TWO WORLDS MERGE

ECONOMIC INTEGRATION TO EMPOWER LIVELIHOOD

RIANNE ADMIRAAL
5039193

Two Worlds Merge

Rianne Admiraal
5039193

Tutors:
Vanessa Grossman
Rachel Lee
Harald Mooij
Nelson Mota
Frank Schnater

Global Housing: Mixing Navi Mumbai
AR3AD105

TU Delft Department of Architecture
BK Bouwkunde

Architecture & Dwelling

CONTENT

RESEARCH PLAN

BACKGROUND

Cities, especially in the Global South, are seen as places of hope and opportunities. The place with for example great employment chances. This is one of the reasons that people from rural areas migrate to the bigger cities. In reality, however, the image of the 'good life' that you can have in the city is achieved by a tiny minority. The vast majority of the inhabitants are struggling to get employment and 'proper' housing.

According to the Annual Report of 2018-'19 published by the Indian Government, 68,4 per cent of the workers in non-agricultural sector were engaged in the informal sector (Government of India 2020: iv). With the rapid urbanization and the influx of people from the hinterland, it is becoming increasingly difficult to find employment and a dwelling in the formal sector.

Parallel to the growth of cities in the Global South is the growth of informal settlements. In India, the terms *formal sector* and *informal sector* are used interchangeably as *organised sector* and *unorganised sector* respectively (Saha 2010: 230). By informal settlements is meant the unregistered housing units. These settlements are unplanned and are not authorized by the government. The occupants have no legal and social protection. Many of the people who live in informal settlements do not have formal jobs and use their domestic space to generate income through various home-based enterprises. These income generation enterprises are important for households to survive and provide themselves with some income and shelter. Both activities, domestic and economic, are happening in the same building; the houses of these families.

PROBLEM STATEMENT

The predominance of informal settlements and economies in cities in the Global South is a consequence of the formal sector who does not provide adequate opportunities in terms of economic activity for disadvantaged people (Mayoso 2012:30). In the last decades of the twentieth century, economic events in India have reduced the scale of the formal sector and driven many people to earn their living in the informal sector. Setting up a shop or workplace can be both complex bureaucratically and costly. As a result, households use their domestic space because it can be used at no additional costs (Kellett 2001: 1). For many households in India, home-based enterprises are essential for a sustainable livelihood. In Mumbai specific, almost one third of the informal sector is engaged in home-based enterprises (Government of India 2020: i)

However, home-based enterprises are being criticized for the employment conditions, land use planning or building control. These enterprises are perceived to be the generator of poor working and living conditions (Tipple 2001: 2, National Commission for Enterprises in the Unorganised Sector 2007: 30, 64). Besides, they are seen as a cause of deteriorating the public space. Home-based enterprises are interlinked with street vendors. The enterprises are mostly not visible from the streets, therefore the vendors provide and support the home-based enterprises by selling their products in the public space. In Mumbai the total number of street vendors is estimated around 350.000. This makes Mumbai the city with the largest amount of street vendors of all the major cities in India (Saha 2010: 231). Other income groups, besides the informal sector, benefit from these products and services, because they are often cheaper, more diverse in range and more accessible in terms of time and distance than those in the formal market (Kamalipour 2019: 2). Nevertheless, the street vendors are regarded as encroaching the public space.

The negative perception of the home-based enterprises and the informal sector, influences the ability of people in poverty to provide themselves with adequate income and housing, reducing the chance to gain a sustainable livelihood.

RESEARCH QUESTION

There is a great opportunity to develop floor plans or design architectural elements which can influence the combination of working and living within the same building and the visibility of the home-based enterprises. The lower income groups depend on these enterprises and their success can contribute to sustainable economic development. This resulted in the following research question:

How can the impact of the socio-spatial integration of home based enterprises in domestic space and neighbourhood empower the livelihood of the lower income groups in Navi-Mumbai?

First of all, some important terms will be defined and explained. It is important to frame these concepts because they form the base for the research. Furthermore, there are five sub questions:

- What is the relationship between domestic space and livelihood in Mumbai?
- What is the relationship between neighbourhood and livelihood in Mumbai?
- How do people combine domestic and economic activities in their dwelling?
- What are the socio-spatial impacts of home-based enterprises?
- How can the domestic setting empower livelihood of the lower income groups?

THEORERTICAL FRAMEWORK

Many architects and academics have written about **housing and homes**. These definitions go from quite general, “a home is a place in which to eat and sleep and have one’s belongings with some degree of privacy.” (Allsopp 1974: 37). To more sophisticated explanations ’Hayward embraces home as a physical structure, home as a territory, home as a locus in space, home as self and self-identity, and home as a social and cultural unit” (Quoted from Marsoyo 2012: 19). For this research the following explanation of the term housing by Laquian is very interesting, he defines that housing is not for home life alone. But “a house is a production place, marketplace, entertainment centre, financial institution, and, also a retreat.” (Laquian 1983: 85). The very last quote clarifies that a house is much more than a place only for living, but has a multiplicity of uses. Marsoyo emphasizes that “the home is not only for social reproduction but also a place for production.” (Marsoyo 2012: 6). In Mumbai many households run a **home-based enterprise** (HBE) and mix economic and business with domestic activities in their dwelling.

Home-based enterprises are small-scaled businesses that operate in the domestic setting and are managed by households. The family members provide labour. The three basic components of a HBE are **family, work** and **dwelling** (Ernawati et al. 2020, Kellet 2000, Marsoyo 2012). The enterprises differ in scale of the business, and domestic space dedicated to it.

HBEs are often linked with the **informal (unorganised) sector**, a study performed by Tipple, including New Dehli (India), states that many of the known characteristics of the informal sector are conformed by HBEs (Tipple 2005: 611). These enterprises distinguish from corporations and quasi-corporations because of their legal status and the type of accounts they hold (Ojoko 2017: 224 , Government of India (2020): 13). Rahman (2016) who looked into housing as a capital for securing **livelihood** of the urban poor states that “the major interrelation between housing of the urban poor and poverty eradication relies on the potentials of housing as a unit of production and self-actualisation.” (Rahman 2016: 2). Many households in the lower income groups experience great benefits from the home-based enterprises. A study done by Cardiff (2001: 5) shows that in all the cases, one of them being Bhumeeheen Camp in Dehli, the HBEs increase the **employment opportunities** for low-income households. Besides opportunities, these enterprises **generate income** for the households, in India 58 per cent found income through a HBE. In that same study Tipple (2005) adds that between one-third and one-half of households solely earn money from the HBE (Tipple 2005: 623). Furthermore, “there is a reciprocal relationship between home-based economic activities and the consolidation of **social networks**” (Ernawati et al. 2020: 55, Marsoyo 2012: 38). The social relationships with the buyers, neighbours and pedestrians is important, because the operator can identify what products or services are desired by them and can respond to the needs. Close social proximity and familiarity can be one key to the success of the HBE. Therefore, space for facilitating social interaction is important.

The beforementioned benefits frame the importance of a HBE for livelihood opportunities of lower income groups. “A livelihood is a set of capabilities, assets, and activities that provide a means for people to meet basic needs and support their well-being.” (Marsoyo 2012: 46). Unfortunately, the current situation of the combination of economic and domestic activities undesirable. The homes are small, which implies **adjusting** the home environment to suit the business. This results in a disruption of the daily life of families. To separate economic and domestic activities the families need to invest effort, which result in the **‘shifting of space’**. During the day the house is a workplace, in the evening it will change to a home.

Not only households benefits from the HBE, but they have an influence on a larger scale; **the local** (neighbourhood), **urban** and **national scale**. “The central point of the HBEs is that they are carried out in the dwelling unit and surrounding spaces.” (Marsoyo 2012: 21). This is confirmed by Ojoko and Baba (2007) who describe “the hierarchical organisation of spaces that are used in home-based income generation includes the dwelling (meaning a house); its courtyard; the lane or street (immediate to a given dwelling) abode; the broader neighbourhood and, the public open spaces.” (Ojoko & Baba 2007: 224). Therefore, it is important for this research to consider the different scales that HBEs operate in. A HBE should be accommodated in an urban plan, because it plays an important role in local service facilities (Rahman 2016: 9, Marsoyo 2012:39). Other income groups purchase products made in these enterprises and in that manner they contribute significantly to the urban economy (Ernawati et al. 2020:55, Saha 2010: 231).

METHODOLOGY

In the first weeks of the Global Housing studio different **case studies** were analysed to get a sense of the different context. Since the studio is operating in a different culture compared to Dutch in which I grew up. The analyses will help to better understand the life, floorplans and construction techniques of India and more specific Mumbai.

In this research, first of all, the different terms will be explained and defined. This will prevent misunderstandings about what is meant by something in this research. This will be done through **theoretical and literature review**, such as researches, publications and books. Besides, the following case studies will be analysed: Seaside Society (Mumbai), Ragunath Yadav (Delhi) and Airoli Sites and Services (Mumbai). Lastly, **ethnographic research** will be conducted. This qualitative data will be observations based on space, activities and movements. If this is not possible due to the COVID-situation, the result of the aforementioned case studies will be used to better understand the context and situation of home-based enterprises.

RELEVANCE

A lot of research has already been done on home-based enterprises. These focuses on how this principle originated, its influences from different perspectives and partly how it influences the lives and domestic environment of residents. All these studies provide a good base and perspective for my own research. However, the literature does not describe the translation of these theories into actual floor plans or architectural 'solutions'. The current situation is being studied, but these are homes that have not taken into account the shift from living to living-working conditions. Therefore, this research could contribute to the processing of space or architectural elements to combine living and working conditions in a healthy and good way.

There is a great relevance to look at the translating of these researches into architecture. Since, as already described in the *background*, an ever-growing group is migrating to the city. Only a small part of these find a formal job and housing. Unfortunately, the vast majority end up in the informal sector. Being able to properly accommodate this group - with the opportunity to earn an income in a healthy and good way - will hopefully lead to better integration in the city.

BIBLIOGRAPHY

Avermaete, T. (2006). *The Spaces of the Everyday. A Dialogue Between Monique Eleb and Jean-Philippe Vassal*. OASE 69, p. 65-77 NAi Publishers.

Bhowmik, S. K. (2004). *Politics of Urban Space in Mumbai: 'Citizens' Versus the Urban Poor*. University of Magdeburg

Bhowmik, S.K. and Saha, D. (2013). *Financial Inclusion of the Marginalised; Street Vendors in the Urban Economy*. New-Delhi: Springer

Bose, D. and Saggar, M. (1994). *RBI Staff Studies: The data base of unorganised sector in India*. Bombay: Department of economic analysis and policy

Ernawati, R., Syariah, A., Widiastuti, M. and Ratodi, M. (2020). *Spatial Adaptation on Home-based Enterprises Development in Kampung*. Science and Technology Publications, Lda, 54-61

Ezeadichie, N. H., Jiburum, U., Onodugo, V. A., Onwuneme, C. A. and Attama, K. (2018). *Integrating Home-Based Enterprises in Urban Planning: A Case for Providing Economic Succour for Women of Global South*. Berkely Planning Journal, 30 (1), 82-101

Gartenberg, I. (2014). *Organising Vulnerable Home-based Workers in India*. From New Dynamics in Collective Bargaining in the Informal Sector: Impressions from India, 206-227

Government of India (2020). *Annual Report; Periodic Labour Force Survey*. New Delhi: Ministry of Statistics and Programme Implementation

Hertzberger, H. (2000). *Space and the Architect; Lessons in Architecture 2*. Rotterdam: 010 Publishers

Hurley, D. (1990). *Income generation schemes for the urban poor*. Oxford: Oxfam

Kamalipour, H. and Peimani, N. (2019). *Negotiating Space and Visibility: Forms of Informality in Public Space*. Sustainability, 11 (17)

Kellet, P. and Tipple, G. (2000). *The home as workplace: a study of income-generating activities within the domestic setting*. Environment & Urbanization 12 (1), 203-213

Kellet, P. and Tipple, G. (2005). *Researching Domestic Space and Income Generation in Developing Cities*. Methodologies in Housing Research, 206-223. Gateshead: The Urban International Press

Laquian, A.A. (1983). *Basic Housing: Policies for Urban Sites, Services, and Shelter in Developing Counties*. Ottawa: International Development Research Centre

Marsoyo, A. (2012). *Constructing Spatial Capital; Household Adaptation Strategies in Home-Based Enterprises in Yogyakarta*. Master Thesis, University of Newcastle upon Tyne

Murthy, S. V. R. (n.d.). *Measuring Informal Economy in India; Indian Experience*. New-Delhi: National Statistical Office

National Commission for Enterprises in the Unorganised Sector (2007). *Report on Conditions of Work and Promotion of Livelihoods in the Urorganised Sector*. New-Delhi: Dolphin Printo Graphics

Ojoko, E. O. and Baba, A. N. (2017). *Strategies for Coping With Multi-functional Dynamics of Residential Housing*. International Journal of Technical Research & Science, 223-229

Paul, B., Murthy, V. and Datta, S. (2011). *Working and Living Conditions of Women Domestic Workers: Evidences from Mumbai*. Mumbai: Tata Institute of Social Science Deonar

Rahman, A. U. (2016). *Housing as a capital for securing livelihood of the urban poor; Reflections from Mumbai and Dhaka*. Paper presented at the 17th N-AERUS Conference Gothenburg (Sweden)

Rybczynski, W. and McGill University (1984). *How the other half builds*. Montreal: Centre for Minimum Cost Housing.

Saha, D. (2010). *Decent work for the street vendors in Mumbai, India – A distant vision!*. Baywood Publishing Co., Inc.

Tipple, G., Coulson, J. and Kellett, P. (2001). *The effects of home-based enterprises on the residential environment in developing countries*. London: ITDG Publications

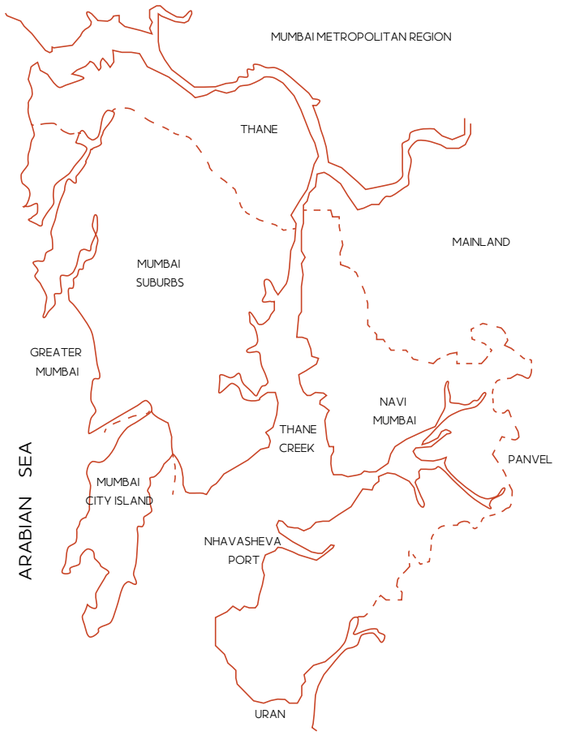
Tipple, G. and Kellet, P. (2002). *Home-Based Enterprise and Housing Policy: Evidence from India and Indonesia*. Paper presented at the ENHR 2002 Conference in Vienna

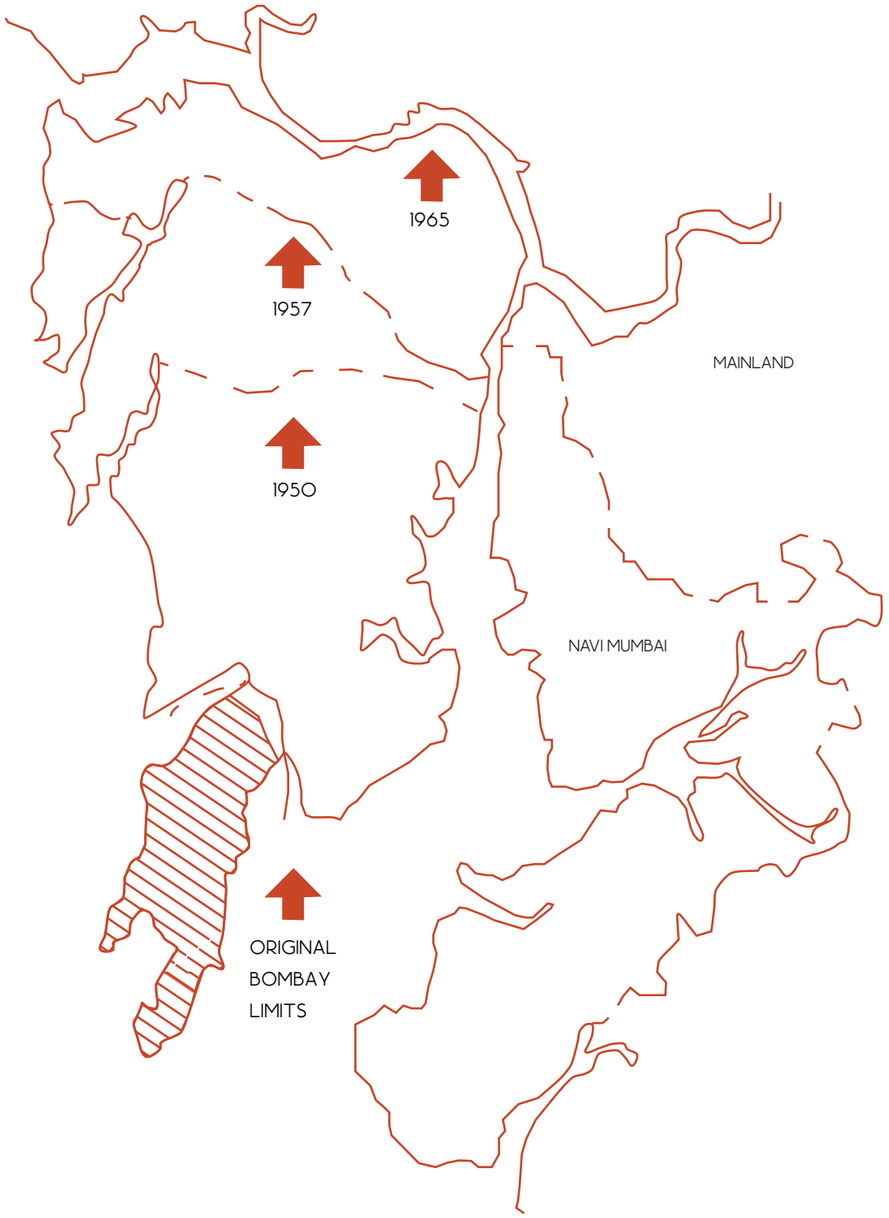
Tipple, A. G. (2005). *The Place of Home-based Enterprises in the Informal Sector: Evidence from Cochabamba, New Delhi, Surabaya and Pretoria*. Urban Studies, 42, 611-632

Vanka, S. P. (2014). *Public Space and Life in an Indian City: The politics of Space in Bangalore*. PhD, University of Michigan

RESEARCH

This year's theme for the Global Housing studio is Mixing Navi Mumbai and is about affordable housing.
Navi Mumbai is a satelitetown of Mumbai, which is one of India's most heavily populated cities, ranking as the biggest metropolitan region in the country.
As a result, a design for a new city called Navi Mumbai was presented in 1964. It was originally planned to further extend the urbanization of Mumbai to the mainland instead of any further northwards. This satellite town needed to decongest the population, absorb the migration from the countryside, reduce the concentration of economic activity on Bombay Island and lower the traffic congestions. Navi Mumbai was a city planned for the common man; with jobs and housing in different sectors.





Decongest population source: bbc.com

Absorb migration source: newsclick.in

Reduce the concentration of economic activity on Bombay Island source: theprint.in

Lower traffic congestions source: dnaindia.com

GROWTH OF MUMBAI

Figure 5.
Ecology Mumbai 1670

1500 - 1850

In 1670 the ecology of the Bombay archipelago was relatively untouched. The islands commercial use was predominantly an outpost for European trade and very few people inhabited the area. Therefore the ecology was largely untouched; forest, mangroves and marshes dominated the land (Edwardes, 1902).

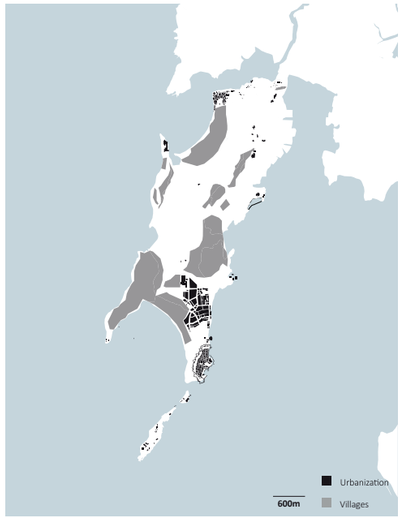


Figure 3.
Urbanisation Mumbai 1812

1500 - 1850

The sixth chapter (1780 – 1814) is defined by continued growth and an awareness of the importance of urban planning. The population expanded to 180,000, undeterred by the extensive fort city fire of 1803. The fire provided an opportunity for city restructuring and the introduction of formal settlements outside the fort walls. 1803 saw the completion of the Bombay-Salsette causeway. (Edwardes, 1902: 110-261)

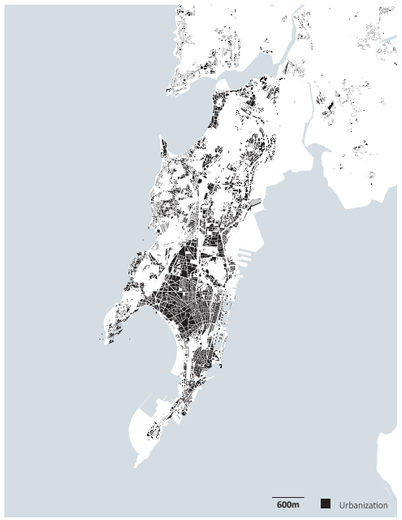


Figure 2.
Urbanisation Mumbai 1909

1850 - 1920

By 1850, all the original islands of the archipelago had been already combined via land reclamation. The major urban growth during the industrialization period was the reclamation of the port area in the eastern coast, and the consolidation of the urban core between the fort (with its demolished walls) and the neighbourhoods to the north-west. New settlements appeared along the railway that leaded to Victoria Terminus.

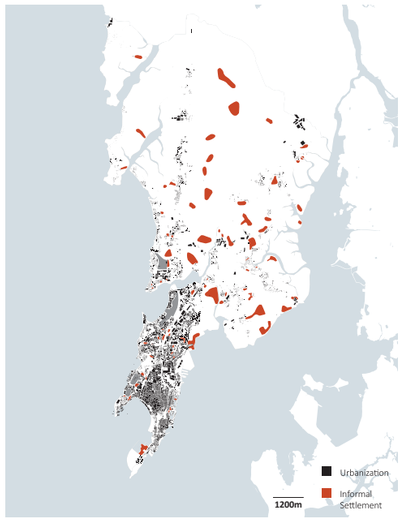


Figure 3.
Informal Settlements Greater Mumbai 1934

1920 - 1948

The informal settlements in the 1920's were forming, just like the formal settlements, along the main infrastructural arteries as people wanted to live as close as possible to work or economic activity. These informal settlements sprang up on barren land in the island of Bombay, near town centres of the suburbs and on mountain slopes, where the land is less suitable for construction.

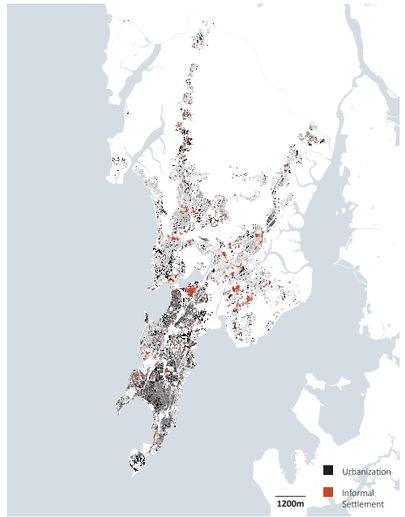


Figure 7.
Informal Settlements Greater Mumbai 1964

1948 - 1970

Informal settlements also grew along with the urban expansion. Large number of migrants who could not afford to rent or buy a house tended to live in the slums. There were 20,000 pavemewnt dwellers as early as 1952; the number grew to 62,000 by 1961. The Municipal Corporation of Mumbai (BMC) was empowered to improve and clear slums in 1954. But there was no significant clearance until 1967. (Risbud, 2003:5)

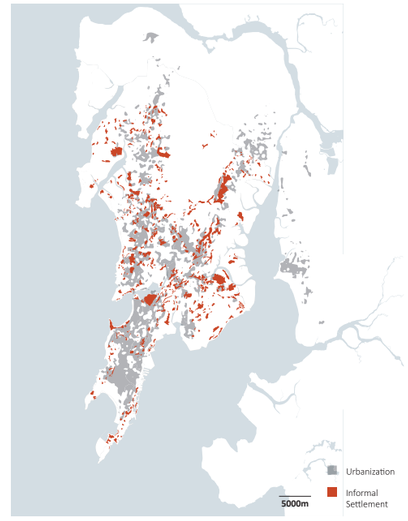


Figure 5.
Informal Settlements Greater Mumbai 1976.

1970 - 1980

The collapse of the formal industrial sector in the 1970s led to unemployment and loss of employer-provided housing. Moreover, the continuous retreat of the State of Maharashtra's housing agency MHADA from the affordable housing construction sector led to a rise in slums. Finally, the high price of land rendered most housing unaffordable to most of the population of the city. (Johnson & Nadkarny n.d.)

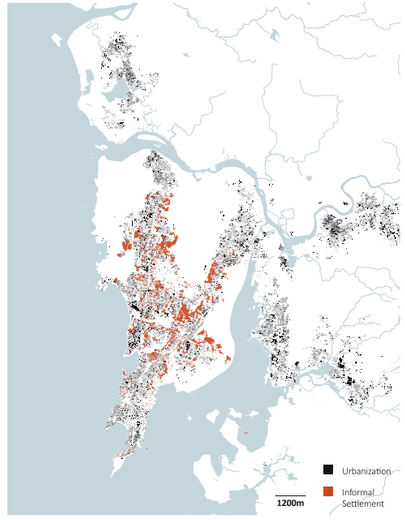


Figure 5 .
Informal Settlements Mumbai Metropolitan Region 1995

1990-2010

Since the 2000s as part of the Mumbai's goal of being a World Class City, the government is invested in having a slum-free city in the next decade. However, the housing schemes currently being carried out have failed to provide a solution for informal settlements where the conditions remain difficult for inhabitants with no access to services like water and sewer systems.

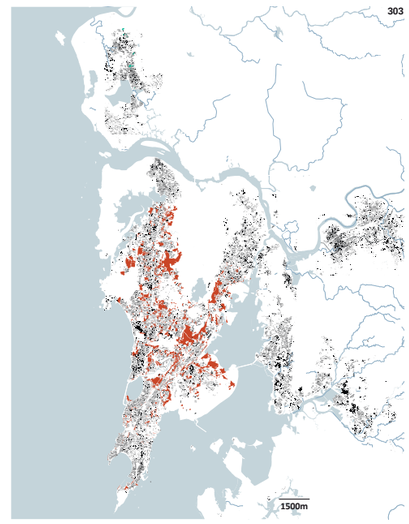


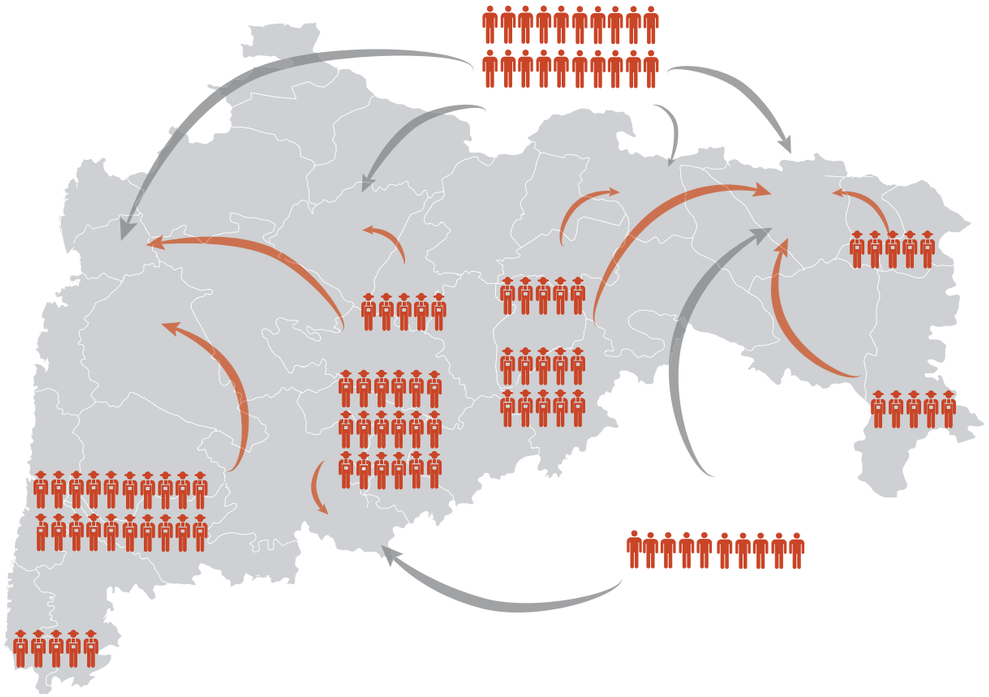
Figure 3.
Informal Settlements Mumbai Metropolitan Region

2010 - Now

Informaility within Mumbai City has been well documented, however there is little to be found outside of the city. Most information is from visual analysis of urban form and is therefore an estimation. In most cases, informal settlements are centred along railway tracks.

source: Mumbai: A periodical Investigation (made by students of previous Global Housing Studio)

MIGRATION



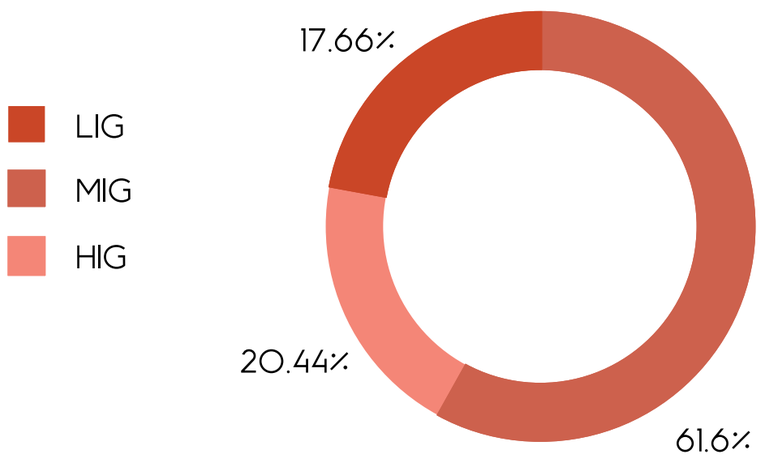
70 % Migrants from rural areas within Maharashtra

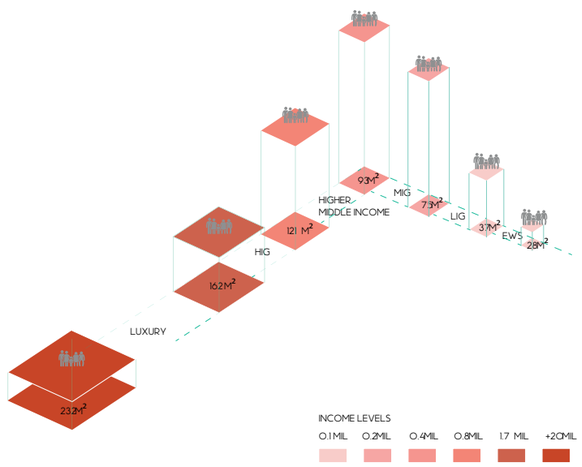
30 % Migrants from rural areas within Maharashtra

Deprived from: Mumbai: A periodical Investigation (made by students of previous Global Housing Studio)

An interesting phenomenon happening within India is the Rural-Urban migration and seasonal internal migration. India as a whole is about 30% urbanized, while Maharashtra is 45% urbanized (MOHUA, 2018). There is a very clear trend of Southward migration, where people from the less affluent Northern states make their way to more affluent states. The majority of these internal migrants come from rural areas often looking for jobs in the larger cities. Some are part of the group of seasonal migrants who look for work in cities and return to harvest crops in the village, later in the year, while others hope to make the move to the city a longer term decision. These seasonal workers usually work in construction, hotels, textiles and manufacturing, transport and domestic work, to name a few examples, but the lack of provision of dwellings forces them to often live in rented rooms, open spaces, slums, pavements and even their worksites (Sharma, 2017). Zooming into Maharashtra, the overwhelming majority of migrants moving to the big cities are people from within the state, usually living in rural areas. The other 30% are migrants from other parts of the country (Mumbai: A periodical Investigation).

INCOME GROUPS





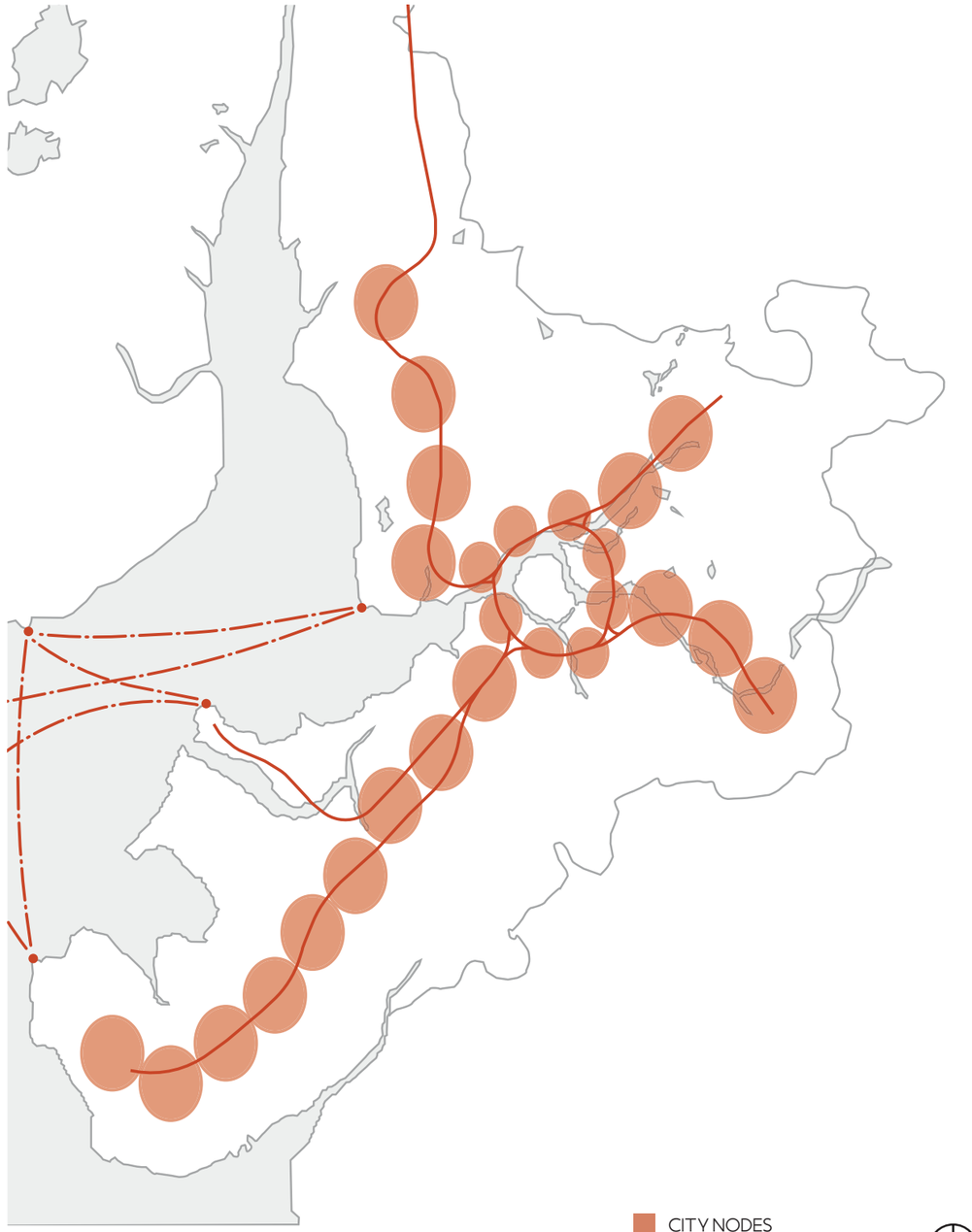
In Mumbai or India the population is divided in three main income groups; lower, middle and high income group. There are subdivisions within the income groups. This is based on the income that people earn. It also influences the size of the floorplans (next page).

Navi Mumbai became instead of a city for the common man, as many cities of the so-called Global South, a place where social inequality is growing and housing becomes a commodity. Housing is a primary human right, but for the urban poor it is a prerequisite of political and social citizenship. For them a house is not only for life alone, but a house is also a production and marketplace.

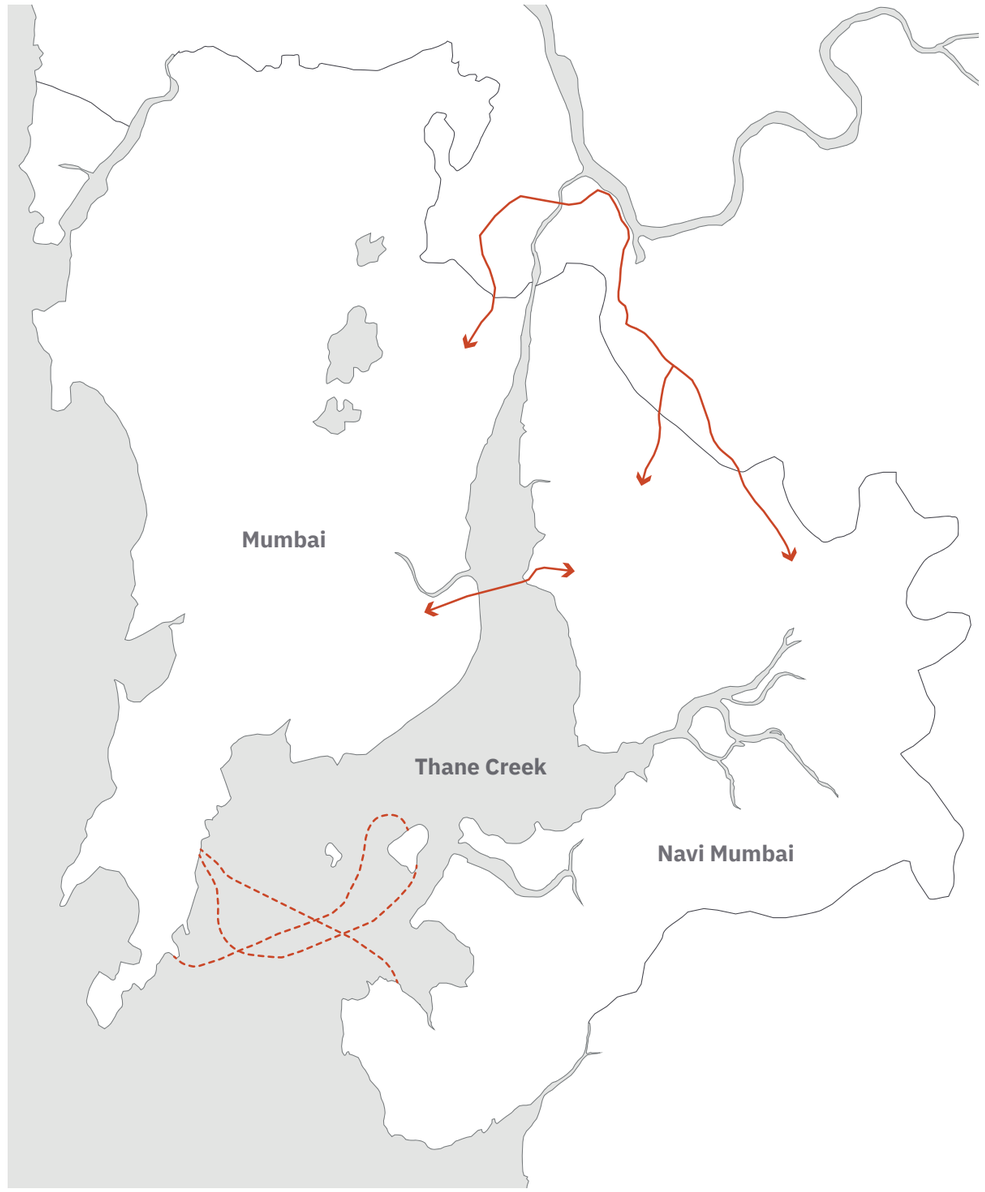
The informal settlements are isolated island within the city and the bounderies are hash. So it becomes more difficult to interact and integrate into the city.

Deprived from: Mumbai: A periodical Investigation (made by students of previous Global Housing Studio)

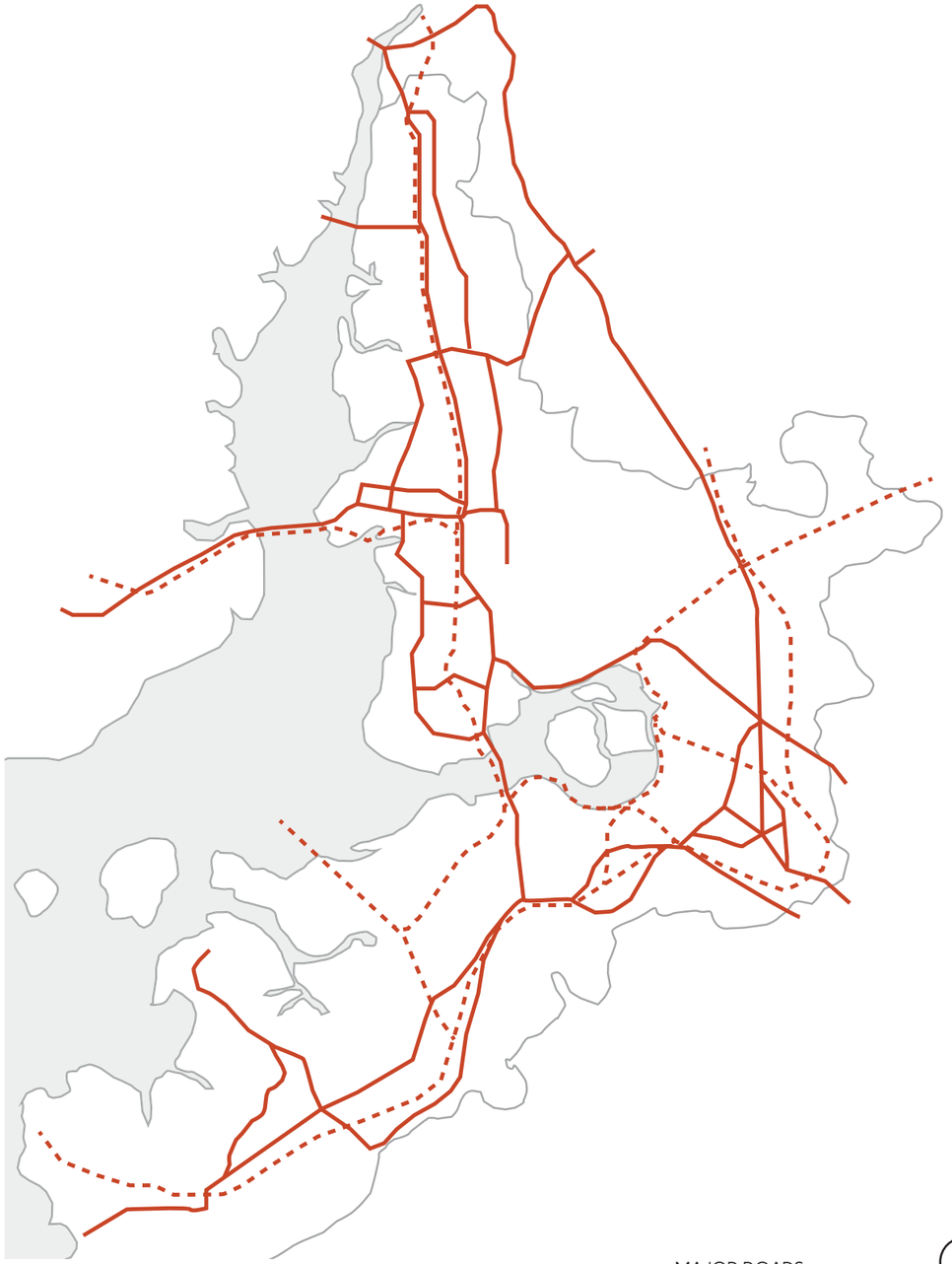
ORIGINAL PLAN



CONNECTIONS WITH MUMBAI



ROADS AND TRAIN TRACKS



MAJOR ROADS

TRAIN TRACKS

IMPORTANT INFRASTRUCTURAL DEVELOPMENTS

TIMELINE

1960 - Policies mainly centred on slowing down the rate of urbanization through controls on the growth of large metropolitan cities.

1964 - the Municipal Corporation of Greater Bombay (MCGB) submitted its development plan for greater Bombay, proposing an investment of 70 Billion Rs.

1970 - The draft regional plan got accepted and shortly after the City and Industrial Development Corporation of Maharashtra

1971 - Actual construction of new Bombay began, with CIDCO as its main developer.

1980 - Policy makers had begun to accept the inevitability of the growth of the largest cities in the urban system.

1989 - Most of the buildings build in Navi Mumbai cater to the lower income group. (53% of all 65.068 residential units) A large problem with these building was their monotony, which lead to a lack of attachment from the residents to the buildings.

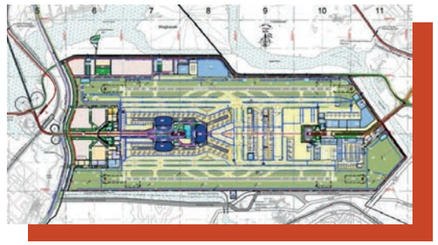
1990 - CIDCO began to actively involve other agencies in building houses to combat this monotony.

1991 - The economic liberalisation of India happened, with the goal of making the economy more market and service-oriented and expanding the role of private and foreign investment.

1995 - A benchmark regional plan for development was introduced by the MMR (Mumbai Metropolitan Region) - The plan was published in 1995 and sanctioned 1999

2000 - The Government of India introduced the concept of Special Economic Zones (SEZs). Navi Mumbai Special Economic Zone (NMSEZ) is 1,766.13 hectares

2007 - Central government approved construction for the proposal for an international airport in Navi Mumbai CIDCO was appointed as the main agency for its implementation



The Navi Mumbai International Airport is expected to be fully operational in by 2024, at the latest.

2011 - 41.84% of the population, currently lives in informal settlements which have grown in pockets throughout the city, with little access to adequate housing, infrastructure, and urban services.

2015 - A proposal was made for a multi-product Special Economic Zone (SEZ) at Dronagiri, Navi Mumbai this was later axed due to slow implementation

source: Navi Mumbai: An Urban Story; Historical review of Navi Mumbai (made by students of the Global Housing Studio 2021 - 2022)

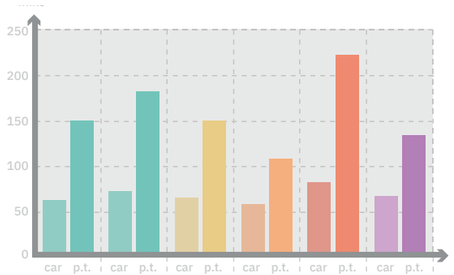
COMPARATIVE ANALYSIS

PROJECT INFORMATION

	 Charles Correa Artist's Village	 Raj Rewal CIDCO Housing	 Airoli Sites & Services
Year	1983-1986	1988-1993	1986
Design	Charles Correa	Raj Rewal	-
Client	CIDCO	CIDCO	CIDCO
Scheme	Low-rise	Low-rise	Sites & Services
Tenure	Home ownership	Home ownership	Home ownership
Target group	EWS, LIG, MIG	EWS, LIG, MIG	EWS, LIG, HIG
Amenities	Yes	Yes	No
No. Dwellings	550	1048	8100
Dwellings/Hect	102	136	189
GSI	0.4	0.3	0.7
FSI	0.6	1.1	2.1
Unit size	15-70m²	19-105m²	14-19m²
Price Rupees	₹0.2 lakh - 1.8 lakh	₹2 lakh- 6 lakh	₹4.957-13.349
Price Euro	€233 - 2,094	€2,327 - 6,980	€57-152

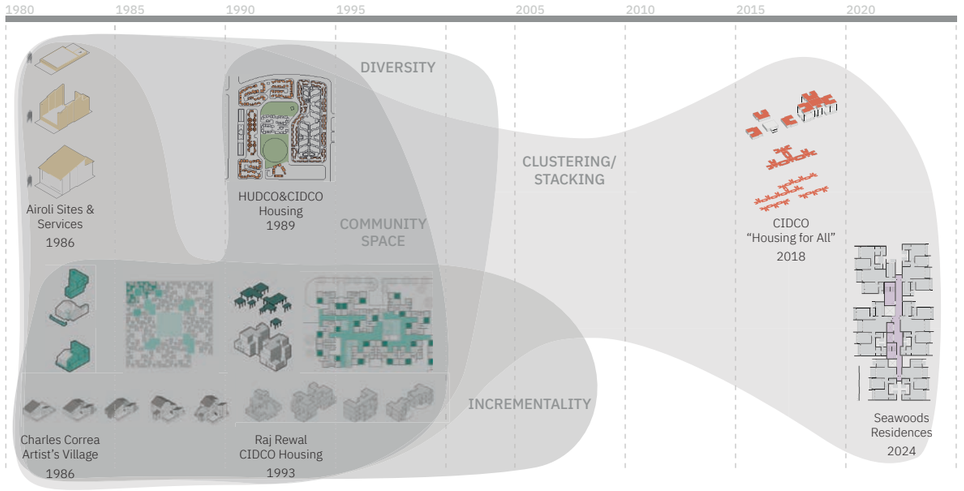
	 HUDCO&CIDCO Housing Sanpada	 CIDCO "Housing for All"	 Seawoods Residences
Year	1988-1989	2018-current	2024
Design	Hema Sankalia	CIDCO	Larsen & Toubro
Client	HUDCO & CIDCO	CIDCO	Larsen & Toubro
Scheme	Housing diversity	Mas housing	Sites & Services
Tenure	Ownership/ Rental	Home ownership	Home ownership
Target group	LIG, MIG, HIG	EWS, LIG	HIG
Amenities	Yes	Yes	Yes
No. Dwellings	1000	15,080	350
Dwellings/Hect	104	410	175
GSI	0.48	0.14	0.26
FSI	0.16	2.1	2.9
Unit size	15-90m²	26-30m²	57,59,85,93,96m²
Price Rupees	₹21,761-1,20,749	₹2,03,8500-2,84,4200	₹2Cr - 3,6Cr
Price Euro	€251,90-1397.75	€23,500-32,800	€231,705-417,070

LOCATION AND CONNECTIVITY



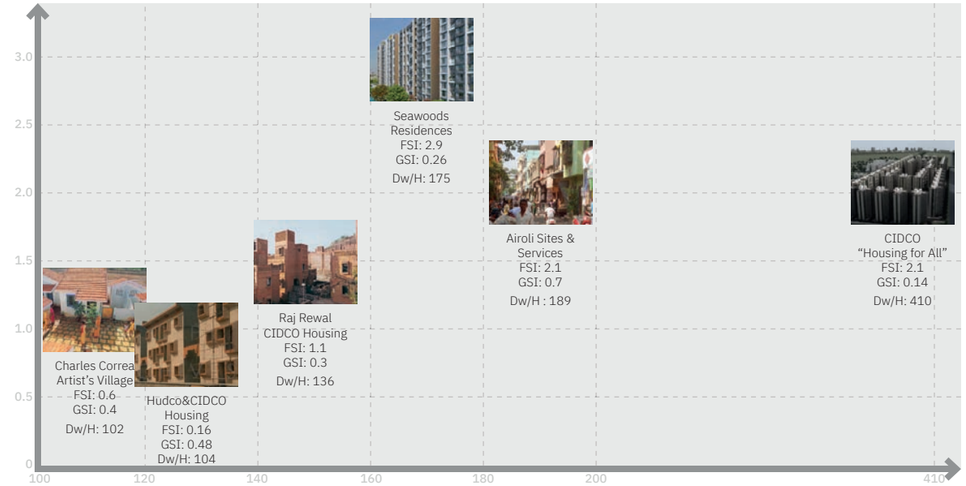
Graph showing the travel time to Mumbai Central by car and public transport

TIMELINE



Overlapping themes of the case studies through time

DENSITY



Graph showing the density of each case study by FSI over dwellings/hectare

DOMESTIC LIFE


Charles Correa's Artist's Village

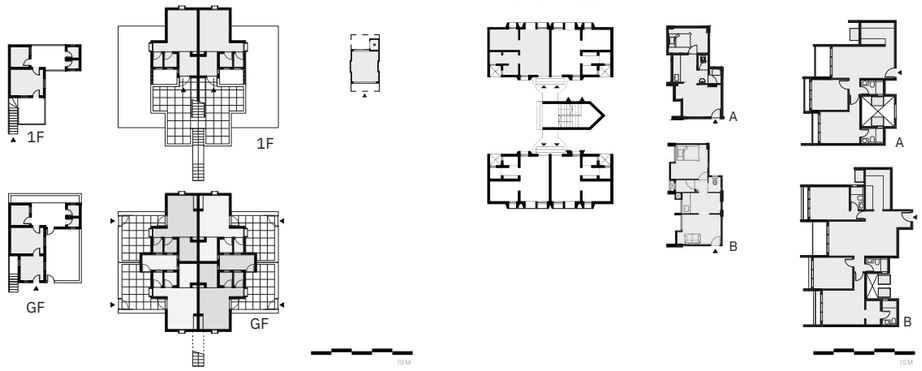

Raj Rewal CIDCO Housing


Airoli Sites & Services


HUDCO & CIDCO Housing Sanpada, Hema Sankalia


CIDCO's "Housing for All"


Seawoods Residences



ENVIRONMENT


Charles Correa's Artist's Village

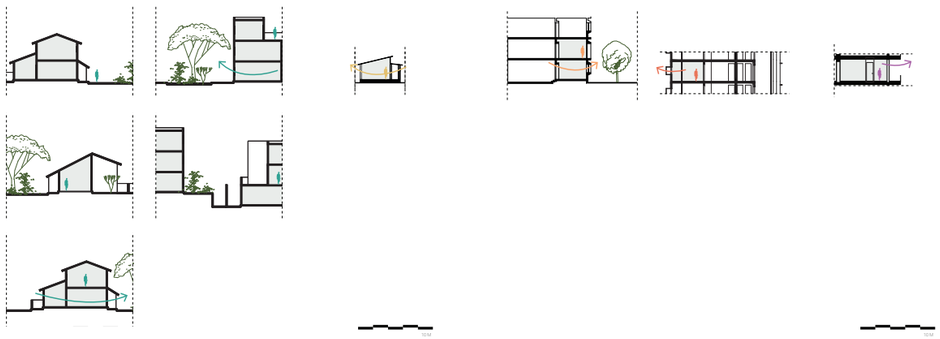

Raj Rewal CIDCO Housing


Airoli Sites & Services


HUDCO & CIDCO Housing Sanpada, Hema Sankalia

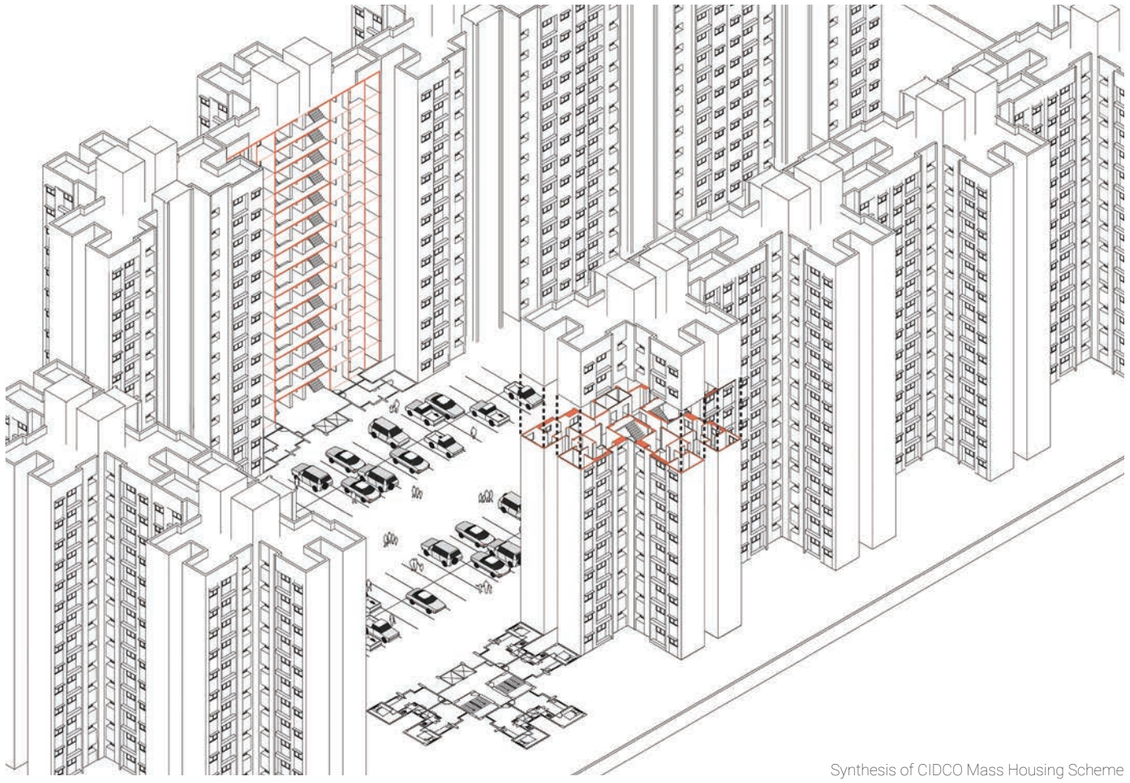

CIDCO's "Housing for All"


Seawoods Residences



source: Navi Mumbai: Comparative Synthesis; Thematic comparisons of the case studies (made by students of the Global Housing Studio 2021 - 2022)

CIDCO HOUSING FOR ALL



Synthesis of CIDCO Mass Housing Scheme

source: Navi Mumbai Research Booklet; Jacky Choi & Stijn Kemps

CIDCO Housing for All is a reaction to the housing shortage in Mumbai (and India as a whole). The Housing for All scheme is meant for EWS and LIG households, to re-locate them from slums to a pucca house. The scheme consist of a unit type for both income groups and is repeated on every floor. A problem of this project is the lack of ammenities and landscaping. The architecture and floorplan design is monotone, which not cater for
different types and sizes of families.

Futhermore, there is no interaction with the different floor levels / ground floor.

Location: Navi Mumbai (IN)
Year: 2018 - current
Dw/ha: 410
GSI: 0,14
FSI: 2,1
Unit size: 26 - 30 m^2
Program: mass housing (EWS & LIG)

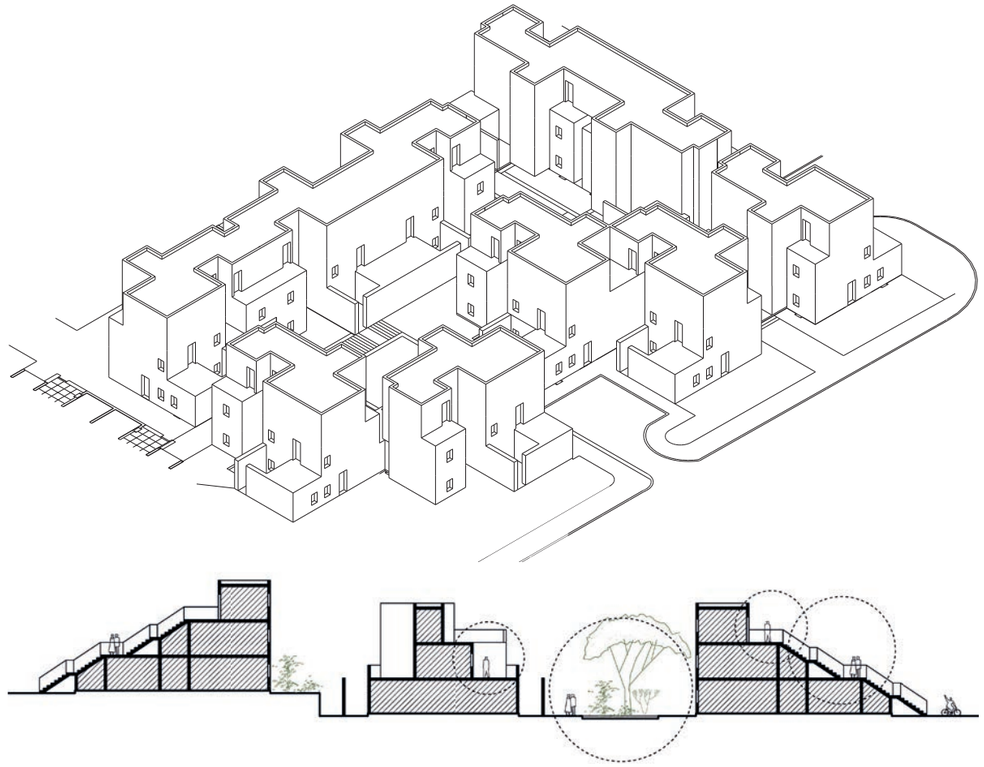
CHARLES CORREA ARTIST VILLAGE

source: Navi Mumbai Research Booklet; Yiyi Lai & Kunzhao Zou

The design of the Artist Village by Charles Correa consist of a cluster, which can be stamped and forms a hierarchy of different open spaces. These go from more private to public. The design of social linkage contributes to maintaining the connection between residents.
The originally designed commercial spaces and parking lot can not meet today's requirement, which resulted in most of the common spaces have been occupied by vehicles.

Location: Navi Mumbai (IN)
Year: 1983 - 1986
Dw/ha: 102
GSI: 0,4
FSI: 0,6
Unit size: 15 - 70 m^2
Program: low-rise housing (EWS ,LIG & MIG)

RAJ REWAL CIDCO HOUSING



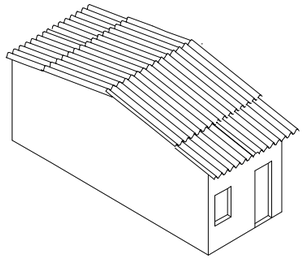
source: Navi Mumbai Research Booklet; Yiyi Lai & Kunzhao Zou

The CIDCO Housing in Belapur is located on a hillside. The dwelling units are design along a loop, which creates a diversity of spatial expierences. Intimate courtyards, internal spaces free from vehicular traffic and shaded pedestrian paths play an important social role.
The downside is that the needs of particular groups are neglected, as there are no play areas for children and no ramps for the elderly or disabled.

Location: Navi Mumbai (IN)
Year: 1988 - 1993
Dw/ha: 136
GSI: 0,3
FSI: 1,1
Unit size: 19 - 105 m^2
Program: low-rise housing (EWS ,LIG & MIG)

THREE BASIC COMPONENTS

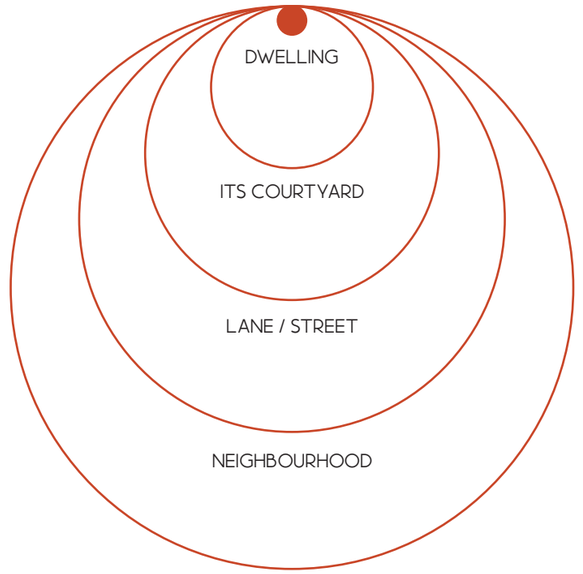
FAMILY



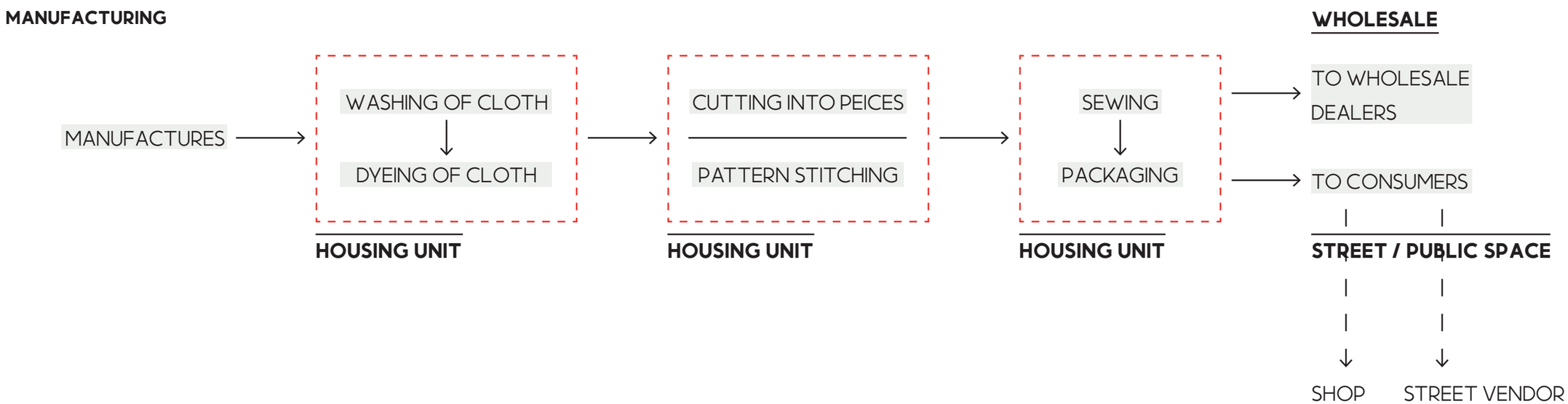
DWELLING

WORK

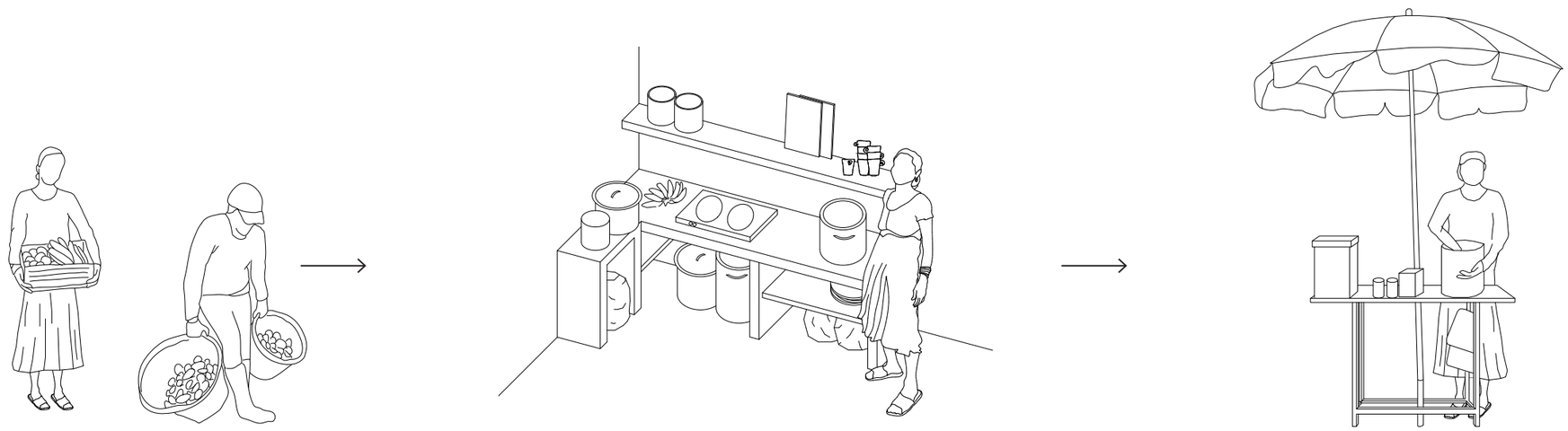
HIERARCHICAL ORGANISATION



PROCESS FLOW

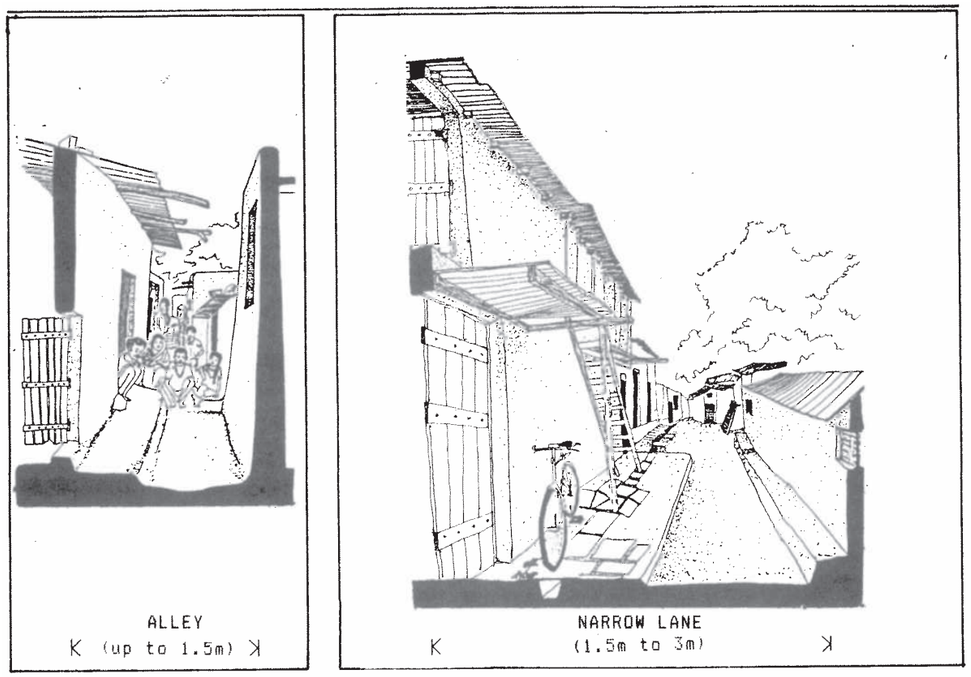


FOOD STALL

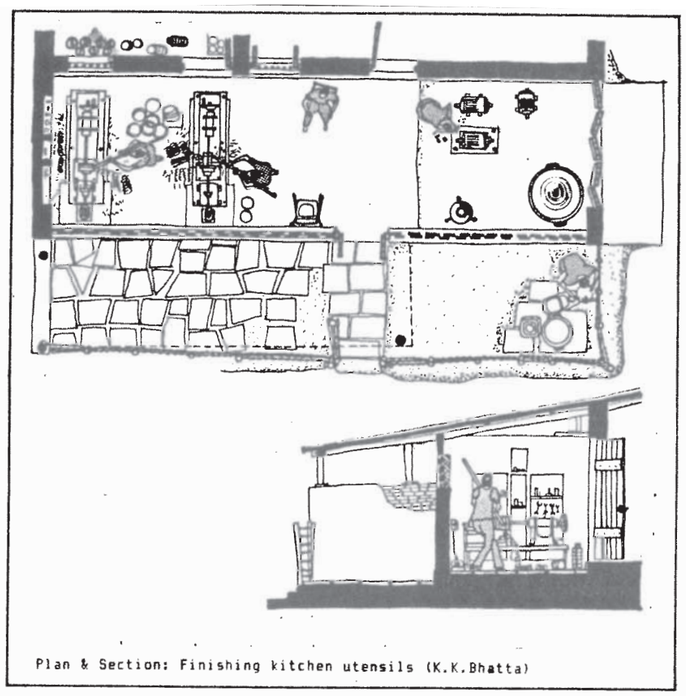


HOME-BASED ENTERPRISE

STREET TYPES

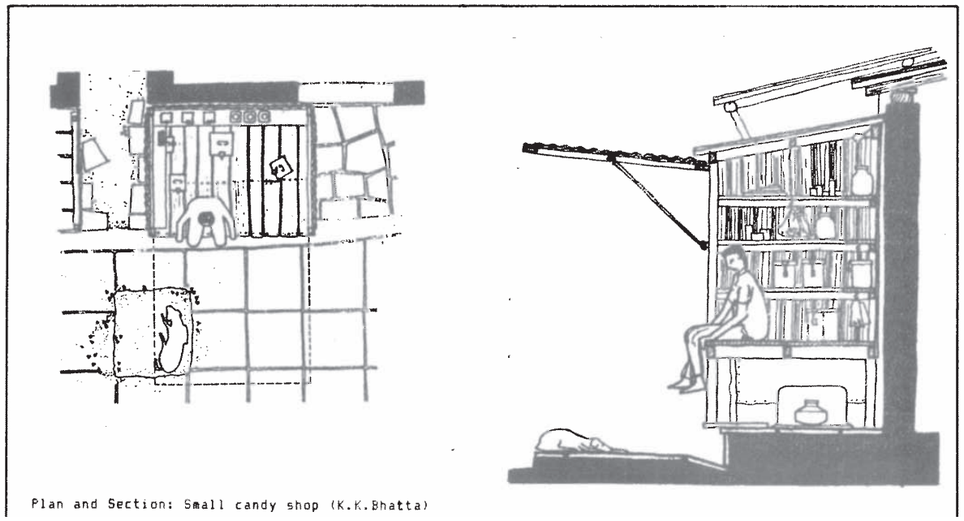


source: Rybczynski, W. and McGill University (1984). *How the other half build*s. Montreal: Centre for Minimum Cost Housing.



WORKSHOP: POLISHING ALUMINUM UTENSILS

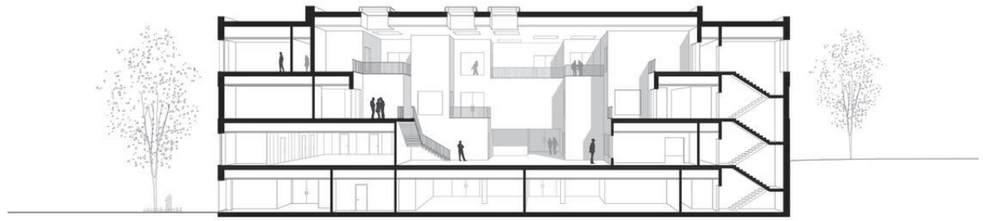
SMALL CANDY SHOP



source: Rybczynski, W. and McGill University (1984). *How the other half build*s. Montreal: Centre for Minimum Cost Housing.

REFERENCES

UNIVERSITY COLLEGE NORTH

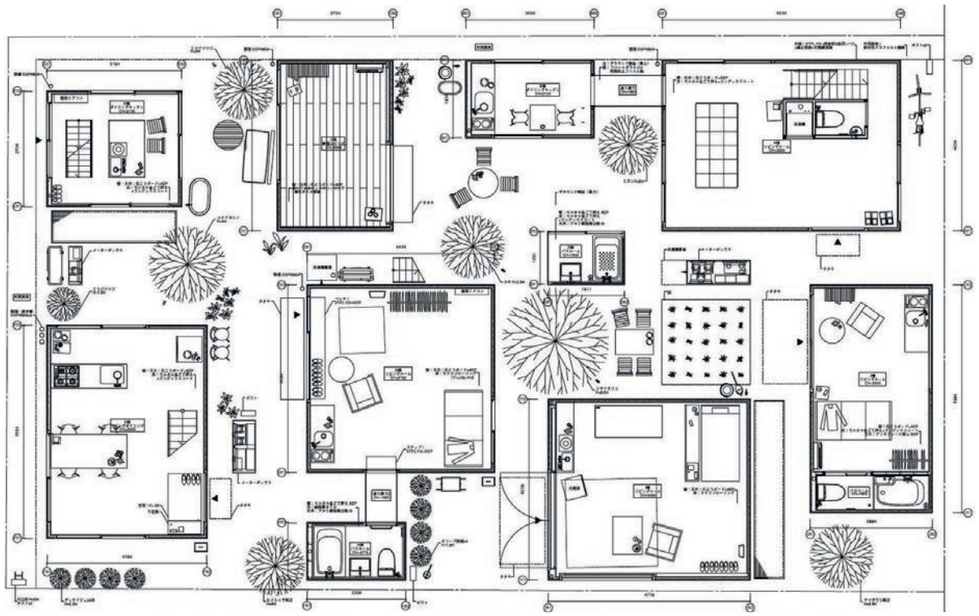


source: https://www.adept.dk/project/university-college-north

This university building is located in Denmark and has a very interesting section. The floors have a set back per level. This results in the possibility to see and interact with a person on the other levels.
This interaction is very interesting for households in home-based enterprises, because the social network plays a very important role.

ADEPT Architects
Location: Aalborg (DK)
Year: 2013-2015
Size: 6.000m^2
Program: education

MORIYAMA HOUSE



source: ArchDaily.com

source: ArchDaily.com

Moriyama housing is located in Tokyo, the architect designed a housing unit for himself and the other dwellers. The different 'households' share the garden, which meanders through the different housing units. The continuity of the open space shared by the people, creates a sense of community. Besides there is a close contact with ground level.

Ryue Nishizawa
Location: Tokyo (JP)
Year: 2002-2005
Size: 290m^2
Program: residential

SEIKH SARAI HOUSING COMPLEX

source: Angel Muñiz

source: ArchDaily.com

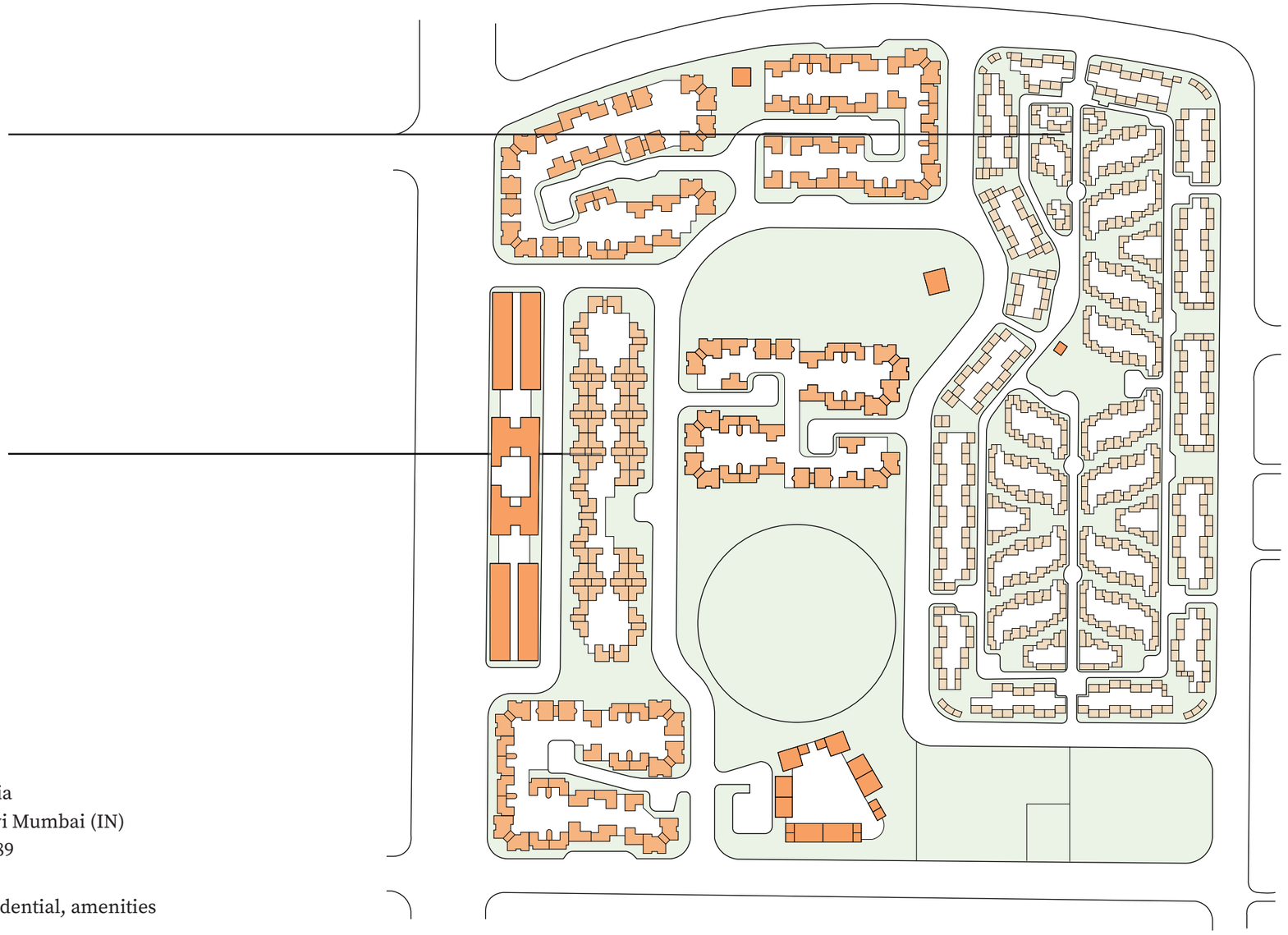
This social housing project is located in India. The design consist of a series of clusters which are interrelated. The courtyards are surrounded by two or three-stories high buildings and create intimate space. There is a clear demarcation between pedestrian and vehicular routes.

Raj Rewal
Location: New Delhi (IN)
Year: 1970
Size: 3,82ha
Program: residential

HOUSING DIVERSITY

LIG

MIG

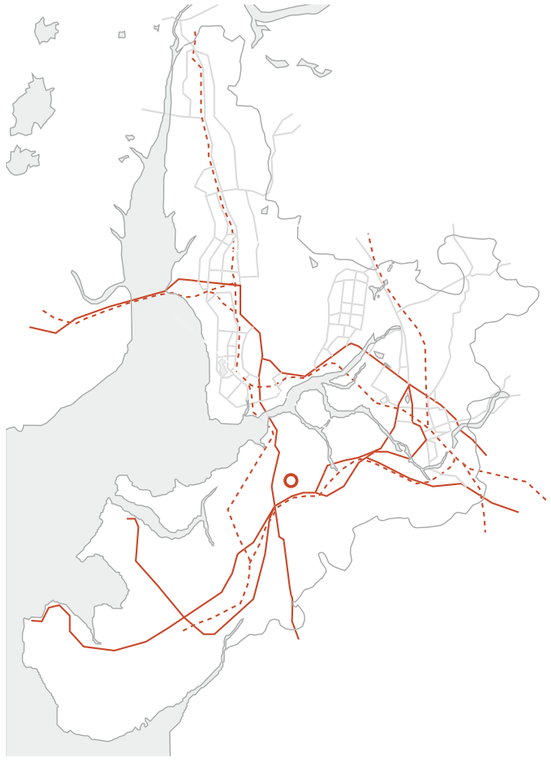


Housing Diversity, located in Navi Mumbai, is an example of the integration of different income groups within one masterplan. It shows clearly the difference in housing types; floorplan lay-out and architecture of the LIG, MIG and HIG housing units.

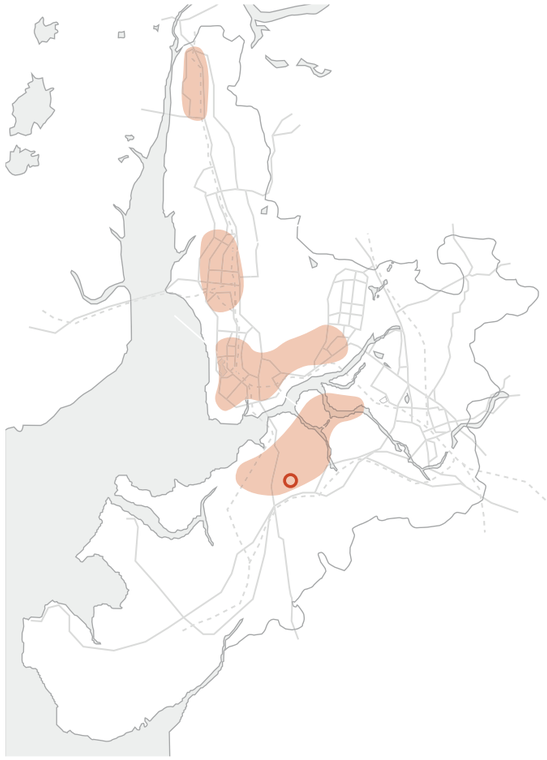
Hema Sankalia
Location: Navi Mumbai (IN)
Year: 1988-1989
Size: 9,63ha
Program: residential, amenities

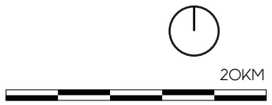
SITE

HIGHWAYS AND RAIL ROADS

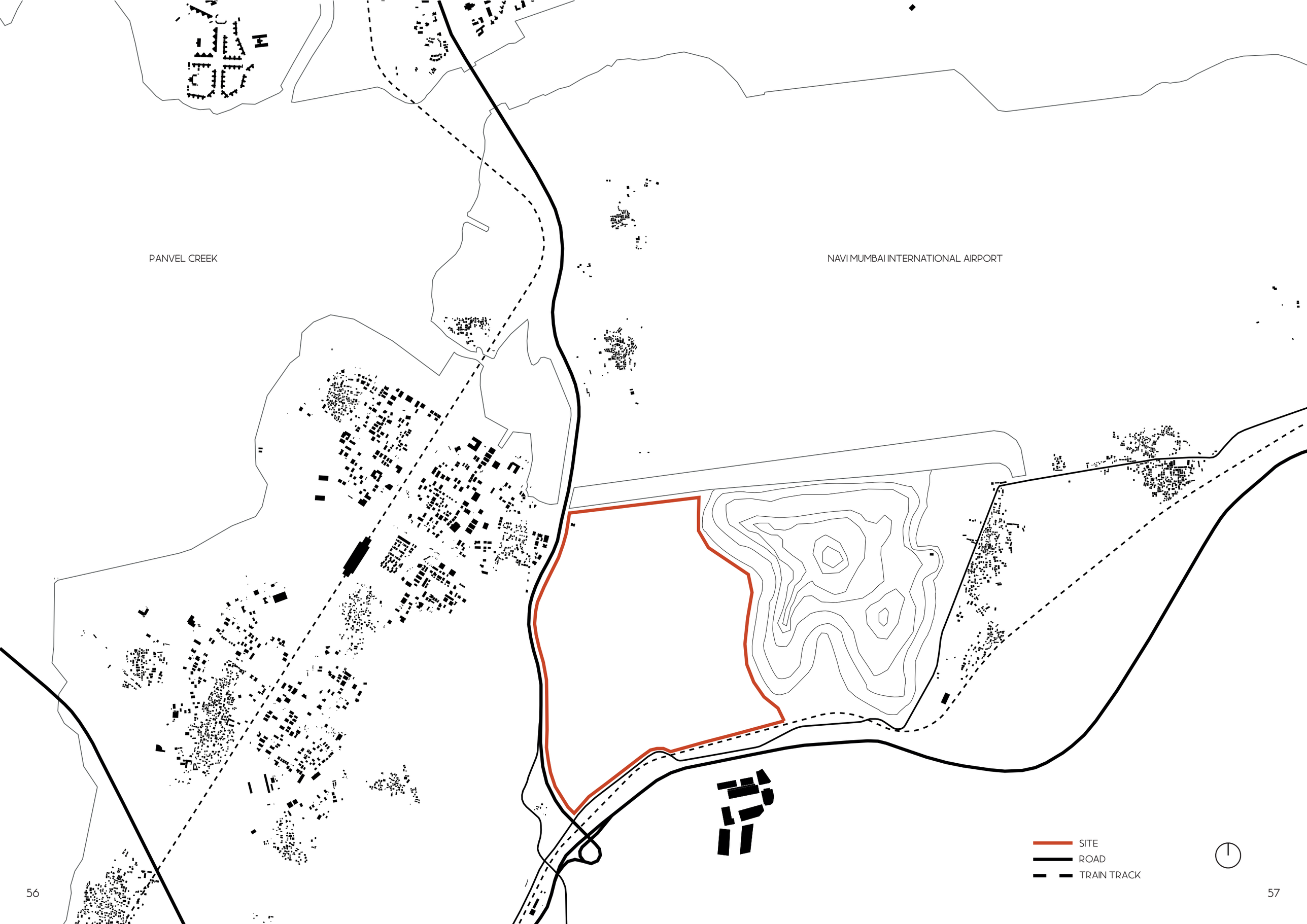


ECONOMIC DEVELOPMENT ZONES

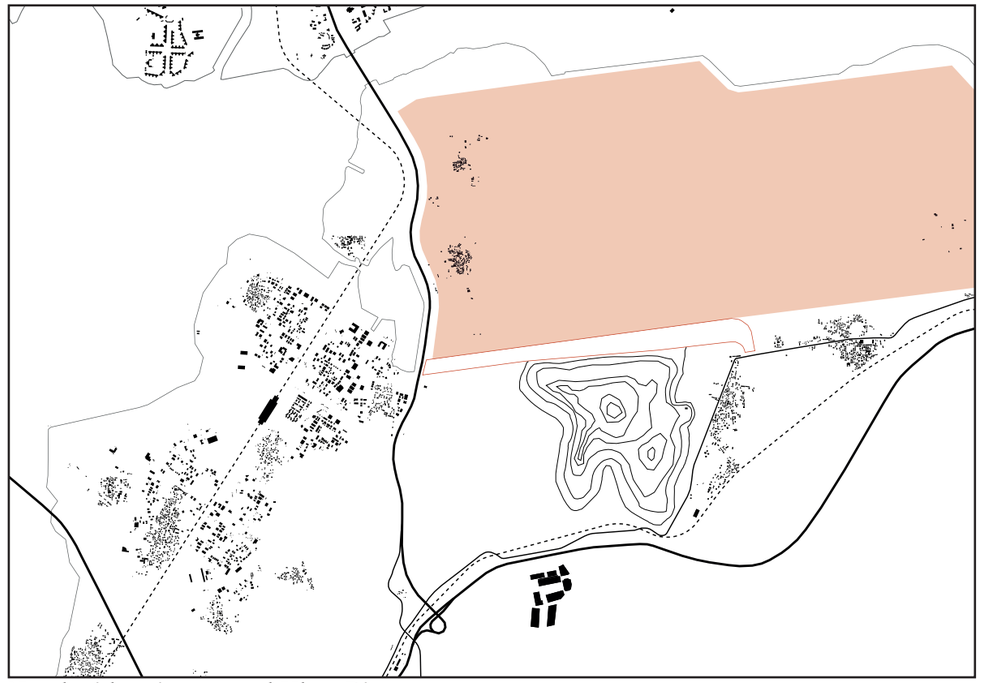




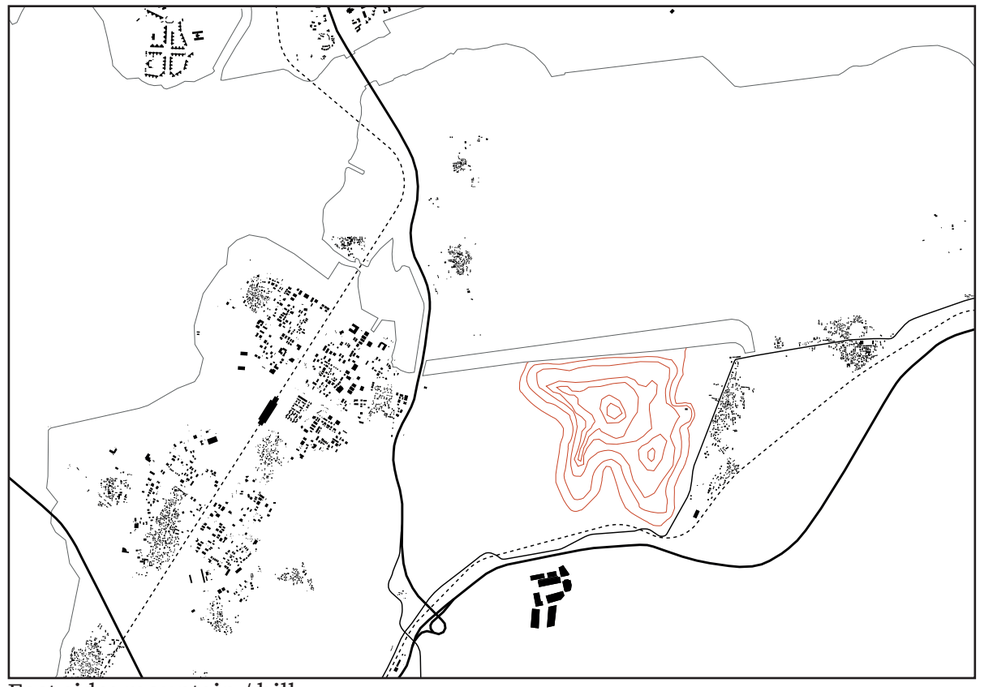
The site is located in the southern part of Navi Mumbai, at an intersection of two highways and rail roads. Of great importance for the project is the connectivity of the location. It should be well connected to the rest of the city; by (rail) roads. Because in Mumbai many people commute from home to work and purchase meals or other items from street vendors or (food) stalls. The places where people are passing generates income for the lower income groups.
The site is located in one of the economic development zones, which attracts businesses; jobs for both the formal and informal sector. By situating the project there it creates an interaction of different income groups. These can support each other; the lower income groups by providing services and products and the middle and high income groups (but also the lower income groups) by receiving the services and purchasing the products.


PANVEL CREEK
NAVI MUMBAI INTERNATIONAL AIRPORT
SITE
ROAD
TRAIN TRACK

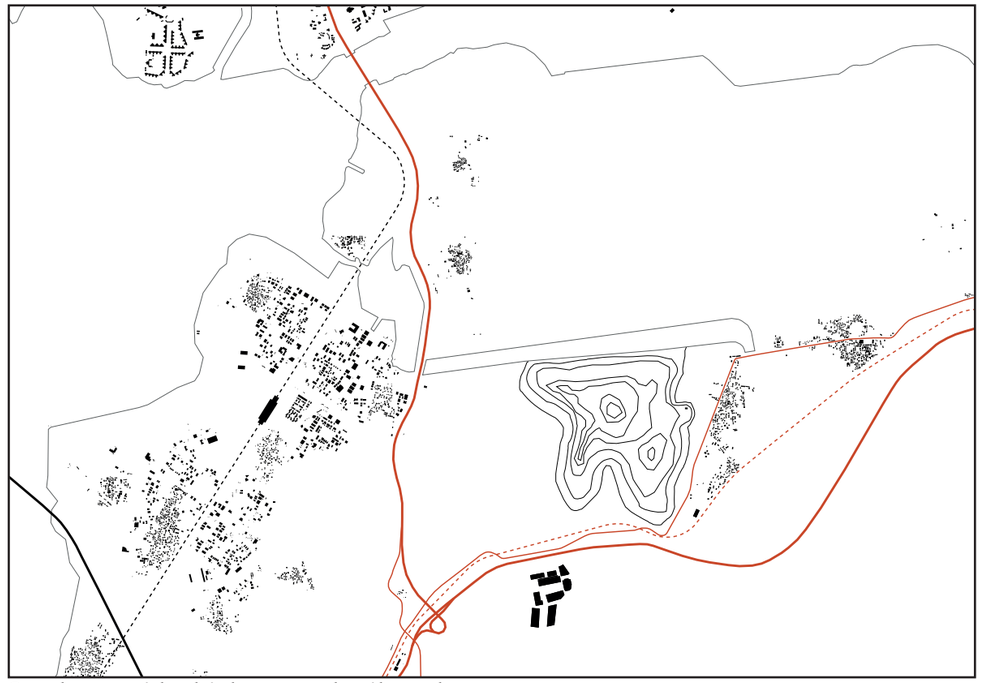
LOCATION SIDES



North side: airport and Ulwe River



East side: mountain / hill

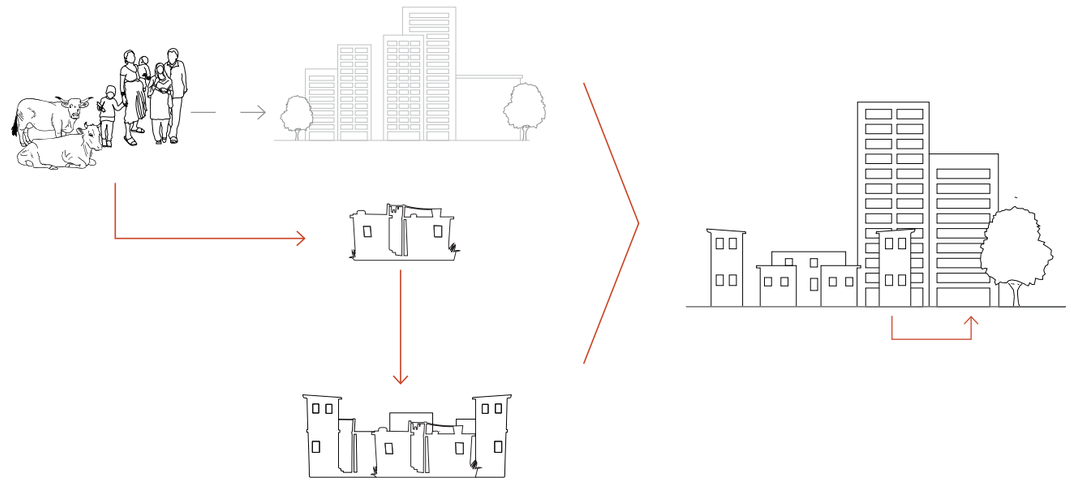


Southwest side: highway and rail roads

The site is an undeveloped area in the Southern part of Navi Mumbai. The plot is located below the Navi Mumbai Airport and seperated from it by the Ulwe River. The new airport should be operating by the end of 2024. On the Southwest the high way and rail roads create a boarder. The east side is bordering a small mountain. These different sides of the project plot influences the position of different functions and the housing areas for the different income groups.

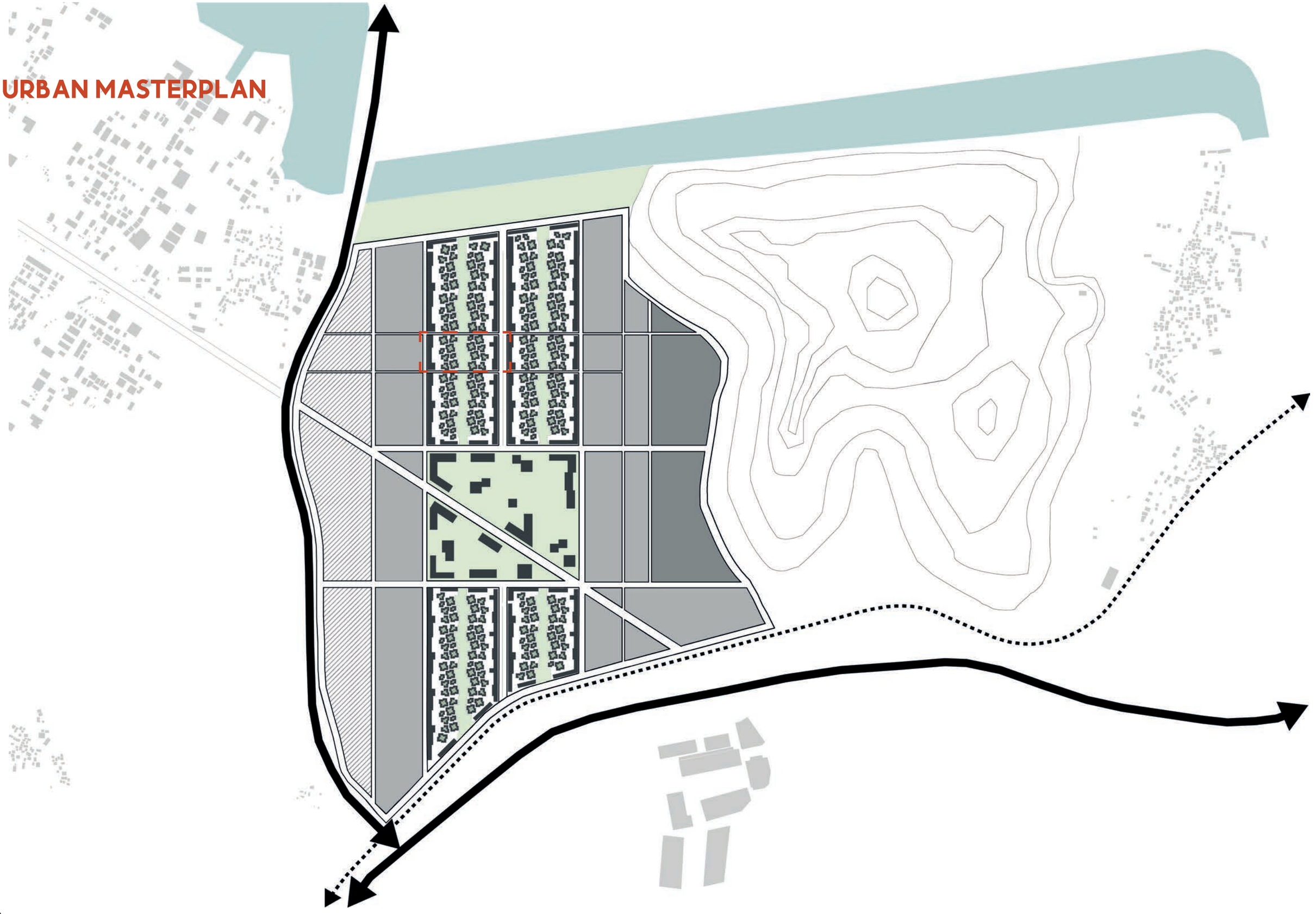
DESIGN

GOAL

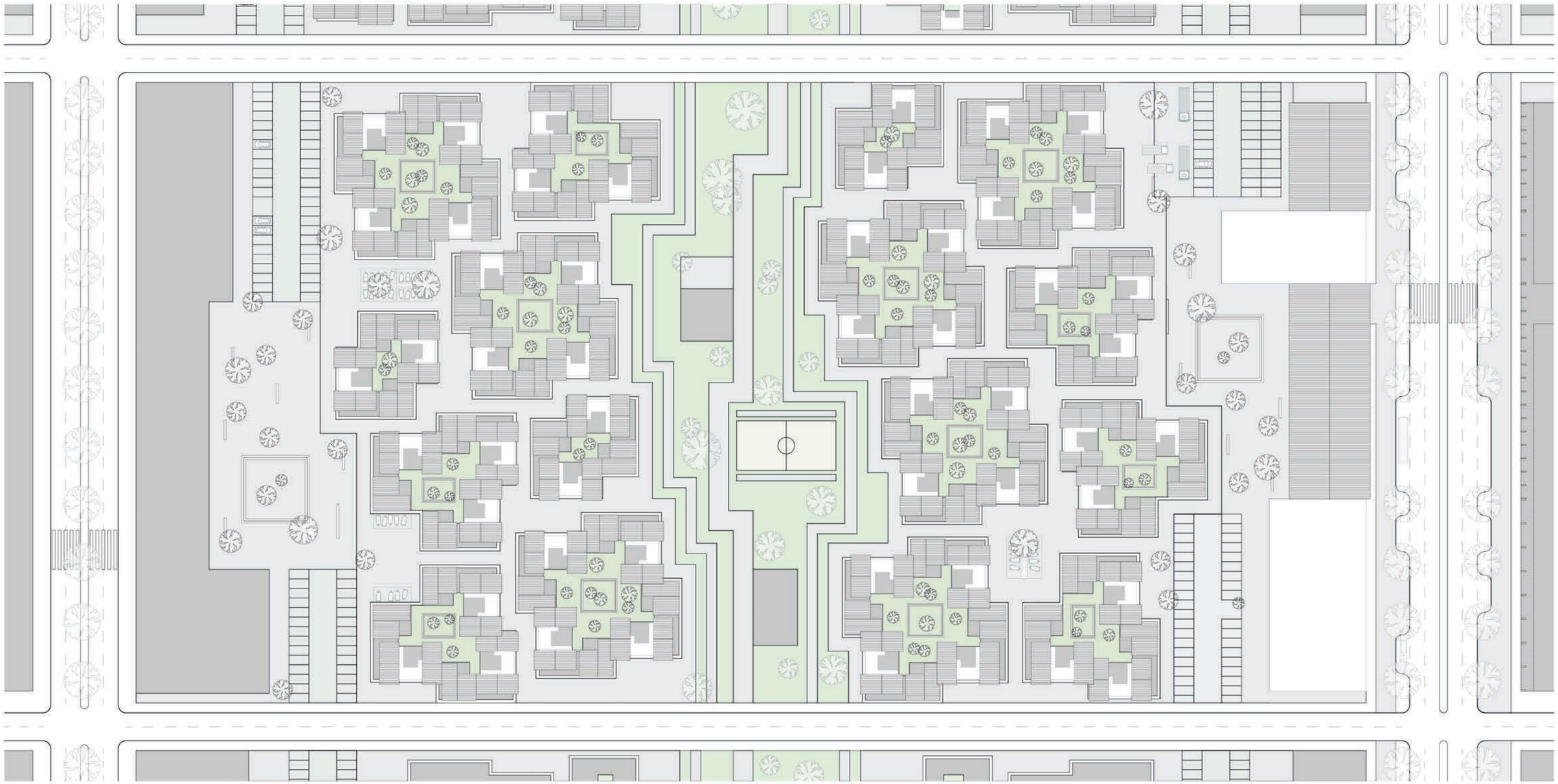


With my project I want to integrate the people from the lower income groups better into the city's urban fabric. So the lower income groups have fuller access to wider social networks, a more dignified social role and a deeper source for accumulating information, credibility and dignity for the urban poor in public life as well.

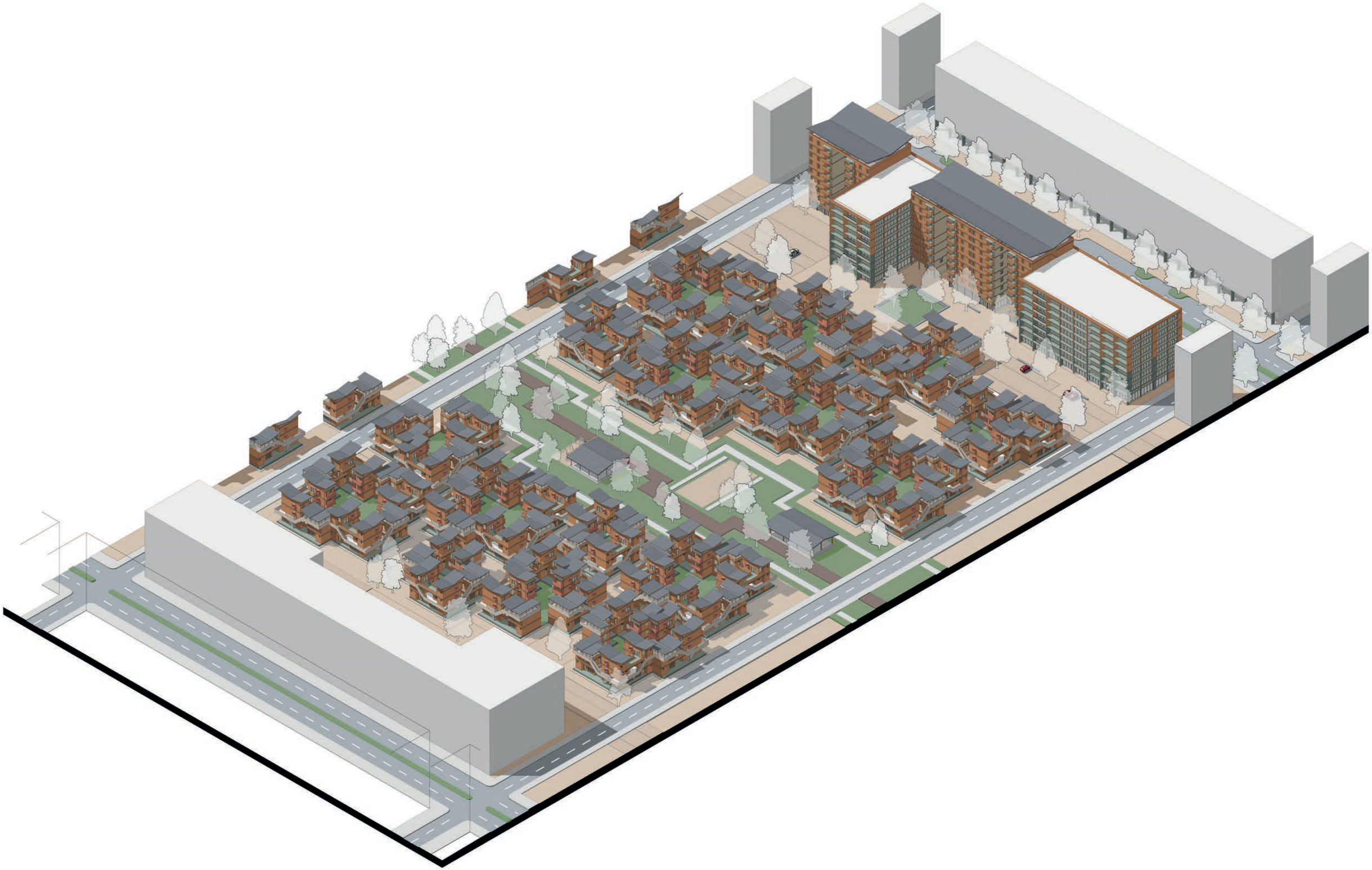
URBAN MASTERPLAN



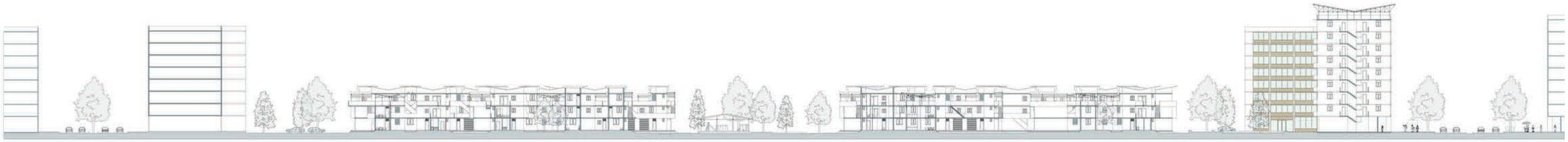
MASTERPLAN



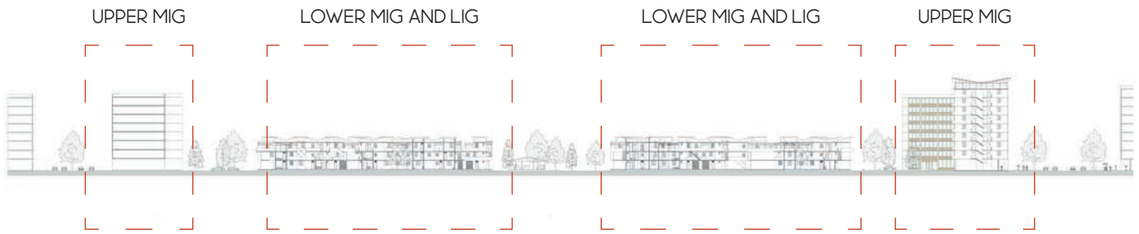
1:1.000

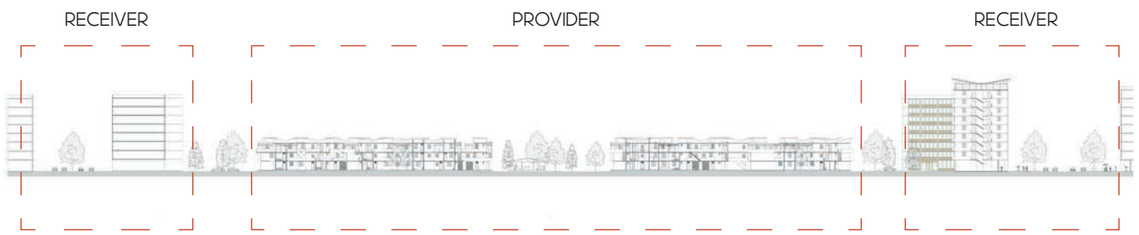


MASTERPLAN – SECTION



1:1.000


UPPER MIG
LOWER MIG AND LIG
LOWER MIG AND LIG
UPPER MIG


RECEIVER
PROVIDER
RECEIVER

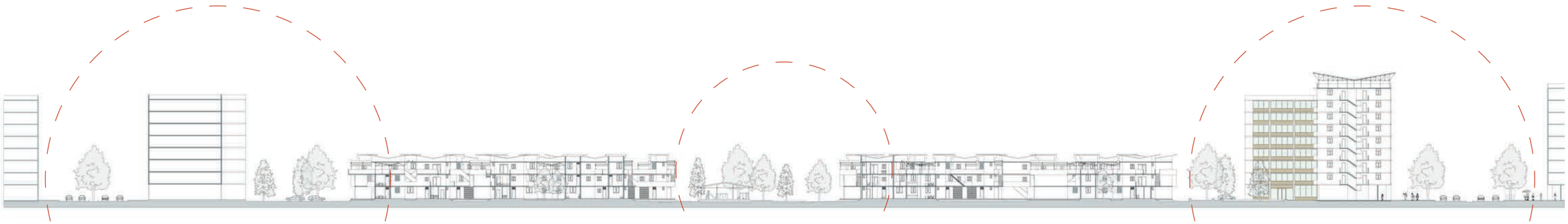

EXCHANGE
EXCHANGE


MAIN STREET
CITY SCALE
PARK
MAIN STREET
CITY SCALE

MERGING 'TWO WORLDS'

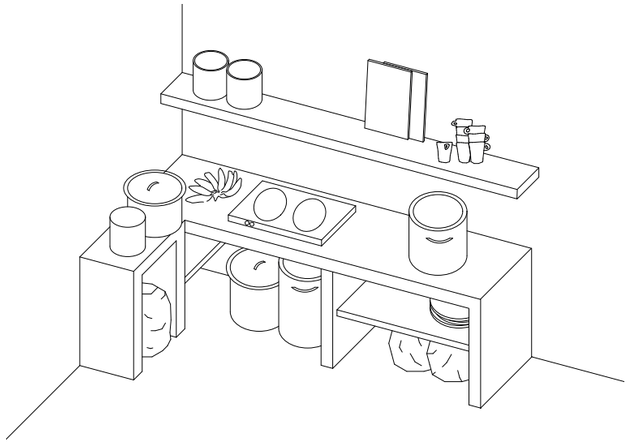
MERGING 'TWO WORLDS'

MERGING 'TWO WORLDS'

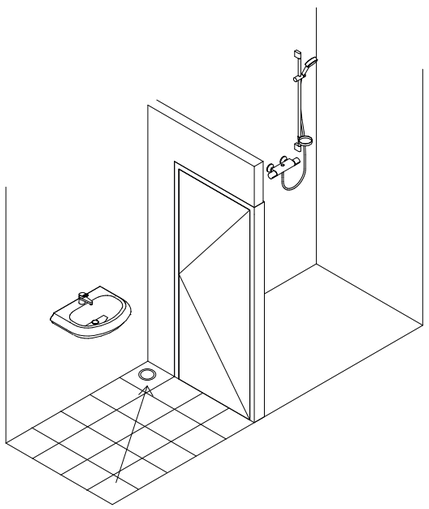


UNIT SCALE

IMPORTANT ROOMS FOR HOME-BASED ENTERPRISES

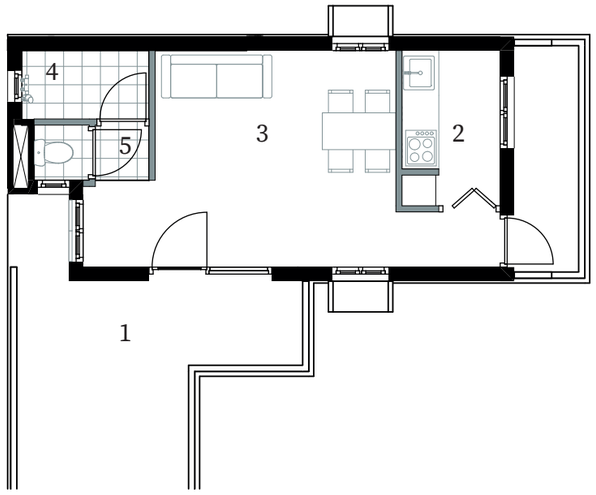


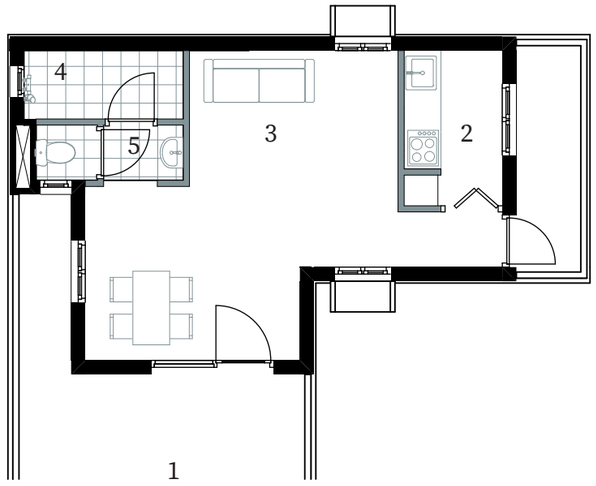
KITCHEN

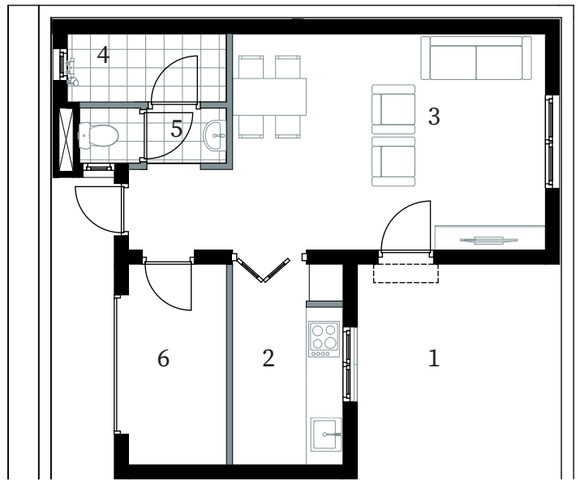


WASHING ROOM

UNIT FLOORPLANS





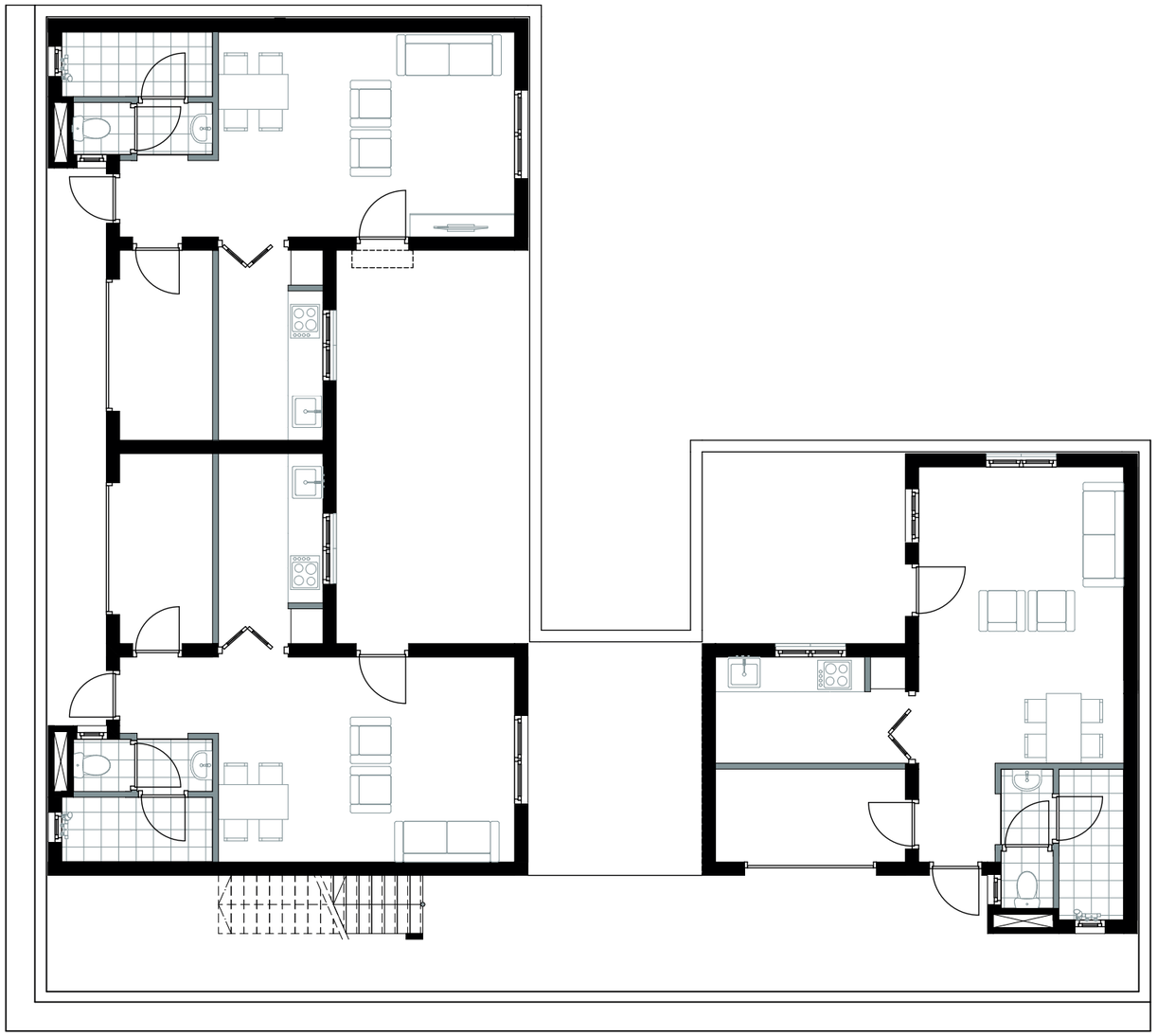


1:100

1.Outside space
2. Kitchen
3. Living room
4. Toilet / shower
5. Washing area
6. HBE

1:1.00

CLUSTER - GROUND FLOOR



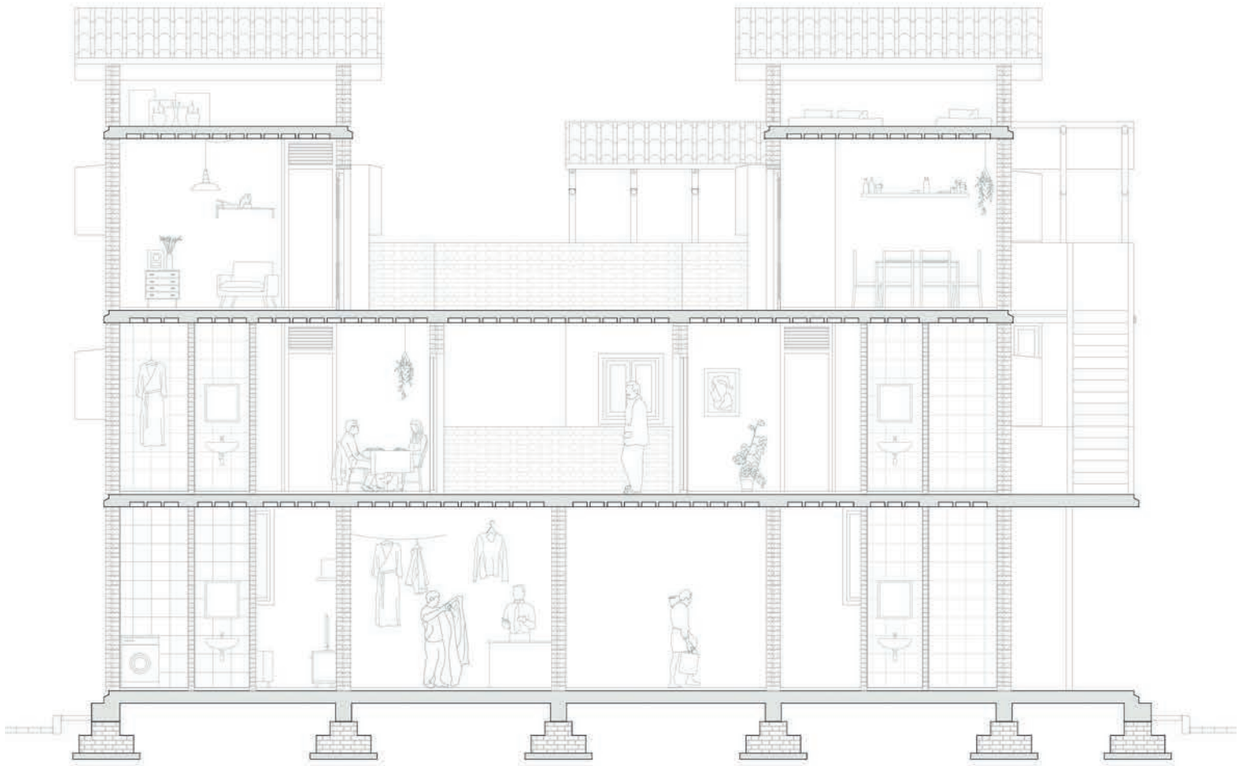
1:100

CLUSTER - FIRST FLOOR

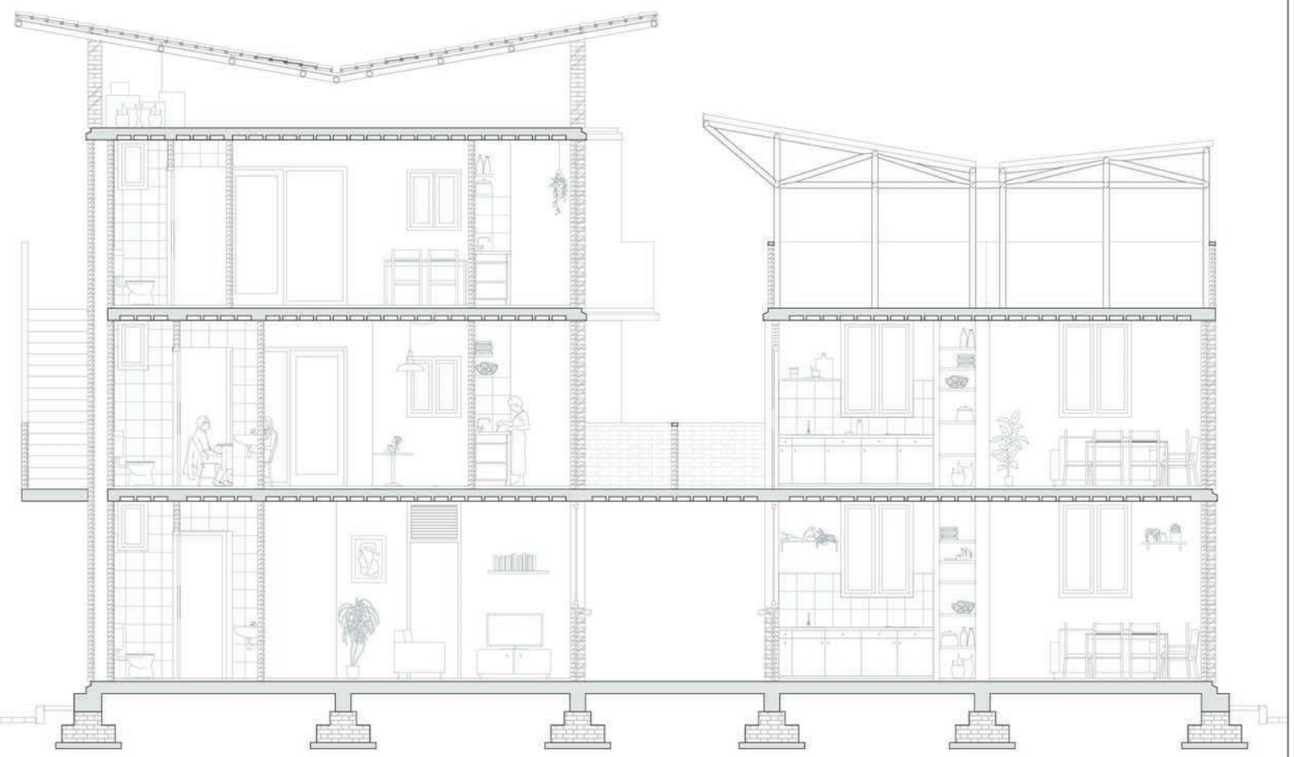
1:100

CLUSTER - SECOND FLOOR

1:100

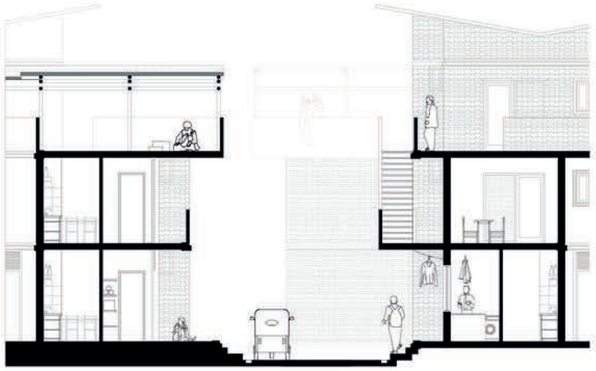


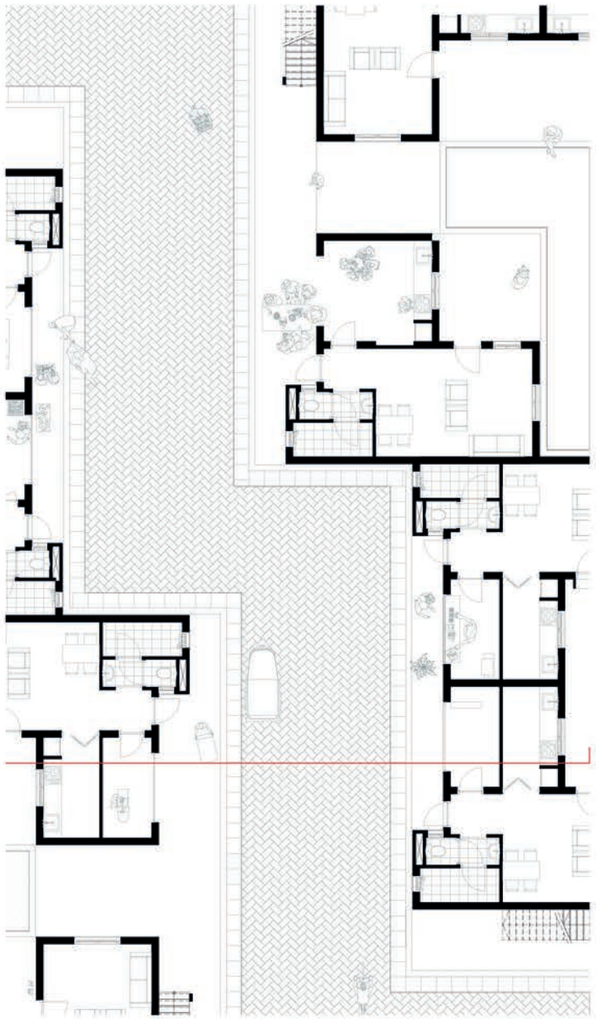
1:1.00



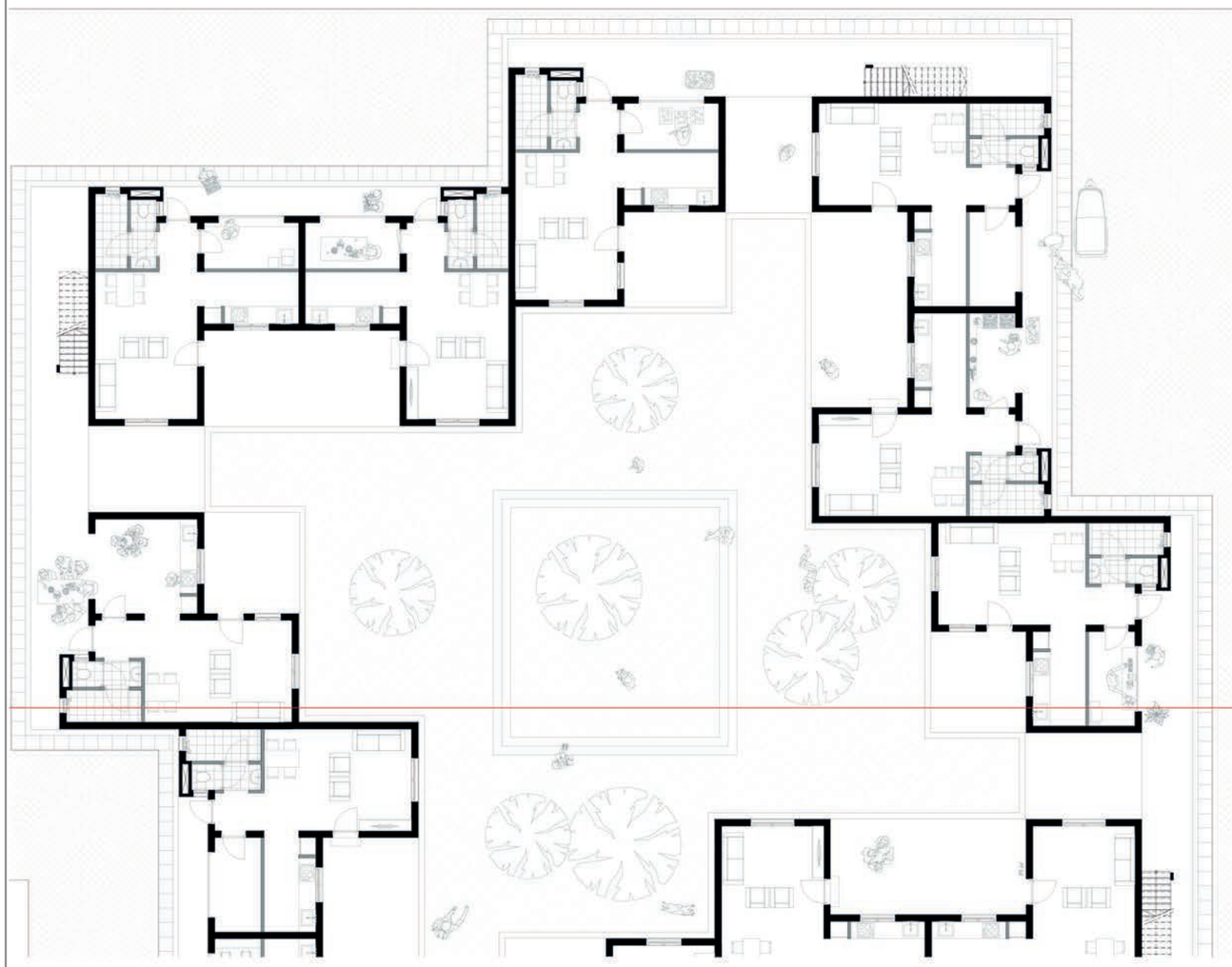
1:1.00

CLUSTER - WORK SIDE

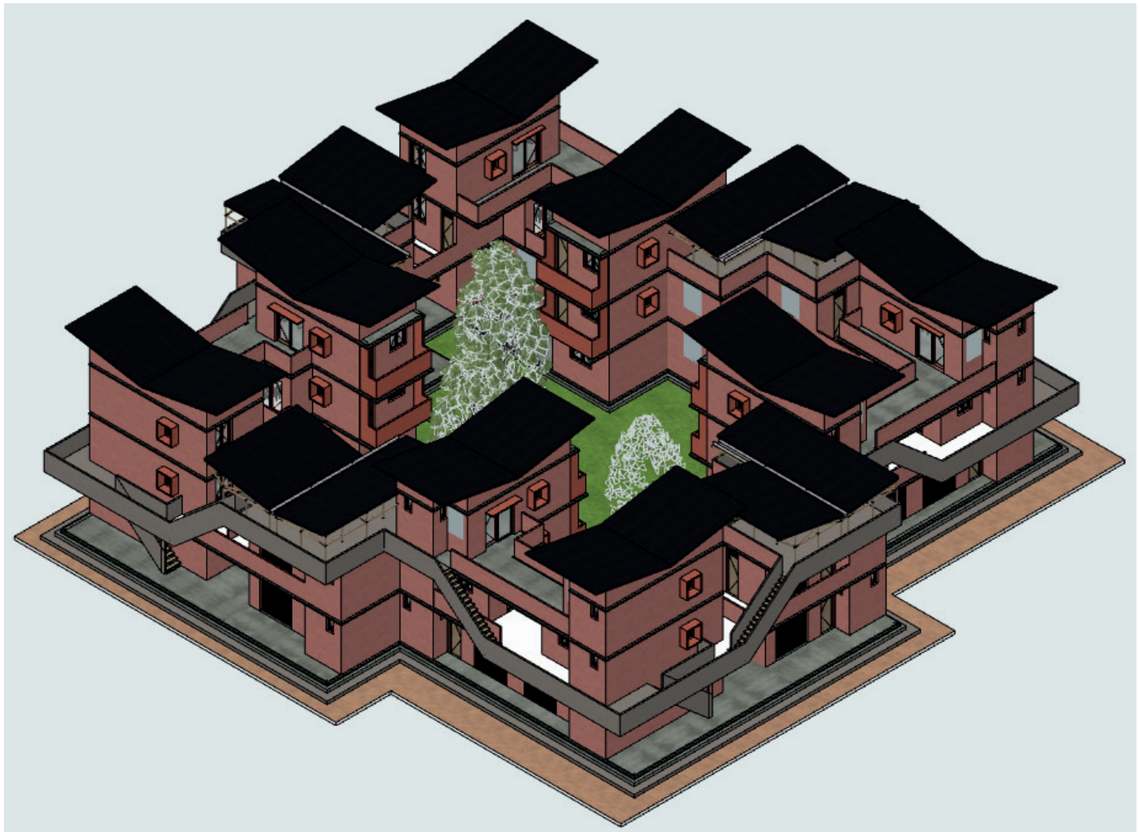




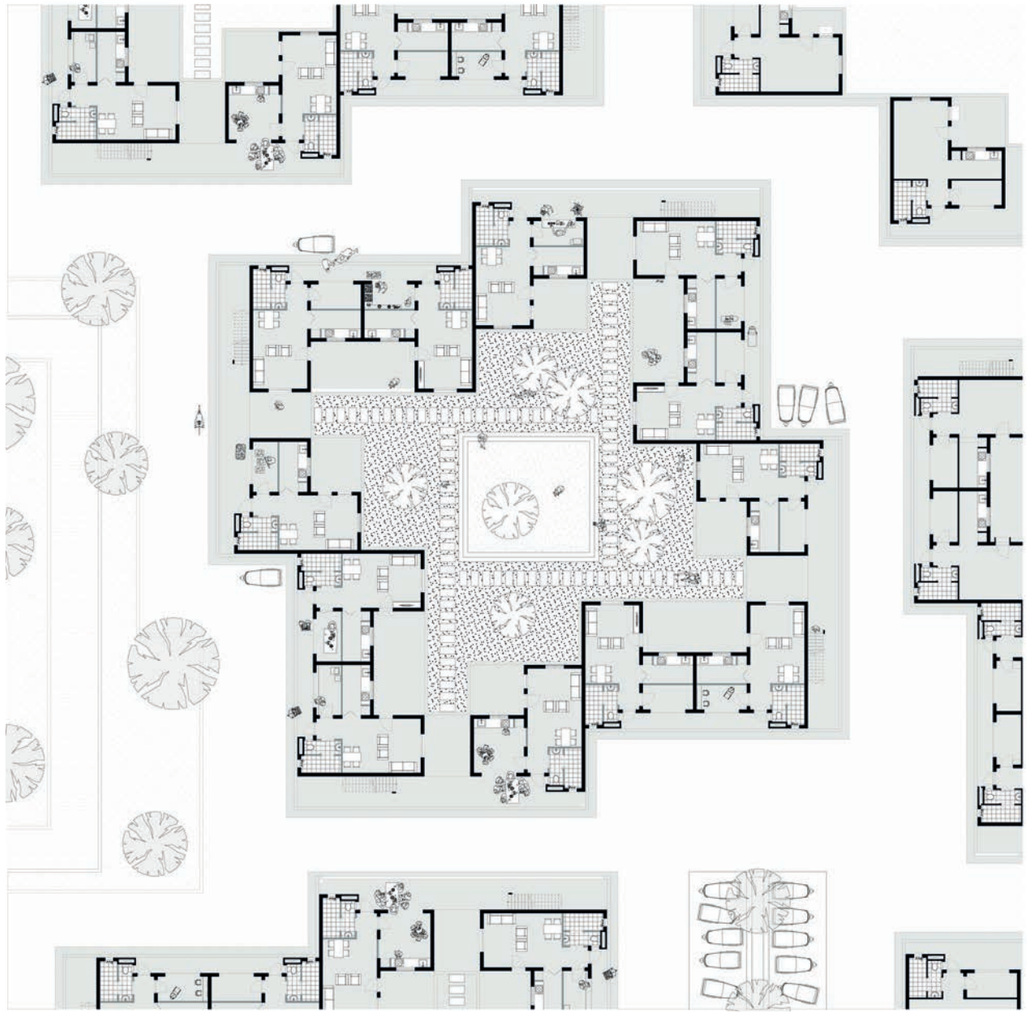
CLUSTER - LIVING SIDE



CLUSTER AXOMOMETRY



CLUSTER - GROUND FLOOR

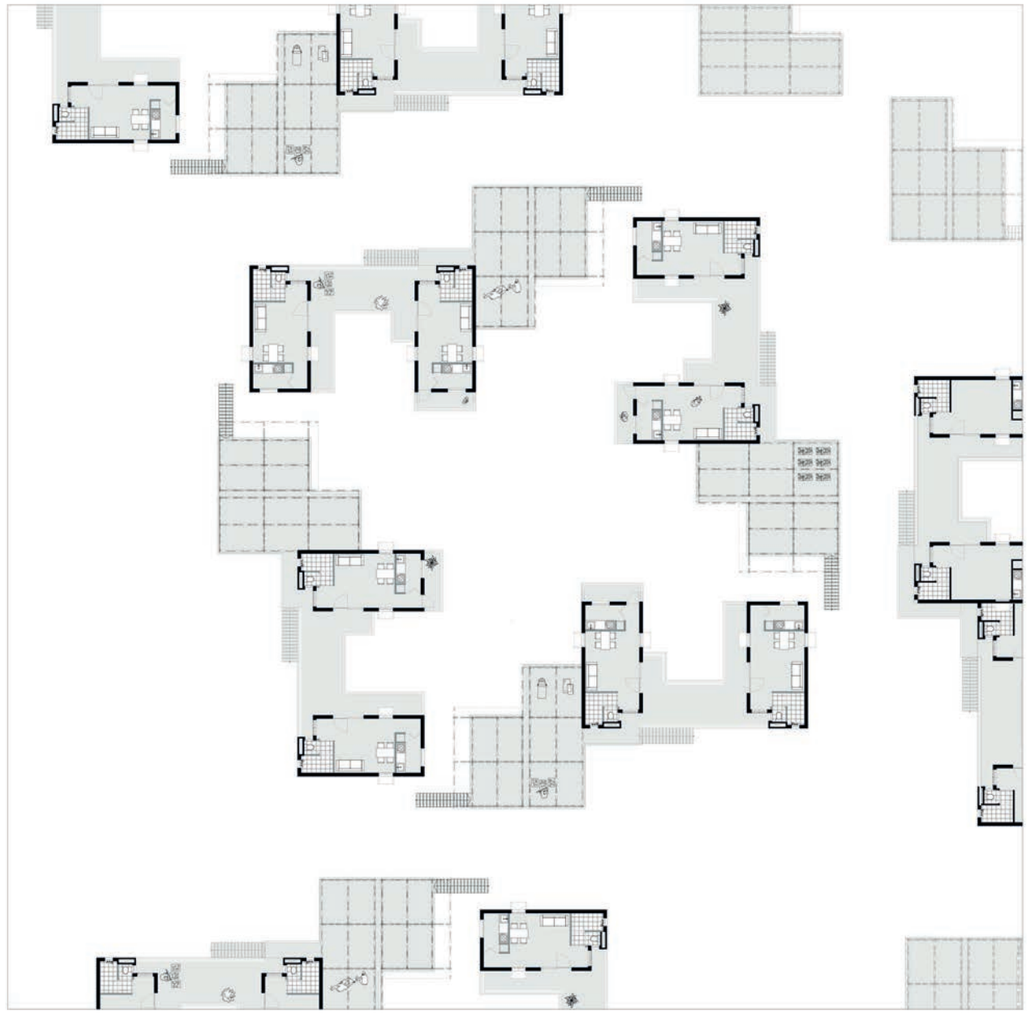


1:200

CLUSTER - FIRST FLOOR

1:200

CLUSTER - SECOND FLOOR

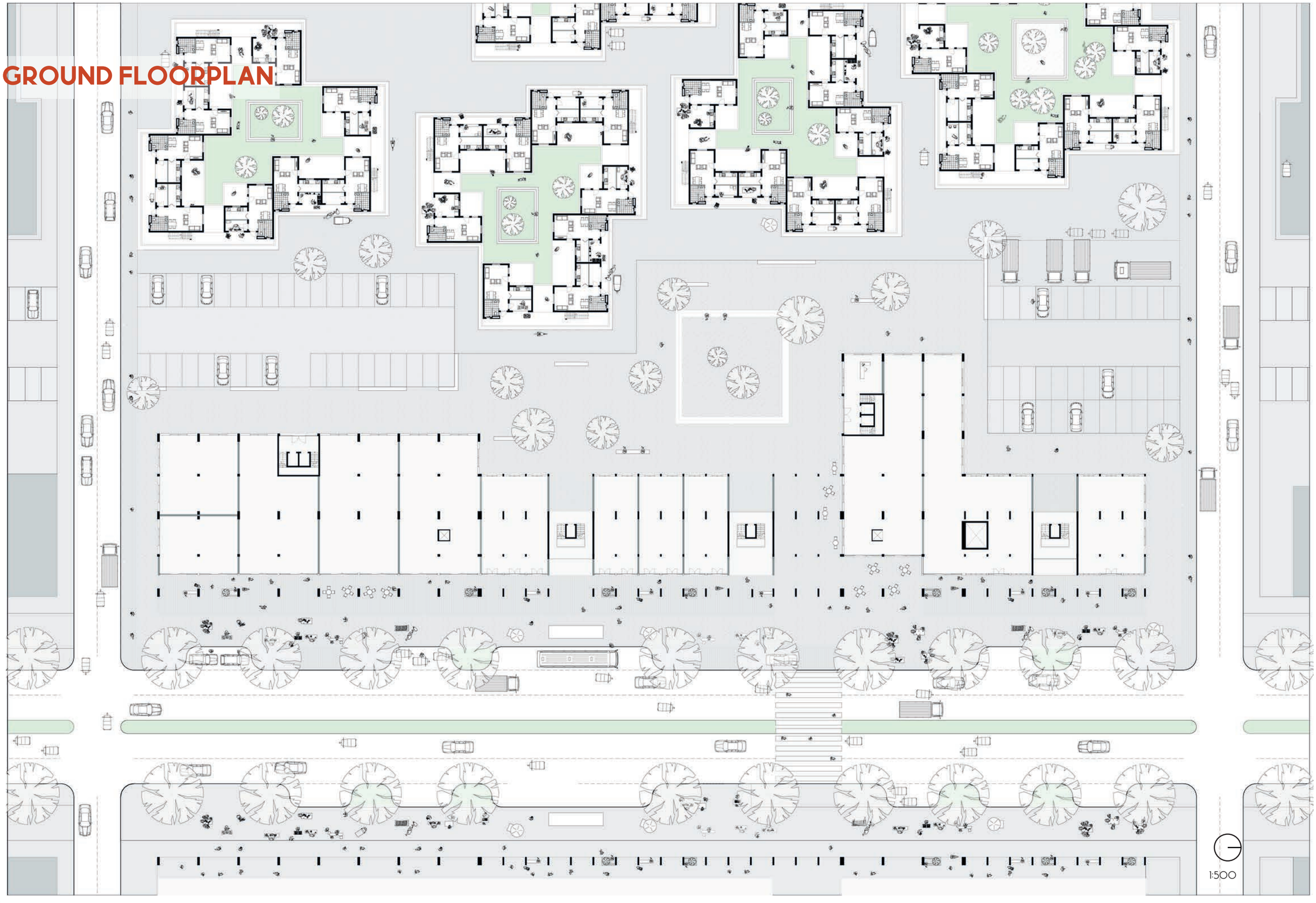


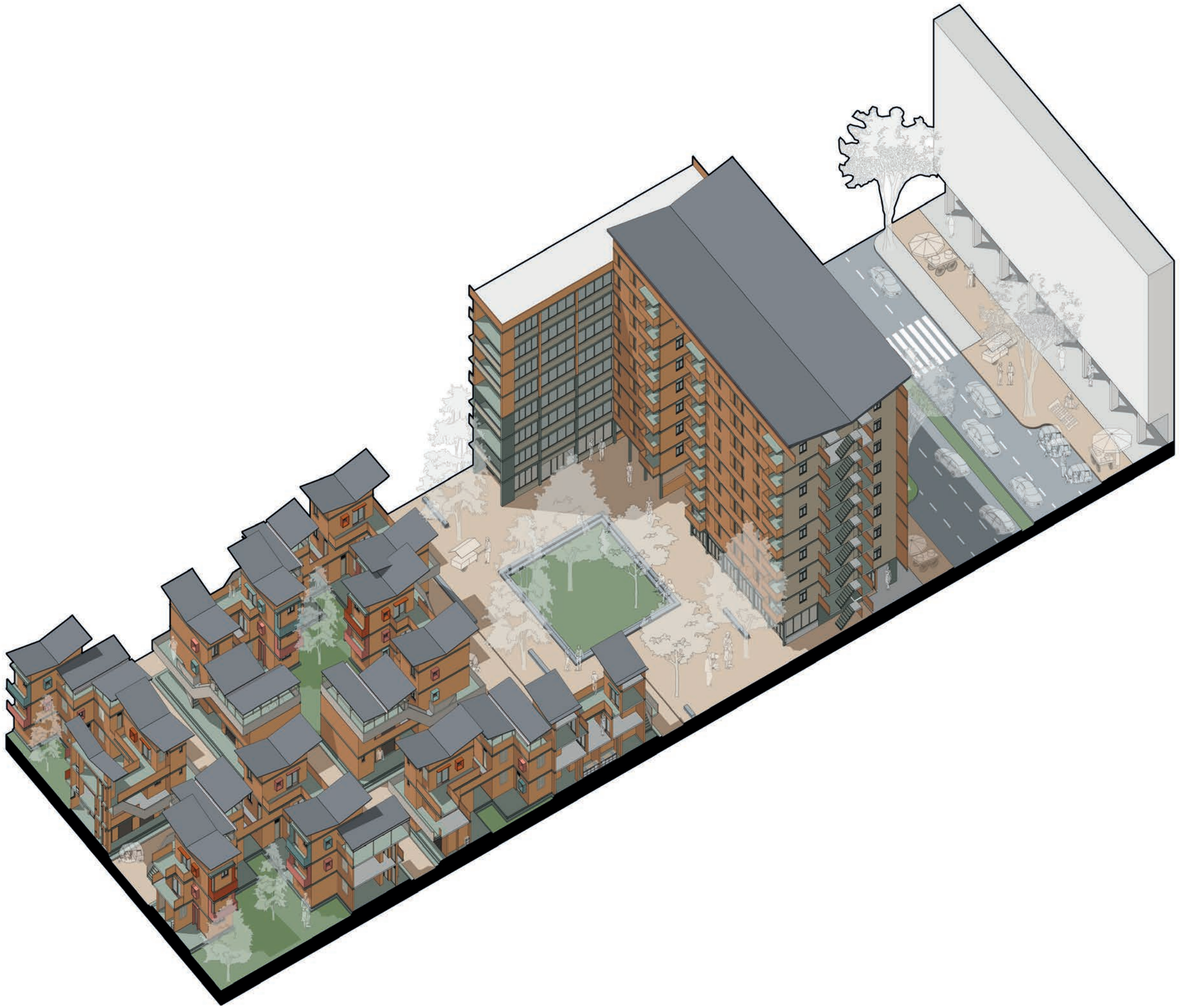
1:200

CLUSTER - ELEVATIONS

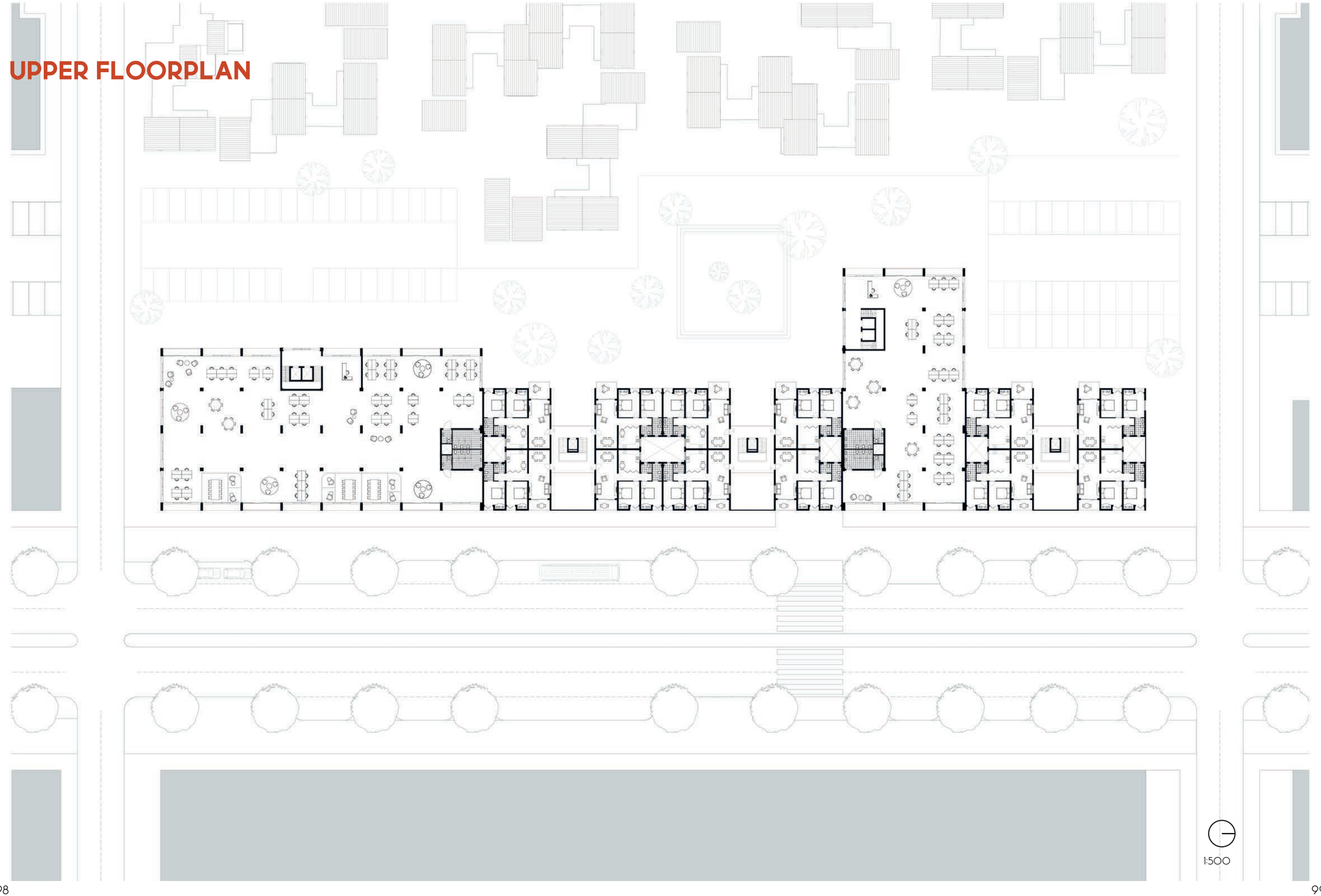
CLUSTER - ELEVATIONS

GROUND FLOORPLAN





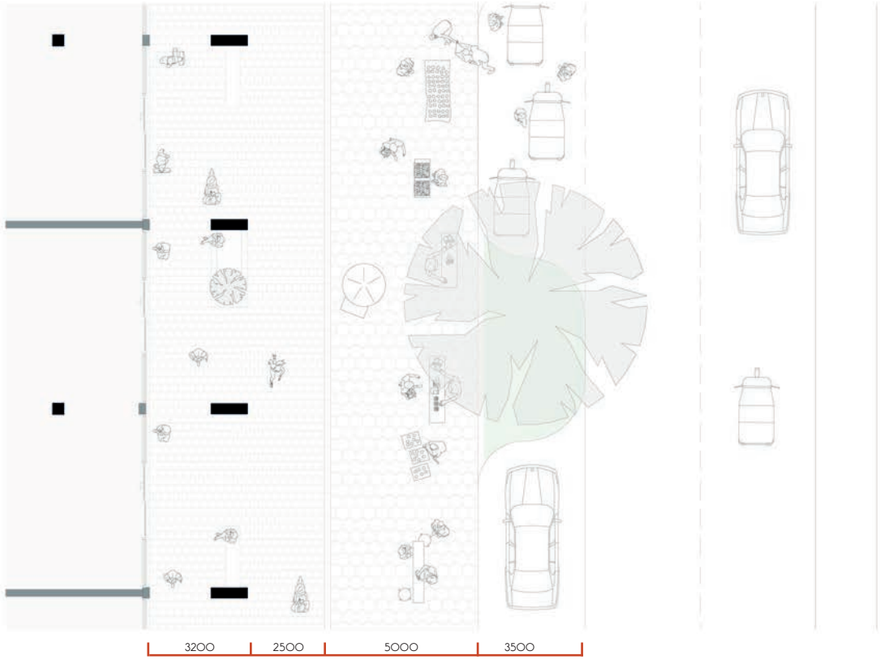
UPPER FLOORPLAN

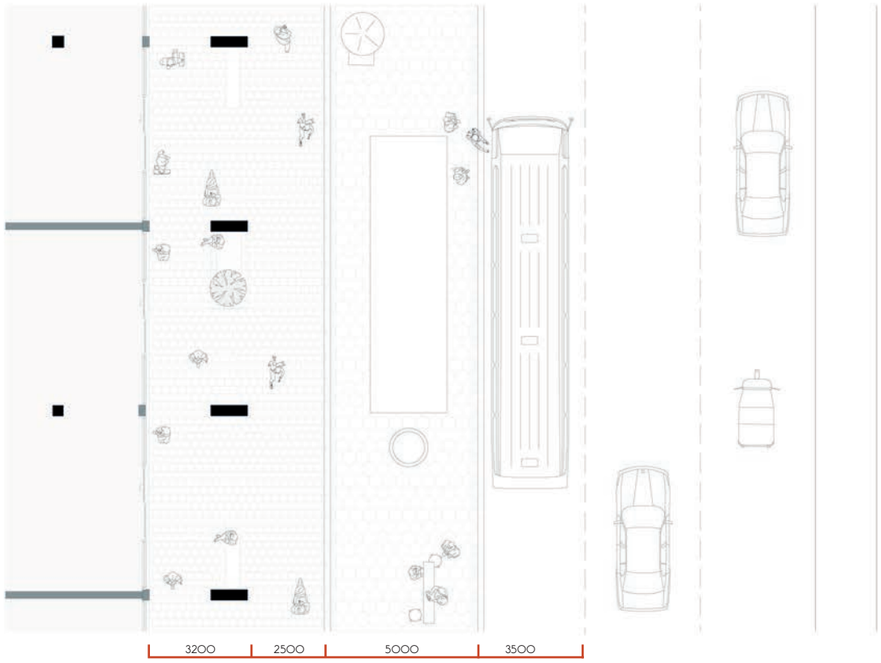


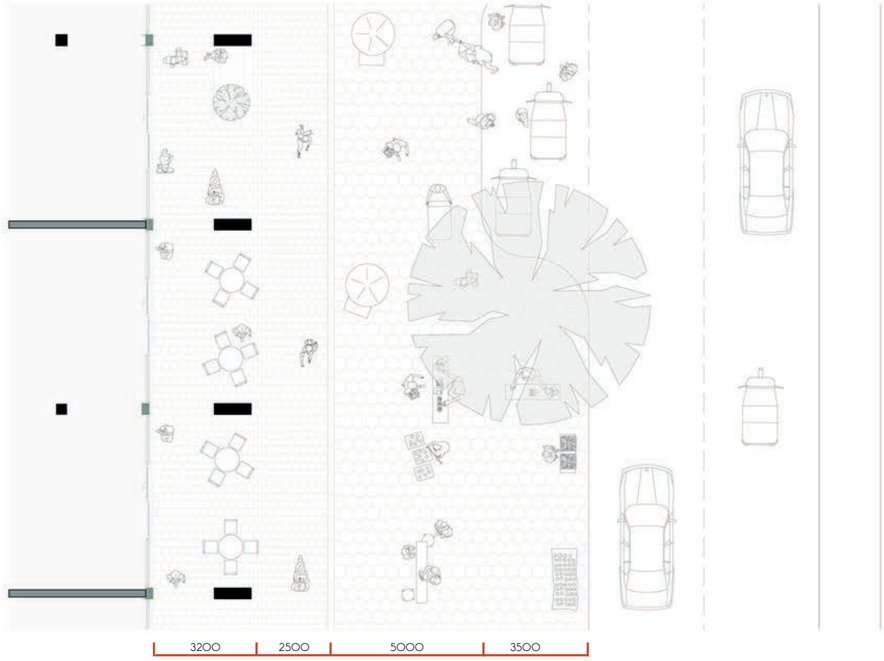
1:500

MAIN STREET

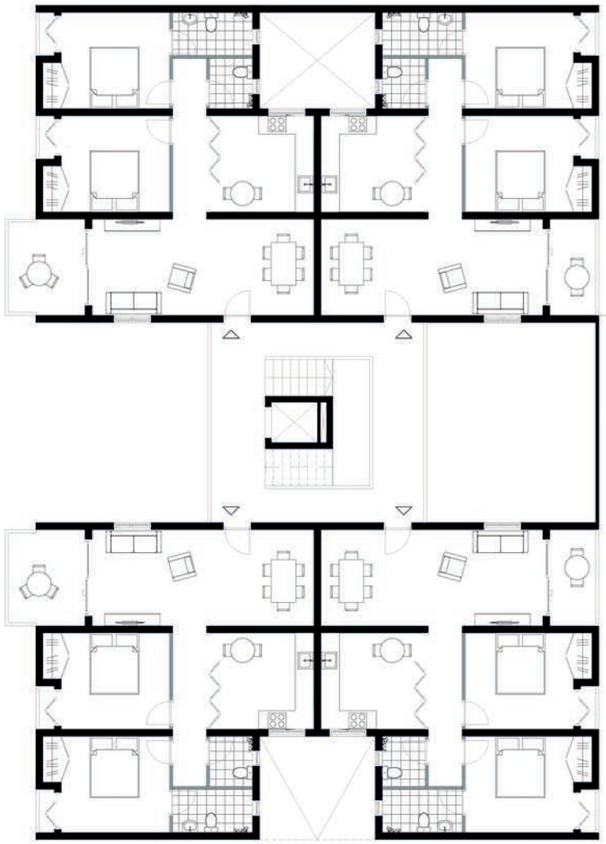
PROFILE MAIN STREET

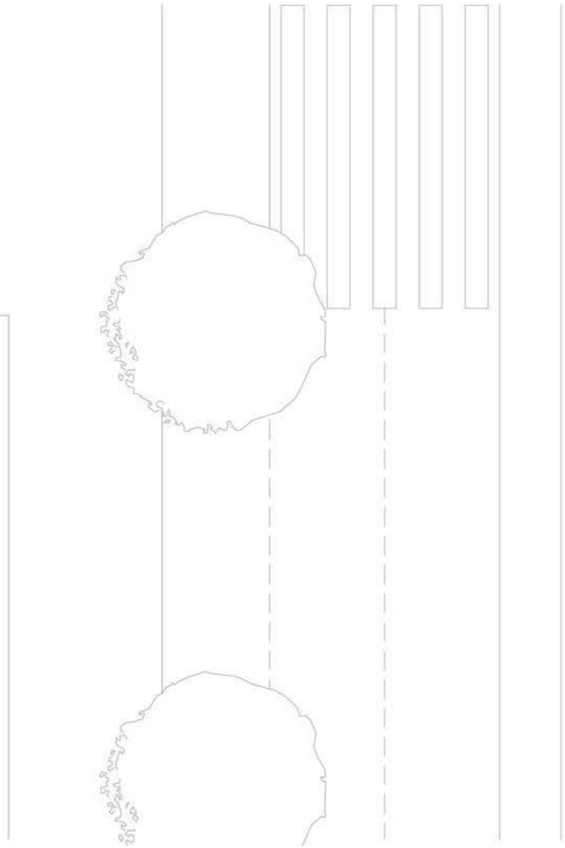






MIG DWELLING UNITS





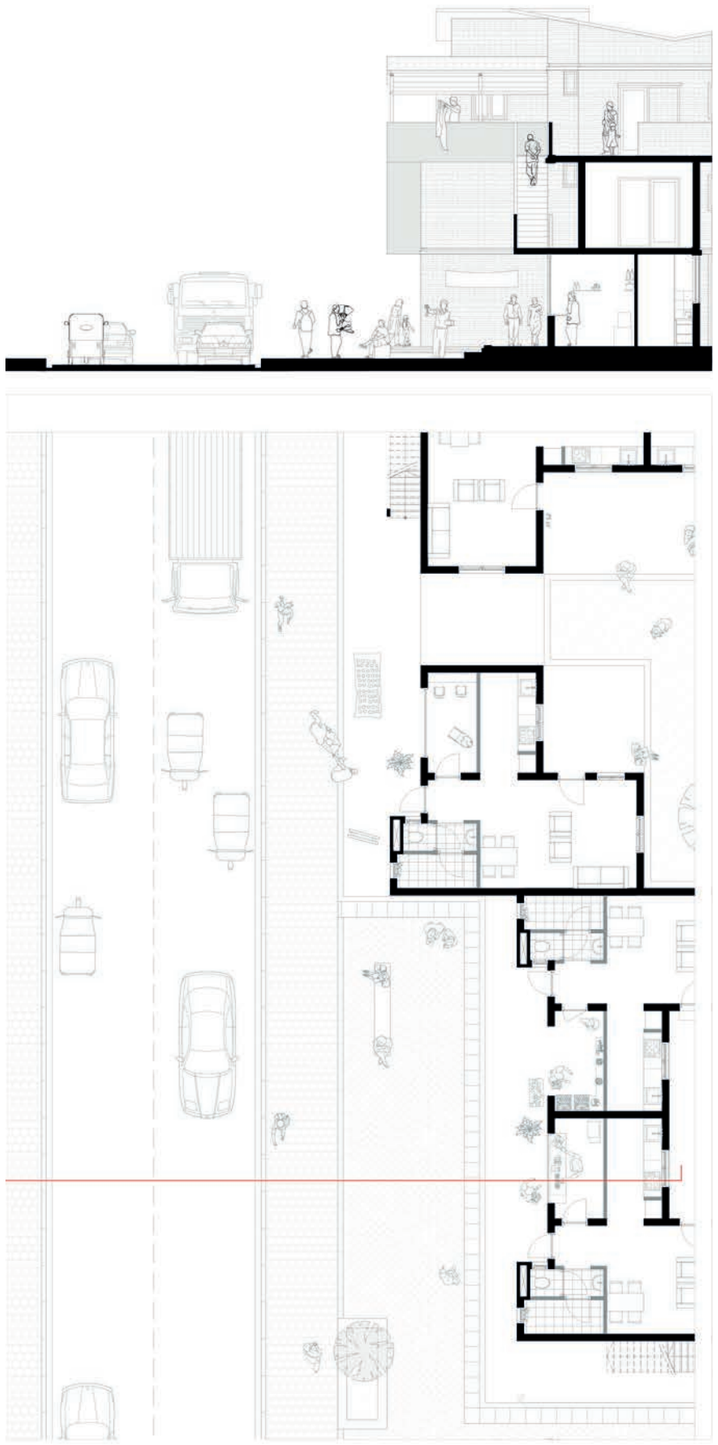
1:200

MIG SECTION

1:200

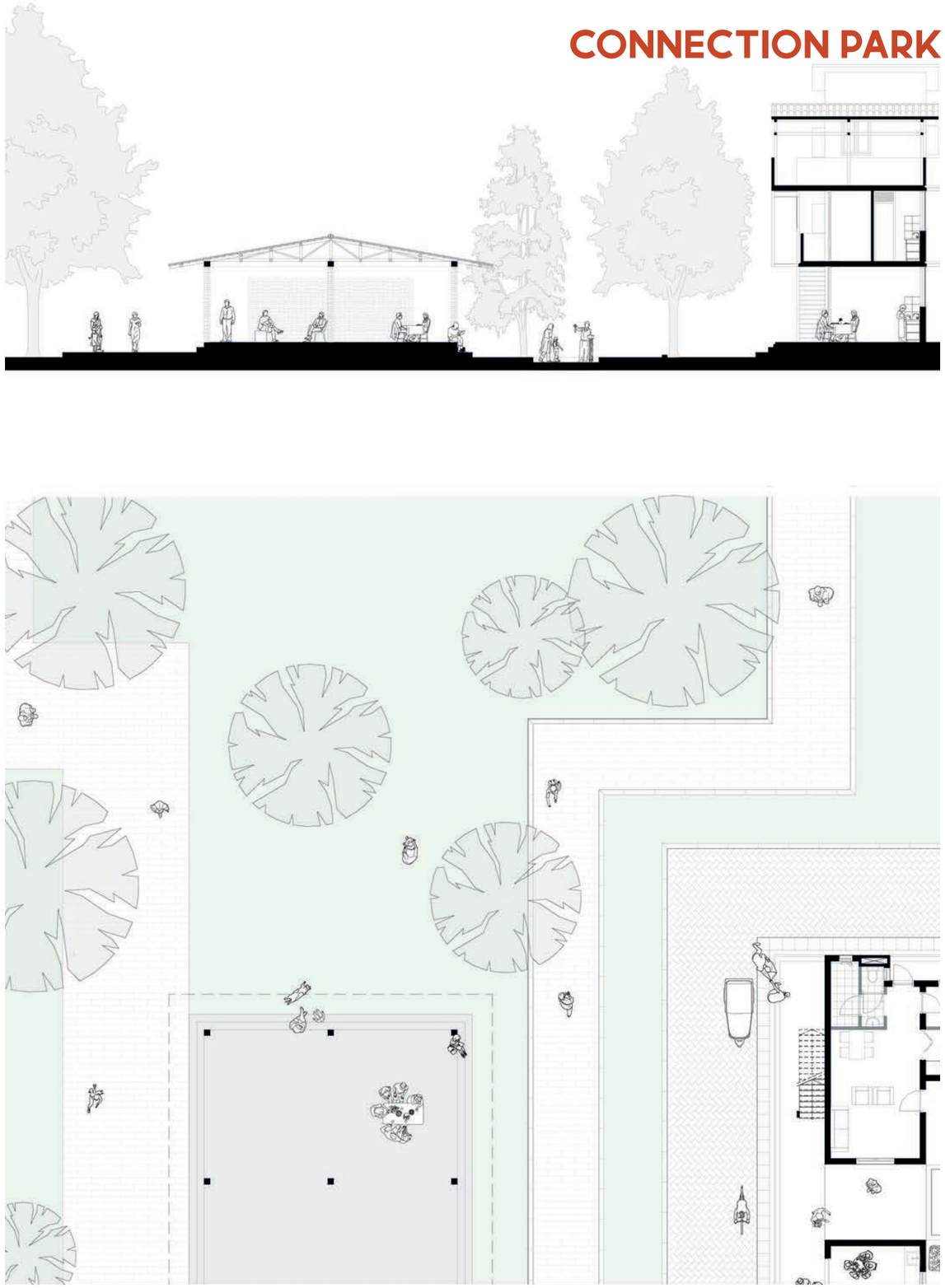
MIG ELEVATIONS

CONNECTION SECONDARY ROAD



1:200

CONNECTION PARK



MATERIALISATION

RURAL AREAS

RURAL AREAS – 'PUCCAFICATION'

THATCHED ROOF

WOODEN ROOF STRUCTURE

MAINTAINING COW DUNG FLOOR

MAKING OF BRICKS

CLAY AND EARTH BRICKS

USE OF CEMENT

Rural areas
The logic of rural architecture is to use locally available materials. A typical house is built on a base of earth contained in a low stonewall/ A wooden structure of poles and beams bears the thatched oof. Walls are filled in with matting of leaves or wicker and then plastered with layers of mud and cow dung. This plasterwork is essential in keeping snakes, insects and rodents out. Cow dung is sticky and has a binding effect, but is easily damaged by termites. Mud is termite resistant, but brittle. By combining these characteristics, a sturdy termite resistant plasterwork is reached through the application of alternating layers. The floor is made of earth and sealed with the same technique as the walls, the ability to breathe contributes to quality of the interior climate.

Slums
The slum dwellers use also locally available materials, but these are not natural materials like in the rural areas. But they are cheap materials that come from mass production and are recycled or waste products. The
absence of equipment makes is hard to make the materials fit and results in the sloppiness look of the dwellings.

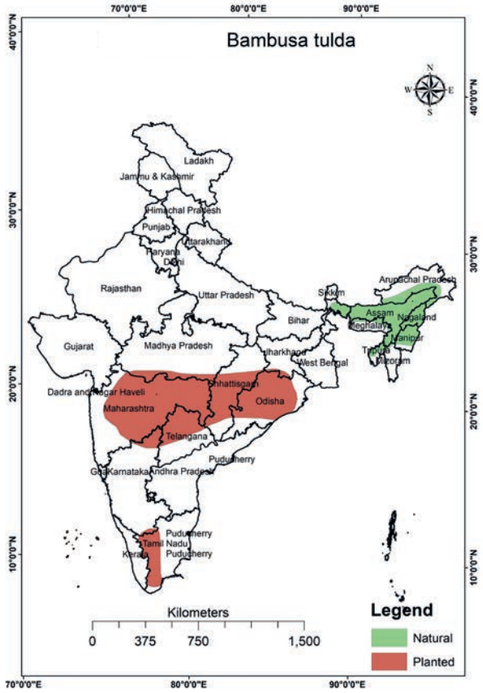
SLUMS

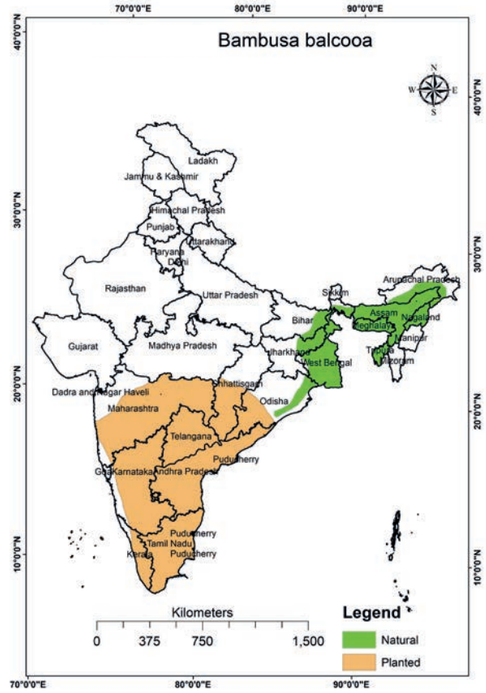
PLASTIC SHEET

CORRUGATED STEEL

INDIA SOIL MAP

BAMBOO PRODUCTION





These bamboos are suitable for construction purposes and grow in the state of Maharashtra.

MATERIALS

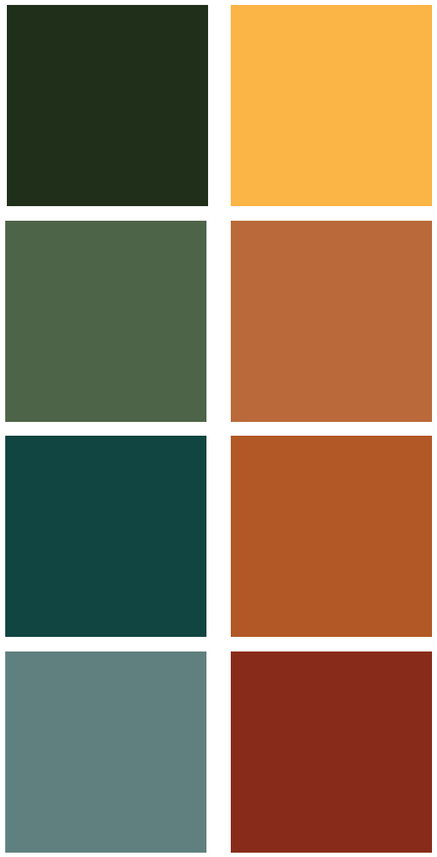
COMPRESSED EARTH BLOCKS

CONCRETE FILLER SLAB

BAMBOO

CERAMIC ROOF TILES

COLOURS



LANDSCAPING

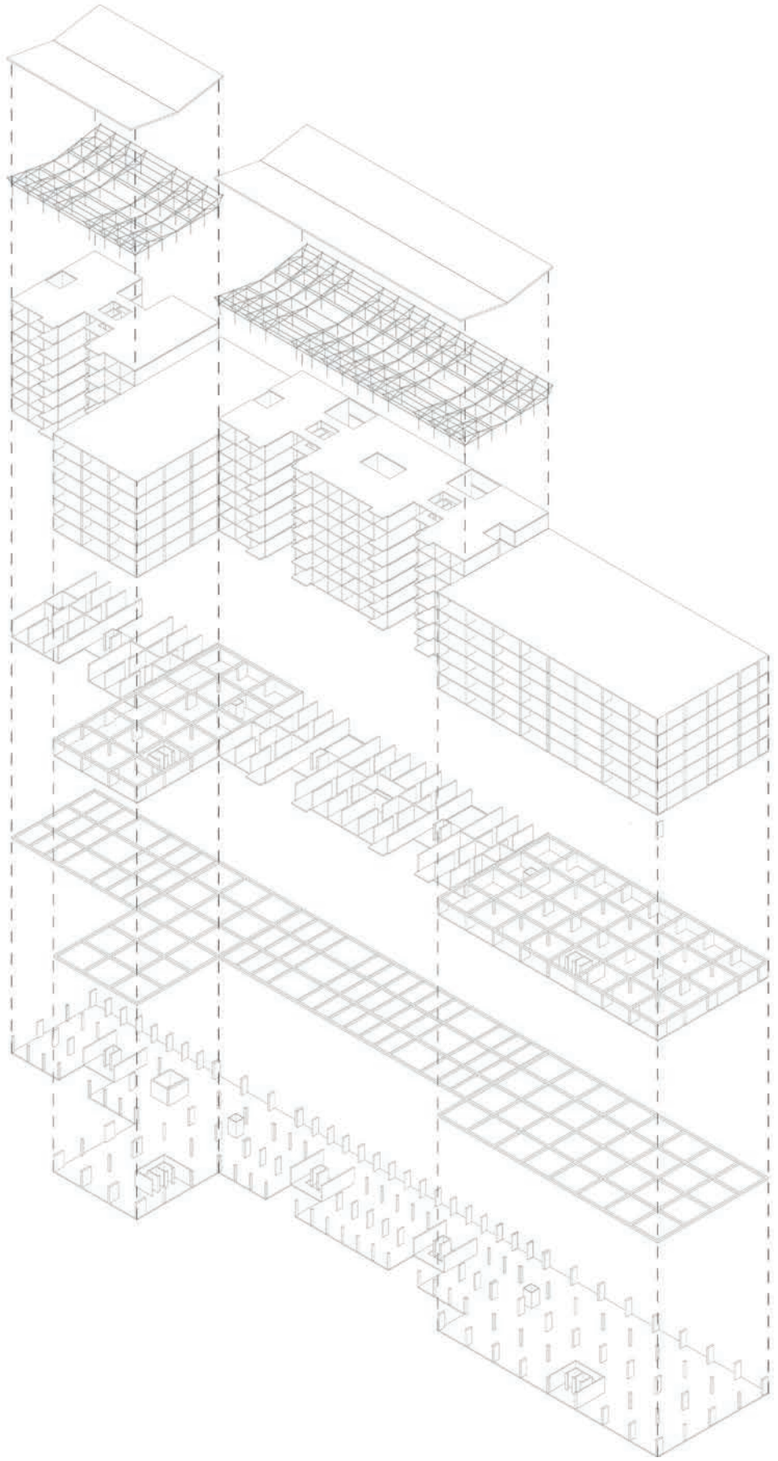
Jack Fruit Tree

Palm Tree

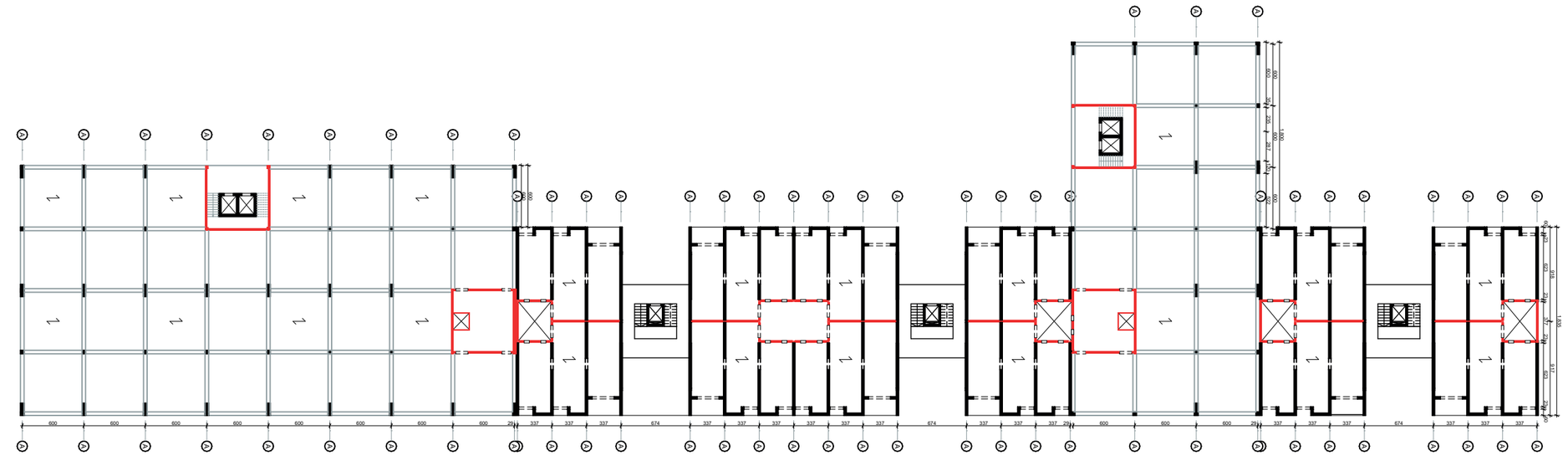
Neem Tree

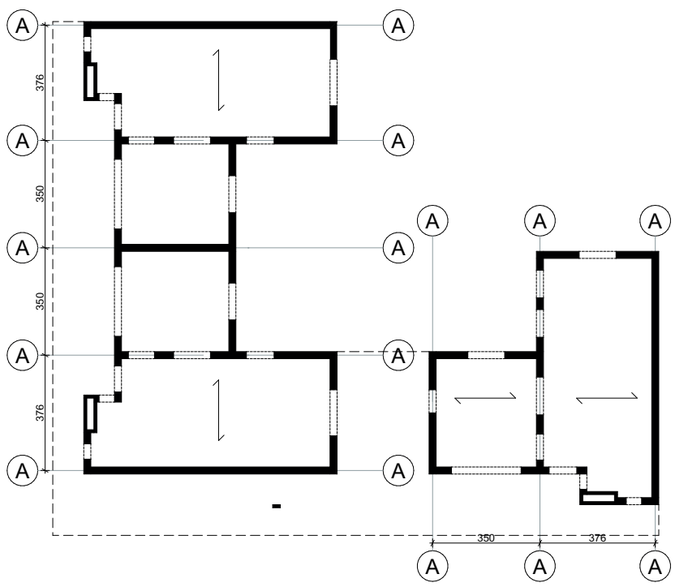
Osaka Tree

CONSTRUCTION

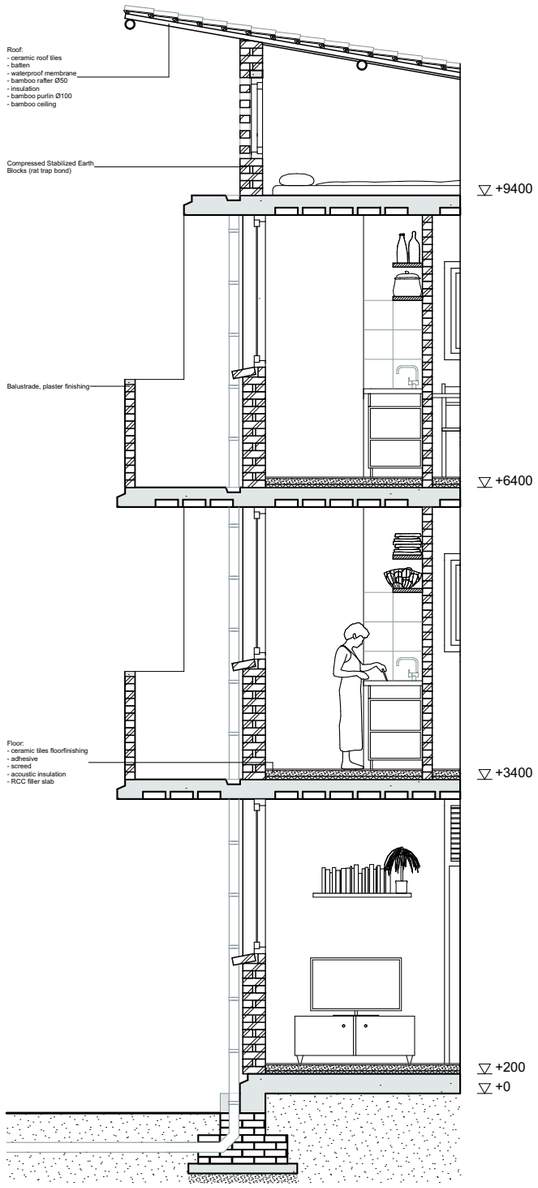


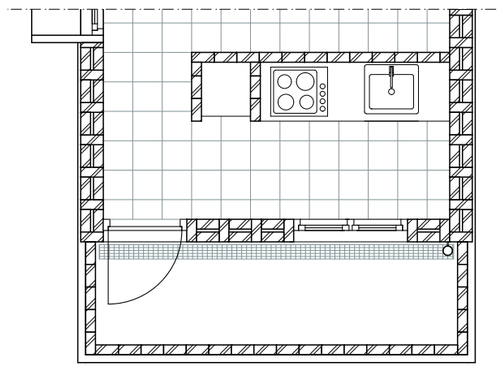
CONSTRUCTION

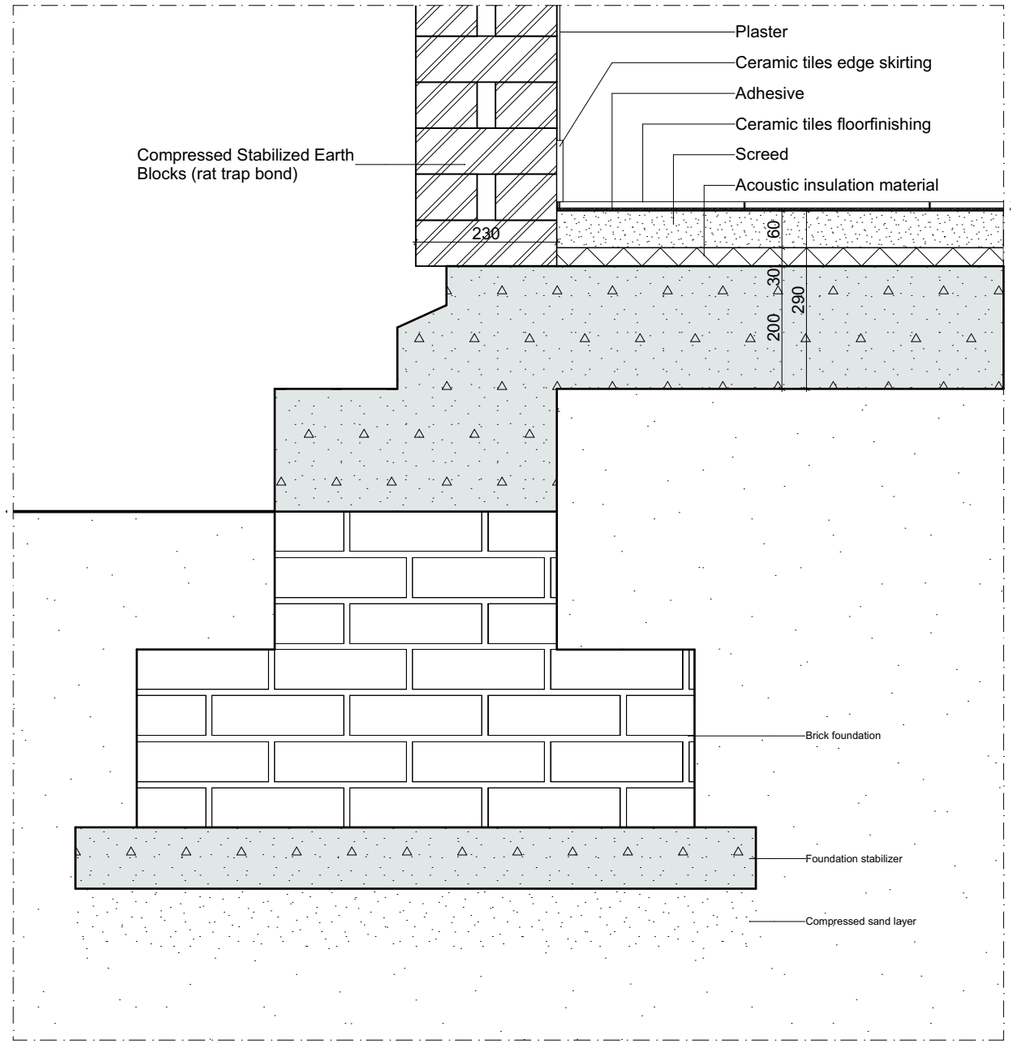


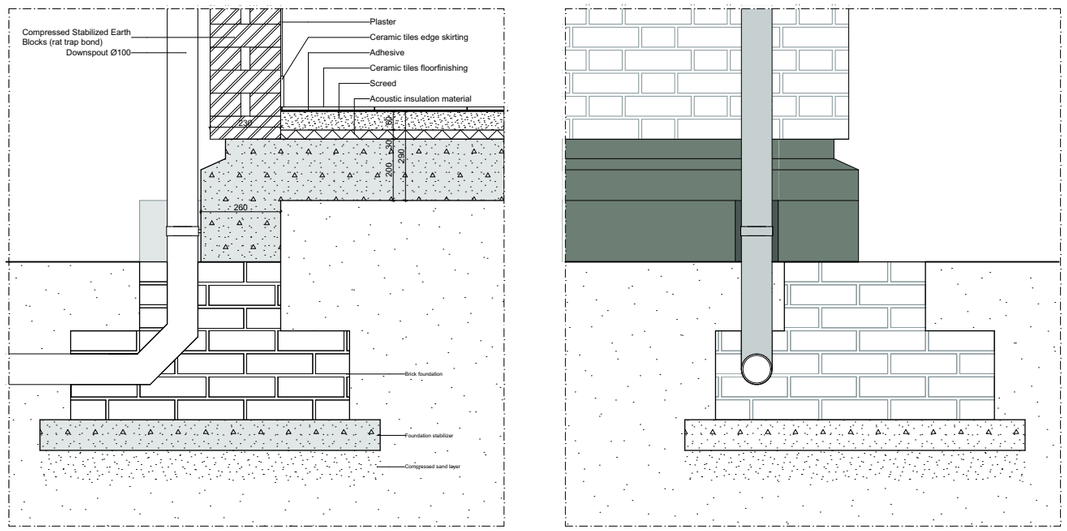


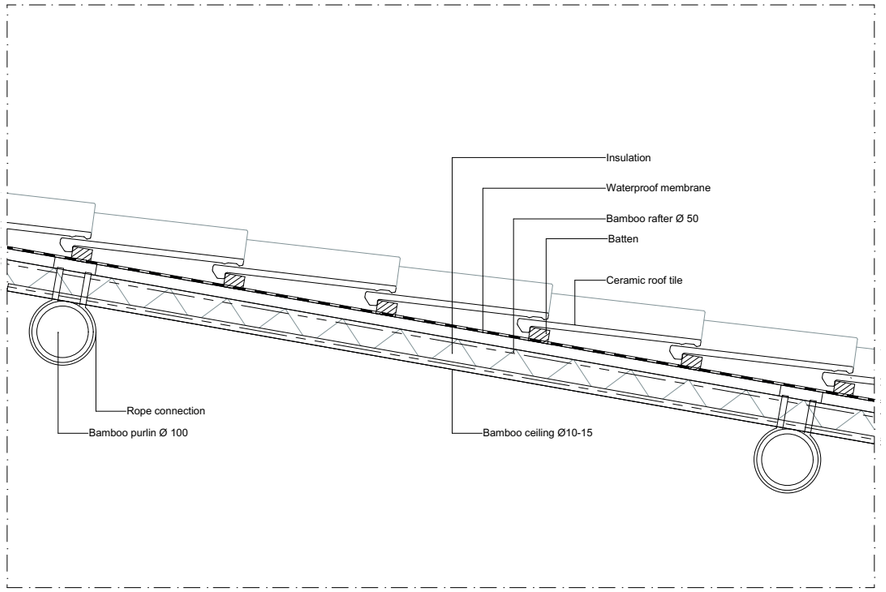
The clusters are made of compressed stabalized earth bricks. The concrete filler slabs have an embedded concrete ring-beam, which spread the loads evenly over the bricks.
The MIG appartment building has concrete columns and walls on the first four floors and the top four floors are made of compressed stabilized earth bricks. The load-bearing capacity of the earth bricks is not enough to go up to eight floors.


Roof:
- ceramic roof tiles
- batten
- waterproof membrane
- bamboo rafter Ø50
- insulation
- bamboo purlin Ø100
- bamboo ceiling
Compressed Stabilized Earth Blocks (rat trap bond)
Balustrade, plaster finishing
Floor:
- ceramic tiles floorfinishing
- adhesive
- screed
- acoustic insulation
- RCC filler slab
+9400
+6400
+3400
+200
+0

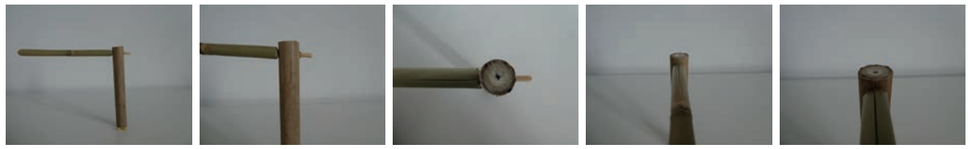



Compressed Stabilized Earth Blocks (rat trap bond)
Plaster
Ceramic tiles edge skirting
Adhesive
Ceramic tiles floorfinishing
Screed
Acoustic insulation material
230
60
30
290
200
Brick foundation
Foundation stabilizer
Compressed sand layer





Mortise and tenon joint

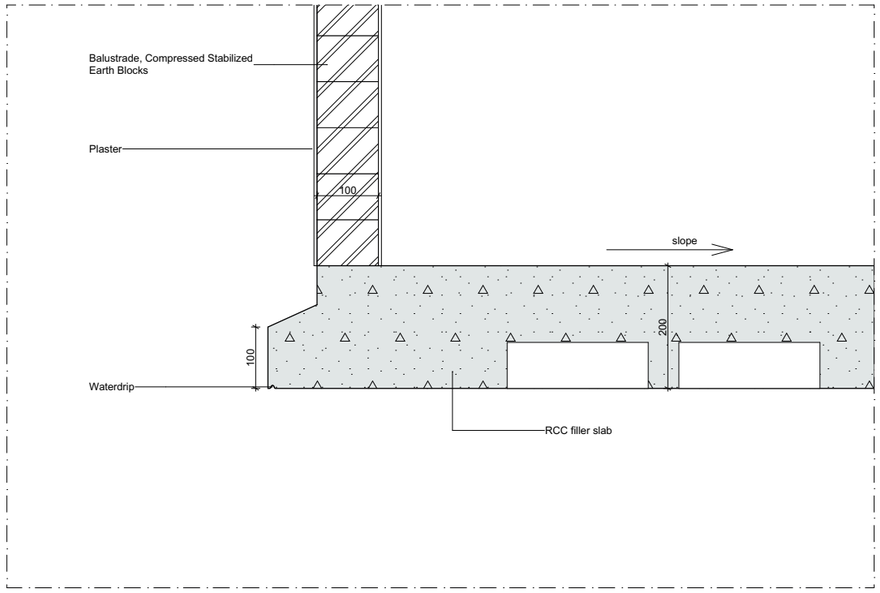


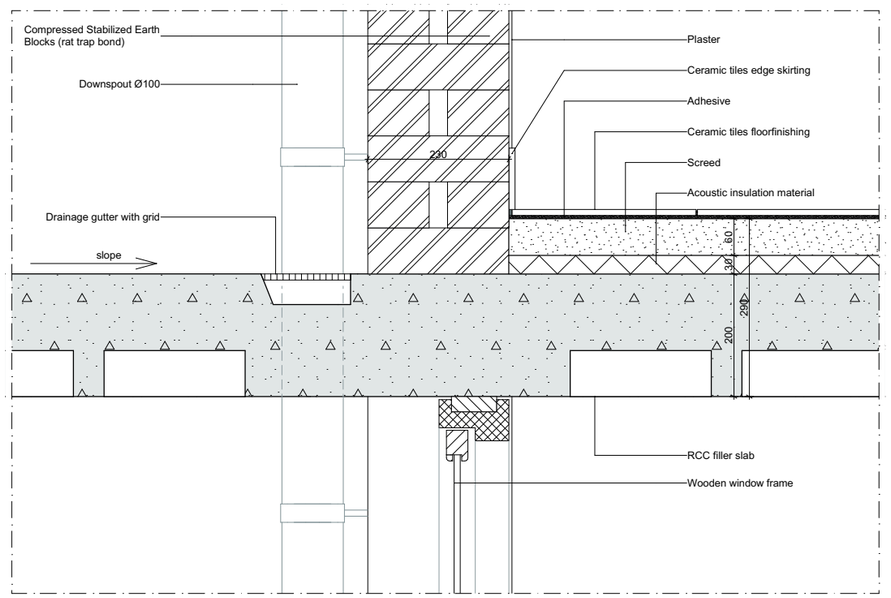
Rope connection diagonal

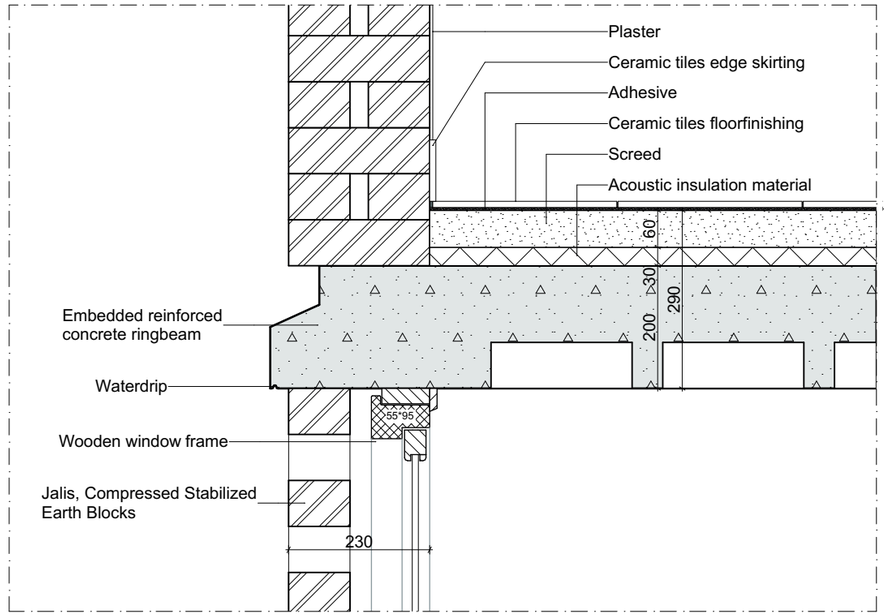
Rope connection square

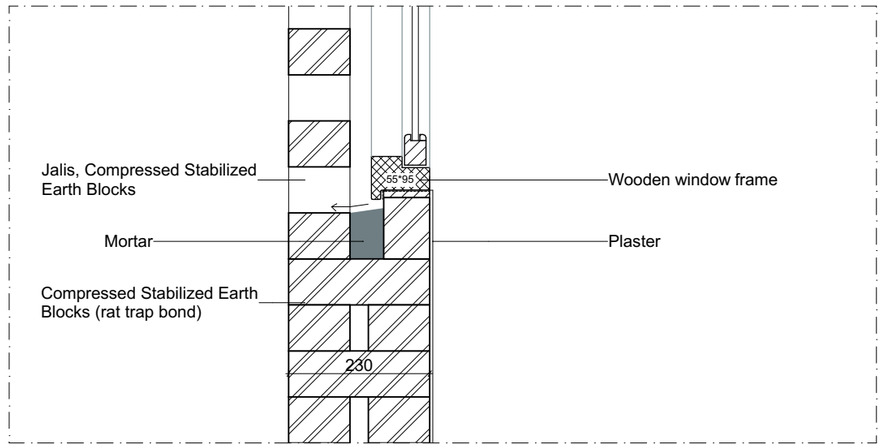
The roof construction is made of bamboo. Different possibilities where tested. A big disadvantage of the mortise and tenon joint is that bamboo is not straight and therefore the connections between the columns can become very difficult. In addition, this connection can influence the strength of the column. The cross connections are not incidental, making holes in bamboo weakens it and will split more easily.

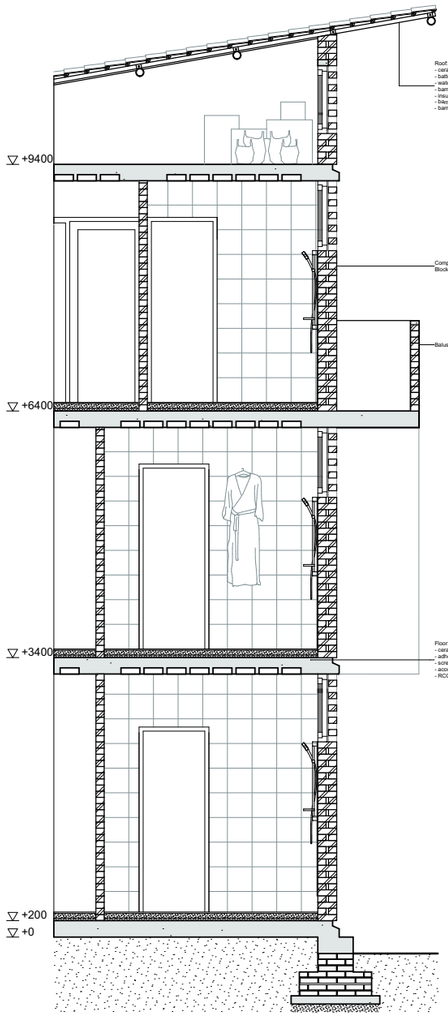
In the last two variants, the connection is made with ropes to lash the bamboo. This has been tested in two different ways, namely diagonal and square. Both connections are very reliable and strong. For aesthetical reasons, diagonal connection is chosen.

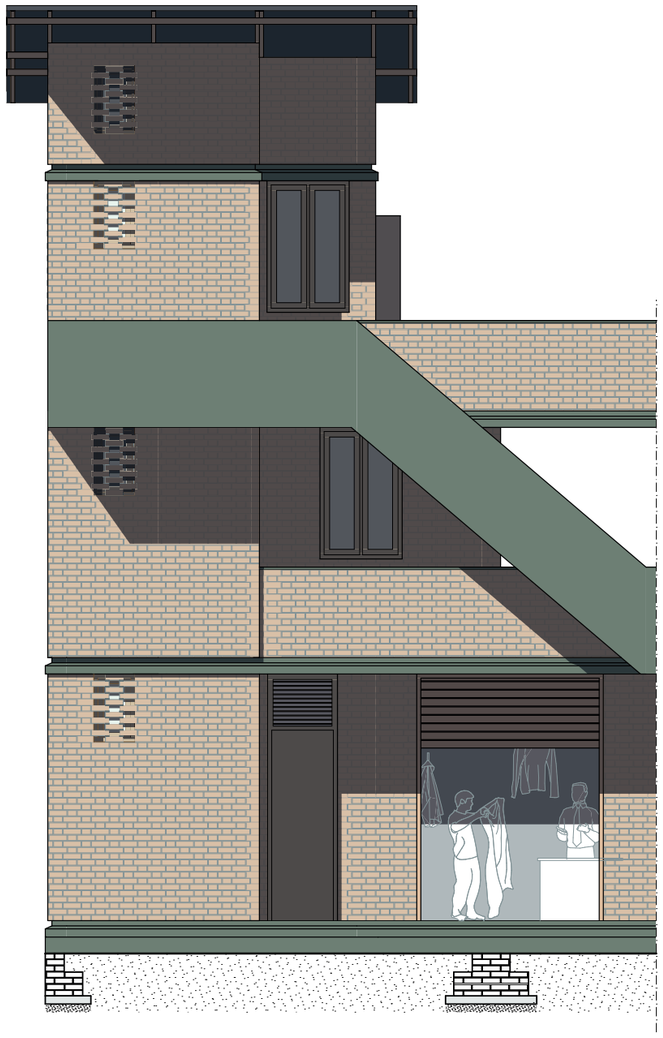

Balustrade, Compressed Stabilized Earth Blocks
Plaster
100
slope
100
200
Waterdrip
RCC filler slab

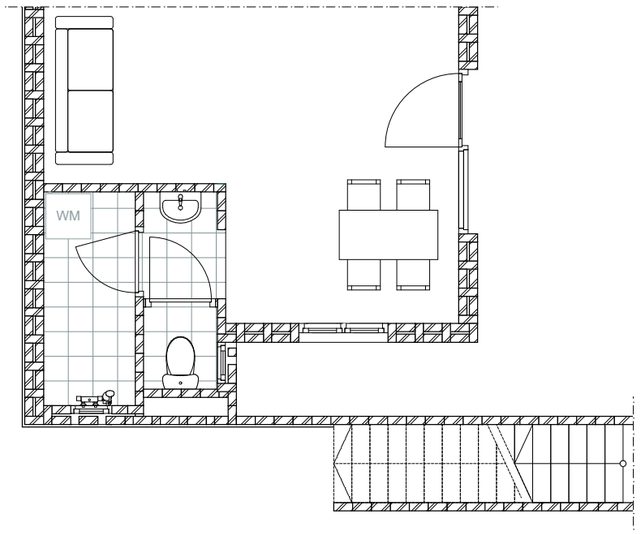

Compressed Stabilized Earth Blocks (rat trap bond)
Downspout Ø100
Drainage gutter with grid
slope
230
Plaster
Ceramic tiles edge skirting
Adhesive
Ceramic tiles floorfinishing
Screed
Acoustic insulation material
60
30
290
200
RCC filler slab
Wooden window frame

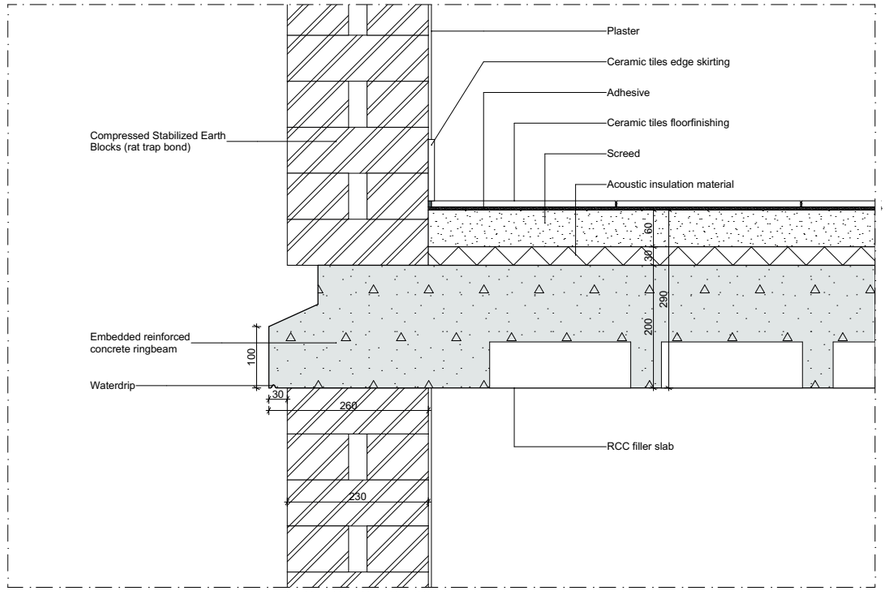

Plaster
Ceramic tiles edge skirting
Adhesive
Ceramic tiles floorfinishing
Screed
Acoustic insulation material
60
30
290
200
Embedded reinforced concrete ringbeam
Waterdrip
55*95
Wooden window frame
Jalis, Compressed Stabilized Earth Blocks
230

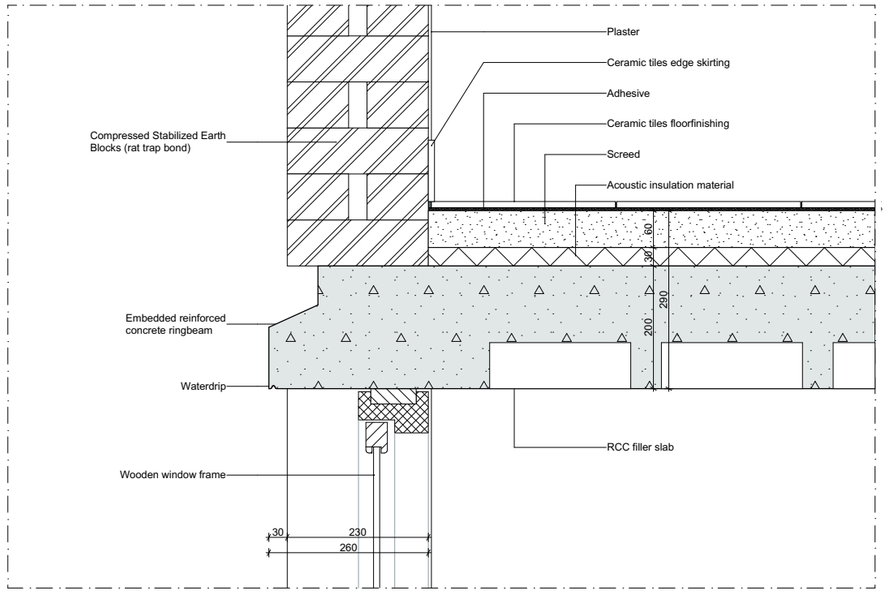

Jalis, Compressed Stabilized Earth Blocks
55*95
Wooden window frame
Mortar
Plaster
Compressed Stabilized Earth Blocks (rat trap bond)
230


Roof:
- ceramic roof tiles
- batten
- waterproof membrane
- bamboo rafter Ø50
- insulation
- bamboo purlin Ø10g
- bamboo ceiling
+9400
Compressed Stabilized Earth Blocks (rat trap bond)
Balustrade, plaster finishing
+6400
Floor:
- ceramic tiles floorfinishing
- adhesive
- screed
- acoustic insulation
- RCC filler slab
+3400
+200
+0



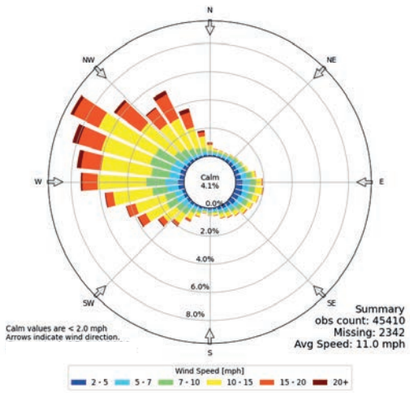

WM

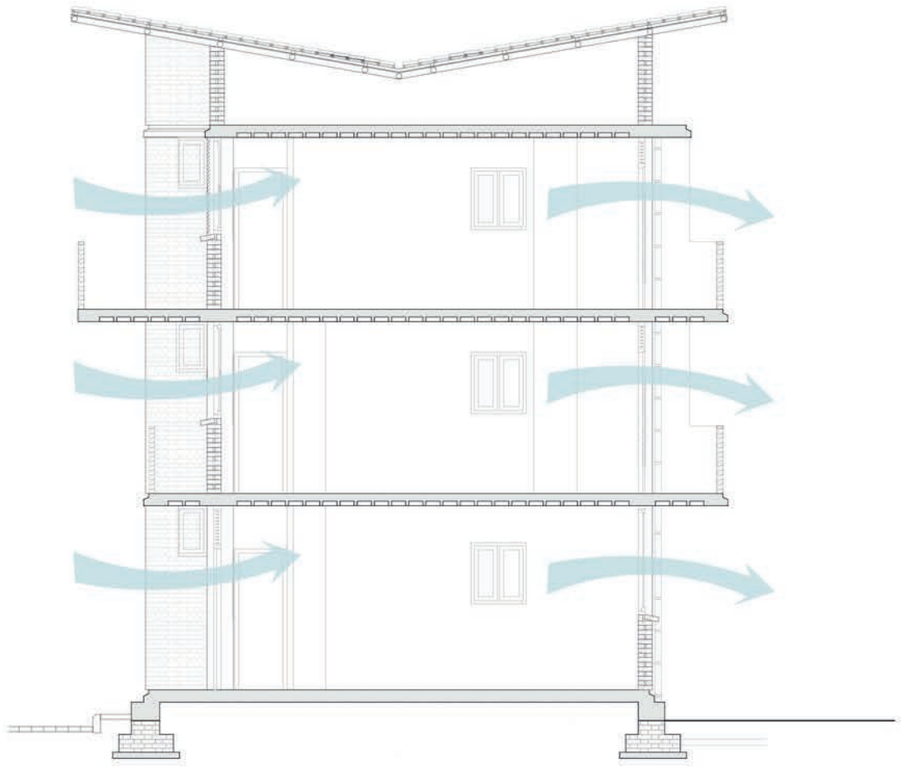

Plaster
Ceramic tiles edge skirting
Adhesive
Ceramic tiles floorfinishing
Screed
Acoustic insulation material
Compressed Stabilized Earth Blocks (rat trap bond)
Embedded reinforced concrete ringbeam
Waterdrip
RCC filler slab
60
30
290
200
100
30
260
230

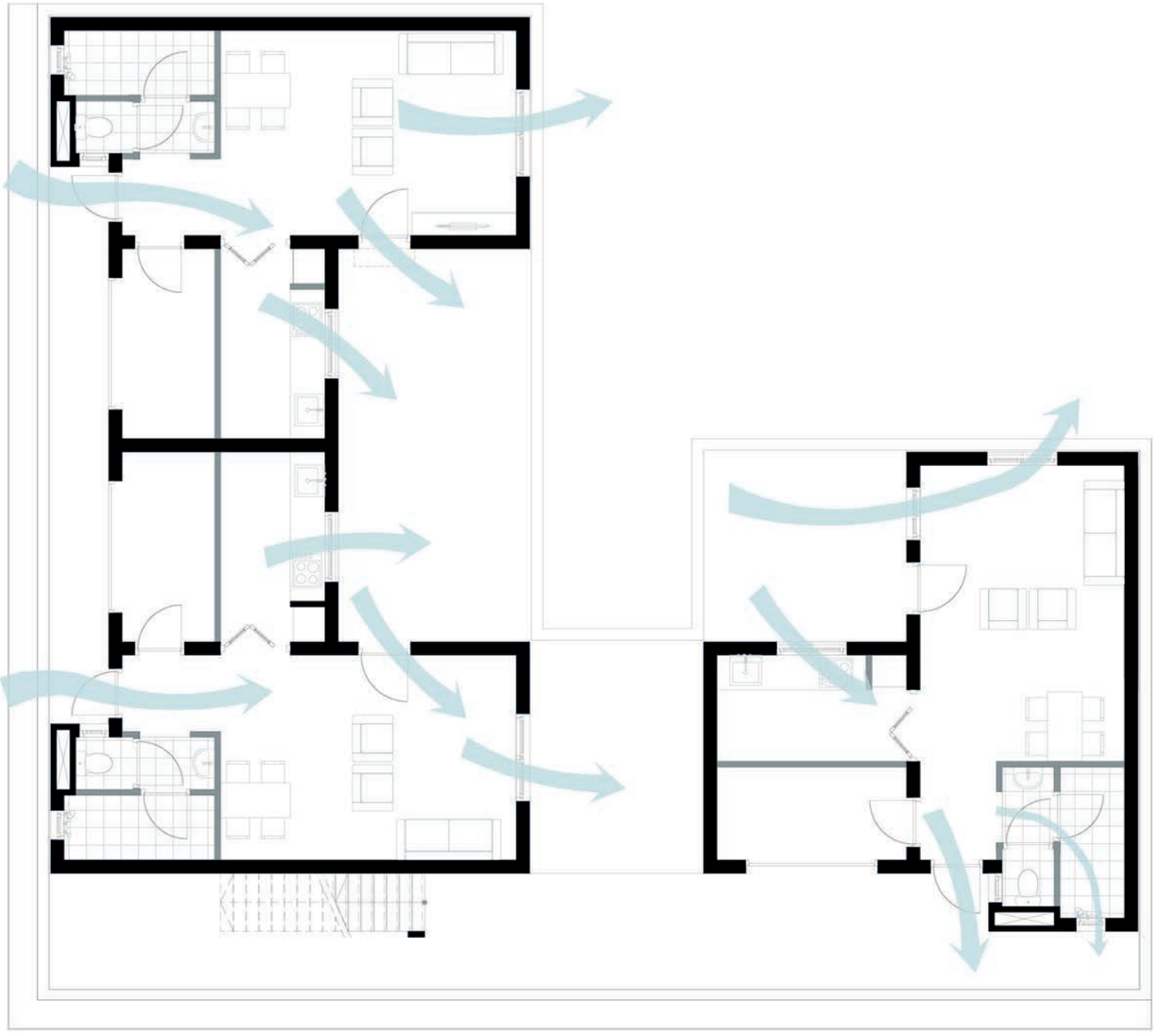

Plaster
Ceramic tiles edge skirting
Adhesive
Ceramic tiles floorfinishing
Screed
Acoustic insulation material
Compressed Stabilized Earth Blocks (rat trap bond)
Embedded reinforced concrete ringbeam
Waterdrip
RCC filler slab
Wooden window frame
60
30
290
200
30
230
260

CLIMATE

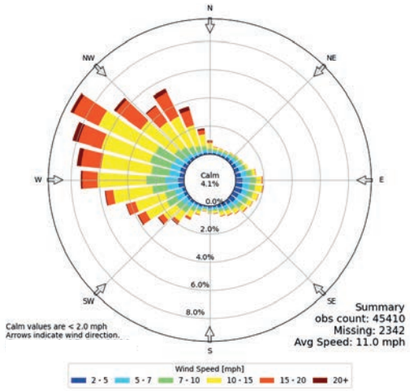
VENTILATION

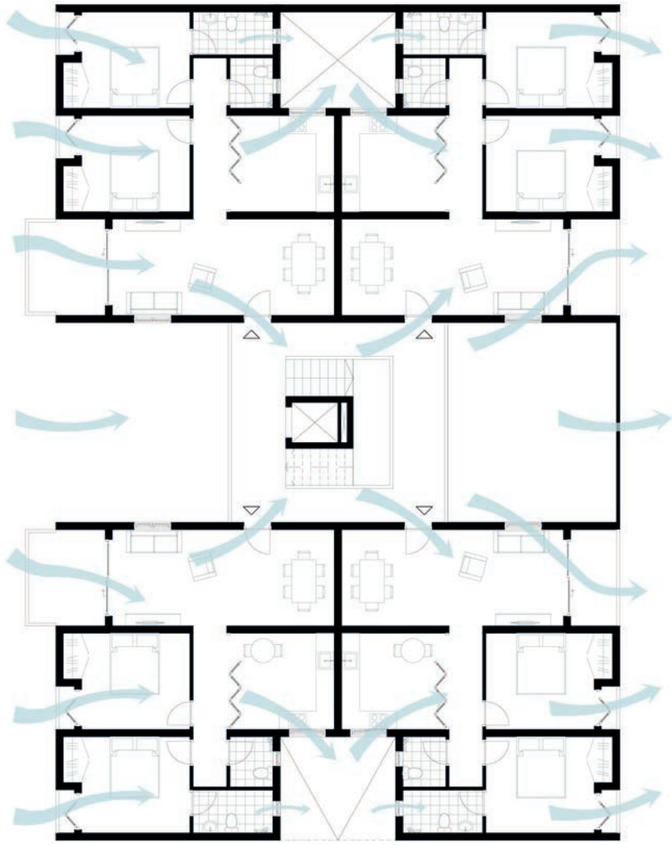




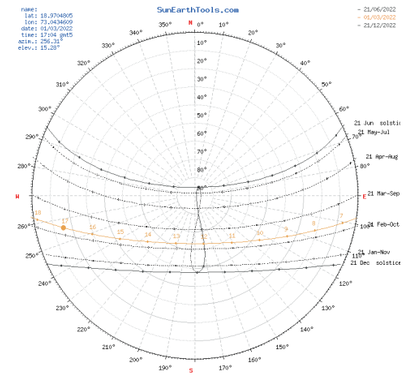


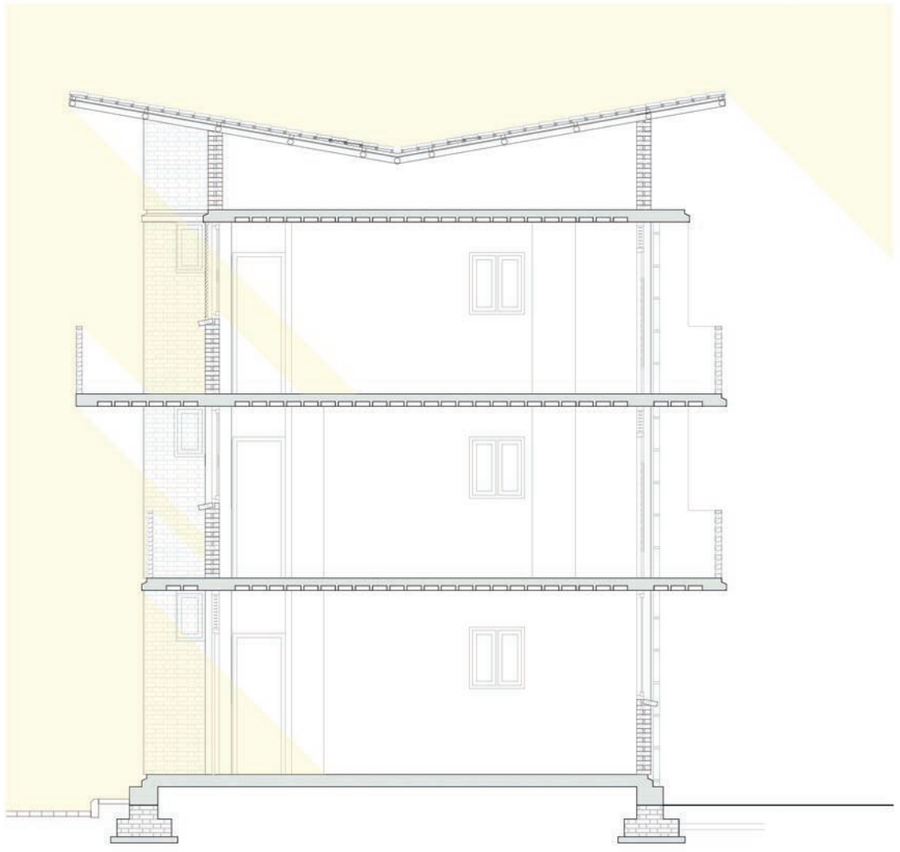
VENTILATION



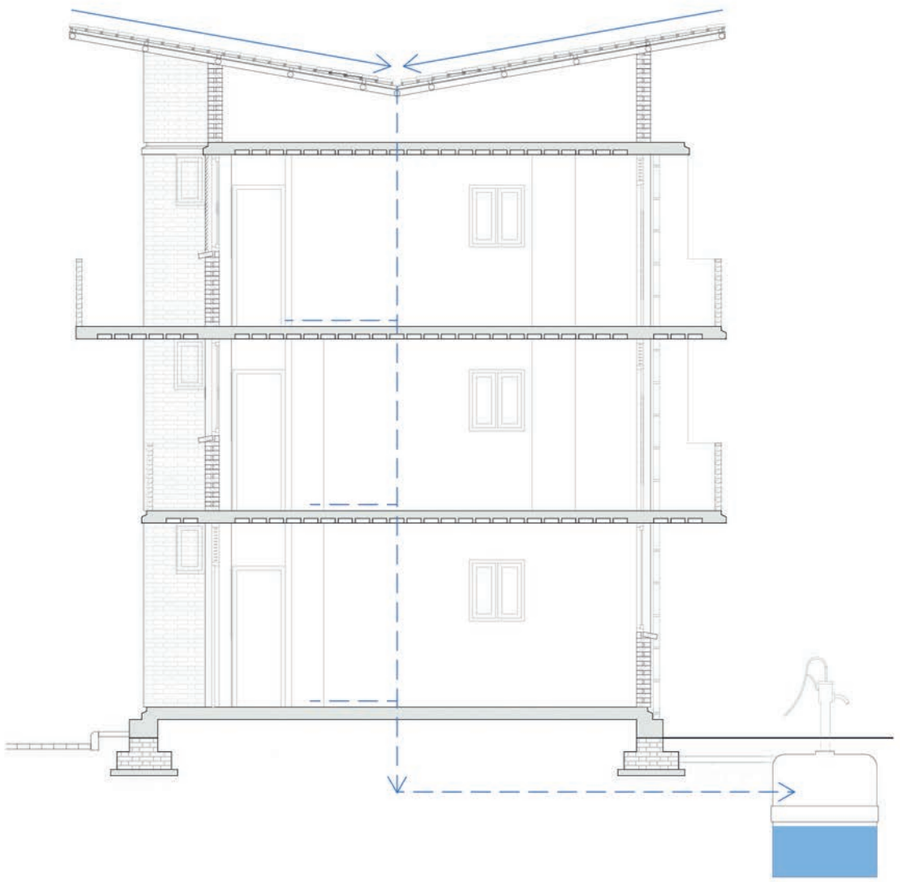


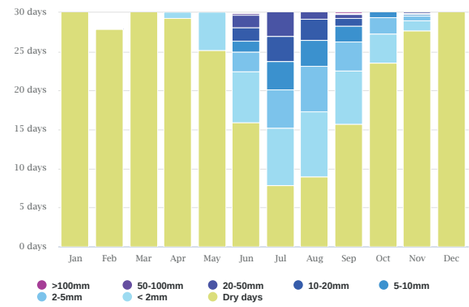
SHADING


SunEarthTools.com
name:
lat: 18.9704805
lon: 72.8434659
date: 01/03/2022
time: 17:04 GMT5
azim.: 257.33
elev.: 17.28°
- 21/06/2022
- 01/09/2022
- 21/12/2022
21 Jun solsti
21 May-Jul
21 Apr-Aug
21 Mar-Sep
21 Feb-Oct
21 Jan-Nov
21 Dec solstice

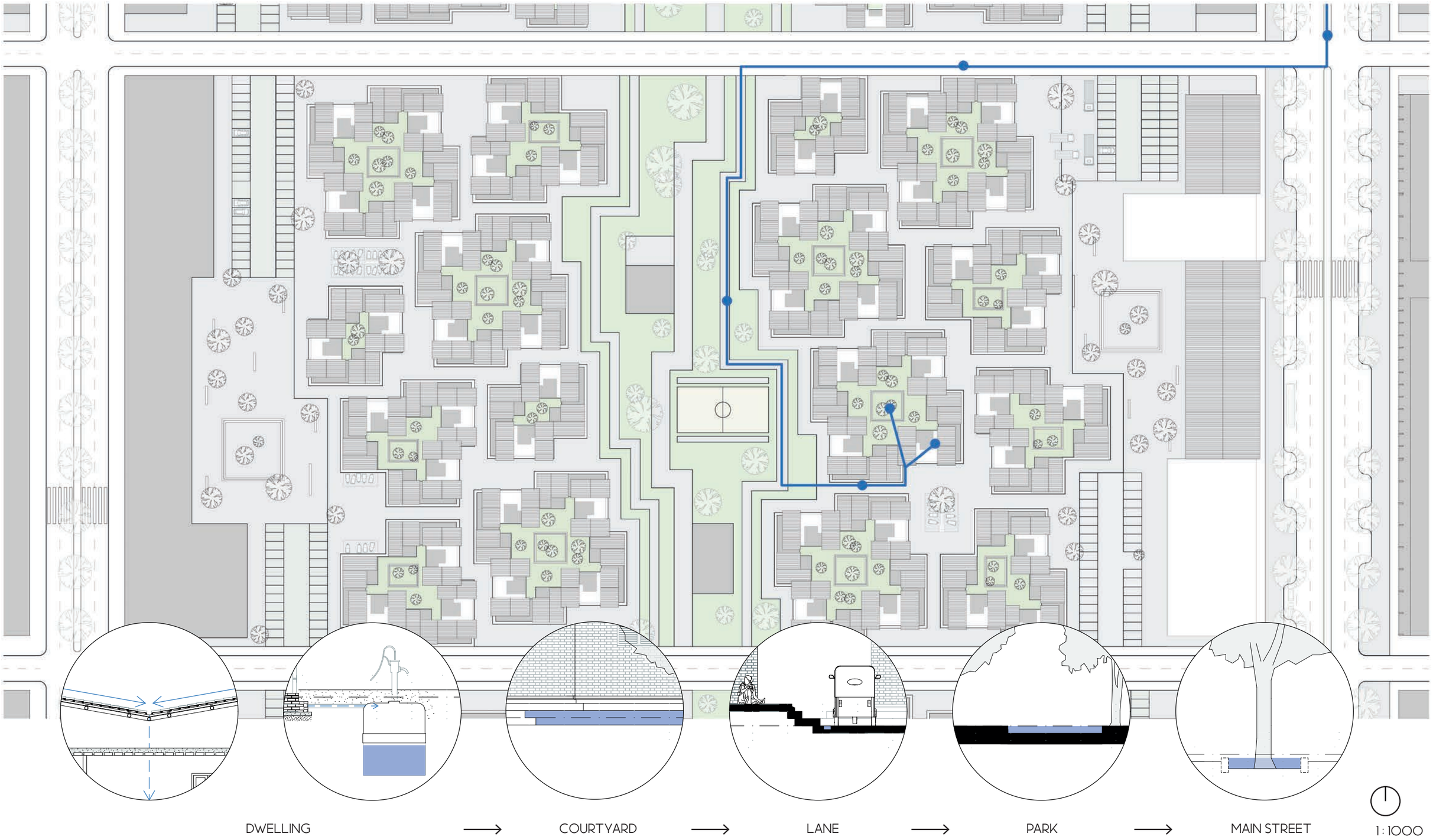


WATER MANAGEMENT

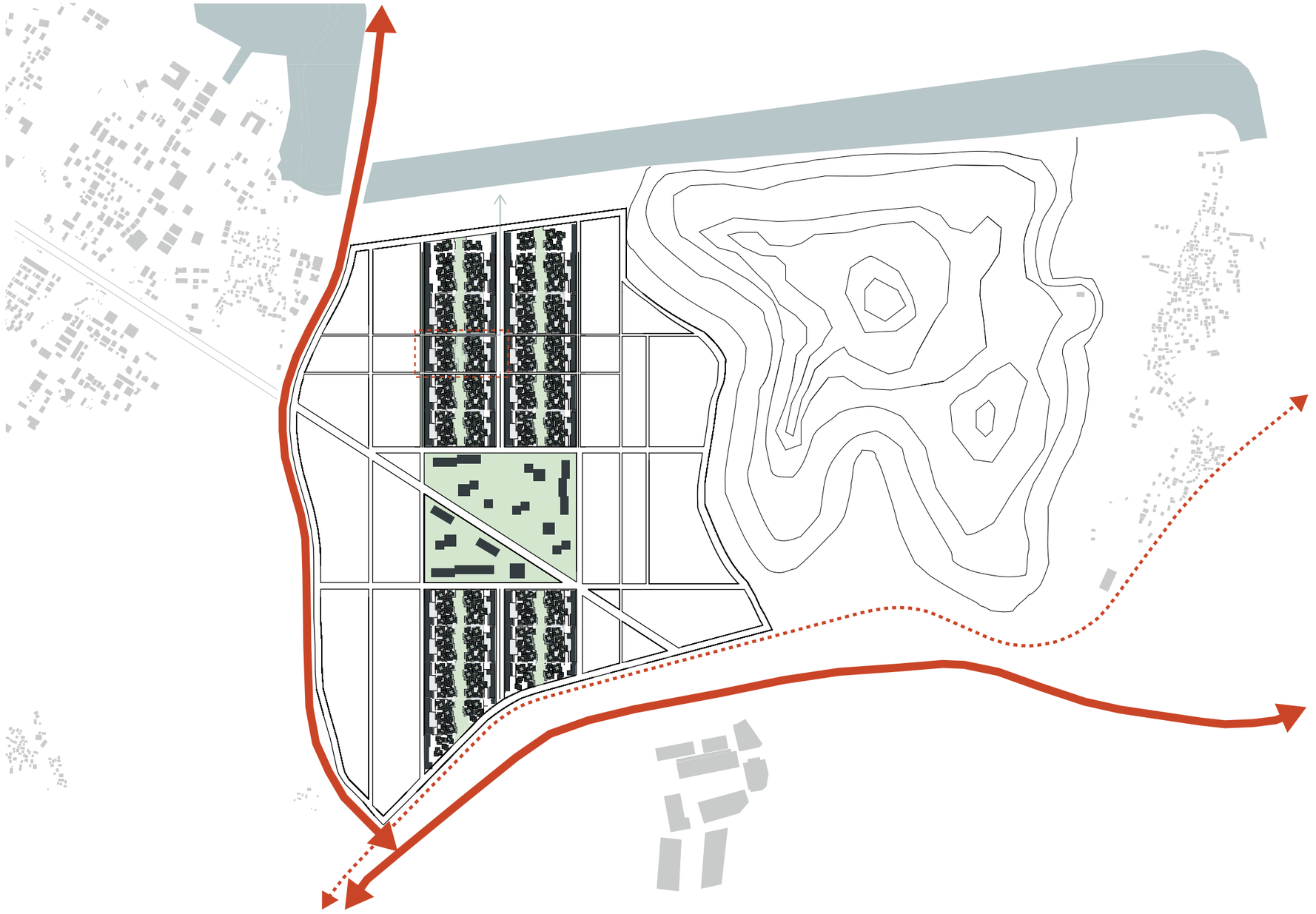




WATER MANAGEMENT



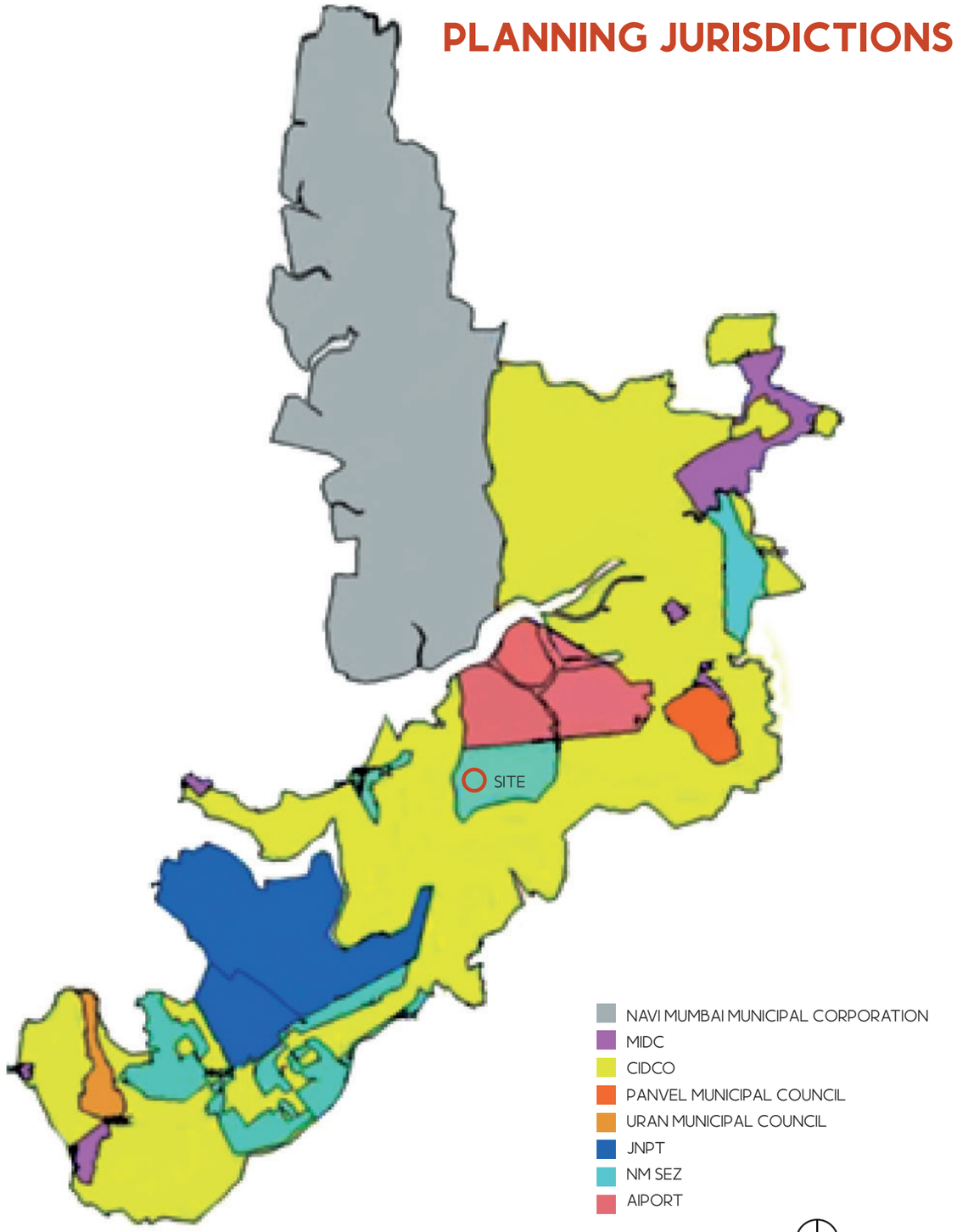
WATER MANAGEMENT



The monsoons are a big problem in (Navi) Mumbai. Every year for a couple of months there is a lot of rain.
The butterfly roofs collect the water. Some of this can be used for toilets and washing machine. The rest will be collected in an underground tank. With a handpump the dwellers can use the water if needed. On cluster scale there is a sunken courtyard which can be flooded during peak hours. The water from the roads will go towards the park. There is a raised path and a sunken path, the latter will change during to monsoon in a water track and will go to the secondary roads and via a gutter towards the main road. Which has a sunken green zone in the middle. So both pavements and streets will slope towards this and will eventually end in the Ulwe river. So to prevent water entering the dwellings, they are raised with three steps (600mm). The images on the previous pages show how the dwelling, courtyard and roads deviates from zero.

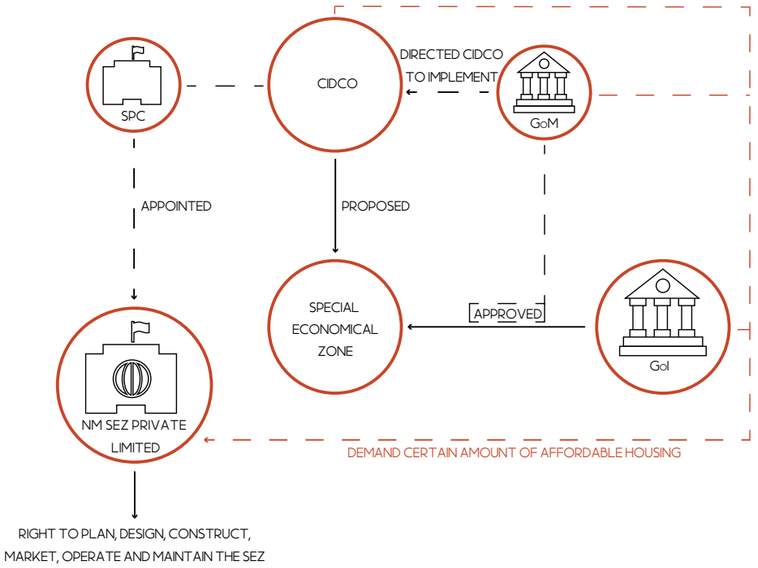
MANAGERIAL STRUCTURE

PLANNING JURISDICTIONS



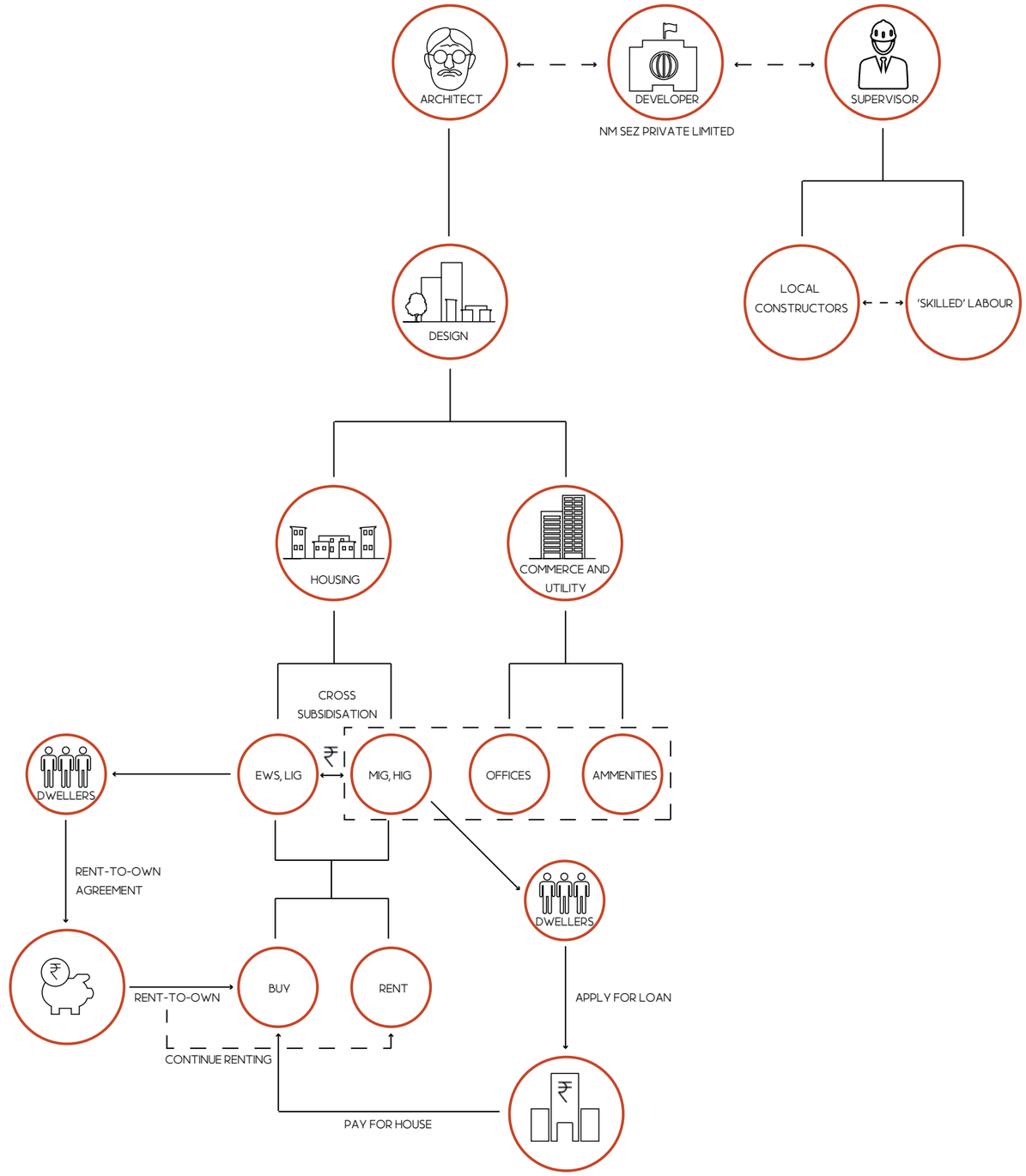
source: https://niua.org/cidco/development-timeline-of-mumbai-and-navi-mumbai/

NAVI MUMBAI SEZ PRIVATE LIMITED



This side location is owned by the Navi Mumbai SEZ Private Limited. The Government of India (GoI) had accorded approval to the proposal CIDCO to set up a Special Economic Zone in Navi Mumbai. Government of Maharashtra (GoM) directed CIDCO to implement the Navi Mumbai SEZ project. A Special Purpose Company (SPC) in the year 2004 named Navi Mumbai SEZ Private Limited (NMSEZ), which has the right to plan, design, construct, market, operate & maintain, administer & manage the SEZ, which is being set up covering a land area of 2140 hectares in Navi Mumbai. Since the government was involved in the land ownership, I suggest that they should demand a certain amount of affordable housing. So that in future developments all income groups will be implemented.

STAKEHOLDERS



REFLECTION

My whole life I am a big fan of travelling. While visiting other countries I find it very fascinating to see the differences; in architecture, how people live and use public and domestic spaces and the ingenuity of people. Especially in India the latter is very visible, if you look at buildings there are a lot of expansions and changing of facades, colours are changed and decoration added. Projects are sometimes unrecognisable after a couple of years or decennia. I find this very fascinating, but also how people find themselves ways to thrive. The last one in India is for the lower-income groups correlated to home-based enterprises. These income generating activities happen in the domestic setting or in front of the house. Products and goods are sold on the streets. This is one aspect that makes streets and public spaces in African and Asian countries so vibrant. Nevertheless, this relates to unhealthy working and living conditions and congestion of public spaces. In my project and design, I want to address the issue of home-based enterprises and how they can be integrated into the city. The title of my project is Two Wolds Merge and results in the merging of the lower-income groups with their informal networks of income generating in the formal city, who benefits from the services and goods provided by the lower-income groups.

RESEARCH METHODS AND APPROACHES

A large part of the first semester of the Global Housing Studio was about getting a sense of the Indian context. Different precedents and prototypes were analysed not only to understand the layout of dwelling units but also to better understand how people live, household organisation and the difference between income groups in India. Besides, the analysed projects were compared with each other concerning density, FSI and GSI. These numbers I have not considered in earlier design projects, but I think it is an interesting aspect (at the beginning) of the project to understand these different densities and qualities and set an aim for one's own project. Furthermore, the case studies helped to get into the Indian architectural elements, concerning climate responsive design, material use and construction techniques. The booklet made by students from a previous edition of the global housing studio gave information on the history of the development of Mumbai and Navi Mumbai, the economic liberalisation in the 1990s and the different housing (managerial) schemes.

Unfortunately, due to the COVID situation it was not possible to do a site visit. But I am glad that I have been to India and Mumbai two years ago to have a sense of the culture, the sounds, the smells, the busy streets and the number of people. So at the starting point of this graduation studio, I already had an image of India and Mumbai. I think a site visit would have helped to gain a better insight into housing, lifestyle and usage of domestic space and public spaces through ethnographical research. Luckily, other scholars published findings from their fieldwork. By carefully reading and looking at their observations I was able to learn more about the home-based enterprises which is the core of my project. The book How the other half builds by Rybczynski, the master thesis by Ghosh and publications by Kellet and Tipple helped me during the process. The first two mentioned sources are before or at the beginning of the economic liberalisation of India (1991), from when the economy changed from industry and production dominated to a market- and service-oriented economy. But the economic activities described and visualized in their research are still happening today, there might be a shift of focus and the scope is smaller. But still many people in Mumbai earn their money from the goods produced in their domestic setting and the services that they deliver, as the statistics of the Indian Government show.

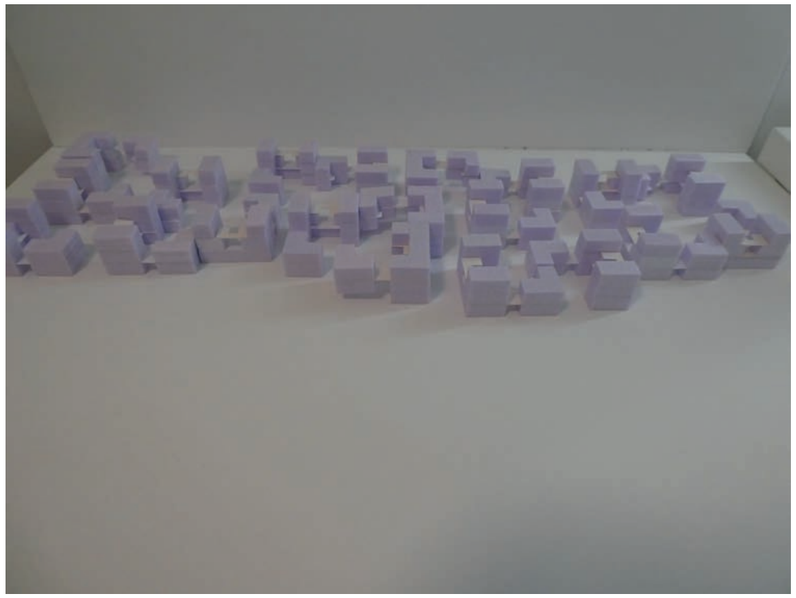
To conclude, other studies were helpful in understanding the home-based enterprise situation in India. I think a site visit would have helped, but on the other hand, I know that a one or two week site visit would not have given all the answers and would not have prevented from getting stuck during the design process.

RESEARCH AND DESIGN

The information especially generated in the first semester of the graduation years formed a base for the design. As described before the collaborative research and (case study) analyses gave insight into the Indian context and the housing situation and tradition in India and specific Mumbai. The literature study helped to define the problem statement and to deepen it. During the design process, I referred back to research that I conducted to keep being context-sensitive and to avoid making general consumption or filling it in myself. But also while designing I realised I lacked information and therefore needed to further elaborate on certain topics to be able to proceed with the design process.

At moments when I got stuck in the process, it helped to look back at the research plan or the video that I made containing the background and problem statement. The compressed visual information gave grip during to process because it illustrates clearly what I want to address and in the end want to achieve with my project. So it helps to keep the goal clear and therefore helped by making decisions.

Another way to keep going was by the changing of working method, after a few weeks in the second semester I realised my project was not going the way I had envisioned. So I made physical models of a cluster that I had at the P2 and played around to see how I could configure them and in what spaces it would result. This change of working method gave a new impulse to the design process. This is something that I learned in MSc 1, it helps to get away from the computer and to look at bigger masses, and let myself not be limited by a CAD program. That is why I still like to first sketch my ideas and try to avoid the computer in the first stage of the design process to not already look into details and therefore limit myself.



GLOBAL HOUSING GRADUATION STUDIO AND MASTER OF ARCHITECTURE, URBANISM AND BUILDING SCIENCE

This year's Global Housing Graduation Studio theme is Mixing Navi Mumbai and is about affordable and adequate housing for all. This is a relevant topic because in India, but in many more countries, housing for all is a problem. There are housing shortages everywhere and especially in affordable housing. So the focus of the design approach is on efficiency, but still need to remains its qualities on a larger scale. So efficiency, resilience, replicability and scalability are key components and are very much related to the problems architects are facing today (globally).

This studio taught me that housing is much more than a place where we eat, sleep and spend some of our free time. If you look at the 24hour cycle of how people use their space this becomes clear. This kind of drawing was new and refreshing and gave a deeper understanding of housing. This also learned me that as an architect I/we should keep in mind the lifestyle of people but also how this can easily change over time and can be influenced by new trends and changing society.

The managerial structure/ stakeholder analysis was also new for me but adds an extra layer to the project. This learned me that architecture is much more than designing floorplans and creating livable buildings. Considering all the different aspects addressed by the studio gives a more holistic design which is thought of on different scales. This makes that a project can last longer.

ETHICAL ISSUES AND DILEMMAS

Even though I have been in quite a few African and Asian countries it continues to amaze me how housing differs around the world. For example, the size of a dwelling unit in Mumbai; families share one unit that is some cases smaller than my bedroom which I do not share. In Mumbai, it is not strange that a whole family sleeps in one room or that the whole house is only one room. But on the other hand in upper MIG and HIG dwelling units every bedroom has its own bathroom; which is not even the case in the Netherlands. So, in India there is a difference between the dwellings for the different income groups and that was something to keep aware of in the design process. Not projecting Dutch (society) standards on an Indian context. Another aspect that I struggled with in the beginning is the fact that every room has to be placed at the façade or a big shaft because of ventilation. So it felt very counterintuitive to place toilets and bathrooms along the facades. Because in the Netherlands we would place them in the middle of the house and ventilate mechanically, so other rooms can enjoy daylight and have a view.

However, although a year is long to gather a lot of information, it is not enough to completely dive into the different context, culture and lifestyle of Indians. All the information that we gather as a group (The Contextual Research of Navi Mumbai, Housing and Health Workshop together with the students from LUMC, precedent analysis) and my individual research I tried to process in my project. But there is probably also information that I did not take care of in the design. Because there are many more layers to concern; for example historical, economic and political layers. In the studio, we have touched upon these topics but to fully understand all these layers a year might not even be enough. I do not say this to tear down my project, but to be critical that to a certain extent to project might not be hundred per cent 'Indian proof'.

This problem of operating in a different culture is also mentioned in one of the texts that we had to read for the Research Plan Course (AR3A010). In the text by Ijlal Muzaffar called ''The World on Sale": Architectural Exports and Construction of Access, the author is pushing for a deeper understanding of the complexity of the context and using globalization to project Western or First World ideals on a different context. But on the other hand also be aware that these countries change because of globalization and that we should not force traditional ideas on, in my case, the Indians as if they have not moved on. These are very sensitive aspects which need to be carefully considered while designing, therefore the reciprocity of research and design is very important, to stay context-sensitive and prevent general consumptions or the projection of my Western perspective on an Indian context.

SOCIAL, PROFESSIONAL AND SCIENTIFIC FRAMEWORK

Cities, especially in the Global South, are seen as places of hope and opportunities. The place with great employment chances. This is one of the reasons that people from rural areas migrate to the bigger cities. In reality, however, the image of the 'good life' that you can have in the city is achieved by a tiny minority. The vast majority of the inhabitants are struggling to get employment and 'proper' housing. According to the Annual Report of 2018-'19 published by the Indian Government, 68,4 per cent of the workers in the non-agricultural sector were engaged in the informal sector (Government of India 2020: iv). With the rapid urbanization and the influx of people from the hinterland, it is becoming increasingly difficult to find employment and a dwelling in the formal sector. In the last (two) decennia Mumbai experiences a rural-urban migration, many of these come from within the state of Maharashtra. This Rural-urban migration and the formal sector that cannot provide adequate jobs and housing for all those people create bigger segregation between the formal and informal sector; the informal settlements and the city respectively. The settlements are islands within the city or at the periphery of the city, so they are isolated entities. Most of the people in the settlements do not have formal jobs and use their domestic setting to generate income. The home-based enterprises are mostly not visible from the streets, therefore the (street)vendors provide and support the enterprises by selling their products in the public spaces. Other income groups, besides the informal sector, benefit from these products and services, because they are often cheaper, more diverse in range and more accessible in terms of time and distance than those in the formal market (Kamalipour 2019: 2). Nevertheless, the street vendors are regarded as encroaching the public space. The negative perception of the home-based enterprises and the informal sector influences the ability of people in poverty to provide themselves with adequate income and housing.

As described before other income groups purchase products made in these enterprises and in that manner they contribute significantly to the urban economy (Ernawati et al. 2020:55). As per statistics available in India so far, it has been seen that GDP from the unorganised sector is almost half of the total GDP (Government of India 2012: 30). These numbers show that the informal economy is of great value, but is not recognized by the formal economy. Hence, in my project

I find the integration of the two groups important because they complement each other. So, it is not only about creating a healthy way of combing working and living, but also a healthier integration in the city. That is why the title of my project ‘Two Worlds Merge’ is about two different scales. The first is the dwelling scale by combining working and living within one unit and the second scale is the neighbourhood or city by integrating the informal economy into the formal city. This (economic) integration of the lower-income groups will lead to an empowerment of their livelihood. This should prevent further segregation of the lower and higher income groups within the city of Mumbai.

TWO WORLDS MERGE

ECONOMIC INTEGRATION TO EMPOWER LIVELIHOOD