

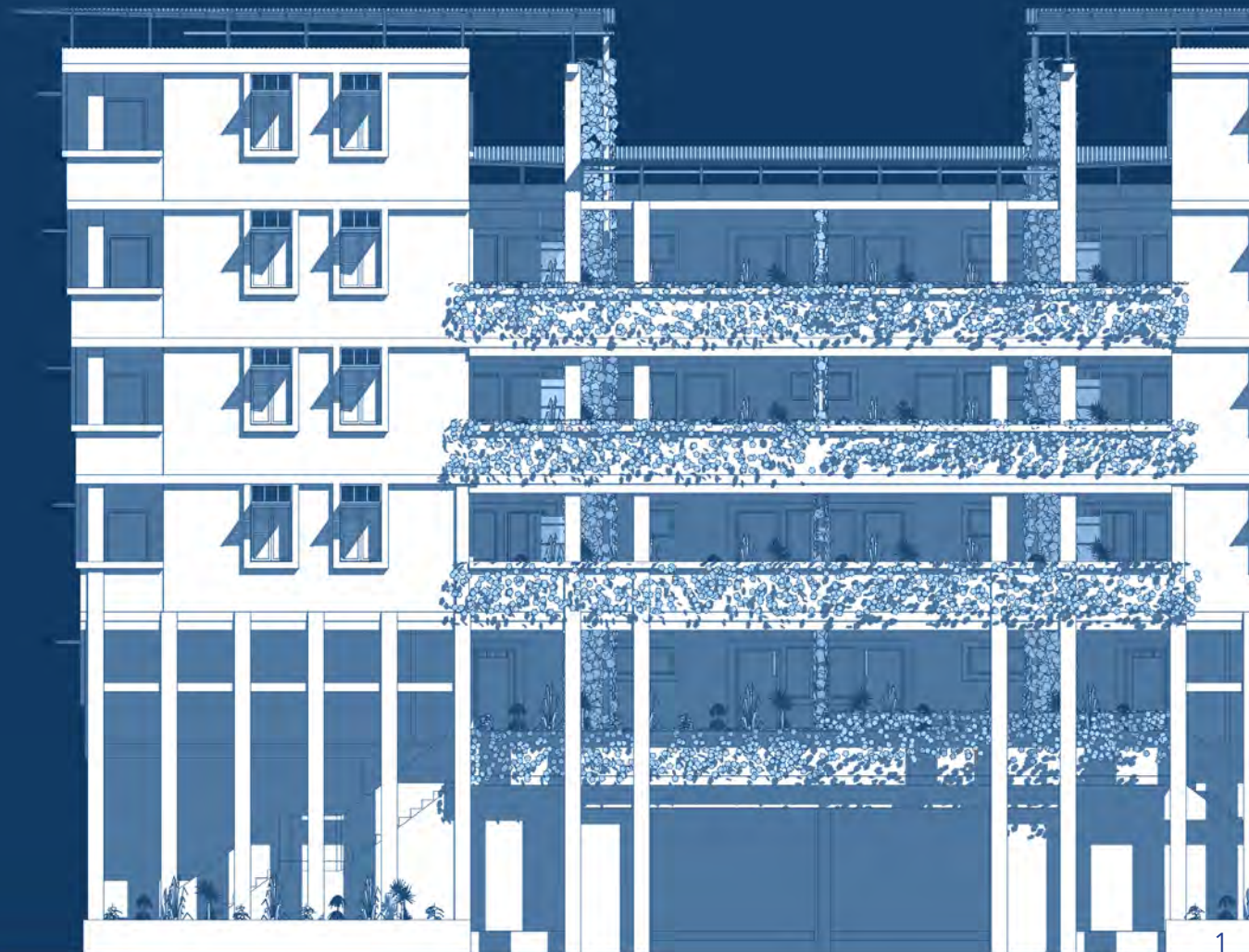
Kebele 24

An urban redevelopment scheme for multistory dwelling in Addis Ababa, Ethiopia

Casper Pasveer

P5

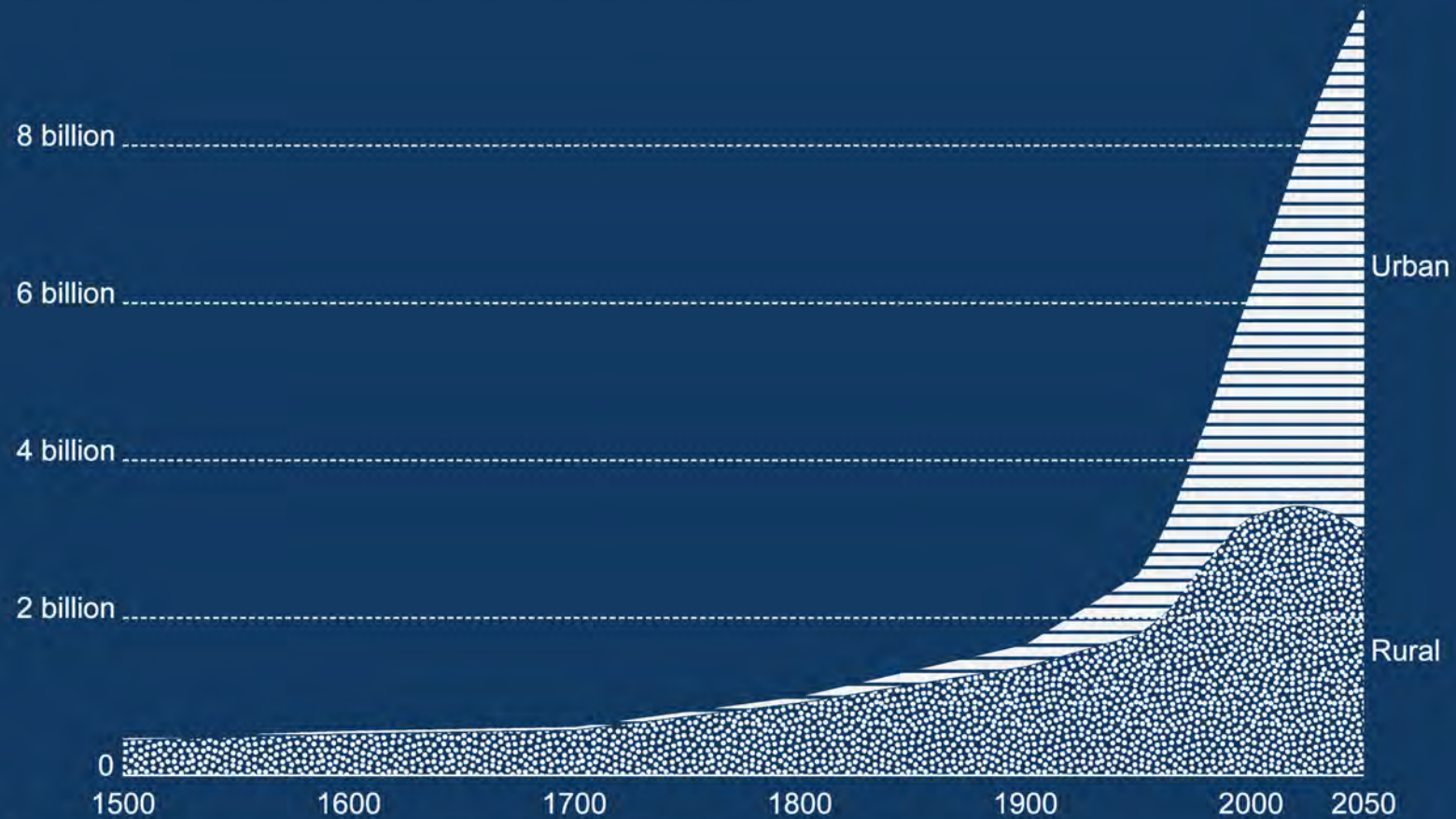
26-08-2020



Global Housing?

Urban and rural population projected to 2050, World

Total urban and rural population, given as estimates to 2016, and UN projections to 2050. Projections are based on the UN World Urbanization Prospects and its median fertility scenario.



Source: OWID based on UN World Urbanization Prospects 2018 and historical sources (see Sources)
CC BY

2.500.000.000

Total population Europe

750 million

Urbanisation rate

74%



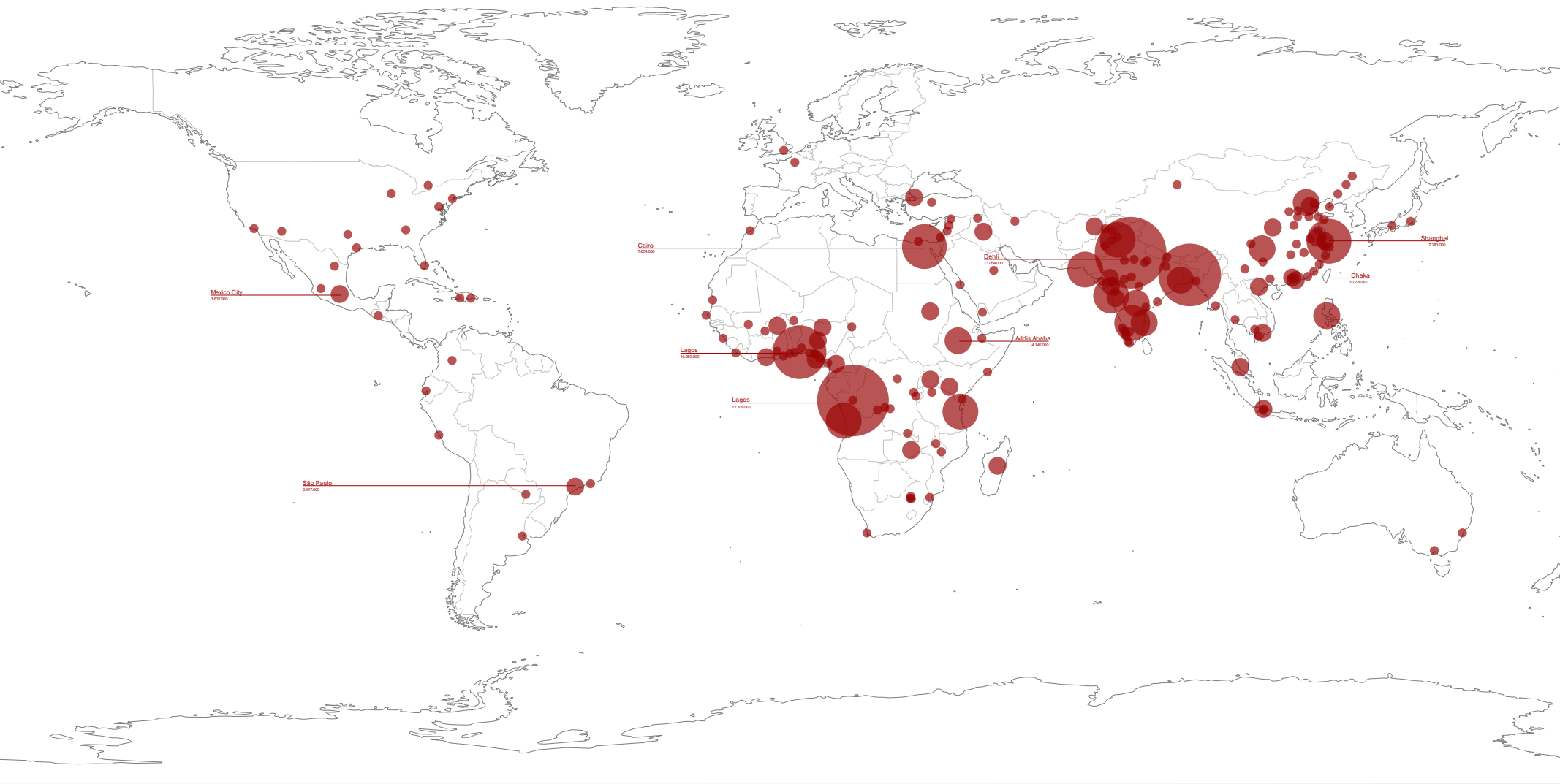
Urban population Europe

≈550 million people

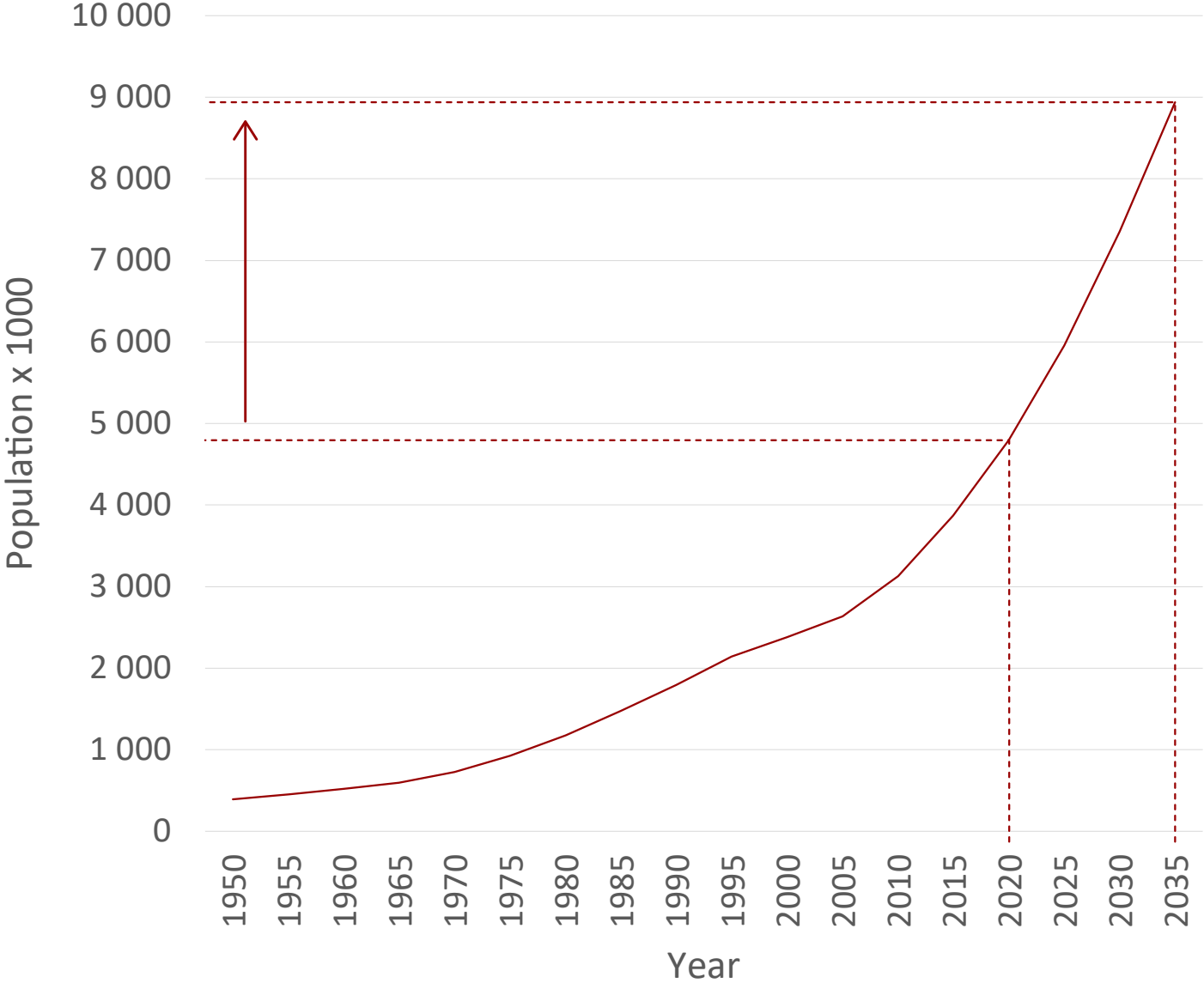
$$\frac{2.500.000.000}{550.000.000} \approx 5$$

**5 times the build environment
of Europe**

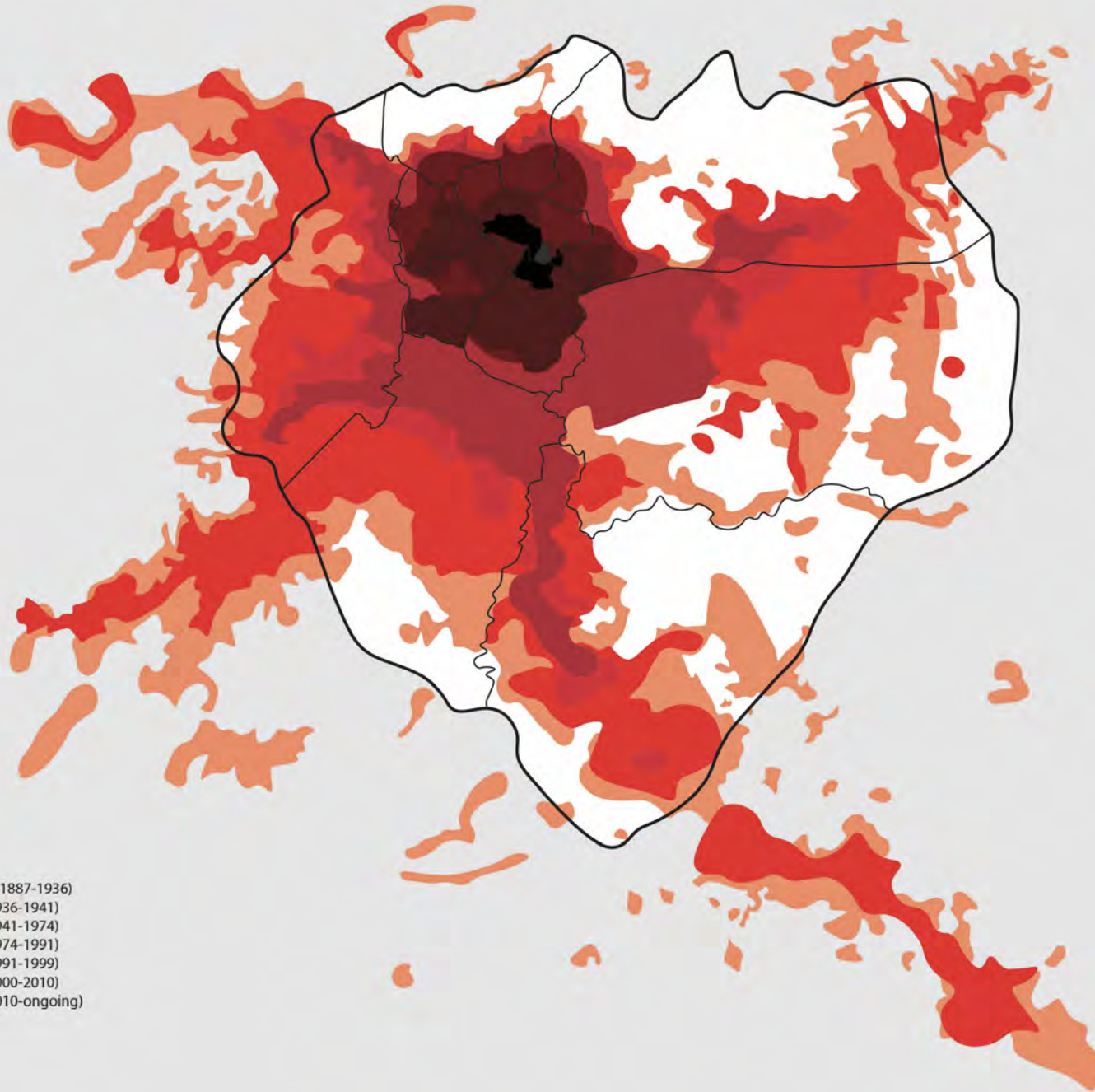




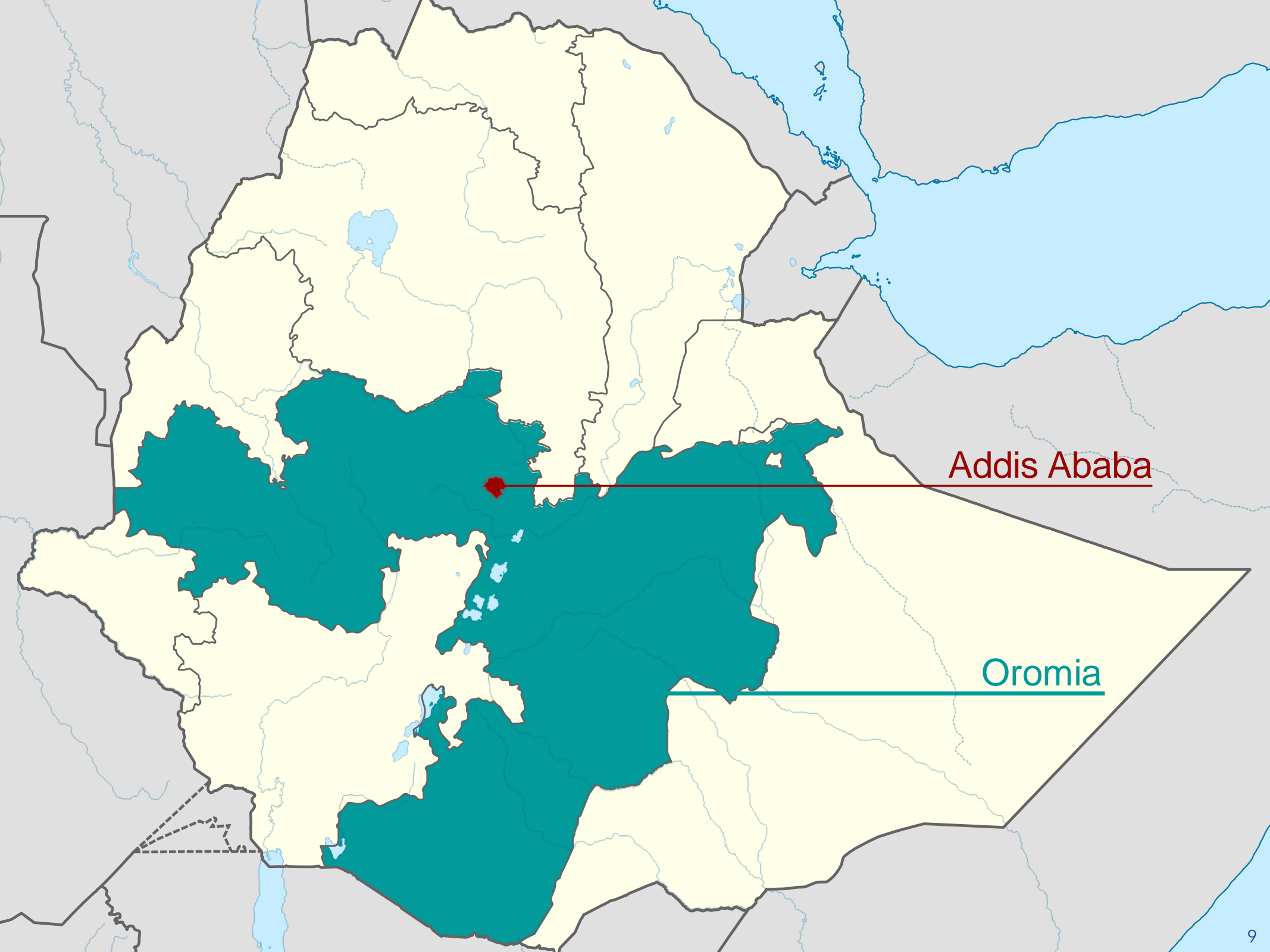
Population Addis Ababa



Source: UN Department of Economic and Social Affairs
Created by C.Pasveer



- Foundation (c. 1887-1936)
- The Italian Occupation (1936-1941)
- The Imperial Regime (1941-1974)
- The Dergue Era (1974-1991)
- The Post Dergue Period (1991-1999)
- Urbanization (2000-2010)
- Globalization (2010-ongoing)



Addis Ababa

Oromia



Cities

This article is more than 2 years old

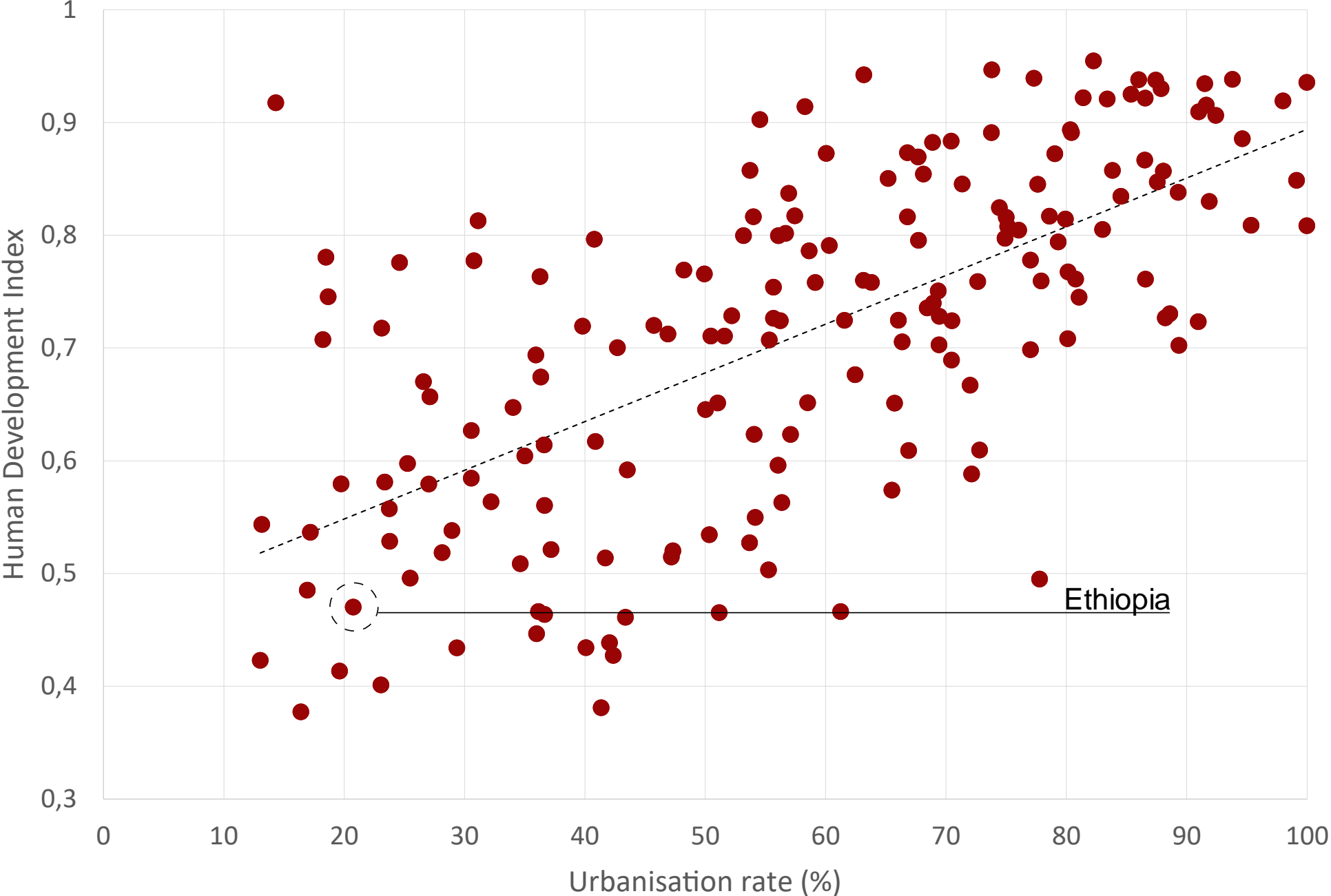
'It's life and death': how the growth of Addis Ababa has sparked ethnic tensions

Addis Ababa had a plan - to expand, and lead newly prosperous Ethiopia into a brave new century. But after protests led to a violent and harrowing state crackdown, what happens next could reverberate across Africa

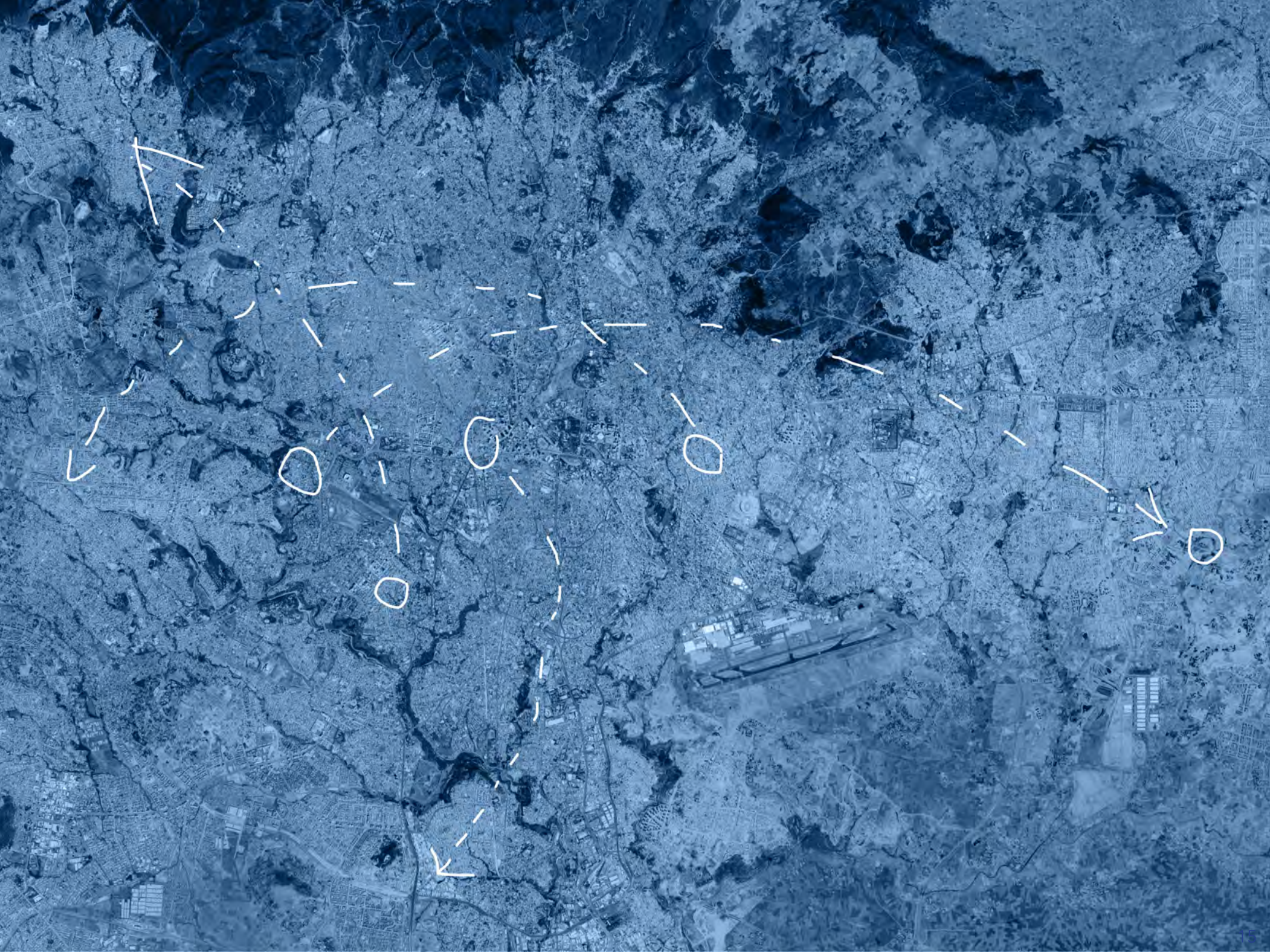
- The population of Addis Ababa will double in the next 15 years
- There is already a shortage of 1.200.000 units
- This growth can only take place within the city perimeters

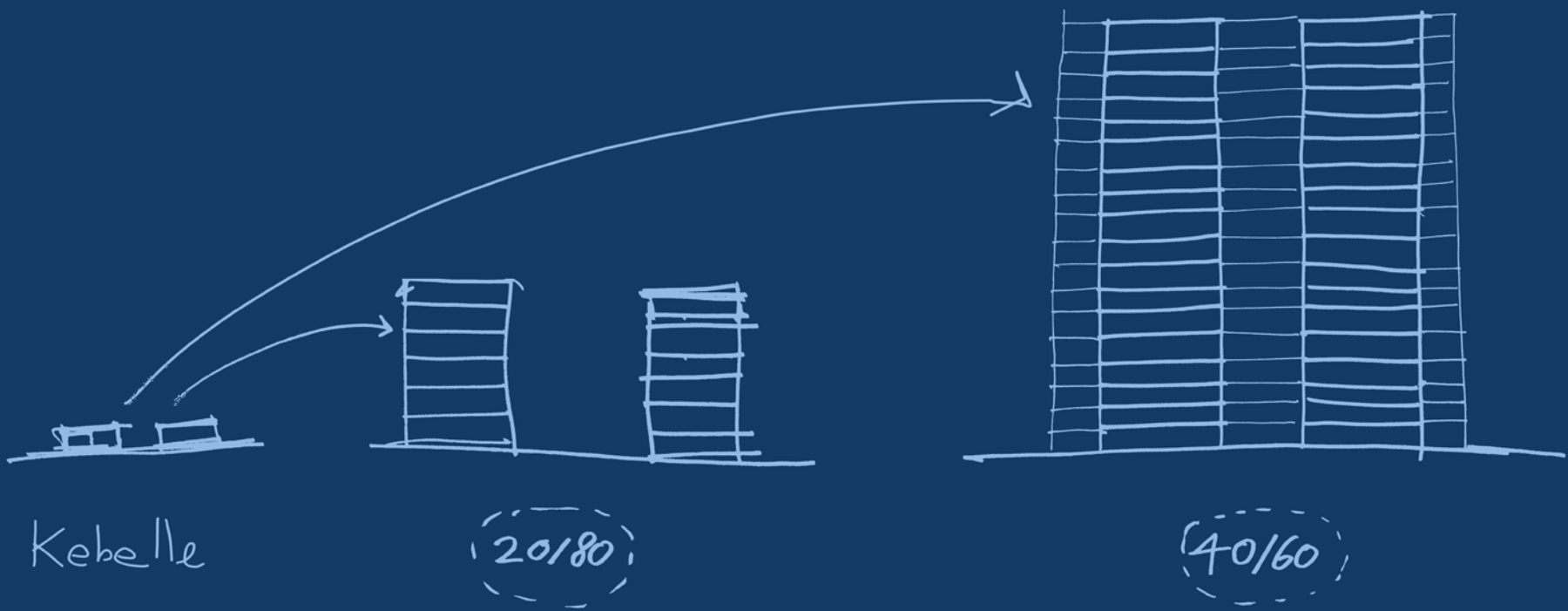
The only way accomodate this growth is to densify existing urban areas.

Human Development Index compared to urbanisation rate (2018)

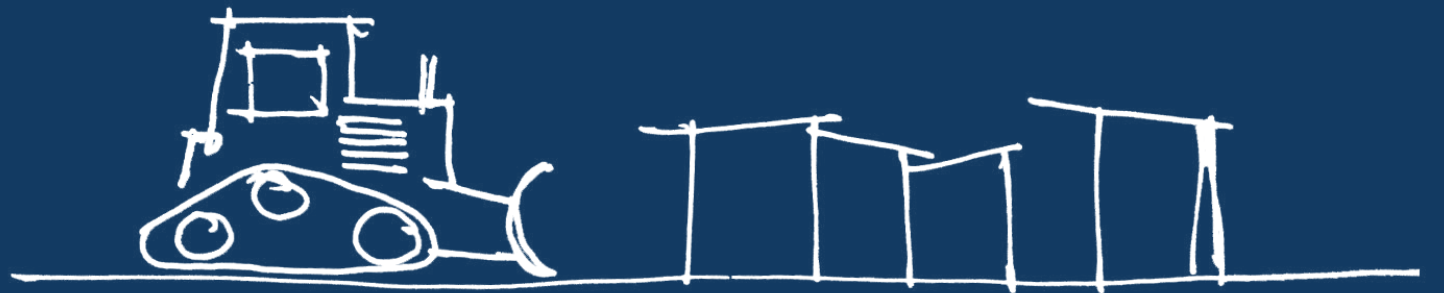
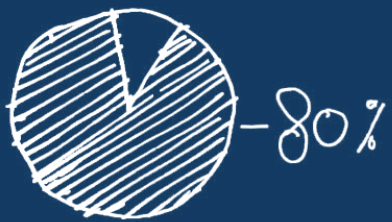














2001

2019

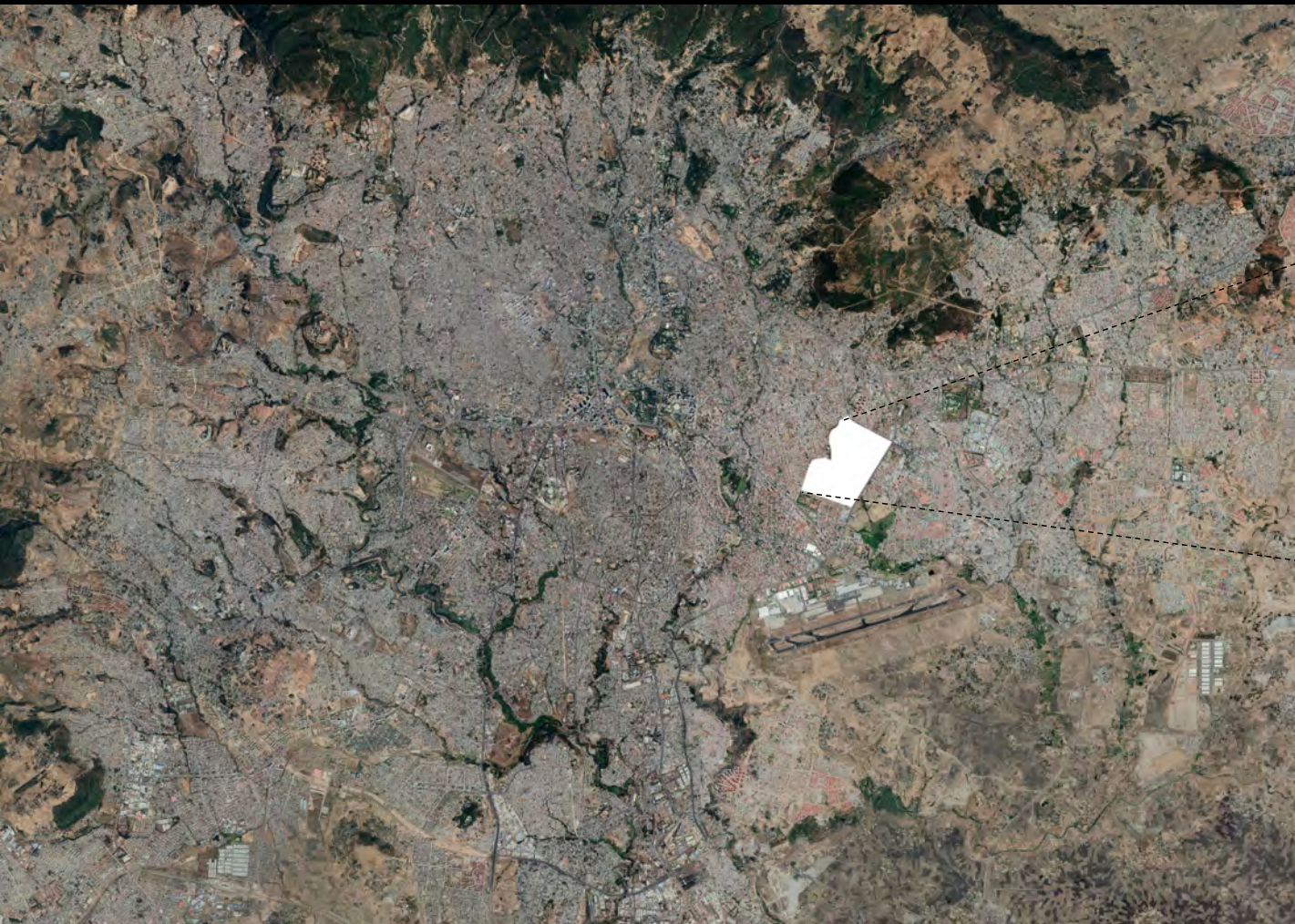


Source: Jean Claude Latombe



How can a large scale, affordable and progressively built housing scheme, incorporate the needs of different social classes while accomodating and maintaining different kinds of (informal) economic urban activities and being at the same time adaptive to future social changes?

- Densify on a large scale
- Mix of different social classes
- Space for informal ways of tenure (rental)
- Space for a mix of (in)formal economy. Home based enterprises
- Respect traditional living, cooking customs etc
- Create safe collective spaces
- Create a community, and the sense of ownership
- Protect existing communities by progressively building
- Create opportunities to let the local inhabitants profit from the development



Kebele 24



Source: Google Earth







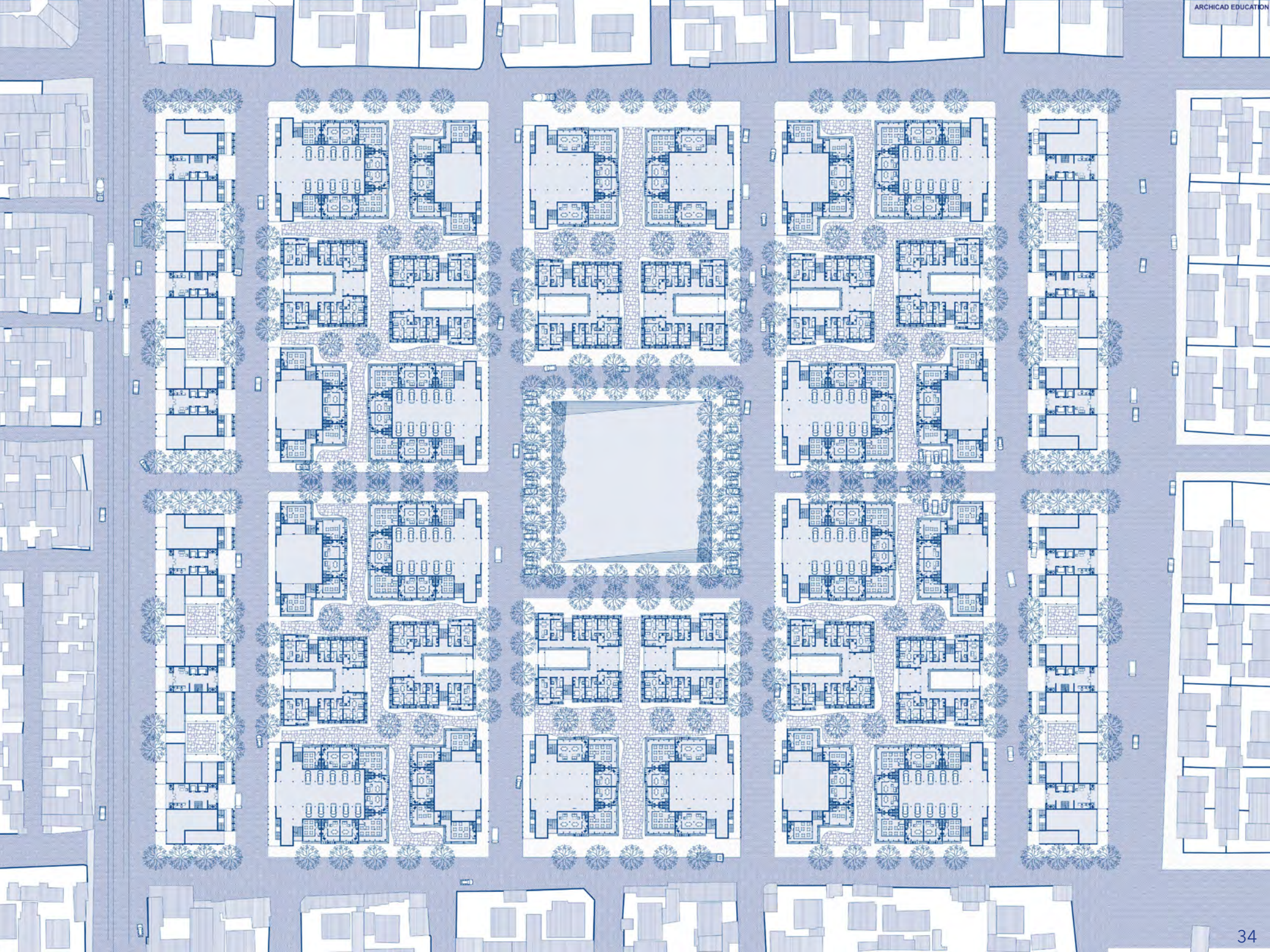












Current

M2

AREA

80615

FOOTPRINT

44418

FLOOR AREA

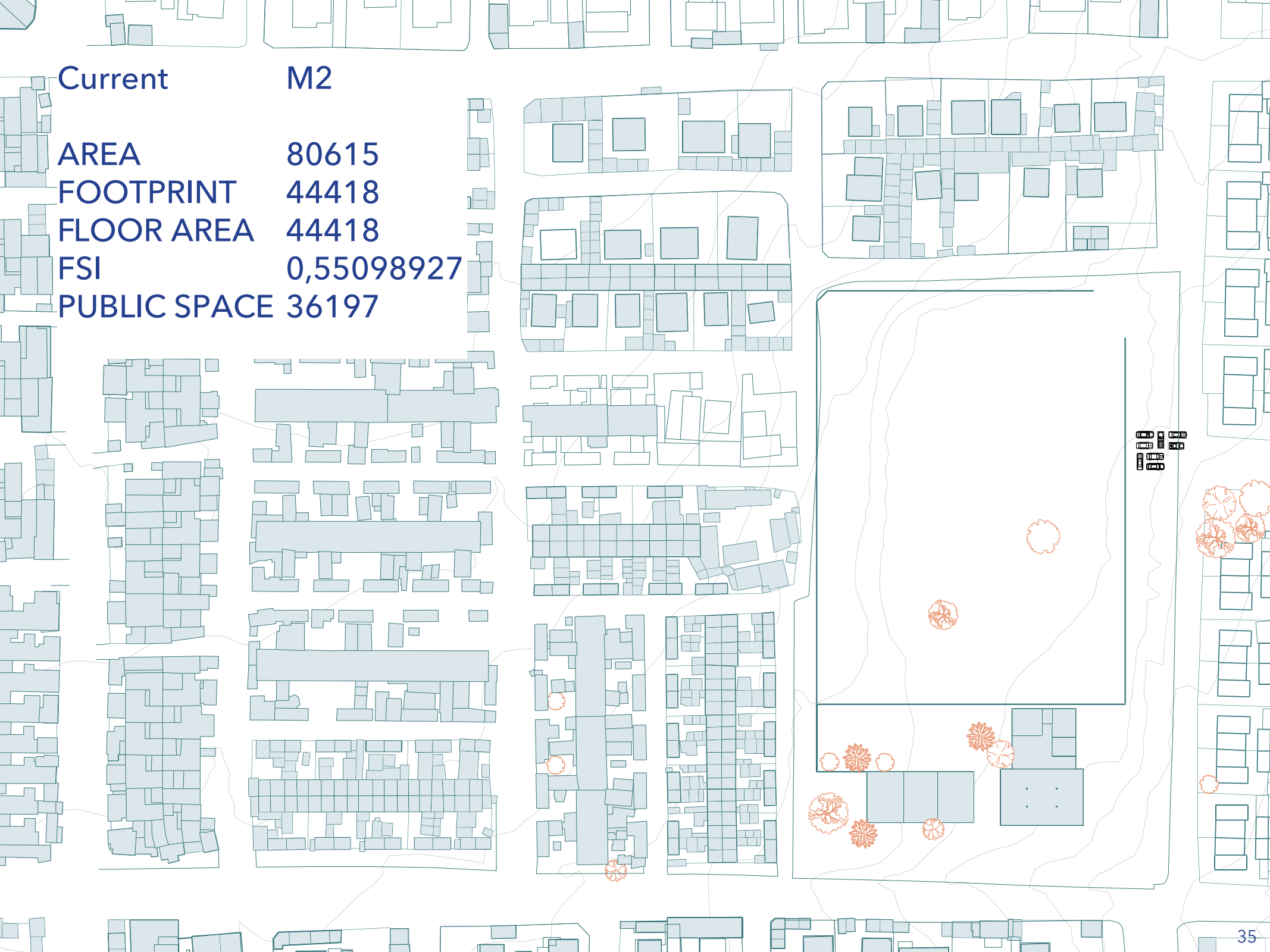
44418

FSI

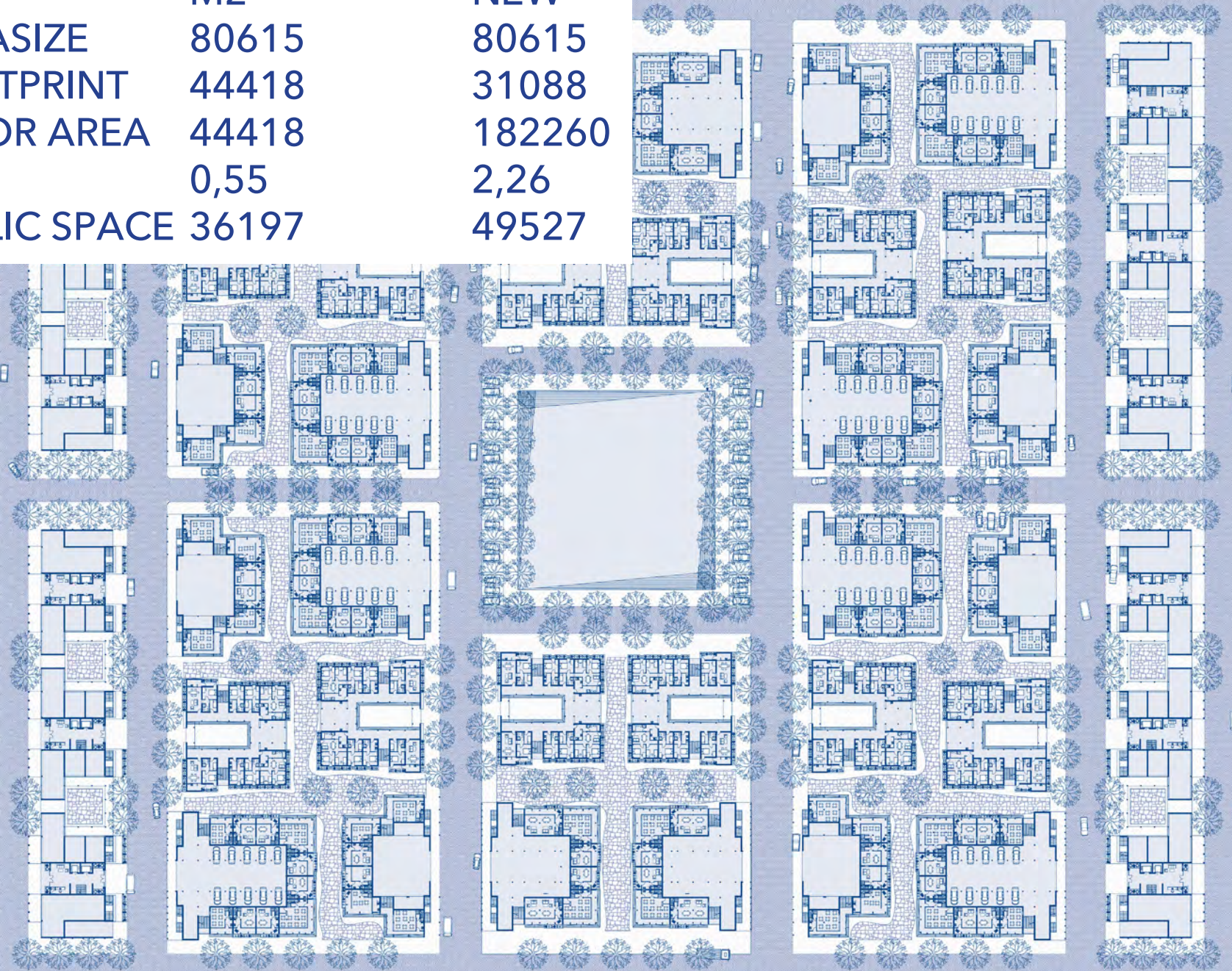
0,55098927

PUBLIC SPACE

36197

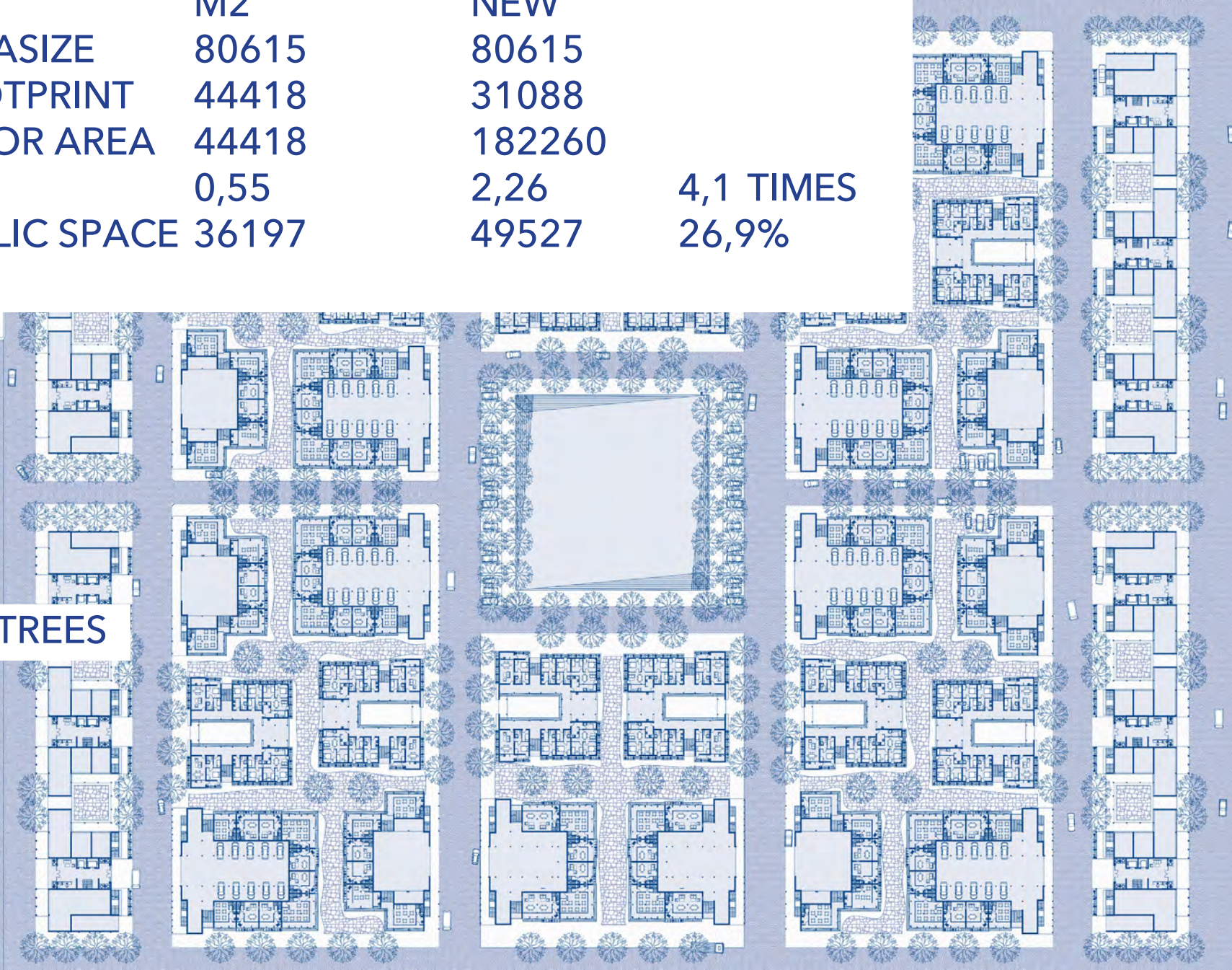


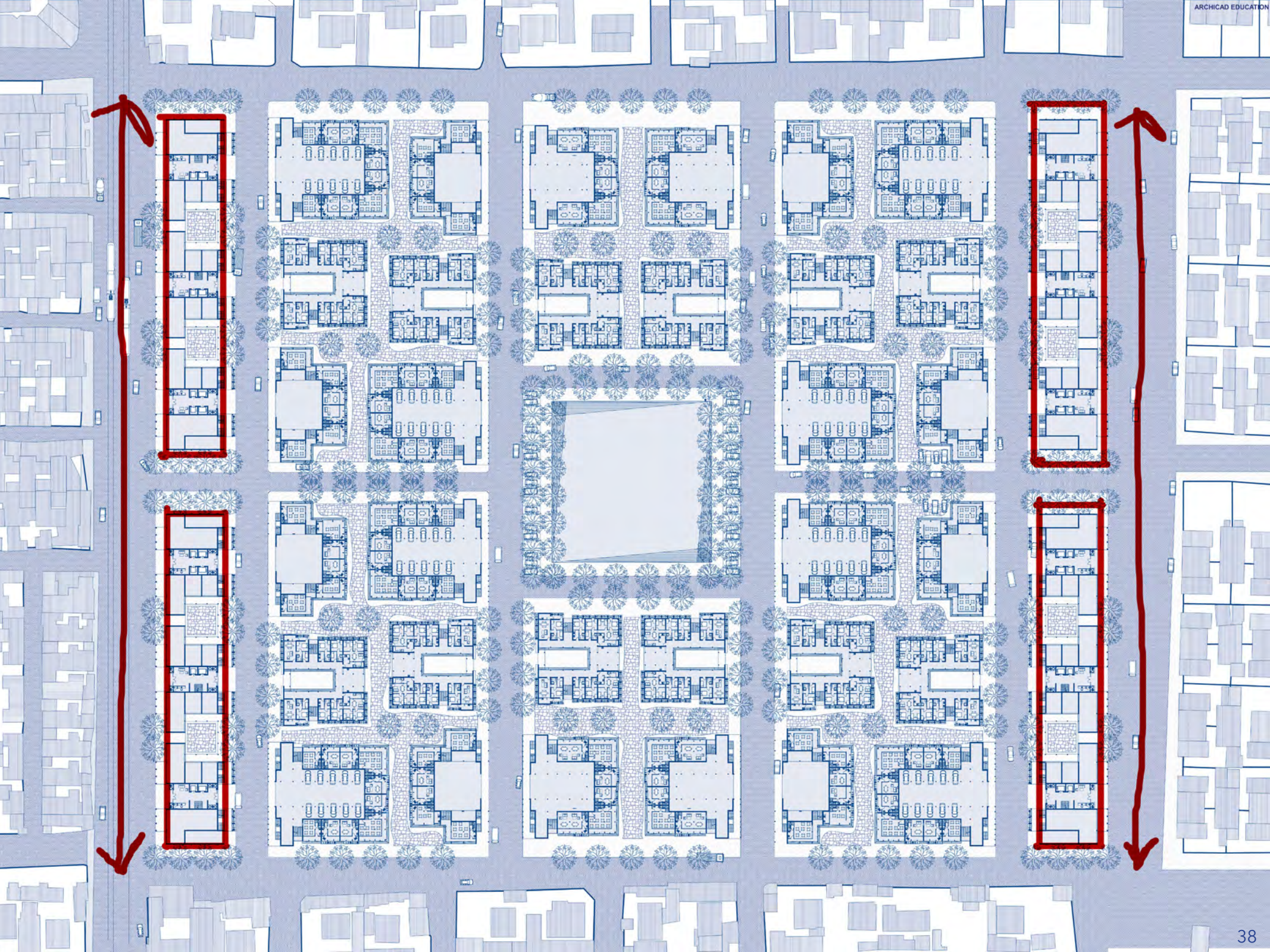
OLD	M2	NEW
AREASIZE	80615	80615
FOOTPRINT	44418	31088
FLOOR AREA	44418	182260
FSI	0,55	2,26
PUBLIC SPACE	36197	49527



OLD	M2	NEW	
AREASIZE	80615	80615	
FOOTPRINT	44418	31088	
FLOOR AREA	44418	182260	
FSI	0,55	2,26	4,1 TIMES
PUBLIC SPACE	36197	49527	26,9%

234 TREES

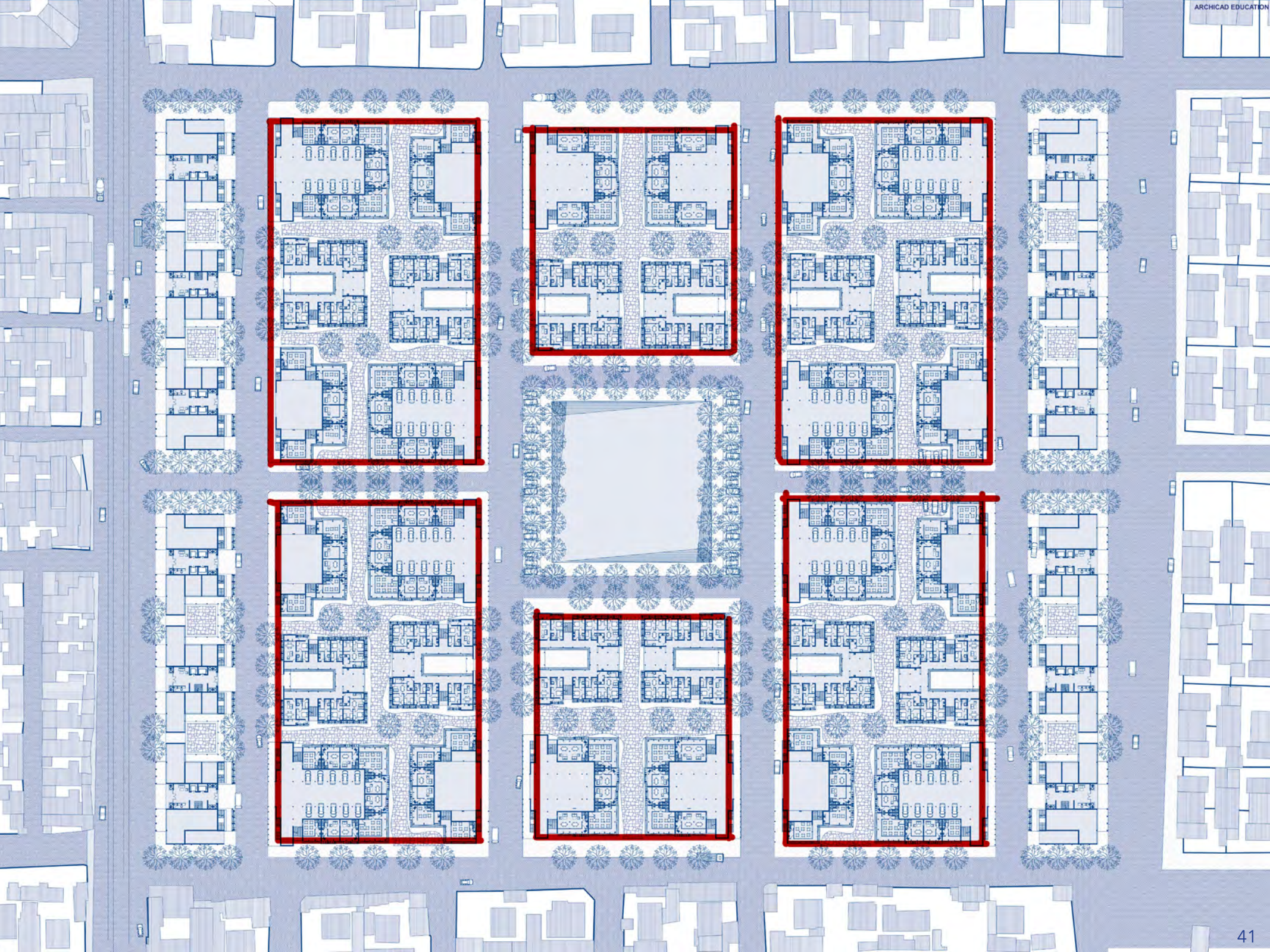


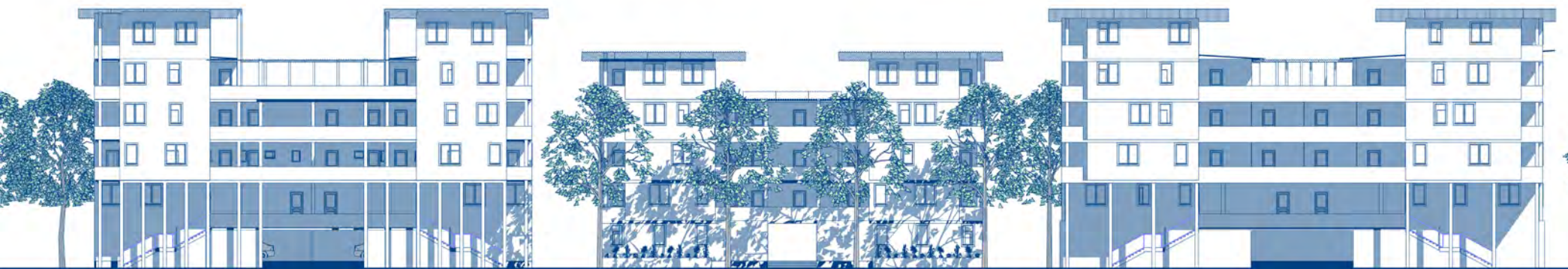


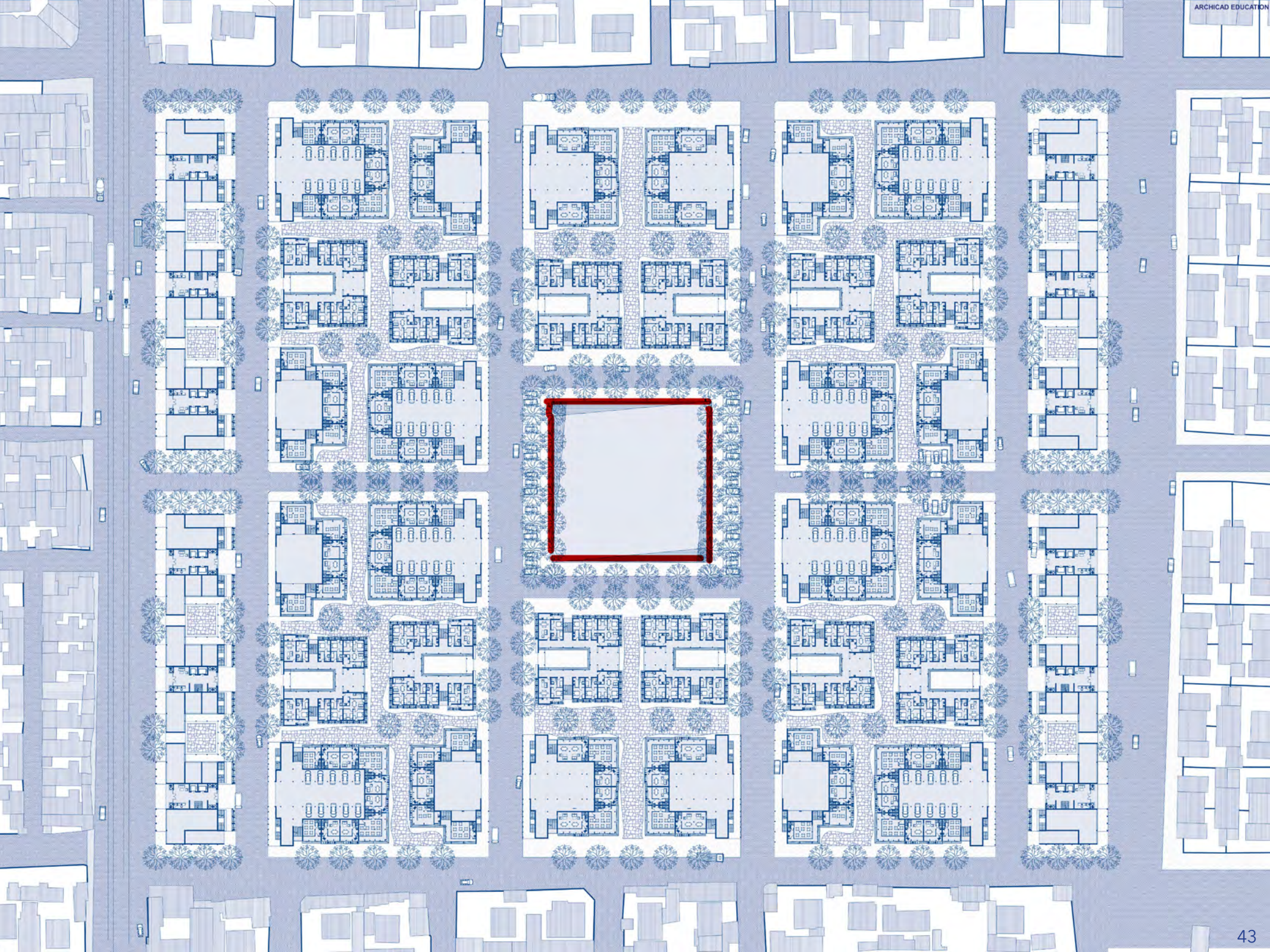


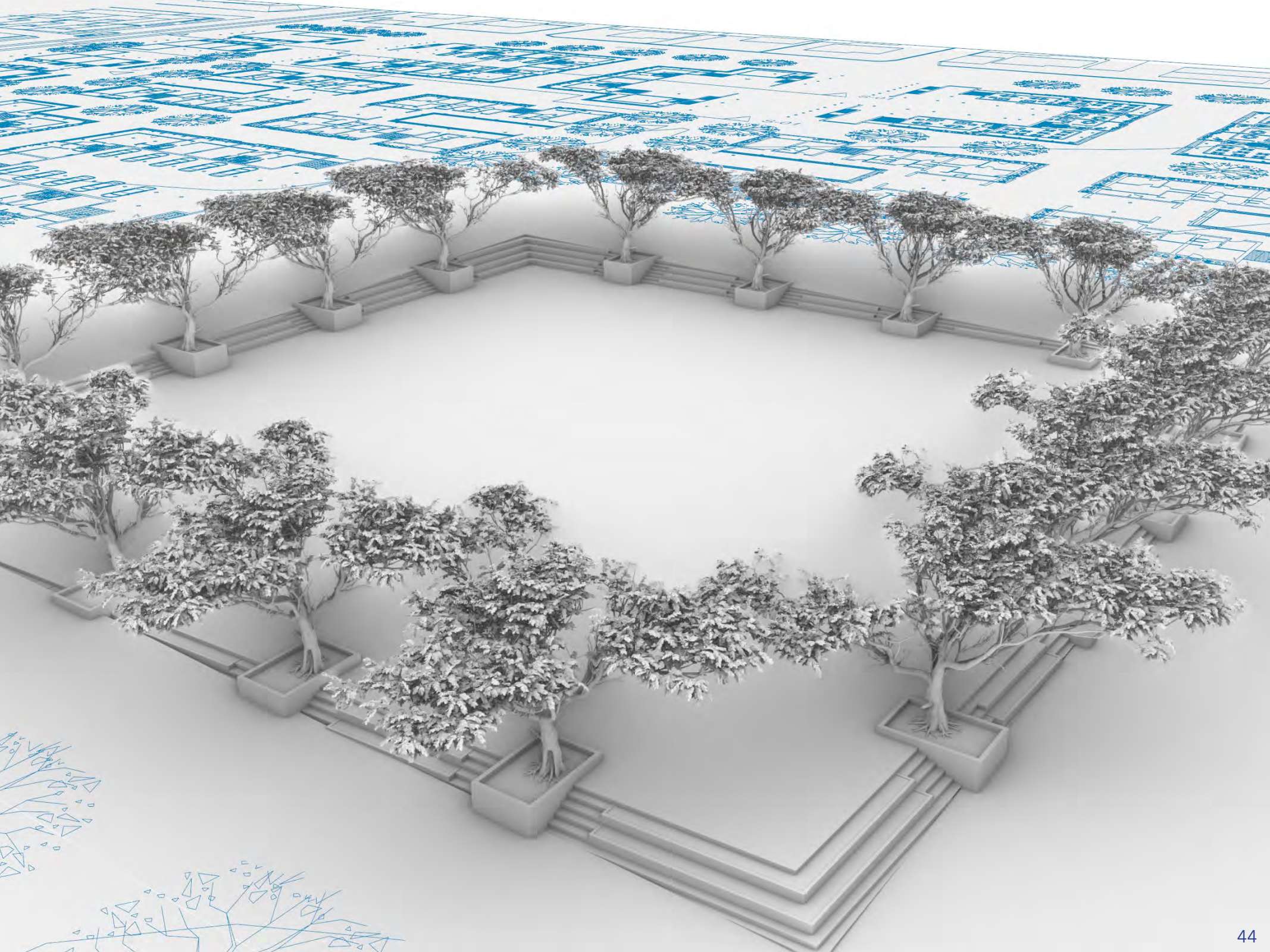
Elevation (1)





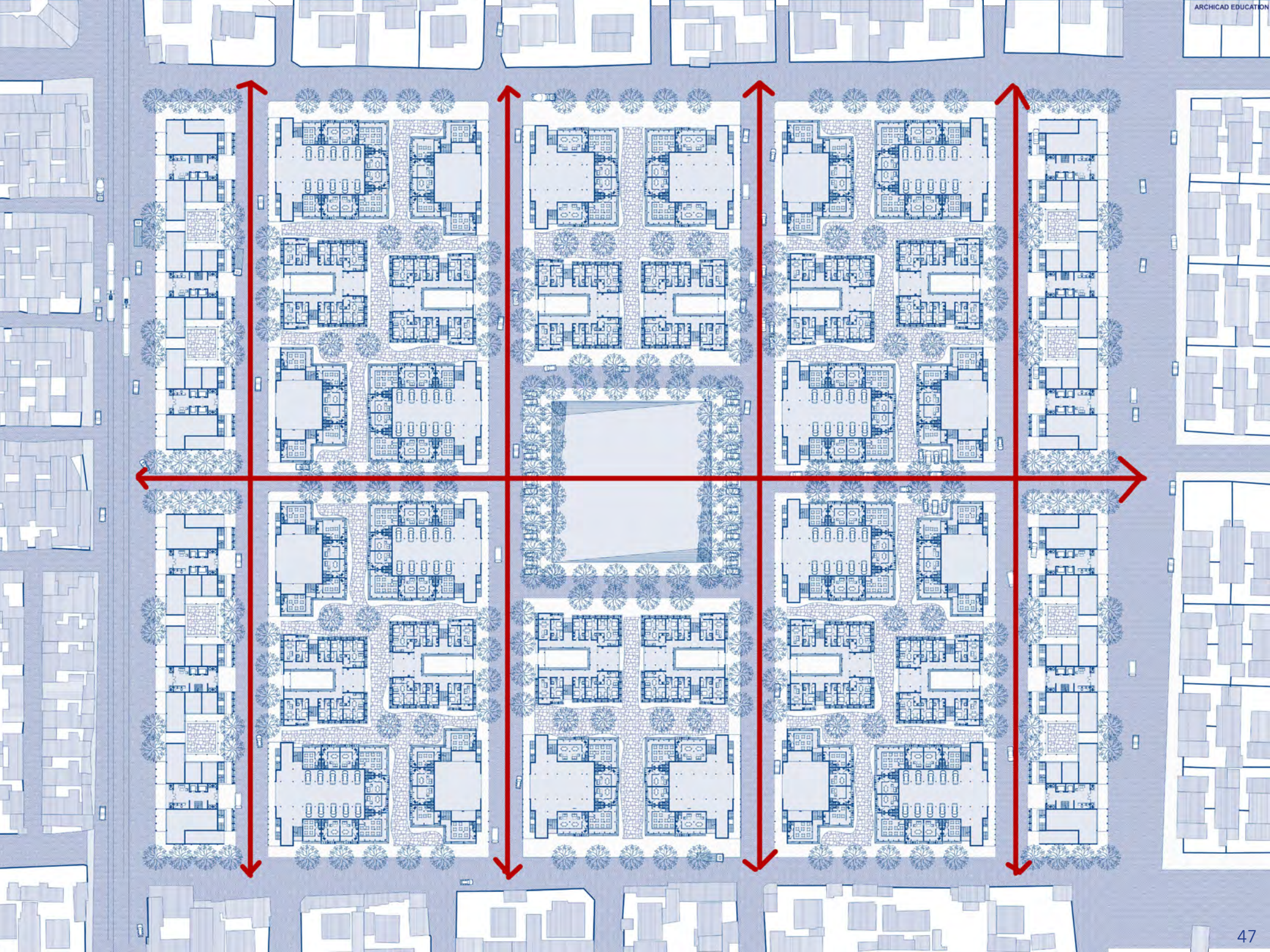


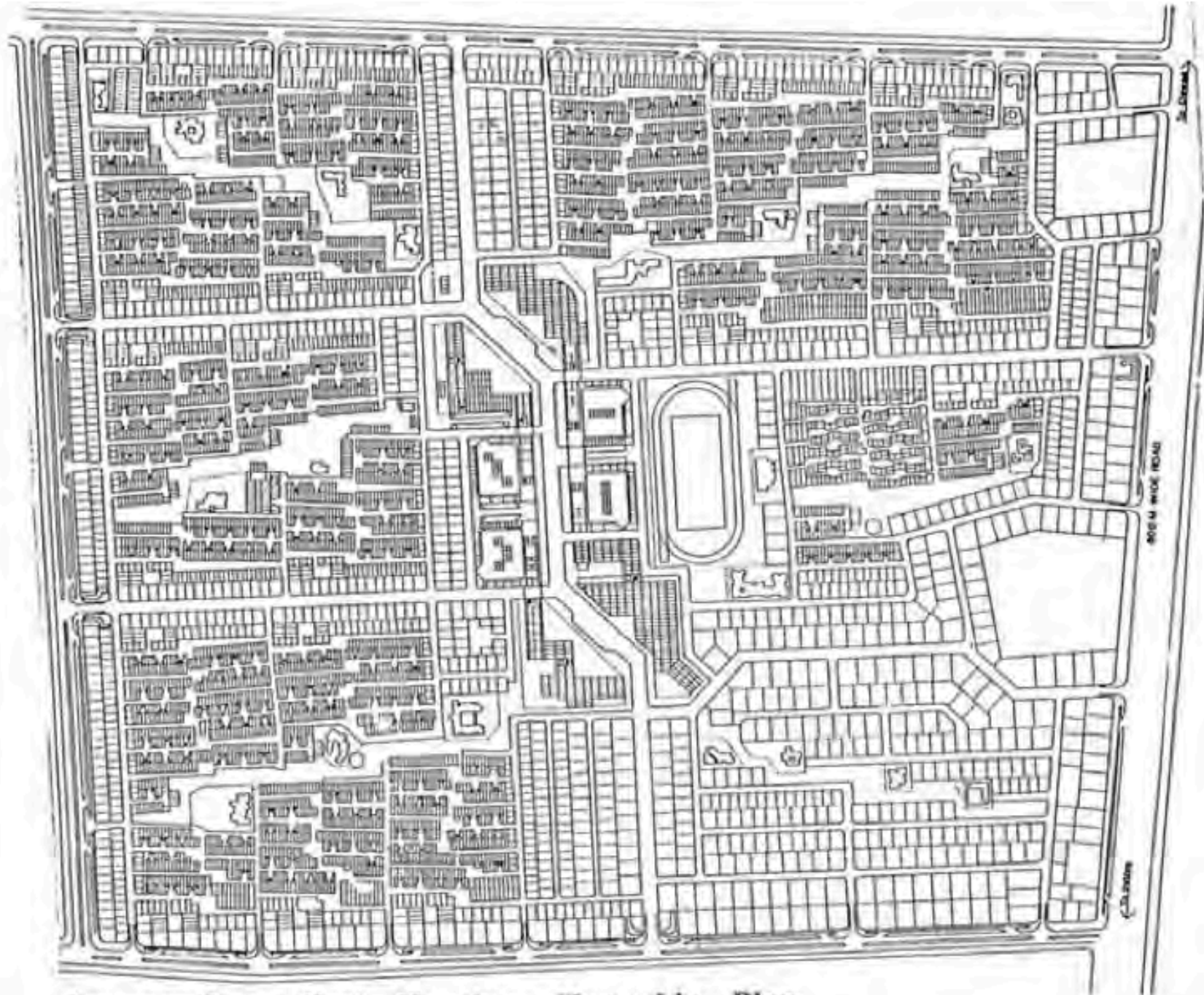




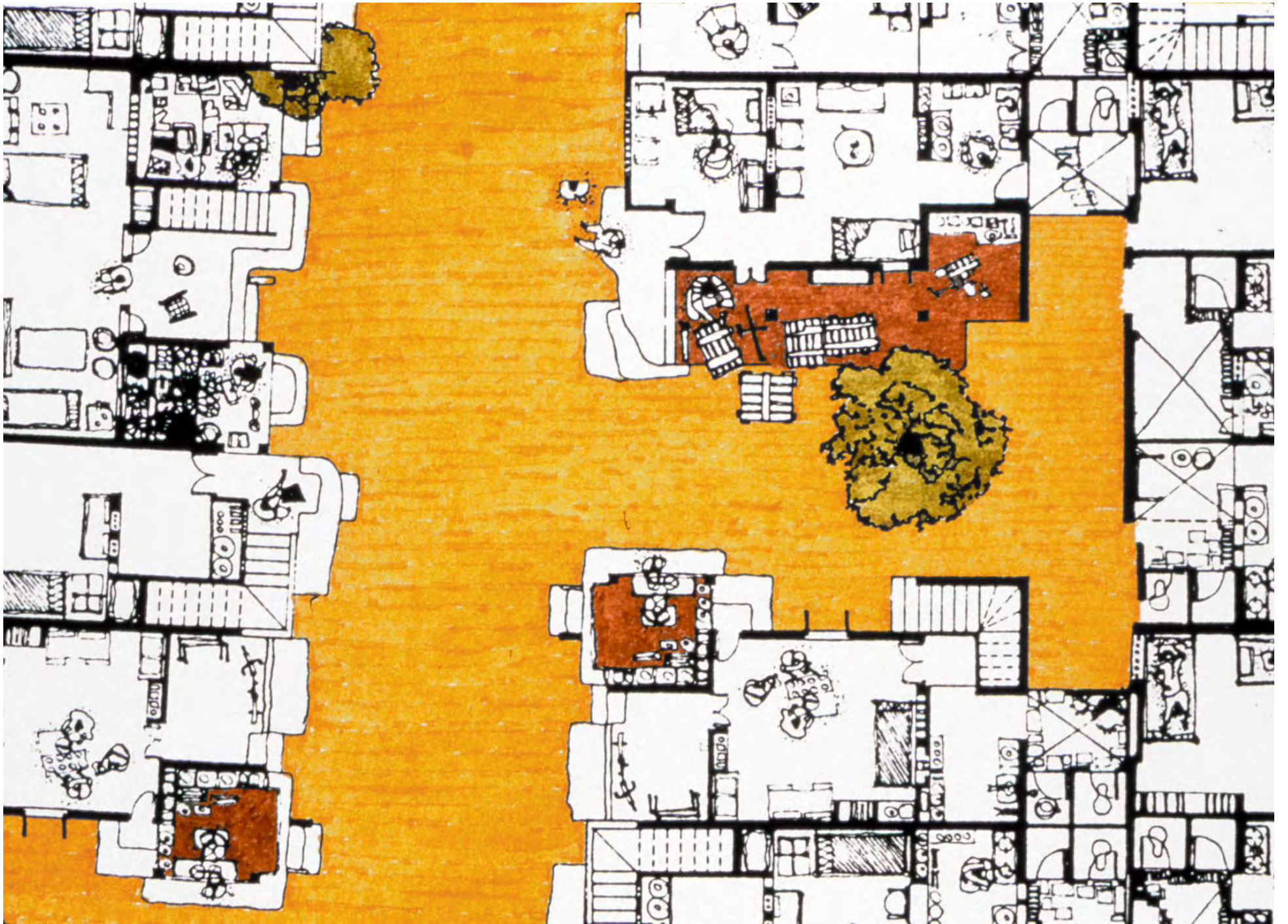




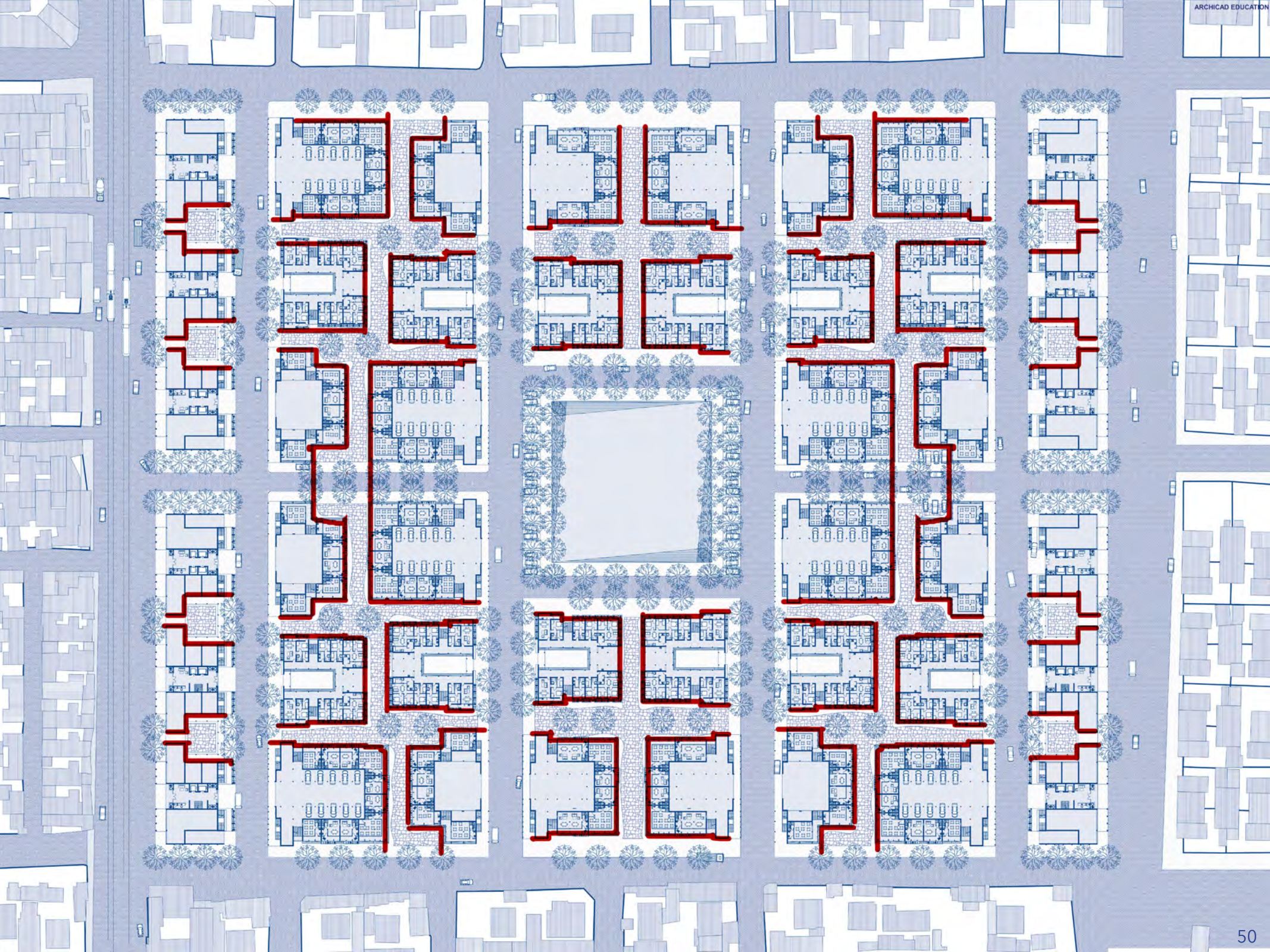




Aranya Low Cost Housing - Township Plan

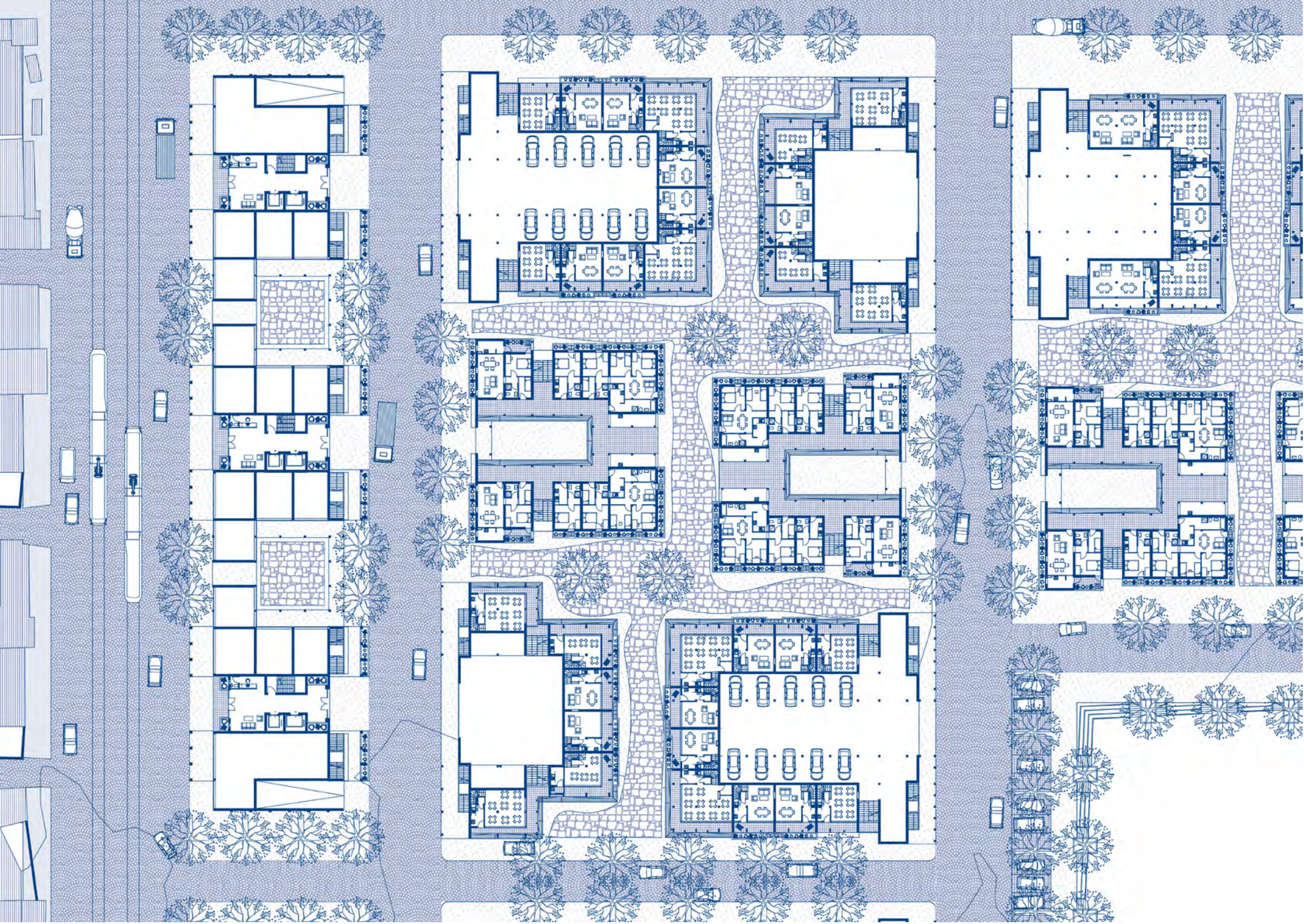


McGill University. Minimum Cost Housing Group (1990)





Source photo: SPOOL (A. Fornasiero, P. Turconi) creative commons 4.0









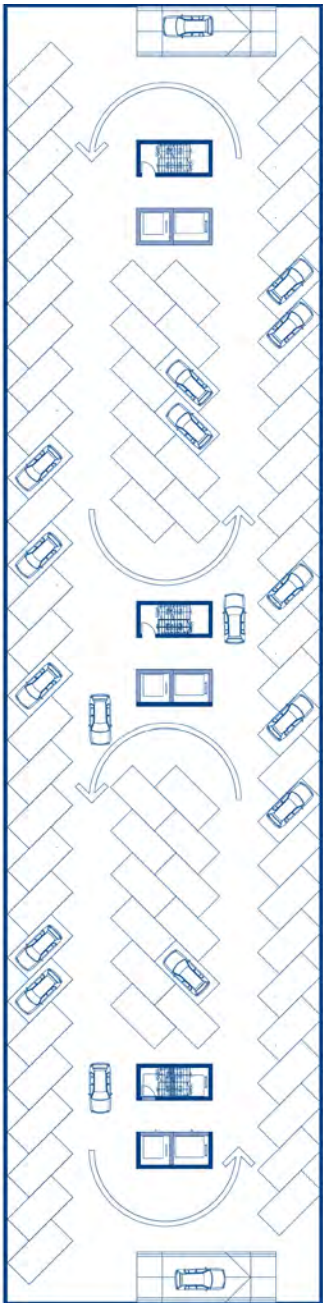


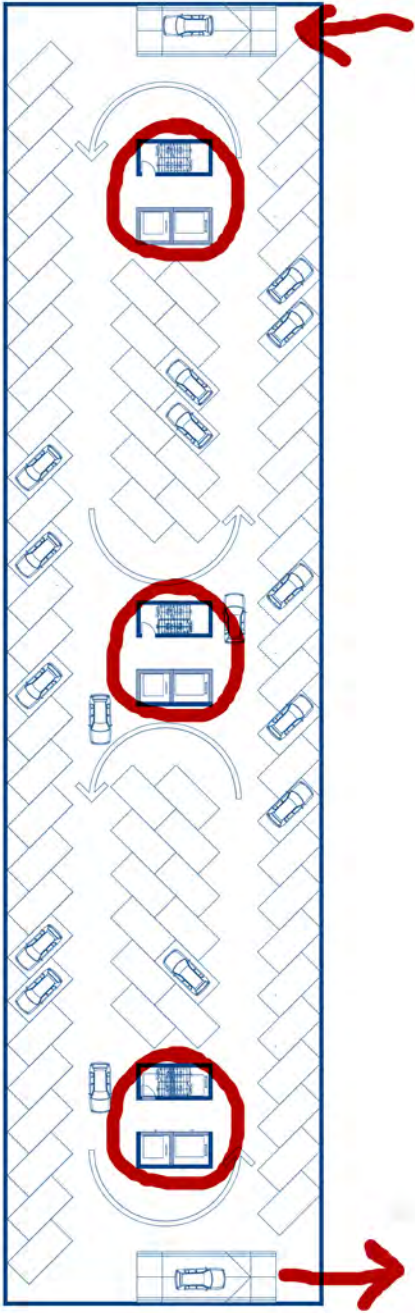


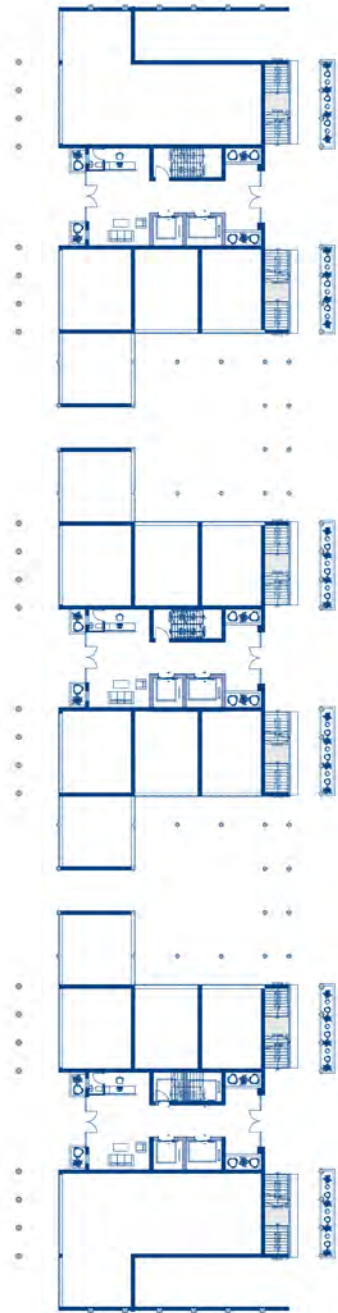
Elevation (1)

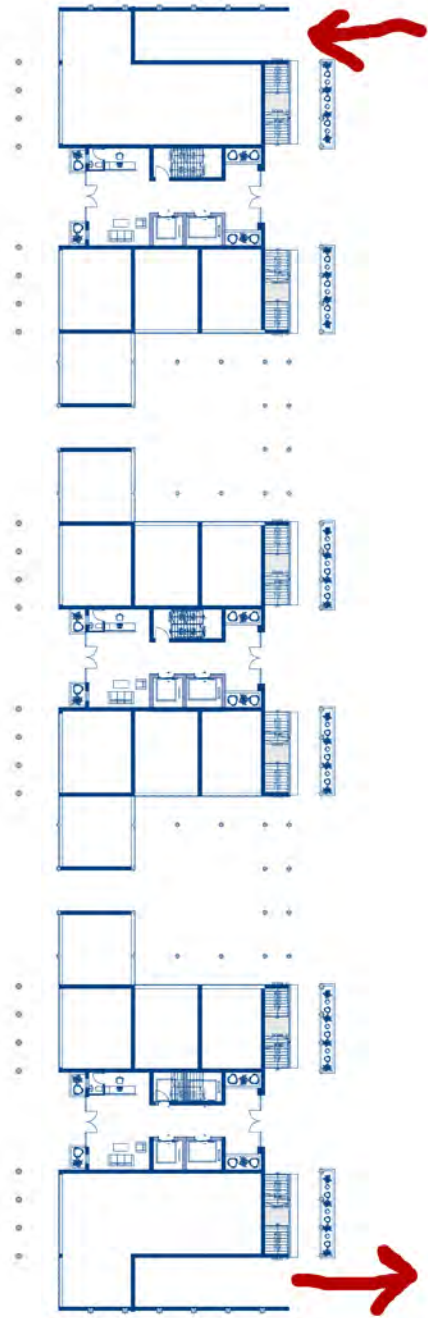


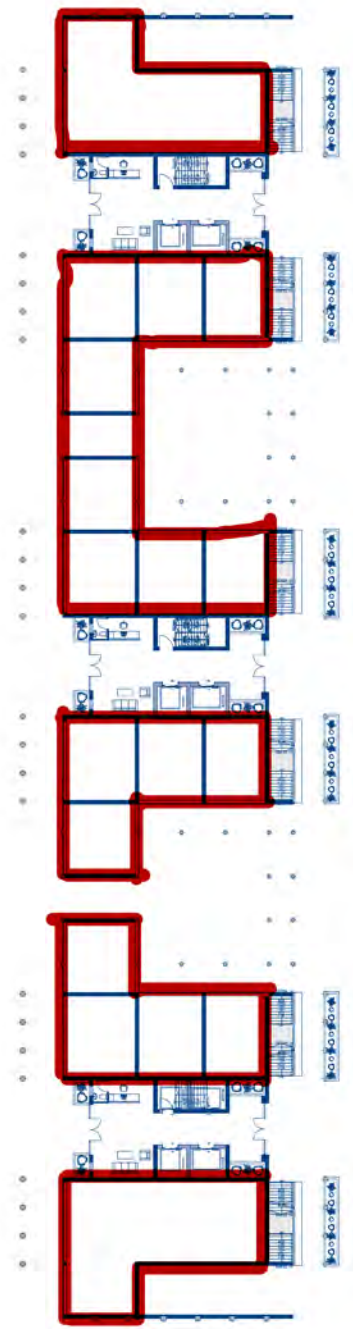
Elevation (1)

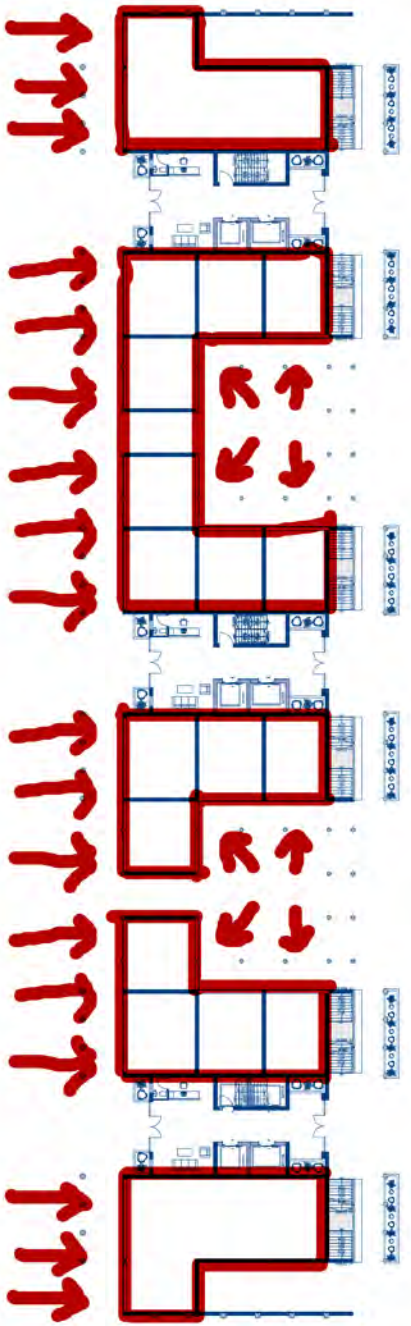


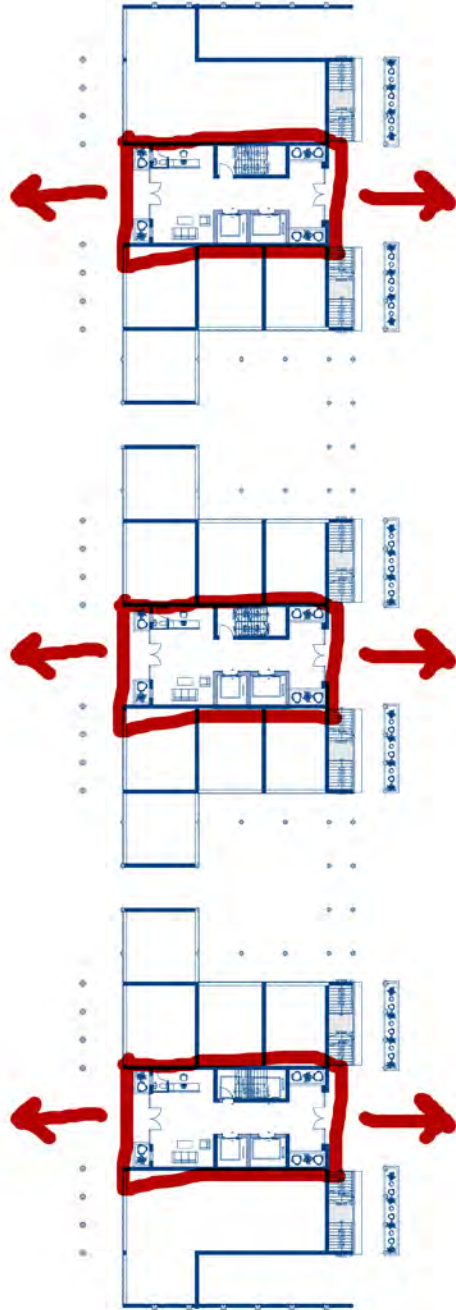


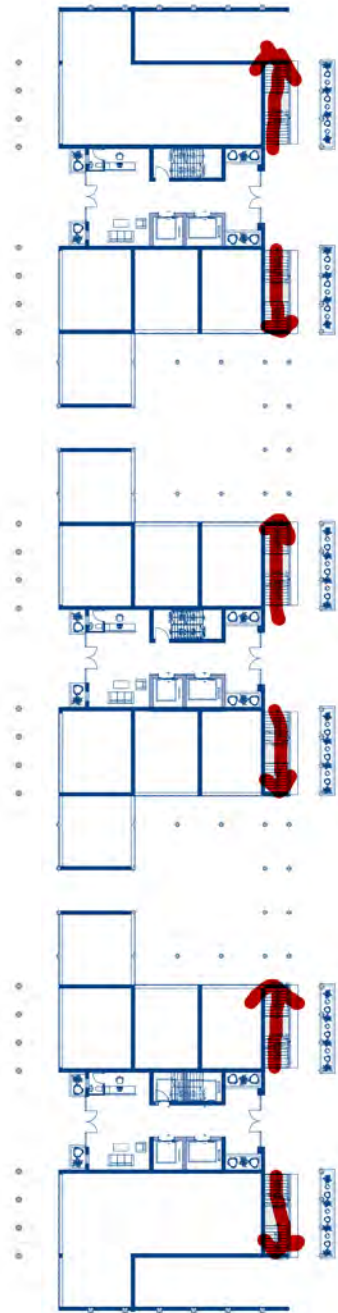


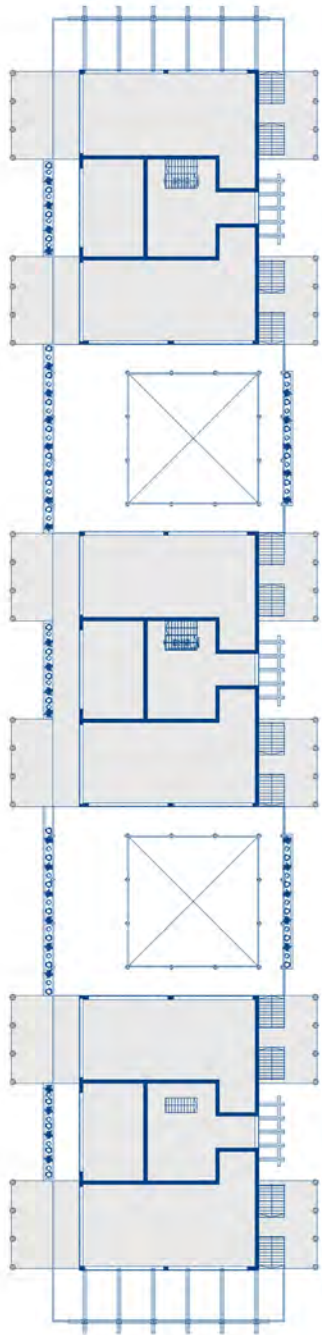


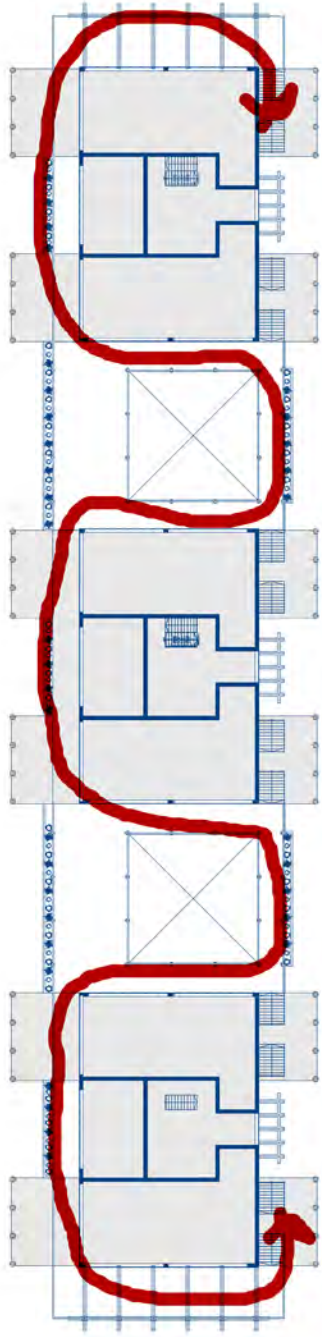




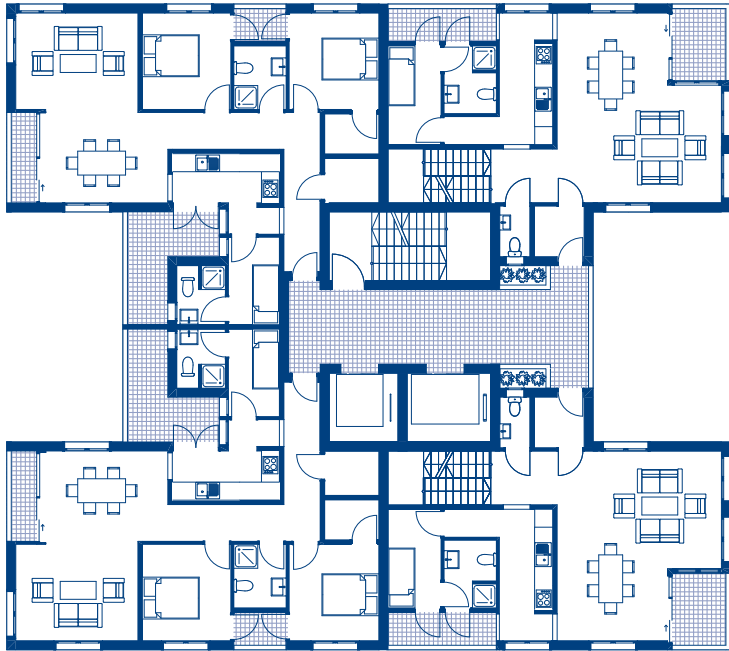


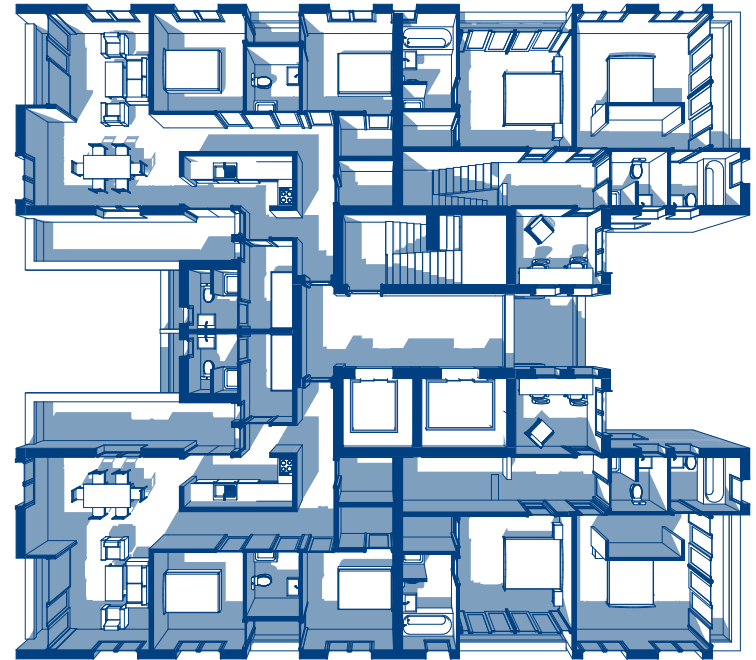
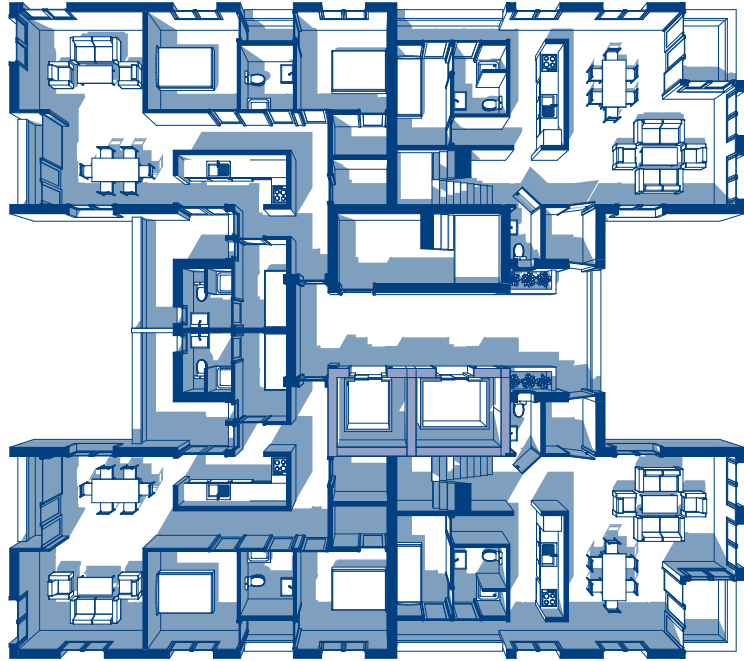


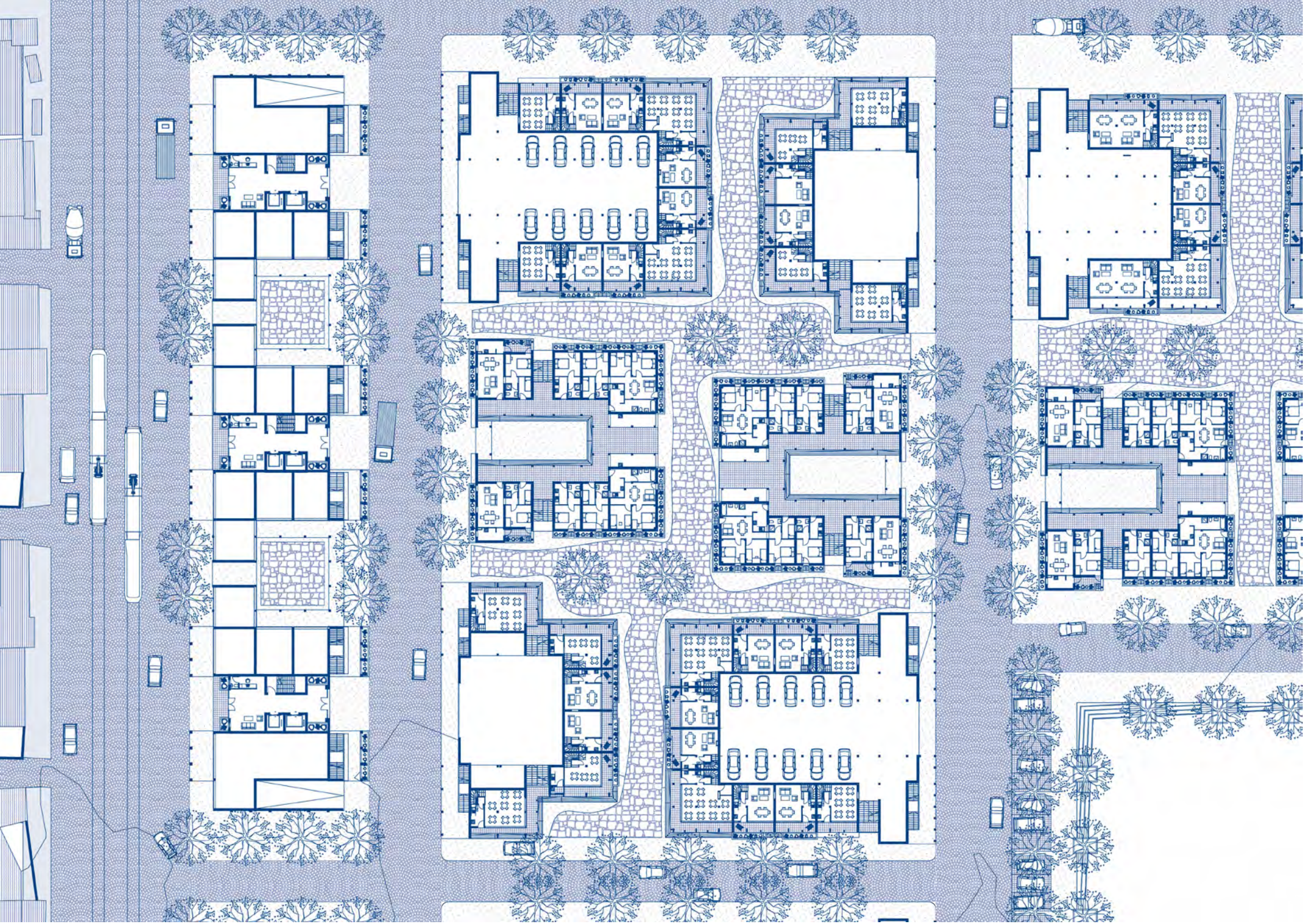


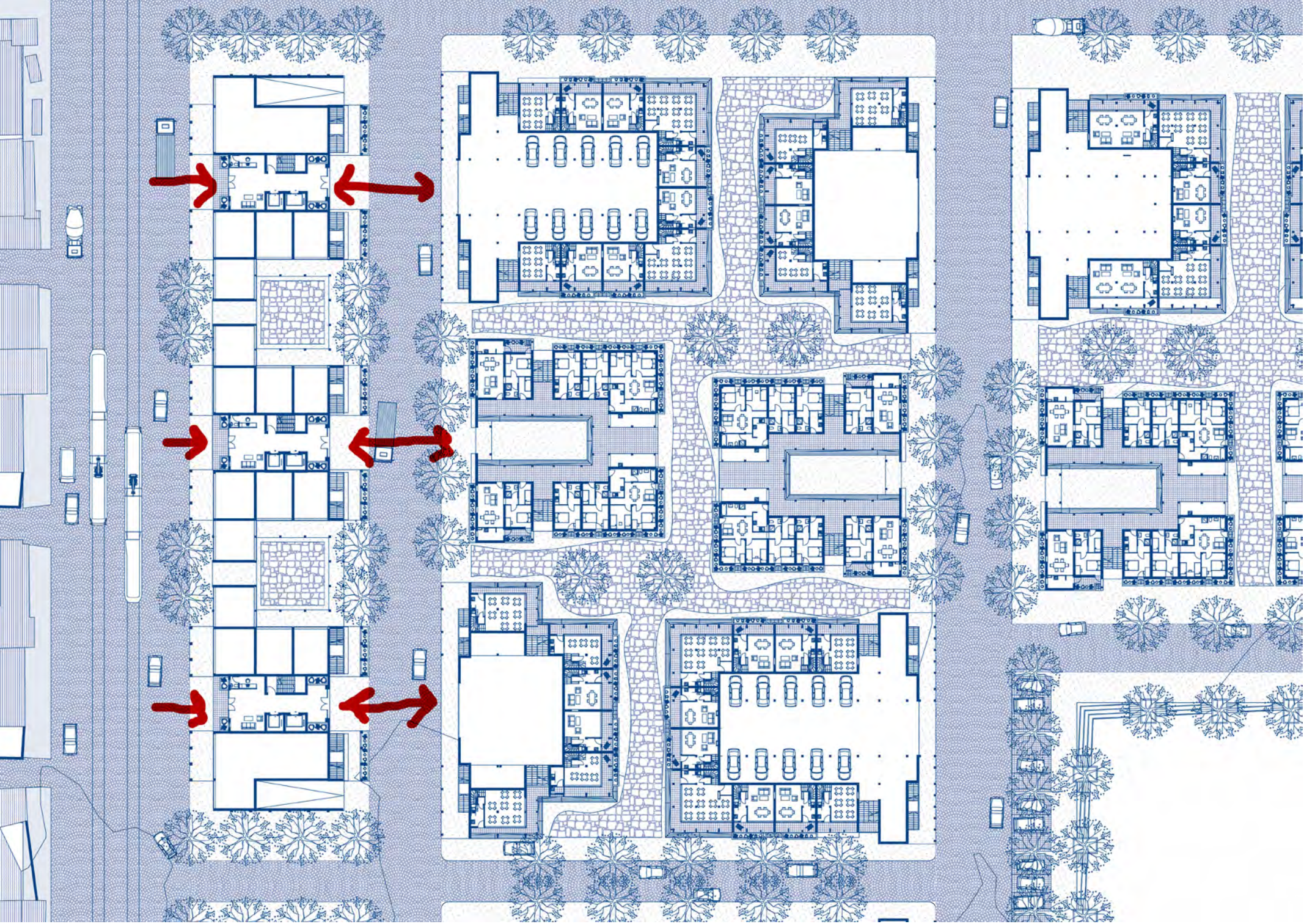


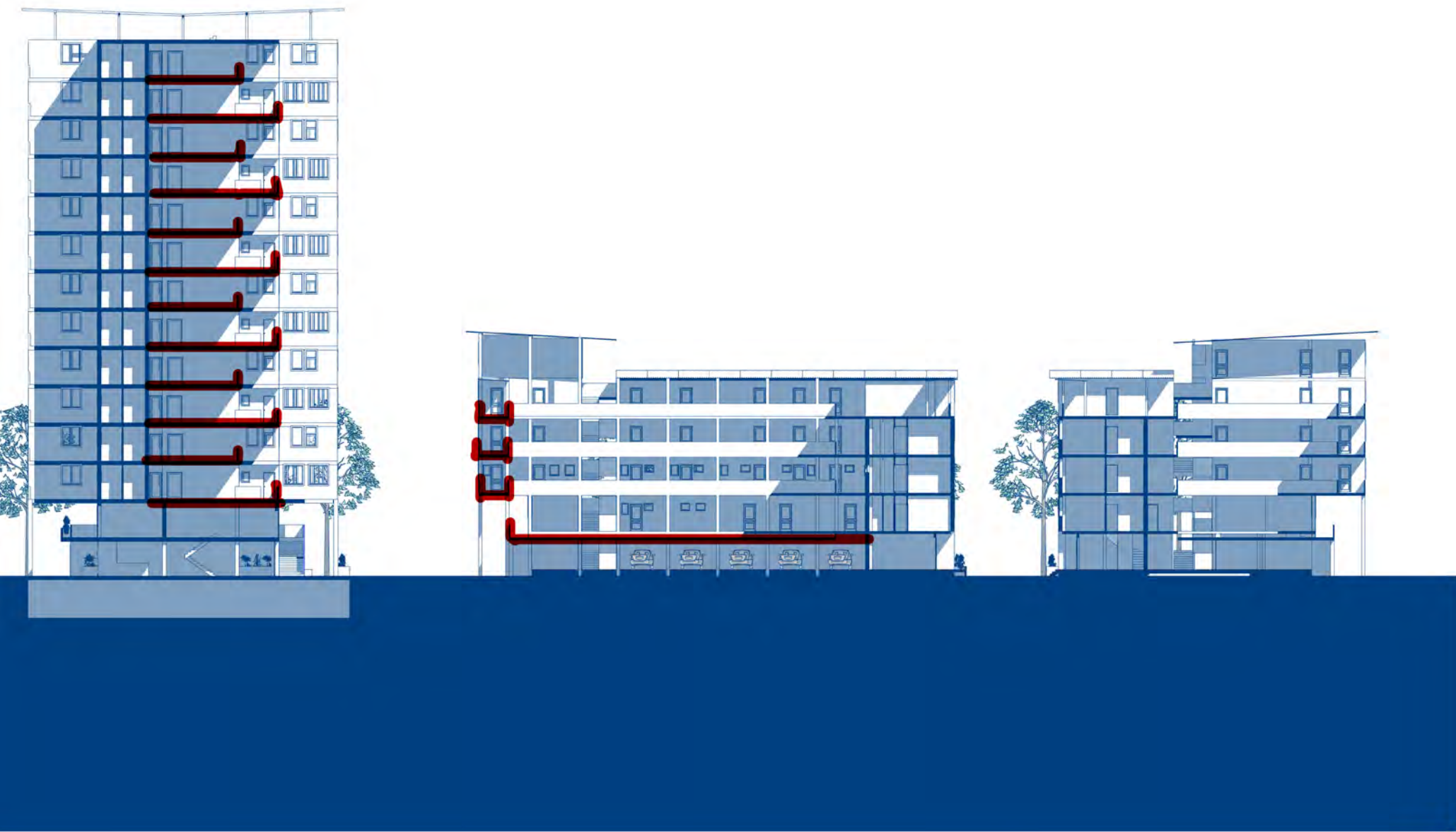


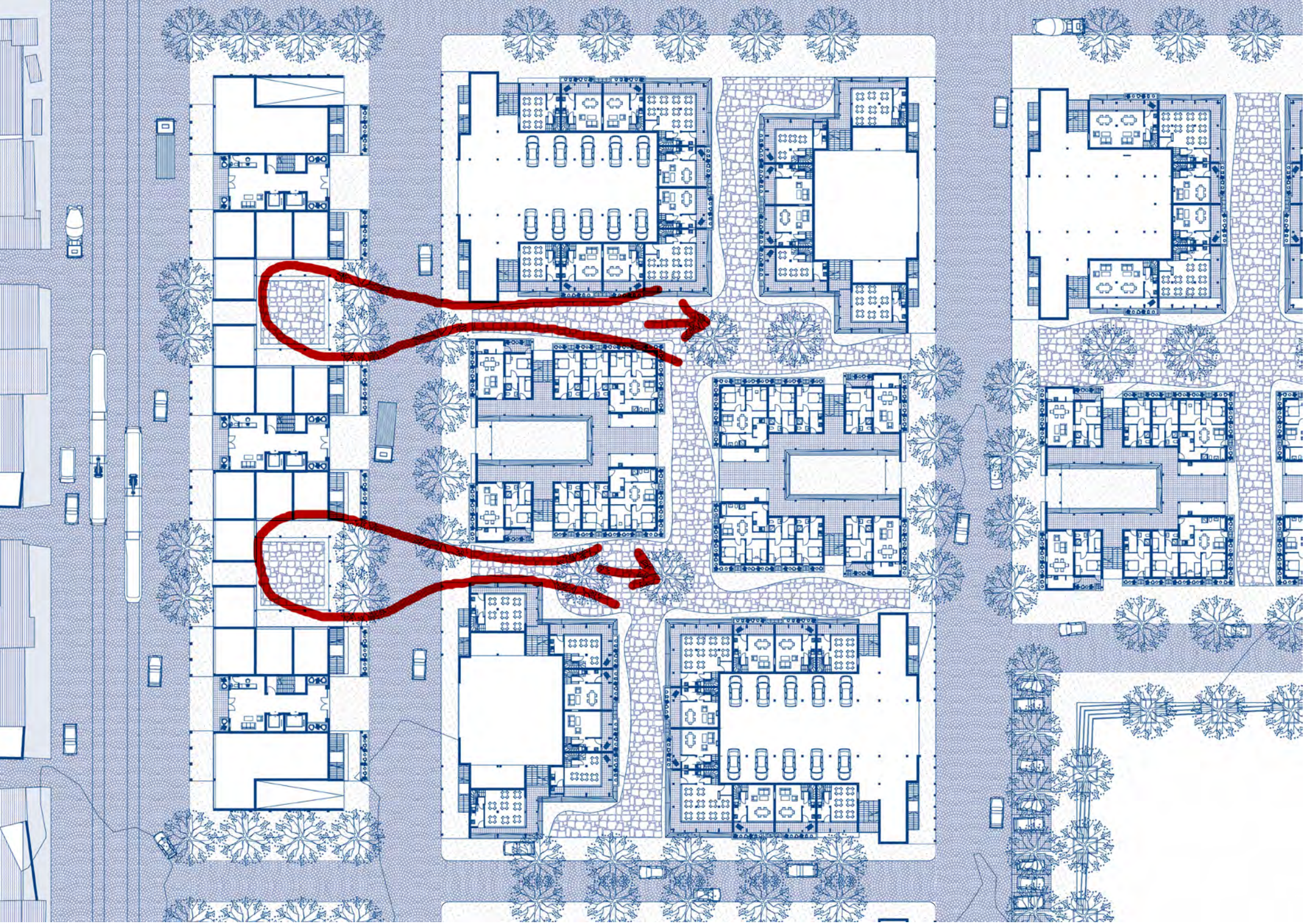


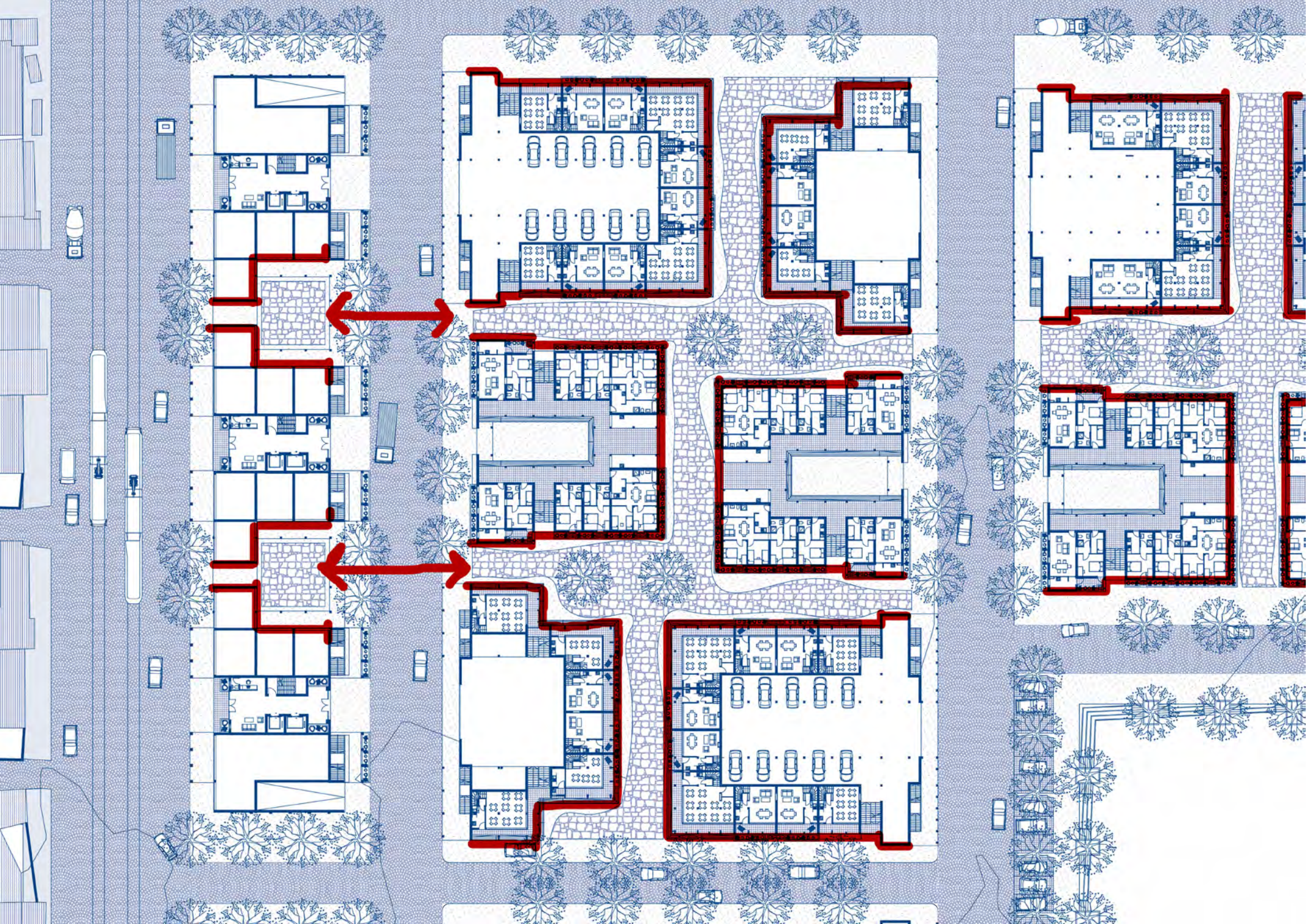


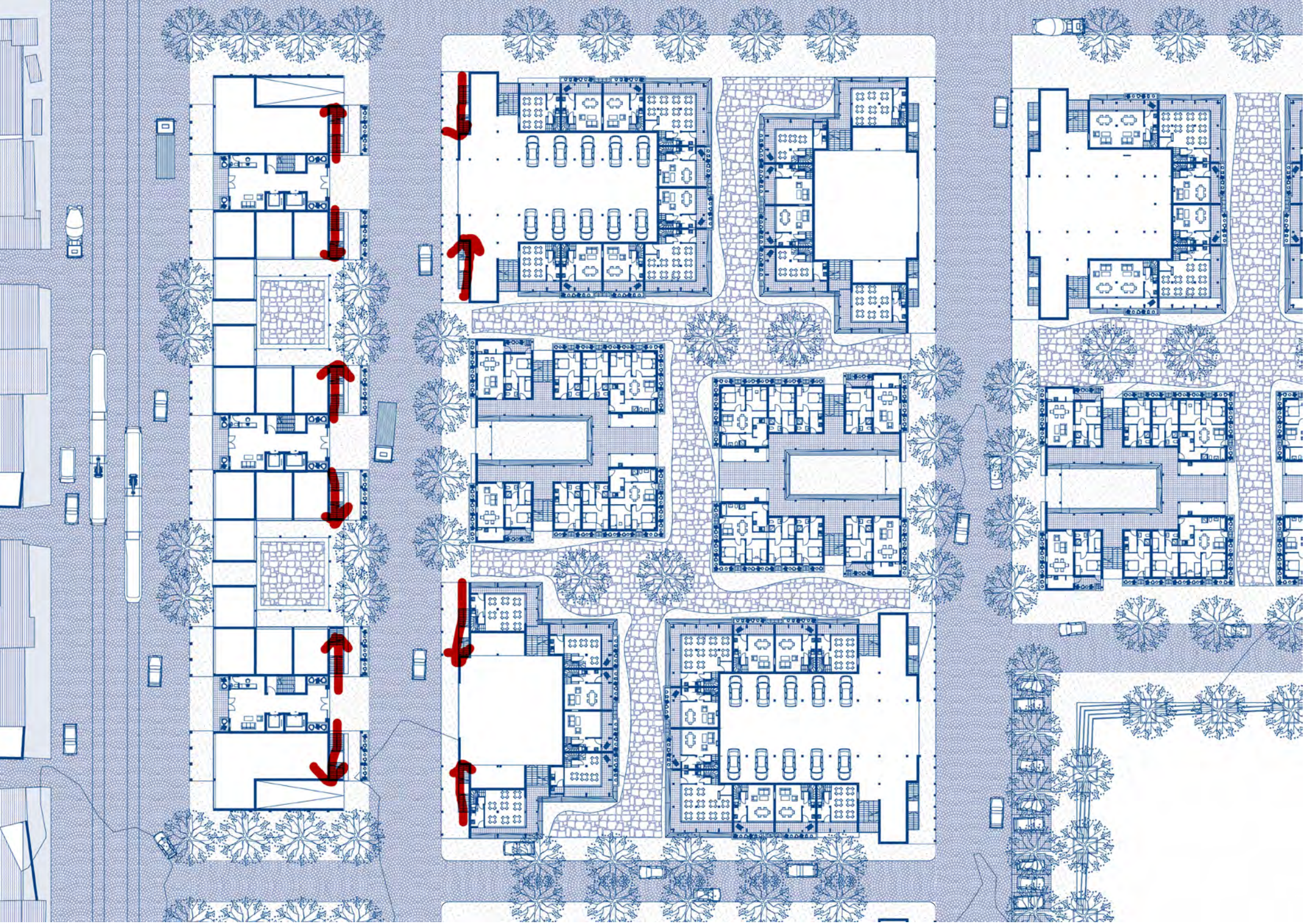


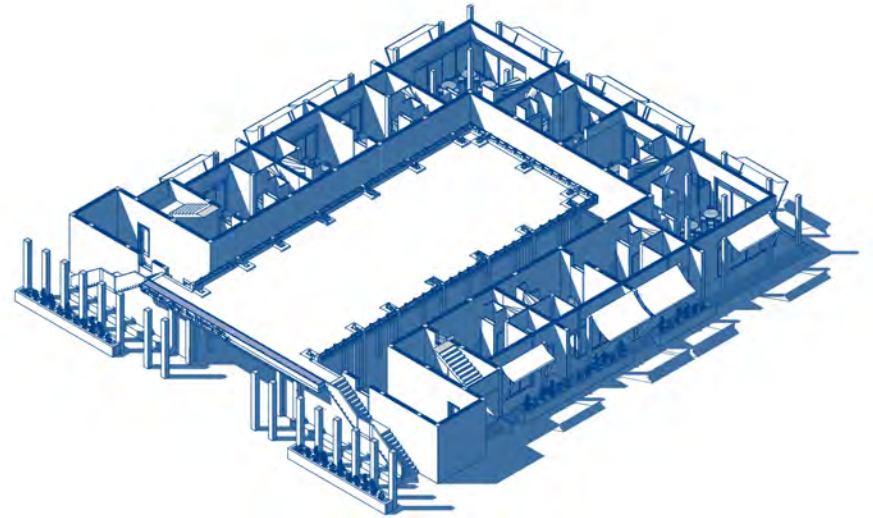
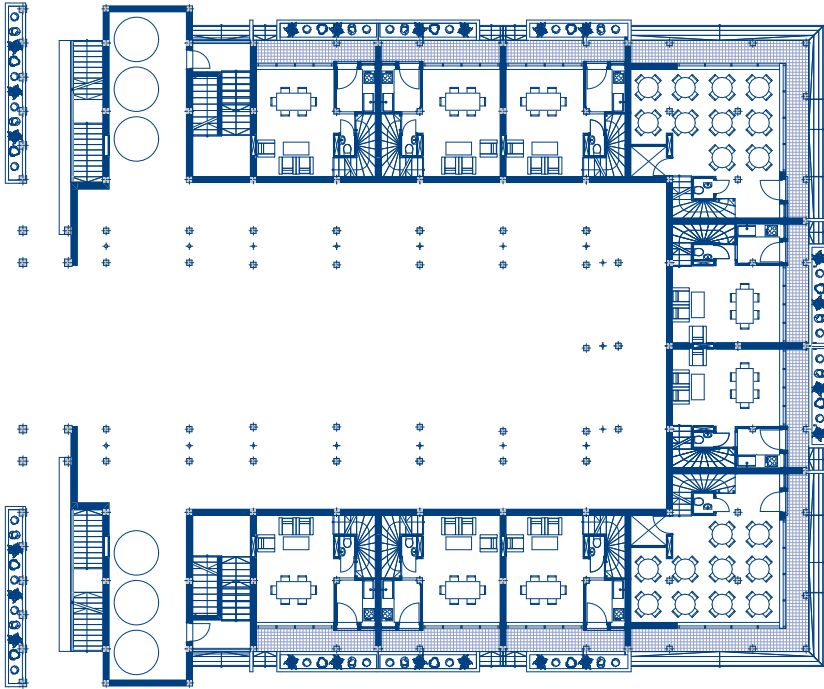














Source: DASH



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Bete Urael Mini Market & Juice
0911 17 79 55 / 0910 09 05 71

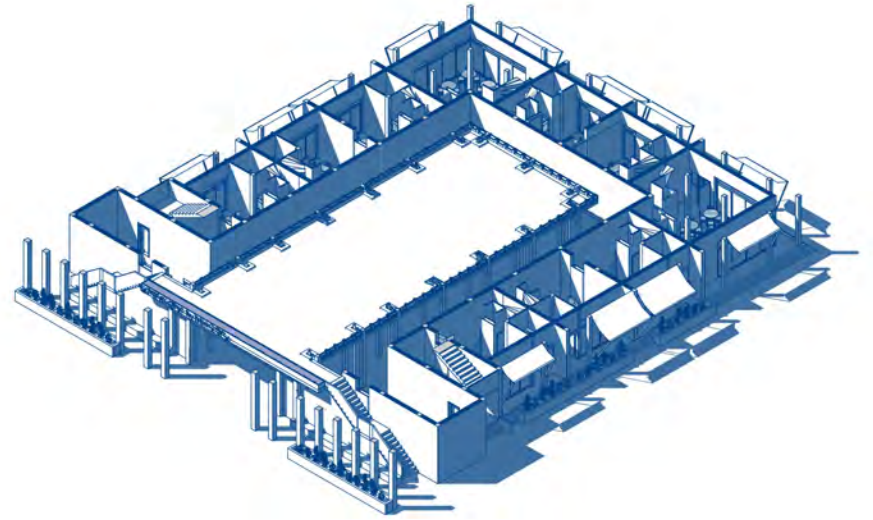
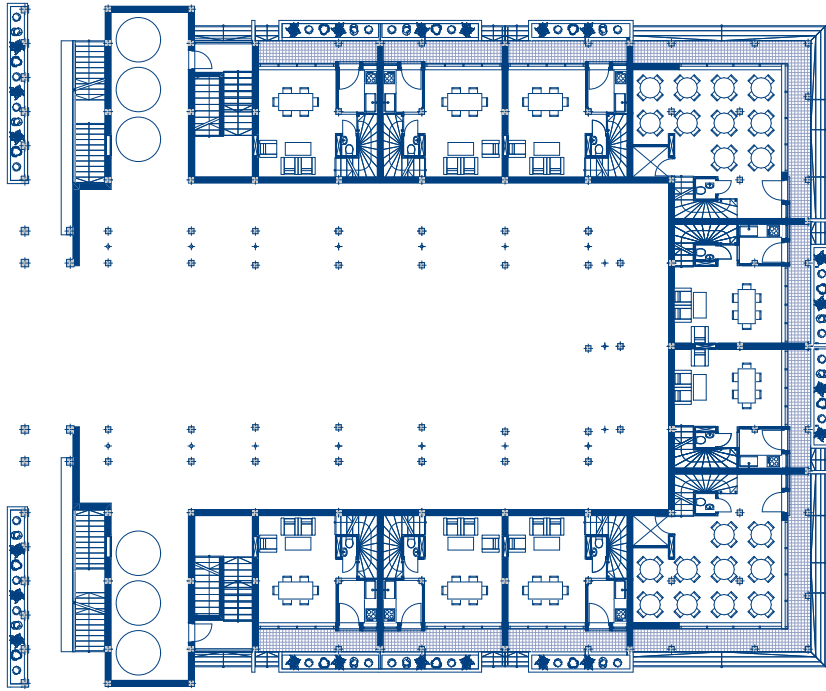
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KLM Kids Fashion
09 11307185 / 09 11818692

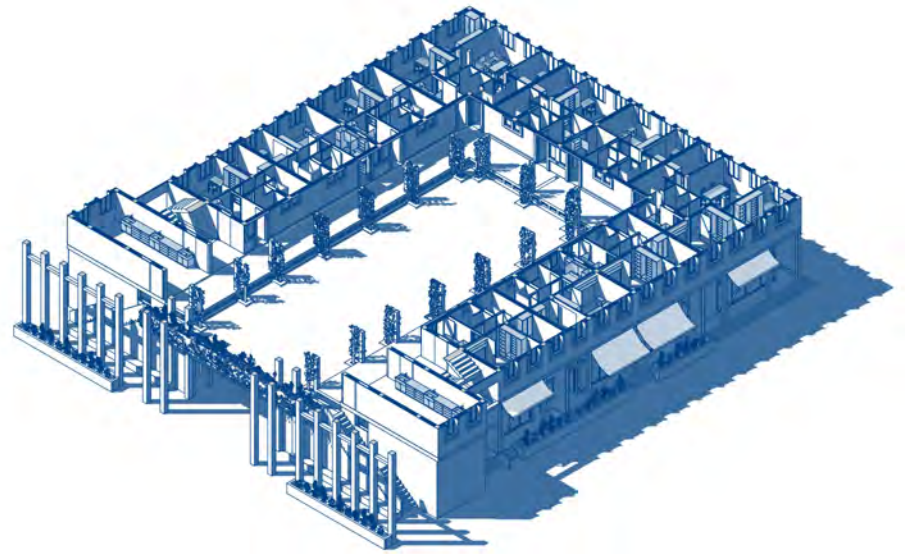
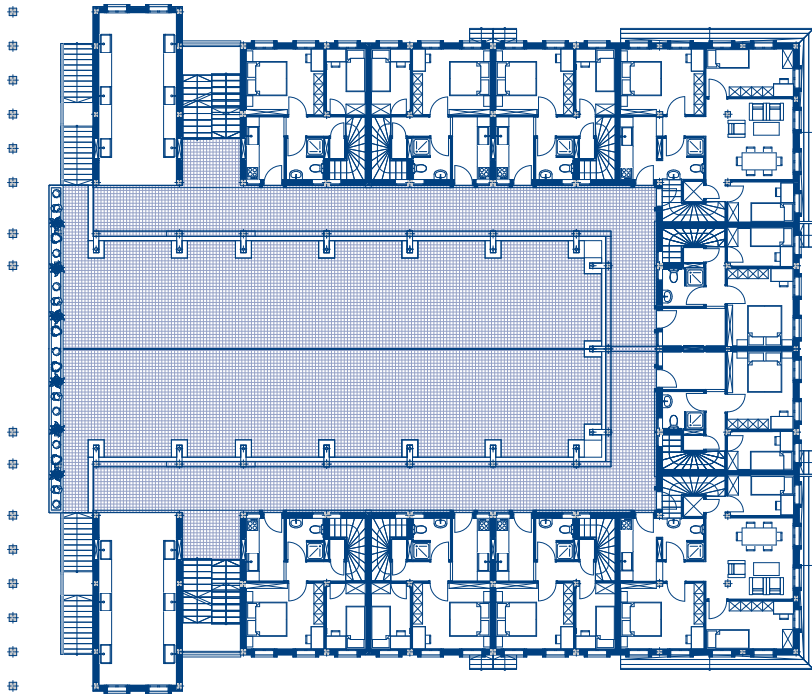


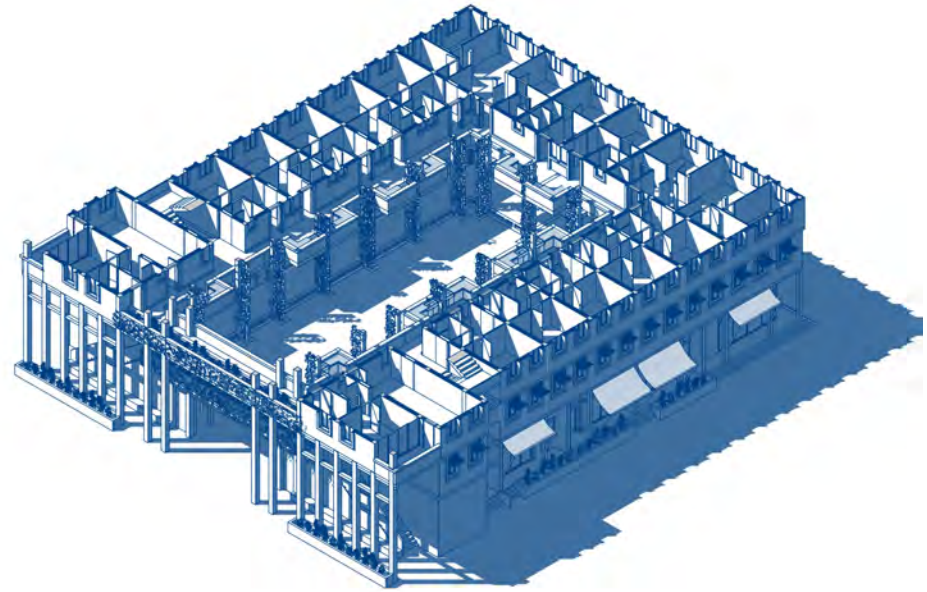
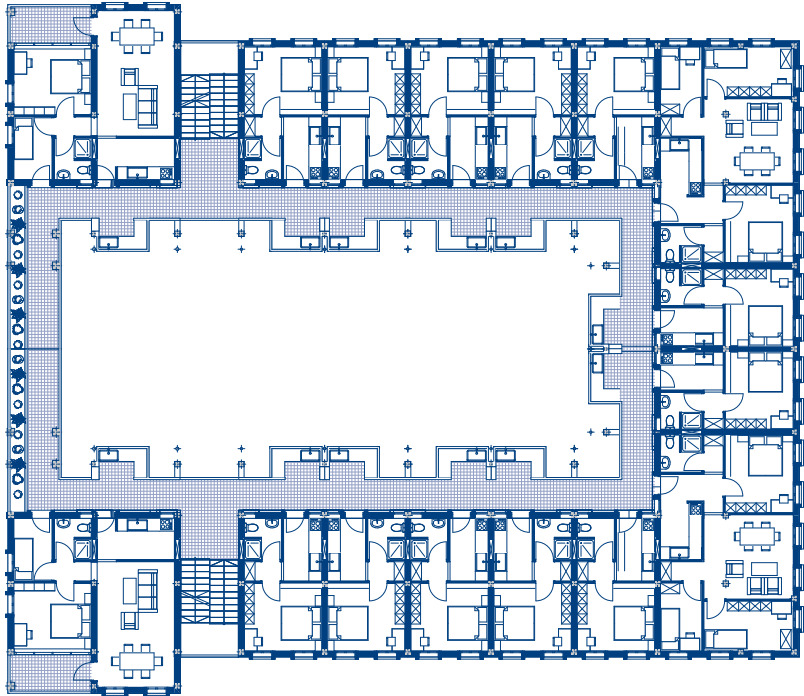


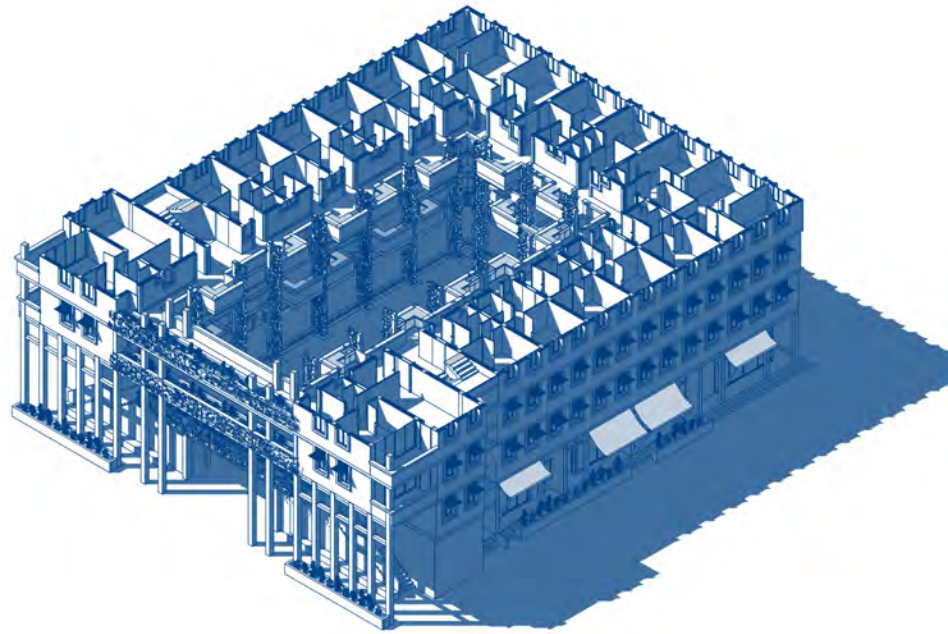
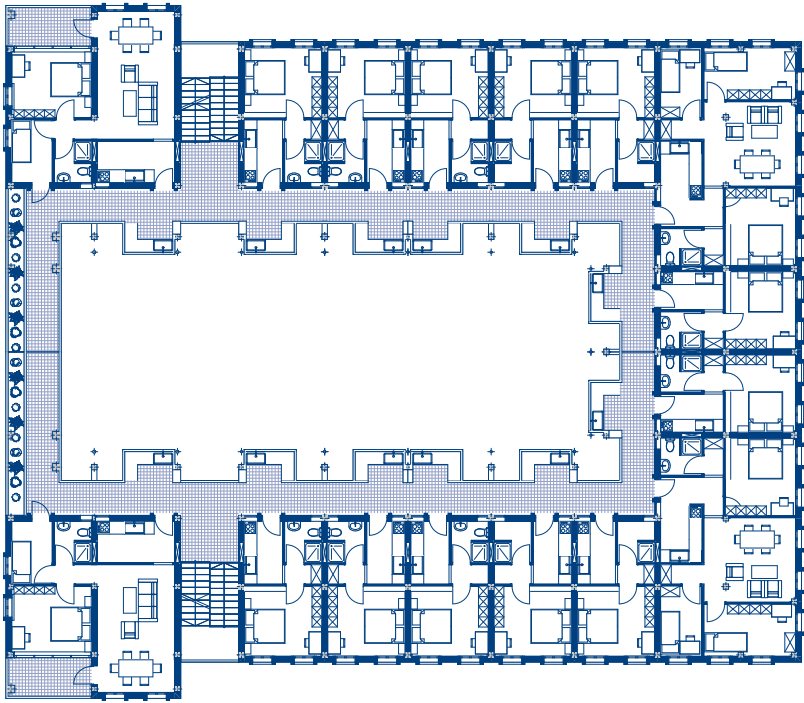
entrepreneurial

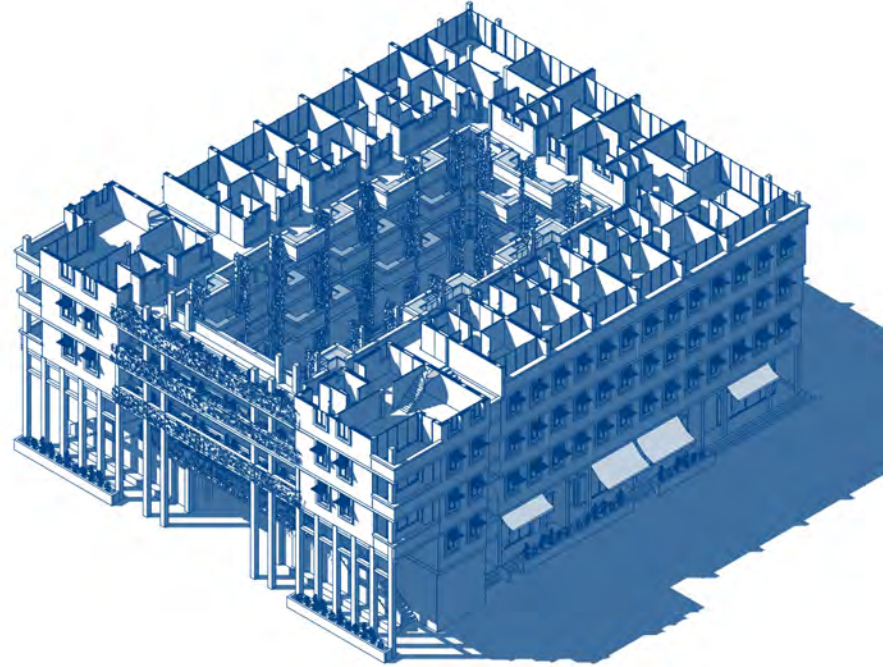
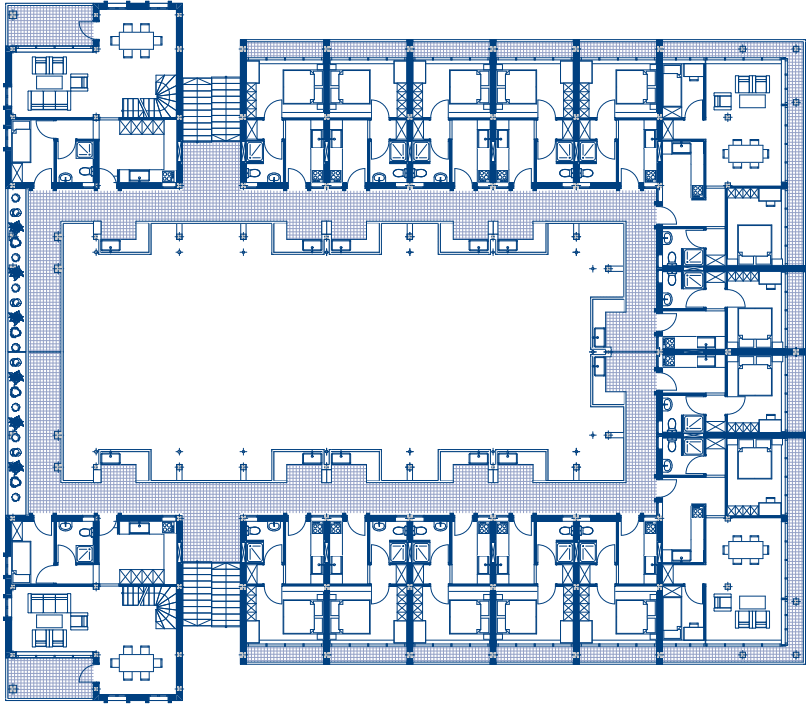


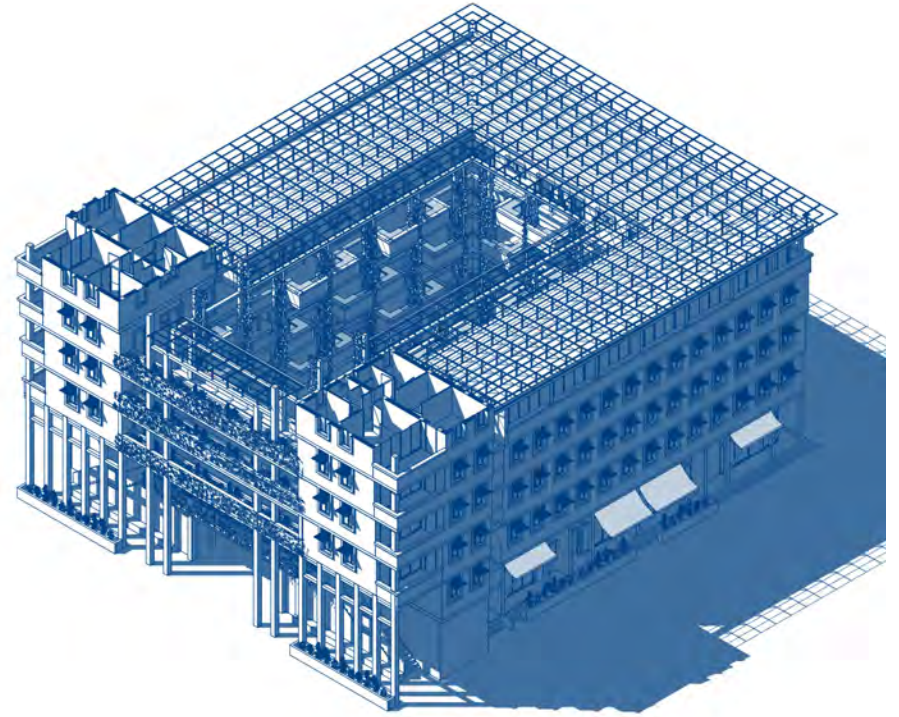
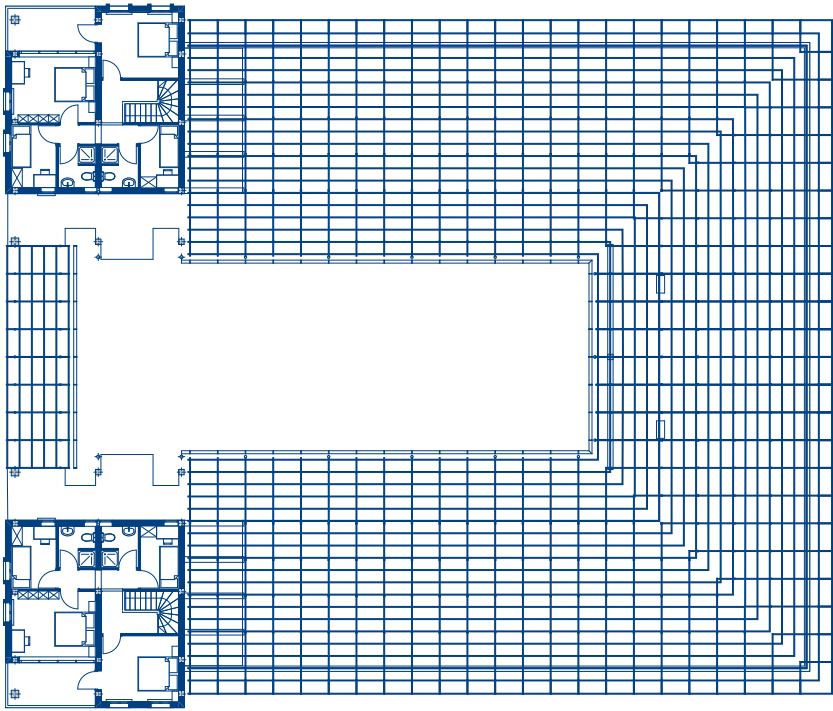


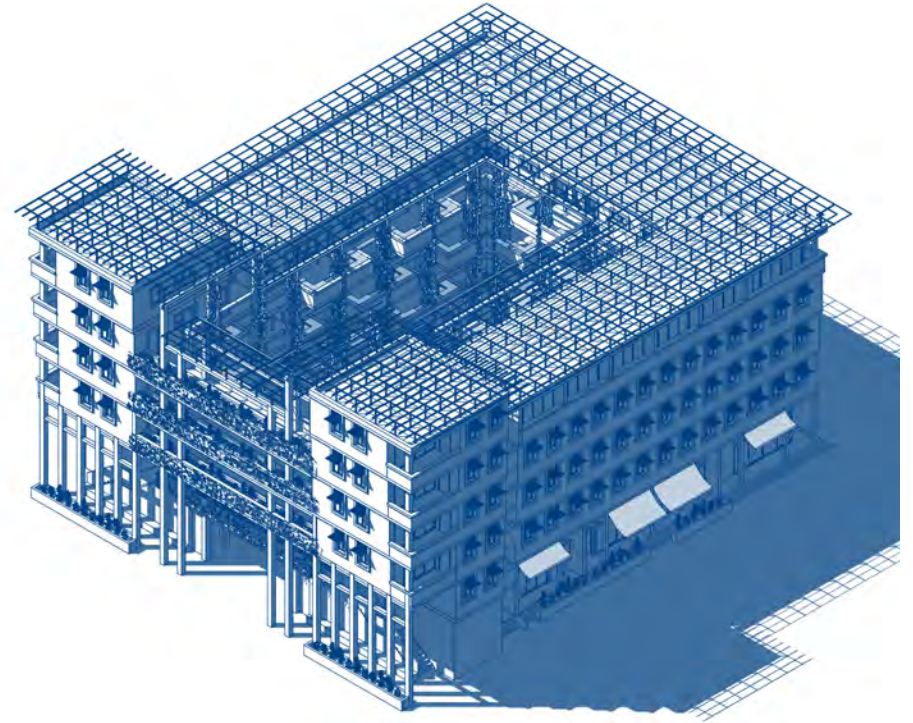
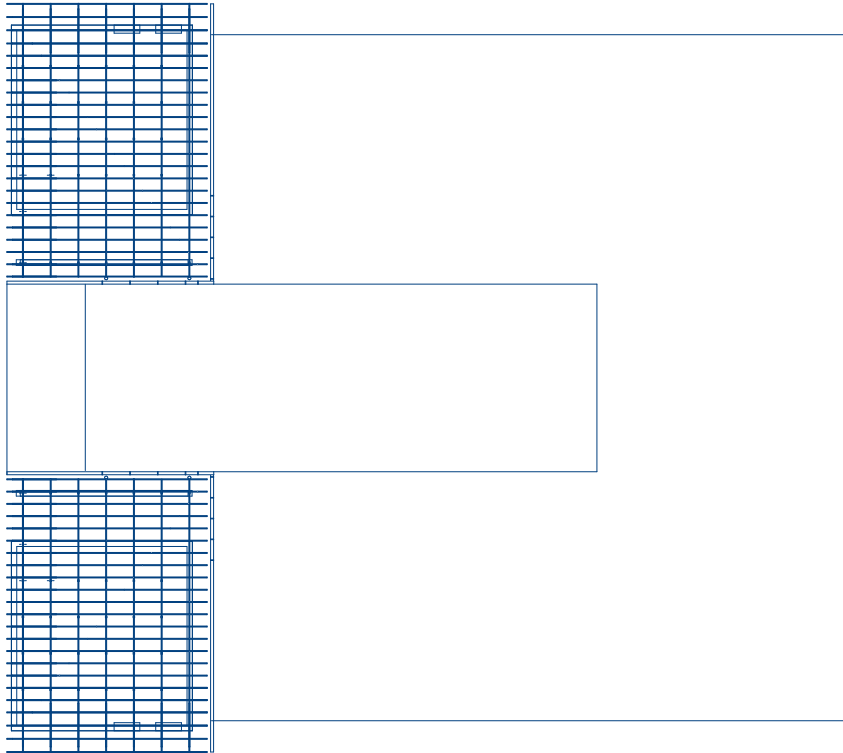


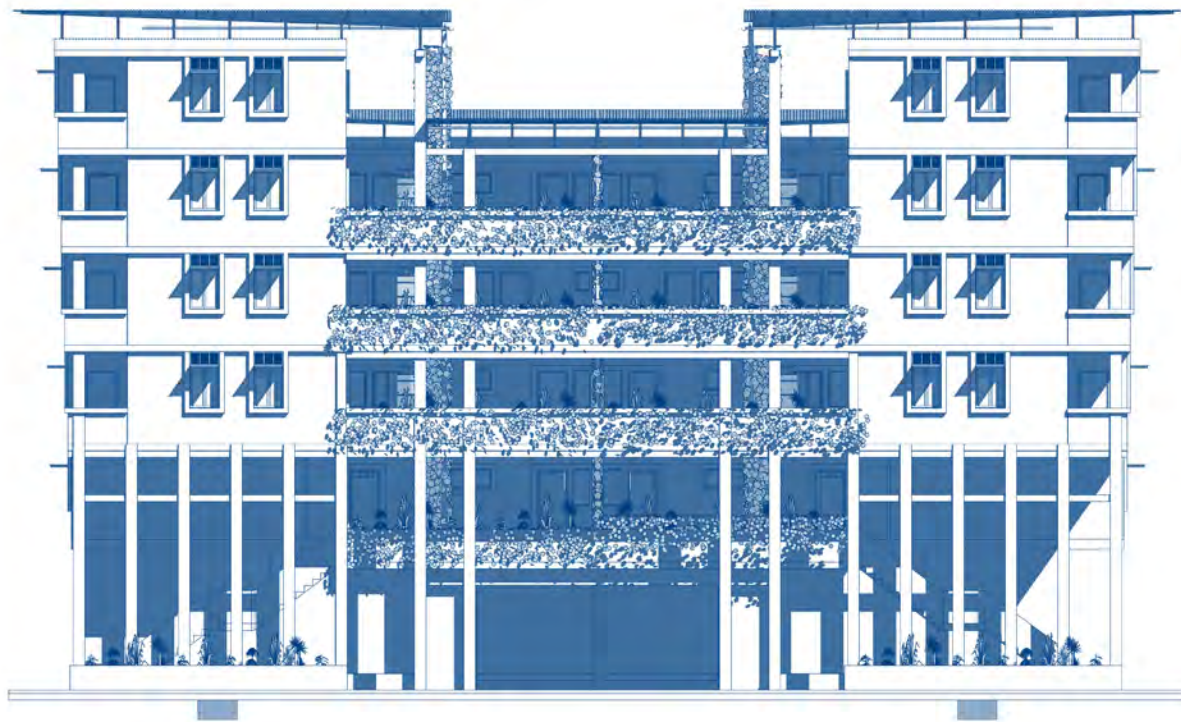


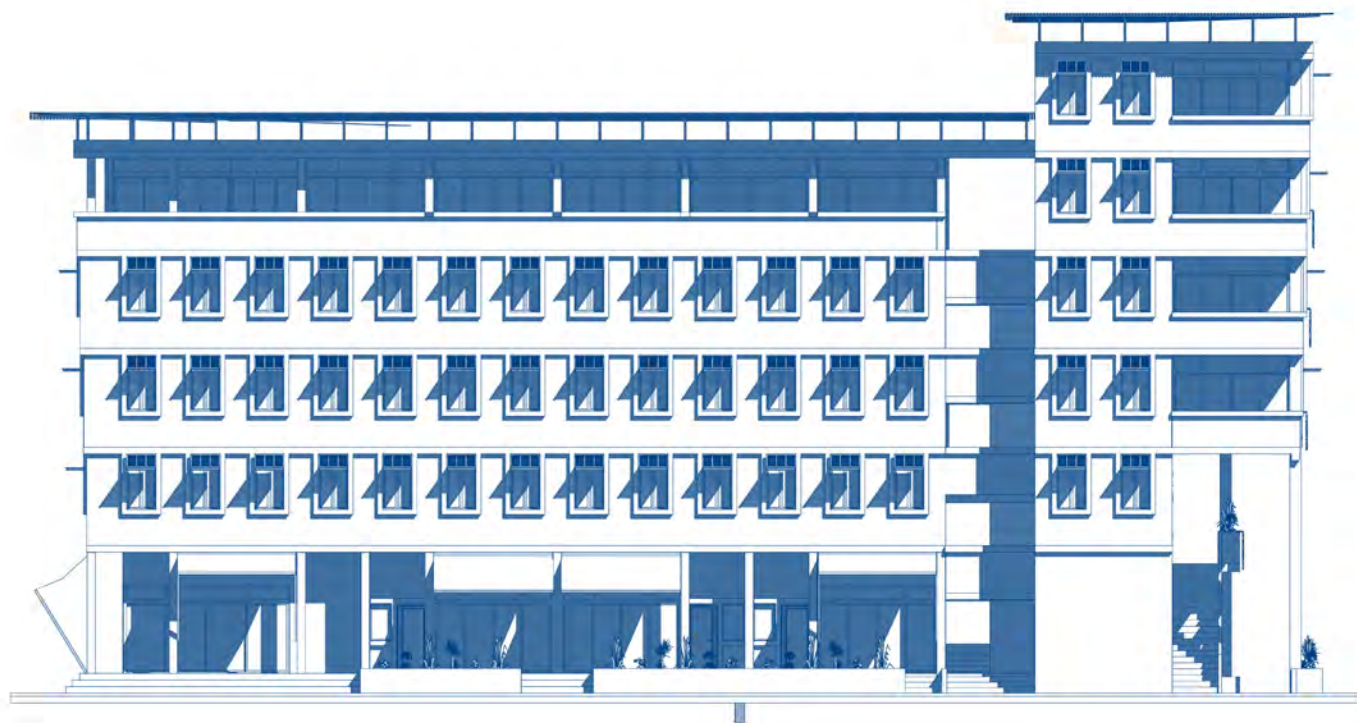


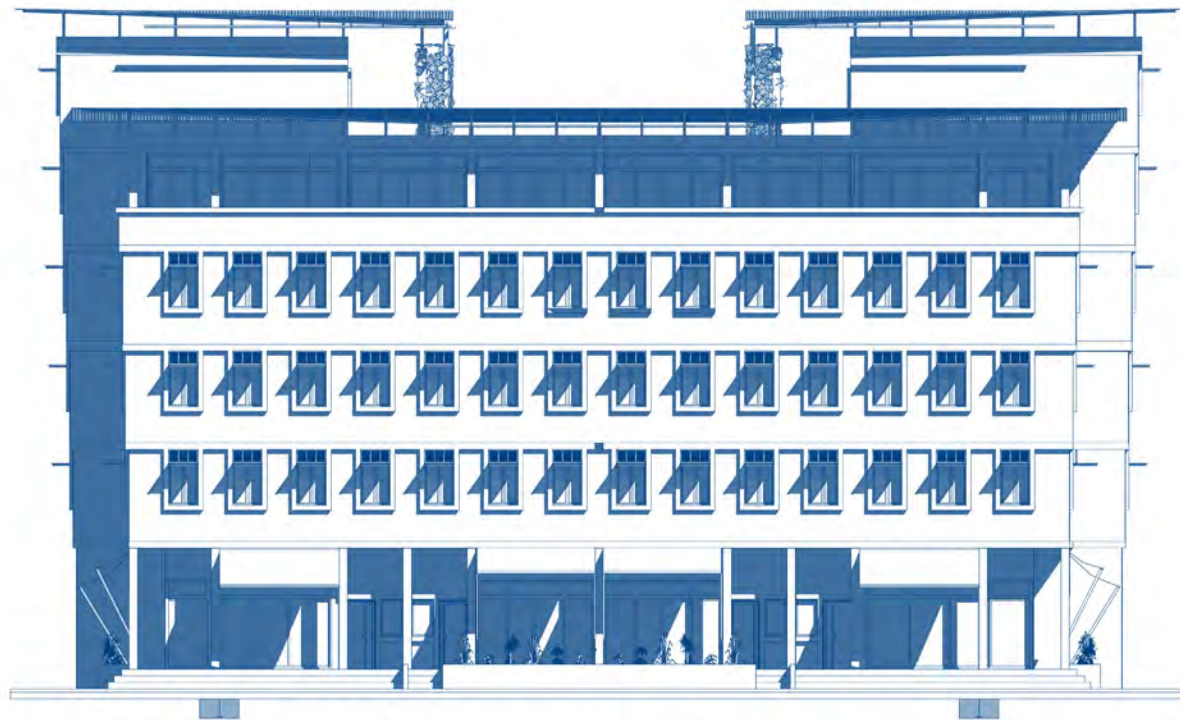




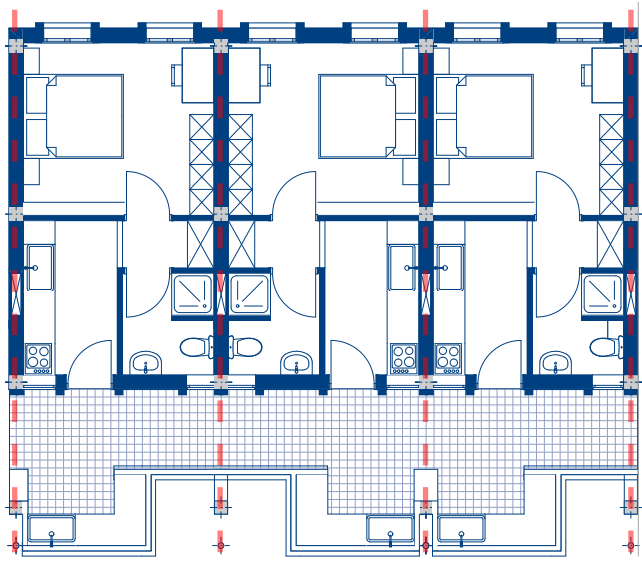




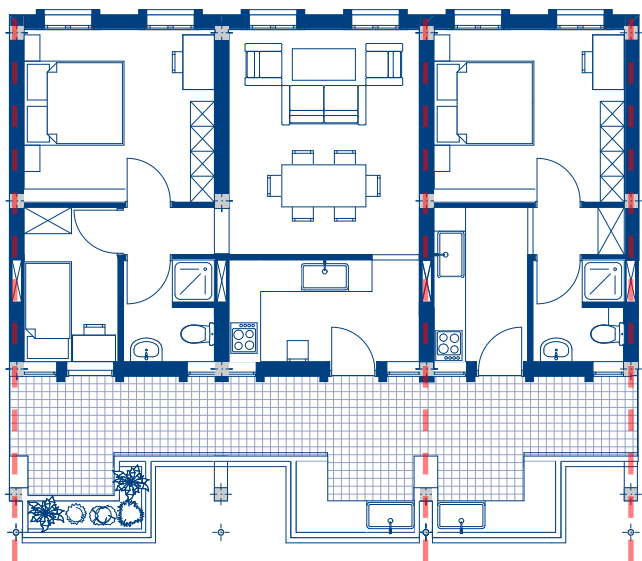
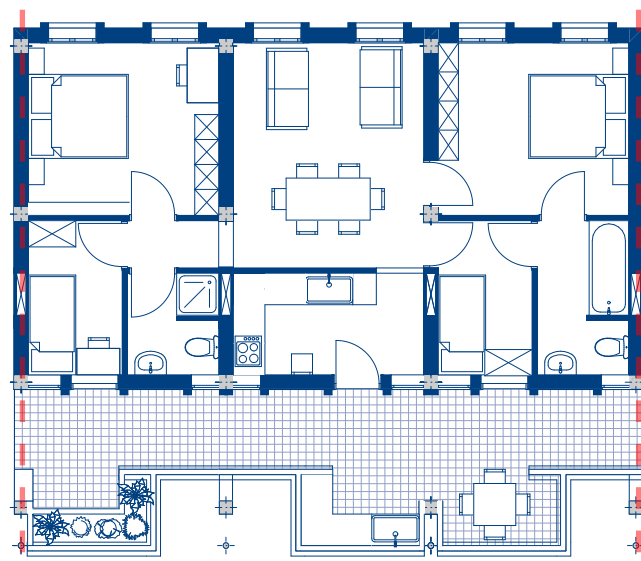




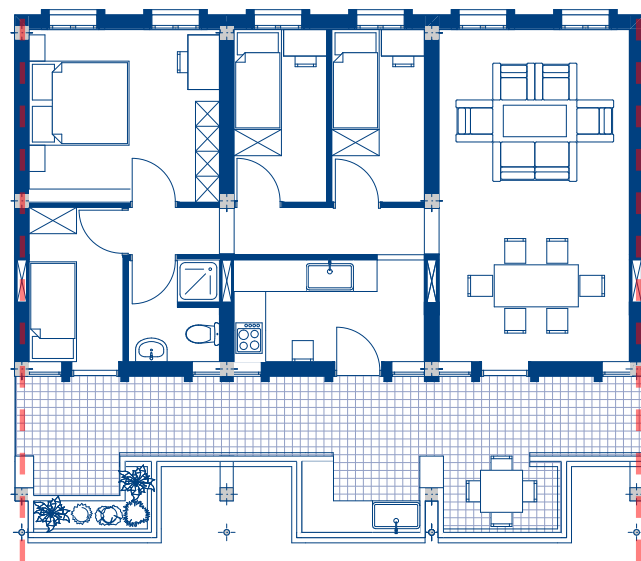
24m² gross 24m² gross 24m² gross



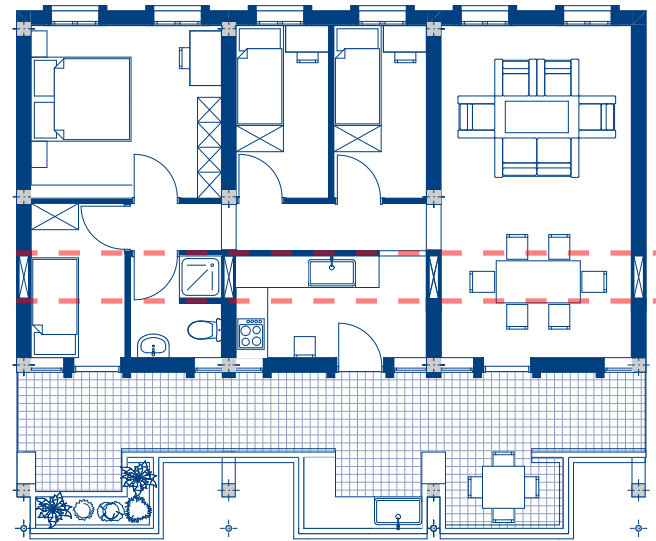
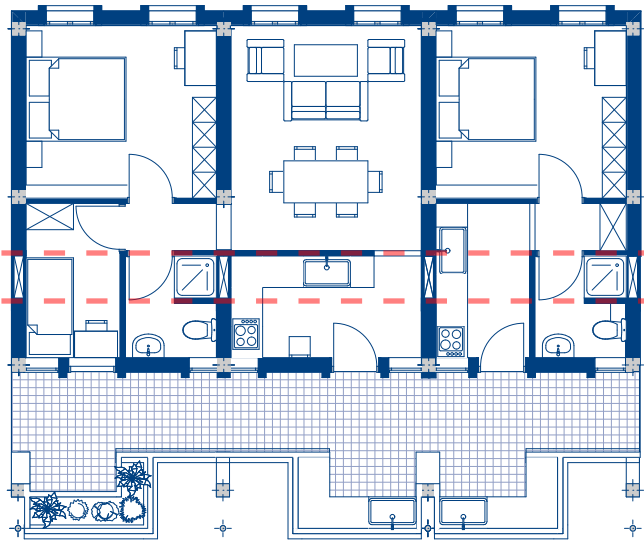
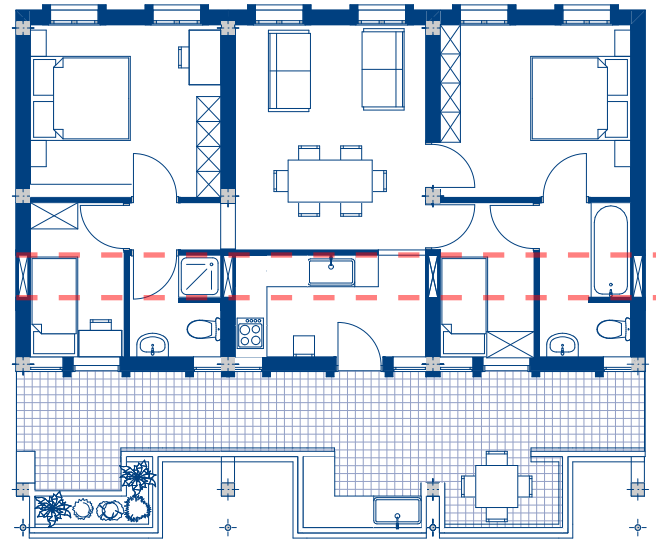
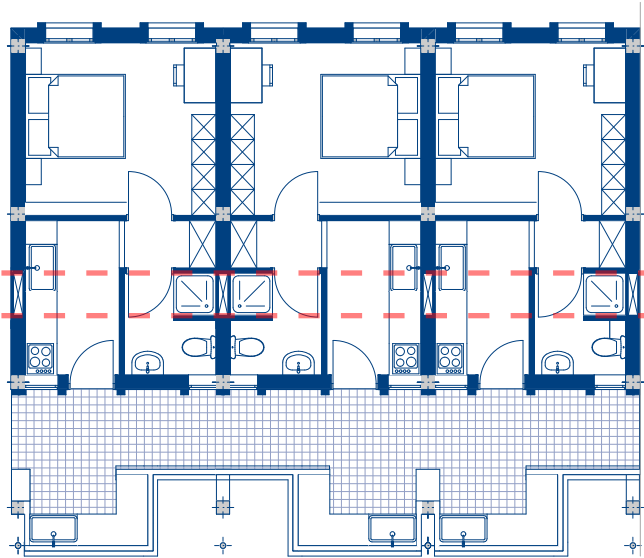
72m² gross

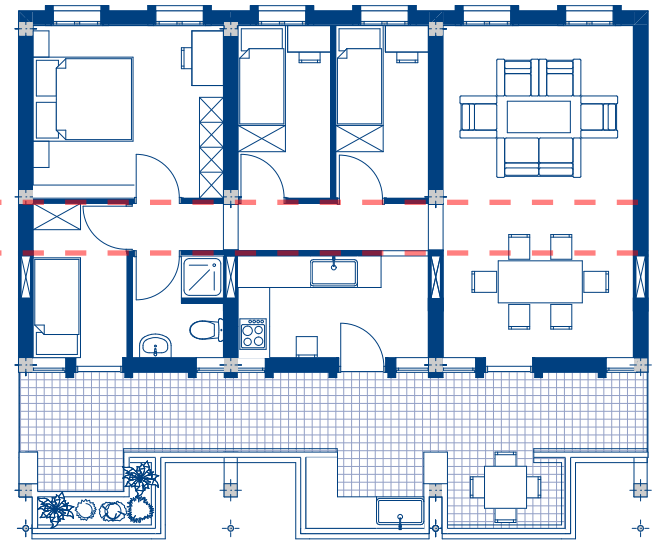
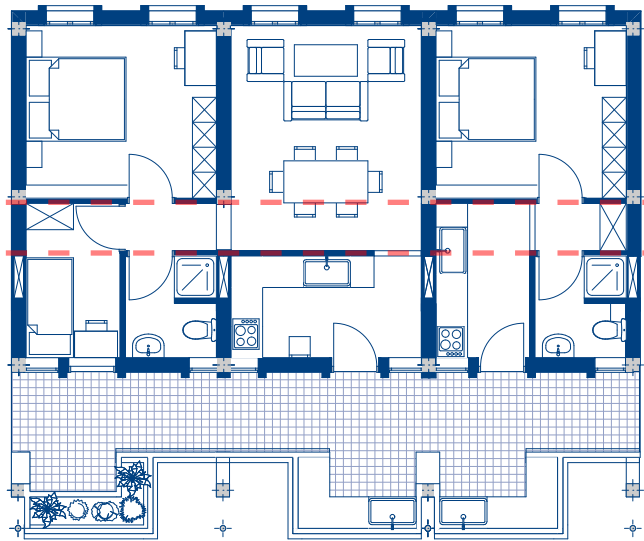
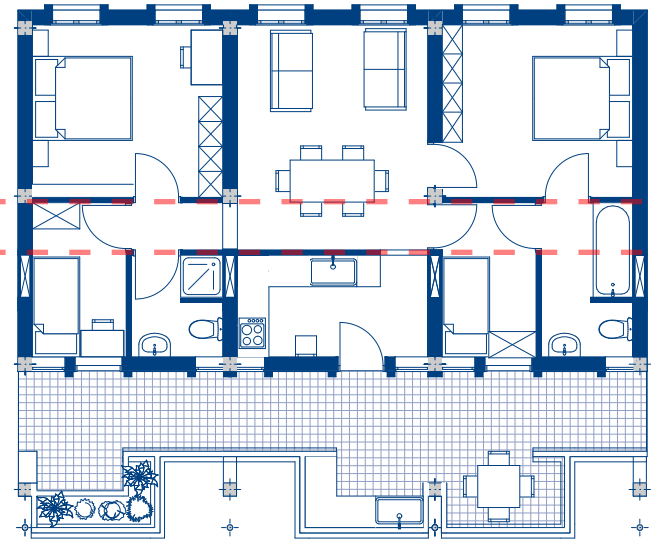
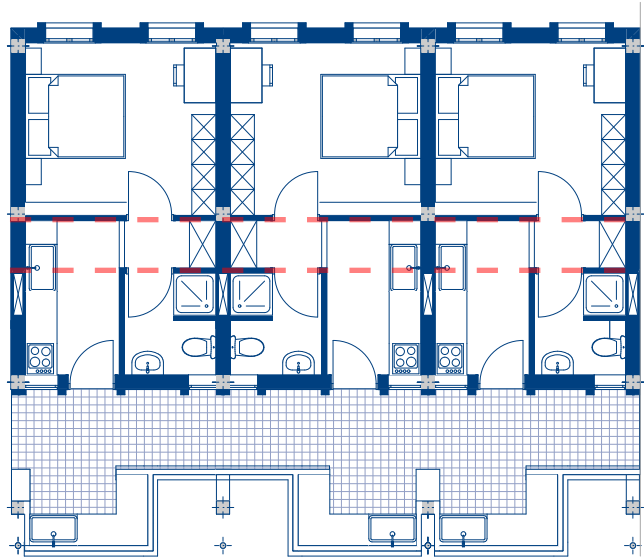


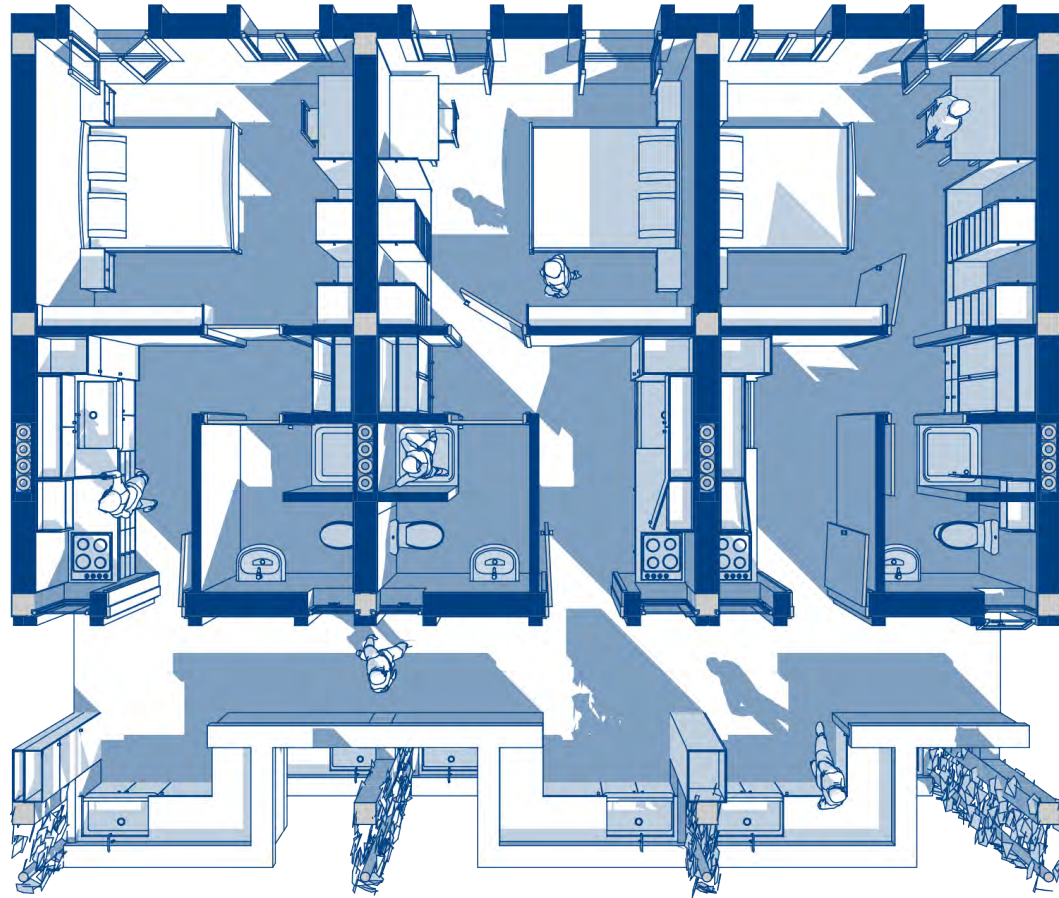
48m² gross 24m² gross



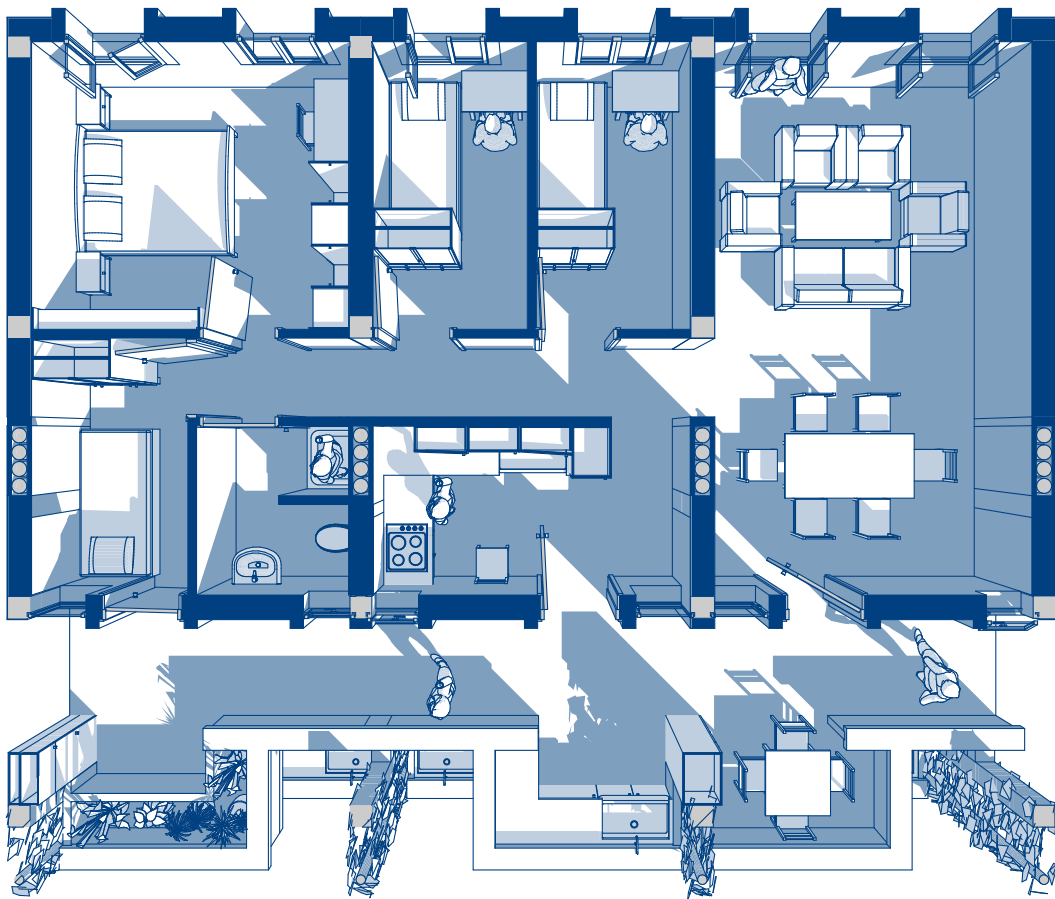
72m² gross

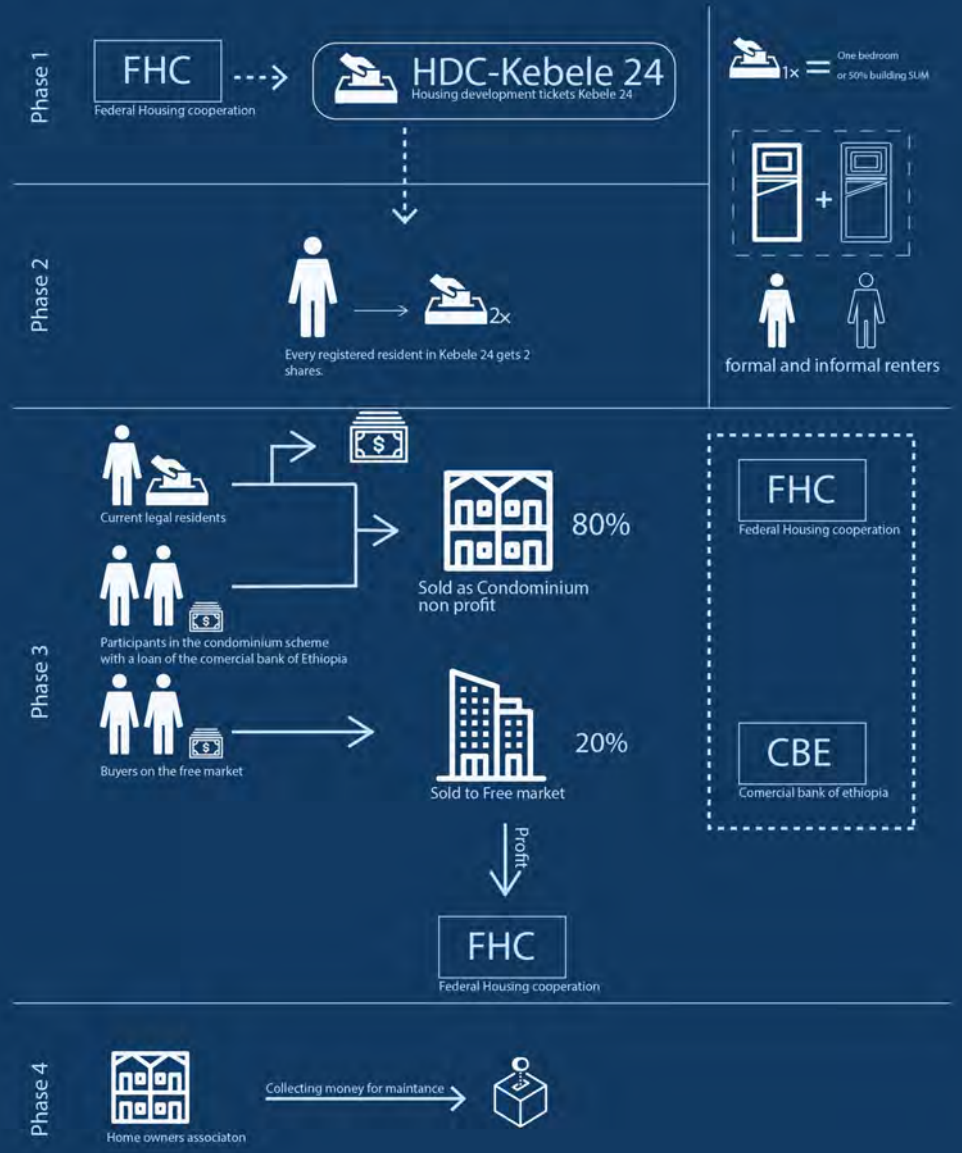


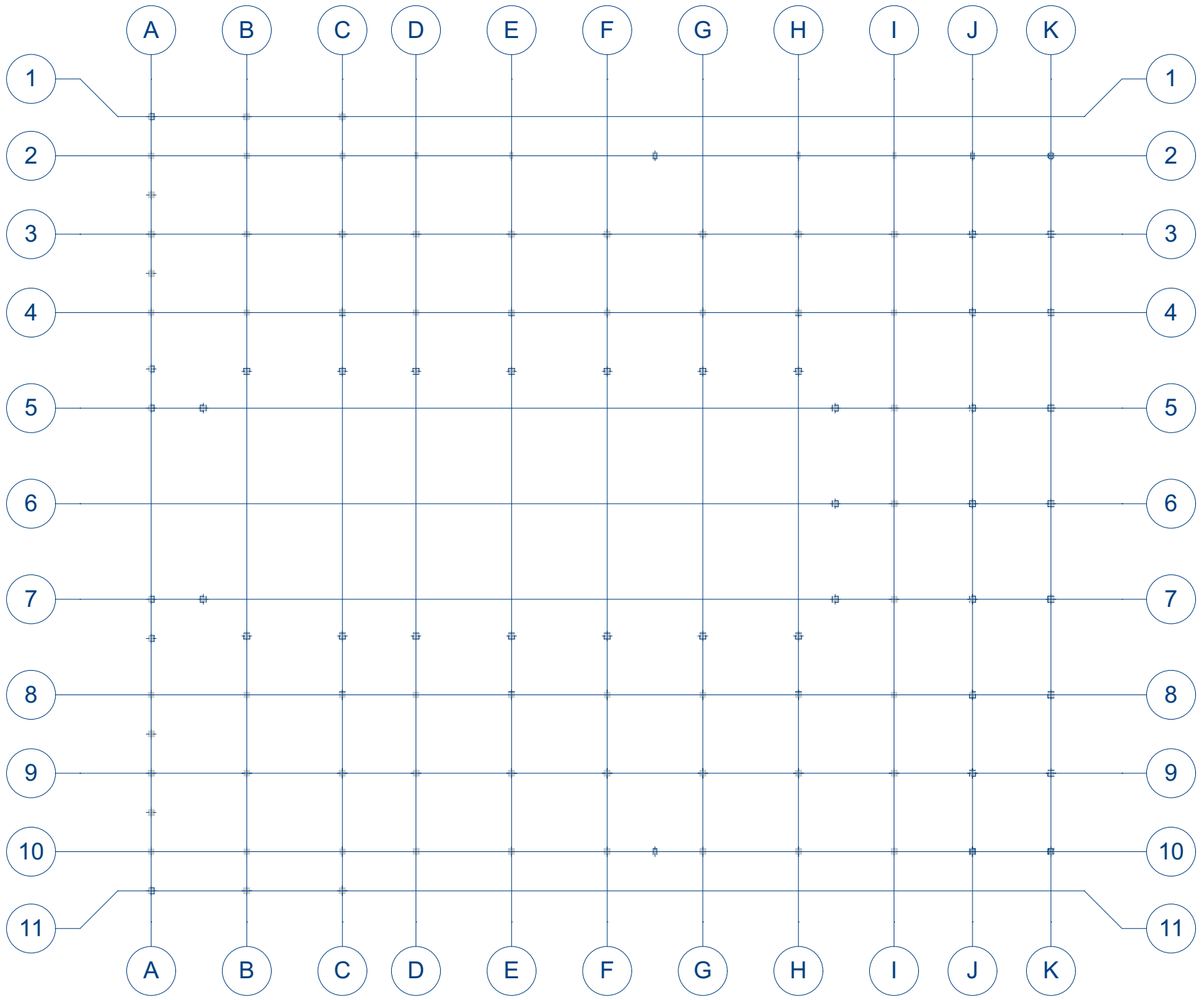


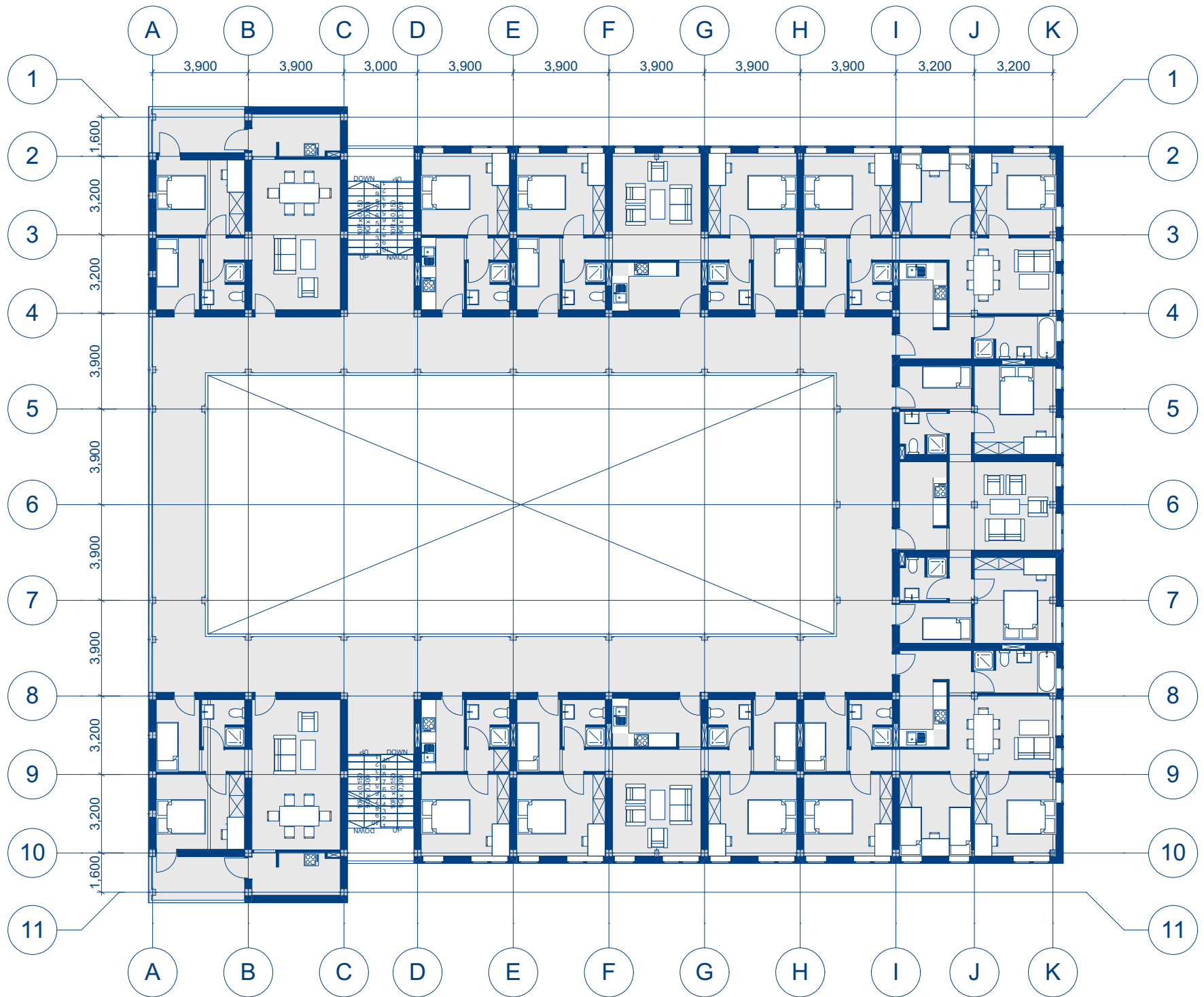


2











PSYCHROMETRIC CHART
Adaptive Comfort

LOCATION: ADDIS_ABABA/BOLE, -, ETH
Latitude/Longitude: 8.98° North, 38.8° East, **Time Zone from Greenwich** 3
Data Source: SWERA 634500 WMO Station Number, **Elevation** 2355 m

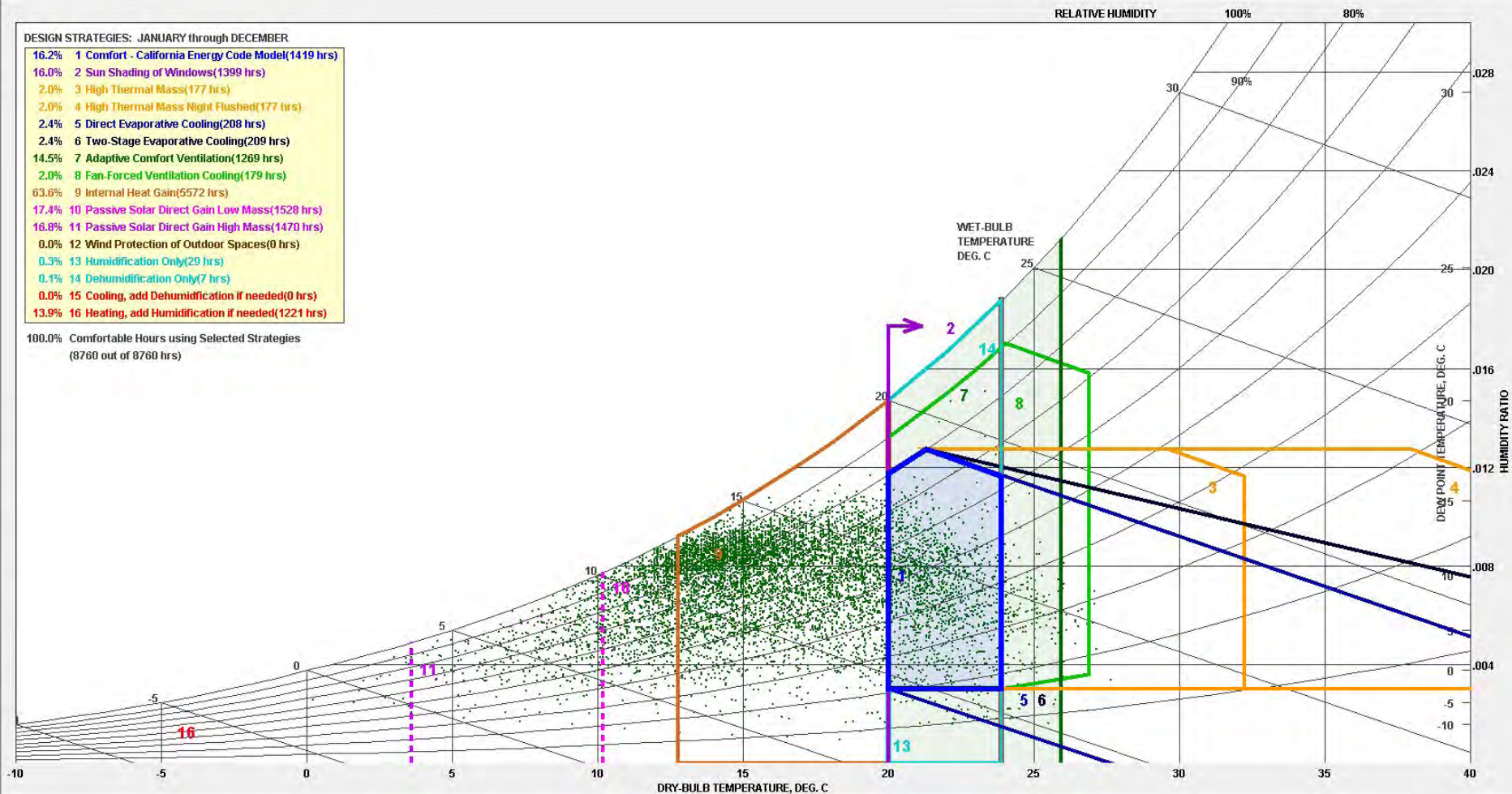
LEGEND

COMFORT INDOORS
 100% ■ COMFORTABLE
 0% ■ NOT COMFORTABLE

DESIGN STRATEGIES: JANUARY through DECEMBER

- 16.2% 1 Comfort - California Energy Code Model(1419 hrs)
- 16.0% 2 Sun Shading of Windows(1399 hrs)
- 2.0% 3 High Thermal Mass(177 hrs)
- 2.0% 4 High Thermal Mass Night Flushed(177 hrs)
- 2.4% 5 Direct Evaporative Cooling(208 hrs)
- 2.4% 6 Two-Stage Evaporative Cooling(209 hrs)
- 14.5% 7 Adaptive Comfort Ventilation(1269 hrs)
- 2.0% 8 Fan-Forced Ventilation Cooling(179 hrs)
- 63.6% 9 Internal Heat Gain(5572 hrs)
- 17.4% 10 Passive Solar Direct Gain Low Mass(1528 hrs)
- 16.8% 11 Passive Solar Direct Gain High Mass(1470 hrs)
- 0.0% 12 Wind Protection of Outdoor Spaces(0 hrs)
- 0.3% 13 Humidification Only(29 hrs)
- 0.1% 14 Dehumidification Only(7 hrs)
- 0.0% 15 Cooling, add Dehumidification if needed(0 hrs)
- 13.9% 16 Heating, add Humidification if needed(1221 hrs)

100.0% Comfortable Hours using Selected Strategies
 (8760 out of 8760 hrs)



M... PLUS California Energy Code

PLOT: COMFORT INDOORS

Hourly Daily Min/Max

All Hours Select Hours

1 a.m. through 12 a.m.

All Months Select Months

JAN through DEC

1 Month JAN Next

1 Day 1 Next

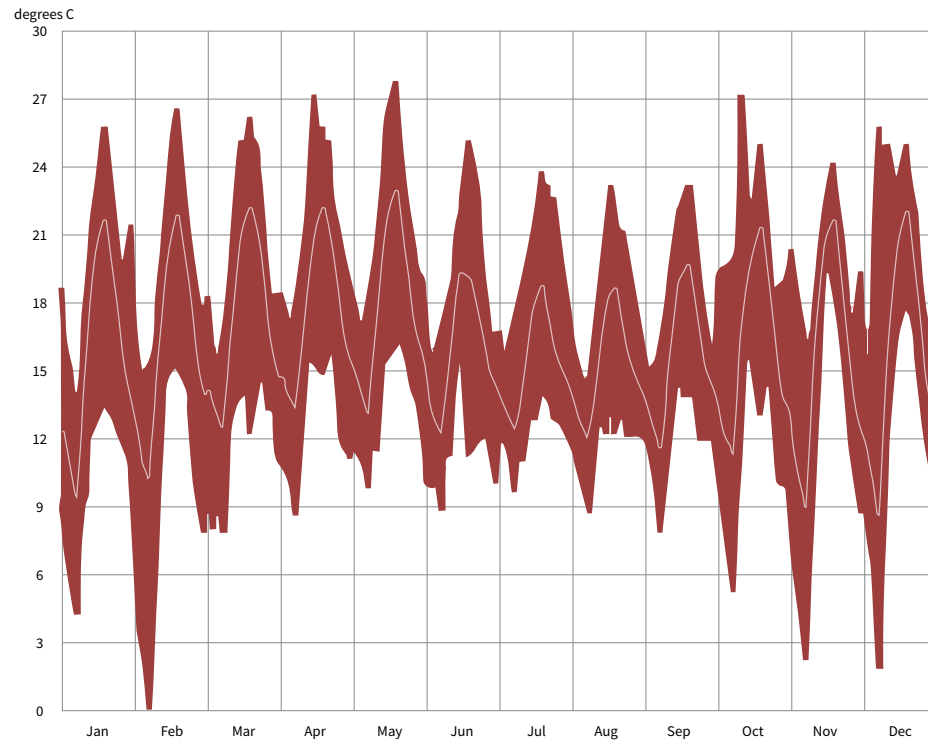
1 Hour 1 a.m. Next

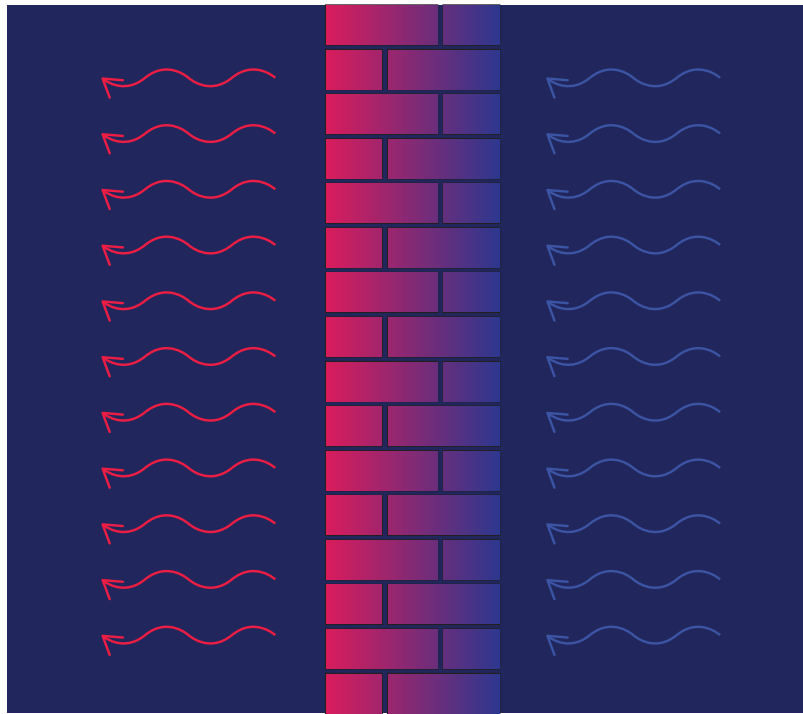
TEMPERATURE RANGE:

-10 to 40 °C Fit to Data

Display Design Strategies

Show Best set of Design Strategies

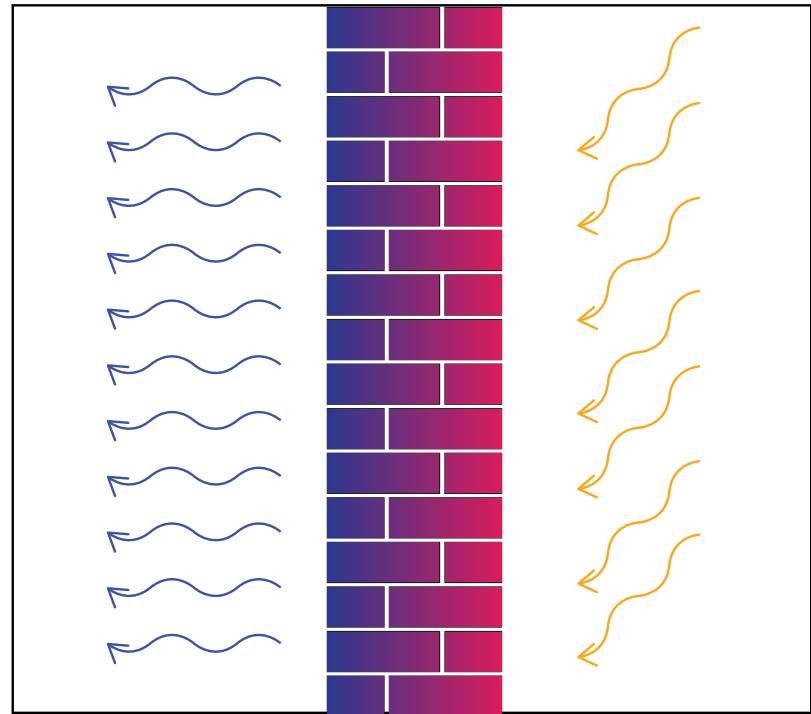




Inside

Night

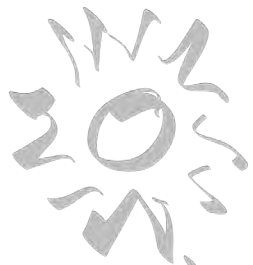
Outside



Inside

Day

Outside

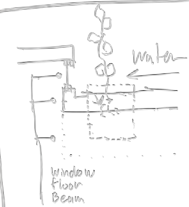


The roof is made out of corrugated steel plates. The roof is elevated on top of the concrete slab forming a so called tropical roof.



a vertical climbing plant in between the column and the downspout.

Clean rainwater is collected on the roof, and then transported to large tanks on the basement.

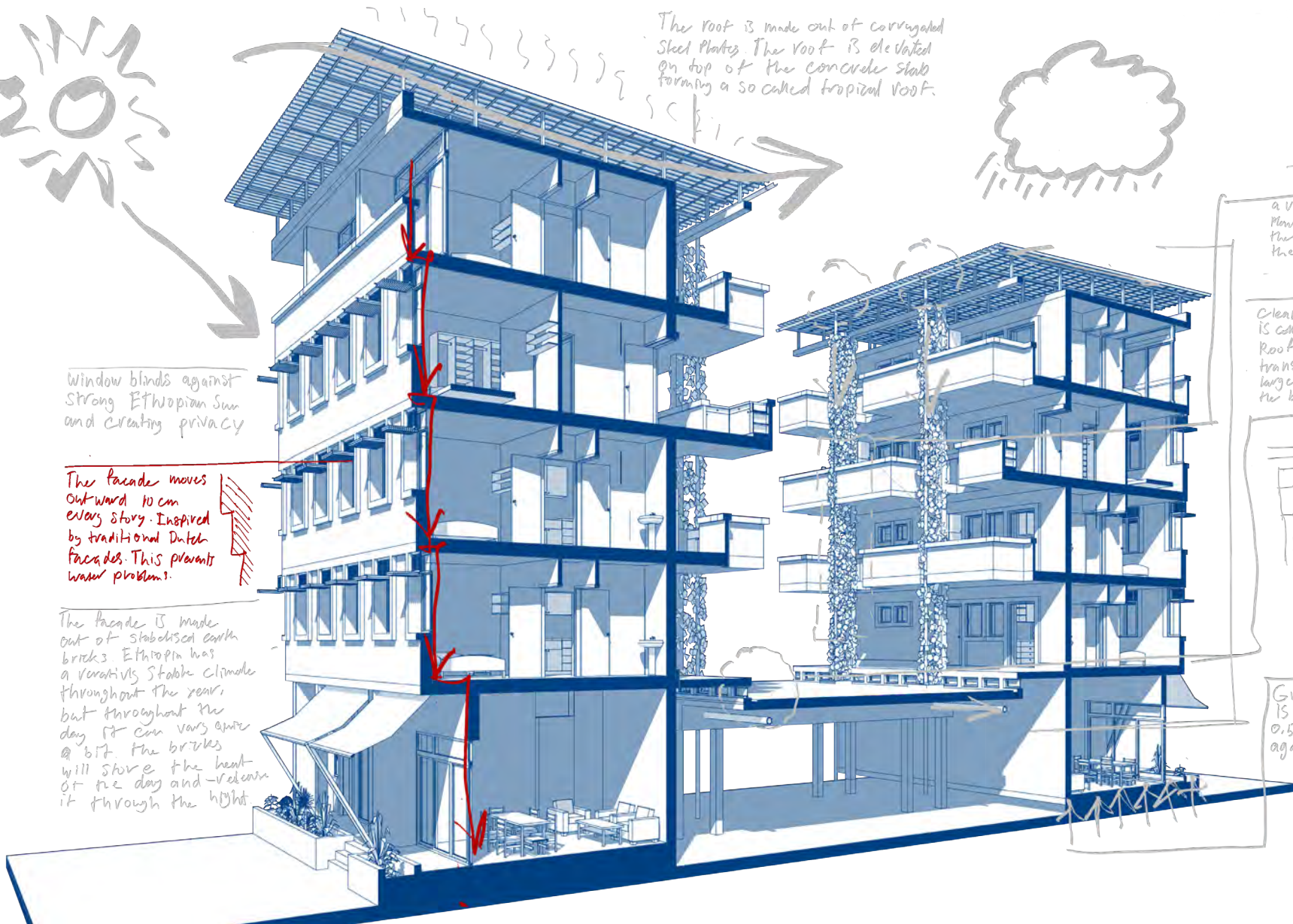


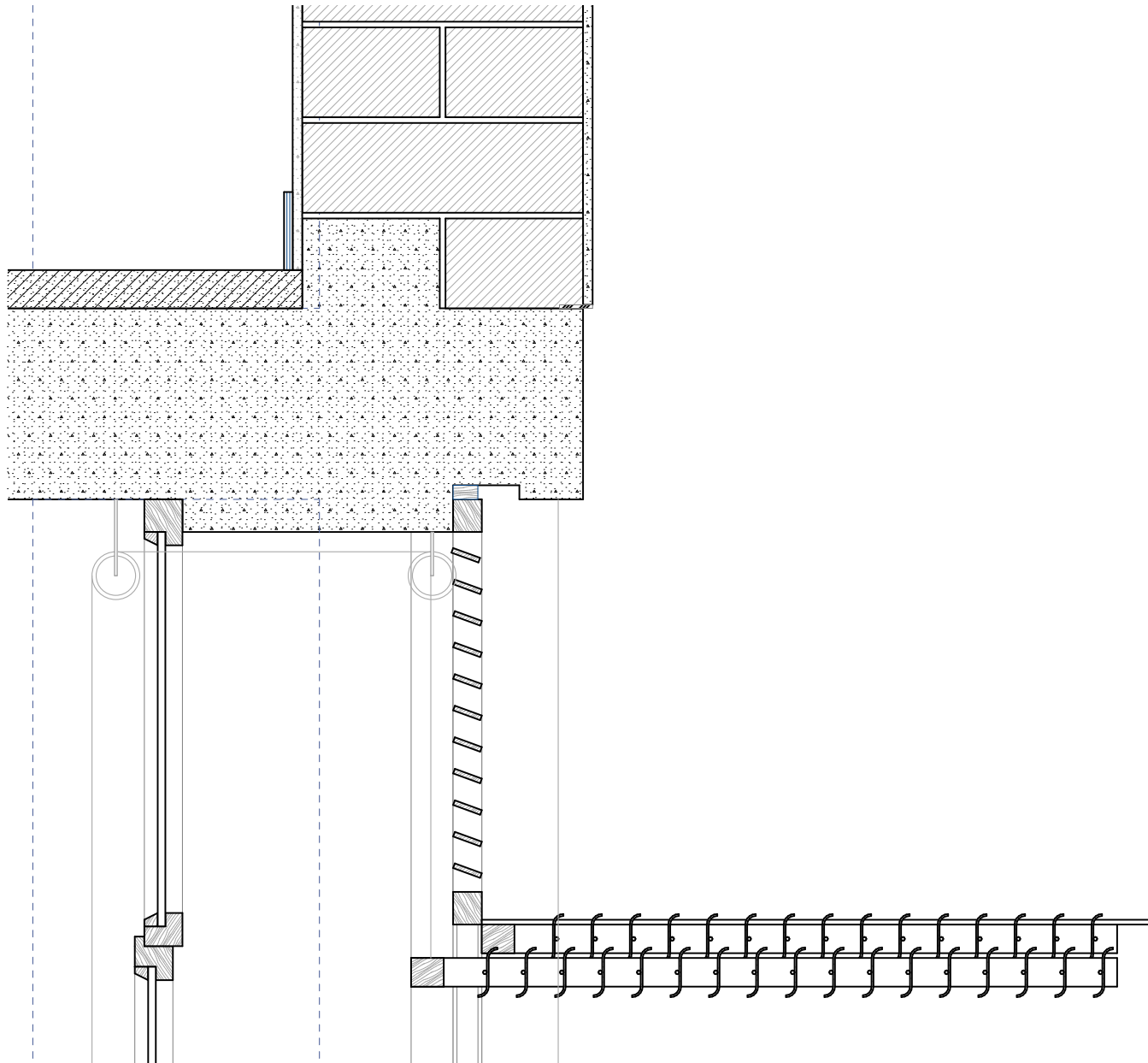
Ground floor is elevated by 0.5M protecting against floods.

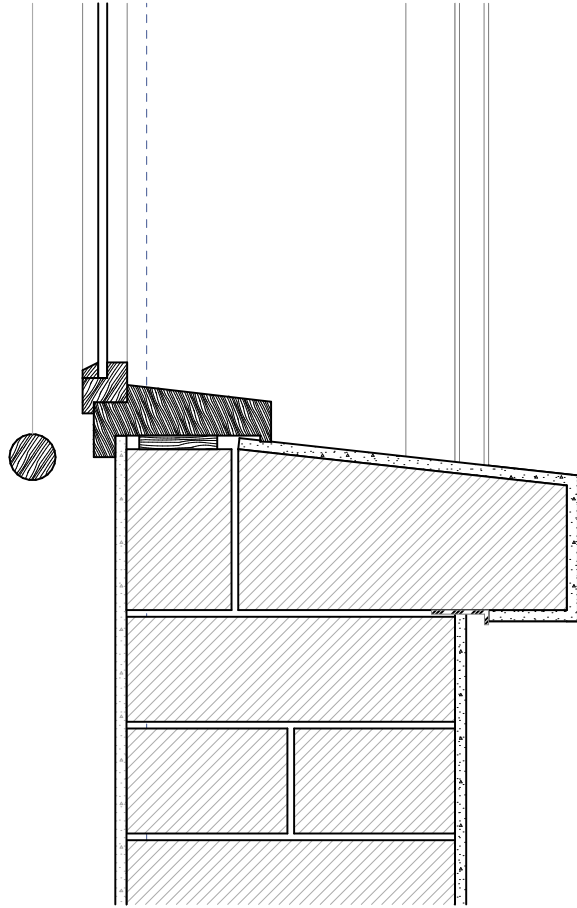
Window blinds against strong Ethiopian sun and creating privacy

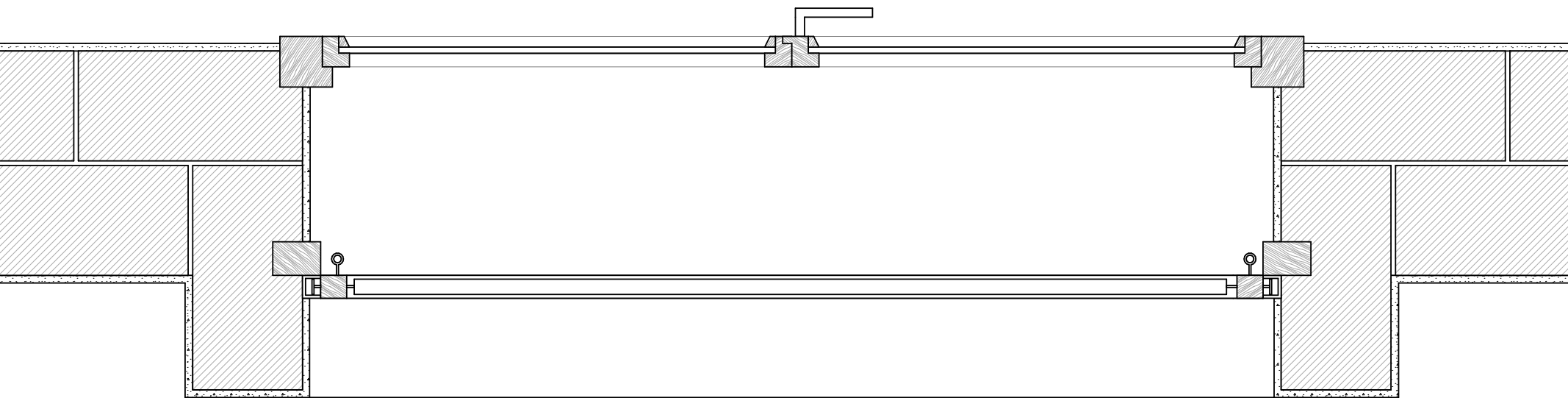
The facade moves outward 10 cm every story. Inspired by traditional Dutch facades. This prevents water problems.

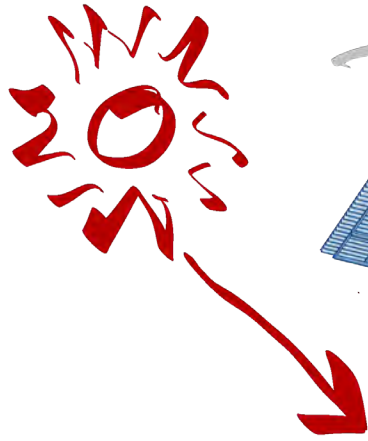
The facade is made out of stabilised earth bricks. Ethiopia has a variable stable climate throughout the year, but throughout the day it can vary quite a bit. The bricks will store the heat of the day and release it through the night.











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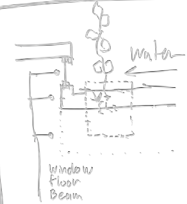
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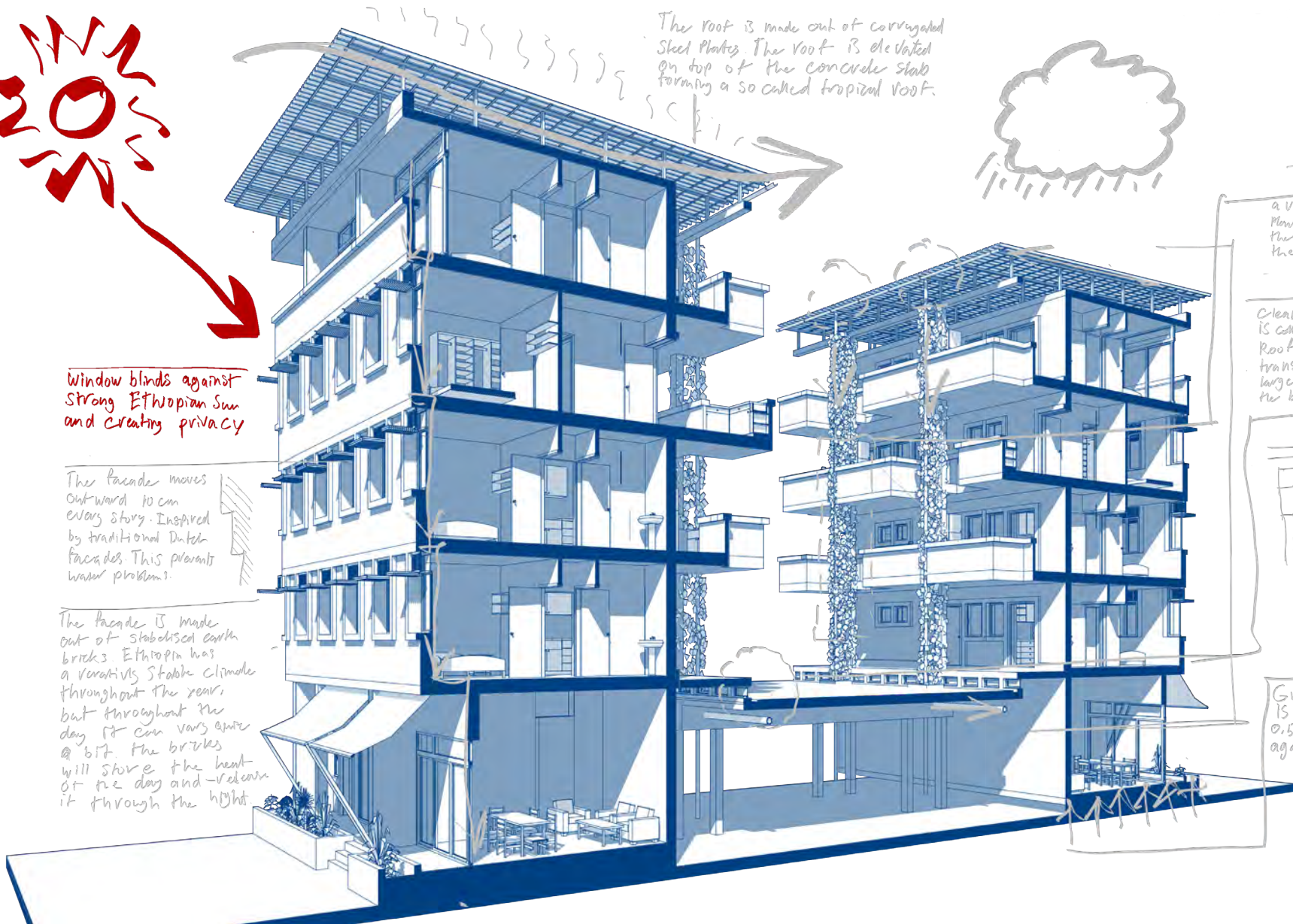


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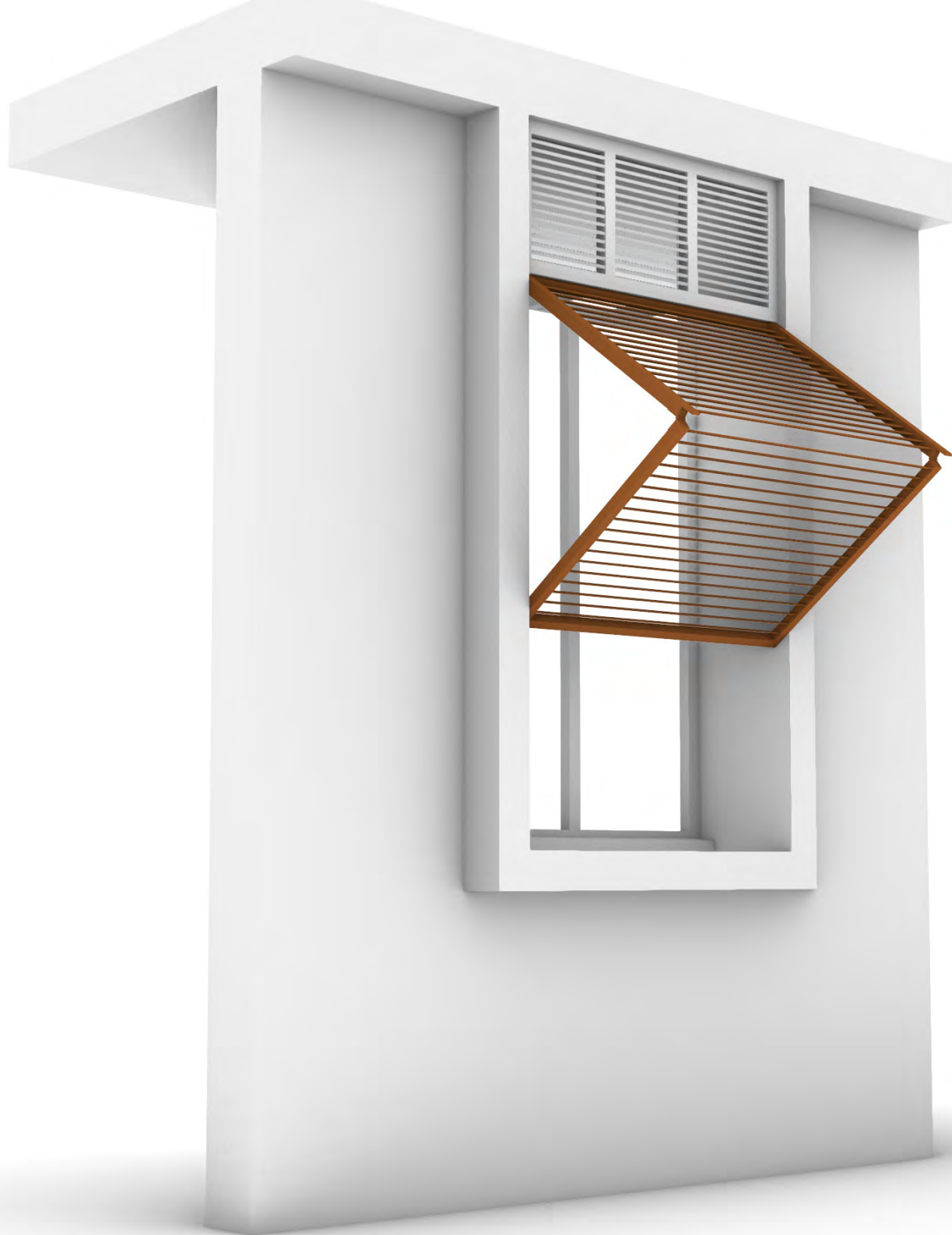


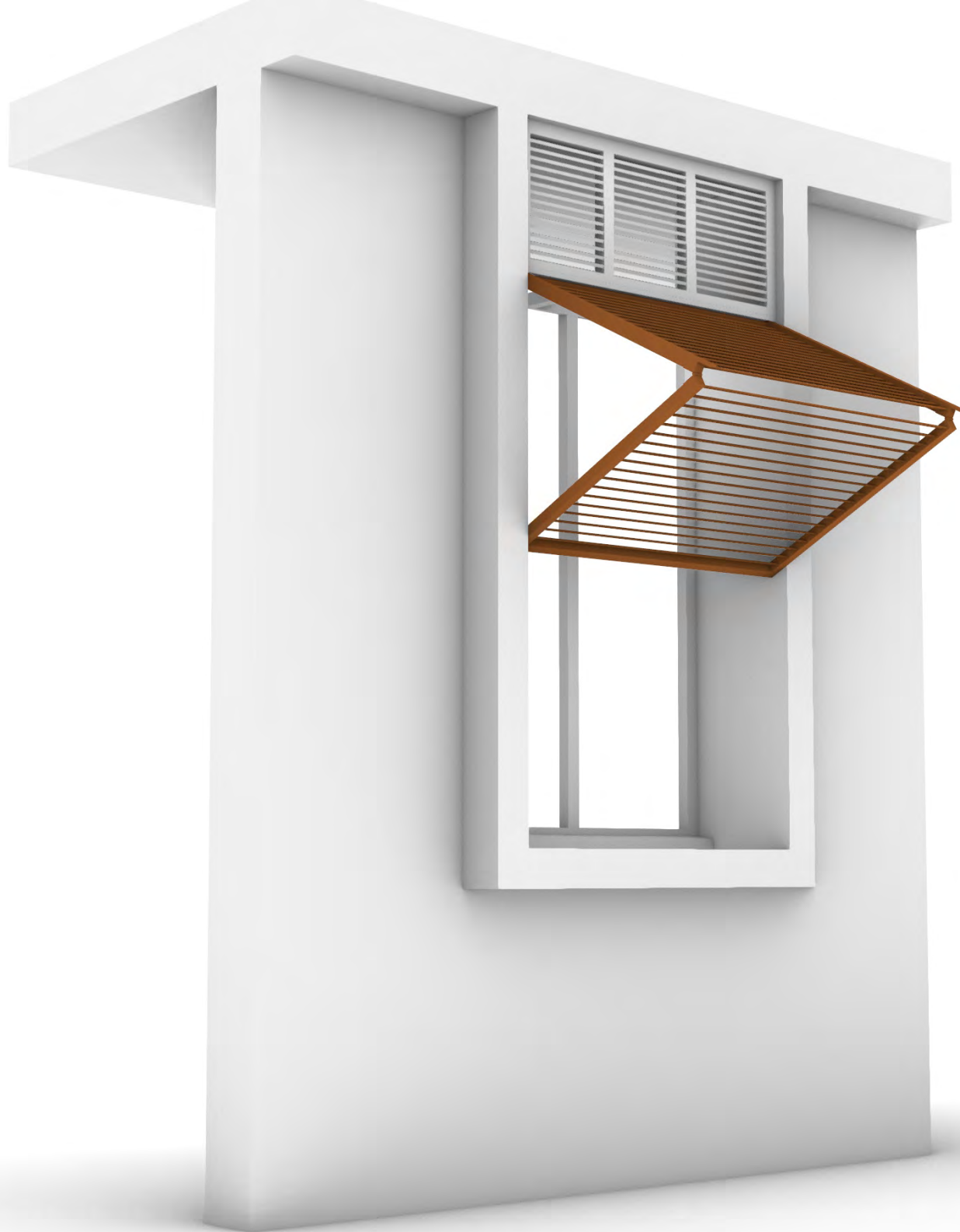


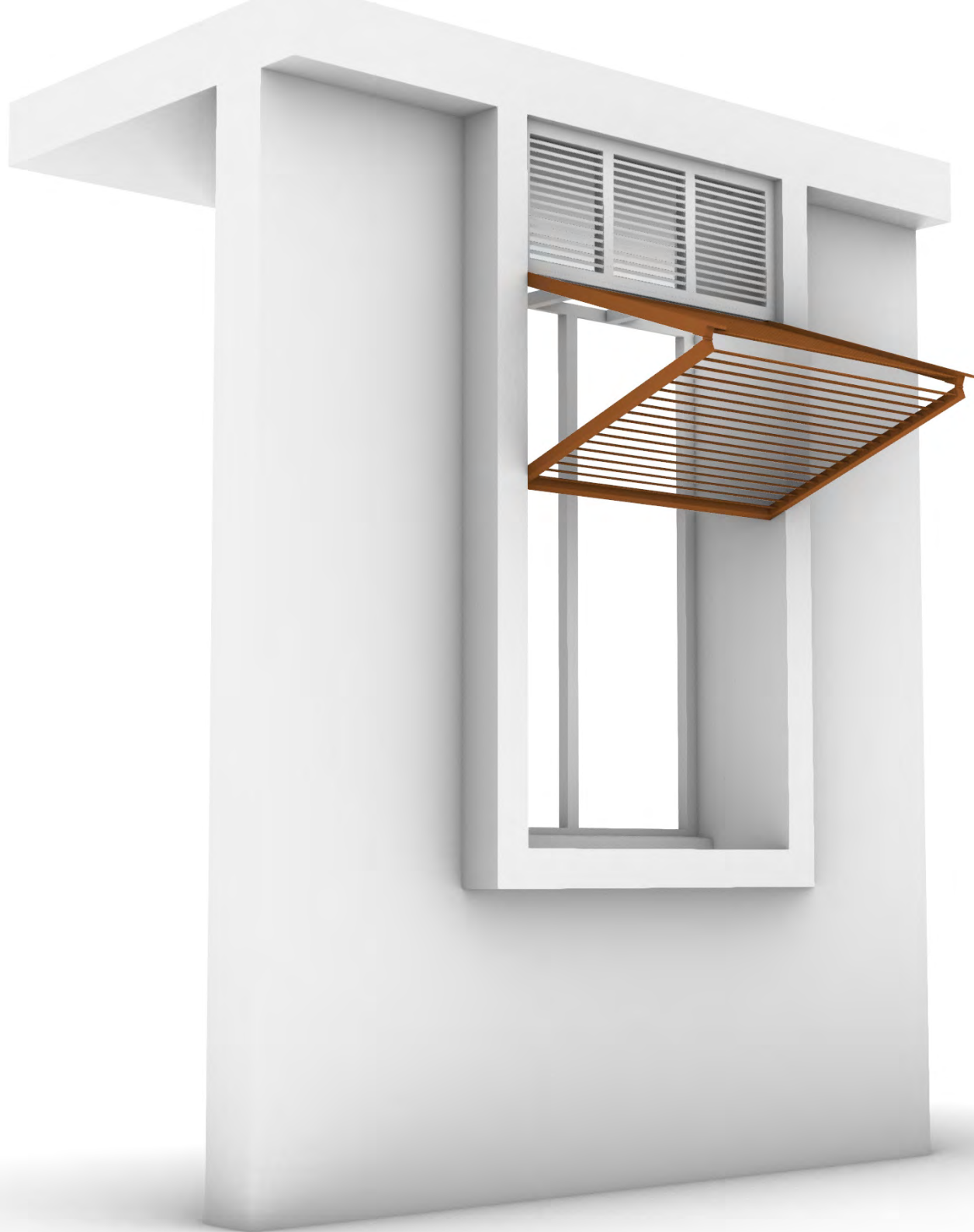








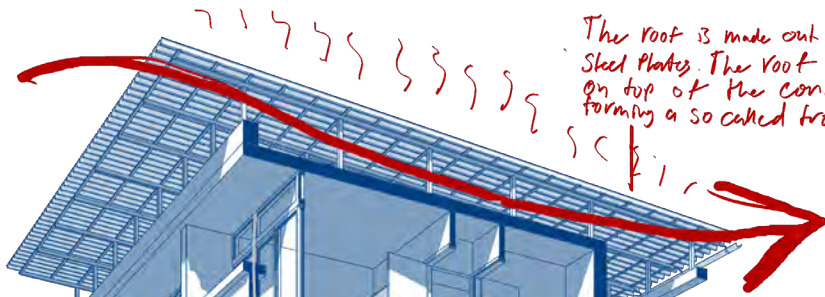
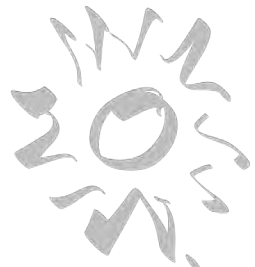










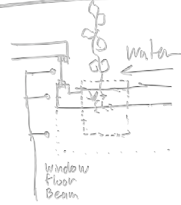


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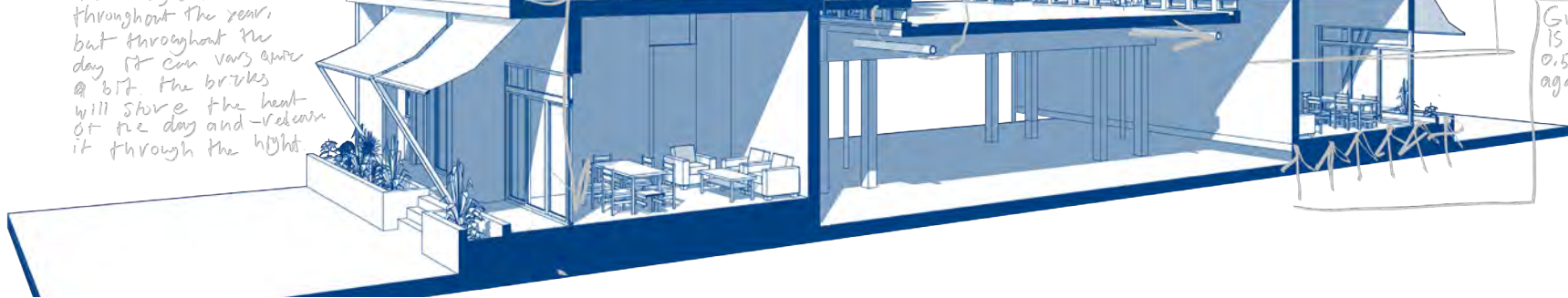


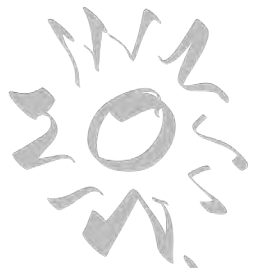
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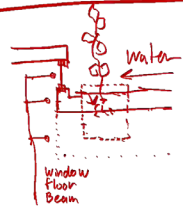


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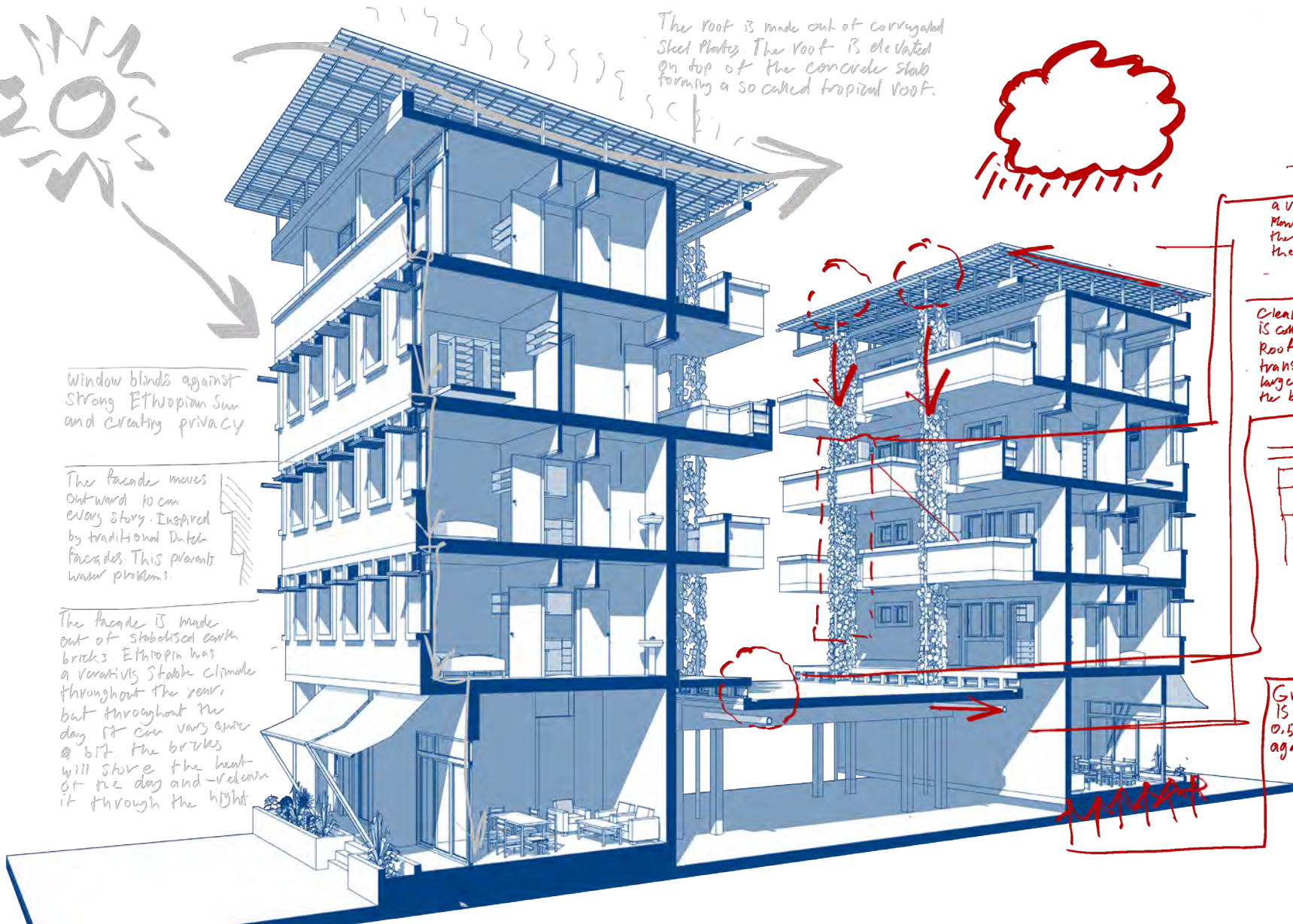


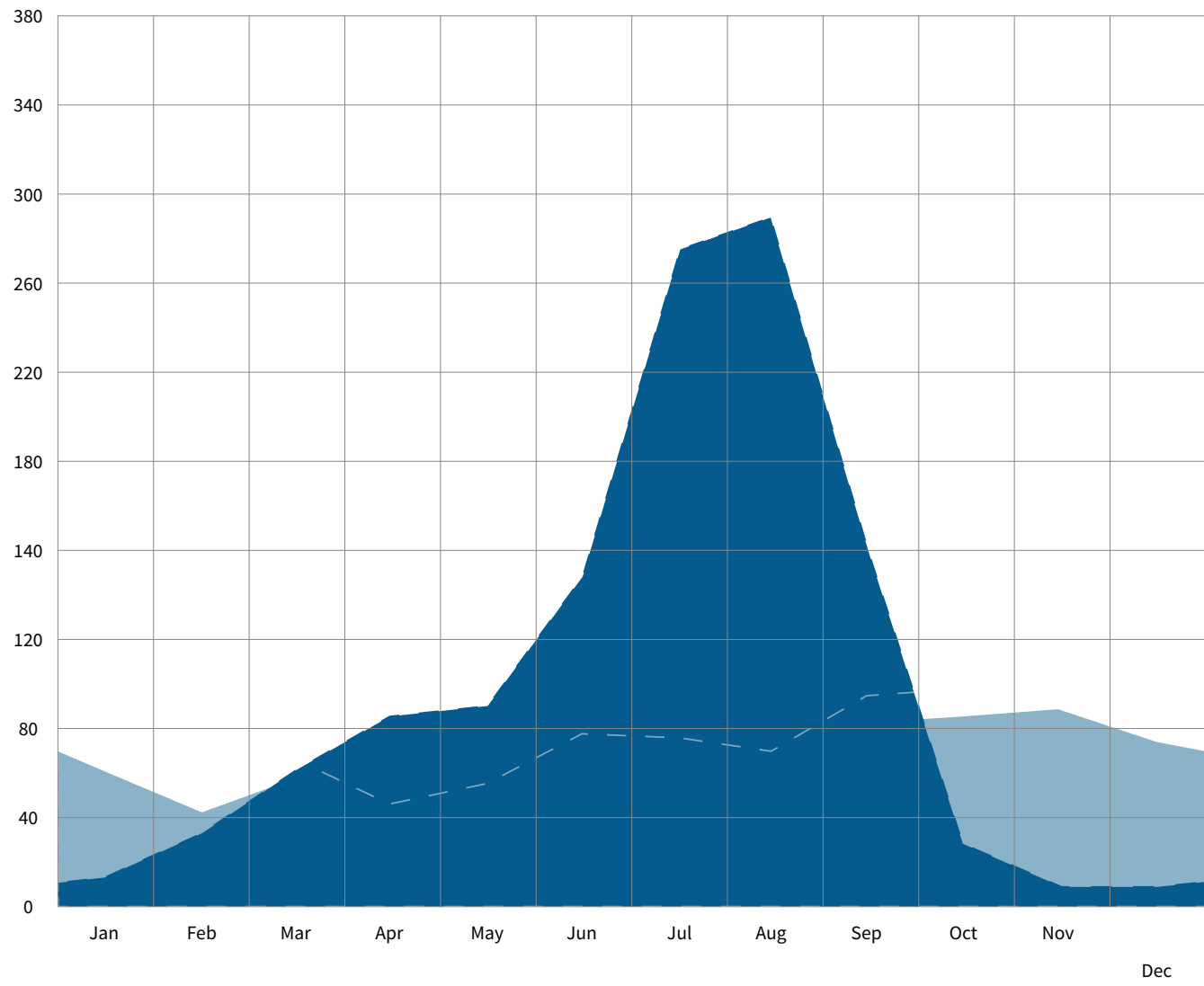
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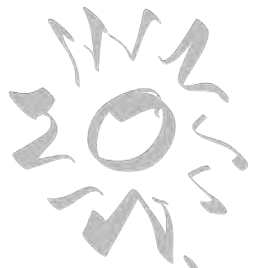
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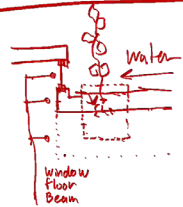


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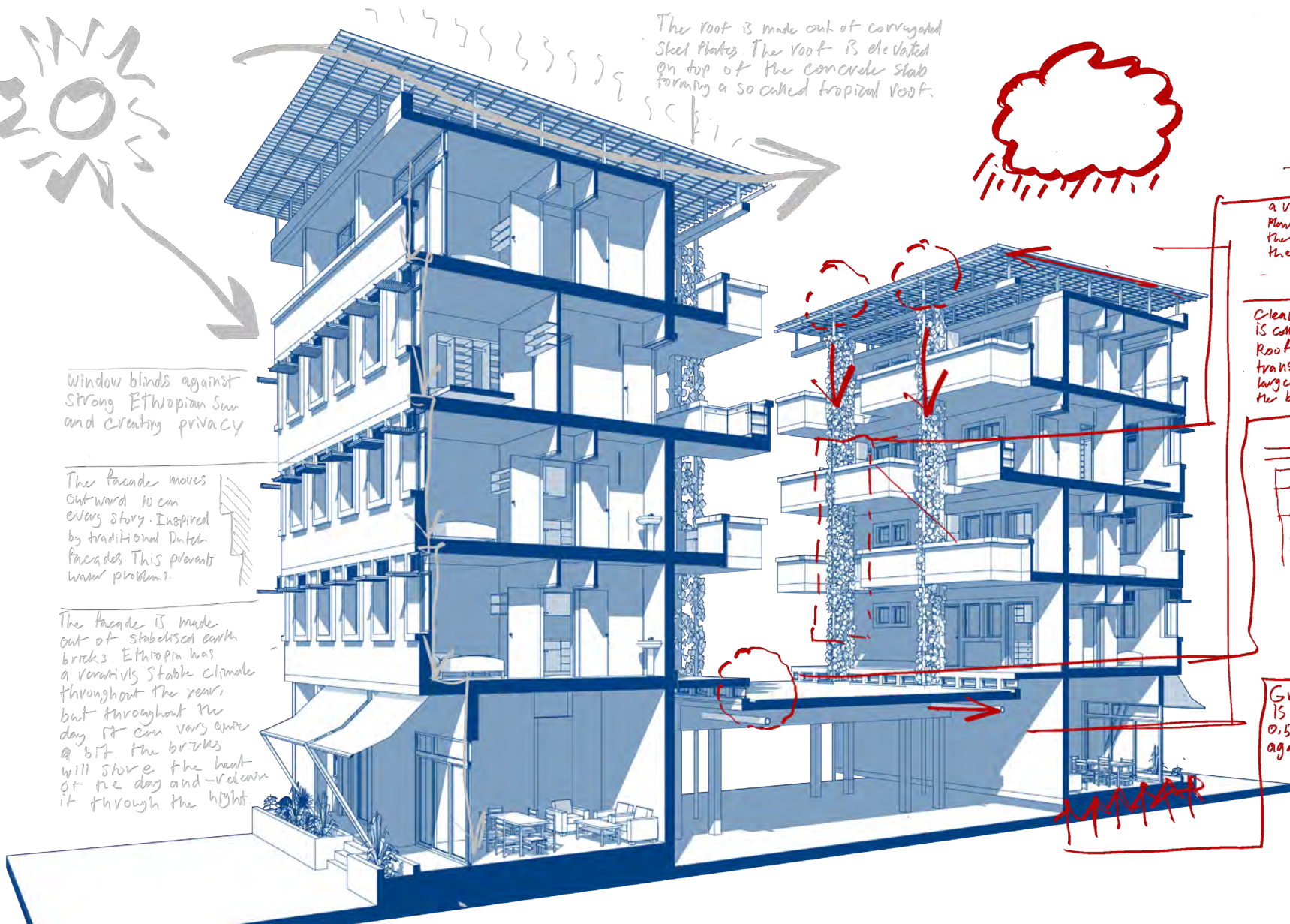


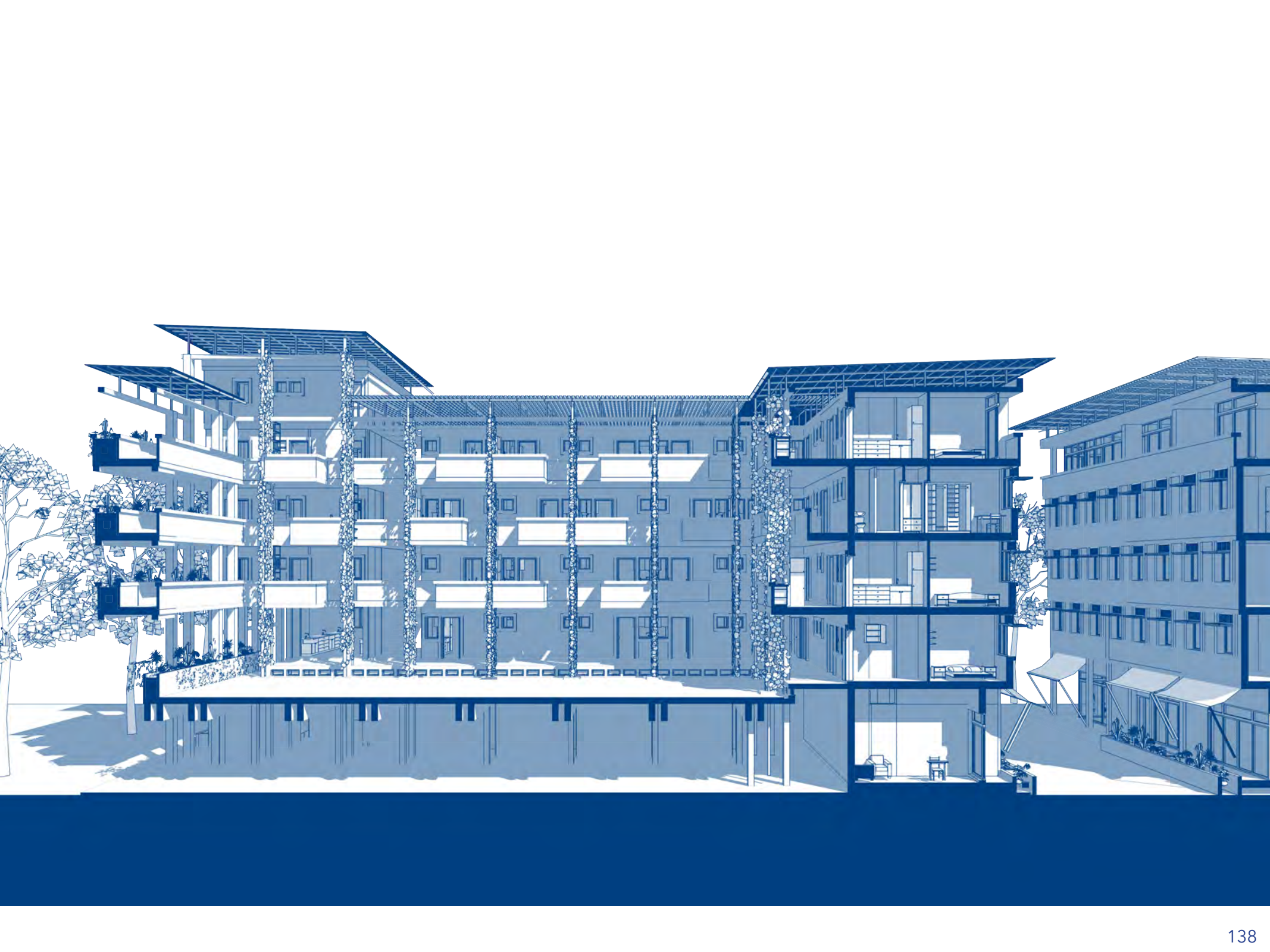
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RSION