

ADDIS ABABA LIVING LAB

# RESPIRE

A breathing space in a city of acrimony

Yadie Kenno Meko

“Instead of architects assuming we know what is right and jumping in to assert our experience, expertise and good intentions, we need to step back, listen and be ready to learn, unlearn, and adapt.”

—Karen Lu & Mary-Margaret Zindren, Dezeen



# RESEARCH

# ETHNOGRAPHIC RESEARCH

Group Analysis and Graphic Novel of Two Contexts

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## SOCIAL SPACES IN BLIIDORP, ROTTERDAM

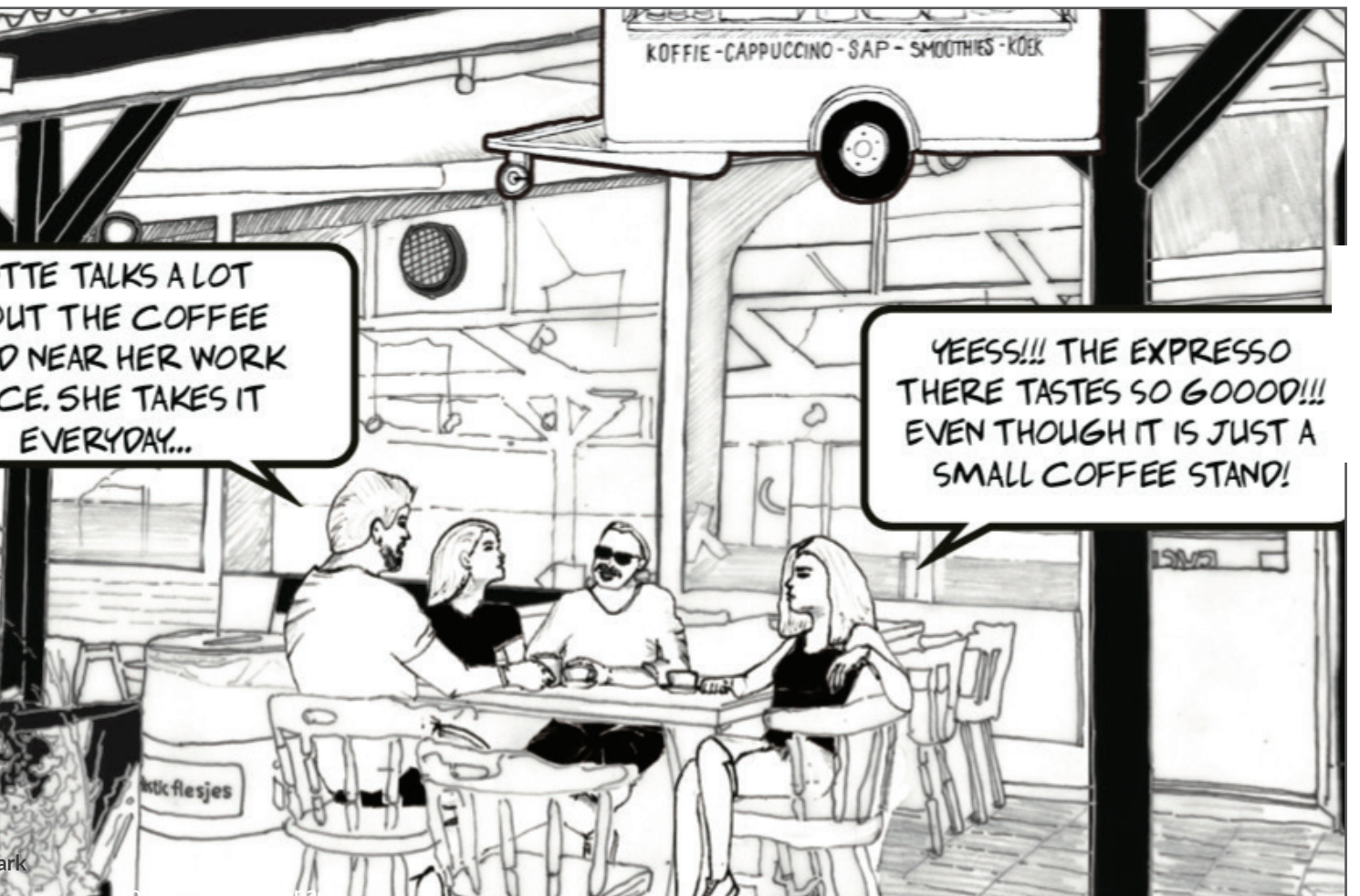
Research



Morning jog in Vroesenpark



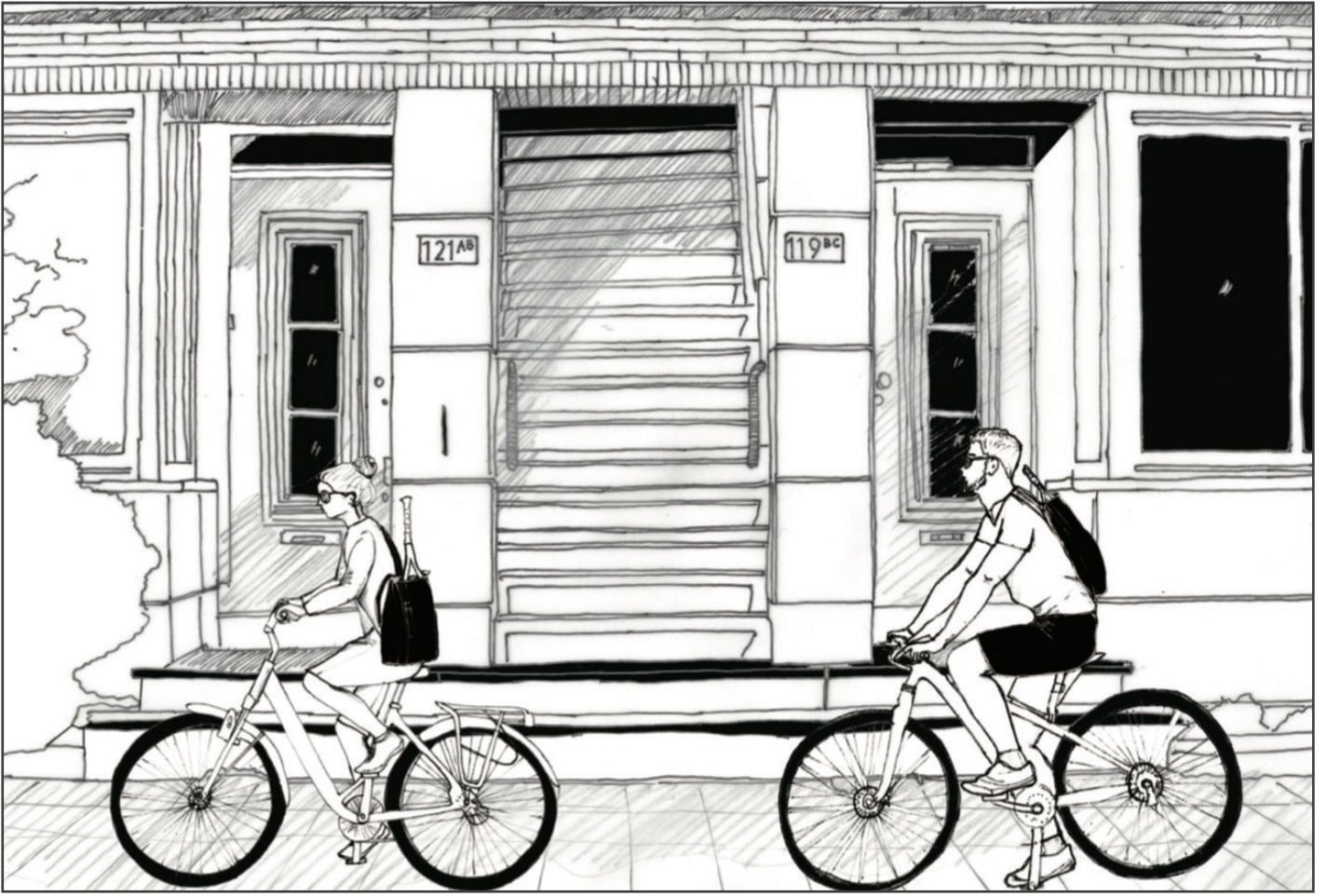
Brunch with freinds in Vroesenpark



## SOCIAL SPACES IN SUMMIT, ADDIS ABABA







## BORDERS IN BLIIDORP

PORTICOS AS BORDERS

## BORDERS IN SUMMIT

Most gated neighbourhoods with middle and high-income households often have guards. This is due to the urban insecurity that is prevalent in Addis Ababa. The increase in income disparity and recent conflicts has exacerbated the security issue.

Additionally, the shortage of resources such as affordable housing has not helped the issue. In Summit, guard posts can be seen placed sporadically throughout the neighbourhood. Although some of them are left dilapidated and empty, some are still in use.



Design Goal

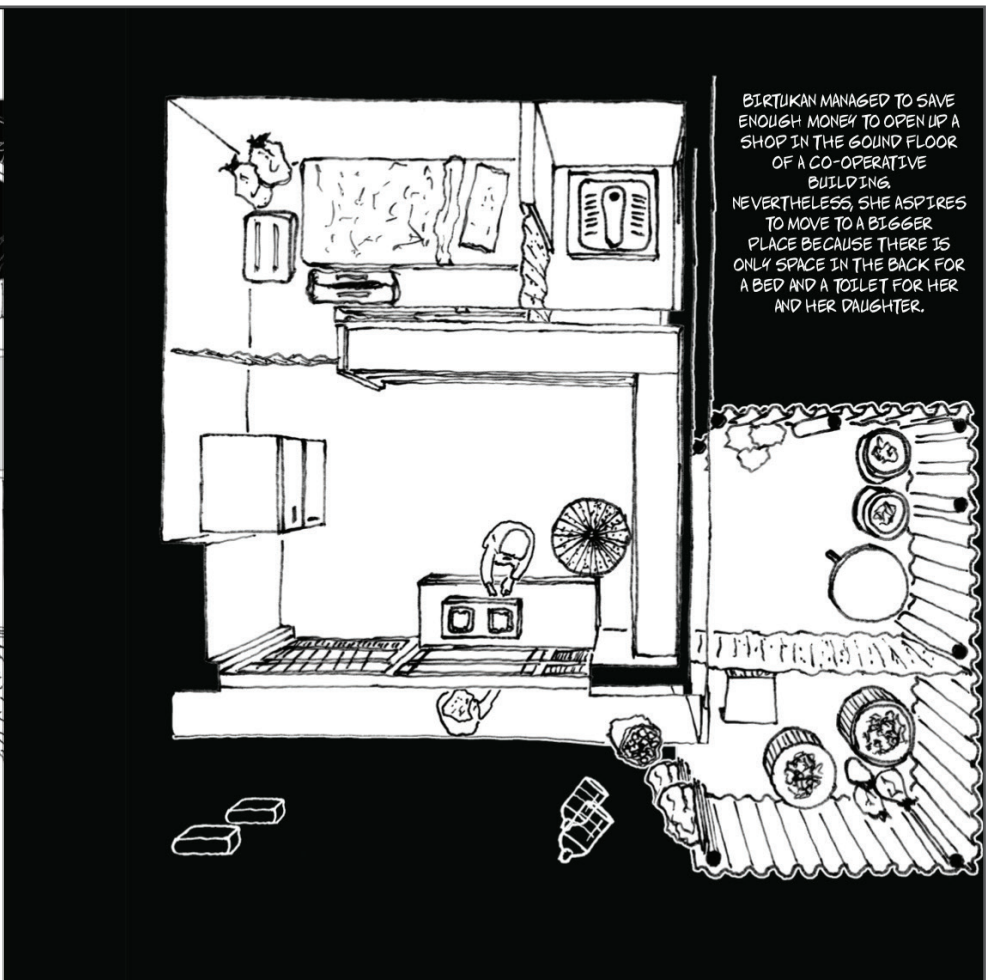


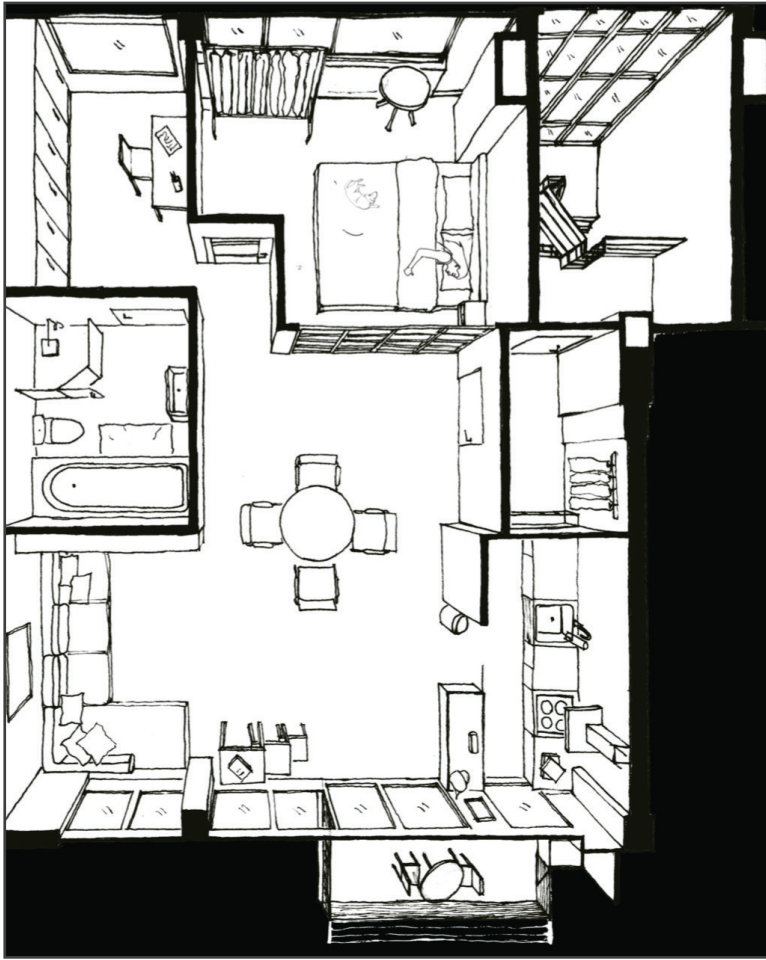
## INCOME GENERATION

SMALL COFFEE STANDS (BLIIDORP) VERSUS NEIGHBOURHOOD

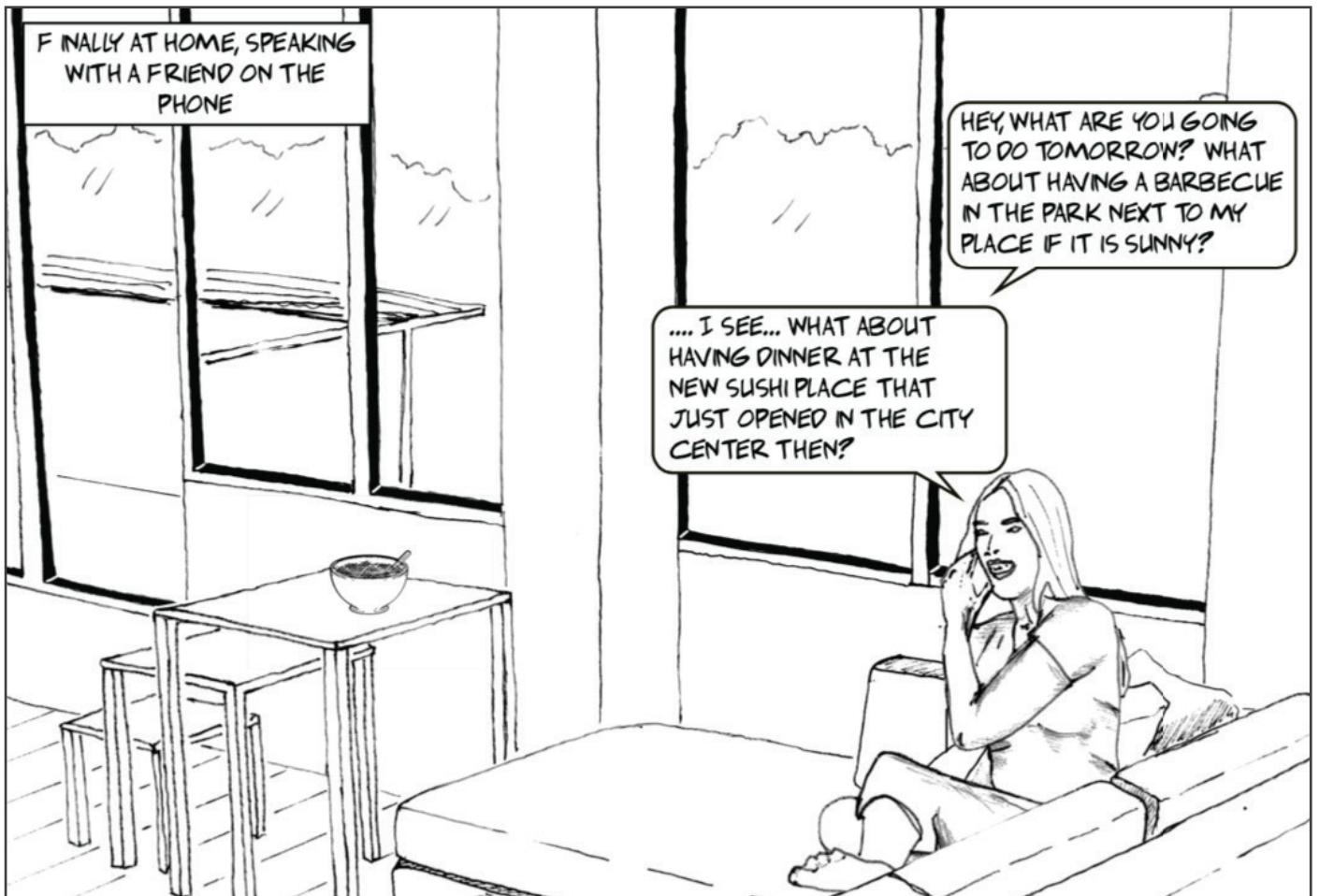
VEGETABLE STORES (SUMMIT)

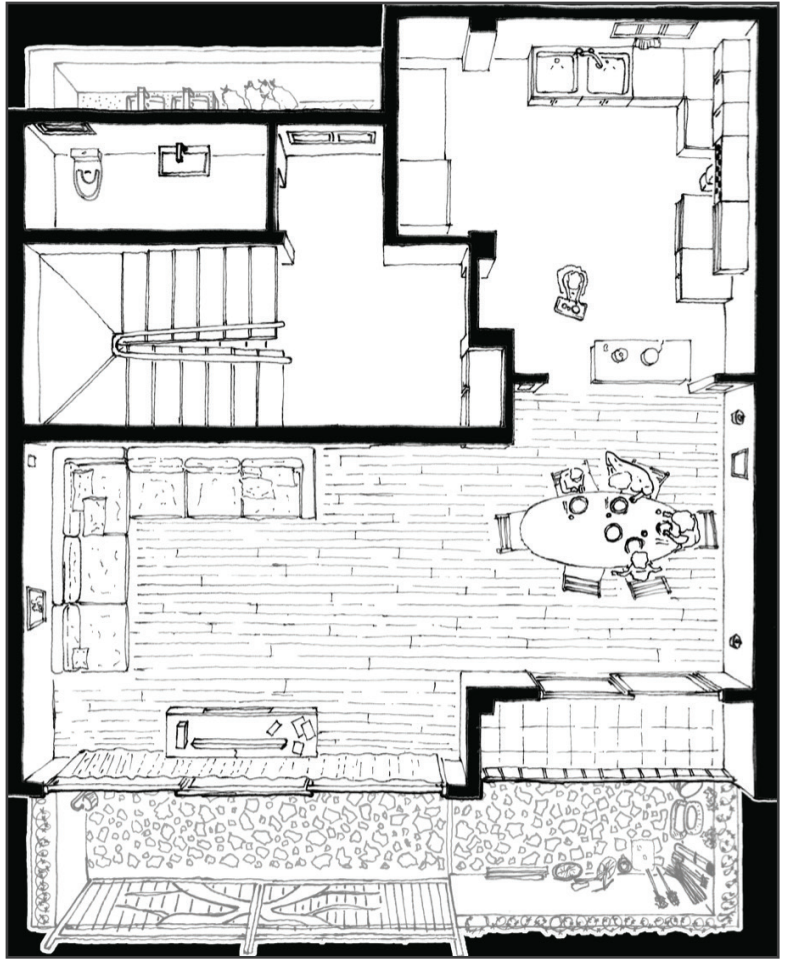






Research





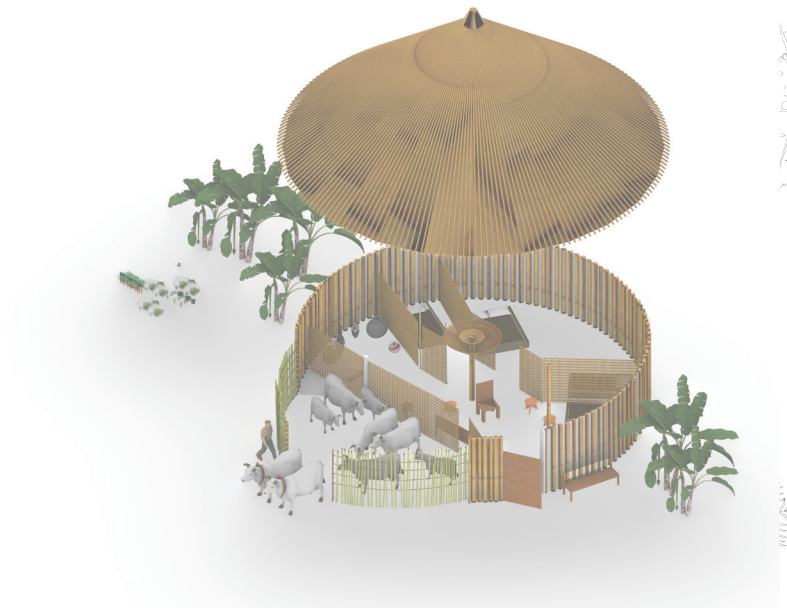
# HOME LIFE DIARIES

INDIVIDUAL RESEARCH AND INTERVIEW OF DOMESTIC PRACTICES IN ETHIOPIA

Research

## DOMESTIC PRACTICES IN A TRADITIONAL 'TUKUL' HOUSING IN WESTERN ETHIOPIAN

peaceful and spontaneous interactions with neighbours happen outdoors in the shade under the shade, at the main entrance



false banana  
for fibers



Pros:

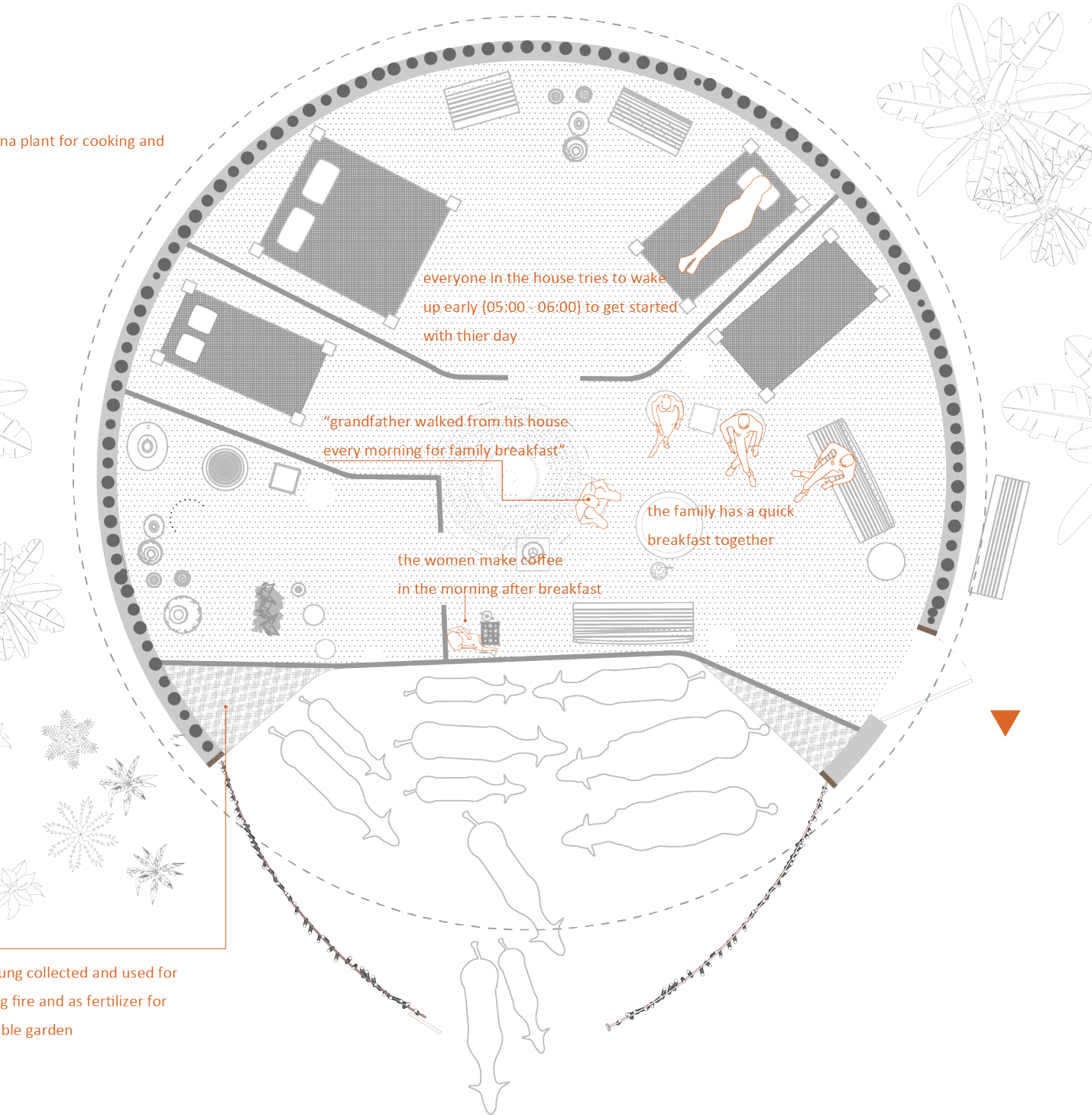
- symbiotic relationships between different domestic practices
- balance between privacy and communal life achieved by layout

Cons:

- minimal light and ventilation

Cow d  
cookin  
vegeta

na plant for cooking and



Design Goal

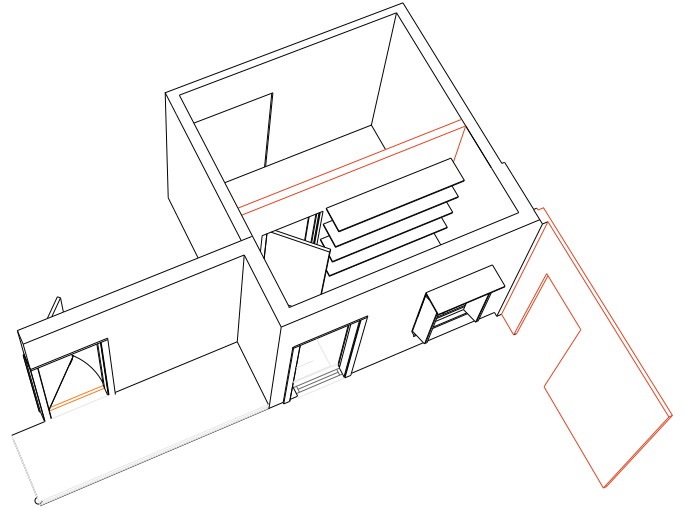
# CASE STUDIES

SUMMIT COOPERATIVE HOUSING - '20 X20'

CASE STUDY - Summit  
Cooperative Housing- 20x20

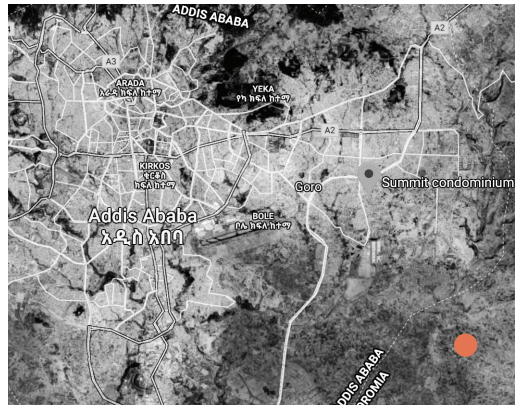
**Original**  
=1 ground Floor  
Commercial space

**Existing w/ Additions -**  
Back room bedroom (~ 3mx4m),  
Adjacet kitchen for making 'injera'  
-wood with plastic covers



Research





Design Goal





Home ownership



CO-OPERATIVE HOUSING



PRIVATE DEVELOPERS



## FIRST COOPERATIVE HOUSING IN ADDIS - 1992

1992 Cooperative Housing,

“...model cooperative society...organized in 1992 with a membership of 20...  
government employees with middle-income...”

- 1190 sqm of land
- Kebele 12 (sub-district)/ center city
- close to facilities

-original five storey design changed to six storey -> increased cost -> 50% cost covered by investors



No.	Function / one family	Area/m <sup>2</sup>
1	Living/Dining room	25.00
2	Master bedroom with bath	24.00
3	Children's bedroom	12.00
4	Toilet & shower	3.00
5	Kitchen & Laundry	9.00
6	Lobby	2.00
7	Maid's room or Store	3.00
8	Circulation	5.00
	<b>Total Area</b>	<b>83.00</b>

*Table 2 Ground & Basement*

9	Super market	350.00
10	Store	350.00

CO-OPERATIVE HOUSING MAJOR OBSTACLES

Research

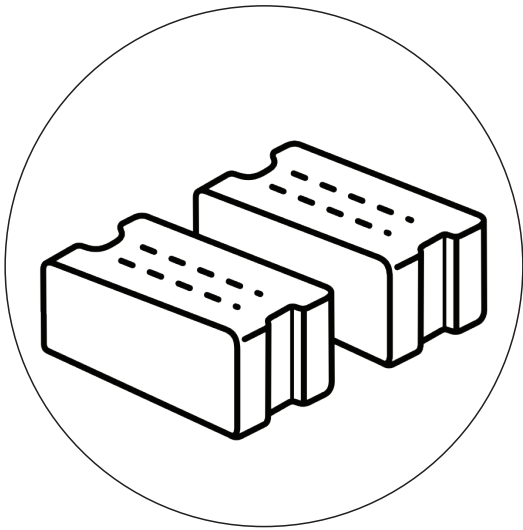


Funds

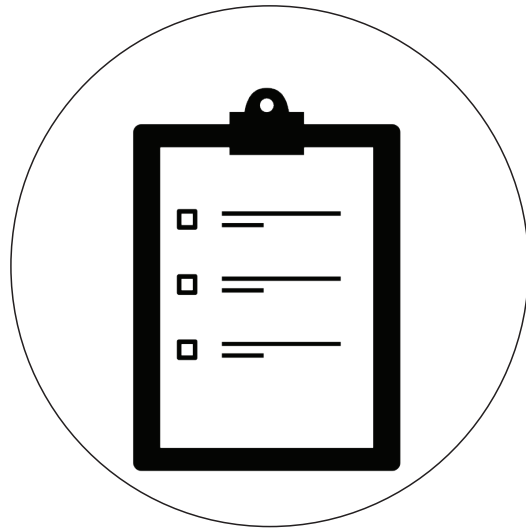


Infrastructure

(6-12 months delivery delayed to 2 years)



Materials



Regulations

## Humanscapes Habitat in Auroville

“Humanscapes Habitat is an investigative project which explores environmentally friendly housing with in-situ construction methods and introduces a human ecology by using the “principles of cohousing concept of living, facilitating interaction among neighbors for inclusive social development, economic and environmental benefits”

Research





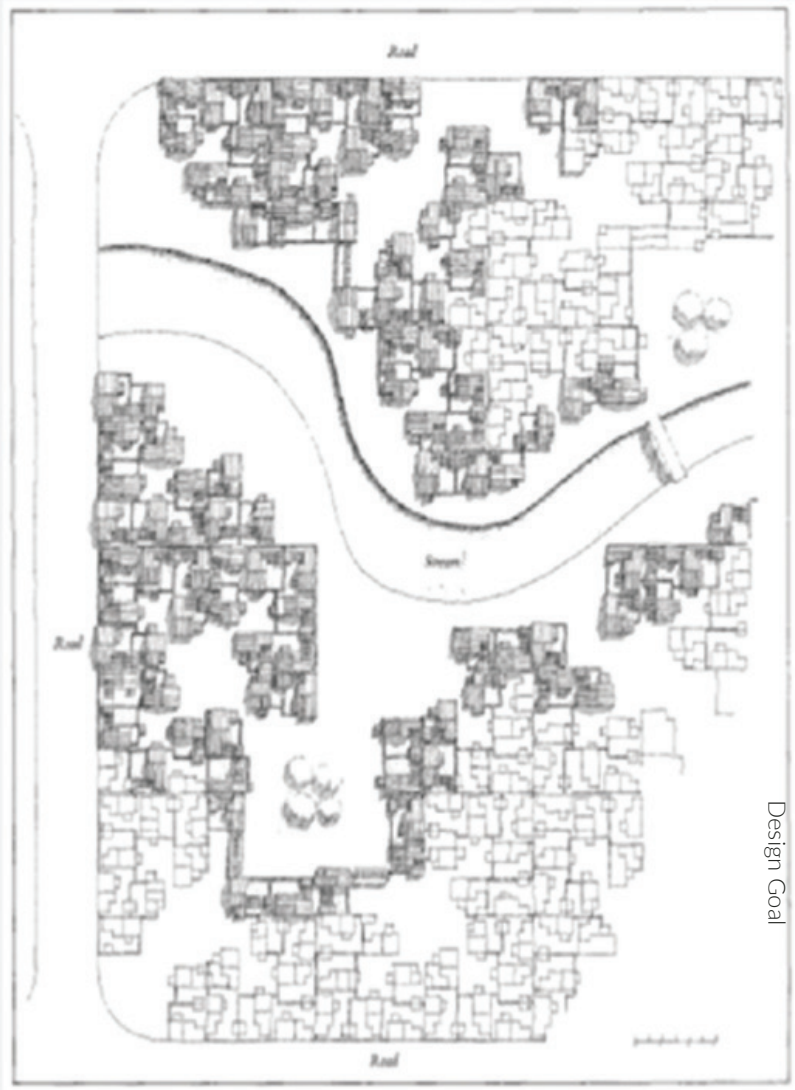
Belapur Housing in Mumbai by Charles Correa.

*Figure 1*

*1. Belapur housing development: 1.7 housing units around a courtyard 8m x 8m; 2. bigger module of 21 houses, surrounding a community space of 12m x 12m; 3. Sitting plan (Correa, 1989).*

A “low-income housing development takes the traditional Indian settlement patterns and applies it the spatial hierarchical configurations at the private dwellings scale “through

the ‘doorstep’



-Computation and Performance - Volume 2 - Languages of Design



# **KOLFE - THE CHOSEN SITE**

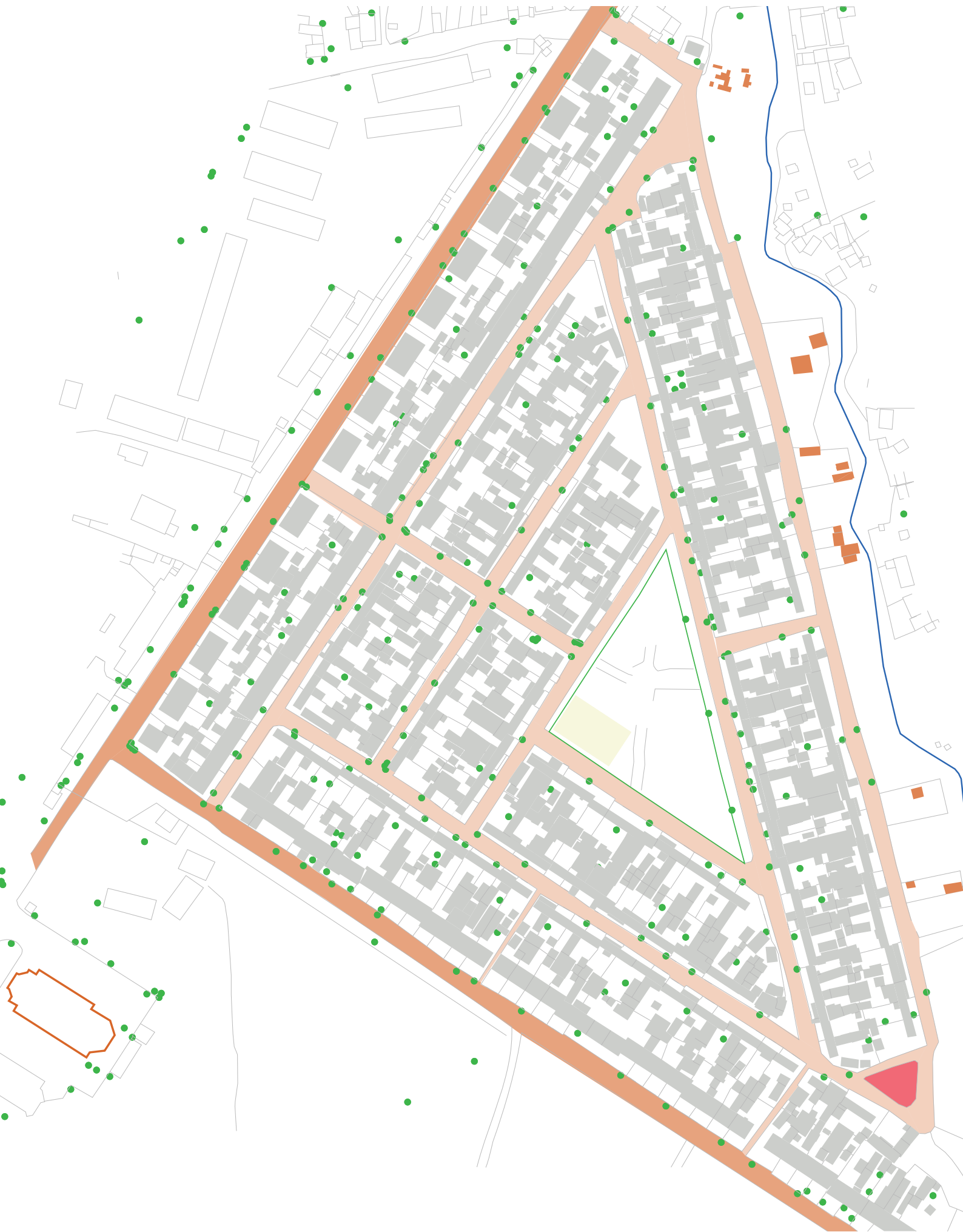




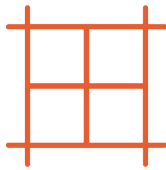




Kolfe is a neighbourhood within the Kolfe Keranio sub-city – one of the ten sub-cities of Addis Ababa. It was originally a resettlement site for about 300 households from the inner city slums of Filwoha and Estifanos during the Sheraton Addis construction that started in the 1960s. The units were low-cost core housing scheme housings built and assigned to the families by FHC. The original renters are either retired and still living in the units after multiple alterations or have passed on and left the units to family members. The current inhabitants are predominantly from low and low-middle income households.



Kolfe is a triangular site flanked by busy main streets on two sides and by a stream on the longer side running from north to south. The stream can be accessed at the bottom edge of the site and is mostly neglected which has led to it becoming a trash dumping location. The stream also poses a problem once in a while during the rainy season when it fills up and overflows into the neighbourhood. The site has a well defined grid of cobblestone secondary/ pedestrian streets which accommodate most of the neighbourhood activities. The majority of the inhabitants have lived at this site for over thirty years and have managed to expand their original units with multiple alterations over the years. Consequently, although the site has a low density, the individual lots have insufficient open spaces due to the horizontal expansion. The inhabitants have also managed to maintain their original sense of community which has helped them create a community cleaning system to maintain the inner streets. Aside from the lively market on the main streets at the periphery of the site and the weekly local market at the southernmost part, the site lacks adequate amenities that can be used by the community.



street grid



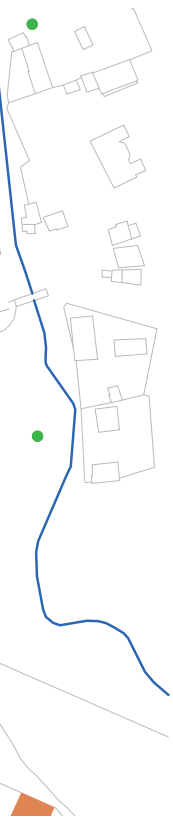
unmaintained stream



cobblestone pavement

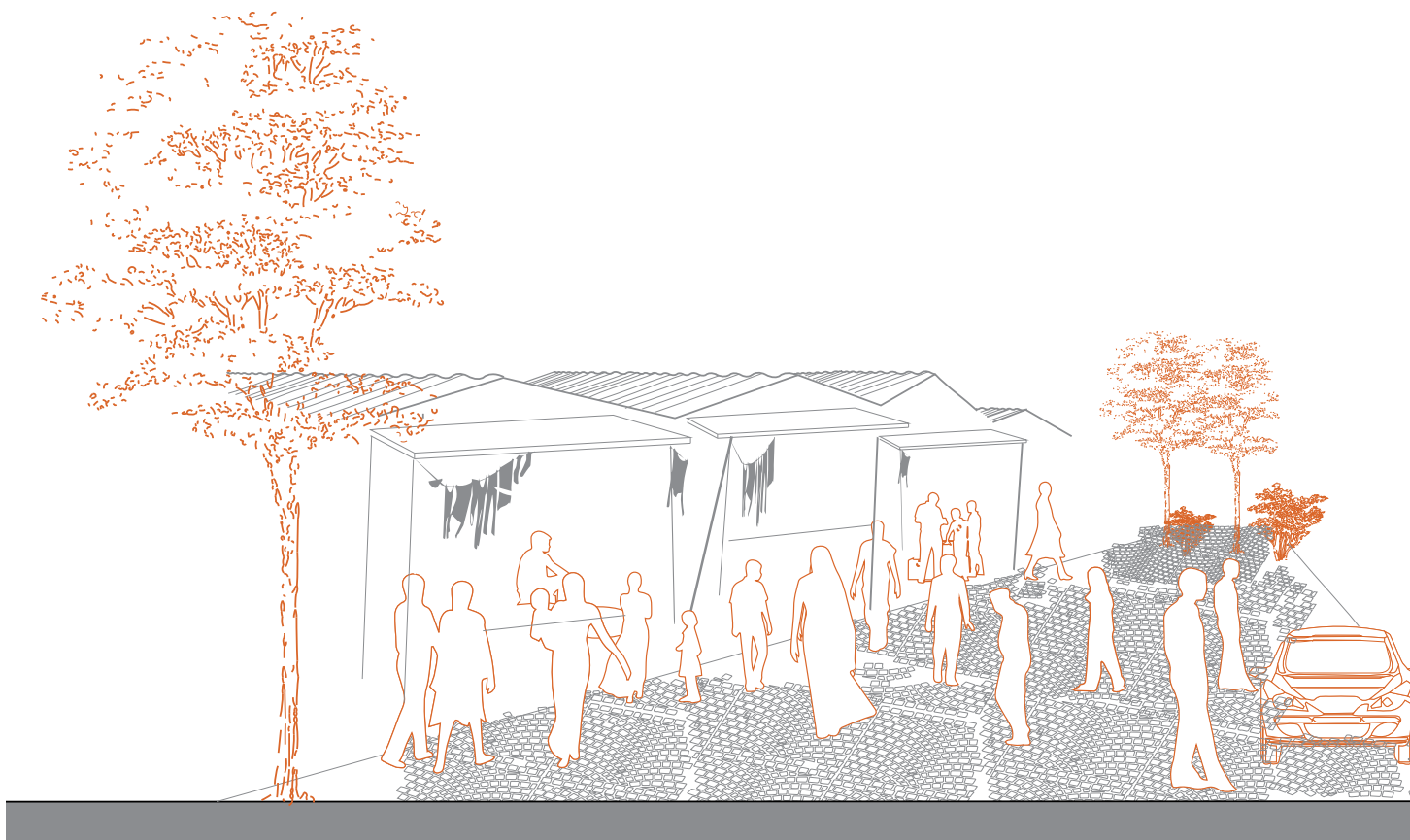


horizontal expansion

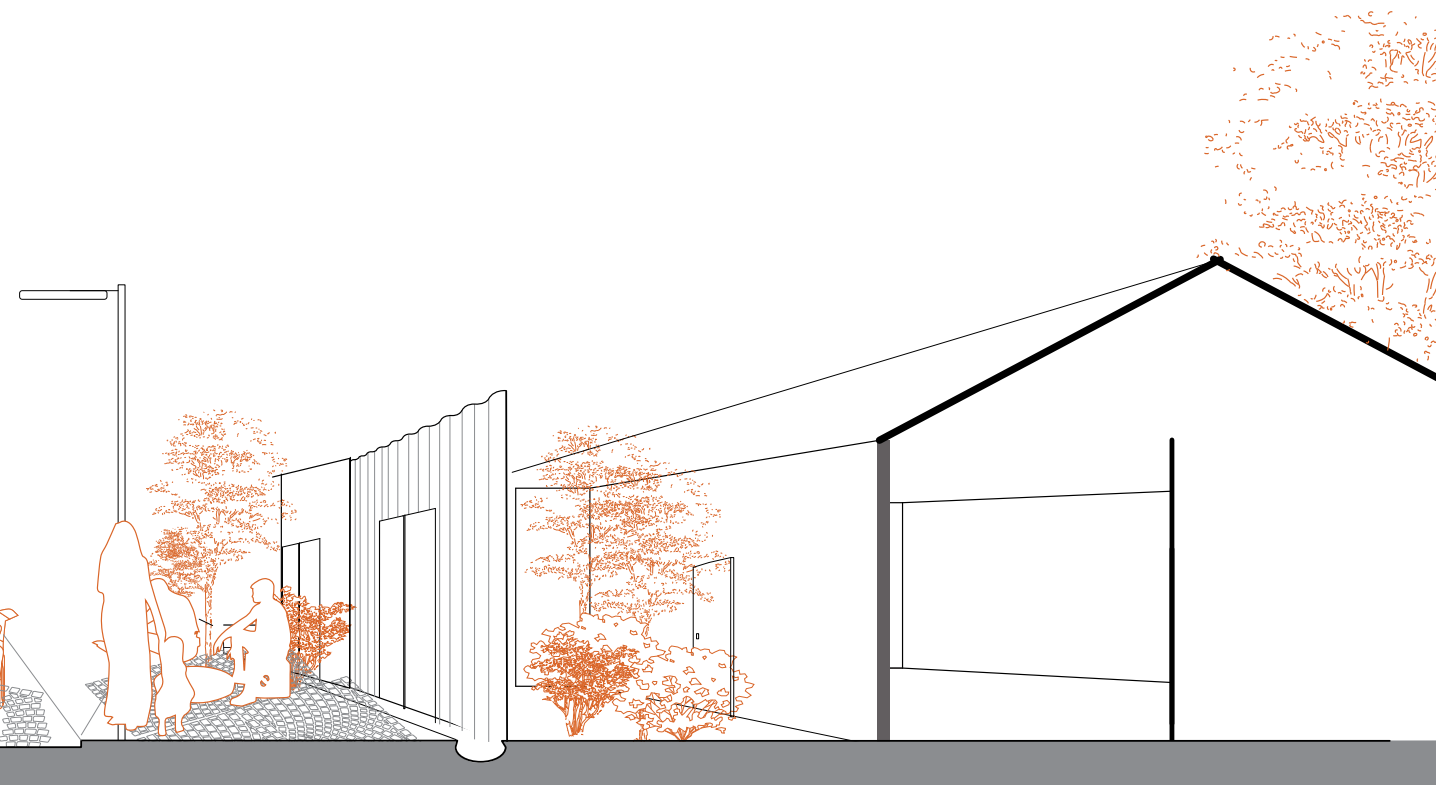


-  - Informal Settlement
-  Primary/Vehicular Street
-  - Secondary/Pedestrian Street
-  - Neighbourhood Church
-  Neighbourhood Market

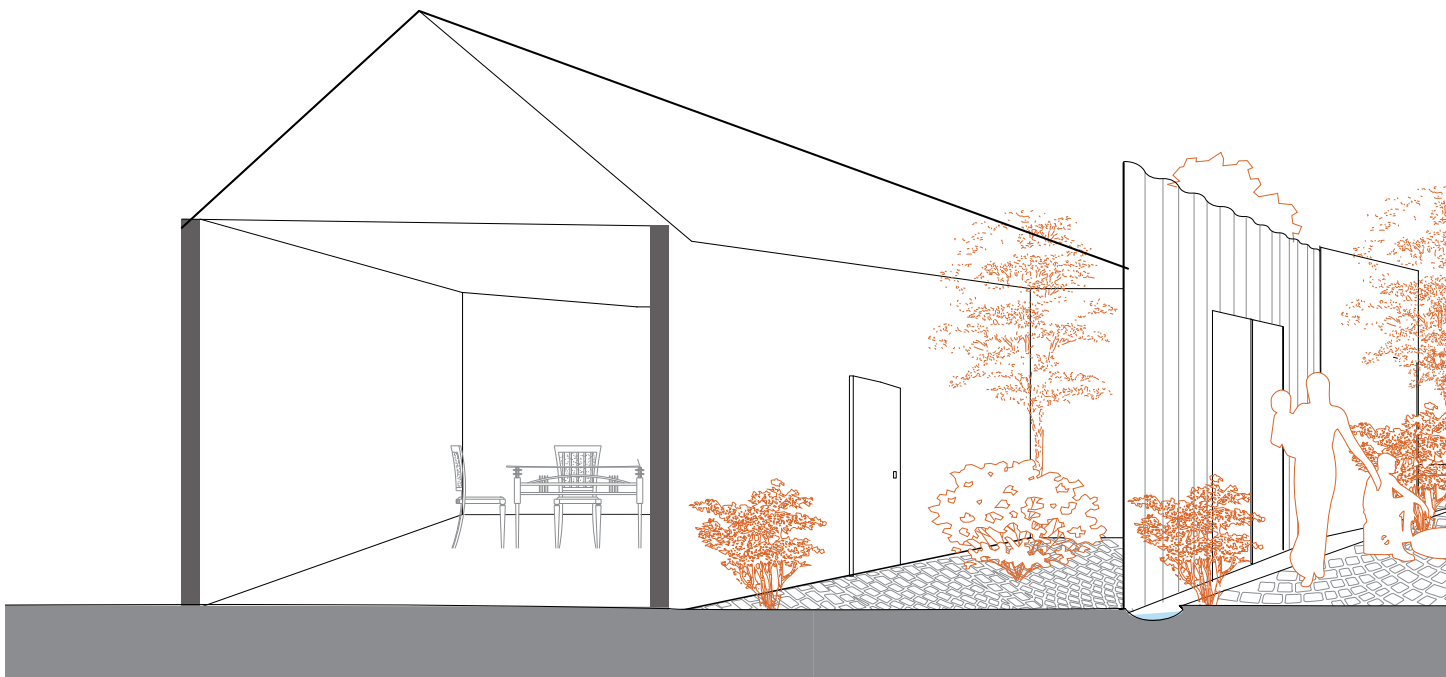
## PRIMARY STREET ACTIVITIES



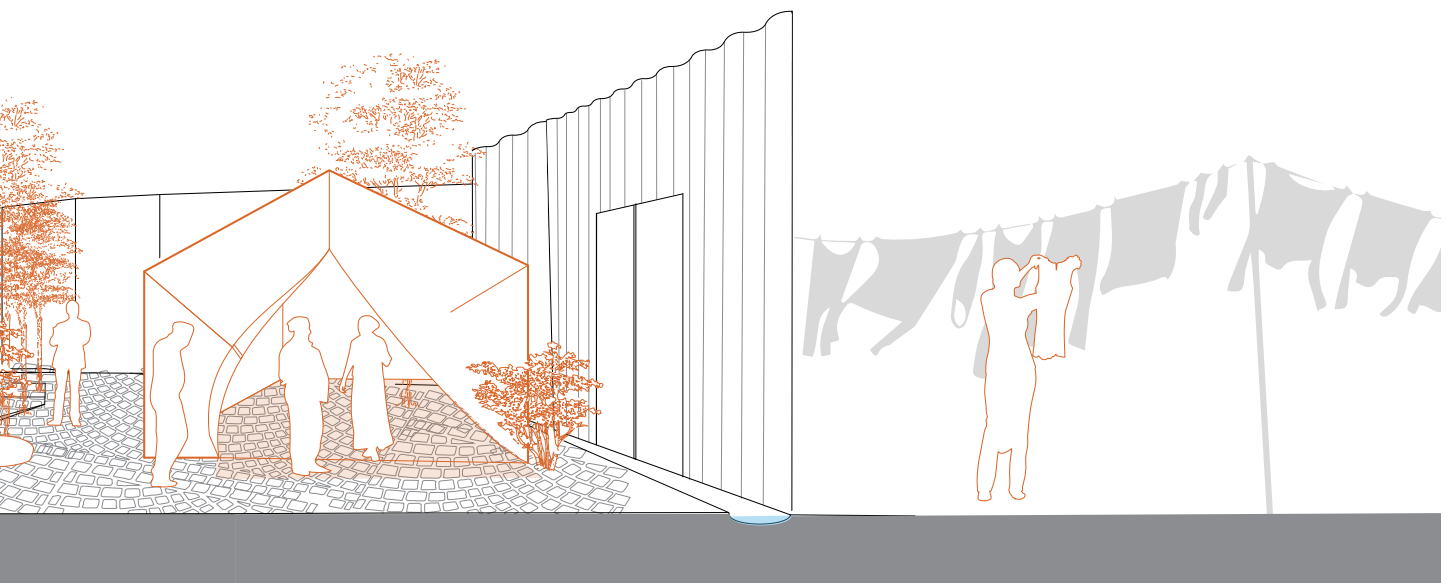
The primary streets are located on the western part of the site. The north-west primary street is home to a busy local market which invites a lot of lively activity to the area. Although this market keeps the area very busy and crowded, most foot traffic is kept to the edge of the chosen site.



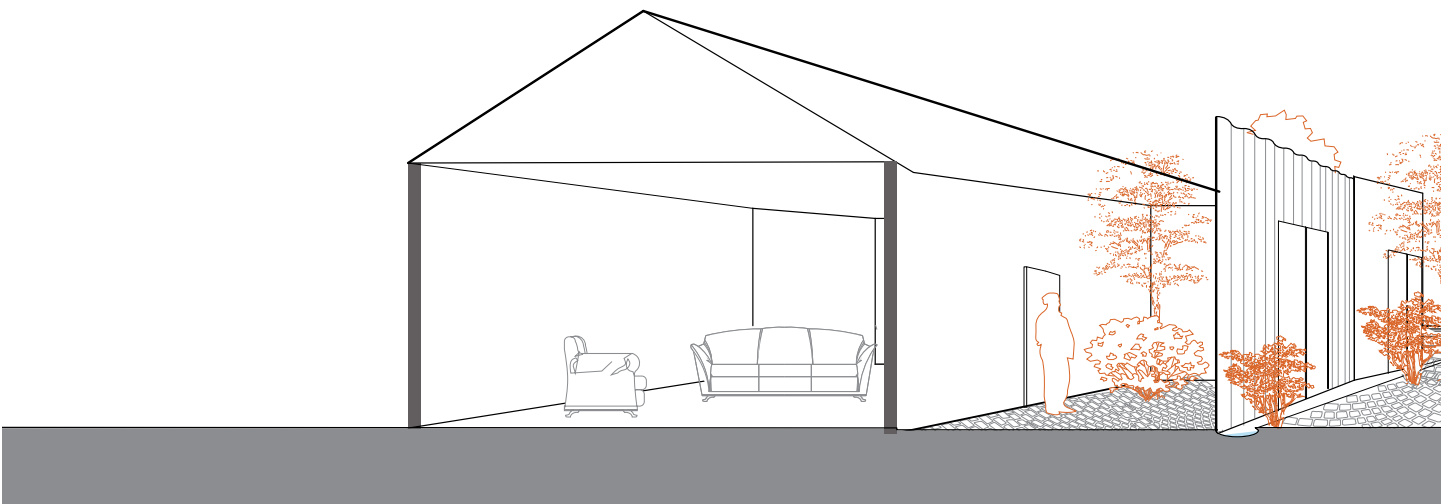
## SECONDARY STREET ACTIVITIES



The secondary streets are mostly clean and nicely paved with cobblestones. The site offers a sense of calm and quietness from the busy street just outside of the neighbourhood. These pedestrian streets accommodate most of the community activities such as traditional mourning rituals and festivities such as the lighting of 'chibo' – traditional bonfire during the Meskel holiday – throughout the year. Even though the inhabitants have some plants by their gates just outside their homes, the area lacks adequate permeable surfaces which could factor into the flooding issues they have experienced in the past.



## MARKET STREET ACTIVITIES



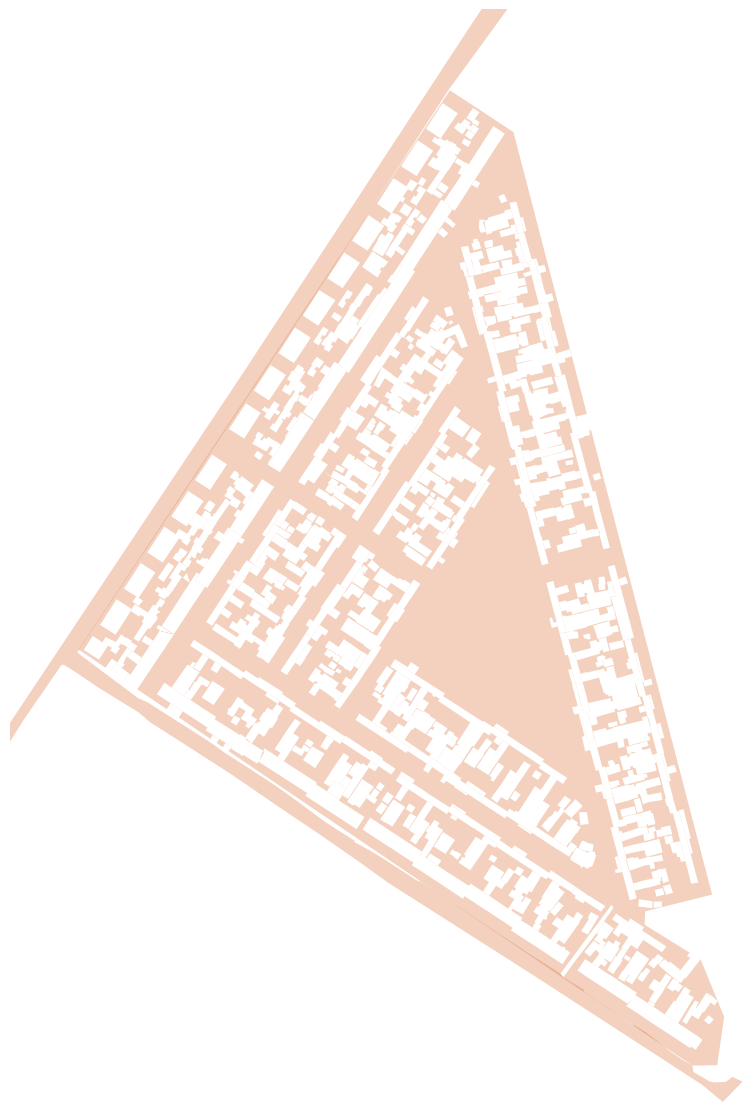
The neighbourhood market at the southernmost part of the site is a place allocated for informal market activities by the FHC. Regardless, the location of the market is highly criticised by the people because it is far away from everything and is therefore very rarely used. Instead, most informal market activities still take place in the streets where they are easily accessible by the inhabitants.





Built Space

Private

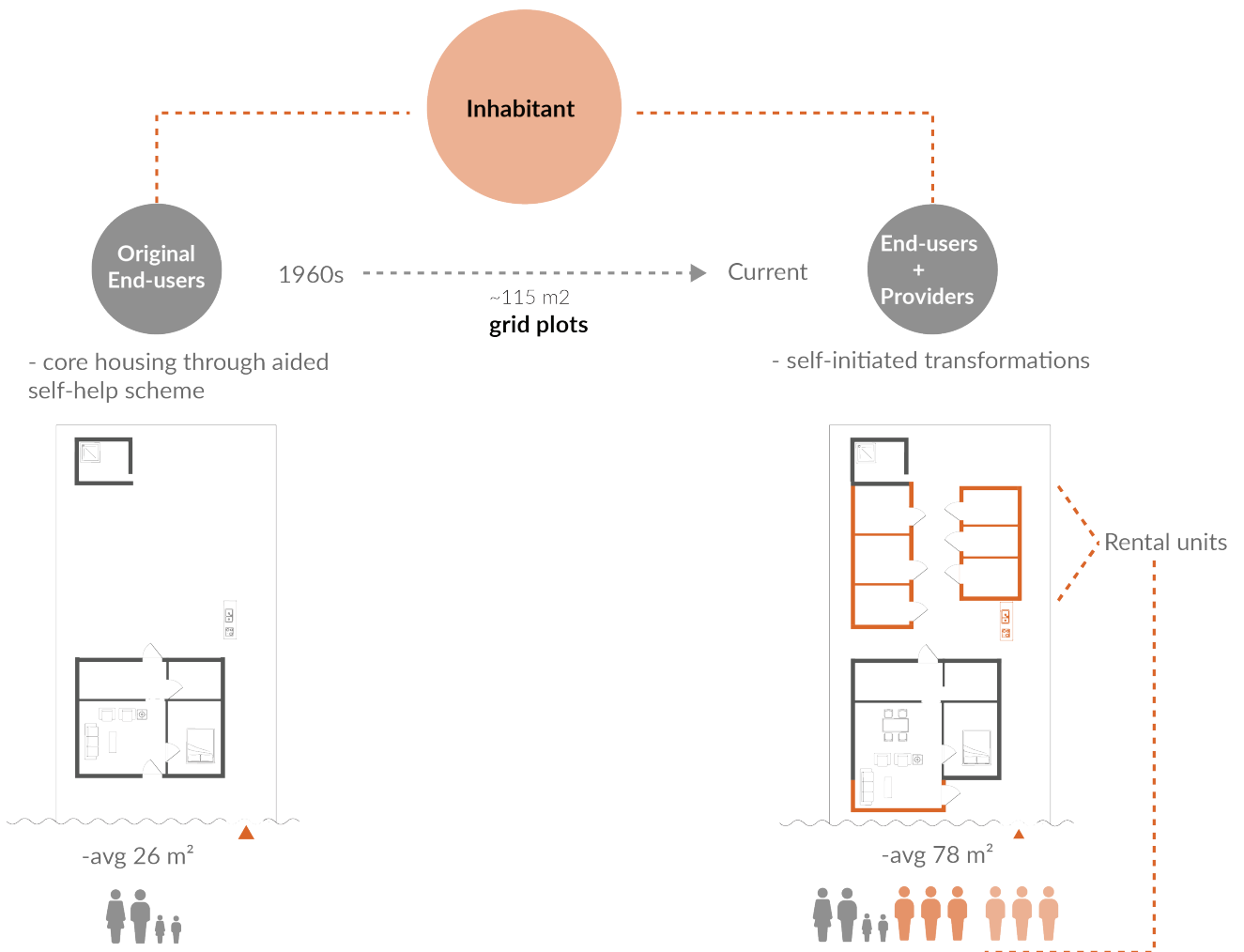


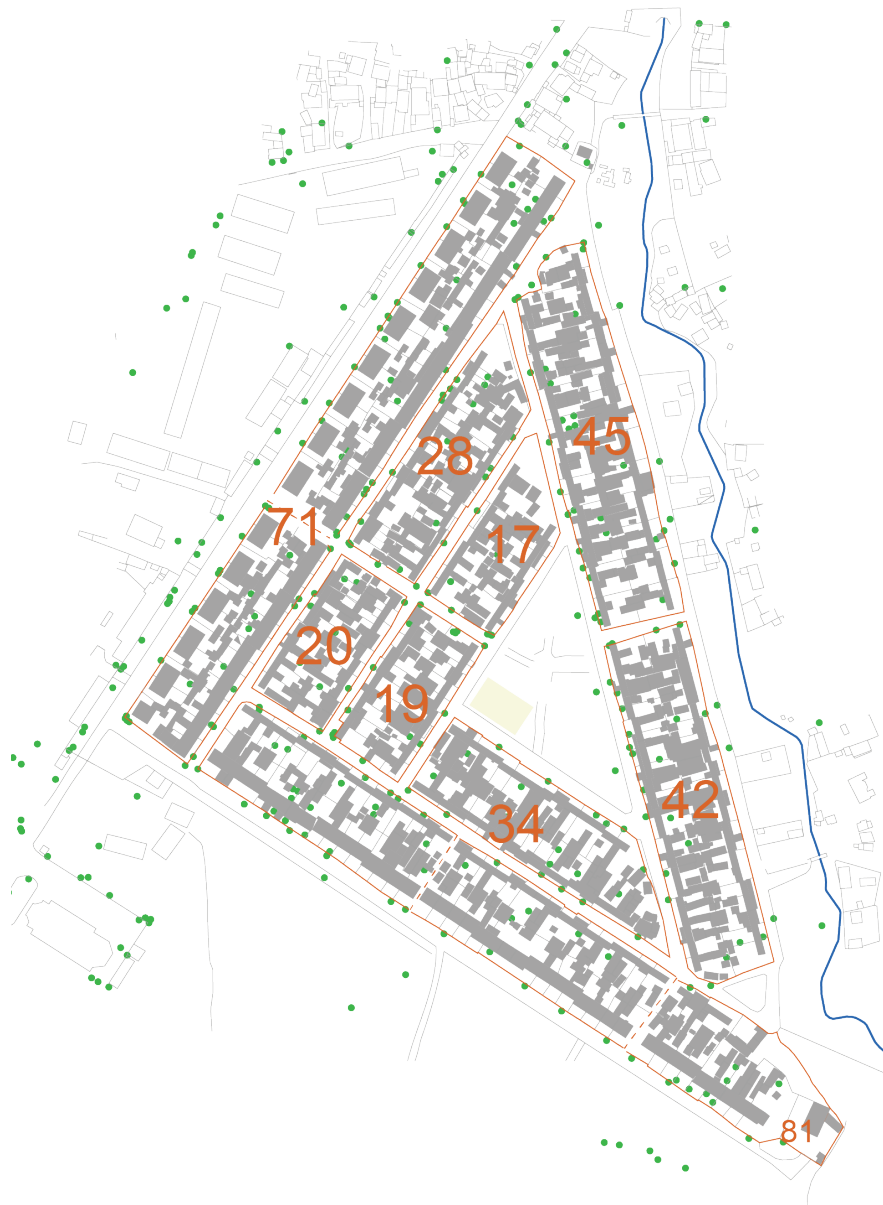
Open Spaces

Public Space= Buffer Zones

\* mostly impermeable surfaces \*

# SELF- INITIATED TRANSFORMATIONS - KOLFE

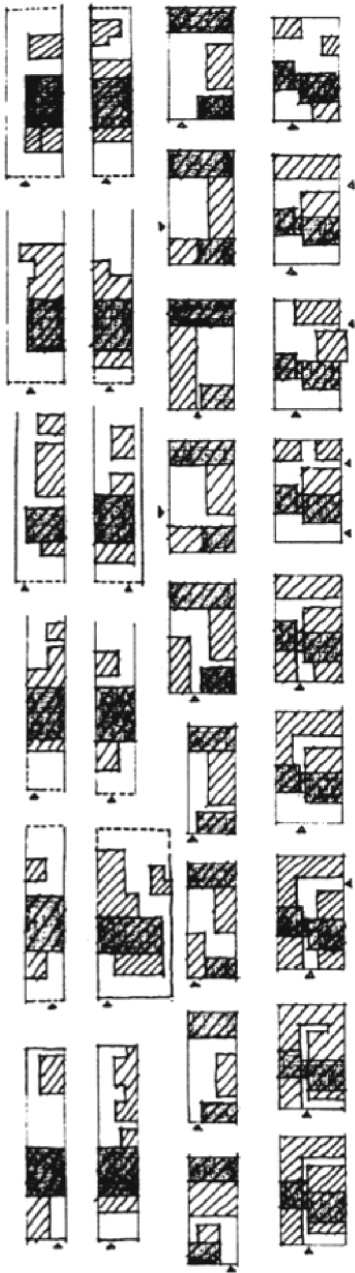




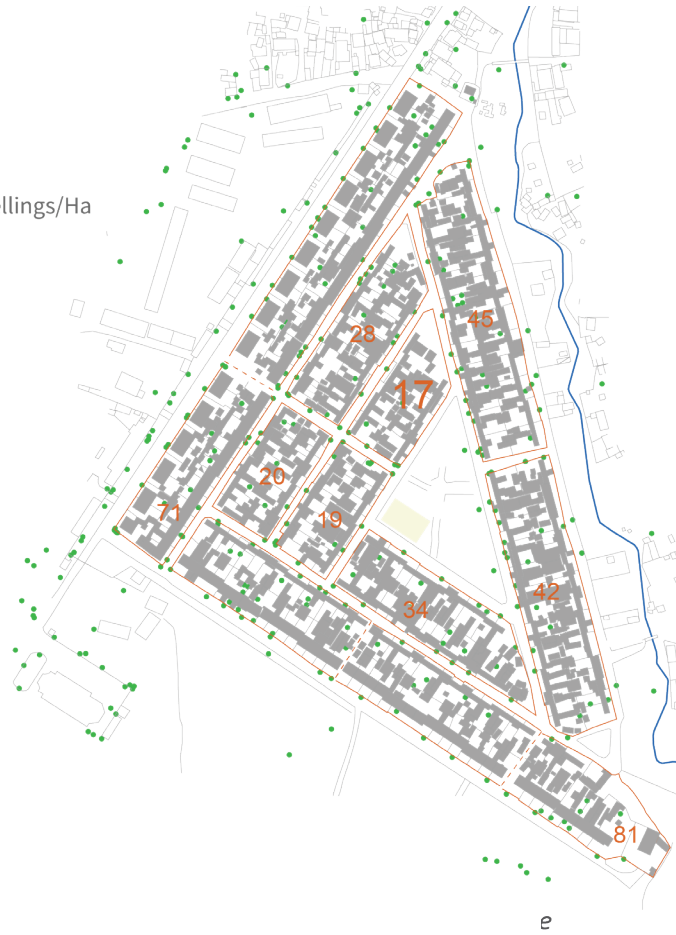
Number of Households

## Self-initiated transformations in Kolfe

Research



357 HHs  
2,540 inhabitants  
~ FSI= 0.55, 55 dwellings/Ha



Schematic presentation of extension models  
( D Shiferaw).

For “traditional and spontaneous urban houses of Ethiopia...the habitable rooms are surrounded by subordinated functions and open spaces. It is very difficult to draw up a typical transformation morphology...because it is the core house and tenure status that mainly dictated the extension patterns”. The transformation patterns mostly resulted in enclosing the inner courtyards. ( D Shiferaw).

- 63% 'chika' wall extension
- improvements funded by private savings, informal activities and 'ikub'
- ownership -> improvements

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- ownership -> improvements

"Transformation motives:

- socio-culturally determined aspirations,
- growth of family size,
- desire of generating income
- response to harsh climatic conditions
- desire to copy prevalent housing forms"

(Shiferaw, 447)

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- socio-culturally determined aspirations,
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- desire to copy prevalent housing forms"

(Shiferaw, 447)

*Transformation trends: (a) extension systems within given plot; (b) formation of accesses; (c) subdivision of outdoor spaces ( D Shiferaw).*

*In Kolfe, 63% of the householders used traditional construction method while the rest used hollow concrete blocks and natural stones. "Materials used in such spontaneous extension processes are not durable and sustainable and householders can not afford to buy durable ones. (D Shiferaw). For instance, wood is a construction material that is becoming scarce in Ethiopia and contributing " resulting in desertification. This*

# SELF- INITIATED TRANSFORMATIONS - CASE STUDY OF MR. M'S DWELLING

Research



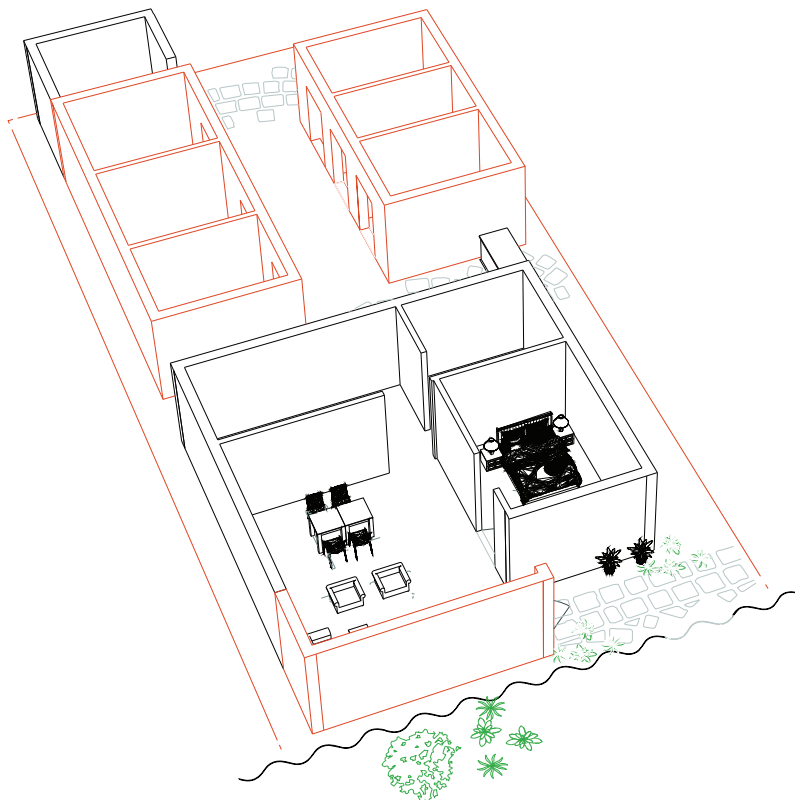
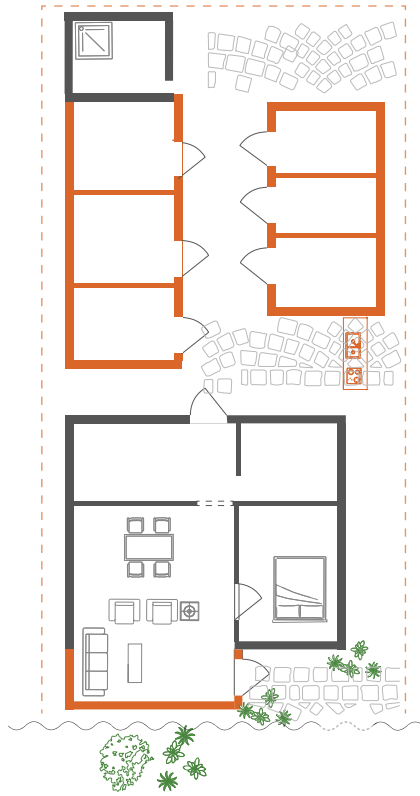
## Original

- =1 Living Room, 1 Bedroom, 1 Kitchen
- =HCB construction
- = 13 Birr/month

## Existing w/ Additions
















- =4 Bedrooms, Outdoor Kitchen, and 3 rental units
- = 'Chika' with wood construction
- =380 Birr/month
- = 4 households





# INTERVIEWS WITH THE PEOPLE

Research

		Aspirations/ Desires
<p>Mr. M.</p> <ul style="list-style-type: none"> <li>-retired (79 yo)</li> <li>- 6 children</li> <li>-original 'settler'</li> <li>-likes to garden</li> </ul> 	<p>sub-renting -3 renters</p>	<p> maintain income</p> <p>WILLING TO SUBSTITUTE W/...</p> <p> own a store</p> <p> veg. garden</p>
<p>Ms. S.</p> <ul style="list-style-type: none"> <li>~40's</li> <li>- 2 sons - one injured &amp; at home</li> <li>- caregiver of mother (Ms. K)</li> </ul> 	<p>-washing clothes (at home with mother)</p>	<p> maintain income</p> <p> children activity for son</p> <p> better quality housing</p> <p>WILLING TO ...</p> <p> live in high-rise</p>
<p>Mr. T.</p> <ul style="list-style-type: none"> <li>-retired</li> <li>- 3 sons</li> <li>-original 'settler'</li> <li>-crowded house</li> <li>-likes to socialize with friends</li> </ul> 	<p>-retirement + funds from diaspora</p>	<p> live with family-spacious unit</p> <p> elderly/ game center</p> <p> shaded leisure area</p> <p> neighbourhood market - formal</p>

# domestic practices and housing layouts

Mr. M.'s daily routine:  
(retired)

- 4:00 -wake up for church
- breakfast
- walk
- socialize
- 12:00 - garden
- 16:00 walk



Fig. Existing Site Plan of Kolfe

## Pros:

- ability to expand horizontally (if one can afford)
- Privacy
- Close proximity to neighbours and communal spaces (ex. church)

## Cons:

- doesn't own dwelling = lack of housing security
- very minimal open/communal space
- lack of green space for gardening
- limited opportunities for income generation activities

# EXISTING - DWELLING OF MR. M IN KOLFE

Research



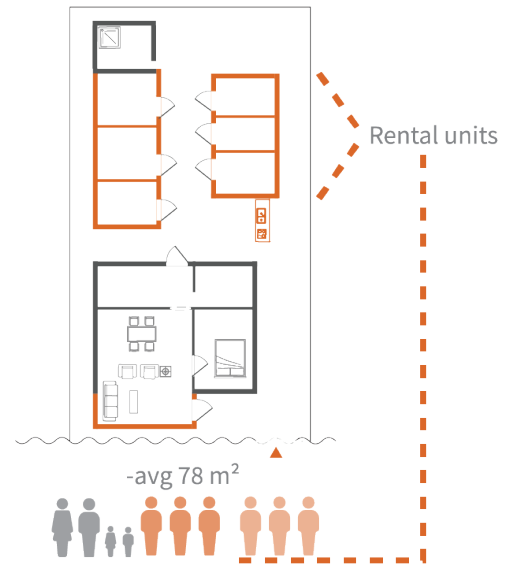
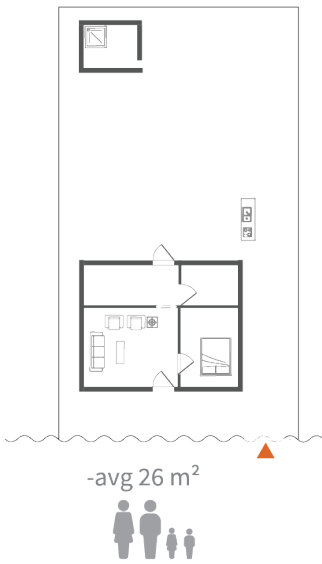
1960s

Current



-core housing through aided self-help scheme

-self-initiated transformations



Original layout of two- rooms typology in Kolfe

Original layout of two- rooms typology in Kolfe with alterations 1



“...HUMAN SCALE IS ESTABLISHED NOT SIMPLY BY MOVING, BUT BY **MOVING IN A WAY WHICH IS PUZZLING**, AS IN A MAZE; WHICH **ENCOUNTERS OBSTACLES**, AS IN **MOVING SLOWLY** IN A CROWD; WHICH HAS TO DEAL WITH HEAVY SENSORY LOAD, AS IN LATERAL VISION. THE URBAN PLANNER WHO WOULD CREATE AN UNOBSTRUCTED PEDESTRIAN ENVIRONMENT IS DOING THE PEDESTRIAN NO EXPERIENTIAL FAVOURS.... **PEOPLE EXPERIENCE HUMAN SCALE IN TERMS OF COPING WITH RESISTANCES.**”

— Richard Sennett, 2019



# DESIGN

The goal of this project is to explore how “buffer zones” or open spaces can be implemented at different scales: a neighborhood or urban scale with different facilities; a cluster or building scale, such as a courtyard; and at unit scale as a “porch” at one’s entrance which can also accommodate informal income generation activities. Many community development activists advocate for the inclusion of various facilities which take the elderly, youth, women, and children into account when designing new neighborhoods. These facilities can also act as areas where communal events take place and, for instance, the grandparents can enjoy greater freedom with opportunities to spend time with their own grandchildren or interact meaningfully with other young children in the center – an activity proven to elevate health and quality of life. Public spaces need to be formally designed with the inhabitants’ best interests at heart, and they should respond to different site conditions and accommodate for different user groups that enhance neighborhoods and communal life. As Gerd Junne points out in his article, the built environment “influences social relations.” Therefore, it can be used to introduce inclusion and stability in a society. This project will explore how different typologies can be used to include – and introduce – different income groups on the site of Kolfe while providing equitable quality of life to the different groups of the society.





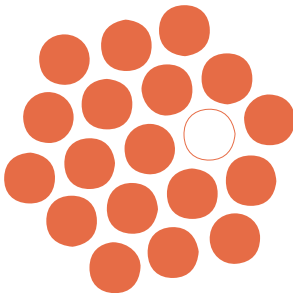
Kolfe Open Market

DESIGN FOCUS

social mixity /  
mixed income

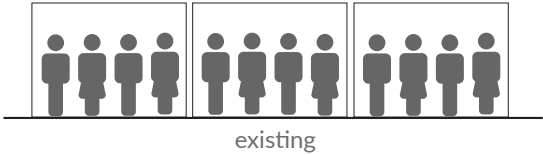


social inclusion



Design Goal

inhabitants

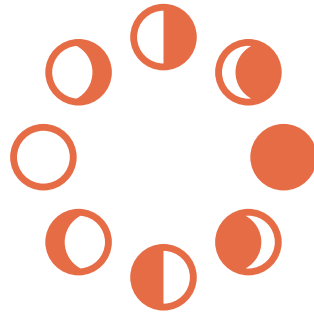


in situ redevelopment

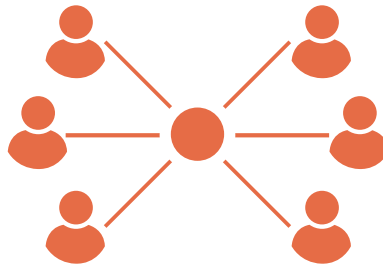
materials



phasing



communal  
space







The built environment “influences social relations.” Therefore, it can be used to introduce inclusion and stability in a society. This project will explore how different typologies can be used to include – and introduce – different income groups on the site of Kolfe while providing equitable quality of life to the different groups of the society.

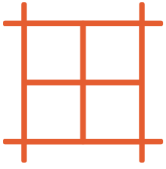




The built environment influences social relations ...it can be used to introduce inclusion and stability in a society (Meko, Graduation Thesis, 2019).

Open spaces can be implemented at different scales:.

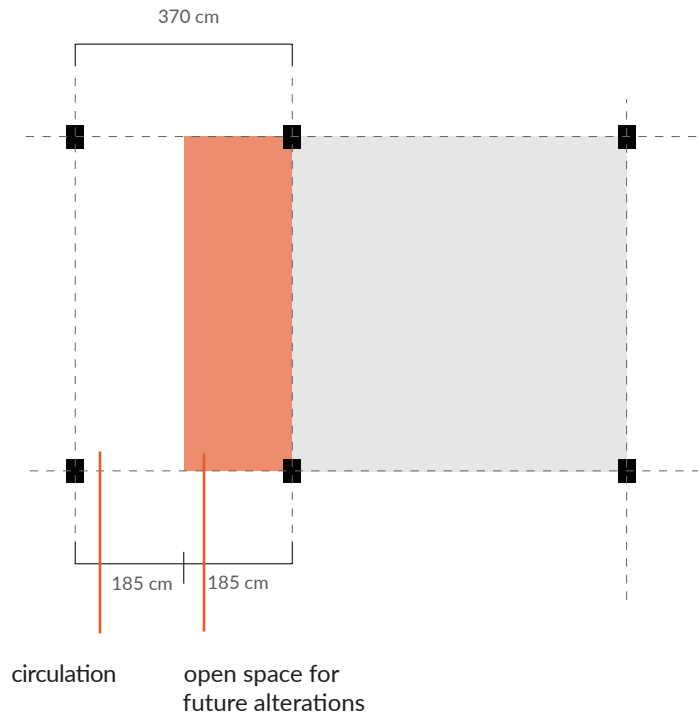
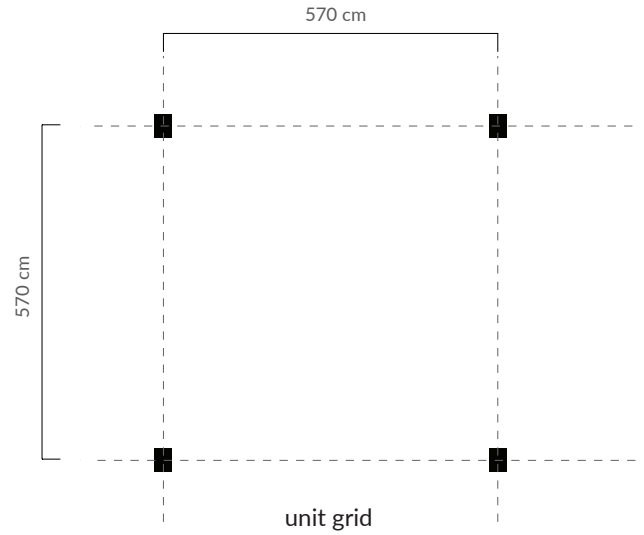
		Aspirations/ Desires
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<p>Mr. T.</p> <p>-retired - 3 sons -original 'settler' -crowded house -likes to socialize with friends</p> 	<p>-retirement + funds from diaspora</p>	<p>live with family-spacious unit</p> <p>elderly/ game center</p> <p>shaded leisure area</p> <p>neighbourhood market - formal</p>

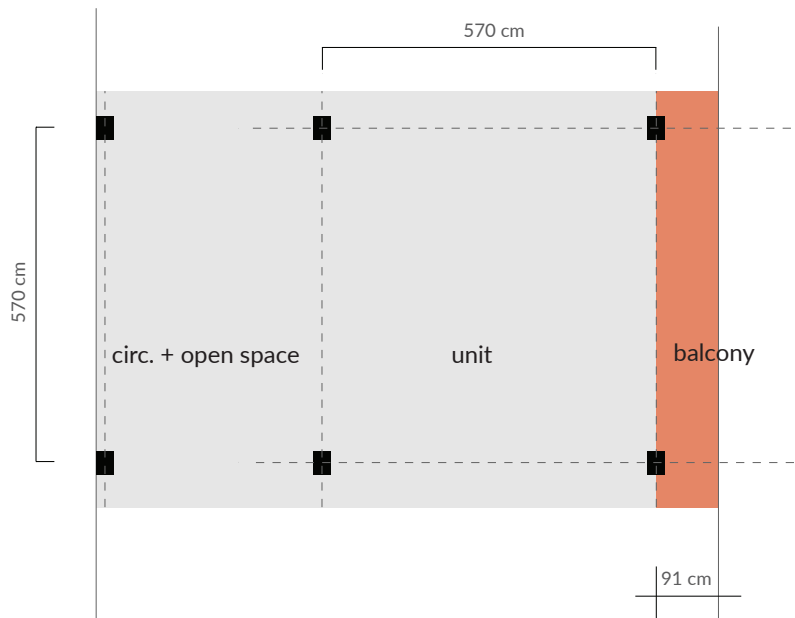


## UNITS GRID AND STACKING

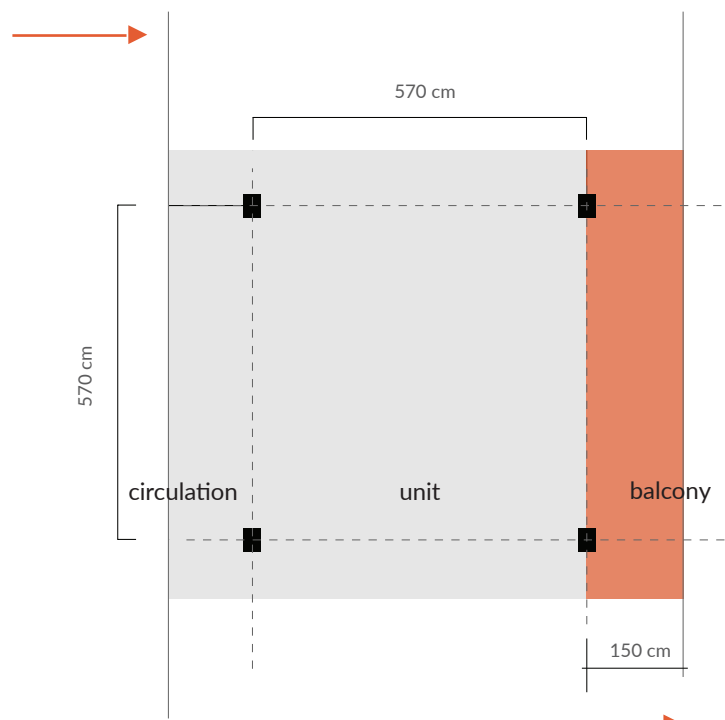
The lower level floors house the units suitable for low-income households with open spaces facing the central courtyard to accommodate household activities that can be performed in semi-public space at one's front door and altered for future expansion. Most low-income households traditionally practice a more communal lifestyle and, according to Shiferaw, performed household chores in semi-public spaces. These open spaces can also be appropriated to accommodate income generating activities. The balconies (which face the streets) are also vital since they are often used by inhabitants to dry spices, clothes, etc.

Design





lower level floors  
(26 - 60 sqm units)



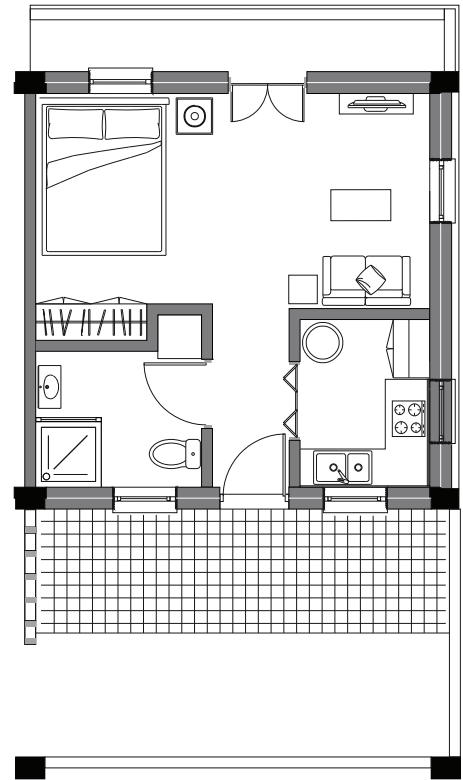
upper level floors  
(+ 70 sqm units)



## UNIT TYPES - LOW INCOME

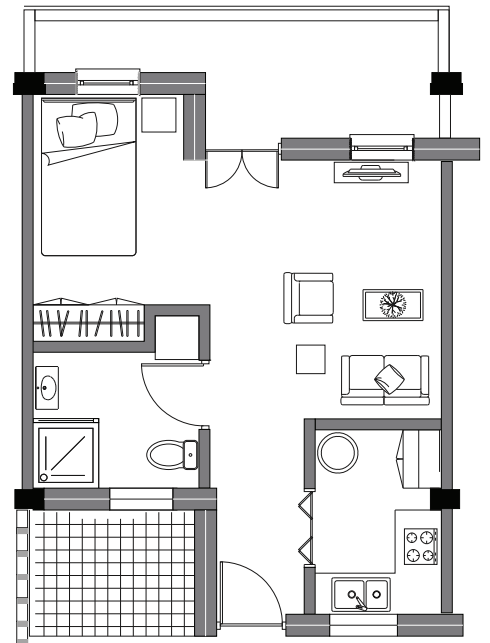
The lower level floors house the units suitable for low-income households with open spaces facing the central courtyard to accommodate household activities that can be performed in semi-public space at one's front door and altered for future expansions. Some units have balconies facing the streets. These open spaces can also be appropriated to accommodate income generating activities. The balconies are often used by inhabitants to dry spices, clothes, and other household chores.

Design



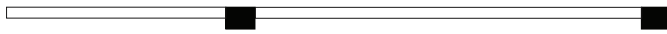
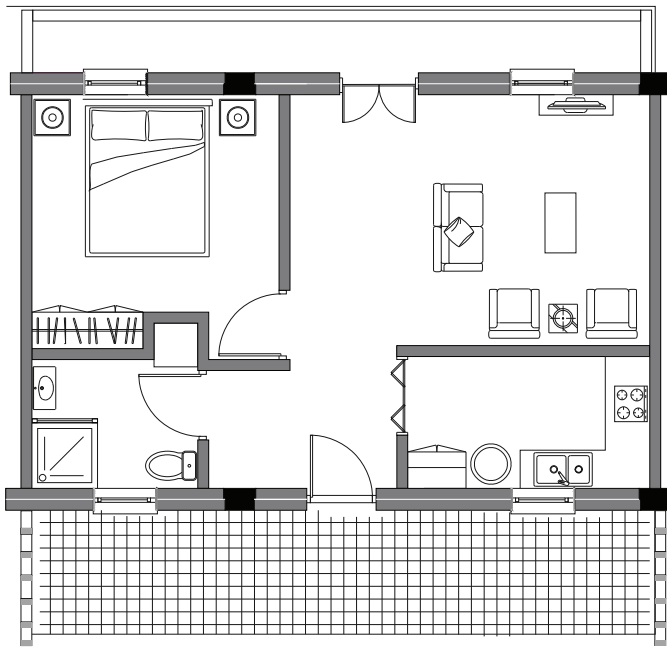
### Studio

unit: 29 sqm  
 open space: 9.5 sqm  
 balcony : 5 sqm



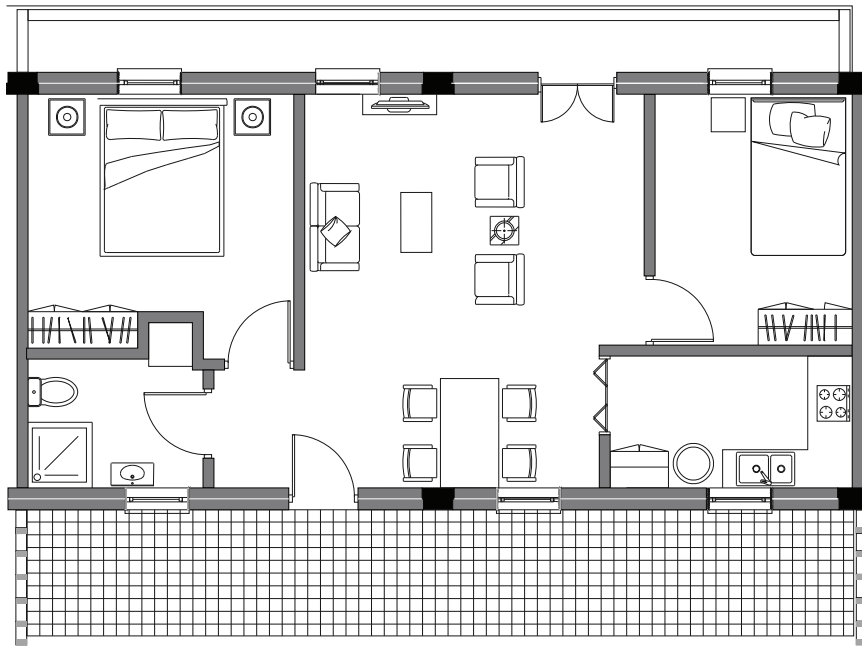
### One Bedroom w/ inset balcony

unit: 32 sqm  
 open space: 4 sqm



**One Bedroom**

unit: 46 sqm  
 open space: 15 sqm  
 balcony : 8 sqm

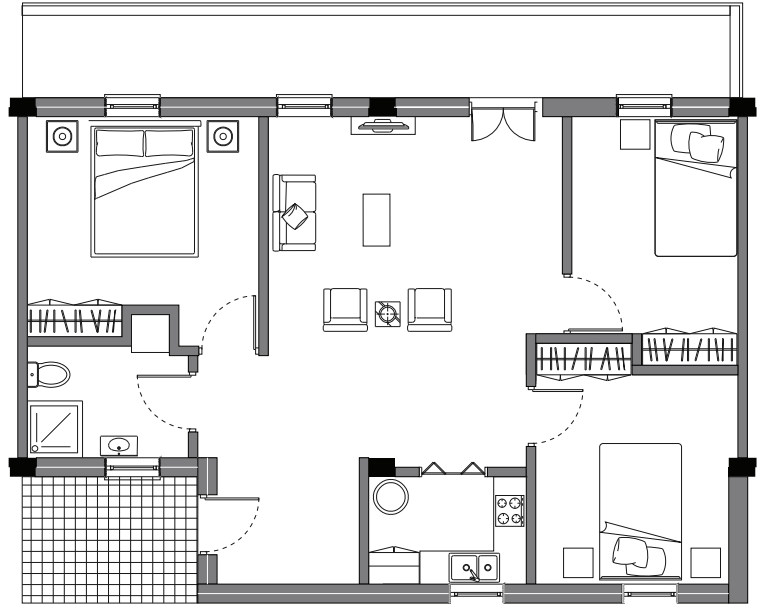


**Two Bedroom**

unit: 61 sqm  
 open space: 19 sqm  
 balcony : 10 sqm

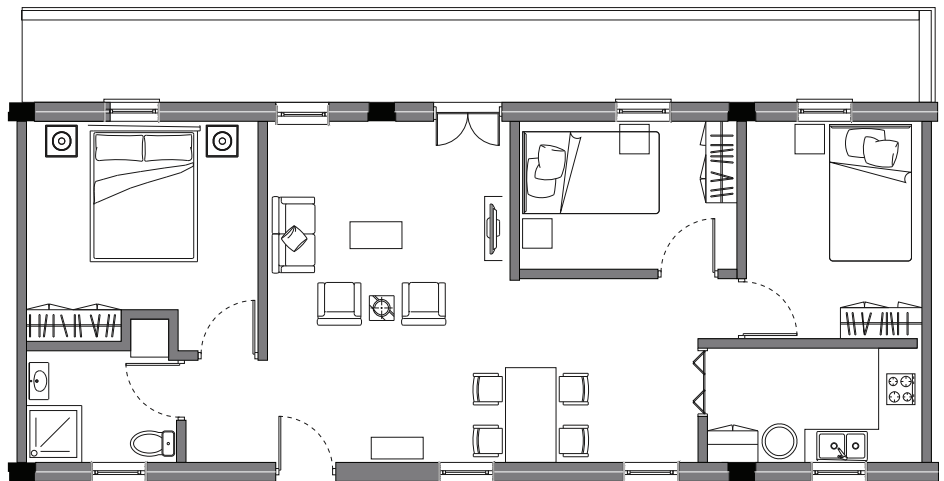
## UNIT TYPES - MIDDLE INCOME

The upper level floors house the units suitable for middle-income households. These units have larger open balcony units than the lower levels achieved by cantilevering. Instead of having the open spaces divided into either side of the units, the balconies accommodate most of the private activities and can be appropriated by the owners as desired in the future.



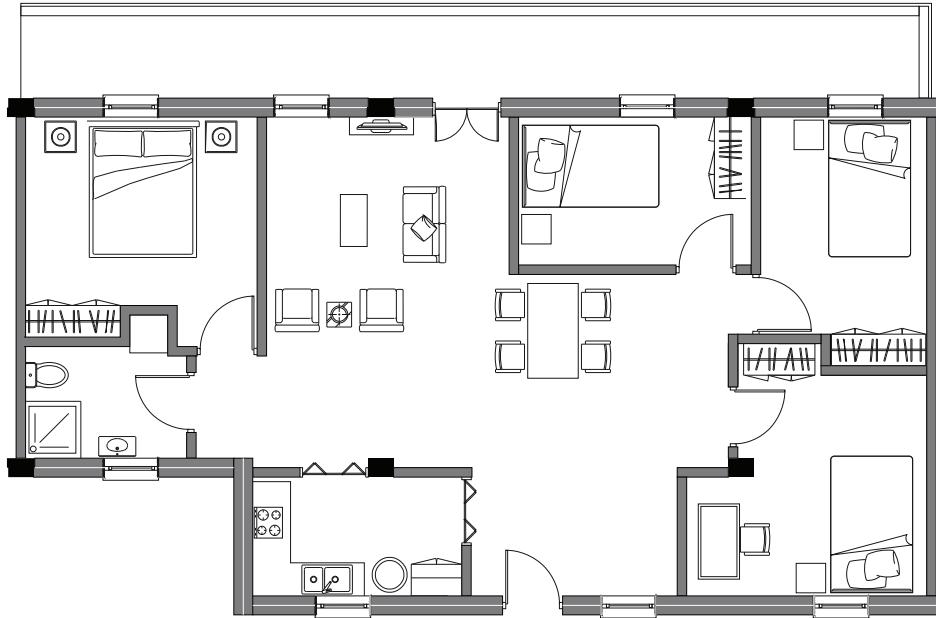
### Three Bedroom

unit: 77 sqm  
open space: 5 sqm  
balcony : 15 sqm



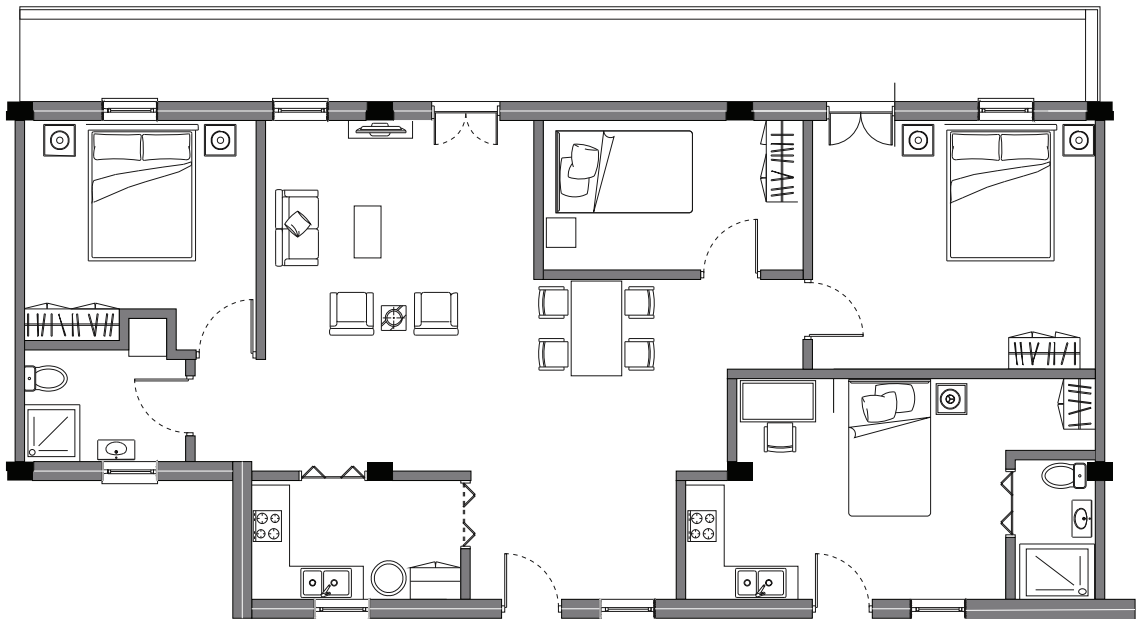
### Three Bedroom

unit: 81 sqm  
open space: -  
balcony : 21 sqm



**Four Bedroom**

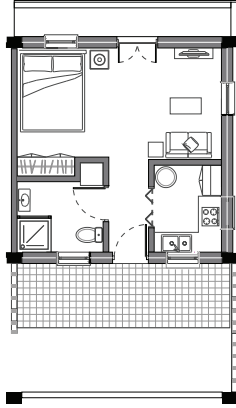
unit: 100 sqm  
 open space: - sqm  
 balcony : 21 sqm



**Four Bedroom or Three Bedroom w/ Rentable unit**

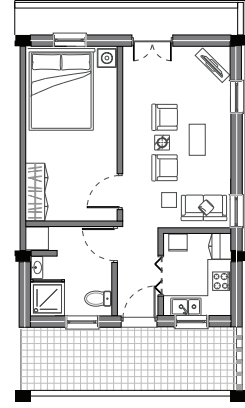
unit: 120 sqm  
 open space: -  
 balcony : 25 sqm

## UNIT TYPES - CORNER



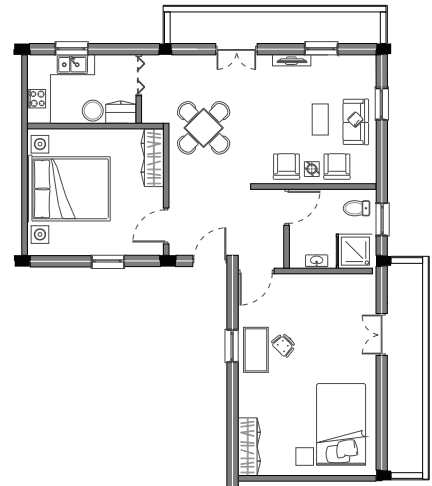
### Studio

unit: 30 sqm  
open space: 9 sqm  
balcony : 4 sqm



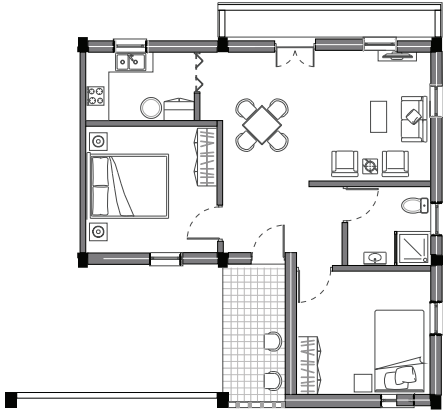
### One Bedroom

unit: 38 sqm  
open space: 5 sqm  
balcony : 4 sqm

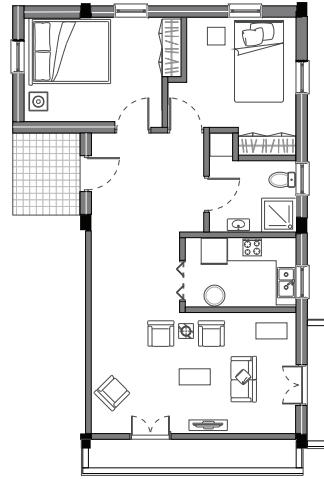


### Two Bedroom

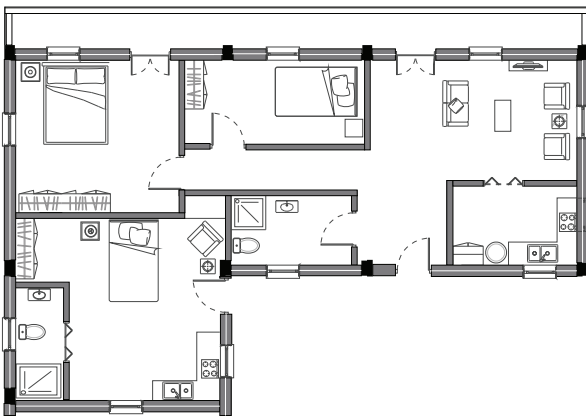
unit: 70 sqm  
balcony : min. 6 sqm



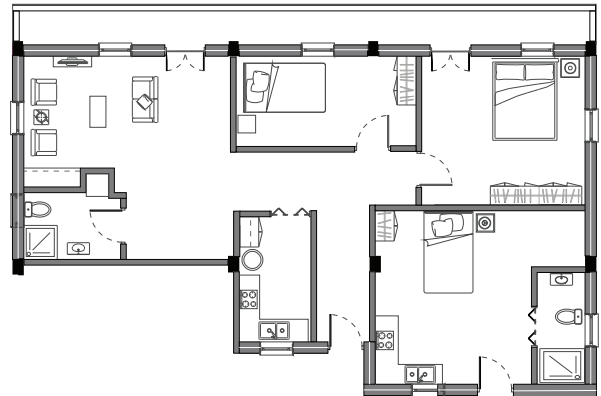
**Two Bedroom**  
 unit: 61.5 sqm  
 open space: 5 sqm  
 balcony : 5 sqm



**Two Bedroom**  
 unit: 65 sqm  
 open space: 3.5 sqm  
 balcony : 6 sqm



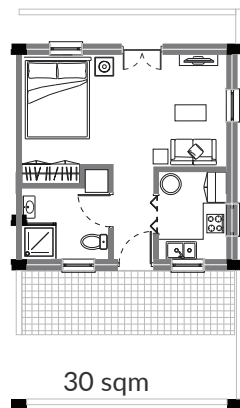
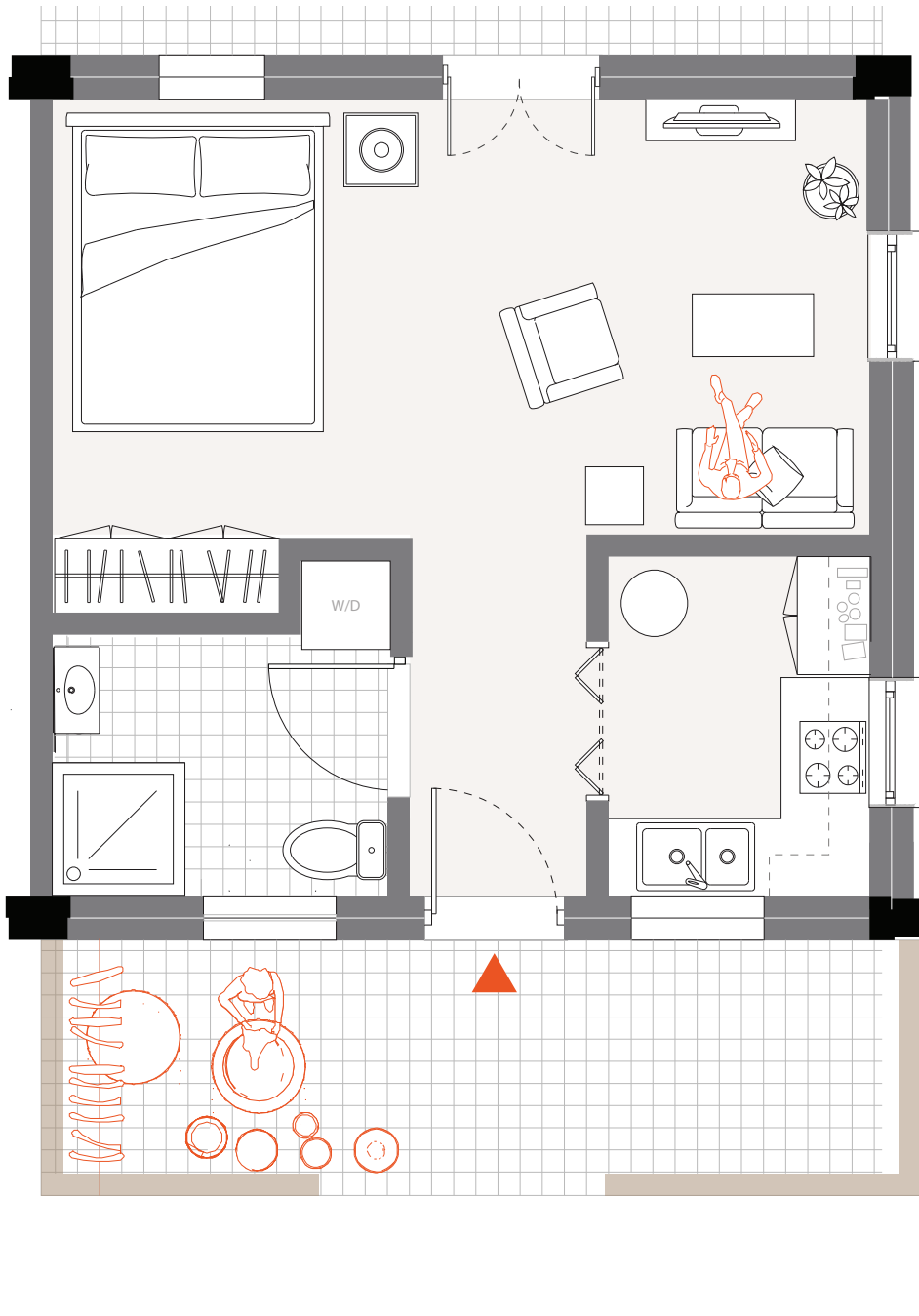
**Four Bedroom or Three Bedroom w/ Rentable unit**  
 unit: 100 sqm  
 balcony : variable (min. 6 sqm)  
 rentable unit : 27sqm



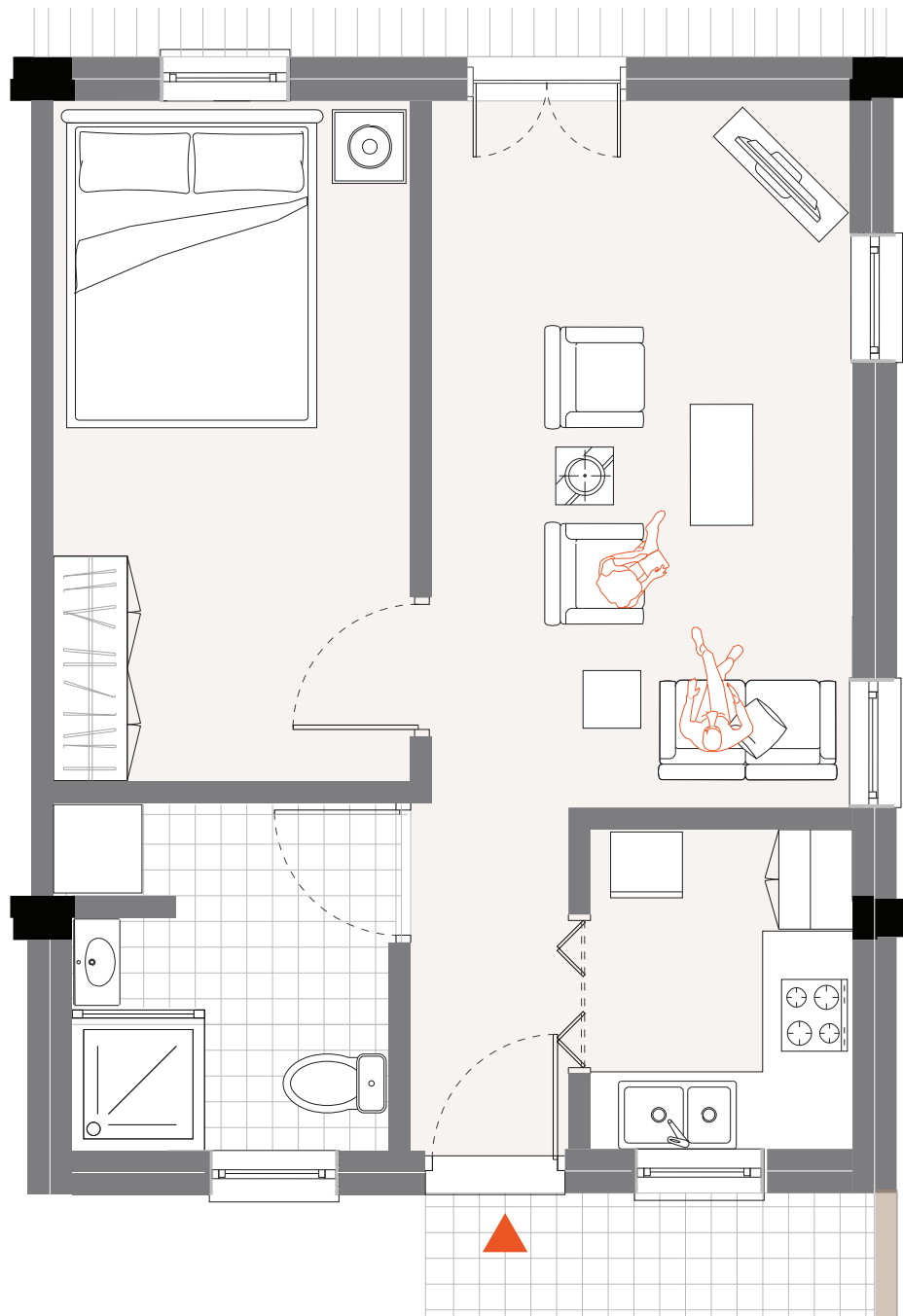
**Four Bedroom or Three Bedroom w/ Rentable unit**  
 unit: 105 sqm  
 balcony : variable (min. 5 sqm)  
 rentable unit : 25 sqm

# POSSIBLE FUTURE ALTERATIONS - STUDIO UNIT WITH OPEN SPACE

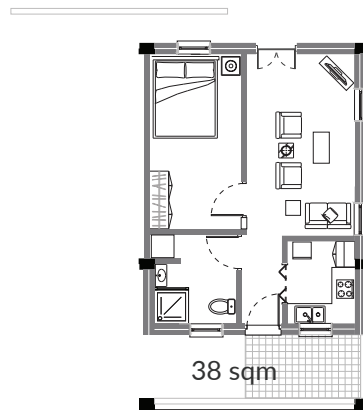
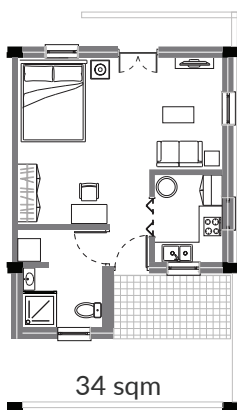
Design



TRANSFORMED



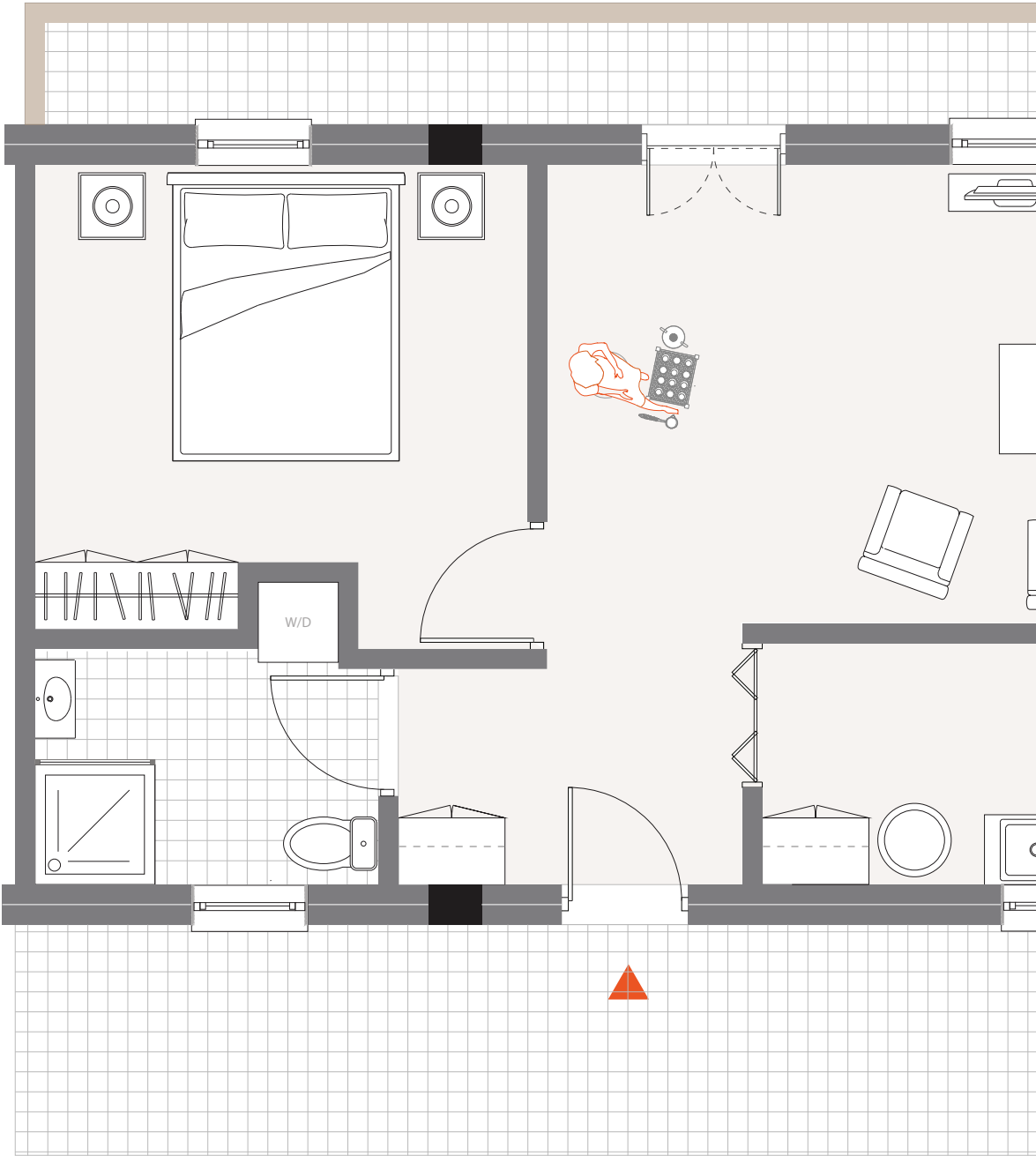
Design



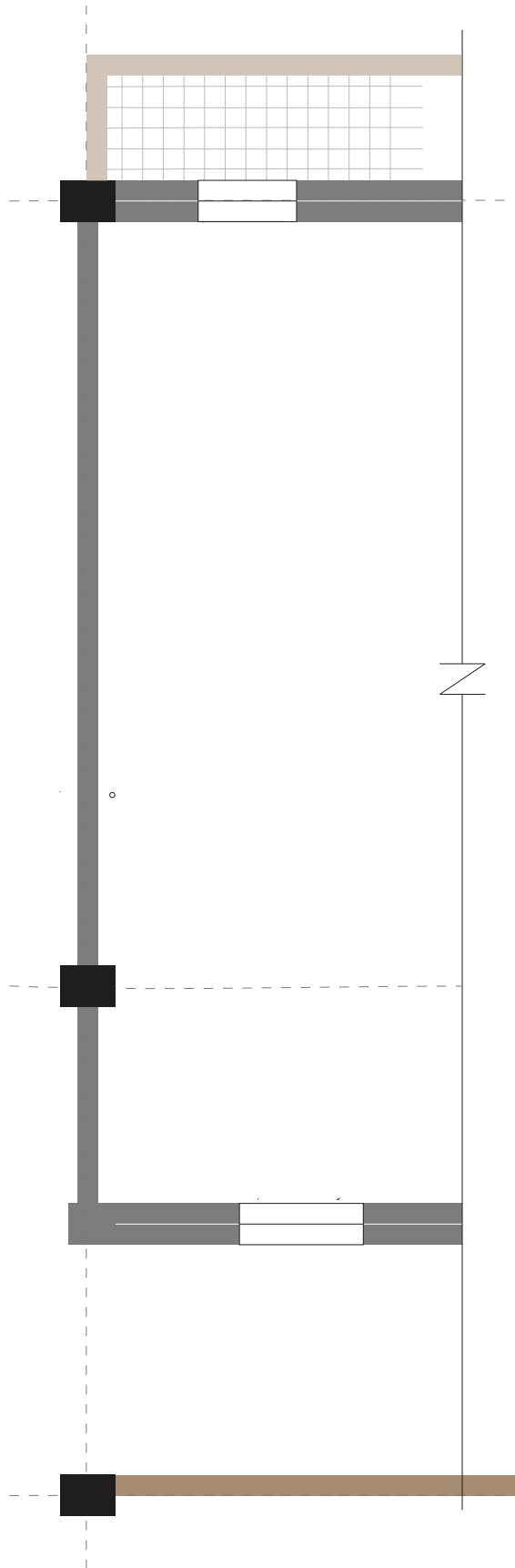
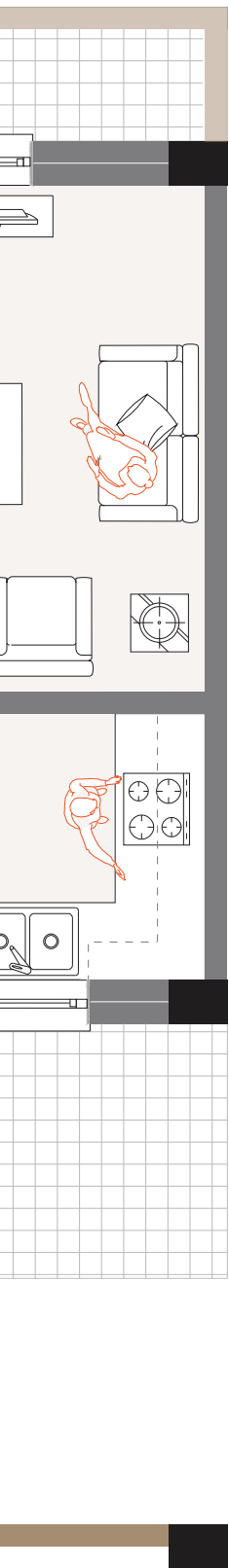
1:50

POSSIBLE FUTURE ALTERATIONS - ONE BEDROOM UNIT WITH OPEN SPACE

Design



50 sqm



TRANSFORMED

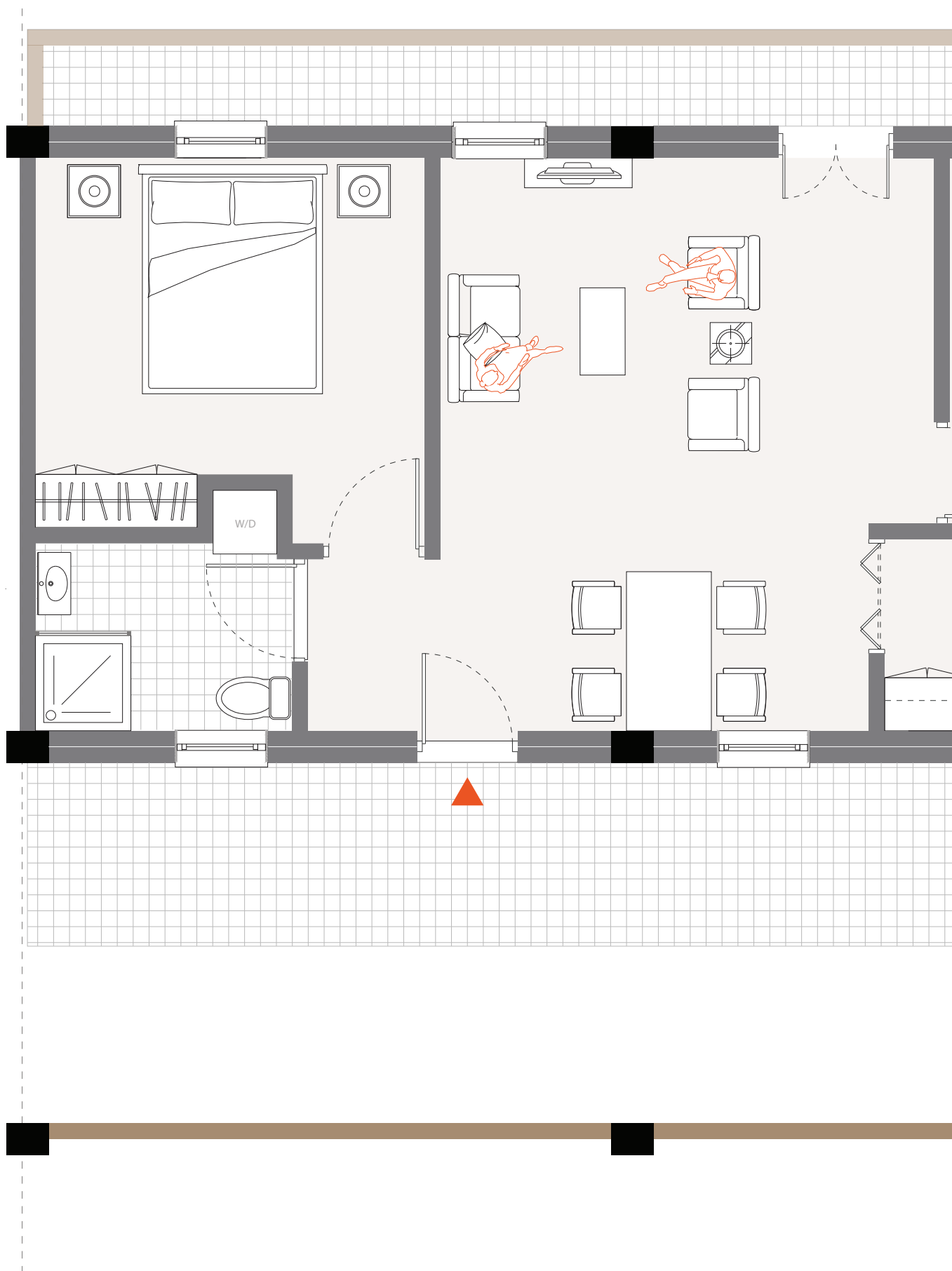
63 sqm

1:50

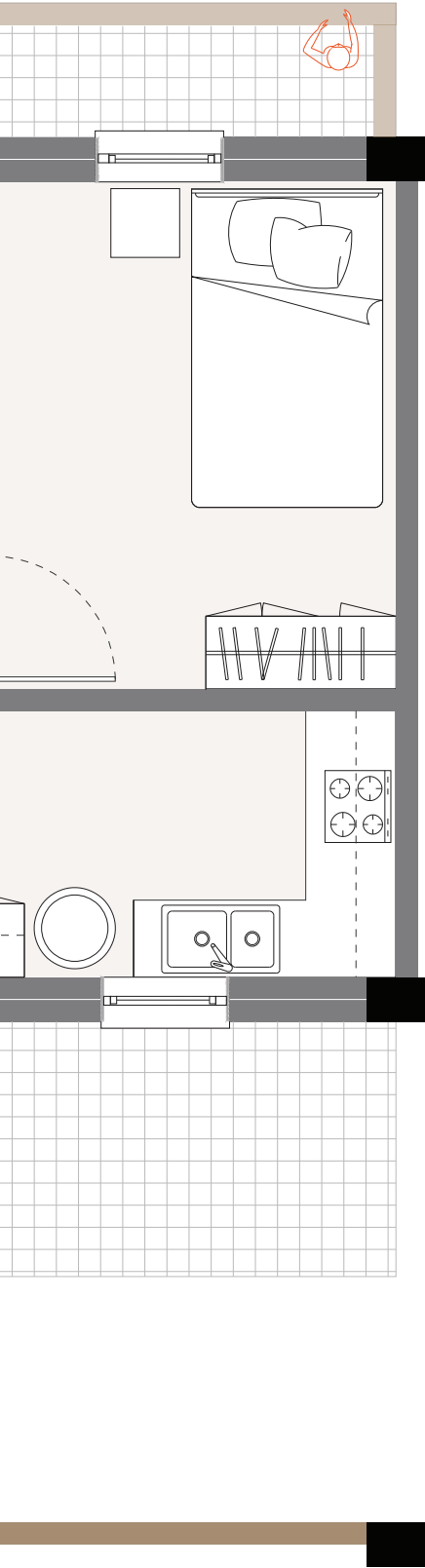
Design

# POSSIBLE FUTURE ALTERATIONS - TWO BEDROOM UNIT WITH OPEN SPACE

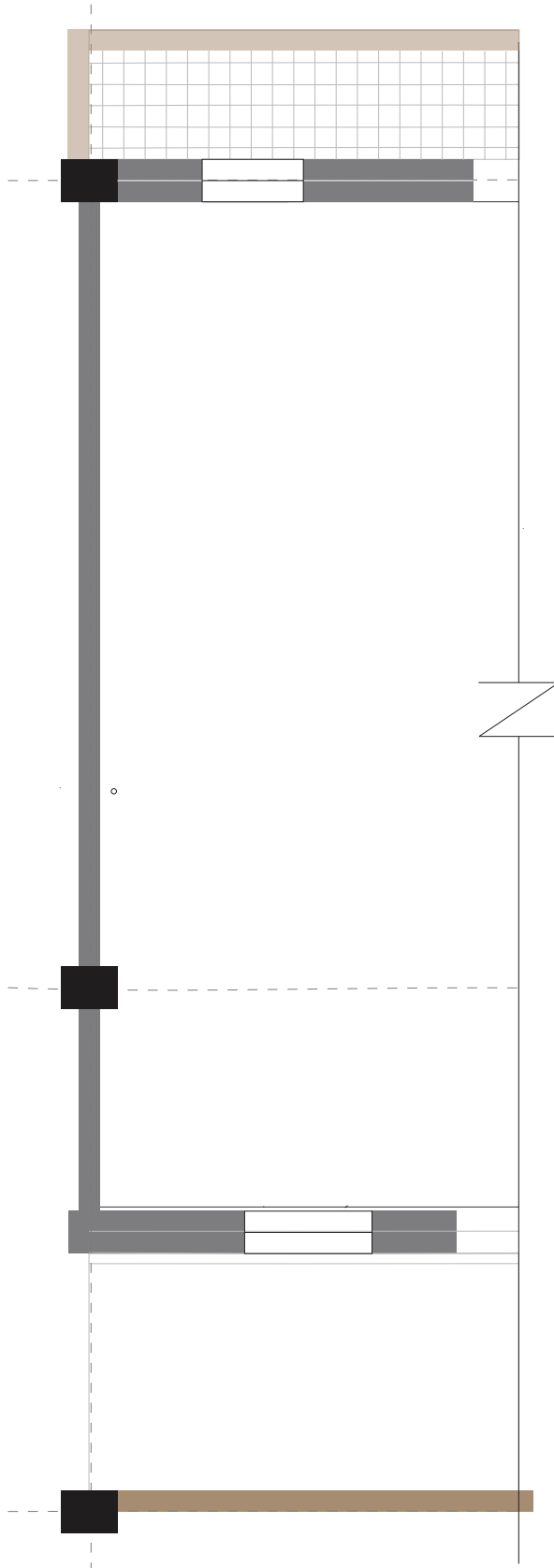
Design



61 sqm



TRANSFORMED

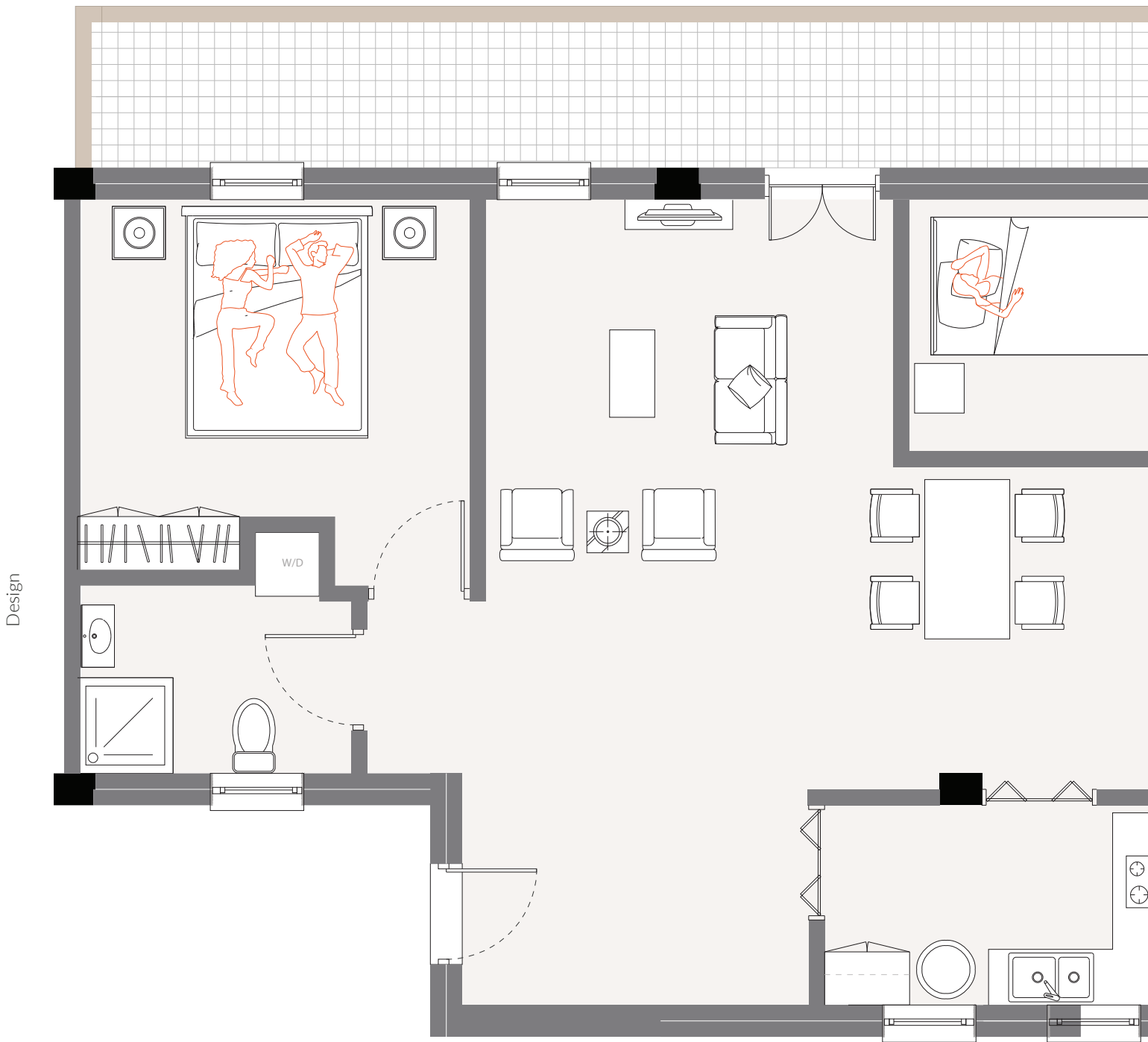


80 sqm

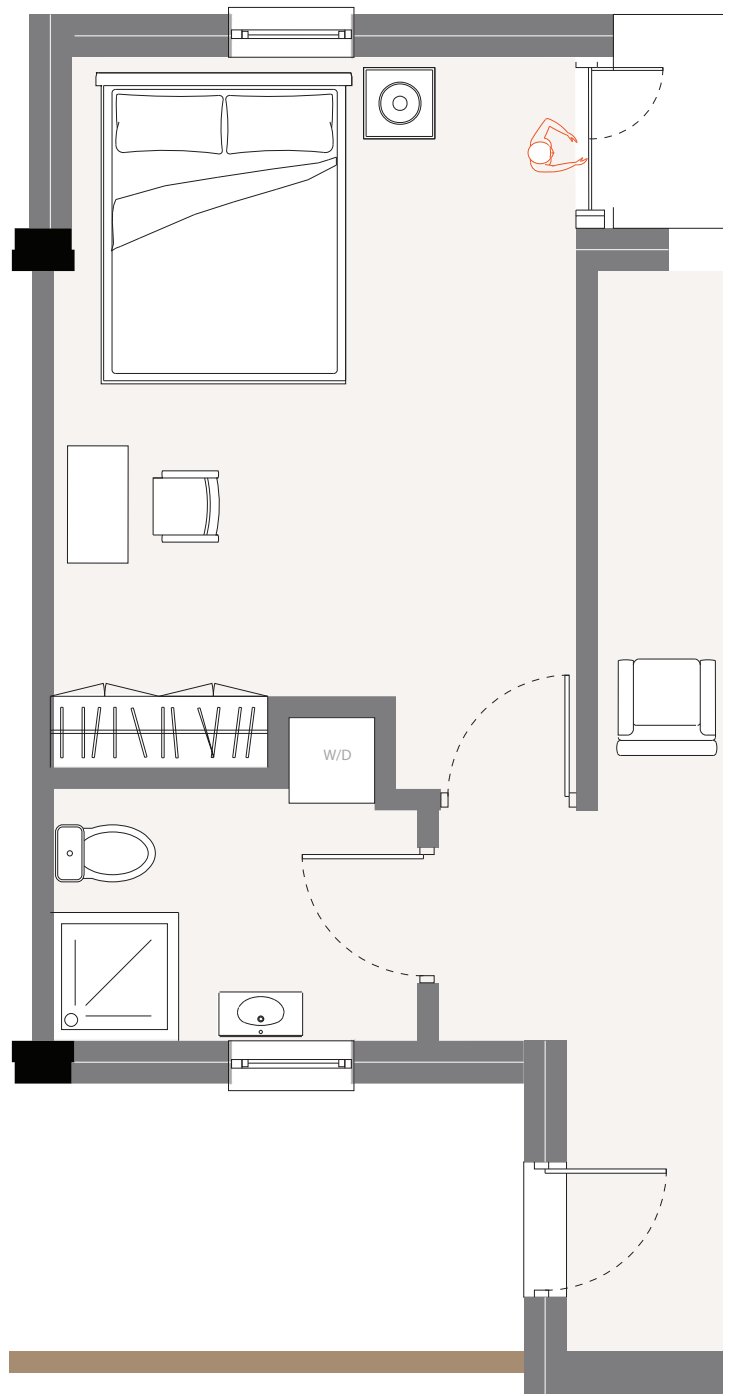
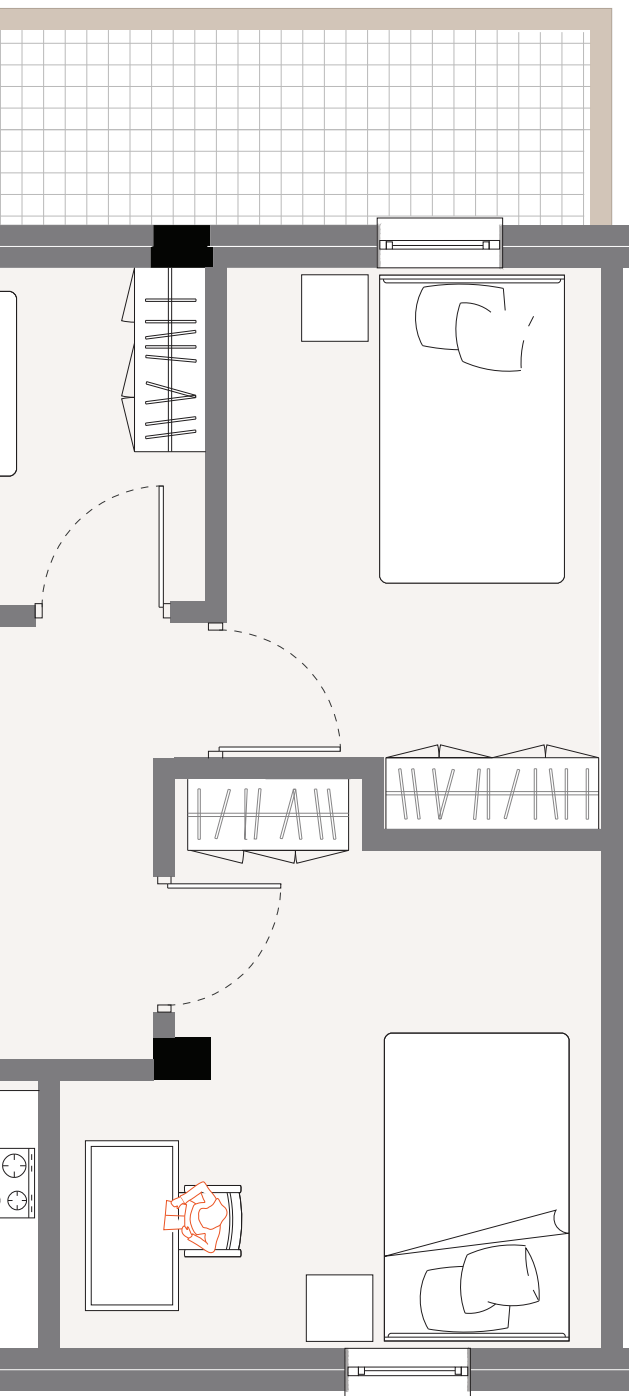
1:50

Design

# POSSIBLE FUTURE ALTERATIONS - THREE BEDROOM CORNER UNIT



100 sqm



Design



TRANSFORMED

101 sqm  
\*access to balcony from master bedroom

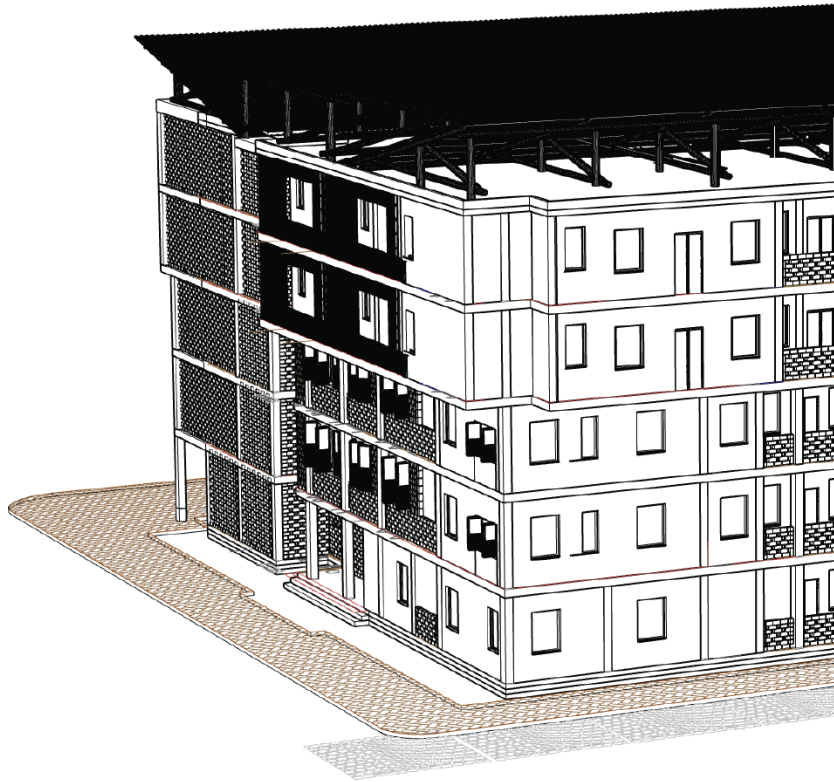


# **BLOCK SCALE**



C - Courtyard Block

Design





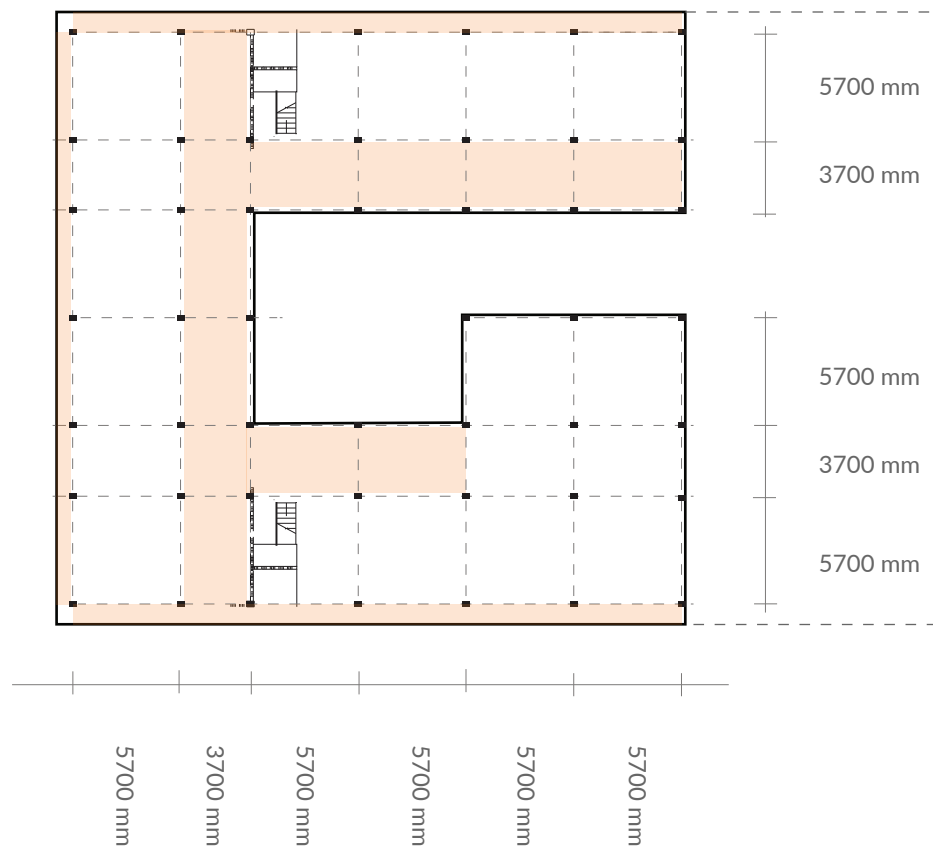
L - Courtyard Block



COURTYARD

# BLOCK STRUCTURAL GRID

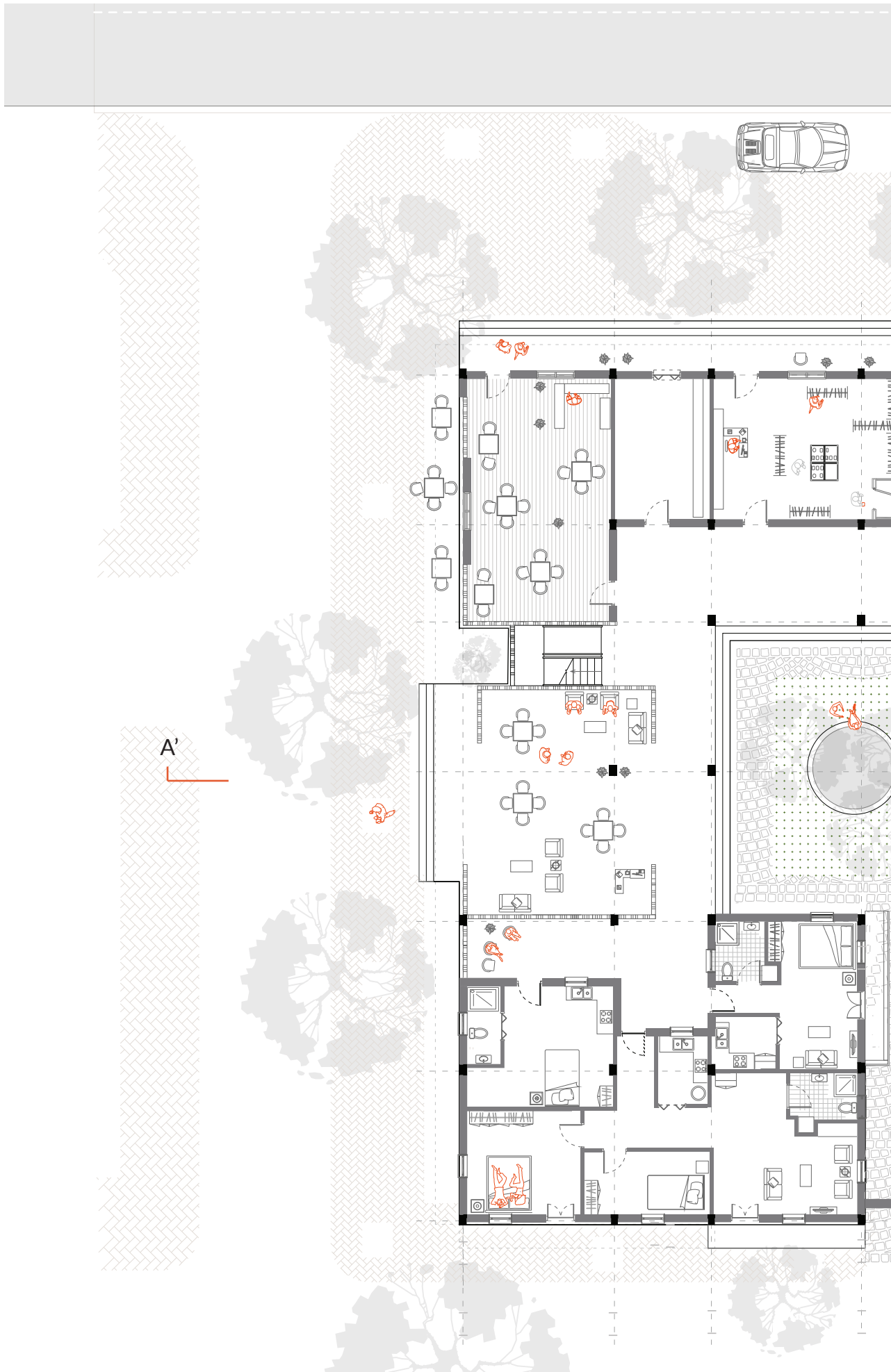
Design

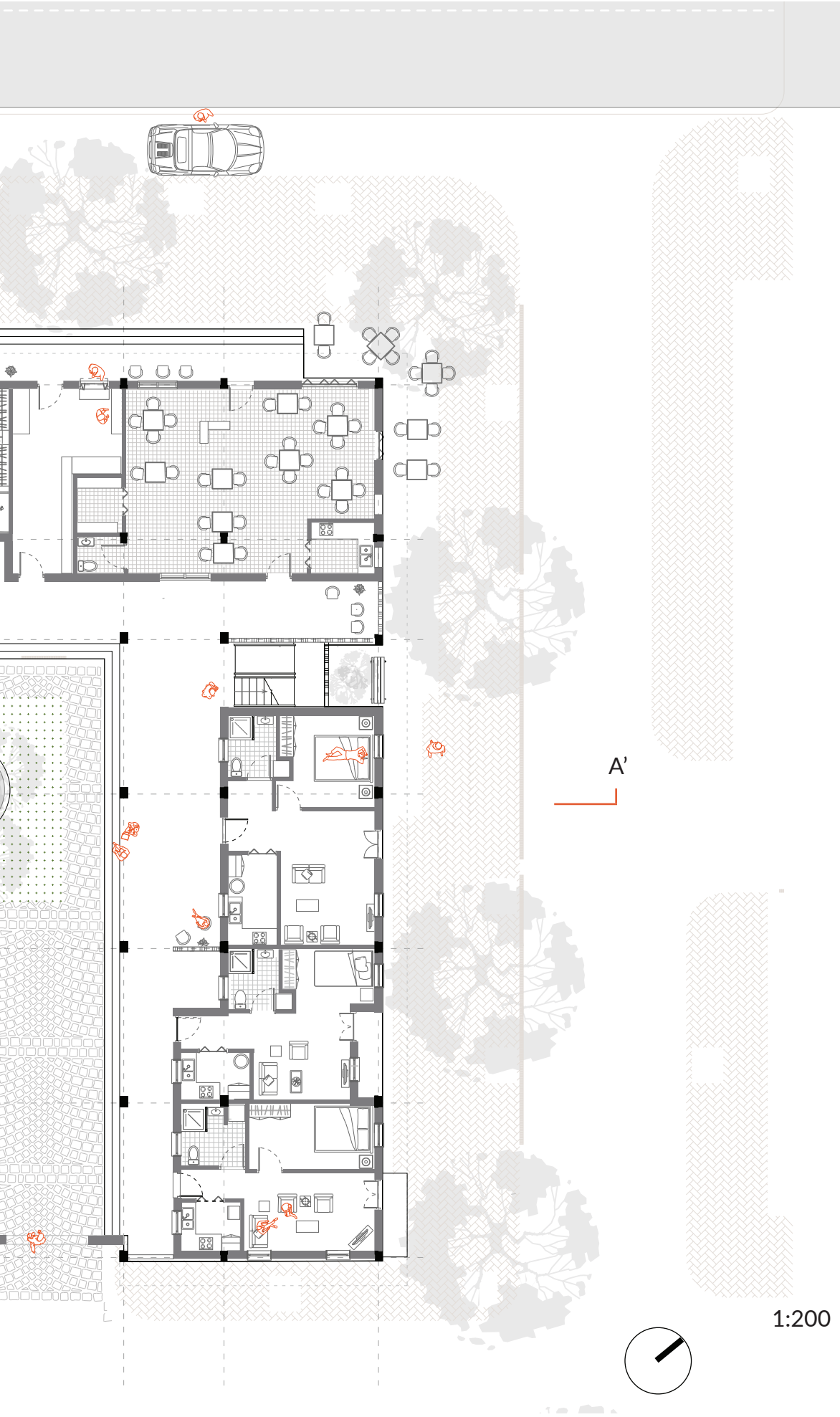




# 'C' - COURTYARD - GROUND PLAN

Design



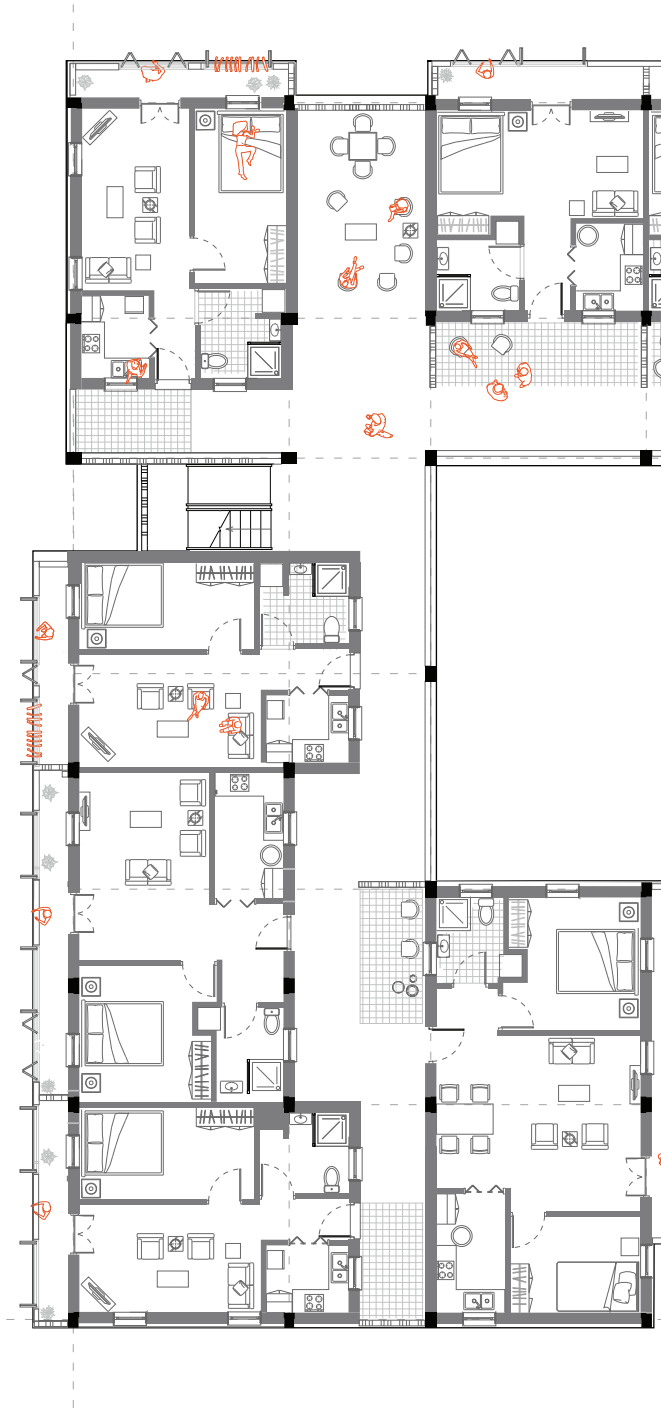


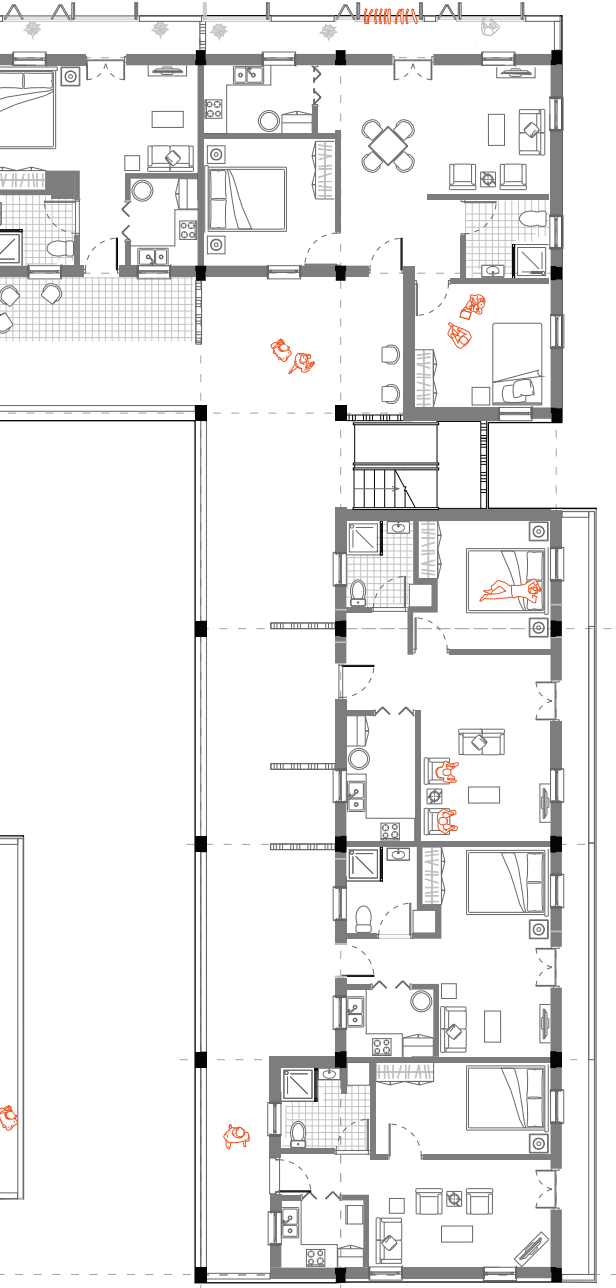
1:200

# 'C'- COURTYARD - FIRST FLOOR

Design

A'





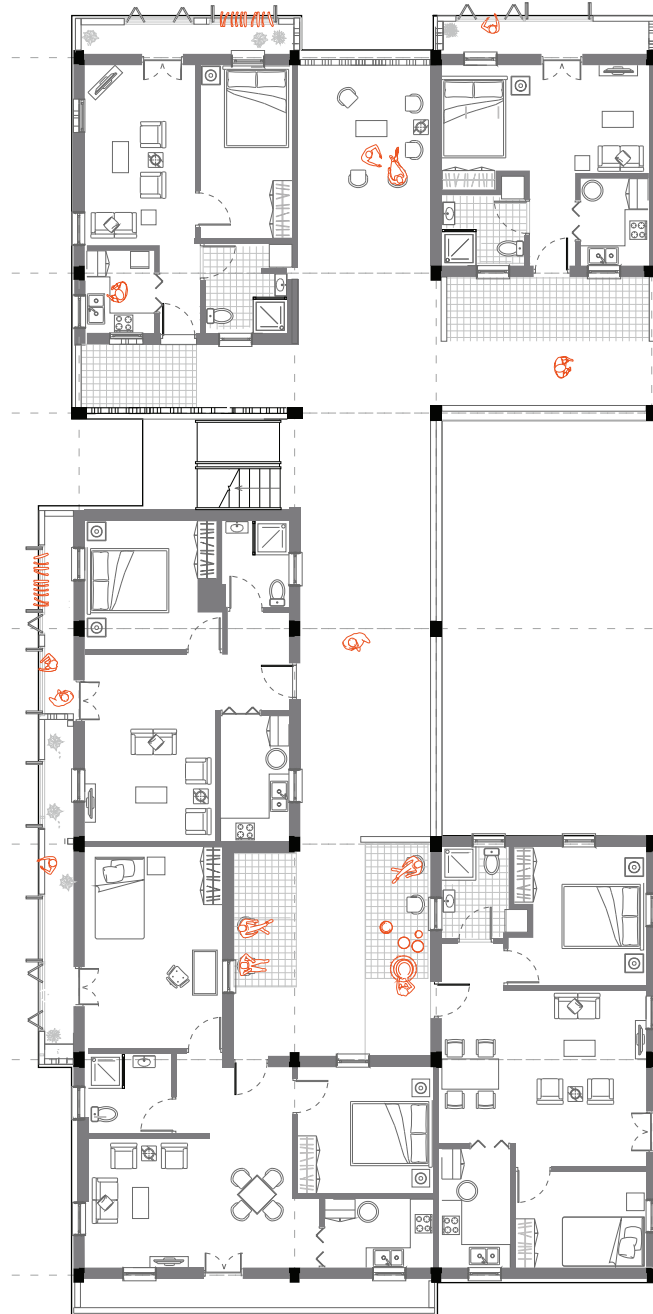
A'

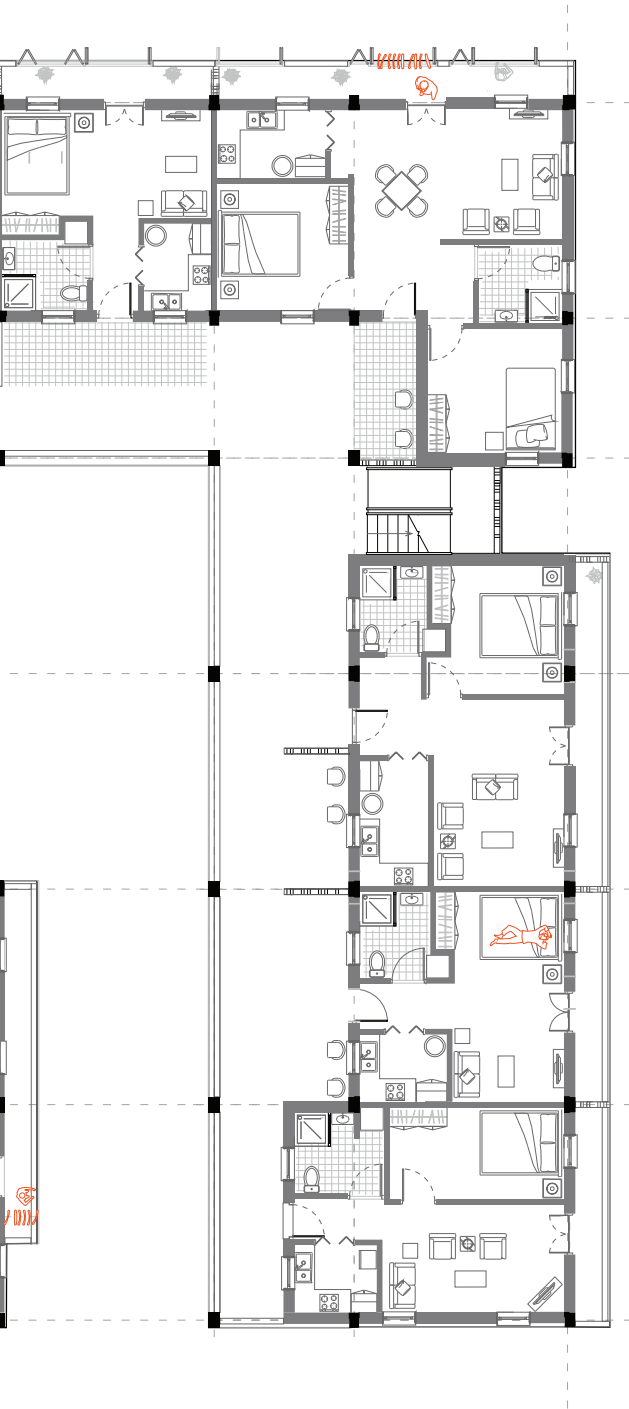
1:200

# COURTYARD - SECOND FLOOR PLAN

Design

A'





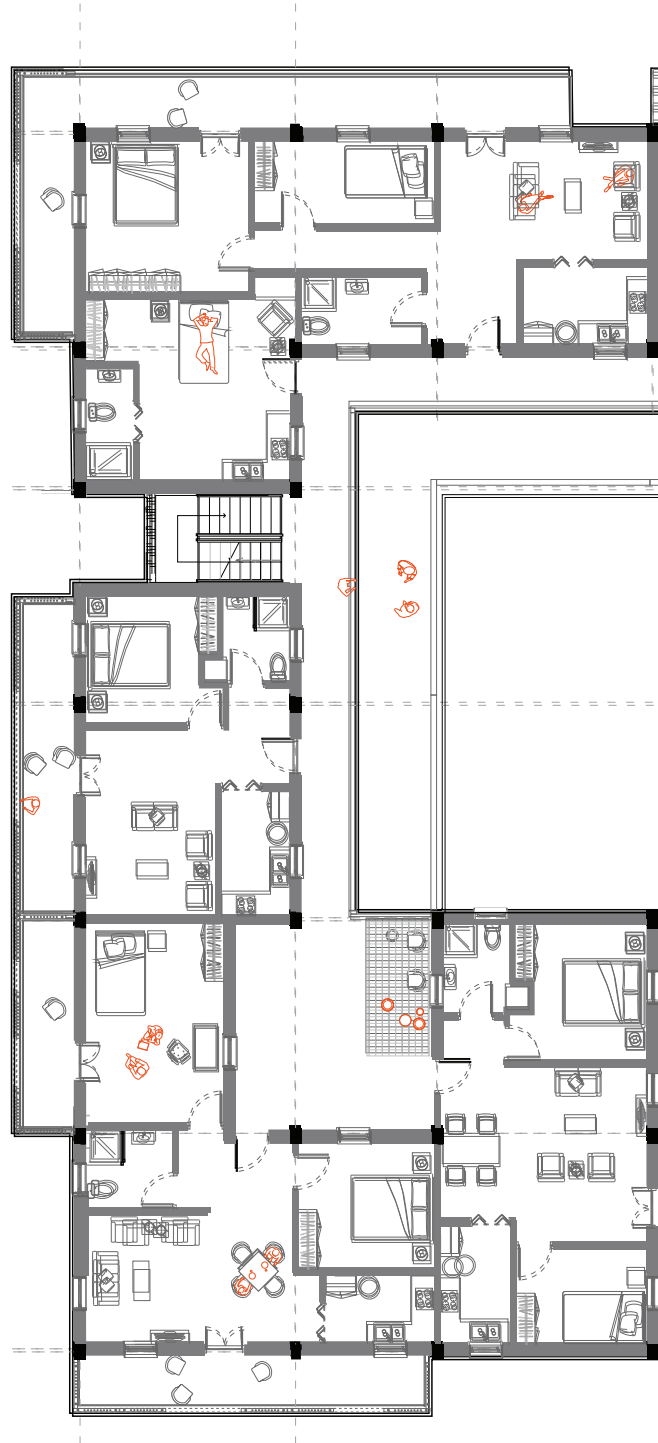
A'

1:200

# COURTYARD - THIRD FLOOR PLAN

Design

A'





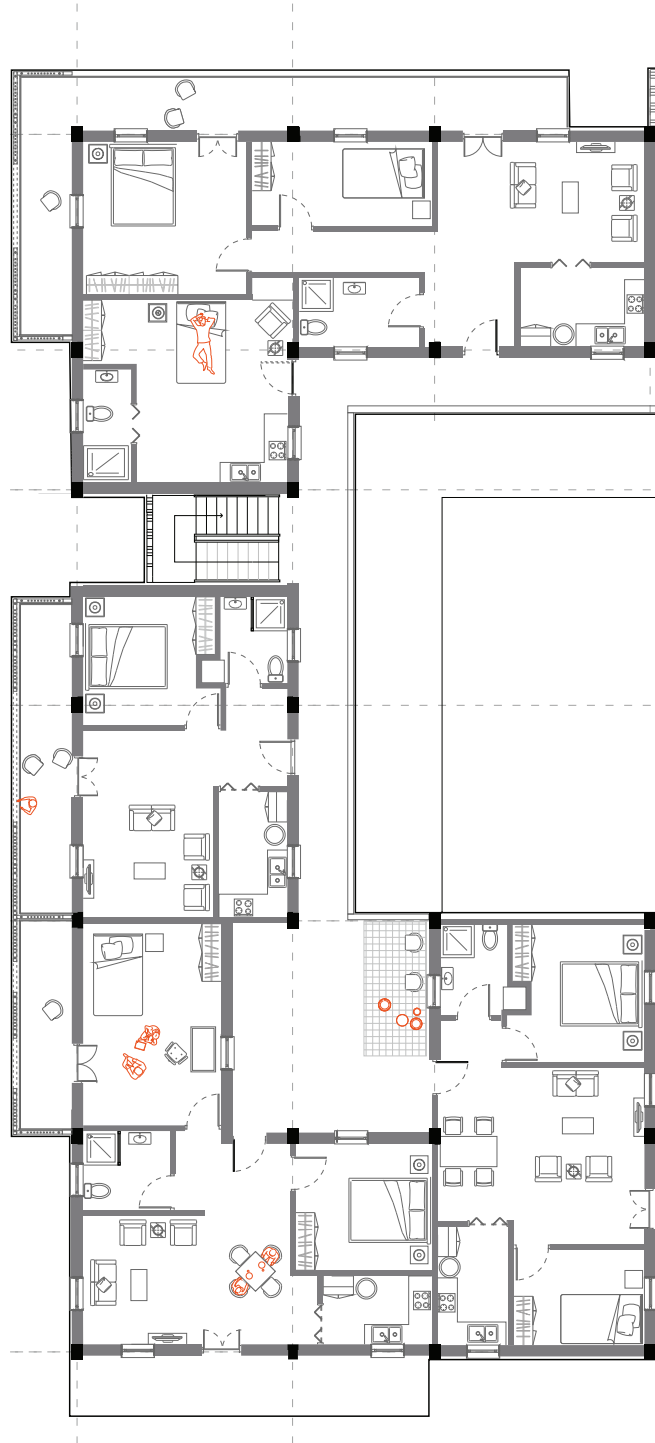
A'

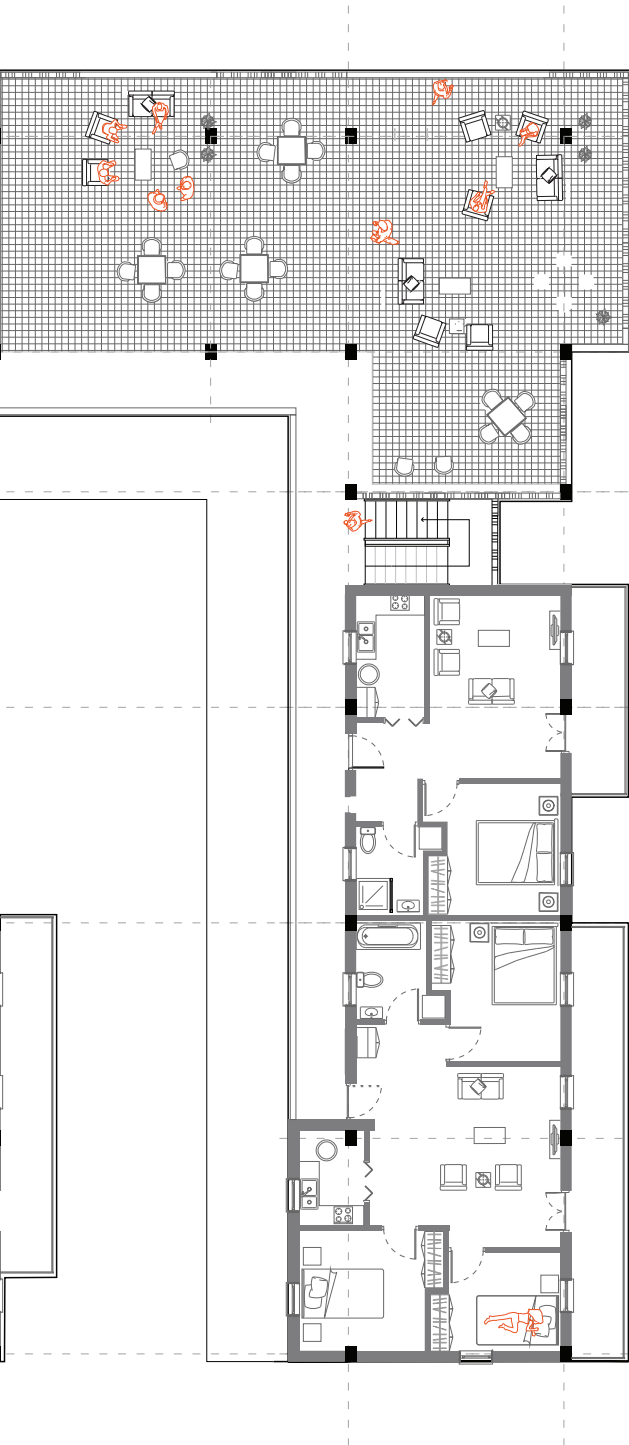
1:200

# COURTYARD - FOURTH FLOOR

Design

A'



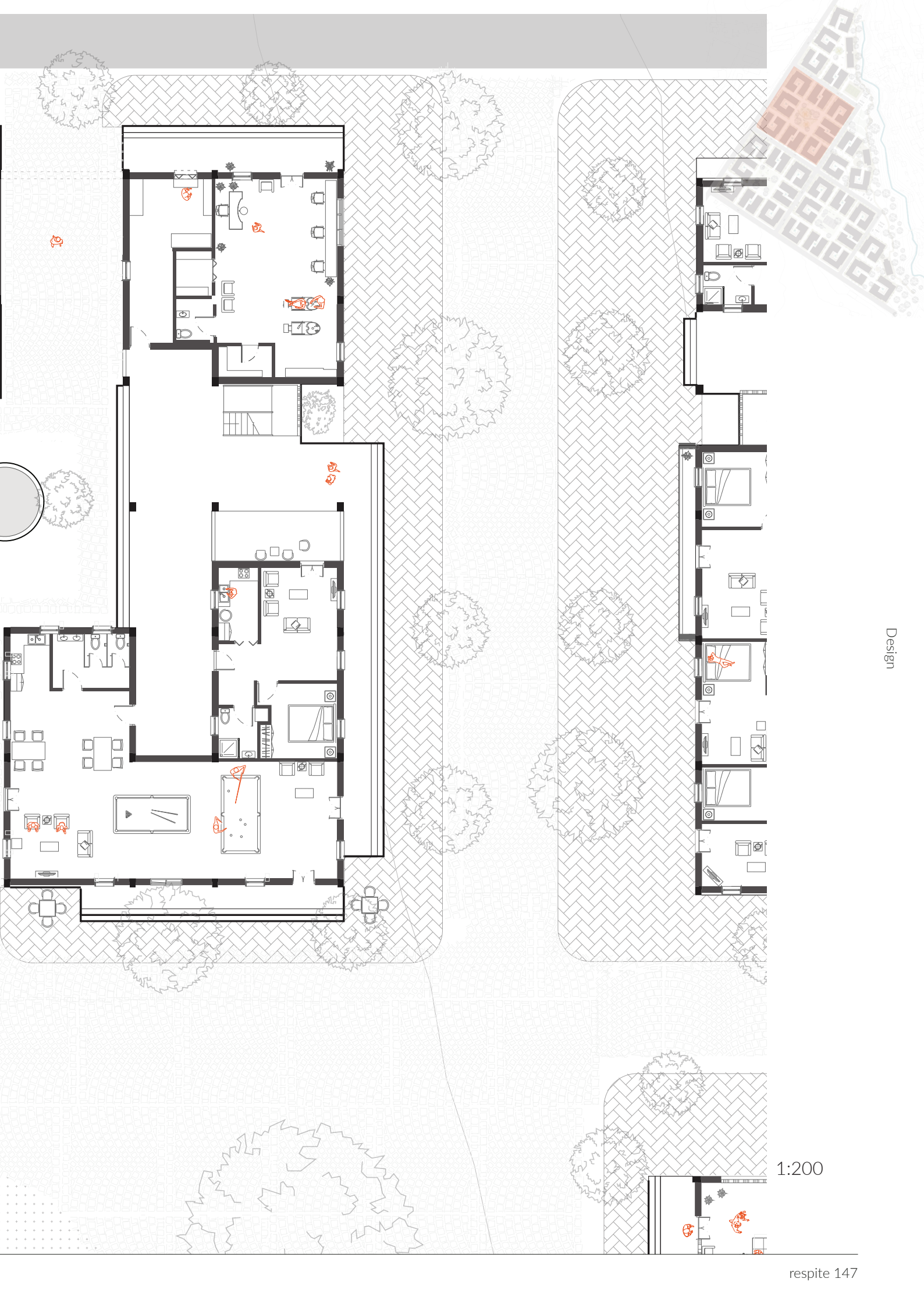


A'

1:200

# 'L' - COURTYARD - GROUND FLOOR PLAN





Design

1:200

# COURTYARD CROSS SECTION



Design

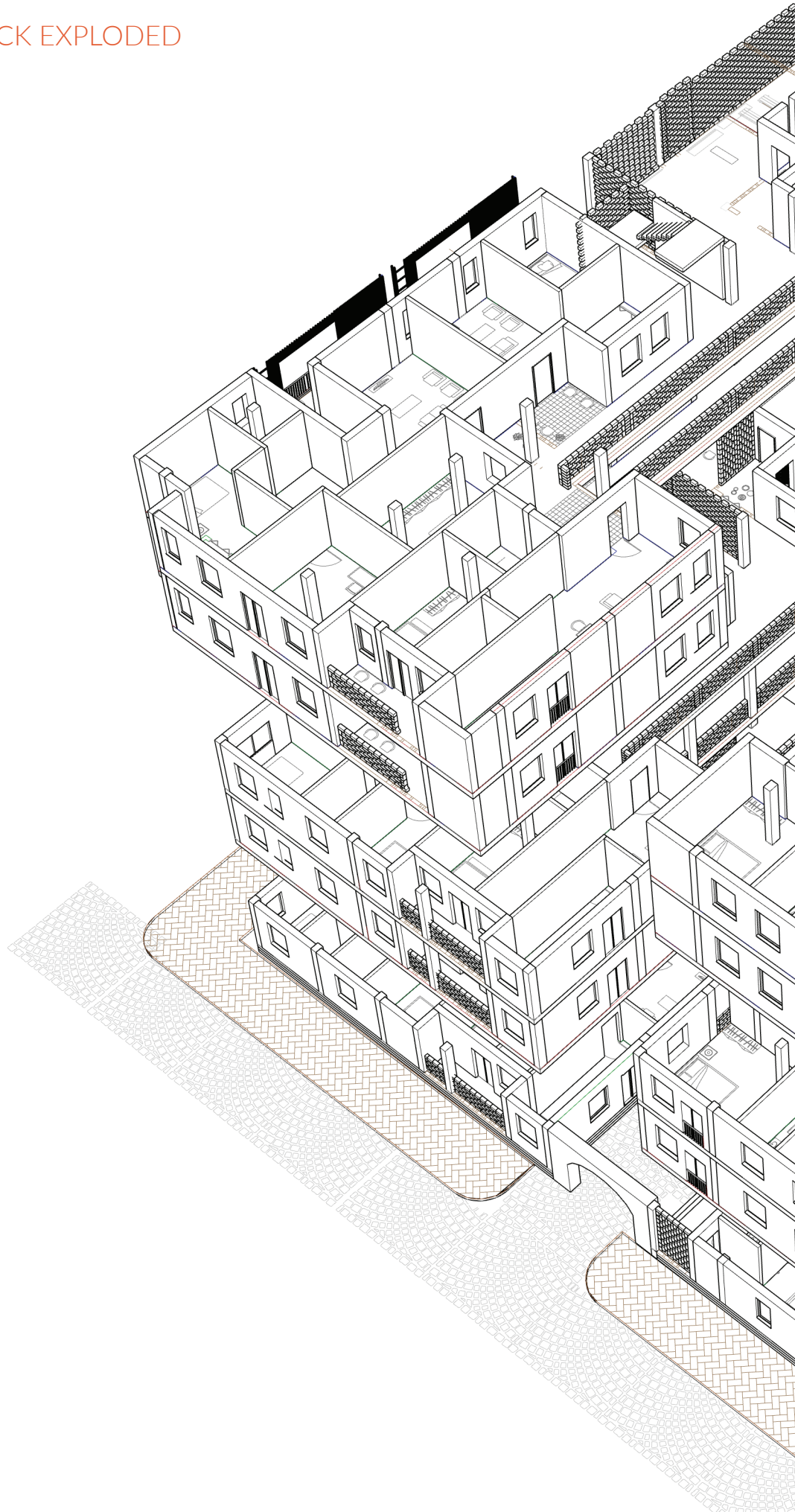


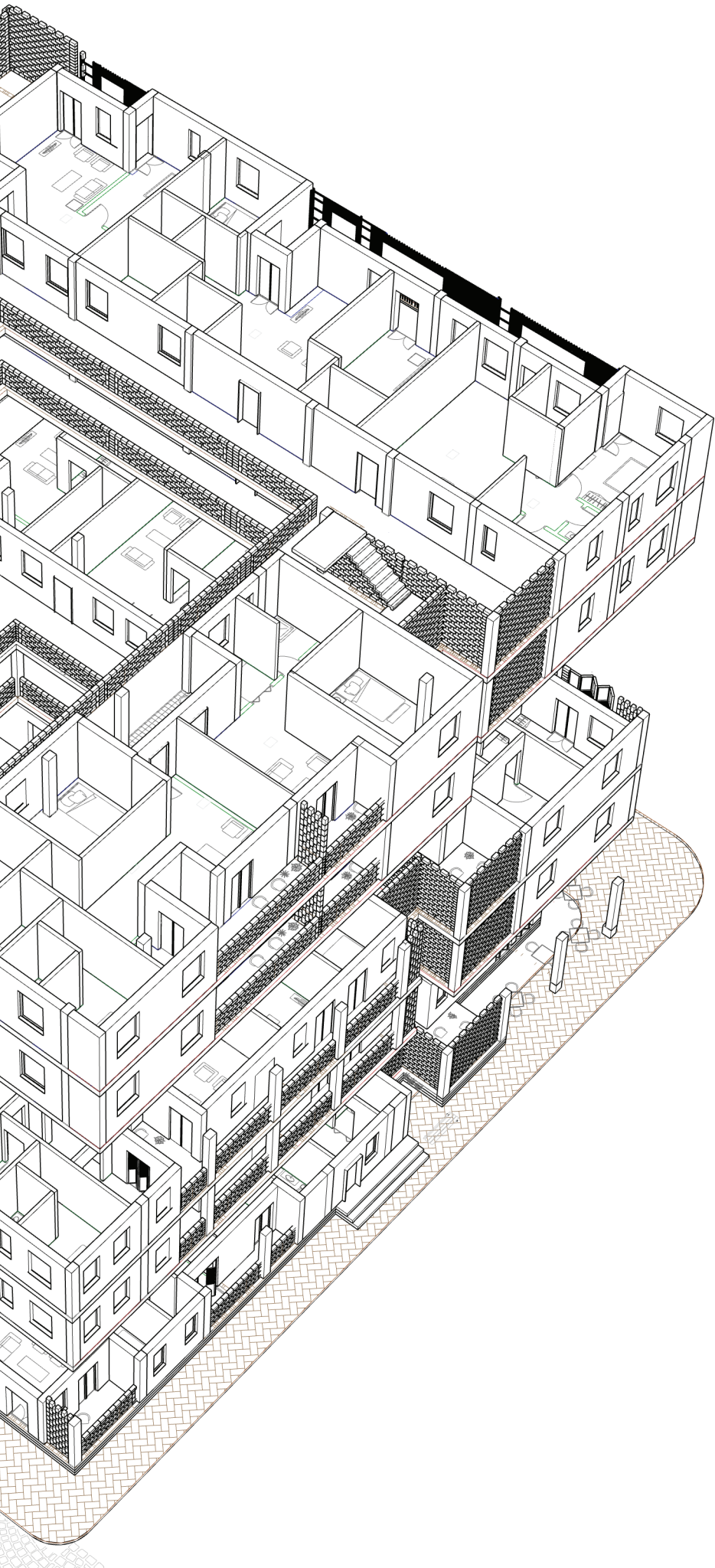
Design

1:100  
A' - A'

CORTYARD BLOCK EXPLODED  
AXON

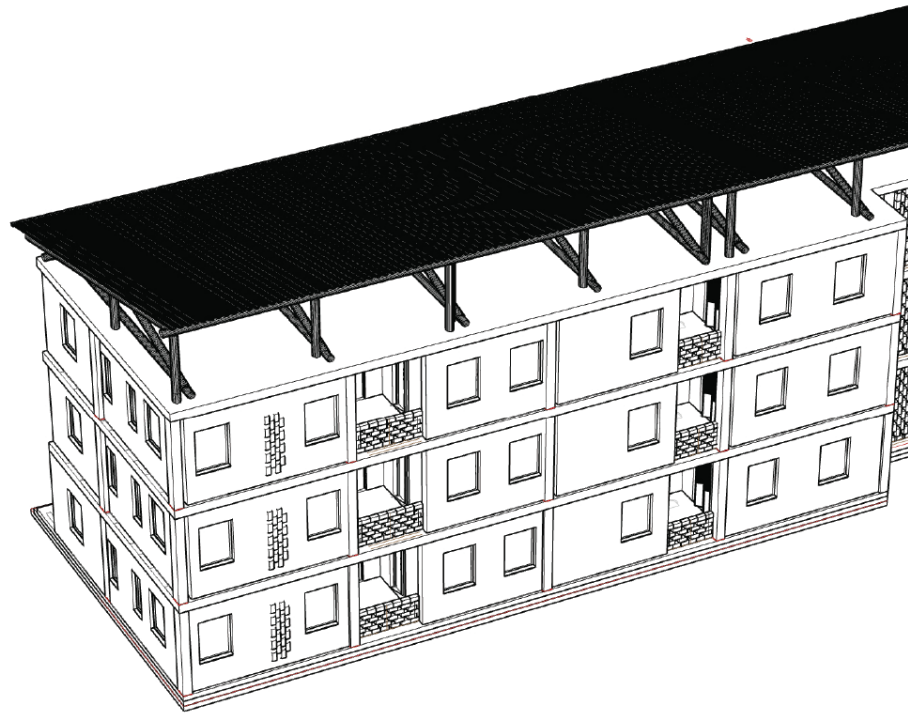
Design

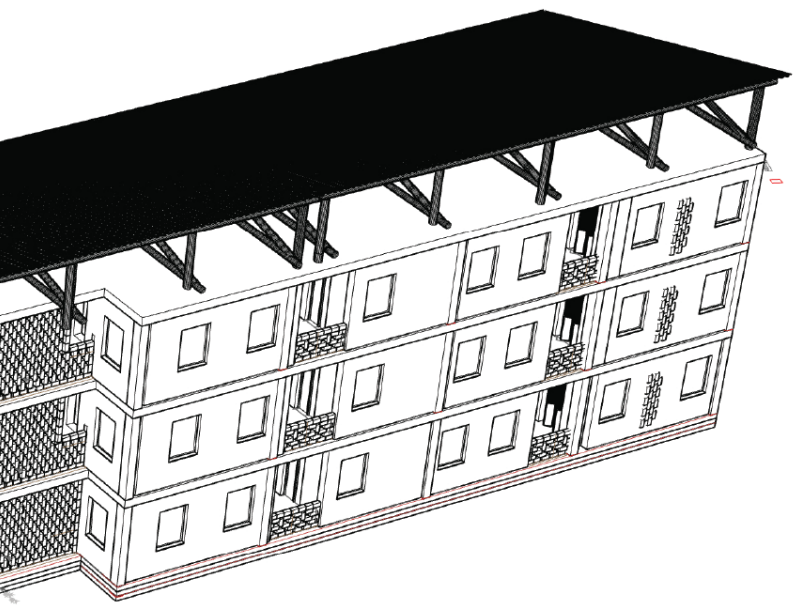




# BUILDING TYPOLOGY - WATERFRONT

Design

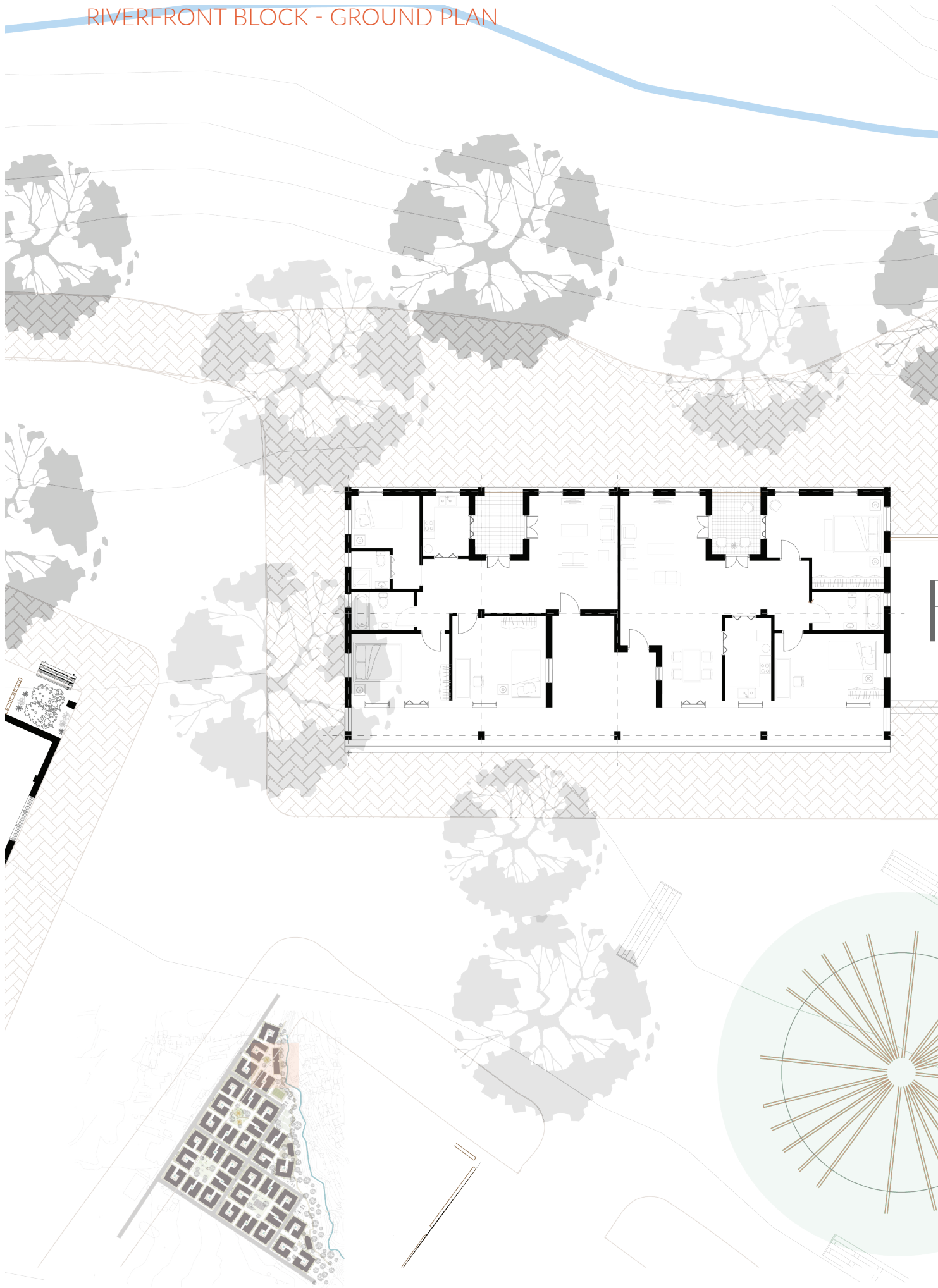


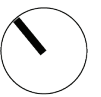
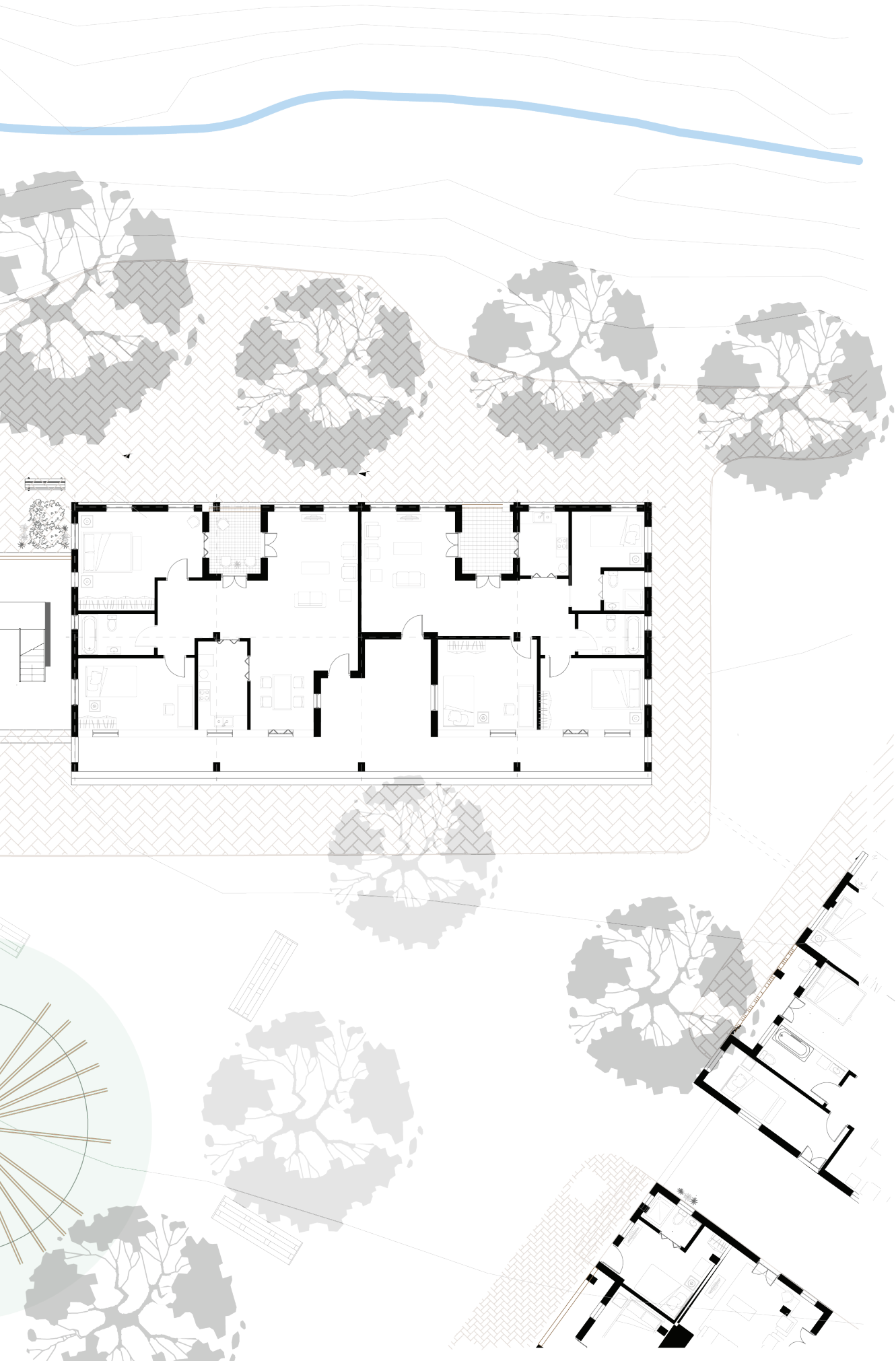


RIVERFRONT

# RIVERFRONT BLOCK - GROUND PLAN

Design





1:200

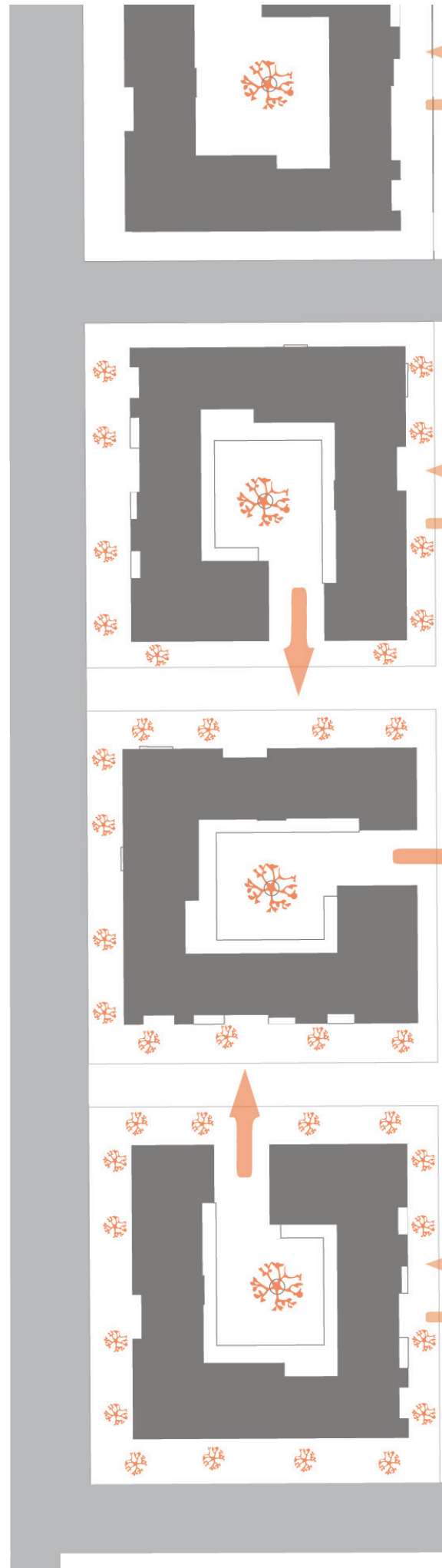


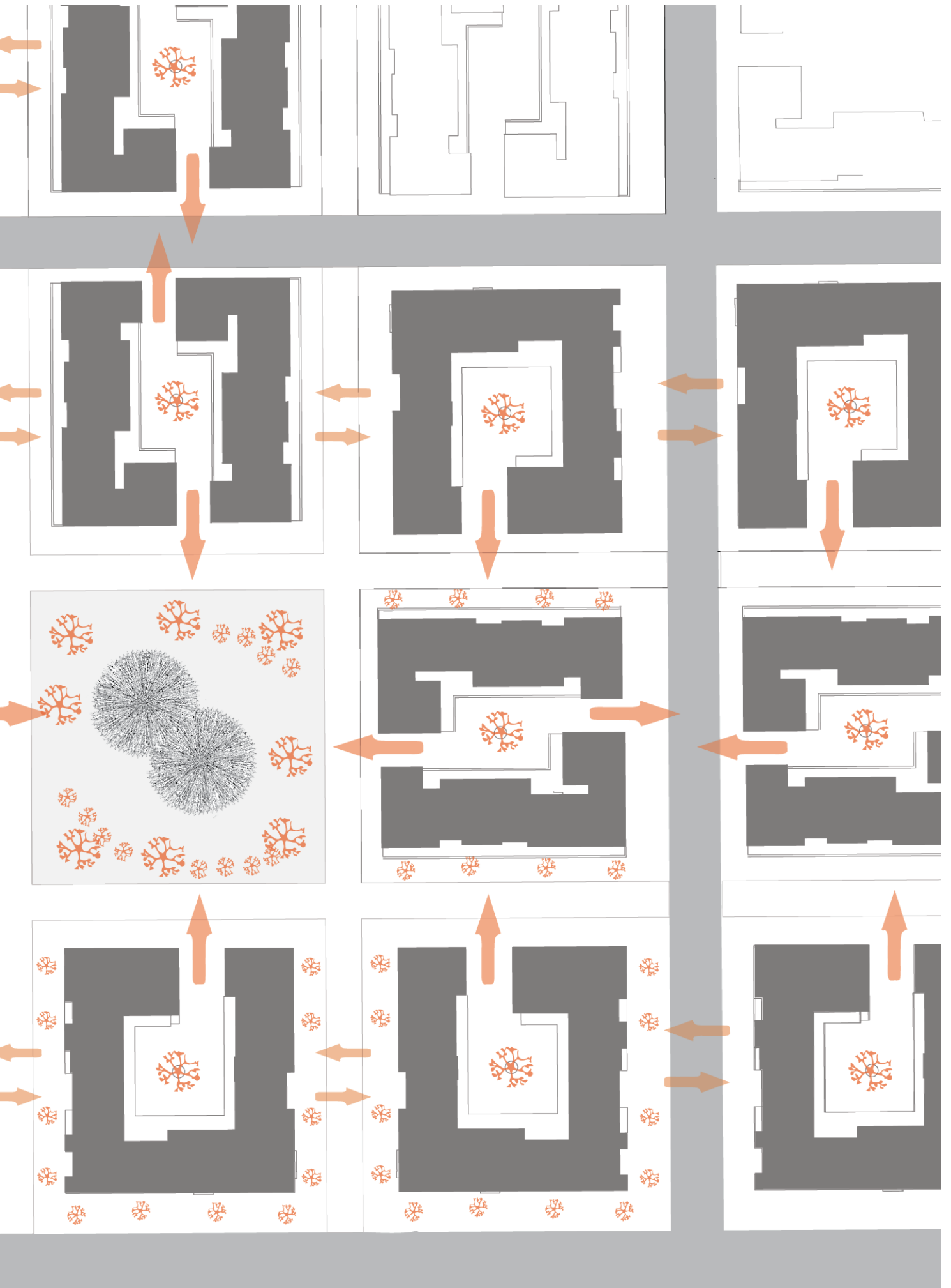
# CLUSTER

## CLUSTERING

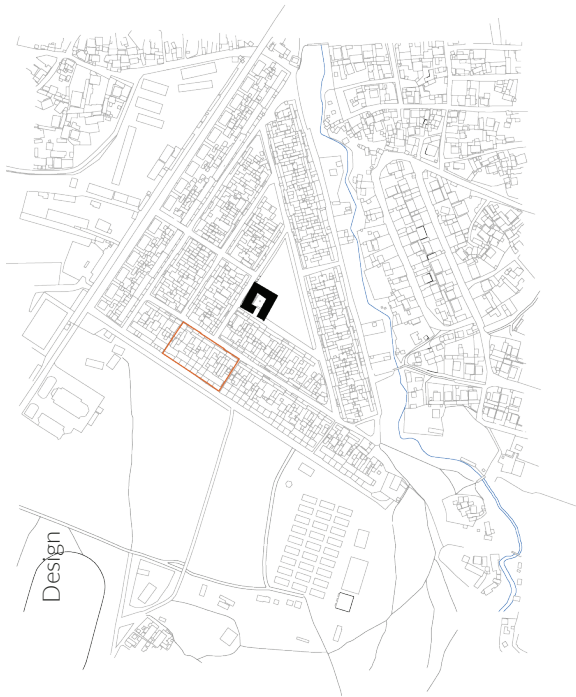
- central communal space = social and environmental buffer
- courtyards = intimate space and as a means of interaction => monastery cloister.
- inhabitants from the same 'sefer' into the same block/building
- preserve the intimate relationships they developed over

Design





## PHASING



### Phase I

#### Phase I - G+4

Relocate 17 households

Internal cross-subsidization

40% Low- income Core Housing

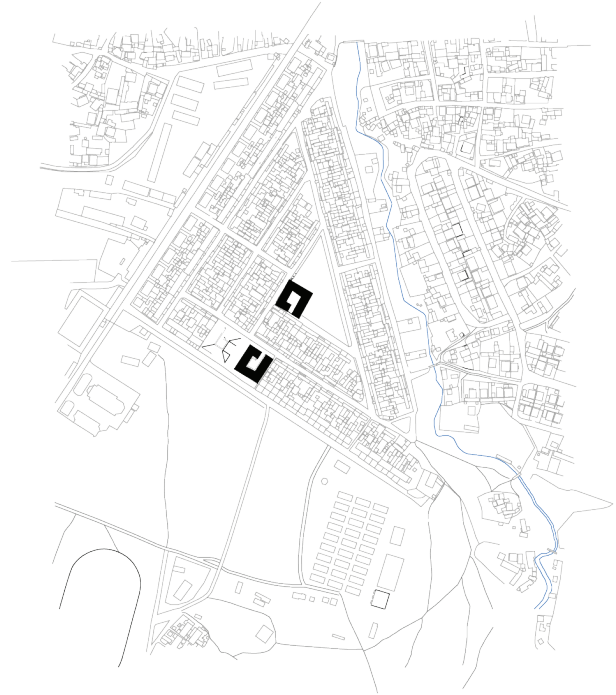
+

60% Middle-income Housing=Ownership

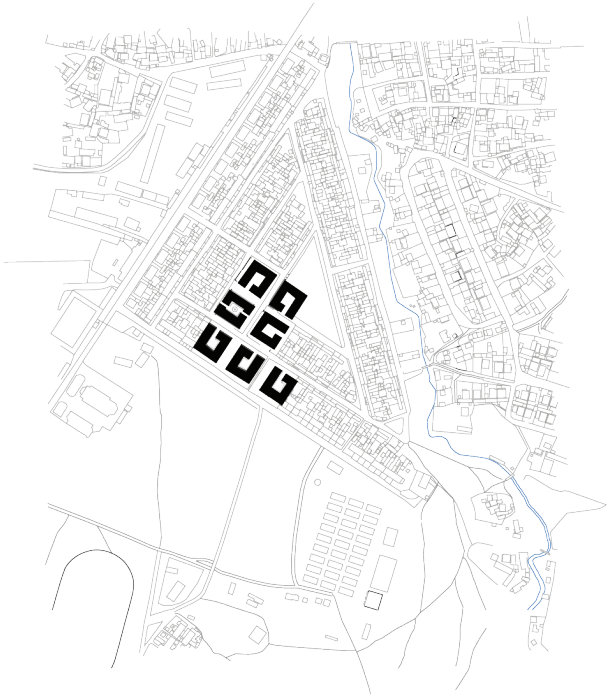
~ Ground Floor Retail Units

8 Low-income units

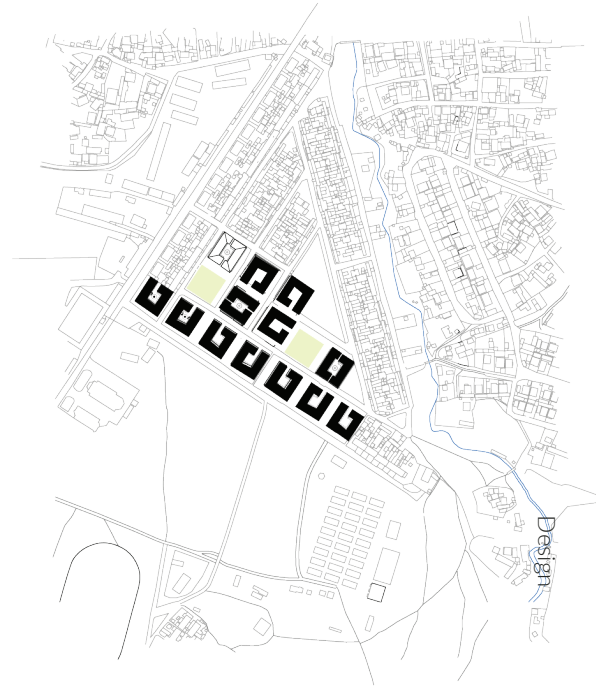
10 Middle-income units



### Phase II



Phase III



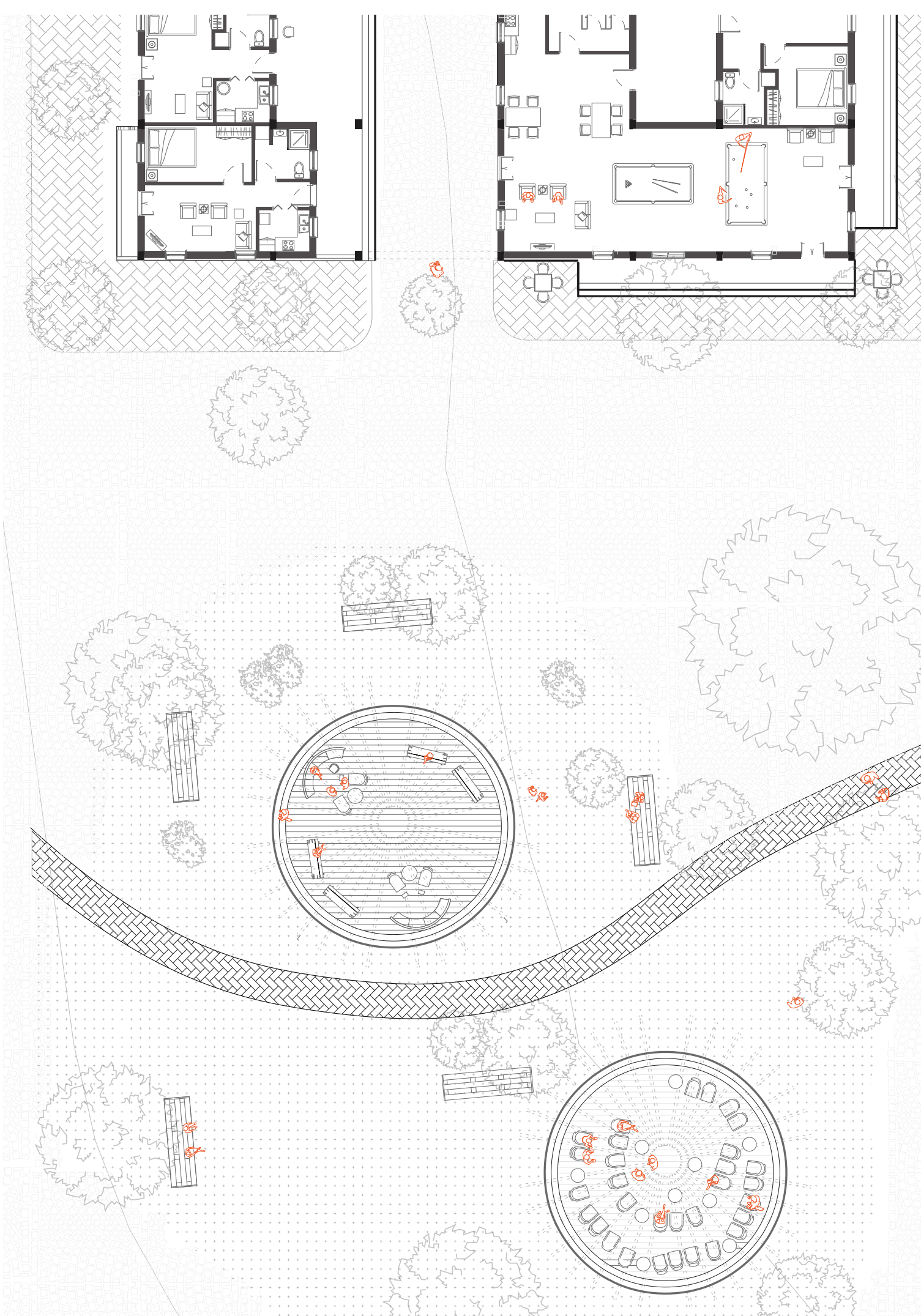
Phase IV  
Complete Cluster 1 & 2

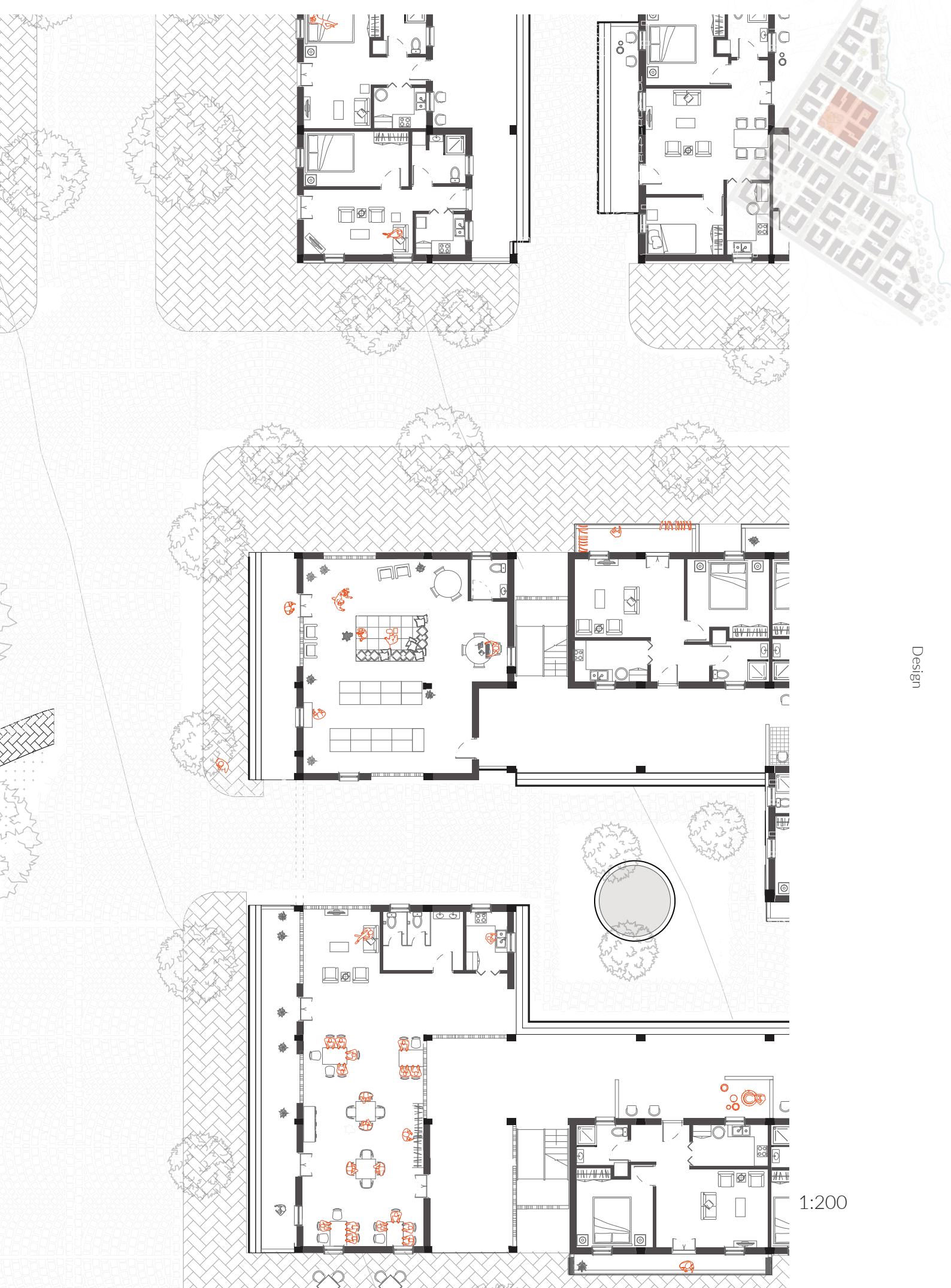
# CLUSTER - GROUND PLAN

Design







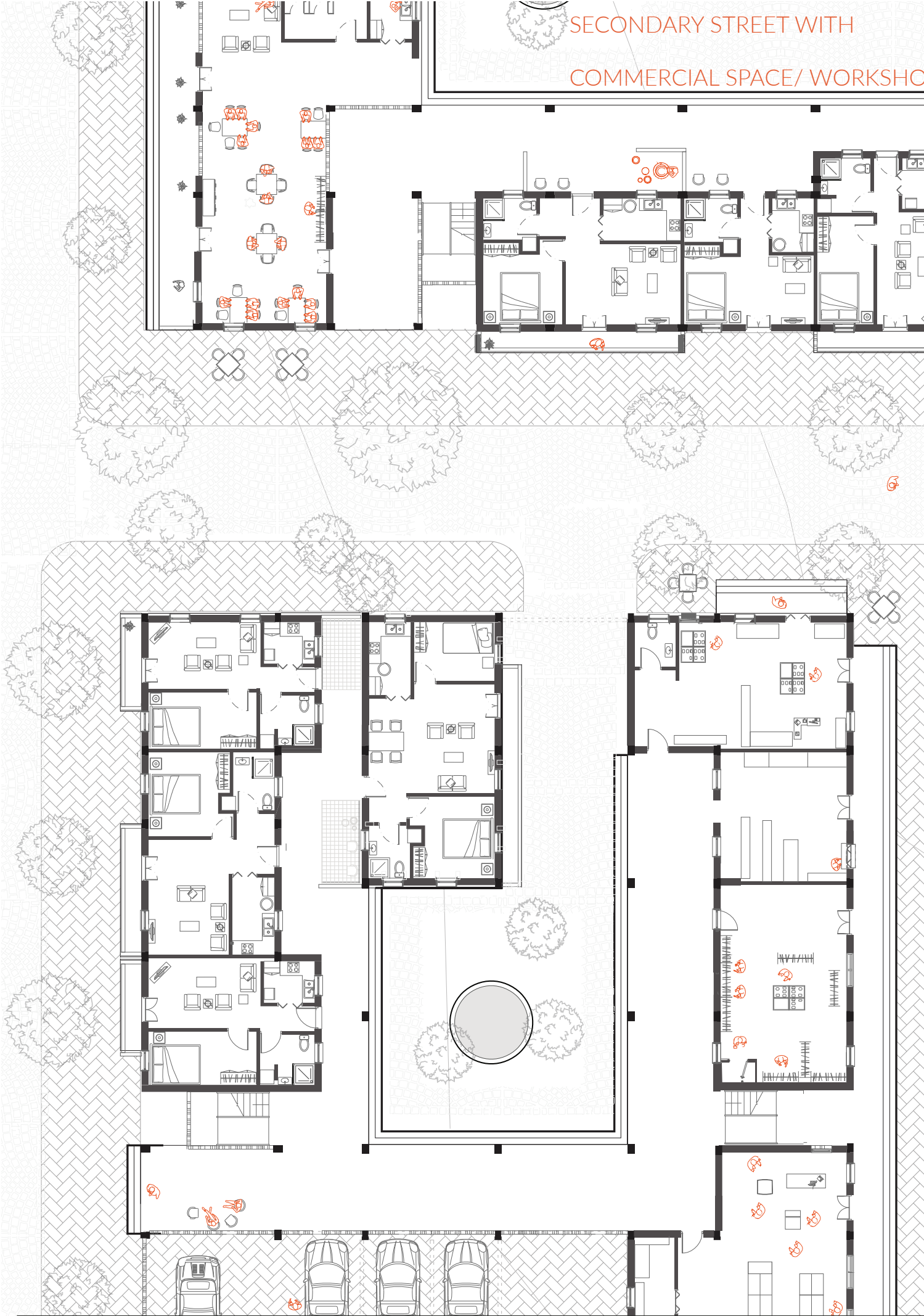


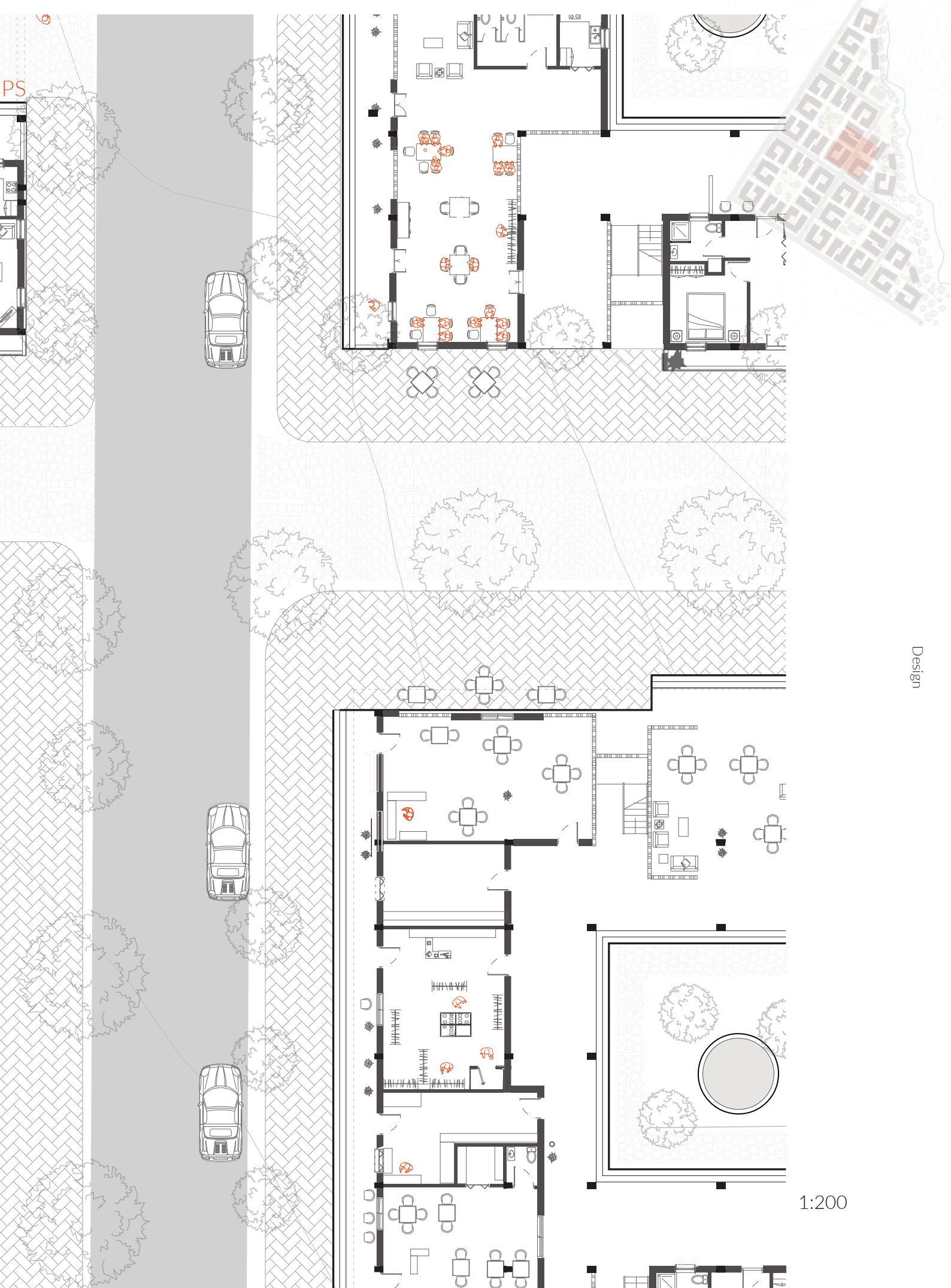
Design

1:200

SECONDARY STREET WITH  
COMMERCIAL SPACE/ WORKSHOPS

Design





PS

Design

1:200



Design



Design

1:200

PEDESTRIAL STREET ELEVATION

Design





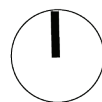


# URBAN SCALE

SITE PLAN

Design





1:2000

## URBAN STRATEGY

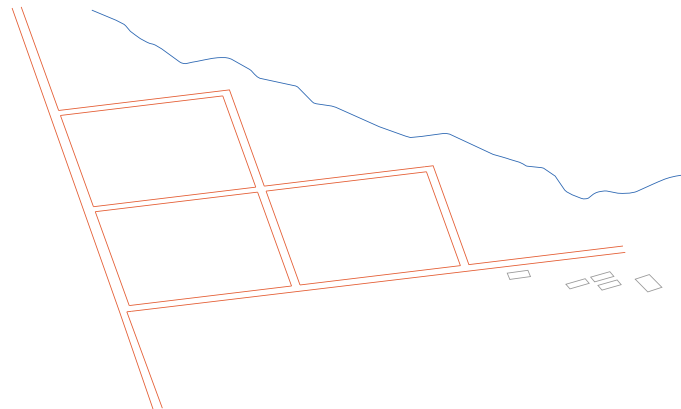
According to Richard Sennett, designing an urban plan without **obstacles or “surprise encounters” and findings** isn't really beneficial to pedestrians and it actually negates the **natural and human-scale way people experience their surroundings**... there should be obstacles or “resistance” to help people have a more natural experience in an open space.

The urban plan strategy of the site commenced with the **extraction of the base road structure**. This will help make the redevelopment plan more **efficient and cost-effective**. This also becomes the springboard for the new **site grid which was achieved by extending the road lines**. The main ‘arteries’ of this grid are used as vehicular roads.

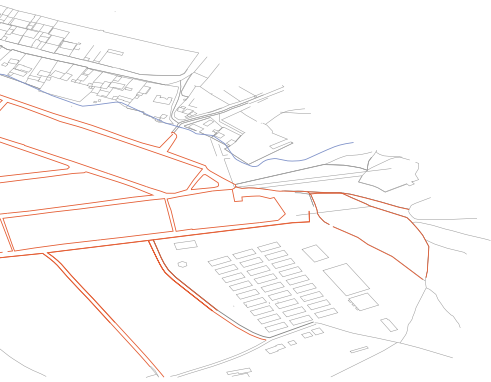
To add a more human-scale experience and **permeability within the site, pedestrian road grids were added** within the confines of the vehicular roads. Next, the **new blocks and programs** were introduced which will be built in phases and create **more obstacles and seamless connections** between the built structures and within the open spaces.



Start from base structure



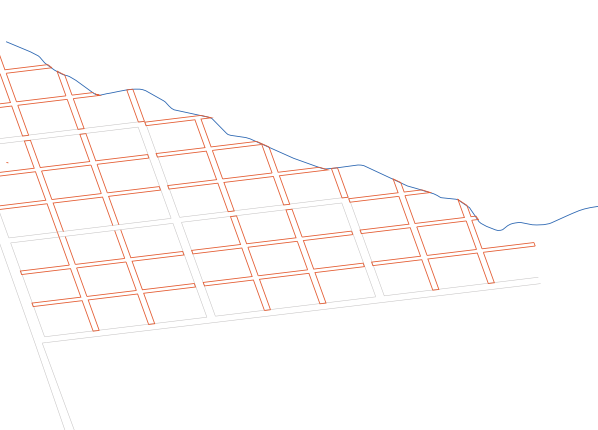
Vehicular road enclosing each cluster



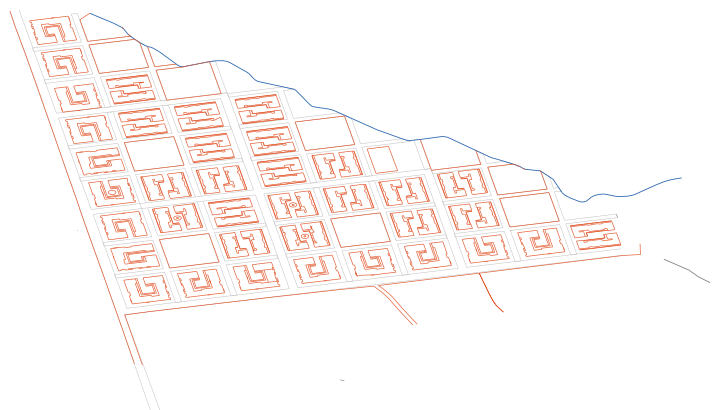
Existing in situ infrastructure



Extend street lines and apply a new grid



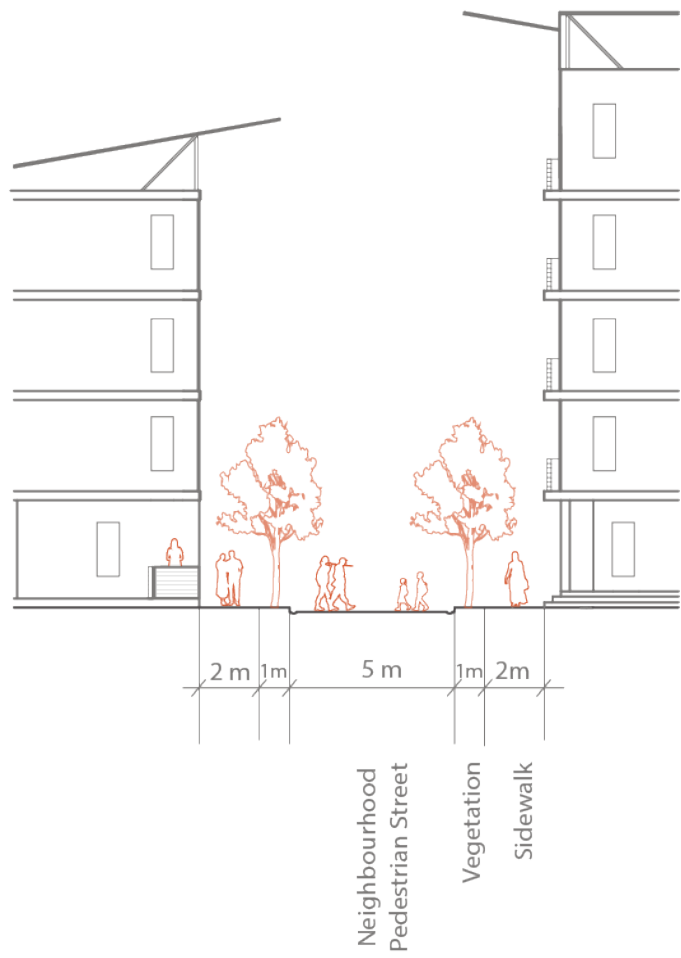
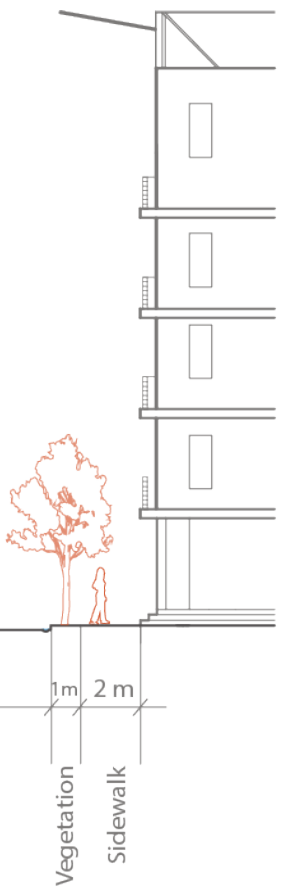
Add permeability with pedestrian street



Add permeability with pedestrian street

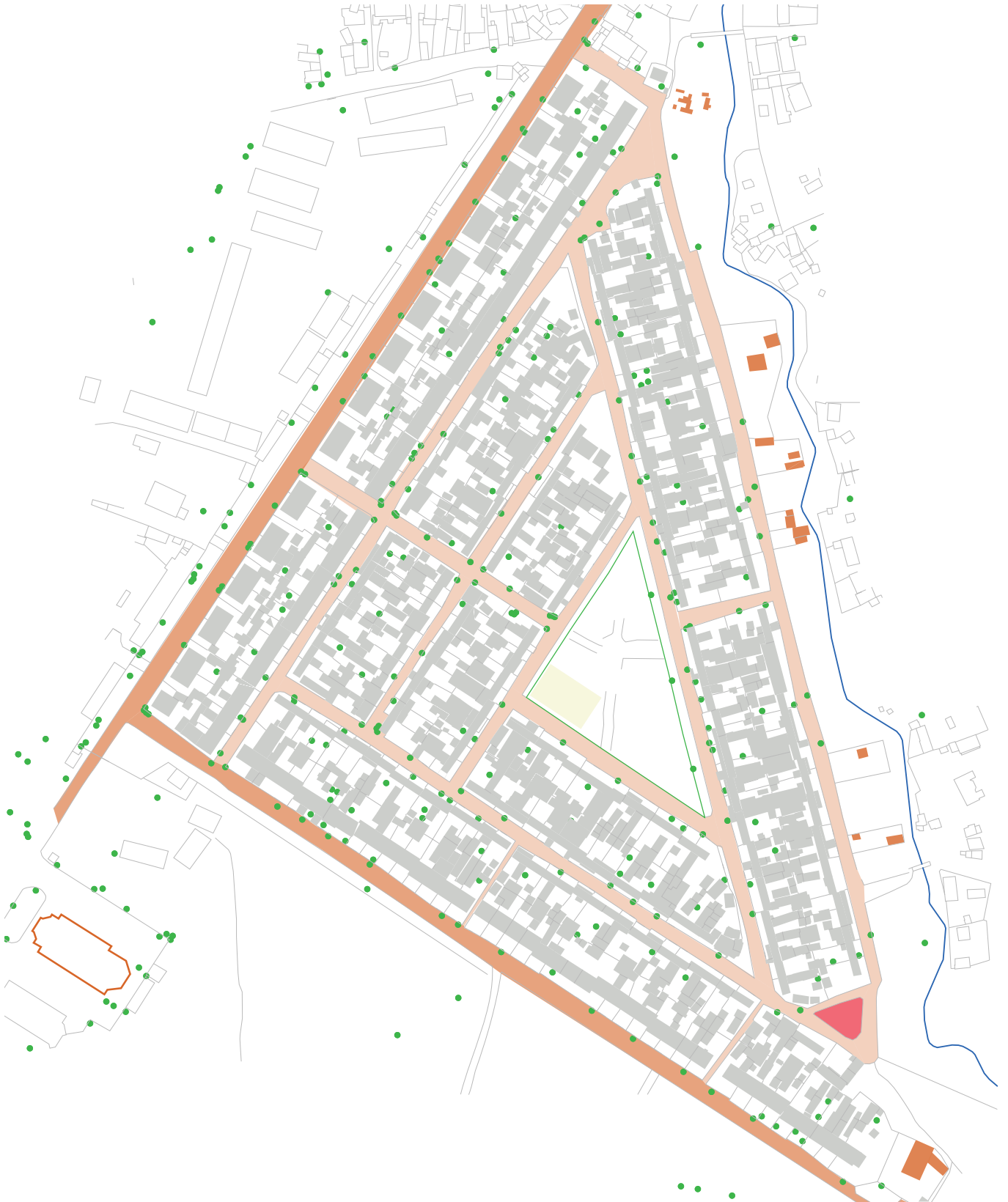
# Street Profiles





EXISTING

Design



Existing Density

FSI= 0.55

~55 dwellings /Hectare

357 plots/ ~2,540 Inhabitants

NEW DEVELOPMENT



FSI= 1.76

avg. 64 dwellings /Hectare

6 clusters/ communities  
36 blocks



# **BUILDING TECHNOLOGY**

## MATERIALITY

Earth has been used as building material in Ethiopia (and other regions) for centuries. It is a material well suited for low-income housing, but with modern technologies such as **Compressed Stabilized Earth Blocks (CSEB)**, this material can be adopted into the construction method of other income groups (middle and high) as well.

Some of the benefits of using CSEB are low construction cost and carbon emission, improved energy efficiency due to its low thermal conductivity, easy to train, and reduced use of cement. Fired CSEB brick creates 22 kg CO<sub>2</sub>/tonne compare to that of concrete blocks (143 kg CO<sub>2</sub>/tonne), common fired clay bricks (200 kg CO<sub>2</sub>/tonne) and aerated concrete blocks (280 – 375 kg CO<sub>2</sub>/tonne) – about 40% less carbon emission on average (Rigassi, 1985). A mixture with 5% cement will suffice for the strength and durability requirement whereas 7% will satisfy most building code requirements.

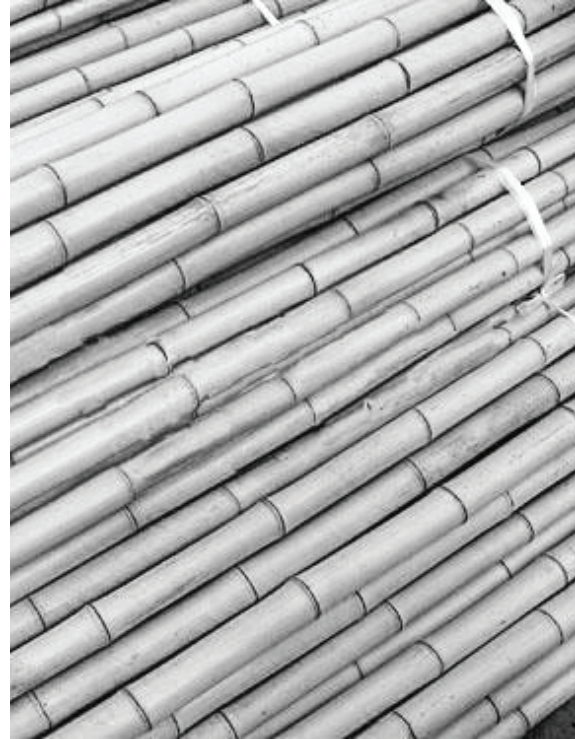
Building Technology

Reusing and using local materials is a tradition well known and worth preserving in Addis Ababa.

**Cobblestone & corrugated sheet metal**- the existing cobblestone pavers and corrugated sheet metal used for gates and roofing in the Kolfe site can be reused and repurposed as pedestrian pavers and roofing for the blocks



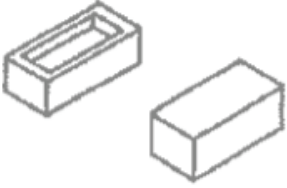
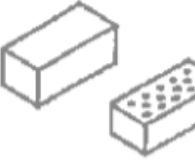
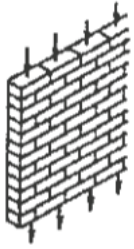
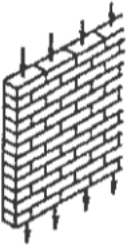
Currently, **bamboo** is mostly used in Addis Ababa for designer furniture which are more suitable for the high-income households. Bamboo is otherwise widely used as household and construction material in the Southern and some Western part of Ethiopia. By integrating bamboo poles for sun shading and exterior finishing as needed this sustainable material can be introduced as a building material in the Addis Ababa context as well.

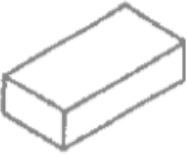
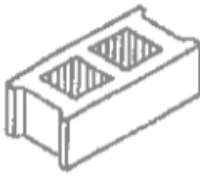
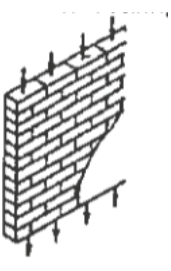
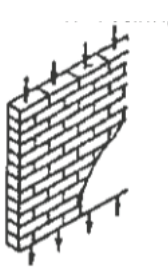


**Pottery** in Ethiopia has a long history. According to some sources, pottery, similar to other crafts, dates back to the Axumite Empire (100 BC - 400 AD). Pottery is normally made by the women out of clay collected from the riverside. These pots are often still used in the household for , for example coffee making. This local knowhow can be harvested and integrated into the construction process.



# MATERIAL ANALYSIS

	CED/ CSEB	Fired bricks
Type	 <p>29.5 14 X 9</p>	 <p>22 X10.5 X 6.5</p>
Appearance	smooth/ medium to good	rough to smooth, good to excellent
Performance	low to very good	low to excellent
Use (in masonry)	<p>load-bearing</p>  <p>without render</p>	<p>load-bearing</p>  <p>without render</p>

	Adobe blocks	Concrete blocks
		
	40 X 20 X 10	40 X 20 X 15
	irregular/ poor	rough/ average
	poor	low to very good
	load-bearing	infil
		
	with render	with render

Source: Rigassi, 1985.

# CONSTRUCTION SCHEME

CSEB has three stages of process during production: soil **preparation**, mix **compression** and the **curing**. Soil on site can normally be utilized after the quality test. Training local labourers can be done easily with minimal instructions.

Handmade pottery can be used as filler material for site-cast concrete floor slabs. Filler slab can save up to 17 % in cost, 16% - 33% in cement, and up to 45% in steel used.

Building Technology

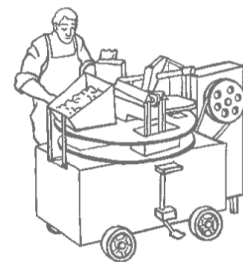
**preparation**



**compression**



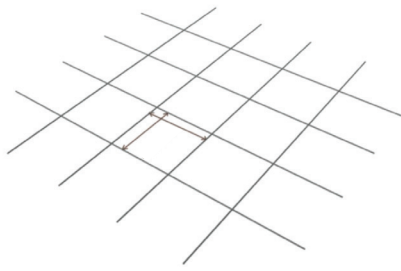
Manual = 700 - 1500/ day



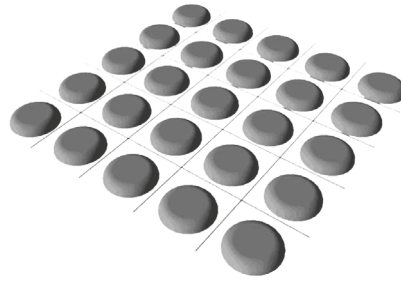
Motorized = 1000 - 5000 / day

**curing**

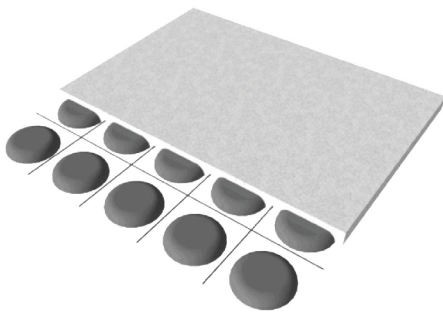




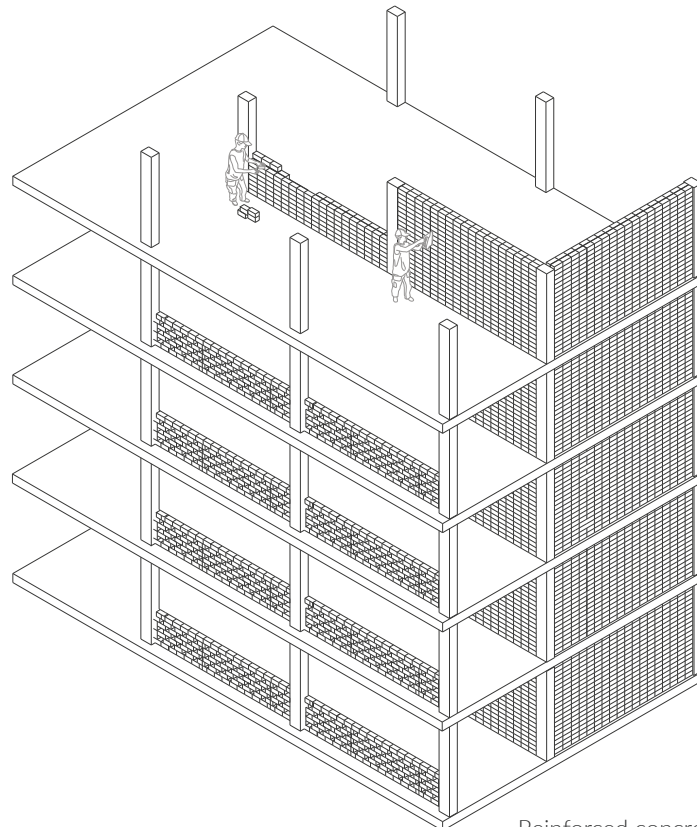
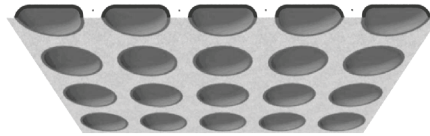
45 cm x 45 cm grid (8mm Th.) steel reinforcement



Laying filler material - handmade clay pots

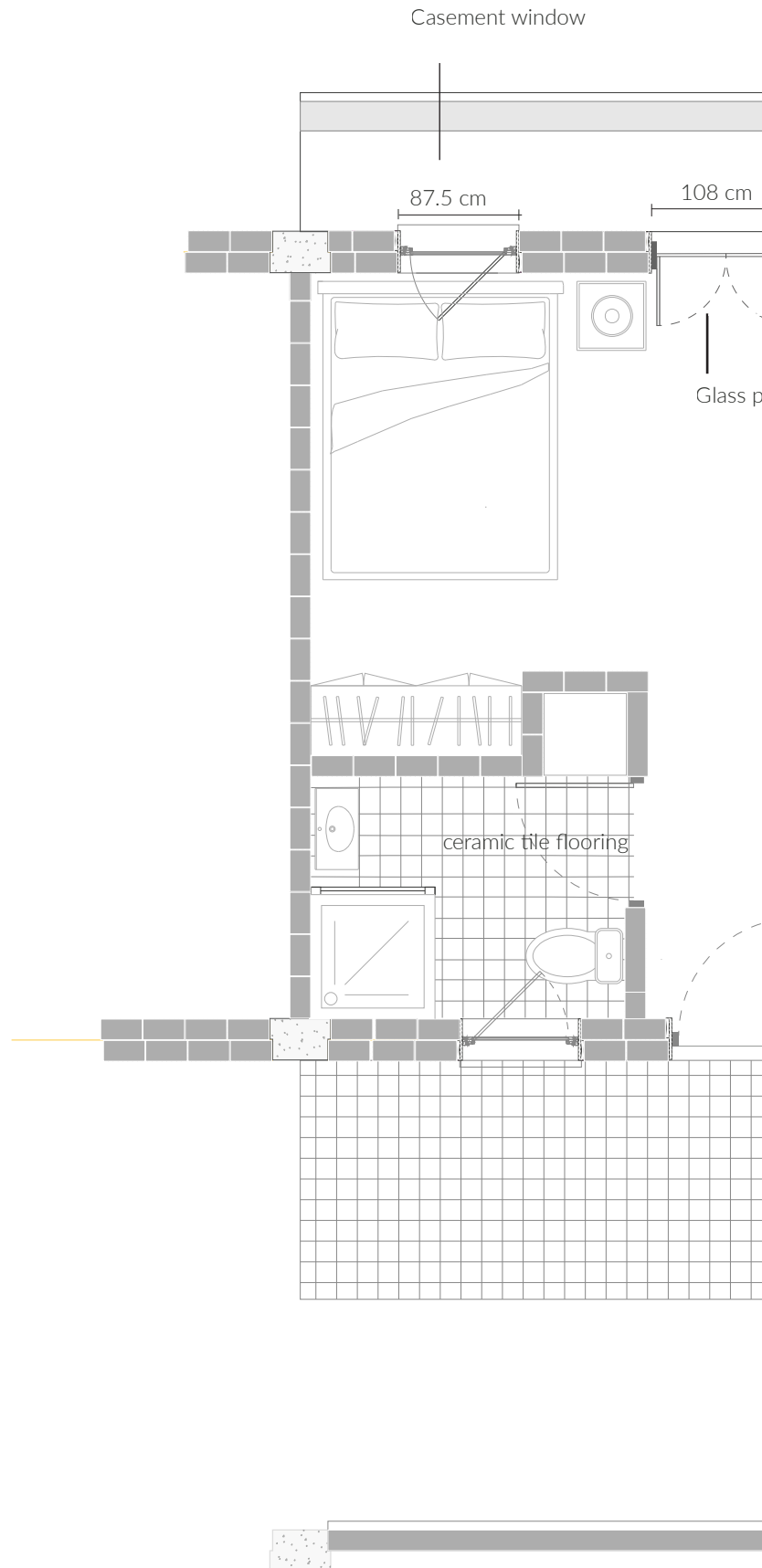


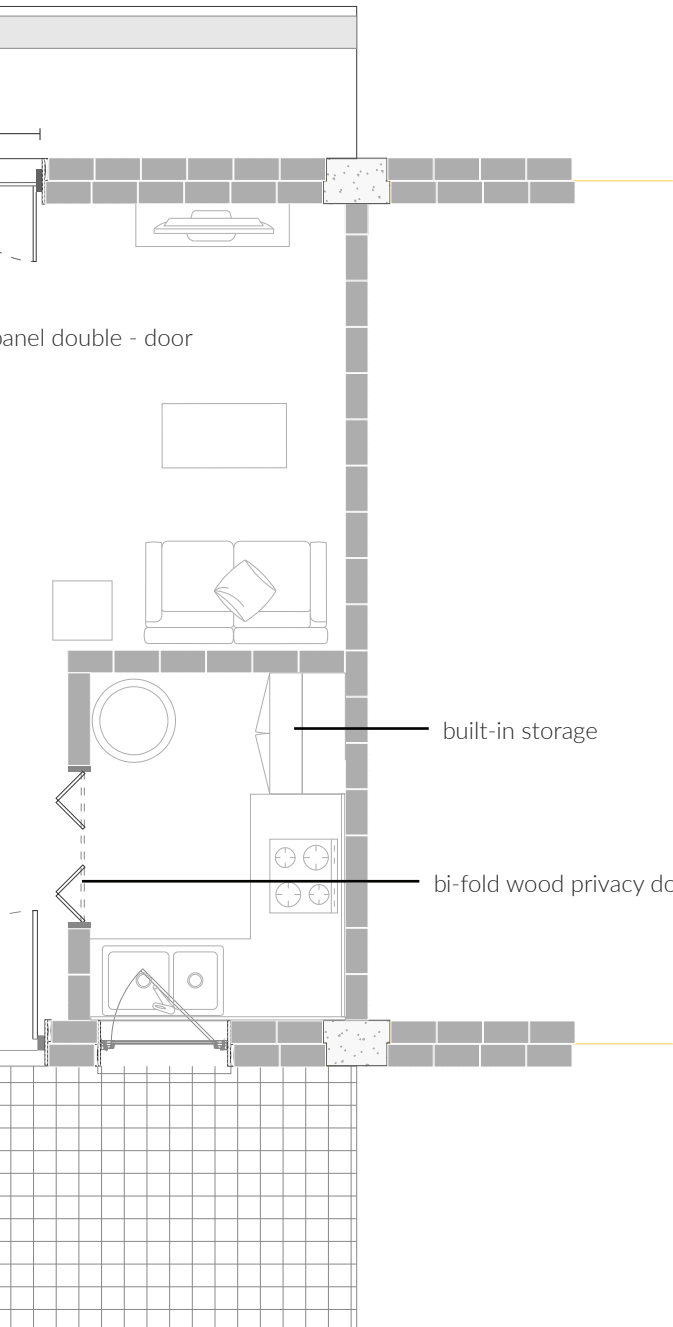
Casting concrete slab



Reinforced concrete (RCC) frame with CSEB infill

# TYPICAL STUDIO UNIT



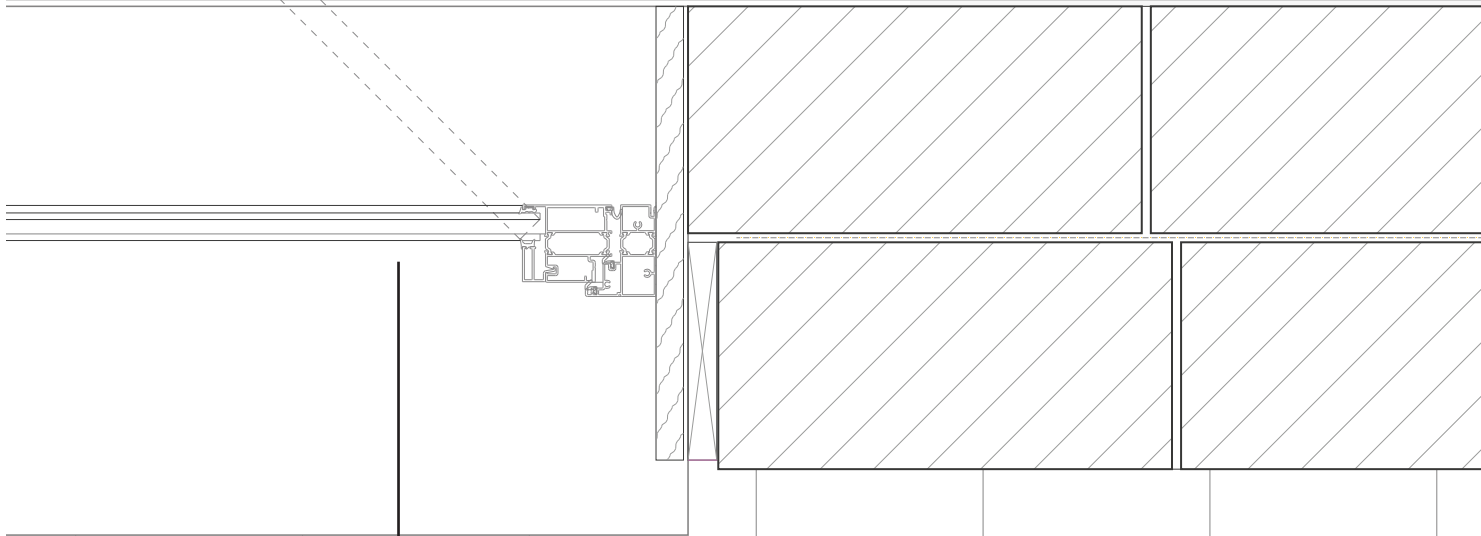
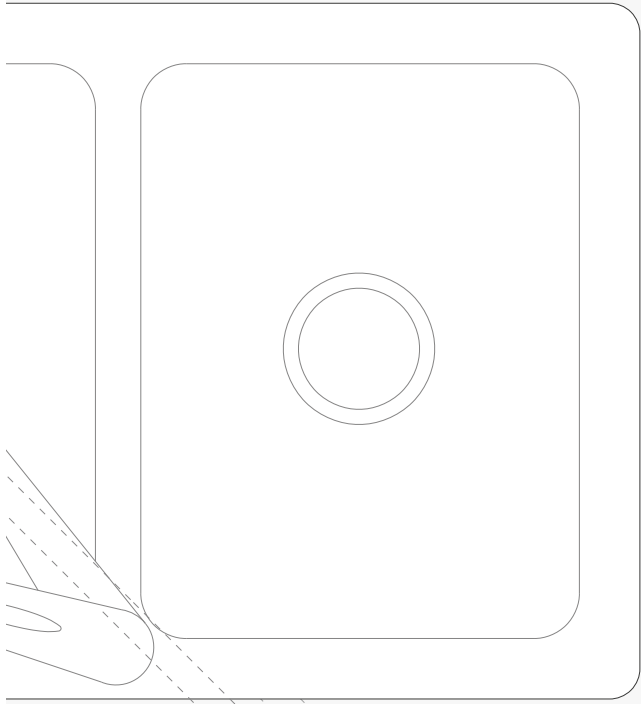


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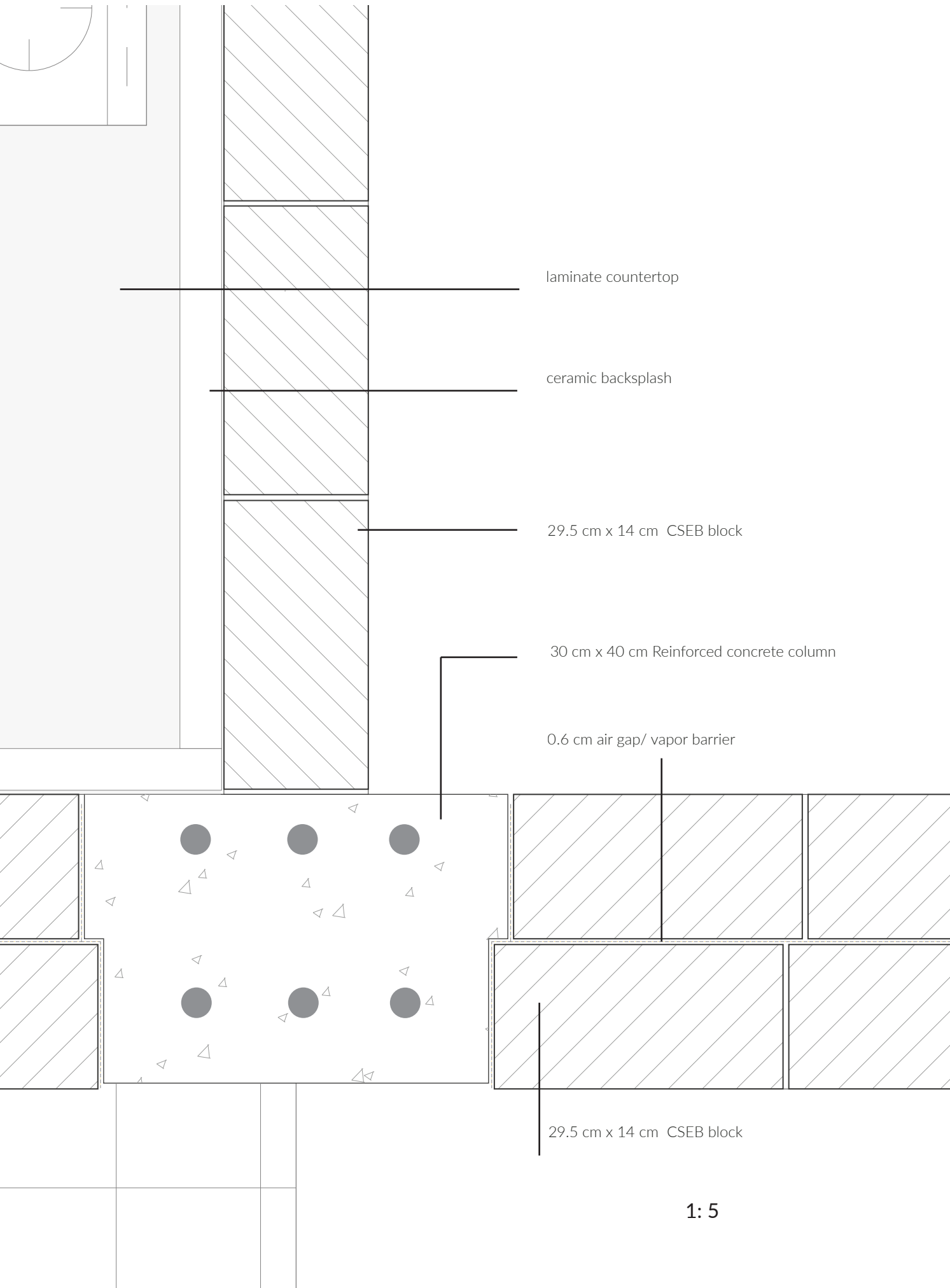
# TYPICAL WINDOW WALL SECTION

ceramic tile flooring

Building Technology



Casement window







u in Technology X

# CLIMATE

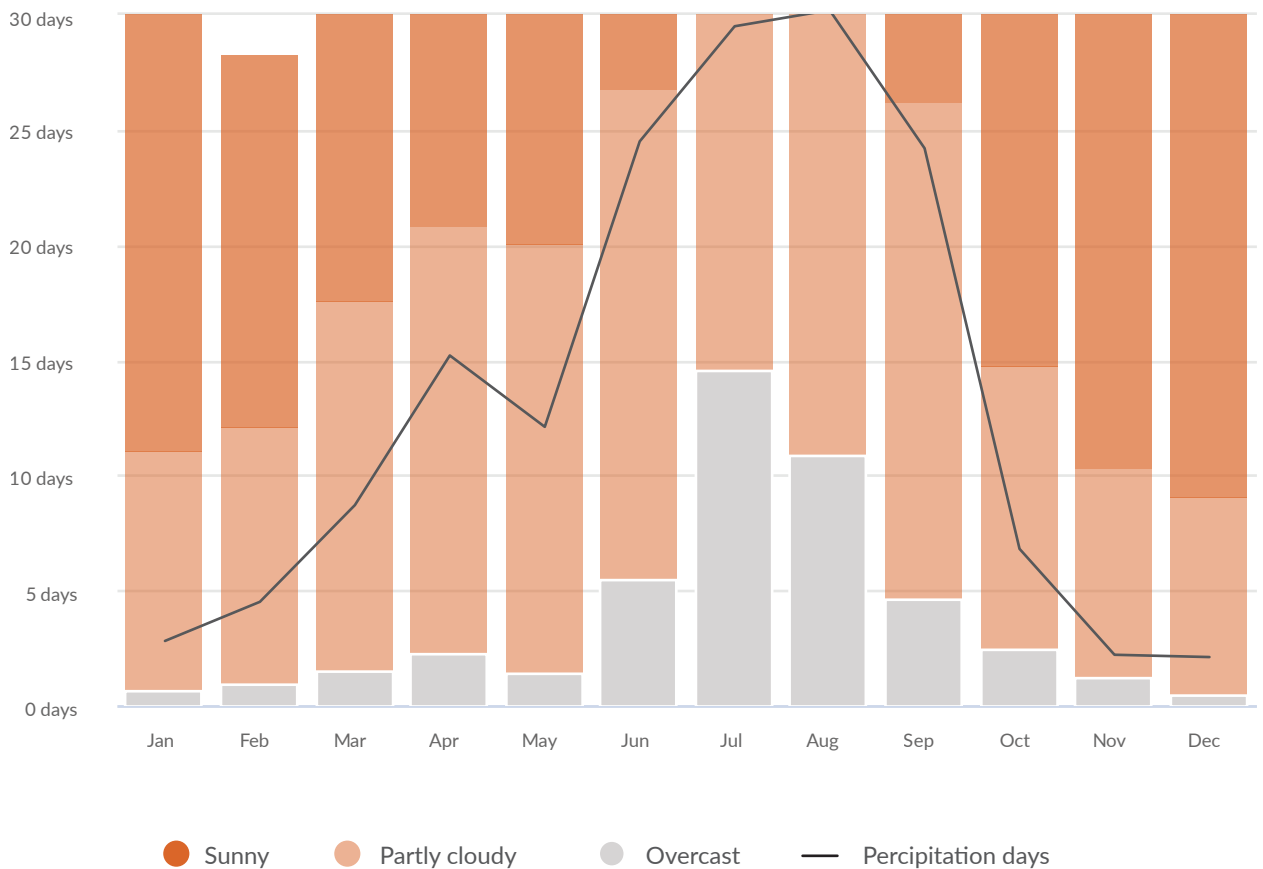
The climate in Addis Ababa is normally sunny with a temperature ranging between 25 and 18 degree celsius. Because it has a very comfortable temperature year round, most of life in Addis Ababa is spent outdoors. Despite common misconceptions, Addis Ababa receives ample rainfall throughout the year with an average rainfall days of 132.

The warmest and longest daylight hours are between March and May while the cold months are usually during the rainy season from July to September. Due to its location close to the equator, Addis Ababa has a high sun angle during the day which can be beneficial to lighting intimate spaces such as the courtyards.

The prevailing wind directions in Addis Ababa are from the East and Southeast direction.

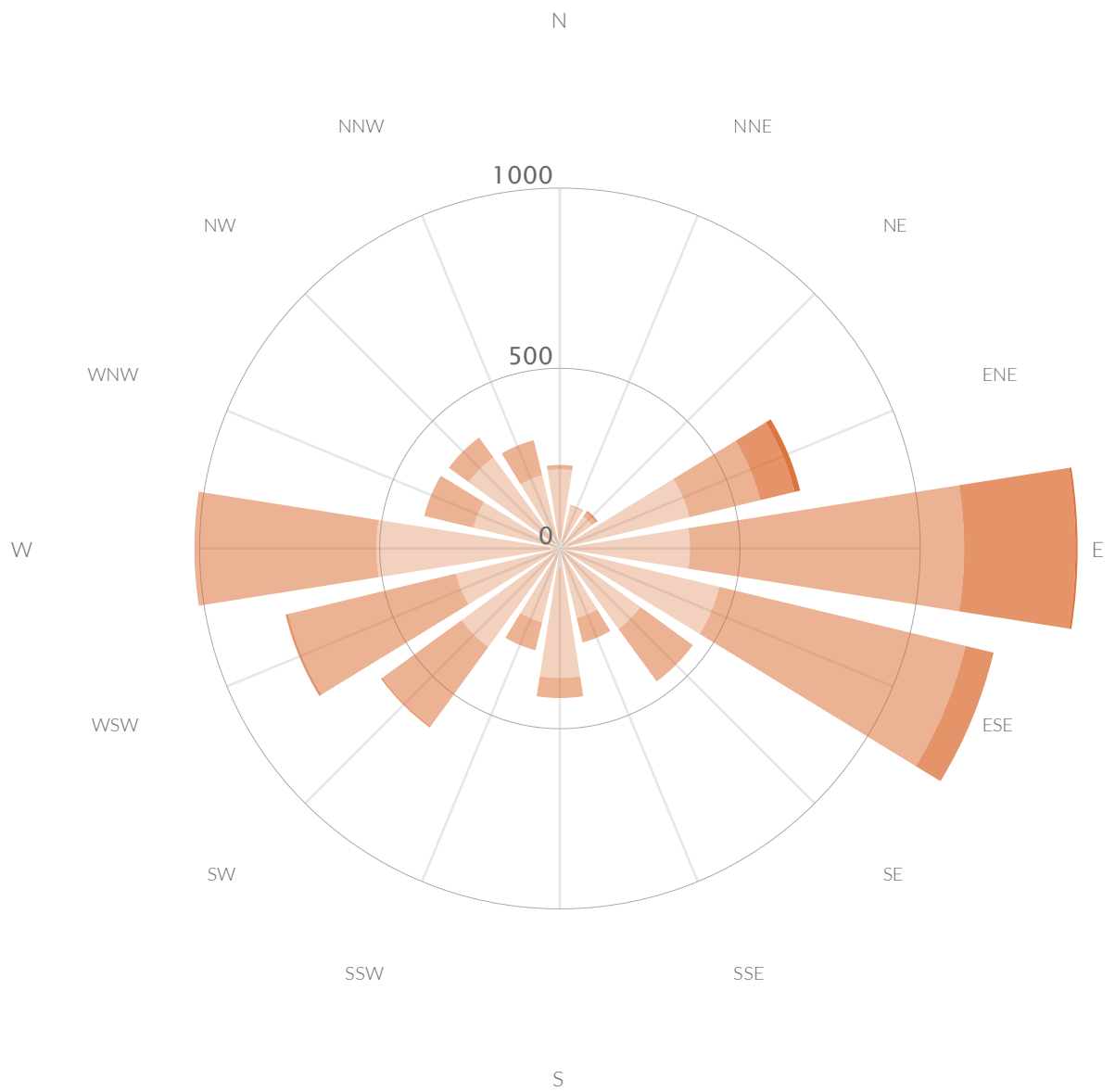
Building Technology

Cloudy, sunny, and precipitation days

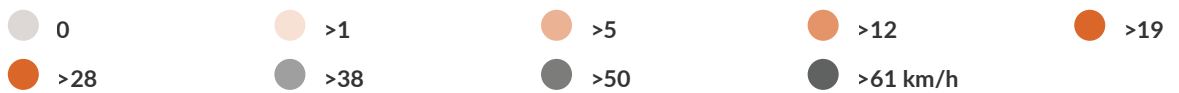




Dominant wind direction

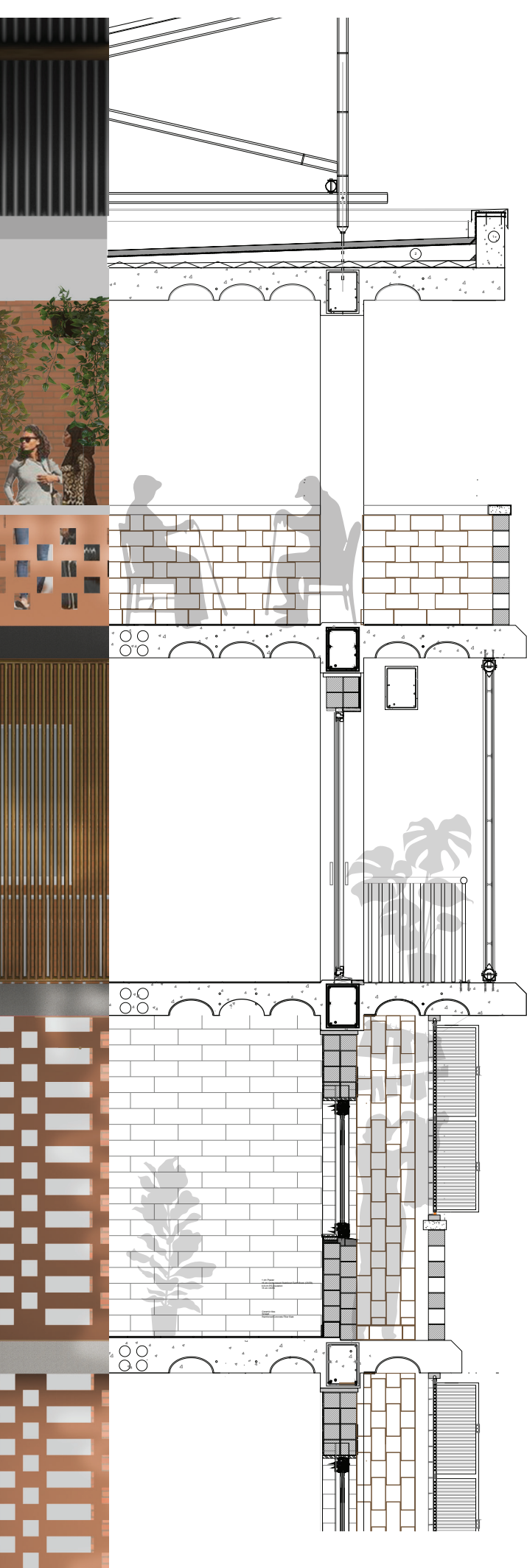


Building Technology



Source: meteoblue.com





Corrugated sheet metal roof

Bamboo roof truss

CSEB perforated handrail

Third Floor  
+9.9 m

Bamboo poles  
vertical louvres

Steel handrail

Second Floor  
+9.9 m

Wood window shutters

First Floor  
+6.6 m

60 cm

298 cm

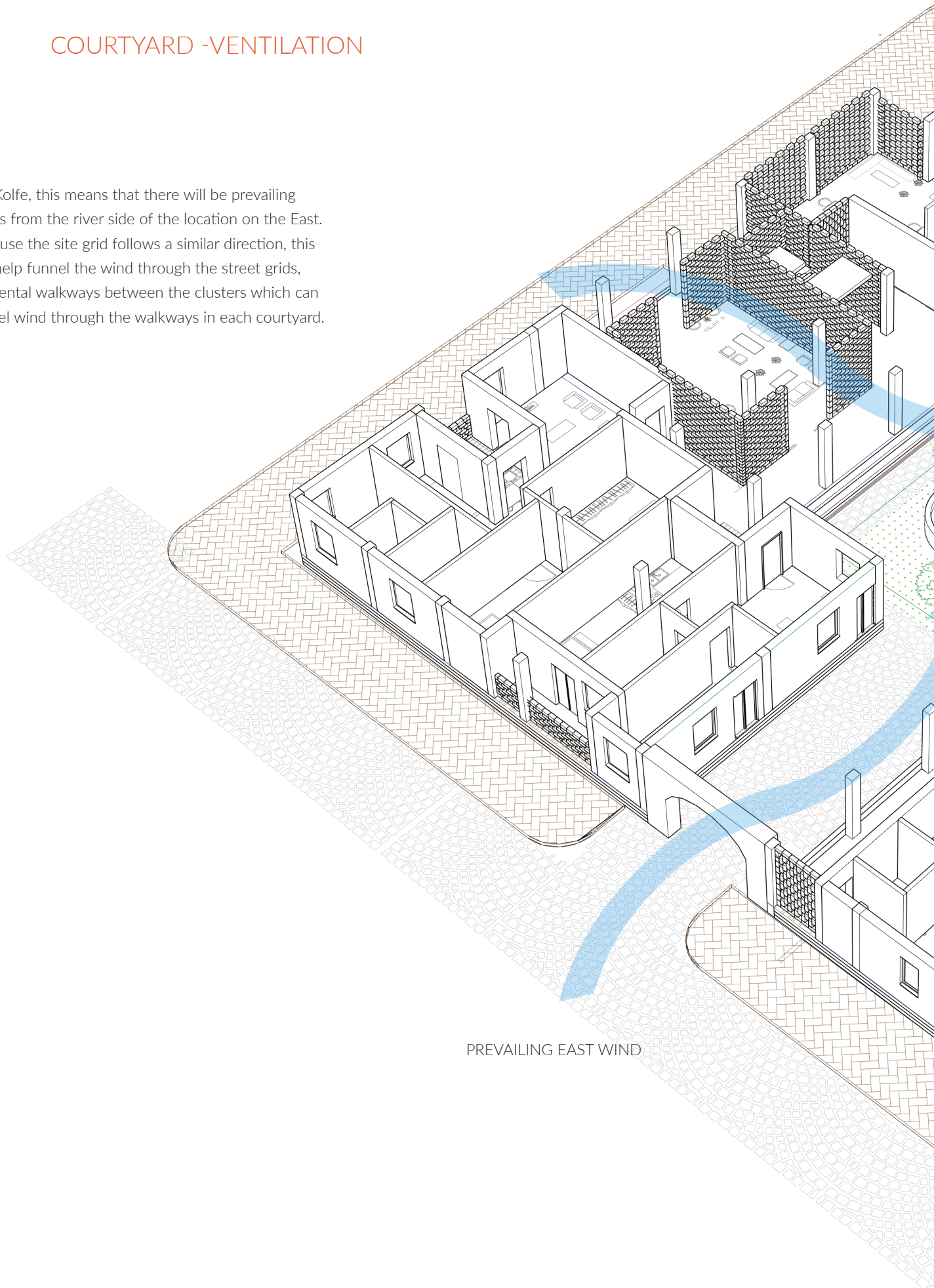
Building Technology

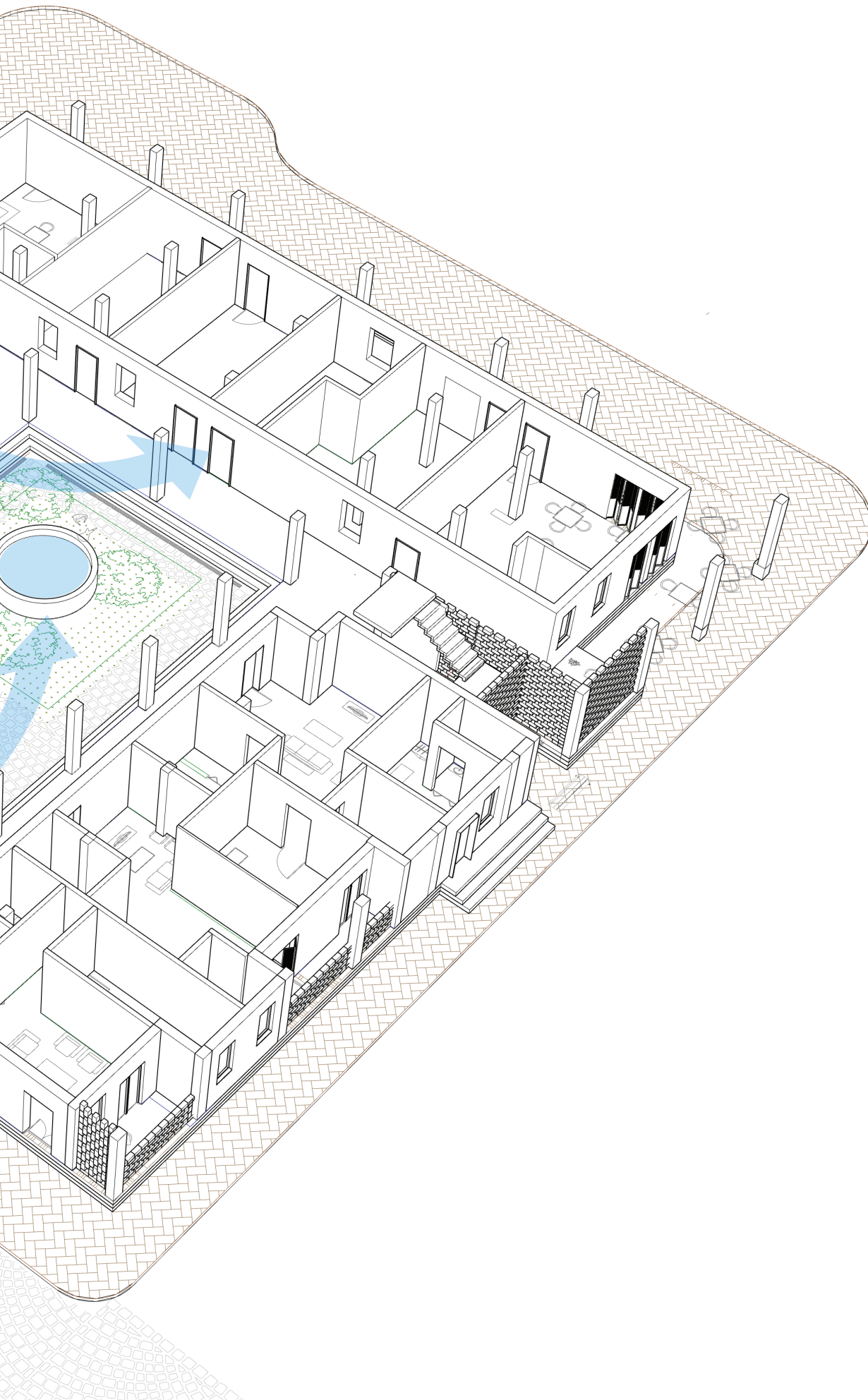
60 cm

181 cm

## COURTYARD -VENTILATION

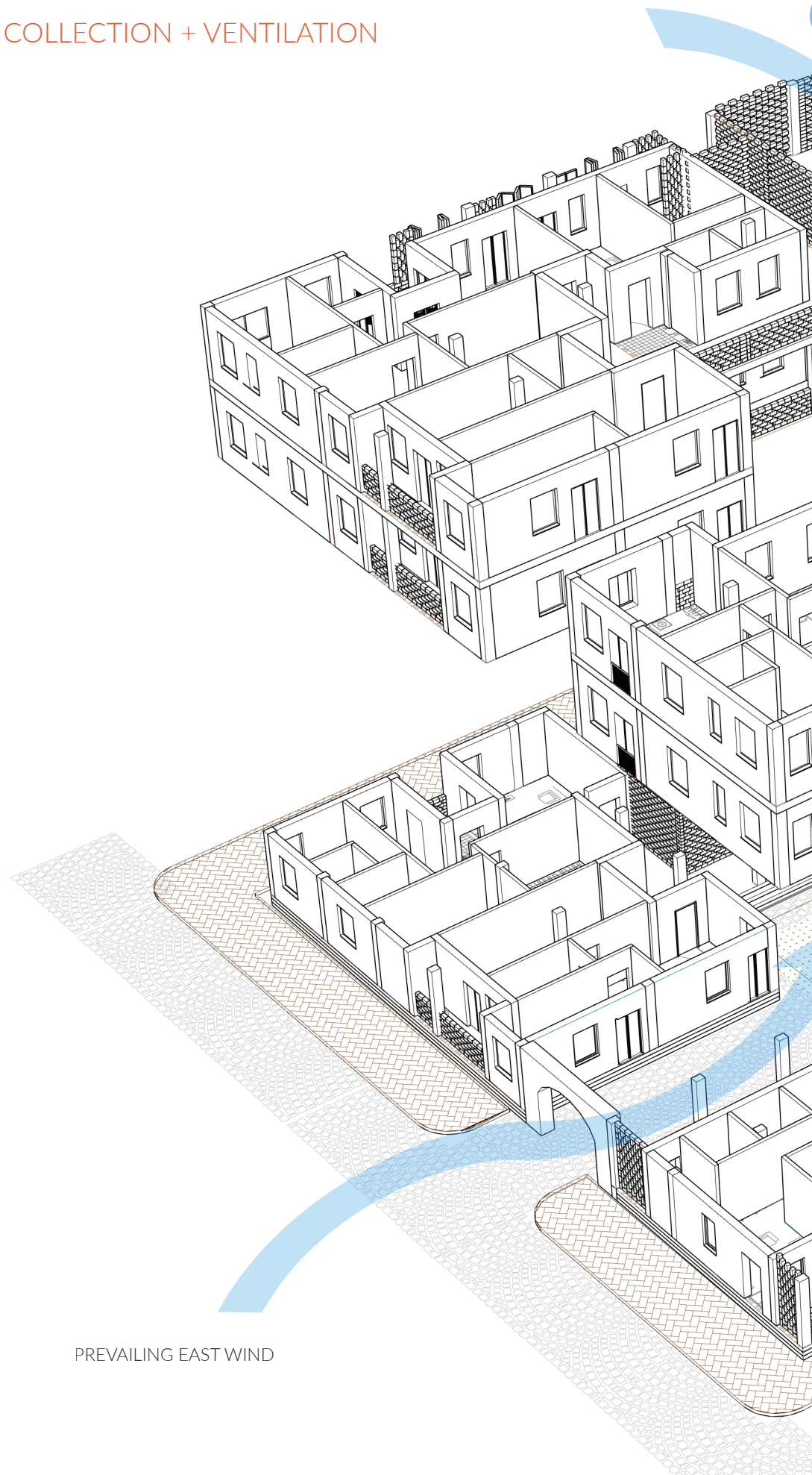
For Kolfe, this means that there will be prevailing winds from the river side of the location on the East. Because the site grid follows a similar direction, this will help funnel the wind through the street grids, incidental walkways between the clusters which can funnel wind through the walkways in each courtyard.

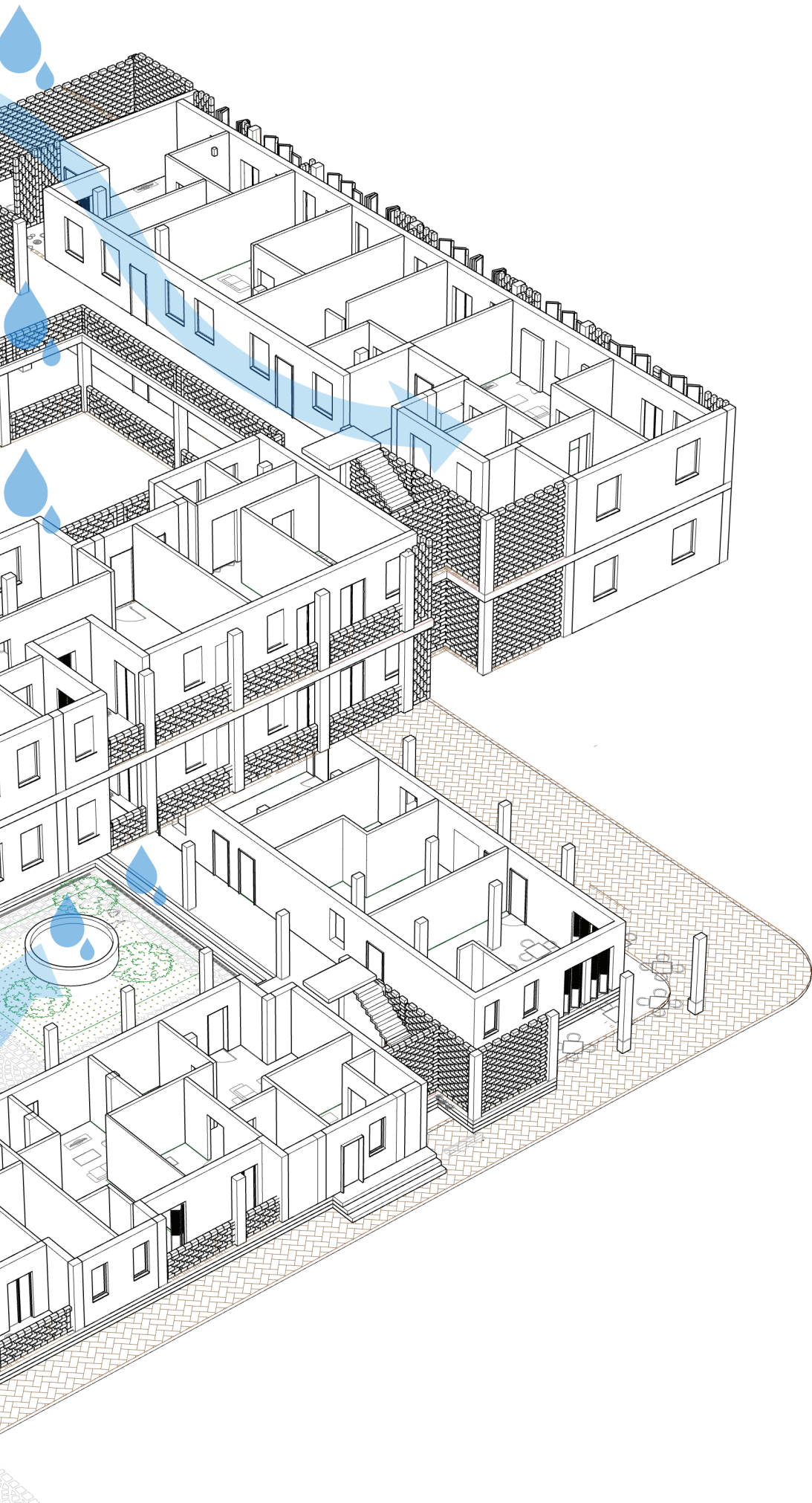




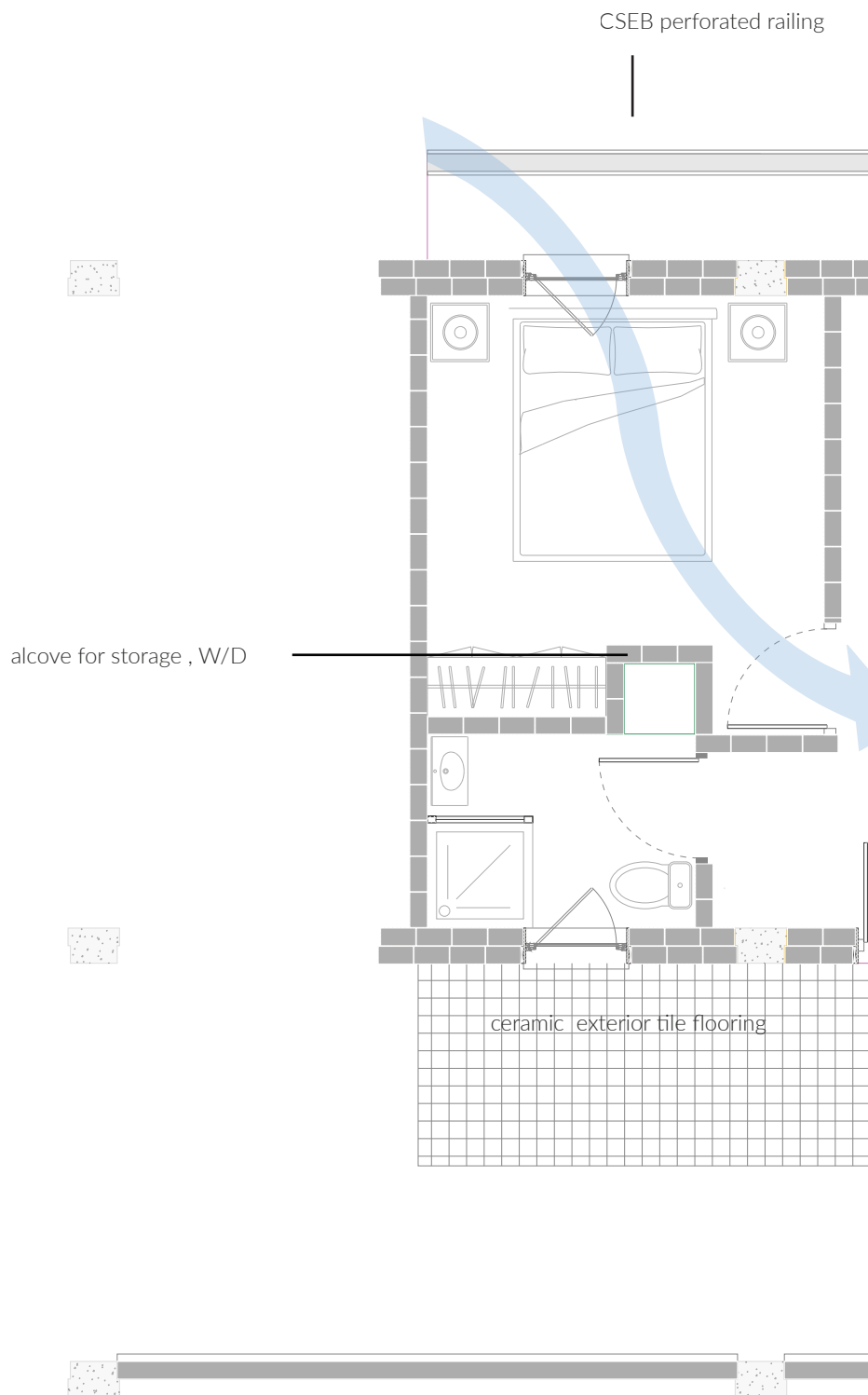
GROUND + FIRST + SECOND AXON

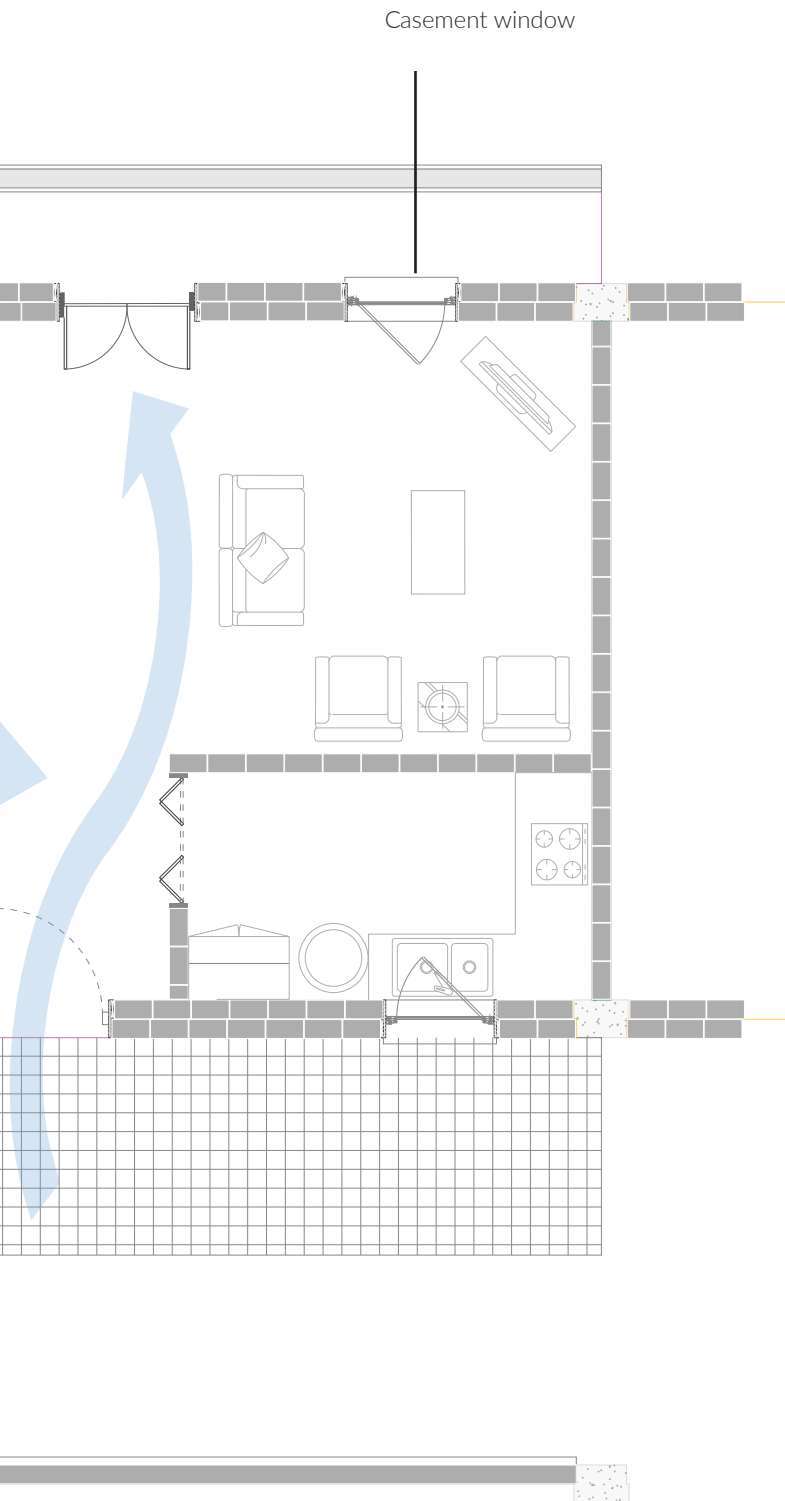
BLOCK WATER COLLECTION + VENTILATION





# TYPICAL ONE BEDROOM UNIT - VENTILATION

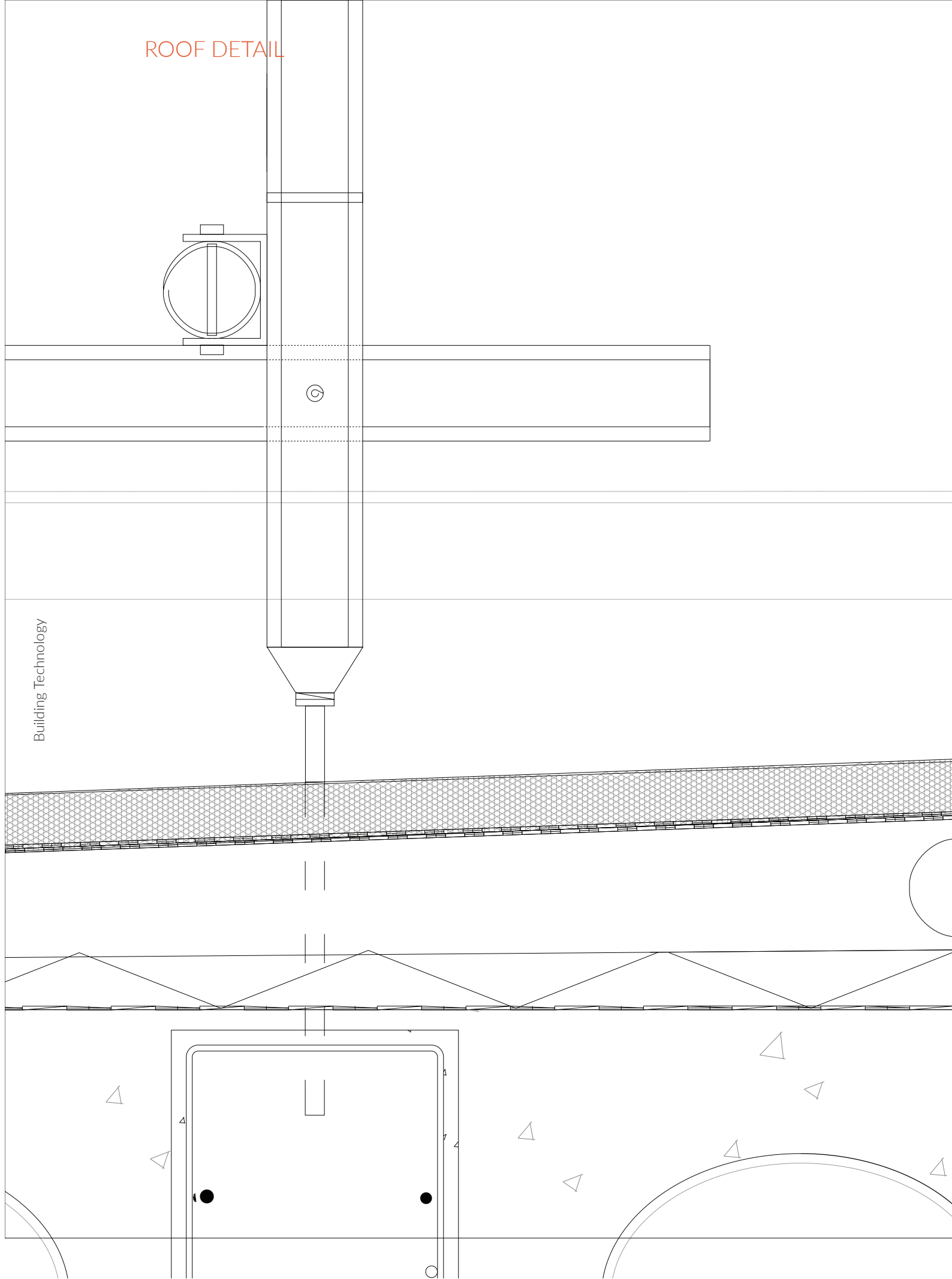




1: 50

# ROOF DETAIL

Building Technology

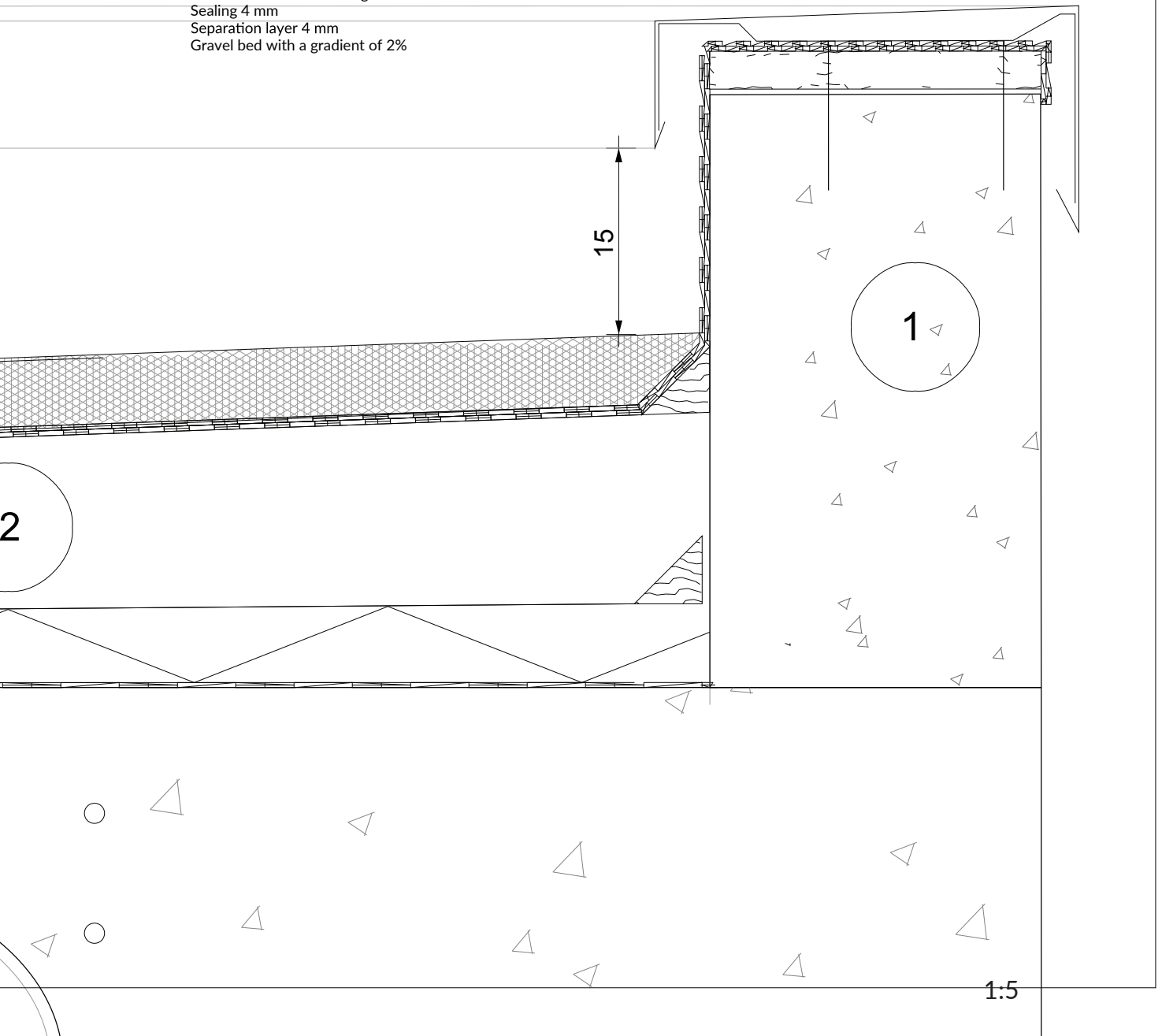


1 . Parapet

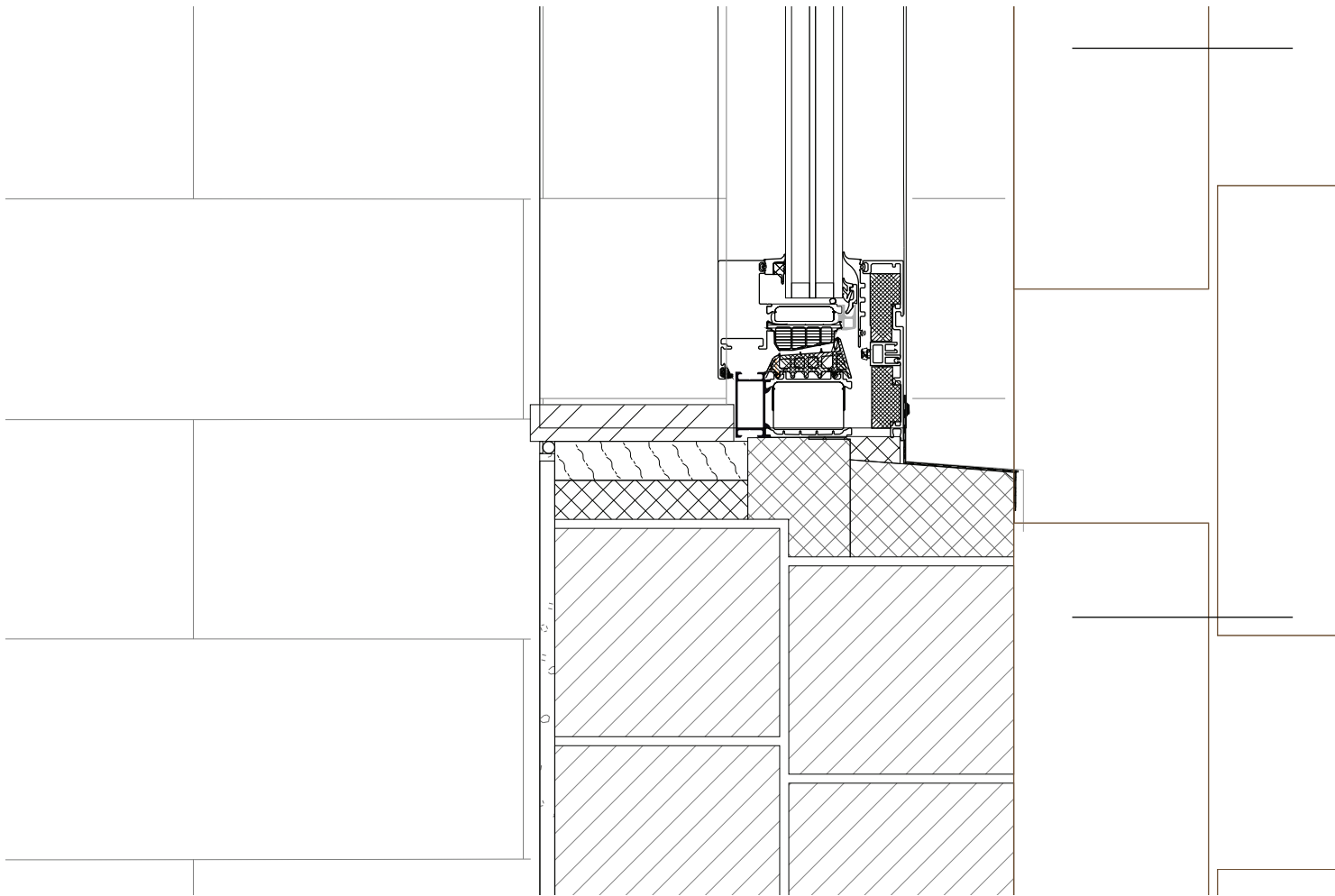
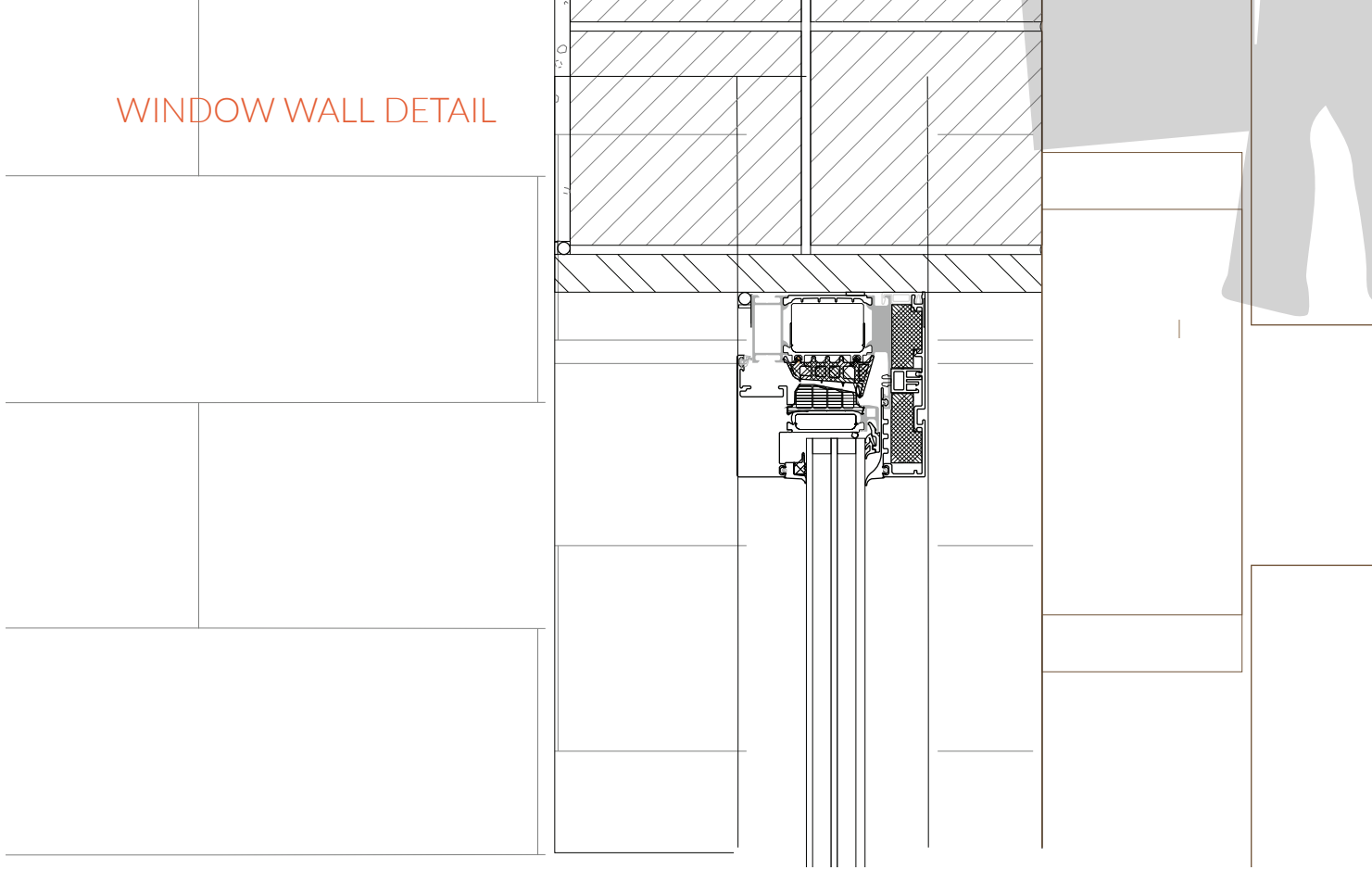
Metal coping plate with 2% gradient  
Flex-flashing  
Separation layer 4 mm  
Bonding adhesive 4 mm  
Compensation wood  
Vapor barrier 4 mm  
Exterior plaster 20 mm  
Reinforced concrete 0.20 m

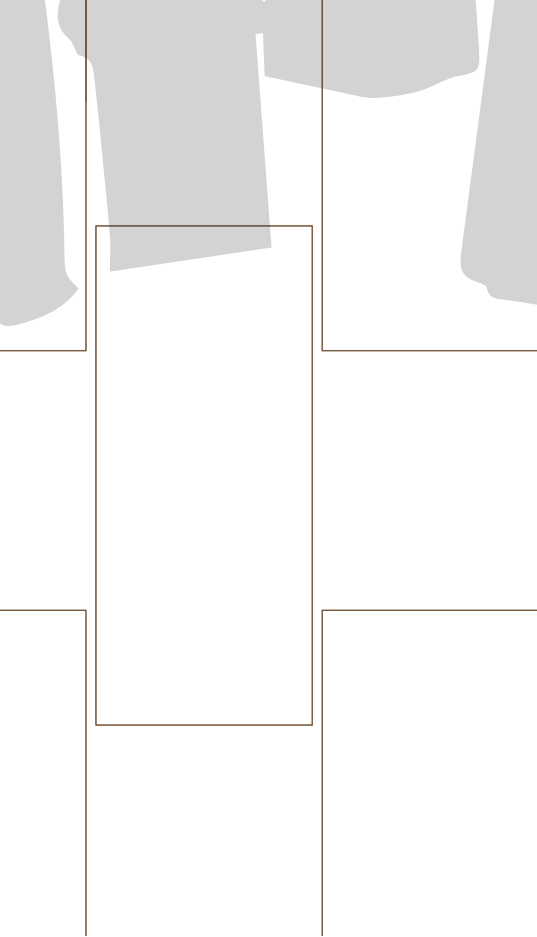
2 . Roof structure

Reinforced concrete ceiling 0.3 m  
Vapor barrier 4 mm  
Thermal insulation with a gradient of 2%  
Sealing 4 mm  
Separation layer 4 mm  
Gravel bed with a gradient of 2%



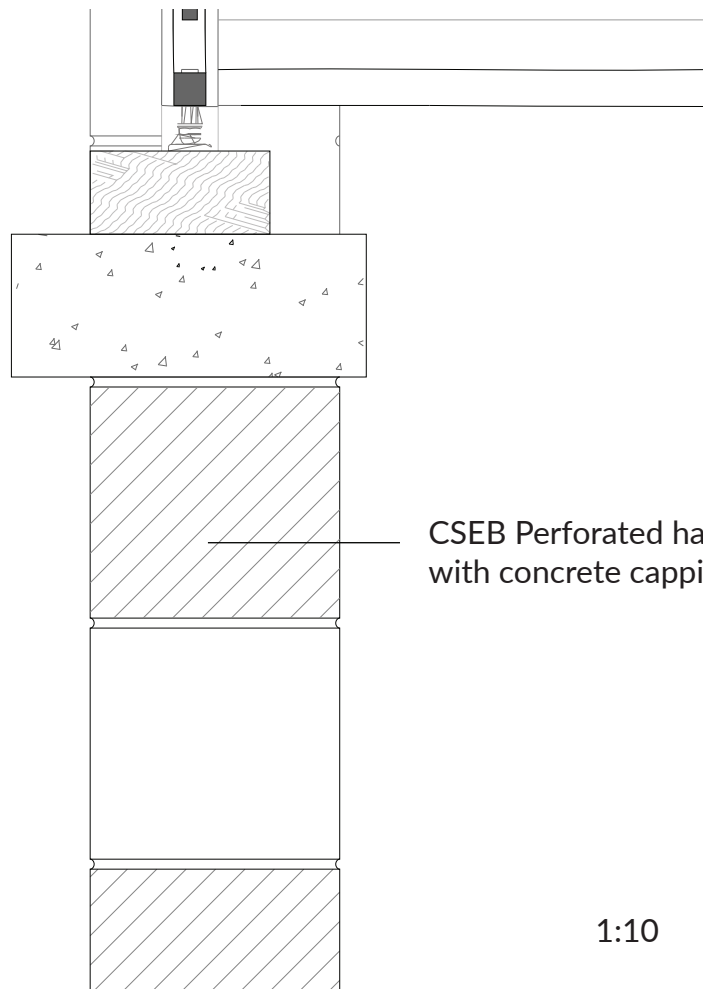
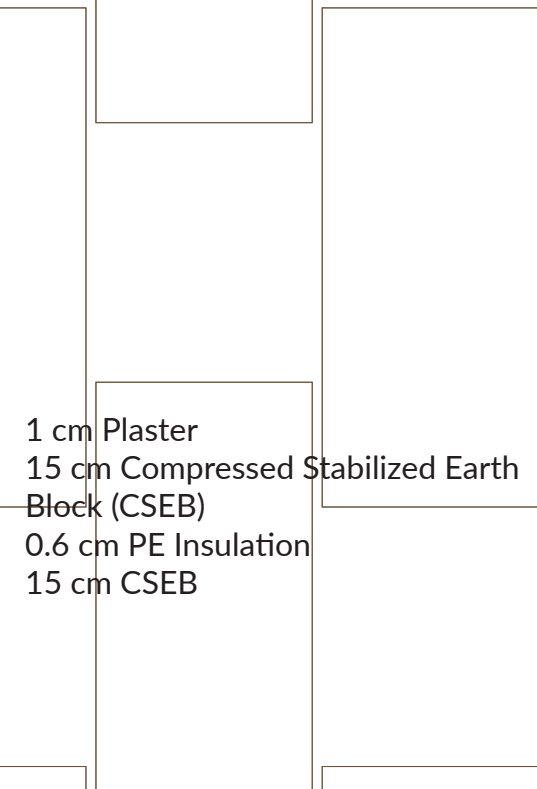
# WINDOW WALL DETAIL





Wood window shutters  
\*paint options\*

87.5 cm W  
Casement window



CSEB Perforated handrail  
with concrete capping

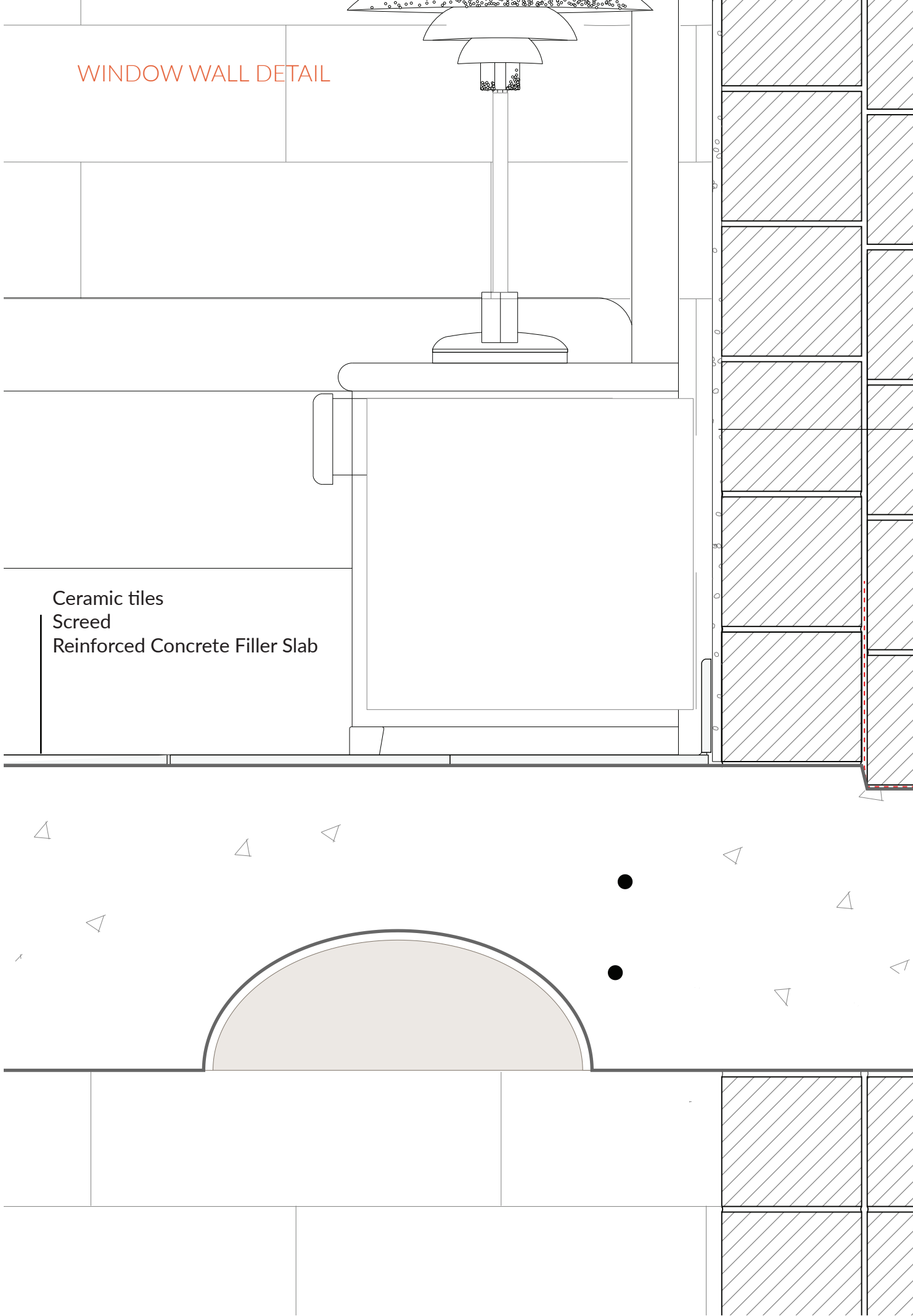
1:10

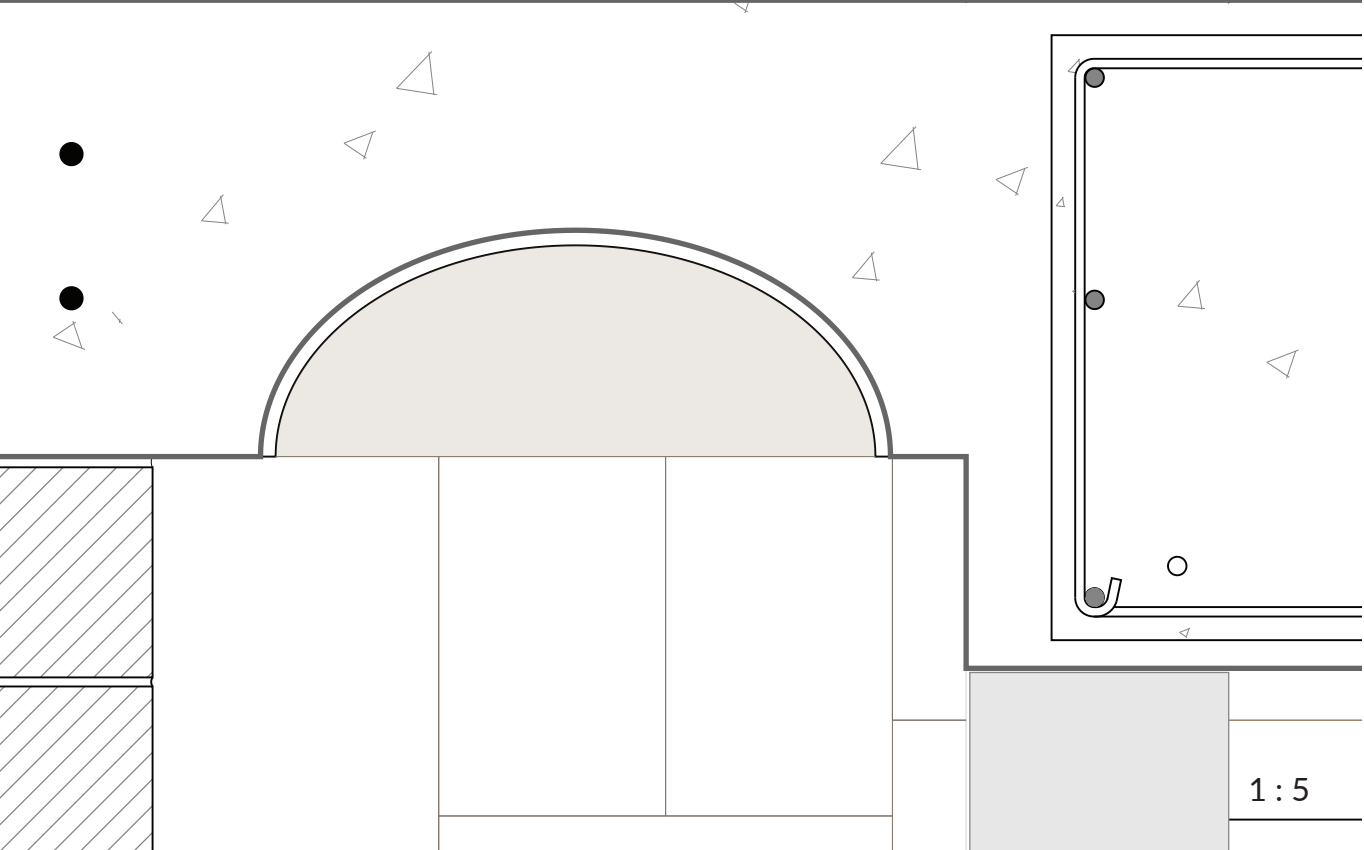
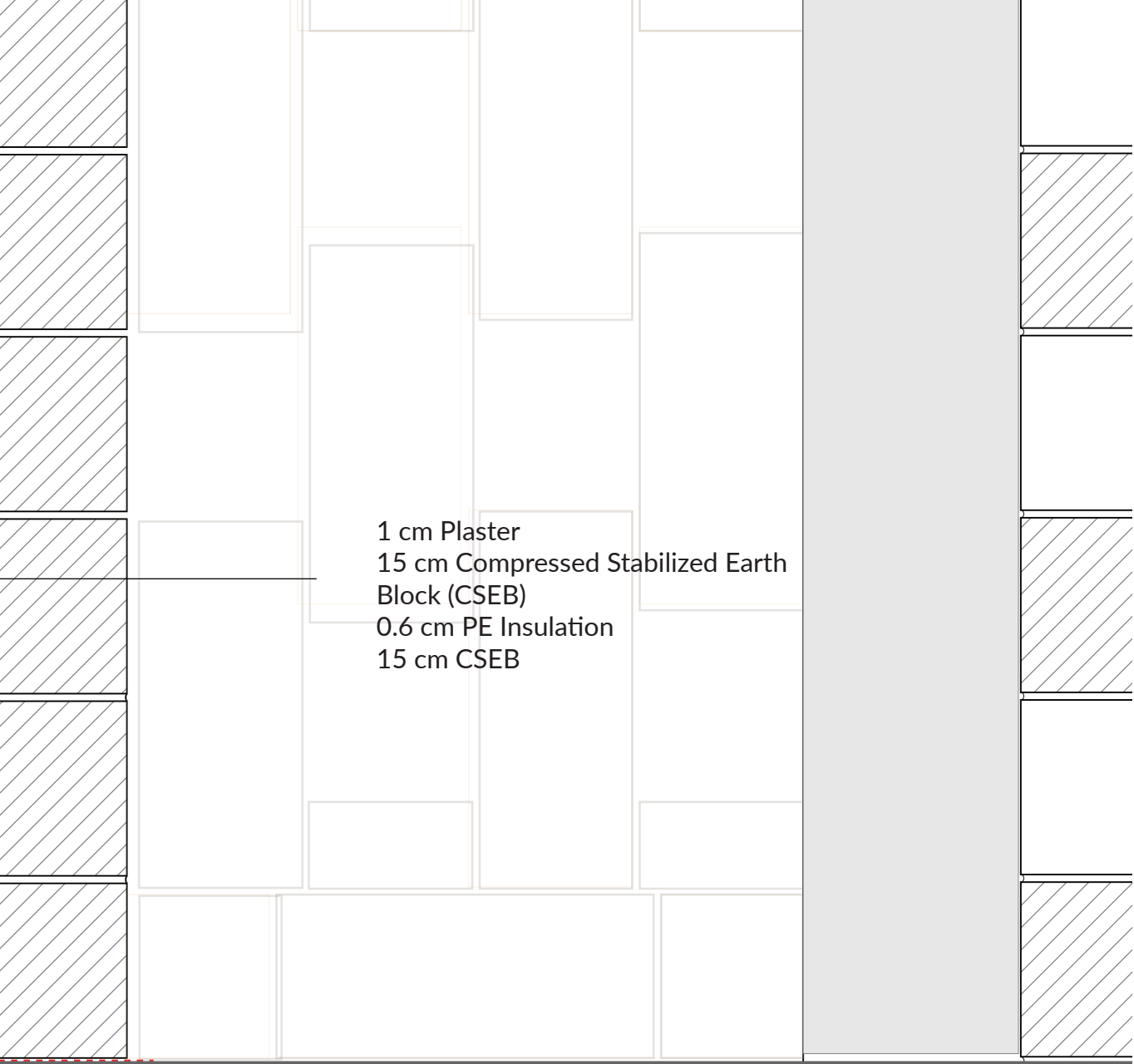
1 cm Plaster  
15 cm Compressed Stabilized Earth  
Block (CSEB)  
0.6 cm PE Insulation  
15 cm CSEB

# WINDOW WALL DETAIL

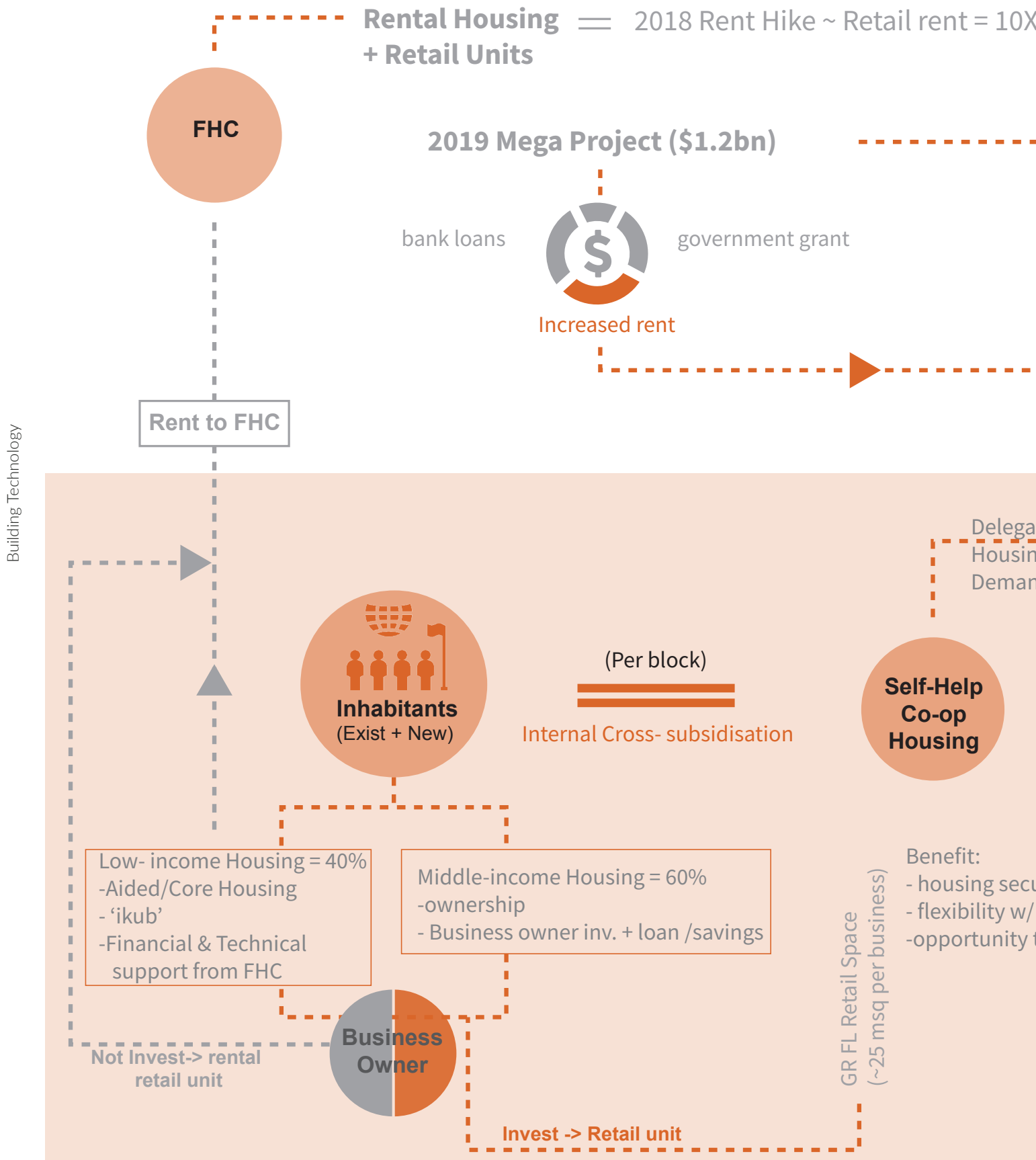
Building Technology

Ceramic tiles  
Screed  
Reinforced Concrete Filler Slab





# STAKEHOLDERS' ANALYSIS



**- UNSUSTAINABLE**



**Proposal**

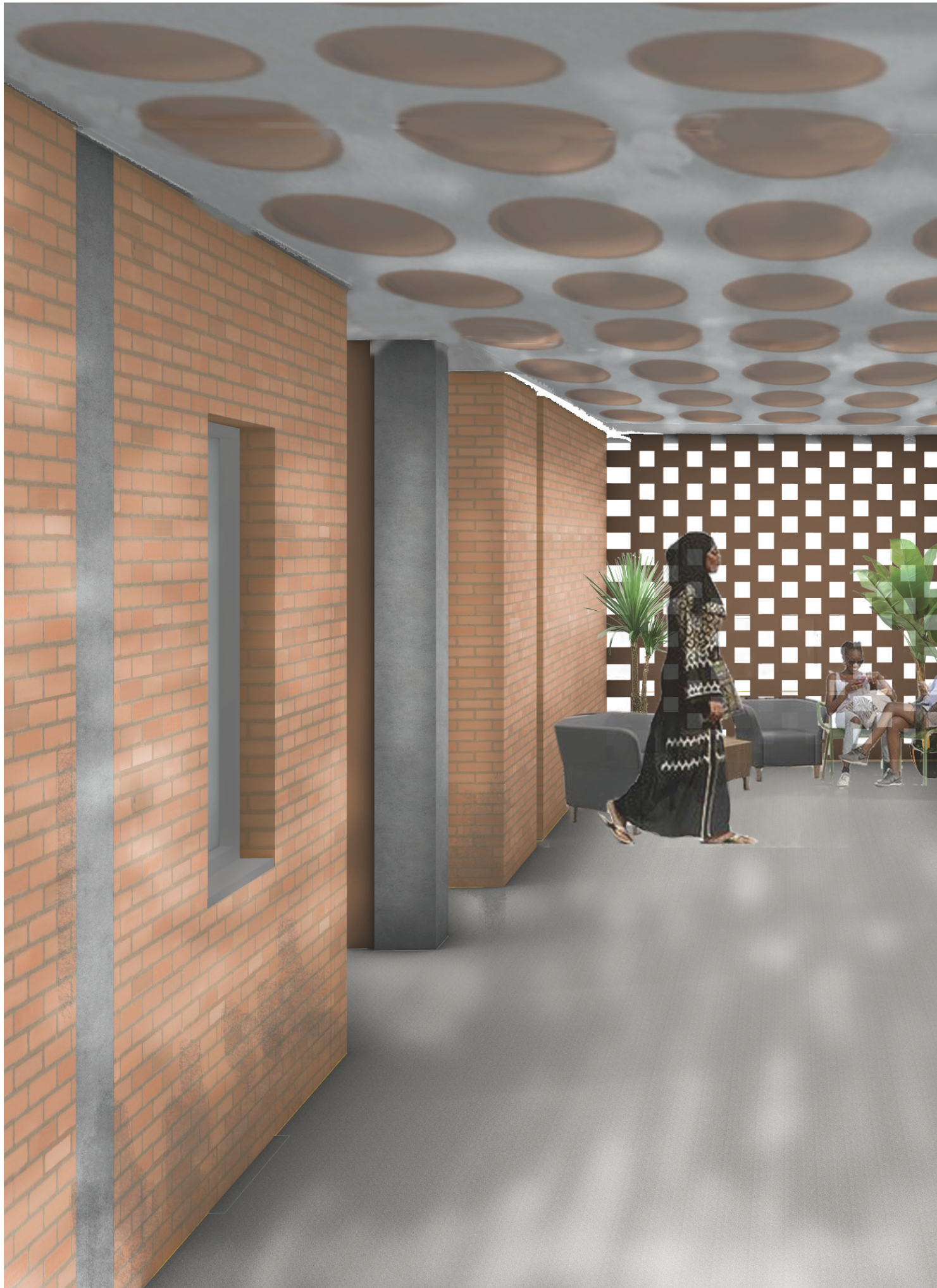
- Regulating and directing self-help build
- Infrastructure
- Maintain existing housing & dwellers
- Technical support for low-income

The major stakeholders of this project are the inhabitants (mainly the existing inhabitants) and the FHC. The architect mainly acts as a mediator and designer of the project. It is clear from recent changes implemented by the FHC that the methods being used are unsustainable for the future of FHC and require change in their approach.

This scheme suggests that FHC continues as, aside from maintaining its existing housing stock, a body that enforces the regulations, maintain and provide infrastructure, and provide technical support for the low-income inhabitants.

The co-operative can alleviate a great deal of the housing provision by organizing the inhabitants into a cooperative and obtaining retail investors to fund the project which will also allow it to provide core-housing for the low-income households.

# BLOCK COMMUNAL SPACE - FIRST FLOOR









COMMUNAL TRADITIONAL 'MESKEL' BONFIRE IN CLUSTER





# RIVERFRONT WALKWAY

Design





# URBAN CONNECTION - MARKET STREET

Design















# REFLECTION



## RELATIONSHIP BETWEEN PROJECT TOPIC, THE STUDIO TOPIC, MASTER TRACK (ARCHITECTURE), AND THE MASTER PROGRAM (MSC AUBS)

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The studio topic for this graduation project of Global Housing: Addis Ababa Living Lab focuses on "Creating Resilient Dwelling Clusters for Urban Resettlement". The topic aims to address the housing shortage in Addis Ababa and explore human-friendly solutions which take into account existing social ties.

The current housing provision in Addis Ababa has mainly focused on fast and cheap solutions which, in some instances, precipitated tight and low-quality living conditions far away from major amenities. Through the quest for cheaper land to house the masses, the city resorted to employing eminent domain and acquiring farmland on the outskirts of the city. This intensified underlying ethnic and income inequality tensions and housing instability which combined to create the existing acrimony very present in the city. It is no surprise that this issue has mainly affected the poverty-stricken individuals of the city who continue to receive the short end of the stick when it comes to housing security. The Global Housing studio, and in particular the Affordable Housing projects, address these issues and explore sustainable ways of addressing the needs of the low-income community of our society.

The built environment influences social relations. With that in mind, we can say that the built environment can be used to introduce inclusion and stability in a society. My topic focuses on using open and communal spaces as social (and environmental) buffer zones which elicit spontaneous and peaceful interactions between neighbours while reintroducing traditional domestic practices in visual and verbal contact with neighbors. The project will use these spaces as both social and environmental buffer zones by introducing central courtyards in the blocks and a communal courtyard in each cluster.

## RELATIONSHIP BETWEEN RESEARCH AND DESIGN

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During the research, hypothesis and design process, there were a few moments which influenced my design and managerial approach. First was the general research followed by readings I did in class regarding the state of housing and land ownership issues in Addis Ababa. This research helped me understand the shortfalls of the most recent mass housing schemes implemented by the city when it comes to the urban poor and how they have affected the social, economical, and housing security of the people. In almost all cases, the top-down approach in the condominium setup does not account for the well-connected community life and spaces which exist in the inner city of Addis Ababa amongst the urban poor that are often created by bottom-up initiatives in the neighbourhoods. This underlines the importance of a balance between the top-down and bottom-up approaches in the community when designing communal and open spaces which can accommodate social activities.

The second stage of my research which greatly influenced my design hypothesis was the field trip, site surveys, and some ethnographic research I conducted in Addis Ababa. In addition to conducting interviews in two sites in Addis Ababa and participatory design – although very minimal due to time constraints – I opted to stay in one of the condominium buildings built during the early phases of the Integrated Housing and Development Plan (IHDP) mass housing scheme by the government. This experience added another level to my ethnographic research in Addis Ababa and the daily life of the inhabitants by gaining a firsthand, 2-3 weeks experience in the dwelling units. From this immersion, I learned that the layouts of the dwellings – both in rental homes in Kolfe and condominium units – are restrictive (which necessitated alterations) and I was faced with some unpleasant realities that city dwellers face on a daily basis. For instance, due to the political and ethnic tension which has permeated into the housing security issues of the city, the priority of daily life activities has shifted from the communal life and close-knit social activities – a practice deeply rooted in Ethiopian culture – to privacy and housing secu-

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rity, This has caused the sense of community and social life to dissolve in the neighbourhoods and has forced communal spaces which can accommodate social activities to take a backseat. During this time I also did some research for a volunteer TU Delft research project – Home Life Diaries – on the traditional ‘tukul’ housing of Western Ethiopia where my father grew up. This work shed some light on traditional domestic practices. Additionally, through the graphic novel group work for the Research Seminar course I was able to contrast the living situation in the predominantly low-income communities such as Kolfe and the middle to high-income households such as Summit in Addis Ababa. My design proposal attempts to reintroduce social life and spontaneous interactions into daily activities and create open spaces which respond to different site conditions and accommodate different user groups at different scales – unit, building, and community – while keeping flexibility and private domestic life in mind.

The last part of my research that is taken into account for my design proposal are the case studies of three housing projects: a 1992 cooperative housing in Addis Ababa, Humanscapes Habitat in Auroville, and Belapur Housing in Mumbai by Charles Correa. The model cooperative housing in Addis Ababa built in 1992 was one of the first and most successful cooperative schemes. Although the scheme was mainly suitable for the middle-income households and failed to serve the low-income households it was meant to support, it was successful in providing an alternative and affordable home ownership opportunity with a mixed-use housing building for middle income households. My design bridges the gap between the different income groups by allocating 40% of the units to low-income households with core housing.

The other two projects are socially-conscious housing projects in India which also take different private and communal activities into account. Humanscapes Habitat is an investigative project which explores environmentally friendly

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housing with in-situ construction methods and introduces a human ecology by using the “principles of cohousing concept of living, facilitating interaction among neighbors for inclusive social development, economic and environmental benefits.” Lastly, Belapur low-income housing development takes the traditional Indian settlement patterns and applies it the spatial hierarchical configurations at the private dwellings scale “through the ‘doorstep’”, the communal courtyard, and the larger public space. Correa emphasises the focus on the dwelling unit and the open space and expands it to the larger public space using its geometric grammar, which allows for flexibility and future alterations. This idea of spatial hierarchy which starts from the dwelling and expands into the public promenade is an approach that can work well in the Ethiopian context and its common domestic patterns. The dwelling units which make up a block can be thoughtfully connected to other blocks based on the site condition thereby creating alternating open spaces.

## RESEARCH METHOD AND APPROACH CHOSEN IN RELATION TO THE GRADUATION STUDIO ME- THODICAL LINE OF INQUIRY

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The studio's approach for the graduation project was divided into phases throughout the year. Naturally, my approach was somewhat guided by this approach. These phases were:

### Phase 1 \_ Design Research / Projective Mapping

During this process, the studio class was divided into groups to study the Ethiopian – particularly the Addis Ababa – context and build an intellectual base before conducting site surveys. The research results from this process were synthesized into research booklets with four main topics: hard data, soft data, spatial mapping, and housing.

My role during this phase was within the soft data group researching on and analyzing the widely varied cultural backgrounds (including arts and craftsmanship) of Ethiopia. During this research we mapped out the commonly known history of Ethiopian kingdom, politics, religious background, and the different cultures. For my role, I studied the arts and local cultures based on the region and geographical location which not only greatly influence the common practices of the different groups but also shapes their way of life. The Ethiopian culture including clothing, food, rituals, ceremonies, and religious practices are mostly influenced by environmental influences and the neighbouring regions. Addis Ababa is a melting pot (or perhaps a salad bowl) of different cultures and ethnic groups. It is seen as a safe haven by people who travel to the city for myriad reasons. These individuals maintain their cultural expressions and customs which very much shapes their interactions in the city. For this reason, having a good understanding of the different cultural, historical, and political background is (and has been) very beneficial when conducting ethnographic research in a specific context.

#### Phase 2 \_ Field Trip / Site Survey

The main goal of the field trip to Addis Ababa in November 2019, also broadly discussed in the previous section, was to conduct site surveys, research, and workshops for the graduation project and Research Seminar course. During the site survey and ethnographic research, we went to the site of Kolfe to conduct interviews and identify the core problems and positive attributes of the site. By talking to the inhabitants, I was able to gather information on their daily lives in the household, their communal life, aspirations, and changes they desired to include into the redevelopment process of Kolfe. In most cases, their aspirations and the shortfalls of the original core housing provided by the government or Federal Housing Corporation (FHC) can be seen through the multiple self-aided transformations made by the homeowner over the years. (Fig. 10 )

#### Phase 3 \_ Design Hypothesis

As mentioned previously, the site surveys and research conducted in Addis Ababa during the field trip greatly influenced the problem statement and design hypothesis process. I was then able to synthesize the information I gathered and used it for the problem statement and research questions to formulate my design hypothesis. With this phase, I started to explore the urban strategy for the site and think about design strategies and phasing schemes. Although my approach has focused on maintaining the existing infrastructure and neighbourhood structure which would allow the existing social ties to transition into the new blocks, the triangular shape of the site and the existing river on the east side of the site has been a challenging factor. It has been clear that maintaining most of the existing infrastructure would be a positive approach since it is also a cost-effective and efficient way of redeveloping the site. As I delved deeper into the process, I experimented more with different ways of orienting or clustering the blocks, creating more porosity and creating a more organic connection to the river.

#### Phase 4 \_ Preliminary Project

The current version of the design proposal is a compilation of the different research, analysis and case studies conducted throughout this process to cre-

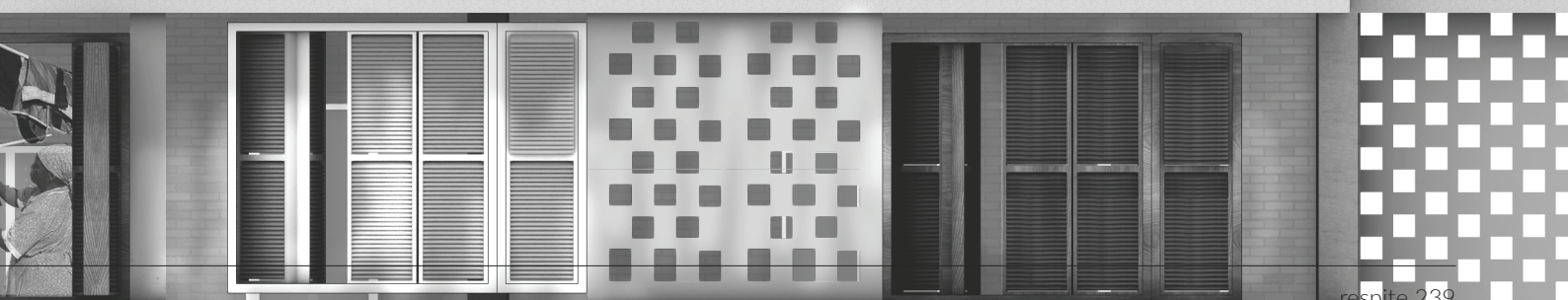
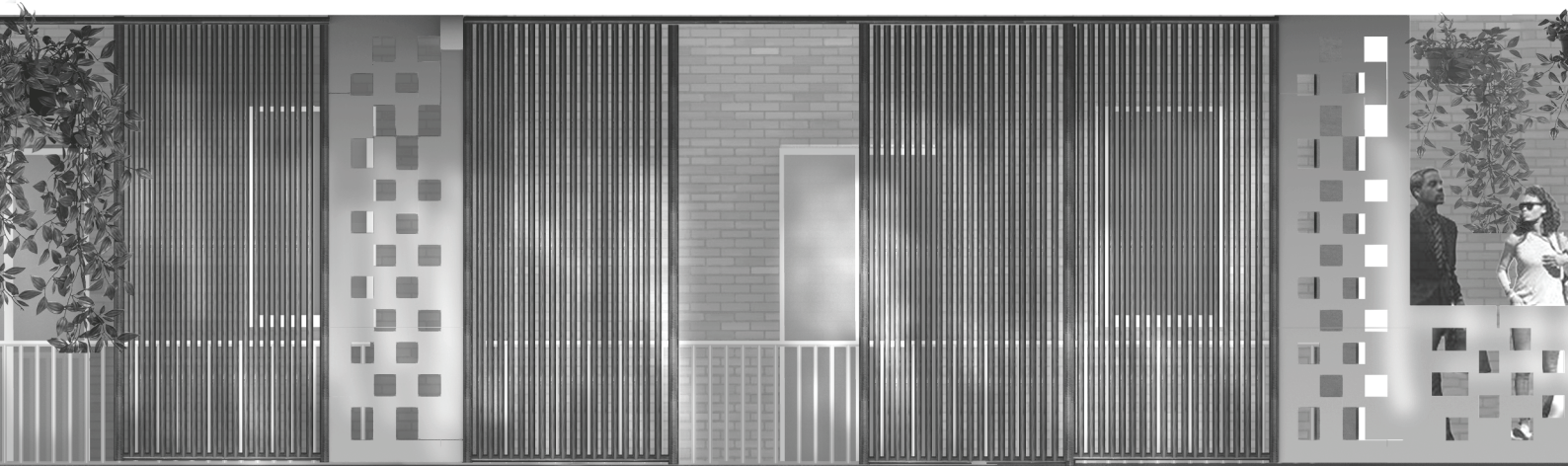
ate a human-scale community for the existing and new inhabitants of Kolfe. The design reintroduces traditional domestic practices into the central/ social spaces which were inspired by the case studies and ethnographic studies. The unit designs also take into account vernacular domestic rituals such as intimate spaces and open versus closed areas of the home. The phasing scheme used responds to existing community ties where the current households from the same 'sefer' can organize a cooperative for the housing. These cooperatives can transition into the same block which are characterized by the courtyard typologies. The proposed scheme introduces cooperative housing which was successful in Addis Ababa's housing history and makes the necessary adjustments to include low-income households.

The central courtyards in the blocks, each featuring a water collection tank and vegetation, create intimate spaces where people can enjoy their social interactions in the beautiful weather. The central courtyards also connect to a common social space for each cluster which can accommodate the social activities currently present in the neighbourhood of Kolfe.

## RELATIONSHIP BETWEEN THE GRADUATION PROJECT AND THE WIDER SOCIAL, PROFESSION- AL AND SCIENTIFIC FRAMEWORK

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The built environment greatly influences social relations, and how people experience their environment. This project explores how different spatial hierarchical configurations and social spaces can be used to include – and introduce – different income groups on the site of Kolfe while providing equitable quality of life to the different strata of the society. A sustainable, human-scale design approach which takes the community and social life into account while also respecting the private lives of the home has the ability to influence an individual's sense of security and peace of mind. Finding ways of achieving this goal in affordable housing can have great impact in the low-income community which can potentially also be realised in different contexts.



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## LIST OF IMAGES (NOT BY AUTHOR):

Img. 1 -Aerial View of Addia Ababa, 1934

<https://www.wikizeroo.org/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRmlsZTpFVEgtQkICLUthaXNlcnBhbGFzdCxfJTlyZGVyX2dyb3NzZV9HaWJpJTlyX2F1c19kZXJfTHVmdC1BYmVzc2luaWVuZmx1Z18xOTM0LUx0CU19NSDAyLTlyLTAyMjIudGlm>

Img. 2 Woman walking in 'Bete Giyorgis', one of the rock-hewn churches in Lalibela, Ethiopia"

<https://www.linkethiopia.org/ethiopia/learn-about-ethiopia/history/>

Img. 3 Konso village

[https://commons.wikimedia.org/wiki/File:Konso\\_village\\_01.jpg](https://commons.wikimedia.org/wiki/File:Konso_village_01.jpg)

Img. 5 Picture of Menelik II

<https://origins.osu.edu/review/when-ethiopia-stunned-world>

Img. 4 Fasilides' Castle from the Solomonic Dynasty in Gondar

<https://www.linkethiopia.org/ethiopia/learn-about-ethiopia/>

Img. 6 First palace of Menelik, Entoto, Shewa II

[https://commons.wikimedia.org/wiki/File:First\\_palace\\_of\\_Menelik\\_II\\_1.](https://commons.wikimedia.org/wiki/File:First_palace_of_Menelik_II_1.)

Img. 7 Empress Taitu

<https://i.pinimg.com/originals/dc/91/cb/dc91cb139297f224ba699fc78c316e3a.jpg>

Img. 8 Haille Salassie Enters Addis Addis

[https://ww.wikiwand.com/en/History\\_of\\_Addis\\_Ababadis\\_Ababa.jpg](https://ww.wikiwand.com/en/History_of_Addis_Ababadis_Ababa.jpg)

Img. 9 Addis Ababa Inner City

<https://scroll.in/article/930055/a-gentrified-addis-ababa-has-no-place-for-street-hustlers-the-same-people-who-helped-build-it>

Img. 10 Addis Ababa Condominium Construction Site

<https://www.theguardian.com/cities/2017/dec/04/addis-ababa-ethiopia-redesign-housing-project#:~:text=%E2%80%9CAddis%20Ababa%20has%20run%20out,like%20Haile%20can%20cause%20problems.>

Img. 11 Tilu Dimtu Housing Complex

<https://www.theguardian.com/cities/2017/dec/04/addis-ababa-ethiopia-redesign-housing-project>

## LIST OF IMAGES (NOT BY AUTHOR):

Img. 12 Addis Ababa Condominium Aerial View

<https://www.afro105fm.com/afrofm.com/2018/06/12/ethiopias-economy-record-2-percent-dip-wb-report/>

Img. 13 A slum in the old Piassa neighbourhood of Addis Ababa, slated for demolition

<https://www.theguardian.com/cities/2017/dec/04/addis-ababa-ethiopia-redesign-housing-project>

# Global Housing - Addis Ababa Living Lab

Yadie Meko

2020