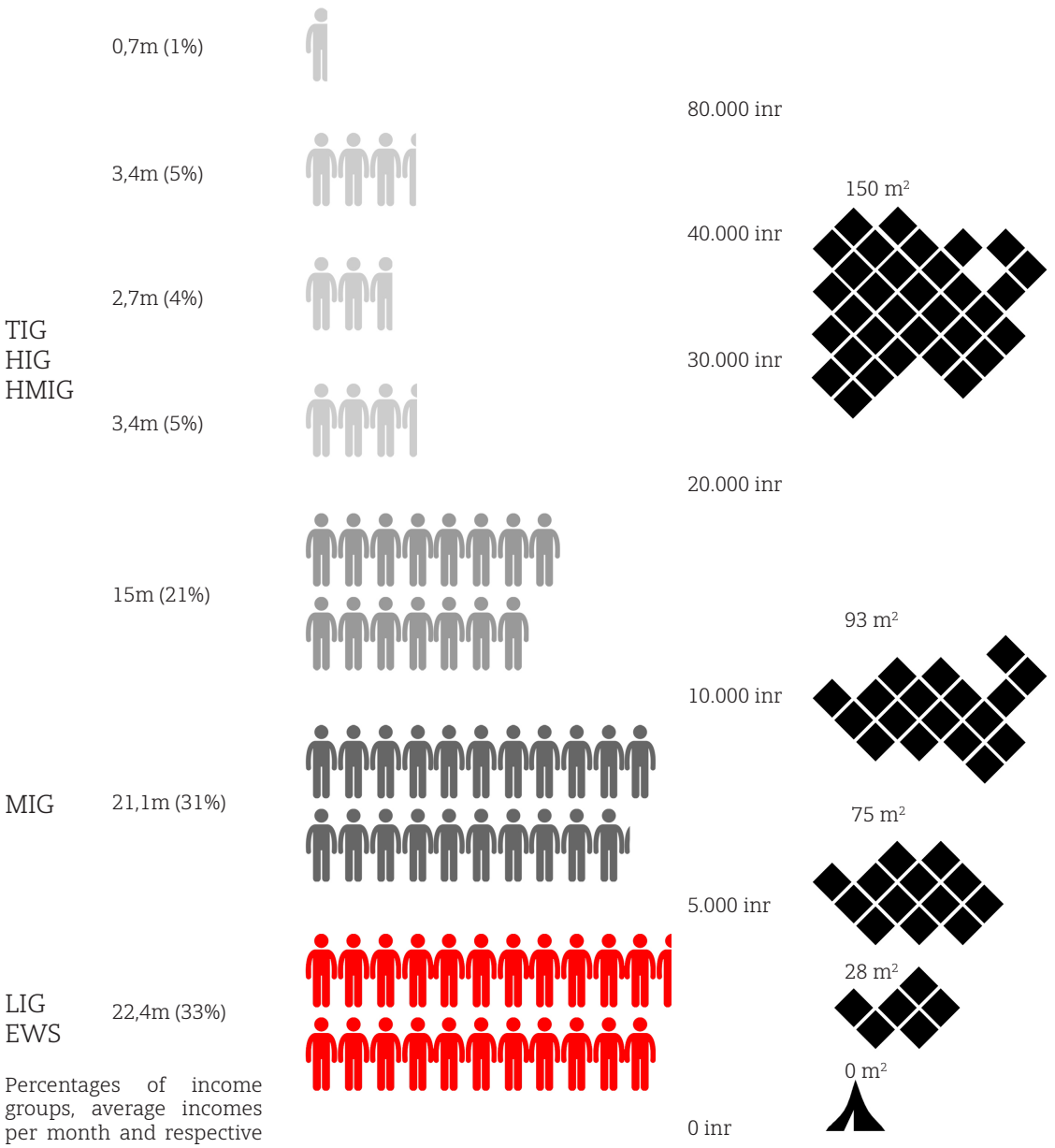
Gaurav

Uttar Pradesh

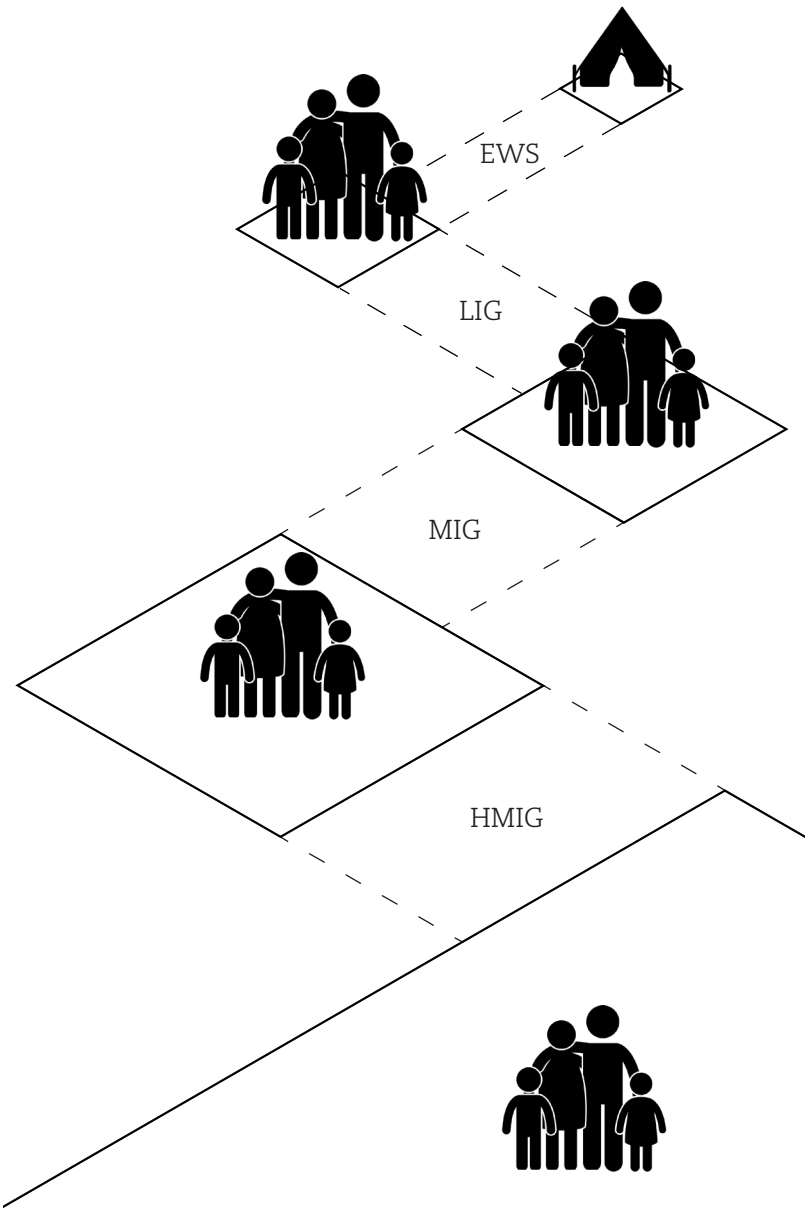
[1] Doug Saunders, Arrival City: how the largest migration in history is reshaping our world (New York: Pantheon Books, 2010).

Income groups and housing

The remarkably high density of Nalasopara is accomodated in a very unequal distribution. Families of 5 members (in average) who belong to the economically weaker sector dwell in rooms of 6m^2. Meanwhile, higher income groups dwell in significantly larger spaces.



Percentages of income groups, average incomes per month and respective dwelling sizes.



Dwelling sizes according to income groups.

On-Site Investigation


STREET GARAGE

The understanding of the context and the observation of the minimum

Since the task is to design a dwelling project in an area that is not familiar to us, the research methods applied become highly relevant. The Chair suggests a combined approach: a visual ethnographic method to understand the local patterns of inhabitation, plus a thorough study of the socioeconomic context and the investigation of building typologies. In my opinion, the success of the combination of these approaches lies in the complementarity between the observation of the intimate and social patterns of inhabitation, and the broad understanding of the context. The last one is possible through readings and discussions of articles and documentaries, and the analysis of local dwelling projects.

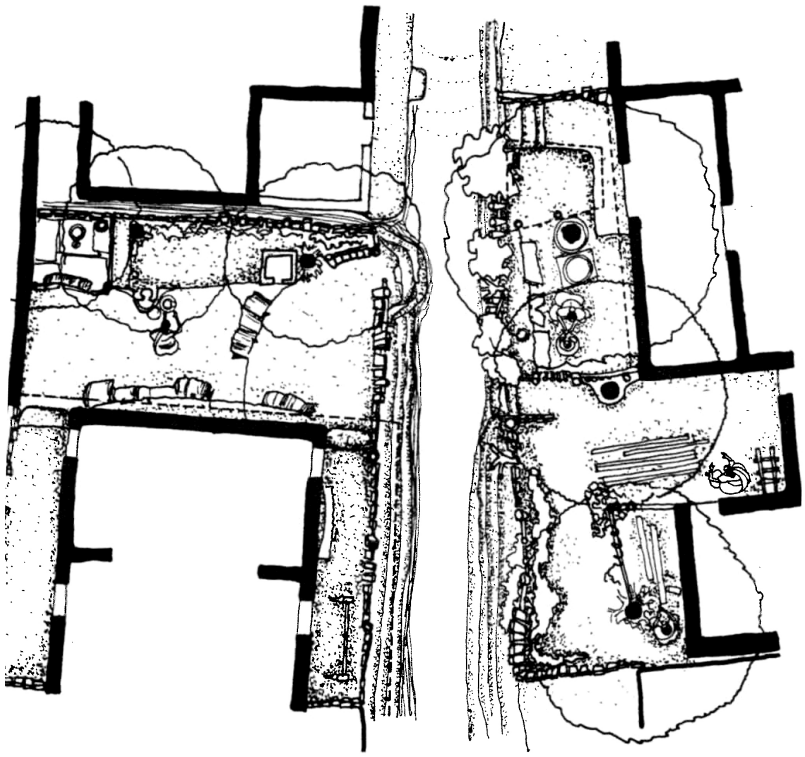


Fig. 1: Floorplan of the yards in a settlement of Indore, part of the study 'How The Other Half Builds', by researchers of the McGill University in 1984. The aim of the study was to understand the patterns of everyday life in the slums of Indore, and the Aranya Housing Project by B. V. Doshi was designed by reflecting upon the information gathered.

I intend to give meaning to this approach by building a theoretical framework that takes both international and local references. The local references are both from well-acknowledged writers and architects, and from the local patterns of inhabitation I was able to observe during the field trip. For example, I became very interested by the ways in which locals transform their houses in order to

create more space for their families or to determine a place for income generation.

My objective is to build a theoretical framework that can accompany the process of designing, and that is flexible to accommodate new findings that I may have during the design phase. I think that, in order to achieve a solid design proposal, it should be able to answer to all the observations along the research in every matter. This is why the field trip plays a crucial role: by experiencing the reality, I became aware of how important the 'small-scaled' activities are, and in which way the space can influence them. For example, some steps in the shade can be the perfect place to share a conversation between neighbours while they wait for the school bus. In my opinion, these 'minimum' elements are as essential as the urban master plan and the outline of the development policy.

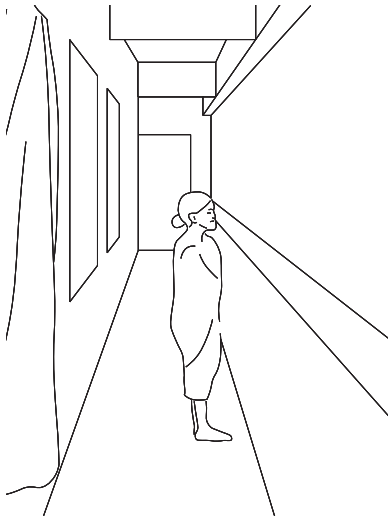
Finally, I am positive that in order to make a solid contribution to the discussion of affordable housing in India, I should make use of my own context and background. Therefore, I aim to introduce Latin American projects to the debate. For example, there are many affordable dwelling projects in Buenos Aires that can provide useful information to approach dwelling architecture in other parts of the world, regarding policies and the roles of the government and the private sector. I strongly believe that if all the students bring experiences from their own context, we can build a more complete and complex understanding of the matter of affordable housing, worldwide.

Awareness of a Subjective Investigation

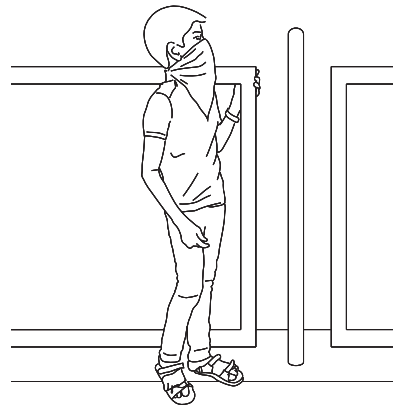
The gathering of information regarding the patterns of inhabitation was completely based on our observation and the communication with the locals. As a research group, we decided to try to see the reality through the eyes of the inhabitants of Nalasopara. We are aware that our observations are relative to the moments we visited (thursday and saturday afternoons in the beginning of November) and the people we spoke to. Our goal as researchers was to embrace the subjetivity of our findings, using it as a toolbox for the elaboration of our designs.

As a result, I introduce here the characters of the narrative and the path we walked through in the site.

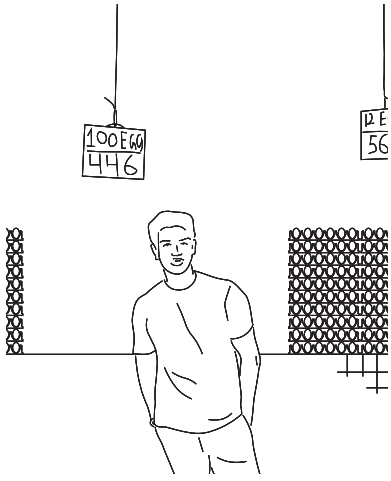
Left: Geeta
Lives on the first floor of a hand-shake chawl in Rahmat Nagar
From Central Mumbai
Her husband is from Rajasthan and works in construction
Mother of two boys



Right: Mohamad
Just finished his exams
Goes to 7th grade of Usman Singh College
His parents are from inner Maharashtra
His favourite dish is Vada Pav

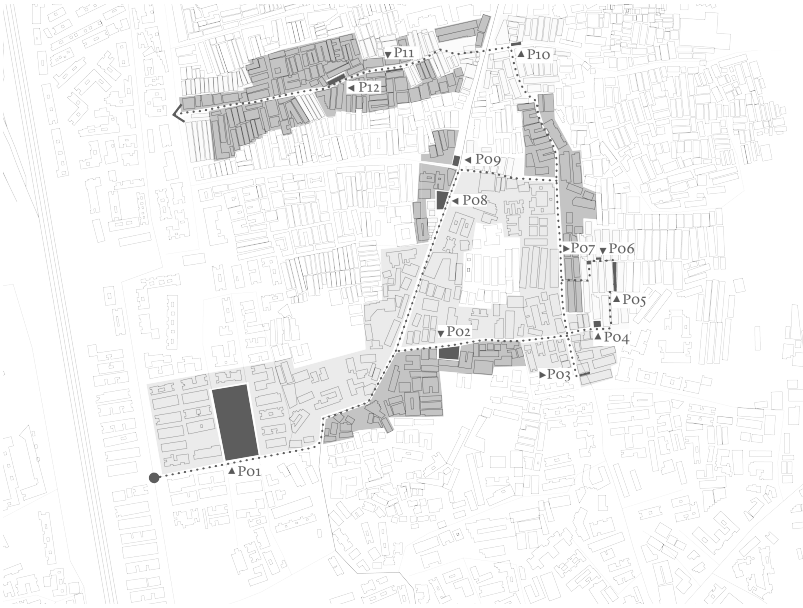


Left: Aman
Lives on the first floor of a hand-shake chawl in Rahmat Nagar
From Central Mumbai
Her husband is from Rajasthan and works in construction
Mother of two boys

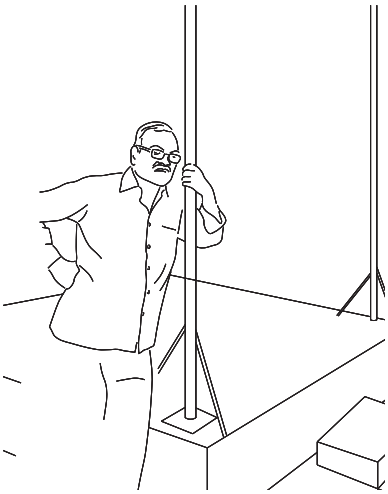


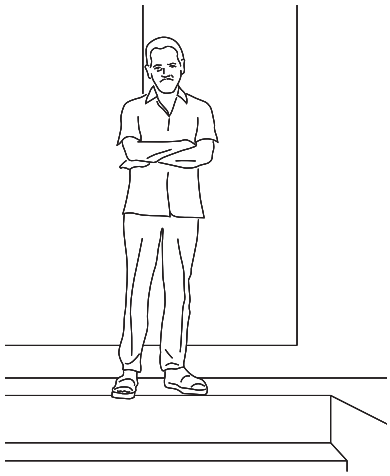
Right: Gaurav
Lives with his parents in a flat in a hand-shake chawl in Rahmat Nagar.
Helps Aman at the egg store.





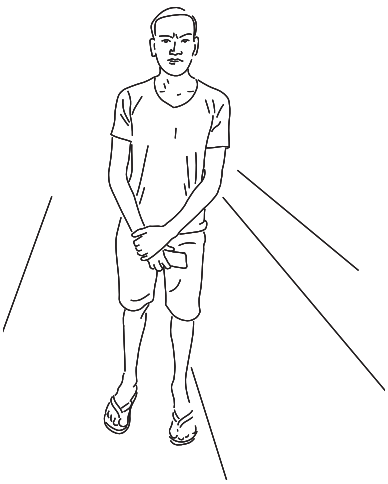
Map of the journey through Nalasopara, covering areas of baithi chawls, hand-shake chawls and open, public spaces.





Left: Sanjee Gupta
Originally from Uttar Pradesh, has lived in Nalasopara for 25 years. Has three kids and owns a shop in the baithi chawl area.

Right: Vishal
Owns a shop of mens wear. Knows all the kids from Vijay and lets them sit in front of his shops in the afternoons.





Left: Gord
Business student, visiting his brother and cousin at the chawl.
Born in Mumbai, considers that Nalasopara is a very poor area without interesting features for architects.

Right: Sanjay
14 years old, spends most of his time playing football on the street. Thinks that girls do not play but gossip.



The street as a gathering space

Street in Nalasopara
Mumbai



The courtyard as an extension of the house

Swadeshi Market Chawl
Central Mumbai



The street as a space for income generation

Chai place,
Jaipur, Rajasthan, India

The social spaces are key in the everyday life of Nalasopara. In the neighbourhood, ang also troughout the whole country, the importance of the outdoor, collective and public spaces can be appreciated. These work as expansions of the houses, as gathering spaces, and as potential places for income generating activities.



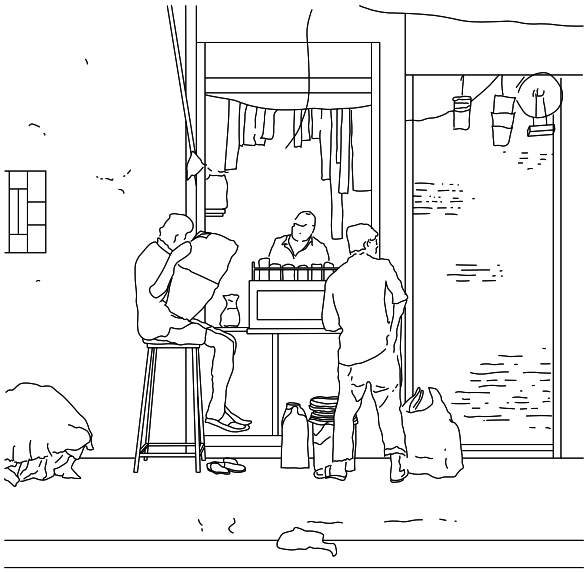
The street as a gathering space

Rickshaw driver meeting
Street in Nalasopara



The courtyard as an extension of the house

Baithi chawls
Nalasopara



The street as a space for income generation

Pan selling place
Nalasopara



Gully Cricket

We always come to play here because it's for free ... we learnt to play at the cricket school but that is only for members.



Alley of Intimacy

Women stay in their comfort zones, and men stay on the streets.

Social Spaces
Seen trough the eyes of their users



Waiting Plinth

We are waiting for the school bus. It will come again at 12.30 pm



Social Corridor

My husband and I moved here from Bombay because it's cheaper... we pay Rs. 2000 a month.

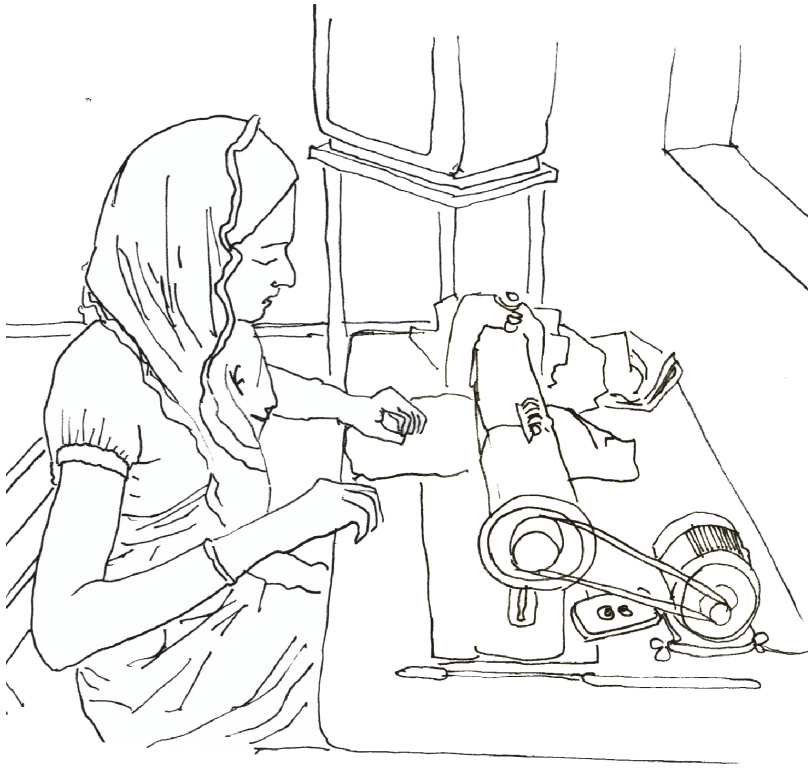


The Threshold

The contact between a house and the public space is crucial: productive, commercial and social activities are likely to happen in this zone.

Production

The dwelling space in many cases also accomodates income generating activities, mostly done by women.





Water Usage

The reserve of water is highly important in mid-rise buildings without a continuous supply of water.



Meals

Meals are a very important activity that happens in the interior, which all the family members share.

Drawings in this spread by Claire Barry, Shirin Hadi and Joseph Tjong-Ayong



The Street Stall

The street commerce is the means of living of a high percentage of the dwellers of Nalasopara.

Indoors Production

The production of handcrafts and jewellery are done mostly inside the dwellings, by women.



Income Generation



Ground Floor Shops

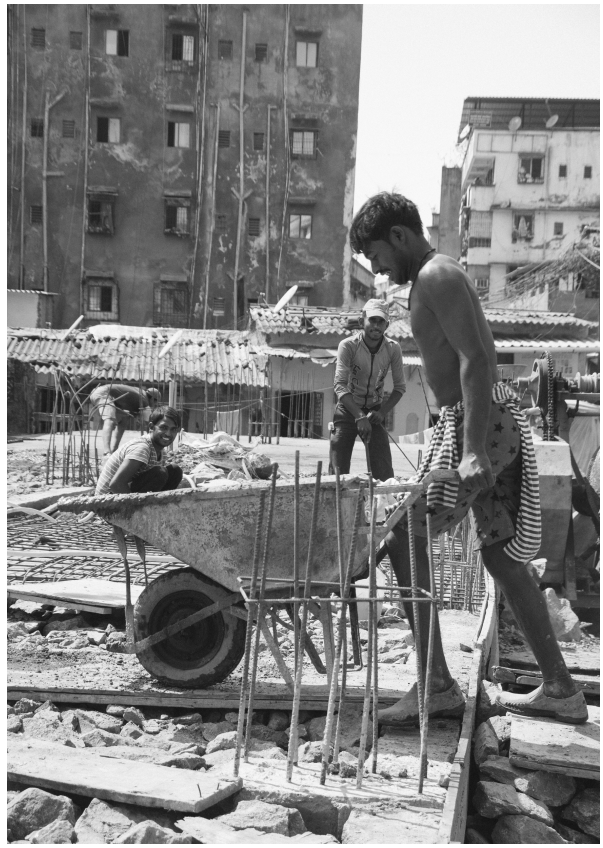
In most of the high-hierarchy roads, the ground floors of houses are used as shops, expanding to the streets.



Workshops

In the less busy streets, the ground floors of the hand-shake chawls are mainly used for workshops

Pictures in this spread by Jennifer Nam, Matthew Riches and Biling Yang



Handcraft Construction

The construction in Nalasopara consists mainly of handcrafted, in-situ reinforced concrete structures and brick wall infills.

Reinforced Concrete

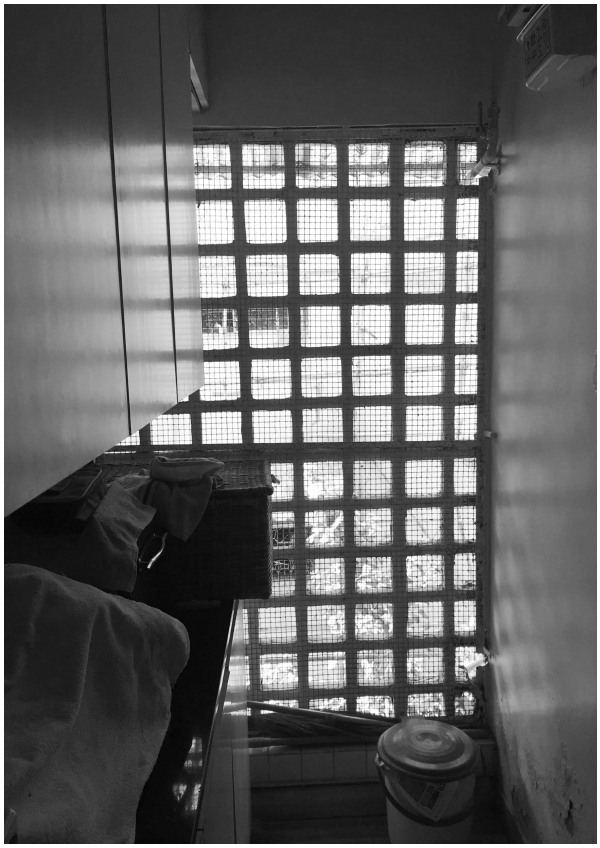
The reinforced concrete is the best-known material by the local workforce.





Climate Adaptation

Pitched light roofs are used to give shade, to deviate monsoon rains and to cool down the roofs and openings.



Jalis

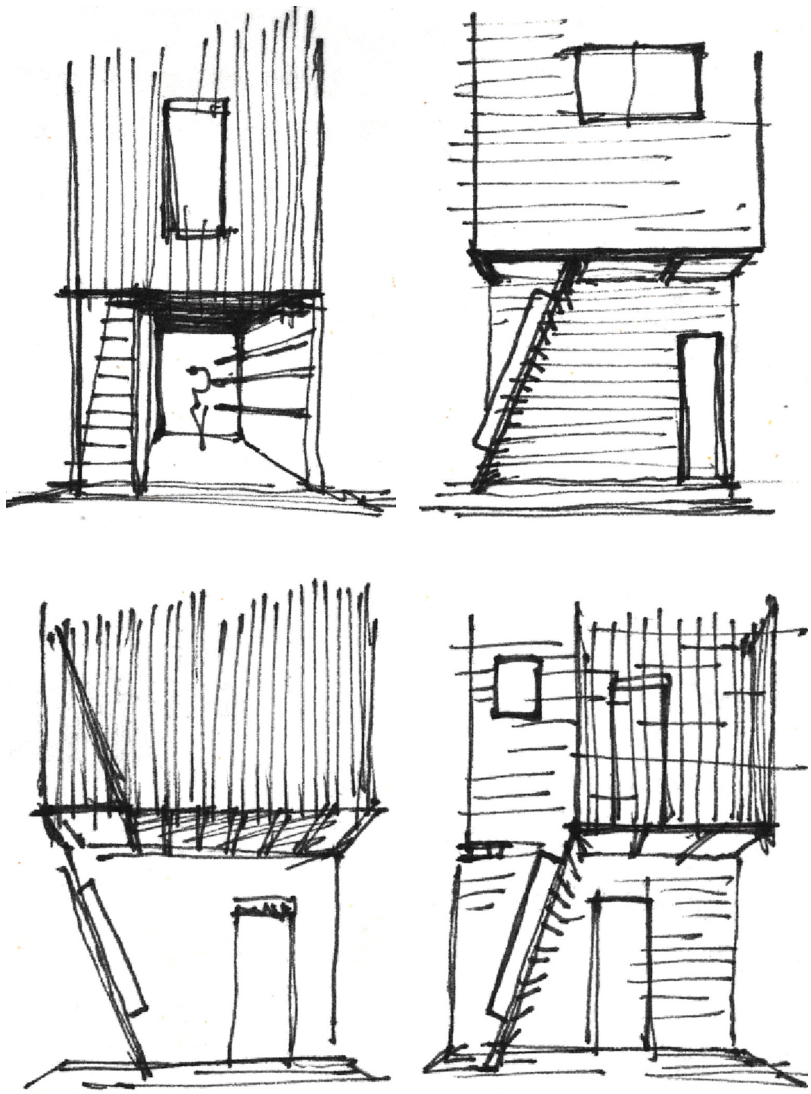
The jalis, architectural pieces that have existed in India for centuries, are used to ventilate as well as protect and give shade to the dwelling. Both handcrafted and industrialised jalis can be found.

Pictures in this spread by Jose de la Torre, Wout Kruijer and Linn Opsahl

Aesthetics of Transformation[1]

Along the city of Mumbai, the 'aesthetics of transformation' can be seen in different neighbourhoods and in different types. Some dwellers of Dharavi build upper stories in order to rent a room to a paying guest or to have a shop on the ground floor and a dwelling upstairs. Meanwhile, the dwellers of the chawls in the city centre encroach their houses by adding cantilever volumes, or give identity to their units by redesigning their thresholds. In all the cases, the observation of the transformations made by people provide a very complete catalogue of possibilities, and also shows, in a very clear way, the necessities and ambitions of the dwellers, regarding climate comfort, place, spatial appropriation and income generation.

When designing a mass-housing scheme, it is crucial to evaluate to which extent these practices can be accomodated and encouraged by the structure and configuration of the design.



Figs. on this page:

Catalogue of the ways in which the dwellers of Dharavi build upper floors and connect them independently to the street. As a result, they can accomodate a bigger family, rent out a room or split the unit into a commercial space on the ground floor and dwelling upstairs.

[1] Deviation from 'As Found Aesthetics'; theory by Alison and Peter Smithson about the importance of understanding the patterns of everyday life of the place where an architect will do a design.











Figs. on this page:

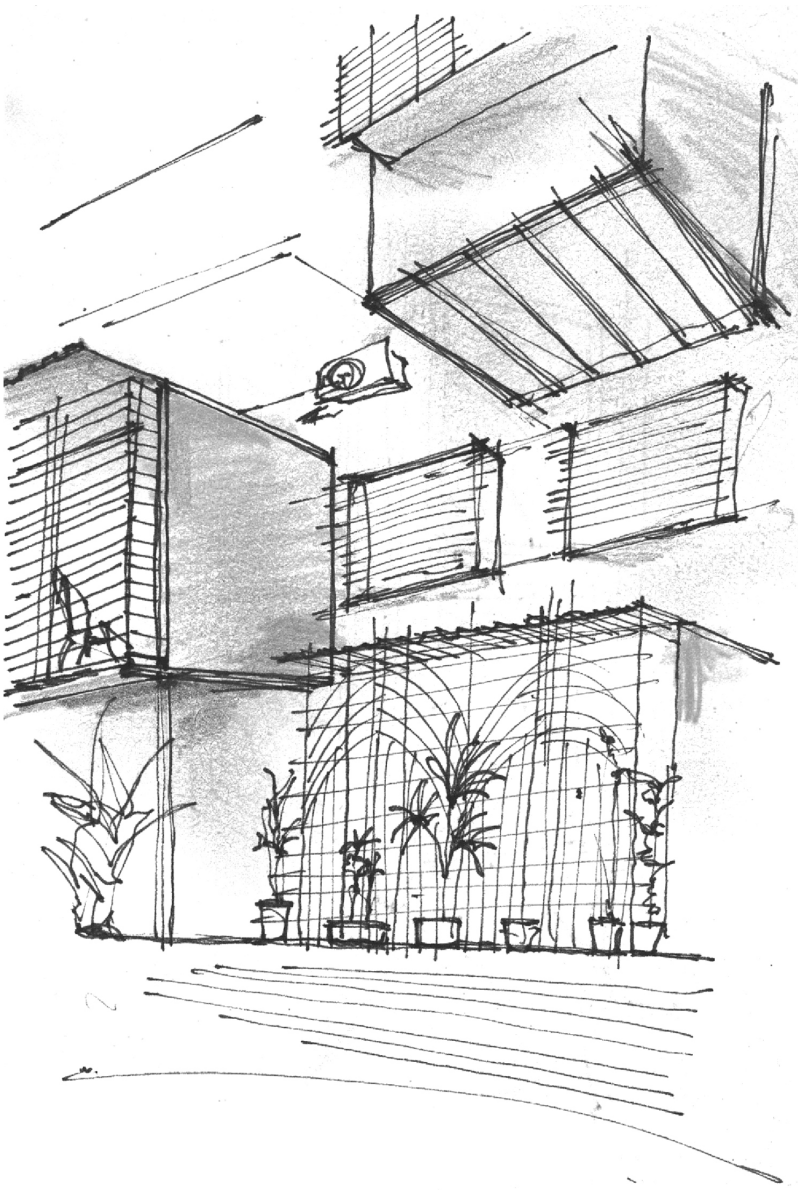
Demonstration of how the urban space gains complexity thanks to the incorporation of new architectural elements by the dwellers through time.





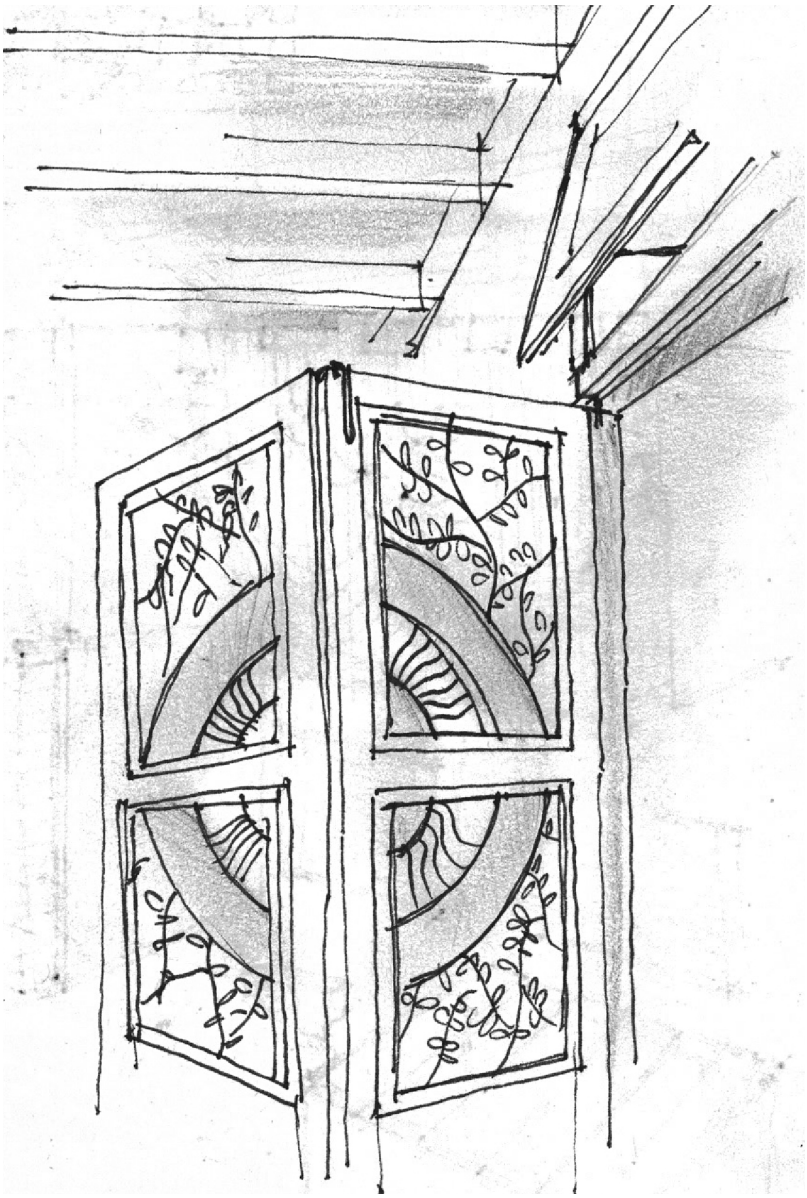
Figs. on this page:

Cantilever volumes added by dwellers of the BDD Chawls, in central Mumbai. These elements provide more space for the otherwise very reduced units.









Figs. on this page:

Modification of entrance door of a dwelling unit in the Bhatia Chawl, in central Mumbai. The replacement of the door gives identity to the family that dwells in the unit, providing recognition within the community of the chawl.

The Role of Undetermined Social Spaces in the Creation of Place

A comparative analysis of the social spaces of Wereldhaven (Rotterdam, the Netherlands) and Nalasopara (Mumbai, India).

We are a group of architecture students with the task to design a dwelling project in Nalasopara, Mumbai. In order to gain knowledge about the way in which people use the space and interact with one another in the area, we carried out a field research to understand and communicate the local patterns of inhabitation. This process had two stages: first, we implemented the method of visual ethnography in Wereldhaven, a housing complex in the east of Rotterdam, designed by Jan Wils in 1941. The aim of this stage was to understand the method of investigation, and come up with a personal, specific way of analysing and communicating the information. The categories of study were social spaces, income generating activities, borders, building techniques and domestic spaces. This experience also provided a base to perform a comparative analysis when studying the neighbourhood of Nalasopara, in Mumbai. This time, we had the clear objective to study the area where we would later design a dwelling project. With my group, we focused on the study of social spaces. Some of the questions we addressed during the field study were:

Which activities happen in those places? How is the spatial configuration of those spaces? Which social groups participate of those activities? Which is the scale of the spaces? How do those spaces relate to the dwelling areas and to the other sectors of the neighbourhood? Were the spaces designed for that activity?

By trying to find answers to those questions, I became particularly interested in the way in which the spatial configuration of a public space influences the type of activity that can happen in that specific space. In other words, my aim is to comprehend to which extent the space, being the physical component of a place, determines the way in which people will use the place.

As a result, the concepts of determination and undetermination of spaces become highly relevant. The topic of undetermined spaces is not new in architecture. Gilles Deleuze and Felix Guattari published in 1980 their book A Thousand Plateaus.[1] The authors proposed that

[1] Gilles Deleuze & Felix Guattari, A thousand plateaus (Berkeley, CA: Venus Pencils, 2009)

there are two ways to approach space: striated space and smooth space. In the first one, associated to sedentariness, there is always a specified route, and the person who walks knows where the path is going to end. In the smooth space, by contrast, there is not a pre-established path; the experience of walking through the space can lead to many different outcomes. This type of space is associated with the idea of nomadism. This concept of undetermined space was taken by Bernard Tschumi in his winning proposal for the Parc de la Villette, in Paris, in 1982. In the park, a grid of red folies contrasts with a series of meandering paths in which the wanderer does not know where he or she will end.

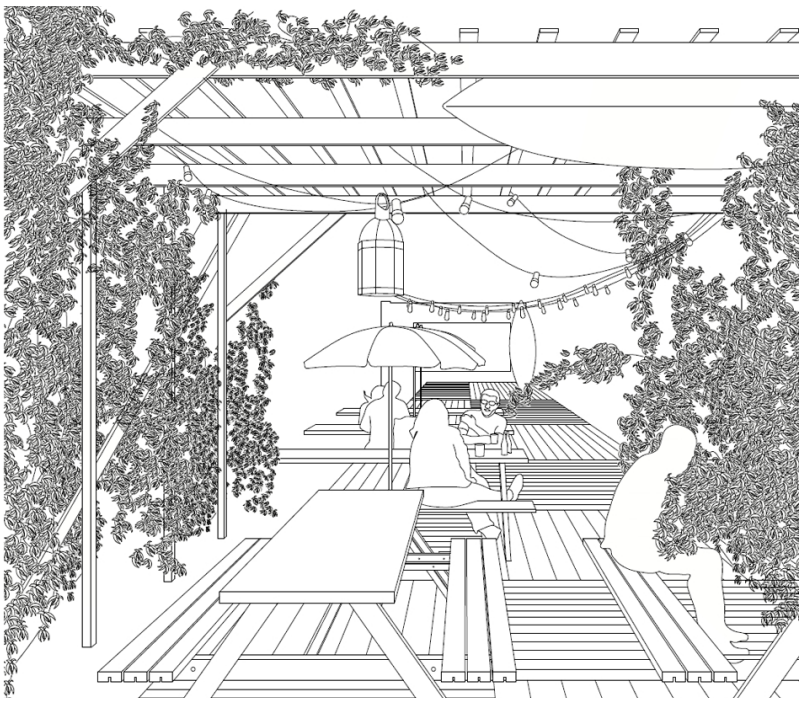


Fig. 1: Foodcourt in the courtyard of the Industriegebow.

The idea of undetermined spaces helped me form a critical understanding of the social spaces in Wereldhaven and in Nalasopara. In the Dutch neighbourhood, the spaces for the gathering of the neighbours were designed according to the function they would have. The size of those spaces, the level of enclosure and their relation with the main commercial avenue and the housing blocks were factors that determined their use. For example, the secluded courtyard of the Industriegebouw, surrounded by restaurants and cafés, became an optimum area for an outside food court (fig. 1). Meanwhile, the wide green strips between the low-rise housing blocks were designed as collective spaces, meant to be used for the leisure of the inhabitants of the complex. Goudsesingel,

the main avenue separating the two above-mentioned spaces, evolved as a clear commercial and circulation line, without spaces for social gathering (fig. 2). All these three scenarios have very specific features regarding layout, scale and connectivity. They were aimed to fulfil a particular mission, and they were designed accordingly. In my opinion, this linear process between necessity and design proposal has two main effects. On the one hand, the specificity of the design makes these spaces very efficient in answering to their particular function. For example, all the balconies from the living areas of the row houses in the Wereldhaven complex face the collective green strips. As a result, they give an atmosphere of domesticity and enclosure to the collective area, clearly different from the vehicular roads. However, by designing outdoor spaces to fulfil a specific mission, the door is closed to other uses that the inhabitants may give to the place. If we take again the example of the collective green strips of Wereldhaven, according to the inhabitants, when the children grow up, families stop making use of those spaces.[2] This is a result of the high specificity of the design: if other functions were introduced, such as cafés or urban furniture, or if the relation between the dwelling blocks and the green area had more variety, perhaps more activities could take place there. In most of the social spaces found in Wereldhaven, the (deliberated) design aiming for specific functions led to an efficient but uniform use of social space.



Fig. 2: Goudsesingel, main commercial avenue

[2] Interviews conducted in place.

This approach towards design can be linked to the idea of striated space, where determination is used to achieve safety, clarity and effectiveness in the design of the social spaces. According to Richard Sennett, to some extent, this aim for determination obstructs the openness of the design. Sennett explains the phenomenon of openness as the possibility of a place to evolve trough time, adapting to new conditions, and allowing new activities to take place, beyond the scope of the original plan.[3] The social spaces of Nalasopara, analyzed in terms of determined and undetermined, can be placed in the other extreme of the scope.



Fig. 3: Kids chatting at the stairs in front of the tailor shop.

I do not aim to make a romantic picture of the social spaces I found in Nalasopara. If they became smooth spaces that may differ according to the experience of the people who use them, it is not because of the work of architects who aimed for open spaces, but as a result of the lack of planning overall. However, I do find very interesting features that are relevant to be analysed. The way in which the social spaces are linked to each other in Nalasopara is very complex. In opposition to the case of Wereldhaven, in Nalasopara the lines determining the perimeter of a social space are not clearly defined. Furthermore, except in the case of the cricket ground named 'Central Park' by the local kids, social spaces do not have identifiable layouts that would facilitate a specific function for the space. This creates a certain level of un-determination of

[3] Richard Sennett, Building and dwelling: ethics for the city (New York: Farrar, Straus and Giroux, 2018).

the space as a physical element, and therefore the people are the ones who determine the activities. For example, the stairs in front of a tailor shop can be the perfect place for kids to sit and chat in the afternoon (fig. 3). Also, an open square within the compressed urban fabric of the baithi chawls can be a place for gathering, for drying grains and for a religious altar (fig. 4). Or a 6-meter wide alley in between courtyard blocks can be the best place for teenagers to play football, and for a group of men to gather and drink chai. In all these examples, the lack of determination of the space makes it a flexible one, where varied activities can coexist and take place. Furthermore, the small objects that exist in the space, such as the stairs by the tailor shop or the altar in the baithi chawls, gain a high significance: in a network where all the spaces have similar physical characteristics, these small objects may define the way in which people use the space.



Fig. 4: Meeting square in the baithi chawls

This difference between the determination of the social spaces in Wereldhaven and the un-determination in Nalasopara also relates to other patterns of inhabitation. If we take the income generating activities, for example, the Dutch economy works with a system of formal and regulated employment. By contrast, in India, 70% of the population works in the informal sector.[4] The clear definition of spaces in Rotterdam is suitable to hold a safe

[4] Doug Saunders, Arrival City: how the largest migration in history is reshaping our world (New York: Pantheon Books, 2010), 41

working system. In the Indian case, the flexibility of the spaces gives the inhabitants the opportunity to perform self-employed jobs, as well as informal, temporary works. These, as Saunders explains, are the only possibility for newcomers to start a life in the city.[5]

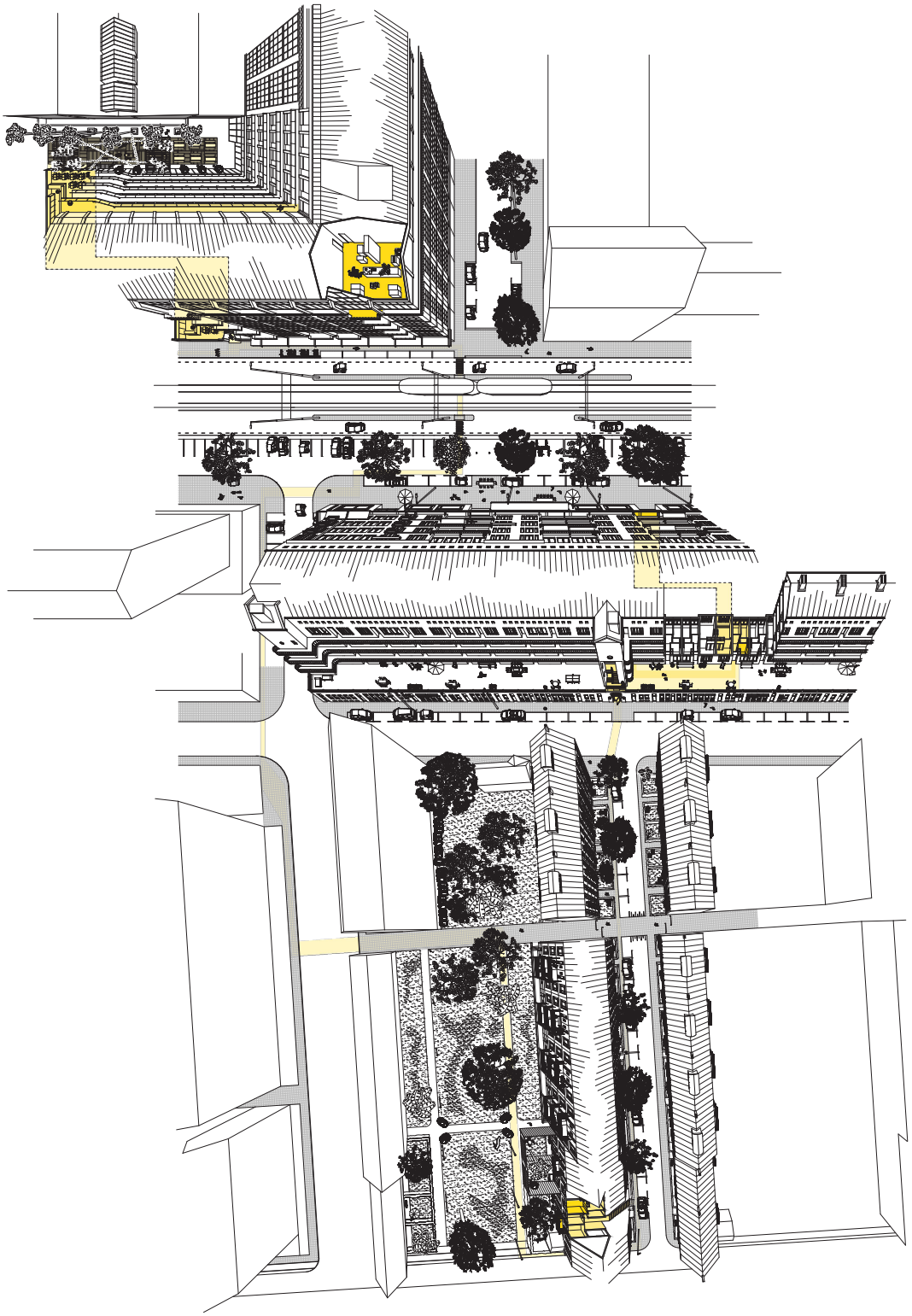
To conclude, I aim to take both the striated and smooth social paces that I found in Wereldhaven and Nalasopara, respectively, as references. In my opinion, a neighbourhood should have a combination of both kinds of spaces. By aiming for this, we can design spaces that are safe and efficient for the development of the community. But at the same time, propose spaces that are not clearly determined, that will become a place depending on the way that people appropriate them.

If we manage to combine spaces that are striated and smooth, we are providing alternatives for the different social groups to interact with the city in varied ways. This way, we can aim for the Right to the City, an idea coined by Henri Lefebvre and developed by David Harvey in his book Rebel Cities.[6] In my opinion, we can contribute to make the city a right for everyone by providing different alternatives in the use and appropriation of social spaces.

[5] Doug Saunders, Arrival City: how the largest migration in history is reshaping our world (New York: Pantheon Books, 2010), 41

[6] David Harvey, Rebel Cities: From the right to the city to the urban revolution (London: Verso, 2013).

Intersecting Universes - Wereldhaven, Rotterdam





Challenge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Challenge

As a student of the Global Housing Studio, I am faced with the task of designing a housing project in the context of the so-called 'Urban Global South'. The course focuses on Nalasopara, an arrival city in the Vasai Virar area, in the northern fringe of Mumbai. This settlement experienced in the last 20 years a major population growth.[1] This is caused by the considerably lower rent in relation to Mumbai, and the effective connection provided by the train, allowing the dwellers of Nalasopara to reach Central Mumbai in less than an hour. As an arrival city, Nalasopara became populated not only by rural-urban migrants from the impoverished villages of Maharashtra, Uttar Pradesh, Gujarat and Rajasthan.[2] These newcomers arrived to the city looking for jobs and a new life, away from restrictions related to religion and caste. Nalasopara became also a magnet for families who dwelled in central Mumbai but, due to the disproportion between their income and the price of rent, were forced to seek for dwelling in the outskirts of the city.

The train created the possibility of a settlement in Nalasopara and boosted its growth by connecting it to central Mumbai, However, as a physical element, the railway constitutes a clear barrier between the two detached neighbourhoods of Nalasopara West and East. In Richard Sennett's terms, the railway creates a non-porous boundary[3] which does not allow mixture and exchange between its two edges. This phenomenon happens not only in Nalasopara, but also along the whole city of Mumbai. In Nalasopara, particularly, it generated two different realities: to the west, a series of developments for low and middle income groups, accompanied with proper infrastructure but lacking designed communal spaces. To the east, however, the scenario is more shocking: in the area of Rahmat Nagar, private contractors constructed a series of (illegal) 5-storey slab buildings lacking services and with extremely poor conditions of light and ventilation. These slabs, sometimes as close as one meter to each other, lack proper infrastructure, and there is a complete neglect of public, communal space.

The area of Rahmat Nagar, with its large housing stock and low rent prices, became a magnet for newcomers, urban-rural migrants that come from the impoverished provinces of northern India and inner Maharashtra. As Doug

[1] Ministry of Home Affairs, Government of India: Census of India (2011) https://web.archive.org/web/20040616075334/http://www.censusindia.net/results/town.php?stad=A&state5=999

[2] Interviews conducted in-place. 03/11/2018 iii Richard Sennett, Building and dwelling: ethics for the city (New York: Farrar, Straus and Giroux, 2018).

[3] Richard Sennett, Building and dwelling: ethics for the city (New York: Farrar, Straus and Giroux, 2018).

Sanders states, many of the rural-urban migrants arrive in the city alone, without a network of acquaintances to help them set up their new lives.[4] Furthermore, they come from different backgrounds and have distinct dwelling practices. Therefore, open, communal spaces designed for the interaction of the inhabitants and variety in the housing alternatives are crucial to make a settlement more open for newcomers, and to encourage the formation of a community. As a result, the single answer of dwelling types in Rahmat Nagar, plus the inexistence of (designed) spaces for the gathering of the inhabitants are failing to meet the necessities of the newcomers.

The lack of variety in dwelling types and communal spaces constitute obstacles in the quest to achieve the formation of a community in Nalasopara. The idea of community, following Christopher Alexander's ideas, consists of a group of people (its size can vary) that share a common good, resource or goal, which makes the members feel attached to the group.[5] These communal elements should not be underestimated, because they can be tools for inhabitants to be connected with their place and their neighbours. For example, in the Barrio Alfredo Palacios, built in Buenos Aires in 1966, the outdoor green spaces were developed after the dwellers moved in, and the owners themselves were encouraged to get organised and design the greenery, the football field and the playgrounds. This led to a strong sense of participation and belonging between the dwellers, and even today the outdoor spaces of the neighbourhood are very well maintained and used by the inhabitants.
In addition to the lack of communal spaces, in a market-driven economy where developers find it more profitable to build luxury and semi-luxury dwellings, the possibility of ownership becomes very difficult to achieve for the low income groups. As a matter of fact, due to the requirements from the banks and micro-financing institutes to provide loans and the disproportion between incomes and the value of land, only 5 to 6% of the households in Mumbai can afford a market purchased house.[6] The difficulty of ownership, in addition to all the above mentioned circumstances, makes the ideas of community and sense of belonging a very tough challenge.

The building density required to receive the growing number of newcomers to Nalasopara needs to be balanced between the two sides of the railway. Otherwise, the 5-storey slabs, almost adjacent one to another, that already occupy the area of Rahmat Nagar, will end up

[4] Doug Saunders, Arrival City: how the largest migration in history is reshaping our world (New York: Pantheon Books, 2010).

[5] Christopher Alexander, Community and Privacy (United States of America: Anchor Books, 1965).

[6] Sahil Gandhi, Economics of Affordable Housing in Indian Cities: The Case of Mumbai. (Environment and Urbanisation Asia, 2012)

colonising the whole East of Nalasopara. This is a very threatening risk: this neighbourhood, inhabited by the economically weaker sector and low income groups, will be completely left out of open spaces and variety in dwelling types.

To summarize the problem statement, I argue that:

The disparity and disconnection between Nalasopara West and East, the 5-storey chawls as the single answer of dwelling typology in Rahmat Nagar, the lack of (designed) meeting places and the difficulty of ownership are obstacles to achieve community and sense of belonging.

To investigate and give an answer to the above mentioned problem, I propose the following research questions:

How can the introduction of punctual interventions in the public spaces, related to leisure and commercial activities, integrate the two detached and dissimilar neighbourhoods of Nalasopara West and East by encouraging the inhabitants of both areas to use those facilities?

How can the placement of high-dense mid-rise clusters of dwelling architecture on both sides of the railway embrace the formation of intimate communities?

How can the market-driven economy of contemporary India be used as a tool to pursue this quest?

In the mentioned research questions, five main elements arise: the architecture of dwelling, the idea of community, the aims of integration and adaptation, and the frame of action given by the market-driven economy. In the following paragraphs, I will explain how these concepts interact with one another in the formulation of the research question.

I aim to study the architecture of dwelling and the pursuit of a community in terms of scale. Charles Correa, in his book The New Landscape, explains that the sphere of dwelling not only relates to the house itself, but also includes all the spaces related to integration and participation of the inhabitants.[7] Meanwhile, the idea of community can be also addressed in terms of its size. Christopher Alexander explains in A Pattern Language that a small-sized community is optimum for specific functions, and if this community is merged with another

[7] Charles Correa, The New Landscape. Urbanisation in the Third World (Butterworth Architecture, 1989).

one, creating a bigger one, its size becomes optimum for other kinds of functions.[8] For example, a cluster of 20 houses can be perfect to hold a children playground in its core. Meanwhile, a group of 50 households can be suitable to develop production activities for income generation. As a result, the thorough study of the different scales of clustering becomes crucial in the quest to achieve senses of community and belonging within the inhabitants.

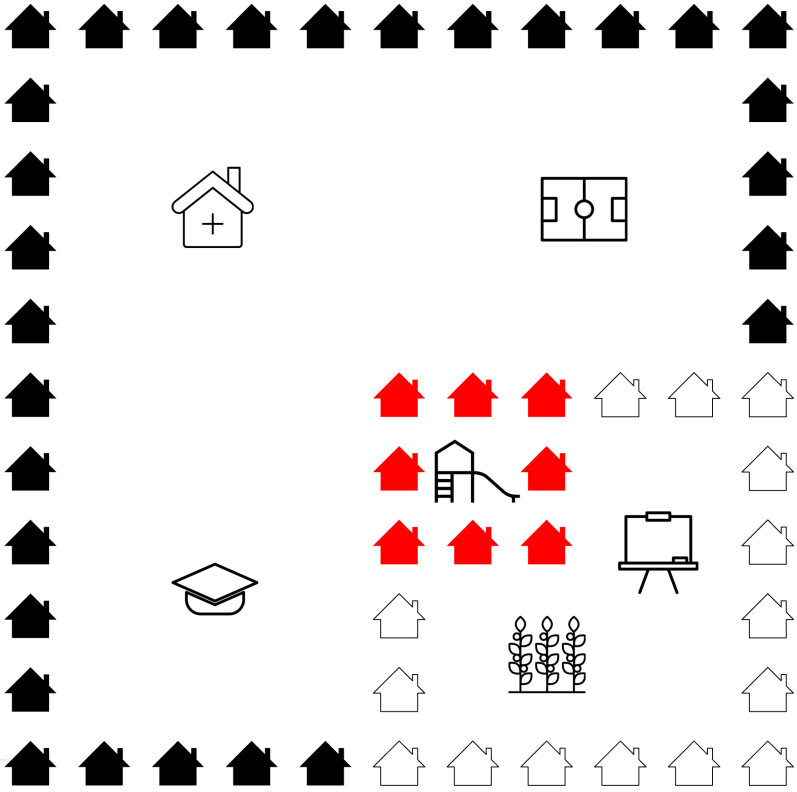

Fig. 1: Community, understood in terms of size.

Cristopher Alexander, A Pattern Language (Munich: Fachhochsch, Fachbereich Architektur, 1990).

Alexander also reflects on the urban hierarchy and the transition points between spaces: "The transition points that at first appeared as secondary joints between realms now emerge as important primary elements in their own right".[9]

The concepts of integration and adaptation – connoted in the idea of 'dissimilar neighbourhoods' – will be understood as principles. Charles Correa develops a "bill of rights for housing in the Third World",[10] a series of principles which includes ideas such as equity, pluralism and participation. I recognize integration and adaptation as goals, which can be achieved by combining the study of international projects with the analysis of the local patterns of inhabitation.

[8] Christopher Alexander, A Pattern Language (Munich: Fachhochsch, Fachbereich Architektur, 1990).

[9] Christopher Alexander, Community and Privacy (United States of America: Anchor Books, 1965).

[10] Charles Correa, The New Landscape. Urbanisation in the Third World (Butterworth Architecture, 1989), 53.



Fig. 2: Dwelling architecture, understood beyond the house: open to sky space, participation, equity and income generation.

Charles Correa, The New Landscape: Urbanisation in the Third World (Singapore: Mimar Books, Butterworth Architecture, 1985).

Finally, I am convinced that all the statements above mentioned are only valid when understood within the frame of the contemporary economic situation of India. I intend my project not to be an isolated intervention, but to discuss the possibility of a plan that can be reinterpreted in other development projects within Mumbai. Accordingly, I aim to give validity to my proposal by studying how it can be attractive for private developers. Therefore, my goal is to develop a scheme which has three main features: proposes a spatial design that encourages sense of belonging within the inhabitants; deals with the issue of ownership, trying to maximize the percentage of owners within the residents;[11] and creates a profitable scheme for developers. I aim to investigate systems of cross-funding in order to achieve a combination of profitability for developers and affordability for inhabitants.[12]

In this quest, density becomes a crucial issue: P. K. Das, in his book Chasing the Affordable Dream, states that densities beyond FSI 3.0 are not physically sustainable in Mumbai, since the infrastructure is not prepared to handle higher levels of density.[13] Taking this into account, I want to achieve a high but sustainable level of density to make the proposal attractive to developers, and simultaneously reduce the impact of the land value in the final price of the dwellings, making them more affordable for the inhabitants.

To face this challenge, I intend to develop a design proposal that has a specific goal in each of the different of scales of intervention: starting from the urban scale, along the hierarchy of public and collective spaces, until the intimacy of the dwelling. For the urban scale, I aim

[11] Interview conducted in-place: the collected information shows that a big percentage of the population of Nalasopara are permanent residents, who have dwelled in the area for more than ten years and are planning to stay. 03/11/2018

[12] Vinit Mukhija, Squatters as developers? Mumbai's slum dwellers as equity partners in redevelopment (1990).

[13] P.K. Das, Chasing the affordable dream, A plan to house Mumbai's millions (Mumbai: Bombaykala Books, 2018), 80.

to integrate the two sides of Nalasopara by introducing a bridge over the railway and a series of communal amenities along the road that connects the two neighbourhoods. These amenities, such as market and sports centre, are in every case composed by a collective space and a marker indicating the presence of the amenity. Following the theory of Signals and markers operating spatially[14] by Alison and Peter Smithson, my objective is to create a series of punctual interventions to activate the line that communicates the two sides of Nalasopara. Furthermore, if some of these interventions are related to commercial activities and the creation of jobs (on both sides of the railway), the possibility of integration would grow because employment would be the most powerful reason for people to cross the railway.

In order to address the transition between public and private space, I aim to make a thorough analysis of the pedestrian precinct,[15] studying the spatial sequence between the main road and the entrance to the house. The different scales of collective space and the grade of enclosure can provide hints to comprehend which communal activities are more suitable for each space. Finally, in the design of the dwellings, I aim to create variety in the types, as well as possibilities for households to modify the layout of their houses. The challenge is to achieve a fairly high density and a systematic construction method while favouring variety in dwelling types, and a strong connection between the house and the collective space.

To conclude, I can summarize my position in the following statement:

To balance the outbreak in density which is currently focused in Rahmat Nagar and encourage a city that is open for newcomers, the connection between Nalasopara West and East should be embraced. In order to achieve this connection and create a community linking both sides of the railway, issues such as urban markers, collective spaces, variety in dwelling types and the seek for ownership should be investigated. Finally, to transform this project into a possible action plan for other developments in Mumbai, density and profitability for developers should be of high importance. Considering all these aspects, I aim to investigate and make a solid contribution to the discussion about affordable housing in Mumbai.

[14] Alison and Peter Smithson, The charged void: Urbanism (New York: The Monacelli Press, 2005), 302.

[15] Ardalan, Nader; Candilis, Georges; Doshi, B.V.; Safdie, Moshe; Sert, Jose Luis. Habitat Bill of Rights. (Tehran: Hamdami Foundation, 1976)

[16] Daniel Hoornweg and Kevin Pope. Population Predictions for the World's Largest Cities in the 21st Century (Environment and Urbanization 29, no. 1 (April 2017): 195–216.

Research Framework


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Compact

Urban References

How can the introduction of punctual interventions in the public spaces, related to leisure and commercial activities, integrate the two detached and dissimilar neighbourhoods of Nalasopara West and East by encouraging the inhabitants of both areas to use those facilities?

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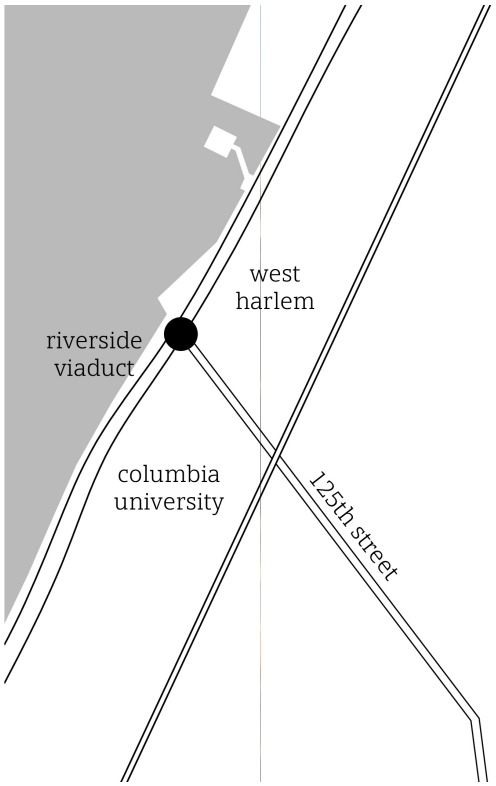
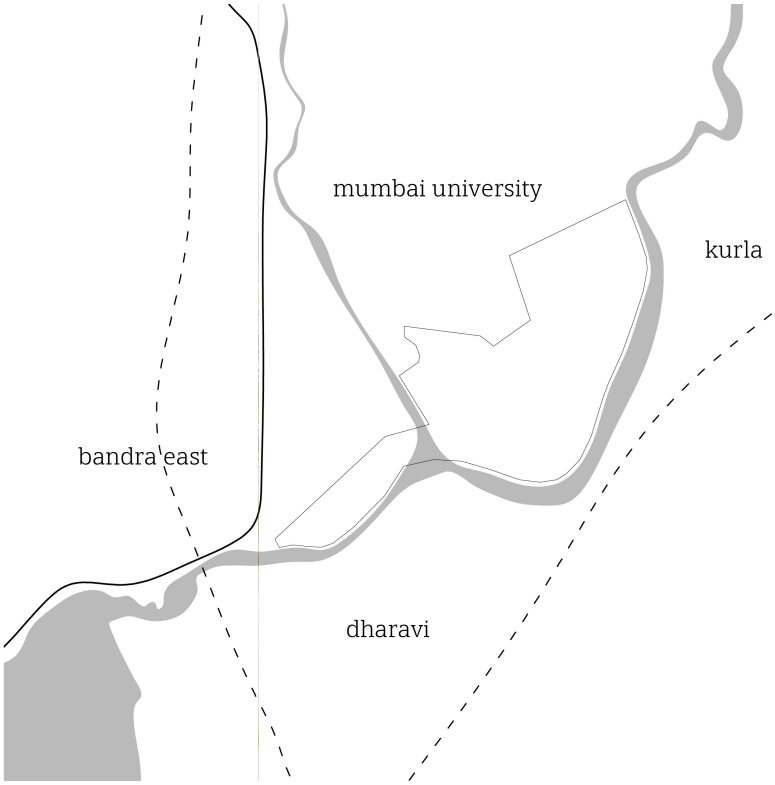
The Transformation of an Urban Boundary into a Porous Border

A Grocery Store between Columbia University and West Harlem - New York

In order to break the urban boundary that the elevated railway created between the wealthy neighbourhood of Columbia and the low-income area of West Harlem, the decision was to place a grocery store. With the conception that everybody uses a grocery store, the intention was to transform the defined boundary into an active and porous urban border.







Bandra-Kurla Business Complex - Mumbai

The complex was built between the areas of Bandra, the University of Mumbai, Kurla and Dharavi. These neighbourhoods are occupied by different income groups and different activities. With the concept of using employment as a catalist for social integration, this business centre provides different kinds of jobs and different opportunities and activities for the groups in the neighbouring areas.



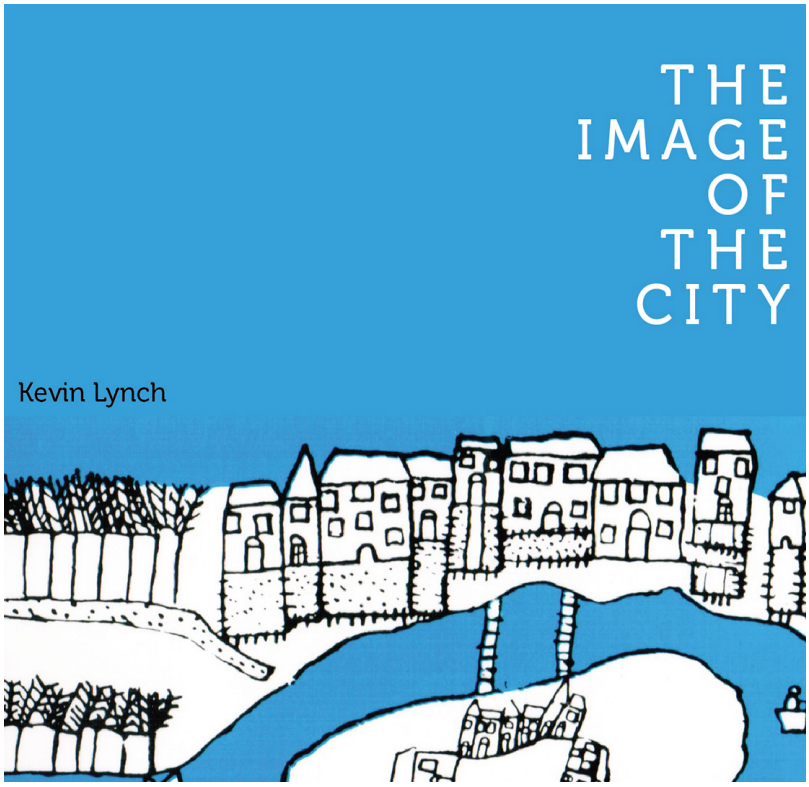
The Concise Townscape - Gordon Cullen

Gordon Cullen explains that the townscape is the way in which the city is recognised and perceived, including all architecture and urban elements. In his drawings, he illustrates the walk that a person does through the city. The open spaces, as well as the transition ones, are part of the journey. Therefore, their proportions, decoration and light are elements to address the spatial sequence of the pedestrian.



The Image of the City - Kevin Lynch

In this book, the concept of 'imageability' of the city is addressed. The way in which people conceive and understand the space needs to be analysed. The author suggests that a way to achieve coherence is the urban operation of continuity and landmarks. For landmarks to exist, to be reference points, they have to operate within a city with a continuous urban form. Landmarks, then, are exceptions to that form: a void, a building, a tower, or stairs can work as landmarks.





CESC Pompeia - Lina Bo Bardi - Sao Paulo

The building works as a landmark due to its proportions, its social function and its aesthetics, different to the architecture in its surroundings. As a landmark, it becomes a magnet, attracting people to participate of the activities held in the complex.



Nehru Place - Delhi

In his book Building and Dwelling, Richard Sennett explains that the Nehru Place, as an open, elevated esplanade surrounded by office buildings, became a hotspot for (formal and informal) commercial activities. Due to its proportions, its open to sky space and the density of shops, it became a strategic place in Delhi for commercial activities, and, as a result, for social integration.

Architectural References

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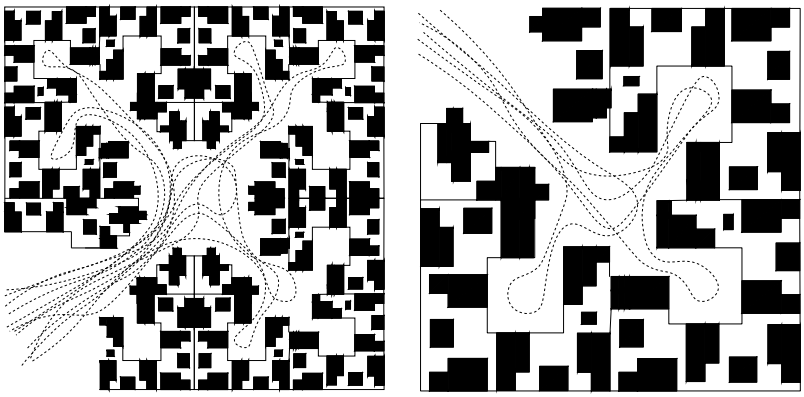
Sequence of Courtyards and Hierarchy of Collective Spaces

Belapur Housing, Charles Correa - Navi Mumbai - 1985

The studied feature of this project is the hierarchy of open spaces. This low-rise high-dense project in Navi Mumbai develops a module of housing in a grid of 3x3 modules (obtaining 9 modules per cluster). From these, the central module, plus one of the corners, are left free in order to guarantee accesibility. As a result of the repetition of this cluster, the courtyards vary in size and function. Every cluster has a central, small and quiet courtyard that belongs only to the units of the cluster. However, when many clusters are arranged together, the new courtyard that they shape is bigger in size and belongs to the path in which many neighbours walk. This resulting hierarchy is a very successful tool to create different opportunities in the collective space.







Left: Scheme of 4 clusters

Right: Zoom in 1 cluster

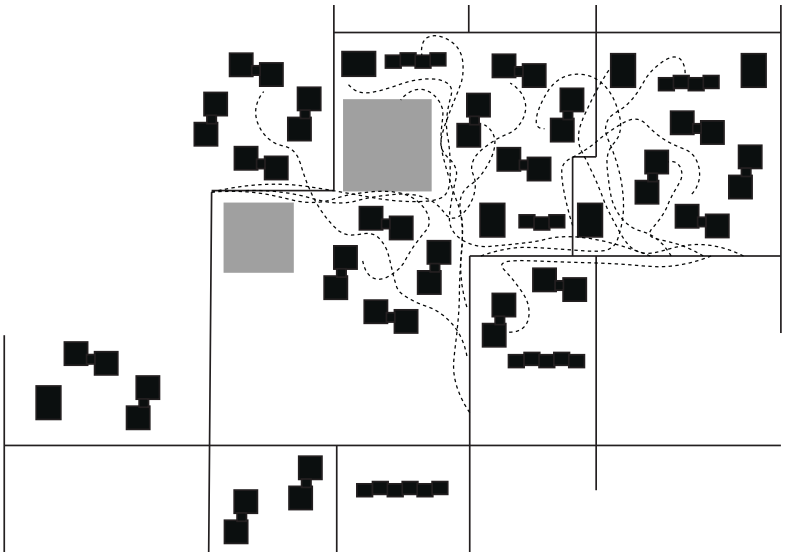


Pictures: typical residential clusters in Belapur

Barrio Alfredo Palacios - Estanislao Kocourek
Buenos Aires - 1966

This project creates, with the use of ordinary free-standing blocks of 12 floors, a system of courtyards that have different relations with the street, and therefore different levels of enclosure. The courtyards in connection with the access way are longitudinal and have a public character. The courtyards in between the towers, even though they are completely open in their extremes, are squared and acquire an atmosphere of quitetness and domesticity, being in direct relation with the dwellings.





Built / Void scheme of Barrio Alfredo Palacios



Pictures: courtyards of the Barrio Alfredo Palacios

Gifu Kitagata Apartments, SANAA - Motosu - 1995

The interesting feature of this project is the incorporation of the collective in direct relation with the dwelling units. The common spaces, represented by the voids, are distributed among the slab in order to be close to each flat. The collective space, therefore, brings the quality of the courtyard to a more intimate place, right in the threshold of the unit.

View of the voids in the Gifu Kitagata Apartments



Swadeshi Market Chawl - Mumbai -1909

In this project in Central Mumbai, the housing units are organised in strips, as well as the courtyards. Each unit faces a courtyard. As a result of the creation of different courtyards, only few units share each one. As a result, the open space becomes intimate, and it is used as an extension of the houses that have their access through it.



One of the courtyards of the Swadeshi Market Chawl

Managerial References

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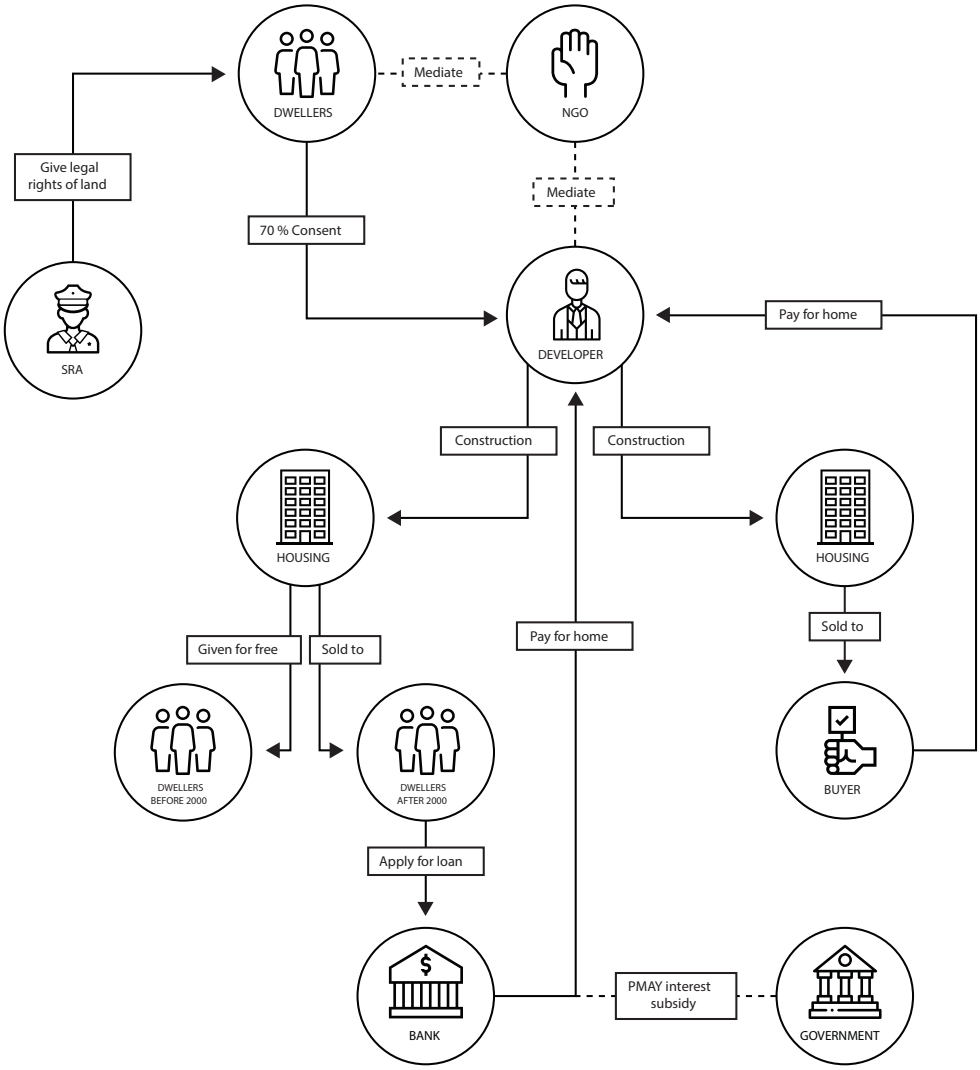
MHADA

The Agency realised only 203.624 dwellings from 1995 to 2014 (less than 5% of the amount they intended to).

The system prioritizes former dwellers over newcomers in a city that is expected to increase its population by 25.000.000 inhabitants in the next 25 years.

The proposals do not meet the necessities of the dwellers in relation to location and contact with the ground floor and the street.



Udaan, Sameep Padora - Mumbai -2018

This low-income housing project is completely run by private interests. The architect managed to introduce, in a dense scheme that ensures profitability, elements to promote the life of the inhabitants. Collective spaces, as well as good sanitary conditions of ventilation and lighting were achieved. The architect explained that the elements introduced did not alter dramatically the price of the construction, and benefited the image of the developer. As a result, a positive balance between efficiency and resilience was achieved by means of design.





Successful Managerial Proposals For Housing Affordability

Markandeya Cooperative Housing Society - Dharavi

The Slum Redevelopment Agency allowed an increase in the density of the area.

The relocation of the dwellers was within Dharavi.

The funding was possible through a cross-subsidy scheme:

86 units (1952m^2) were sold at market price to outsiders
92 units (1831m^2) were sold ar Rs. 15.000 to slum dwellers



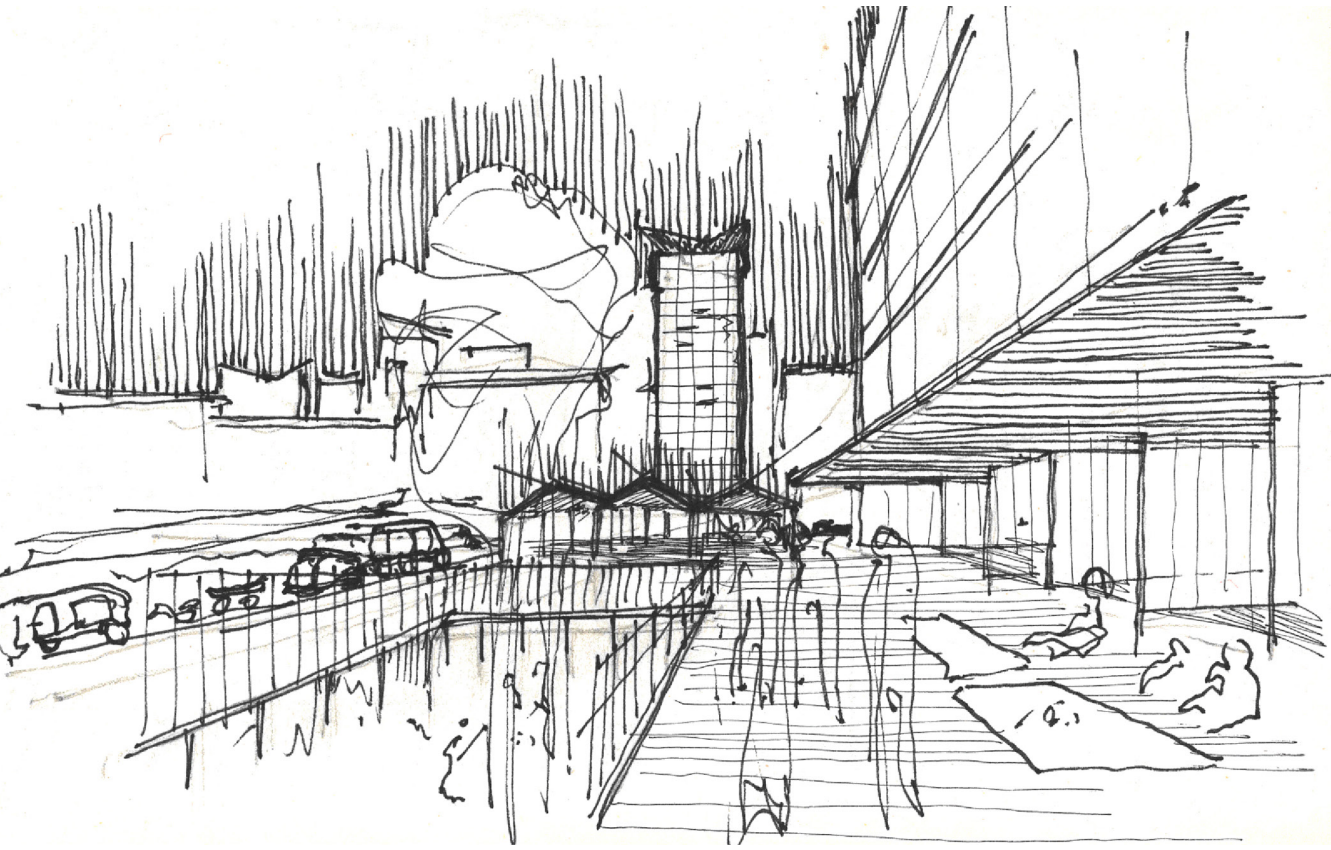
Sangharsh Nagar, PK Das - Mumbai -2002

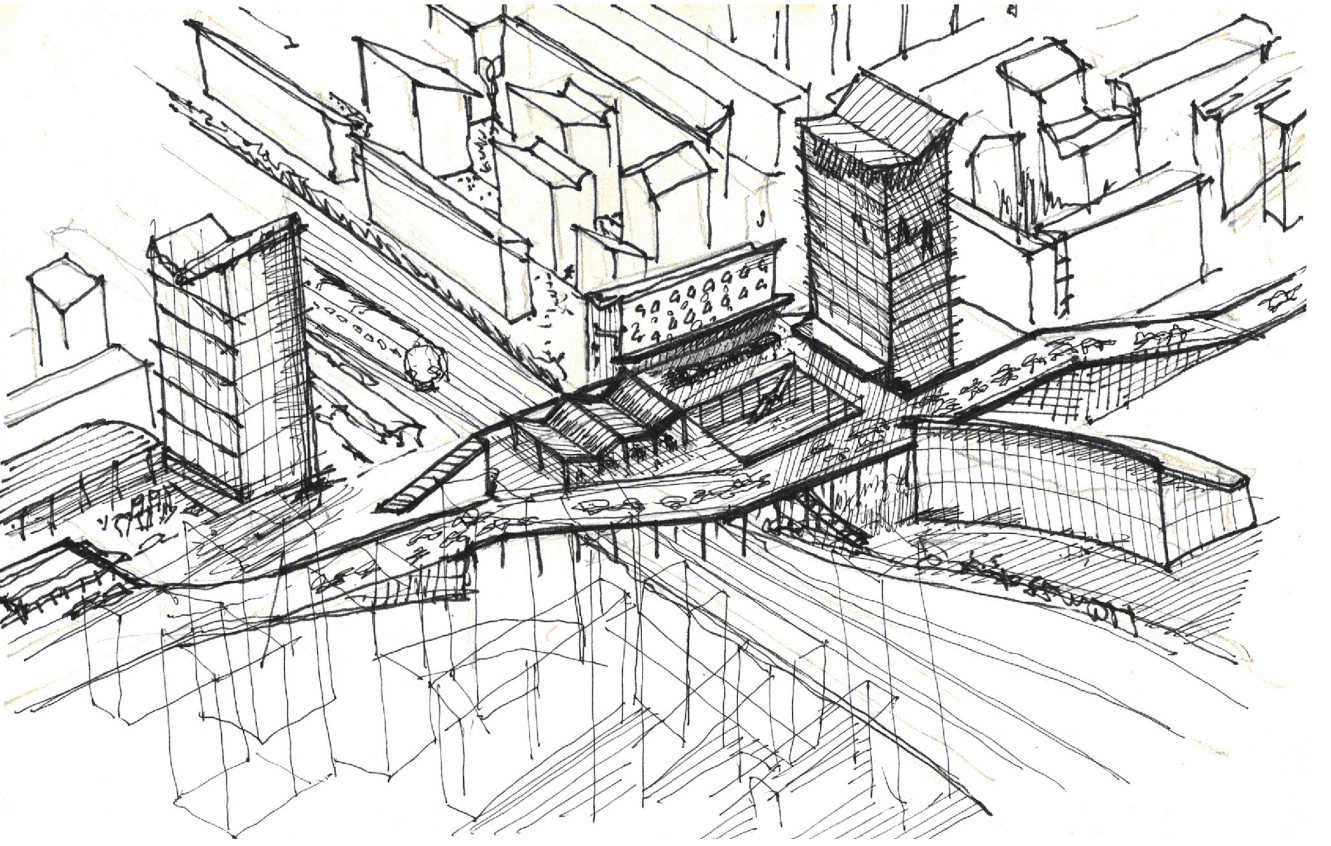
For this project, the architect and activist PK Das managed to create an alternative solution to the MHADA schemes for slum redevelopment. This was achieved by the work with the community and the social action.

The architect assures that densities beyond FSI 3.0 are not sustainable with the infrastructure of Mumbai. Therefore, an FSI similar to 3.0 can be an atractive idea for a developer (since more sellable units can be accomodated) and as well reduce the price for the occupants, making it more affordable.



Urban Proposal





00. Existing Situation

Nalasopara West and East, separated by the railway.
Abundant vacant areas in the west and extremely high density in Rahmat Nagar (east).

01. Connecting Axis

Identification of the strategic line to connect the two sides of the railway, based on the existence of commercial and leisure activities in the east, and the abundance of territory in the west.

02. The Bridge as a Catalyst

The first intervention is to introduce a bridge to connect the two Nalasoparas. The bridge is not a linear element but a place in itself: an elevated platform, strategic for commercial activities. The centrality of the bridge is complemented with a sports centre on the west side and a market place on the east. These facilities, which will be used by inhabitants of both west and east, will cater for the integration both groups.

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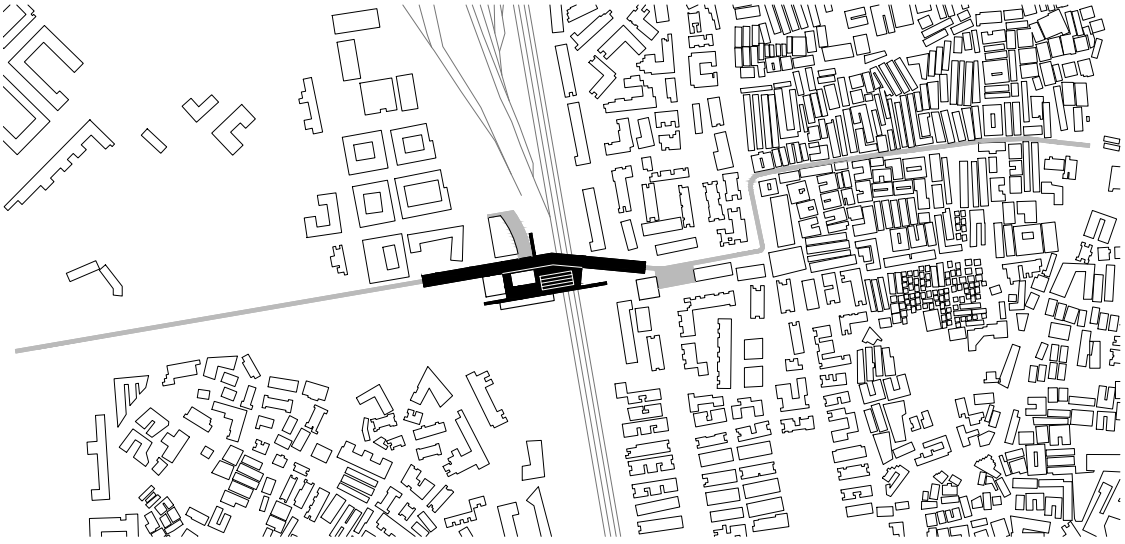

03. Existing Infrastructure

Analysis of the existing roads. The different urban fabrics can be observed: incomplete rigid and organic structures in the northwest and southwest respectively. Meandering, disconnected roads in the east.

04. Connection of Infrastructure in the West

Identification of the main strategic roads to create an unified system of circulation in Nalasopara West.

05. Connection of Infrastructure in the East

Idenfitication of the strategic roads to boost the connectivity in the east. These findings give clues to define which areas in the east should be the first ones to be redeveloped, based on the potential connectivity and the extreme closeness between handshake chawls.

0 50 100 200







06. Dwelling Proposal: First Operation

Consolidation of the main road as connecting and commercial axis.

West: up to 620 new dwellings
Entirely dedicated to market sale to fund further interventions.

07. Dwelling Proposal: Possible Operation

Possible, large-scale operations of developers in the construction of new dwellings in the West and East and partial relocation of Eastern residents.

West: up to 836 new dwellings
East: approx. 420 dwellings demolished /
up to 260 new dwellings

50% of new west development destined for relocation

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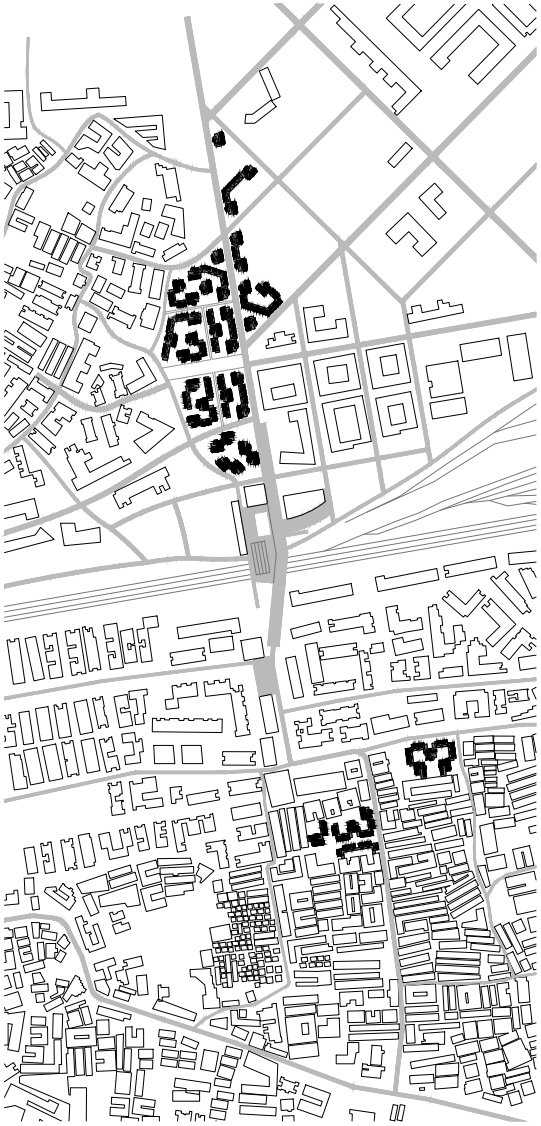
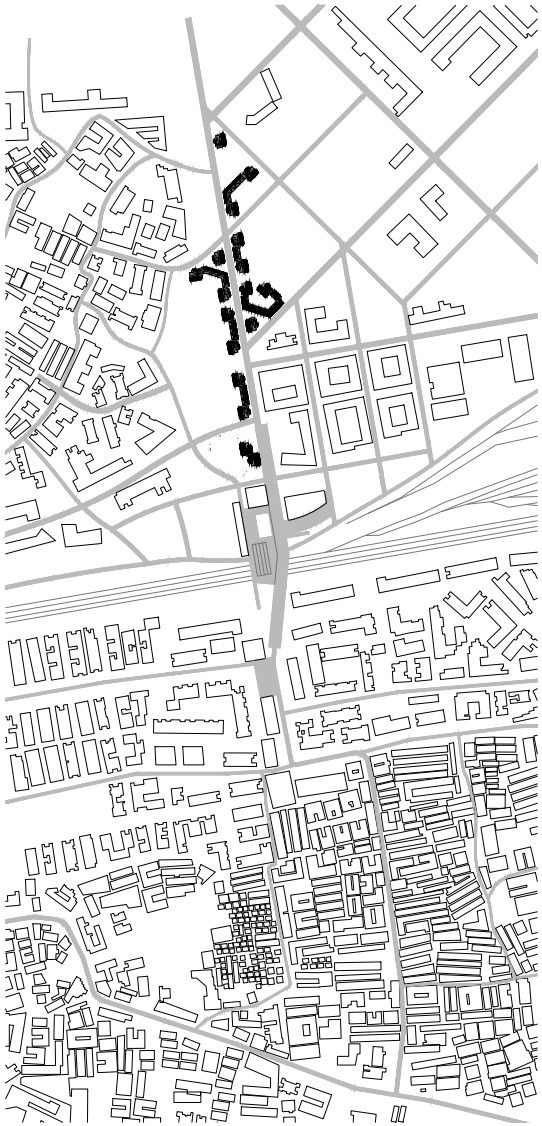






08. Dwelling Proposal: Possible Operation

Possible, small-scale operations of developers in the construction of new dwellings in the West and East and partial relocation of Eastern residents.

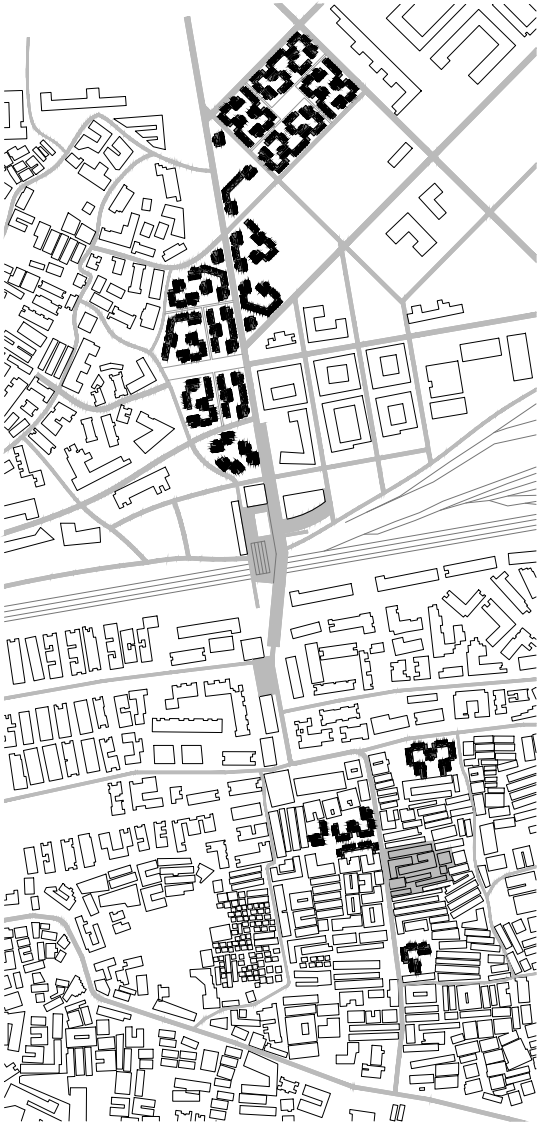
West: up to 250 new dwellings
East: approx. 112 dwellings demolished /
up to 80 new dwellings

44% of new west development destined for relocation

09. Dwelling Proposal: Possible Operation

0 50 100 200

Possible, mid-scale operations of developers in the construction of new dwellings in the West and East and partial relocation of Eastern residents.







West: up to 787 new dwellings
East: approx. 330 dwellings demolished /
up to 200 new dwellings

42% of new west development destined for relocation

10. Dwelling Proposal: Possible Operation

Possible, large-scale operations of developers in the construction of new dwellings in the West and East and partial relocation of Eastern residents.

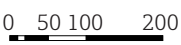
West: up to 1180 new dwellings
East: approx. 518 dwellings demolished /
up to 384 new dwellings
44% of new west development destined for relocation

Total values:

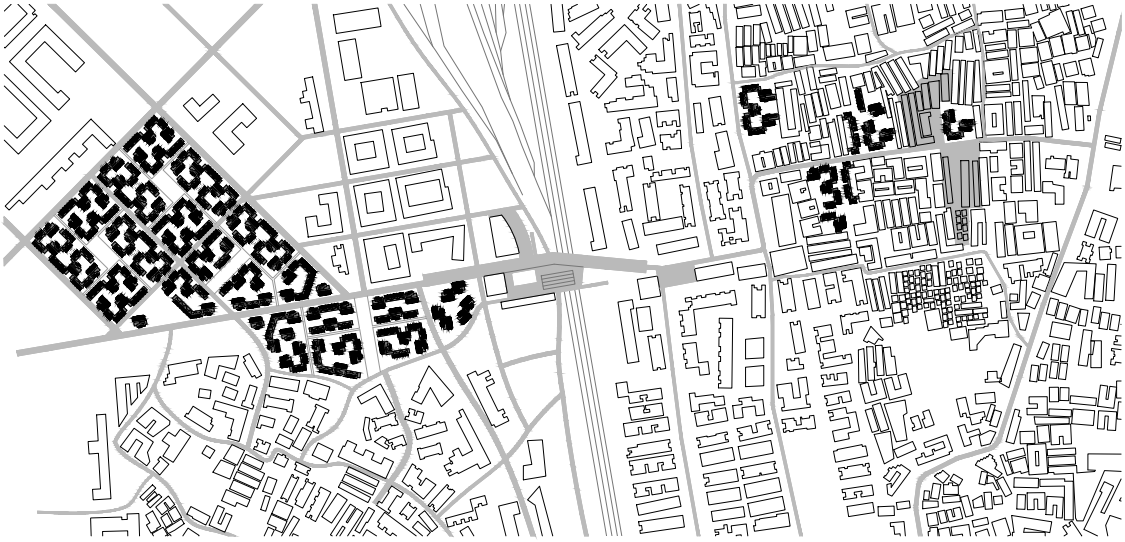
Nalasopara West: up to 3.658 new dwelling units (630 households per hectare)
(38% intended for relocation of former dwellers of the East)

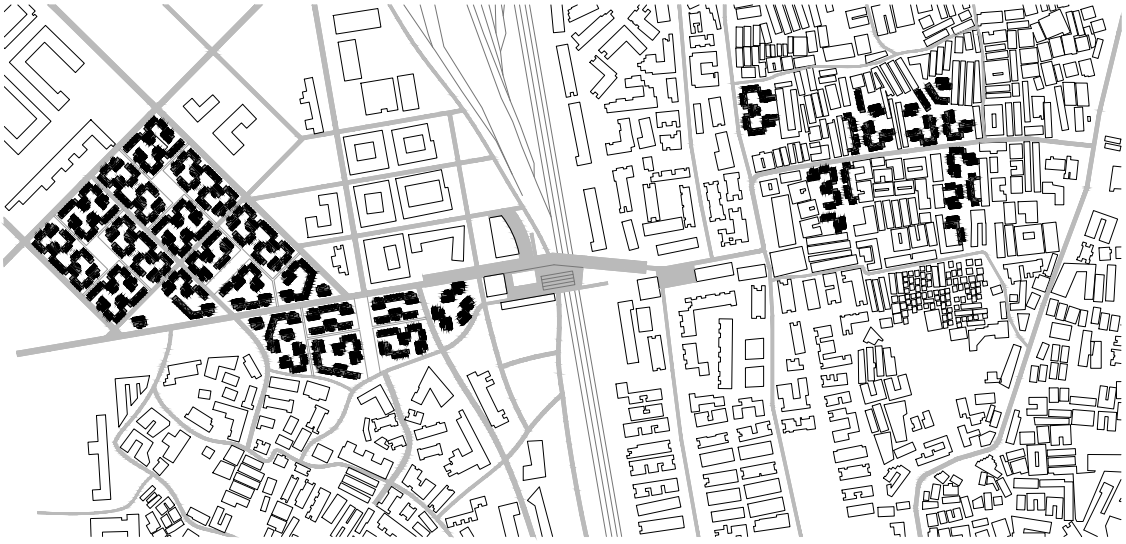
Nalasopara East: approx. 1.440 dwelling units demolished
Up to 924 new dwelling units

Final outcome: +3.142 units









The main connecting path is a continuous walk, with only three instances of exception. The starting / ending points (in the west an educational facility and in the east a leisure place, due to the specific lacks today in both areas). The bridge, with the sports centre and the commercial activity is the other instance of exception.

The continuity of the path is intended to integrate the two detached areas. As Kevin Lynch explains, the continuity can cater for a sense of imageability of the neighbourhood, in which the landmarks can operate by contrast to the constant.[1]

The mid-scale urban amenities, such as schools, primary health units and gathering places are located outside the line of the main path. Instead, they are located in the core of the clustering groups, shared by an average of 800 households.

Finally, the small-scale facilities, such as community centres, kindergartens and co-working areas are located within the clusters, in the entrances to the main courtyards. These facilities are shared by groups of 100 to 200 households. This sequence of large-medium-small scale facilities, shared by a decreasing number of households, is intended to give definition and meaning to the communities in terms of their size. As Christopher Alexander explains, different sizes of communities can be accurate for different functions and shared elements.[2]

[1] Kevin Lynch, The Image of the City (Boston: Birkhauser, 2004).

[2] Christopher Alexander, A Pattern Language (Munich: Fachhochsch, Fachbereich Architektur, 1990).

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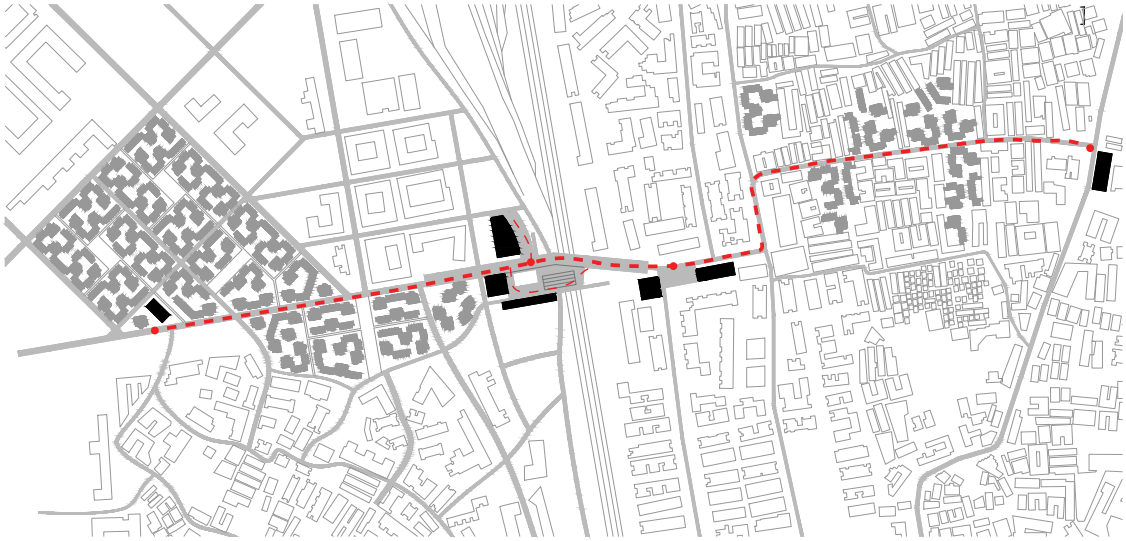
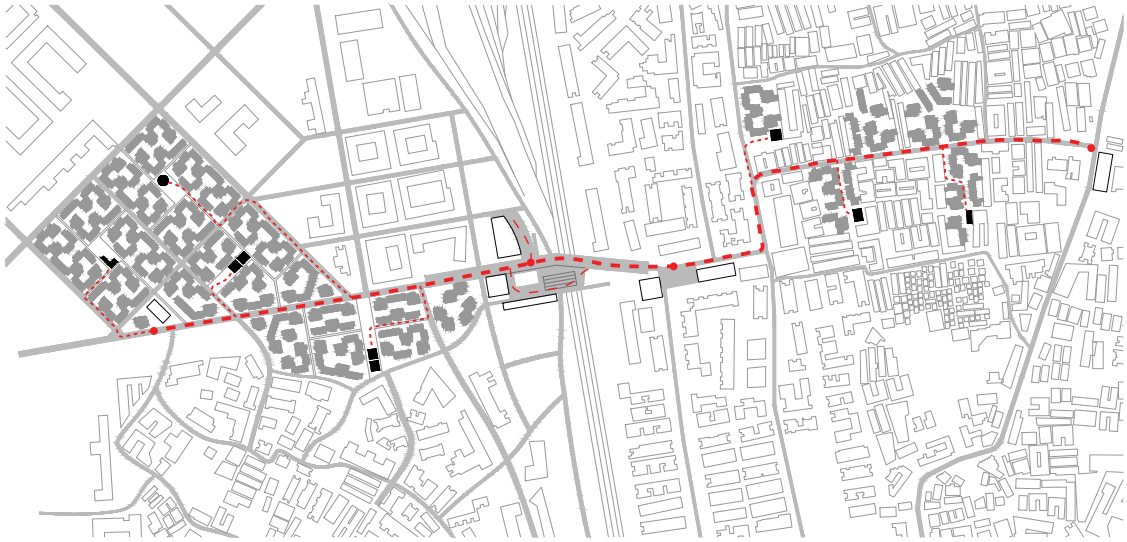
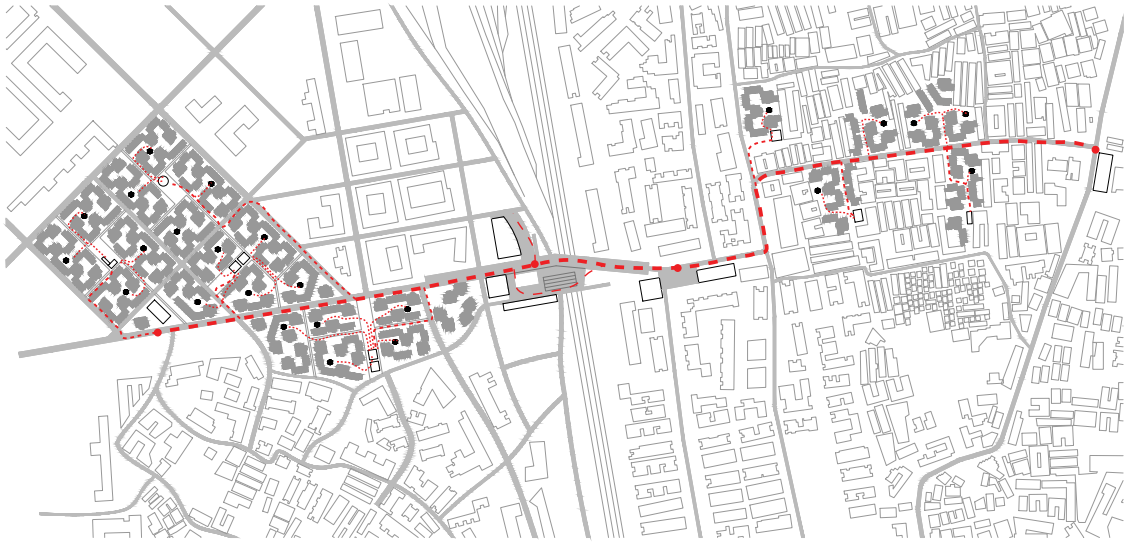






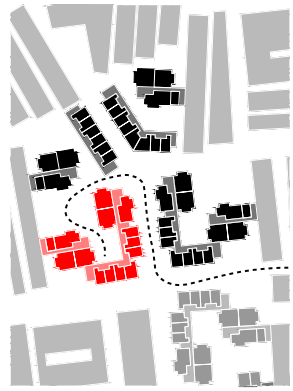
Clustering System in Nalasopara West



The clustering system in Nalasopara West works in an incremental level. 800 households (in 1,2 hectares) share a solid perimeter with vehicular streets, for commercial activities and a central courtyard with a mid-scale amenity. These 800 households are divided into 4 groups, which share a small-scale amenity, and are organized in a system of open - but yet private courtyards. Finally, the smallest clustering unit is the intimate courtyard, shared by 70 dwelling units approx.



Towards the East ,the system works in a similar way of hierarchy of courtyards as in the West. However, the shapes and links of the modules adapt to the existing chawls, infrastructure, open and available space. A new piece is introduced: the free-standing element which touches the corridor of the existing chawl, in order to make the existing architecture participant of the collective spaces that the new pieces add.



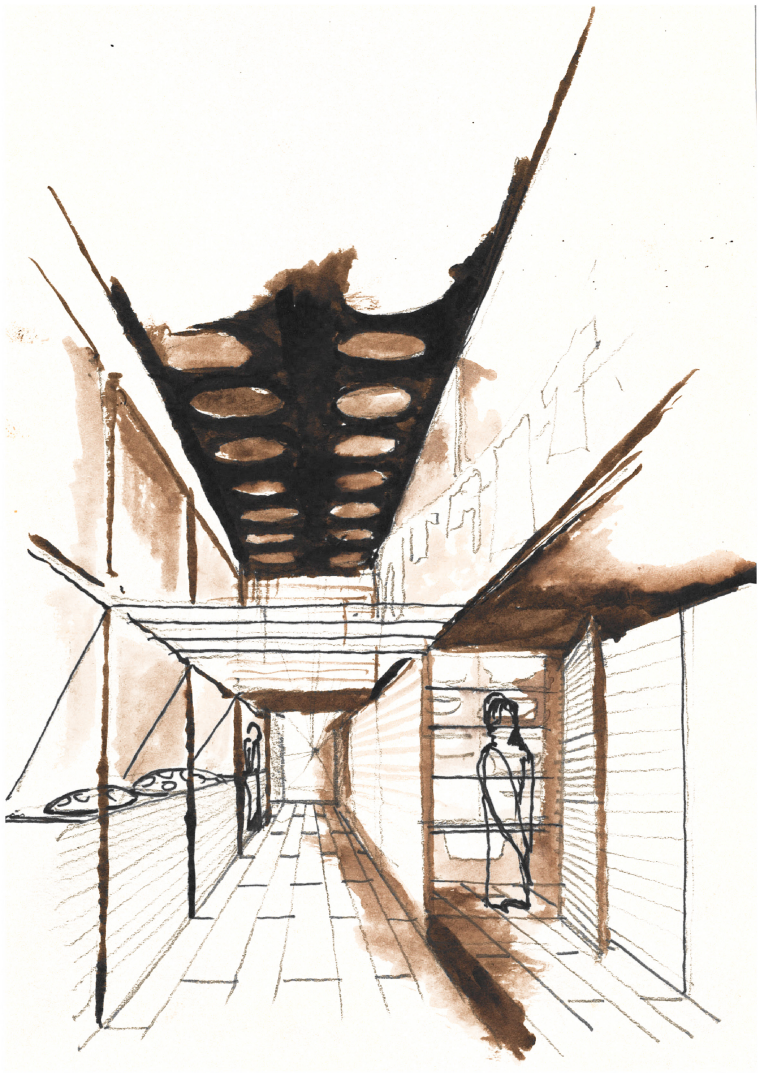


Urban sequence from east to west

The integration of the two Nalasoparas through the eyes of Geeta, a lady that dwells on the east and walks 500m to her job, in a house in the west.



Geeta lives in one of the new clusters in Nalasopara East. When she leaves home to go for work, she leaves her house through a shaded, intimate threshold with a low ceiling. That space, next to her kitchen, is shared with her neighbours. After the threshold, she walks along the corridor of the second floor, facing the courtyard. The neighbours use the corridor to dry their clothes, to dry chili and papad and to interact. Little kids run and play there. Many neighbours have encroached their houses, making the corridor a diverse space, with different heights along the way.



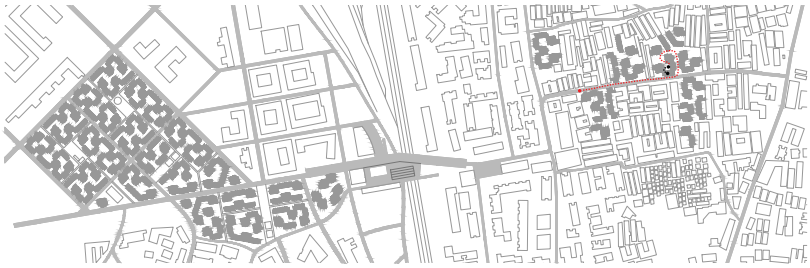




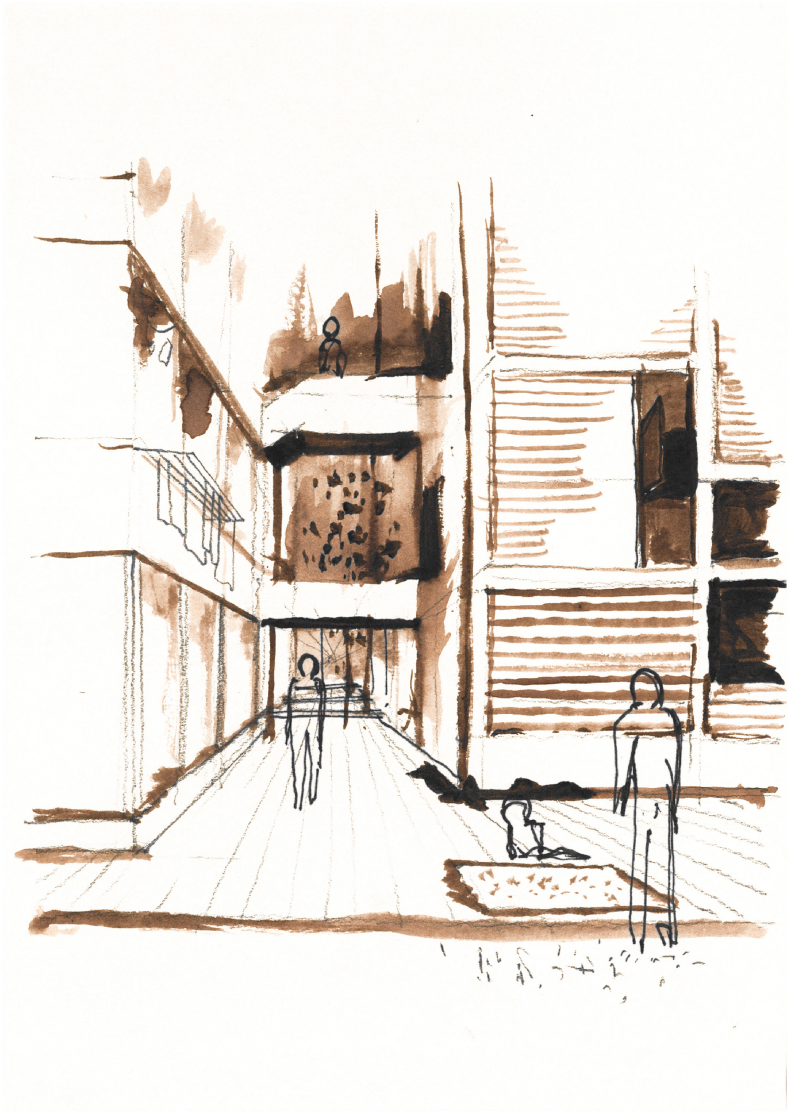
After going downstairs, she walks across the courtyard. There, kids play and neighbours spend their time in the shade. From the courtyard, all the entrances to the houses of Geeta's neighbours can be seen.



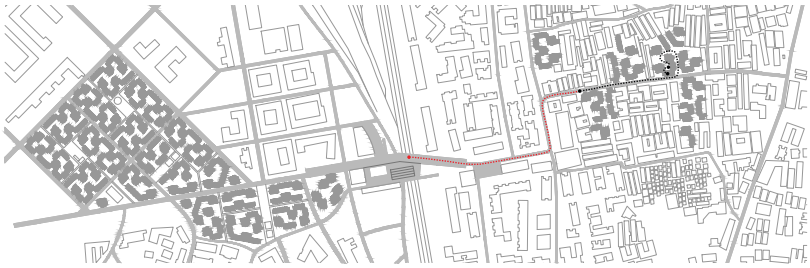




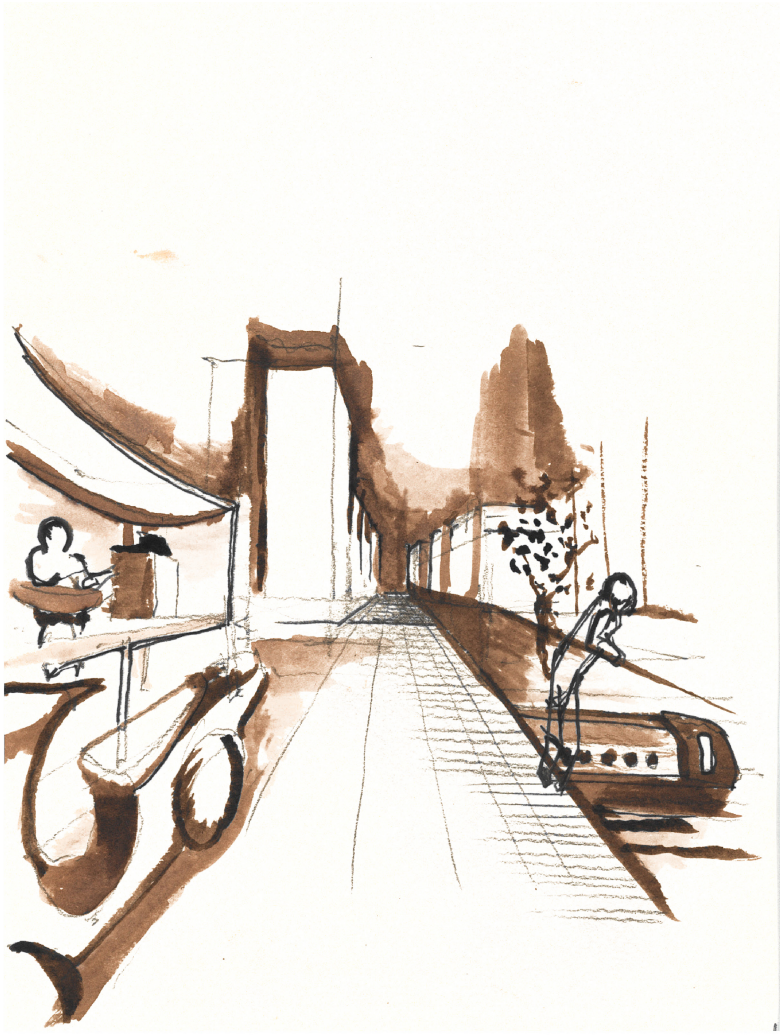
She walks along the street. The new buildings are located in a parallel way to the street, creating a continuity as she walks. This continuity contrasts with the previous mid-rise chawls, that give their side facade to the main street. The new buildings are attached to the previous ones, creating setbacks and new, shaded places. She can buy vegetables on the way to work from the street vendors.



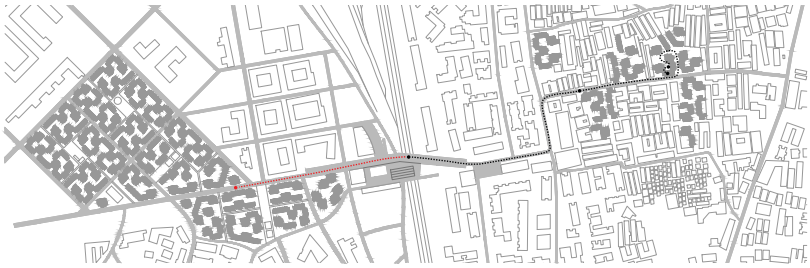




She arrives to the briddge and overlooks the trains passing by. From the bridge, the perspective of the new road in Nalasopara west can be seen. It is a linear, continuous perspective that goes from the bridge until the end of the neighbourhood. On the bridge, many market stalls are installed. Geeta can buy a chai from a vendor and have a quick talk.



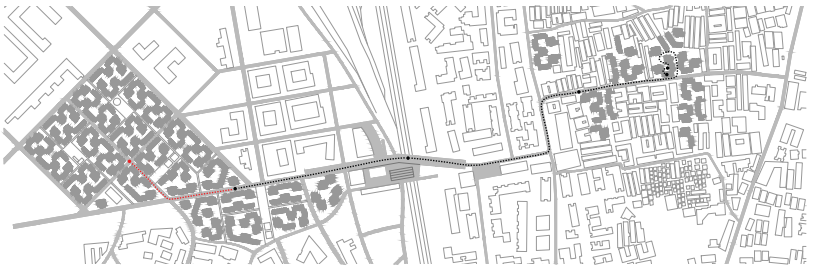




She is now waling along the main street of Nalasopara West. The streetscape resembles the one on the East, in her neighbourhood. The exception is that here all the buildings are new, and the scenario is continous. Along the main street, all the ground floors of the buildings hold small shops in shaded walkways.



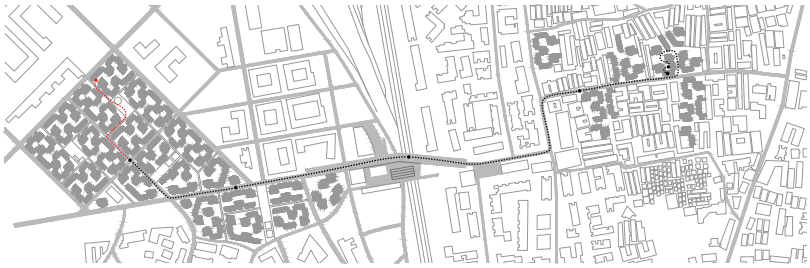




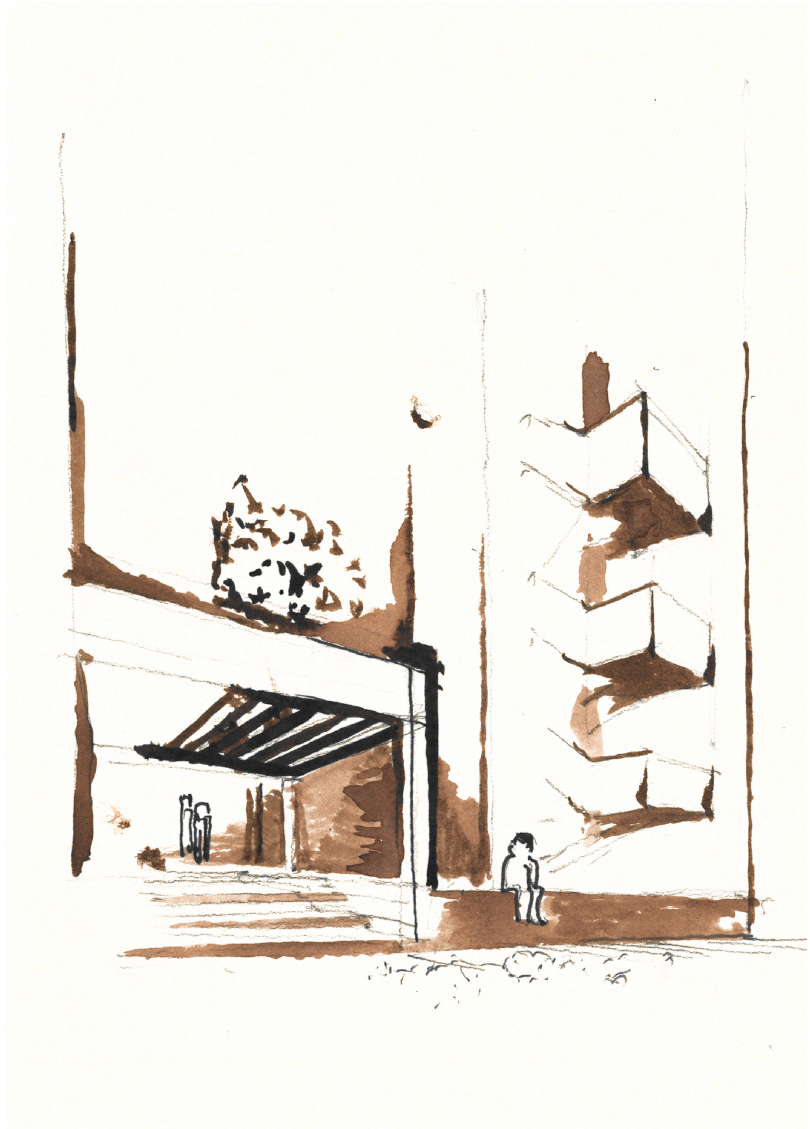
When walking in one of the inner streets of Nalasopara West, she stops at a corner. The corners are open, and neighbours can meet there.



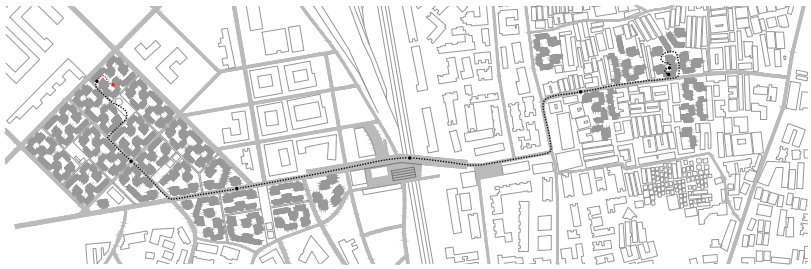




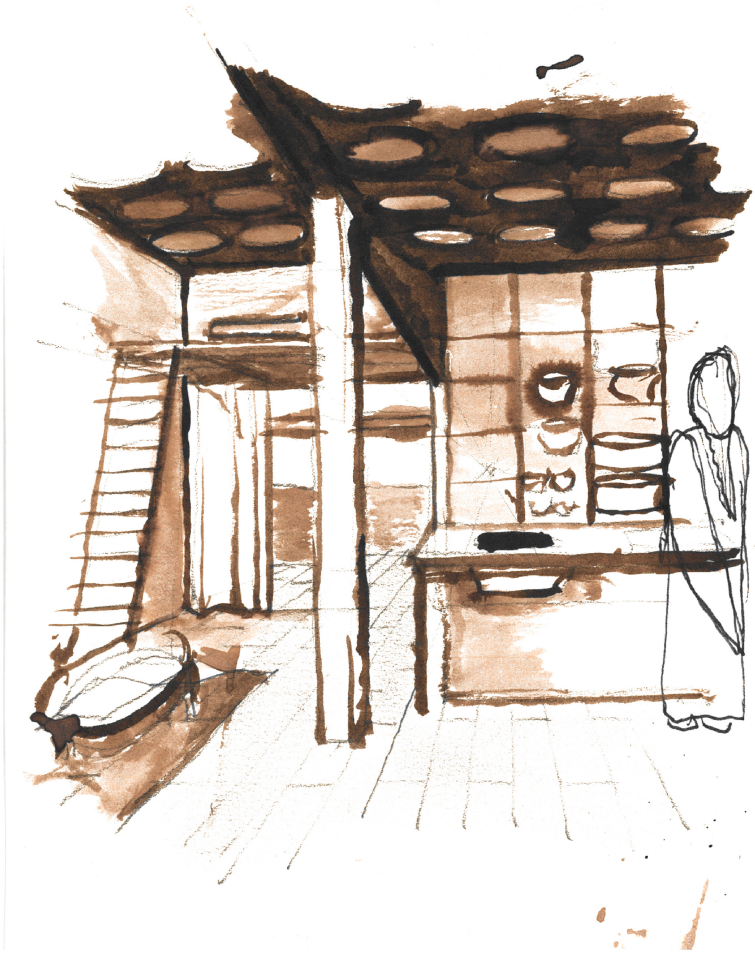
When she reaches the block where she works, a virtual threshold materialises the entrance to the community. Just like in the community where she lives, the way of entering is by going 4 steps up, in a space that is defined by the shade of a pergola and a tree. Anyone can enter to this new street, but mostly people who live or work in this block use it.







She finally reaches the house where she works. The way of entering the house, just like hers, is through a shaded, intimate space with low ceiling. After that the ceiling goes up and the living area is very lit and ventilated. The difference between her house and her employer's house is that at the second one, they purchased the unit next to it and they rent it out to seasonal workers to have an extra income. They have also adapted their house, by creating a mezzanine in the living area for storage.





Cluster Proposal



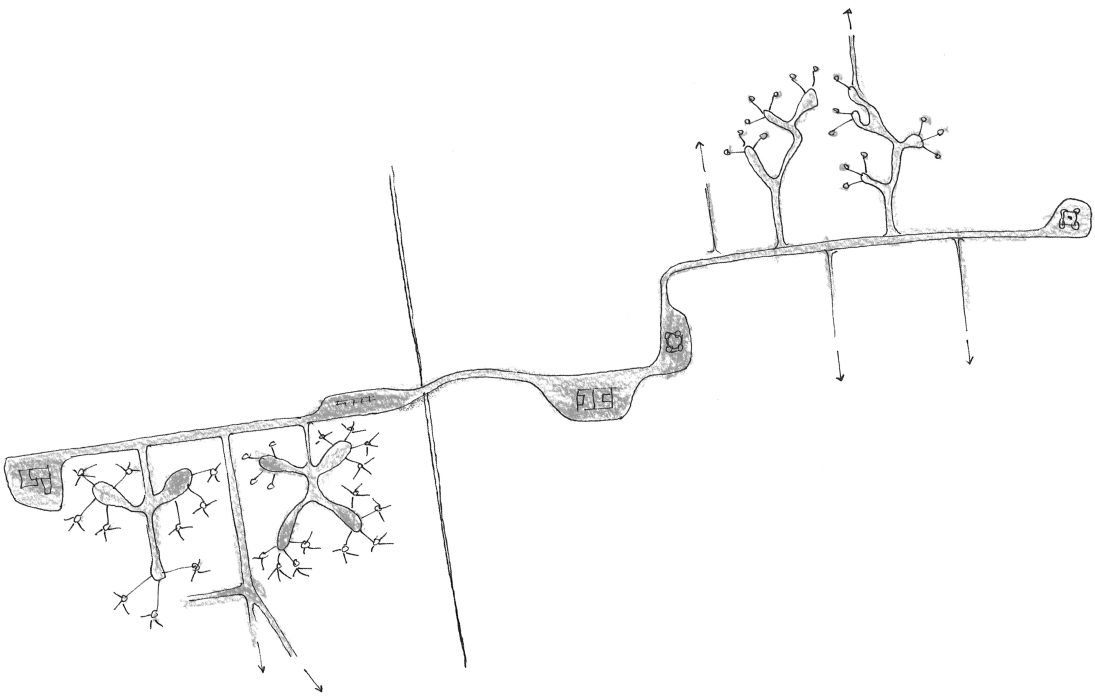
The sequence of spaces

In the first draft of the design, the two main features investigated were the sequence of spaces and the hierarchy of them. Three key features were taken from the city of Mumbai: the courtyard as an extension of the dwelling, and the street, both as an opportunity for income generation and for social integration. As a result, the first hypothesis highlights the path in which a person goes from the main commercial street to the inner streets, to the collective space, and finally to the intimacy of the courtyard and the threshold to the dwelling unit. The key element to be further developed was the way in which all these instances interact with one another.



The hierarchy of spaces

On an urban level, the first design hyphotesis focused on the integration of the two detached neighbourhoods on both sides of the train through an axis of public amenities. Markets, sports, educational and leisure facilities could provide 'landmarks' in a landscape mostly dominated by dwelling buildings. These landmarks, located along the connecting axis, would then lead to secondary and terciary streets, with small-scale amenities such as community centres, co-working facilities and kindergartens.

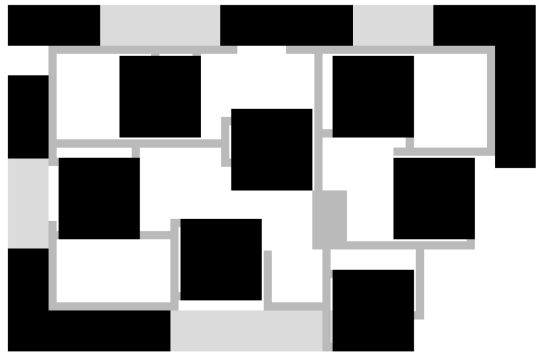


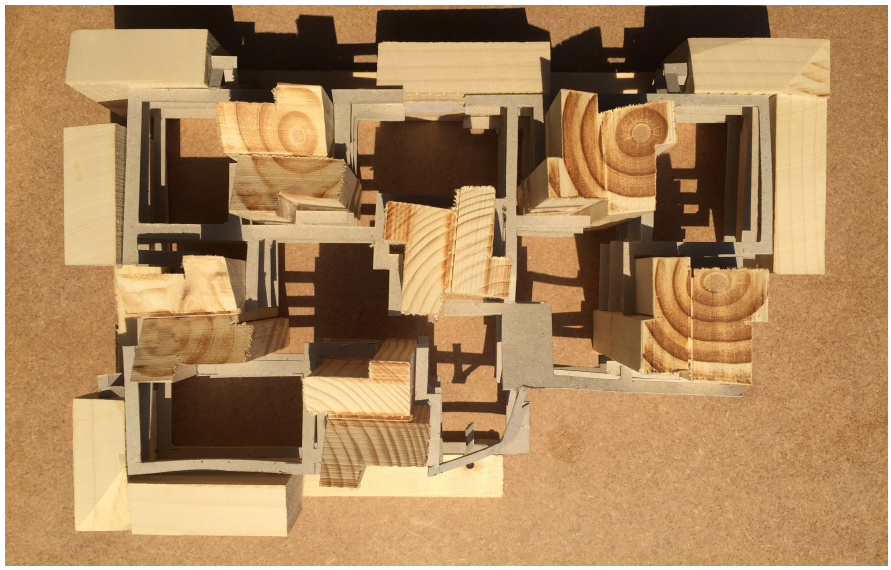
Process - First Stage

The open frame and the infill

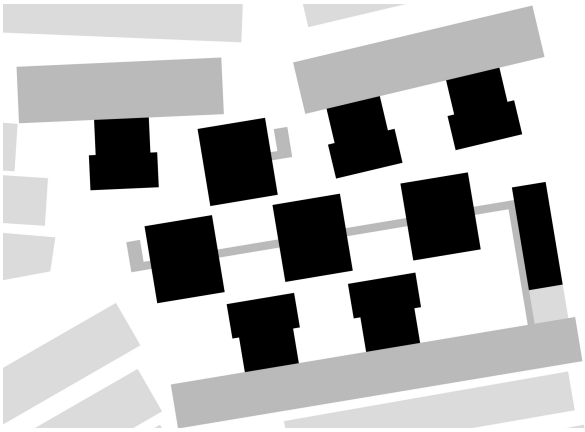
The challenge of integration, taken now to the clustering scale, implied the design of a scheme that could be adapted both to the fabric of vacant areas on the west (this page) and the existing chawl fabric on the east (next page).

The first proposed clustering scheme combined an infill of 8-storey free-standing blocks framed by a perimetral, lower corridor building. This scheme catered for the coexistance of different courtyards, and the constant porousness to the street.





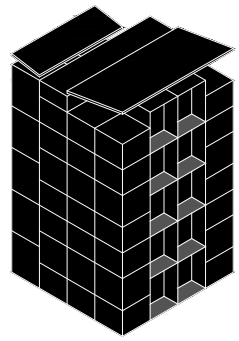
Even though the scheme was successful on an abstract level, when placed in between the chawls of Nalasopara East (working as the 'perimetral frame') the system showed its flaws: it could not have different scales of intervention, because all the courtyards were similar in size and did not create any sequence or hierarchy of spaces. The open spaces, as a result, became monotonous and repetitive, and since dwellers needed to access their dwellings through the courtyards of other buildings, there was no possible intimacy.



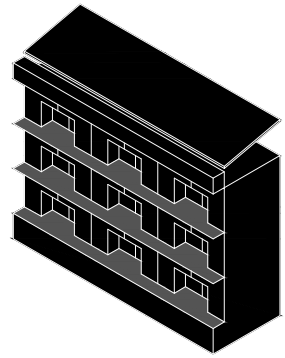


Configuration of the Cluster

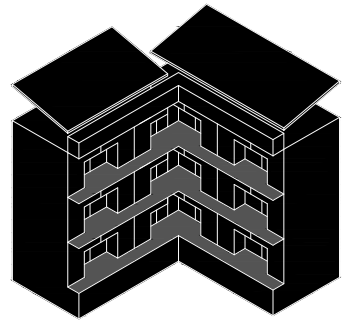
The clustering system consists of two simple and ordinary typologies: the free-standing block and the corridor building. The first one holds units with emphasis on the private space.



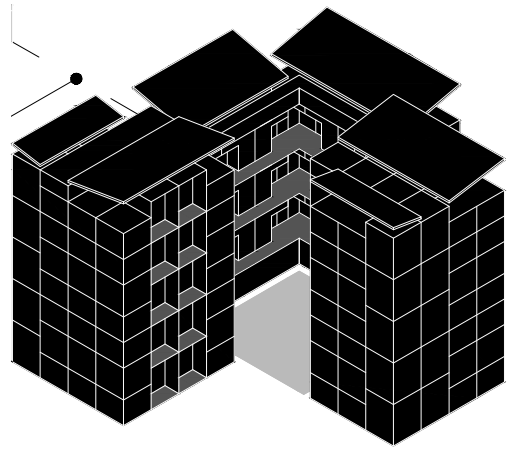
The corridor building, without elevator and lower in height, holds smaller units with emphasis on the collective space and the shared threshold to the dwelling.

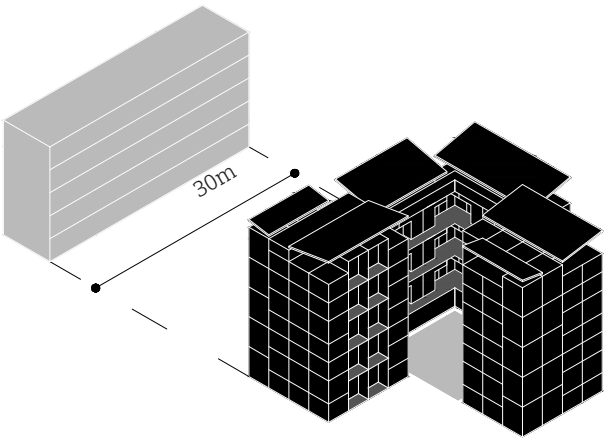


The L shape of the corridor building defines one collective side, with orientation to a courtyard, and a sharper outer line towards the public street.

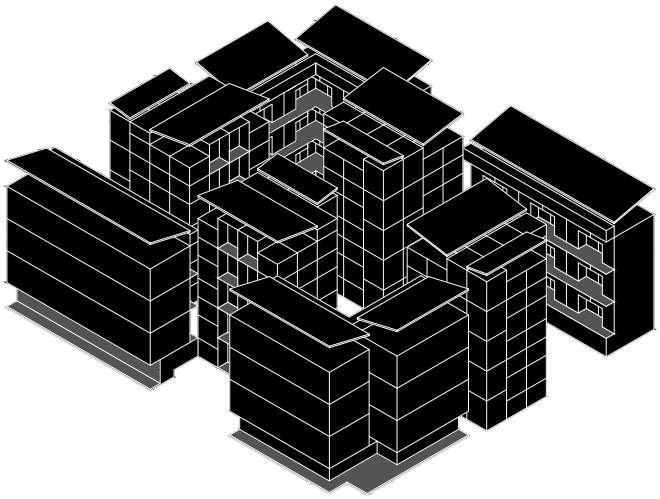


The combination of the free-standing blocks and the L-shaped corridor building creates an open cluster. The four corners have different qualities: one corresponds to the main access, and its opposite is defined and closed. The remaining two, one with a setback and the other continuous, create different spaces in relation too the outer streets.

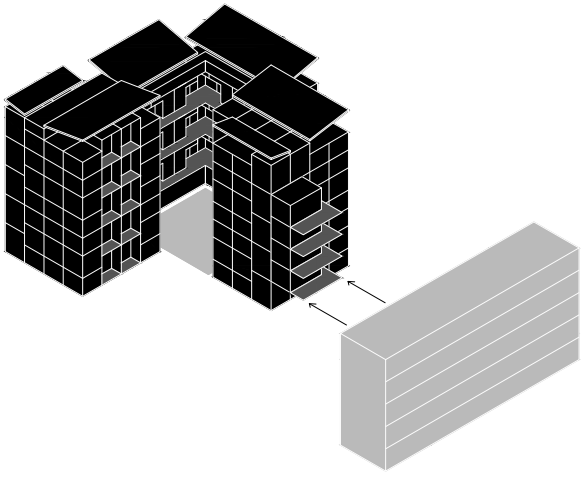




The whole module is 30m long, which equals the length of the shortest chawl typology (those are commonly 30 or 50m long), which makes the module optimal for urban redevelopment within the fabric of chawls on the East.



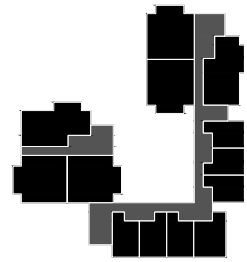
Towards the west, the module permits different systems of combination, creating clusters with different levels of openness and intimacy. The idea of frame and perimeter from the design hyphotesis is maintained.



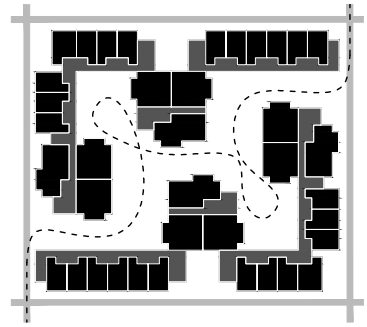
Towards the east, the module works by proximity with the existing chawls. Whilst thriving for a high density, the existing chawl corridors, which today are 1m wide but are still a collective space for the neighbours, gain a quality sace for interaction in the encounter between the existing chawl and the new module.

Operation of the Clustering System - West

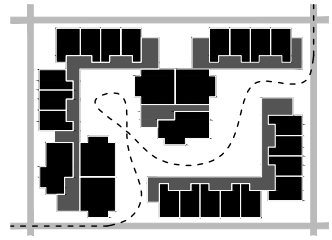
Open cluster - Basic Unit



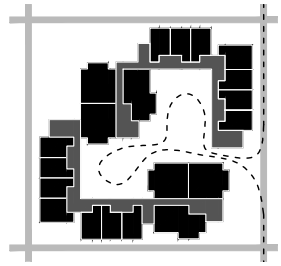
Public perimeter - Collective corridor and intimate courtyards



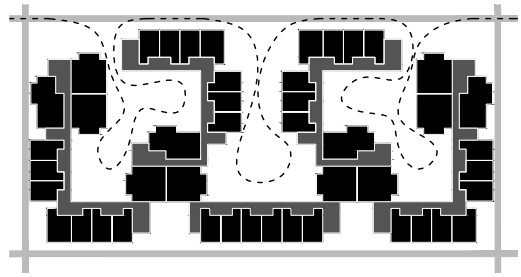
Public perimeter - Collective corridor and intimate courtyards

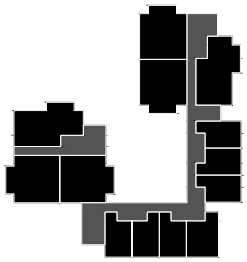


Public perimeter and intimate courtyards

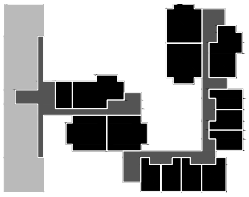


Public perimeter and variation of intimate courtyards

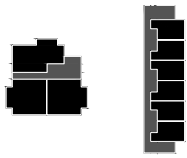




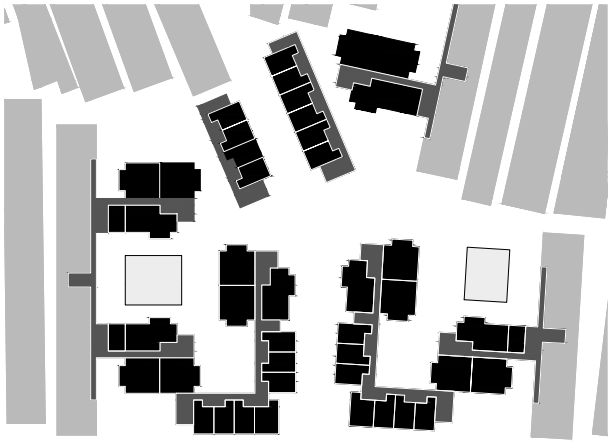
Open cluster - Basic Unit



Operation by addition to the existing chawls



Decomposition of the elements to fit irregular places

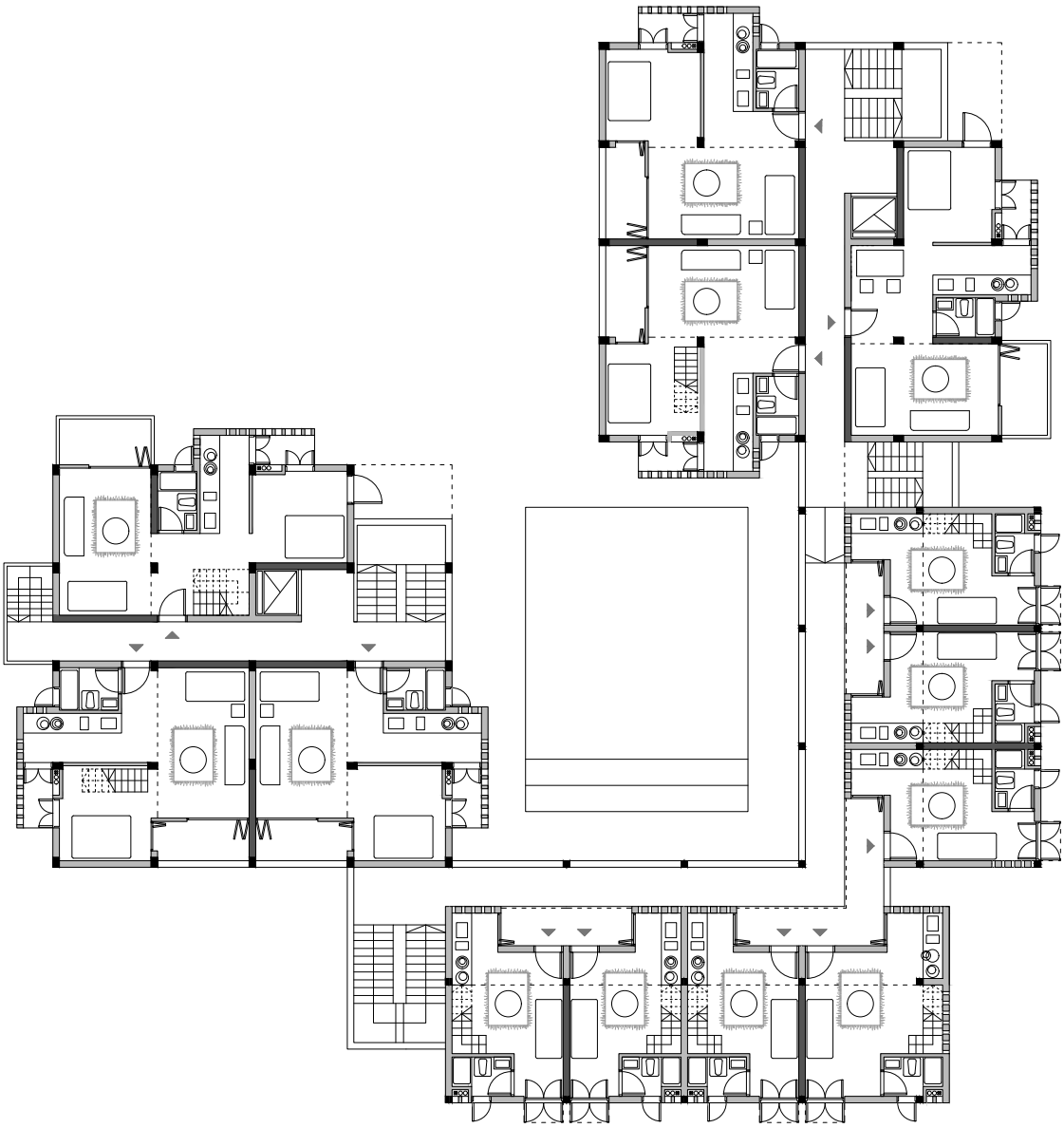


Example of intervention in Nalasopara East - bigger courtyards suitable for collective amenities



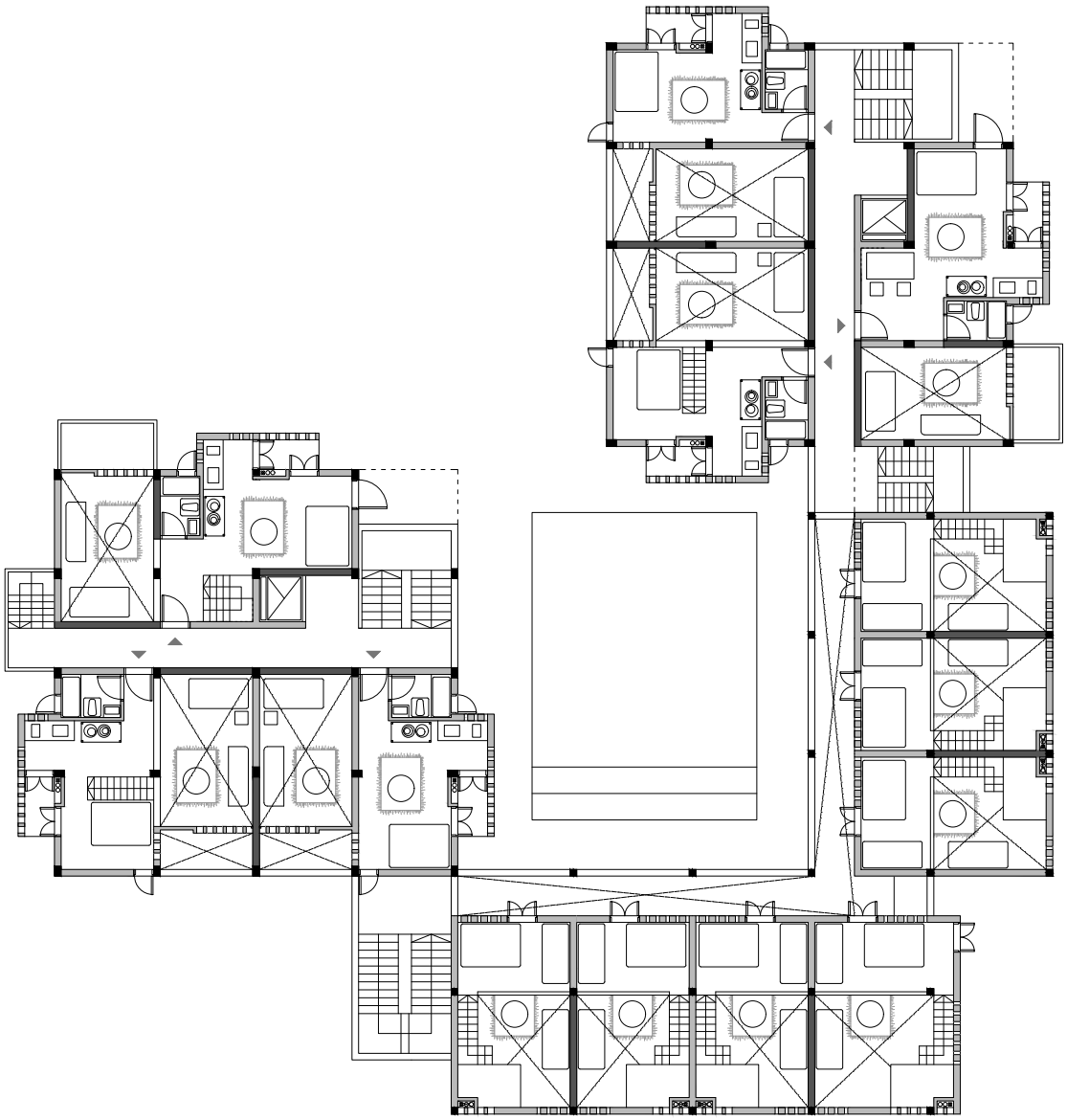
The basic unit, both for the construction in the vacant areas of the west and the urban redevelopment within the existing fabric on the east is the open cluster.

This module, 30x30m holds an open courtyard around which different dwelling types are organised. In the free-standing blocks, corner units with LIG and MIG dwellings, and in the corner corridor building EWS and LIG units. The means of access are independent for every building, catering for the sensation of safety of the dwellers. However, the 10x10m courtyard is situatied in the core of the cluster and works as the heart of the block, for the integration of the dwellers of the complex.

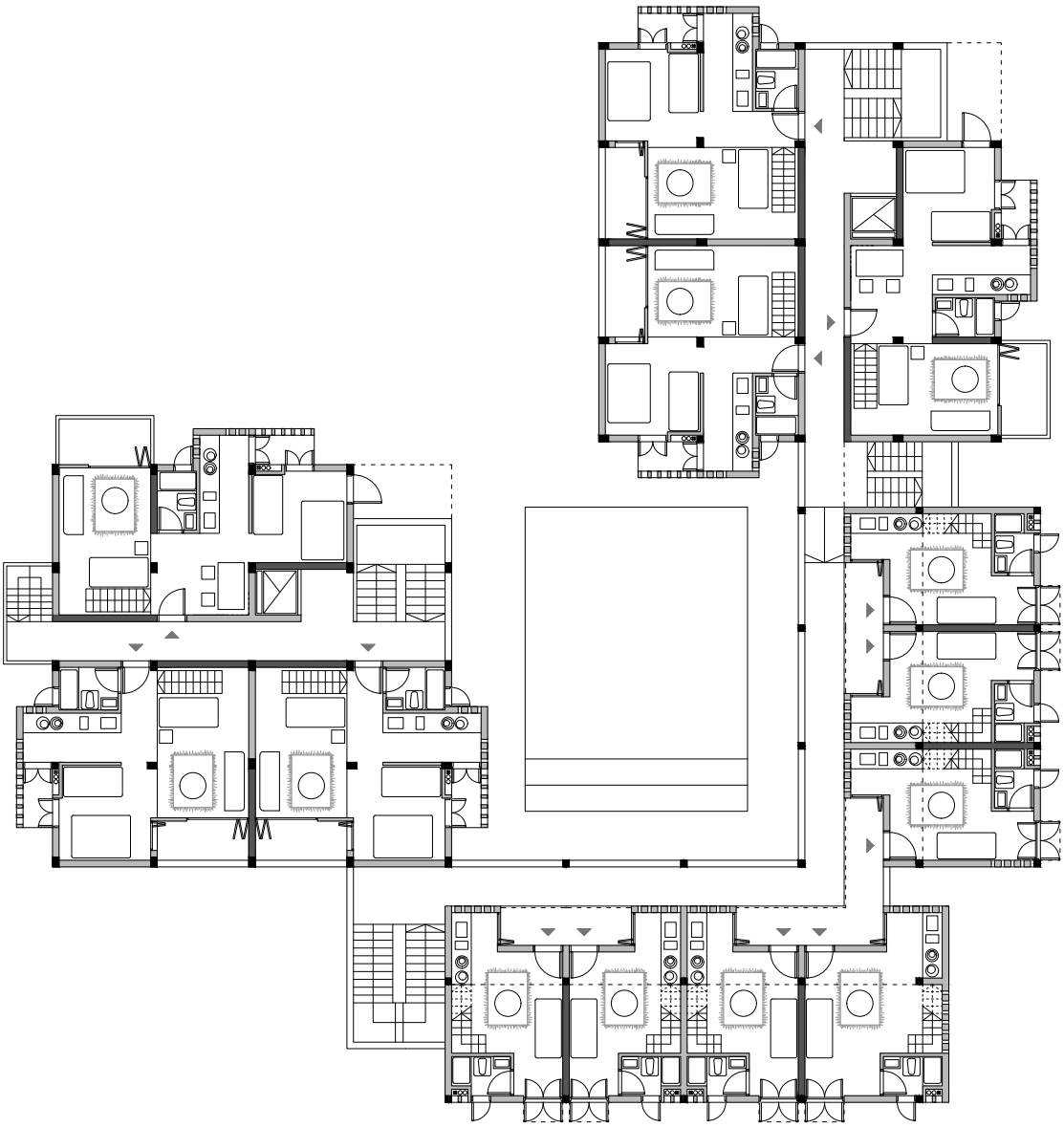


Open Cluster Module - Lower Floor Plan

0 1 2 5m



Open Cluster Module - Middle Floor Plan



Open Cluster Module - Upper Floor Plan

0 1 2 5m

Cluster Example - Nalasopara West



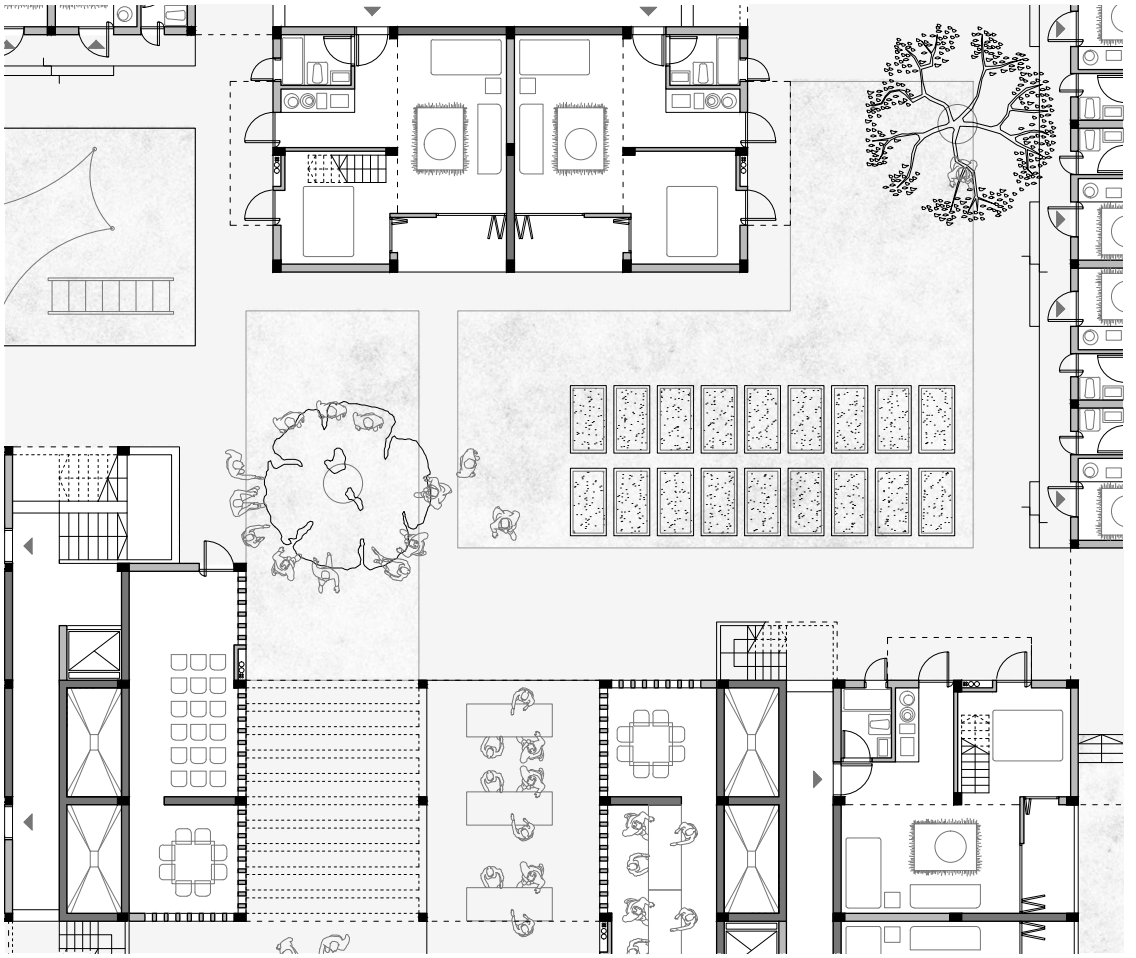
0 2 4 10m

Second Floor Plan



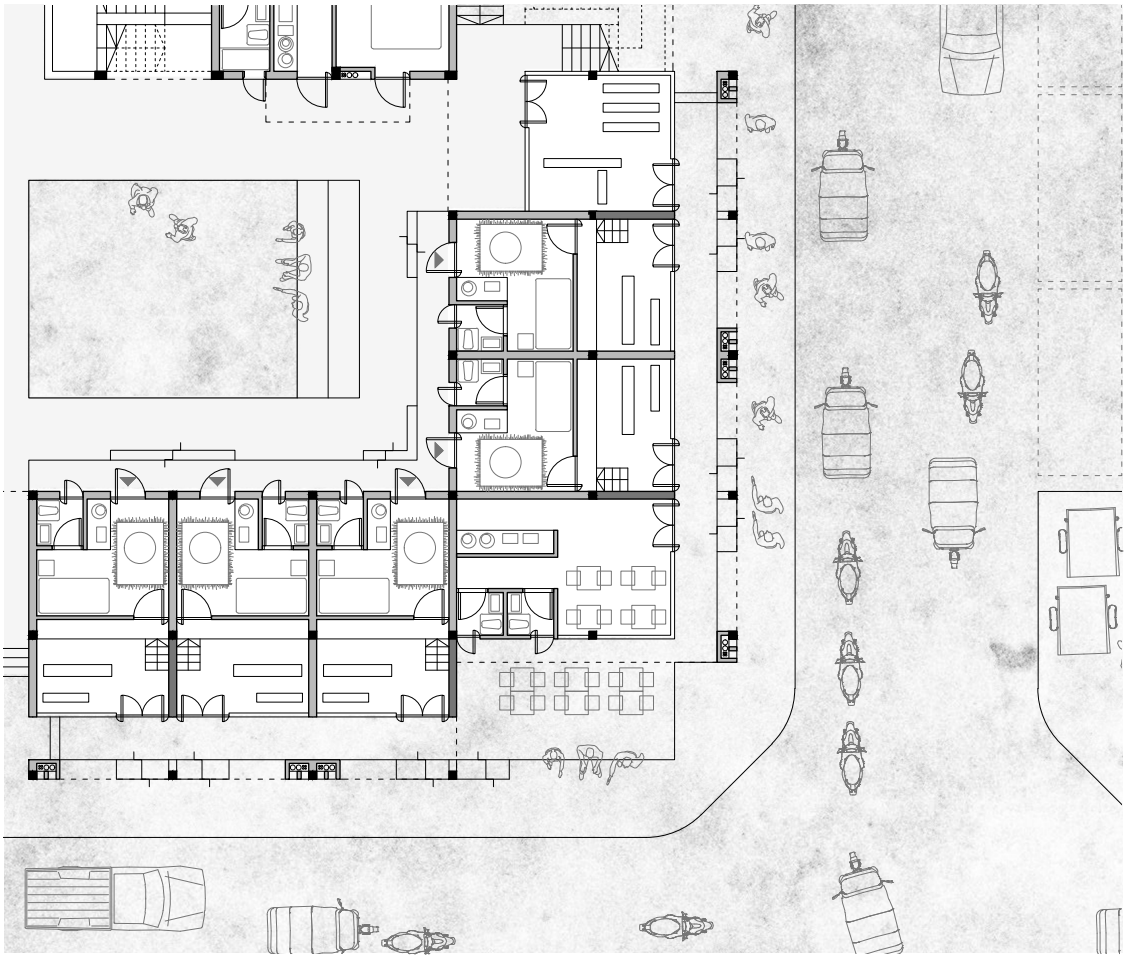
Ground Floor Plan

Instances on the Ground Floor - Nalasopara West



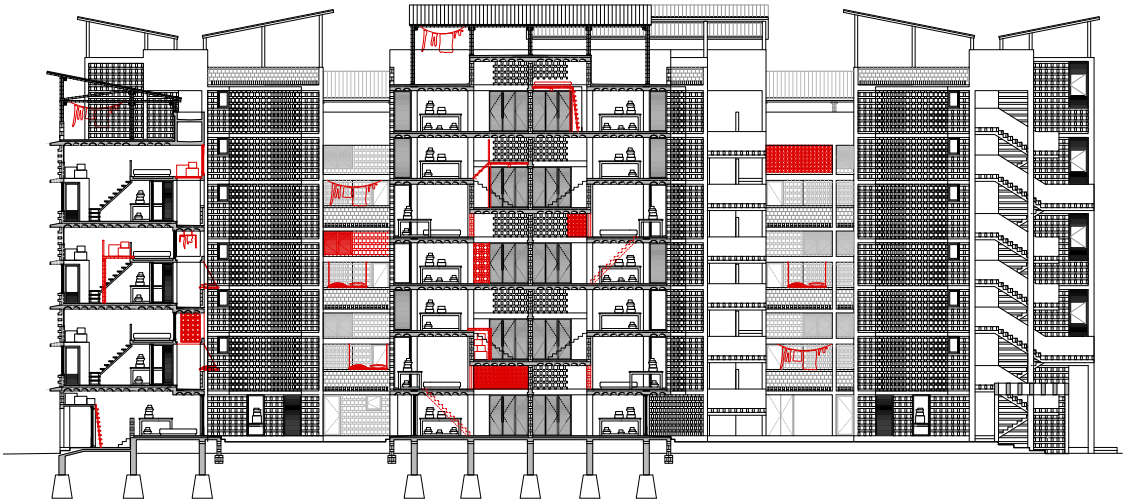
0 1 2 5m

Central spot of the collective spine



Public corner and
intimate courtyard

The sequence of spaces, both outside and inside the dwellings, is defined by the section. The main access to a cluster is marked by 4 slow steps of 80x15cm under the shade of a concrete pergola, which marks the access to the collective realm. The courtyards have a proportion of 1/2 (width / height) that creates adequate shade for the ground floor but allowing light entrance to the dwellings. The free-standing blocks operate as vertical elements (20m high) whilst the corridor buildings (height 16m) create a horizontal framing for the cluster. Inside the dwellings, the section is implemented to define the sequence of access to them: through a shaded, intimate space with low ceiling, then the space opens with heights of 3,6m to provide better air circulation and the possibility for the creation of mezzanines for sleeping areas and storage.





Long Section through
cluster in the West

0 1 2 5m

Cluster Example - Nalasopara East



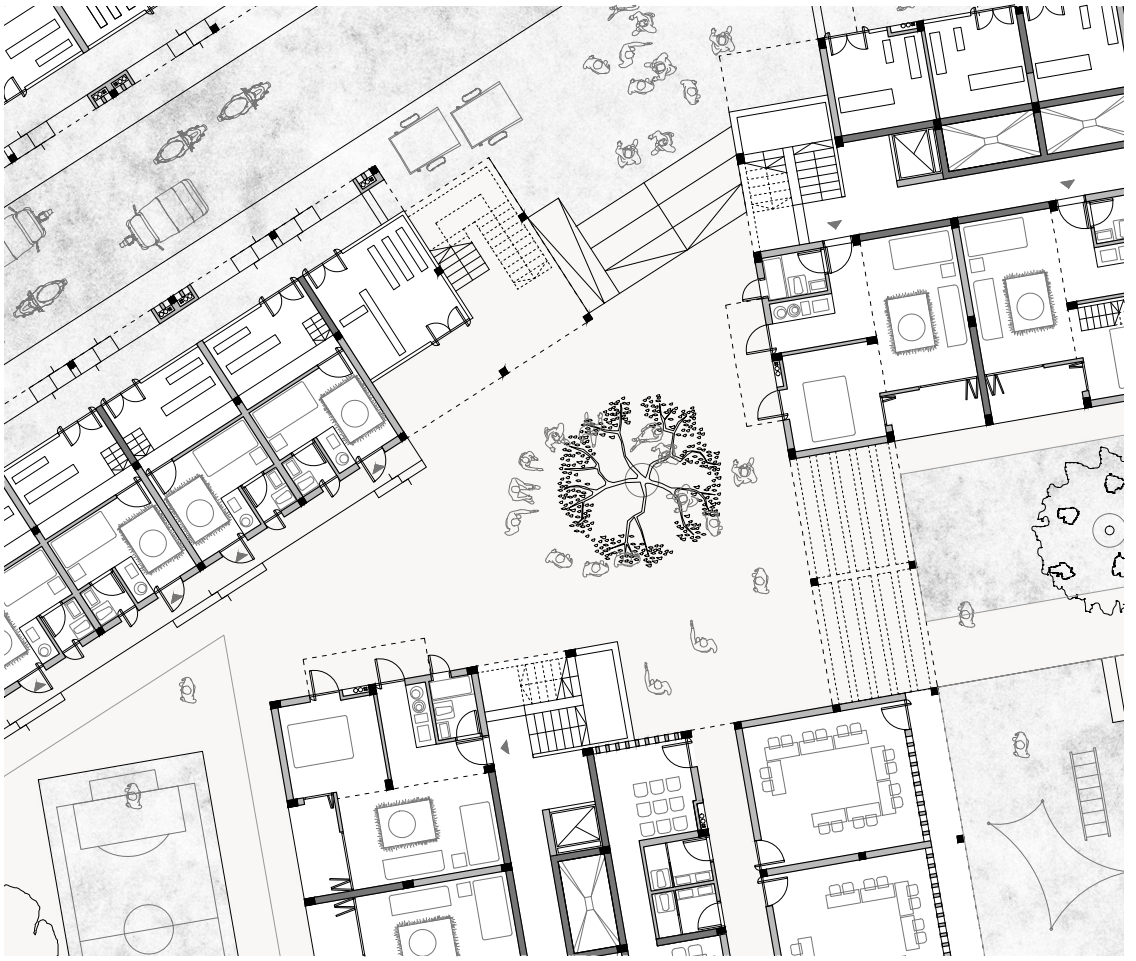
0 2 4 10m

Second Floor Plan



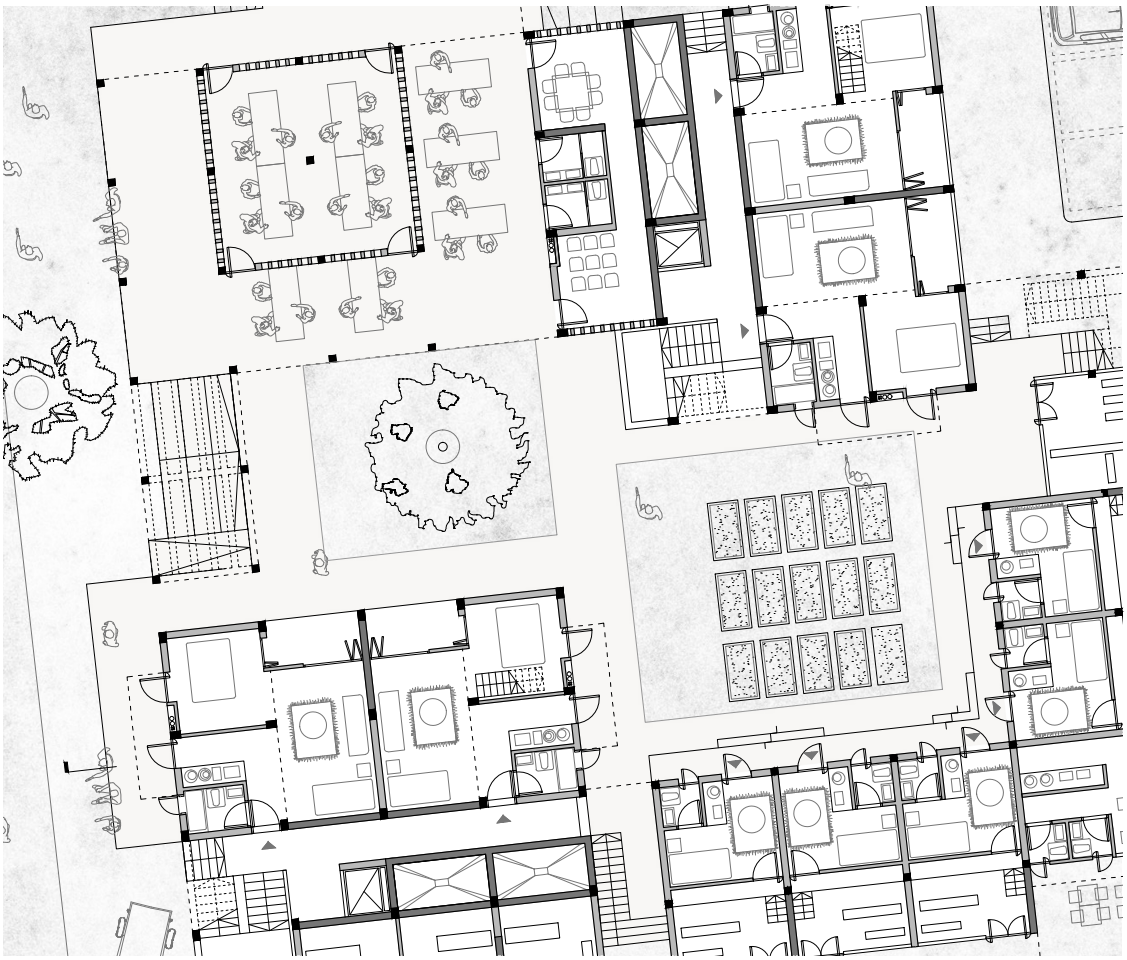
Ground Floor Plan

Instances on the Ground Floor - Nalasopara East

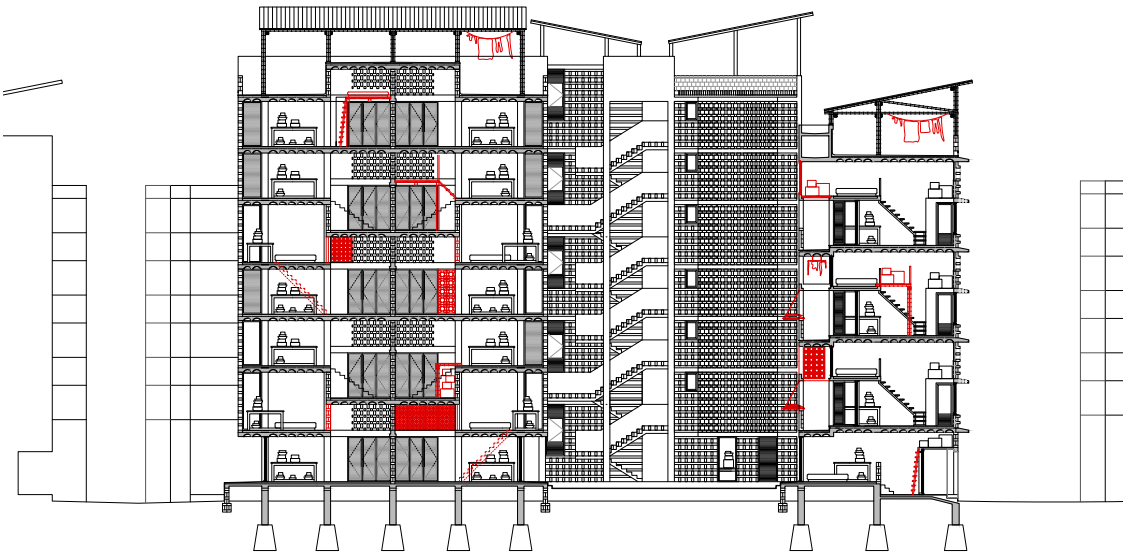


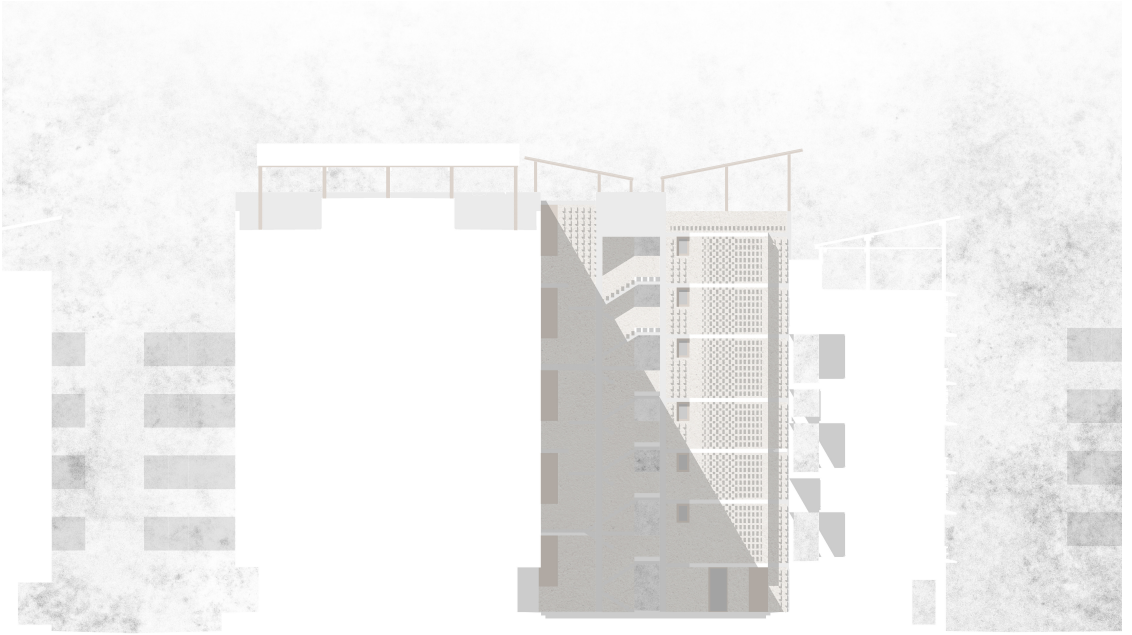
0 1 2 5m

Entrance to the community



Sequence of courtyards





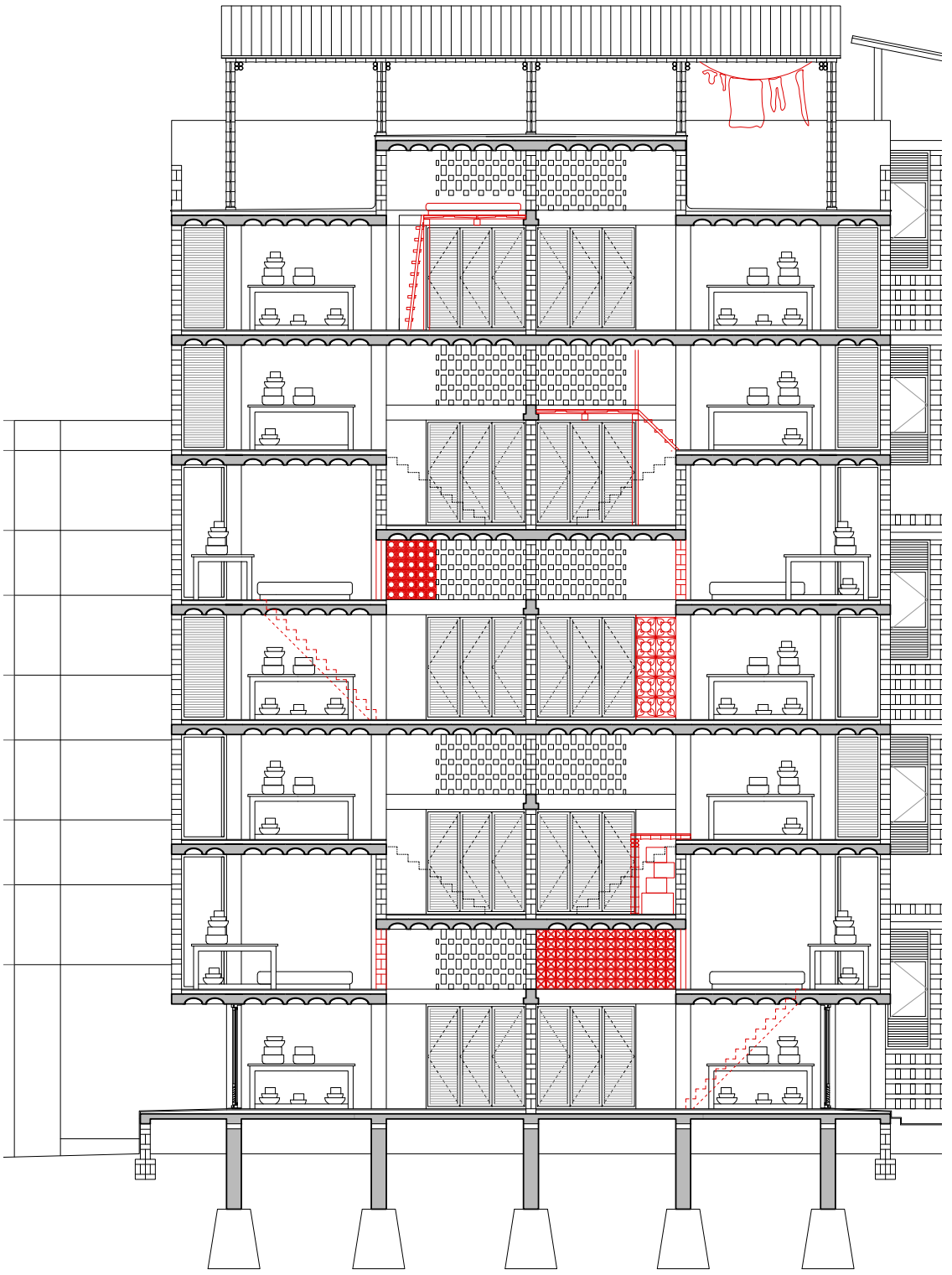
0 1 2 5m

Cross-section Cluster in the East

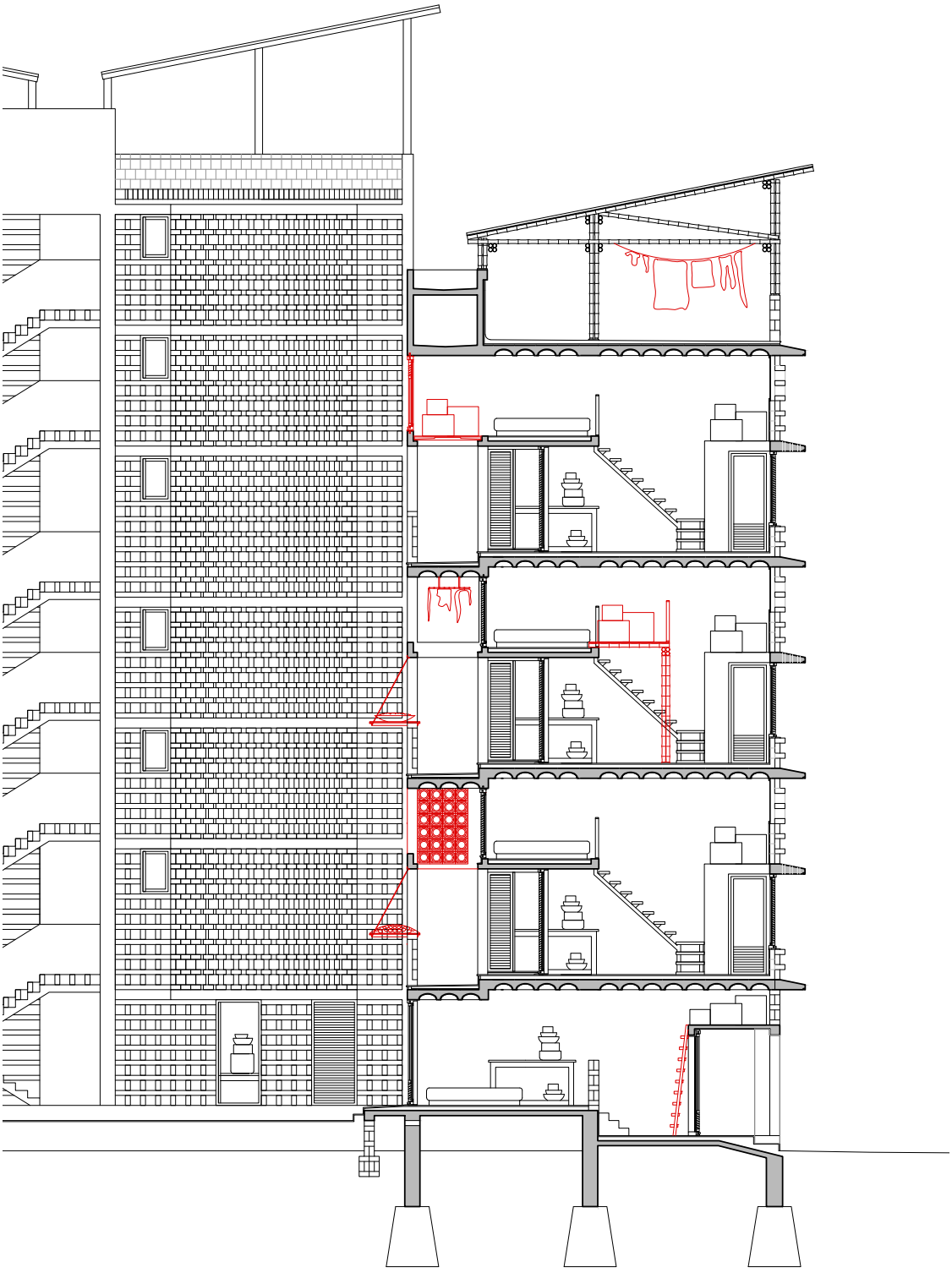




South Elevation - Main
Rahmat Nagar Street



Typical cross-section of the free-standing block

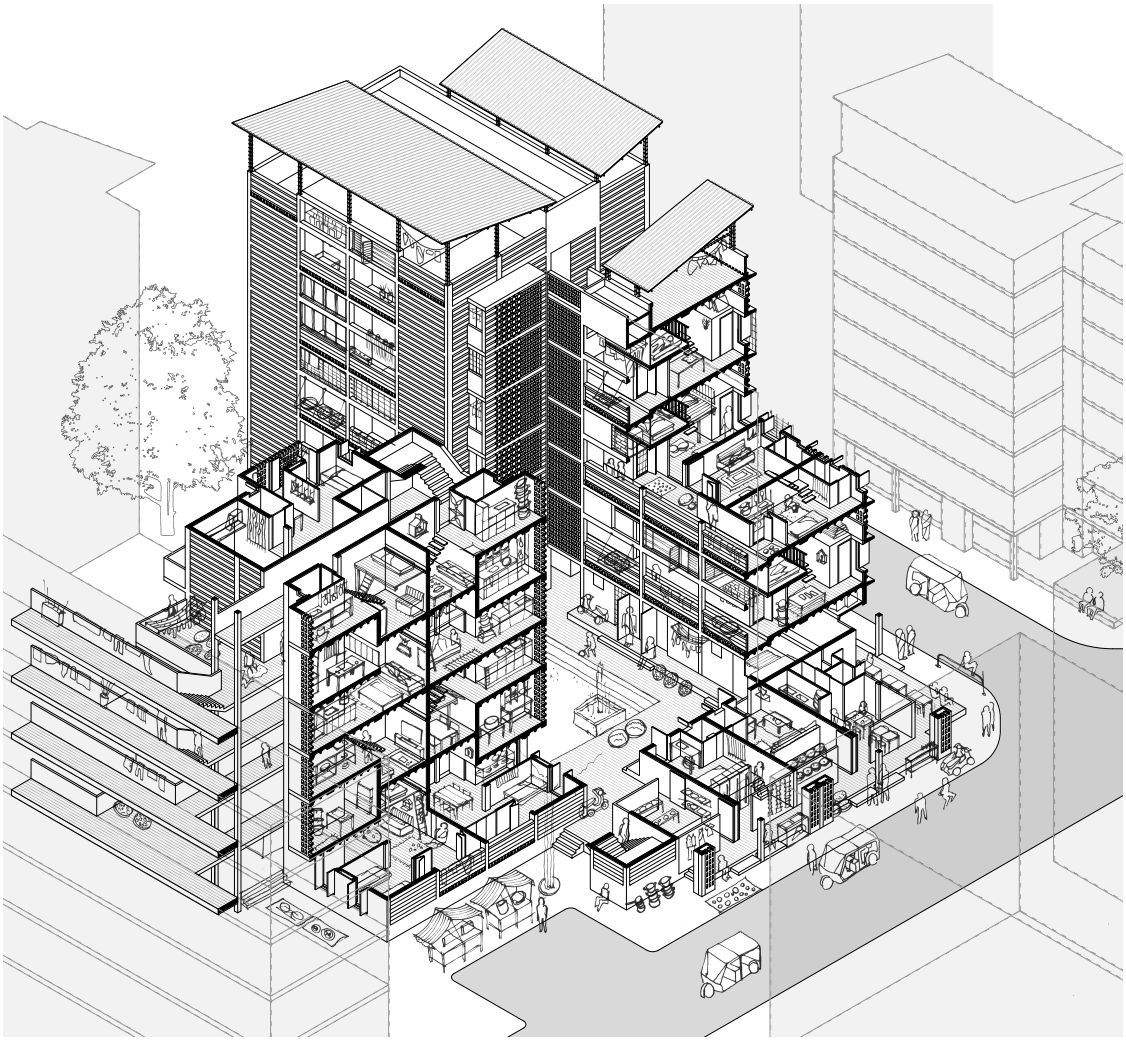


Typical cross-section of
the corridor block

In the open cluster module, different activities merge and happen simultaneously. The ground floor caters, in the connection with the street, for commercial and urban activities. Meanwhile, in relation to the courtyard, domestic activities are predominant in the ground floor.

Meanwhile, the different dwellings allow for different income groups and varied means of transformation and appropriation. Whilst the focus in the smaller dwellings is put in the collective area, in the larger dwellings the private zones are further explored and developed.

Finally, in the combination with the existing chawls (in Nalasopara East) the connecting circulation and widening of the collective space cater for the integration, both morphollogically and socially, of the new architecture and the existing tissue.



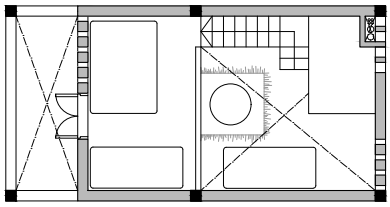
Dwelling Proposal



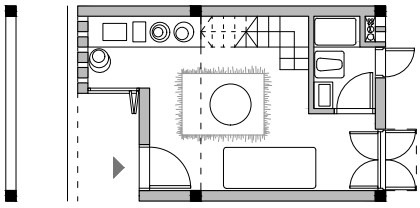
The Variation of the Dwelling Units and their Possible Adaptations

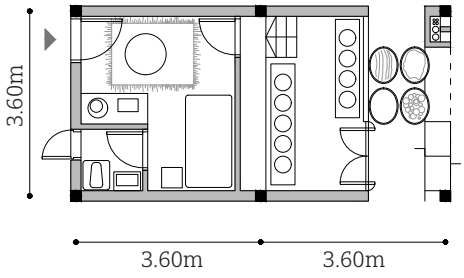
The dwelling units range from 18m^2 to 60m^2 in order to provide spaces for different income groups and household sizes. All the units have two facades for accurate ventilation and different levels of relation between the collective and the private space. Their design is based on the on-site observations of how dwellers live and modify their units. Their section is used as a tool to define the sequence of entrance to the house, always through a shaded and intimate threshold to then open the space for flexibility.

The units in the free-standing blocks provide the opportunity of annexing different units through the split levels, in order for families to divide their property and rent-out an independent room, or convert the whole surface into a single house if the family is bigger. In the units in the corridor building, the emphasis is placed on the relation between the collective corridor and the house (especially the kitchens). This is also a result of the observations on-site, where the collective space is used for cooking, interacting and working, due to the limited surface of the private areas.

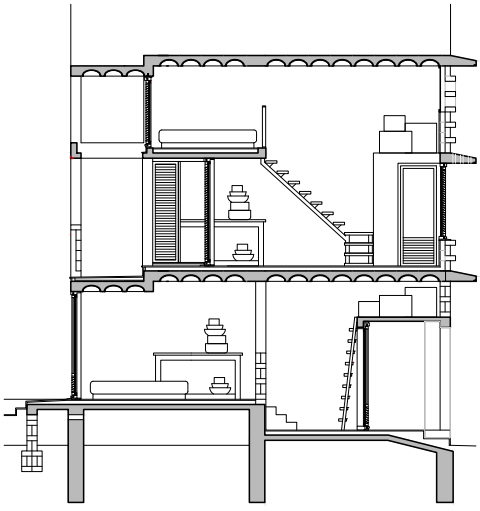


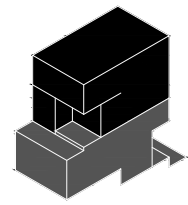
Type A - 28m²



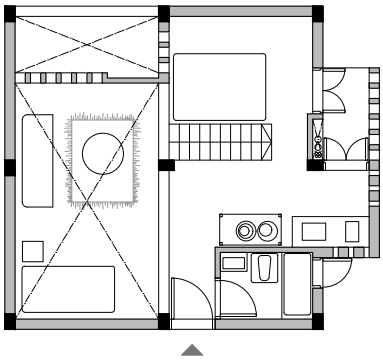


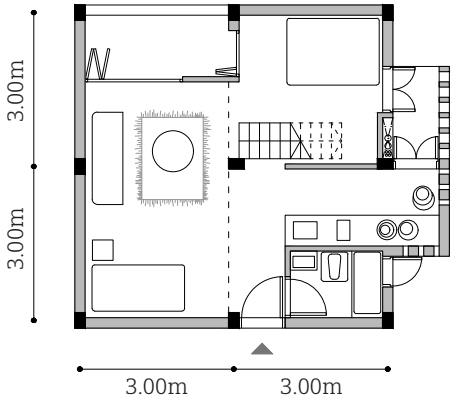
Type B - Working +
Bedroom - 19m²



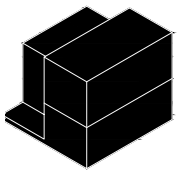


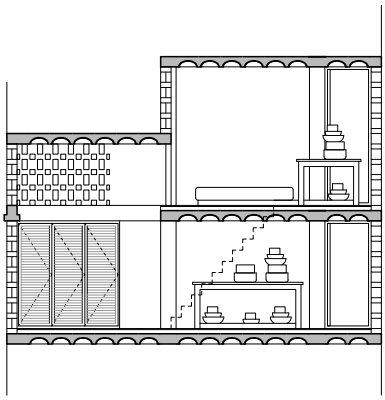
0 1 2 5m

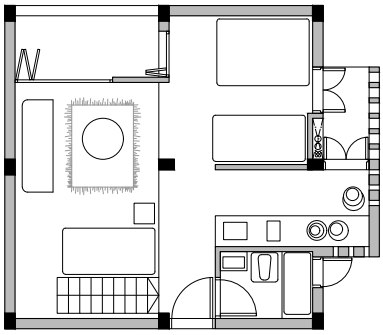




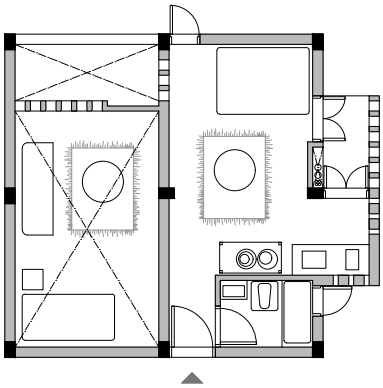
Type C - House + Rent
- 54m^2



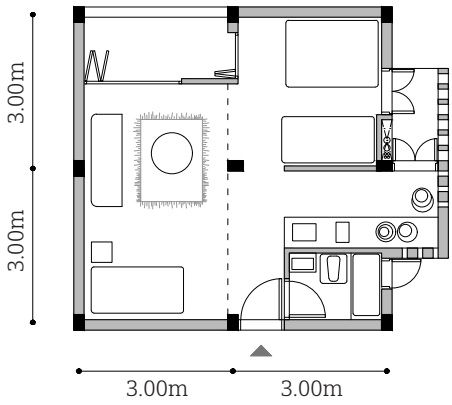




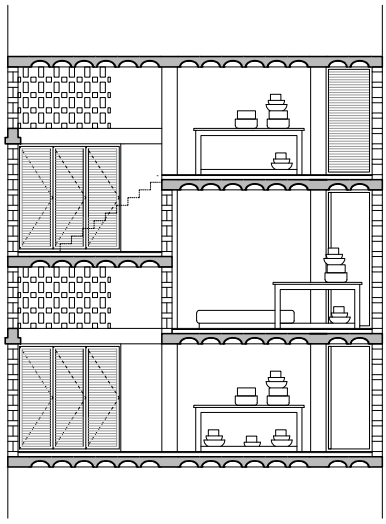
Type D - 36m²

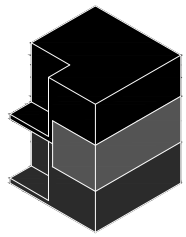


Type E - 18m²



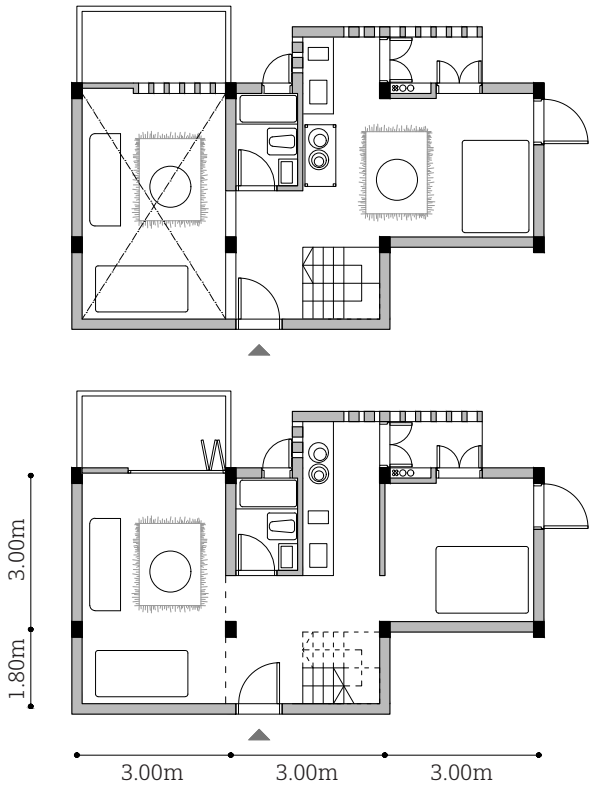
Type F - 36m²

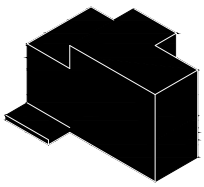


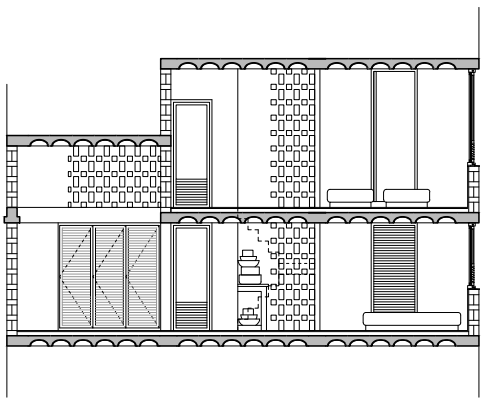


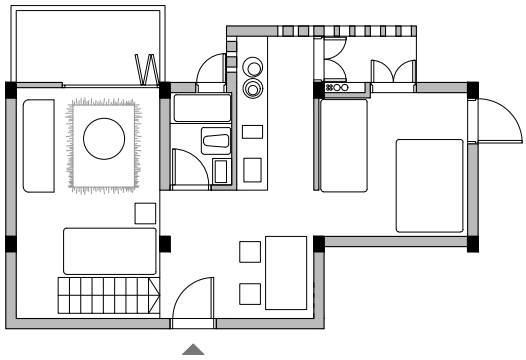
0 1 2 5m

Type G - House + Rent
- 59m²

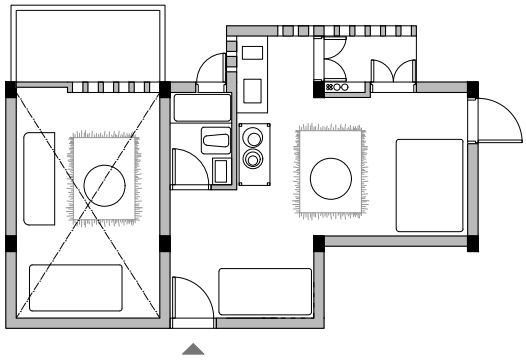




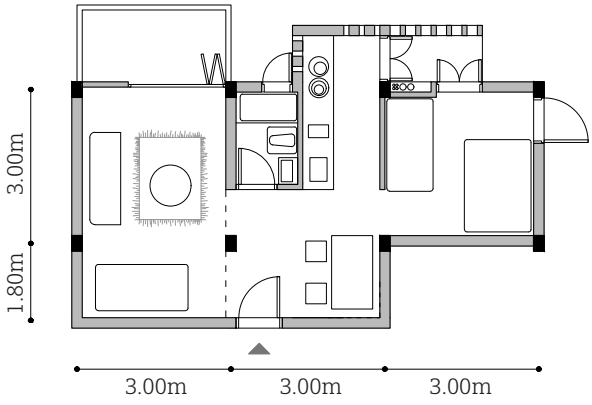




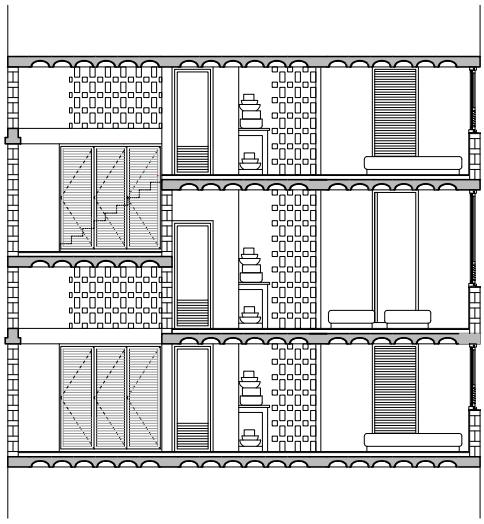
Type H - 36m²

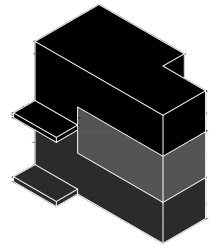


Type I - 23m²



Type J - 36m²





0 1 2 5m

Cluster Integration, and Responses for Different Income Groups in the Dwellings

The dwelling units range from 18m^2 to 60m^2 in order to provide spaces for different income groups and household sizes. All the units have two facades for accurate ventilation and different levels of relation between the collective and the private space. Their design is based on the on-site observations of how dwellers live and modify their units. Their section is used as a tool to define the sequence of entrance to the house, always through a shaded and intimate threshold to then open the space for flexibility.

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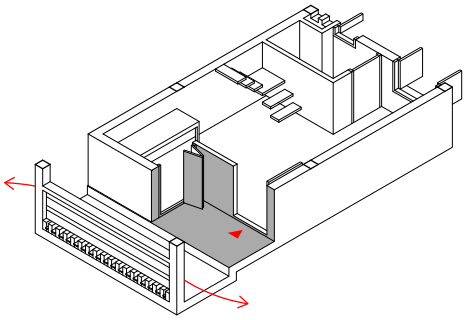
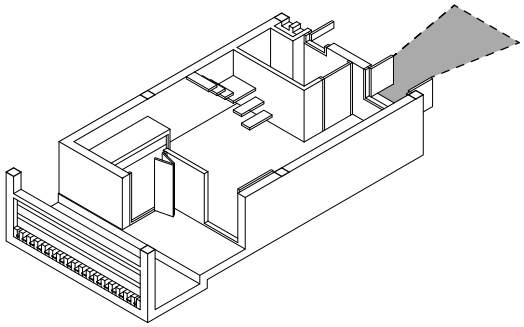
Access and outdoor spaces

The outdoor space in the smaller dwellings is always connected to the access to the house and the collective space.



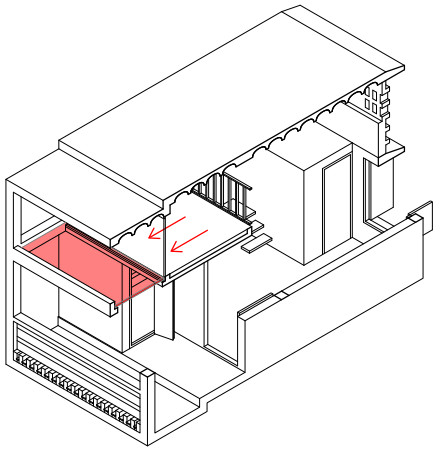
Expansion of visuals

These dwellings are located in the lower blocks, and the distance between buildings varies between 7 and 9 meters.



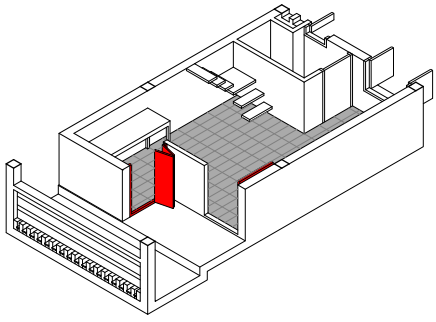
Appropriation

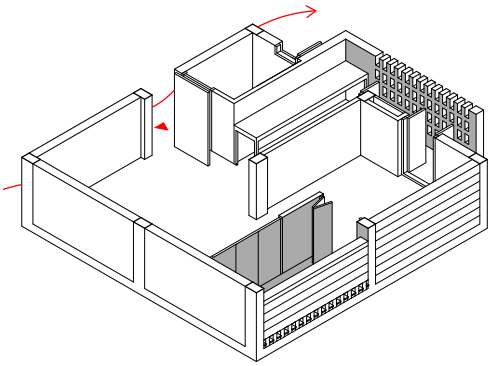
The means of appropriation in these houses is through encroachment over the collective corridor and the inside of the dwelling.



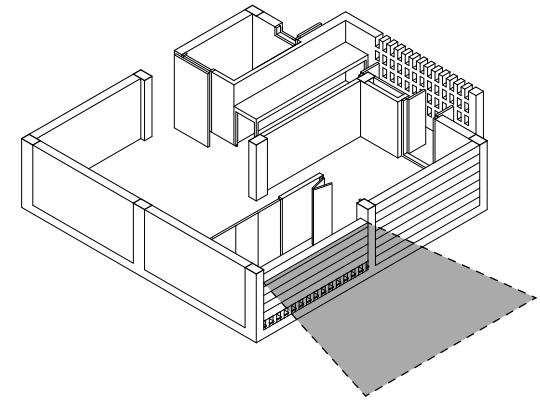
Materials

The ceramic tiling is chosen to make the dwellings more affordable, and the openings to the collective areas consist only of wooden louvres.

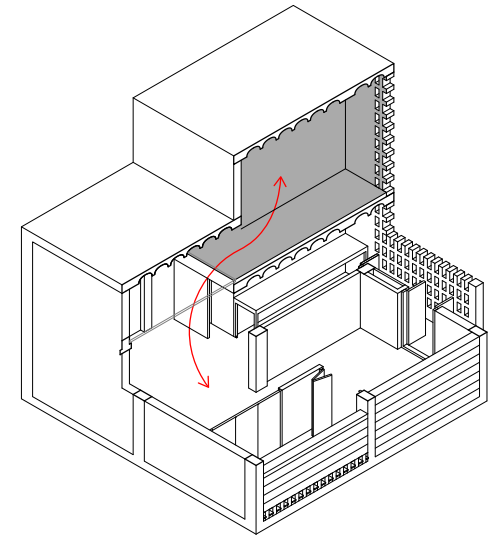




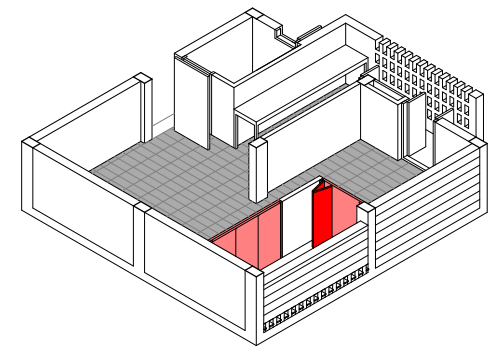
The outdoor spaces in the larger dwellings are completely private, separated from the means of access to the house.



Due to the configuration of the clusters, the visuals from the main openings of these dwellings range from 10 to 18 meters between buildings.



The middle units can be annexed to the lower dwelling units, creating spaces for renting out or for expanding the house.



The ceramic tiling is chosen to make the dwellings more attractive for middle income groups. The openings consist of glazed panels and wooden louvres.

Materialisation



Free-Standing Block - West Facade

Roof

Light roof layer:
Inclinated bamboo cane light structure (Diam app. 100mm)
Corrugated metal sheet covering
Space between light roofing and concrete slab for shading and passive cooling of the concrete roofing. The space is accessible by the dwellers, for drying clothes and other necessities.

Hard roof layer:
Protecting screed - cement mortar - 20mm
Waterproof foil
Leveling concrete 50mm - 2% slope for free-water running towards facade
In - situ casted reinforced concrete slab with incorporated beams 200mm
Handcrafted ceramic claypots for making structure lighter (height 100mm - diameter 360mm)

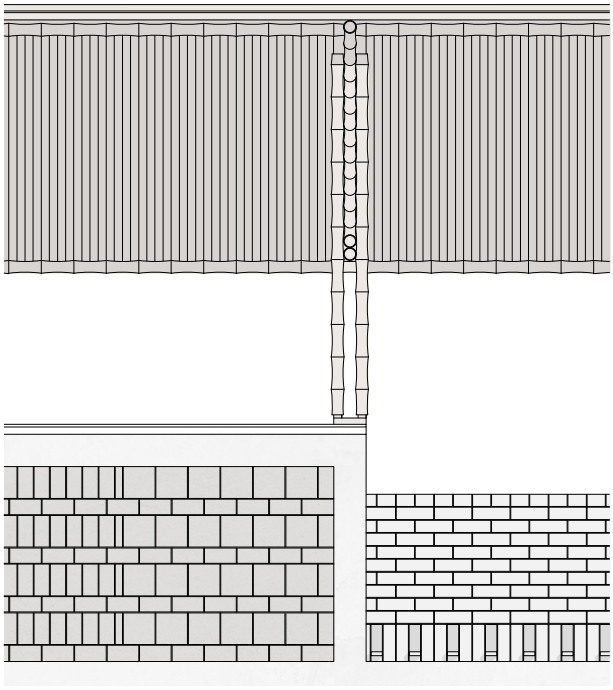
Typical floor elevation

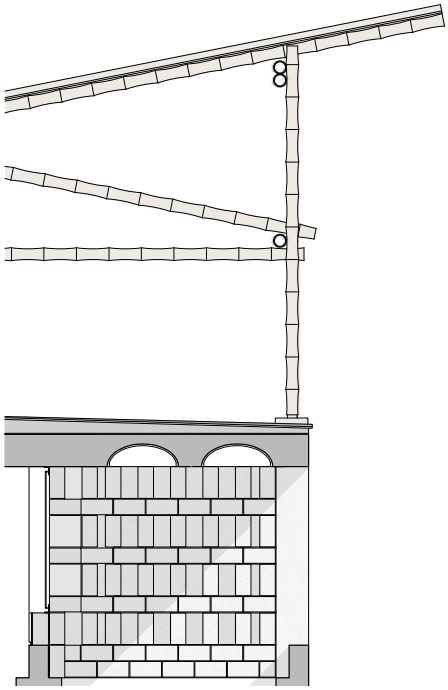
Facade:
Fly-Ash Bricks 230x110x70mm (west facade in contact with monsoon predominant wind and rain)
Pattern for casting diagonal shadows and passive cooling of the facade
Waterproof asphaltic paint
Hard and soft rendering - 20mm + 5mm respectively
Paint as interior finishing

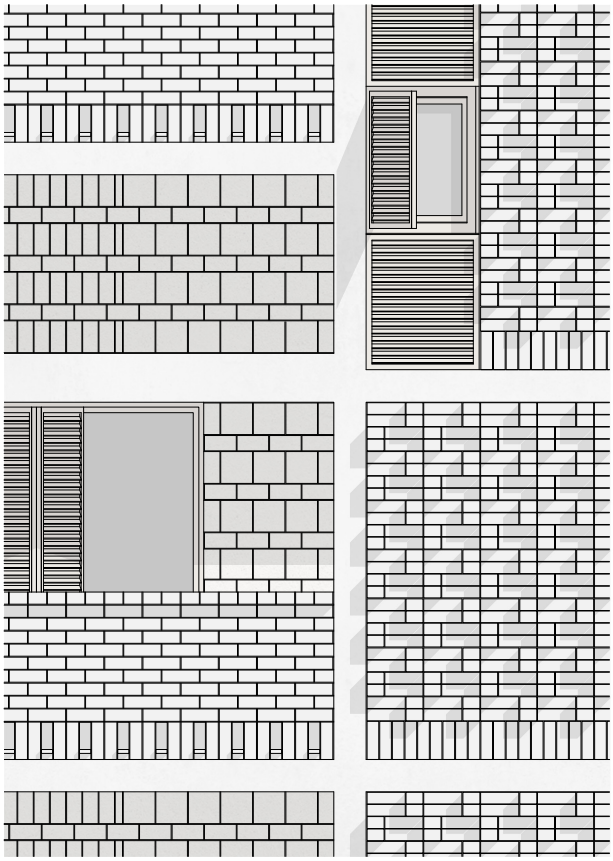
Floor:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar - 20mm
Leveling concrete 50mm
In - situ casted reinforced concrete slab with incorporated beams 200mm
Handcrafted ceramic claypots for making structure lighter (height 100mm - diameter 360mm)

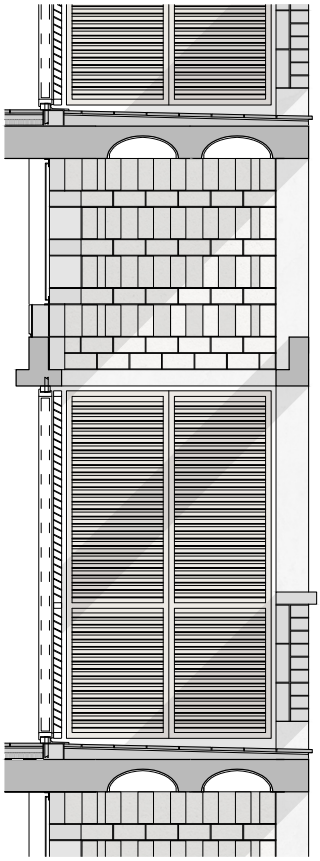
Openings:
Wooden frame + preframe bolted to structure (superior) and second phase concrete dice (inferior)
Openings covered by logias: Louvre shutter operating outside frame - for future inclusion of glazing or metallic grid by inhabitants
Openings in outer facade: openable single glazing layer + wooden louvre shutter
Jalis conformed by brick patterns

0 .2 .4 1m









Foundation

Inner Floor:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar - 20mm
Leveling concrete 50mm
In - situ casted reinforced concrete slab 120mm
Air gap between concrete slab and soil - 600mm

Foundation:
In situ casted reinforced concrete foundation beam 300mm wide - height according to soil study
Openings in foundation beam for ventilation of air gap - diam. 20mm
In situ casted reinforced concrete foundation pad aligned with columns - dimensions according to soil study

Outer floor

Next to building:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar 20mm
Concrete layer 80mm
Natural soil

Courtyards:
Natural absorbing soil without alterations

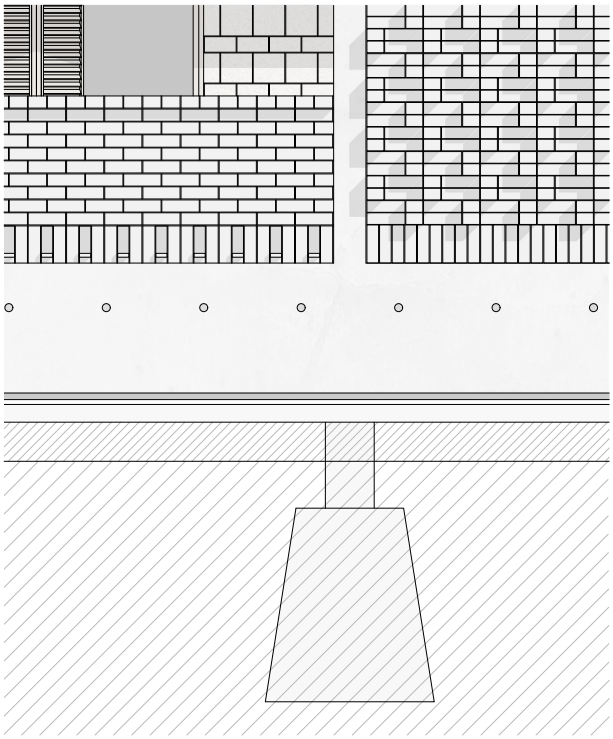
Floor plan

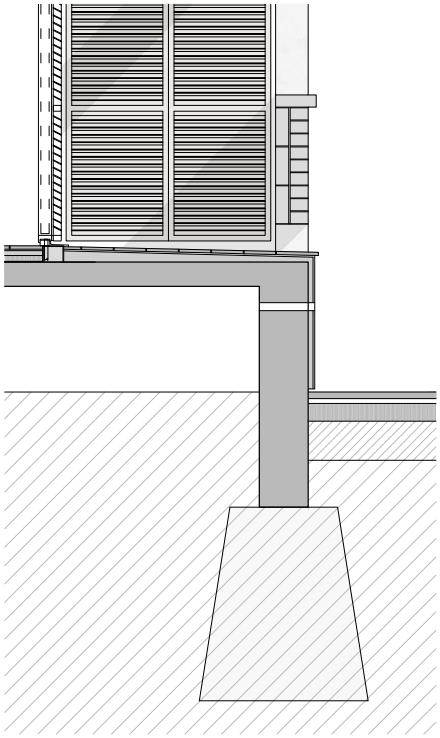
Facade:
Fly-Ash Bricks 230x110x70mm (west facade in contact with monsoon predominant wind and rain)
Pattern for casting diagonal shadows and passive cooling of the facade
Waterproof asphaltic paint
Hard and soft rendering - 20mm + 5mm respectively
Paint as interior finishing

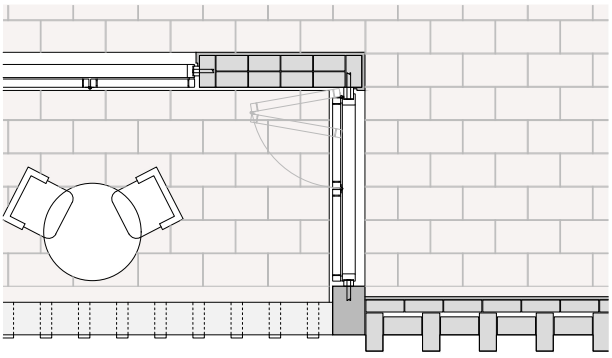
Floor:
Ceramic tiles 200x400mm

Openings:
Wooden frame + preframe bolted to structure and bricks
Louvre shutter operating outside frame - for future inclusion of glazing or metallic grid by inhabitants

0 .2 .4 1m







Perimeter Building - South Facade

Roof

Light roof layer:
Inclinated bamboo cane light structure (Diam app. 100mm)
Corrugated metal sheet covering
Space between light roofing and concrete slab for shading and passive cooling of the concrete roofing. The space is accessible by the dwellers, for drying clothes and other necessities.

Hard roof layer:
Protecting screed - cement mortar - 20mm
Waterproof foil
Leveling concrete 50mm - 2% slope for free-water running towards facade
In - situ casted reinforced concrete slab with incorporated beams 200mm
Handcrafted ceramic claypots for making structure lighter (height 100mm - diameter 360mm)

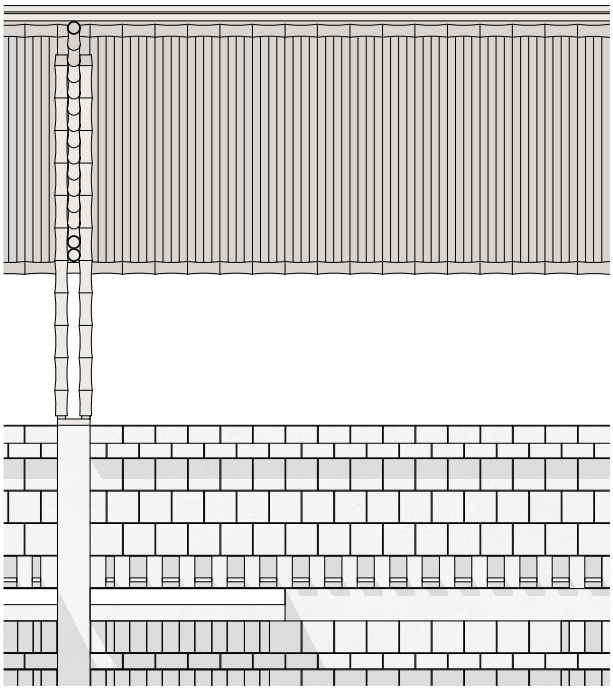
Typical floor elevation

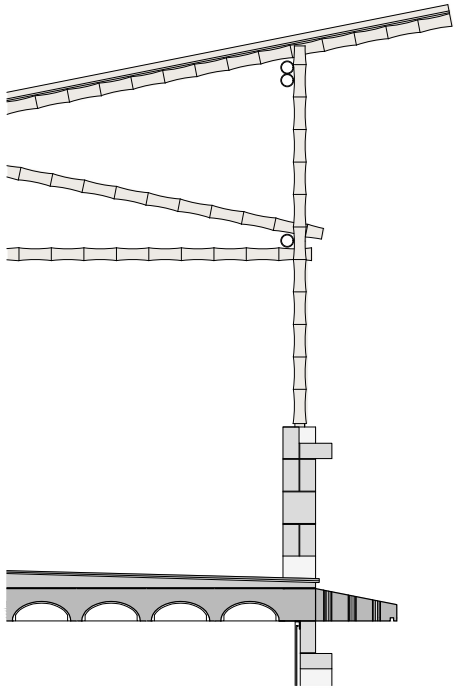
Facade:
Soil-cement compressed bricks (in southern, eastern and northern facades, where there is no impact from rain and major winds)
Pattern for casting vertical shadows and passive cooling of the facade
Waterproof asphaltic paint
Hard and soft rendering - 20mm + 5mm respectively
Paint as interior finishing
Reinforced concrete overhangs - perforations diam. 30mm for vertical flow of air in case dwellers attach a cage outside the windows

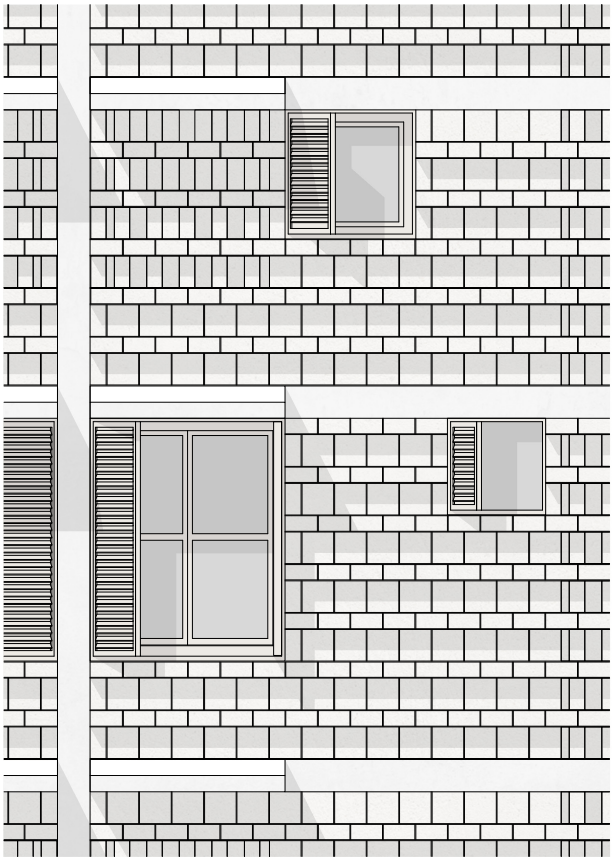
Floor:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar - 20mm
Leveling concrete 50mm
In - situ casted reinforced concrete slab with incorporated beams 200mm
Handcrafted ceramic claypots for making structure lighter (height 100mm - diameter 360mm)

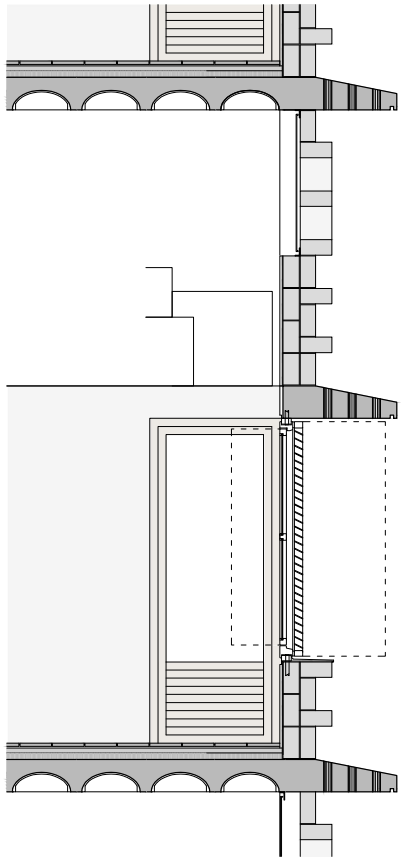
Openings:
Wooden frame + preframe bolted to structure (superior) and second phase concrete dice (inferior)
Openable single glazing layer + wooden louvre shutter
Jalis conformed by brick patterns











Foundation

Inner Floor:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar - 20mm
Leveling concrete 50mm
In - situ casted reinforced concrete slab 120mm
Soil filling with material from demolished chawls in Nalasopara East

Foundation:
In situ casted reinforced concrete foundation beam 300mm wide - height according to soil study
columns - dimensions according to soil study

Outer floor

Next to building:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar 20mm
Concrete layer 80mm
Natural soil

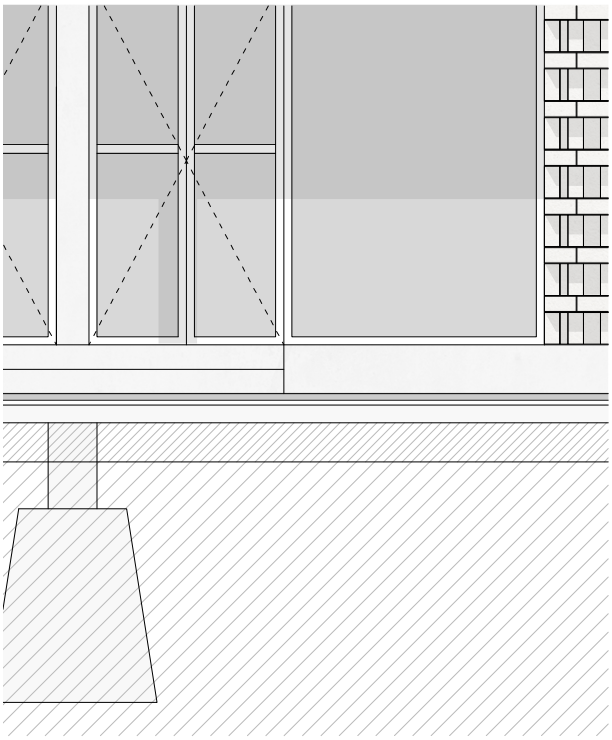
Floor plan

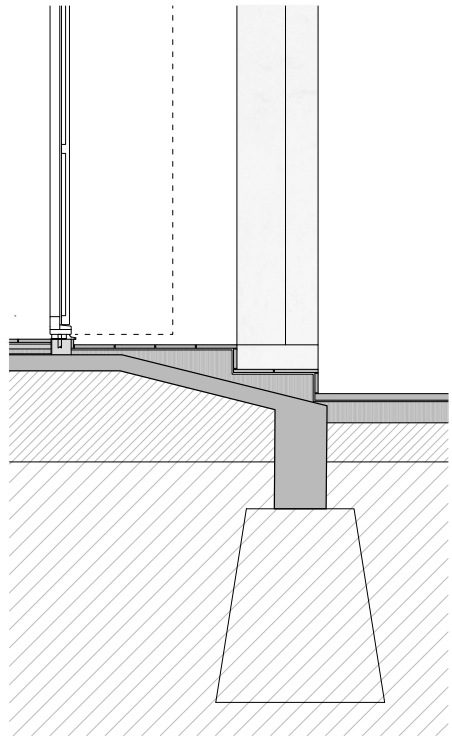
Facade:
Soil-cement compressed bricks (in southern, eastern and northern facades, where there is no impact from rain and major winds)
Pattern for casting vertical shadows and passive cooling of the facade
Waterproof asphaltic paint
Hard and soft rendering - 20mm + 5mm respectively
Paint as interior finishing
Reinforced concrete overhangs - perforations diam. 30mm for vertical flow of air in case dwellers attach a cage outside the windows

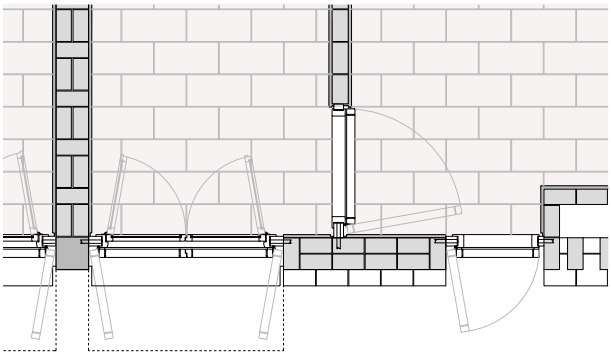
Floor:
Ceramic tiles 200x400mm

Openings:
Wooden frame + preframe bolted to structure and bricks
Openable single glazing layer + wooden louvre shutter

0 .2 .4 1m





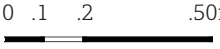


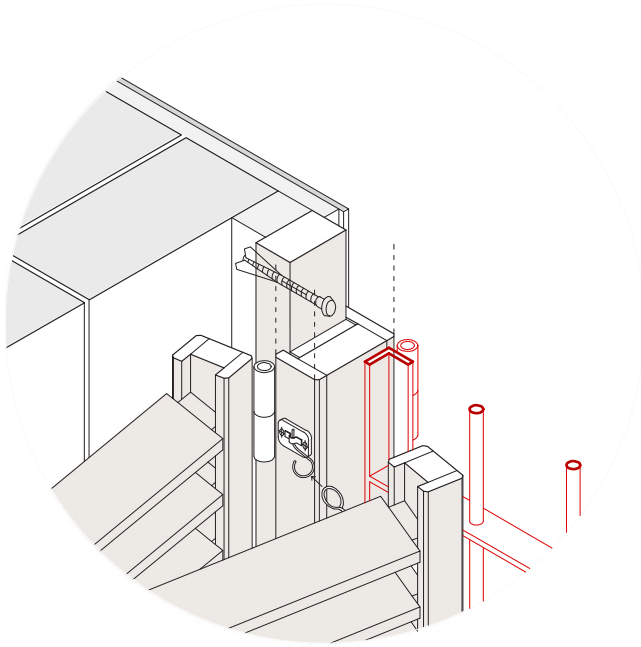
Detail: The threshold

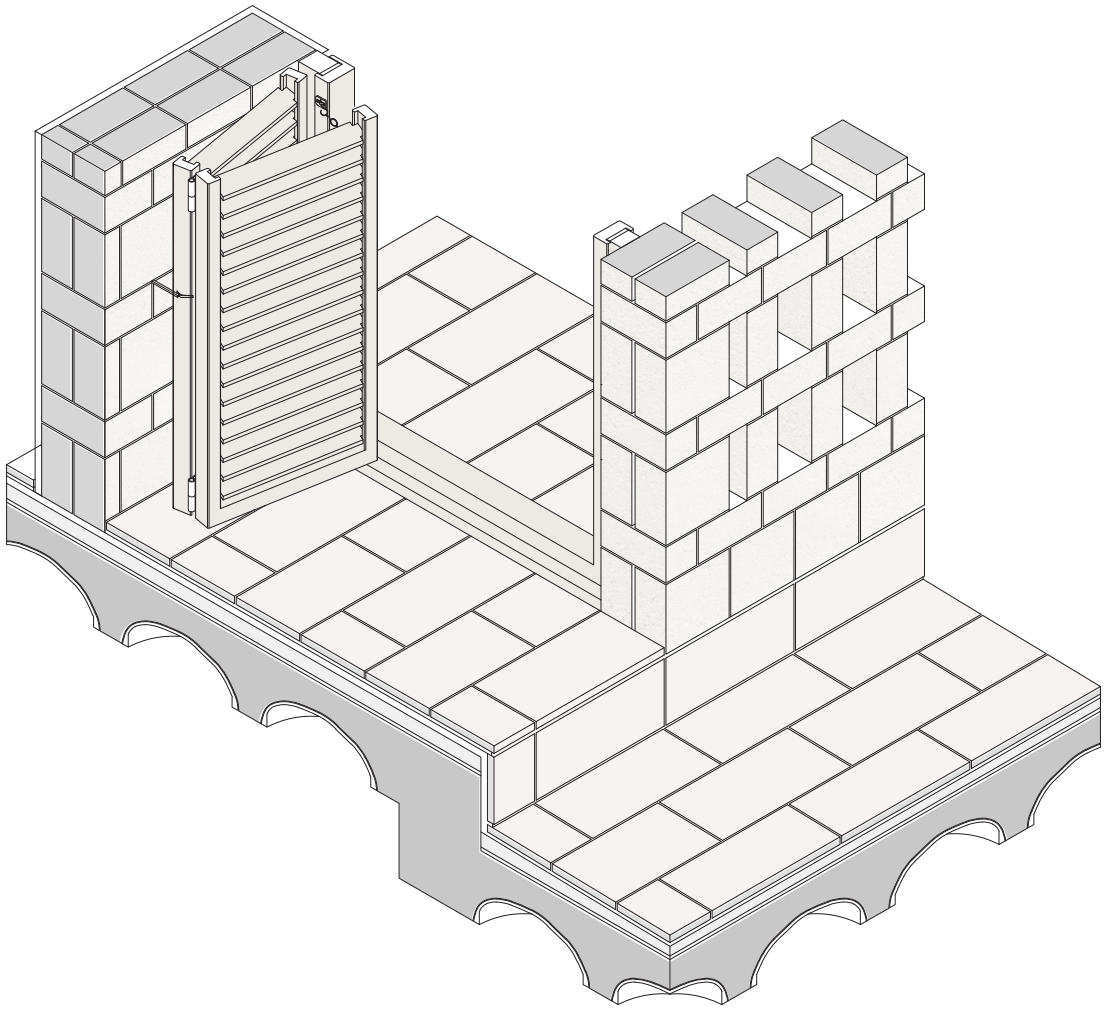
Wall:
Soil-cement compressed bricks
Hard and soft rendering - 20mm + 5mm respectively
Paint as interior finishing

Floor:
Ceramic tiles 200x400mm
Cement adhesive
Finishing screed - cement mortar - 20mm
Leveling concrete 50mm (sloped 2% towards facade in gallery)
In - situ casted reinforced concrete slab with incorporated beams 200mm
Handcrafted ceramic claypots for making structure lighter (height 100mm - diameter 360mm)

Openings:
Wooden frame + preframe bolted to structure (superior) and second phase concrete dice (inferior)
Openable wooden louvre shutter - operating outside frame - for future inclusion of glazing or metallic grid by inhabitants
Hook + metallic clamp to rigidize shutter in case of wind
Jalis conformed by brick patterns







Detail: The connection concrete - bamboo

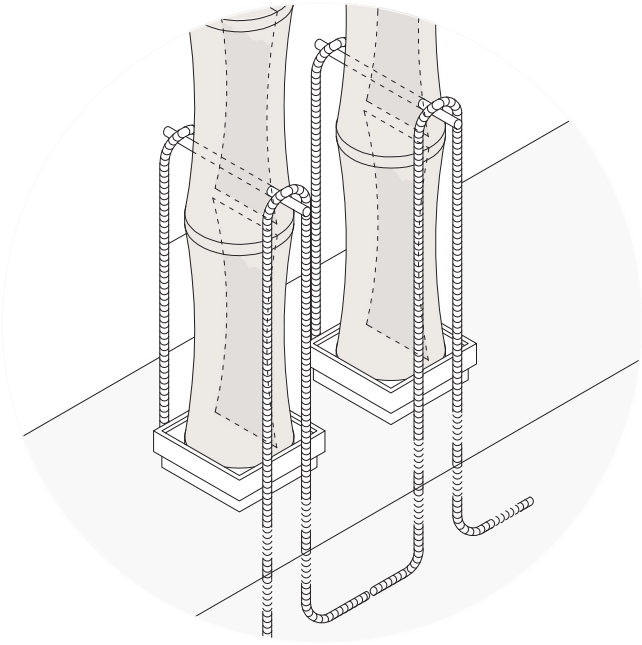
Gutter + Tank beneath gutter:

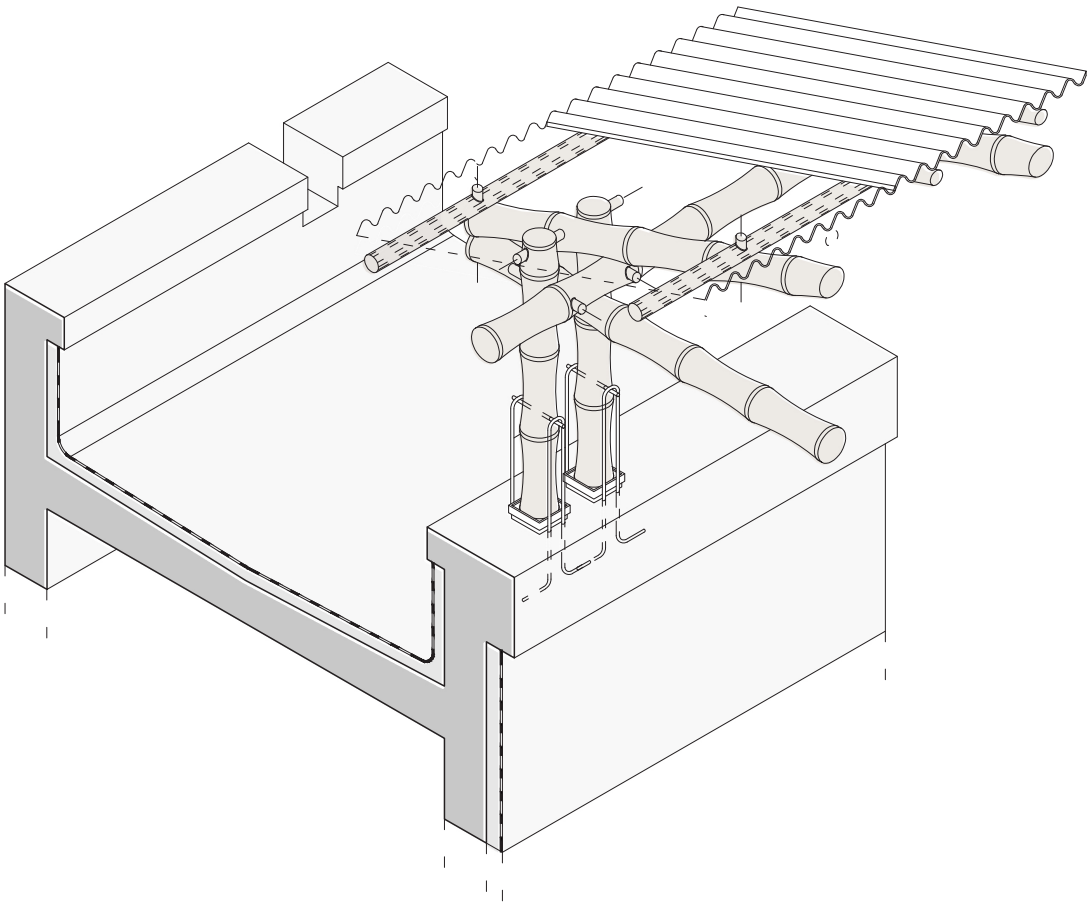
Casted in situ reinforced concrete - beams 120mm high
Leveling screed - concrete 30mm
Waterproof foil
Opening on top part for overflow

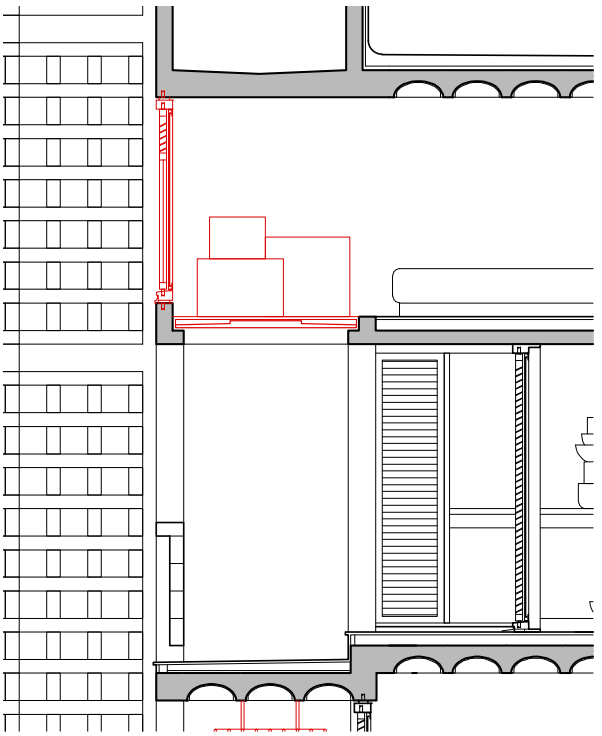
Transition to bamboo structure:
Rigidization with steel bars attached to concrete
Rigid base with rubber layer to take dilatation and movement
Bamboo joints by bolt + cement mortar filling in the capsule

Roofing:
Inclinated corrugated metallic sheet finishing 20% slope
Joint through bolts to bamboo structure

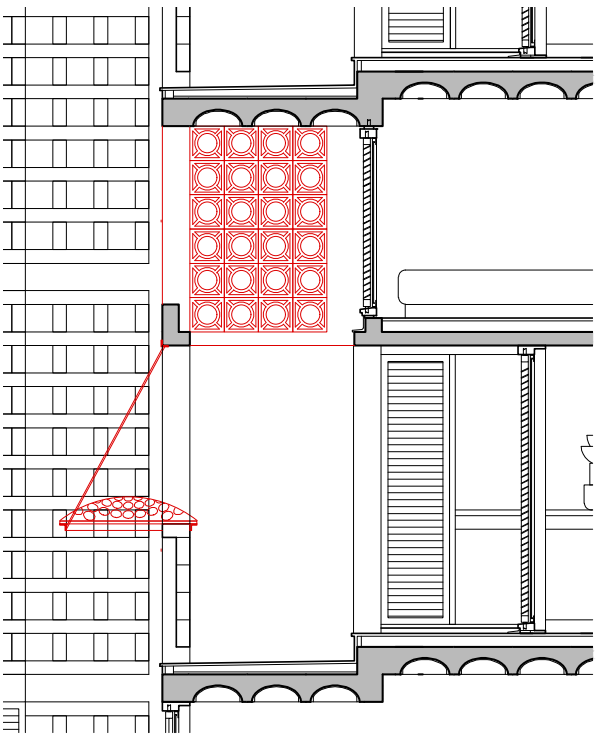




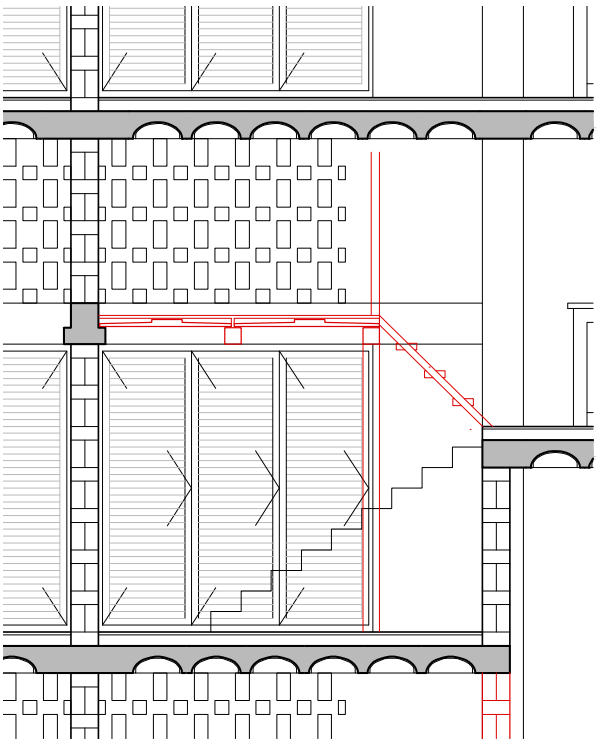




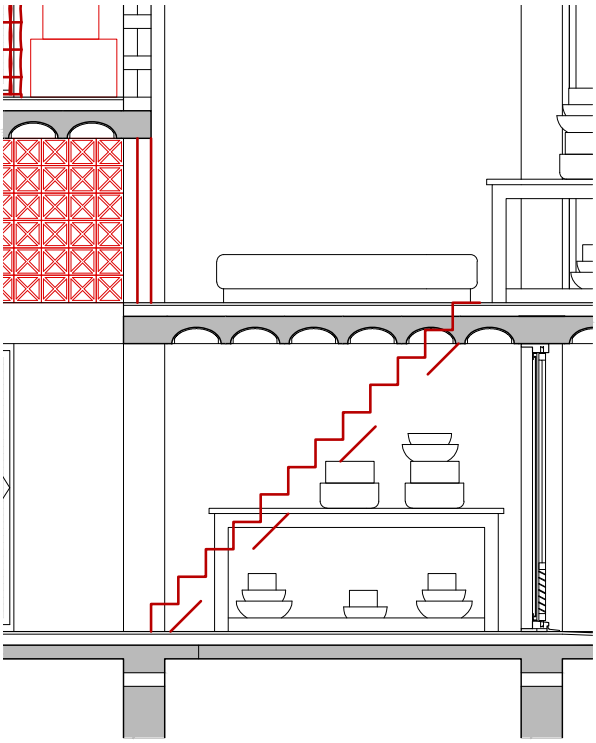
Encroachment of sleeping mezzanine for storage over corridor



Hanging of platforms in the sun for the drying of food or clothing



Addition of storage mezzanine in the split-level units



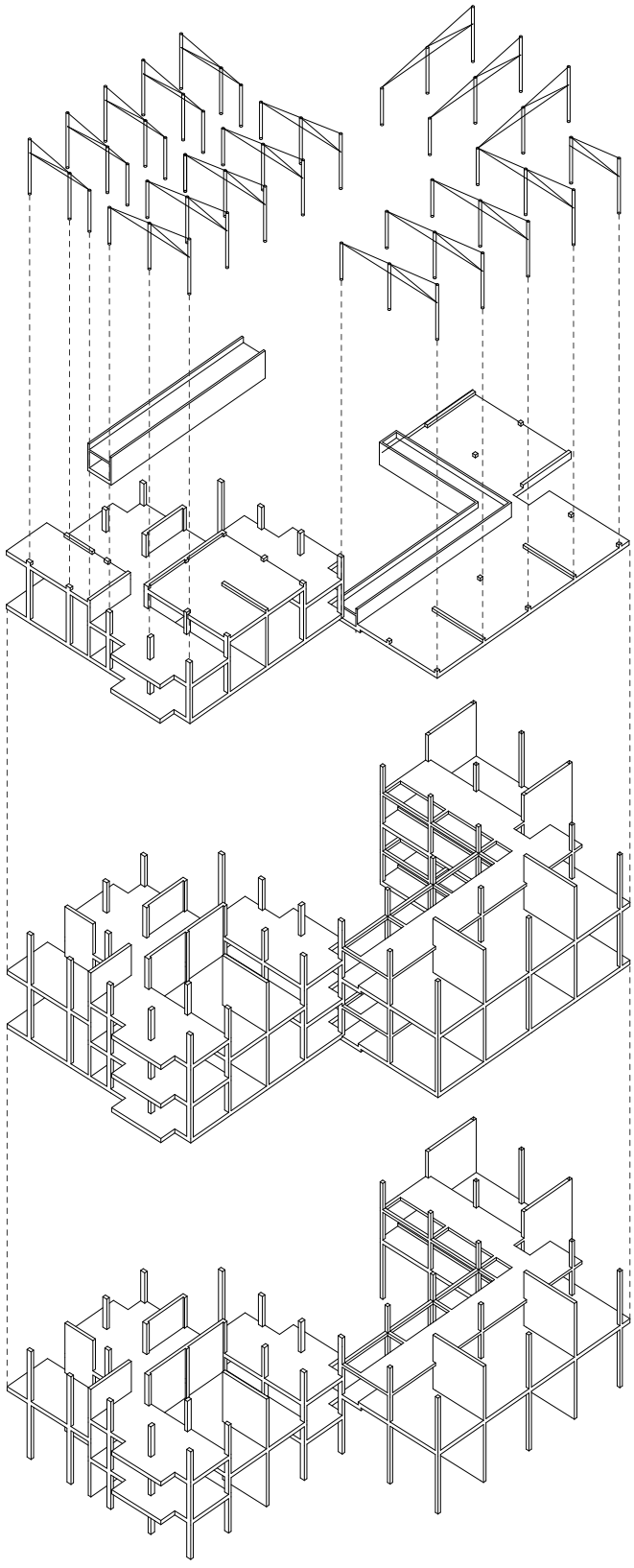
Incorporation of intermediate level to lower unit

Evolution through Time





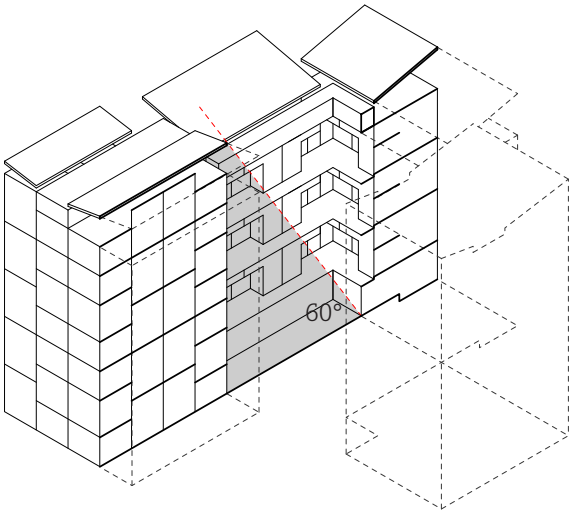
Structural proposal



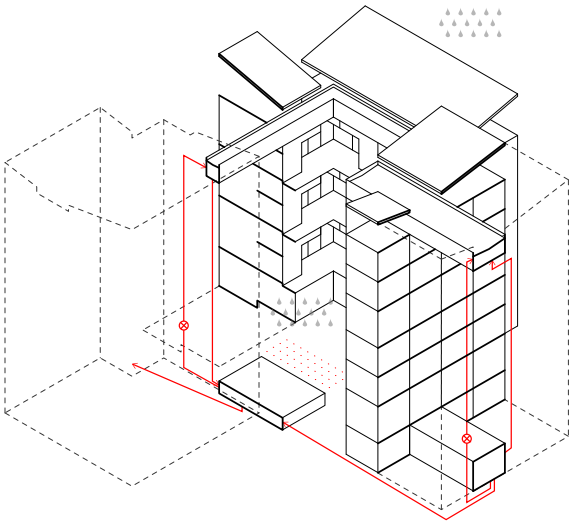
The main structure is made of casted in situ reinforced concrete, a technique that is well known in Nalasopara and that can be done in a handcraft manner, bringing job opportunities.

The column grids are 3mx3m and 3,60mx3,60m. Concrete walls are strategically located to stabilize the building from the wind.

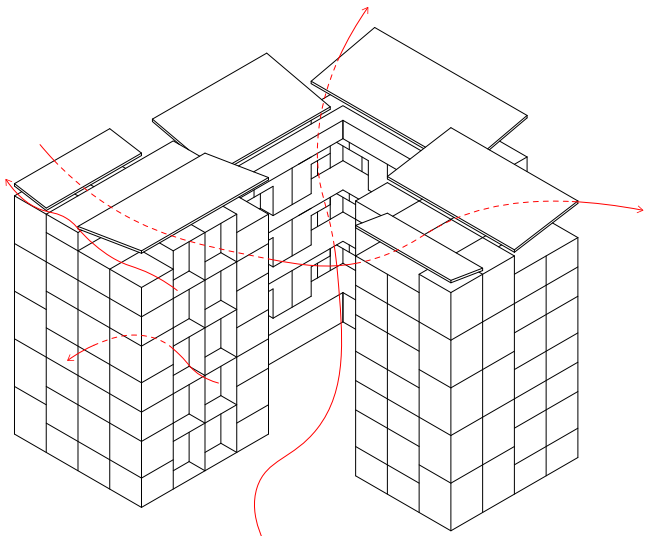
In the roof, the concrete is replaced by a light bamboo structure



The courtyards are 10x10m, and the height of the free-standing blocks is 20m. As a result, the courtyards are shaded for a long period of time every day. The facades, depending the orientation and the hour, still receive sunlight. As a result, logias, overhangs and brick patterns are implemented to diffuse the direct impact of the sun.



Large gutters on the roofs are immediately connected to the superior tanks. These supply water, by gravity, to the dwellings. When these are empty, pumps lift the water from the tanks located on the ground floor (only a limited amount of times a day / week). The courtyard soil is absorbing, and the gathered wated can be stored. When this amount is reached, the water is delivered to the street, 60cm below.



The most crucial feature of the humid and hot subtropical weather in Mumbai is ventilation. The courtyards have openings on their four corners for free circulation of air. The roofs also allow the flow of air between the concrete slab and the metallic roof. The dwellings always have two facades of ventilation: cornered in the case of the free-standing blocks and crossed in the corridors.

Managerial Proposal

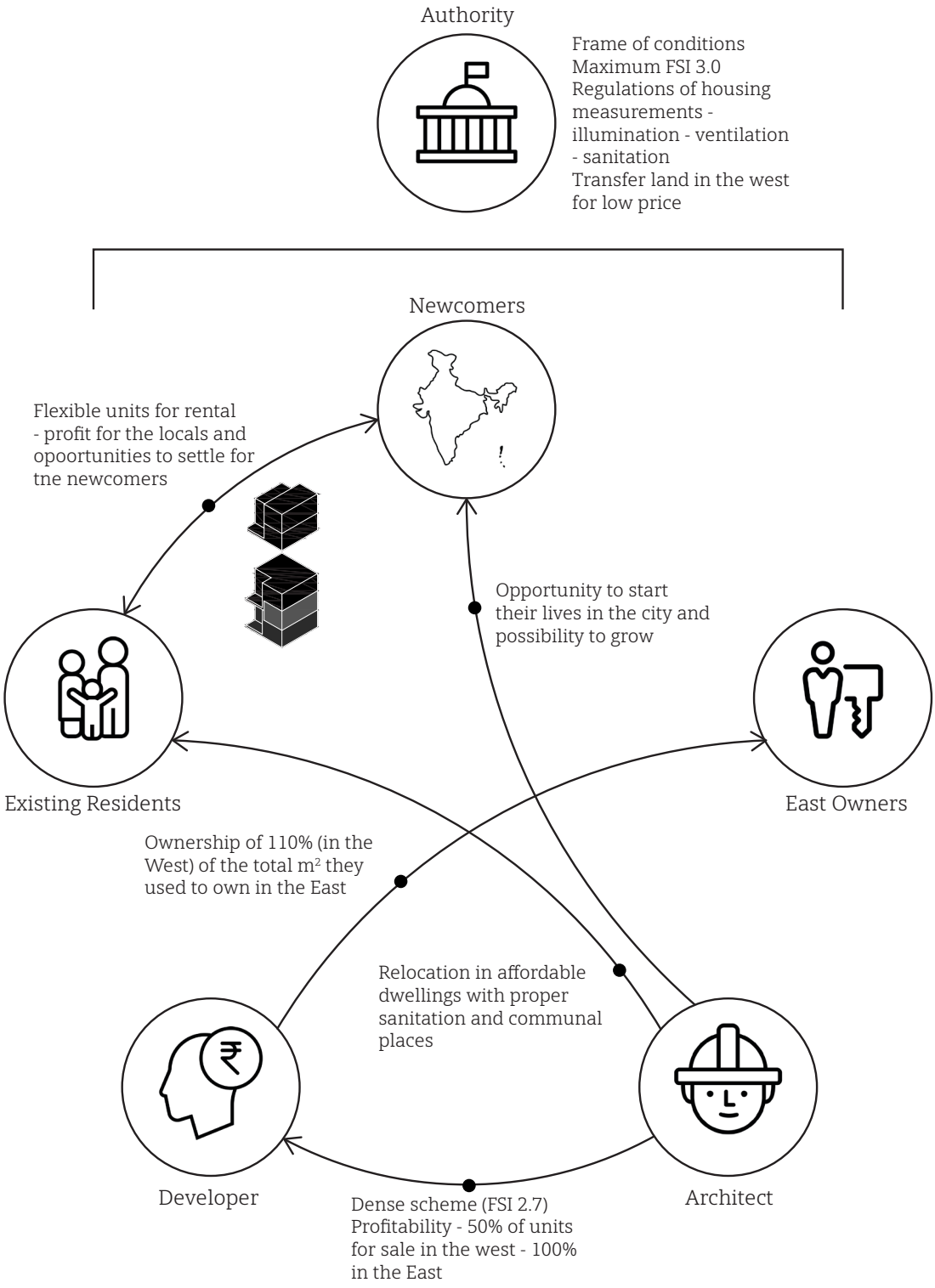


The system relies on the premise that the design can achieve a balance of efficiency and resilience. By providing a design that is both affordable for dwellers (both owners and tenants) and profitable for developers (feasable in terms of simplicity of the design and FSI of 2.7) the project can be undertaken by developers. Avoiding the active participation of the government, the proposal can have a broader impact in terms of scale, providing housing for the great number of newcomers and current residents that require it.

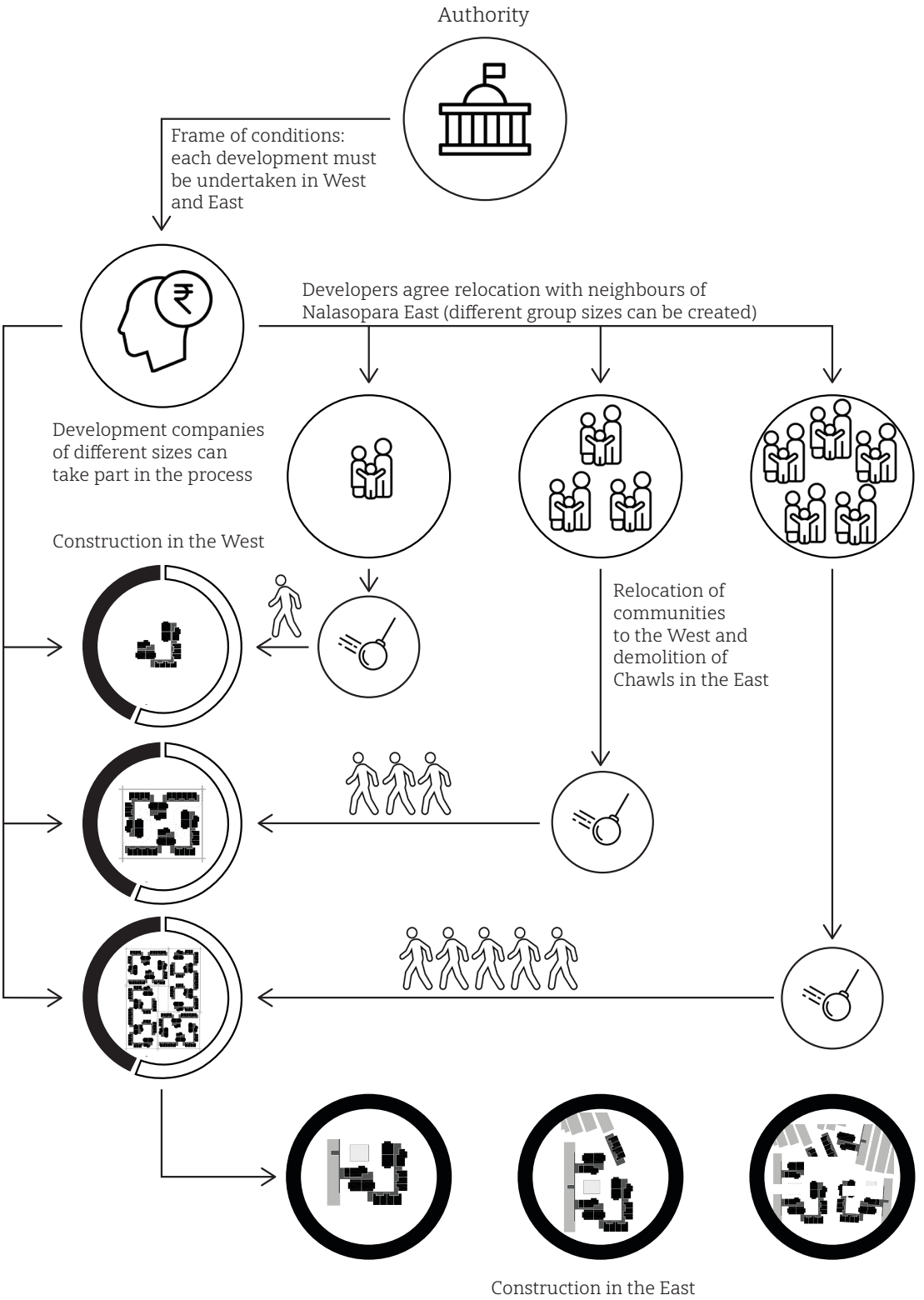
The relocation of families is always in distances below 500m and the owners of the demolished chawls are given the 110% of their current m^2 in the new development.

The different possible configurations of the dwelling units cater for opportunities for the different income and social groups: newcomers as groups, seasonal migrants that come alone, and former residents. The design allows units to rent units out and to grow in size.

The main objective is to develop a scheme that can be replicable - with adaptations regarding context, history and climate - to different parts of Mumbai. The intention is not to repeat the module, as this is design based on the population and existing urban conditions and measurements of Nalasopara. Instead, the planning can be adapted to other neighbourhoods that face the challenge and necessity of being integrated to their surrounding areas, breaking the boundaries that railways and highways create.

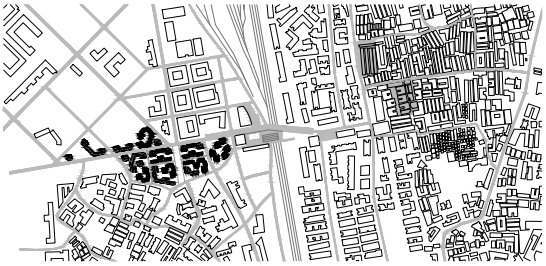

Authority
Frame of conditions
Maximum FSI 3.0
Regulations of housing measurements - illumination - ventilation - sanitation
Transfer land in the west for low price
Newcomers
Flexible units for rental - profit for the locals and opoortunities to settle for tne newcomers
Opportunity to start their lives in the city and possibility to grow
Existing Residents
East Owners
Ownership of 110% (in the West) of the total m² they used to own in the East
Relocation in affordable dwellings with proper sanitation and communal places
Developer
Architect
Dense scheme (FSI 2.7)
Profitability - 50% of units for sale in the west - 100% in the East

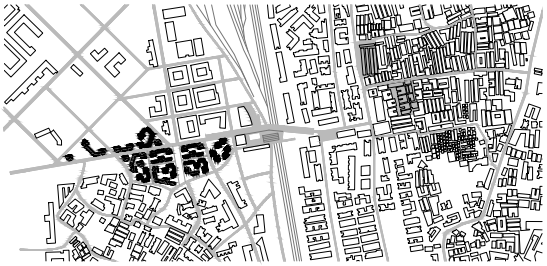
Stages of the process and proportions of funding



Possible scales of operation

The















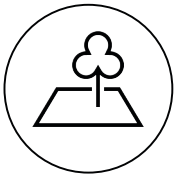




Costs and Profit - General Values

The economic model seeks for a sustainable balance between profitability and affordability, being the main goal the integration of the two neighbourhoods and the replicability of the model.

Even though the redevelopment in the East makes the profit margins decrease for developers, the earnings are still higher than in the schemes that the SRA uses. Therefore, the task of the authority is to verify that every proposal in the West has its counterpart in the East, achieving urban integration and new, affordable dwellings. Only after completing the first stage of the developments (balancing West and East) developers are entitled to maximize their profit by building entirely in the West.

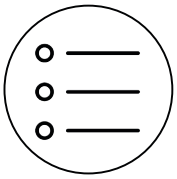


Land Price
15.000 ₹ / m^2 *



Construction
16.000 ₹ / m^2 **

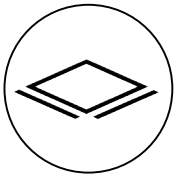
(+10% demolition)



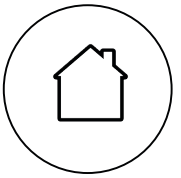
Charges
7.698 ₹ / m^2 **

Total Costs
1.190 Lakh ₹

37% Profit Margin



Market Price
60.000 ₹ / m^2 ****



Dwellings for Sale
2.760 m^2

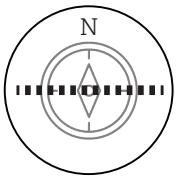


Relocation
1.280 m^2

Total Earnings
1.632 Lakh ₹



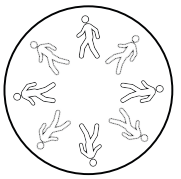
Current Stage:
32% of new dwellings for relocation
37% profit)



West - East integration by public amenities, infrastructure and architectural image



Replicability:
20% to 60% of new dwellings for relocation
(20% to 50% profit)



Relocation of dwellers within the neighbourhood

Costs and Profit - Dissagregation of Values

100 dwellings, of which:	
West	75 new dwellings
East	32 dwellings demolished
East	25 new dwellings
Land Area	1.500 m2
Built Area	4.000 m2
(West)	3.000 m2
(East)	1.000 m2
(For Relocation)	1.280 m2
(For Sale)	2.720 m2
Dwellings	18 m2 to 59 m2
FSI	2,7 average

Values	Price (m2)	
Land	15.000 ₹	*
Construction (Mumbai values)	16.000 ₹	**
Development charges	2.500 ₹	**
Expenses	1.800 ₹	**
Consultation fees	1.078 ₹	**
Project management costs	720 ₹	**
Transit fees (temporary rental)	0 ₹	***
Interest on loan	1.600 ₹	**
Total price Construction West	23.698 ₹	
10% Demolition in Nalasopara East	1.700 ₹	
Total price of Construction East	25.398 ₹	
Selling price of dwelling units	60.000 ₹	****

	Surface (m2)	Price (m2)	Price (TOT)
Land	1.500	15.000	225 Lakh ₹
Construction (West)	3.000	23.698	711 Lakh ₹
Construction (East)	1.000	25.398	254 Lakh ₹
TOTAL COSTS			1190 Lakh ₹
EARNINGS	2.720	60.000	1.632 Lakh ₹
PROFIT			442 Lakh ₹
PROFIT INDEX			37,1 %

Advantages of the project:

Land value in Nalasopara is remarkably lower than in other neighbourhoods in Mumbai
The stages West / East of the project provide direct relocation of dwellers without needing temporary housing
The development charges can be reduced by the Government (even if the land is owned by the private sector)
The percentage of sale units (68%) is considerably higher than the one in the SRA project,
which makes it more profitable for developers

Constraints of the project:

The m2 for sale in Nalasopara is lower than in other neighbourhoods in Mumbai
The East development involves demolition and provision of housing for existing dwellers (reducing profit margin)
If the project did not include redevelopment in the East, the profit margin would be 110% -
the integration of the neighbourhoods would not be achieved)

Conclusion

Integration by public amenities and architectural image of the two sides of Nalasopara
37% of profit margin for developers (SRA maximum is 30%)
Relocation of dwellers within the neighbourhood, in remarkably better living conditions
Balance Efficiency Resilience in the calibration of urban integration between neighbourhoods,
affordability and 37% profitability
Replicability of the project, allowing for a scope of profitability from 20% to 50% and
allowing different percentages of relocation / market units

*	Privately owned land in Nalasopara West. 99 Acres Real Estate (www.99acres.com)
**	Average Project Costs - Das, PK: Chasing the Affordable Dream. (Bombaykala Books, Mumbai 2018)
***	People do not need temporary relocation due to the stage-based construction
****	Makaan Real Estate (www.makaan.com)

Relevance


गणेश स्टील
एण्ड सेल्स सर्विस
हस्तकला मेंहदी
HASTKALA MEHENDI
Shop No. 2, Shivshakti Apt. Opp. Vedant School,
Behind Sitara Bakary, Nagindas Pada, Naissopara (E).

Relevance

The scope of the discussion of high-density, affordable housing projects in growing cities

The urban growth of Indian cities (particularly Mumbai) and the prevalence of the economic system leaded by private interests are two aspects that will not only remain, but will be strengthened in the upcoming years.[1] As architects, we should be aware of the necessity of affordable housing in the growing megacities to give places to newcomers. The housing shortage in India is already massive,[2] and rural-urban migration is a phenomenon that will continue to grow. Therefore, architecture will have to provide answers to the big masses of migrants settling in the cities every year.

As a result of this situation, the issues discussed in the Global Housing Studio are highly relevant. My objective is to work on a design proposal that deals with the mentioned aspects in order to make a solid contribution to the discussion about affordable housing in India.



Fig. 1: Settlement of Dharavi on the front, growing metropolis of Mumbai on the background.

To address these aspects, I aim to propose a project that has different missions in every scale. In the urban scale, it deals with the issues of density and integration. I intend to make an urban proposal that manages to distribute a high but sustainable density of FSI 3 in a balanced way, along the two sides of the railway that today divides Nalasopara West and East. I strongly believe that density is a key issue to plan cities for the future: newcomers will

[1] Daniel Hoornweg and Kevin Pope. Population Predictions for the World's Largest Cities in the 21st Century (Environment and Urbanization 29, no. 1 (April 2017): 195–216. 1177/0956247816663557)

[2] 27.000.000 housing units are needed to accomodate the Economically Weaker Sector in India. 10.000.000 people live in slums in Mumbai. 1.000.000 people in Mumbai are homeless. Nelson Mota, Mixing Mumbai: Affordable housing for inclusive development. (TU Delft presentation, 06/11/2018)

continue to arrive, and the issue of density has to be dealt with using a strategy that caters for sustainable and good-quality housing conditions, within a very dense urban scheme.

Regarding integration in the urban scale, my objective is to bring together the two detached neighbourhoods to the West and East of Nalasopara by introducing a system of interventions in the public space. These punctual interventions, holding leisure and commercial functions, are meant to attract inhabitants of both sides, by providing facilities such as sports centre, and especially job opportunities.

The objectives of the project, in the scale of the cluster and the dwelling, are also very significant. The system of clustering, combining a rigid frame with an inner flesh of blocks and courtyards, caters for the formation of communities of neighbours, understood in different sizes. While 20 households share one small-sized courtyard, a group of 60 can share an outer space suitable for urban farming or other productive activities. Furthermore, the cluster of 180 houses has a consolidated perimeter for commercial activities. In the design of the dwellings, systematic construction techniques, as well as the possibility for the inhabitants to transform their dwellings are embraced.

With these ideas in mind, I believe that, due to the magnitude of the housing shortage, the relevance of my project relies on the possibility of it being reinterpreted for other developments within Mumbai. If the barrier of the railway is broken, and the dense housing scheme provides a good business opportunity for developers as well as sustainable and affordable housing for newcomers, then the system can be reinterpreted to other areas in Mumbai that are facing similar conditions.

The relationship between research and design and the position of the project within the wider context

The aim of this text is to reflect upon my experience in the Global Housing Graduation Studio. It has been certainly a very challenging, as well as fulfilling, experience. The process involved many discussions, especially regarding the role of architecture as a tool for social integration and the role of architects designing in a foreign environment. In these discussions, the relationship between research and design, as well as the understanding of architecture in terms of social and ethical aspects were highly relevant.

On a first stage, I would like to draw the attention to the relationship between research and design in this process. The task, to design dwelling architecture in Nalasopara, involved getting familiarised with a context that, one year ago, was completely unknown by me and most of my fellow students. As a result, the role that the research component played was crucial to the development of the project. A careful investigation of the general context of India and Mumbai, as well as the social and dwelling practices in Nalasopara, would lead to a design that could provide better answers and opportunities to the local population.

For this matter, the Chair of Architecture and Dwelling proposed a combined approach: as a first stage, a solid investigation of demography, history (and architectural history), climate and economy in Mumbai. However, a statistic-based research would never be enough to comprehend the social practices and the way in which the local population dwells in Nalasopara. As a result, the Chair proposed to combine the statistic approach with an ethnographic method, which has its roots in the social sciences. The aim of this research method was to incorporate and communicate the 'patterns of inhabitation' of the local population. Parameters such as social practices, the domestic environment, income generation activities and building techniques were addressed. To introduce the students in this method, the teachers showed examples of previous experiences in which ethnography was used by architects to learn the social and intimate practices of a social group, in order to develop a careful and suitable design for the studied community. Furthermore, students were asked to practice this method on a first instance in The Netherlands, in

order to be sharper and more critical when carrying the research in Nalasopara.

In my opinion, this dual approach towards the research component is strongly related to the designs that arose after the research. Once we set a collective database of information regarding both statistic data and the study of the patterns of inhabitation, we had material to ground our projects. Moreover, the statistic data (e.g. related to the current economic situation of Mumbai and the relocation of slum dwellers) could only work in combination with the observation of the patterns of inhabitation (e.g. how the inhabitants make a living in the informal economy), and vice versa. The design projects had to give answers both to the general conditions and the most intimate urban and dwelling practices. As an example, the issues of land ownership, feasibility, density and affordability had to be carefully considered in the design process. For those aspects, the gathering of statistical data was the main source of information. Meanwhile, the designs had to cater for social integration, for achieving a strong sense of belonging within a population mainly consisting of newcomers, and for the creation of places where the users could interact with one another, feel safe, and generate income. All these aspects could only be addressed consulting the book of 'patterns of inhabitation', the outcome of the ethnographic research held in site.

To finalise with the relationship between research and design, I would like to mention an aspect was particularly influential in my design process: the research and design do not need to be conceived as different stages. In fact, after my first design hypothesis, not only I went back many times to consult the database of information, but I also used my own project as an element of research and experimentation that, in combination with the results of the field research, helped me to be critical and re-elaborate many of the features of my design. For example, the experimentation with the proportions of the courtyards in my own project (the core of the project, spaces for social integration) became a source of information that complimented the observations made on-site.

Regarding the relationship between the topic of my graduation project and the studio topic, I believe that the investigation I carried out in my project was only possible within the frame of the studio, and it was also highly influenced by it. Of course, in programmatic terms, the studio clearly focuses on the matter of affordable housing

in the Global South, and all the projects held within the scope of the studio are mainly about the architecture of dwelling. However, I would like to address the relationship between my project and the studio in a deeper way. The studio provides an optimal space to discuss the issue of affordable housing, which in my opinion is one of the key issues in architecture, with teachers and fellow students from different parts of the world. This international atmosphere not only permits exchange of opinion and references, but is also a place in which each student can reflect upon their own context. In my case, being from Buenos Aires, I took my graduation project as a means to discuss issues that are very relevant in my city of origin. The title of my graduation project, 'Community in the time of the market economy', states the challenge of thriving for architecture of integration in a context where the decisions on how to build are mainly in the hands of the private sector. This happens both in Mumbai and in Buenos Aires, and my project, instead of critiquing this phenomena, aims to find an answer that can be both affordable and integrative for the inhabitants and also profitable for developers, so that the projects can have a wider impact and the participation of governments (which has proven to be, at least, complicated in both countries) can be reduced. Furthermore, the main goal of my urban and architectural proposal, which is the linking of two dissimilar neighbourhoods nowadays separated by the railway, is a reality that I have seen in many spots of Buenos Aires. As a result, in my project I intended to make use of an international, challenging and stimulating atmosphere to reflect upon matters that, because of my background, are particularly sensitive to me.
This, in my opinion, is also valid to address the relationship between my project and the master track. The most inspiring feature of the MSc in Architecture at TU Delft is the exchange between professionals and students from distinct origins that have completely different formations in the same subject. Architecture, as a result, becomes a discipline that is understood in open terms, and having many perspectives leads to a more critical vision of the discipline overall.

Having stated the relationship between my project and the scope of the studio and the MSc in Architecture, I would like to address now the relationship with the professional framework. As I mentioned, the issue of affordable housing is the most urgent, if not the most critical mission that architecture has yet to respond to. Naturally, this matter involves not only architects

as professionals but also governments, policy makers, social scientists and the private sector, to name a few. The complexity of actors involved in carrying a mass housing proposal is the reason why it is very relevant to analyze the project in relation to the professional framework. In my opinion, the project as a result has less validity, in this subject, than the knowledge and experience attached to its process. The proposal itself, since it will not be constructed, will not be able to house the weakest sector of the Indian society. However, along the process, several discussions and reflections were held, regarding to what extent a housing scheme proposal can influence the opportunities of its dwellers. As a group of students, we thoroughly investigated issues such as the connectivity and infrastructure of suburban areas in the Global South, the sustainable density of the buildings and the quality that architecture can give, using scarce resources. In the design of my project, I reflected, on each different scale, how architecture can create places for people to feel safe, and at the same time boost their opportunities in the city, using limited resources.
Even though I think these discussions are crucial, I believe there is a disconnection between the academic circles of investigation and the groups who actually build mass housing projects. I think that if we can build stronger relations between us, who are dedicated to understand the reality of the inhabitants of Nalasopara, and the developers who construct housing for them, the influence of our research could be much wider. I am positive that with very few modifications, result of a thorough investigation and that would not alter the profitability of developers; the issue of affordable housing could be faced in a more successful way.

This leads to another crucial aspect of this reflection, which is the appearance of ethical dilemmas along the process. I believe that the first dilemma is intrinsic in the task: we are a group of foreigners designing a housing project in India. Even though we were committed to understand the reality of the area, and we did a wide research to gather tools for our design, the first question that arises is why we think that, as foreigners, we can provide better answers than the locals. After going through the design process, I can state that the best way in which we can address this issue is by fostering international collaboration. As foreigners educated in different parts of the world, we can provide innovative, fresh ways to undertake the tasks. If we combine our visions with the local professionals, knowledgeable in terms of history and skilled regarding

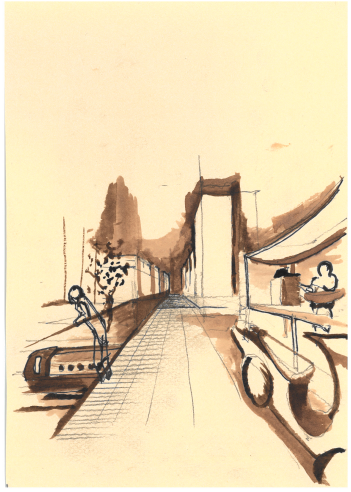
the local way of thinking architecture, probably innovative, better answers can be reached.

To conclude, I can state that the development of this project, even if it was only conceived in an abstract way, helped me understand the complexity, as well as the urgency, of mass housing projects around the world. Being such a complex topic, involving many stakeholders and dealing with the necessities of millions of people, it calls for an open discussion in which dwellers, academics, designers, scientists and investors should find a common solution. I am aware that my project would probably not provide an absolute solution to the housing shortage in Mumbai. However, I am positive that it brings a valuable contribution to the discussion of affordable housing, worldwide. I sincerely expect to keep working on this field, since I find it not only fascinating and challenging, but mostly, necessary.



































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