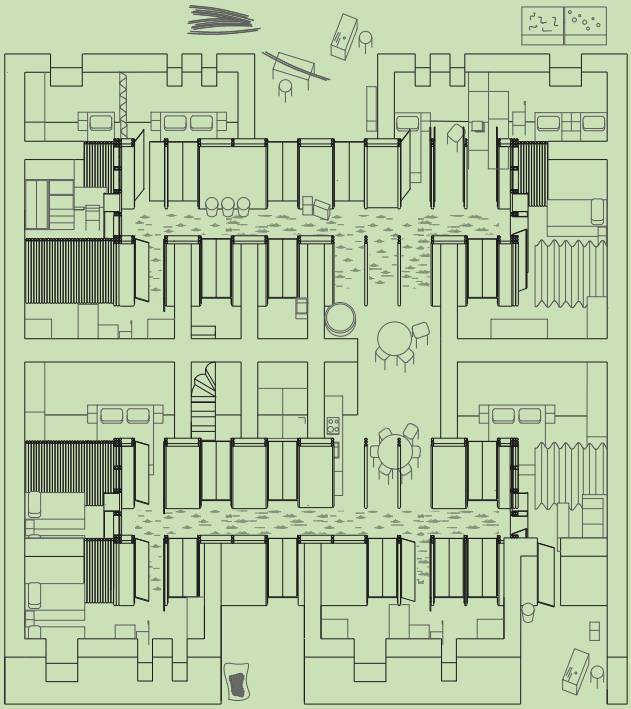

.A City web.

Federica Fogazzi
Research and Design Booklet
Global Housing Graduation Studio
Tu Delft

.A City Web.

Building a groundscraper

Federica Fogazzi
Research and Design Booklet
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Contents


TOYOTA

01.Research

.Introduction.

The Global Housing Graduation Studio focuses within the urban context of Addis Ababa, capital of Ethiopia, in order to tackle the future developments of this booming city.

Urbanisation is an issue of growing concern in Ethiopia, the city of Addis Ababa is expanding according to an average annual growth of 3,8% with rapid and radical changes, mainly due to rural-urban migration as people seek new opportunities in the city to escape rural poverty.

Ethiopia has never experienced urbanism in this scale and in this complexity; through the last two decades of rapid growth, its housing shortage increased dramatically. Fist and foremost, nowadays Ethiopia faces an enormous challenge to deliver accommodation for the urban poor.

Trying to understand the particular cultural, social, environmental, political and economic conditions of this developing country and more in gen-

eral of all the “Global South”, the aim of this studio is to formulate a critical position upon the role of the architect and architectural forms in these changing and clashing conditions, completely different from our own.

Addis Ababa. Ras Mekonen street

Addis Ababa. Deiach Wube sefer

.Context.

Addis Ababa is quite a young city, just founded in 1886 by Menelik II .

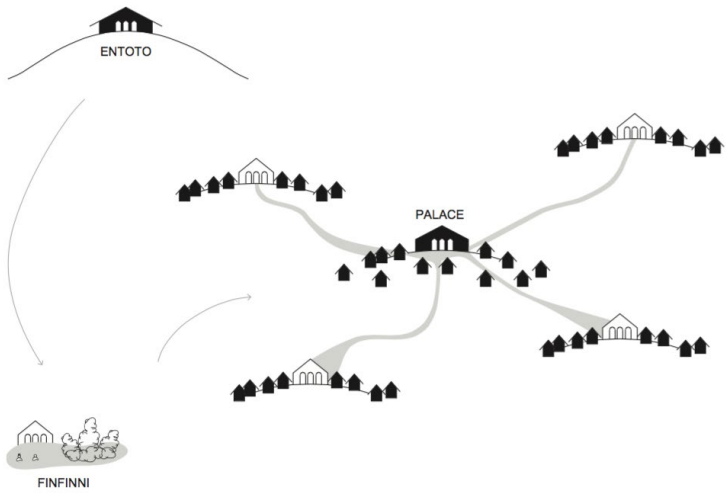
From the moment of its foundation, the capital layout expressed the traditional system of hierarchy of the ruling class and its society. As in the previous capitals, the principal men of state and of the nobility began to settle around the Ghebbi. Their palaces, usually built on top of the hills, were surrounded by several huts thus forming an enclosure, or compound, whose size varied according to the importance and the power of the dignitary living in. These buildings were far from only being dwellings, as they all had a significant political importance. In the capital, administrative and judicial functions were carried out from private residences.
These leading people, after claming the most favourable and dominate locations for their residences, distributed the remaining portion of land among their vassals. The pattern of settlements and land use that were established at that time became en-

tranced because, due to the realities of that time, social hierarchy could not be marked by physical distance. Due to the underdevelped economy of that time, members of the upper and lower classes were too interdependent to live in separate quarters. Food, clothes, shelters, everything was made by the inhabitants themselves; thus, servants and serve had to live side by side.

At the moment of its foundation, and in the years that followed, the city lacked very basic infrastructure. There were no roads, or at least not in the modern way we intend them. Unoccupied land was left in between the compounds as a buffer zone to minimize conflict that might have arisen between the armies of the nobility, and it usually performed as a path. In general, these paths were also used as connections between the main gathering places: the palaces, the Gebbi, the Market and the Church.

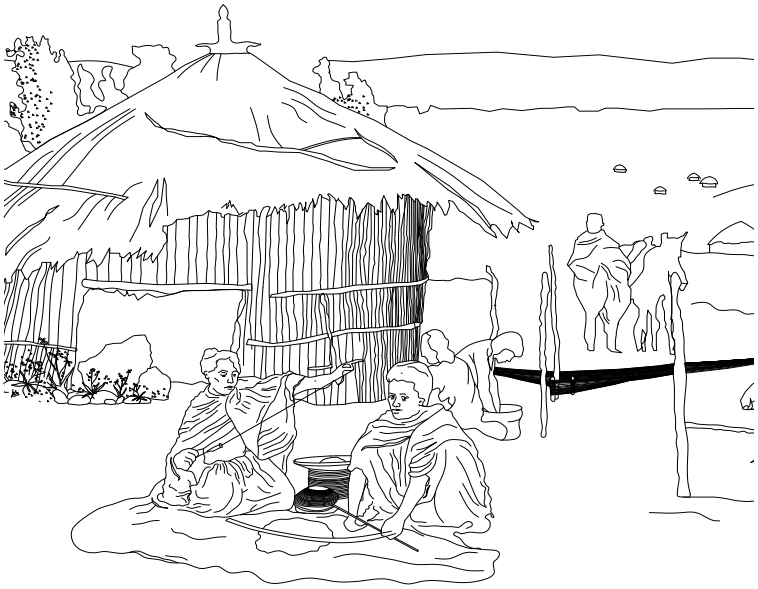
The Emperor quarter was surrounded by the camps of his military leaders, called “safar”. The city was composed of the leaders’ ”safar”, and also dotted with other “safar” designated after an ethnic group who occupied an area. The “sefers” were scattered over a wide, rugged territory, they were fundamental territorial unit: self-defined and autonomous.These separated neighbourhoods still today mark the character of the city. They became the motor of the development of the city.
First, the “sefer” were separated by natural buffer zones as rivers, slopes or streams; during the years, thanks to the speed of urban growth, these boundaries blurred more and more. Despite this, those first settlement areas remained and preserved their social communities, with people and families feeling the belongings to that specific area and living in a very close economic and social relationship to each other.
Even today, these undifferentiated neighborhoods in which shack and villa, rich and poor, foreigners and

locals, and people of various refilling and ethnic affiliation live side by side. It is still a city with a strongly clear social proximity between various social group. It maintains a high sense of neighbourhood based community solidarity that cuts across class and ethnic divisions. Hence, even today, it is a place of considerably low levels of ethnic tensions.



Addis Ababa. Spacial structure diagram of the first settlements

Addis Ababa. Several compunds overlooking the Ghebbi



Addis Ababa. Tukul

Case study: Alfred Ilg's house

This house was designed by the Swiss engineer Alfred Ilg and served as a residence for him and his family until 1907. It was constructed in the 1890s in a strategic location along the first street of Addis Ababa, halfway between the Palace and the Arada. Originally, the house was surrounded by large trees and by several servant quarter tukuls.

Alfred Ilg's House is one of the few historical residences that can be still found in Addis Ababa. Although it has re-worked many times and is now in a state of disrepair, it can be studied as an example of the eclectic architectural style that dominated the palaces in the first period of the Ethiopian Empire. Specifically, it is an interesting case study to uderstand how the first residenceshad been derived from the evolution of the traditional typologies. Initially, the house had a rectangular plan while the veranda had an oval one.

The house was constructed on a balsat stone strip foundation. The walls had a total depth of 70 cm and were

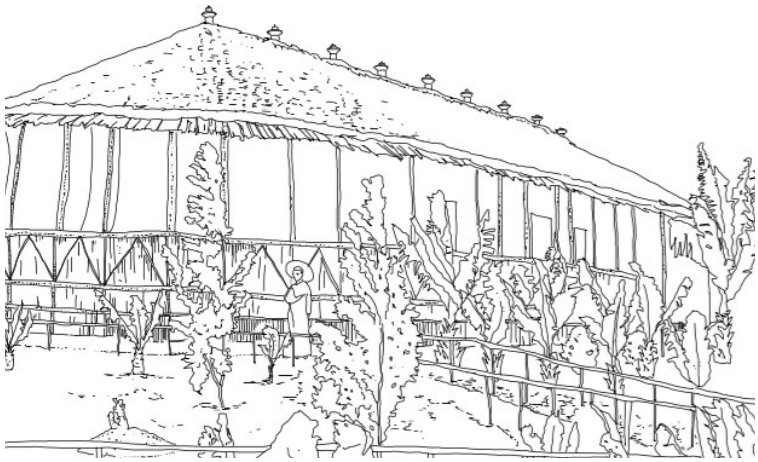
made of wooden frames . Inside, they were plastered with mud and lime, while outside they were cladded with sand stone joined in mud mortar and coated with lime. The conical straw roof was covered with thatched and set on timber posts.

By 1935, the plan had already evolved from a rectangular into an oval shape including part of the veranda on both sides into the house. The house had grown in size and two rectangular blocks had been added to the original building. This shape corresponds to the ones that can be found today.

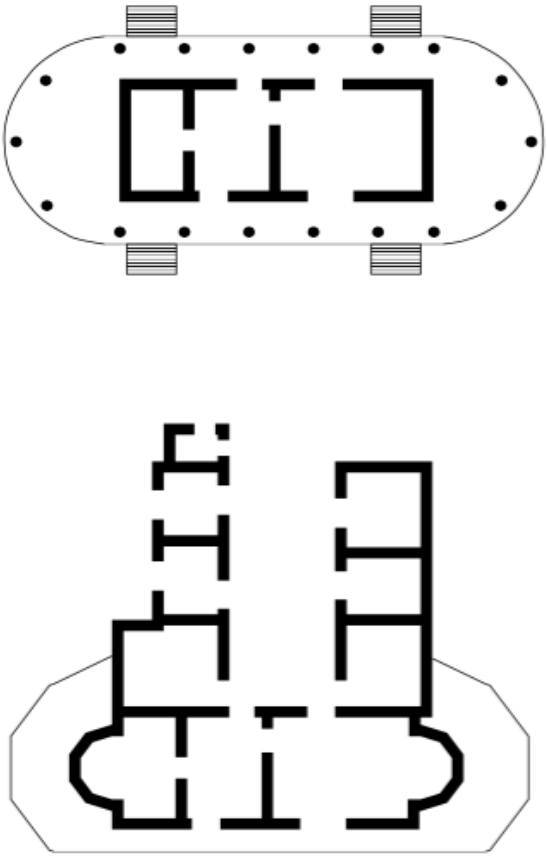
This building is unique in bringing together two extremely different cultures in one setting. From the outside, the house shows a strong Ethiopian Identity. (Fig x)

The oval form, the thatched roof, the reed ceiling and hand rails, the masonry wall with traditional mud mortar joint and the lime plastering all are traditional Ethiopian features. On the contrary, the interior of the house is characterized by a strong European taste.

Most probably, European people like Alfred Ilg tried to recreate a European atmosphere inside their houses, as both the use of wallpaper and the furniture suggest.



Addis Ababa. Alfred Ilg's house exterior view



Addis Ababa. Alfred Ilg's house plan in the1890s and in 1935

.An uncontrolled urban development.

As Ethiopia was the only African country that was not colonised, Addis Ababa was able to keep the indigenous constellation-like layout on which was founded.
Indeed, despite the Italian occupation, the grand Italian vision of total order never became reality because of the time it took for the definitive master plan to be approved in combination with the relatively short period of occupation (1936-1940). By the time the fourth plan finally come into being in 1939, Ethiopians as well as Italians had been building whatever they needed instead of respecting the prohibition imposed by the Italian governments. They were living in a disorganised, tangle of shacks and tukul toward the centre of town.
There were projects however that did materialise under Italian supervision. The roads built by the Italians have endured. Hotels were enlarged, the Casa del Fascia was established in a pre-existing building at the top of the hill and an imposing City Hall was designed by Plinio Marconi.

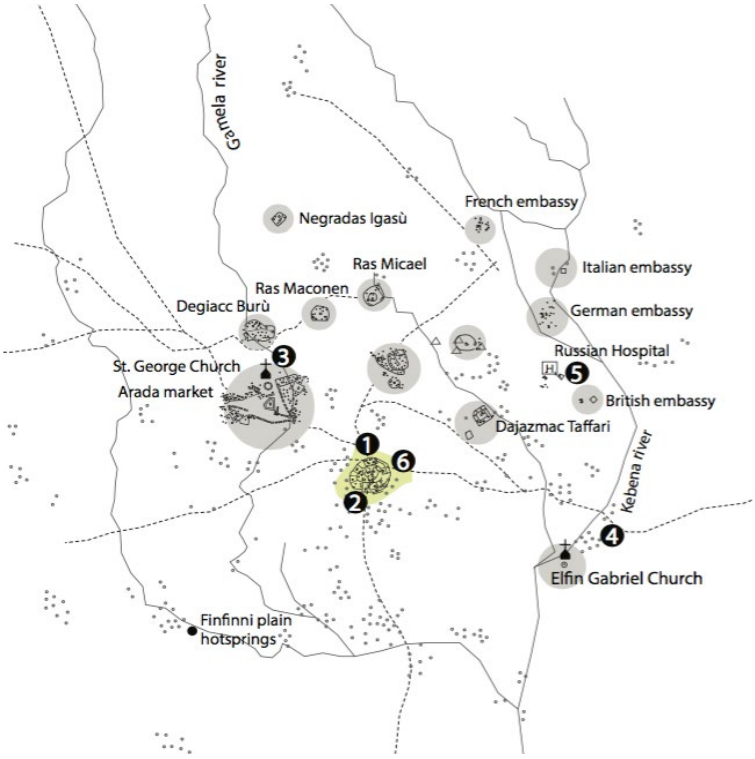
Also the Merkato area, an important site as it embraced whites and natives, is one of the most remarkable remains.

In general, Addis Ababa was characterized by both its former structure and the superimposed colonial plan. Moreover, in the following years both the two flowing British master plans and French ones did not have a major impact on the layout of Addis Ababa due to a lack of formal endorsement by the government. Indedd, the constellation-like layout and this relatively uncontrolled urban situation allowed for the arrival of numerous people, who settled in between the compounds, in rural typologies.

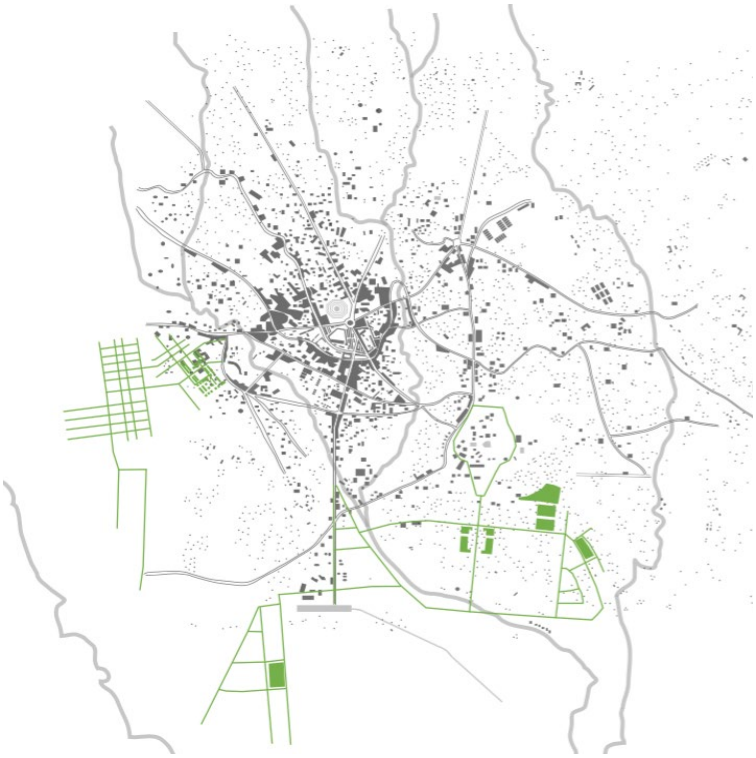
During the Derg Regime several changes occurred, especially in the organization of the territory. In 1975, the urban and rural land was nationalized, as a result of the new socialist approach of the Derg.
They declared several Proclamation Acts in order to resettle the existing land policies in a clear and equal division between the dwellers.
The Revolutionary regime decided to introduce one of the most radical land reforms ever attempted in Africa in order to reordered social and economic relationships in Ethiopia.
With the Proclamation Act of 1975 the Derg nationalized all land of the country with different consequences both in rural and urban territory. The goal was an equal redistribution of the soil, in order to rebalance the differences between riches and poor, following a socialist model, and so to arrange an house for everyone.
The most important part of this reform was related to the housing sector, especially to the fact that the Derg restricted to a single one the number of residential units that a household could own, without any distinction between poor and rich. The ownership of extra houses was declared illegal and confiscation occurred. All the extra houses owned by individuals were consequently nationalized and transferred to governmental author-

ities who had the responsibility for renting them to the ones in need. All rents were reduced, reflecting the official ideology of social justice and socialism.

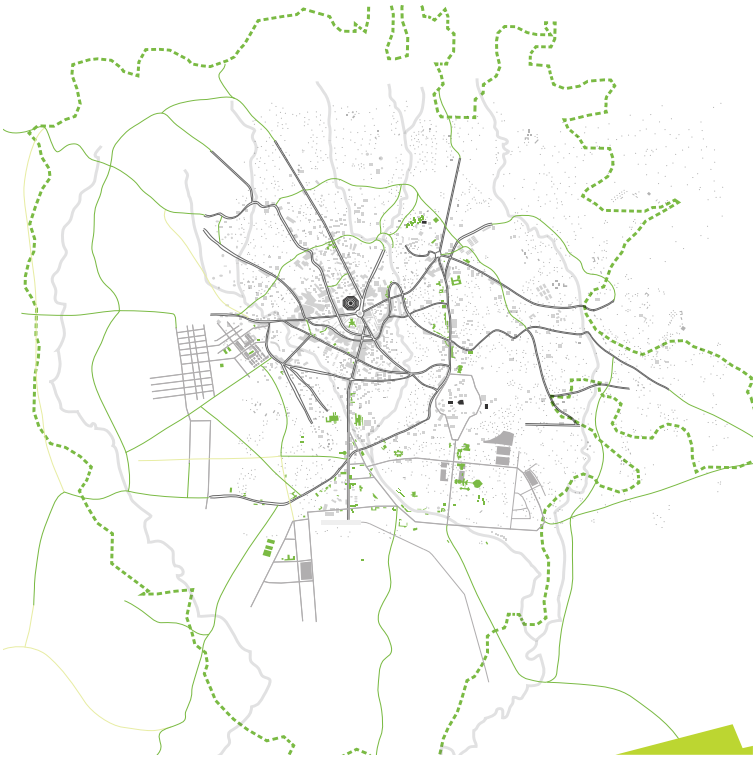
However, even if the Derg reforms mainly worked on the organization and the development of the housing sector, it still could not solve the basic problems like insufficient housing capacity, poor sanitation and shortages of basic infrastructure. The city was still growing without any proper plan intervention.



Addis Ababa. 1890s.

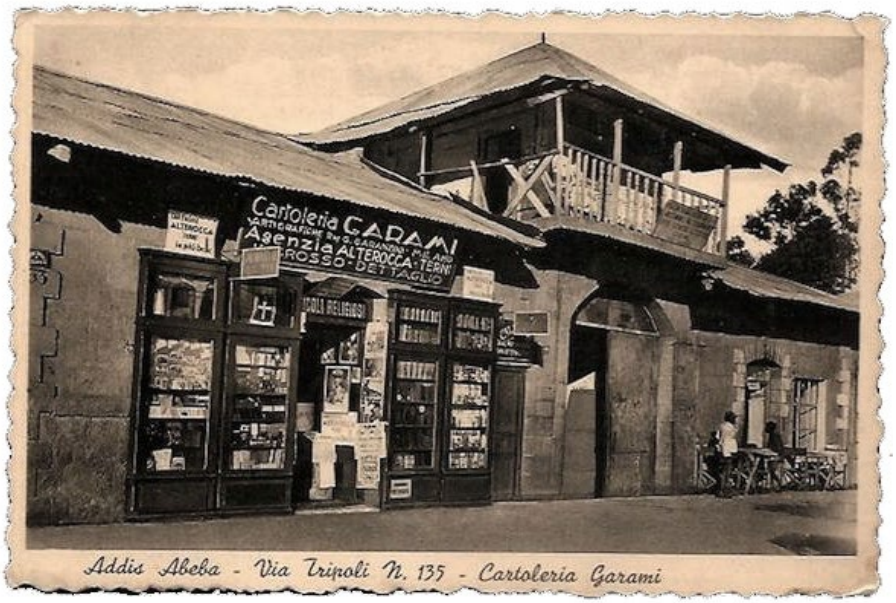


Addis Ababa. 1940.



Addis Ababa. 1975.

Addis Ababa. 1940.



Addis Ababa. 1940. Tripoli road.

Addis Ababa. 1940. Indigenous quarter

Addis Ababa. 1940. Ghebbi

Case study: Casa Popolare, 1940

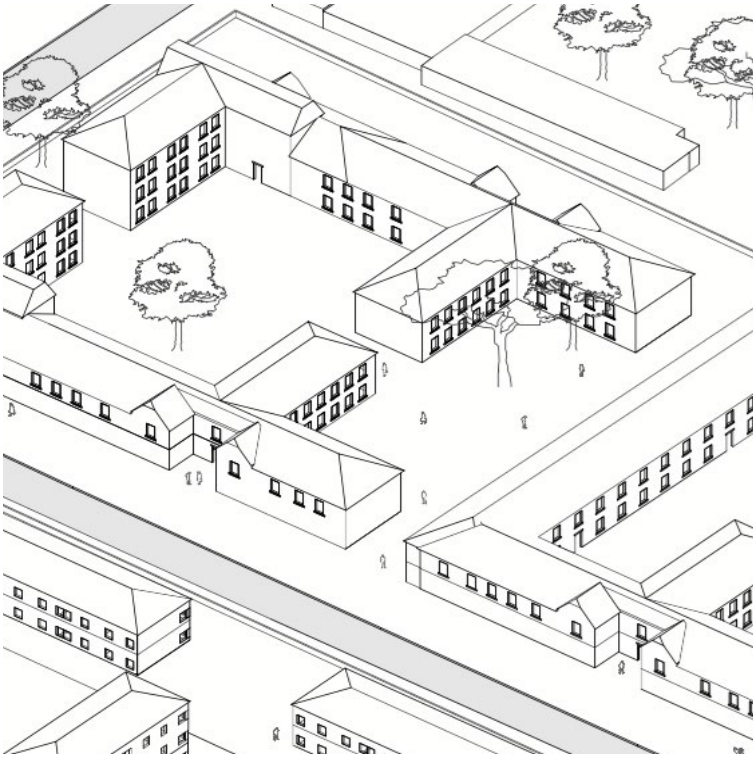
While thousands of Ethiopians were being evicted and relocated to the west, large complexes for the Italian workers arose south-east of the Ghebbì. Initially, right after the war between Italy and Ethiopia, these worker's dwellings were the most needed. The large scale projects planned in Ethiopia, like the road construction, required a large amount of manual labourers.

The first few years the amount of Italian workers in Ethiopia was estimated to be around sixty- thousand people. Later on however, this number declined to around twelve thousand. While the Italian officials and high-ranking members were placed in the Kazanchis, the Italian workers were stationed at the Casa Popolare. Because of the decline in Italian labourers, the initial mainly Italian working staff was eventually heavily assisted by local manual labourers.

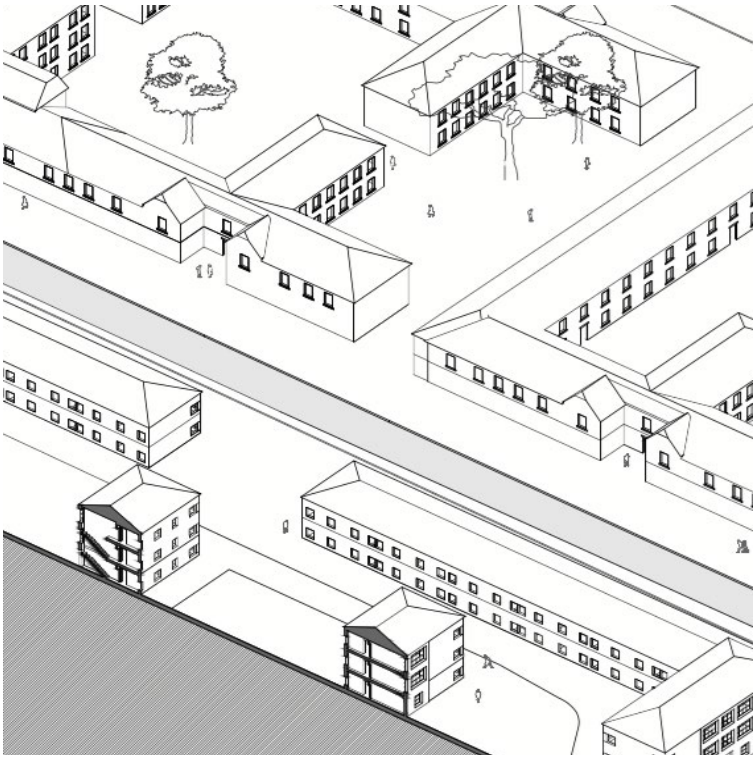
The Casa Popolare complex consists of two complexes the size of the ur-

ban grid and two small complexes on the eastern side of that. Both complexes can be explained as courtyard buildings, using two- and three storey buildings to enclose these courtyards. The courtyards are then divided by three-storey apartment buildings. A small wall enclosed the complex, creating some private area in front of the complex, between the street and the houses. The smaller complexes to the east seem to be a mere beginning of the same complexes to their respective west, which haven't been completed.
The southern larger complex seems to follow the same layout as the northern complex, but is disrupted with a wing that connects the northern and southern part of the building, in effect completely sealing of a smaller part of the courtyard. The way in which this complex encloses different parts of the inner courtyard is also slightly different compared to the northern complex. While in the northern building three volumes of three storey height are placed in the middle of the courtyard, in the southern complex "half" two storey volumes are placed adjacent to the southern and northern wings.
In time, the area seems to have changed only slightly. In the northern entrance of the northern complex some small buildings arose. Also the wall was heightened, probably by materials such as wooden planks and corrugated metal sheets.

The Casa Popolare would be an alien figure in Addis Ababa for a long time after the Italian Occupation. Indeed, it was, the tallest building in its area. For a long time after the Italian occupation, a large part of the houses were still built with wood and mud floors. This rendered multi-storey buildings impossible. In time, the thatched wooden roofs were replaced by more durable sheets of corrugated steel, but the urban layout of these sprawling settlements remained chaotic, and the materials used not durable.



Addis Ababa. Kirkos sub-city. 1940. Casa popolare



Addis Ababa. Kirkos sub-city. 1940. Casa poplare. Section

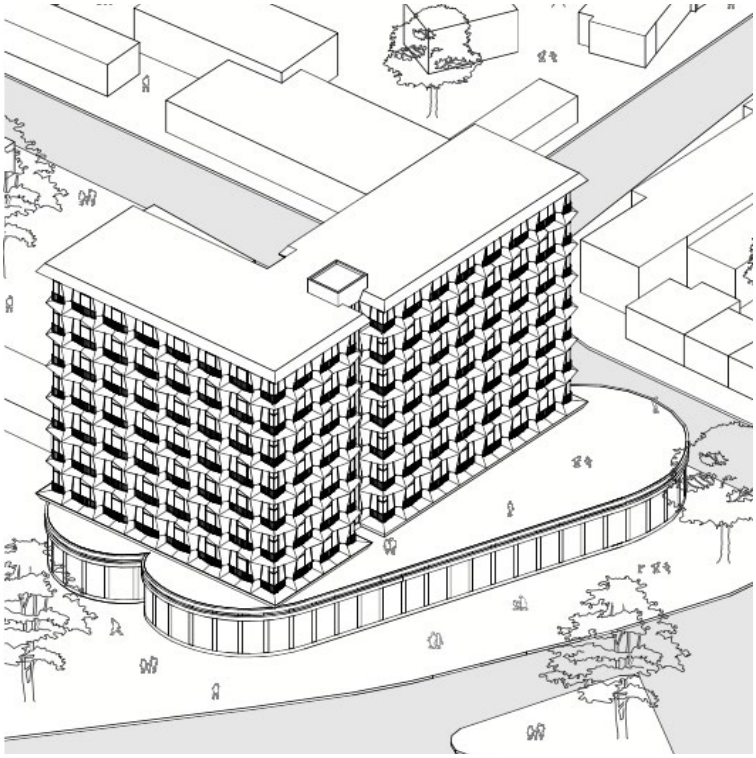
Case study: Bedilu Building, 1960

Built on the corner the main road from Mex- ico Square towards the National Theatre the Bedilu Building shows one of the most eye-catching façades of the modern period in Addis. The load-bearing grid of smoothly executed concrete shapes is formed in such a way that the edges of the large glass win- dow infill which are framed with fine brass profiles are slightly angled, thus resulting in a subtle octagonal outline. A further highlight are the glass corners, which give the whole building an elegant touch hardly found in the city elsewhere.
The two volumes are arranged in an L-shape and a beautifully executed spi- ral staircase connects the two parts. The facade of the ground floor, which accom- modates commercial functions, swings in a light curve independent of the shape of the upper floors. The upper floors originally housed apartments.

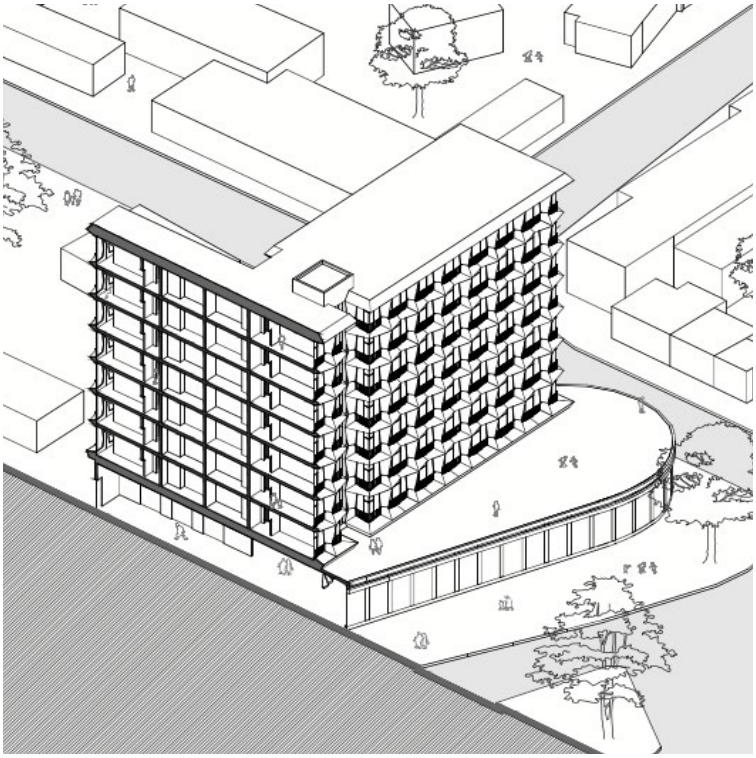
The surrounding buildings were constructed from wood and mud, while the alien modern building towered

high above the ur- ban landscape.

Bedilu Building has a L-shape floor plan, with four apartments. Two apartments are mirrored which creates four different apartments. The apartments are accessible with the staircase and the corridor. The floor plans of each apartment are still conventional. One enters the apartment through the front door which leads to a hall. The hall is connected with every other room in the dwelling, such as the bathroom, the living room, and the bedrooms.



Addis Ababa. Kirkos sub-city. 1960. Bedilu Building



Addis Ababa. Kirkos sub-city. 1960. Bedilu Building. Section

Case study: Kirkos upgrading, 1975.

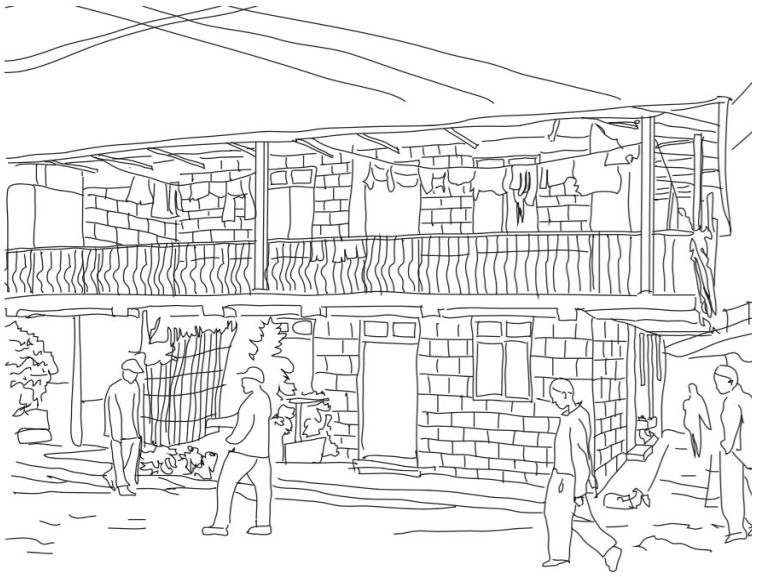
As well as many governmental efforts had been done to alleviate poverty, also many external organizations, as banks and Non-Governmental Organizations, started working in Ethiopia during the Derg period. Indeed, the Kebele administrations couldn't coop with the large amount of inhabitants within the neighborhoods. The living conditions were still very poor and the mortality was very high.
For this reason most of the projects of that time consisted on supporting and upgrading living conditions of vulnerable groups. Norwegian Save the Children Fund (Redd Barna), Concern and Oxfam, and IHA-UDP are only few of the NGOs that started some project during that time. Between 1987 and 1993, these NGOs have collectively built 1906 new housing units, repairing 879 dwelling, building 597 kitchens, repairing 77 kitchens and constructing 460 latrines.high above the urban landscape.

Kirkos is a proper example of upgrading projetc run by Norwegian Save the

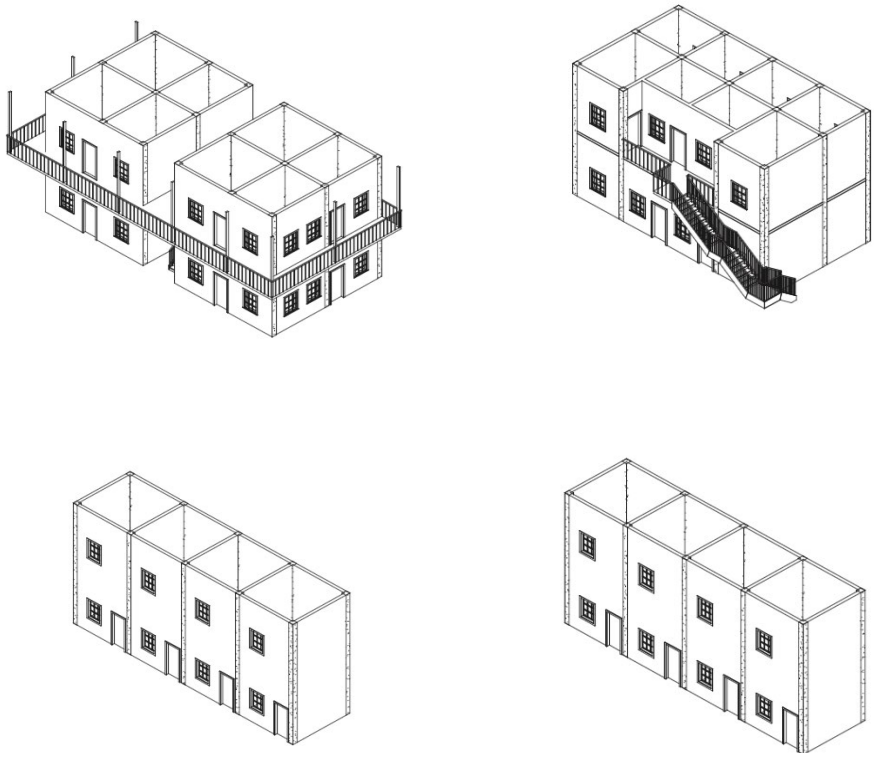
Children Fund (Redd Barna).

During the upgrading of the Kirkos, the inhabitants were temporarily relocated in the nearby kebele 14 in a single story row house. When the project was delivered to the Kebele administration, the Kebele administration poorly used law enforcement and the living conditions weredeteriorated. Uncontrolled housing transformation took places and inhabitants started constructing additions into three homes.

The project introduced 4 different housing units.
Type 1: A double storied block with a perimeter balcony. The upper floor has a large balcony to provide the upper floor households with enough workspace compensating the loss of direct contact with the ground. The Kebele administration complained that it was too luxurious for the low-income dwellers and the RBE developed a second type.
Type 2: a double storied block containing a number of housing units with each unit having its own internal stair. This type was also found to be expensive, as it required a number of internal stairs for each housing unit and the cable administration started allocate two households in one housing unit, which resulted in over-crowdedness and lack of privacy. So a different type was developed.
Type 3: A doubled storied block with an open external stair. Tin this type a household occupies a housing unit either at the ground or upper floor. The majority of the housing blocks are of this type.
Type 4 (relocation unit): Single storied blocks of row houses. These blocks were constructed in an over-spill area located in Kebele 14 to relocate households displaced from the case area during upgrading. In this case uncontrolled housing transformation is visible. There was an absence of facilities such as kitchen and store rooms in the design of housing types. The focus of the design was to provide multi purpose rooms and common latrines.



Addis Ababa. Kirkos up-grading project. 1975.



Addis Ababa. Kirkos up-grading project. 1975. House units

.Social issues.

Rural to Urban migration

The rapid rate of urbanisation is primarily caused by poor rural living conditions and persistent famine, forcing rural populations to migrate to cities in search of alternative livelihoods. Current migration patterns in Ethiopia are driven by the same factors that led to historical migration flows.

Past Ethiopian migration flows were mainly generated by a number of so-called push and pull factors such as overpopulation, famine, poverty, land scarcity, governmental agricultural policies, and a lack of agricultural resources. Nowadays it is evident from existing studies that approximately 50 to 70 percent of the population migrates temporarily or permanently to look for better living conditions. Rural to urban migration among youth between 10 and 19 years of age occurred primarily for educational opportunities, followed by work opportunities and escaping an early marriage. People usually migrate with a relative or family friend or are sent to live with family or friends in the city who are

expected to help them mainly for accommodation issues. In fact, migrants can often rely on a social network to provide them with shelter, food, and employment.

Addis Ababa, being both the political and commercial capital of Ethiopia and the seat of African Union, is seen as a "promising city" and it is attracting more and more migrants mainly looking for better education and job opportunities. Everyday more than 95 incomers decide to come and stay in the city.

As a consequence, the city results in severe overcrowding, shortages of housing and water, overtaxed social services, and unemployment.

The latter is the major social problem in urban Ethiopia. The national labor force survey (data from 2013) shows that in Addis Ababa the level of unemployment (25.1) is much higher than average urban unemployment rates. The opportunities for work are limited to informal work such as domestic work, coffee shop assistant, shoe shiner or street vendors. Therefore, this has led to shift in rural poverty to urban poverty. Recognizing this local mobility is potentially important to understand the dynamics of the central area of the city, mainly dominated by single story developments and "informal settlements".

PULL FACTORS

environmental drivers

DROUGHT
climate changes
land shortage
FOOD/WATER SHORTAGE

socio-economic drivers

RURAL unemployment
RURAL POVERTY
lack of education
POOR COMMUNICATION

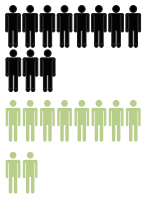
moving along
with FAMILIES
and FRIENDS

JOB opportunities
EDUCATION opportunities
MARRIAGE arrangement
better wages
social networks
health care centers

PUSH FACTORS

natural growth

rural-urban migration



1,1 milion

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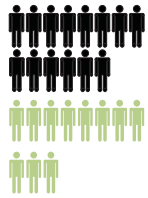
1,0 million



1,3 milion

1,2 million

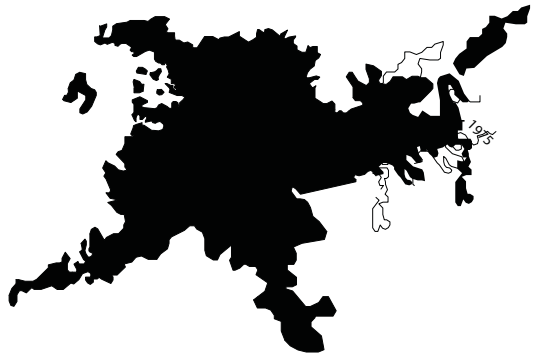
1994

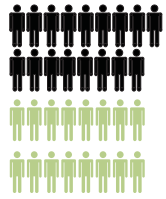
2002

1,4 milion

1,3 million

2007



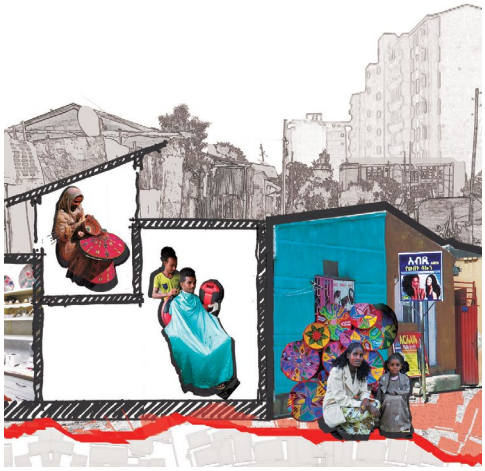


1,7 milion

1,6 million

2015

Courtyard business



Dwelling production and business

Street vendors

Walking salesmen

Informal settlement in Kirkos subcity

Informal settlement in Kirkos subcity

Addis Ababa. Yeka Abado

.Urban transformation.

The Integrated Housing Development Programme

In 1994 the Land Reform Programme was introduced to decentralise the urban planning responsibilities and to encourage secondary cities to attract rural migrants to ease pressure on the limited housing available in Addis Ababa and other major urban areas. Housing shortage was worse than it had been 10 years earlier.
There was only 0.93 housing unit per household available. This meant 5.5 individuals per housing unit. Addis Ababa's first housing policy, which incorporated the Governments' practice of maintaining public ownership, was implemented during that time. Despite large subsidies and land provided at highly subsidised rates, the private sector failed to deliver affordable housing. Housing prices rose and even for people with higher incomes it was extremely difficult to access affordable housing.

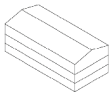
To tackle this problematic situation since 2005 Ethiopia has been implementing an ambitious government-led low- and middle-income

housing programme: The Integrated Housing Development Programme (IHDP), where low-cost housing is being built on a large scale, house the population from the former slums in short time.

This program primarily focusses on mass housing, but also creates huge employment opportunities, provides basic infrastructure facilities, promotes urban renewal to reduce slum areas and it introduces cheap construction technology.
The program has already reached lots of successes like the construction of 100,000 apartments for 0.5 million people, job opportunity for more than 200,000 residents in 3000 small and medium-sized enterprises.
Considering the quantity aspects, this program can bring positive results; on the other hand, the qualitative ones should be discussed. This building type derives from the Western model of multi story-condominium block with lack of cultural spatial space: large-sized fragmented building blocks surrounded by bigger open spaces that do not relate with the dwellers. Indeed, the main attention is put on the building, the object itself, and not on the open space; these are often left over spaces that become land of none or garbage collection spots.
Moreover, this high-end developments guided by a uniform planning concepts endanger the typical mixed-use neighbourhoods. Finally, the majority of the people living in poor-quality housing cannot afford the needed down payments for the new homes.

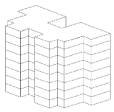
Addis Ababa. Yeka Abado

Condominiums. Main locations



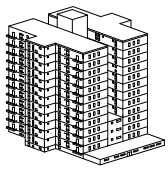
Target group: **low-income group**
Height: G+1 / G+2
House type: only studio (31 sqm)

10/90



Target group: **low- and middle-income group**
Height: G+4 / G+7 / G+12
House type: 1-bedroom (50 sqm) / 2-bedroom (70 sqm) / 3-bedroom (85 sqm)
Other program: **10% commercial**

20/80



Target group: **high-income group**
Height: high-rise with lift
House type: 1-bedroom (55 sqm) room (75 sqm) / 3-bedroom (100
Other program: **20% commercial**

40/60

Condominiums. Typology and prices

.Casa study: Gerji Condominium Project.

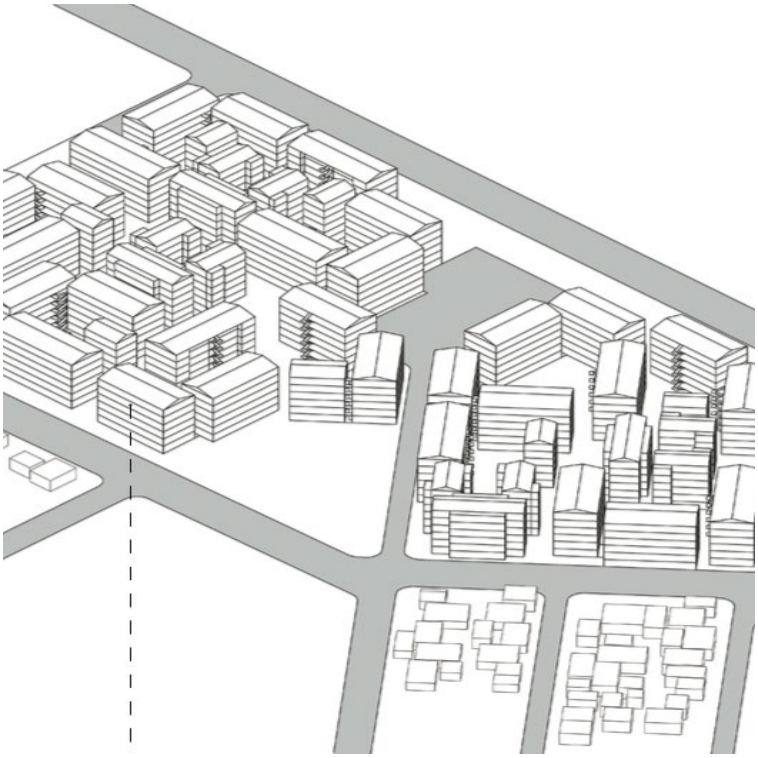
As the gradual inadequacy of the vacant land in the inner-city, the second phase of the Grand Housing Program began to expand to the outskirts of the city. Gerji Condominium Project is an example in this period.

It was developed on the outskirts of the capital city in 2005. It is located in the west side of Bole district which is only 3 kilometres away from Bole International Airport. It lies 1 kilometres east of the Ring Road connected by a main road passing through the community.
The neighbourhood occupies an area of 5 hectare and consists of 58 building blocks including 52 dwelling blocks of G+5 and 6 communal buildings of G+2.

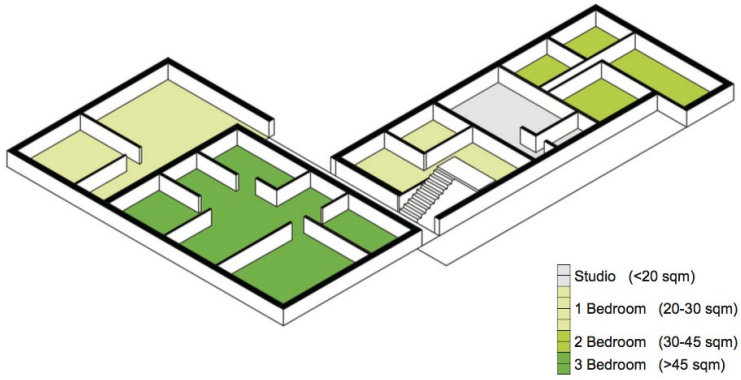
The organization of the master plan follows the road system around and divided into 2 parts by 2 parking lots. The enclosure of the semi-public communal courtyard is the respond to the cultural needs of the residents. Usually a free standing 3 storeys building in

the open courtyard is designed as the communal place. The courtyard could serve as a protected playground for the children as well as the gathering space for women's meetings. At the same time, it together with the communal building can be seen as the extension of the living units and provides some daily housework such as hand-washing laundry and cooking extensive meals.

This condominium contains four house types, namely studio, 1 bedroom unit, 2 bedroom unit and 3 bedroom unit in order to meet the spatial requirement of different buyers. No matter the size of the rooms, a bathroom, which includes a shower, flush-toilet, and basin, and a separate kitchen are built in each unit. The various types are distributed evenly in the building blocks instead of being completely separated in different buildings. This proposal encourages the mixture of different income groups.



Gerji condominium. Masterplan



Gerji condominium. Sample of floor plan

.The infrastructure policies.

Ethiopia is a country of road transportation. Over the last seven years funds for road construction have increased massively. A quarter of the State's budget on infrastructure is spend on roads. Also, the government has assigned $4 billion to the Road Sector Development Program (RSDP), to build, upgrade and repair roads over the next ten years.

Streets have a major role; not simply for communication but also for the type and form of activities that develop along them, which shapes the configuration of cities and settlements.
In the rural areas of the country this massive role of roads is clearly visible: all villages develop their major activities, shops and life along streets; while dwellings and community areas are located deeper in the territory, creating an interesting horizontal layering of the settlements. While the streets is framed by tall building, the back of the neighborhood is often characterised by informal settlements.
Also in the city the streets keep this

significant roles as, due to the absence of space inside the houses, dwellers are forced to extend their activities "outside"; therefore the streets become a self living organism.

If we take a look at the current evolution of communication networks, the new city plan, developed according to market driven forces, is producing huge impacts. Various "sefer" areas were destroyed or cut in parts due to the construction of massive infrastructure, such as the Ring Road, planned in 1998 to reduce unnecessary traffic in the city and connect the outer parts of the it, or the Light Tram Line, built in the city center after a funding agreement in 2010 between theEthiopian Railway Corporation and the Export and Import Bank of China.

As a consequence, social bounds and income possibilities have been affected and people of the corresponding areas had to leave the inner city to the outskirts with the hope to find new possibilities.

Towards Ayat area. Light tram line.

Kirkos subcity. Light tram line.

.Design research.

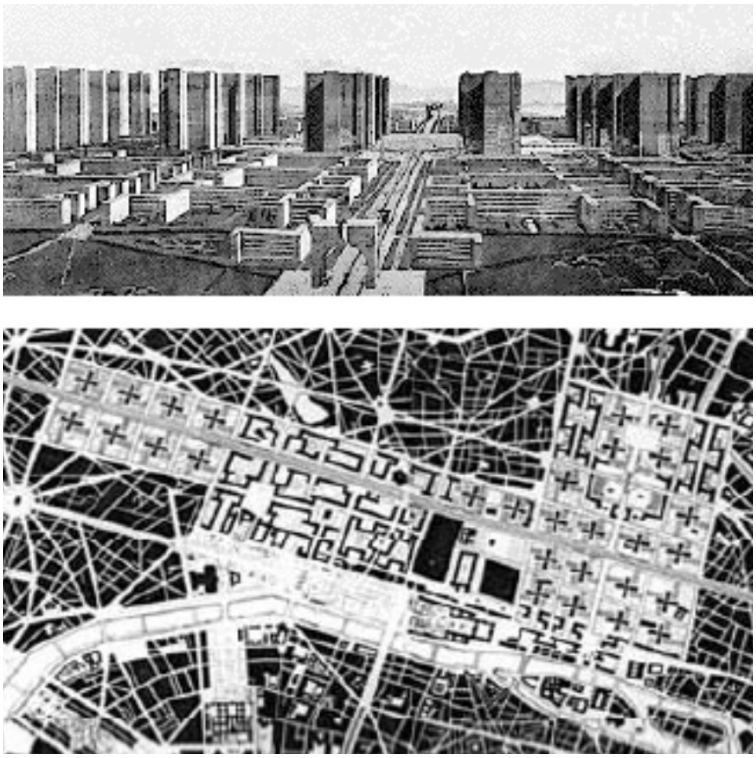
After the Second World War, in Western Europe, a vivid debate on how to understand and face the urban growth and the urban realm arose. The idea of mat-building emerged in the late 1950s as a consequence of the debates within CIAM over principles of functional zoning. A group of younger architects, known as Team 10, suggested this alternative option to the functional city described in Le Corbusier's Athens Charter (1933), in which the four functions of daily life -living, working, circulation and recreation- were segregated from one another.

Starting from the concept of the stem, Candilis Josic and Woods conceived the urban realm as a matter of spatial practise and activities. They concentrate on the streets, on the mobility in order to promote and establish a continuos collective pedestrian circulation system, which attempts to structure the everyday practices of dwelling by offering a continuos and diversified realm that mediate between pub-

lic and private. Hence, they developed the concept of the mat-building, also known as ground scraper, than can be seen as a large-scale, high-density structure organised on the basis of an accurately modulated grid. It is a process, a growing structure of additive elements defined by a delicate interaction between variations and repetitions of form. Instead of a static architectural composition, mat-architecture is the installation of a generative structure.

The mat was intended to provide flexibility in planning for a range of functions over time, thus assuring its own long life; its very realisation is spread out over time and subject to revision and adaptation.
The mat system suggests how the structure and the organisation of cities is based on the activities within them. These activities, which generate and coordinate the whole system, are articulated and materialised by buildings and spaces, by passages and squares, and by the careful intertwine of public and private realms. In contrast to standardised architecture that ignores the specific nature of its context and uses, the order of this approach is determined by community hierarchies and contextual associations.

Through the analysis of this strategy and following the logic of the ground scraper it is clear how it is possible to produce an inclusive high density environment without giving up the interaction among inhabitants and between them and the space surrounding them.



Le Corbusier. Plan Voison. Paris. 1925.

Candilis-Josic-Woods. Paris. 1925.

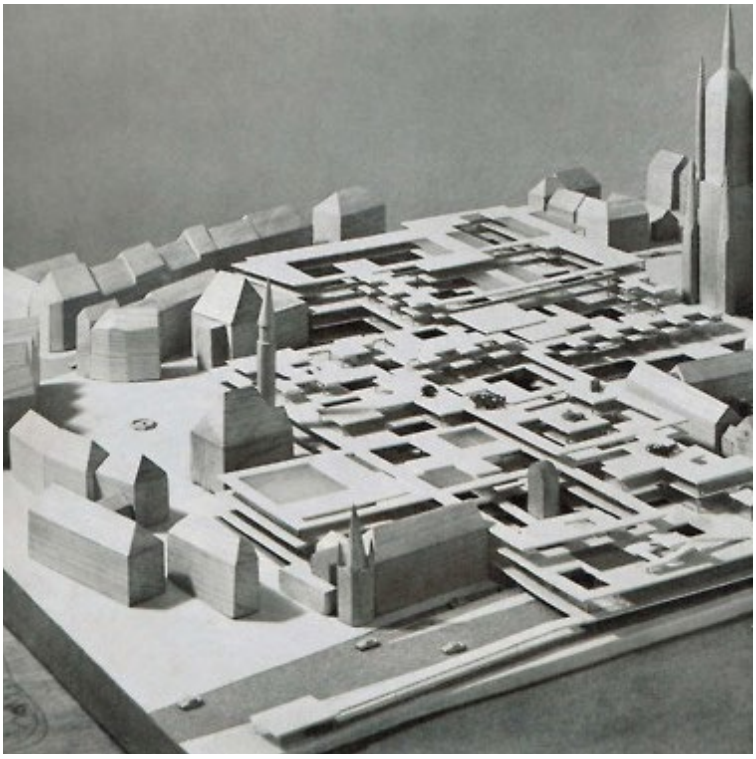
Case study: Competition project for the reconstruction of the city centre of Frankfurt by Candilis-Josic-Woods, 1963

Candilis-Josic-Woods took part, in 1963, in the competition entry for the reconstruction of Frankfurt- Römerberg centre, an area destroyed in the Second World War between the city hall and the cathedral.

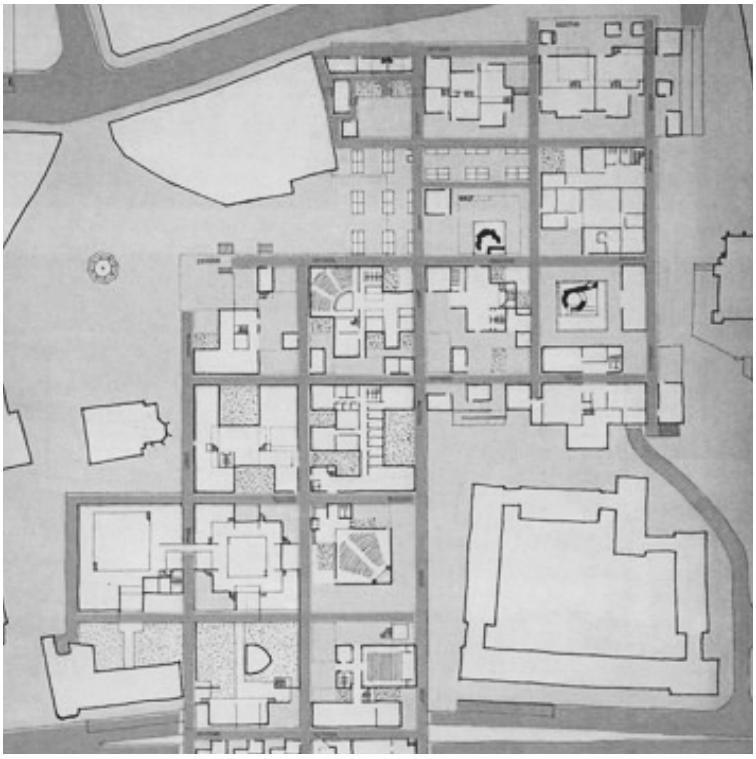
According to Candilis-Josic-Woods, the new centre should embrace both the dense urban quality of the traditional European city and the new socio-spatial patterns characteristic of the post-war period. Despite the apparent complexity of its grid, the scheme demonstrates that the scale and traces of the surrounding urban fabric are reinterpreted on the ground level of the project as an attempt to harmonize the project and the neighboring urban tissue. The circulation grid of the mat corresponds to the existing network of pedestrian walkways on the site in order to keep the existing human scale. Relationships with context are further intensified by the sequence of embedded open spaces, courts and patios that are present in the entire project.

Dealing with a new urban development in a historical urban tissue also needs the introduction of new spatial practices: a huge number of activities has to be housed; just imagine if all these had to be considered separately, the result would be chaos. Instead These various parts must be made into a whole, a single system. Using a mat typology enabled the partners to distribute the multitude of activities needed into a clear, coherent, adaptable order. Indeed, the spatial configuration is organised on a multi-level grid of pedestrian walkways that link public activities at the lower level with the private dwellings on the upper levels.
Moreover, the building is used as a physical linkers with the surrounding urban tissue throughout direct pathway or a means to re-create context throughout new extension and integration.

By this project, Candilis, Josic and Woods demonstrate the possible understandable coexistence of different urban environments throughout common values of the traditional city and the urban fabric composed by the mat-building.



The mat developments in-between the existing context



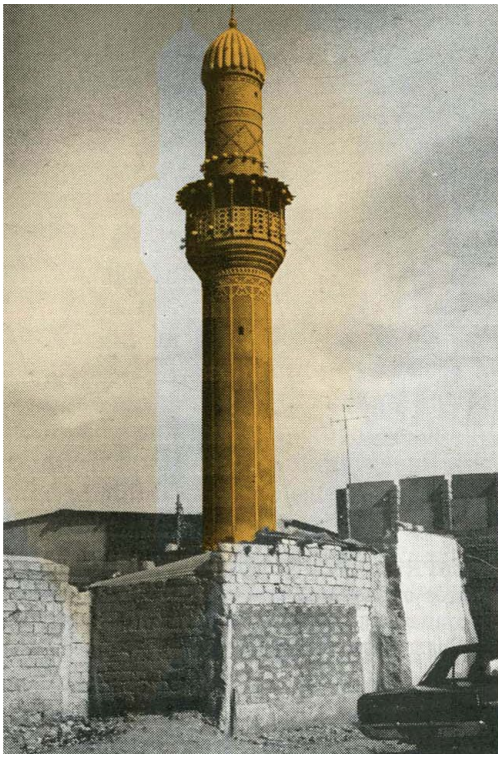
Ground floor organisation

Case study: Project for the reconstruction of the city centre of Kuwait by Alison and Peter Smithson, 1970-1972

After the discover of oil in Kuwait in 1940, the fast development of the area according to Western-style buildings and traditions led to loss of local spatial and cultural identity. In 1968, the Emir of Kuwait invited four foreign firms to propose their masterplans for the redevelopment of Kuwait.

Re-evaluating the main essence of the Arab city, the British architects created a mat-building that enabled pedestrians to wander in any directions, while retaining their visual connection with the most important elements in the cultural identity of the city: the mosques and minarets. The minarets form a net of fixed points in the space that is characterised by a lack of urban definition. Indeed, these were used as nodes that split the mat-building and create the intertwine galleries while linking the new design to the tradition of the place. The new urban form allows pedestrians freedom of movement, especially at the ground floor, away from the sun and traffic noise, in a city where most of the inhabitat use private transport.

The clever integration of the minarets, symbol of the arabic culture, the introduction of courtyard, typical element of the traditional arabic house, and the inter-visibility between new and old city towards the galleries, guarantee a comprehensible relation with the existing identity and reality and the possibility for further expansion and change.



Minarets as visual connection points

Ground floor organisation

Case study: Unità Orizzontale in Tuscolano neighbour, Rome by Adalberto Libera, 1950-1954

This is an experimental housing complex built in the city of Rome just after WWII. The complex is made up of 200 houses for 800-1000 people, divided in three different building types: the one-floor courtyard houses, the multi-storey building with accesses from balconies, and the services block. The site is geometrically defined by two roads, the rail line and a fourth border, and it is completely enclosed by a wall with a single access cutting through the service block.

Libera's scheme for the Tuscolano is arranged around a central open space whose limits are parallel to the general perimeter. Around the central void, the different grids defining the groups of courtyard houses are organized perpendicularly respect of the perimeter lines.

The interstitial spaces between the groups are green rest areas in continuity with the central space. In the middle of the site stands the four-storey building, the only vertical element of the composition, housing small apartments for single persons or couples.

Libera was deeply interested in the balance and continuity between the interior spaces and the open and collective areas. The courtyard houses tissue in Tuscolano responds to a cellular logic where the room, the patio, the house and the whole neighborhood are all inter-dependent elements, but are arranged following a geometrically controlled and repetitive pattern.
The courtyard houses are each "L-shaped" with all the main rooms facing the internal patios and arranged in groups of four following an ingenious scheme: three houses face the same interior open space and the fourth one is opened towards the exterior, in this way the resulting internal open spaces, the patios, are also L-shaped. There's a gradual passage from the exterior city areas to the semi-public space of the central void through the small residential pathways to finally get to the interior private spaces: a carefully designed sequence underlined by the volumes and by the choices of materials.

Coexistence of different type of buildings

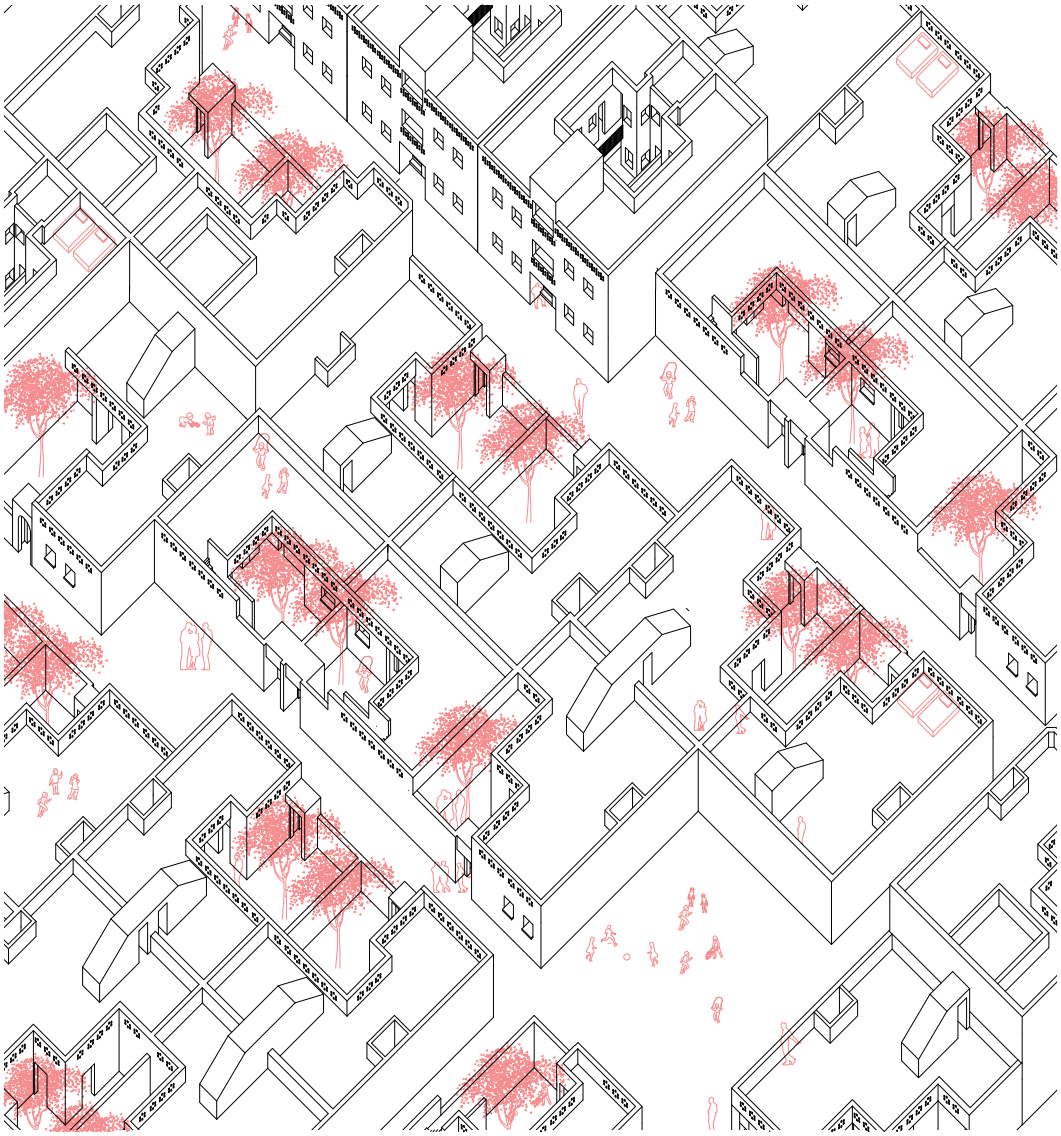
Neighborhood life

Case study: SOS Children's Village In Djibouti by Urko Sanchez Architects, 2014

Among most recent projects the SOS Children's Village In Djibouti by Urko Sanchez Architects resembles the logic of the mat building.

The houses are arranged in an apparent disordered way that allow the creation of continuos alleys where public and private spaces follow a clear and defined hierarchy. In the private spaces, the inside and outside areas of the house melt, allowing residents to maintain certain common outdoors living.
In the end, this results in a small village with open, pedestrian-only streets and playing fields for children and different open spaces for gathering and public activities.

Rooftop view



Axonometric view

Case study: Shustar New Town by Kamran Diba, Khozestan, Iran, 1974-80

Shushtar New Town is located close to the ancient city of Shushtar in the southwest of Iran. It is divide from the old city by the Shatit River that is also the southern boundary of the site. The new complex is designed for 30,000 inhabitants, all employed at the Karoun Agto industrial company. Indeed, the company decided in 1974 to plan a residential and urban complex to house its technical, administrative and working staff, thus providing two major opportunities to the inhabitants of Shushtar and its neighbouring villages: useful and well remunerated productive employ- ment; dwellings with all sorts of urban and infrastructure facilities (not only urban facilities but also optimal hygienic environment). Development of the Shushstar New Town was also intended to revitalise the old town and to accommodate expansion generated by industrial growth in the region.

Site

The location of the site is suitably chosen in its relation to the industrial

complex (18 km from Shustar).
The new satellite town articulates compact segments of differentiated living units around a pedestrian central spine -the mall- along which it distributes public spaces, green areas, shopping facilities, schools, public paved squares, mosques, resting places, bazaars and scattered monuments. Moreover, this central boulevard is connected with the main street of the old town, where a big, splendid bazar and the mosque are located. Cars' access is limited inside the new city in order to preserve as much as possible pedestrian and more private spaces close to the dwellings. The cars are segregate from the internal community life and all the parking spots are concentrated collectively at strategic point.
Topographically the site si undulating, while allows for a variety of building forms (there is a gentle slope from north to south). The new city follows the traditional urban pattern of Iranian cities with an interwoven urban fabric even though the new urban blocks follows a more modern and regular configuration.

Urban block
The first area, that has been realised before the revolution, is contained in a large square plan divided into 4 four urban block by the main boulevard and another perpendicular axis. This organisation reflects the form of the traditional islamic city: a radial town, with the palace of the local overlord and public services in the centre and living quarter around.
In this case, the central intersection of this two axis is the main meeting point: the market place. This square is surrounded by 3 to 4 storey arcaded buildings (hotels, offices and shops).
The contrast between of the narrow paved street of the neighborhoods, which are almost treeless, makes the boulevard a very precious place with strong imageability. Along the other perpendicular axis, sport facilities and parkings spots are located. This and the other public buildings grouped along the east/west pedestrian bou-

levard are designed to give neighbourhood identity to each block in the traditional manner. They are usually located at an angle of the grid, which organise the entire plan. Moreover, to interrupt the regular housing pattern inside the four urban blocks, other smaller common ares are designed along the narrow pedestrian street. This public spaces are meant to be stimulating, convivial and inducing positive social behaviour (playground and meeting-place).- Neighbour facilities such as the mosque and the baths are located at nodes in the small scaled walkway system. This system is organised in order to connect all the meeting areas, indeed, the streets are not just an empty ribbon running through the built space, but measure of outside space.

Cluster

The architects refers to the projects as "high-density horizontal apartment house". Focusing on one urban block is pretty visible how the urban fabric is dense: more that sixty dwellings per hectare.

The all concept of the urban block is an appropriate response to the hot, humid climate of low-lying Shushtar, which has little water divert to agriculture. Due to this climate issue the streets are quite narrow in order to provide shade. These are connected the inner part of the block with the urban amenities along the main axis. In order to avoid the monotony of the modern western urban blocks, the architect moved the block to create a tightly interwoven network of streets and passages that offer a variegated perspective while preserving a human scale.

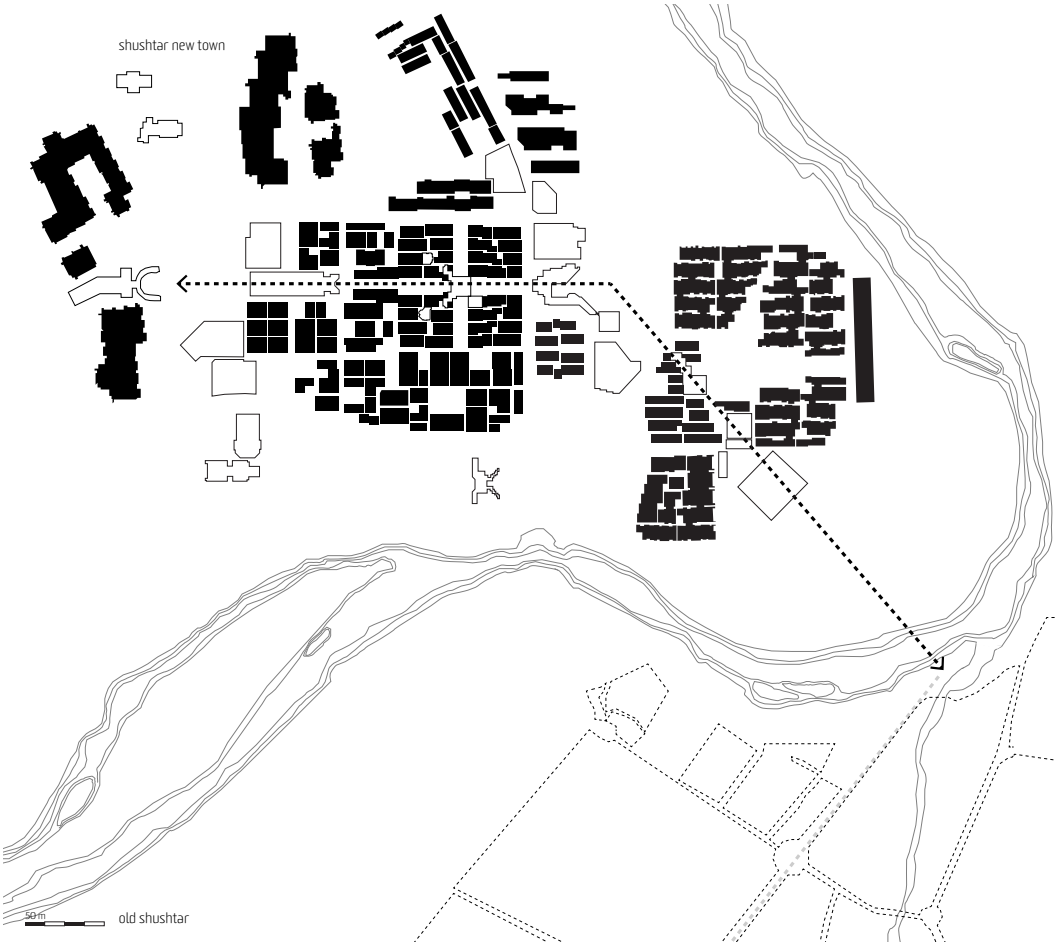
The architect said that, observing the old cities, streets are used as kind of playground and meeting-place. Moving and consciously erasing some of the housing the inner communal spaces are created.Indeed, this small streets were designed non primarily for a corridor like function, but to to generate common areas and maintain a life of their own. This open meeting spaces present in each small neighbourhood are catalysing element be-

tween the administrative, economic, and religious centre, the houses and the residential areas. Moreover they represents a space for social meeting, playground for children and they create a visual and spatial diversity.

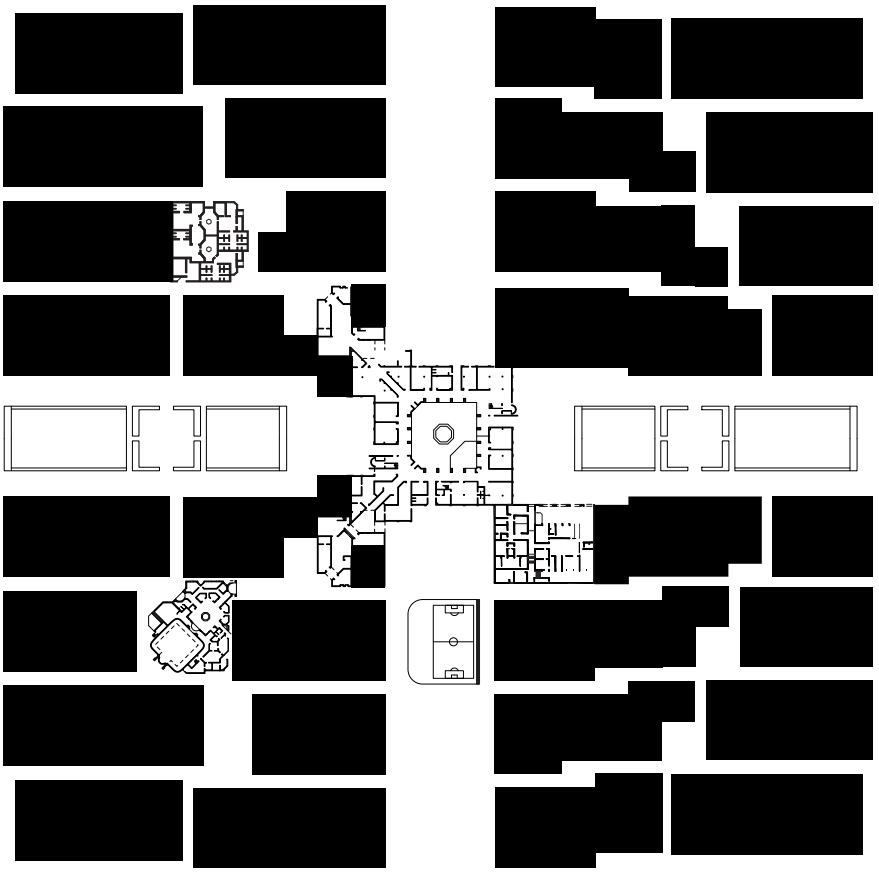
Dwellings

All the dwellings in this block are limited to one and two story units with courtyards. The starting module is the typical introverted islamic courtyard house. The western housing concepts of rooms with specific functions is abandoned in favour to the tradition use of fewer larger multipurpose rooms, ranging in size from 3x4 m up to 5m. Occupants can subdivide some these rooms if they wish. The organisation of the house can be schematise in three macro areas: the Andaruni, the private family area, and the Biruni, the one reserved for exterior and social relations. The linkages between these two zones are assured through the courtyard space and the services area (kitchen and bathroom)

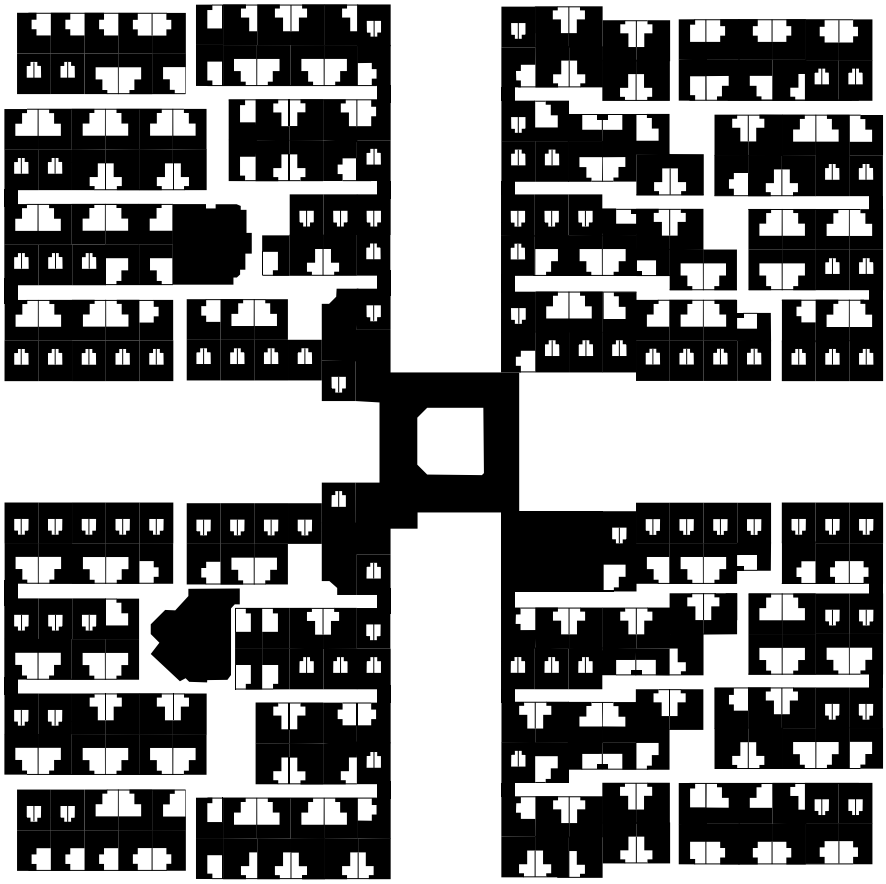
In the desert regions it was found that the central courtyard produced a pleasant cooling effect, becoming a place of general meeting and assembly. Indeed, this courtyard is the main important spot in the use, it is considered as another multipurpose room, usable most of the yeas in Shushtar's climate. Moreover, locating all this private gardens along the street can provide shade and green touch to the narrow street. Terrance roofs, with appropriate stairs and parapets, are the evening quarters for the warmer seasons, that sometimes people use even for sleeping. Finally the house that are places with the courtyard on the same side can be combined and extended by the inhabitants that needs more spaces.



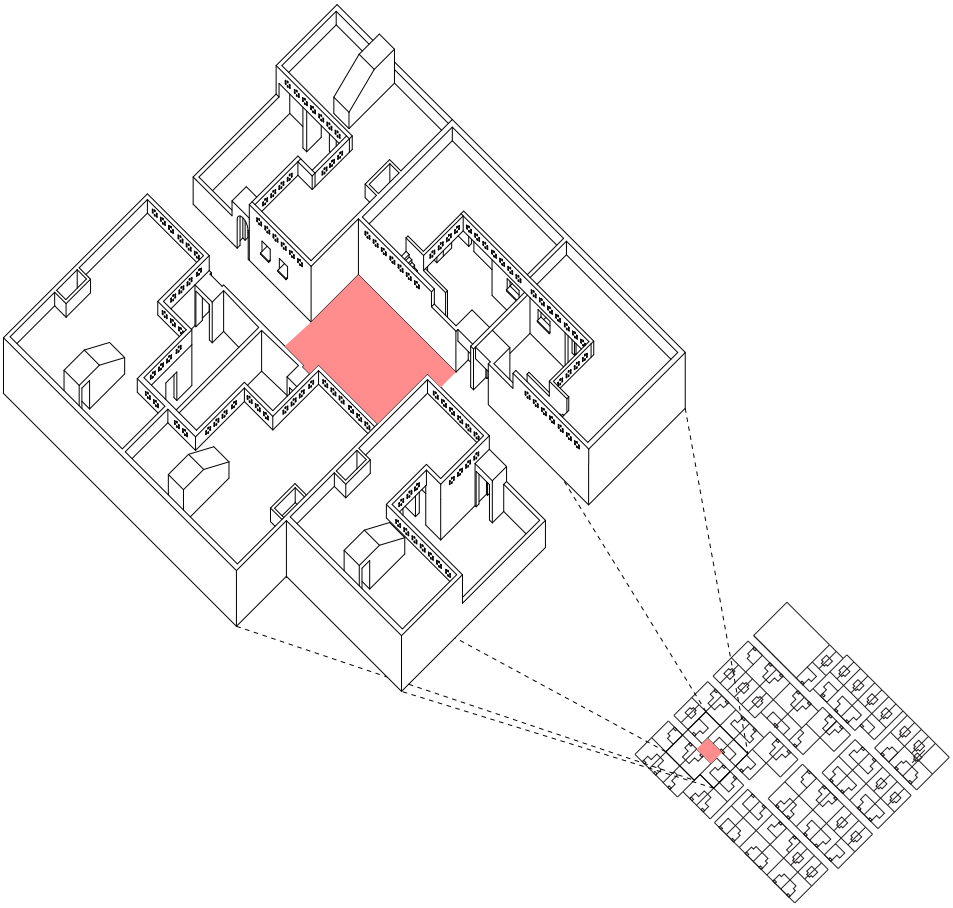
Site. Morphological analysis. Public and private areas



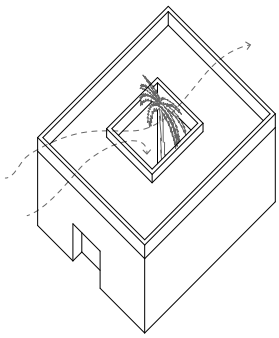
Cluster. Morphological analysis. Public and private areas



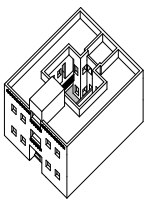
Site. Morphological analysis. Solids and voids



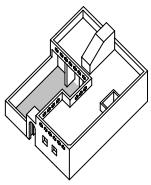
The stamp. Composition of dwellings to create common neighbourhood spaces



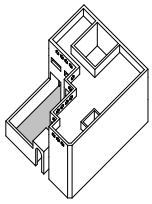
Mothertypology



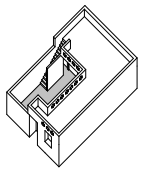
A1_Central courtyard



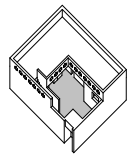
B1_Front side courtyard



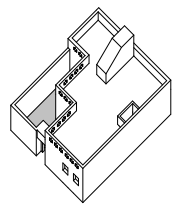
B2



B3



B4



B5

Dwellings. From mothertypology to six different variations of the courtyard typology

.Site survey.

Kirkos subcity

Kirkos sub-city is located in the centre of Addis Ababa, within Kebele 13, which constitute the smallest administrative levels in Ethiopia. It is one of the densely populated sub-cities in Addis Ababa with a population density of 150 persons per hectare.

This sub-city is clearly divided into two halves: a modern quarter and an informal one. The former comprises the new high rise real estate developments, advanced infrastructure such as the light train line, and some important facilities as the stadium, the main square (Meskel square) and the Un headquarters. The latter is characterised by one-floor developments mainly built in metal sheet, mud and straw.

Each of this quarter is defined by its own urban morphology: on one side, structured and regular large scale developments with huge roads and high speed roads; on the other, small scale houses with narrow streets and hidden courtyards where any kind of formal and informal business take place. Due to the continuos growth of the

city, the central location of this neighbour and the nearby construction of the light train line and the speculation it implies, the existence of this historical low-income inclusive neighbourhoods is in danger.
This two conflicting reality are separated by a large green void, which was left as a protected area of the current abandoned train station. This terrain vague represents the meeting point between the two opposite urban models, where all the different dynamics that are presented in Addis Ababa become visible.

View from La Gard train station

Light tram line

Location

HIGH DENSITY

HIGH-RISE BUILDING

FORMALITY

EXCLUSIVITY

HIGH SPEED

"What high-rise does is to separate large numbers of people from the street, so we end up with a city that is detached from street life, we end up with a city that is based on ***enclaves*** *and* ***gated communities****..."*
Michael Buxton

LOW SPEED

INCLUSIVITY

IN-FORMALITY

LOW- RISE BUILDING

LOW DENSITY

Morphology

2003

2008

."Slum" extentions toward

.New condominium devel

ls the train station

lopments

2015

.Light Tram Line

."Slum" clearance

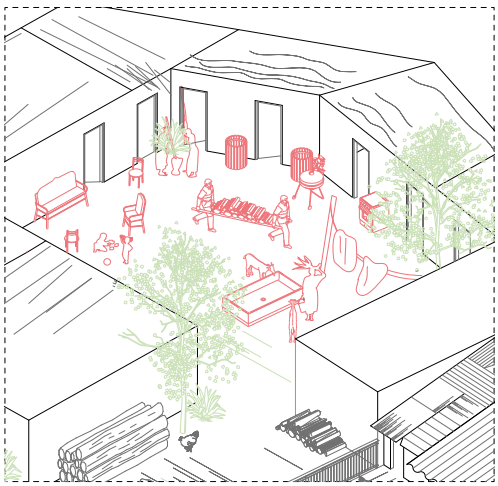
.High-rise developmets

.New roads inside Kirkos (BRT)

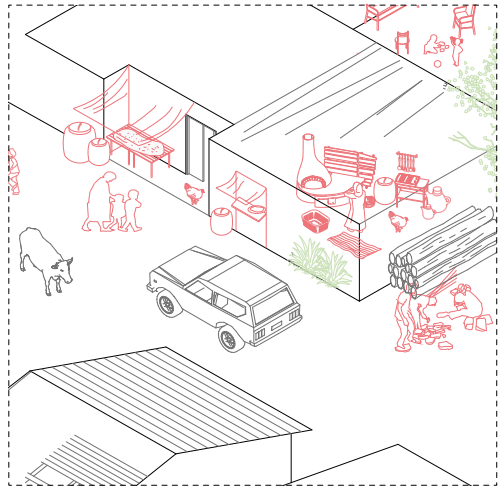
LDURP_Land development and urban renewal plan:
clearance of 70 ha for new developments in Lideta, Kirkos and Arada districts.

Relevant buildigs

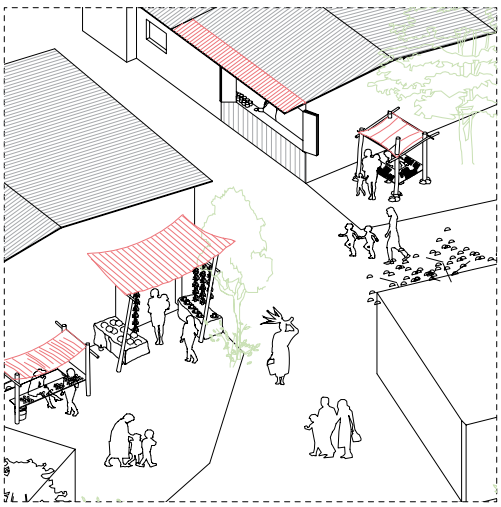
Streets hierarchy



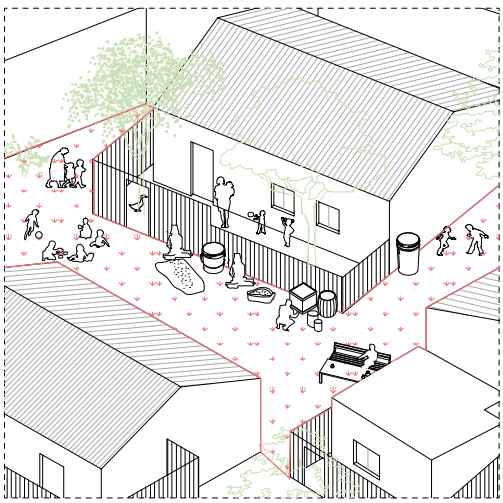
The courtyard



The threshold



The sheltering roof



The square

02.Project

.Statment.

This process of growing influences enormously, not only the city itself, but also people life styles and social relations. In fact, from the end of the 20th century, the attitude of urban growth shifted from being a strategy of inclusion to a tool for marginalisation and ghettozation.

The issue of exclusivity is one of the major concerns that urbanisation is bringing to discussion. New typologies and urban conformations make it all clear: not simply the Grand Housing Scheme, in which the same type of apartment block is endlessly repeated, is trying to delete the fruitful presence of informal settlement living forms and mixed-use neighbourhoods, but gated communities are spreading at the edge of the city, granting richer people protected area of high class life. Integration is avoided, people interaction are not part of the plan and scale is too big to create an inclusive environment.
Due to the these extensive redevelopments of old areas through punctual

and large scale interventions, the face of city is being completely changed and it looks like a fragmented tissue where different part are not able to communicate to each others. The fabric of old neighbourhood is often ignored and destroyed, leading to the loss of a sense of identity and displacement of communities.

These lead to the question of *How the contemporary high-rise developments can be integrated with the traditional low-rise urban fabric while enhancing its socio-spatial patterns?*

And due to the necessity of embracing the inevitable modernisation of the city, *How to negotiate between the contemporary requirements of the growing city and the traditional way of living?*

Moreover, a great interest should be put in the selection of the material in order to build affordable houses using local and sustainable material to reduce the cost, to benefit from the materials' features and to increase the possibility of new local business. This arise the question of *How to use local material resources to design a building complex that innovates traditional typology and produce a modern and efficient environment?*

.Towards the project. A city web

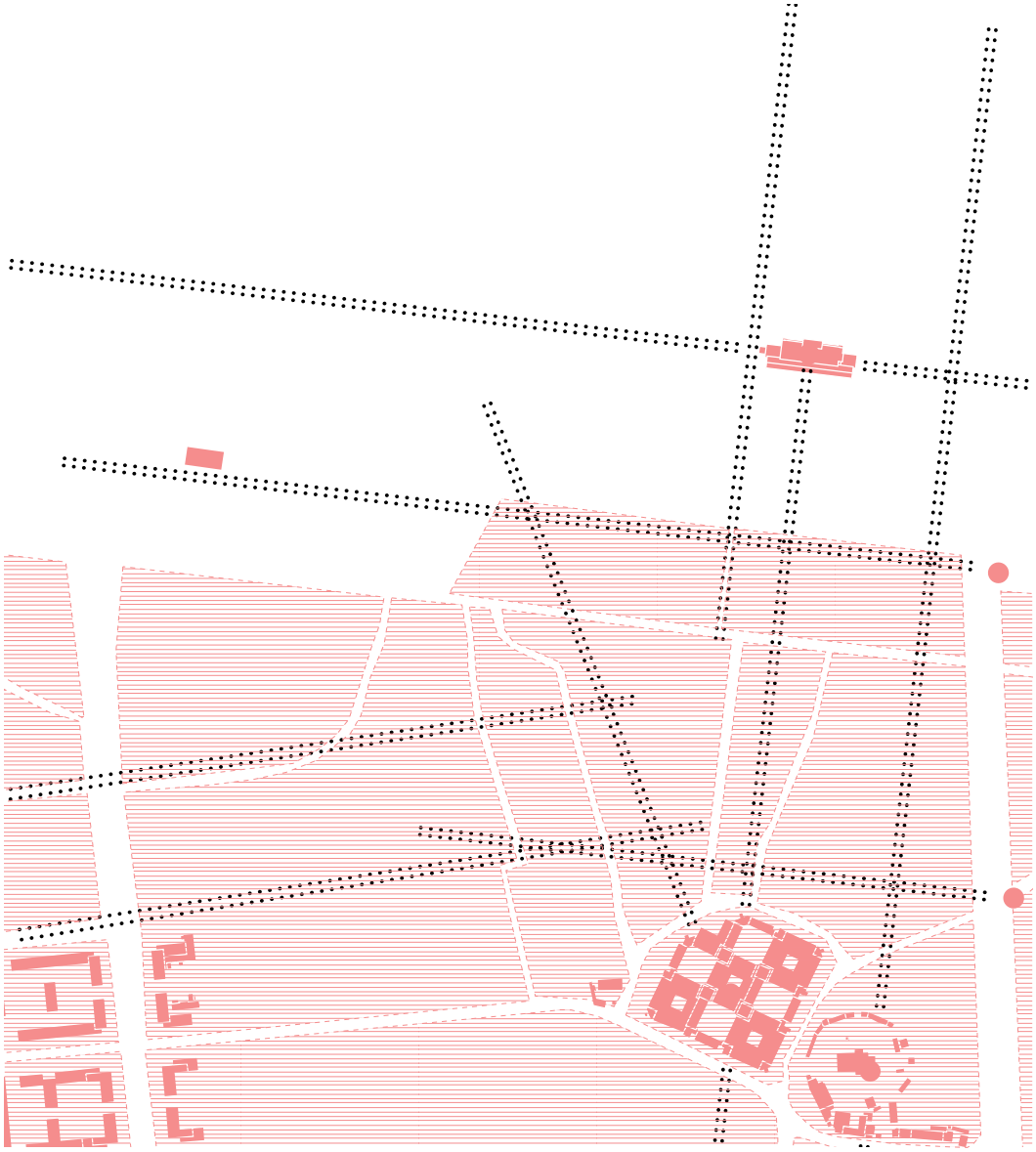
The in-between area of Kirkos becomes the starting point of the project, that aims to bridge and reconnect- materially and symbolically- the two halves of the city.
As the urban poors are usually the first to be displaced from the central area to condominiums build in the outskirts of Addis Ababa, the reconstruction of the quarter can be realised in stages, with relocation of the population and activities into new buildings within the same area.
A concept that implies the search for a dwelling environment that is neither completely modern nor completely traditional, but incorporates the field of tension between both, is used.

The development of the stratefy start from a grid, that has the capacity of accomodating multiple and particular developments and open spaces while maintaining a certain general logic.
The result is a web of connections in which the gradual transition between public and private domains becomes clear in the succession of main streets,

alleys, patios and dwellings.
The continuous pedestrian connections, open spaces and public amenities which constitute the locus of collectivity, site of meeting, trade and play. Two main pedestrian roads connect vertically this neighbour to the others around. These two streets lead to two main open spaces, that are defined by the middle/high-rise developments. These open spaces host playgrounds, meeting points shaded by trees, water points, and multifunctional bamboo structure that, with the temporary addition of textile and bamboo planks, can be uses as market stalls, performance places and and as morgue. Moreover the ground floor of the middle-rise buildings houses public functions, such as educational, cultural, social and commercial activities that activate the porch and the the open spaces around.

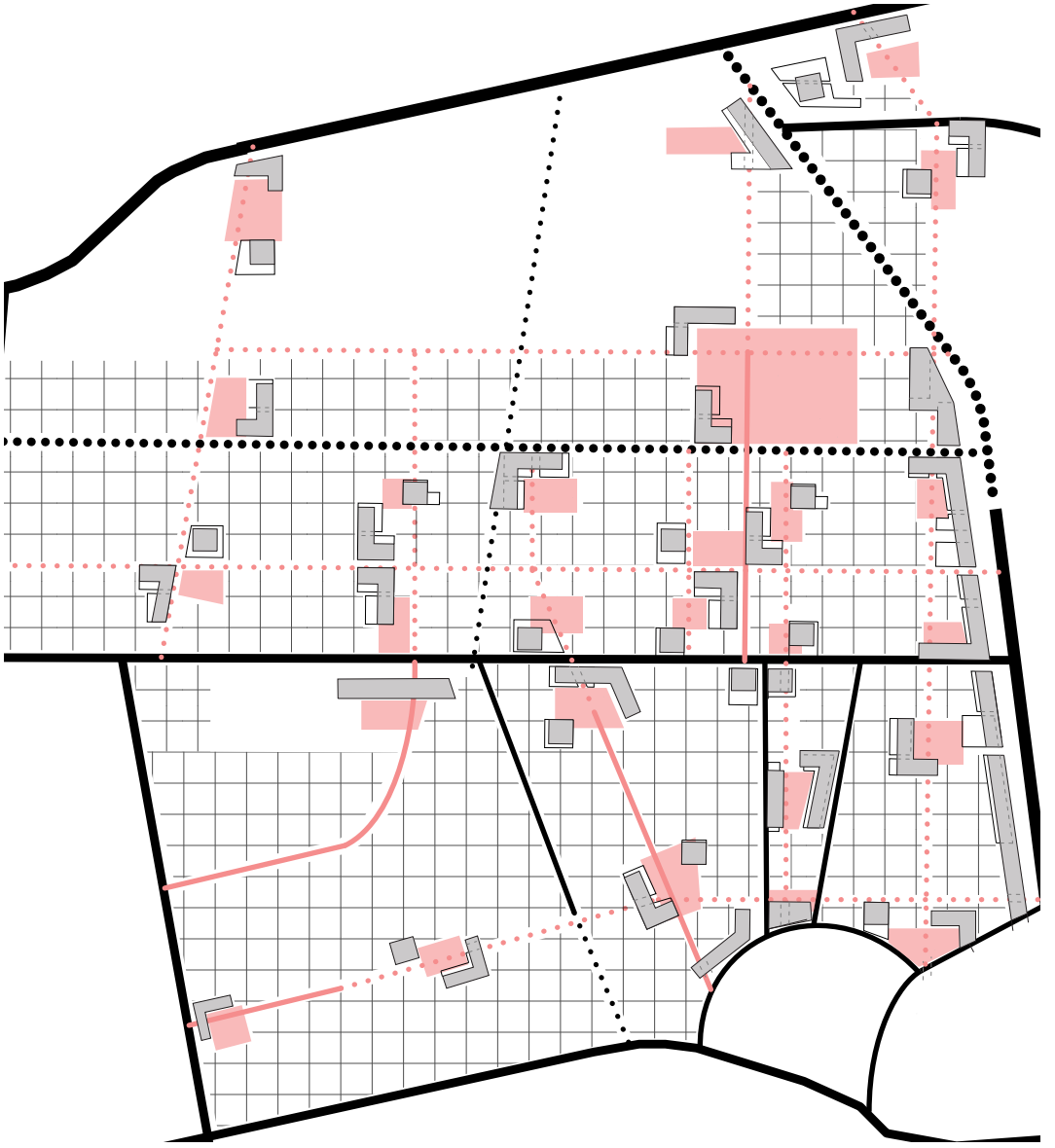
The low-rise housing blocks are then located in the openings and in-between spaces of the web of connections. A great attention is put on the threshold as a space of transition between public and private, the inhabitants have the possibility to use it as a working or a selling space, activating and extending the life in the small roads inside the neighbour.

The web of connection, made by the open spaces and the different kind of streets, is a device that structure the composition of the building environment and can be adapt to the context or can be extended to re-create it.

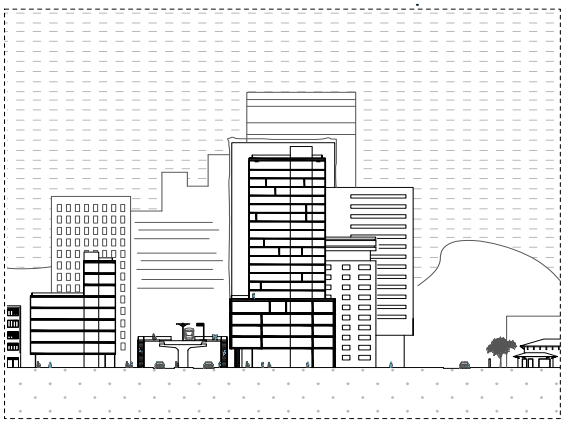


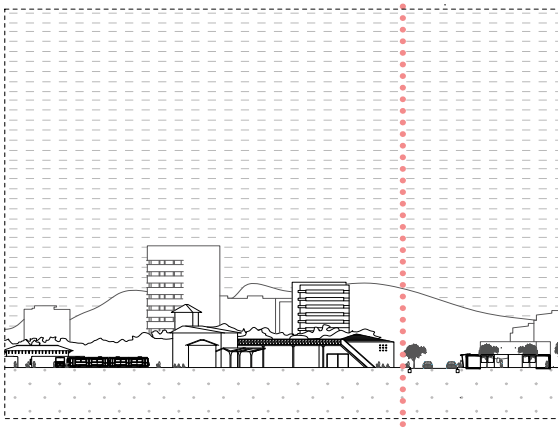
Following the logic and structure of the existing streets and neighbourhood, connecting the elements with a continuos pedestrian web.

The public domain is realised as a means of collective spaces, open air areas and terraces which become the place for gathering, playing and social interactions

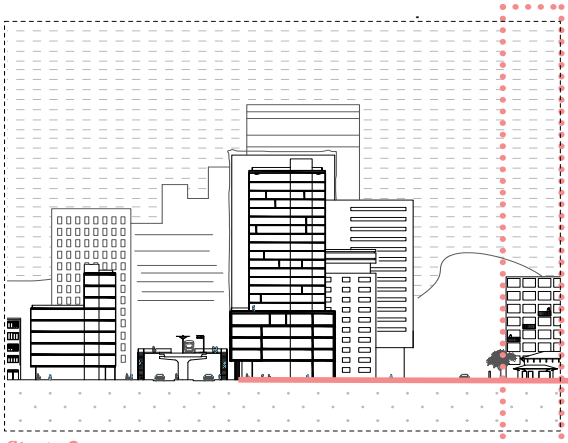


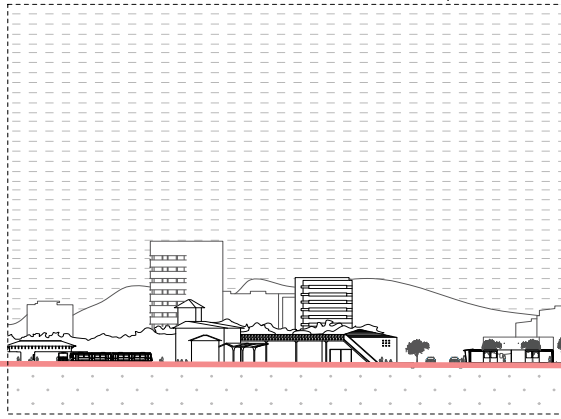
Along the main connection, the architectural volumes contain all the collective functions: educational, cultural, social and commercial activities; .the low-rise developments can be placed within the in-between spaces of this connection.



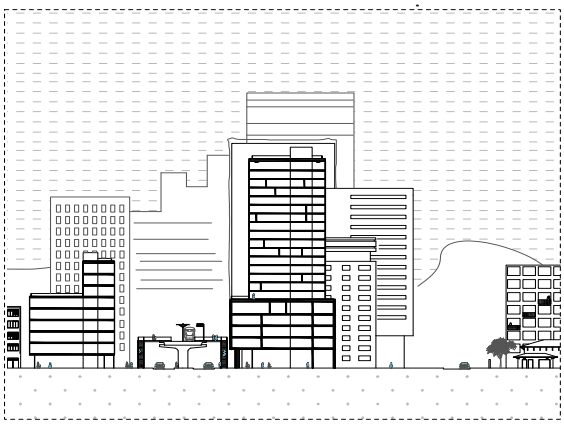


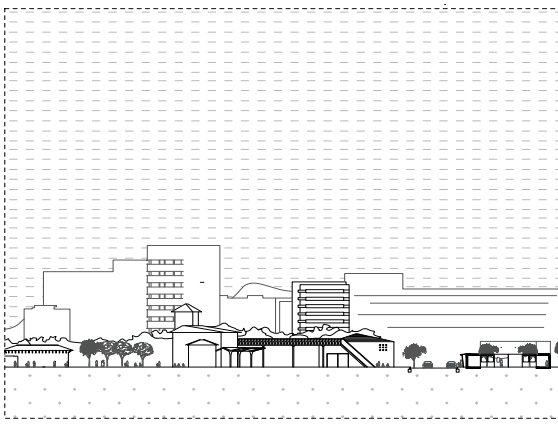
Stage 1
Filling the void



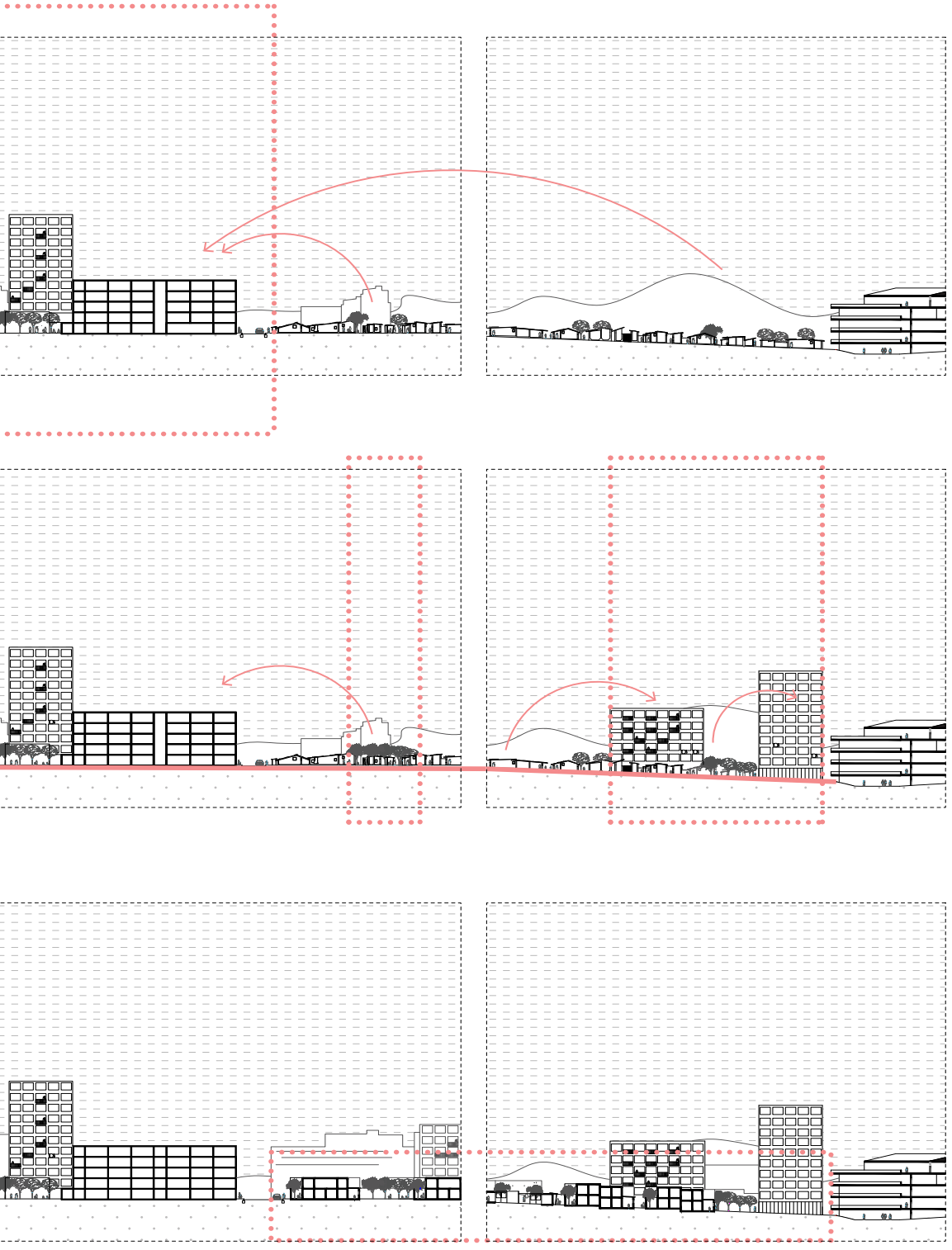


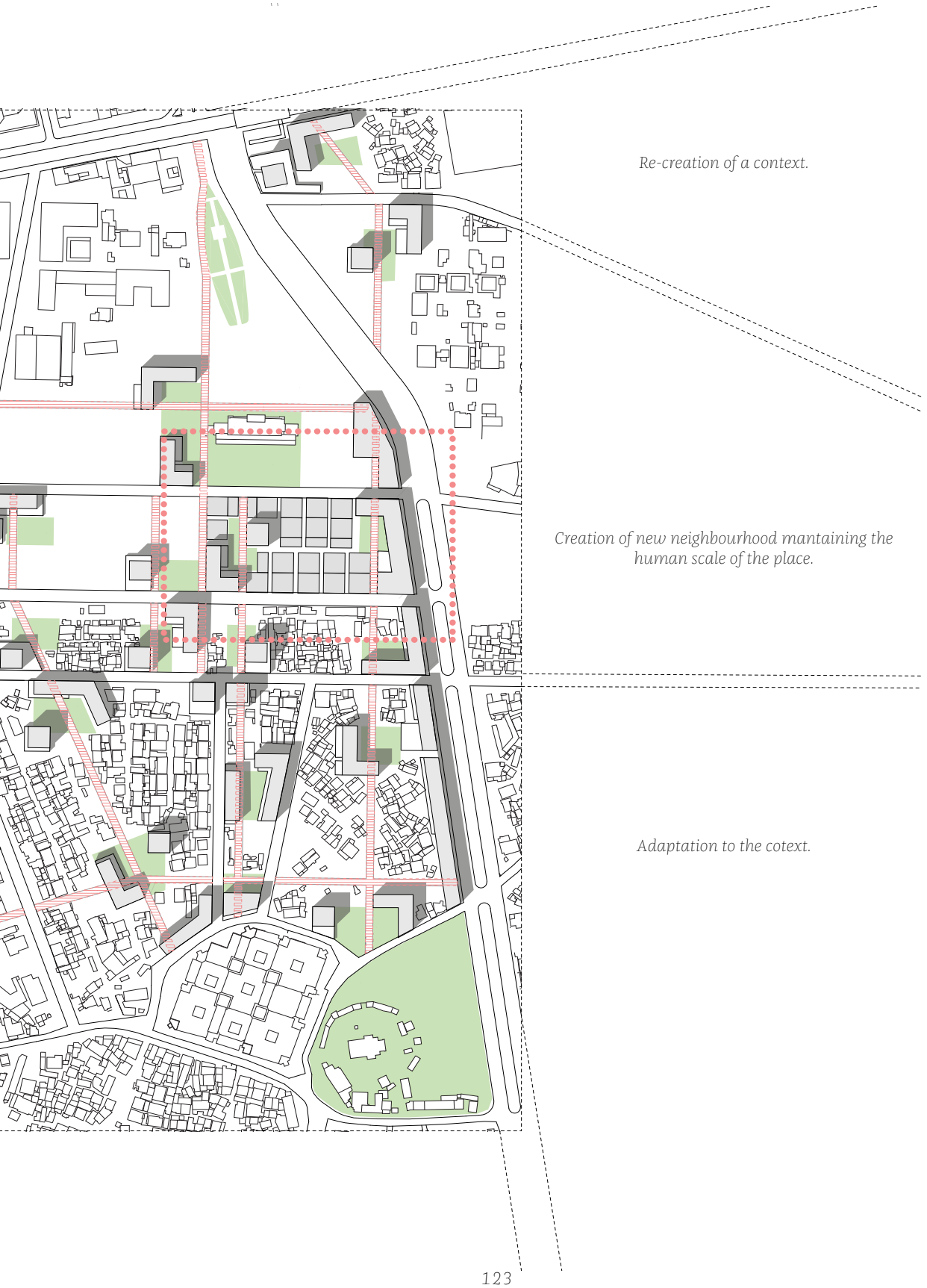
Stage 2
Developing the "web" with the middle-rise buildings and public facilities





Stage 3
Complete the new neighborhood with the low-rise developments

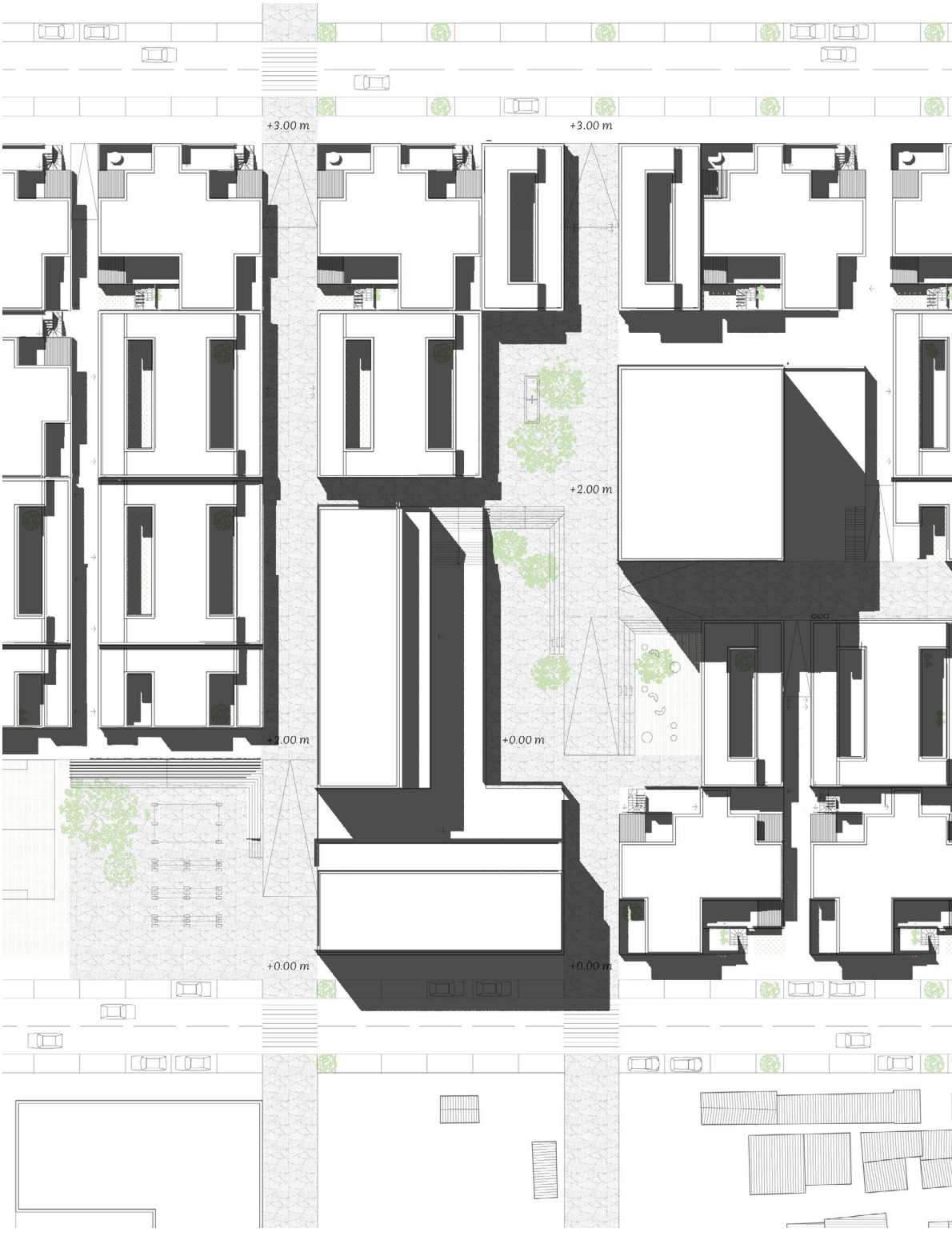




Re-creation of a context.

Creation of new neighbourhood mantaining the human scale of the place.

Adaptation to the cotext.

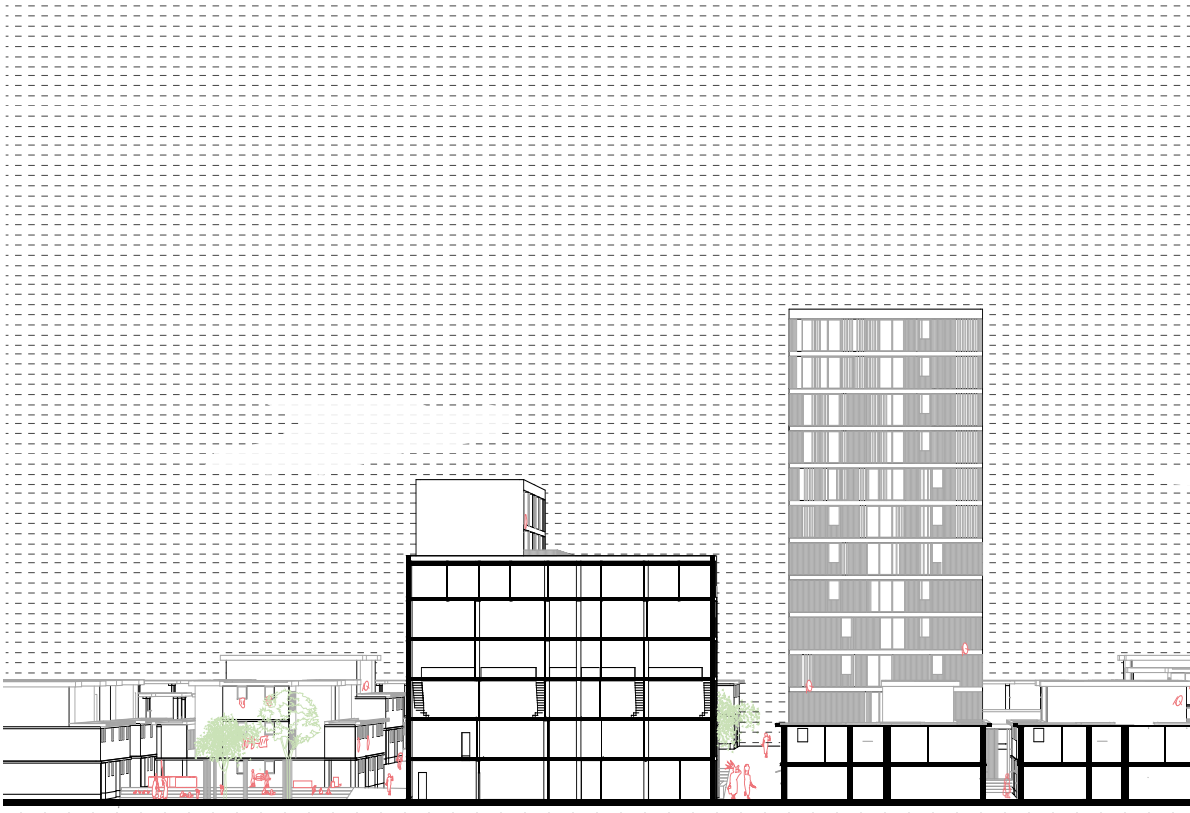


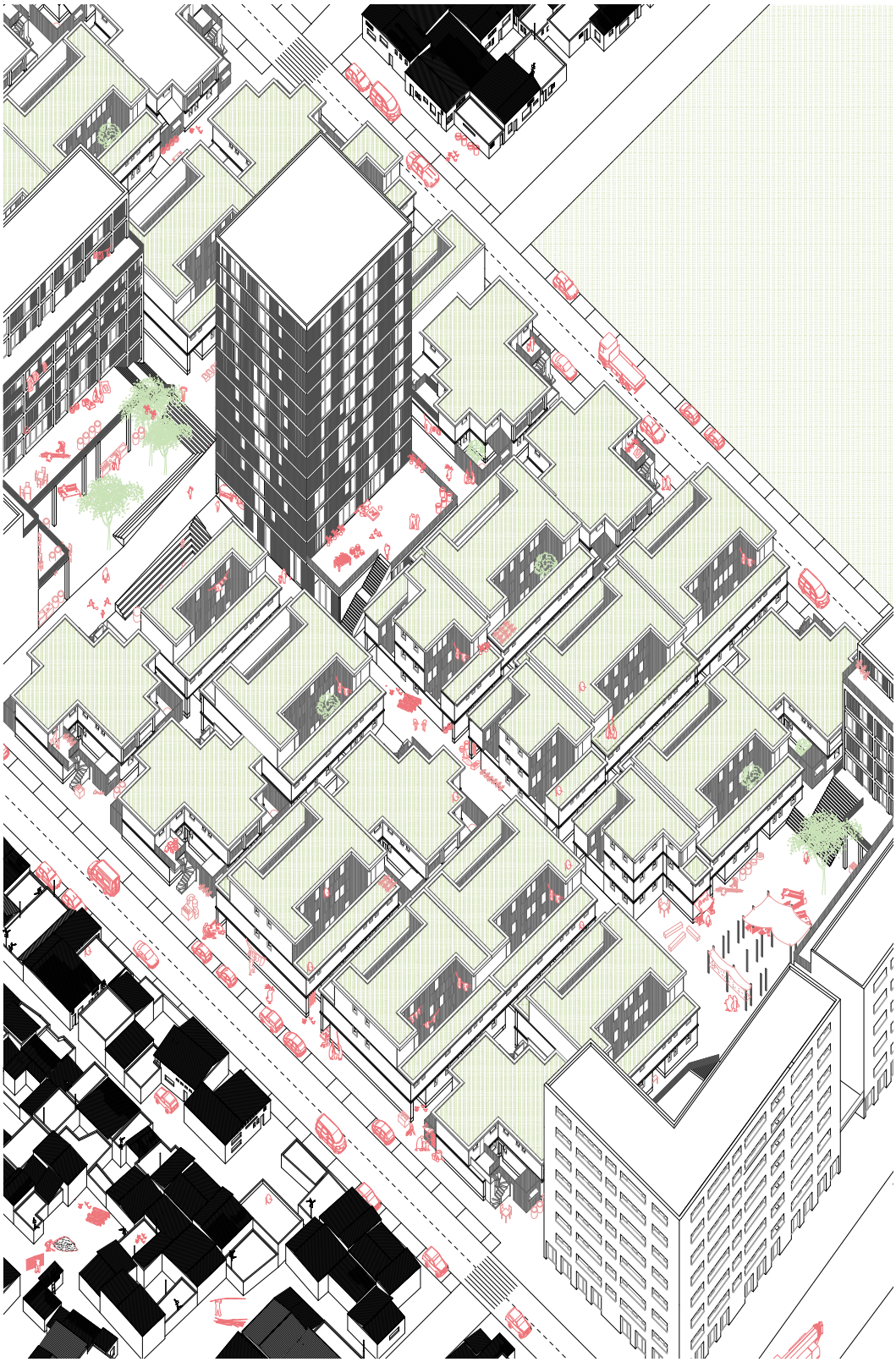
Current density in Kirkos: 150 u/ha
Condominium density: 175-300 u/ha
Intervention density 260 u/ha

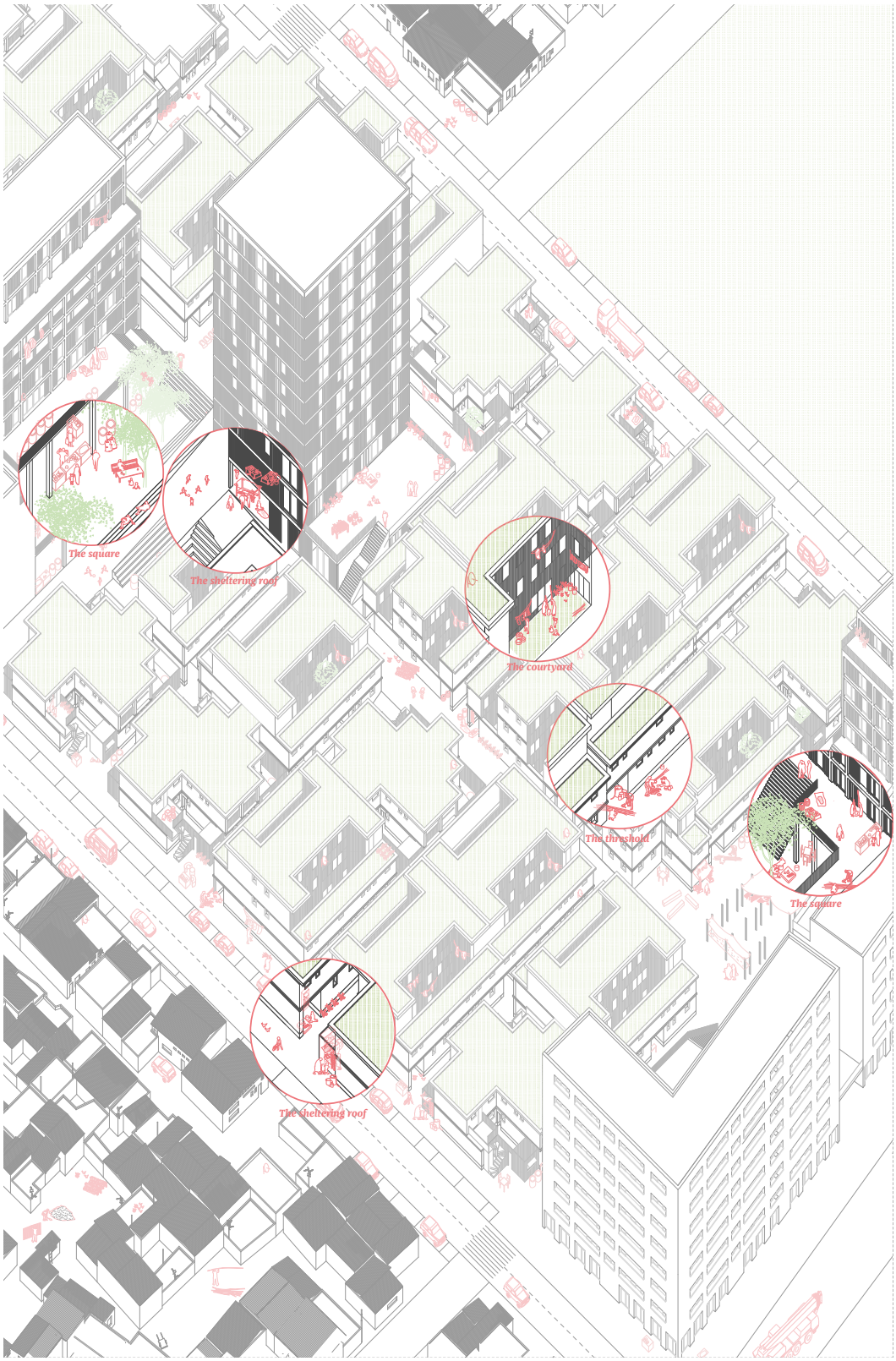

+3.00 m
+2.00 m
+2.00
+1.00 m
+0.00 m

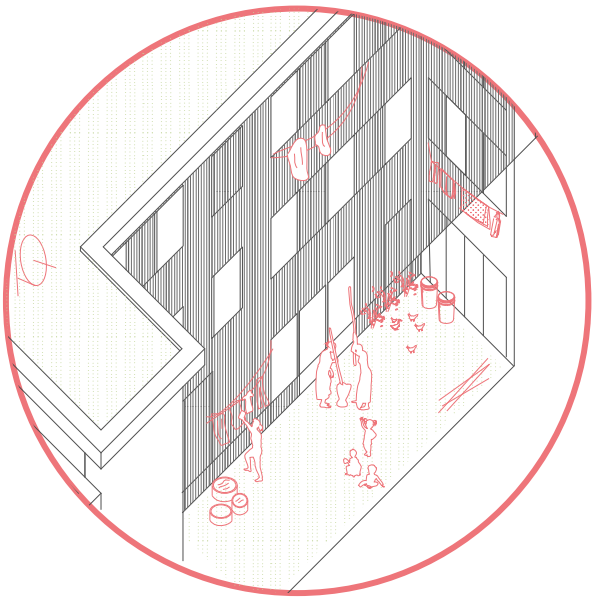
Ground floor interface

Ground floor plan

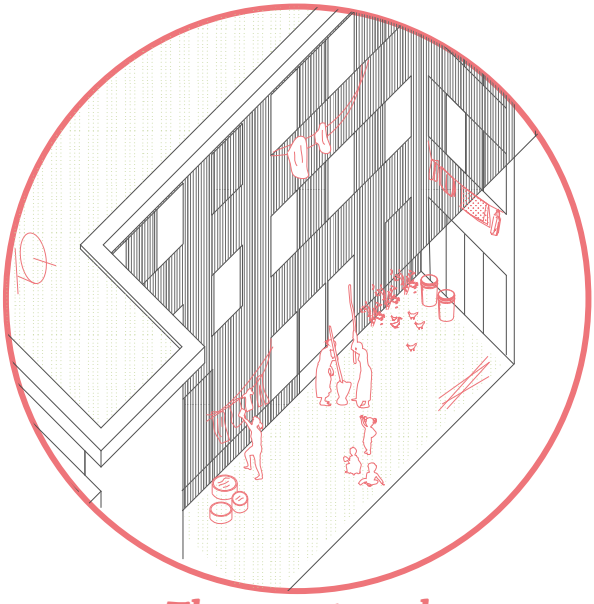




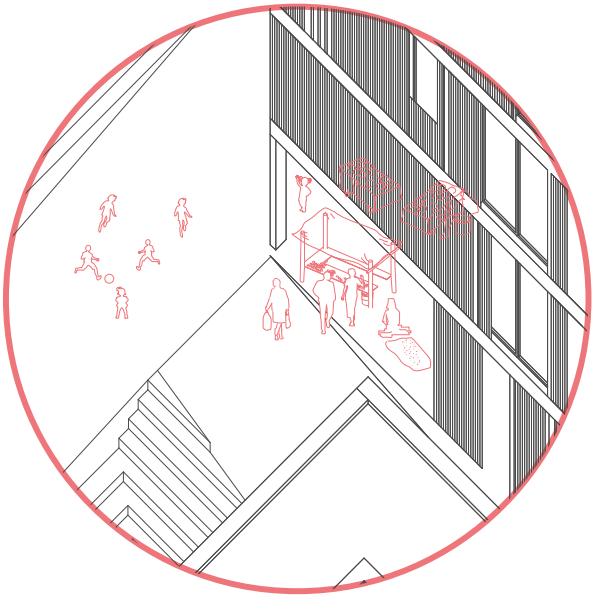

The square
The sheltering roof
The courtyard
The threshold
The square
The sheltering roof



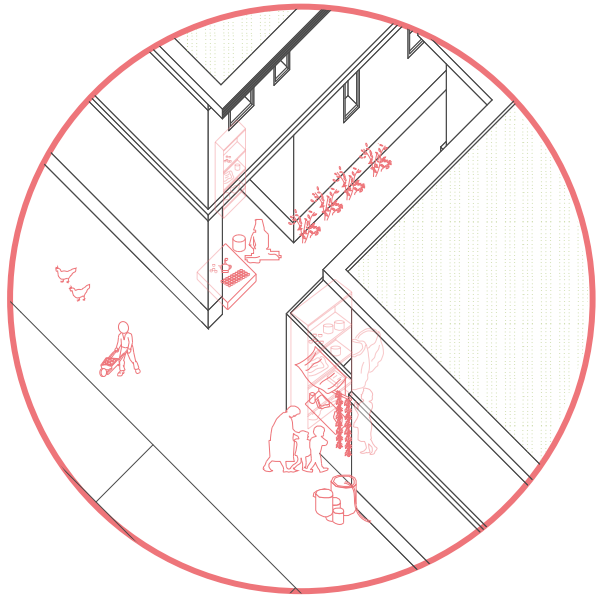
The courtyard



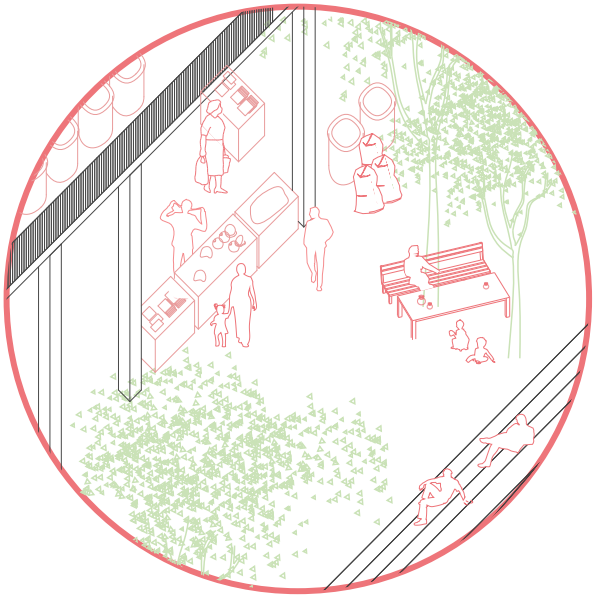
The courtyard



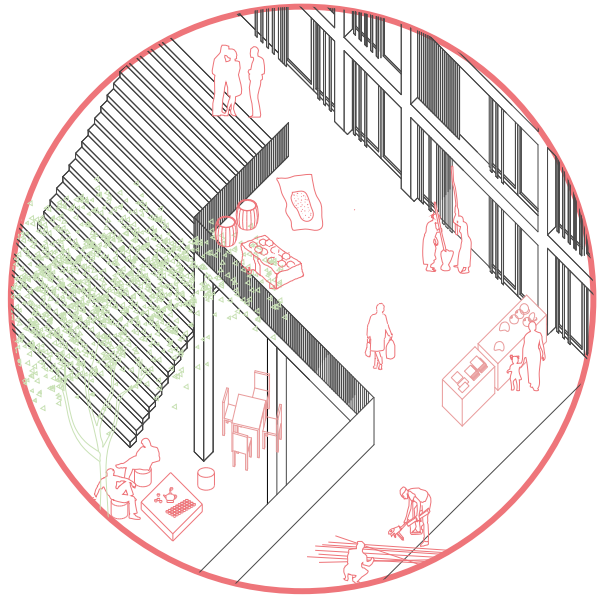
The sheltering roof



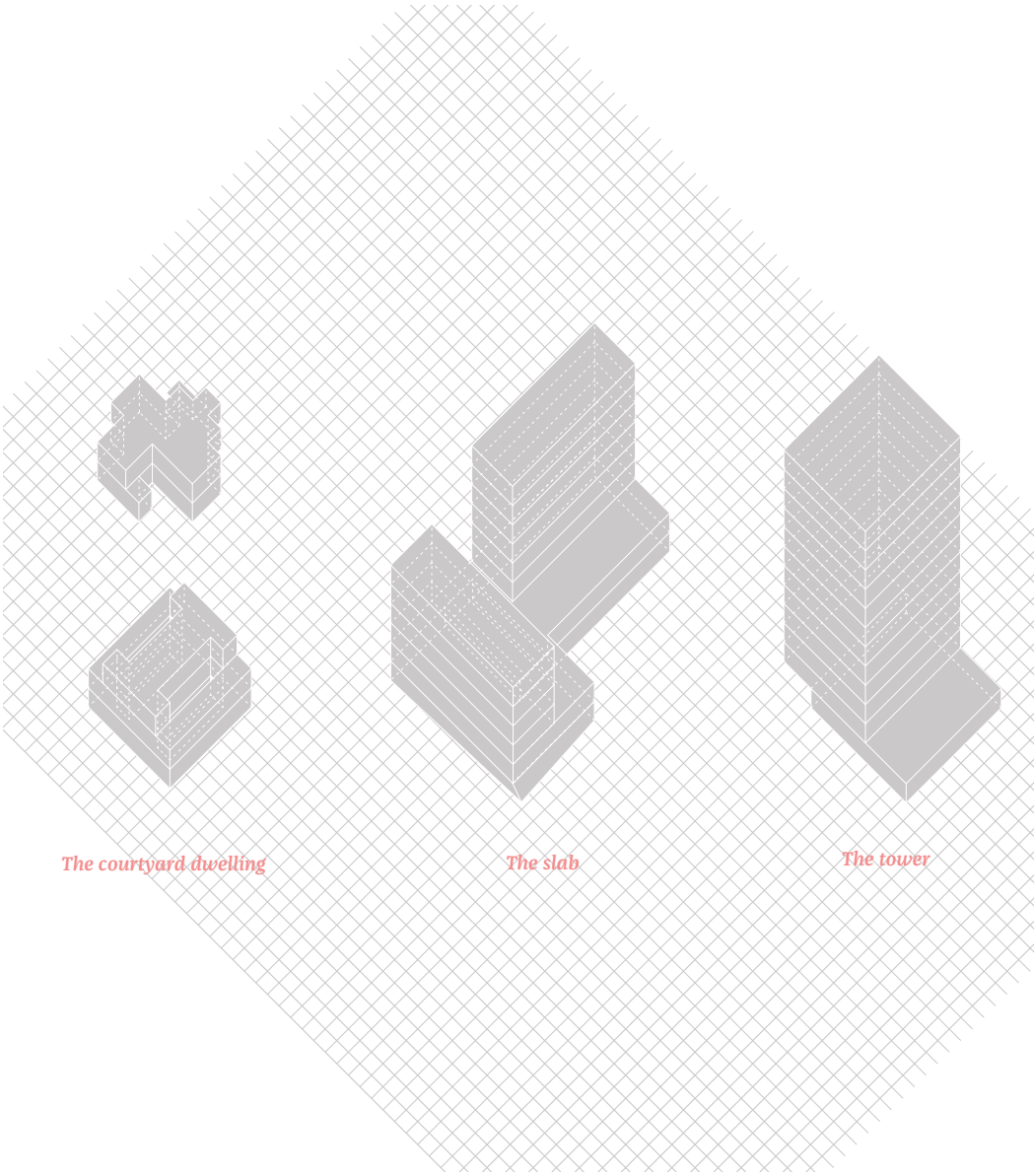
The sheltering roof



The square



The square

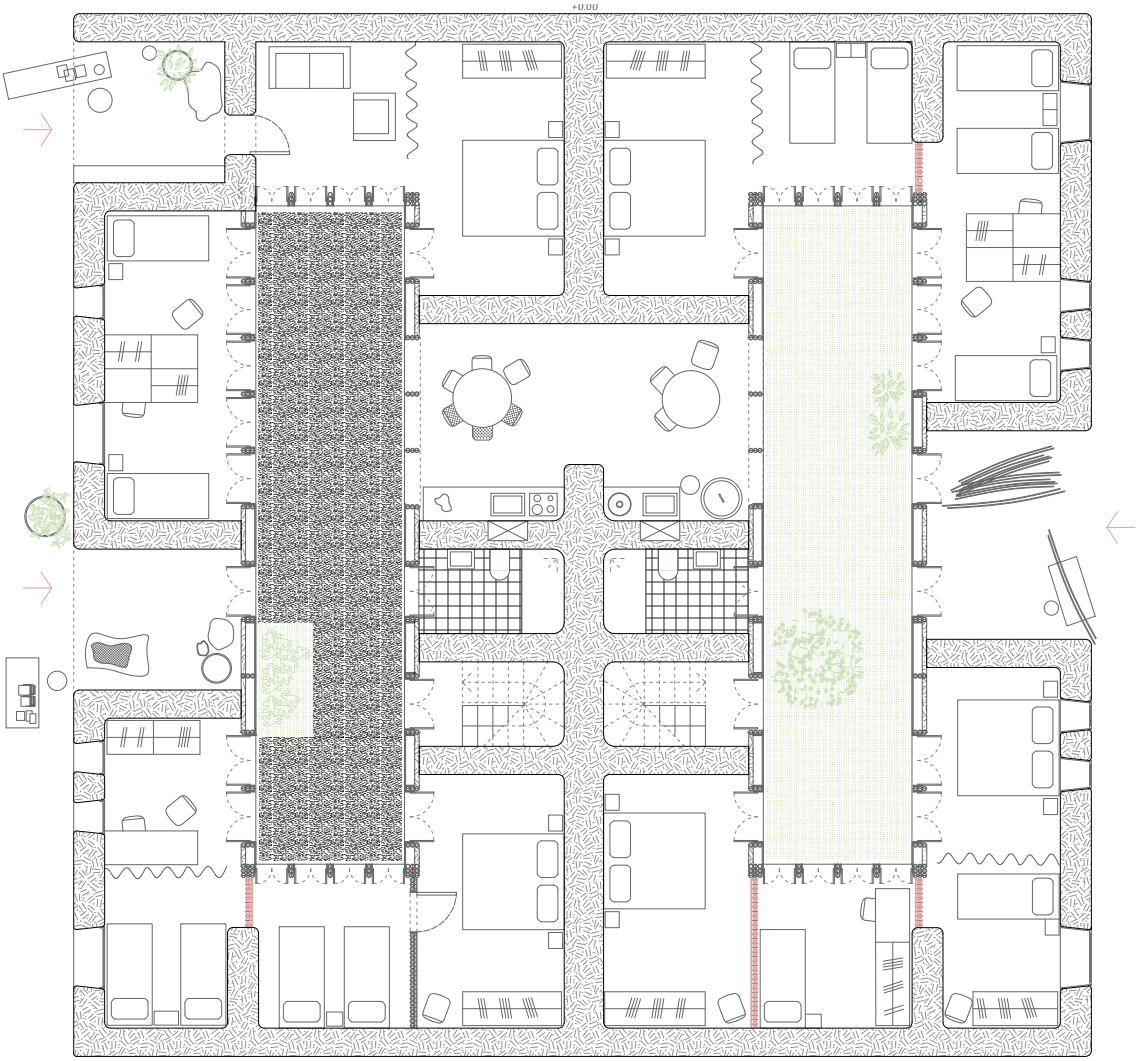


The courtyard dwelling

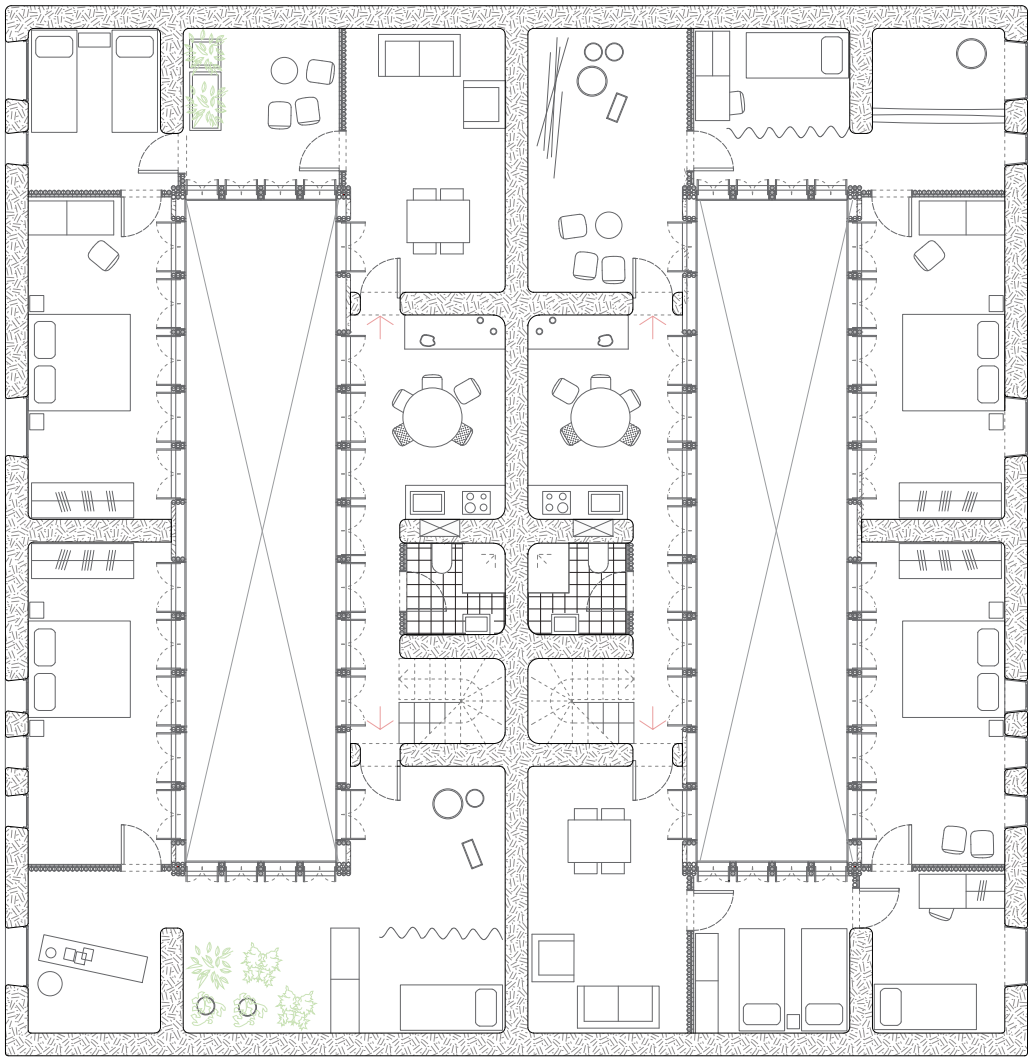
The slab

The tower

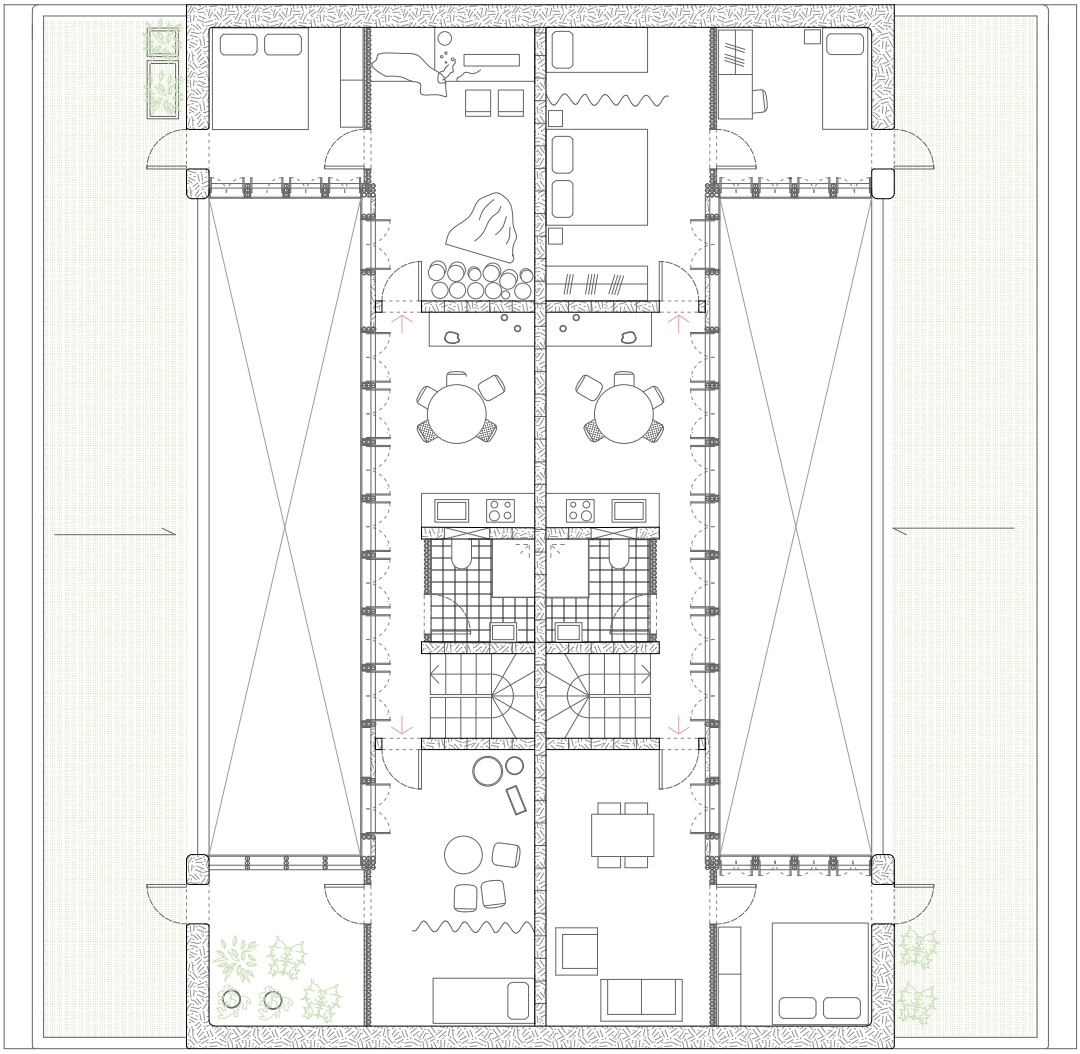

Public amenities
Low-income group
Middle-income group
Upper-middel-income group



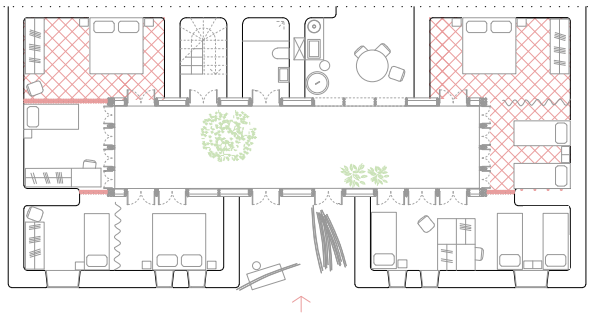
Low-income group typology
12 private houses (max 35 sqm),
shared courtyard, bathroom and kitchen
+0.00



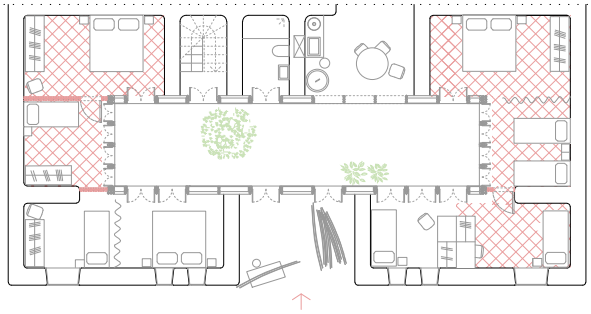
+3.00



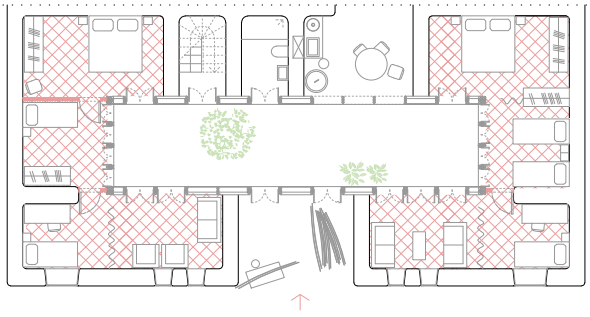
+6.00



TWO households + THREE rentable rooms

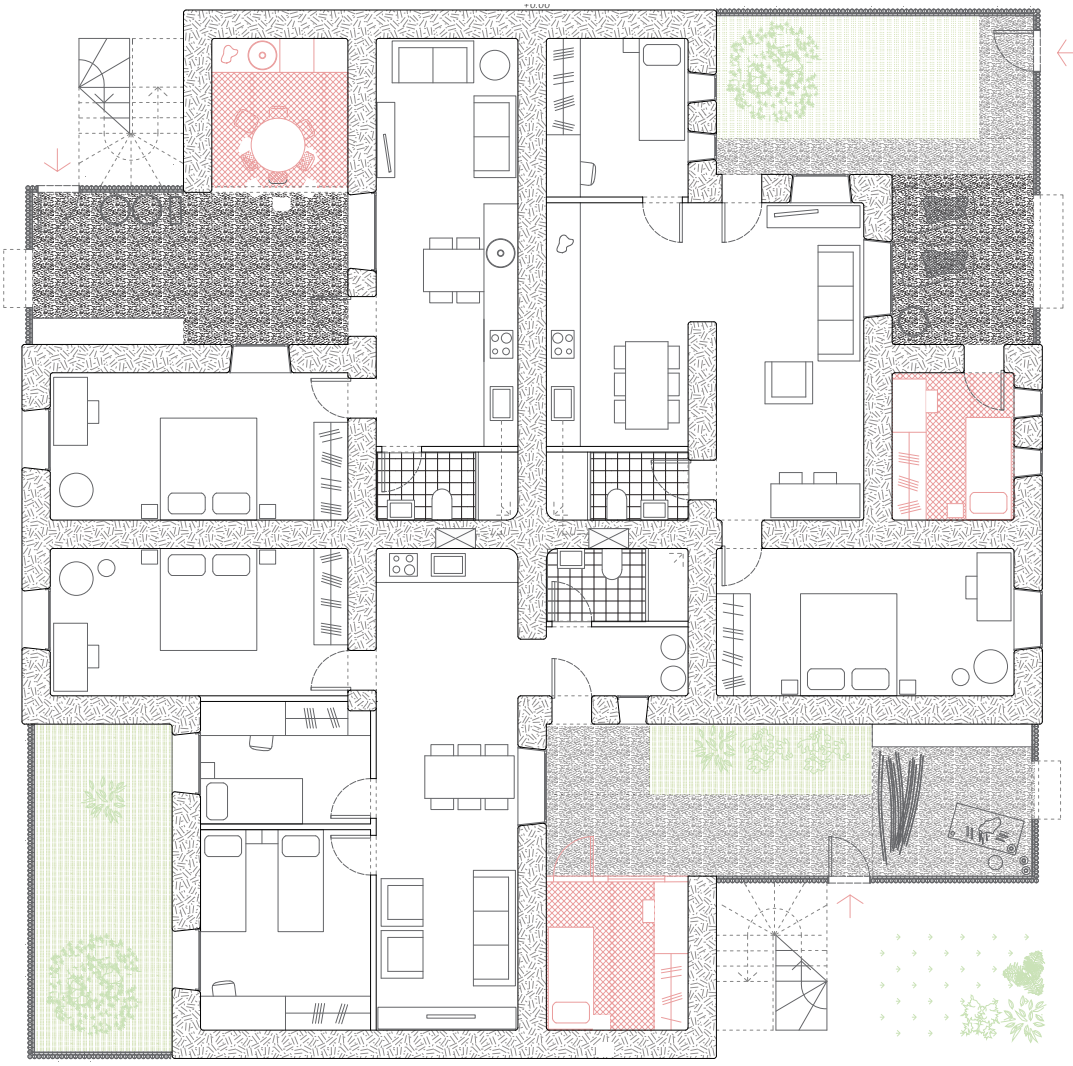


TWO main households + TWO rentable rooms



TWO households

About polivalency

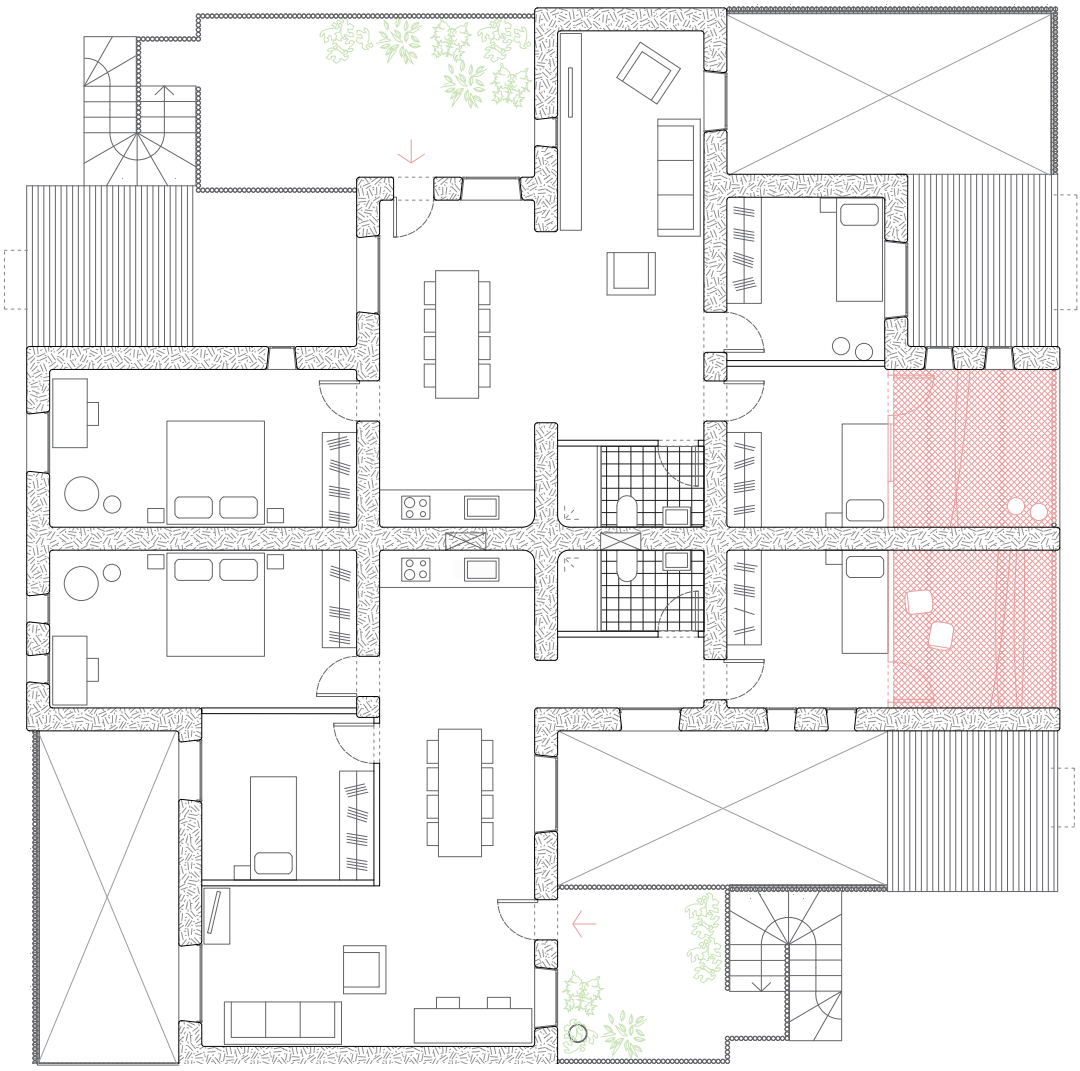


Middle/High-income group typology

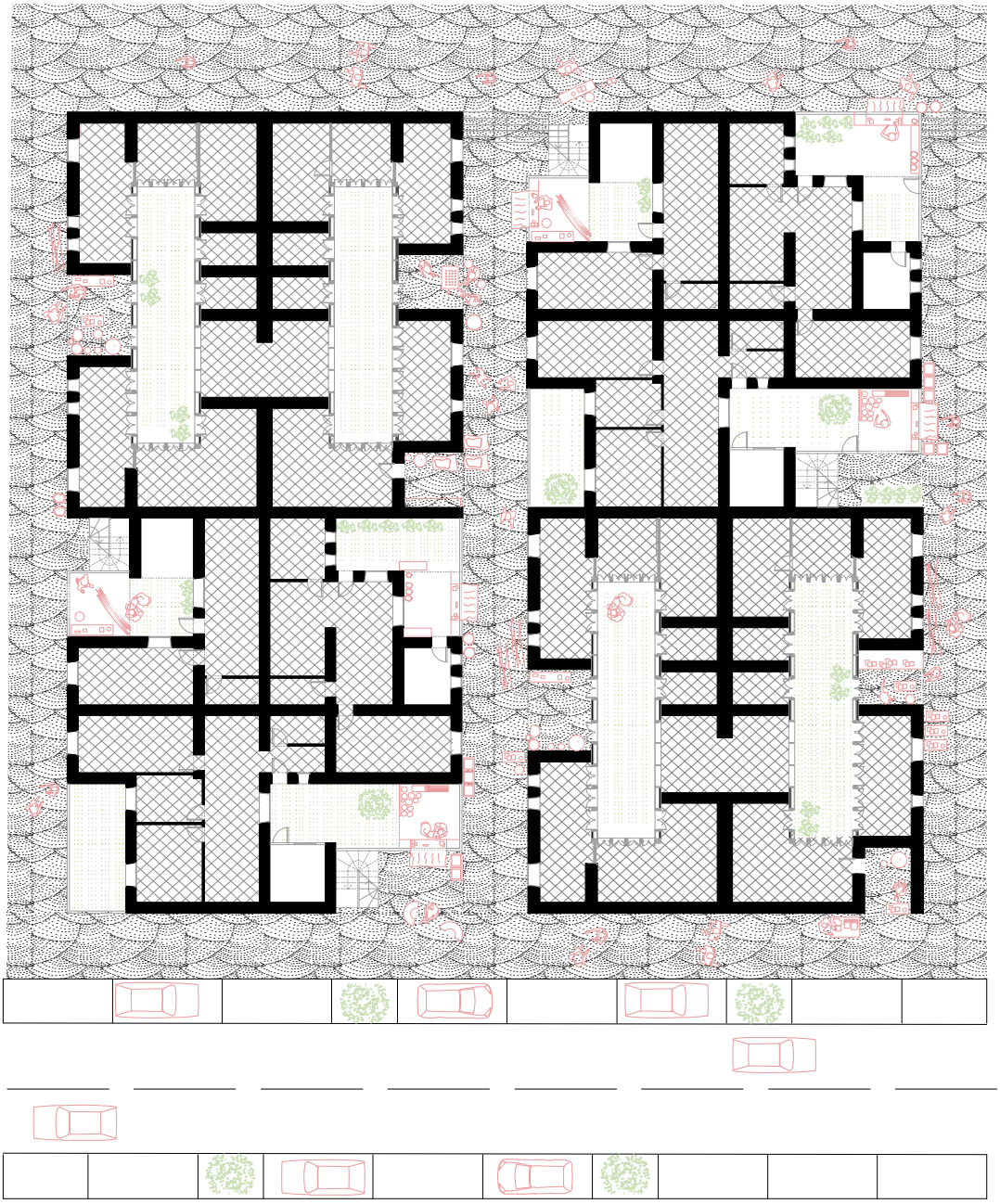
5 private courtyard houses

(40 to 100 sqm) ,

+0.00

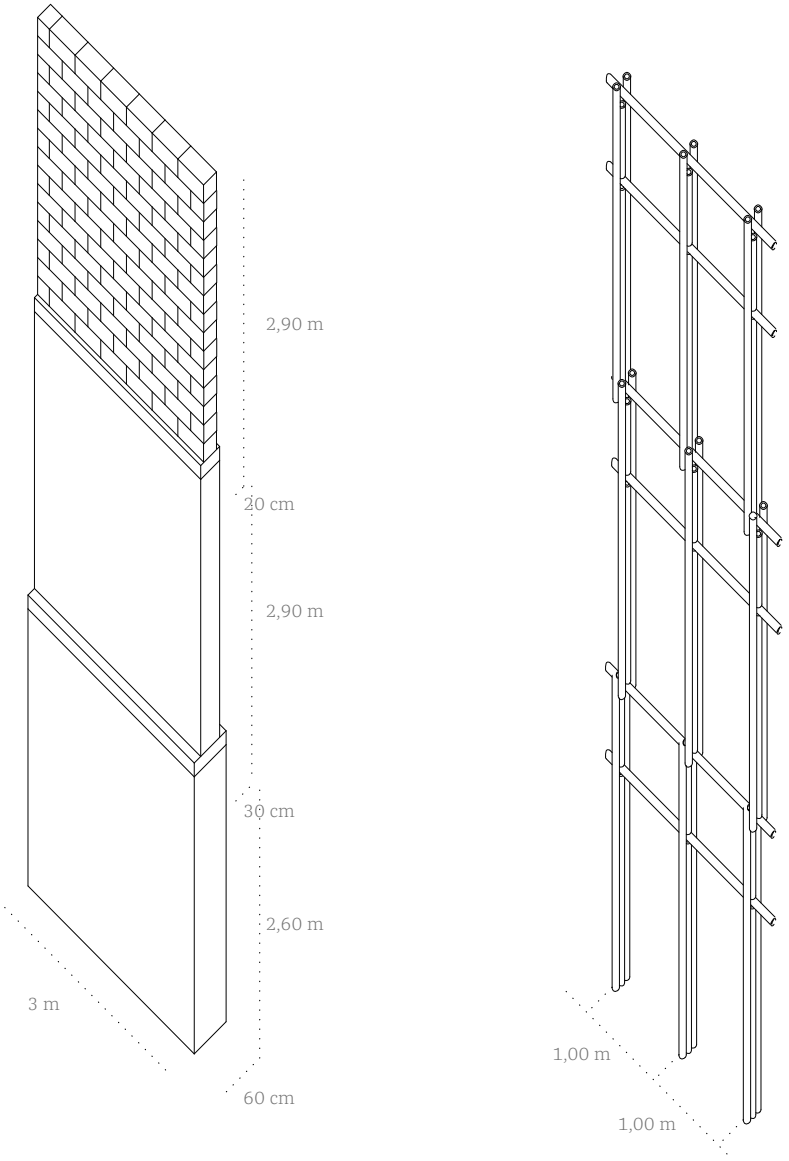


+3.00



.Materialization.

A number of East African countries import building materials, making construction expensive and often unaffordable for many local people. Alternatively, local resources have been relatively ignored as a sustainable building material. In this project the focus lays on two environmental friendly alternatives suitable for low-income groups: earth and bamboo. One of the major problems in promoting these as a building material is lack of awareness among government, researchers, builders and local communities and also the lack of skilled human resources and technical knowhow. The main aim of this design is to introduce and integrate these two local materials in order to promote a border range of construction and to implement a new business exploring local ready available resources.



Rammed earth walls and bamboo columns

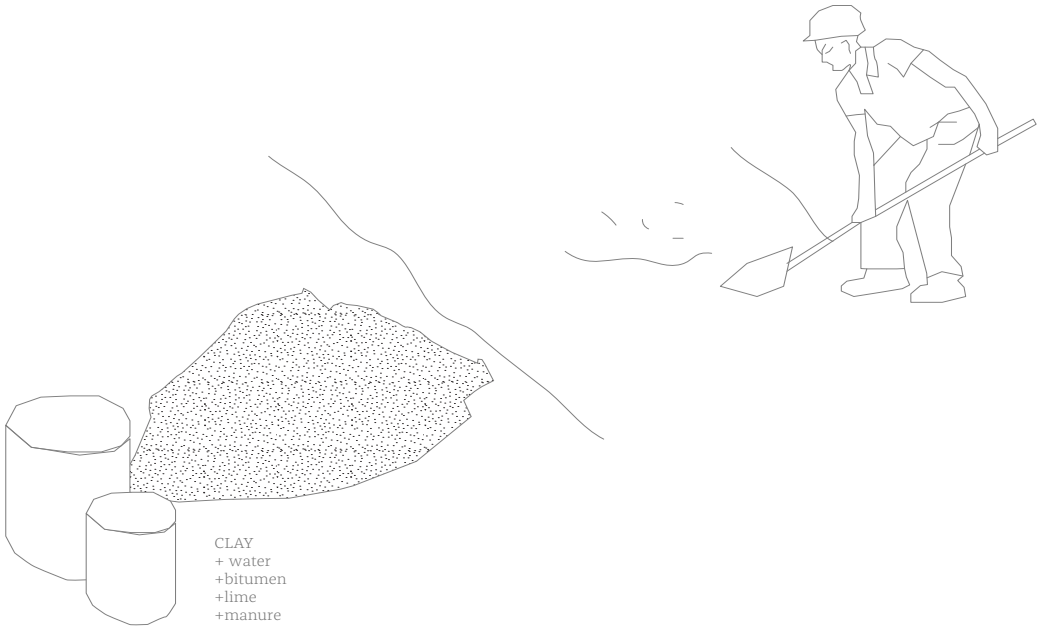
.Earth.

It is frequently obtained directly from the building site when excavating foundations or basements,. Indeed, Ethiopia has a rich soil with high levels of clay particles. Most soils do not function as construction material only by mixing them with water. To remedy this issue a binder has to be added to the mixture. As binders different kinds of grass and straw (teff) can be used as well as others, like cow dung or material gained form termite-heaps.

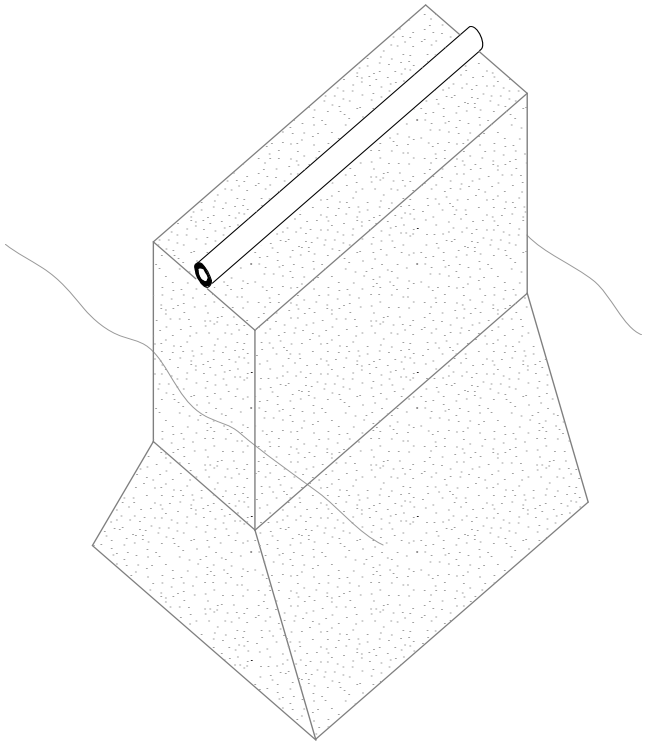
Advantages:
-Ready available
-Balancing air humidity
-Balancing indoor climate thanks to its thermal masses
-Low in cost
-Low energy input. The production requires very low energy input which makes the material environmental friendly.

Disadvantages:
-Not a standardised building material, depending on the site

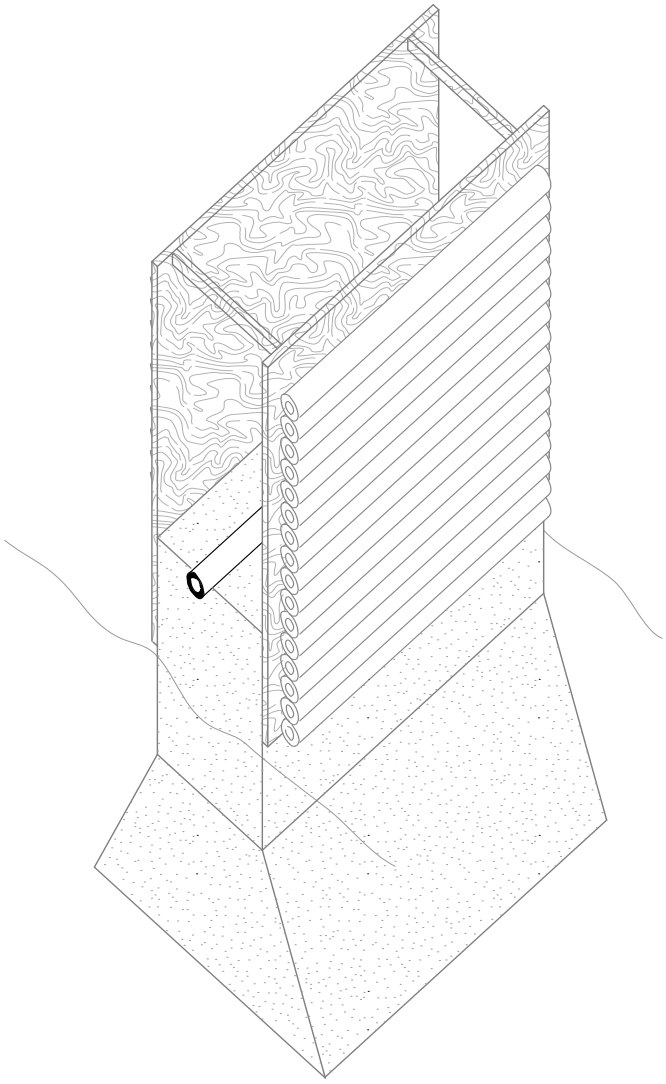
-Poor water resist. It's necessary the addition of stabilisers as cement, bitumen and animal products or the protection thought overhang or water repellent. Moreover, against the rising humidity proper concrete foundation should be built.
-Low in tensile strength. The tensile strength is poor but it is not a big problem since constructional solutions allow for such materials to be used.



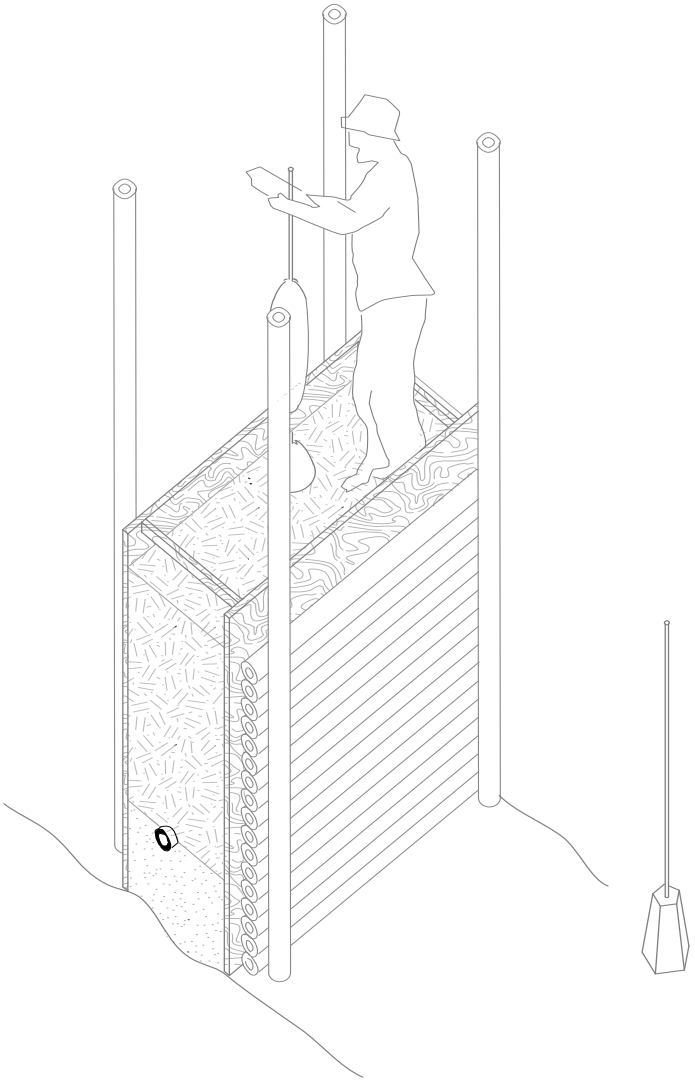
Digging and preparing the soil
Making few samples, testig various ratios to find the best mix



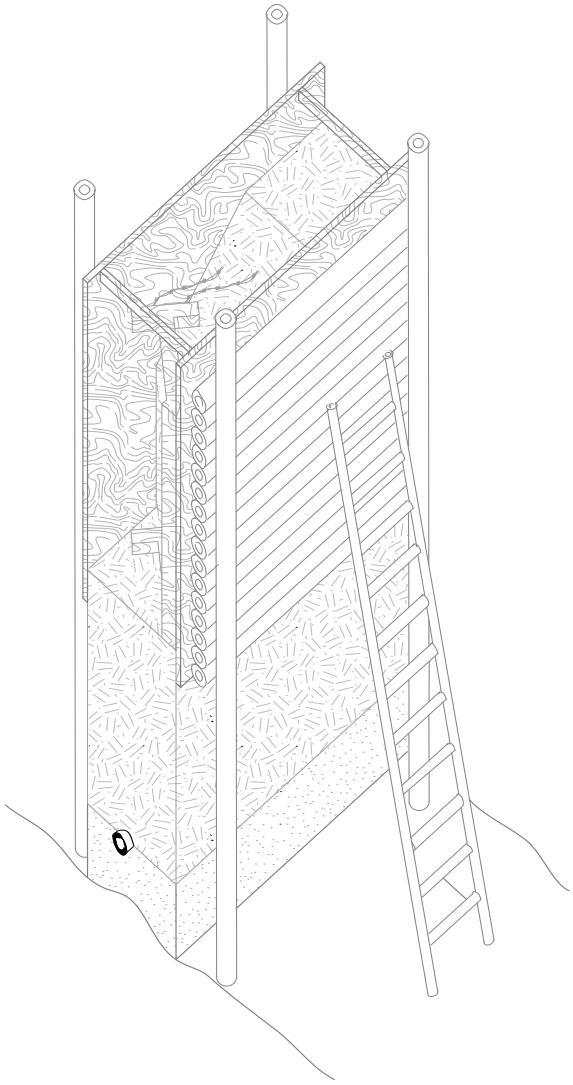
Building the concrete foundation



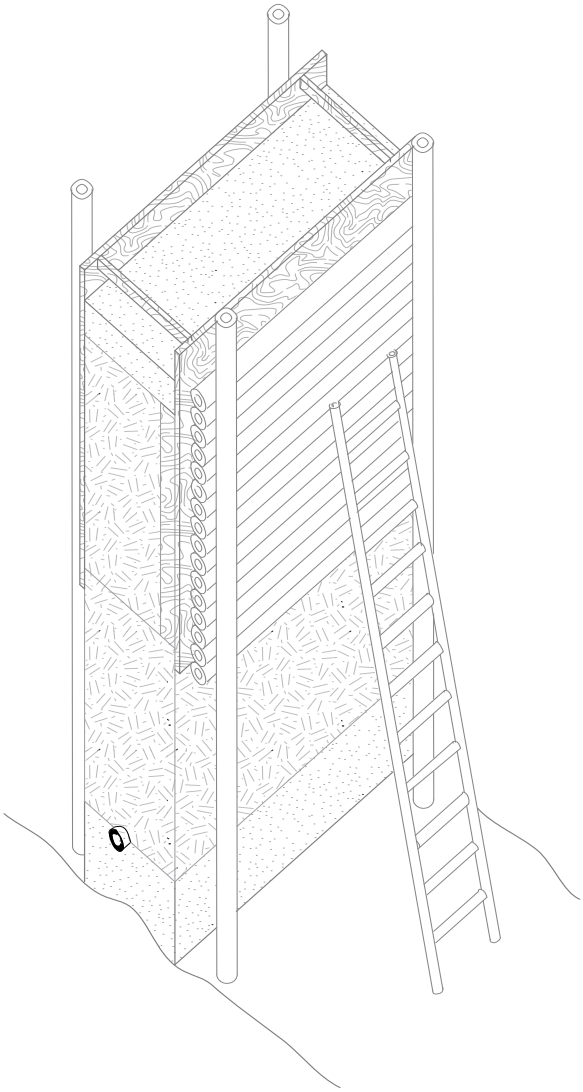
Preparing the formwork with the bamboo that then can be recycled into roofing and flooring



Ramming the earth



Ramming the second layer of earth, providing the bamboo laminated frame for the window



Building the ring concrete beam

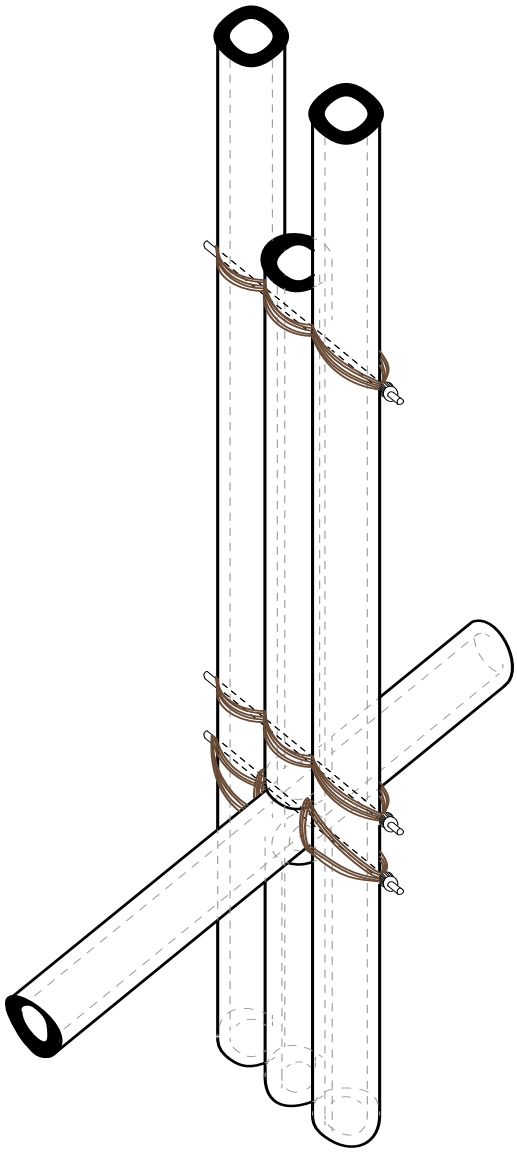
.Bamboo.

"If properly managed, this highly versatile resource could spur economic growth in a world export market valued at two billion dollars in 2011, reduce deforestation and cut carbon emissions."
INBAR director general J. Coosje Hoogendoorn told IPS.

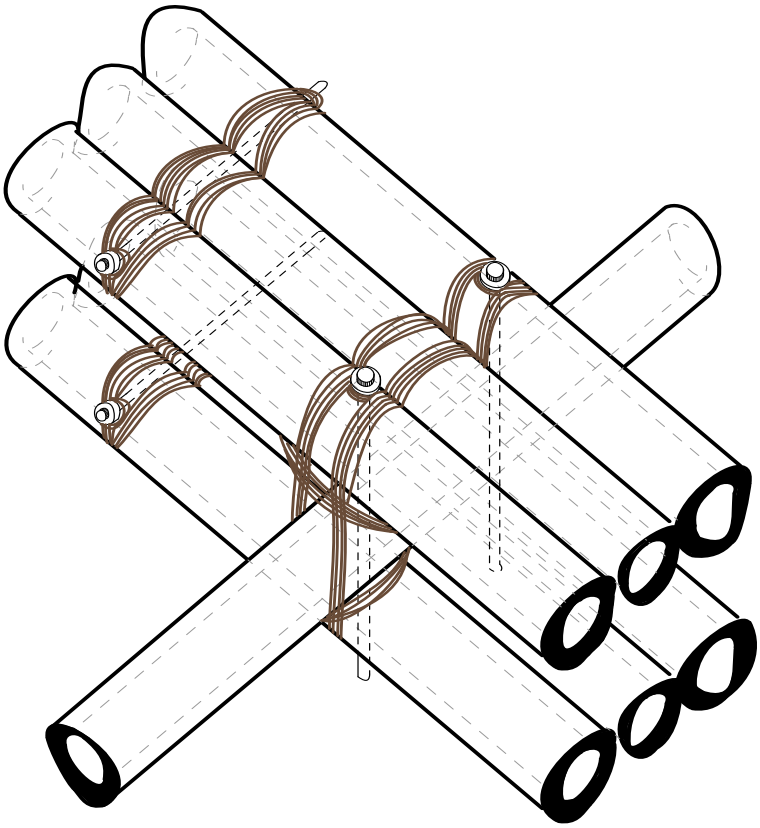
The rational for the application of bamboo comes from its abundance throughout the country, Ethiopia has the largest natural bamboo forests and bamboo growing area in Africa. However, the Ministry of Agriculture and Rural Development were unwilling to disclose any figures on the bamboo economy, but added that there had been no formal bamboo economy in Ethiopia until 2012. Although this material is currently under utilised, there is great potential for this vast resource in large-scale commercial applications that could benefit millions of dwellers.
Two indigenous species of bamboo, Oxytenanthera abyssinica (lowland bamboo) and Yushane alpine (highland bamboo), grow in the south-west,

south and central parts of Ethiopia in an area close to 4,000 square miles. Due to the lack of sufficient rainfall the eastern part of the country does not support bamboo habitation. Oxytenanthera abyssinica grows up to 20 feet in length and 2 inches in diameter, while Yushane alpine can reach up to 60 feet high and 4 inches in diameter. Of the total consumption of bamboo in Ethiopia, only 15% Oxytenanthera abyssinica and 20% of Yushane alpine is used for construction.

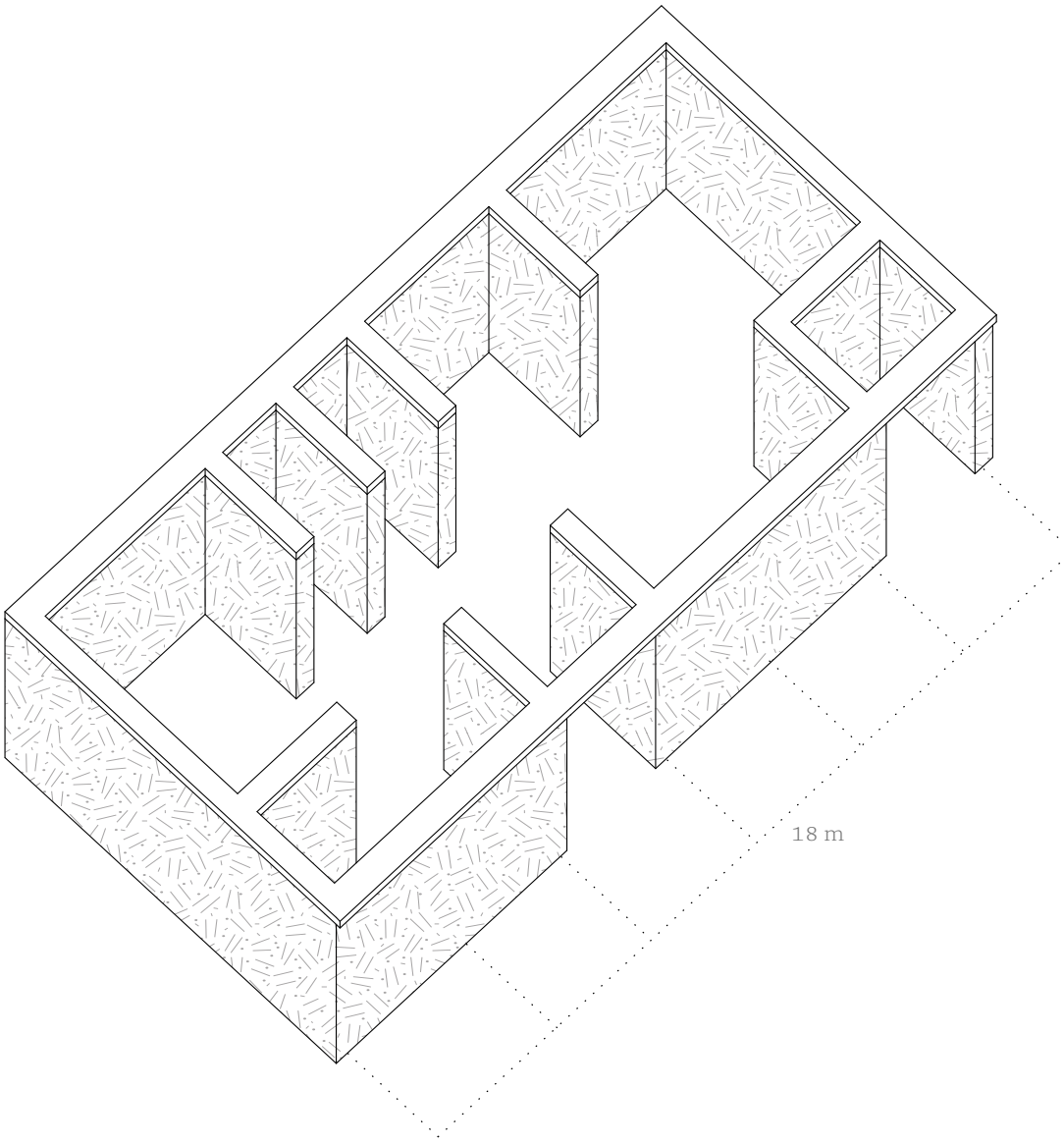
A feasibility study on the bamboo housing sector in Ethiopia was carried out by INBAR (International Network for bamboo and Rattan) in order to asses bamboo's potential to meet regional housing needs in a low-cost, eco-friendly manner.
It was found that lowland bamboos are not applicable for processing bamboo panels. However, highland bamboos can be used as structural elements and also to produce laminated lumber and plywood with properties that are better than Moso bamboo, the most commonly used species for making bamboo plywood and curtain laminated lumber products in China.
In Ethiopia, after the processing centre becomes operational in 2012, the Addis Ababa Housing Authority has already agreed to use bamboo plywood panels as wall partitions for Government urban condominium developments that target low-income households. This means there is a direct link to the market and the panels can enter the formal housing sector. A factory, with a capacity of 2000m3 bamboo panels per year, can directly employ more than 100 people and provide indirect employment to at least 500 families by involving them in the production chain.



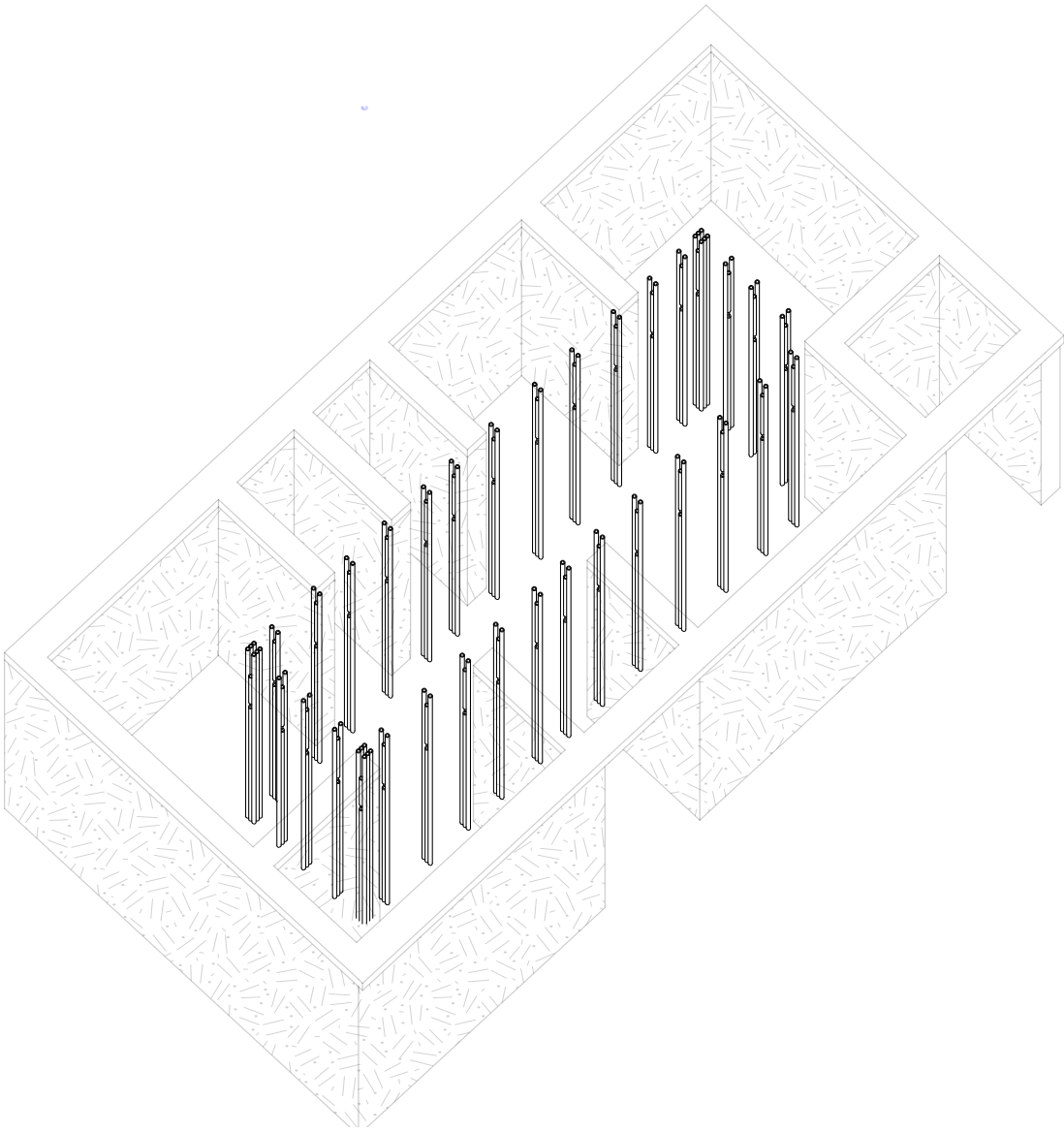
Bamboo columns and beamfixed with screw and ropes



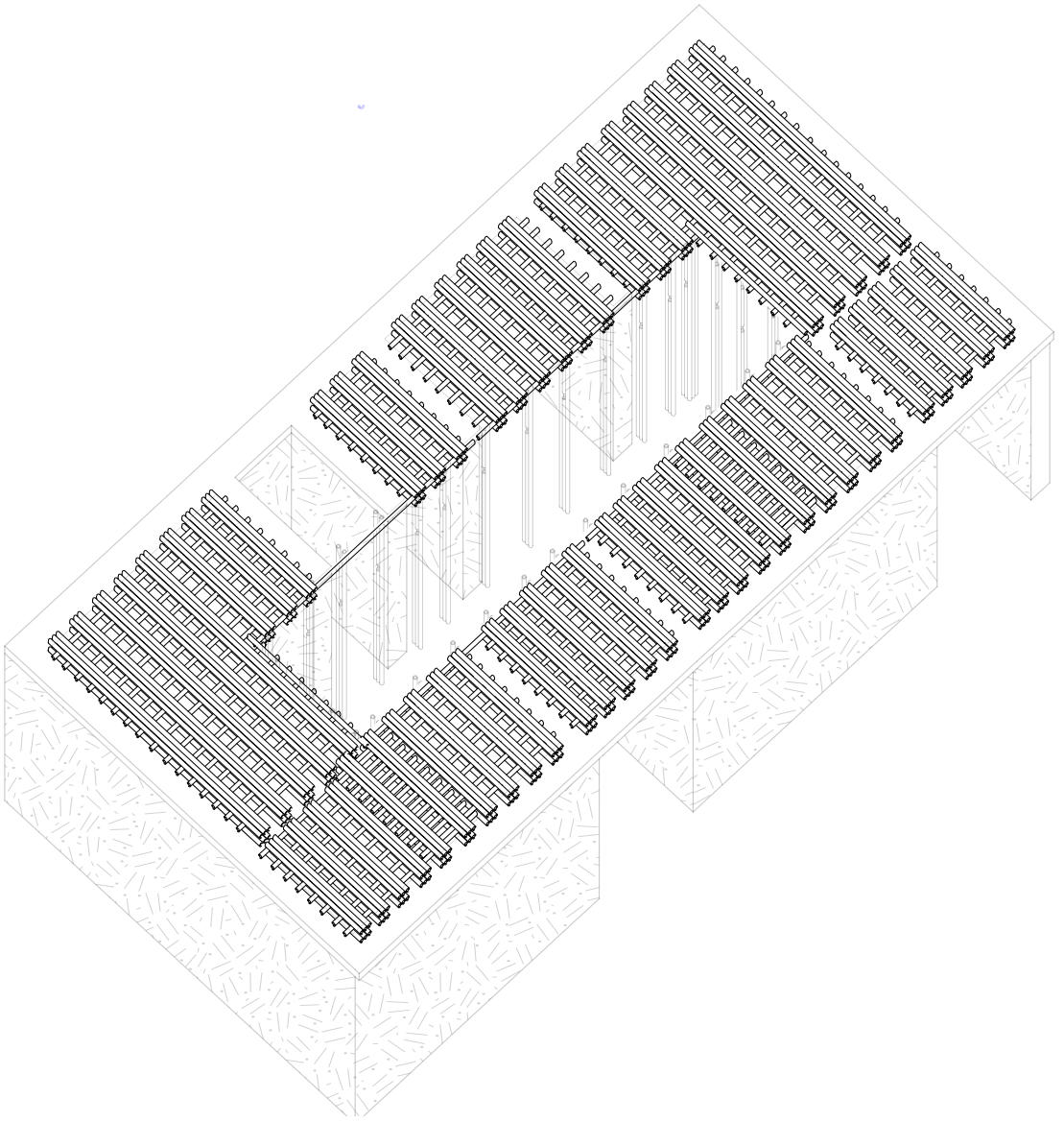
Three layer of bamboo flooring fixed with screw and ropes



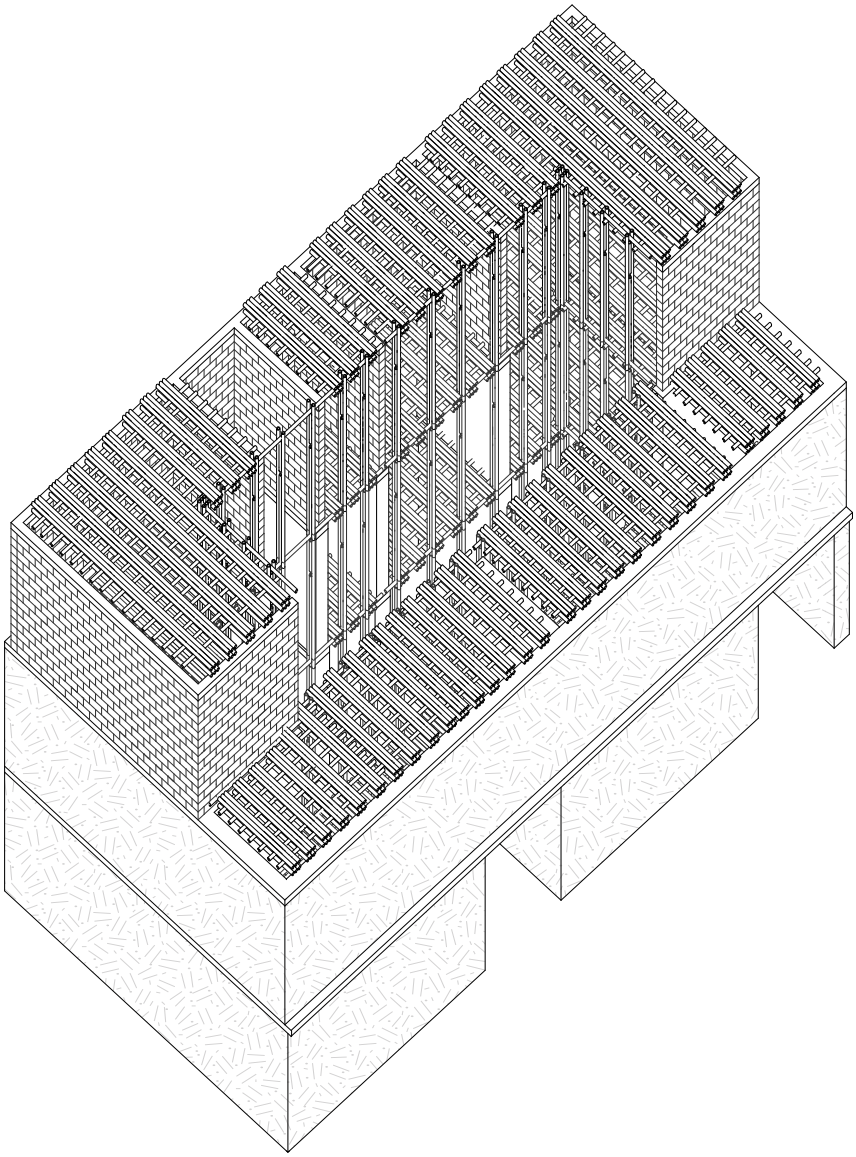
Load-bearing structure_rammed earth



Inner structure_Bamboo columns



Floor structure_Three layers of bamboo



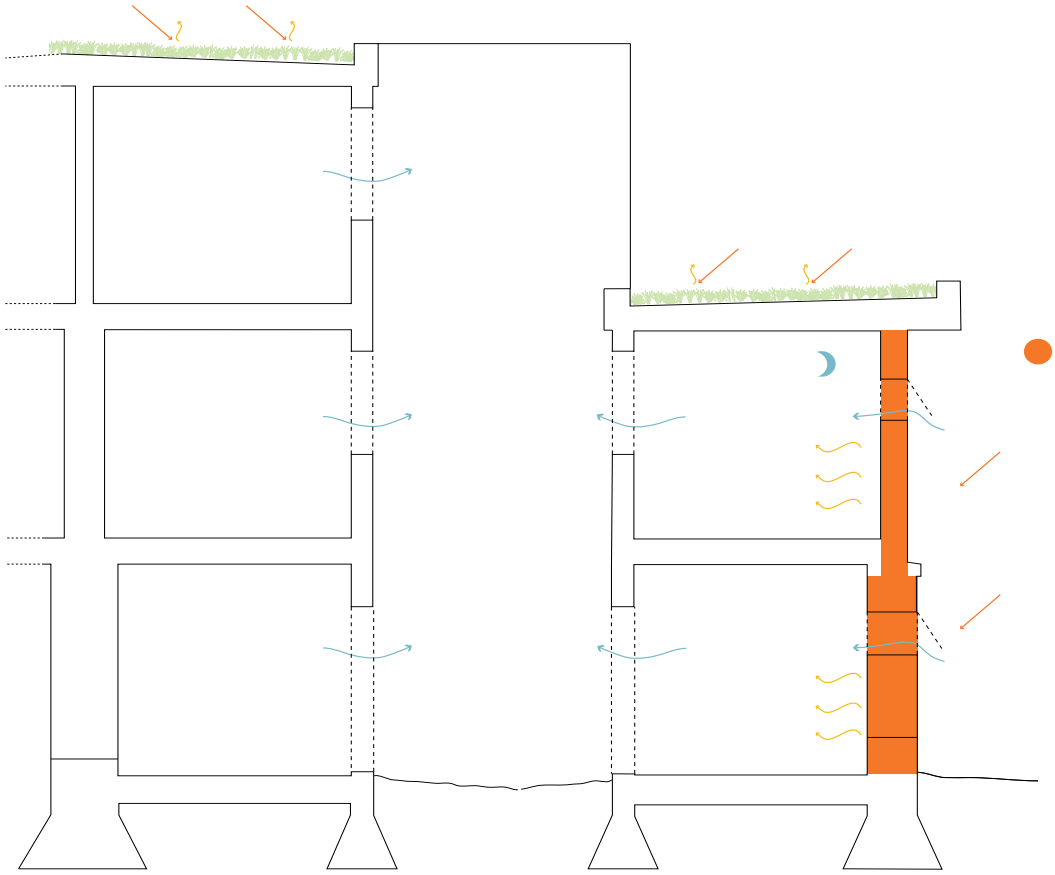
Complete structure

.Climate design.

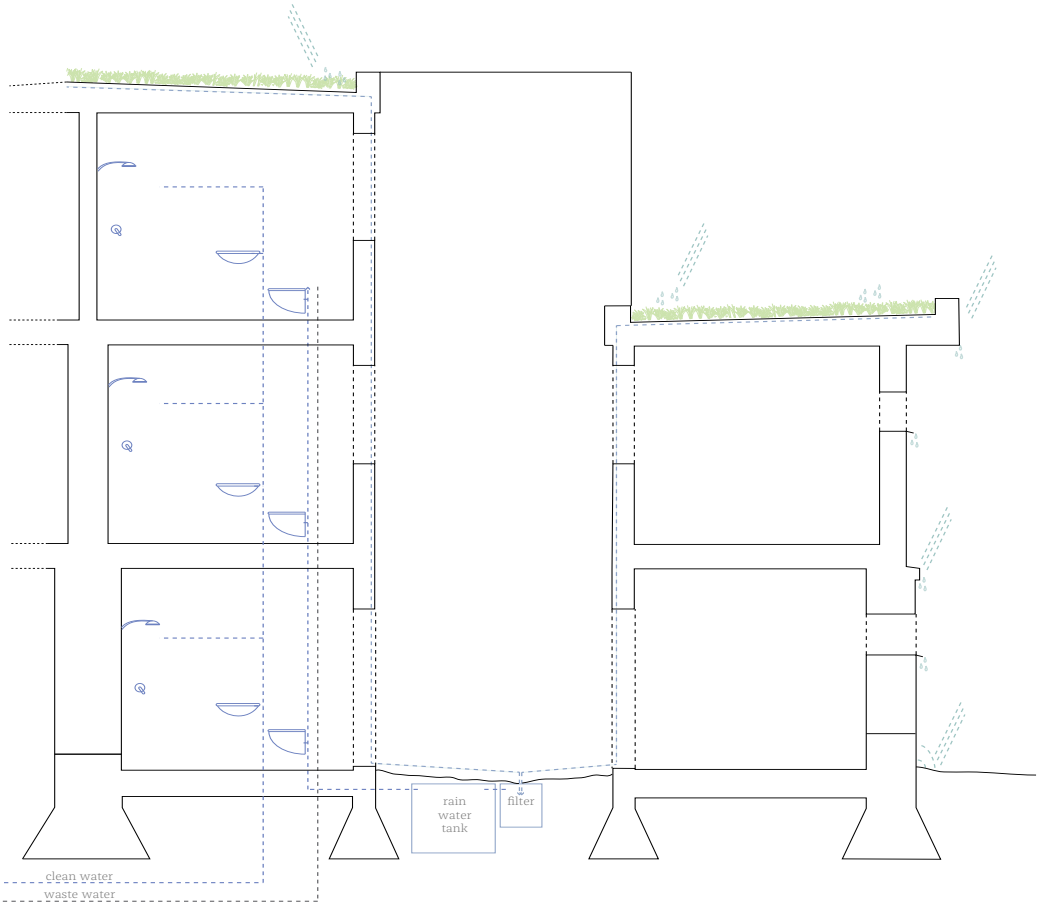
Due to the minor seasonal fluctuation of outdoor temperature, the average is between 15_20° throughout the year, natural ventilation can be used for passive cooling. The main challenge is the daily temperature swing which can reach up to 29° in summer months (November-January) during the day and to 7° at night. For this reason the rammed earth, which behaves as heavyweight masonry with a high thermal mass, is a perfect material. Indeed its thermal mass absorbs or 'slows down' the passage of heat through a material and then releases that heat when the surrounding ambient temperature goes down.

To avoid overheating in the highest floor due to the radiation on the roof, a green has been applied. The greater insulation offered by this can easily moderate the temperature of a building, as roofs are the sight of the greatest heat loss in the winter and the hottest temperatures in the summer.
Furthermore, the green roof reduces the amount of stormwater runoff and

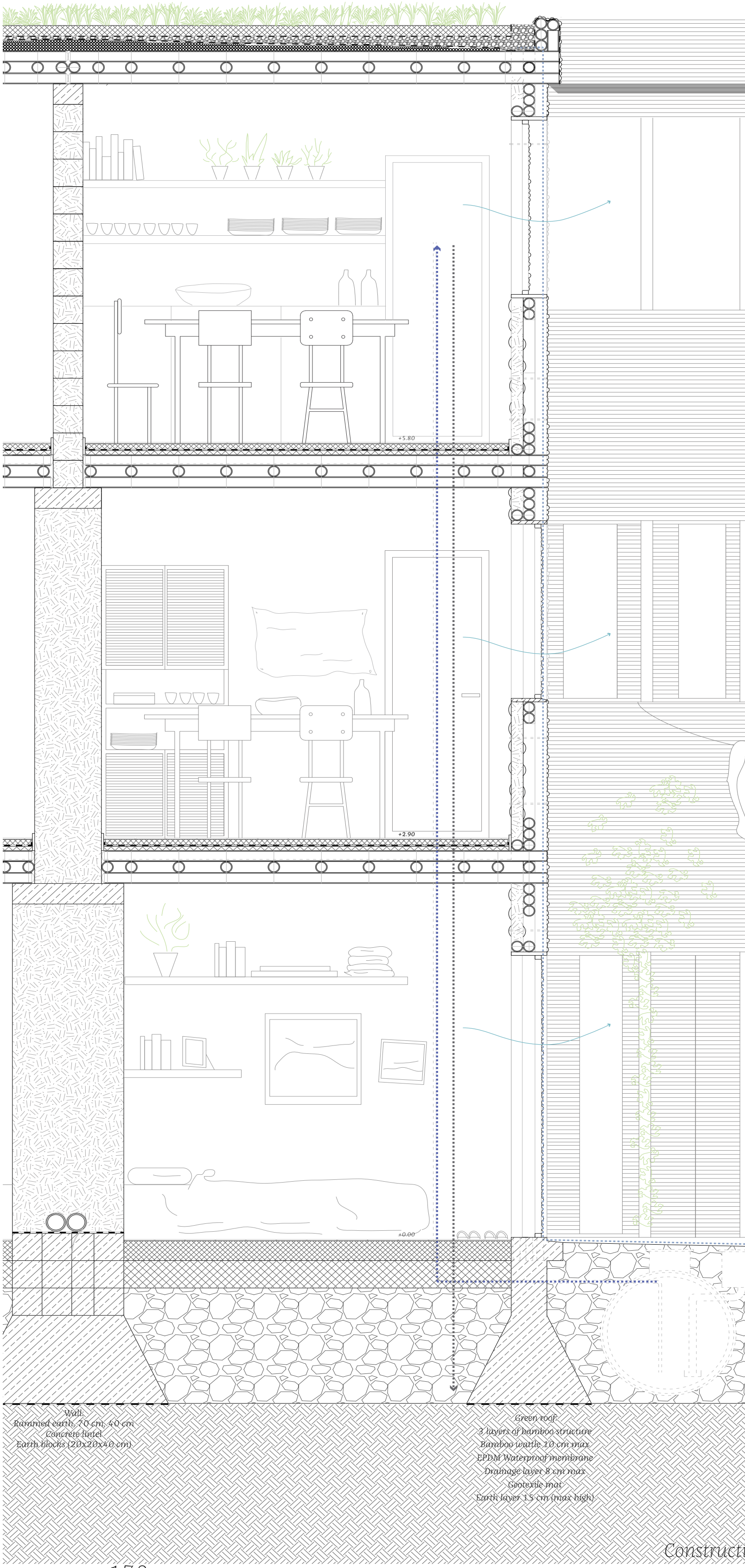
also delay the time at which runoff occurs, resulting in decreased stress on sewer systems at peak flow periods and decreasing the risk of flooding in the small courtyard during the rainy season. It not only retains rainwater, but also moderate the temperature of the water and act as natural filters for it in order to facilitate its depuration and reuse for toilets.
Finally, the green roof can also help reduce the distribution of dust and particulate matter throughout the city, as well as the production of smog. This can play a role in reducing greenhouse gas emissions and adapting urban areas to a future climate with warmer summers.

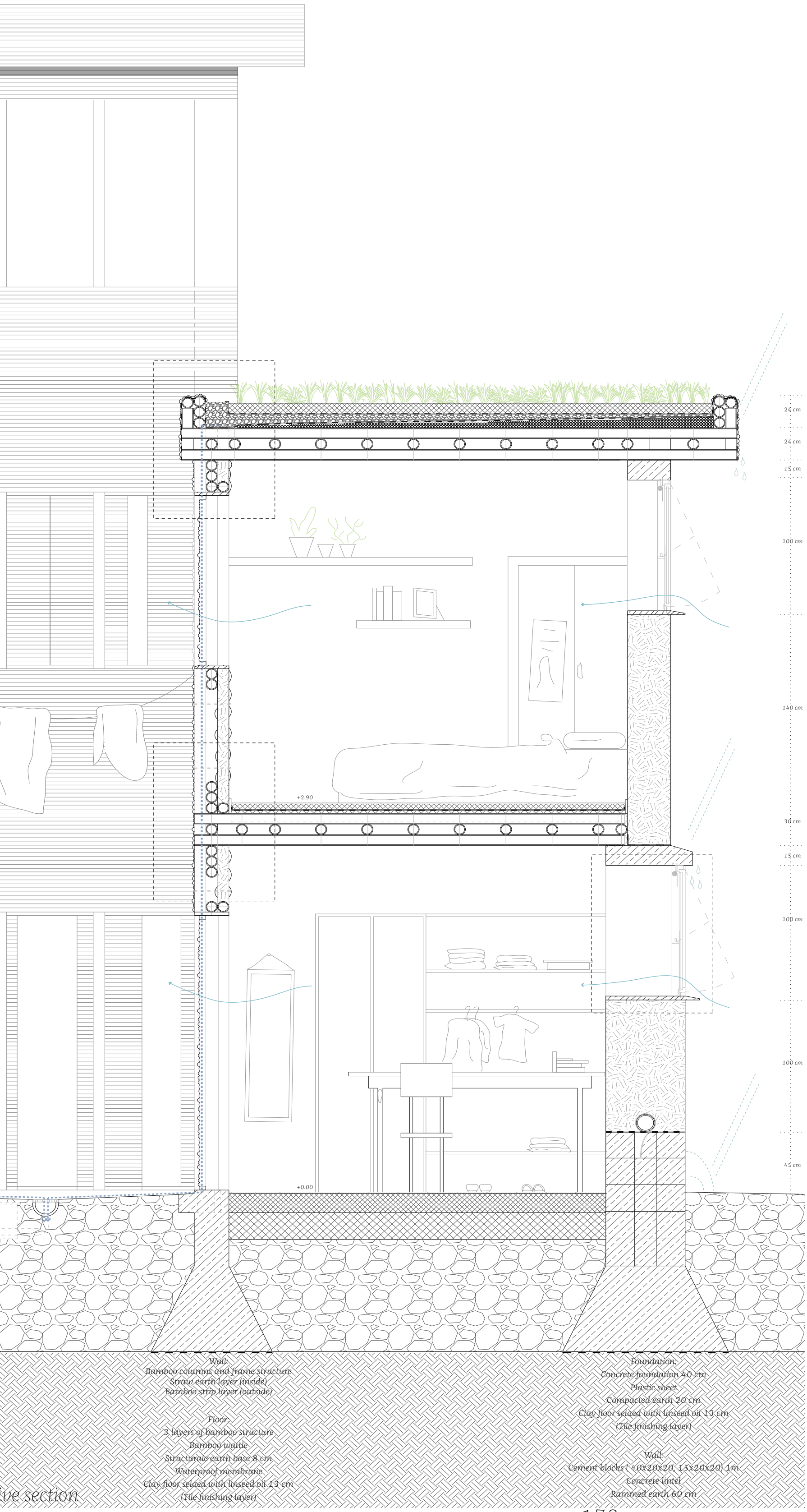


Indoor climate

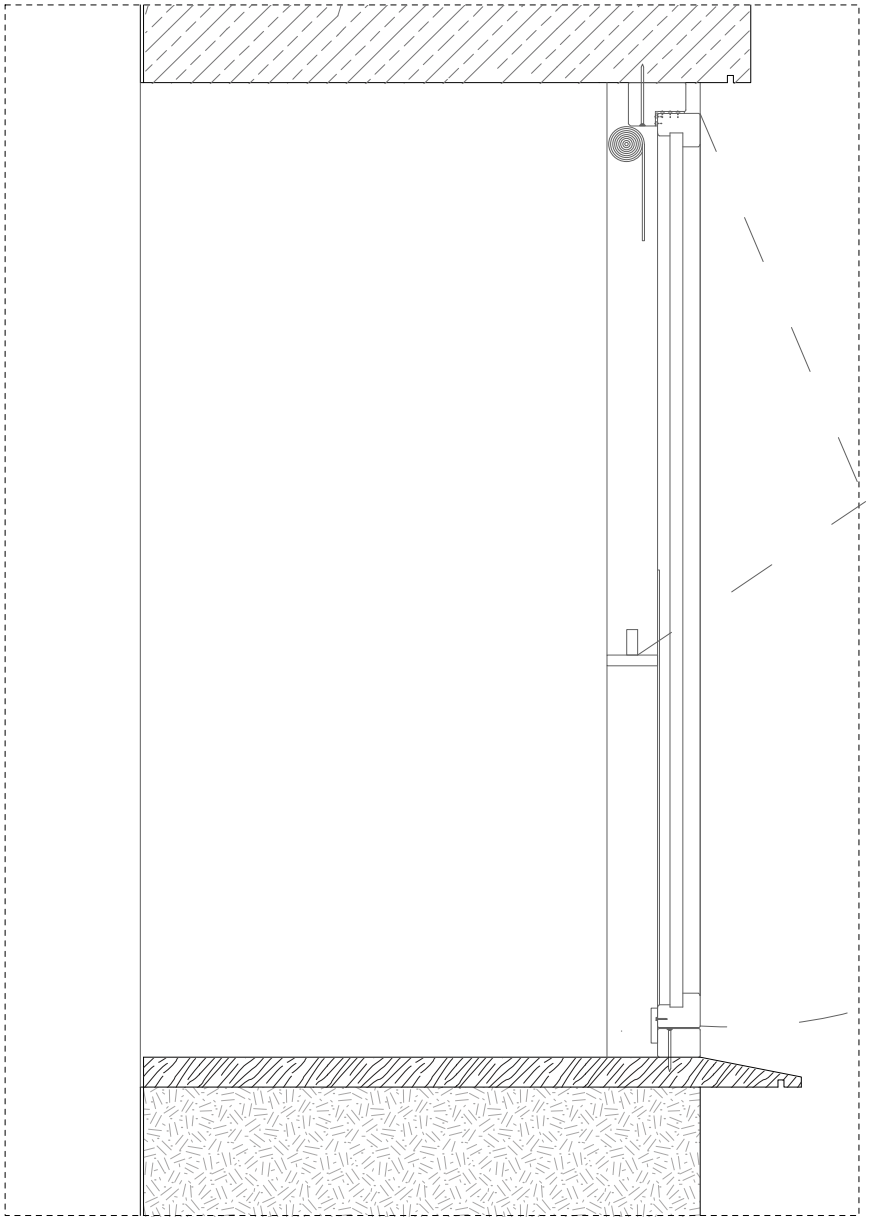


Water managment


+5.80
+2.90
+0.00
Wall:
Rammed earth, 70 cm, 40 cm
Concrete lintel
Earth blocks (20x20x40 cm)
Green roof:
3 layers of bamboo structure
Bamboo wattle 10 cm max
EPDM Waterproof membrane
Drainage layer 8 cm max
Geotexile mat
Earth layer 15 cm (max high)
Construct

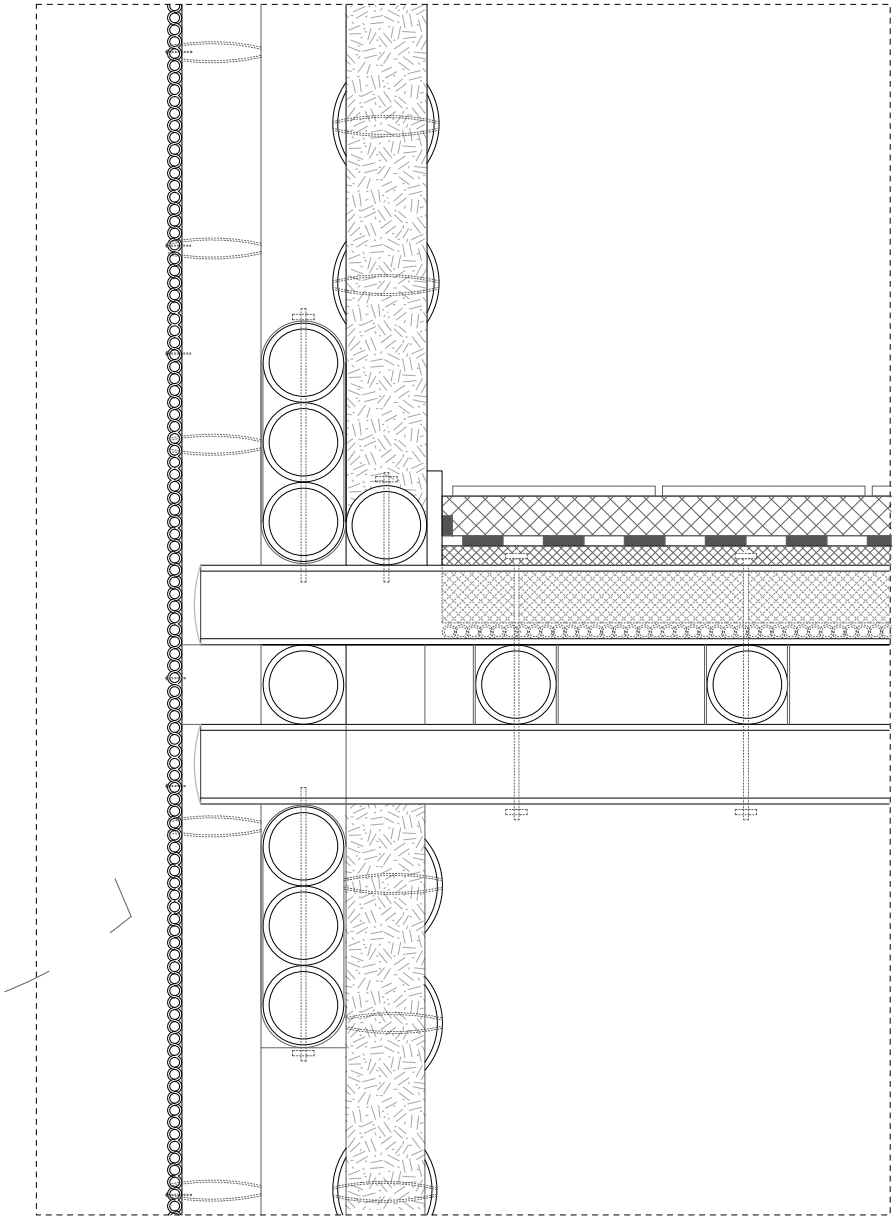

24 cm
24 cm
15 cm
100 cm
140 cm
30 cm
15 cm
100 cm
100 cm
45 cm
+2.90
+0.00
Wall:
Bamboo columns and frame structure
Straw earth layer (inside)
Bamboo strip layer (outside)
Floor:
3 layers of bamboo structure
Bamboo wattle
Structurale earth base 8 cm
Waterproof membrane
Clay floor selaed with linseed oil 13 cm
(Tile finishing layer)
Foundation:
Concrete foundation 40 cm
Plastic sheet
Compacted earth 20 cm
Clay floor selaed with linseed oil 13 cm
(Tile finishing layer)
Wall:
Cement blocks (40x20x20, 15x20x20) 1m
Concrete lintel
Rammed earth 60 cm

ive section



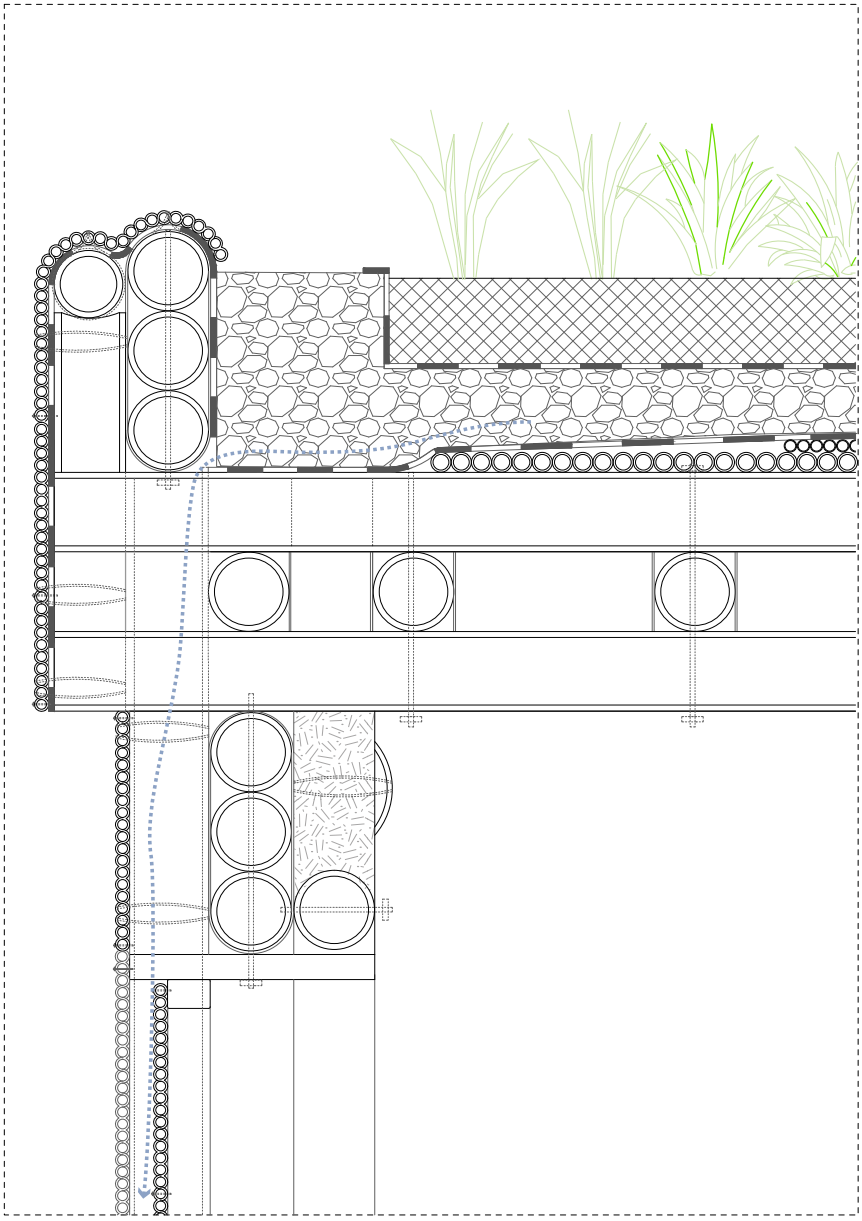
Wall:
Rammed earth stabilized with bitumen and lime 60 cm
Plaster (inside)
Laminated bamboo windowsill
Concrete lintel

Window:
Laminated bamboo frame
Single glazed window
Bamboo roll up curtain



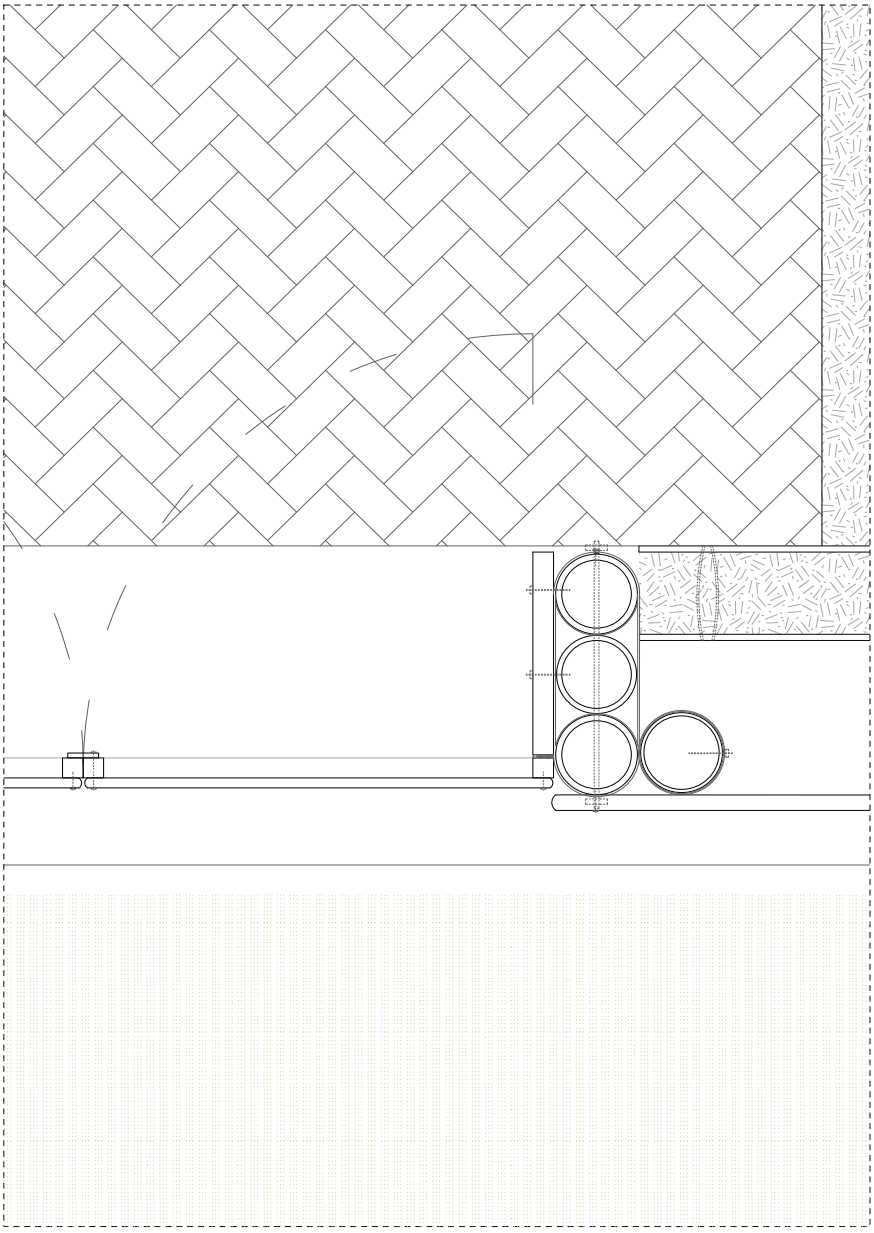
Floor:
3 layers of bamboo structure
Bamboo wattle
Structurale earth base 8 cm
EPDM Waterproof membrane
Clay floor selaed with linseed oil 13 cm
(Tile finishing layer)

Wall:
Bamboo columns O 8 mm
fixed with screws and ropes
Straw and Teff earth layer (inside)
Bamboo strip layer (outside)
fixed with nails to the bamboo structure



Green roof:
3 layers of bamboo structure
fixed with screws and ropes
4 layers of bamboo wattle 10 cm (max high)
EPDM Waterproof membrane
Drainage layer 8 cm max
Geotexile mat
Earth layer 15 cm (max high)

Wall:
Bamboo columns Ø 8 mm
fixed with screws and ropes
Straw and Teff earth layer (inside) held by
bamboo planks fixed with iron wires
Bamboo strip layer (outside)
fixed with nails



Window:

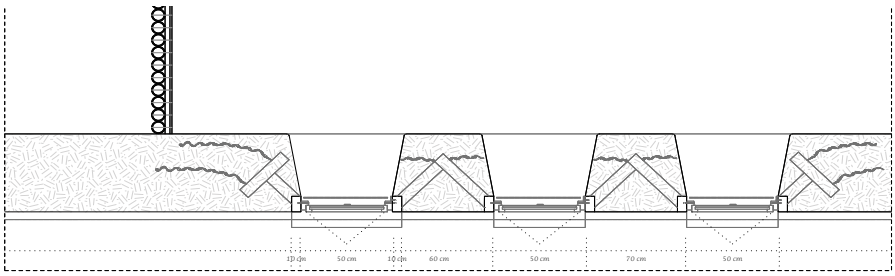
Laminated bamboo frame
Bamboo strip layer
fixed with nails to the frame

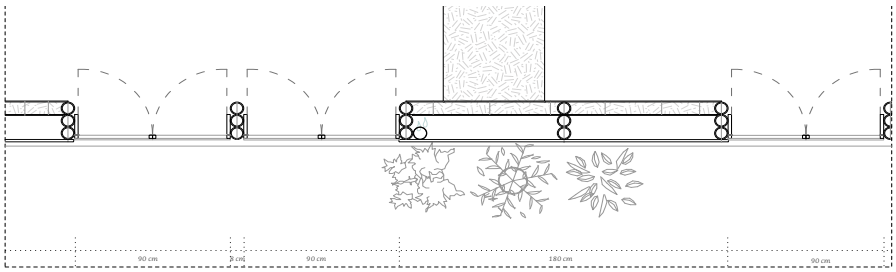
Structural Wall:

Rammed earth stabilized with bitumen and lime 60 cm

External Wall:
Bamboo columns O 8 mm

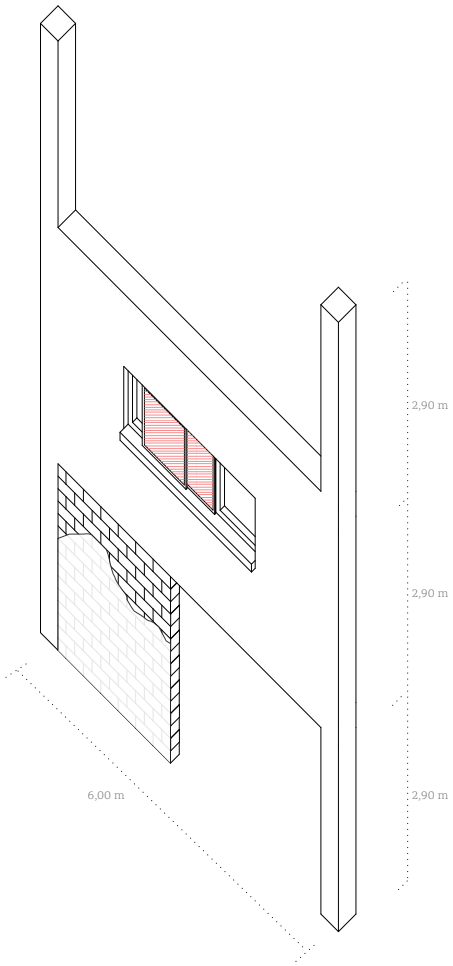
fixed with screws and ropes
Straw and Teff earth layer (inside) held by bamboo planks fixed with iron wires
Bamboo strip layer (outside)
fixed with nails


10 cm
50 cm
10 cm
60 cm
50 cm
70 cm
50 cm

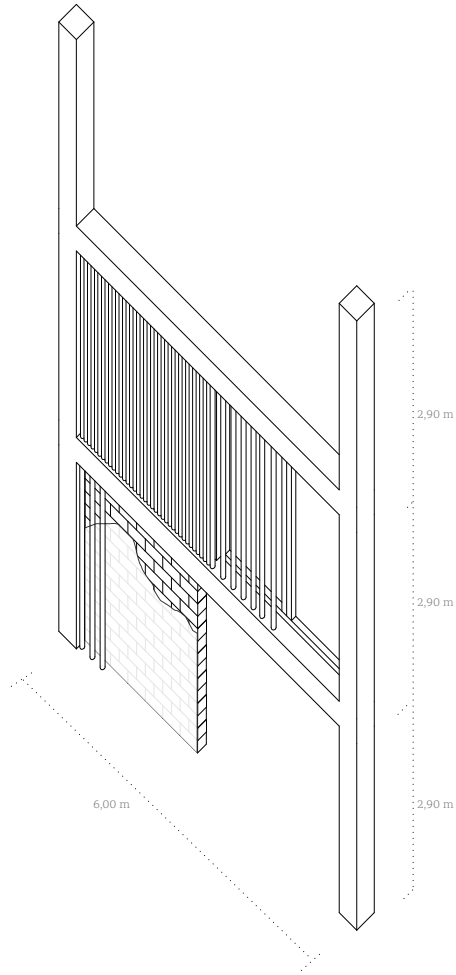

90 cm
90 cm
180 cm
90 cm

.Middle-rise developments.

.Materialization.



West and South facade

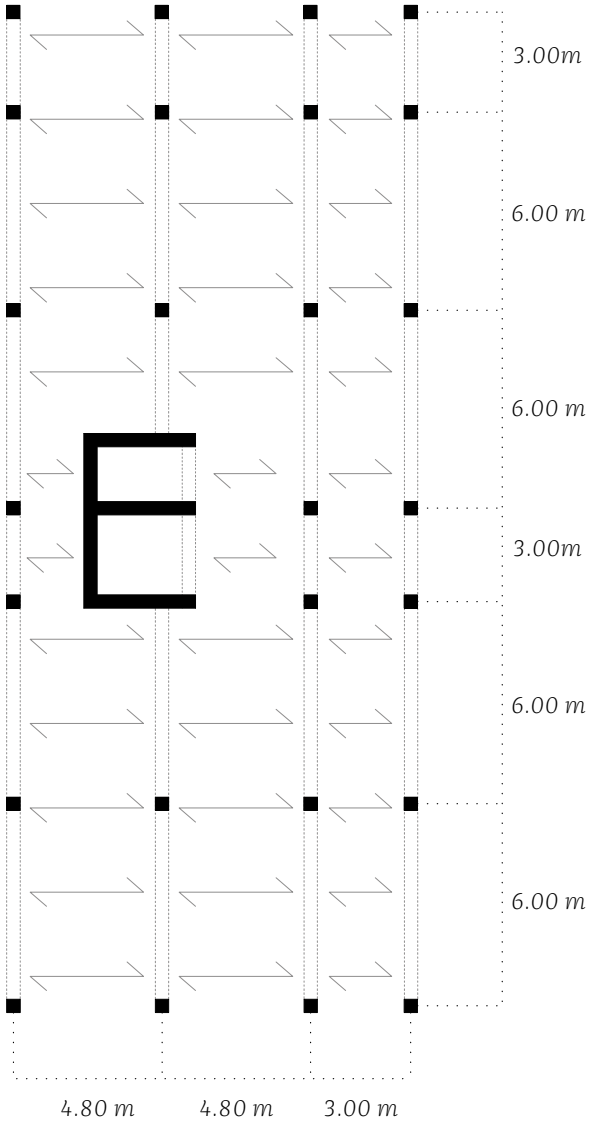


East and North facade

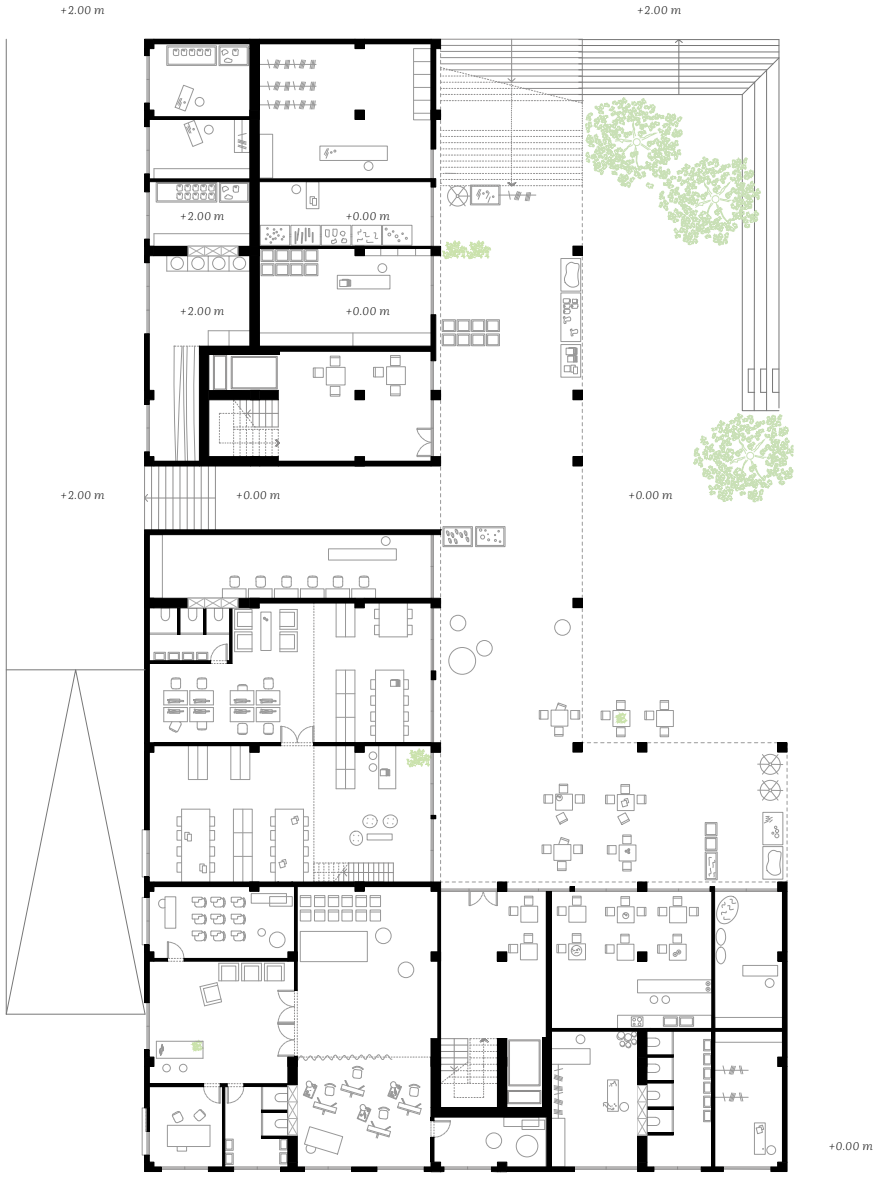
Concrete structure
Adobe blocks

Bamboo

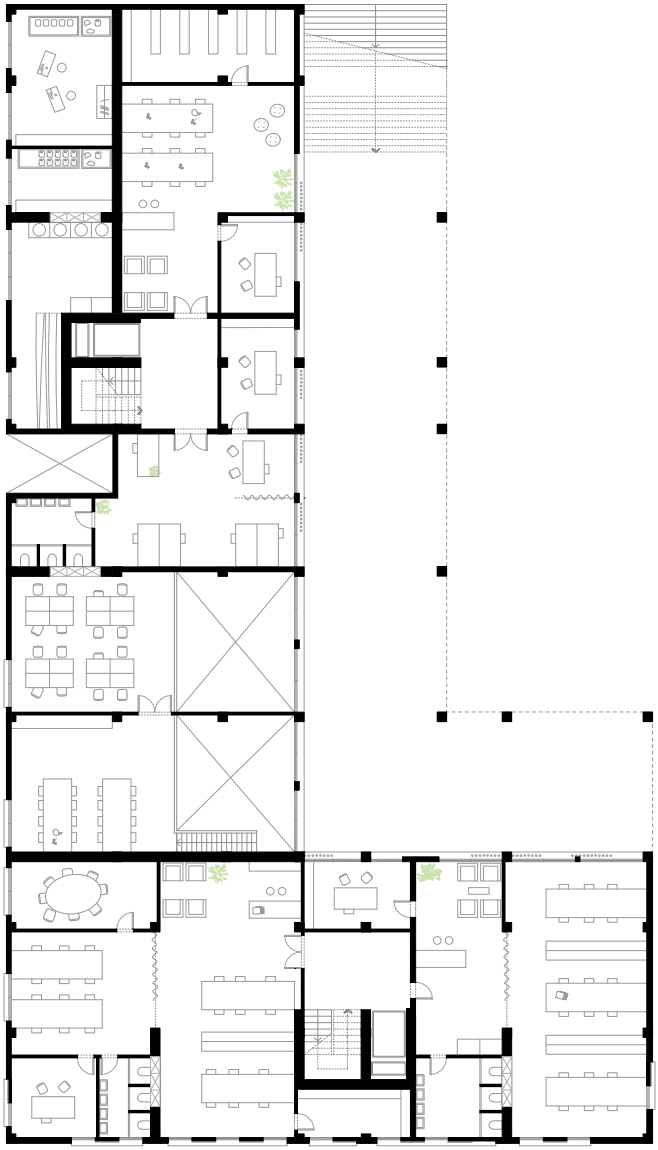
.The slab.



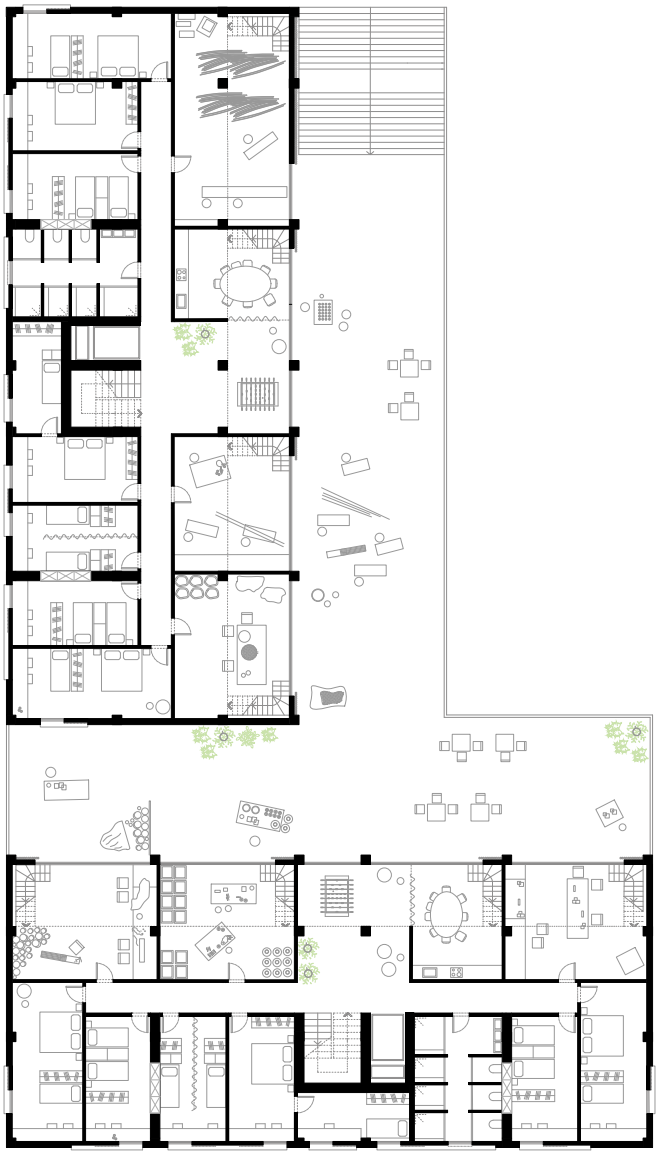
Structural scheme



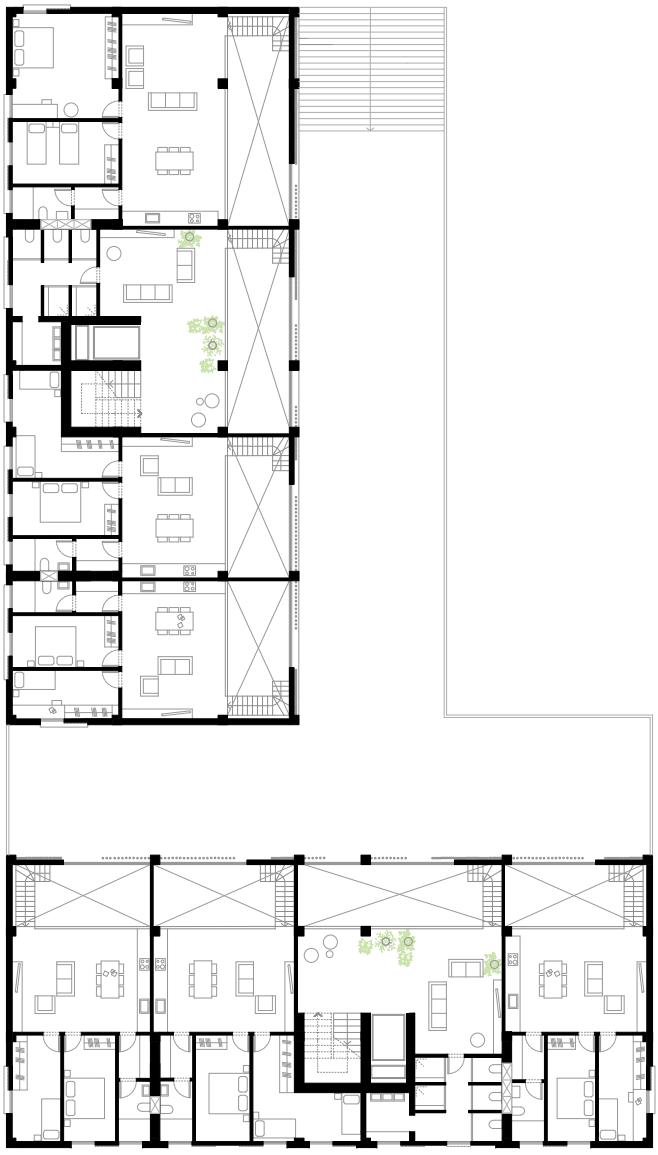
Ground floor
Owned and Rented retail shops
Amenities: Bar, Library, Cultural center,
Public toilets, Laundry and clean water supply



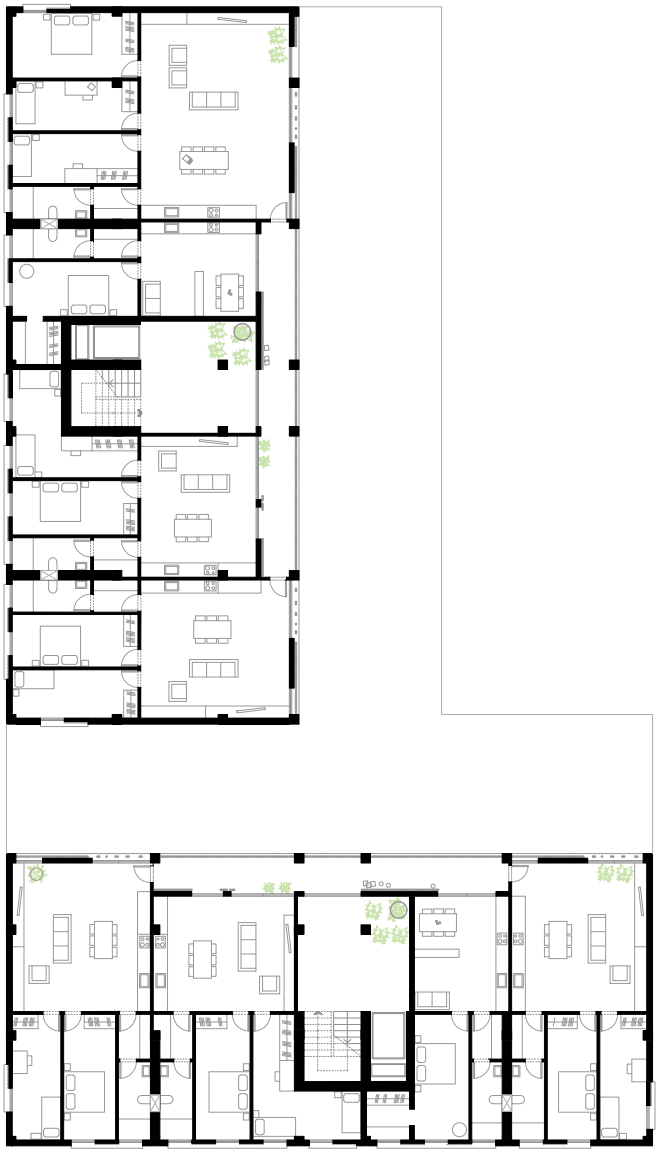
First floor
Owned and Rented office spaces



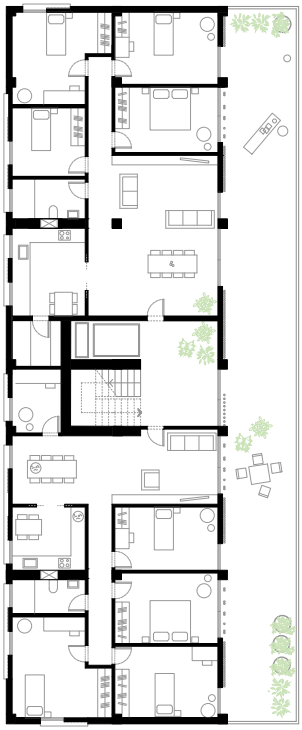
Second floor
Rented rooms+ Shared kitchen, toilets and showers
Common terrance
Workshops connected to private dwelling

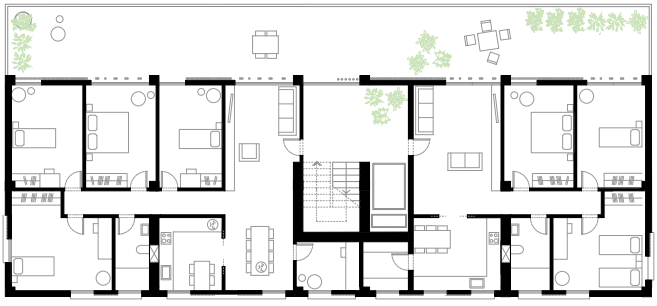


Third floor
Living + working typology_ One/Two bedrooms apartments
50 to 80 sqm



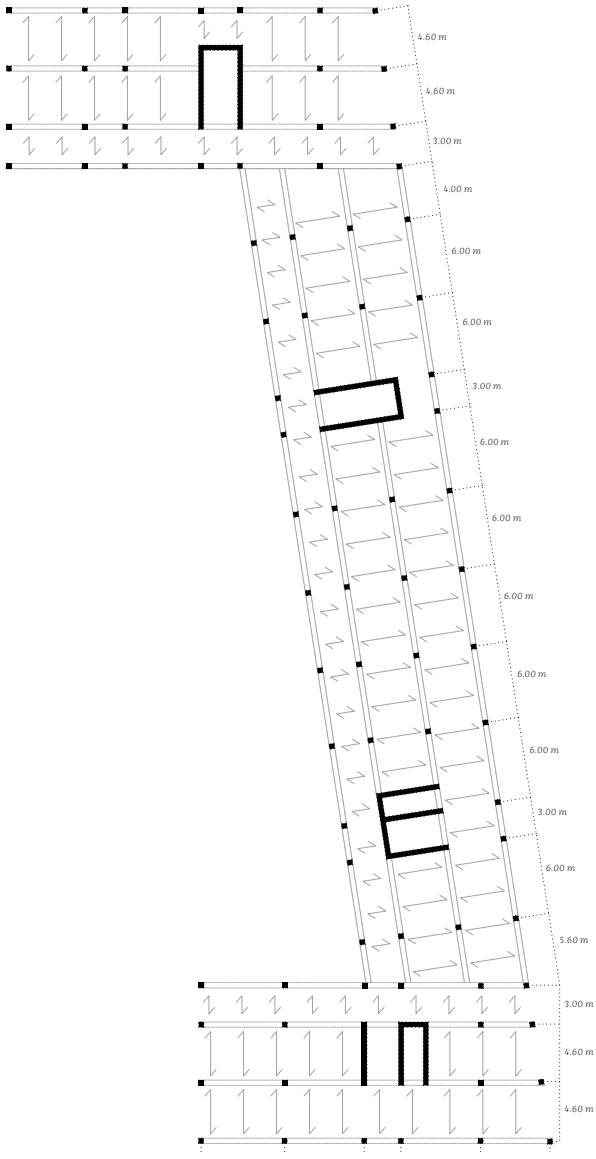
Fourth/Fifth floor
Gallery typology_ One/Two bedrooms apartment
40 to 70 sqm





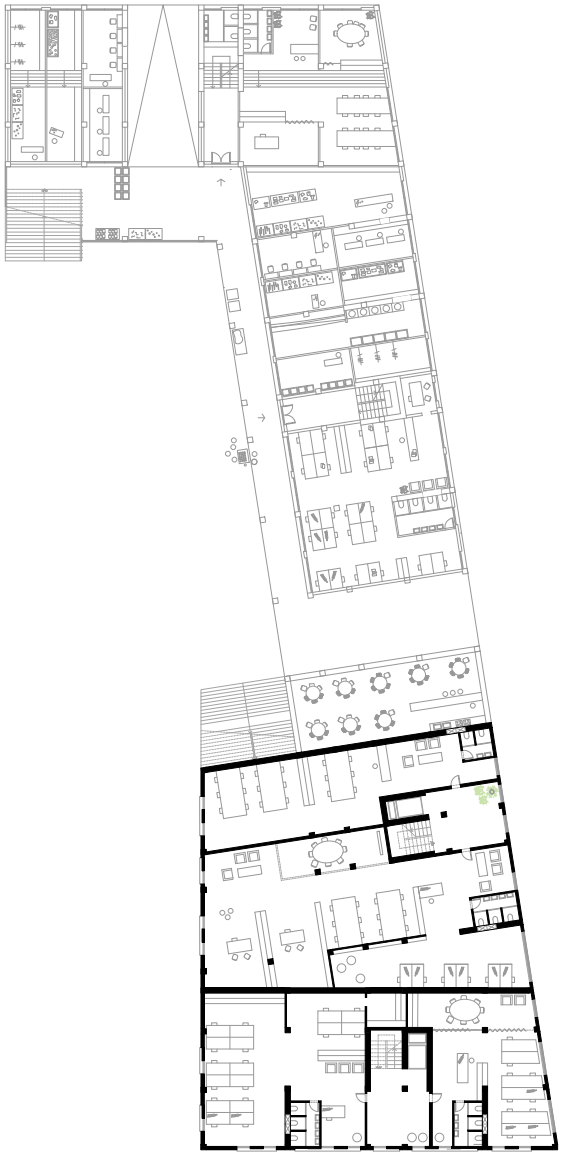
Fifth/Sixth floor
Central core typology_ Three//Four bedrooms apartment
90 to 100 sqm

.The slab.



Structural scheme

Ground floor
Owned and Rented retail shops
Amenities: Bar, Public toilets, Laundry



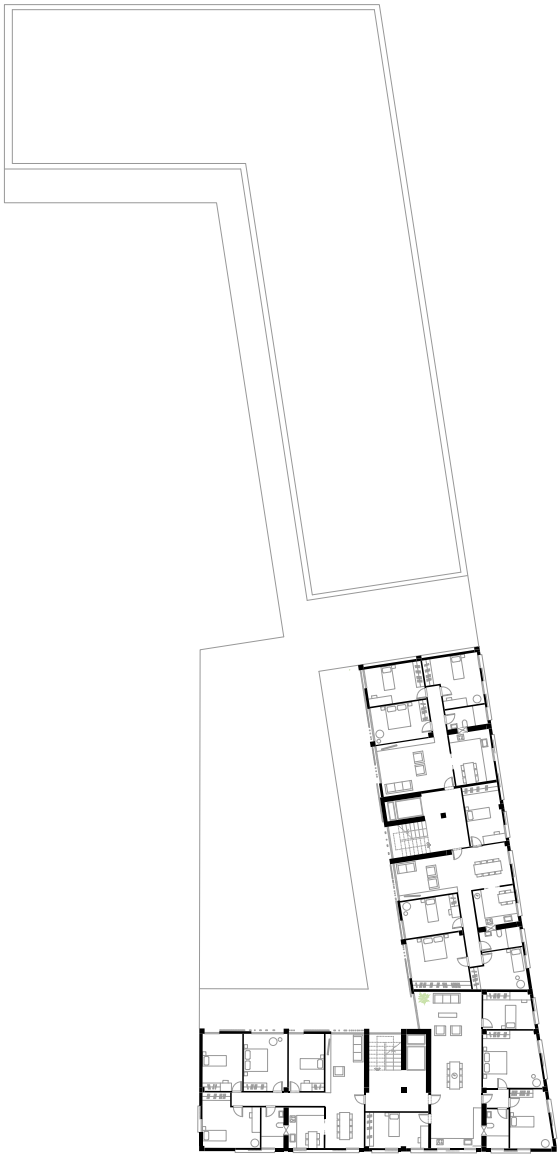
First floor
Owned and Rented office spaces

Second floor
Rented rooms+ Shared kitchen, toilets and showers
Common terrance
Workshops connected to private dwelling

Third floor
Living + working typology_ One/Two bedrooms apartments
40 to 80 sqm

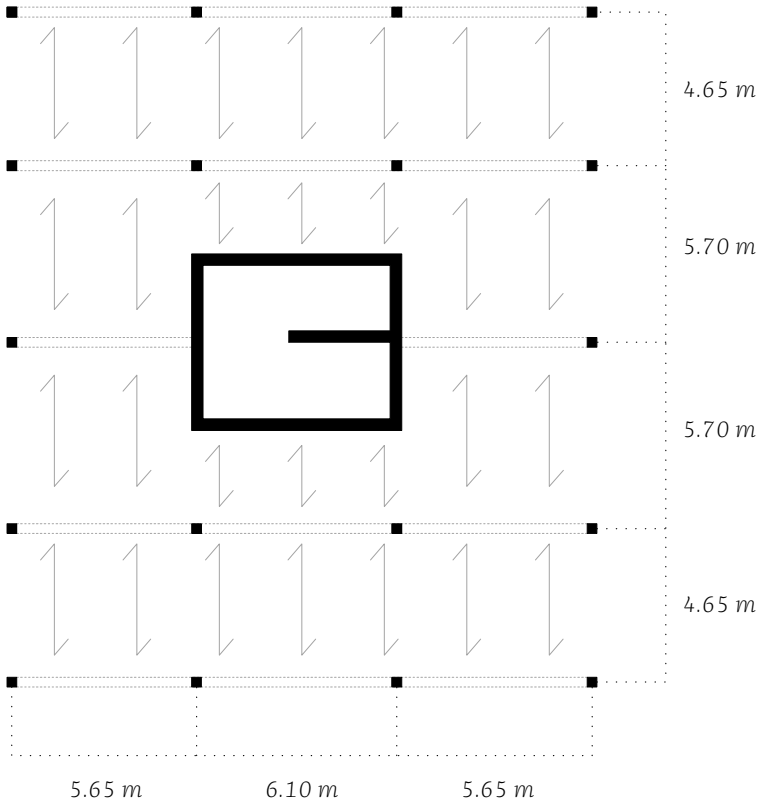
Fourth/Fifth floor
Gallery typology_ One/Two bedrooms apartment
40 to 70 sqm

Central core typology_ Three//Four bedrooms apartment
90 to 100 sqm

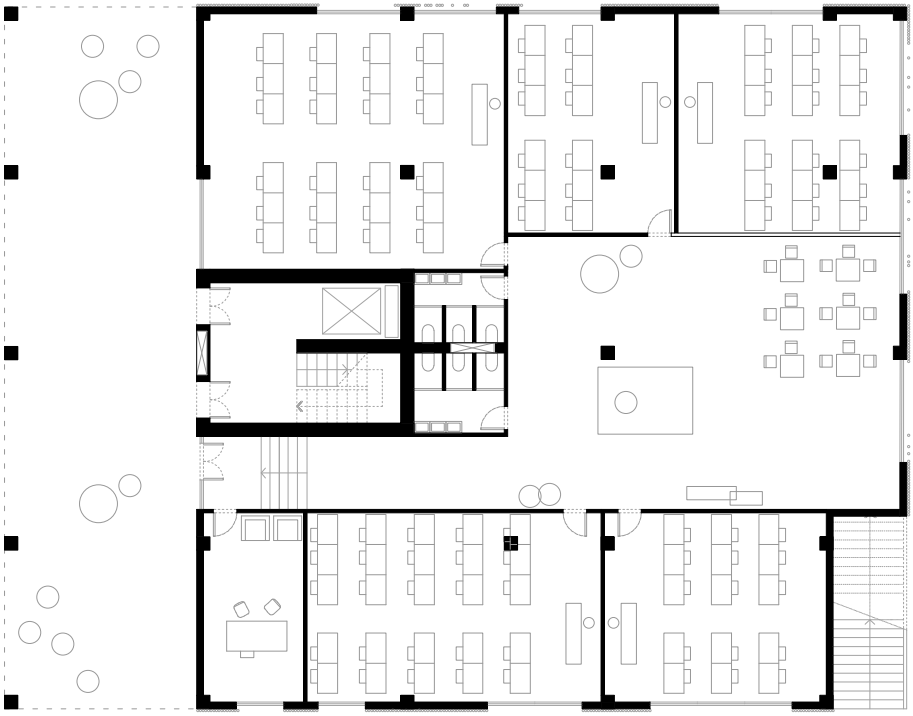


Fifth/Sixth floor
Central core typology_ Three//Four bedrooms apartment
90 to 100 sqm

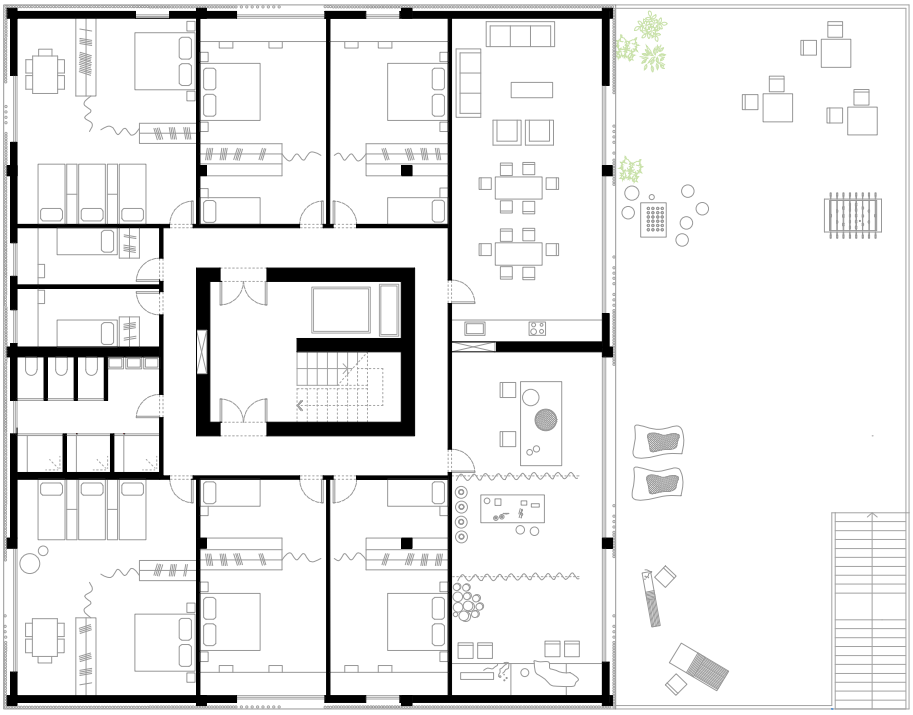
.The tower.



Structural scheme



Ground floor
Owned and Rented retail shops
Amenities: Bar, Public toilets, Laundry

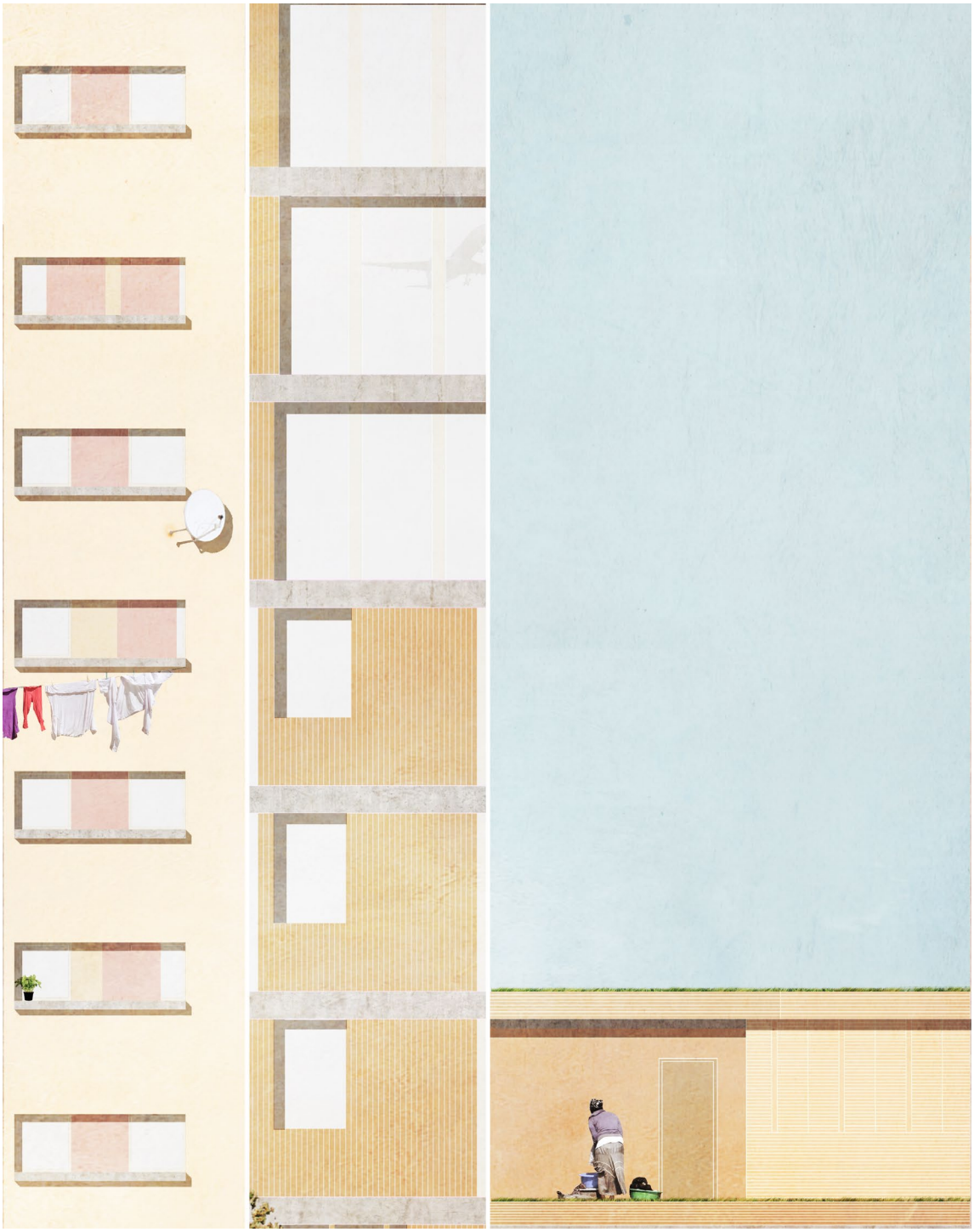


Fist floor
Rented rooms+ Shared kitchen, toilets and showers
Common terrance
Collaborative workshops

Sample of floor plan
Central core typology_ Two//Three bedrooms apartment
60 to 100 sqm

Sample of floor plan_Higher floors
Central core typology_ Two//Three bedrooms apartment
100 to 120 sqm

Sample of floor plan_Higher floors
Central core typology_ Two//Three bedrooms apartment
100 to 120 sqm



.Reflections.

Context

The Global Housing Graduation Studio focuses within the urban context of Addis Ababa, capital of Ethiopia, in order to tackle the future developments of this booming city. Given the status of institutional capital and most advanced metropolis in Ehiopia, Addis Ababa is undergoing massive changes, turning a city into an experimental case of territorial urbanisation at a metropolitan scale.

Trying to understand the particular cultural, social, environmental, political and economic conditions of this developing city and more in general of all the "Global South", the aim of this studio is to formulate a critical position upon the role of the architect and architectural forms in these changing and clashing conditions, completely different from our own. Indeed, this studio allows me to work in a complete new environments and context, struggling with strong dwelling pressing issues that will determinate the condition of future cities.

To accomplish this task, relevant issues such as the importation of foreign typologies, the recollection of community, the breakage of social connections and means of generating livelihood, the increasing migration from the rural areas to the city, the growing number of urban poor, were studied and taken into consideration. Reflecting on the conflicting dynamics that are taking place in this city, especially in the central areas where the typical low-income developments are endangered by the new real estate developments and the urban poor have been relocated in the outskirts of the city, I focused my attention on finding a in-between solution that could satisfy the necessities of the low-income residents and of the State and private developers.
First and foremost, nowadays Ethiopia faces an enormous challenge to find proper urban and architectonical strategies that allow, at the same time, either the development of the city and the preservation of its social and spatial patterns. I developed a critical point of view over the "western policies" carried out in Addis Ababa and I concentrated my attention on the specificity of this city: the mixed neighbours where the limit and the continuity between public and private domain has a great importance.

The location that I have choosen for my intervention, after the site survey in November, is the centrally situated Kirkos sub city, which is one of the relatively most established neighborhoods, but not resilient to the pressing real estate value that urges high density developments. This sub-city is clearly divided into two halves: a modern quarter and an informal one. The former comprises the new high rise real estate developments, advanced infrastructures such as the light train line, and some important facilities as the stadium, the main square (Meskel square) and the Un headquarters. The latter is characterised by one-floor developments mainly built in metal sheet, mud and straw. My interest was triggered by this particular place

as, here, all the different sides and dynamics of the city become clearly visible.
Moreover, this two conflicting realities are separated by a large void, a terrain vague that represents the meeting point between these two opposite urban models. Indeed, I identified the possibility to use this void as the starting point for my urban proposal in order to allow the reconstruction of the quarter in stages, with relocation of the population and activities into new buildings within the same area.
The project aims to bridge and reconnect -materially and symbolically- the different controversies of the city. A concept implying the search for a dwelling environment that is neither completely modern nor completely traditional, but incorporating the field of tension between both is used.

The idea is an urban strategy whose the main attention is drawn on the open public and semipublic spaces. The result is a web of pedestrian connections, open spaces and public amenities which constitute the locus of collectivity, site of meeting, trade and play; while the proper architecture tissues can adjust itself to this open spaces and to the existing neighbour in order to respect the morphology of the city.
In this urban proposal different building types (the low rise courtyard houses, the multi-storey buildings and the high-rise tower) can coexist in a coherent way in order to re-create an inclusive environment where various income groups live together and different activities can take place.
The idea of having such a variety of dwelling typologies came from the need to satisfy the necessities of all the parties involved: the low income group whose life relies on the working and selling spaces in the streets and who need a more flexible environment; the middle-high residents who prefer more private and comfortable spaces, and the developers who have the possibility both to rent and sell a great variety of spaces.

The main goal of my design is to provide a spatial device that is simultaneously capable of accommodating a larger program with the ambition of creating a urban system in which forms of dwelling, woking, gathering and moving converge. It is a strategy and not a defined traditional masterplan. Indeed, the main idea, that I had since the starting point of the concept, was to provide a solution that would not become site specific but could be implemented also in other other of Addis Ababa. The web of pedestrian connections should link the existing neighbour, the current public spaces and the new ones; while the middle and high-rise developments are flexible elements that can adapt themselves to the topography of the area and the context, trying to maintain it.

Research & Method

The first step taken in the studio has been the analyses and deep study of the history of Ethiopia and Addis Abeba, focusing mainly on the development of different urban plans and housing types through books and previous researches. This first research phase helped me to become more familiar with the African context and to understand better not simply the scattered morphology typical of this place but also the dynamics that generated it. Moreover, the analysis of different house typologies of four main period showed us how the traditional dwelling has been abandoned, starting from the Italian occupations (1936-1940), being replaced by more western typologies.

A second research phase has put in evidence different realities happening in Addis Ababa: the rural-urban migrations, the developments of new infrastructure systems, the mass housing developments and the huge presence of informal settlements that characterise the 80% of dwelling in the city. I focused my attention on the local mobility in order to understand reasons and consequences of such a impressive phenomenon and to this can be converted from being a threat to and asset for the city and for the fu-

ture developments.
Indeed, this can become an easy way of extra income generations for the residents of the city, giving them an extra space to rent temporary, while it can also be a business for developers that can rent small rooms for short period.

A third phase focus on the analysis of socio-spatial patterns typical of Addis Ababa. This has put in evidence traditional gathering places, way of living, way of building and way of generating formal and informal incomes. I took many of these aspects into consideration in my proposal, not only in the creation of a hierarchy of streets that allow for different social activities, but also in the organisation of the dwellings, where extra spaces for working, selling and gathering are provided.

The final phase of the research was the site survey of the capital and of great part of the country, which has been absolutely essential for the full understanding of this culture far from the Western world.

Besides this focus on the local history and tradition, it was essential to have broader prospective, taking into account the knowledge from global examples dealing with urbanization processes. With regard to this responsibility, my research question can be extended on a more general issue, that is how can architects provide for a new lively developing urban environment while enhancing its socio-spatial patterns present in its historical urban structure? and first and foremost, how they can find a balance between a new urban project and the existing urban context?
Studying and re-evaluating a modern strategy of formal organisation called mat-building, an horizontal high-dense low-rise system that Shadrach Woods referred to as groundscrapers, I investigate how this approach can contribute to the contemporary debate of sustainable built environments and can be adapted in scattered developments in rapidly urbanising cities,

such as Addis Ababa. Indeed, rather than relying on a modernism tabula-rasa approach that aim to create homogeneous and finished solutions, a different attitude is required. An approach that focus on the gradual transformation of existing conditions need to be considered.

Looking at the relationship between research and design, they evolved together enriching constantly one and other. Since the beginning I develop my interest in the relationship between the inhabitants and the outdoor spaces of the city. Already from the first research phases it was clear how Ethiopian people has always had a strong relationship with the streets as a living organisms of social interactions but also as a places that allow them to produce livelihoods and to survive. I was really interested in this deep dependence on the outdoor spaces and on how people perform to reclaim this necessity. This is way I decided to integrate my research with the discourse of urbanisation developed by the Team 10, where the attention was put non in the buildings as house for a single function but on the open spaces as space of collectivises and areas for multiple activities.

At the beginning this approach seemed too modernist and rigid, while, also playing more with the topography of the area, I menage to create a continuous dialogue between different outdoor public spaces and the public amenities located in the middle and high-rise developments. Indeed, with my project I want to provide a continuos public realm that is completely forgotten in the new condominium developments but on the other hand, it is often reclaim but the inhabitants' living practices.

Relevance

I believe this thesis project can claim some degree of importance in the discussion over new development strategies for the "Global south" cities. Institutions like UN-Habitat have made a big contribution to the understanding of the extreme living conditions

of almost one billion slum dwellers all over the world. However the debate regarding these urban transitions in academic institutions still seem limited with respect to its relevance; I strongly think that we should enrich the way these booming cities are planned and transformed. This is not just a matter for architects and urban planners but it should be seen in a more general framework, including the economical e social dynamics linked with that.
The intent of my research was to propose a solution that was far from being a copy of our western city, but to provide a design that could satisfy the current density problems while respond and respect the every socio-spatial transformations and dynamics of this city. To conclude the project presents a viable solution to the city renovation that, on one hand, is respectful of the upgrading process and of the new scale needed and, on the other, of all those activities and social spaces that are now endangered by the radical transformation of the cityscape.

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2015-2016

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Nelson Mota
Sjap Holst

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Faculty of architecture
24th June 2016