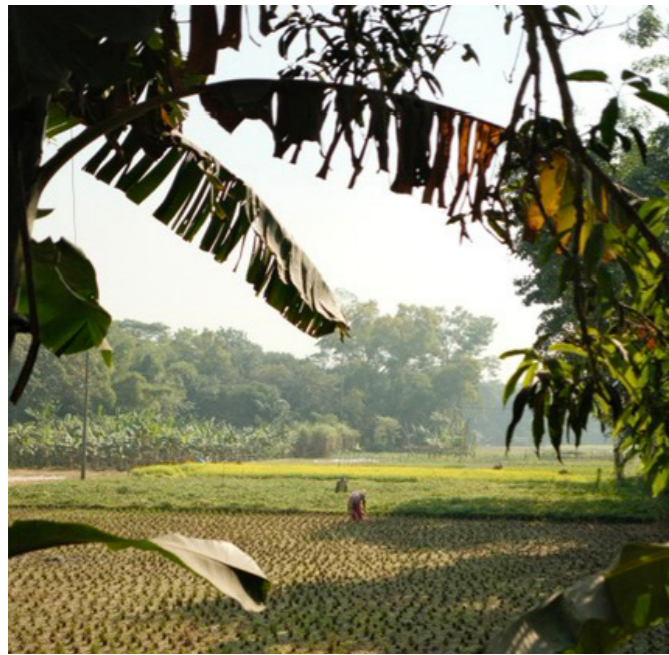


THE URBAN BLOOM

Global Housing Graduation Studio, P5 presentation

Lotte Bijwaard

FIELDWORK PREPARATION



1. Village life



2. Losing jobs

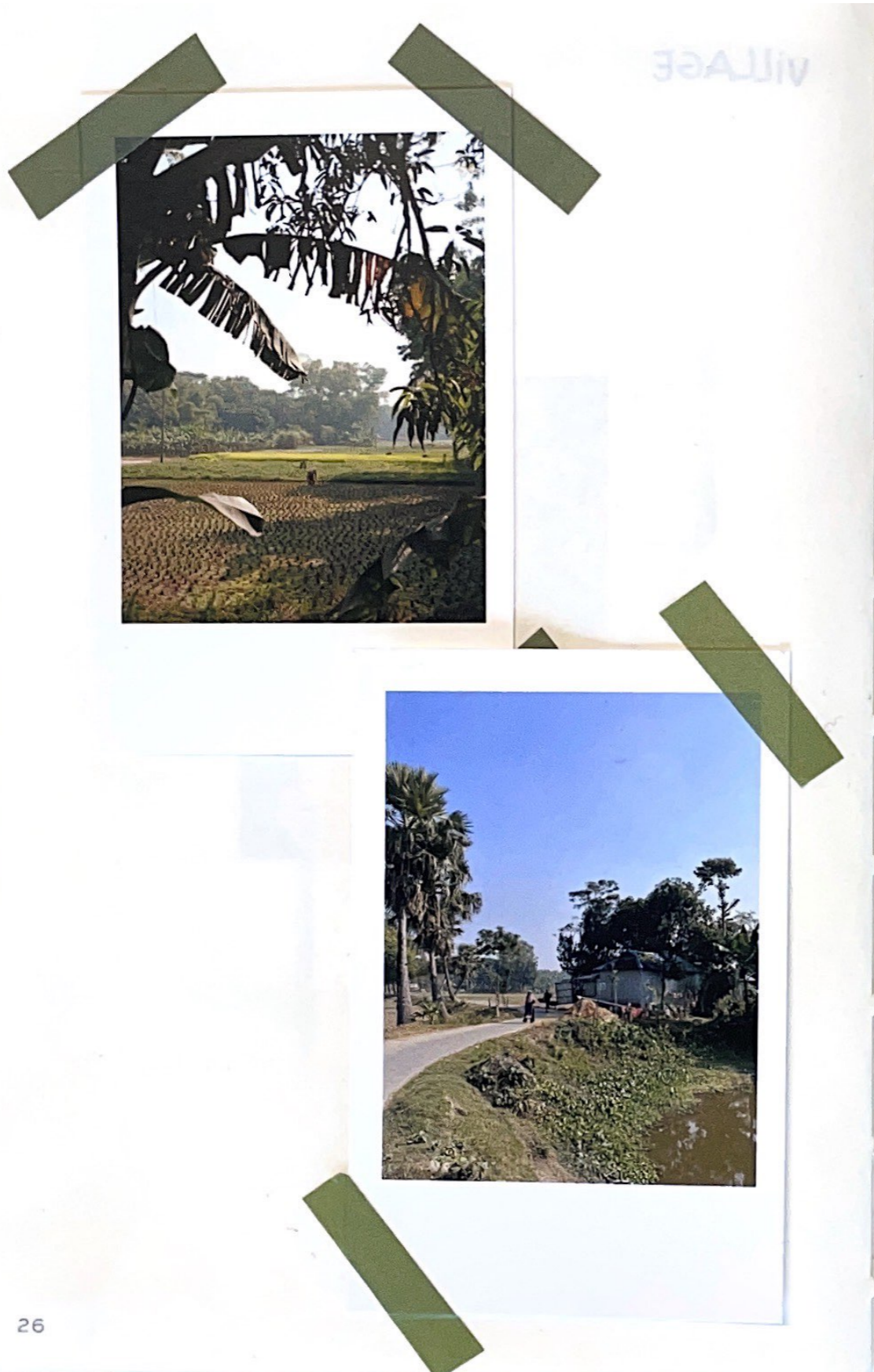


3. Migrating to cities



4. Living in Slums

VISIT OF EKDUARIA



26



- all families living in different compounds
- self sustaining village

27

Fieldtrip sketch: map of village Ekduaria

VISIT OF EKDUARIA



SADIK

01. VIDEO

01. VIDEO: TAKEAWAYS

“They don’t want to move to the city because they **don’t know how to live in the city**. Living in the city is **more challenging.**”

- Jafar

01. **VIDEO:** PROBLEM

No **houses** that feel like **home**.

02. RESEARCH

02. RESEARCH: QUESTION

How can the **needs of the rural-urban migrants** be integrated into an **open building system** to create a future-proof, **large-scale housing project** which reduces the affordable housing shortage in Sylhet?

02. RESEARCH: AIM

This research aims to develop a **future-proof** open building system with the potential for a **large-scale housing project** in Sylhet that effectively addresses the specific housing needs, **socio-cultural preferences**, and **affordability** requirements of rural-urban migrants, to reduce the current and expected affordable **housing shortage** in Sylhet. Additionally, the project aims to facilitate a **smoother transition** from rural to urban living for rural-urban migrants by integrating the **character** of positive and valued elements from **rural life** into urban design elements.

This approach not only benefits the rural-urban migrants who will reside in the building but also enhances the living environment for other residents by incorporating design choices that positively impact the **overall quality** of life within the housing complex.

02. RESEARCH: AIM

**future-proof
large-scale housing project
socio-cultural preferences,**

**affordability
housing shortage
smoother transition
character**

rural life

overall quality

02. RESEARCH: QUESTION

How do I, as a western architecture student, design for the bangladeshi people?

02. RESEARCH: NEEDS OF RURAL-URBAN MIGRANTS



1. Green environment



2. Open and low

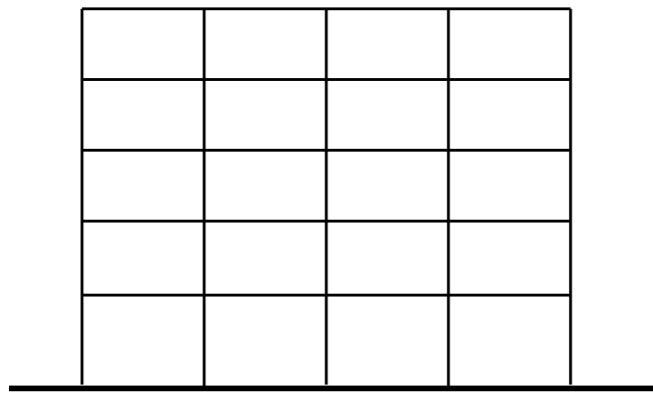


3. Close community

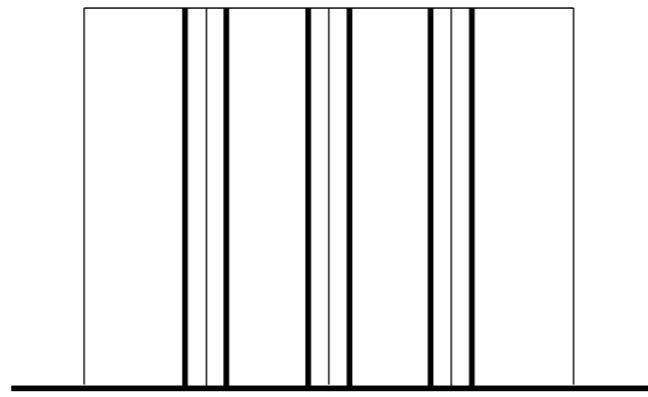


4. Transition public-private

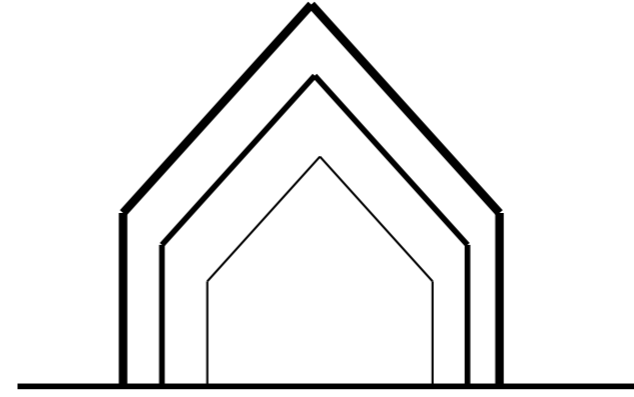
02. RESEARCH: OPEN BUILDING



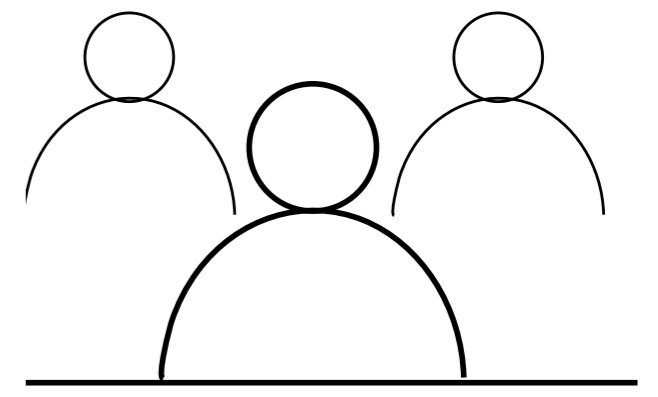
1. Open floorplan & height of 3,5 m



2. Planned shaft placement

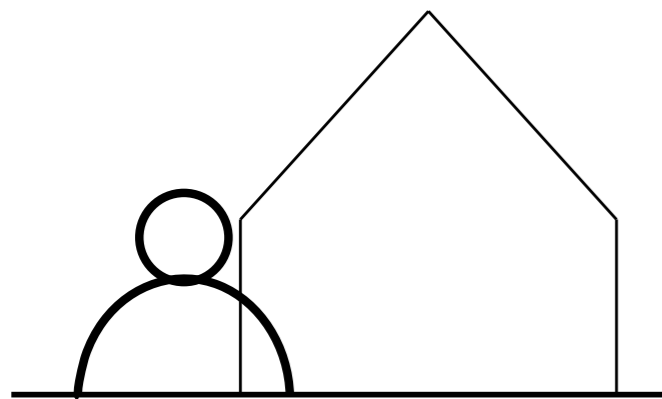


3. Layerd construction

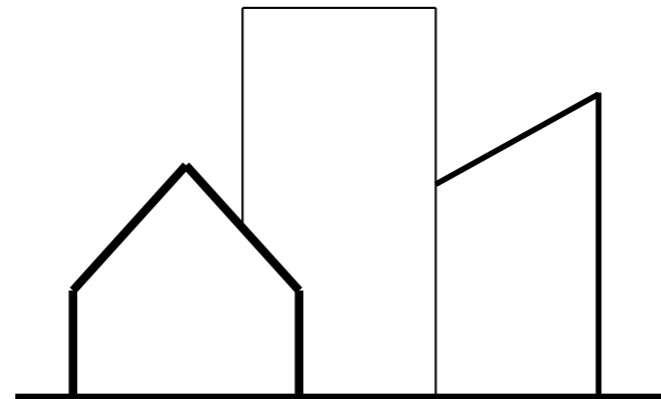


4. Resident involvement

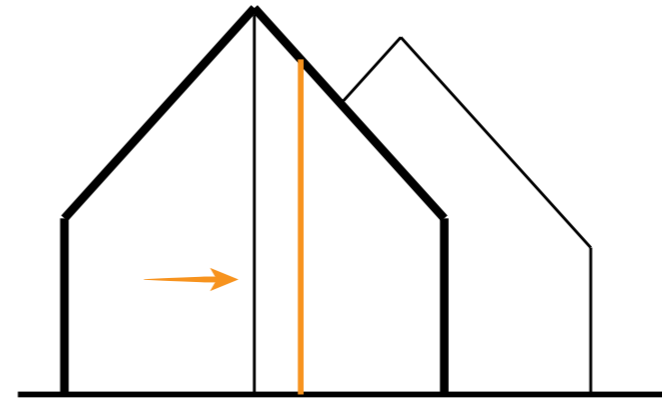
02. RESEARCH: LARGE SCALE BUILDINGS



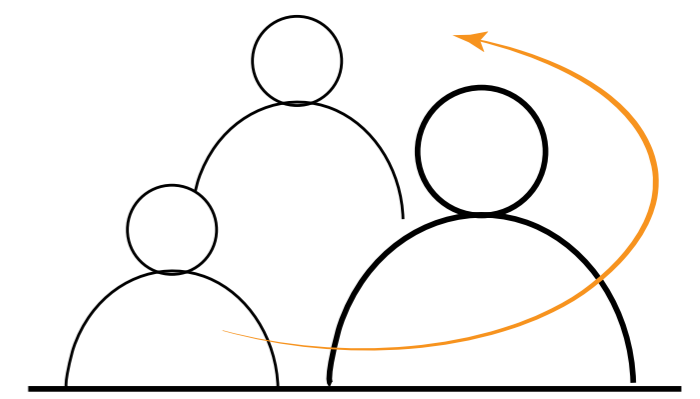
1. Human scale



2. Diverse architecture



3. Individuality & flexibility



4. Encouraging social interaction

03. **SITE ANALYSIS**

03. SITE ANALYSIS: HAWKERS MARKET

temporary Market ::



Bamboo construction



HAWKERS MARKET - SITE



top view site

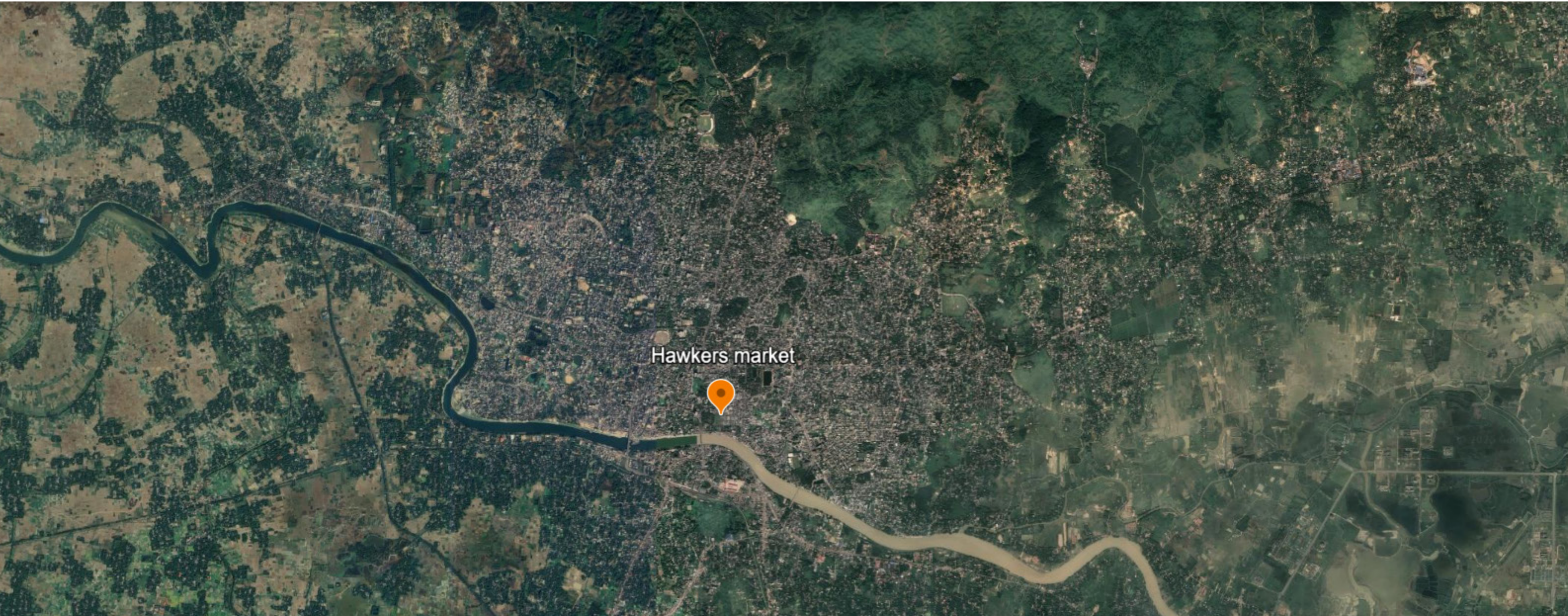
Market stall



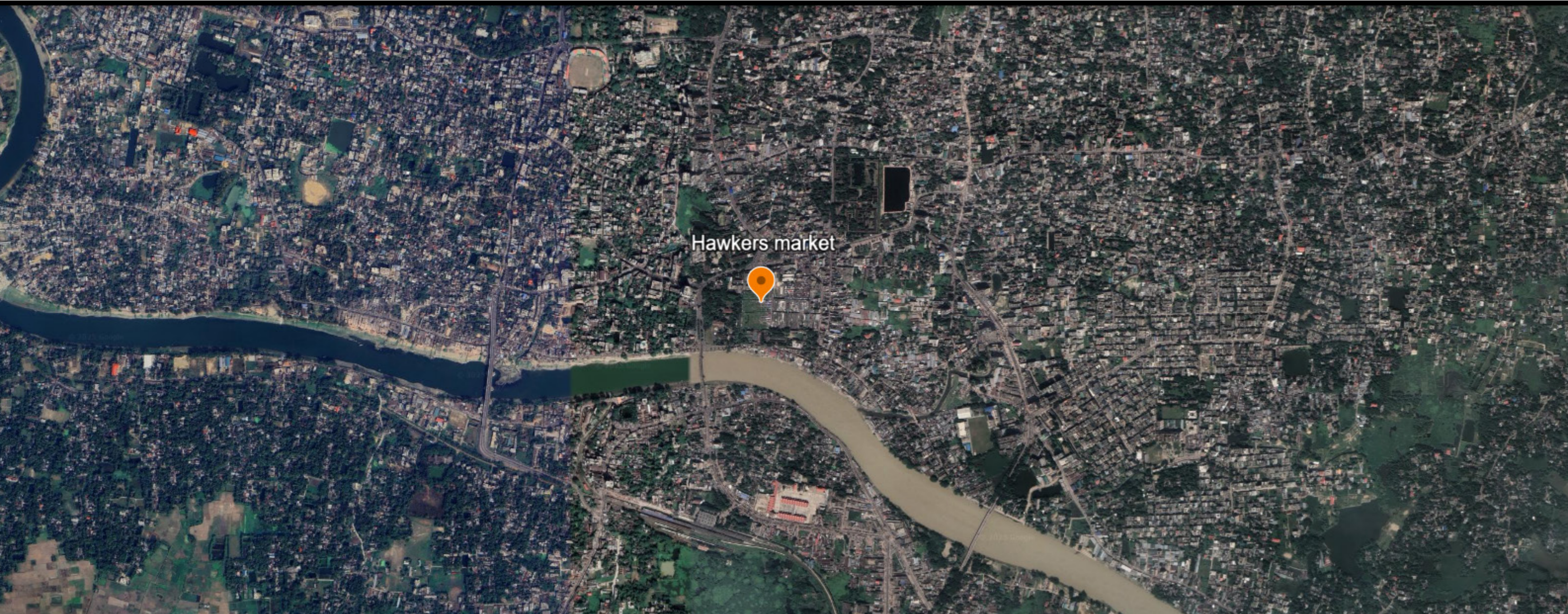
03. SITE ANALYSIS: LOCATION



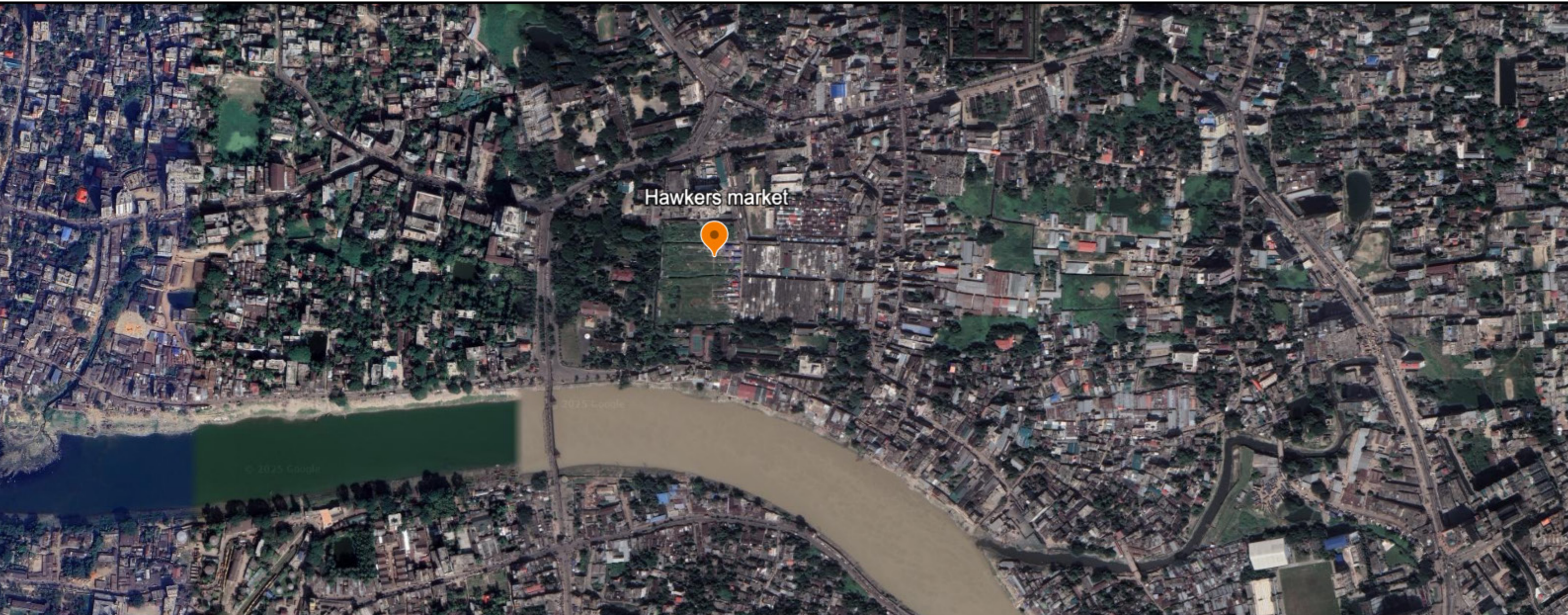
03. SITE ANALYSIS: LOCATION



03. SITE ANALYSIS: LOCATION



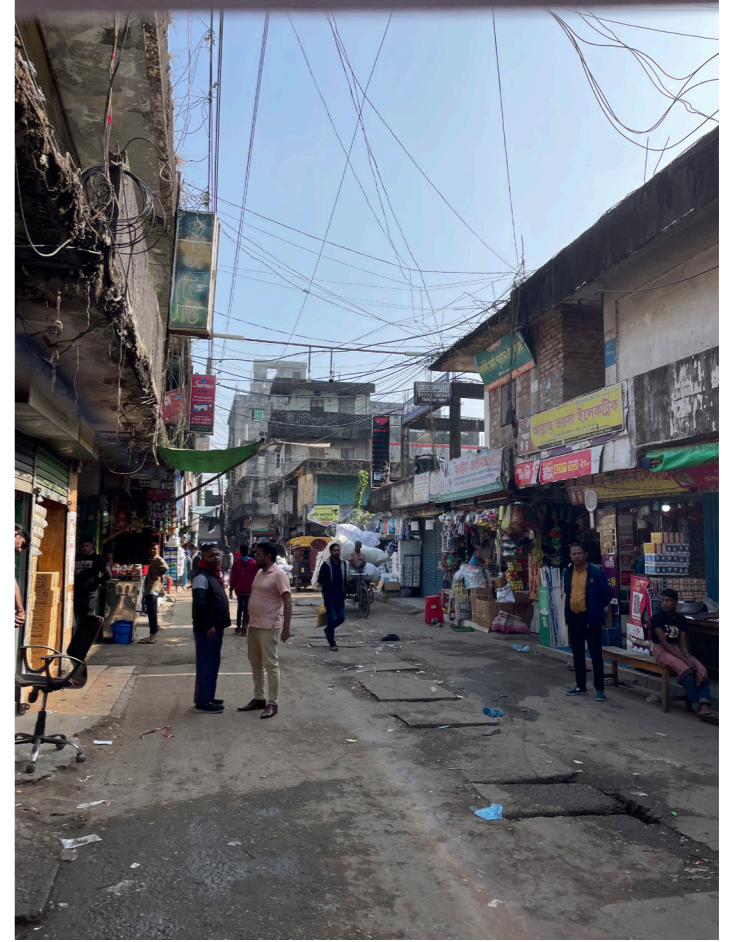
03. SITE ANALYSIS: LOCATION



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03. SITE ANALYSIS: LOCATION



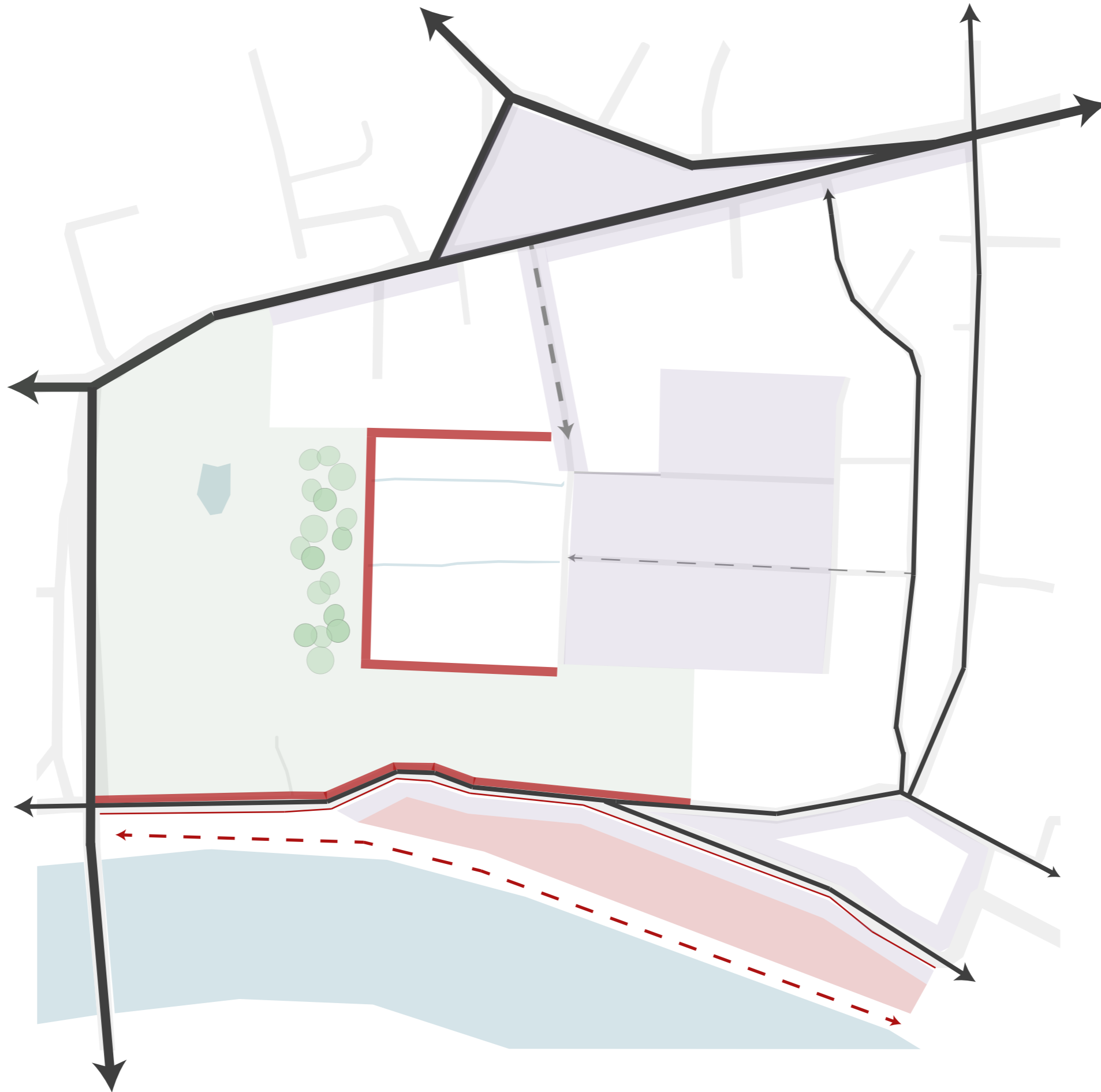
03. SITE ANALYSIS: PHOTO'S CURRENT MARKET



03. SITE ANALYSIS: LOCATION



03. SITE ANALYSIS: PLOT

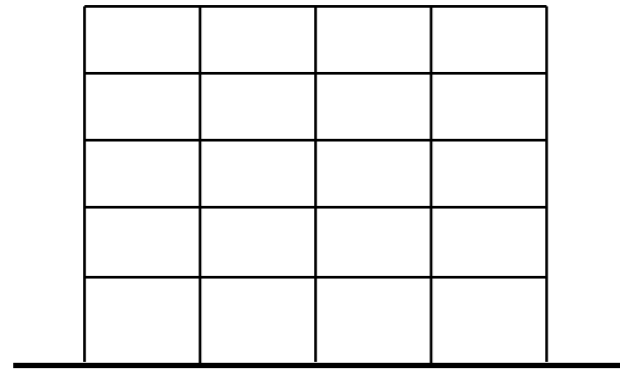


- Market
- Informal settlement
- Private Government Ground
- Surnma River

THE URBAN BLOOM

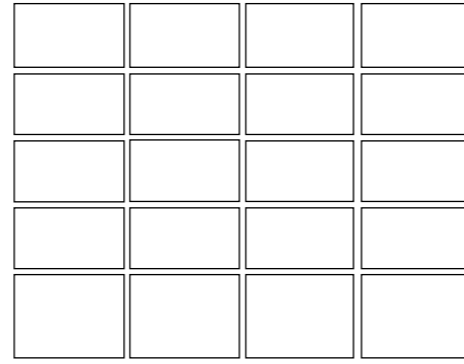
CONCEPT

1. PRINCIPLE



Construction

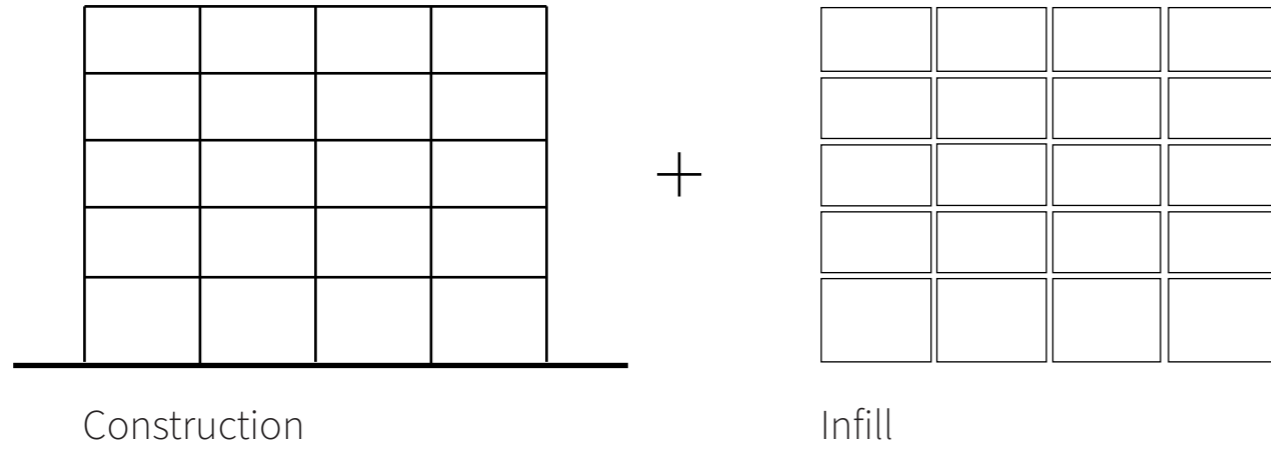
+



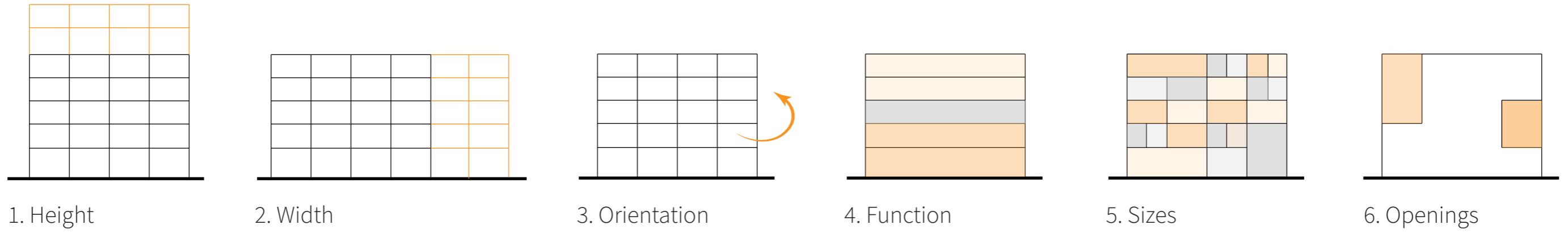
Infill

CONCEPT

1. PRINCIPLE

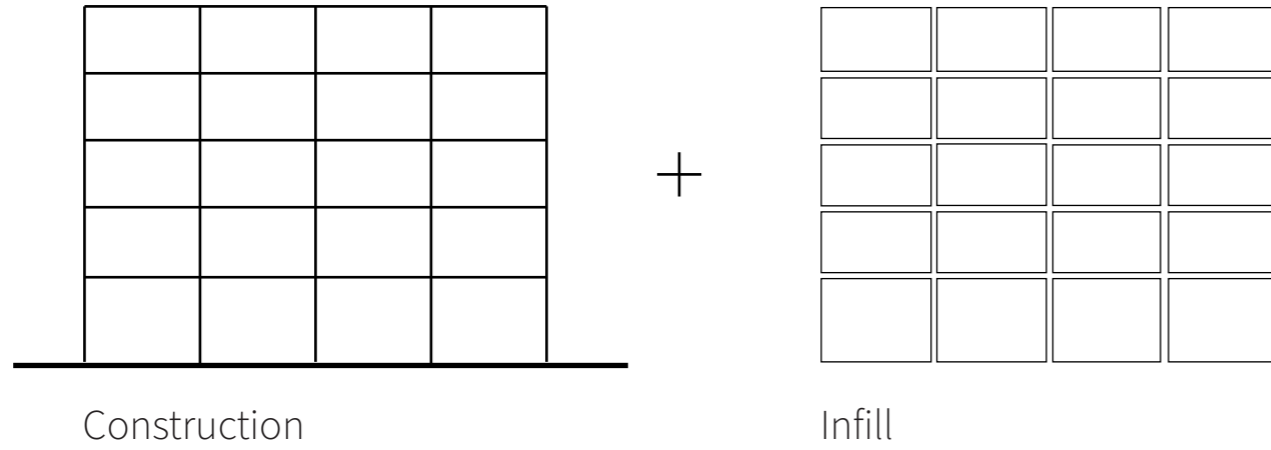


2. VARIATIONS

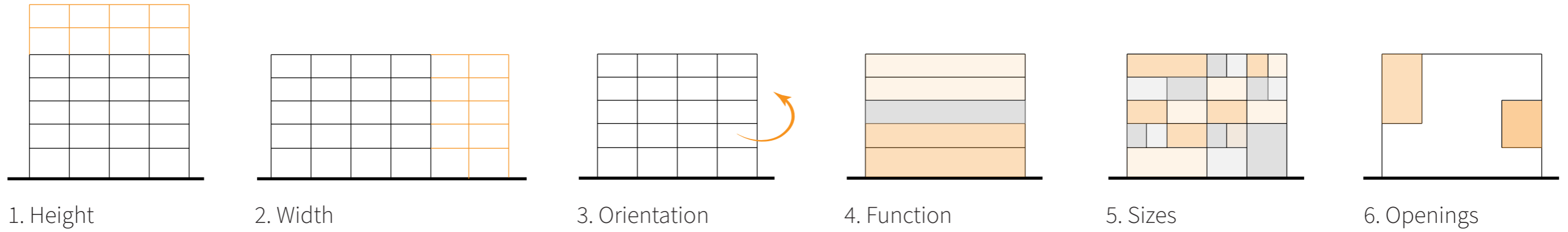


CONCEPT

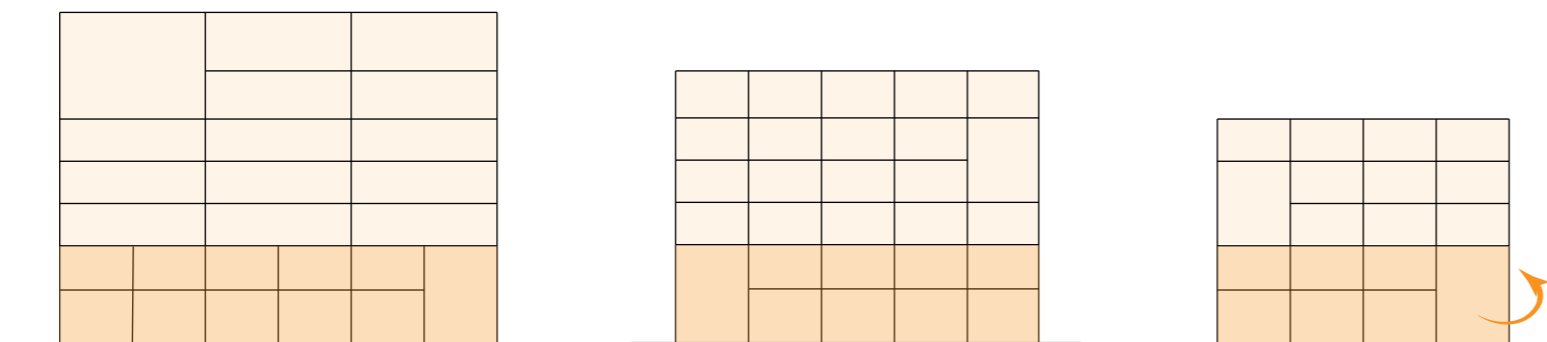
1. PRINCIPLE



2. VARIATIONS



3. CHOICES



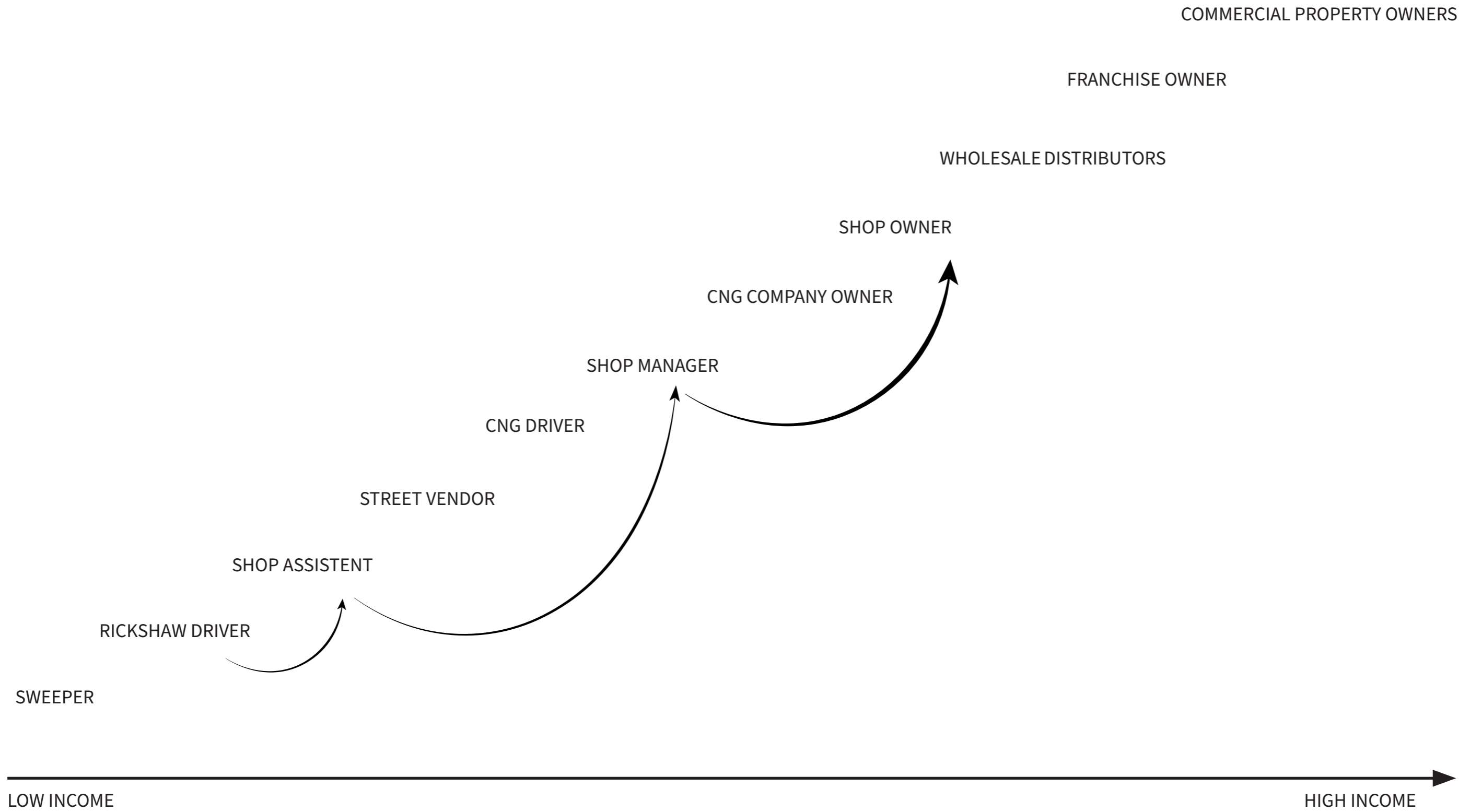
1. Different height; 9-6 stories
2. Different widths; 4-7 series
3. 2 different orientations, N-Z & E-W
4. Market ground/1st floor, housing 2-9 floor
5. 1 size; could be combined// low and middle income
6. 2 openings per floor, different per building

01. **UNIT**

01. UNIT: PEOPLE



01. UNIT: PEOPLE



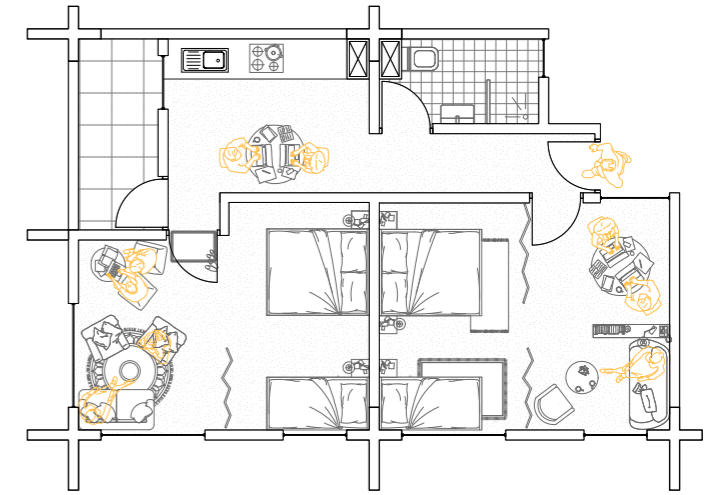
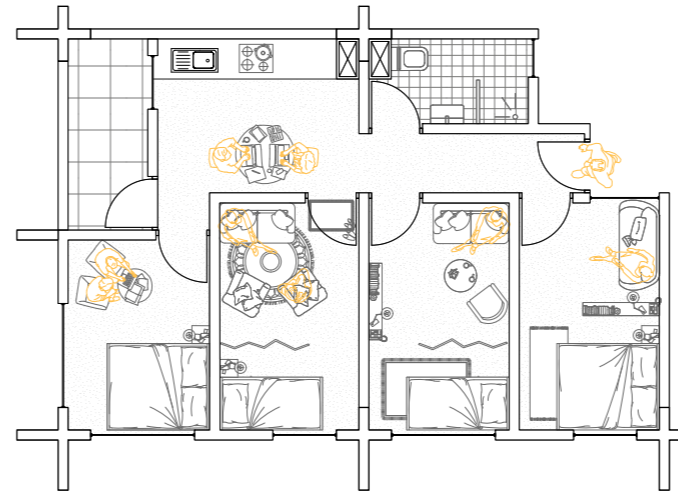
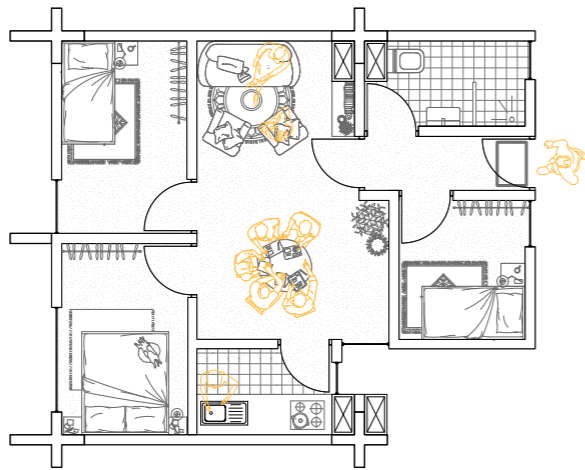
01. UNIT: CLIMBING THE LADDER

1. LOW INCOME

65 m²// 6,5 m²

26 m²// 6 m²

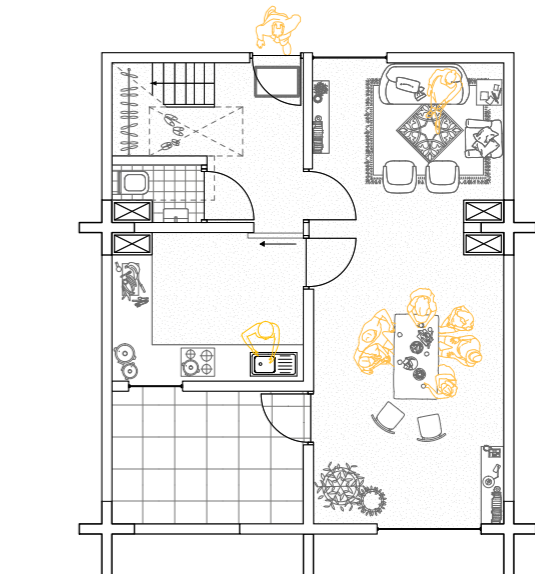
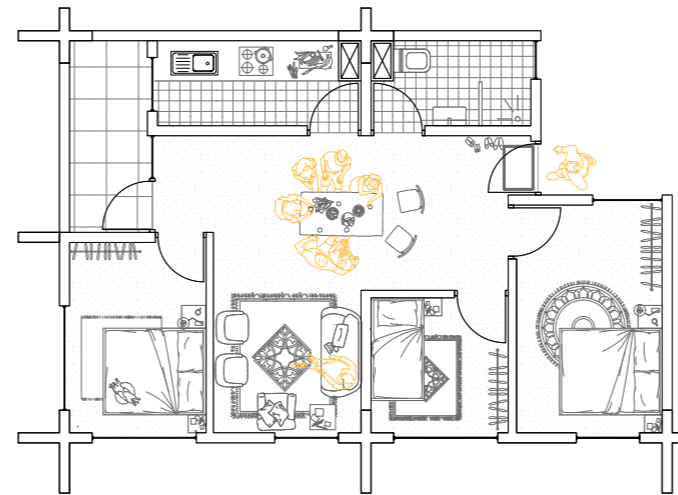
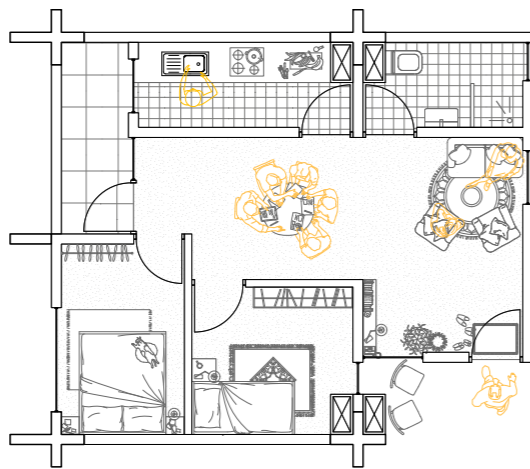
13 m²// 3 m²



2. MIDDLE INCOME

65 m²// 12 m²

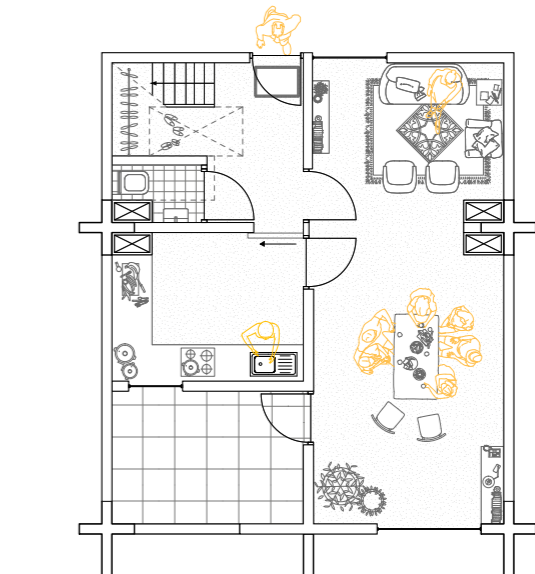
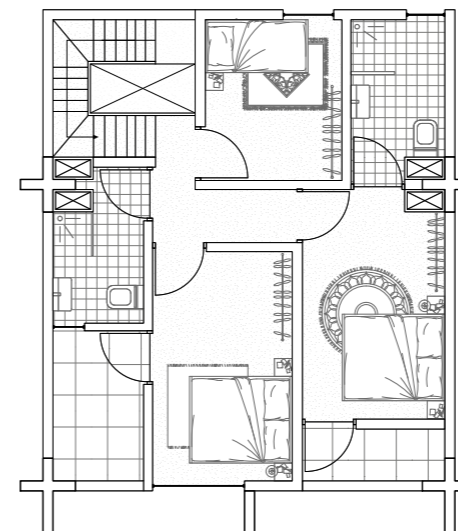
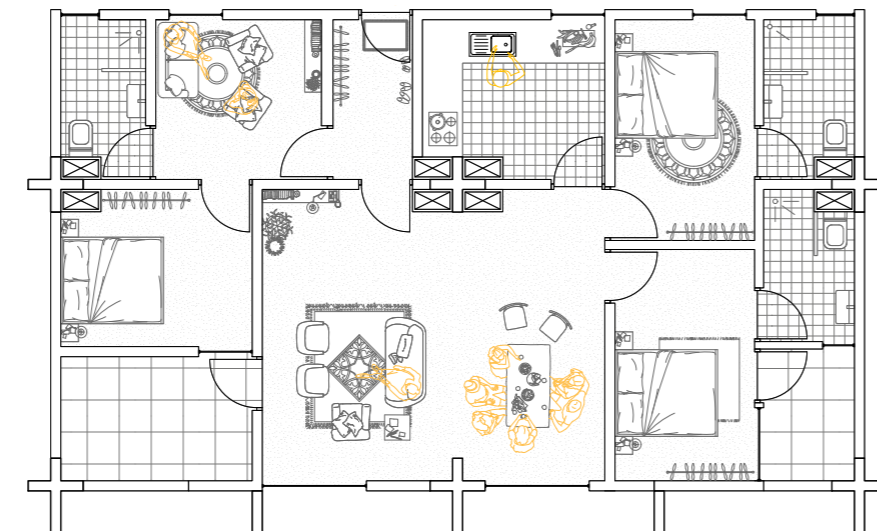
77 m²// 12 m²



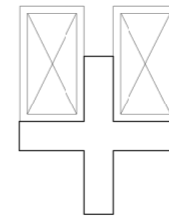
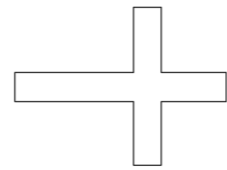
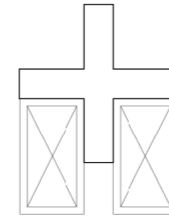
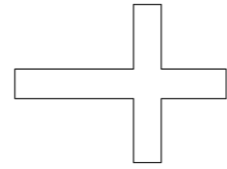
3. HIGH INCOME

132 m²// 14 m²

127,5 m²// 18,5 m²

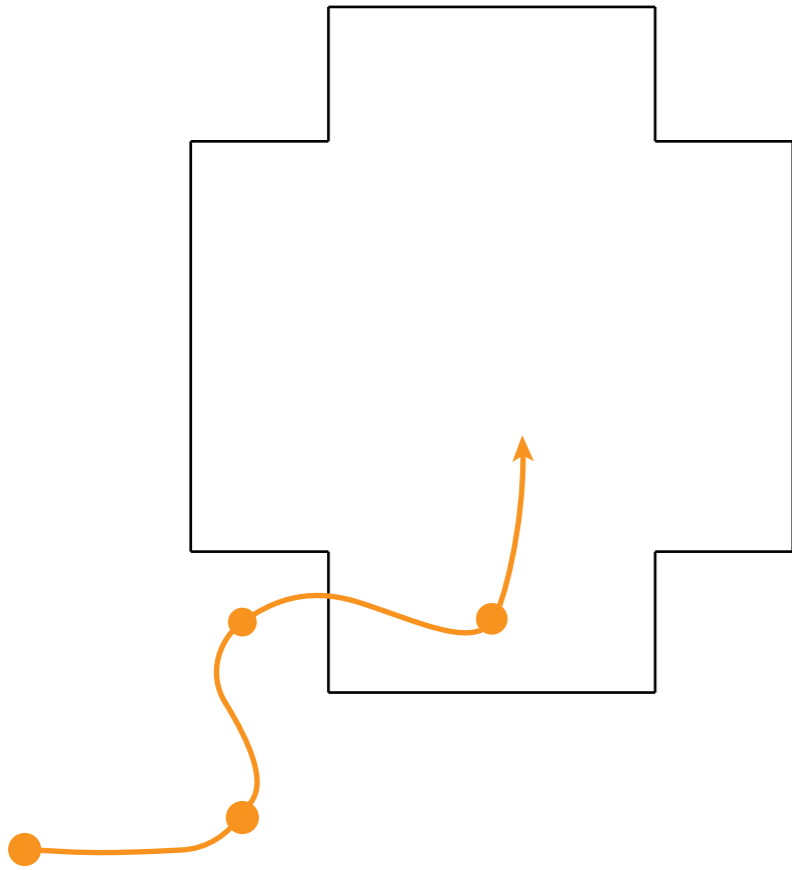


01. UNIT

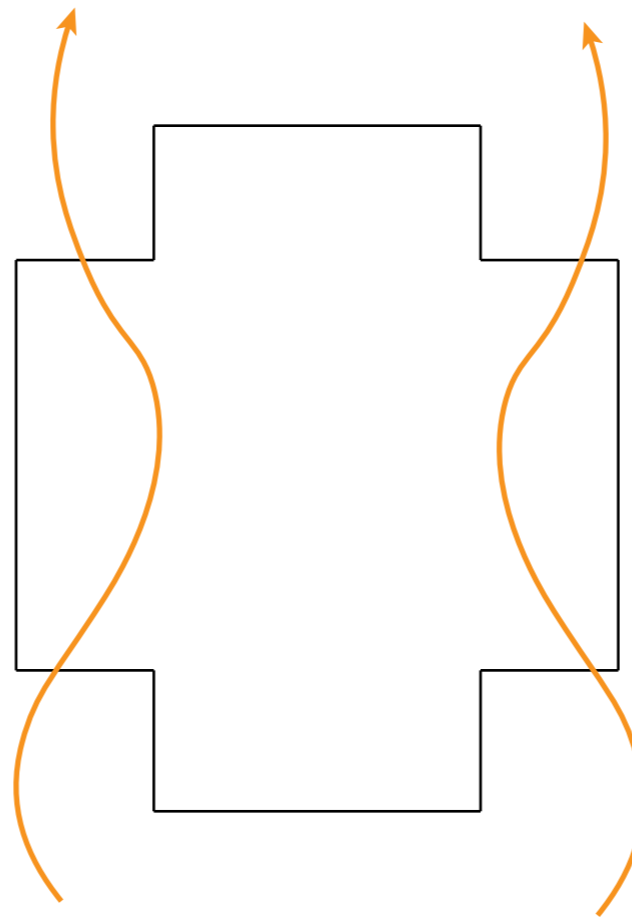


01. UNIT: STRATEGY

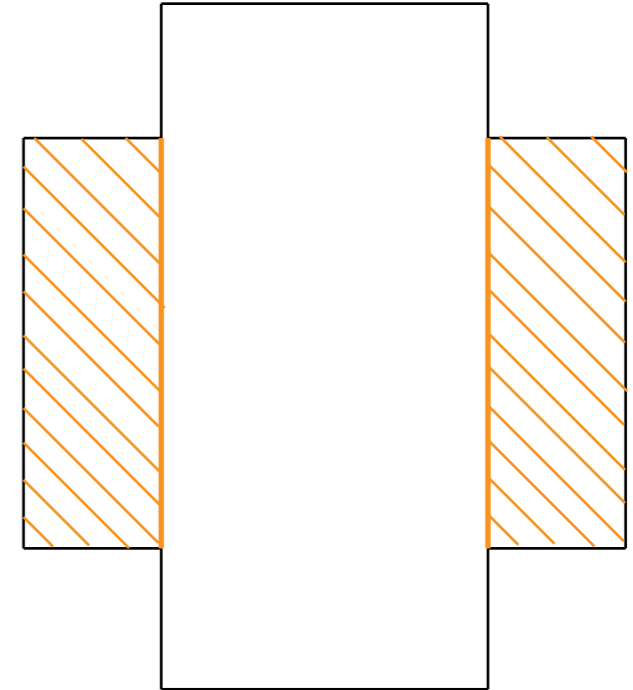
1. Transition public-private



2. Ventilation & daylight

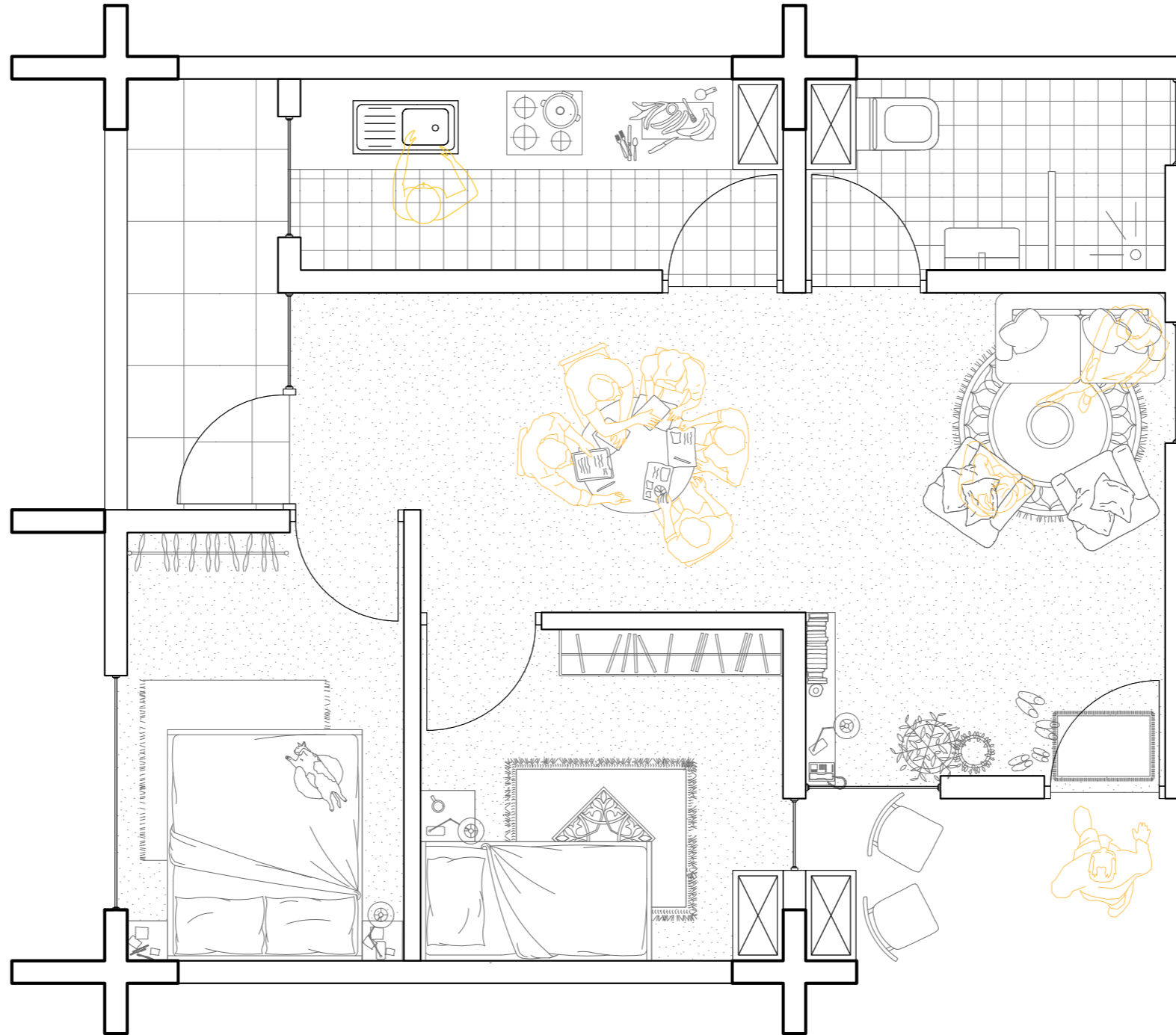


3. Clustering wetzones

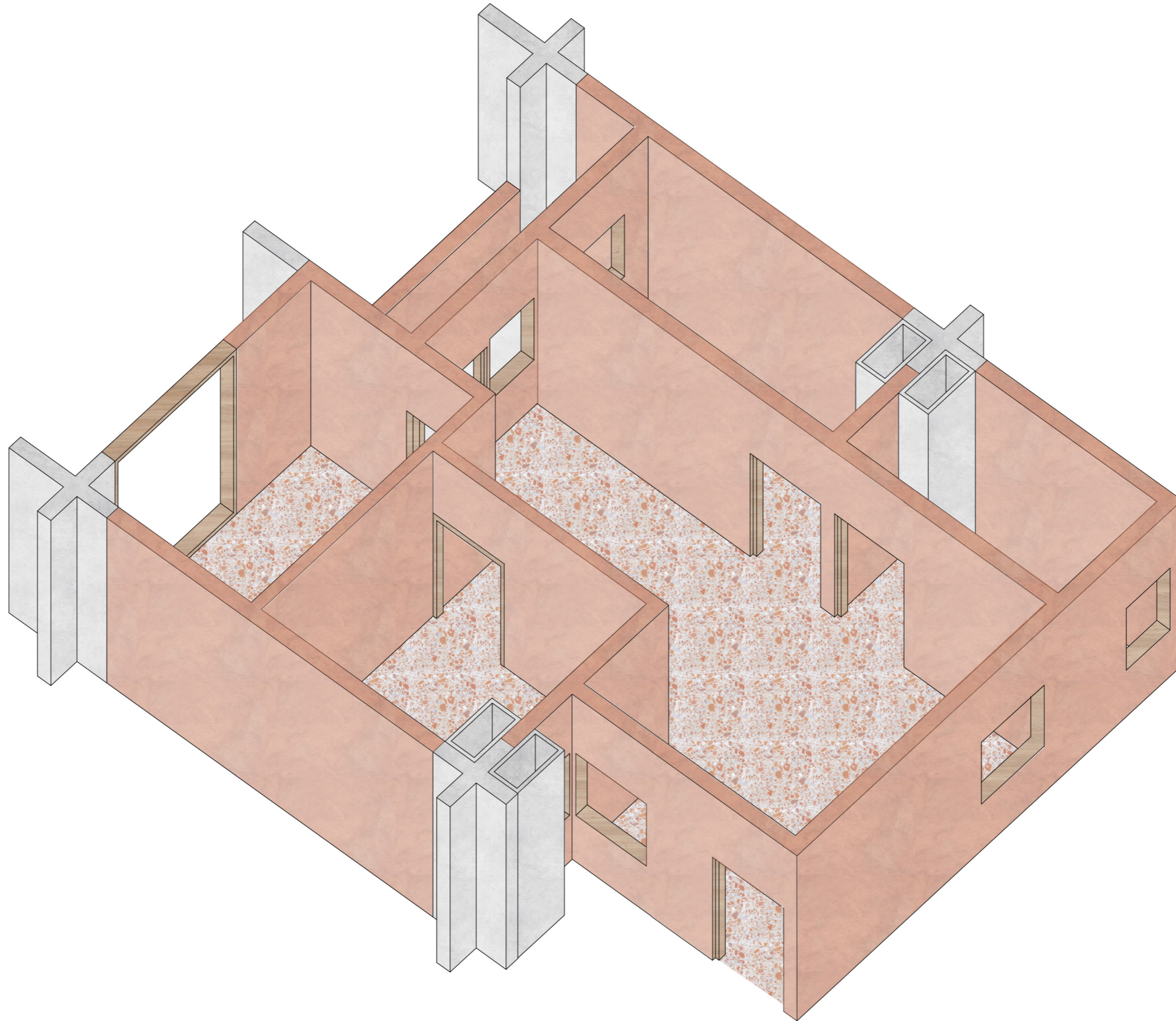


01. UNIT: MIDDLE INCOME

Area: 77 m² excl.
12 m² outside space
(6 m² front, 6 m² balcony)

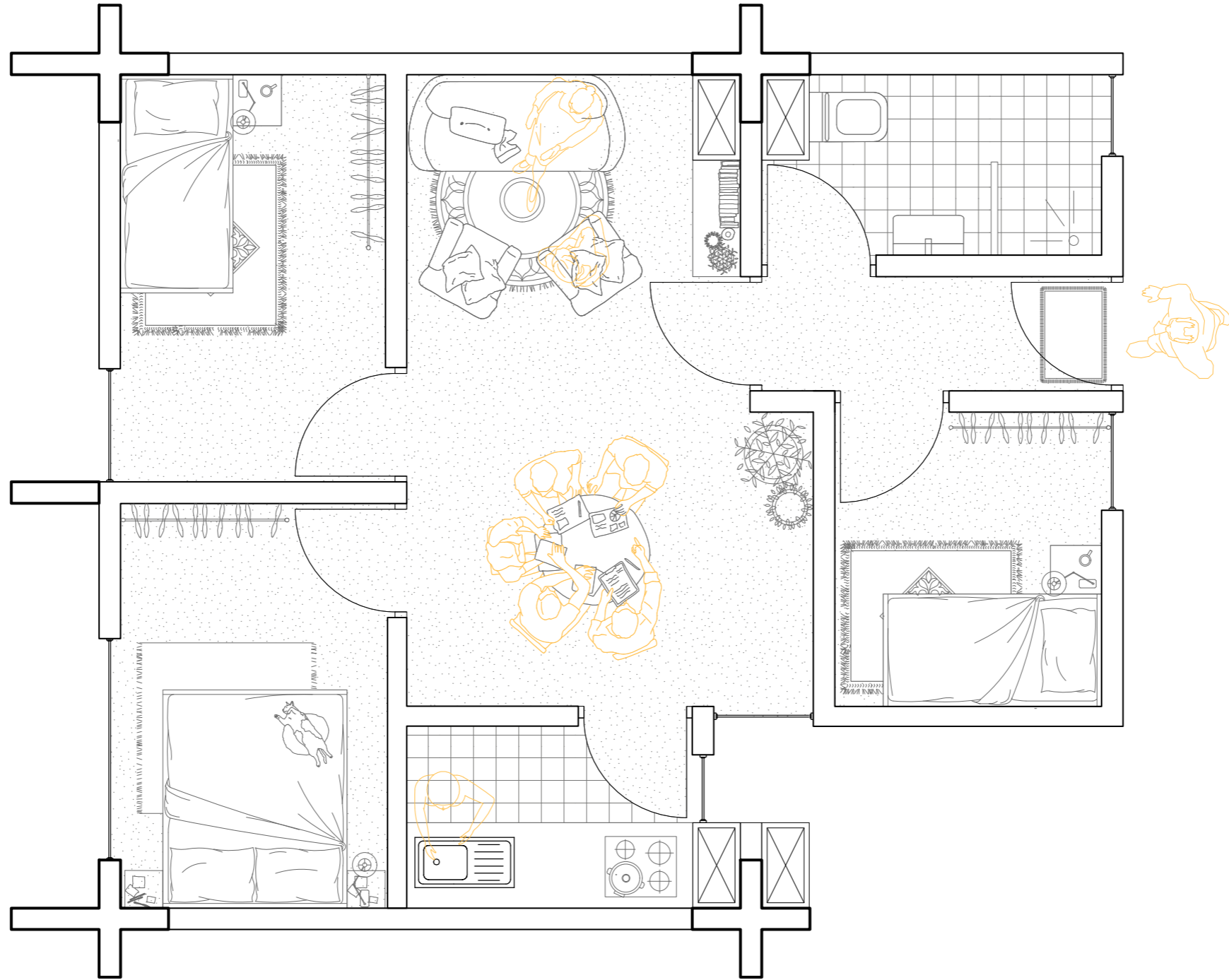


01. **UNIT:** MIDDLE INCOME



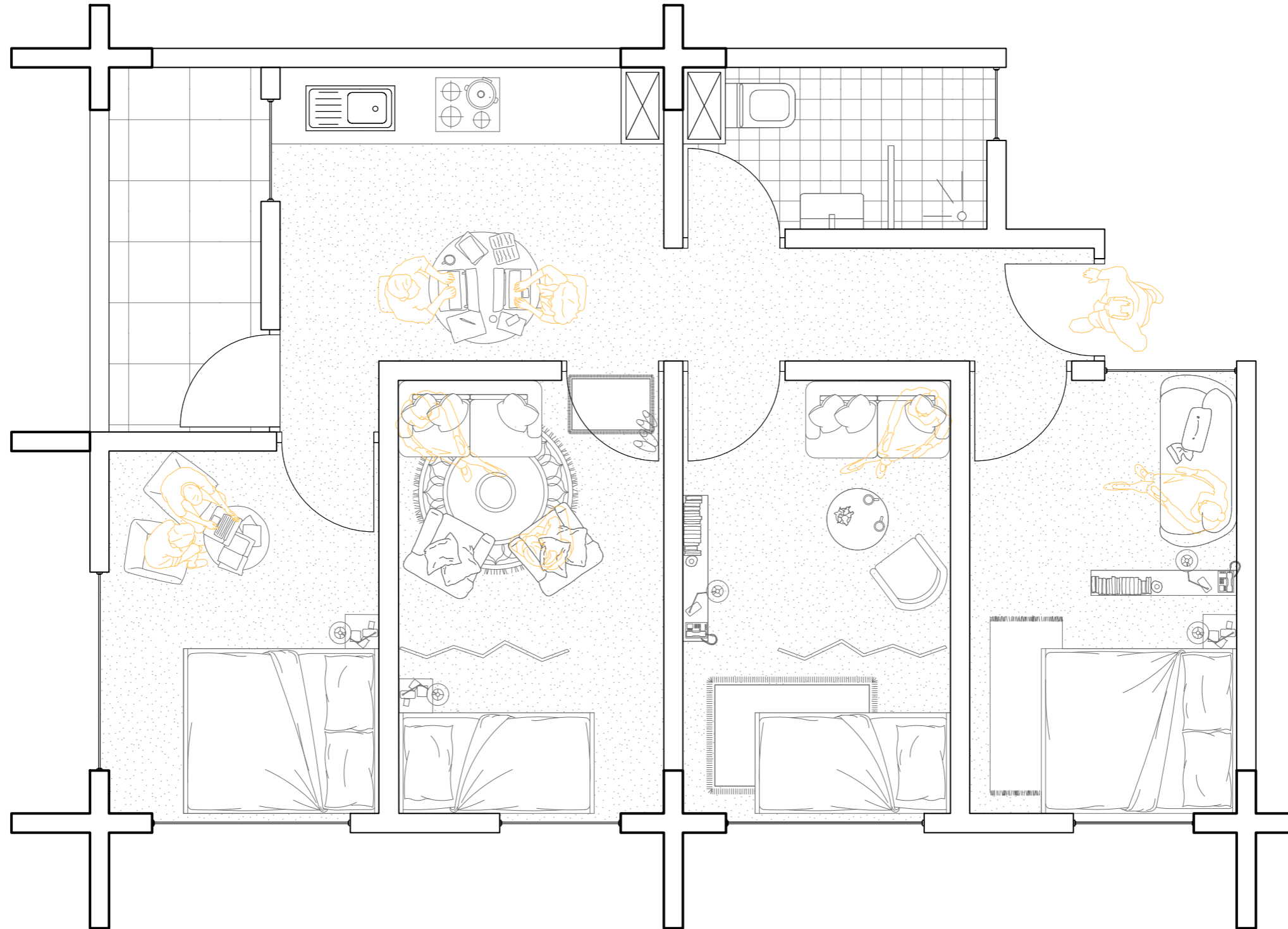
01. UNIT: LOW INCOME

Area: 65 m² excl.
6,5 m² front outside
space



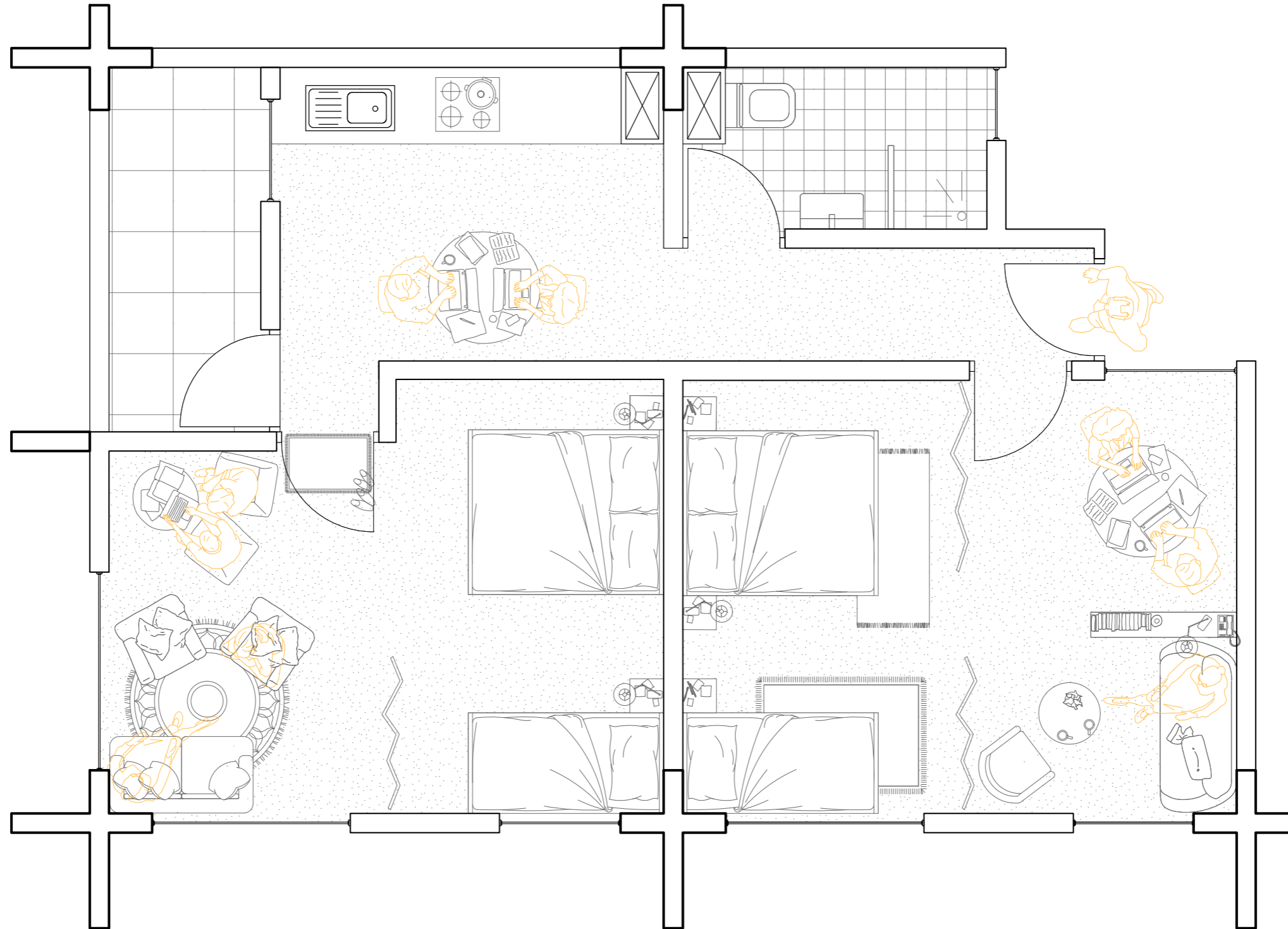
01. UNIT: CORNER LOW INCOME

Area: 13 m² excl. shared kitchen &
12 m² shared outside space (6 m² front, 6 m²
balcony)



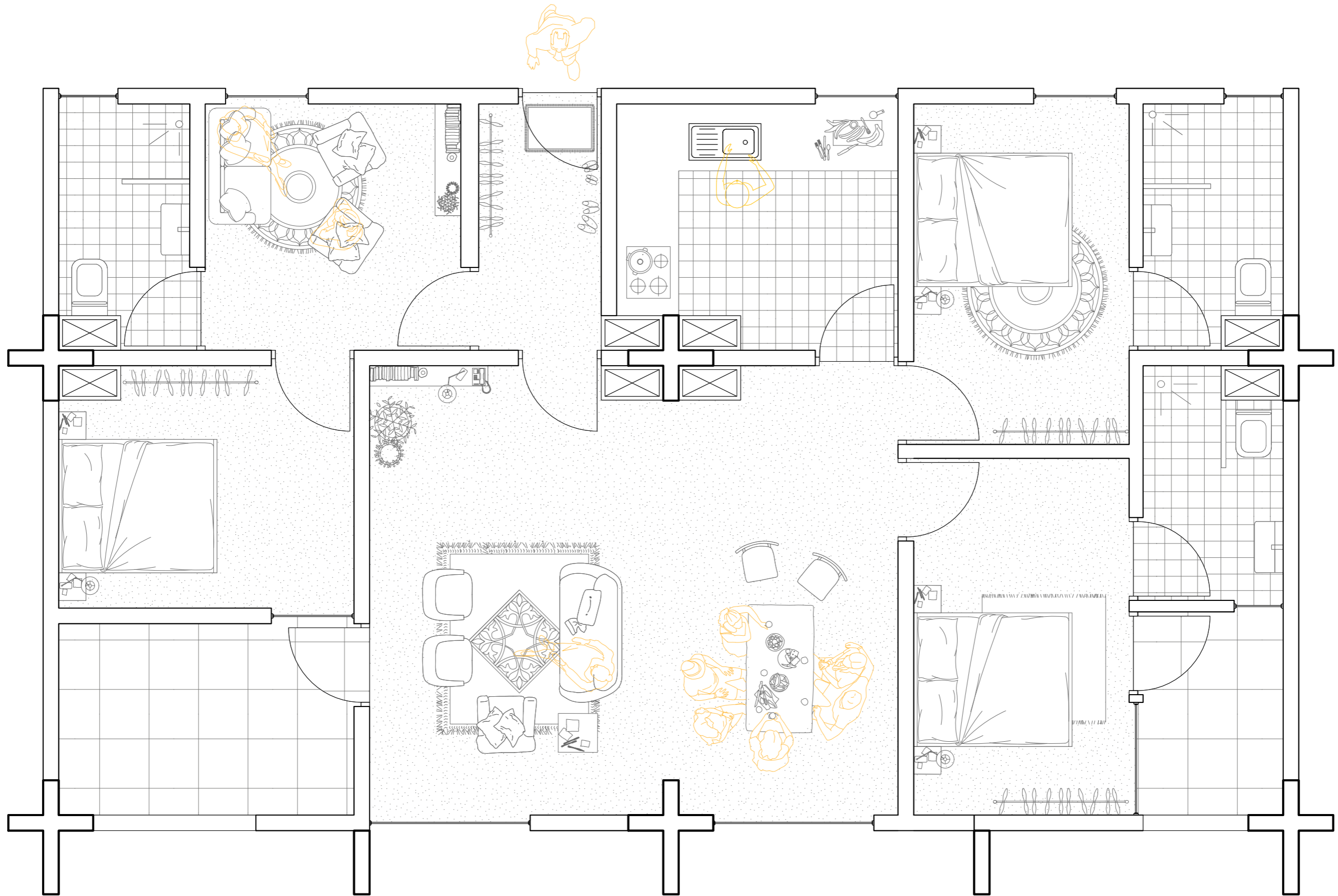
01. UNIT: CORNER LOW INCOME

Area: 26 m² excl. shared kitchen &
12 m² shared outside space (6 m² front, 6 m²
balcony)



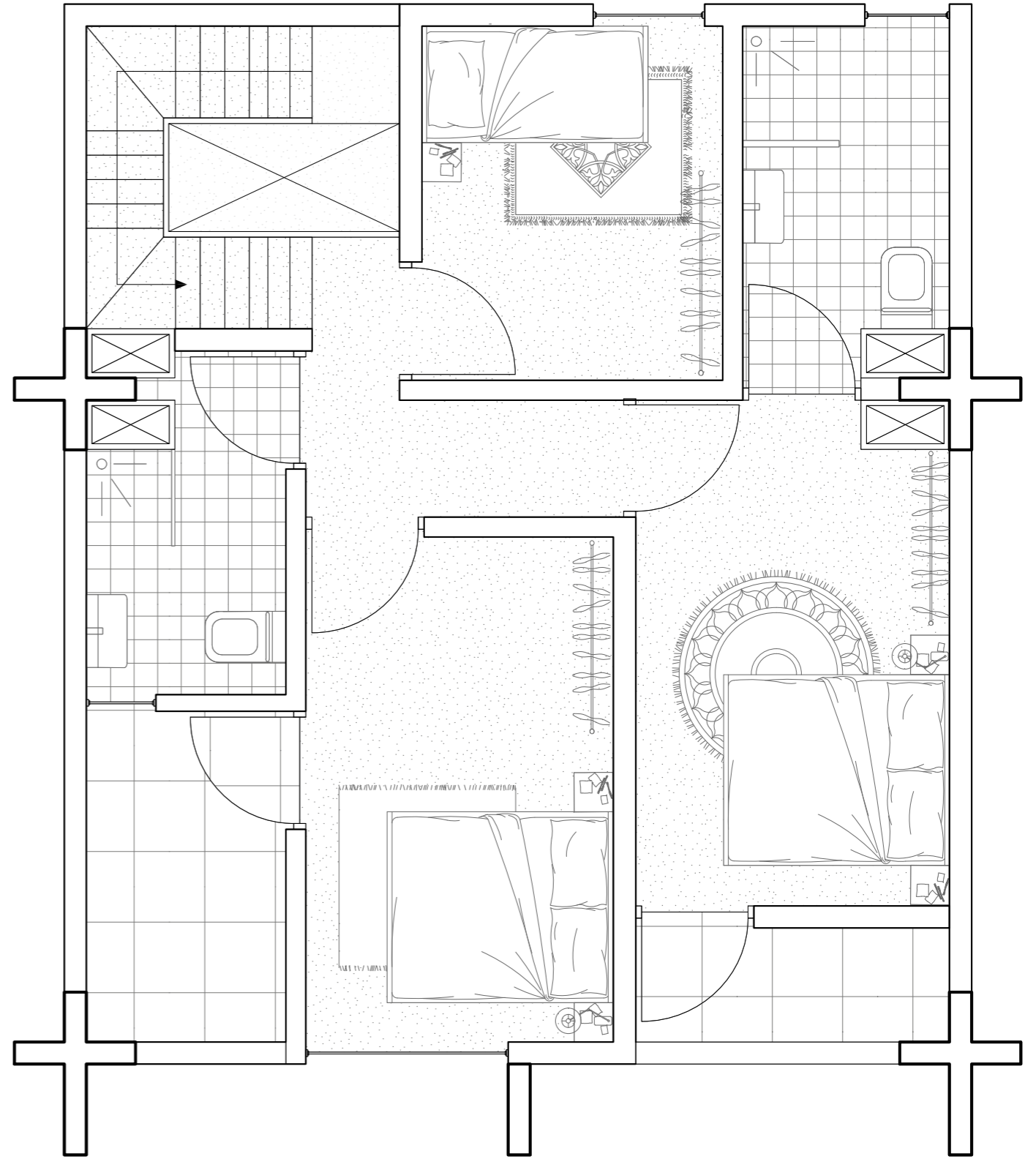
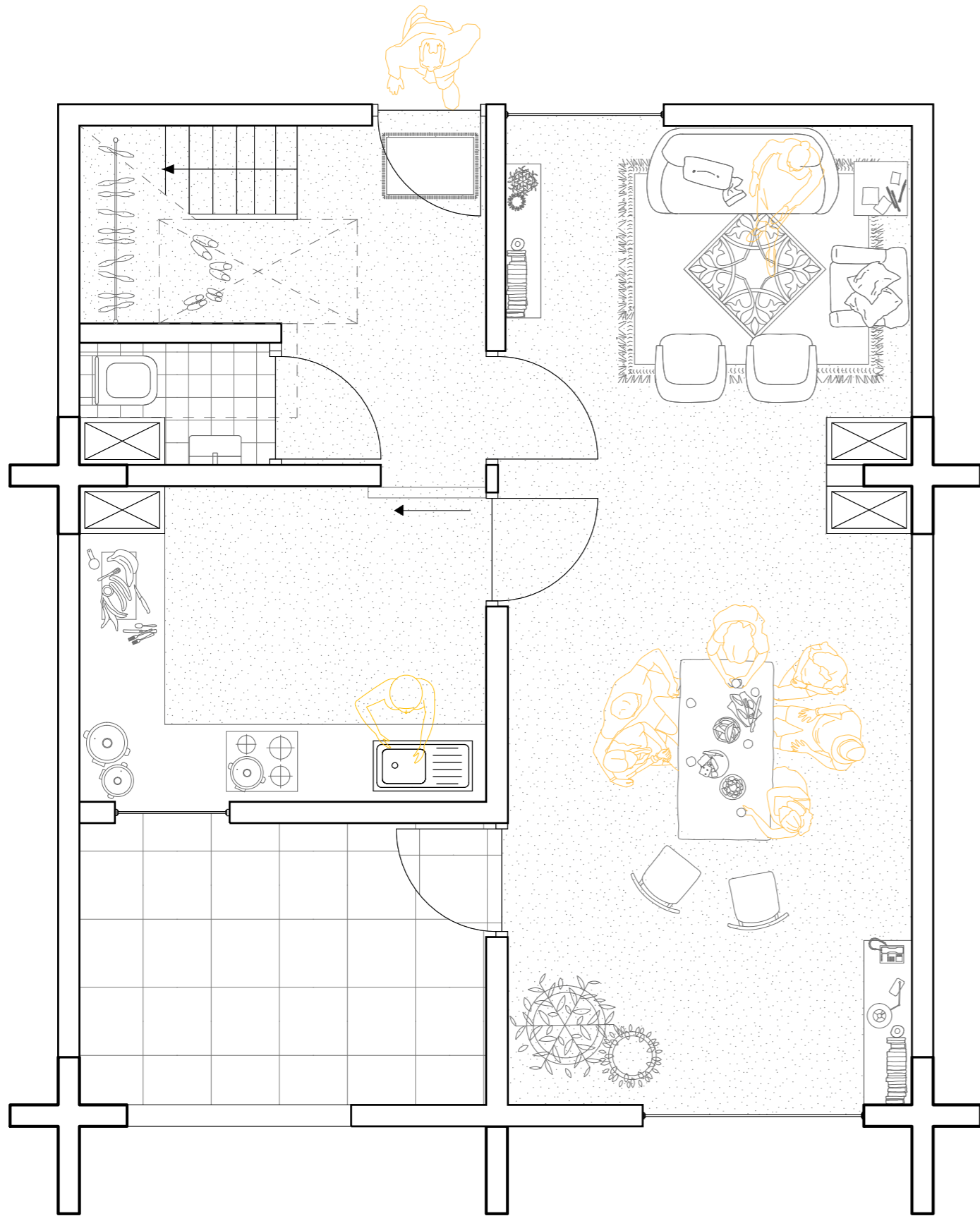
01. UNIT: HIGH INCOME

Area: 132 m² excl.
14 m² outside space
(9 m² balcony, 5 m² balcony)

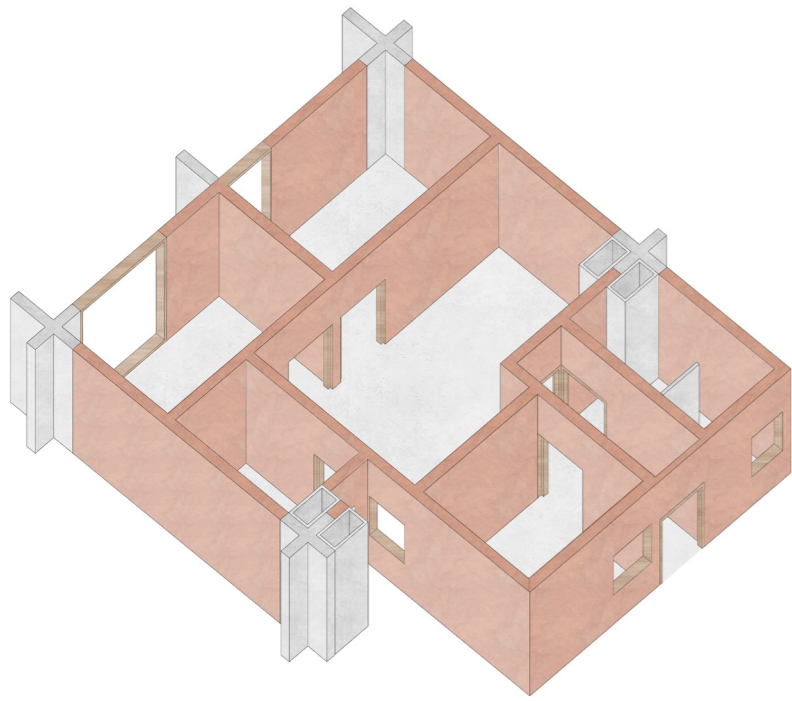


01. UNIT: HIGH INCOME

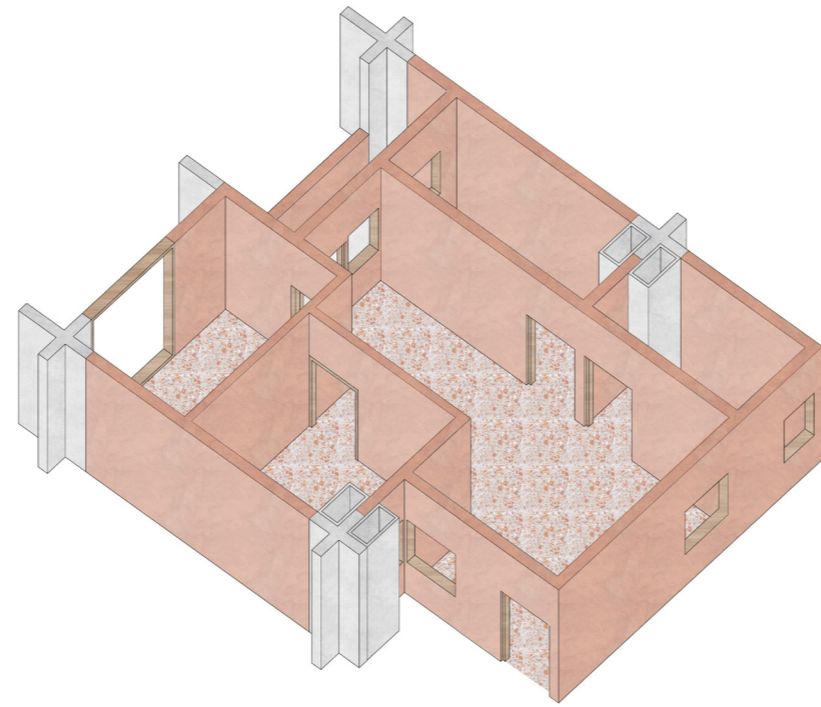
Area: 127,5 m² excl.
18,5 m² outside space (10 m² balcony,
5,5 m² balcony, 3 m² balcony)



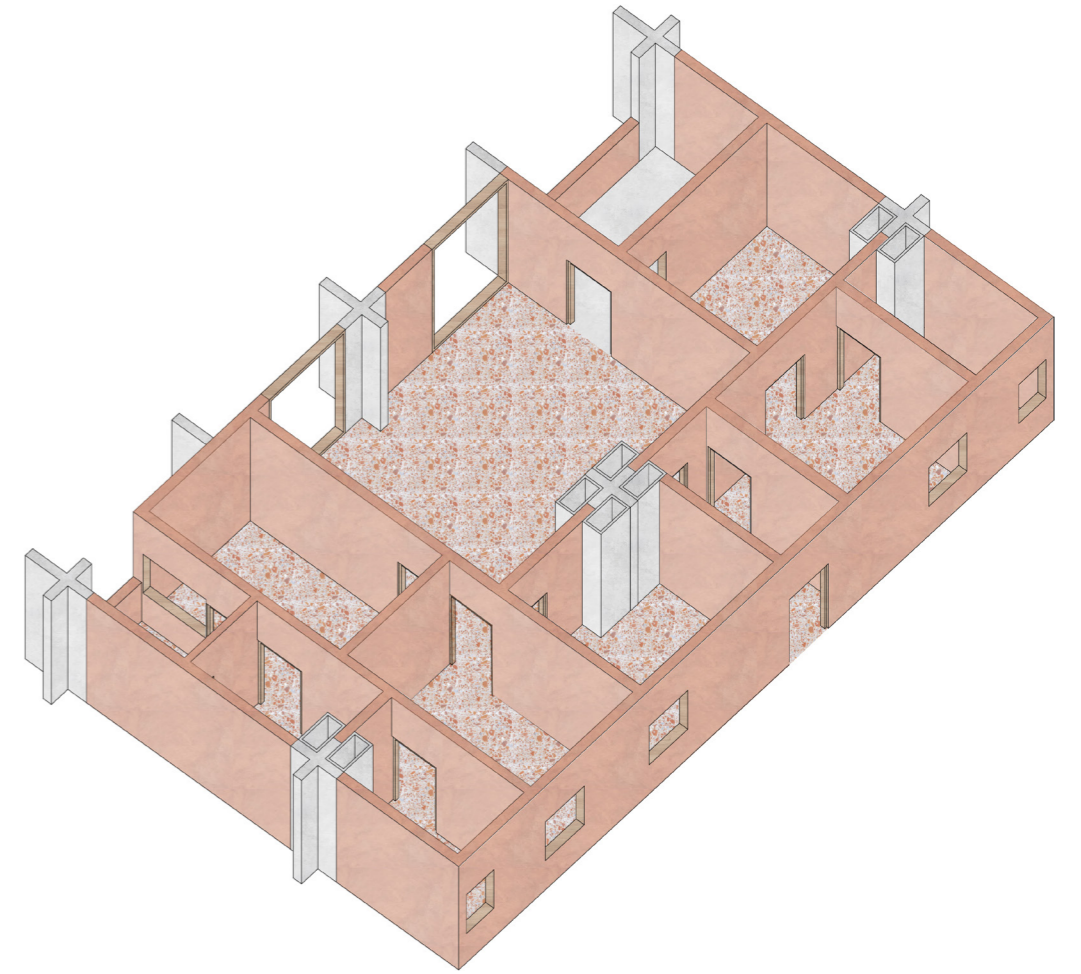
01. UNIT



Low income



Middle income

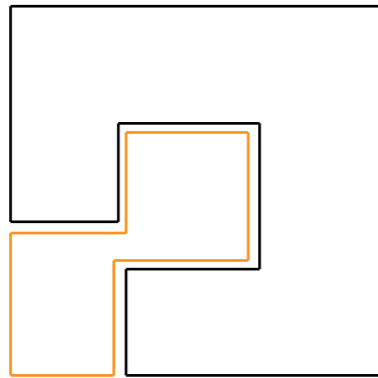


High income

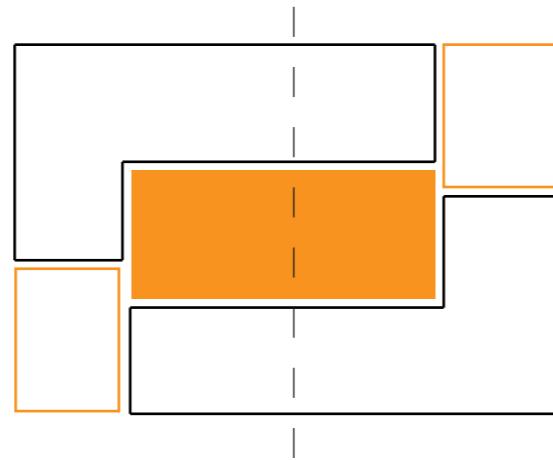
02. **CLUSTER**

02. CLUSTER: STRATEGY TRANSLATION URBAN

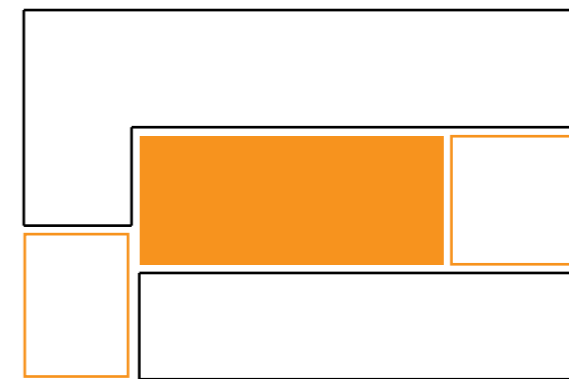
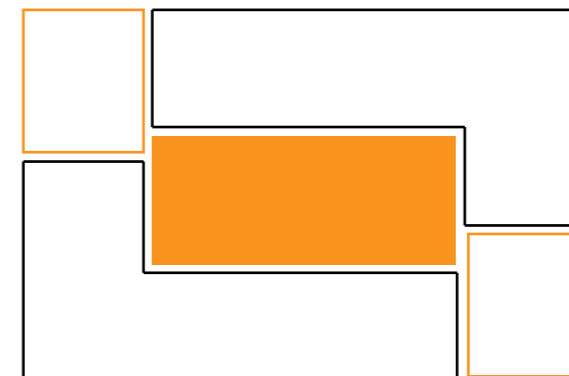
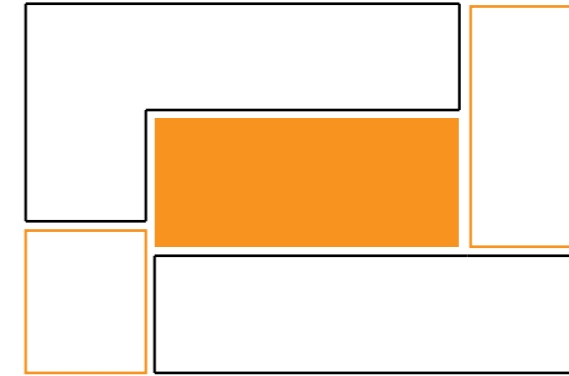
1. Starting point



2. Courtyard & openings

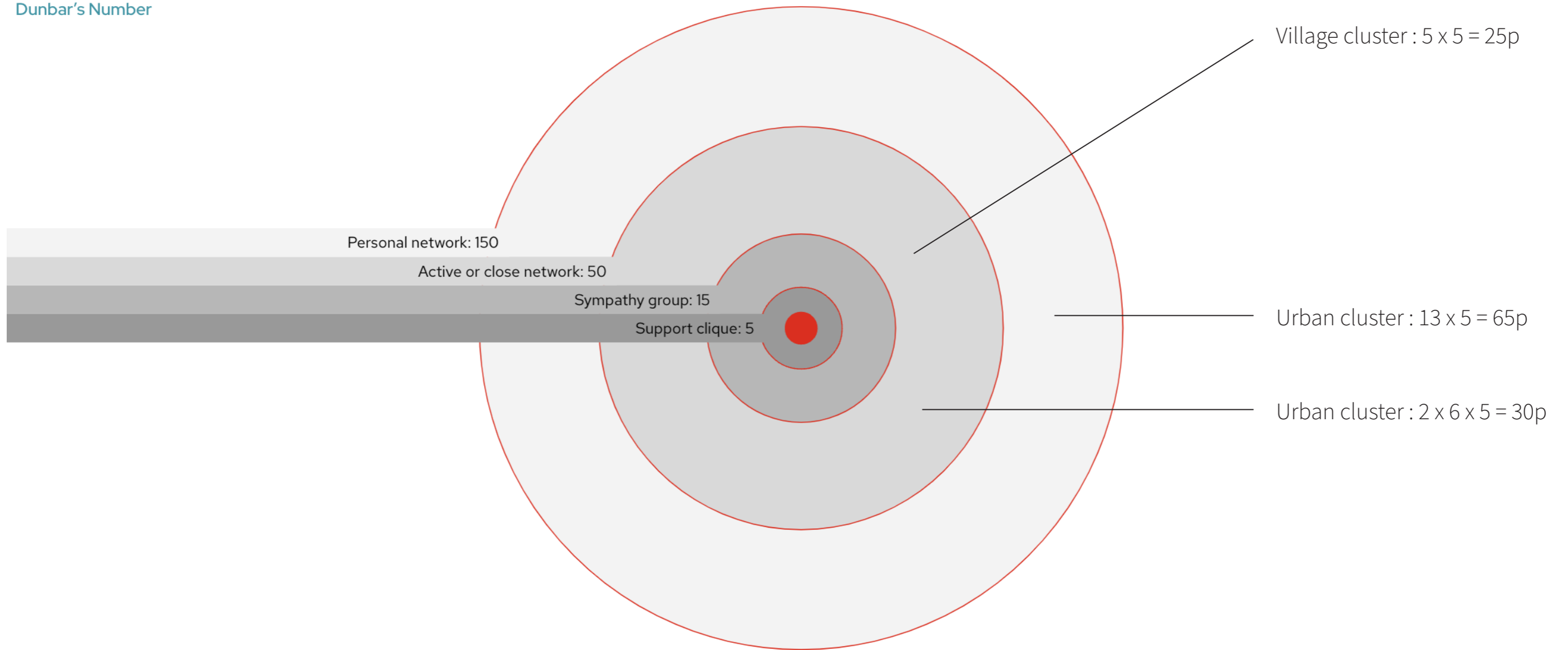


3. Variations: diverse architecture

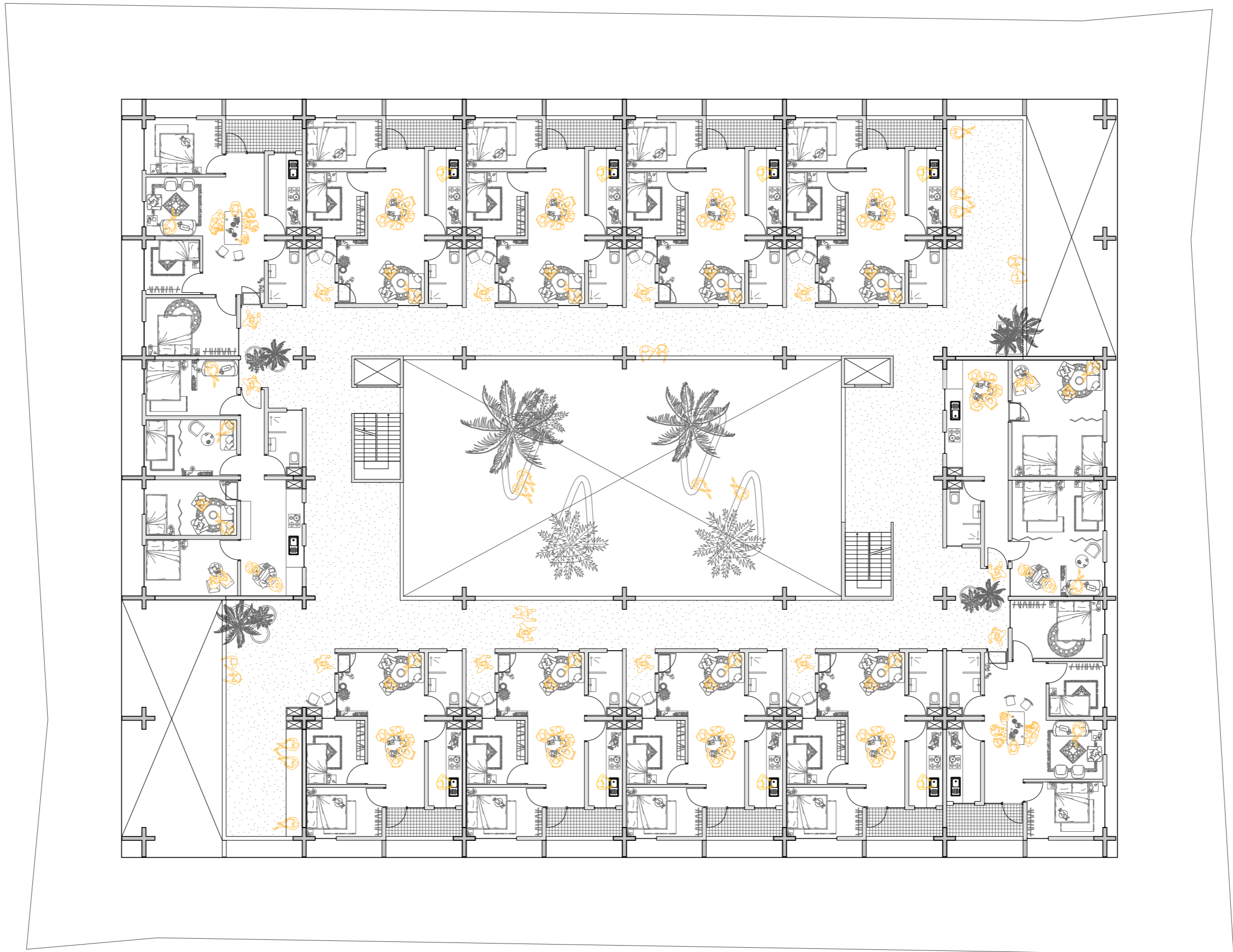


02. RESEARCH: COMMUNITY: DUNBAR THEORY

Dunbar's Number



02. CLUSTER: 3RD FLOOR MIDDLE INCOME



02. CLUSTER: COMMUNAL SPACE



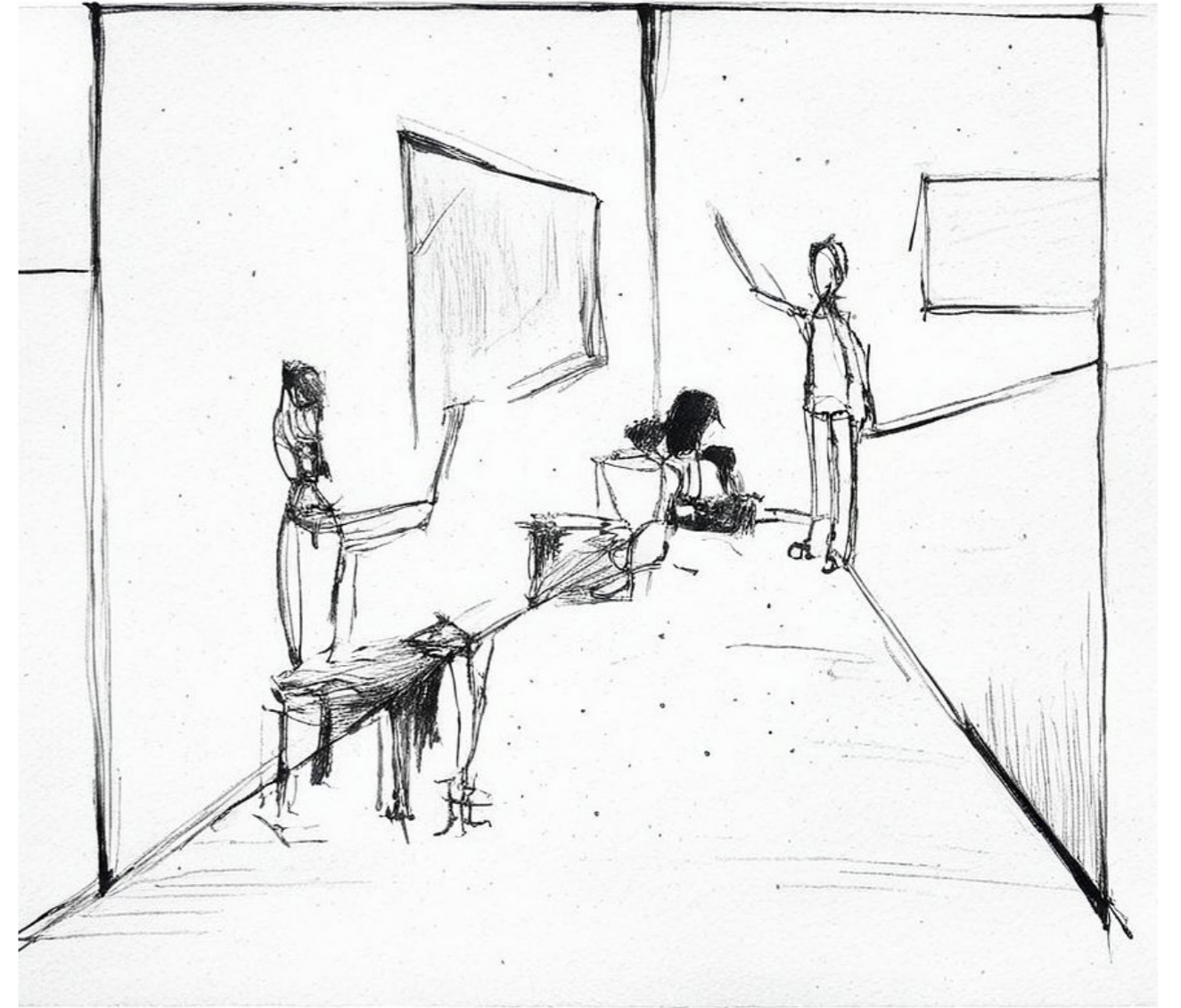
02. CLUSTER: COMMUNAL SPACE



02. CLUSTER: CHARACTER OF VILLAGE IN URBAN CONTEXT; COMMUNITY



Community with compound

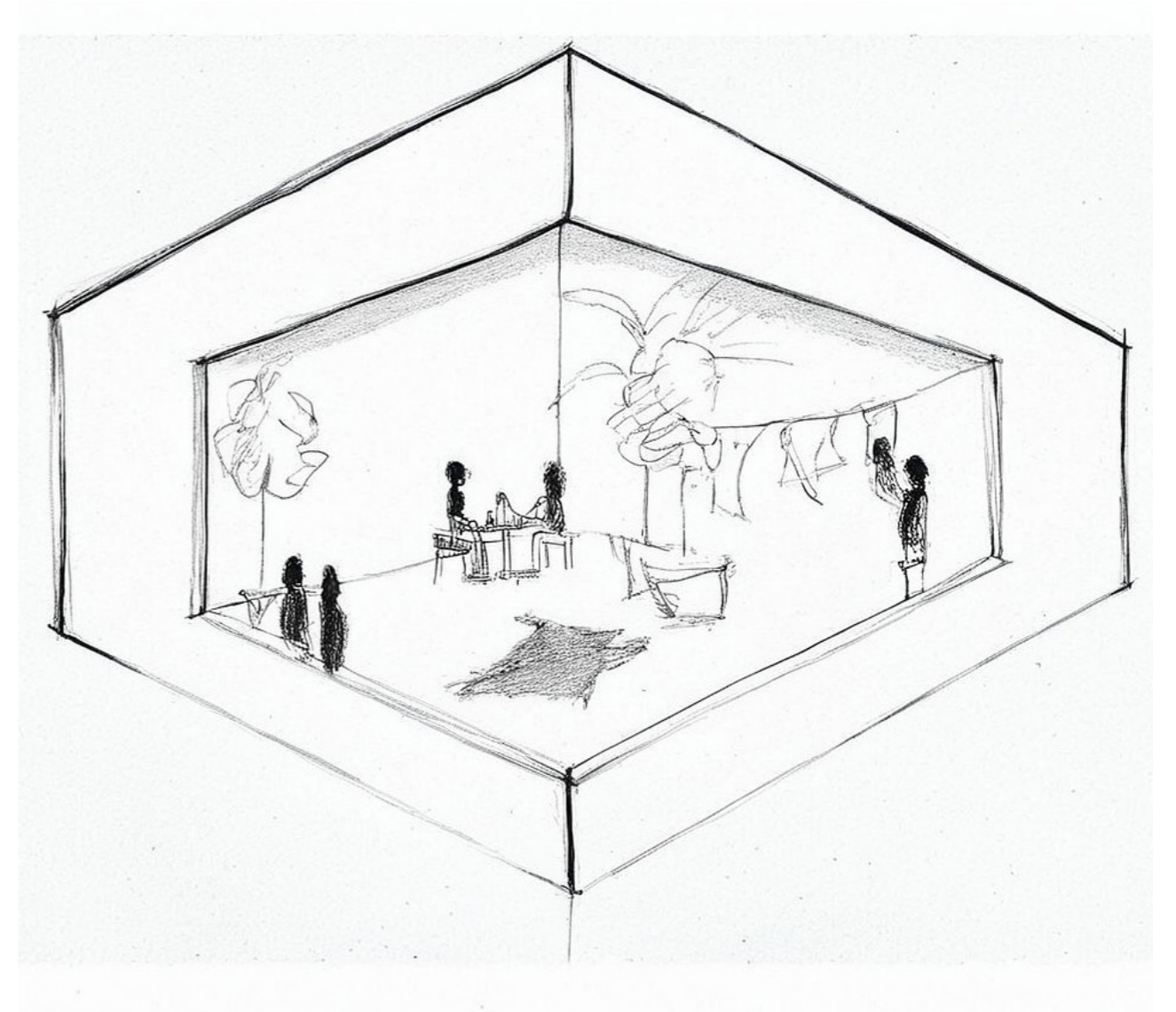


Community with cluster

02. CLUSTER: CHARACTER VILLAGE IN THE URBAN CONTEXT: GREEN COMMUNAL SPACE

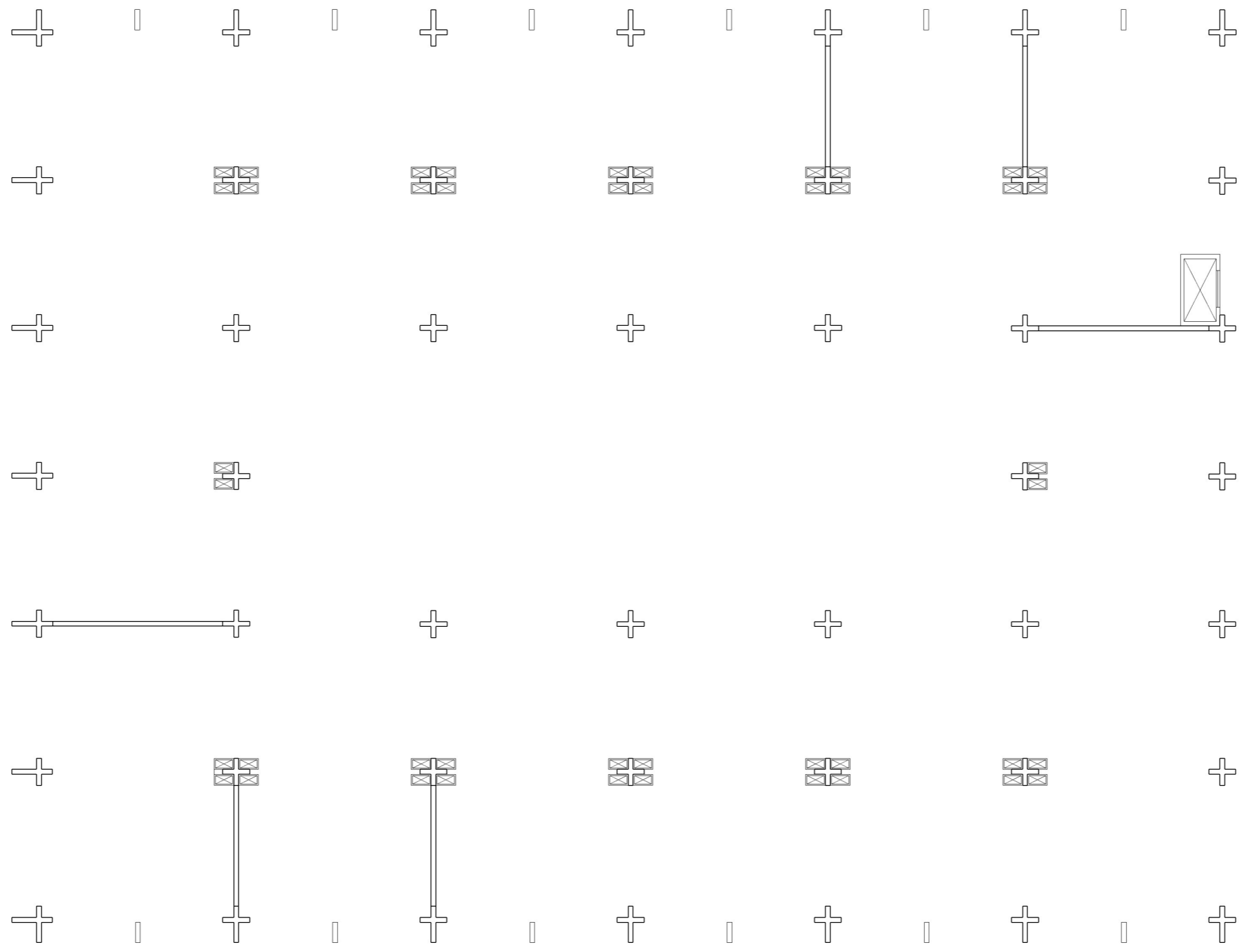


Communal area in compound

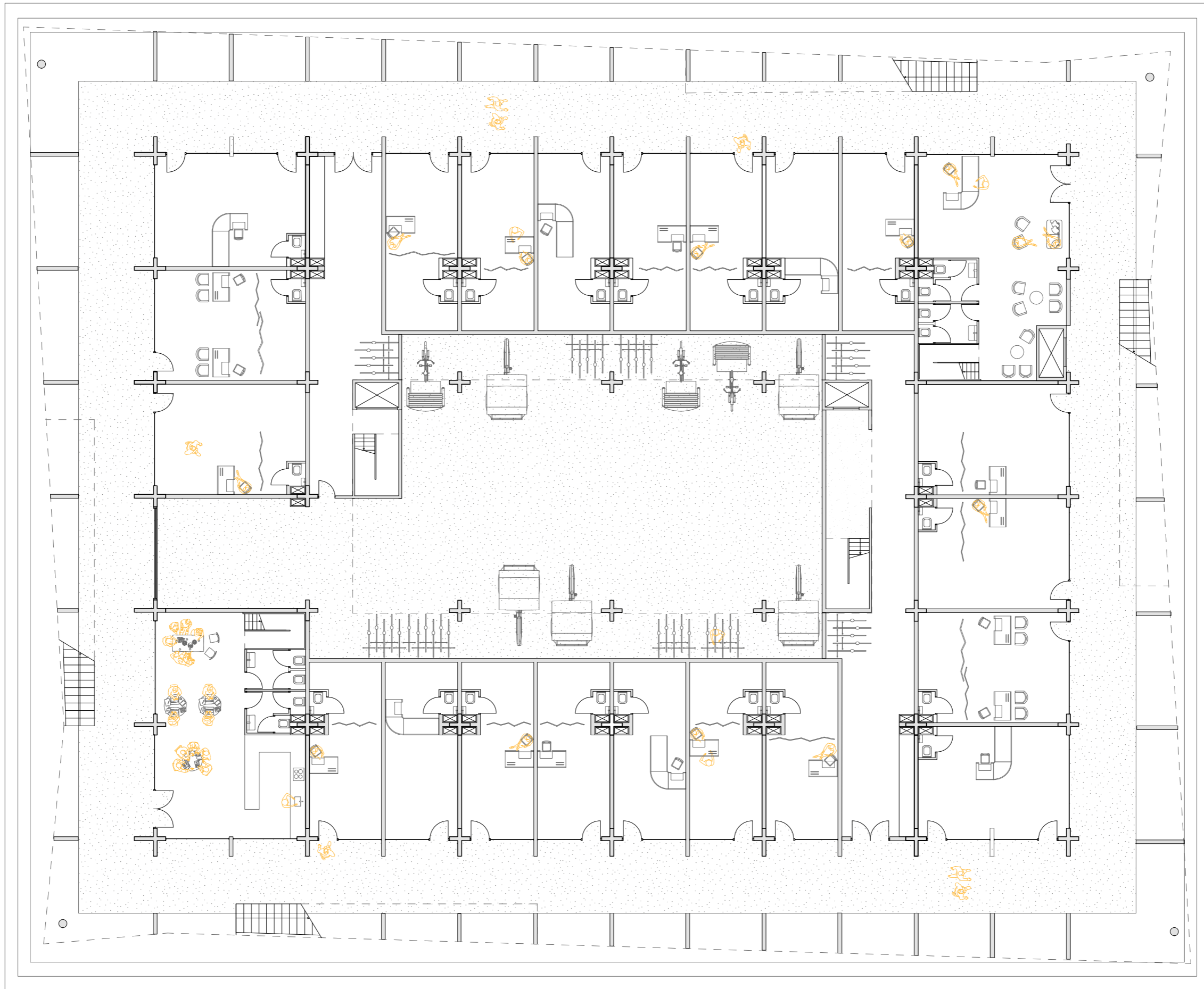


Communal area in corner of cluster

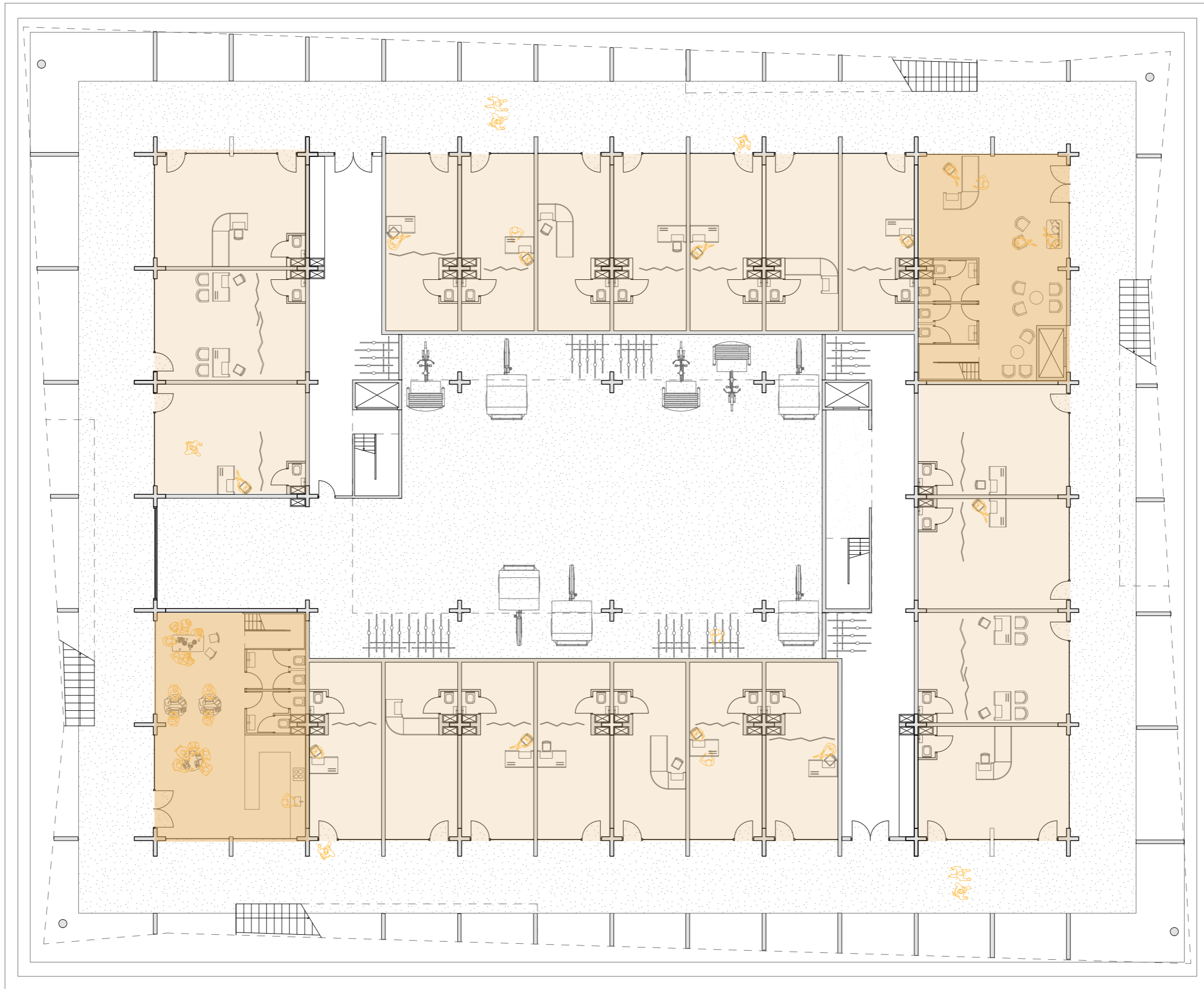
02. CLUSTER



02. CLUSTER: GROUND FLOOR PLAN

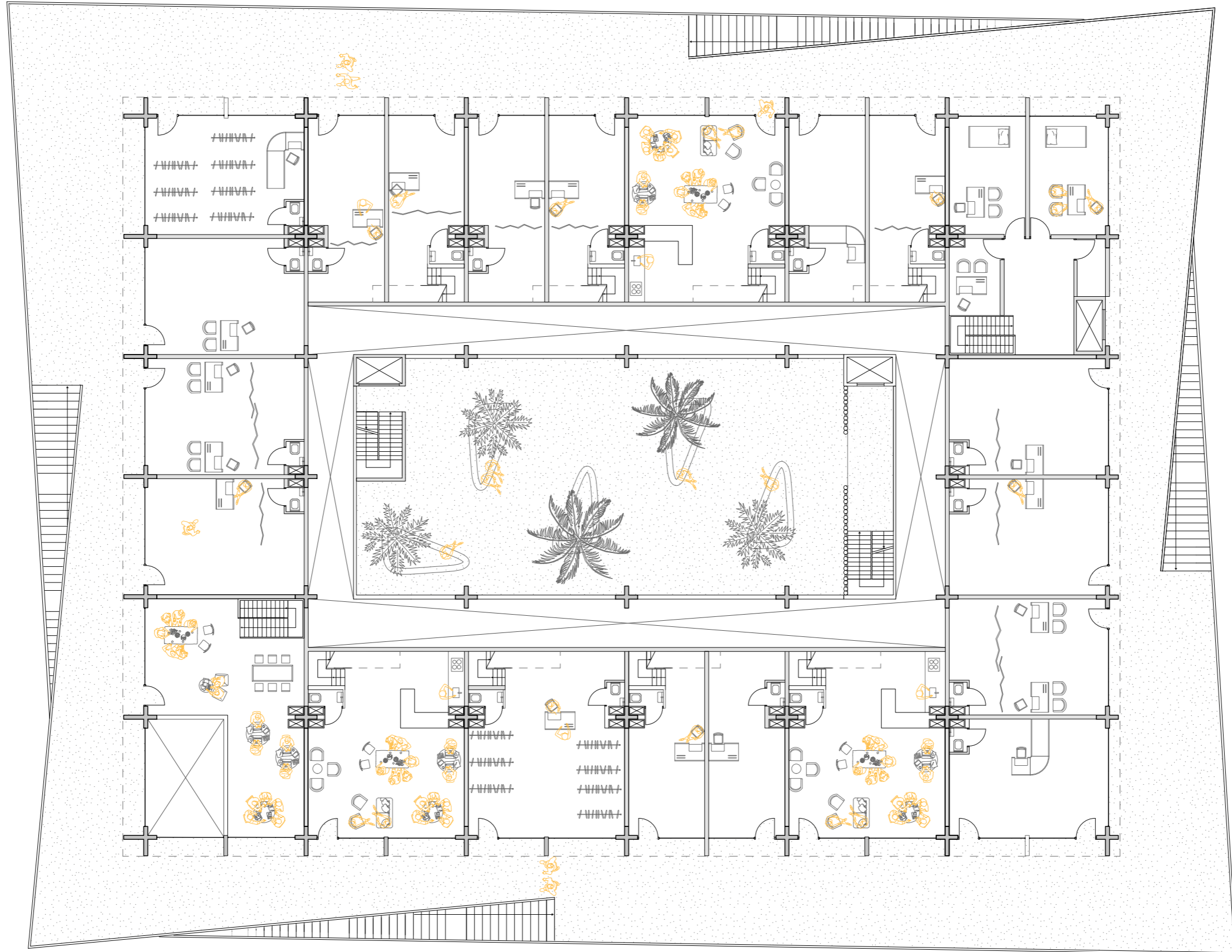


02. CLUSTER: GROUND FLOOR PLAN



- Duplex amities
- One story shops

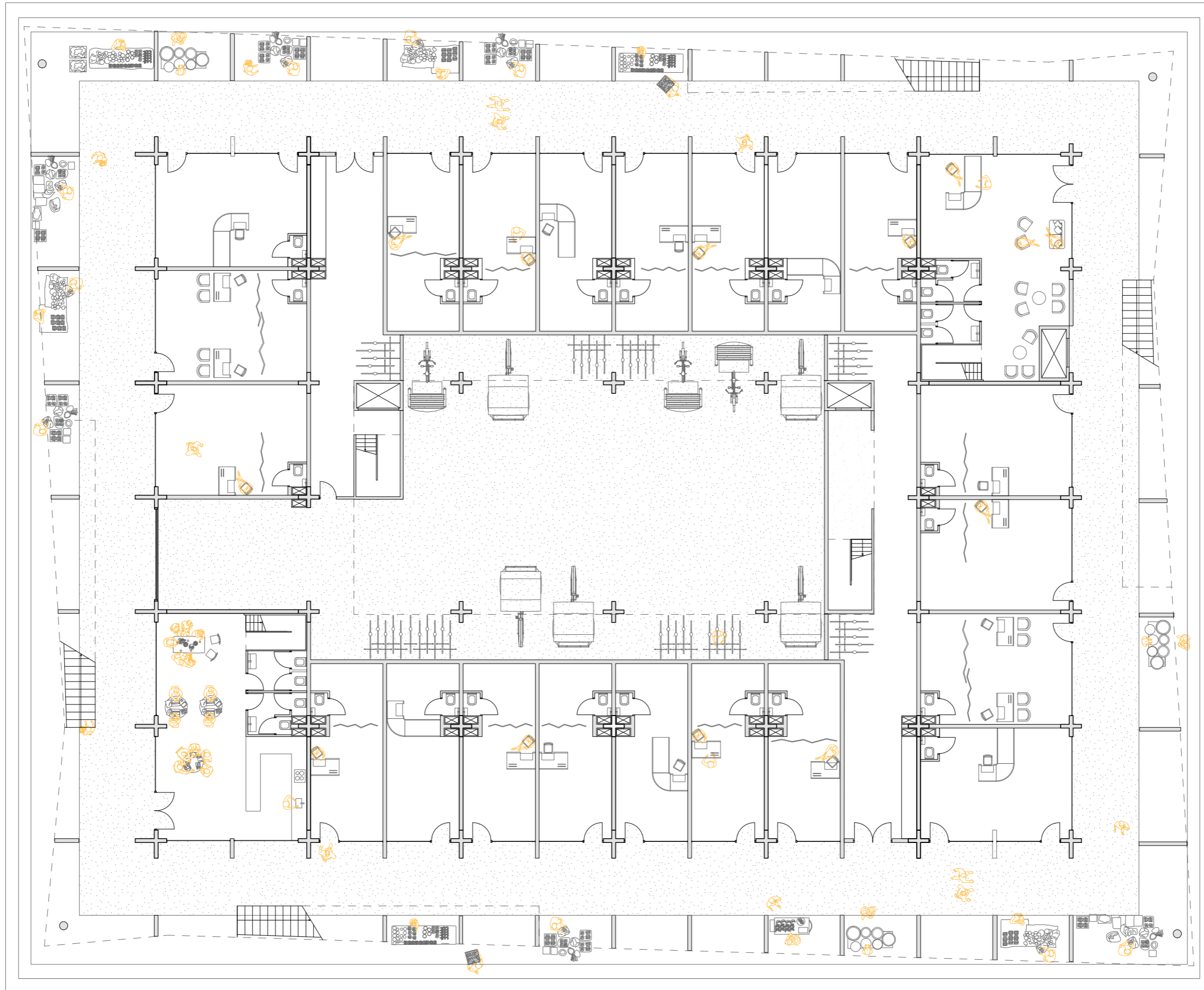
02. CLUSTER: 1ST FLOOR PLAN



02. CLUSTER



02. CLUSTER: GROUND FLOOR PLAN



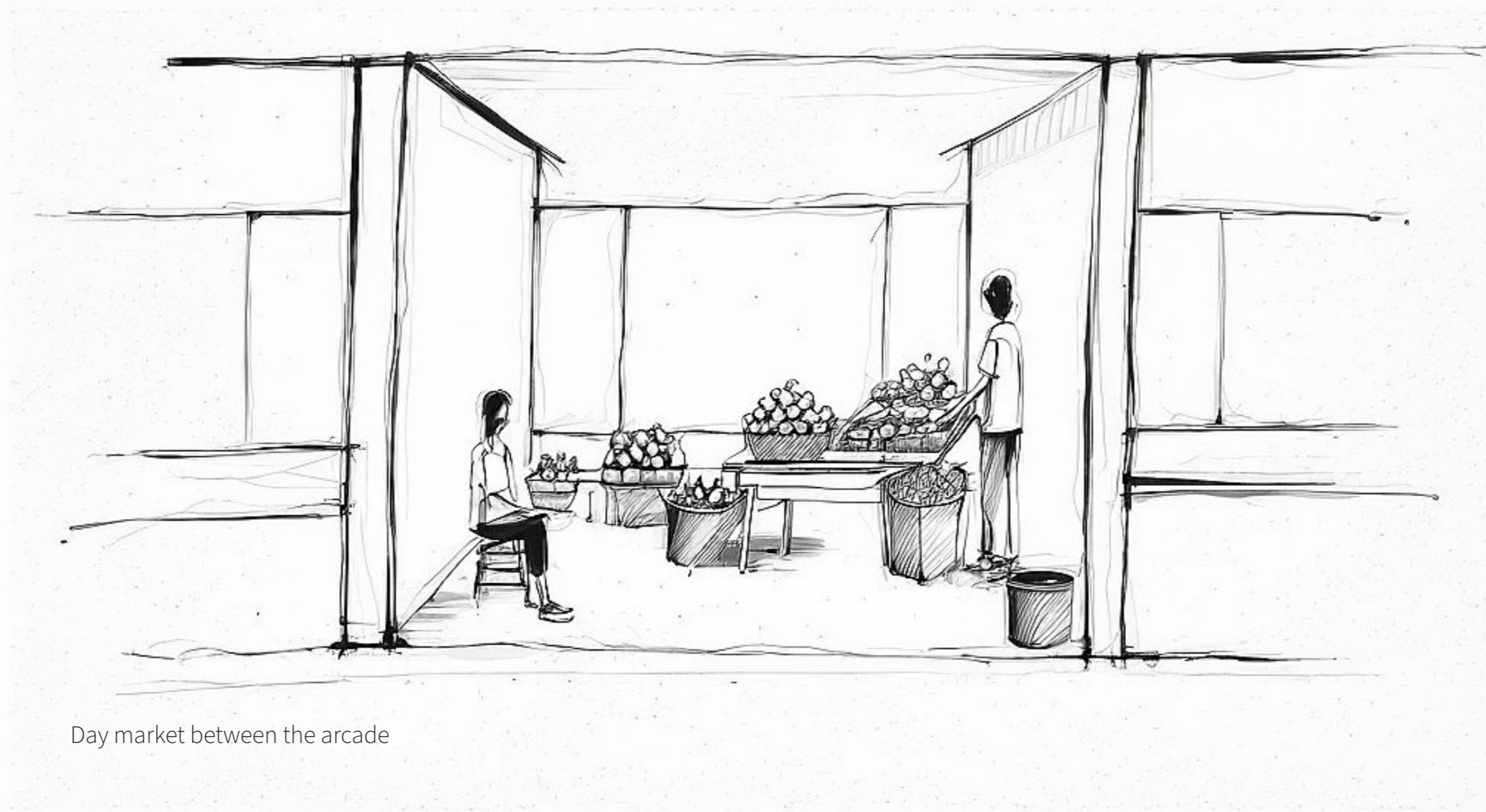
02. CLUSTER: PATTERN OF HABITS



02. CLUSTER: MARKET DAY

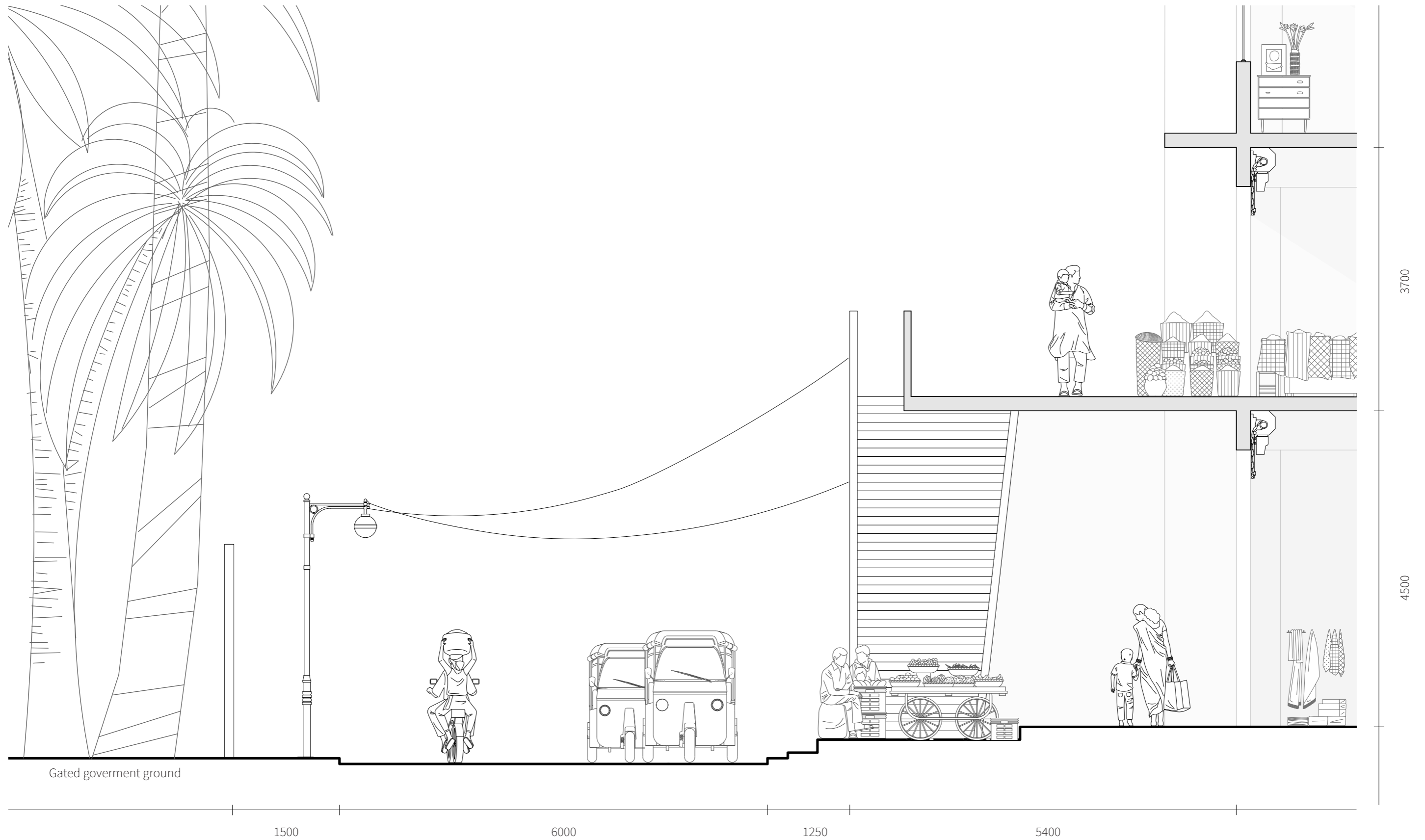
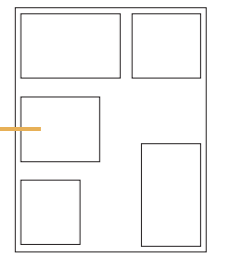


02. CLUSTER: MARKET DAY



Day market between the arcade

02. CLUSTER: STREETPROFIE MARKET DAY



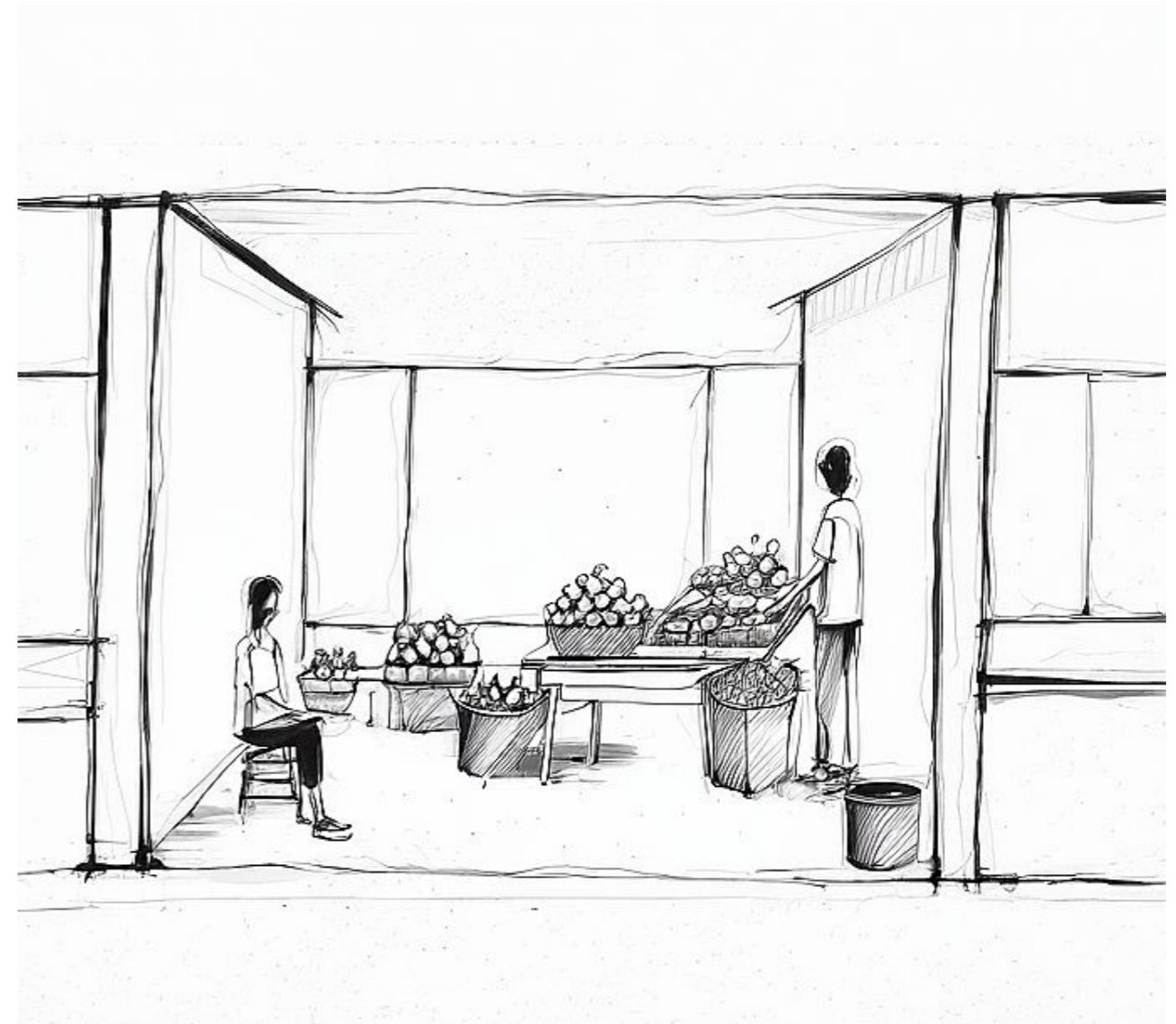
02. CLUSTER: IMPRESSION MARKET DAY



02. CLUSTER: CHARACTER OF VILLAGE IN URBAN CONTEXT: SHOPS



Small shop in the village

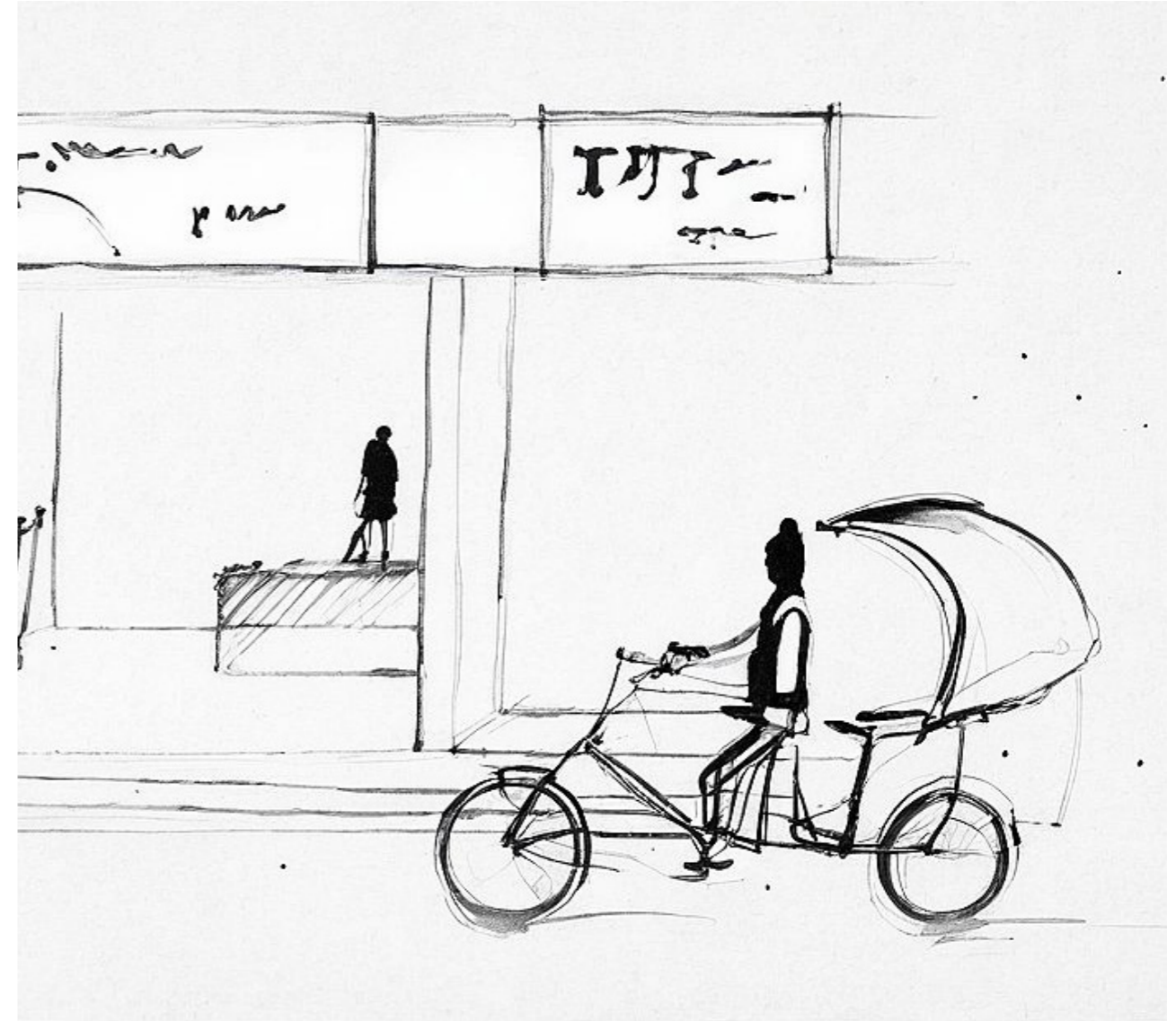


Multiple different shops at the site

02. CLUSTER: CHARACTER OF VILLAGE IN URBAN CONTEXT: WORK

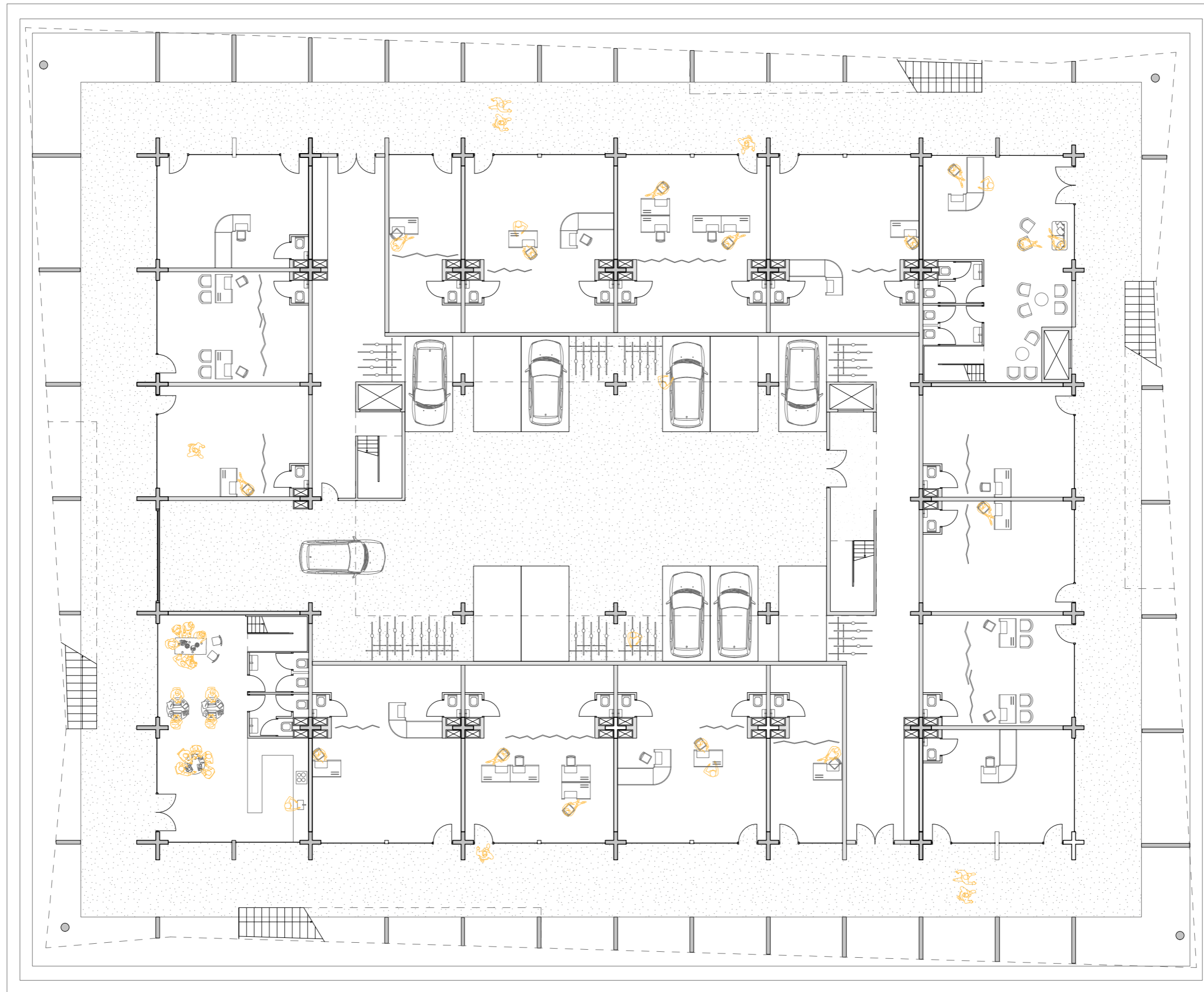


Labour market

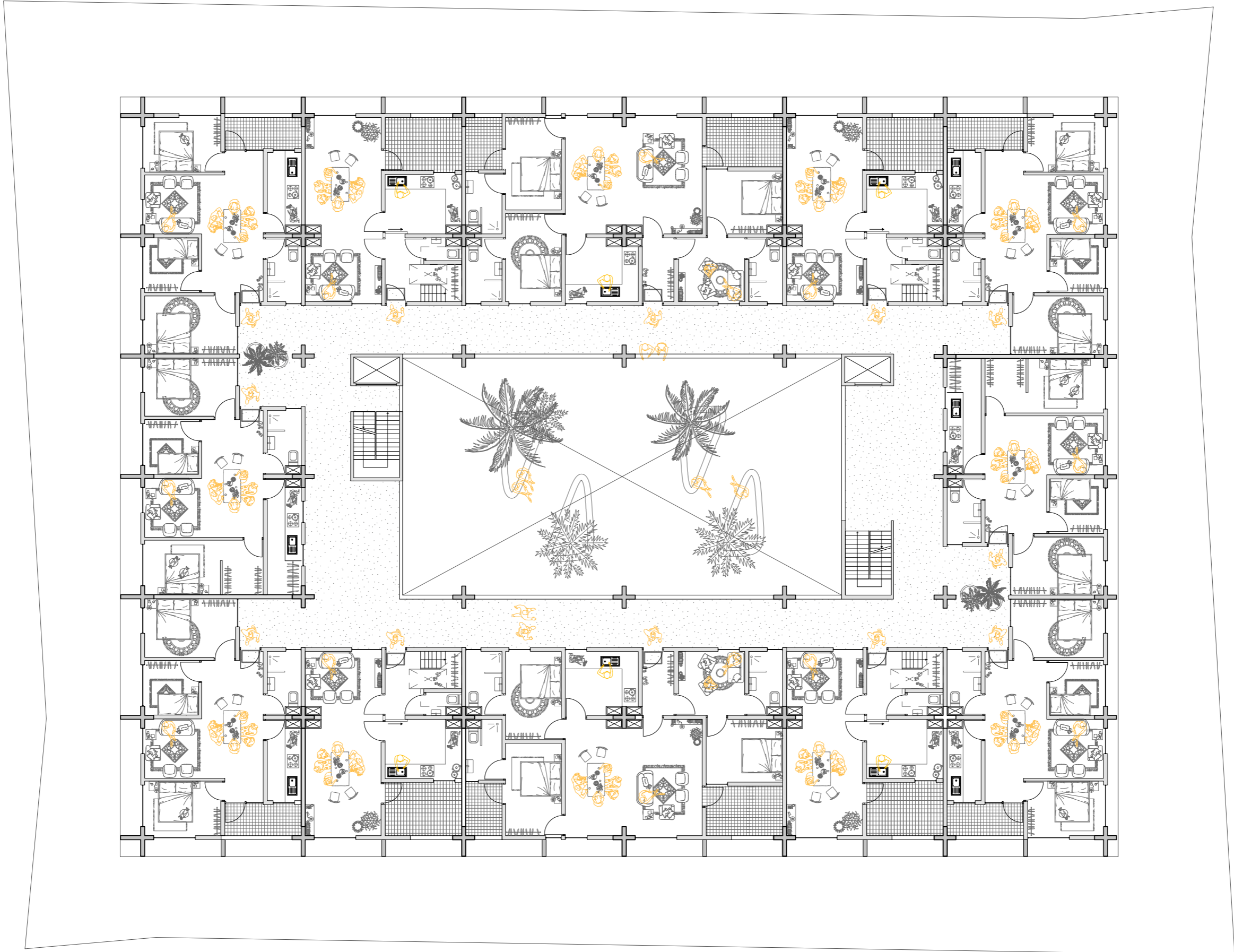


Shop assistant or rickshaw driver

02. CLUSTER: GROUND FLOOR PLAN HIGH INCOME



02. CLUSTER: 3RD FLOOR HIGH INCOME

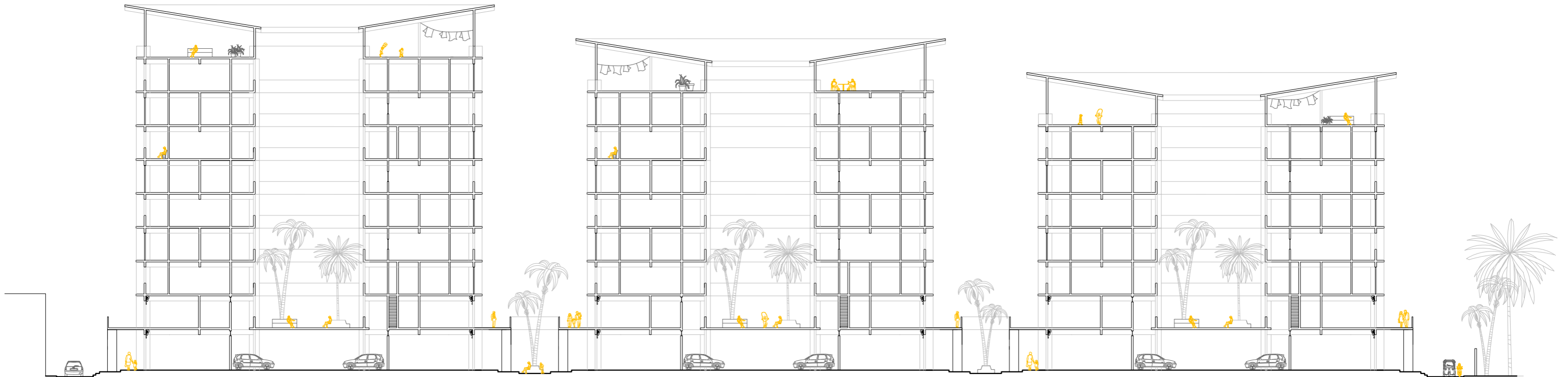


03. NEIGHBOURHOOD

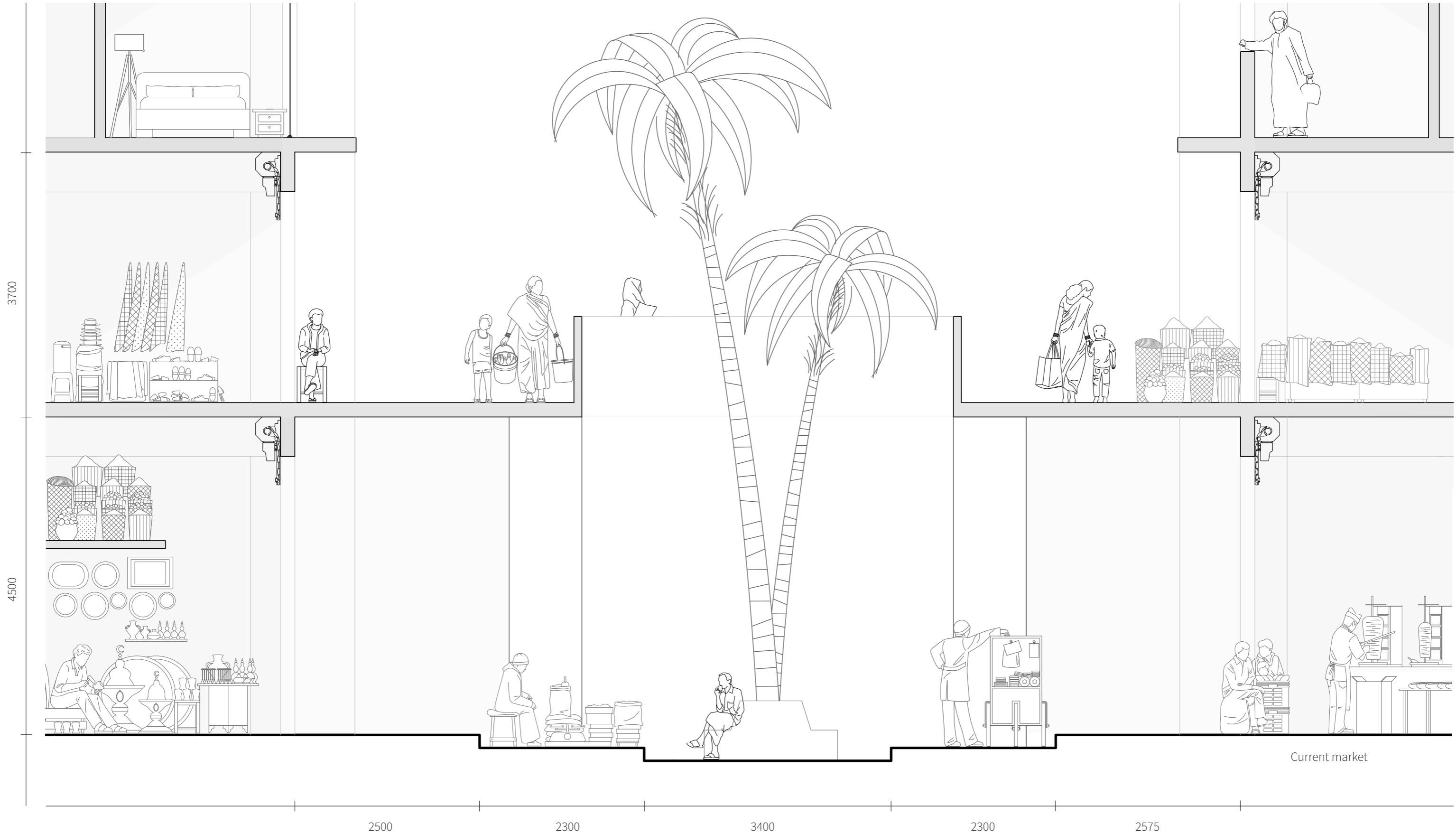
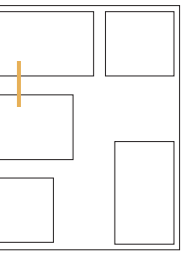
03. NEIGHBOURHOOD: GROUND FLOOR PLAN



03. NEIGHBOURHOOD: PLOT SECTION



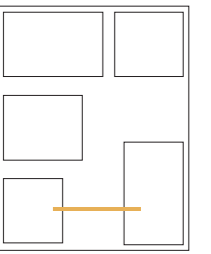
03. NEIGHBOURHOOD: STREETPROFILE MARKET PLATFORM



03. NEIGHBOURHOOD: PLOT SECTION



03. NEIGHBOURHOOD: STREETPROFILE MIDDLE PARK



03. NEIGHBOURHOOD



03. NEIGHBOURHOOD: MASTERPLAN



03. NEIGHBOURHOOD: CHARACTER OF VILLAGE IN URBAN CONTEXT: GREENARY



Green environment

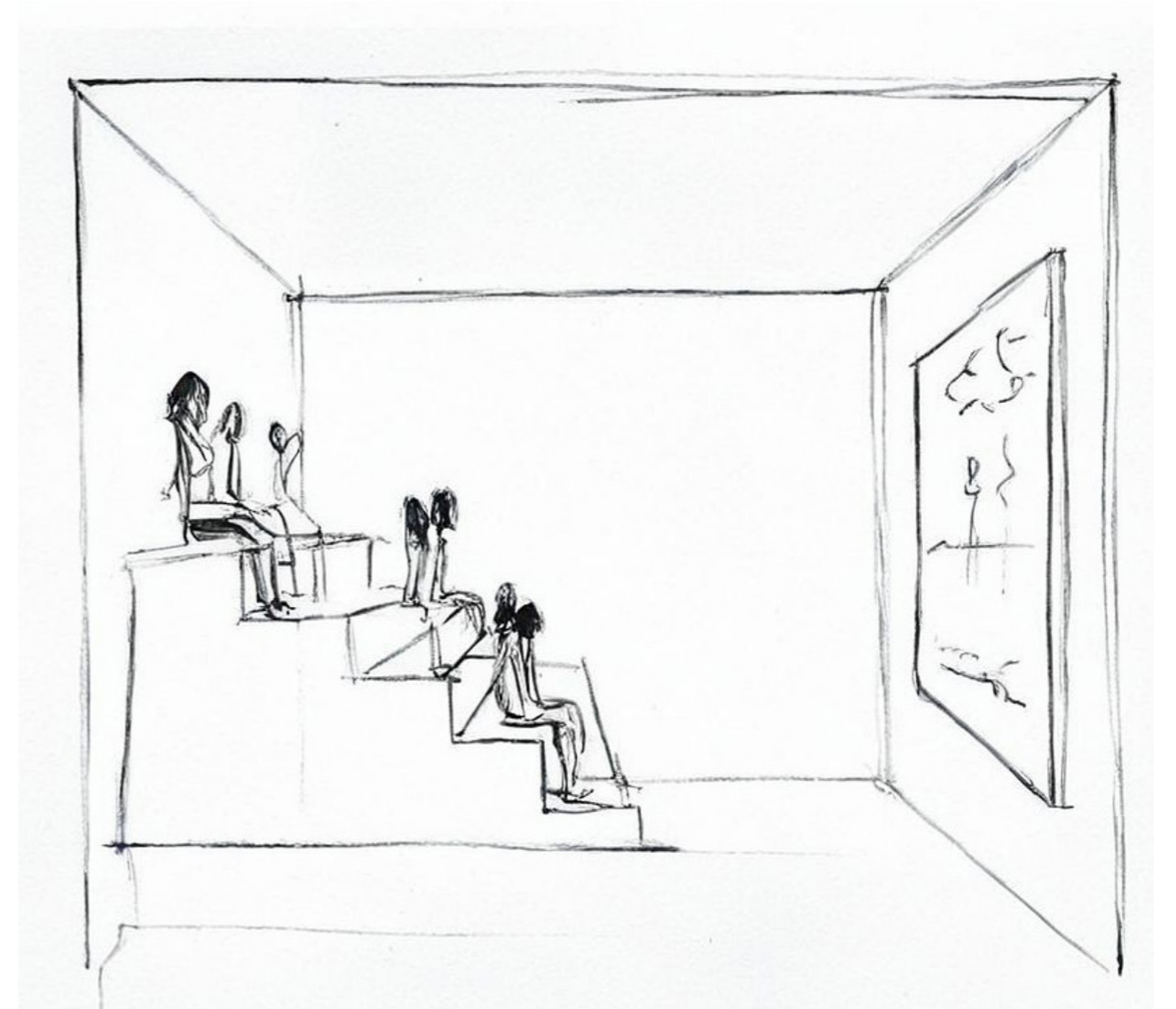


Green river boulevard

03. NEIGHBOURHOOD: CHARACTER OF VILLAGE IN URBAN CONTEXT; COMMUNITY ACTIVITIES



Pub night

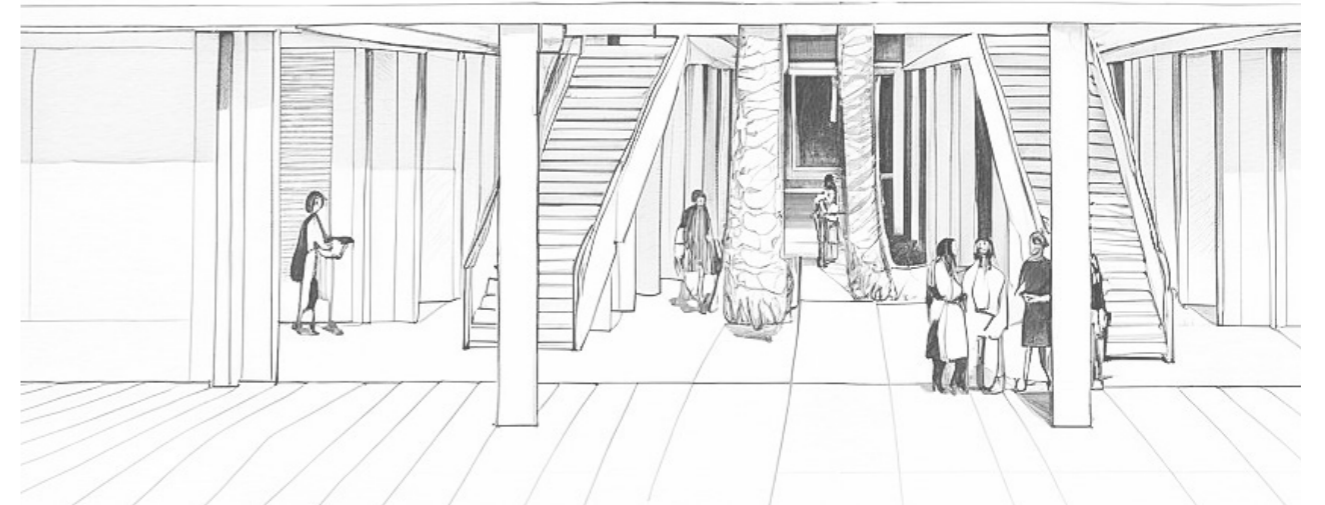


Cinema night

03. NEIGHBOURHOOD: CHARACTER OF VILLAGE IN URBAN CONTEXT: HUMAN SCALE



Low rise building



Platform with middle rise building

04. MATERIALITY

04. MATERIALITY: STRATEGY

“Although with the best intentions, these fly-in solutions might help a little bit but are **not sustainable**. It is often said that, in spite of the enthusiasm and goodwill of different international agencies that come in to provide assistance, these efforts are based on charity and are mostly focused on building housing with **expensive materials and techniques** (which also have a very high carbon footprint). They try to create a holistic model to help people rebuild their lives.

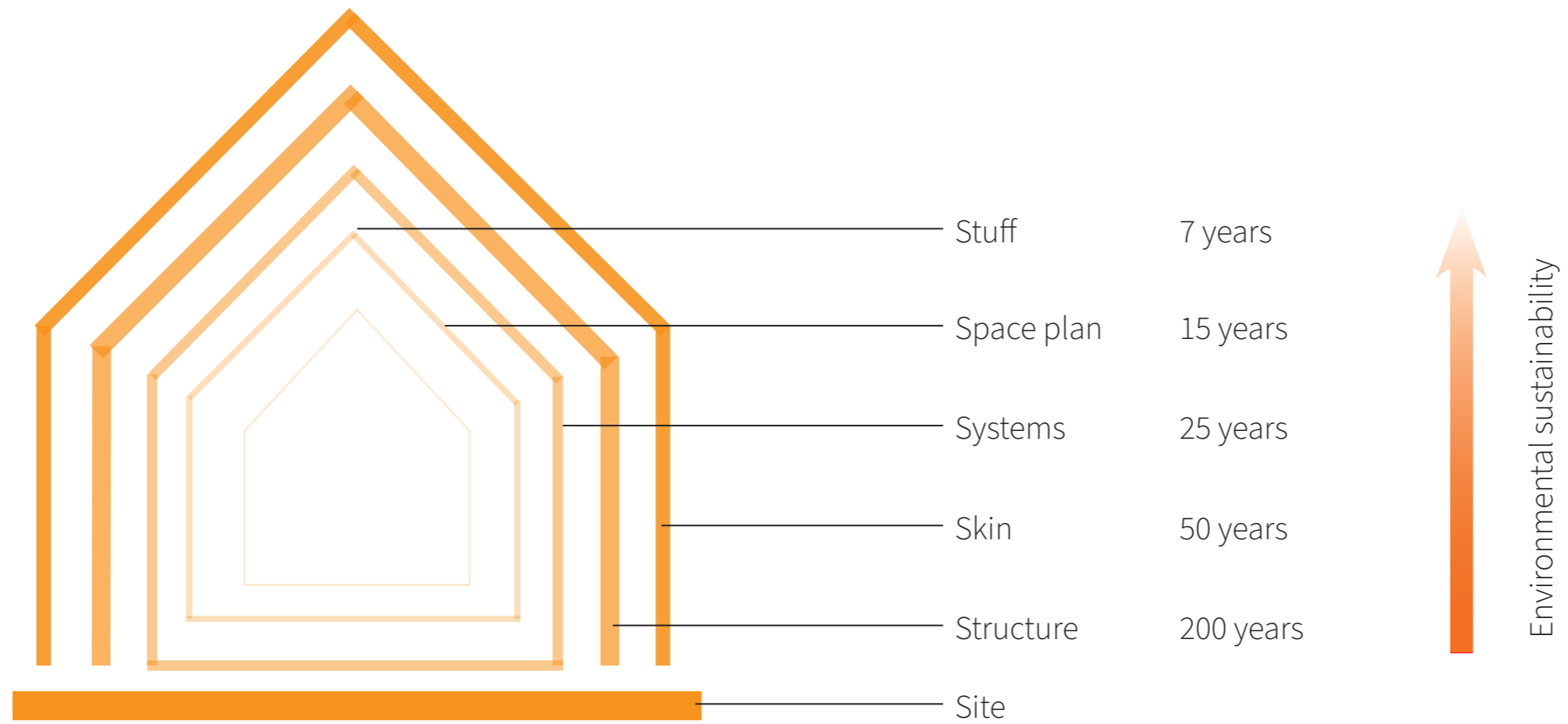
Most of the time, there is **no local expertise** available for such constructions, and the introduced methods are not sustainable in the long run. As a result, the local community cannot continue the process when the funding comes to an end. **How do they proceed forward?** They don't have the skills, so they can't do anything themselves afterward.”

-Yasmeen Lari

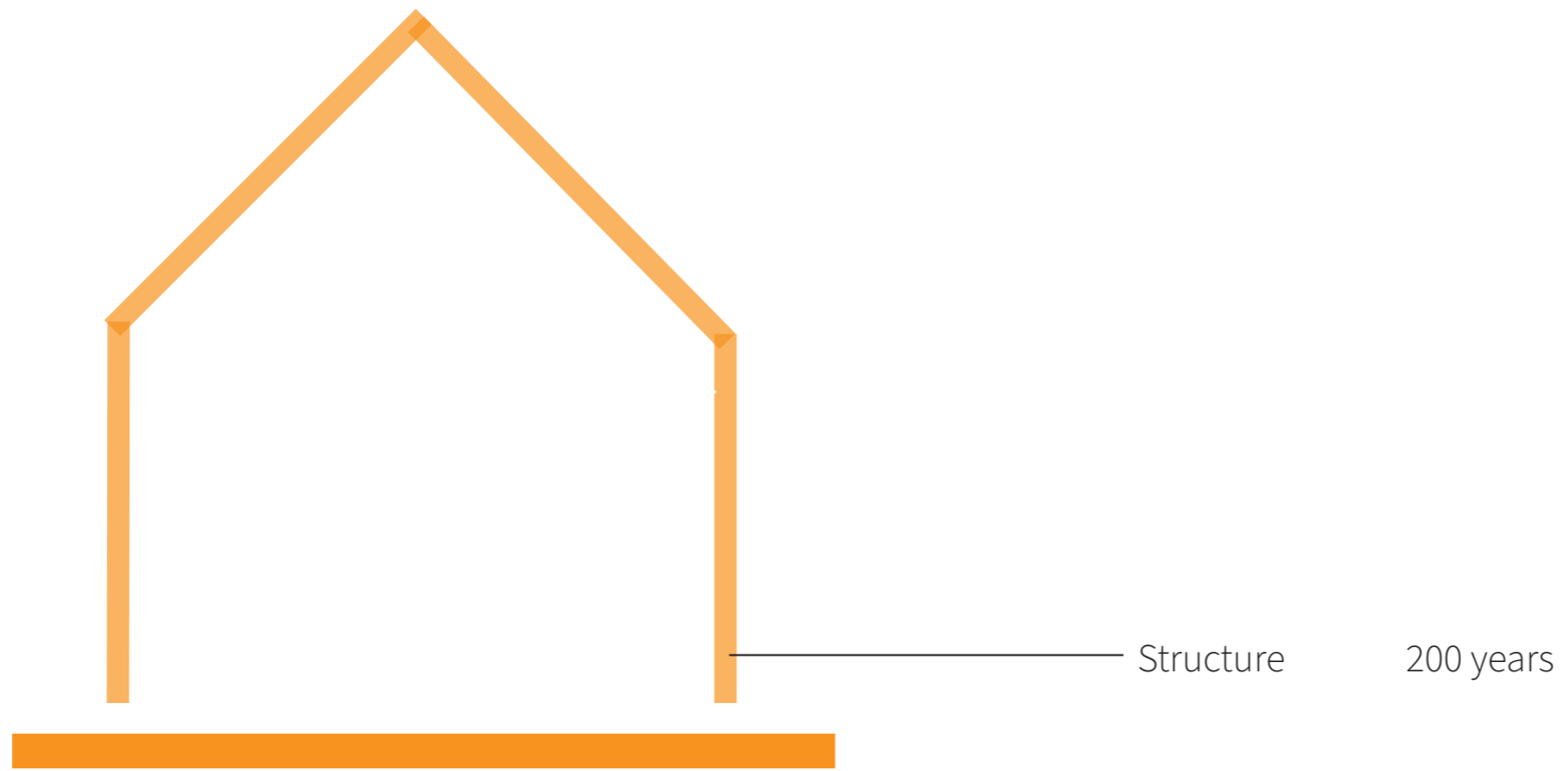
02. RESEARCH: QUESTION

How do I, as a western architecture student, design for the bangladeshi people?

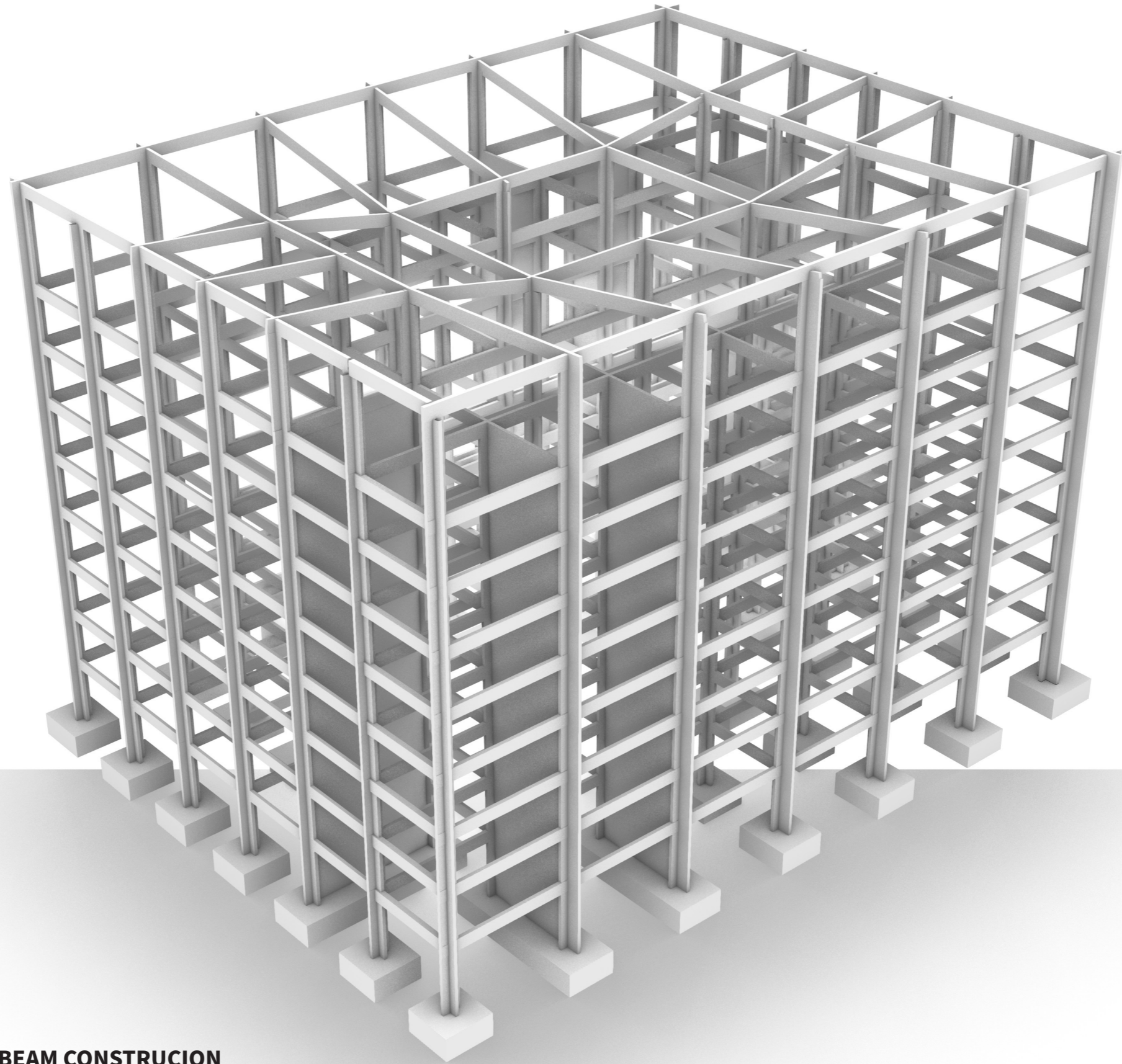
04. MATERIALITY: STRATEGY



04. MATERIALITY: STRATEGY

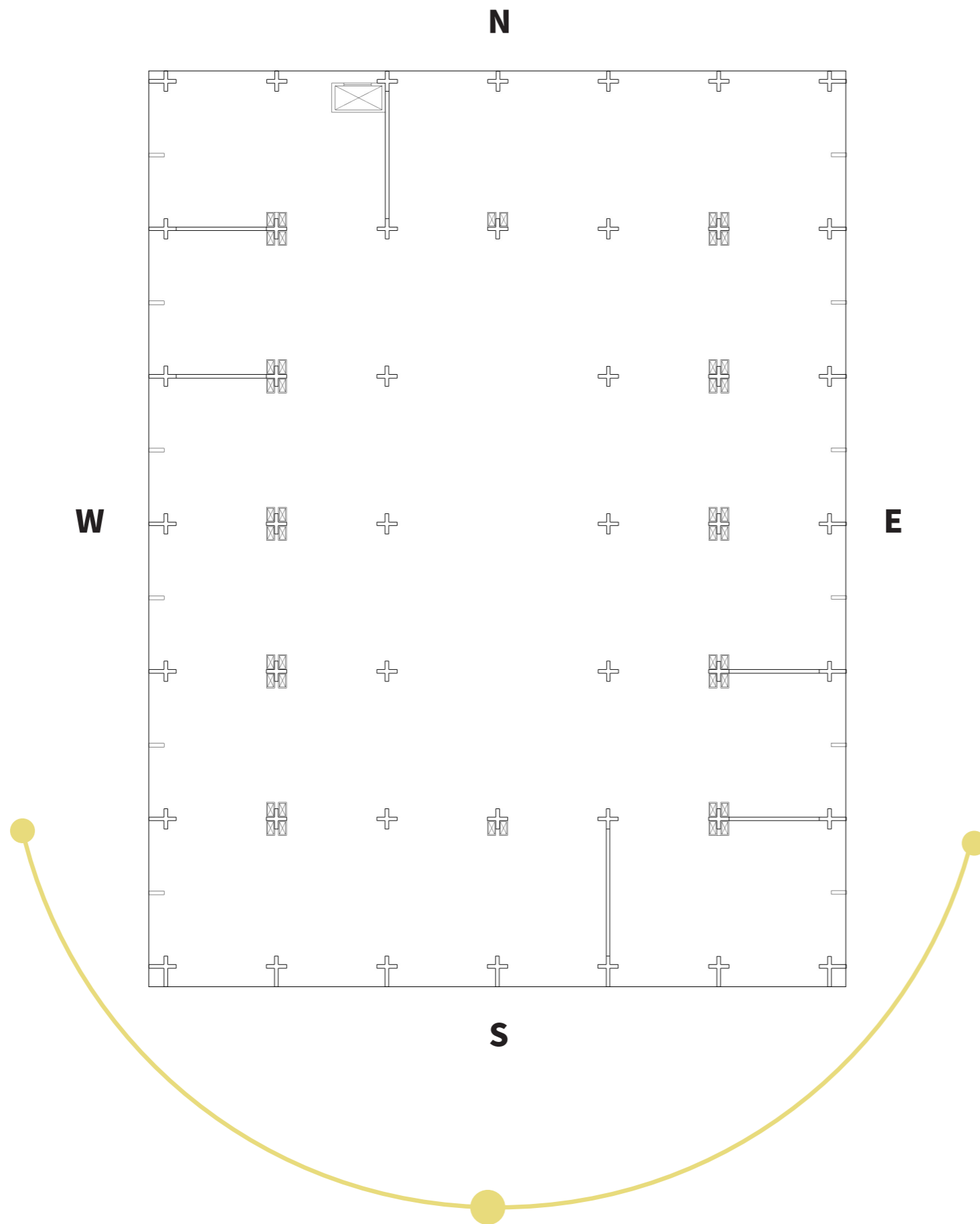


04. MATERIALITY: CONSTRUCTION



IN-SITU CONCRETE COLUMN-BEAM CONSTRUCTION

04. MATERIALITY: CLIMATE ADAPTATION



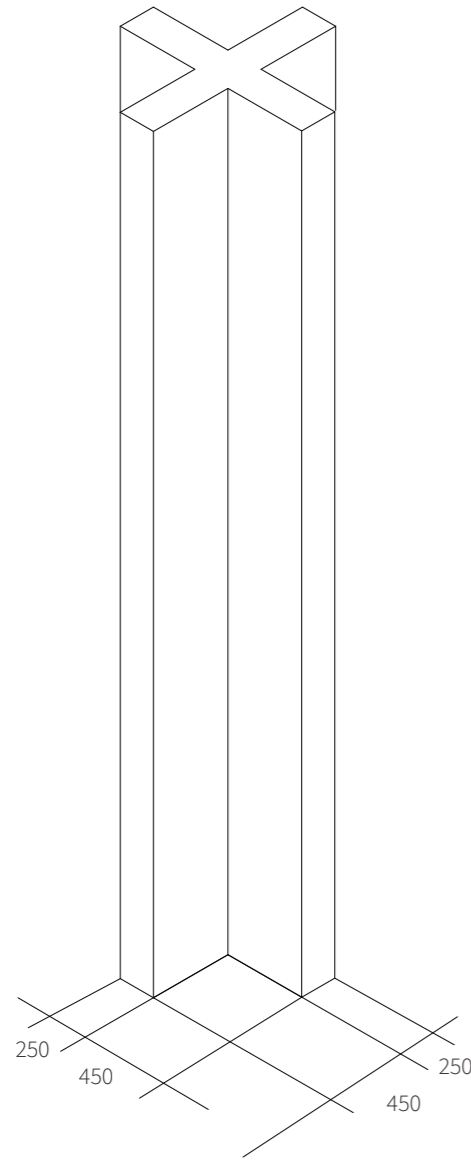
North: No sun, free amount windows

South: Sun blocking by overhang + minimal windows

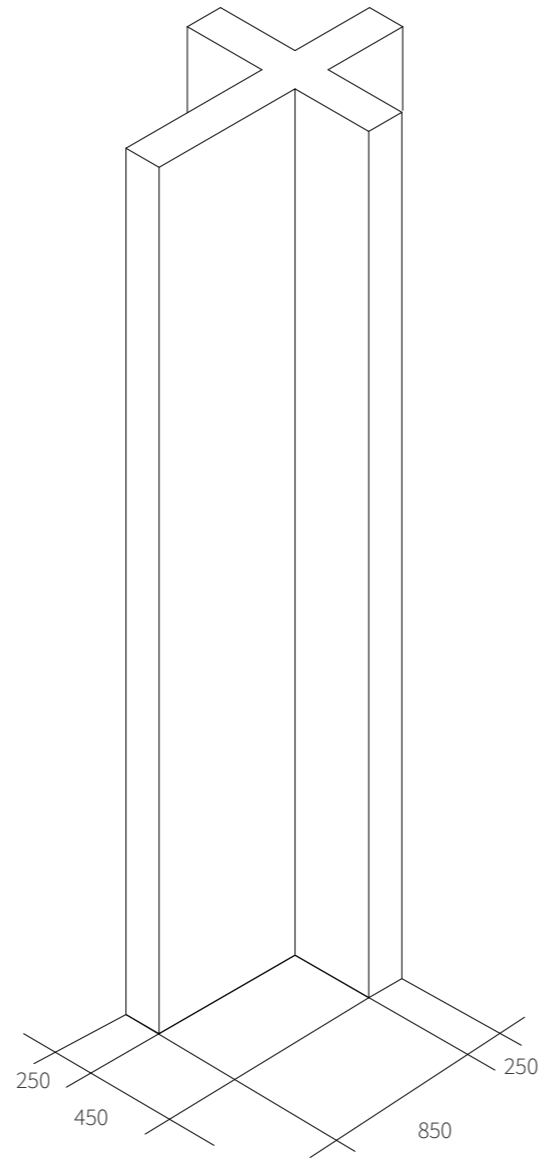
West/East: vertical sun blocking, windows in shading area

04. MATERIALITY: CONSTRUCTION

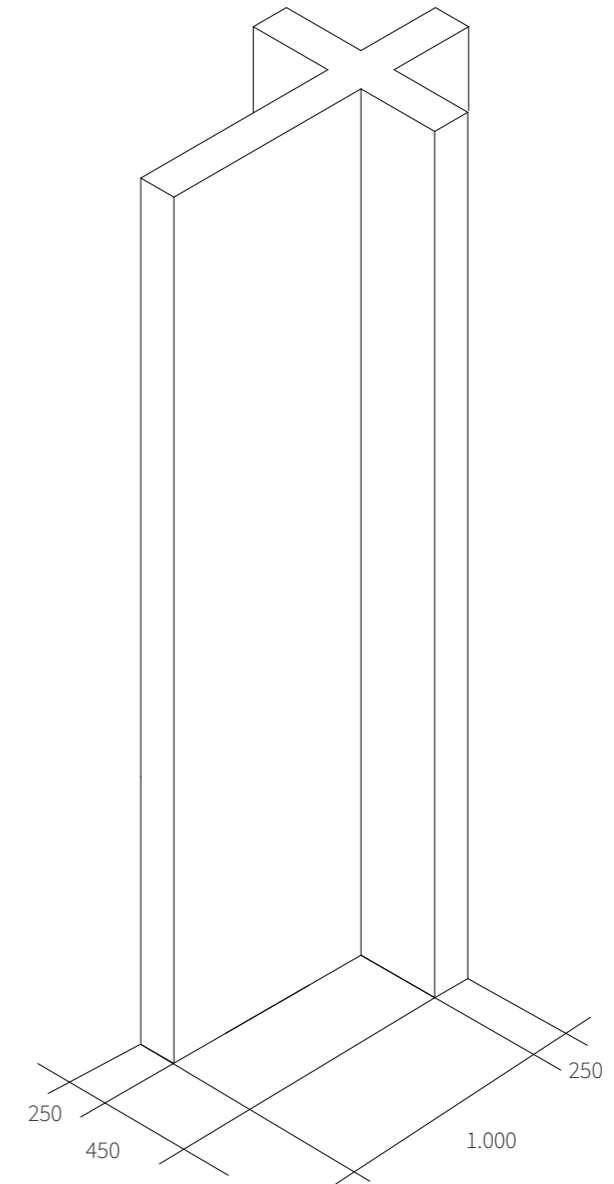
1. Standard columns/North facade



2. West/East facade



3. South facade



04. MATERIALITY: STRATEGY

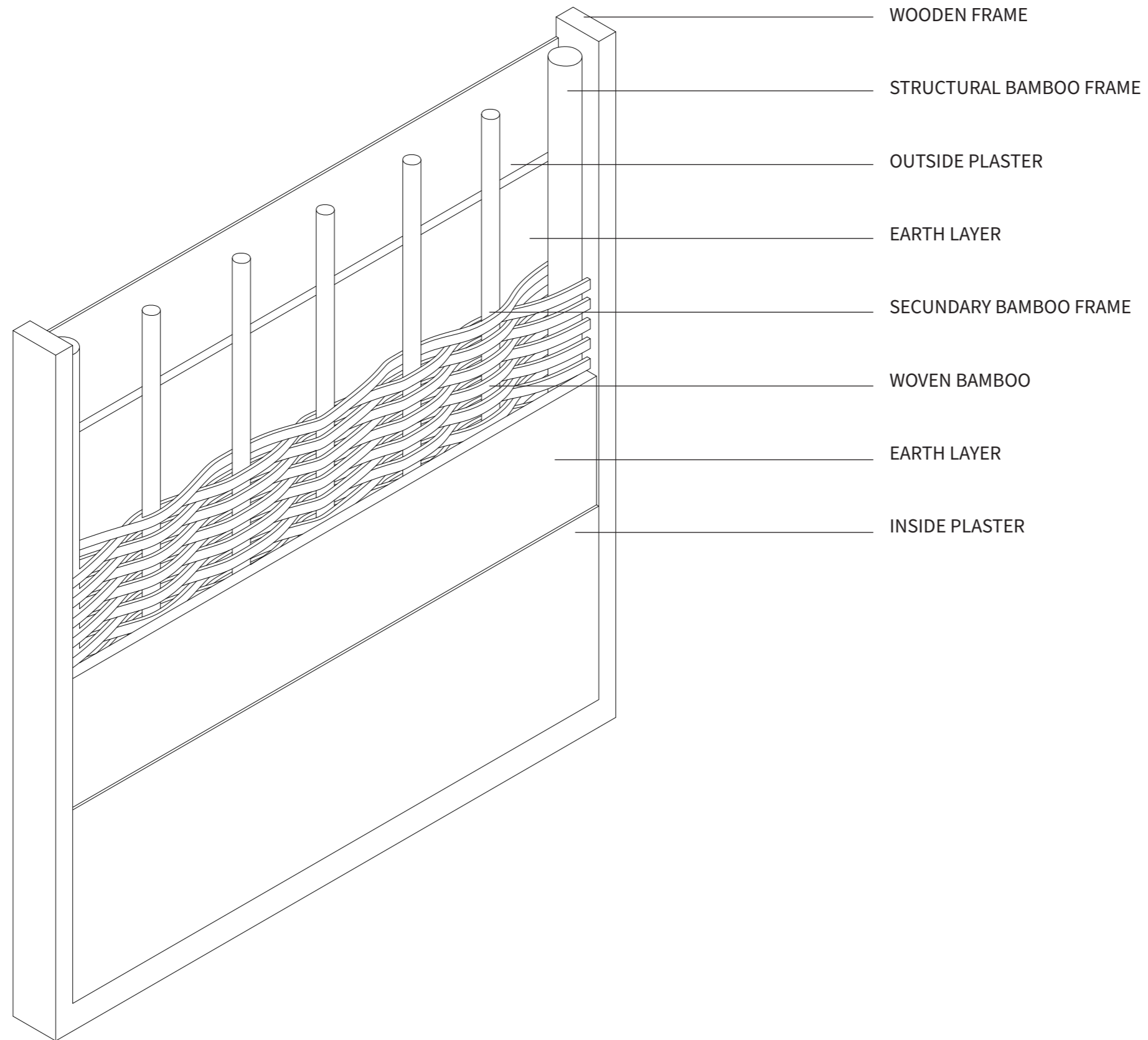


04. MATERIALITY: INFILL

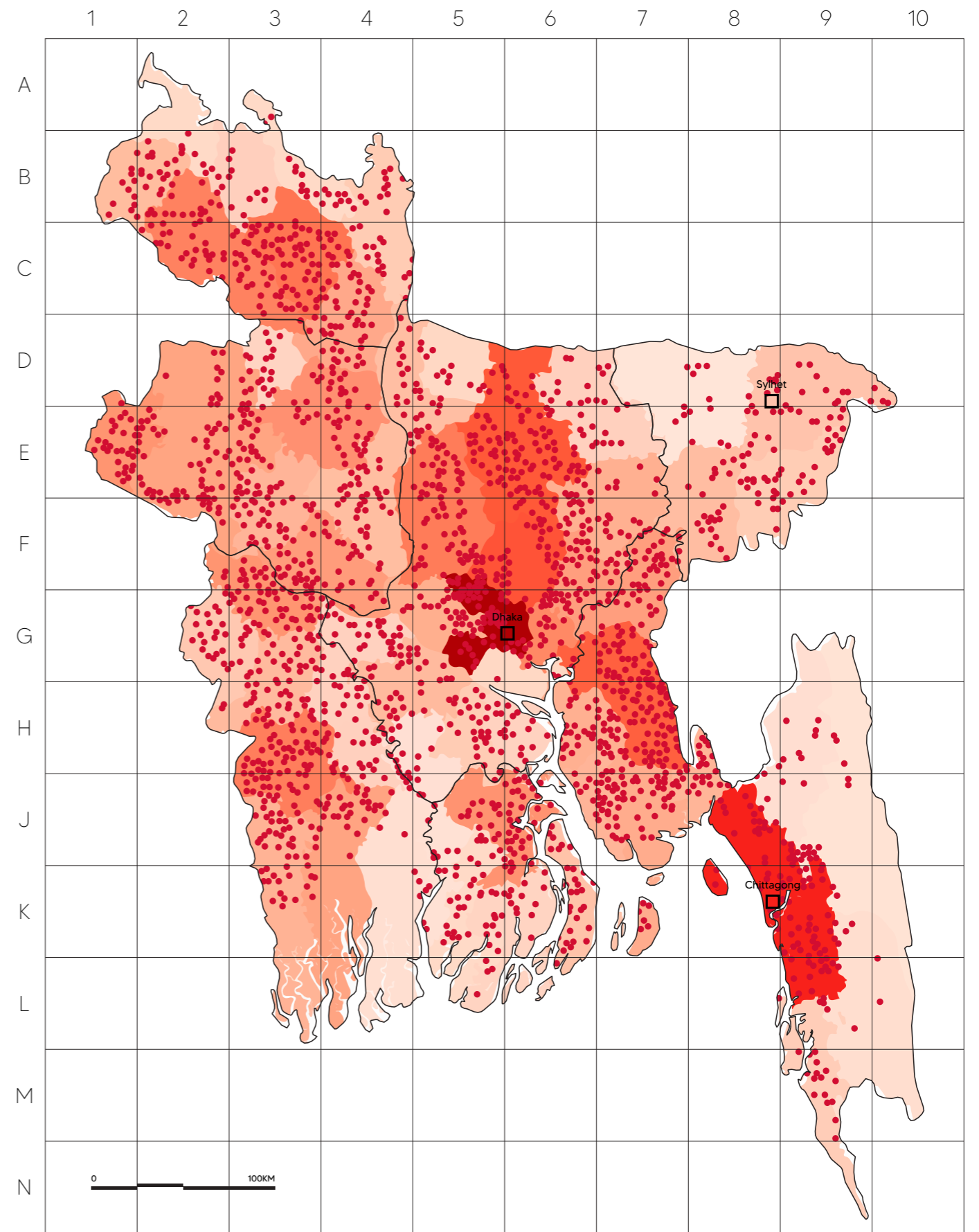


VERNACULAR BUILDING TECHNIQUE

04. MATERIALITY: INFILL



04. MATERIALITY: INFILL STRATEGY



1.2 brick kilns per district (Lee et al., 2021)



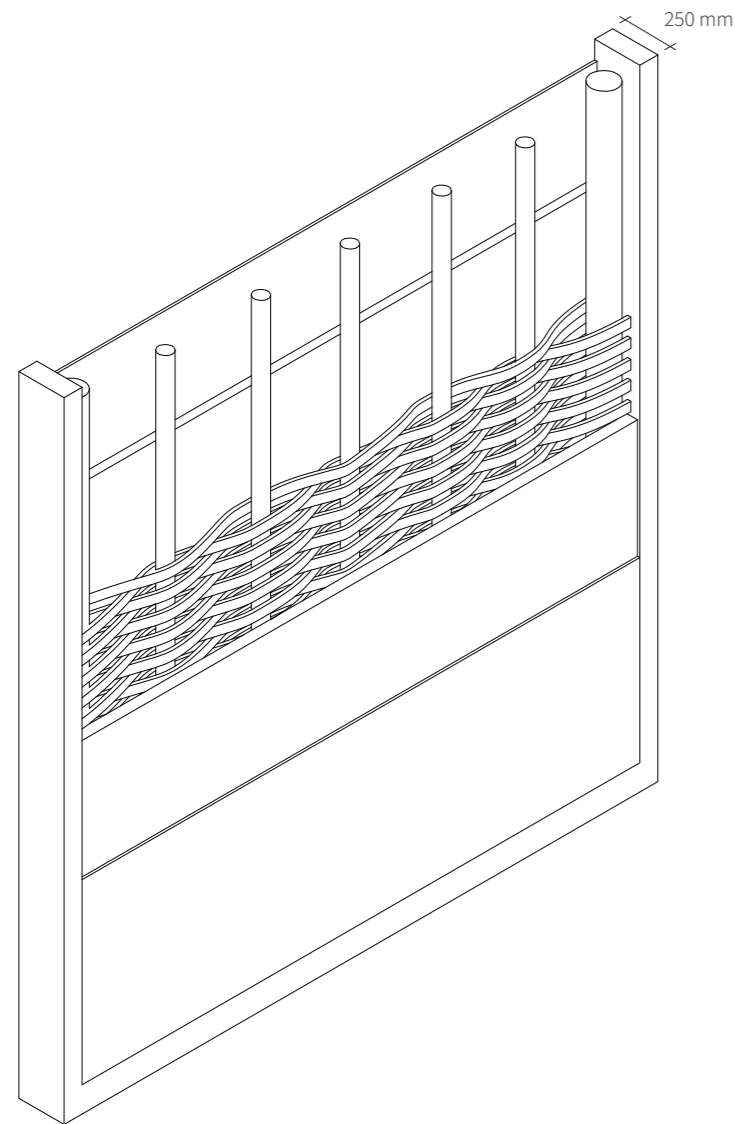
04. MATERIALITY: 3rd GRADE BRICKS

	FIXED CHIMNEY KILN	ZIG ZAG KILN	TUNNEL KILN
OVERVIEW KILN			
PLAN			
AIRFLOW			
NUMBER OF KILNS IN BANGLADESH (2018)	2235	5524	81
BRICK TYPE	Solid	Solid	Solid & Hollow/Perforated
PARTICULATE EMISSION (MG/M3)	1000+	300-800	<50
PRODUCTION CAPACITY (BRICKS/DAY)	20.000 - 50.000	15.000-50.000	80.000-200.000
CLASSIFICATION BRICKS	<ul style="list-style-type: none"> ■ Class I ■ Class II ■ Class III 	<ul style="list-style-type: none"> ■ Class I ■ Class II ■ Class III 	<ul style="list-style-type: none"> ■ Class I ■ Class II ■ Class III
CAPITAL COST	20.000 - 50.000	15.000-50.000	80.000-200.000
COST BREAKDOWN	Construction Material 84 % Labour 15% Equipment 1%	Construction Material 75 % Labour 13% Equipment 12%	Fully mechanized
BRICK DIMENSIONS (MM)	230 x 115 x 75	230 x 115 x 75	230 x 115 x 75



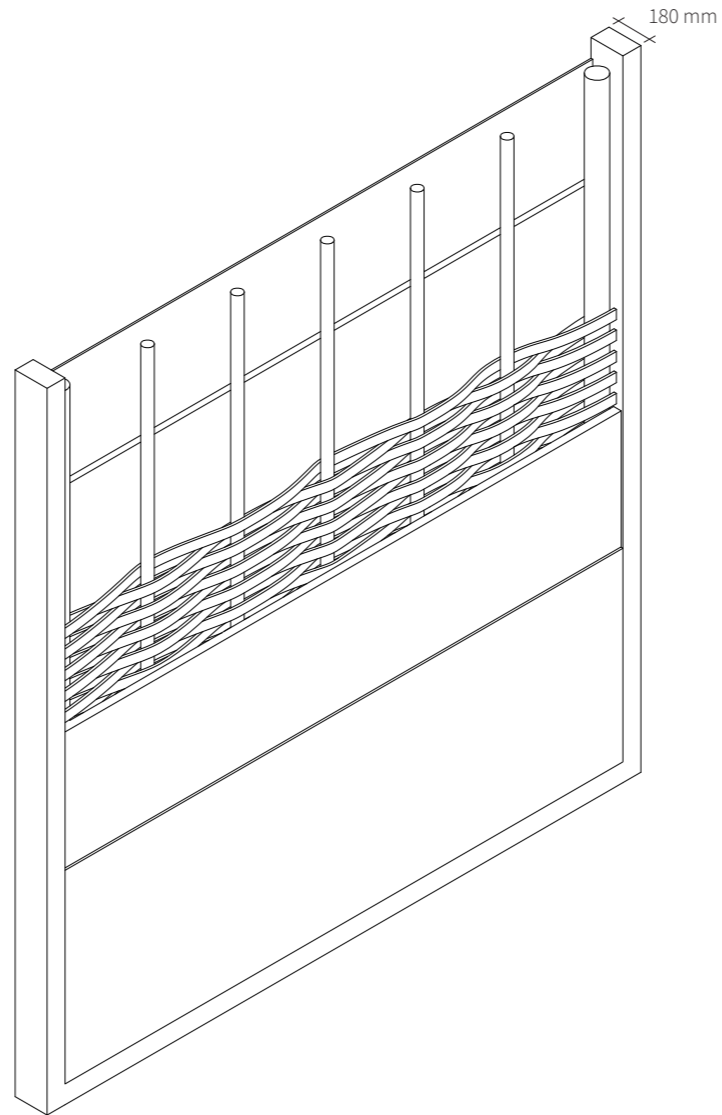
Photo by Joëlle Steendam

04. MATERIALITY: INFILL PANELS



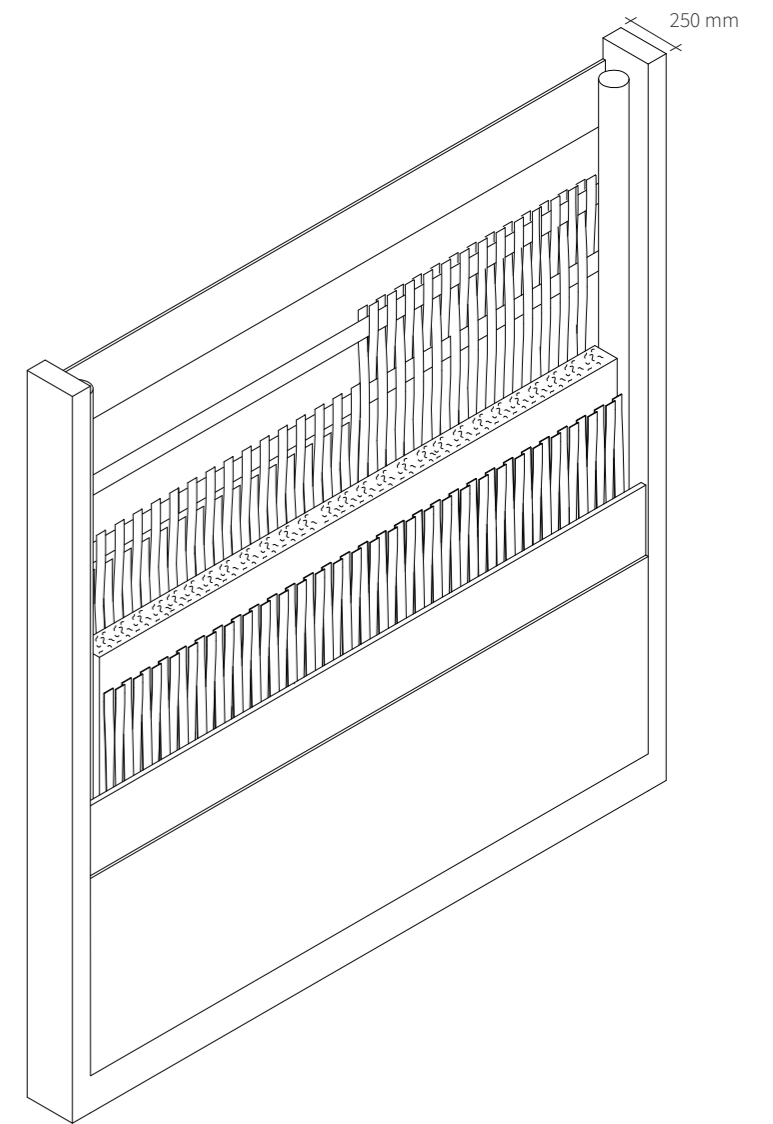
FACADE

OUTSIDE FINISHING: COCCIOPESTO
INSIDE FINISHING: CLAY PLASTER
HORIZONTAL WATTLE
THICKNESS: 250 MM



PARTITION WALL INSIDE

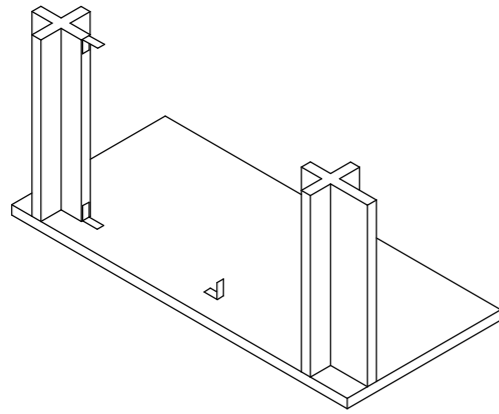
FINISHING: CLAY PLASTER
HORIZONTAL WATTLE
THICKNESS: 180 MM



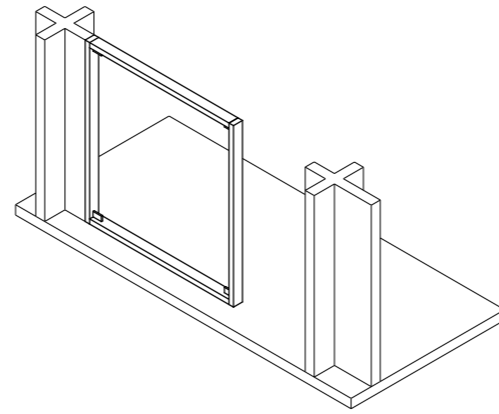
PARTITION WALL NEIGHBOURS

INSIDE FINISHING: CLAY PLASTER
VERTICAL WATTLE
CAVITY FILLED WITH NATURAL FIBERS
THICKNESS: 250 MM

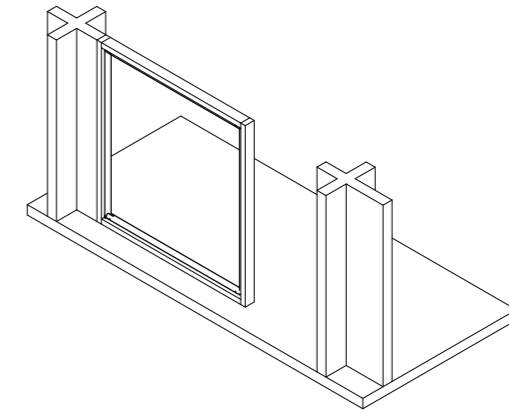
04. MATERIALITY: INFILL BUILDING PROCESS



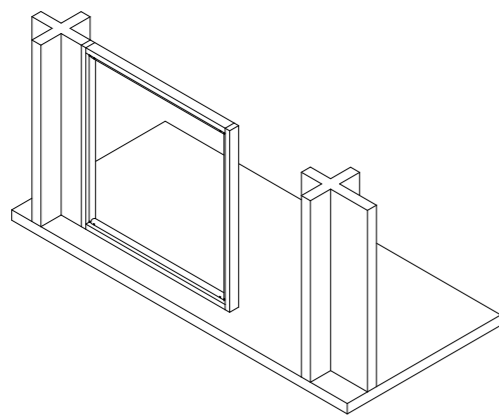
1. Steel joint



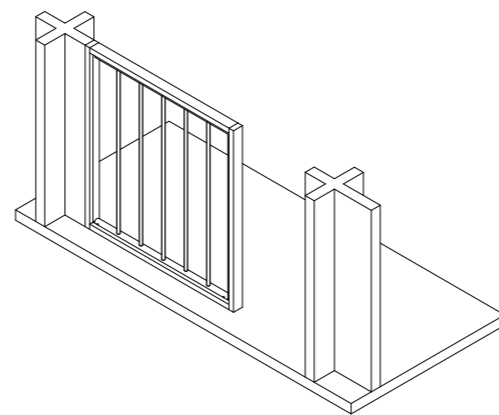
2. Wooden frame



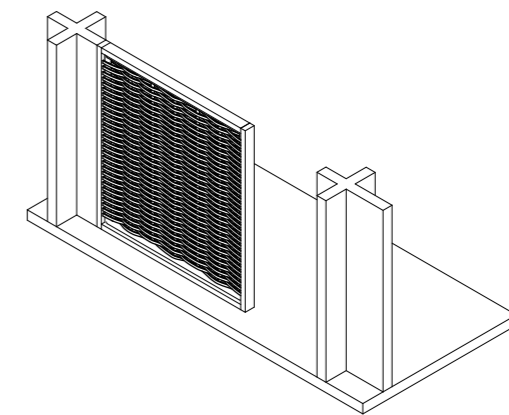
3. Bamboo frame



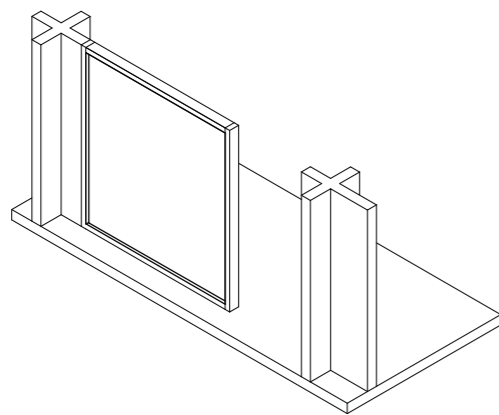
4. Screwing bamboo



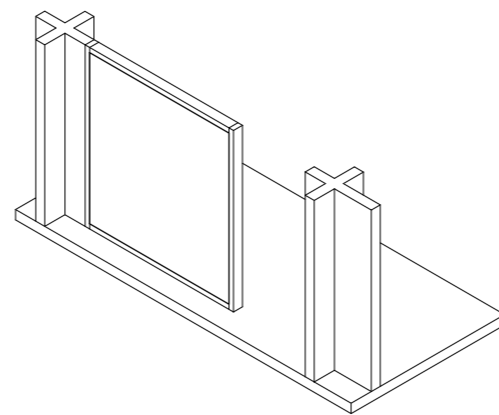
5. Secondary bamboo frame



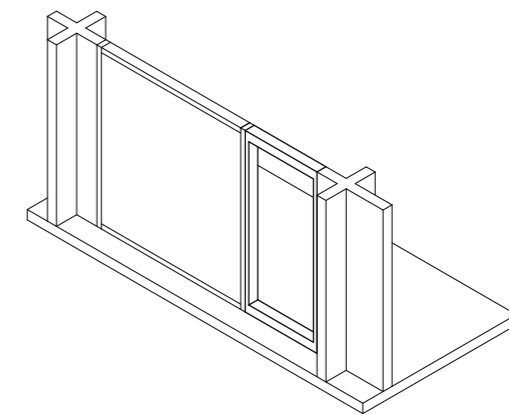
6. Woven Bamboo



7. Earth layer



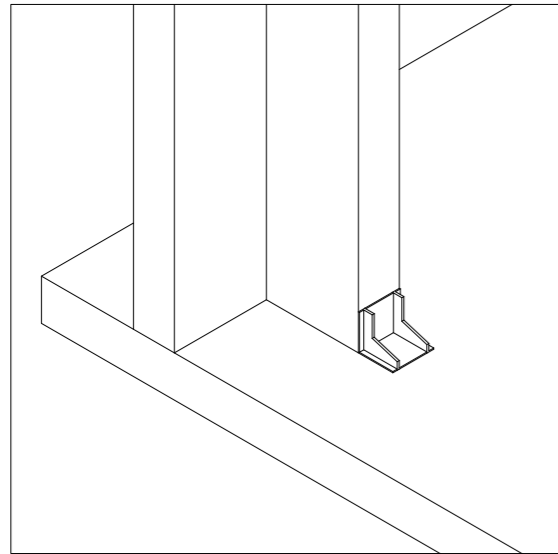
8. Lime plaster



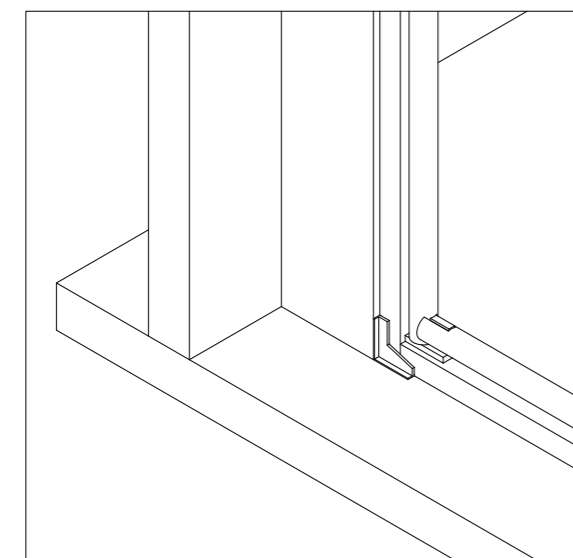
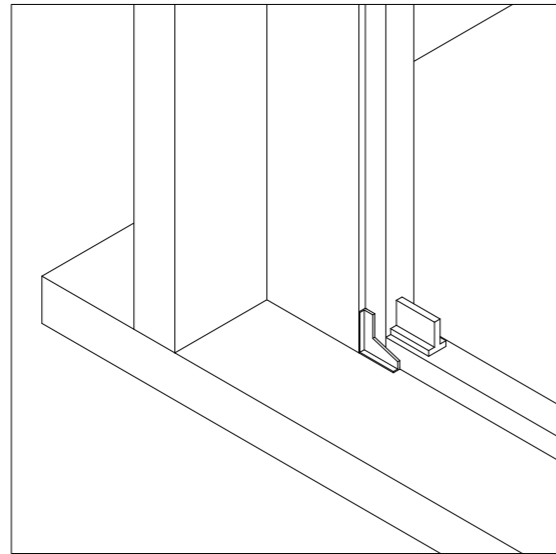
9. Window frame

04. MATERIALITY: INFILL BUILDING PROCESS

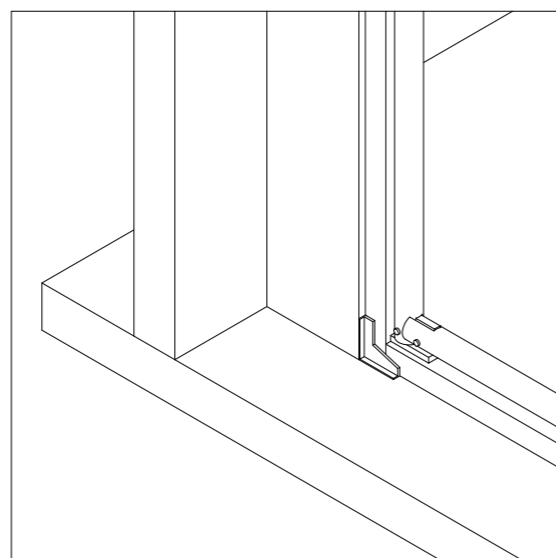
1. Steel joint



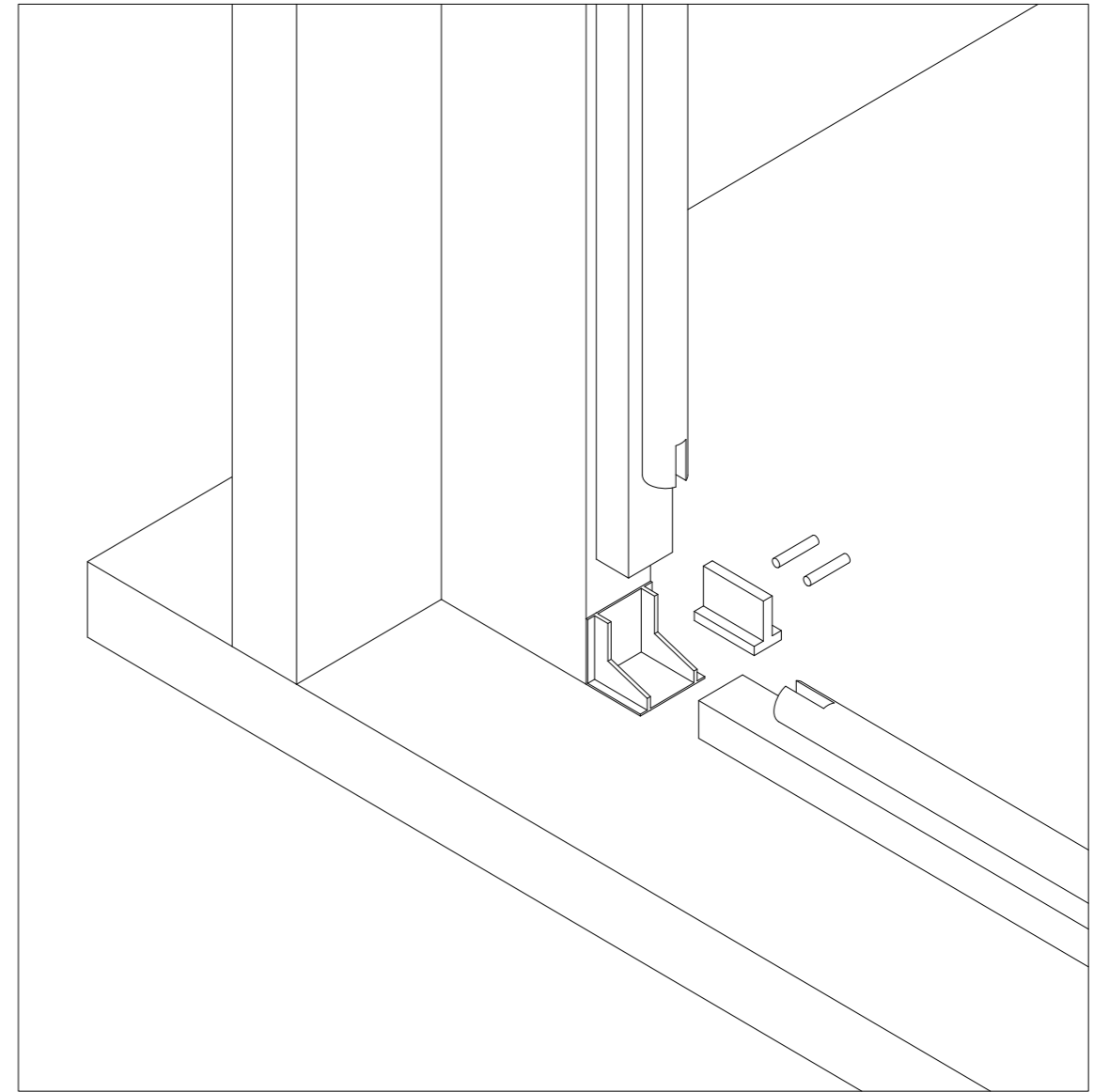
2. Wooden frame & connection element



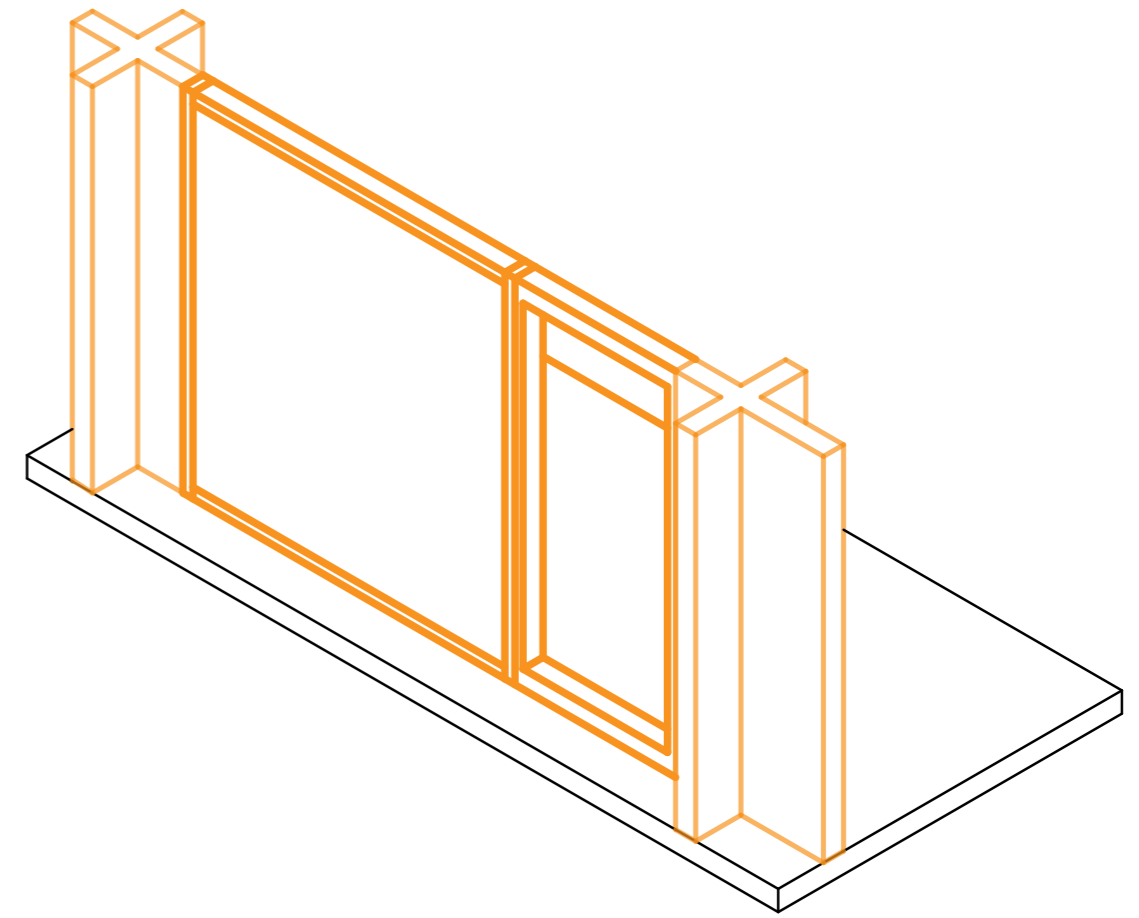
3. Bamboo frame



4. Bolde to connection element



04. MATERIALITY: STRATEGY



04. MATERIALITY: INFILL: SHOP FACADE



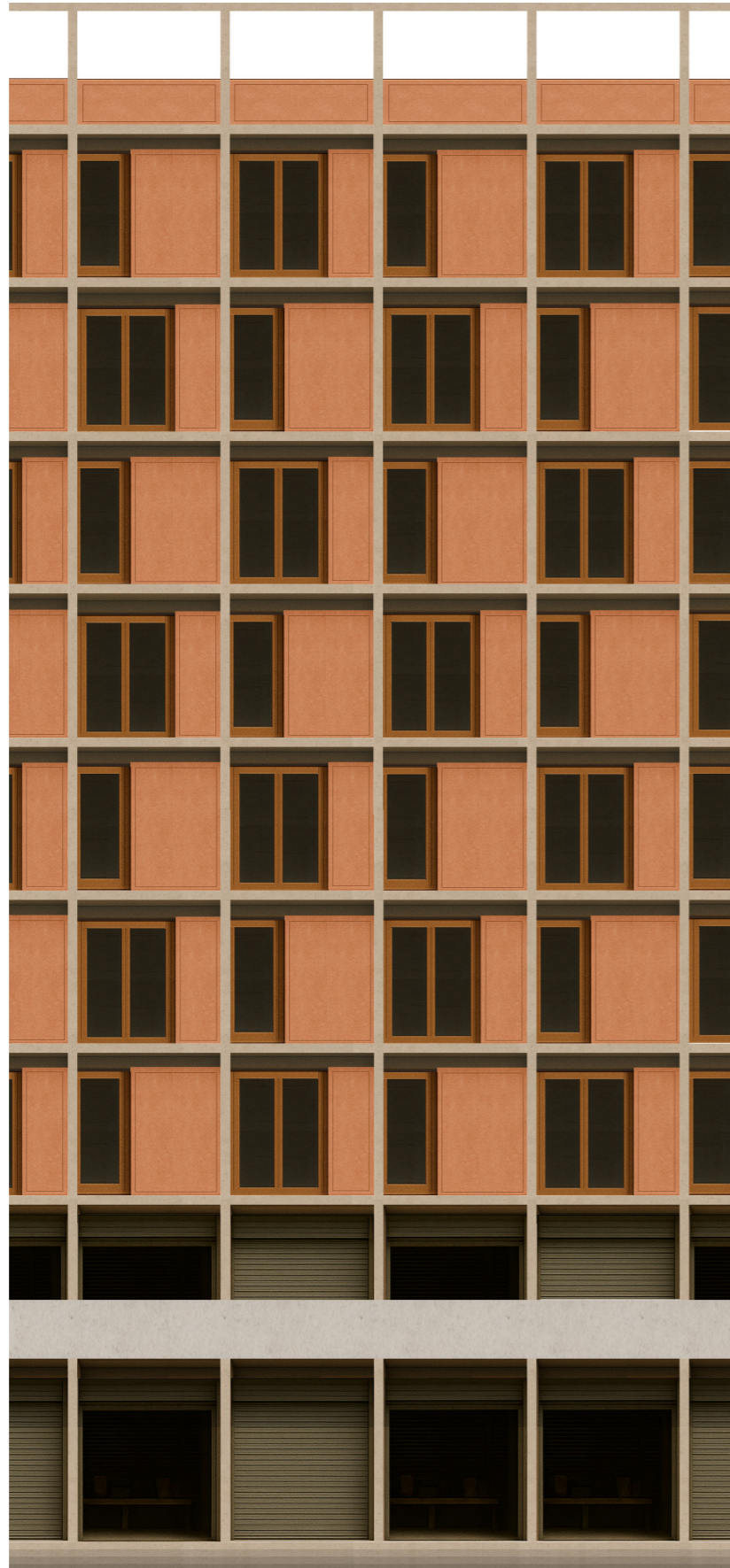
Current situation hawker market Sylhet



04. MATERIALITY: ELEVATION

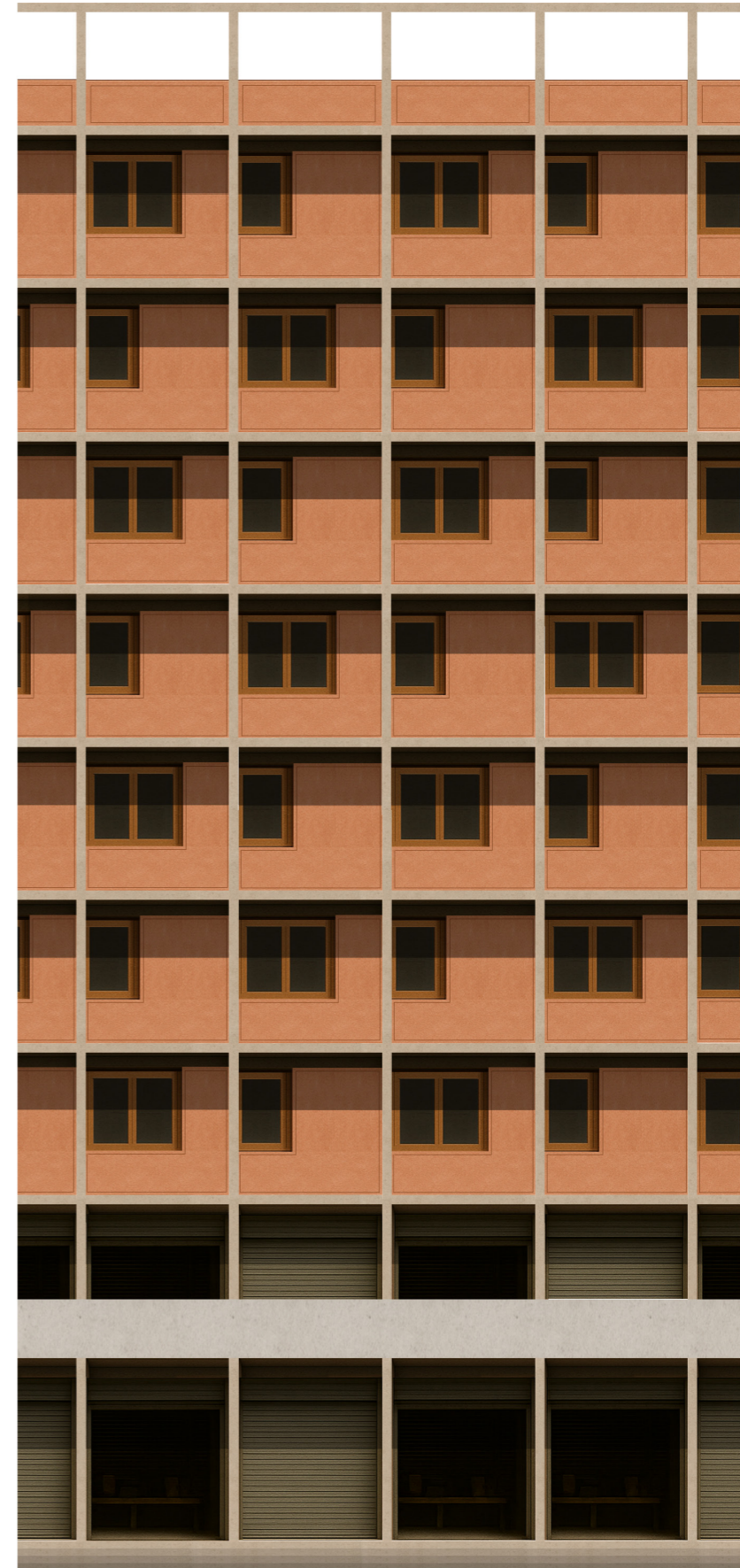
NORTH ELEVATION

No overhang
No vertical shading



SOUTH ELEVATION

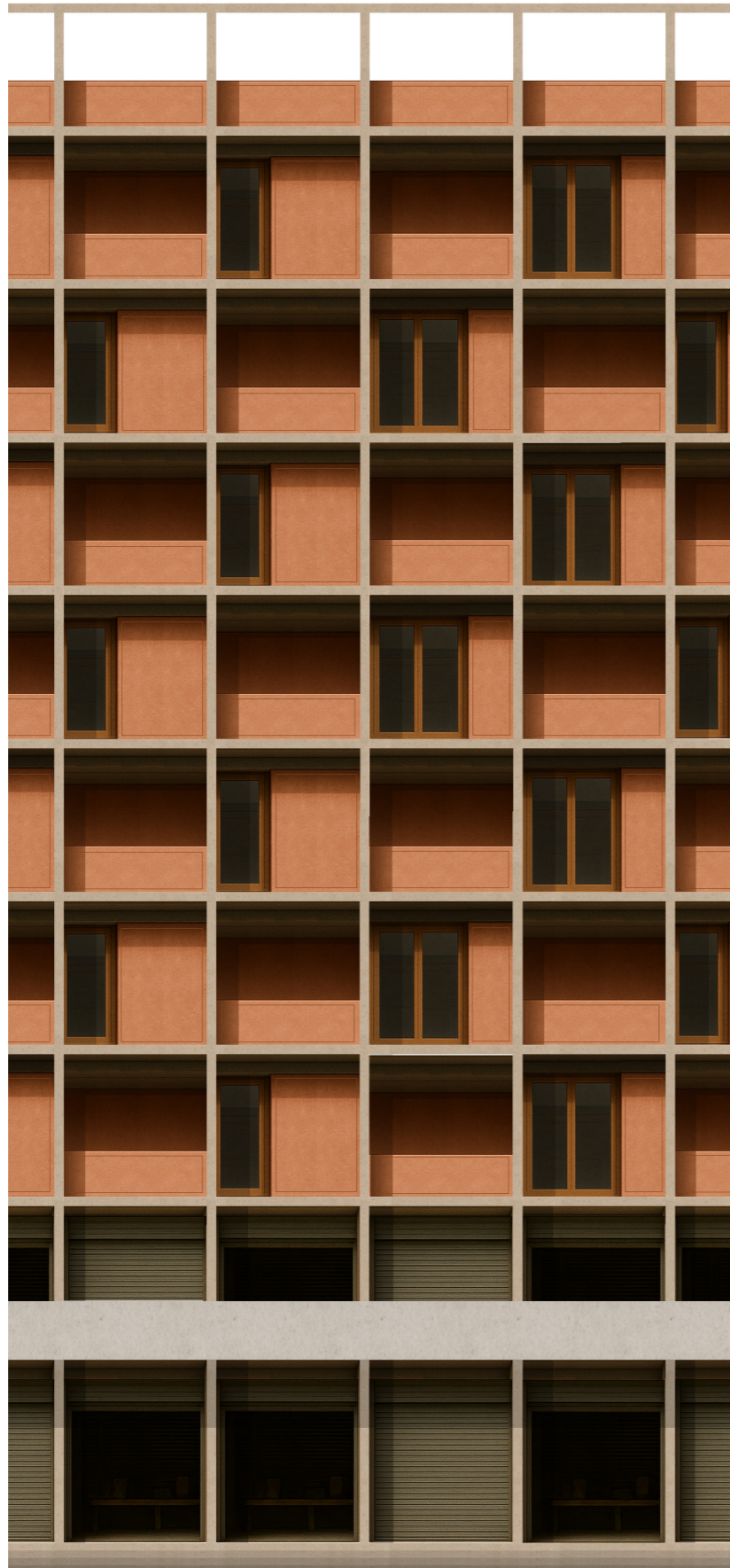
Horizontal overhang
No vertical shading



04. MATERIALITY: ELEVATION

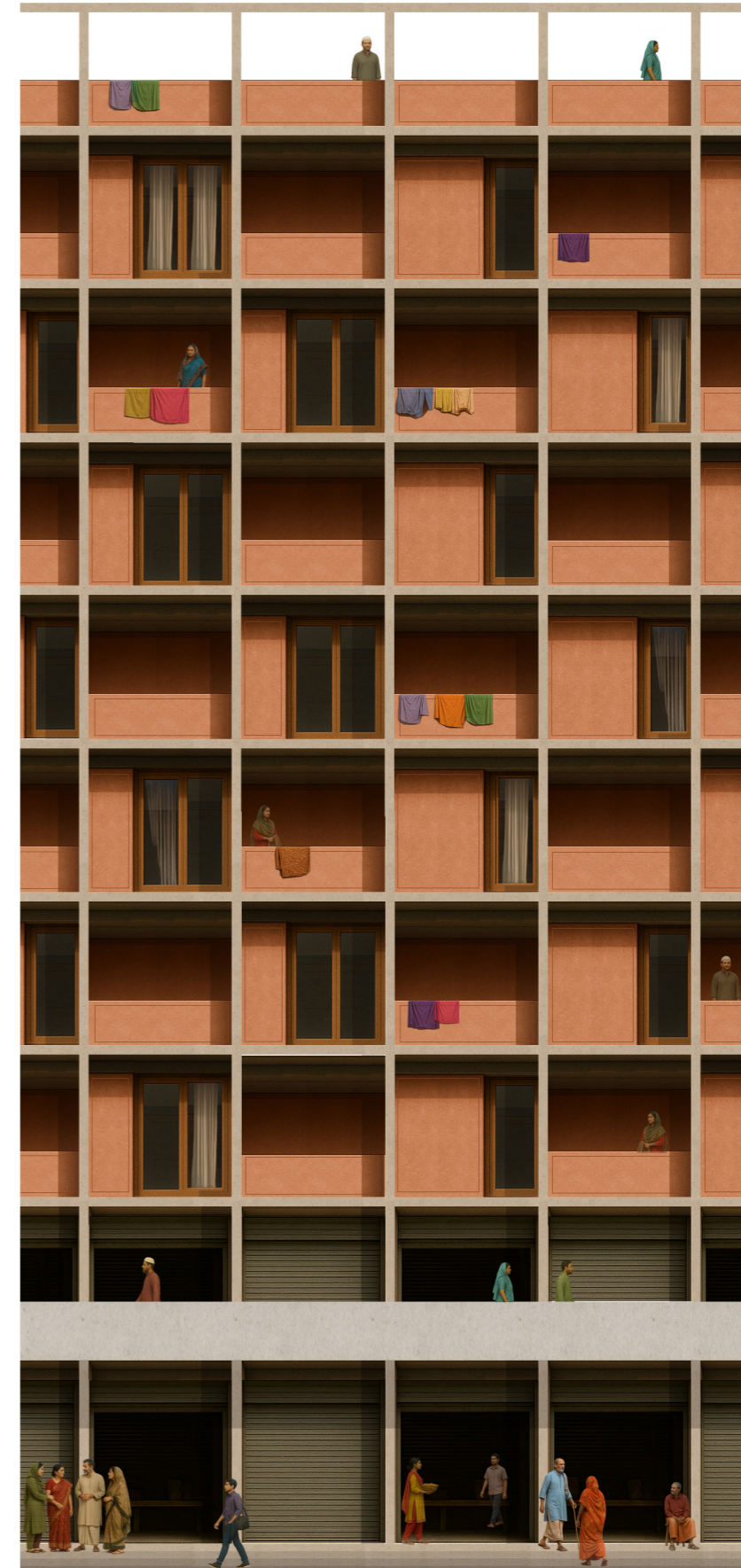
WEST ELEVATION

Horizontal overhang
Vertical shading



EAST ELEVATION

Horizontal overhang
Vertical shading



04. MATERIALITY: RESEARCH QUESTION

How can the needs of the rural-urban migrants be integrated into an open building system to create a **future-proof**, large-scale housing project which reduces the affordable housing shortage in Sylhet?

05. MANAGERIAL STRATEGY

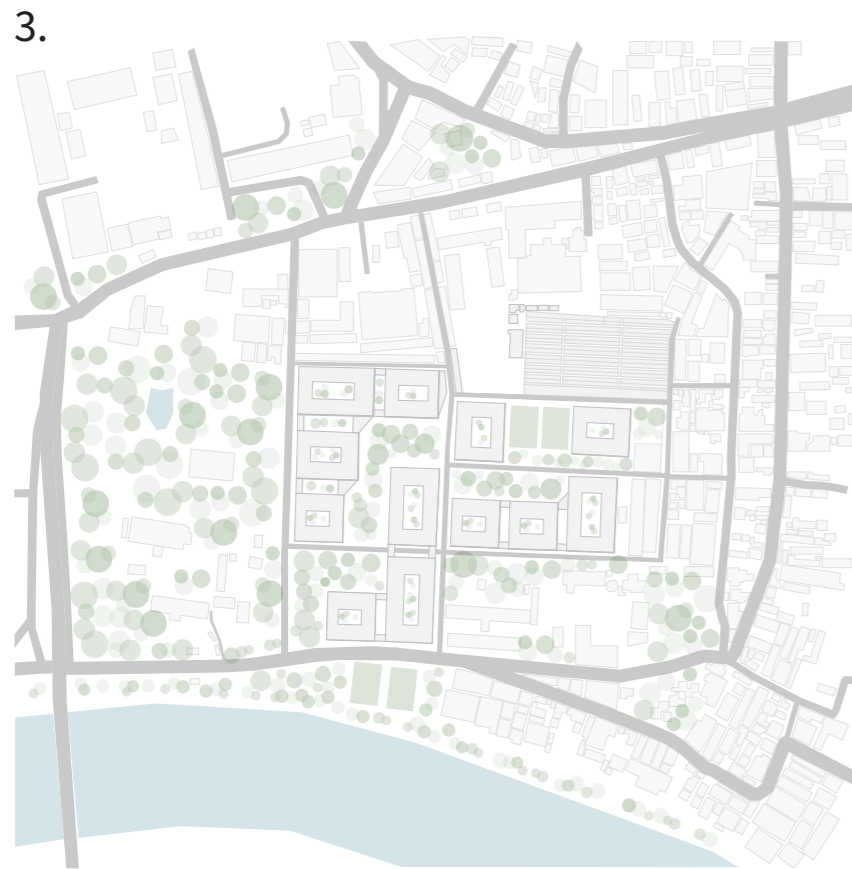
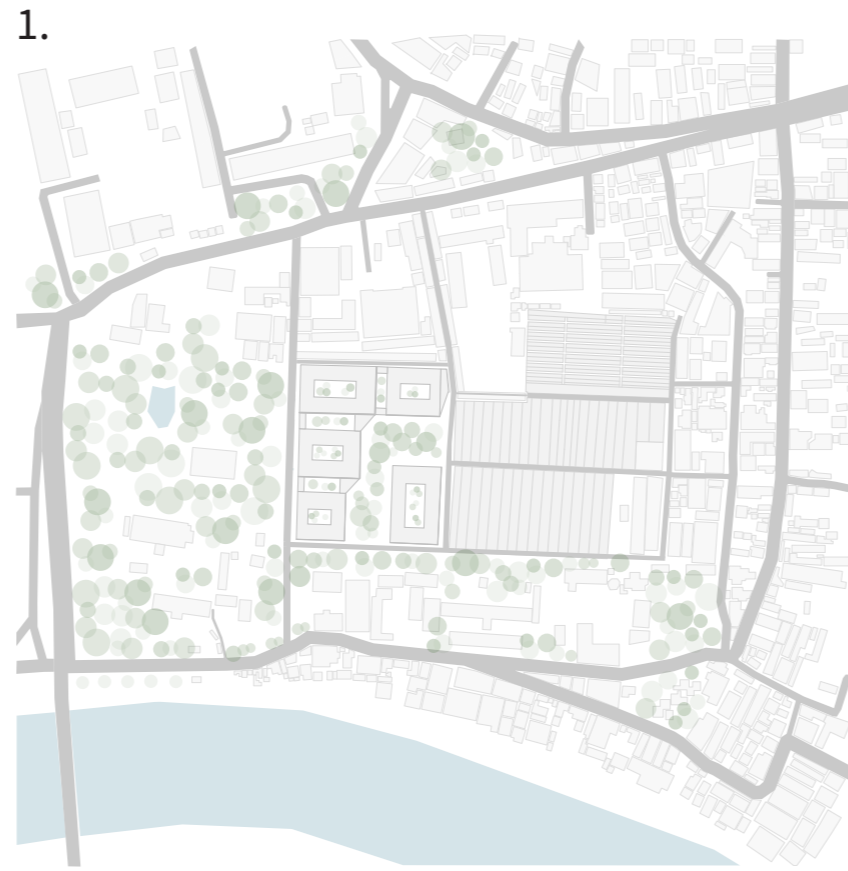
05. MANAGERIAL STRATEGY: CONCEPT

TYPE	RENTAL INCOME	ROLE	PAYBACK TIME
LOW INCOME UNITS	Low	Social function	Long (15–20 years)
MIDDLE INCOME UNITS	Moderate (market-rate)	Financial support function	Medium (10–15 years)
COMMERCIAL SPACES	High	Profit-making function	Short (5–10 years)

05. MANAGERIAL STRATEGY: FINANCIAL CALCULATION

Total rental income	Tk 152.532.800
Total expences	Tk 50.613.879
NET ANNUAL REVENUE FIRST 20 YEARS	Tk 101.918.921
Net annual revenue after payback	Tk 152.509.921

05. MANAGERIAL STRATEGY: BUILDING PHASES



05. MANAGERIAL STRATEGY: INCOME GROUPS



- High income
- Middle income
- Low income

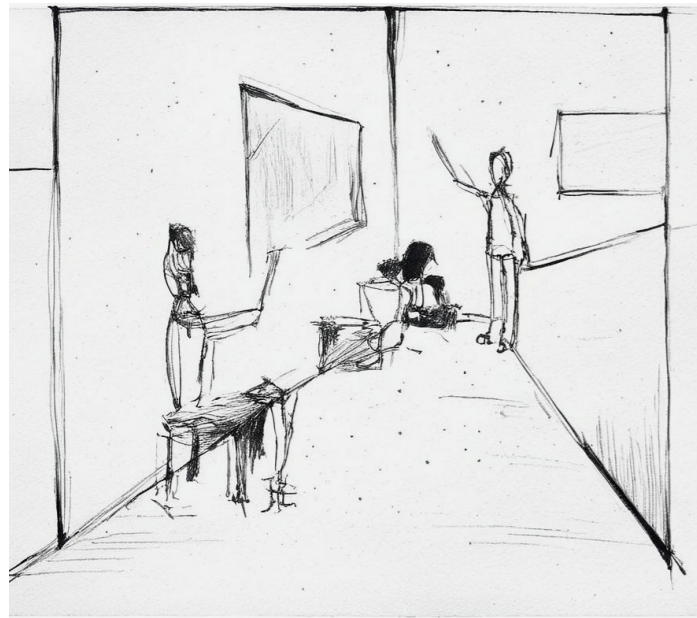
05. MANAGERIAL STRATEGY: PROJECT'S ABACUS

LOW INCOME UNITS	128 units (65 m ² /unit & max. 8 residents)
LOW INCOME UNITS	76 units (26 m ² /unit & max. 4 residents)
LOW INCOME UNITS	152 units (13 m ² /unit & max. 2 residents)
MIDDELE INCOME UNITS	60 units (65 m ² /unit & max. 6 residents)
MIDDLE INCOME UNITS	36 units (83 m ² /unit & max. 8 residents)
HIGH INCOME UNITS	0
TOTAL DWELLINGS	528 dwellings
RESIDENTS	1832 residents (couch occupied 2280)
COMMERCIAL SPACE	9620 m ²
TOTAL SHOPS	212
	10 x 180 m ² (Duplex)
	75 x 45 m ² (40 Work-Living)
	127 x 35 m ² (68 Work-Living)

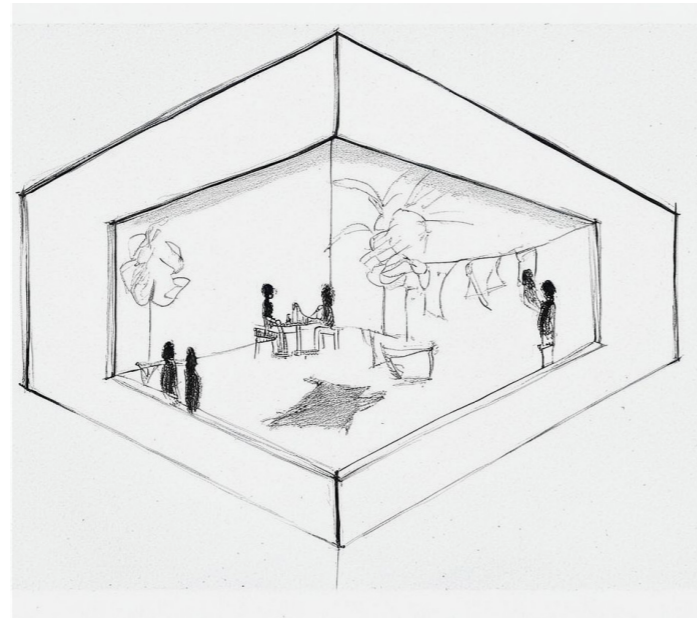
AREA	17.089 m ²
FSI	2,96
GSI	0,45
RESIDENTS/HA	1077
DWELLINGS/HA	310
OPEN SPACE	55 %
OPEN SPACE/RESIDENT	5 m ²

CHARACTER OF VILLAGE IN URBAN CONTEXT

1. Cluster community



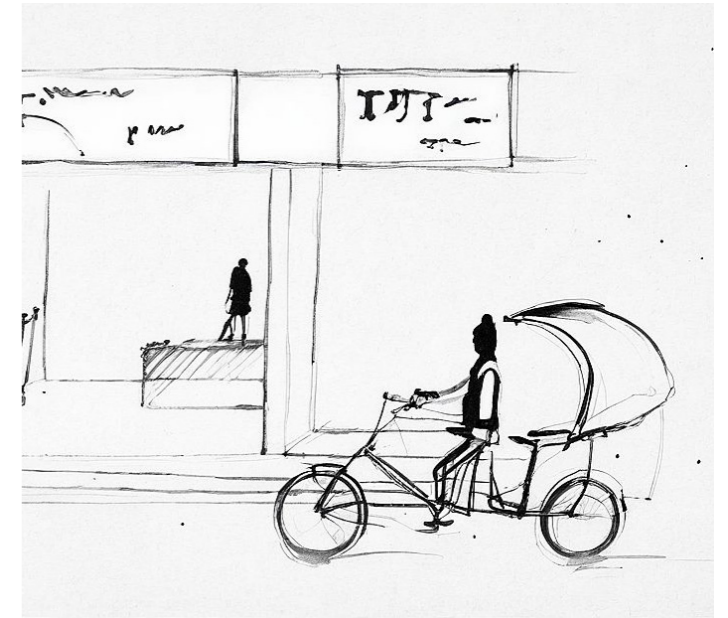
2. Communal spaces



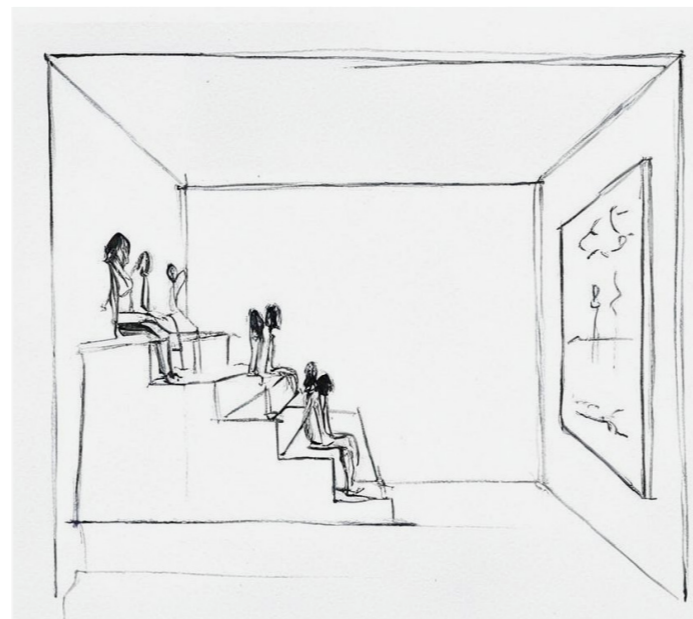
3. Vendor spaces



4. Job opportunities



5. Green boulevard



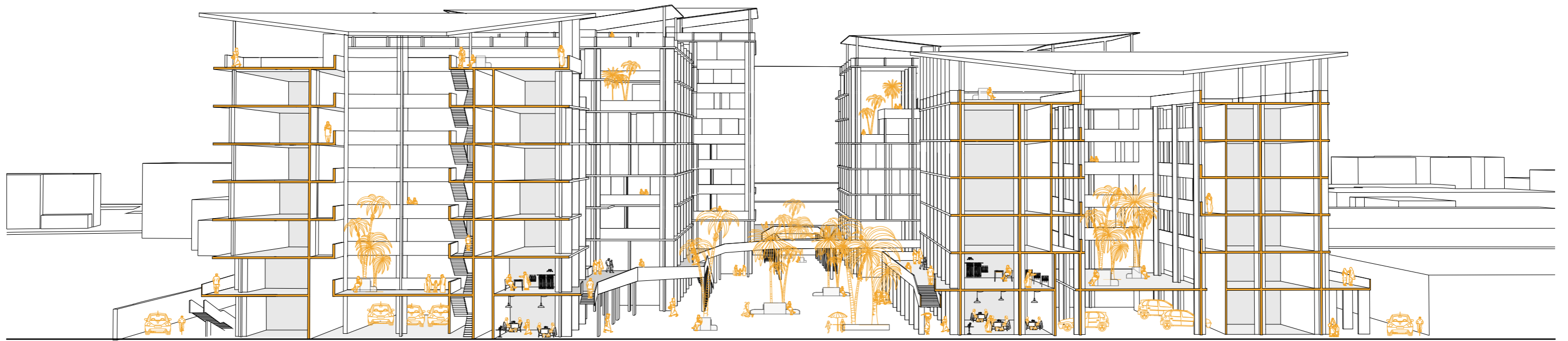
6. Amenities



7. Human scale

THE URBAN BLOOM

A large scale housing project in the commercial heart of Sylhet city,
merging urban energy with village character

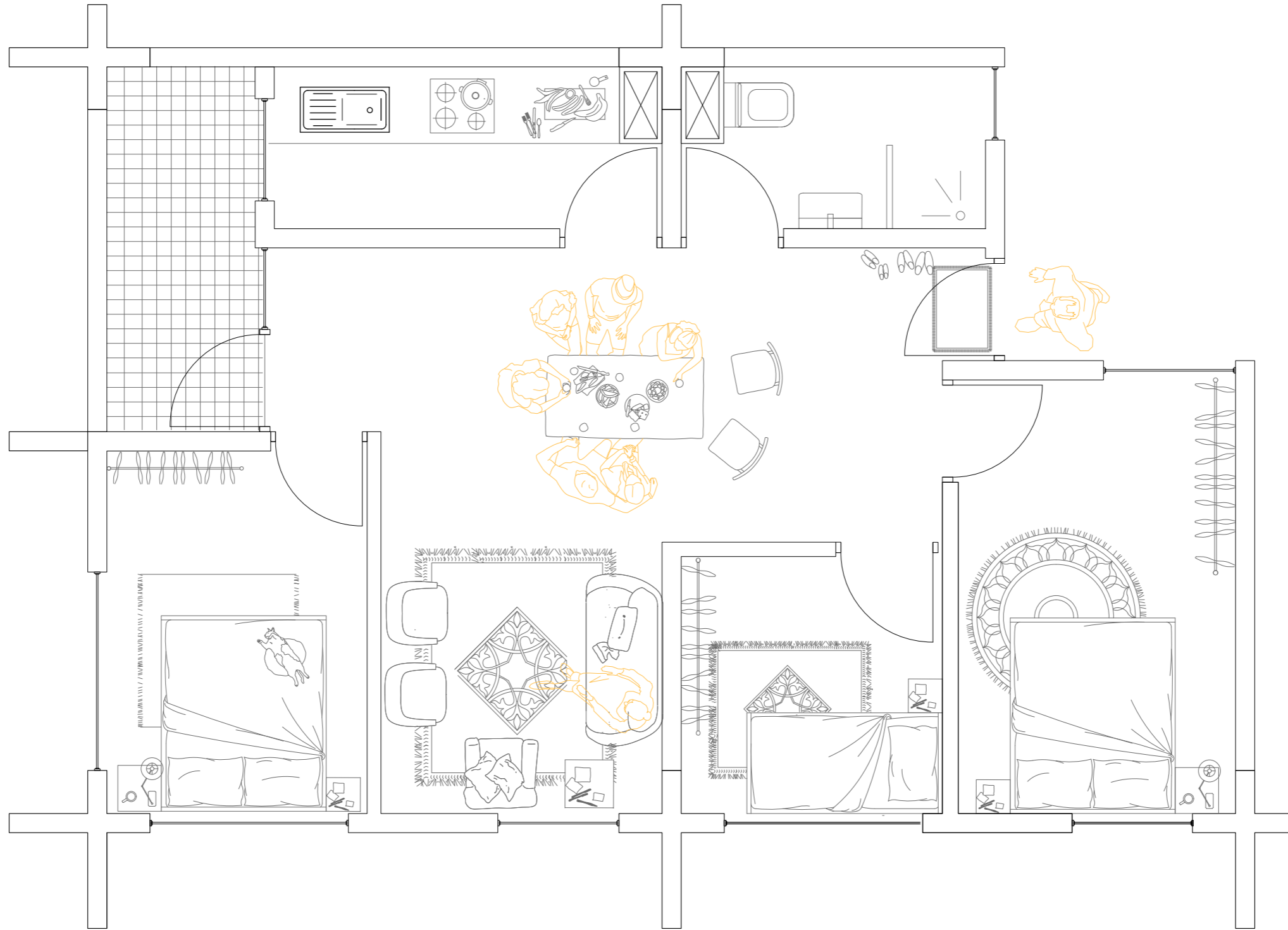


THE URBAN BLOOM

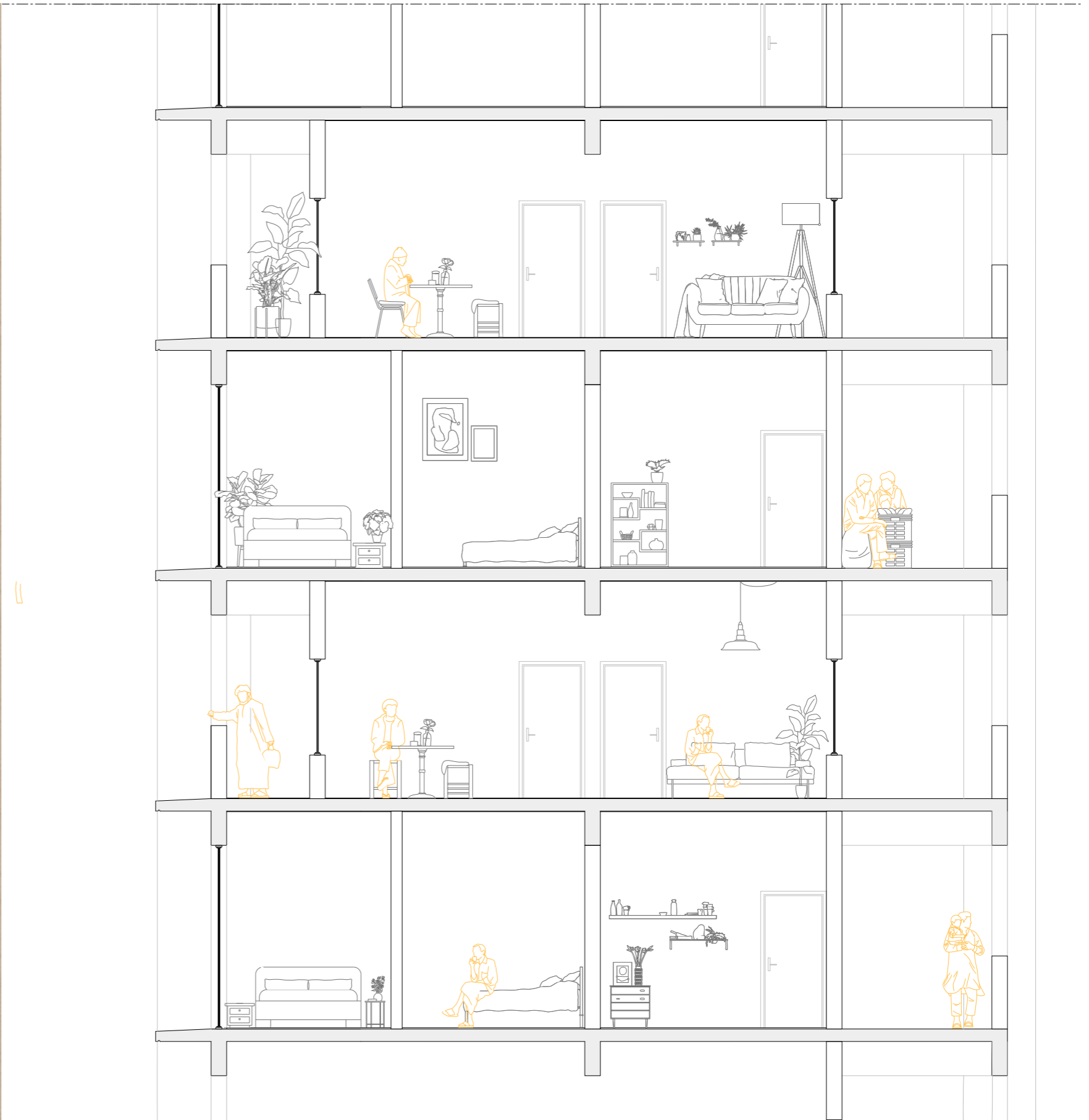


01. UNIT: CORNER MIDDLE INCOME

Area: 77 m² excl.
12 m² outside space
(6 m² front, 6 m² balcony)



01. UNIT: MIDDLE INCOME



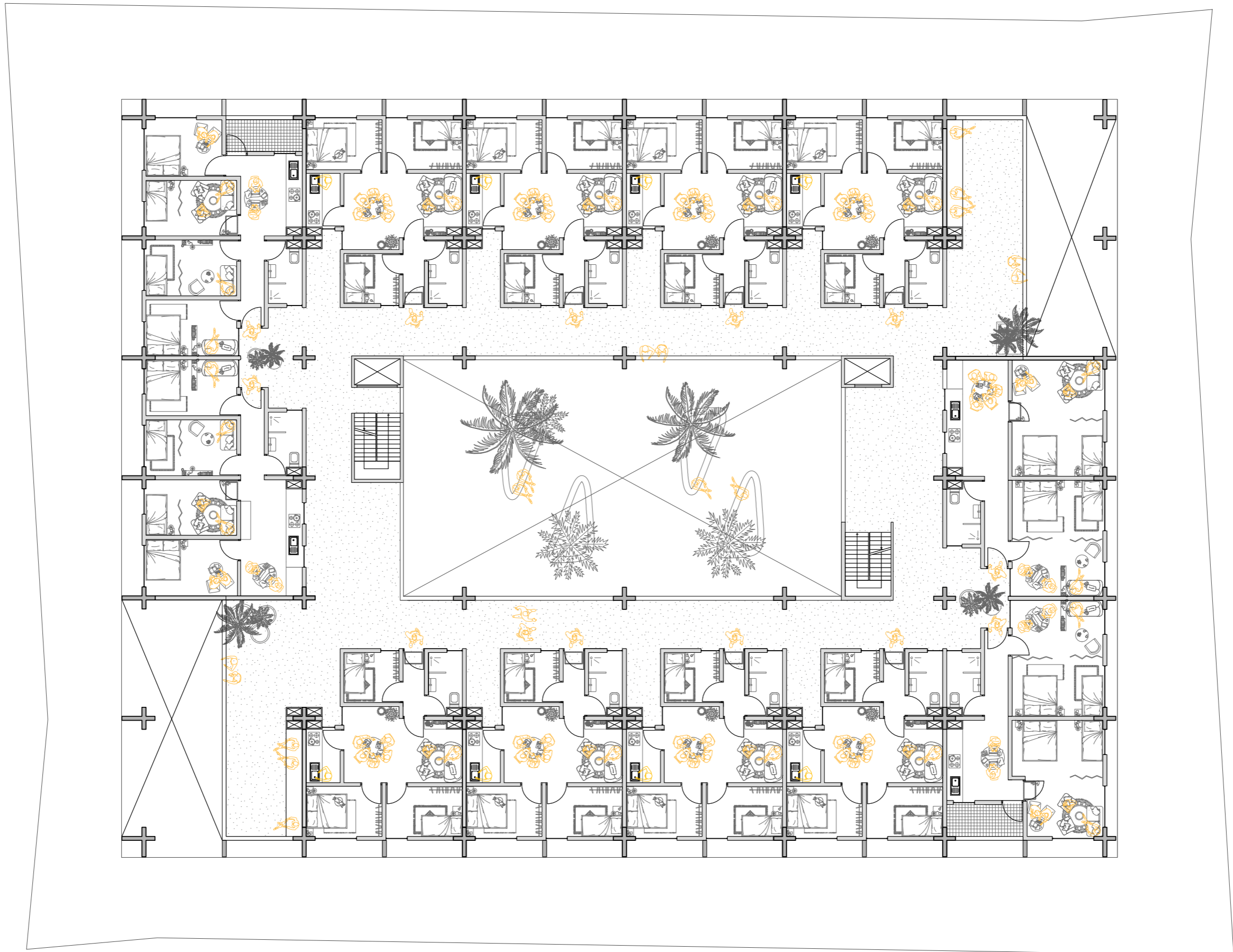
02. CLUSTER: IMPRESSION MARKET DAY



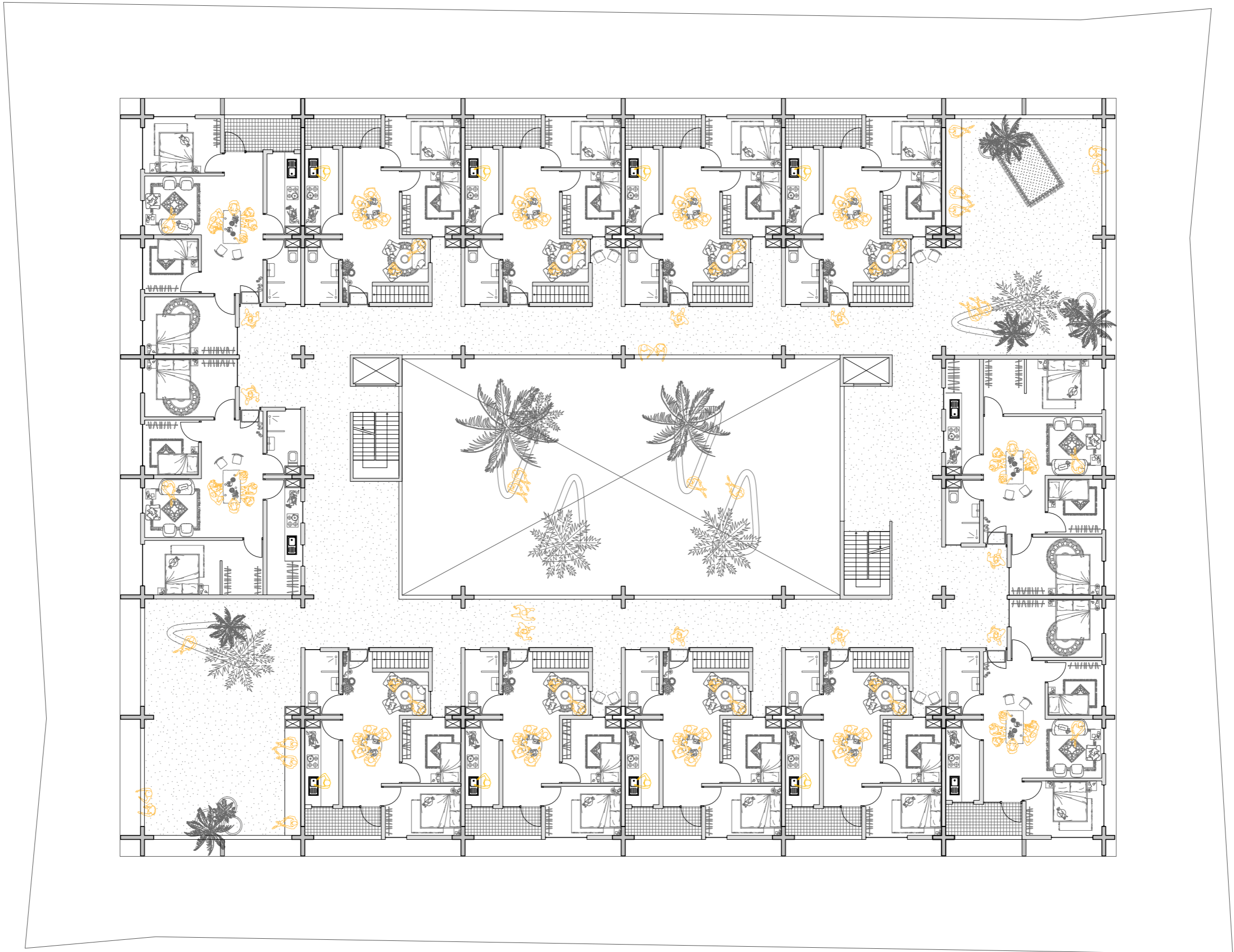
04. MATERIALITY: INTERIOR IMPRESSION



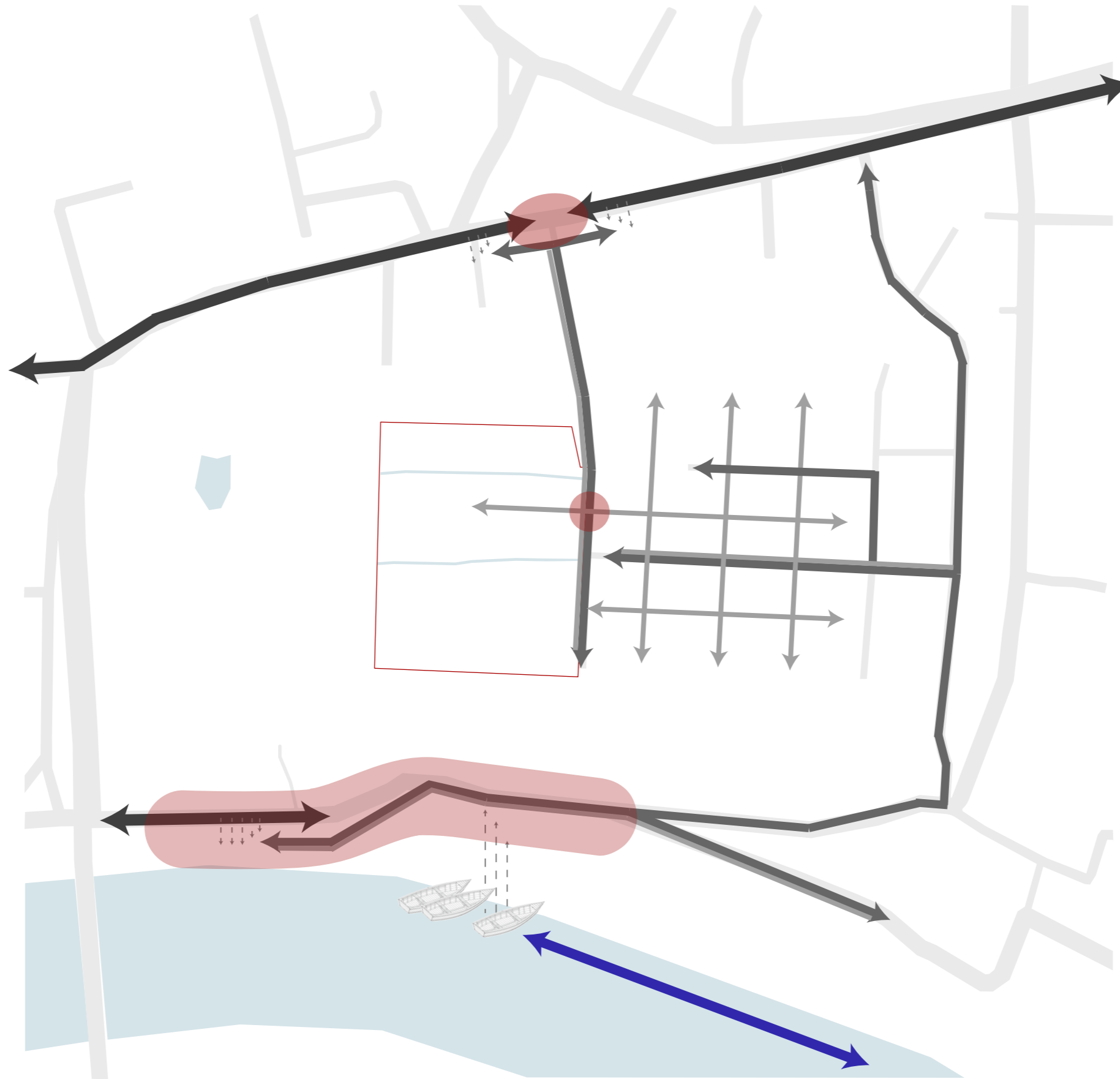
02. CLUSTER: 3RD FLOOR LOW INCOME



02. CLUSTER: 2ND FLOOR



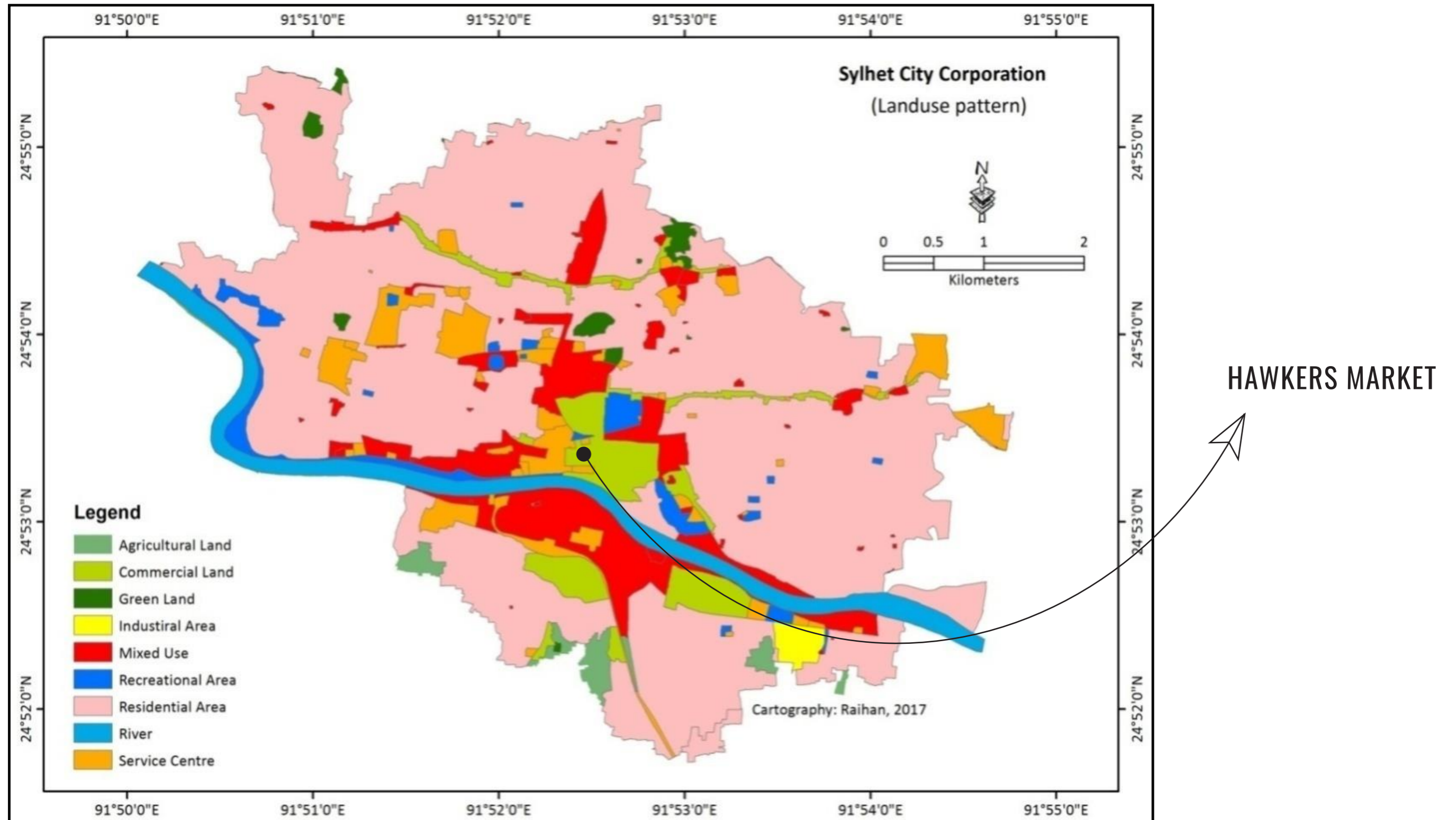
03. SITE ANALYSIS: INFRASTRUCTURE



- ➡ Boat
- ➡ Big Truck
- ➡ Small Truck
- ➡ Rickshaw/Cng
- Bottleneck
- Infrastructure
- Design plot
- Surnma River

03. SITE ANALYSIS: LOCATION

Figure 1.3: Types of Land Use in SCC



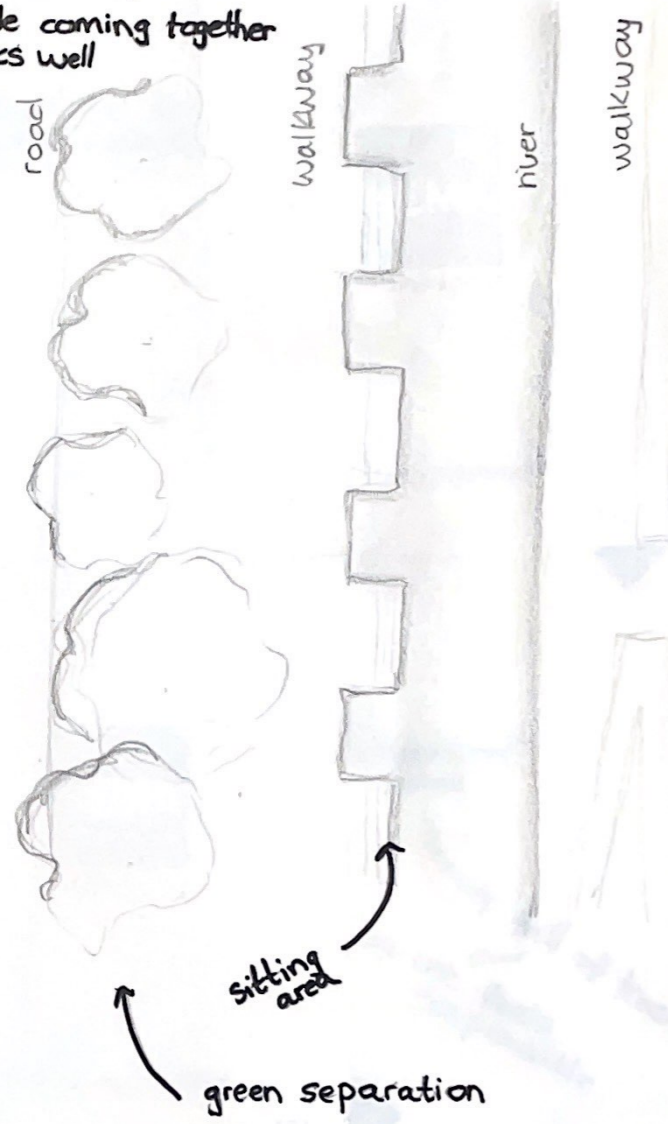
Source: SCC, 2017.

03. NEIGHBOURHOOD: WATERFRONT CONNECTION/ ROOM FOR CONNECTION SPACES

Sylhet - WATERWAY

NEW WATERWAY

↳ people coming together
→ works well



53



Fieldwork sketch: new waterway

03. NEIGHBOURHOOD: WATERFRONT CONNECTION



Current waterfront



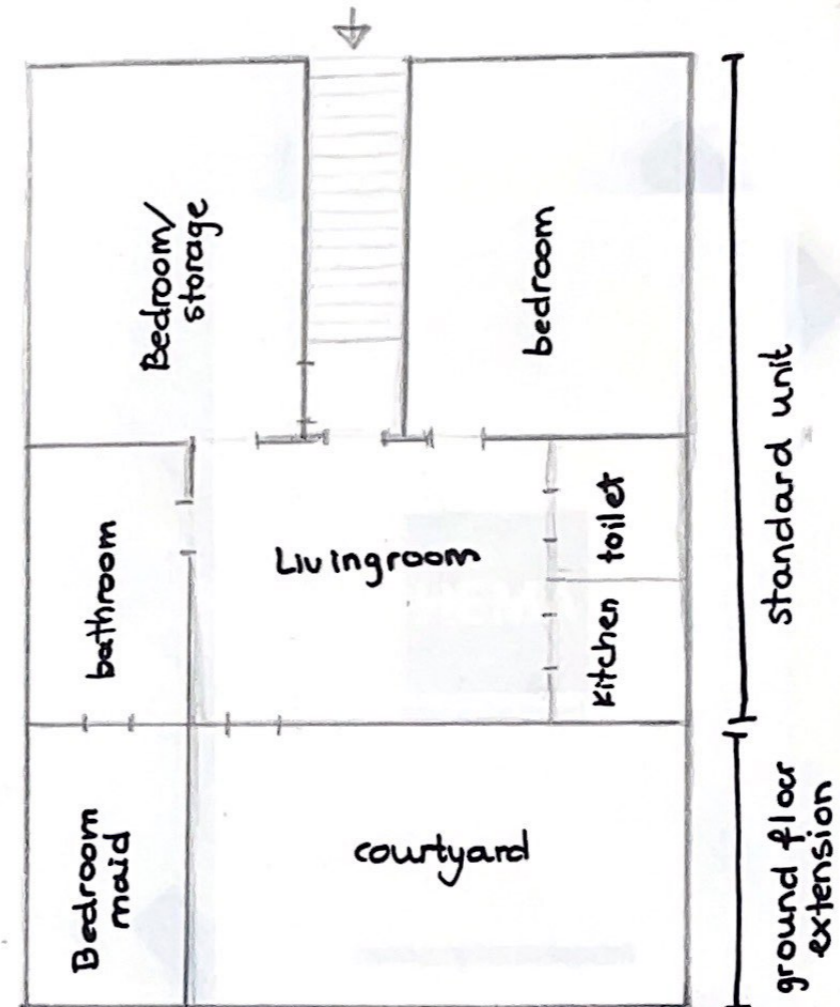
Hidden waterway

01. UNIT: CASE STUDY LIVING PREFERENCES



DHAKA - WORKERS HOUSE

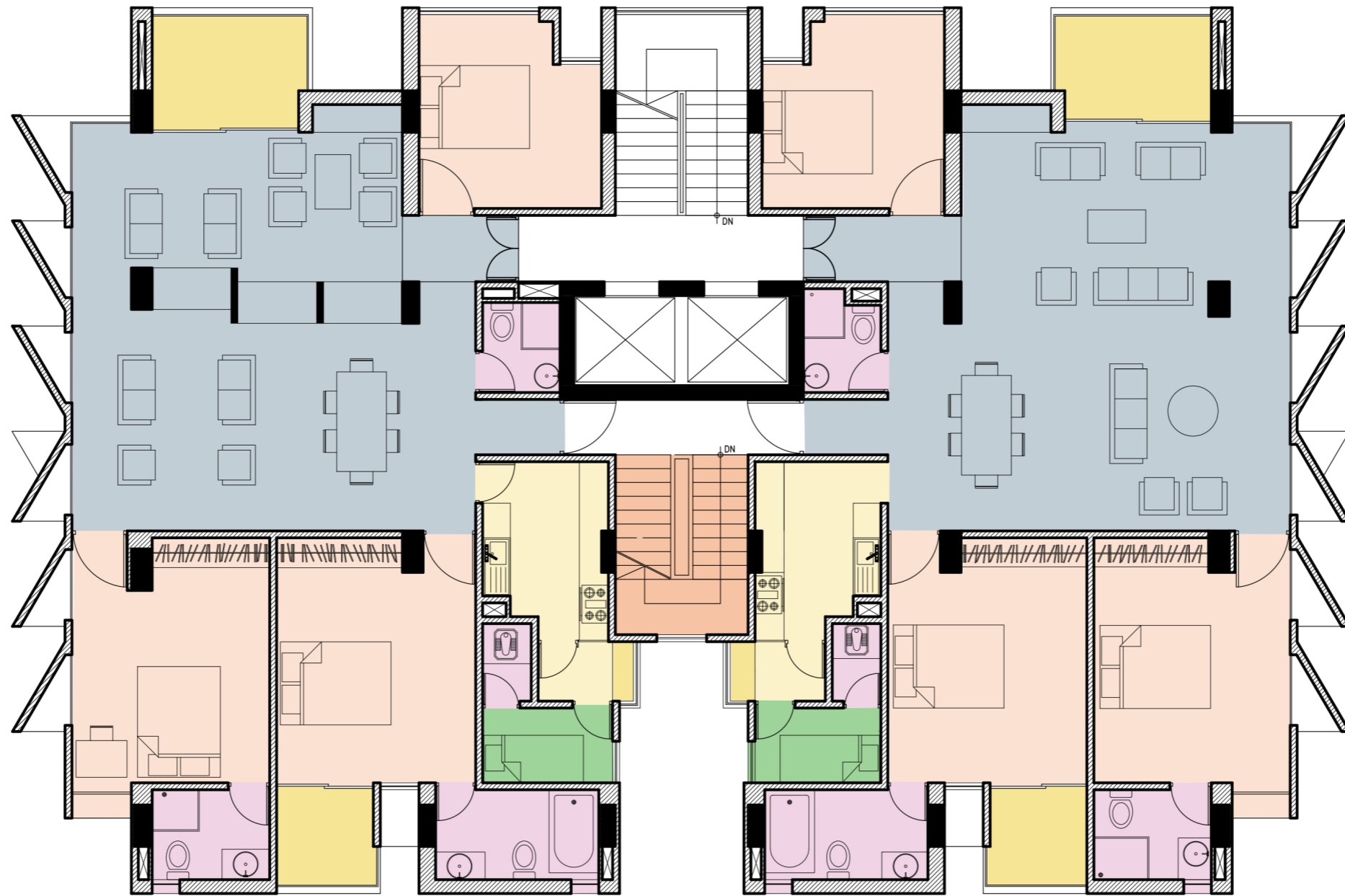
- goverment housing
- for doctors: ranking 4/5



dynamic facade
- a lot of facade to roll down
- air flow
→ shaded are through all back

Fieldwork sketch: goverment workers housing

01. UNIT: CASE STUDY LIVING PREFERENCES: COMFORT REVERIE, MTA

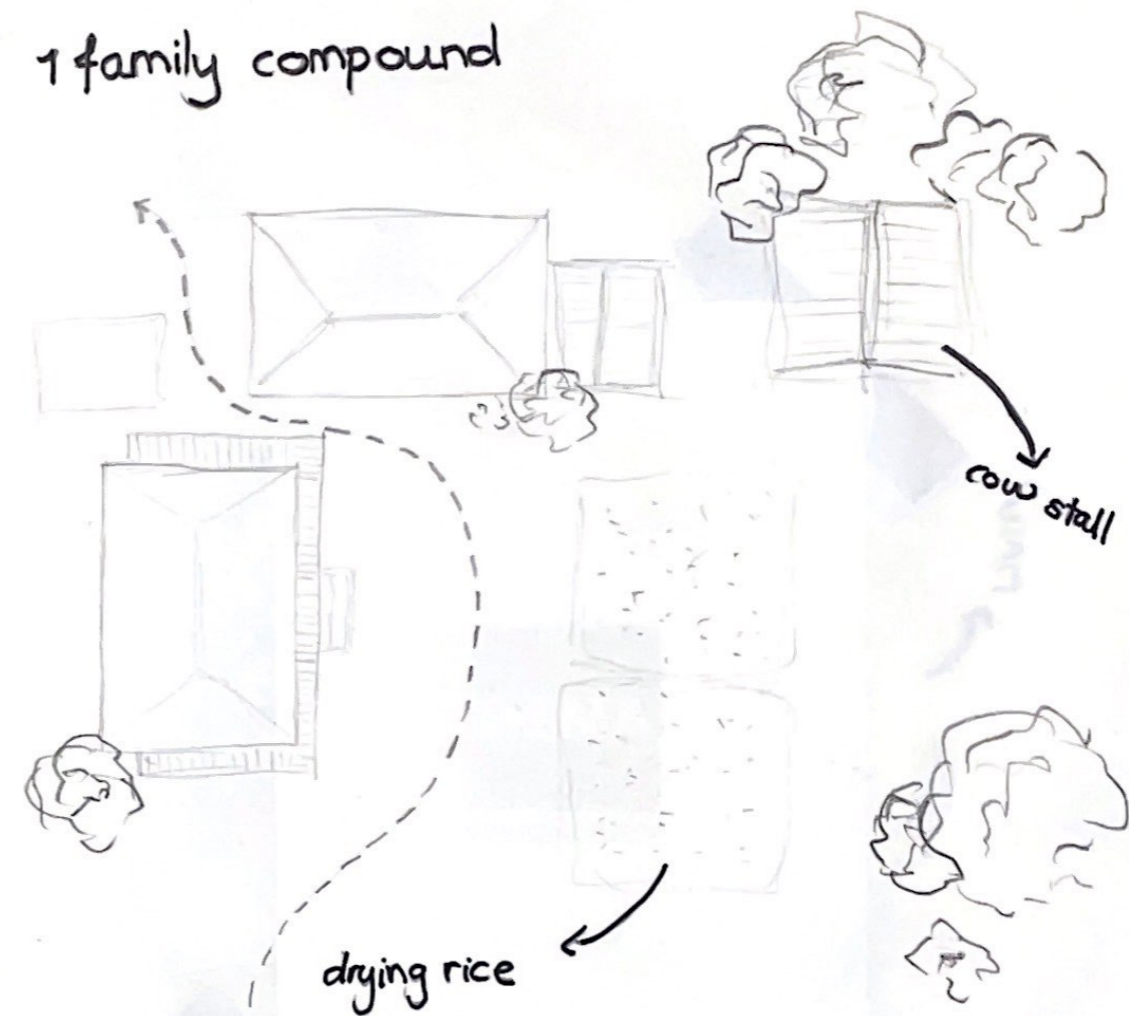


02. CLUSTER: CASE STUDY LIVING PREFERENCES



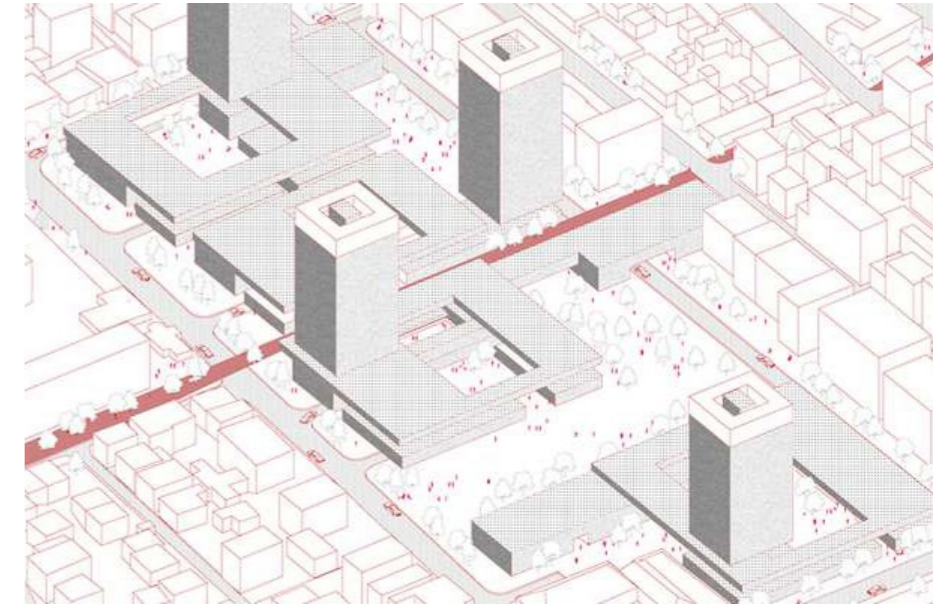
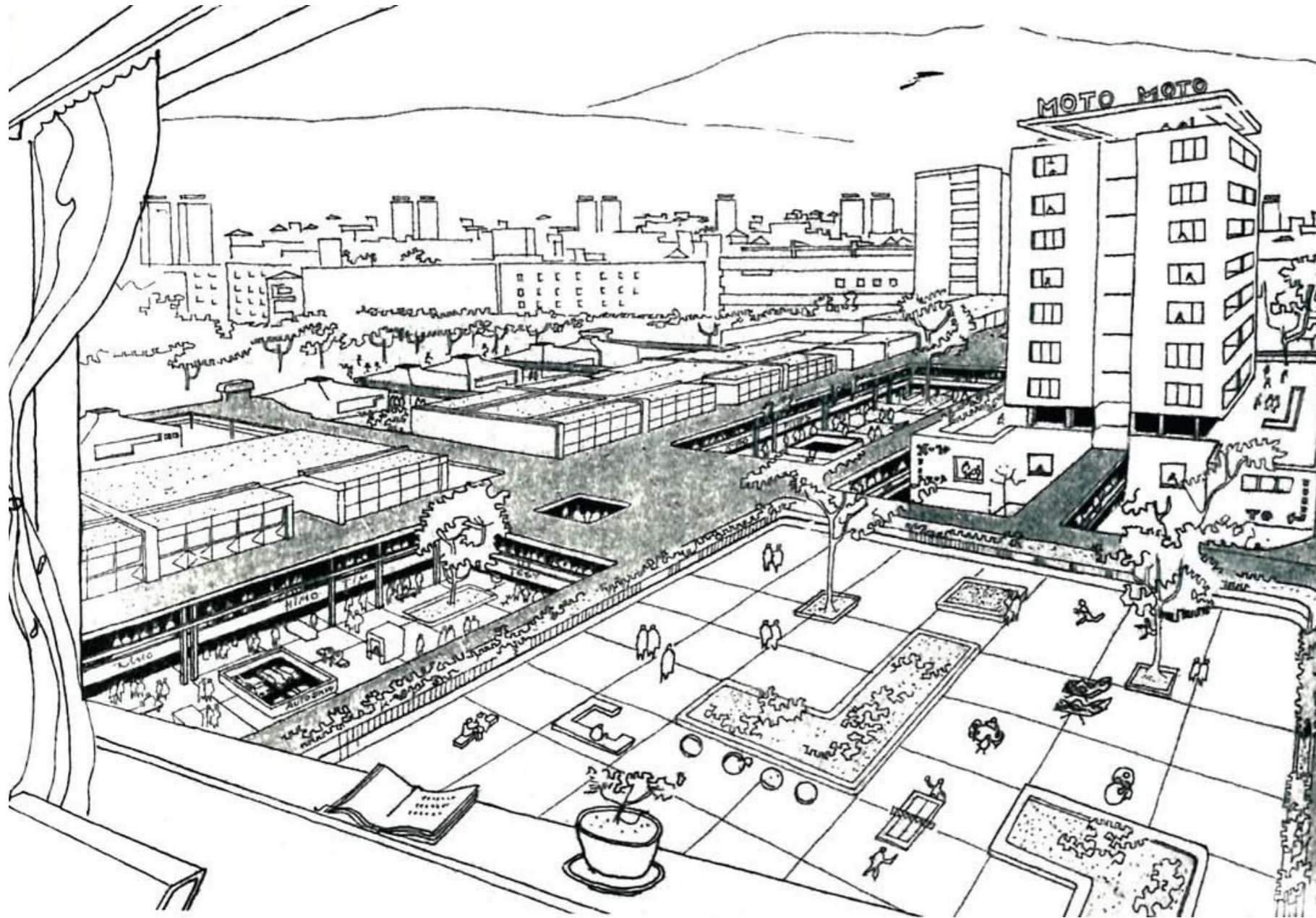
VILLAGE

1 family compound

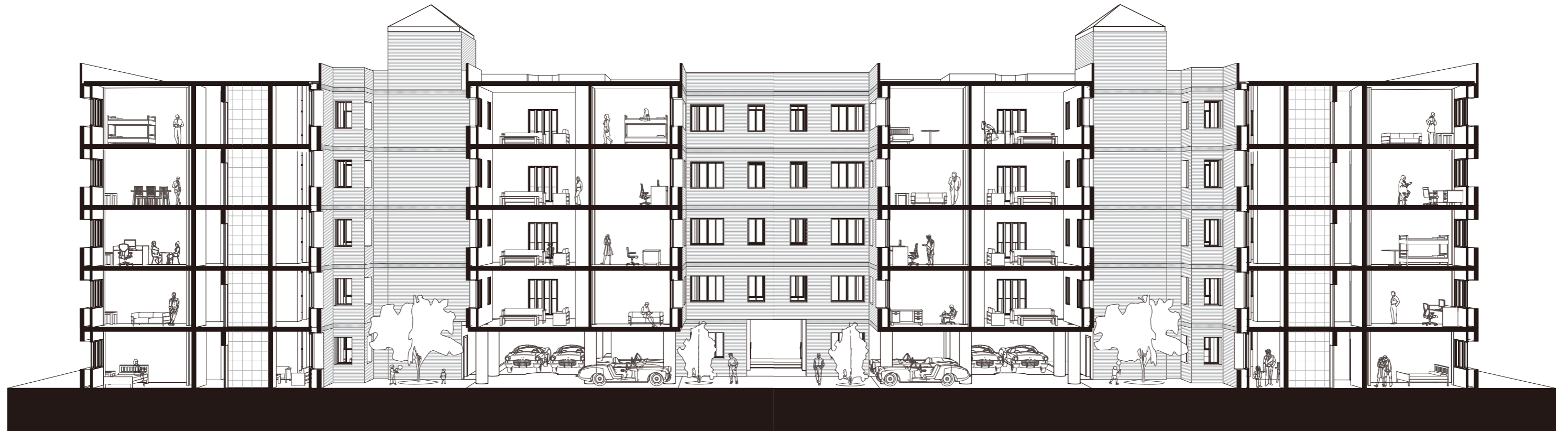


- using middle communal space as working space

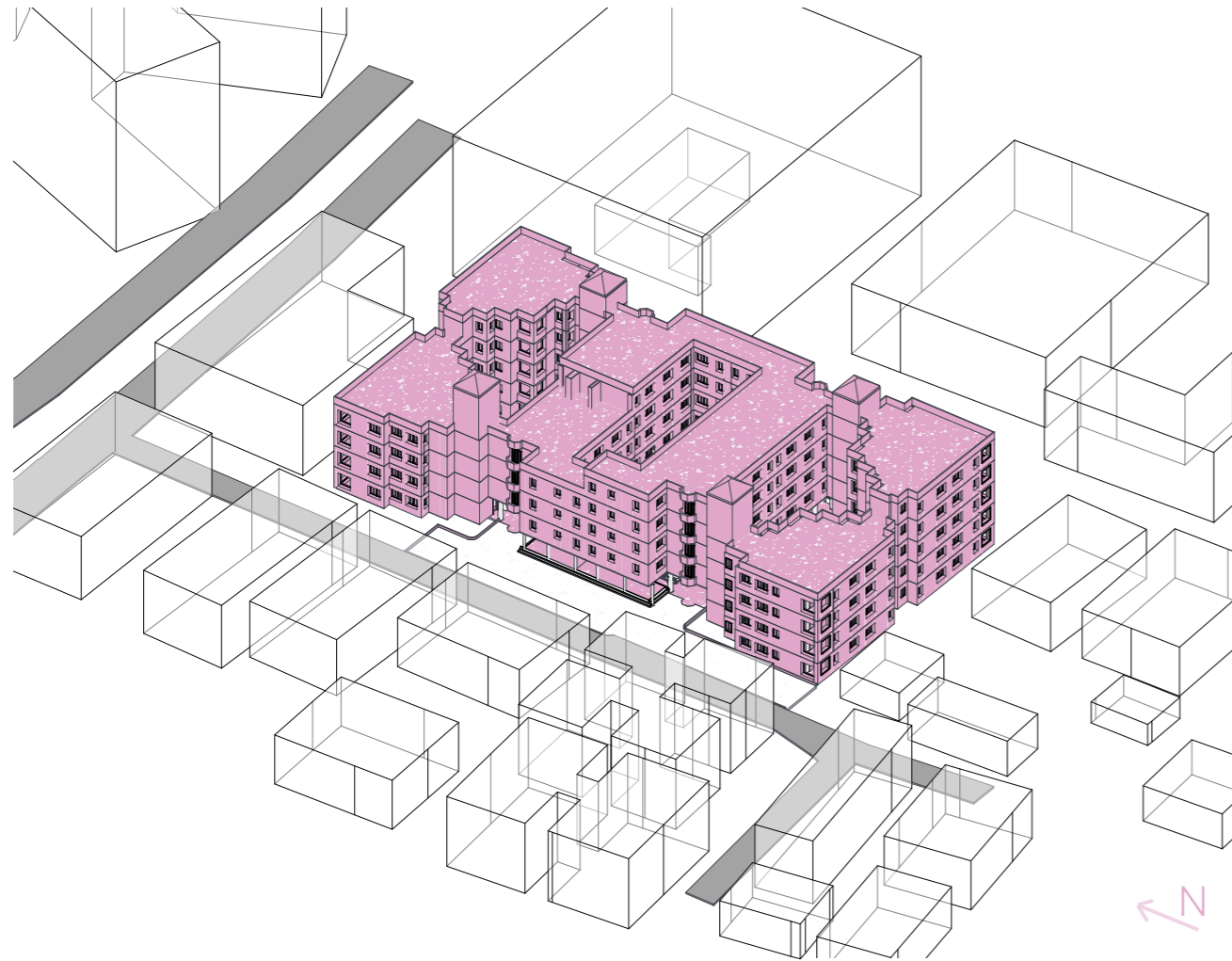
02. CLUSTER MARKET CASE STUDY: CITY TRADE CENTER SKOPJE



02. CLUSTER: CASE STUDY LIVING PREFERENCES: KALINDI HOUSING COMPLEX, BASHIRUL HAQ & ASSOCIATES



02. CLUSTER: CASE STUDY LIVING PREFERENCES: KALINDI HOUSING COMPLEX, BASHIRUL HAQ & ASSOCIATES



03. SITE ANALYSIS: PHOTO'S INFRASTRUCTURE

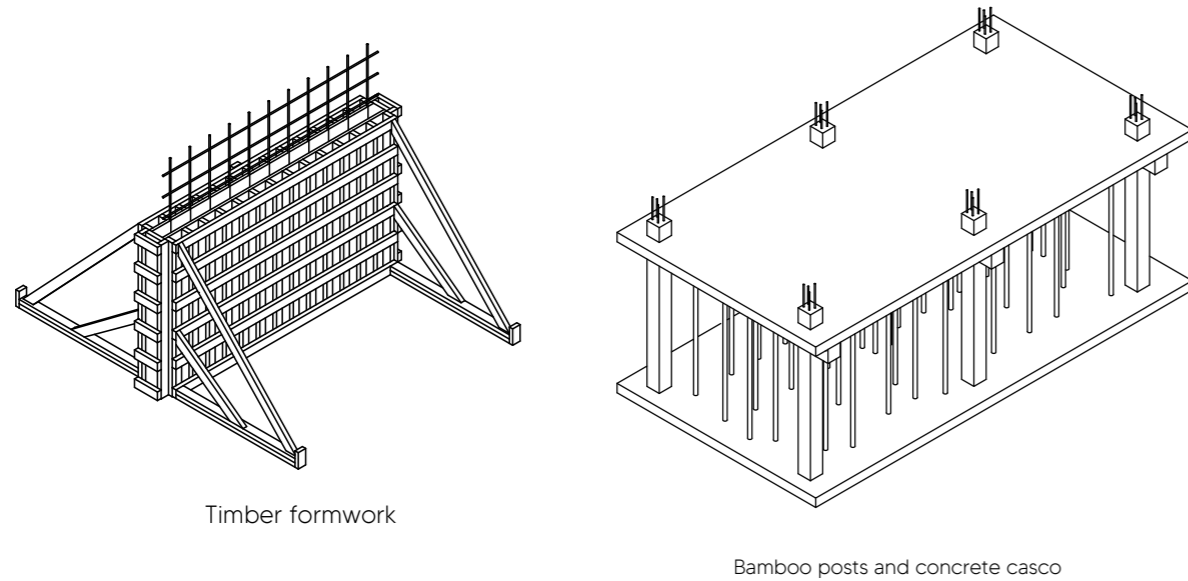


02. CLUSTER: CURRENT MARKET PHOTO'S



04. MATERIALITY: CONSTRUCTION

1. IN SITU CONCRETE CONSTRUCTION



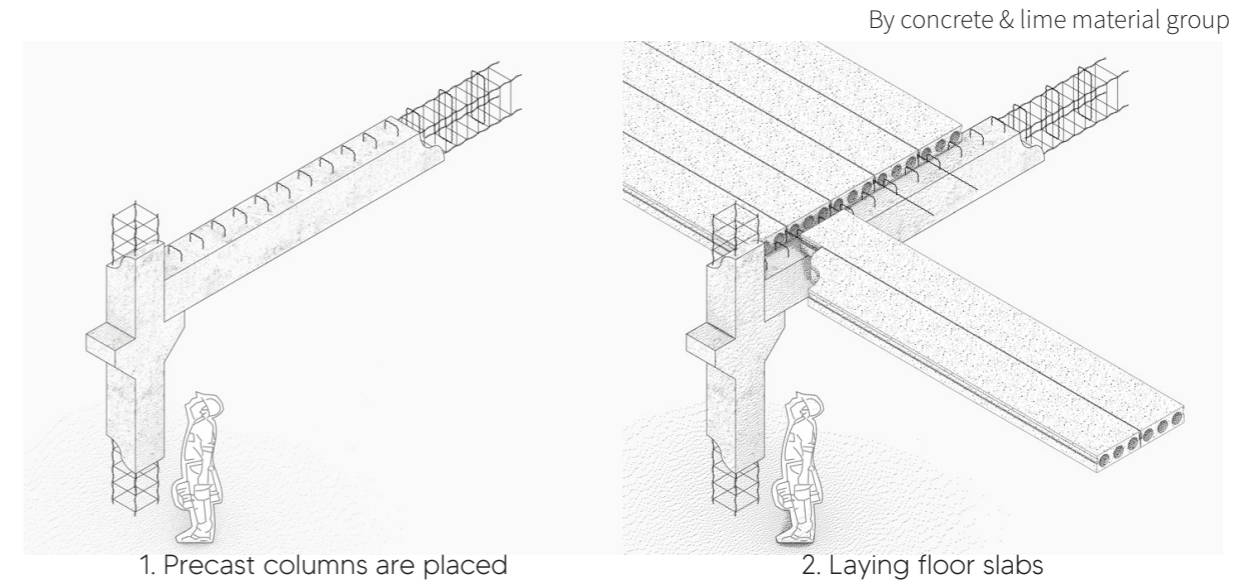
Timber formwork

Bamboo posts and concrete casco

- labour intensive, but low labour price
- Currently used in Bangladesh
- 38% cheaper

BOQ: Cast in place concrete construction							
Item	Description	Unit	Quantity	Productivity labour	hours of labour	Unit price (BDT)	Total (BDT)
Preliminary Work							
Excavation	Digging for foundations	m ³	500	1 m ³ per hour	500	300	150.000
Formwork	Column and beam formwork (incl. labor)	m ²	3.000	0,2 m ² per hour	15.000	350	5.250.000
Concrete work							
Concrete production	On-site mixing an pouring	m ³	1.200	0,5 m ³ per hour	2.400	250	600.000
Reinforcement	Placing steel reinforcement	ton	150	0,05 ton per hour	3000	250	750.000
Other costs							
Material transport	Transport of cement, sand, gravel and steel	trip	100			2.000	200.000
Equipment rental	Mixers, vibrators, scaffolding	-	-			-	500.000
Total							7.450.000

2. PREFAB CONCRETE CONSTRUCTION



1. Precast columns are placed

2. Laying floor slabs

- No large scale prefab concrete construction industry
- Expensive transportation
- Expensive to rent a crane on site

BOQ: Pre-fab concrete construction							
Item	Description	Unit	Quantity	Productivity labour	hours of labour	Unit price (BDT)	Total (BDT)
Preliminary Work							
Excavation	Digging for foundations	m ³	500	1 m ³ per hour	500	300	150.000
Prefab elements							
Prefab concrete production	Factory-made prefab columns and beams	m ²	1.200			6.500 per m ³	7.800.000
Transport of prefab	Delivery to site	trip	150			5.000	750.000
Prefab installation	Assembly of prefab columns and beams				4.800	400	1.920.000
Crane operator	Operating crane for installation				480	600	288.000
Other costs							
Material transport	Transport of cement, sand, gravel and steel	trip	100			2.000	200.000
Equipment rental	Crane and lifting equipment	-	-			-	1.000.000
Total							12.108.000

04. MATERIALITY: INFILL STRATEGY

MATERIAL	PRICE PER M²
CI SHEETS	0,35 - 3,50 euro
WOOD - TEAK	1,37 - 5,85 euro
WOOD - SAL	1,37 - 5,85 euro
BAMBOO	2,52 - 5,04 euro
CEMENT BLOCK	3,47 - 5,54 euro
CONCRETE BLOCK	4,80 - 7,67 euro
BRICK	3,80 - 6,87 euro
ADOBE BRICKS	0,92 - 2,30 euro

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ADOBE BRICKS	0,92 - 2,30 euro

04. MATERIALITY: INFILL STRATEGY

1. WATTLE & DAUB

1. Bamboo structure	1,26 euro/m ²
2. Woven lattice of natural fibres, reeds or wooden strips	0,78 euro/m ²
3. Mud plaster: finest clay, coarse, sand and silt.	-
Total	2,04 euro

2. ADOBE BRICKS

1. Brick: clay, sand & water	1,26 euro/m ²
2. Mud mortar: clay, sand & water	0,78 euro/m ²
3. Mud plaster: finest clay, coarse, sand and silt.	-
Total	2,09 euro

04. MATERIALITY: INFILL STRATEGY

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1. Bamboo structure	1,26 euro/m ²
2. Woven lattice of natural fibres, reeds or wooden strips	0,78 euro/m ²
3. Mud plaster: finest clay, coarse, sand and silt.	-
Total	2,04 euro

PRO'S

- Local building technique so the knowledge is already there
- Quick construction
- Cheap technique; no expensive tools necessary
- Use strengths of different materials
- Lightweight
- Easily dismantled

CONS

- Negative social connotation

2. ADOBE BRICKS

1. Brick: clay, sand & water	1,61 euro/m ²
2. Mud mortar: clay, sand & water	0,48 euro/m ²
3. Mud plaster: finest clay, coarse, sand and silt.	-
Total	2,09 euro


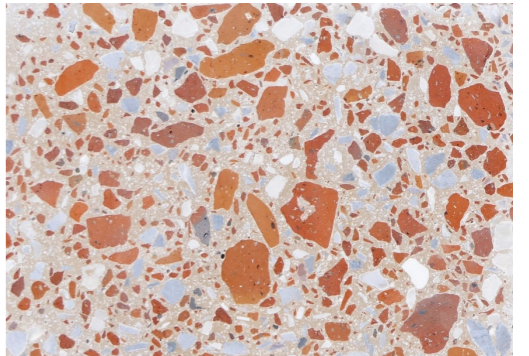


PRO'S

- Low labour intensity
- Quick learning process for the building technique
- Reusable formwork
- flexible dimensions of produced bricks

CONS

- Heavy weight
- requires large open area for drying process
- Long building process due to slow drying

04. MATERIALITY: USING 3rd GRADE BRICK

COCCIOPESTO OUTSIDE FINISHING & INSIDE FLOOR FINISHING	LIME	LIME	 
	SAND	SAND	
	WATER	WATER	
	RECYCLED FIRED CLAY	RECYCLED BRICKS OR 3RD GRADE BRICKS: PLASTER: CRUSHED FLOOR FINISHING: BIGGER AGGREGATES	
CLAY PLASTER INSIDE FINISHING	CLAY	CLAY	 
	LOAM	LOAM	
	SAND	SAND	
	WATER	WATER	
		BRICK DUST?	
EARTH LAYER	CLAY	CLAY	
	SAND	SAND	
	WATER	WATER	
	WASTE FILLING	NATURAL FIBERS (INBETWEEN 2 EARTH LAYERS)	

05. MANAGERIAL STRATEGY: FINANCIAL CALCULATION

	QUANTITY/AREA	RENTAL PRICE	ANNUAL REVENUE/ EXPENCES	NOTES
COMMERCIAL SPACE	9620 m ²	Tk 1.000 per m ² per month	Tk 115.440.000	Higher rental price
LOW INCOME UNIT	128units (65 m ² /unit,max. 8p)	Tk 8.000 per month	Tk 12.288.000	Subsidized social housing rents
LOW INCOME UNIT	304 units (13 m ² /unit, max. 2p)	Tk 1.600 per month	Tk 5.836.800	Subsidized social housing rents
MIDDLE INCOME UNIT	60 units (65 m ² /unit,max. 8p)	Tk 15.000 per month	Tk 10.800.000	Market-rate rents
MIDDLE INCOME UNIT	36 units (83 m ² /unit, max. 6p)	Tk 19.000 per month	Tk 8.208.000	Market-rate rents
TOTAL RENTAL INCOME	-	-	Tk 152.532.800	
CONSTRUCTION EXPENSES	-	-	Tk 50.591.000	50.591 m ² x Tk 20.000 per sqm = 1.011.820.000 / 20 years = 50.591.000
MAINTANANCE EXPENSES	-	-	Tk 22.879	Estimated at 15% of total income
TOTAL EXPENSES	-	-	Tk 50.613.879	
NET ANNUAL REVENUE FIRST 20 YEARS	-	-	Tk 101.918.921	Project is payed back in 20 years
NET ANNUAL REVENUE AFTER PAYBACK	-	-	Tk 152.509.921	

