Kenya

Nairobi

Historical summary

Inhabitants

1899

First proto-building assemblies: a work field is installed for the construction of the tramway that still connects Mombasa to Kampala, the communication line between Uganda and Kenya, completed in 1901.
The village of Nairobi becomes the capital of East British Africa

1914 14 000 inhabitants (1911)

Beginning of the english colonial period: Nairobi land is owned at 80% by whites. There already is a strong separation of ethnic groups.
In 1915 the British government issues the Registration Ordinance to regulate travel to and from the city.

1921 24 300 inhabitants (1921)

Introduction of the African shilling.
Kenyan land is considered among the most profitable for agricultural exploitation

1948 108 900 inhabitants (1944)

FIRST MASTER PLAN OF NAIROBI.
Urbanization is limited by a selection of transfer permits, filtered upstream on the base of applicant's income and working capacity.
The city is divided into 8 Division and 50 Locations.

1950 186 000 inhabitants (1955)

MAU MAU UPRISING
Military insurrection led by an anti-colonial Kikuyu group called Mau Mau and some members of the British militia, is totally suppressed in 1956.

1963 186 000 inhabitants (1955)

INDEPENDENCE AND PROCLAMATION OF THE REPUBLIC OF KENYA
In 1963 a strong population growth, combined with the growing urbanization rate from the countryside due to the fall of the Registration Ordinance, put the area's infrastructures under pressure. Nairobi is proclaimed capital of the Republic of Kenya in 1964

1972 380 000 inhabitants (1965)

MASTER PLAN 'Nairobi Metropolitan Growth Strategy'
It was studied according to modernist dictates but never approved due to conflicting economic and political interests.
This version of the master plan also did not prioritize public spaces.

1999 2 143 254 inhabitants (1999)

In 1999 the KENYA VISION / NAIROBI METRO 2030 program was drawn.

2007 3 375 000 inhabitants (2009)

POST-ELECTORAL INSURRECTIONS DUE TO ALLEGED ELECTION RIGGING

2020 4 735 000 inhabitants (2019 est.)

2030 14 300 000 inhabitants (est.)

Free land — 1895 — Protectorate — 1907 — Colony — 1963 — Republic — 2020

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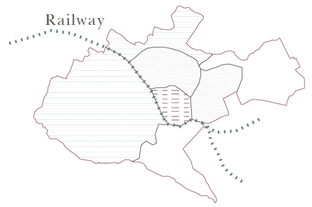
Urban scenries

Masterplan 1948

Masterplan based on racial separation.
European: on 80% of land
Asians are housed near the building site areas,
Locals: located in the swampy and malarial lands of the south-east.
Pulic and green spaces: 27%

That masterplan, which until 2006 was the only version ever applied for the city of Nairobi, was well equipped of public and green spaces. The city uncontrolled expansion has put under pressure a urban plan intended for a small number of inhabitants (just over 250 000), erasing public space areas due to illegal occupation;
The external areas of the city have been used for what is now called the 'green belt of the city', made up of parks, hunting reserves and forest reserves.



Nairobi divisions 1963

After independence, the city is divided into a series of Constituencies. Each one is further divided into wards, for a total of 85.

1. Westlands
2. Starehe
3. Ruaraka
4. Roysambu
5. Mathare
6. Makadara
7. Langata
8. Kibra
9. Kasarani
10. Kamukunji
11. Ebakasi West
12. Embakasi South
13. Embakasi North
14. Embakasi East
15. Embakasi Central
16. Dagoretti South
17. Dagoretti North

Metropolitan Growth strategy 1972

Masterplan is drawn following the modernist precepts, but never approved due to internal political disharmonious interests. Some of the proposal are realized, though on local scale.

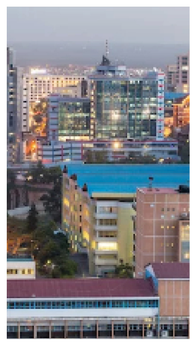
Nairobi Metro City 2030

Following the Millennium Development Goals, Nairobi will be improved and presented as the new lantern of Africa and the economy leader in the world

NAIROBI SCENES

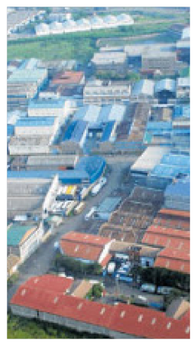
Nairobi is as faceted as it presents itself on the international scenario.
Mainly, four city types characterize the city

Metropolis

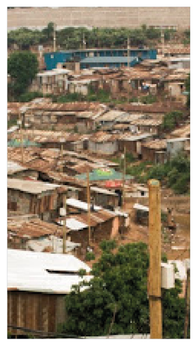


Garden City

Indusrial city



Slum



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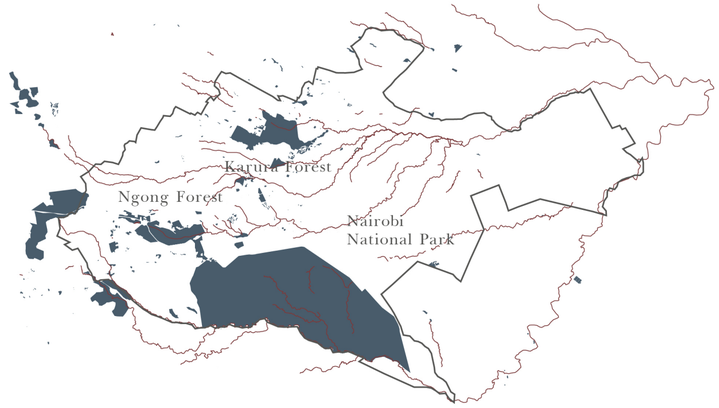
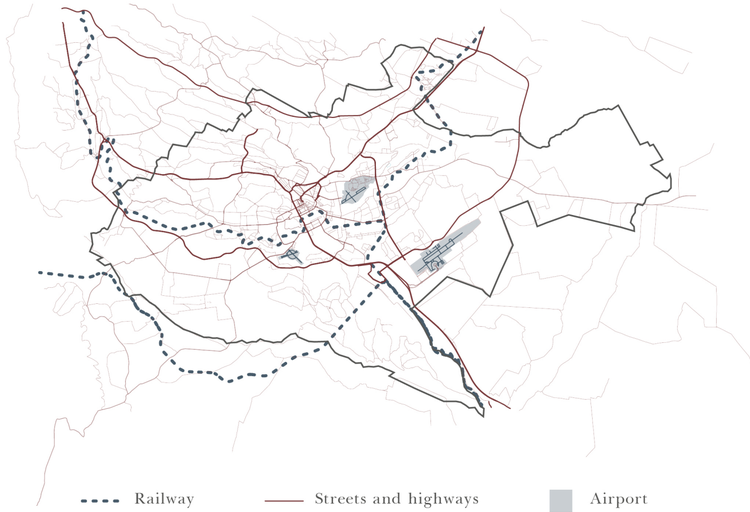
Urban and residential intervention in 4B and Gitathuru Villages

Urban outliners

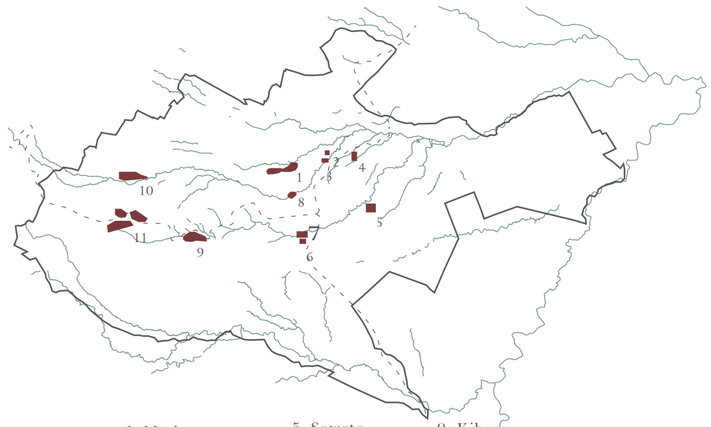
Rivers and parks



Infrastructures



Slums of Nairobi



1. Mathare
2. Korogocho
3. Uruma
4. Dandora
5. Soweto
6. Viwandani
7. Mukuru
8. Pumwani
9. Kibera
10. Kangemi
11. Kawangware

60% of Nairobi Population lives in 6% of its territory

PLAQUE 1
THE CITY OF NAIROBI

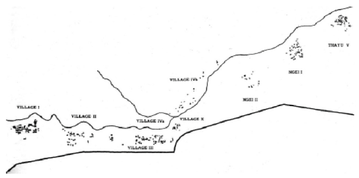
Nairobi

Mathare

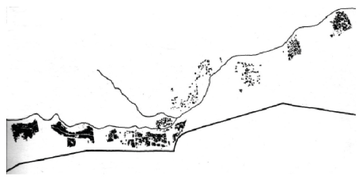
Historical summary

1920-30
During its formation, Mathare Valley was subdivided into nine rural villages rented from Indian landlords. It was divided between 1920 and 1930 and distributed to private individuals and public institutions.

1950
In 1954 part of the settlements were demolished behind the fear of the Mau Mau movement. After independence a huge immigration flux from land to city made the villages explode into what nowadays is known as the Mathare slums and Valley.



Mathare Valley settlements, 1964



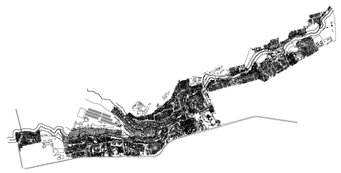
Mathare Valley settlements, 1969

1970
Land owning:
34% by the state
8% by the Nairobi City Council
58% by individuals
Squatters occupied lots, and still lay claim on them, in a rural and informal way.
As land ownership was distributed between the state and housing companies during the 70s, the following distribution of housing plots was heavily influenced in the valley.

Mathare Valley settlements, 1971

2000
After the heavy post-independence influx, poor shelters in Mathare offered a way cheaper option for people coming from rural areas. The extreme density that is today visible has reached a very high population density, and, as it keeps being considered by locals a temporary settlement from locals, mislead and poorly ruled by the governance, its development has been nearly impossible.

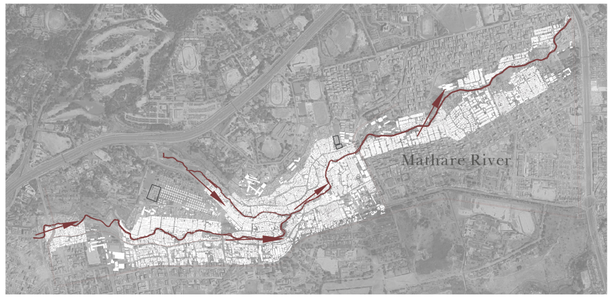
Mathare Valley settlements, 2001



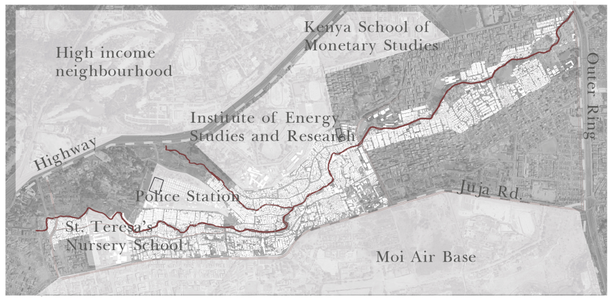
Mathare Valley settlements, 2020

Geomorphology

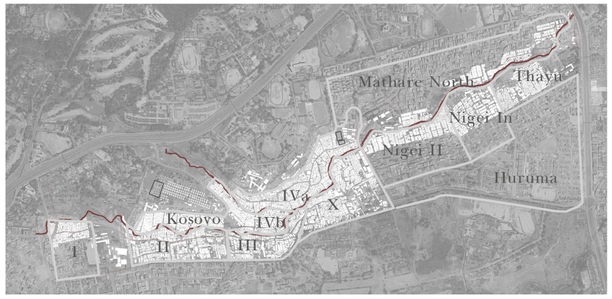
Mathare River



Man-made boundaries



Villages of Mathare



Population

Mathare

Population:
800 000

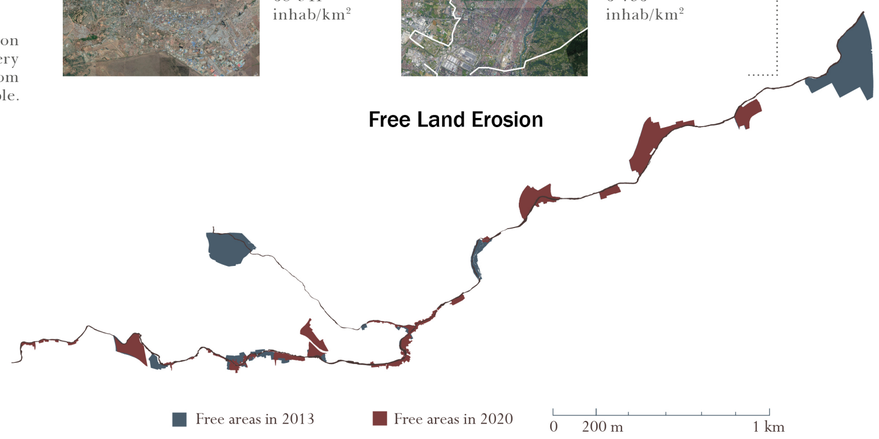
68 941
inhab/km²

Torino

Population:
800 000

6 736
inhab/km²

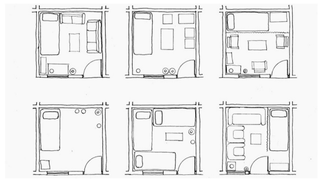
Free Land Erosion

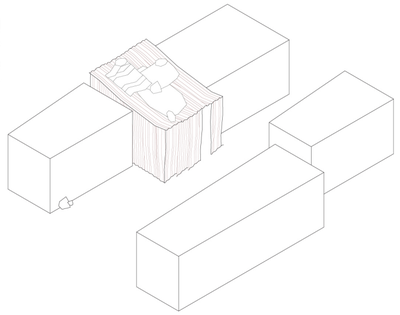


A schack architecture catalogue

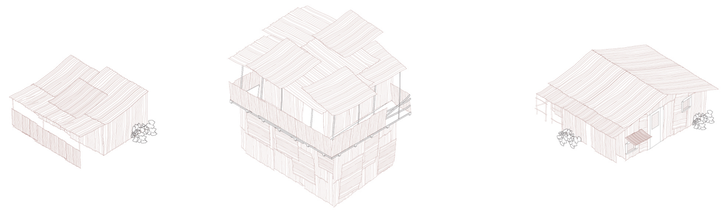
SHELTER

It is the fundamental element and it can be used in clusters or as single ambient. Its shape can vary from a minimum of one room to a multiple room house. It serves both as house and warehouse for shops and activities.

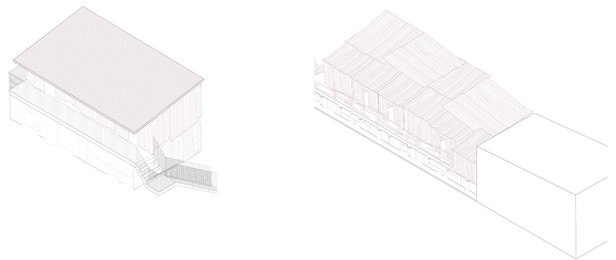




Compositions

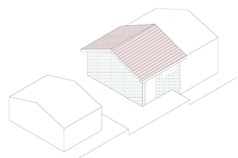


Parasitism



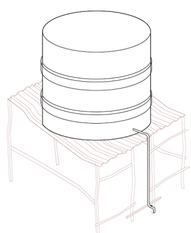
FORMAL SETTLEMENTS

These buildings were raised up to 8 storeys, making them illegal due to country laws, although the standard of living in these buildings is not anyway as low as in informal settlements. Forms of parasitism are visible around their basement, generally used as commercial spaces.



WATER TANK

It is one of the most important structures in the slum, as it provides water where the pipeline doesn't reach the population. Water is sold here at a high price compared to areas were water lines arrive



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PLAQUE 2
MATHARE VALLEY

Free areas

Slum shacks

10 m buffer zone

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PLAQUE 3:

SATE OF AFFAIRS

0 20m 100m

Roads

Primary Roads

Open saces

Seconday roads

The condition of the streets in this areas are very low. The connections with the neighbouring villages are more or less non-existant and the motored circulation is impossible due to the occupation of the streets, during the years, by vendors and schack buildings.

Services

Primary Roads

Open saces

Seconday roads

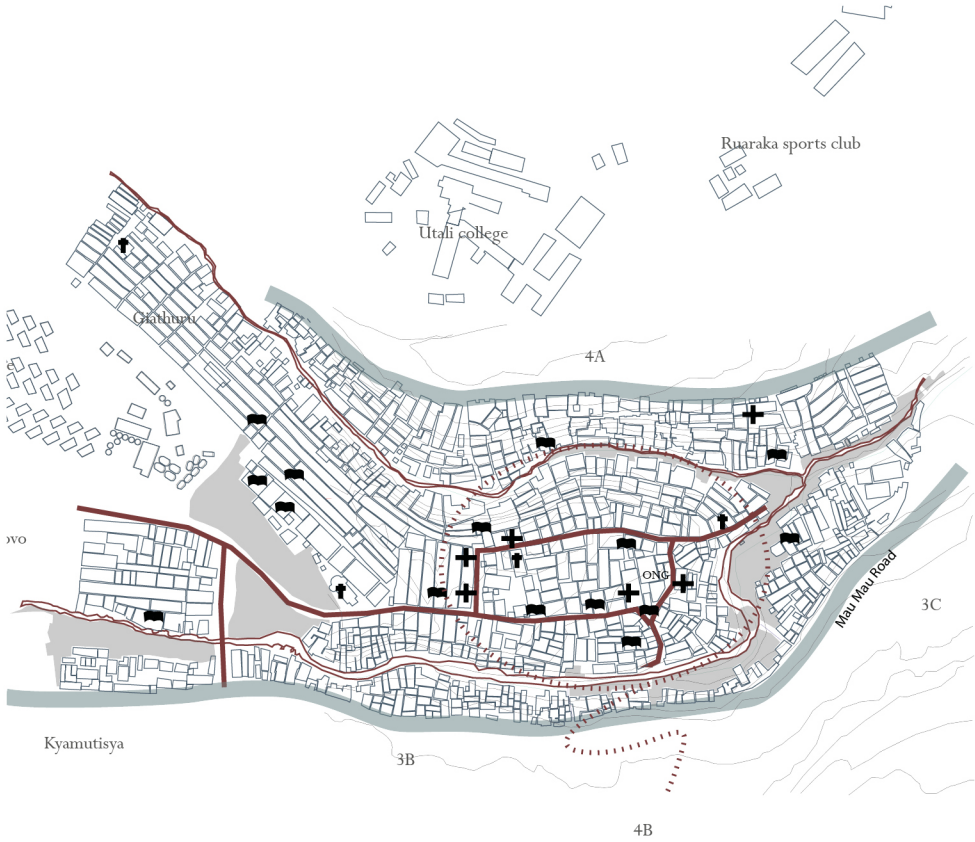
ONG Ong

Sanitary structure or hospital

Cult or religious structure

School or education structure

Mathare 4B is home to one of the biggest medical centres of the sum, the SHOFCO MATHARE, led by an ONG. This is one of the structures barely reachable by emergency wagons in case of emergency, which isn't always he case for other structures of this kind. School and educational are mostly private entities and associations, providing low education for a high price.



Sanitary services

Primary Roads

Open saces

Seconday roads

Toilets

Currently, the provision of toilets and sanitation points in the area is drastically low.

The absence of a sewerage system makes it impossible to plan a correct distribution of this services to the population, which should be correctly planned with a mutual distance of 60 m one to the other if compared to the population number of the slum.

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PLAQUE 3A

STATE OF AFFAIRS
ANALYSIS

01 Healthcare
02 School
03 Sanitary services
04 Church
05 Commynity Centre
06 Sport area offices

01 Playground
02 Sport area
03 Third age Gym
04 Wooden deck
05 Belvedere
06 Public gym
07 Dreinage Garden
08 Open air theatre

Principal Pathways
Secondary Pathways
Multifunctional project
Reisdential project
Sqares

10 m buffer zone
Pedestrian areas
Vegetable gardens
Adaptive River Basin
Slum shacks

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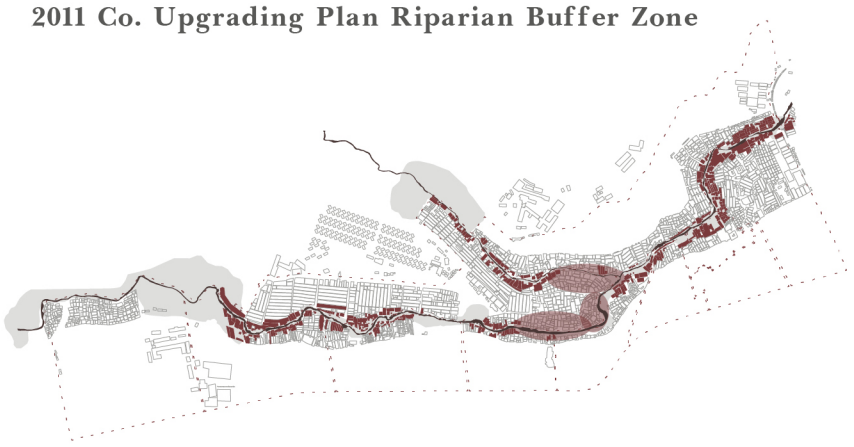
PLAQUE 4
MASTERPLAN

0 20m 100m

River Basin Area

2011 Co. Upgrading Plan Riparian Buffer Zone

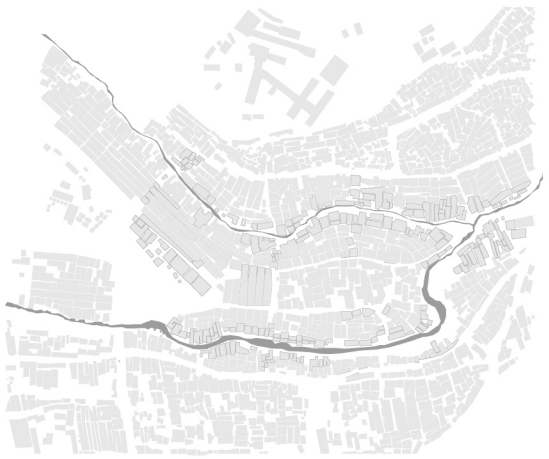


10 m Riparian Buffer Zone

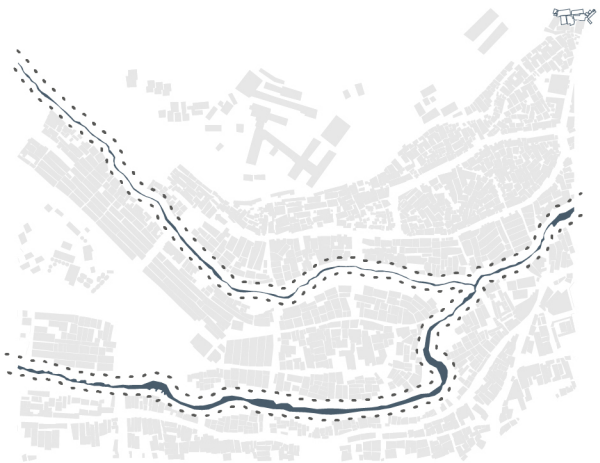
■ Livelhoods afected ■ Risky areas in case of exceptional events

■ 2011 Co. Upgrading Plan Riparian Buffer Zone

The risk of a flood catastrophic event is very high due to the presence of informal architecture blocks right next to the river bed. The creation of the river basin's area is necessaryto find a solution to this problem. Following the law of Kenya, the minium spacing required between any kind of activity and the river has a minimum range of 10m, whic can be integrated with the free areas still standing in the slum to create a park, which would have both an environmental role and a community one, working as te river basin and as a collector of urban devices for the community like decks, playgrounds, playfields and walkways.



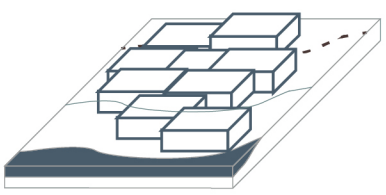
2020
State of art



2030
Creation of the River Basin

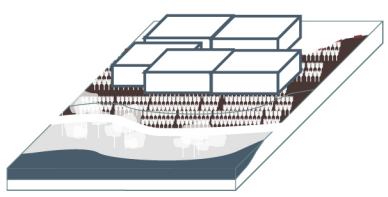
Necessities
- Creation of a safe zone from floods
- creation of a buffer zone between the riparia area andthe residential one
- Recovery of the waters from liquid and solid pollution

Strategy
- Demolishment of informal architecture built within the 10m buffer zone
- Vegetation growth along the river and study of urban devices



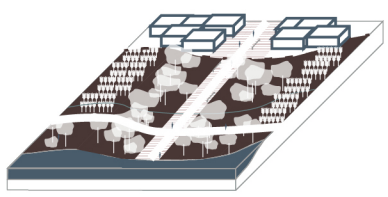
2020

State of art



2030

Park

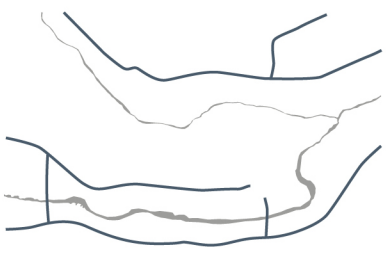


2030

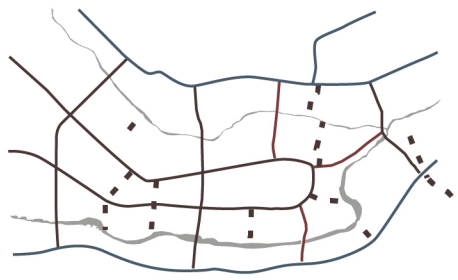
Pathways

Transport system

Streets are at the moment unfit to emergency wagons and automobiles, affecting the general usability of the area and the velocity of emergency intervention. The implementation of both pathways and driveways will implement security and livability of the slum



2020
State of art



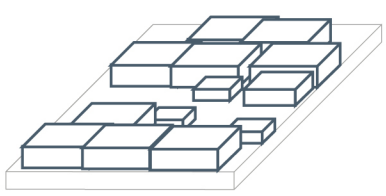
2030
State of project

Necessities
- Drainage
- Liberation of circulation areas
- Traffic typology distinction
- Better lighting of streets

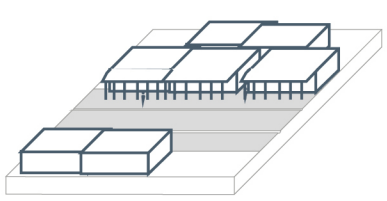
Strategy
- Enlargement of the street area
-Creation of sidewalks and developent of existing commercial areas along the streets
- Creation of a drainage system

Necessities
Public functional areas with services integration
- Lighting developmnt
- Better and continuous patroage of pedesrian areas

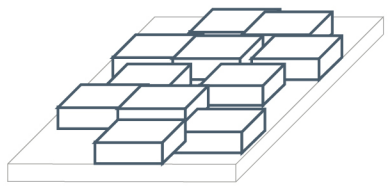
Strategy
- Creation of principal pedestrian areas, able to create asafer moving pattern
- Drainaging flooring
- Sanitary services integration
- Lighting implementation



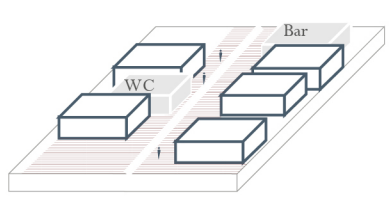
2020



2030



State of art



2030

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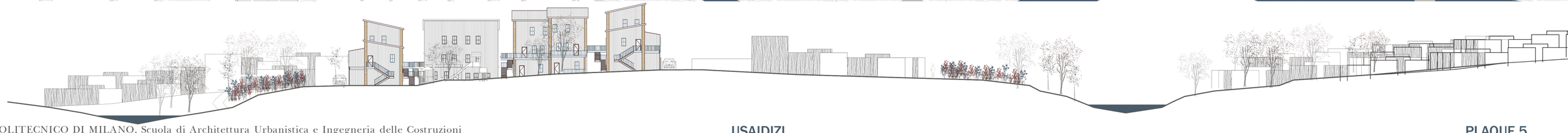
PLAQUE 4A
STRATEGIES AND NECESSITIES

B’



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PLAQUE 5
VOLUMETRIC VIEW

0 5m 25m

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PLAQUE 6
GROUND FLOOR

0 5m 25m

Development Strategy

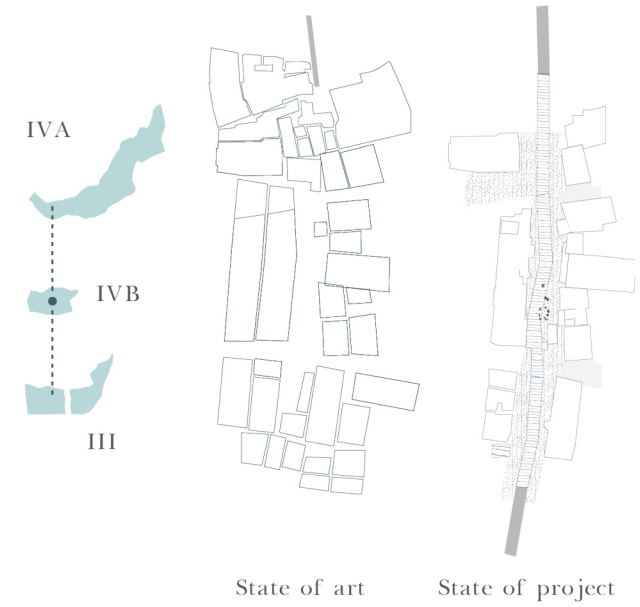
The avoidance of forced eviction is a statement in the project. A version of the masterplan where the upgrade may take place without affercting existent activities and livelihoods may be a strategy in order to convince people for a voluntary relocation, in attendance for the project to b completed.

Phase 1

Phase 2

Principal pathway

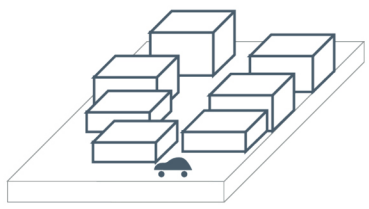
The pedestrian pathway is the core of the urban intervention, as a connector between th villages. It will provide a better mobility as well as the prevention of the isolation of Mathare 4B



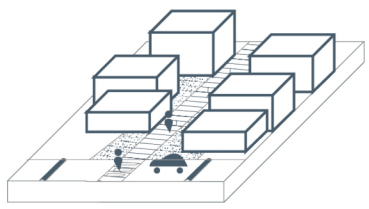
State of art

State of project

Pedonal Crossing
A dfferent flooring material will signal the passages between streets and pedonal areas; Speed inhibitor devices will increase the securityof pedestrians

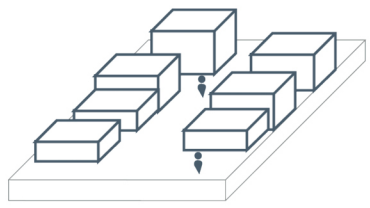


State of art

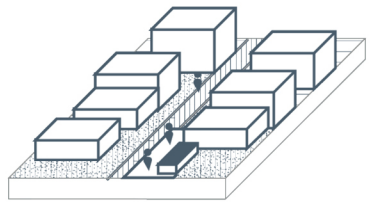


State of project

Water povision
The presence of a fully developed water point is a must in the design of the area, as it works both as service to the community and social collector



State of art



State of project

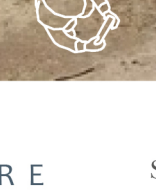
Existing churc

The design of an appropriate space for the moments before and after the religious functions is important, because it builds a space for the community to gather.
The division from the traffic improves the security of the zone, protecting one of typical spaces of the villages since ever.

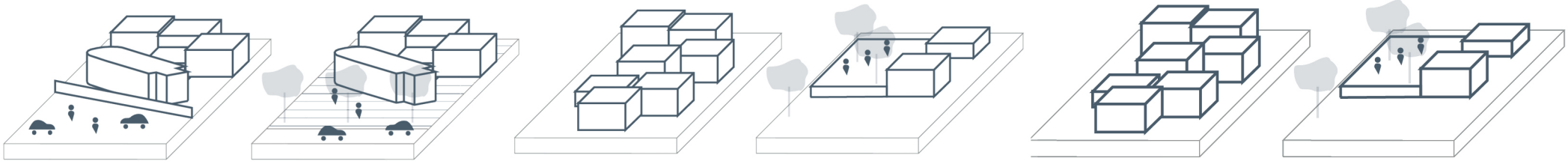
Existing school

With the occasion of the River Basin, neighbouring constructions would be replaced by empty space, giving the opportunity to place a new area next to the school for the kids attending.

New school



Although the presence of the Mcedo school in a nearby position, the general absence of such a service justifies the planning for a new school.
The protected position between the clusters and on the main way connecting them, makes it a nevralgic centre for the residential area.



Materials

Driveways
Stabilized rammed earth

Sidewalks
Stabilized rammed earth separated by wooden lath

Squares
Stabilized rammed earth

Pathways
Tuff autochthonous stone

Pathways
Tuff autochthonous stone

Playgrounds
Stabilized rammed earth separated by wooden lath

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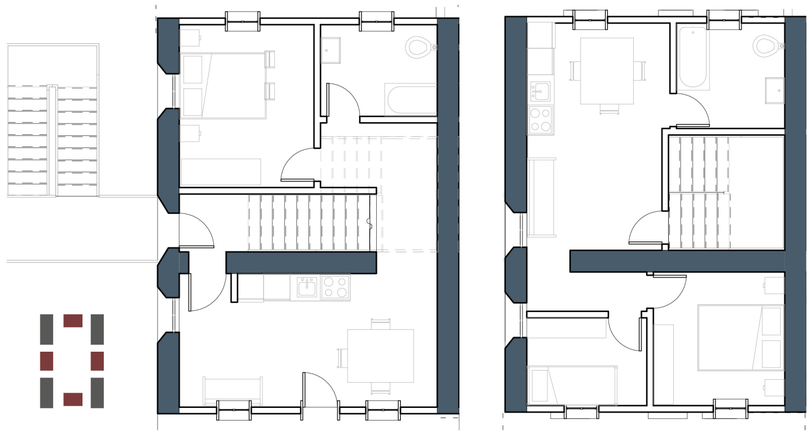
PLAQUE 6A
STRATEGIES GROUND FLOOR

Modules

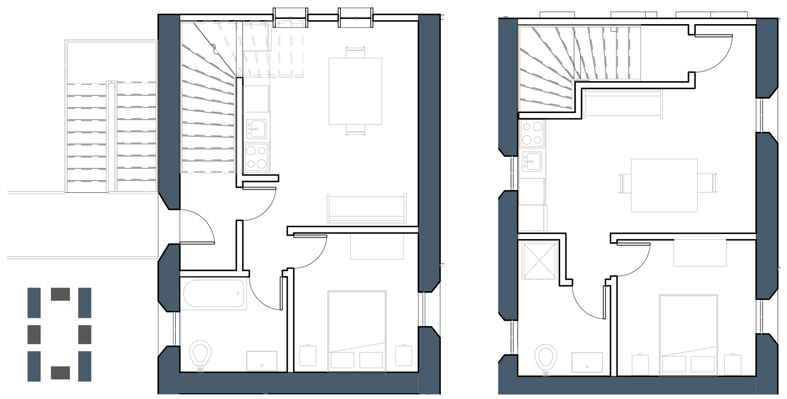
Floorplans

Two types of modules, one longitudinal and one angular, provides a horseshoe shaped composition that can be mixed and composed as needed

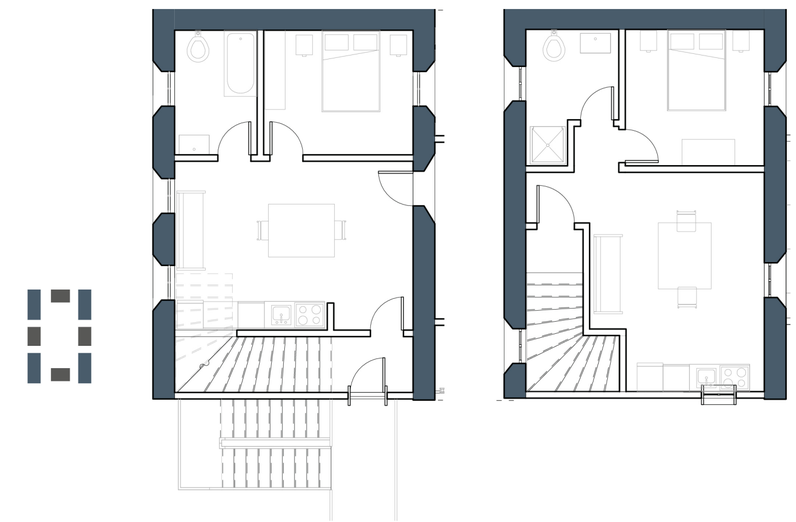
Modulo 1



Modulo 2a



Modulo 2b



Module composition

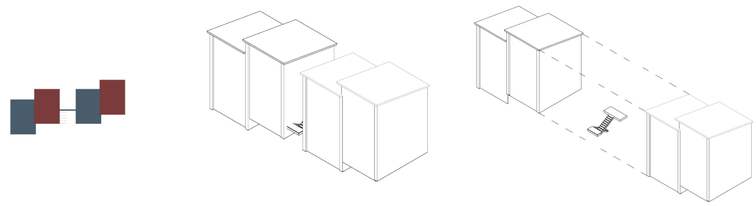
Horizontal flexibility

The compositions of the two modules give a high adactability to the project;
The independence of the structures frees the project from time and building constrains. The presence of a 3 m gap distance between the dwellings works both as a passage and as a ascent device.

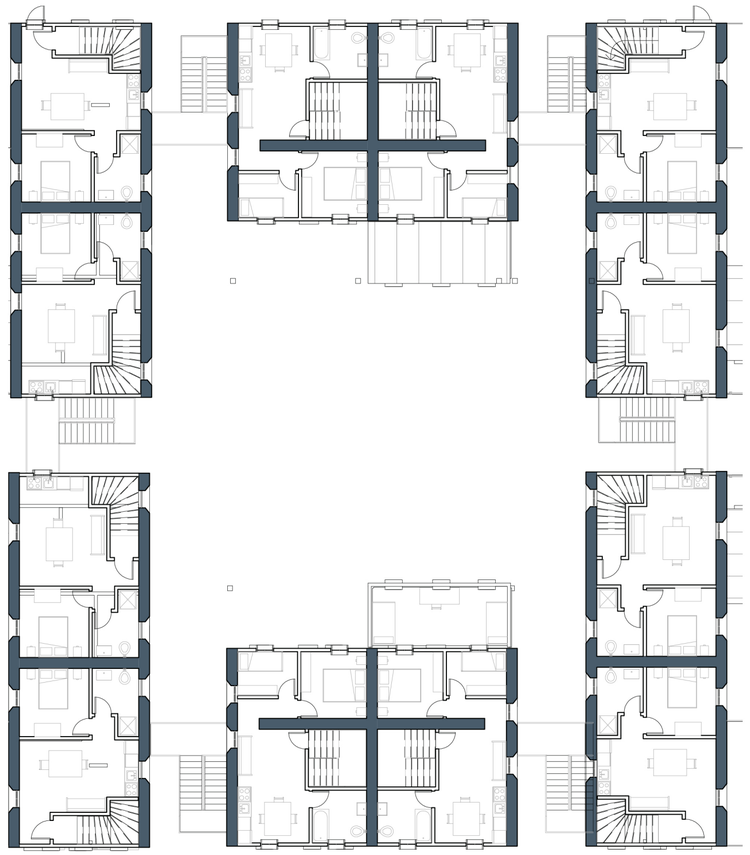
The alternation and variation of the compositions creates private spaces in the areas, at disposal of both the communities living in the residential area and people from other parts of the slum.

Vertical flexibility

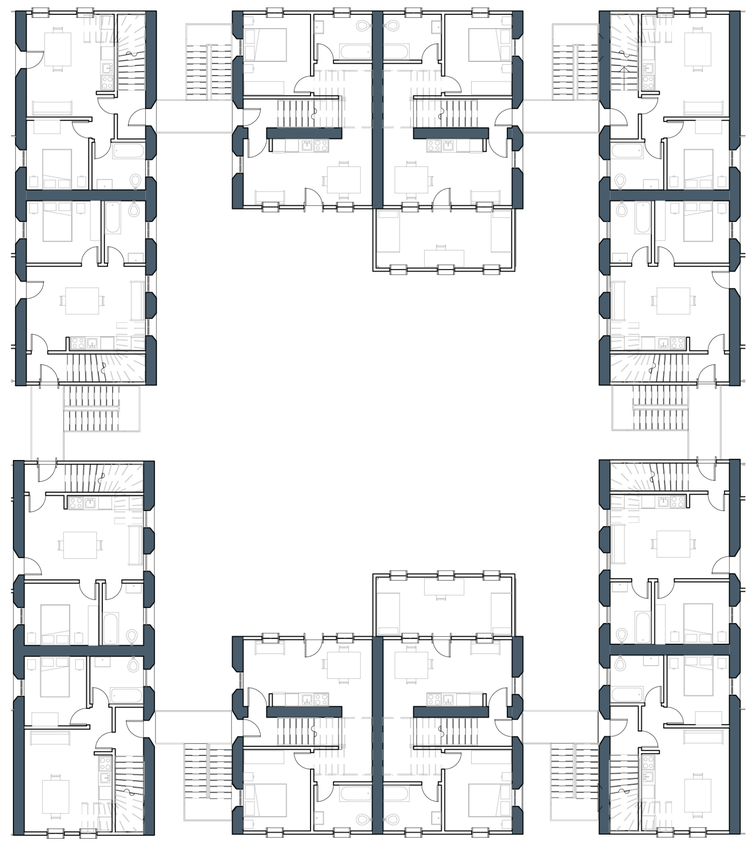
A ground level flexibility is needed too, as the project is built over is not flat. As a matter of fact, gentle slopes shape the area, forcing the design of the dwellings to be adaptable to he height gap



First floor



Second floor



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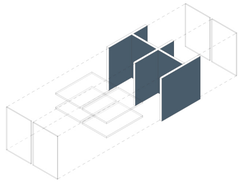
PAQUE 7
MODULES FLOORPLANS

0 1 m 5 m

Structure

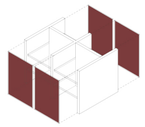
Rammed earth Structure

The non scatolar scheme, usually required for this kind of construction, is balanced by a connecting wall between the two external ones, which works as a solid spine.



Metal sheet facade

The facade is composed by a metal sheet layer, structured by the internal wooden frame and isolaed by a rumor barrier



Cypress wood

Cypress tree is one of the species characterizing the area vegetation of Mathare. It is to be taken into consideration as a local material

Roof

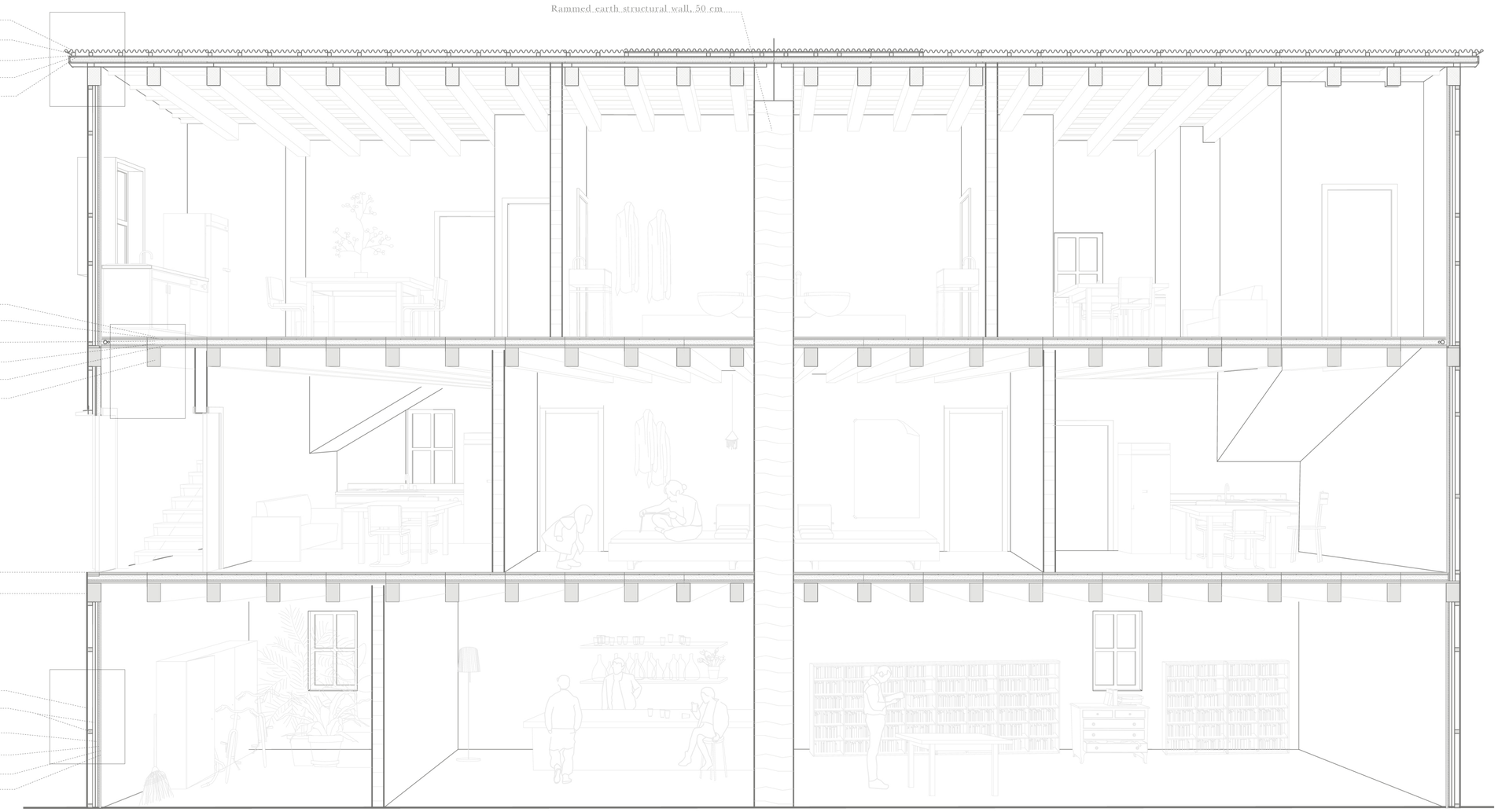
Metal sheet layer
Interscape, 5 cm
Impermeable membran, 0,5 cm
OSB panel, 1,5 cm
Insulation, rock wool, 6 cm

Interfloor

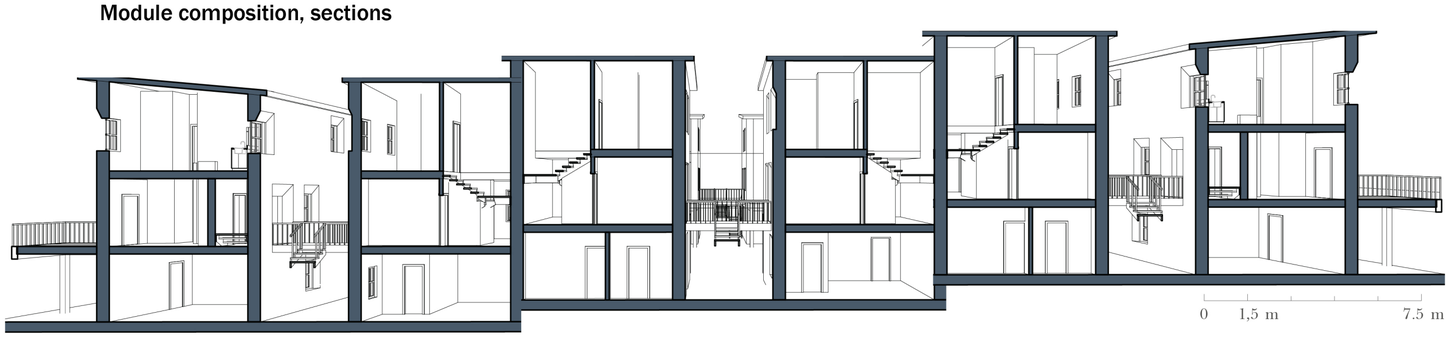
Flooring, 3 cm
OSB Panel, 1.5 cm
Expanded clay system screed, 6 cm
Anti-impact insulator, 1.3 cm
OSB Panel, 1.5 cm
Wooden beam, 18x25 cm, Cypress

Metal sheet facade

Metal sheet layer
Wooden (Cypress) frame: 5 cm
Interscape, 5 cm
Anti-impact insulator, 1.3 cm
OSB Panel, 1.5 cm
Plaster, 0.05 cm



Module composition, sections



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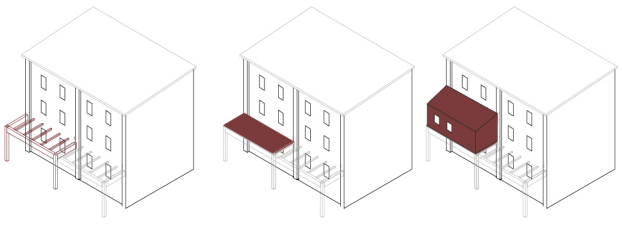
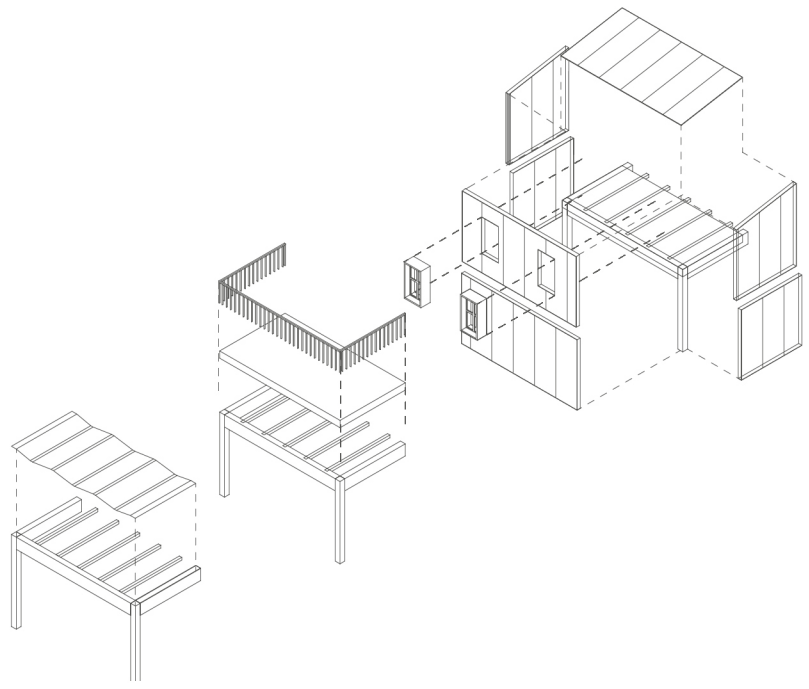
PLAQUE 8
PERSPECTIVE SECTIONS AND STRUCTURE

Self-construction

Wooden structure

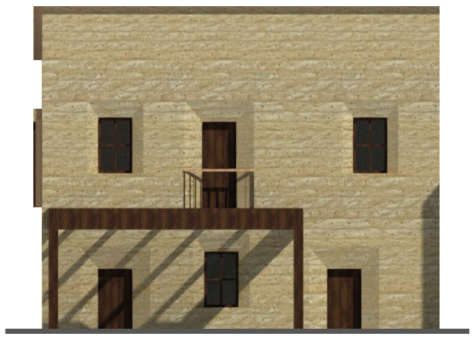
Most of the commercial activities studied have a front porch under which the commercial activity may take place, while the rest of the residential functions take place inside. An external porch made of structural wood, can solve the functions of a platform over which to extend the square footage, a veranda, a balcony or as a commercial activity area.





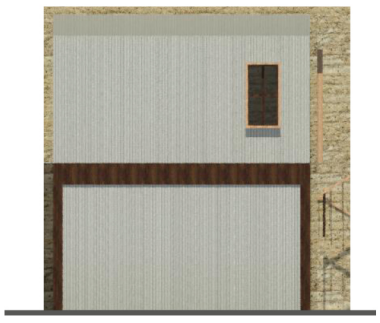
Façade possibilities

Type 1: veranda

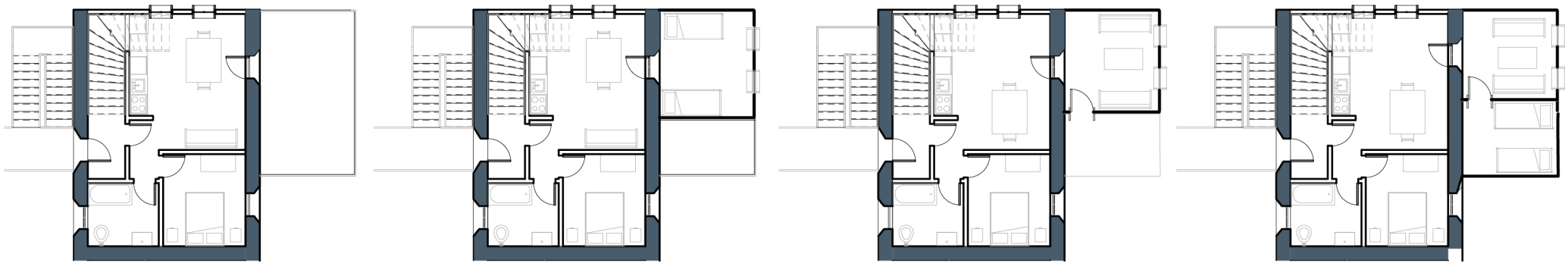


Type 2: balcony

Type 3: additional room

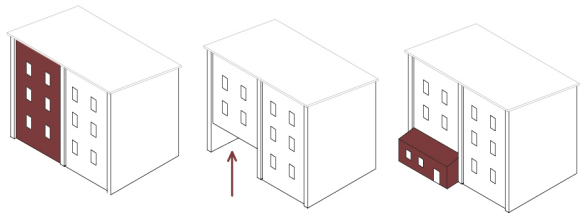


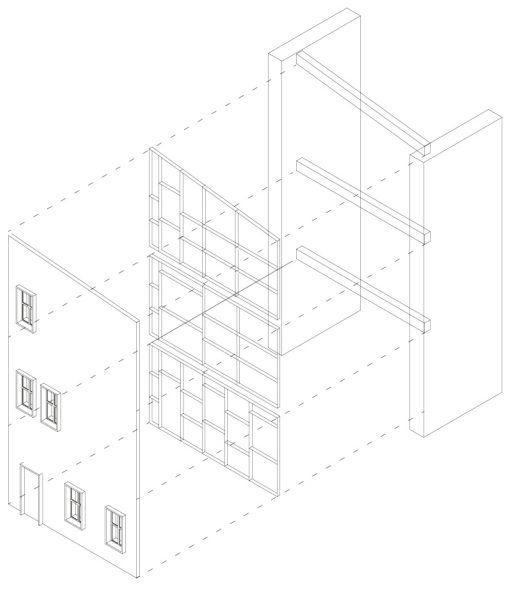
Floorplans possibilities

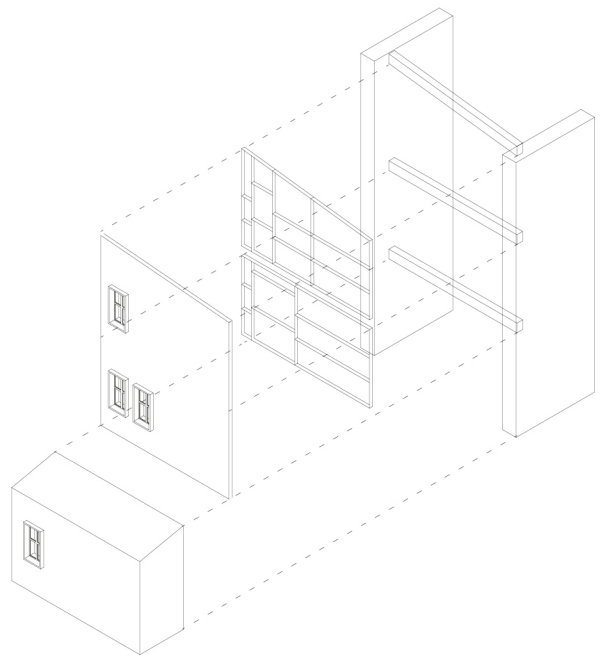


Non-bearing Façade

The metal sheets constituing the façade stand over a wooden structure frame, fixed to the structural elements.
The advantages of these materials, like the cost-effectiveness, the availability on field and the common use of it in the slum contest, make this structure very convenient for the use field the project is built in.
Given the non-bearing function, the lower level can be modified to give more space to the ground commercial floorplan.







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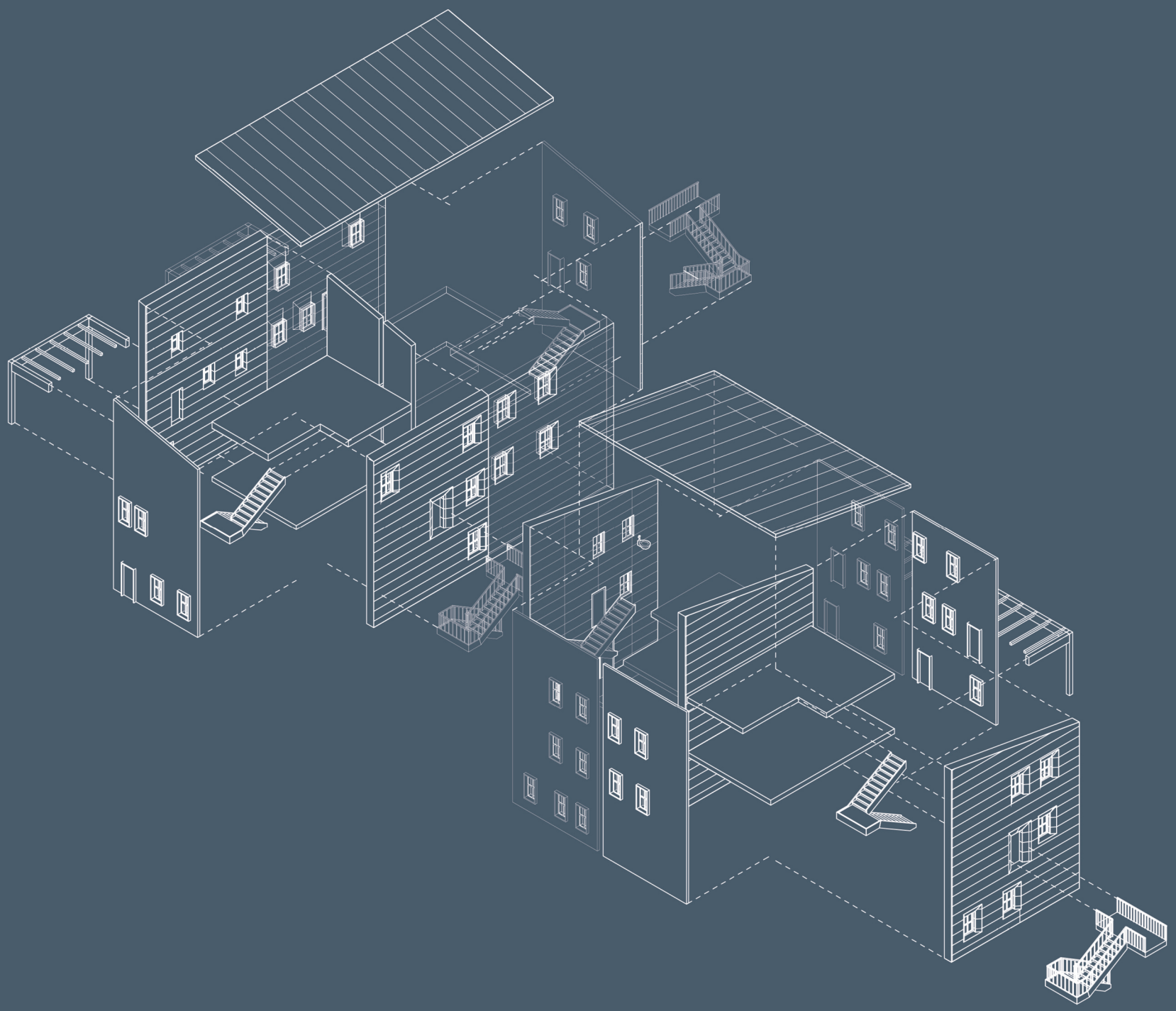

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PLAQUE 8 B
AXONOMETRIC
EXPLODED VIEW

Materials

Corrugated metal sheets

Since the modern period is the excellence material used by sum residents, as it is cheap and easy to handle

Aging process

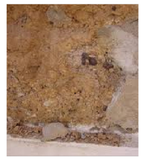


Rammed Earth

It is an economical, resistant and easy-to-handle material

Aging process





Prevision of aging

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PLAQUE 9
DETAIL AND MATERIAL ELEVATIONS

0 0,5m 2,5m