A PRODUCTIVE NEIGHBOURHOOD

Economic activity as a driver for sustainable development

Global Housing Graduation Studio 2018 – 2019
Mentors: Dick van Gameren – Nelson Mota –
Harald Mooij – Gilbert Koskamp
Research Report – Natascha Lüth – 4622758

INTRO

By 2050 68% of the world population is projected to live in urban areas. With currently 55% of the population residing in urban areas, this future scenario implicates a rapid urbanisation. India – with Nigeria and China – is projected to account for more than a third of the world's urban population. A serious global housing shortage is and will be a major challenge of the twenty-first century[1].

Besides a general shortage of housing, the issue of affordability comes into play. Average income is low and earnings generated in the informal sector are nearly half of the salary of the employees considering all types of enterprises. The informal market in India's urban areas represents 94 per cent of all jobs[2] and 52% of women in India's urban areas are working in or adjacent of their own dwellings opposed to only 15% of men[3]. Also, in formal occupation an imbalance of gender can be observed. Only 25% of women between 15 and 59 in Greater Mumbai are occupied in formal work compared to 79% of men[4].

1 United Nations, 2018

In the global context, the issue of increasing urbanisation as well as maintaining and developing economic opportunities is well known, widely discussed and focus of several international policies. For example, the United Nations' Sustainable Development Goals and the New Urban Agenda, adopted at the United Nations Conference on Housing and Sustainable Urban Development named Habitat III[5]. The issues at stake are also addressed on the national level. For example, in the 2015 Statistical Compendium on Slums in India, the Indian government emphasises the importance of Housing for All as well as the acceleration of the rate of job creation and facilitation of self-employment opportunities for the urban poor[6].

2 Ministry of Statistics and Programme Implementation, 2012

3 Ministry of Statistics and Programme Implementation, 2012

4 Census, 2011

Despite the already existing knowledge and approaches, the current issues are mostly inadequately managed. Profit maximising activities by private developers even worse the living circumstances of the population as they do not take into account important aspects of housing. Extremely dense housing lacks space for income generation as well as ventilation, light, water and sanitation. This results in a decrease in family income, a decrease in independency of women and no involvement of inhabitants in the planning process.

5 United Nations, 2015; United Nations, 2016

6 Ministry of Housing and Urban Poverty Alleviation, 2015

Research is urgently needed to address current challenges which will amplify in the coming decades. By investigating the case of Nalasopara and identifying potential solutions which take into account issues of density, affordability, economic development, gender, and participation in planning processes the aim is to generate insights which lead to more humane housing solutions serving the inhabitants needs and making neighbourhoods more resilient.

The results of this study may provide a research approach which could be applied to other locations. Therefore, this study is of high relevance for being able to address challenges of the fast rate of urbanisation, especially in the Global South.

1 URBANISING INDIA AND THE INFORMAL MARKET

More than half of the world's population lives in urban areas. Although India still has the largest rural population, it is projected with only two other countries – Nigeria and China – to account for more than a third of the world's urban population by 2050. It is projected that India will add 404 million urban dwellers by that time[7].

7 United Nations, 2014

The informal market in India's urban areas today represents 94 per cent of all jobs[8]. In Greater Mumbai 42% of the population is living in slums[9]. Within these settlements, informal domestic income generating activities play a significant role in the income generation. 52% of women in India's urban areas are working in or adjacent of their own dwellings opposed to only 15% of men[10]. Also in formal occupation, an imbalance of gender can be observed. Only 25% of women between 15 and 59 in Greater Mumbai are occupied in formal work compared to 79% of men[11].

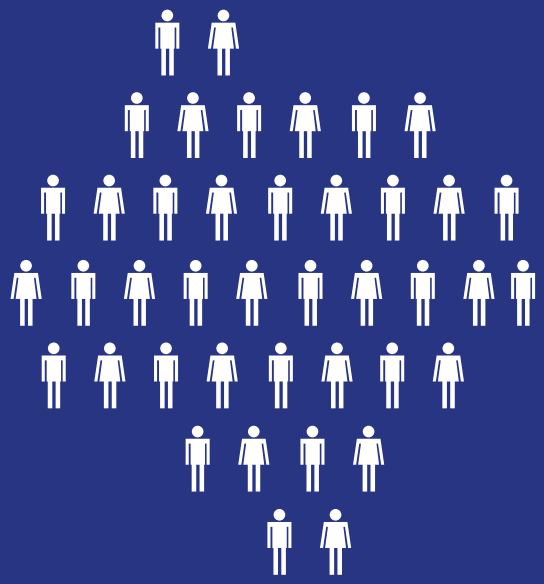
8 Ministry of Statistics and Programme Implementation, 2012

9 Ministry of Housing and Urban Poverty Alleviation, 2015

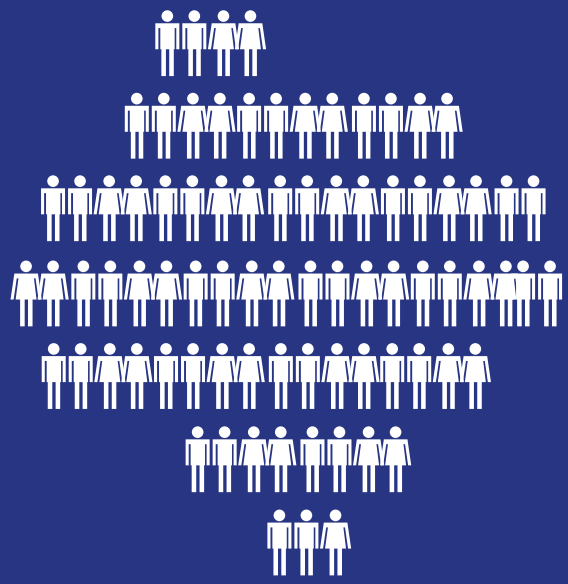
10 Ministry of Statistics and Programme Implementation, 2012

11 Census, 2011

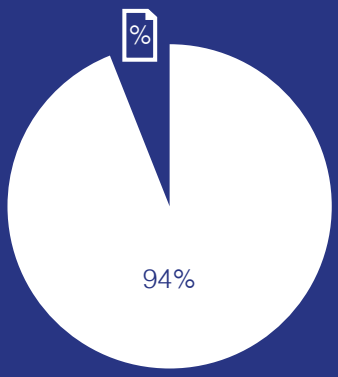
2014 – 410 MIO URBAN DWELLERS



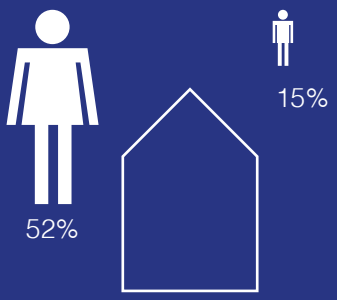
2050 – 814 MIO URBAN DWELLERS



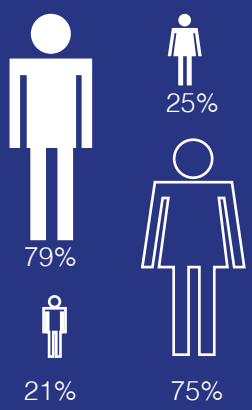
INFORMAL MARKET



DOMESTIC INCOME GENERATION



FORMAL MARKET
WORKER – NON-WORKER



2 SITE OF STUDY NALASOPARA

The site of study for this research is located in the North of Greater Mumbai, a suburb called Nalasopara. It is connected to the city centre by a train travel of one hour. As the trainline connects to workplaces and amenities in the city, it at the same time divides Nalasopara into two sides: Nalasopara West and Nalasopara East. Dominant typologies in the East are the so called baithi chawls and chawls, whereas the West entails newer and larger developments, amongst them high rise developments of the Maharashtra Housing and Area Development Authority (MHADA) and apartment blocks. The focus of this study will be on Nalasopara East.


Water
Train
Nalasopara

3 NALASOPARA EAST

Nalaopara East is characterised by its containment from the hills in the East and the railway line to the West. Major streets connect it to Virar East in the North, Vasai-Virar in the South, the highway 48 to Mumbai city in the East and Nalasopara West. The secondary roads do not follow a legible system and contain many deadends. Likewise, the tertiary roads show a rather organic growth and oftentimes lack connectivity. The figure ground shows clearly crammed areas in the area of the baithi chawls and chawls where almost no open space is left. The chawl neighborhoods with a density of 4 already take up a considerable dimension. The baithi chawls still take up a large portion of land but with their potential of increase in density, these neighbourhoods are in risk of transforming into unsustainable chawl neighbourhoods as well.

Aerial view
Nalasopara

maps. google
.com

200 M

Topography

Train

10 m

Elevation

200 M

Infrastructure

Train

Main Roads

Secondary Roads

Tertiary Roads

200 M

Built Mass

200 M

Non Built Mass

200 M

Location chawls

200 M

Location baithi
chawls

200 M

4 DOMESTIC INCOME GENERATION IN BAITHI CHAWLS

In Nalasopara the baithi chawls represent a typology that facilitate domestic income generating activities. These single storey houses compose into an intimate layout of small alleys and provide space for a variety of income generating activities.

The communal open areas spatially counterbalance inadequacies of the private realm by allowing domestic and income generating activities to spill over to the outside. Women have the possibility to look after their children while at the same time earning a second income to the man's, for example by producing papad, bidi and agarbatti or drying chilli and rice[12].

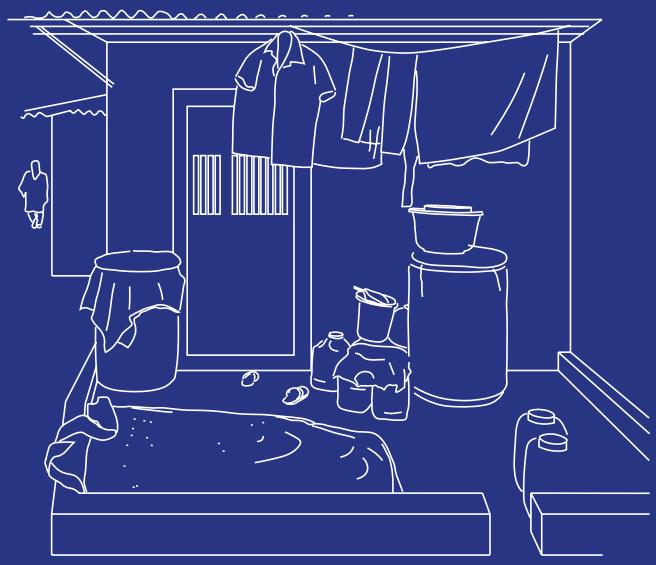
12 Ghosh, 1994

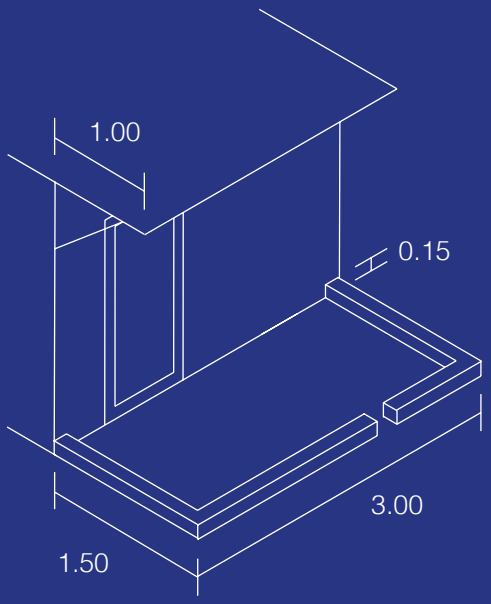
Still, the baithi chawls also lack important aspects concerning income generation and standards of dwelling. Women's work is mainly restrained to the domain of the house and income generating activities only provide low incomes. Moreover, the layout of the dwelling leaves families of on average 5 in only one room of about 16 square metres, lacking appropriate sanitary conditions and running water.

Drying chili

Narrow path in baithi chawls

Drying rice





SUNNY TERRACE

5 LACK OF DOMESTIC INCOME GENERATION IN CHAWLS

Due to the rapid urbanisation in Nalasopara and increasing population density, the area of the baithi chawls is recently facing increasing pressure. Private developers transform former baithi chawls into chawls of 5 storeys that consist of slabs of 40 by 8 metres standing with a distance of only 60 to 120 cm to each other. Hereby, the density is increased from 0.75 to 4 whereas Indian architect PK Das suggests a density of maximum 2.5 for the redevelopment of slums land into affordable low cost housing[13].

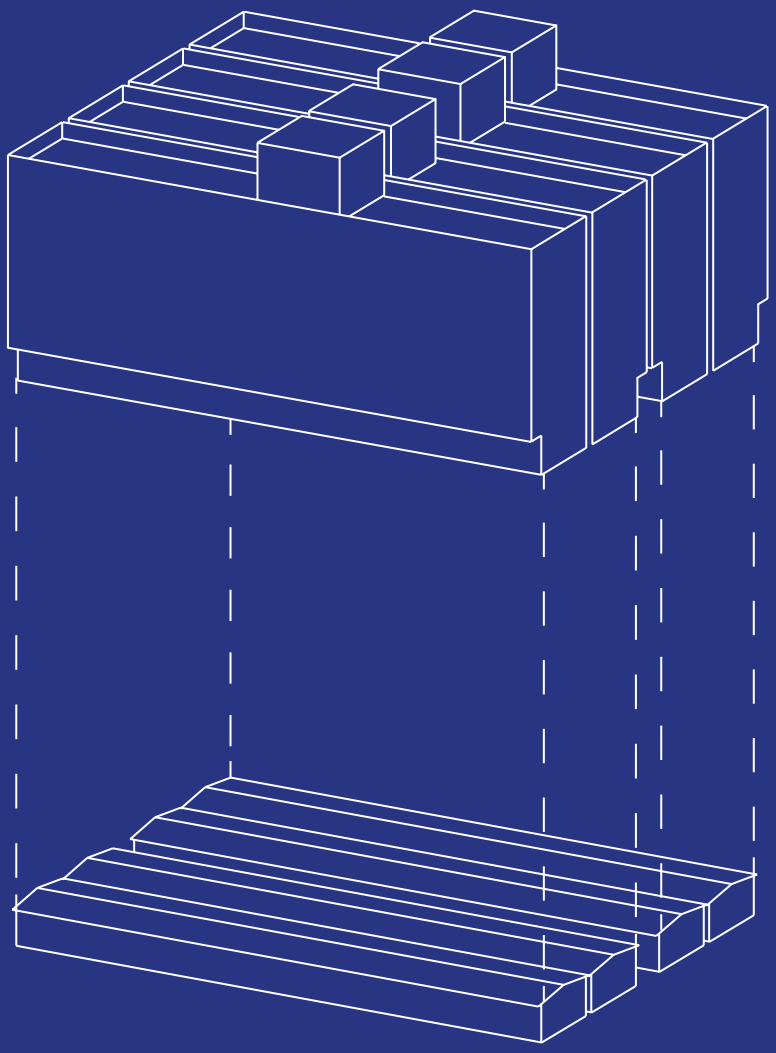
13 Das, 2011

These dense housing schemes aim to maximise profit and do not recognise the inhabitant's demands. They don't consider human living conditions nor do they provide possibilities for domestic income generation due to the lack of daylight, ventilation, water and sanitation. In addition, the dwelling cannot expand towards the narrow corridors in front.

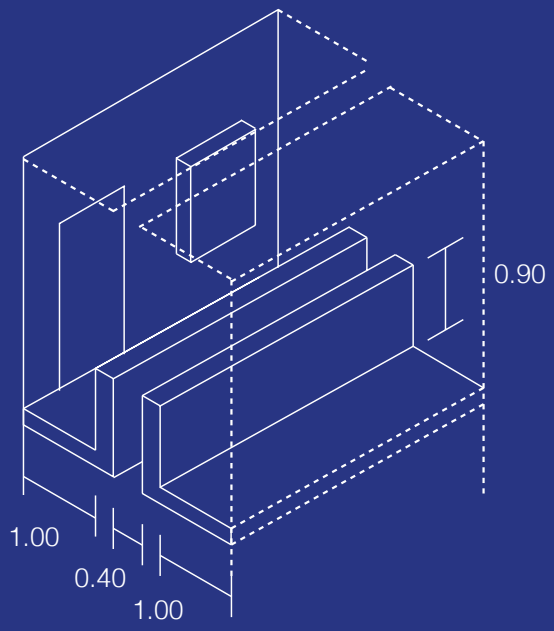
Consequently, women are forced to stop their domestic income generating activities which results in less overall income of the family, an increased imbalance of women participating in the economy, less social life recognition and less independency of women[14].

14 Hill, 2001

Ground floor chawls



First floor
chawls



CORRIDOR OF DARKNESS

6 POLICIES ON URBANISATION AND ECONOMIC OPPORTUNITIES

In the global context, the issue of increasing urbanisation, maintaining and developing economic opportunities is well known and widely discussed and focus of several international policies[15]. According to Goal 8 of the United Nations' Sustainable Development Goals, decent work and economic growth are considered crucial in achieving sustainable development. All countries aim to implement these goals[16]. Within the New Urban Agenda, the United Nations commit to promote the role of affordable and sustainable housing in economic development recognising that housing enhances income and employment generation and can contribute to driving sustainable and inclusive economic transformation at the national, subnational and local levels[17].

15 United Nations, 2015; United Nations, 2016

16 United Nations, 2015

17 United Nations, 2016

The issues at stake are also addressed on the national level. In the 2015 Statistical Compendium on Slums in India, the Indian government emphasises the importance of Housing for All as well as the acceleration of the rate of job creation and facilitation of self- employment opportunities for the urban poor[18]. Likewise, the Development Plan for Greater Mumbai 2014 – 2034 stresses the need to recognise all patterns and types of livelihoods to create inclusive livelihoods in the city and innovate public spaces to accommodate various livelihoods[19].

18 Ministry of Housing and Urban Poverty Alleviation, 2015

19 Urban Design Research Institute & Praja Foundation, 2014

Not only policy is broaching the issue of housing and economic opportunities as the Indian architect Charles Correa calls income generation one of the fundamental principles if there ever was a "Bill of Rights for Housing" in the Global South. In The New Landscape he even goes as far as describing a whole productive neighbourhood based on biological cycles through solar energy. Ponds could be used for the provision of fish. Building ponds would provide additional jobs and the excavated soil could serve for the sun- drying of bricks. In that way, these cycles could form the economic bases of communities and influence their physical pattern. This would establish a new type of human settlement making use of plentiful sunlight and abundant human labour in the Global South[20]. Additionally, Correa mentions the construction process of houses as a key factor in enabling local work force as masons and carpenters[21].

20 Correa, 1989

21 Correa, 1999

In Arrival City, Dough Saunders emphasises the importance of informal self- employment as a starting point of the arrival city[22]. He states: „It is a form of work that is available to almost everyone who comes to the city. The informal, self-employed economy, even though it is more chaotic and often untaxed, is providing better livelihoods for rural migrants than the old lifetime- job economy."

22 Sanders, 1999

7 PARTICIPATORY PLANNING

In terms of managerial system, the 2009 UN-habitat survey found that participatory planning and legal certainty were perceived as key determinant factors of urban economic inclusion. Survey results showed that policies and schemes favouring government induced creation of specific forms of employment along with micro-credit, classified as the most effective ways of reducing inequalities in income and opportunities[23]. In the New Urban Agenda, cooperative solutions are encouraged to improve the supply of housing especially for low-income groups and partnerships among governments, civil society and other actors are promoted. The development of appropriate and affordable housing finance products and the investment in affordable housing through a range of institutions and banks shall be supported[24].

23 UN-Habitat, 2010

24 United Nations, 2016

Equally, architects recognise the importance of public participation in the planning process. Bredenoord promotes the cooperation between public, civic and private sectors and the involvement and participation of inhabitants in order to successfully approach urban development[25]. Das criticises the ineffective mechanisms for public participation not involving the citizens' views[26]. Turner emphasises the stimulation of individual and social well-being through the control of major decisions and contributions to the housing process by dwellers[27]. And Correa states that diverse and pluralistic qualities that are essential to our habitat can only be achieved though a multitude of delivery systems instead of limited centralised agencies as the government or big developers[28].

25 Bredenoord et al, 2014

26 Das, 2018

27 Turner, 2009

28 Correa, 1989

8 ACCOMODATING DOMESTING INCOME GENERATION

Despite the already existing knowledge and approaches, the current situation in Nalasopara is inadequately managed. Profit maximising activities by private developers even worse the living circumstances of the population in the neighbourhood as they do not take into account important aspects of housing. Extremely dense housing developments lack space for income generation as well as ventilation, light, water and sanitation. This results in a decrease in family income, a decrease in independency of women and no involvement of inhabitants in the planning process.

Therefore, the research aims of this study are (i) to identify the needs and aspirations of the people living in the neighbourhood; (ii) to investigate the already existing housing solutions; (iii) to understand possible discrepancies between the existing housing schemes and the needs of the population; and (iv) develop a housing scheme which adapts to the determined needs and local conditions. Therefore the following research question will be the main target of this study:

How can the domestic income generating activities of the baithi chawls be accommodated in denser housing schemes and expand to new income generating activities?

In order to be able to answer the main research question, several operational sub-questions are necessary:

(i) Which are the current sources of domestic income generation?
(ii) How can domestic income generating activities be enhanced throughout the neighbourhood?
(iii) Which employment opportunities can be created in other sectors?
(iv) How can the construction process support the creation of local employment?
(v) What is the current state of economic mobility in the neighbourhood?
(vi) How can social interventions create possibilities for education, self-improvement and training to enhance economic mobility?
(vii) What kind of housing cooperatives do exist?
(viii) Which form of housing cooperatives could be used in the case of Nalasopara?
(ix) Which financial models could be implemented to finance a housing cooperative?
(x) Could Correa's idea of a productive neighbourhood be translated and embedded into a housing cooperative?

9 THREE LEVELS OF DESIGN

The design assignment works on three distinctive levels: an architectural, a soial and a managerial level.

The architectural response aims to level out the density of the chawls with the baithi chawls, create space for domestic income generation, enhance ventilation, light, water and sanitation, create alternative spaces for new income generating activities and be adoptable to different urban conditions in geometry and topography. Social interventions would aim to offer possibilities for education, self-improvement and training; and on the managerial level, the aim is to involve the community in the planning process by forming housing cooperatives.

By using approaches on an architectural, social and managerial level a comprehensive resolution is pursued as family income's shall be increased, independency of women improved and quality of life enhanced.

In order to ground the research in the local context visual ethnography will be used as it focuses on people and their interaction in space. This will be pursued through observation, interviews, photography and drawings.

However, as this research method is shaped subjectively and is limited due to the short period of research on site, heuristics as a second research method will be added to compensate these limitations in a complementary manner. By taking into account (architectural) knowledge that proceeds this study, the reserach will build on existing knowledge as well as contributing with research by design. This part of the study will make use of case studies and literature studies .

ARCHITECTURAL LEVEL

1 PATTERNS OF SOCIAL SPACES

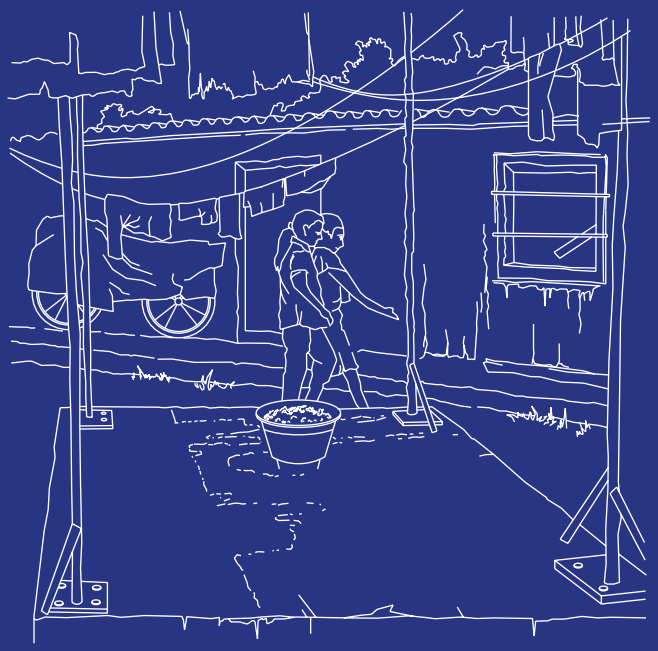
Approaching the architectural design, Nalasopara's social spaces were studied. Within the urban environment that is rather organically grown without following a masterplan, spaces often do not carry a prescribed meaning and can be interpreted and occupied in different ways. Within an environment of extreme scarcity of space, people are very creative in occupying zones in front of their houses, a simple stoop in an alley or a card standing on the street. Designing in this environment means defining spaces while allowing for appropriation.

GULLY CRICKET

WAITING PLINTH

GULLY FOOTBALL

GOSSIP CORNER



MULTIPURPOSE ALTAR

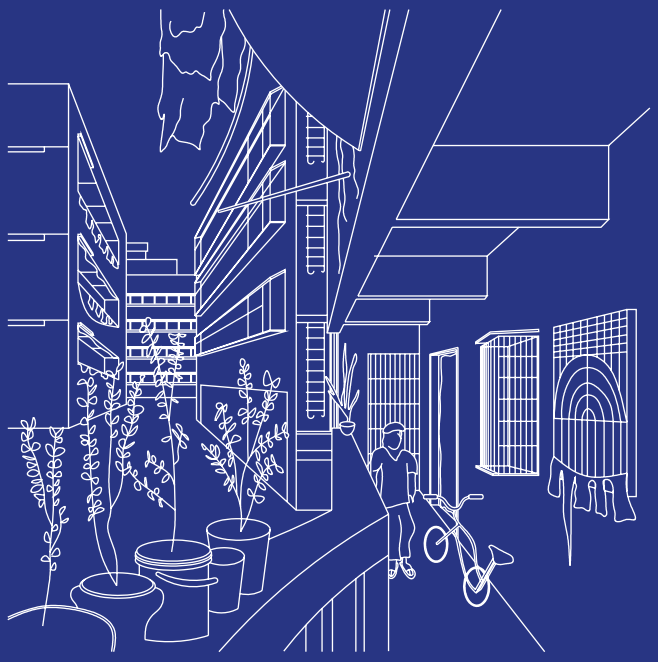
PRODUCTIVE INTERSECTION

LUNCH IN THE SHADE

SOCIALISING ON THE GO

WINDOW CHAT

EXPLOSIVE STOOP



SOCIAL CORRIDOR

ALLEY OF INTIMACY

2 PATTERNS OF INCOME GENERATION

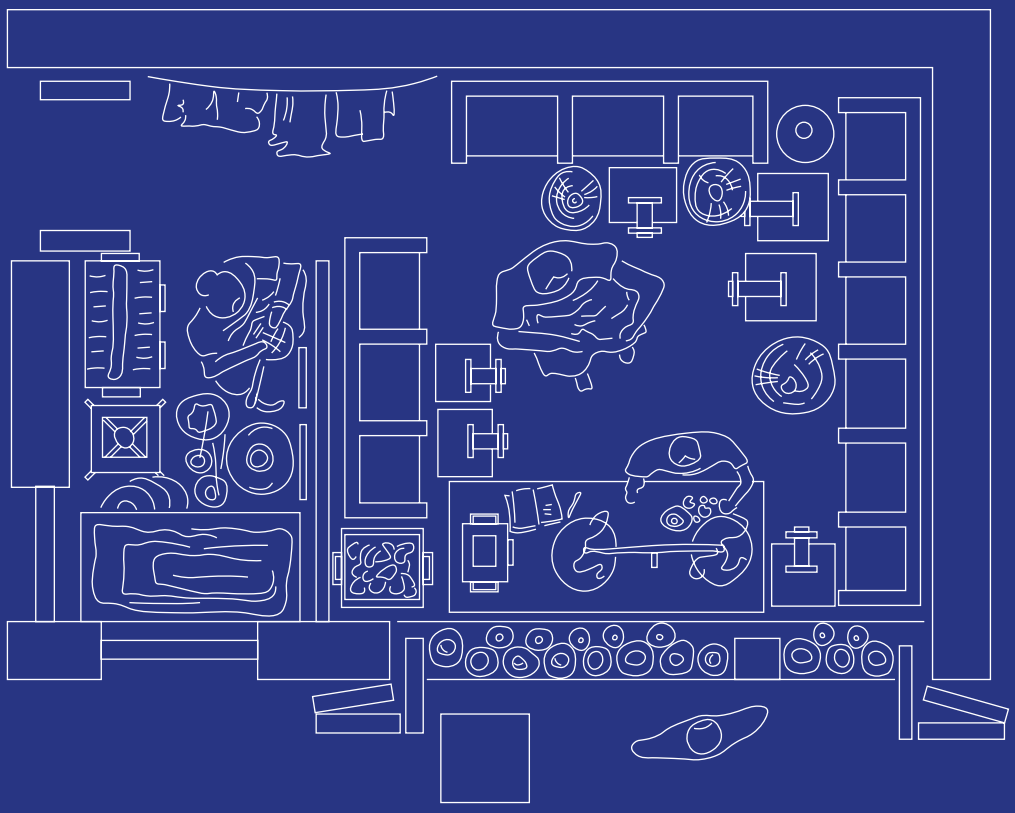
The study of Anandita Ghosh from 1994 called 'The Use of domestic Space for Income Generation in a Low-Income Housing Settlement' shows patterns of domestic income generation in more detail.

She describes these activities as usually small size, small-time activities involving small capital, oriented on local needs and occuring in the intimate proximity to the home.

Her observations were retraced and interpreted in an attempt to deeper undestand the spatial requirements of domestic income generation. It became obvious, that activities not only happen in front of the dwelling but a lot of times also inside the dwelling. She categorizes spaces she attributes these income generating activities to into (A) part of the living space/room, (B) house extensions like porch, verandah etc, (C) part of the passageway in front of the house/room, (D) a space in the main passage which serves as the daily market area, (E) a small seperate stall or shop and (F) a work area not directly connected to the living space. As this study focuses on domestic income generation (A) – (C) will be of higher importance.

The inner organisation remains flexible during the day so that different activities can happen. The space that is used at night for additional sleeping spaces becomes a work place during the day.

Drawing based on Ghosh, 1994

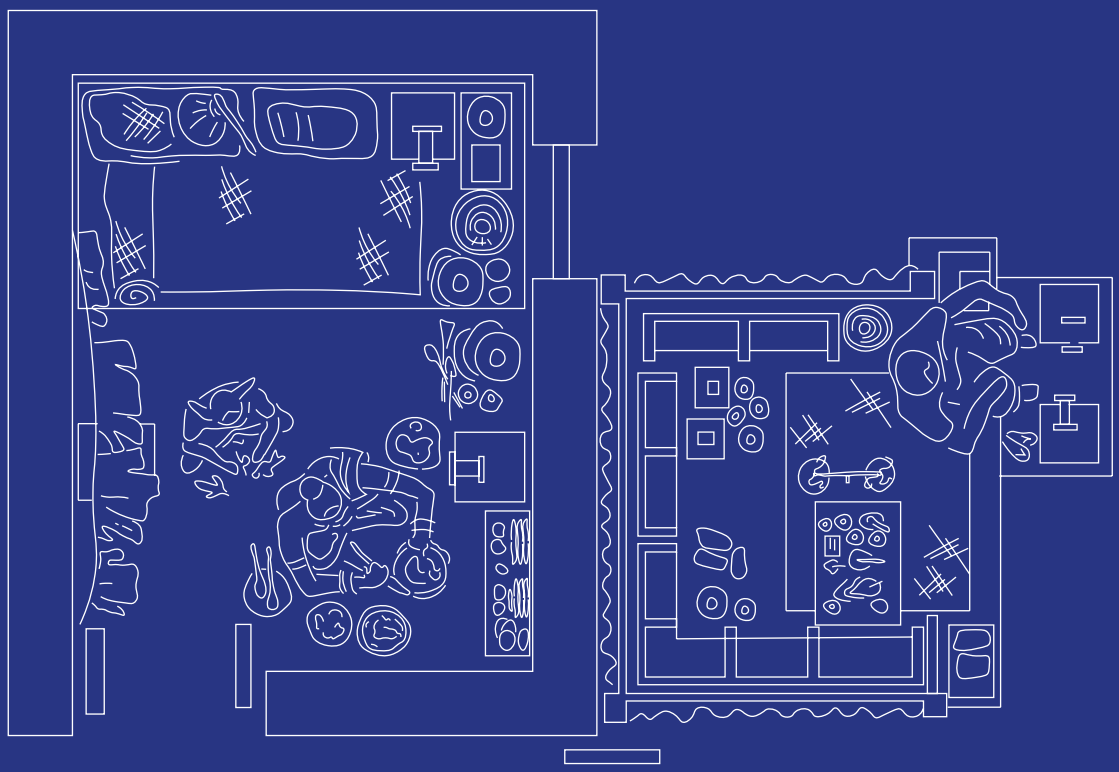


Drawing based on Ghosh, 1994

GROCERY SHOP

50CM

Drawing based on Ghosh, 1994



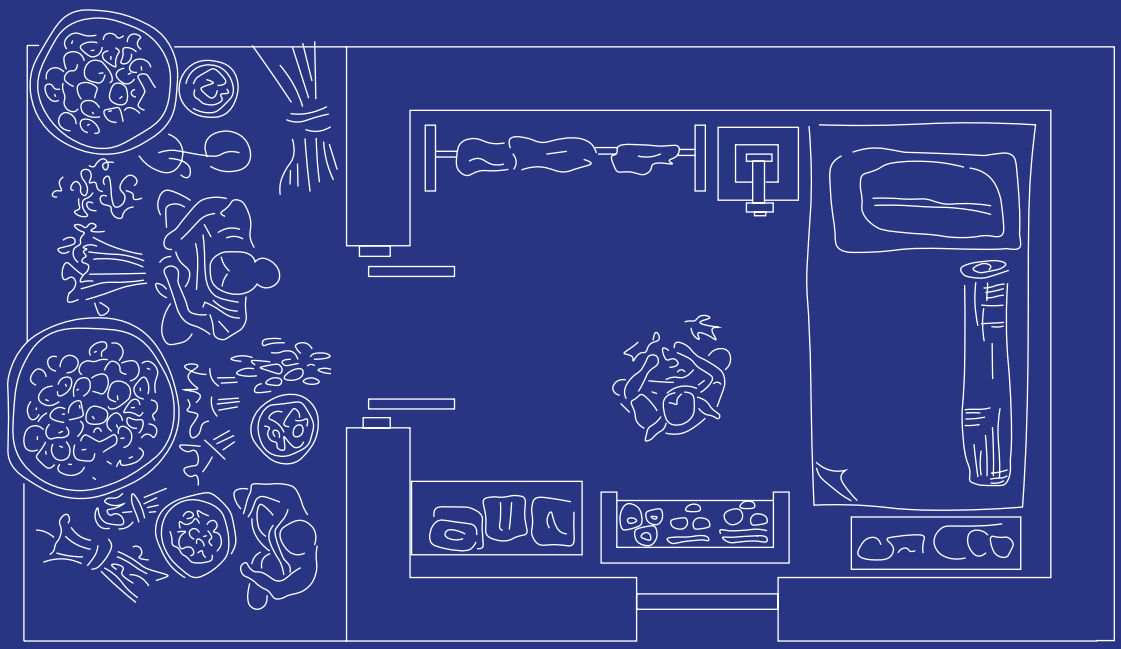
Drawing based on Ghosh, 1994

50CM

VARIETY GOODS SHOP

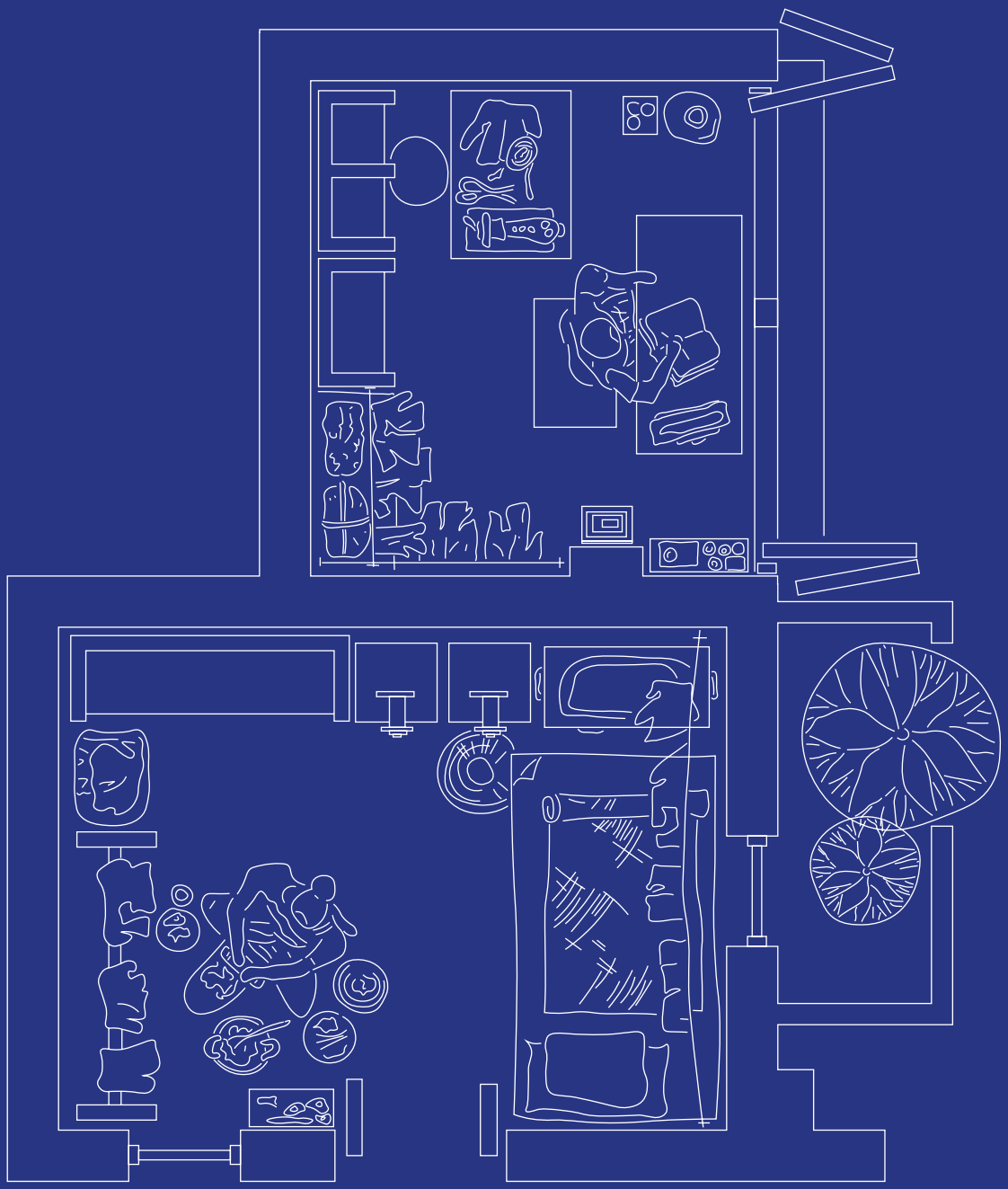
Drawing based on Ghosh, 1994

Drawing based on Ghosh, 1994



VEGETABLE SHOP

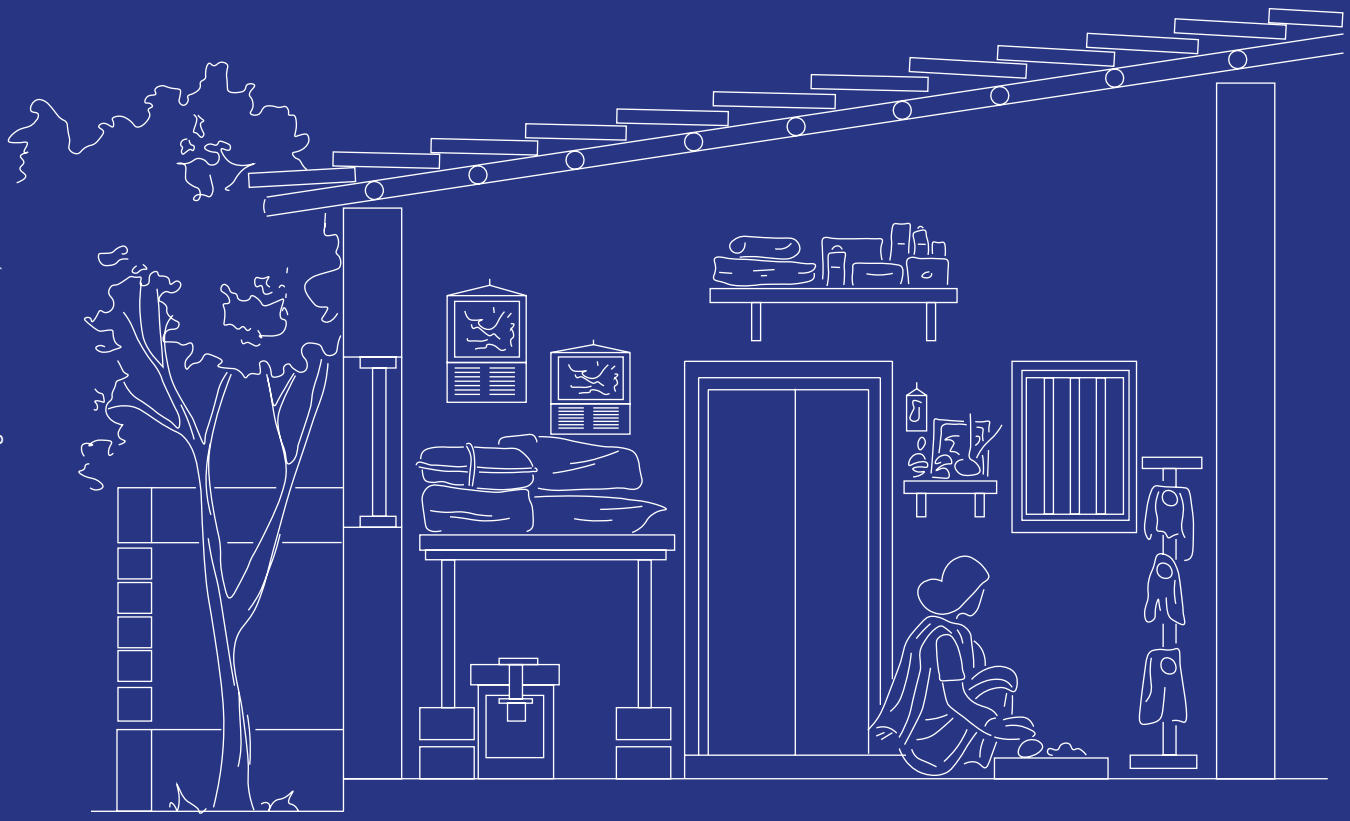
50CM



Drawing based on Ghosh, 1994

50CM

TAILOR SHOP



Drawing based on Ghosh, 1994

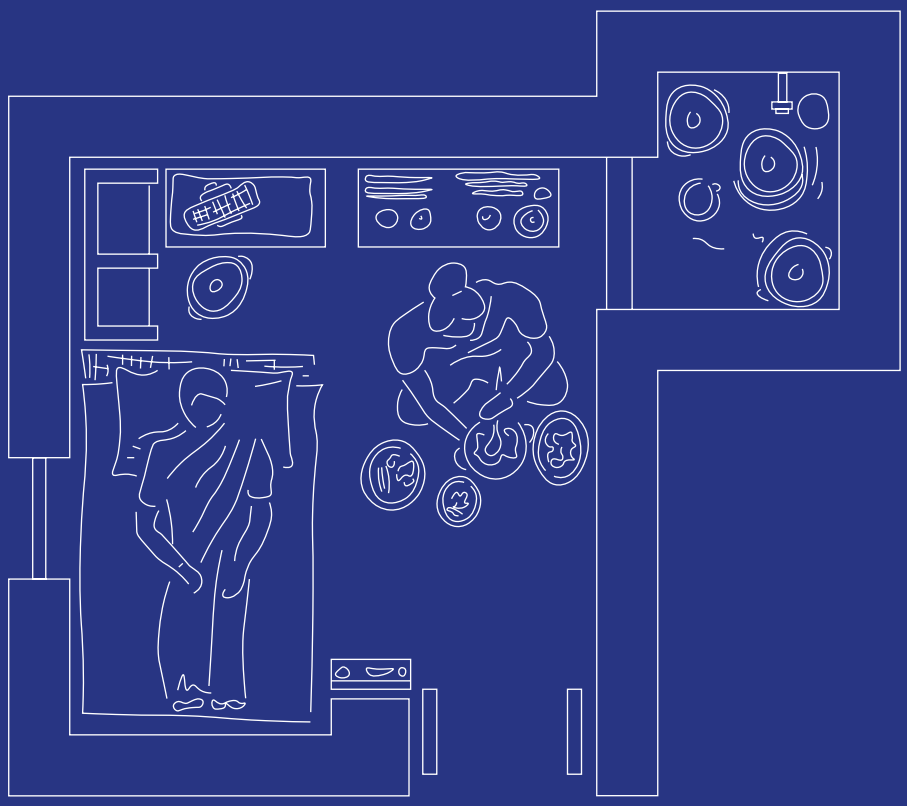
Drawing based on Ghosh, 1994

TAILOR SHOP

50CM

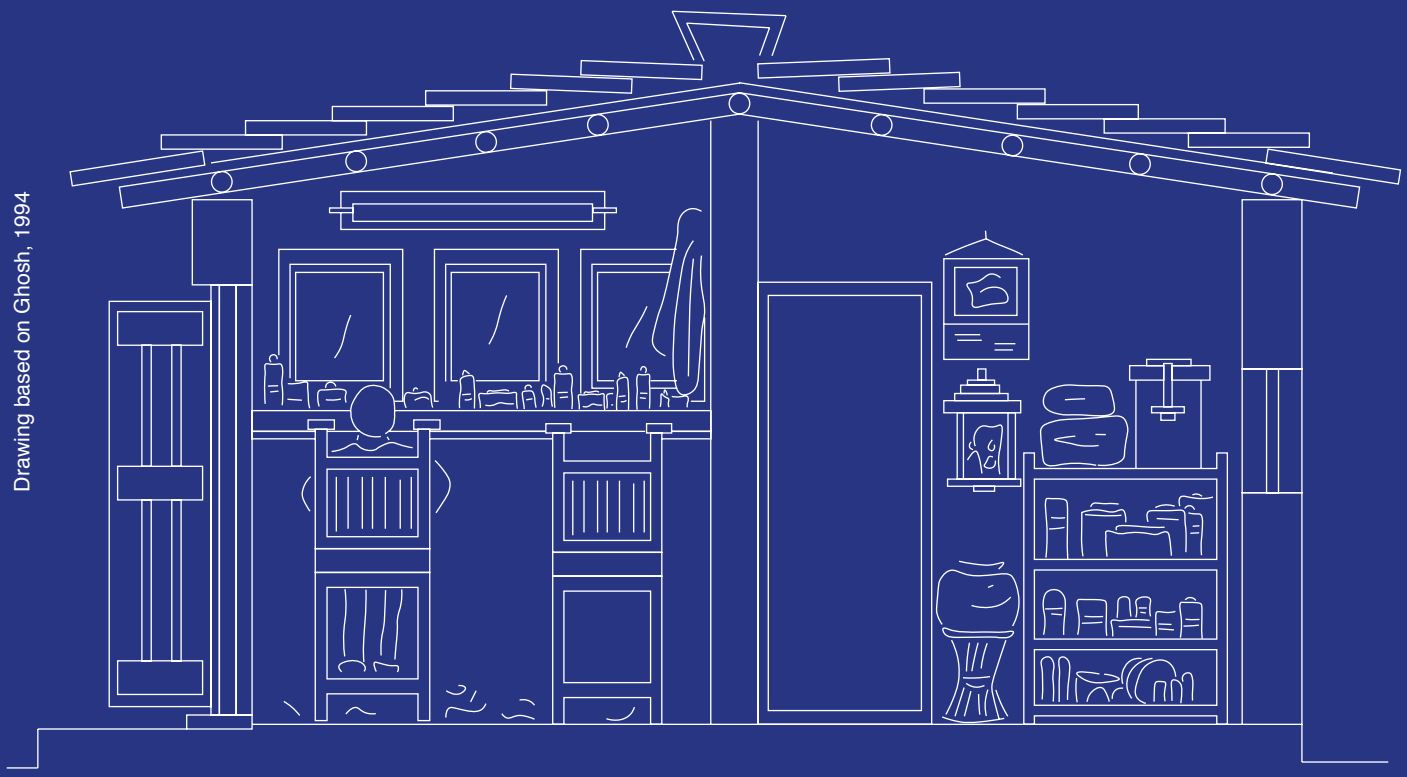
Drawing based on Ghosh, 1994

Drawing based on Ghosh, 1994

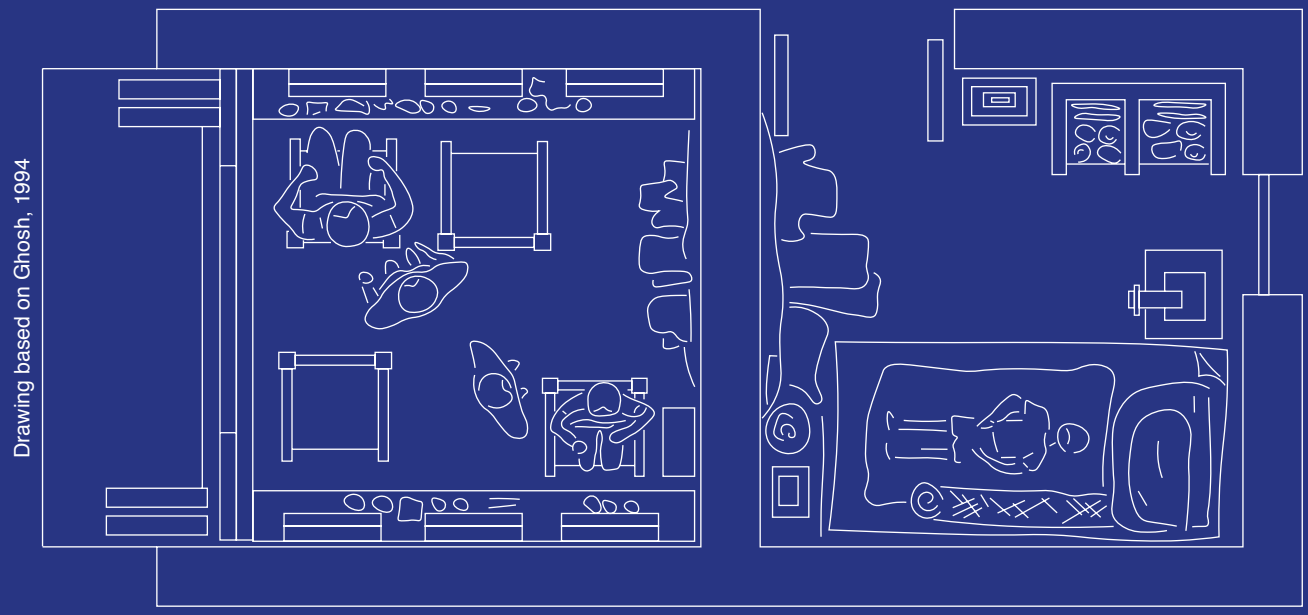


50CM

HOUSE (CLOTHES STALL AT MARKET)



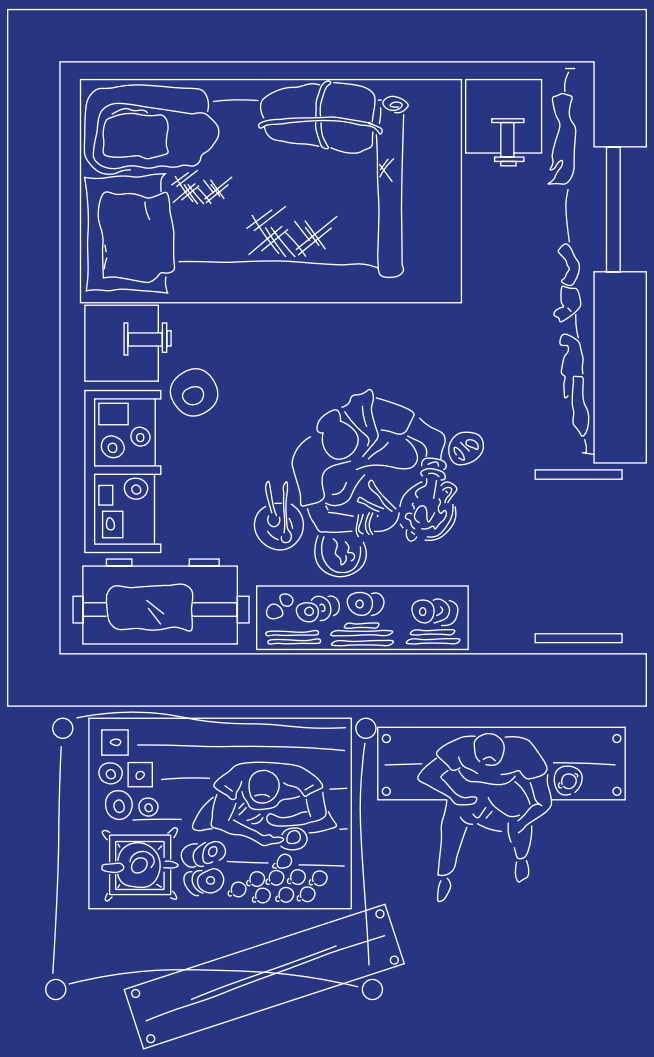
Drawing based on Ghosh, 1994



Drawing based on Ghosh, 1994

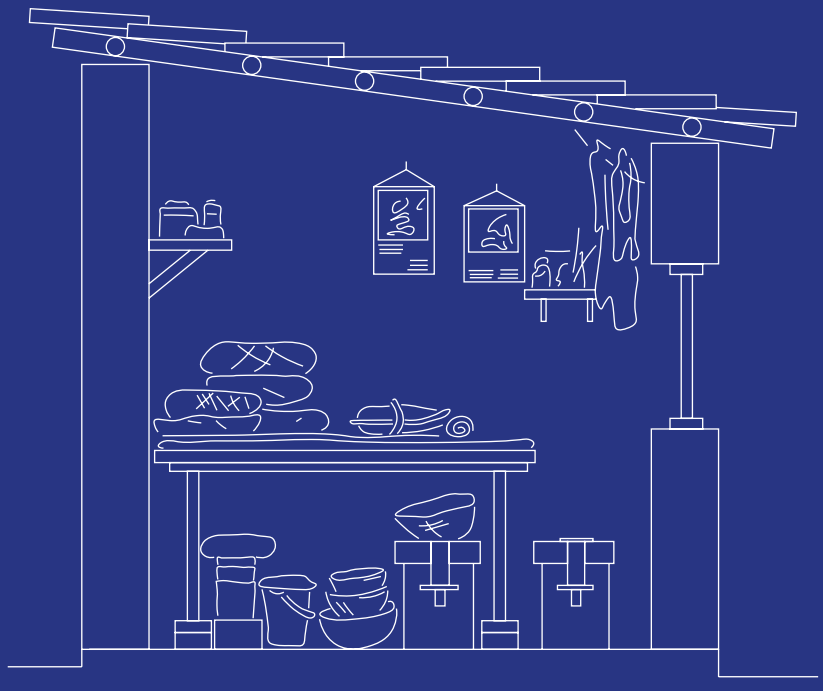
HAIR CUTTING

50CM



TEA STALL

50CM



TEA STALL

50CM

3 PATTERNS OF DOMESTIC ACTIVITY

The patterns of domestic activitiy by my fellow studio mates Claire, Joseph and Shirin show the flexibility of the spatially extremely limited domestic space in the course of the day. The dwelling sees multiple changes from the early prayer, to early morning food preparations, breakfast, income generation activities, relaxation, dinner and finally sleeping space.

Patterns of Domestic Activity of the Research Seminar of the Global Housing Studio 2018–2019 by Claire Barry, Joseph Tjong-Ayong and Shirin Hadi

PATTERNS OF DOMESTIC ACTIVITY

4 LOCATION OF INCOME GENERATING ACTIVITES

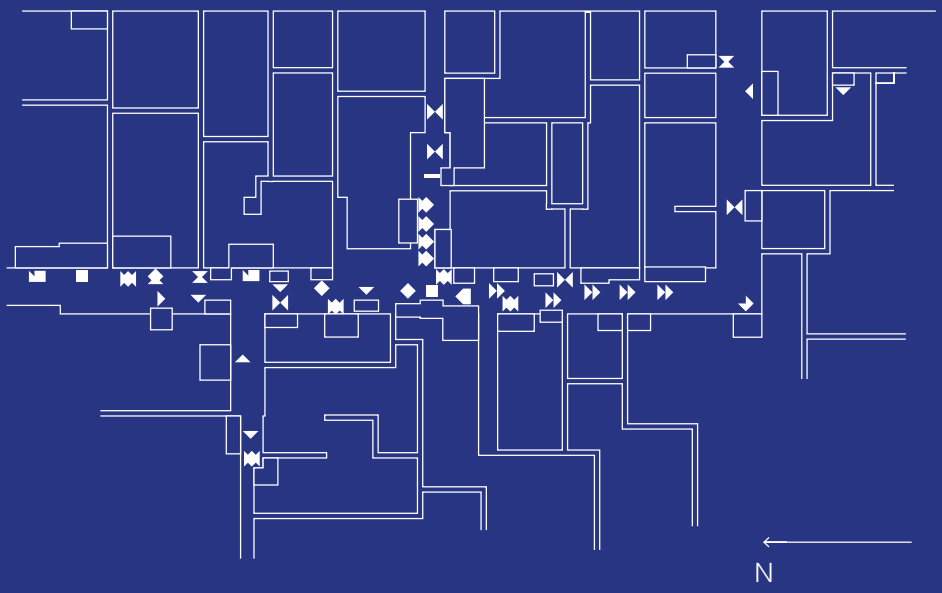
Concerning the location of the various income generating activities, Ghosh differenciates depending on the hierachy of roads. Shops and vendors are usually located on the main road where they receive the maximum exposure to passers by and facilitate transactions. Besides they can be located around small squares and open spaces, street corners and sometimes along narrow lanes and alleys. As they are small in size, depending on the demand, several shops of the same kind appear very close to each other. Shops include clothes, snacks/ food items, tea stalls, grocery, paan, coal, sweets/candy and variety item shops. Vending includes fish, vegetable, pickle, sugarcane juice, egg, fruit, ribbons and toys.

Almost all households located along main or second roads is found to be involved in some kind of small business activity in the domestic space.

Special service shops as metal repair, hair cutting and shoe repair can be located on seconday roads as their demand is constant and customers will go to these shops wherever they are located.

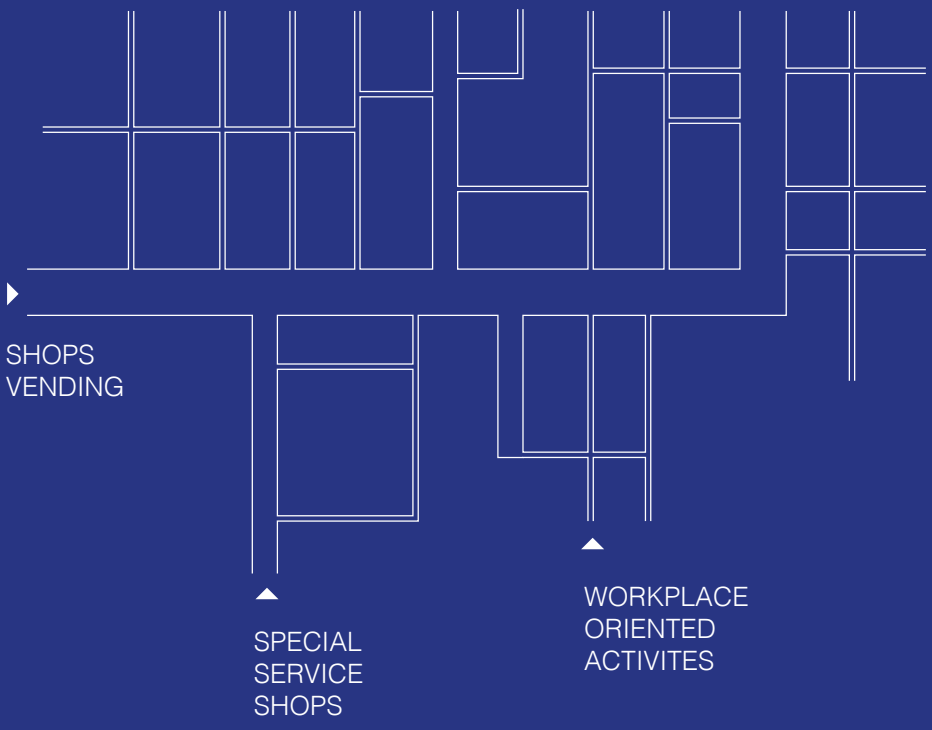
Some households with interior locations/along tertiary roads are involved in workplace oriented activities like rakhi (bracelet) making, bidi (cigarettes) making, tailoring, agarbatti (incense sticks) rolling and papersack making. These activities do not require formal shops for distribution. Some households have a place at the daily market for a temporary vending stall.

COAL
PAAN
VENDORS
METAL REPAIR
HAIR CUTTING
TAILORING
BIDI STALL
TEA STALL
GROCERIES
SNACKS
SHOE POLISH
CLOTHES
FISH
FRUITS
LAUNDRY
VEGETABLES



Drawing based on Ghosh, 1994

LOCATIONAL PLAN OF COMMERCIAL ACTIVITY AREAS



MAIN ROAD
SECONDARY ROAD
TERTIARY ROAD

HIERARCHY OF COMMERCIAL ACTIVITY AREAS

5 ARCHITECTURAL CASE STUDIES

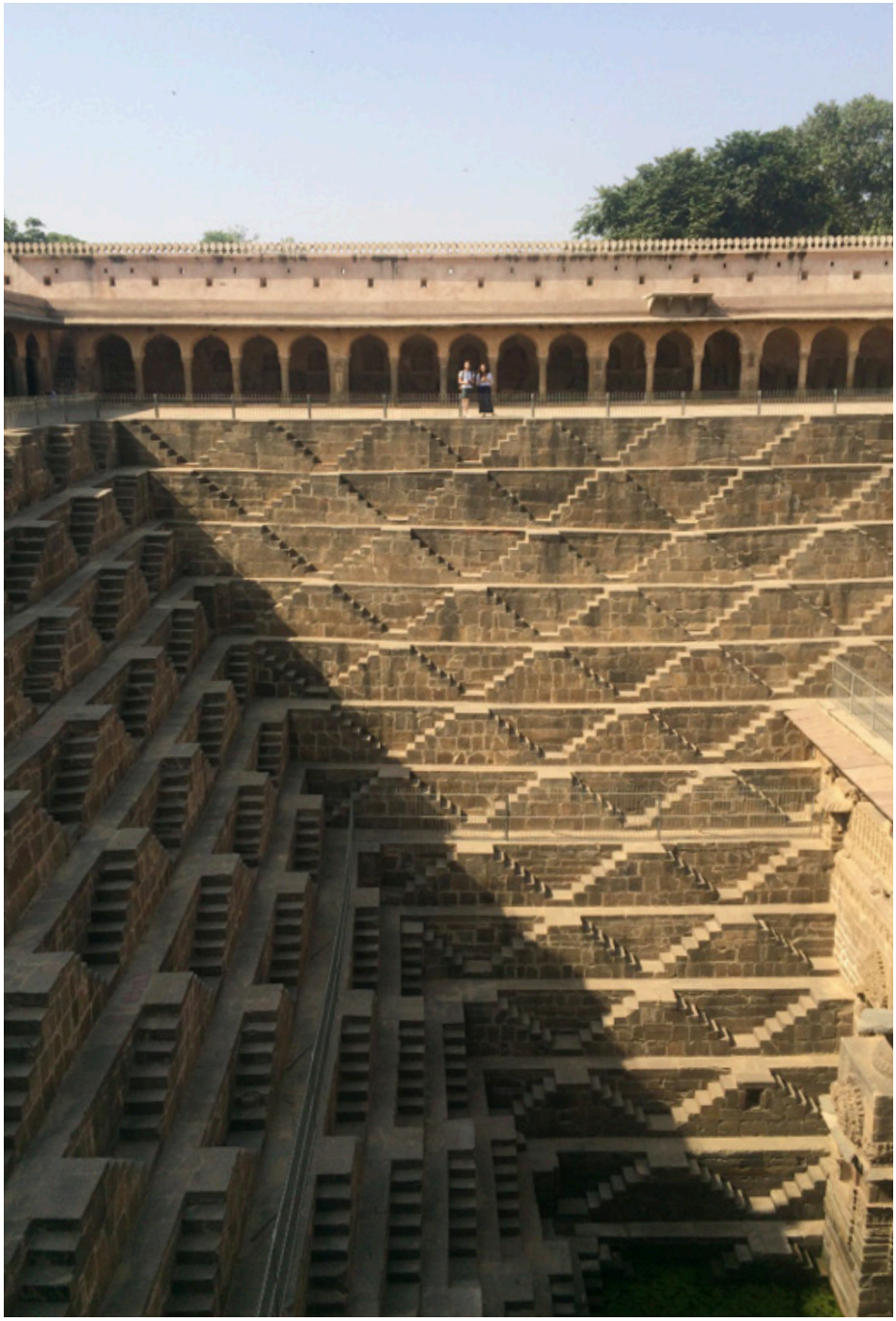
In order to address the architectural design assignment – leveling out the density of the chawls with the baithi chawls, creating space for domestic income generation, enhancing ventilation, light, water and sanitation, creating alternative spaces for new income generating activities and being adoptable to different urban conditions in geometry and topography – several case studies were studied.

A typology that served as inspiration for the design is the step well of chand baori from 800. It combines the mundane act of fetching water with social activities. While stepping multiple levels down to the water basin it provides gathering places on one side of the well that profit from the cooler temperatures next to the water. In the form of a courtyard, it facilitates communication through visual cross connections.

A typology related to residential use that similarly works with the element of terracing is Charles Correa's LIC colony. Through the decrease of the dwelling's lengths, private terraces are provided on each level which enables the dwelling to expand towards the outside on each level.

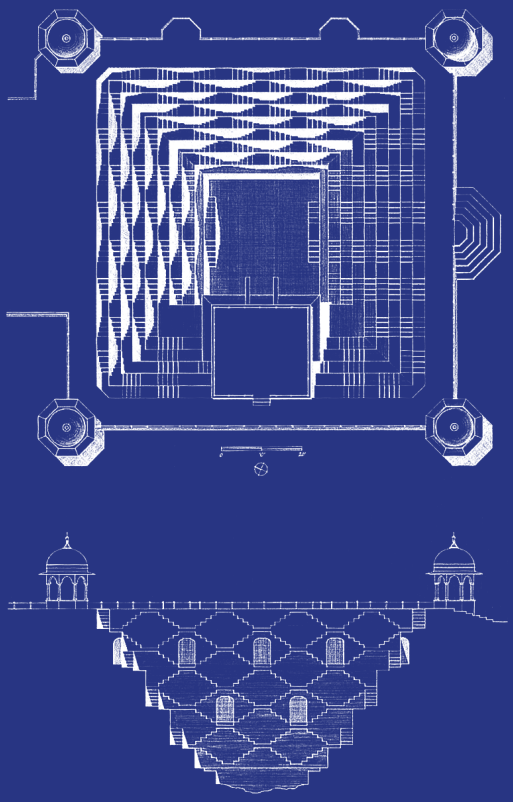
The case study of Raj Rewal's Sheikh Sarai Housing in New Delhi works with the idea of the courtyard as a traditional Indian architectural element. Being a low rise high density housing, it offers three types of cluster that can be combined and form internal pedestrian streets along a central spine. The spine runs from courtyard to courtyard. These are separated by closer building masses which are connected on the upper levels forming gateways. A hierarchy of open spaces is created and the typology organises the dwellings in a cluster while being applicable to multiple sites.

The Previ Housing in Lima by Charles Correa serves as reference for the internal organisation of the dwelling. Being a low rise while high density complex, it follows a linear structure of dwellings that connect the pedestrian community spine of one side to the road accessed by cars on the other. The dwelling is organised in linear bays, while the varying in width between one and two bays. This provides structural efficiency of the parallel party walls while giving diverse dwellings. Three different types of units are combined in different sequences that allow for a varied profile toward the pedestrian street.

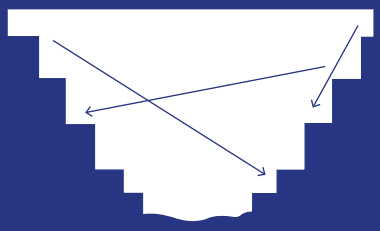


Stepwell Chand Baori, Abhaneri, 800

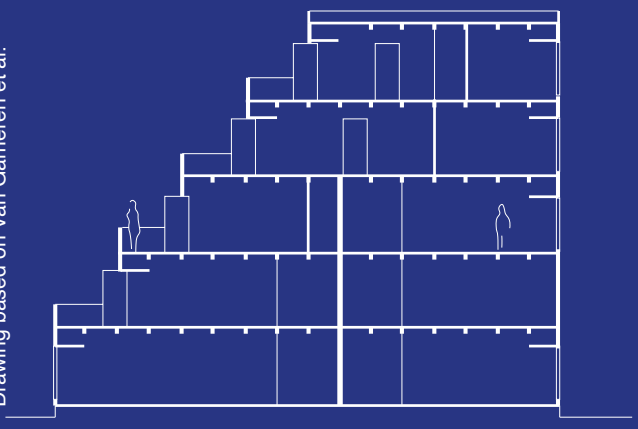
LIC Colony,
Charles Correa,
1972



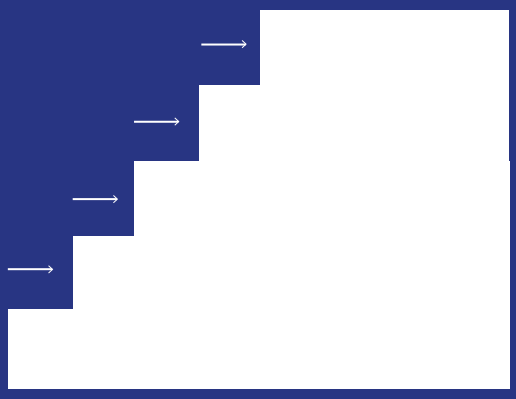
infranetlab.org



STEPWELL CHAND BAORI, ABHANERI, 800

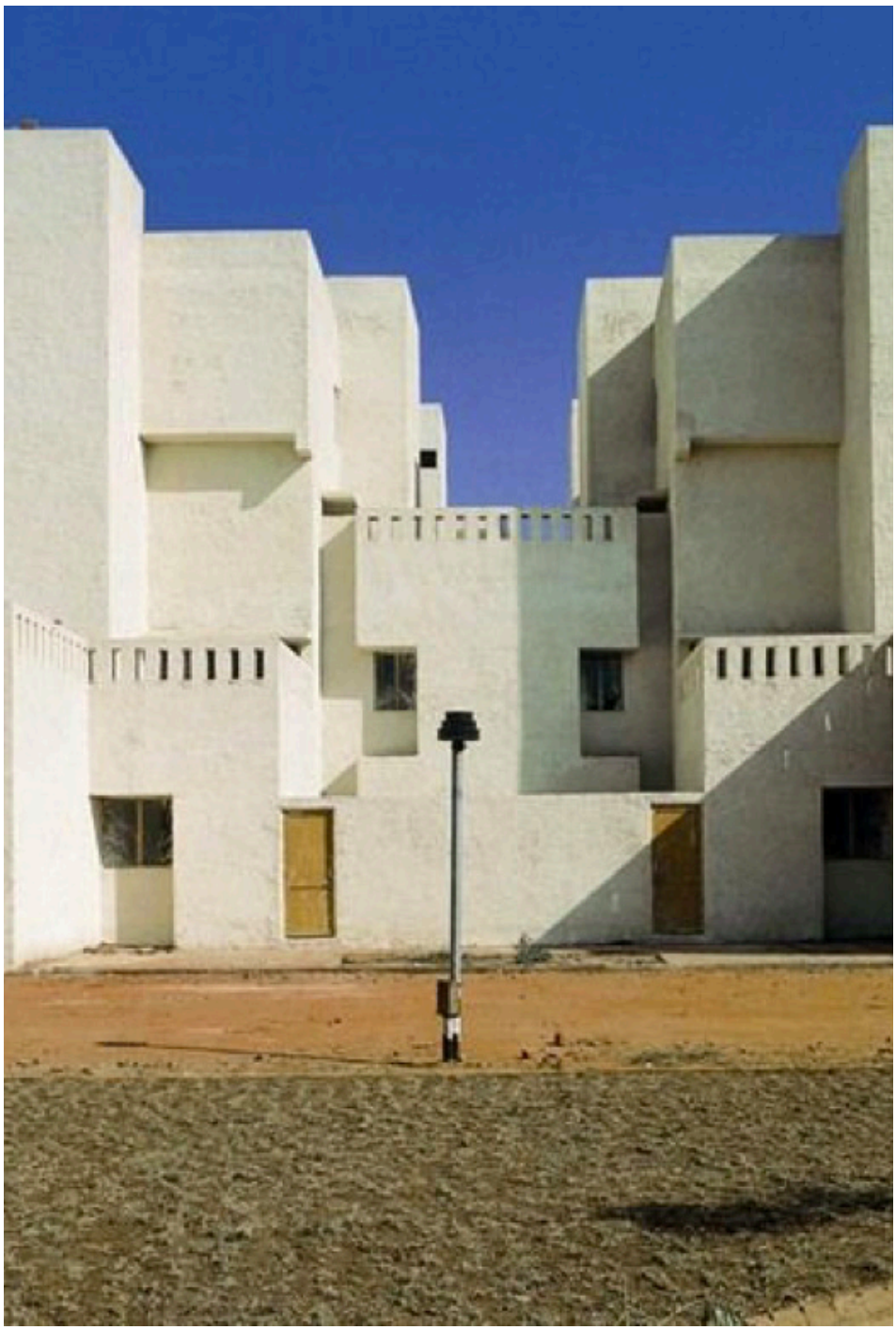


Drawing based on Van Gameren et al.



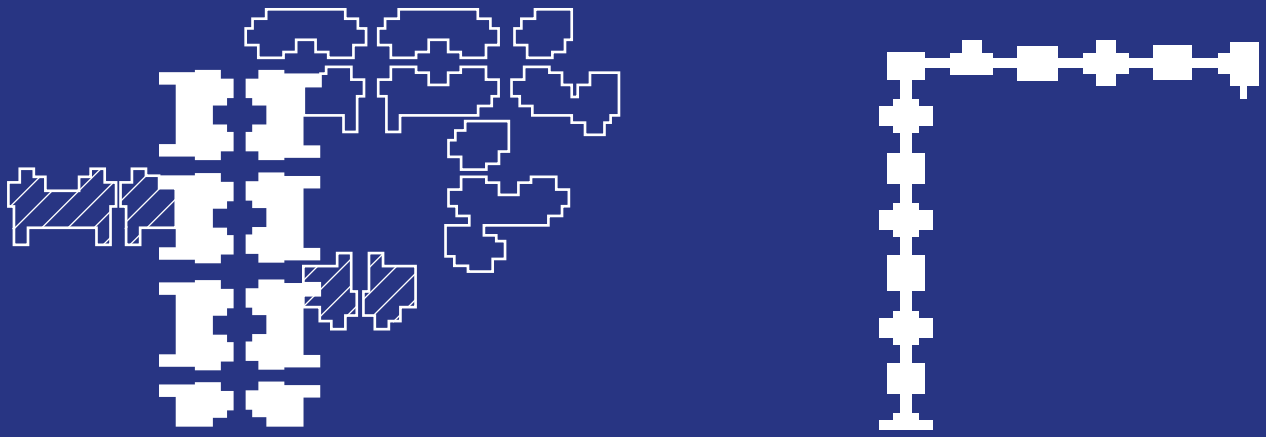
LIC COLONY, CHARLES CORREA, 1972

Sheikh Sarai Housing Complex, Raj Rewal, New Delhi, 1982



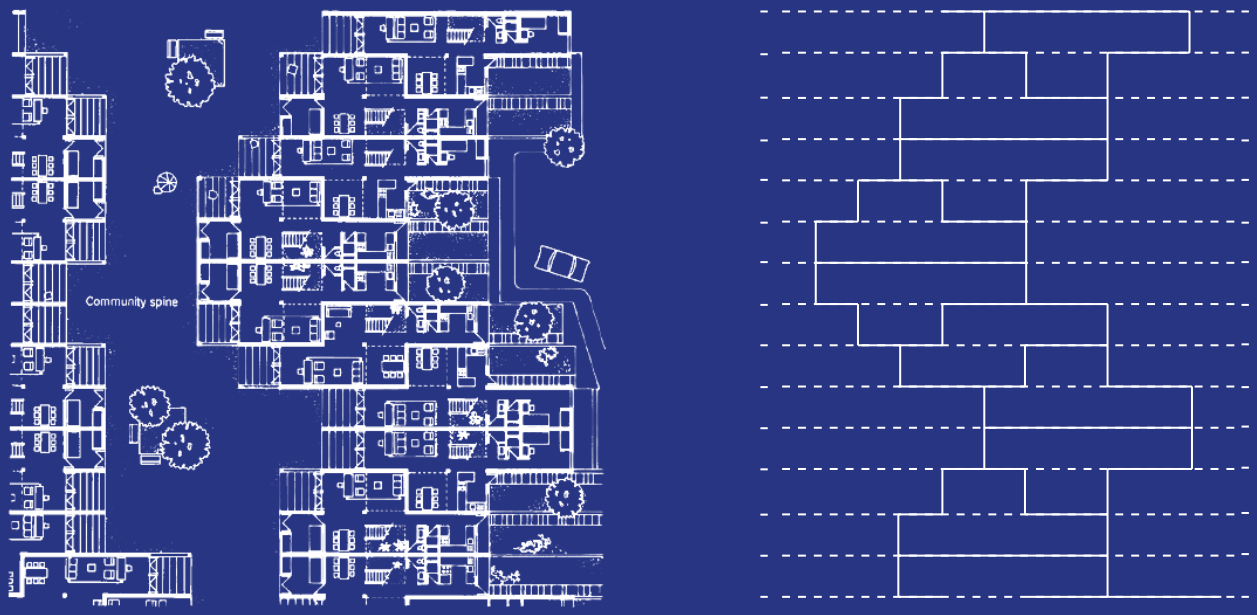
v

Drawing based on rajrewal.org/projects/housing-sheikh-sarai



SHEIKH SARAI HOUSING COMPLEX, RAJ REWAL, NEW DELHI, 1982

Correa, 1999



PREVI HOUSING, LIMA, CHARLES CORREA, 1973

Previi Housing, Lima, Charles Correa, 1973

architectuul.com/architecture/correa-previ-s-housing

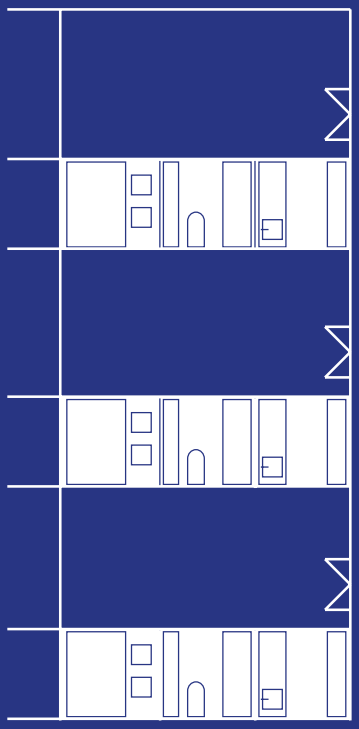
The Gallery of Quintana serves as reference in terms of the organisation of the unit. It organises the dwelling's infrastrucutre as the bathroom, kitchen, storage, closet and bedroom as furniture elements within a functional, compact zone and leaves the adjacent larger space free as a large volume of air that can be dynamically occupied by the dwellers.

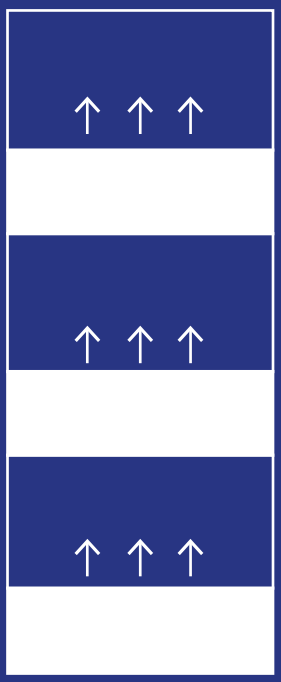
And finally, the section of the Malabia Condominium serves as reference for the efficient vertical use of space. It offers three types of units that interlock each other to create varying interior ceiling heights relating to their programme. The scheme maximizes the floor area without being monotonous.

Gallery of Quintana, Buenos Aires, IR arquitectura, 2013

archdaily.com/571444/quintana-4598-intile-and-rogers-arquitectura

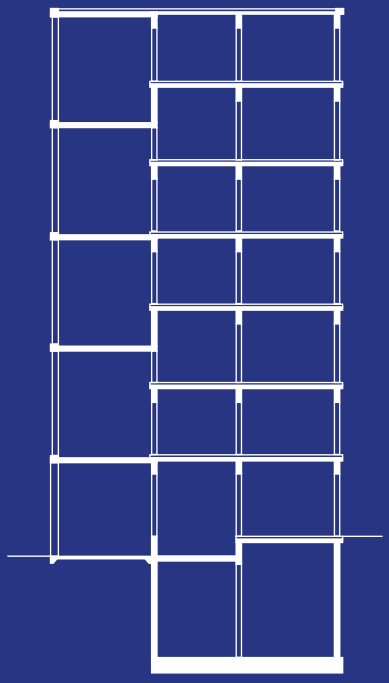
Drawing based on archdaily.com/571444/quintana-4598-intile-and-rogers-arquitectura

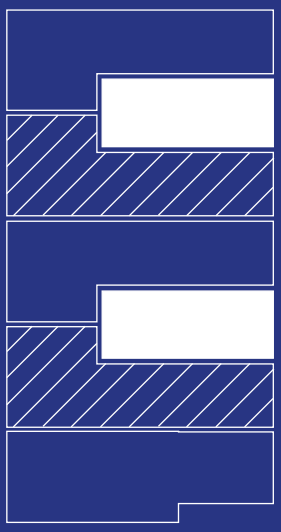




GALLERY OF QUINTANA, BUENOS AIRES,
IR ARQUITECTURA, 2013

Drawing based on studioai.com/#/malabia-condominium





MALABIA CONDOMINIUM, BUENOS AIRES,
STUDIO AI ARCHITECTS, 2014

Malabia Condominium, Buenos Aires, Studio ai architects, 2014

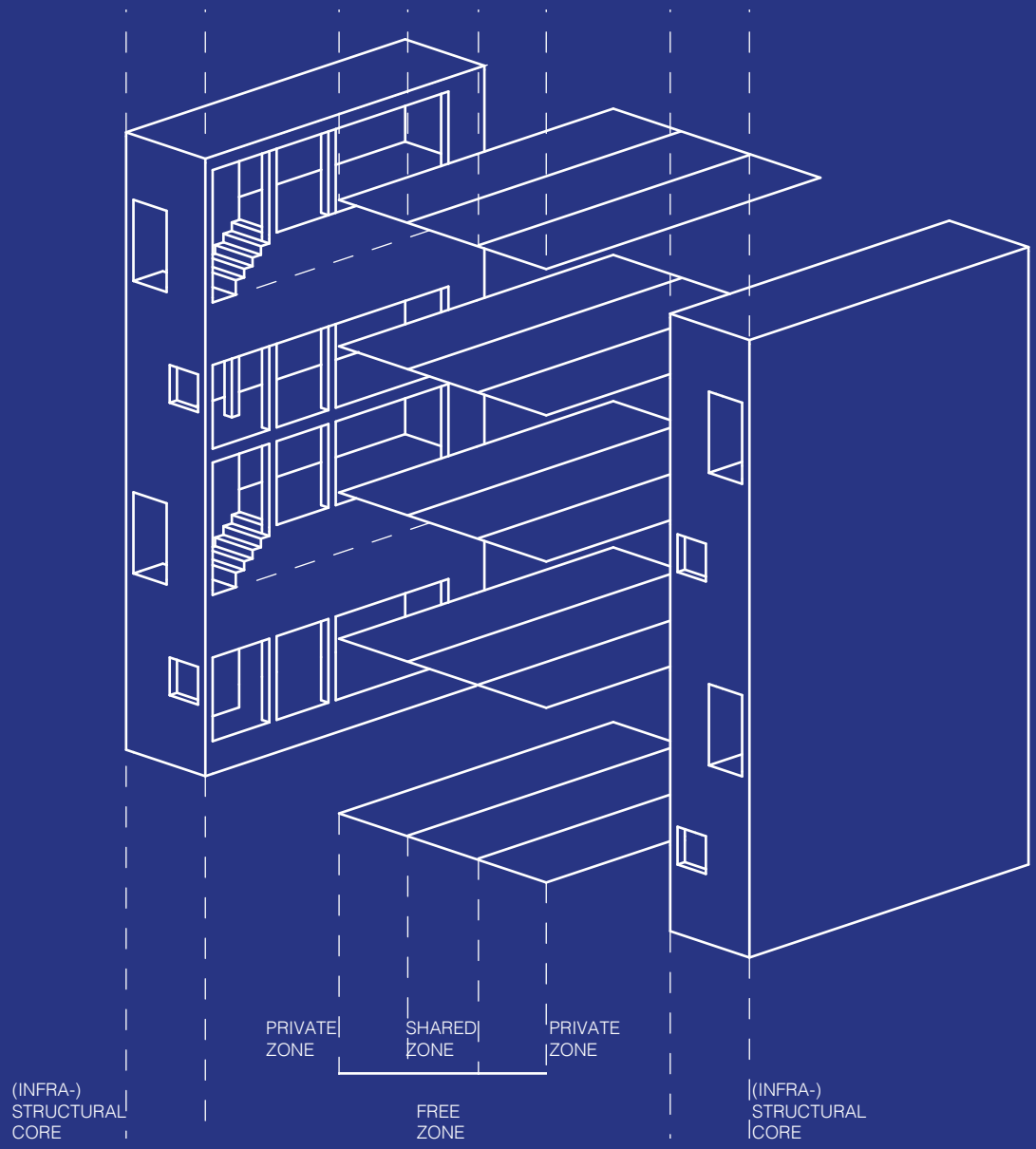
studioai.com/#/malabia-condominium

6 CLUSTER CONCEPT

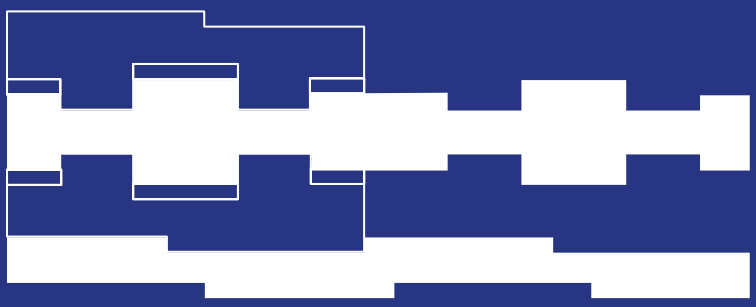
The concept for the cluster focuses the attention of space to the space of income generation. It foresees a series of structural cores that contain the dwellings infrastructure like bedniches, kitchens, bathrooms and circulation. The free zones in between are structurally and programatically free and can change programme in the course of the day and years.

The importance of the free zones is reflected in their one-and-a-half height of space as opposed to the regular height core zones. The free zone consists of three distinct zones: the zones adjacent to the core as the more private dwelling zone and the zones in the middle as a more communal shared zone between the two dwellings on each side. Occupation follows negotiation.

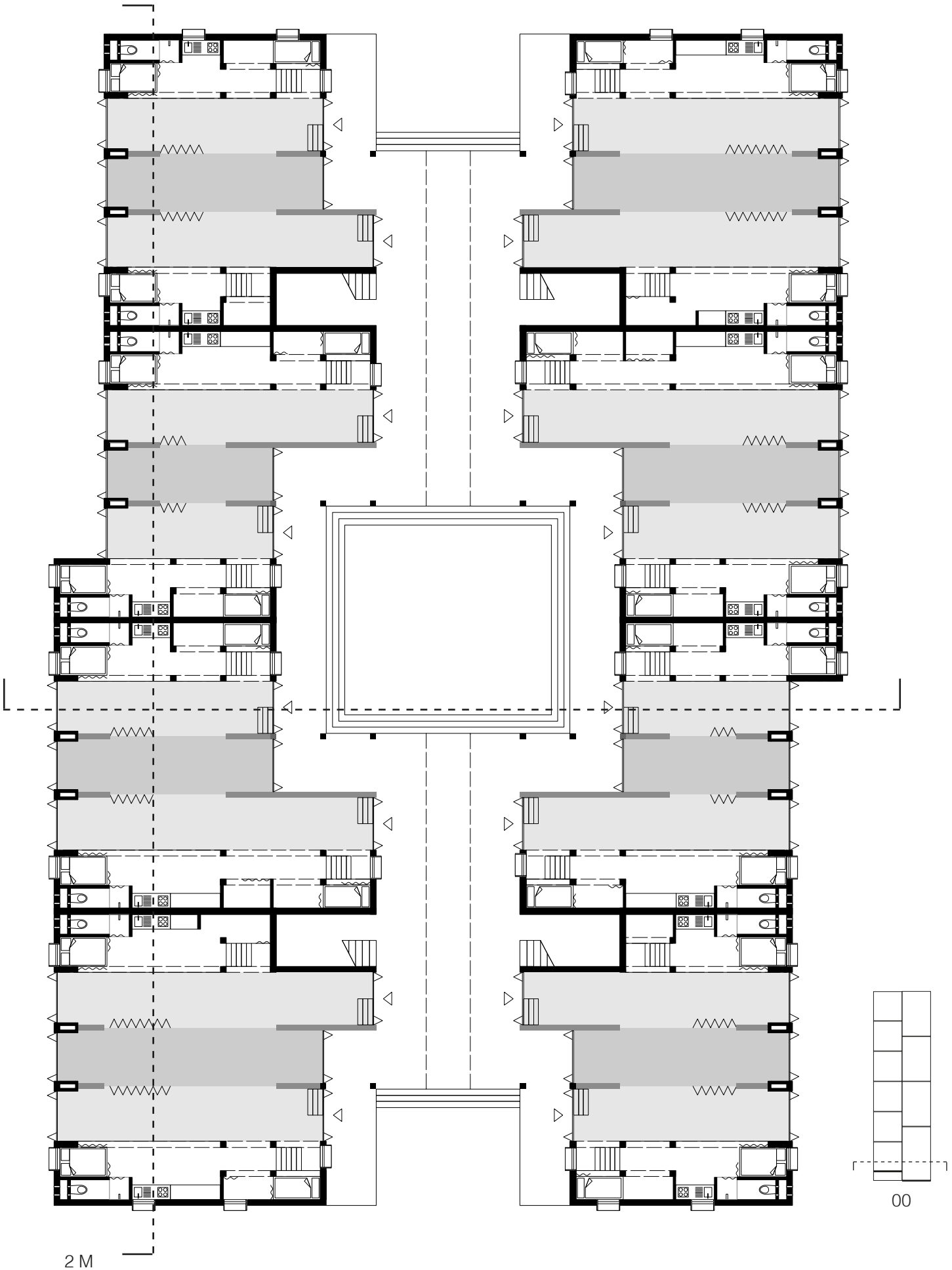
On the urban scale the cluster introduces when being combined, a soft edge to the inner side forming a pedestrian spine from courtyard to courtyard that expands and punctuates. Towards the outerside the cluster introduces a well defined street scape that steps back at points only slightly to allow for appropriation and a varied street profile.

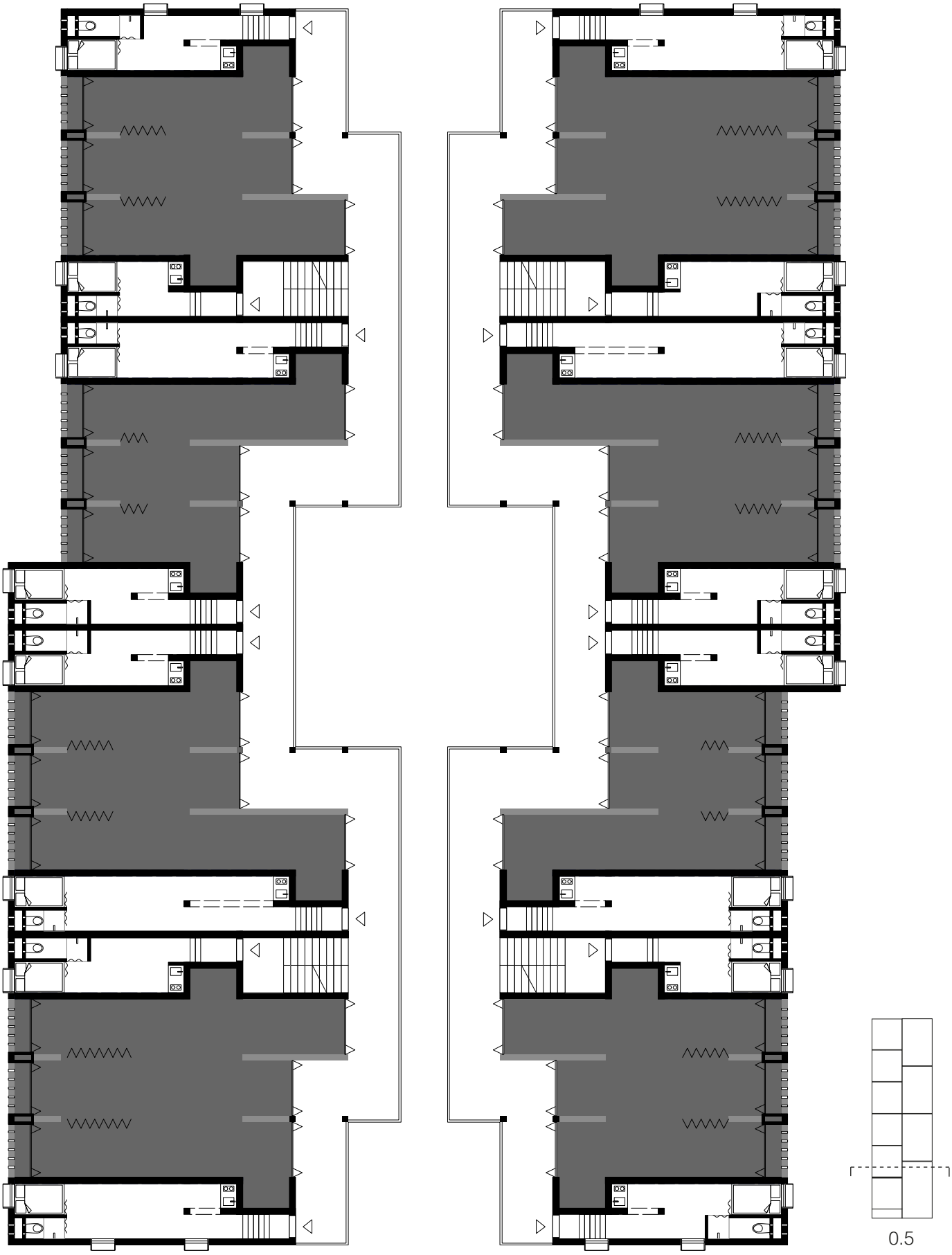


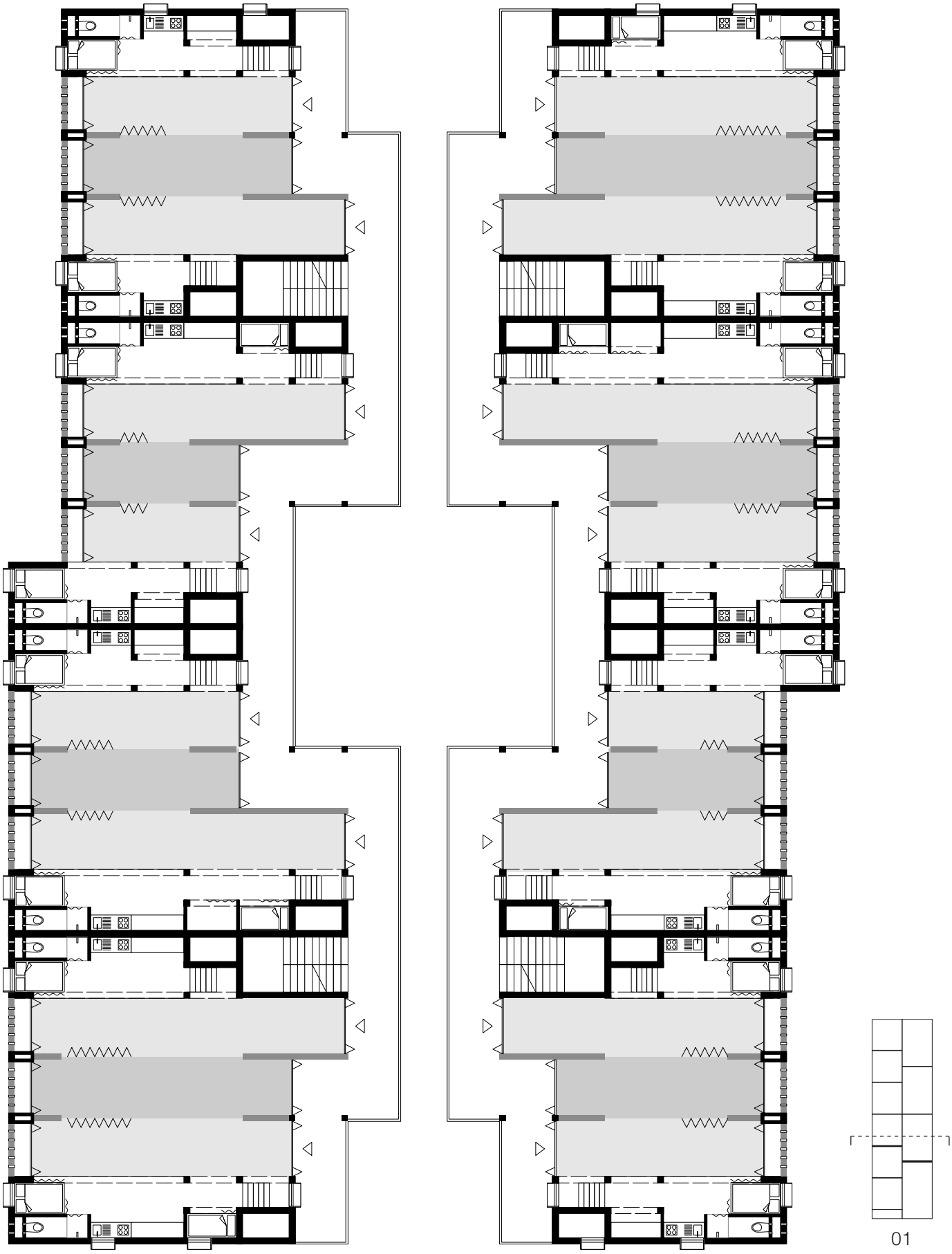
UNIT CONCEPT

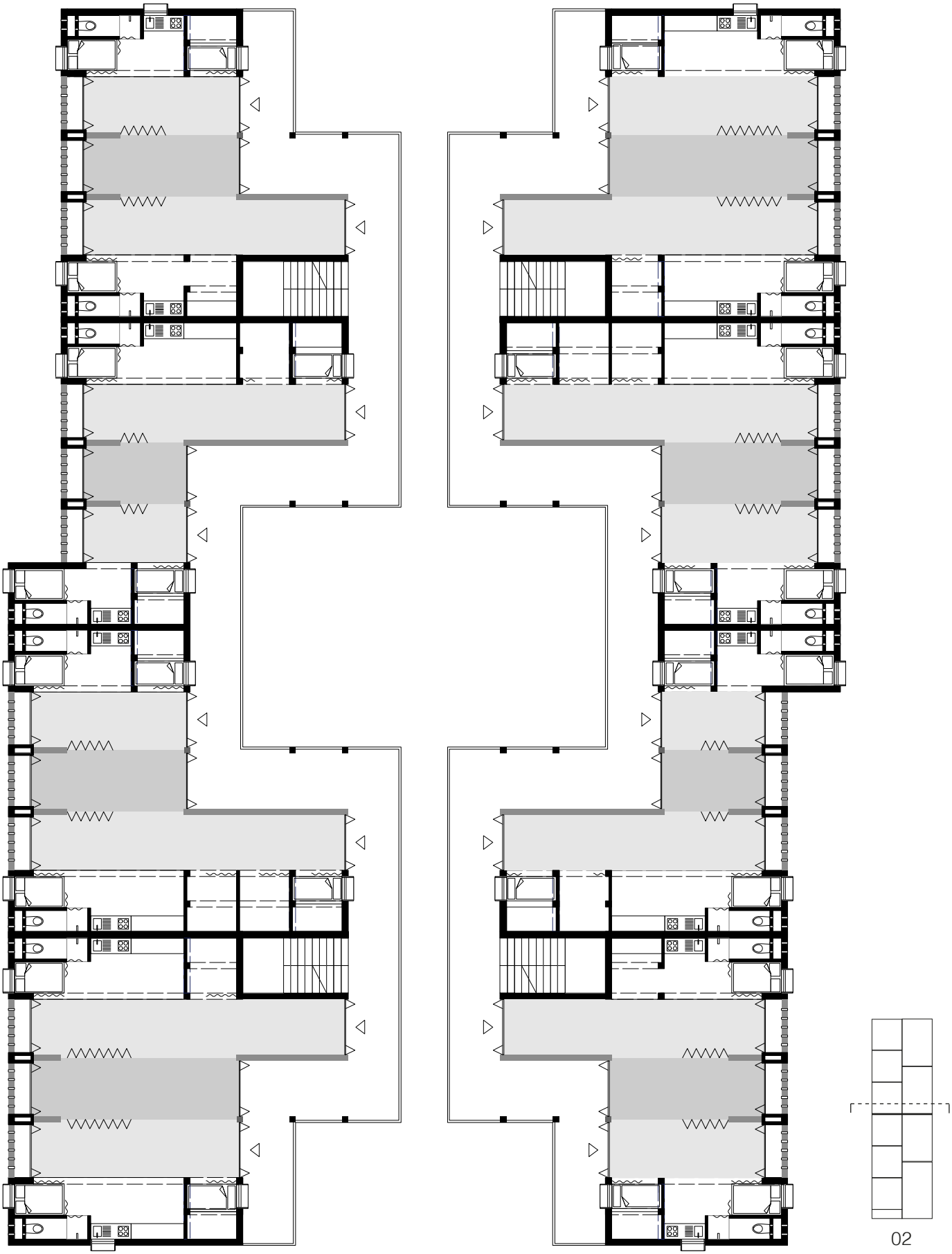


URBAN CONCEPT


00
2 M

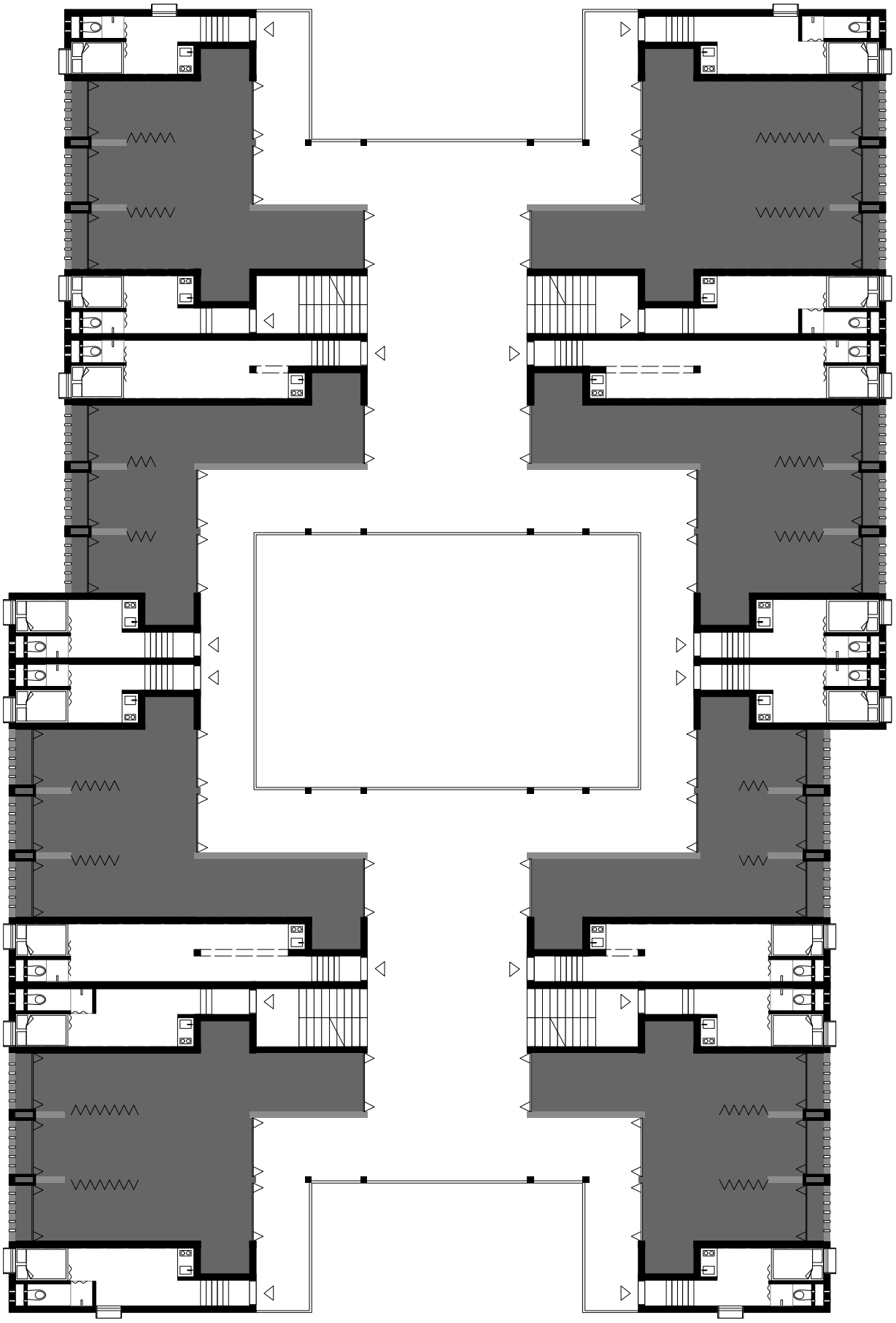

0.5
2 M


01
2 M



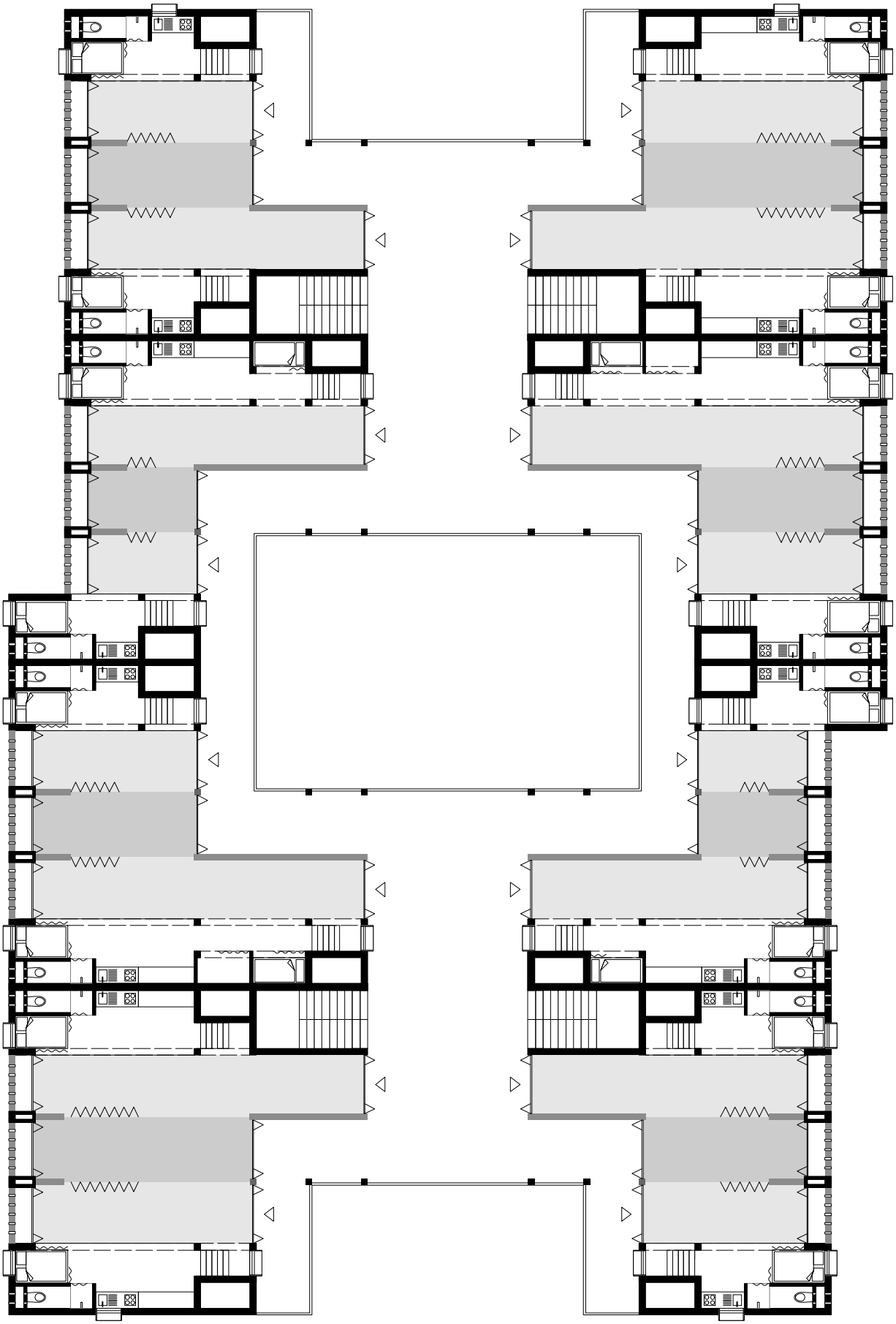
02

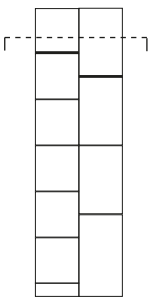
2 M



2.5

2 M



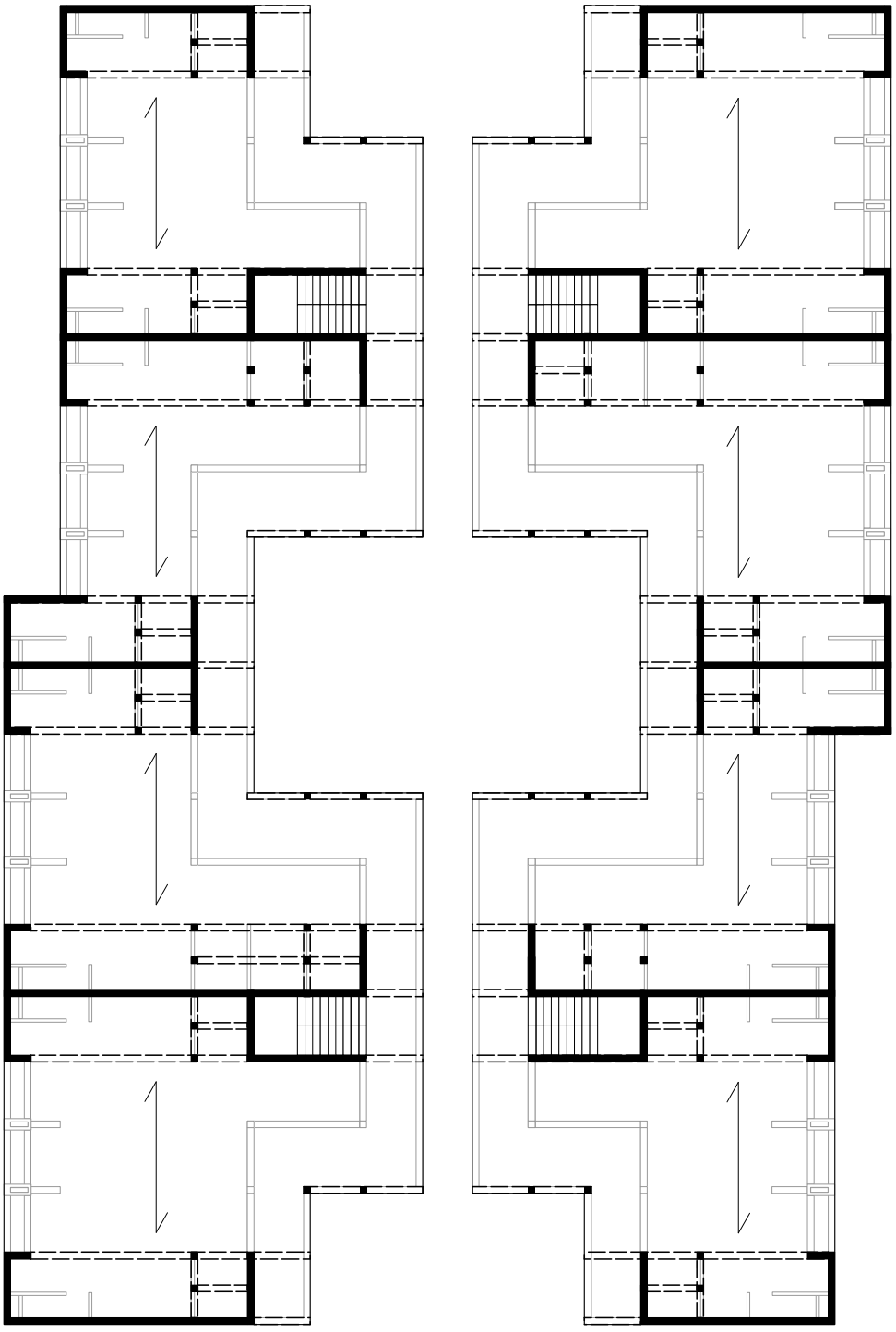


03

2 M

The structural plan shows the load bearing structure of the cores with freely spanning floors in between saving around 30% material and ensuring fast construction. The facade infill is independent.

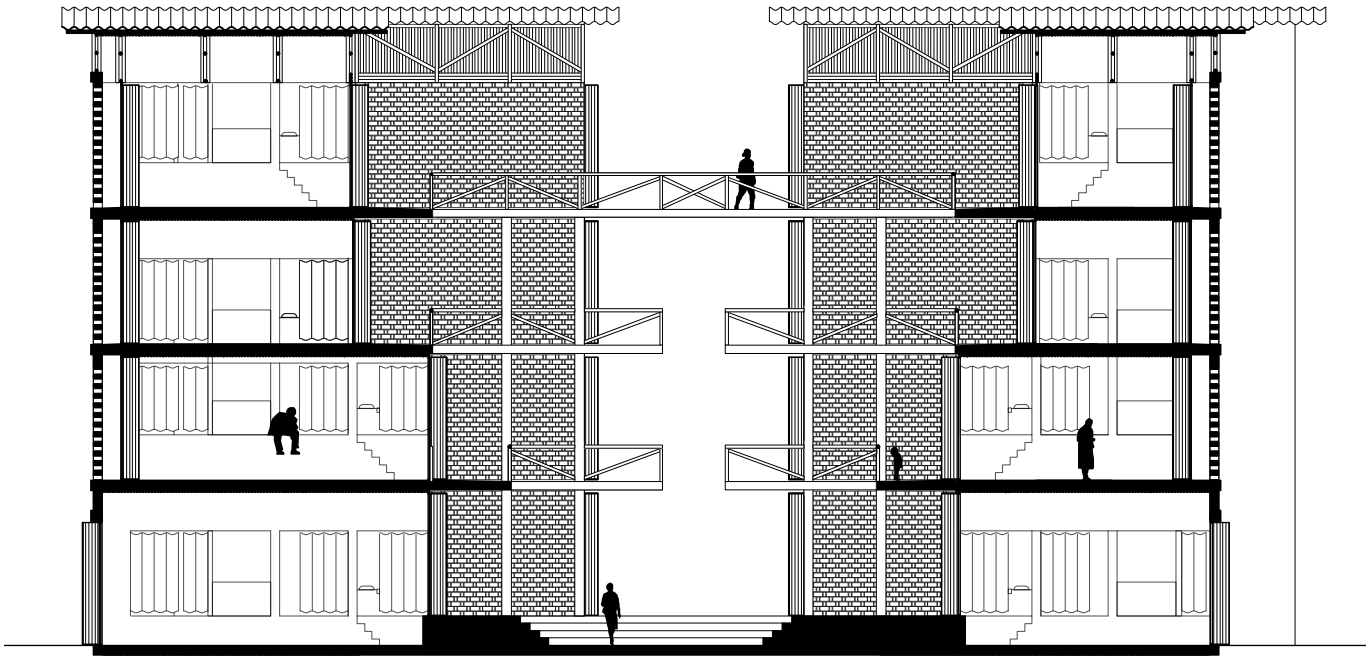
Structural Plan



2.5 M

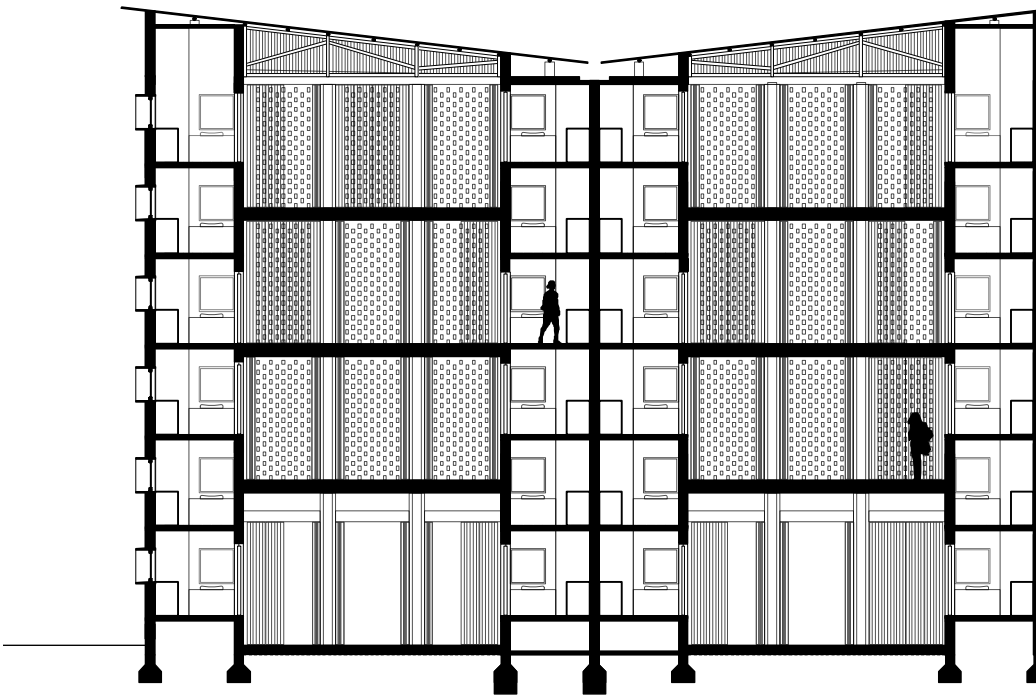
The cross section shows how the building steps back on floor two in order to let more light into the courtyard, establish visual connections through the court and provide qualitative outdoor space.

Cross Section

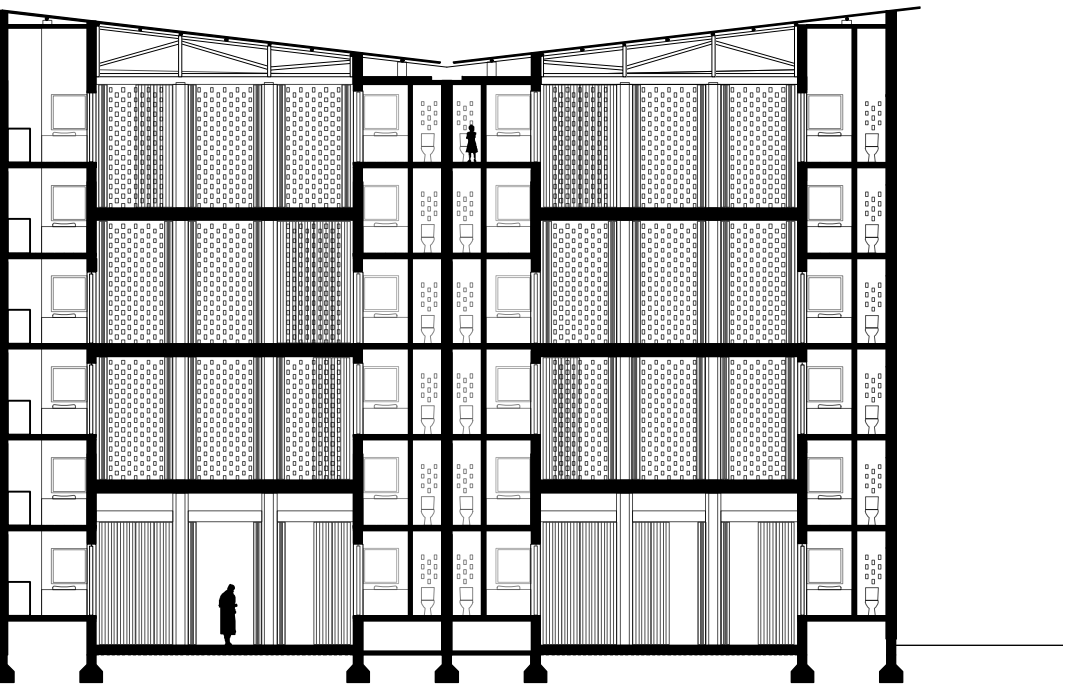


2 M

The longitudinal section reflects the importance of the free zones in their one-and-a-half height of space of 3.60m as opposed to the regular height core zones of 2.40m. This creates three distinct dwelling types: a split level type, a level type and a single unit type.

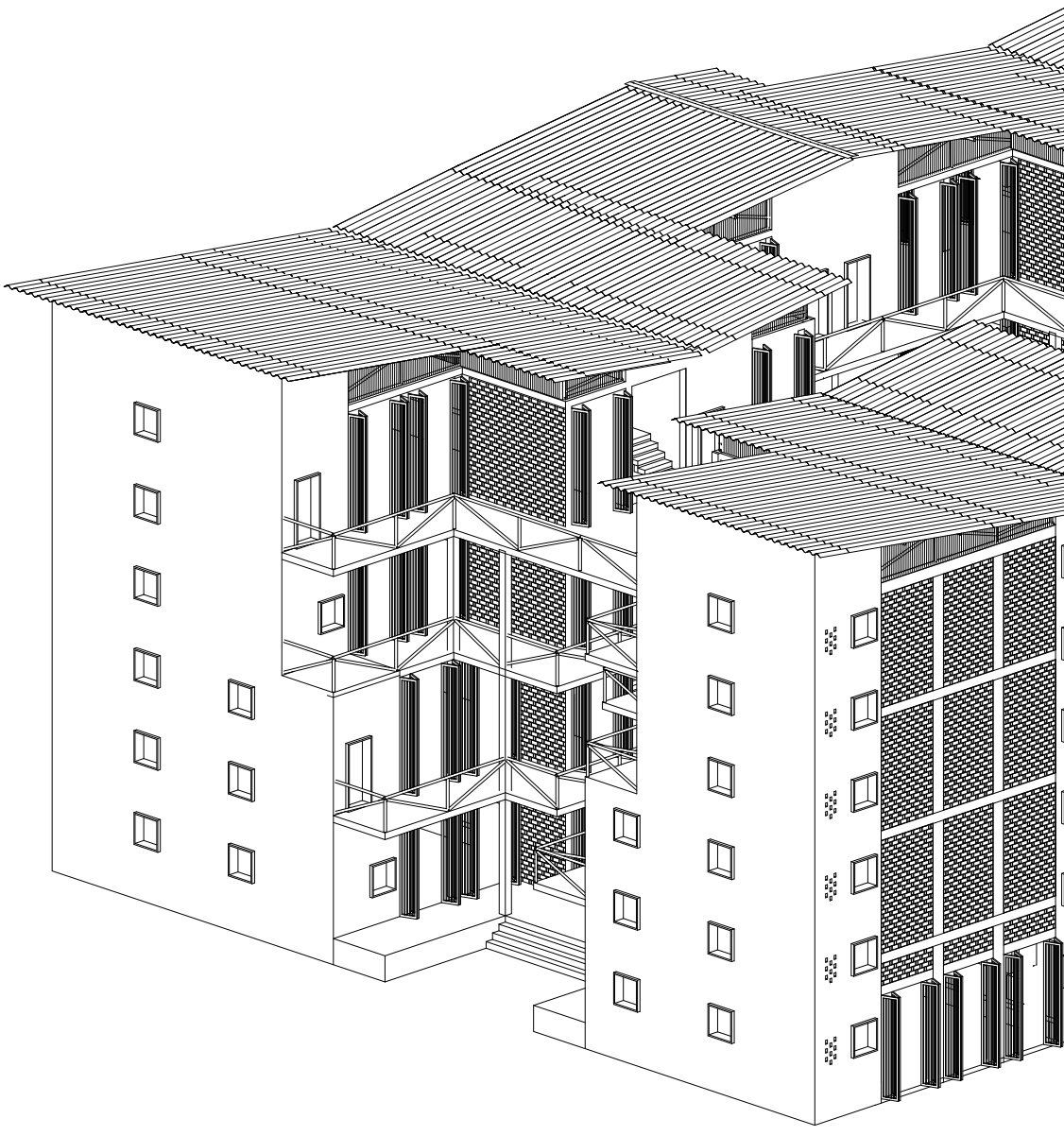


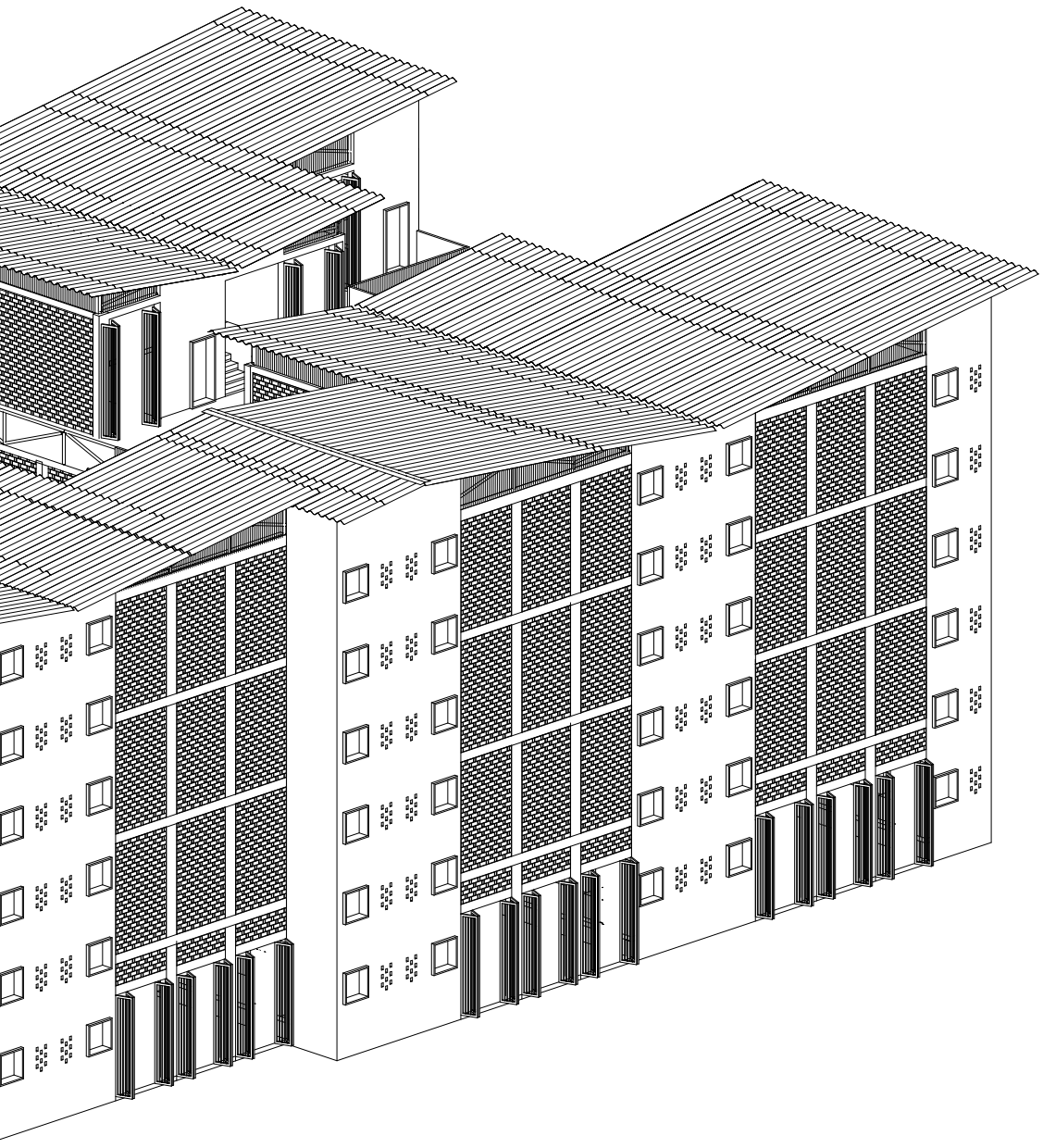
Longitudinal
Section



2 M

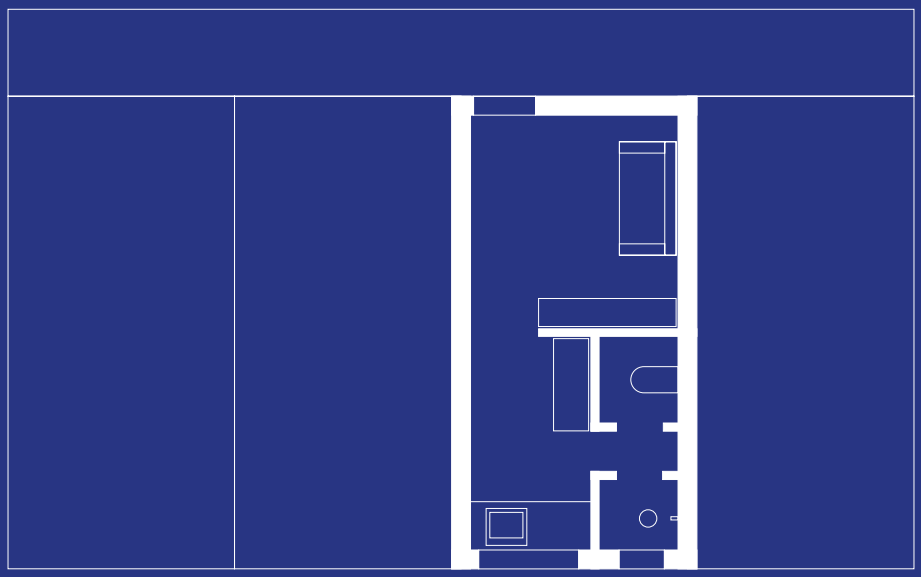
Isometric
View





7 DWELLING TYPES

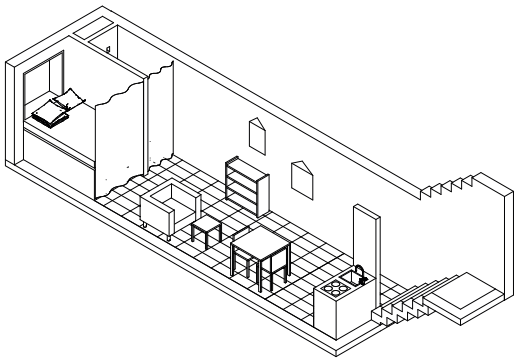
The exisiting dwelling type of the chawls and baithi chawls is characterised by scarcity of space and low flexibility in arrangement to accomodate different uses throughout the day – especially income generation. The same dwelling unit is repeated all over the neighborhood not accomodating different situations in lifestyle and economic situation. Nor does it allow for economic mobility.



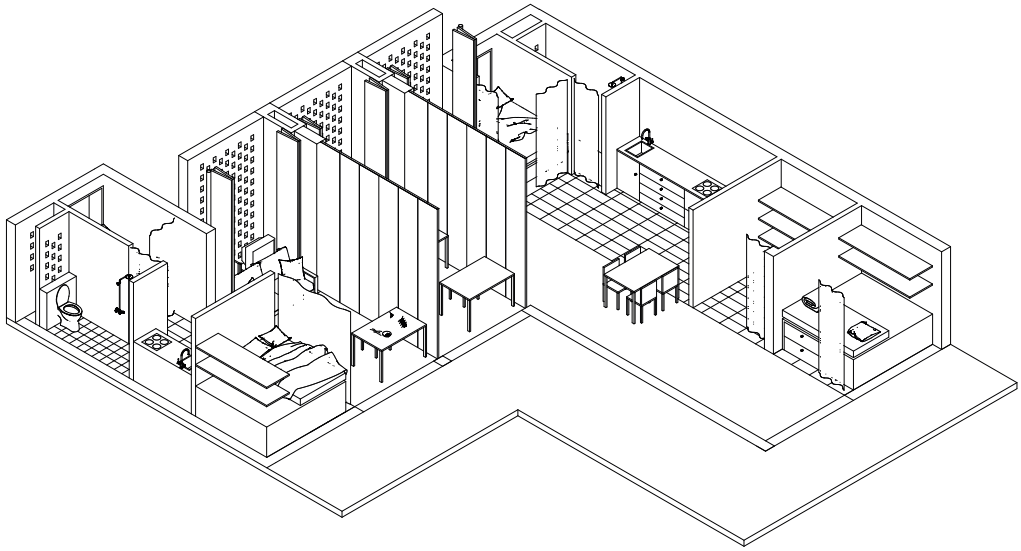
EXISTING DWELLING TYPE CHAWL

1 M

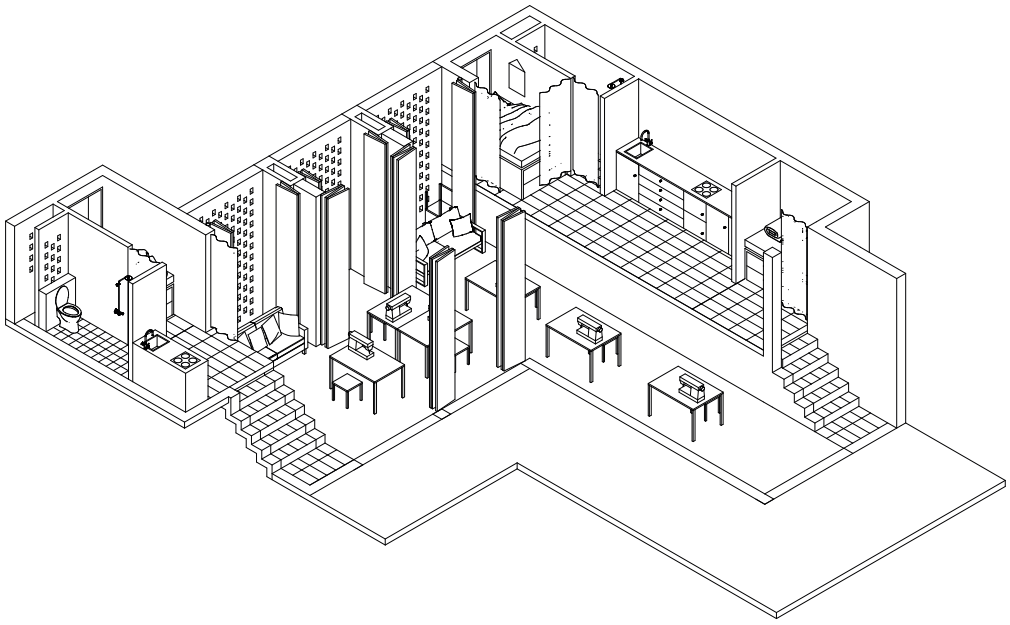
Single Unit –
Work, Sleep



Level Unit –
Work, Relax

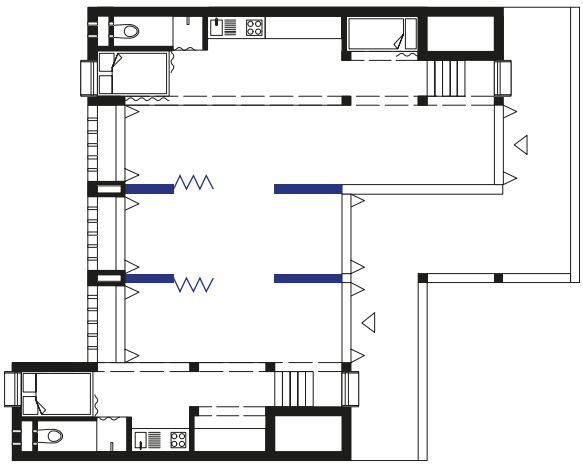


Split Unit –
Work, Sleep

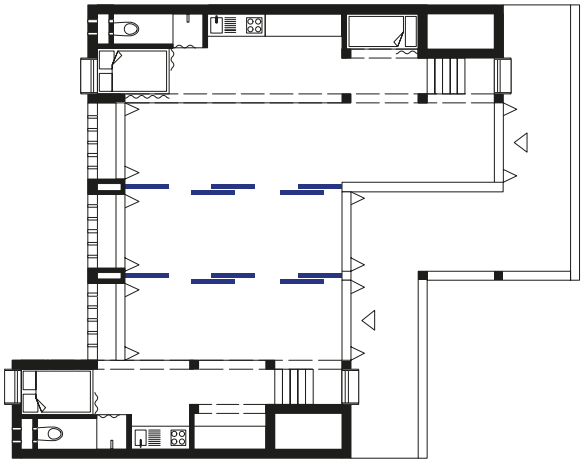


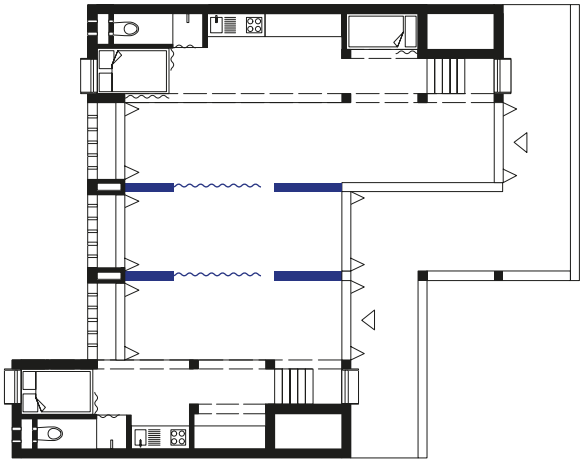
8 DWELLING FLEXIBILITY

Seperation
Option
Foldable Wall

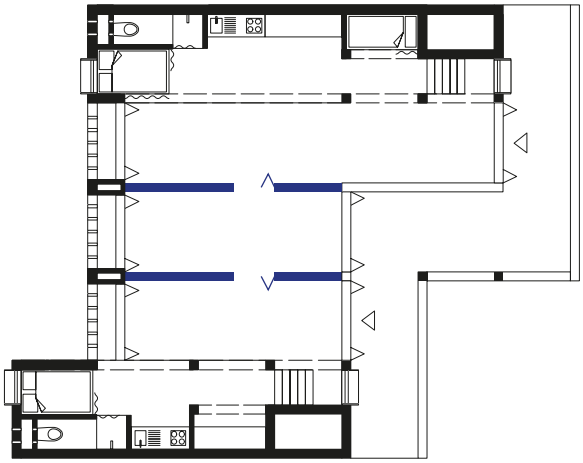


Seperation
Option
Sliding Door



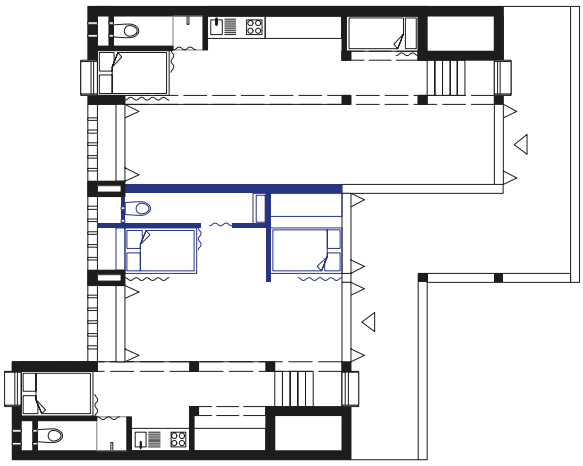


Seperation
Option
Curtain

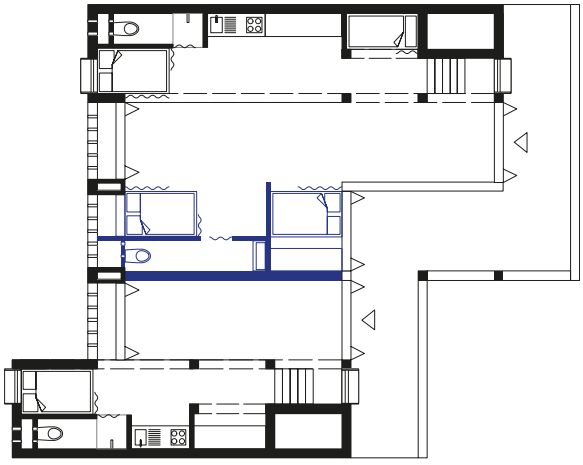


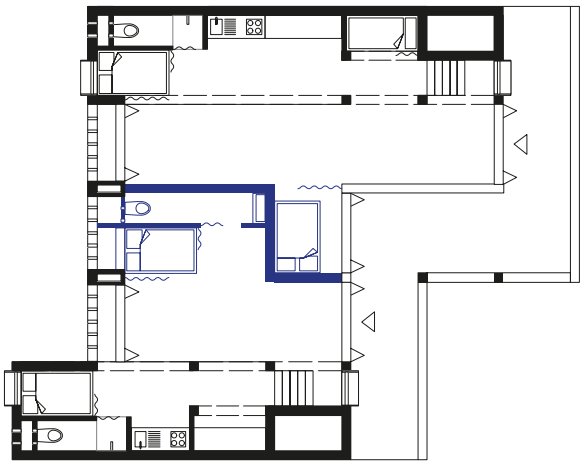
Seperation
Option
Door

Seperation
Option
Permanent Wall
Dwelling A
Expansion 1

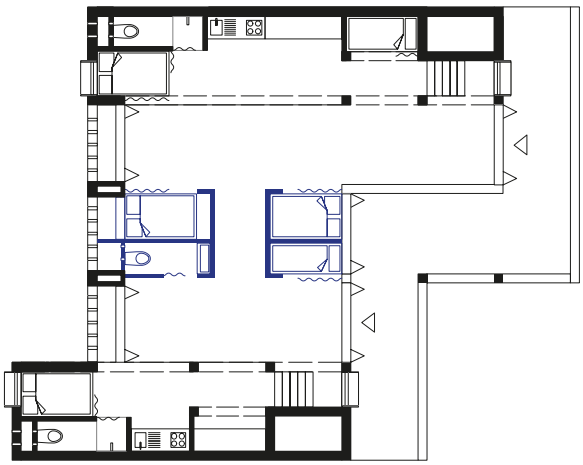


Seperation
Option
Permanent Wall
Dwelling B
Expansion 2

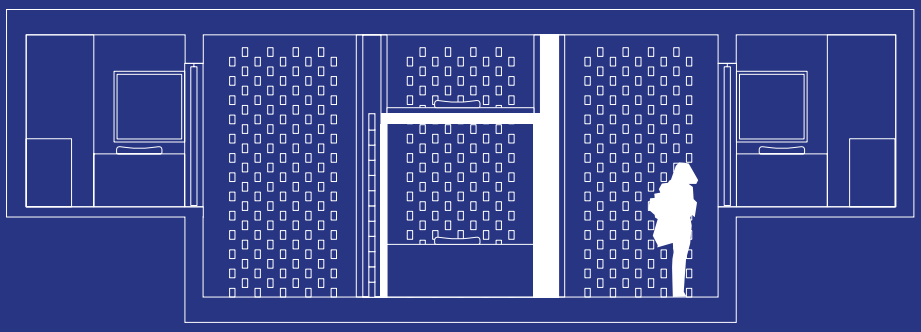




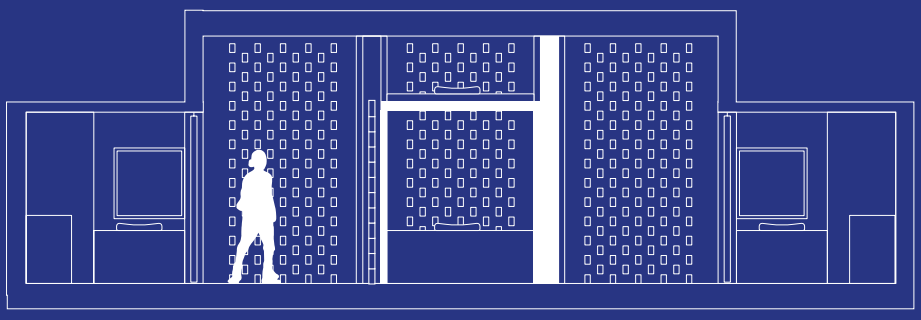
Seperation
Option
Permanent Wall
Dwelling A and
B Expansion
(Private Units)



Seperation
Option
Growing Family
United Dwelling



SECOND LEVEL EXPANSION SPLIT UNIT



SECOND LEVEL EXPANSION LEVEL UNIT

9 DWELLING SIZES

The flexibilty of the dwelling's layouts allows for variable dwelling sizes. For the level and split units, sizes can vary between 29 m2 for the economically weaker section up to 78 m2 for the middle income group. This allows for economic flexibility as the apartment can grow with income. The option for a second level within the shared zone even enhances this flexibility. Single units are dedicated to newcomers to the city starting in the economy and consist of 14 to 26 m2.

LEVEL UNITS, SPLIT UNITS (00, 01)

SHARED UNIT

PRIVATE	SHARED	PRIVATE
38 – 47	17 – 27	33 – 56
EWS – LIG		EWS – LIG

PRIVATE UNITS

PRIVATE	PRIVATE
49 – 60	42 – 67
LIG	LIG

EXPANSION 1

PRIVATE	SECOND	PRIVATE
60 – 73	81 – 100	33 – 56
LIG	MIG	EWS – LIG

EXPANSION 2

PRIVATE	SECOND	PRIVATE
38 – 47	67 – 101	50 – 78
EWS – LIG	LIG – MIG	LIG – MIG

UNITED

PRIVATE
97 – 120
MIG

LEVEL UNITS, SPLIT UNITS (02, 03)

SHARED UNIT

PRIVATE	SHARED	PRIVATE
29 – 47	12 – 22	24 – 56
EWS – LIG		EWS – LIG

PRIVATE UNITS

PRIVATE	PRIVATE
37 – 57	30 – 64
EWS – LIG	EWS – LIG

EXTENSION 1

PRIVATE	SECOND	PRIVATE
45 – 68	61 – 90	24 – 56
LIG	LIG – MIG	EWS – LIG

EXTENSION 2

PRIVATE	SECOND	PRIVATE
29 – 47	48 – 88	36 – 72
EWS – LIG	LIG –MIG	EWS – LIG

UNITED

PRIVATE
83 – 106
MIG

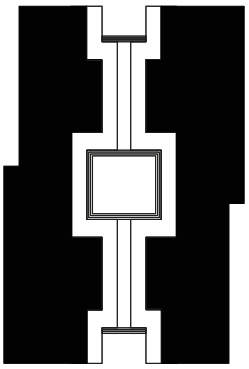
SINGLE UNITS (0.5, 2.5)

SHARED UNIT

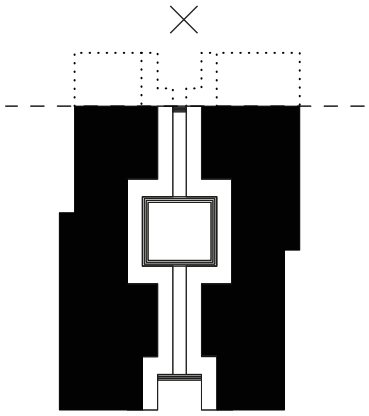
PRIVATE
14 – 26
EWS

10 CLUSTER VARIATION

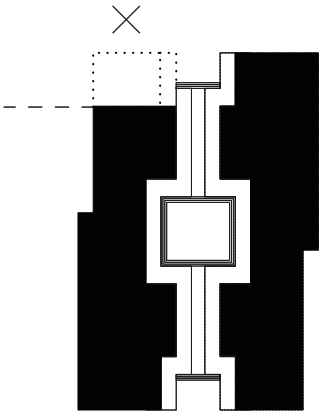
In order to adopt to various urban geometries, a series of cluster variations have been developed. The Closing End Module closes the module towards a road of higher hierarchy. The Pedestrian Community Spine Module, that faces the Pedestrian Community Spine and opens up its head facade to it. A version to elongate or shorten the module, a diagonal version and a version of on additional vertical element to increase density.



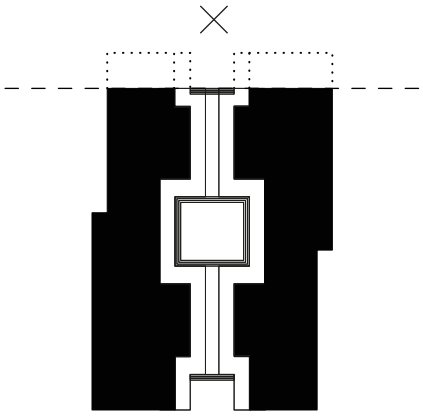
Base Module



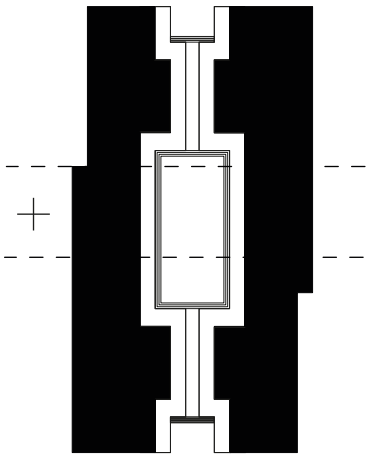
Closing End
Module



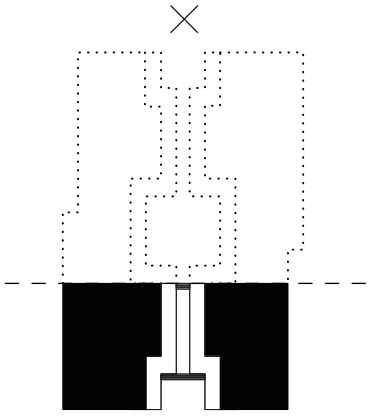
Diagonal
Module



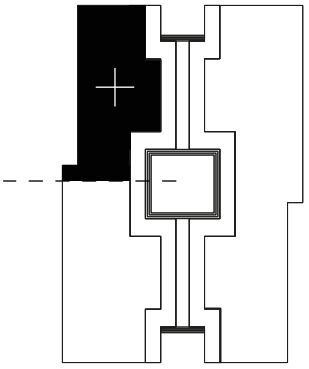
Pedestrian
Communtiy
Spine Module



Longer End
Module

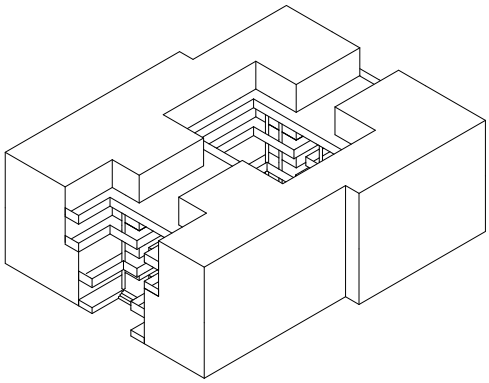


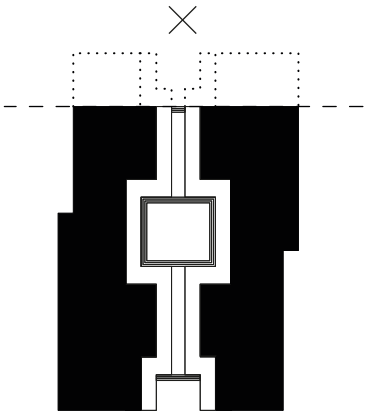
Shorter End
Module

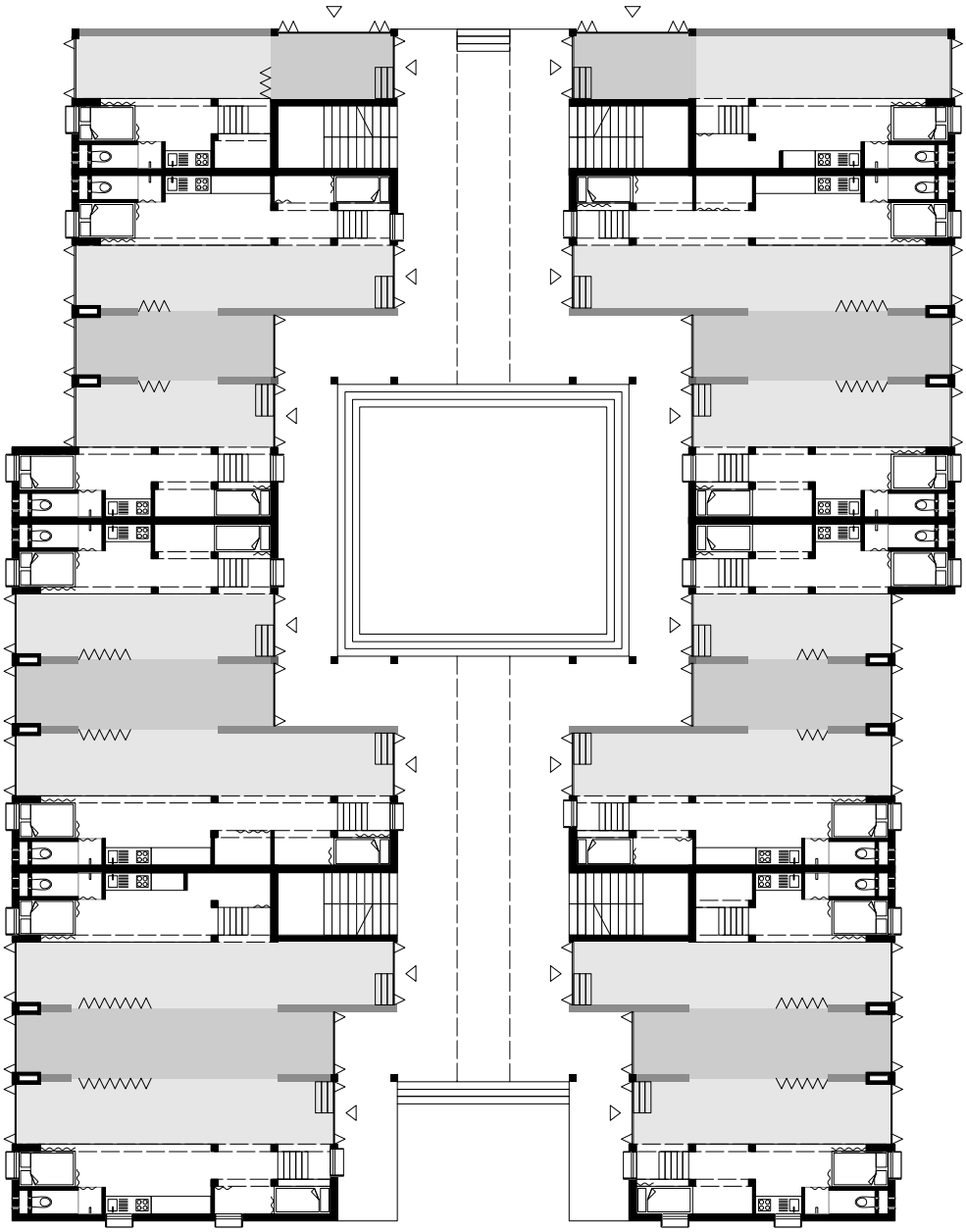


One Up Module

Closing End
Module



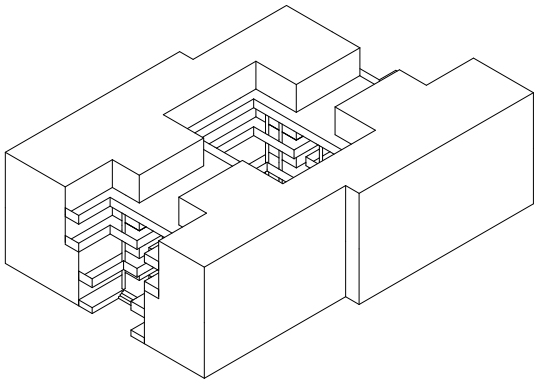


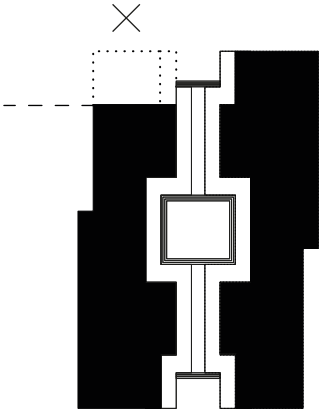


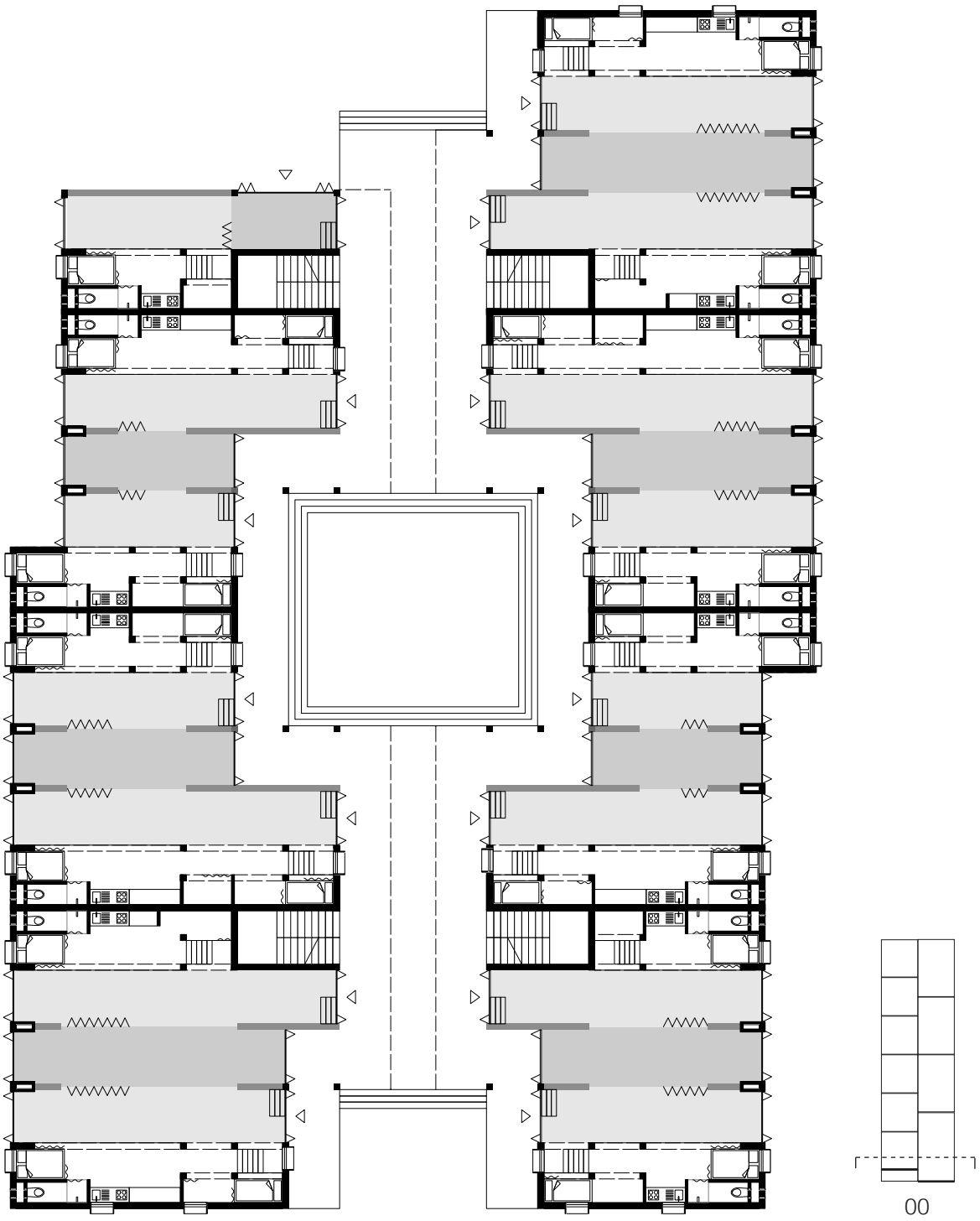
00

2.5 M

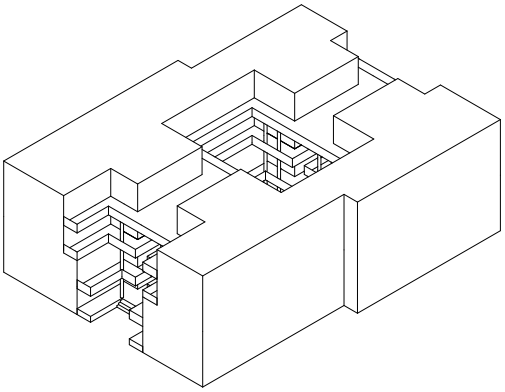
Diagonal
Module

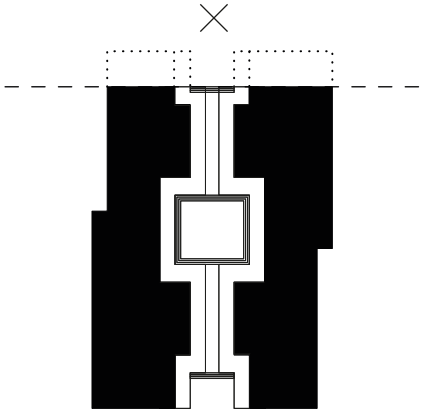


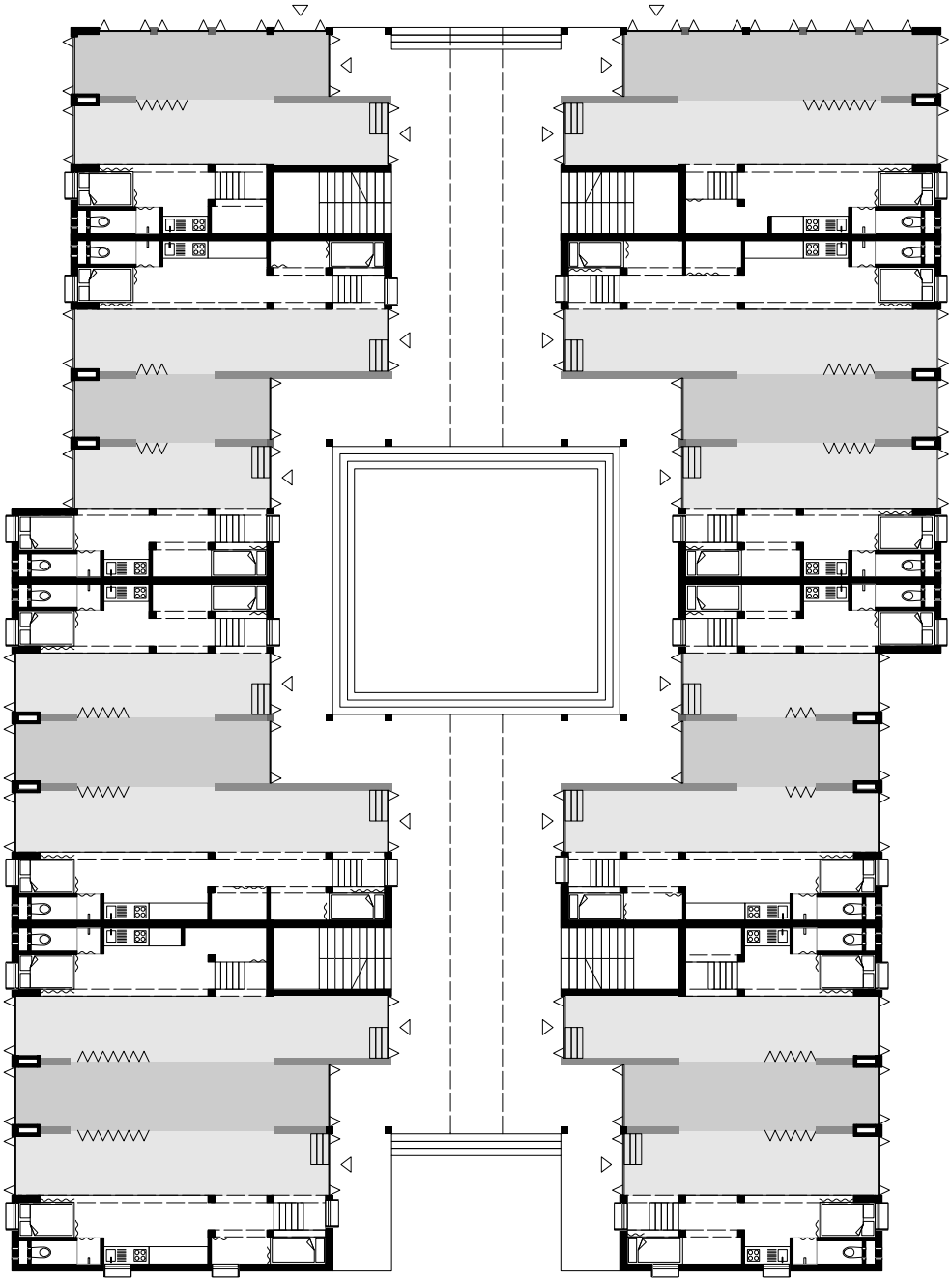



00
2.5 M

Pedestrian
Communtiy
Spine Module



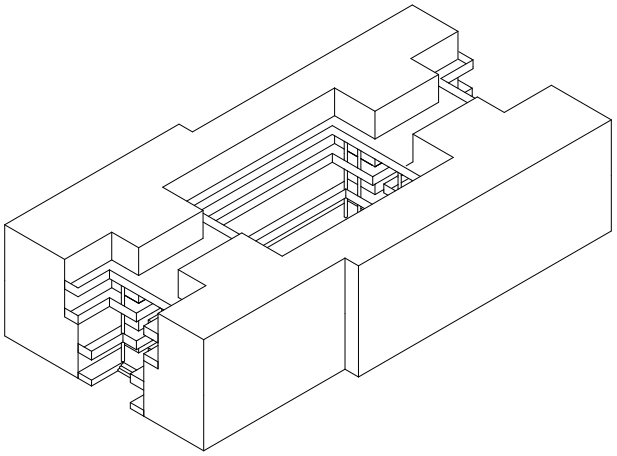


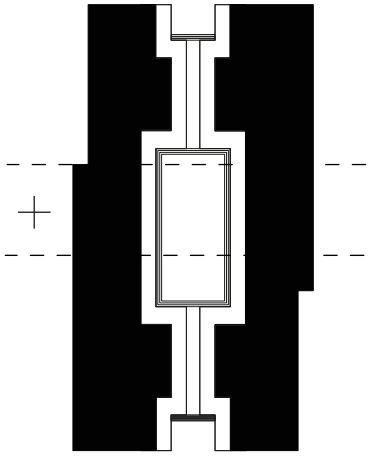


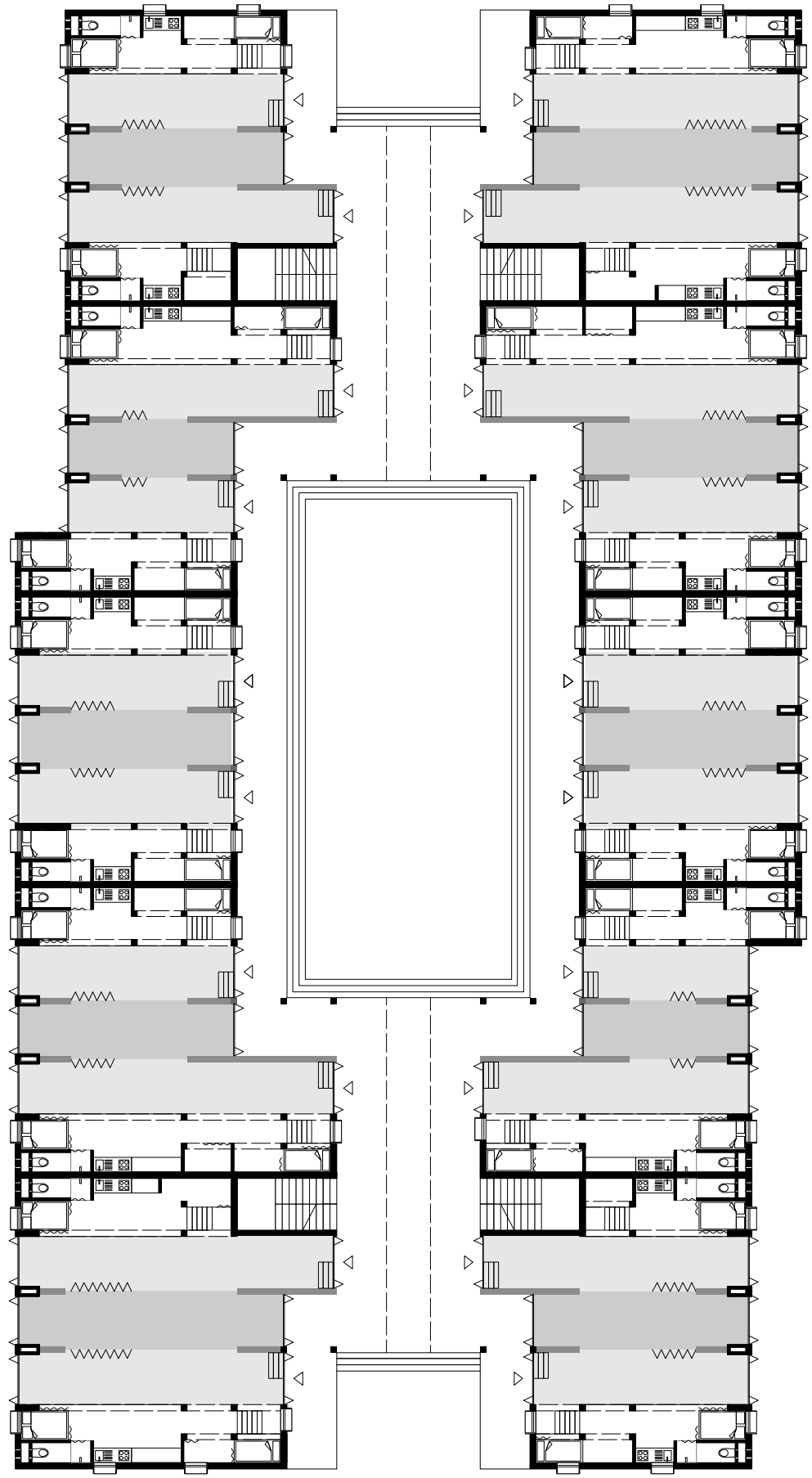
00

2.5 M

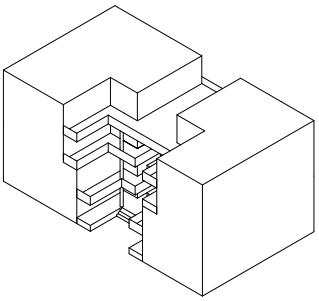
Longer End
Module

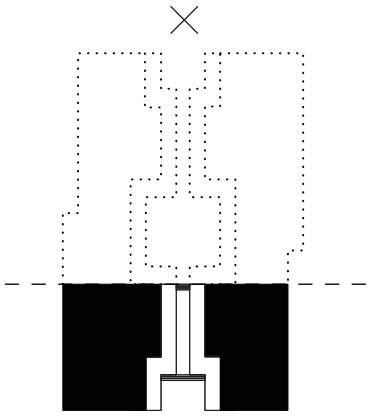


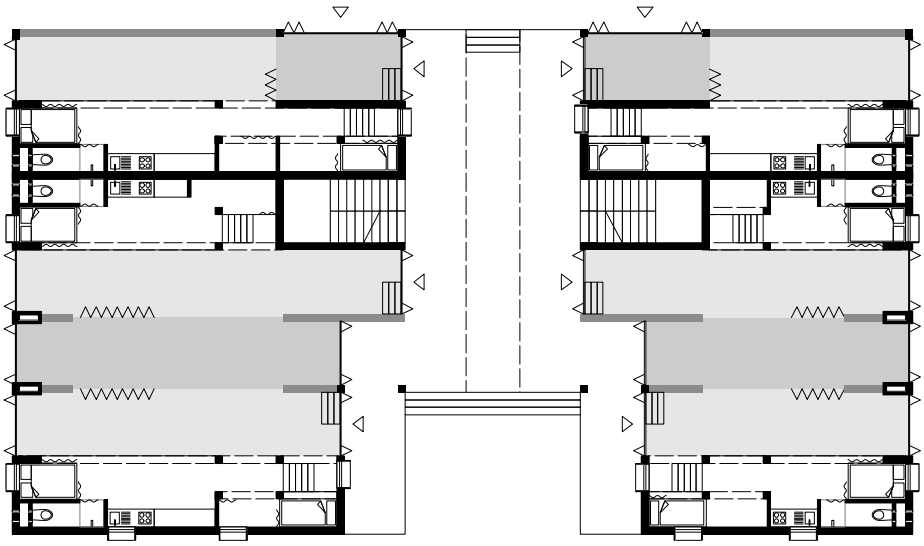


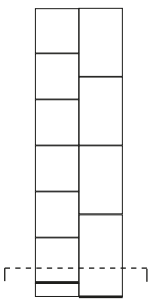

00
2.5 M

Shorter End
Module





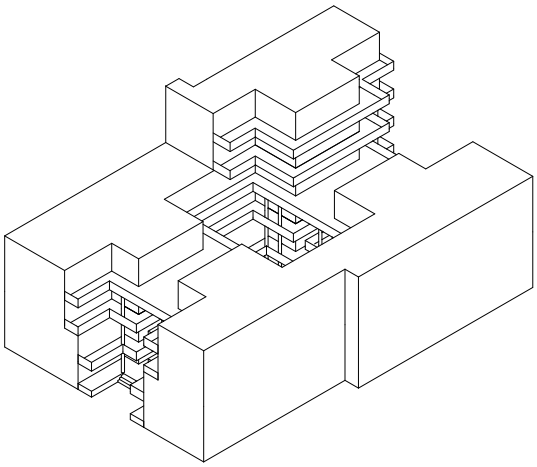


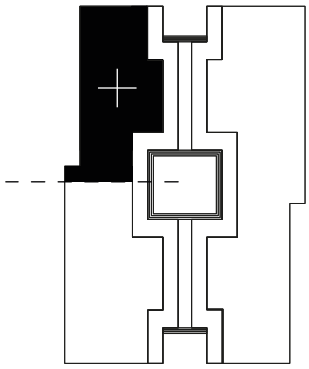


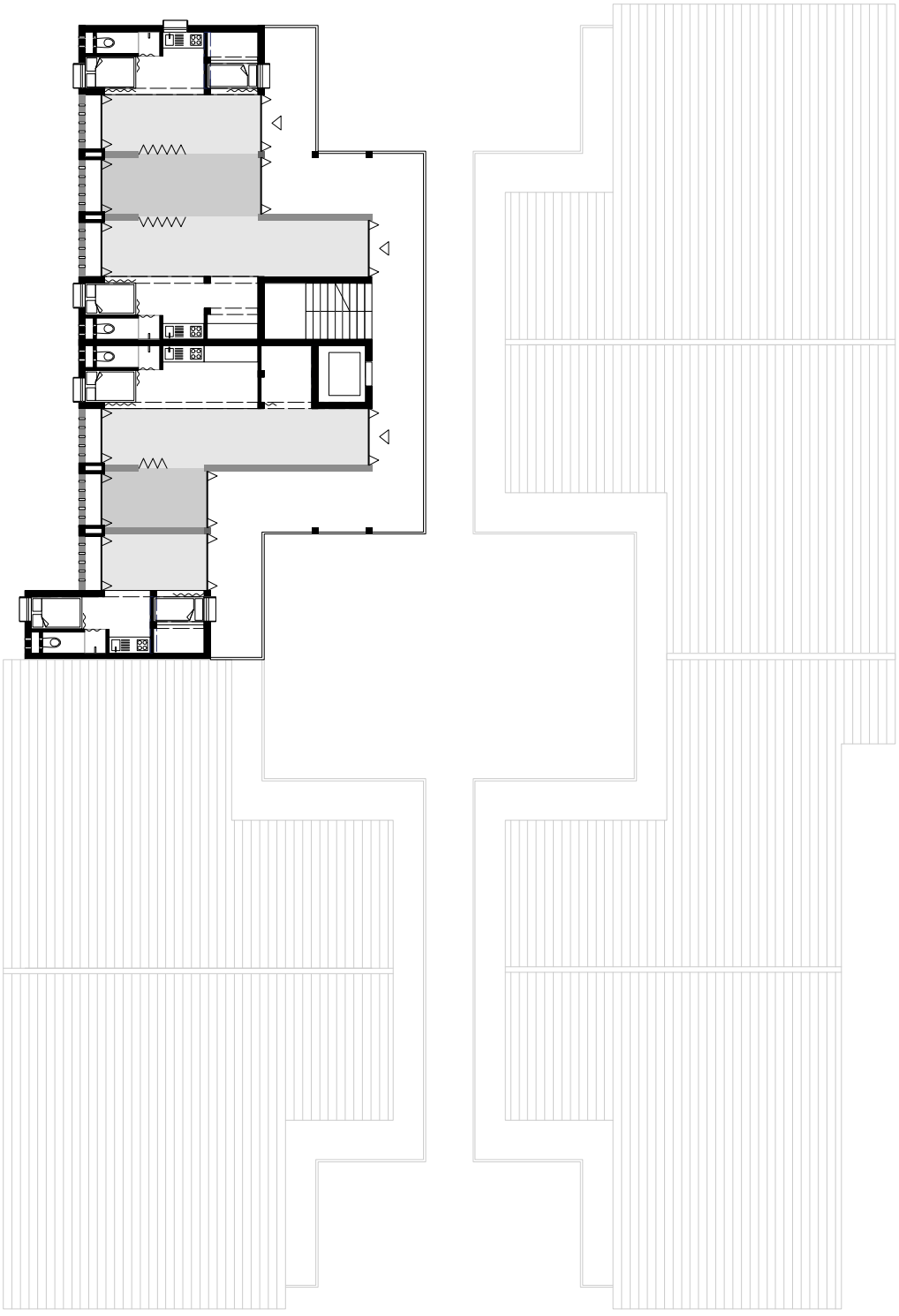
00

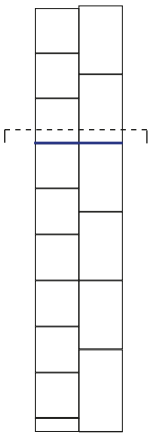
2.5 M

One Up Module









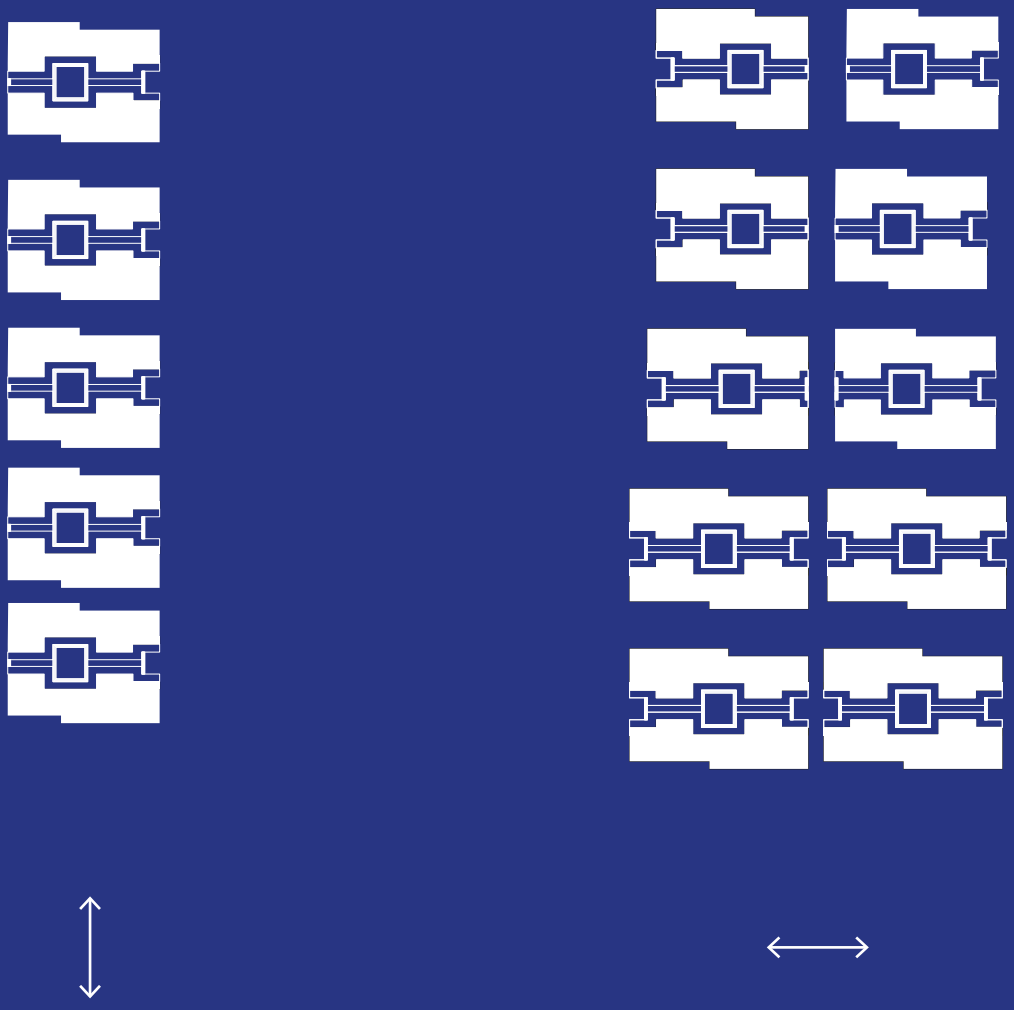
04

2.5 M

11 CLUSTER COMBINATION

In controlling the space between the clusters, different hierarchies of roads are achieved – from the vehicular commercial street of 10m width, to the vehicular street, the pedestrian community spine, rickshaw workshop street and the pedestrian workshop connector of 6m.

Hierarchy of roads



VEHICULAR COMMERCIAL STREET
VEHICULAR STREET
PEDESTRIAN COMMUNITY SPINE
RICKSHAW WORKSHOP STREET
PEDESTRIAN WORKSHOP CONNECTOR

HIERARCHY OF ROADS

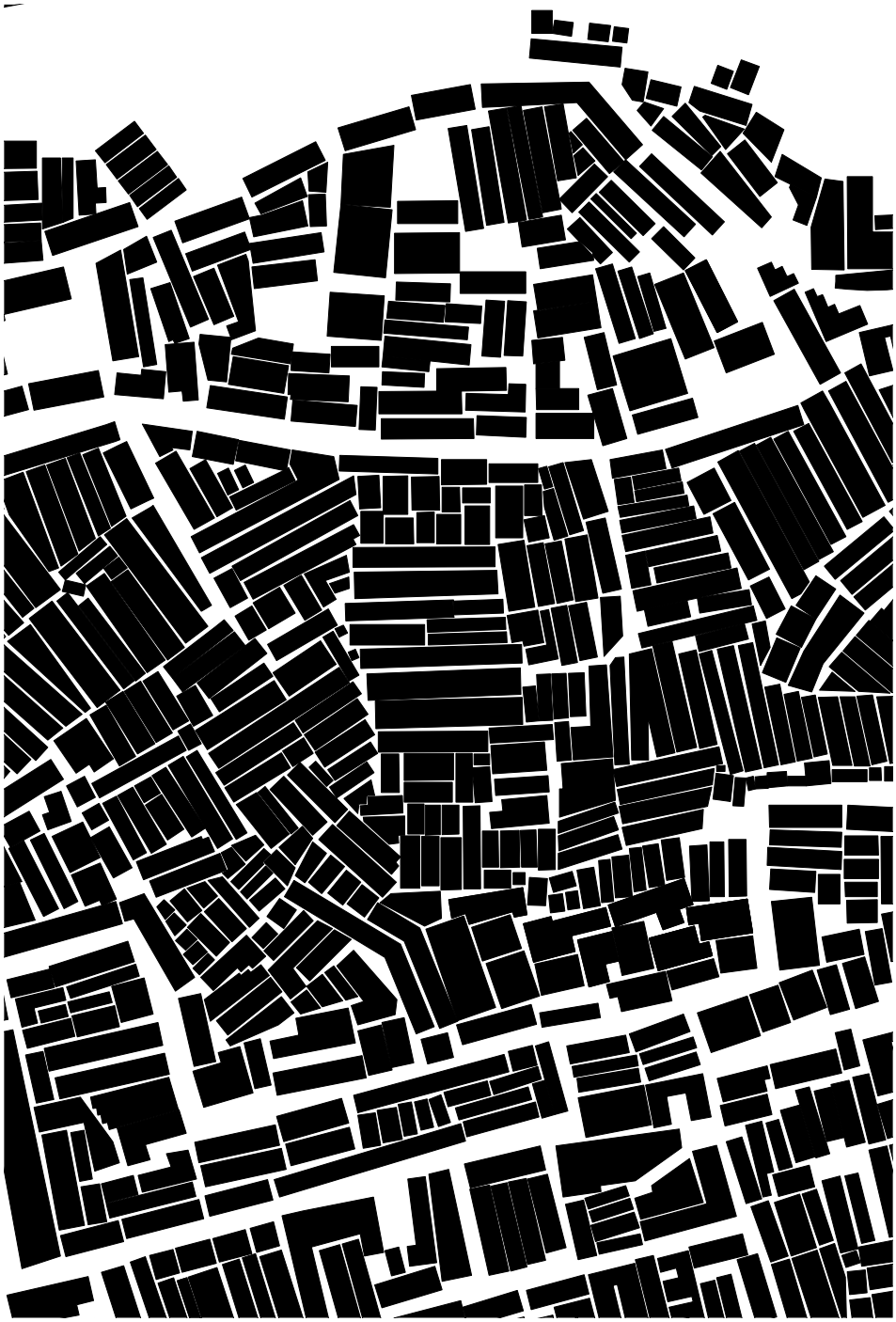
12 THE SITE

The chosen site to test the design strategy lies in Nalasopara East's North. Its built mass is very dense, consisting mainly of baithi chawls and partly already redeveloped areas of 5 storeys, resulting in an overall fsi of 1.4 Open space is extremely scarce and the transition from public to private very limited. Connectivity is low.

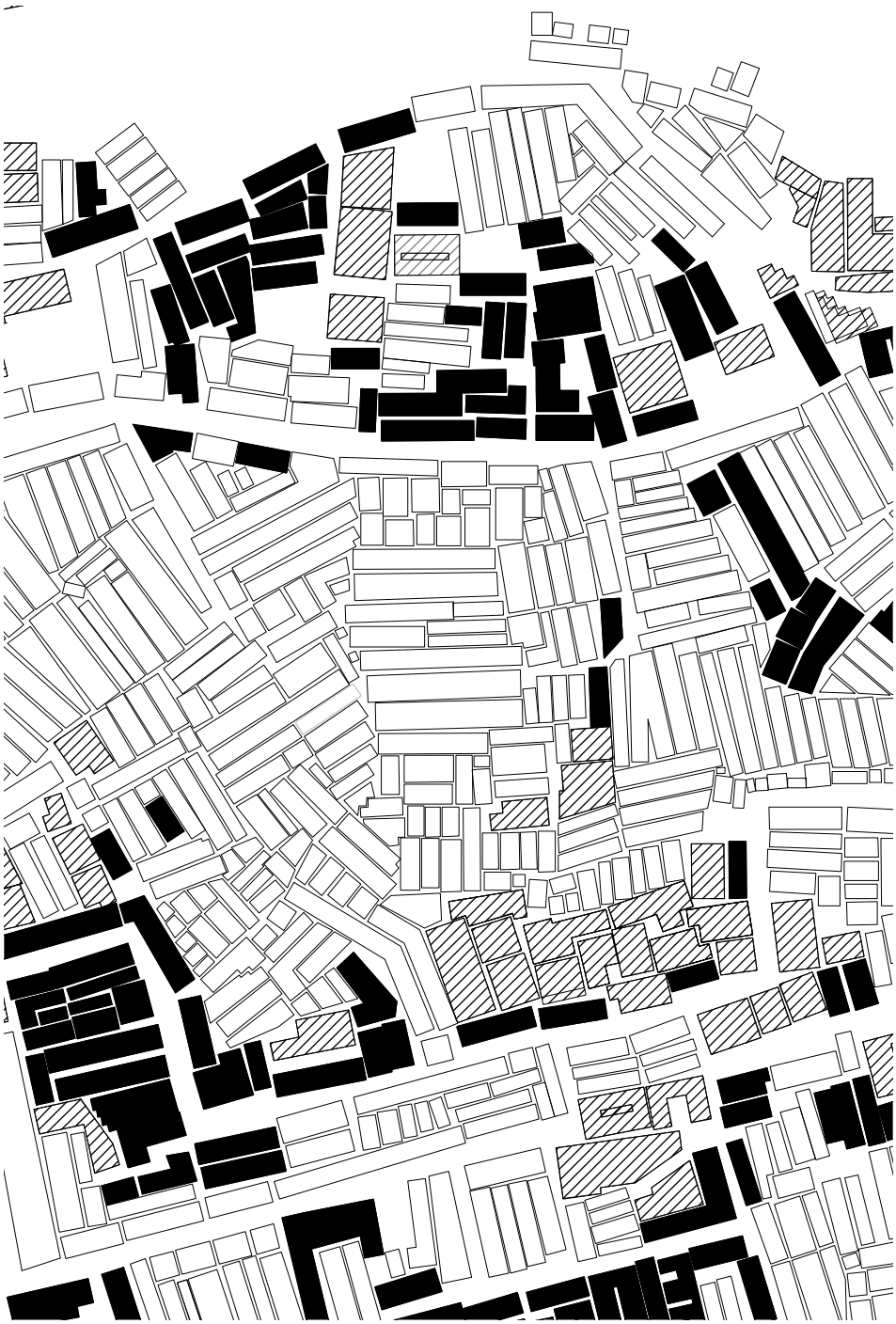
The site

200 M

Building Mass
Existing

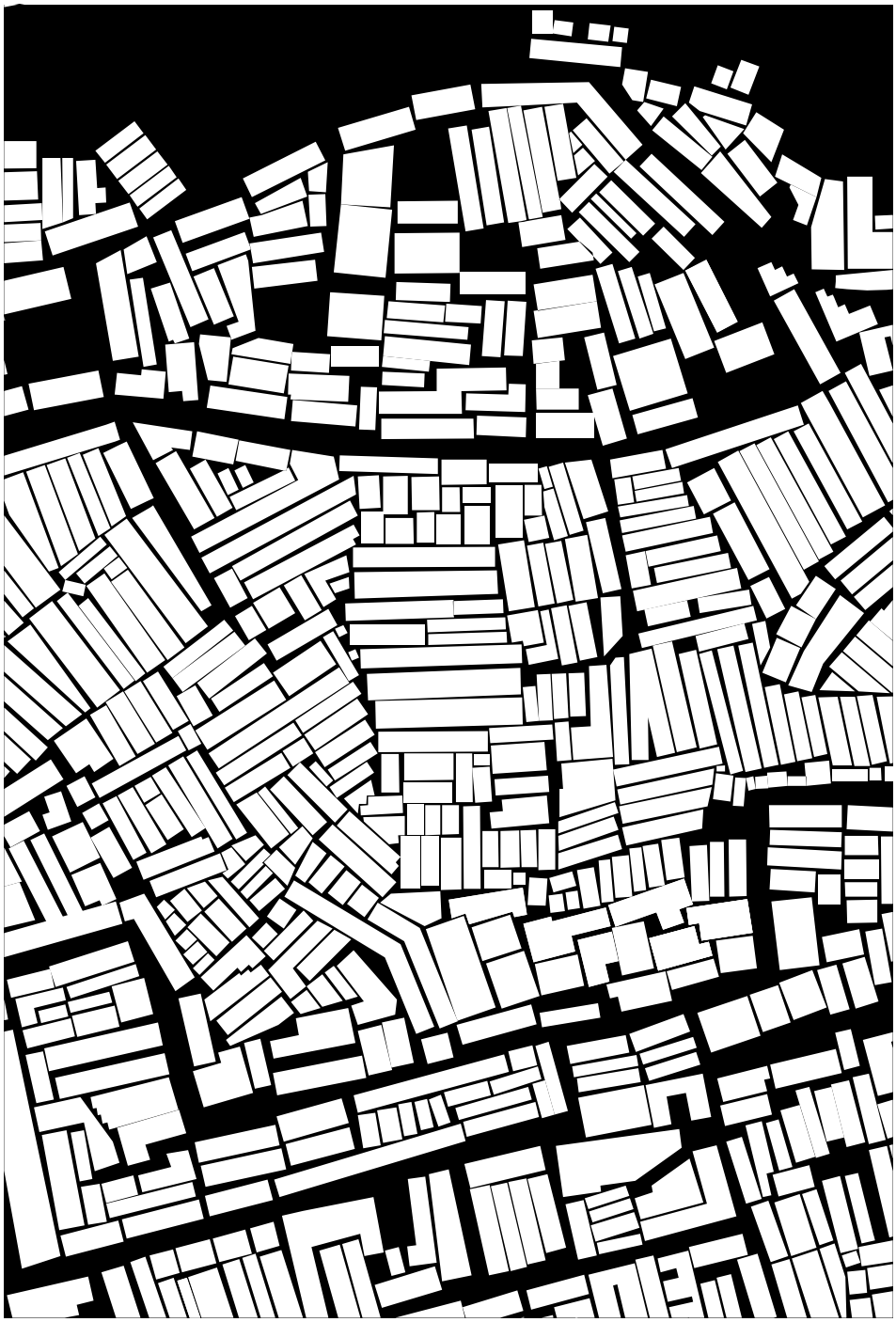


25 M

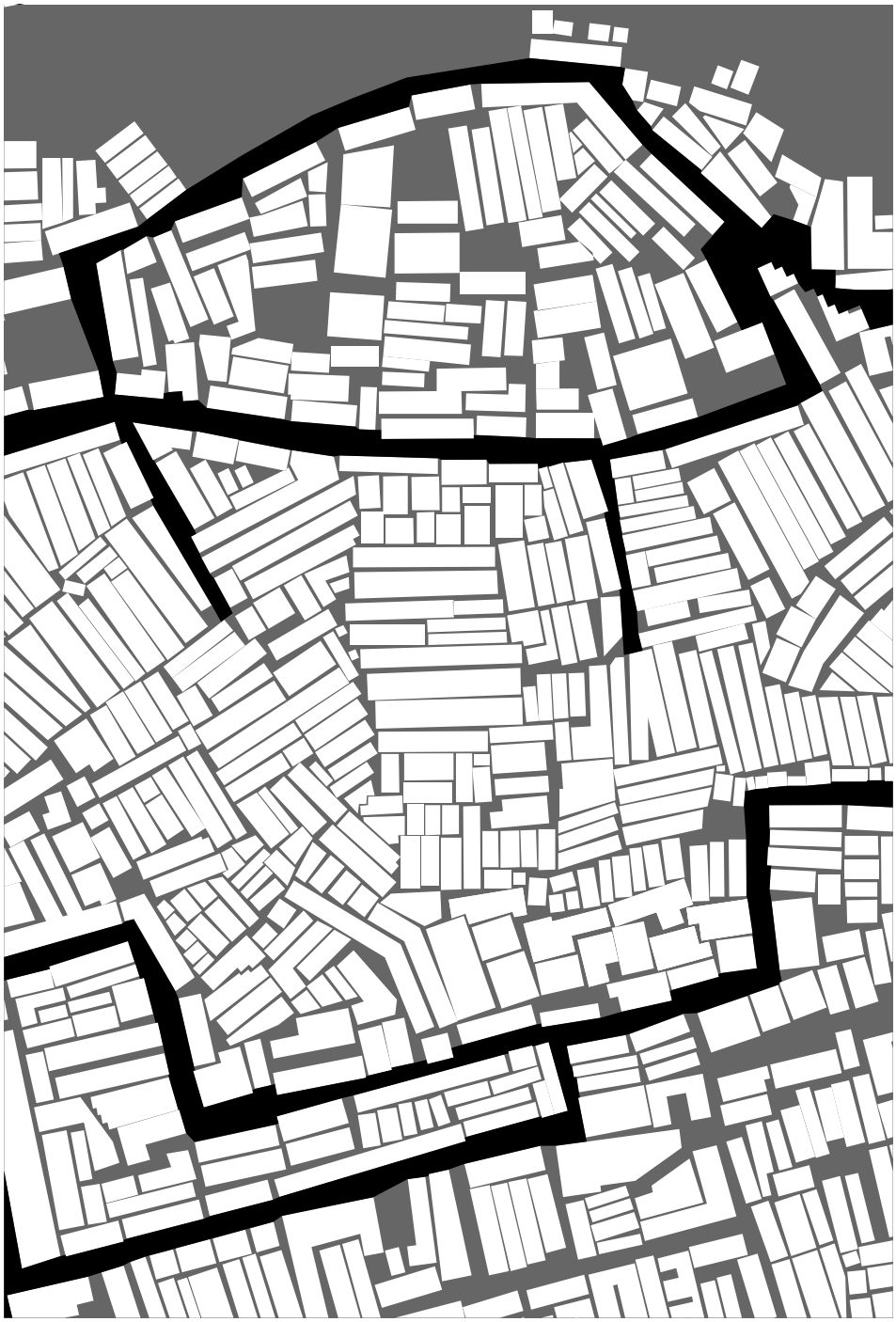

Typologies
Chawls
Baithi chawls
Other
25 M

Open Space
Existing

Open Space
Index 0.2



25 M



Space
Transition
Existing

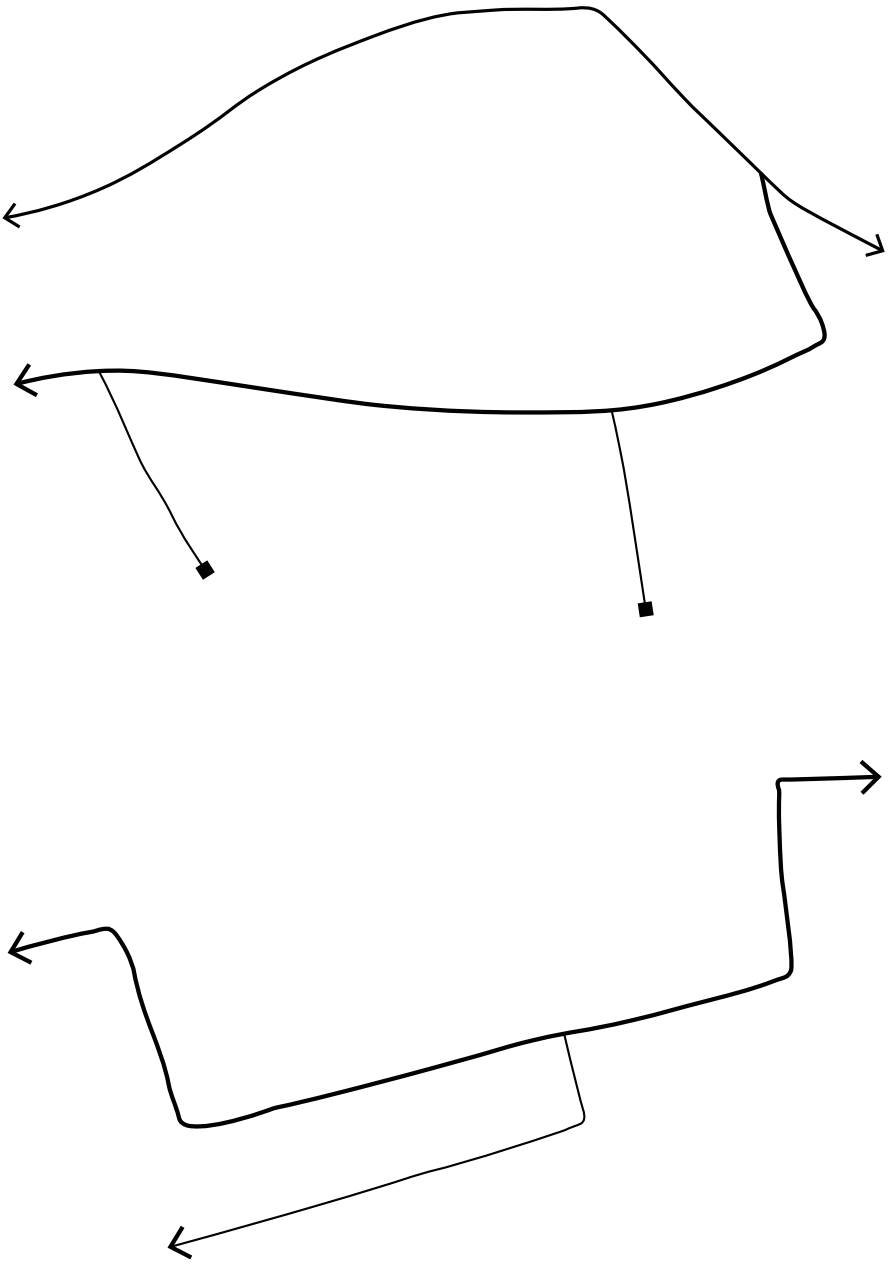
Public

Semi-public

Private

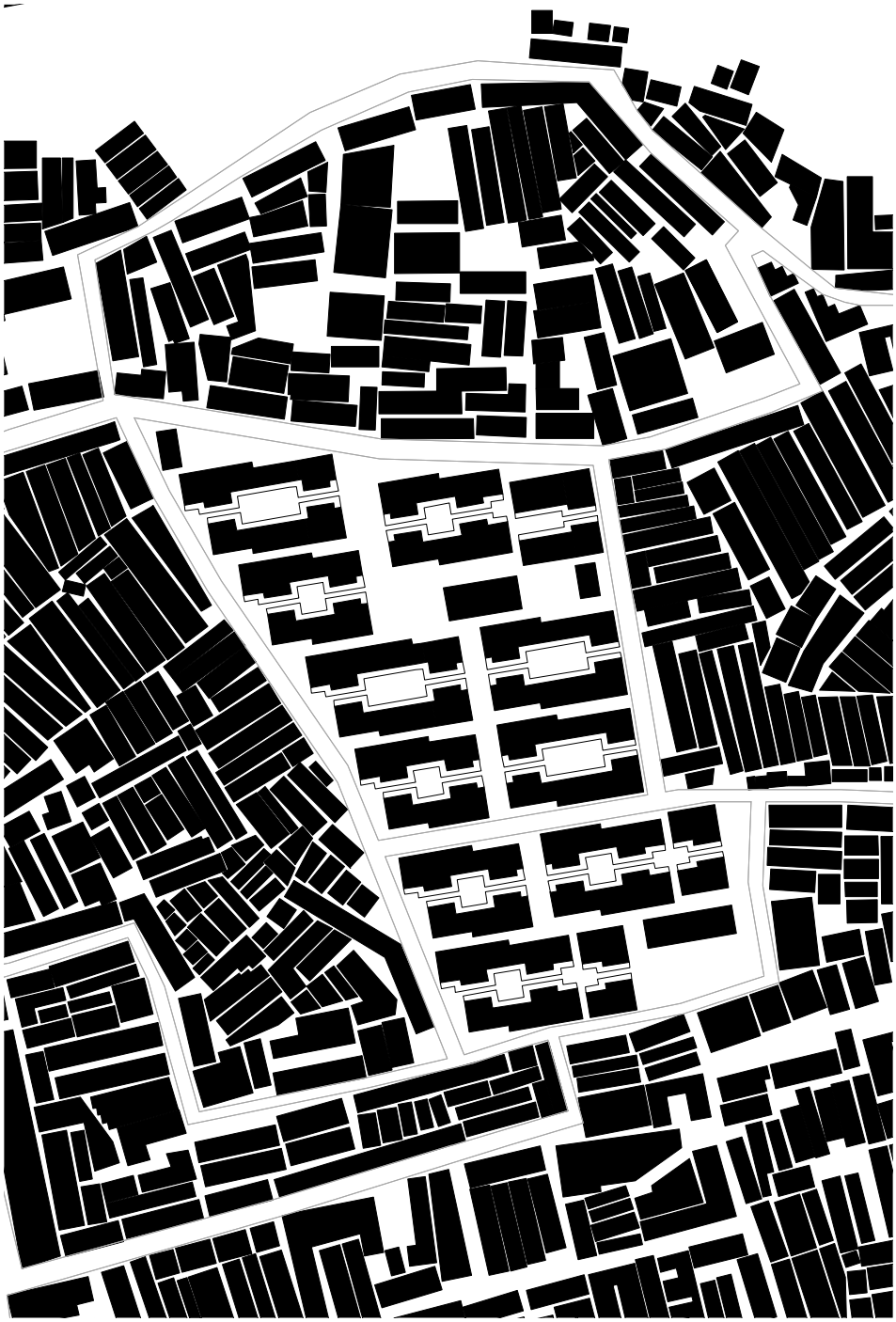
25 M

Hierarchy of
Roads and
Connectivity
Exisiting

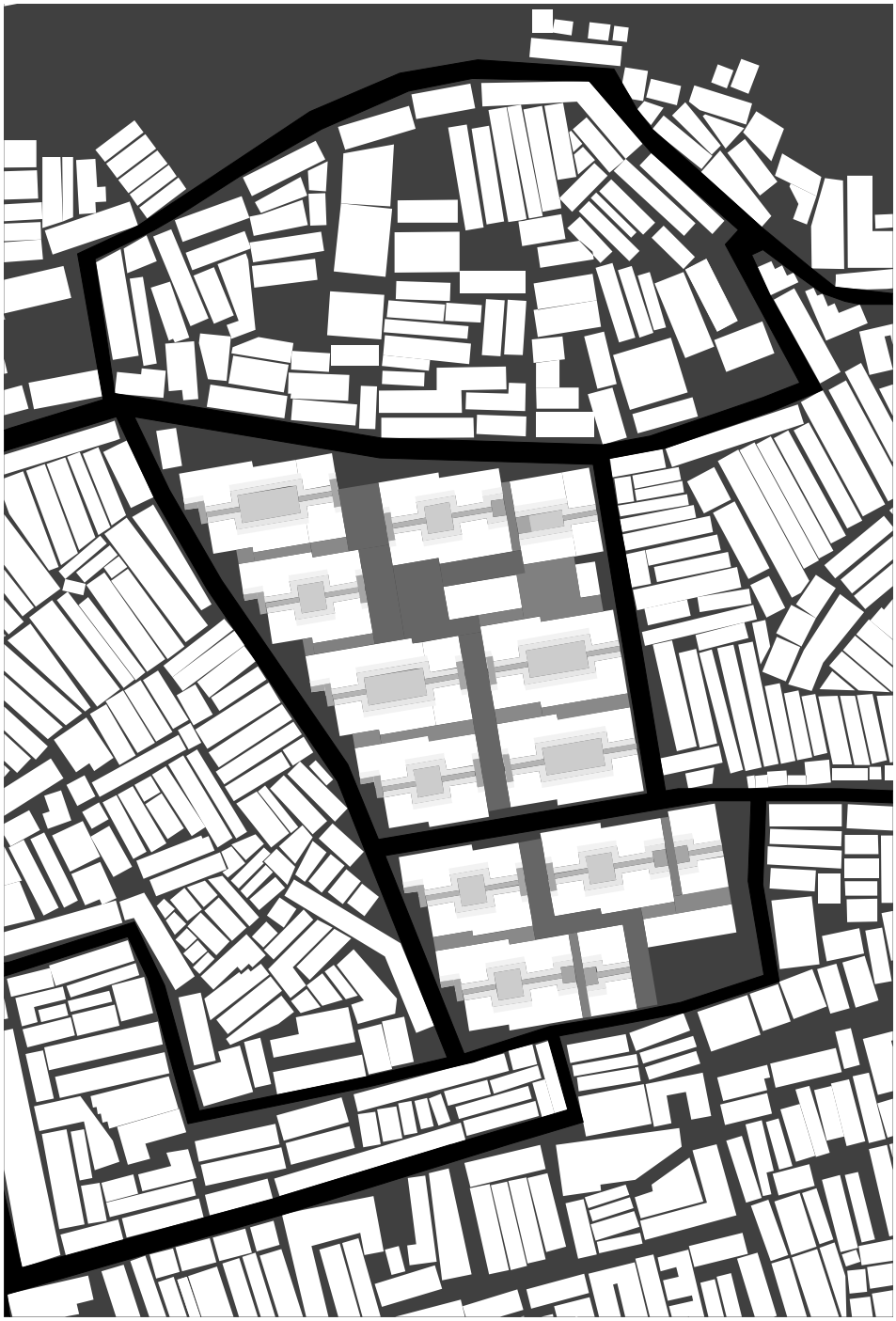


25 M

Design
Proposal Built
Mass



25 M


Design
Proposal
Space
Transition
Public
Semi-public
Semi-private
Private
25 M

Design Proposal Hierarchy of Roads and Connectivity

▬ Vehicular Commercial Street

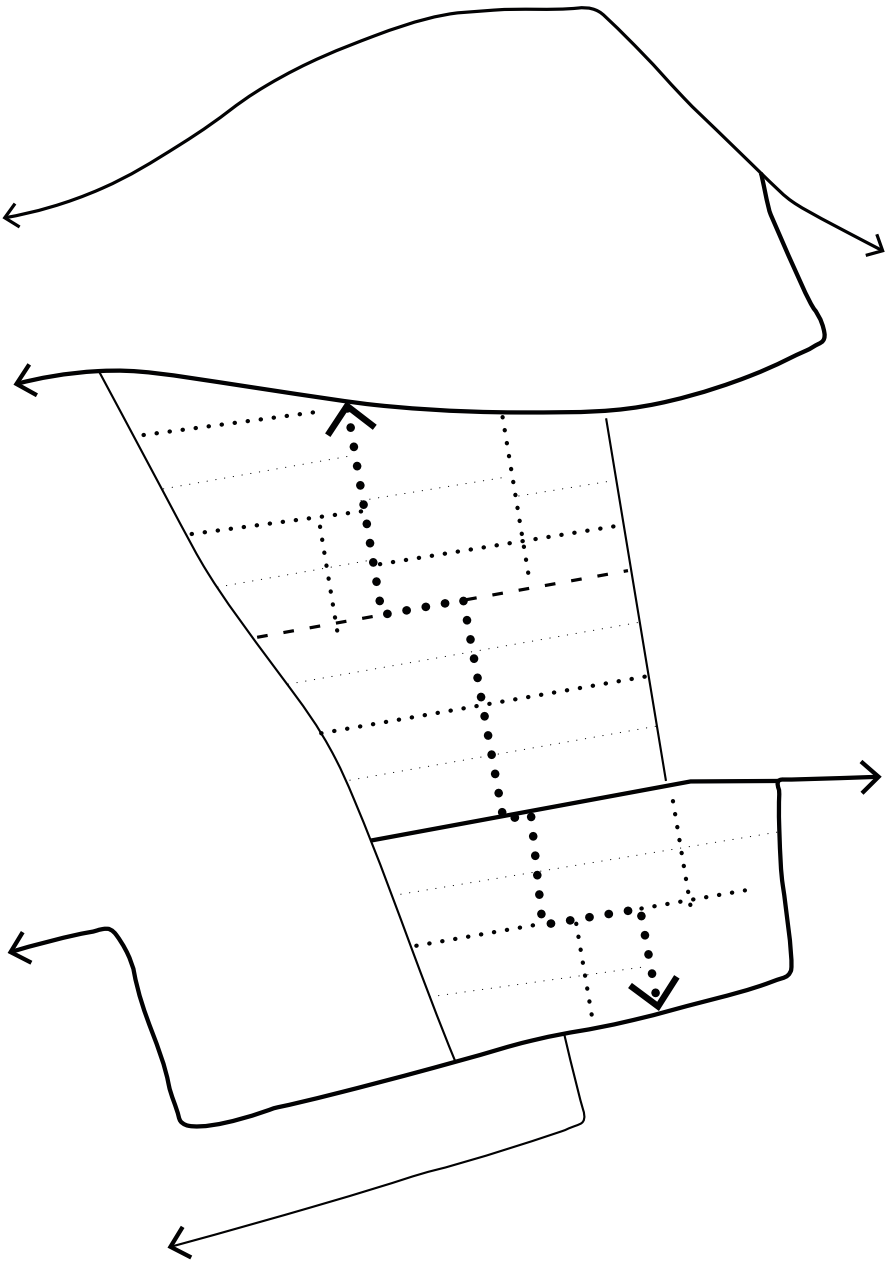
▬ Vehicular Street

● ● Pedestrian Community Spine

- - Rickshaw Workshop Street

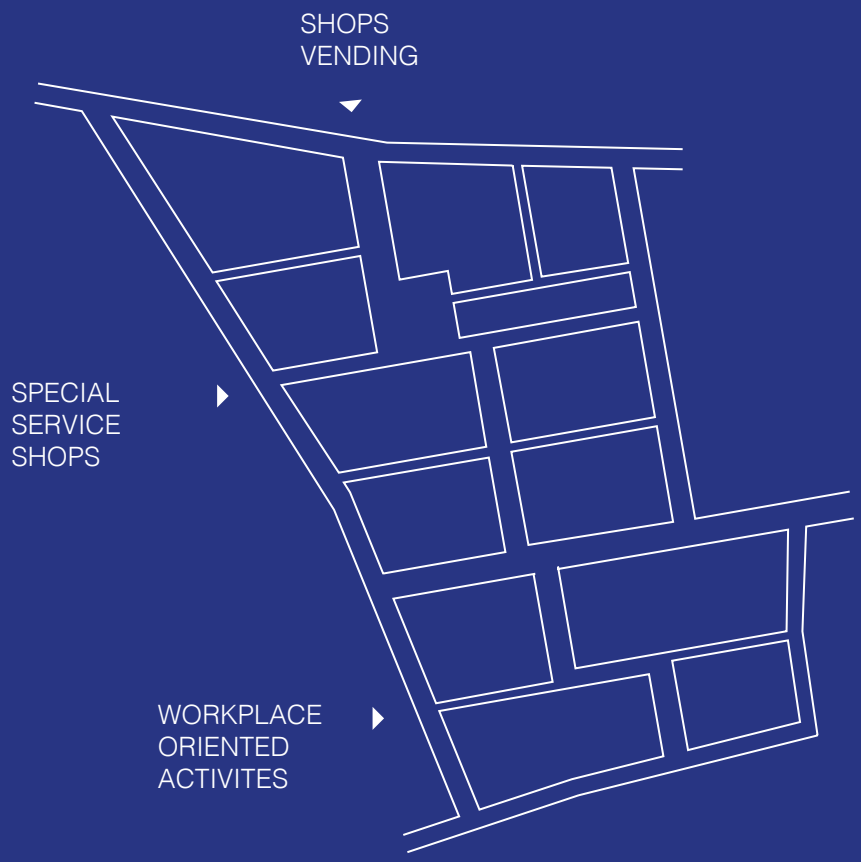
• • • Pedestrian Workshop Connector

..... Pedestrian Courtyard Spine



25 M

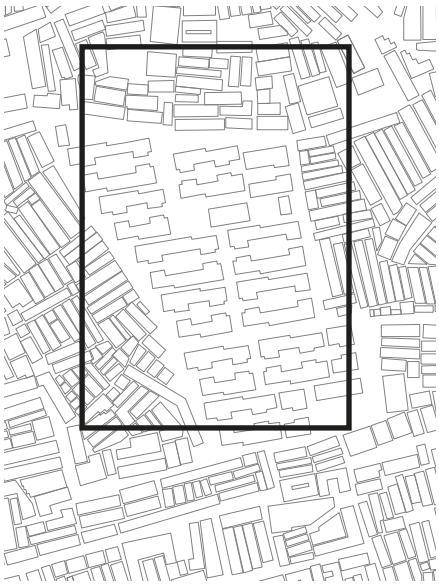
Shops as clothes, snacks/food items, tea stalls, grocery, paan and vending as fish, vegetable, pickle, sugarcane juice, egg, fruit are dedicated to the main road. Special service shops as metal repair, hair cutting and shoe repair to the secondary road and workplace oriented activites as rakhi making, bidi making, tailoring to the tertiary road. The distribution is also reflected in the section, where at the main road secondary and tertiary activities happen on the upper levels and on the secondary road where tertiary activities can happen on the upper levels.



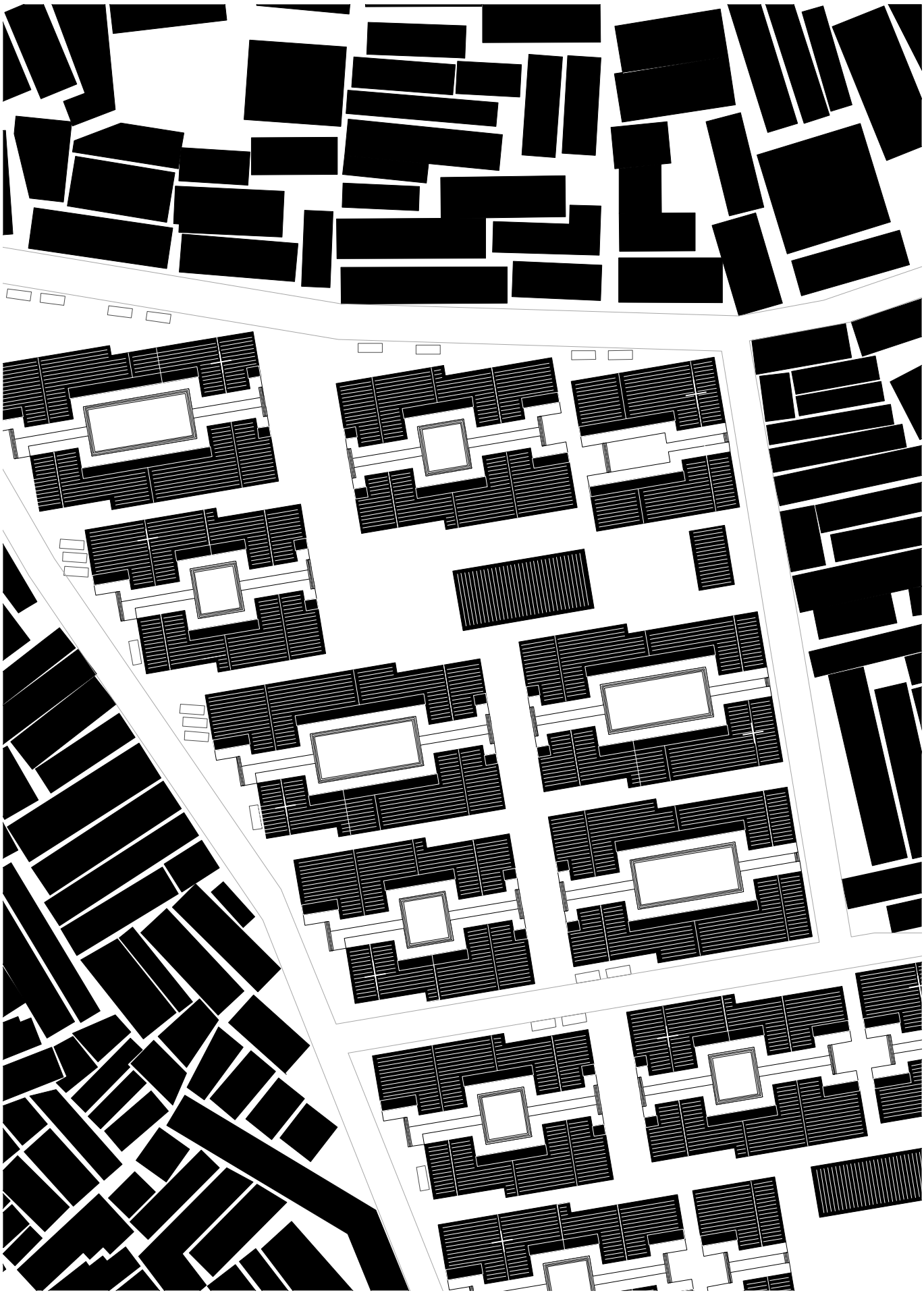
MAIN ROAD
SECONDARY ROAD
TERTIARY ROAD

HIERARCHY OF COMMERCIAL ACTIVITY AREAS

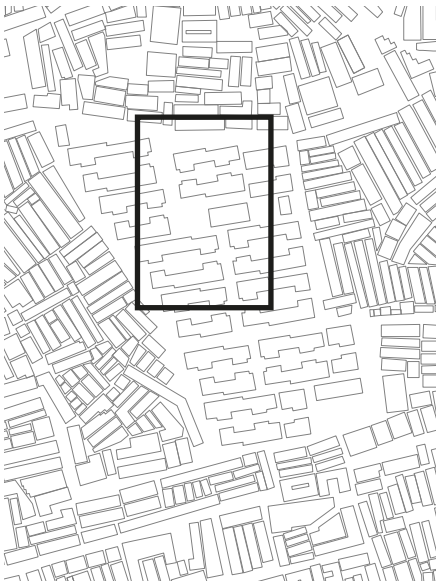
Design
Proposal



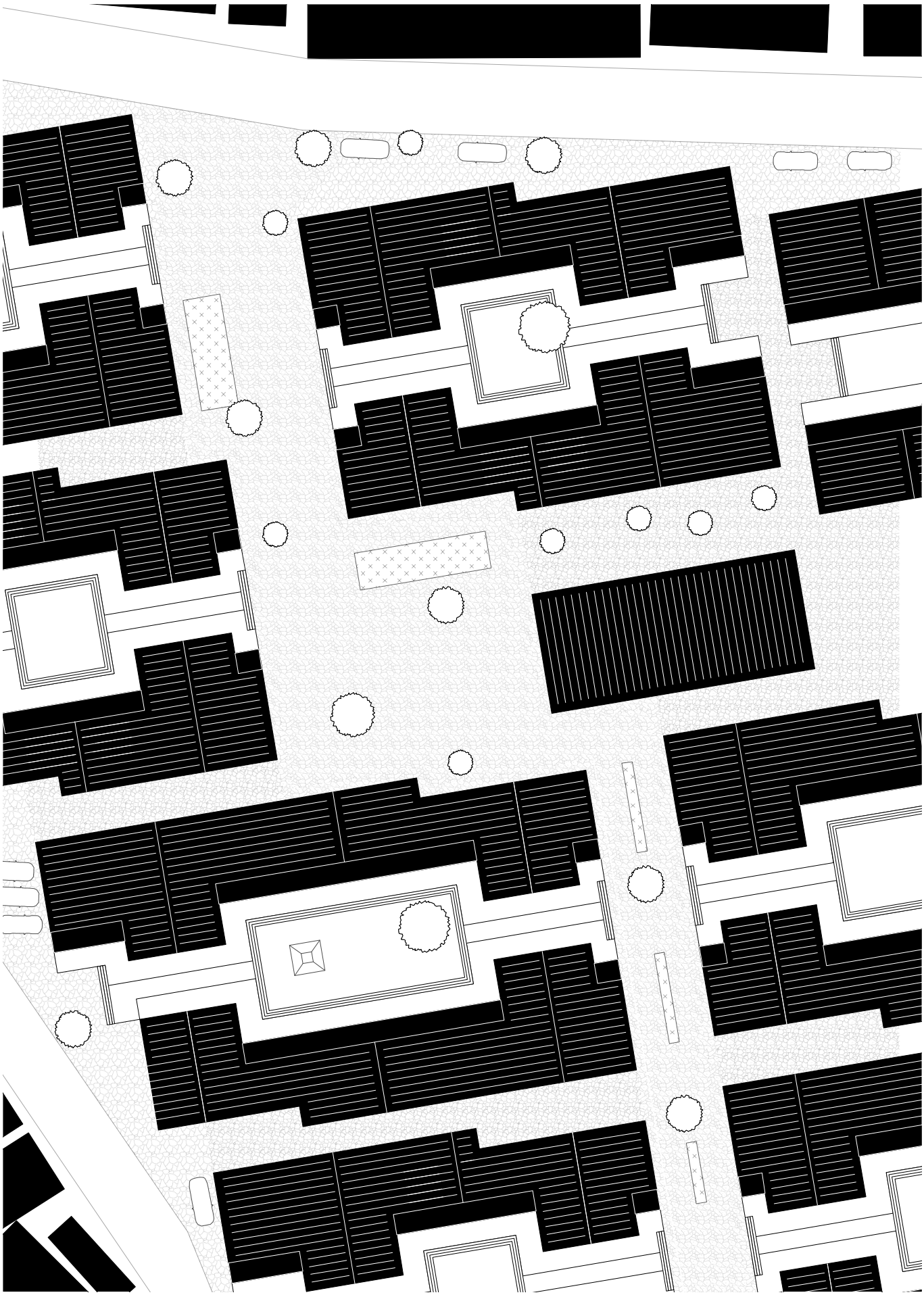
10 M



Design
Proposal



5 M

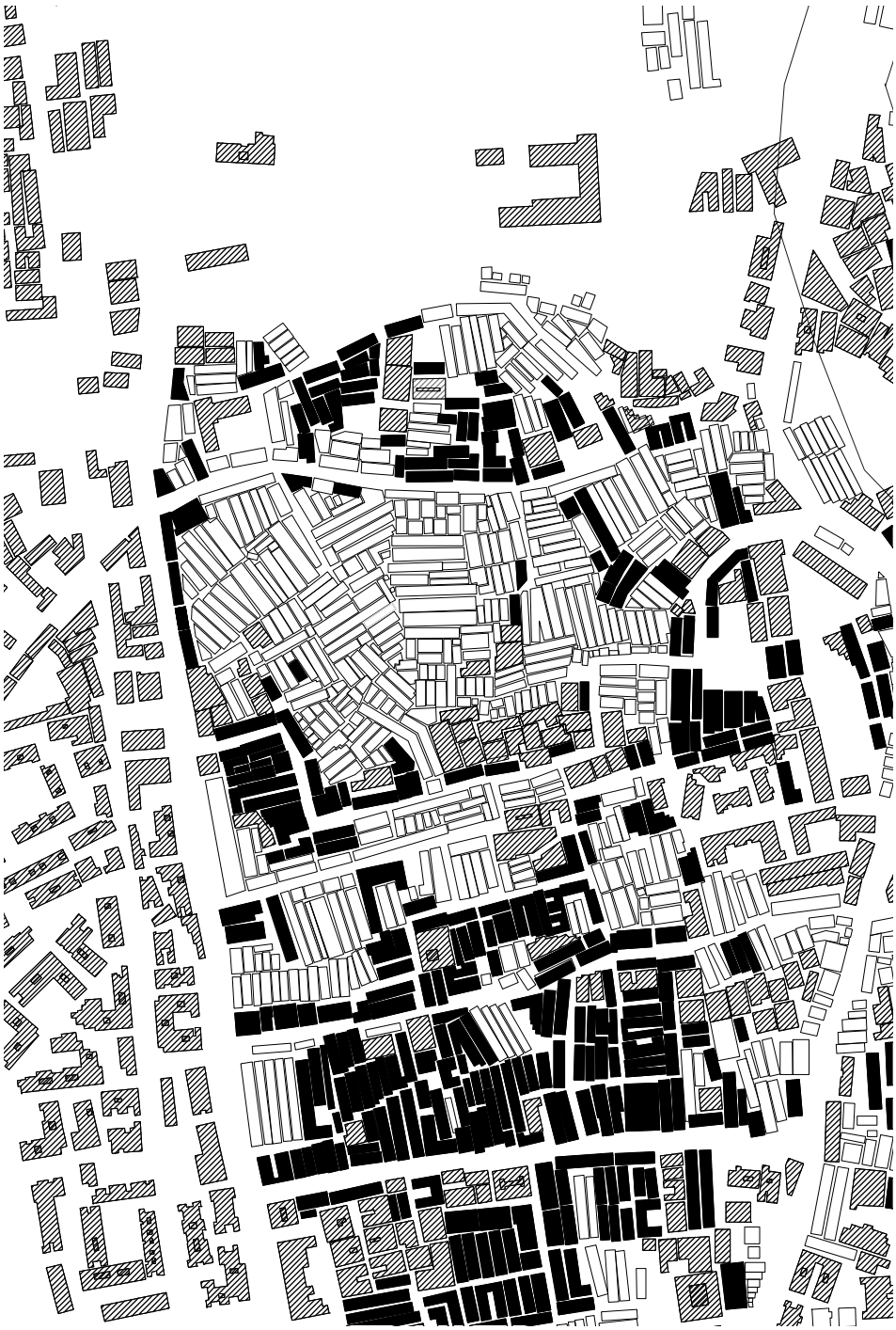


13 COMPARISON

Built Mass
Existing

Fsi 1.2
510 dwellings
per hectar

50 M



Typologies
Exisitng

Chawls
Fsi 4
1600 dwellings
per hectar

Baithi chawls
Fsi 0.7
300 dwellings
per hectar

Other

50 M

Built Mass
Scenario
Private
Developer

Fsi 3.7
1480 dwellings
per hectar

■ Chawls

□ Baithi chawls

▨ Other

50 M

Built Mass
Proposal

Fsi 2.3
520 dwellings
per hectar

50 M

Open Space
Exisitng

Open Space
Index 0.2

50 M

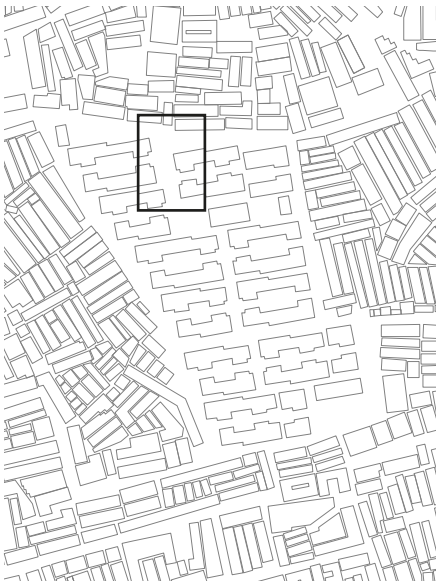
Open Space
Proposal

Open Space
Index 0.6

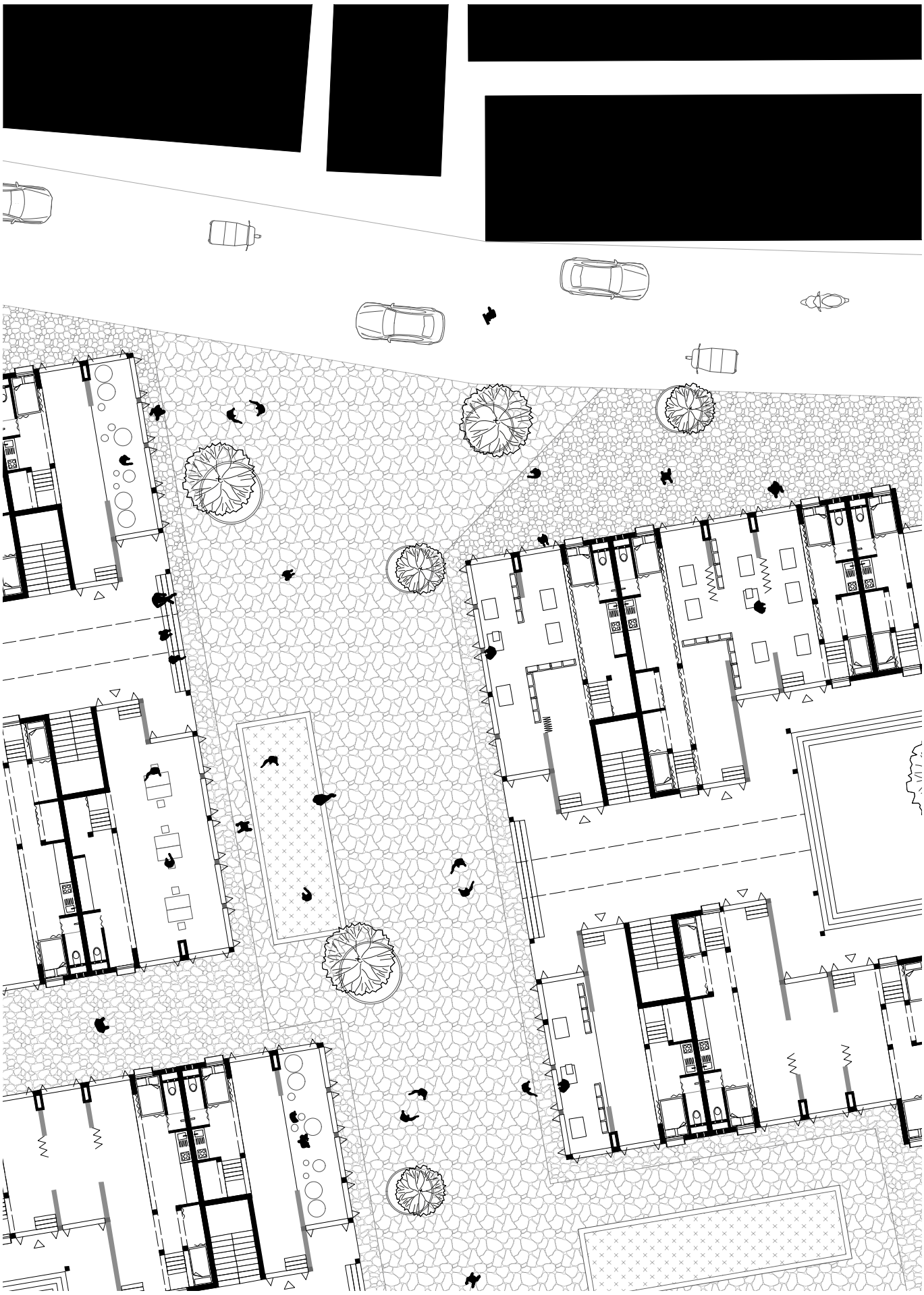
50 M

14 URBAN EXPERIENCE

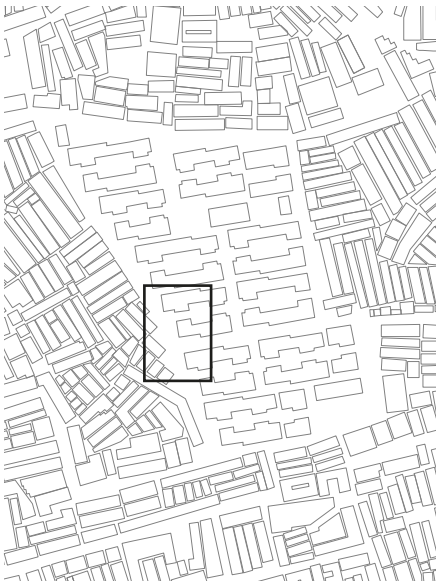
Vehicular
Commercial
Street,
Pedestrian
Community
Spine



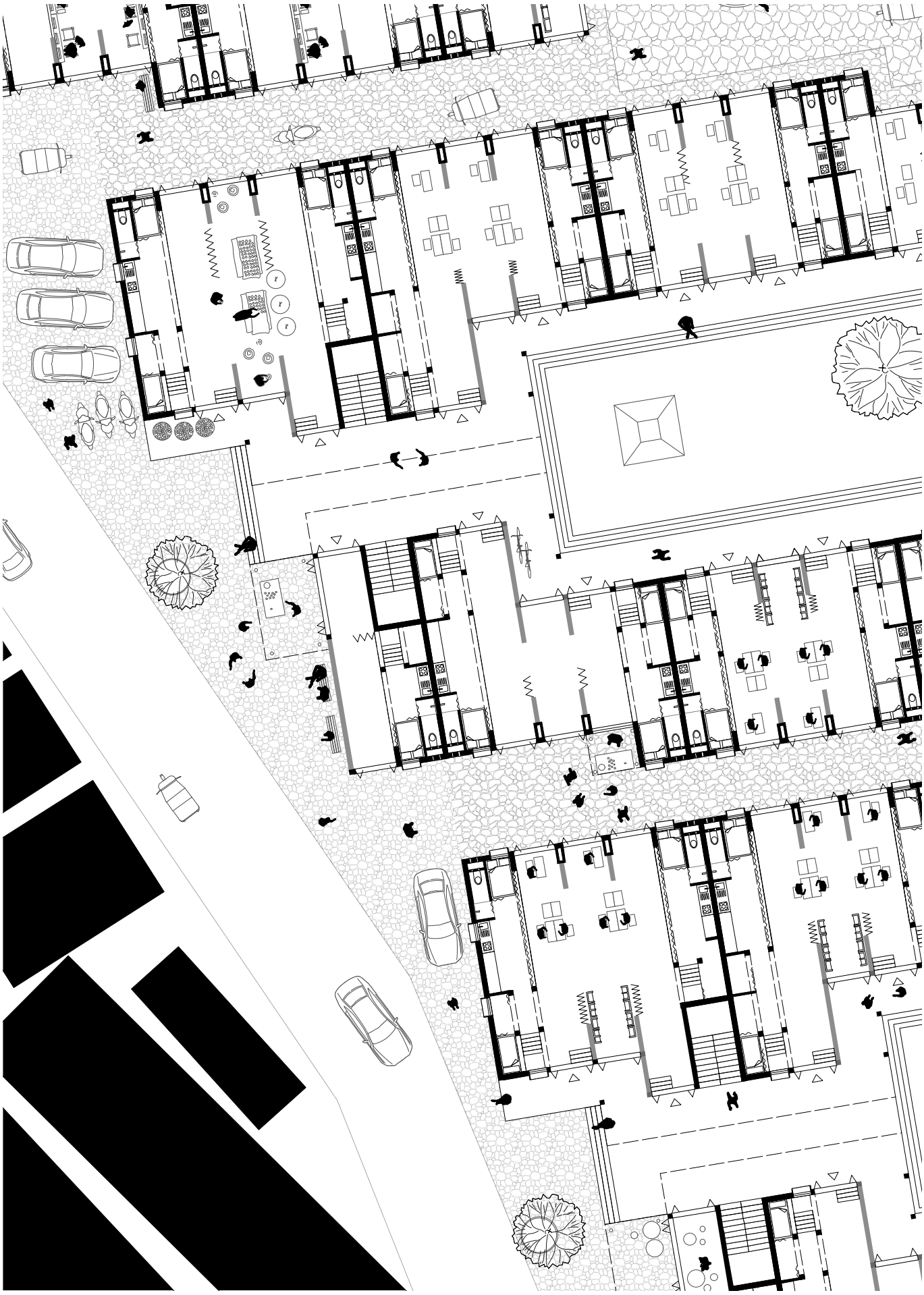
2.5 M



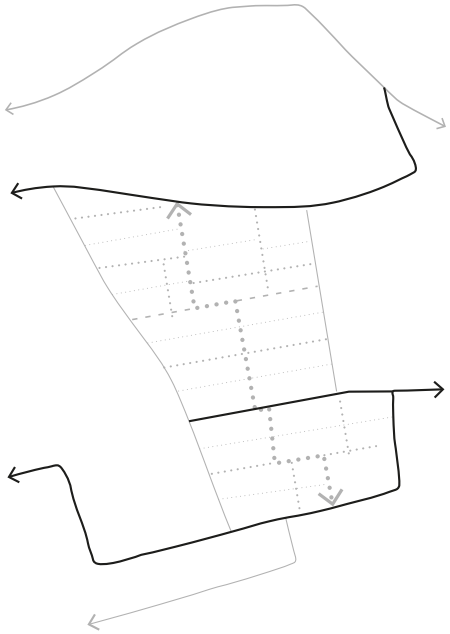
Vehicular
Street,
Rickshaw
Workshop
Street,
Pedestrian
Workshop
Connector,
Pedestrian
Courtyard
Spine

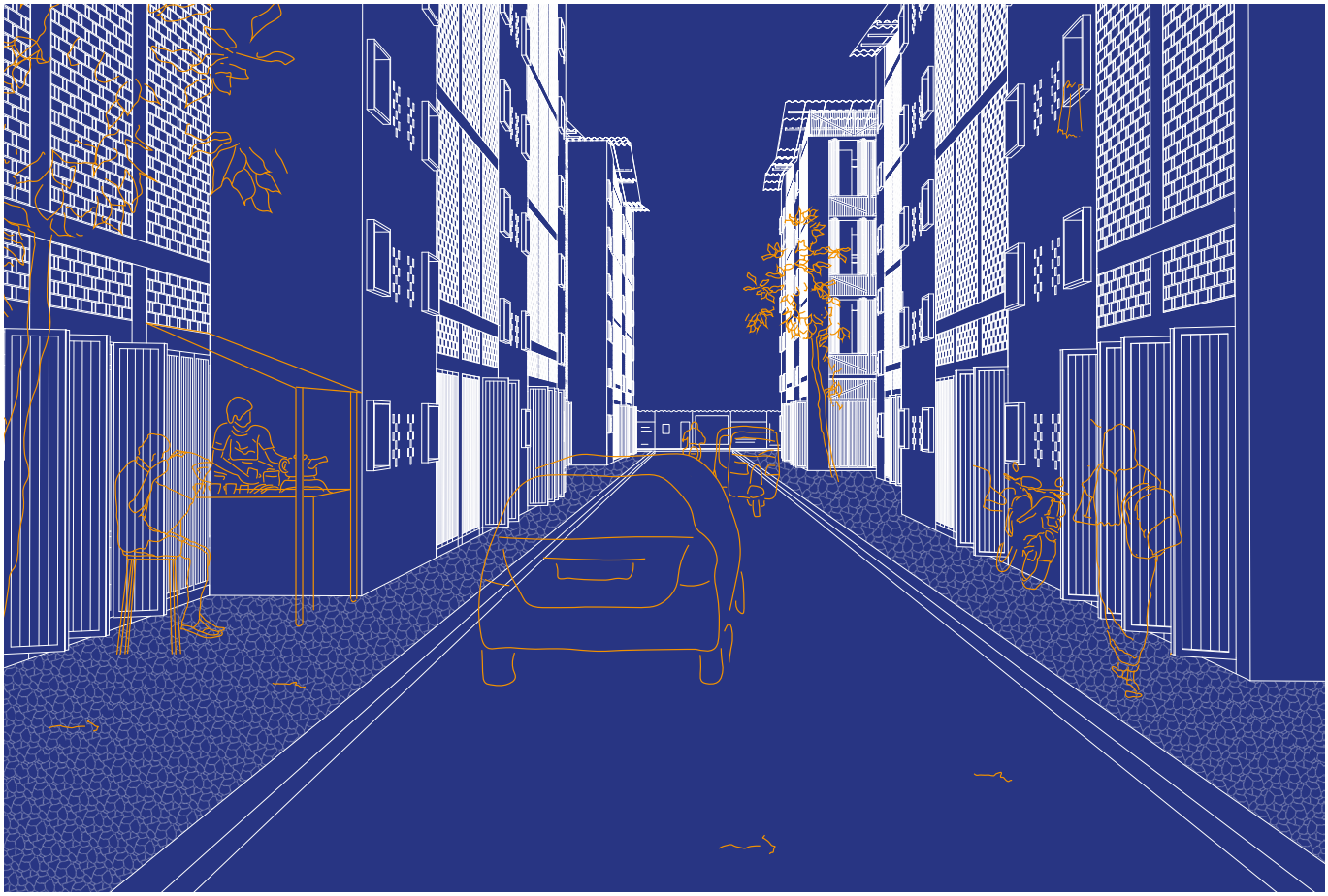


2.5 M

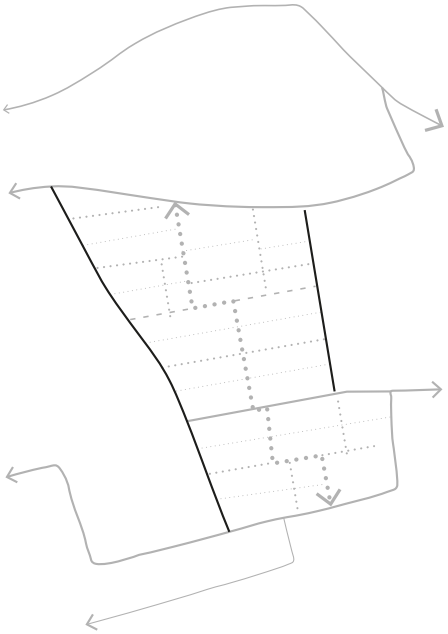


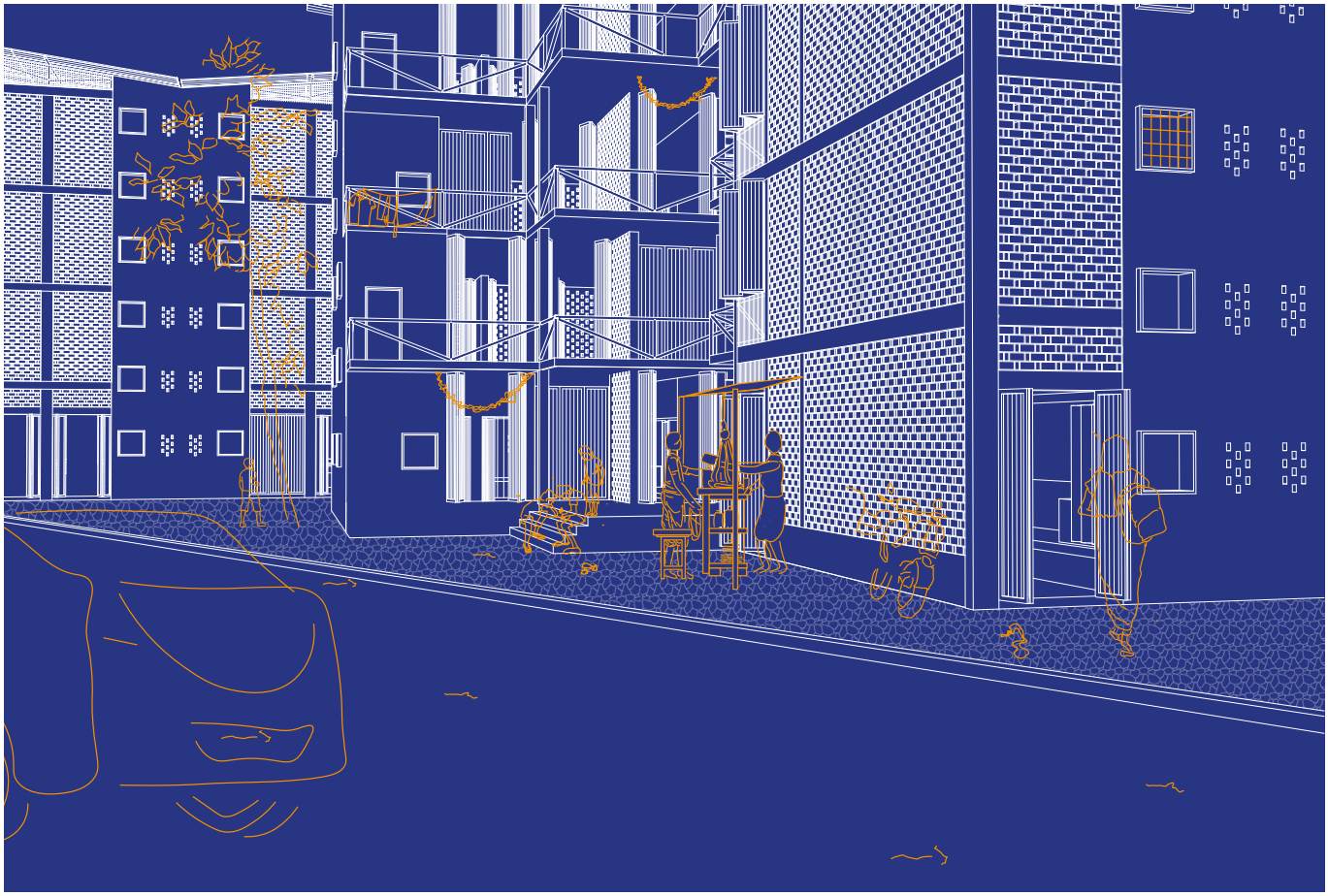
Vehicular
Commercial
Street



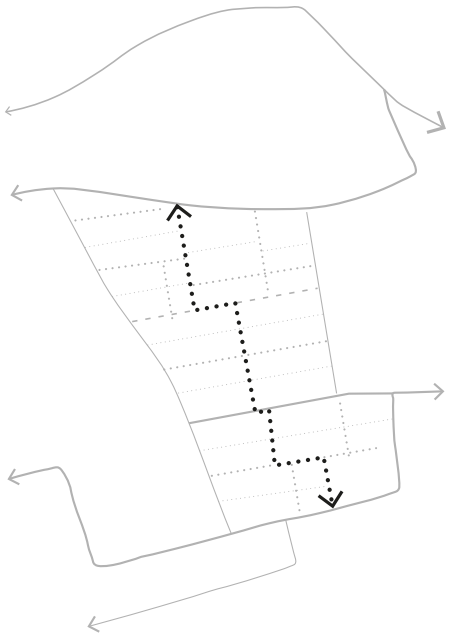


Vehicular Street

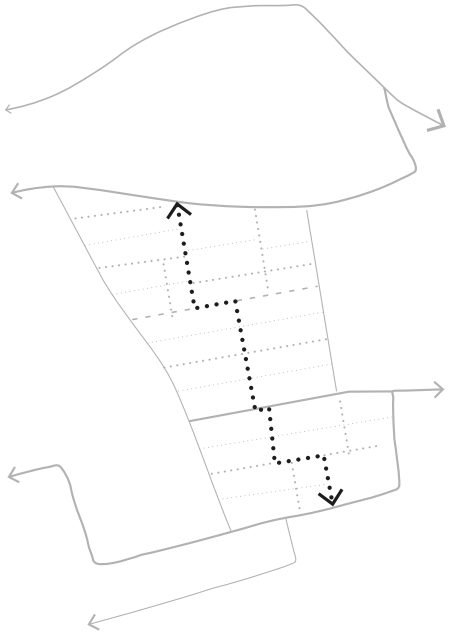




Pedestrian
Community
Spine

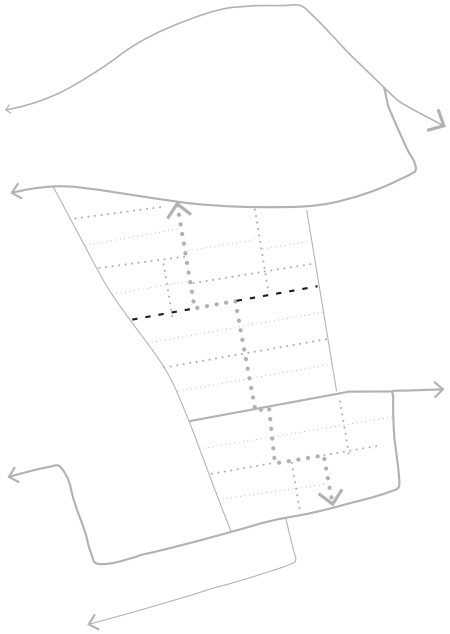


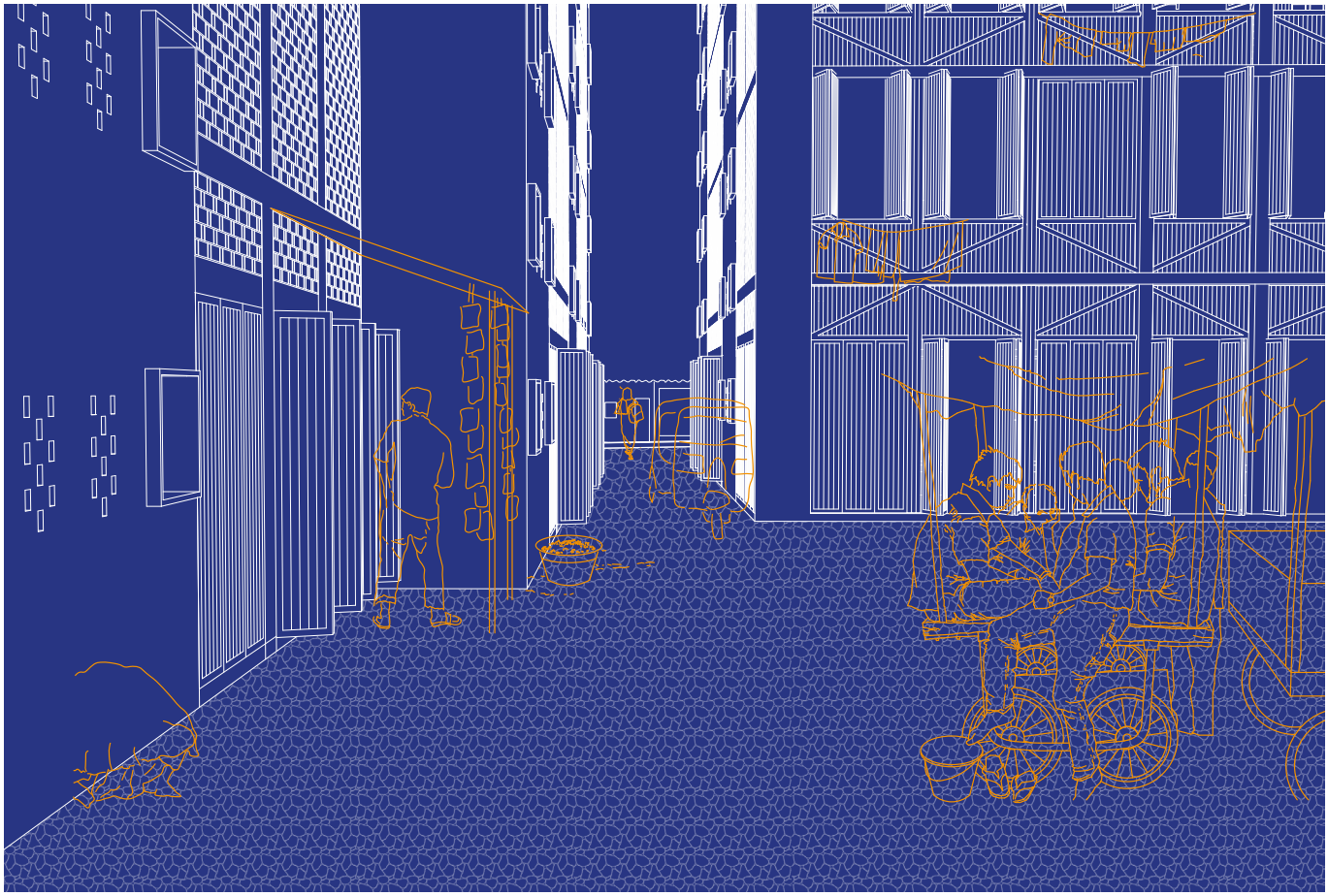
Pedestrian
Community
Spine
Year 5



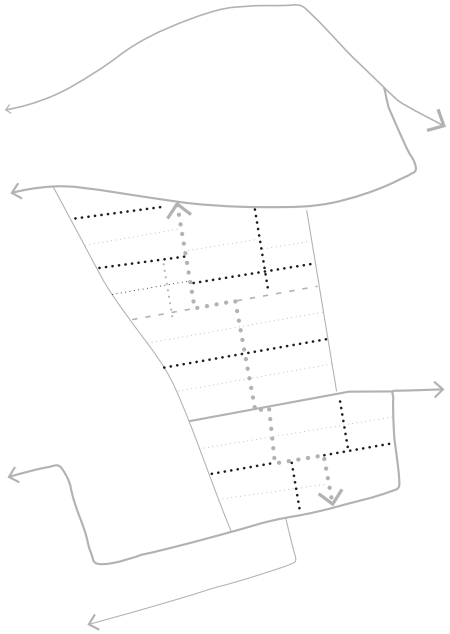

EXCLUSIVE

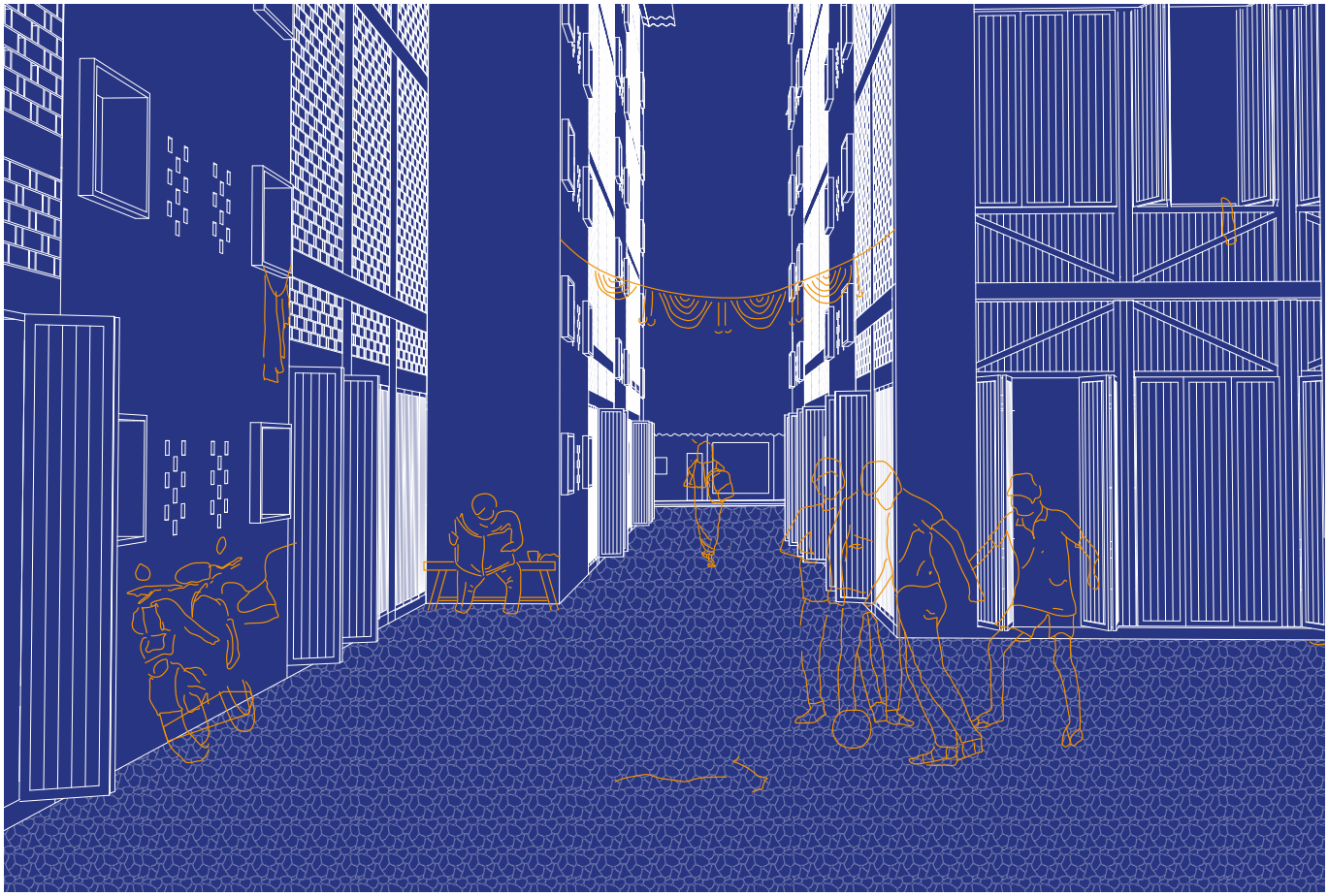
Rickshaw
Workshop
Street



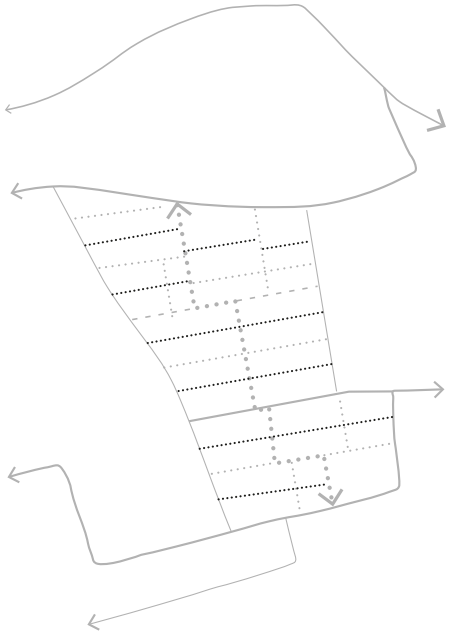


Pedestrian
Workshop
Connector

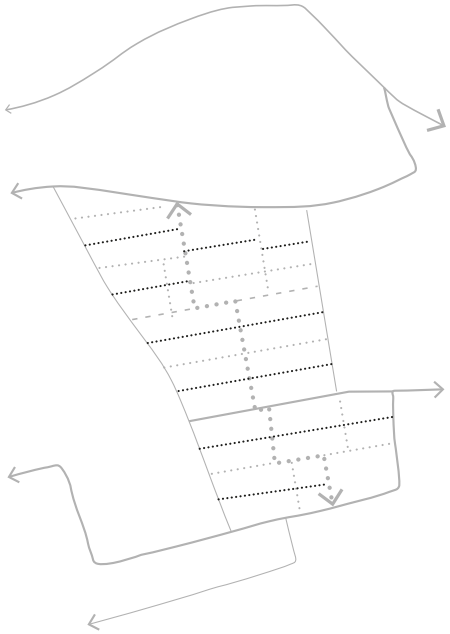




Pedestrian
Courtyard
Spine



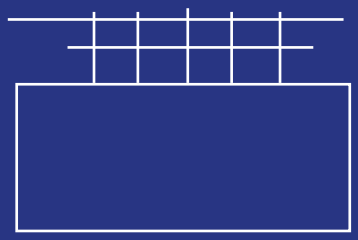
Pedestrian
Courtyard
Spine
Year 5



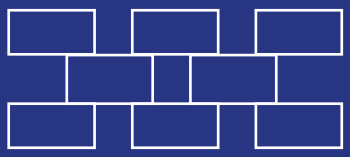
15 MATERIALITZATION

The materialization of the design includes local building techniques and knowledege of skills as well as sustainable materials as far as possible. These include an in-situ concrete construction as load bearing structure and brick infills as non load bearing as well as foldable bamboo elements fabricated on the site and a bamboo structure for the roof. This provides additional employment on the site.

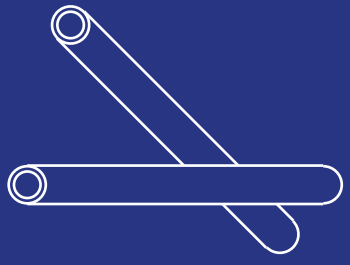
The different materials underline the expression of the building towards its different urban conditions. Concrete as the most private and closed of for the infrastructural zone, brick as a warm still harder material for the free zone towards the urban side and bamboo as the most soft and warm material towards the courtyard and the active plinth towards the urban side.



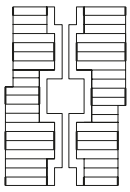
CONCRETE



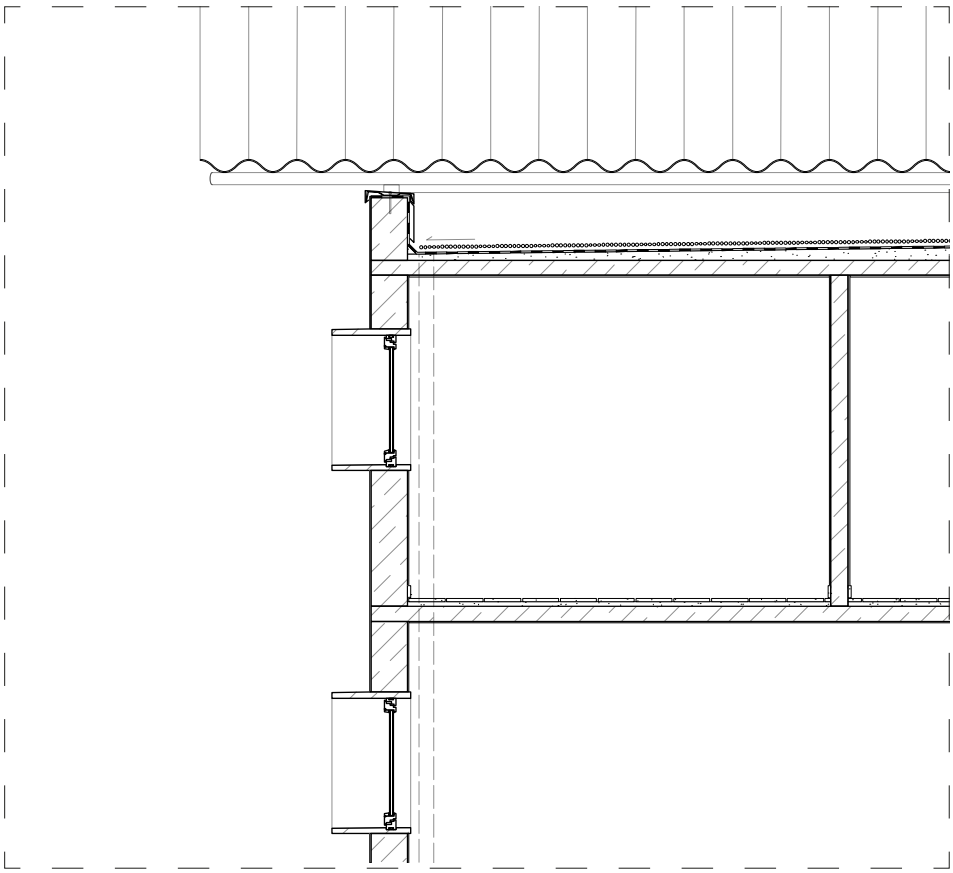
BRICK

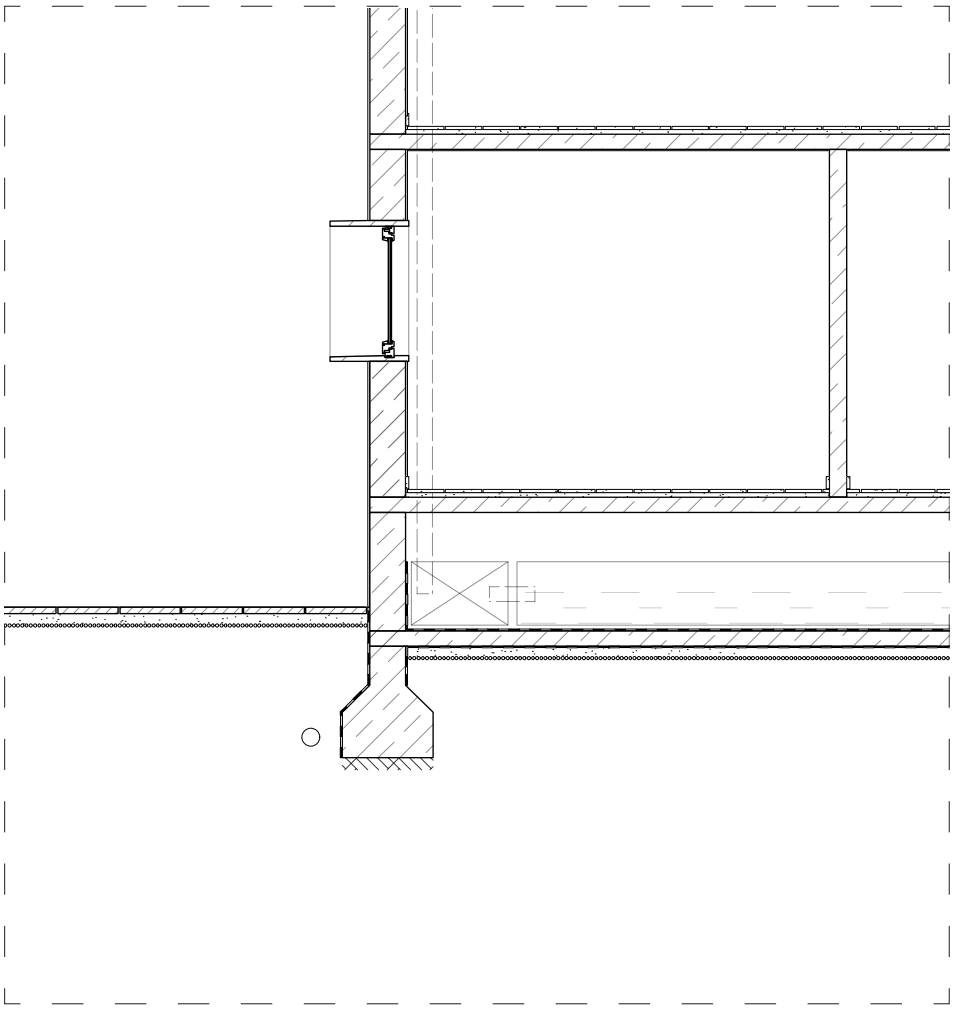


BAMBOO

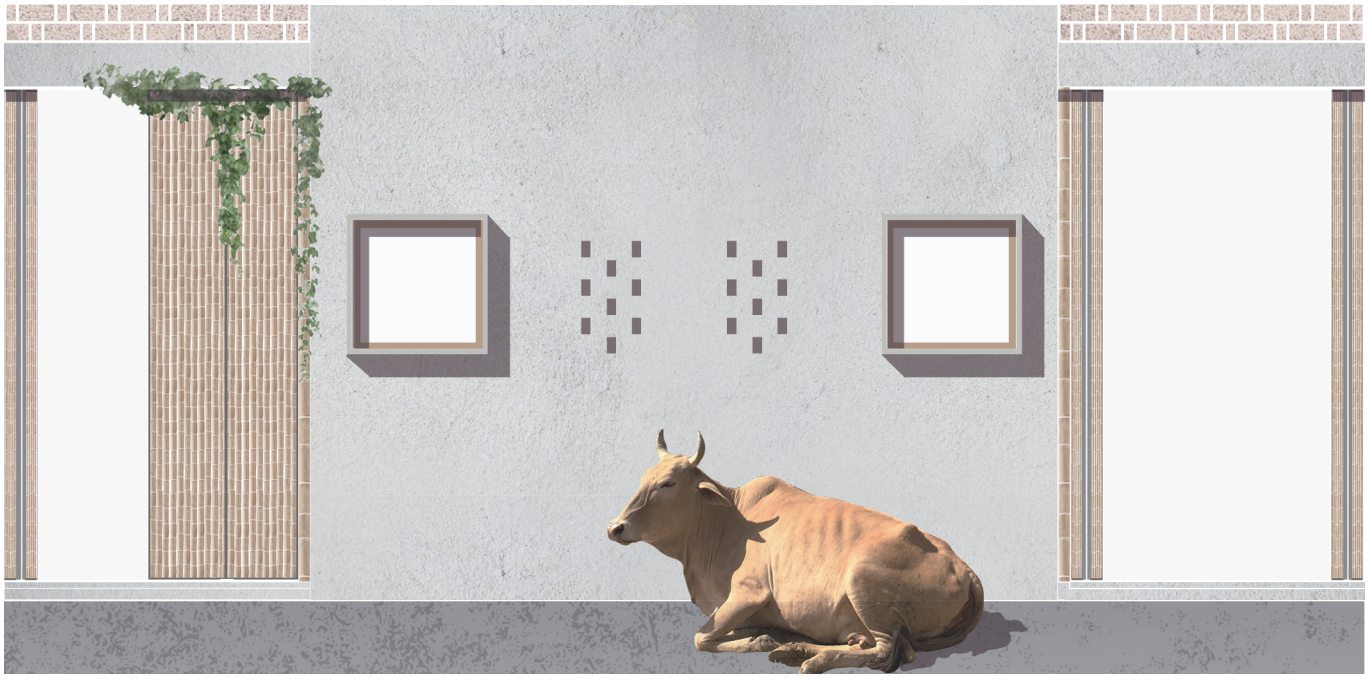


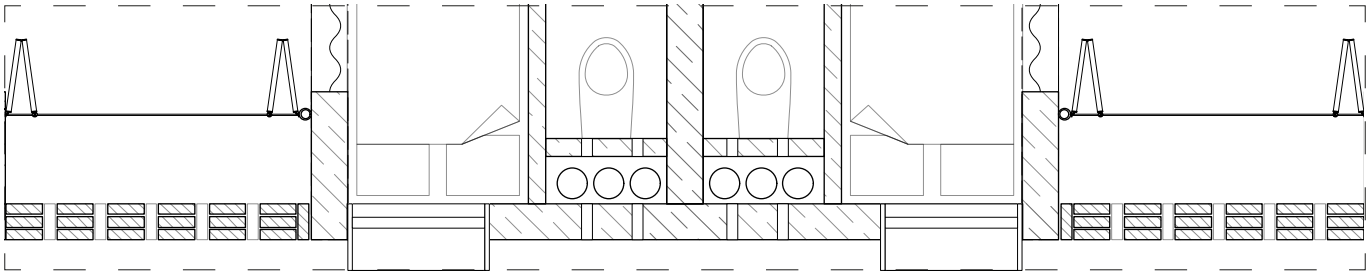
Infrastructural
Core

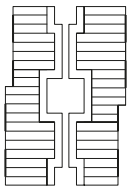




50CM



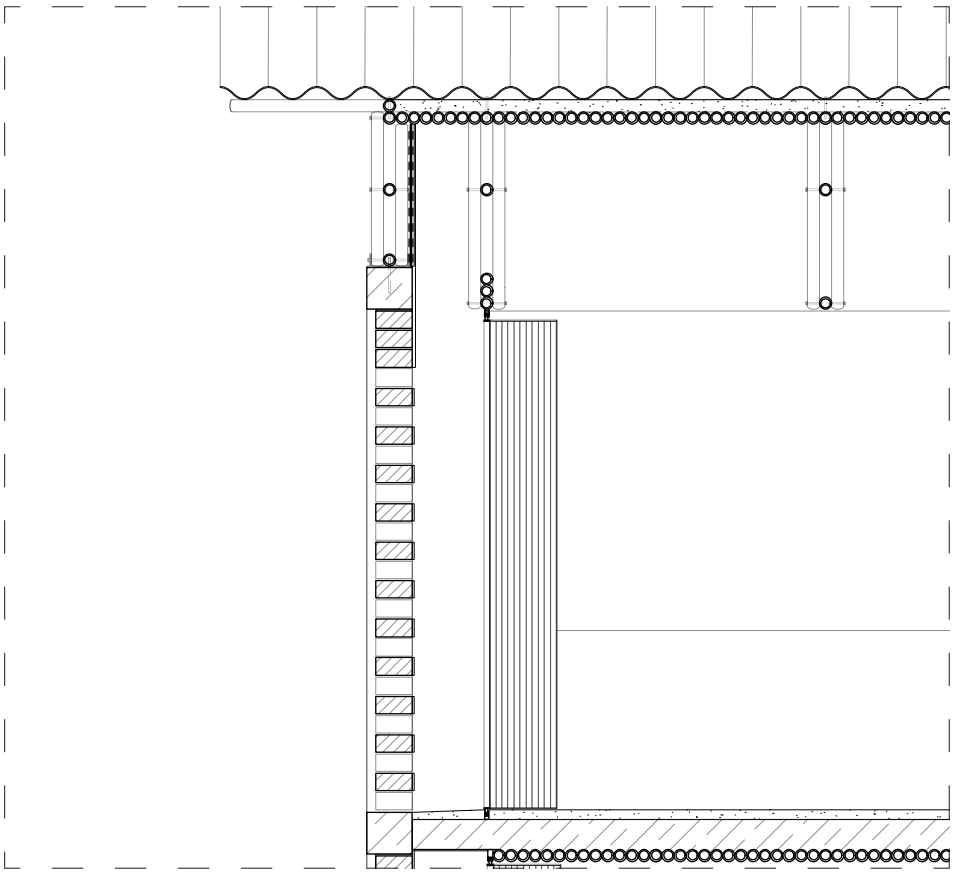


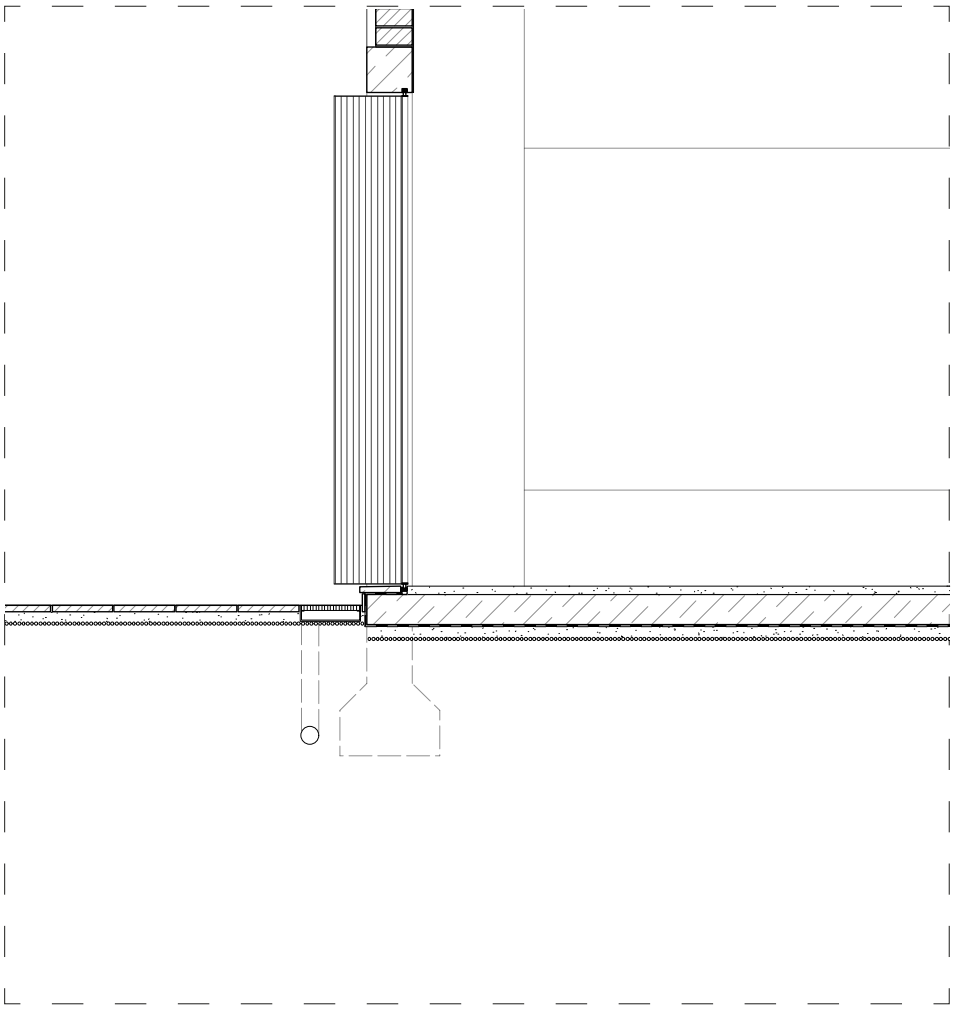


Free Zone
Urban

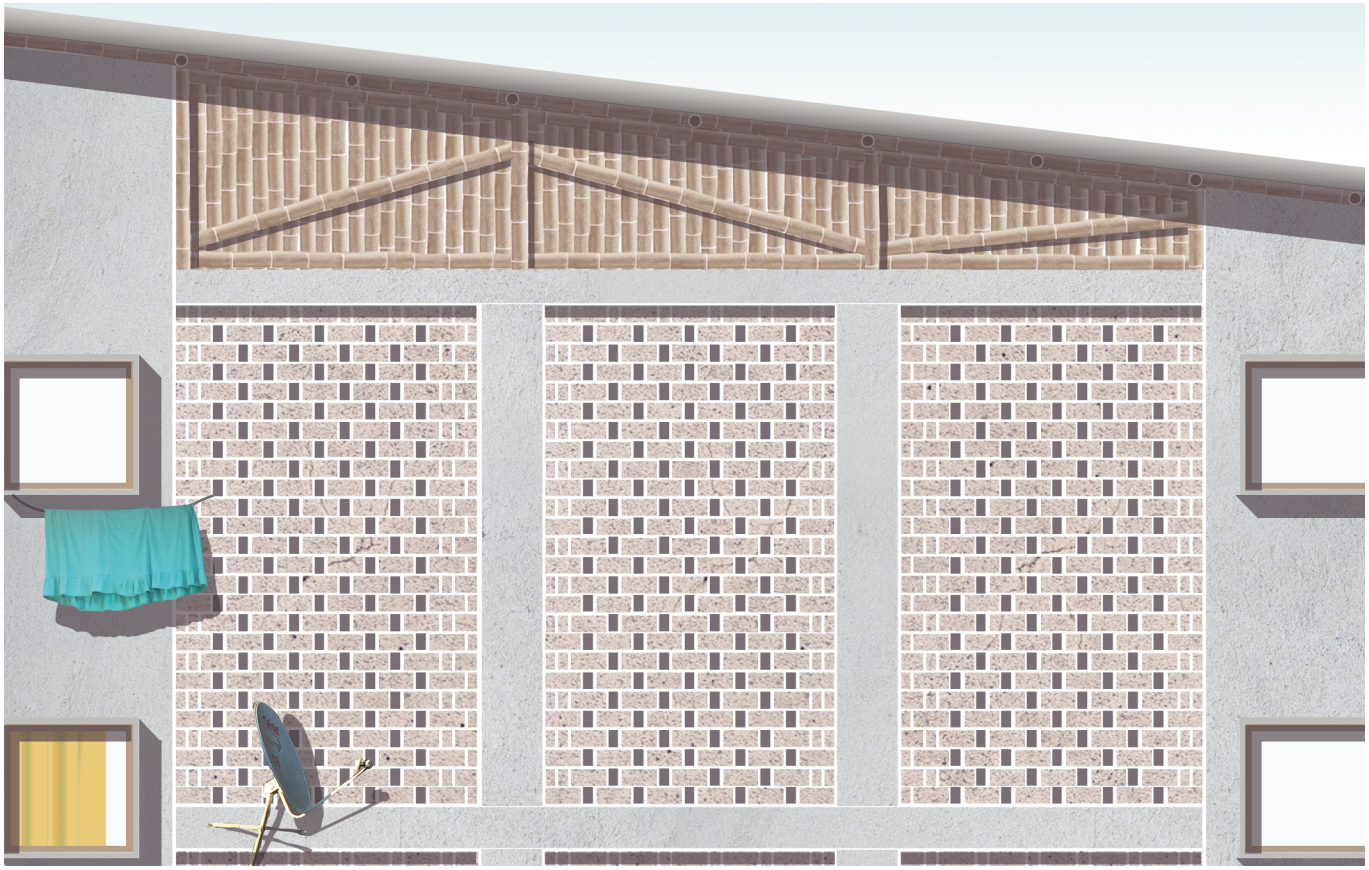
Roof

Corrugated
Sheet
80mm bamboo
with
70 mm loam
filling between
80mm solid
bamboo soffit

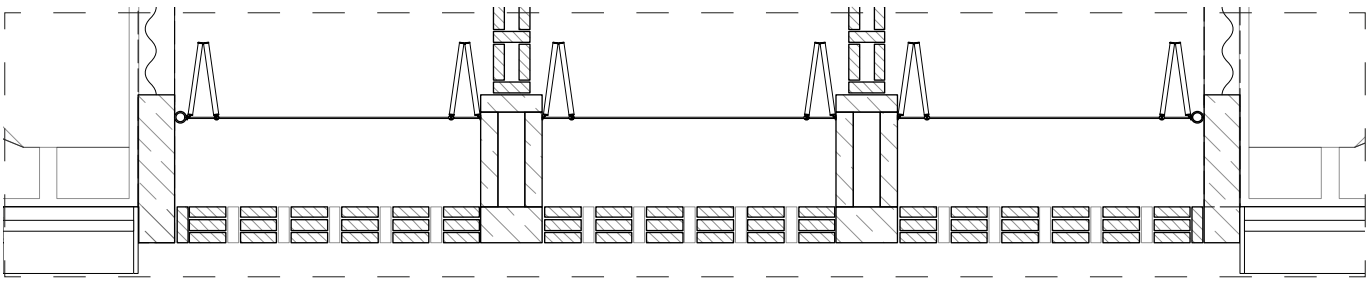


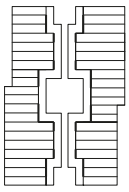


50CM

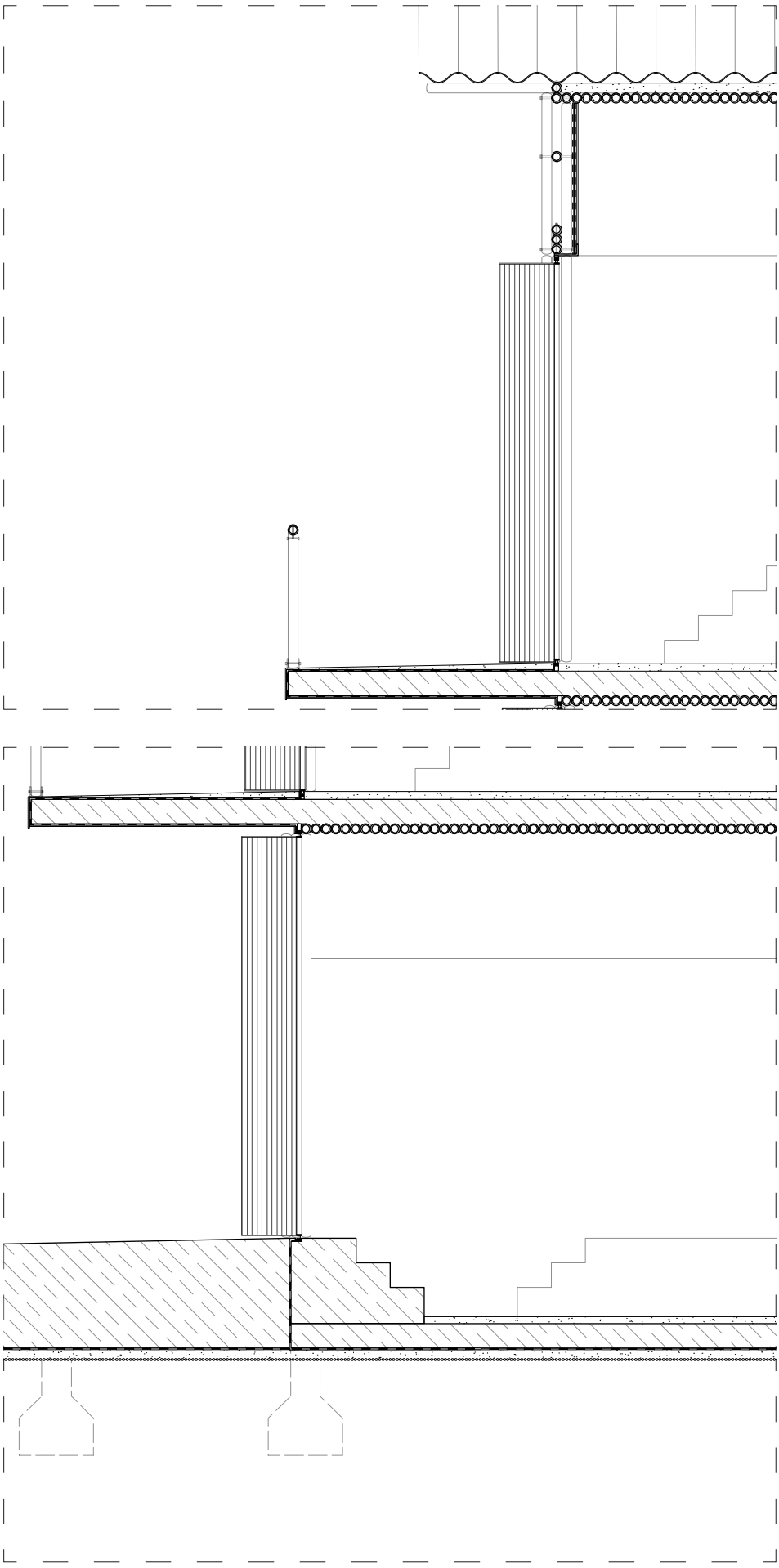



आप्टिकल सेंटर ऑन्ड कॉरिक्ट लेन्स क्लिनिक
आँखों की जाँच मुफ्त में किया जाता है

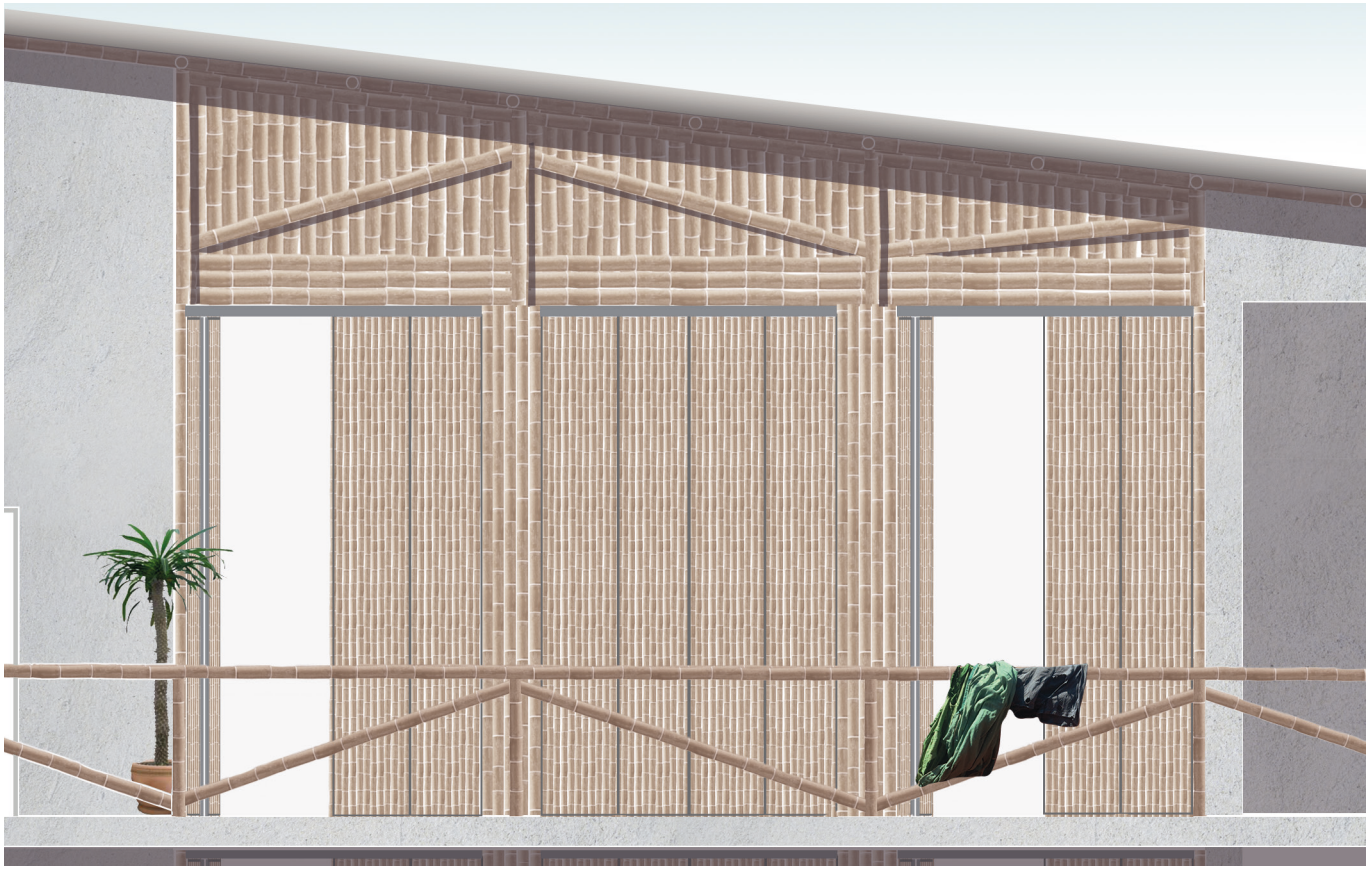


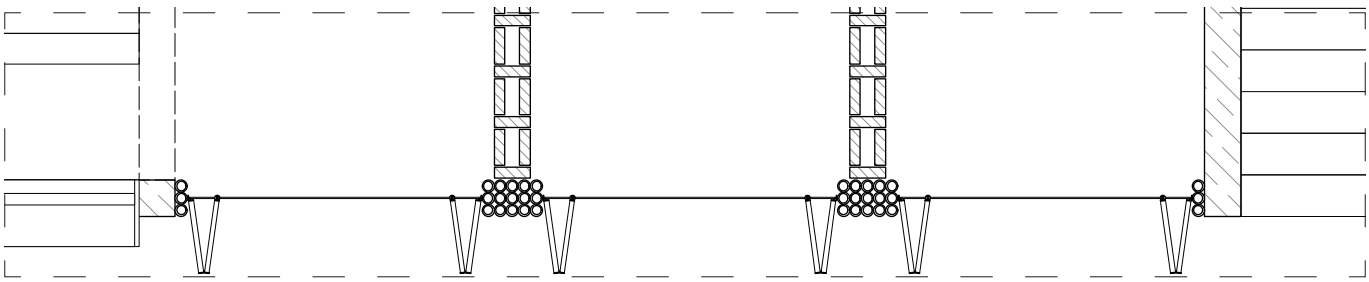


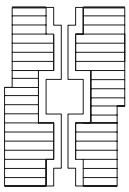
Free Zone
Communal



50CM



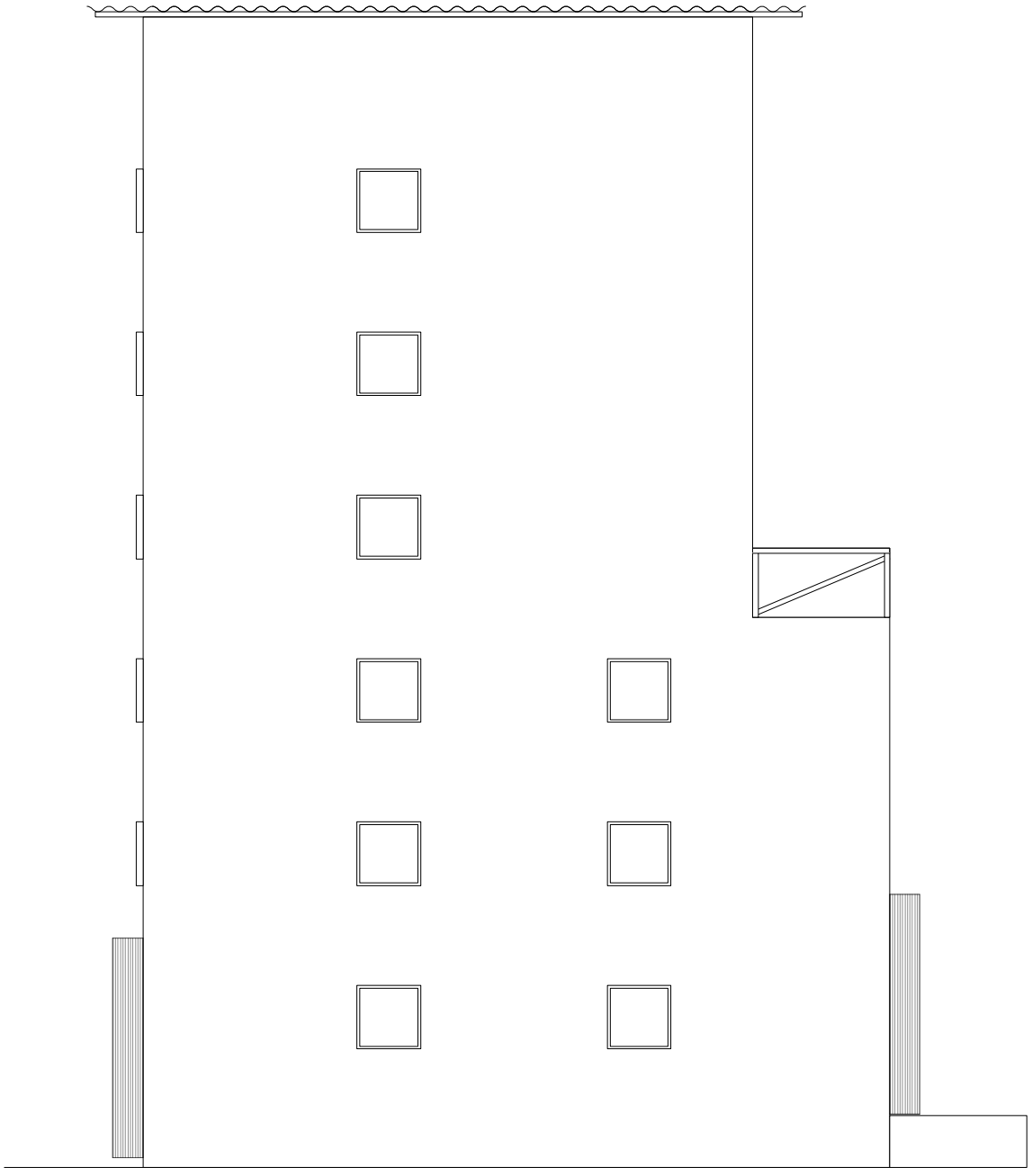


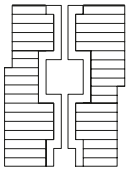


Head Regular

The regular head facade of the infrastructural core with small openings.

1M

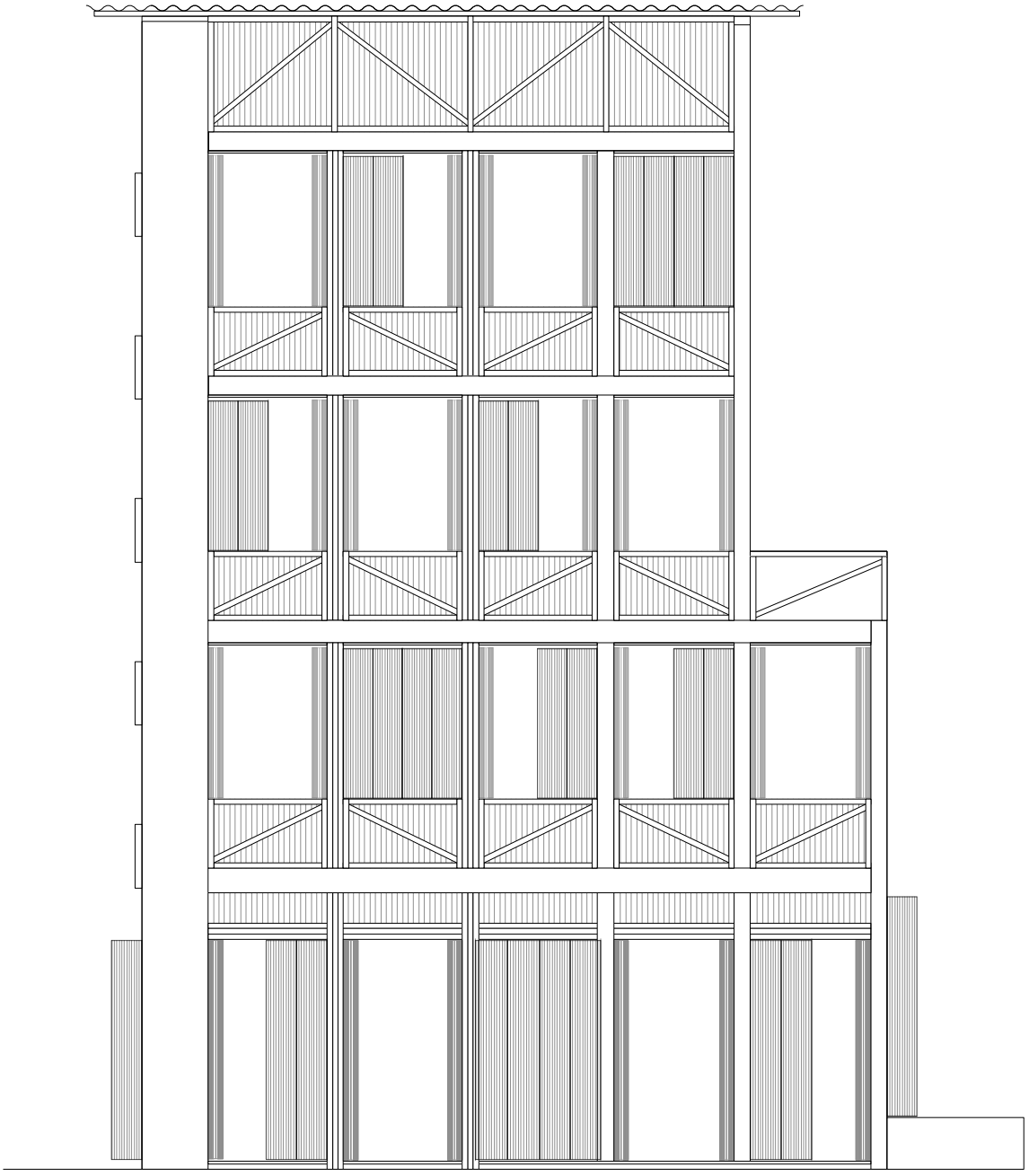


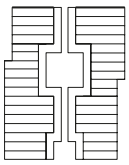


Head
Communtiy
Spine

The head facade towards the pedestrian community spine facade with foldable bamboo elements where the dwelling almost becomes the interior of the community.

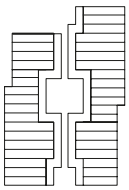
1M

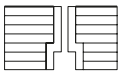




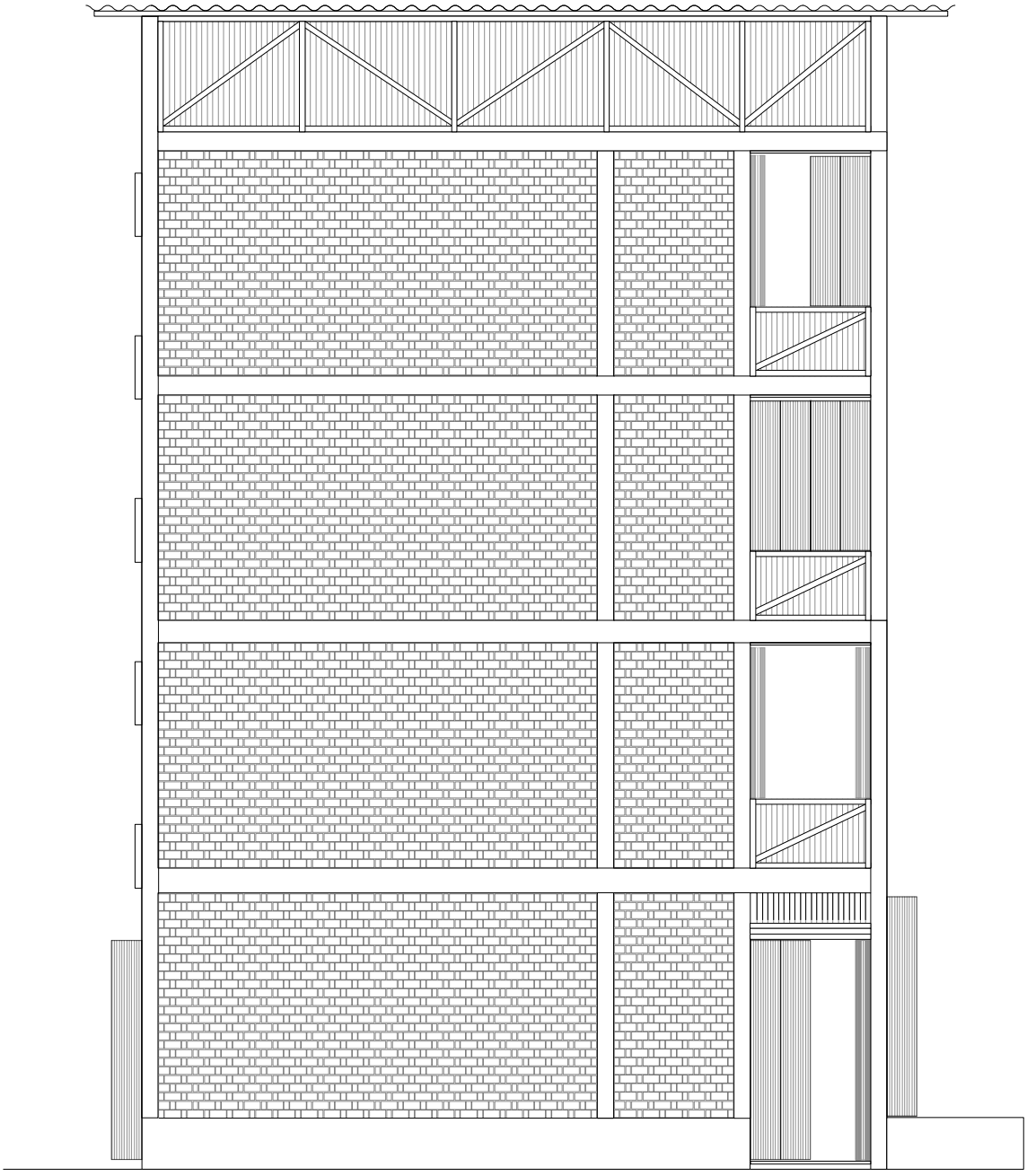
Head Vehicular
Street

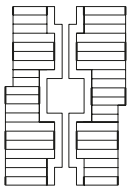
The cut head facade towards the street with partly closed brick wall and partly foldable bamboo elements allowing for punctual public functions allong the street.





1M

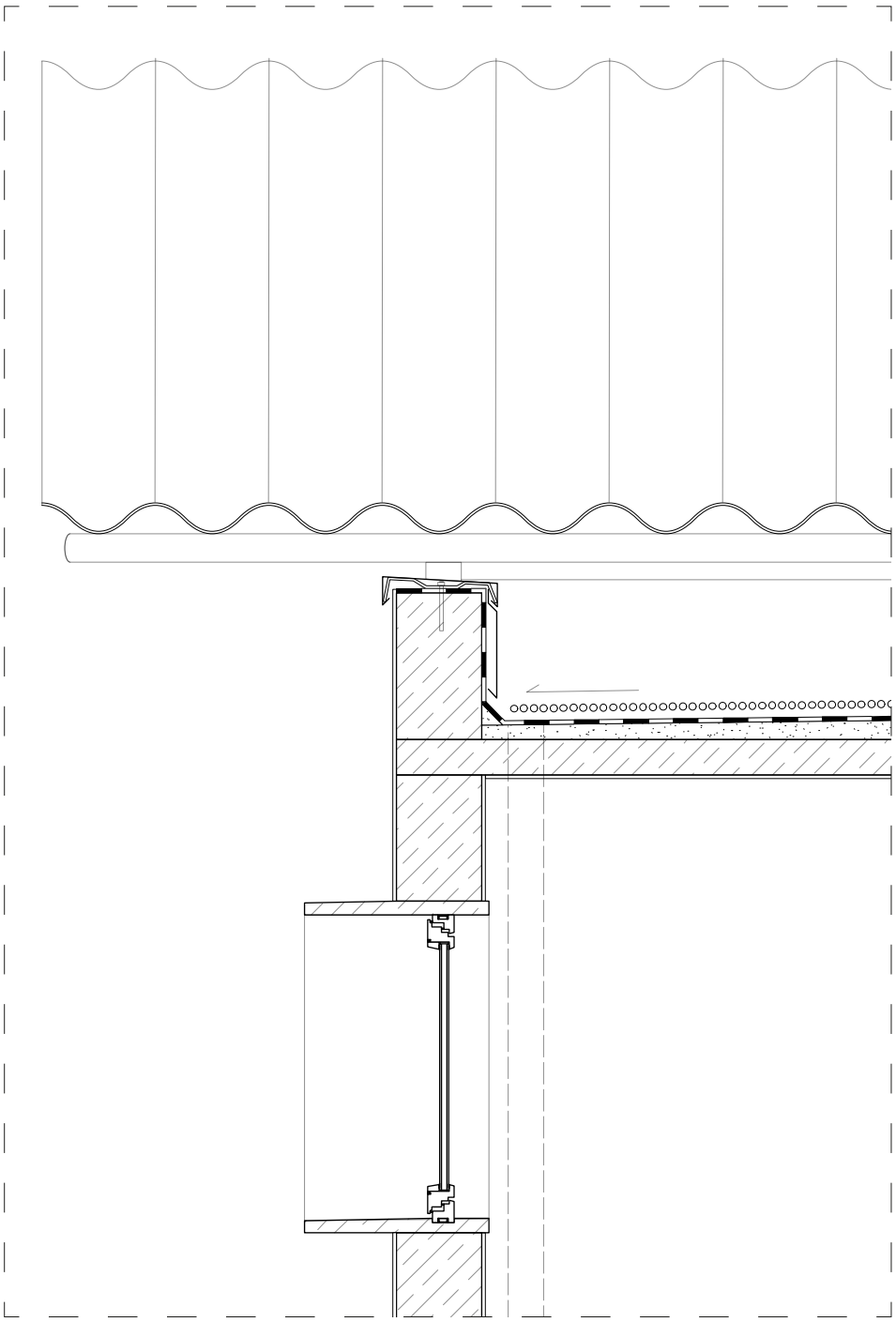




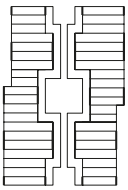
Infrastructural Core

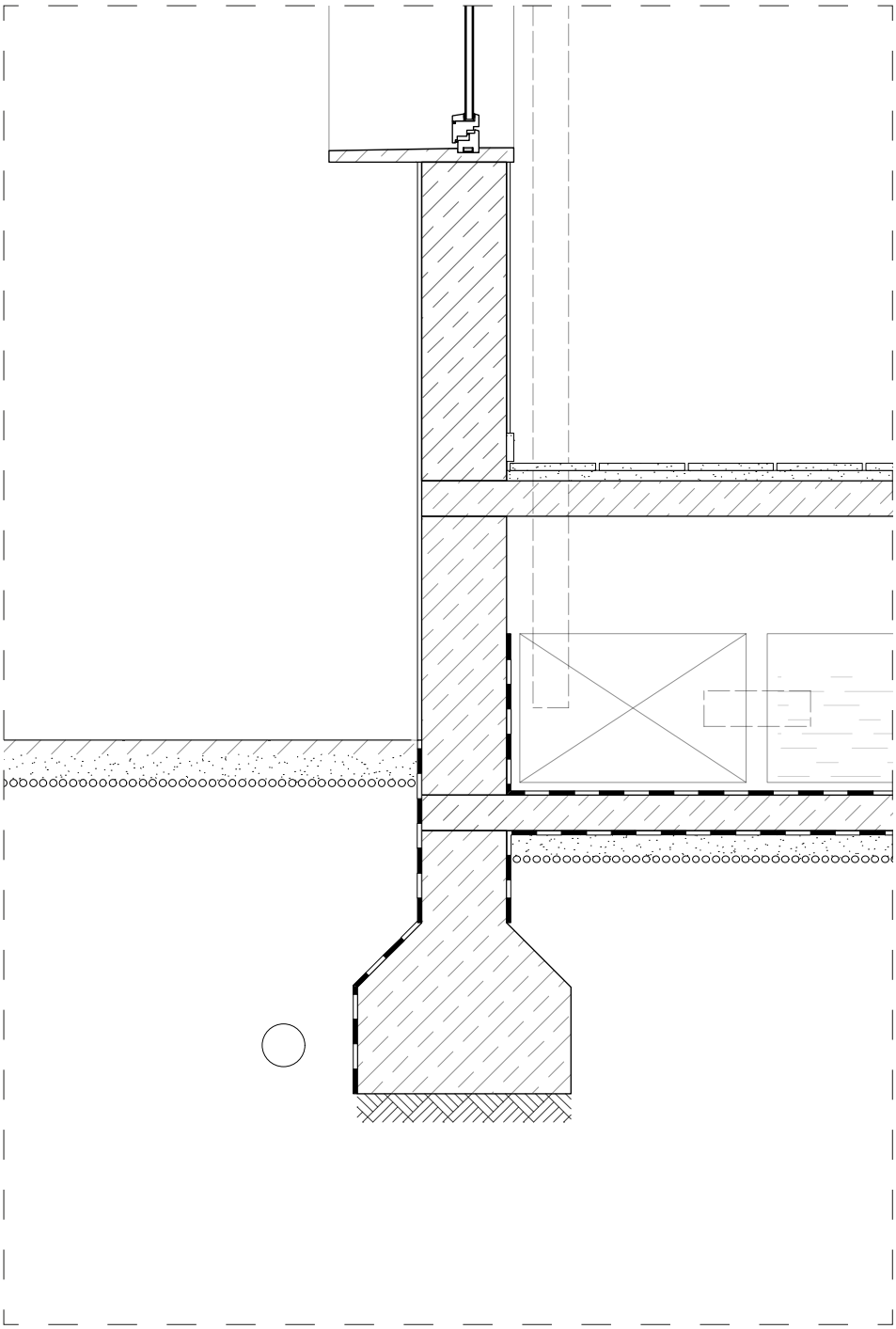
Roof
80 corrugated sheet
80 bamboo beam
100/50 mortar bed
sheet-zinc parapet wall covering
gravel
polythene sheeting
40 - 140 earth layer to falls
100 reinforced in-situ concrete roof
10 plaster

Wall
10 plaster
240 reinforced in-situ concrete
10 plaster
precast reinforced concrete window sill
wooden window frame



20CM



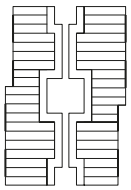


Infrastructural
Core

Floor
20 tile finishing
30 screed
100 reinforced
in-situ concrete

Foundation
polythene
sheeting
100 in-situ
reinforced
concrete
polythene
sheeting
50 sand
300 hardcore
600/300
reinforced
concrete strip
foundation
drainage

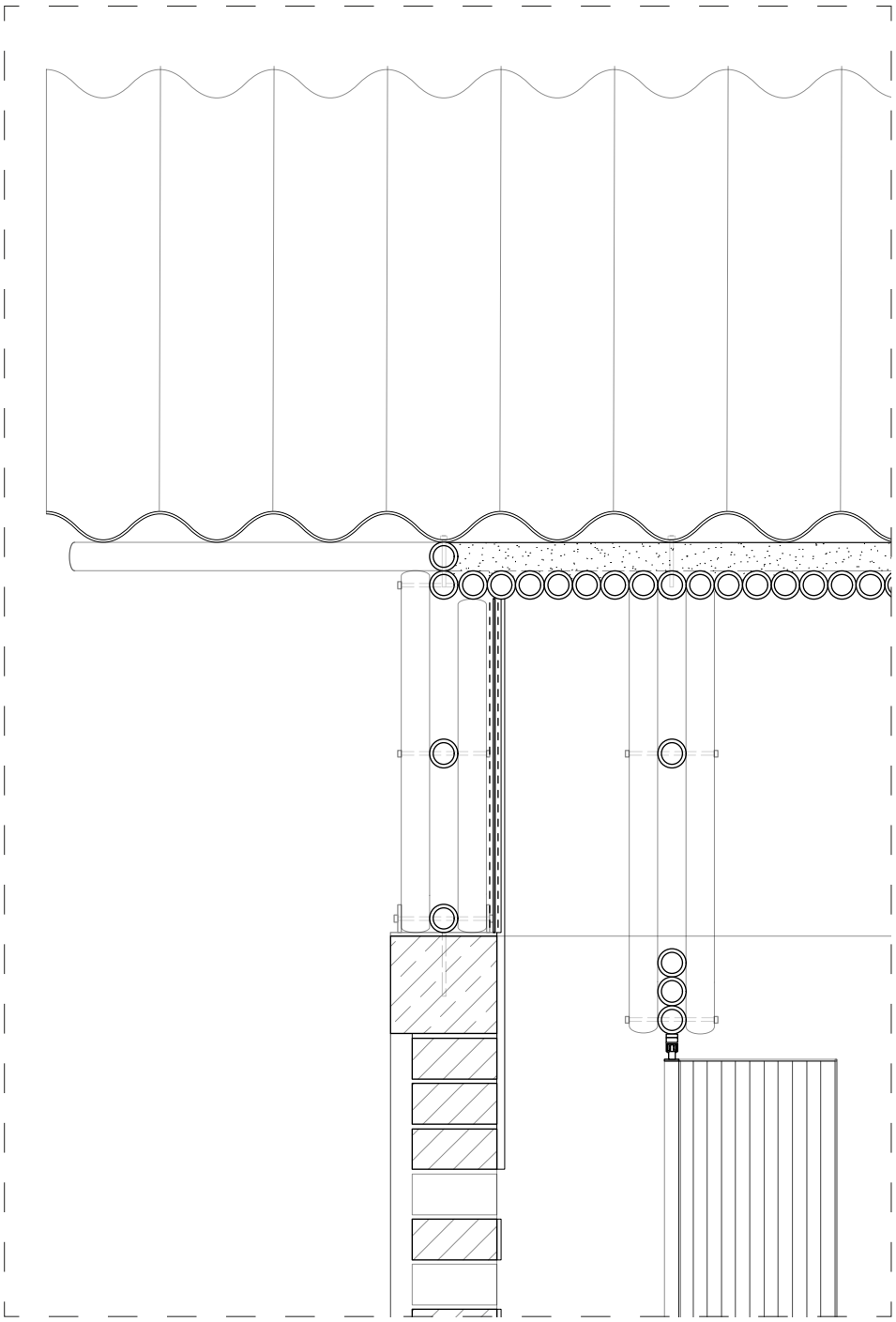
20CM

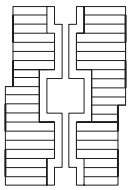


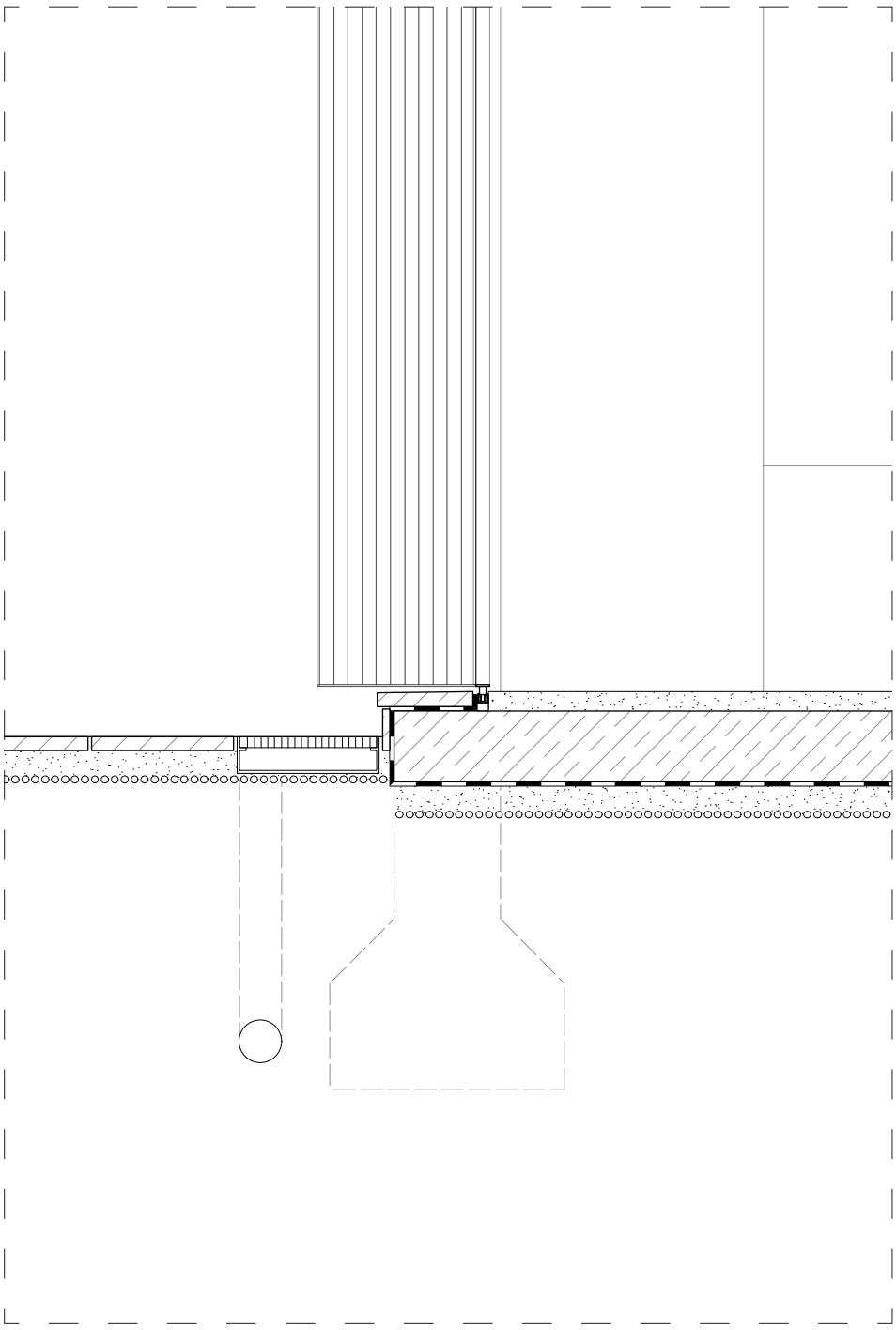
Free Zone
Urban

Roof
80 corrugated sheet
80 bamboo beam with 80 loam filling between
80 solid bamboo soffit

Wall
bamboo truss
bamboo wattle
10 plaster
300/270 reinforced concrete peripheral tie beam
brick in rattrap bond perforated
10 plaster
foldable door with 40/40 steel frame
40 bamboo
8 steel rod welded in at centre



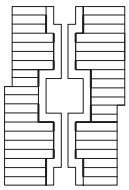




Free Zone
Urban

Foundation
coating
55 monolithic screed
200 reinforced concrete
polythene sheeting
50 layer of sand
300 hardcore
600/300 reinforced concrete point foundation
270/40 concrete cover element
400/100 rain gutter drainage

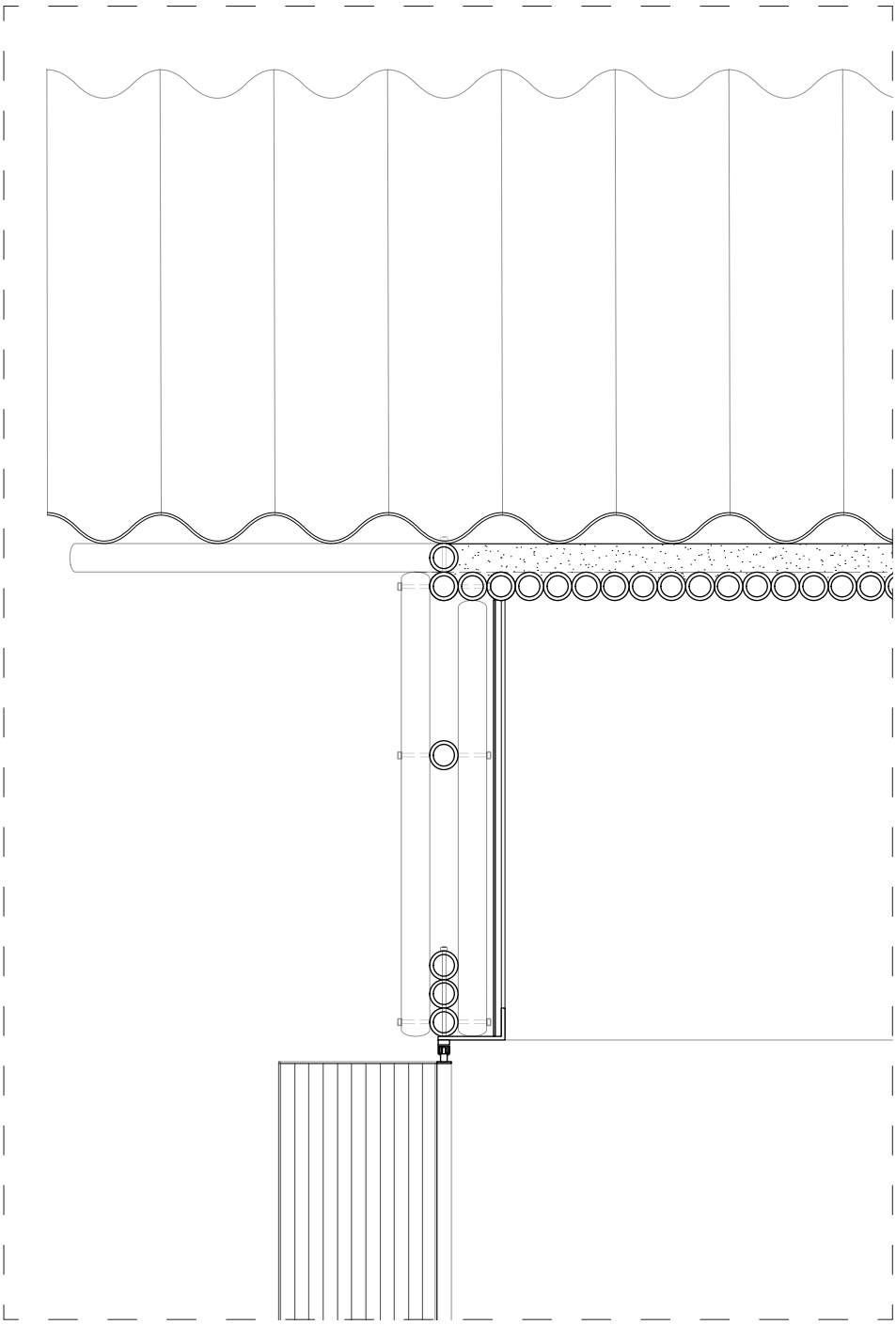
Other floors
55 monolithic screed
200 reinforced concrete
80 solid bamboo soffit as lost formwork



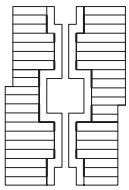
Free Zone
Communal

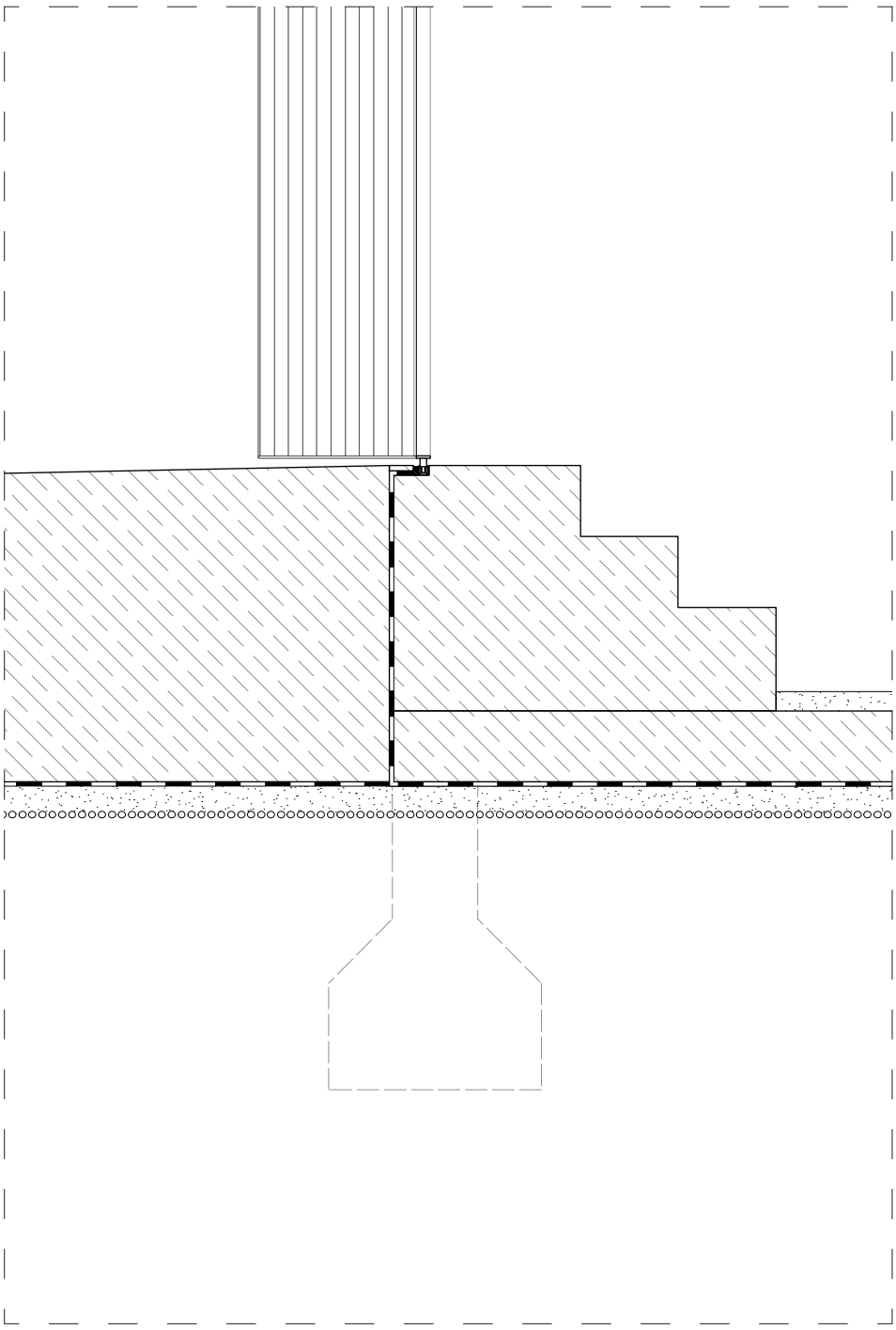
Roof
80 corrugated sheet
80 bamboo beam with 80 loam filling between
80 solid bamboo soffit

Wall
bamboo truss
bamboo wattle
10 plaster
3 x 80 bamboo purlin fixed at ends to structural concrete wall
180/90 steel angle bearer
foldable door with 40/40 steel frame
40 bamboo
8 steel rod welded in at centre



20CM





Free Zone
Communal

Foundation
coating
55 monolithic
screed
200 reinforced
concrete
polythene
sheeting
50 layer of sand
300 hardcore
50/15 concrete
cover element
in-situ concrete
stair

20CM

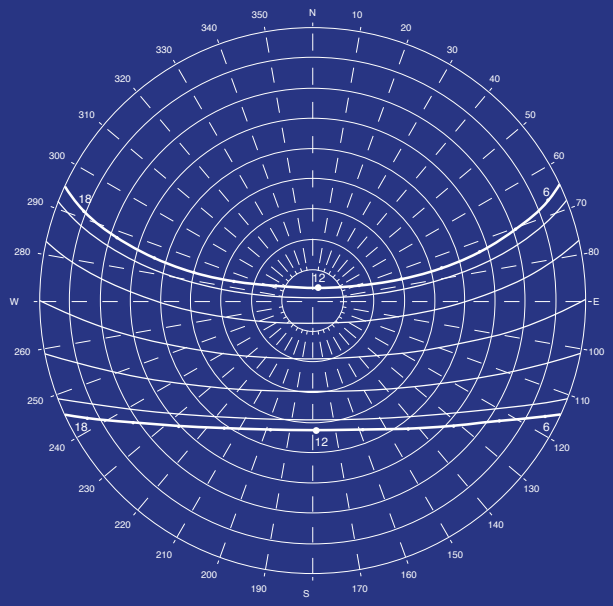
16 CLIMATE

Mumbai's climate is characterized by temperatures around 30° all year around and a high humidity of around 60%. During monsoon season between May and September heavy rainfalls occur with up to 1000mm resulting in an even higher humidity of up to 80%.

The course of the sun features high altitudes of 85.3° in summer and 47.1° in winter.

19°N 72°E

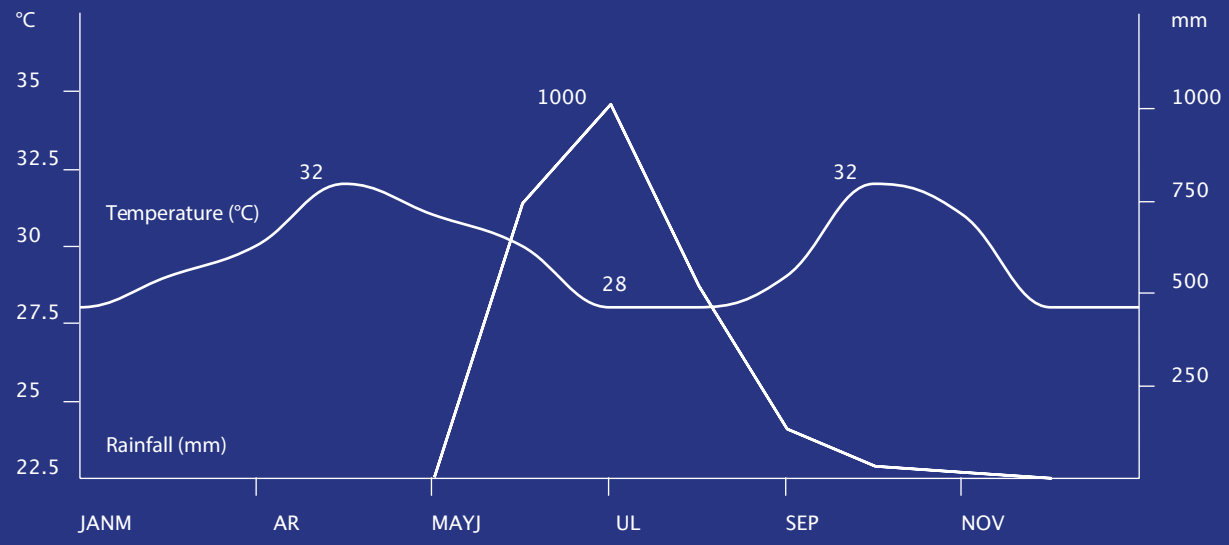
Drawing based on sunearthtools.com



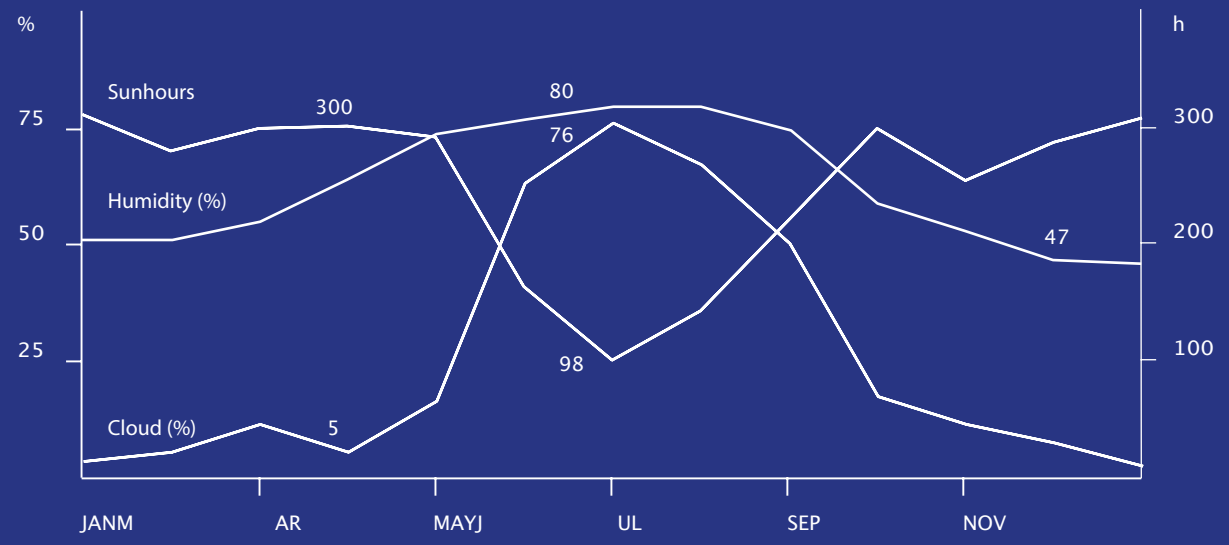
21 JUN 12.00
A30.8 E85.3

21 DEC 12.00
A177.8 E47.1

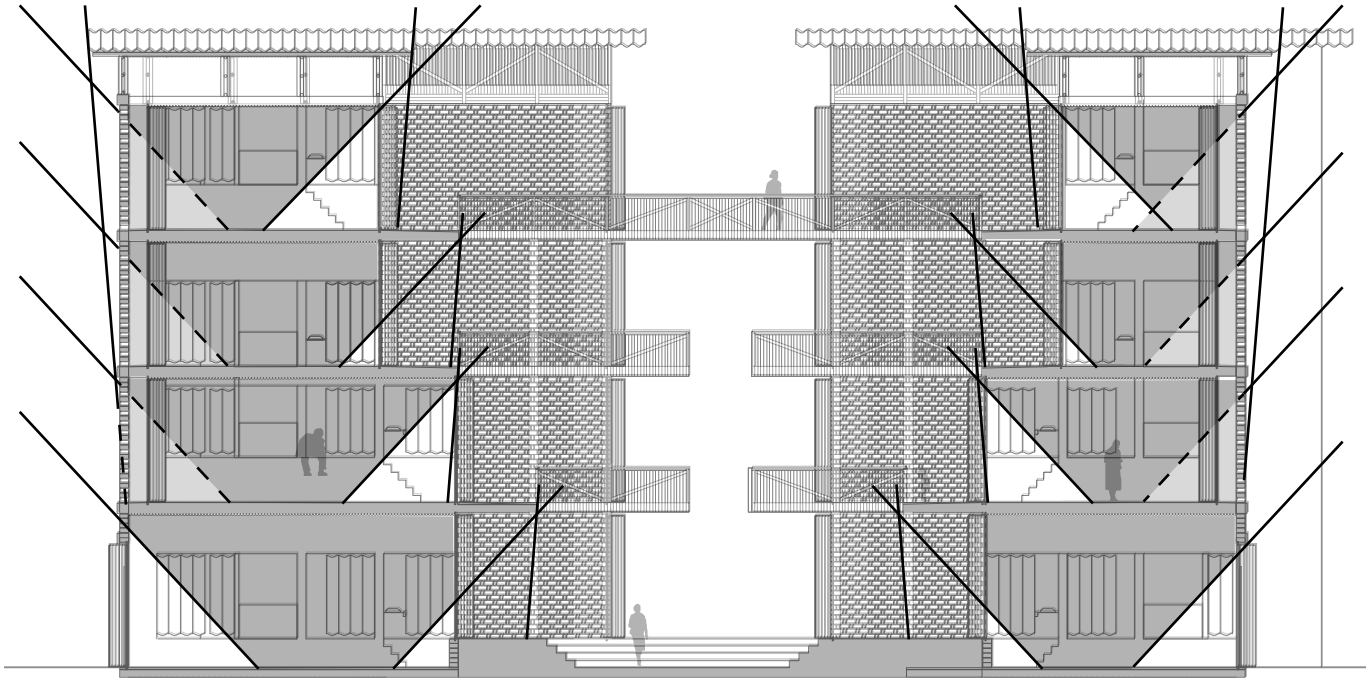
Drawing based on sunearthtools.com



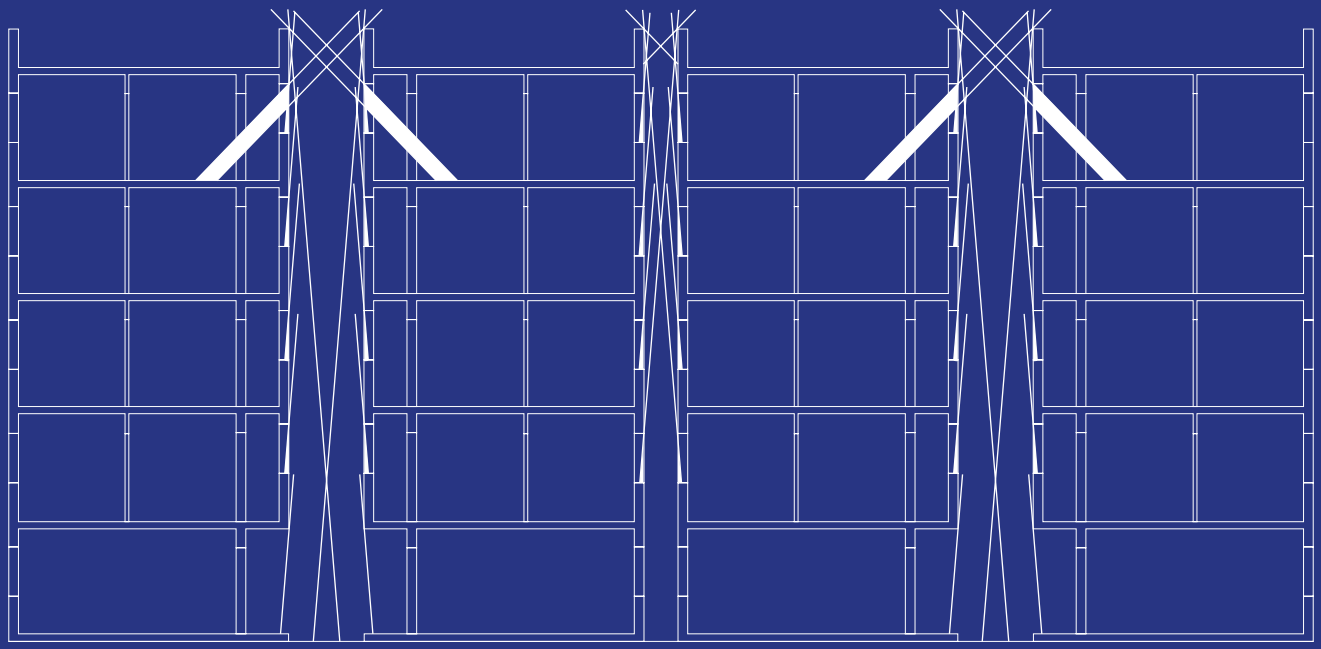
Drawing based on sunearthtools.com



Sun



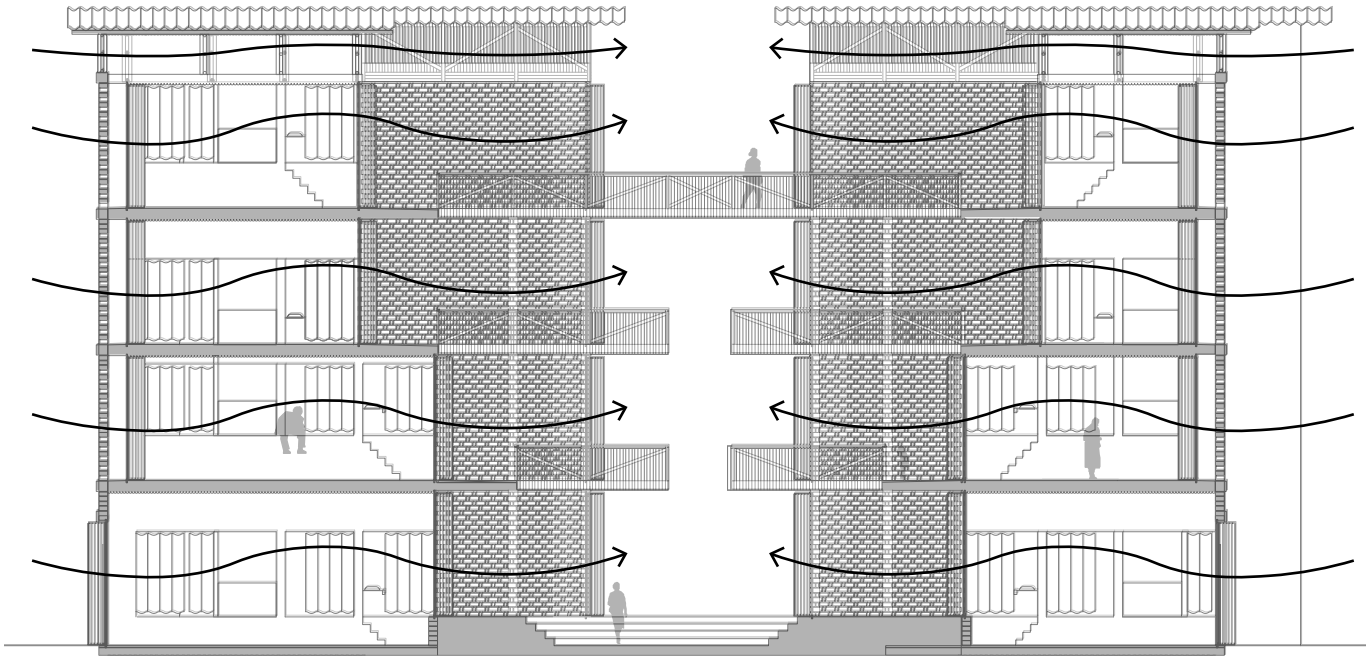
2 M



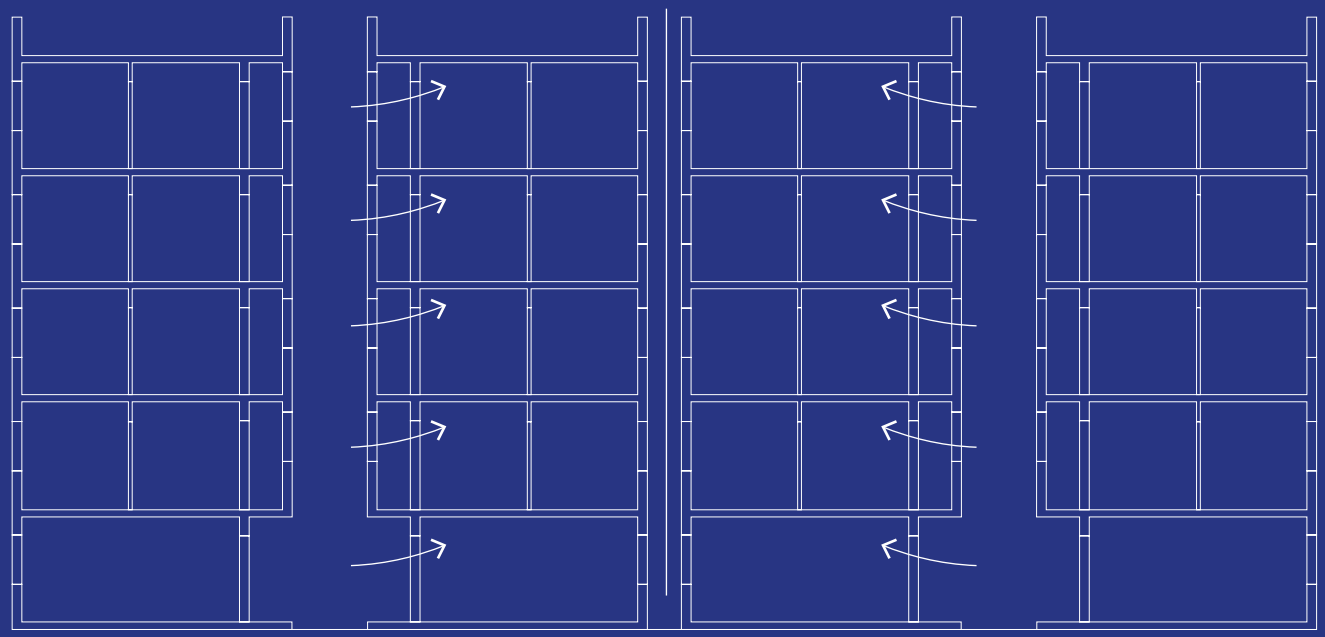
SUN EXISTING

2 M

Ventilation



2 M



VENTILATION EXISTING

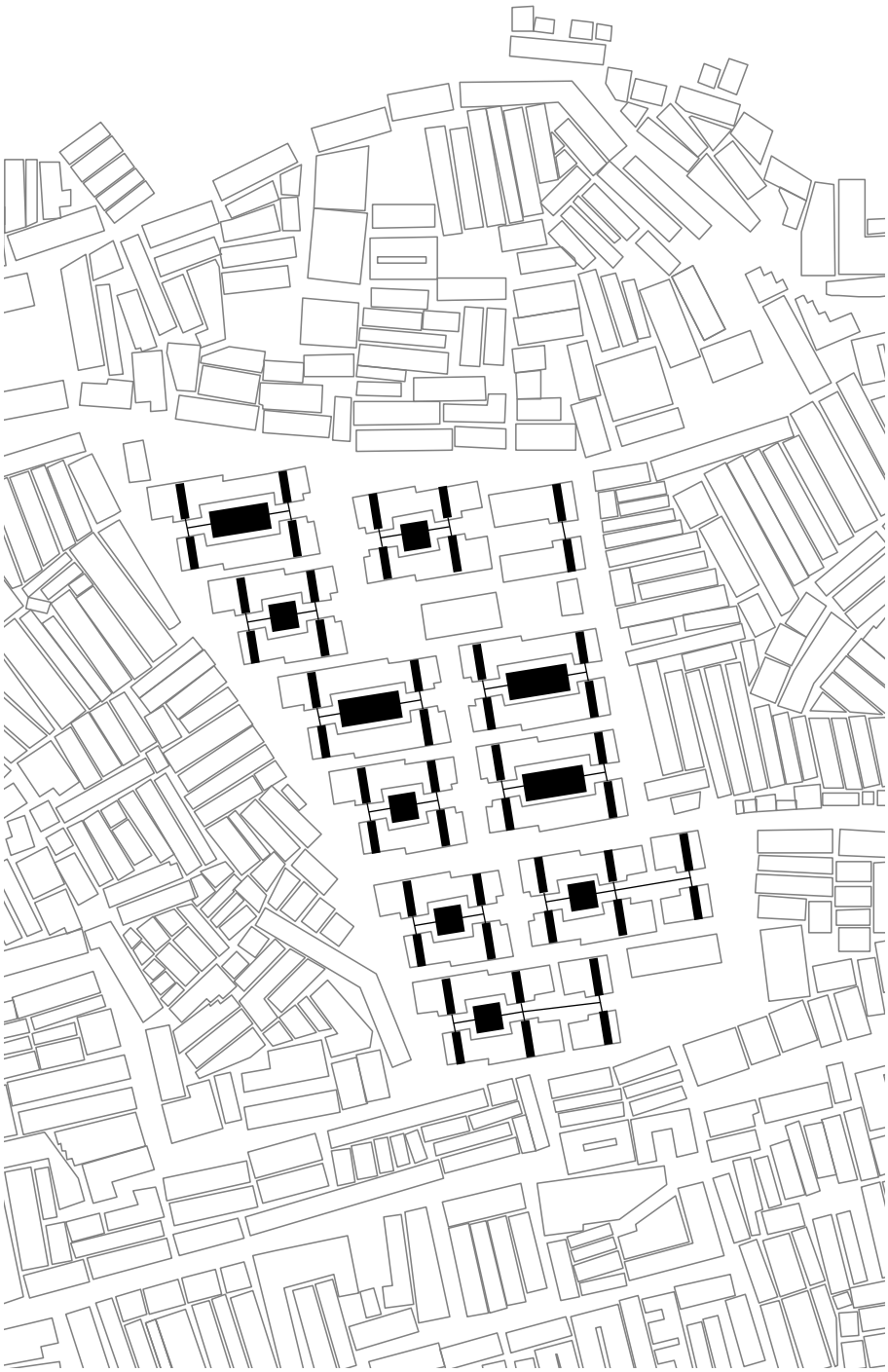
2 M

The roof with its surface of 1080m2 is able to catch 1080m3 of water during peak monsoon season July with 1000mm precipitation.

The capacity of storing water in the containers underneath the building adds up to 65m3. Another 55m3 is achieved by the stepwell, that is connected to the containers and holds additional water. Surplus water will drain.

2 M

Rainwater
Collection



25 M

MANAGERIAL LEVEL

1 HOUSING COOPERATIVES

In order to address the managerial design assignment – involving the community in the planning process by forming housing cooperatives – the latter were studied. Housing cooperatives face a long history in india and are well established. The first co-operatives Societies Act was established in 1904 after which the development however still remained marginal until the 1950s. In 1969 the National Co-operative Housing Federation was founded followed by large investments through the Indian government creating a strong support network to assist the development of housing co-operatives. 1988 marked a further turning point with the United Nations Centre for Human Settlements proposing the enabling approach towards housing, supporting the role of private and third sectors in housing instead of direct public intervention. Legislative barriers were removed to facilitate the participation of sectors. As a consequence, in five decadse the co-operative housing movement grew from 5.564 in 1960 to 100.000 in 2011. In 2011 India housing cooperatives involved 7 Mio Members within a population of 1.21 Billion. It encompased 2.5 Mio Houses out of a total of 246.3 Mio residential houses[29].

29 CECODHAS, 2012

Housing cooperatives in the Global South generally follow three types. Tenure: collective ownership and management. Building: land development and housing construction. Finance: lend money to members for housing purposes. The stakeholders involved in the process mainly are: members, the government, market and external funding[30]. The average size of a Baugruppe in Berlin contains twenty households. It is not recommended to significantly exceed this size in order to bring together a cohesive group of residents. Around this size the cooperative is still manageable[31].

30 Bredenoord et al, 2014

31 Van Gameren et al, 2013

1904
FIRST CO-OPERATIVES SOCIETIES ACT

1909
FIRST HOUSING COOPERATIVE

1912
LEGISLATION HOUSING COOPERATIVES

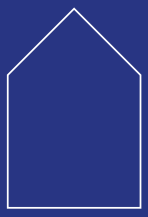
1919
LEGISLATION ADMINISTRATIVE COOPERATIVES

1964
NATIONAL CO-OPERATIVE HOUSING FEDERATION

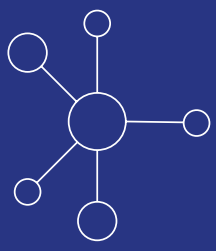
1988
ENABLING APPROACH

TIMELINE HOUSING COOPERATIVES INDIA

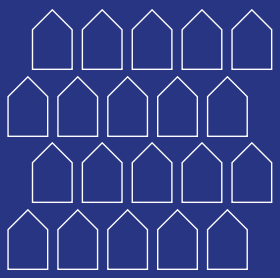
7 MIO MEMBERS



2.5 MIO HOUSES

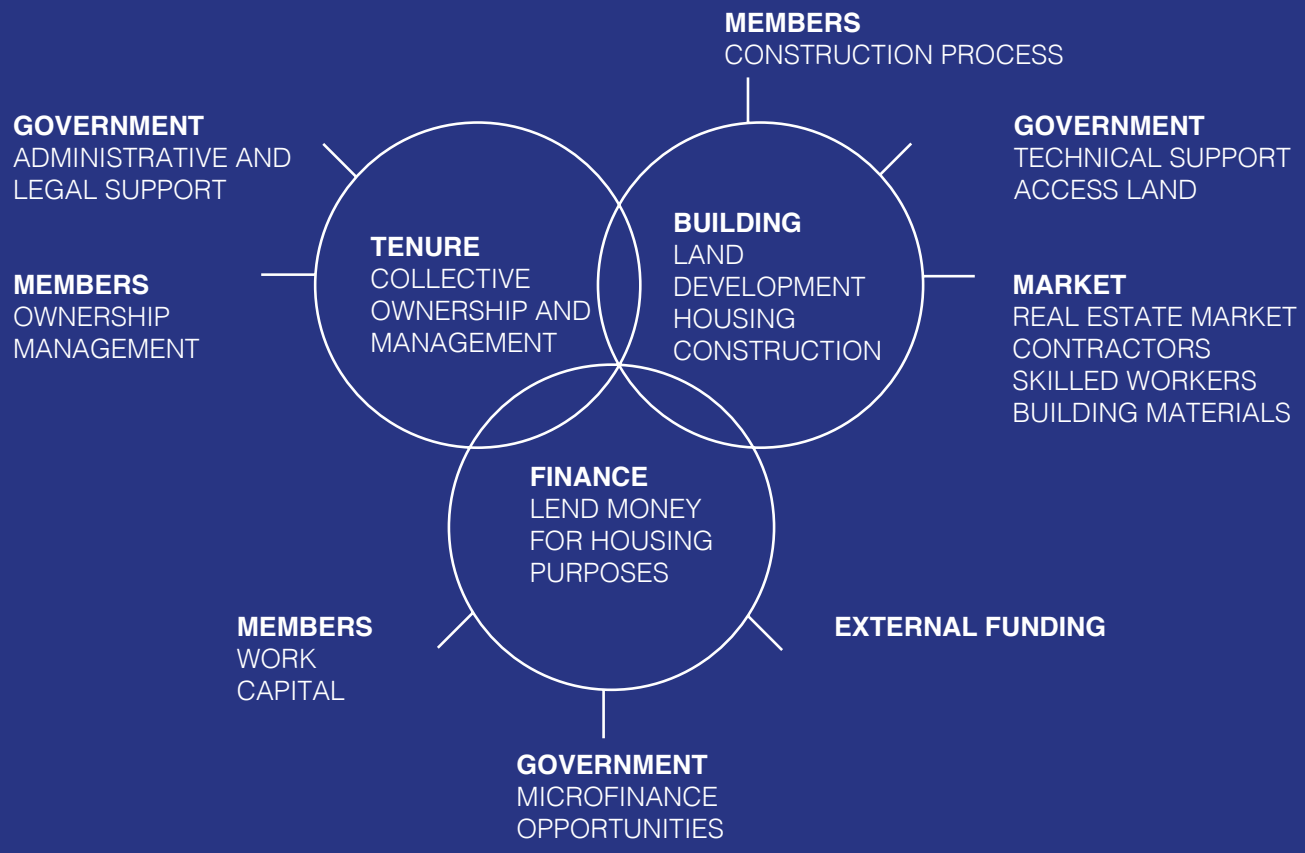


100.000 COOPERATIVES



20 HOUSEHOLDS

NUMBERS HOUSING COOPERATIVES INDIA



THREE TYPES OF HOUSING COOPERATIVES IN THE GLOBAL SOUTH

2 SELF-REDEVELOPMENT

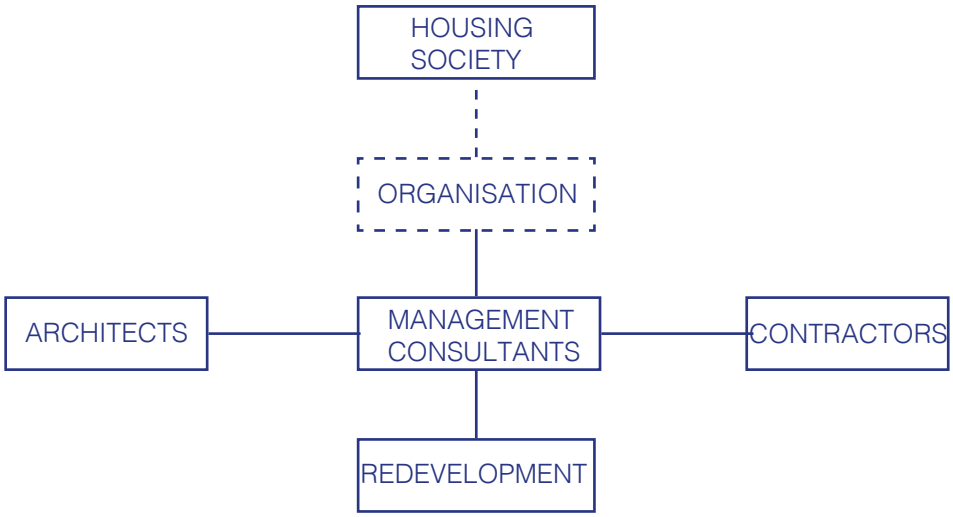
Self-redevelopment is a type of redevelopment entirely executed by the society members. Societies can avail financial laons and appoint management consultants, architects and contractors. In this way, their own requirements can be met, profits remain within the society and the construction can be monitored closely. Hereby, private developers become obsolete. Additional floor area can be used by society members and additional appartments sold to buyers[32].

32 selfredevelopment.org

Self-redevelopment is encouraged by the Indian Government through the self-redevelopment scheme 2018. Within the scheme, the Maharashtra Housing and Development Authority (MHADA) provides a single window system securing faster permissions. The Mumbai District Central Cooperative Bank (MDCCB) sanctiones loans providing financial support. Requirements are set in the Self Redevelopment Loan Policy for Co-Operative Housing Societies.

To help familiarisation with the process and overcome difficulties in delays, management, changing plans and government norms, organisations help guiding societites. These organisations within a transparent process aim to ensure arrangement of finances and oversee adherence to norms as the Real Estate Regularity Act (RERA) and Goods and Services Tax (GST), permissions and construction[33].

33 financialexpress.com/money/self-redevelopment-a-new-beginning-for-old-societies/1450446/



SELF-REDEVELOPMENT SCHEME

The case of Bhendi Bazaar Self-Redevelopment replaces a neighborhood with structurally weak buildings, narrow roads, no system for waste disposal and only few hours of water a day. It encompasses an area of 6 hectar and involves 3200 families, 250 redeveloped buildings and 1250 shops. It is led by the Saifee Burhani Upliftmen Trust (SBUT) which is a public charitable trust registered under the Bombay Public Trust Act 1950. The project aims to develop new buildings, wider roads, modern infrastructure, more open space and commercial areas. Mosques and religious structures are retained and enhanced. For enhanced management and funtionality, the neighborhood has been divided into 9 sub-clusters. 80% of the land mass serves the rehabilitation of existing tenants[34].

34 sbut.com

Bhendi Bazaar Self-Redevelopment Area

sbut.com/glimpsegallery

3 MANAGERIAL MODEL

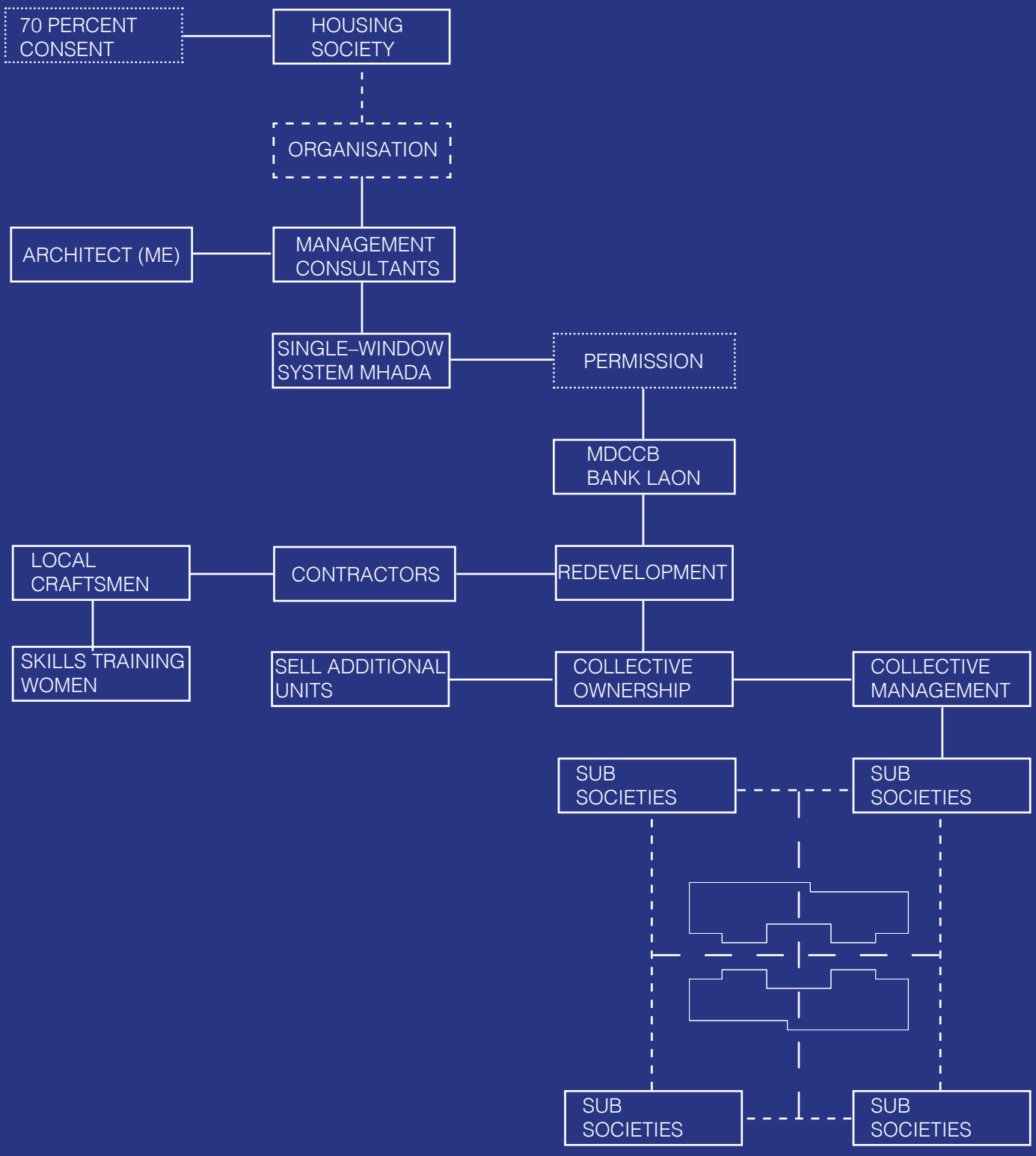
The managerial model of the design foresees a a development and management driven by housing cooperatives within a self-redevelopment scheme encouraged by the Indian government.

With a 70 per cent consent by the dwellers the redevelopment starts. The inhabitants form a housing society under the Cooperative Society Act 1950 or join an existing housing society. The society can then take help by an organisation for the whole process or do it on their own. Architects (in this case me), management consultants and contractors are hired. The single window system by MHADA ensures fast permissions.

Consequently, loans are provided by the MDCCB and the redevelopment starts. The building design promotes the involvement of local craftsmen in the building process through in-situ concrete construction, brick in-infill and locally manufactured bamboo elements. On the construction site, women are equally treated as men in terms of task distribution to ensure higher earnings and skills training.

Once the redevelopment is finished, the ownership is collective, each member owns his or her unit and additional units can be sold. Floor areas are increased up to four fold.

The management of the housing complexes is handled collectively through the housing society as well. By forming four sub societies per cluster with 24 units each, the size is manageable to ensure improved decision making and social cohesion between the members.



MANAGERIAL MODEL

4 FEASABILITY

The calculation of the cost recovery uses MHADA's average cost of tenements in Mumbai 2017 and estimates building costs of 25, 2 crore per cluster.

Each cluster created 2 additional units to the required amount of units which can be sold and help to cover the costs.

The design foresees an income increase through facilitating domestic income generation and trainings provided by NGO's. The increase of income is estimated by 2000 – 4000 + R/month.

As a result, the cost recovery, including rents currently paid in the area of Nalasopara, will take around 27,3 years after which the dwellers will own their dwellings within the housing society. Completely independent of any developer.

3500 SQM/ CLUSTER

Build floorplace

72000 R/SQM

Average cost of MHADA tenements in Mumbai 2017 for the Economically Weaker Section (mhada.gov.in)

252 000 000 R/ CLUSTER

Cost per cluster

COST PER CLUSTER

2 UNITS/ CLUSTER

2 large units adding up to 150 sqm sellable area

72000 R/SQM

10 800 000 R/ CLUSTER

SELL OF UNITS

96 UNITS/ CLUSTER

32 UNITS WORK OUTSIDE

64 UNITS 2ND INCOME

2000 R/MONTH

Average income home based worker (Basu et al, 2009)

2000 R/MONTH

Estimated increased income through trainings or growing businesses or temporary rent out of shared zone

INCOME INCREASE

5000 R/MONTH

Average rent price Nalasopara (numbeo.com)

32 UNITS

Work outside

160 000 R/ MONTH

Loan coverage per cluster through outside workers

9000 R/MONTH

Average rent price Nalasopara + income increase

64 UNITS

2nd income

576 000 R/ MONTH

Loan coverage per cluster through 2nd incomers

241 200 000 R PER CLUSTER

Cost per cluster minus sell of units

8 832 000 R/ YEAR

Loan coverage per cluster

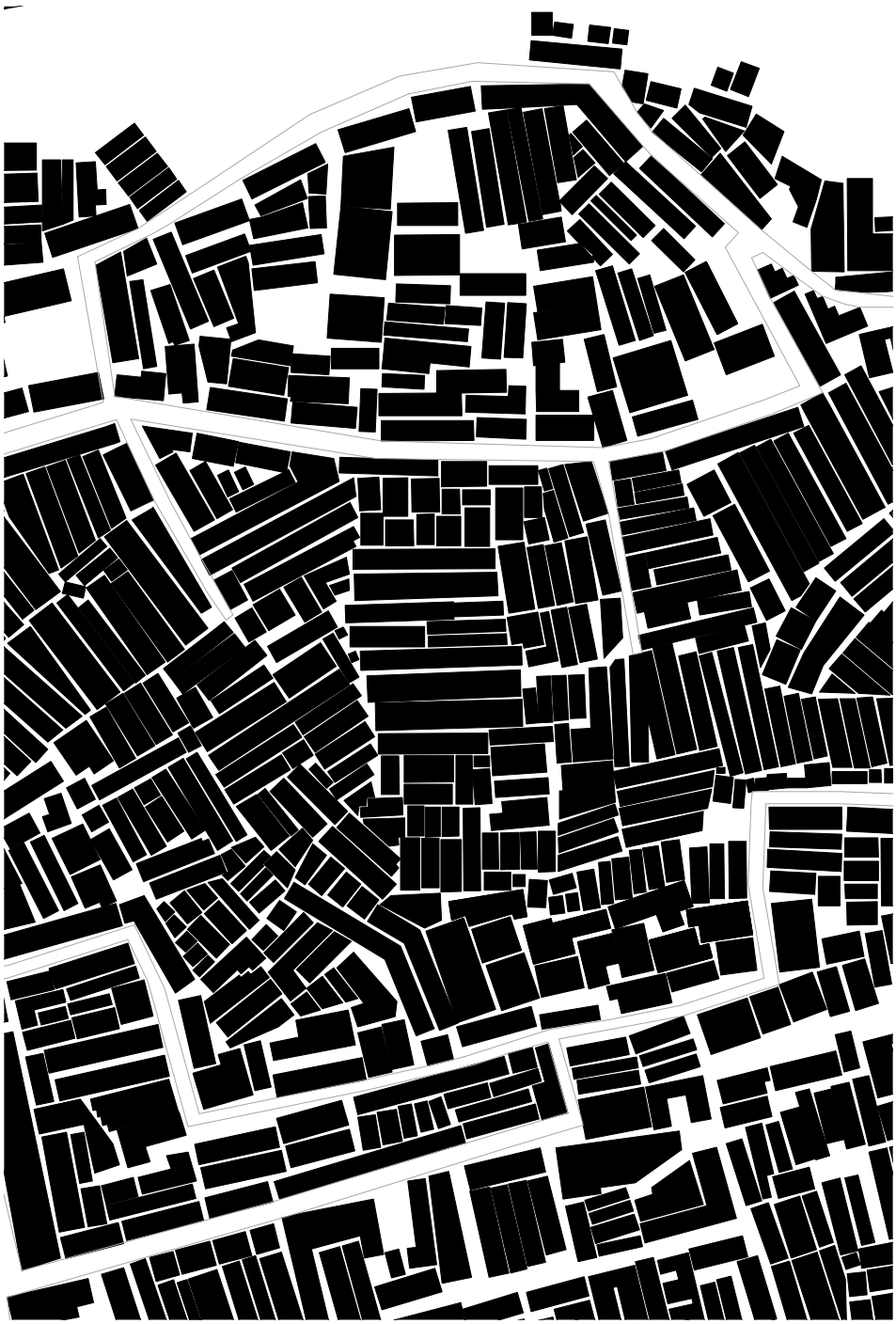
27,3 YEARS

Duration cost recovery

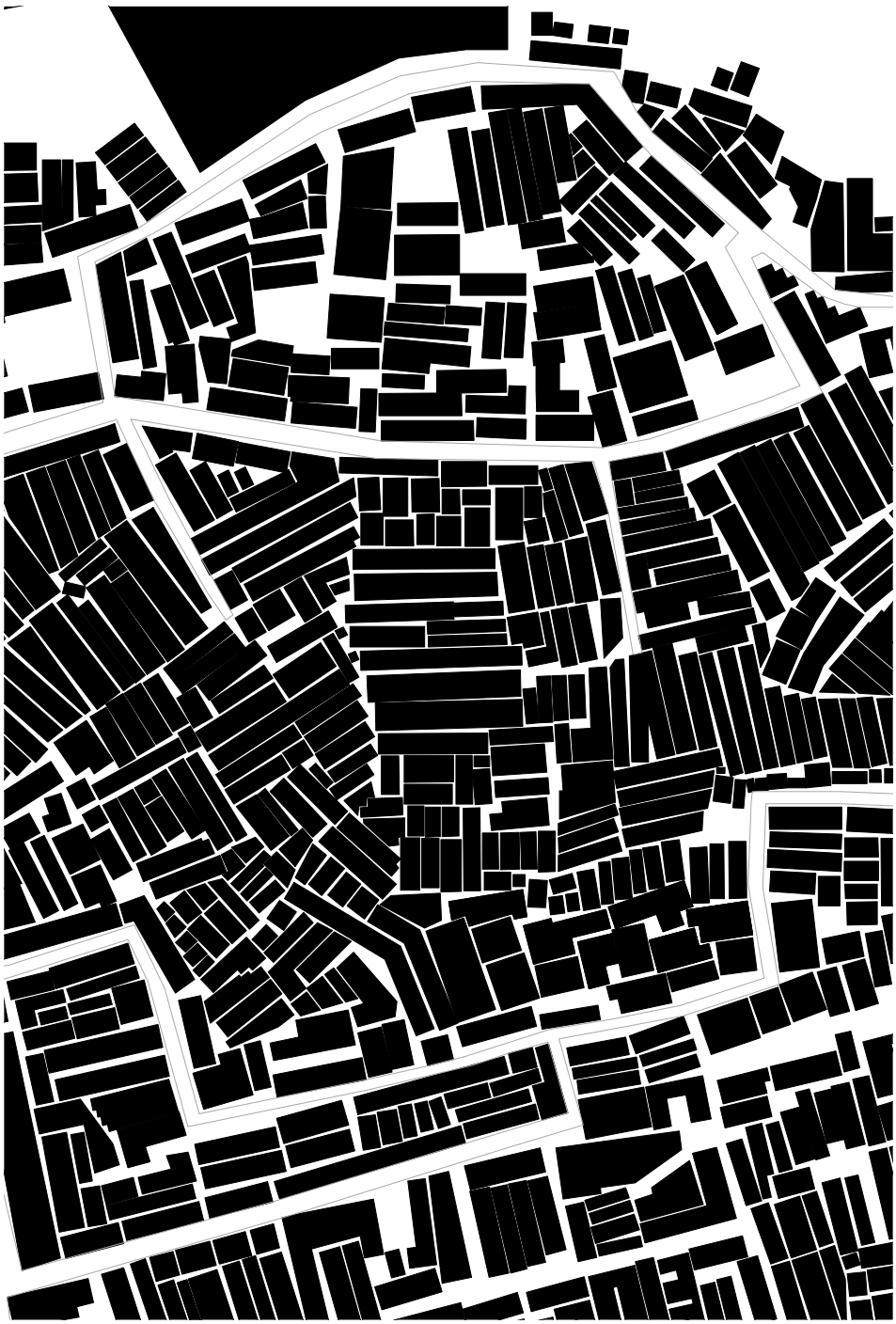
COST RECOVERY

5 CONSTRUCTION PHASES

Phase 0



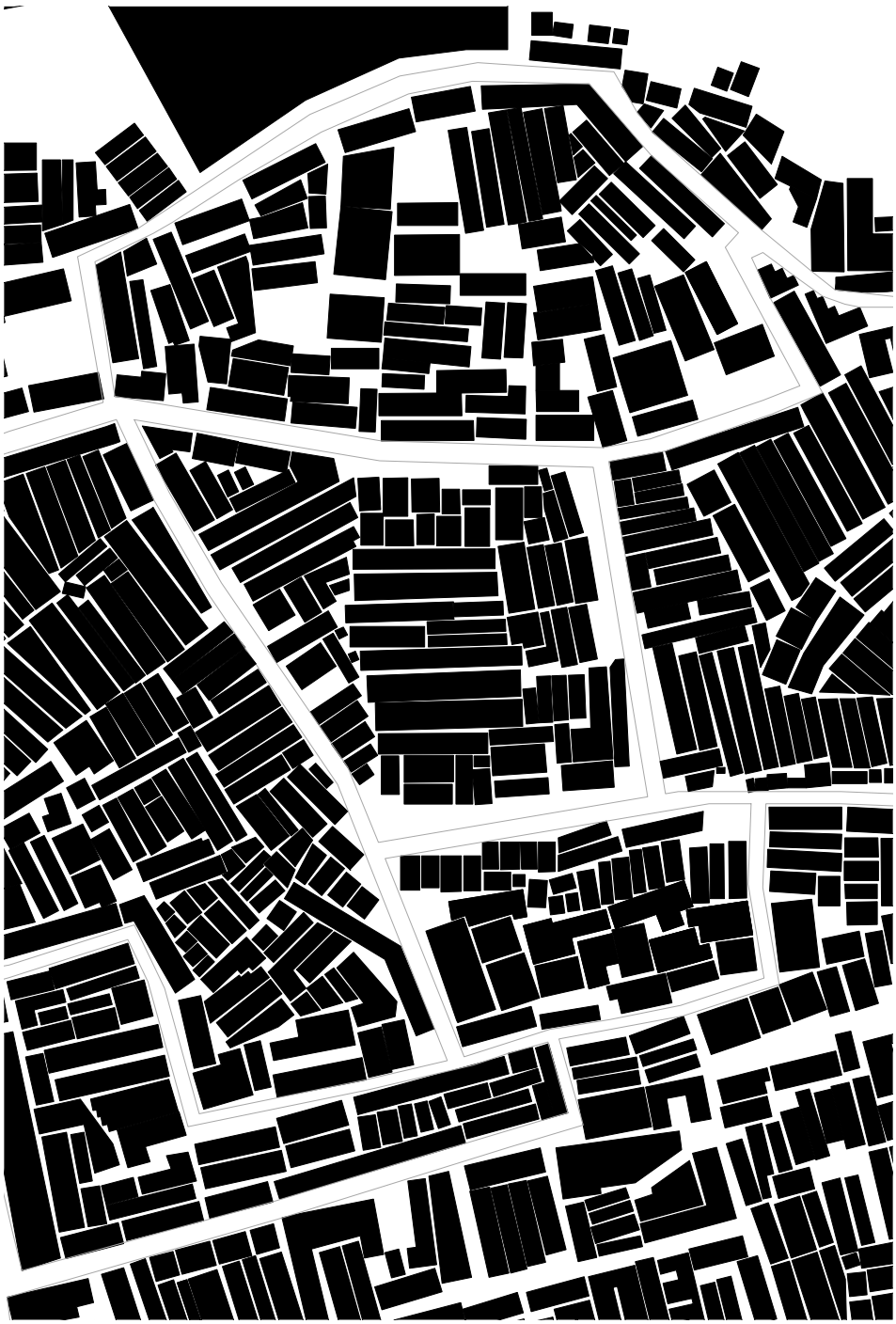
25 M



Phase 1
Temporary
Resettlement

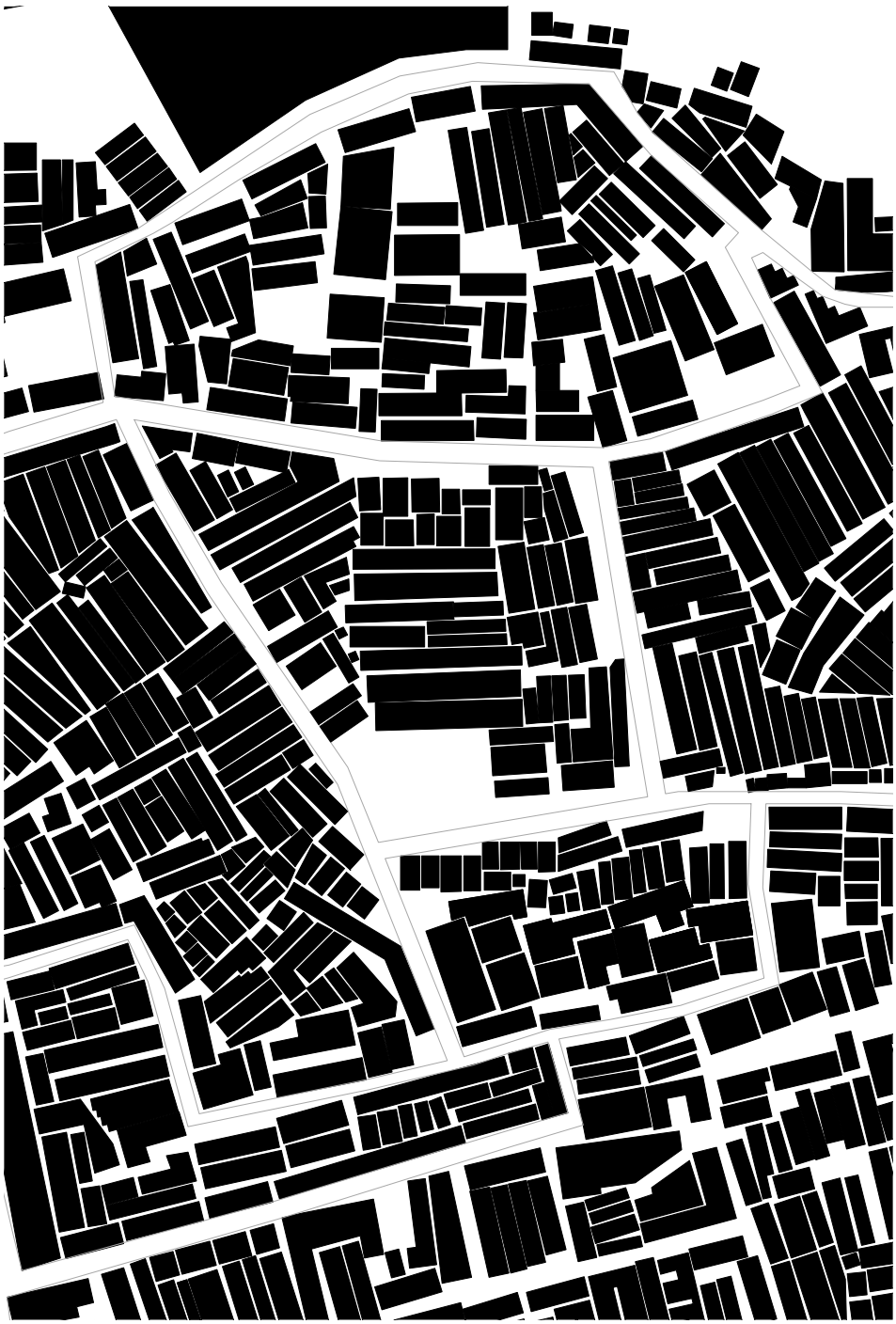
25 M

Phase 2
Infrastructure



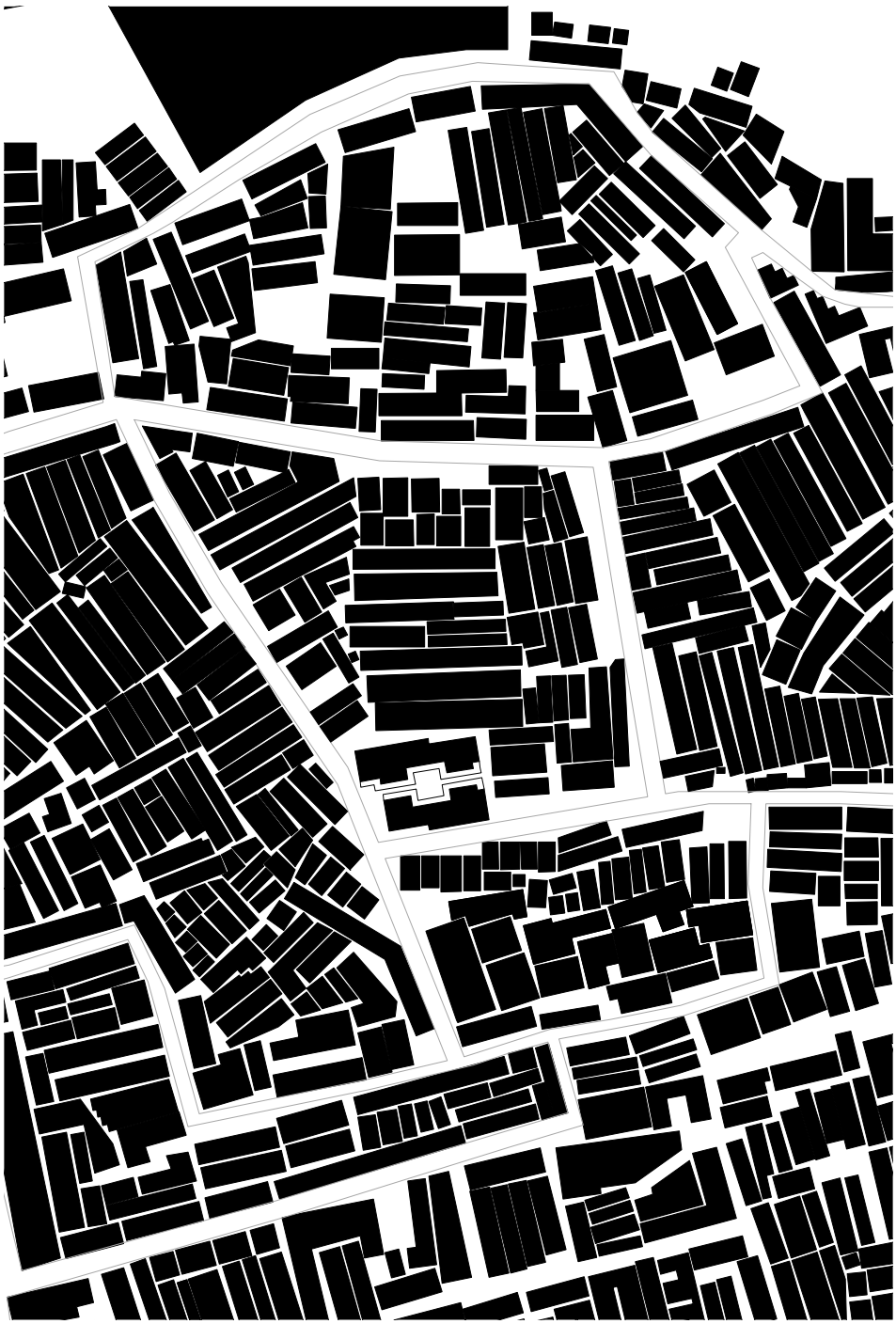
25 M

Phase 3
Site Preparation



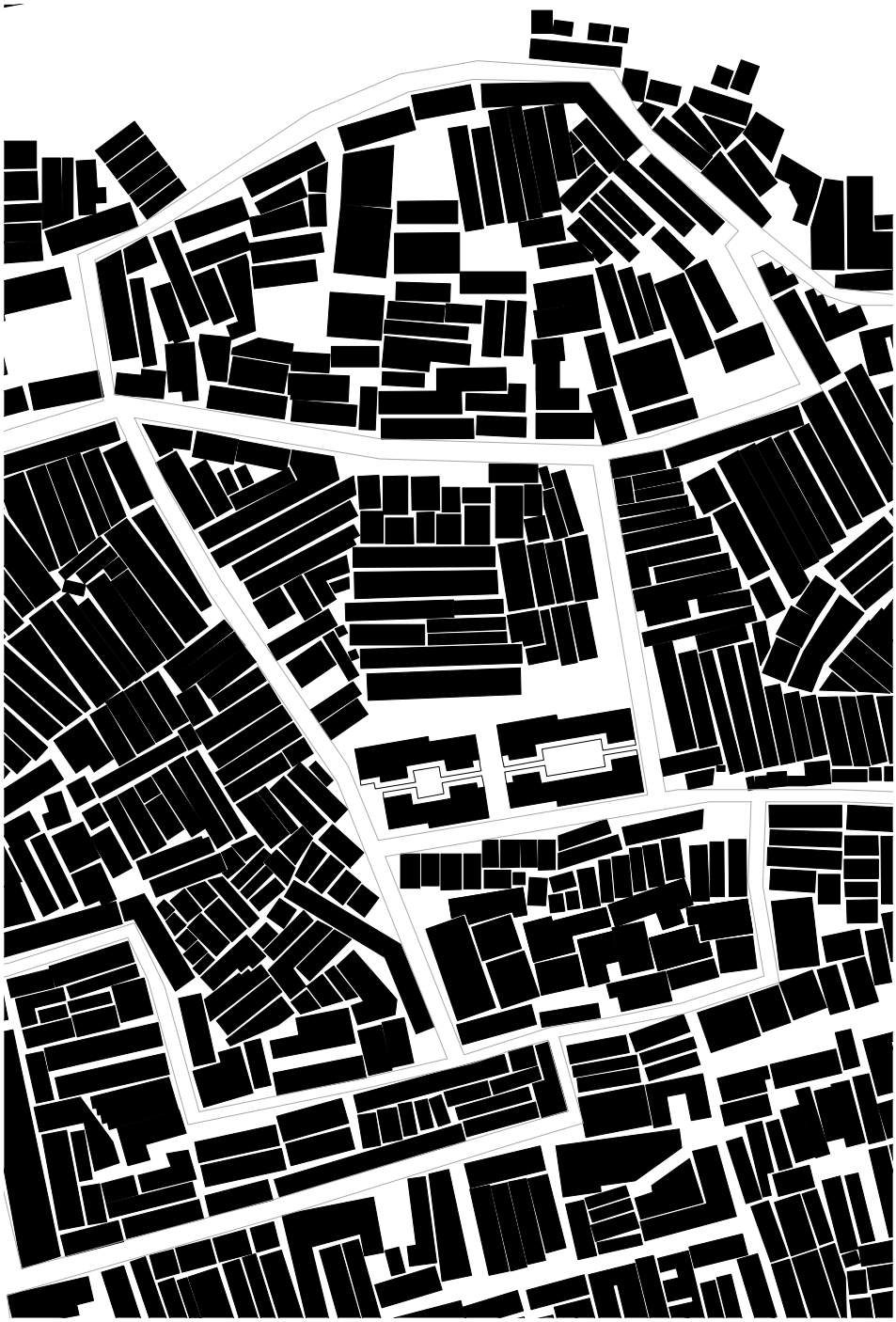
25 M

Phase 4
First Module



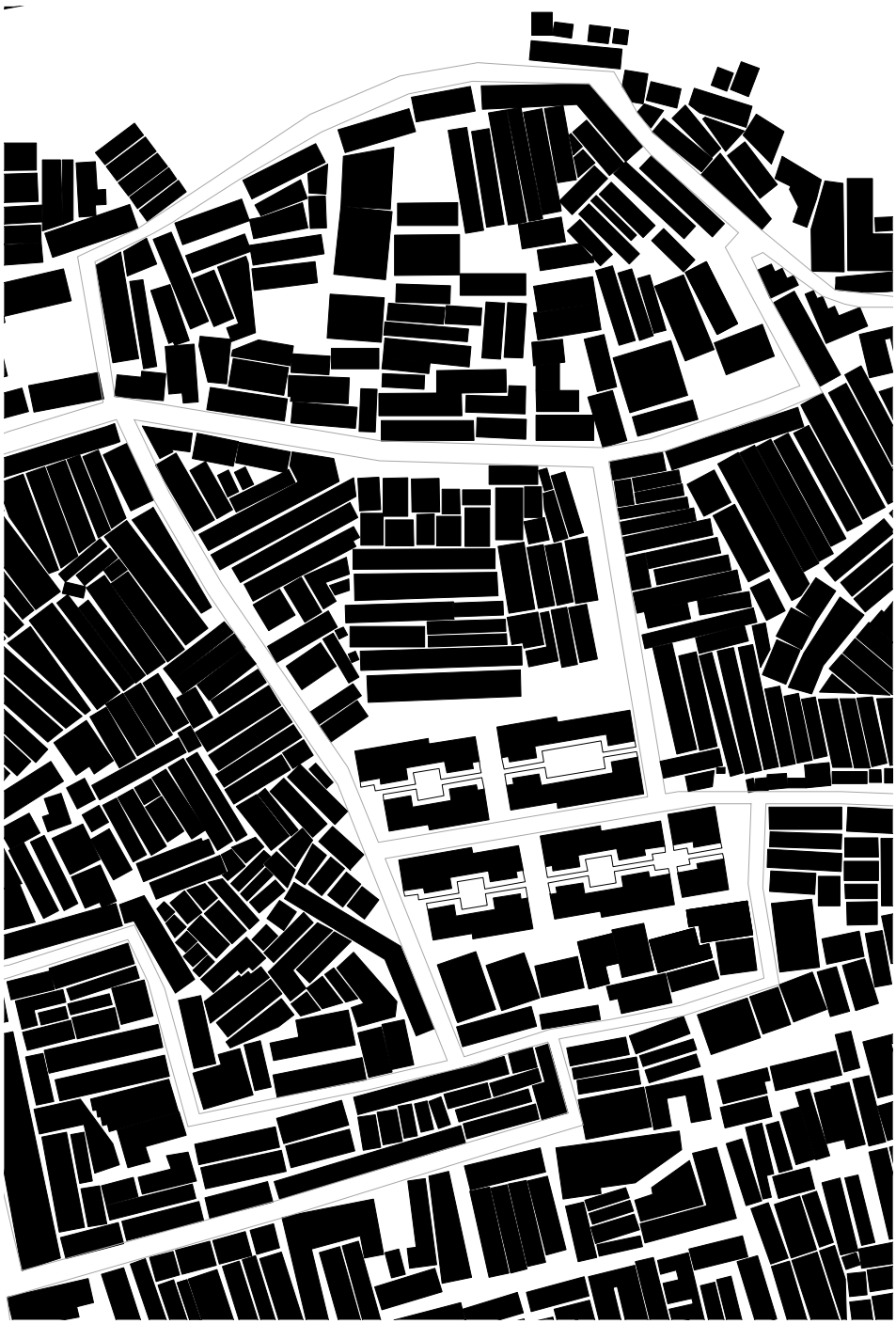
25 M

Phase 5
Second Module

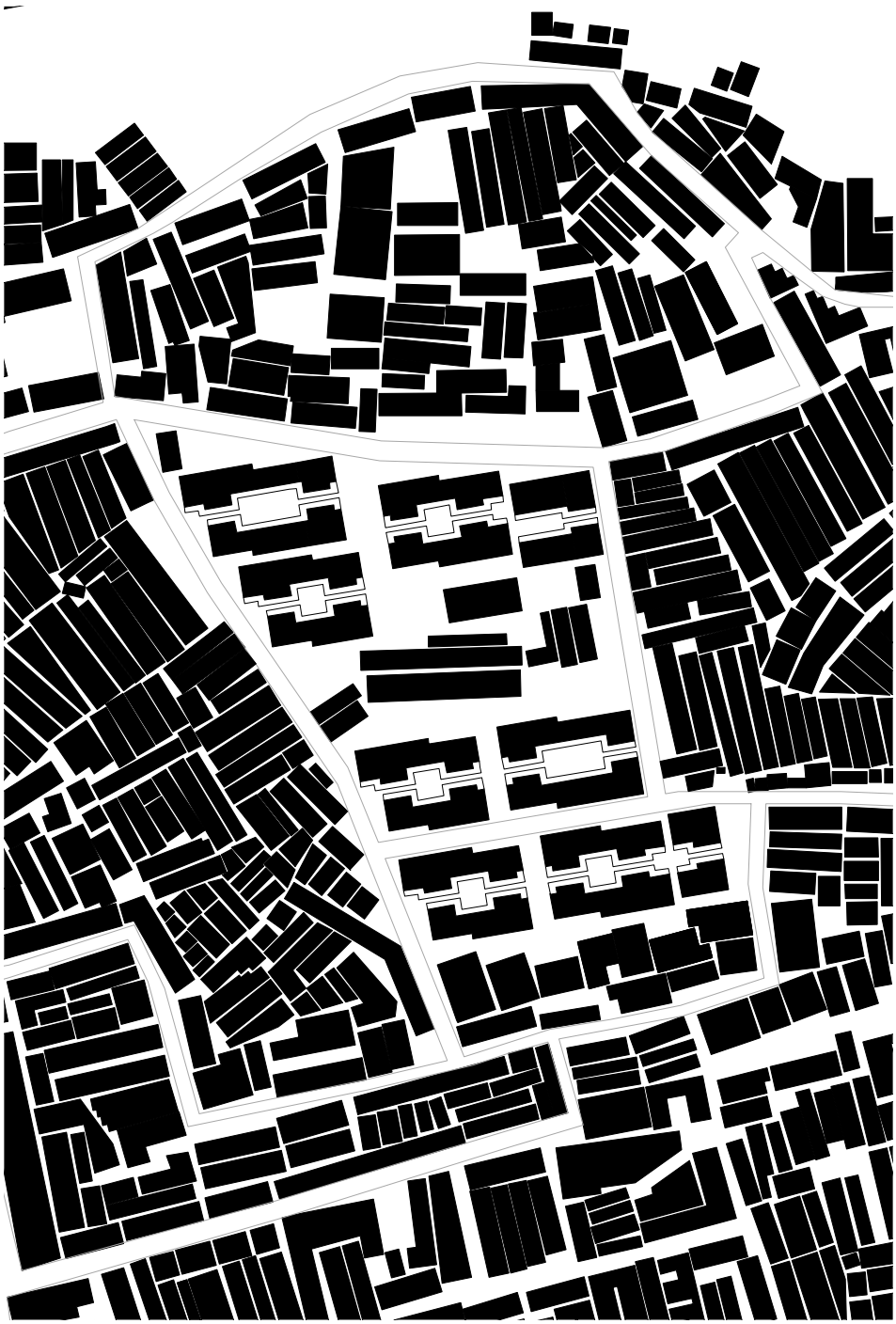


25 M

Phase 6
Further
Modules



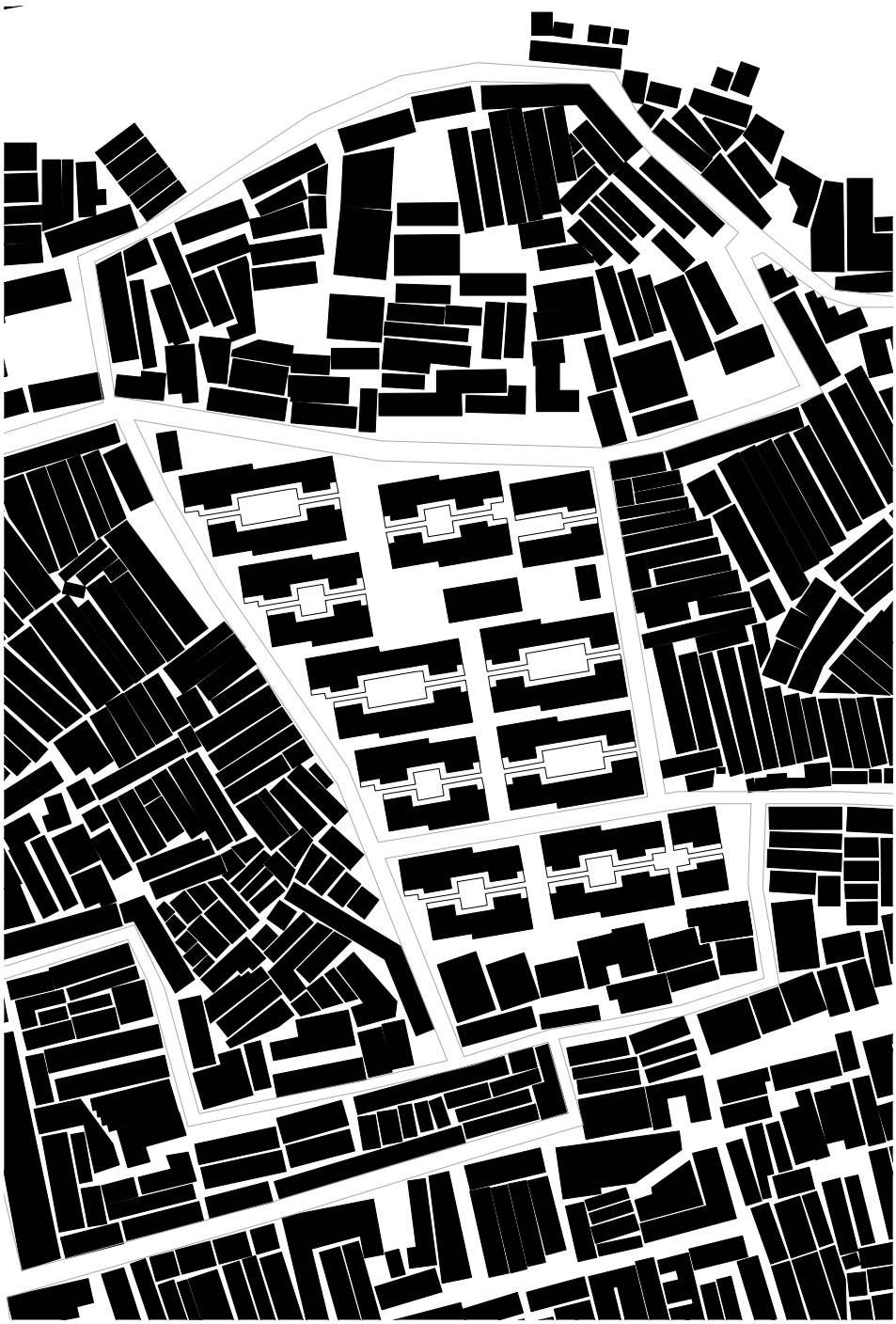
25 M



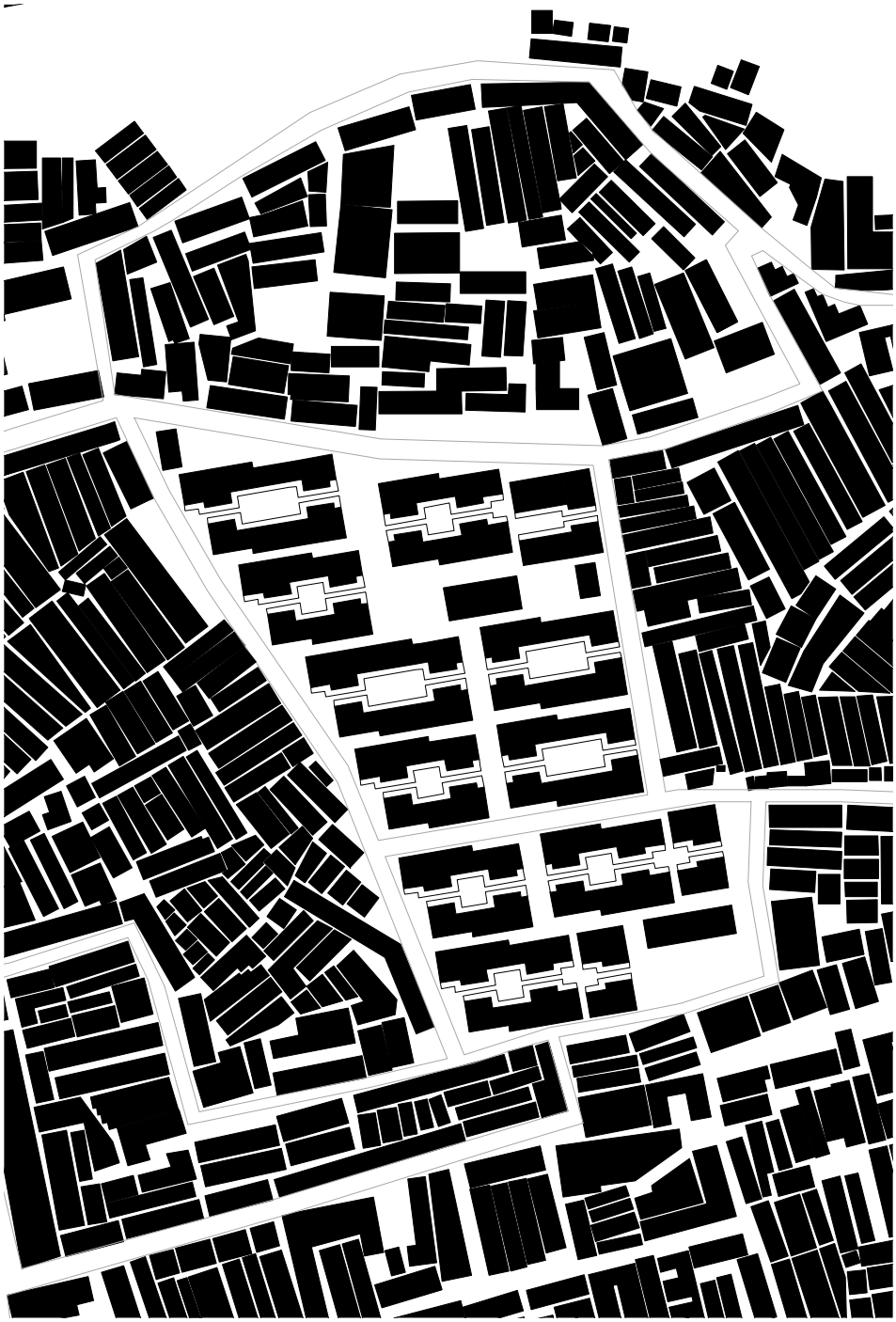
Phase 7
Further
Modules and
School

25 M

Phase 8
Further
Modules



25 M



Phase 9
Last Modules
and Communtiy
Centre/Library

25 M

SOCIAL LEVEL

1 SOCIAL CASE STUDIES

In order to address the social design assignment – offer possibilities for eduction, self-improvement and training – several case studies were studies.

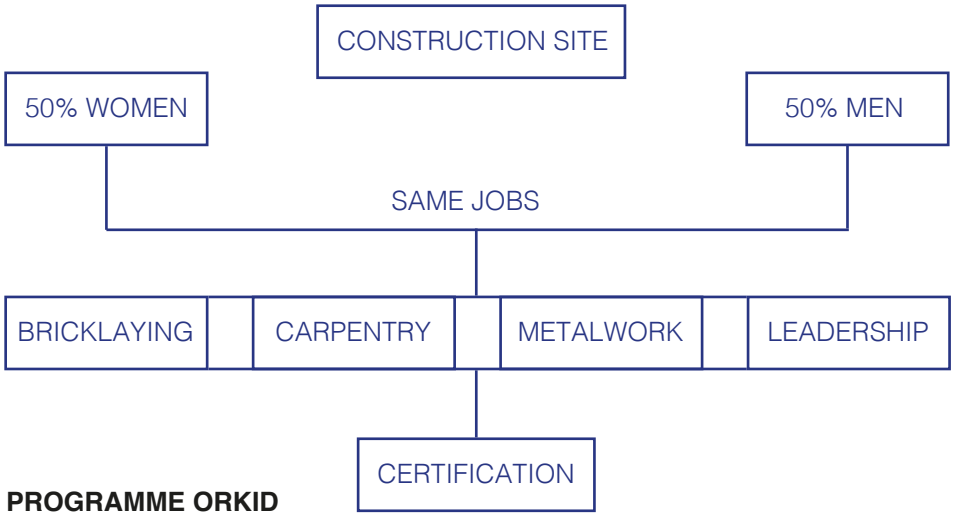
The first case study is Orkid Studio, a social enterprise based in Nairobi, Kenya, which focuses not only on the design of buildings, but on the design of design and construction processes in ways that promote equity, inclusion, and social development.

In their programme called BuildHer, the studio looks at women specifically being a disadvantaged group that lack access to employment and economic opportunities. It trains women to take on leadership roles across Orkid's worksites, developing skills and abilities that are transferable to a broad range of careers. Beyond technical training the program creates community among groups of women and fosters self-confidence.

"We feel happy when we're working with men, as we are paid equally and thus feel we are equal. Never in my life would I have imagined this. I am used to tilling soil and washing people's clothes to earn a living." Hellen, aged 31

On Orkid's construction sites at least 50% of the workforce are women that take the same jobs as men receiving same earnings. Trainings of women involve bricklaying, carpentry and metalwork. Upon finishing the training women receive certification and the possibility of a significant increase of income in their future jobs[35].

35 orkidstudio.org/projects/women/



PROGRAMME ORKID

A woman working on one of Orkid Studio's worksite in Kenya

orkidstudio.org/projects/women/

Girls in
Apnalaya's
Citizenship
program

apnalaya.org/
photo-events

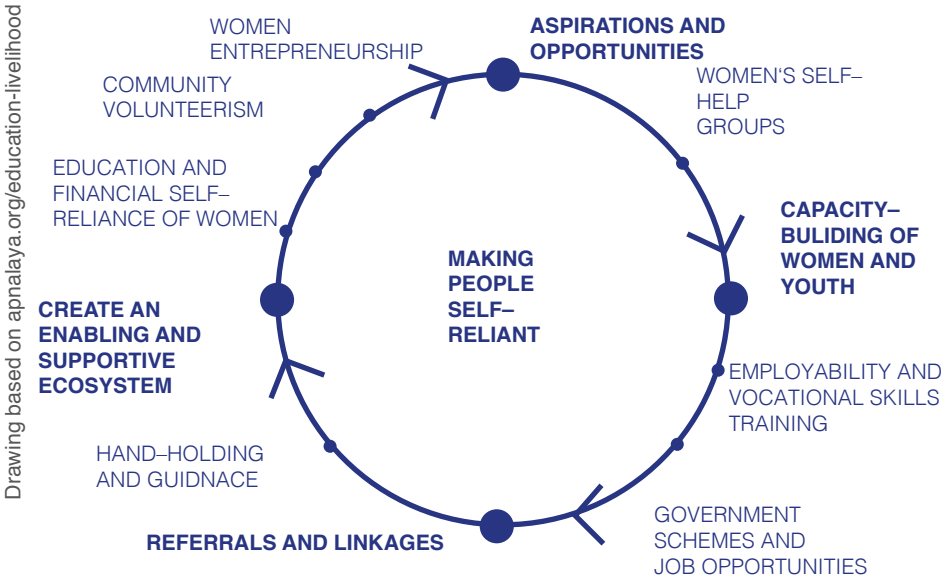
Mumbai-based NGO Apnalaya focuses on the improvement of health, livelihood and gender relation for underserved people. Extreme poverty often compels parents to pull their children from formal education and skills training and pressures adolescents to start earing early which perpetuates poor skills set, low income and inter-generational poverty. For their livelihood programme they stress the urgent need of livelihood interventions to break the inter-generationally persistence of poverty and marginalisation and focus on the holisitic development of the individual with a particular focus on women and youth.

Apnalaya's livelihood programme with youth involves career readiness programmes, that aimes to build human and social capital of youth between ages 14 – 25. This is achieved through building awareness and a supportive ecosystem and life skills, looking at aptitude and employment skills, linkages to vocational training and job placements.

The livelihood programme with women includes community child care. Building and operating day-care facilities helps women with reliable child care support in order to find gainful employment and enhance economic security. Adolescent girls are able to continue their formal education not having to take care for their younger siblings and holistic early childhood development is ensured for children.

The livelihood programme with women further includes job referrals through skill-based training. It supports employability and skill building in the areas of sewing, catering and running day care facilties. Furthermore it trains financial literacy and creates self-help groups, helps procure bank loands, improves access to government schemes and a supportive environment for start-ups to promote entrepreneurship in the form of small shops and businesses. Hereby a sustained livelihood and financial security for women is enhanced and community awareness and attitude towards women improved. [36]

36 Apnalaya, 2018



LIVELIHOOD PROGRAMME APNALAYA

2 SOCIAL INTERVENTIONS

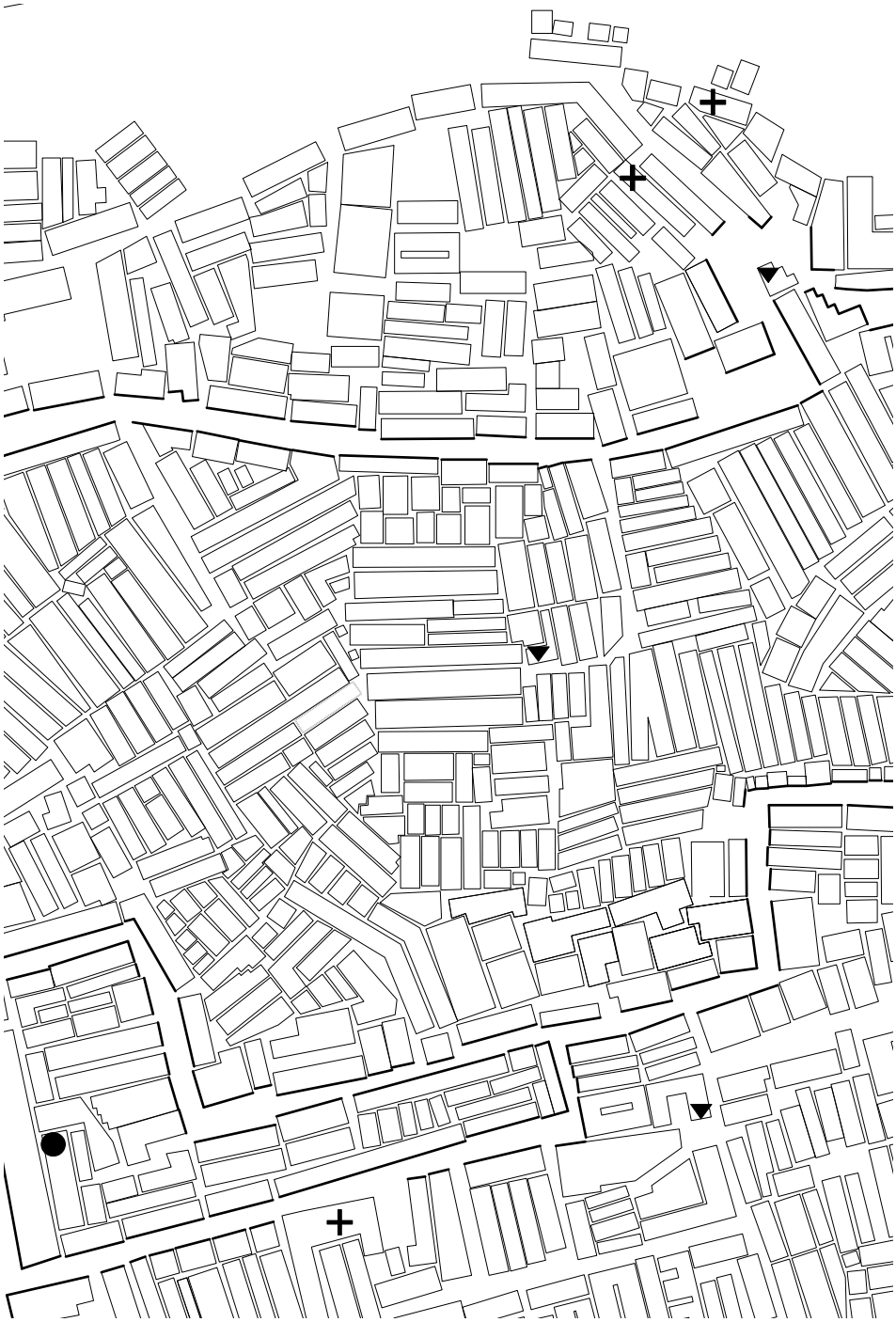
Amenities
Exisiting

▼ Temple

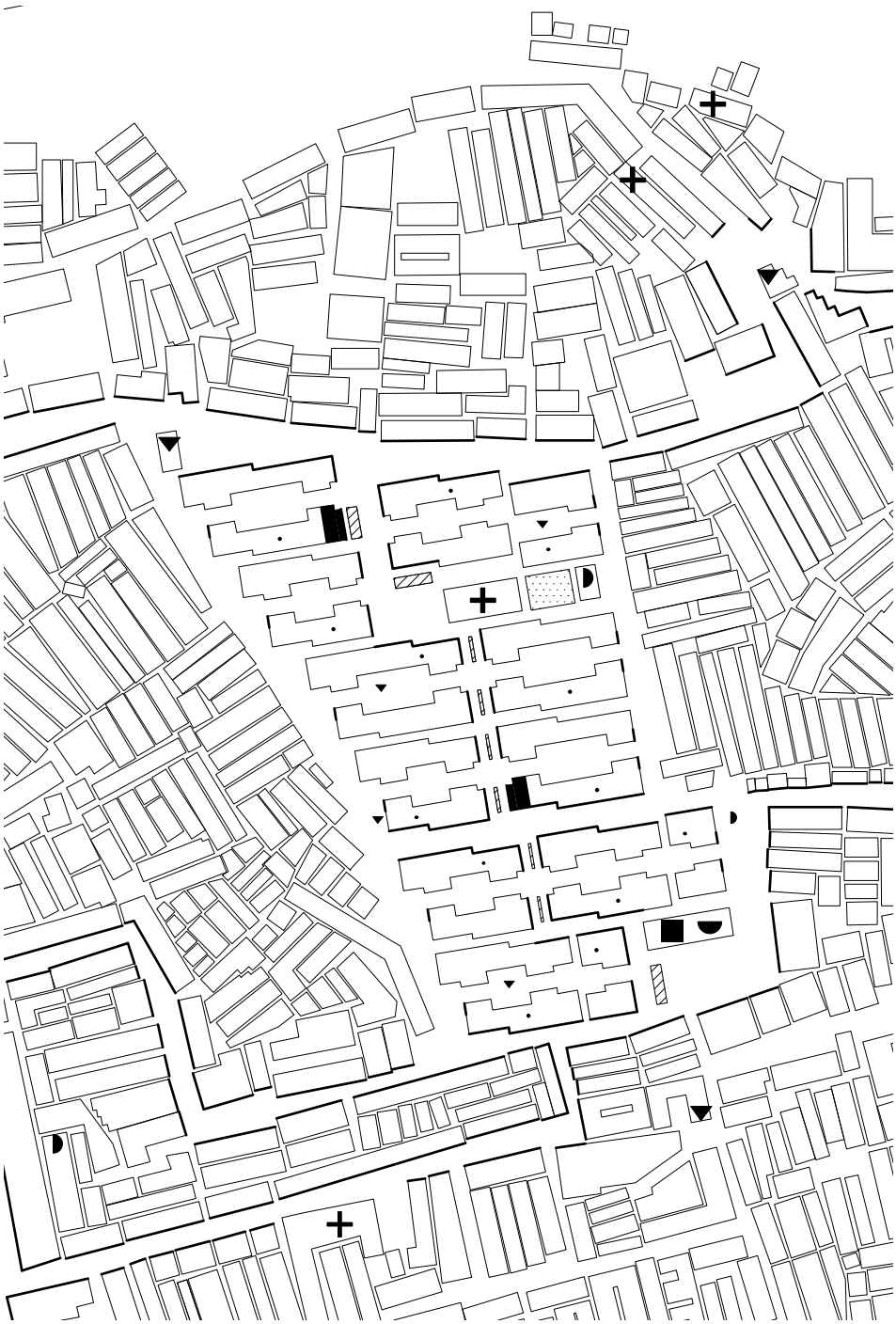
● Mosque

+ School

— Commercial
Plinth



25 M



Proposal Social Interventions

Community Centre

Library

NGO

Child Day Care Facility

Vegetable Garden

Park

Temple

Mosque

School

Commercial Plinth

25 M

OUTRO

1 REFLECTION

The relationship between research and design
ON ECONOMIC ACTIVITY IN CONTINUOUS EVOLUTION

Within the lectures of Research Methods in MSc 3, Jorge Meijia gave a lecture on heuristics. He stressed that research is never suspended and everything we do demands research. The process of research does not stop when shifting from research to design but by designing, research is being produced as well. Research and design are in constant exchange.

In my process I identified that following first research, preliminary first designs have led to more research followed by further designing, research and so on. Would the research have stopped from the moment of designing; the design would have remained superficial and not well grounded. For instance, my design in the beginning more focused on the in front space of the dwelling which after further research in informal economic activities on the site and typological research, led to an approach that focuses the attention on the inside of the dwelling by still keeping the qualities of the outside space.

Meijia further elaborated on the fact that the project should not try to proof but be able to be proven wrong. With regards to this, I tried to document my line of thought, precedents used and research done throughout the whole process in order to make the design process transparent and to be able to be questioned.

The relationship between the graduation project and the studio topic
ON ECONOMIC ACTIVITY IN AFFORDABLE HOUSING SCHEMES

The scope of the graduation studio global housing evolves around "Affordable Housing for Inclusive Development" in Mumbai, India. It seeks to find solutions for the unsustainable urbanisation currently occurring in the Global South. The case study of Mumbai is applicable to several cities in the Global South, urbanising at a fast rate with a third of all urban dwellers living in slums. We as students are asked to rethink affordable housing schemes that are being in practice today applied to the case of Nalasopara, Mumbai.

After being confronted with the reality of Nalasopara, I decided for my thesis to not only focus on affordable housing provision, but also investigate the accommodation of income generating activities within these housing schemes. In the global context, the issue of increasing urbanisation as well as maintaining and developing economic opportunities is well known, widely discussed and focus of several international policies – as the United Nations' Sustainable Development Goals, the New Urban Agenda and the 2015 Statistical Compendium on Slums in India[37].

37 United Nations, 2015; United Nations, 2016; Ministry of Housing and Urban Poverty Alleviation, 2015

In Nalasopara, domestic income generating activities are currently able to exist in the informal typology of the so called baithi chawls. These single-storey informal houses within a dense, maze-like urban layout allow dwellers to expand the dwelling's inside to a small space in front of the dwelling on the communal corridor.

Despite the already existing knowledge and approaches, the current issues are mostly inadequately managed. Profit maximizing activities by private developers extrude baithi chawls into so called hand-shake chawls. These 5-storey slab buildings standing with only a distance of 60 to 120 cm to each other leave no daylight, ventilation and possibility of domestic income generating activities for the dwellers. This results in a decrease of family income, a decrease in independency of women and no involvement of the inhabitant in the planning process.

Research is urgently needed to address current challenges which will amplify in the coming decades. My project therefore in an urban renewal scheme aims to redevelop an area of baithi chawls and chawls with a housing scheme that allows domestic income generating activities by women in a denser urban configuration.

The relationship between research method and approach and the graduation studio

ON ECONOMIC ACTIVITY IN VISUAL ETHNOGRAPHY

A strong focus of the Global Housing Studio lies in visual ethnography as a research method and approach towards the design. In "Spatialising Culture: An Engaged Anthropological Approach to Space and Place" Low writes about the anthropological approach to space and place. She depicts the study of culture and political economy in space and place as useful in revealing material and representational injustice and forms of social exclusion. In engaging with the communities, dignity and rights of all people are respected and social justice is promoted[38]. Working in a culturally, socially and politically highly different environment compared to the ones I have worked in before, visual ethnography can be of use for me to ground the research in the context as it focuses on people and their interaction in space. It entails the "exploration of people and cultures, looking at phenomena from the point of view of the subject"[39]. More specifically, observation,

38 Low, 2014

39 Lucas, 2016

interviews, photography and drawings are used to identify current sources of domestic income generation and their spatial requirements and to identify current limitations of domestic income generation related to space.

Within the research process, I began with on-site investigations. This research, however, was limited to two days on the site due time limitations in the overall graduation process. Outcomes were patterns mapped as the "Productive Intersection", that represented an intersection of small alleys in the baithi chawl area used for water access through a pump and the drying of local bread in the sun in front of the dwellings. Another pattern depicted on these investigations is the "Alley of Intimacy" that shows a small alley in the same neighbourhood where women sit in front of their dwellings socialising and being occupied with small activities and drying chili. Clearly, the outcomes of the study represent our predominant limitation – with a few exceptions – to the outside of the dwelling due to difficulties in communication with the dwellers through language barriers and the carefulness not to invade people's private domain.

In order to try and compensate these limitations, back in the Netherlands, I made use of an extensive study from 1994 on "The Use of Domestic Space for Income Generation in a Low-Income Housing Settlement" by Anandita Ghosh of the McGill University in Montreal. The study in Calcutta, India, was conducted for a period of two months in the field and on a site with similar characteristics to my site of investigation. The site of investigation is also a dense informal one-storey housing settlement, with hutments constructed with temporary building materials like mud, bamboo, iron, tiles or asbestos sheets. Some feature more permanent hutments made of brick and roofed with tile. Infrastructure is similarly low with no water supply or drainage system, no paved roads or streets, no lights or electricity. Inhabitants consist of the low-income group of dwellers mainly working in the tertiary sector, a socially close-knit group of inhabitants, where women are occupied with income generating activities in or close to their homes[40]. A difference between the 90s and today might constitute the liberalisation of the Indian economy in 1991 followed by an economic transition in the 90s from an economy dominated by industry and production to a market- and service-oriented economy[41]. However, economic activities described in Ghosh's study (e.g. embroidering, textile industry) still exist, even if shrunken and occurring mainly in dispersed forms in informal, low-income settlements[42]. Other activities have universal need and have been found on the site visit as grocery, vegetable and variety goods shops, hair cuttings and tea stalls.

40 Ghosh, 1994

41 Statista

42 Banerjee, Guha

When working with Ghosh's study, it made me realise how limited my previous observations had been. Superficiality in visual ethnography is condemned by several researchers; the theorist Foster criticises artists that are working in the field for only a day or a week and making site-specific art that is only grounded on this short interaction[43]. Desai

43 Foster, 1999

discusses this problem as "pseudo-ethnography"[44]. Through the addition of Ghosh's study, I was able to investigate the dwellings more thoroughly and recognised that a lot of activities are actually invisible from the outside as they take place in the house. By carefully re-tracing Ghosh's drawings, I developed a method that would allow me to carefully study her observations, avoid overlooking small details and re-interpreting the drawing. Not having been on the site, this method is clearly limited. However, in this way, I gained valuable insights in addition to my own observations that I was able to incorporate into my design.

44 Desai, 2002

The relationship between the graduation project and the wider social, professional and scientific framework – transferability of the project results

ON ECONOMIC ACTIVITY IN THE GLOBAL CONTEXT

By 2050, 68% of the world population is projected to live in urban areas. With currently 55% of the population residing in urban areas, this future scenario implies rapid urbanisation. India – with Nigeria and China – is projected to account for more than a third of the world's urban population. A serious global housing shortage is and will be a major challenge of the twenty-first century[45].

45 United Nations, 2018

The United Nations stress in Goal 8 of the Sustainable Development Goals the need for decent work and economic growth as crucial in achieving sustainable development. All countries aim to implement these goals[46]. By investigating the case of Nalasopara and identifying potential solutions which take into account issues of density, affordability, economic development and gender, the aim is to generate insights which lead to more humane housing solutions that could be applied to other locations. Whereas the design developed in this study is context specific to the domestic informal work sector in Mumbai, India, the line of investigation as well as the strong focus of incorporating possibilities for economic activity in housing schemes could be transferred to other contexts in order to serve the high need of addressing challenges of the fast rate of urbanisation, especially in the Global South.

46 United Nations, 2015

Ethical issues and dilemmas

ON ECONOMIC ACTIVITY IN THE INFORMAL LOW-INCOME SECTOR

Looking at economic activity in the informal low-income sector, especially in a culturally, socially and politically to me unknown context, has been a challenging task. 79% of the informal sector earns less than 20R (less than 0.5$) per day[47], being the most vulnerable group in the economy. Globalisation even further increased the size of

47 NCEUS, 2007

the informal labour market from 83% to 93% of the total labour force. Working conditions within the informal sector are characterised by low earnings and high risk of poverty with women being more likely segregated into the lower segments of the informal labour market than men. Access to education is limited[48].

48 Basu et al, 2009

Within the four different types of informal employment relations (street vendors, domestic workers, construction workers and home-based workers), I focus on the group of home-based workers in my study – mainly women being involved in attaching fall to sarees, beading, tailoring, hemming, embroidering, attaching buttons, etc. – have the highest overall quality of life compared to the other three groups. Although, only 16% of daily tasks being perceived as unpleasant and a flexible schedule is highly appreciated[49], the work solely provides low earnings and repetitive tasks in poor conditions leading to physical and mental illness[50]. With my design I try to answer to their spatial needs in dedicating the main area of the dwelling to these productive zones, providing more space, social interactions and a communal atmosphere to support and improve these activities. However, this is where architecture ends. For me it feels very limiting proposing a building as an answer to such complex issues. As a result, I additionally propose social interventions that would offer possibilities for education, self-improvement and training. These investigations however had to remain early stage, as the focus of the study was on an architectural level. A change in policies and governmental support would be needed in order to tackle the issue of economic activity and economic mobility in the long term.

49 Basu et al, 2009

50 Tipple, 2006

2 REFERENCES

Apnalaya (2018). Annual Report 2017 –2018. Apnalaya, Mumbai.

Basu, Ranjeeta and Thomas, Marie (2009). Exploring women's daily lives and participation in the informal labour market in Mumbai, India. Gender & Development Vol. 17 , Iss. 2.

Bredenoord, Jan, van Lindert, Paul and Smets, Peer (2014). Affordable Housing in the Urban Global South: Seeking Sustainable Solutions. Routledge, Abingdon.

CECODHAS Housing Europe and ICA Housing (2012). Profiles of a Movement: Co-operative Housing around the World.

Census (2011). Census of India 2011: main workers, marginal workers, non-workers and those marginal workers, non-workers seeking/ available for work classified by age and sex data sheet. New Delhi: Census of India.

Chalana, Manish (2010). Slumdogs vs. Millionaires. Journal of Architectural Education, 63:2, 25-37

Correa, Charles (1989). The New Landscape. Butterworth, London.

Correa, Charles (1999). Housing and Urbanisation. UDRI, Bombay.

Correa, Charles (2012). A Place in the Shade: The New Landscape and Other Essays. Hatje Cantz, Ostfildern.

Das, PK (2011). Affordable Housing for Mumbai: Presentation to the Chief Minister of Maharashtra. Mumbai.

Das, PK, Singh, Gurbir, Dewan, Ritu and Agarwal, Kabir (2018). Chasing the Affordable Dream: A Plan to House Mumbai's Millions. Bombaykala, Mumbai.

Foster, Hal (1999). The return of the real. The MIT Press, Cambridge.

Ghosh, Anindita (1994). The Use of domestic Space for Income Generation in a Low-Income Housing Settlement. McGill University, Montreal.

Hill, Elizabeth (2001). Women in the Indian Informal Economy.

Work, Employment and Society Vol. 15, No. 3, Sydney.

Lucas, Ray (2016). Research Methods for Architecture. Laurence King, London.

Ministry of Housing and Urban Poverty Alleviation (2015). Slums in India: A Statistical Compendium 2015. Government of India, New Delhi.

Ministry of Statistics and Programme Implementation (2012). Informal Sector and Conditions of Employment in India. Government of India, New Delhi.

NCEUS (2007). Report on Conditions of Work and Promotion of Livelihoods in the Unorganised Sector. Government of India, New Delhi.

Rybczynski, Witold, Bhatt, Vikram, Alghamdi, Ali, Niskier, Marcia, Pathare, Bhushan, Pirani, Amirali, Puri, Rajinder, Raje, Nitin, Reid, Patrick (1984). How the Other Half Builds: Space. Centre for Minimum Cost Housing, McGill University, Montreal.

Saunders, Dough (1999). Arrival City: How the Largest Migration in History is Reshaping Our World. Windmill.

Statista. India: Distribution of the workforce across economic sectors from 2007 to 2017. 2018. https://www.statista.com/ statistics/271320/ distribution-of-the- workforce-across-economic-sectors-in-india/

Tipple, Graham (2006). Employment and work conditions in home-based enterprises in four developing countries: do they constitute 'decent work'? Work, Employment and Society, 20(1), 167–179.

Turner, John F. C. (2009). Housing by People: Towards Autonomy in Building Environments. Marion Boyars, London.

UN-Habitat (2010). State of the World's Cities 2010 2011: Bridging the Urban Divide. Earthscan, London

United Nations (2014). World Urbanisation Prospects. United Nations, New York.

United Nations (2015). Transforming our world: The 2030 Agenda for Sustainable Development. United Nations, New York.

United Nations (2016). New Urban Agenda. Habitat III, Quito.

United Nations (2018). World Urbanisation Prospects. United Nations, New York.

Urban Design Research Institute and Praja Foundation (2014). Planning for Mumbai: the Development Plan for Greater Mumbai 2014–2034. UDRI & Praja, Mumbai.

Van Gameren, Dick, Van den Heuvel, Dirk, Van Andel, Frederique, Klijn, Olv, Kraaij, Annenies, Mooij, Harald and Van der Putt, Pierijn (2013). Building Together: The Architecture of Collective Private Commissions. DASH, 8. Nai 010 Publishers, Rotterdam.

Van Gameren, Dick, Van Andel, Frederique and Van der Putt, Pierijn (2015). Global Housing: Affordable Dwellings for Growing Cities. DASH, 12/13. Nai 010 Publishers, Rotterdam.

Van Gameren, Dick, Varma, Rohan. Living Ideals: Designs for Housing by Charles Correa.