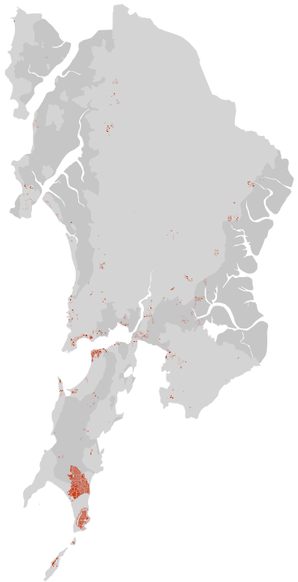
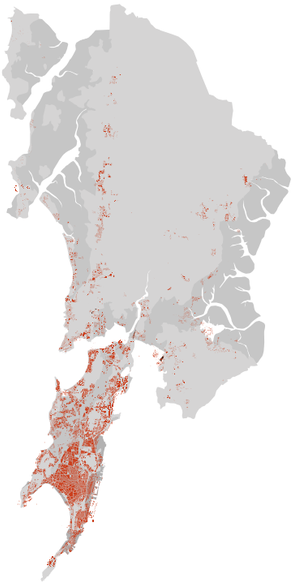
LEAVING SPACE

an alternative for the chawl redevelopment in Nala Sopara

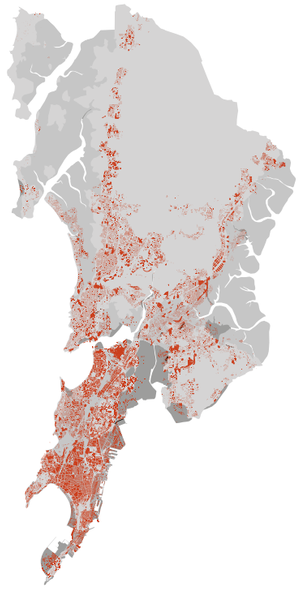
problem statement // Mumbai // India



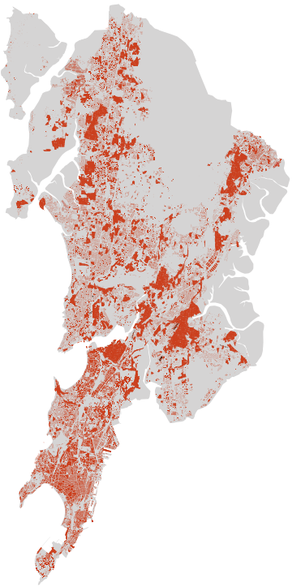
1812



1909



1964



2012

235.000

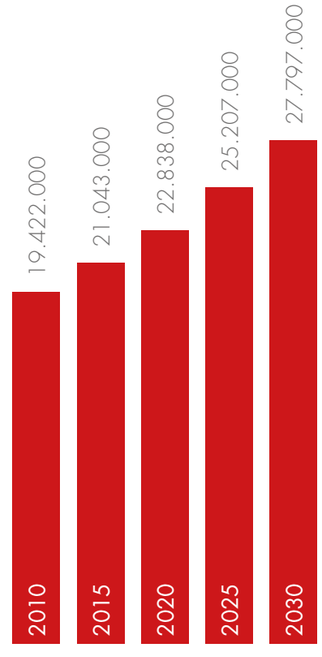
1.018.388

4.152.056

12.442.373

problem statement // **urban growth in Mumbai**

maps of Mumbai: Rohan Varma // https://www.census2011.co.in/census/city/365-mumbai.html // D'Cunha, Jose Gerson (1900). "VI The Later British Period". The Origins of Bombay (3 ed.). Asian Educational Services. p. 348.



population MMR

Mumbai Metropolitan Region

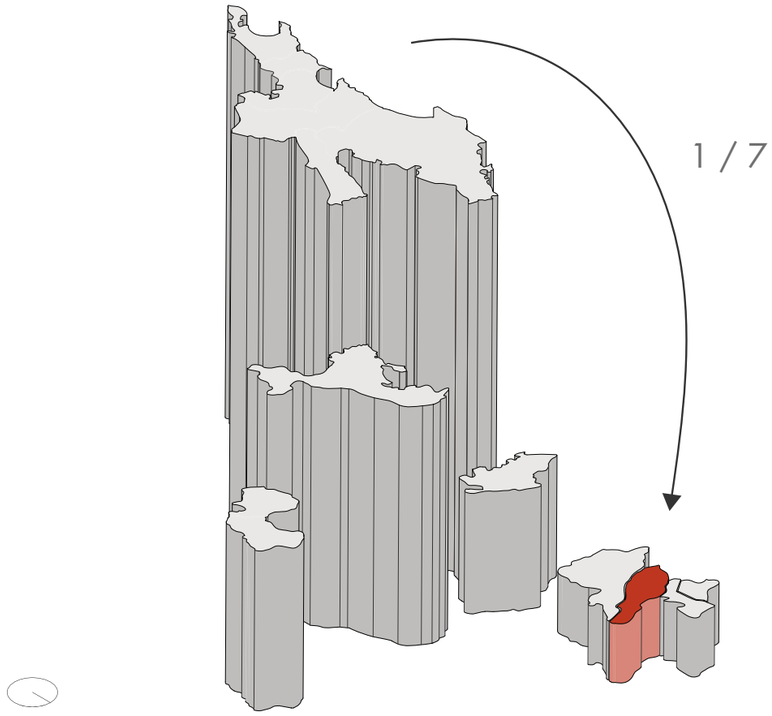
Vasai-Virar

NalaSopara

problem statement // urban growth in Mumbai

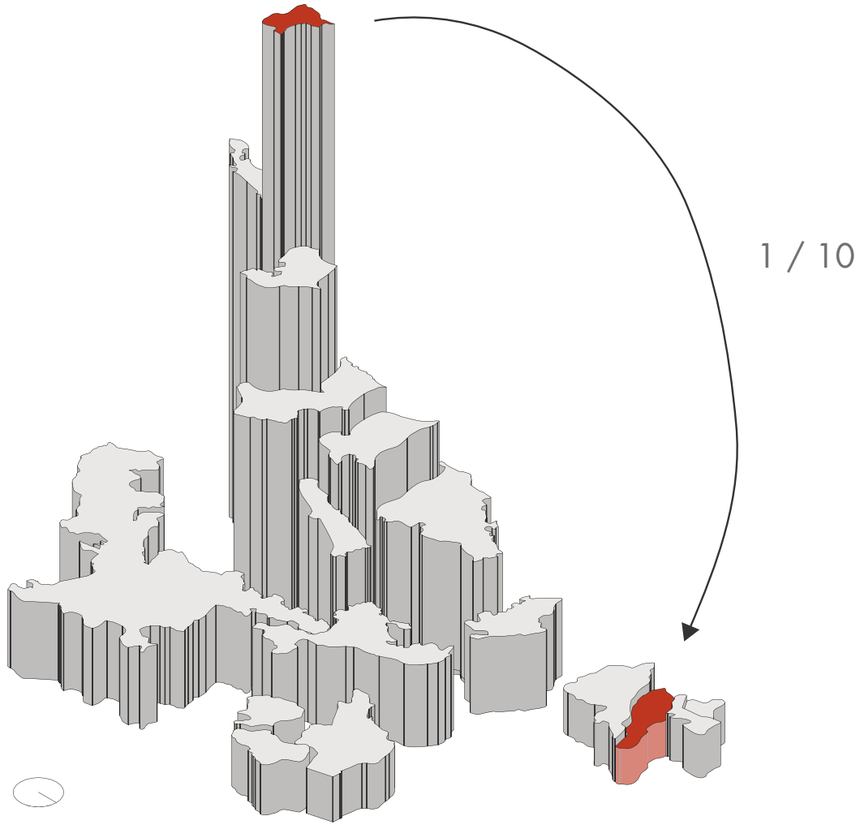
Urban Age India, The London School of Economics and Political Science, https://lsecities.net/publications/conference-newspapers/urban-india-understanding-the-maximum-city/

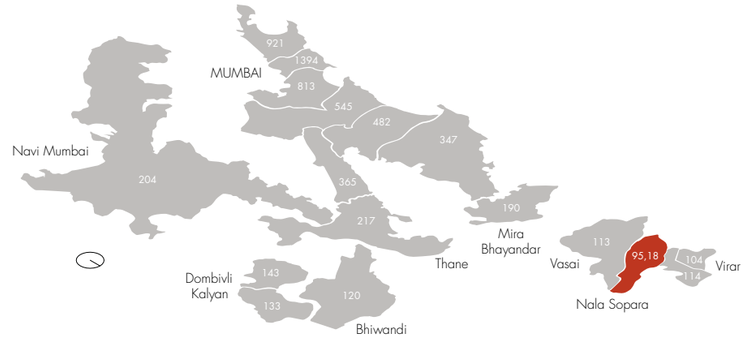
problem statement // urban growth in Mumbai



problem statement // **population densities**

Urban Age India, The London School of Economics and Political Science, https://lsecities.net/publications/conference-newspapers/urban-india-understanding-the-maximum-city/





problem statement // **rent prices**

Parekh , D. (2008) Report of the High Level Task Force
Aff ordable Housing for All. India:GOI.

2002

2005

problem statement // Growth Nala Sopara

problem statement // Growth Nala Sopara

2013

problem statement // Growth Nala Sopara

2017

problem statement // Growth Nala Sopara

problem statement // urban fabric of Nala Sopara

WEST EAST

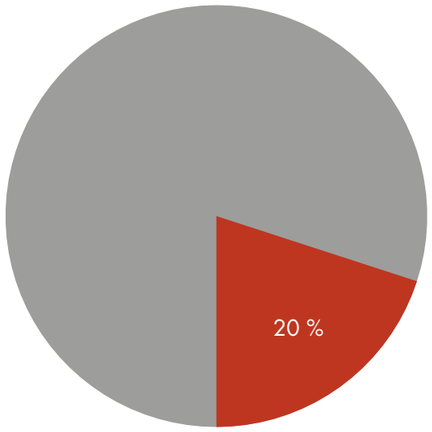
mhada development

appartment buildings

chawls and baithi chawls

chawls and baithi chawls

problem statement // urban fabric ofNala Sopara



part of population of Mumbai housed in chawls

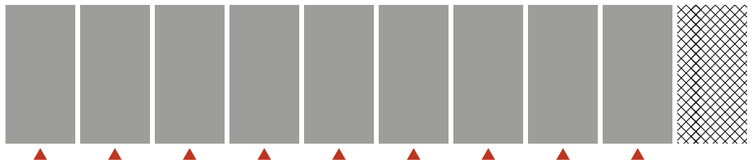
BDD chawl // Mumbai South

chawls // Nala Sopara

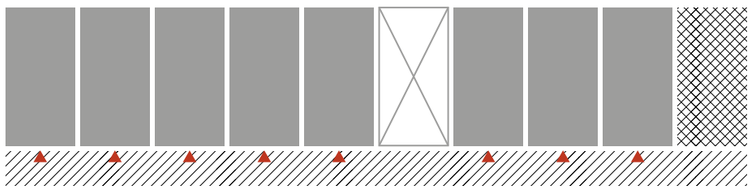
Swadesi Market// Mumbai

problem statement // **the chawl**

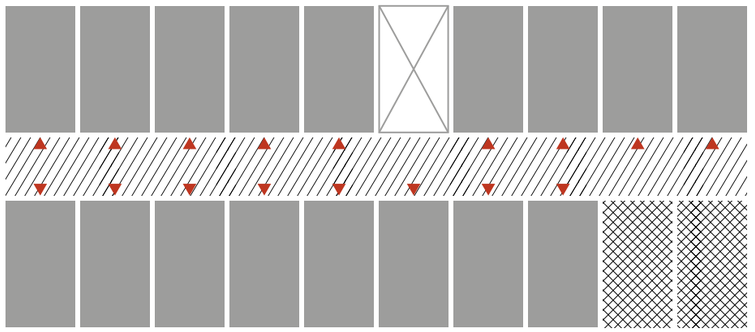
Manisch chalana. Slumdogs vs. Millionaires: Balancing Urban Informality and Global Modernity in Mumbai, India (Washington: Washington University, 2010)



one story building // alley



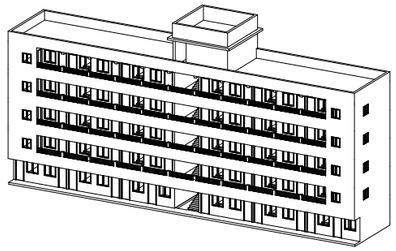
4/5 story building // gallery



4/5 story building // corridor

problem statement **// the chawl**

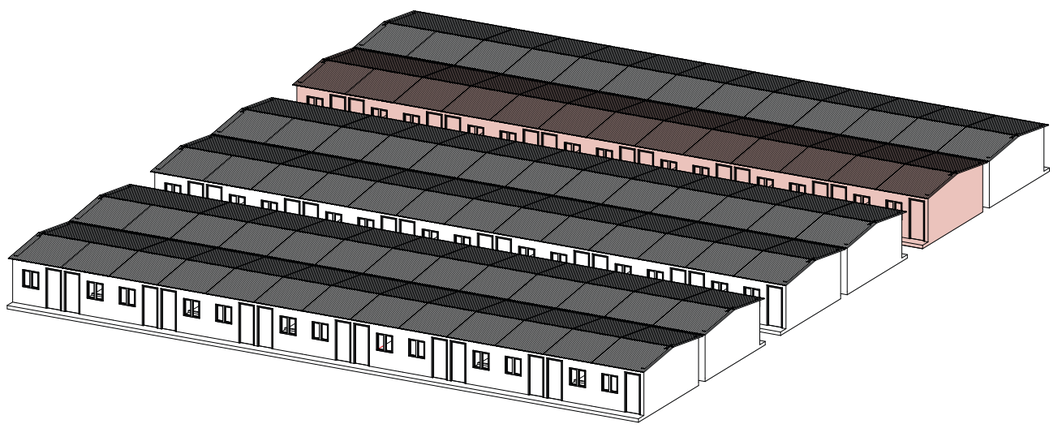
problem statement // the baithi chawl

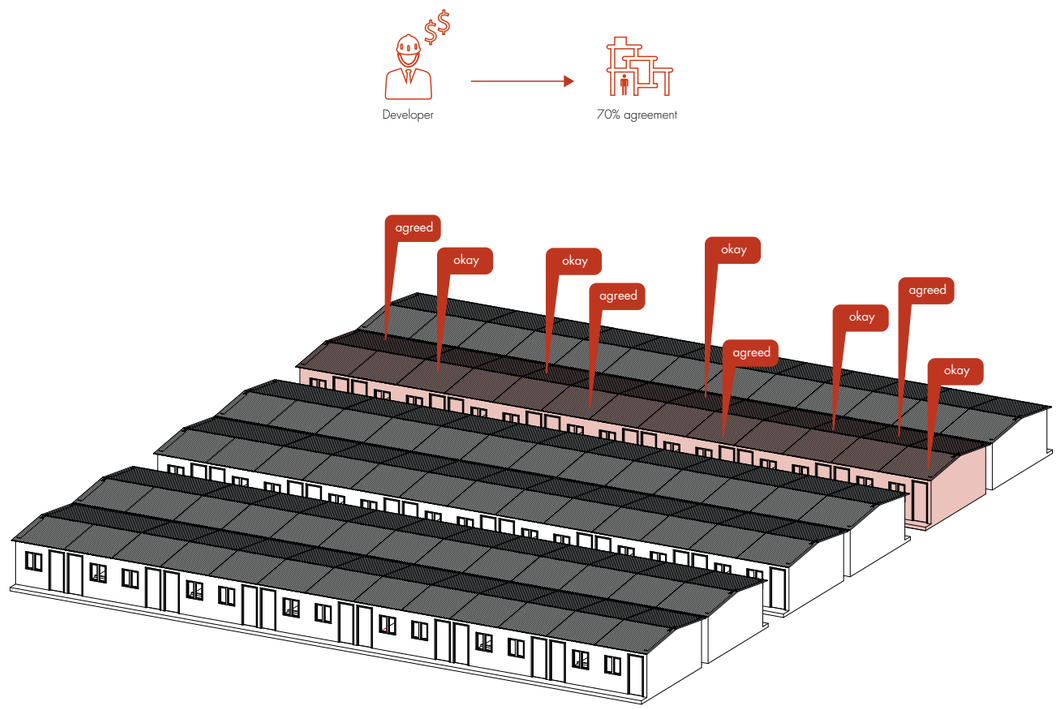


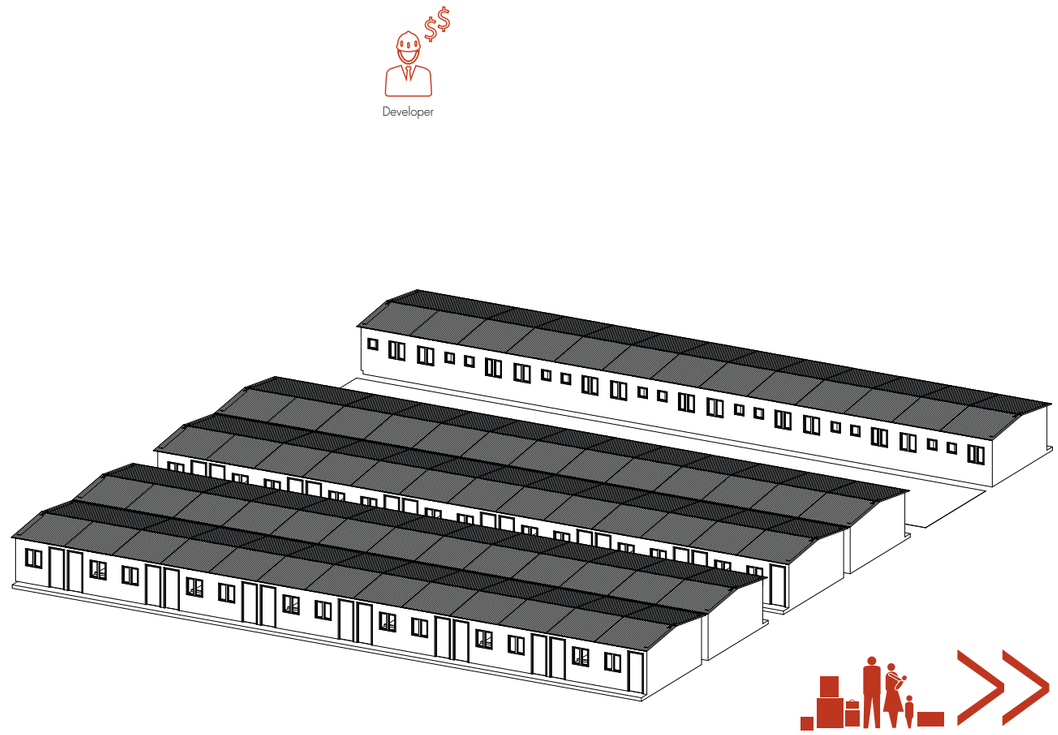
problem statement // **the chawl**

Developer

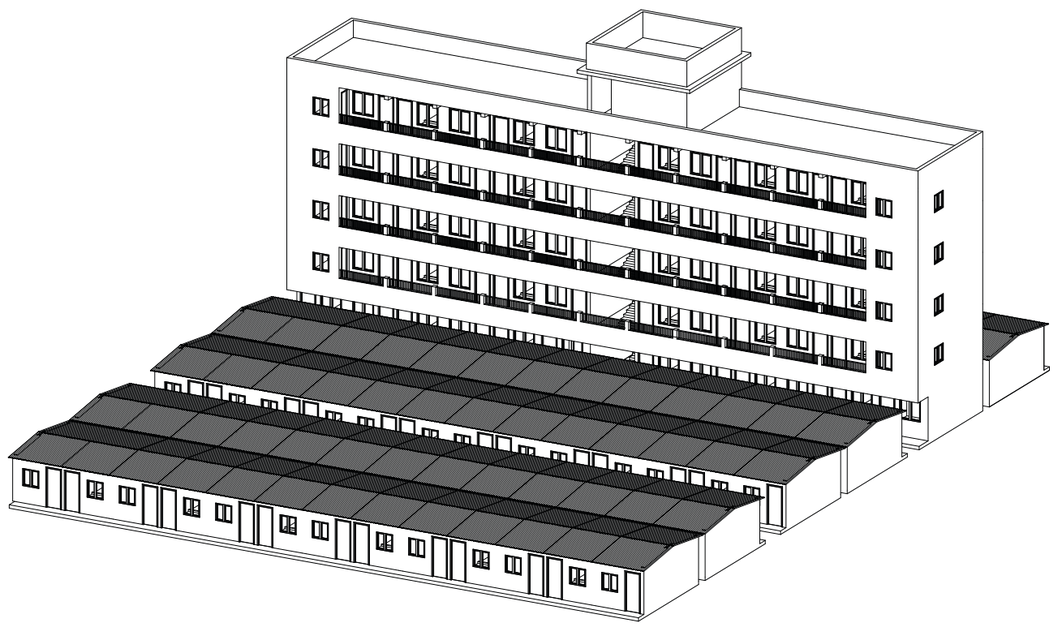
70% agreement

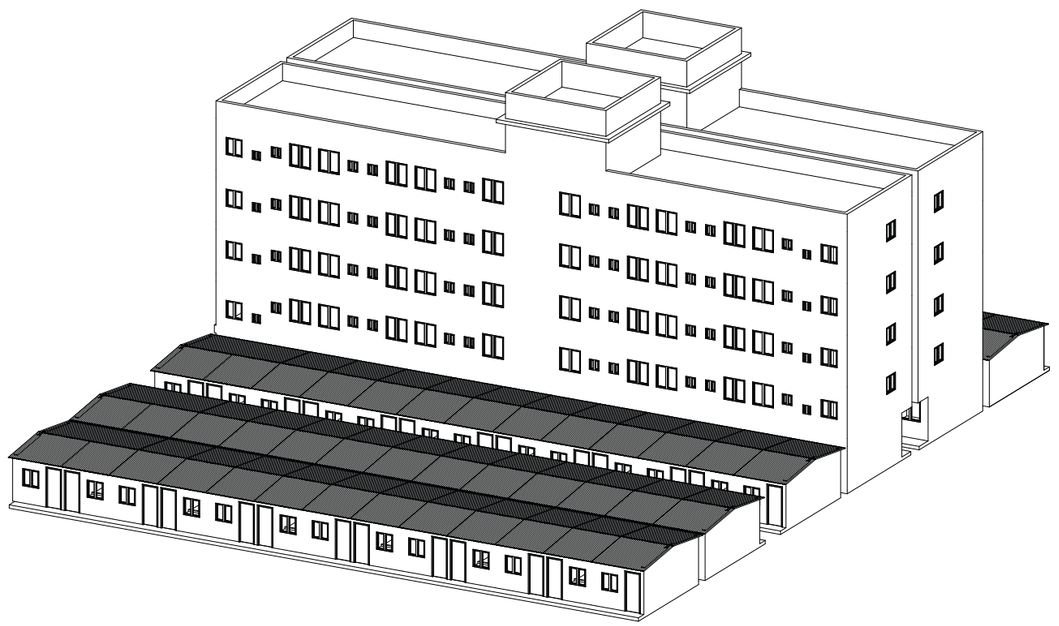


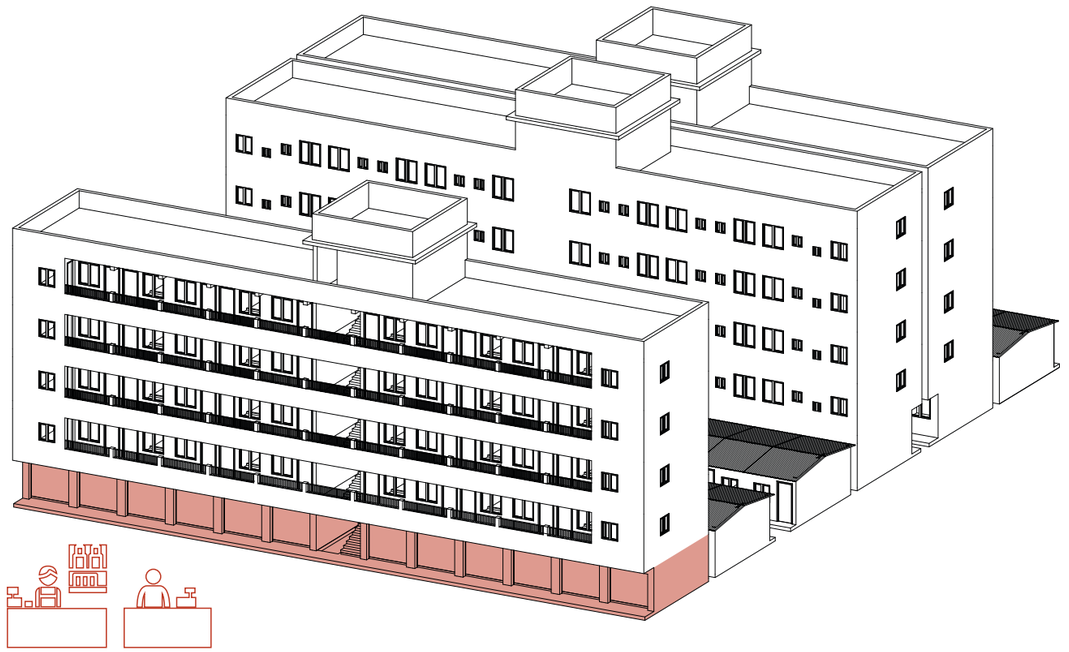

Developer
70% agreement
agreed
okay
okay
agreed
okay
agreed
okay
agreed
okay



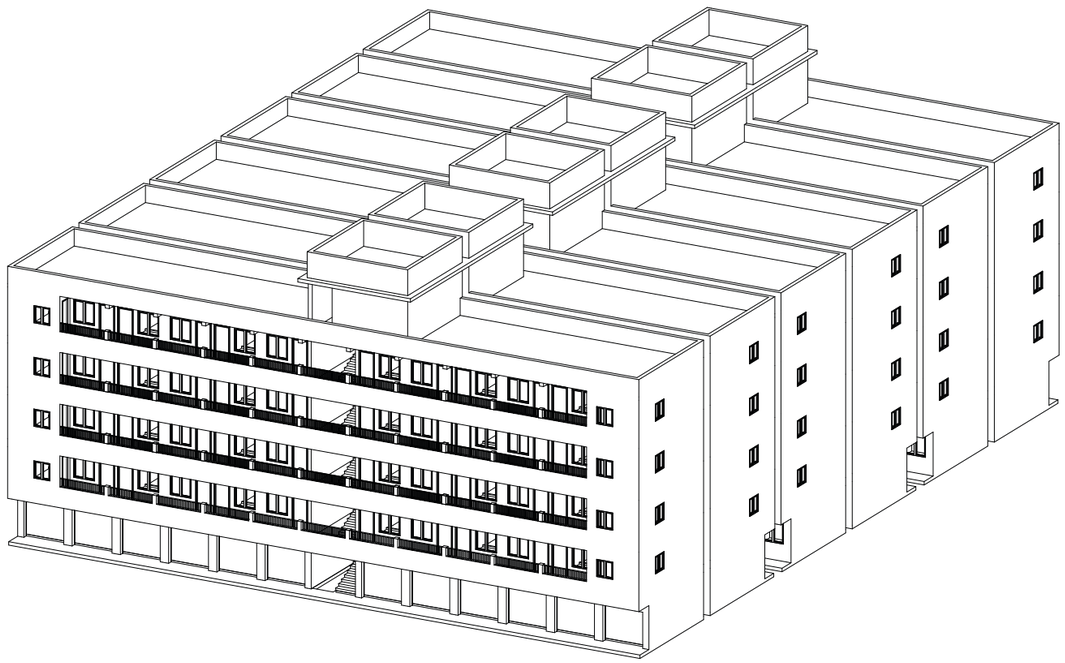
problem statement // current redevelopment strategy

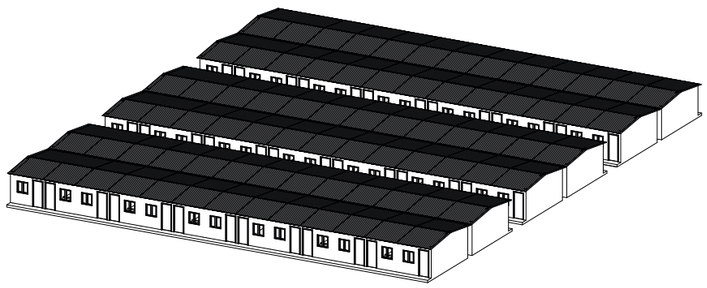


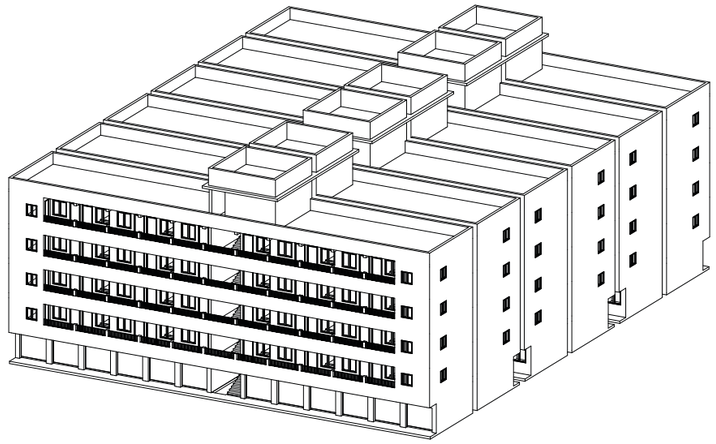




problem statement // current redevelopment strategy







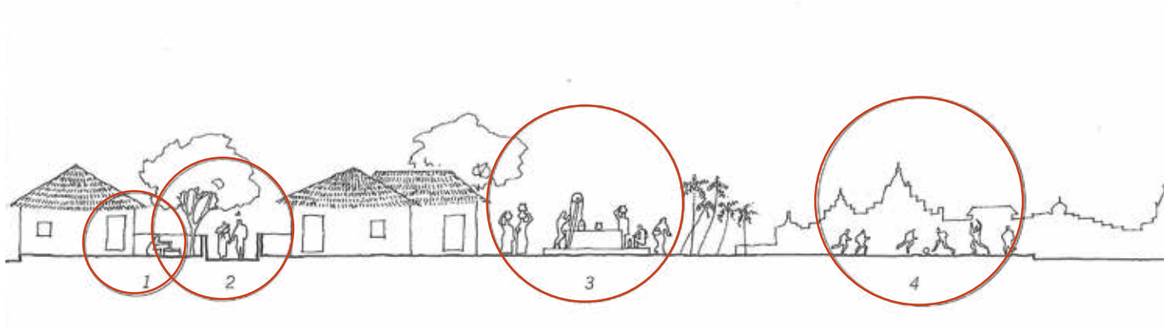
x4

But how about the open space?

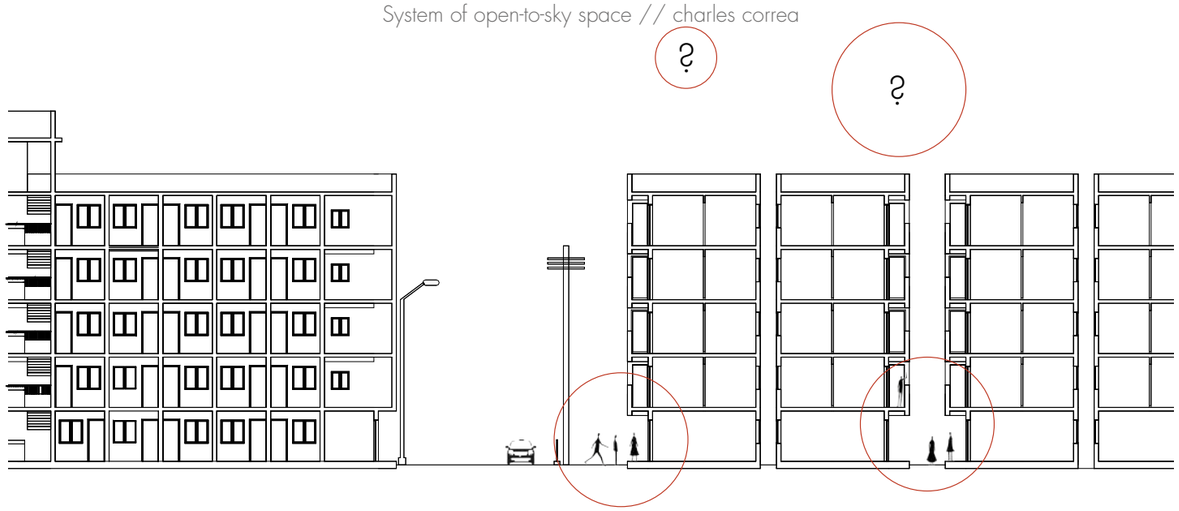
"Successful housing is a seamless continuum of spaces that goed all the way from the most private, to the semi-privat to the public. in this way it create communities"

Charles Correa
(DASH #12-13, 96)

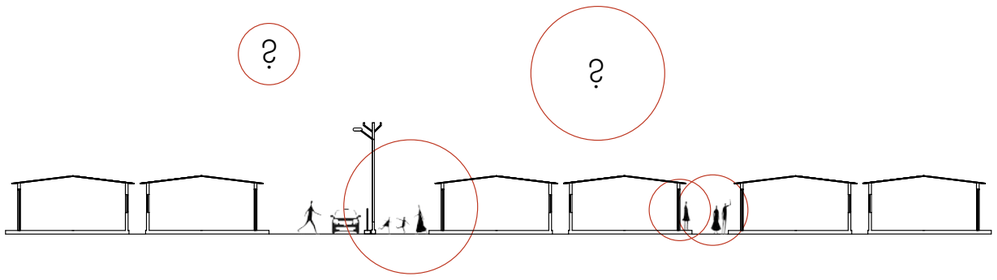
Kuitenbrouwer, Paul, and Dick Van Gameren. 2015. DASH Global housing: affordable dwellings for growing cities. Rotterdam. Vol. 12-13. Rotterdam: Ai010 Uitgevers/Publishers, 96



System of open-to-sky space // charles correa



Chawls

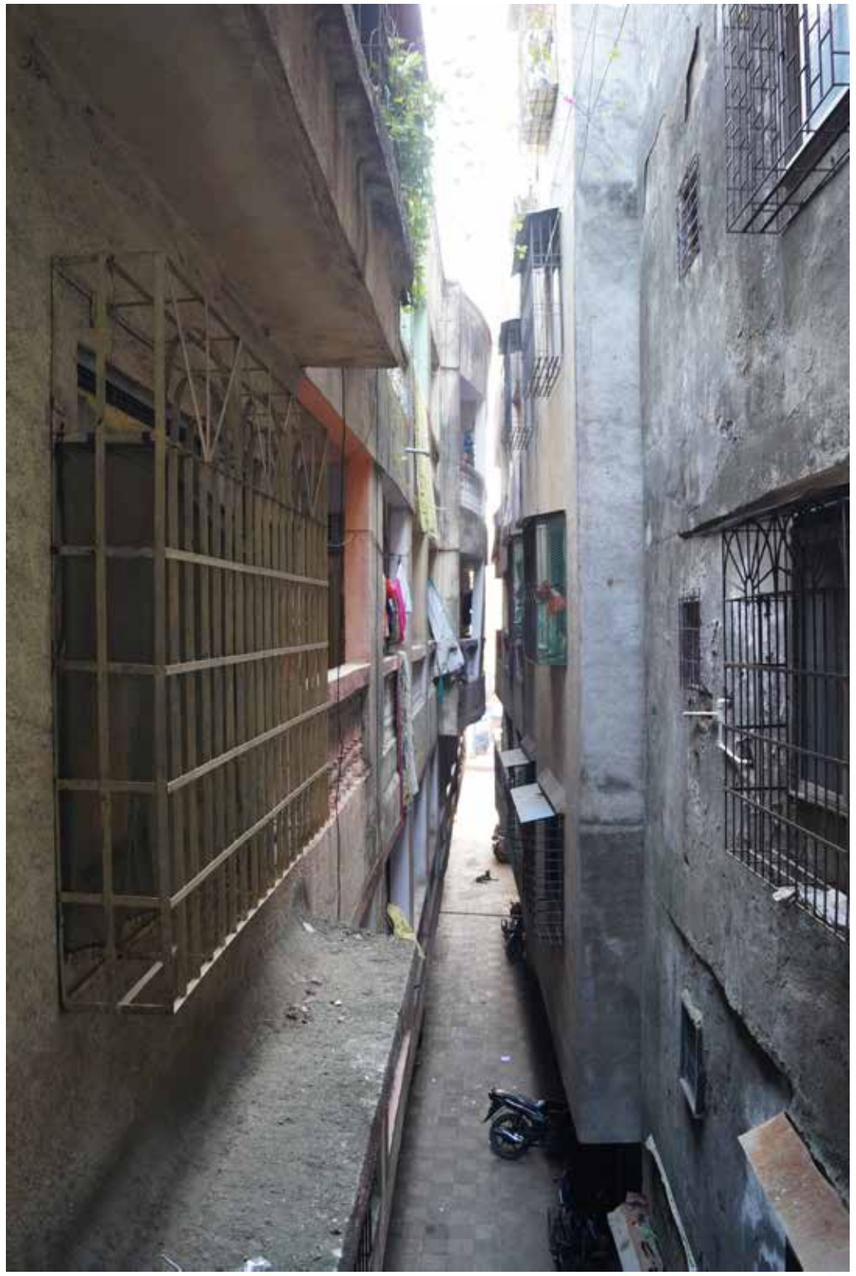


Baithi Chawls

1.Terraces 2. front doorstep 3. water tap 4. open space for the community

problem statement // **open-to-sky space**

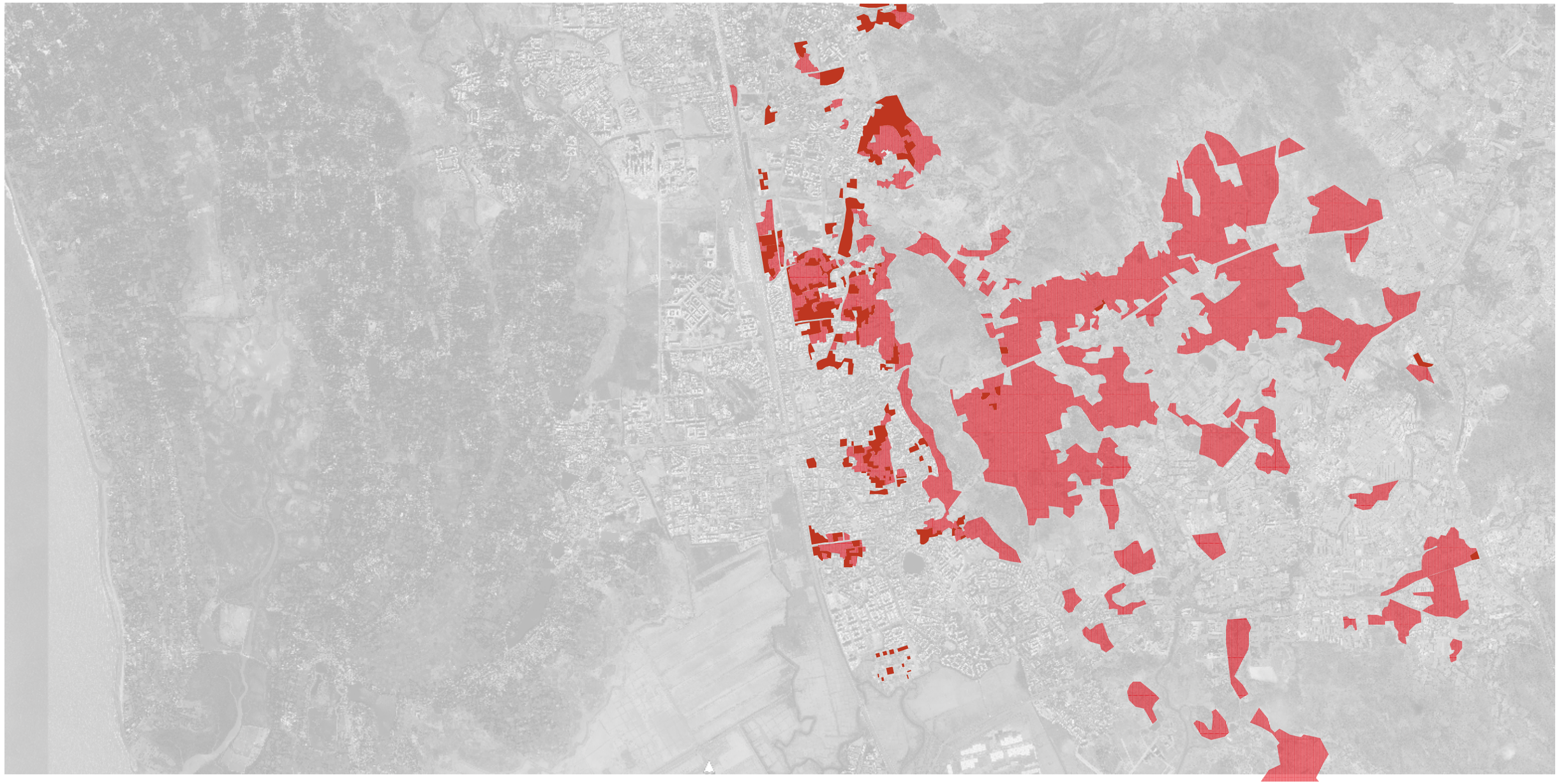
Correa, Charles. 1999. Housing & urbanisation.
Bombay: Urban Design Research Institute



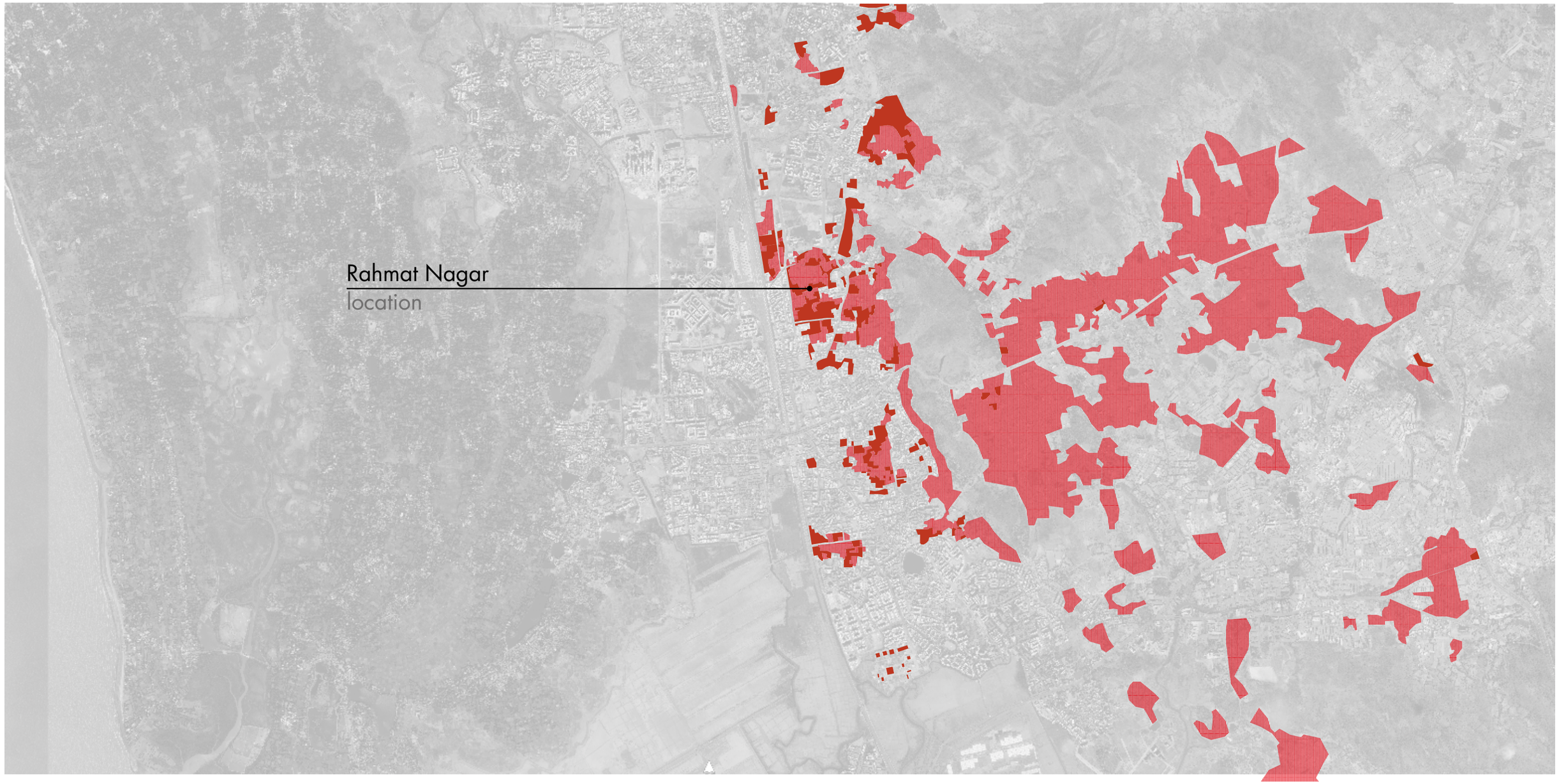
problem statement // **densification**

problem statement // lack of daylight

problem statement // **neglected spaces**



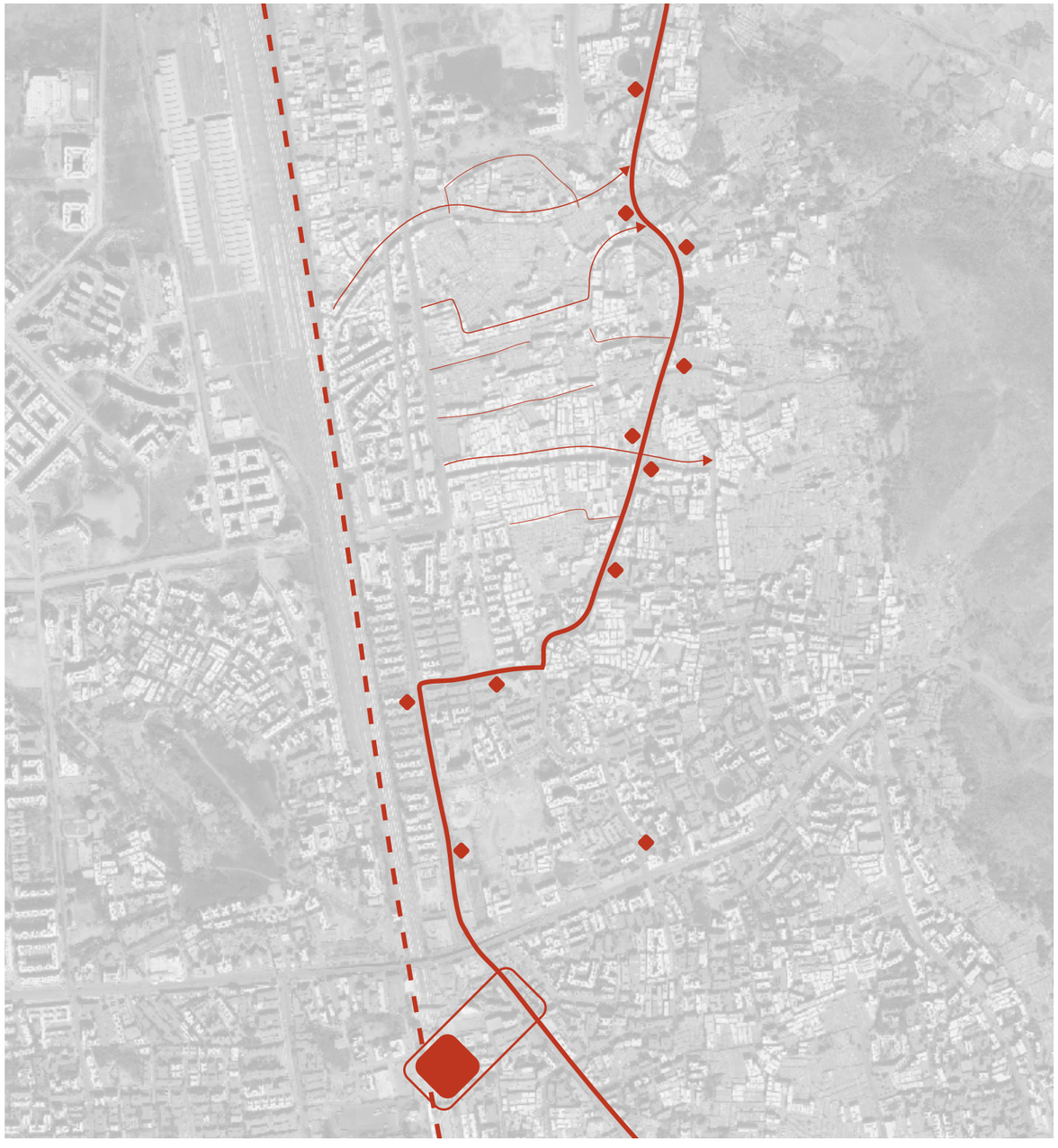
problem statement // **monotonous areas**


Rahmat Nagar
location

How can the crammed (baithi)chawls, of the Rahmat Nagar area, be re-interpreted into a mixed-use area that leaves space for inclusive communities, able to set a feasible alternative for the current chawl redevelopment?

How can the crammed (baithi)chawls, of the Rahmat Nagar area, be re-interpreted into a mixed-use area that leaves space for inclusive communities, able to set a feasible alternative for the current chawl redevelopment?

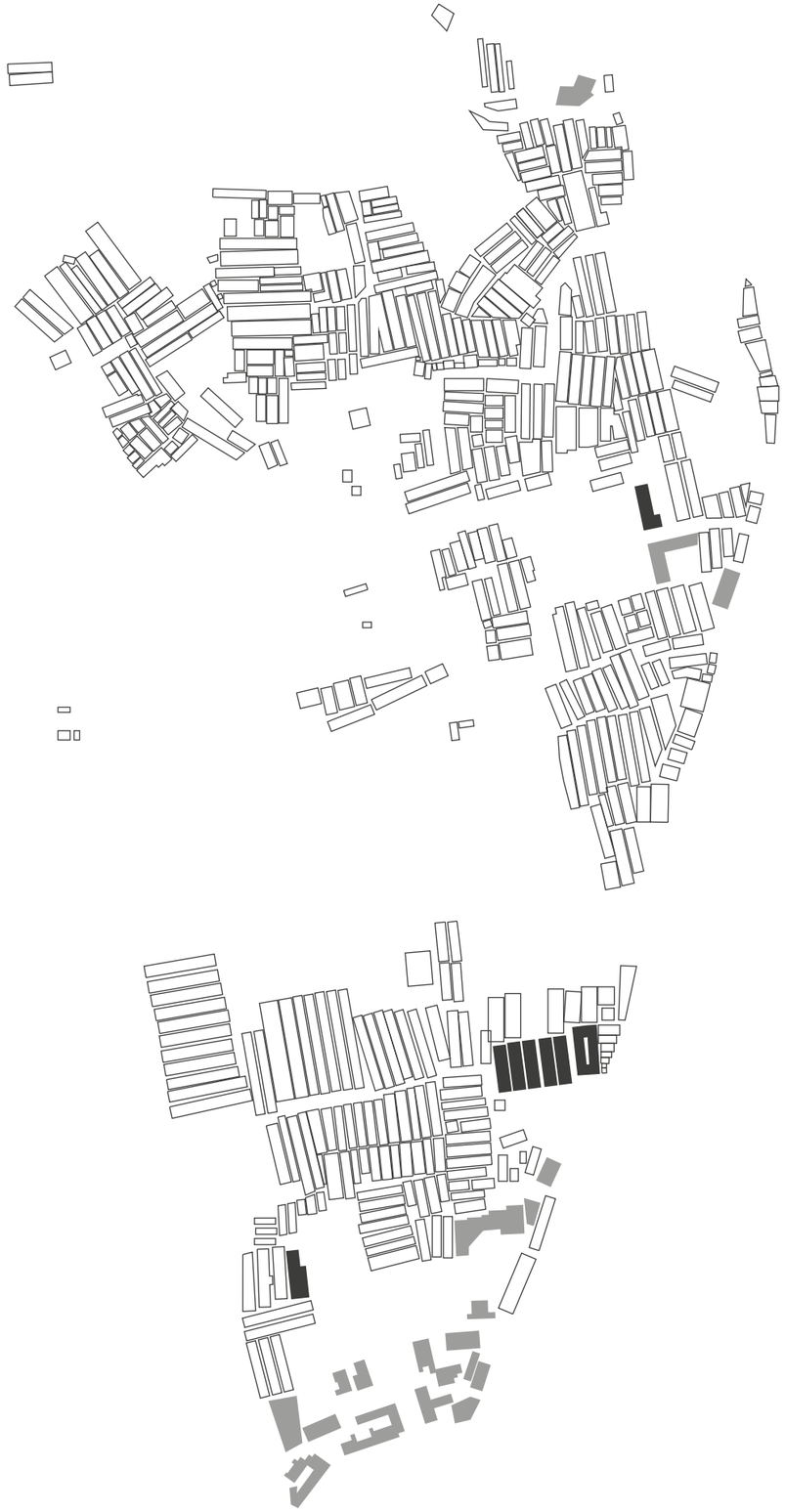
How can architecture provide for inclusive communities?



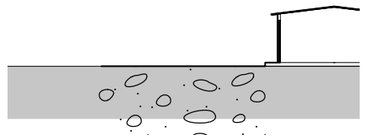
research // location

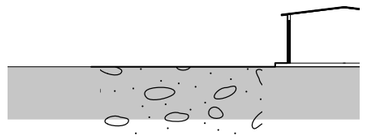
Built

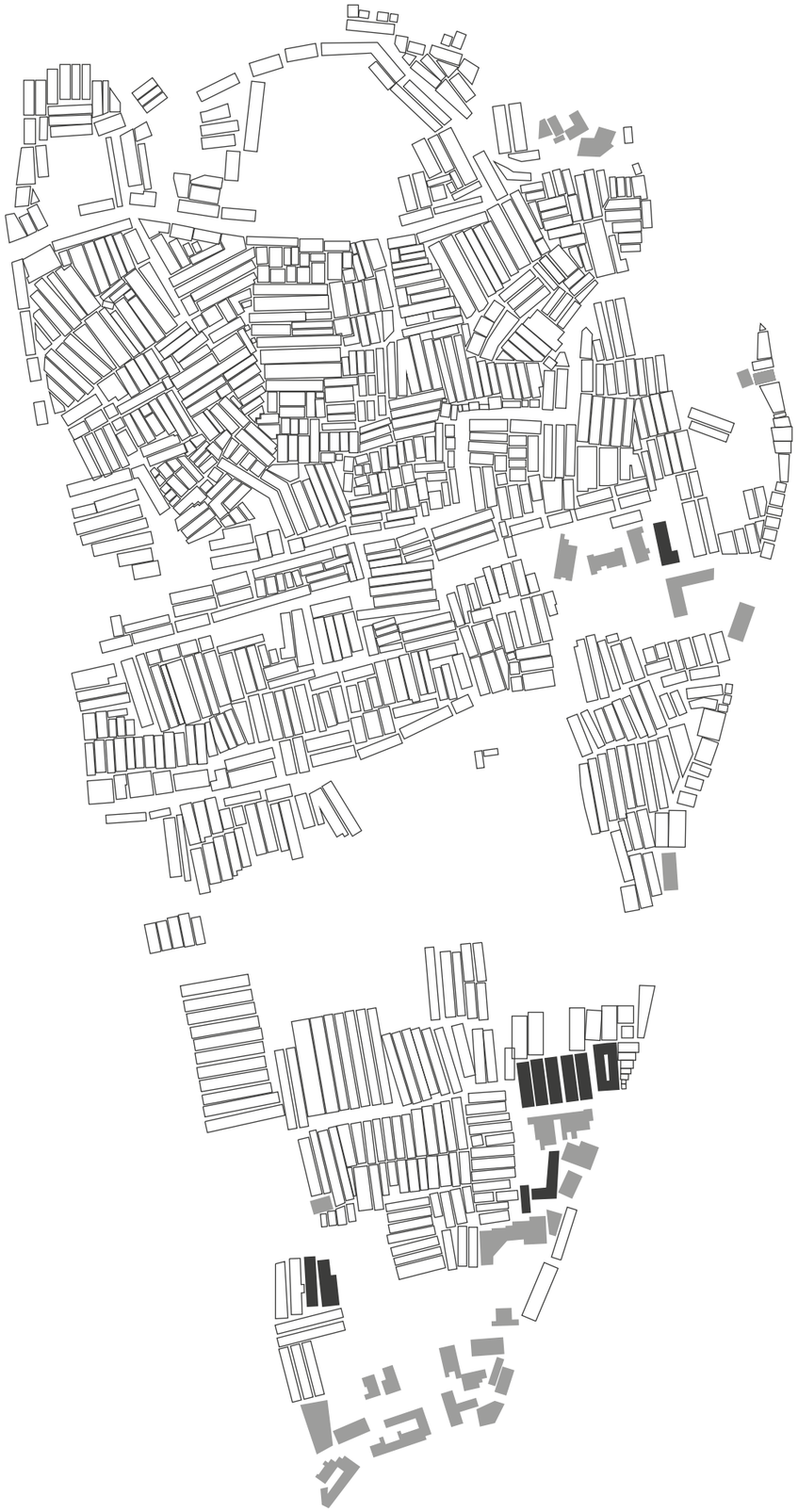
Unbuilt

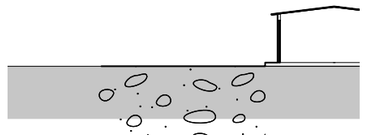


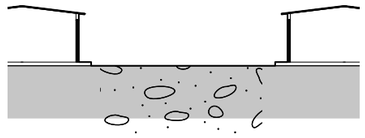
2002





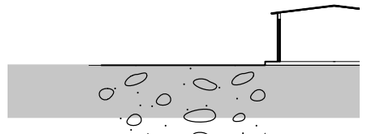


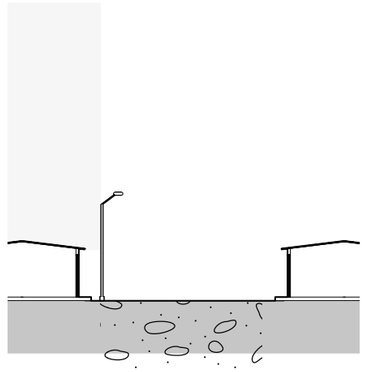


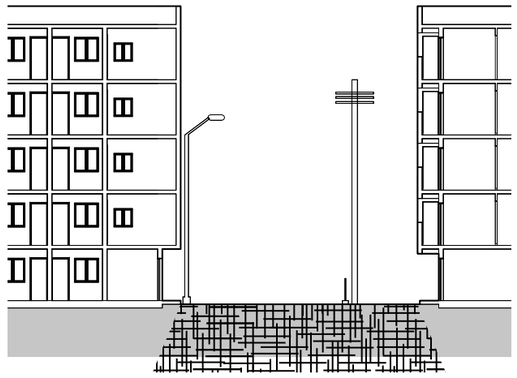


2006

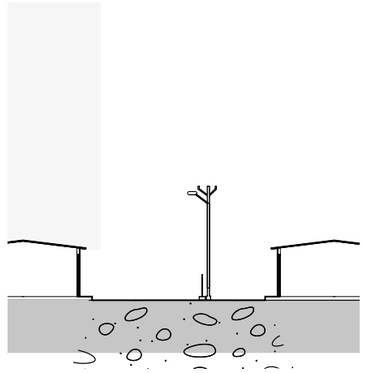
research // history

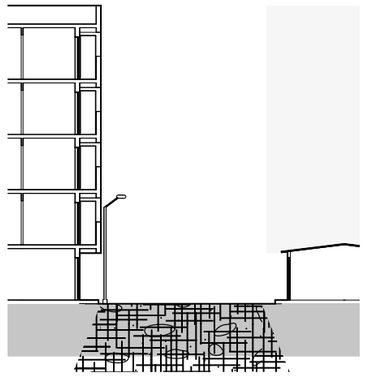


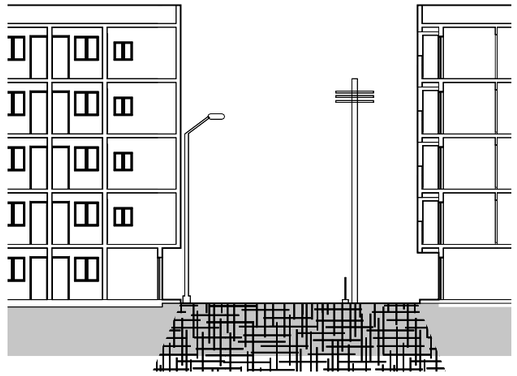




2009

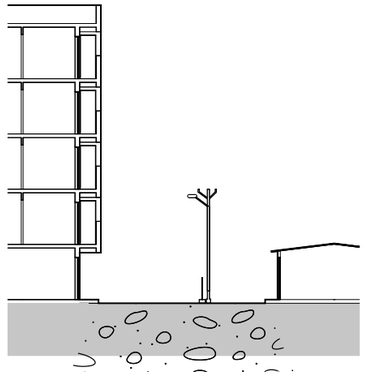


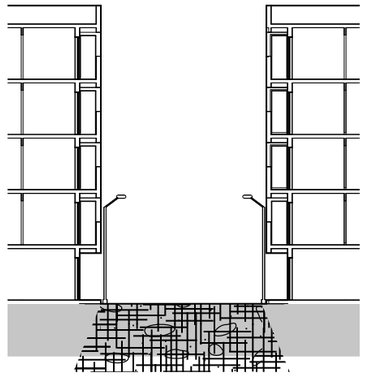


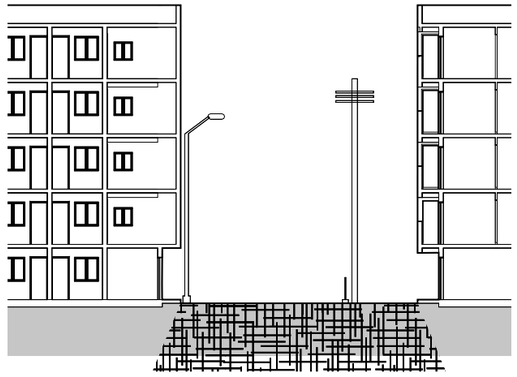


2012

research // history

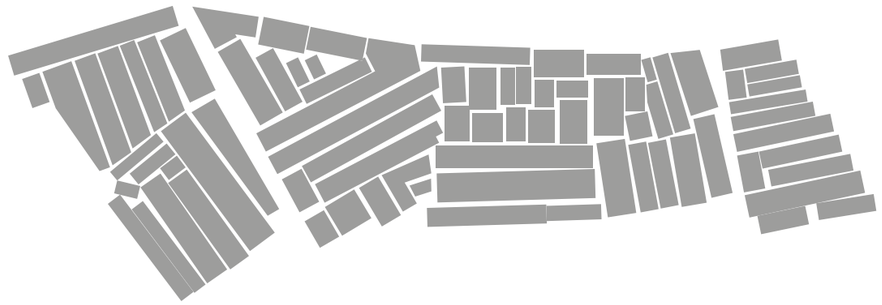




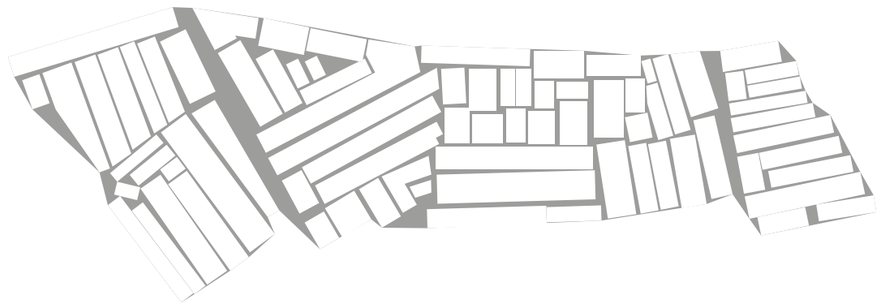


high rise

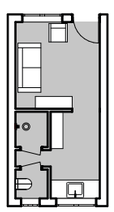
density clusters



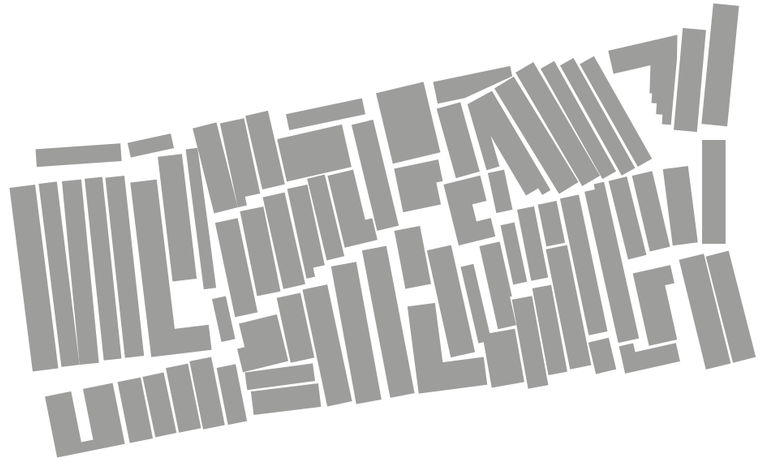
FSI = 0,75



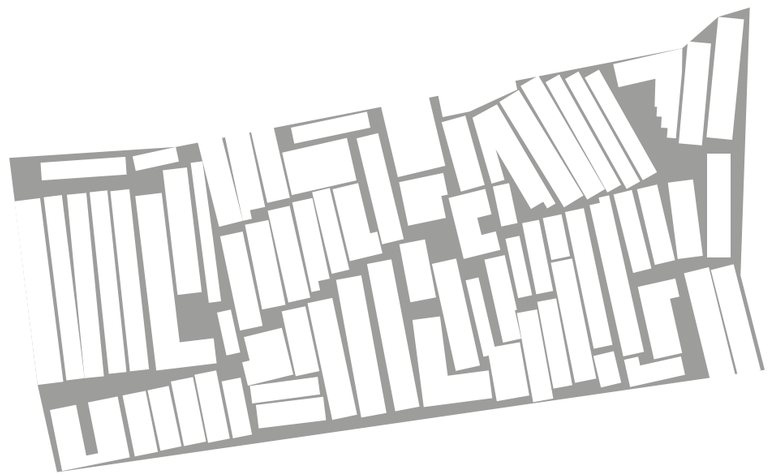
open space index = 0,2

typical floorplan	residents per dwellling	m^2 dwelling per person	units per hectare	people per hectare	m^2 open space per person
					
15,8 m^2	4	3,95 m^2	325	1300	3,0 m^2

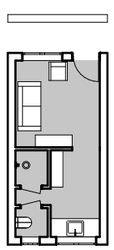
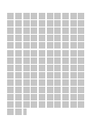
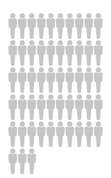
research // desity baithi chawls



FSI = 3

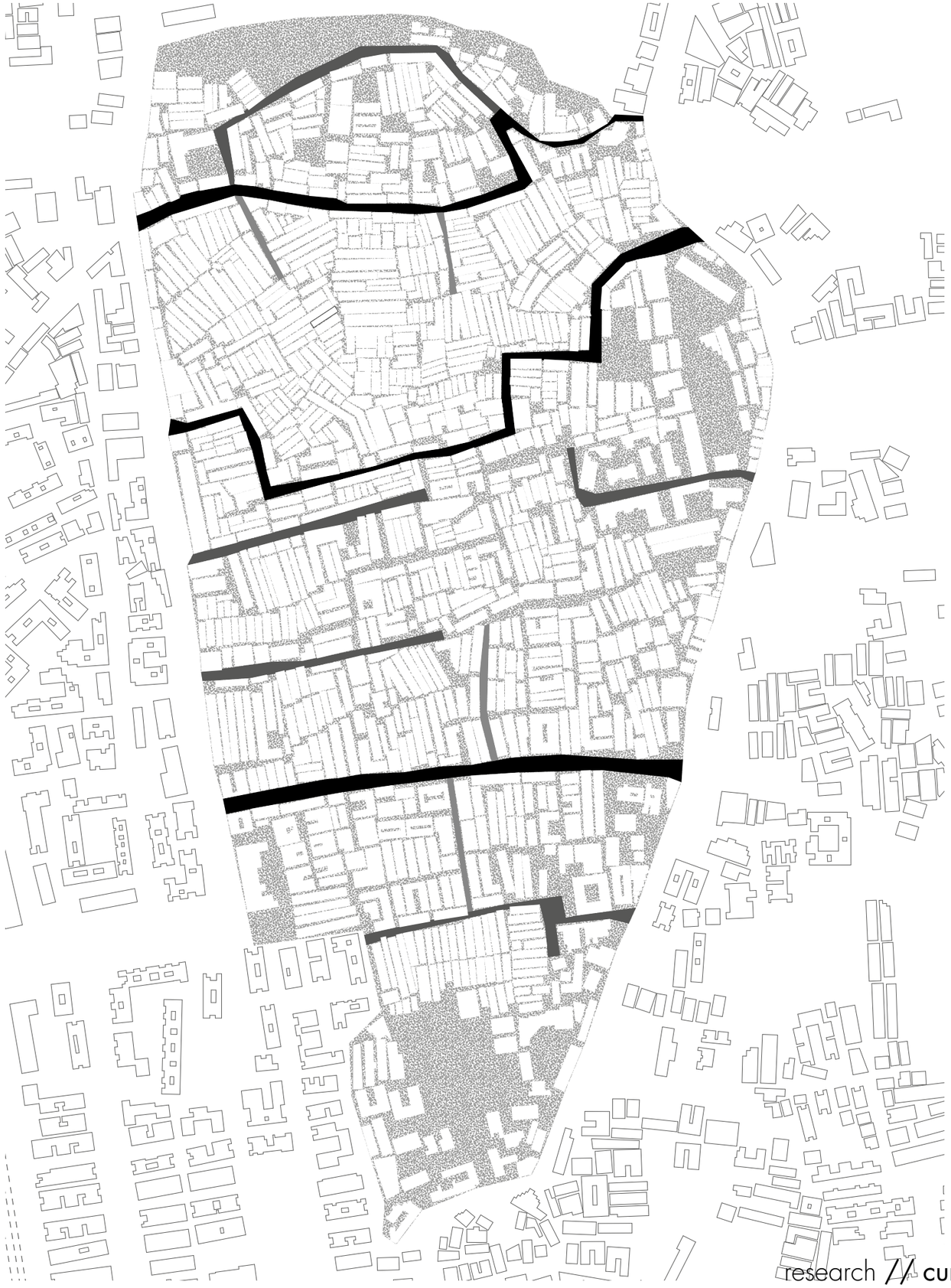


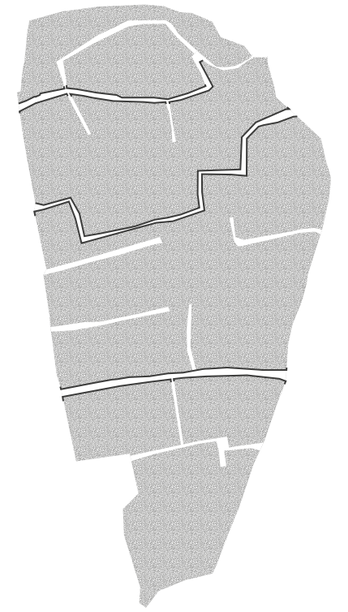
open space index = 0,3

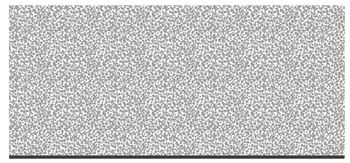
typical floorplan	residents per dwellling	m^2 dwelling per person	units per hectare	people per hectare	m^2 open space per person
					
15,8 m^2	4	3,95 m^2	1325	5300	0,57 m^2

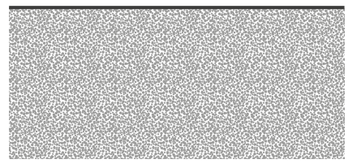
research // desity chawls

URBAN STRATEGY

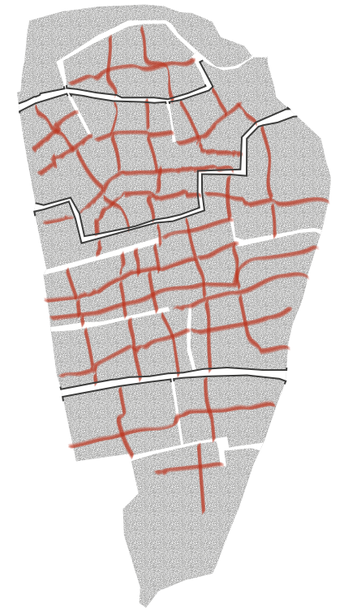


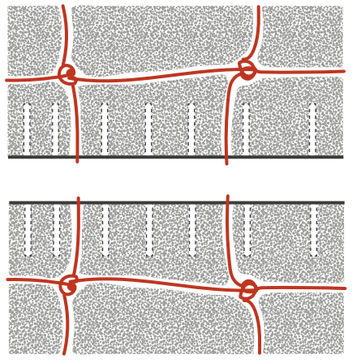




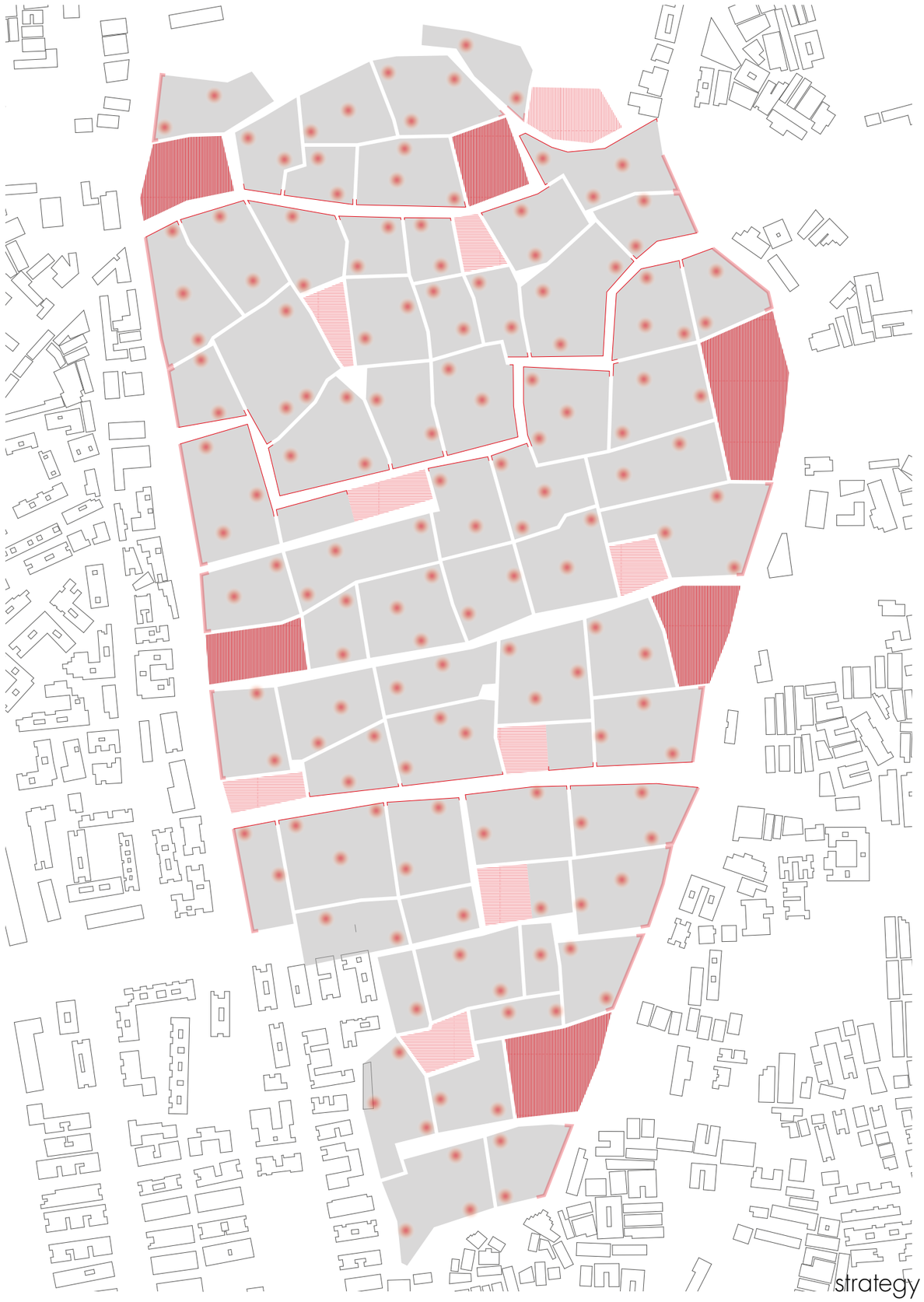


research // current situation





strategy // the community spine



integration of ameneties

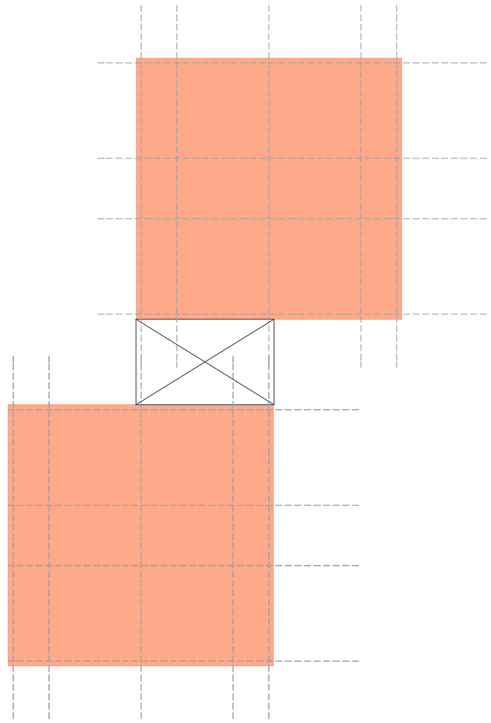
bigger amenity cluster

preserving of commercial plinth

creating secundairy connections

strategy // key points

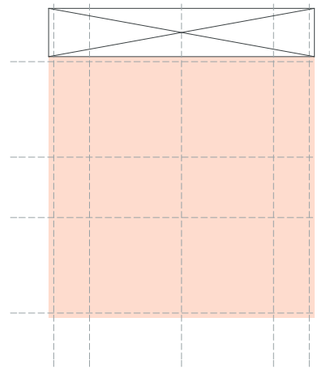
DESIGN



CLUSTER

48 units

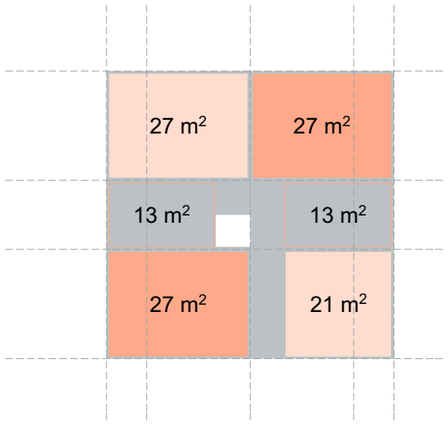
150m2 amenities

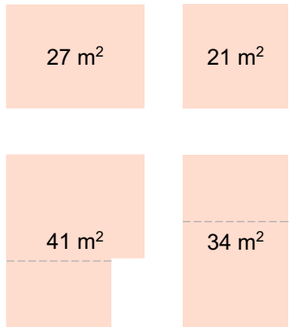


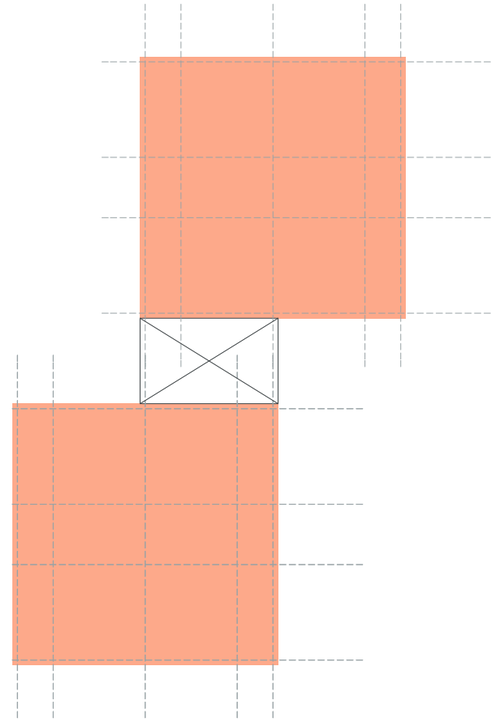
SEPARATE

12 maisonette units

Design // building types





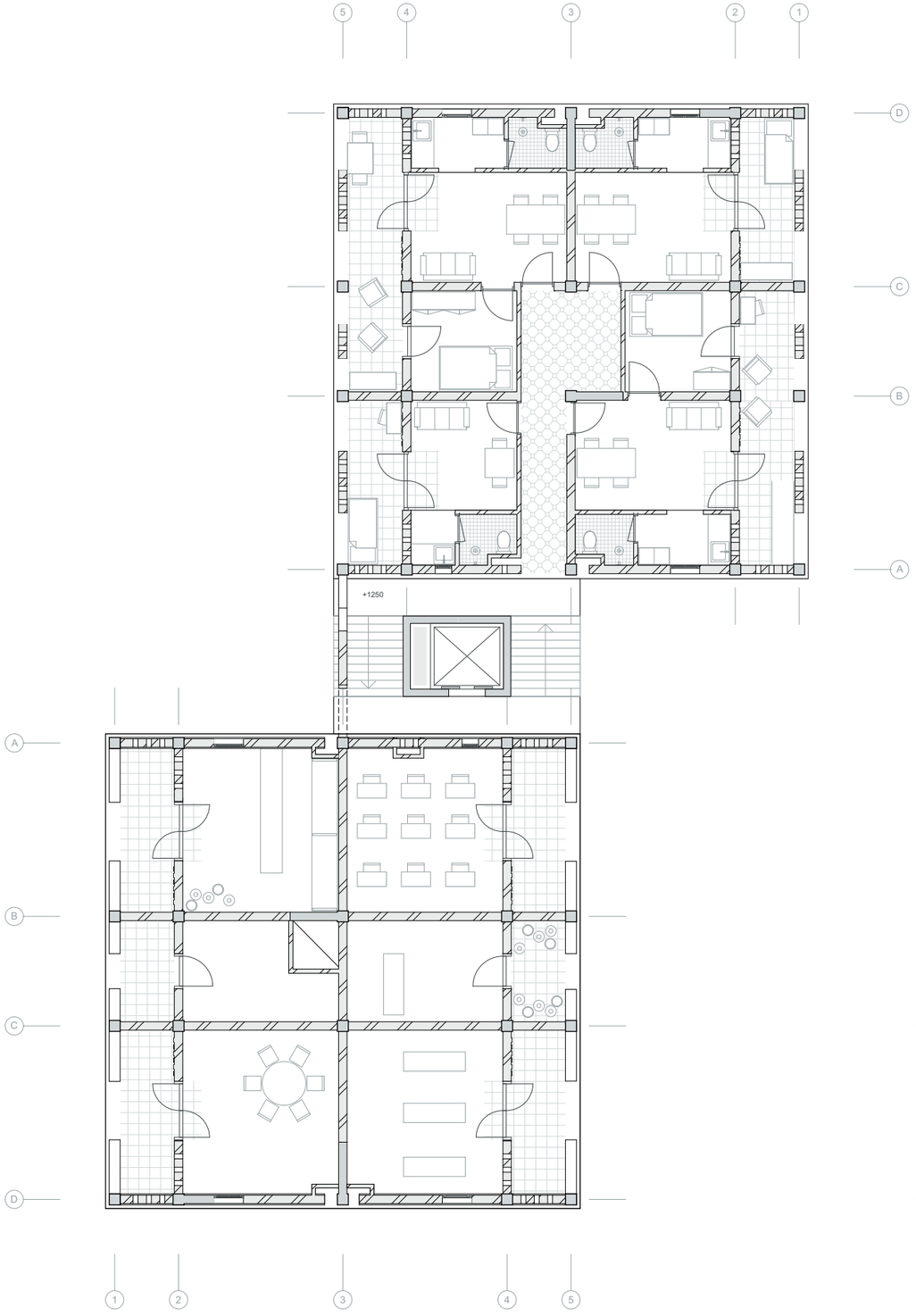


CLUSTER

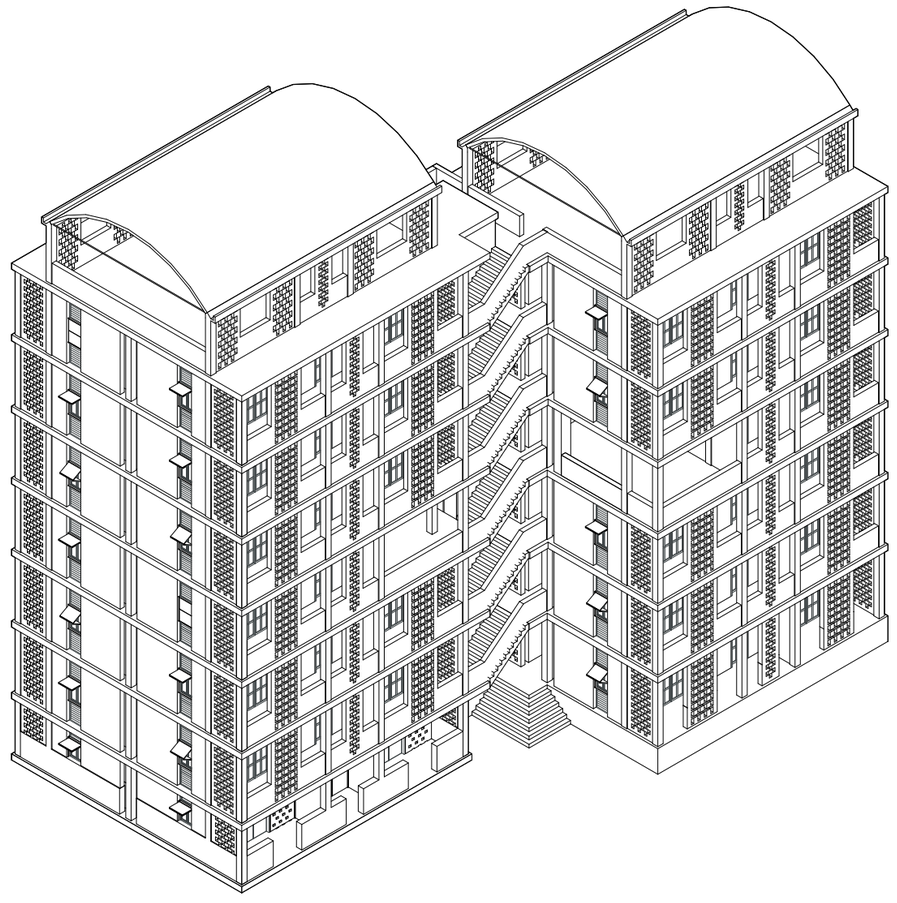
48 units

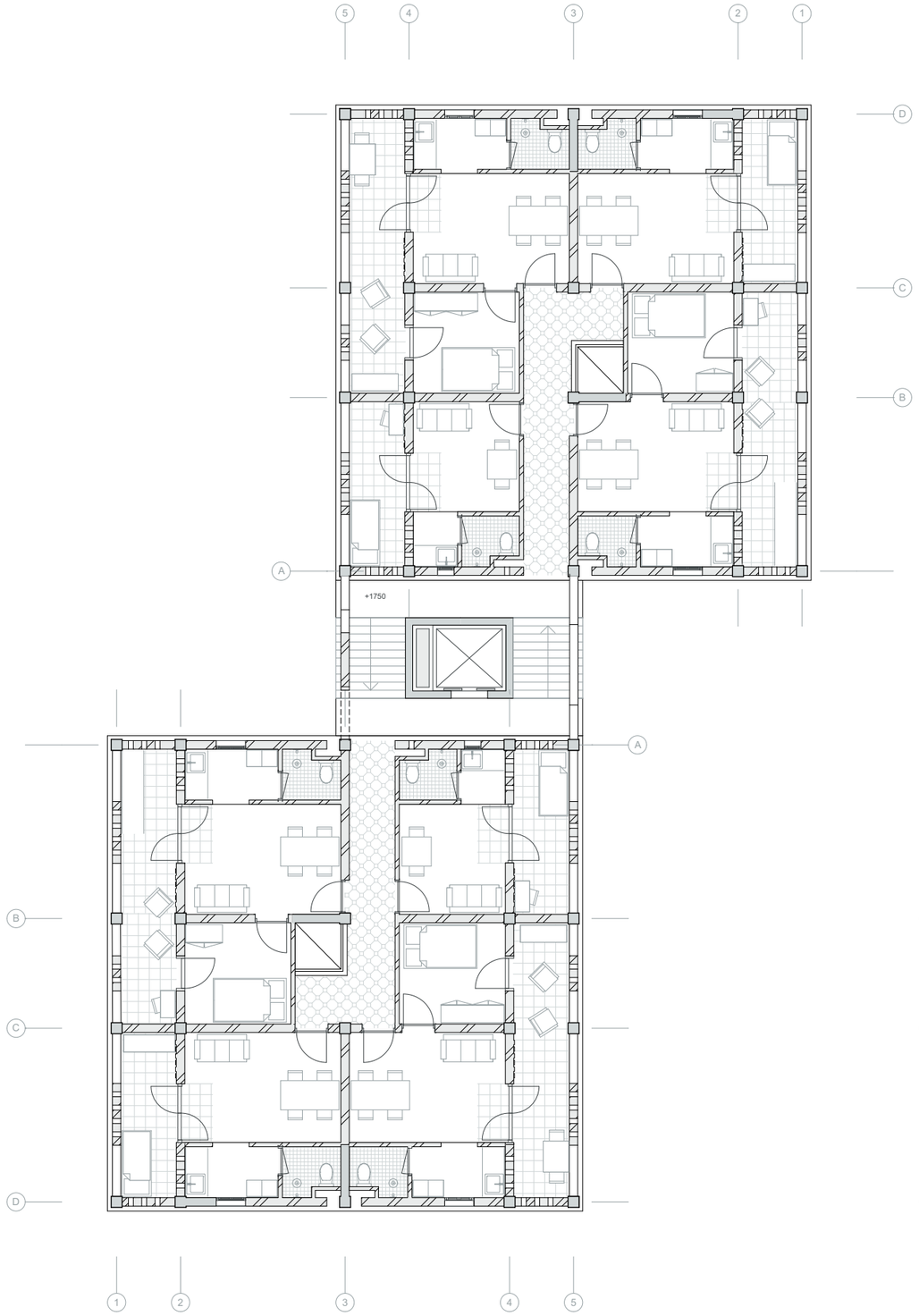
150m2 amenities

Design // **cluster**

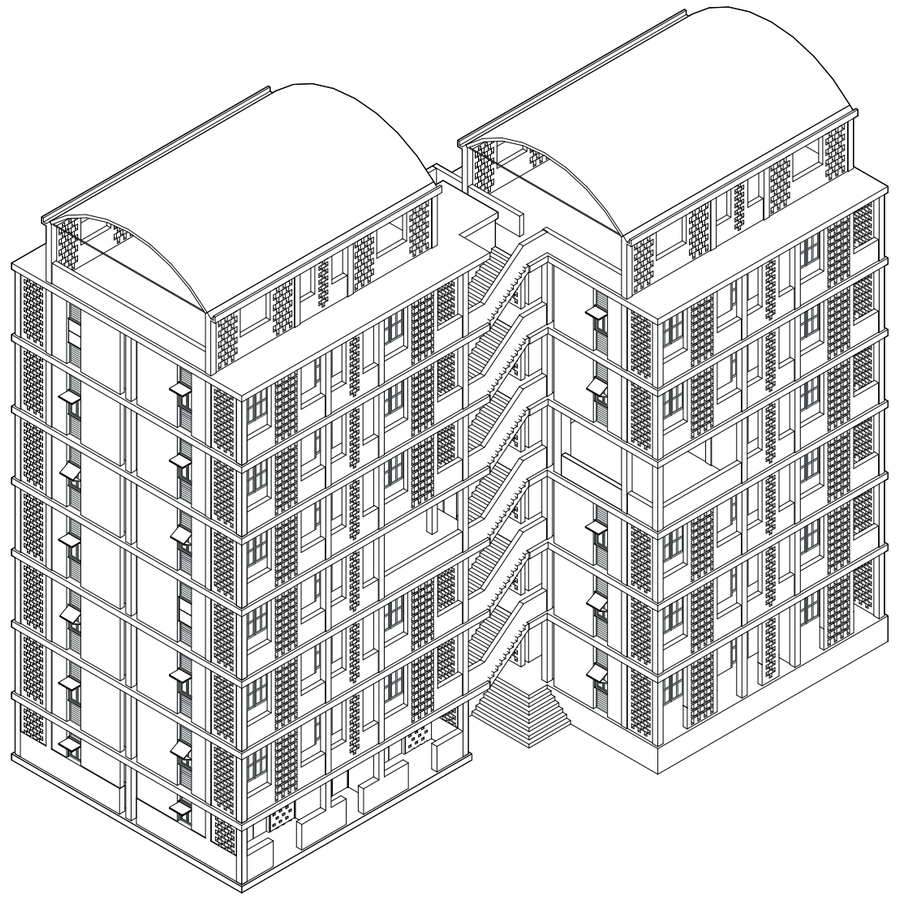


GROUND FLOOR
1:150

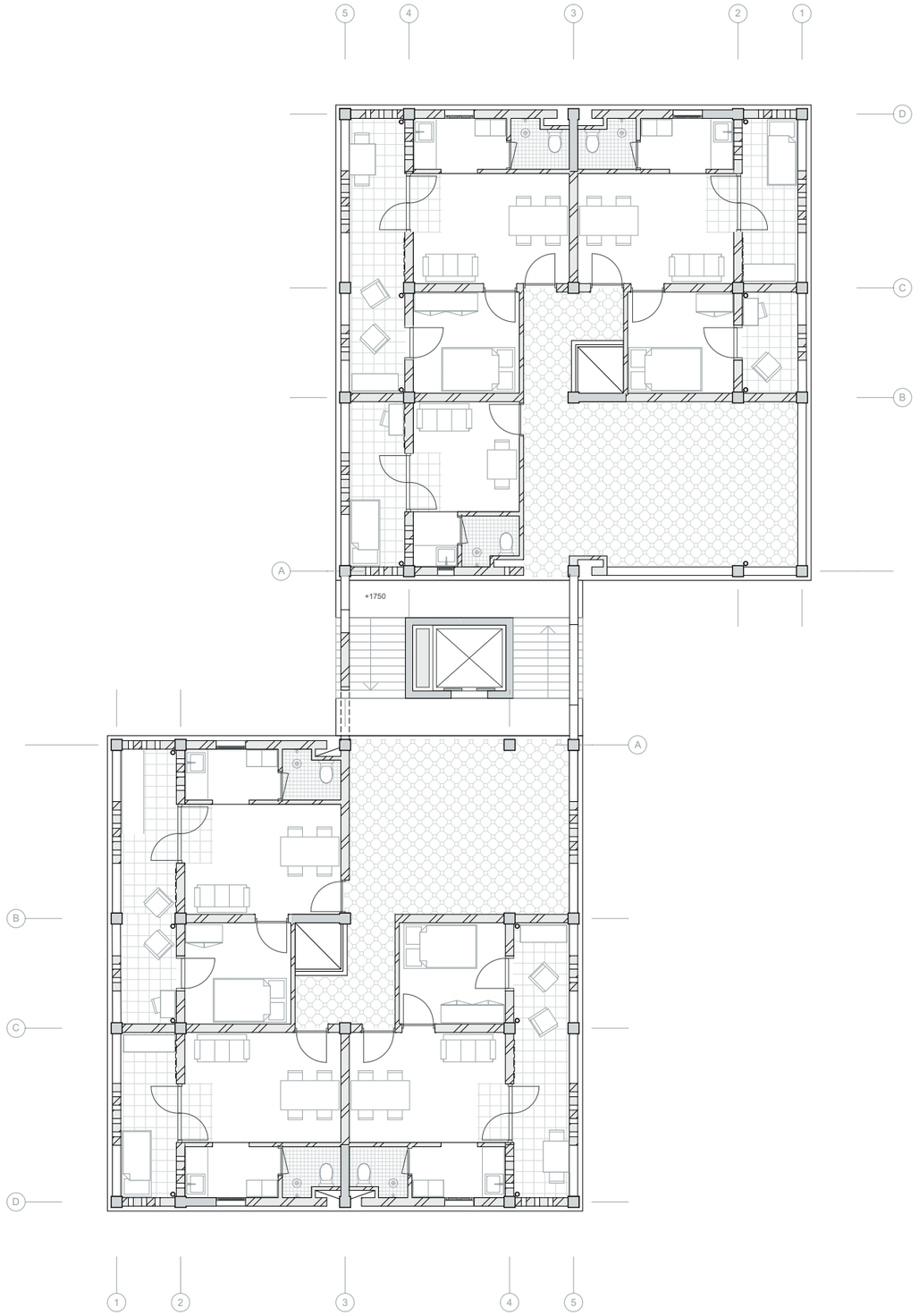




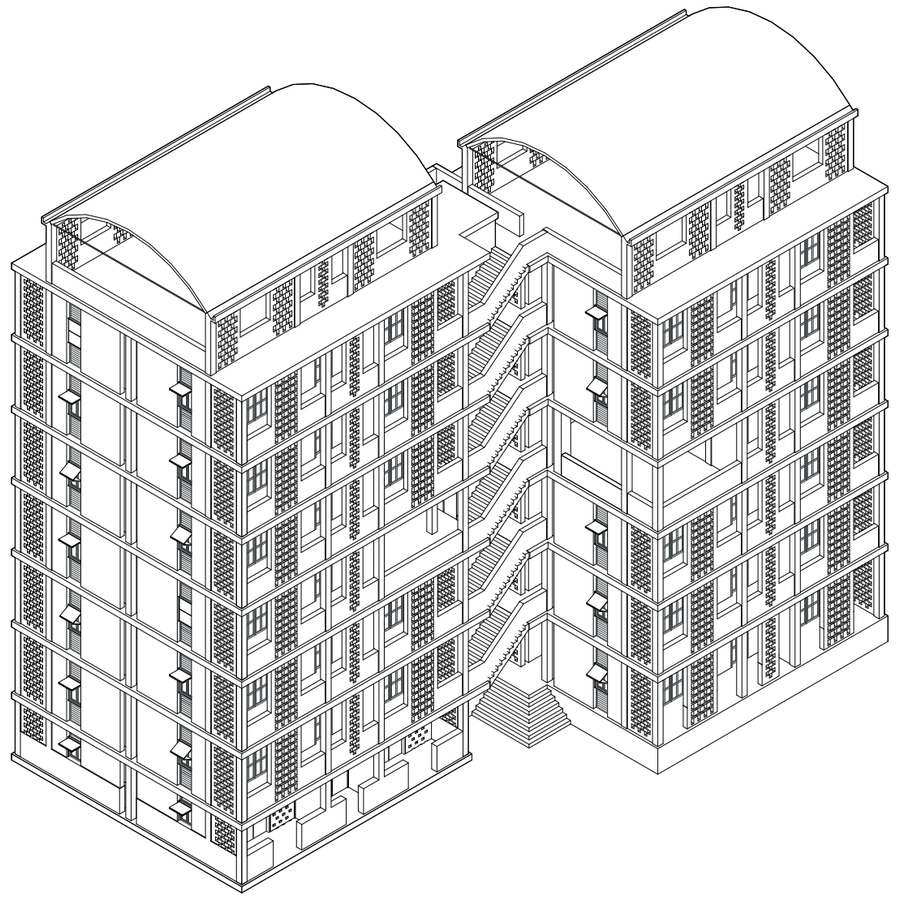
AVERAGE FLOOR
1.150



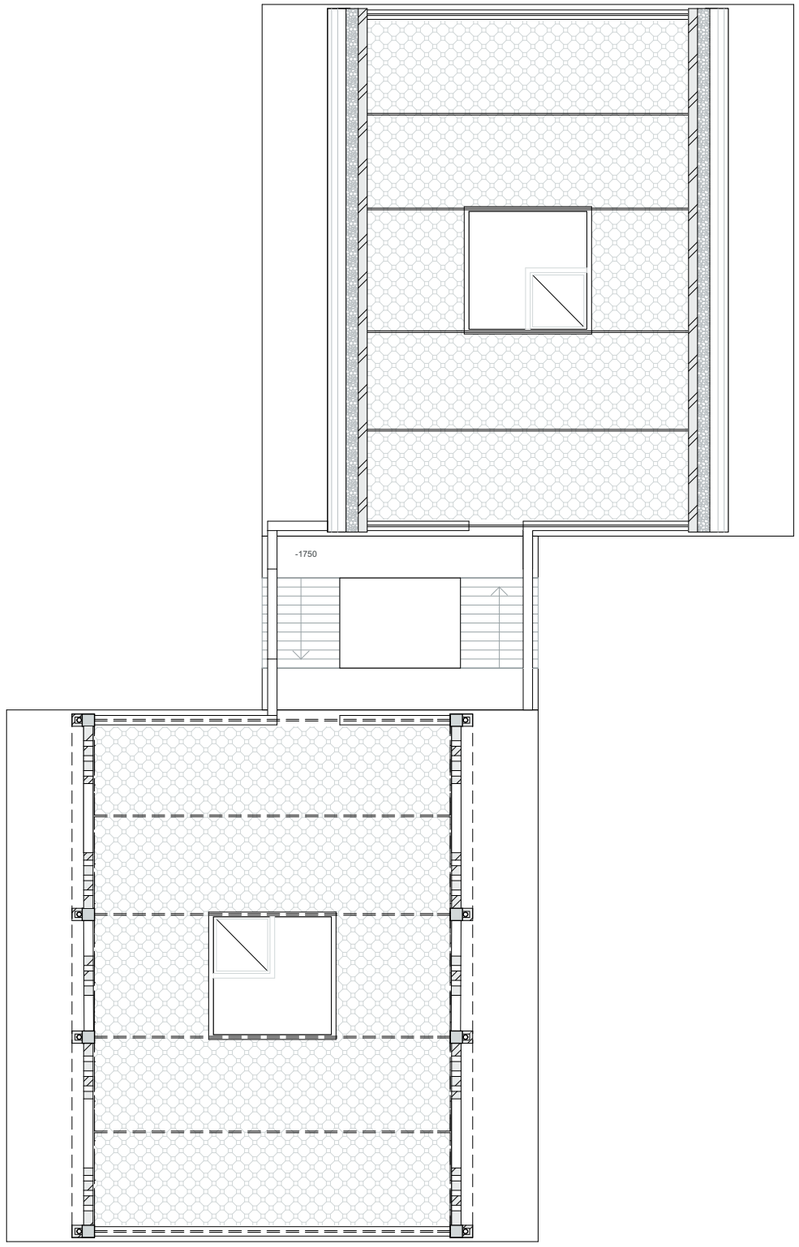
Design // **cluster**



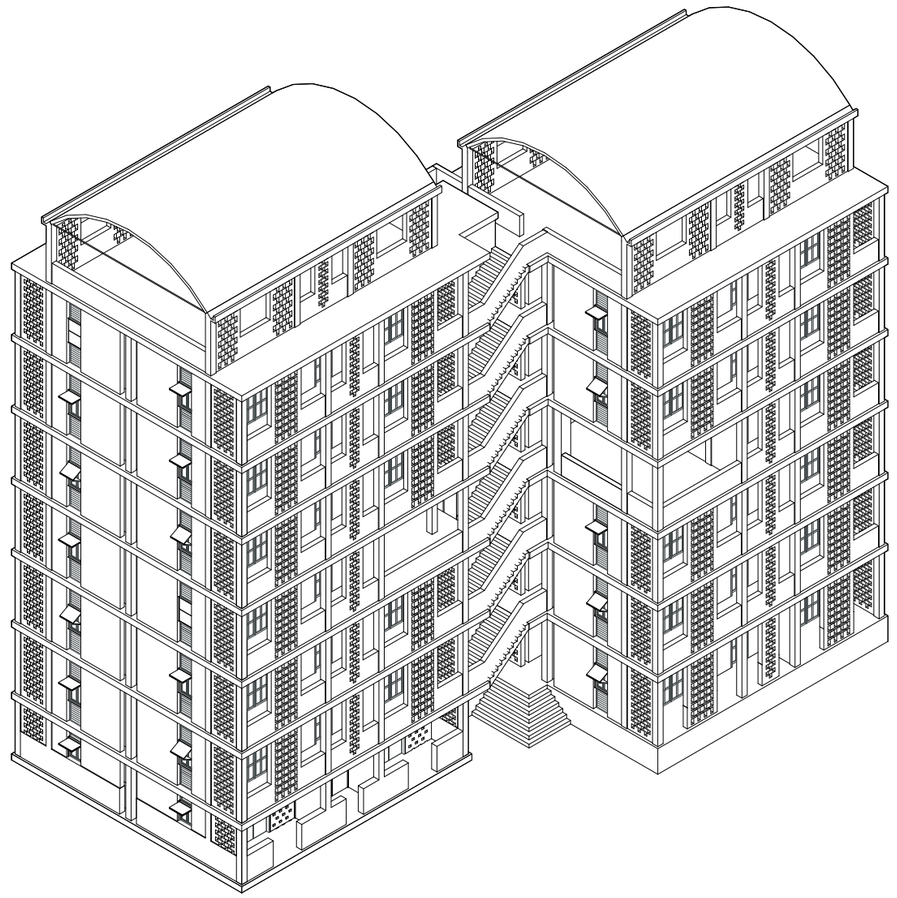
GF + 3
1:150

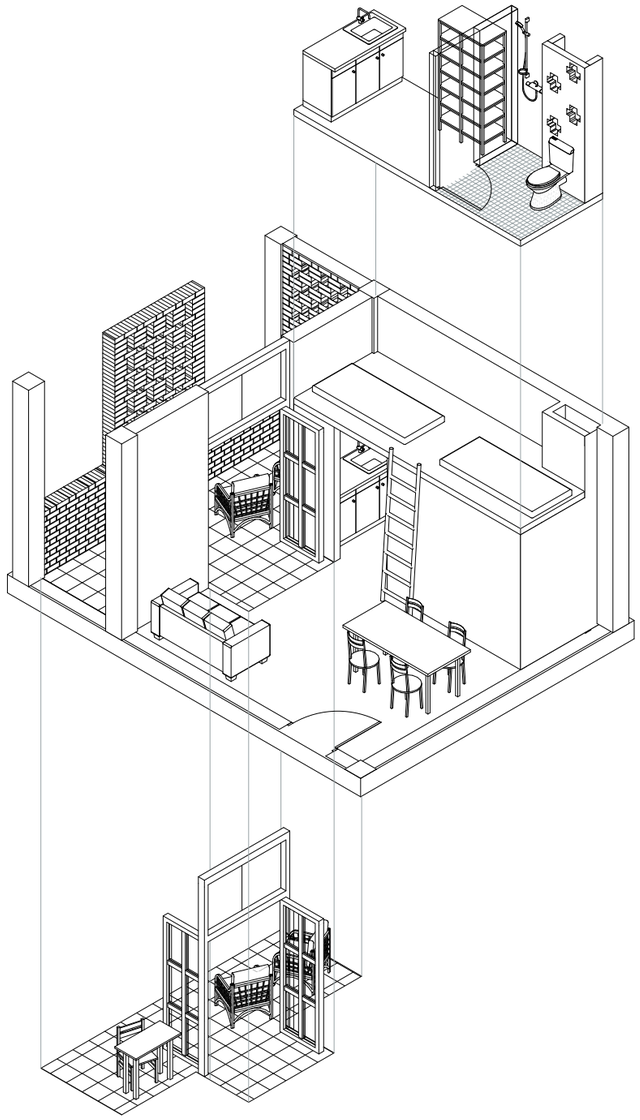


Design // **cluster**



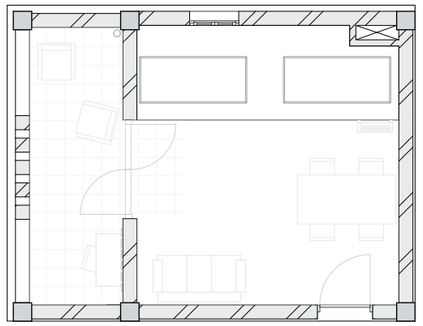
ROOF TERRAS
1:150



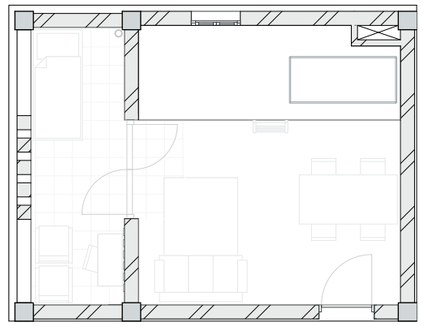


dry season monsoon season

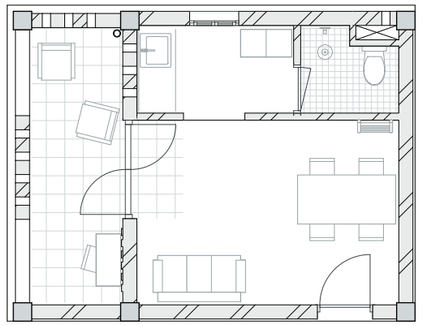
usable space



loft

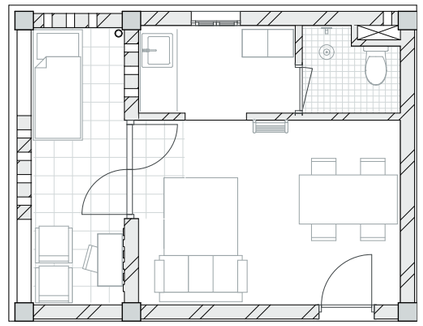


loft



main floor

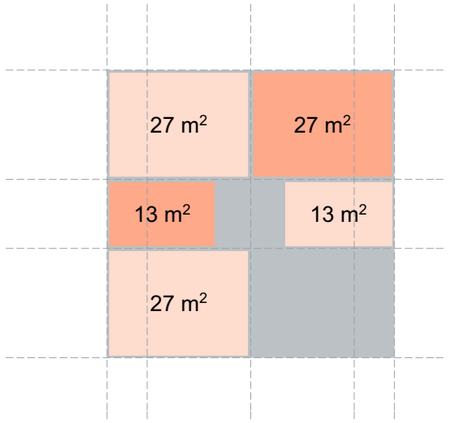
use of space // daytime

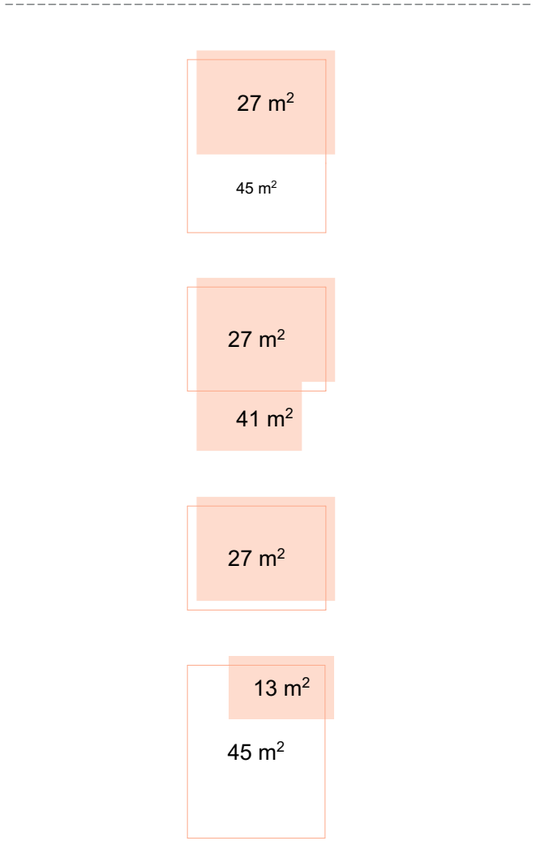


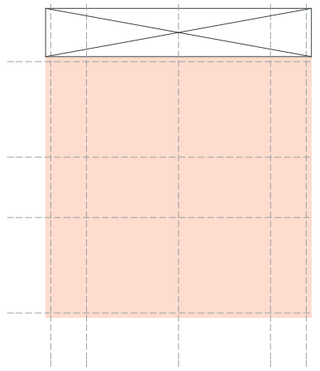
main floor

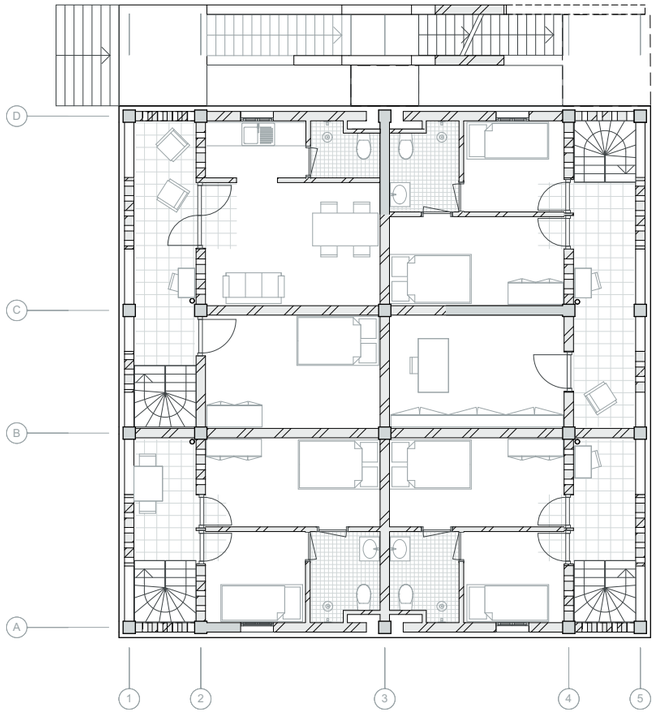
use of space // nighttime

design // cluster // basic unit


27 m²
27 m²
13 m²
13 m²
27 m²

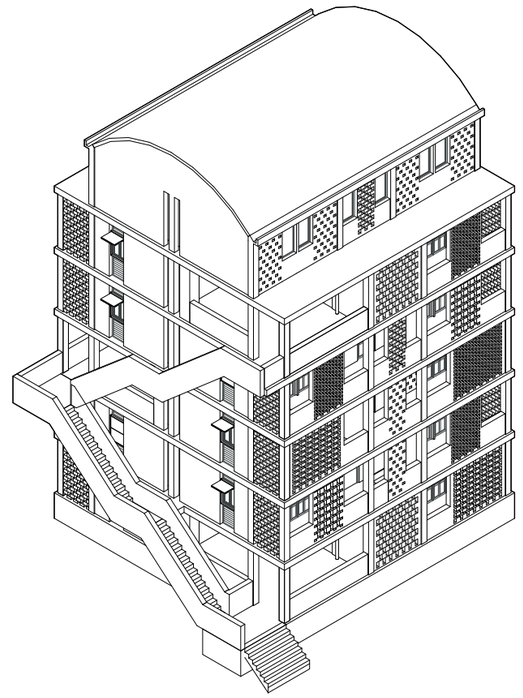

27 m²
45 m²
27 m²
41 m²
27 m²
13 m²
45 m²



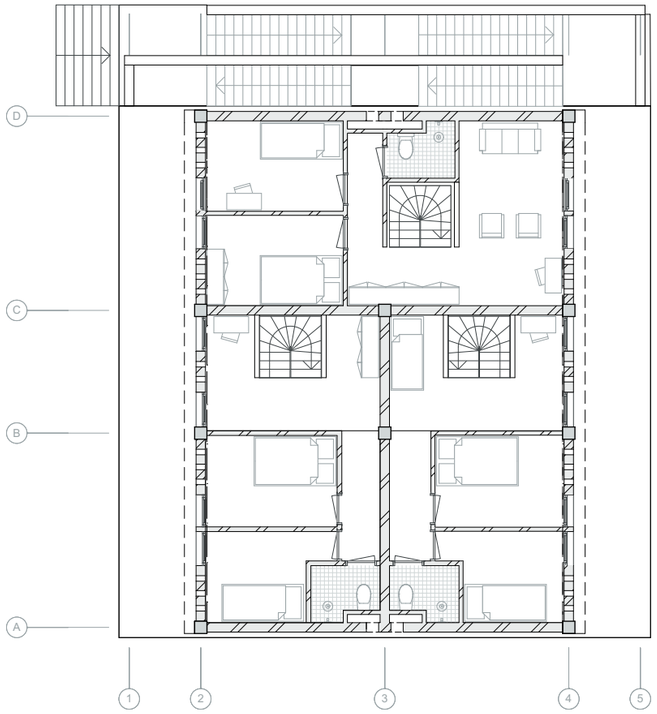


GF + 1
1:150

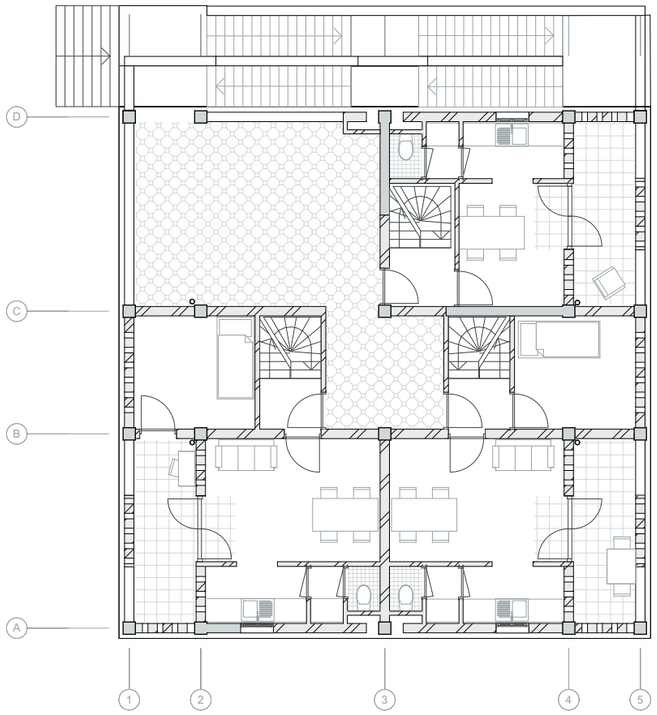
GROUND FLOOR
1:150



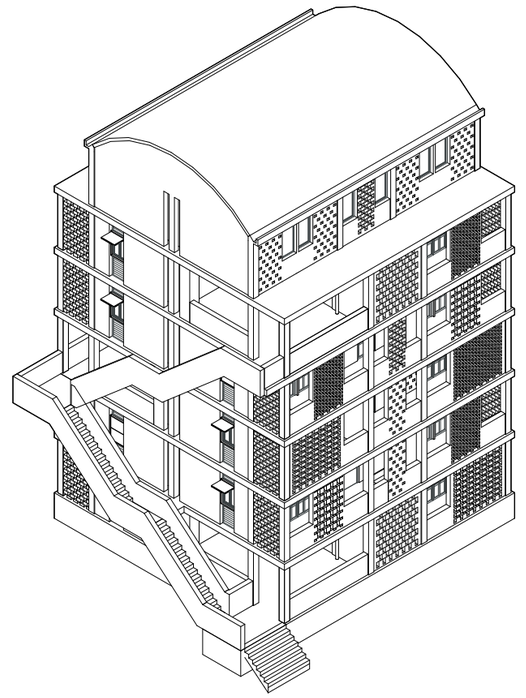
design // **separate**



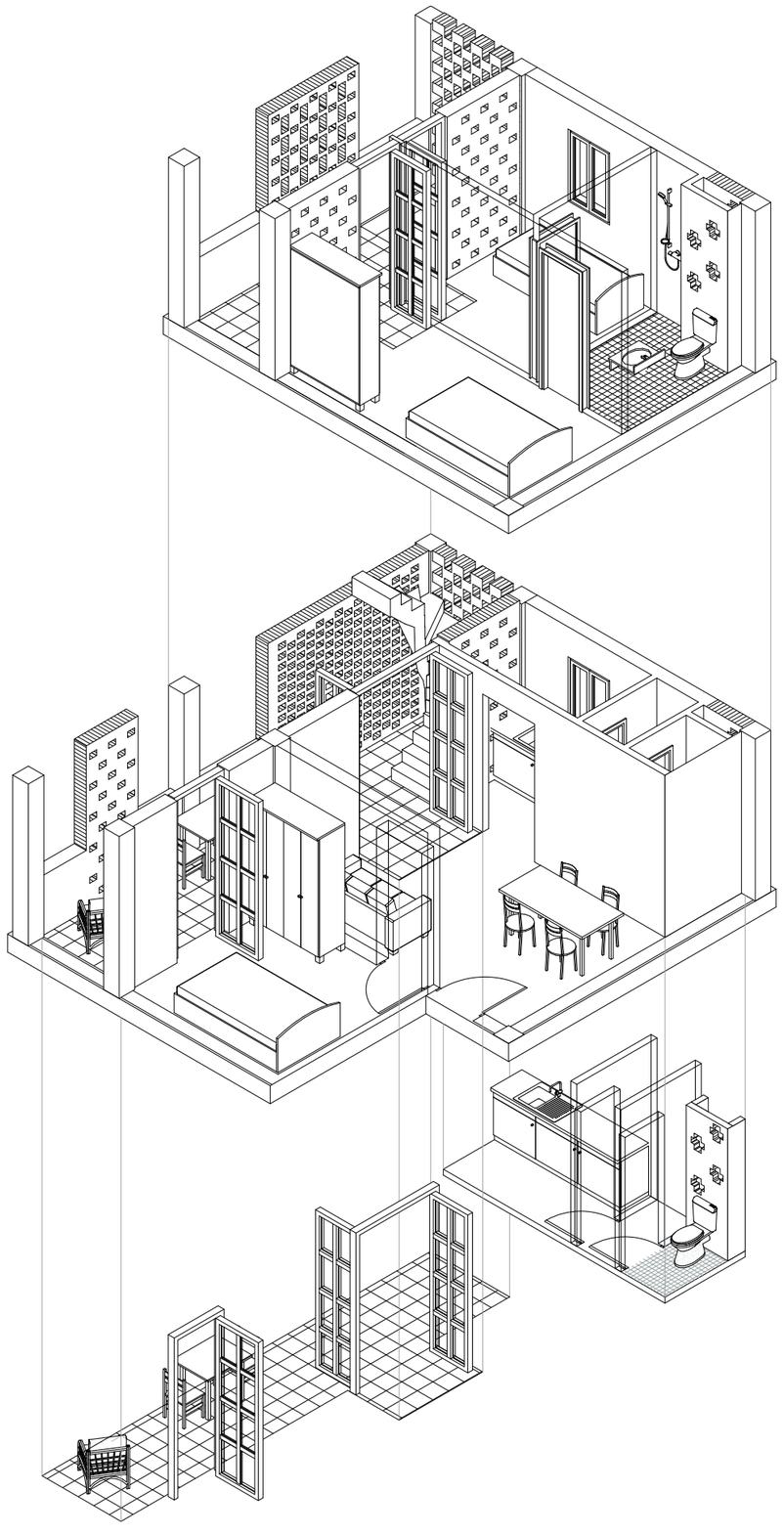
GF +5
1.150

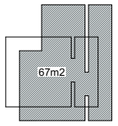


GF + 4
1.150

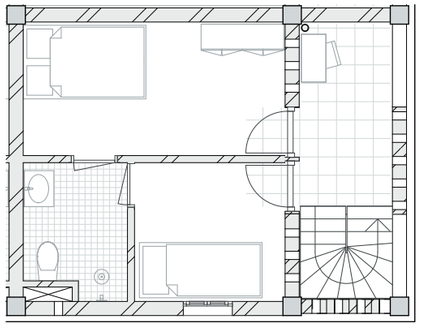


design // **separate**

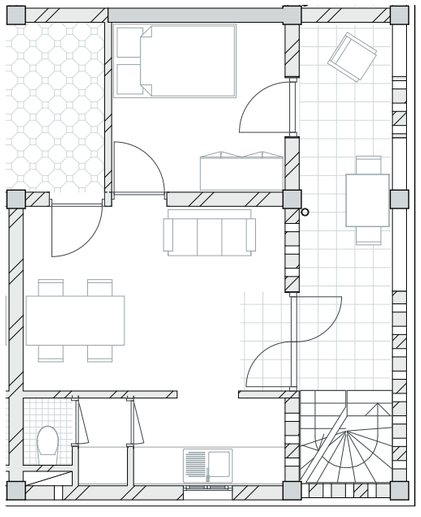




usable space



upper floor

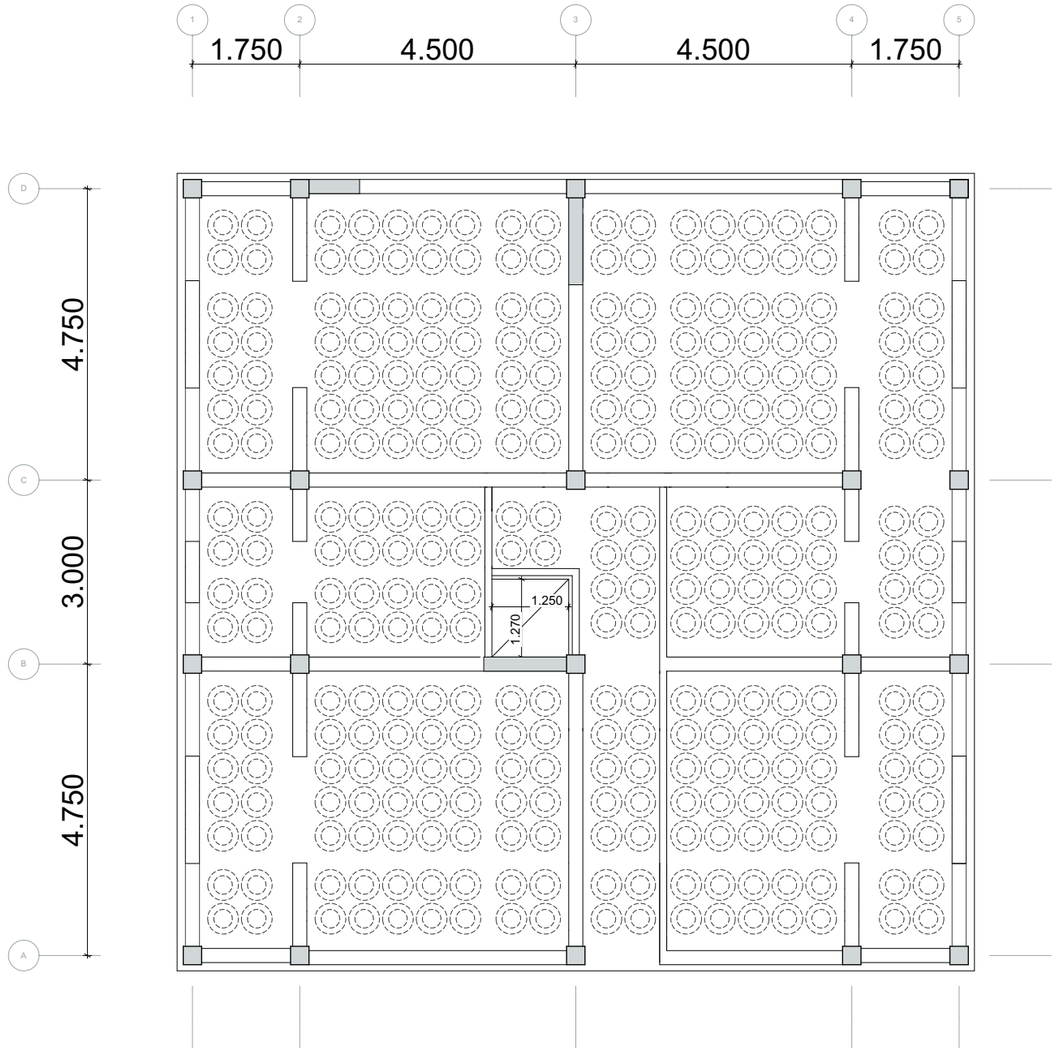


main floor

use of space

design // separate // basic unit

BT



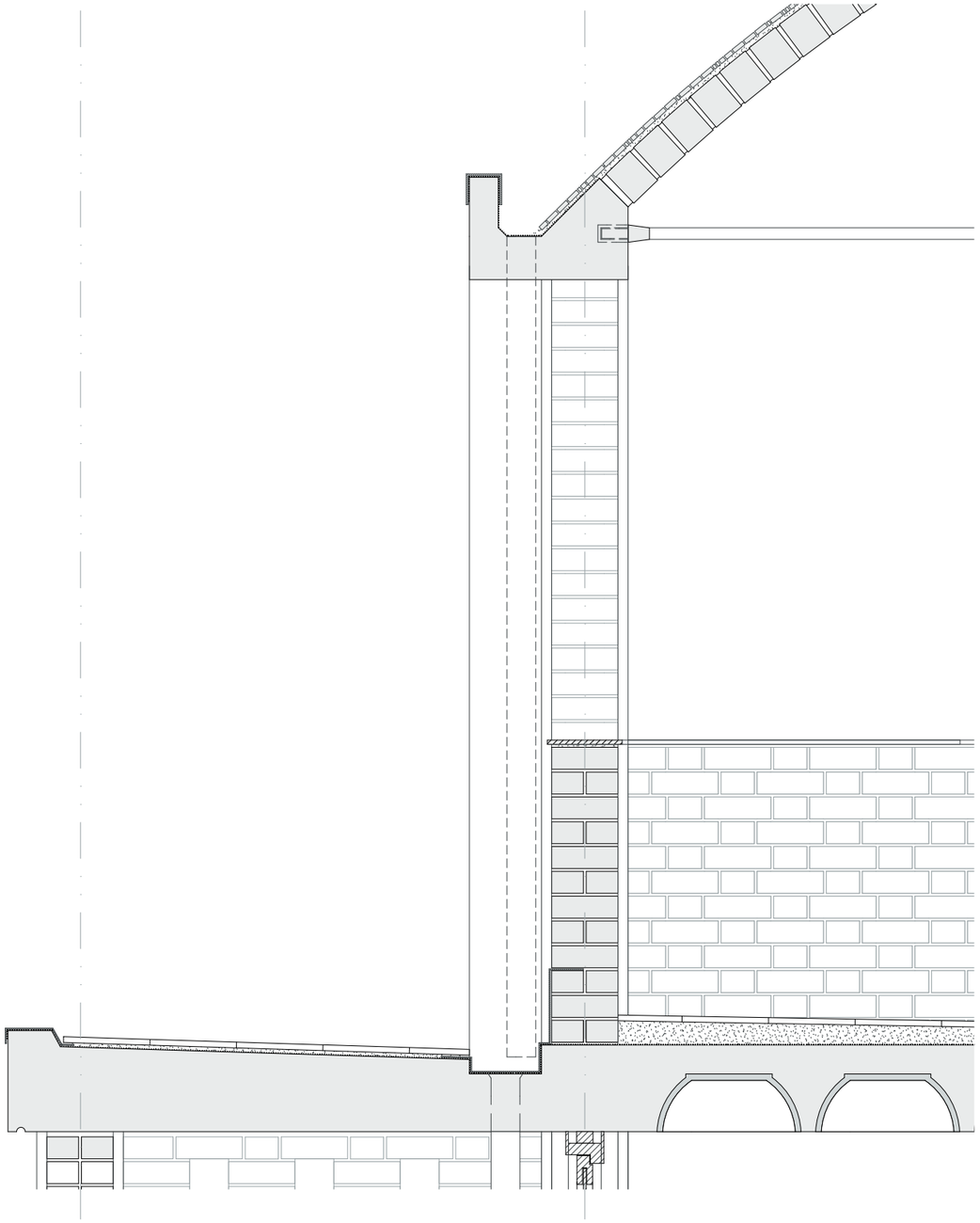
CONSTRUCTION PRINCIPLES

concrete colums

concrete slabs
with embedded beams, and an infill of claypots

free spanning fly-ash brick volt

building construction // **construction floorplan**



ROOF

free spanning fly-ash bricks vault
waterproof membrane
cement
ceramic tile shards
supported by:
concrete profile
pull rod

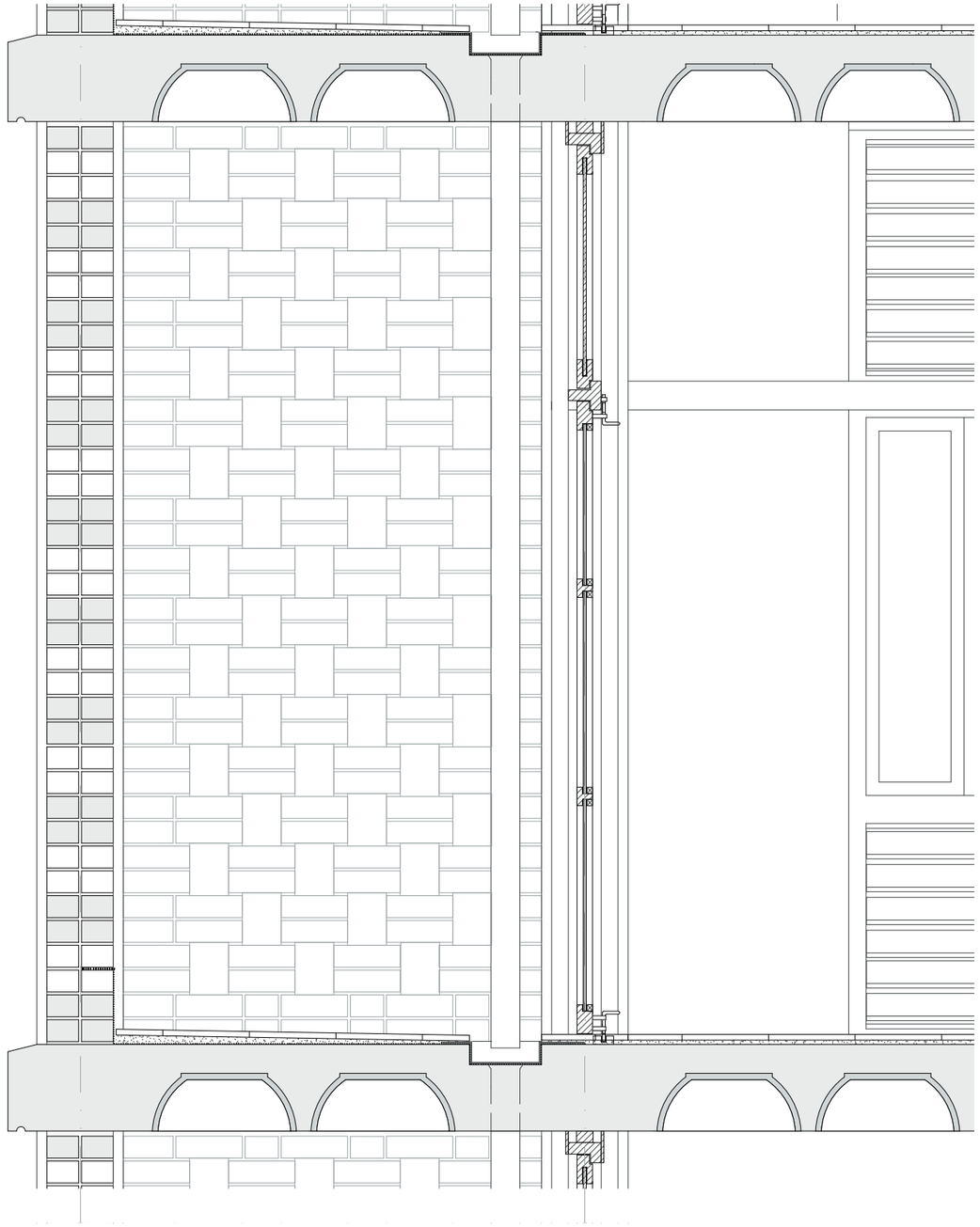
FLOOR

concrete slab // 300 //
embedded beams // clay pot infill
waterproof membrane
cement
tile finishing

WALL

concrete column // 300
bricks // jali
paint
i.c.o. balustrade:
capped with a ceramic tile

FRAGMENT I // 1.20



OUTER FACADE

concrete column // 300
bricks // jali
plaster
i.c.o. balustrade:
capped with a ceramic tile

FLOOR

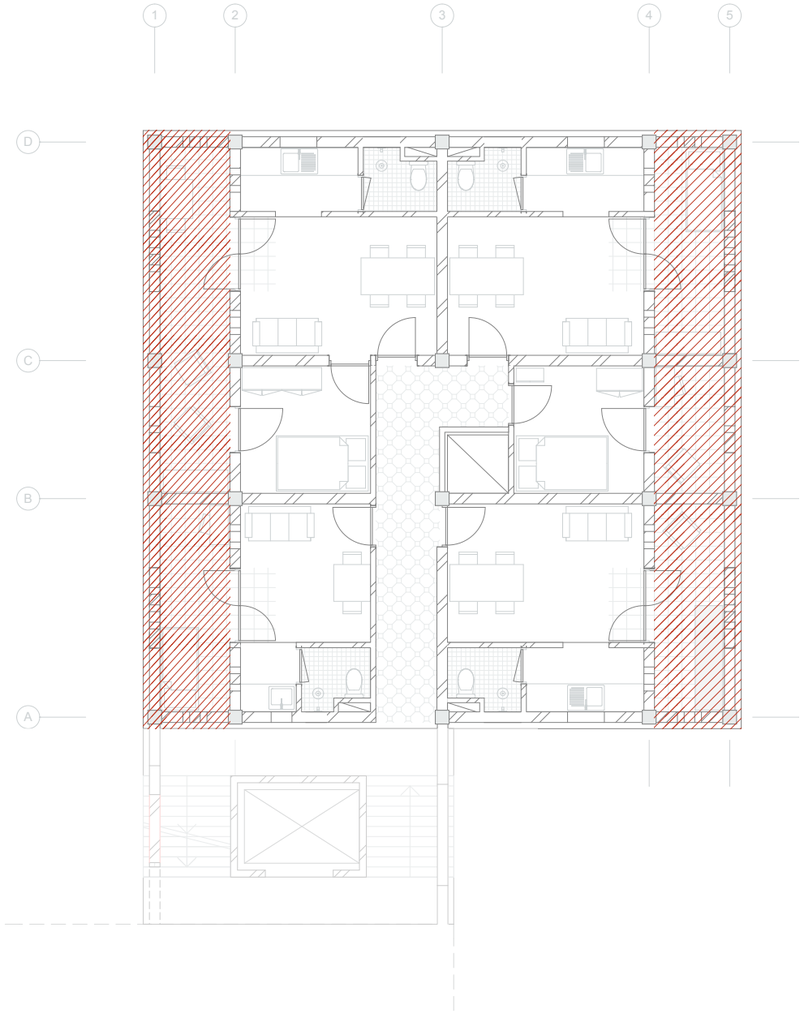
concrete slab // 300 //
embedded beams // clay pot infill
waterproof membrane // only verandah
cement // sloping on verandah
tile finishing

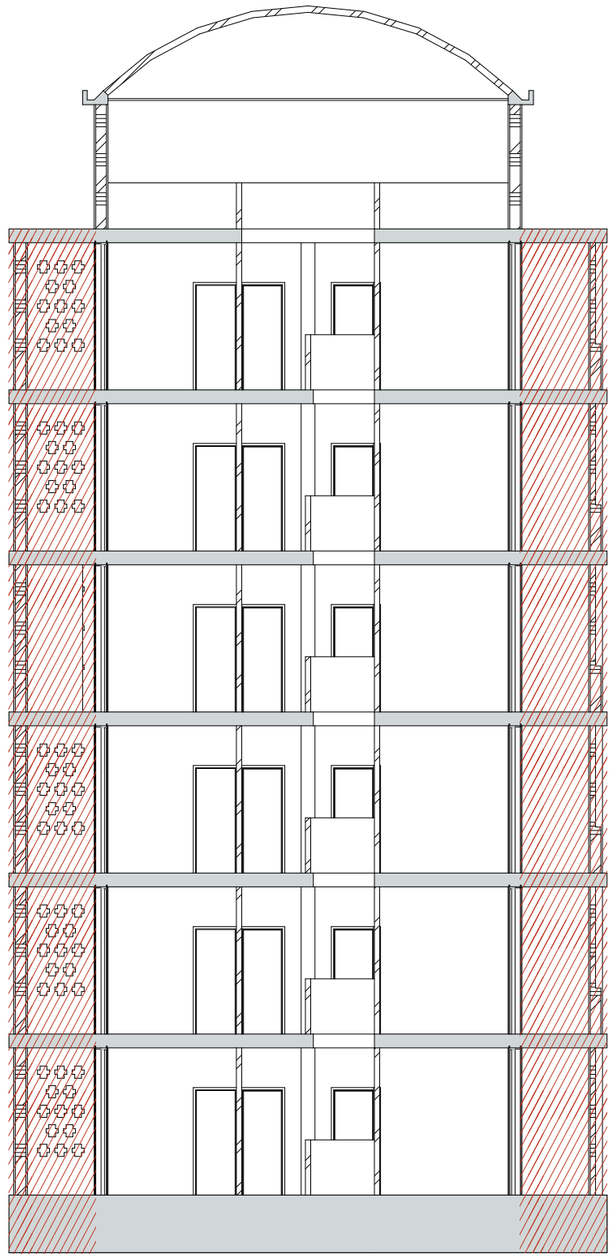
DOOR

wooden double egress door // 2700 //
wooden frame
ceramic plinth

FRAGMENT II // 1.20

building construction // facade fragments





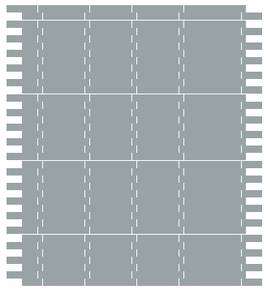
HOT and HUMID CLIMATE:

june - septembre : protection from the rain

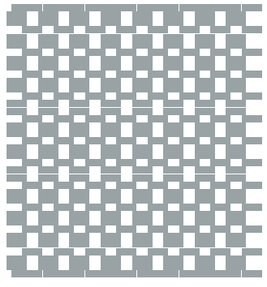
summer: protection from the sun

all year: ventilation to cope with the humidity

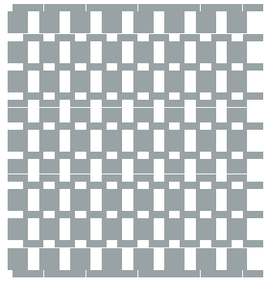
building construction // **climate buffer zone**

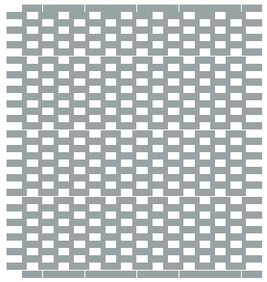


English bond brick pattern

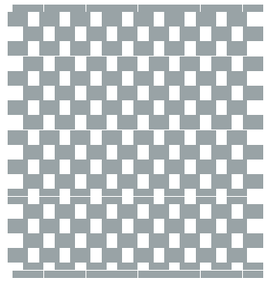


Jali pattern 1 // 45 % less brick

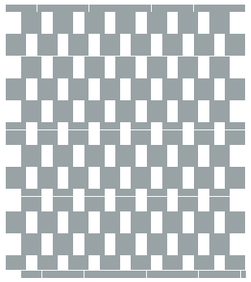




Jali pattern 3 // 47 % less brick

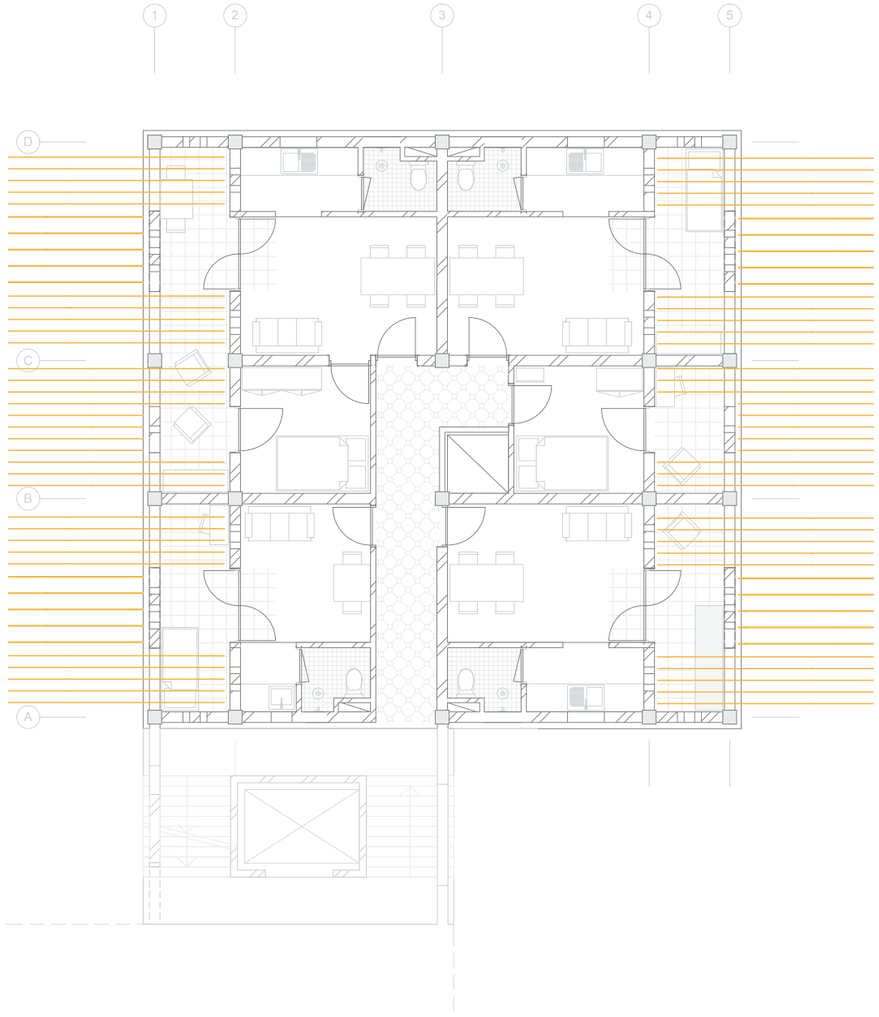


Jali pattern 4 // 47 % less brick

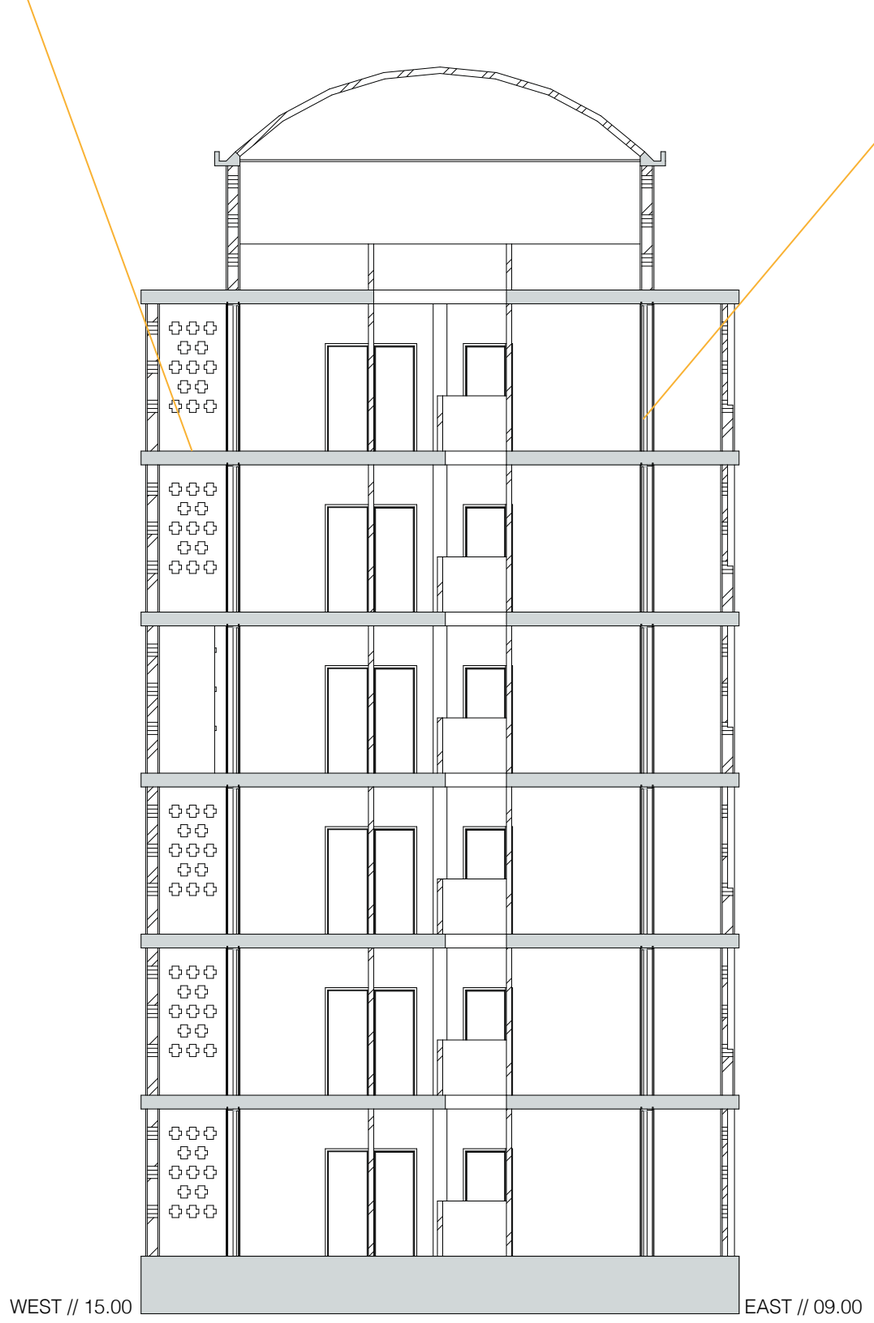


Jali pattern 5 // 47 % less brick

building construction // jali brickwork

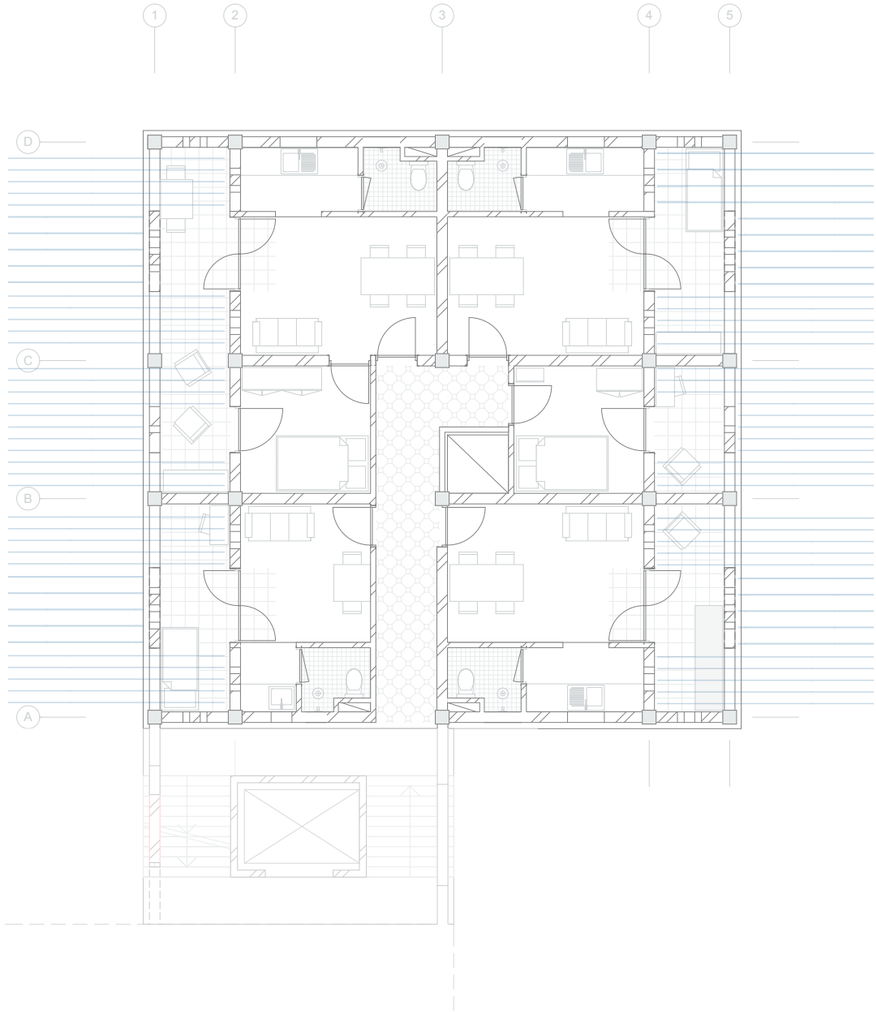


SUN

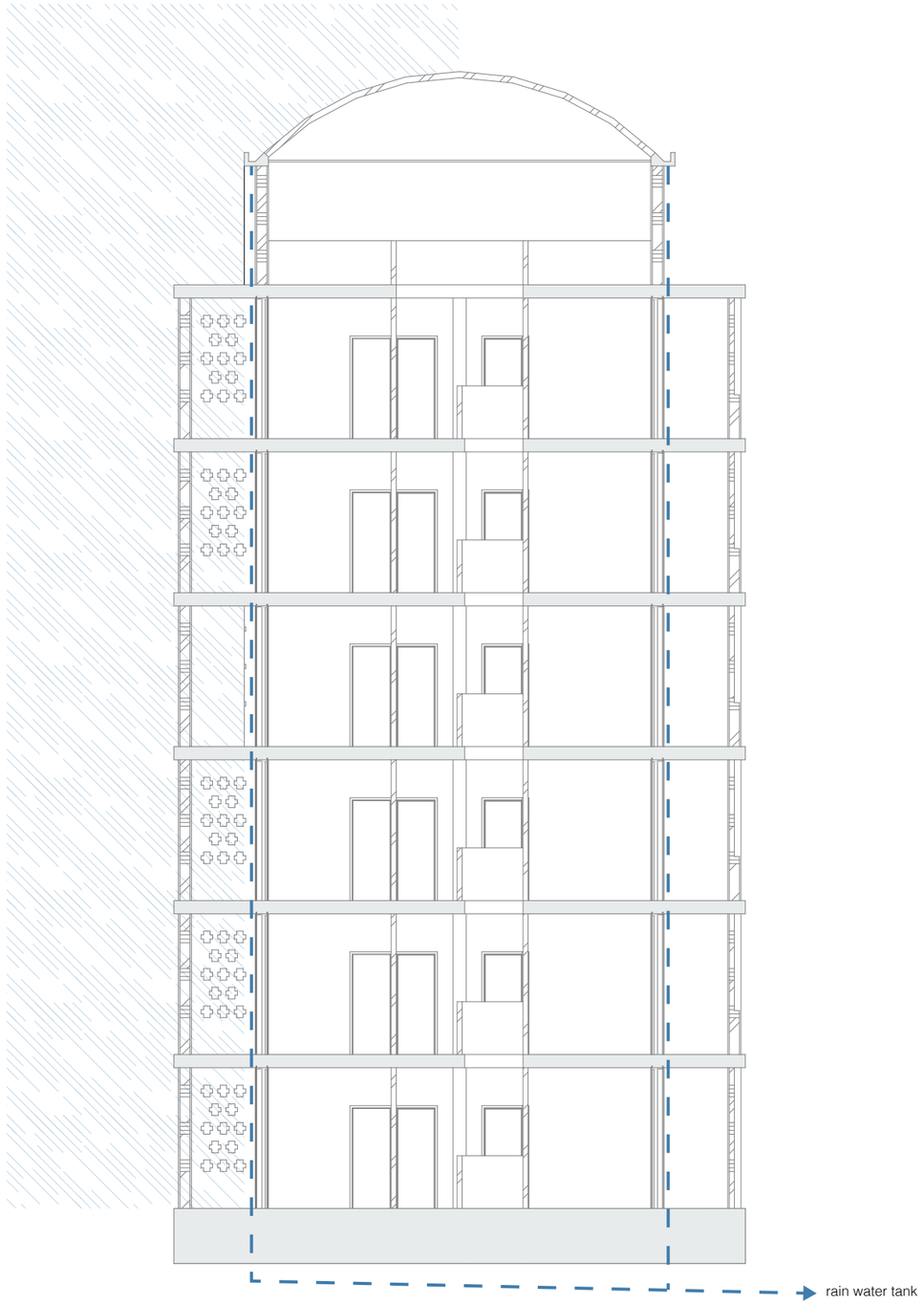


SUN

building construction // **climate buffer zone**

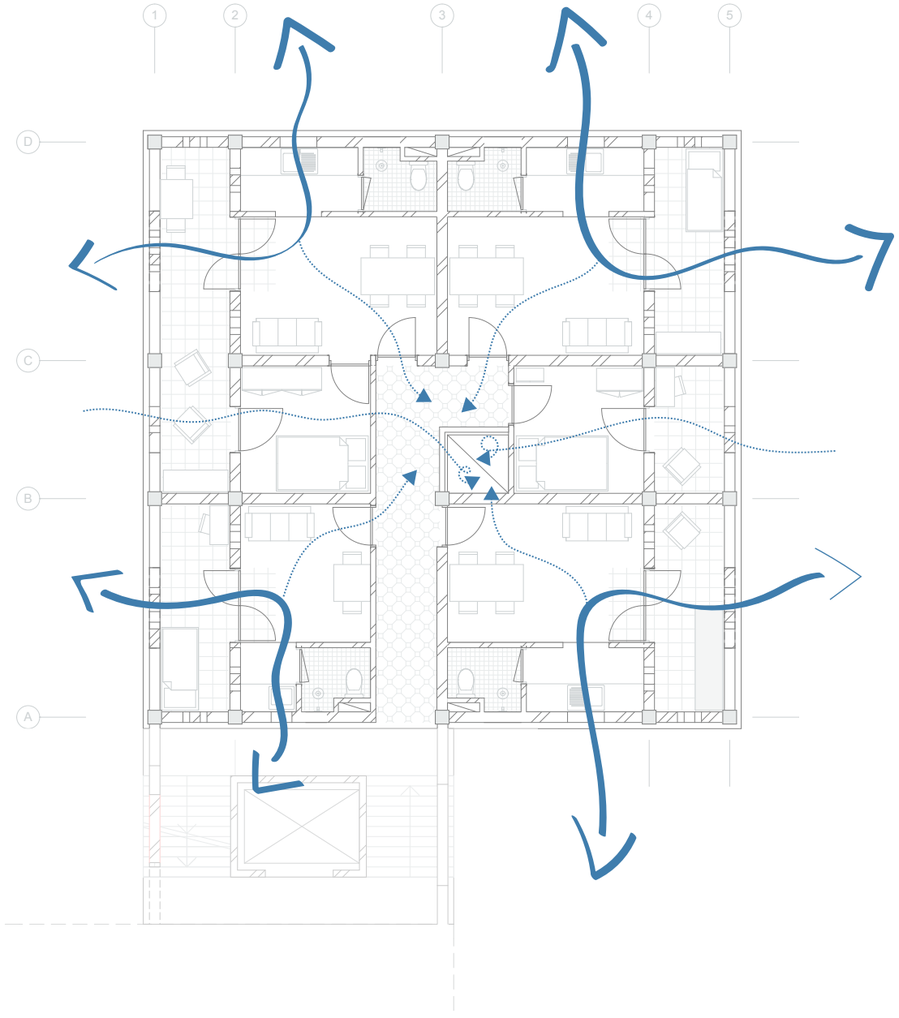


RAIN

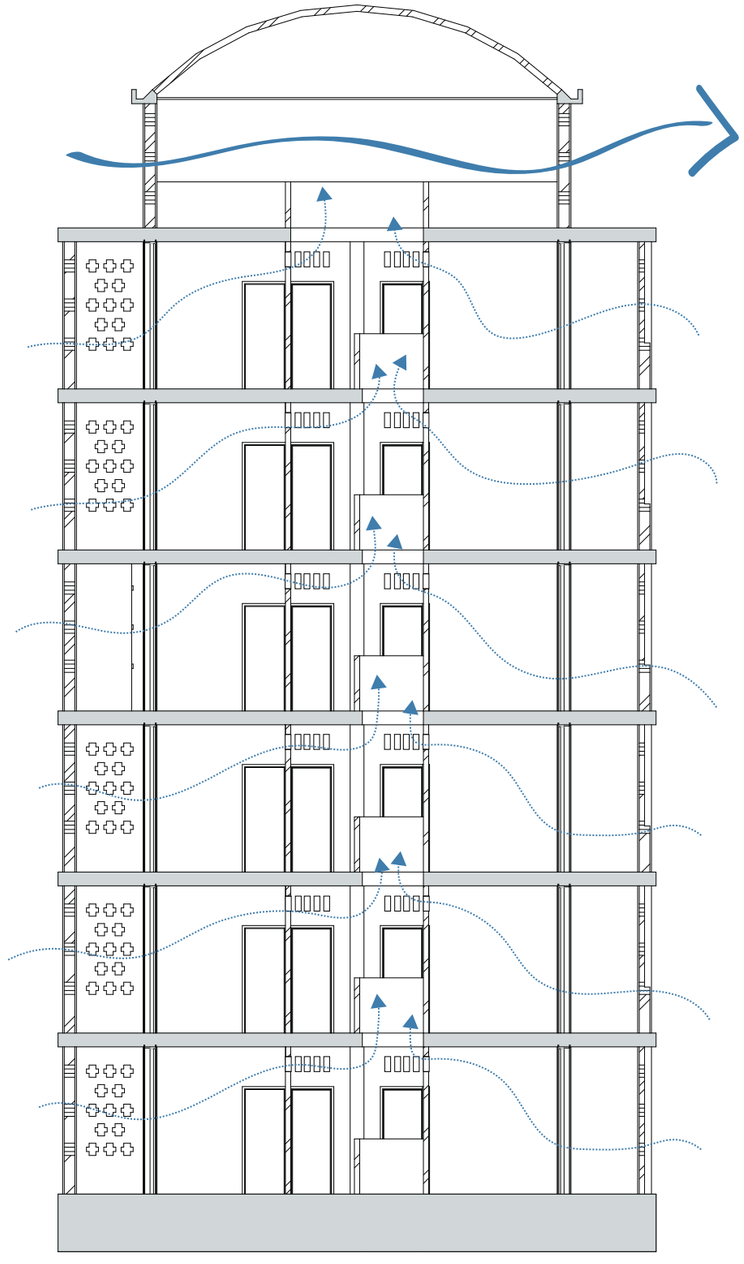


RAIN

building construction // **climate buffer zone**



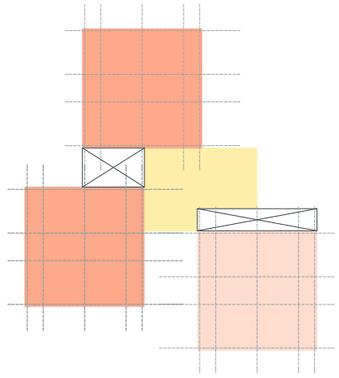
VENTILATION



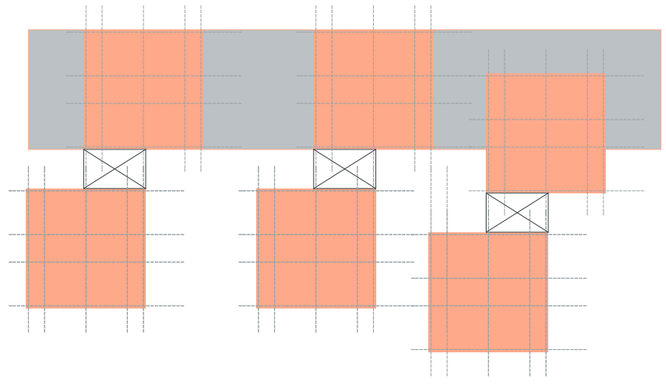
VENTILATION

URBAN LAYOUT

urban layout // progressive growth



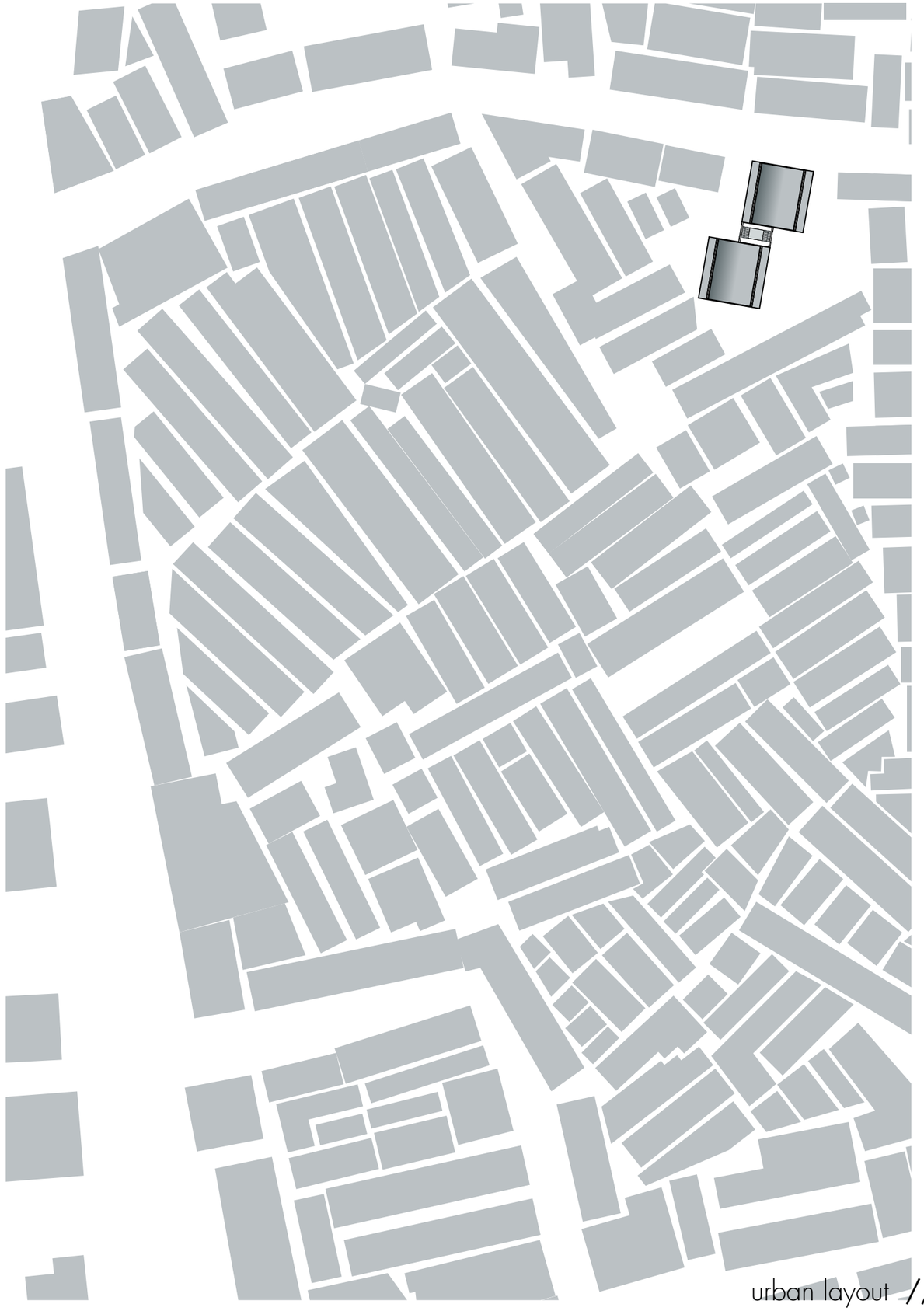
THE COMMUNITY CLUSTER
one seperate and one cluster



COMMERCIAL PLINTH

COMMERCIAL PLINTH
one story plint + clusters

urban layout // clustering principles



ONE CLUSTER
40 units

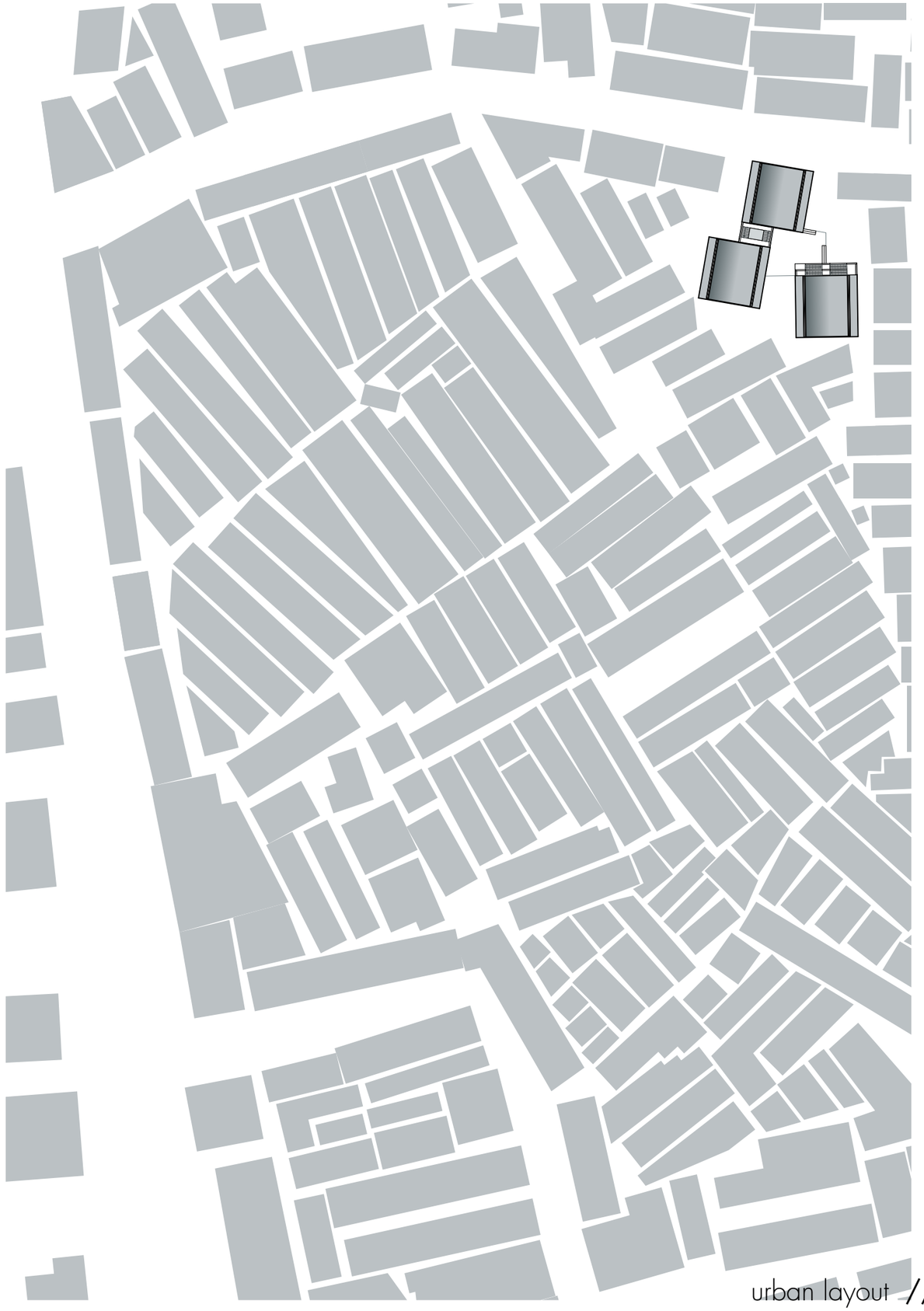
BENEFITS INHABITANTS:
improved living conditions

BENEFITS NEIGHBORHOOD:

-

-

urban layout // progressive growth



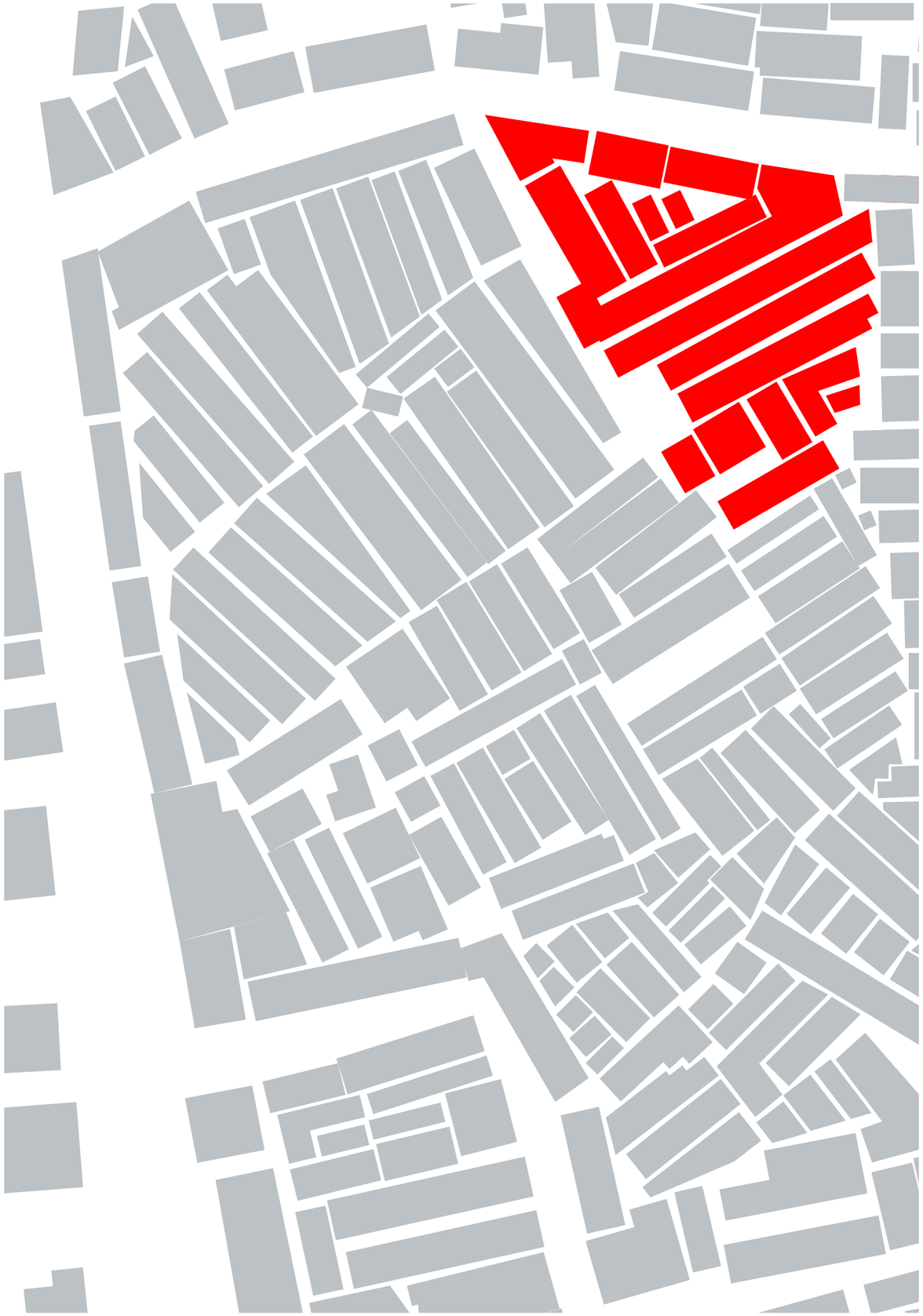
ONE COMMUNITY
52 units

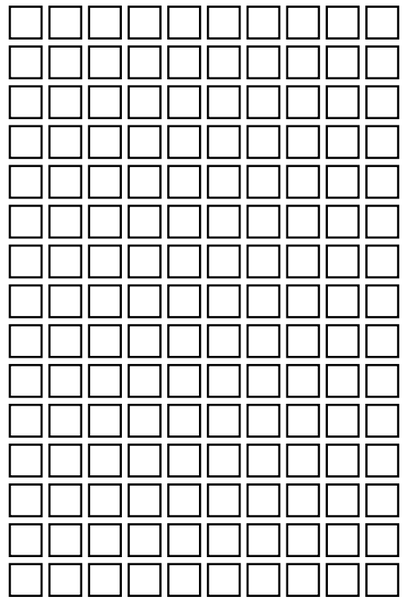
BENEFITS INHABITANTS:
improved living conditions
small pubic space

BENEFITS NEIGHBORHOOD:

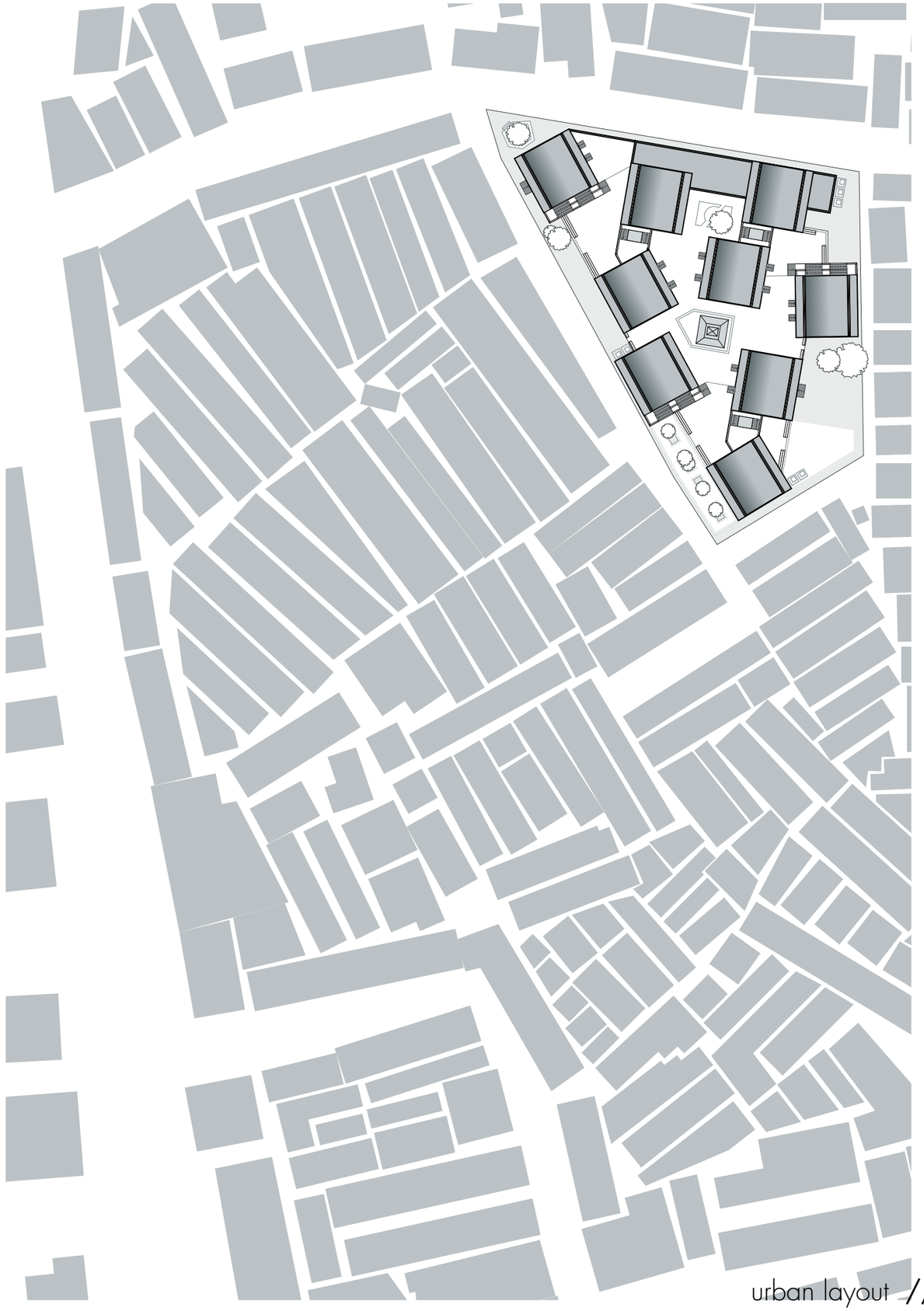
-

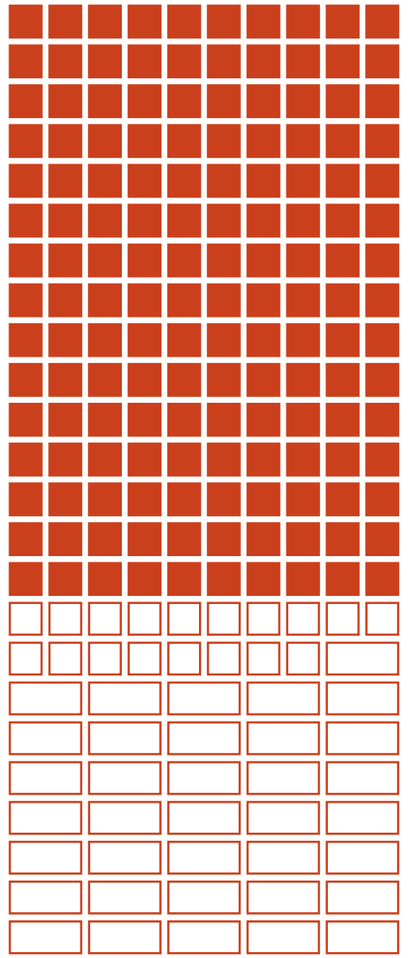
urban layout // progressive growth





150 baithi chawl units





+ 18 EWS/LIG units

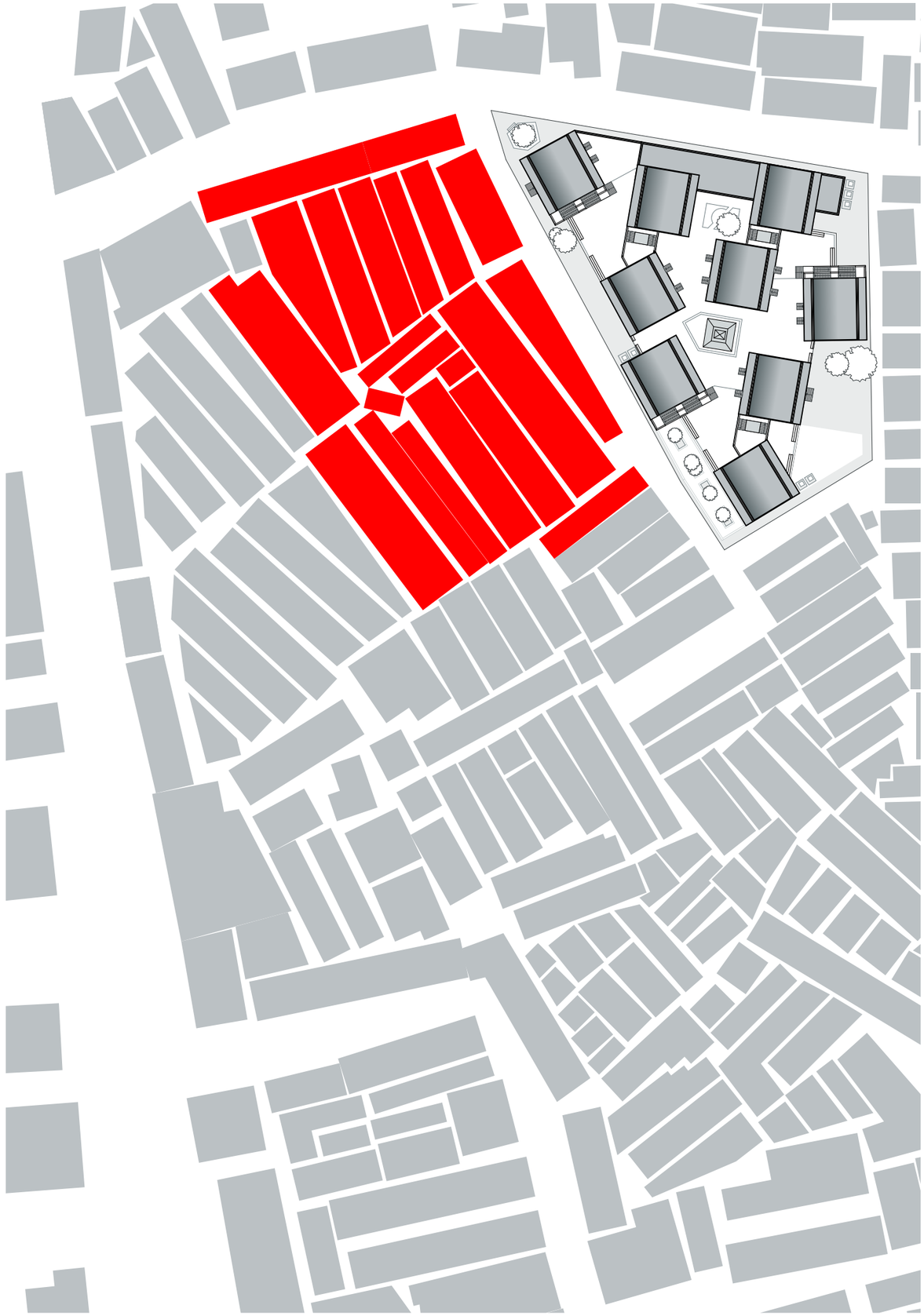
+ 36 MIG units

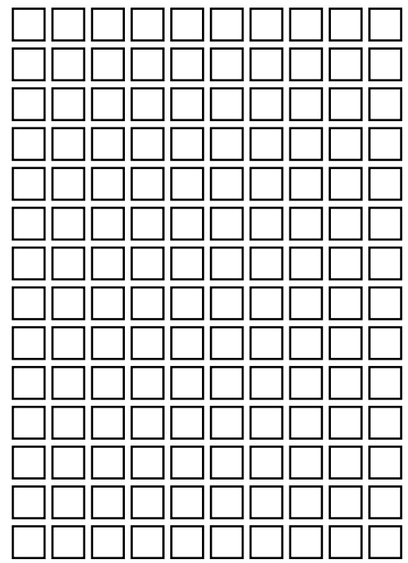
THE POCKET
180 units

BENEFITS INHABITANTS:
improved living conditions
system of pubic space
amenities

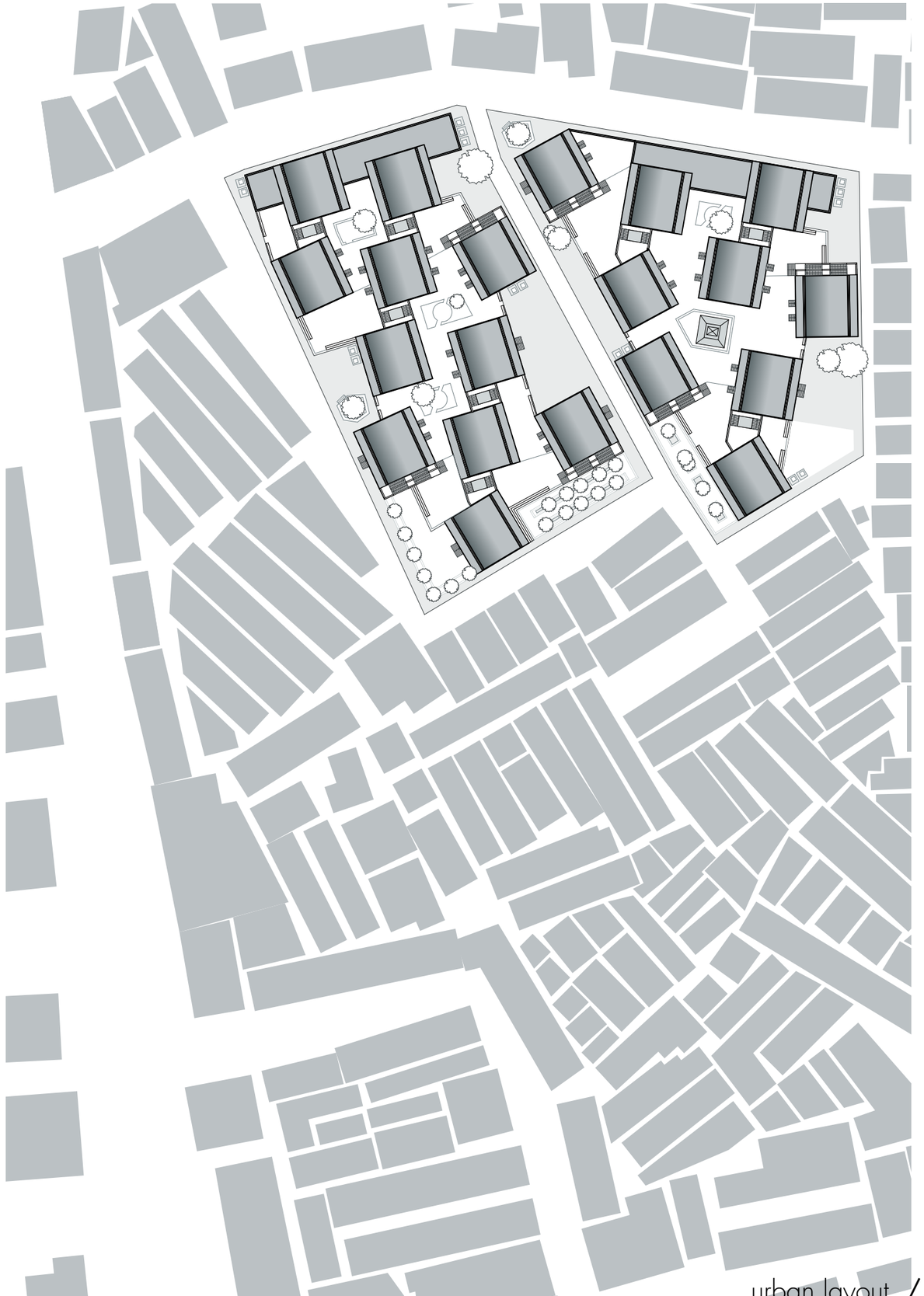
BENEFITS NEIGHBORHOOD:
improved infra structure
enables buildings sites more inward the area
small public square

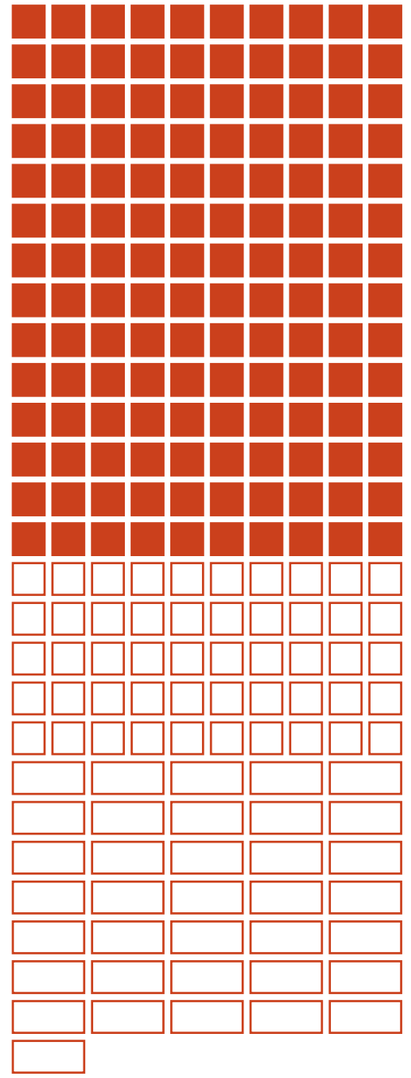
urban layout // progressive growth





140 baithi chawl units





+ 50 EWS/LIG units

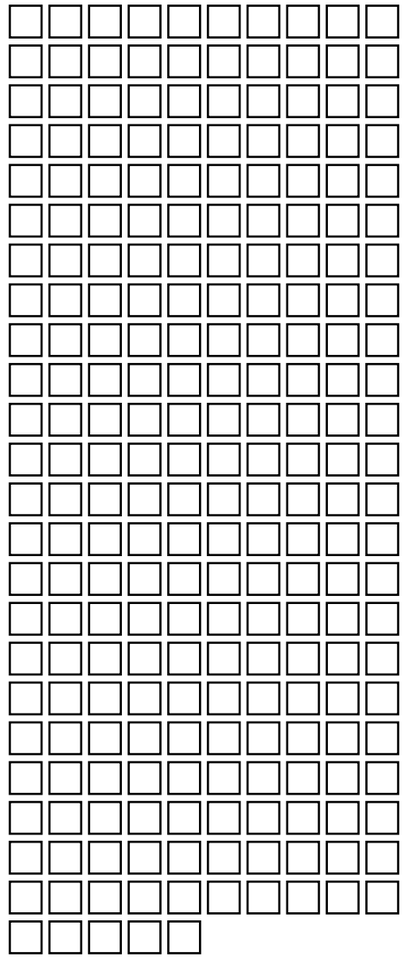
+ 36 MIG units

ONE CLUSTER
180 units

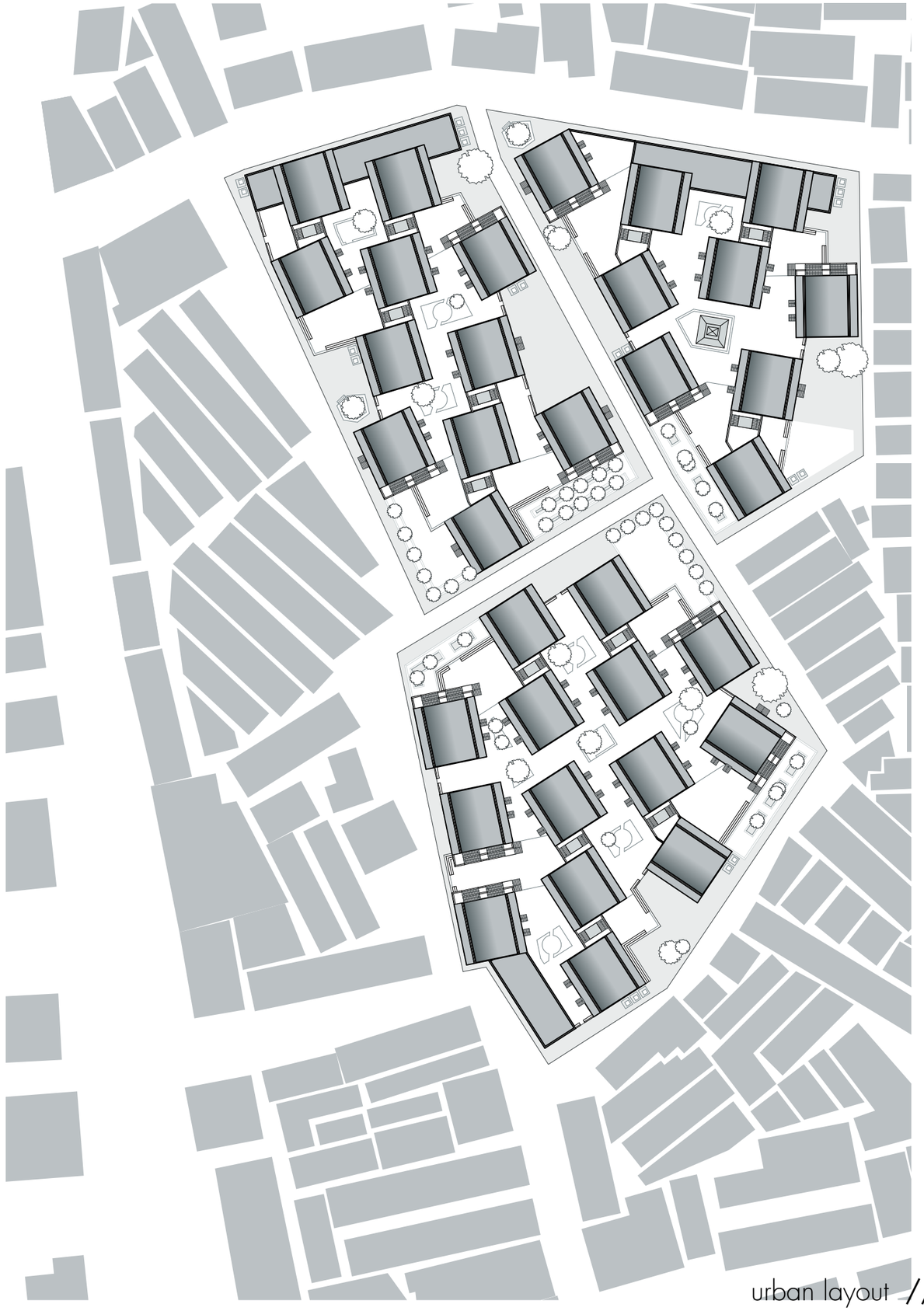
BENEFITS INHABITANTS:
improved living conditions
system of pubic space
amenities

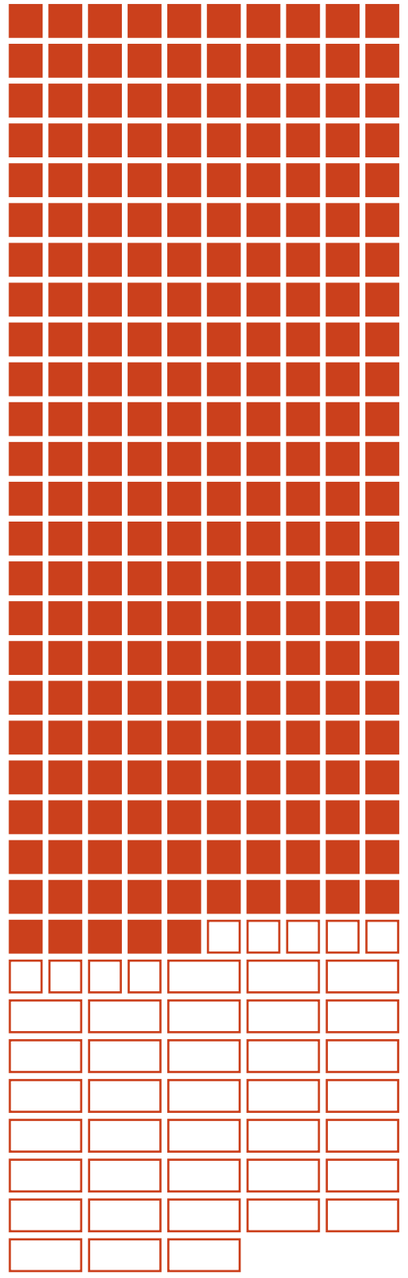
BENEFITS NEIGHBORHOOD:
GOOD infra structure
enables buildings sites more inward the area
public square
network of open spaces

urban layout // progressive growth



255 baithi chawl units





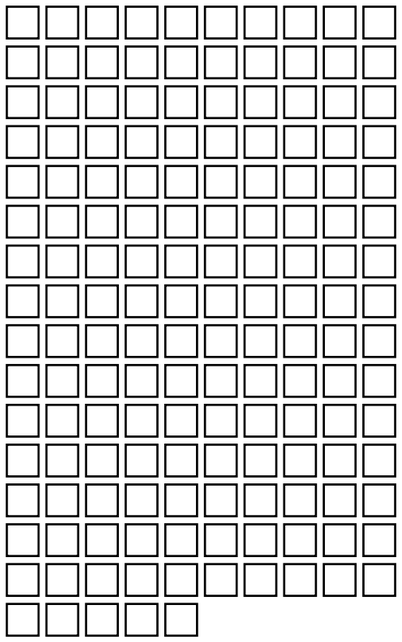
+ 9 EWS/LIG units
+ 36 MIG units

ONE CLUSTER
180 units

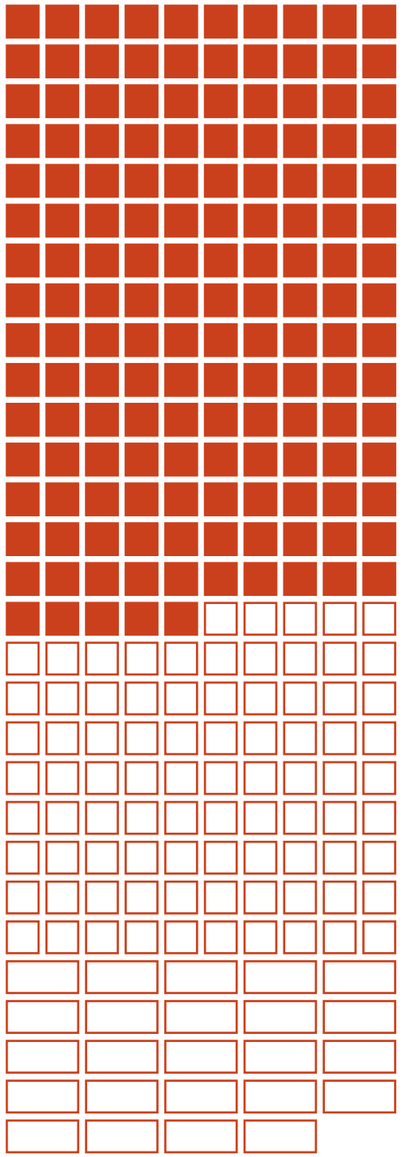
BENEFITS INHABITANTS:
improved living conditions
system of pubic space
amenities

BENEFITS NEIGHBORHOOD:
GOOD infra structure
enables buildings sites more inward the area
public square
network of open spaces
bigger open spaces at crossings

urban layout // progressive growth

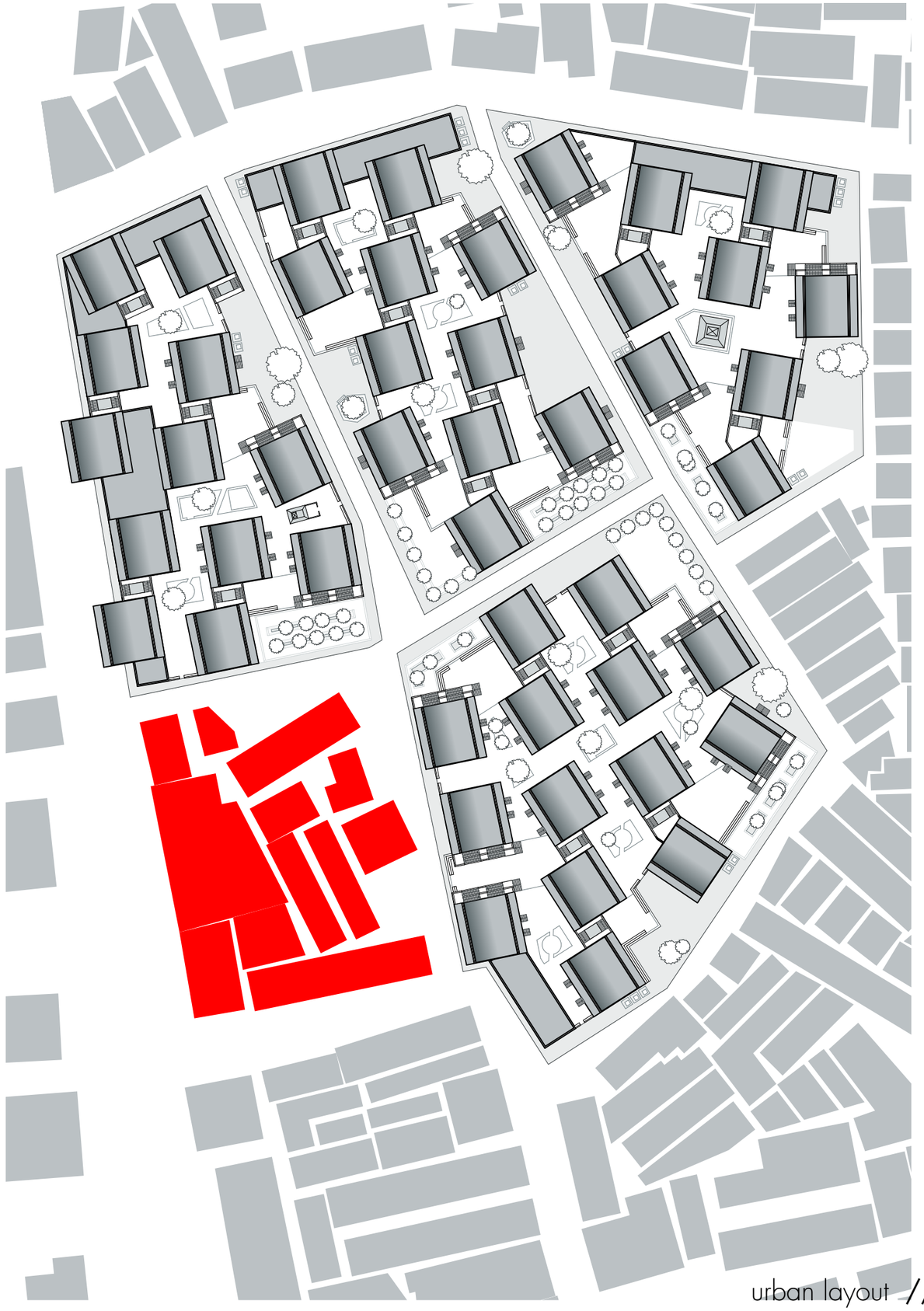


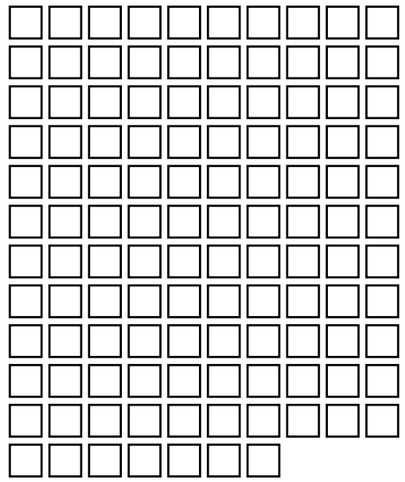
155 baithi chawl units



+ 85 EWS/LIG units

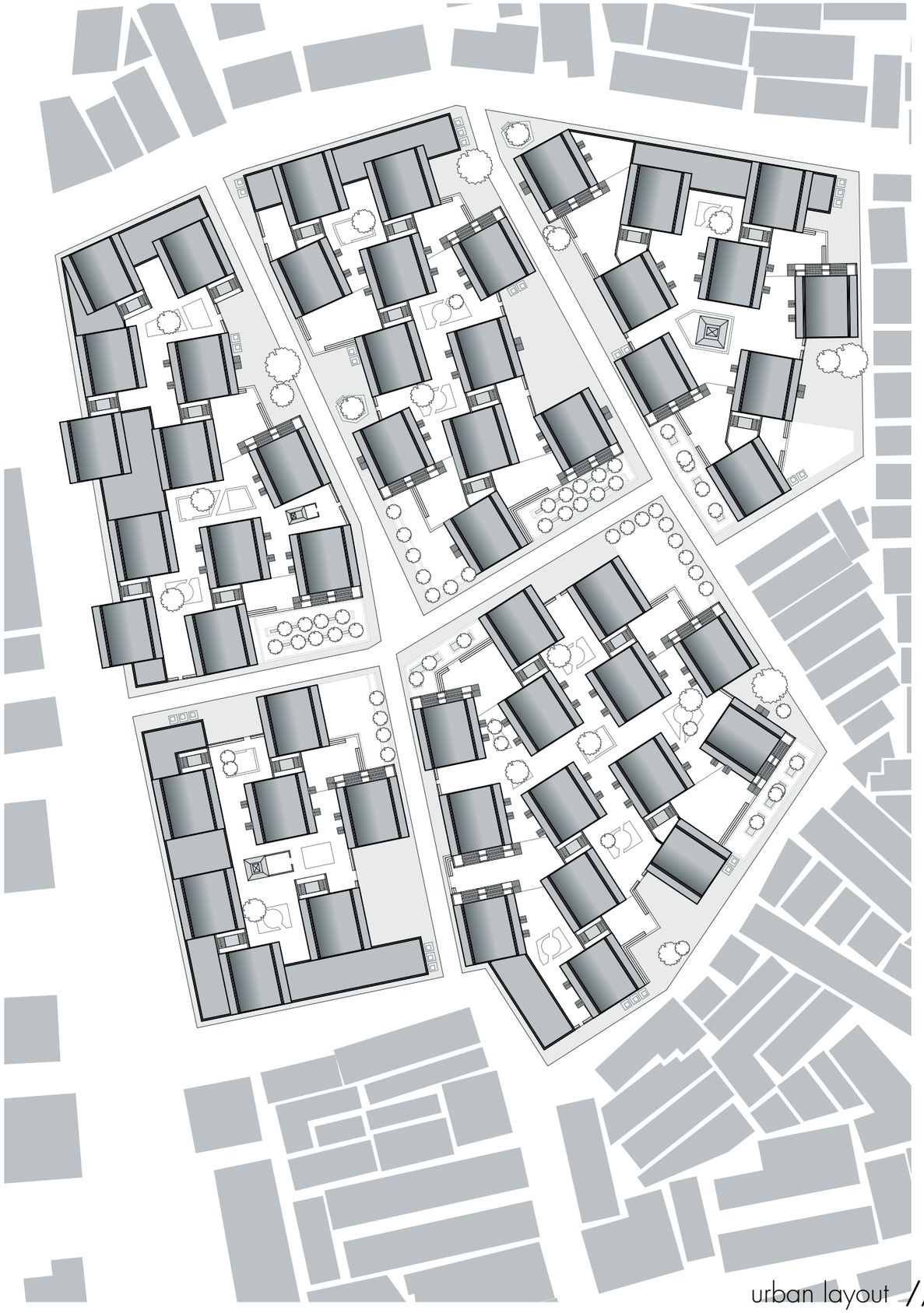
+ 24 MIG units

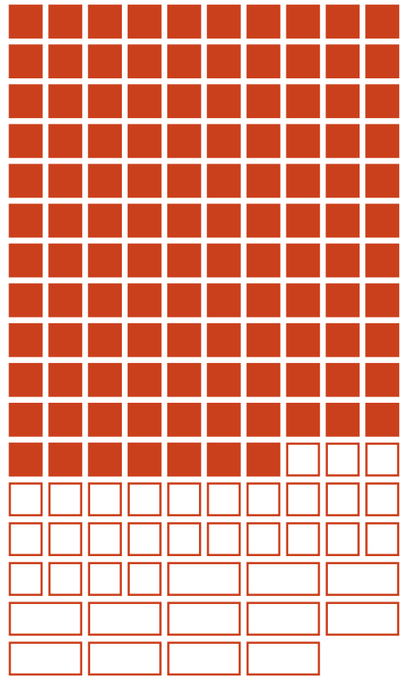




117 baithi chawl units

urban layout // progressive growth





+ 27 EWS/LIG units

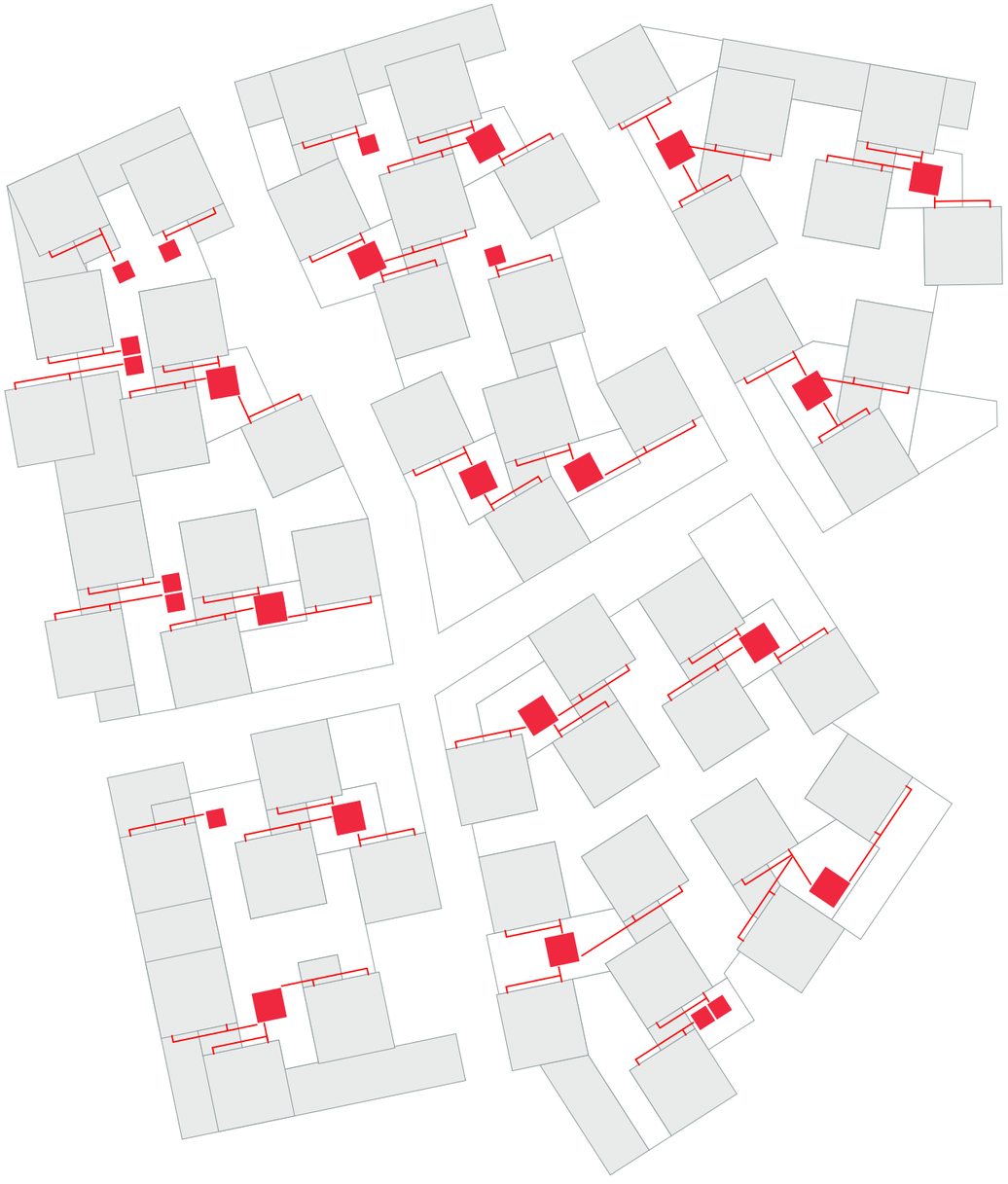
+ 12 MIG units

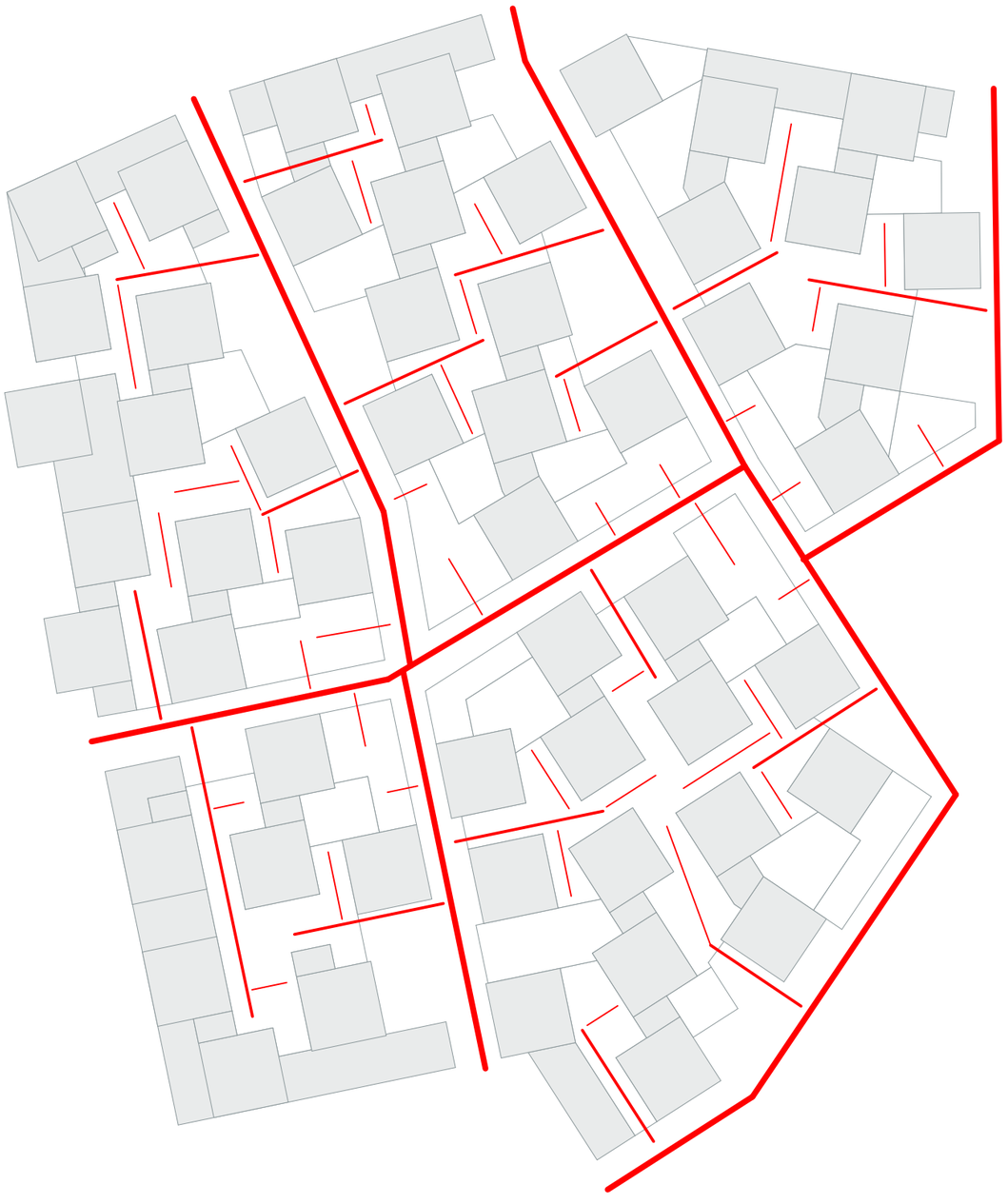
ONE CLUSTER
180 units

BENEFITS INHABITANTS:
improved living conditions
system of pubic space
amenities

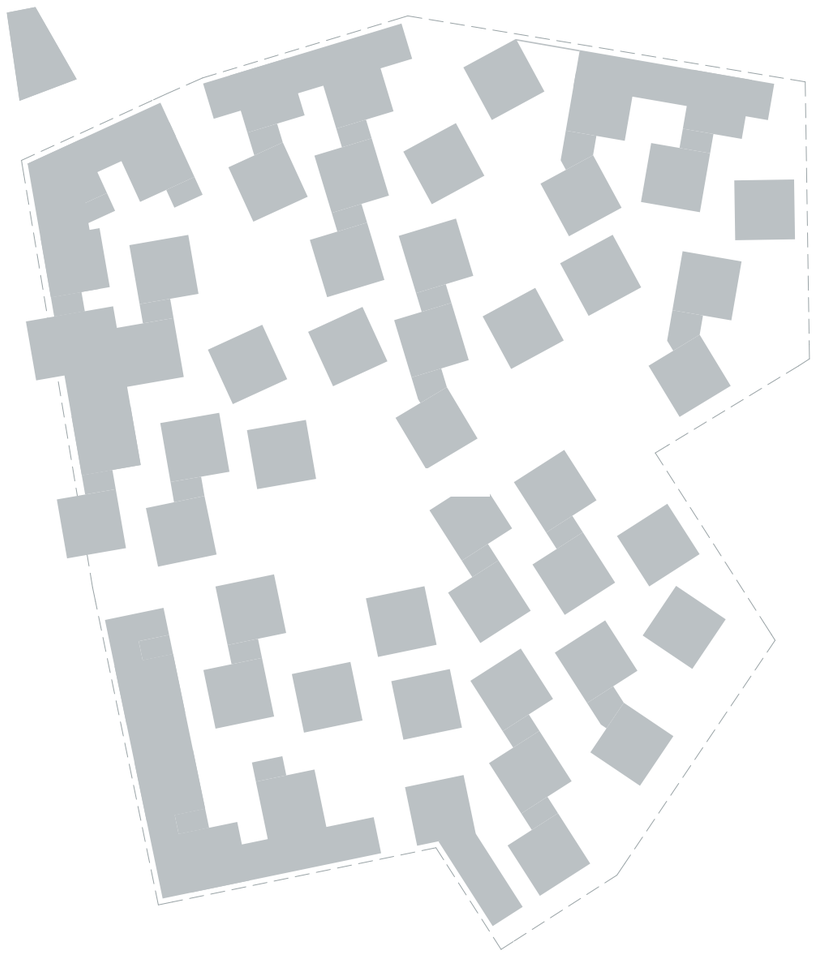
BENEFITS NEIGHBORHOOD:
GOOD infra structure
enables buildings sites more inward the area
public square
network of open spaces
bigger open spaces at crossings
connections through the area

urban layout // progressive growth



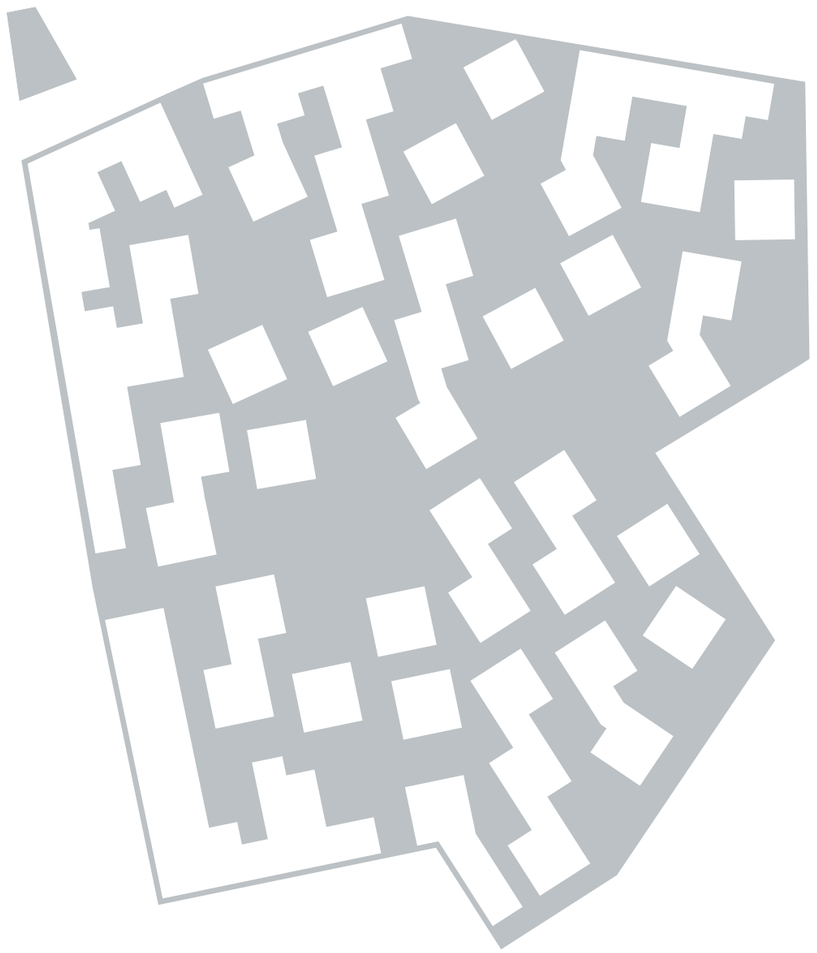


urban layout // **water management**



BUILT

FSI = 2,3

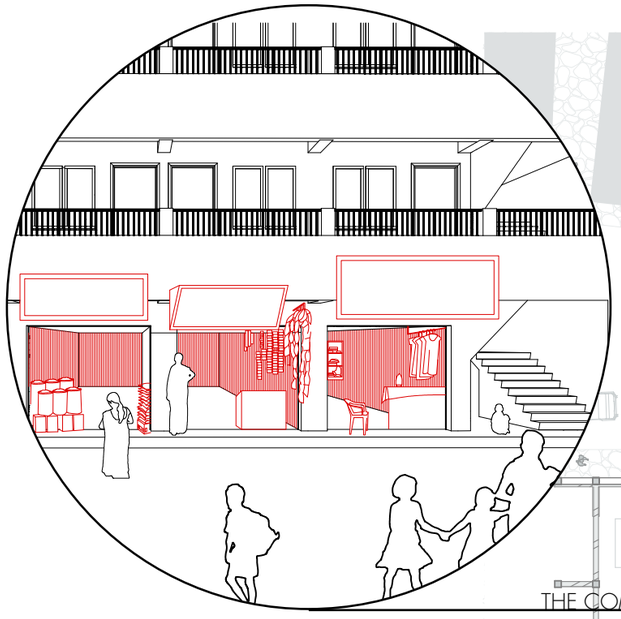


UNBUILT

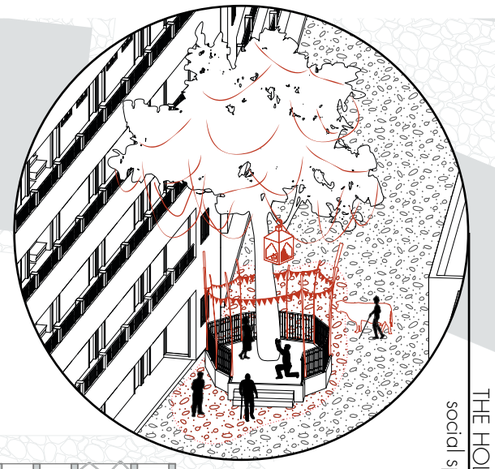
open space index = 0,6

urban layout // built vs unbuilt


N

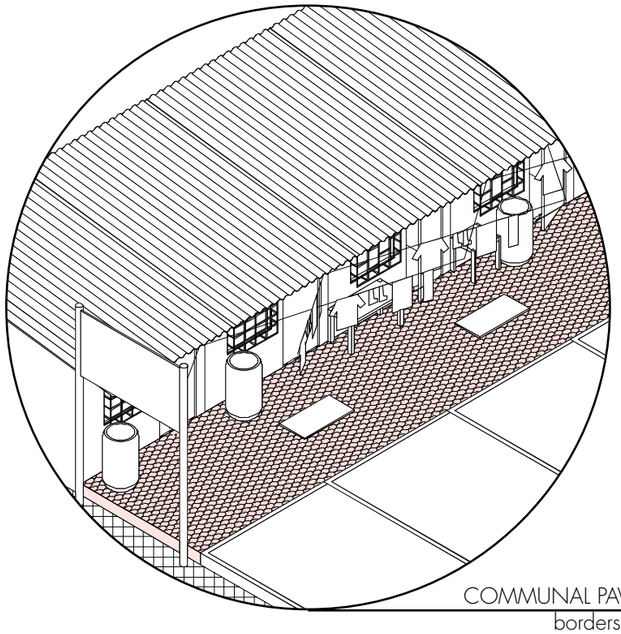


THE COMMERCIAL PLINTH
income genaration

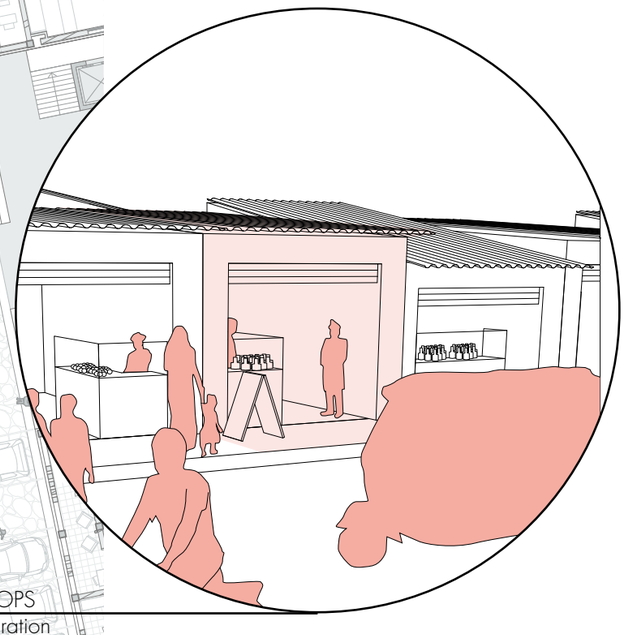


THE HOLY TREE
social spaces

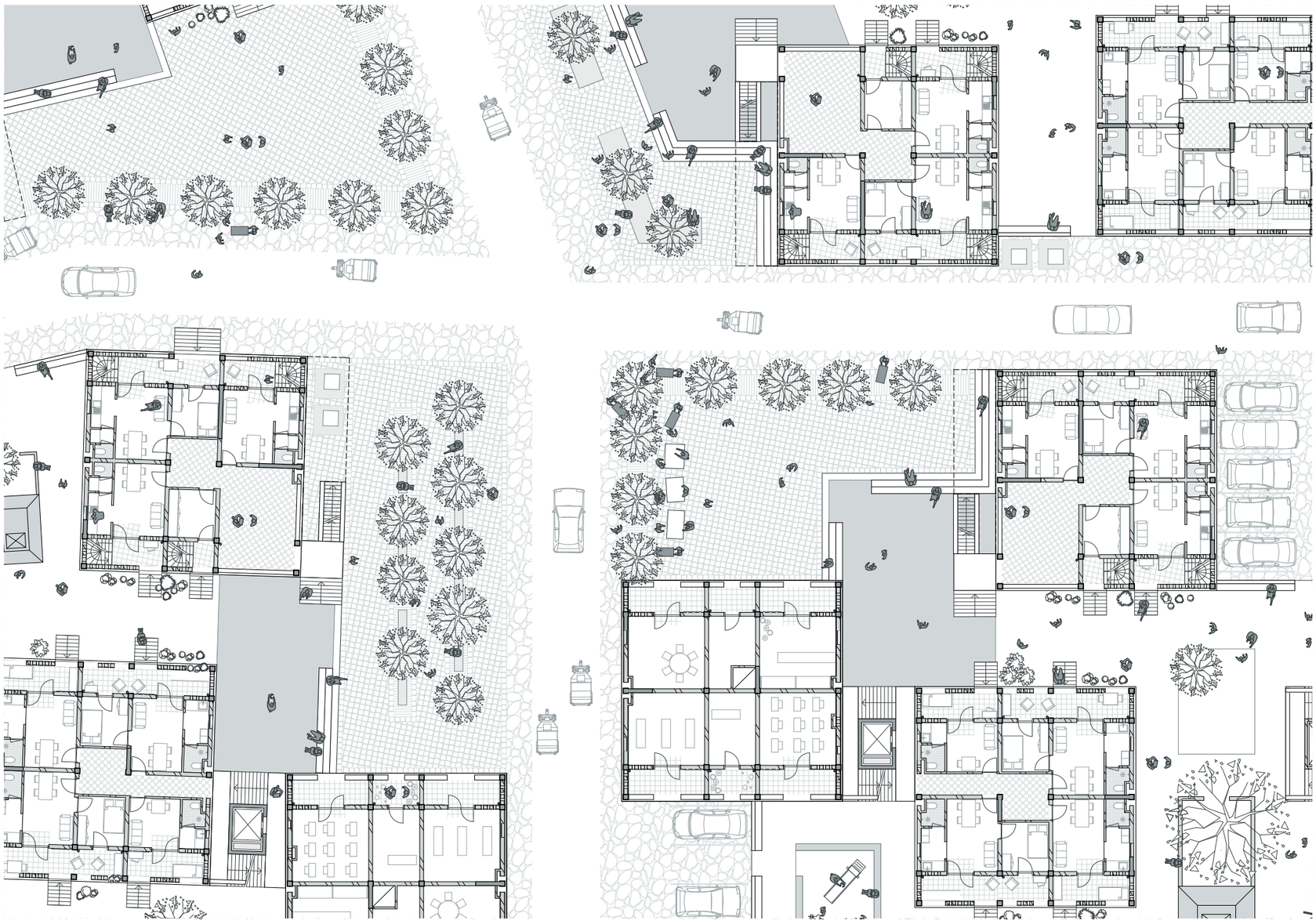
STREET VENDOR
income genaration



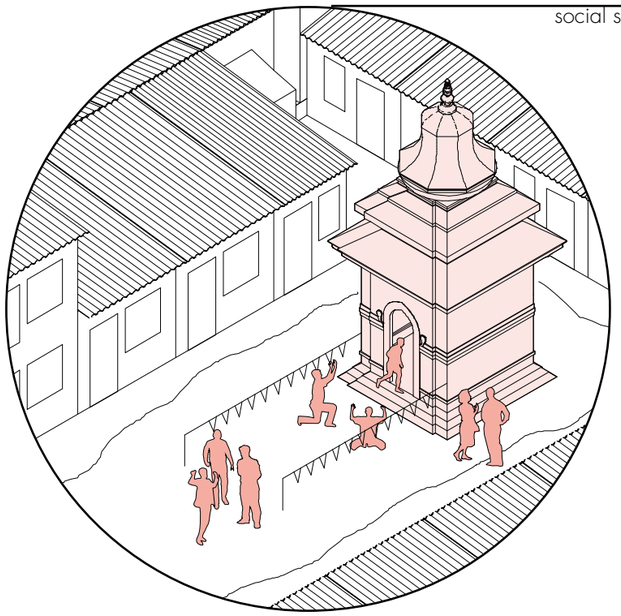
COMMUNAL PAVEMENTS
borders

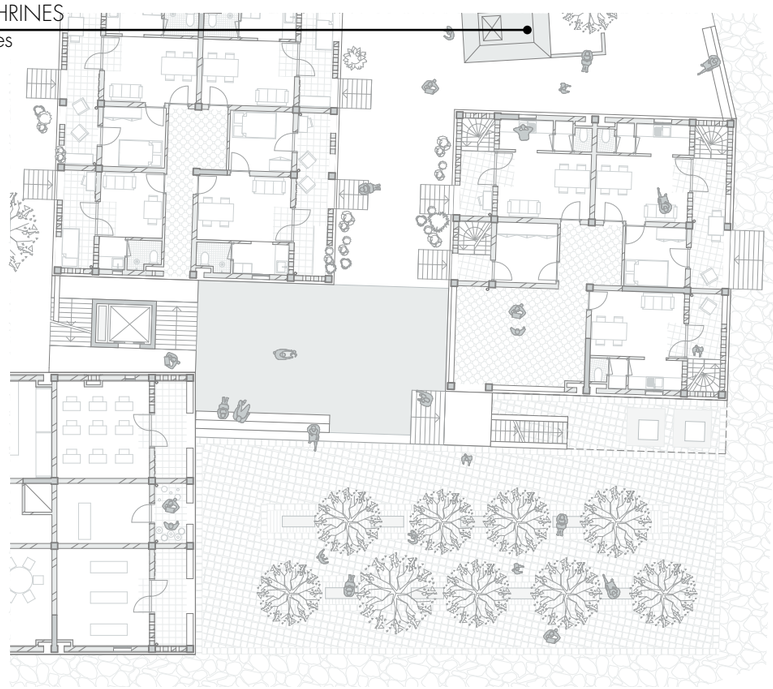


LOCAL SHOPS
income genaration

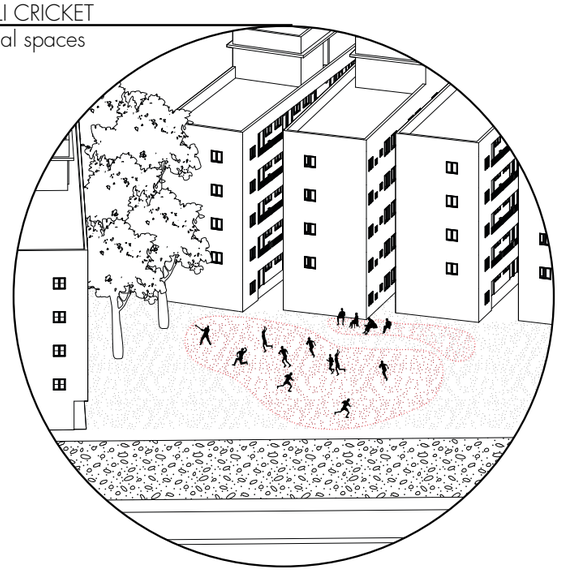


TEMPLES AND SHRINES
social spaces



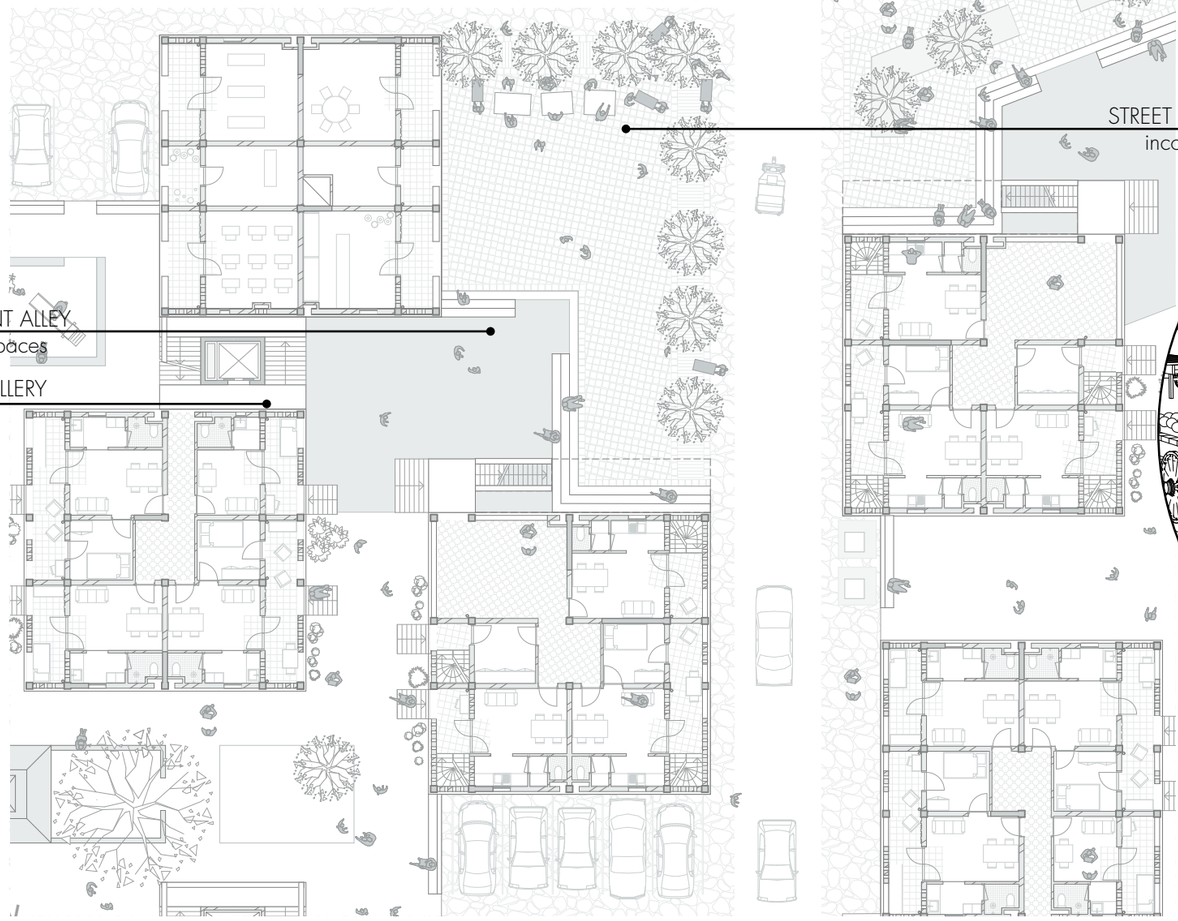


GALLI CRICKET
social spaces

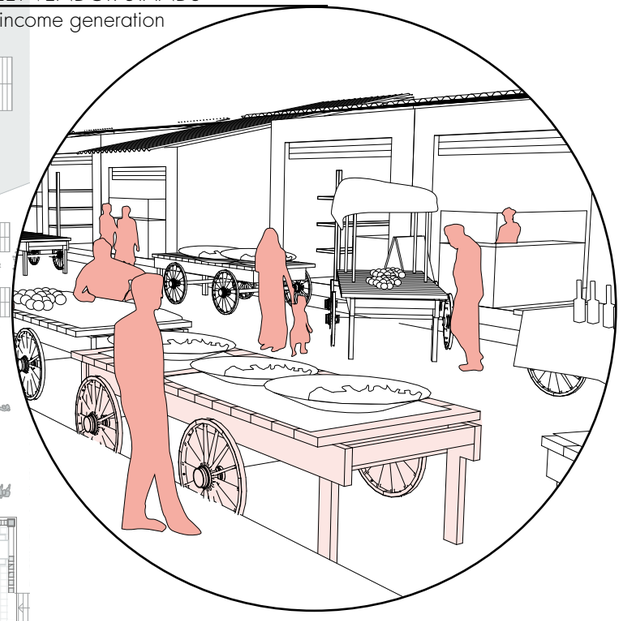


THE FRONT ALLEY
social spaces

THE CIRCULATION GALLERY
social spaces



STREET VENDOR STANDS
income generation



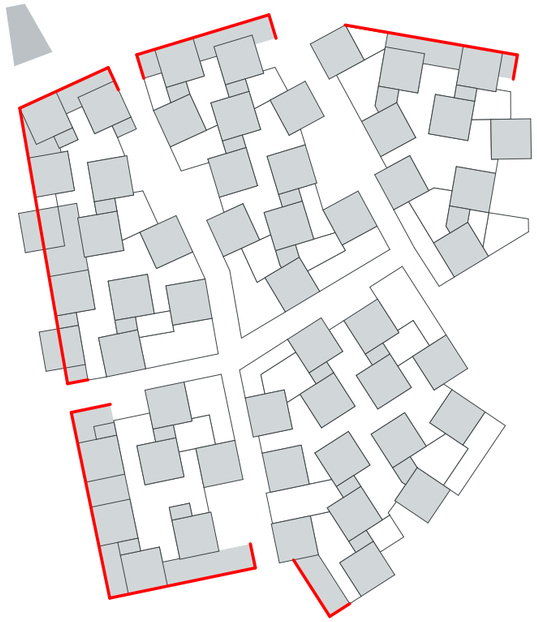
COMMUNITY AND PRIVACY

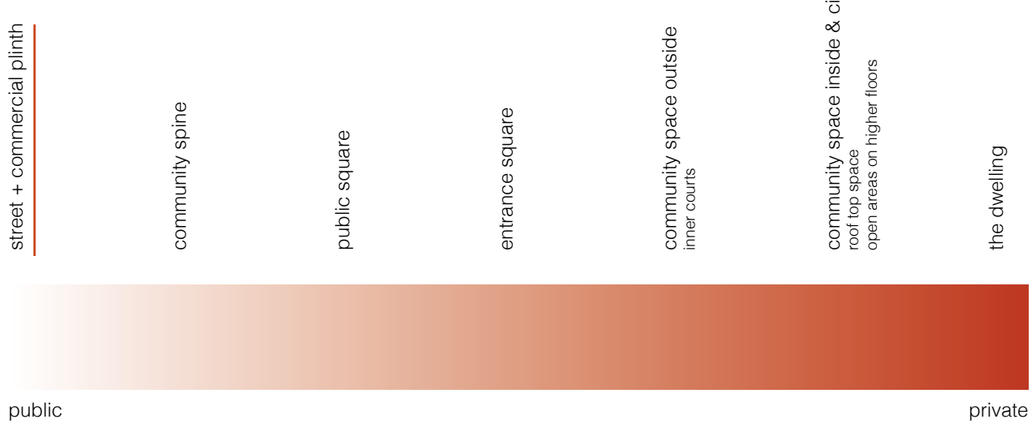
"Successful housing is a seamless continuum of spaces that goed all the way from the most private, to the semi-privat to the public. in this way it create communities"

Charles Correa
(DASH #12-13, 96)

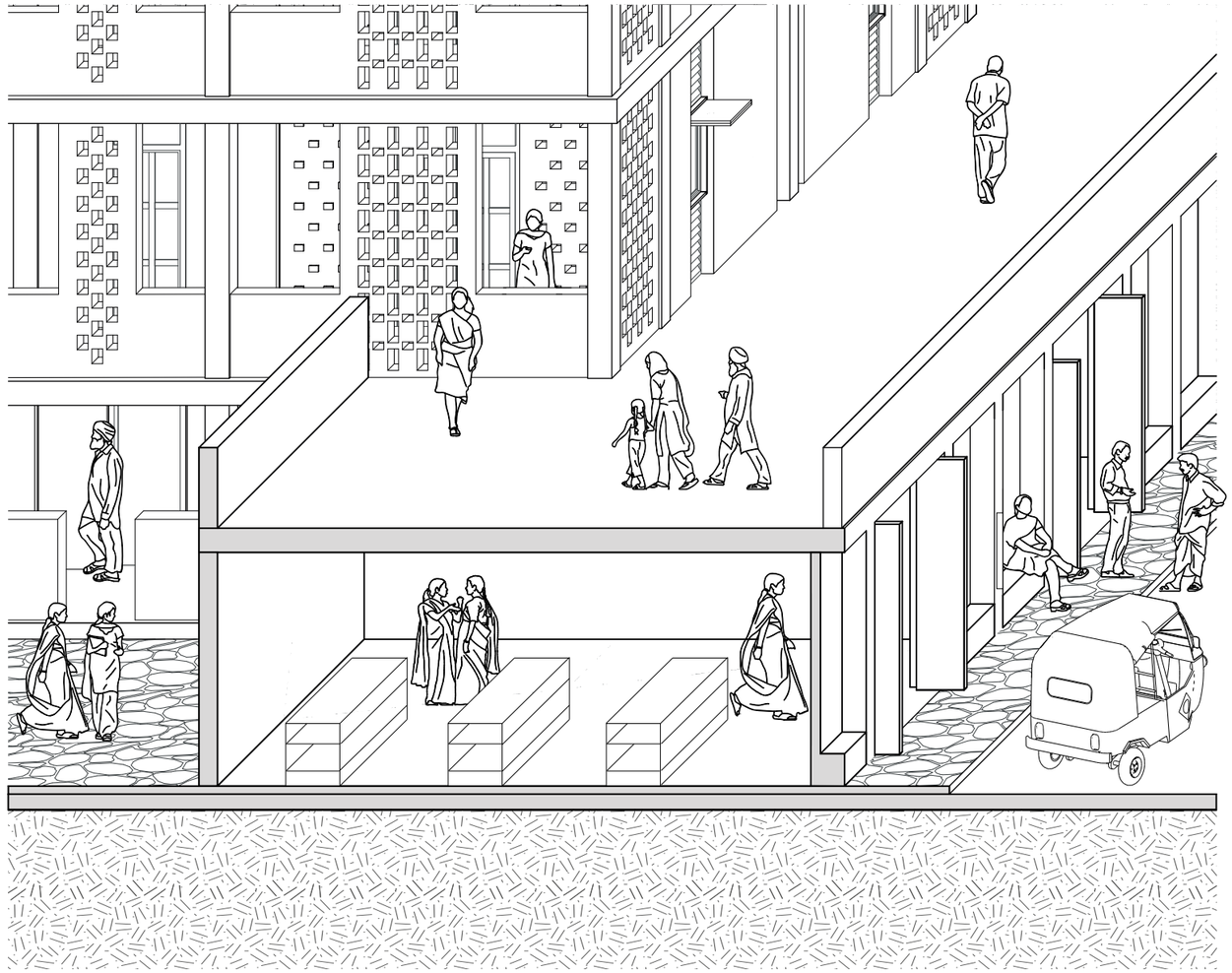
community and privacy // from public to private

Kuitenbrouwer, Paul, and Dick Van Gameren. 2015. DASH Global housing: affordable dwellings for growing cities. Rotterdam. Vol. 12-13. Rotterdam: Ai010 Uitgevers/Publishers, 96

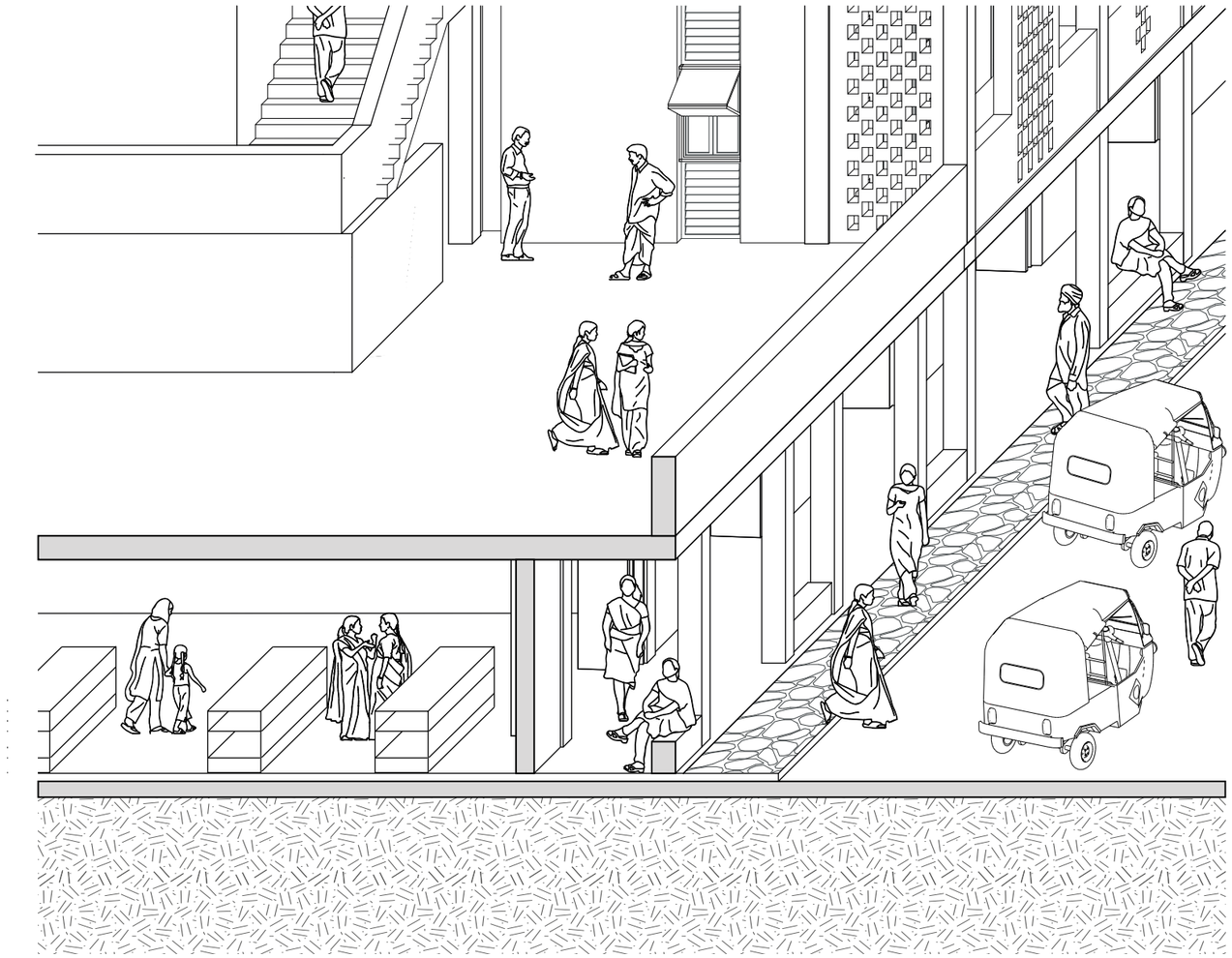




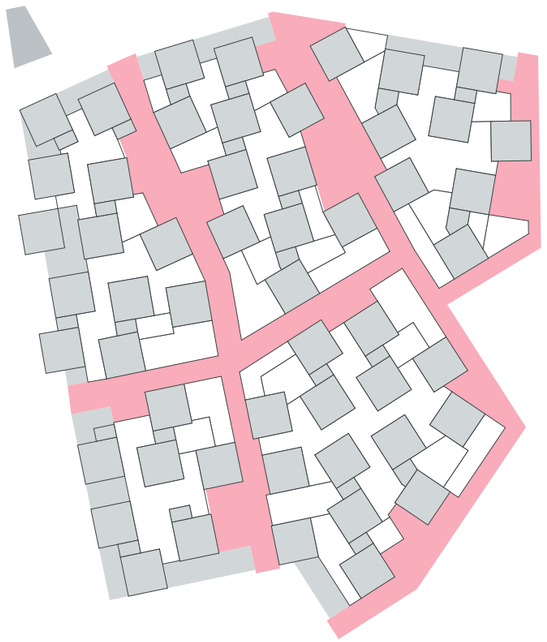
community and privacy // **commercial plinth**

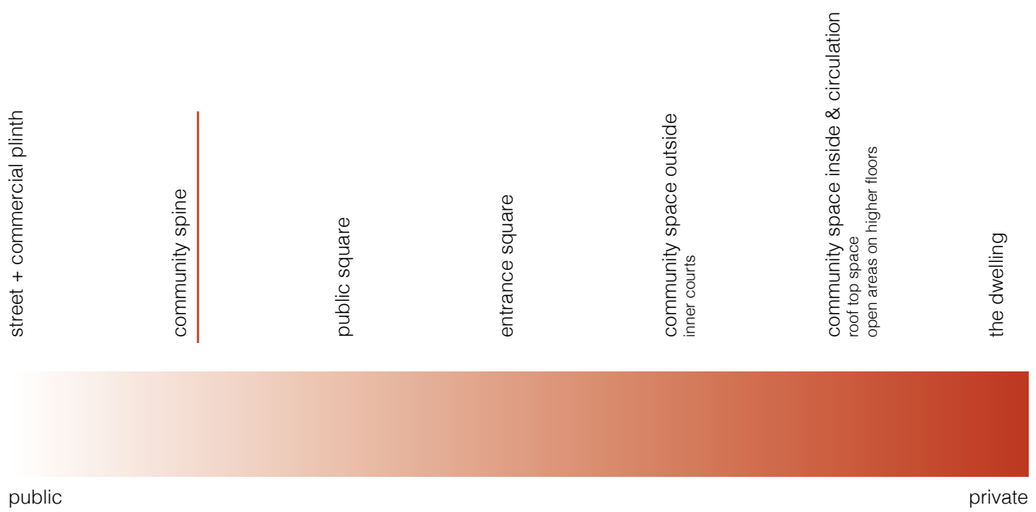


COMMUNITY SPINE
STREET PROFILE // 1:75

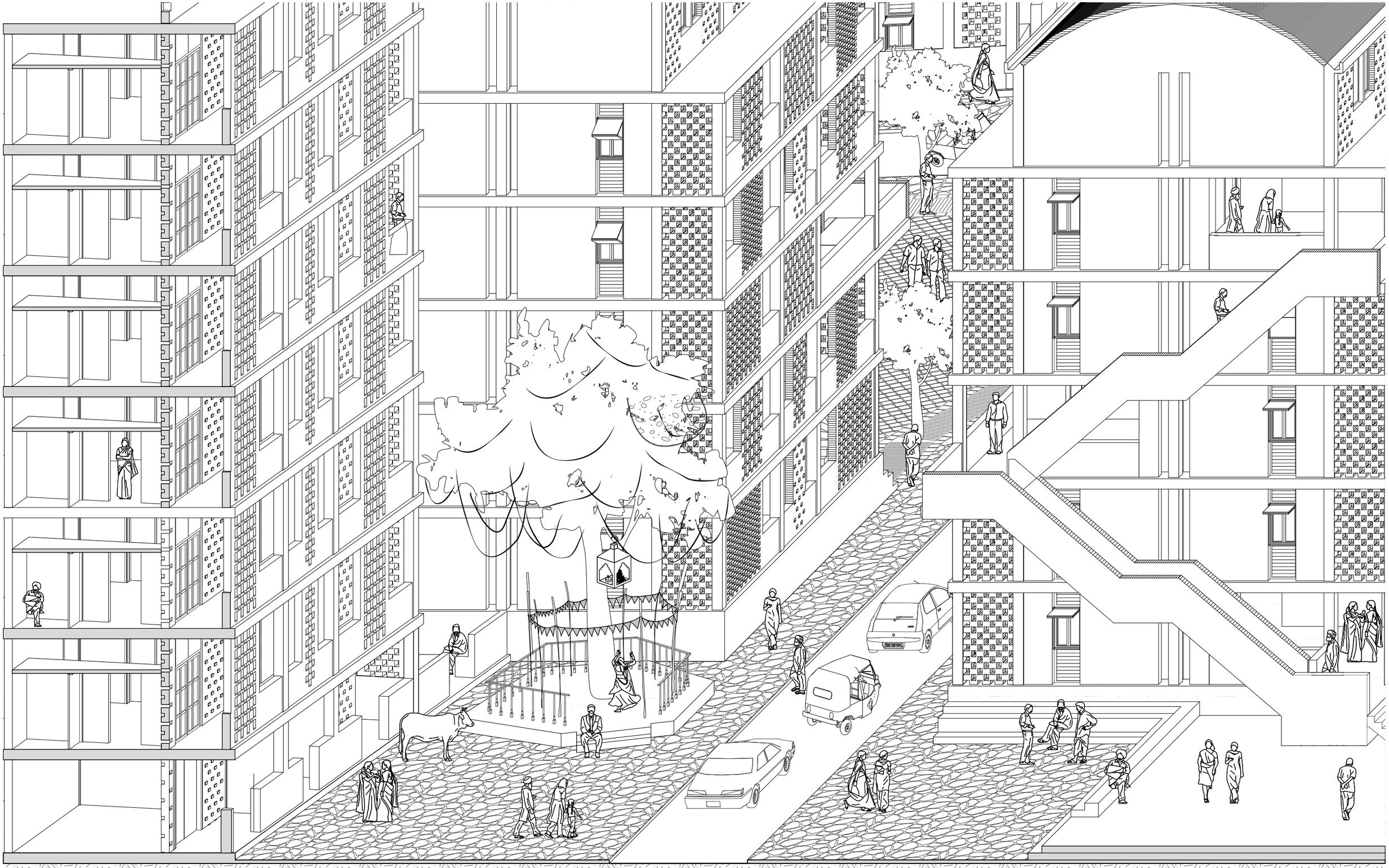


community and privacy // commercial plinth

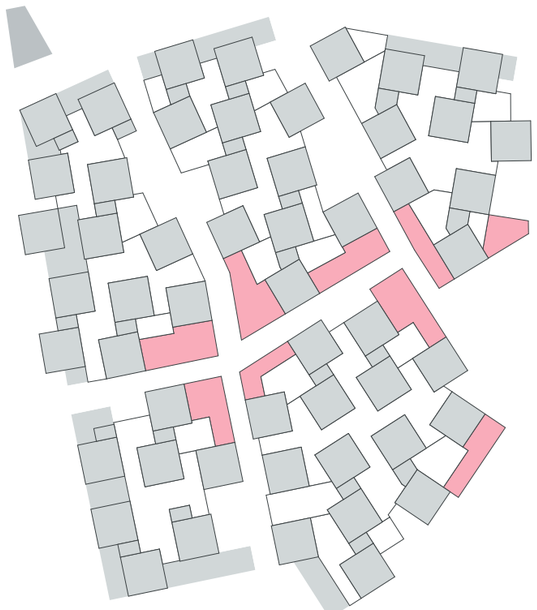


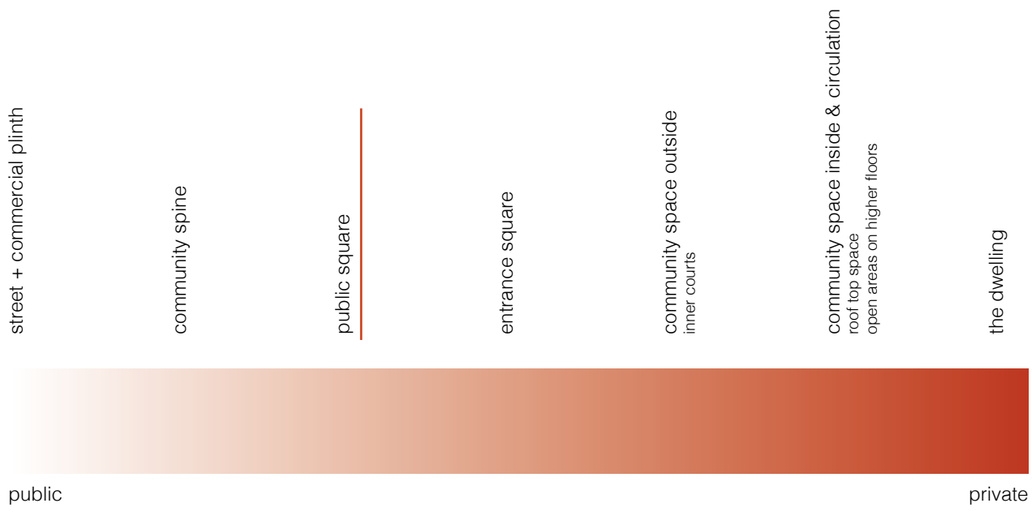


community and privacy // **community spine**



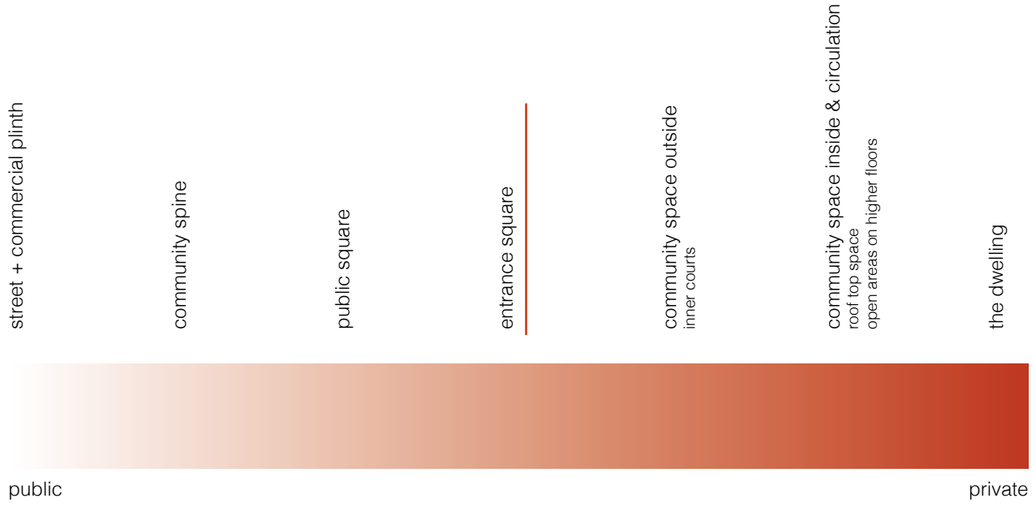
COMMUNITY SPINE
STREET PROFILE // 1:200



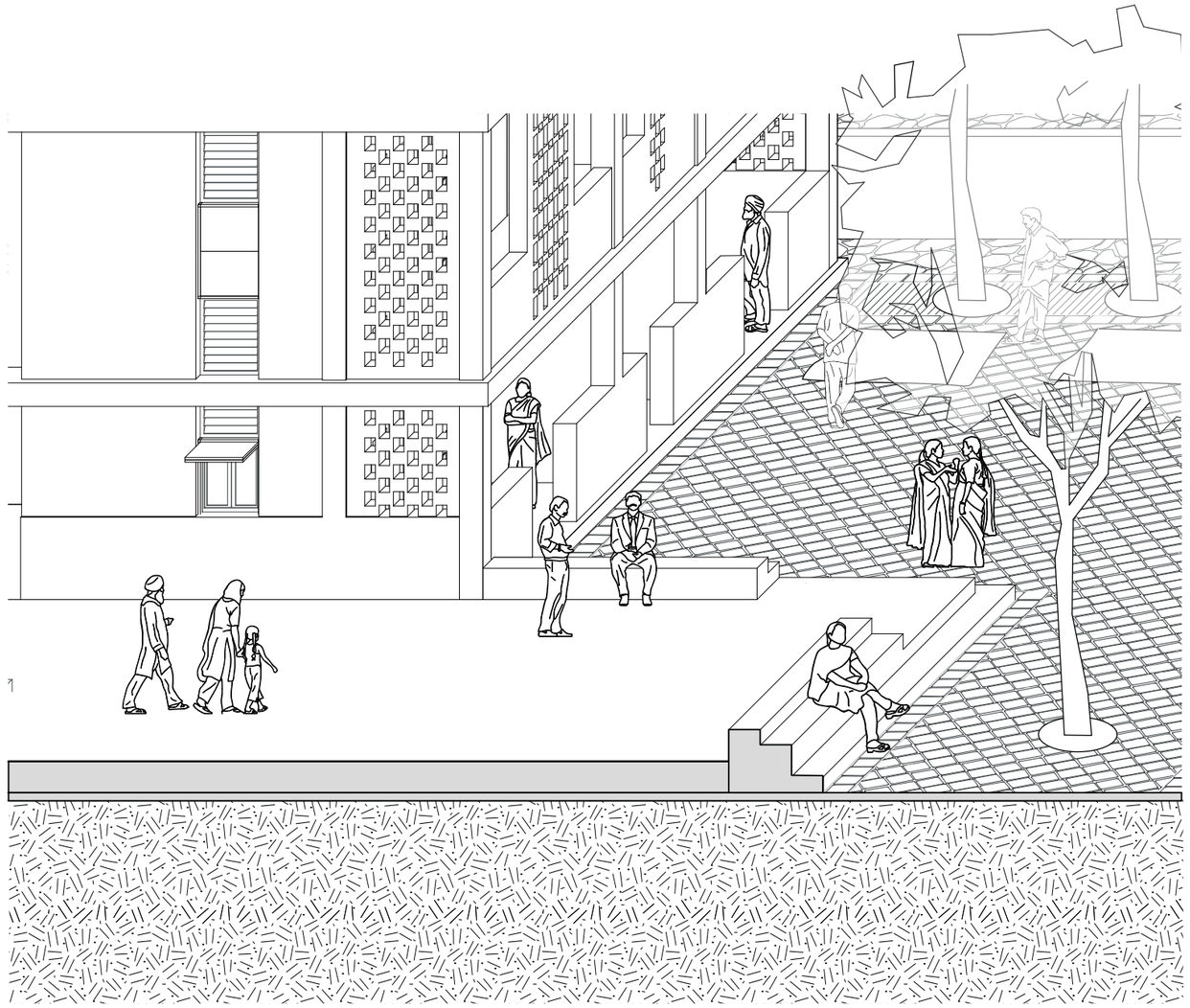


community and privacy // public square

COMMUNITY SPINE
STREET PROFILE // 1:200



community and privacy // **entrance square**



community and privacy // **entrance square**

community and privacy // inner court

public

street + commercial plinth

community spine

public square

entrance square

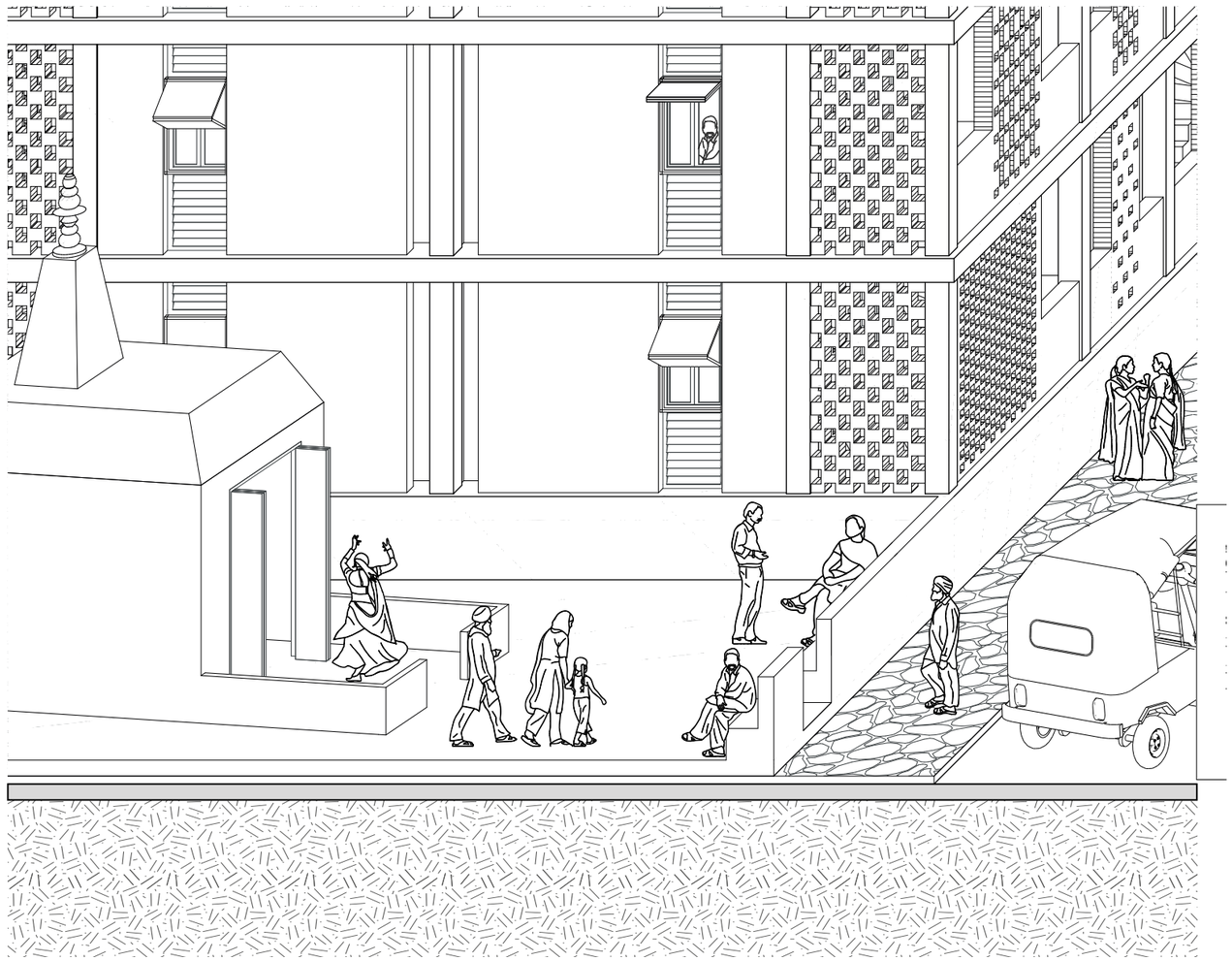
community space outside
inner courts

community space inside & circulation
roof top space
open areas on higher floors

private

the dwelling

community and privacy // **inner court**



community and privacy // **inner court**

community and privacy // community spaces

public

private

street + commercial plinth

community spine

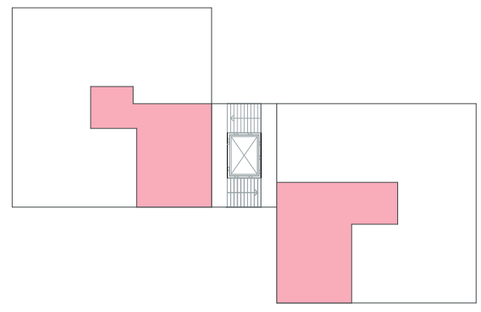
public square

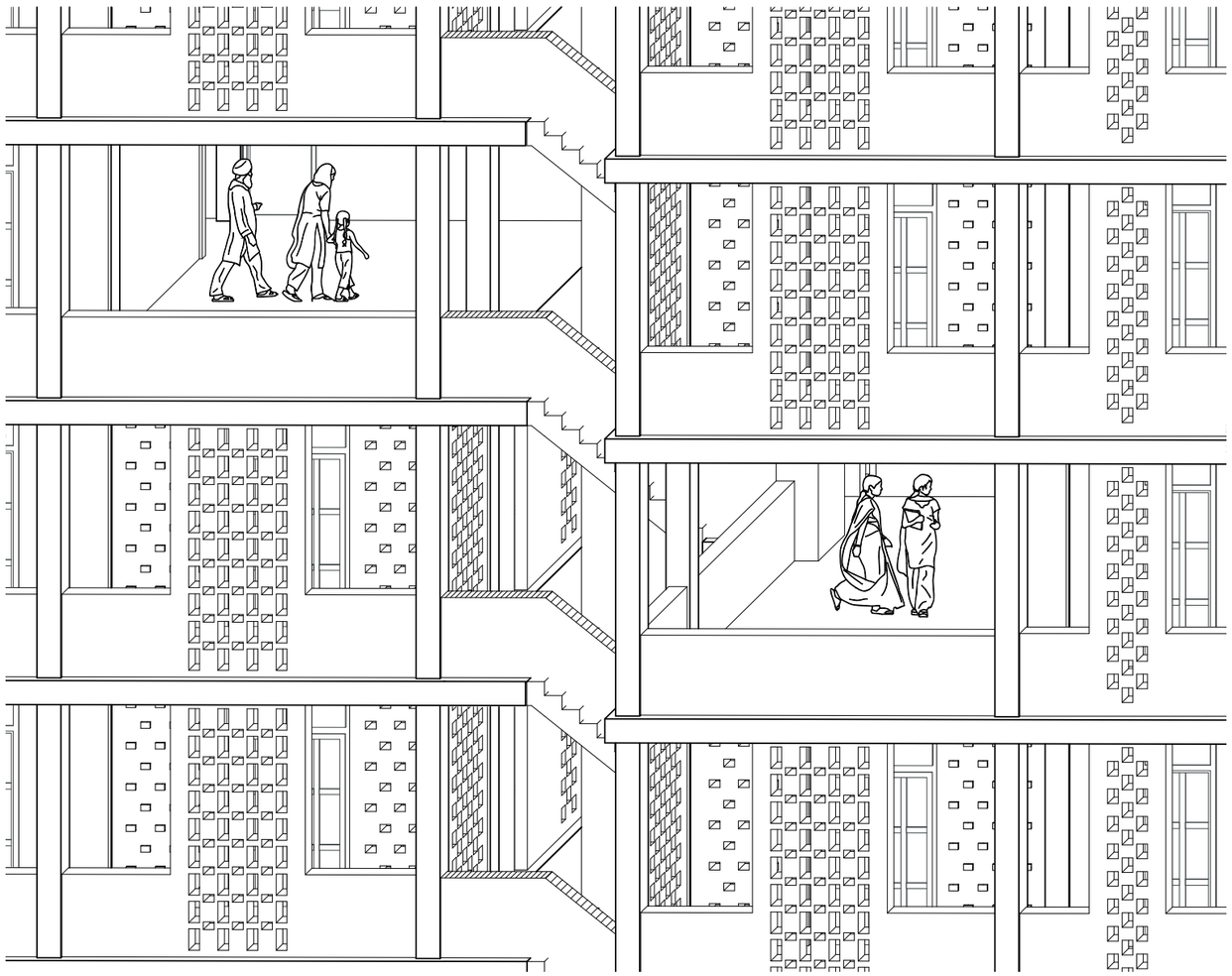
entrance square

community space outside
inner courts

community space inside & circulation
roof top space
open areas on higher floors

the dwelling





community and privacy // the unit

public

street + commercial plinth

community spine

public square

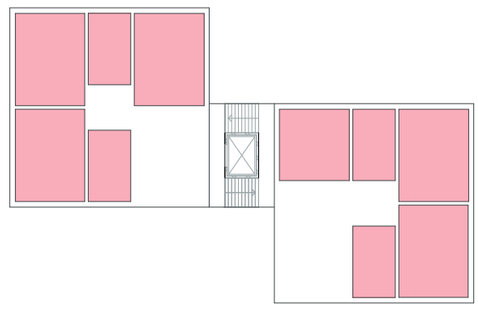
entrance square

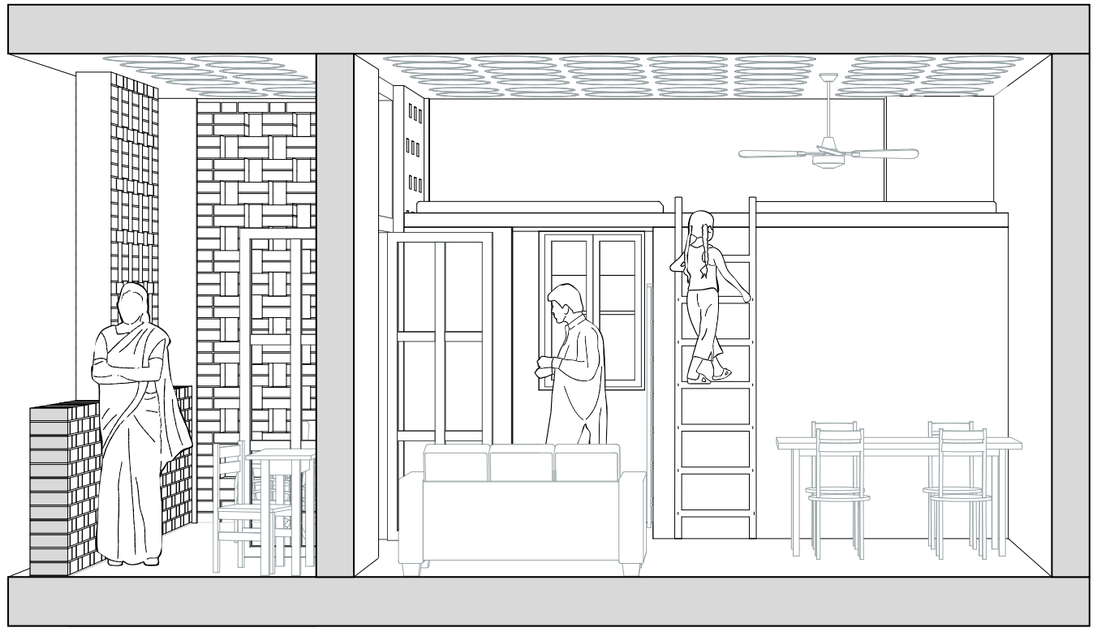
community space outside
inner courts

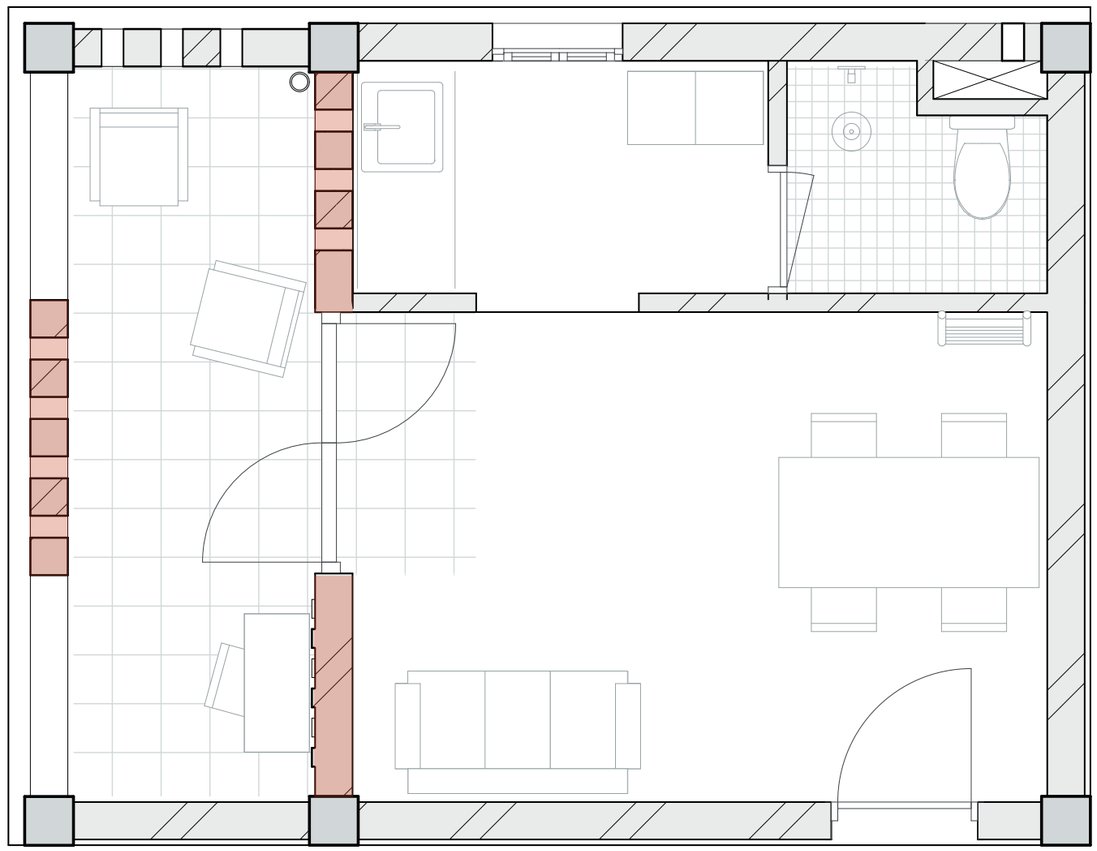
community space inside & circulation
roof top space
open areas on higher floors

the dwelling

private







GROWTH AND CHANGE


नूर बेकरी


नूर बेकरी

AMENITIES

TOTAL COMMUNITY ENVIRONMENT DIAGRAM

social structure	physical structure
Person // 1p //	room
Family // 5-10p //	house, front yard, backyard
Neighbourhood //100 -150 f //	nursery, school, nutrition centre, basketball court, playground, small general store
Community //500 -750 f //	community centre, elementary school, health clinic, religous place, shops and stores
Zone // 1500-2500f //	Zone centre, Police Centre
New Town	Police headquarters, commerical area, fire station, high school, market, hospital

amenities // reference scheme

COMMUNITY

buildings facing entrance square

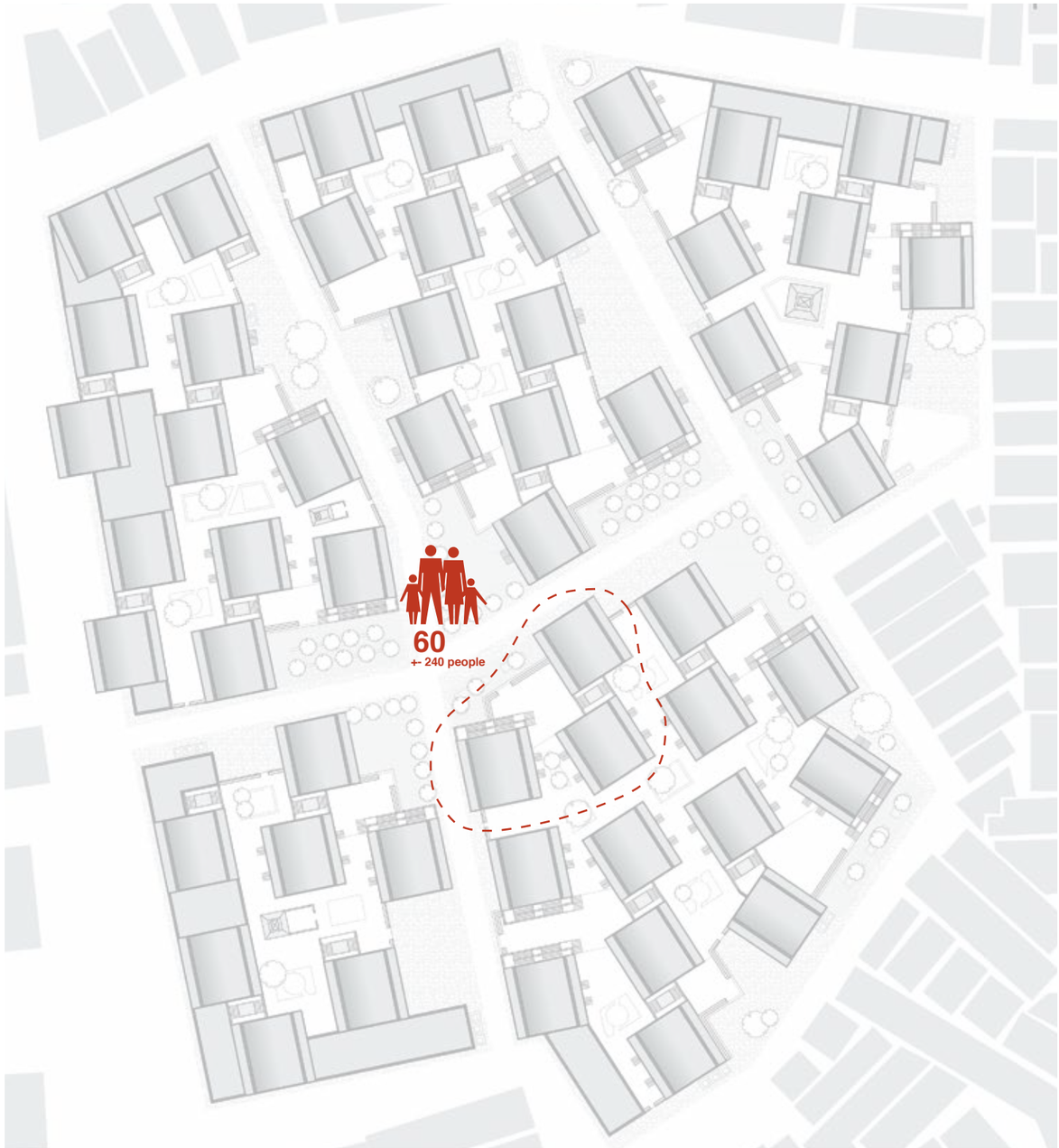
60 families

SHARED SPACES:

entrance square
vertical circulation system
community space on roof
comminity space on higher floors

SHARED AMENITIES:

-



NEIGHBORHOODS

area diffined by community spine and/or commercial plinth

+- 150 - 280 familiess

SHARED SPACES:

inner courts
with
playgrounds and places to sit

SHARED AMENITIES:

small scale amenities
like a nursery or community centre
-

AREA

+- 5 neighborhoods

SHARED SPACES:

the community spine
public squares

SHARED AMENITIES:

one bigger amenity cluster
primary school and community centre

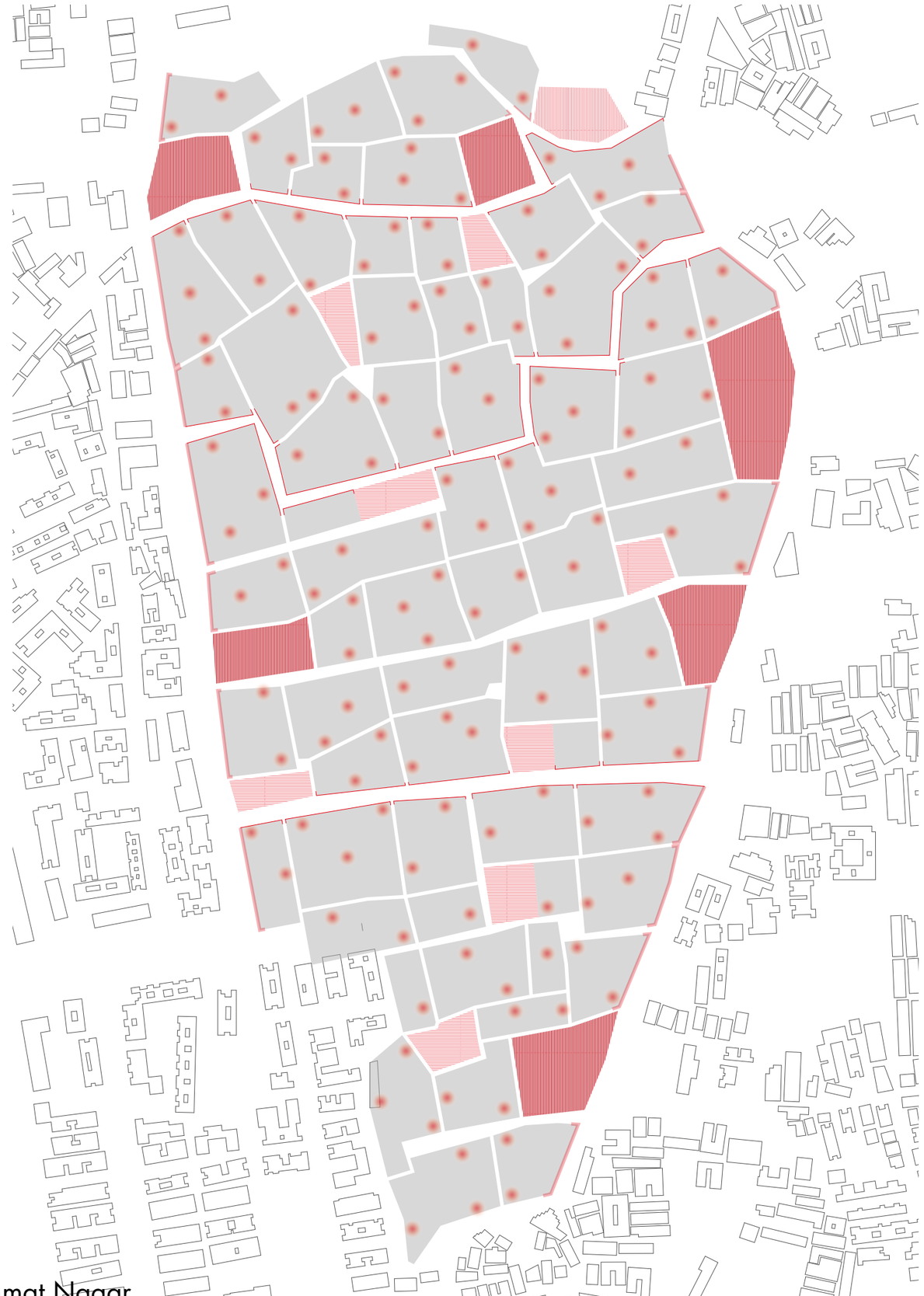
RAHMAT NAGAR

SHARED SPACES:

commercial street
pocket park

SHARED AMENITIES:

the commercial plinth
amenity pockets
-



COMMUNITY COMPARISON

DENSITY
baithi chawl

FSI = 0,75

325 units per hectare

open space index = 0,2

community comparison // density

DENSITY
chawls

FSI = 3

units per hectare = 1325

open space index = 0,2

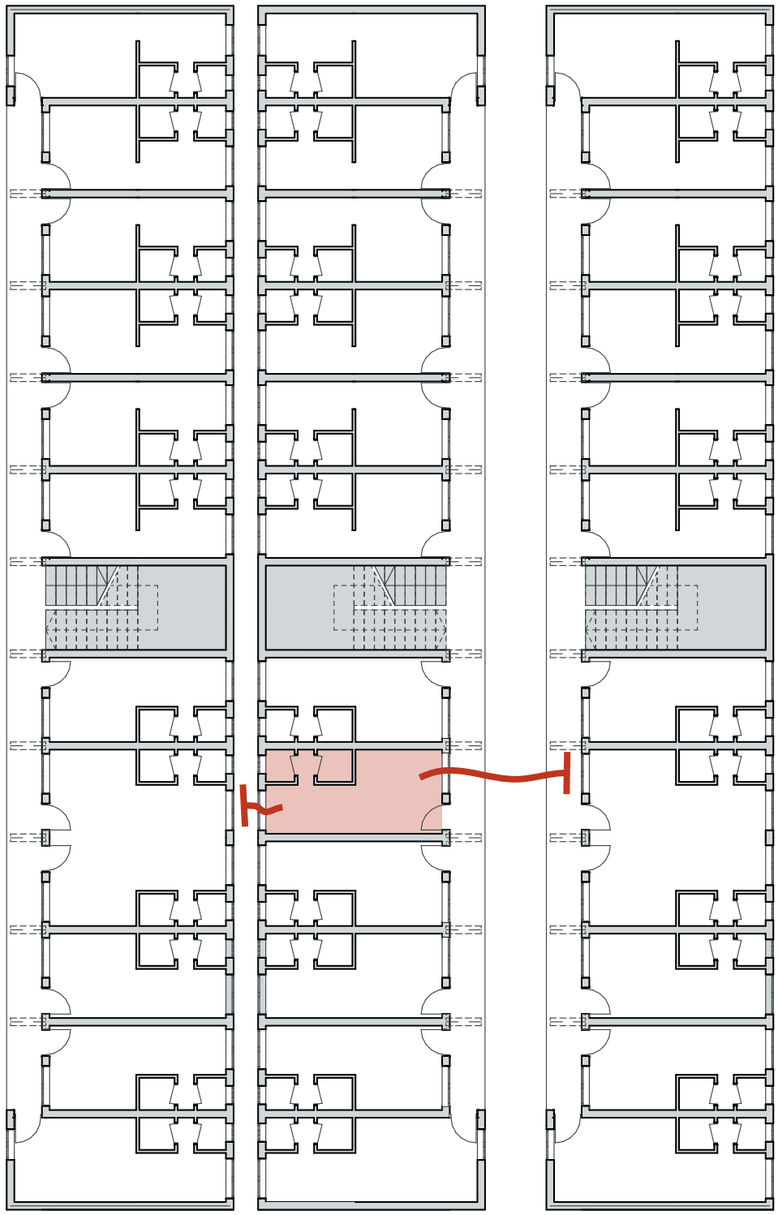
DENSITY
new proposal

FSI = 2,3

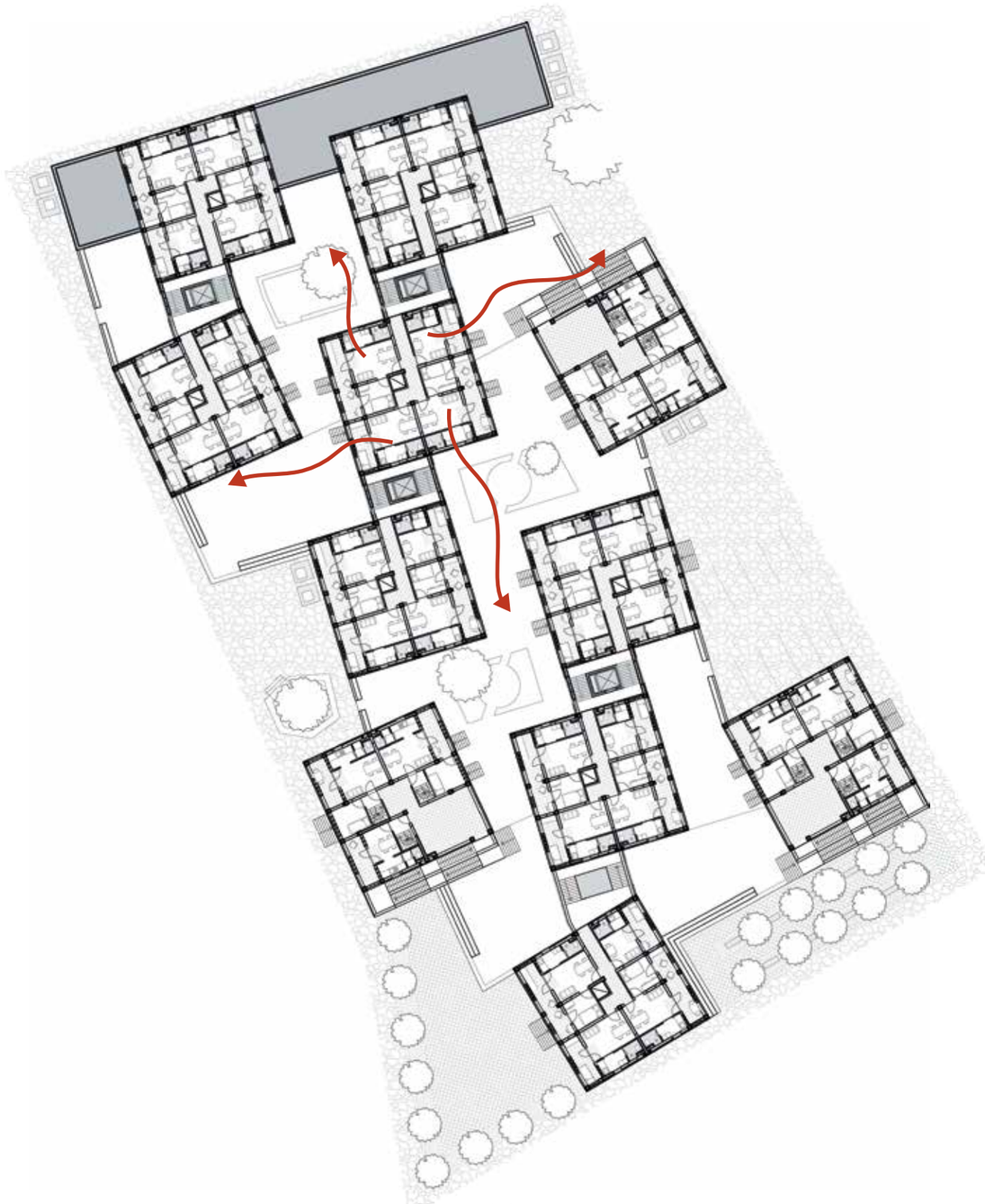
435 units per hectare

open space index = 0,6

community comparison // **density**



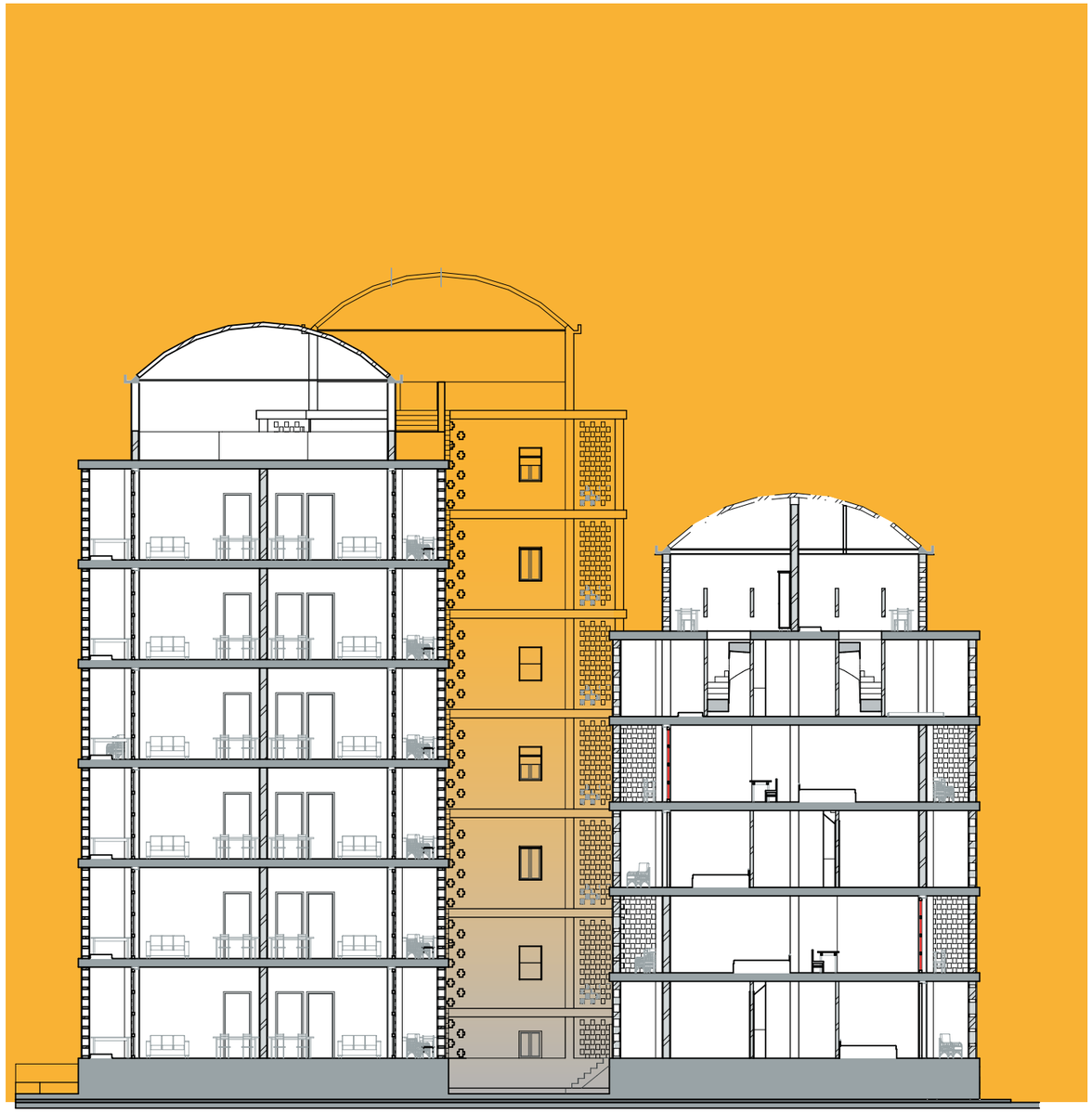
VIEW
chawl



VIEW
new proposal

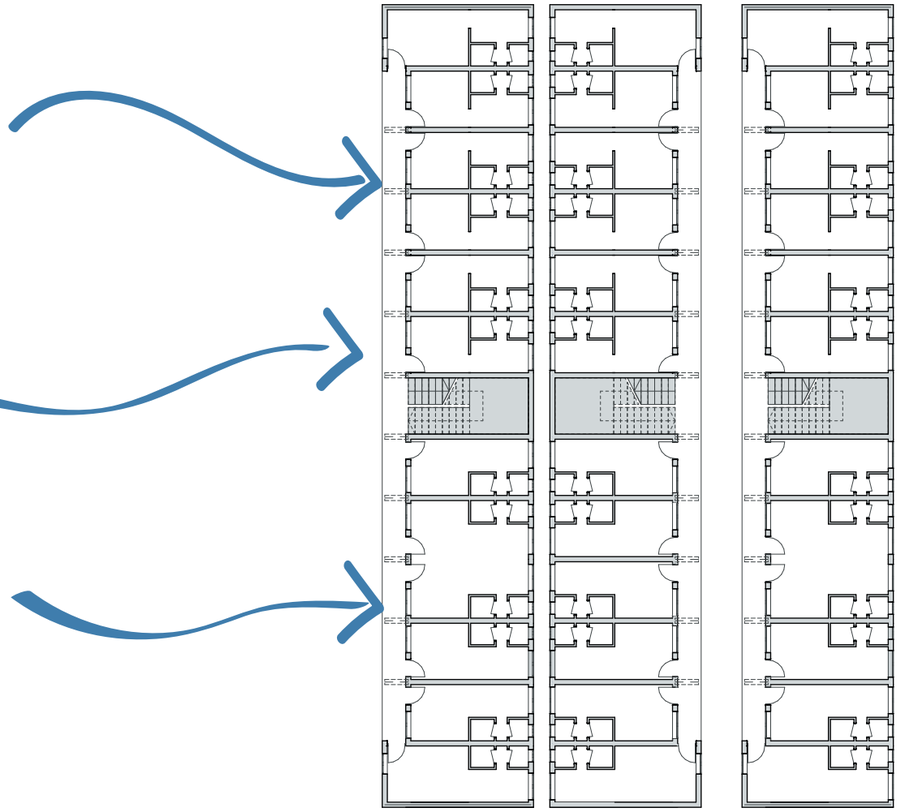
community comparison // Rahmat Nagar

DAYLIGHT ACCESS
chawls

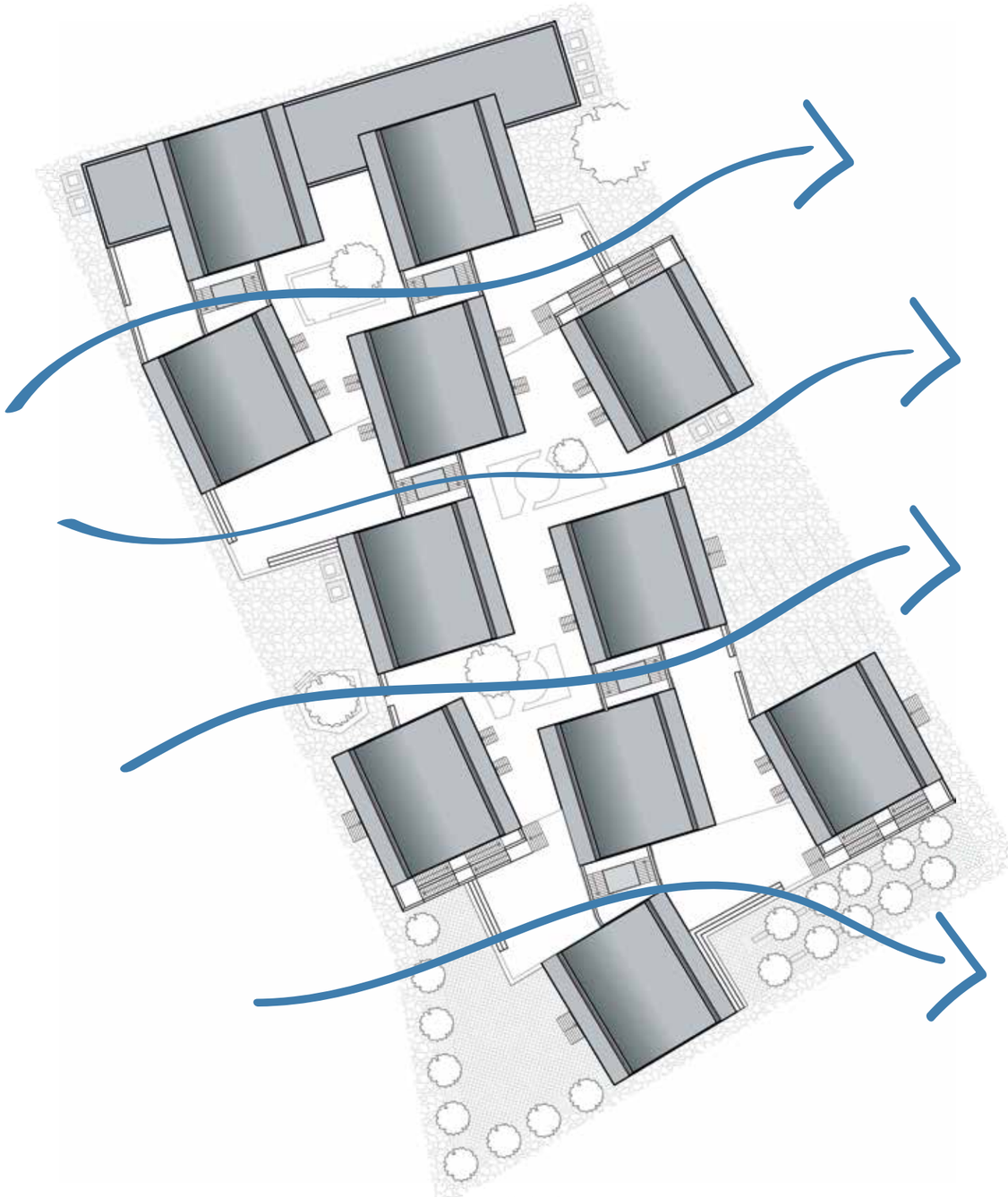


DAYLIGHT ACCESS
new proposal

community comparison // Rahmat Nagar

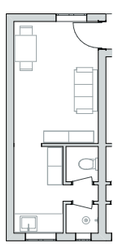


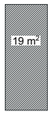
VENTILATION
chawls



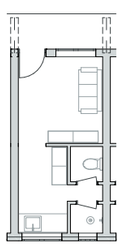
VENTILATION
new proposal

community comparison // Rahmat Nagar



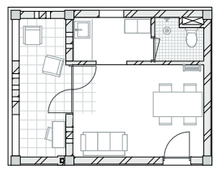


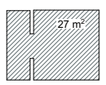
corner apartment
19m²



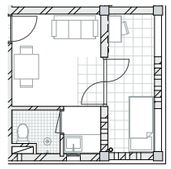
standard unit
16m²

DWELLING TYPES
chawl

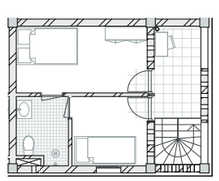


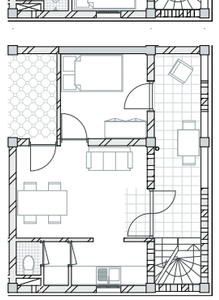


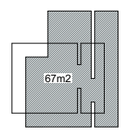
basic unit
27 - 41m²



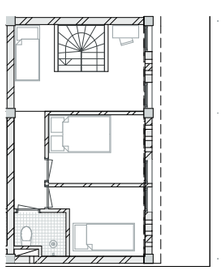
small basic unit
20-34m²

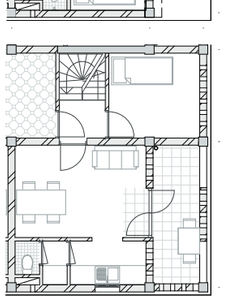


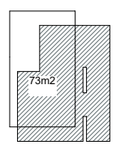




maisonette
67 m²



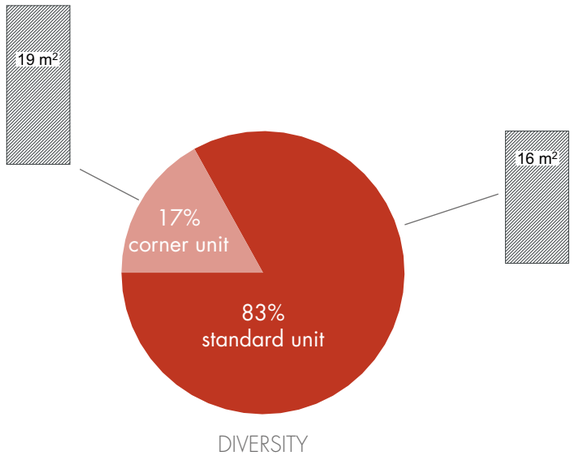




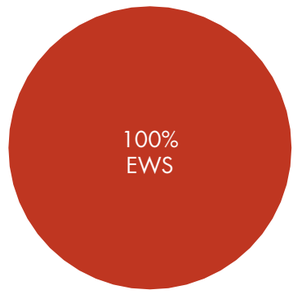
penthouse
73m²

DWELLING TYPES
new proposal

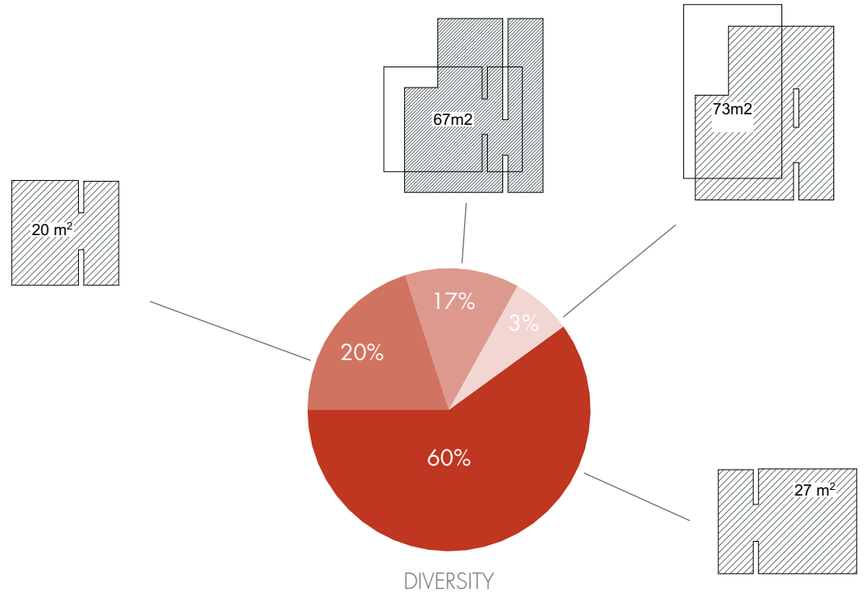
community comparison // Rahmat Nagar



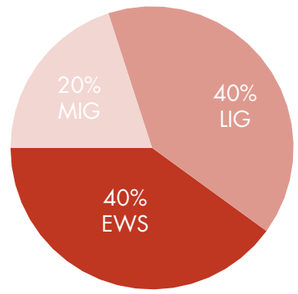
DIVERSITY



INCOME GROUP



DIVERSITY



INCOME GROUP

EWS	//	<27,88 m²
LIG	//	27,88 m2 - 45 m²
MIG	//	45 m2 - 80 m²

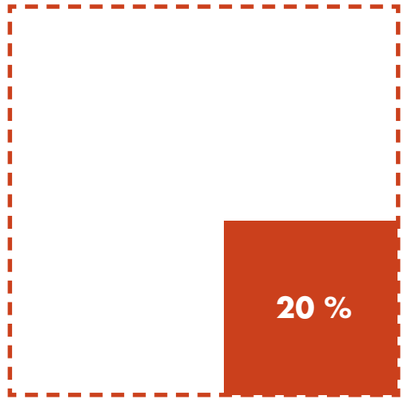
DIVERSITY - DWELLINGTYPES AND INCOME GROUP
chawl

average unit size = 16,5m²

DIVERSITY - DWELLINGTYPES AND INCOME GROUP
new proposal

average unit size 40 m²

community comparison // Rahmat Nagar

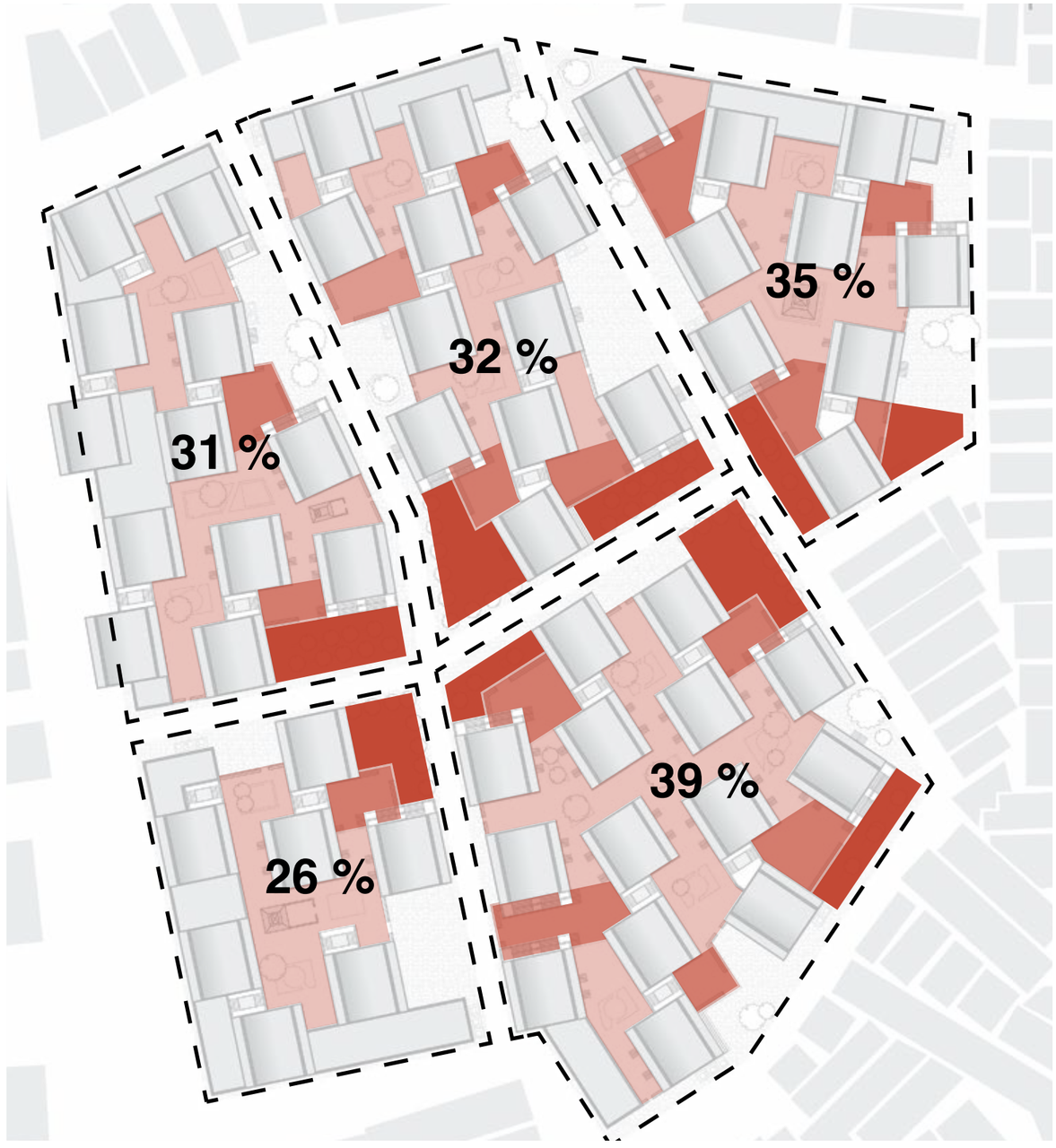


RECREATIONAL OPEN SPACE
according to DCR

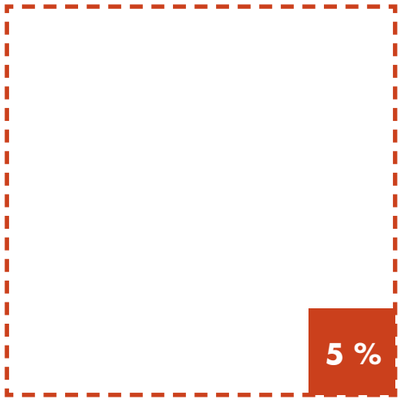
Mumbai, Development Control Regulations, 2016

community comparison // Rahmat Nagar

RECREATIONAL OPEN SPACE
chawls



RECREATIONAL OPEN SPACE
new proposal

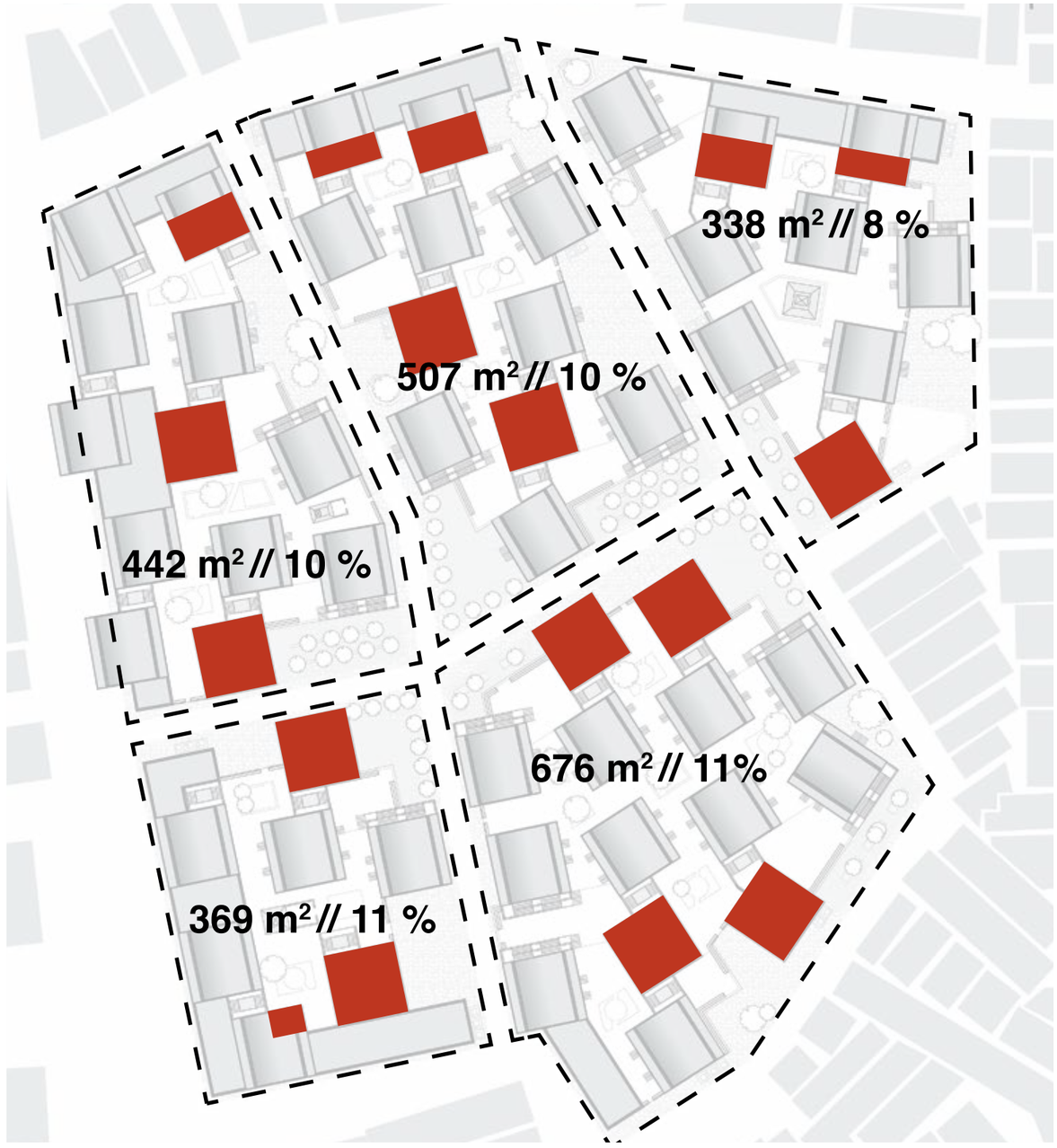


Mumbai, Development Control Regulations, 2016

AMENITIES
according to DCR

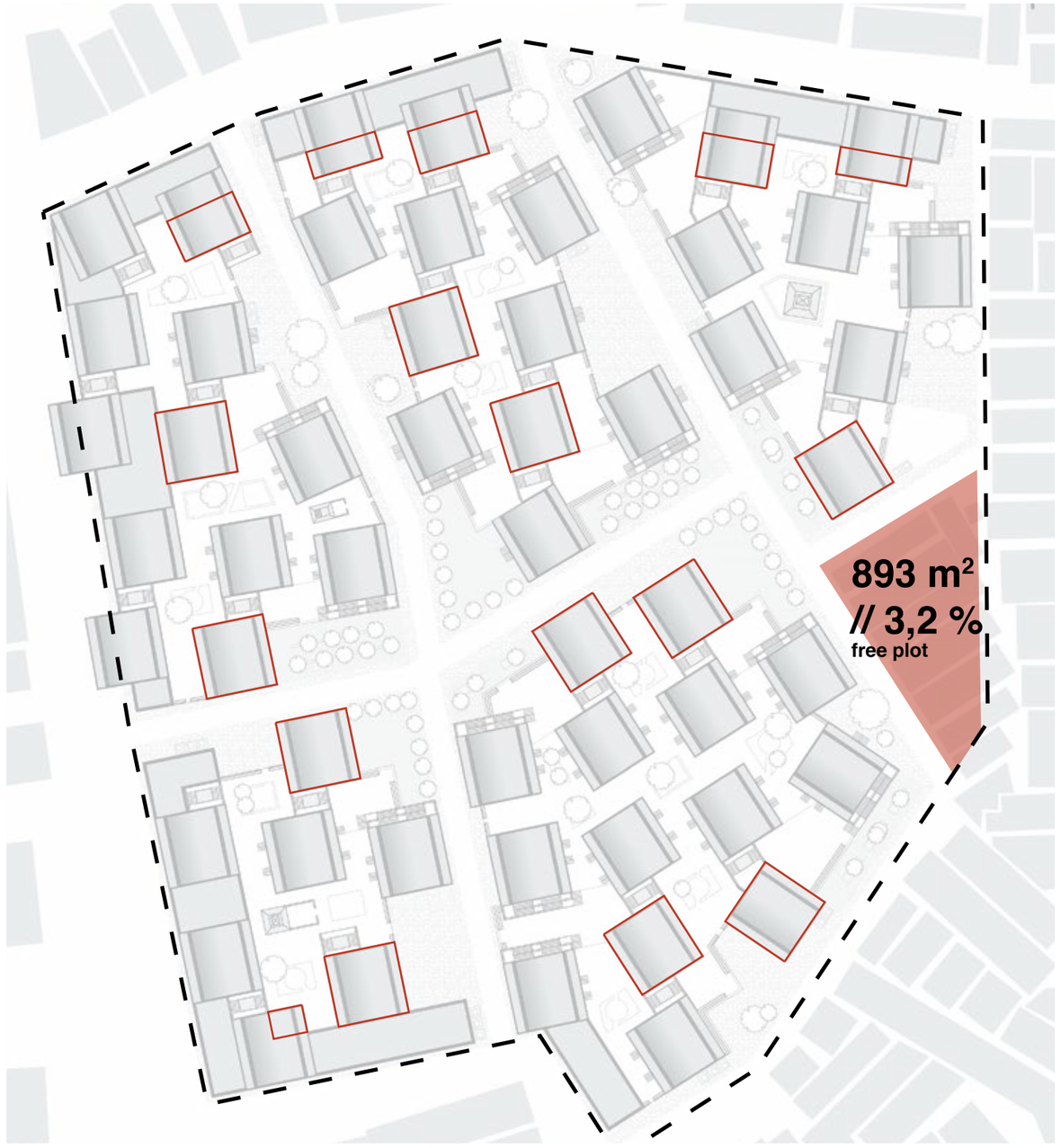
The Mumbai DCR regulations state that 5 % of developed areas schould be reserved for amenities

AMENITIES
chawls



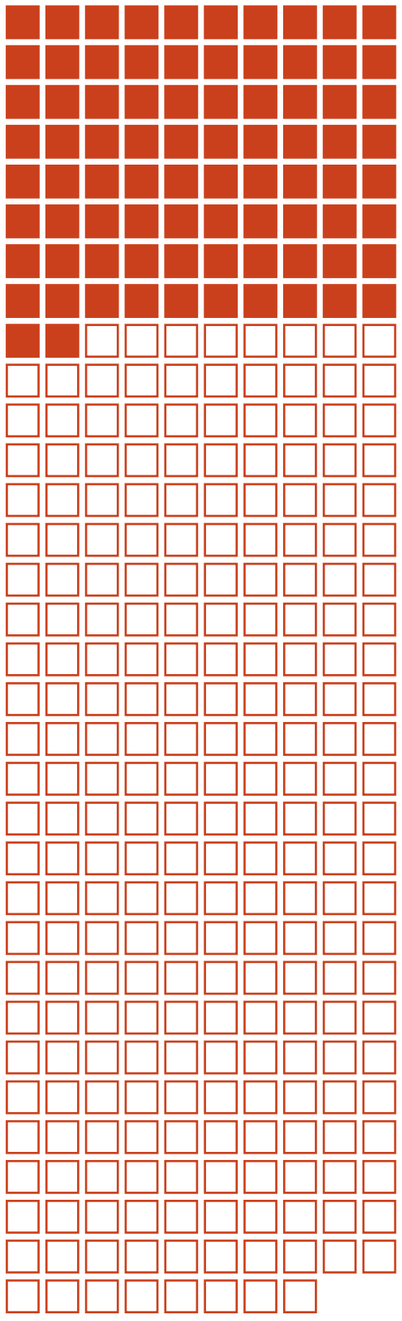
AMENITIES
new proposal

community comparison // Rahmat Nagar



AMENITIES
new proposal

community comparison // Rahmat Nagar

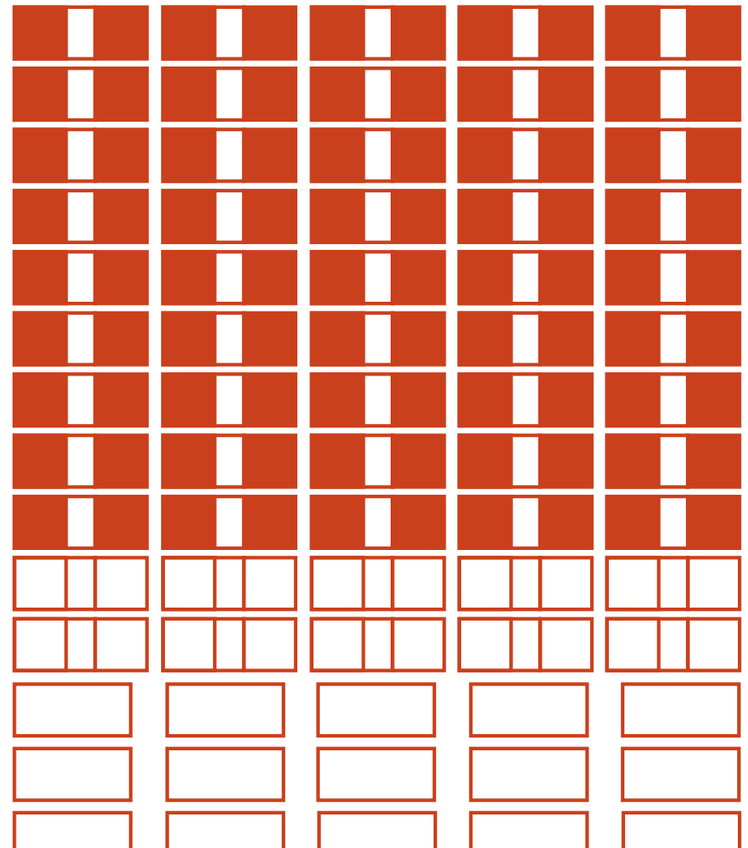


FEASIBILITY

total new build floorspace: 53.922m2
added saleable floorspace: + 40.441 m2

EWS	LIG	MIG
40.4411 m2	0	0

TOTAAL : 205 crore



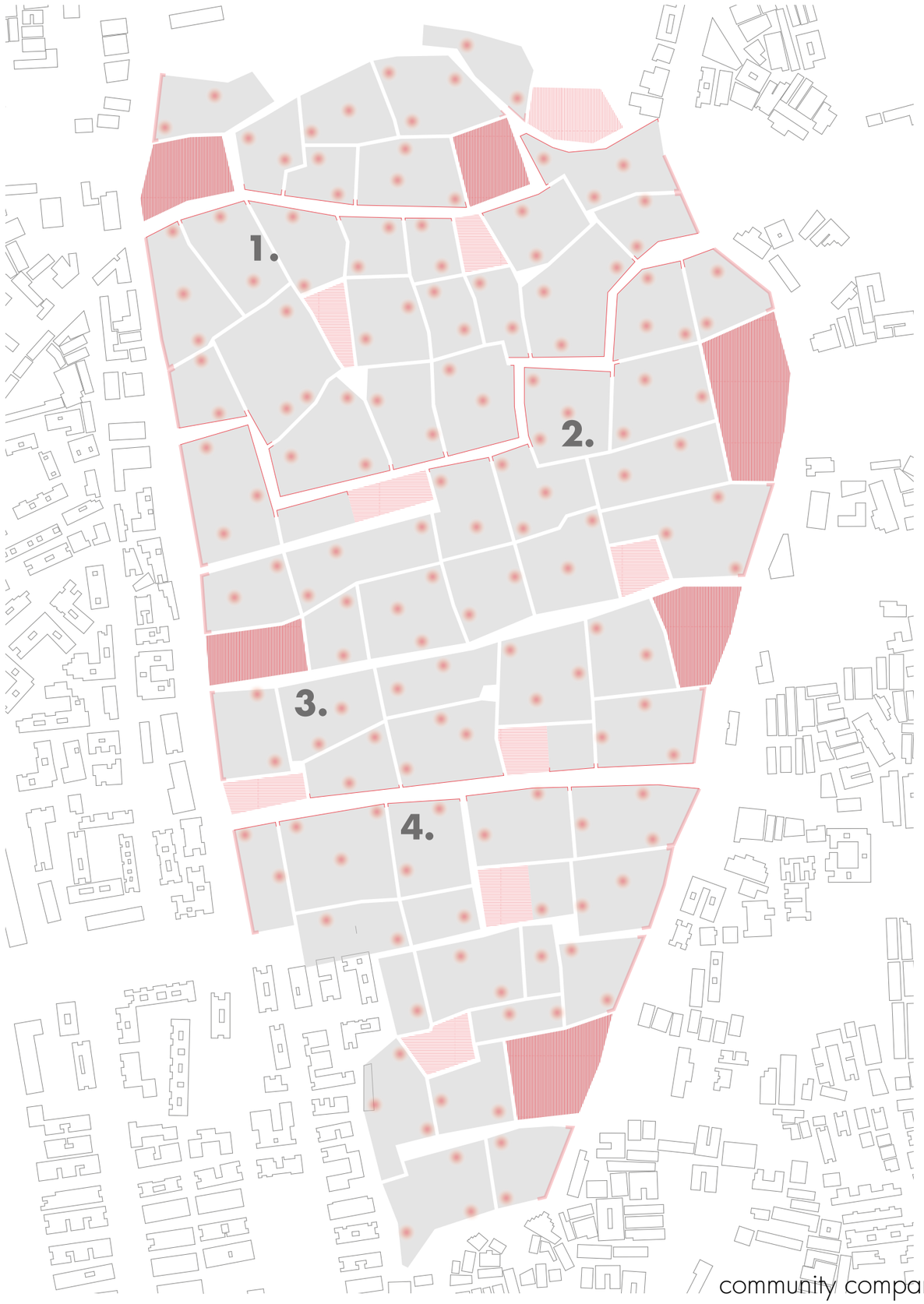
FEASABILITY

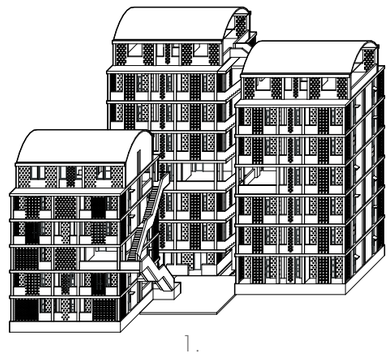
total new build floorspace: 46.255m2
added saleable floorspace: + 19.907 m2

EWS	LIG	MIG
2221m2	3875m2	8508m2

TOTAAL :196 crore

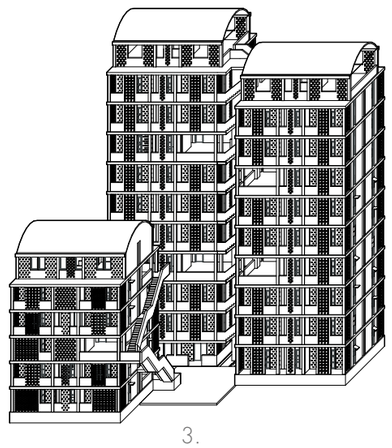
community comparison // Rahmat Nagar



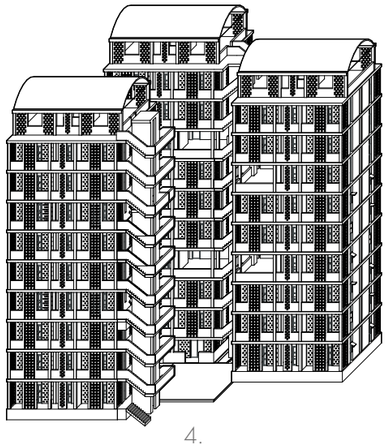


1.
6 - 7 floors
435 units /hectare
average unit size = 40m²

2.
6 - 8 floors
488 units /hectare
increase of profit: 476.196.000 rupees
+24 %



3.
6 - 10 floors
612 units /hectare
increase of profit: 1.428.588.000
+ 73%



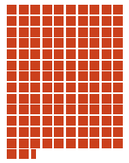
4.
10 floors
722 units /hectare
average unit size: 31m²
increase of profit: 3.375.408.000
+172%

community comparison // Rahmat Nagar

DENSITY

FSI = 3

UNITS PER HECTARE



1325

AVERAGE UNIT SIZE

16,5 m2

OPEN SPACE /pp

0,57m2

RECREATIONAL OPEN SPACE/pp

0m2

AMENITIES

< 5%

€

100%

COMMUNITY COMPARISON
chawls

DENSITY

FSI = 2,3

UNITS PER HECTARE

435

AVERAGE UNIT SIZE

40 m2

OPEN SPACE /pp

13,8 m2

RECREATIONAL OPEN SPACE/pp

7,4 m2

AMENITIES

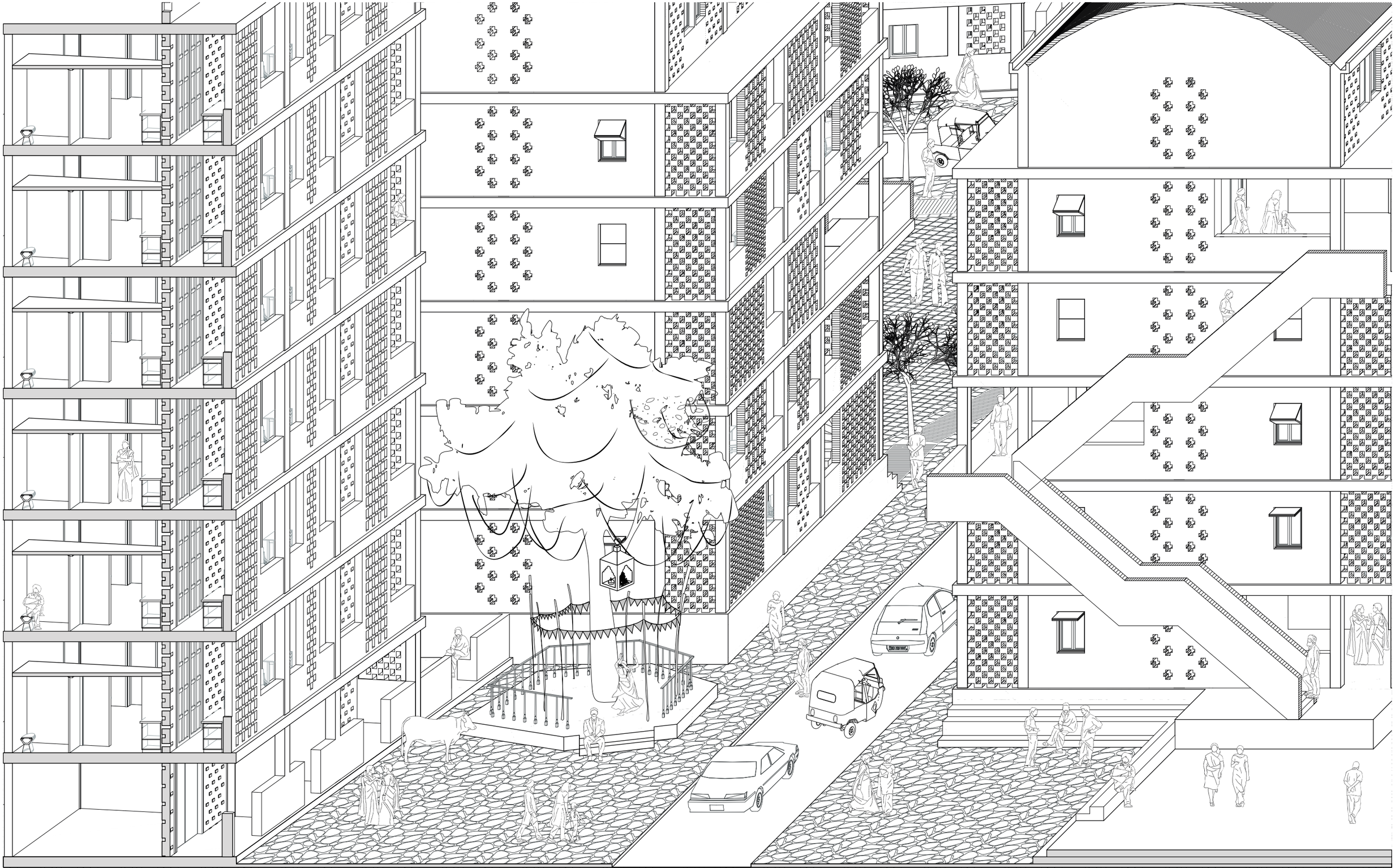
> 10%

€

-4%

COMMUNITY COMPARISON
new proposal

community comparison // Rahmat Nagar



COMMUNITY SPINE
STREET PROFILE // 1:200