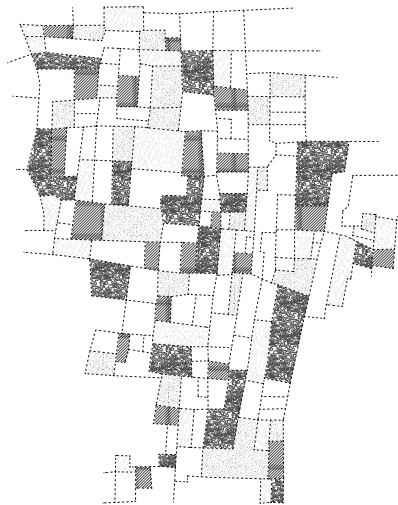


Building A Patchwork of Resilience

**A Situated Participatory Housing Design
Approach for Sylhet's Shonatola Village Community**

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Halleran



Building A Patchwork of Resilience

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The people of Shonatola village for welcoming us into their community

And a special thank you to:

My family, friends and the Global Housing Studio!



Initial sketch exploring the intersection of topics I was interested in exploring through my thesis.

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"The wish for communion exists in the body. It is not for strategic reasons alone that gathering together has been at the heart of every movement for social change...These meetings were in themselves the realization of a desire that is at the core of human imaginings, the desire to locate ourselves in community, to make our survival a shared effort, to experience a palpable reverence in our connections with each other and the earth that sustains us".

Susan Griffin, The Eros of Everyday Life, 1995

Context



Bangladesh

Bangladesh is a country whose landscape is constantly changing due to its geographic location; as the majority of the country lies in the Ganges-Brahmaputra-Meghna Delta, it is especially vulnerable to extreme environmental distress. As such, the ways in which people live in Bangladesh must be adaptable to change, as living in a state of constant movement in a fluctuating landscape is routine. Despite the challenges that the people of Bangladesh endure, they are a people of hope, which fuels their resilience and has the potential to incite change (Paoletti, 2022). The region of Sylhet is located in North-Eastern Bangladesh. The major climate events which impact this area in particular include: significant changes in temperature, drought, heavy rainfall, cyclones and storm surges (Anik & Khan, 2012). As a result,

these environmental variations lead to a lack of fish availability, scarcity of water during droughts and frequent flooding throughout heavy rainfall seasons. This leads to climate-induced migration as people are forced to flee their communities as they become internally displaced throughout the country (Rana, & Iliana, 2021). The ways in which the people of Bangladesh are affected by the environment sheds light on the vulnerabilities of human life and settlement. While in western countries, it may be easier to ignore just how our world is being impacted by the climate crisis, in countries like Bangladesh, who are constantly face to face with the direct effects of climate change, the way of life has become an awakening to the grave dangers of global warming's threat to human existence.



Shonatola Village

The Shonatola village community is located in a peri-urban settlement North West of Sylhet city, between the Surma River and the Shari-Goyain River. This tightly knit community is made up of roughly 1800 people living in about 250 homes, on average seven people per dwelling. The current housing conditions throughout the village vary significantly. There are substantial infrastructure upgrades that need to be addressed to improve the quality of life of villagers, primarily the roads and public space design, water management systems and sanitation upgrades. Land throughout the village is individually owned, and passed down generationally. Families who are more financially stable typically live in concrete or brick homes, while those who have less financial security live in bamboo, tin and mud homes. Shared courtyard space and public gathering space is lacking

throughout the village, although it is strongly desired. As a country, Bangladesh is very homogenous, with a strong sense of Bengali nationalism and islamic culture (Siddiqui, 2024). The primary religion of Shonatola village is muslim.

Villagers throughout Shonatola experience a myriad of forms of environmental and economic problems including poor housing, poverty from a lack of resource mobilisation, limited access to education, food insecurity, depleting access to land, diminishing economic opportunities and insufficient healthcare, hygiene and sanitation resources (Hassan, 2015). It is paramount that one must consider how these challenges intersect and relate to one another when studying this community, so that thoughtful research towards potential solutions can be completed.





Shonatola Community | Challenges



Shonatola Community | Desires



Research Synthesis



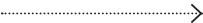
Defining the Problem

The most significant challenge that the Shonatola villagers face is environmental. Two to three times a year, the village experiences serious flooding which can last anywhere from three to ten days. When major community decisions must be made like during flooding periods, the male chief elders and community leaders collectively decide how the village will proceed. This traditional mode of governance where chief elders and community leaders serve as decision makers for the larger collective works well for the community and is a system they would like to preserve.

During times of extreme flooding, the community temporarily relocates to the children's school across the highway, where they take shelter on the upper floor and roof. After flooding, the community returns to the village and begins rebuilding homes most impacted by the flood. Homes which are constructed using bamboo, tin and mud, are most affected and require consistent rebuilding. Studying this community involves careful consideration of what the future of this peri-urban site will look like. As Sylhet city continues to expand, the fate of the village is inherently dependent upon the effects of the urban sprawl. Despite the significant and frequent challenges they face, the Shonatola village is a strong example of a collective whose strength lies within the power of their community.

Problem Statement

The quality of life and dwelling conditions of the Shonatola village community, living in a peri-urban settlement outside of Sylhet city, is under significant threat. The Shonatola villagers experience significant **housing challenges, infrastructural barriers and economic insecurity** due to **climate-induced environmental distress** and the **impacts of Sylhet city’s sprawling urban development** on their way of life.



Research Questions

● How can **architects act as facilitators** of design to improve **capacity-building** of the Shonatola community?

How can architects design dwellings to support future inhabitant’s **individuality and spatial appropriation** to instil individual and collective ownership of their space(s)? ●

How can a **situated participatory housing design approach** be applied to **improve dwelling conditions** of the **Shonatola village community** in Sylhet, Bangladesh?

● How can we use the **timing and extent of community collaboration** to inform a situated method of participatory housing design?

● How can we learn from **traditional local ways of community organisation** to inform an inclusive method of collaborative design?



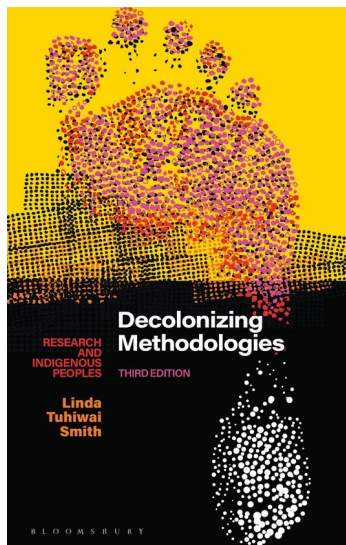
"It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It matters what stories make worlds, what worlds make stories."

Donna Haraway, Staying with the Trouble, 2016

Project Positioning

When conducting research, it is critical that one must acknowledge and assess their personal position to better understand their unconscious biases within the research. Context is everything. When one conducts research it is not being done in a vacuum. The lens that one uses to interpret what they read, what political media they consume, what buildings they study and what history they examine is crucial to the development of the stories that are told and the research that is produced. As an international student studying at Delft University of Technology, in the Netherlands, who is originally from Newfoundland, Canada, my own personal connection with Bangladesh

and more specifically the Shonatola community is limited. I do not proclaim to understand the profound complexities of a culture that is so different from my own and which I have only had limited time to explore beyond the texts and media that I have consumed and the short 2.5 week study trip that our class had taken as part of this graduation study course. I hope, however, to continue to deepen my understanding of the challenges that the people of Bangladesh face and more specifically the Shonatola community, so that I may continue to work towards establishing a socio-culturally sensitive proposal that is situated in its location, culturally relevant and genuine.



A text which has been especially influential in how I will position myself within this research is the text *Decolonizing Methodologies: Research and Indigenous Peoples* by Linda Tuhiwai Smith. Tuhiwai Smith discusses the layered complexities and history of Western researchers studying Indigenous Peoples globally (2021). She identifies in the introduction that the term 'research' is deeply rooted in European imperialism and colonialism, stating that "The word itself, 'research', is probably one of the dirtiest words in the indigenous world's vocabulary"(2021). Research through imperial eyes, can and has, historically misrepresented Indigenous communities. As researchers return to the West, telling stories about their findings, they become accepted as universal truths, further disenfranchising the Indigenous Peoples and communities that were studied. It is

crucial for Western researchers to be critical of the "gaze" of their research, especially when examining a culture that they are not a part of. Thus, this analysis aims to work towards unpacking the imperial and colonial influences that are inherently present, in an effort to call out its weaknesses in a genuine and transparent manner.

In an effort to expand upon my knowledge and to place my own research within the context of that which currently exists, it was important to gather a greater understanding of architects and theorists who have already examined similar themes to those which I hope to build upon in my analysis. My research will explore the intersection of the theories of critical regionalism, post-consensus participation and the system of housing production.



While researching topics surrounding participatory and collaborative community-centred design, I noticed that words which are frequently used to describe the role of the architect include - someone who “empowers” and “enables” communities to create positive change. But what does it mean to empower or enable a community? And does the concept of empowerment or enablement have to begin with a power imbalance which favours the outsider? As Donna Haraway has

highlighted so eloquently in her text *Staying with the Trouble*, words matter (2016). Thus, it is important to think critically about how one describes their role as an architect in a design project. In an effort to be thoughtful about how this project will define its role within the community, I have looked to the practice of capacity-building. The United Nations defines capacity-building as “the process of developing and strengthening the skills, instincts, abilities, processes

and resources that organisations and communities need to survive, adapt, and thrive in a fast-changing world” (United Nations, n.d.). Capacity-building originates from within a community and is sustained over time. It is not a list of conditions or practices to improve upon, that are enforced by an outsider and imposed upon a community. Objectives for capacity-building are expanded upon in the United Nations Sustainable Development Goal 17: Revitalising the

Global Partnership for Sustainable Development (SDG). These include: “increasing technology and innovation in least developed countries and improving data collection and monitoring for the achievement of the SDGs themselves” (United Nations, n.d.). By exploring this research through a lens of capacity-building, the architect can then serve as a facilitator of community development, which is a key distinction and area of investigation that this research revolves around.



Theoretical Framework

To ensure that the final proposal of this research project is socio-culturally considerate and genuinely rooted in the context and community of the Shonatola village, utilising past theorists' work that explore topics of the importance of regional and vernacular architectural practices is crucial. Kenneth Frampton's concept of critical regionalism is a key guiding force within the design approach for this research project. Similarly, to the work of Frampton, Amos Rapoport uses a very regional method to examine housing and local culture and customs throughout his work in *House Form and Culture* (1969). These notions of the importance of grounding architecture in its surroundings are also promoted by Christopher Alexander throughout his text *The Timeless Way of Building* where he feels that regional architecture that acknowledges its locality is necessary in order to reach a desirable spatial quality and atmosphere (1979). Thus, regional sensitivity in design has become a fundamental component of this research, where one of the three pillars to theoretically position this analysis is based upon critical regionalism.

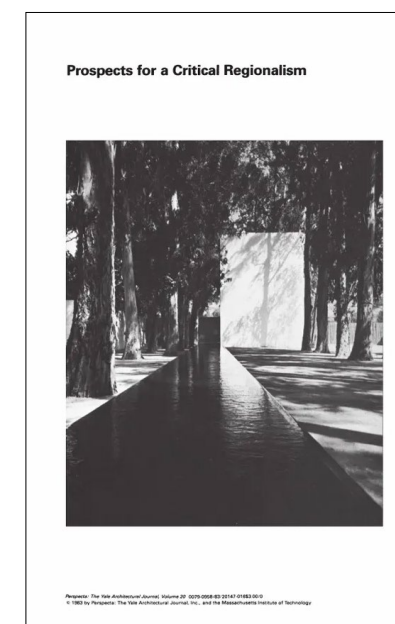
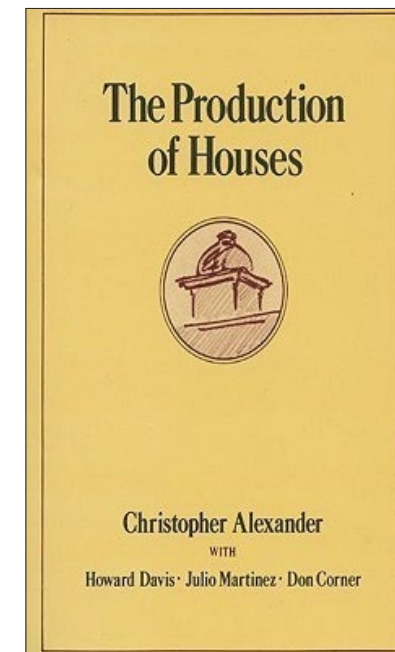
An additional theoretical approach that will be applied to achieving a genuine design proposal is the importance of collaborating with local communities on the design and construction of a project. This can be accomplished through the use of participatory design. Participatory design is an incredibly complex subject. This is highlighted through the work of Markus Miessen in his text *The Nightmare of Participation* (2010). Miessen proposes a new 'post-consensus model' for participatory design which this research will build upon. Examining Miessen's striking opposition to the standardised democratic model of participatory design is important, as it highlights the frequent trap of collaborative design methods which can overly idealise inclusion, advocacy and equality. In such projects, the architect glamorises focus group sessions and consultation meetings as tools to prove their commitment to the community, but as there is rarely any clear direction for next steps, outputs from these sessions often ultimately allow for the dismissal of community perspectives due to a lack of consensus. I have experienced this first hand while working on large **public** projects, attending

focus group sessions that proved to be moments of great conflict. Ultimately, architects did not have the power to make meaningful changes based on community input as consultation meetings occurred too late in the design process. This was arguably the intention of the client, as consultation became more of an unpleasant box that needed to be checked, rather than a key moment to gain future building user design feedback. This analysis will introduce and challenge the factor of time in participatory design, and suggest that the architect move away from participatory design as solely fulfilled by consultation meetings that lead to architects giving empty promises to the community. This will be achieved by examining housing case studies that engage differently and at various times in a project with participatory community-driven development.

The final theory that forms the foundation of my exploration of participatory housing design is from Christopher Alexander's text *The Production of Houses*, where he questions the system of housing production through his Mexicali housing project in Mexico (1985). Within this text, Alexander identifies what he feels are the two greatest flaws within the system of housing production and then works to address them in Mexicali. The identified flaws are as follows:

1. The system must acknowledge that every individual is unique and thus, must allow for the expression of their uniqueness in order to maintain their human dignity.
2. The system must recognize that each individual fits within a social community where human connections are the bonds that maintain it.

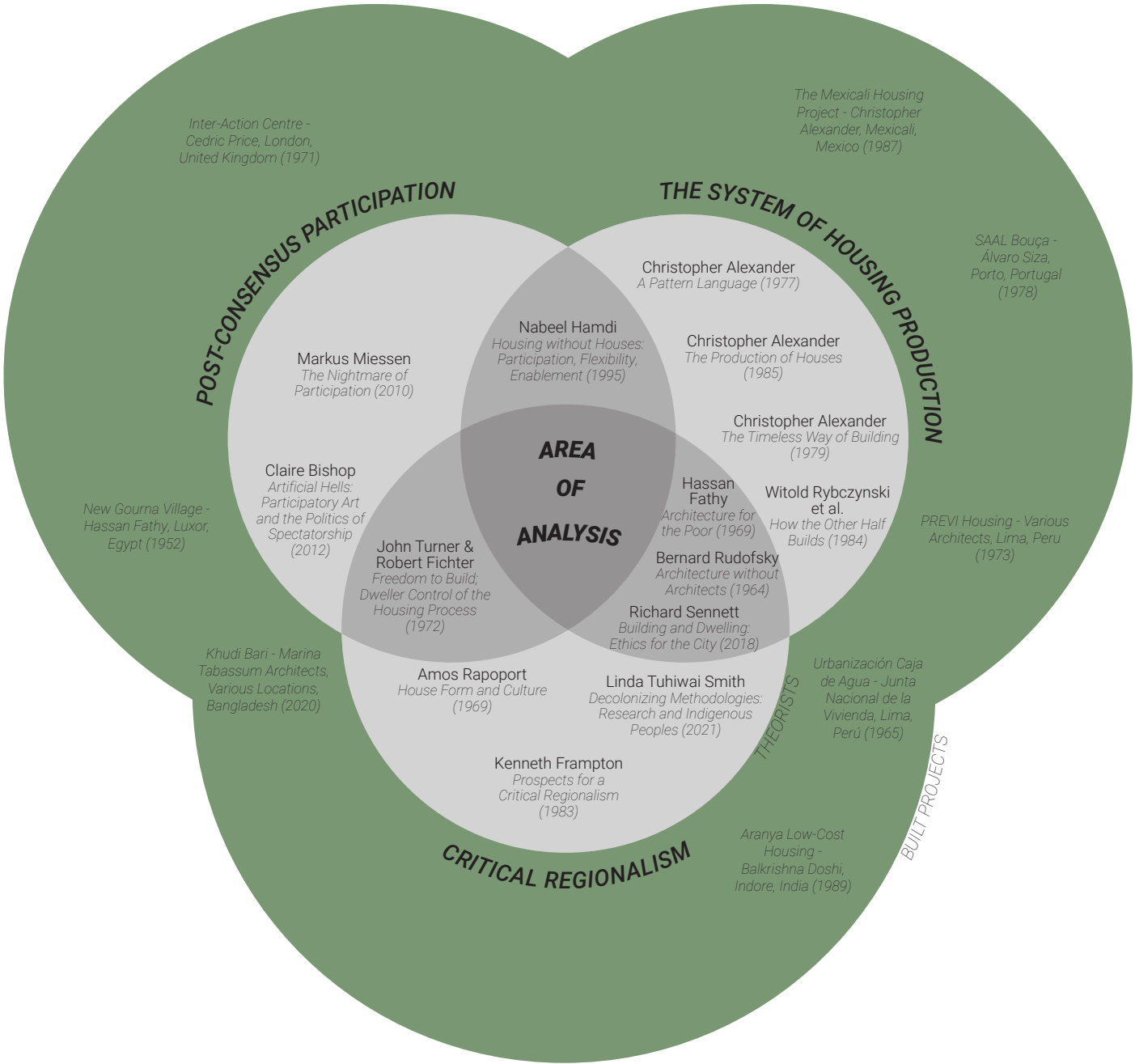
An analysis of Mexicali demonstrates that through a collaborative systematic process and thoughtful spatial planning, a new strategy of housing design can be achieved by fundamentally questioning the structural process of housing production. The method that Alexander uses to address the first flaw is seen through the meaningful collaboration he completes throughout the entire design process

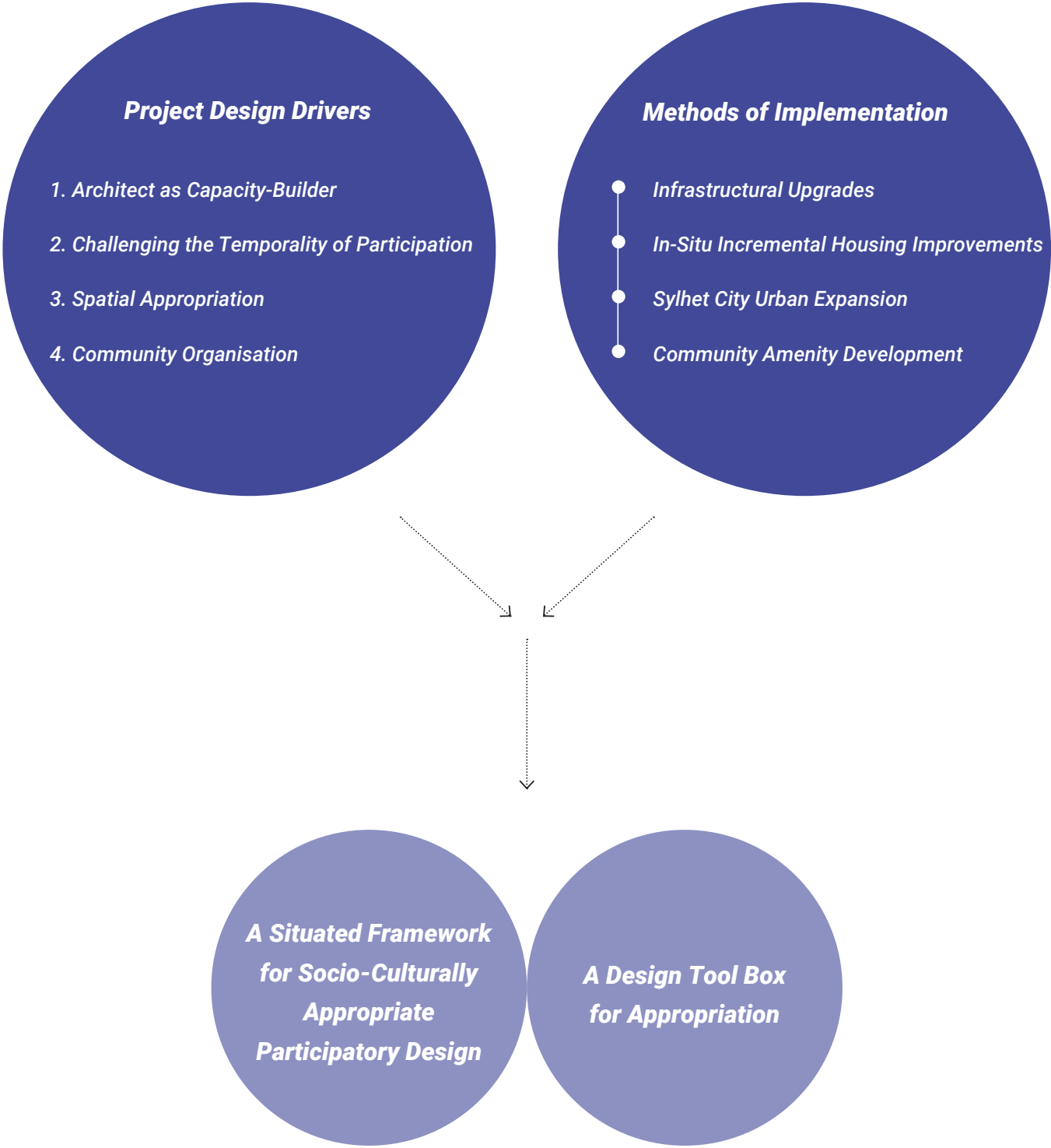


with future homeowners. For example, in the chapter on “The Layout of Individual Houses” he works with future homeowners to design their unique home so that it meets the specific needs and desires of each individual family. To address the second flaw, Alexander applied his previous findings from his earlier volume of A Pattern Language where he developed strategies for the collective design of common land through clustering (Alexander, 1977; Alexander, 1985). Alexander emphasises that in order to achieve a successful collective common space in housing projects, the effort is an entirely human process (1985). He feels it is a practice of collaboration and community where “people come to know each other, work together, trust each other, and together make their world” (Alexander, 1985). These concepts, tested through Mexicali, are valuable and as such, this research will continue to explore the importance of designing dwellings that support individual personalization and appropriation to ensure that future inhabitants feel a strong ownership of their homes.

Another strong example of a project that demonstrates inhabitant appropriation of housing post-construction is seen through the exploratory Proyecto Experimental de Vivienda (PREVI) project in Lima, Peru by Peter Land in collaboration with 13 international architects and 13

Peruvian architects (Land, 2015). This experimental project led to the development of innovative low-rise, high-density housing solutions targeted towards low income families in Lima. Among the international architects to participate in this project was Charles Correa. In discussing the lessons learned from the PREVI housing project, Correa describes the value of incremental housing and the effects of architects taking a step back in the design process (Land, 2015). Correa emphasises the importance of the malleability of incremental housing, as it supports families ability to personalise their spaces, leading to the establishment of authentic vernacular housing, far more genuine and robust than what an architect can attempt to achieve. In this discussion, Correa states the following: “All the architect should do is set up basic ground rules...And then sit back and watch the changes. And learn from the changes that the families are making” (Land, 2015). This conclusion of the practicality of incremental housing in achieving culturally appropriate and situated housing will be significant in informing the approach to this design research project. Through thoughtful theoretical positioning, this research will expand upon the work of past theorists, investigating the intersection of three primary theories of interest - critical regionalism, post-consensus participation and the system of housing production.





Goal

The primary goal of this research is to improve the quality of life and dwelling conditions of the Shonatola community living in a peri-urban settlement outside of Sylhet city by working towards advancing capacity-building to establish housing security, enhanced infrastructure systems, and economic stability.

Project Design Drivers

1. Architect as Capacity-BUILDER



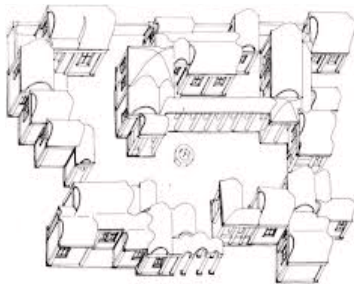
The United Nations defines capacity-building as:

“the process of developing and strengthening the skills, instincts, abilities, processes and resources that organisations and communities need to survive, adapt, and thrive in a fast-changing world” (United Nations, n.d.).

The Architect’s Role as a Capacity Builder in the Shonatola Village

Project Design Drivers

2. Challenging the Temporality of Participation



Mexicali
Christopher Alexander, Mexicali, Mexico

- Community consultation and project decision making prior to construction.



⋮



New Gournia Village
Hassan Fathy, Luxor, Egypt

- Teaching and working with communities during construction to create building materials.



⋮



Urbanización Caja de Agua
Junta Nacional de la Vivienda, Lima, Perú

- Post construction self-help expansions to homes.



⋮

Challenging the Temporality of Participatory Design | Proactive Approach

Project Design Drivers

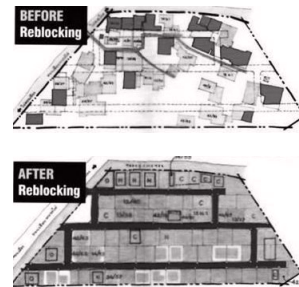
2. Challenging the Temporality of Participation



Incremental Housing Strategy
Urbanouveau and SPARC,
Pune, India



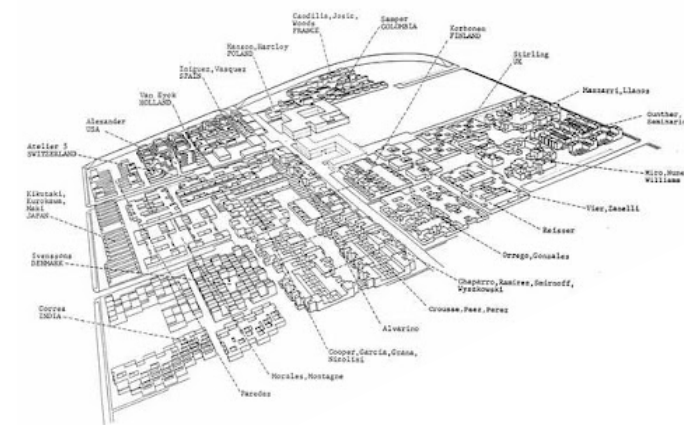
Jhenaidah Community Upgrading
Co.Creation.Architects,
Jhenaidah, Bangladesh



Baan Mankong (Secure Housing) Initiative
Community Organization
Development Institute,
Bangkok, Thailand

Project Design Drivers

3. Spatial Appropriation



PREVI Experimental Housing Project
Peter Land and various other architects, Lima, Perú



Spatial Appropriation and Housing Design

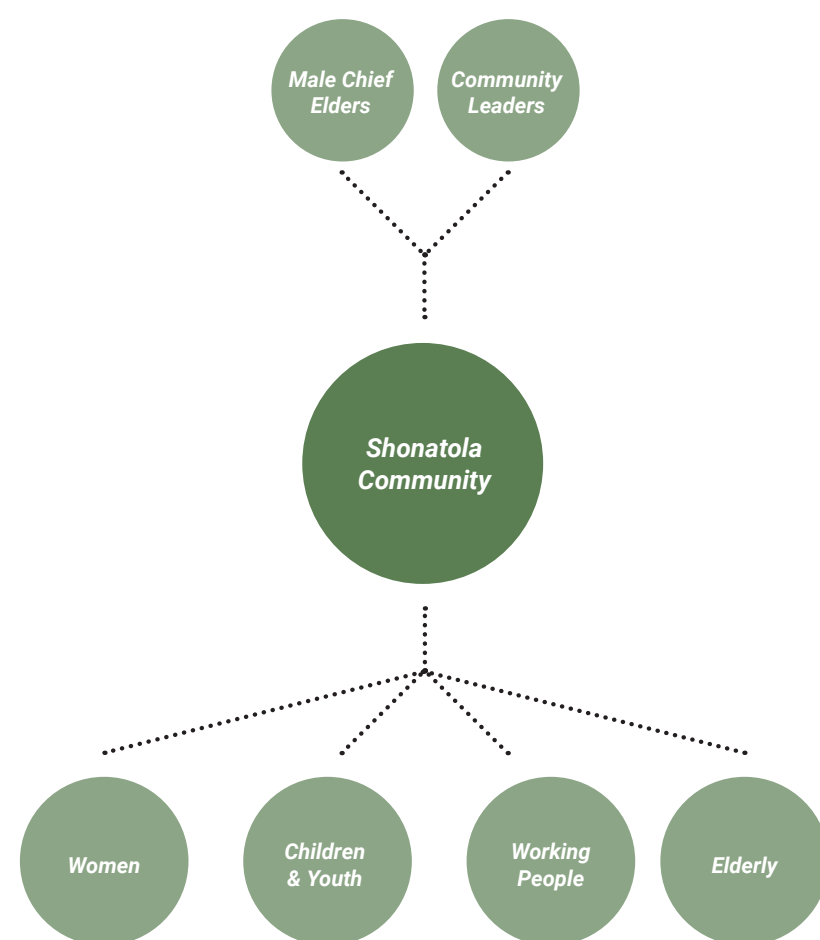
**Pre-Design
+
Post-Design
Participation**

**Pre-Design
+
Concurrent-Design
+
Post-Design
Participation**

**Pre-Design
Participation**

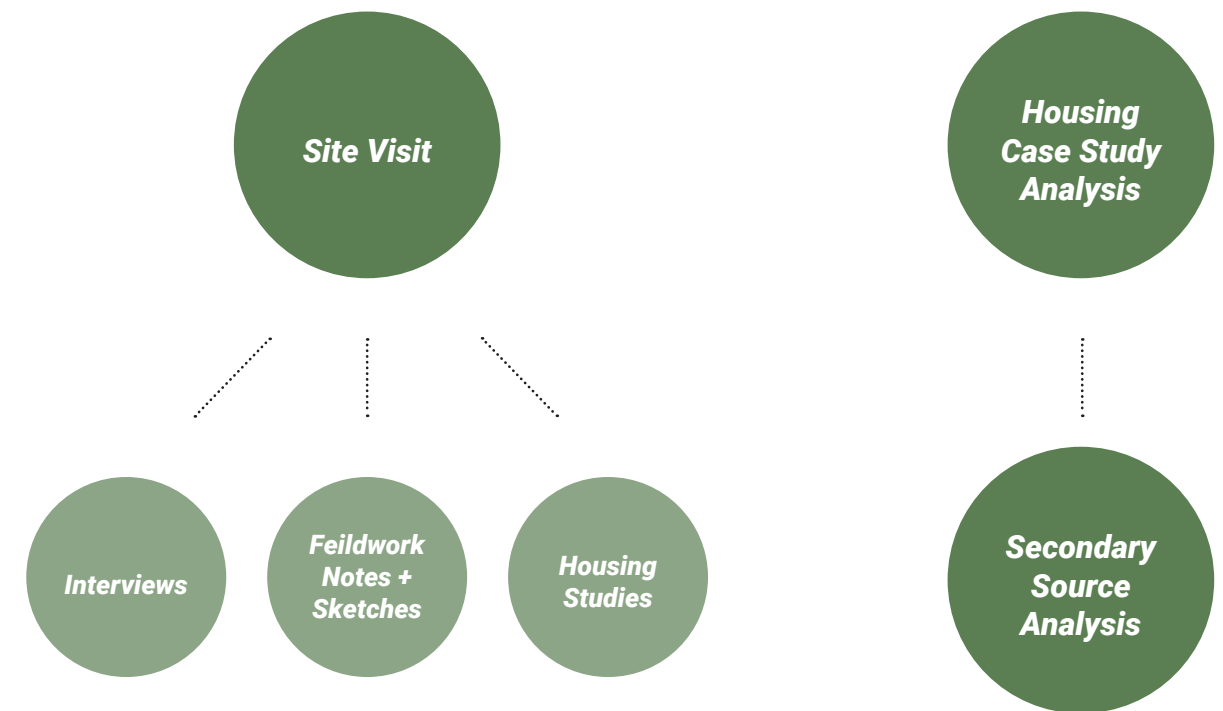
In-Situ Incremental Participatory Housing Upgrading | Reactive Approach

**Project Design
Drivers**
**4. Community
Organisation**



Community Organisation





Methods

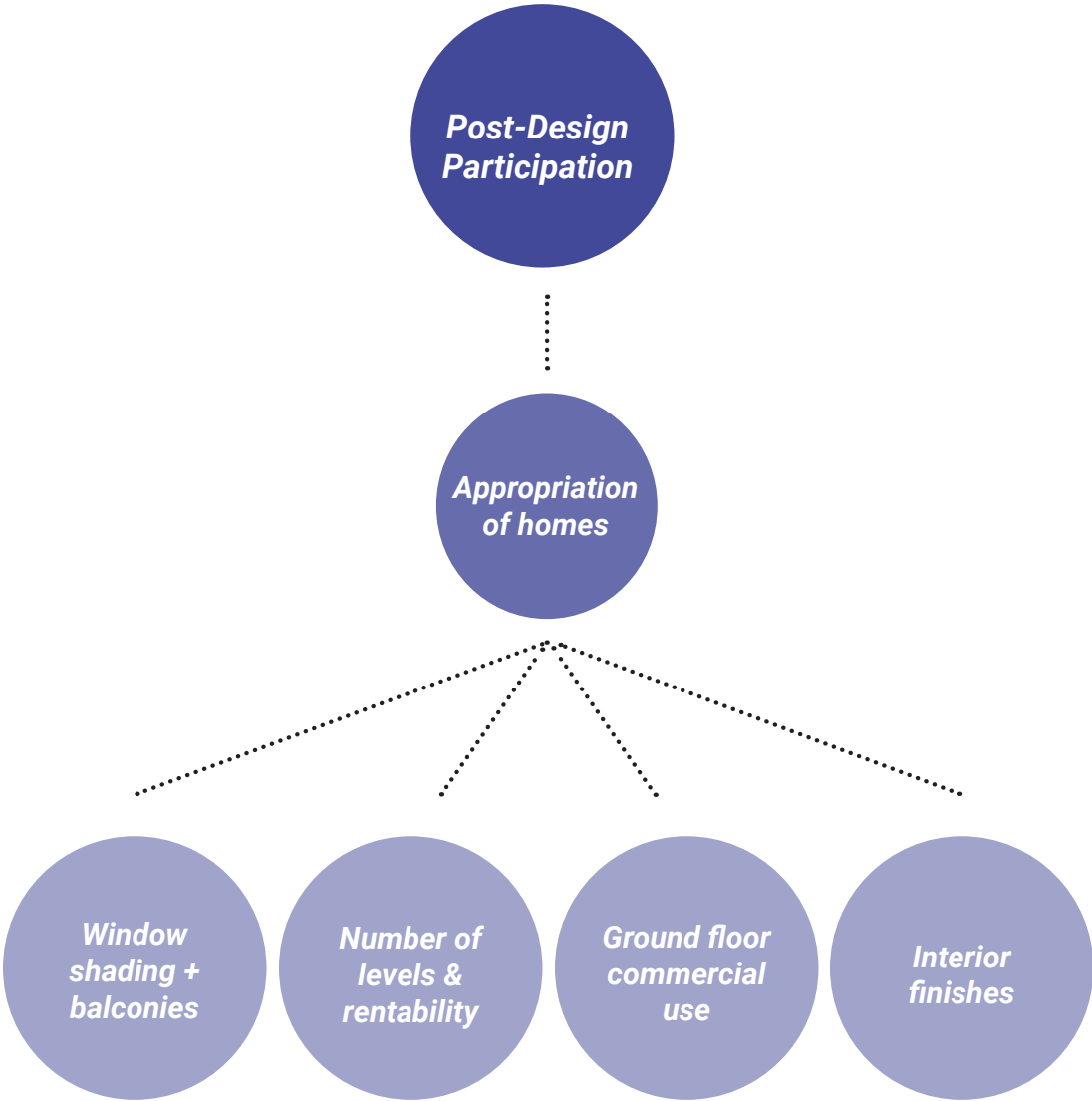
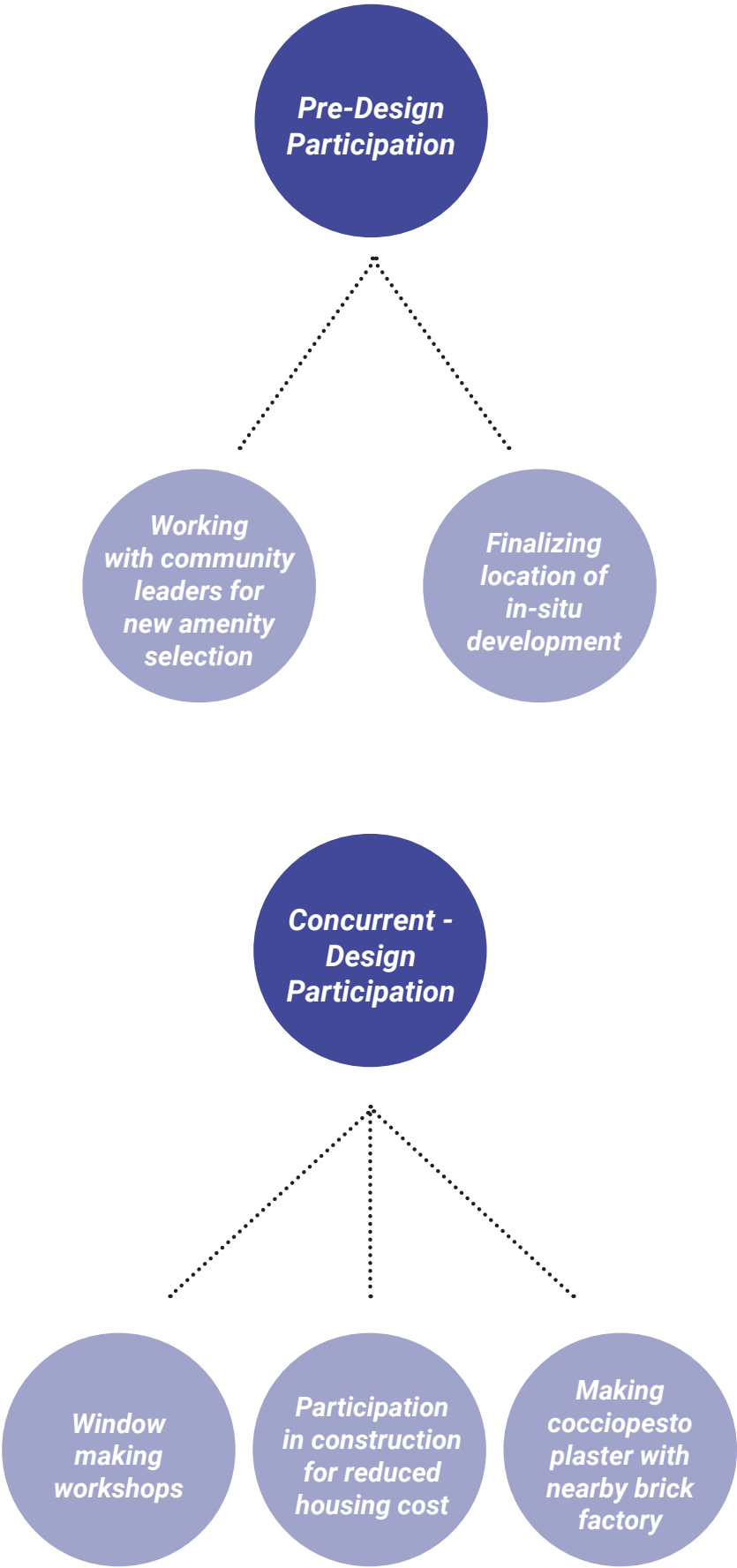
This research study will utilise qualitative research methods to establish a systematic framework for socio-culturally appropriate participatory housing design to support future developments for the Shonatola community. During the fieldwork site visit to Dhaka and Sylhet, several methods of research analysis occurred. These include: semi-structured interviews with members of the Shonatola community and people who live in the wider context of Sylhet, as well as the development of a personal fieldwork diary of written notes from the trip, observational findings, sketching and collaboration with Shahjalal University of Science and Technology students and professors. Collaging community narratives from the interviews and workshops will serve as an important output for this analysis to gain an overview of what the community feels should be prioritized to improve their quality of life. To gain greater insight into the existing conditions of housing of the community, an investigation of their

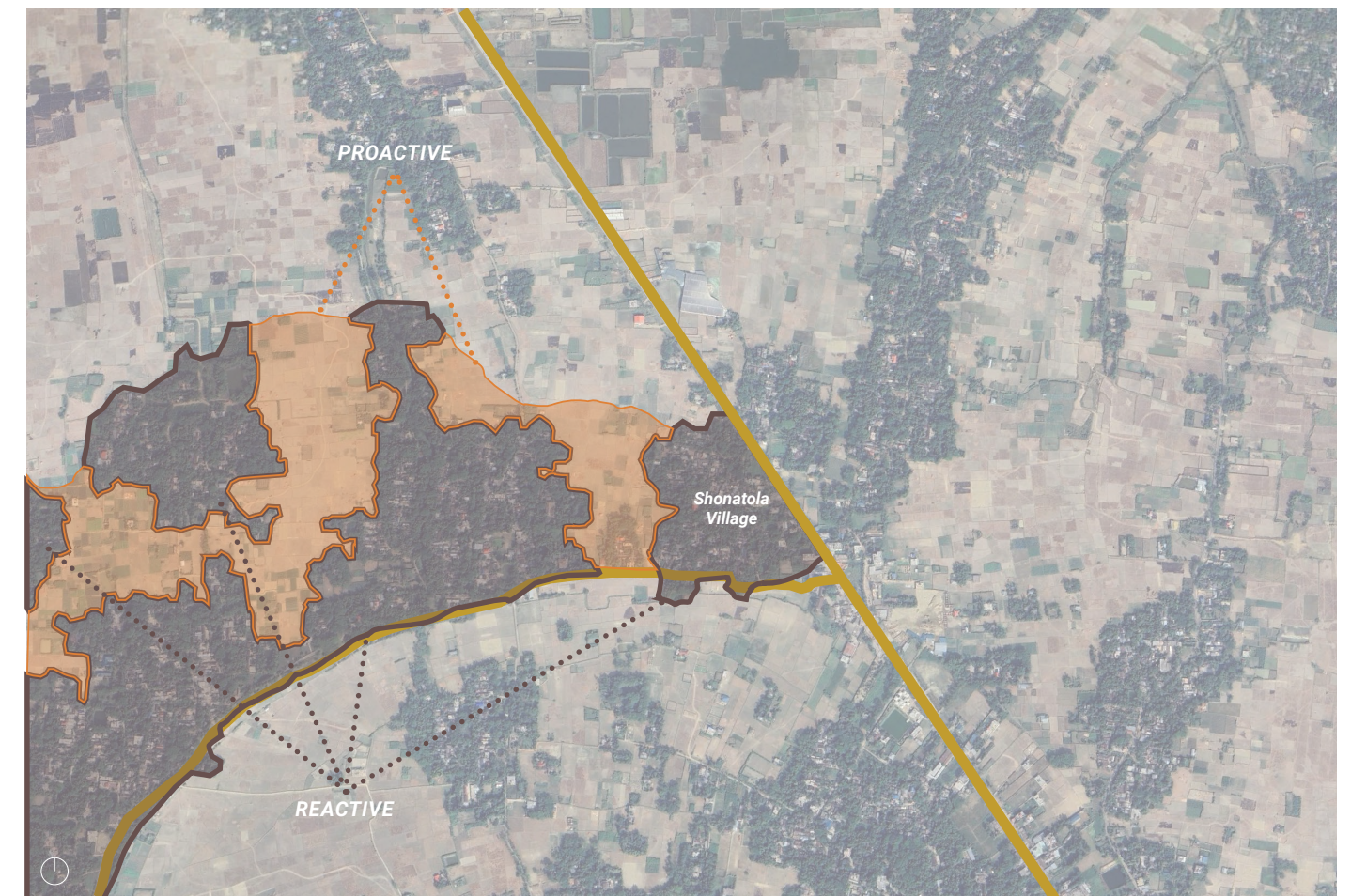
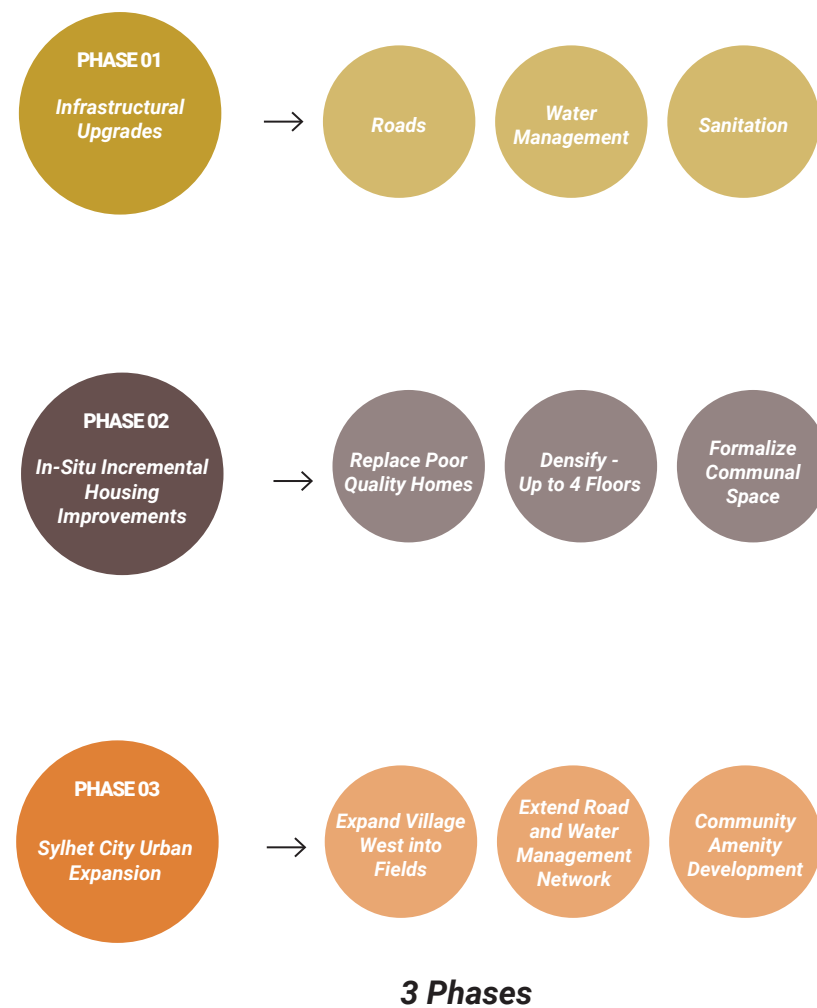
standard of housing and material commonly used will be explored. Furthermore, the qualitative methods to be implemented include an in-depth case study analysis examining housing projects around the world that engage differently with participatory community-driven development, including Urbanización Caja de Agua in Lima, New Gourn Village in Luxor, Mexicali housing project in Mexico, an in-situ incremental housing project in Pune, a community upgrading project in Jhenaidah and the Baan Mankong initiative in Bangkok. Furthermore, examination of the experimental PREVI project in Lima will also be crucial in informing how aspects of spatial appropriation can be utilised through housing design. Lastly, studying secondary sources including news articles, online texts, historical books and architectural theory texts is also critical to gain a greater holistic understanding of this research topic.

Design



Types of Participation for this Proposal

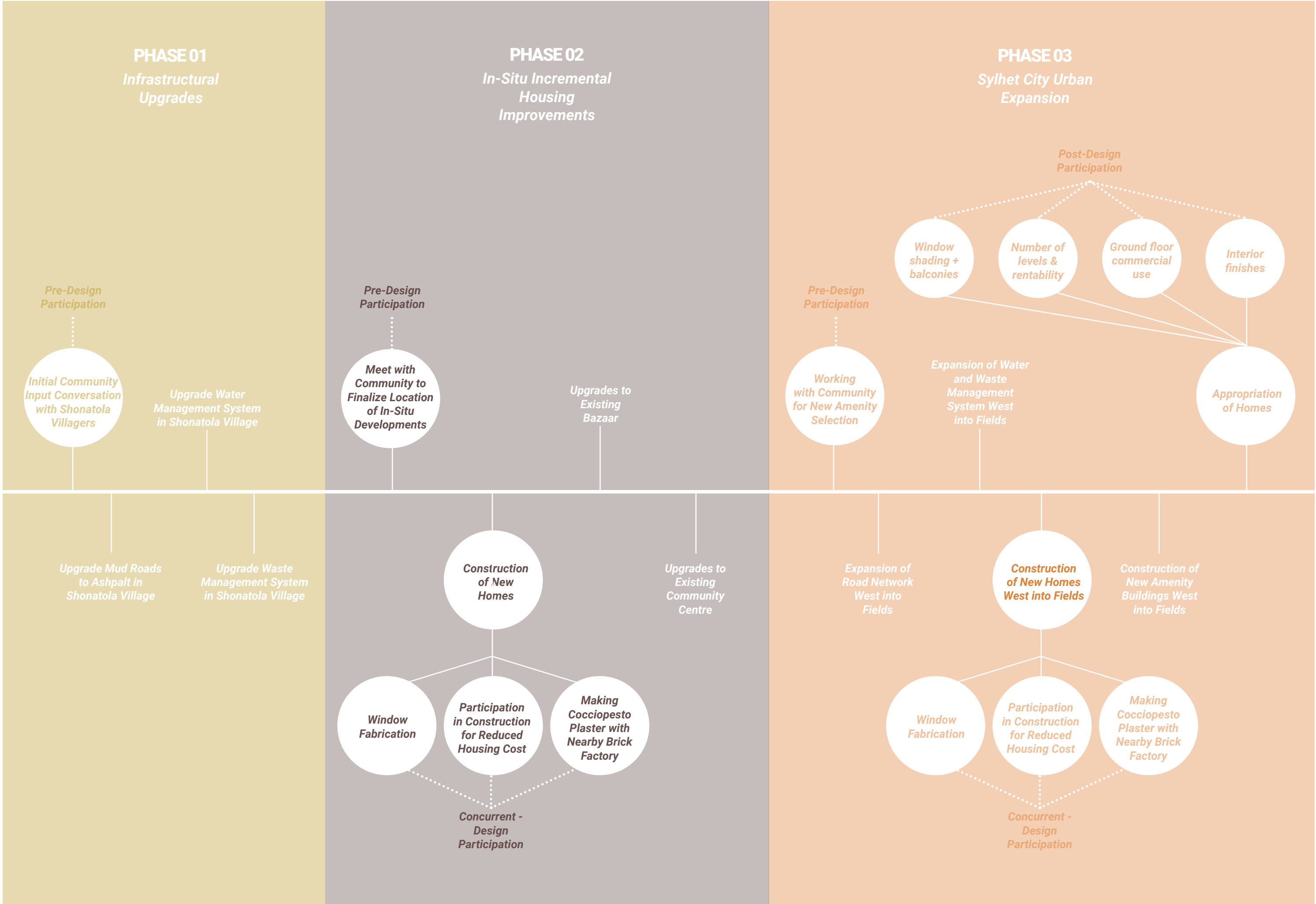




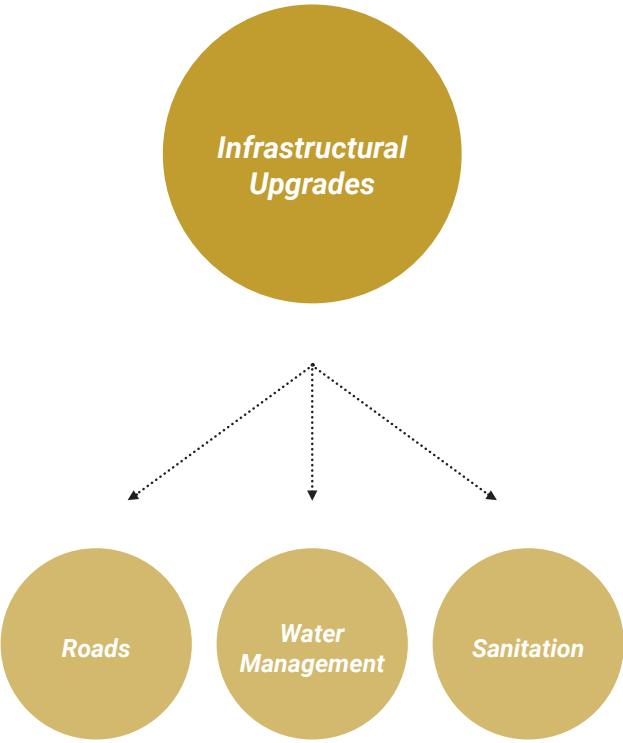
Concentrated Arc Development

A Systematic Framework for Participatory Design

The subsequent design proposal implements a three phase design approach to address the defined research question. Phase one addresses infrastructural upgrades to the existing community, phase two confronts a reactive approach to in-situ housing improvements to the existing village and phase three proposes a proactive design approach to densify the Shonatola settlement by expanding west, beyond the current village limits. This results in three reactive and two proactive design schemes.



Phase 1





**Initial Community Input Conversation
with Shonatola Villagers**

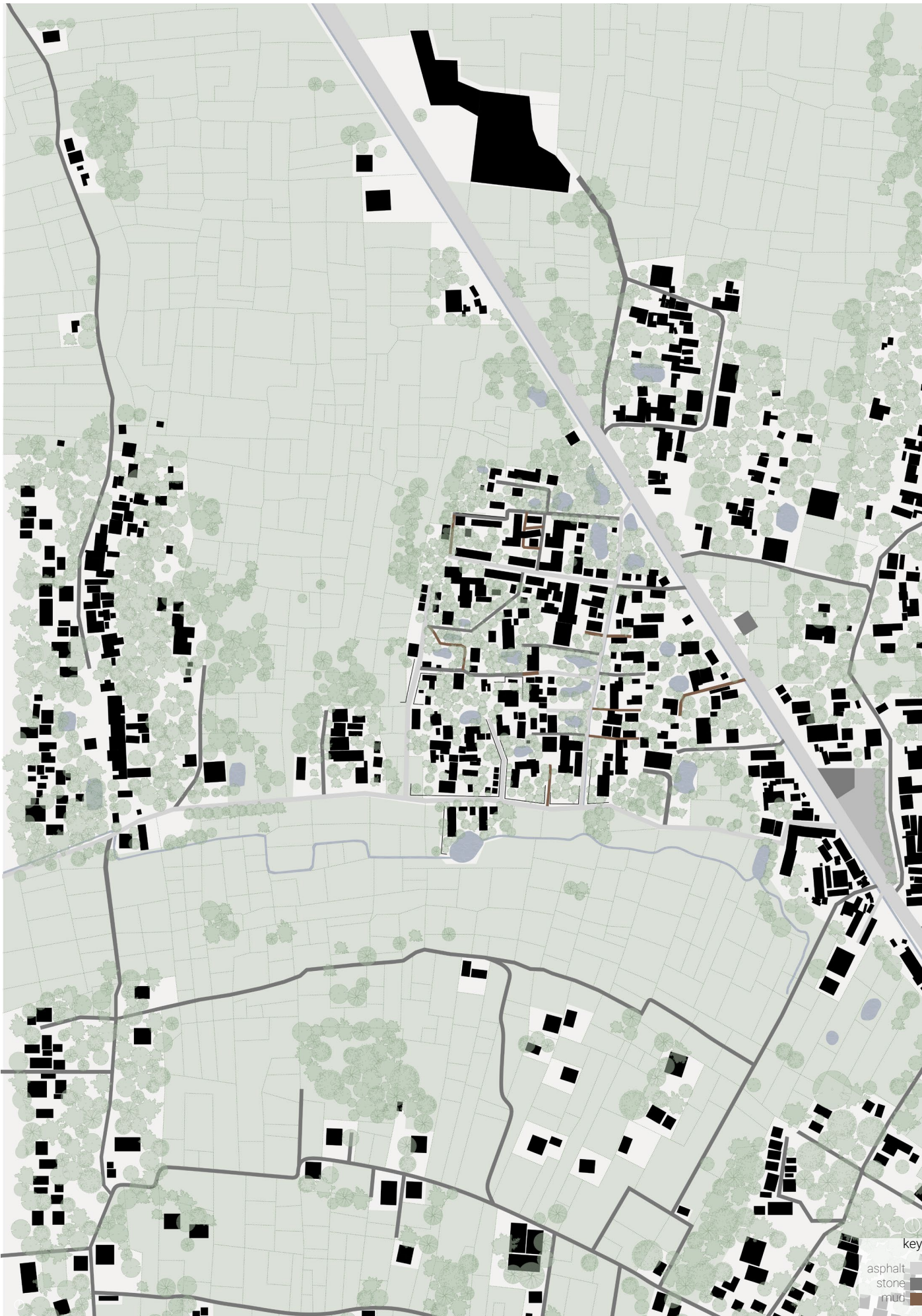
⋮
**Pre-Design
Participation**



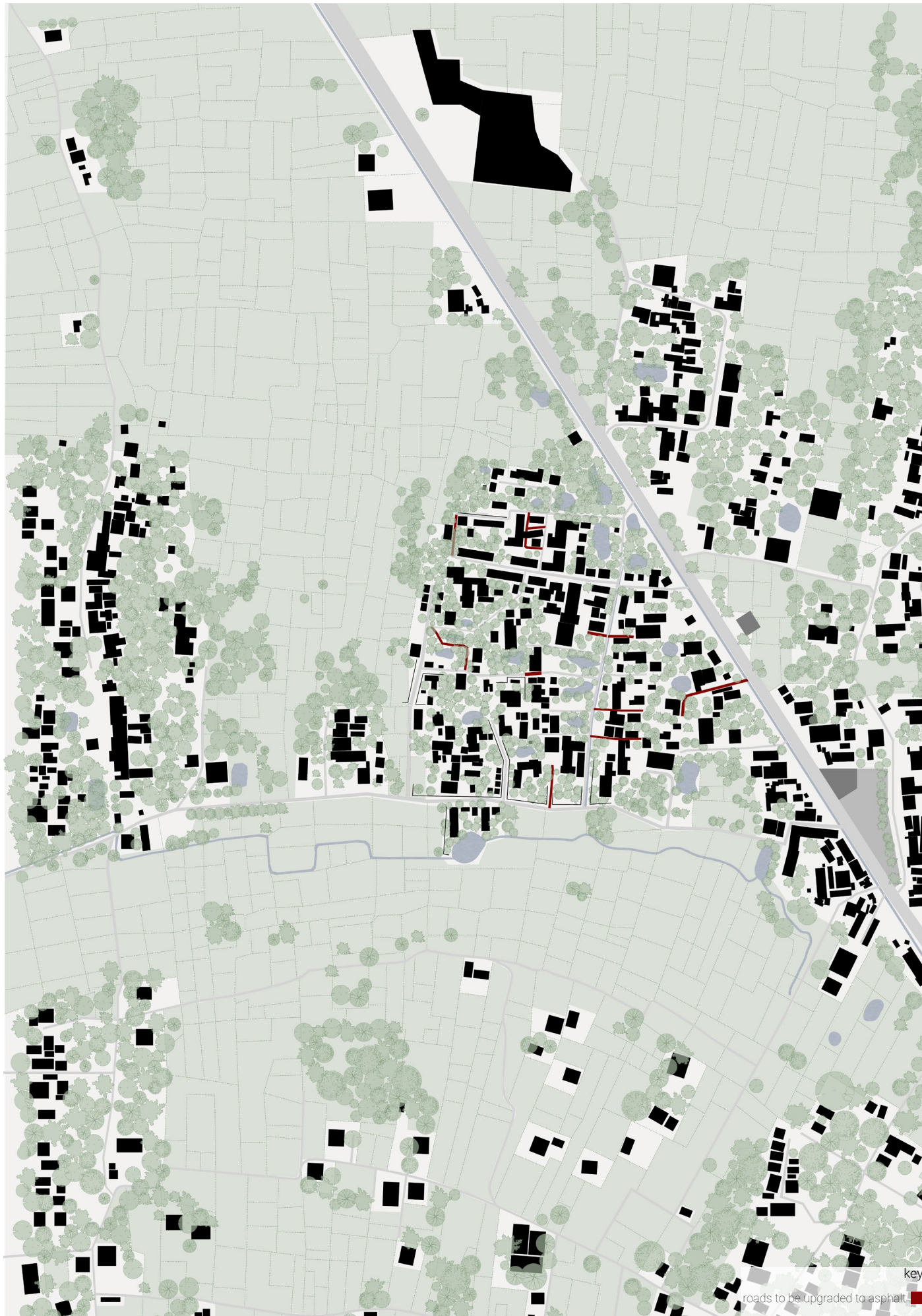
Development Information Pamphlet



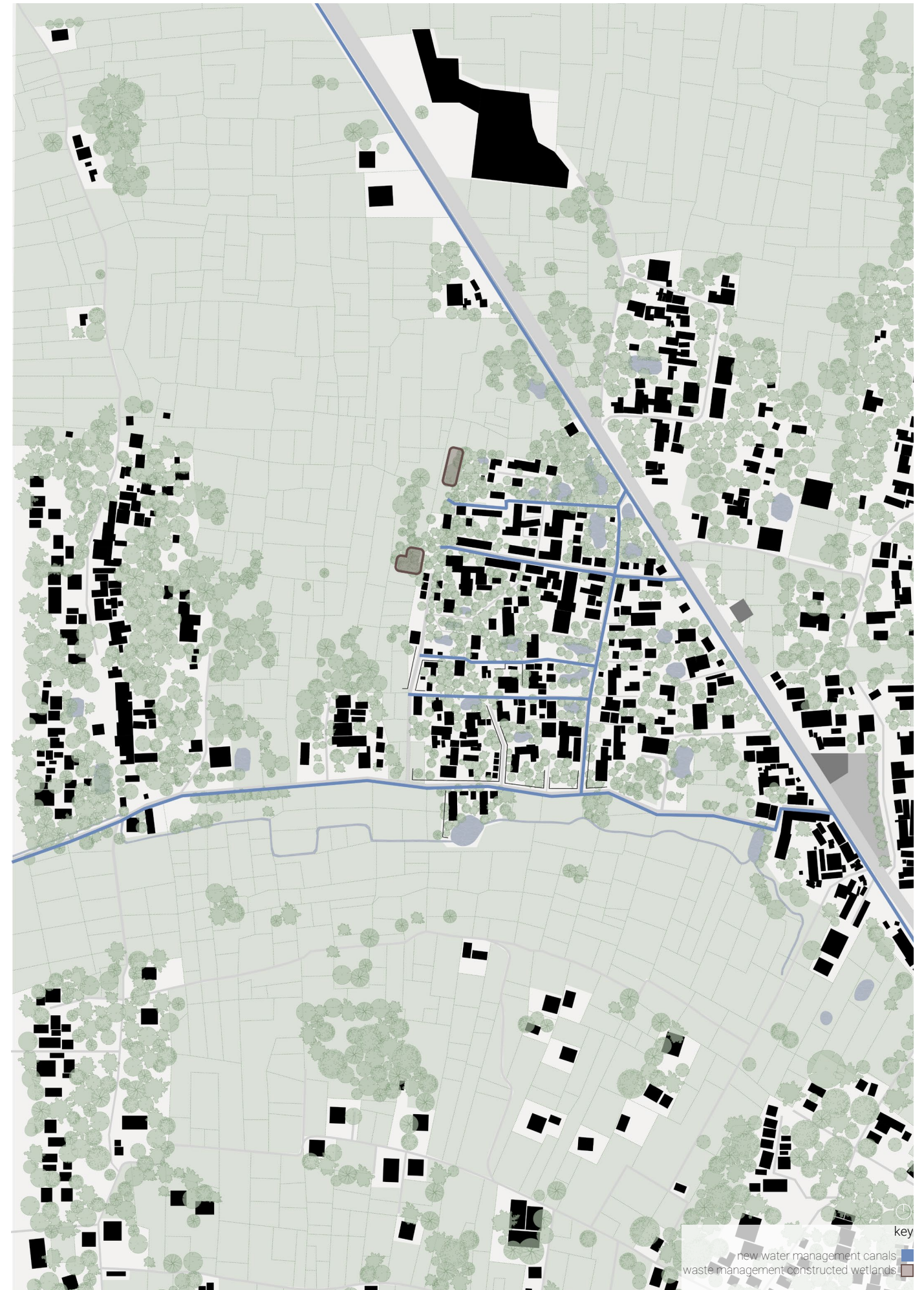
Existing Master Plan



Existing Road Materials

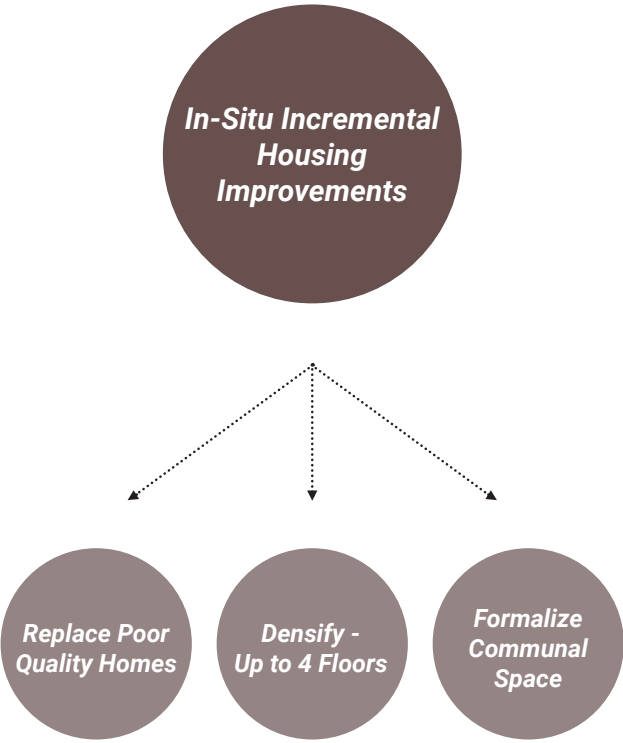


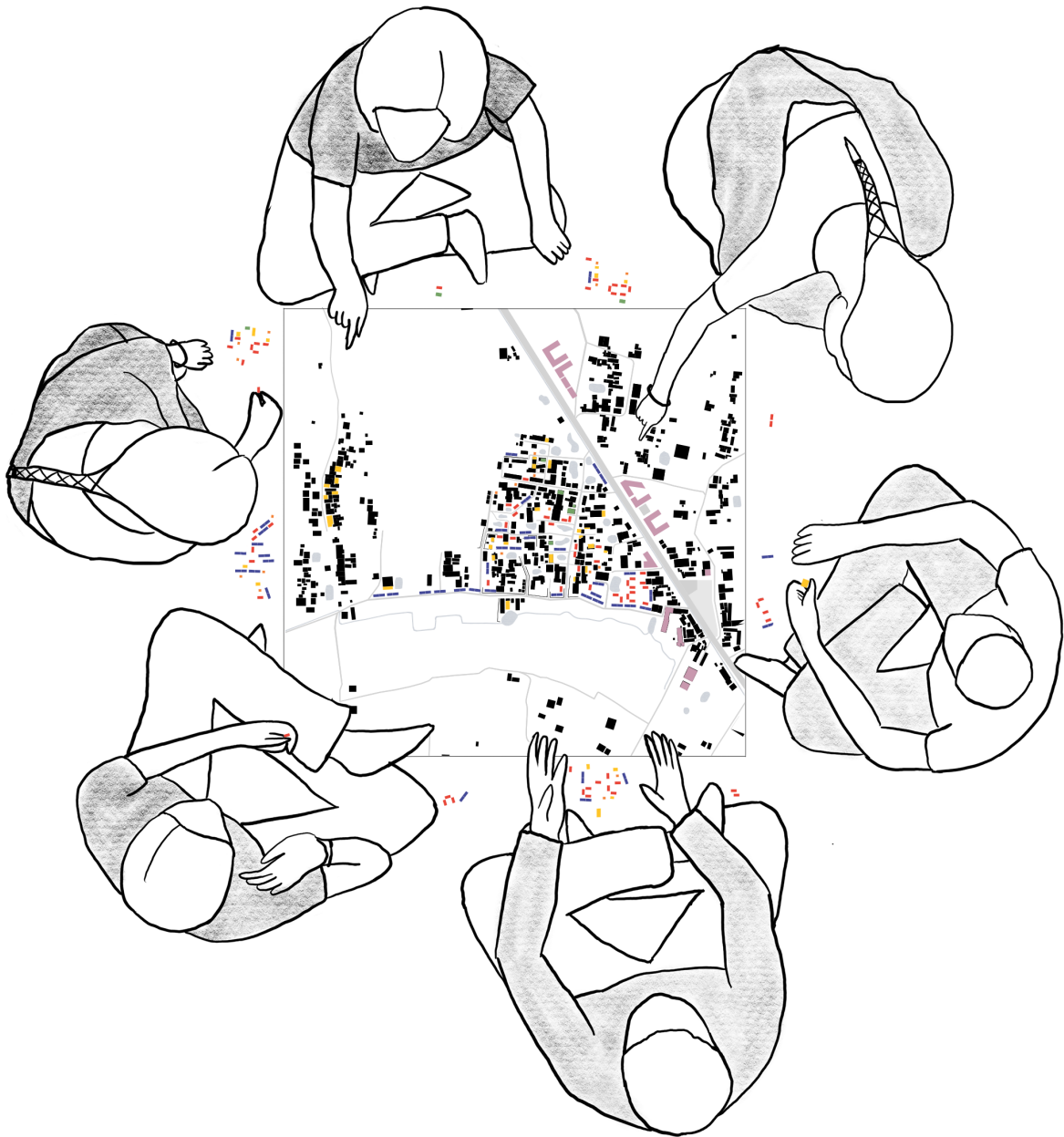
Infrastructure Upgrades



Infrastructure - Water and Waste Management

Phase 2

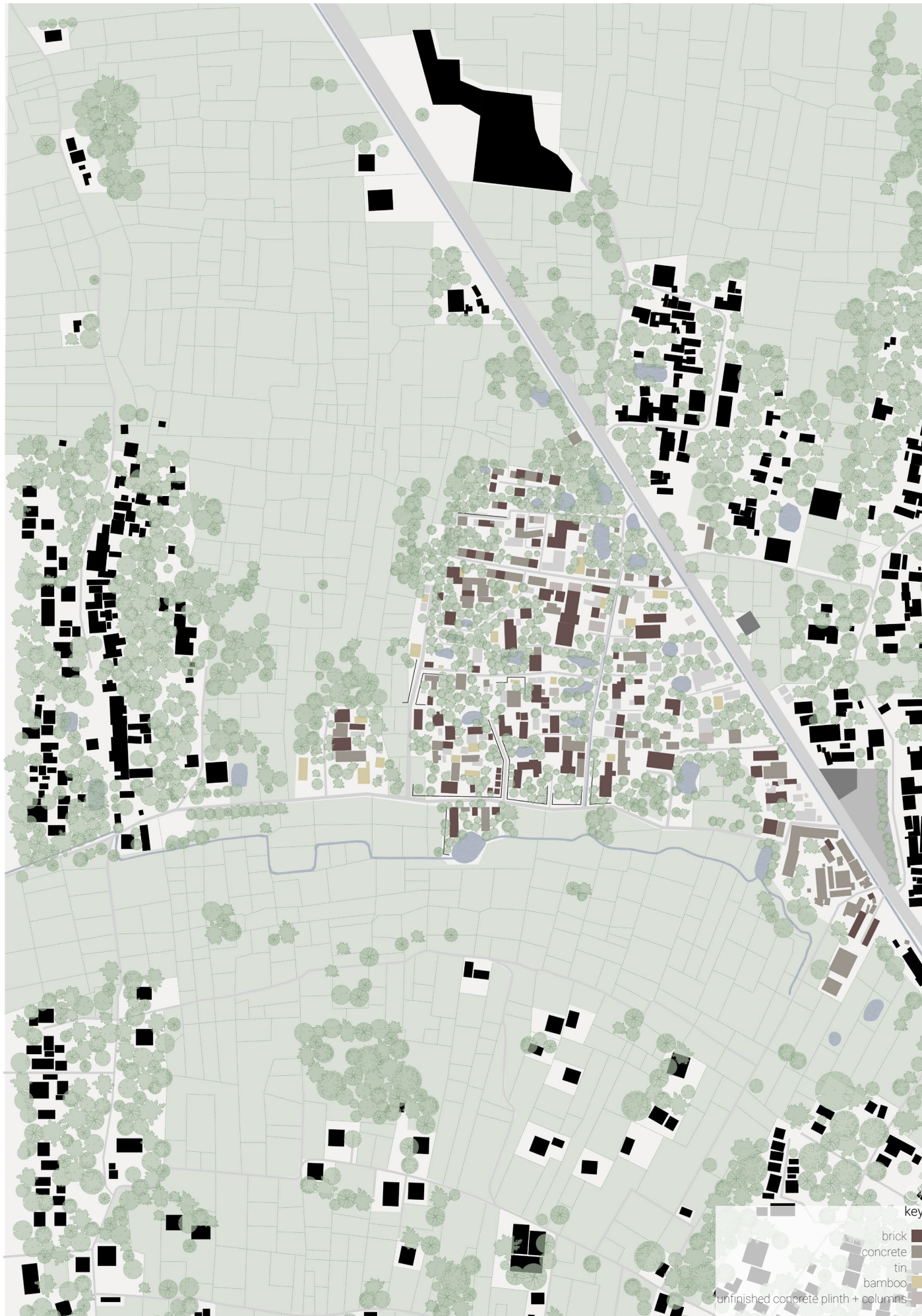




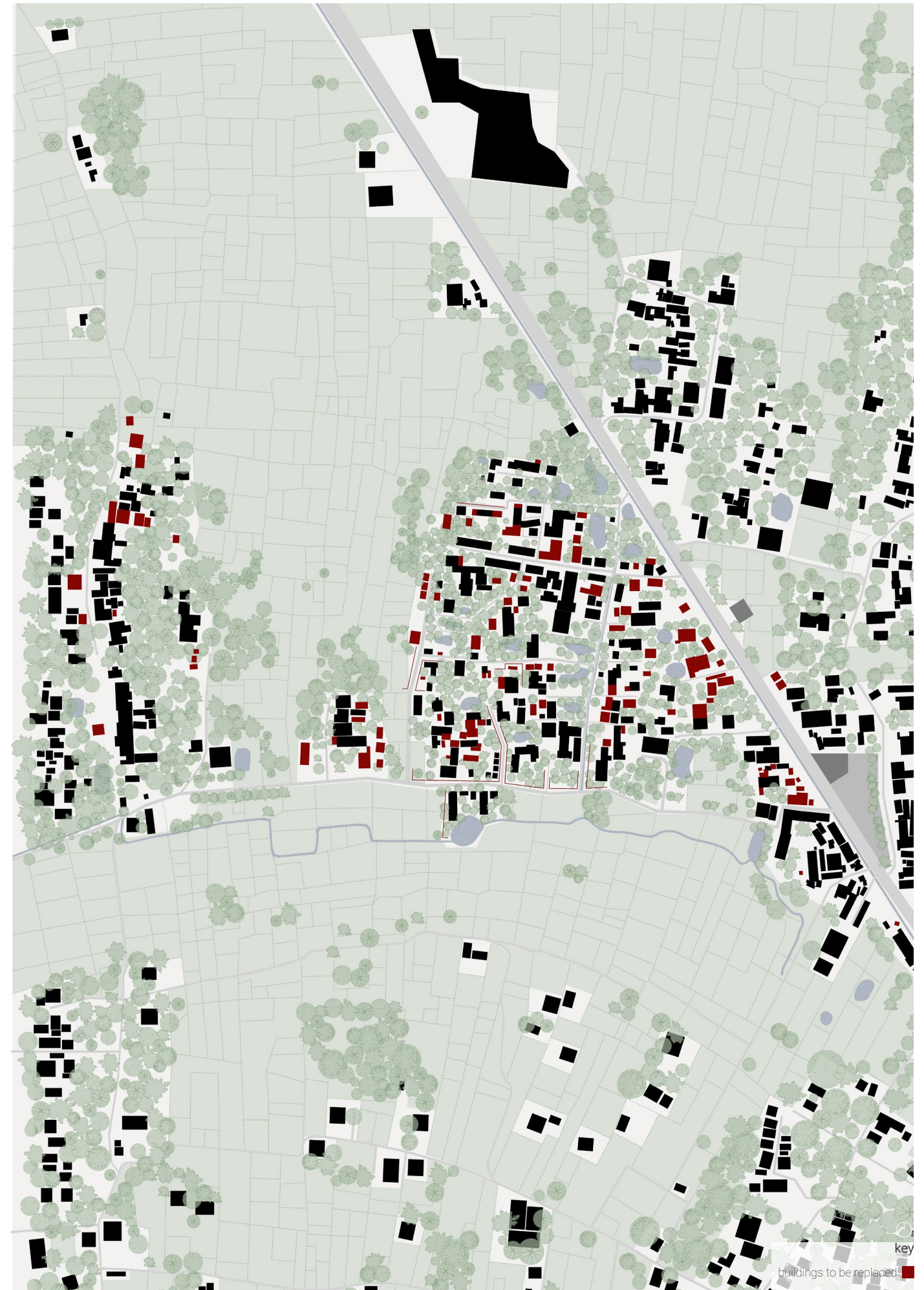
**Community Consultation Workshop
to Finalize In-Situ Development Locations**



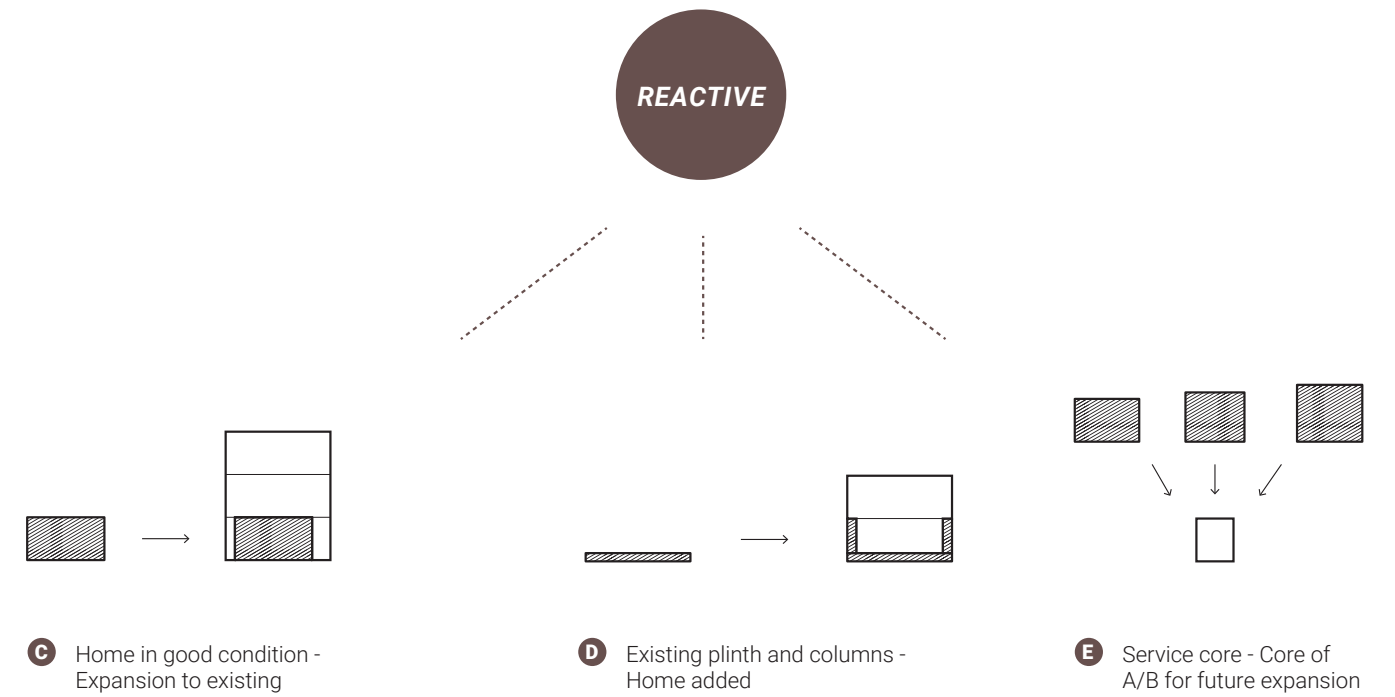
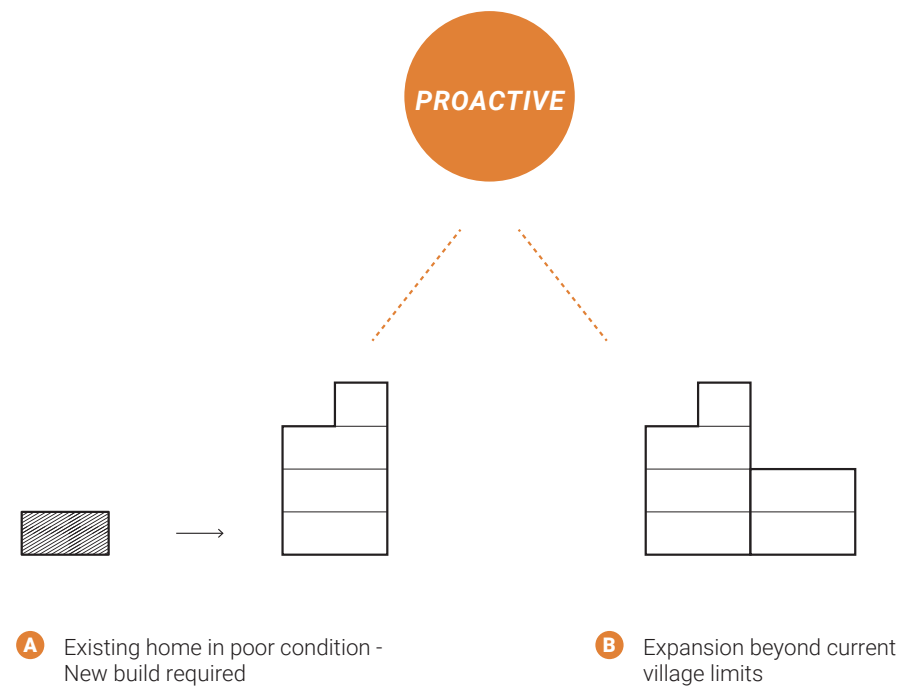
**Pre-Design
Participation**



Existing Building Materials



Existing Dwellings to be Replaced



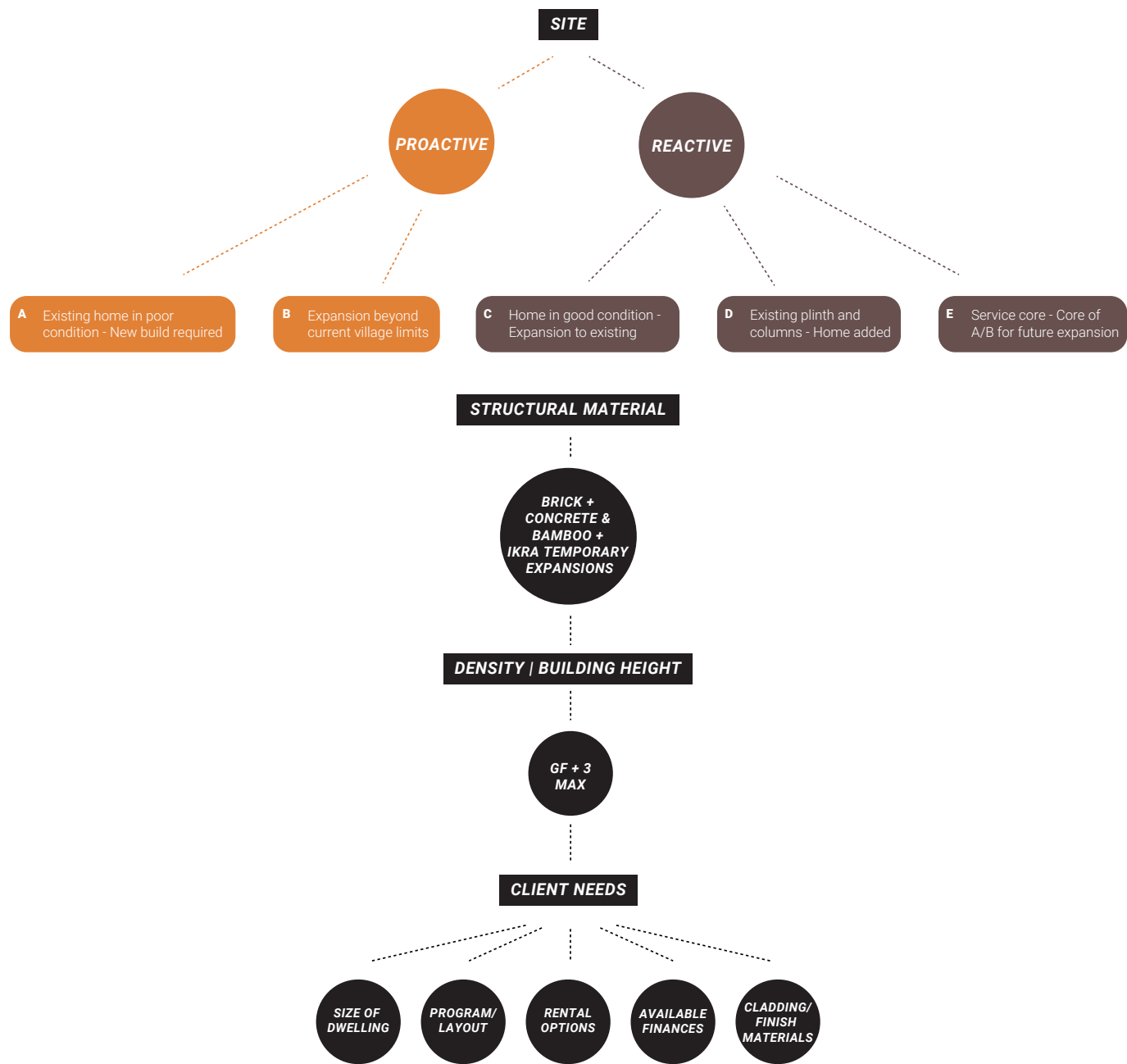
5 Strategies / Proactive Vs Reactive Development

The reactive design proposal suggests a scheme for expansions to existing dwellings, which are considered optimal for further development, proposes a dwelling design scheme for existing foundations and plinths that have been built throughout the village and

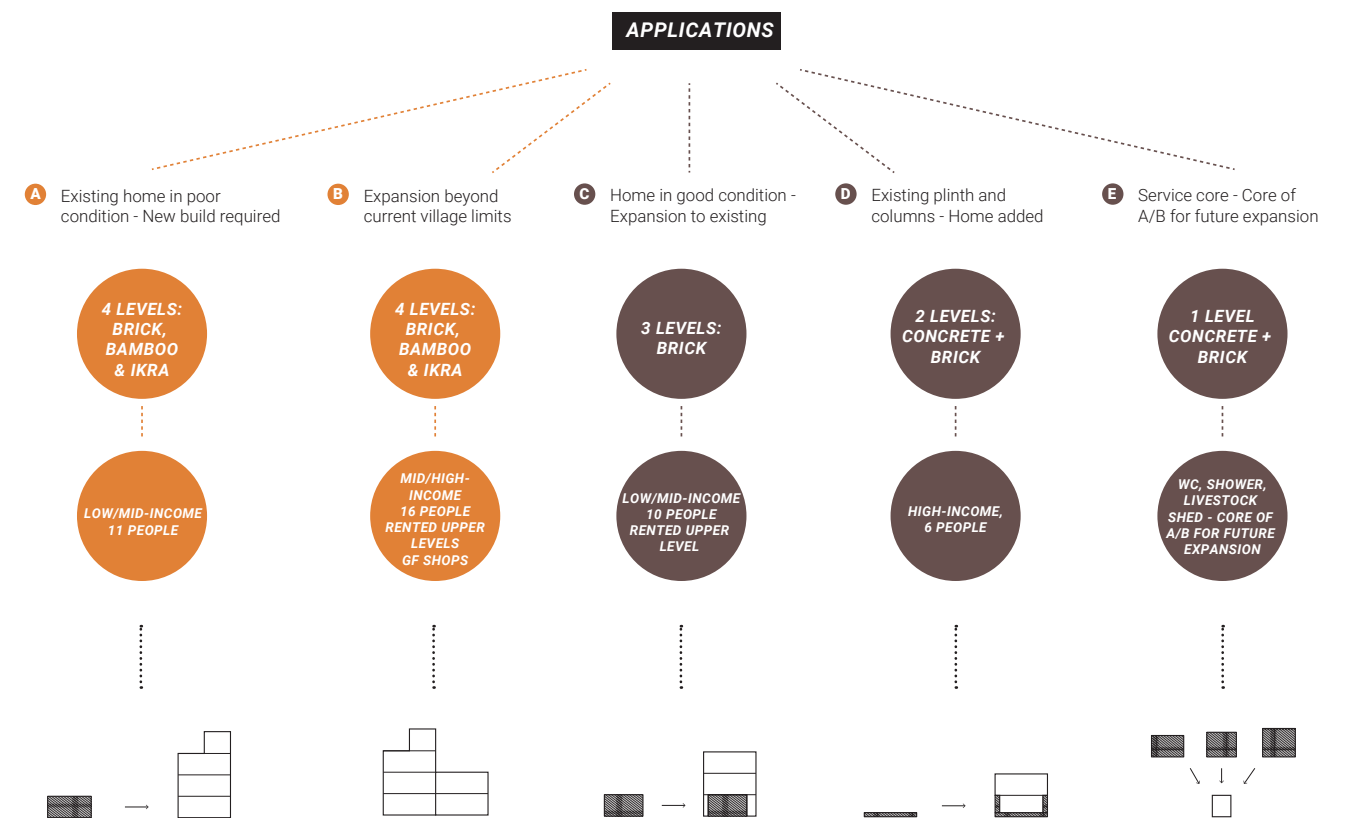
additionally a service core scheme to support existing homes. The proactive proposals offer new dwelling designs for existing homes within the village that require replacement and for new homes to be built

West, beyond the current village limits. This project provides a systematic method for development, by offering a housing solution which promotes and uplifts current villagers within Shonatola by improving their

current living conditions and supporting their ability to keep living on the land they have lived for generations, while also addressing the need for future expansion and densification of this peri-urban site.



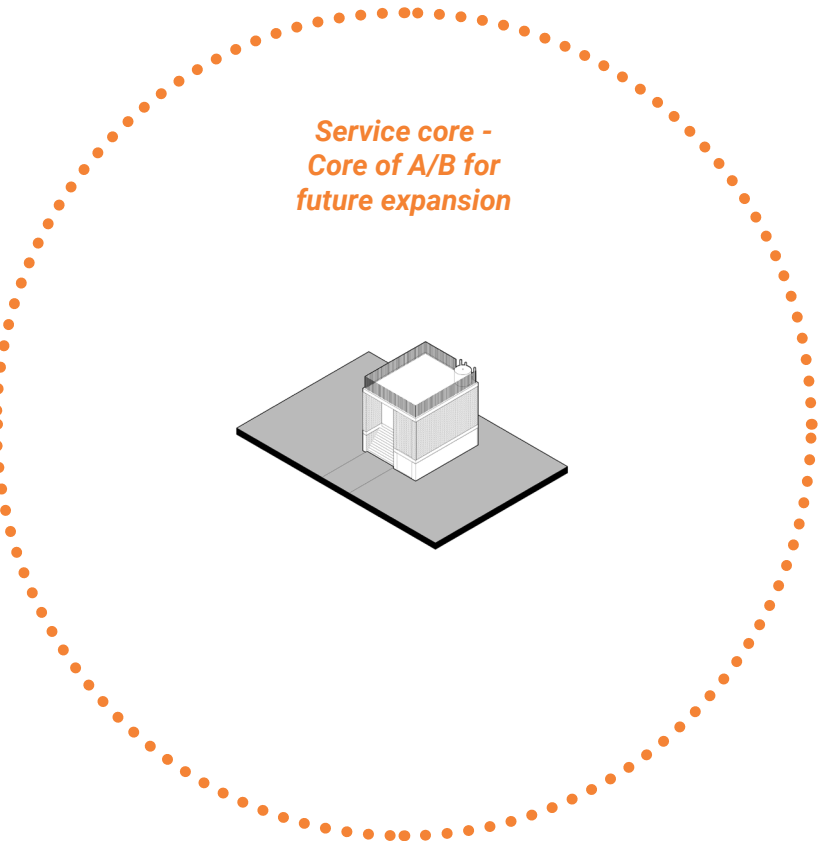
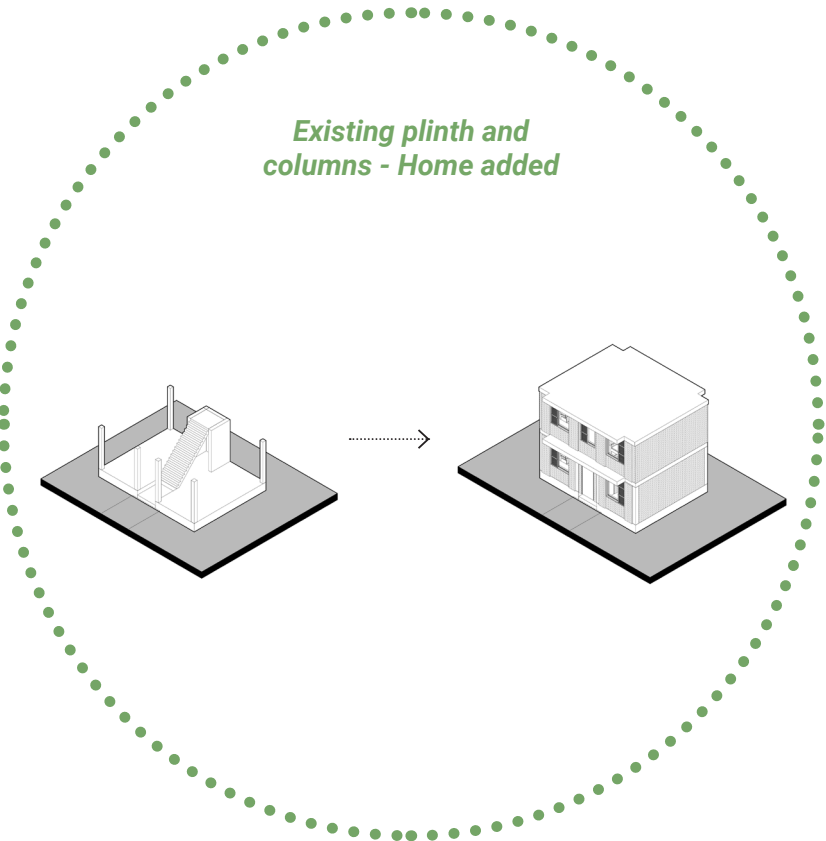
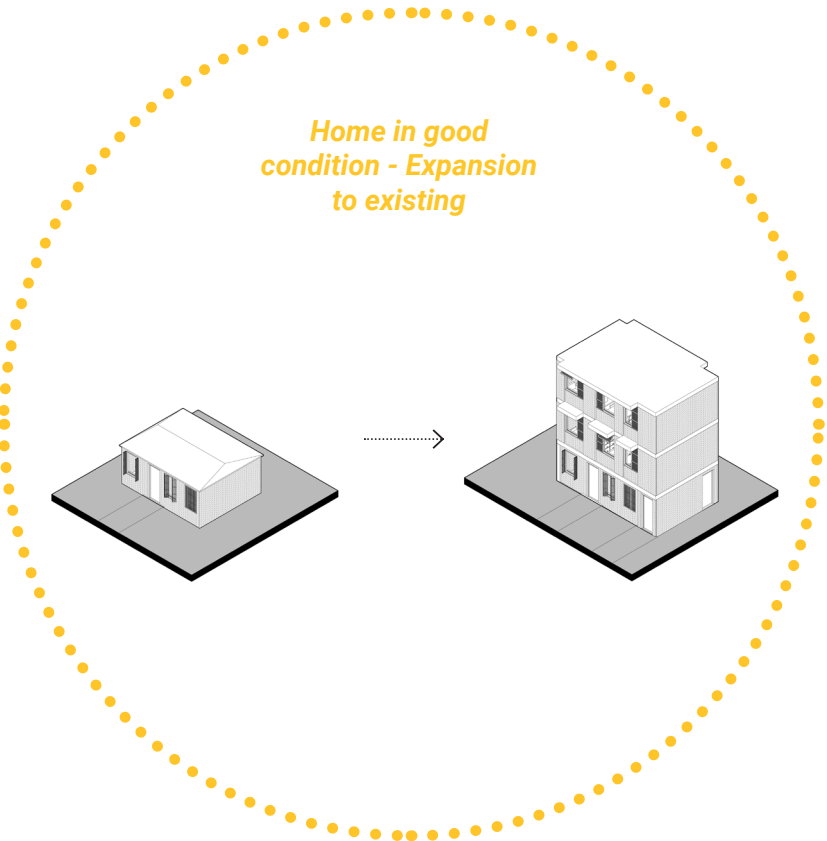
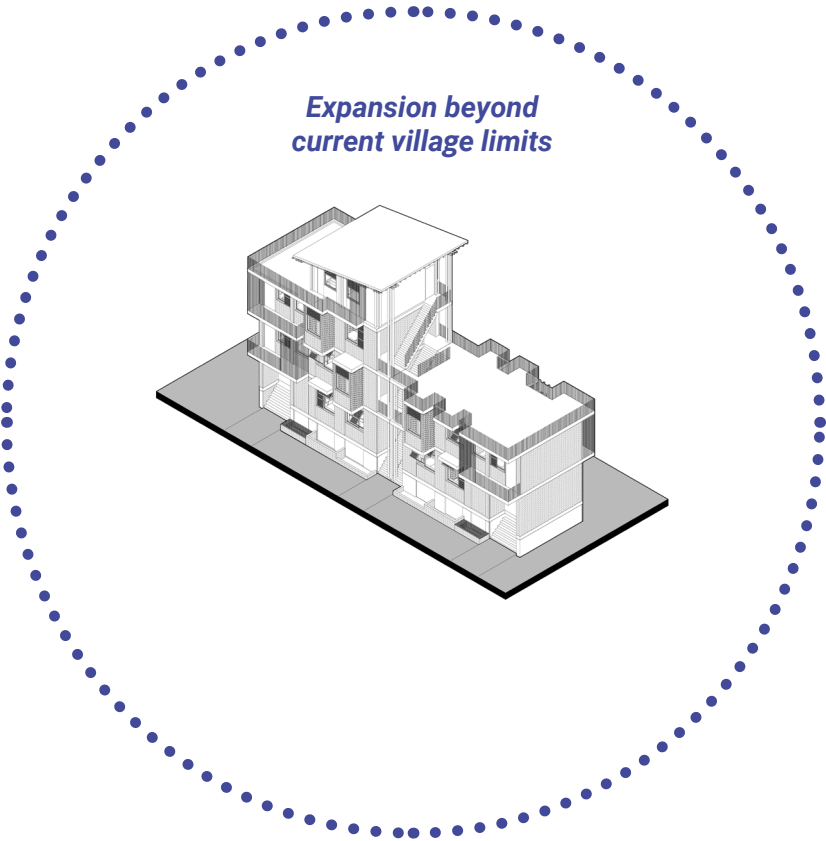
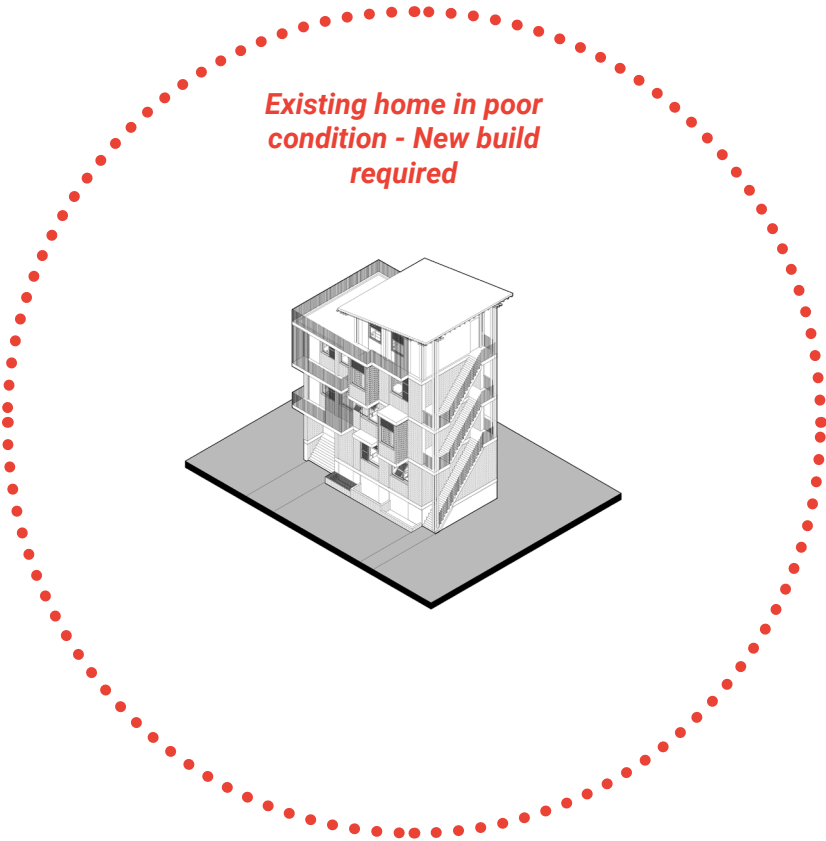
A Patchwork Development Strategy



5 Applications

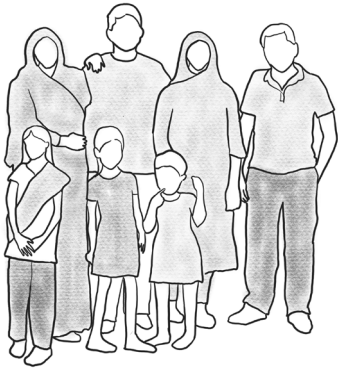


5 Situated Interventions

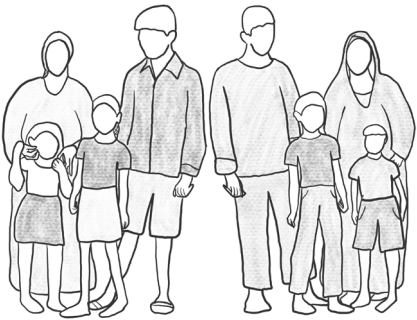


5 Families

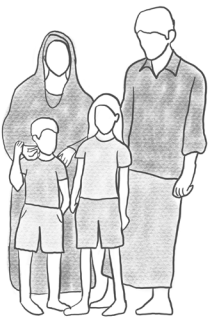
the RED family



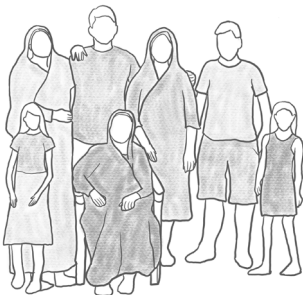
the BLUE family



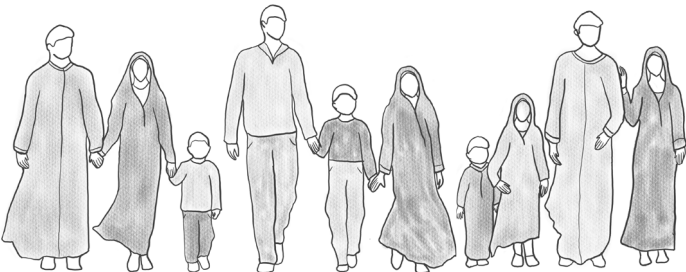
the YELLOW family



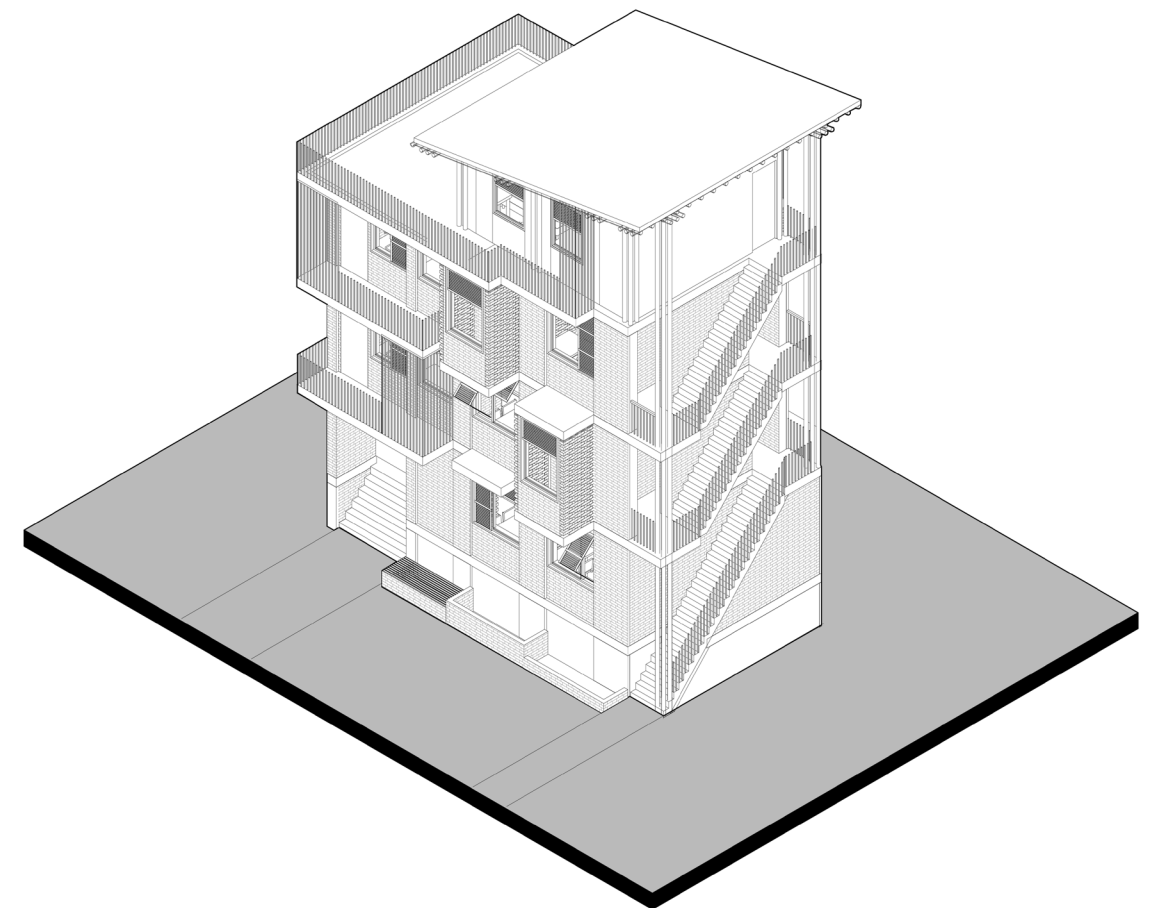
the GREEN family

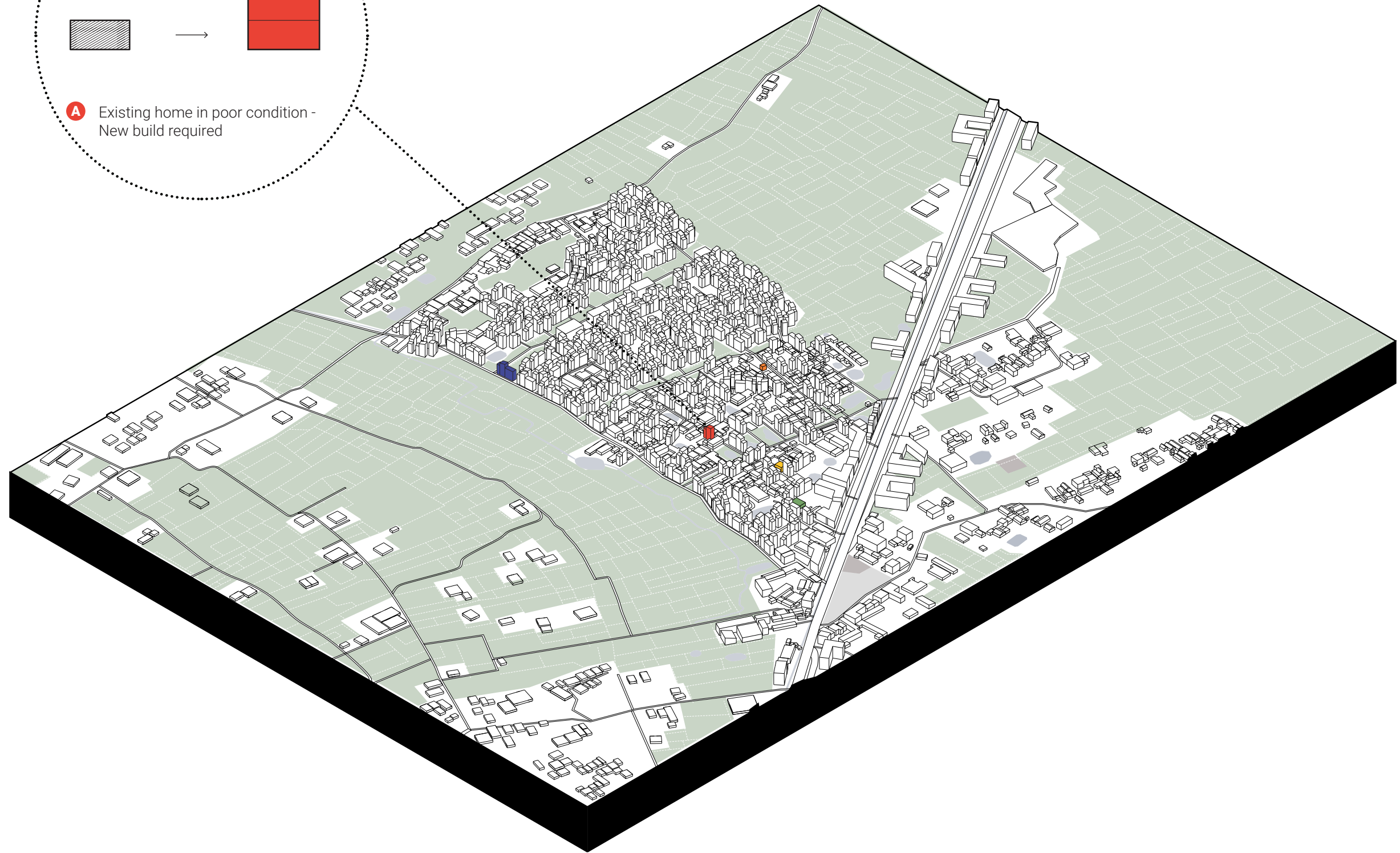
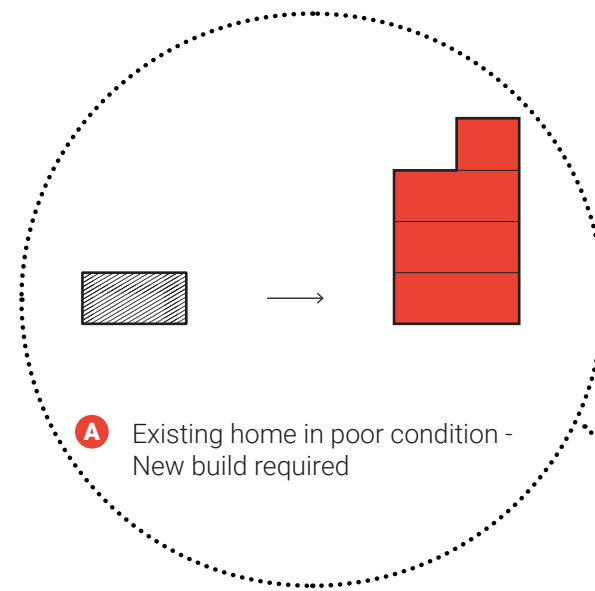


the ORANGE families



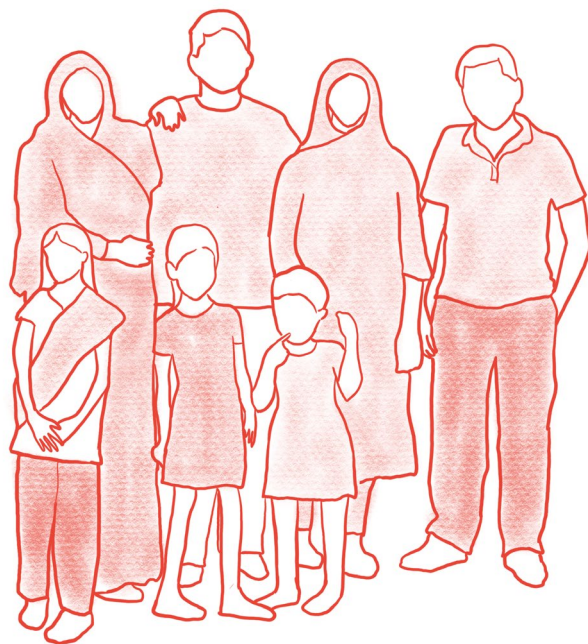
*A. Existing Home in Poor
Condition - New Build Required*



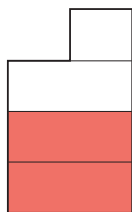


the RED family

Home Owners



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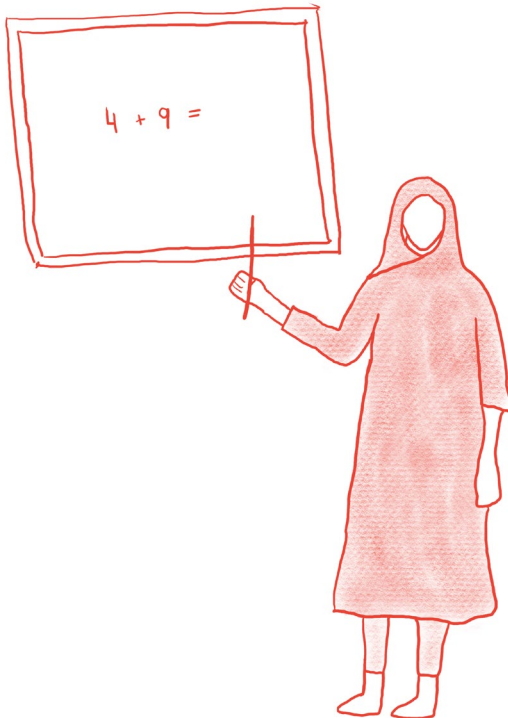
Income Generation Opportunities



Duck Rearing

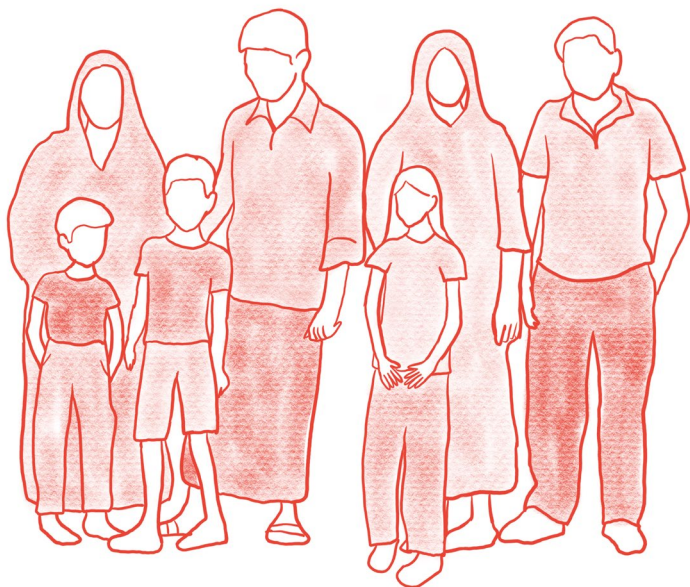


Paddy Farming

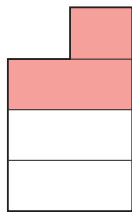


Teaching

Renters



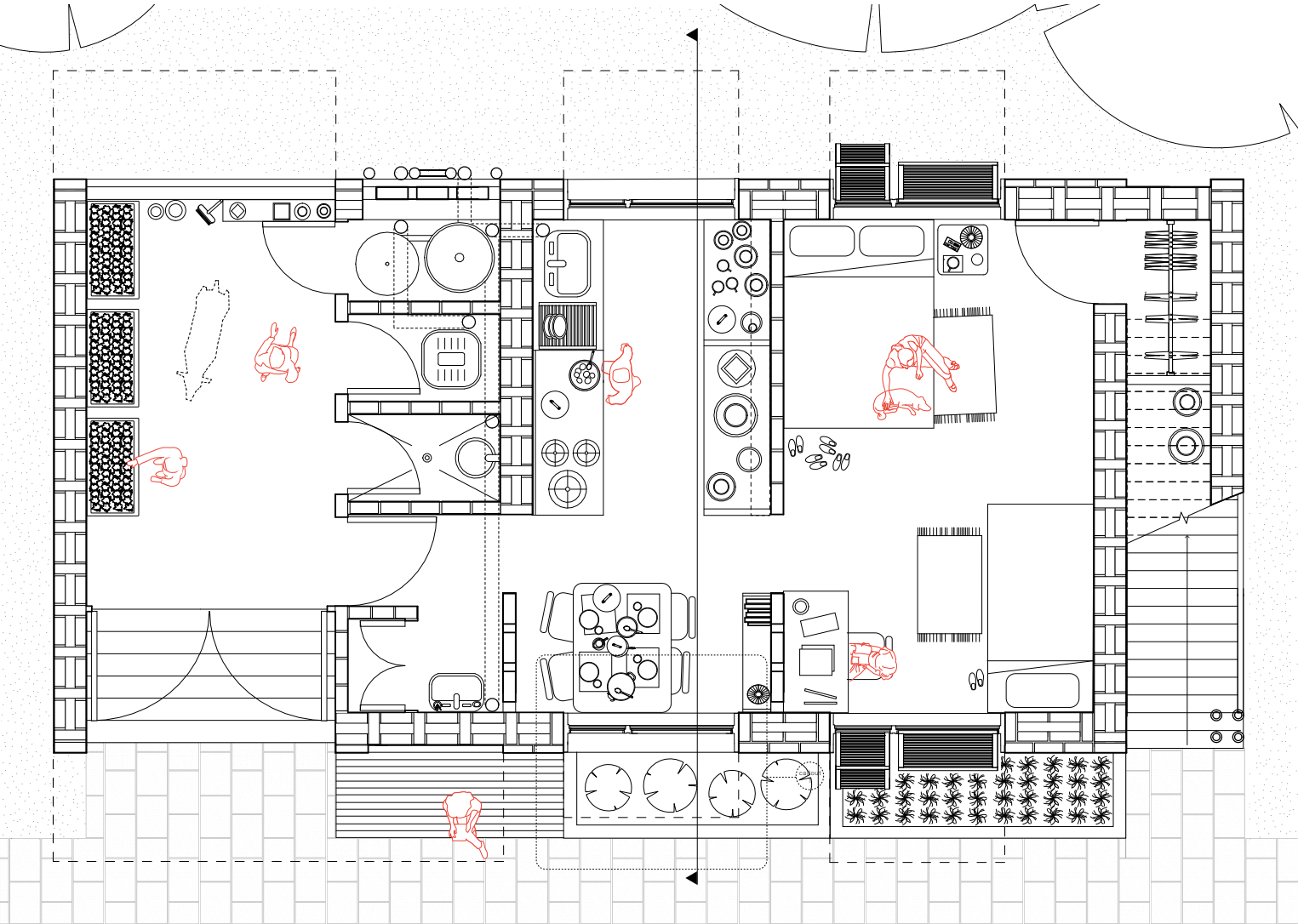
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Window Production

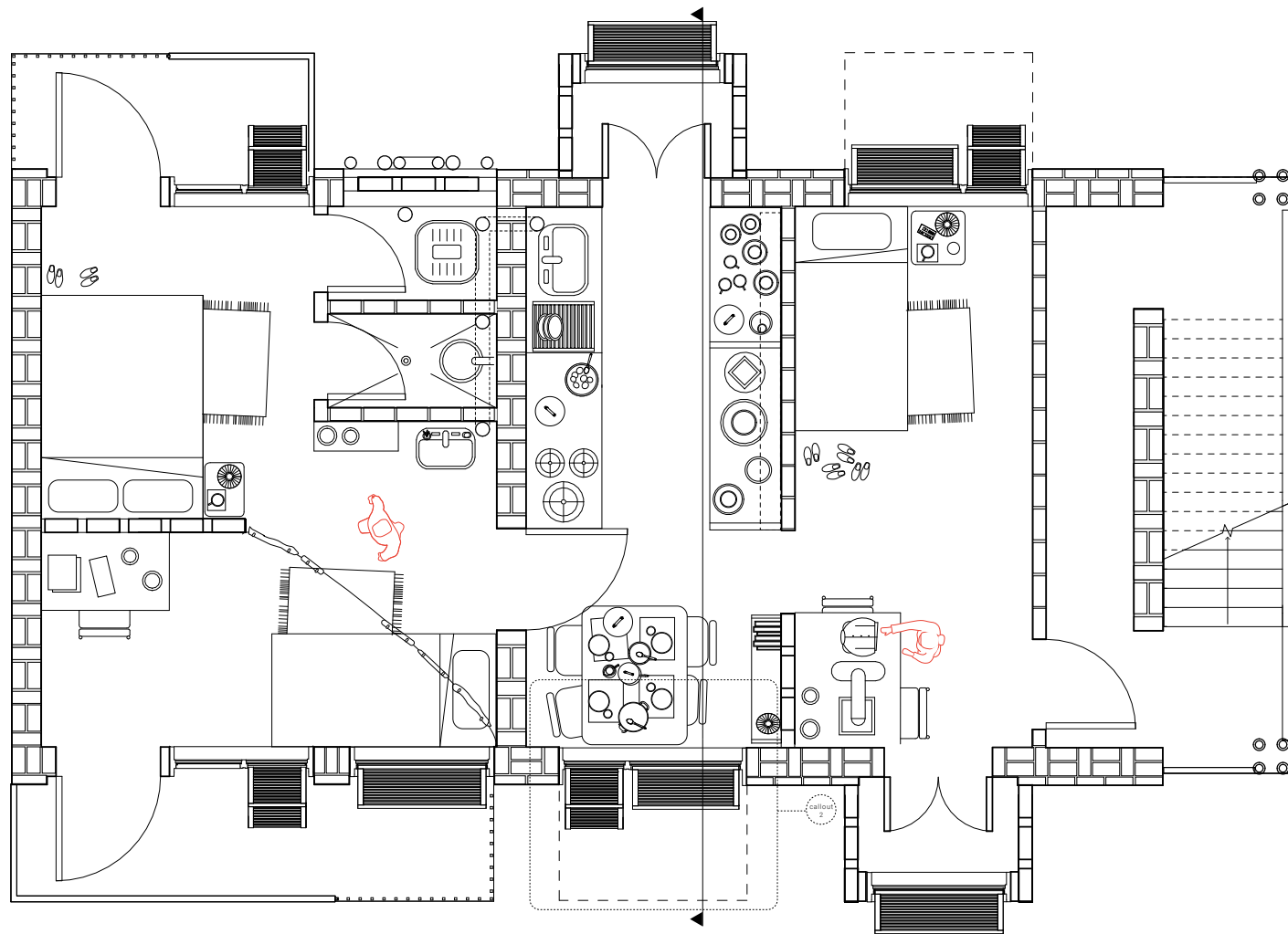
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Concurrent-Design Participation

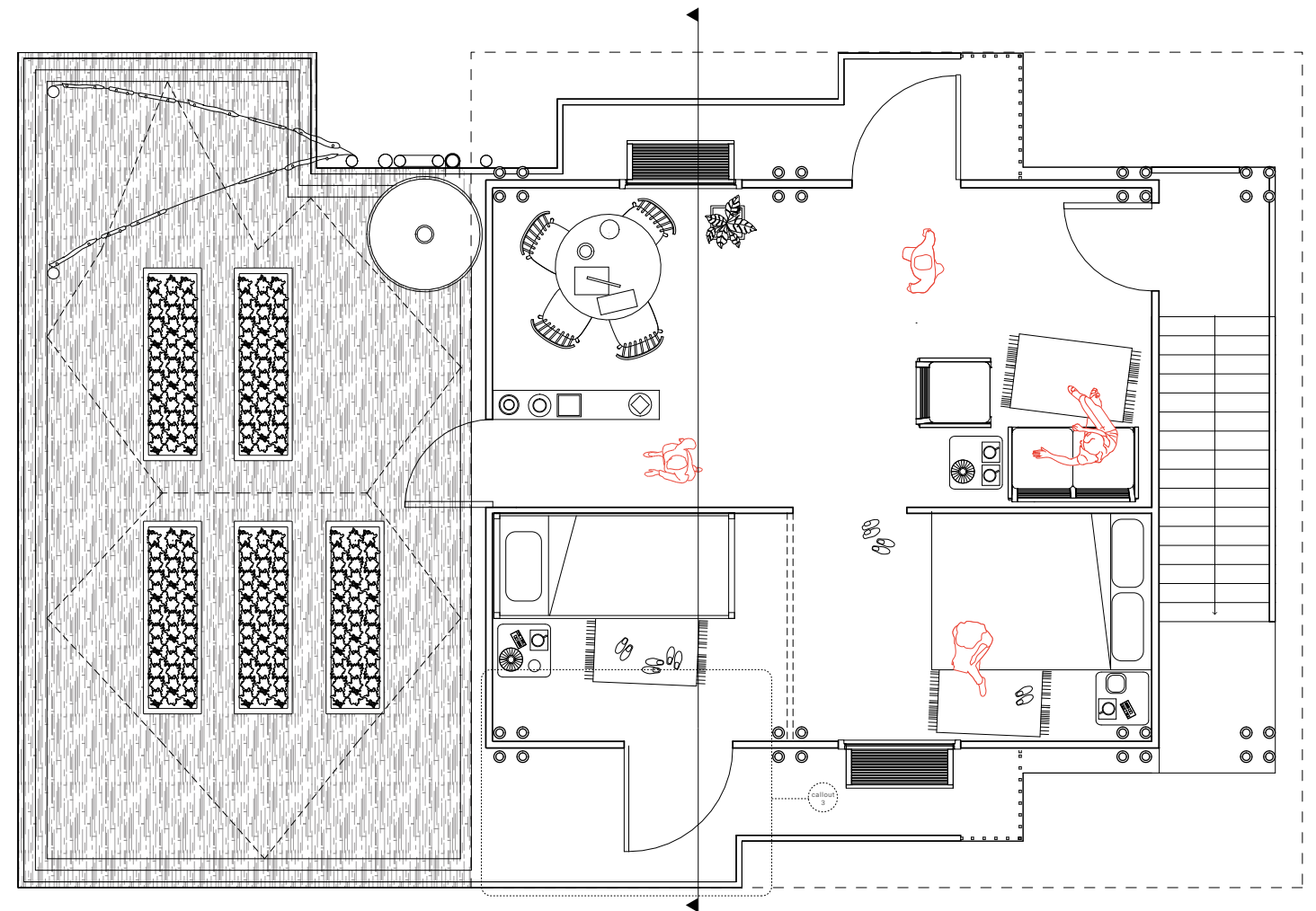


A. Existing home in poor condition - New build required | Ground Floor Plan

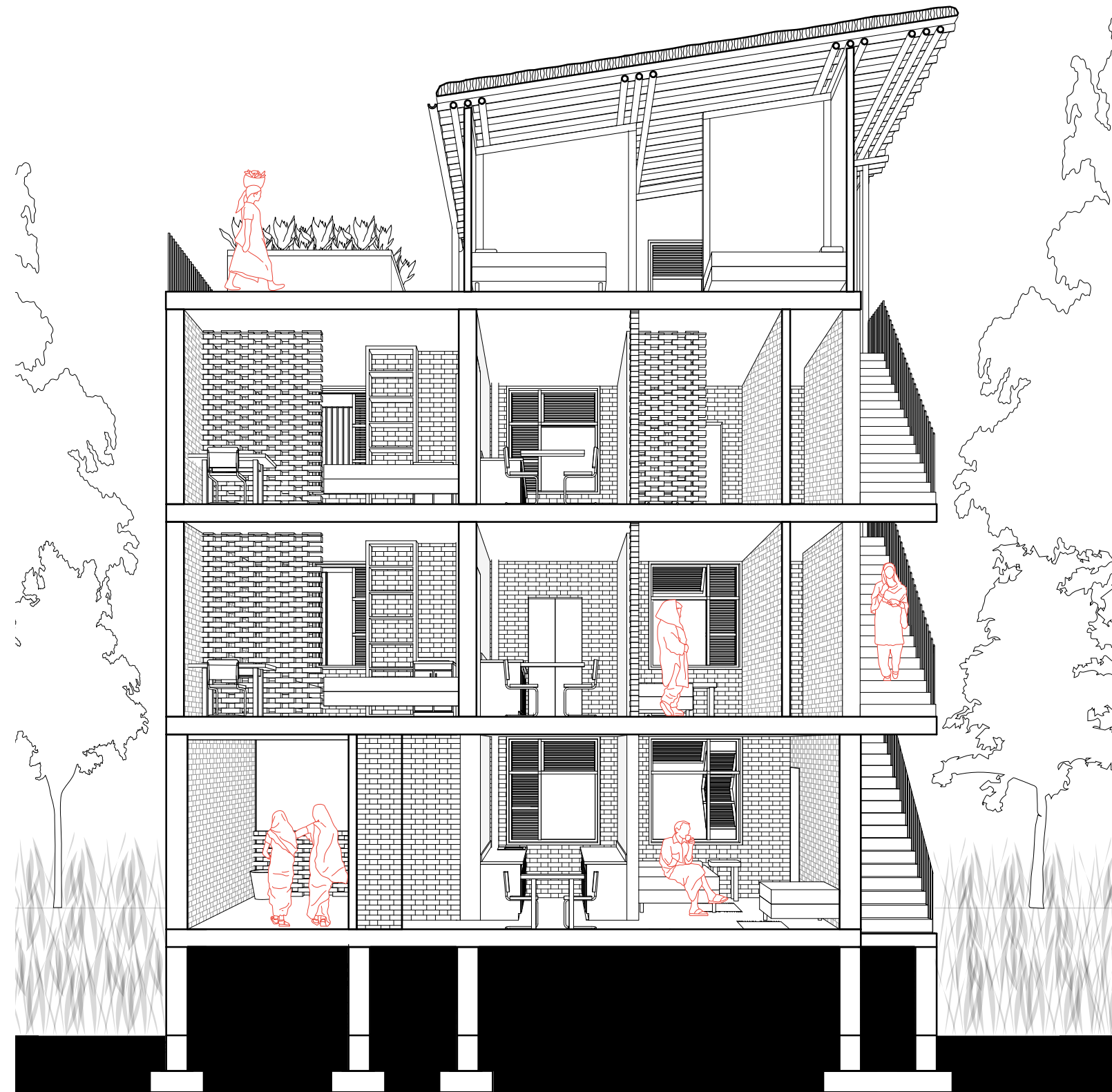




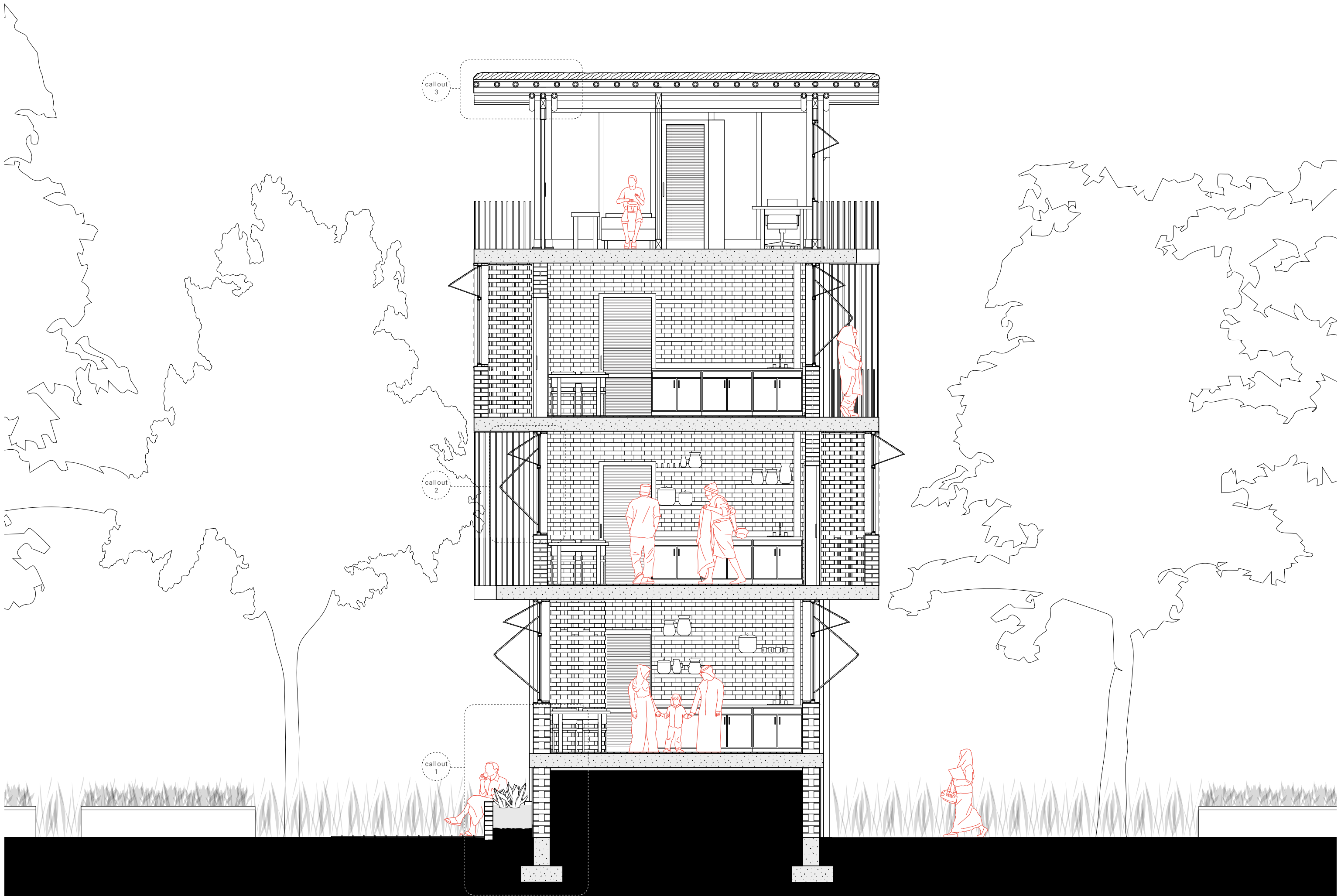
A. Existing home in poor condition - New build required | Level 1 & 2



A. Existing home in poor condition - New build required | Level 3



A. Existing home in poor condition - New build required | Sectional Perspective

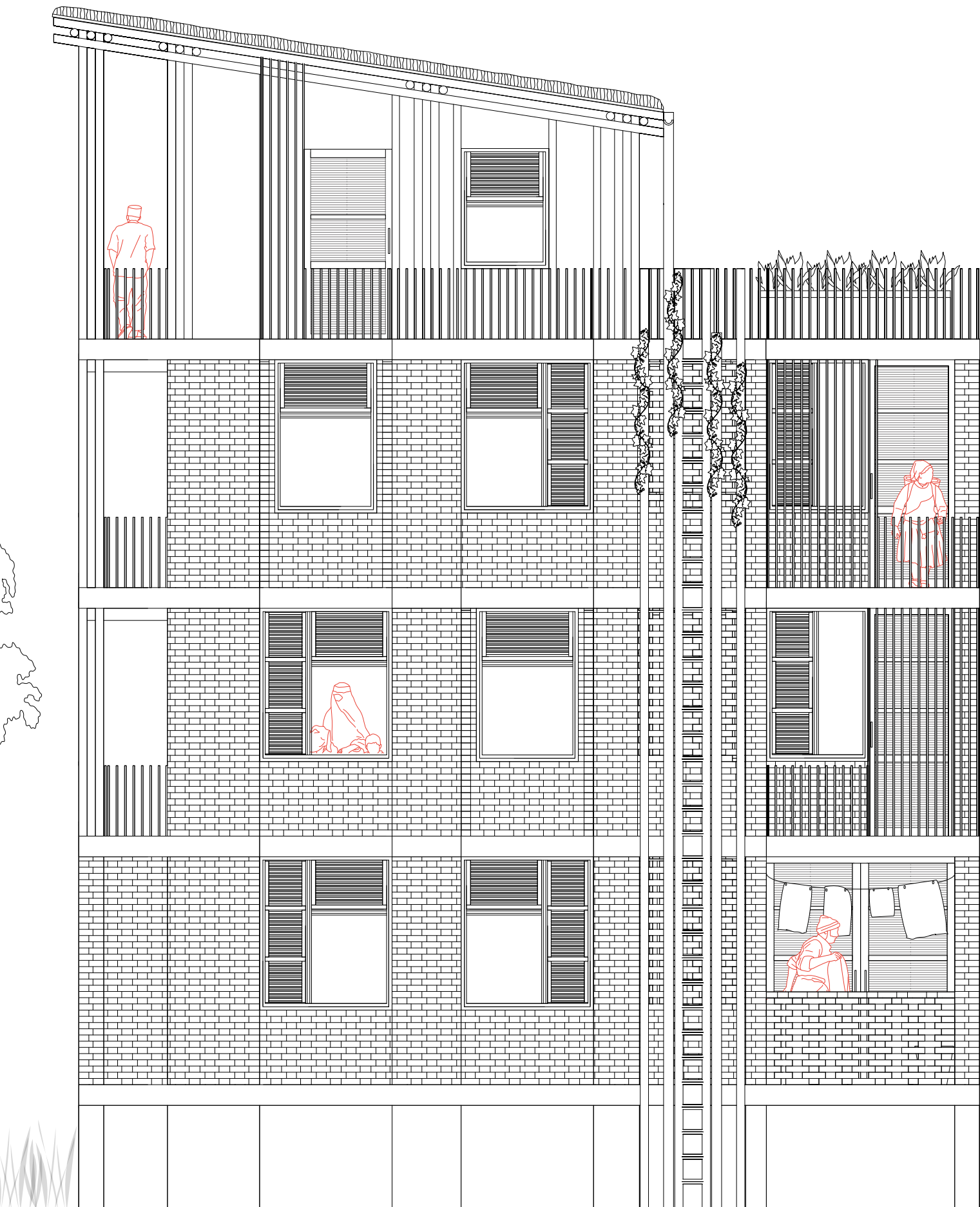


A. Existing home in poor condition - New build required | Section



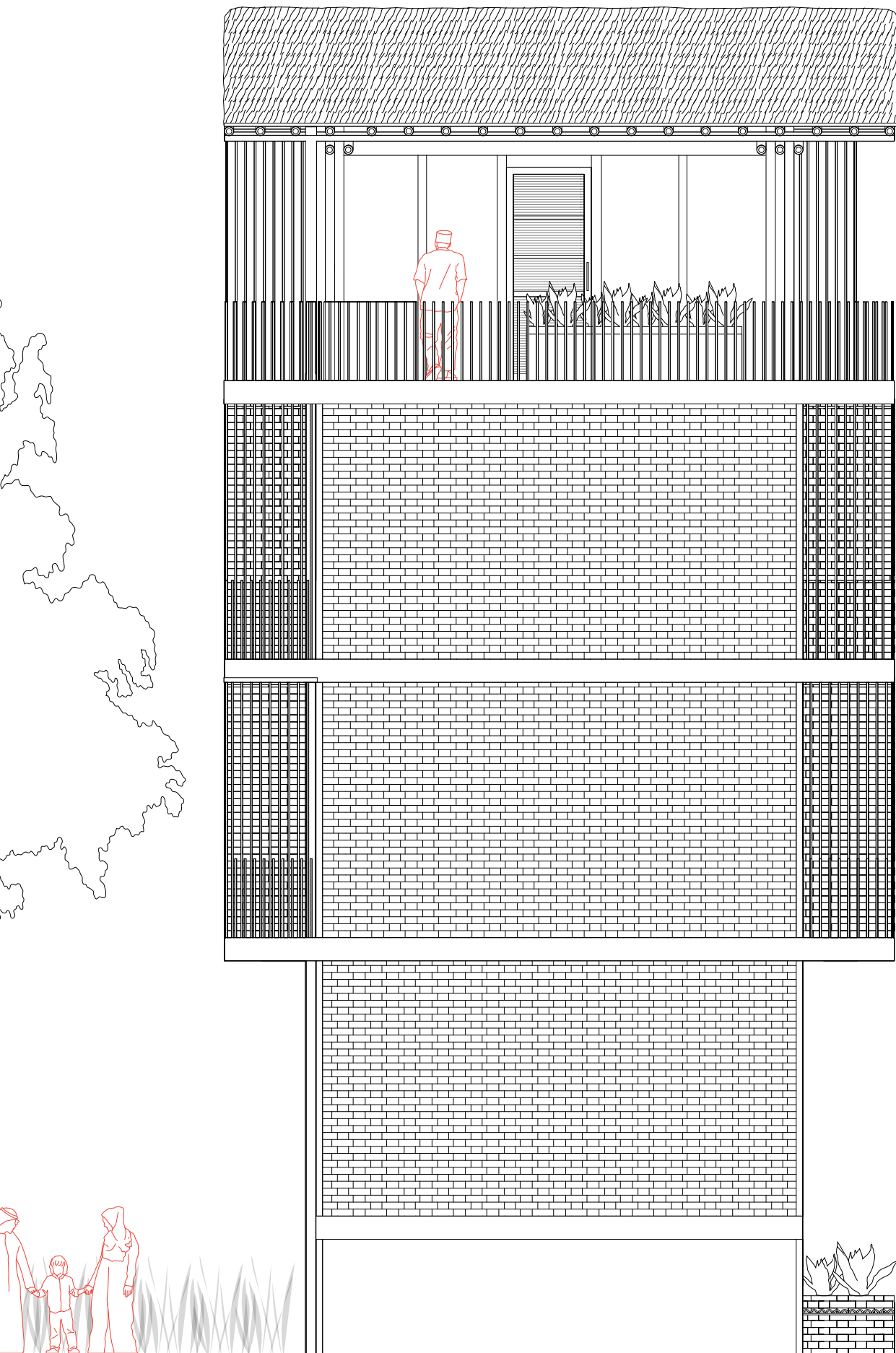
A. Existing home in poor condition - New build required | South Elevation





A. Existing home in poor condition - New build required | North Elevation

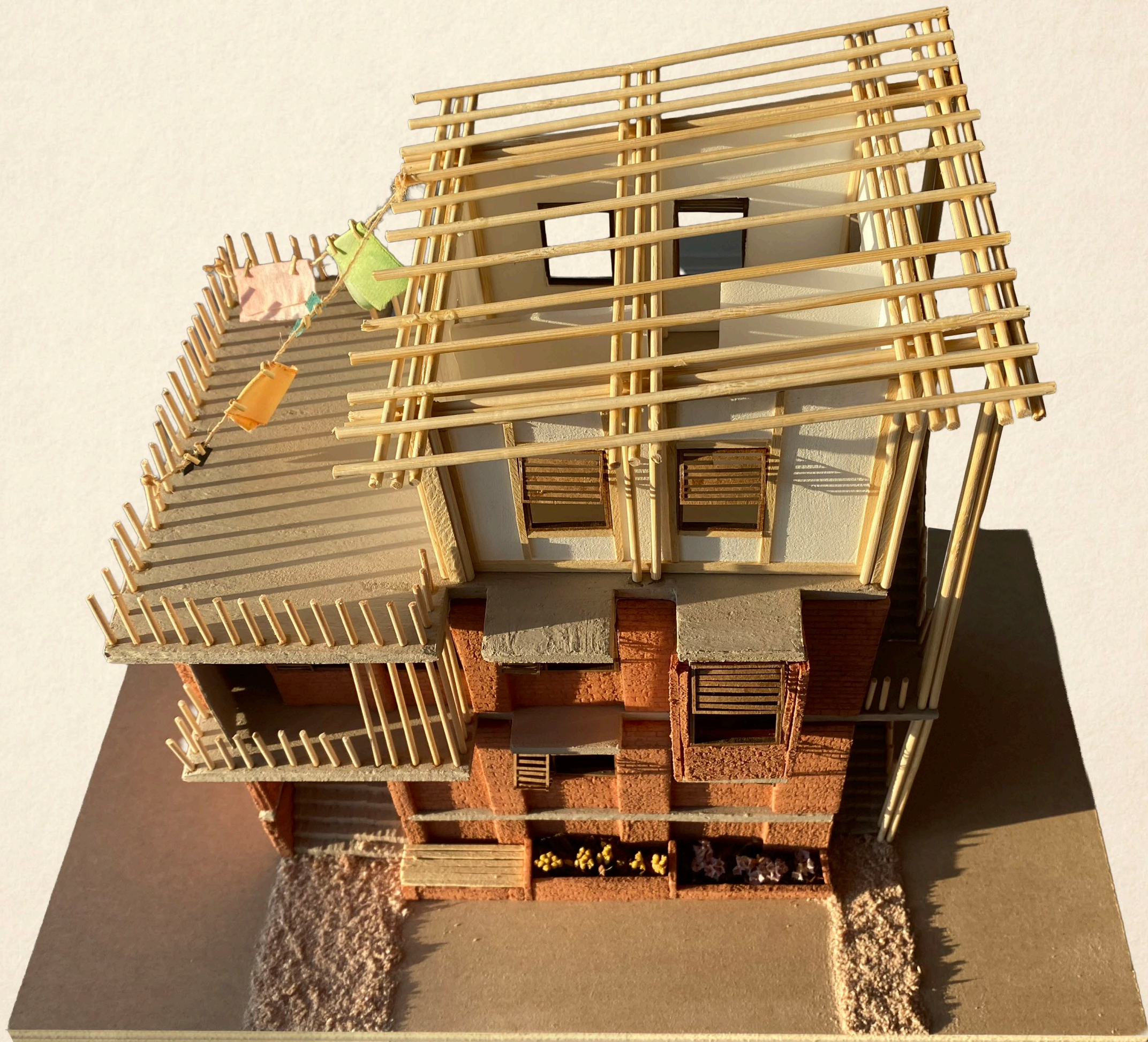




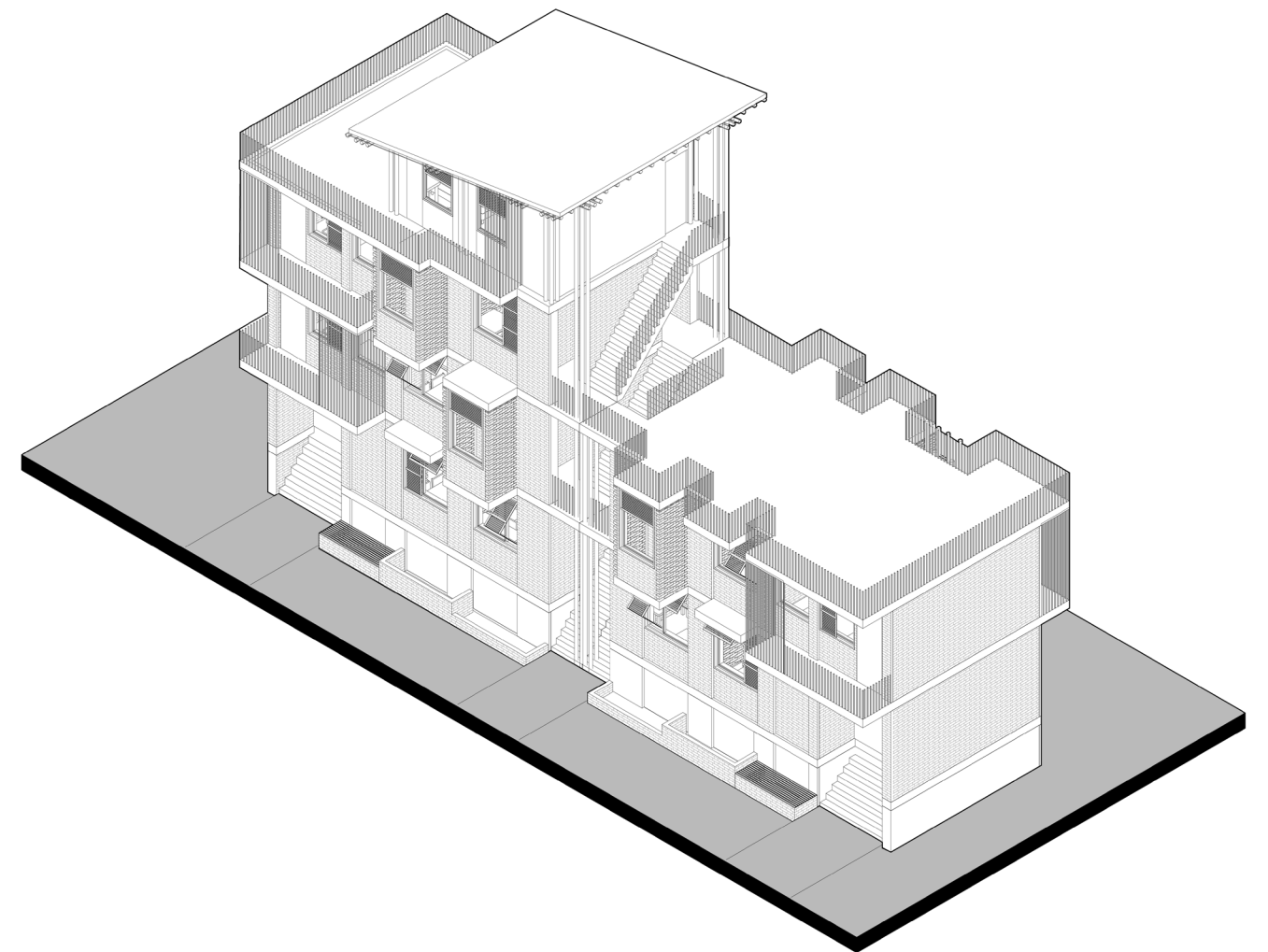
A. Existing home in poor condition - New build required | West Elevation

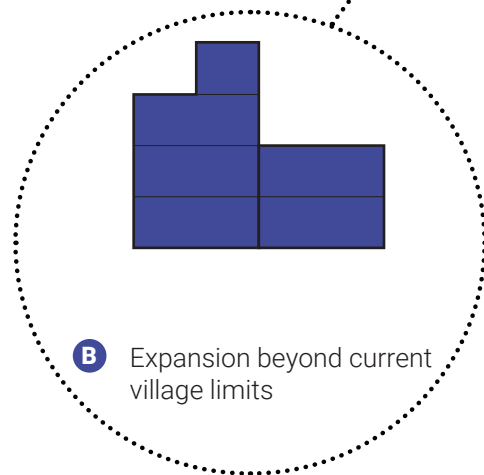
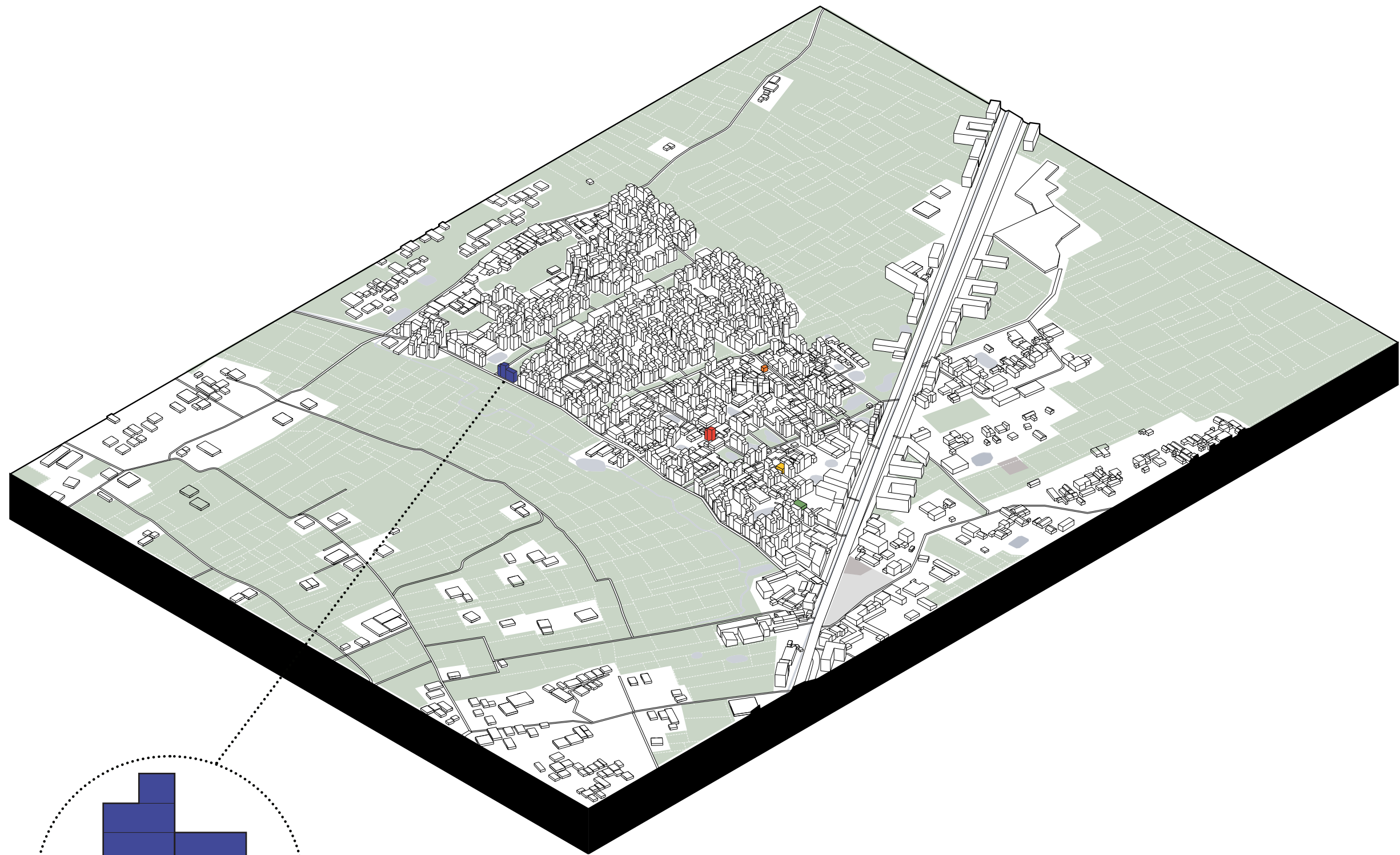


A. Existing home in poor condition - New build required | East Elevation

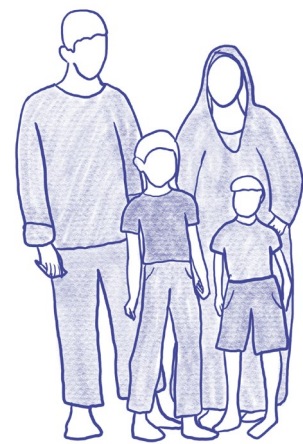


*B. Expansion Beyond
Current Village Limits*

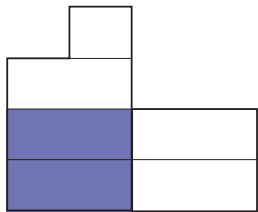




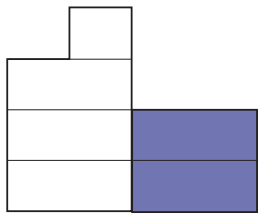
Home Owners



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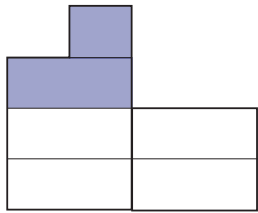
.....



Renters



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Income Generation Opportunities



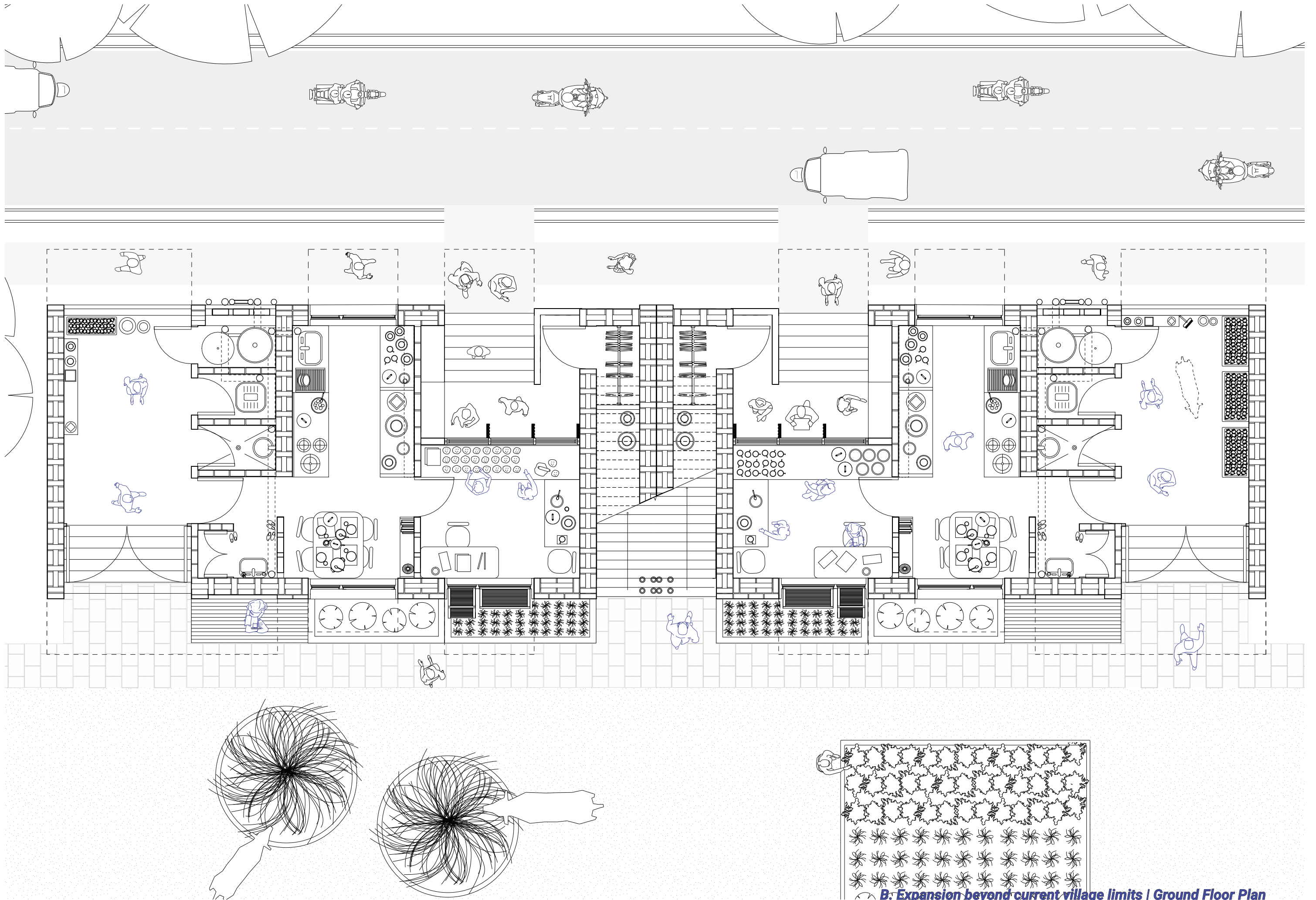
Naan Shop

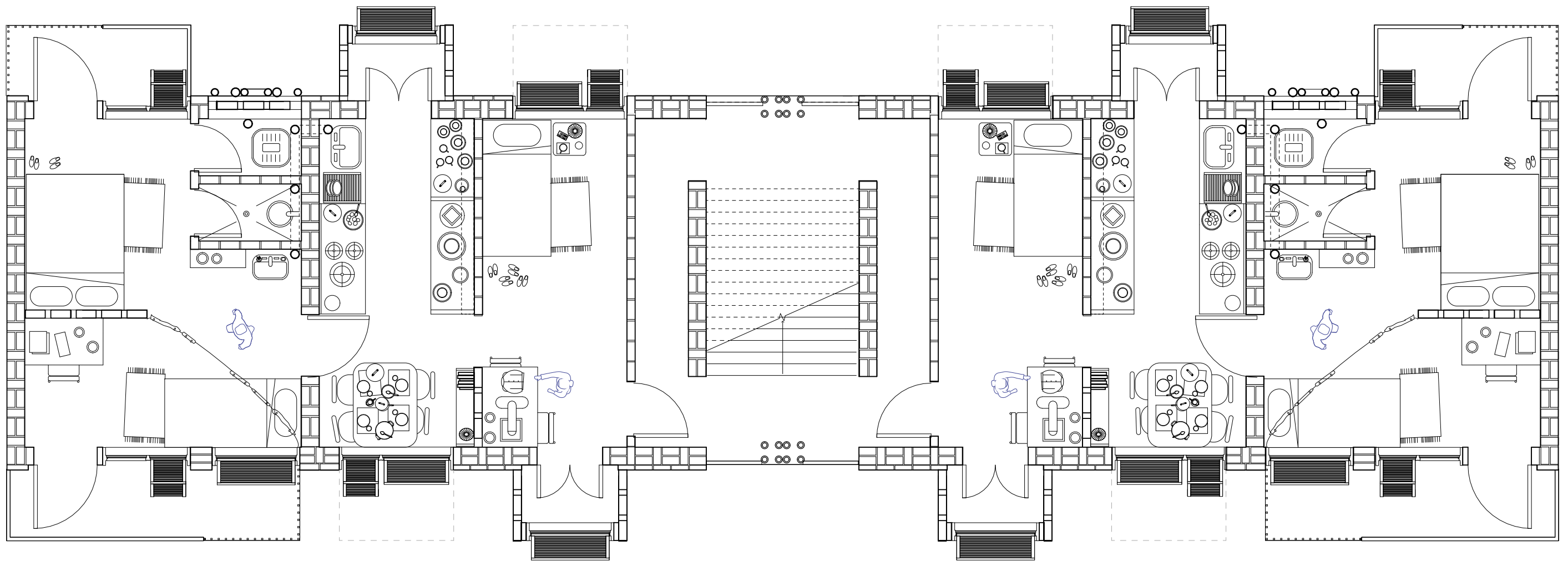


Chai Shop

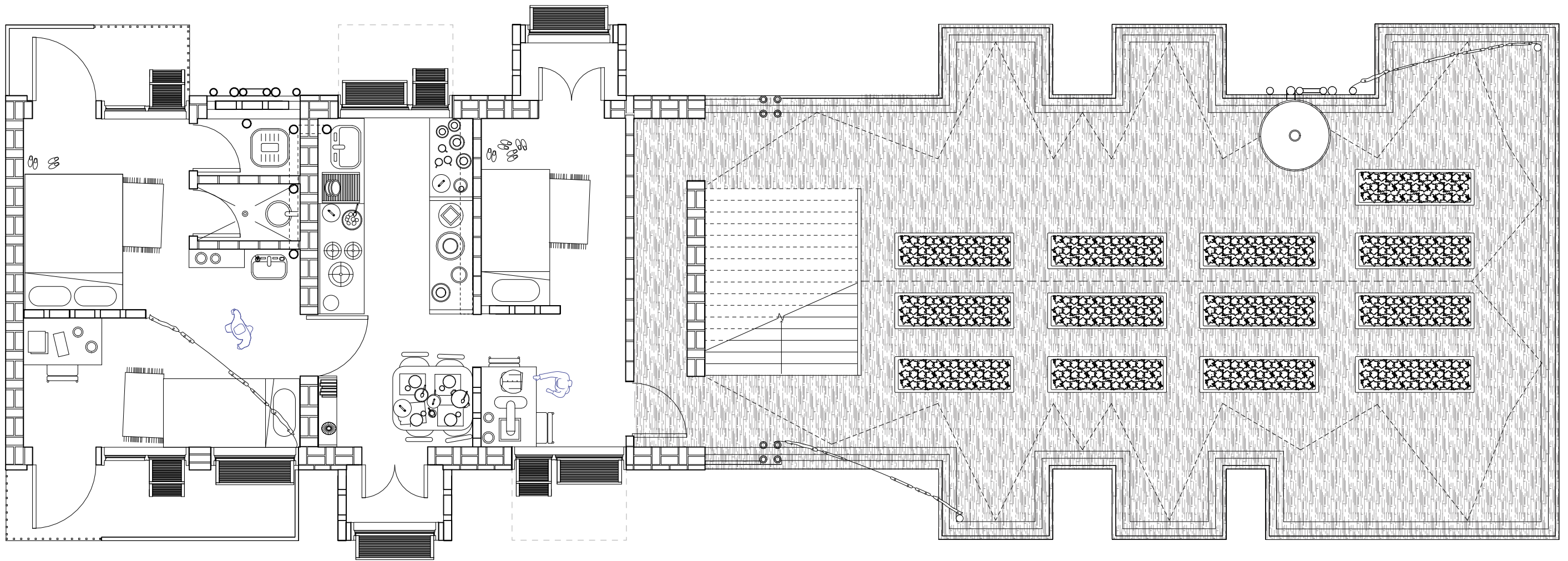


Paddy Farming



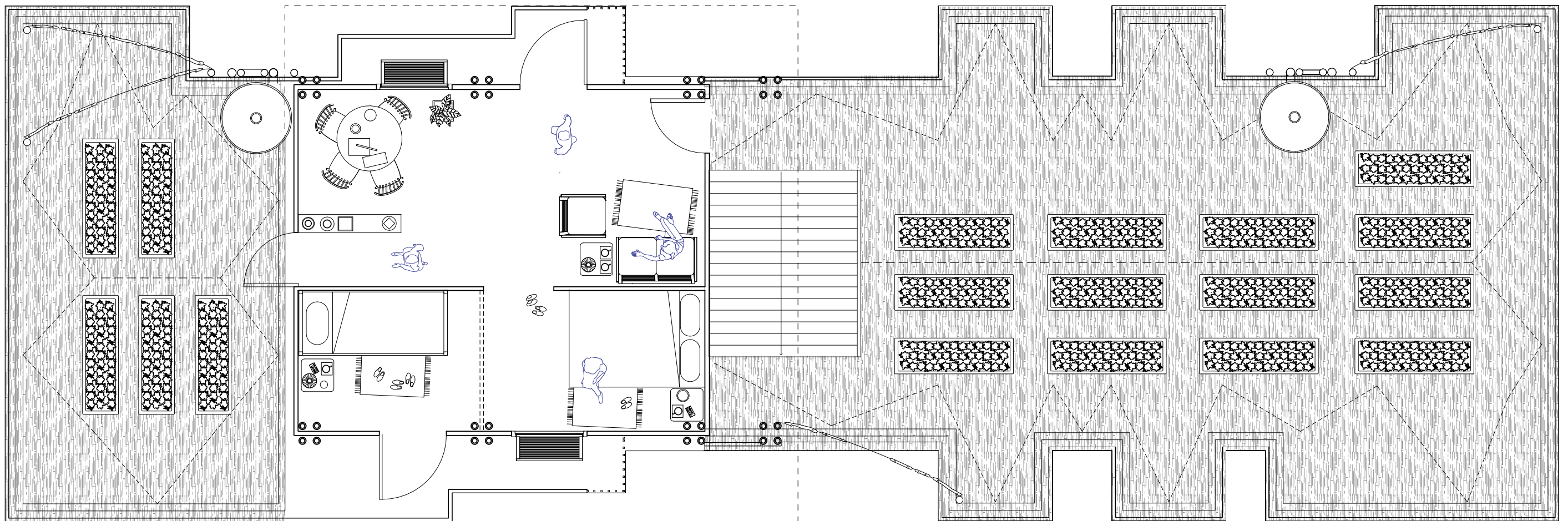


B. Expansion beyond current village limits | Level 1



B. Expansion beyond current village limits | Level 2

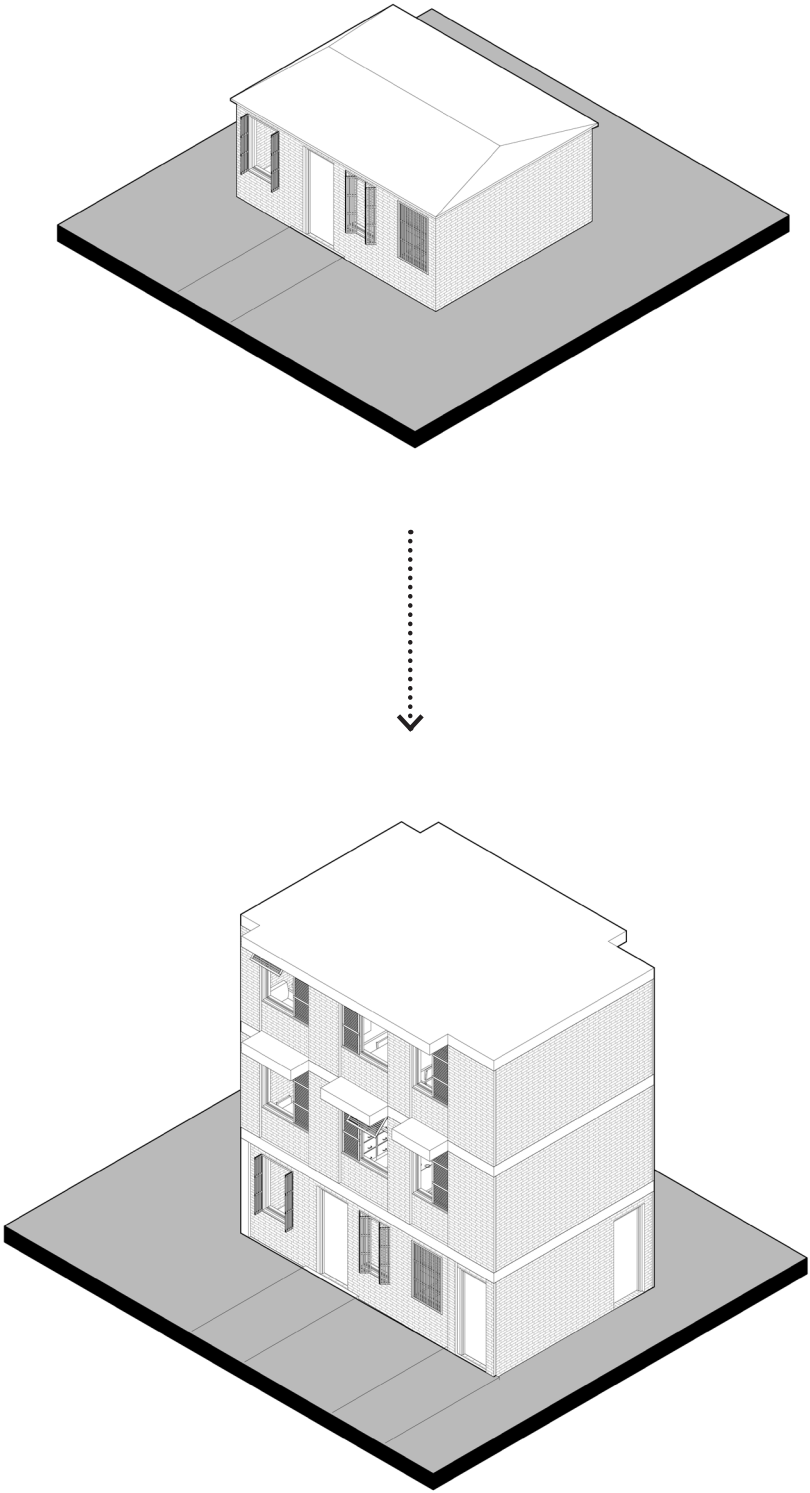


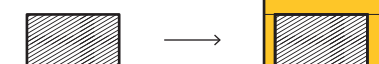
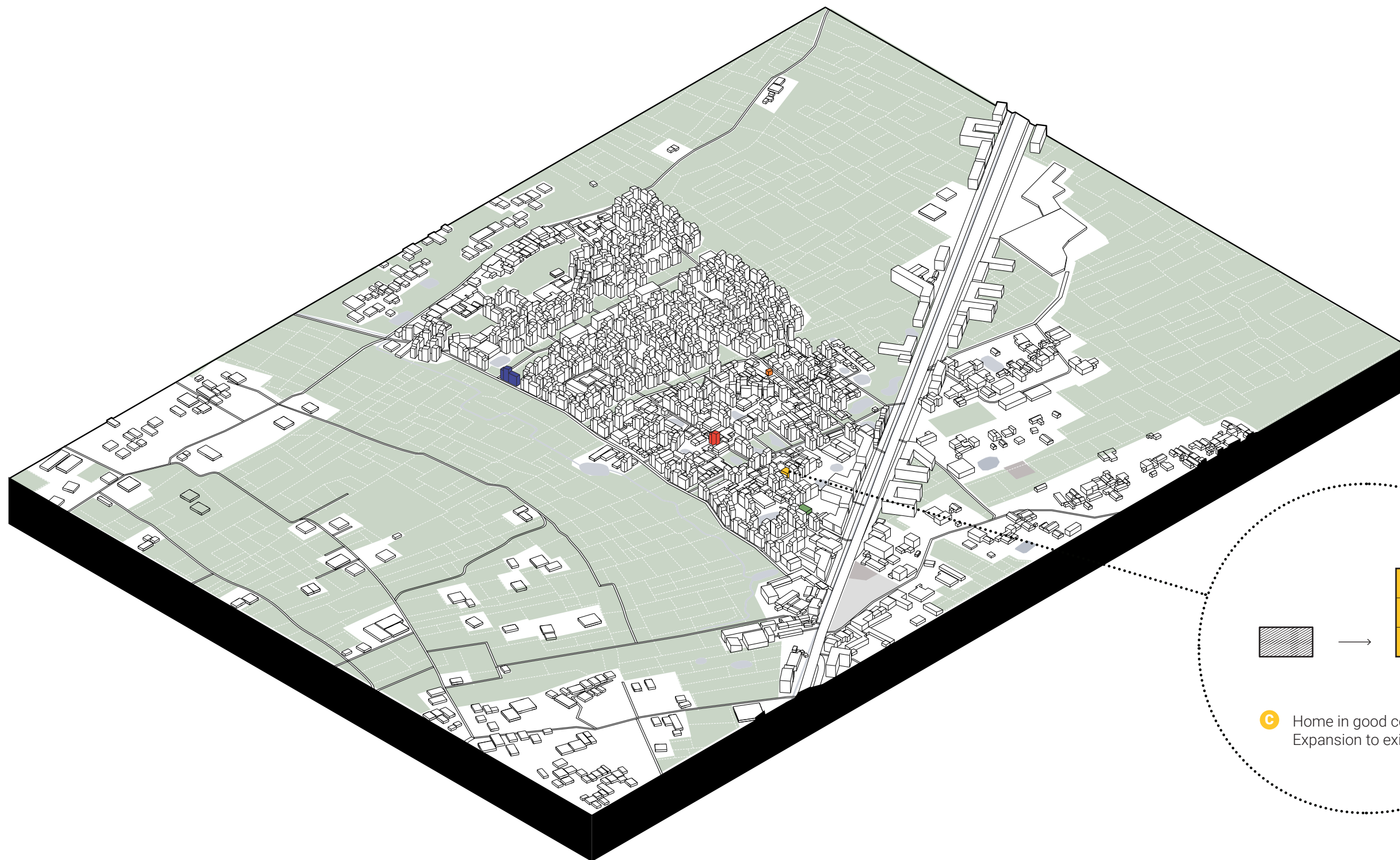


B. Expansion beyond current village limits | Level 3



*C. Home in Good Condition -
Expansion to Existing*

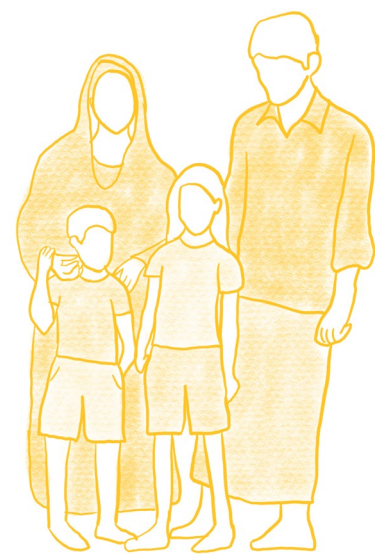




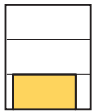
C Home in good condition -
Expansion to existing

the **YELLOW** family

Home Owners



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Income Generation Opportunities

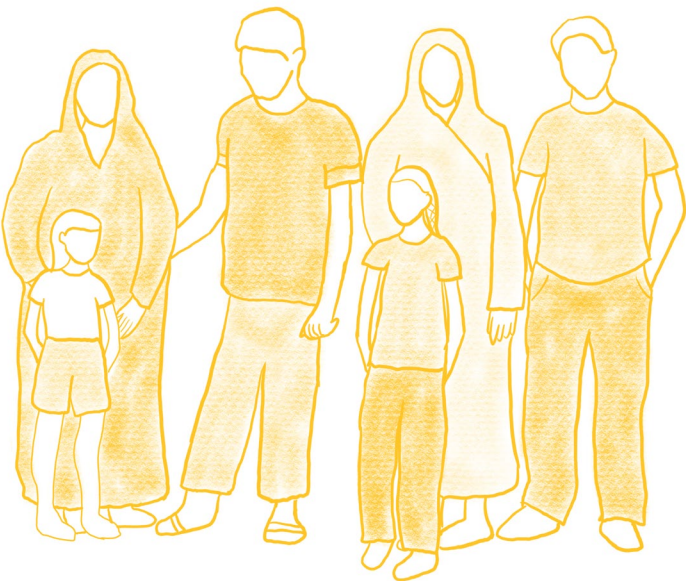


Farming

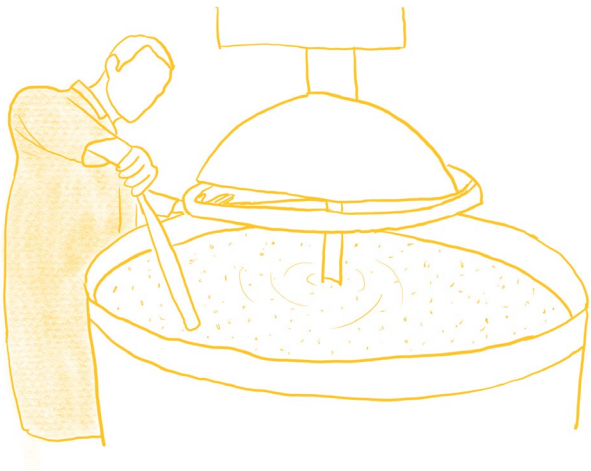
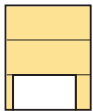


At Home Textile Production

Renters



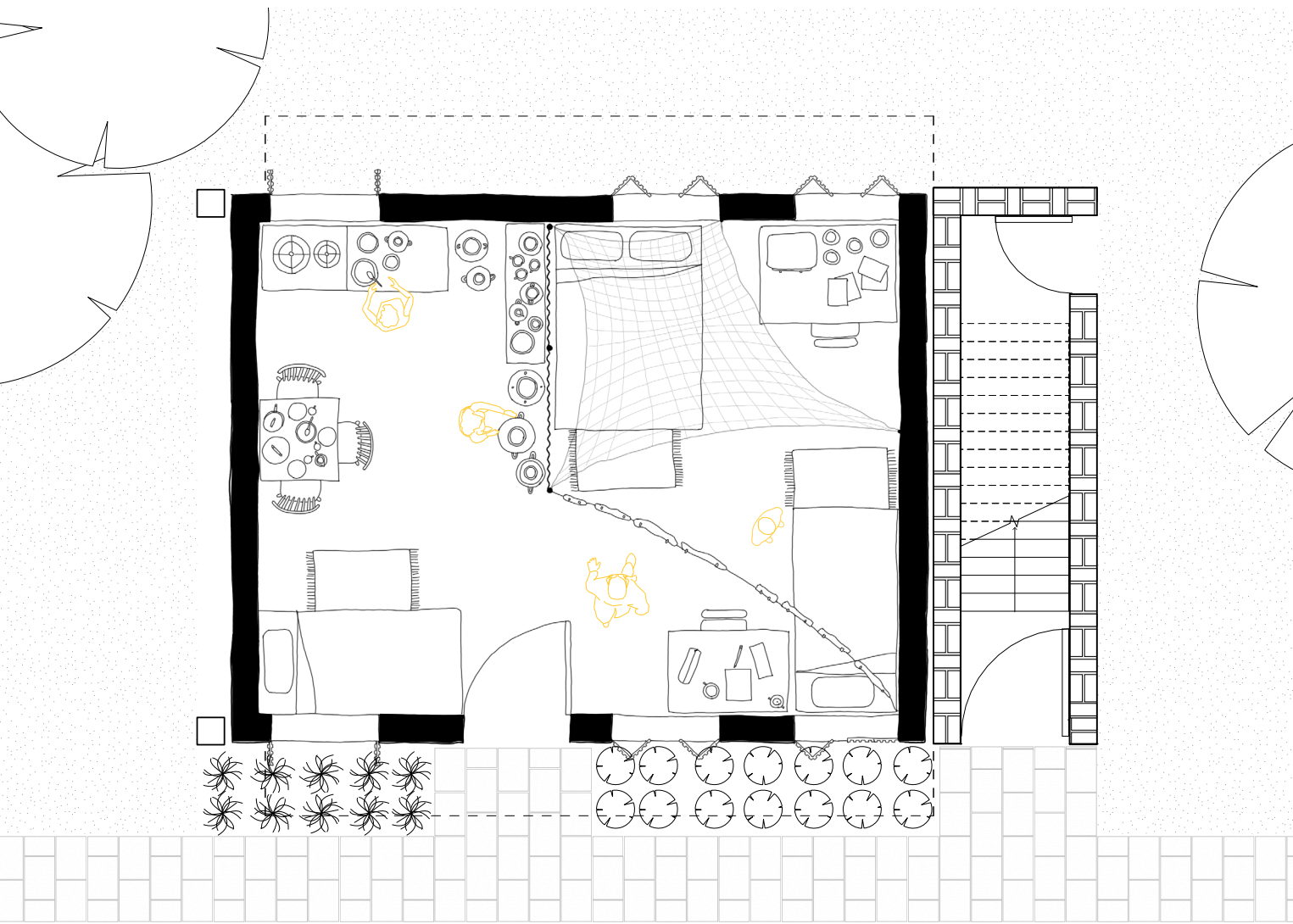
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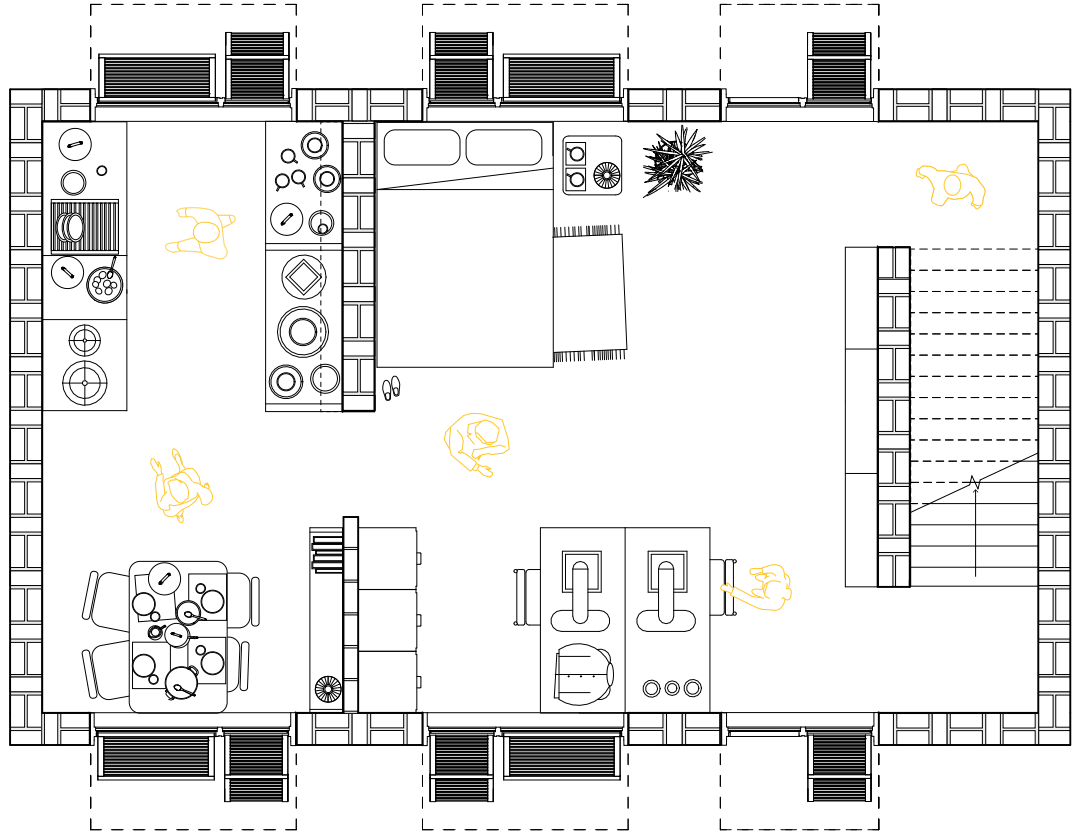
Cocciopesto Production

.....

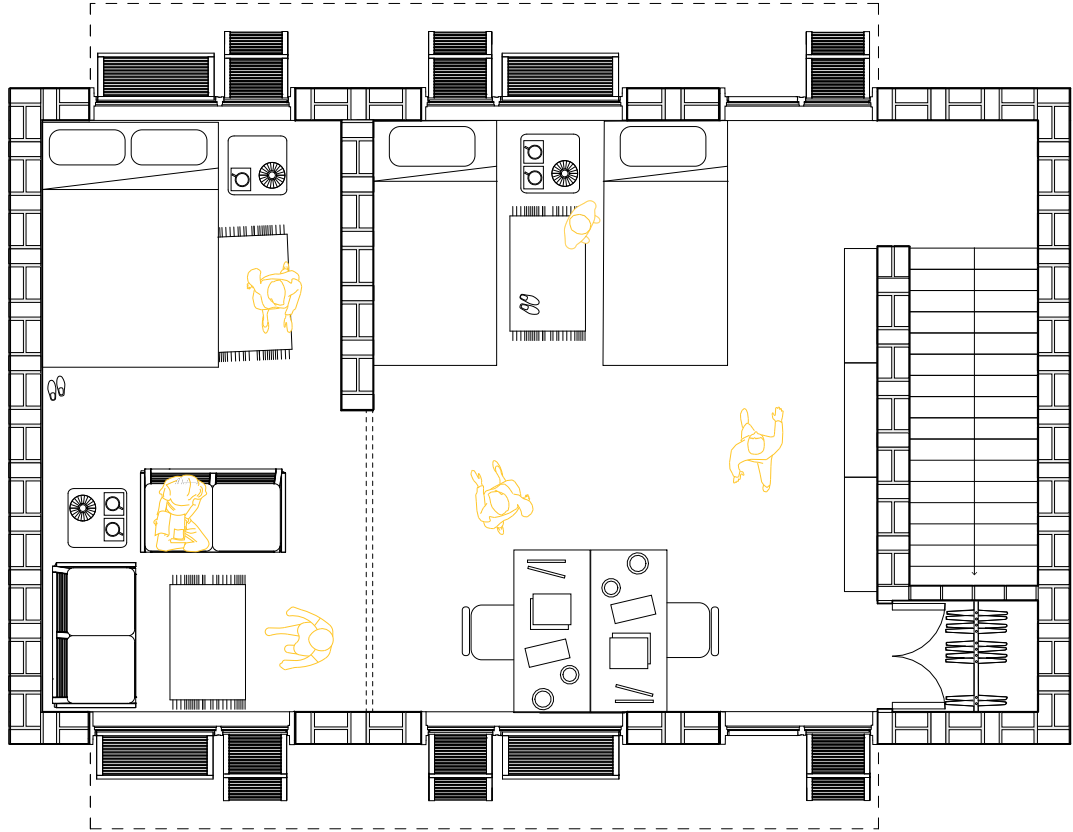
**Concurrent-Design
Participation**



C. Home in good condition - Expansion to existing/ Ground Floor Plan



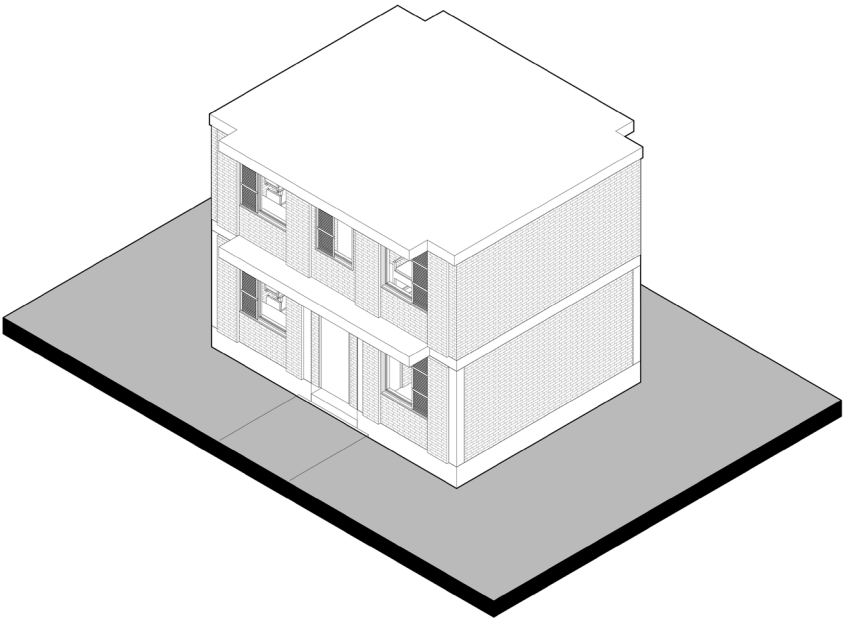
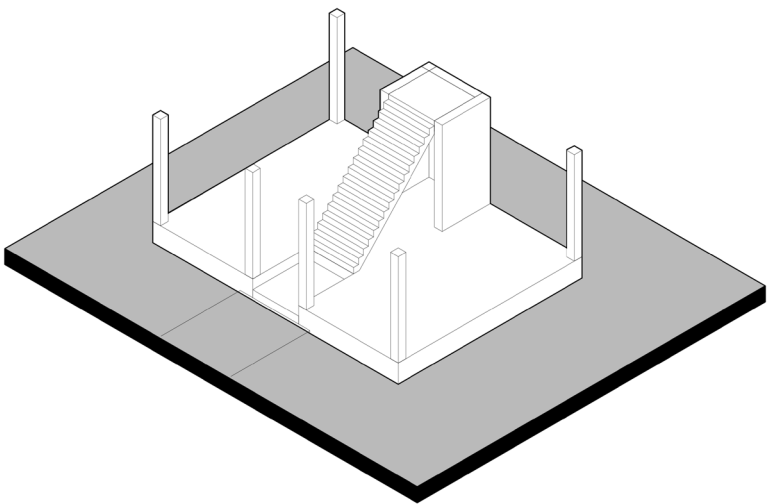
C. Home in good condition - Expansion to existing/ Level 1

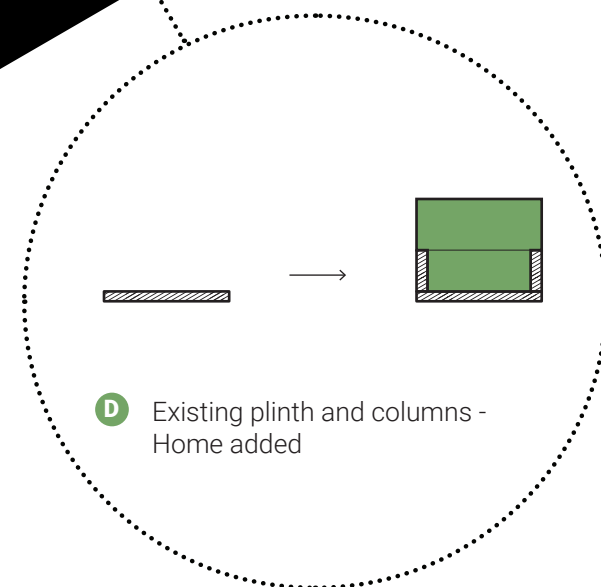
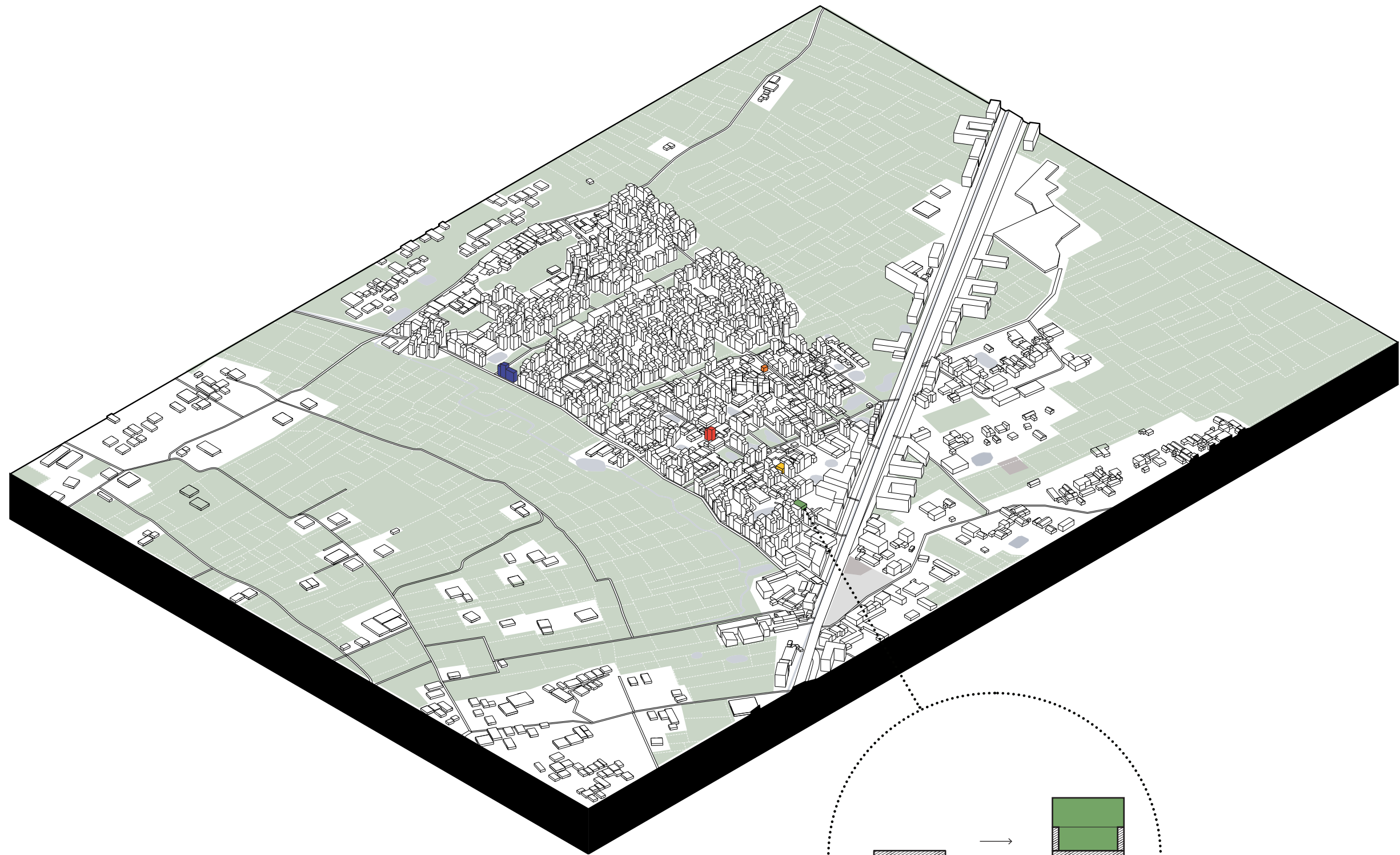


C. Home in good condition - Expansion to existing/ Level 2



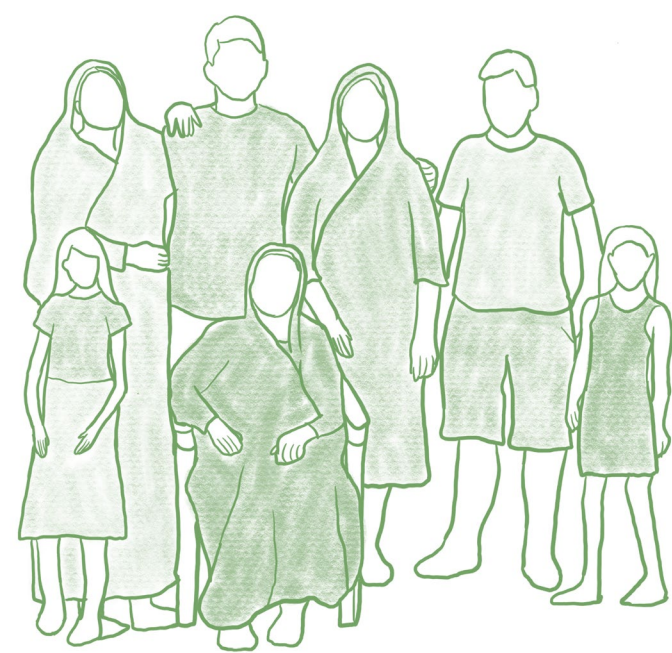
*D. Existing Plinth and
Columns - Home Added*





the **GREEN** family

Home Owners



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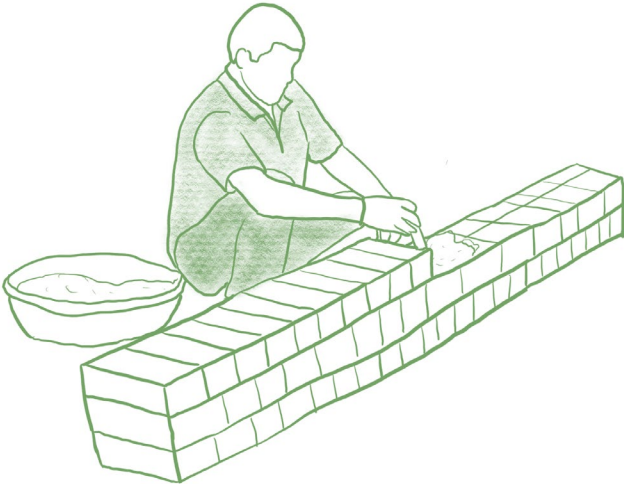
Income Generation Opportunities



Farming



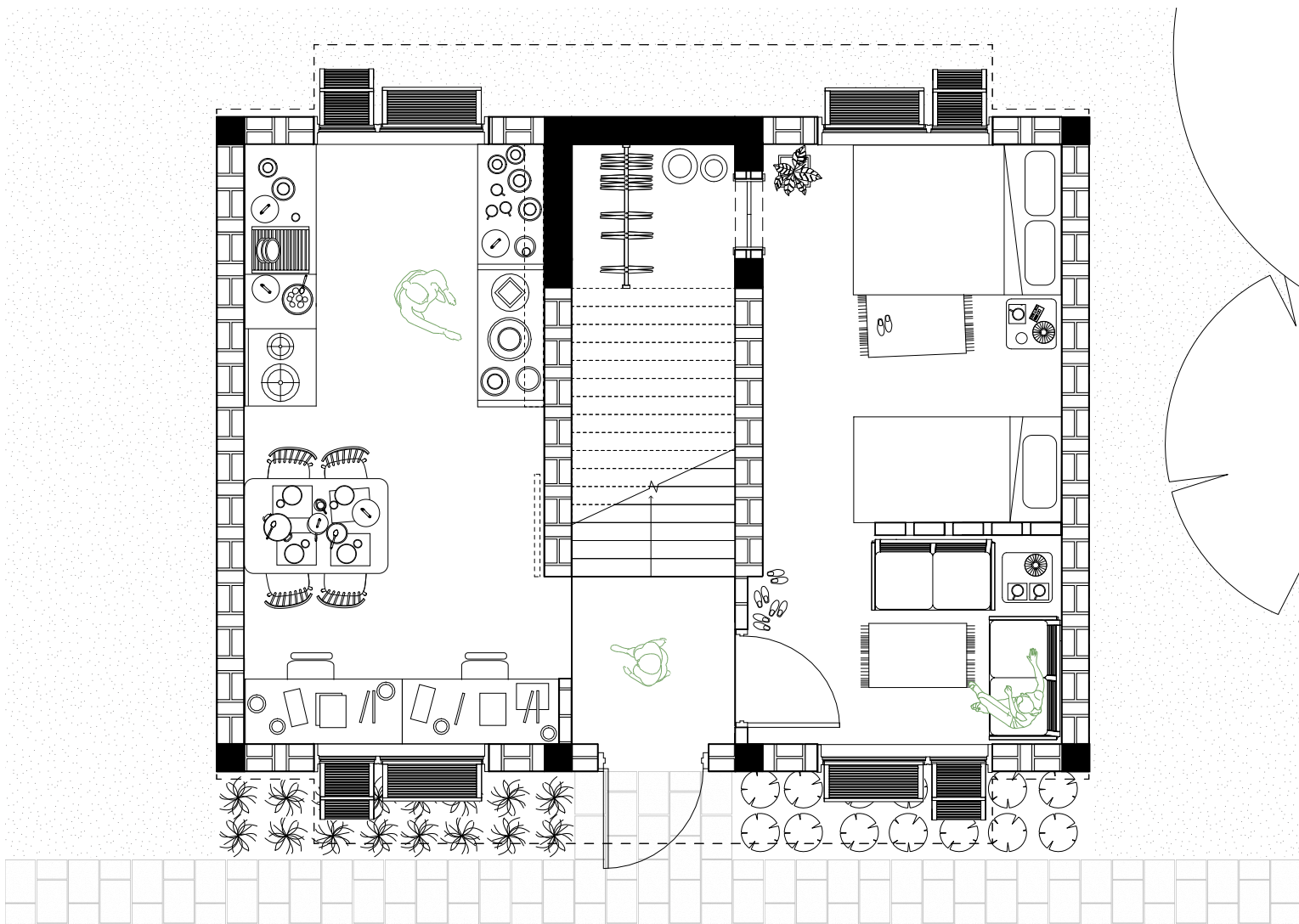
Bazaar Vendor



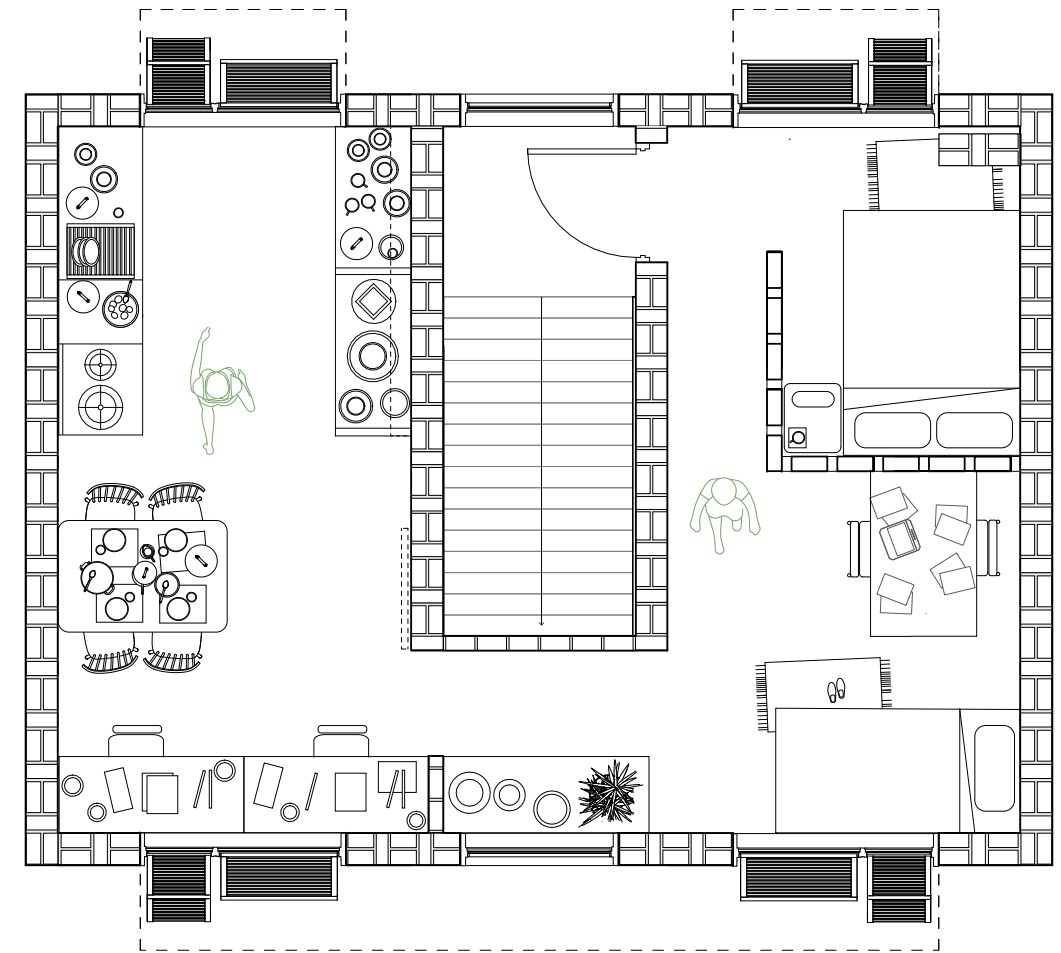
Builder

.....

**Concurrent-Design
Participation**



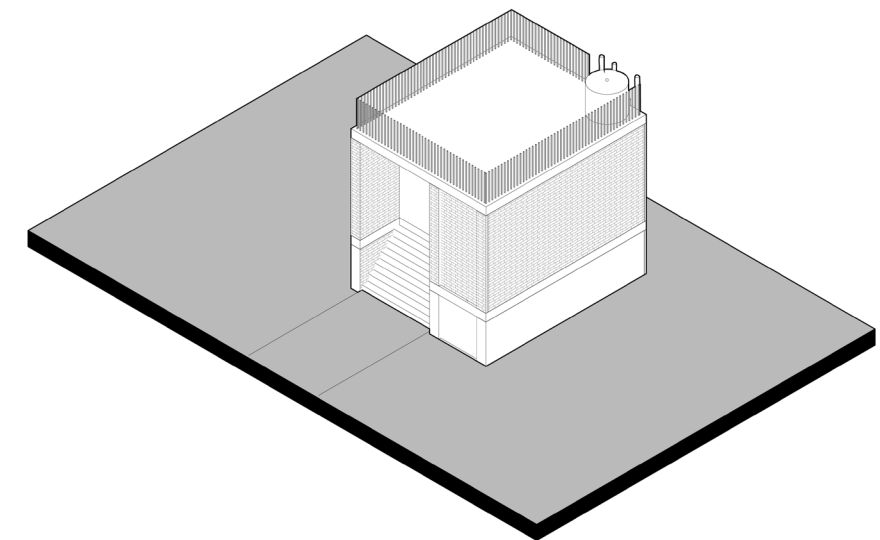
D. Existing plinth and columns - Home added | Ground Floor Plan

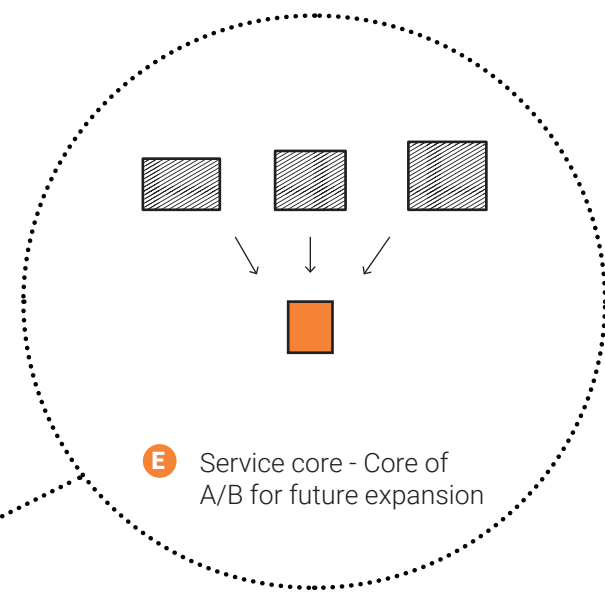
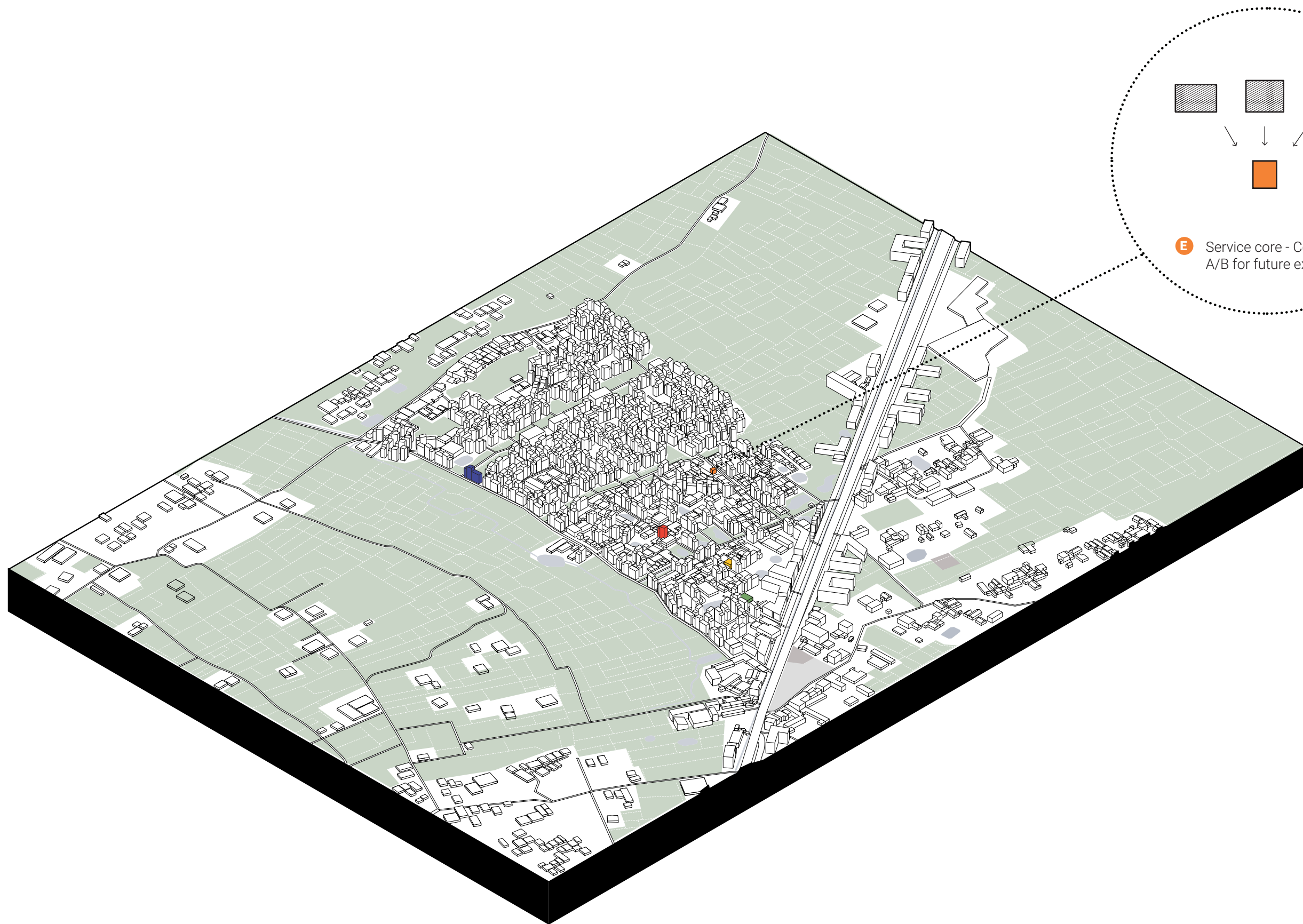


D. Existing plinth and columns - Home added | Level 1



*E. Service Core - Core of A/B
for Future Expansion*

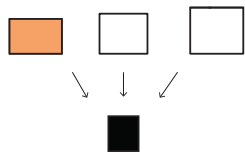




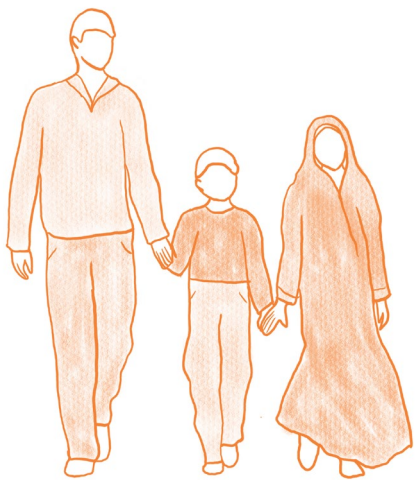
Family 1



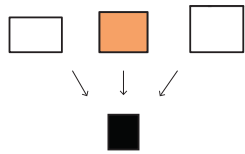
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Family 2



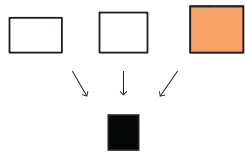
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Family 3



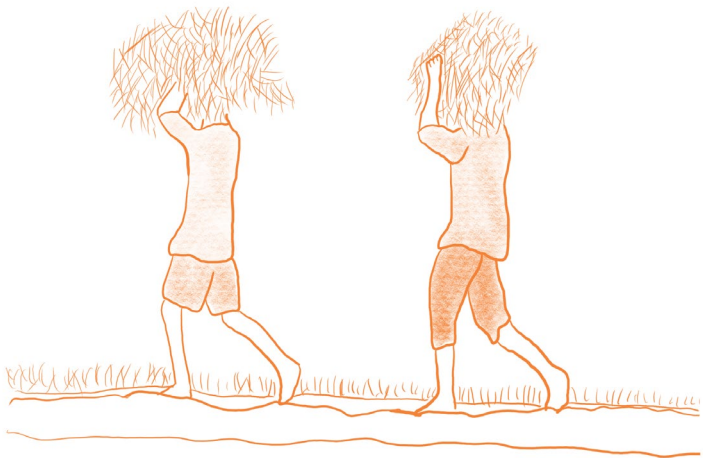
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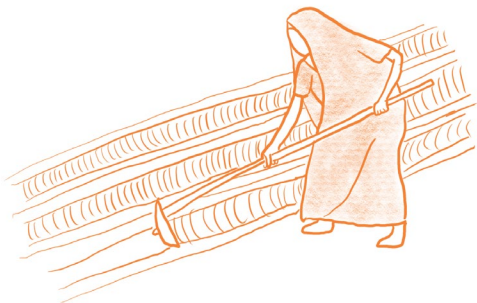
Income Generation Opportunities



Cleaner for the New Health Clinic



Paddy Farming



Vegetable Farming



Cocciopesto Production

.....

Concurrent-Design Participation



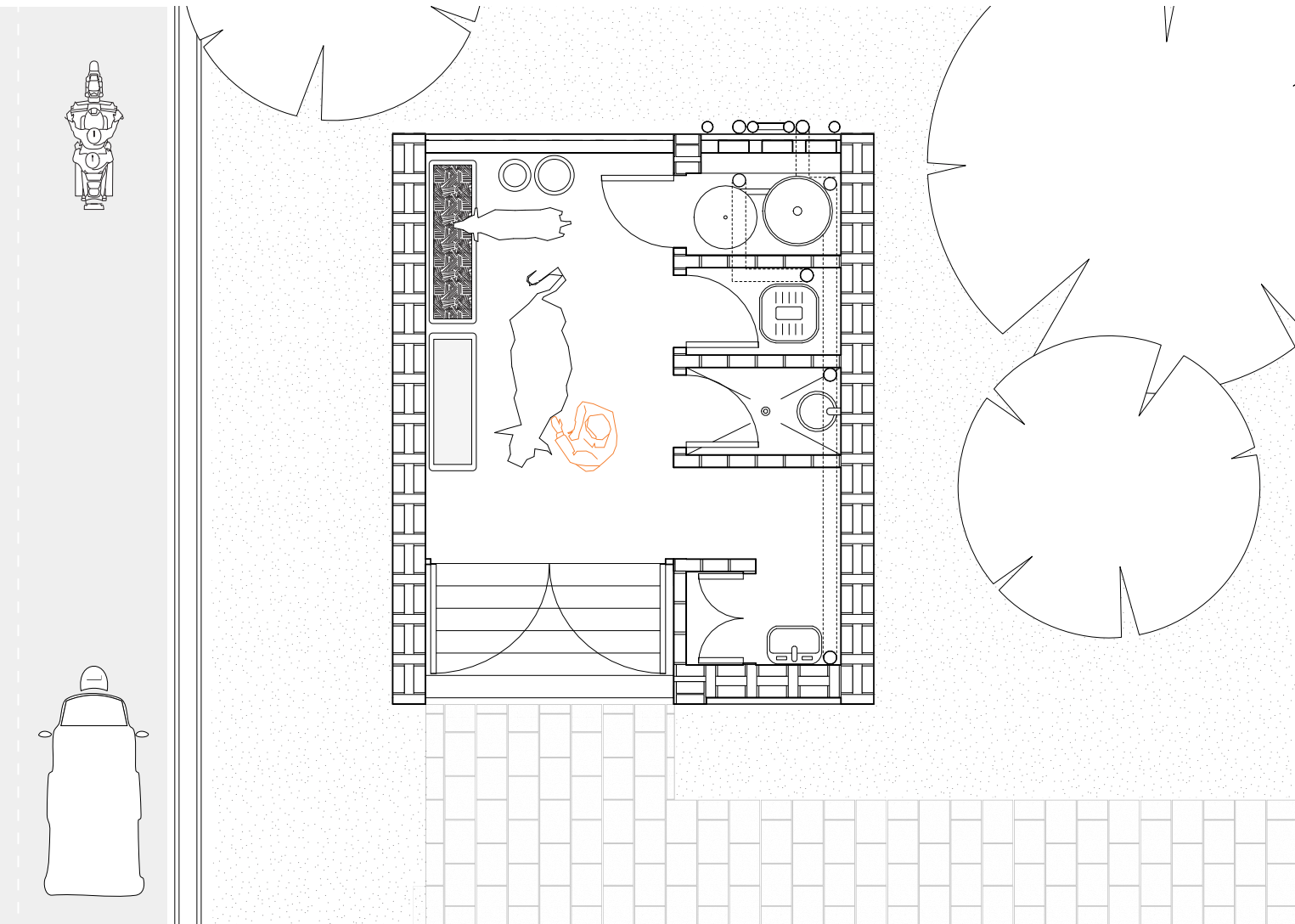
Existing Water and Sanitation Conditions in Shonatola Village



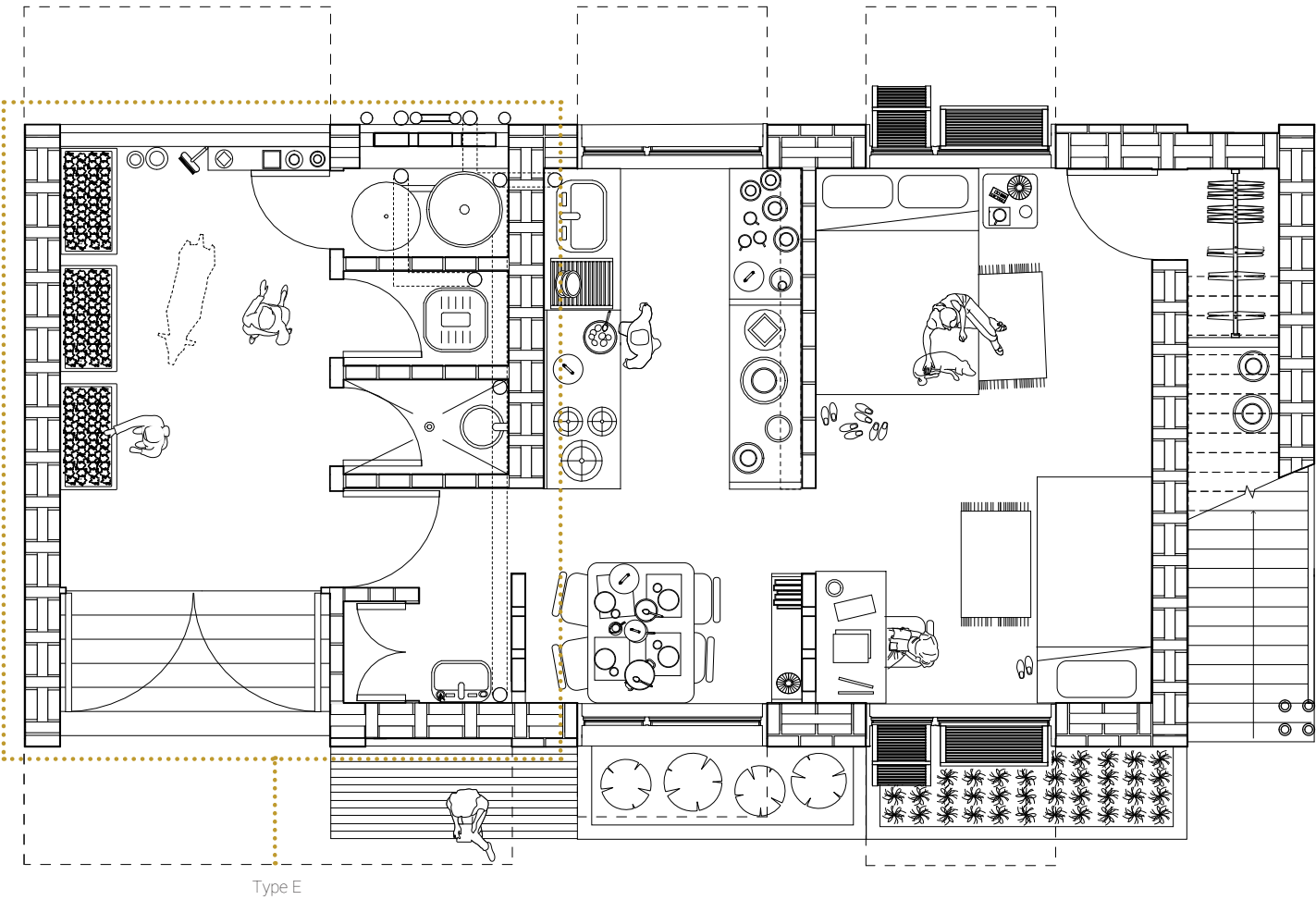
key
 housing
 kitchen
 toilets
 animal shed



Precedent: Jhenaidah Community Upgrading |Co.Creation.Architects, Jhenaidah, Bangladesh

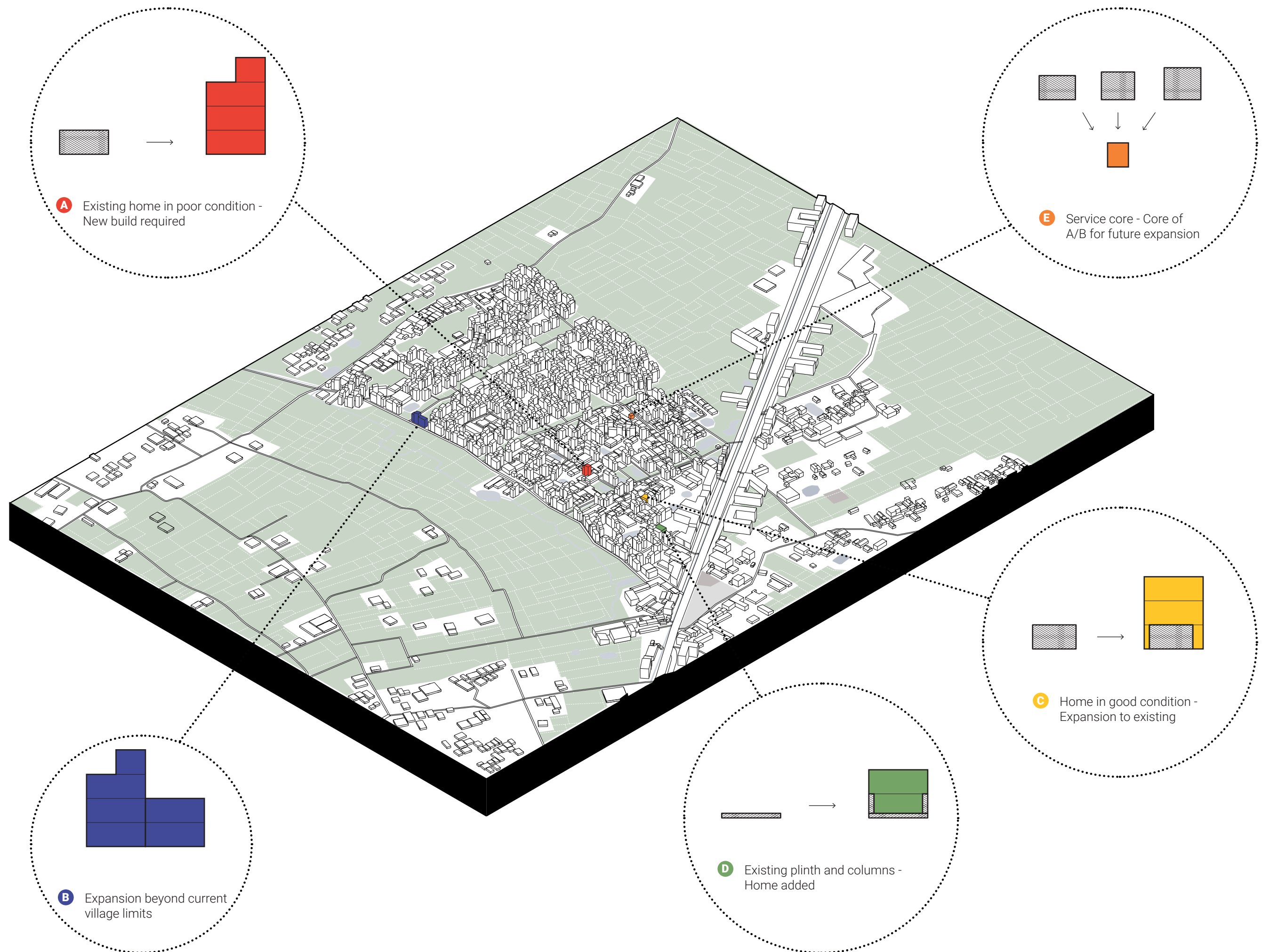


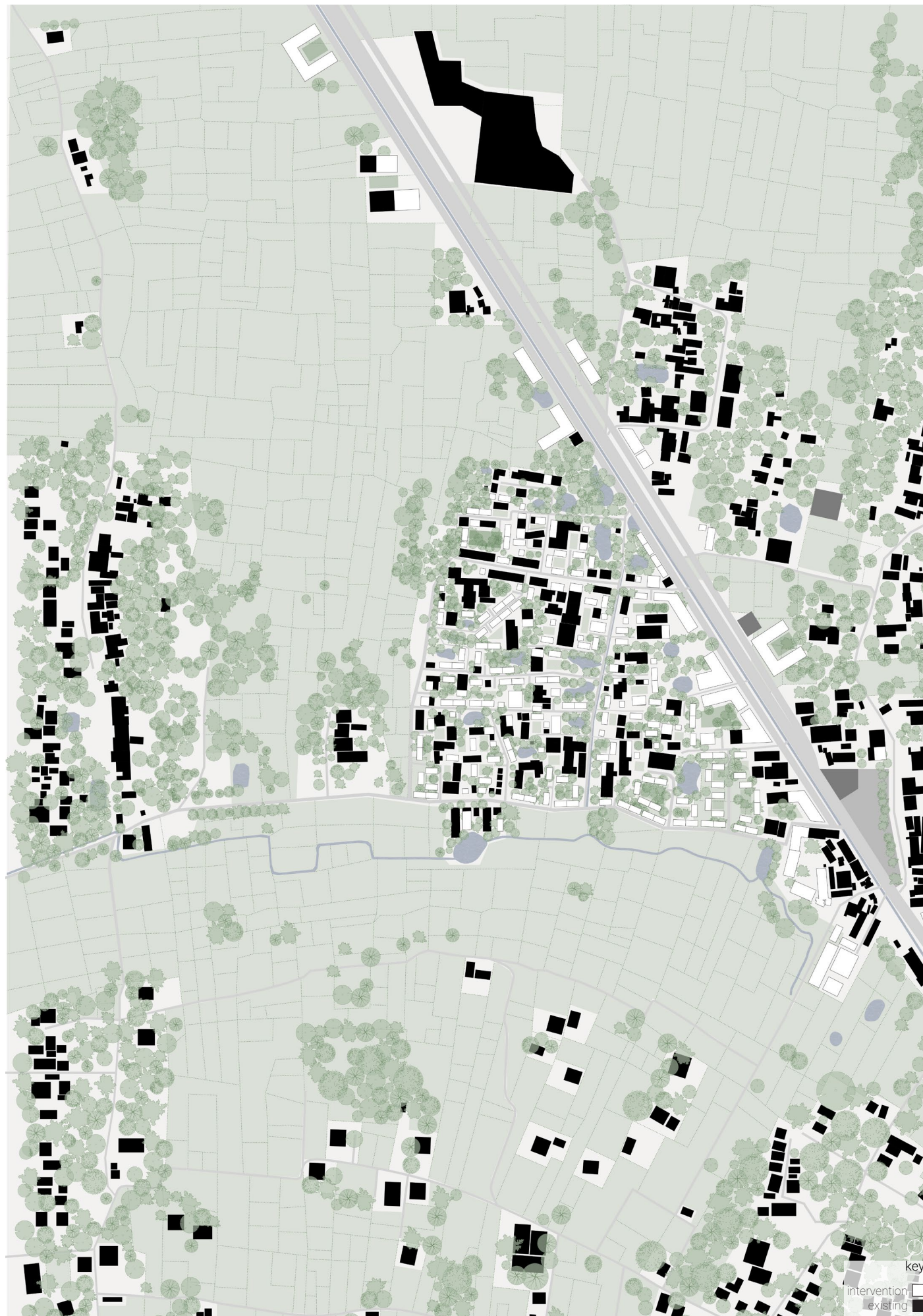
E. Service core - Core of A/B for future expansion | Ground Floor Plan



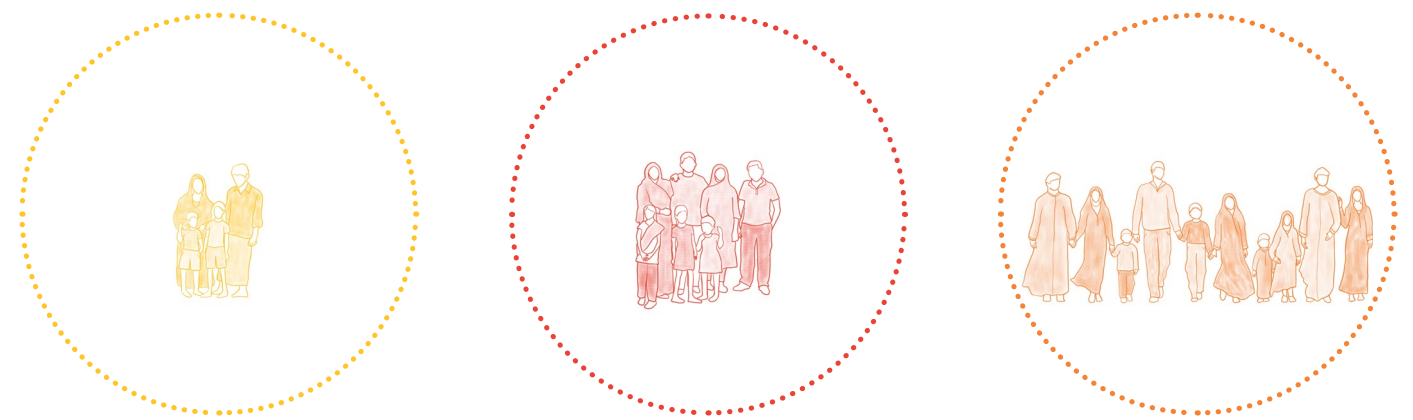
E. Service core - Post Expansion (A.) | Ground Floor Plan



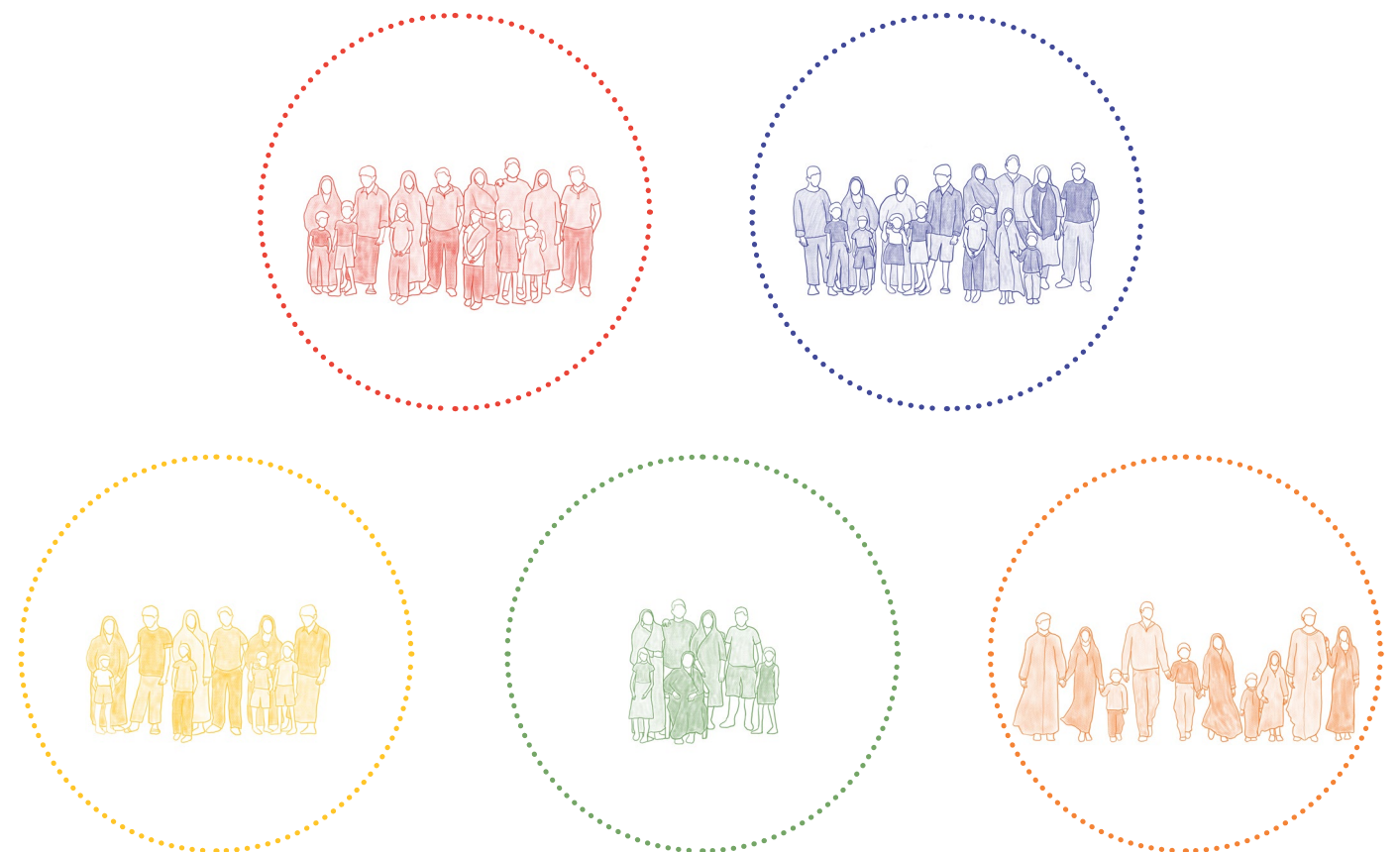




In-Situ Incremental Housing Interventions + Phased Amenity Upgrades

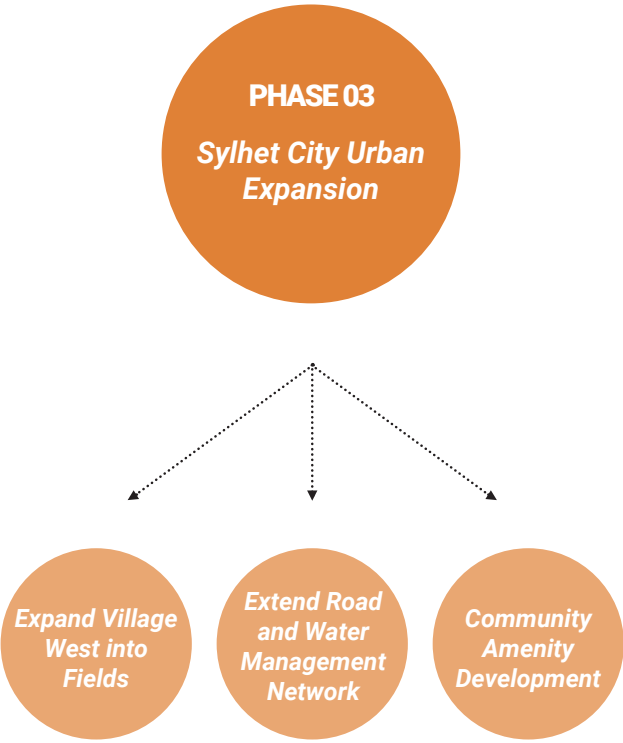


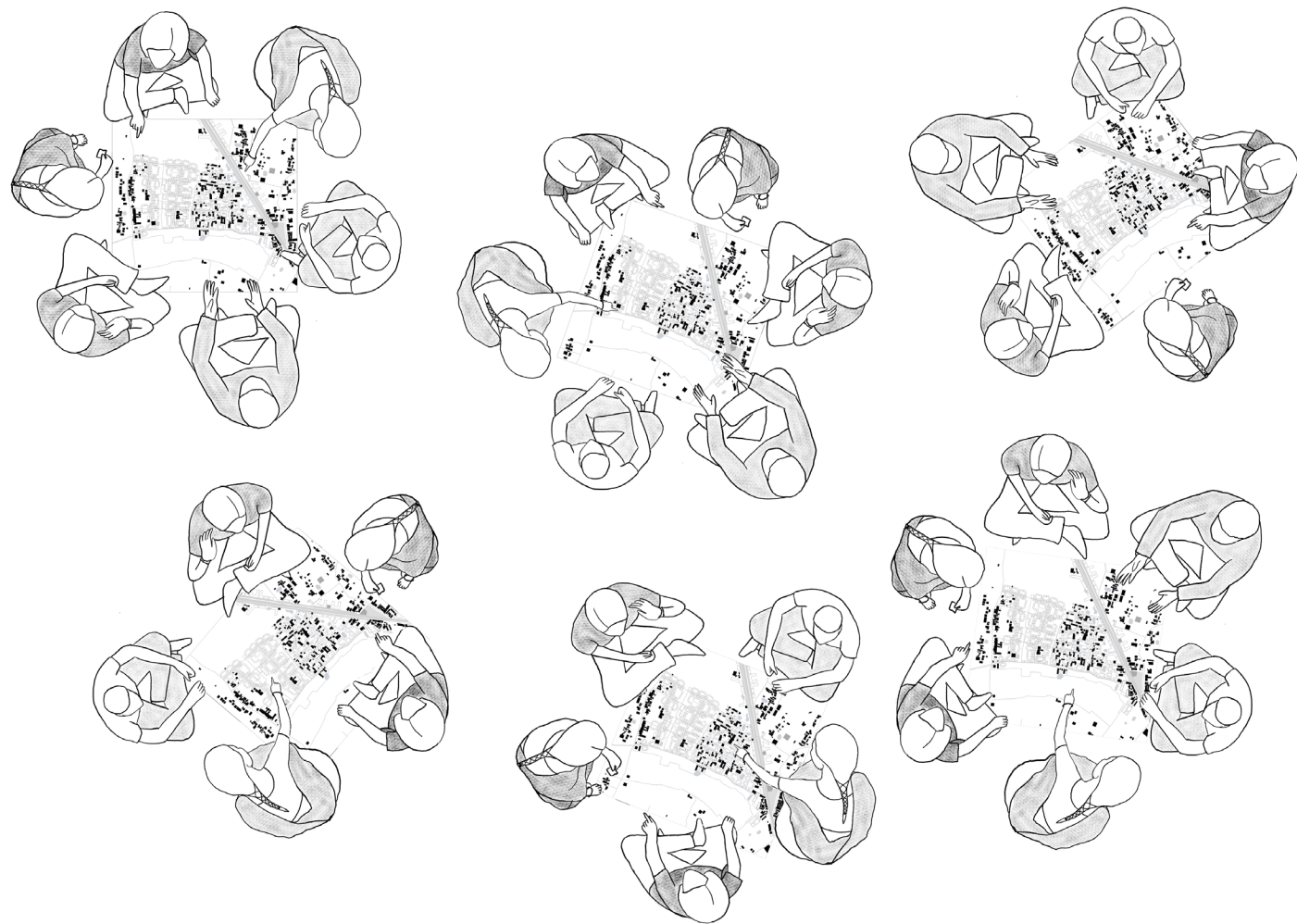
Existing Housed Families in Shonatola Village



New Expanded Housed Families in Shonatola Village

Phase 3



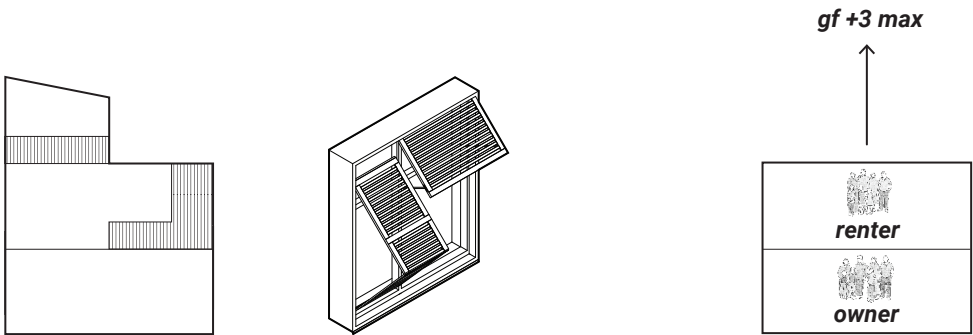
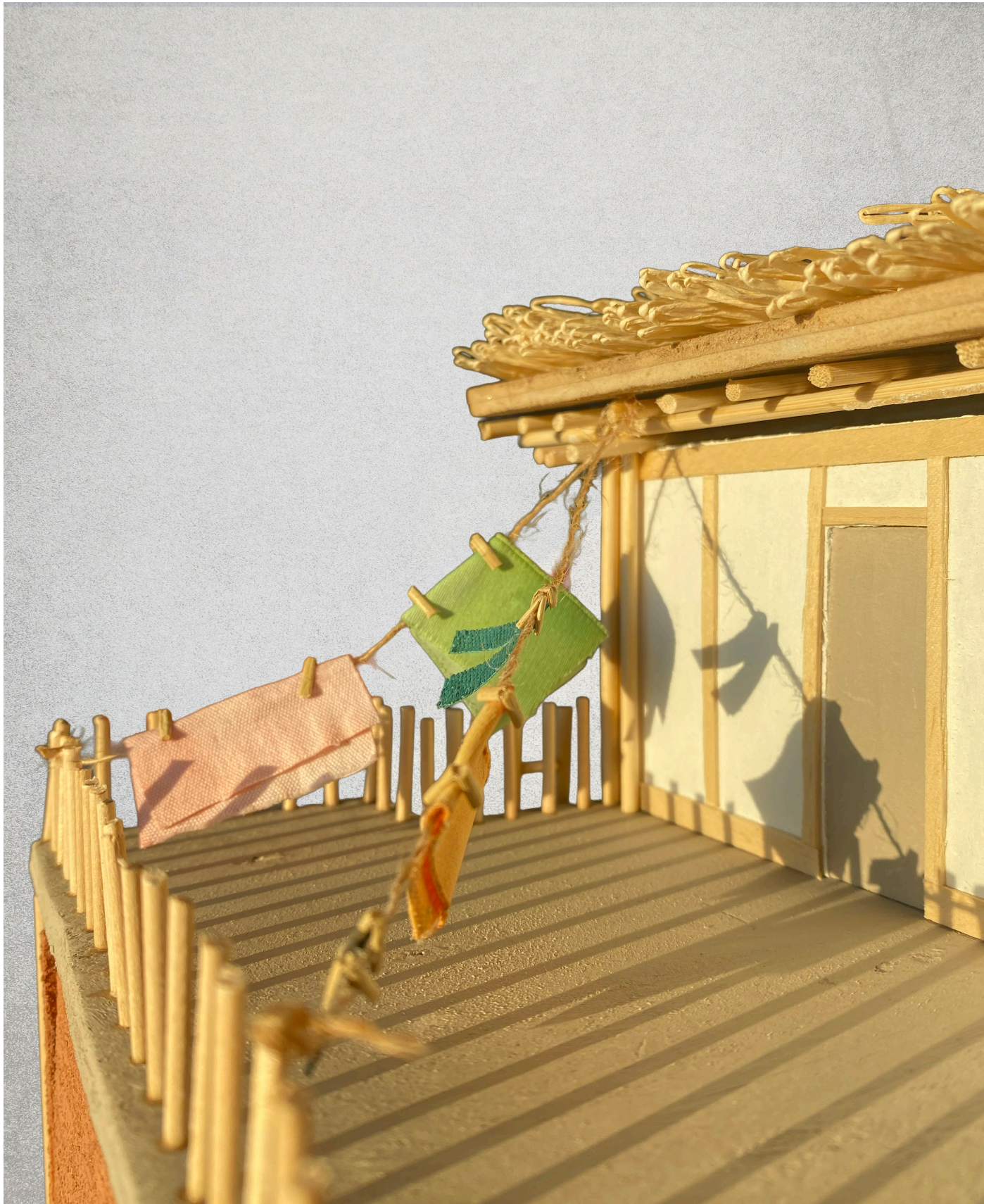


**Community Workshop for New
Amenity Selection**



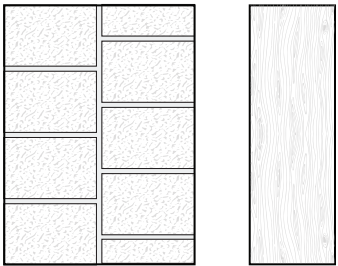
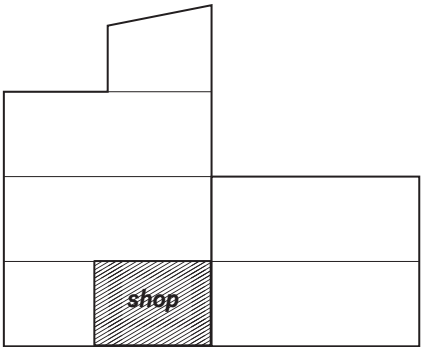
**Pre-Design
Participation**





**Window Shading
+ Balcony Locations**

**Number of
Floors &
Rentability**



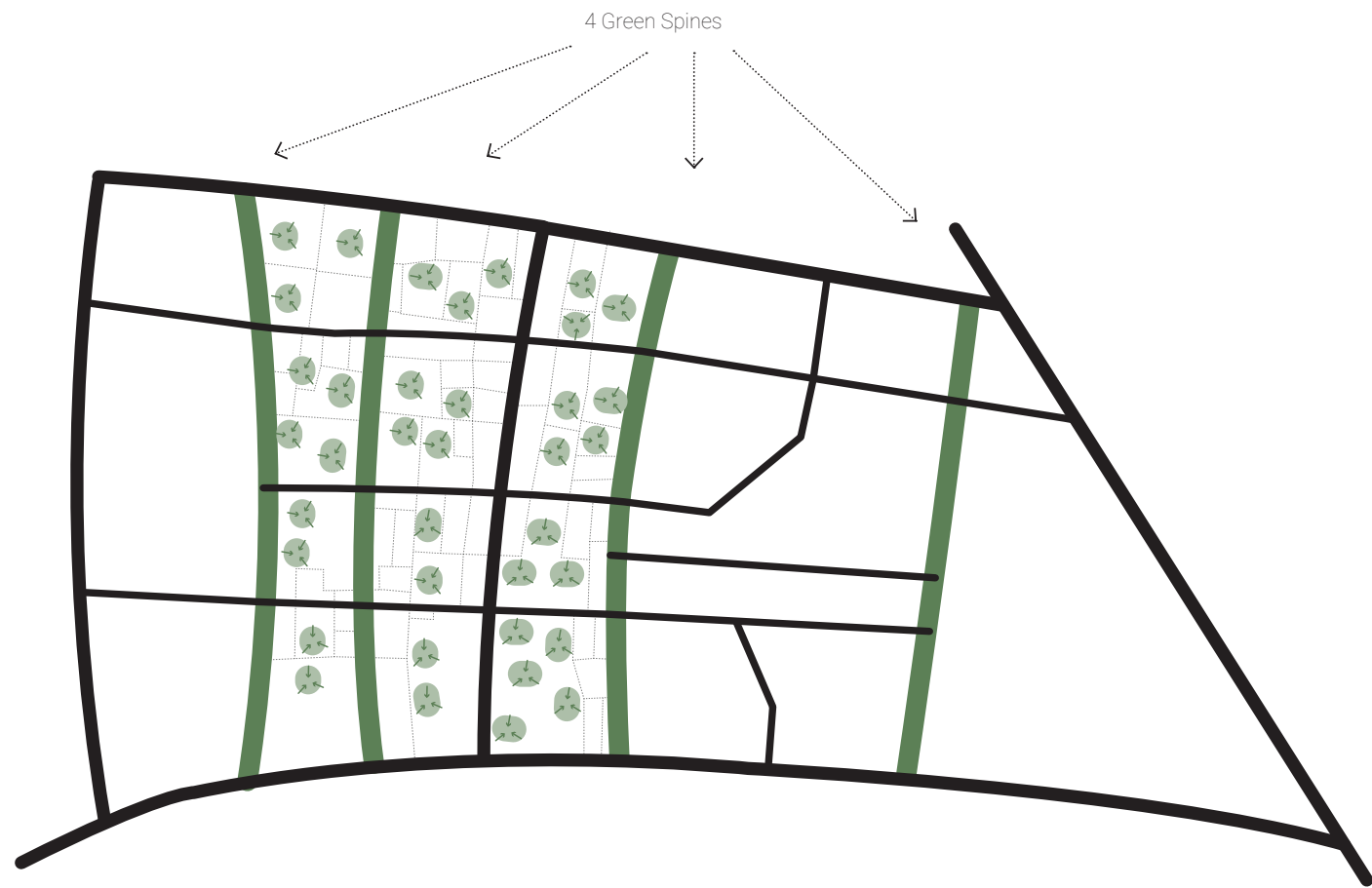
**Ground Floor
Commercial Use**

Interior Finishes

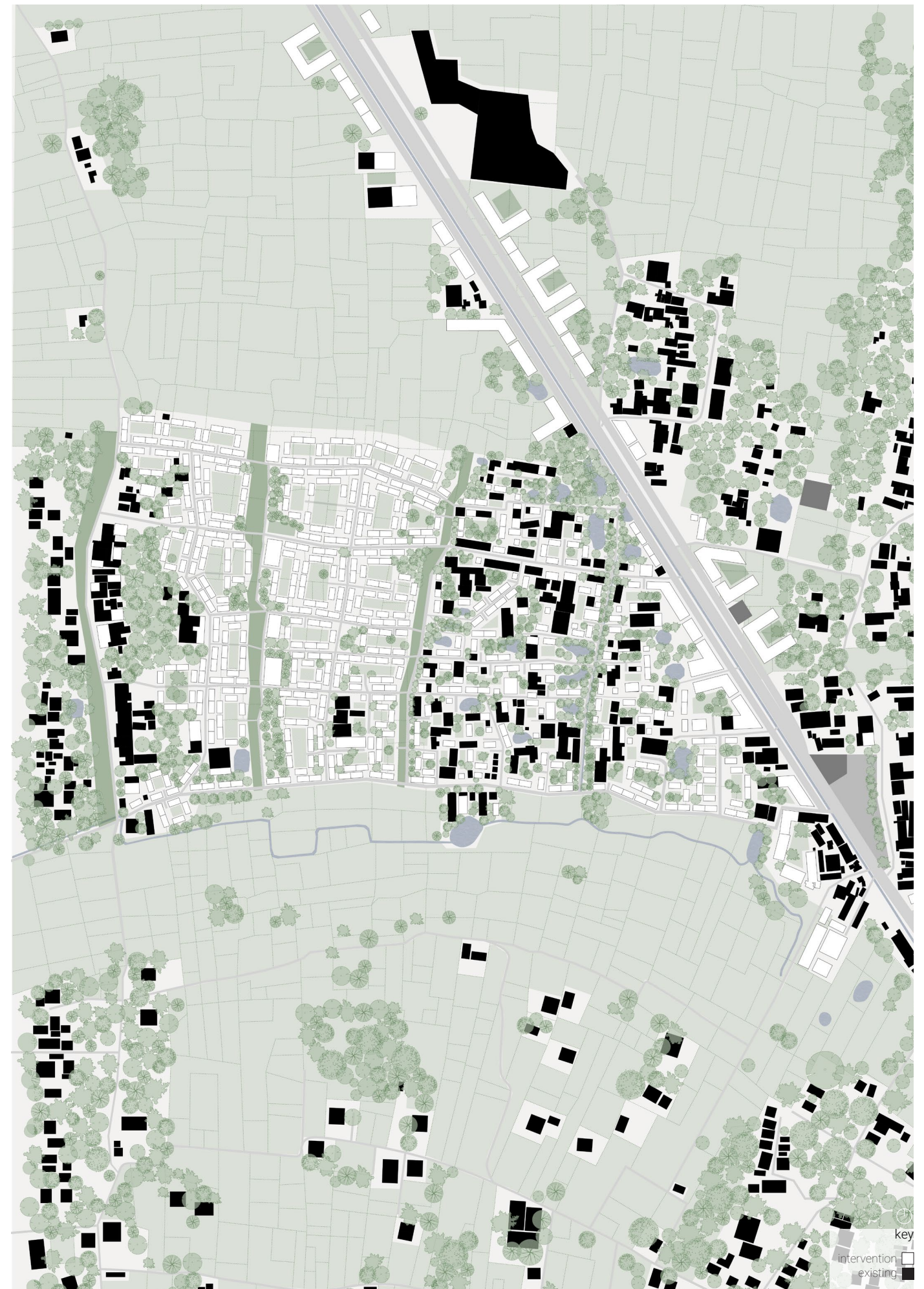
Appropriation of Homes



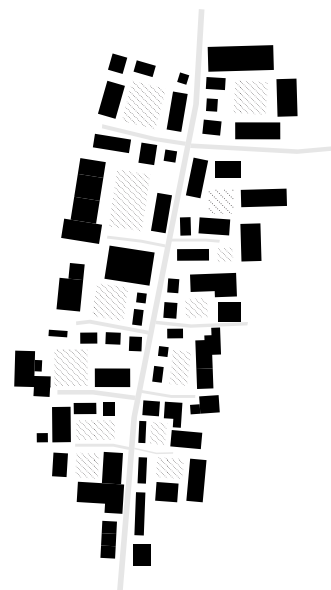
**Post-Design
Participation**



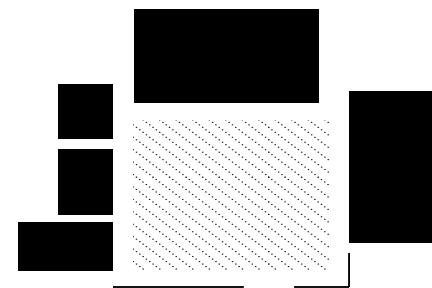
Master Plan Parti



Expansion of Village West into Fields - Dwellings



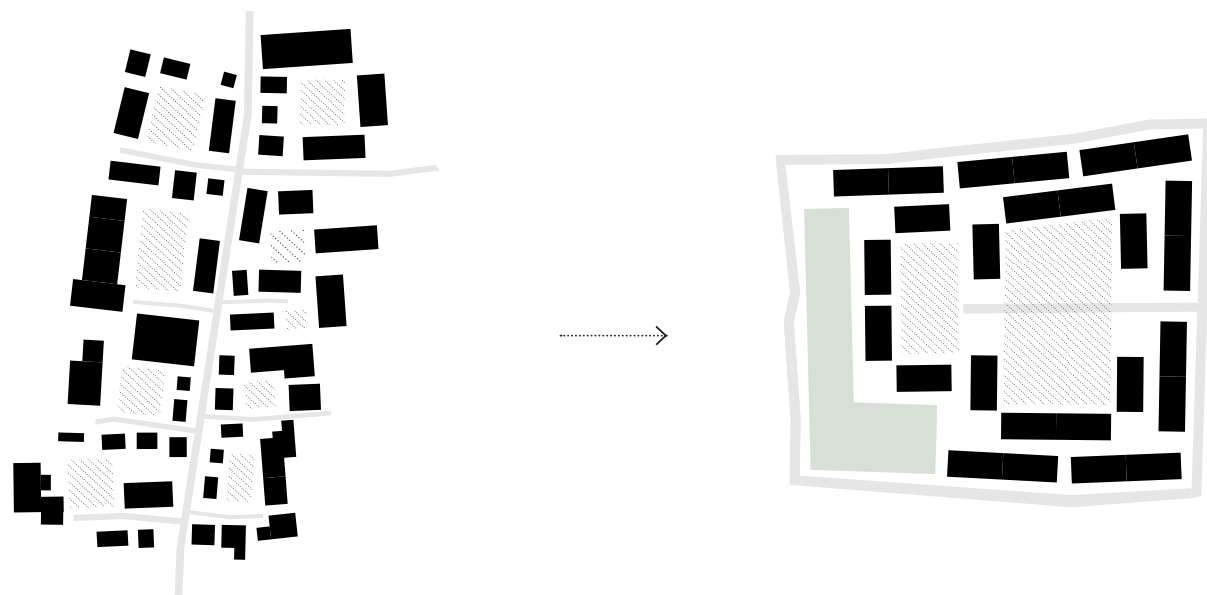
**Existing Organic
Patterns**



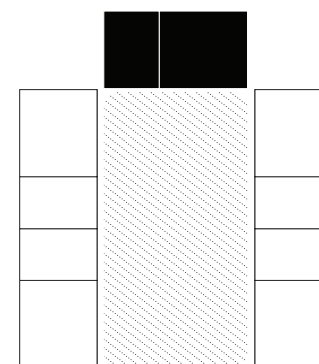
**Vernacular Courtyard
Typology**



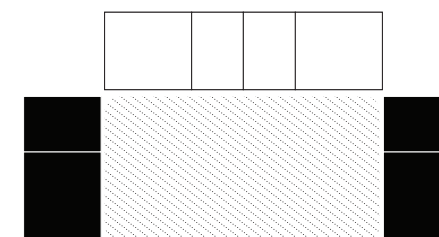
Transition of Public to Private Space



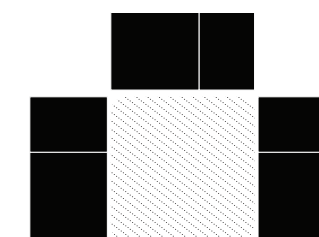
Formalizing Patterns



Cluster 1 | $A, B, B = 43ppl$

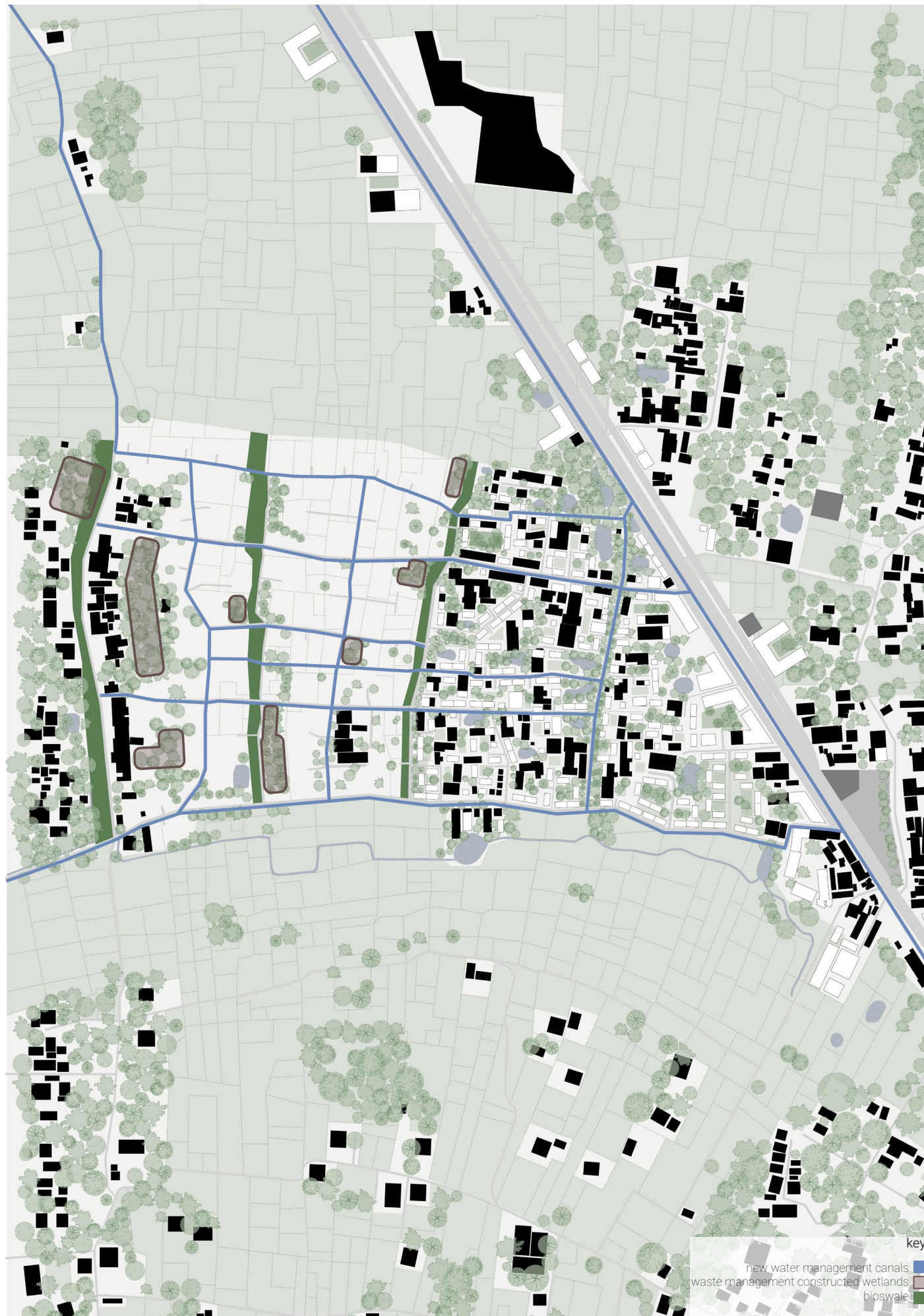


Cluster 2 | $A, A, B = 38ppl$



Cluster 3 | $A, A, A = 33ppl$

Cluster Rule of Thumb

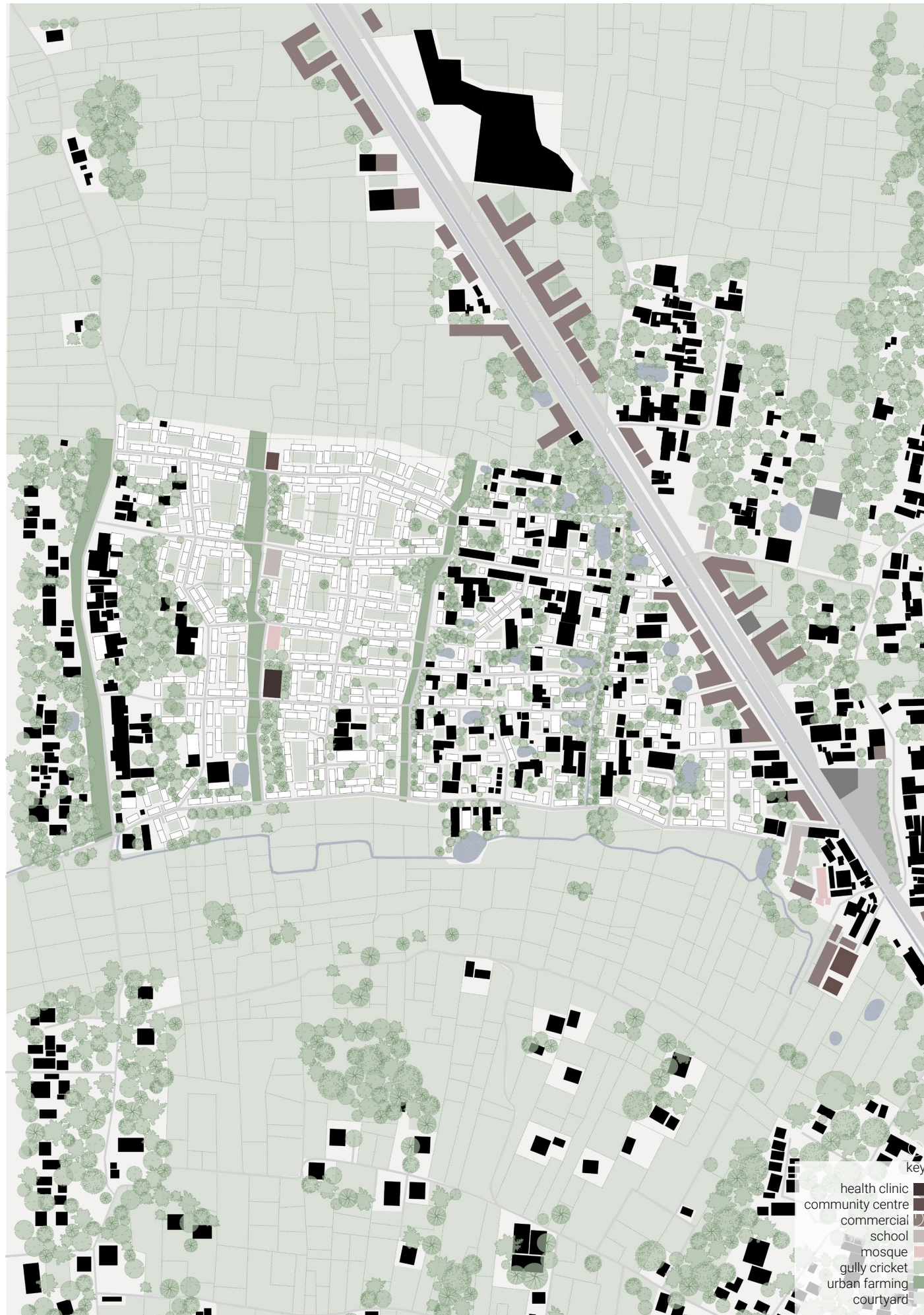


Infrastructure - Expansion of Roads and Water and Waste Management

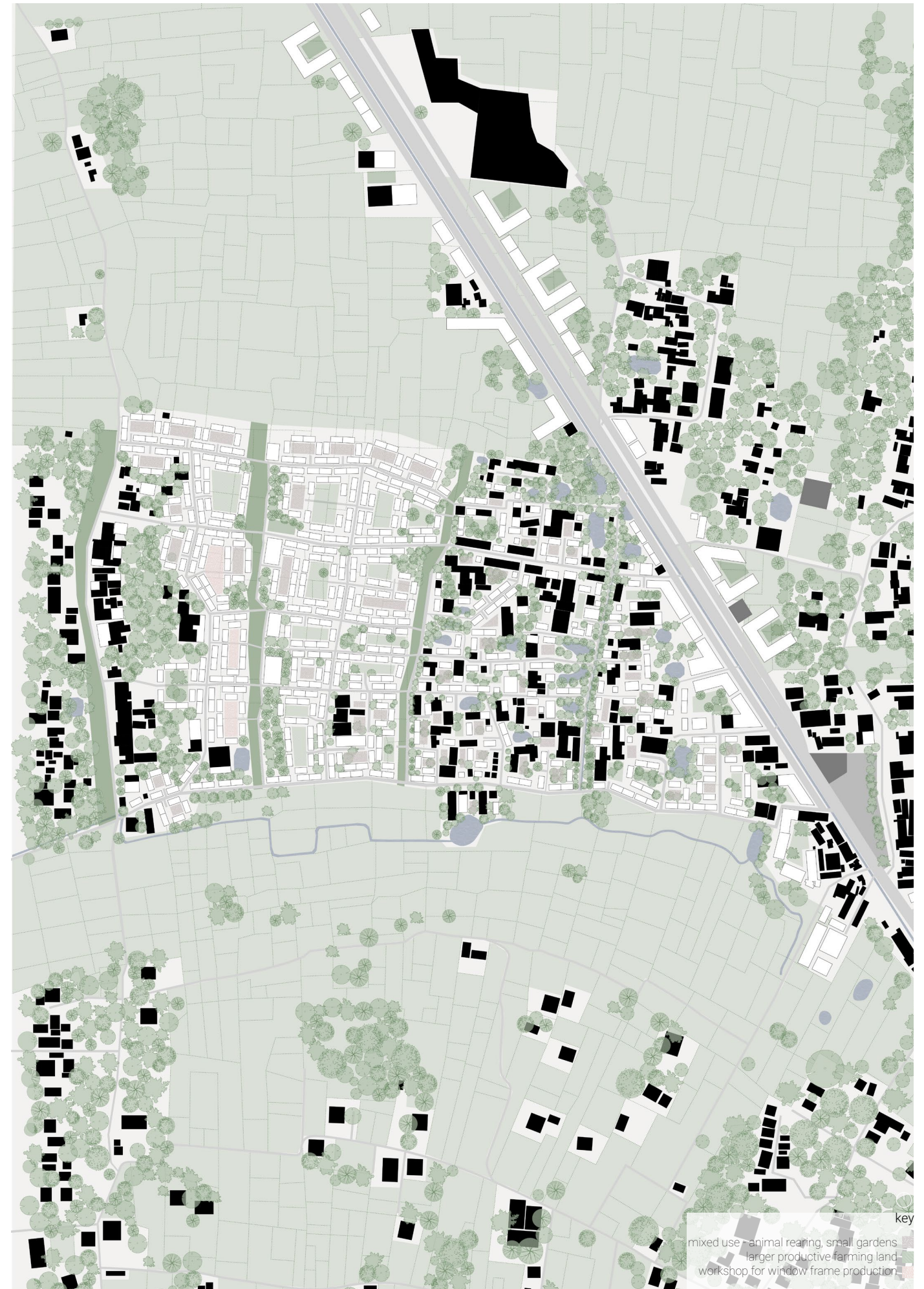


Proposed Intervention Building Types





New Community Amenity Uses



Courtyard Uses

Residential

A - 200
B - 159
C - 47
D - 7
E - 25

Total New Dwellings = 572

Existing Dwellings = 241

Total dwellings = 813

Housing Type

40% lower income
40% middle income
20% higher income

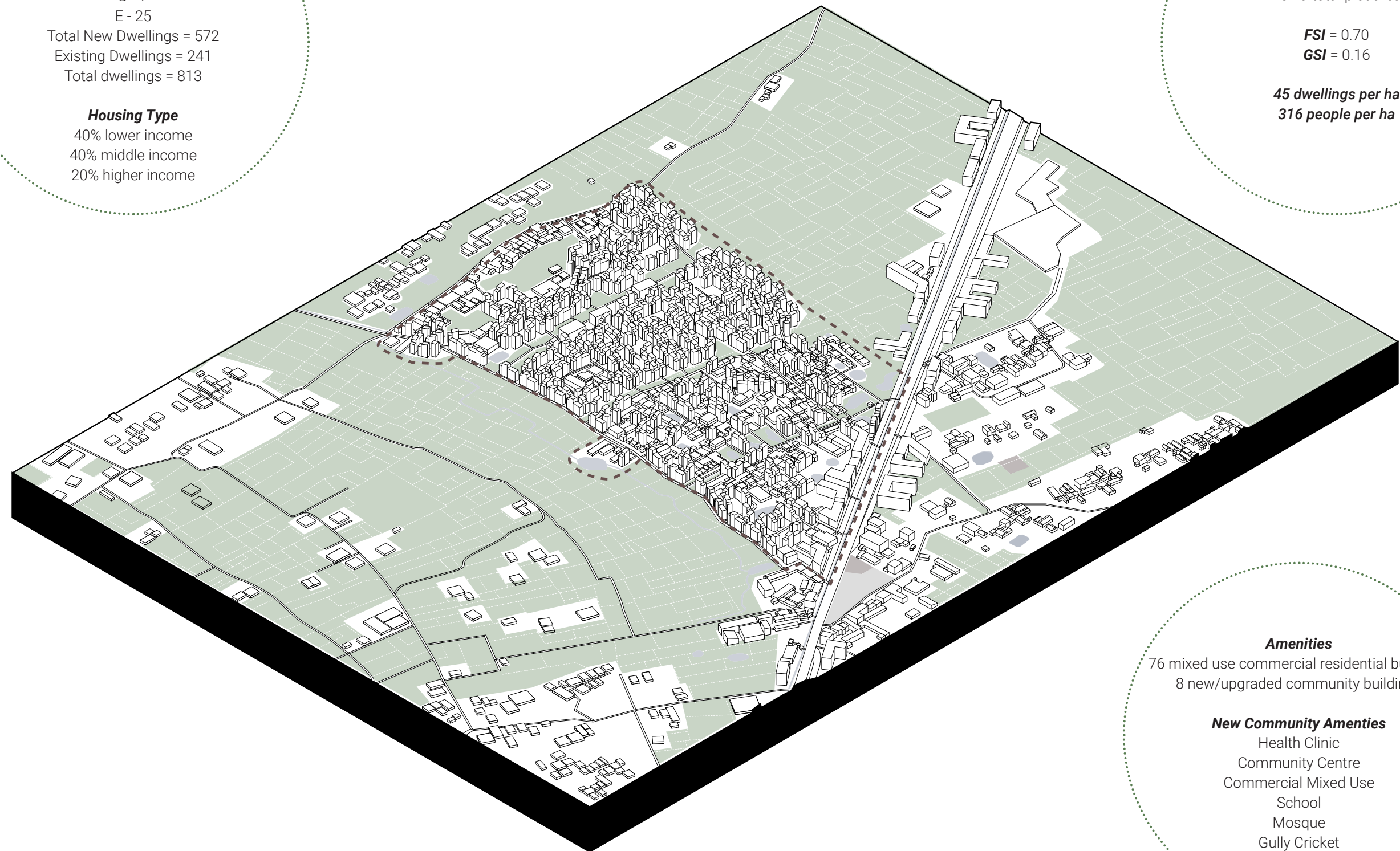
Land

10 ha agricultural land
8 ha Shonatola village
18 ha total plot area

FSI = 0.70

GSI = 0.16

45 dwellings per ha
316 people per ha

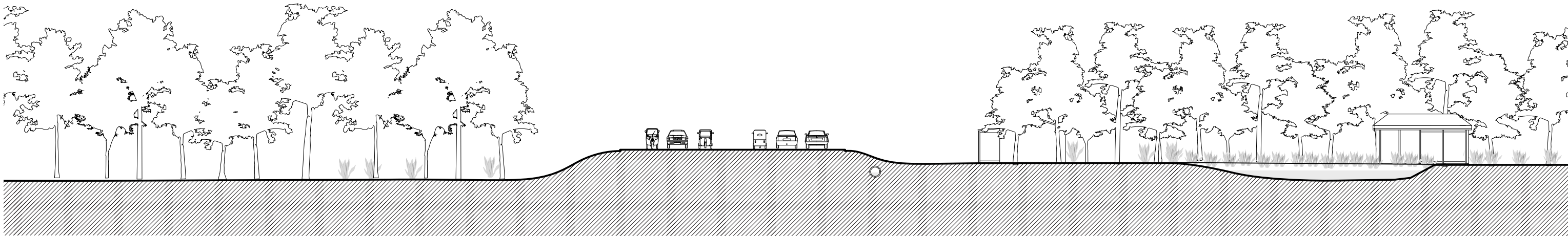


Amenities

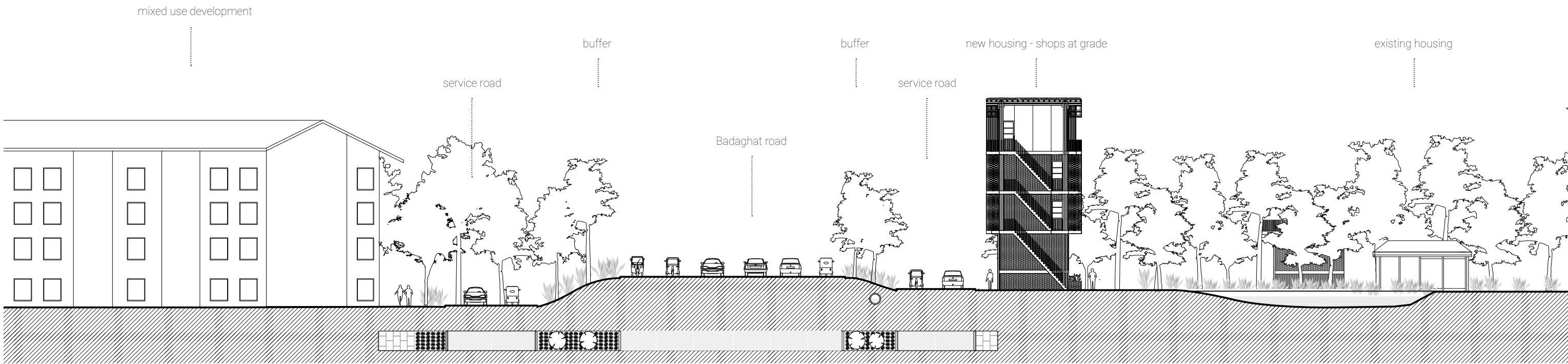
76 mixed use commercial residential buildings
8 new/upgraded community buildings

New Community Amenities

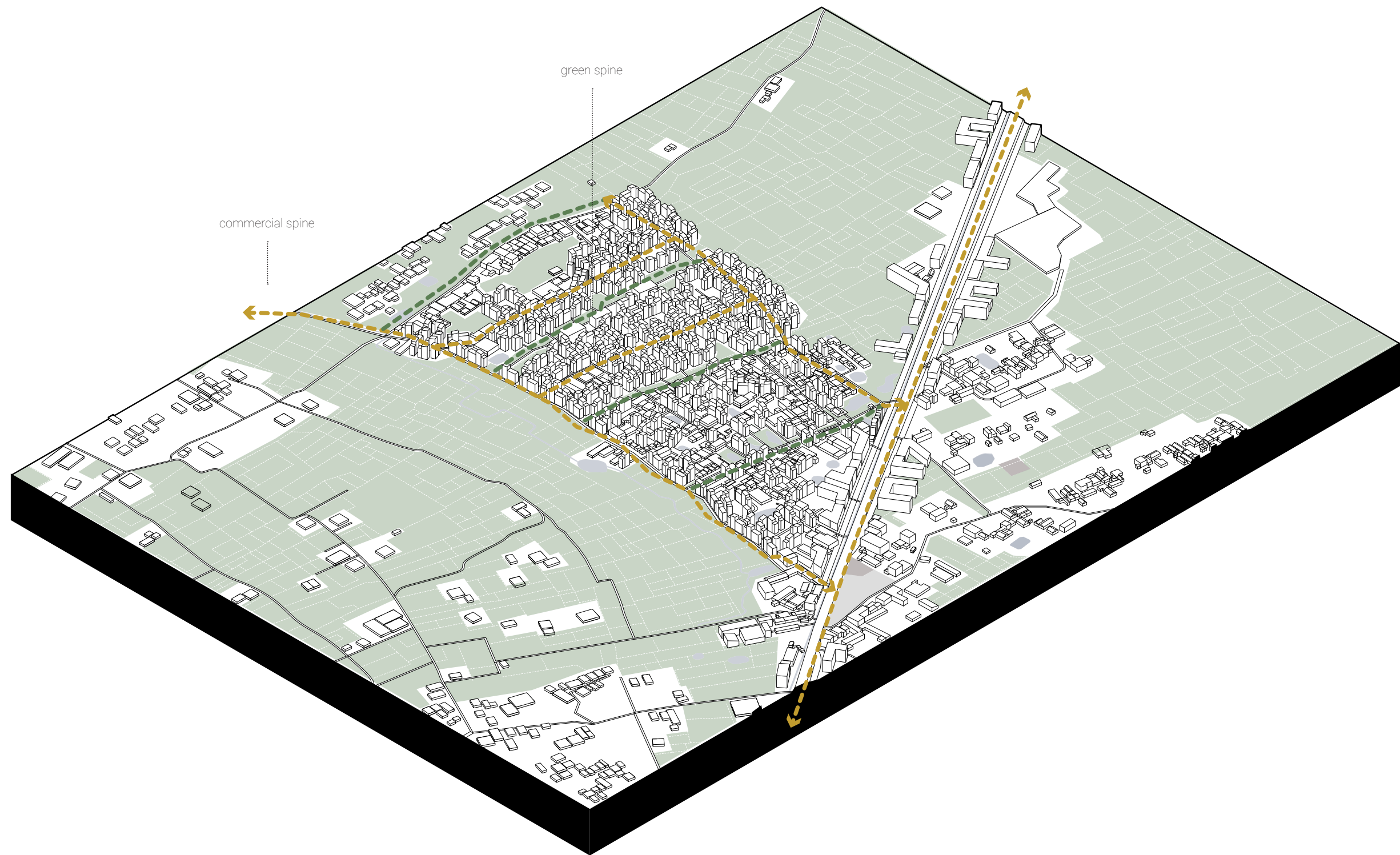
Health Clinic
Community Centre
Commercial Mixed Use
School
Mosque
Gully Cricket
Urban Farming



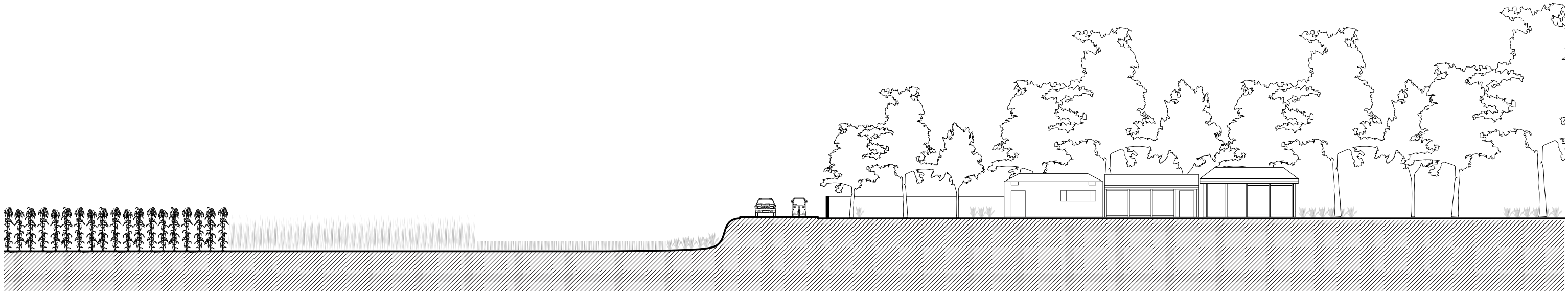
Existing | Site Section - Badaghat Road



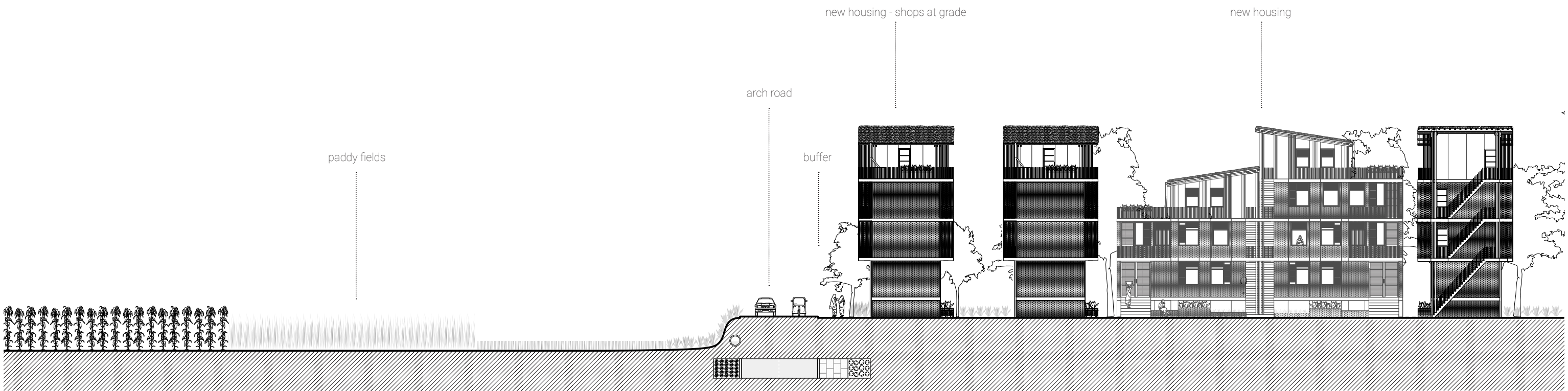
Proposed | Site Section - Badaghat Road







Existing | Site Section - South Paddy Fields



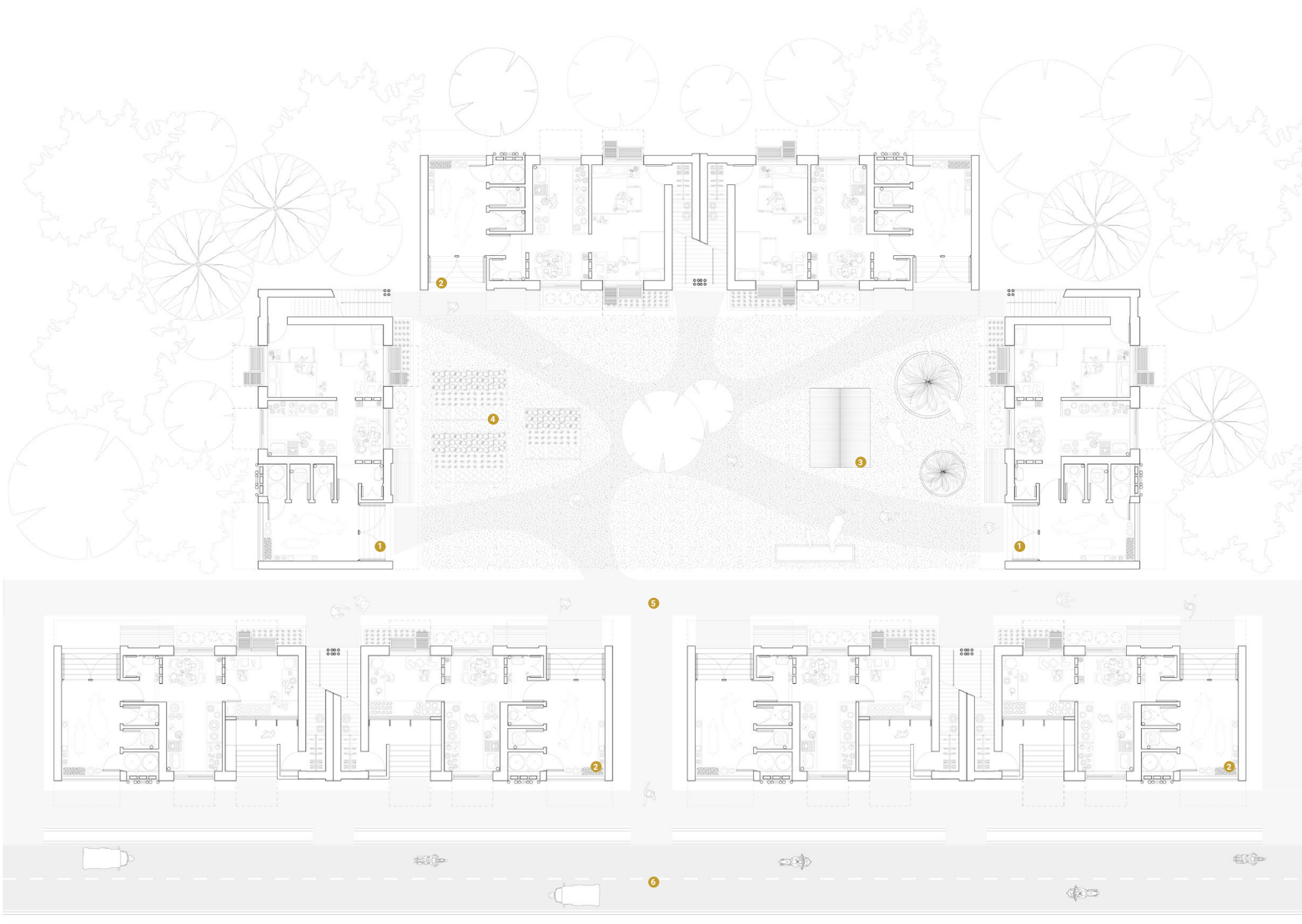
Proposed | Site Section - South Paddy Fields



- key
- animal rearing 1
 - raised planter farming 2
 - gully cricket 3
 - green space along spine 4

Cluster Plan

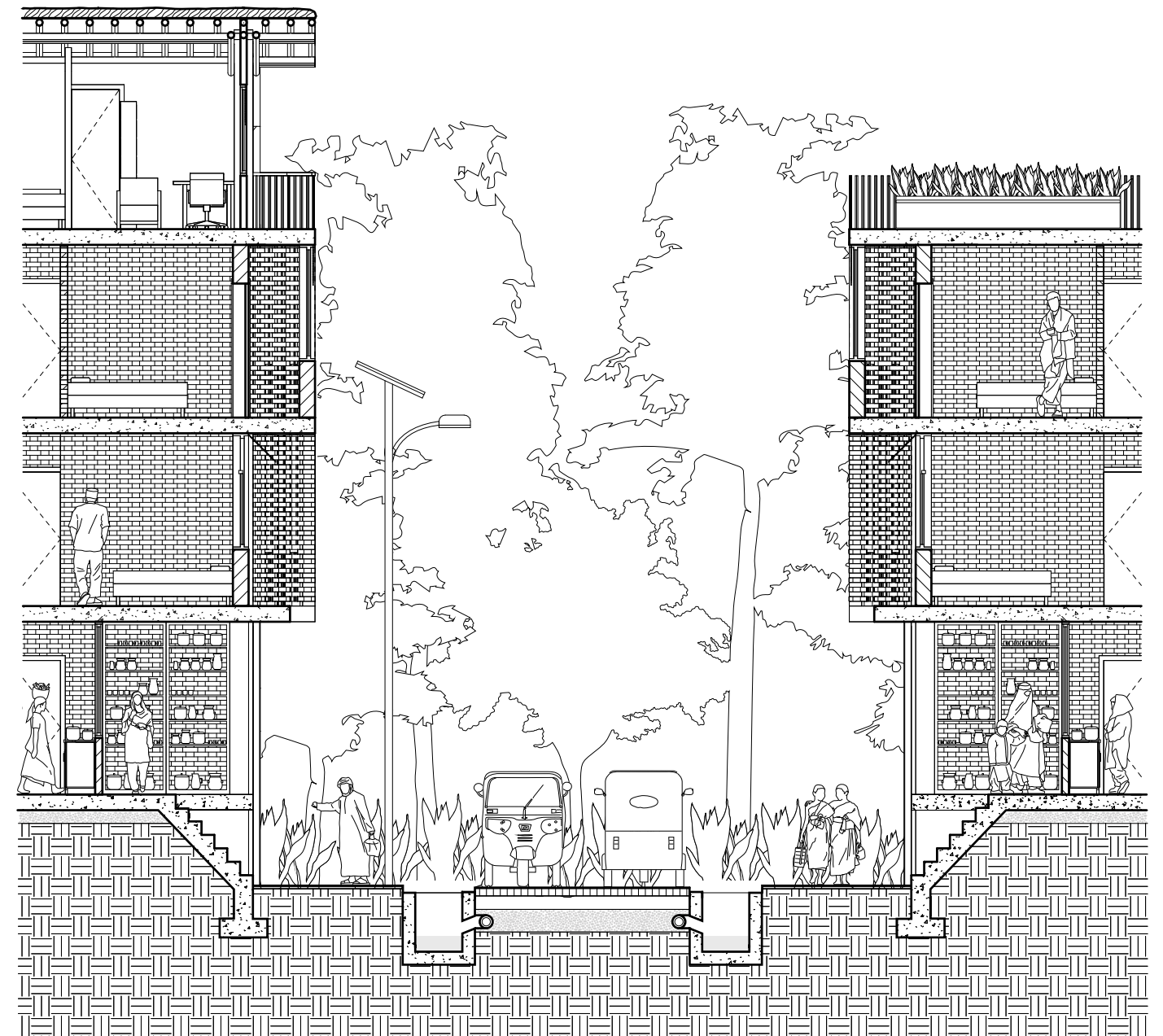




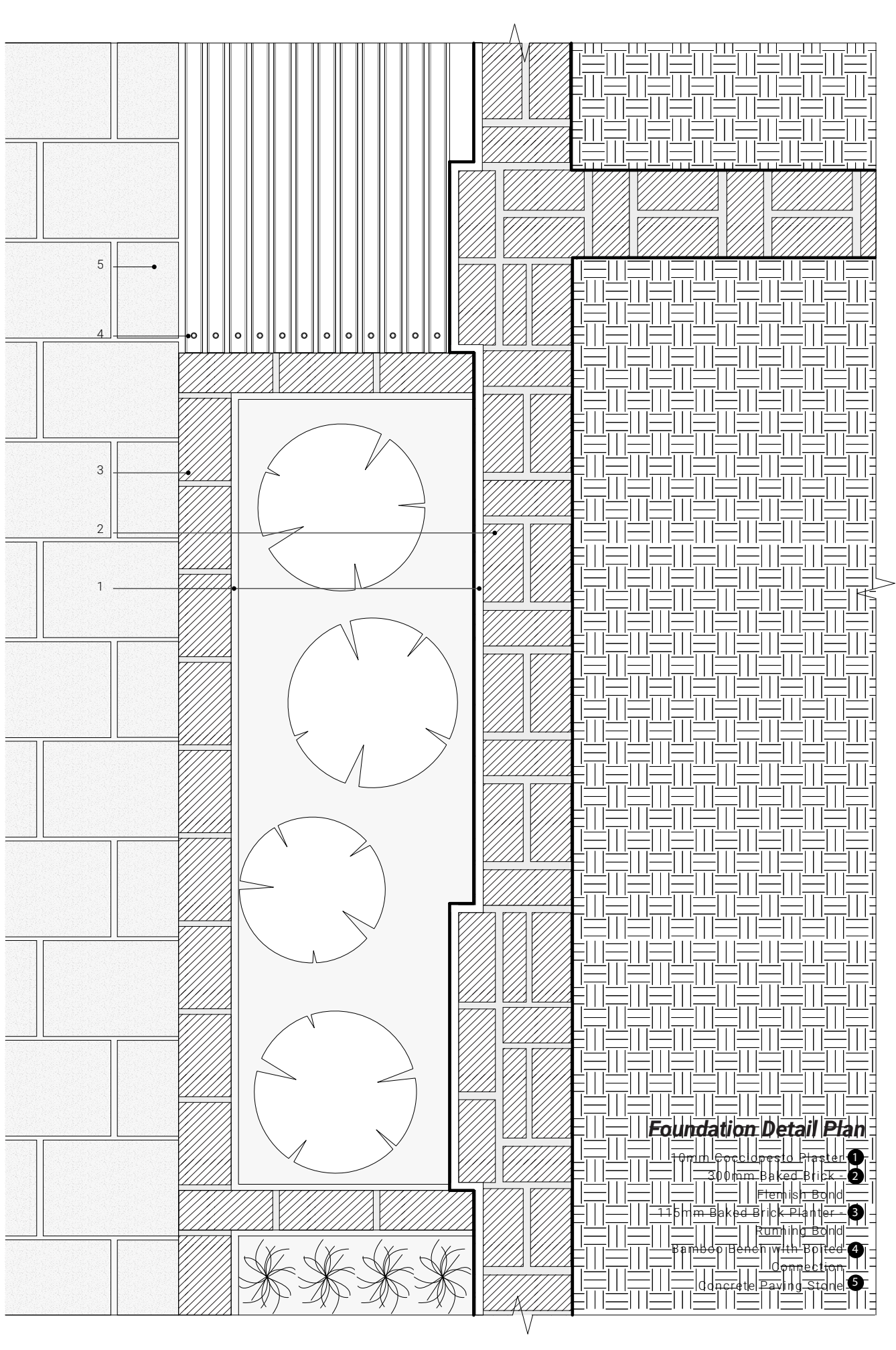
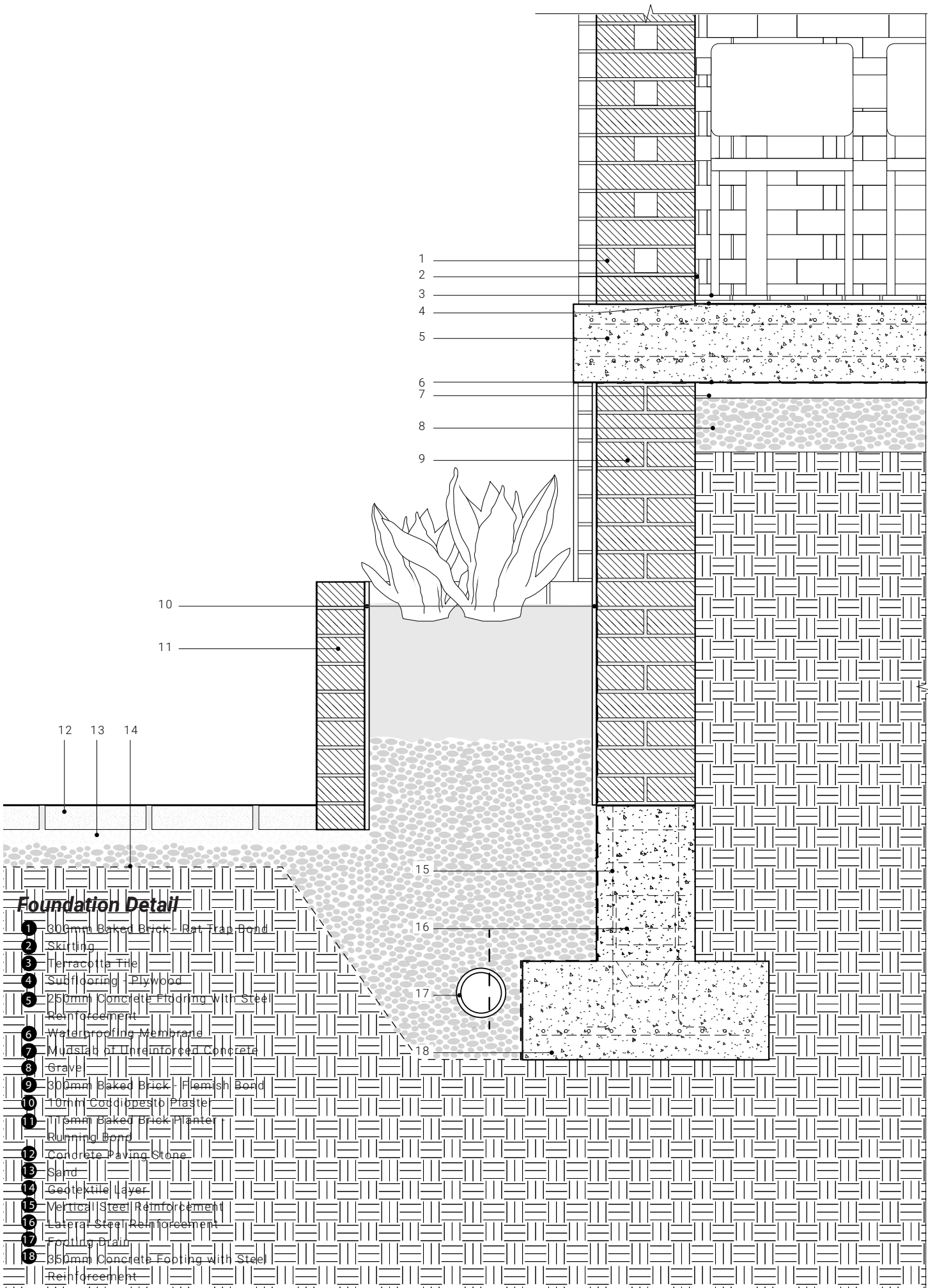
Cluster Plan

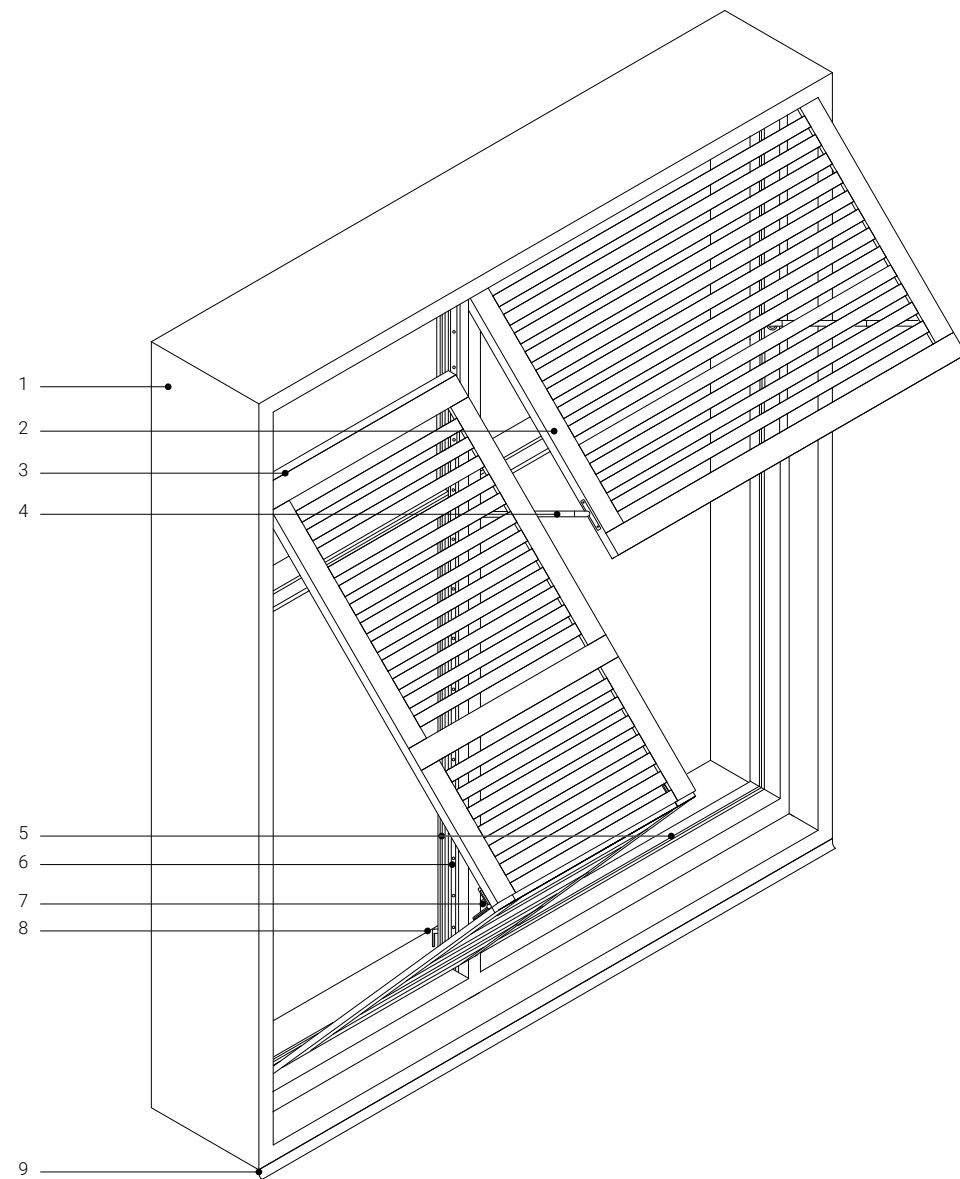
key

- type A housing 1
- type B housing 2
- animal rearing 3
- raised planter farming 4
- secondary road 5
- primary road 6



Commercial Spine | Street Section

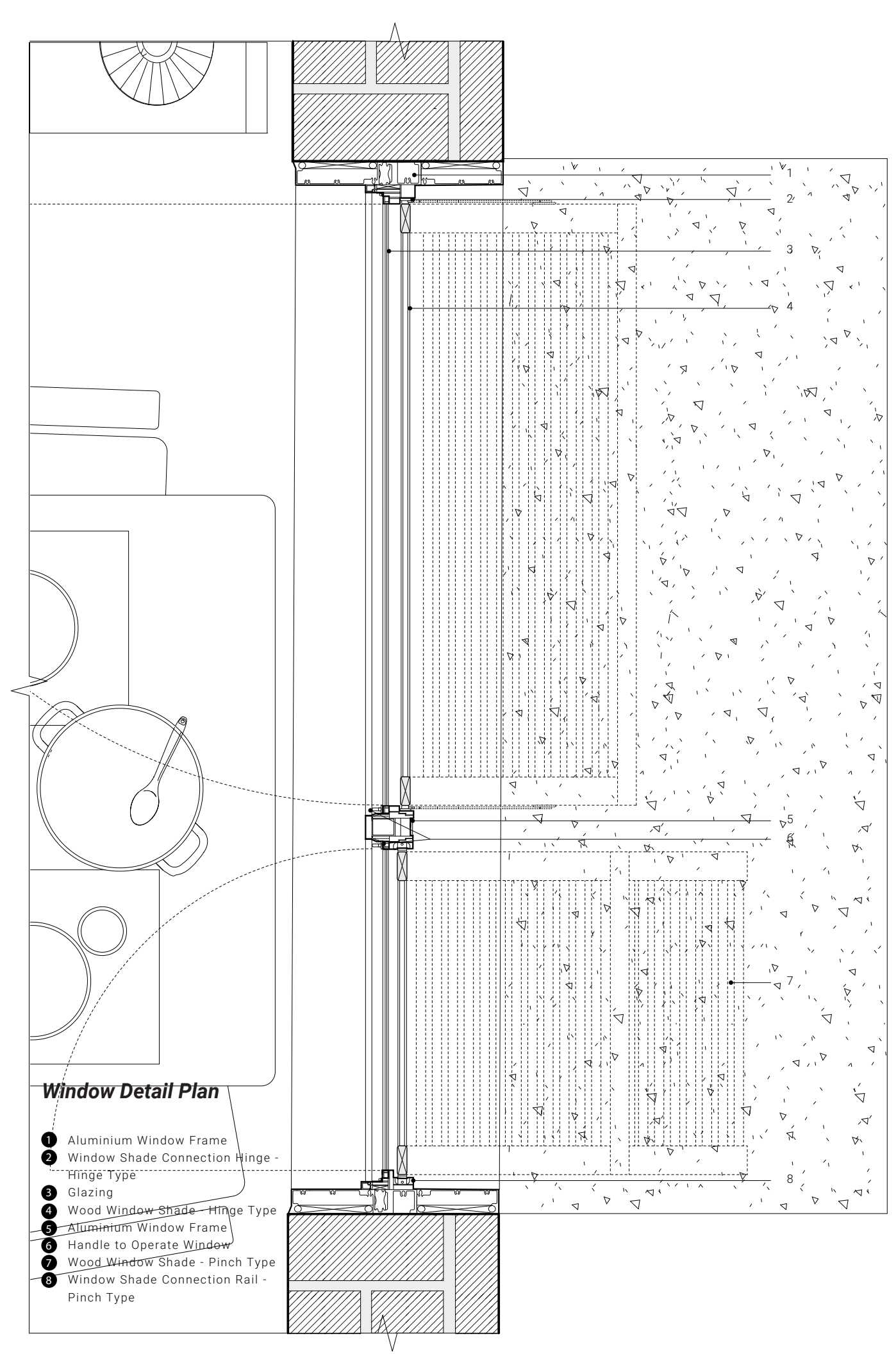
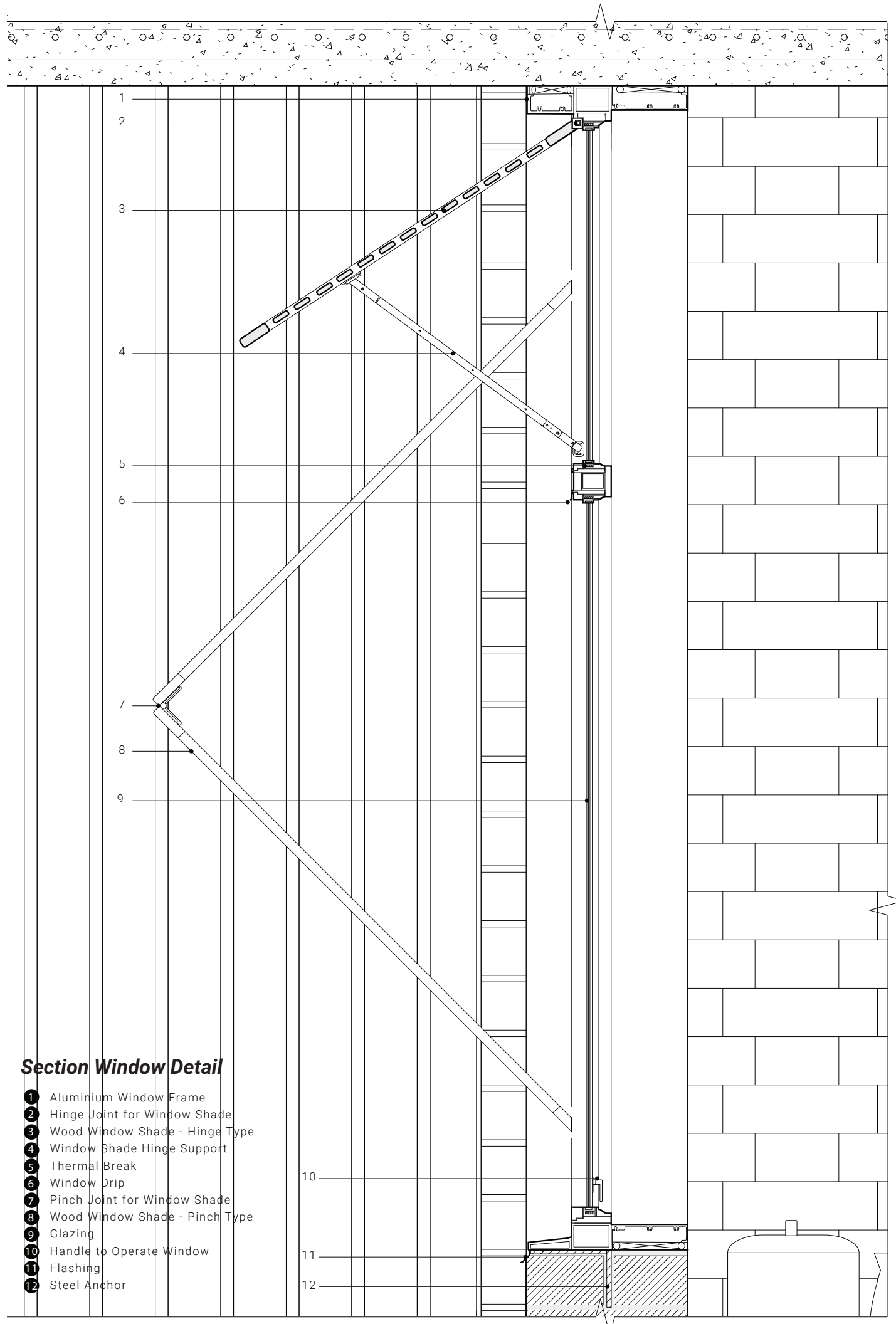


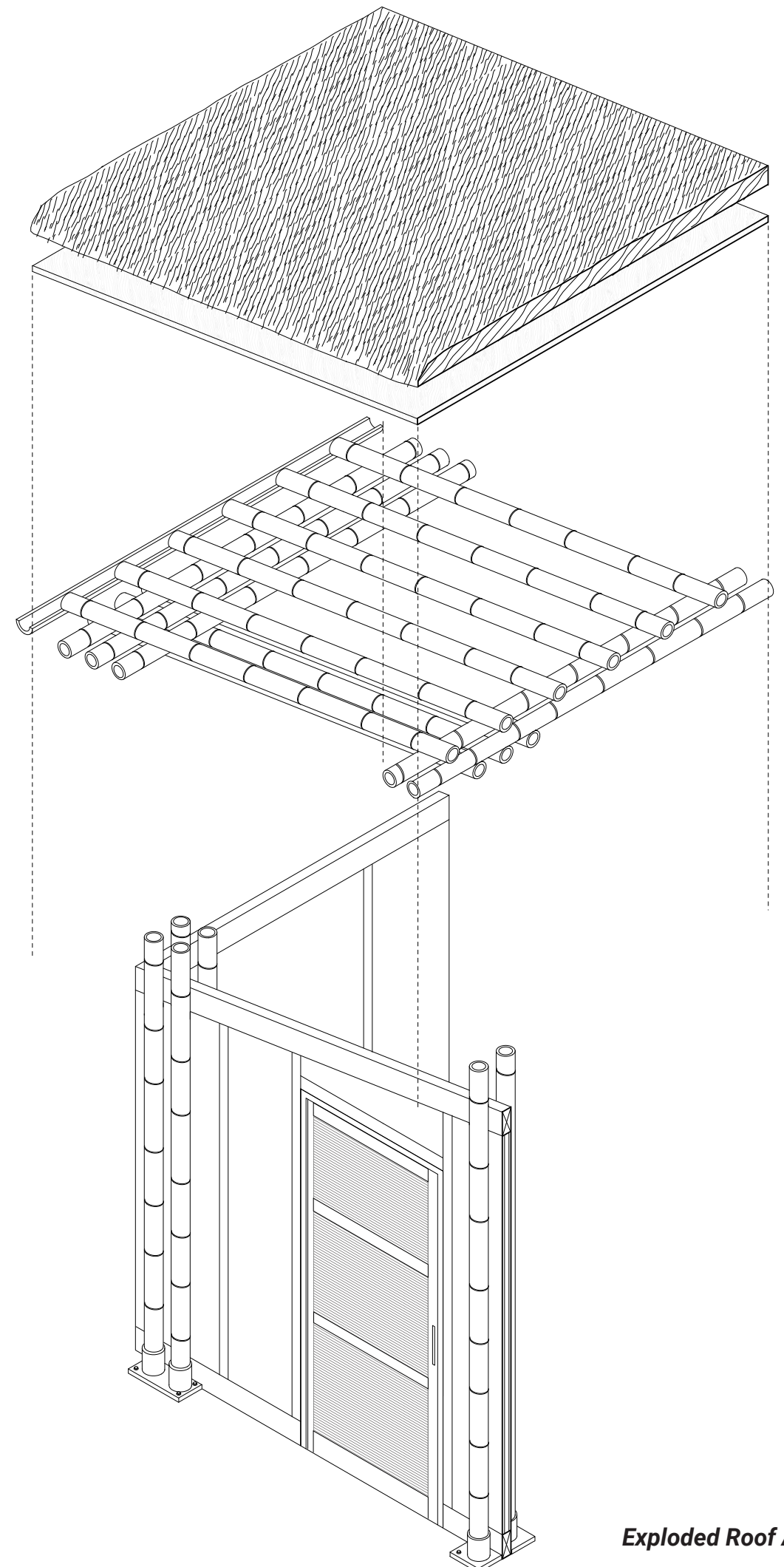
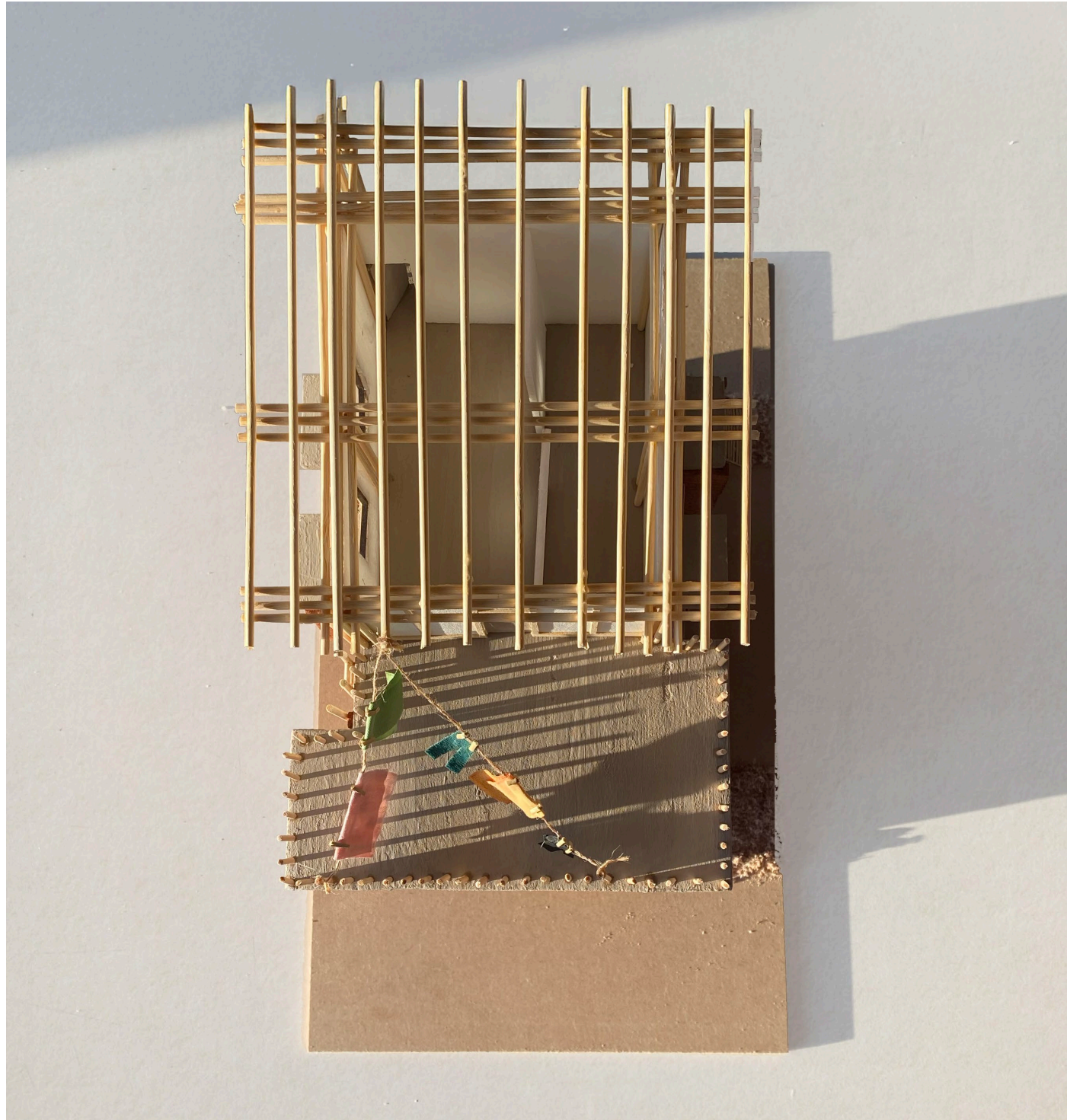


Window Axonometric Detail

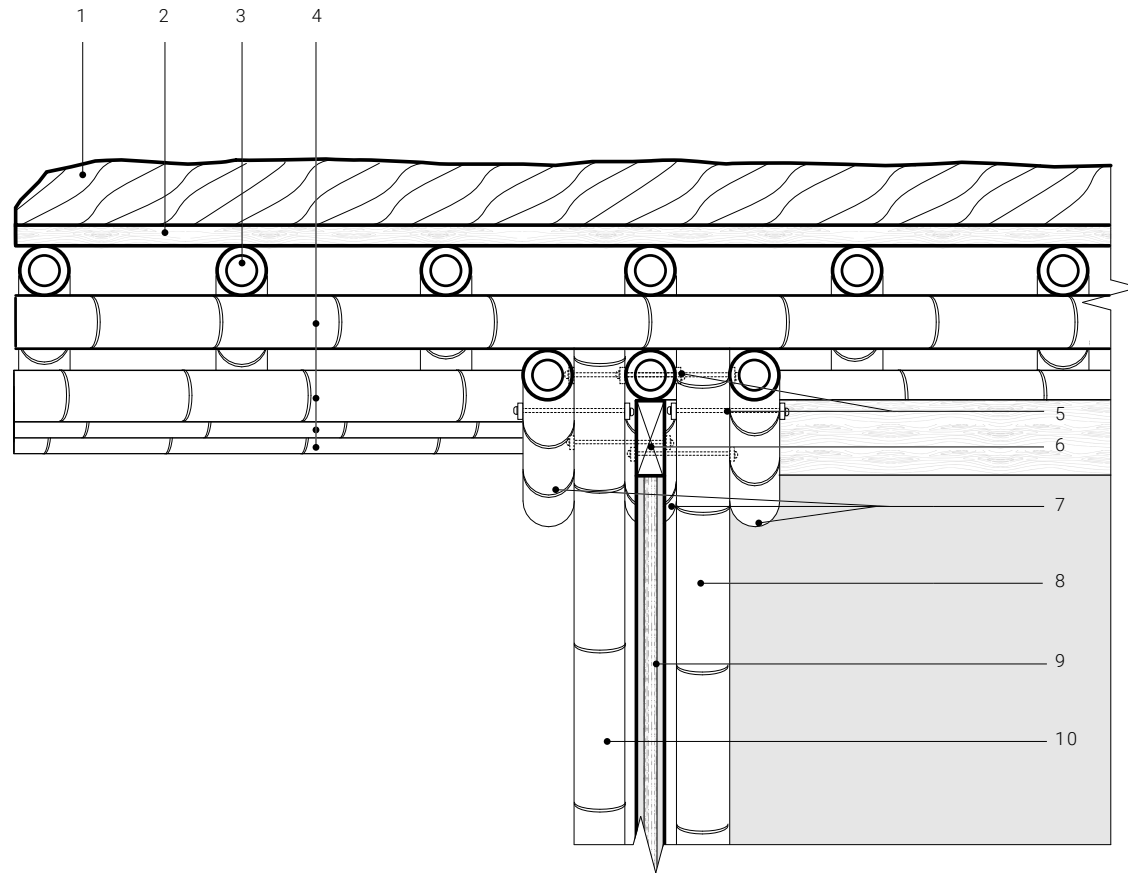
- Aluminium Window Frame ①
- Window Shade - Hinge Type ②
- Window Shade - Pinch Type ③
- Window Shade Hinge Support ④
- Glazing ⑤
- Railing for Window Shade - Pinch Type ⑥
- Pinch Joint for Window Shade ⑦
- Handle to Operate Window ⑧
- Flashing ⑨





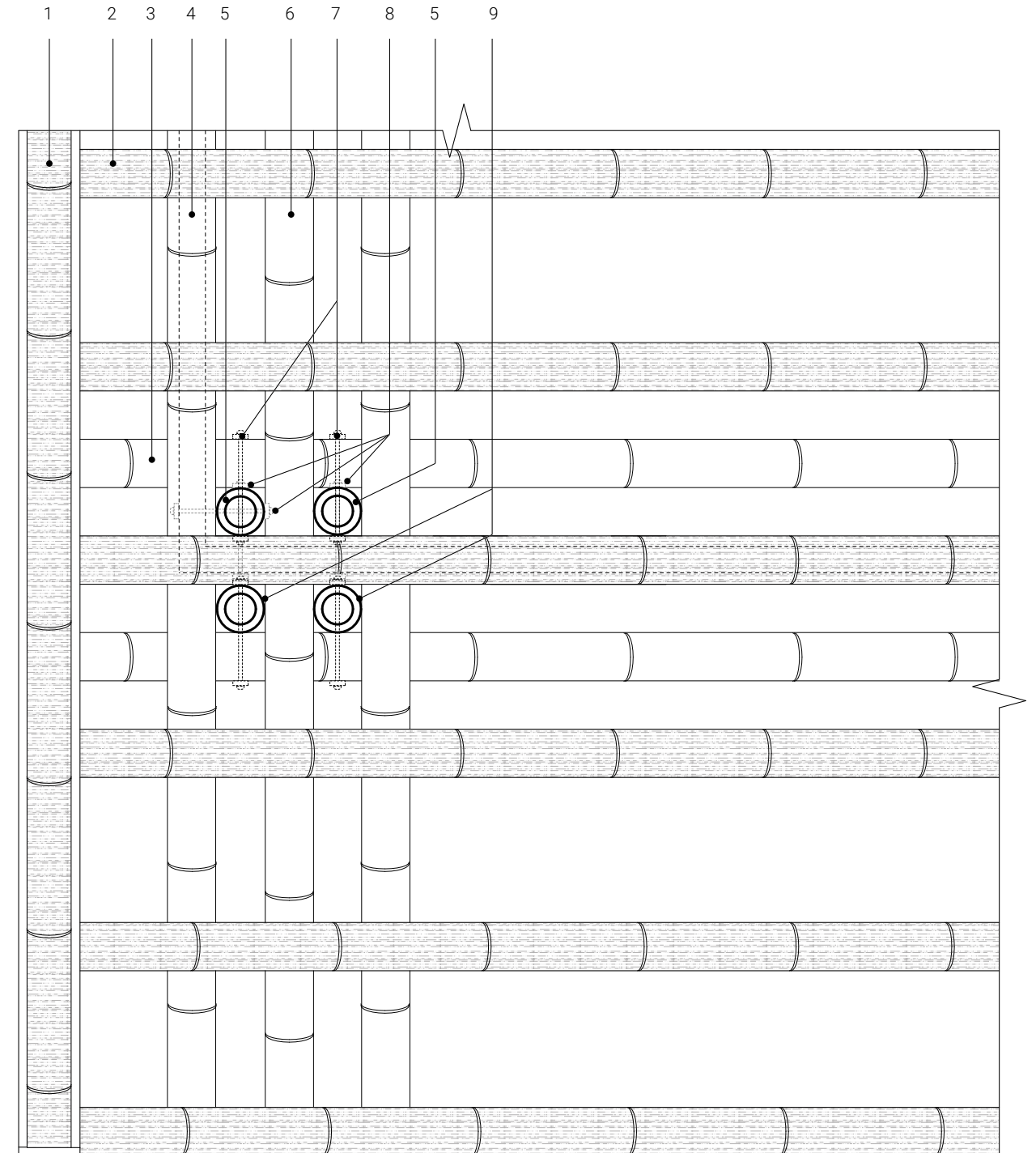


Exploded Roof Axonometric



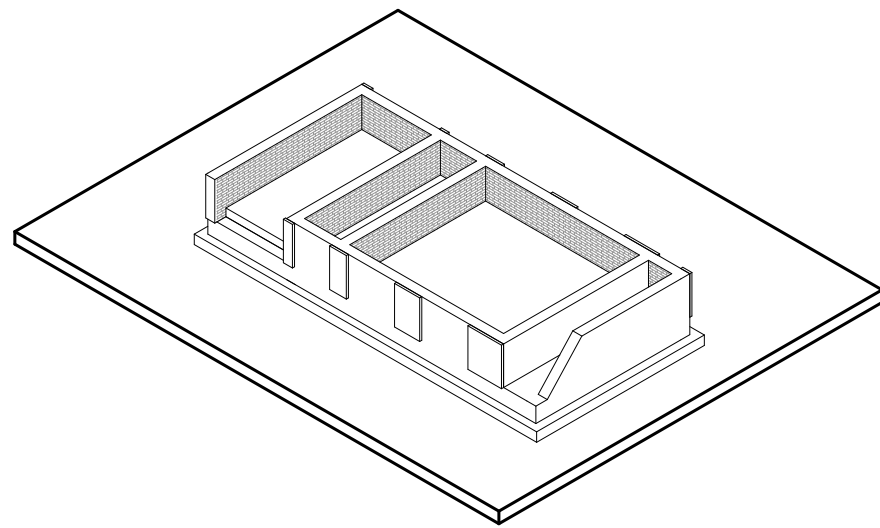
Section Roof Detail

- 200mm Thatch Roof ❶
- Plywood Roof Substructure ❷
- 13mm Bambood Joist ❸
- 13mm Bamboo Secondary Beam ❹
- Bolted Connection - Column to Primary Beam ❺
- Bolted Connection - Column to Wooden Wall Framing ❻
- 13mm Bamboo Primary Beam ❼
- 13mm Bamboo Column - Structural ❽
- 8mm Ikra Reed Wall with Plaster Finish ❾
- 13mm Bamboo Column - Non-Structural ❿

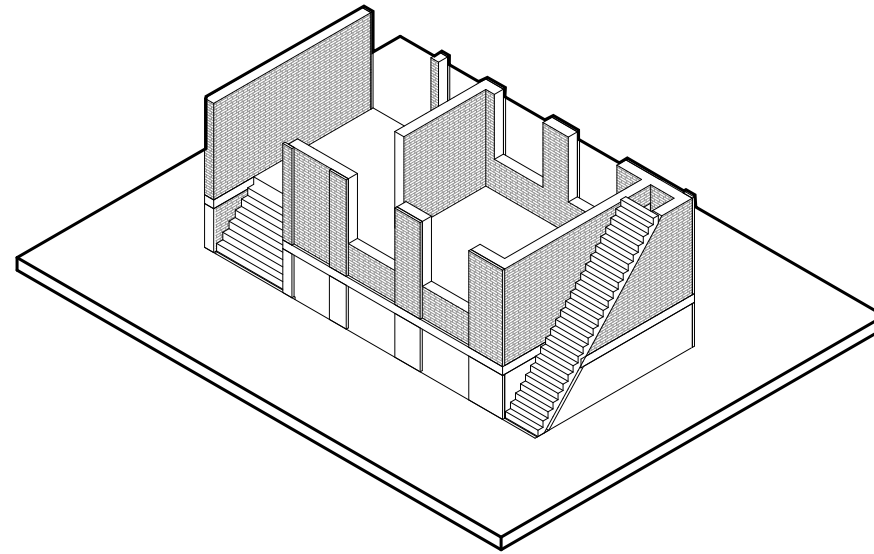


Plan Roof Detail

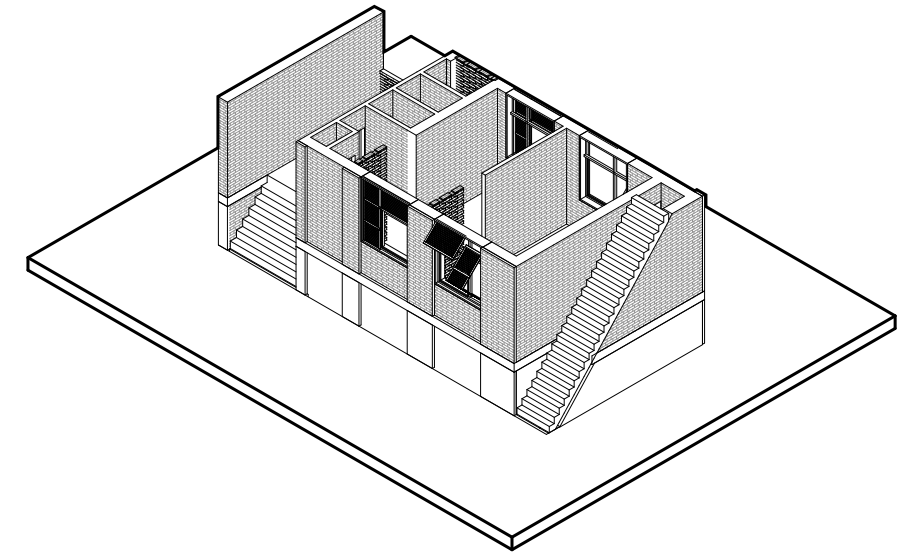
- Bamboo Roof Gutter (1/2 Culm) ❶
- 13mm Bambood Joist ❷
- 13mm Bamboo Primary Beam ❸
- 8mm Ikra Reed Wall with Plaster Finish - Below ❹
- 13mm Bamboo Column - Structural ❺



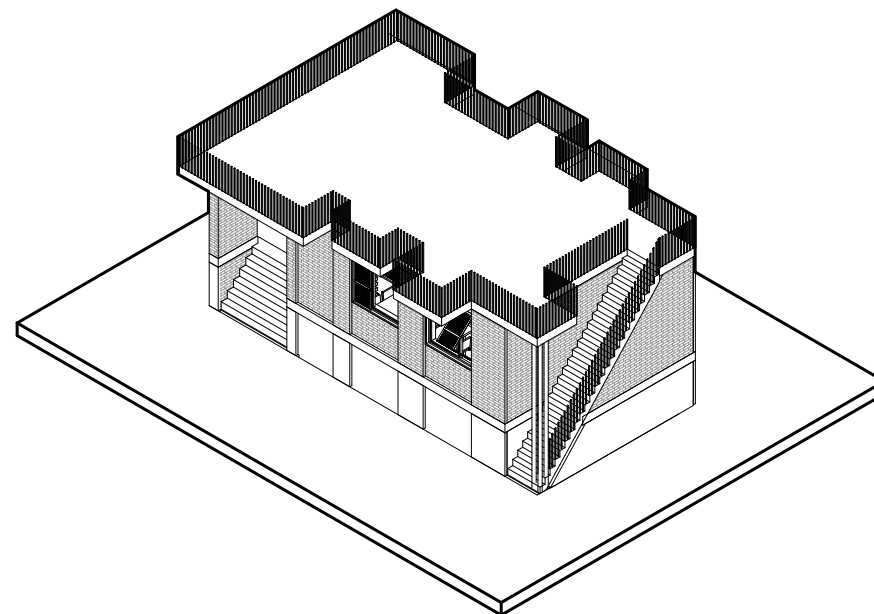
Foundation + Plinth



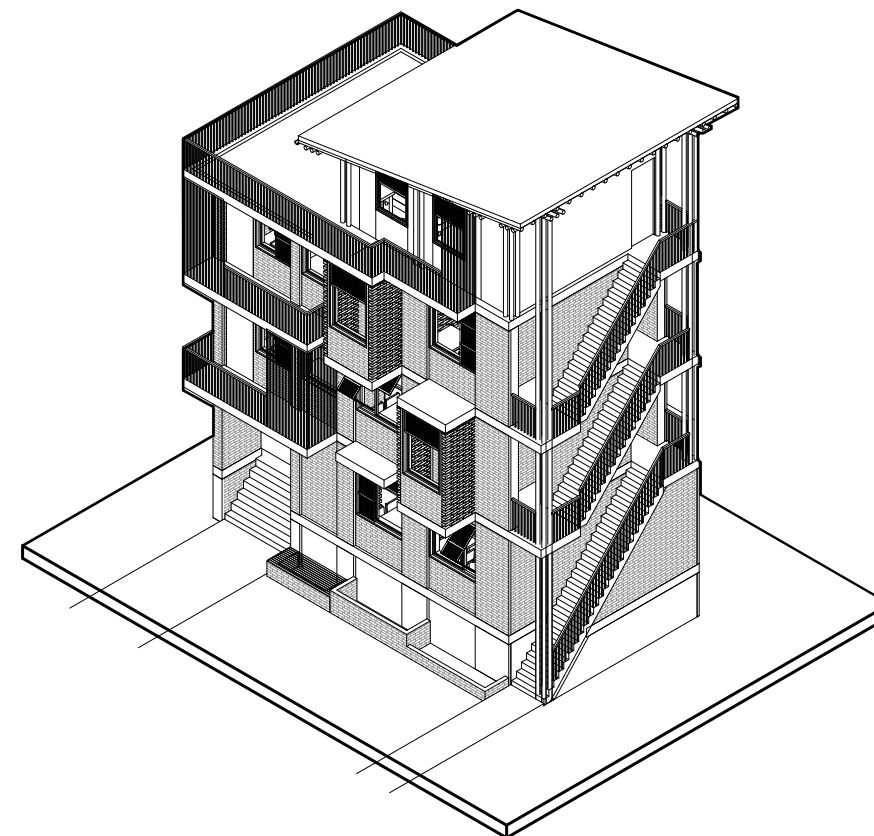
Floor + Load Bearing Walls + Stairs



Interior Partitions + Windows



Roof/Floor + Finishes



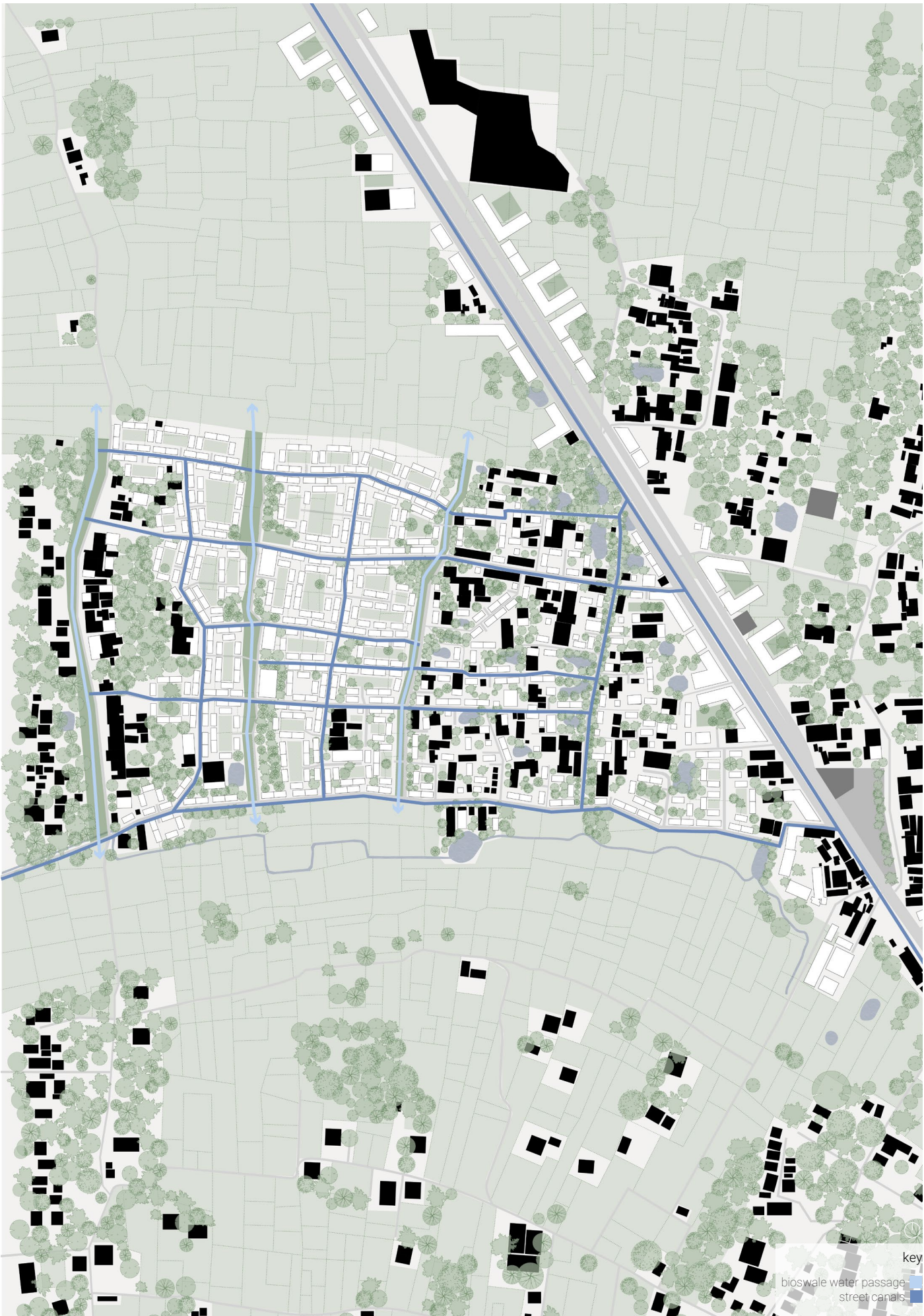
+2.5 Levels Added Over Time



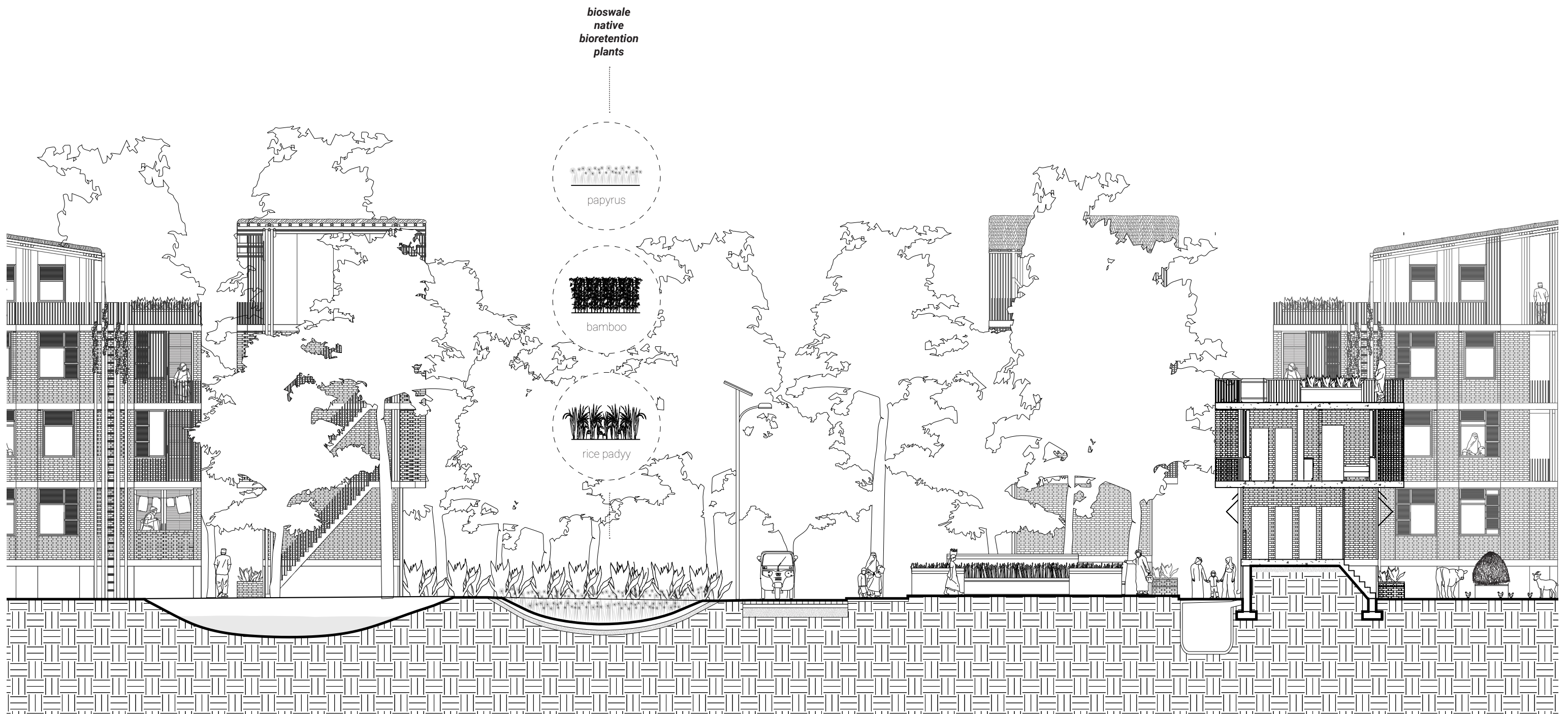
Sustainability

Achieving social and environmental sustainability was essential to this project. Through the use of local building materials for construction, a lower environmental impact is achieved. Examples of locally sourced and produced materials include, local bricks from the nearby brick factory, cocciopesto produced on site, window frames and shutters produced on site and locally grown bamboo for railing and balcony shading.

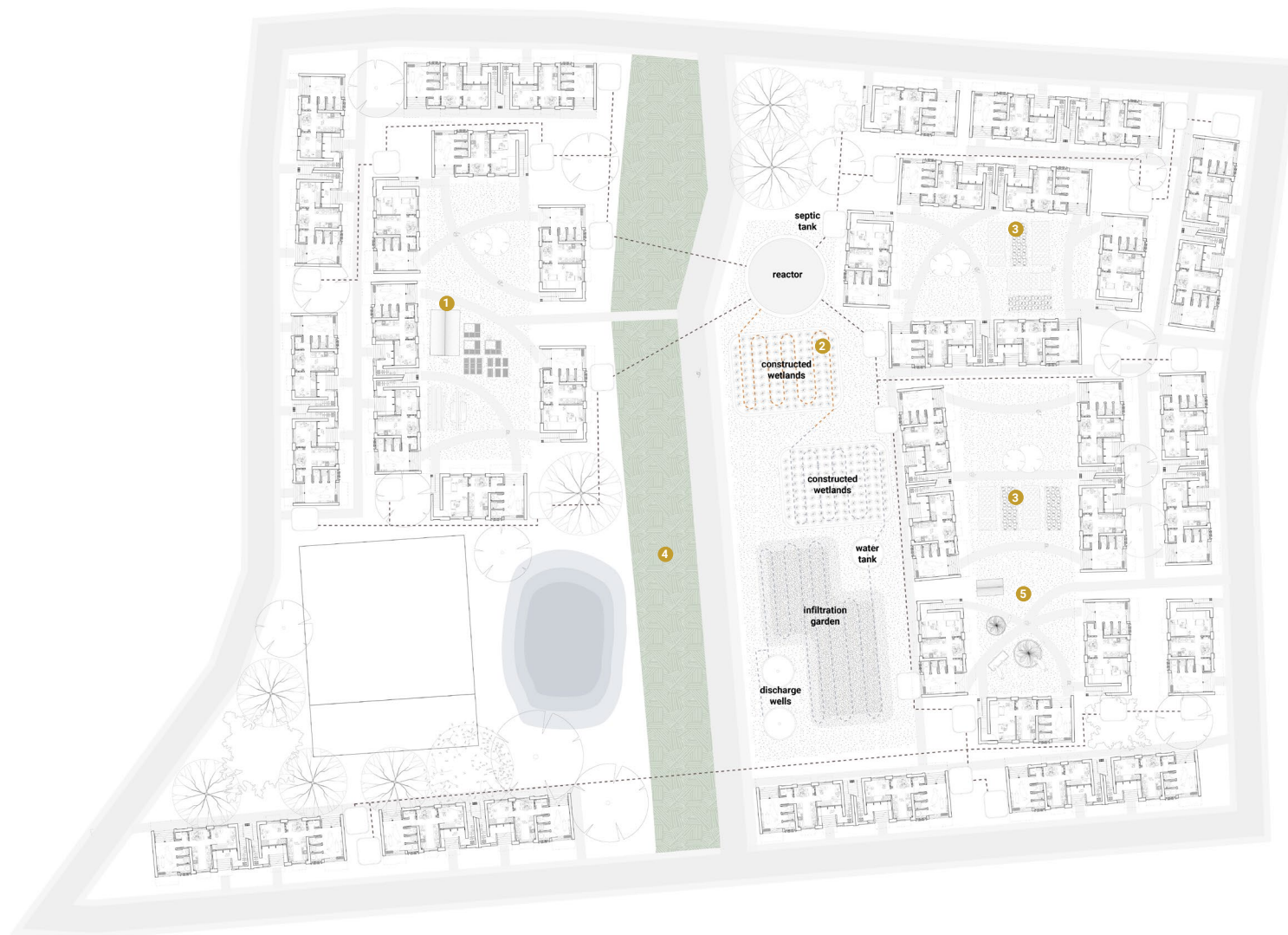
This project provides a systematic method for sustainable community development that offers a variety of housing solutions that can be altered to the needs of individual families. Implementing a design approach that supports current villagers within Shonatola by improving their homes, reducing the need for demolition of existing homes. This allows families to continue to live on the land they have lived for generations while further infusing this project with a community-focused sustainable approach.



Bioswales - Water Management

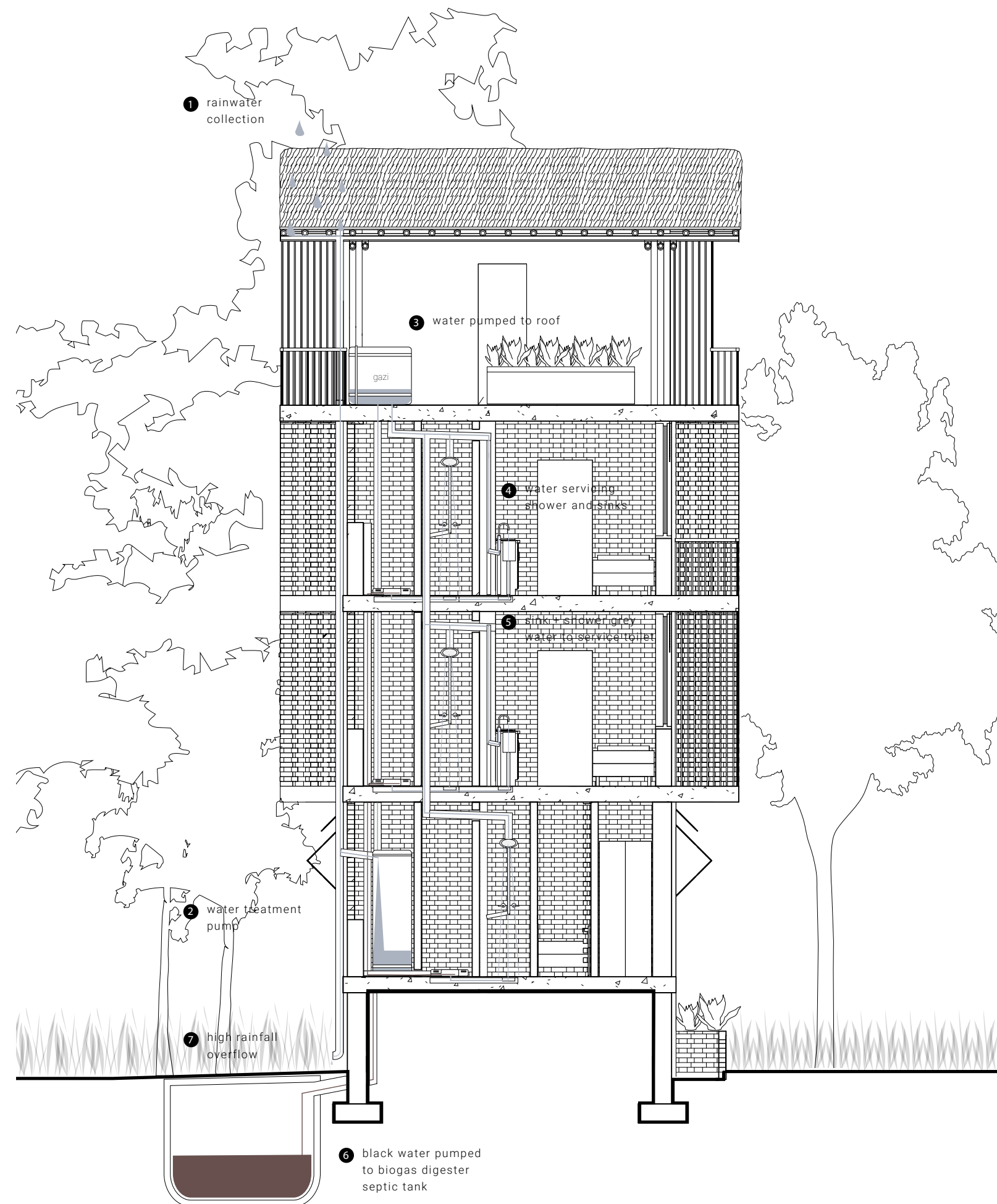


Green Spine | Street Section

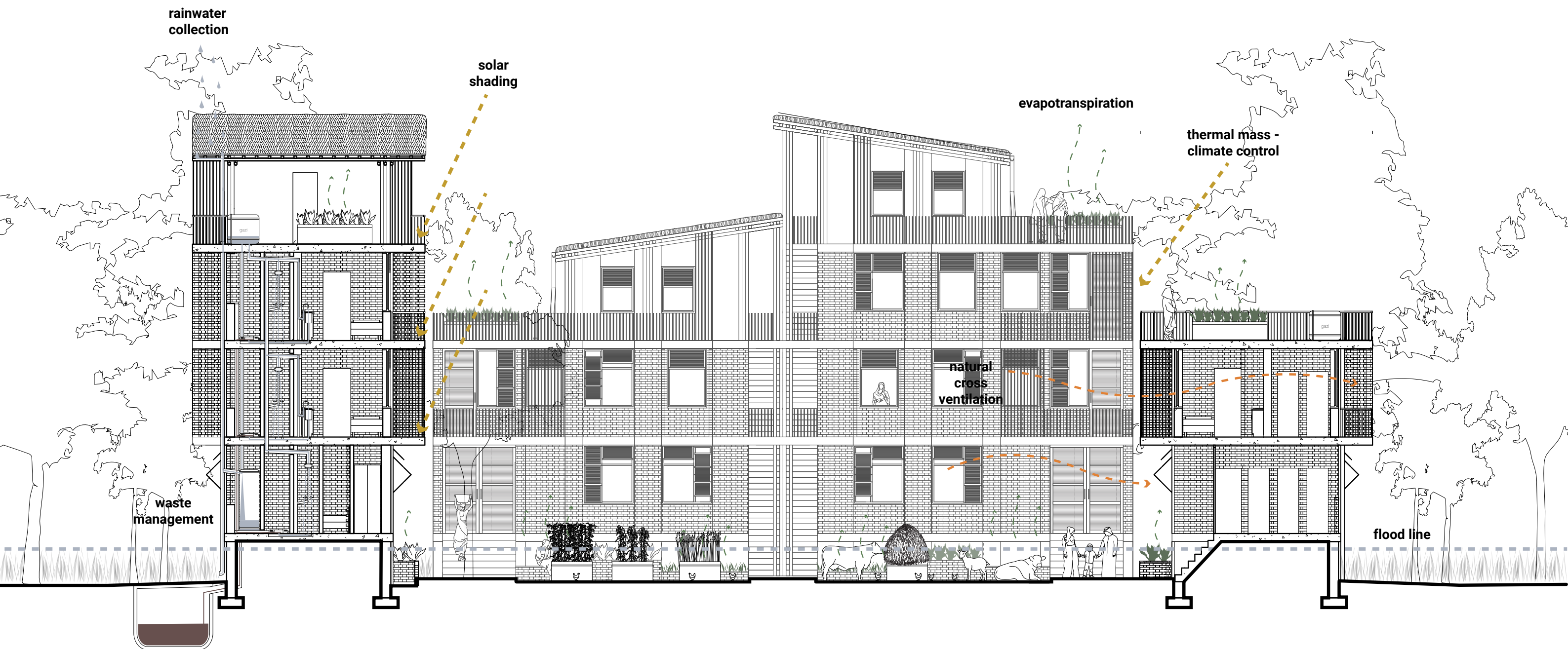


Green Spine | Cluster Plan

- key
- 1 workshop for window frame production
 - 2 natural waste treatment via constructed wetlands
 - 3 raised planter farming
 - 4 biowale
 - 5 animal rearing



Water and Waste Management Building Section



Climate, Sanitation and Water Management Cluster Section



wooden window shades



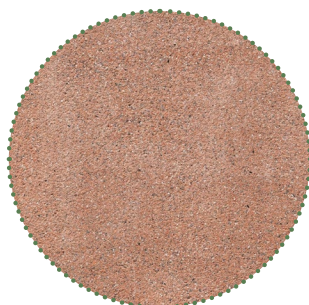
bamboo columns



bamboo railing



bamboo seating



cocciopesto
plaster



thatched roof



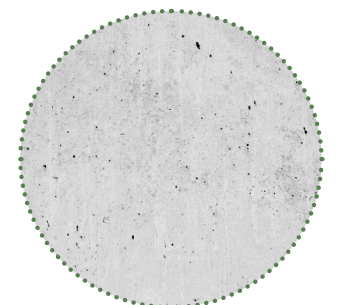
bamboo joists + beams



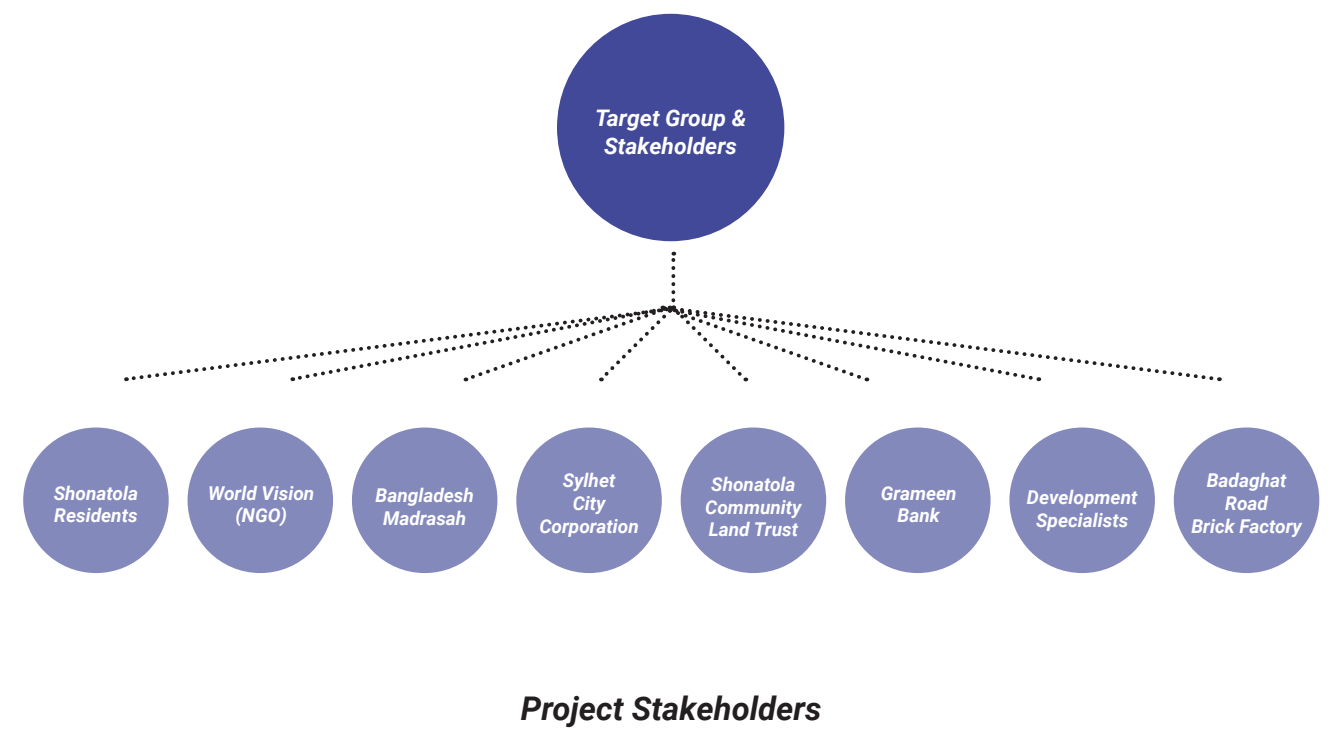
ikra reed walls



fired brick



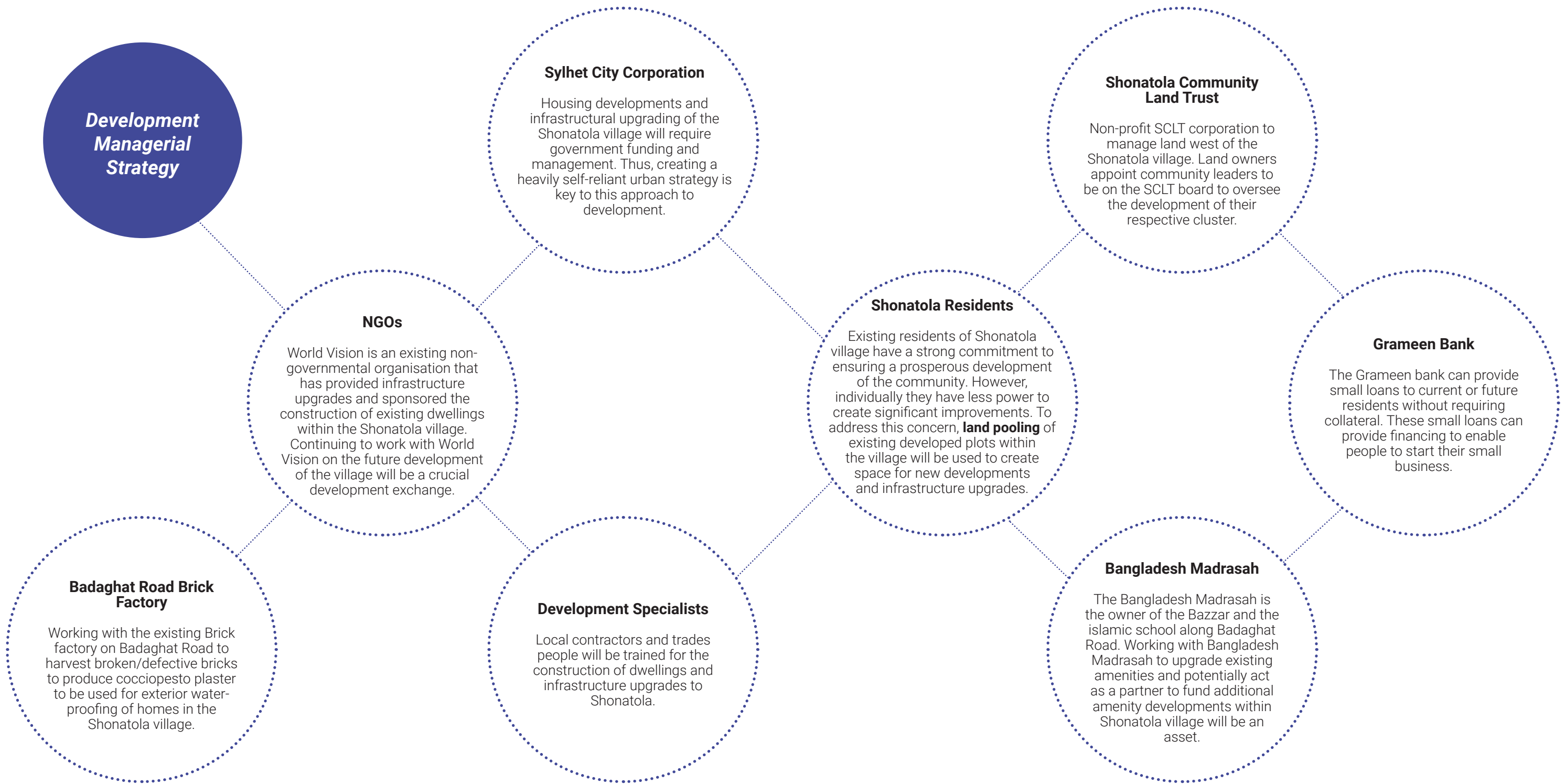
concrete stairs +
flooring



Managerial Approach

Establishing strong bonds with various stakeholders will be crucial to ensuring the success of this project. Working with the Sylhet City Corporation, World Vision (NGO), Bangladesh Madrasah, Grameen Bank, Badaghat Road Brick Factory, development specialists and of course the Shonatola residents.

The Shonatola Community Land Trust (SCLT) is a non-profit corporation that manages the land west of the Shonatola village. Land owners appoint community leaders to be on the CLT board of directors to oversee the development of their respective cluster.



Reflection



Photo of the study trip global housing students and professors in the rice paddy field outside of Sylhet. By S. Anikate, 2024.

Introduction & Motivation

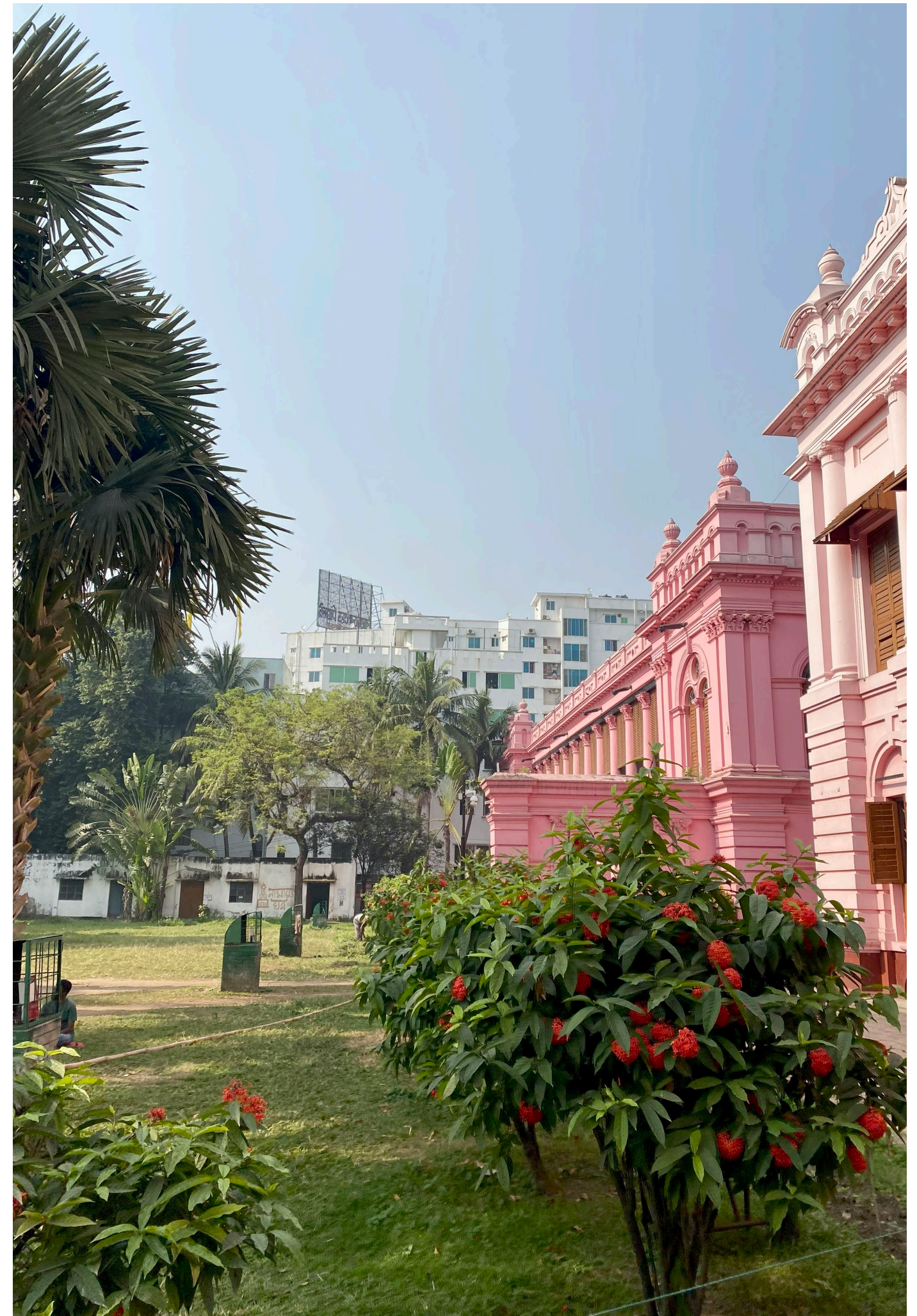
Housing design is inherently political. As an architect your job is to advocate for future building occupants to achieve the best design result. This is just as essential when designing luxury homes for wealthy clients, as it is for designing social housing for people of low socioeconomic status. Housing is a right, not a privilege. As such, it is crucial to reflect upon your role as an architect, as someone who can have significant power in shaping future communities. This interest in examining the role of the architect in society, led me to find a deep interest in participatory design. Exploring this topic through a low income housing project based in Sylhet, Bangladesh, was a great opportunity which led to an ever-growing interest in dissecting and challenging the temporality of participatory design and the role of an architect in a design project. These topics are relevant in all cities around the world as community driven participatory developments that are situated in place and are culturally infused should become standard practice.

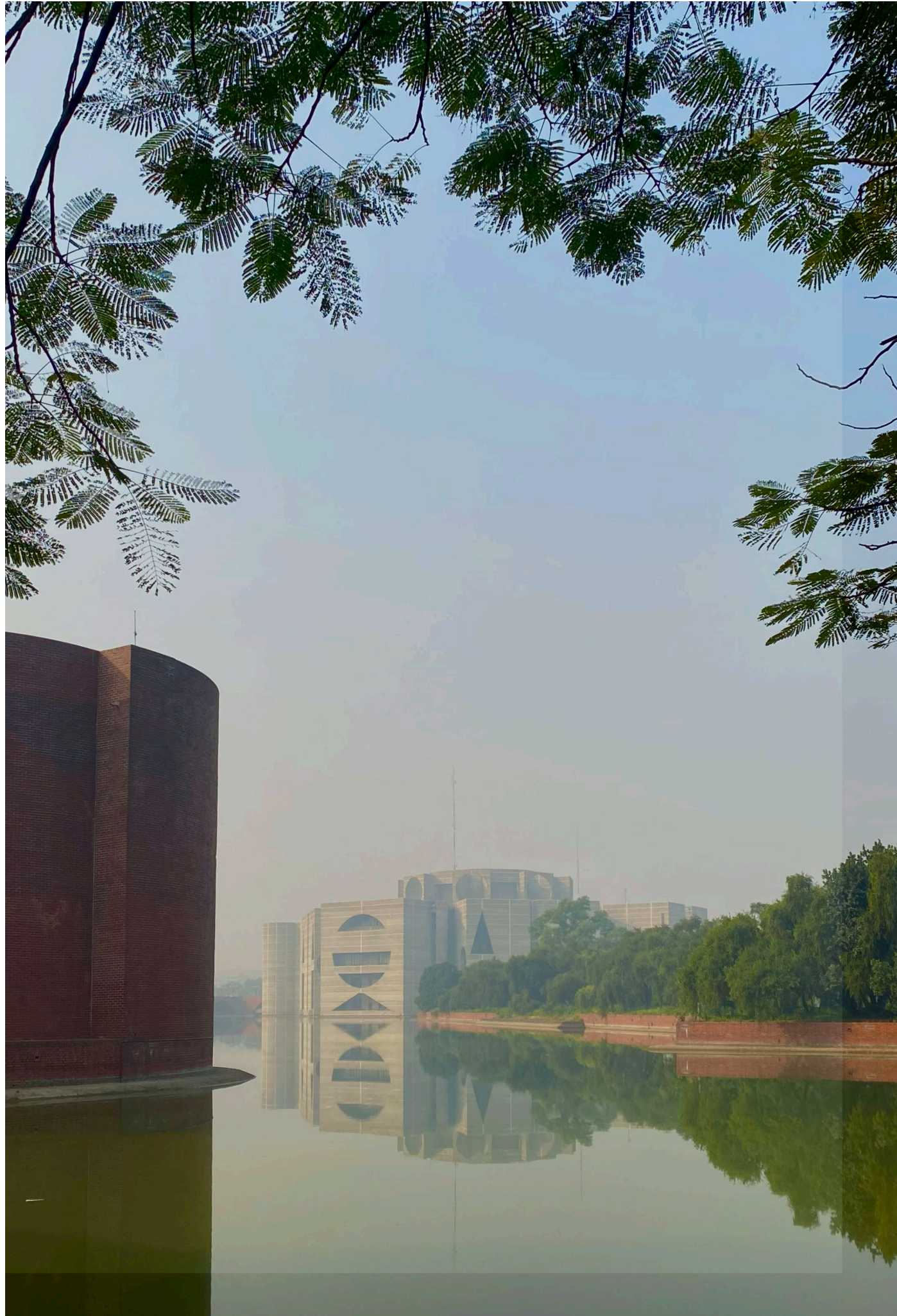
Understanding the How and Why?

Bangladesh is a country that experiences extreme environmental distress. This is no exception when examining the Shonatola village north-west of Sylhet city. Two to three times a year villagers experience serious flooding. When major community decisions must be made during these periods, male chief elders and community leaders collectively decide how the village will proceed. Studying this community involves careful consideration of what the future of this peri-urban site will look like. As Sylhet city continues to expand, the fate of the village is inherently dependent upon the effects of urban sprawl. Despite the significant and frequent challenges they face, the Shonatola village is a strong example of a collective whose strength lies within the power of their community. As such, the Shonatola community proves to be an exciting case study to examine participatory design. A grounded, socially conscious and situated design approach is especially important for this project, as I am not from this community or culture. Moreover, my own personal connection with Bangladesh and more specifically the Shonatola community is limited. I do not proclaim to understand the profound complexities of a culture that is so different from my own. Although throughout this year, I have certainly expanded my knowledge and appreciation of this community and their way of life. Thus, establishing a socio-culturally sensitive research proposal that is situated in its location, culturally relevant and genuine is dependent upon learning from the Shonatola villagers and designing in a way that protects and supports their growth and future expansion of their community. Utilizing several methods of research analysis helped ground this research project. A thorough literature review was instrumental in setting up a strong research proposal. I examined a large variety of topics including participatory design, regionality in architecture, systemic problems that exist in the production of housing, Indigenous research, colonialism and strategies for creating quality housing for the poor. Furthermore, case study analysis examining housing projects around the world that engage differently with participatory community-driven development, as well as semi-structured interviews with members of the Shonatola community and Sylhet city were also crucial methods of project development.

Continued Learning

Prior to studying at TU Delft, I completed my bachelors at Toronto Metropolitan University, which has an emphasis on technical design. I feel that my bachelors prepared me by providing a strong foundation to build my research and conceptual design skills which I feel that I greatly developed throughout my masters. Choosing the Global housing studio challenged me in ways I did not anticipate. Travelling to Bangladesh proved to be an unforgettable experience that allowed me to deepen my understanding of the country, its customs and its people. As a result I feel that this allowed my project to become more culturally genuine and regionally situated.





Response to Feedback and Personal Learning

Receiving feedback from my research, design and technical building engineering mentors proved to greatly improve and further develop my design and approach to my project. Guidance from these mentors enriched my design as I was given direct design suggestions and interesting and relevant precedent case studies to examine and learn from. Through lectures, and one-on-one design tutoring sessions, my project has greatly improved, becoming much stronger, in its theoretical positioning, its spatial planning and elevation design, as well as its technical approach towards waste and water management. One aspect of the design which has greatly evolved since the P2 presentation is the masterplan of the project. This was an area of the design which required thorough and thoughtful planning. The feedback I received during a design tutoring session to step back and make a detailing existing masterplan drawing of the Shonatola village led to a much more situated masterplan that learns from existing plot lines and road patterns making the proposed masterplan that much stronger and situated.

Relationship between Graduation Topic and Master Track

The Global Housing studio challenges students to explore housing solutions in the Bangladesh Delta from the dwelling, neighborhood and masterplan scales. My project focuses on proposing design solutions to improve the quality of life and living conditions of the Shonatola village community who live in a peri-urban settlement outside of Sylhet city. This project and the studio as a whole, is deeply connected to the Architecture track and the TU Delft Master of Science Architecture, Urbanism and Building Sciences program itself. Exemplified through the studio's focus on the intersection of architectural design, urban planning and technical building engineering to address design challenges through innovative, sustainable and creative ways.

Academic and Societal Value

My resulting design proposal is guided by a situated framework for socio-culturally appropriate participatory design. It challenges previous notions regarding the temporality of community collaboration in participatory design in new ways while addressing the challenges and desires of the Shonatola community. Thorough ethnographic and design research took place to ensure that the project is rooted in place and culture. The resulting housing design proposal provides a three phase design approach. Phase one addresses infrastructural upgrades to the existing community, phase two confronts a reactive approach to in-situ housing improvements to the existing village and phase three proposes a proactive design approach to densify the Shonatola settlement by expanding west, beyond the current village limits. Additionally, the results of my research project will be uploaded to the TU Delft repository and to the studio's archive of projects offering insights to future designers and building upon a plethora of strong Global Housing design work.

Transferability

The situated framework for socio-culturally appropriate participatory design can be modified and applied to other development projects that work with communities who face similar challenges as the Shonatola village globally. As an effect, this will expand the significance of the current research and architectural design proposal significantly. Additionally, five housing design schemes are proposed to address the needs of different housing conditions that exist in the Shonatola community. Each scheme is designed, intended to become appropriated and adapted based upon the needs of the inhabitants, which results in five designs that provide the community with a “Tool box for Appropriation”. This concept can also be adapted and applied to other housing projects globally to address the needs of other communities facing similar housing challenges.

Self Developed Questions

Why is it important to question the role of an architect?

Questioning the role of an architect became something I often thought about while working in architecture before I started at TU Delft. Working on large projects in the city demonstrated that the clients desires do not always align with those of future building users (the public). As the client often had more interest in cost reduction than building beautiful spaces, it became clear that an important role of a designer, that I did not learn in school, was that of an advocate. A good architect does not simply build cost efficient spaces, while blindly following client demands. A good architect places the needs of future building users and community members above all, while simultaneous balancing client desires and project costs.

Why was it important to create multiple design schemes to address different housing conditions in the Shonatola village?

Utilizing a variety of housing design interventions was fundamental to achieving a situated participatory housing design proposal. Rarely does a “one size fits all” work in practice, especially in housing design. This was no exception when designing in the Shonatola village. Providing a systematic method for development that supports current villagers by upgrading their homes while also providing new opportunities to generate income while remaining on the land they have lived for generations was crucial. Moreover, addressing the need for future expansion and densification of this peri-urban site through additional schemes for more dense housing to the west of the site was critical. There are many housing conditions that exist in the village and applying thoughtful design solutions that adapt to each setting offers a more situated regional approach to housing design.

Looking Back

TU Delft’s masters of architecture program is highly respected and internationally recognized. This international recognition is what brought me to TU Delft. Prior to applying to my masters, I completed the Global Housing Design online edX massive open online course (MOOC) which explored the impact of social, economic and environmental factors on housing settlements globally. This course played a significant role in my decision to enrol in the Global Housing graduation studio. As I reflect upon this year, I feel very grateful for having the opportunity to expand my knowledge and understanding of housing design. While designing housing in Bangladesh may be different from the way you may approach housing design in Canada, I feel that the housing design principals that I have learned this year when it comes to the principles of designing community spaces and how to create a culturally grounded participatory design can be implemented in any future housing project. My thesis has both been deeply challenging and rewarding as I continue to expand my knowledge and grow as a designer. It has been a great privilege to study at TU Delft and I feel that in years to come I will look back on this year as a pivotal moment in my life as a person, student and architect.



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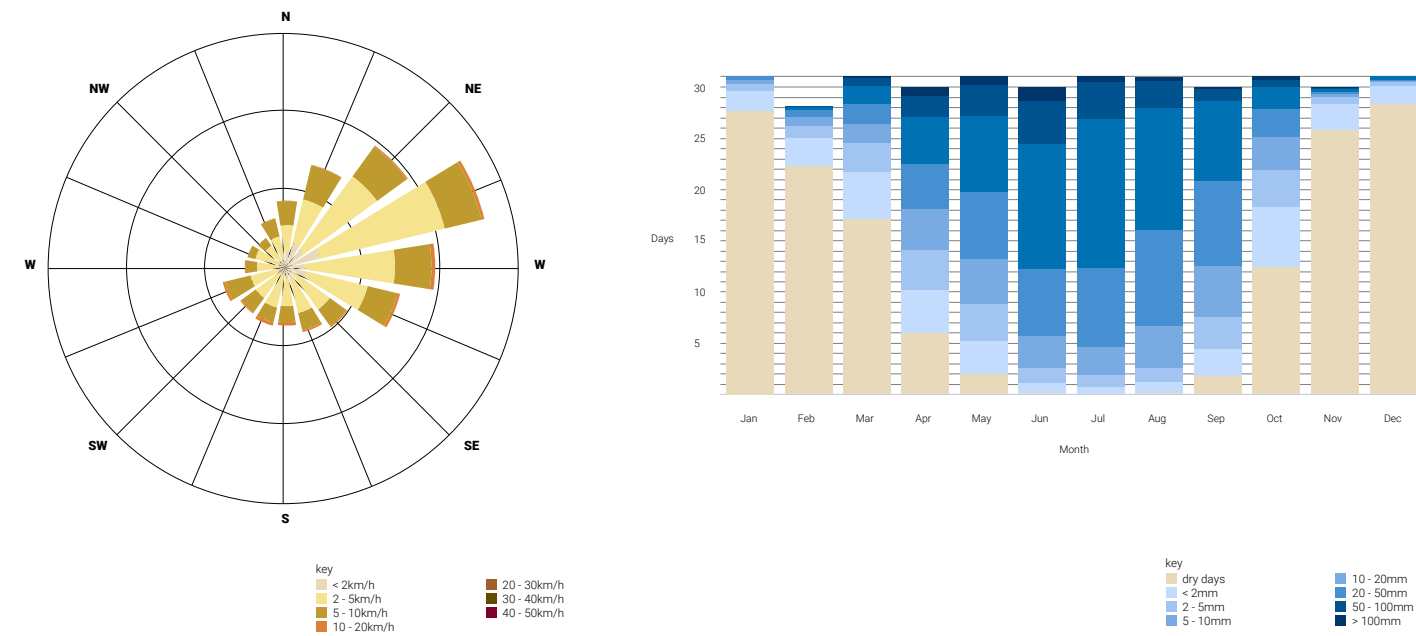
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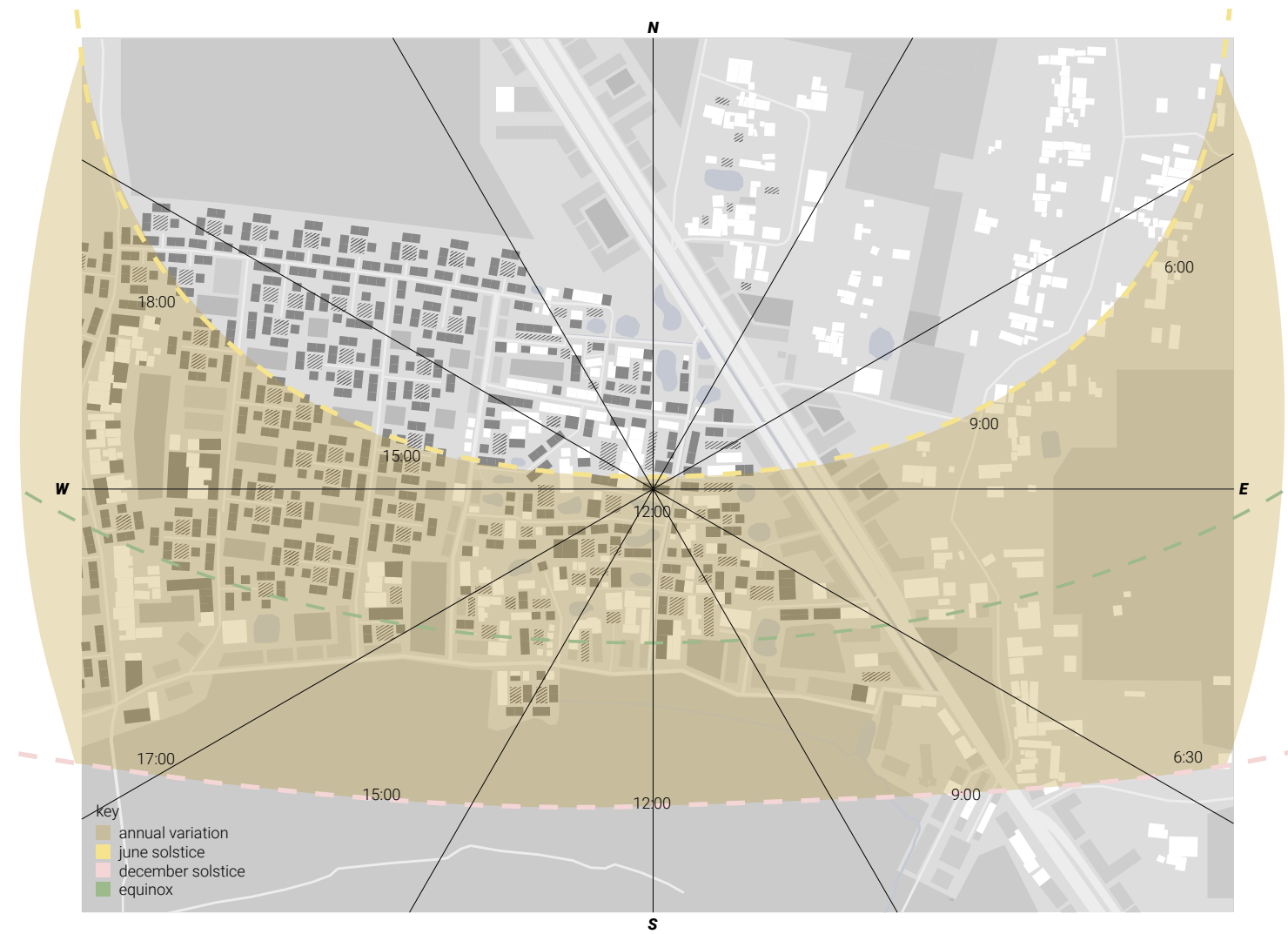
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Predominant Winds

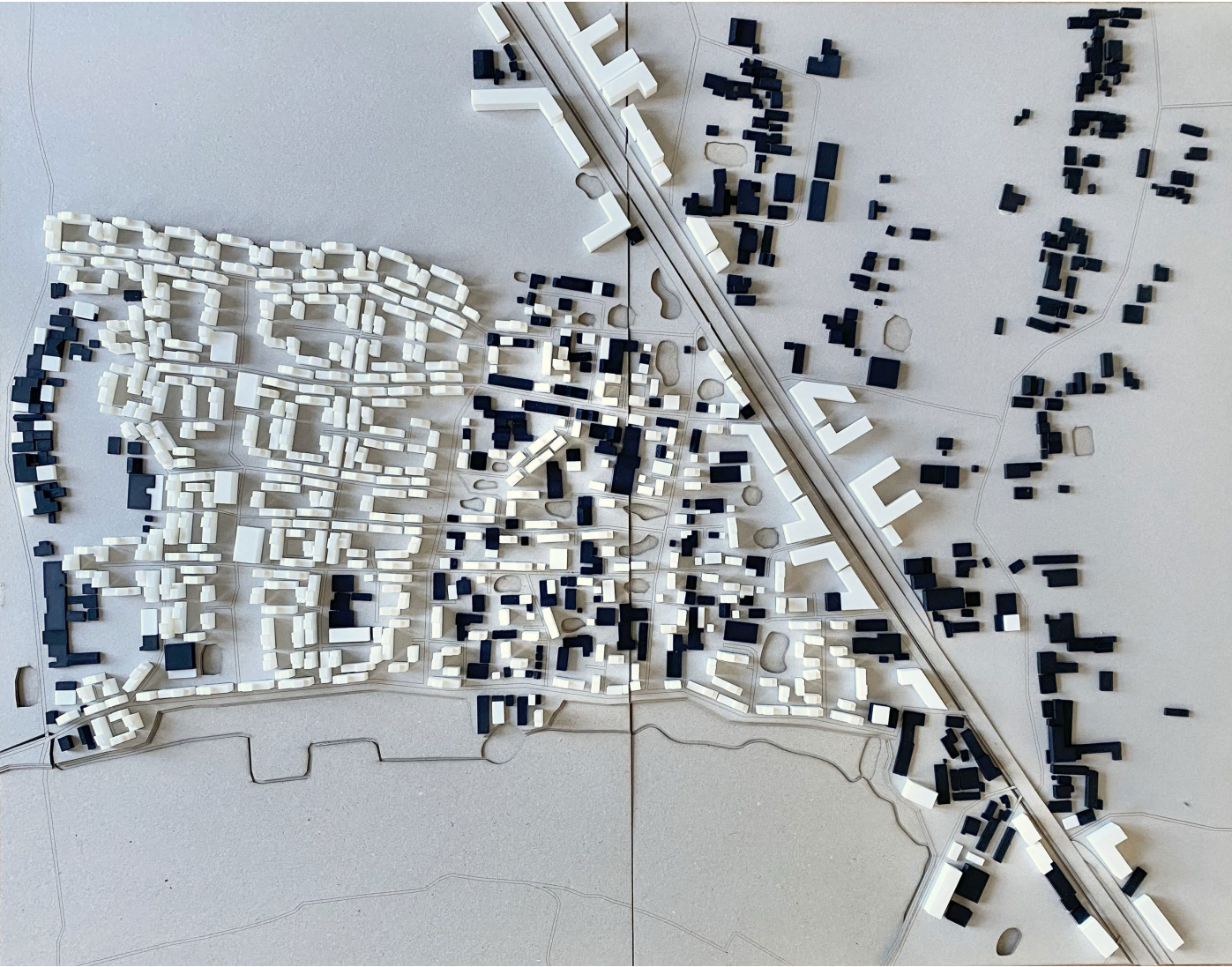
Average Precipitation

Appendix



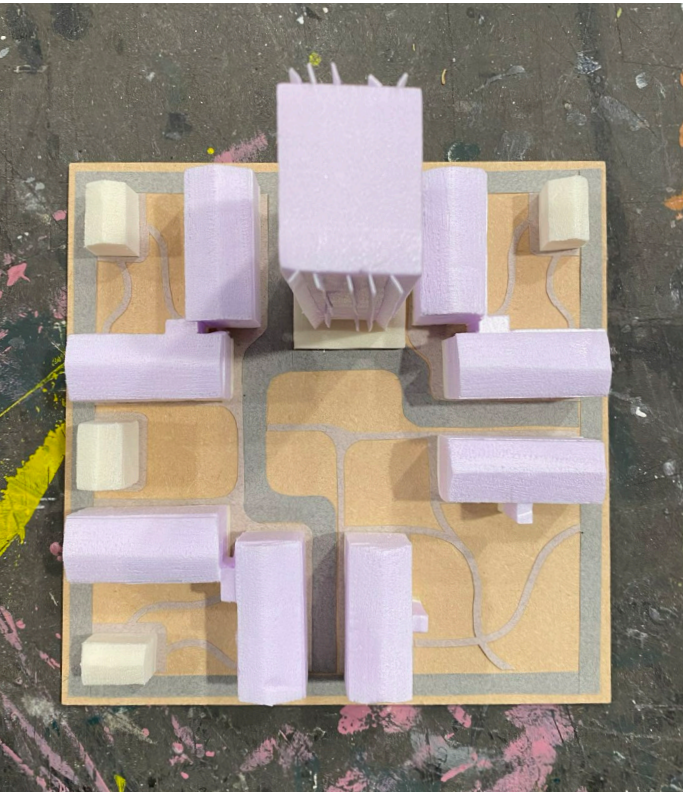
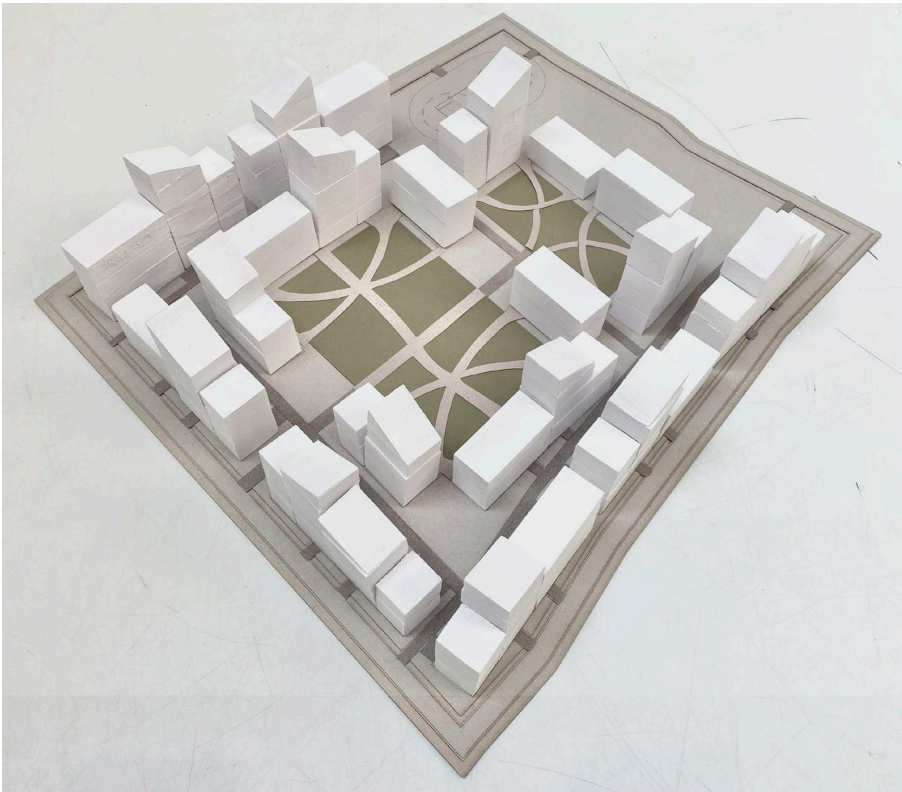
Sun Path

Study Models



Dwelling Model | 1:20

Site Model | 1:1000



Cluster Massing Model | 1:200

Dwelling Model | 1:20



The Density Challenge
2.0 FSI High-rise

Student:
Anna Halleran

Global Housing Graduation Studio

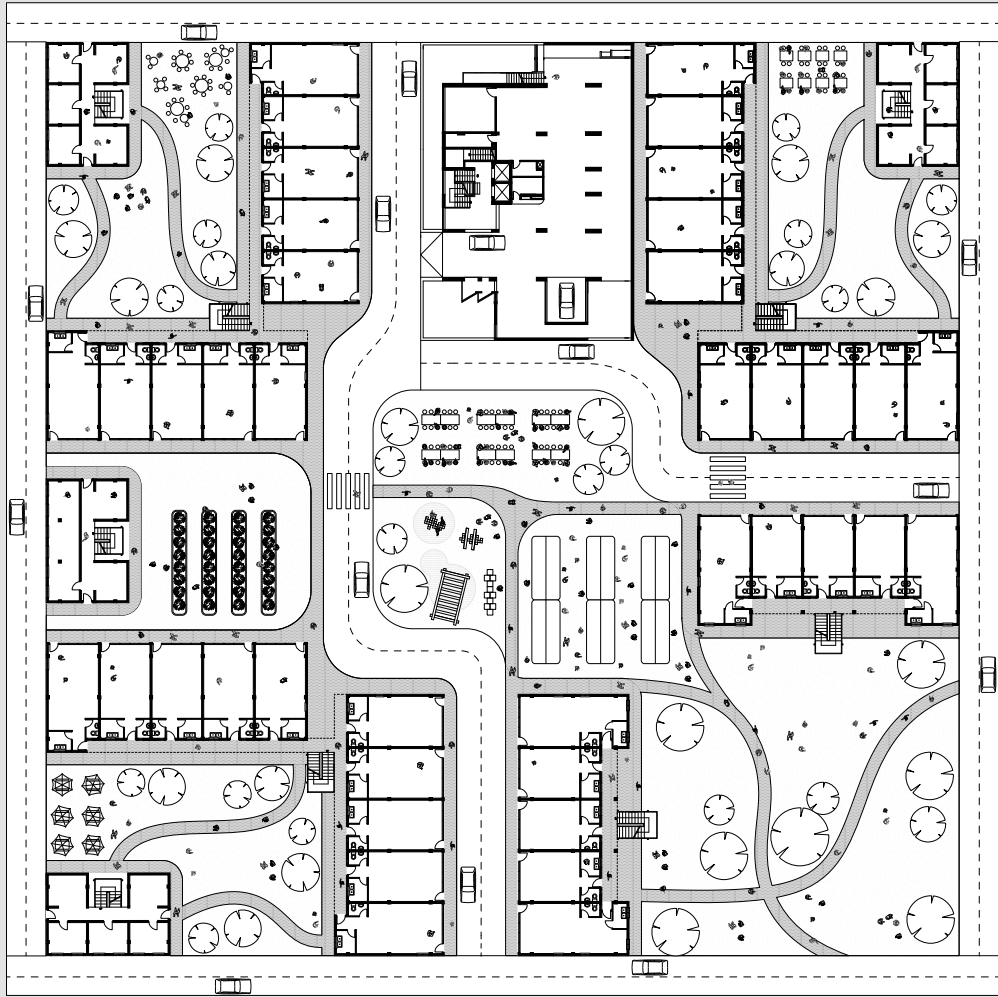
Architecture of Transition in the Bangladesh Delta
Autumn Semester 2024/25 [AR3AD105]

GLOBAL
HOUSING

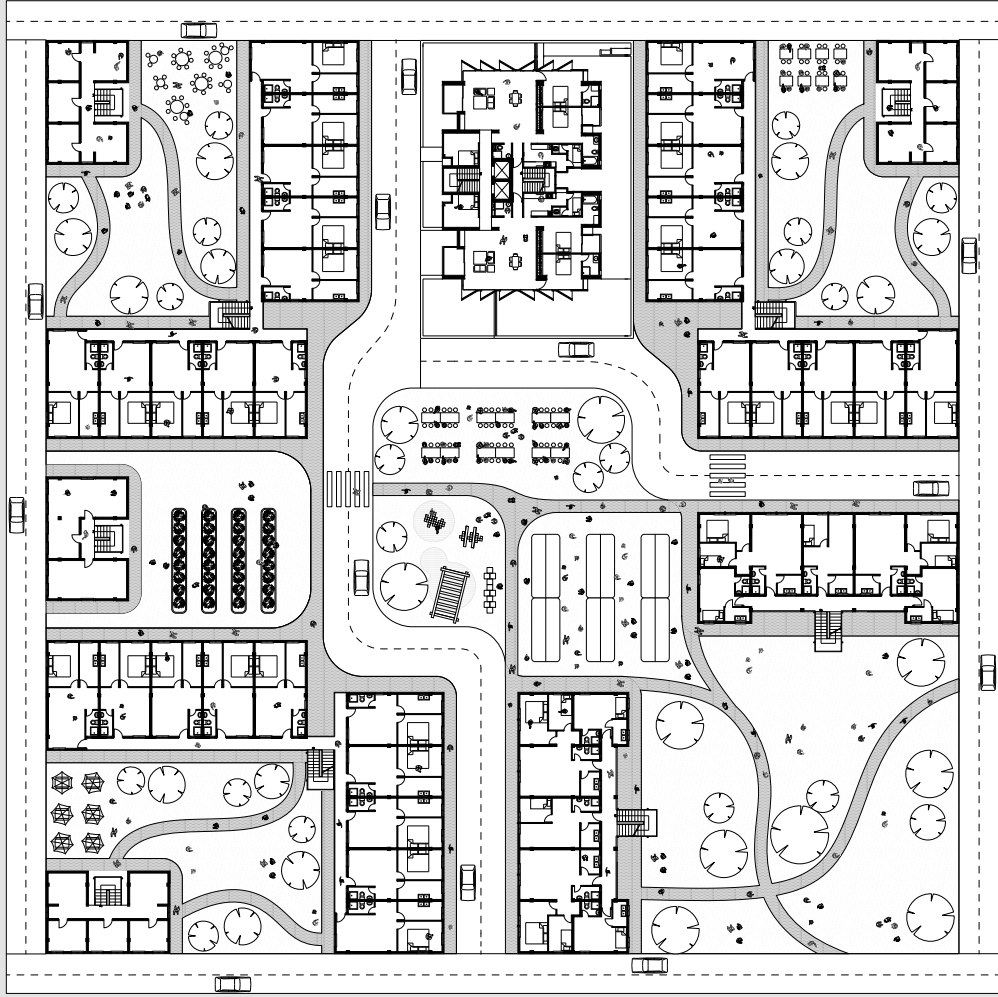
TU Delft

Architecture and
the Built Environment

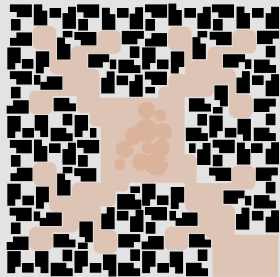
Ground Floor Plan
1/500



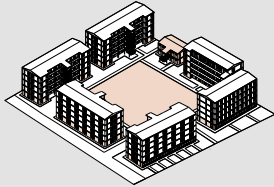
Typical Floor Plan
1/500



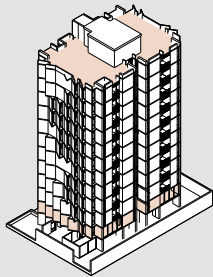
Typological References



Belapur Housing
Charles Correa
Navi Mumbai, India
1983
FSI 0.75



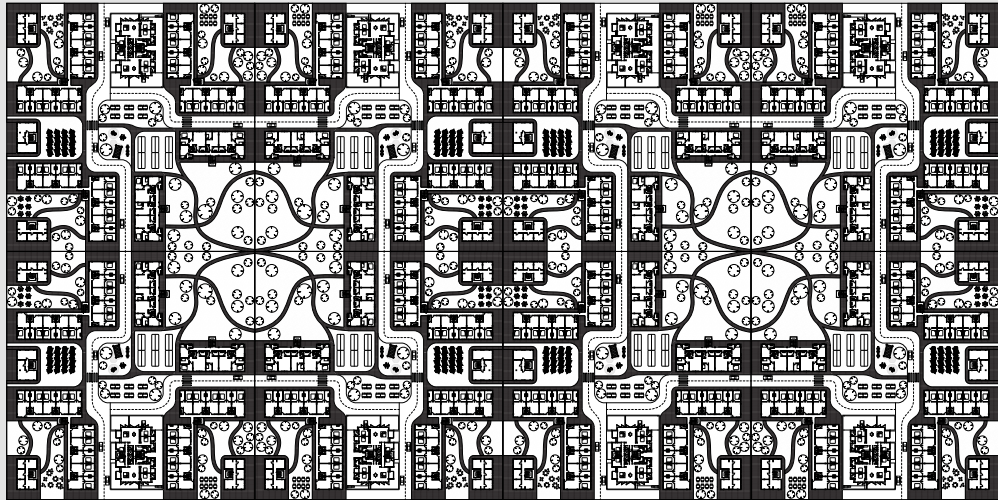
Mickey Leland
Housing Development
Project Office
Addis Ababa, Ethiopia
2006 - 2008
FSI 0.89



Comfort Reverie
Marina Tabassum Architects
Dhaka, Bangladesh
2006 - 2011
FSI 5.92

Communal Space

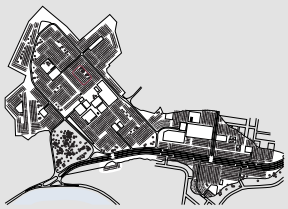
Urban Fragment (Replicability)
1/2000



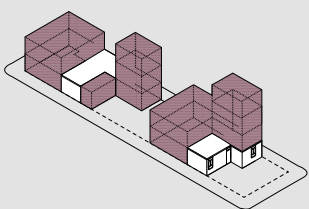
Neighbourhood

Block

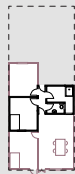
Unit



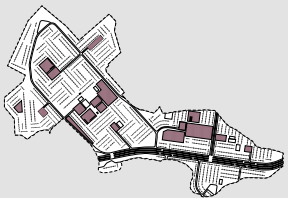
Plot
Area: 37,5 Ha
Dwelling Units: 2372



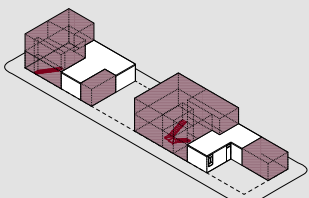
Volume
Ground Floor + Up To 3 Additional Levels



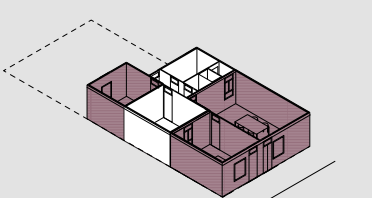
Núcleo 1
Area: 12,5m2



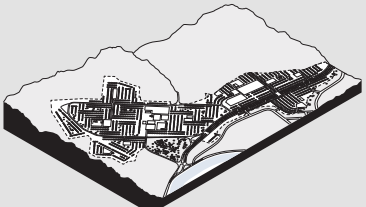
Program
Housing: 143,765 m2
Amenities: 34,595 m2



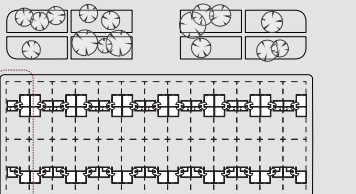
Connectivity
Access and Circulation System



Dwelling Type 1
Area With Addition: 47,0m2



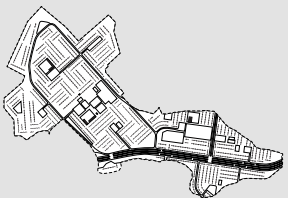
FSI/FAR
0,11



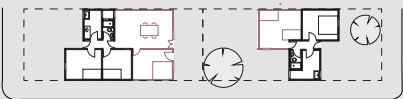
Typical Block Floor Plan
Two Standard Block Types - Dwelling Type 1 & Type 2



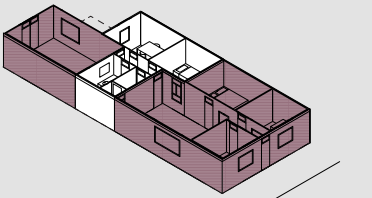
Núcleo 2
Area: 17,0m2



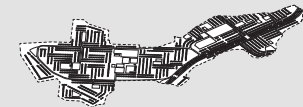
CSI
0,10



Ground Floor Plan
Standard Dwelling Types



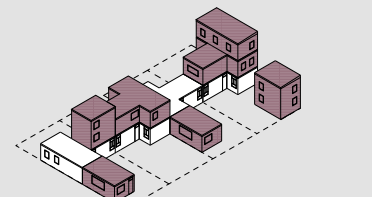
Dwelling Type 2
Area With Addition: 64,0m2



Density
63 du/ha



Section
Sectional Relationship



Incremental Change
Evolution via Self-Help Labour

Urbanización Caja de Agua

Lima, Junta Nacional de la Vivienda, 1961

Plot Area: 37,5 ha
Number of Dwellings: 2372
Density: 63 du/ha
FSI: 0,11
Unit Sizes: 17 sqm; 12,5 sqm
CSI: 0,10
Client: Junta Nacional de la Vivienda
Schema: Public Housing
Design: Junta Nacional de la Vivienda
Tenure: Home Ownership

Caja de Agua uses a 'Sites and Services' model of incremental social housing. The Urbanización Popular de Interés Social (UPIS), provided low income residents with affordable standardized housing units with a range of basic services on lots which allowed for the future expansion of their homes through self-help labor. Each lot is 8m x 20m with neighborhood blocks ranging from 18 to 24 units. Junta Nacional de la Vivienda provided two basic housing units, Núcleo 1 which was 31,5 m2 and provided a

service core with a bathroom and kitchen and one multipurpose room; and Núcleo 2 which was 43,75 m2 and was the same as Núcleo 1 except that it provided an additional room. This allowed for a little over 10m2 divided between the front and back of the homes for homeowners to use to expand their homes in the future. Standard units were constructed with economical materials including concrete blocks, and were left to be finished by residents. Junta Nacional de la Vivienda provided expansion plans for

residents to use when expanding their homes in the future. Including the addition of a front garden, additional bedrooms, and a separate living and dining space. The desire to expand one's home was strong. In as little as five years from the project's completion 94% of residents began making renovations to their homes, with the average resident adding between four and six rooms. Rooms were commonly used as rental spaces that enabled homeowners to generate additional income.

Design Research: Global Housing

Global Housing Graduation Studio
Architecture of Transition in the Bangladesh Delta:
Autumn Semester 2024/25 [AR3AD105]

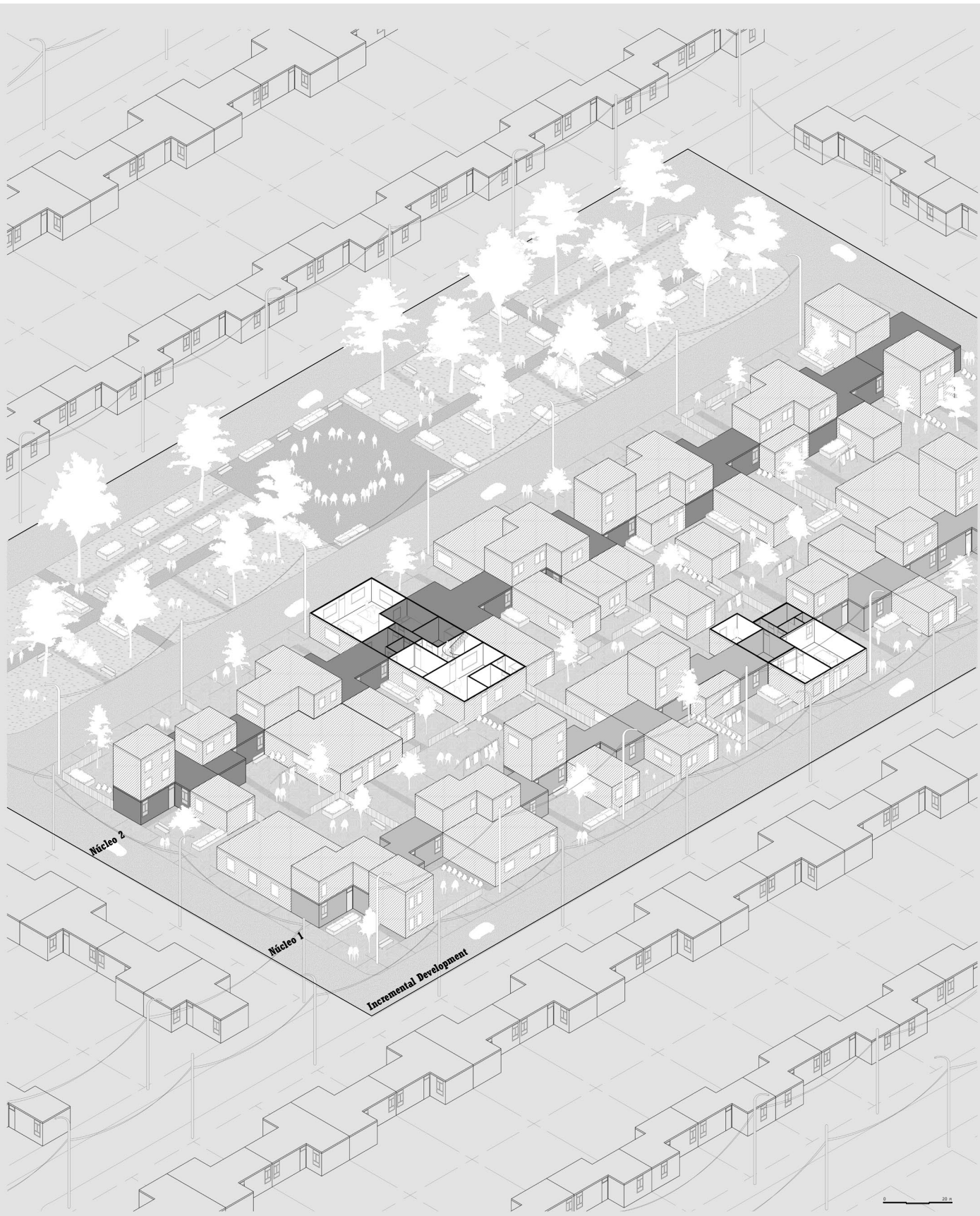
Tutors:

Prof. Matina Tabassum
Dr. Dick van Gerner
Dr. Nelson Mota
Ir. Rohan Varma
Ir. Frederique van Anel
Ir. Antonio Paoletti

Student:

Anna Halleran

GLOBAL HOUSING | TUDelft | Architecture and the Built Environment



Urbanización Caja de Agua

Lima, Junta Nacional de la Vivienda, 1961

Nested in the valley of the Cerro San Cristobal mountain, the Caja de Agua social housing development is located in a site of roughly 37,5 hectares. Proposed by the Peruvian state housing agency in 1961, Caja de Agua was initiated as part of a low-income social housing development program, called Urbanización Popular de Interés Social. The Junta Nacional de la Vivienda, served as both the client and designer for the Caja de Agua development.

The concept of case que crece, (the growing house) was borrowed from the Peruvian architect Santiago Aguirre, who had first implemented the idea in 1954. The project was initiated in 1965, in Caja de Agua and in the neighboring site of Chacarilla de Otéro. Creating over 1.500 lots as a housing alternative to people who lived in the nearby over crowded Cantagallo barriada. The development also provided additional amenities to residents and allocated space within the urban plan for additional

services to be built in the future. Amenities included: parks, schools, healthcare, markets, sporting facilities and churches. As the majority of spaces dedicated to future amenity spaces were not planned by Junta Nacional de la Vivienda and did not allocate future funding, very few of the neighbourhood amenities spaces have been built, since 1965.

Design Research: Global Housing

Global Housing Graduation Studio
Architecture of Transition in the Bangladesh Delta:
Autumn Semester 2024/25 [AR3AD105]

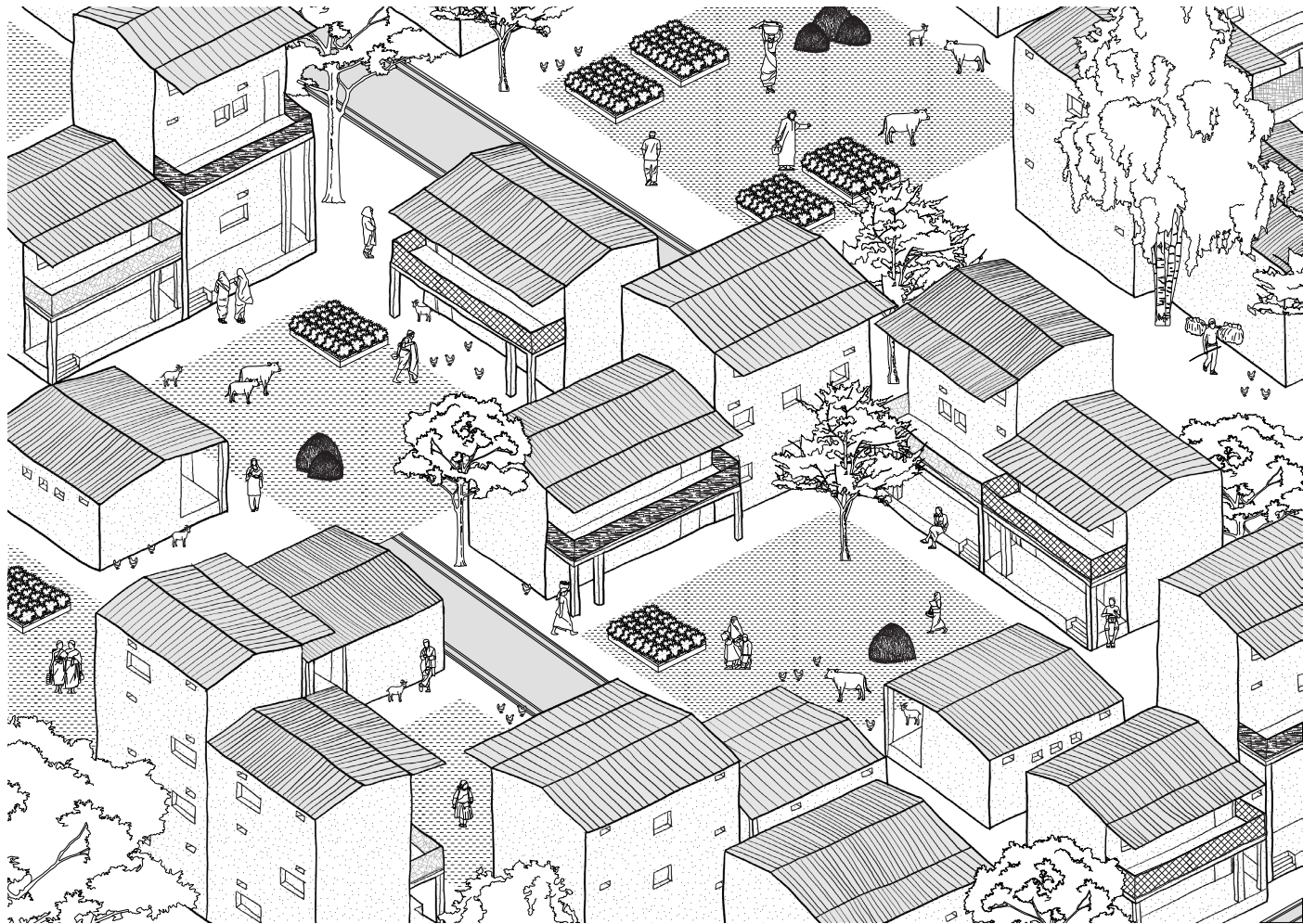
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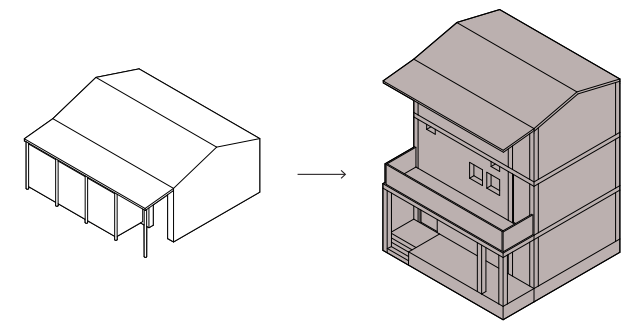
Student:

Anna Halleran

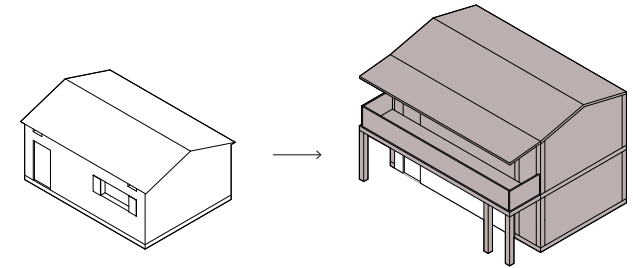
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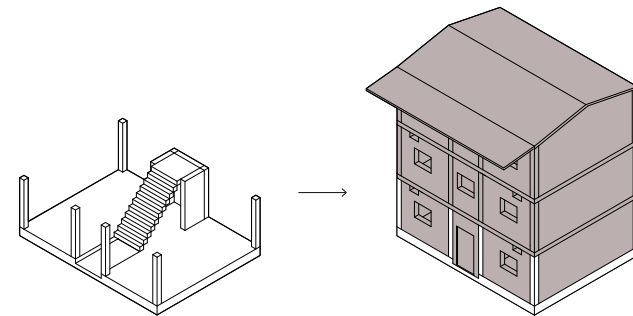
P2 Sketch Perspectives



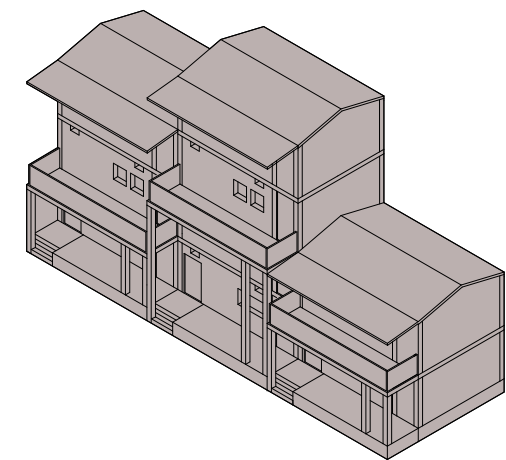
1 Existing home in poor condition - New build required



2 Home in good condition - Expansion to existing

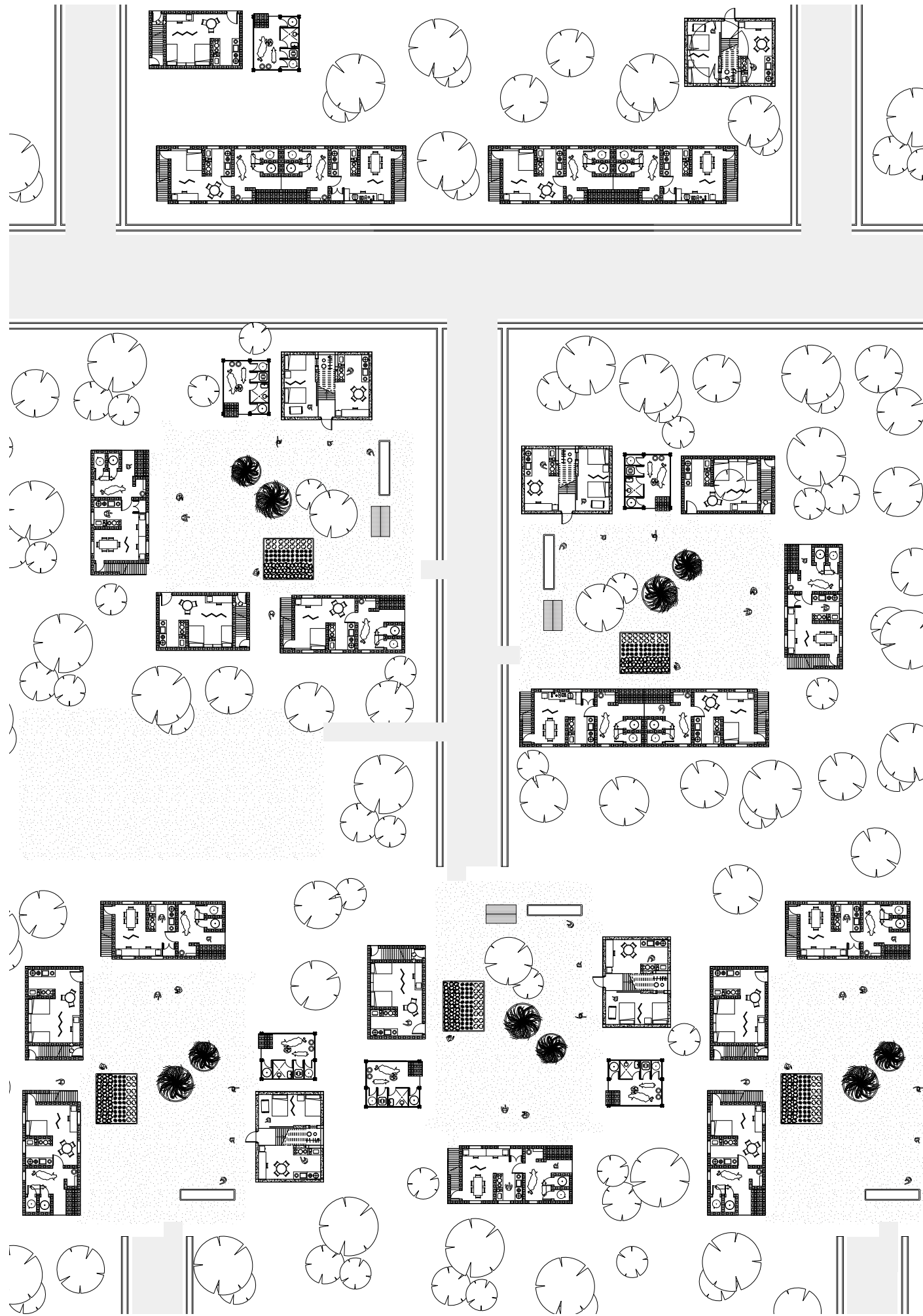


3 Existing plinth and columns - Home added



4 Expansion beyond current village limits

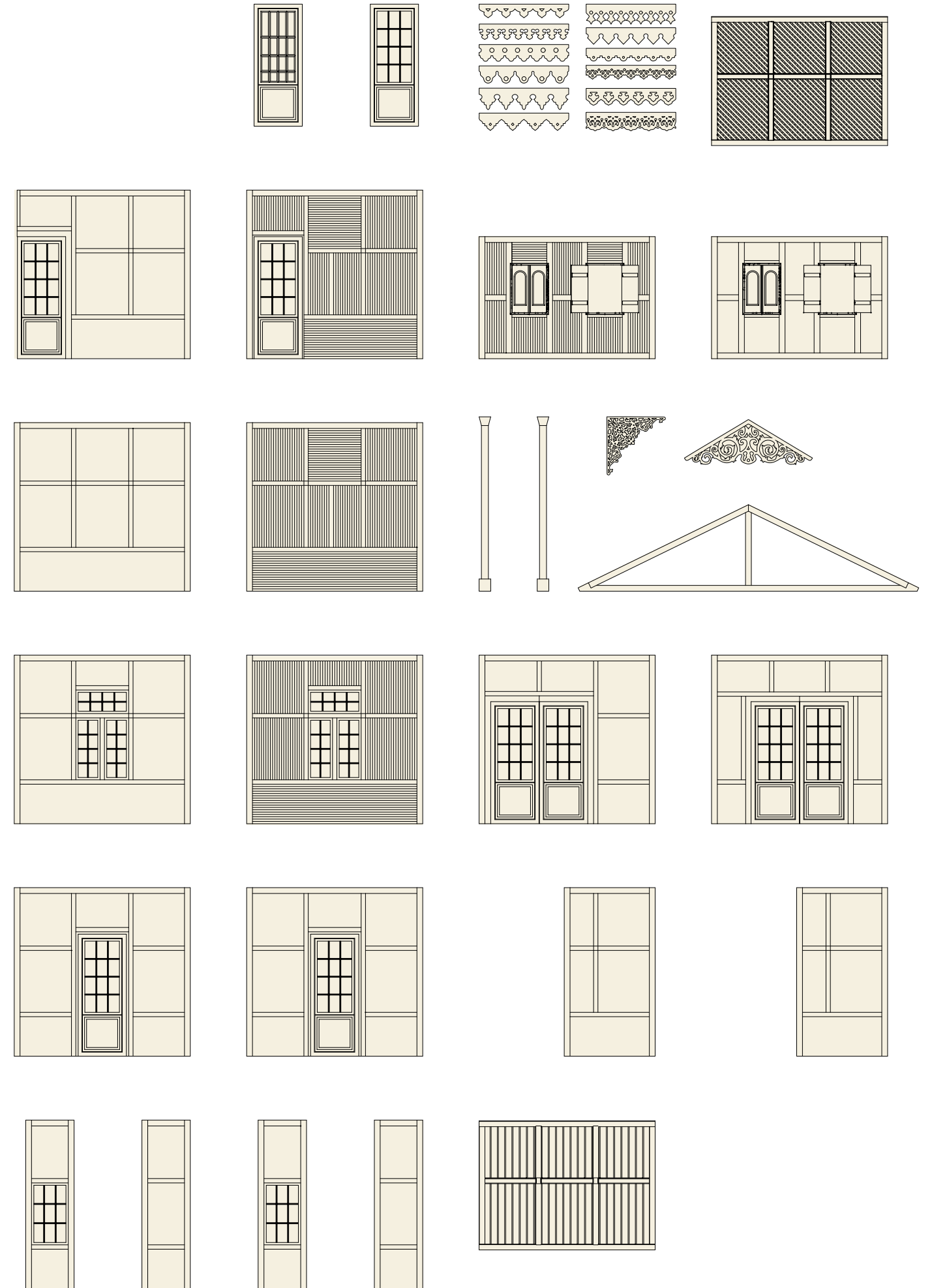
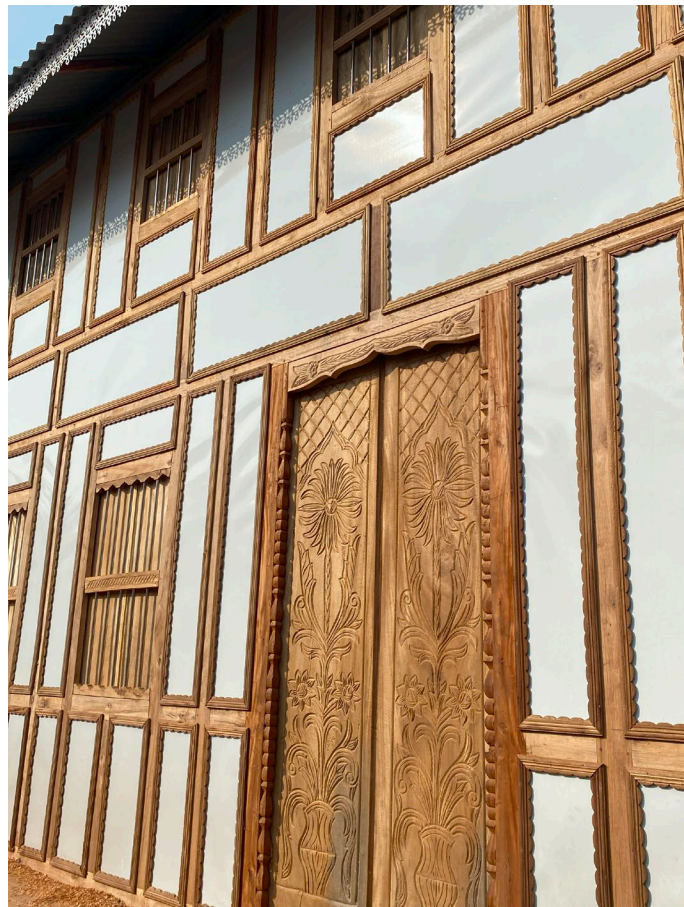
P2 4 Options



P3 Cluster Plan



P3 Master Plan



Bangla Baton Case Study

Bangla Baton Kit of Parts



thank you

ধন্যবাদ