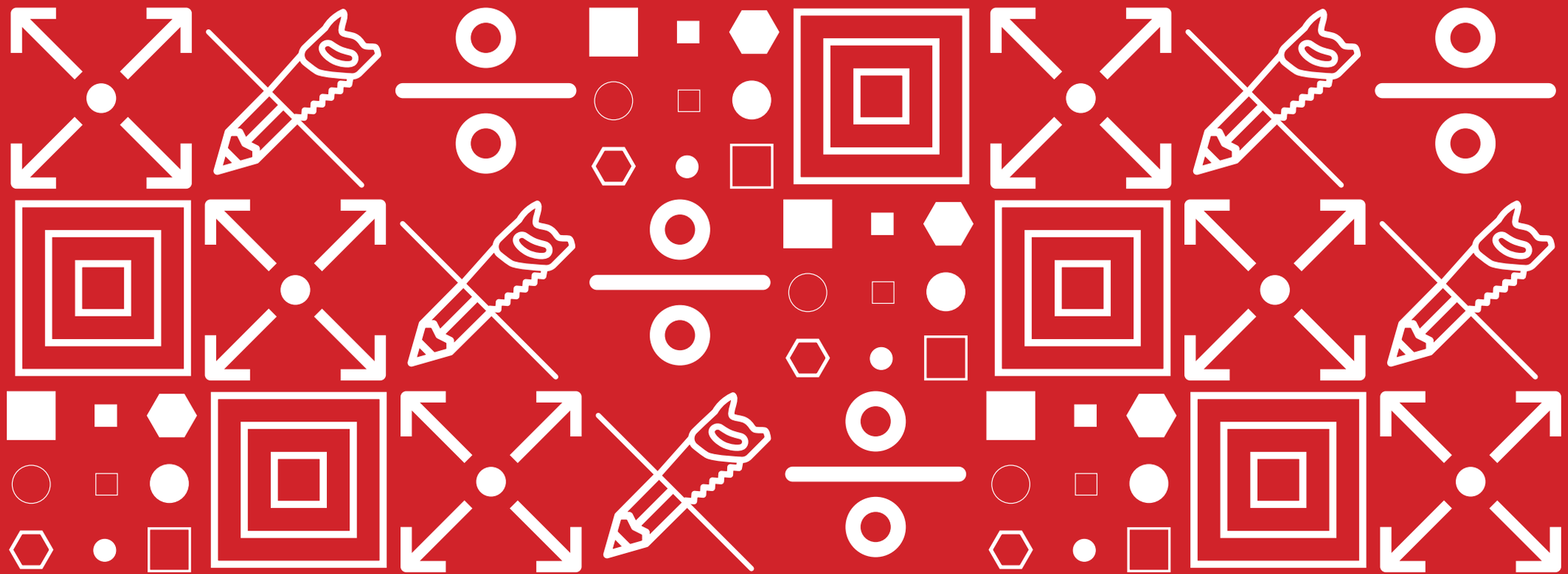
An Architecture of Enablement

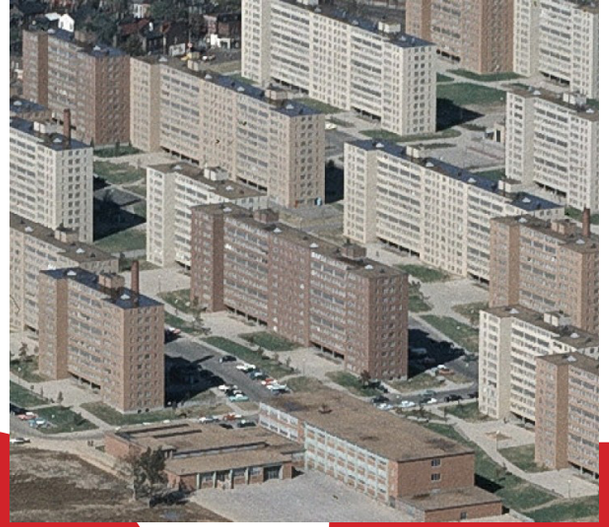


A Participatory Housing Process for Addis Ababa, Ethiopia.

Zhuo-ming Shia
P5 Presentation

95%

http://www.un.org/sustainabledevelopment/cities/





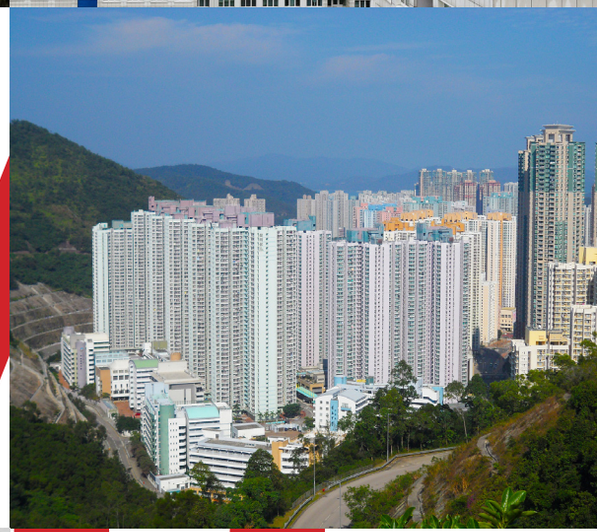
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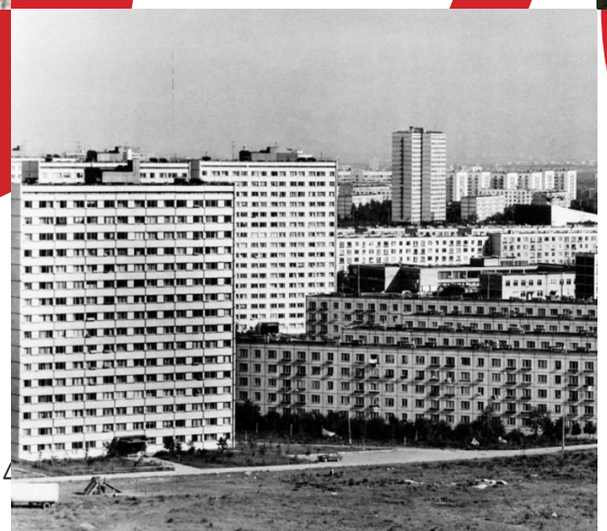






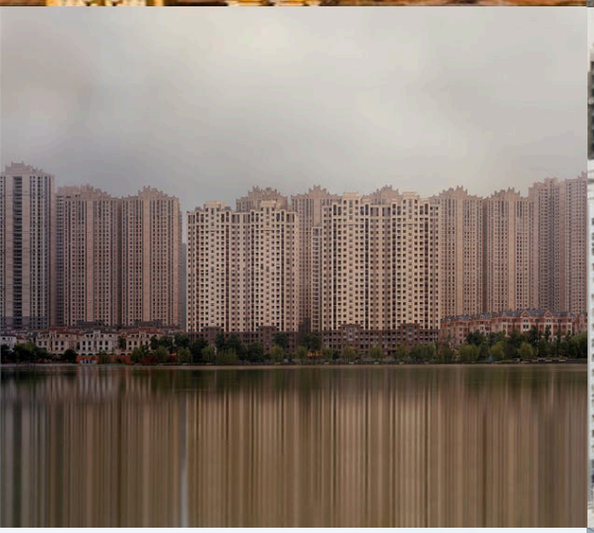










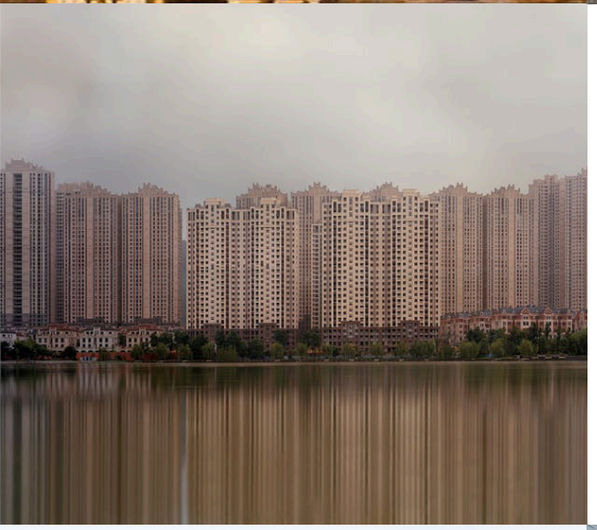










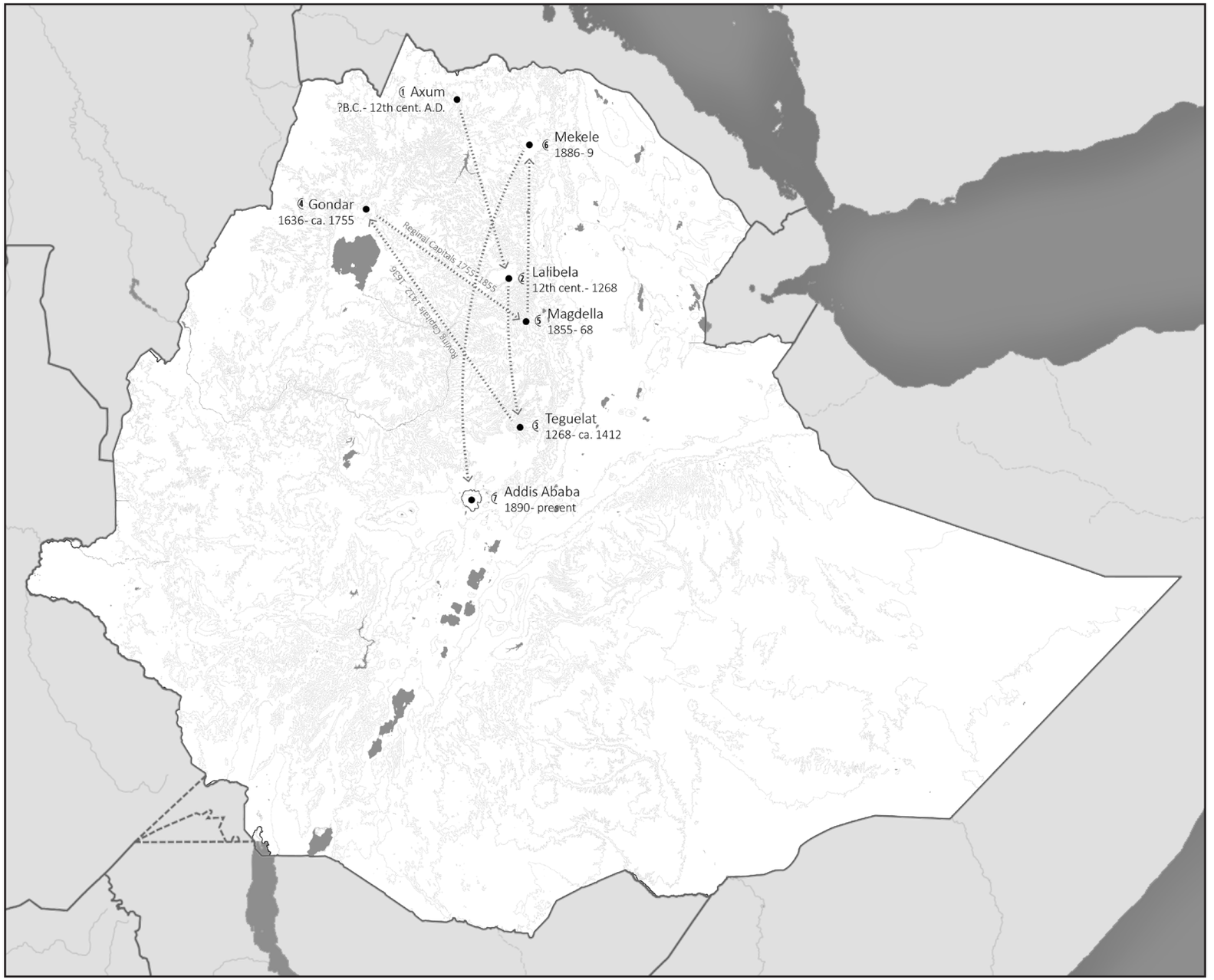
"If the layout of each house must be marked on a plan before any construction begins, the architect will be forced into **mass design**"

- Hassan Fathy
Architecture for the Poor








Axum
?B.C.- 12th cent. A.D.
Mekele
1886- 9
Gondar
1636- ca. 1755
Regnal Capitals 1755-1855
Roving Capitals 1412 -1636
Lalibela
12th cent.- 1268
Magdella
1855- 68
Teguelat
1268- ca. 1412
Addis Ababa
1890- present

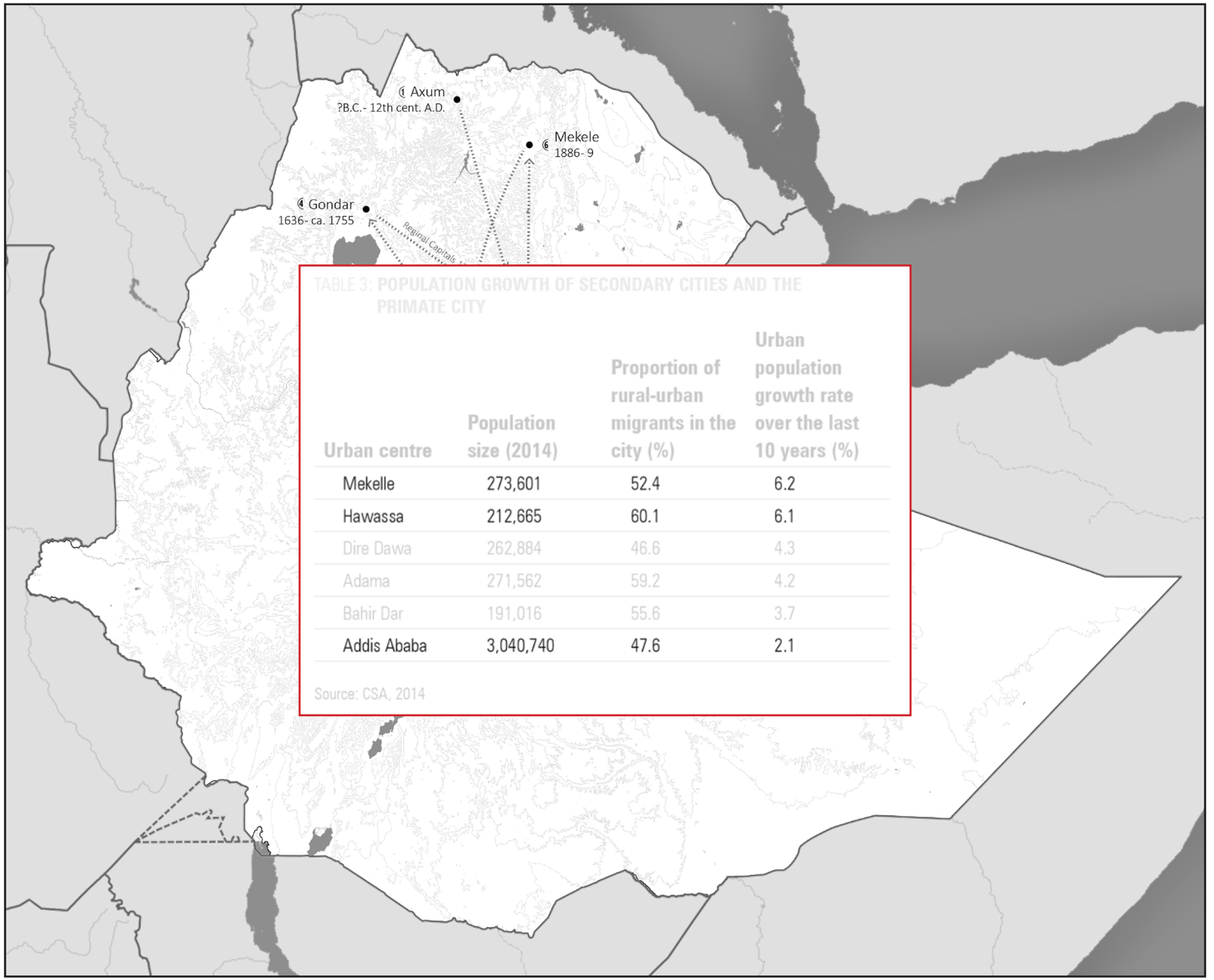
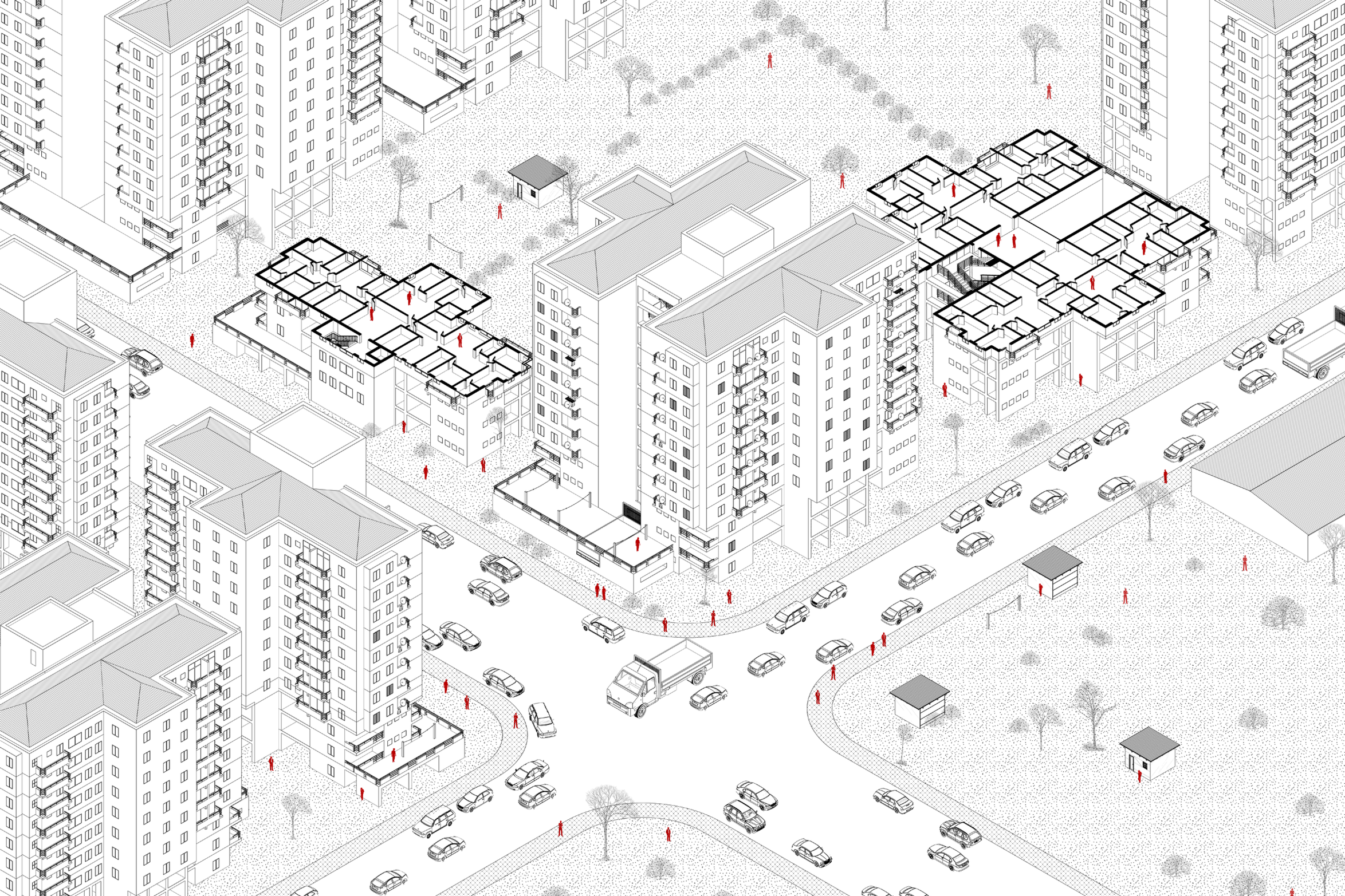
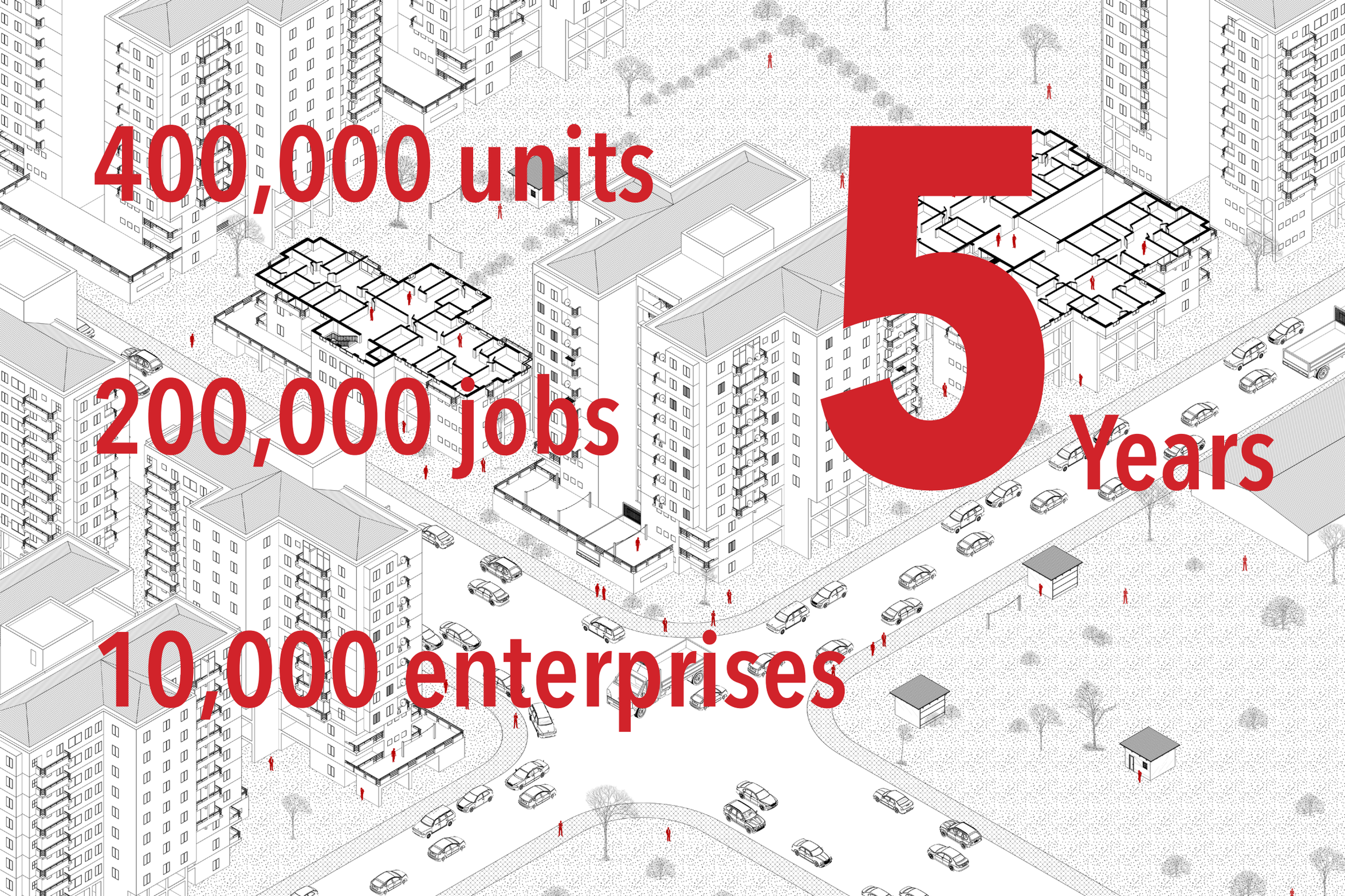


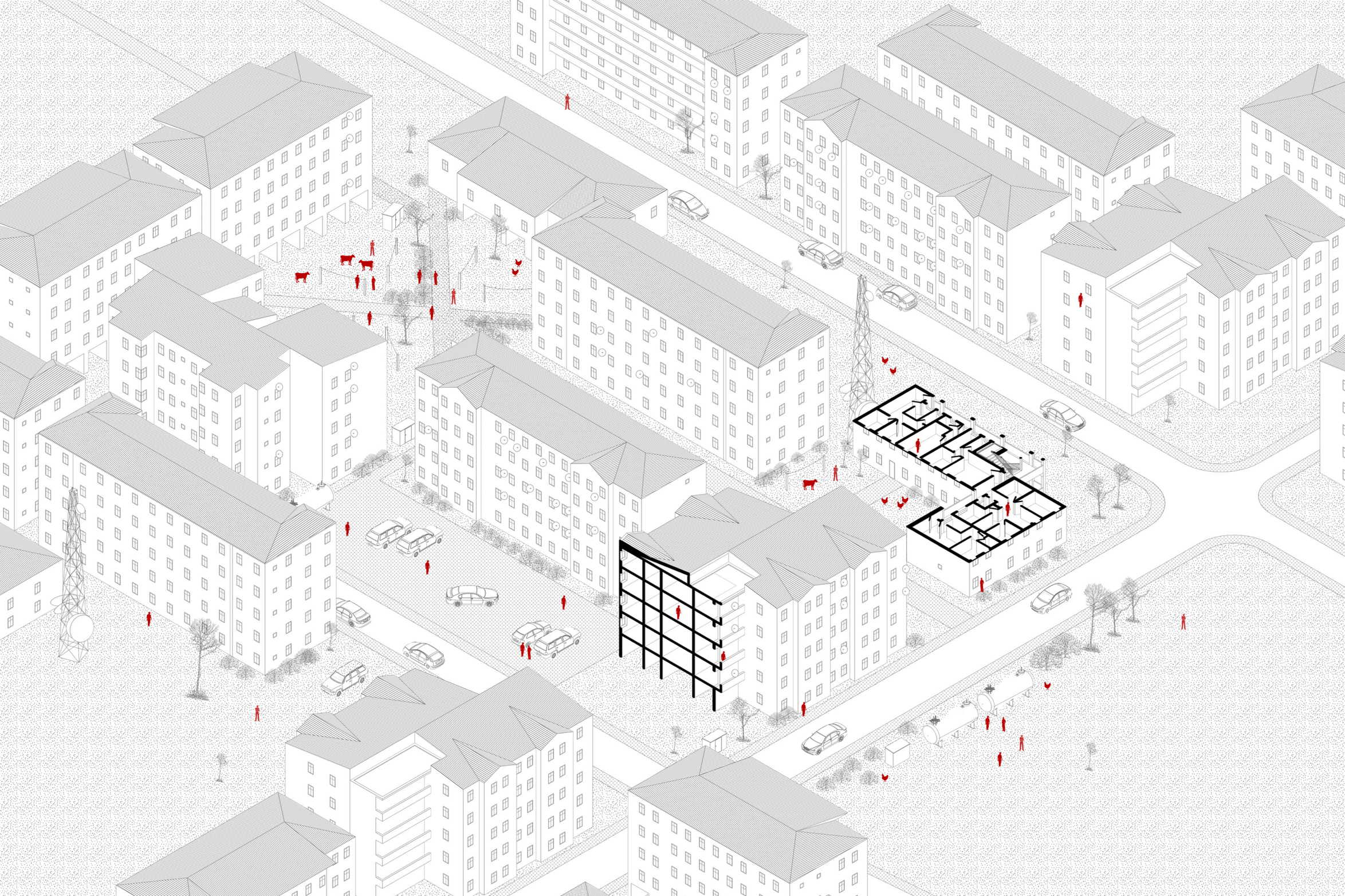
TABLE 3: **POPULATION GROWTH OF SECONDARY CITIES AND THE PRIMATE CITY**

Urban centre	Population size (2014)	Proportion of rural-urban migrants in the city (%)	Urban population growth rate over the last 10 years (%)
Mekelle	273,601	52.4	6.2
Hawassa	212,665	60.1	6.1
Dire Dawa	262,884	46.6	4.3
Adama	271,562	59.2	4.2
Bahir Dar	191,016	55.6	3.7
Addis Ababa	3,040,740	47.6	2.1

Source: CSA, 2014




400,000 units
200,000 jobs
10,000 enterprises
5
Years



"If condominiums remain the only option,

>50%

of all households will not be able to afford formal shelter unless their income and employment are drastically improved".



-Fasil Giorhis
Housing in an Informally Grown City

Top
Down

Bottom
Up





"Relying on **slow-time**, on whatever chance throws up, without a guiding image, **life in cities cannot improve**.

If cities are to be come more **just**, their foundation have to be put in order through **design**.

"

- Richard Sennett on Lewis Mumford
Building and Dwelling

Top
Down

Bottom
Up

Sensitivity	Efficiency
Flexibility	Standardisation
Participation	Design*
Individual	Masses
Cite	Ville
Incremental	Instantaneous
Heterogeneous	Homogeneous
Complex	Simple
Democratic	Authoritarian
Infill	Support
Sefer	Kebele

How can the masses of Addis Ababa be housed through a participatory design decision-making process?





1. Kirkos 13
Kebele
n/a



2. Menen
Kebele
n/a



3. Mercato
Market
1930s



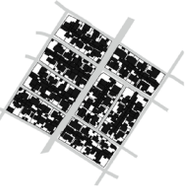
4. Colonial Architecture
Villas
1930s



5. Kebele 41
Kebele Upgrading
1981



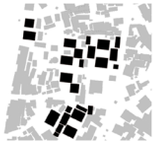
6. Kolfe
Resettlement Complex
1981



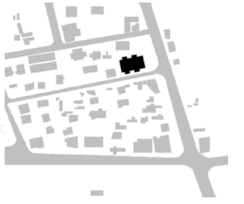
7. Nefas Silk
Resettlement Complex
1982



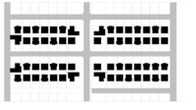
8. Gerji
Resettlement Complex
1986



9. Red Barna
Resettlement Complex
1987



10. Kebele 12
Cooperative
2000



11. Ayat Villas
Villa
2002



12. Kolfe Keranio
Villa
2002



13. Gerji Condominium
Condominum
2005



14. Akaki Kality
Condominum
2011



15. Chefie Bole
Condominum
2014



16. CCD Home Sites
Villas
2015



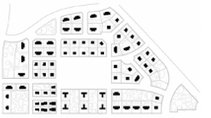


1. Kirkos 13
Kebele
n/a

2. Menen
Kebele
n/a



3. Mercato
Market
1930s



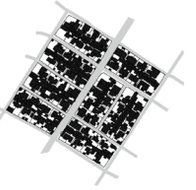
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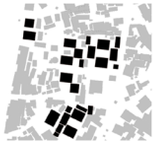
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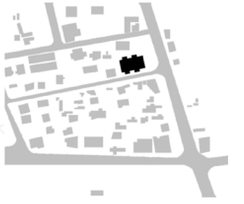
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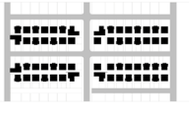
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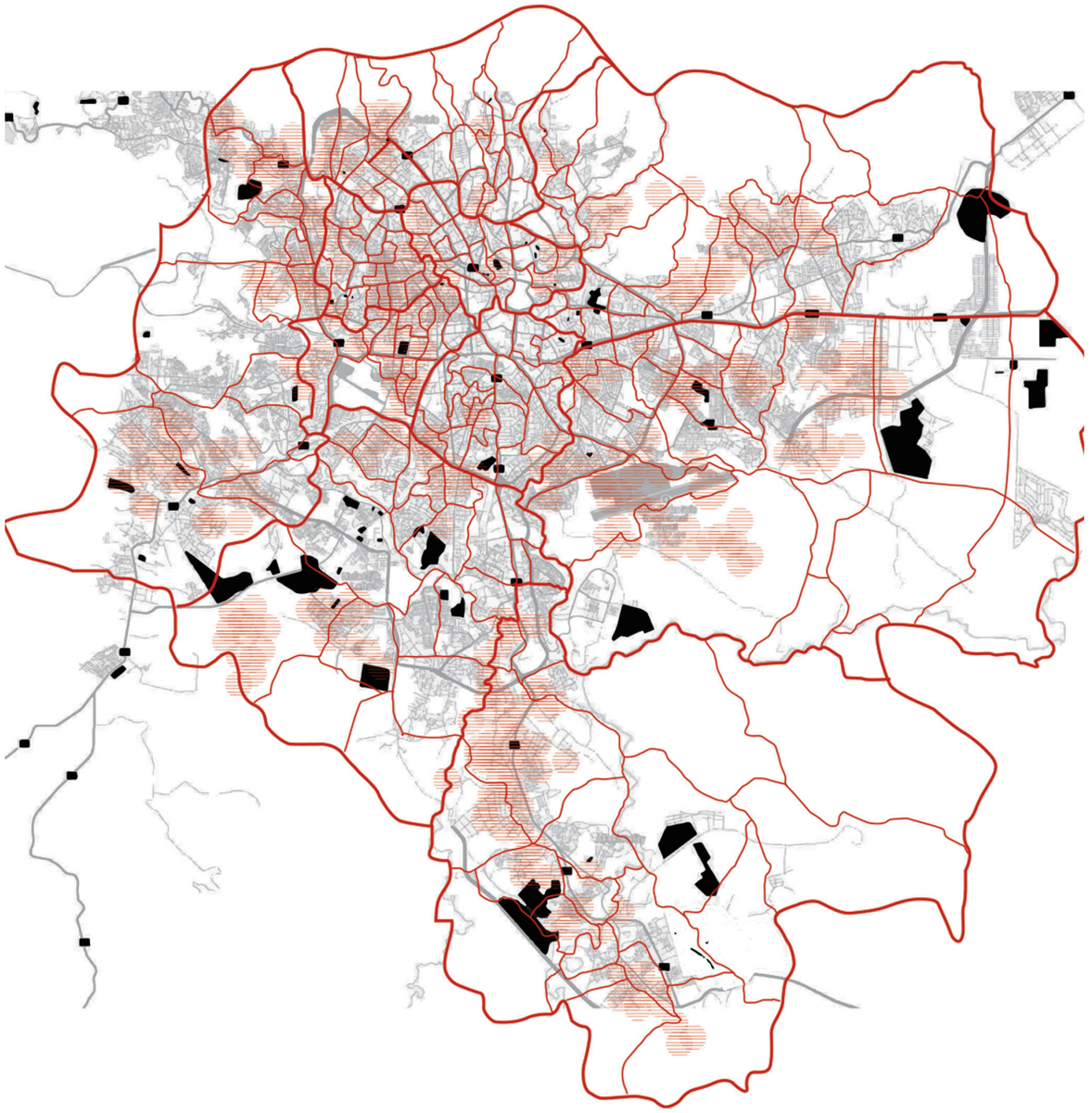
14. Akaki Kality
Condominum
2011



15. Chefie Bole
Condominum
2014

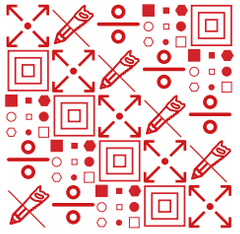


16. CCD Home Sites
Villas
2015



Patterns of Participation

Formulating a Toolkit to aid Architects in Designing Participatory Housing Methodologies in the Global South



Zhuo-ming Shia

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iv

Cover: Families building their own homes in Mexicali

Christopher Alexander talks about the importance of the human rhythm in construction, and that the process of construction today is only a completion of a task in exchange for money rather than a fundamental human experience of creating your own home.

Credits: Building Living Neighbourhoods

Author and Graphic Design: Zhuo-ming Shia

This research was conducted for the fulfillment of the Honours Programme Master TU Delft, Faculty of Architecture and the Built Environment, year 2020-2021.

Tutor: Frederique-van Ardel

TU Delft

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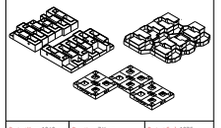
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22 Case Studies

Project Name: PREVI Lima

Architect: Various

PREVI Lima is a rare case of a built collection of competition entries curated by professor and architect Peter Land. A due line-up of international architects as well as local Peruvian architects were chosen to participate, including James Stirling, Christopher Alexander, Aldo van Eyck and Charles Correa. Their task was to come up with ways of producing low-cost, low rise housing to combat the rise of informal slums in Peru, with a focus on designing for house expansion and using innovative construction systems. Although, the application of the ideas generated at PREVI was limited, it became recognized as one of the most extensive affordable housing experiments in the global south.



Project Year: 1968	Duration: 7 Years	Project End: 1975
No. Dwellings*: 467	Site Area: 10,5600m²	Density: 44dw/ha
GSI: 0.42	FSI: 0.84	Avg. Dwelling Size: n/a
Nature of Participation: Appropriation		

*Less than a third of the proposed 1500 dwellings were eventually realised.

23 Case Studies

Project Name: Oosterwold, Almere

Architect: Various

Located a short bike ride away from Almere, the self-build community of Oosterwold stands in stark contrast with the typical Dutch housing development. Here, users are permitted to build freely on pre-defined plots following loose parameters relating to site borders and FSI. Even the shared infrastructure such as the secondary roads which come off the main arterial road are managed by homeowners collectively. Oosterwold demonstrates a case where user participation is taken to the extreme causing new managerial roles to become necessary.



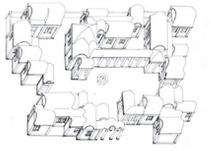
Project Year: 2011	Duration: n/a	Project End: n/a
No. Dwellings: 15000*	Site Area: 43km²	Density: 4dw/ha
GSI: 0.07	FSI: 0.11	Avg. Dwelling Size: 168m²
Nature of Participation: Self-build		

*15,000 dwellings is the extrapolated maximum capacity of the proposed site.
Density, GSI and FSI are taken from a typical neighbourhood cluster

---

30 Aided Self Help





Mexicali by Christopher Alexander

Christopher Alexander is an architect and design theorist who is most known for founding the Pattern Language. Since the first volume in his series of five books, *The Timeless Way of Building*, he has argued for a close relationship between the conception of a building and its users, that "the human environment can only come to order under circumstances similar to those which have existed in most traditional societies"[1]. His second volume, *A Pattern Language*, not only documents a possible systematic reading of the built environment, but also acts as a tool to allow the user to read the built environment. From this, it is clear that user participation was at the centre of his ideology.

The Mexicali project was an experimental project commissioned by the state of Baja California to co-design thirty houses at the cost of $2500 per house. To bring about this closer relationship between building and people and to achieve an alternative to mass housing, Alexander identified the need for a new system of production which he tried to realise in the Mexicali project. Mass housing has the issue of centralised control, which he thought of as an artificial construct, whereas "a biological system is able to achieve its sensitive and complex adaptations because control over the shape of components is widely distributed at a great many levels throughout the organism"[2]. This organic quality can be seen in his participatory method at Mexicali which is strongly based upon twenty-one entries of the pattern language. He was able to decentralise control through delegating responsibility to his students at Berkeley and educating the five Mexican families on the Pattern Language.

Figure 13. Parallel view of the group of houses in Mexicali, Mexico by Christopher Alexander.

31 Aided Self Help

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44 Aided Self Help

Marry Design with Construction: The Architect - X

Another common pattern between the two approaches and indeed with all participatory housing approaches, is an intellectual desire to venture beyond the role of an architect and to understand the building process from different perspectives and levels. Fathy calls for a new relationship between three of these perspectives in what he calls, the trinity:

"The intelligent participation of the client is absolutely essential to the harmonious working out of the building process. Client, architect, and craftsman, each in his province, must make decisions, and if any one of them abdicates his responsibility, the design will suffer and the role of architecture in the cultural growth and development of the whole people will be diminished"[3]

-Hassan Fathy

Fathy's trinity identifies three roles that are in fact fluid and at times overlapping. As in the New Gourna project, the intention to let the local Gourni build their own houses was ultimately unsuccessful, "At Gourna, we were our own designers, supervisors and contractors"[4]. It can be argued that the architect had to take over the role of the client, as the local peasants showed little interest in their new village, as they were dissatisfied with the decision to relocate Old Gourna to begin with.

Alexander argues that in an ideal world, design decisions are made bespoke, house by house. He goes on to say that this is not possible due to the current dynamic between architect and contractor…

"A contractor. Working in the way that contractors work today, does not have the power to make these decisions, since he is working from drawings prepared by someone else. An architect does not have the day-to-day knowledge, nor the time, to make these decisions, since he spends too little time on the site."[5]

-Christopher Alexander

Both architects are dissatisfied with the current role dynamic in the building process and are proposing a change that shortens the distance between the acts of designing and building. This change has different manifestations in each of the case studies.

Hassan Fathy believed in decentralising expertise, for the architect to relinquish some control to local craftsmen as those are the people who have the most expertise. This is why he spent a long time familiarising and understanding local crafts. For example, in Architecture for the Poor, he documents the techniques Nubian Masons used to create a vaulted roof without supports or centering (figure 18), providing a simple and cheap solution for roofing mud brick enclosures. Complementary to his belief of the decentralisation of control in the design process, the importance of the vernacular to Fathy shows that he believes the most elegant and



Figure 18. Nubian Craftsmen building a vault

45 Aided Self Help

---

72 Co-creation

Know? the Users: Heterogeneity

At first, the title of this pattern might seem obvious, a knowledge of the client/end-user is an essential part of any project. The difference between a truly participatory user consultation process and a traditional user consultation is the former requires the architect to enter into the conversation with users without pre-conceiving an intent, or simply put by van der Werf, an open mind[7]. Not doing so could result in the architect pre-empting the words of the user and leading them on to confirm pre-determined ideas. In extreme cases, this is user manipulation

Conversely, it is also wrong to think of consultations as a purely mono-directional transaction, of the architect extracting the ideas and preferences of the user. As Hamdi explains, if the architect was to ask the user "what do you want?", the answer they would get back would most likely be "what can I have?"[8]

Below, both architects recall some of the stories from consultations with their users:

"A mother and a daughter had been on a housing waiting list for about 6 years. While the council was building houses for two people, they all consisted of a double bedroom, whereas this family required two separate single rooms. With our scheme they were able to achieve this. The daughter would also come home later at night so she also wanted her bedroom door to be further away from her mother's so that she wouldn't disturb her. [The participatory process] allows details like that."[9]

-Nabeel Hamdi

This approach directly opposes the classification of users as a monotonous whole and allows specific needs to be addressed, such as different family compositions, the needs of the elderly, disabled as well as personal quirks and preferences. In addition to intensely participatory interviews, Hamdi employed many other methods of engaging his users in design. The complete process involved multiple meetings with all prospective tenants, with some purely for the purpose of getting to know each other. Handbooks were introduced to the tenants including basic instructions for reading a plan and an exercise that allowed the tenants to place furniture and partitions on an empty gridded plan. Afterwards, each family were allocated approximately three hours of individual meeting time where the architect interpreted the tenant's needs through a professional and practical lens.[10]

Van der Werf recalls a more extreme example of his meeting with a young man with mental disabilities. During the meeting, the young man was strongly against the idea of adding any partitions to his allocated unit.

"The young man said he hates spaces. So, what do we do? At that point a thought came into my mind, I asked him do you have a mother and does she come to visit you? He said yes. I proposed to him to have partitions around the toilet so his mother would feel safe. He looked at me and exclaimed, 'that is a good idea! I then

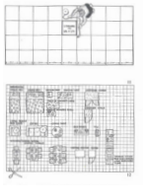


Figure 22. Extracts from self-design handbook developed as part of the participatory process at Adelaide Road

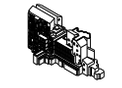


Figure 23. Intensive user consultations as part of the Adelaide Road Project

73 Co-creation

---

86 Co-creation



Maison Médicale (la Mémé)

Around the following year of the Byker redevelopment, a new 'zone sociale' was proposed as an extension to the existing hospital owned by the Catholic University of Louvain, Belgium. This new complex was to house accommodation for medical students along with restaurants, shops and an underground station. Due to planning reforms as a result of the 1968 protests[11], the masterplan needed to gain the approval of the students who rejected it and subsequently recommended a new architect, Lucien Kroll, to take over the commission.[12]

Kroll noted two social approaches to housing design. Firstly that of the strict maternal authority, where the architect, justified by his/her professional knowledge, determines the needs of the users. Secondly there is the participatory approach that, through generating enthusiasm, recognises each user as an active part of the design process, as a node in a network where knowledge is exchanged and responsibility is shared.[13] Le Maison Médicale (Mémé) was a firm expression of the latter. Through this project, Kroll sought to decouple industrial methods with the former militaristic approach to housing design and instead apply industrial thinking to produce organic architecture; an "industrial architecture without industrialists"[14] The wishes of every student's housing needs is not only granted but expressed in the variety of the facade. Even those who opted out of the participatory process were accommodated in the southern block which consisted of standardised room dimensions. This part of the building was later named "the fascists".

As a result, the site was a "battlefield of ideologues"[15]. Kroll, popular among the students, was fired when the students were swayed and accused of being an anarchist. The building embodied both approaches to architecture: the geometrical hospital building clashed with the organic medical school. This inherently political element in Kroll's architecture is noted by many authors. Franco goes further to describe la Mémé as the next step after Ralph Erskine's Byker redevelopment, "if the architect in Byker was a craftsman constructing a negotiated utopia, in la Mémé we might say that Kroll was an activist".[16] In plan, one can detect how this new political attitude towards architecture makes the building footprint seem as if it conforms with the landscape onto which it sits. Indeed, Kroll frequently uses the term 'landscape' (paysage) in the Architecture of Complexity to



Figure 41. Site plan of La Mémé

87 Co-creation

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110 Patterns

The Architect - X

Pattern Definition

While the previous pattern, 'The Source', represents the different architectural manifestations of the architect on-site, 'The Architect - X' provides us with the plurality of different roles that the architect plays out. It is typical in participatory design processes for the architect to perform roles outside of their traditional responsibilities as the designer of space. Contrary to the idea that participation requires less design and therefore less work from the architect, in reality, participation adds more complexity and requires to architect to engage in cross-disciplinary discourses: engineering, building, management, community action, urbanism, technology etc.

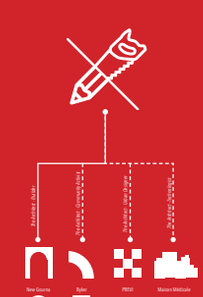
Architect Matthew Frederick quotes: "An engineer knows everything about one thing. An architect knows something about everything."[17] The Architect-X suggests the role of the architect should belong on a higher level, that of an overseer and coordinator rather than a design specialist. This idea related to the Gesamtkunstwerk (total work of art) where the architect has total authority over all aspects of a project.

Instances of the Pattern

This pattern is embodied in the case studies analysed before in four different ways: that of the architect-builder in the Mexicali and New Gourna project, the architect-community activist in Byker and Adelaide Road, the architect-urban designer in PREVI and Oosterwold and finally the architect-technologist in La Maison Médicale.

The term architect-builder was used by Christopher Alexander to represent the ideal coming together of designer and builder who is able to combine design expertise with on-site building experience. Only a professional trained in both of these disciplines is able to realise the specificities of user requirements in a participatory design process. Fathy proposed a model where the three roles of client, architect and contractor (what he called the trinity) were in a dynamic state and often overlapping.

The brutal top-down nature of the UK's social housing estates resulted in a absence of community interaction and collaboration. Therefore, architects that advocated user participation such as Ralph Erskine and Nabeel Hamdi were required to fill that gap. As well as coordinating a participatory design process, these architects needed to primarily unite the previously fragmented community. Erskine, through his presence on site provided an informal public amenity and organised collective efforts such as the flower pot planting initiative at Byker. Community Action Planning is a methodology devised by Nabeel Hamdi that puts the different



111 Patterns

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124 Patterns

The Oosterwold project showed that even in a place that is not dictated by a clear masterplan, clustering and the formation of collective agreements exist. The formation of 'road associations', self-organised groups of landowners who share the same access road, organises the otherwise fragmented families of Oosterwold into groups that are capable of collective actions. In fact, the Dutch government have a regulation that dictates homeowners who share a public space that needs to be maintained must form an association and must meet at least once a year to discuss communal affairs.

Discussion

The configuration of a residential scheme, in terms of different levels of clustering, has a large implication on a variety of factors: how its future users will interact with each other, the level of safety in the community, the ability for collective action and continued user participation after construction.

Philip Kraibbenbarn, an architectural theorist and architect of the co-housing scheme, Centraal Wonen Delft, formulated a participatory design method based on creating different levels of social interaction. He explains, "In order to feel like an individual, you need a small group of people around you… a group of individuals also requires a social context to define what kind of group it is"[18] The presence of a higher level thus defines the existence of the lower level. He continues to explain that "different people have different requirements in terms of the levels"[19], indicating that the configuration of housing units on an urban level should also be open to participation.

Alexander agrees with this as he explains, "It is the human effort that must make the formation of the cluster, not a designer at a distance."[20] Participation on an urban scale is conceivable for small residential projects, where the users can be identified prior to the commencement of design. However, as the scale of residential developments increases, the feasibility of using traditional methods of participation, holding meetings and interviews, decreases. Contexts in the global south are met with even greater obstacles to large scale participation. Perhaps the use of applications and widely accessible online platforms can help coordinate participation on the mass scale.

Establishing a clear, well informed hierarchy of clustering ensures that user participation does not stop after the construction of the building. It provides users with the necessary social infrastructure to overcome issues of maintenance, disputes and changing tenancies, preventing over-reliance on top down decision makers that often results in neglected living spaces.

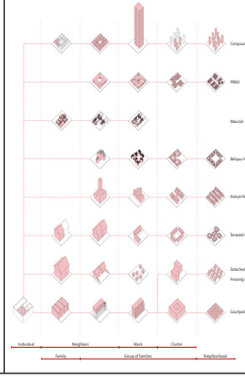


Figure 54. A tree of social spatial levels A collection of different residential typologies are ordered in a hierarchy from the room to the urban tissue level. Under it, the ranges of social groups are shown in relation to the forms.

125 Patterns

Mexicali
New Gourna
PREVI
Oosterwold
Molenvliet
Adelaide Road
Byker
Maison Médicale
The Source
The Architect - X
The Pattern Map
Pattern Creation
Pattern Cross-reference
Support and Infill
Heterogeneity
Clustering

Clustering



- Typologies
- Levels of Indoor Space
- Levels of Outdoor Space

Source



The Architect - X

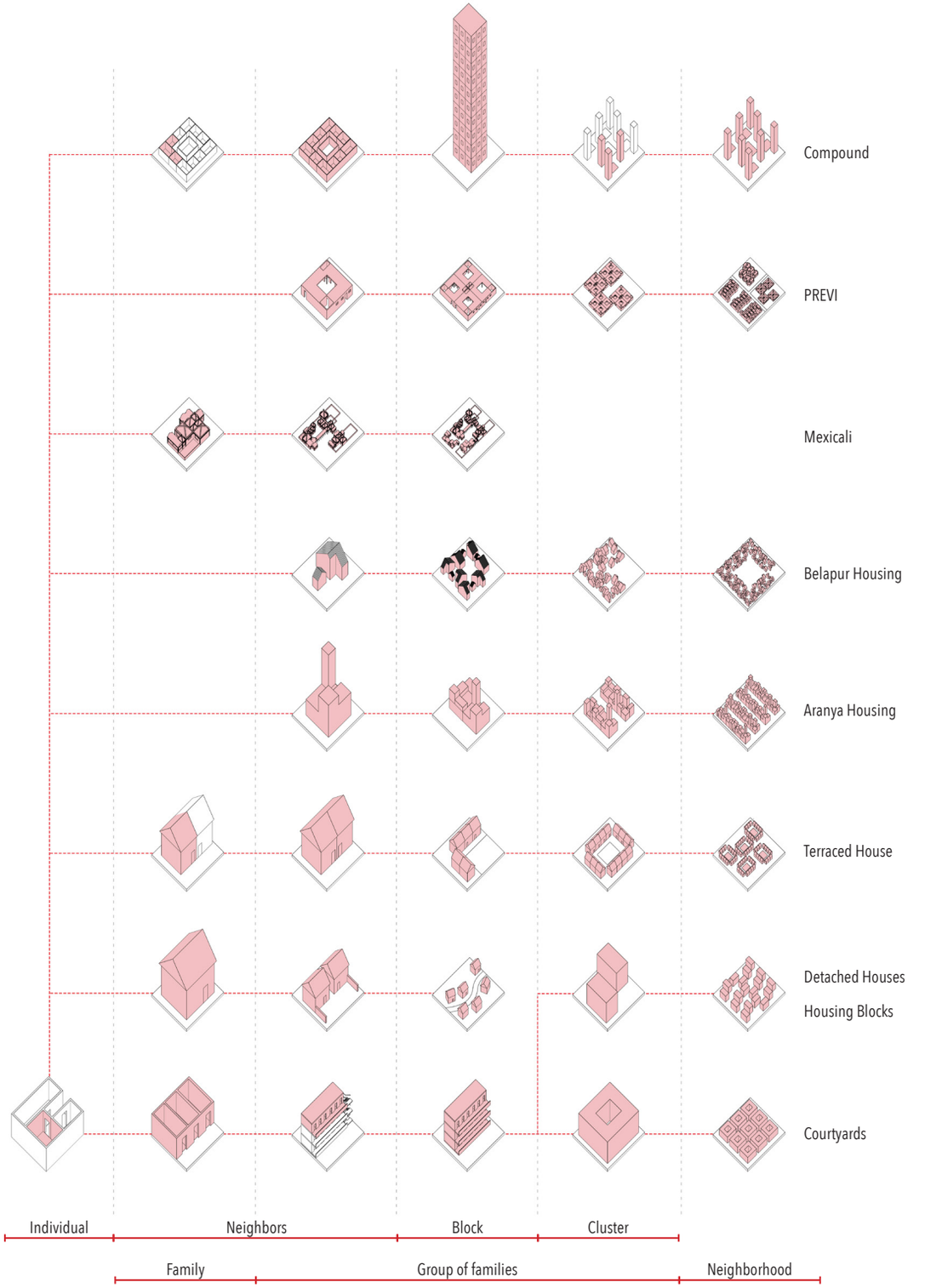


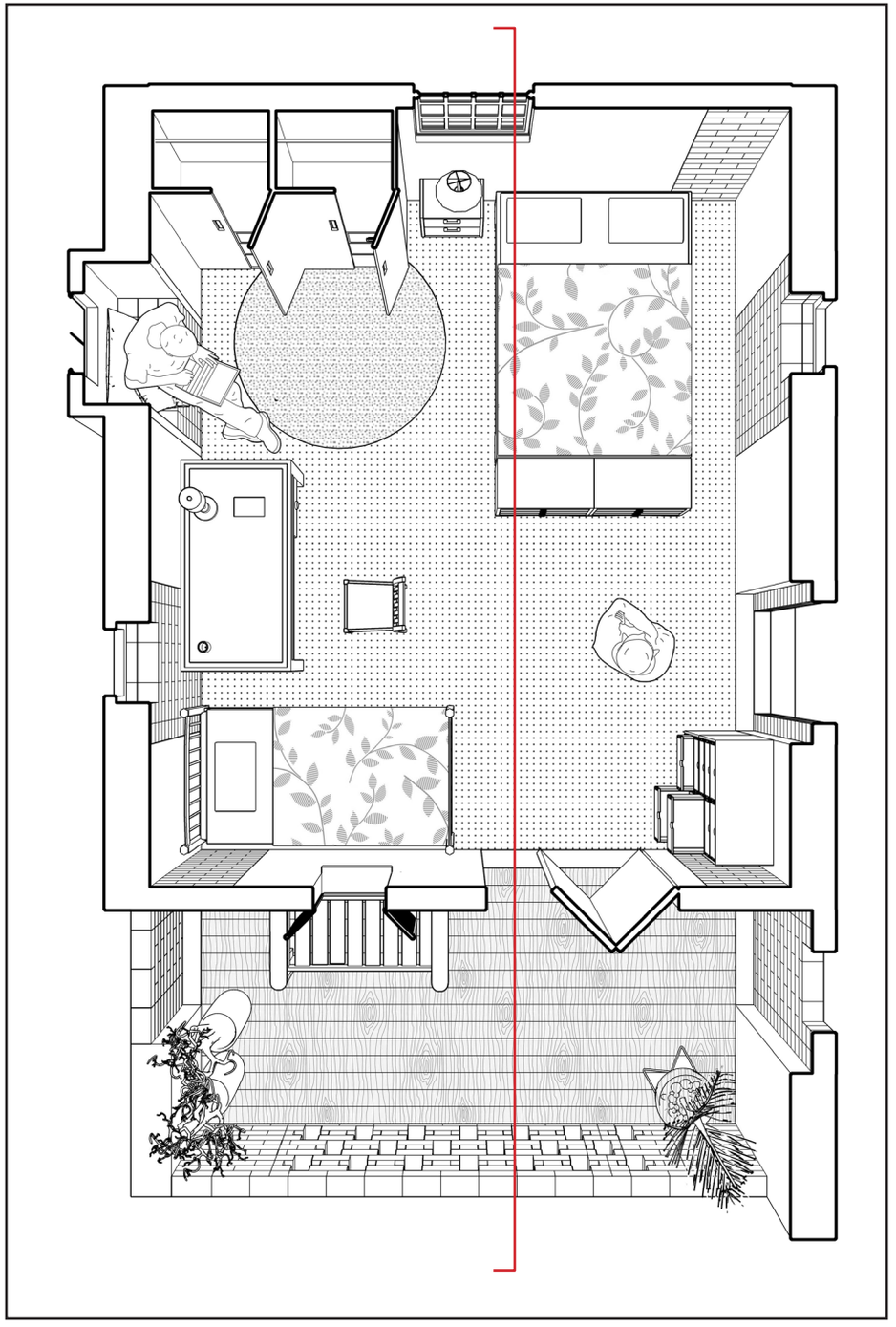
Support and Infill

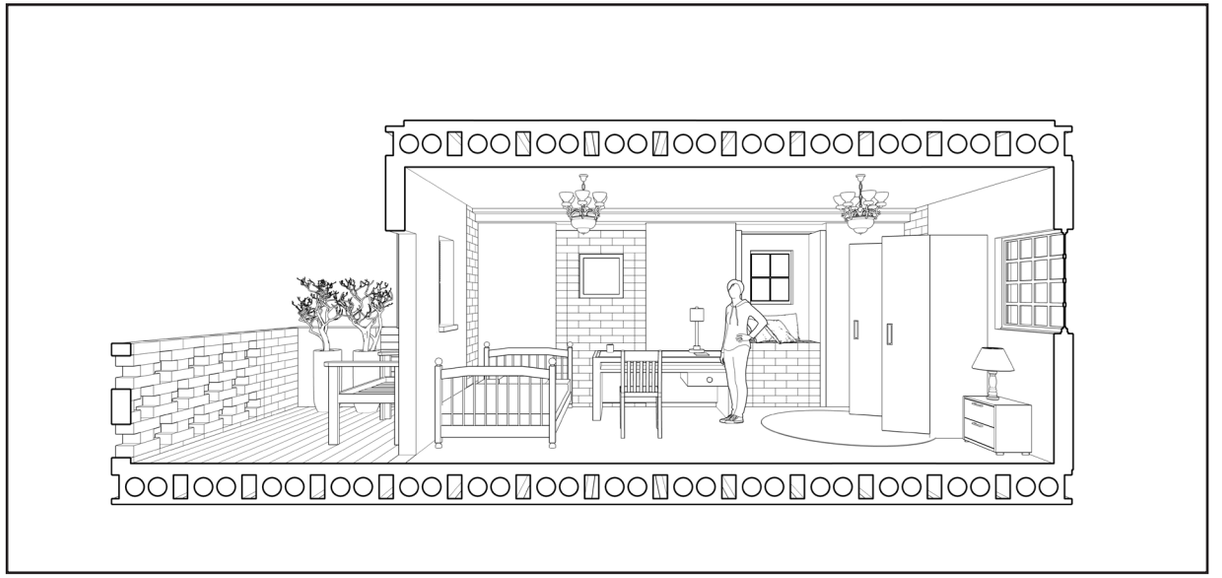


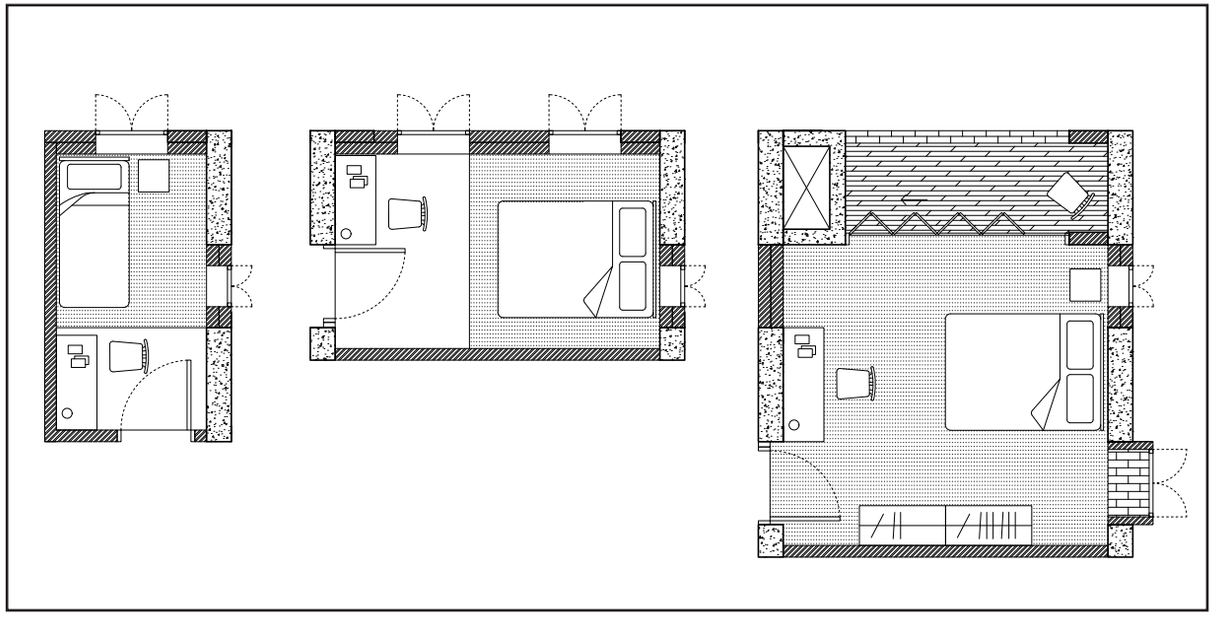
Heterogeneity

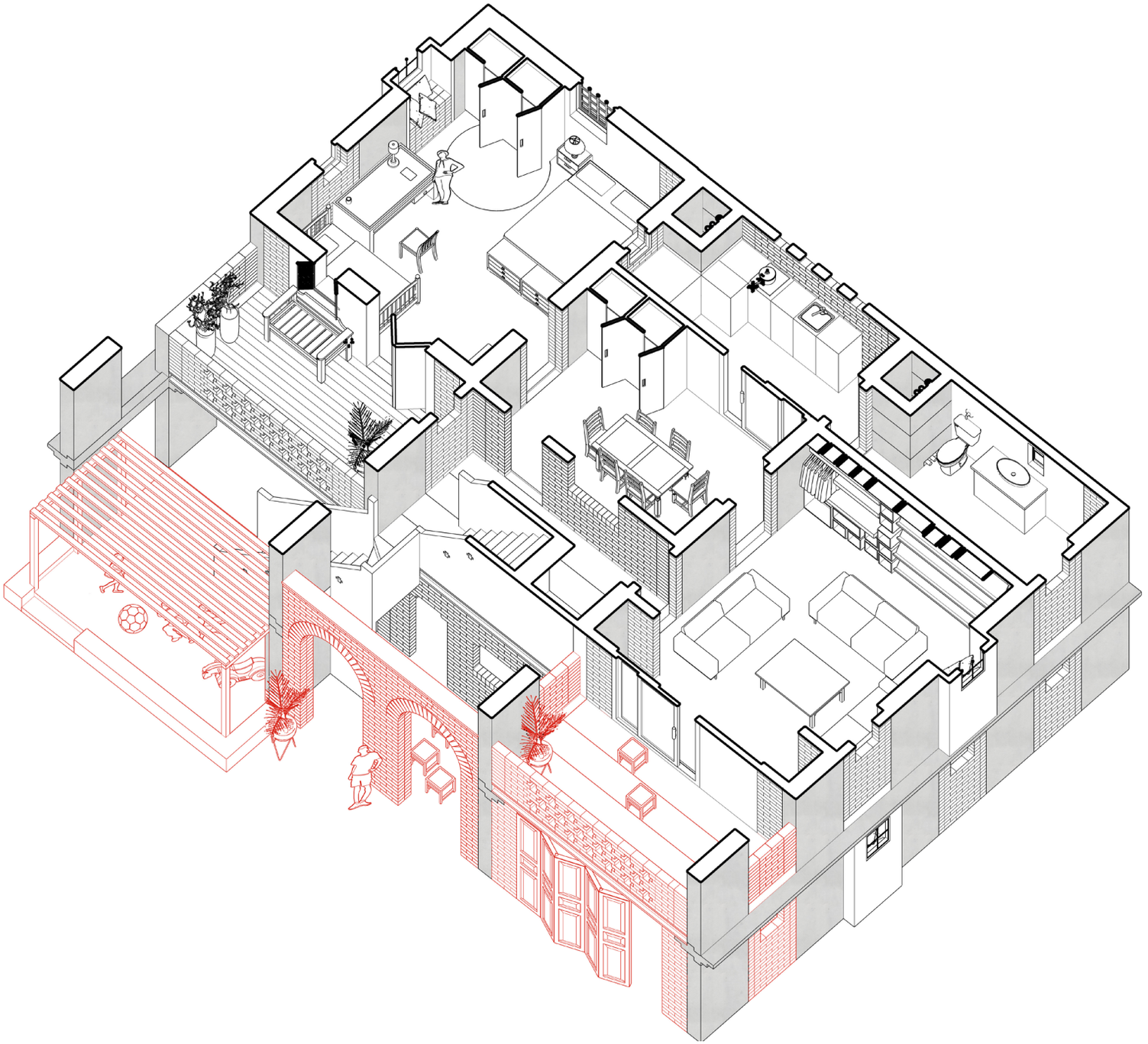


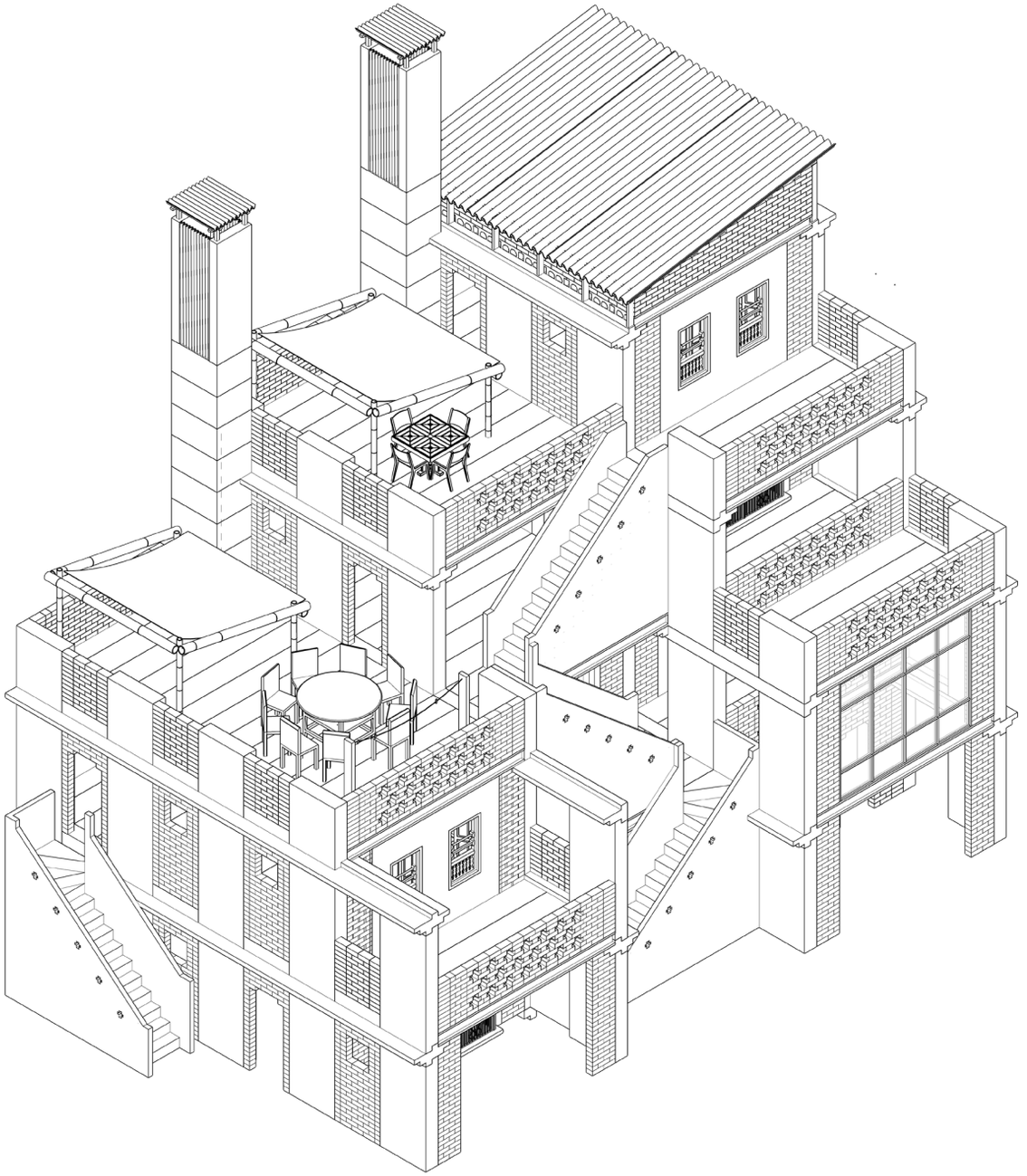


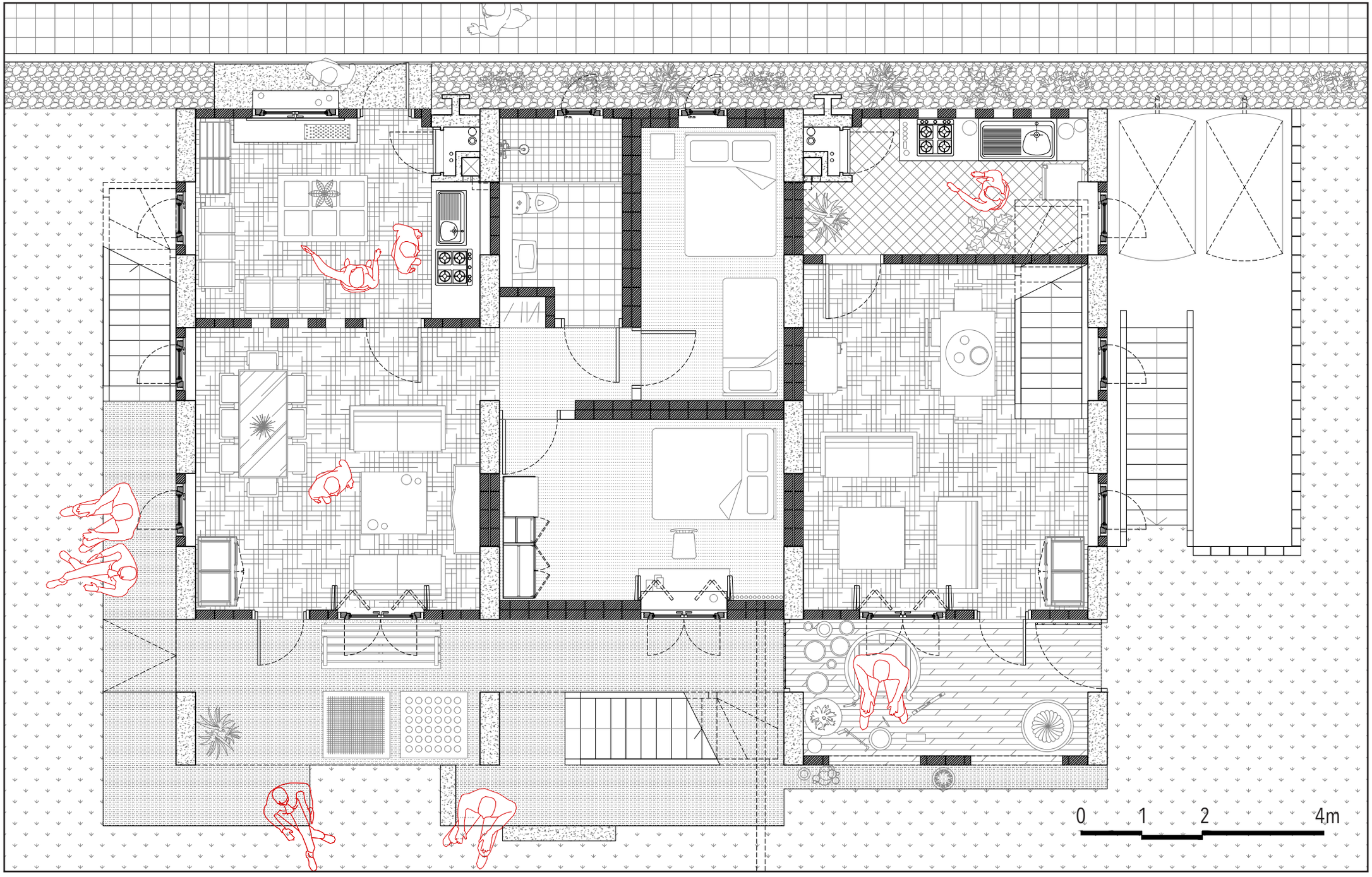


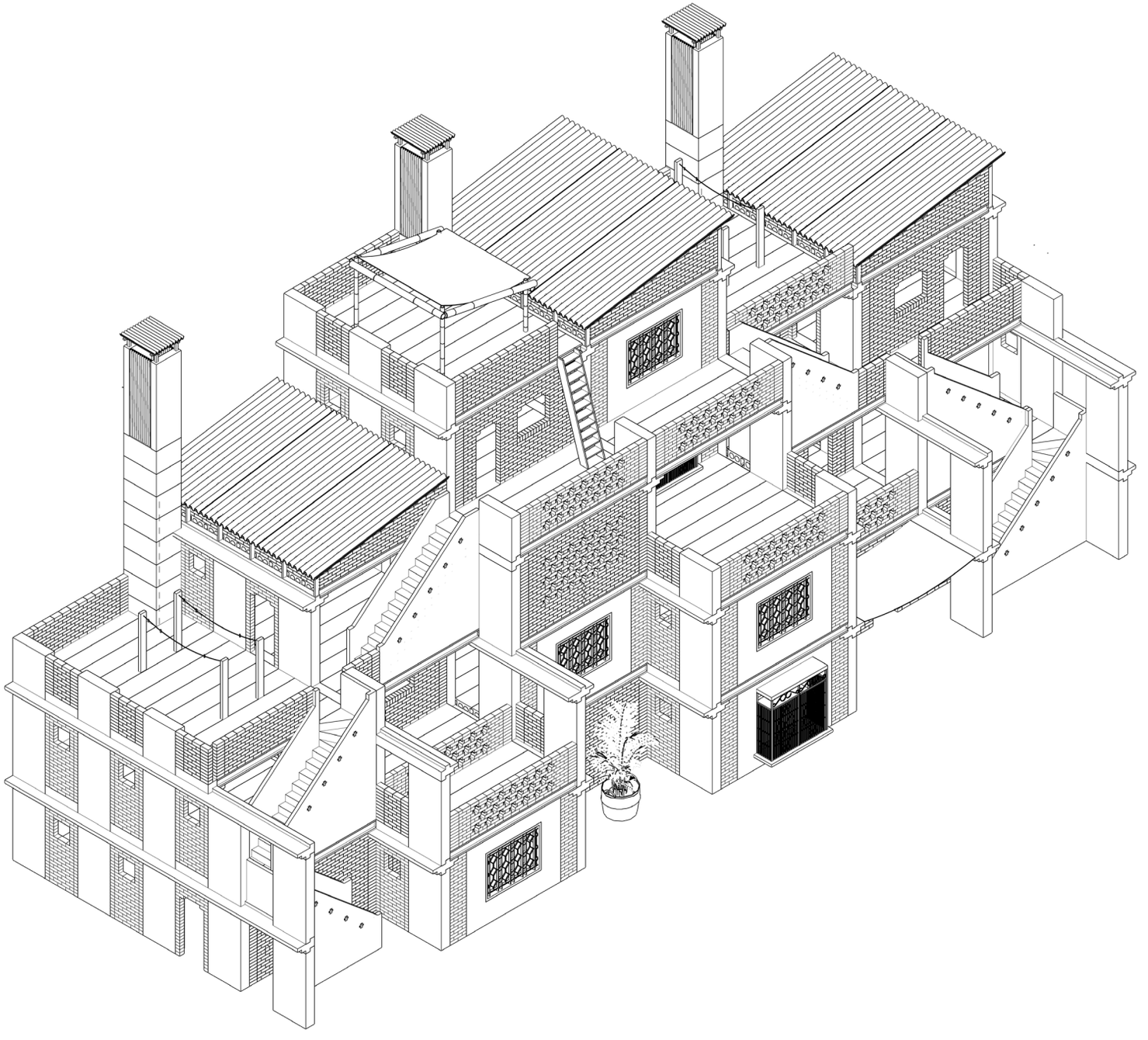


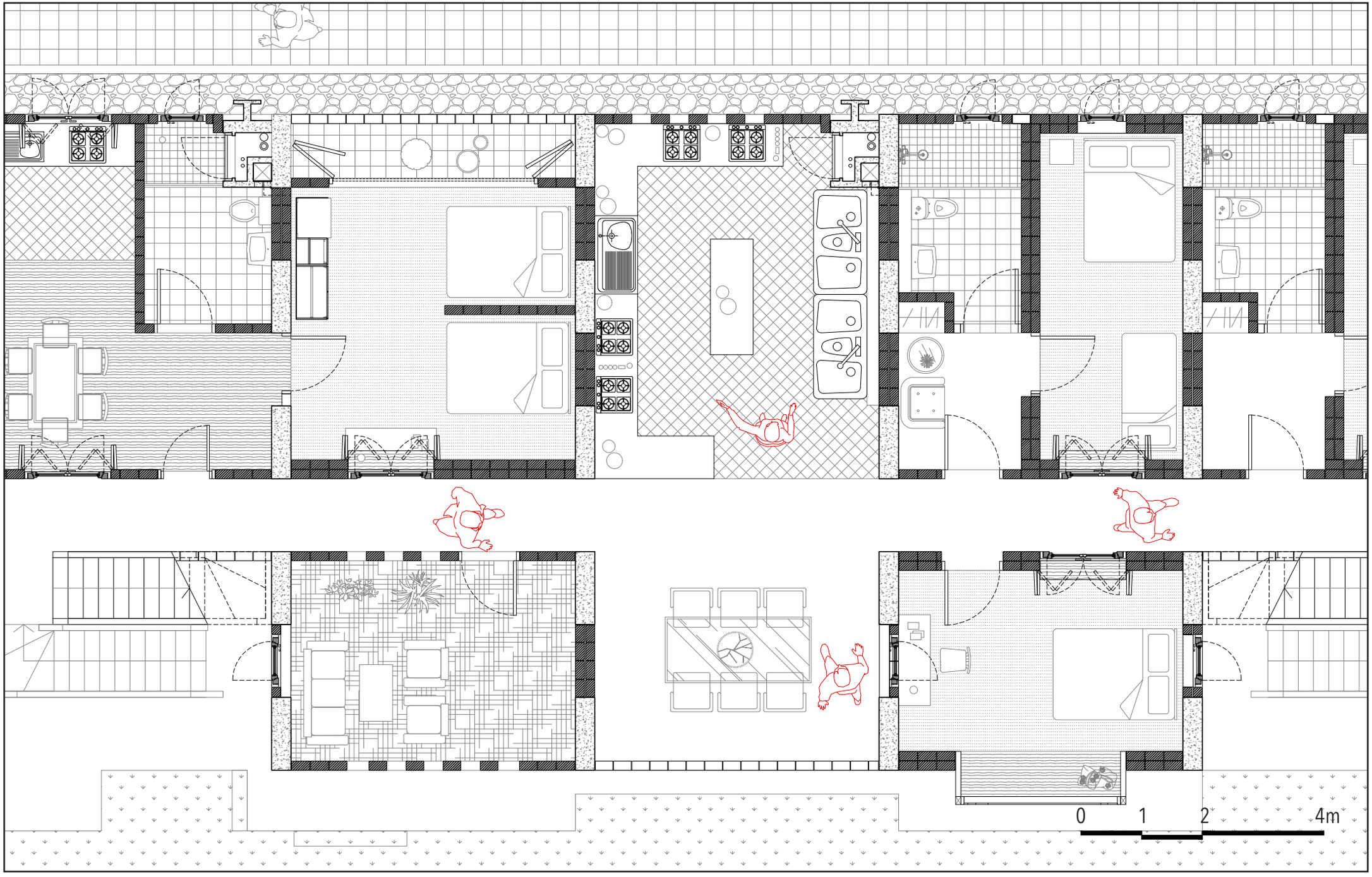


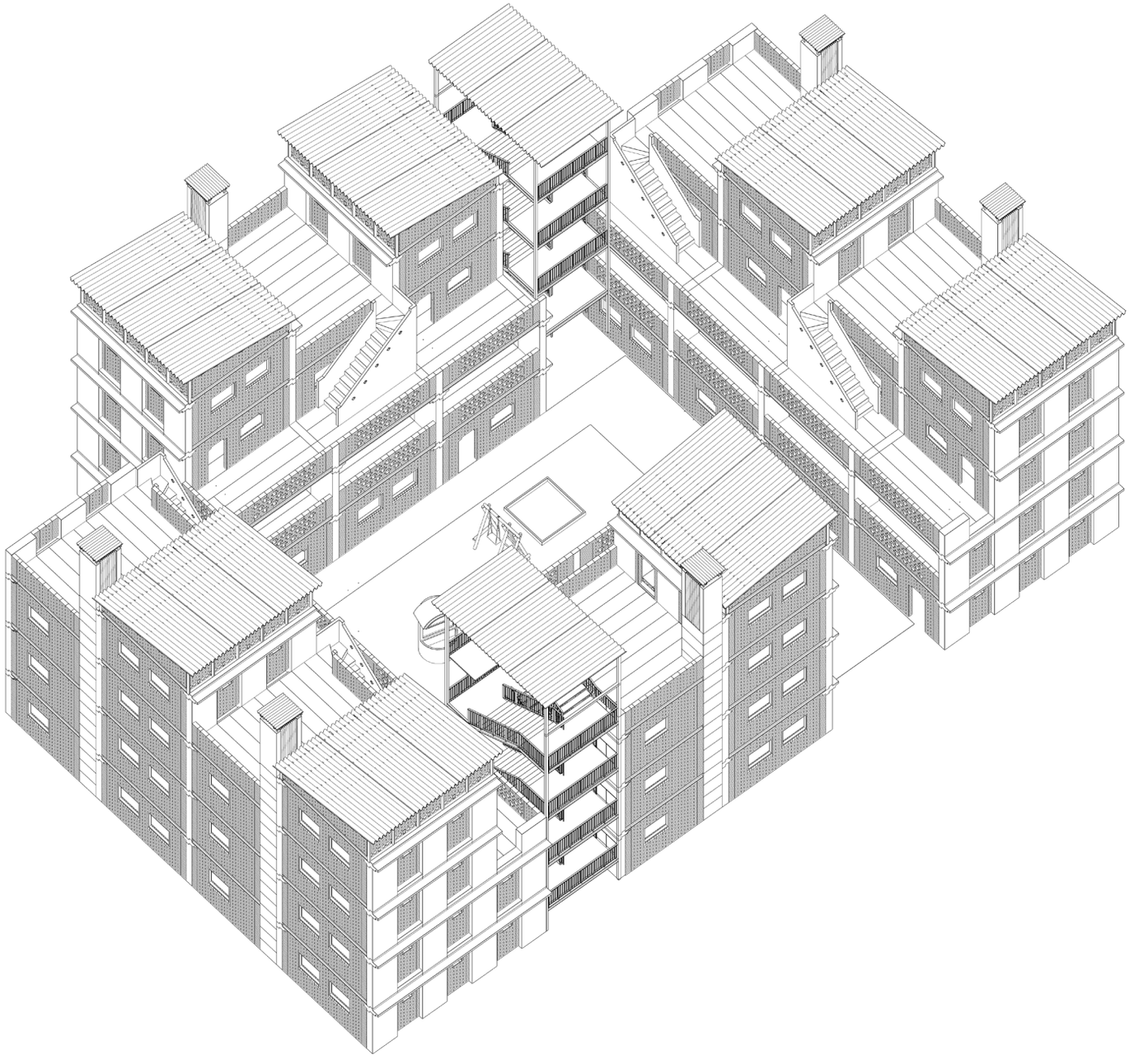


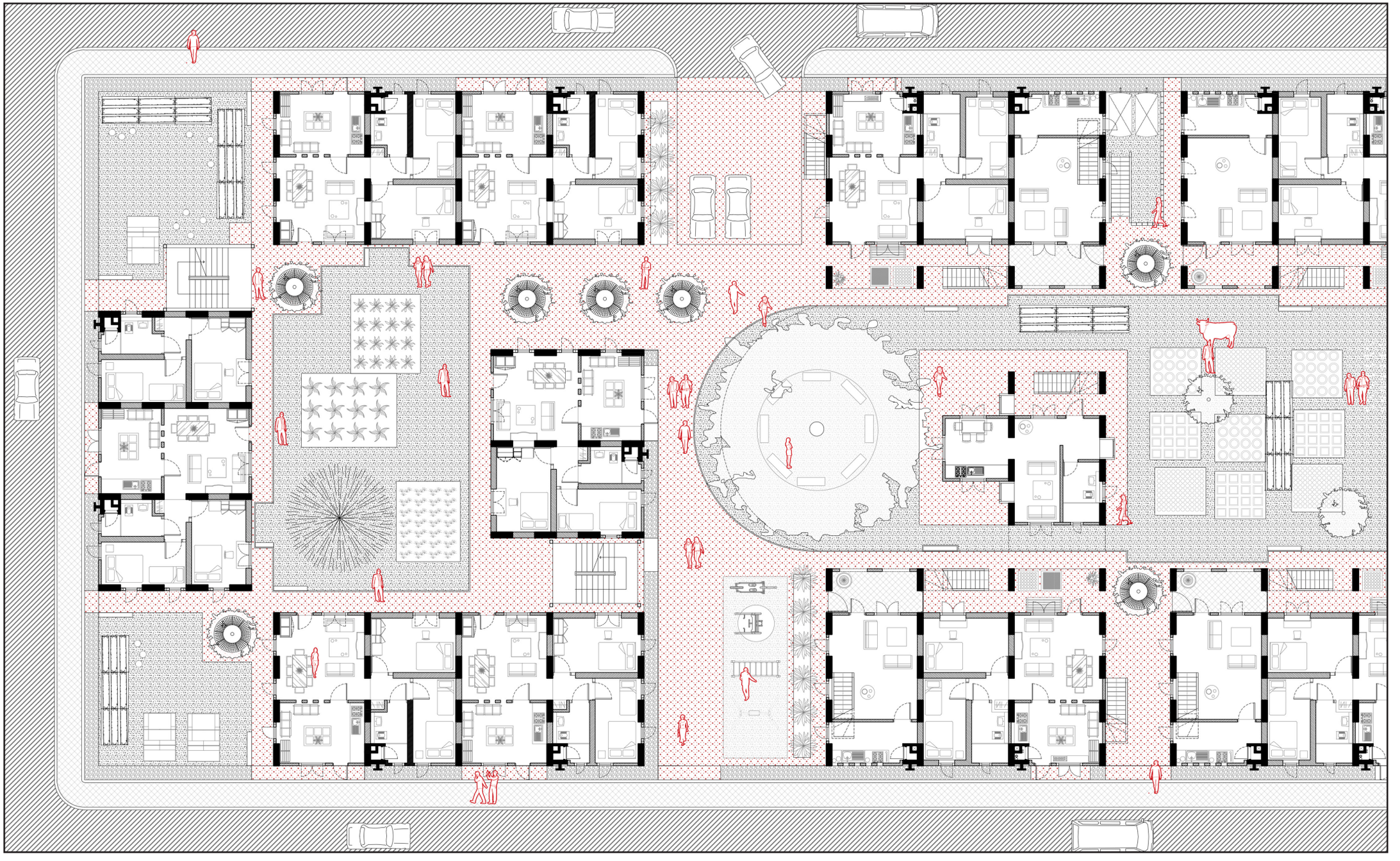


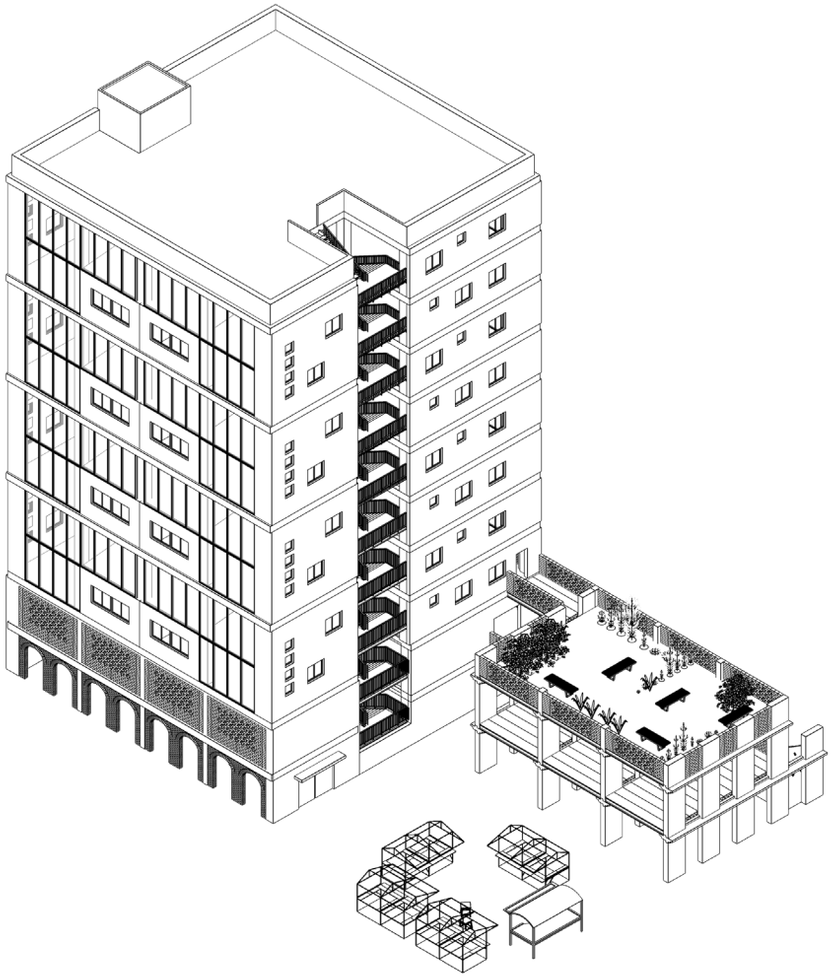

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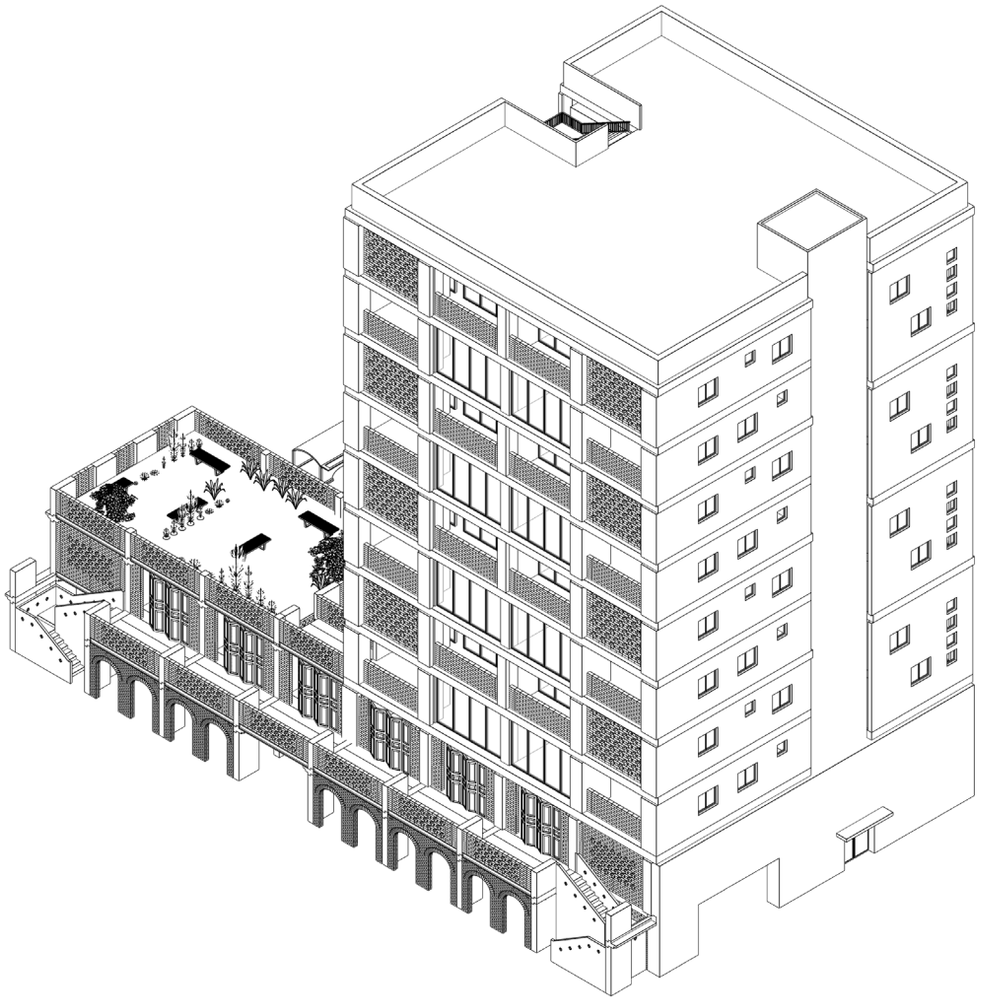


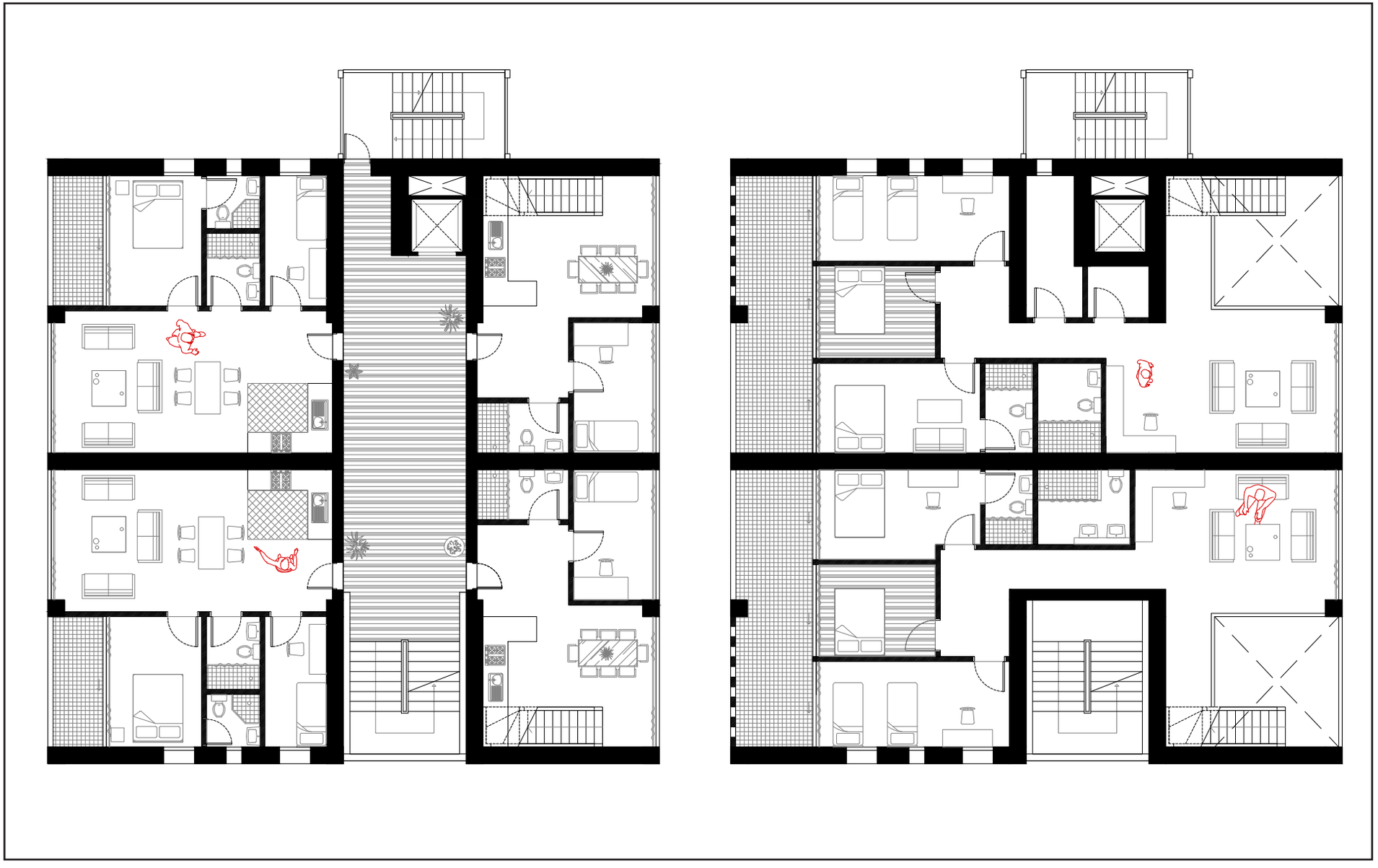

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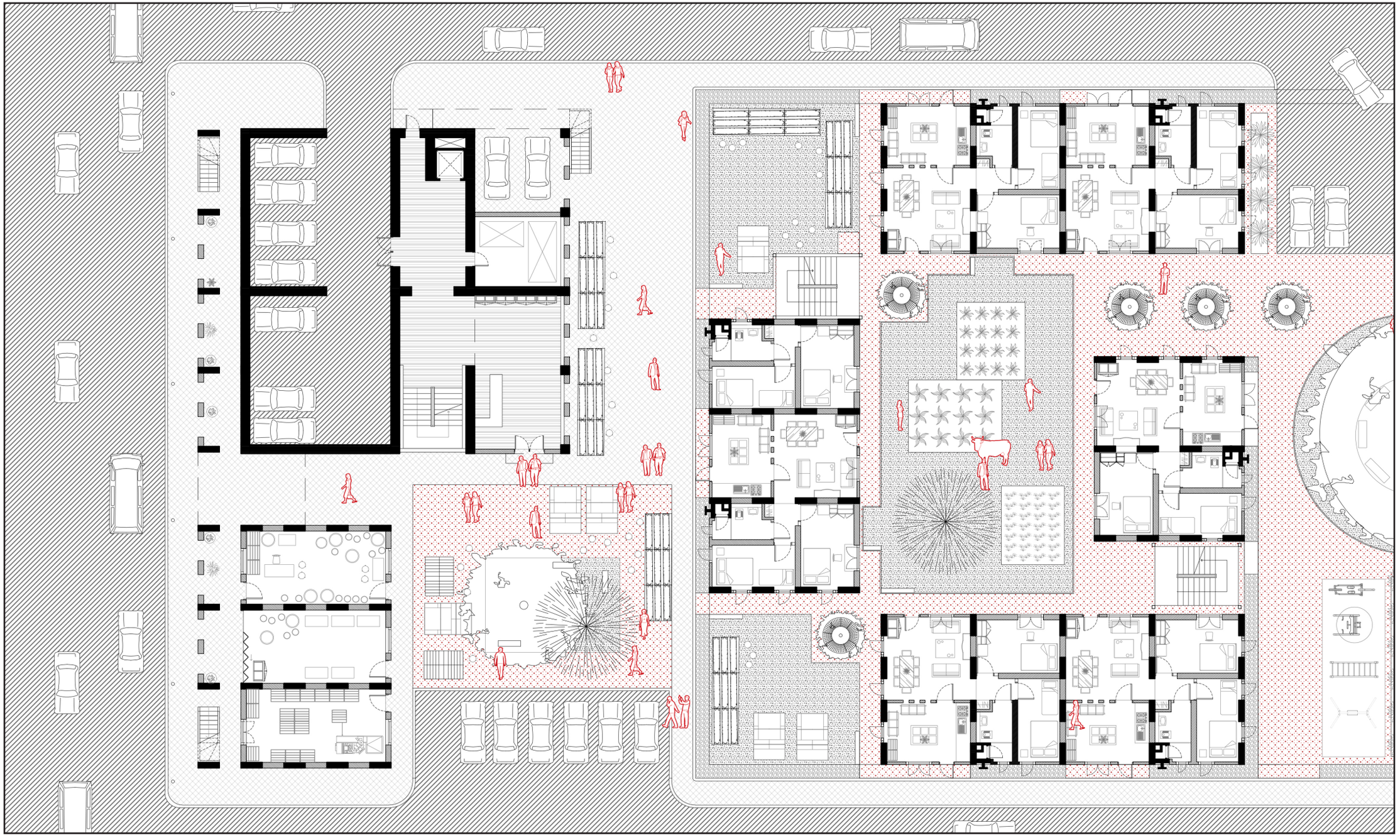


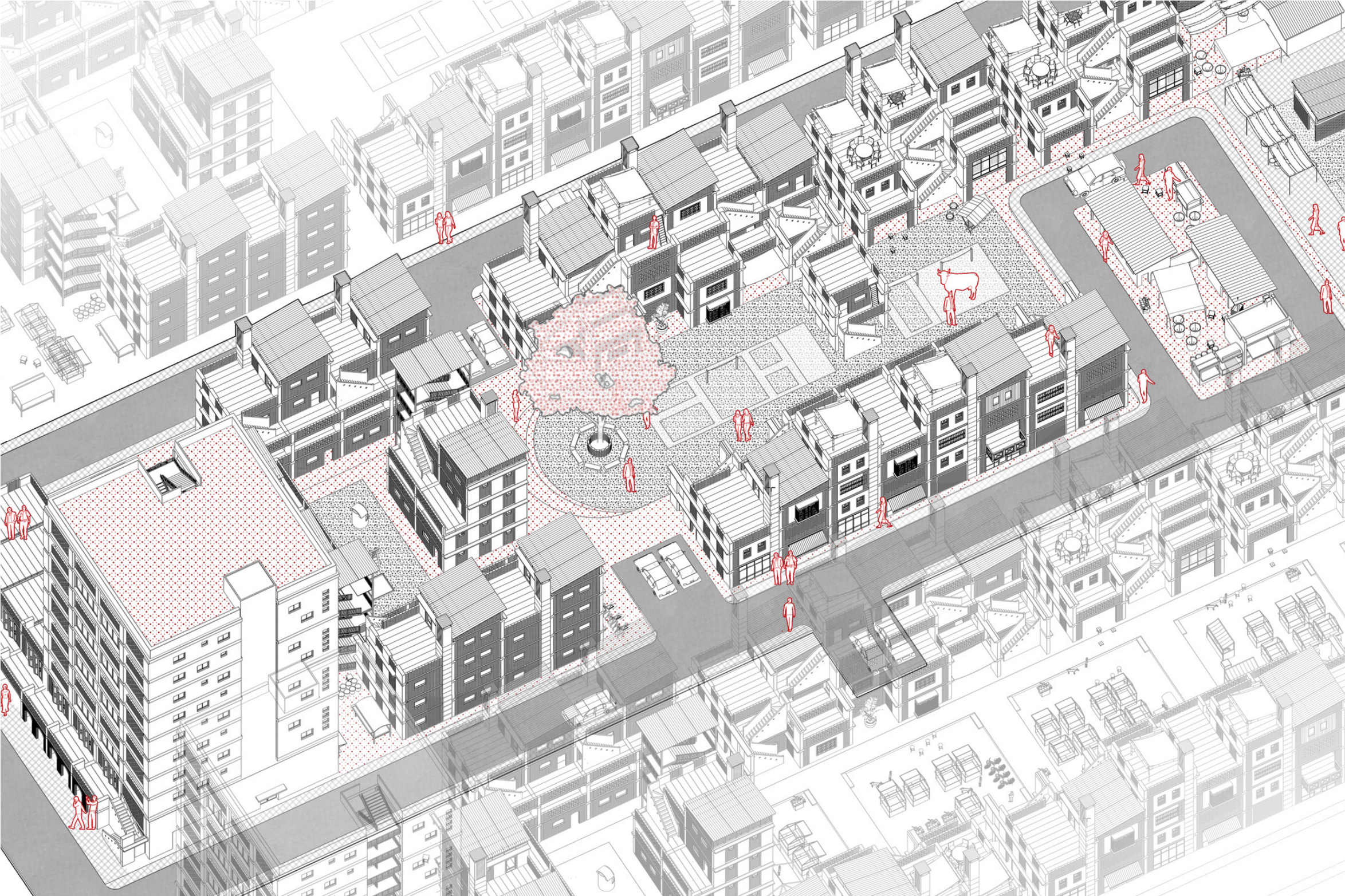

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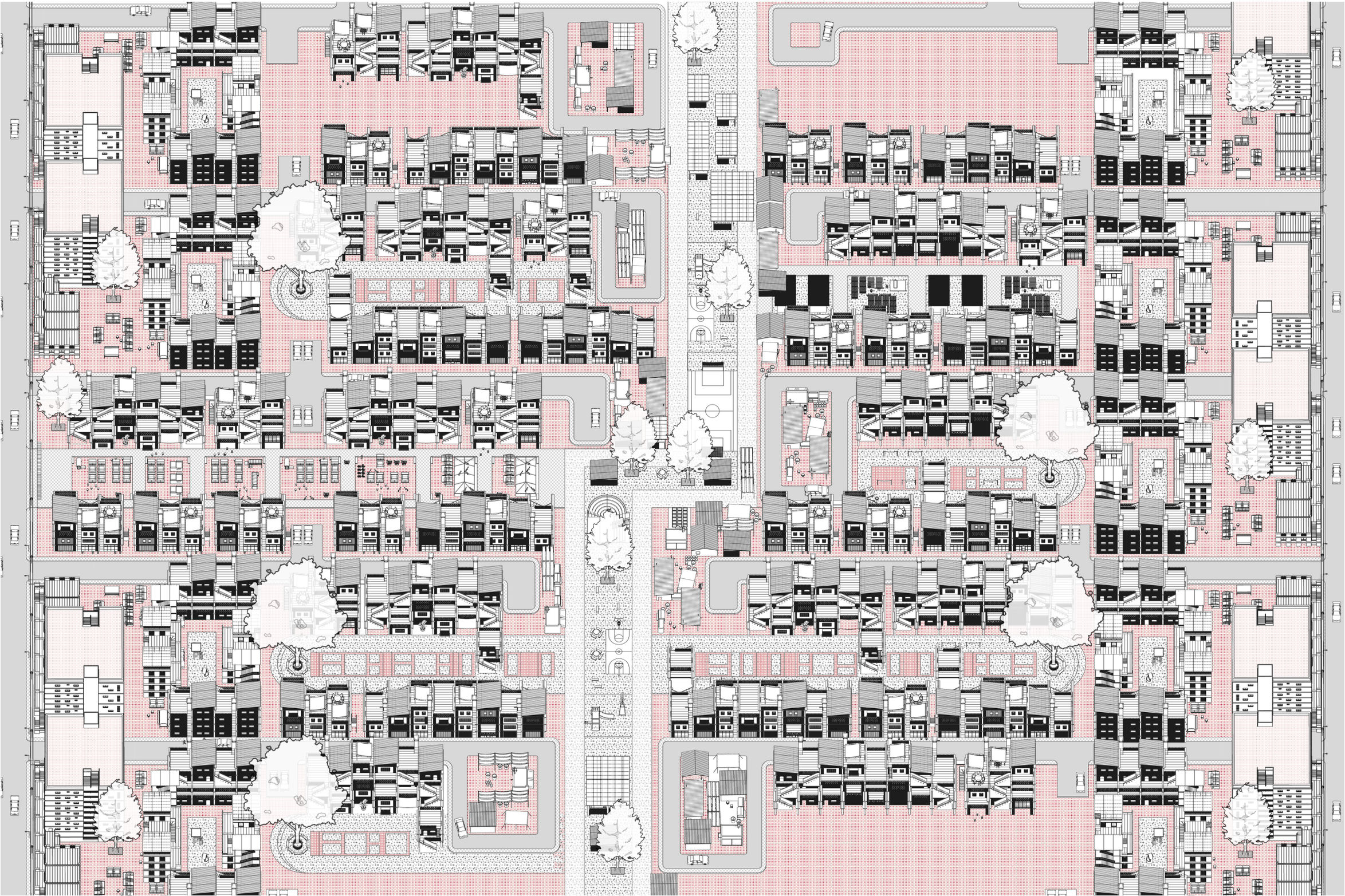


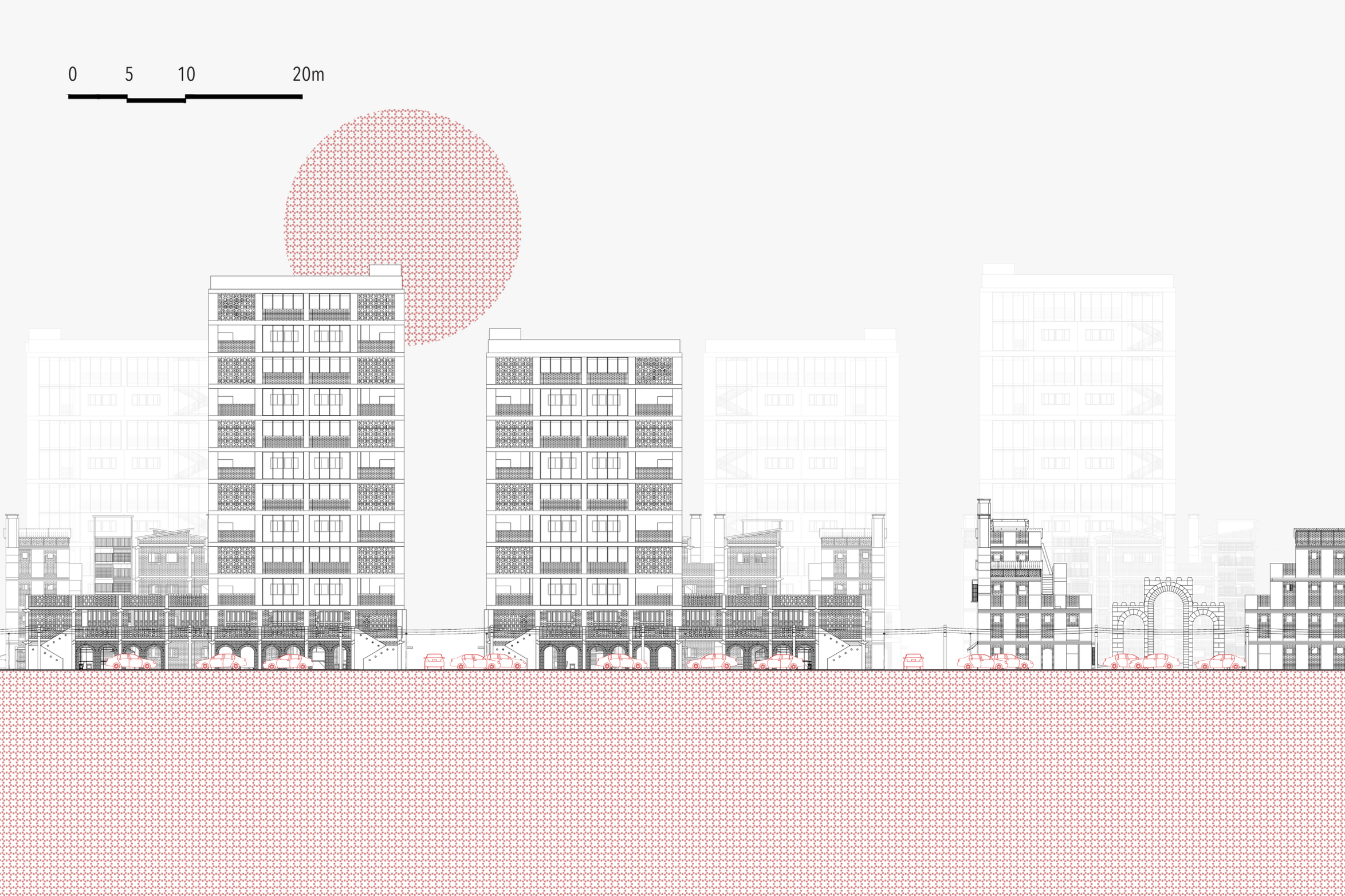


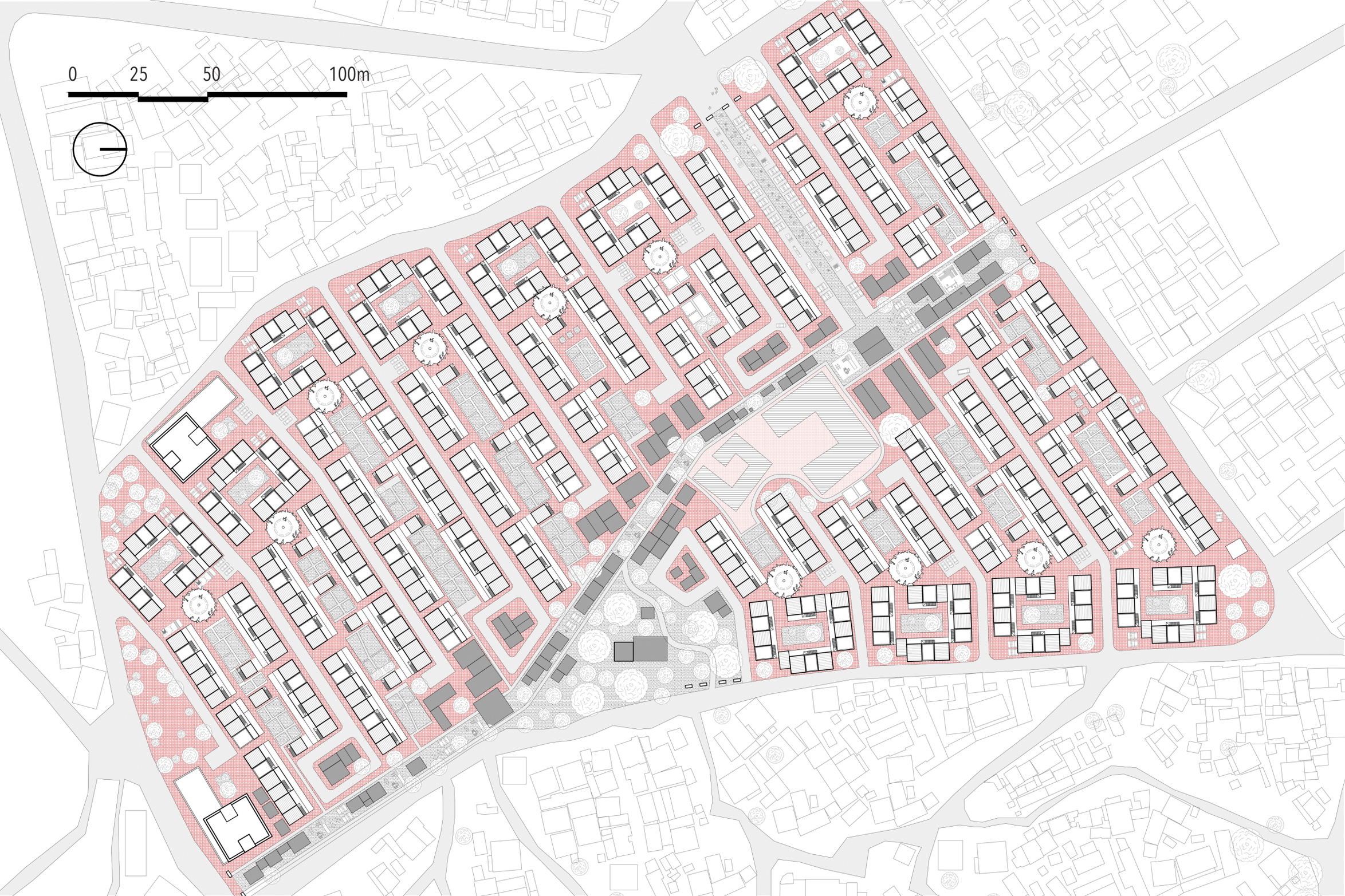

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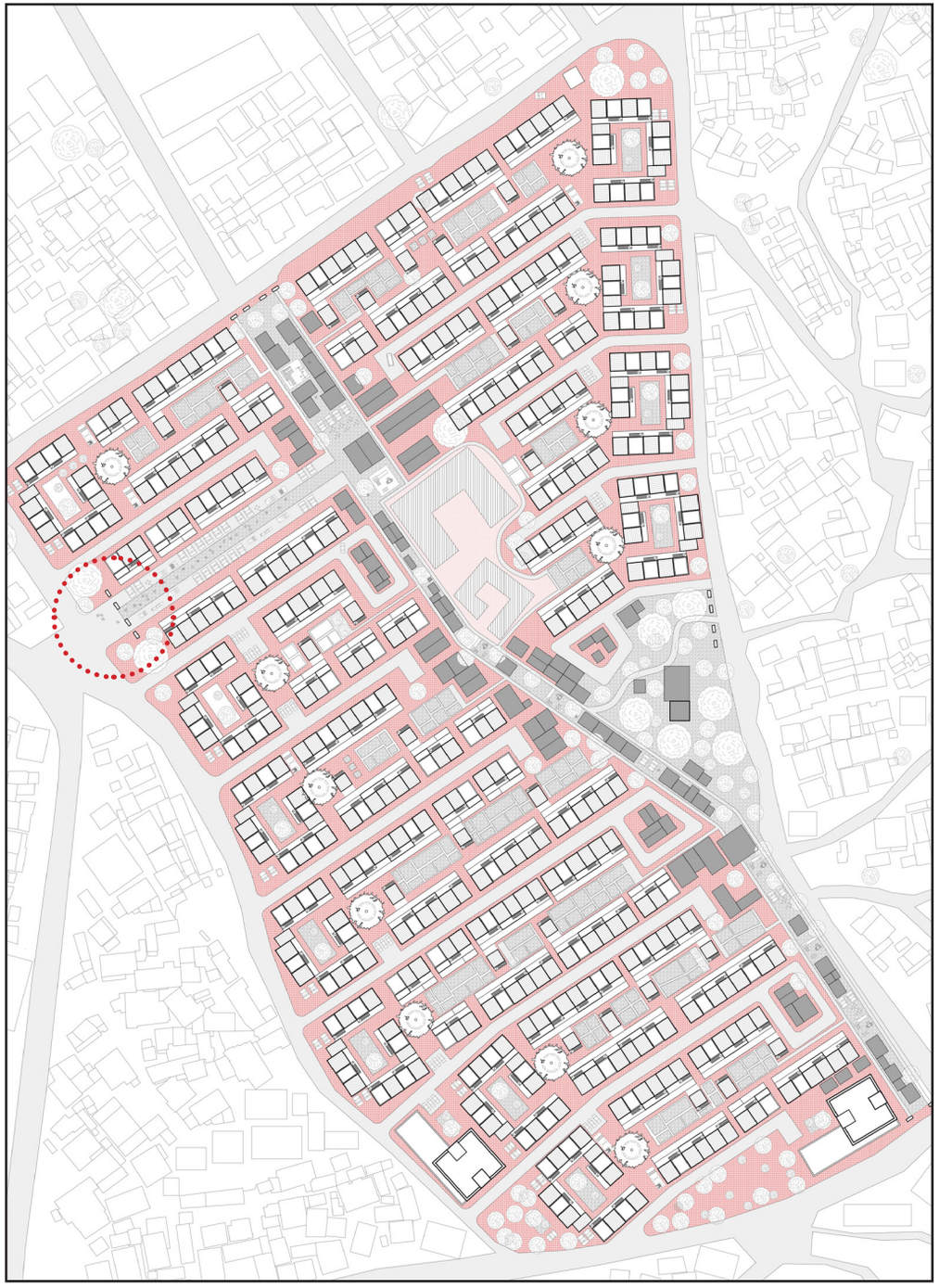

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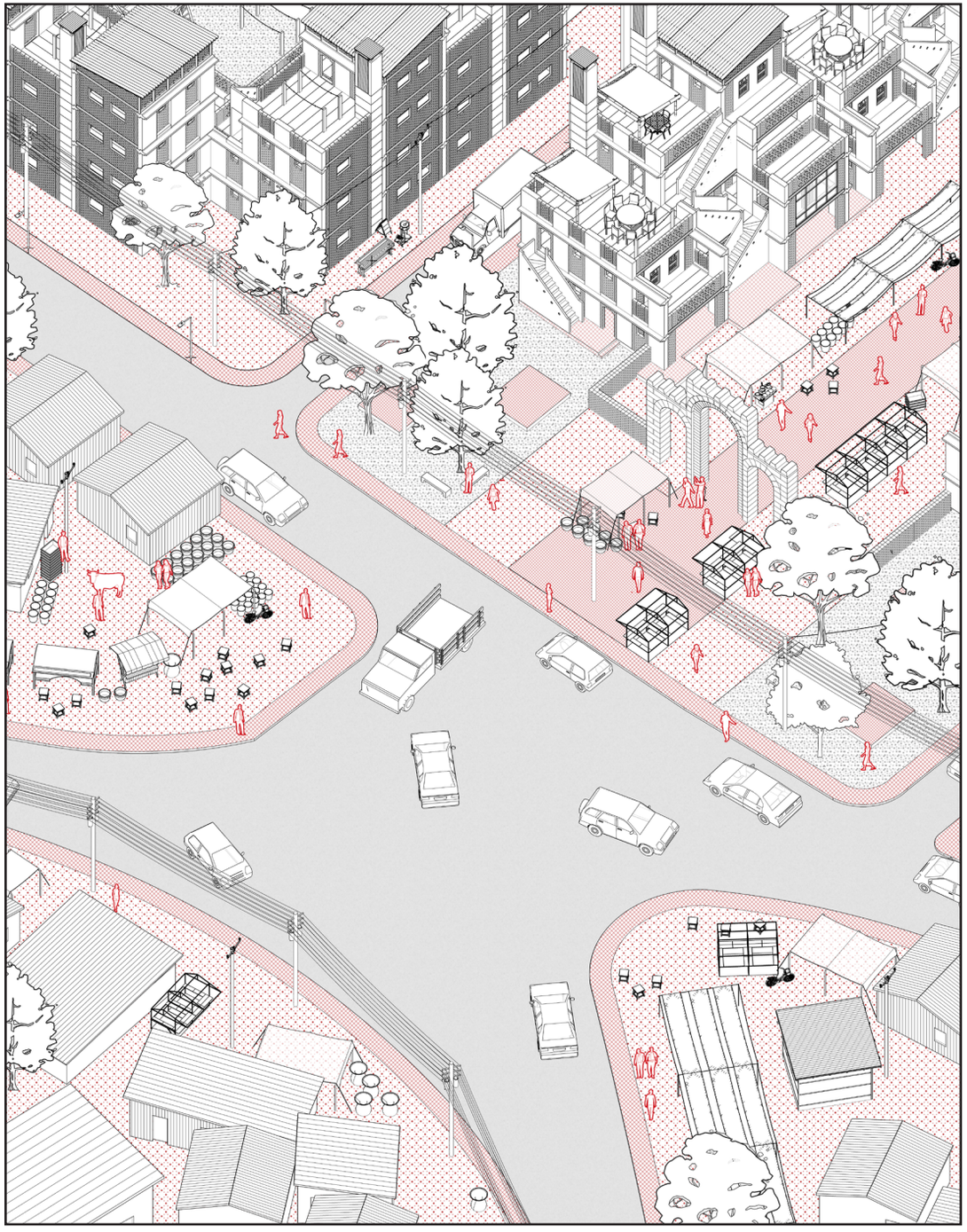


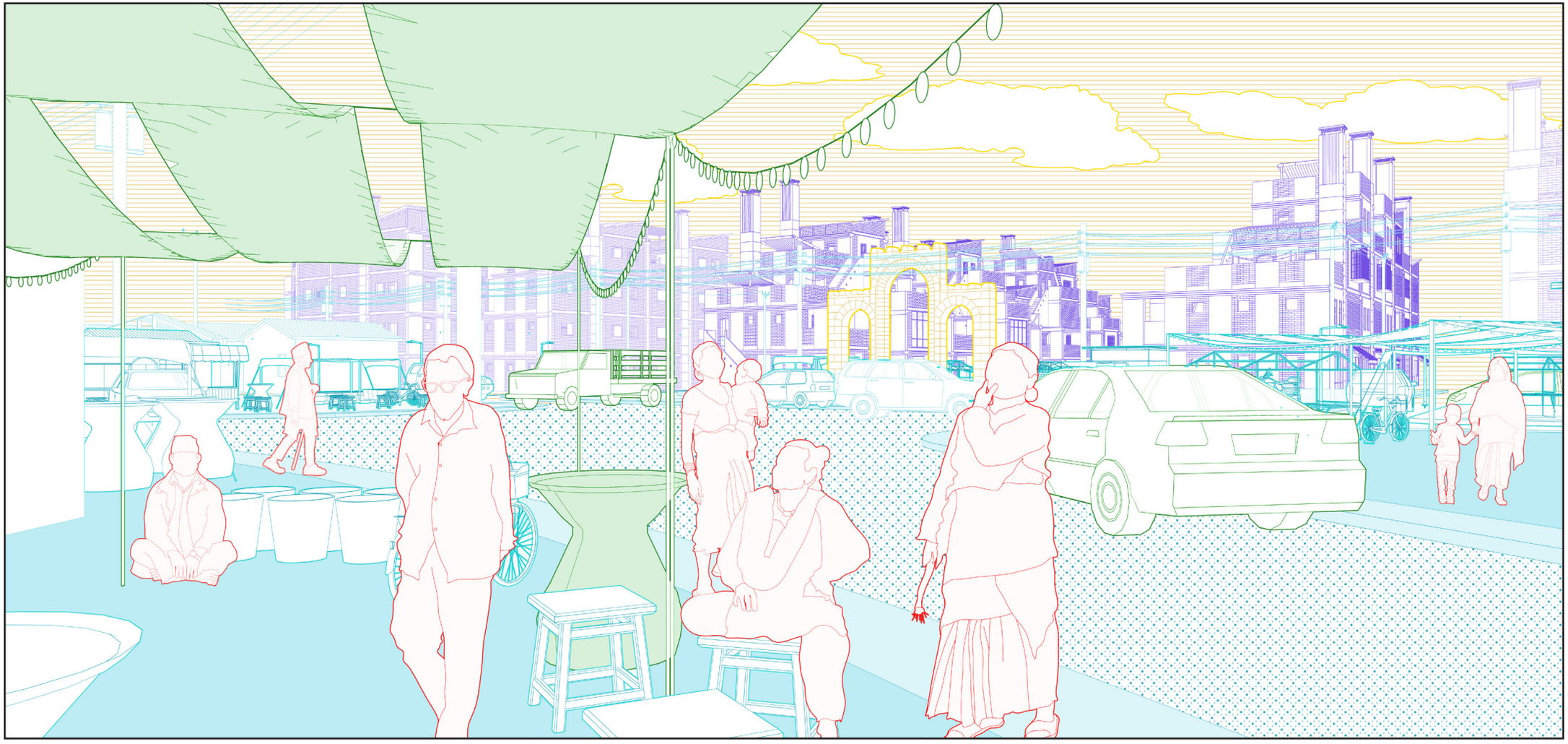


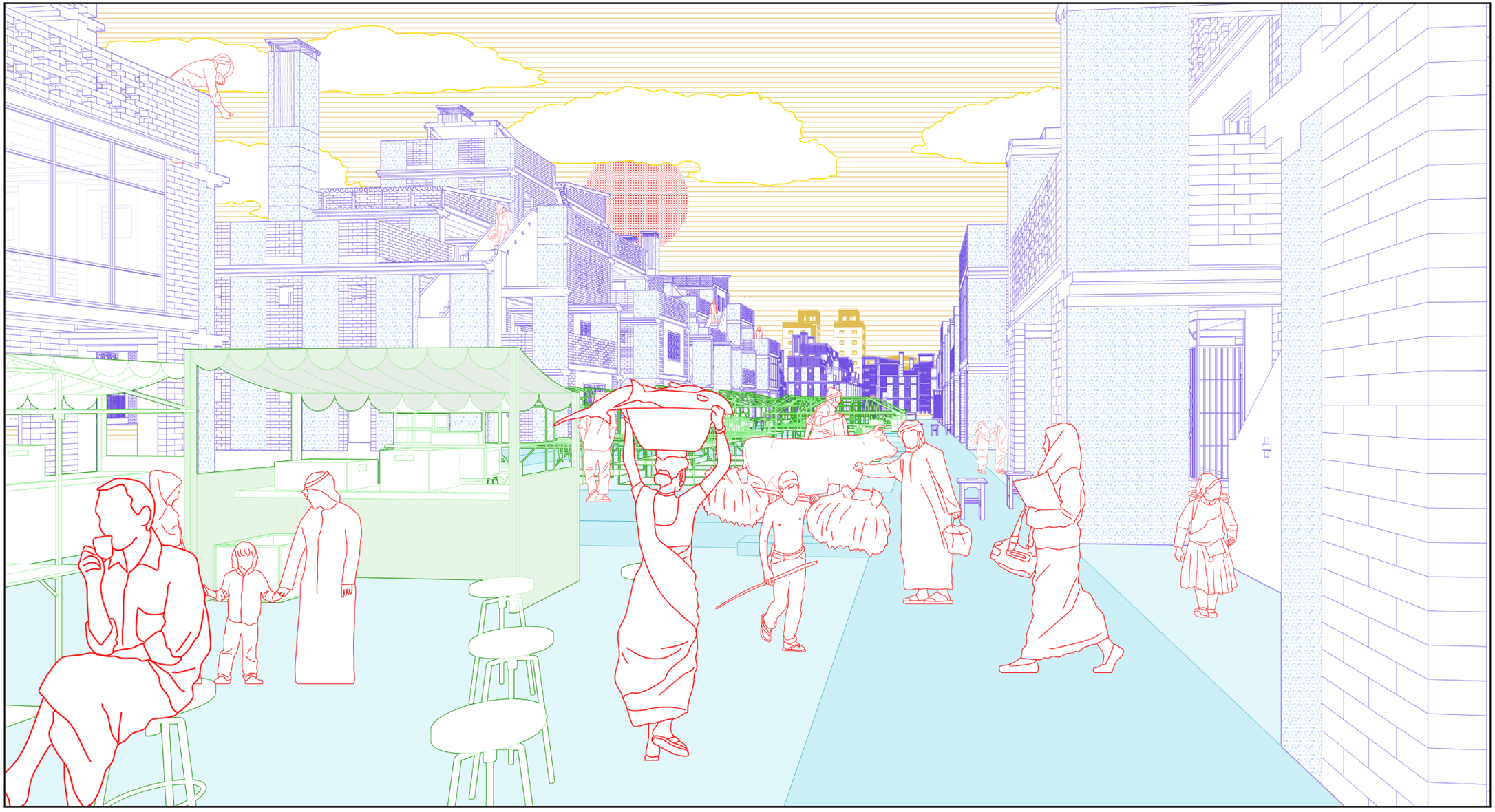

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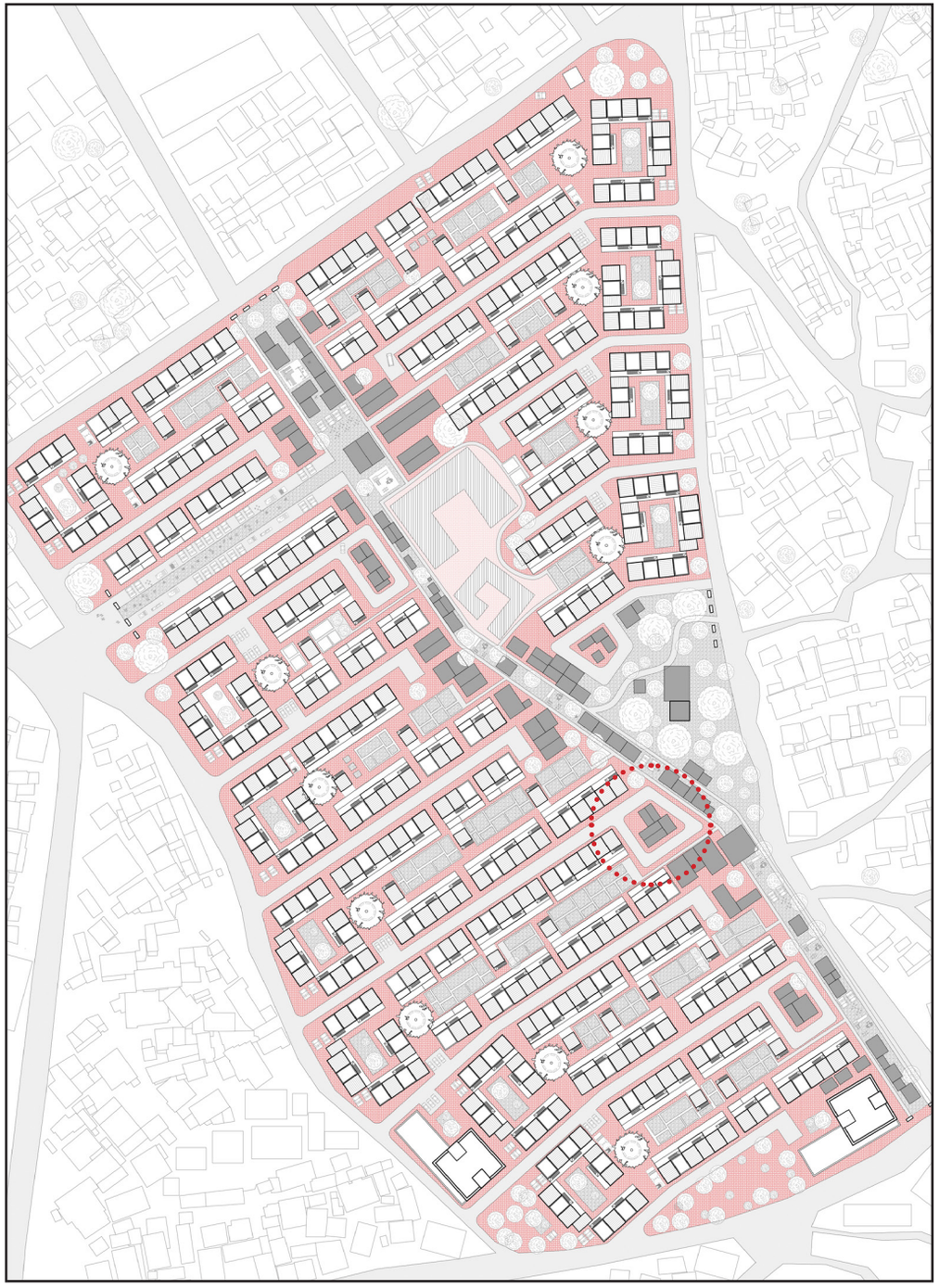

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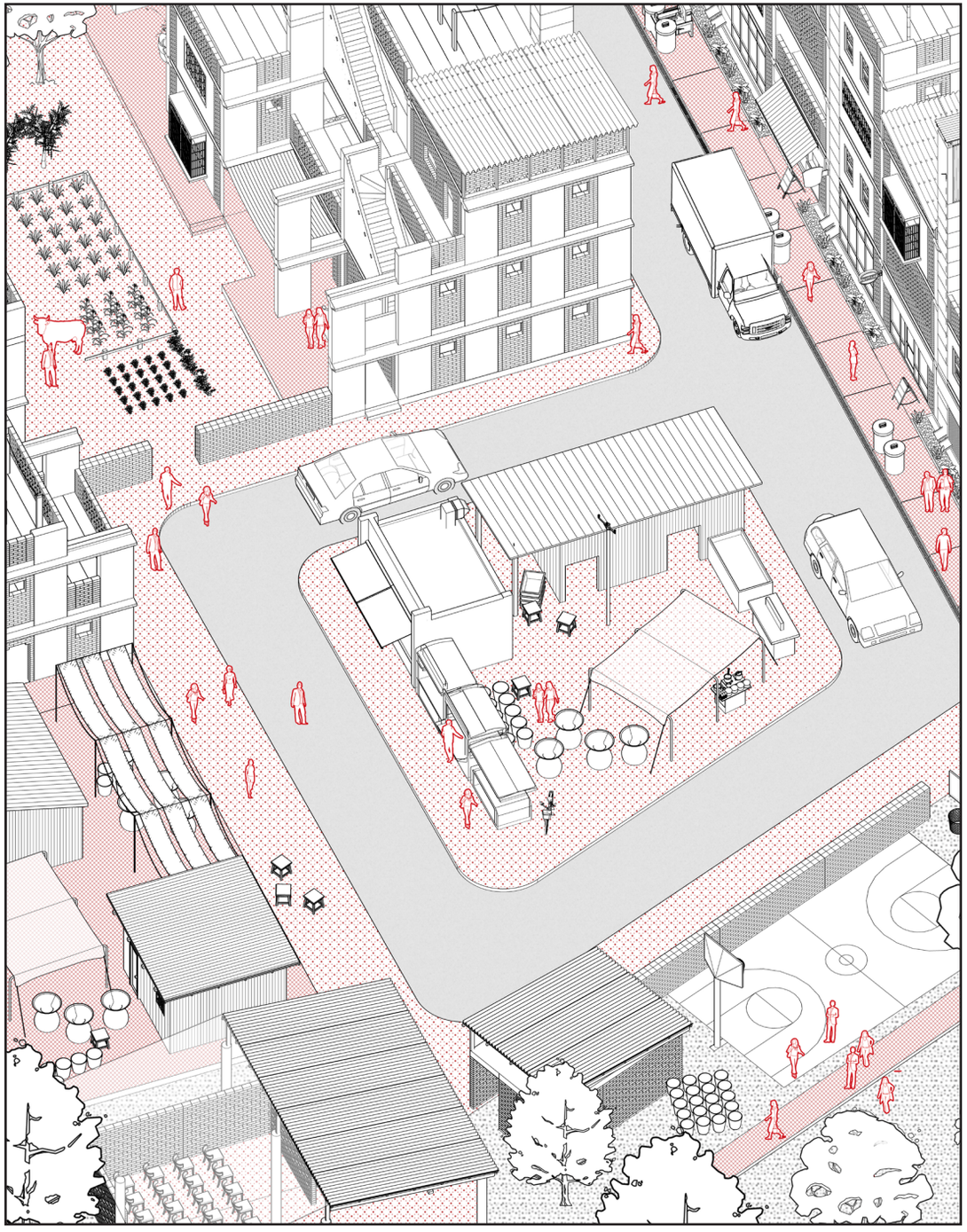


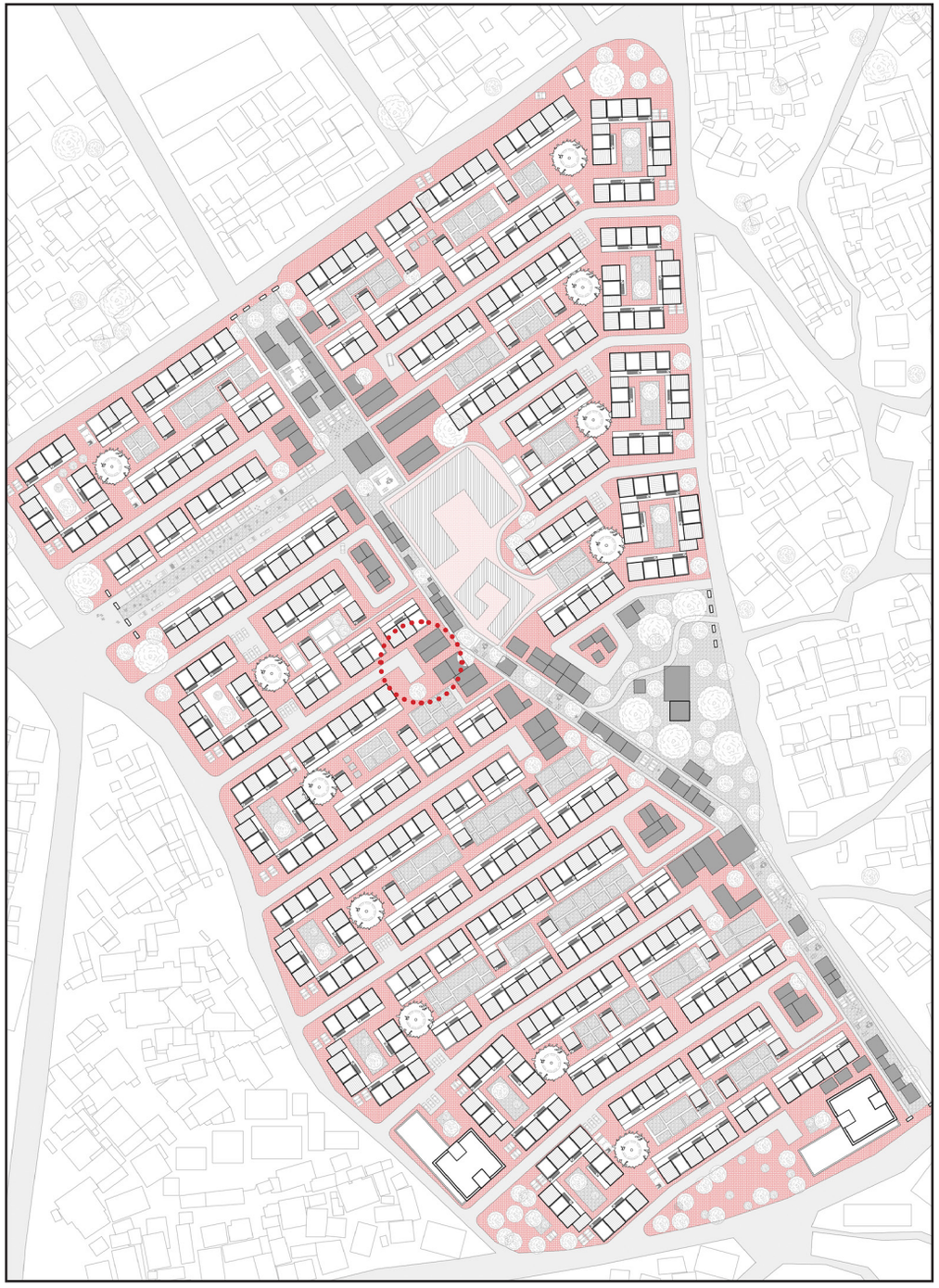


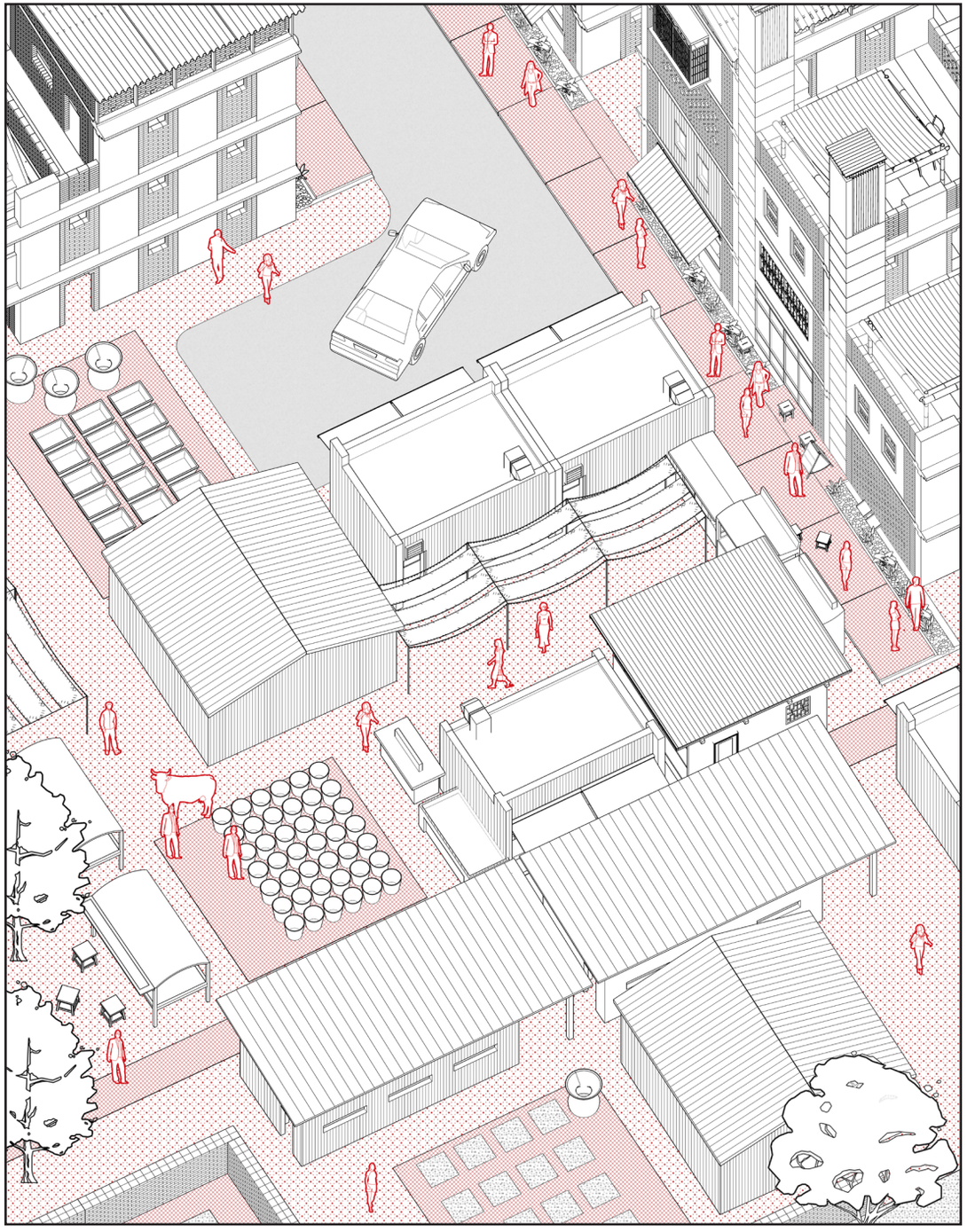


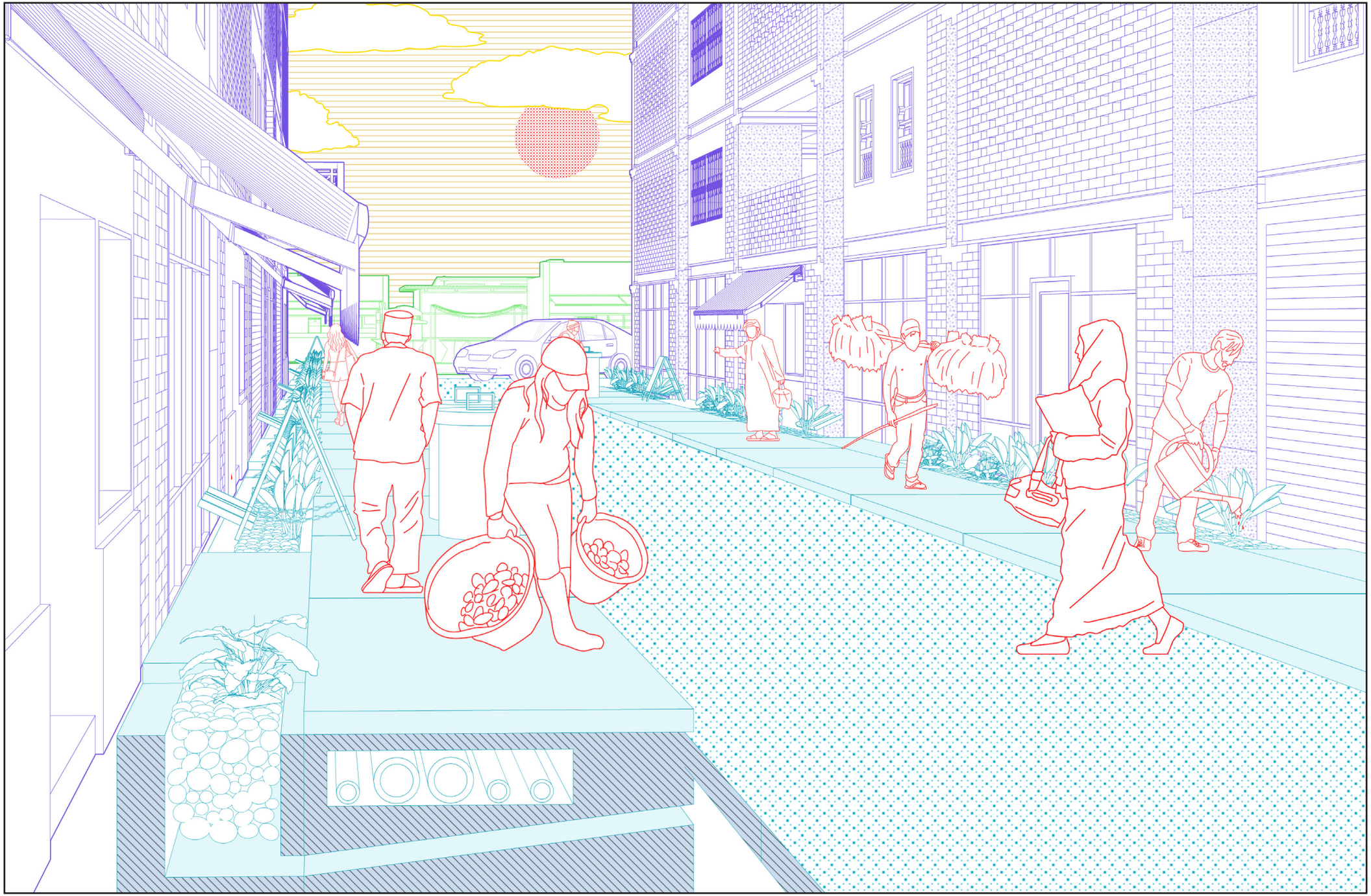


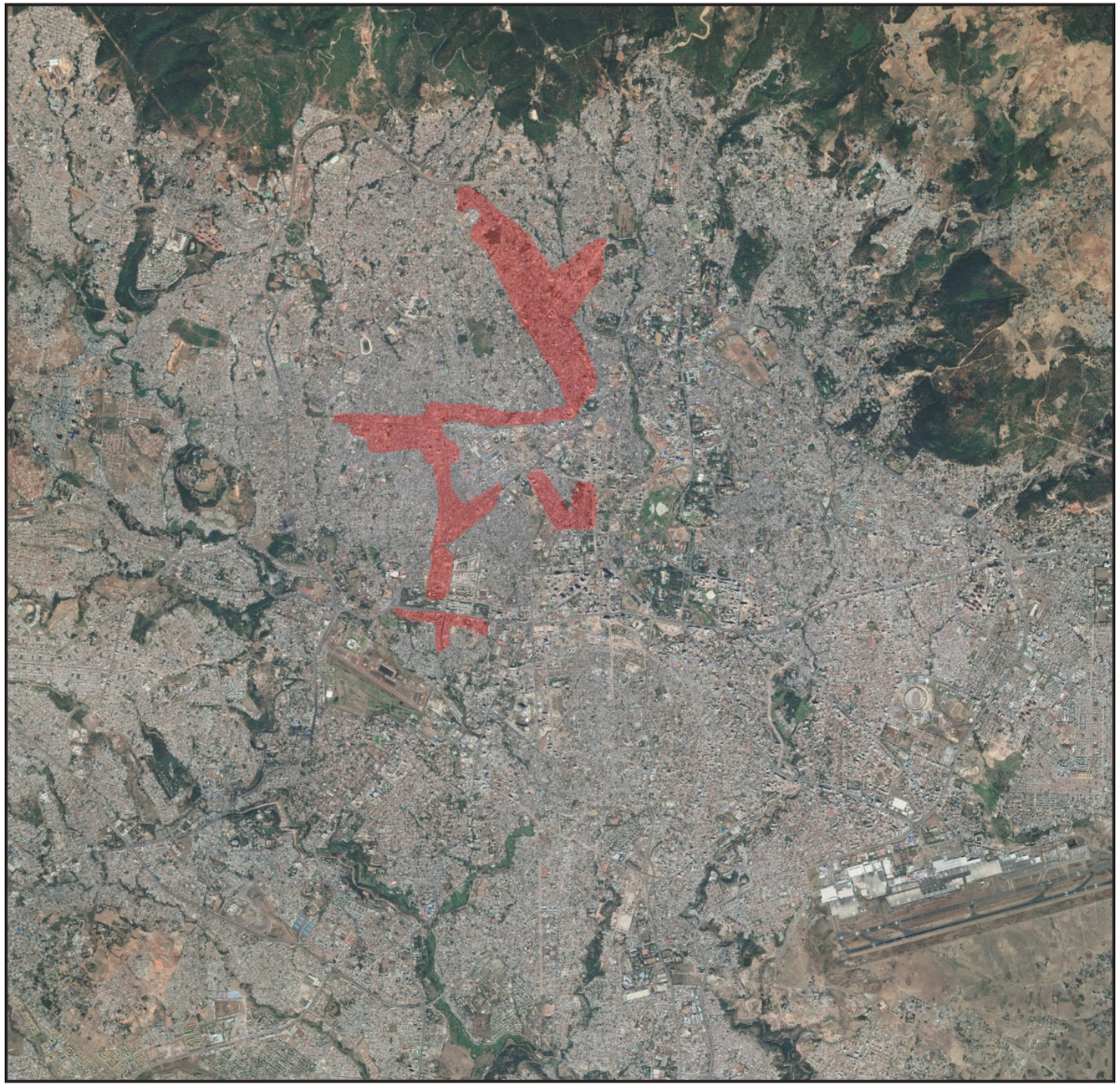


















Clustering

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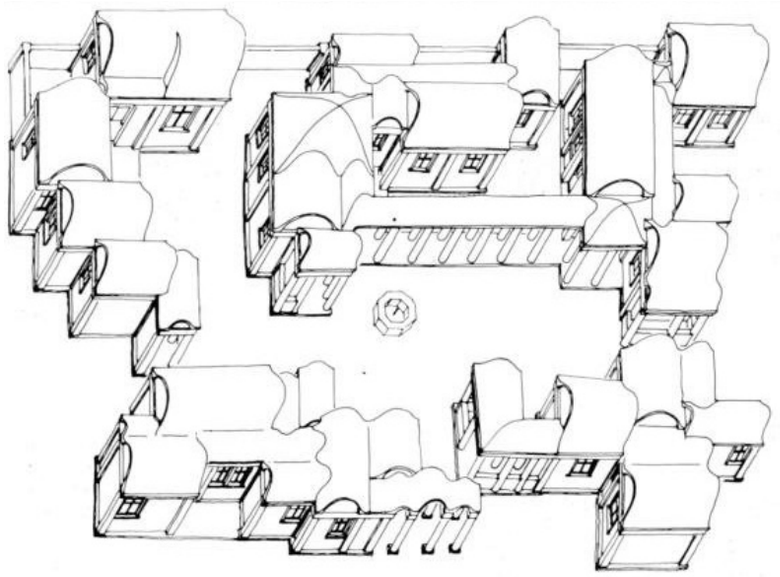
- The Builders Yard
- Phasing

The Architect - X

Support and Infill

Heterogeneity



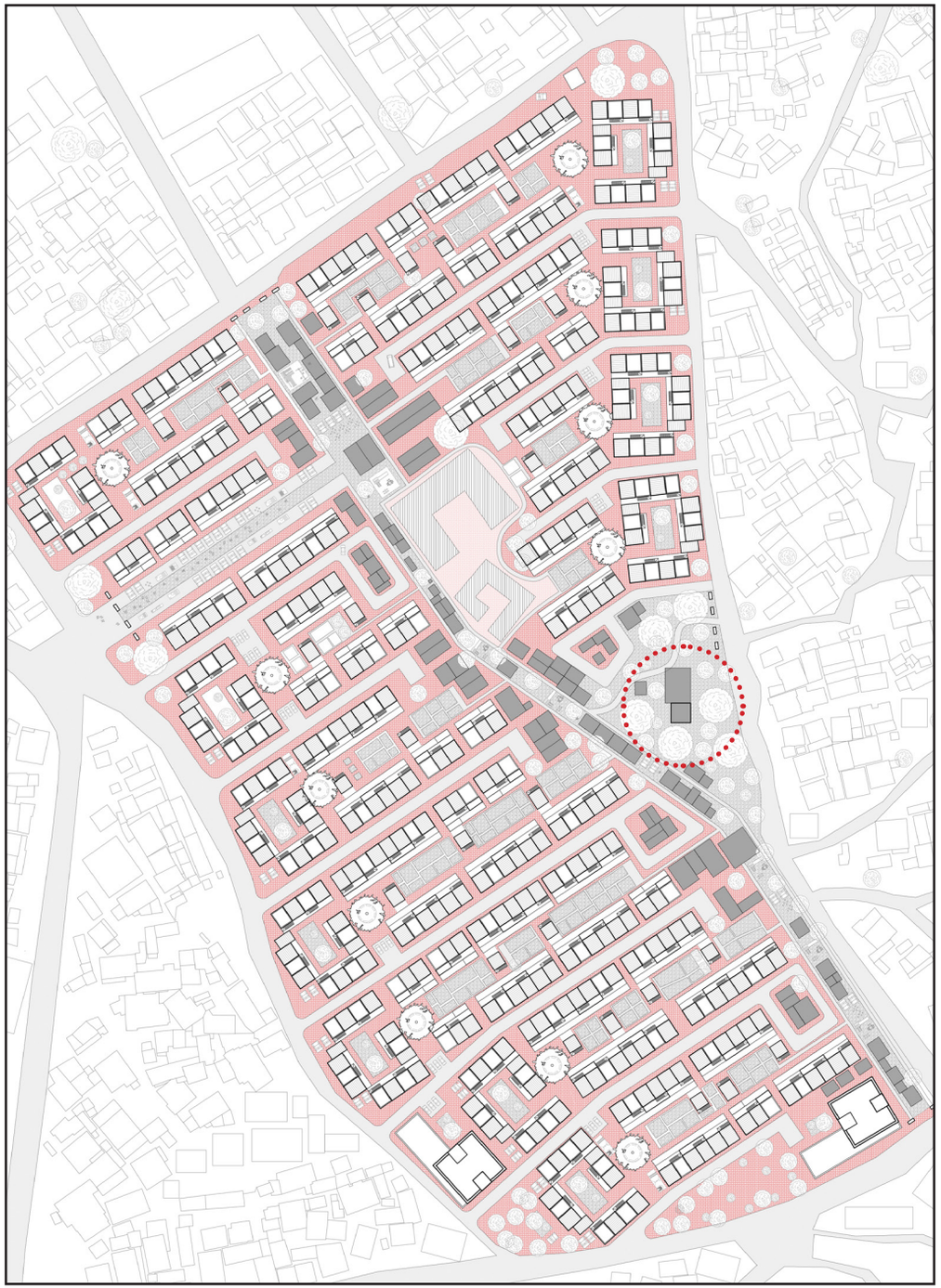


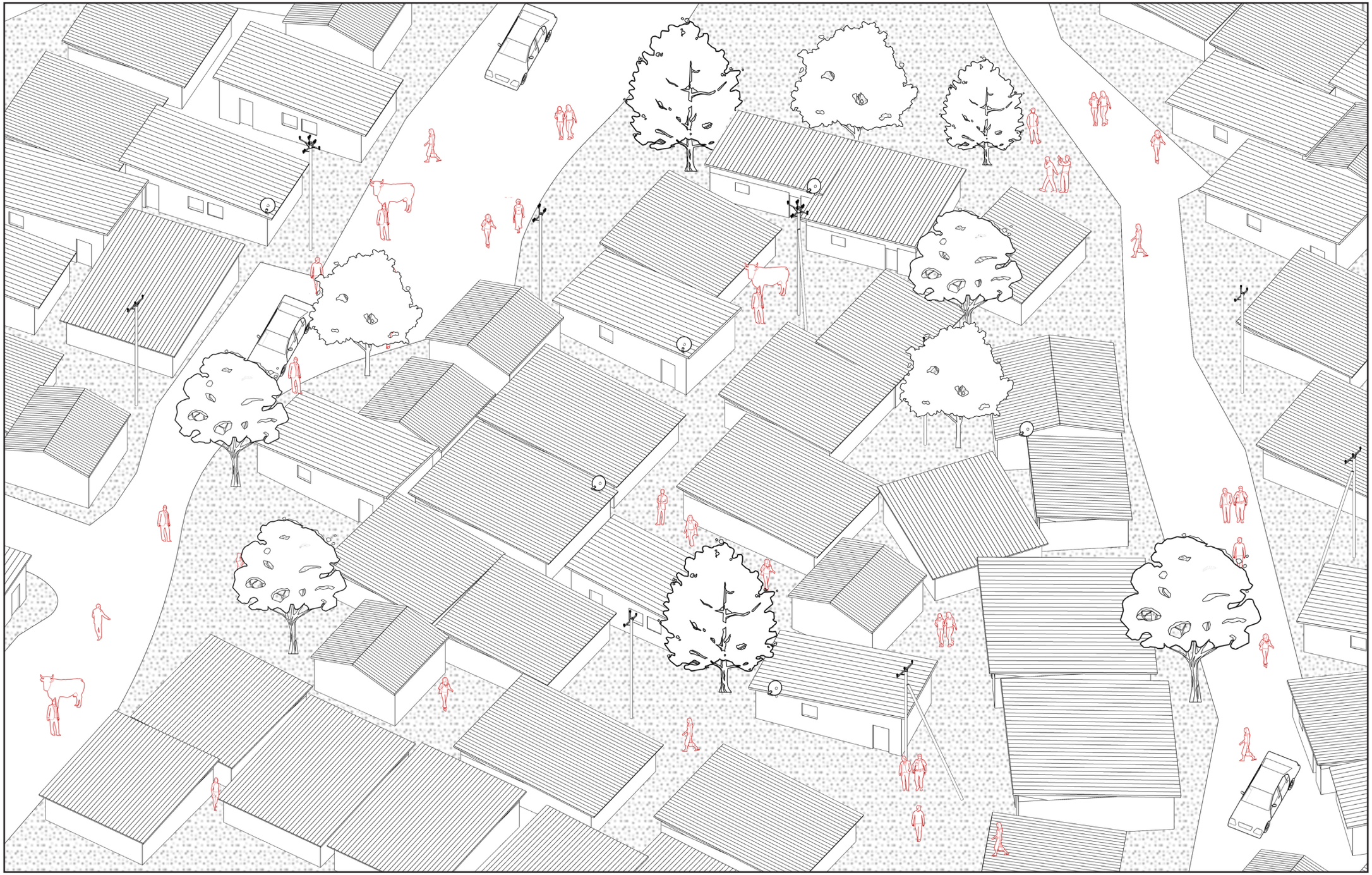


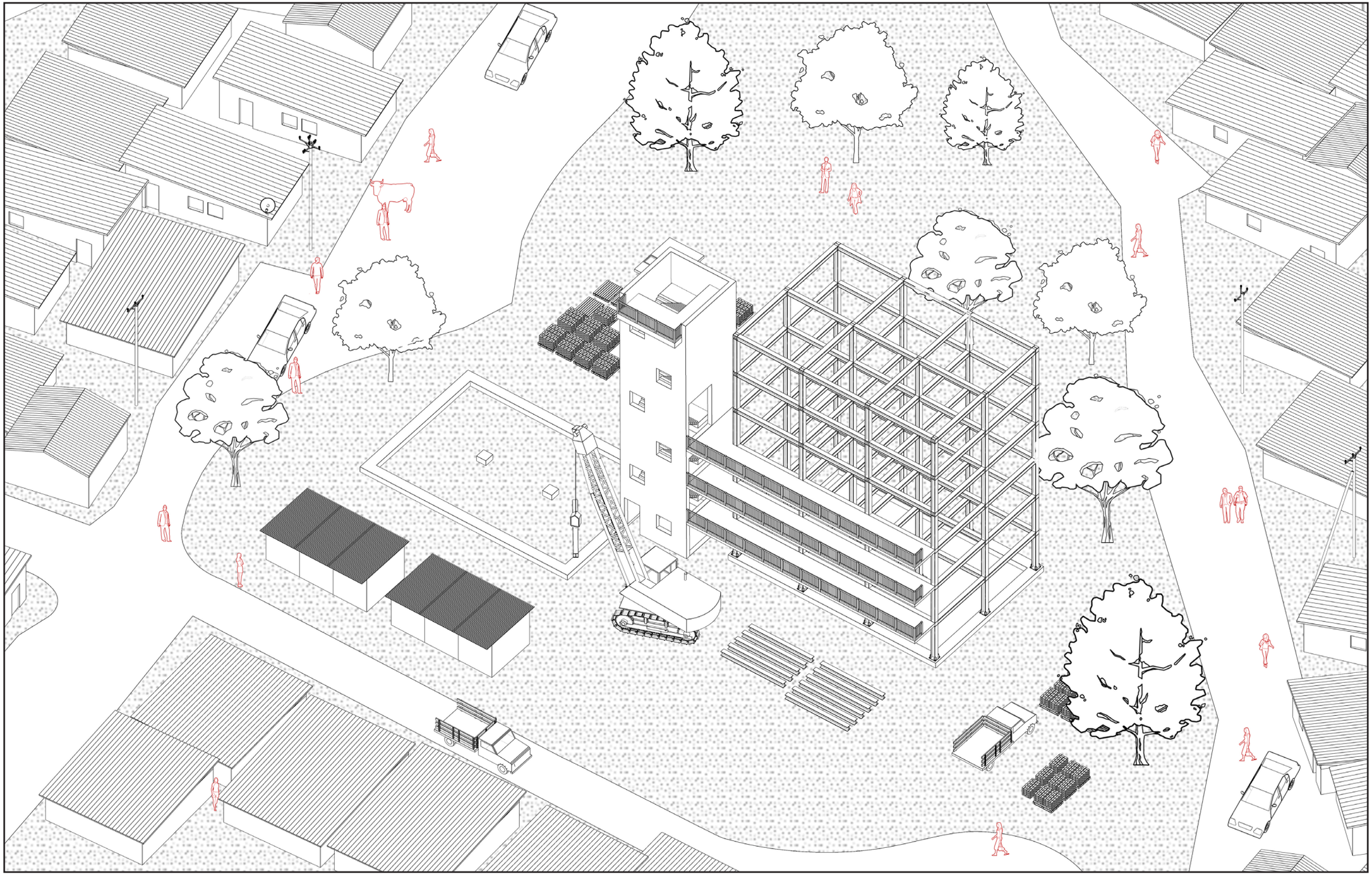
"The Builder's Yard allows for simultaneous activities of **imagination** and **demonstration**. Such 'imaginative demonstration' has the potential to redefine the construction of buildings by reconnecting the processes of **thinking**, **visualizing**, and **making**."

- Charlie Hailey, Ph.D., School of Architecture, University of Florida
Re-viewing the Builder's Yard as a Place for Design Visualization

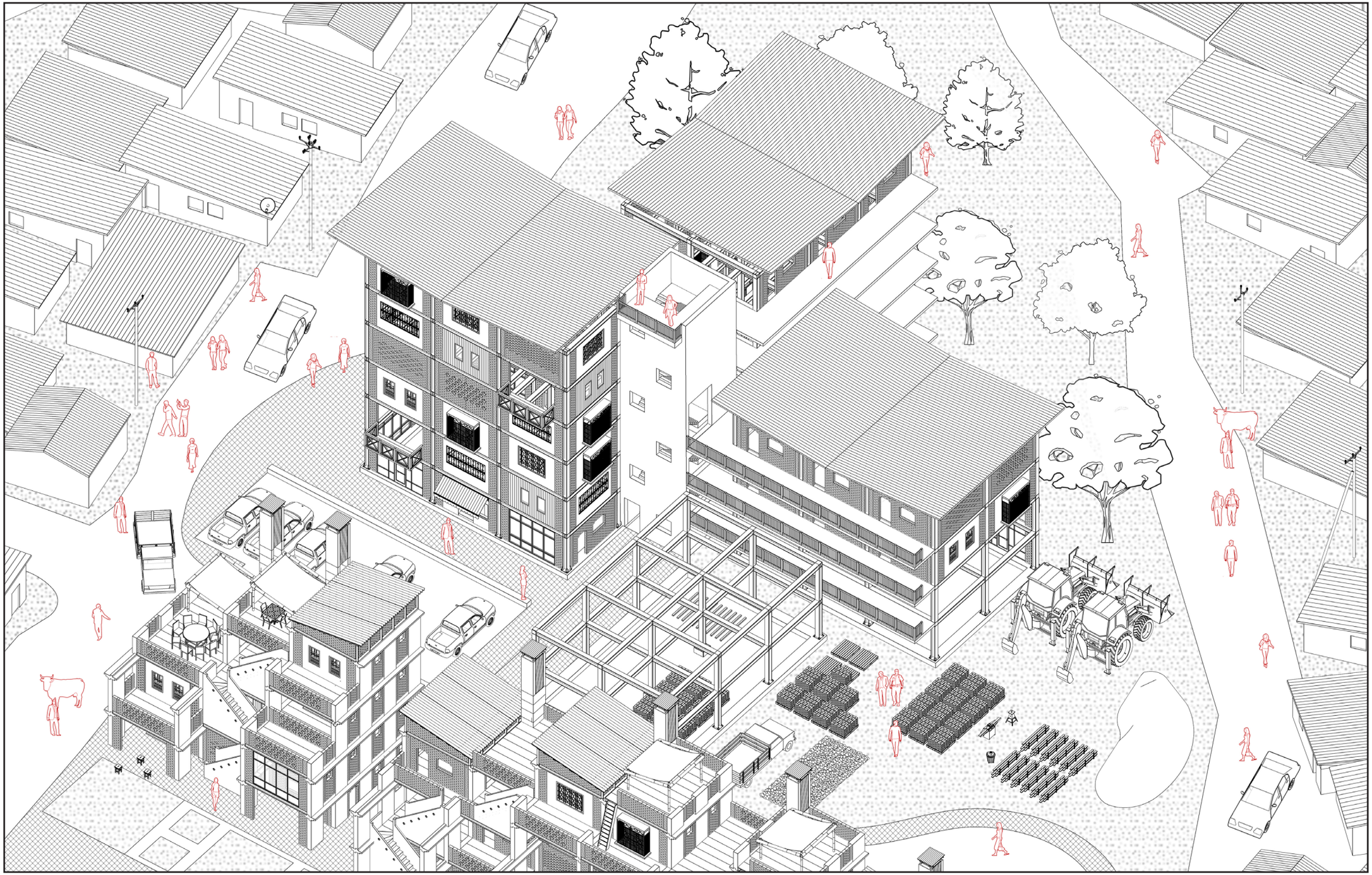


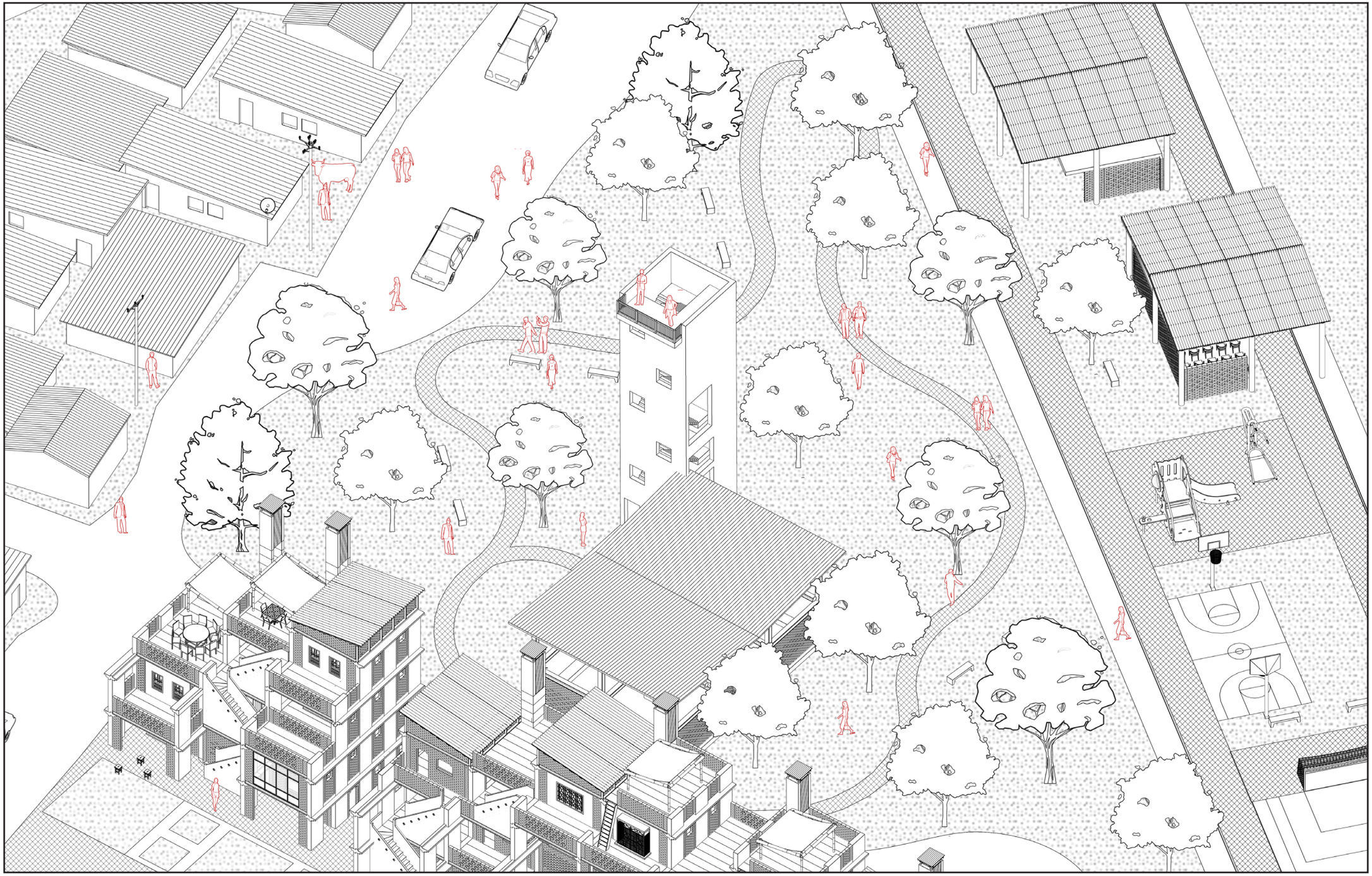






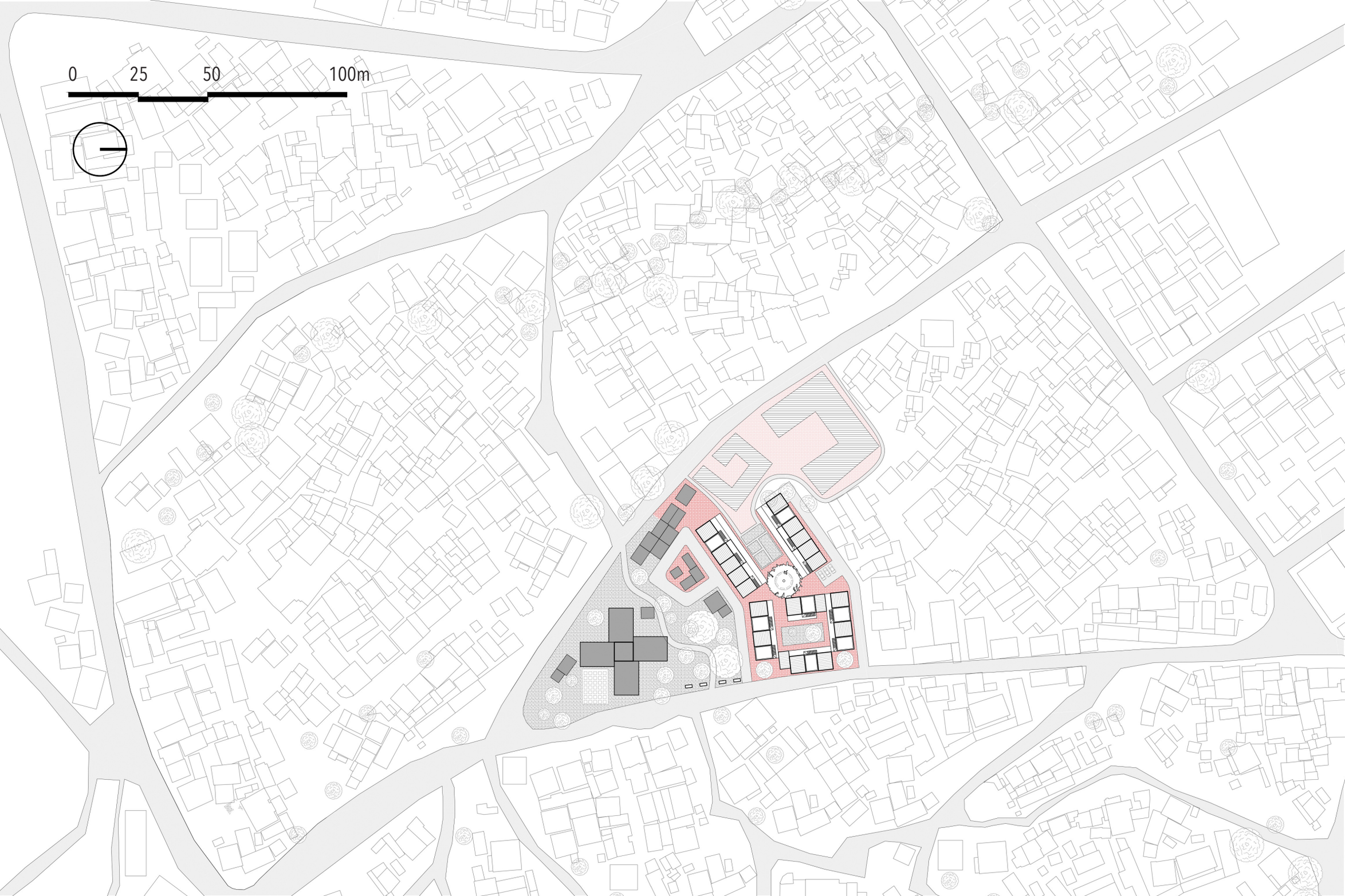


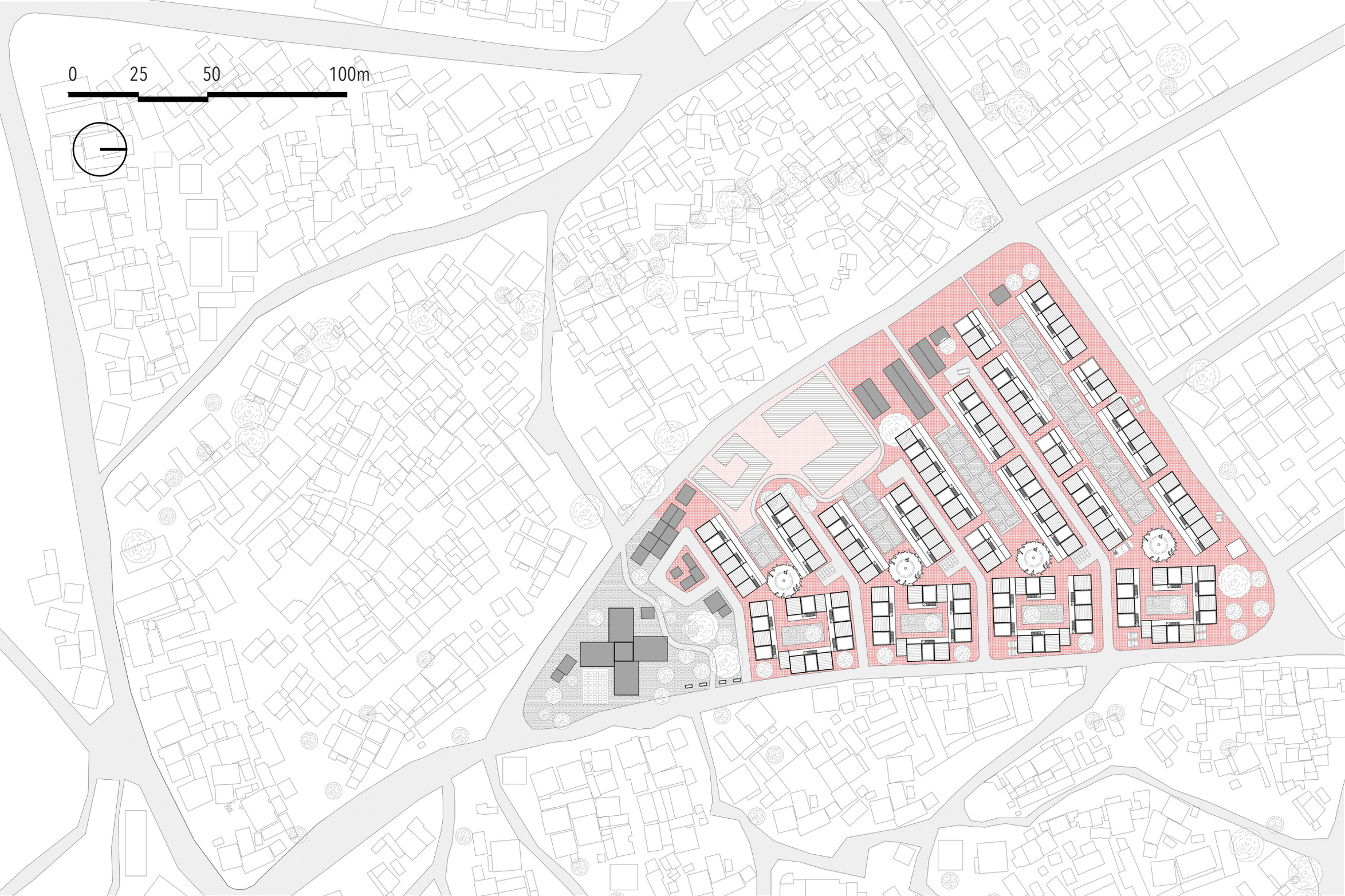


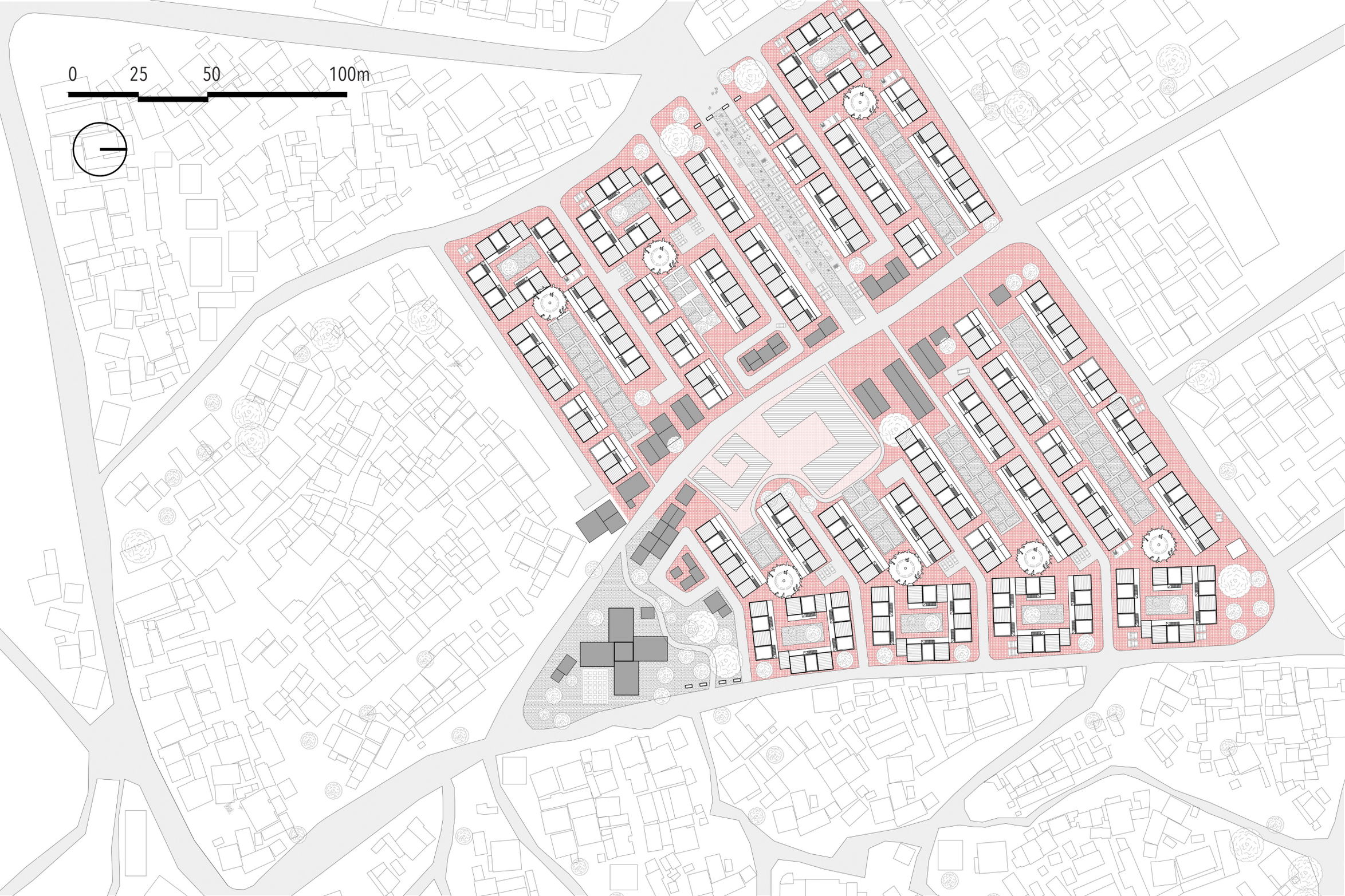


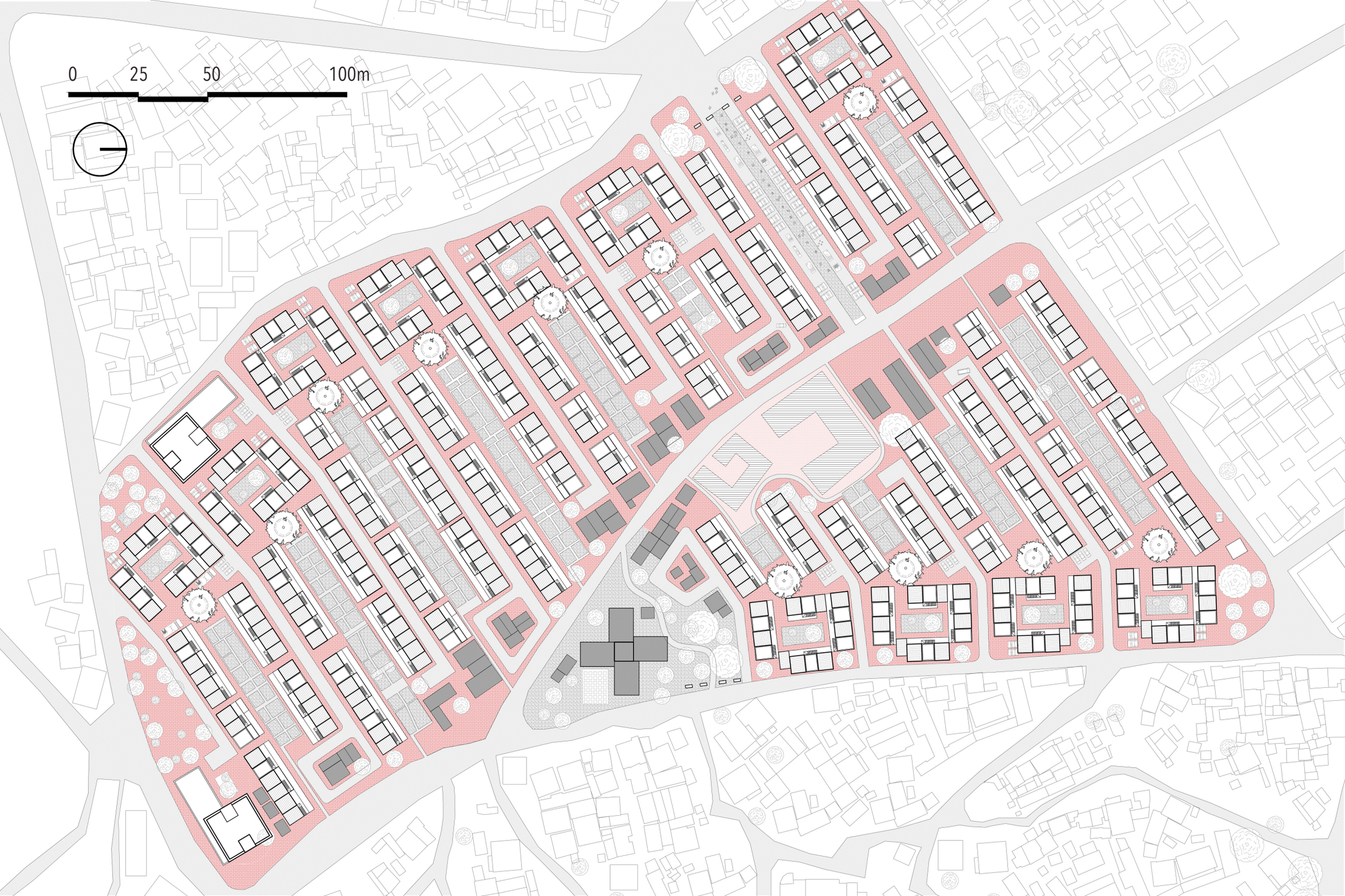

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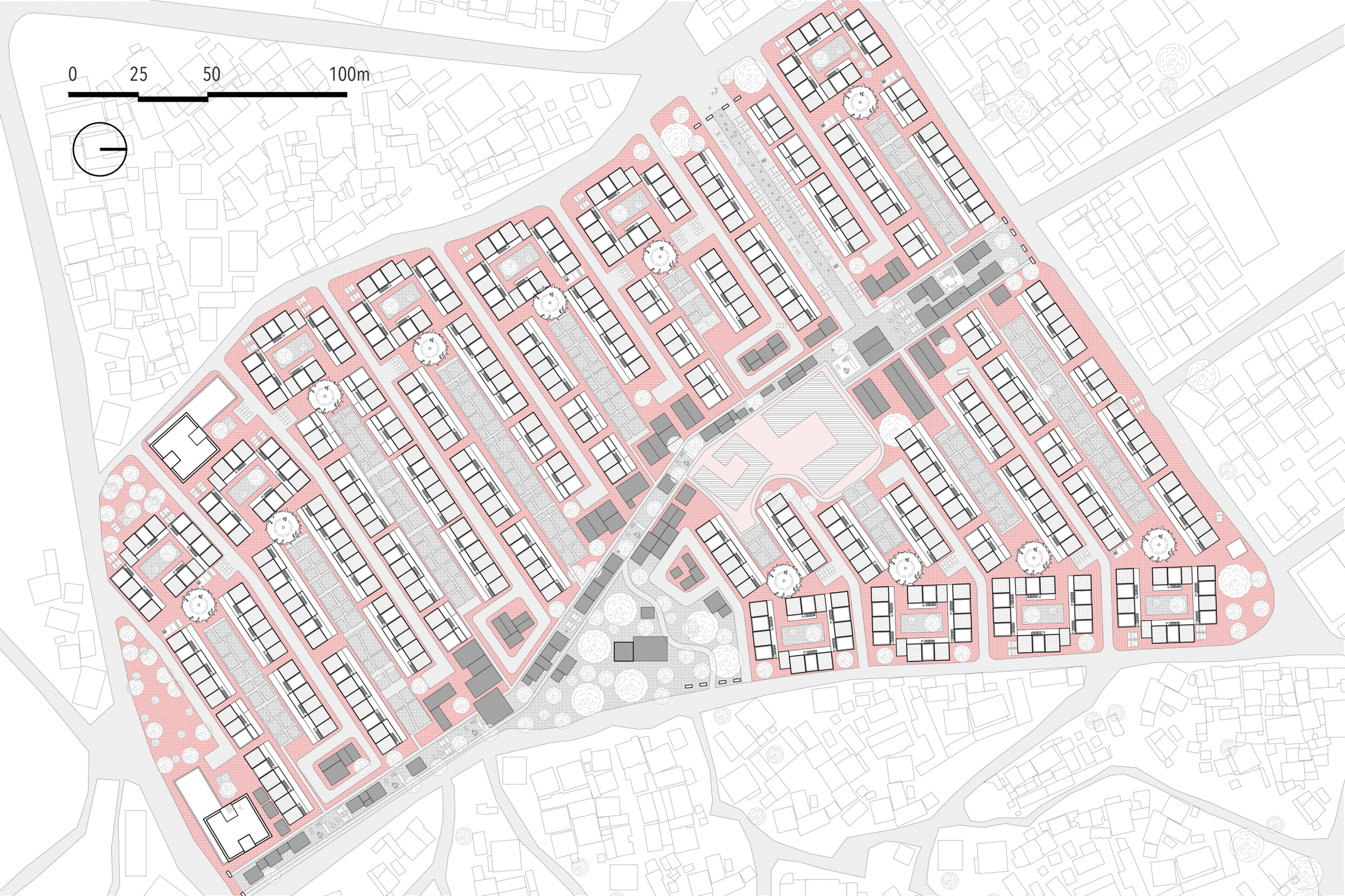

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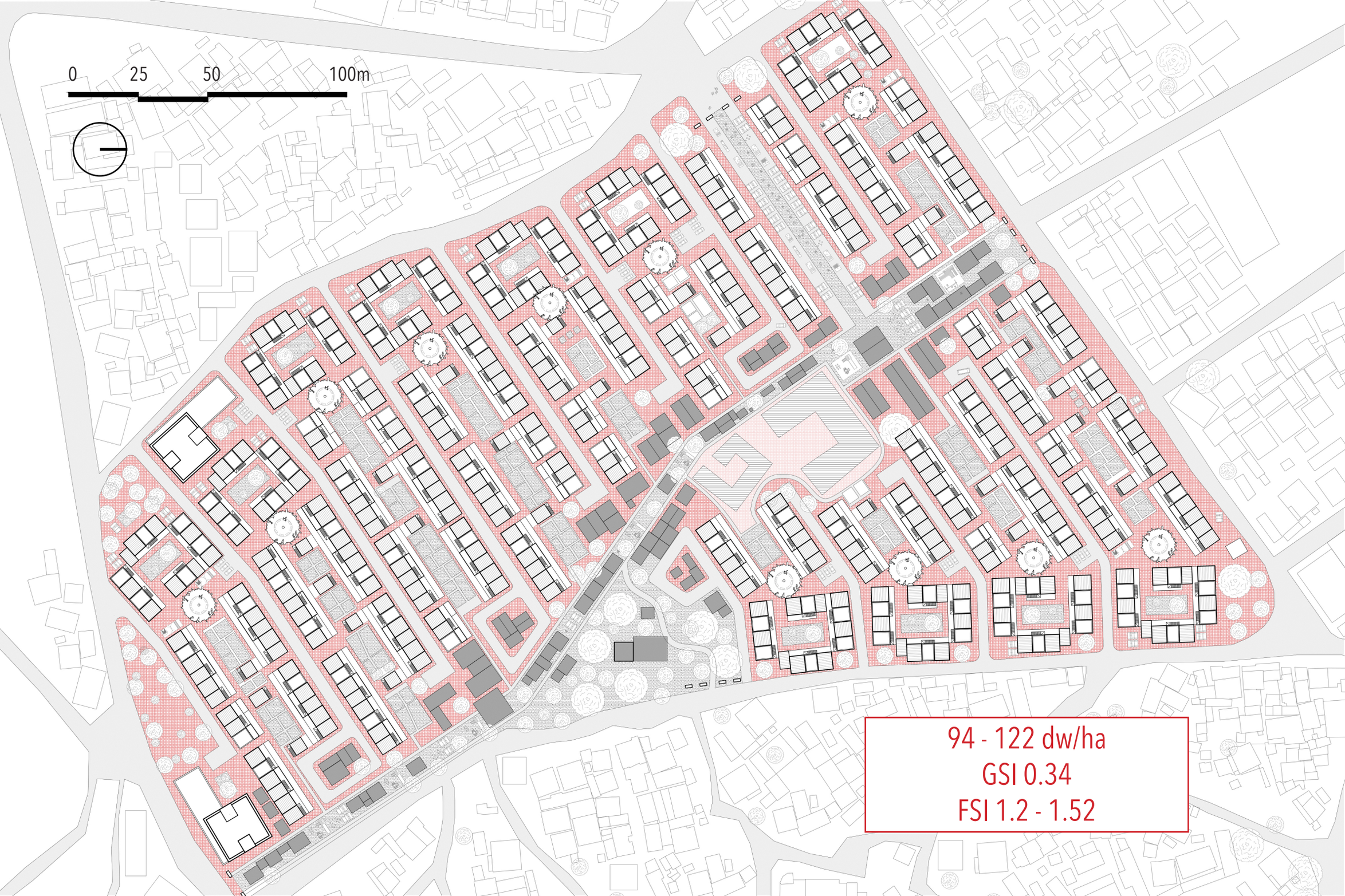

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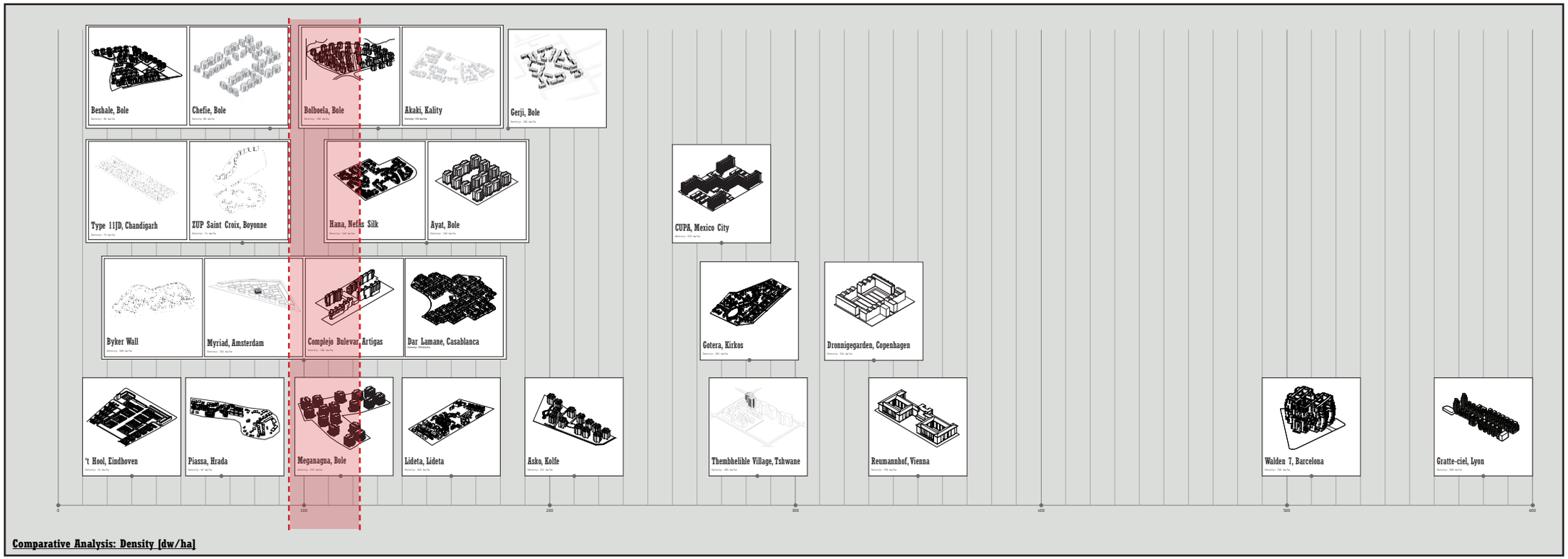

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FSI 1.2 - 1.52



Comparative Analysis: Density [dw/ha]

Clustering

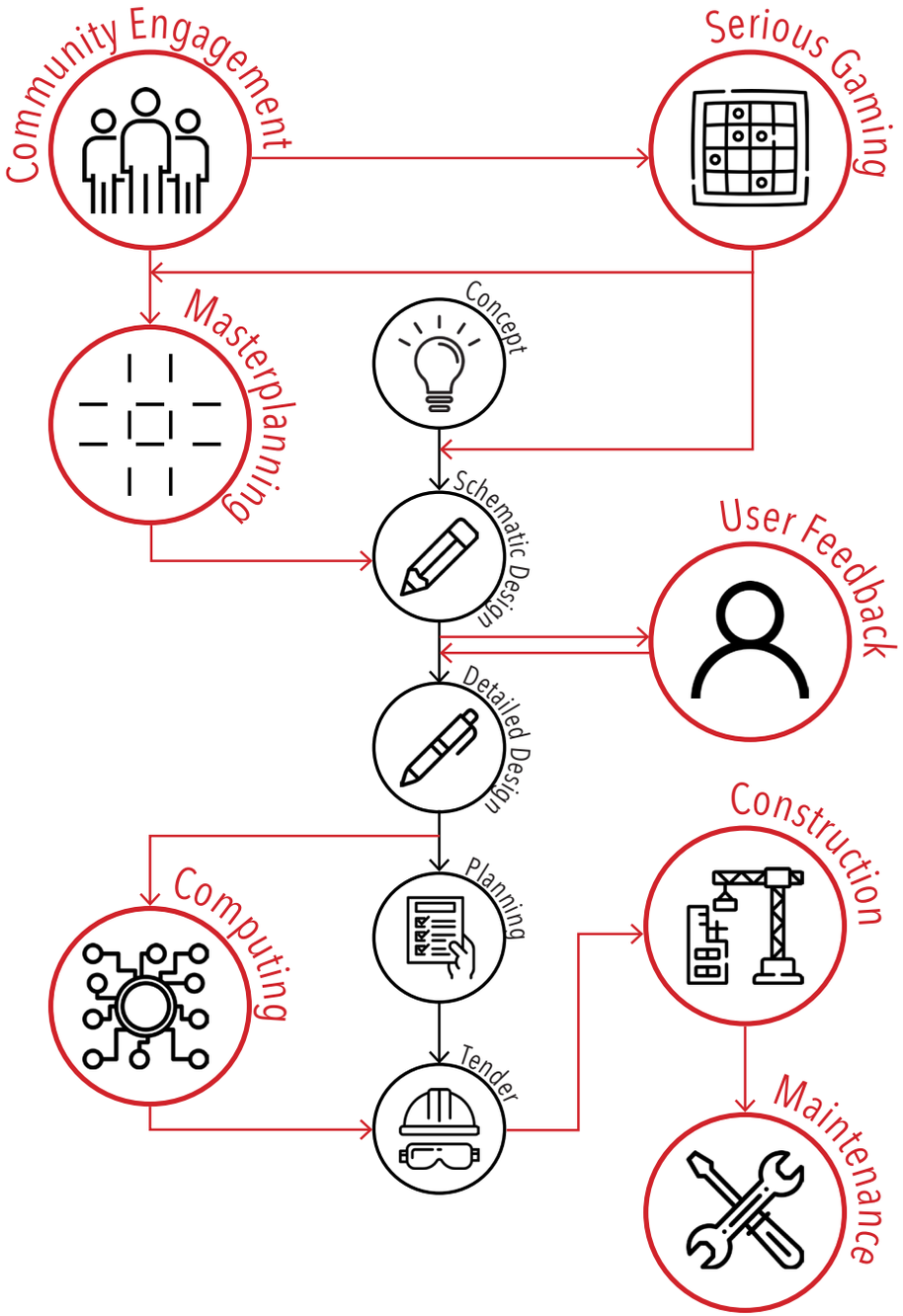
Source

The Architect - X

Support and Infill

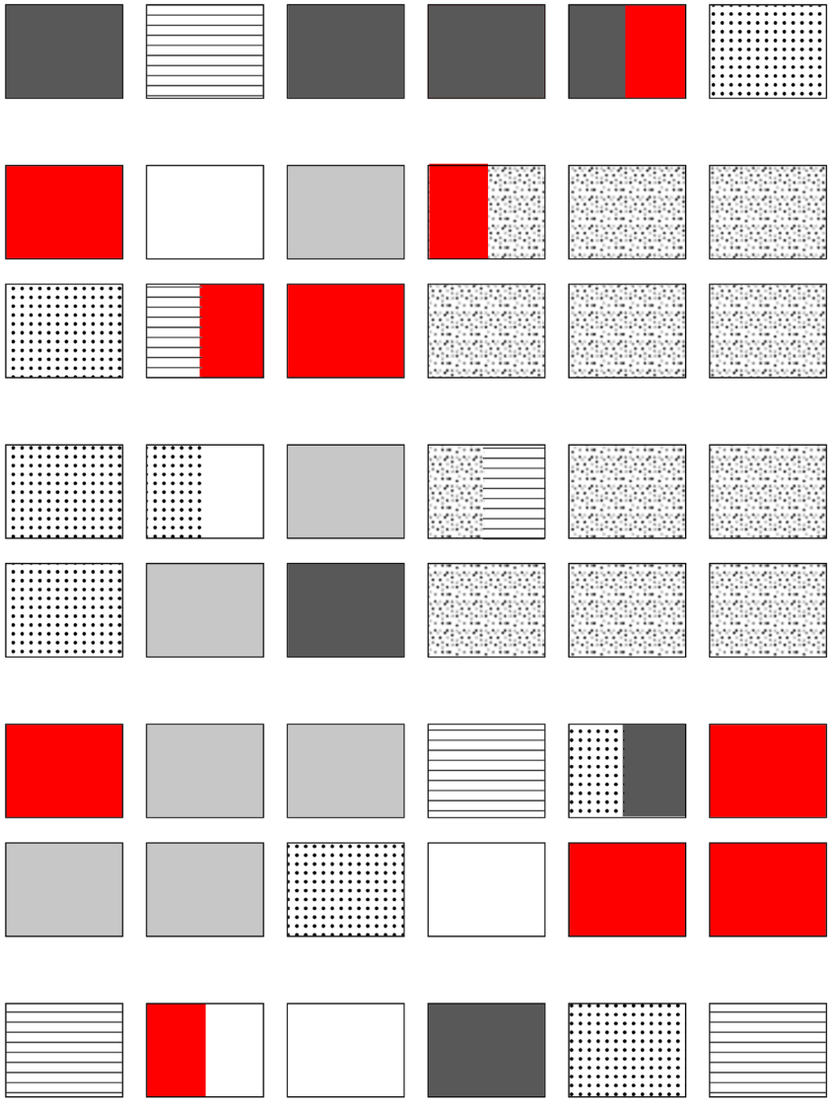
Heterogeneity

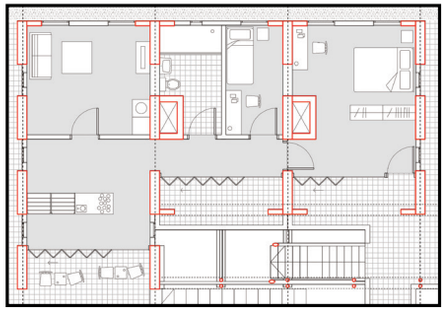
- The Architect - Builder
- The Architect - Activist
- Stakeholders Analysis



Membership basis	Amharic terms	English translations
Locality	*Yäsäfär* *yäakkababi* *Yäqäbäle* *Yäwändoč*	Neighbourhood Area From within the same *qäbäle* administration Men's[45]
Ethnicity	*Yägosa* *Yäbïher* *yagär lïjoč*[46]	Ethnic, clan People's, nations. Of co-migrants from the same area
Institution	*yämäsïriyabet*	Office (work place)
Gender	*Yäsetoč* *yäbaltïnna*[47] *yägwada*[48]	Women's Housekeepers' domestic
Age	*yäwät'atoč*	Of youth
Friendship	*Yägwadäñoč* *Abïroadägoč* *yäqollo* *gwandäñoč* as *wändïmamačoč* *ïhïtïmamačoč*	Friends' Of people who grew up together Of friends eating roasted grain together[49] Literally of brothers, who grew up together Literally of sisters, who grew up together
Kinship	*Yäbetäsäb* *yäbetäzämäd*	Of family Literally of 'relatives of the house'
Religion	*yähaymanot*	Of religion (Church of Mosque-based)
Displacement	*Yätäfänaqay* *yätamällašoč*	Of displaced people Of returnees
Resettlement	*Yäsäfari*	Of resettled or squatters

Alula Pankhurst. The Emergence, Evolution and Transformations of iddir Funeral Associations in Urban Ethiopia. Journal of Ethiopian Studies, June-December 2008, Vol. 41, No. 1/2, Special Thematic Issue on Contemporary Urban Dynamics (June-December 2008), pp. 143-185

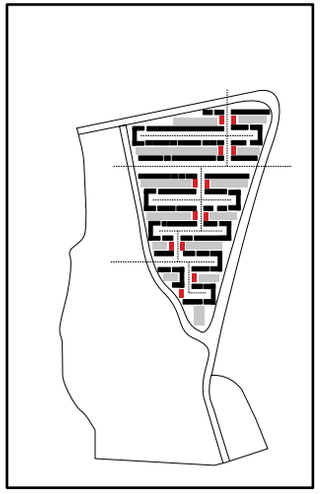




Family
People: 2 - 6

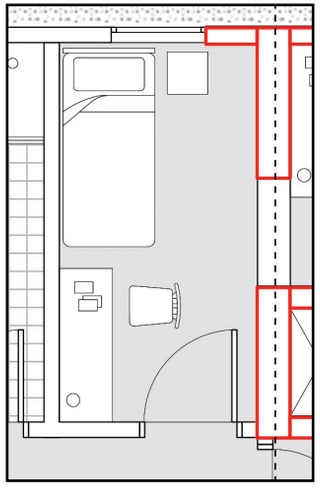


Cluster
People: 50 - 250

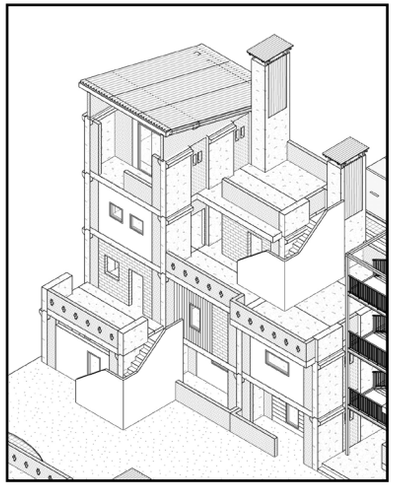


Kebele
People: 3000 - 5000

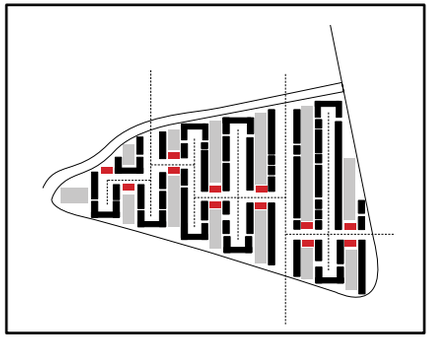
Individual
People: 1



Family Group
People: 10 - 25



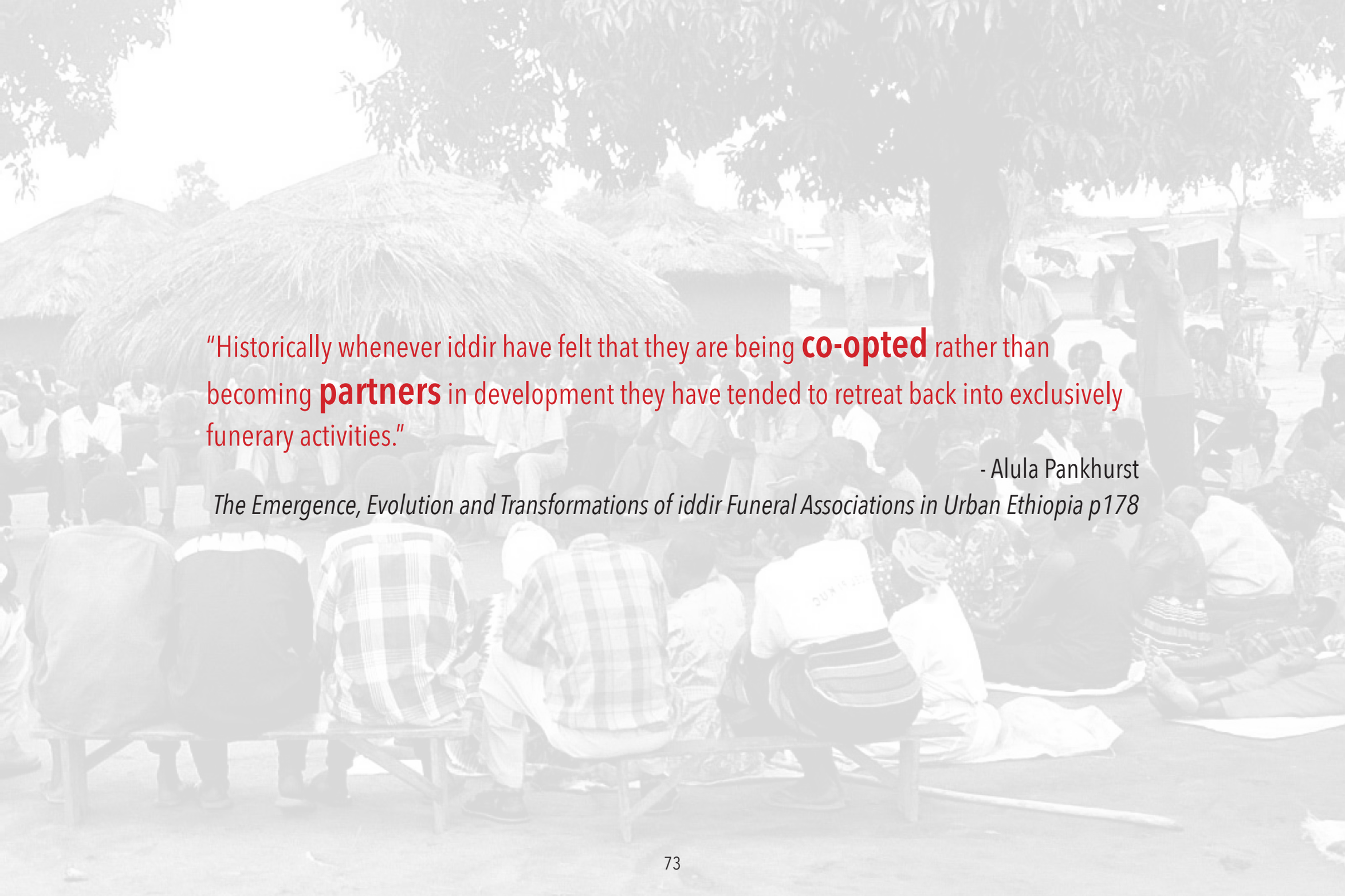
Sector
People: 600 - 3000



Iddir
People: 120 - 5600

Alula Pankhurst and Damen Haile Mariam. Northeast African Studies 2000, New Series, Vol. 7, No. 2, Special Issue: HIV/AIDS in Ethiopia, Part II: Community-Based Organizations, Prevention, Patient



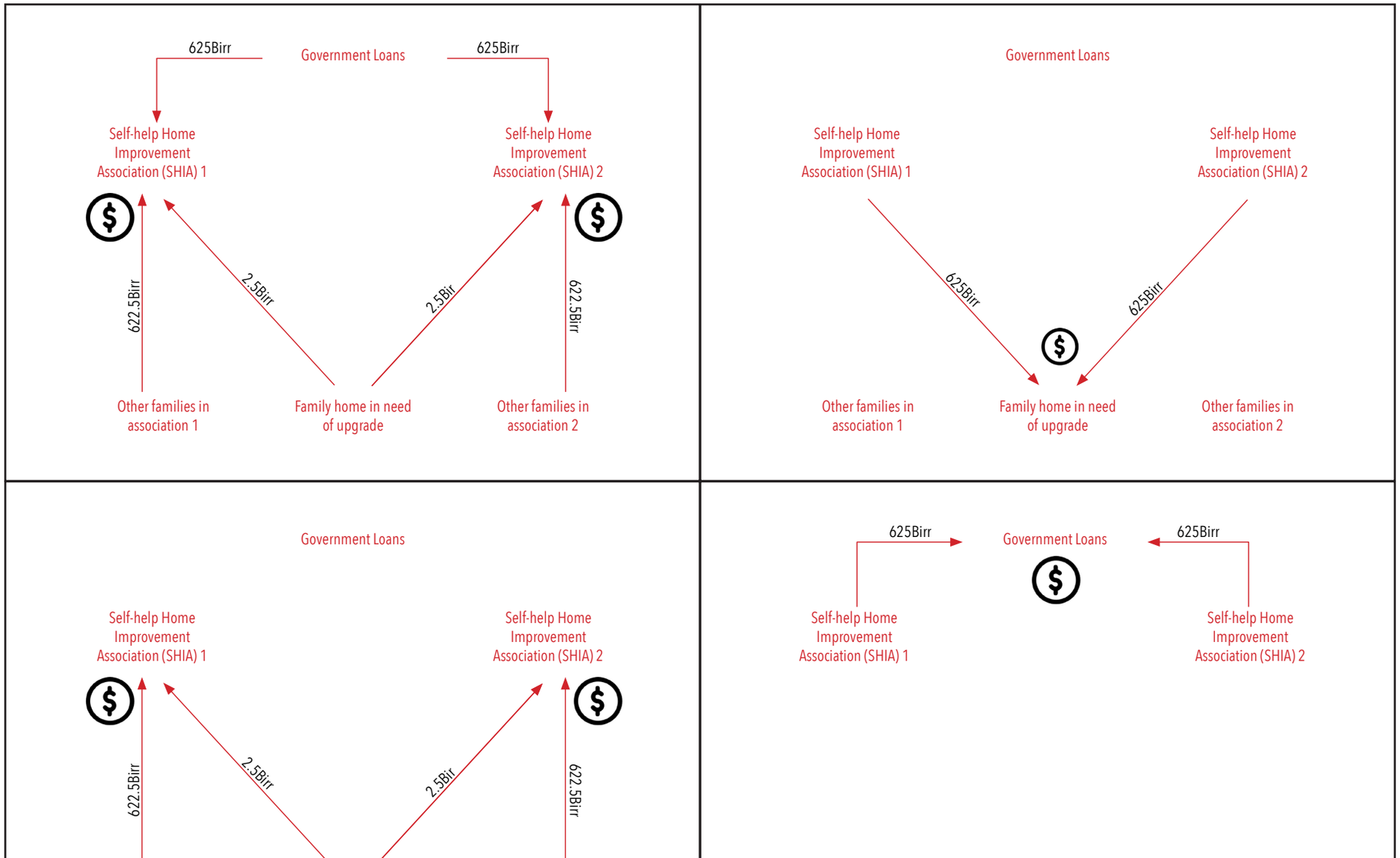


"Historically whenever iddir have felt that they are being **co-opted** rather than becoming **partners** in development they have tended to retreat back into exclusively funerary activities."

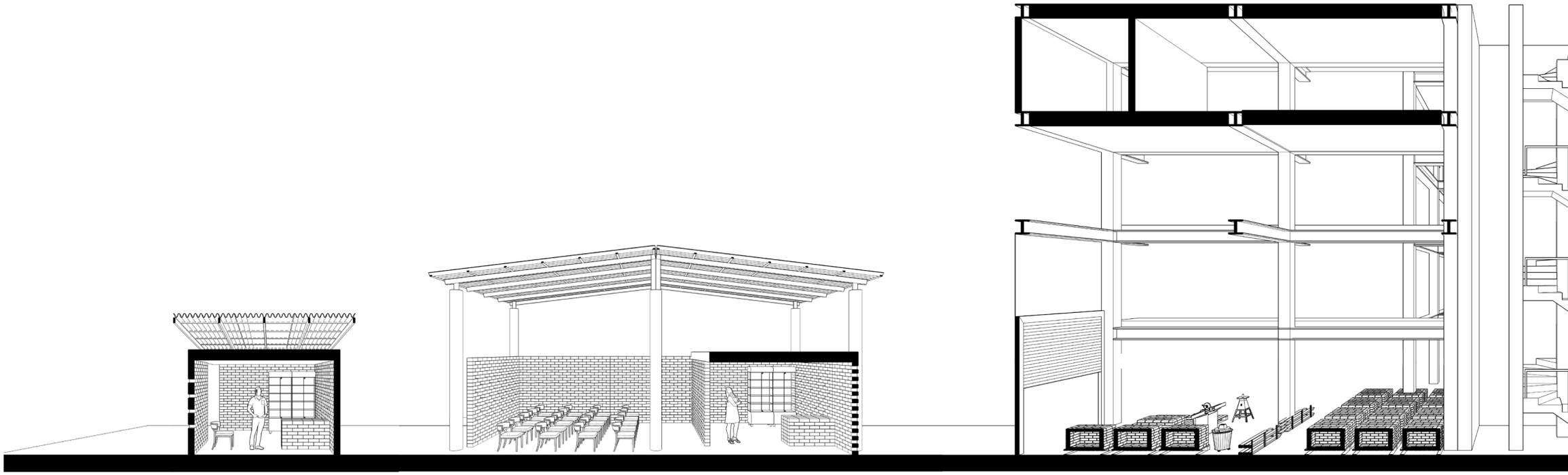
- Alula Pankhurst

The Emergence, Evolution and Transformations of iddir Funeral Associations in Urban Ethiopia p178

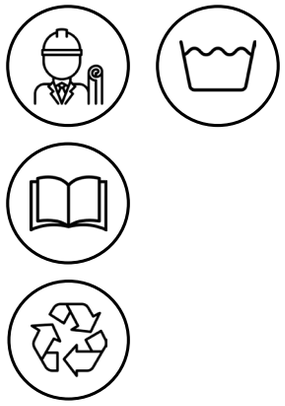
Self-help **H**ome **I**mprovement **A**ssociation



http://interaide.org/pratiques/content/ethiopian-iddir-mechanisms-case-study-pastoral-communities-wolayta-and-kembatta-tembaro?language=en



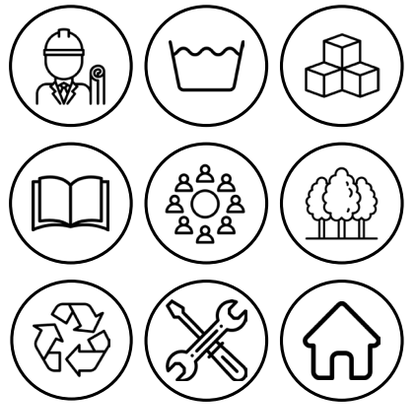
SHIA



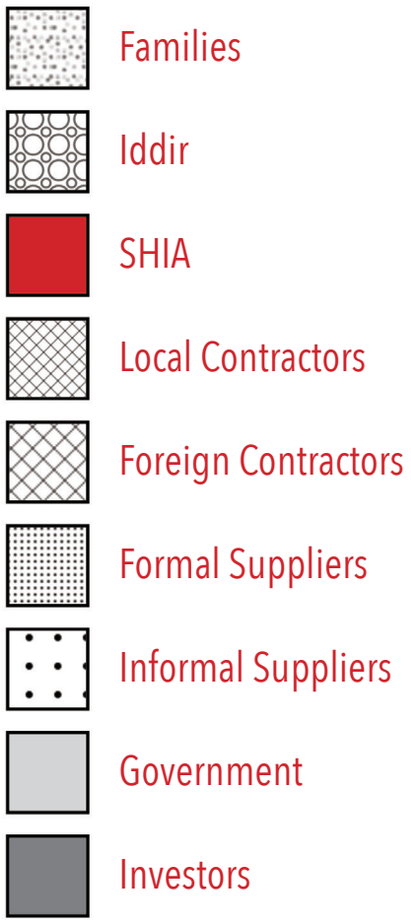
Iddir

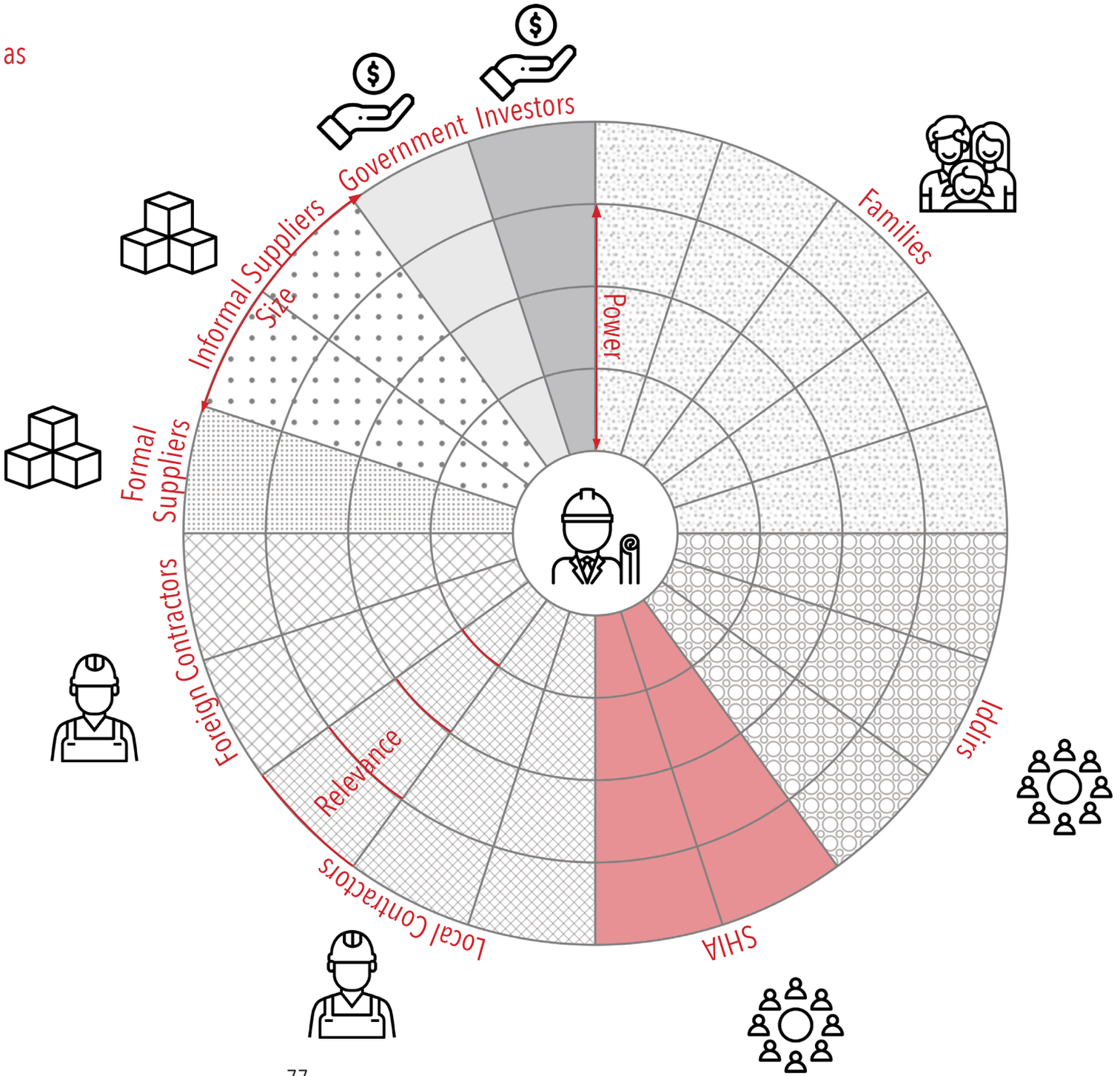


Builder's Yard

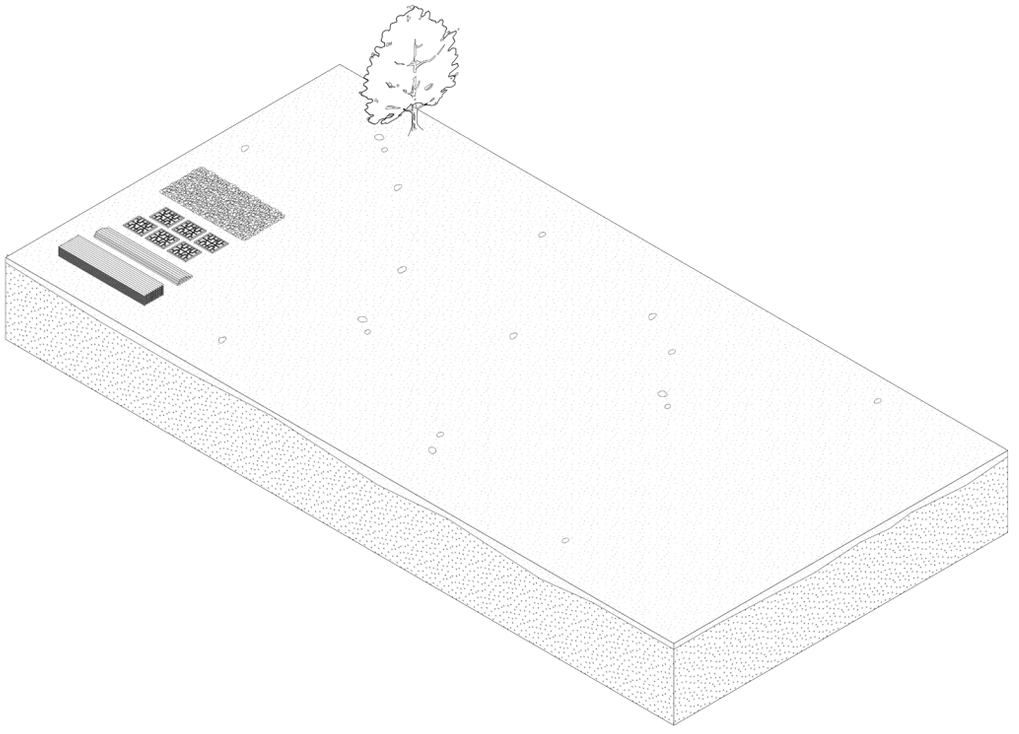


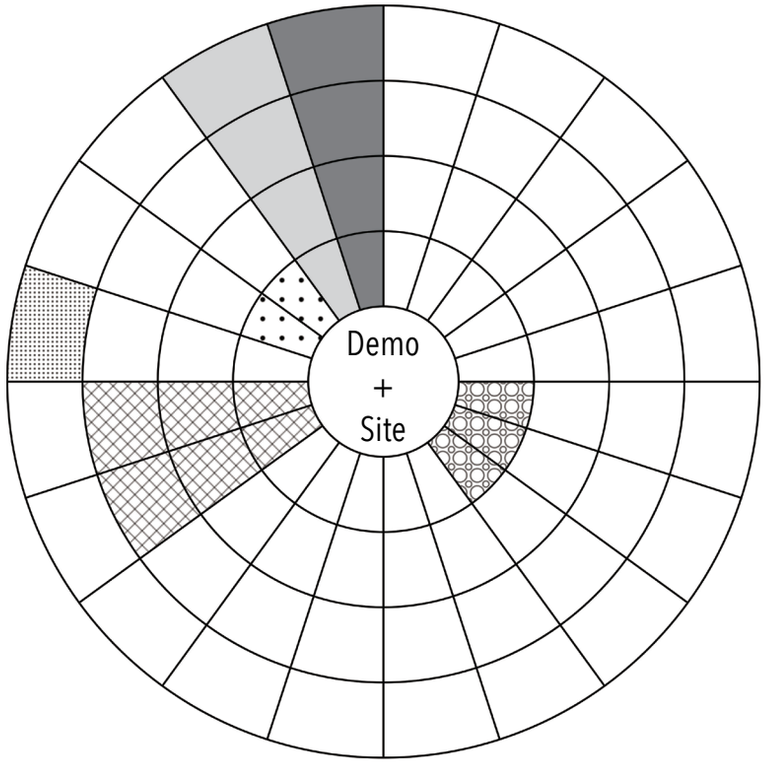
Architect belongs at the centre of the process as 'project manager'.





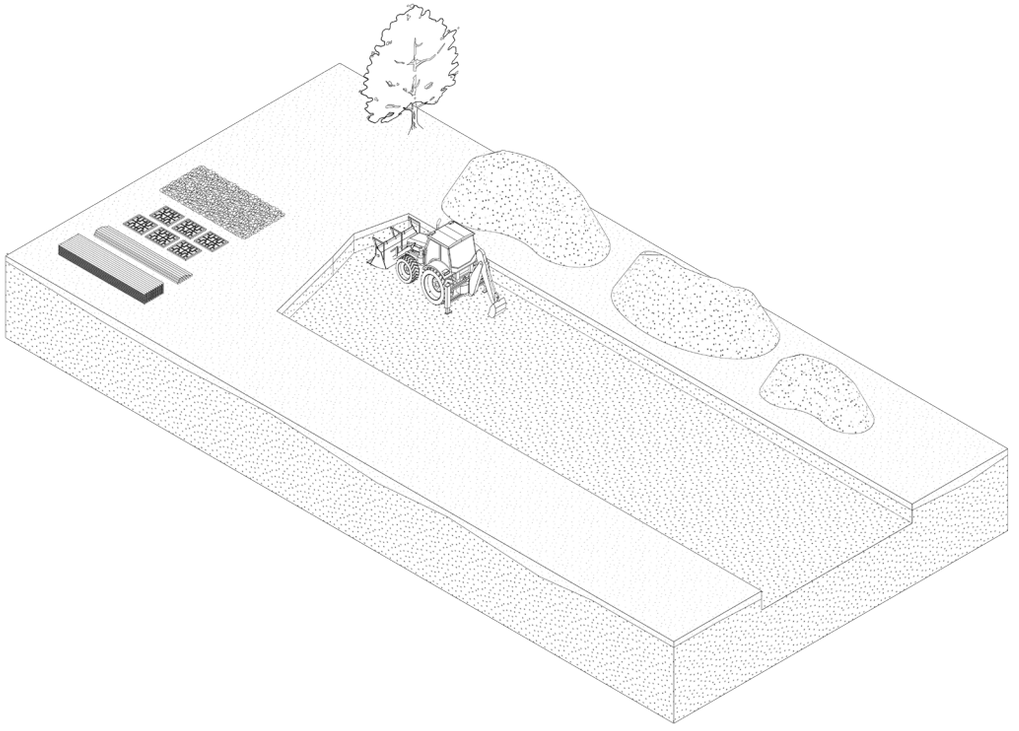
Demolition +Site

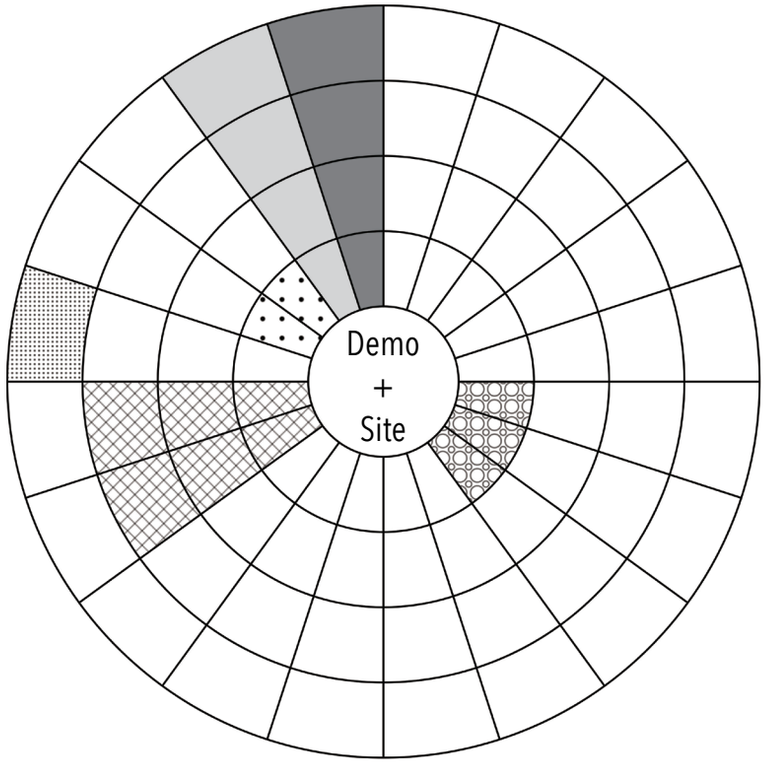




- Families
- Iddir
- SHIA
- Local Contractors
- Foreign Contractors
- Formal Suppliers
- Informal Suppliers
- Government
- Investors

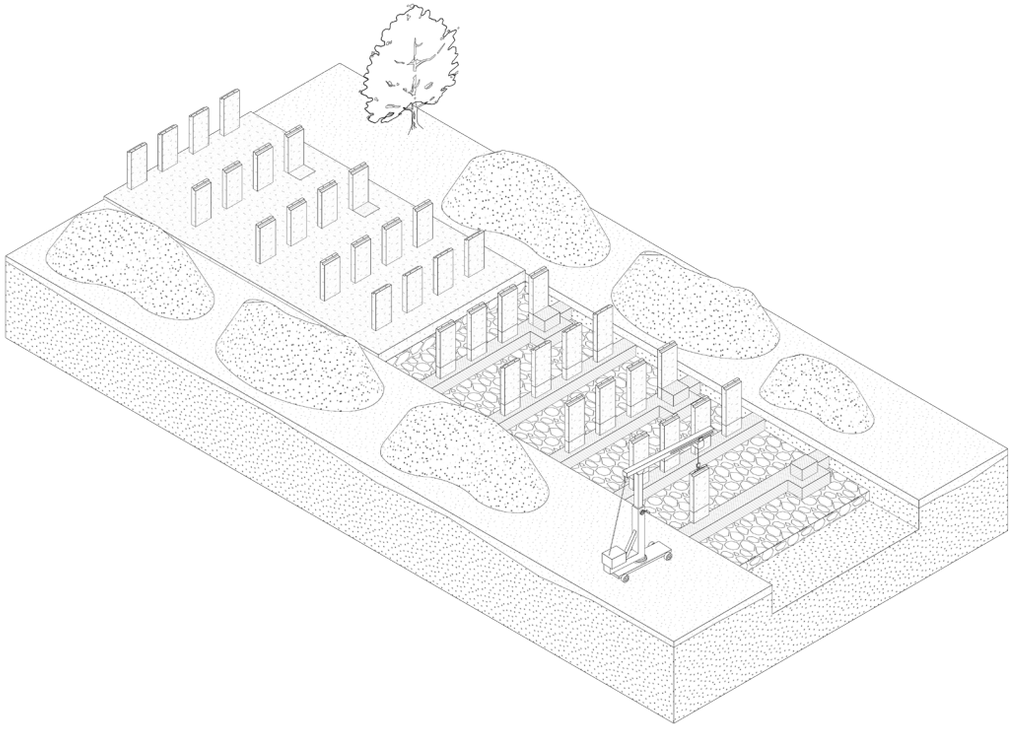
Demolition +Site

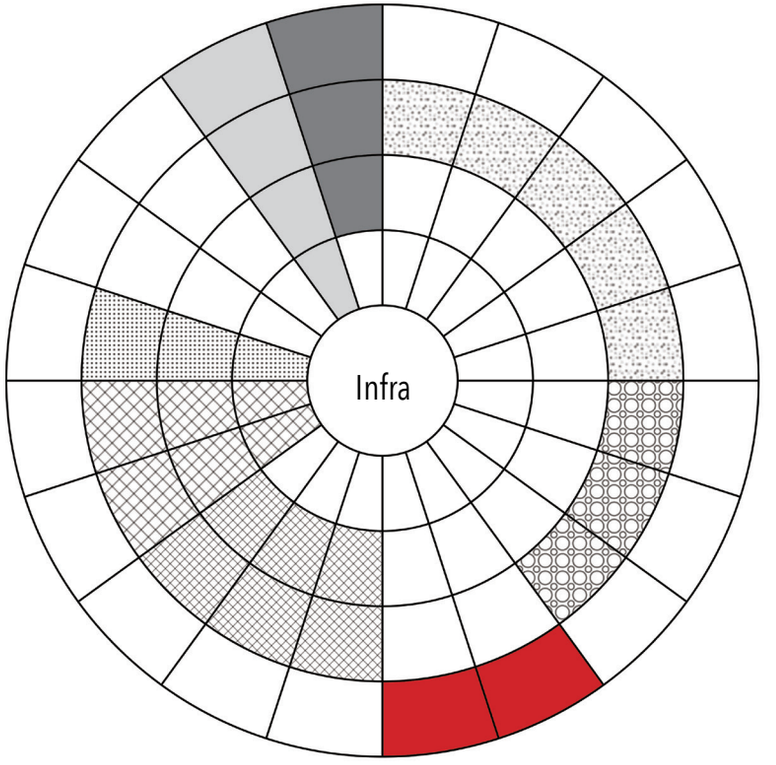




- Families
- Iddir
- SHIA
- Local Contractors
- Foreign Contractors
- Formal Suppliers
- Informal Suppliers
- Government
- Investors

Infrastructure





Families

Iddir

SHIA

Local Contractors

Foreign Contractors

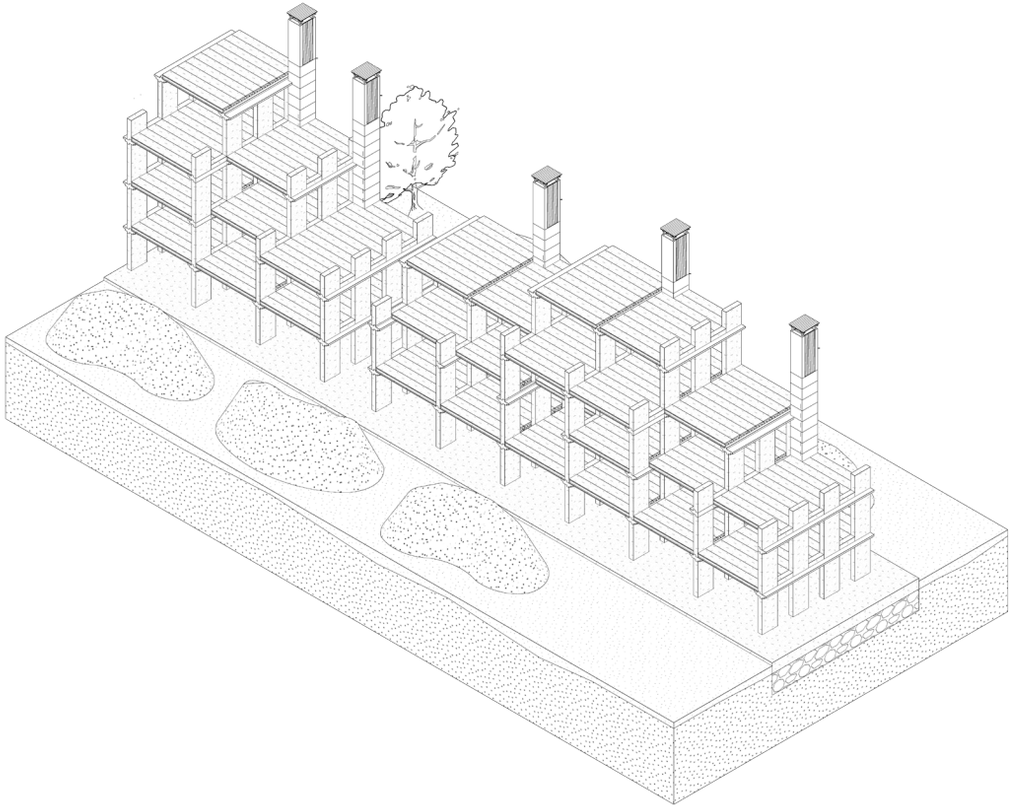
Formal Suppliers

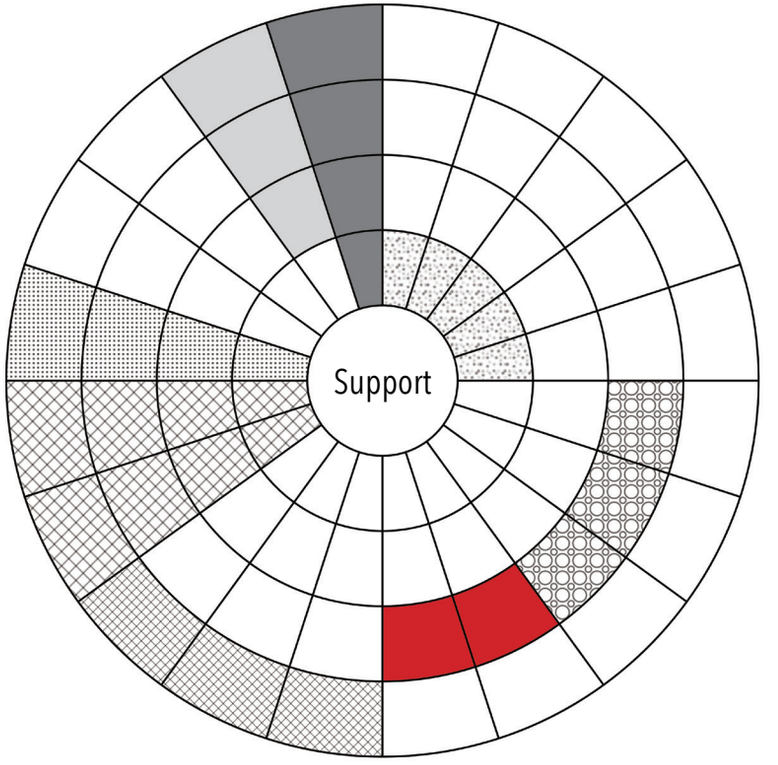
Informal Suppliers

Government

Investors

Support





Families

Iddir

SHIA

Local Contractors

Foreign Contractors

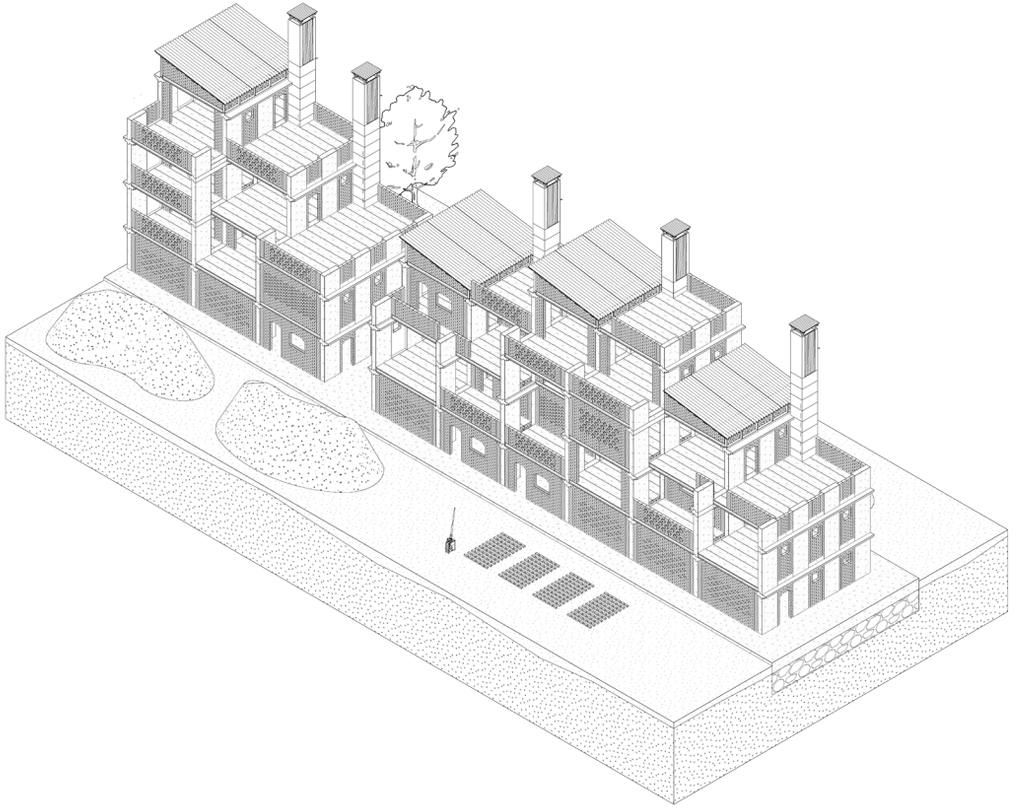
Formal Suppliers

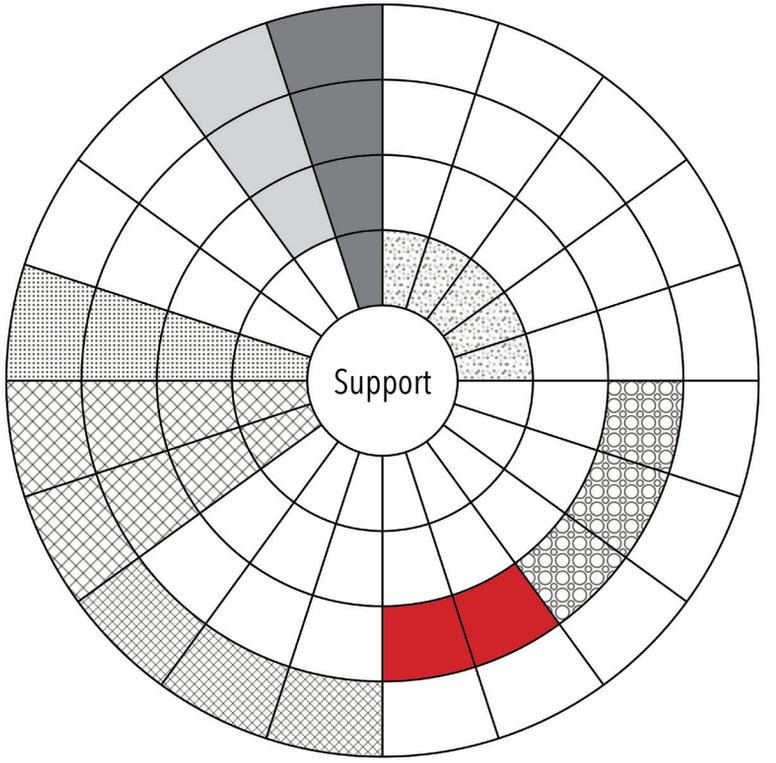
Informal Suppliers

Government

Investors

Support





Families

Formal Suppliers

Iddir

Informal Suppliers

SHIA

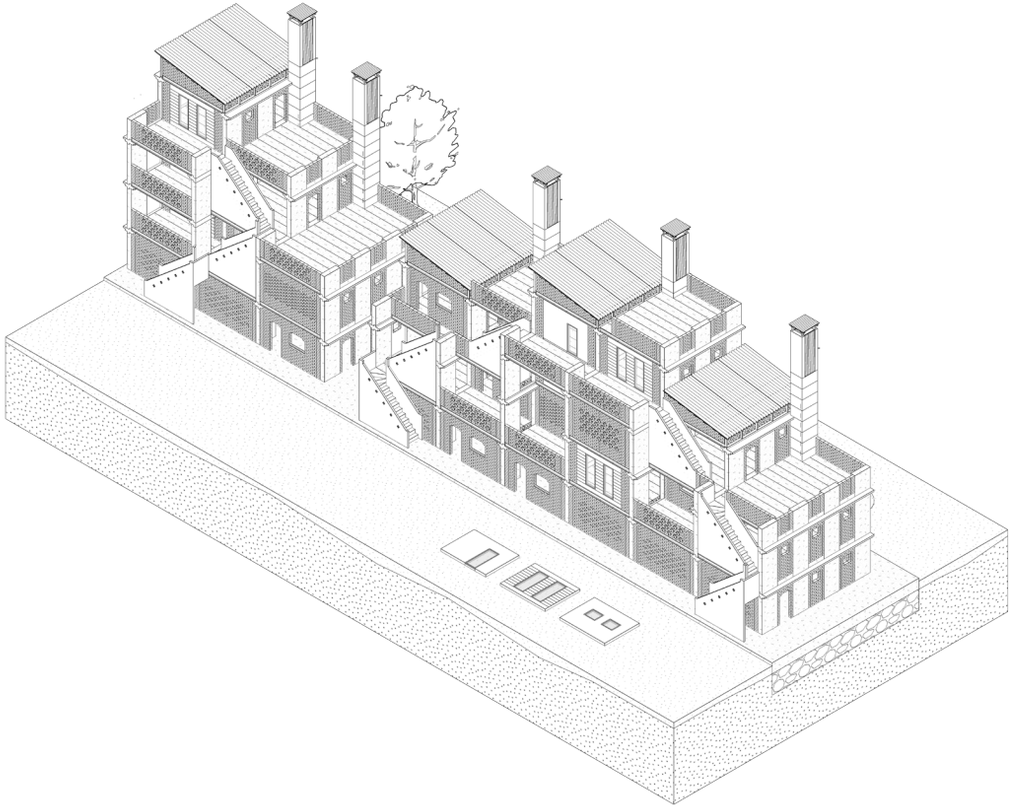
Government

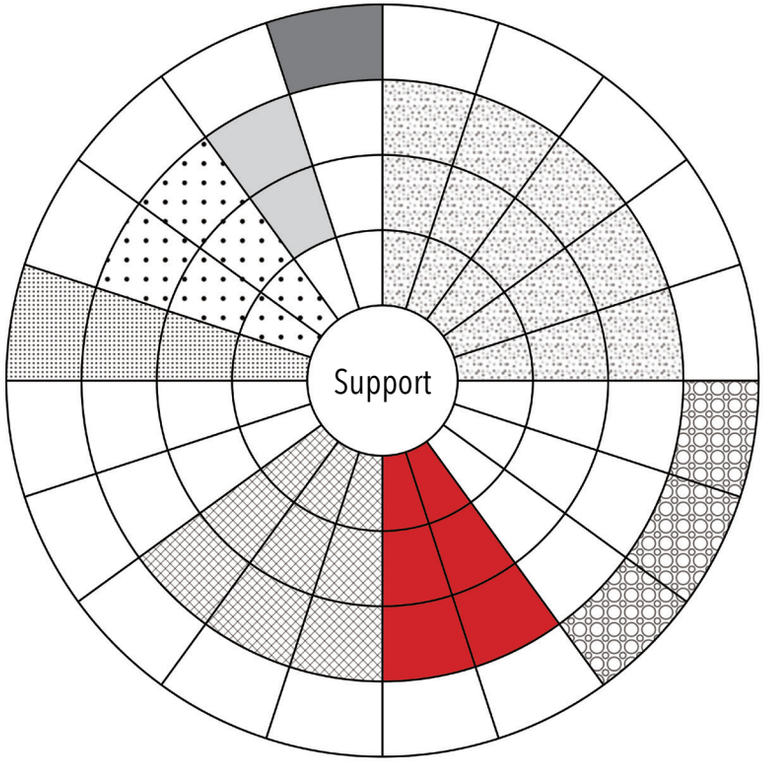
Local Contractors

Investors

Foreign Contractors

Infill





Families

Formal Suppliers

Iddir

Informal Suppliers

SHIA

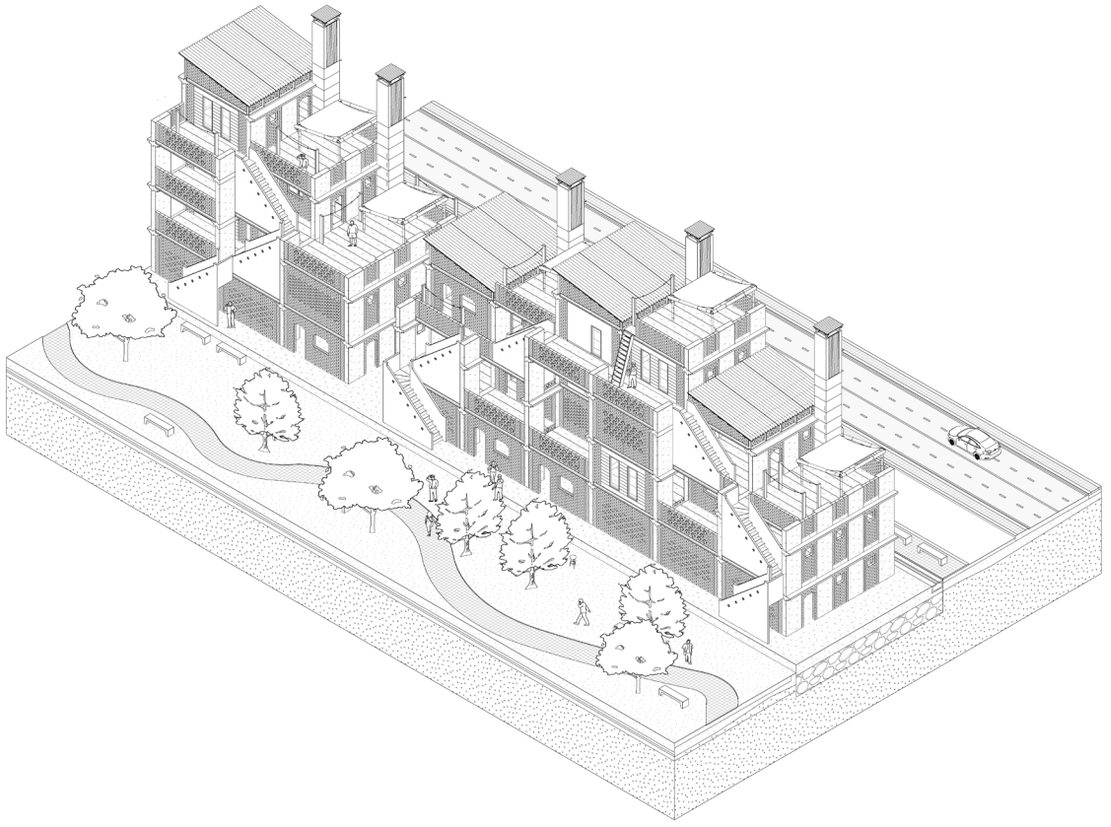
Government

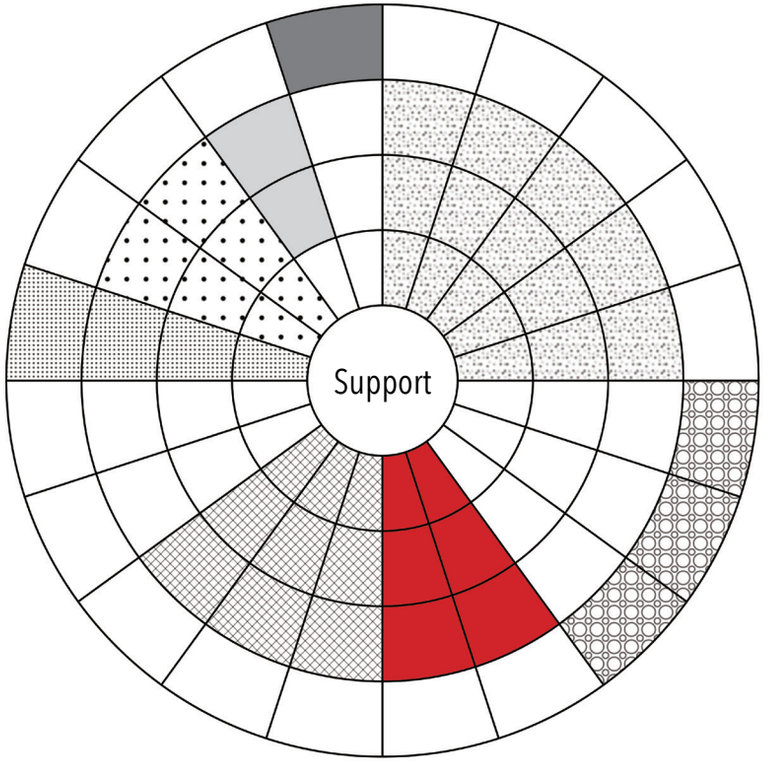
Local Contractors

Investors

Foreign Contractors

Infill





Families

Formal Suppliers

Iddir

Informal Suppliers

SHIA

Government

Local Contractors

Investors

Foreign Contractors

Clustering

Source

The Architect - X

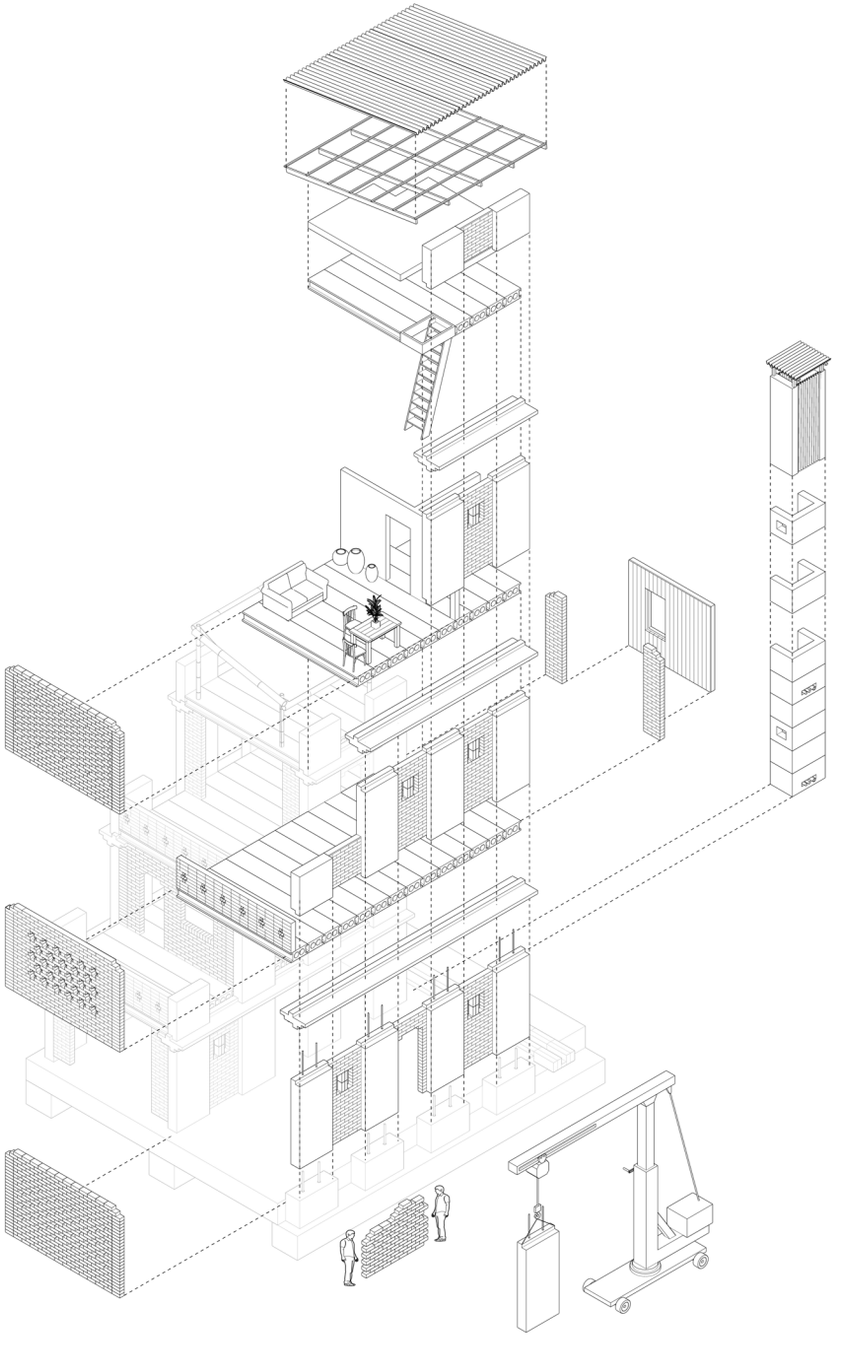
Support and Infill

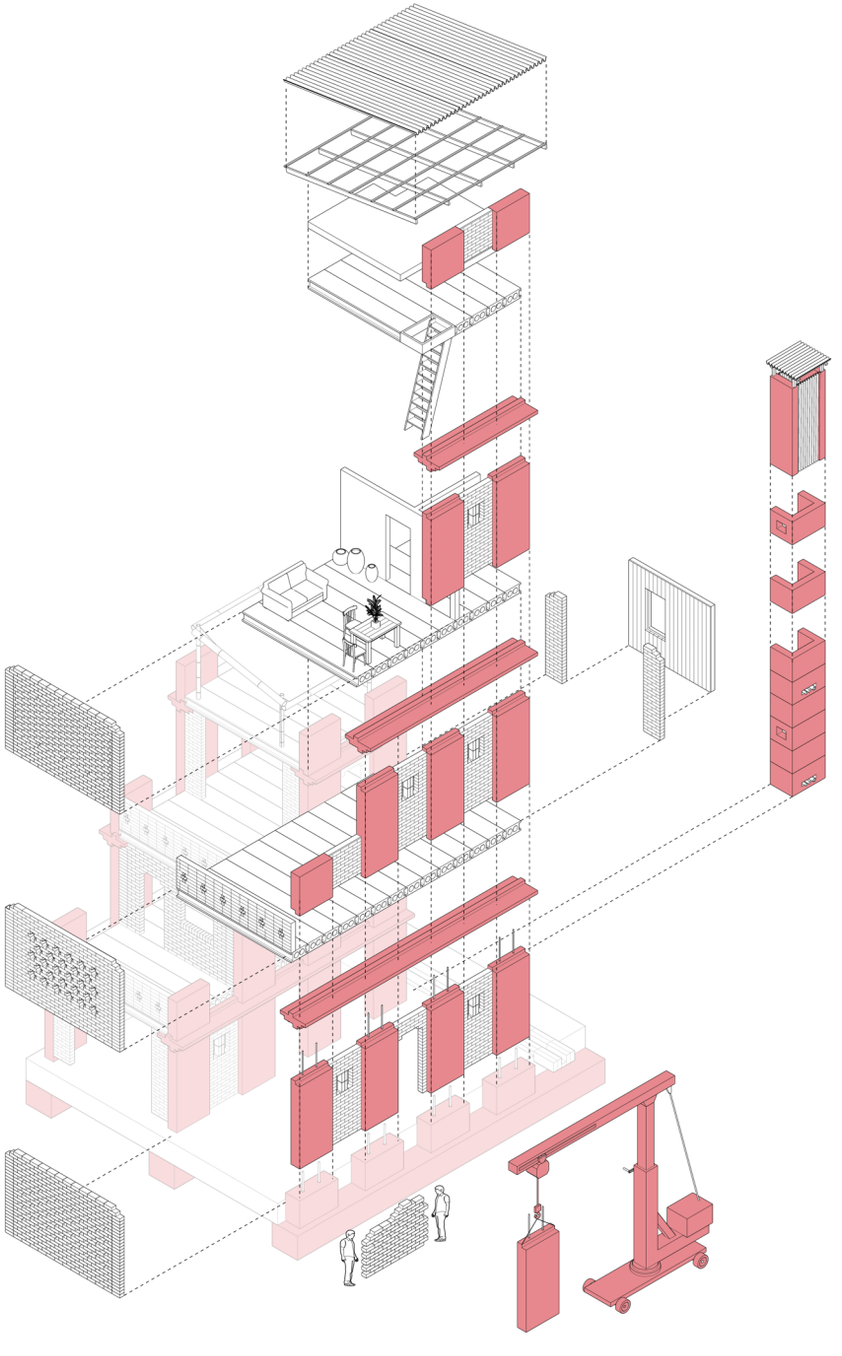
Heterogeneity

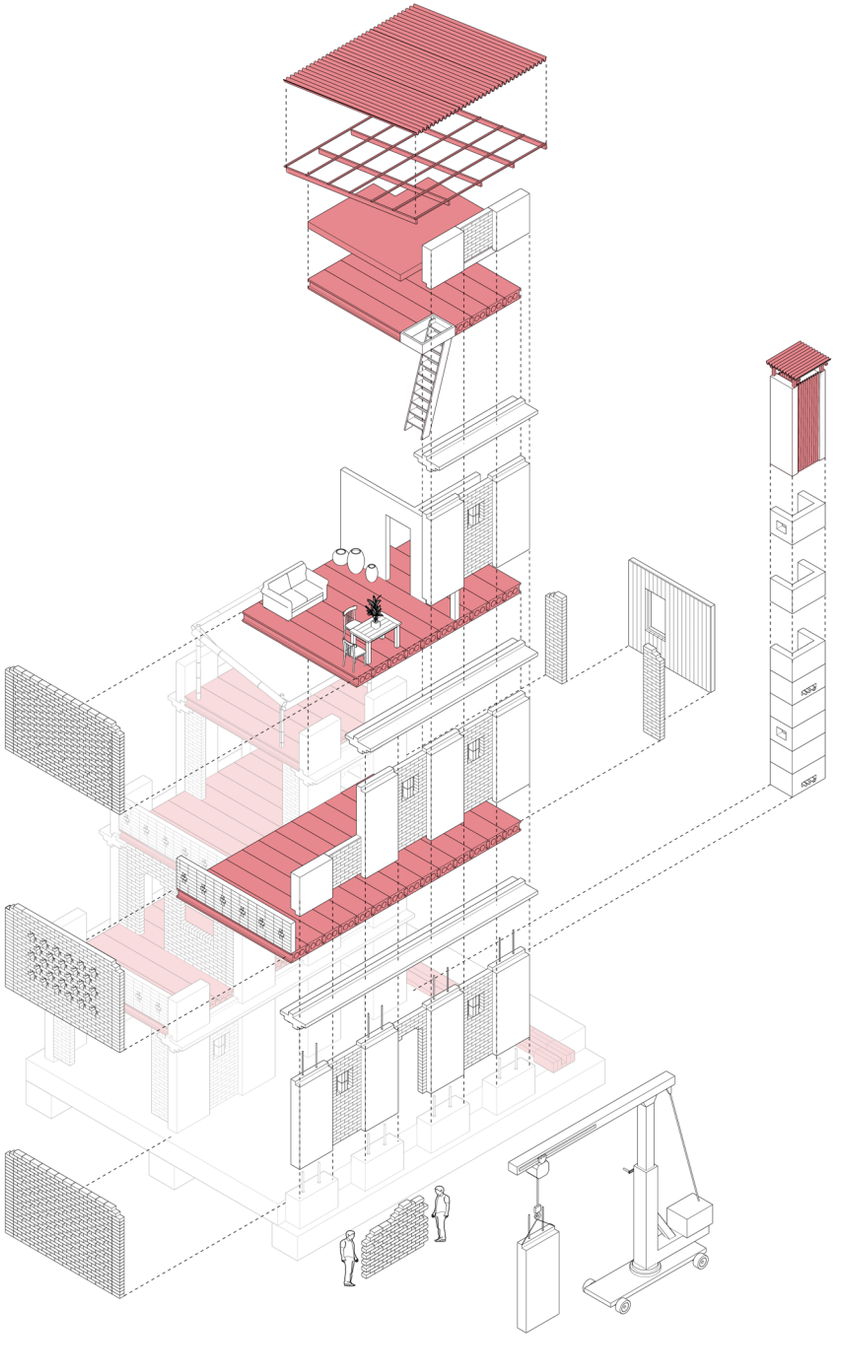
- Structural Hierarchy
- The Support as a Sustainable Vessel

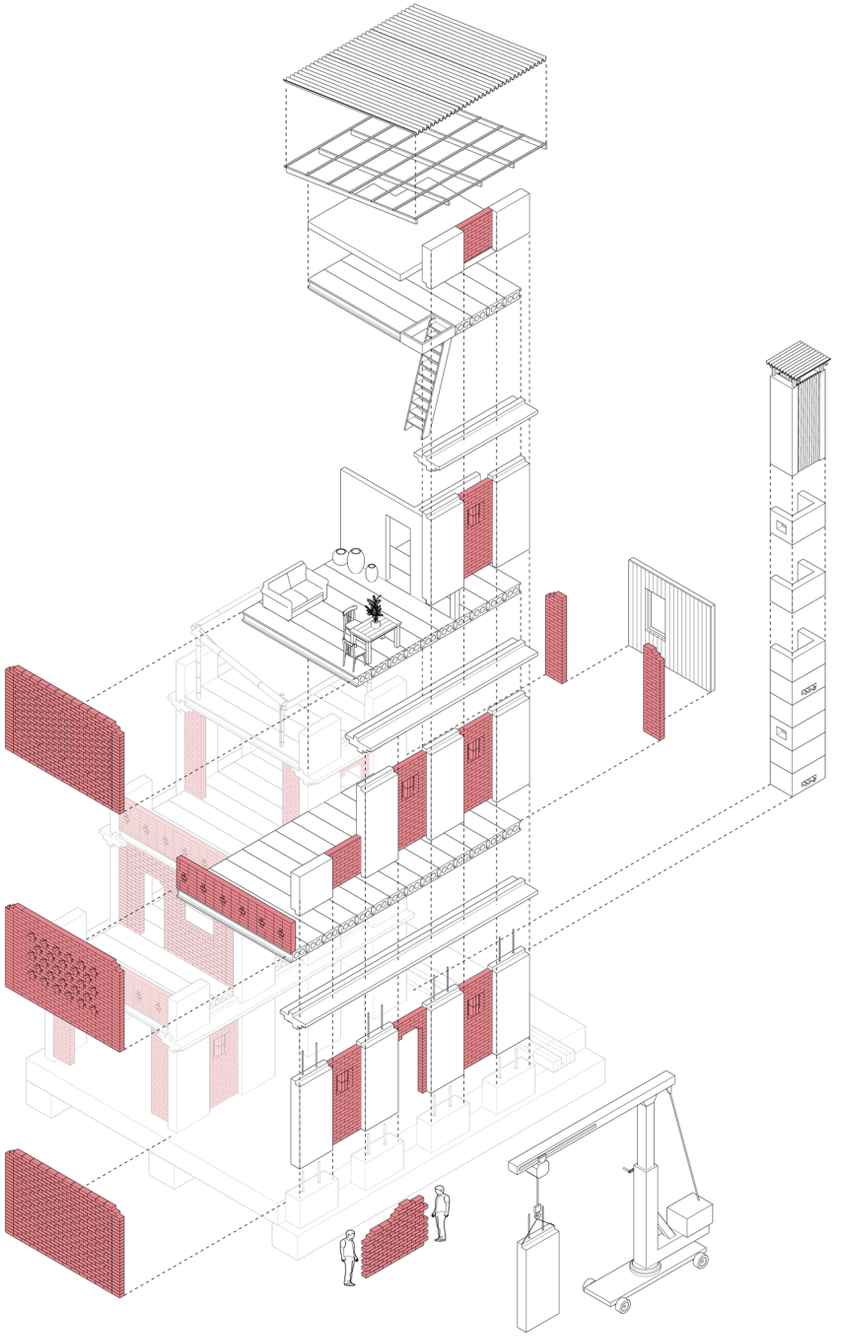


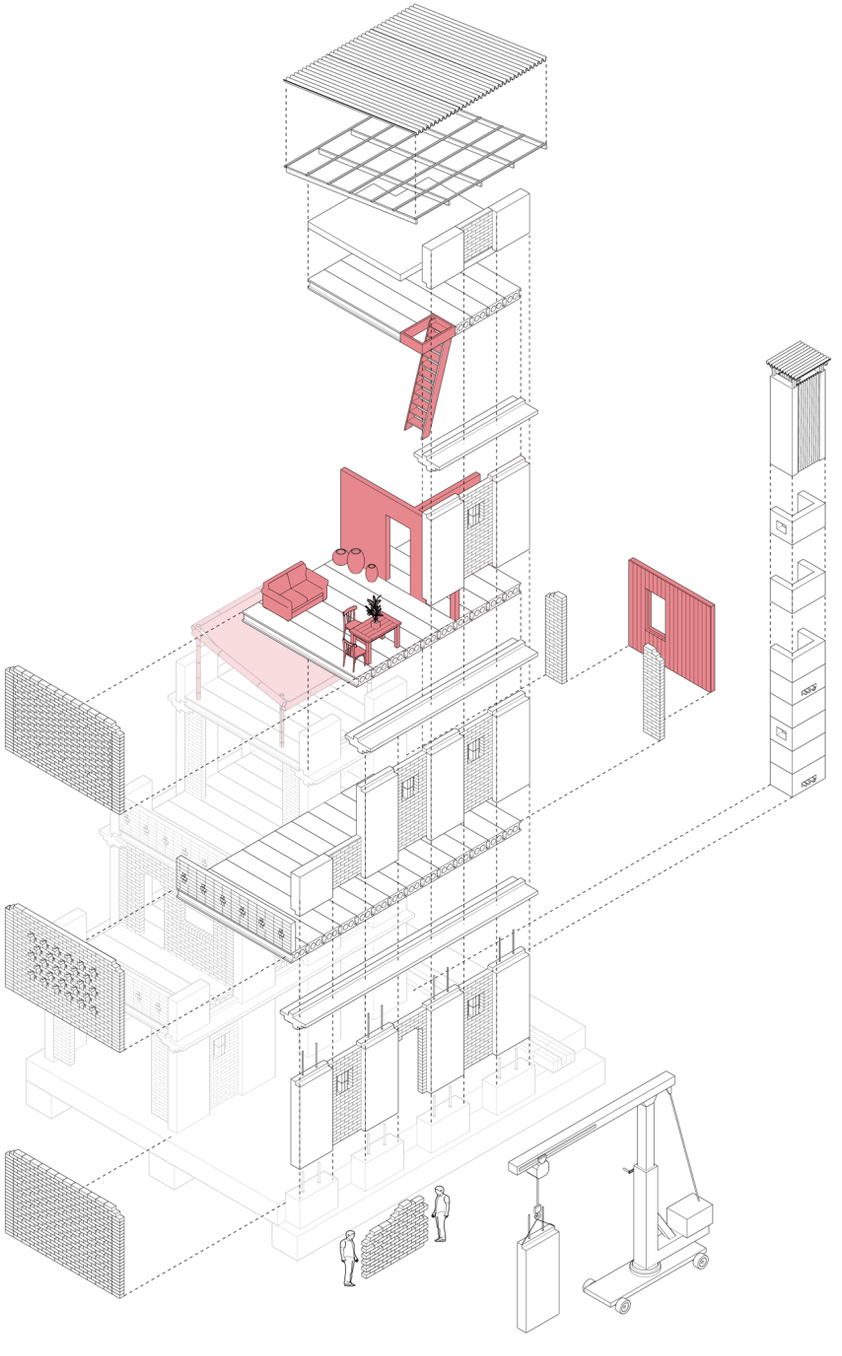


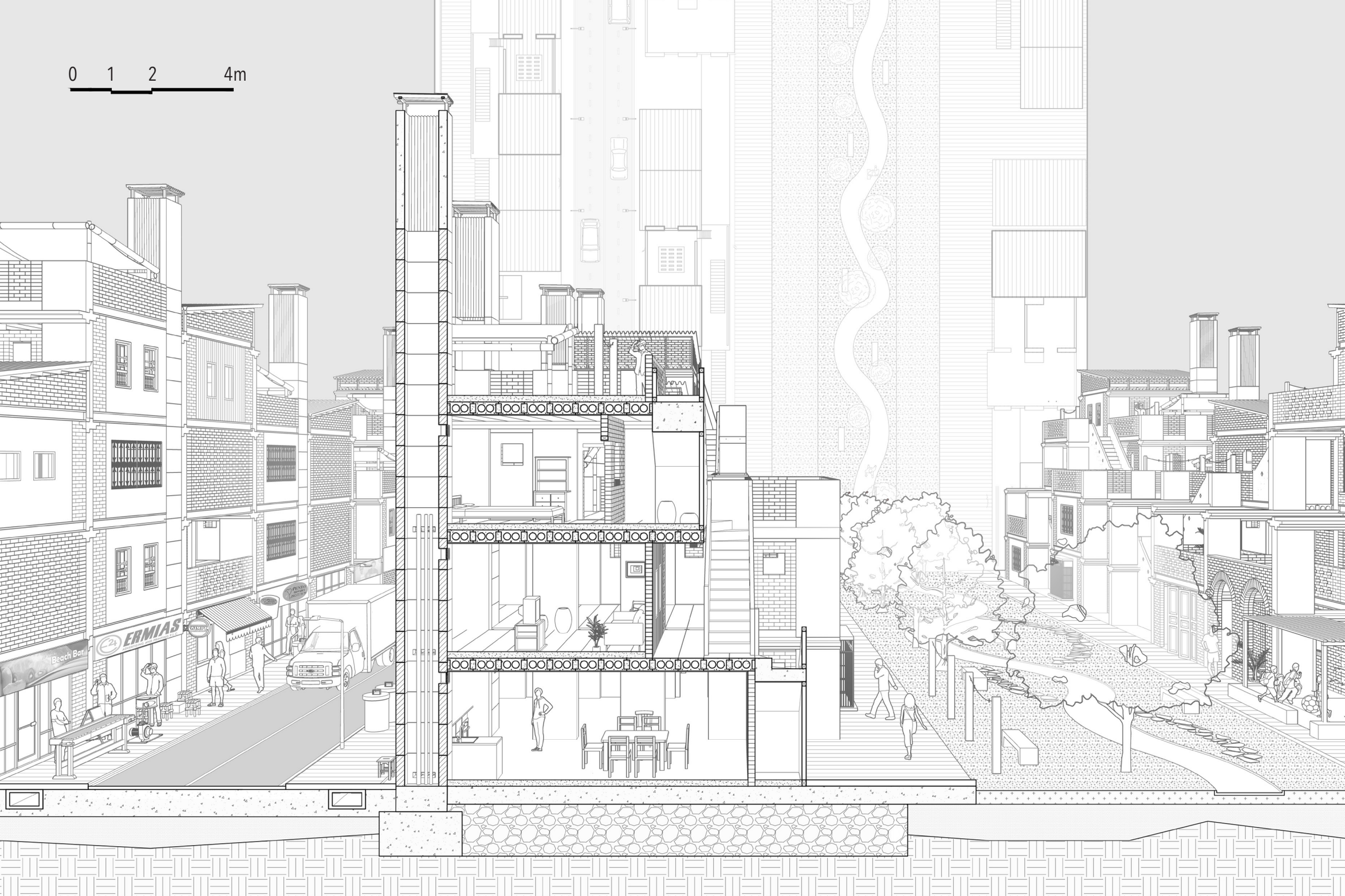


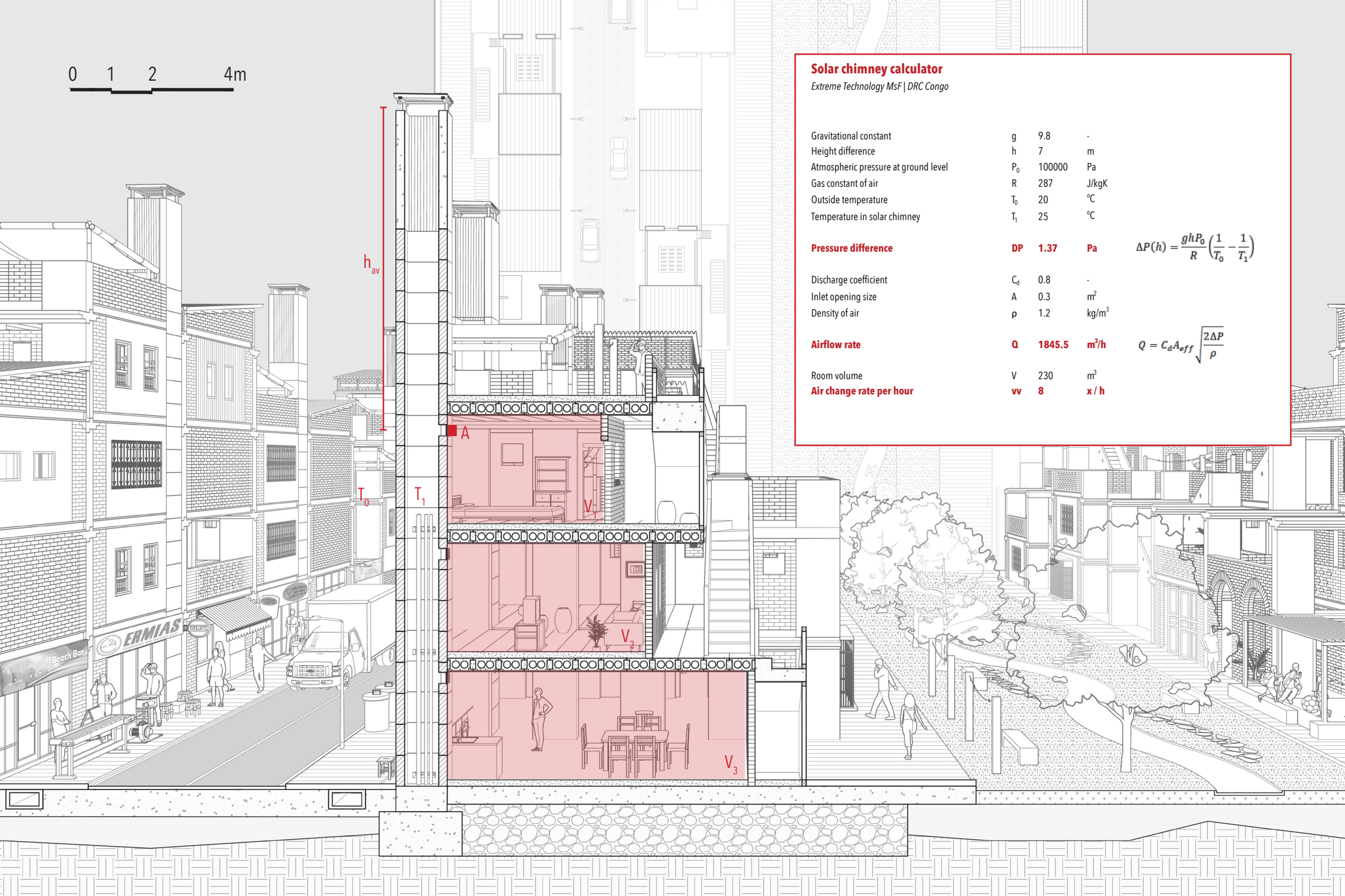








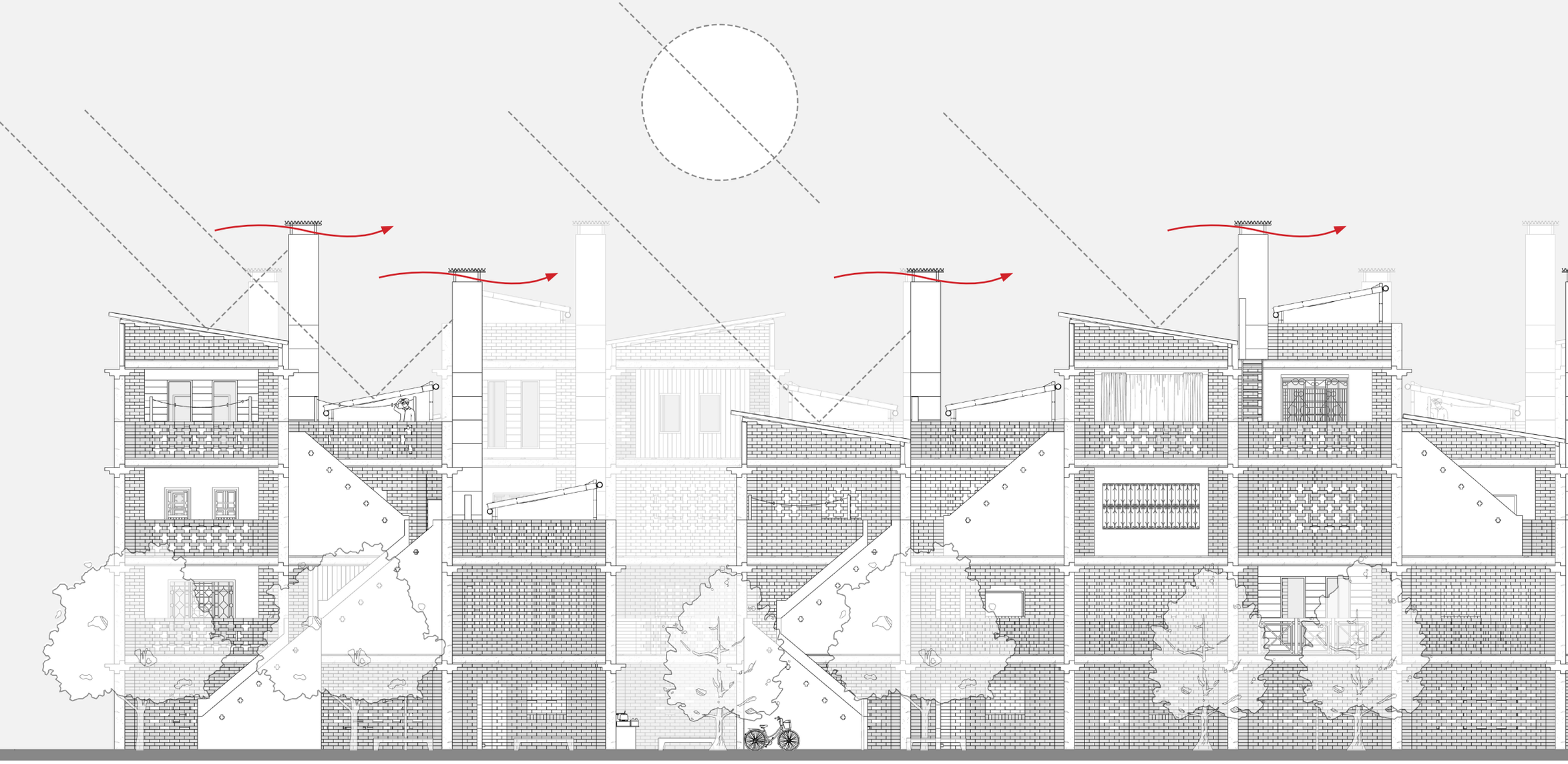

0 1 2 4m
ERMIAS
Beach Bar

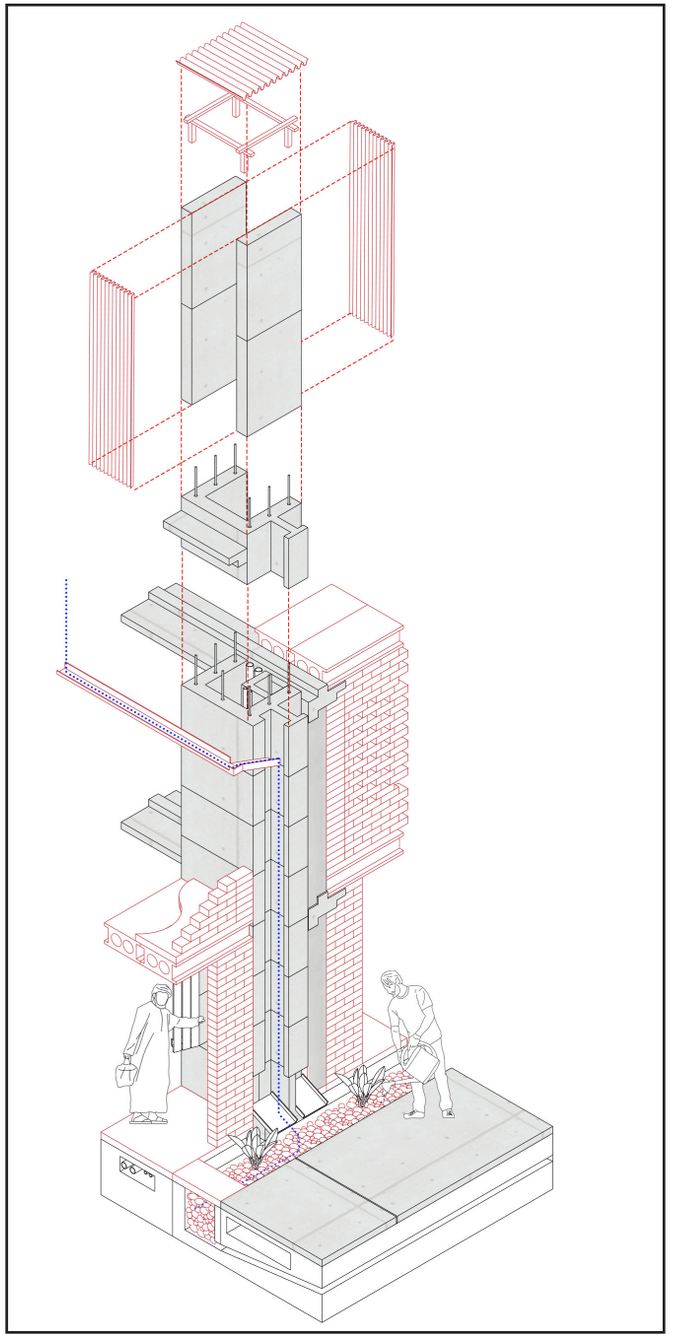


Solar chimney calculator

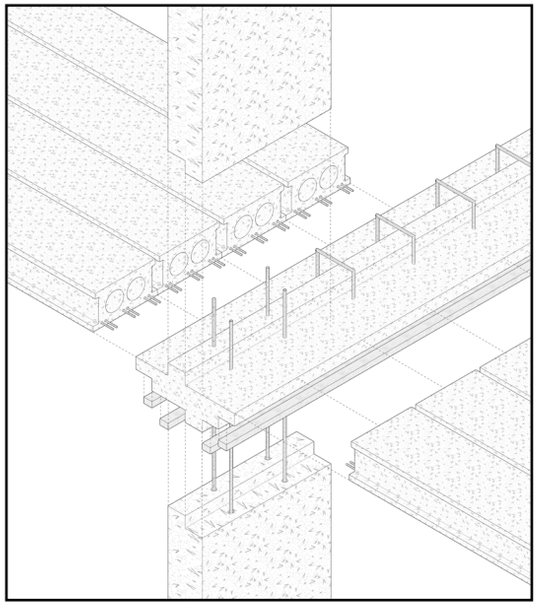
Extreme Technology MsF | DRC Congo

Gravitational constant	g	9.8	-	
Height difference	h	7	m	
Atmospheric pressure at ground level	P_0	100000	Pa	
Gas constant of air	R	287	J/kgK	
Outside temperature	T_0	20	°C	
Temperature in solar chimney	T_1	25	°C	
Pressure difference	**DP**	**1.37**	**Pa**	$\Delta P(h) = \frac{ghP_0}{R}\left(\frac{1}{T_0} - \frac{1}{T_1}\right)$
Discharge coefficient	C_d	0.8	-	
Inlet opening size	A	0.3	m^2	
Density of air	ρ	1.2	kg/m^3	
Airflow rate	**Q**	**1845.5**	**m^3/h**	$Q = C_d A_{eff}\sqrt{\frac{2\Delta P}{\rho}}$
Room volume	V	230	m^3	
Air change rate per hour	**vv**	**8**	**x / h**	

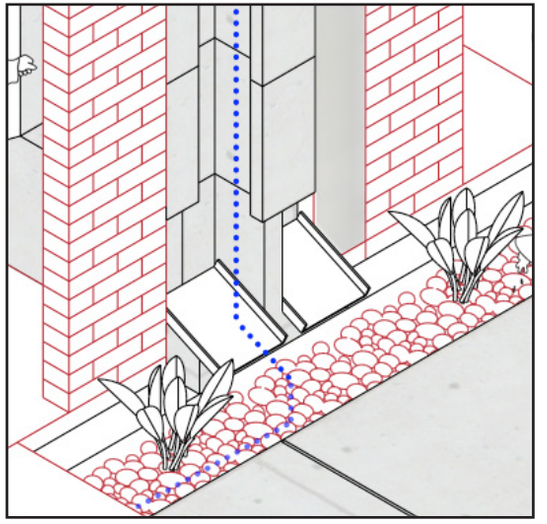




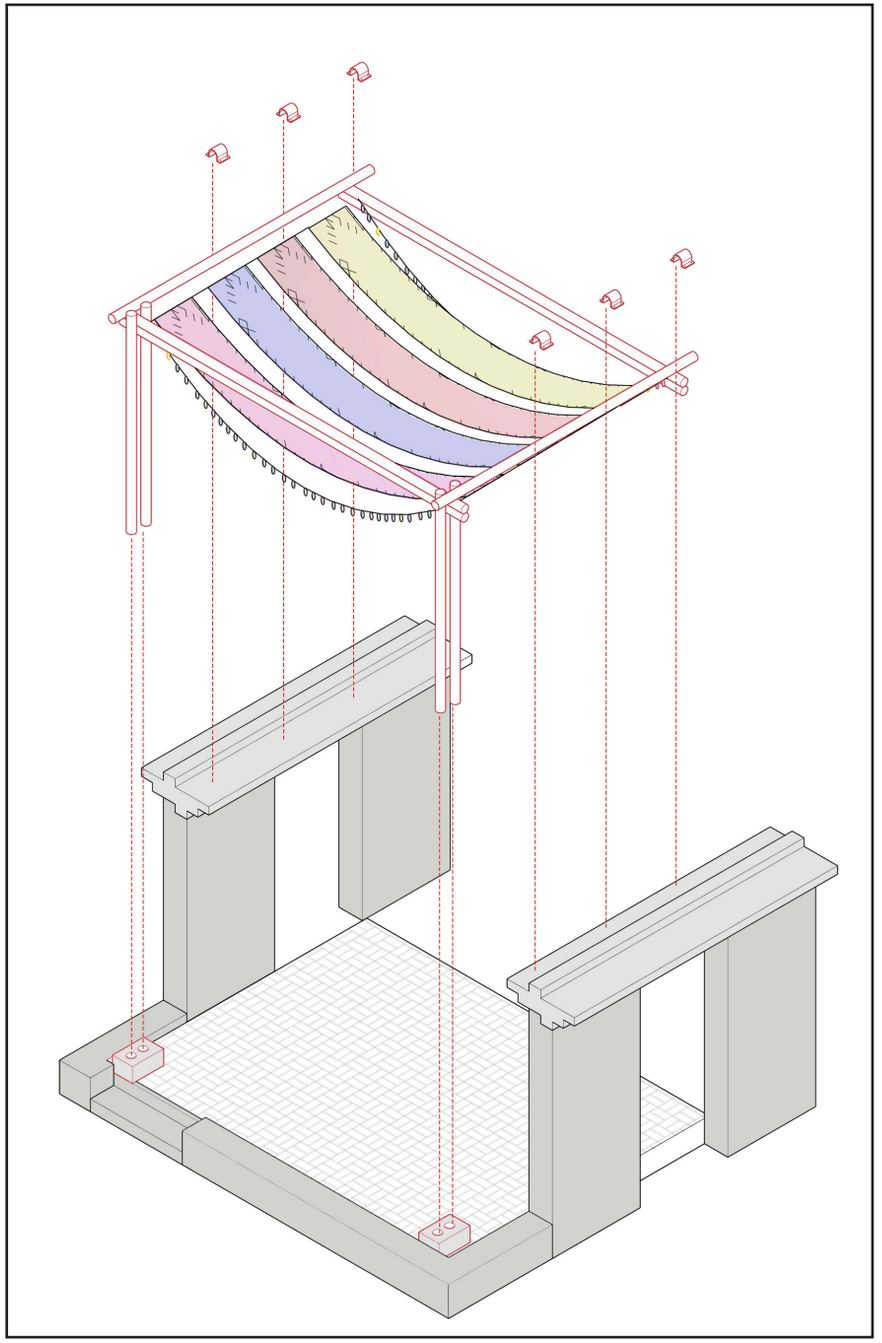
Solar Chimney Core



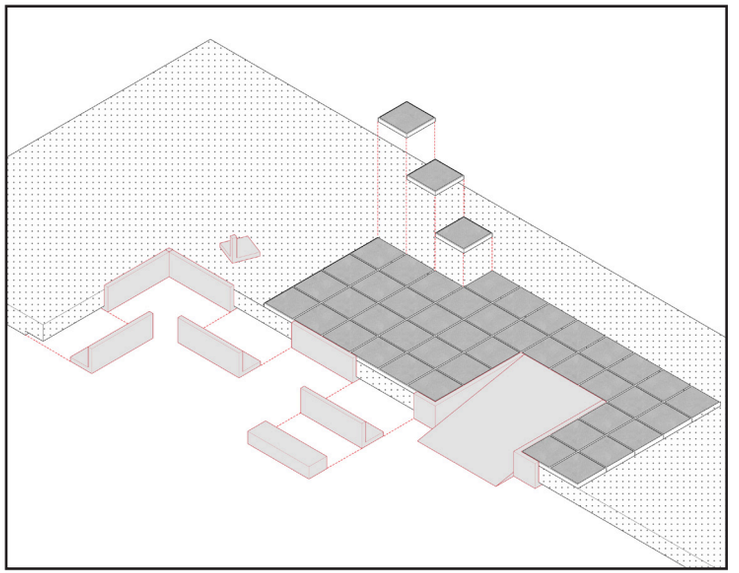
Column, beam, floor connection



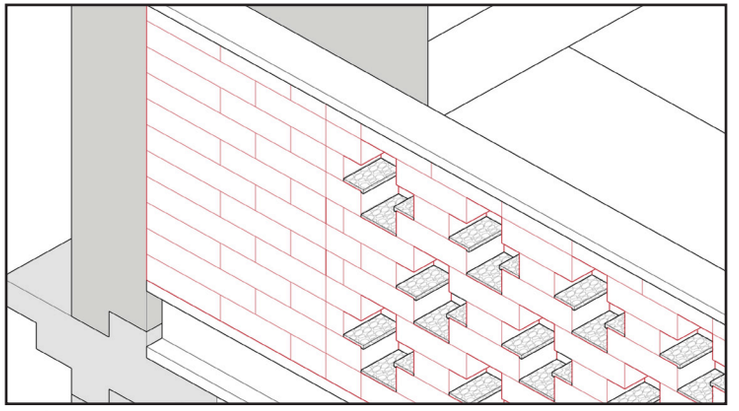
Exposed Drain



Bamboo Pergola



Earth Platform



Perforated CEB

Clustering

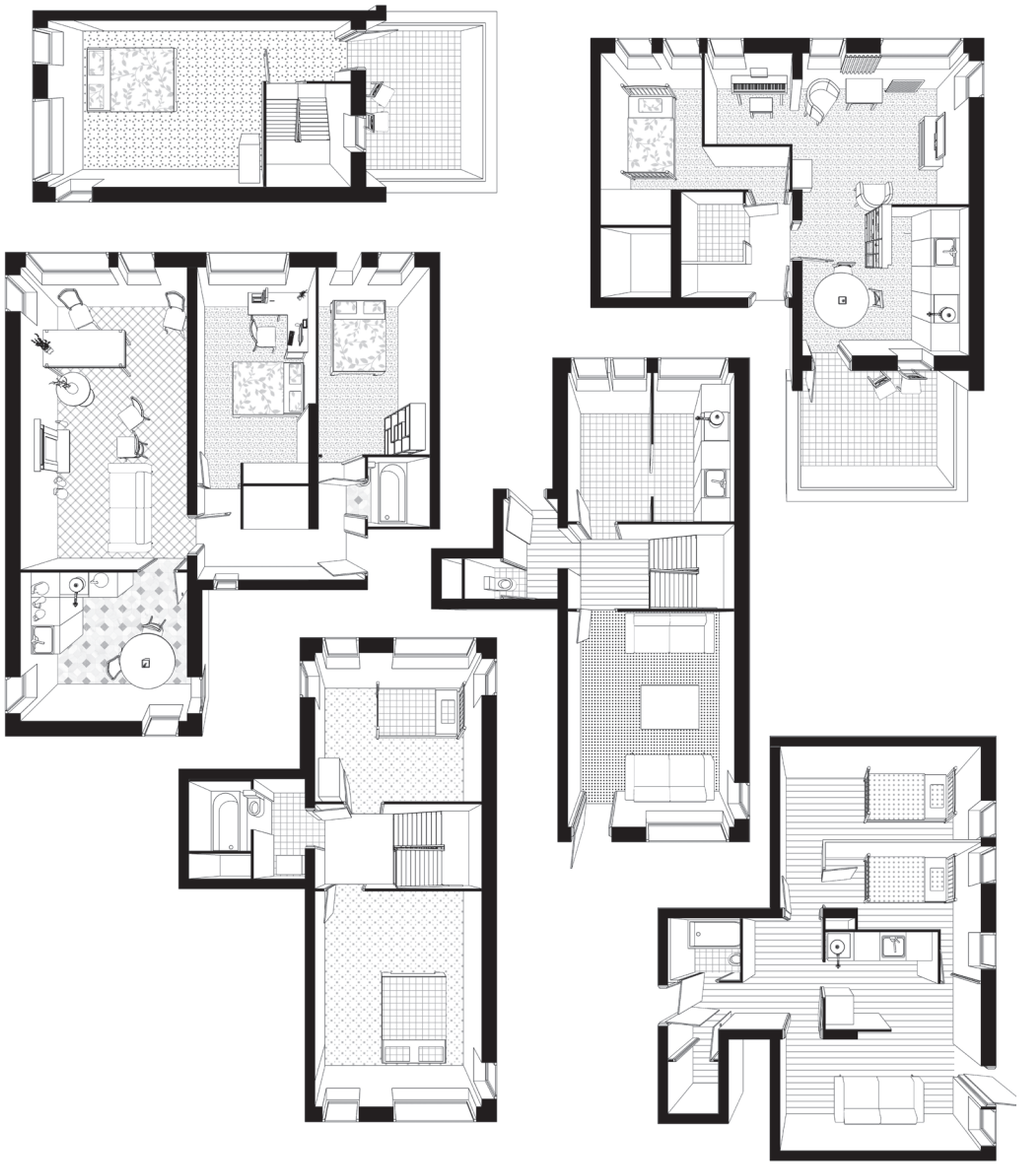
Source

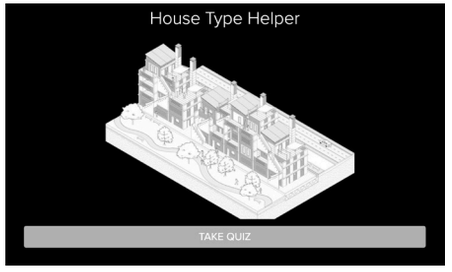
The Architect - X

Support and Infill

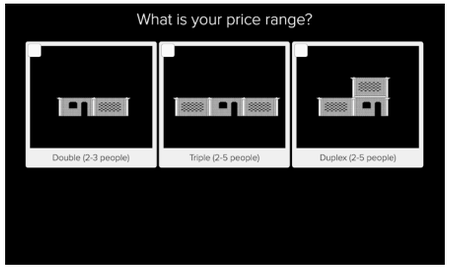
Heterogeneity

- Processes behind Heterogeneity
- Facade Conditions

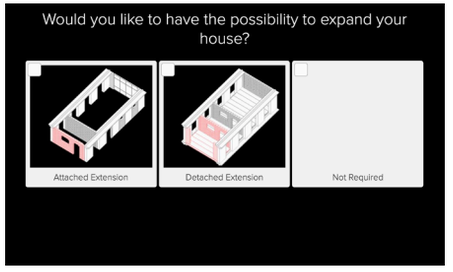


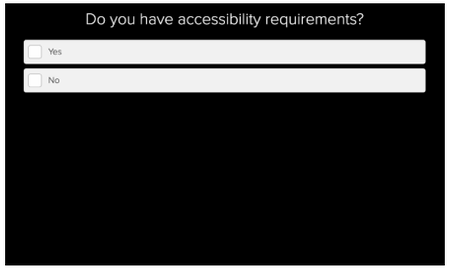


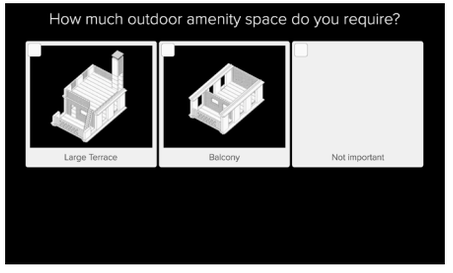
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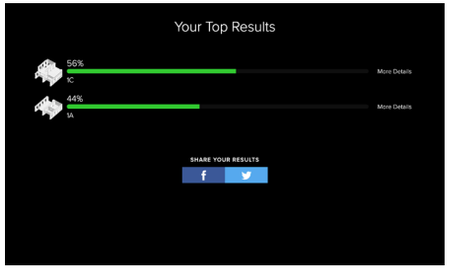


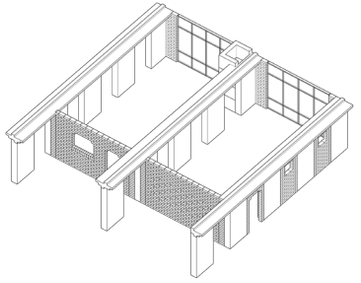


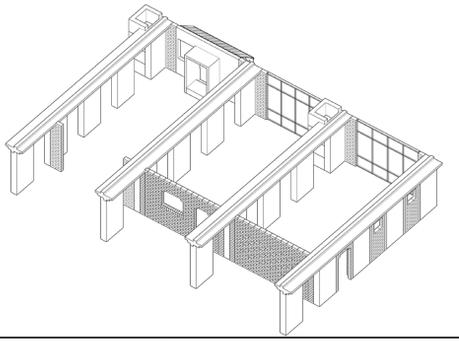


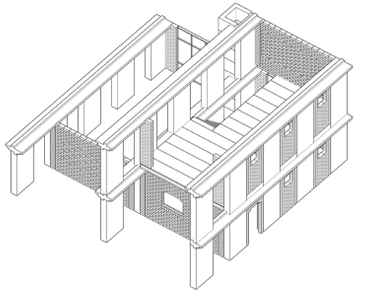


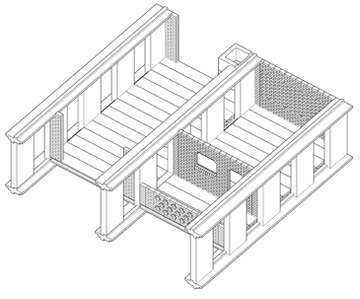


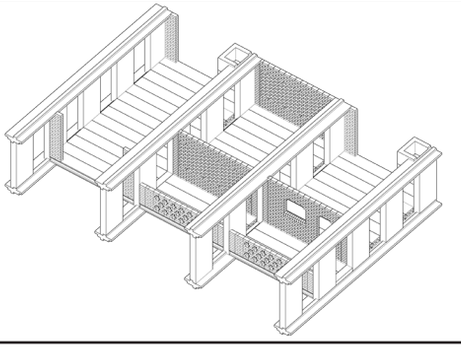


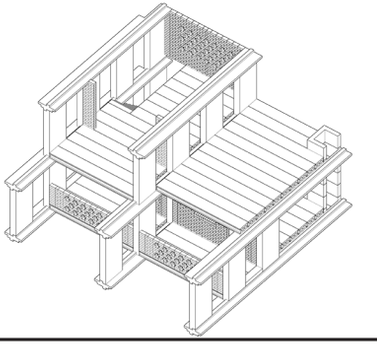


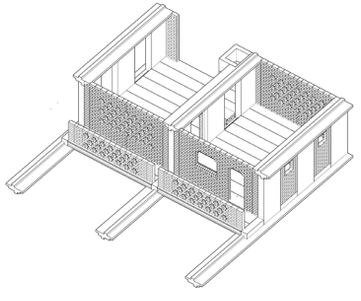


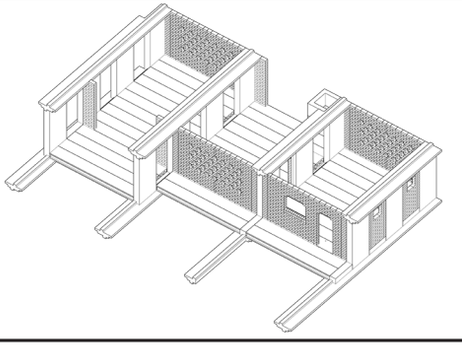


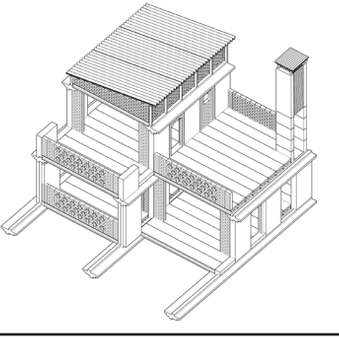


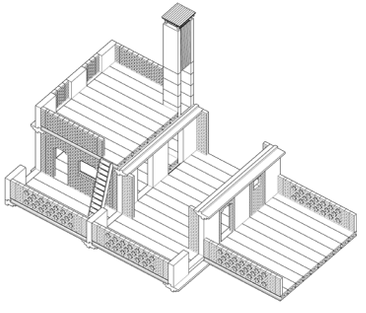


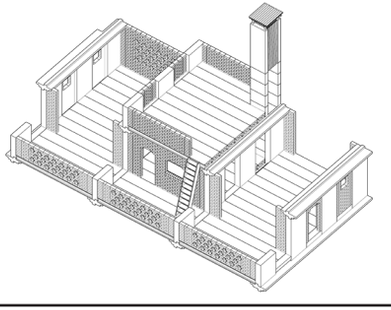


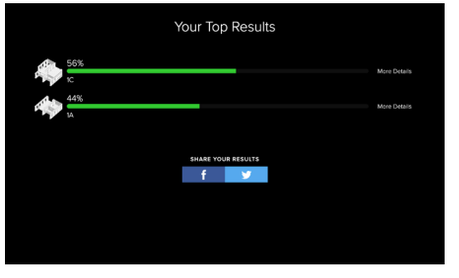




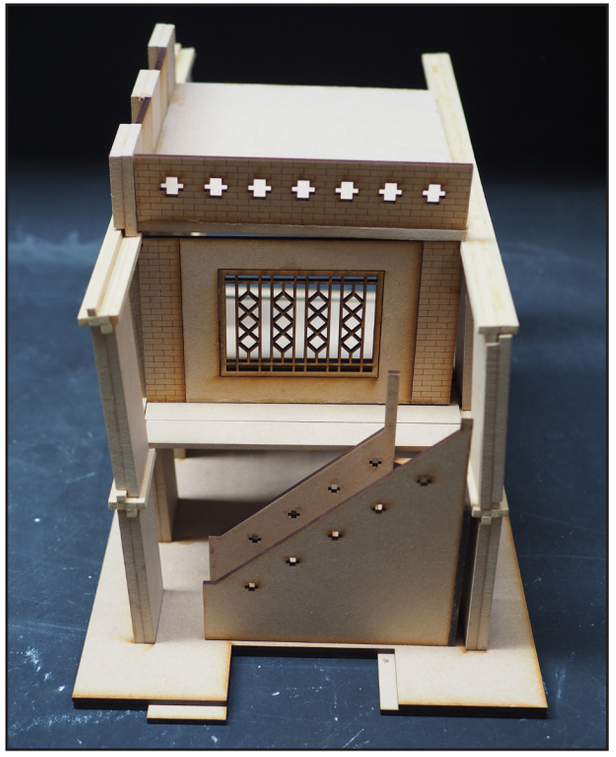
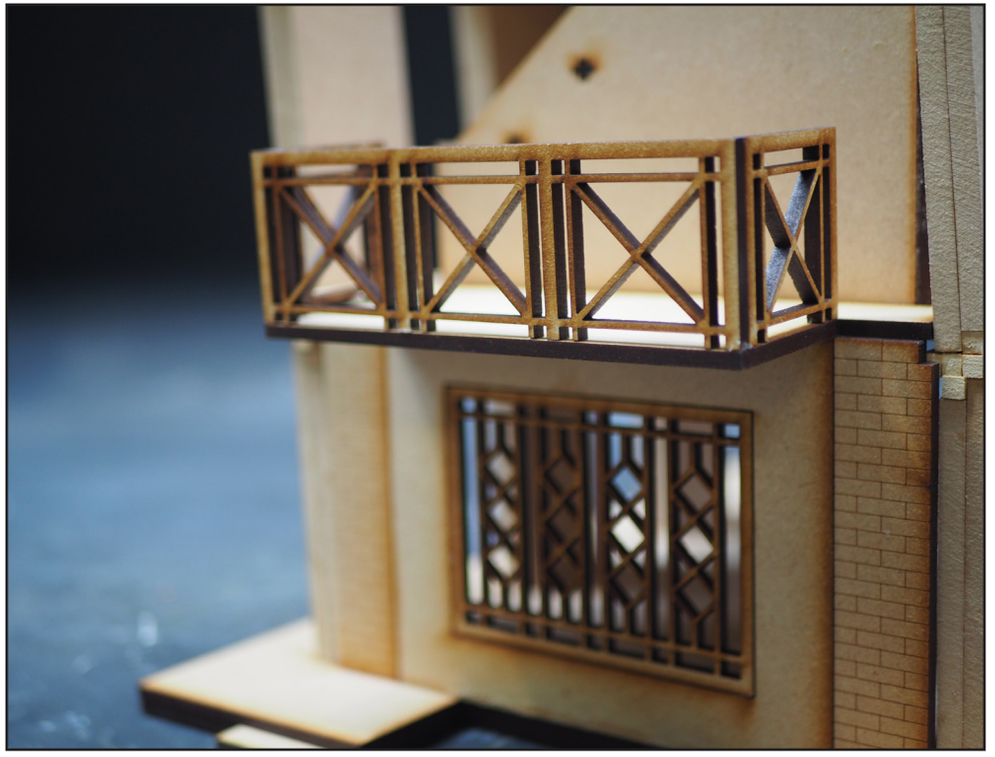
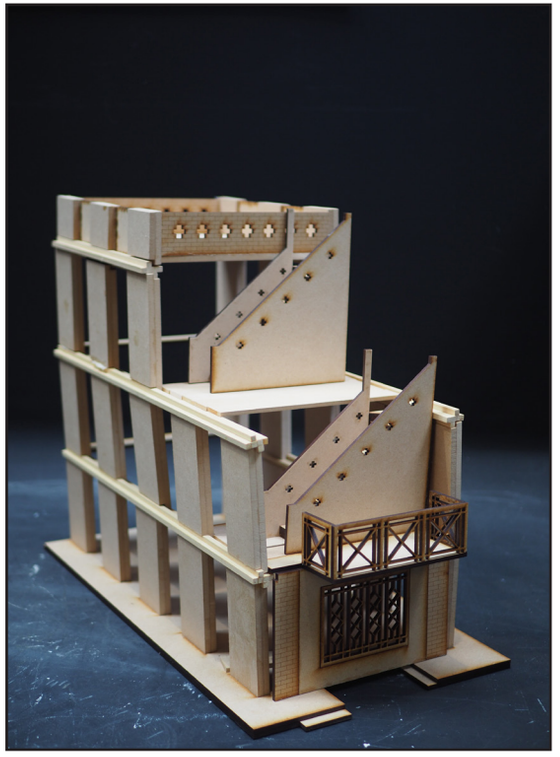


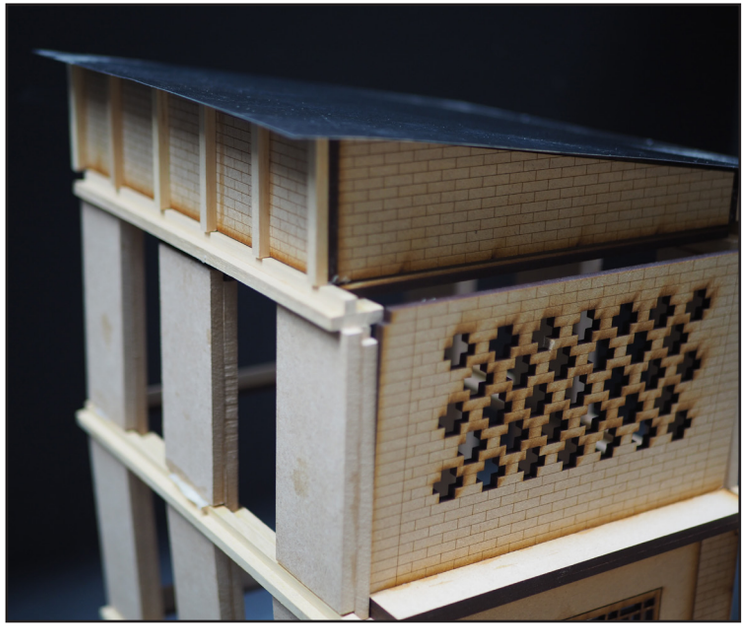




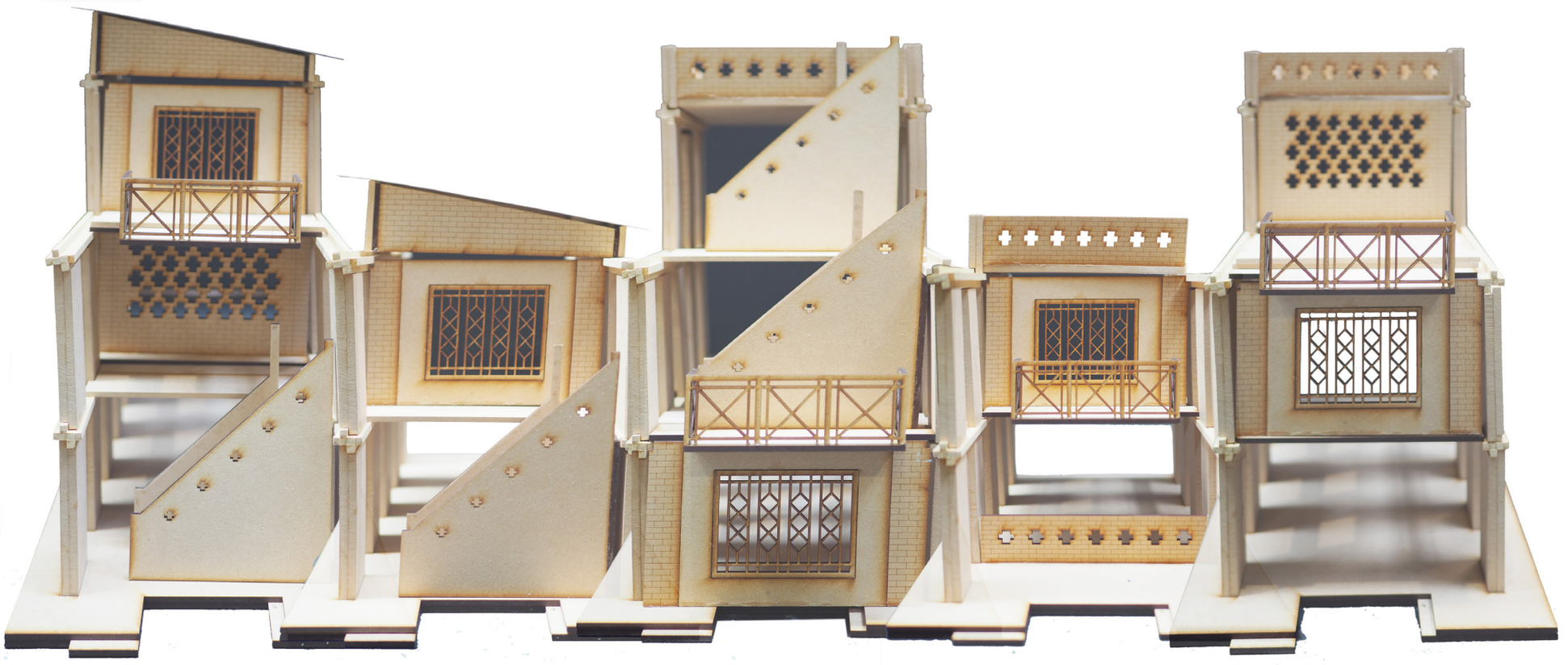

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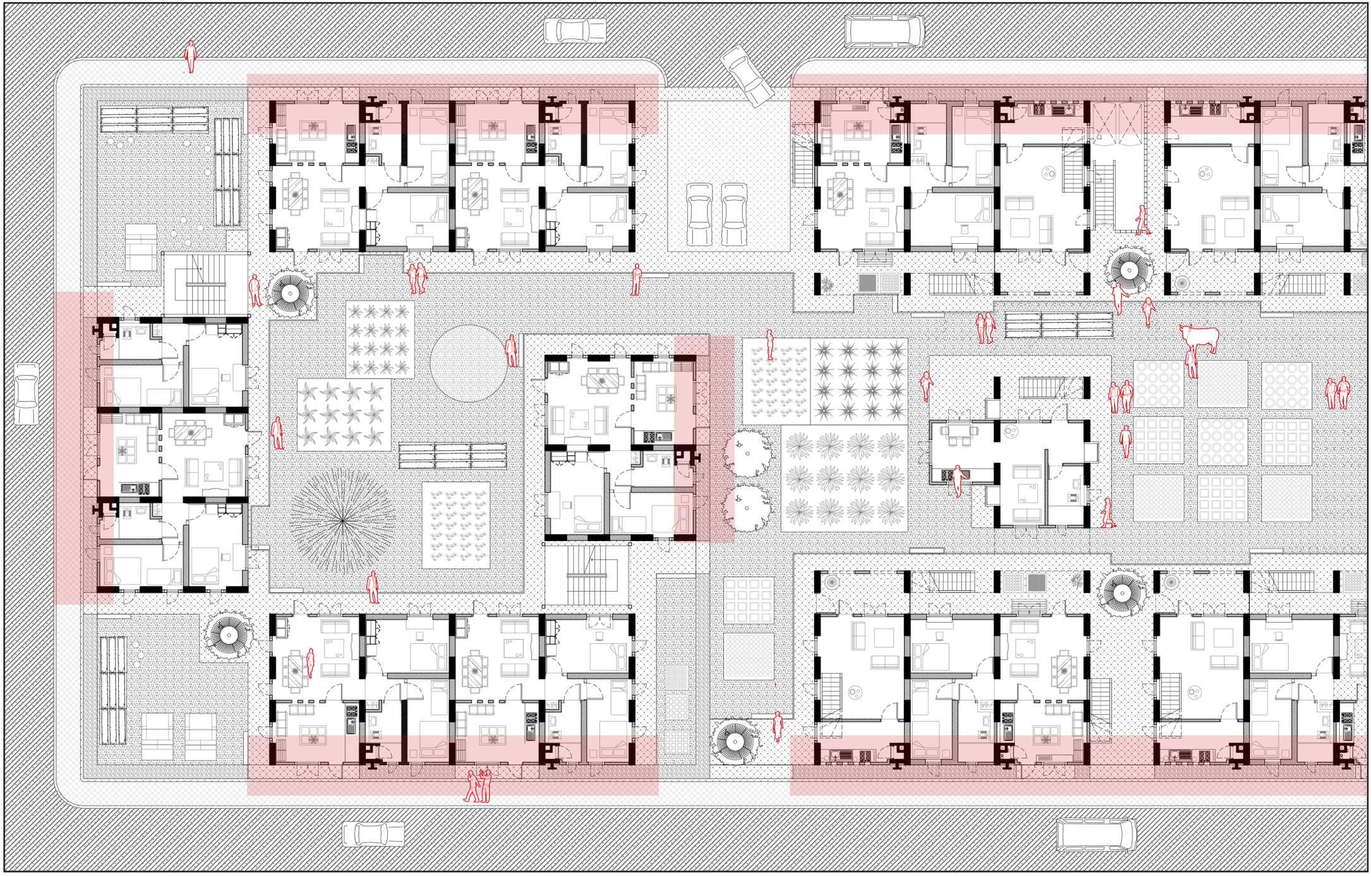


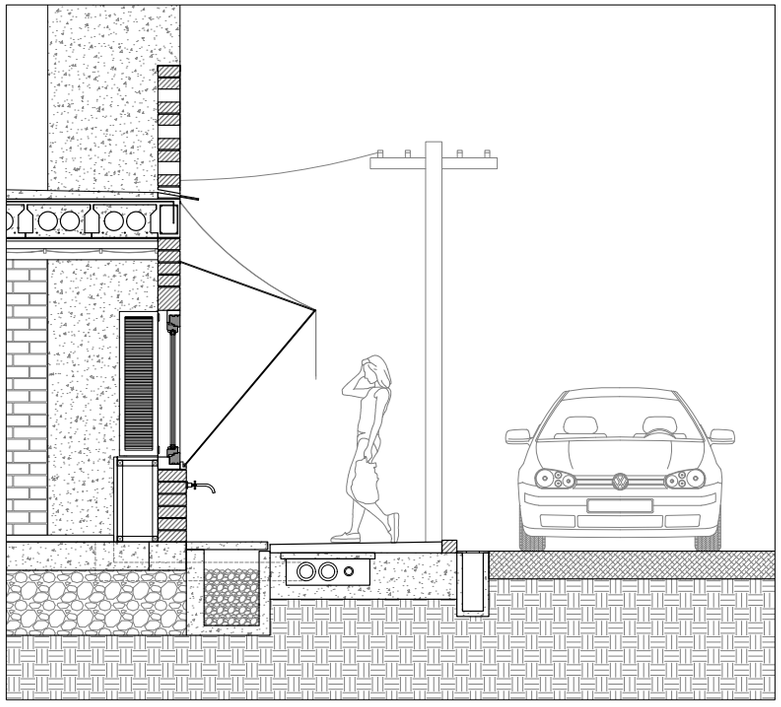








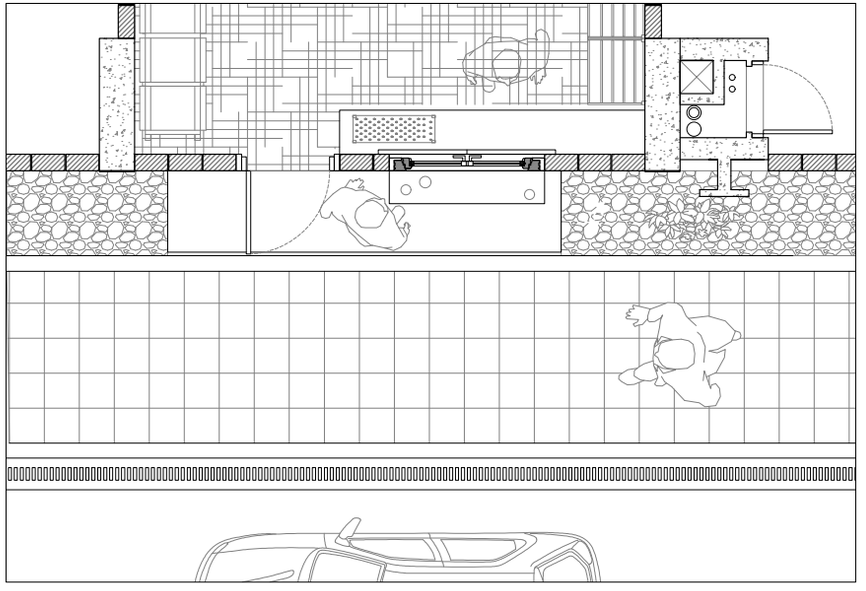


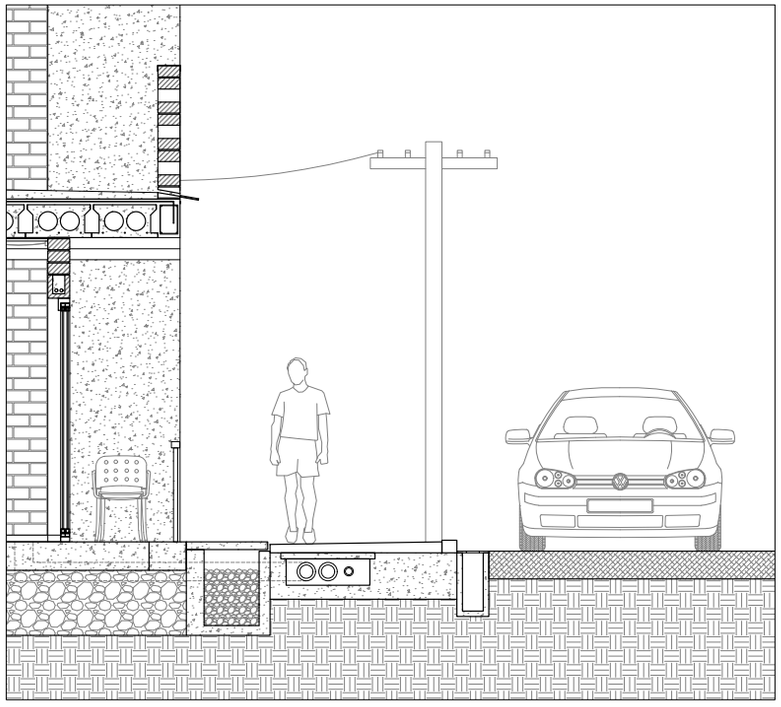


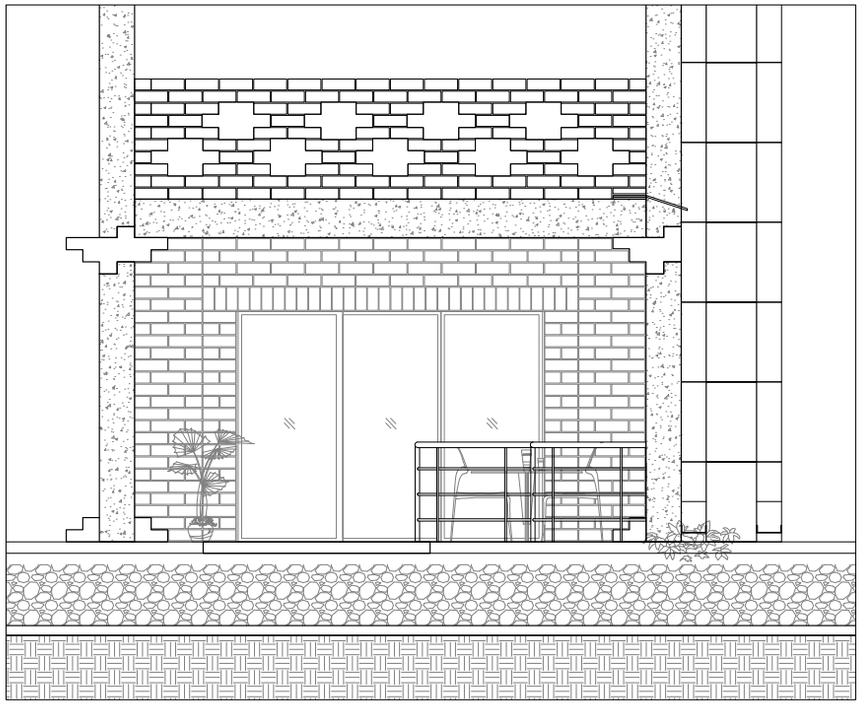




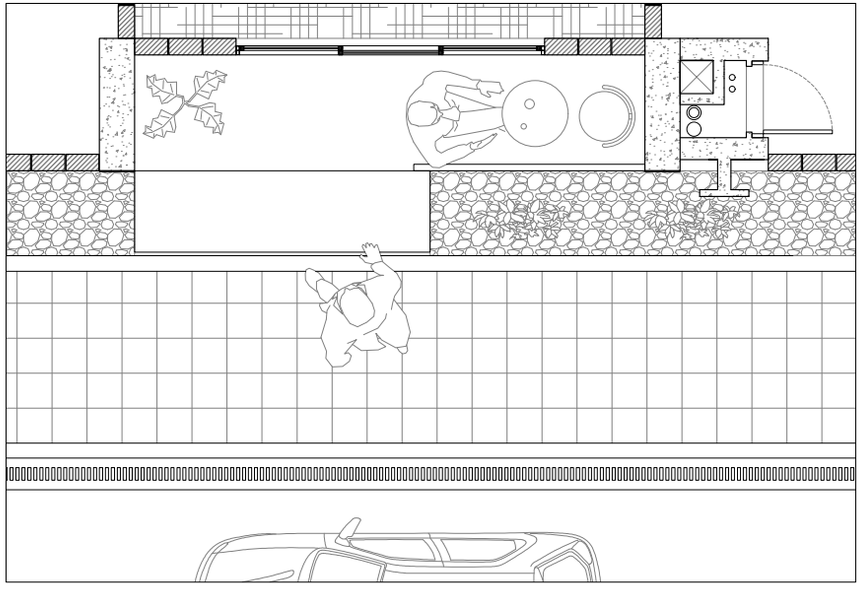
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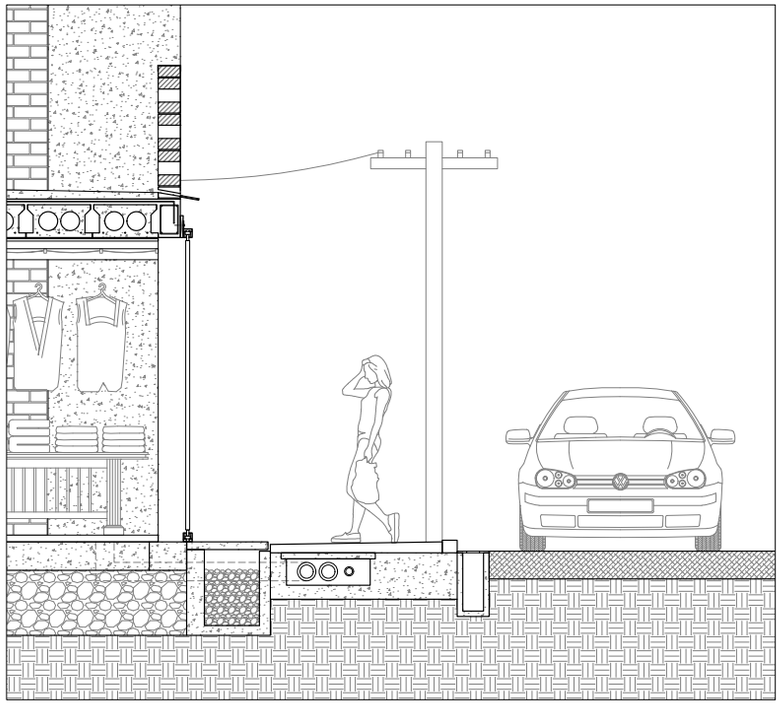






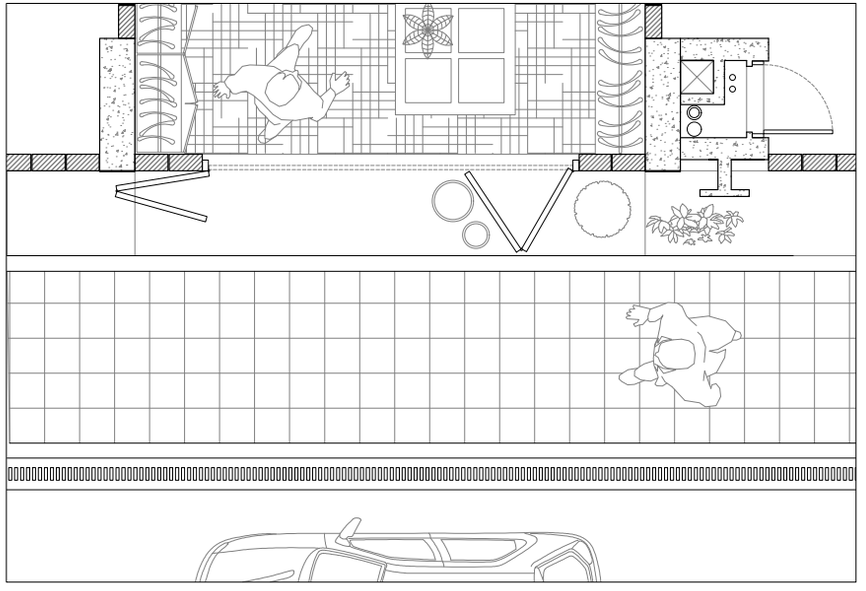
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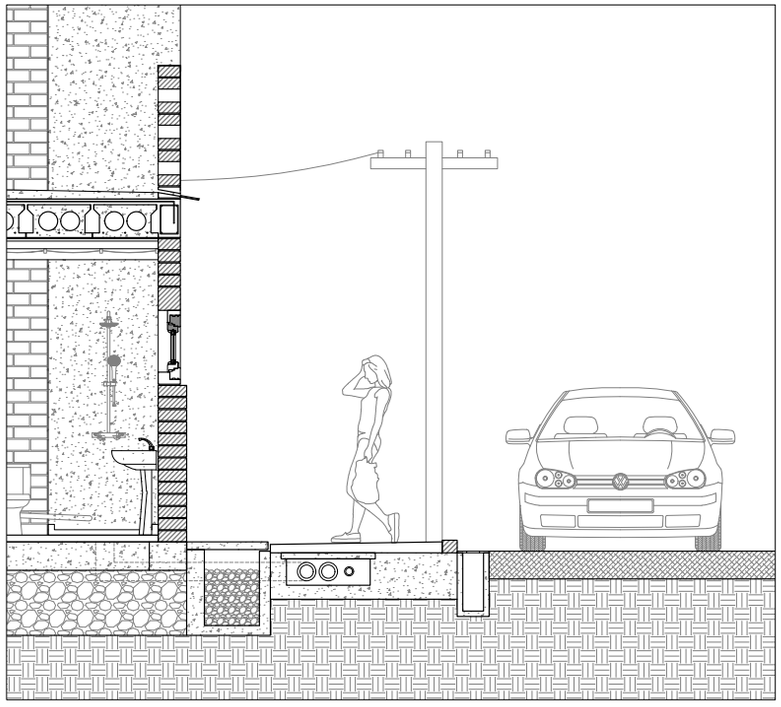


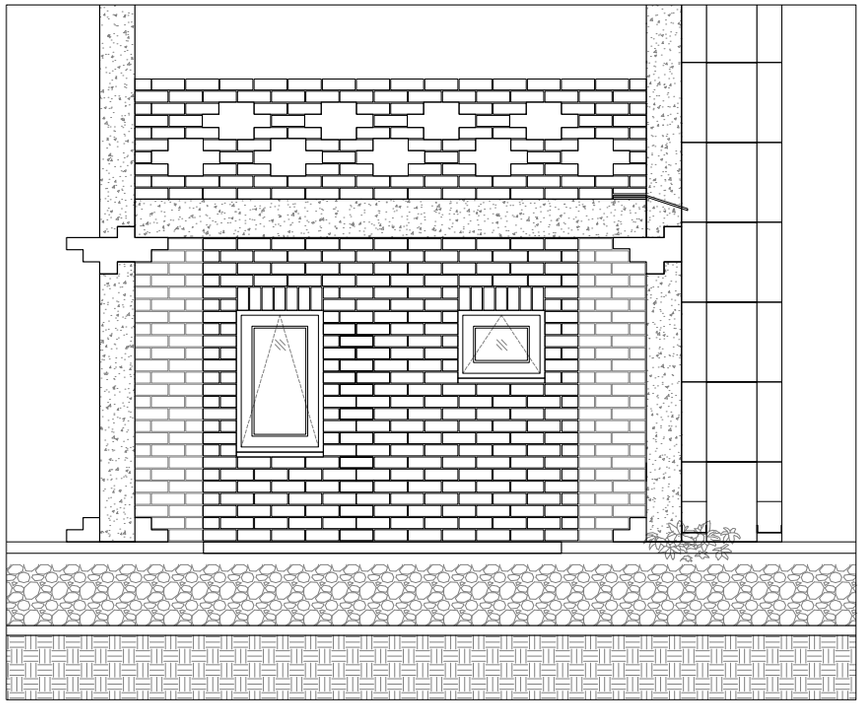




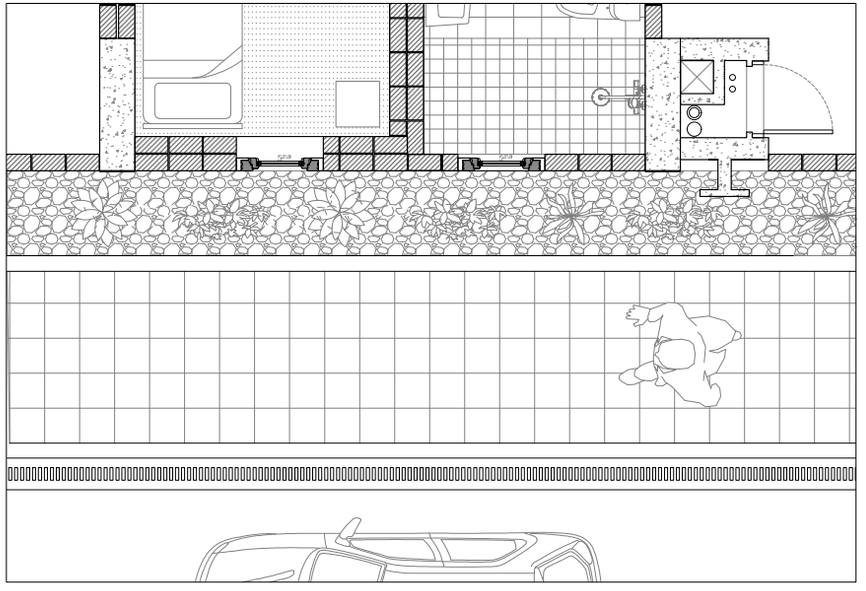
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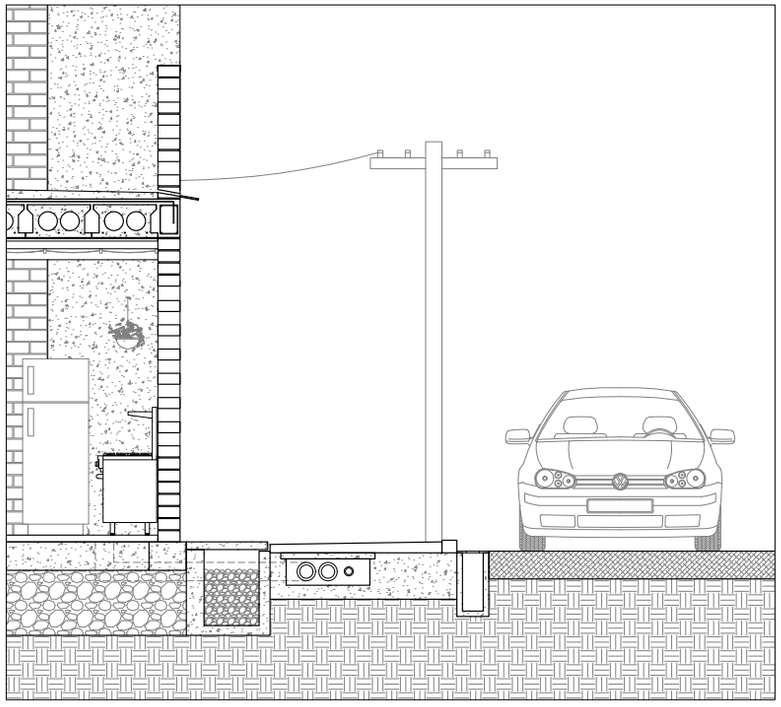


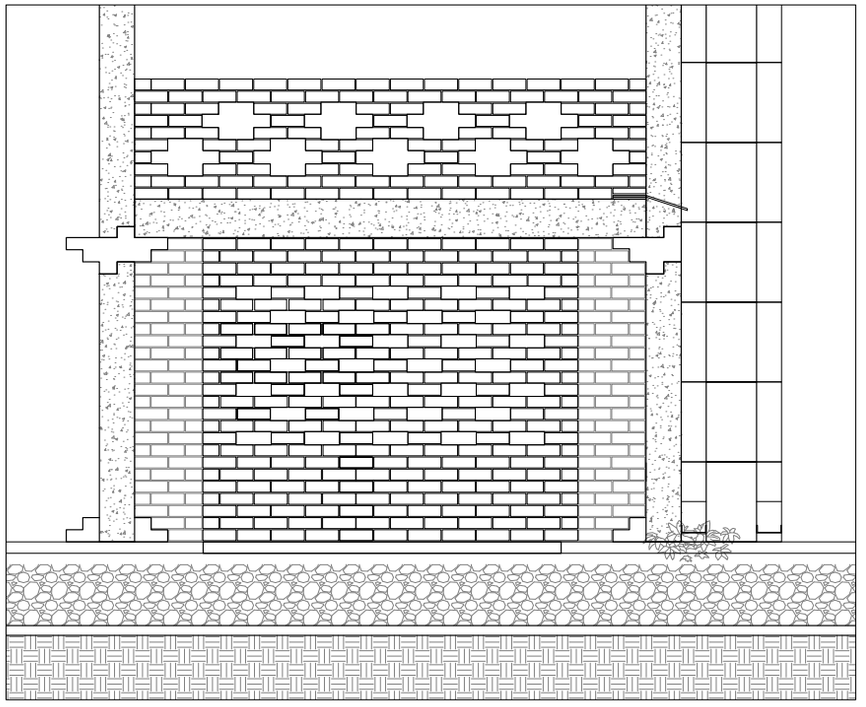




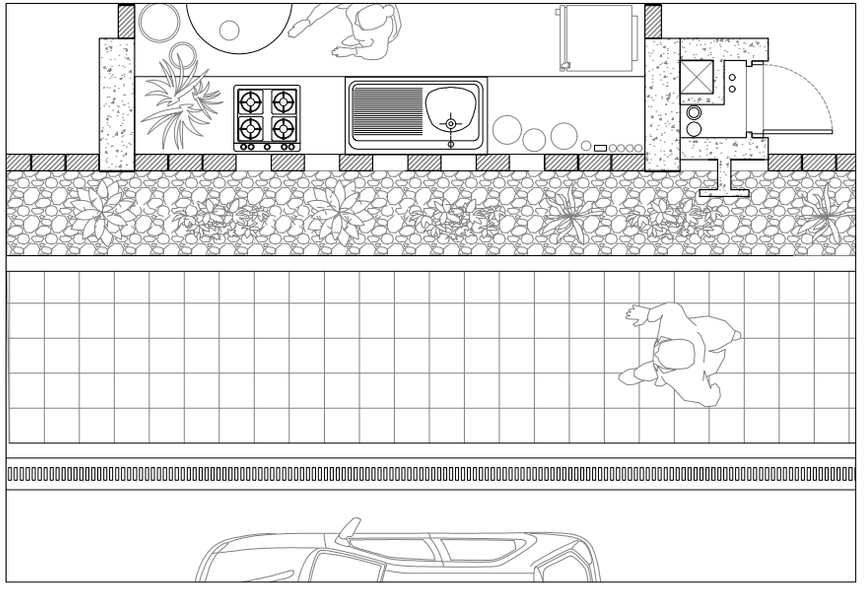
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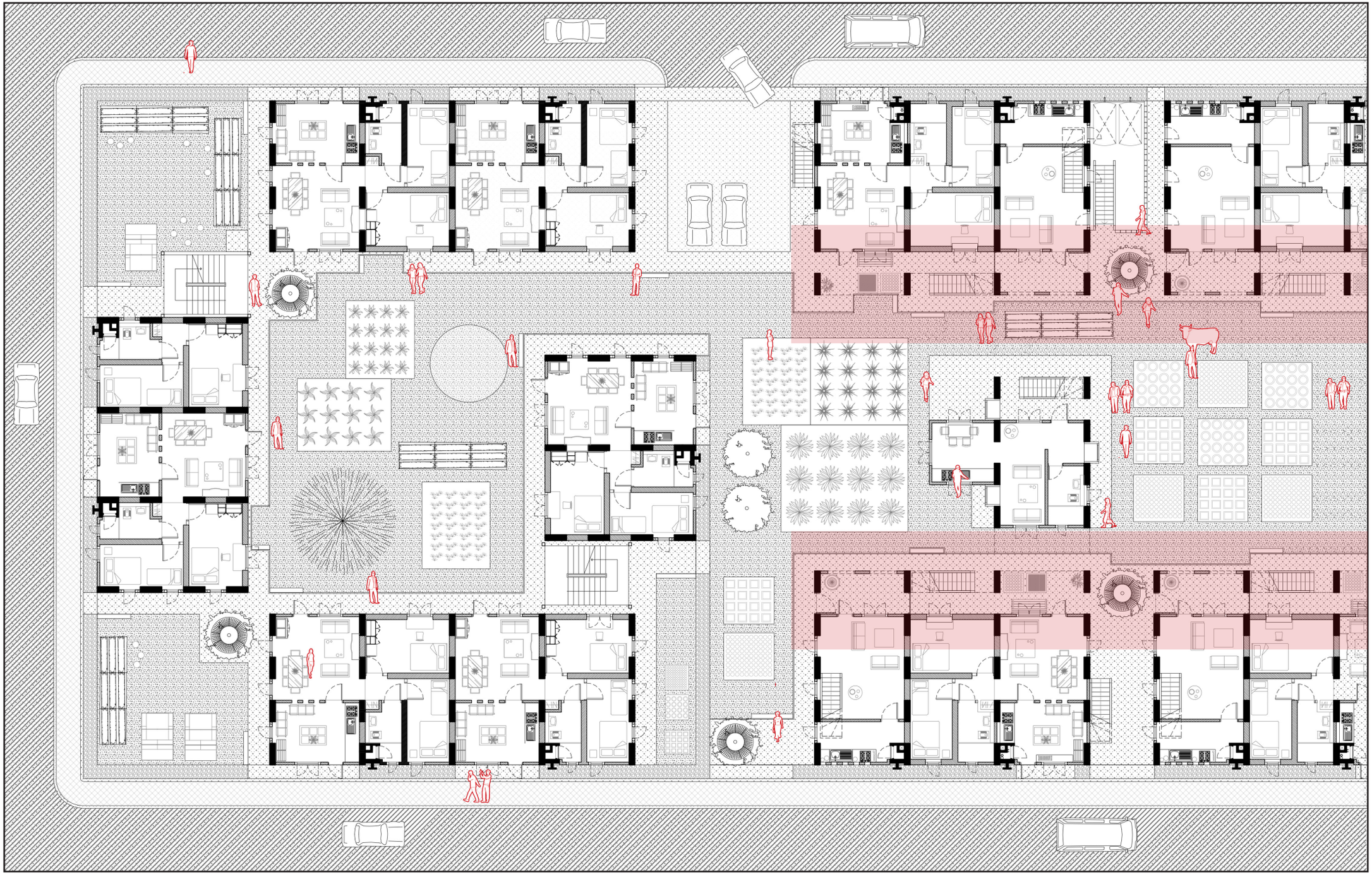


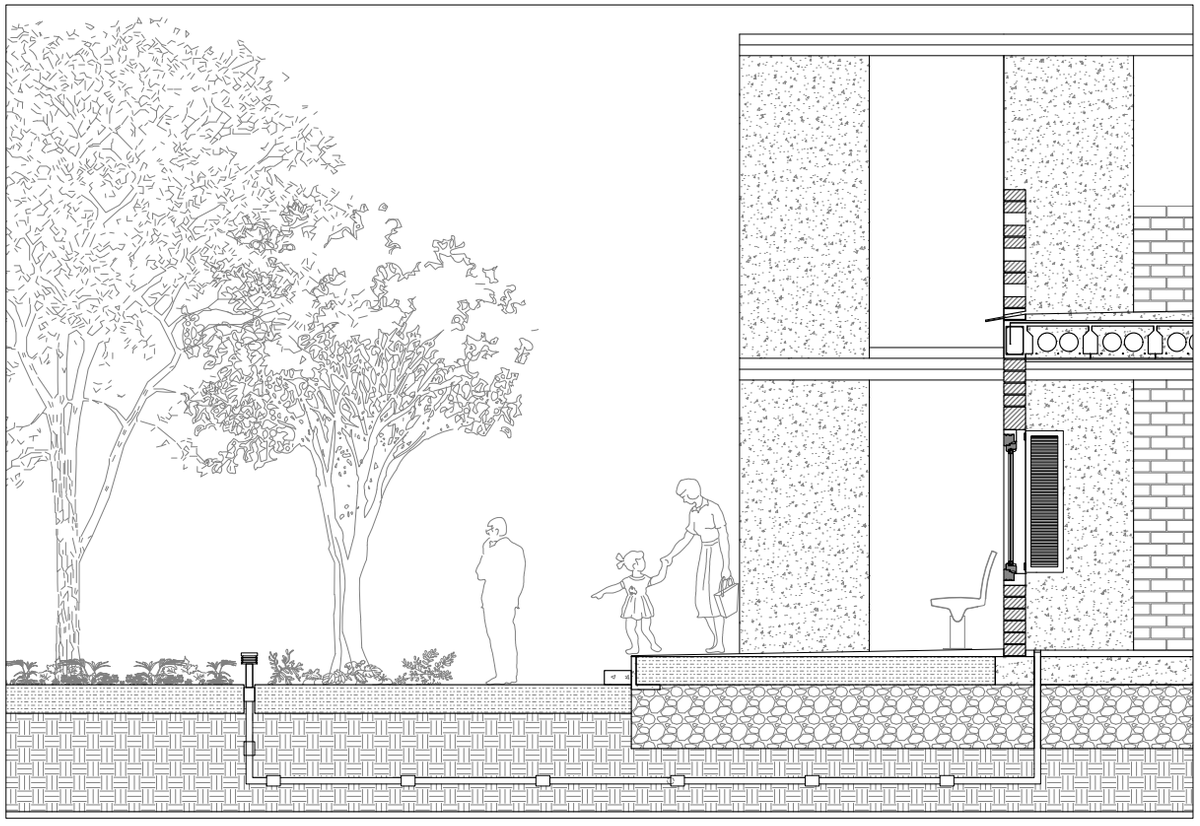


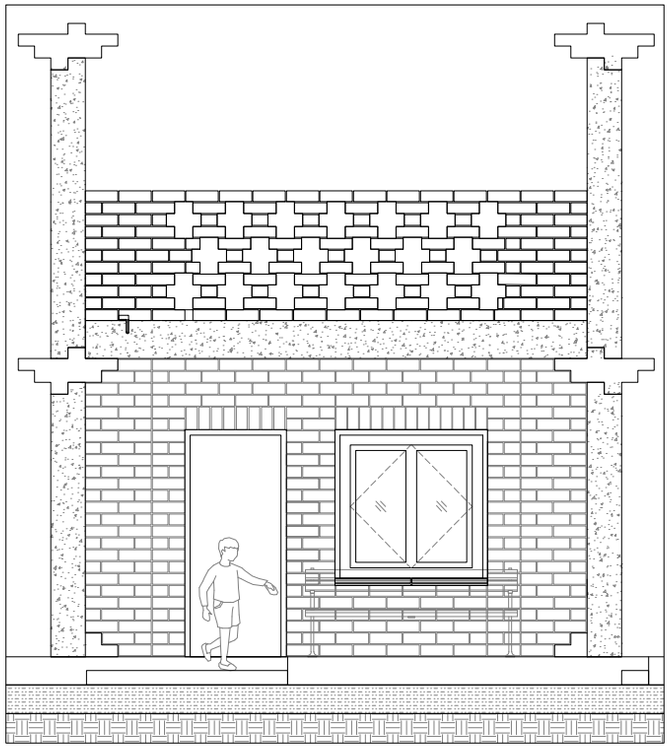


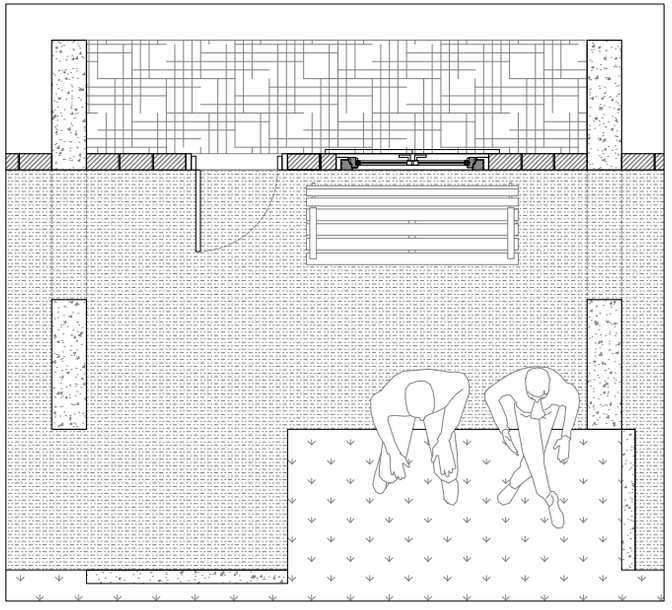
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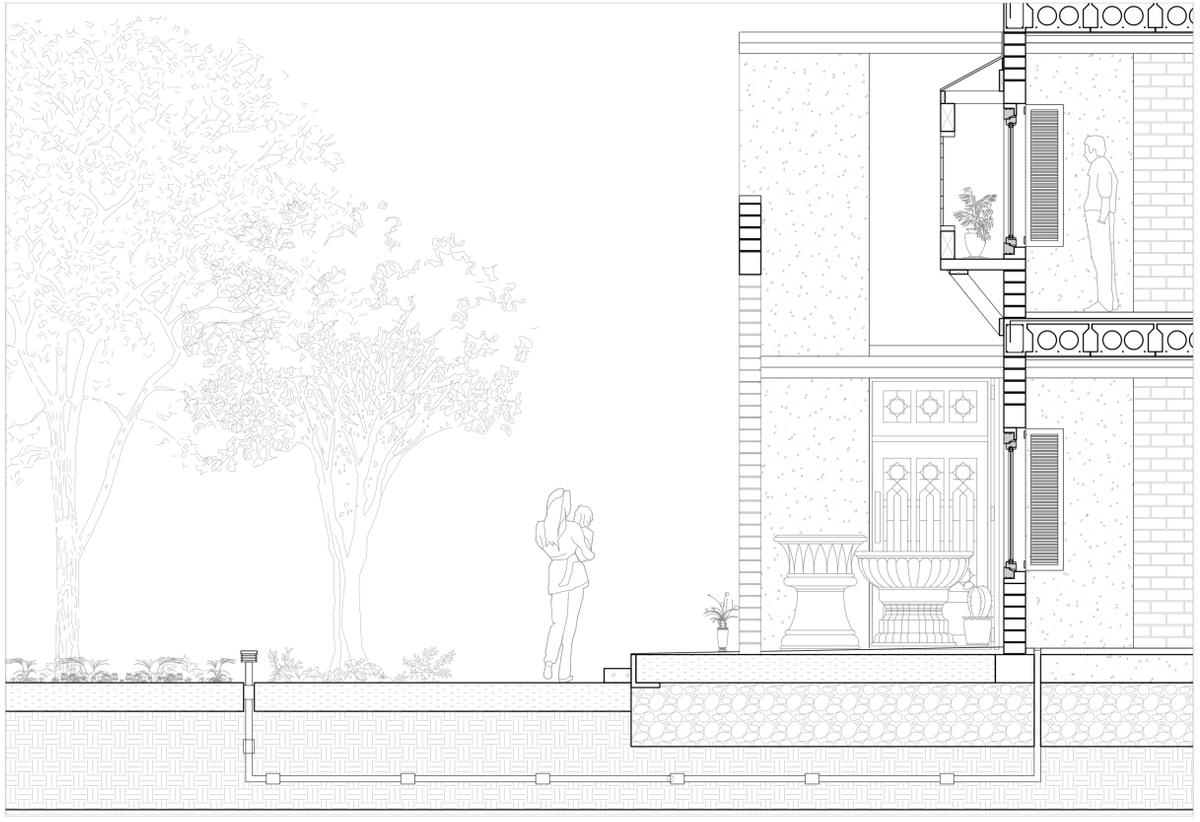


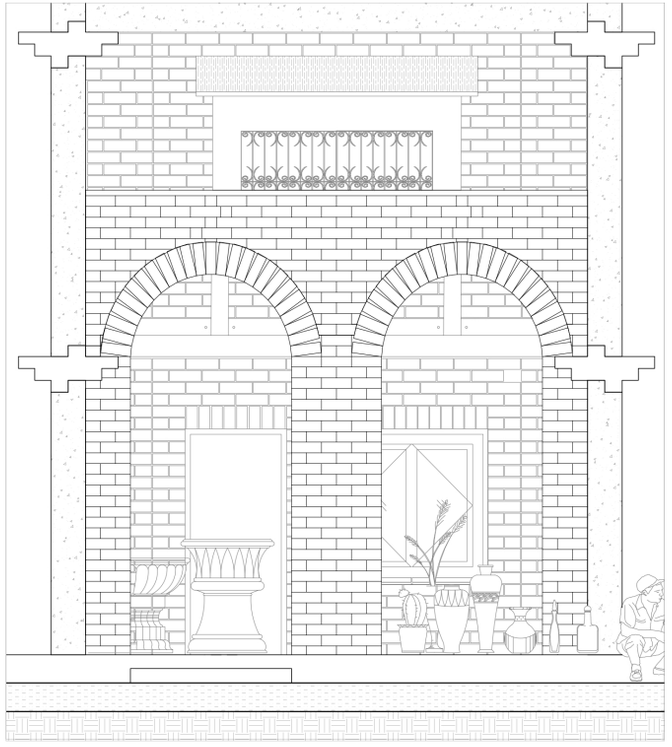


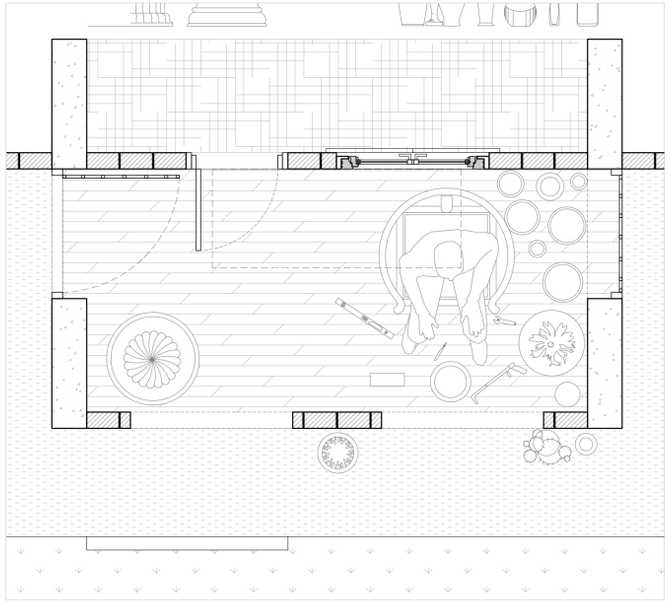




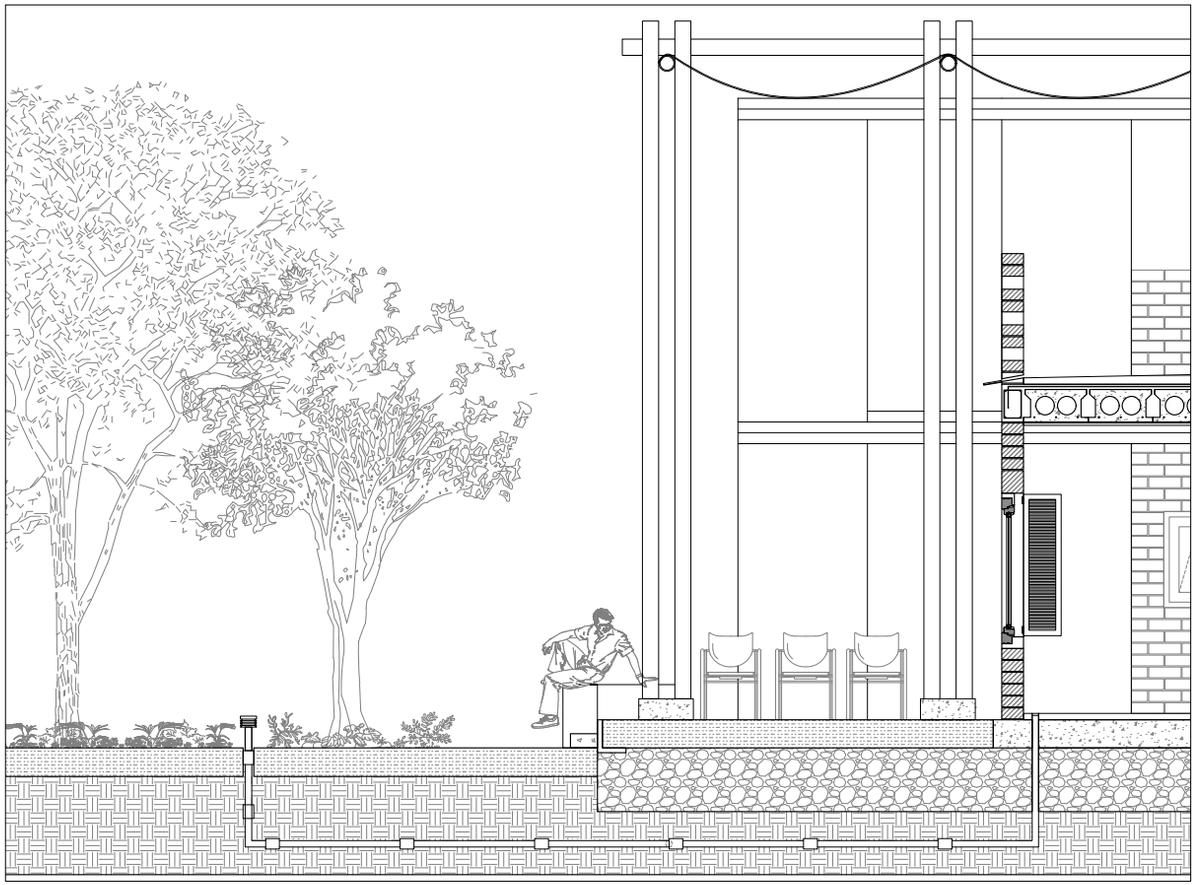
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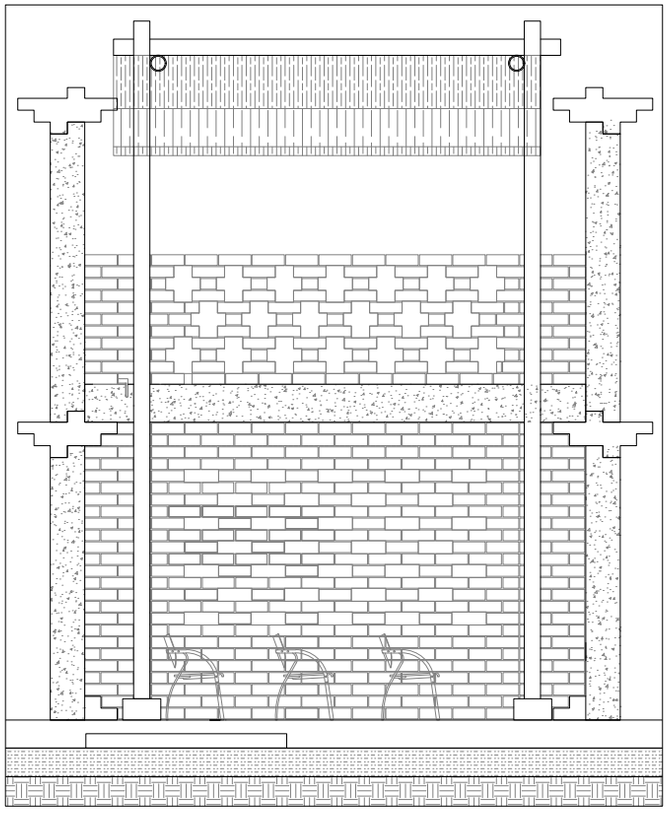


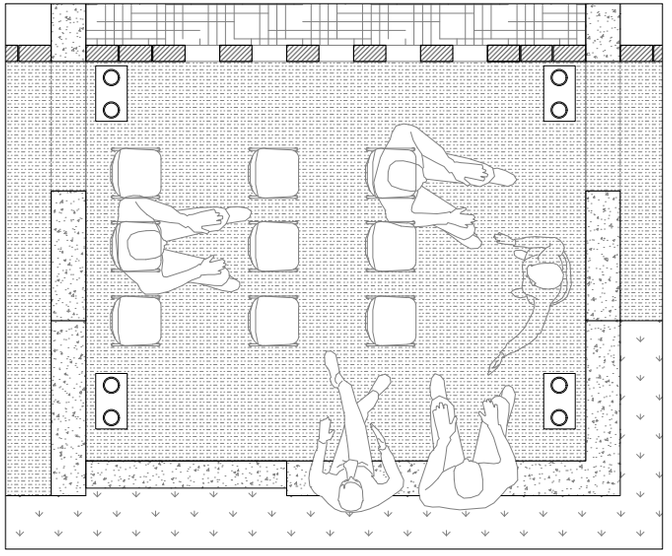




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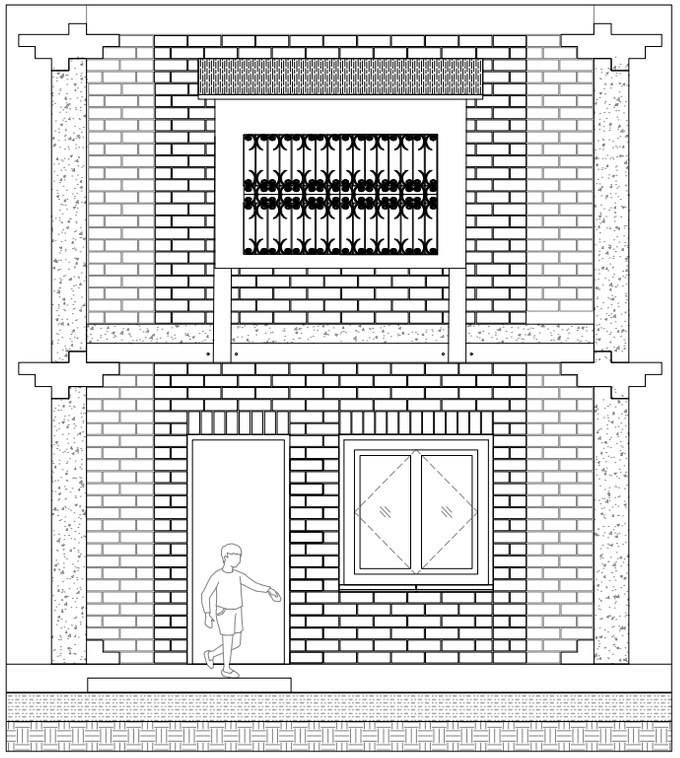




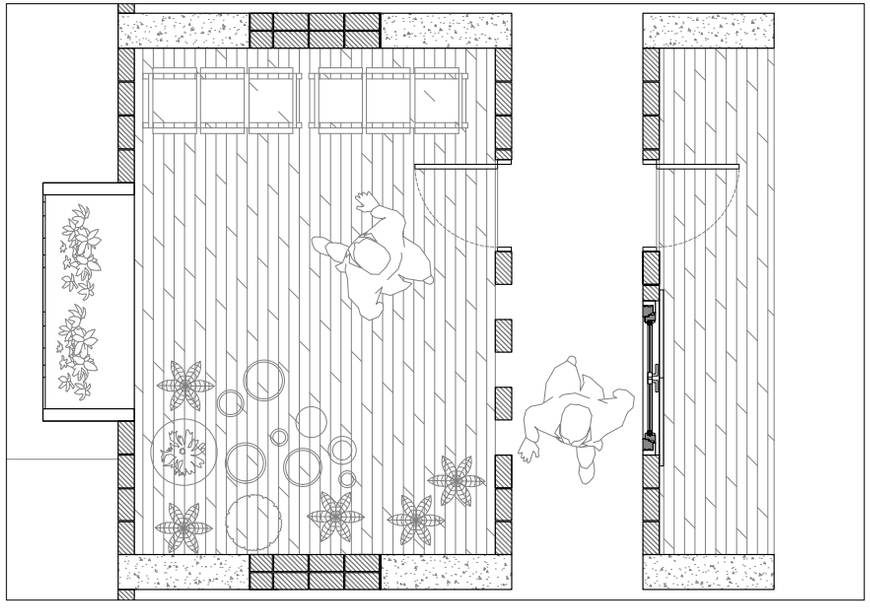


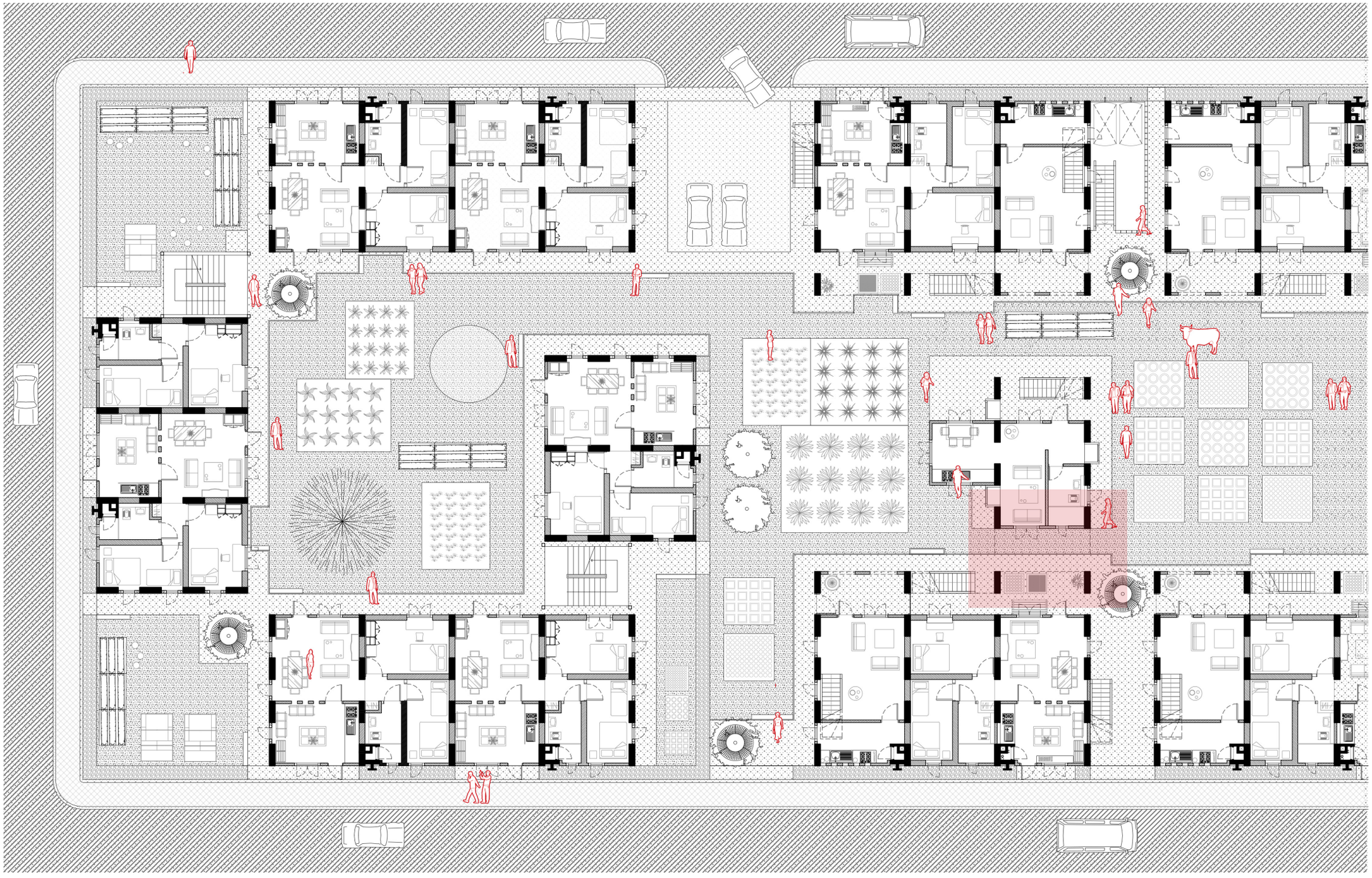
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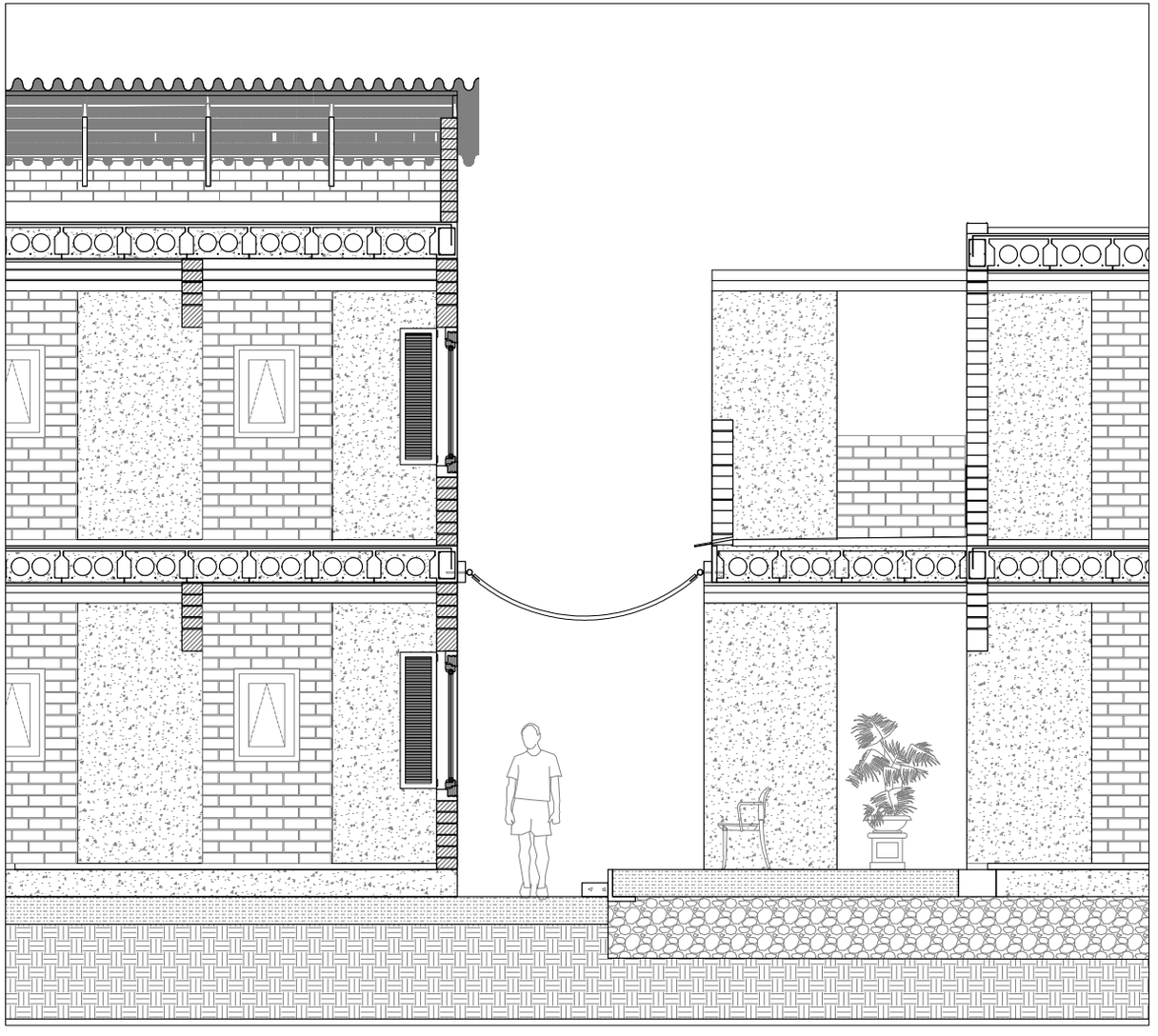


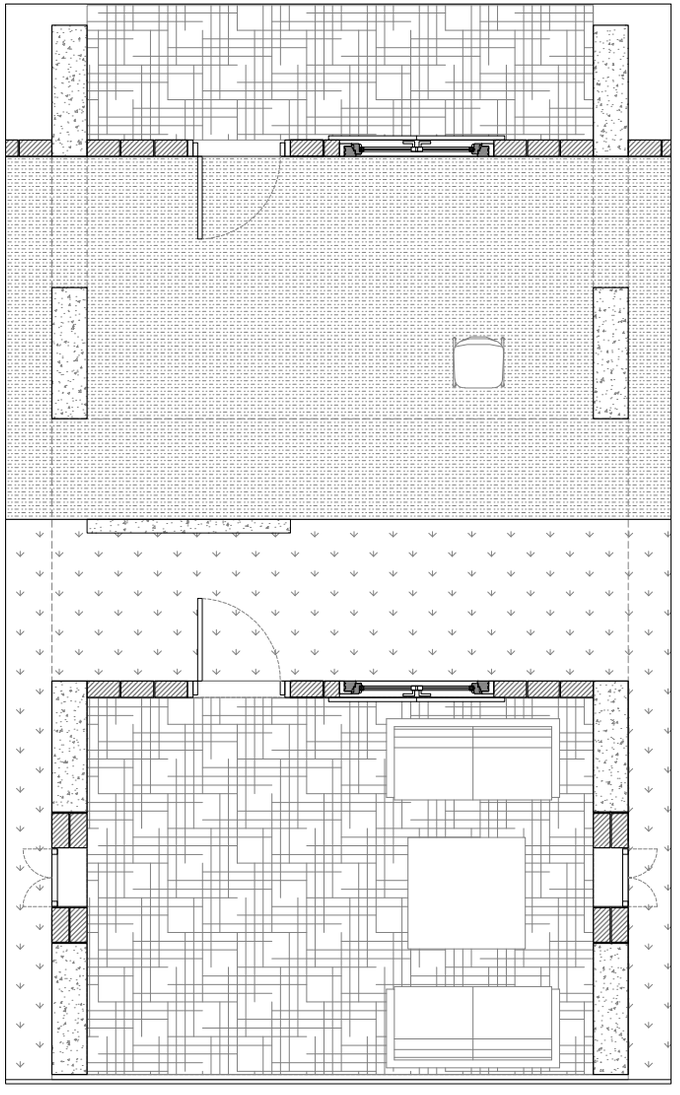


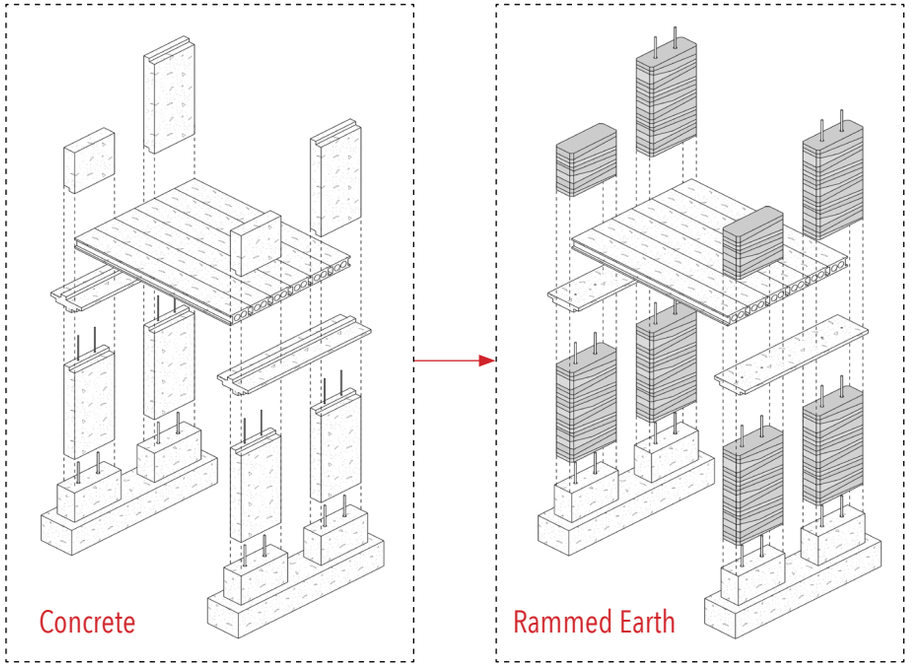
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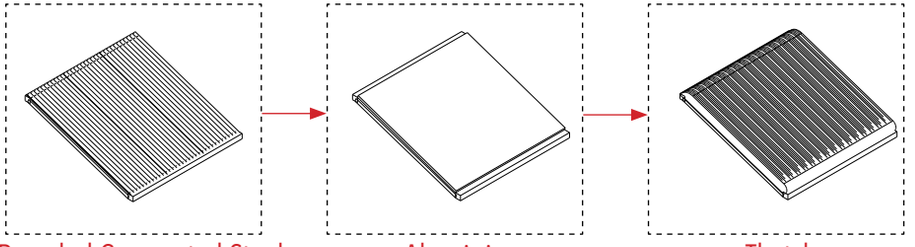


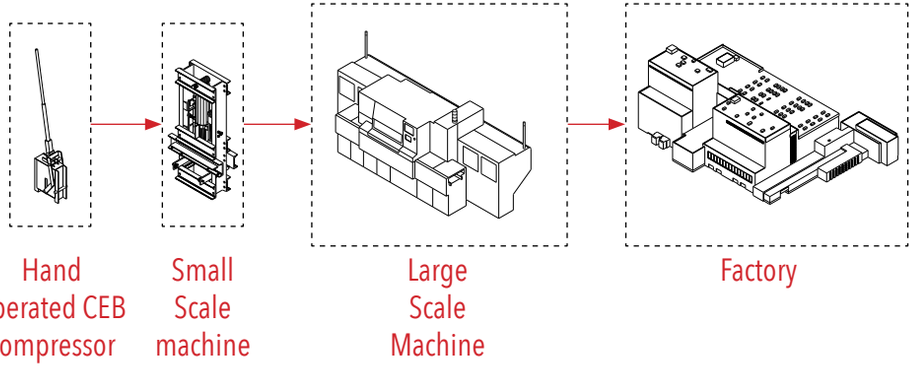


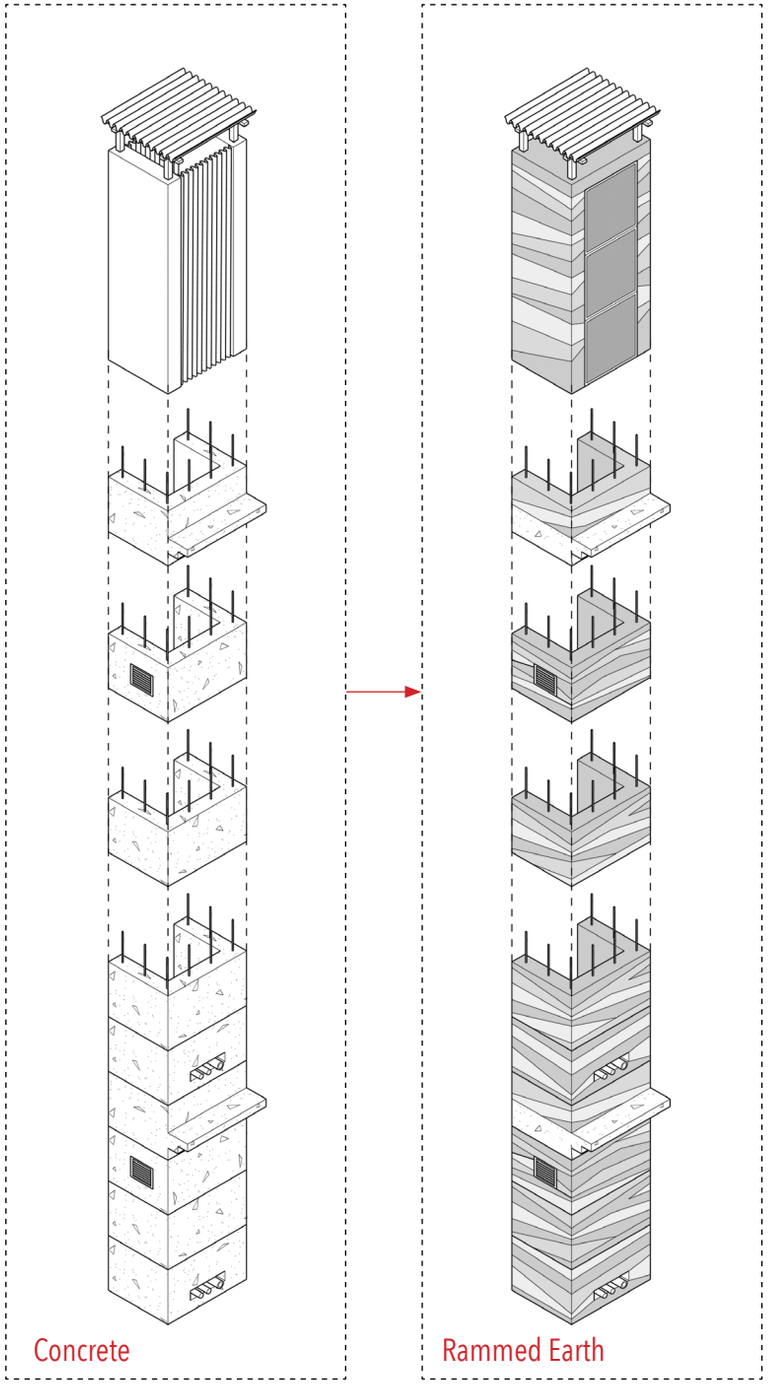


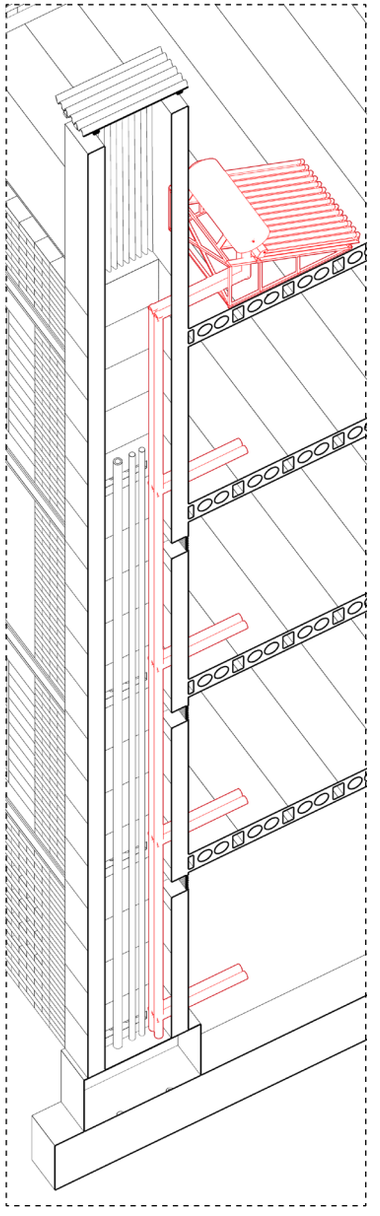



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Rammed Earth


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Aluminium
Thatch


Hand operated CEB compressor
Small Scale machine
Large Scale Machine
Factory


Concrete
Rammed Earth


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