PLAYING WITH RHYTHMS

A Design Process Towards the Realization of a Super-Structure

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Tu Delft Graduation Project

Global Housing Graduation Studio

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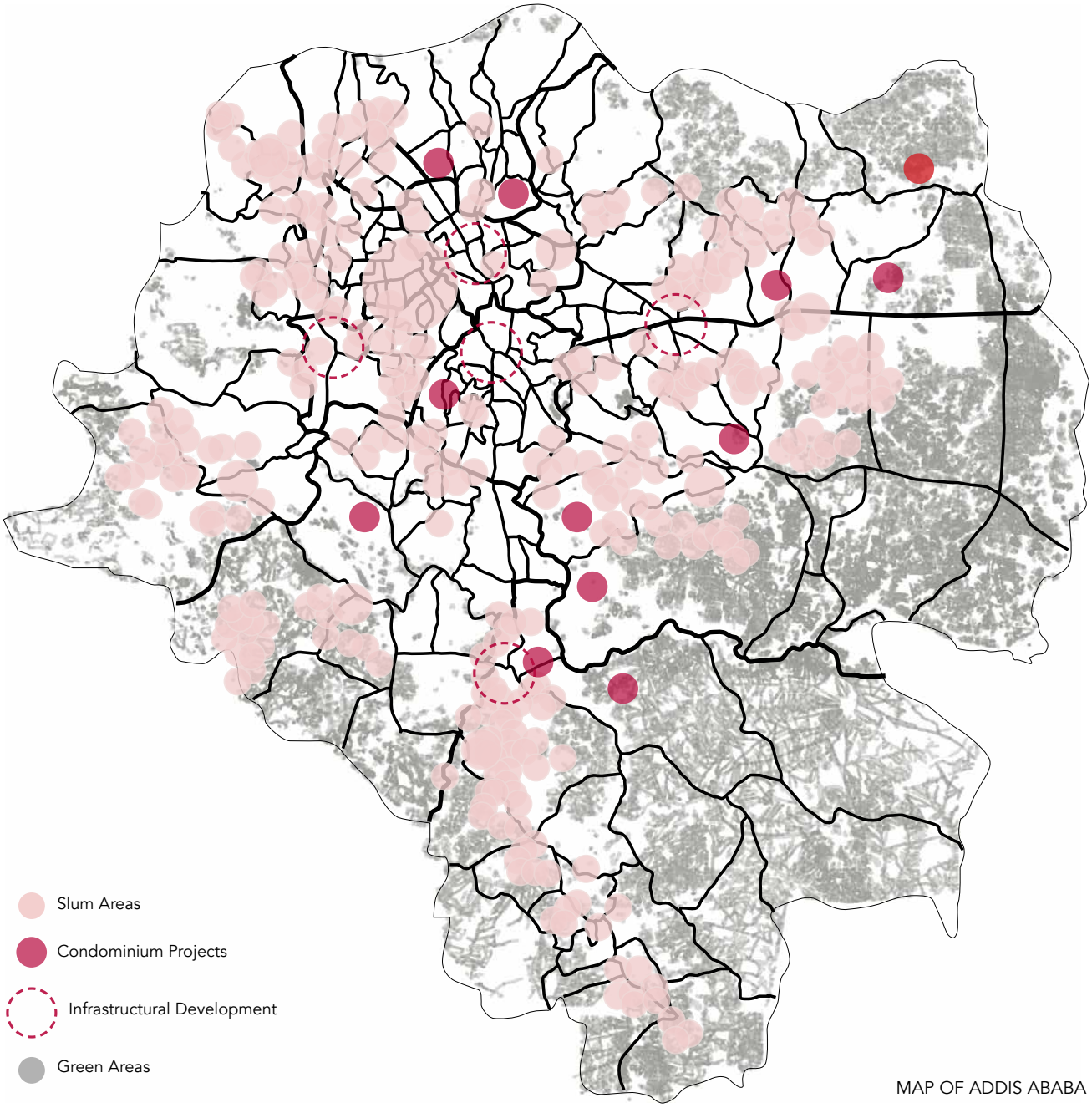
ADDIS ABABA

“Informal City”



MAP OF ADDIS ABABA

Addis Ababa is an informal city; 80% of the metropolitan area consists of informal settlements, also named as “slums”. Despite their poor building conditions, the slums of Addis Ababa represent the traditional lifestyle of the citizens, where every space is meaningful and stand for a different function in daily life. These functions can vary from production activities, where the vegetables are being dried or other goods to sell in the market are being prepared, to domestic activities such as collectively washing clothes or preparing food. The similar construction techniques that are used in the informal settlements create a continuous architectural language and guarantee the human scale in the open spaces, where the street life is always active.

On the other hand, the informally built environments create a threat for Addis Ababa, preventing the urban development and the possibility of implementing facilities such as sewage or clean water. Although they are perfectly fit with the modus vivendi of the citizens of Addis Ababa, eventually they will have to be replaced with another building typology which will open the way to new opportunities in the city providing further growth and progress.

The administration of Addis Ababa is showing a lot of effort for the development of the city, in order to bring it to the level of a metropolis which will become one of Africa's most important economic centers. To achieve this, an advanced railroad network is being implemented and a number of mass housing and commercial projects have been constructed. Consequently, this approach of modernization in Addis Ababa leads to the creation of urban spaces that the current inhabitants are not used to experience, generating metropolitan scenarios that the citizens have difficulties in playing a productive role.

Considering that this situation occurs in the capital cities of many developing countries, the graduation project sees it as an opportunity to propose innovative ideas on the redevelopment of the informal settlements, based on re-organizing them according to existing social and spatial patterns, which were explored within Henry Lefebvre's rhythm theory. As a response to the request of large-scale infrastructure, a new type of infrastructure is being proposed, that can accommodate the present lifestyle of the citizens while providing additional resources for the city.

VIEW FROM A NEWLY BUILT DISTRICT IN ADDIS ABABA

THE RHYTHM ANALYSIS

AERIAL VIEW OF A SLUM IN ADDIS ABABA

1 Commercial Activities

2 Production Activities

3 Domestic Activities

4 Social Activities

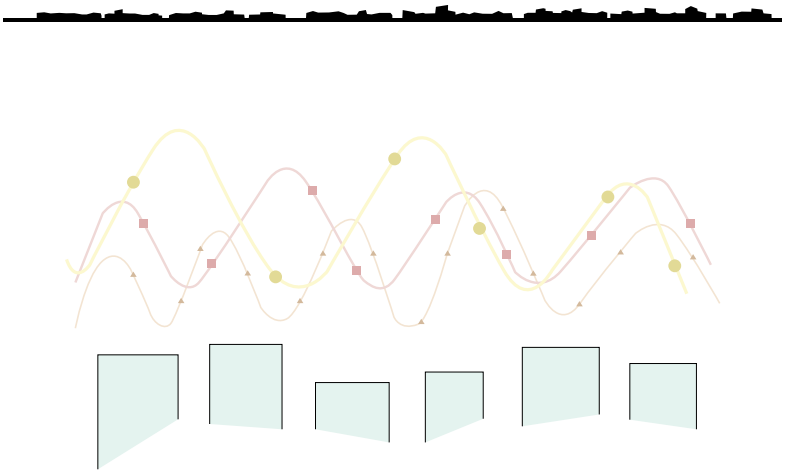
In order to look at the transitions in the city from an objective point of view and to generate an initial design methodology, Henri Lefebvre's theory on rhythms, which he introduced in his critical essays was taken as the main reference. What Lefebvre explains is that the city is formed by a system of signs and codes, which altogether create the unique patterns of inhabitation of an area. If this system is interrupted, the direct relationship between the citizens and their environment will be broken and as a result, autonomous urban situations will be established.

Above all, a rhythm decides the sequence of certain intervals, working as the catalyst element in generating any new order. It is not surprising to know that in creating this concept Lefebvre was inspired from music where there is always a certain tempo that creates a base for the melody that will be placed upon. In the context of a city, the rhythms create the base structure in an urban environment for the daily life to be performed consequently.

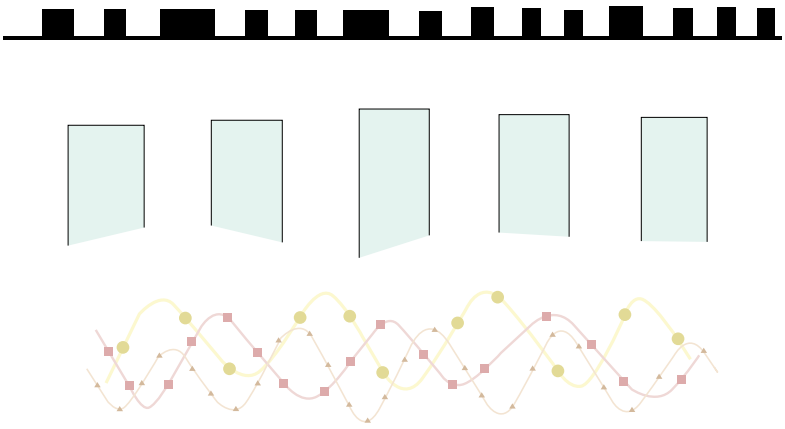
In the graduation project, this concept was used as a reference first for establishing a thorough analysis of different urban scenarios in Addis Ababa, and secondly for formulating a design method. For this reason, the project itself can be seen as a design process towards the realization of a new urban order that has the ability to provide the successful rhythms, therefore, the correct forms of architecture which enable the life patterns in that area to be developed in an effective way.

On the other hand, the attempt to provide the new forms of configuration to Addis Ababa, reconsiders the role of the architect as the facilitator of a new architectural system, that can be designed until the point that the inhabitants can take over, leaving the path to the inhabitants who can be the master of their own built environment as they were in the informal settlements. This approach aims to generate a contemporary urban order based on the existing life patterns of the slums in Addis Ababa.

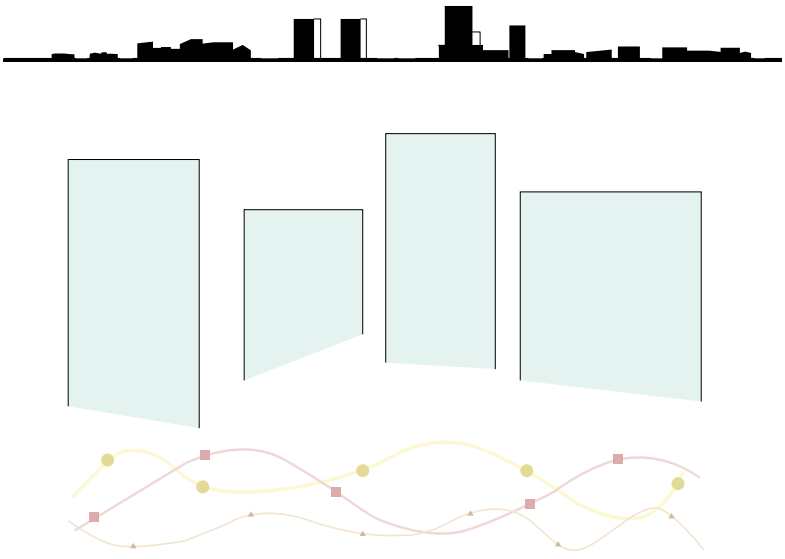
KIRKOS SLUM, ADDIS ABABA



CONDOMINIUM AREA, ADDIS ABABA



BOLE ROAD, ADDIS ABABA



FORMS OF RHYTHMS

Intervals, clusters, time broken and
accented, intense rhythms, slower rhythms, superimposed rhythms, variation and non-variation, increase and decrease, accumulation points, repetitive and different rhythms, longer durations, emptiness, polyrhythmicality (symphonicality), simultaneity, synchronicity, succession of alterations, differential repetitions, interactions, hierarchy, determinant rhythm, order of grandeur, humane scale, stop/resume, currents, streams, flux and reflux, the immediate in its moments and movements, remembrance of other moments and of all the hours, that what remains to scale, rhythms always needs a reference, complexity, loops, plurality of rhythms, all gatherings of bodies are polyrhythmical, an open totality, a meta-stable equilibrium, movements and differences in repetition.

FORMS OF RHYTHMS, IN ORDER OF LEFEBVRE'S TEXTS, BY PROF. GRÖNLUND, (KABK)

A rhythm analysis was used in the project with the aim of making a clear comparison between the informal settlements and the recently built areas, and observe the changes in the city from an objective point of view. The slum area which was taken as a case study is the Merkato district of Addis Ababa, while the regenerated areas are the surroundings of Bole Road, an infrastructure of mobility implemented to the city twenty years ago, and a condominium housing area, which is a mass housing project introduced by the government.

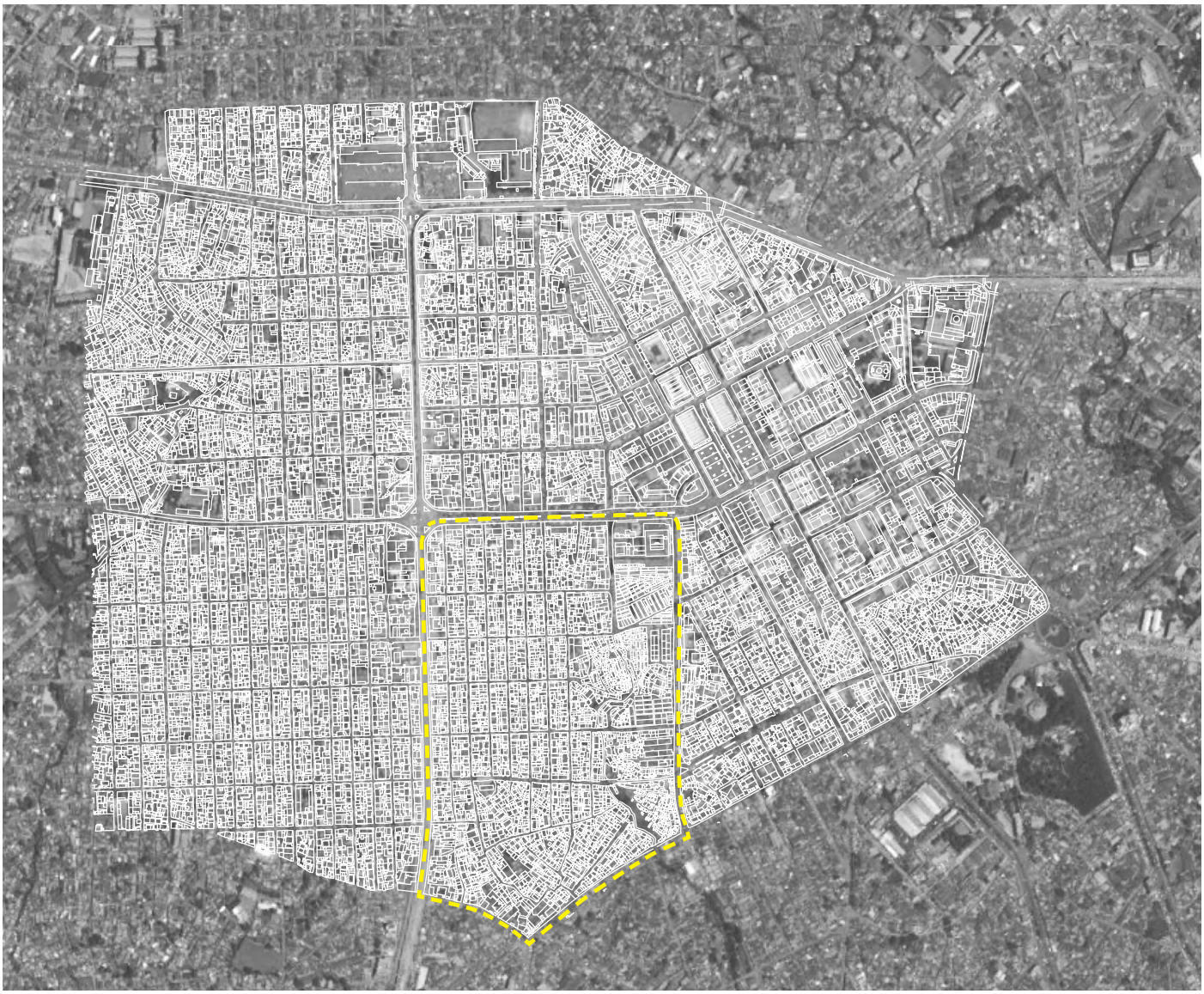
The rhythm analysis initially consisted of finding certain physical elements in the selected area, which were repeated in constant intervals. Through the usage of section drawings and photographical analysis as well as area mapping, the diagrams on the previous page were generated. These diagrams explain how the scale of the built environment effects the daily life, and how the built environment itself is the key factor to generate the successful rhythms. The results were rendered visible first with the sections of each selected area and then with a representation of the daily life which is put in confront with the built environment.
In the first case study we can see the small scale of the slums. In these areas the unplanned activities prevail and have a big influence on the built environment. Although in this area, the repeated elements were mainly forms of action rather than the repetition of exact architectural configurations, the scale of the surroundings was successful to generate the base rhythms within a space and the daily life could be successfully generated upon them.

In the second case study, the rigorous architecture of the condominium project is visible in everywhere, in a very dominant way. But still, the inhabitants found the chance of self expression in small areas such as the balconies or the shared courtyards. Therefore although it is not visible at the first time, there is a variety of active daily activities in the area.

On the other hand in Bole Road's surroundings we did not see this happening. The area was completely transformed by the large scale buildings and there was no room for the spontaneous activities to be performed. The large scale infrastructure of mobility was very dominant, as a result, the elements which could function as rhythms were broken.

This site survey was useful to discover the successful forms of association that should be taken into consideration on the elaboration of a design proposal. The main finding in this analysis was that the human scale was the key factor in the creation of the repeated features of daily life and in the newly generated areas this element was almost impossible to detect. Finding the right scale and architectural forms based on the existing social and spatial patterns of the area, in order to generate new rhythms of the city was the main design goal of the project.

MERKATO



MAP OF MERKATO, ADDIS KETEMA

The Merkato district in Addis Ababa is one of the main areas which are undergoing radical changes. Currently an informal inhabitation, the biggest production, and commerce district in the city, Merkato stands as one of the greatest examples of the mixed inhabitation patterns in the slums of Addis Ababa. During the Italian occupation period, a superimposed grid was built upon the Merkato which formed the prevailing disposition of the buildings. In our site survey to Addis Ababa, we had a chance to analyze the activities that are being carried out in this network of spaces and how the lifestyle of the people is shaped.

Our research group focused on Addis Ketema, the south-eastern part of Merkato. In this area, the grid slowly disappears as we go towards the east, where the main creative area is located. Addis Ketema's social and spatial patterns are shaped thanks to this production district, which creates different types of streets and activities that perform the same disposition of rhythms.

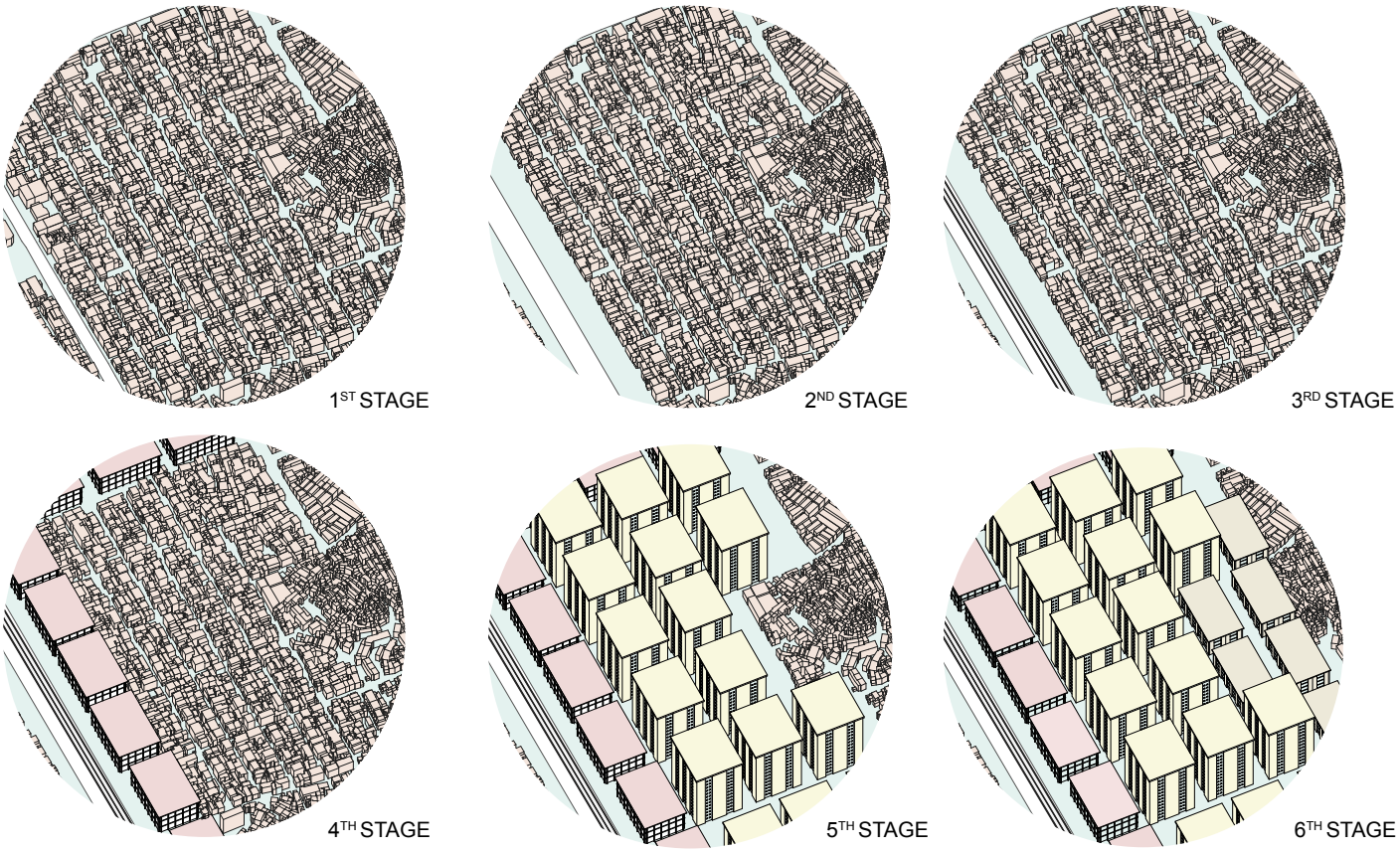
The streets that go towards the production area are busier and they host the main commercial activities and social gatherings. Therefore, in the graduation project, they are named as the "Commercial Streets". The perpendicular paths are more silent and we saw families sitting outside and domestic activities happening. These streets are named as the "Domestic Streets". Besides these two types of streets, there are also more private spaces where only the inhabitants have an access to, which are the "Inner Courtyards". The inner courtyards are shared by several families living around it and they contain specific areas like kitchens and bathrooms that belong only to the households.

COMMERCIAL STREETS
INNER COURTYARDS
DOMESTIC STREETS
PRODUCTION AREA

Commercial Streets

Domestic Streets

Inner Courtyards



HYPOTHETICAL URBANIZATION IN ADDIS KETEMA

Today, a new type of mobility infrastructure is being implemented in one of the biggest streets of Merkato, which is the light rail road. Considering that a large scale infrastructure demands large scale buildings, the light rail road will bring a new type of urban planning approach meant to complement its size, reaching to the point of causing segregation within the district. As a result, the existing variety of living patterns will be demolished, and the rhythms will be one again broken.

The master plan of the area clearly indicates that the existing built environment which is mostly consisted of slums will be replaced by large commercial buildings and a new housing scheme in order to accommodate the growing population. Although this scenario is crucial for the development of the new city, new solutions should be discovered in the perspective of engaging the housing needs of current inhabitants and the requirements of rapidly developing environments.

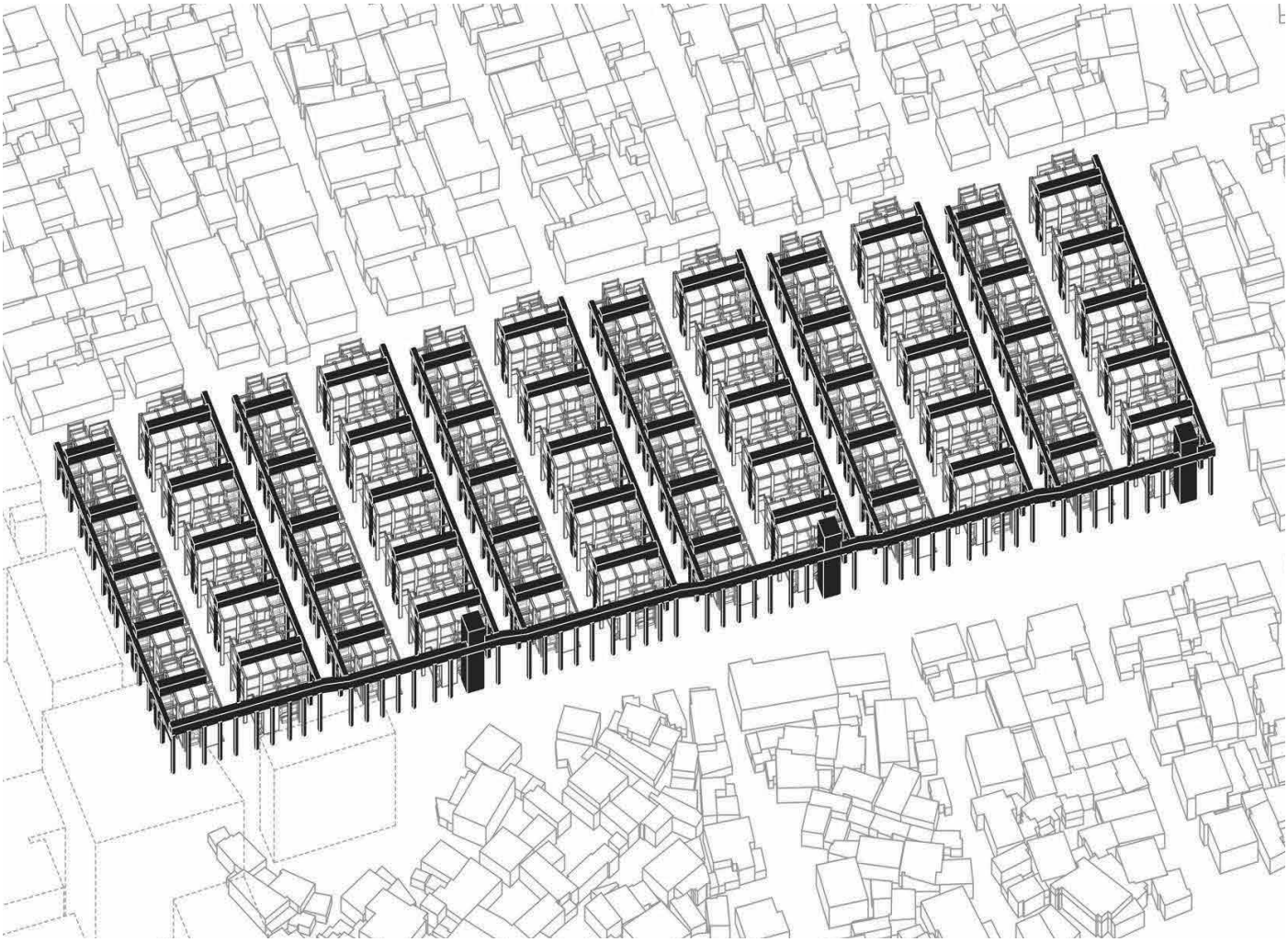
A RECENT VIEW FROM MERKATO, ADDIS KETEMA

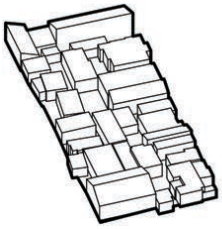
THE NEW INFRASTRUCTURE

Being inspired by the fact that an infrastructure can bring such a change to a certain area, in my project I proposed a different type of infrastructure in the Eastern side of Merkato, Addis Ketema, which would have the chance of connecting the existing habits of the people and of bringing an alternative development strategy. Since the built environment follows also an infrastructural network, I wanted to emphasize on the infrastructure itself and leave the dwelling units be generated from it.

Therefore, the infrastructure acquires the role of a “superstructure” and becomes the protagonist of the project, providing a new urban order to the area, the basic facilities such as water, electricity and sewage, and at the same time creating the base structure of the housing units. Additionally, the superstructure is designed to increase the density of the given area, providing at the same time the chance for further expansion and growth of each dwelling. In other words, the proposed housing scheme would be an attempt to provide new rhythms to Merkato that can give a certain freedom to the inhabitants in order to appropriate their living environment in their way and therefore acquire many identities.

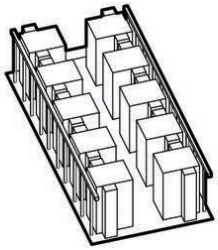
As the structuralist architects had theorized in the 1960’s, the project presents the potential of becoming much more than its initial stage, with carefully studied spatial contributions in order to guarantee the interaction between the inhabitants and their urban environment.



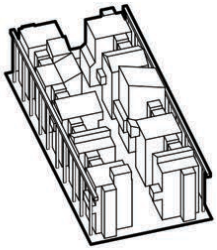


Current Situation
of a Inhabitation Block

Implementing a New
Infrastructural Network

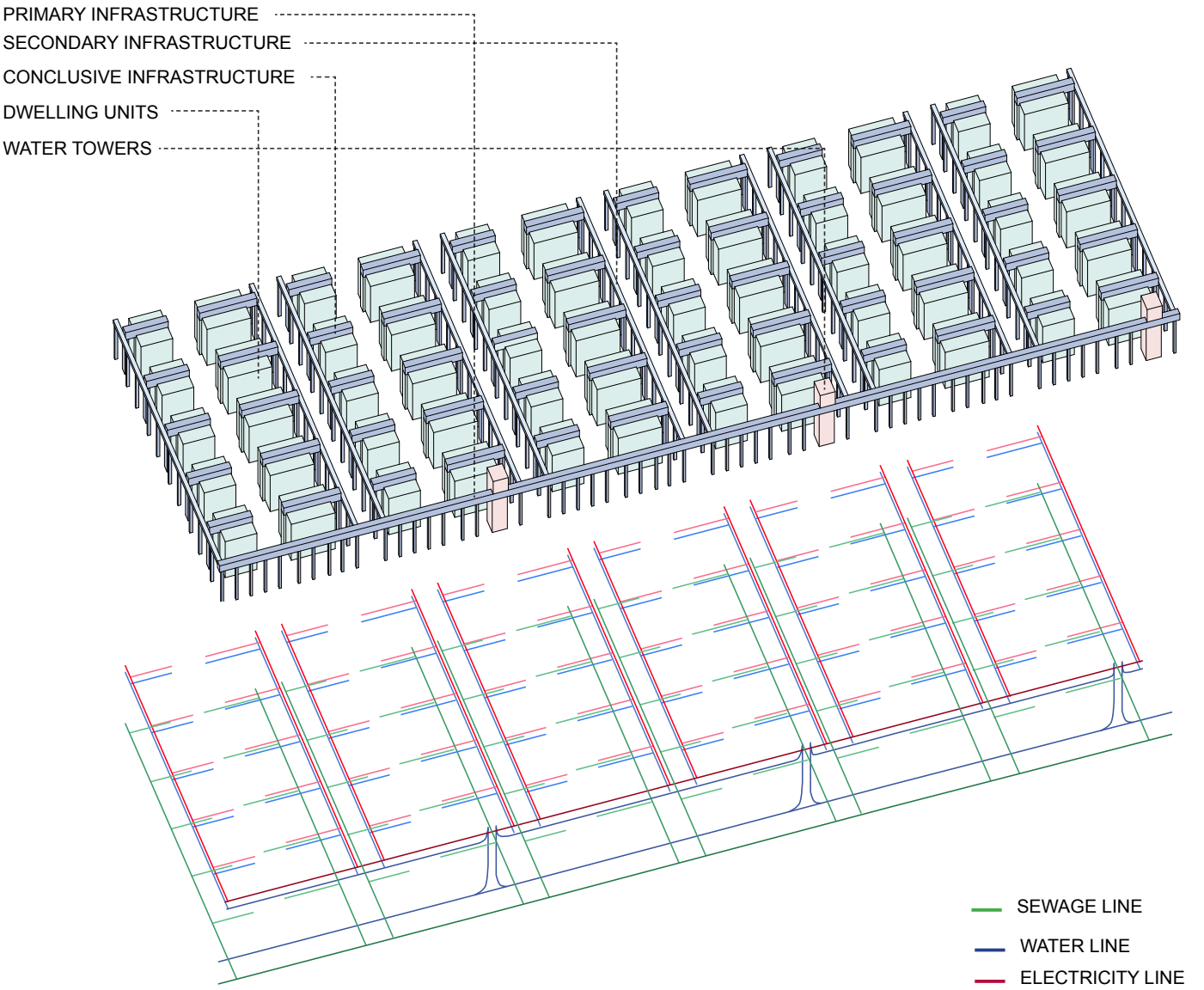


Building the Dwelling Units
and Commodities



Occupation of Dwelling
Units by the Inhabitants

A Conceptual View of the Project, Showing the Primary Infrastructure



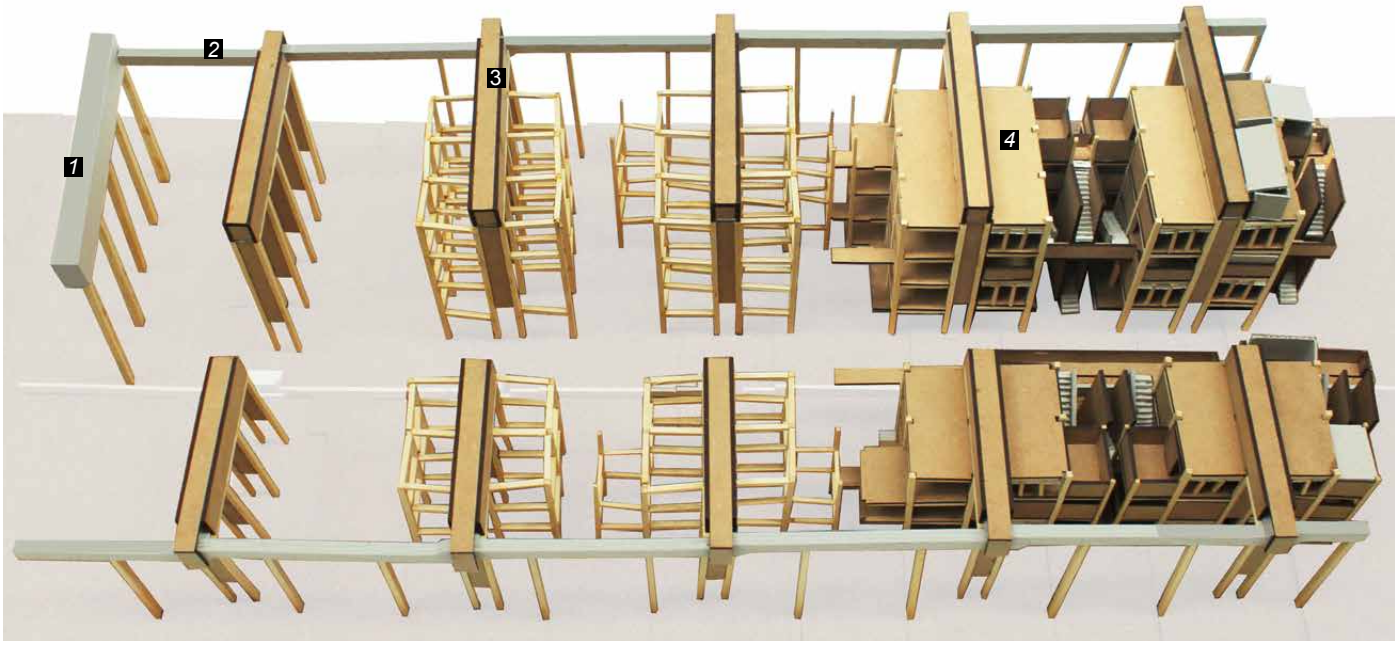
PROJECT DIAGRAM EXPLAINING HOW THE INFRASTRUCTURE WORKS

The infrastructural system of the project provides the basic facilities to the area, functioning as an elevated water and electricity line, and an underground sewage line. In this system, there are three moments of infrastructure, each moment having different dimensions and architectural appearances, which creates a variety of open spaces as they rigorously travel around Merkato.

The first moment is the Primary Infrastructure, where the transportation of the facilities to the project area is initiated. This element has its own freedom of movement following the existing street profile. Bigger in size than the others, the primary infrastructure passes from the commercial streets in Addis Ketema, making them become the Primary Streets of the area. The second moment works as the subdividing element of the facilities from the main infrastructure line into blocks, defining at the same time the outline of each inhabitation block. This infrastructure creates the Domestic Streets, and also a room for expansion for each dwelling unit.

Conclusive Infrastructure is the last moment is where the superstructure ends up in the dwelling units, bringing these facilities inside the houses. The final element forms at the same time the base structure of the housing units. Additionally, on the parallel side of the Primary Streets, where the primary infrastructure ends, there are the secondary streets and they create another variety of space in the project area.

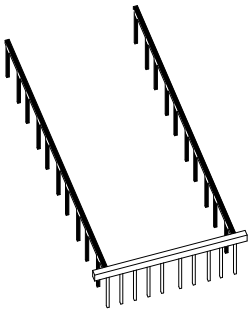
This system is followed by a set of landmarks which are actually the water towers, that pump the water up into the primary infrastructure. Besides these elements, there are a group of residual spaces, which provide the possibility of introducing new public buildings in the future that can improve the collective life.



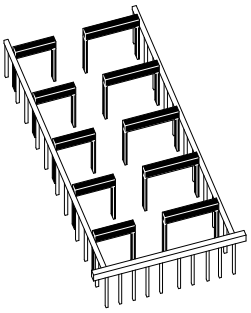
Model of an Inhabitation Block

1 Primary Infrastructure

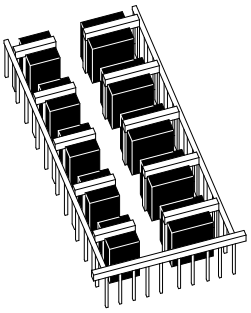
2 Secondary Infrastructure

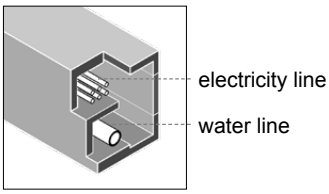


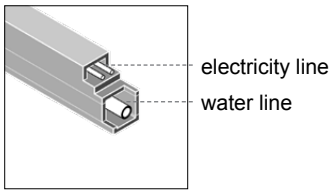
3 Conclusive Infrastructure

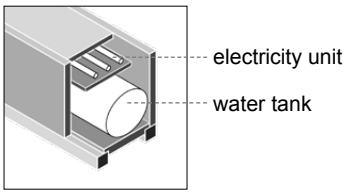


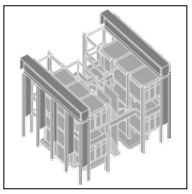
4 Dwelling Units











The Primary Infrastructure stands at the beginning of each block, creating a base structure for the commercial and production activities that take place in the primary streets. This base structure can be used as a separative element between the stores, or can be occupied and built upon to use it as closed workshops.

The Secondary Infrastructure is placed on both sides of the blocks. Besides the distribution of facilities, this elevated infrastructural line stands in front of the dwelling units, working as a base structure for the extension of the houses. The inhabitants of the dwelling units can use this structure as an open element where they do their domestic activities or close it up to extend their living space.

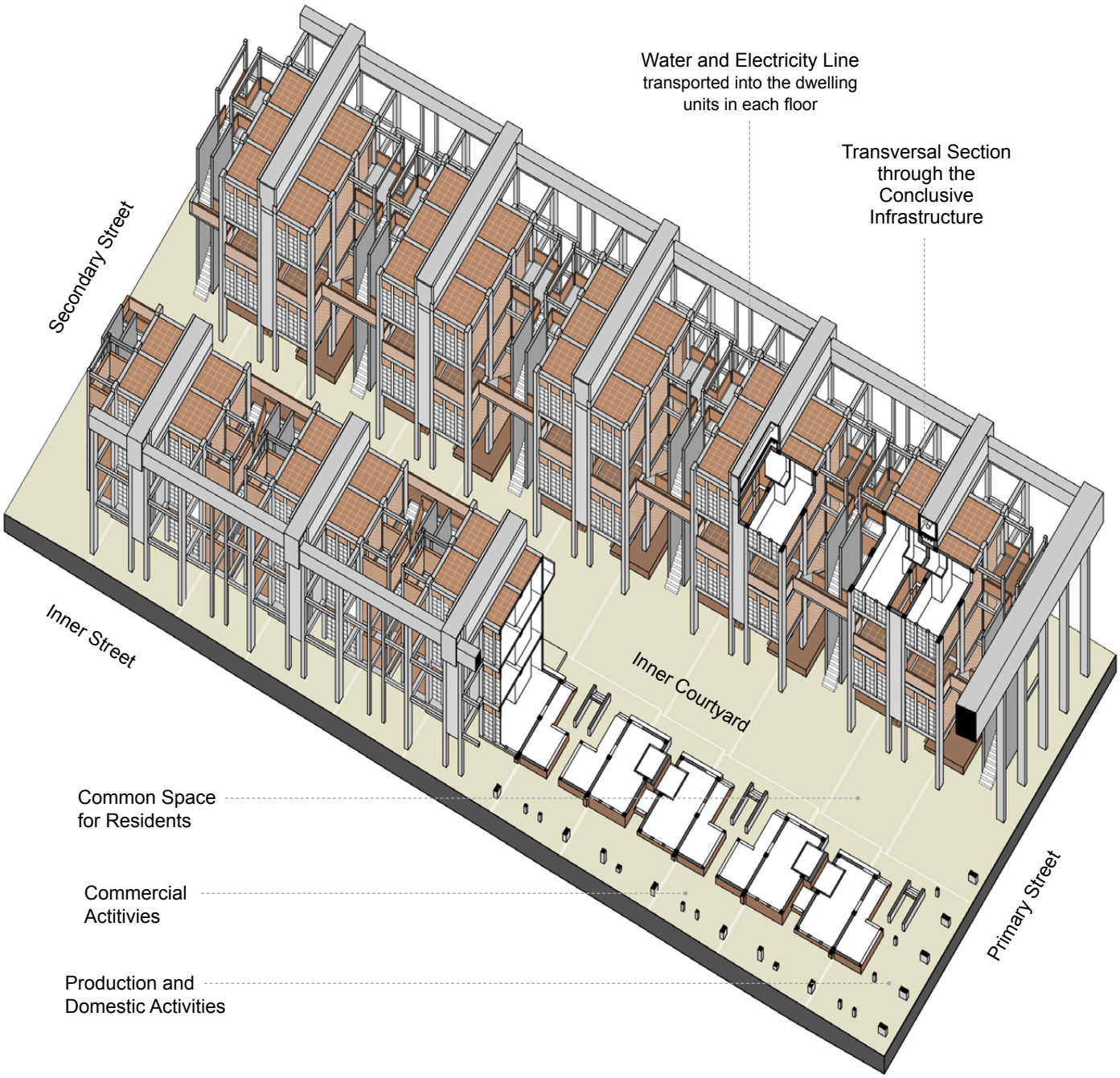
The Conclusive Infrastructure is in the middle of each dwelling unit. This is where the transportation of the facilities end and therefore it works as a water tank and the end line of electricity. From this element, the dwelling units are fed by the facilities and also built-up by its elevated structure.

The Conclusive Infrastructure defines the perimeter of the Inner Courtyards, which result as an open space that can be shared by the dwellers of the block. The shared spaces play a crucial role in the daily life of Addis Ababa, where a wide range of activities is being performed. The Inner Courtyards are the inner semi-public spaces that guarantee the freedom of activities.

Urban Plan of the Project Area

Horizontal Section Through an Inhabitation Block

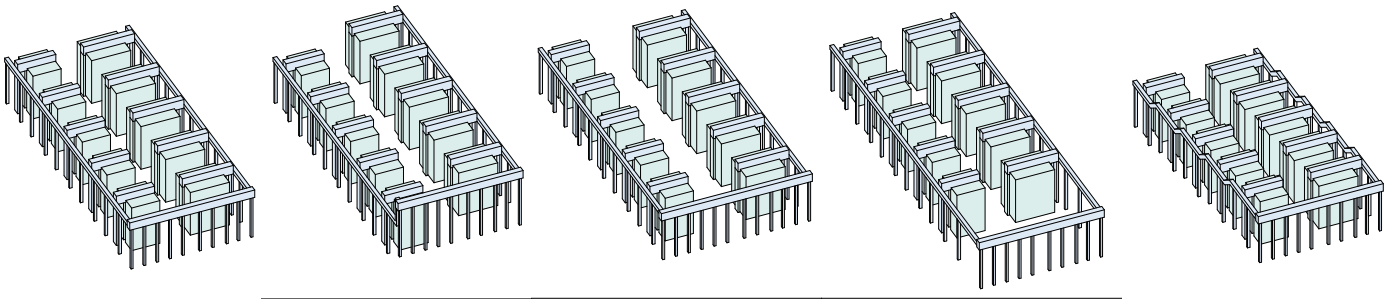
THE BLOCK

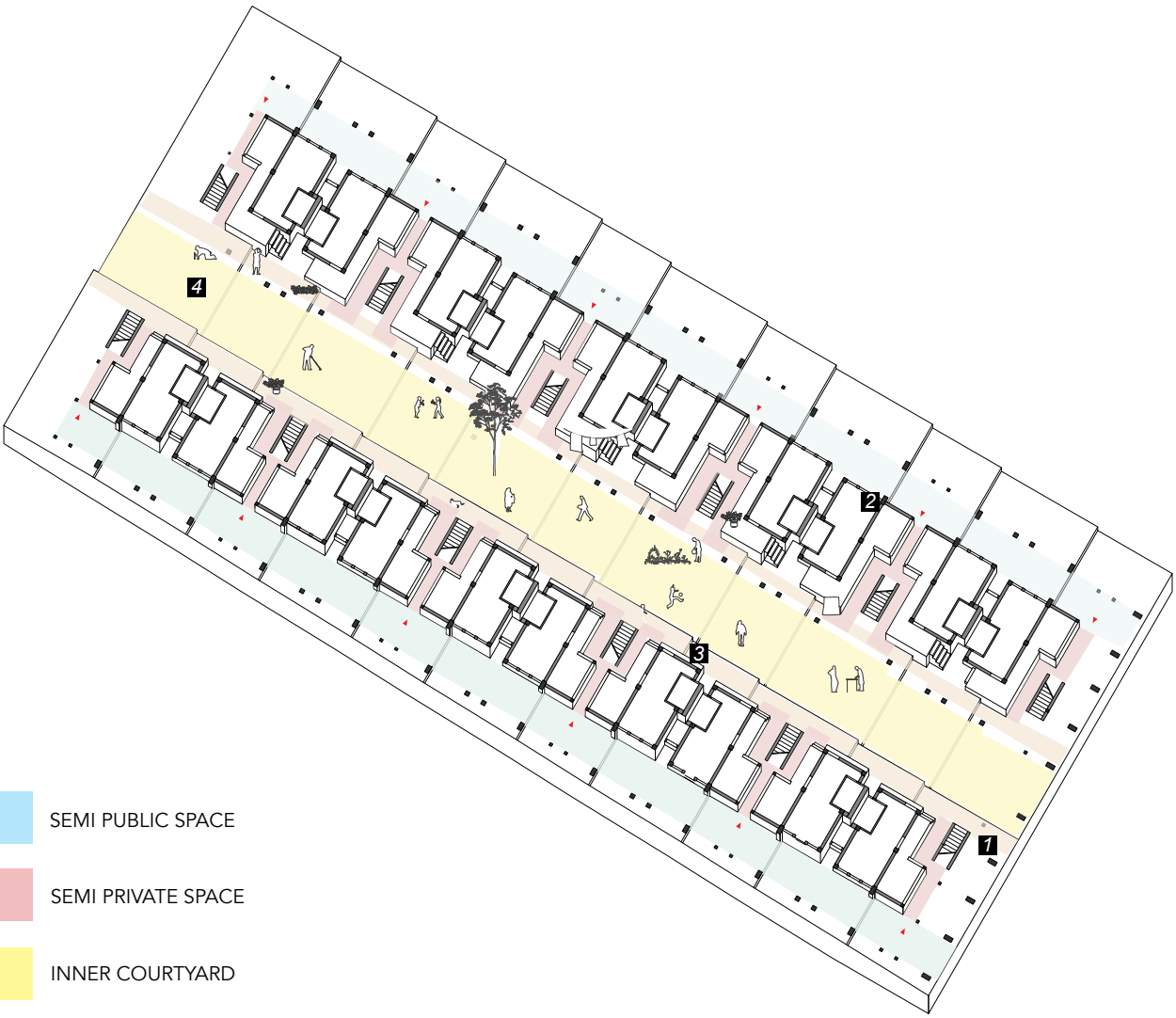


Axonometric View of an
Inhabitation Block

The block is a large scale element, which generates the new urban order in Addis Ketema throughout its repetition. Respecting carefully the existing levels of privacy in the community level, it socially responds to the grid of Merkato, proposing the existing forms of association in the new design. At the same time, the block creates a flexible figure that can be adapted to different heights and levels within the area.

Each block has an inner courtyard around which the housing units are displaced. On the exterior side of the block, the infrastructure manifests itself as a different type of social figure that creates an invisible semi-transparent membrane. On the other hand it provides the each housing unit the possibility of expansion. Therefore the block within itself, contains all the social and spatial configurations of the project.



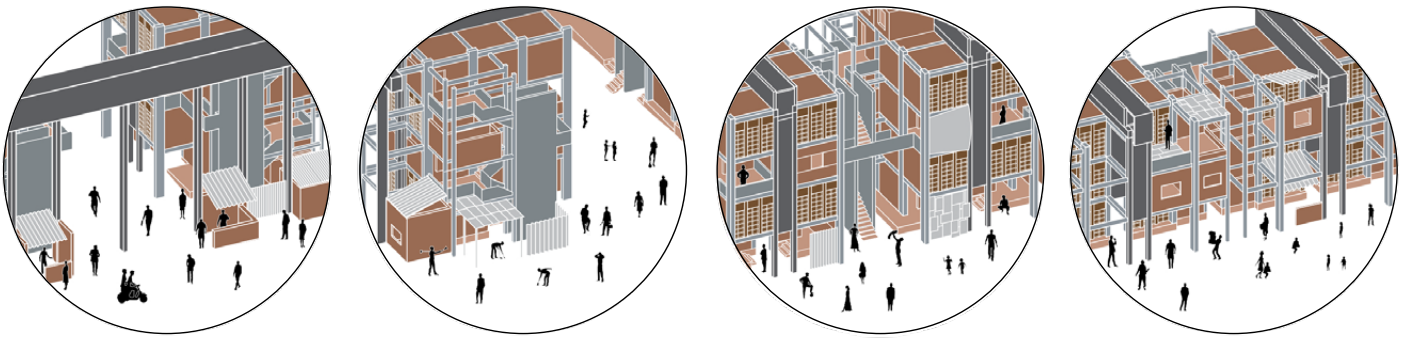


SEMI PUBLIC SPACE

SEMI PRIVATE SPACE

INNER COURTYARD

PLAN OF A BLOCK

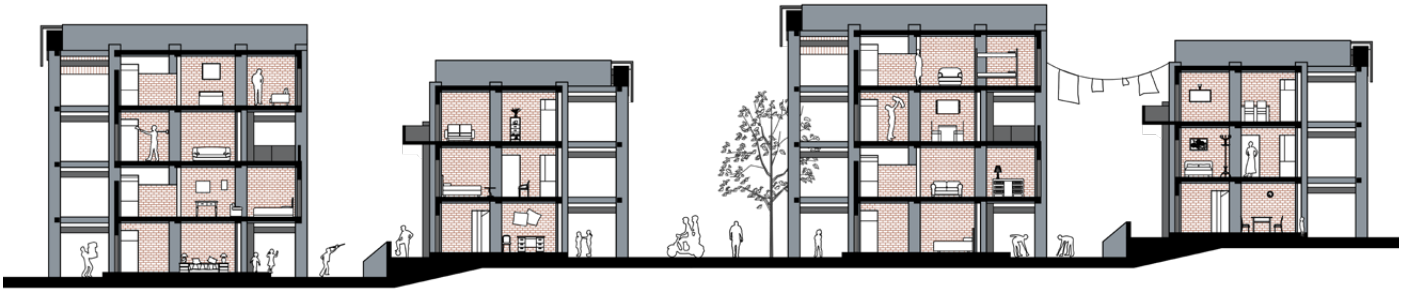


1 Primary Streets

2 Secondary Streets

3 Inner Courtyards

4 Inner Streets



Transversal Section of the Project Area

The plan of a block shows that the disposition of the three moments of infrastructure creates different social patterns. These social patterns imitate the existing social patterns in Merkato's grid, which has different levels of privacy.

The path that the primary infrastructure follows has a larger scale and it is where the public activities occur. The secondary infrastructure works more or less in the same way by creating an inner street which would mostly be used by the dwellers. But once you get into the block by crossing the primary infrastructure, you skip a level of privacy and get into a more private area, which is the inner courtyard.

The access points for the dwelling units are situated in the inner courtyard so that only the people who live there would have an access to this space.

Although this new infrastructural system looks very rigorous and monotonous in a certain sense, the capacity of creating different levels of privacy makes it an open structure where the daily life of the inhabitants can occur in a flexible and open way. It is at this point that the superstructure is proposed as a system of rhythms, waiting to be played, lived, experienced and addes upon by the inhabitants of Merkato.

VIEW FROM THE INNER COURTYARD

THE DWELLING UNIT

Section of a Dwelling Unit

1 Compressed Earth Blocks
20 x 20 cm / Roof Tiles

2 Stabilized Earth
thermal insulation

3 Water Proof Material

4 Reinforced Concrete Frame
for infill masonry

5 Reincorced Concrete Girder

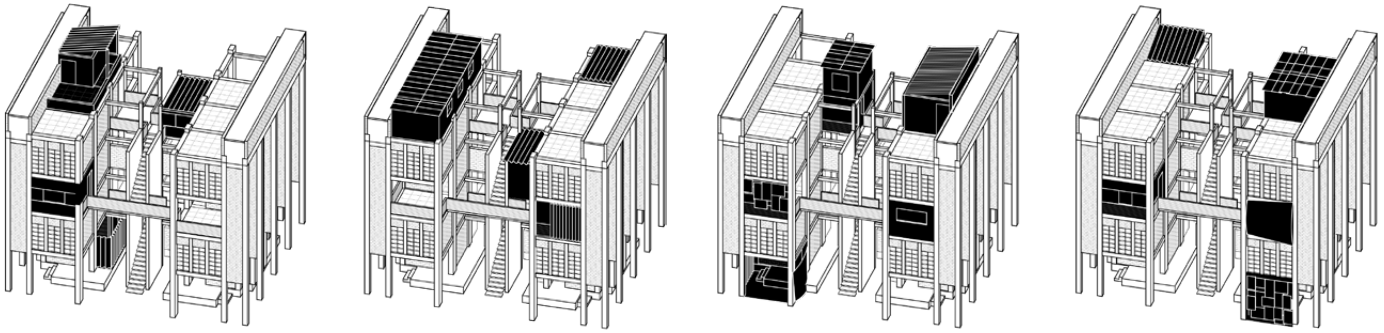
6 Earth Blocks
with chamfered ends

7 Compressed Earth Blocks
29.5 x 14 x 9 cm

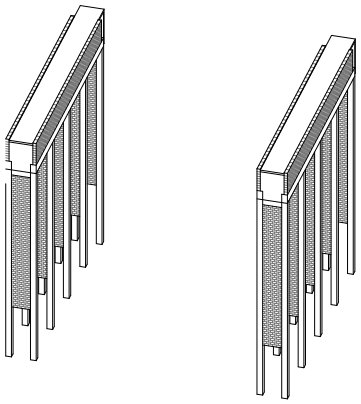
8 Compacted Ground Earth

9 Wooden Steps

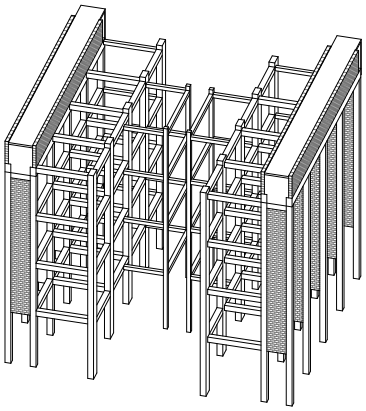
10 Concrete Blocks



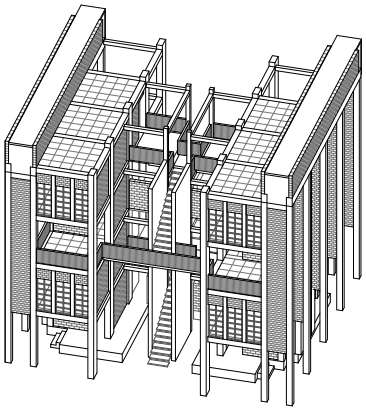
Possibilities of Expansion of a Dwelling Unit



The Conclusive Infrastructure



The Structure of the Dwelling Unit



The Commodities of the Dwelling Unit

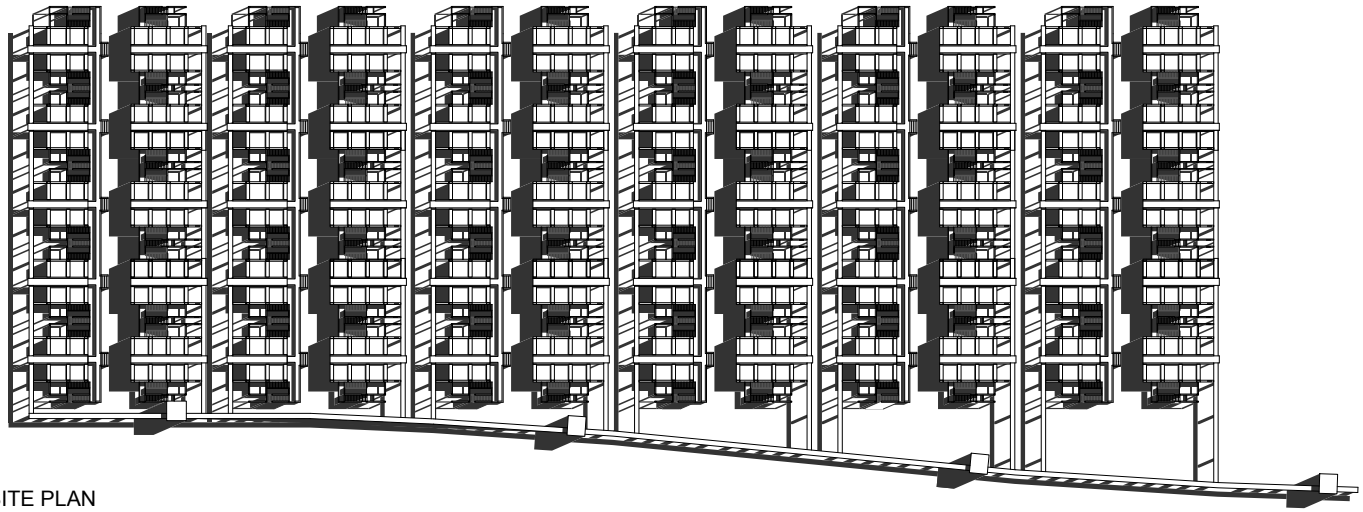
The dwelling units are open to different forms of adaptations. The plans of the units are organized in a way that the minimum is given to the dwellers, with the possibility of gaining more, containing initially a bathroom, a kitchen, a multi-functional room, an open space such as a balcony or a veranda and a space for possible expansion. This means that the dwellers can improve their own living conditions the way they are comfortable with, and therefore achieve the freedom that they used to have in the slums.

The structure of each dwelling unit is a concrete frame attached to the third element of the superstructure. In the initial phase of the dwelling unit, this infrastructure works as a public element which shapes the inner courtyard, while from a long-term perspective it gives the possibility to expand each house, up to doubling its size.

In this way a certain type of incrementality can be achieved, giving the dwellers the possibility of improving their urban environments. The walls of each dwelling are made from compressed earth blocks, filling in the concrete frame. The reason I chose this element was to provide ease of modification of each dwelling unit since the earth block itself is a light element to operate with. At the same time, the earth is a traditional and local building material, used mostly in the informal settlements in Addis Ababa.

VIEW FROM THE DOMESTIC STREETS

THE URBAN IMPLEMENTATION

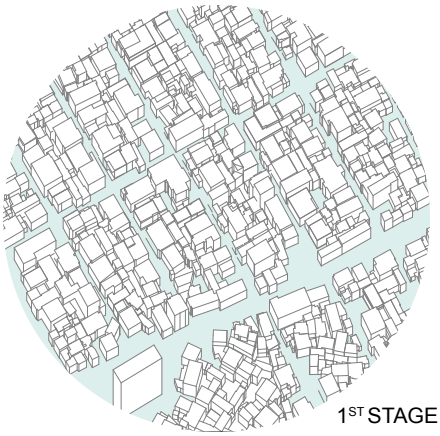


SITE PLAN

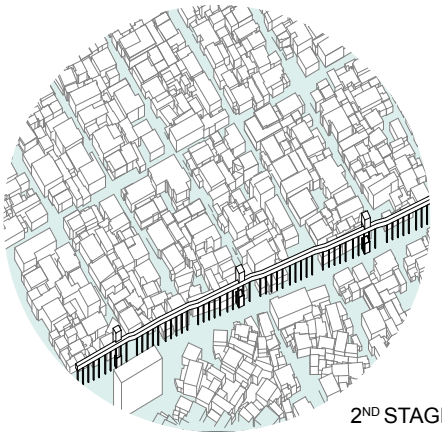
In the informal settlements the houses are built gradually, not all at the same time which is one of the biggest contradictions that the mass housing projects create in the newly proposed areas. When a new built environment is introduced all at once, it is hard for the inhabitants to adapt themselves for the new lifestyle it proposes, and therefore the quality of daily life results very poor.

Being aware of this situation, I tried to make the implementation of the new infrastructural system happen in a gradual way. First, the primary infrastructure would be built, together with the water towers and then one by one the blocks would be introduced in the existing grid. This would help the inhabitants get familiar with the new architectural language of the dwellings and show them the benefits of this big change.

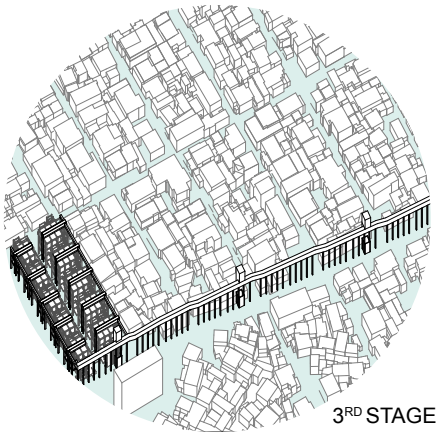
Through this approach, the project can be implemented anywhere within the existing grid of Addis Ketema, providing as a result a new architectural language which can also be adapted to a bigger urban scale.



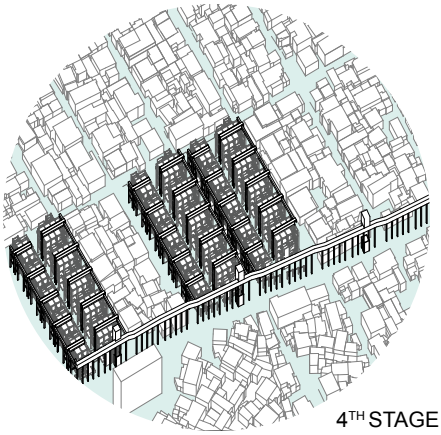
1ST STAGE



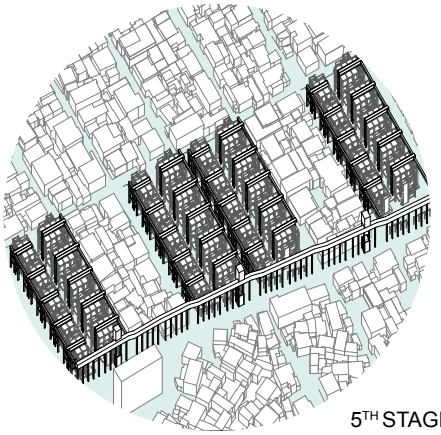
2ND STAGE



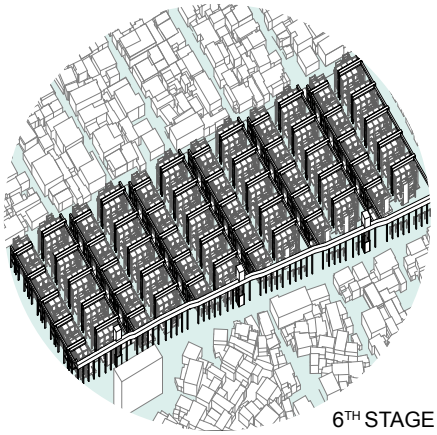
3RD STAGE



4TH STAGE

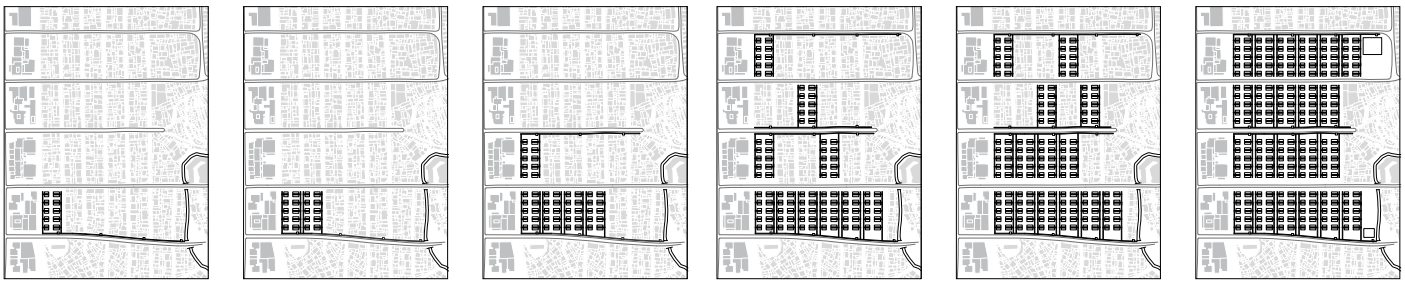


5TH STAGE



6TH STAGE

URBAN EXPANSION PLAN



STAGE 1 STAGE 2 STAGE 3 STAGE 4 STAGE 5 STAGE 6

URBAN IMPLEMENTATION SCHEMES

CONCLUSION

The main challenge I posed to myself in this project was to design a community structure which could be taken over and built upon by the inhabitants. In order to guarantee the full participation in a new building/space, the creation of a community or the protection of an existing community must be guaranteed. Considering that the community is developed through the interaction between the human, the natural and the constructed, the validity of the form of a community depends on the architect, who in this case should realize an objective analysis of the pattern of life where he will be doing his/her intervention.

In other words, the emphasis of the project was to make an urban scheme that would establish an environment in which the dwelling units can be appropriated to their functions and the interaction between these units and their environments will be encouraged. In order to achieve this, I found a lot of inspiration in the literature of Henri Lefebvre about the rhythms of the city, and tried to implement this theory by seeing the rhythms as a base structure to design, which in the end after many explorations, resulted as the Superstructure.

If we think about the project from a broader time gap, the Superstructure would have a longer life cycle than the housing blocks attached to it. While the housing blocks will have the chance to be changed or replaced, the Superstructure will still remain with its basic functions. Therefore, the superstructure is not per se a flexible object or building but it is a system that makes the urban complex flexible enough to foster short-life buildings as well as long lived ones.

In this urban context, my goal was not to design only a housing scheme that would accommodate today's needs. What I aimed for instead was to design a system that would have a longer temporal validity and therefore the possibility to reestablish new possibilities in the future. This makes the super-structure an open-ended system rather than a rigid figure dominating the whole area. In an era where the planning of cities are based on functions rather than the people themselves, this project was also an attempt to reflect on the role of the architect in these circumstances.

VIEW FROM THE SECONDARY STREET