

Maker Housing

निर्माता गृहनिर्माण **Nirmata Grihanirman**

P5 Presentation

Olivia Dolan

5379245

Global Housing Graduation Studio:

Navi Mumbai

Tutors:

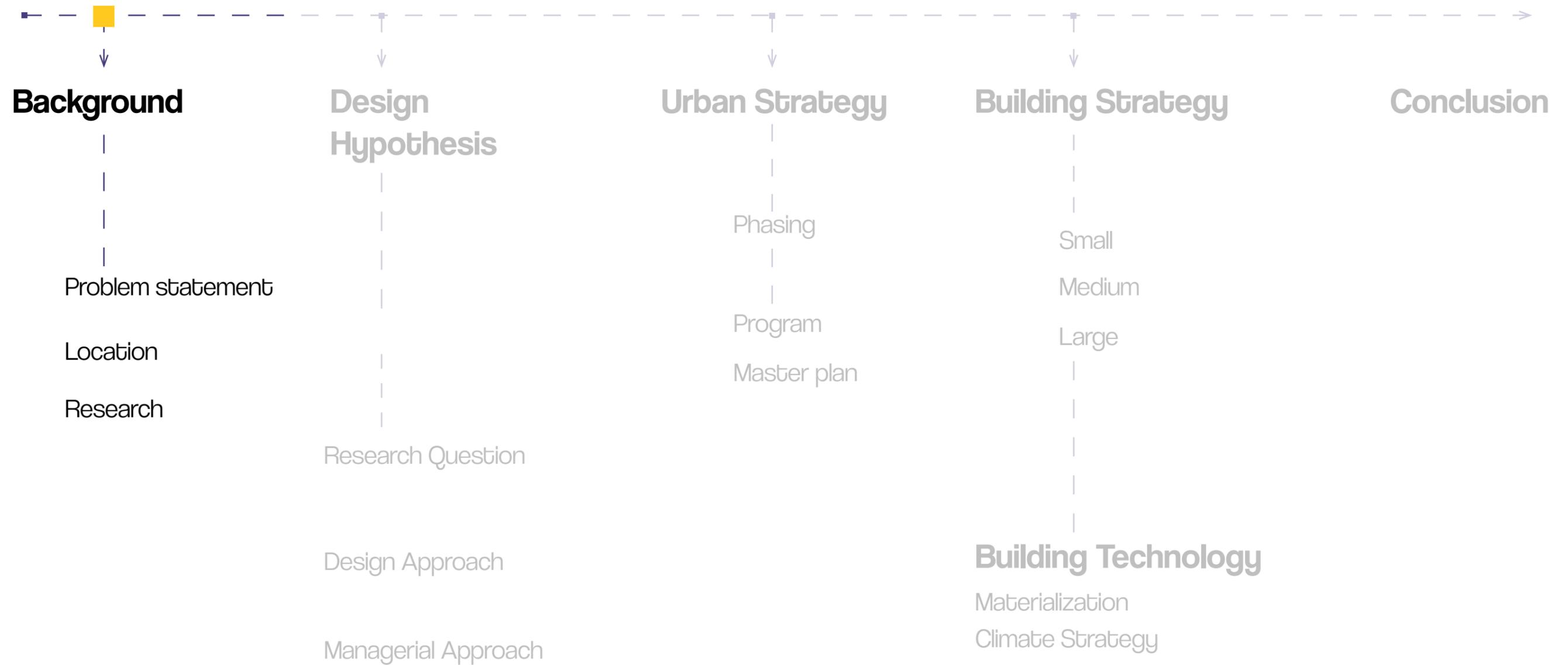
Main mentor: Dr. Nelson Mota

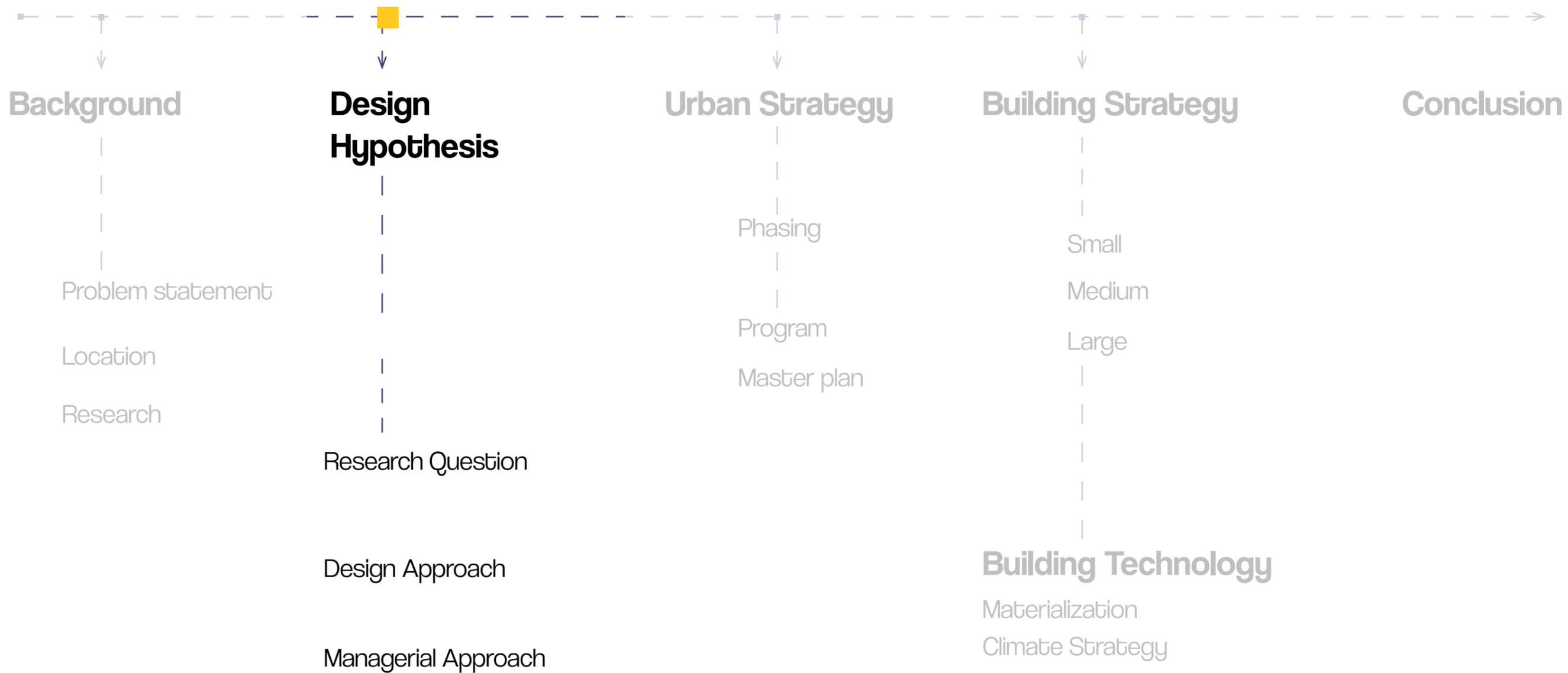
Second mentor: Ir, Stephan Verkuijlen

Third mentor: Dr. Vanessa Grossman

Additional mentor: Ir. Harald Mooij

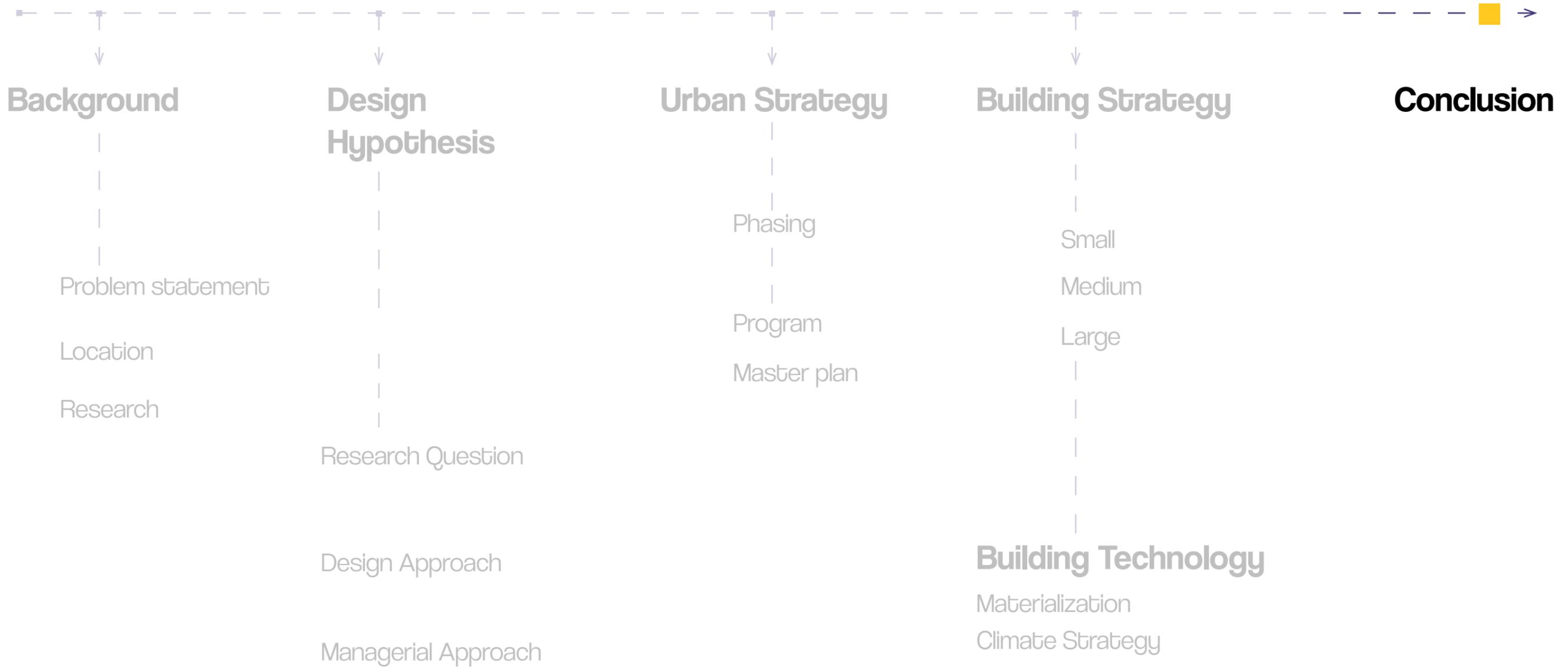
Contents







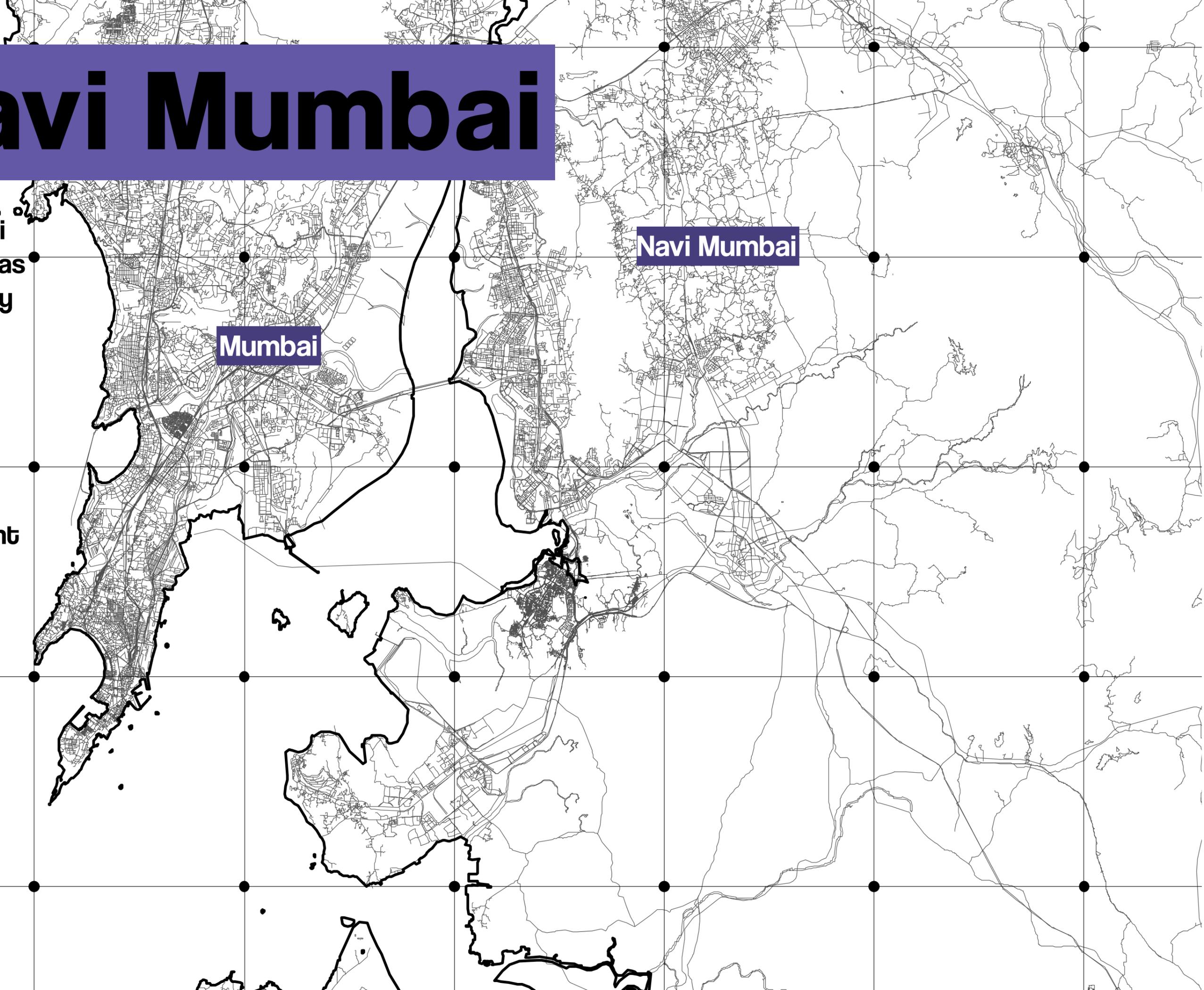




Background

Navi Mumbai

Navi Mumbai
also known as
New Bombay
is a planned
city in India,
situated on
the west
coast of
the Indian
subcontinent



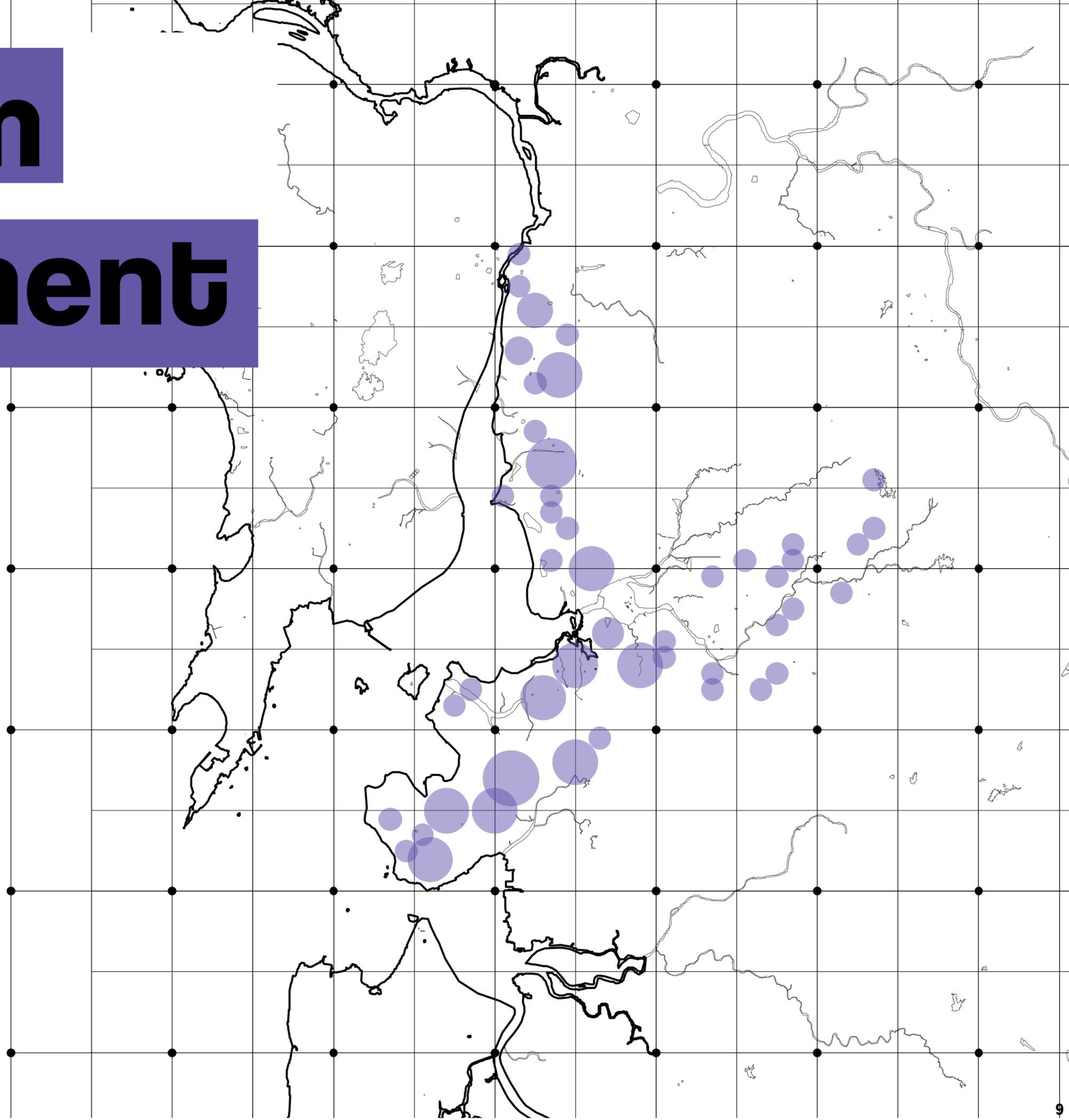
Mumbai

Navi Mumbai

Problem

Statement

Many artisans abandoned their ancestral trade to find a more sustainable income. This damaged the self-sufficient village economy, poor infrastructure of village and slum communities in Navi Mumbai have a significant impact on health, economy and characteristics of the area.



Village Survival

सिडको

CIDCO (City and Industrial Development Corporation)

CIDCO Urban Renewal In 2014, the Maharashtra State Government proposed a resolution for Urban Renewal Schemes for gaothans and surrounding areas in the Navi Mumbai Notified Area to regulate unplanned and haphazard development. The scheme relies heavily on voluntary and participatory involvement of eligible inhabitants of gaothans and surrounding areas.

Number of Revenue Villages

95

Number of Gaothans

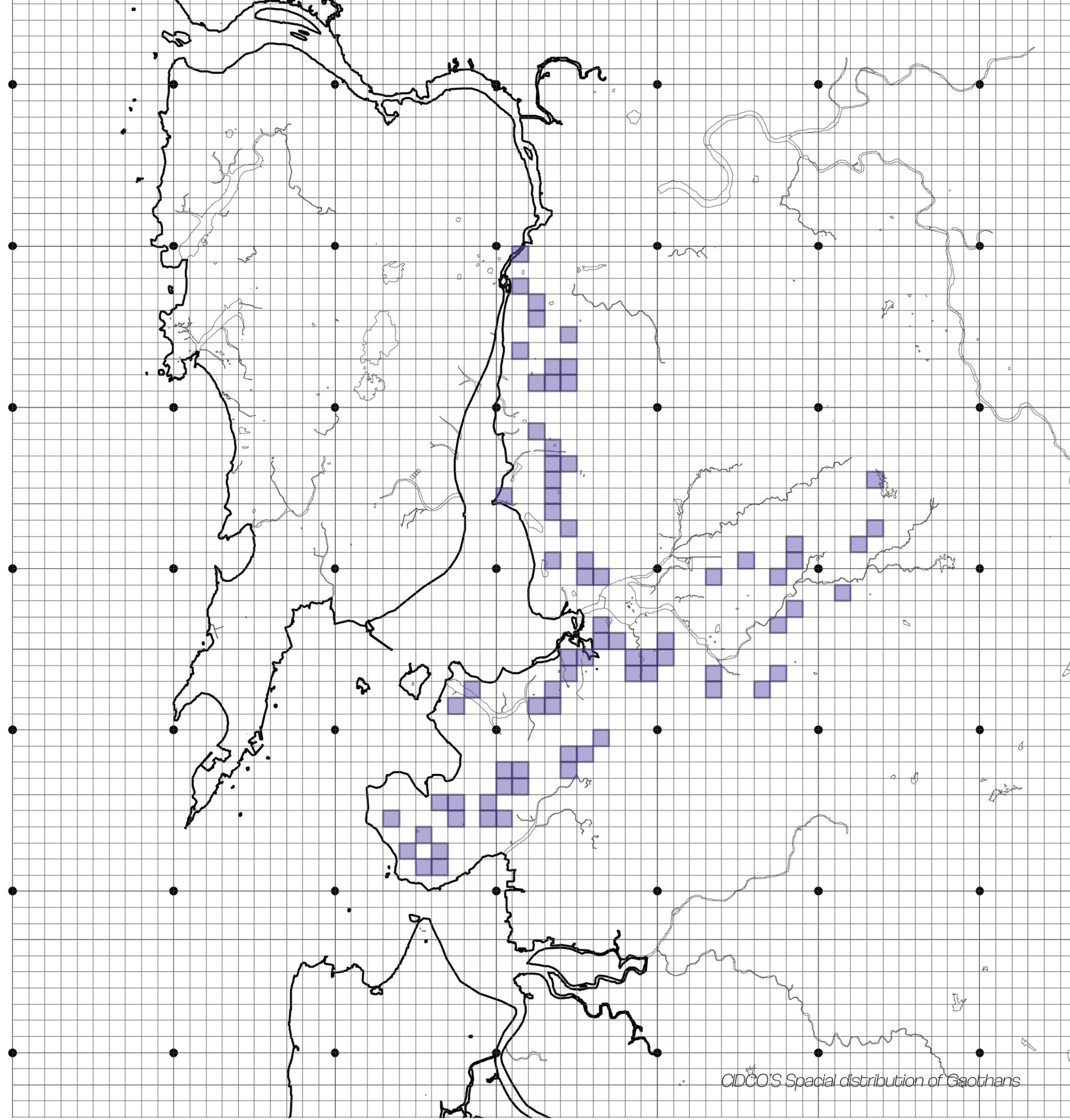
101

Total Gaothan area* (In hectare)

255

Existing population of Gaothans

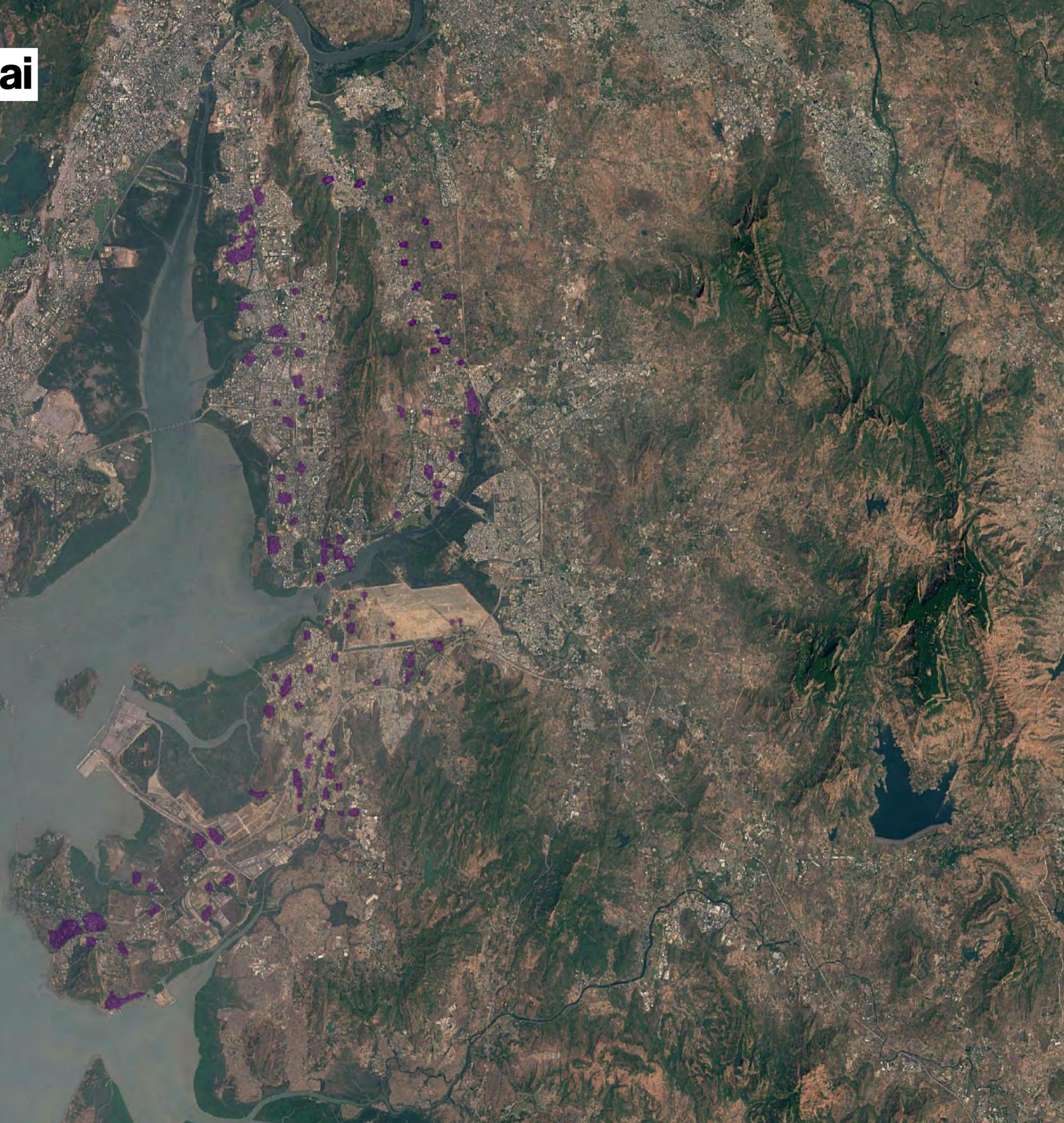
3,49,916



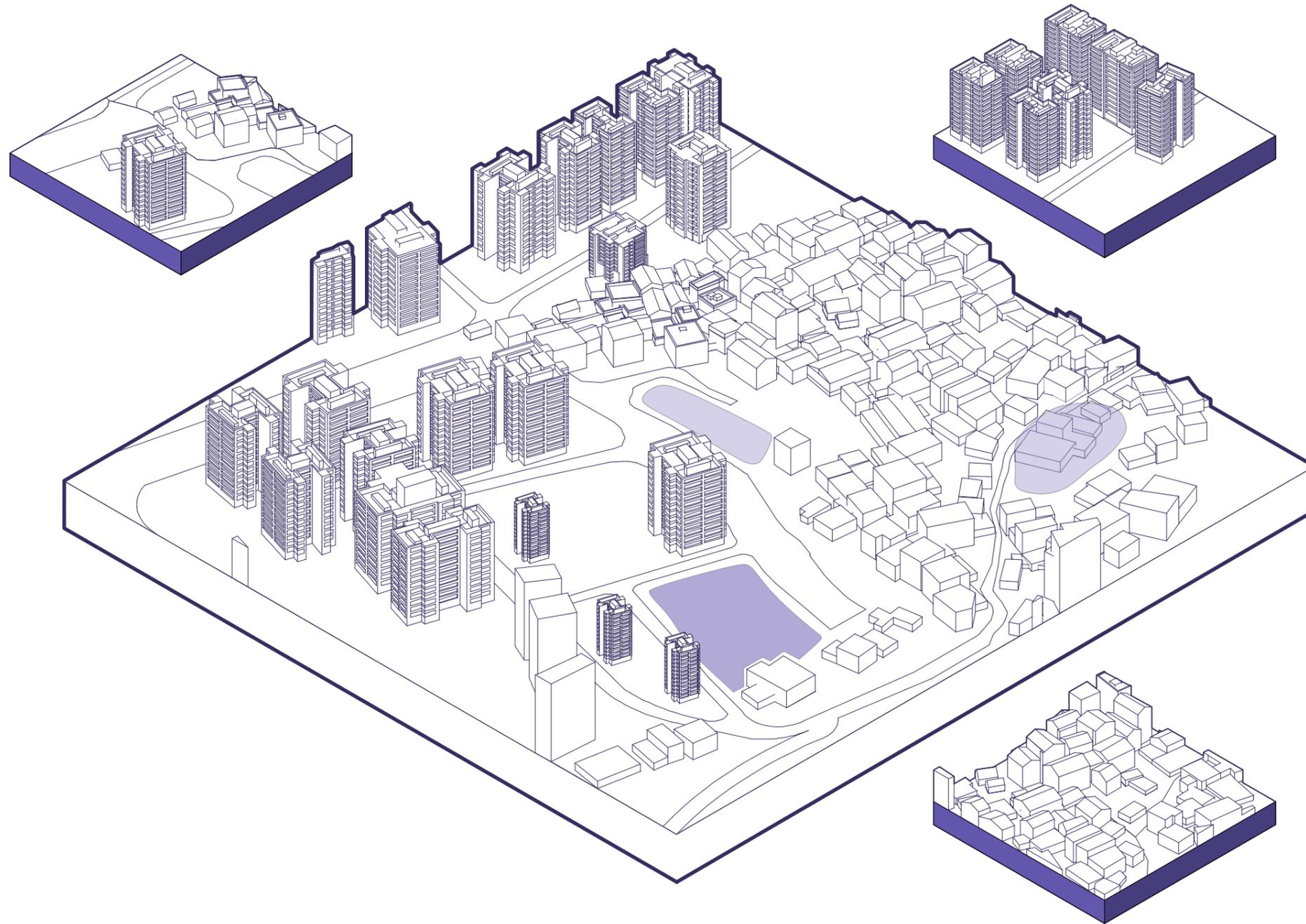
Gaothans in Navi Mumbai

गाँव थान **Gaothan**

“CIDCO and the state government has failed to implement the gaothan expansion scheme in such areas. This has led to the unauthorized construction, giving rise to problems such as narrow roads and footpaths, lack of any kind of ventilation, social amenities, parking facilities or open spaces.”



Problems, Challenges and Potential of Urban Villages



Mumbai: Will the gaothans survive development?

As election day approaches, local problems are raised as candidates canvas for votes.

Author: **DNA WEB TEAM** | Edited By: Fleur D'Souza | Updated: Apr 11, 2019, 03:15 PM IST



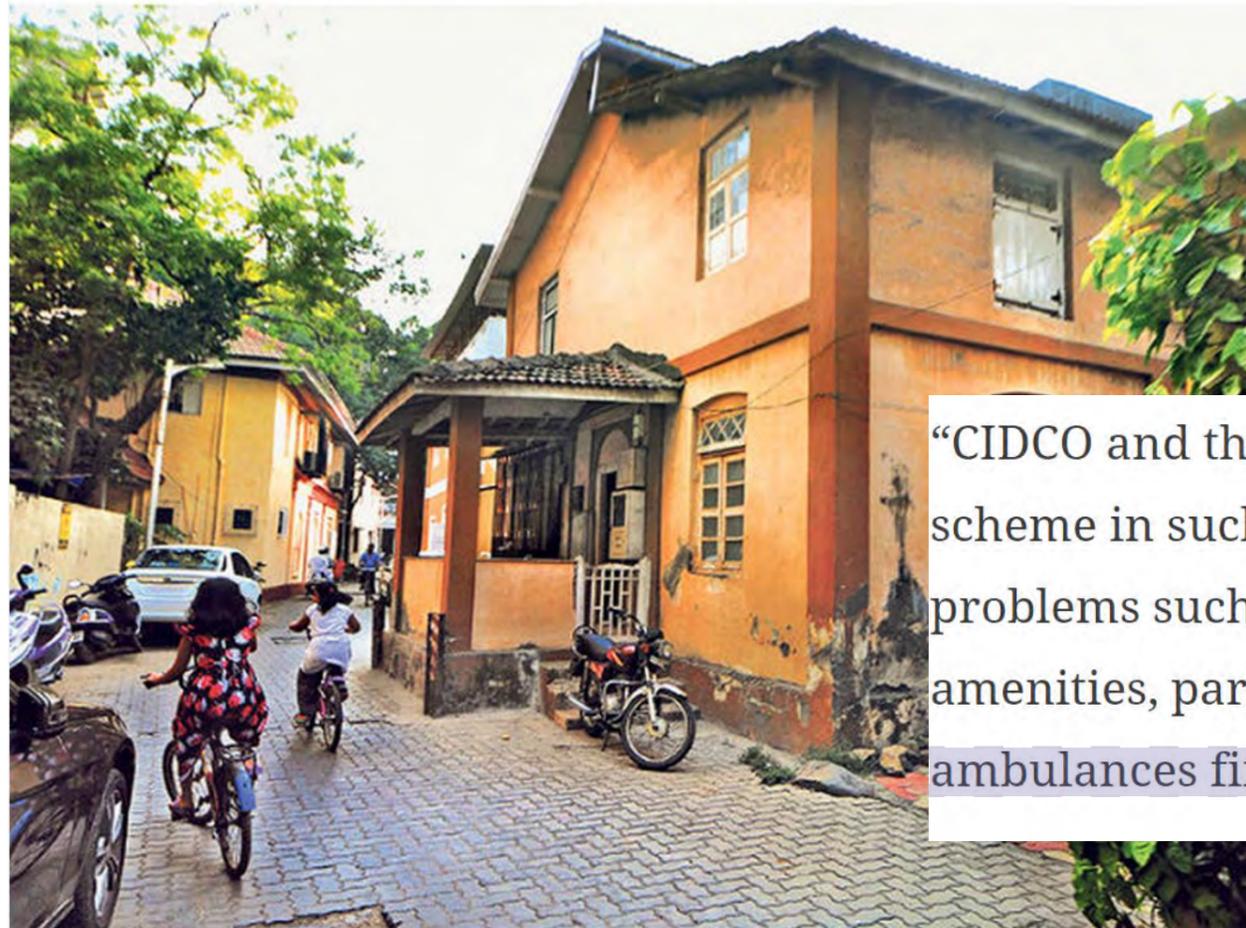
Development shouldn't dwarf urban villages



MUSTANSIR DALVI

FEBRUARY 07, 2016 08:19 IST
UPDATED: NOVEMBER 17, 2021 06:18 IST

SHARE ARTICLE



Koliwad and gaothans in Mumbai are on the road to oblivion, thanks to monolithic Development Control rules and building by-laws



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MUMBAI NEWS

No end to dispute over redevelopment rights for gaothans

Navi Mumbai's gaothan areas a major challenge for fire brigade officials

Reported By: **DNA WEB TEAM** | Edited By: Rahul M Tawade | Source: DNA | Updated: Nov 29, 2013, 05:02 AM IST

THIS STORY IS FROM SEPTEMBER 24, 2016

Gaothan residents resist govt survey

Citizen Reporter
TNN / Sep 24, 2016, 00:41 IST

ARTICLES

Gaothan residents resist govt survey

“CIDCO and the state government has failed to implement the gaothan expansion scheme in such areas. This has led to the unauthorised construction, giving rise to problems such as narrow roads and footpaths, lack of any kind of ventilation, social amenities, parking facilities or open spaces. During emergencies, fire brigade or ambulances find it difficult to enter these areas,” said Fadnavis.



Location

Vahal Village

Vahal Village

An aerial satellite photograph of a residential area. A yellow pushpin marker is placed on a cluster of buildings in the center-right of the image. The text 'Vahal Village' is written in white next to the pushpin. The surrounding landscape includes a river, a road, and various green and brown patches of land.

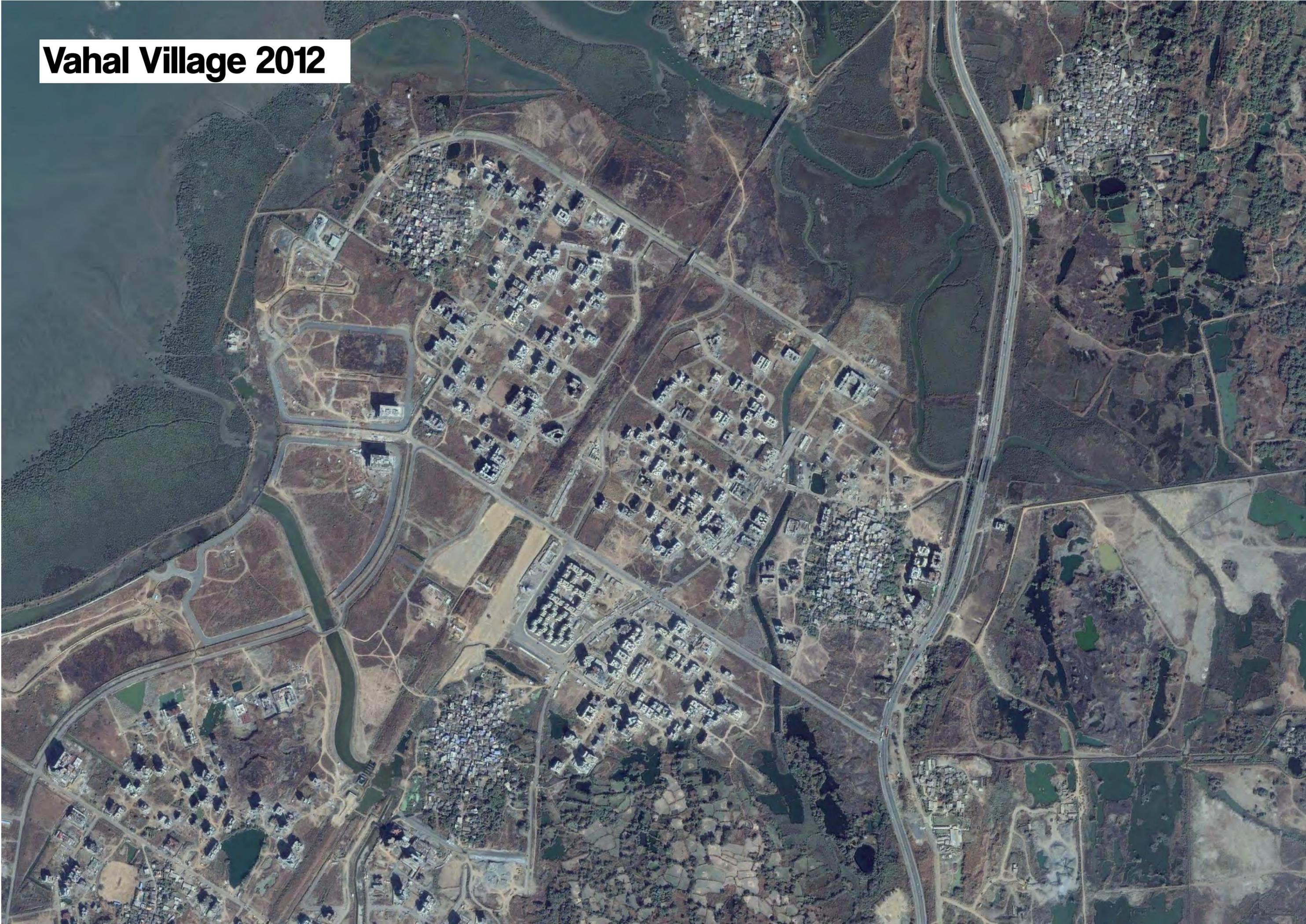
Vahal Village 2009



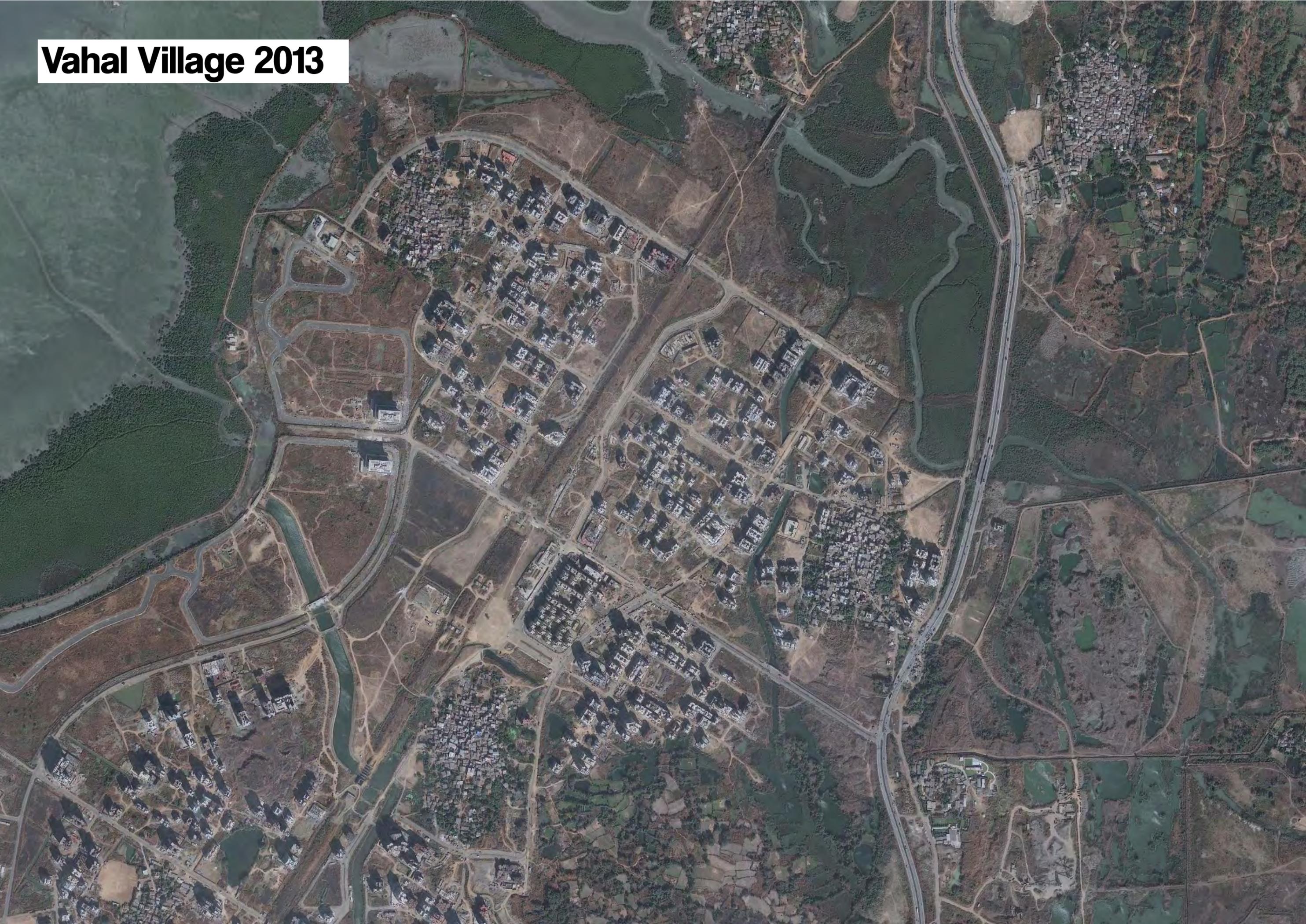
Vahal Village 2011



Vahal Village 2012



Vahal Village 2013



Vahal Village 2015



Vahal Village 2017



Vahal Village 2019

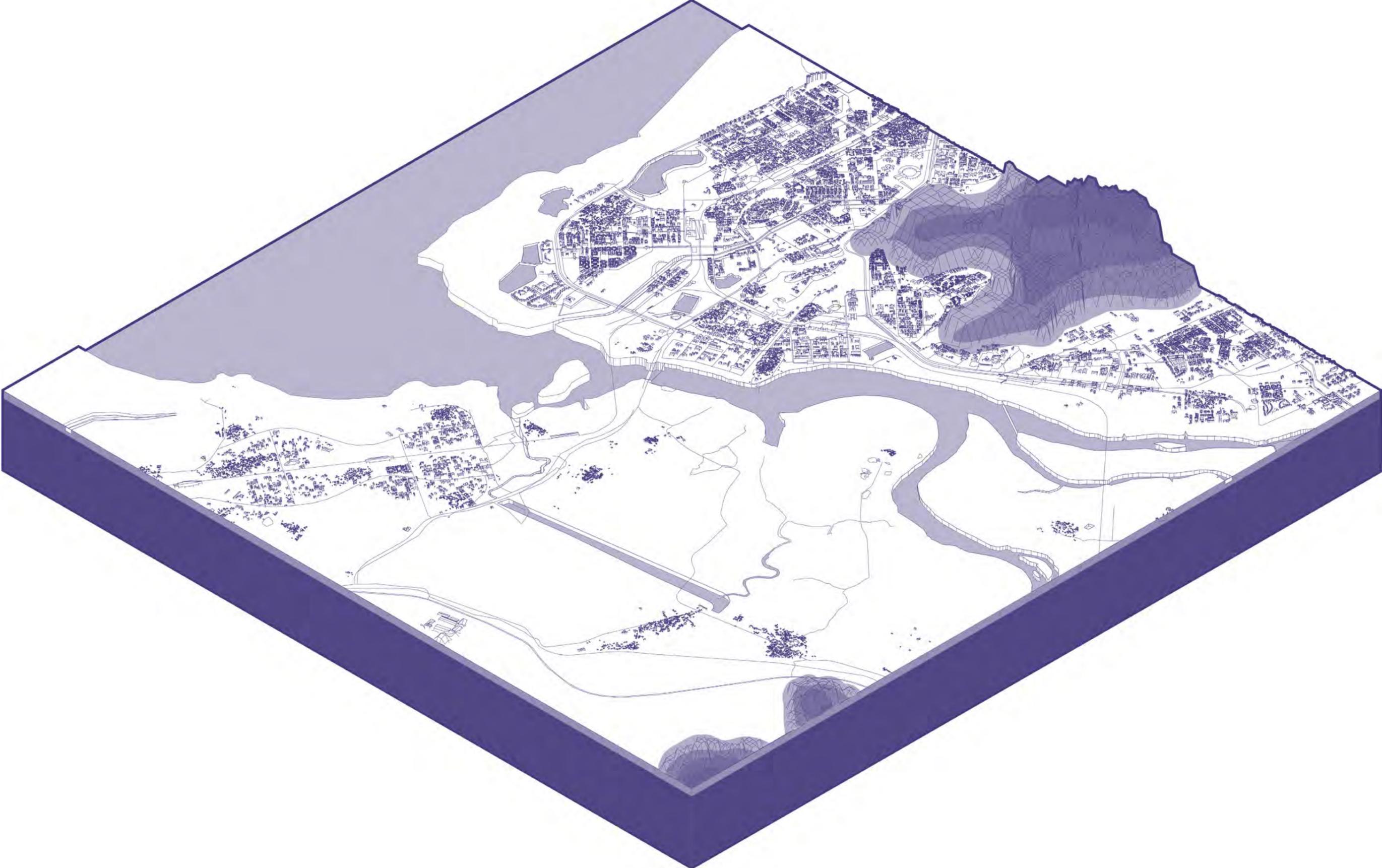


Vahal Village 2021

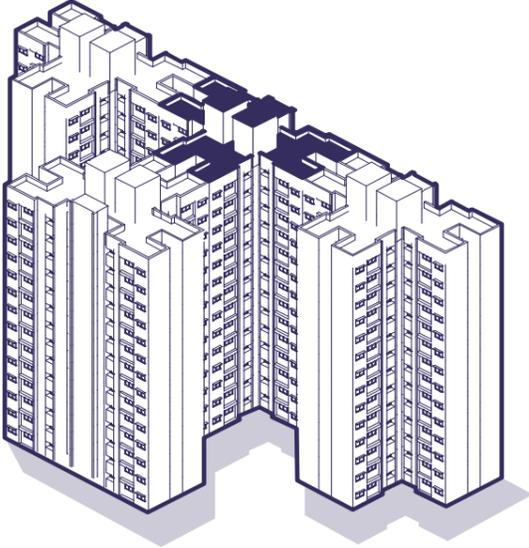


Research

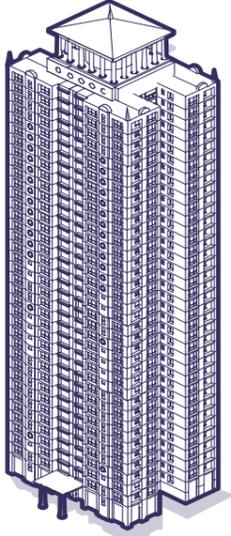
Navi Mumbai Landscape



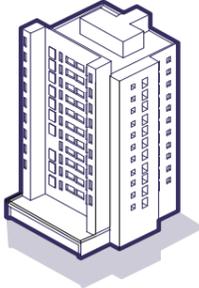
Navi Mumbai Typology



CIDCO



Apartment Tower



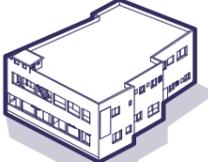
Apartment



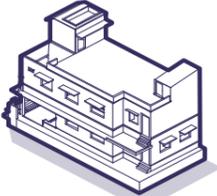
Chawl



Mercantile Housing



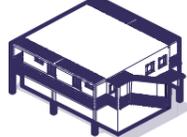
Small Chawl



Redeveloped Attached Plotted Housing



Wadis



Wadis



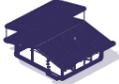
Walk Up Apartment



Villa



Original Village Detached Plotted Housing



Wada/ Agrarian Housing



Market Housing



Informal Housing

Vahal Typology

Typology types:

CIDCO: Concrete apartment blocks

Chawl: Typically wood with additional informal interventions

Informal: Clay/Steel paneling



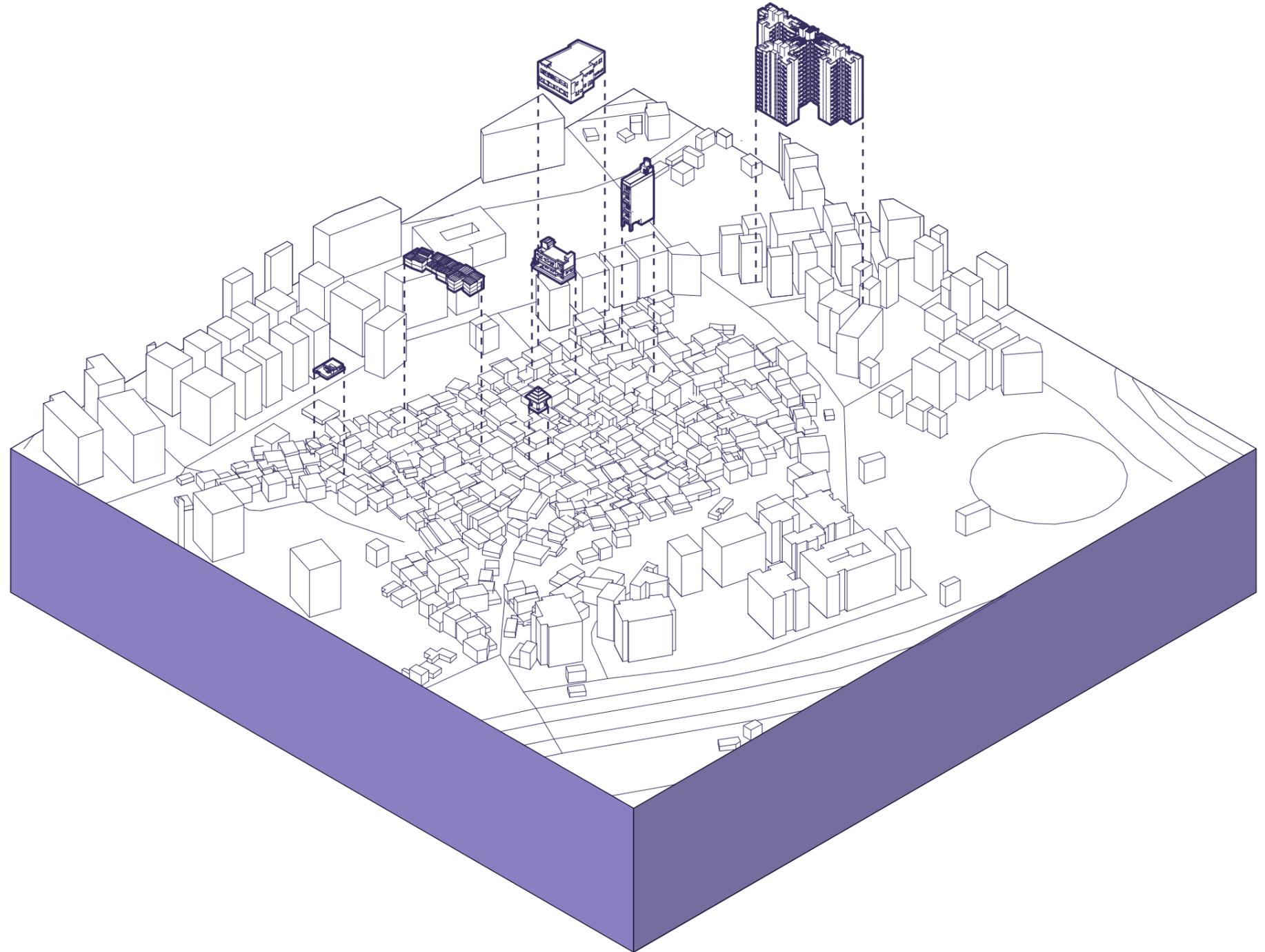
Original Village Detached Plotted Housing



Redeveloped Attached Plotted Housing

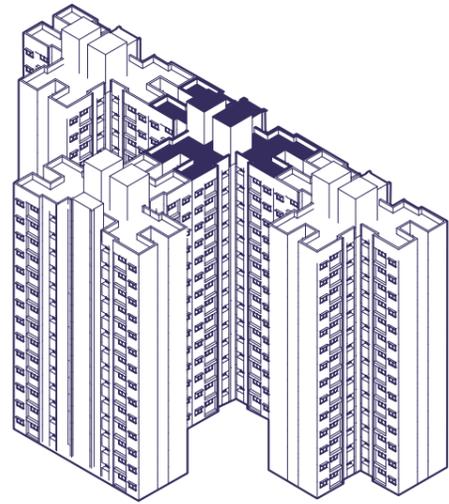


Walk up Apartments Chawls

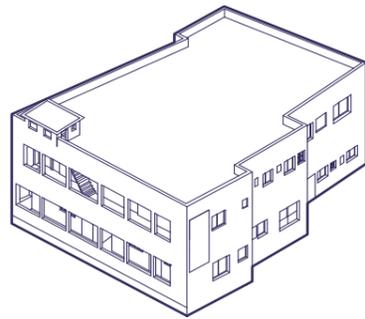


Vahal Vernacular

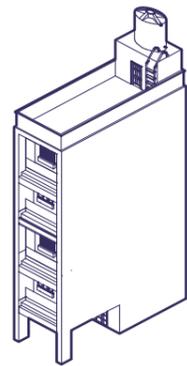
Typology - Vahal is made up of four main typology types with different variations



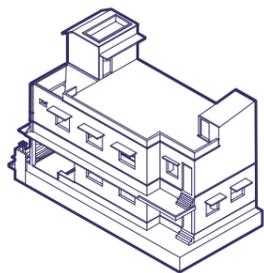
CIDCO Developments



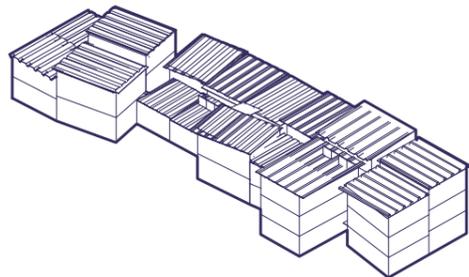
Chawl



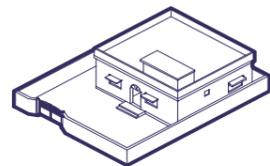
Walk Up Apartments



Redeveloped Attached Plotted Housing

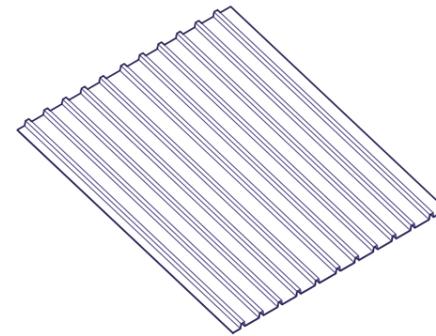


Informal Housing

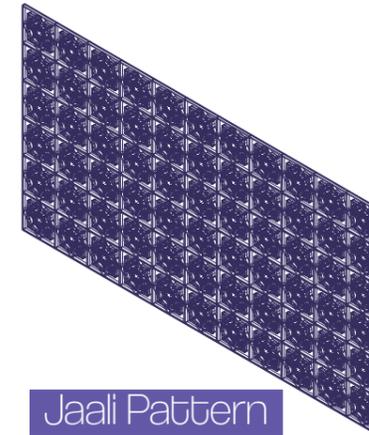


Original Village Detached Plotted Housing

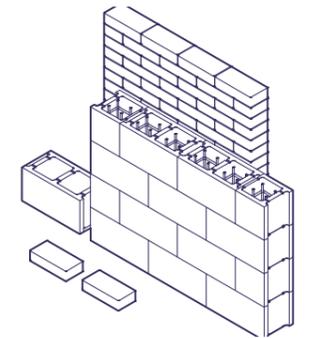
Elements - Vahal has a catalog of village characteristics



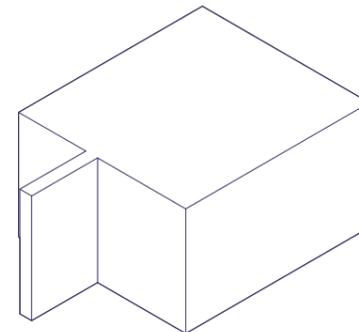
Sloping Roof



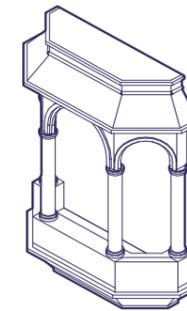
Jaali Pattern



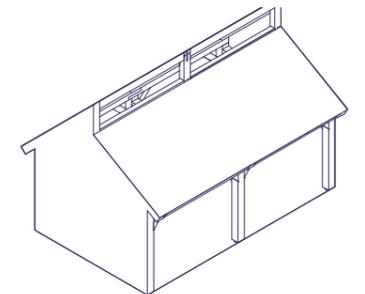
Brick Filter Walls



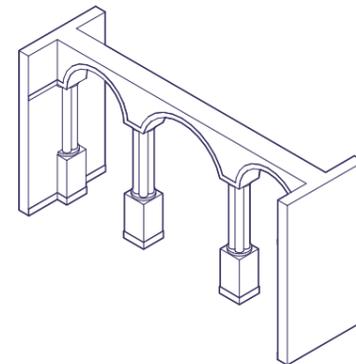
Baffle Walls



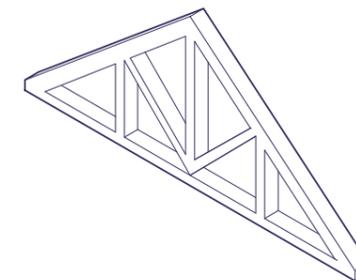
Jharokha Balcony



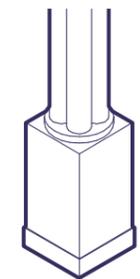
Clear Story Windows



Arched Entrance



Wood Truss



Grounded Base

Current Statistics

Vahal Gaothan is a in Navi Mumbai City in Maharashtra State, India. It belongs to Konkan region.

Latitude

18.976° or 18° 58' 33.7" north

Longitude

73.0341° or 73° 2' 2.7" eas

Population (2020)

1100

Population Density

15463 people per km²

Male Population

582

Female Population

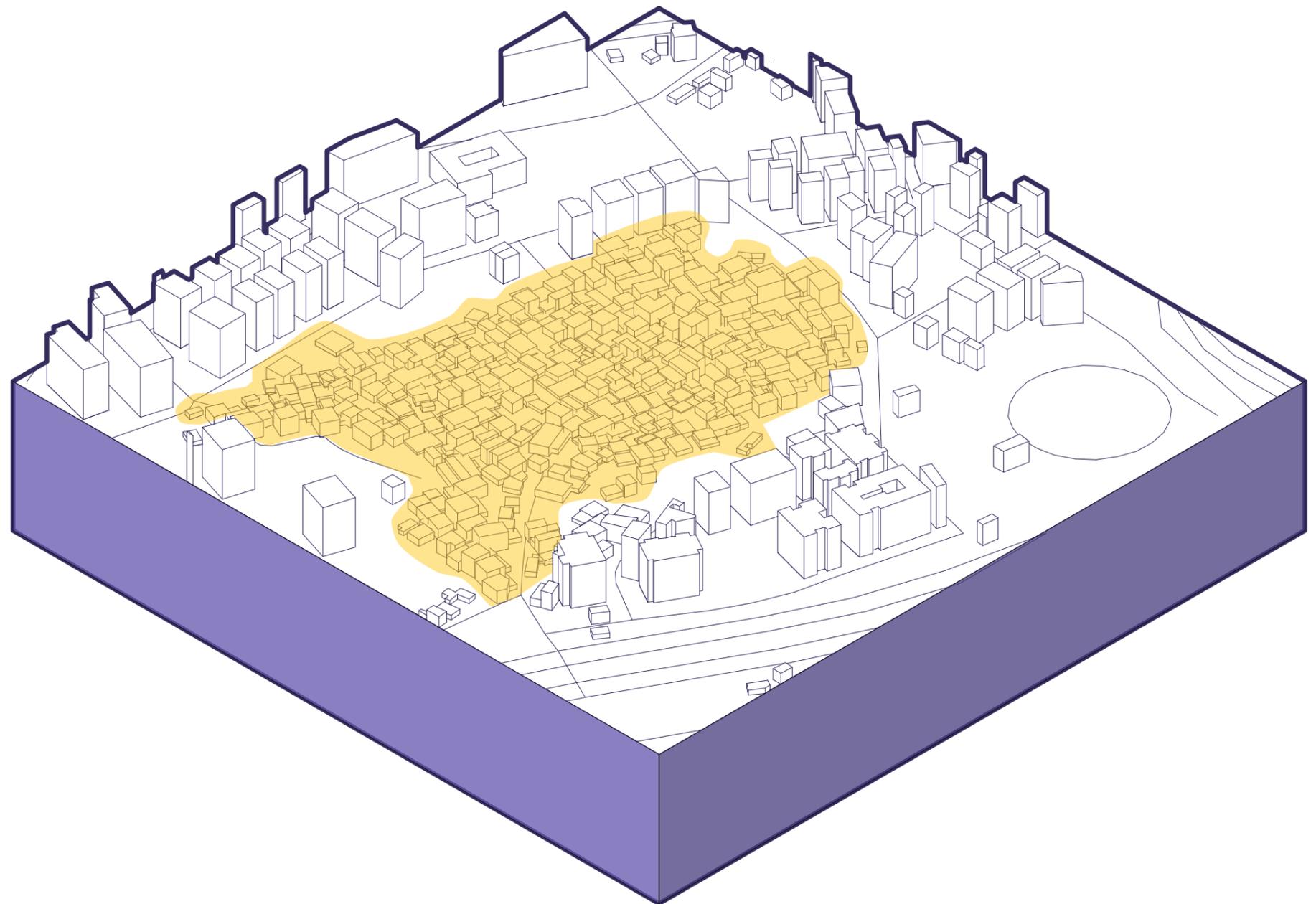
518

Nearest airport & distance

Chhatrapati Shivaji International Airport, 16.85 km

Nearest Railway Station & Distance

Panvel, 7.31 km



data: <https://geologic/places/Vahal-Gaothan,-Ulwe/3BRbwqSCe7>

Social Situations

Roadside



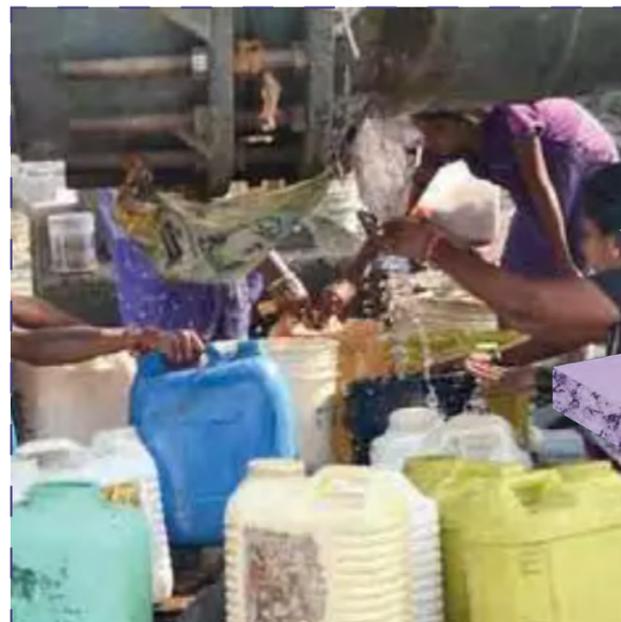
Temple



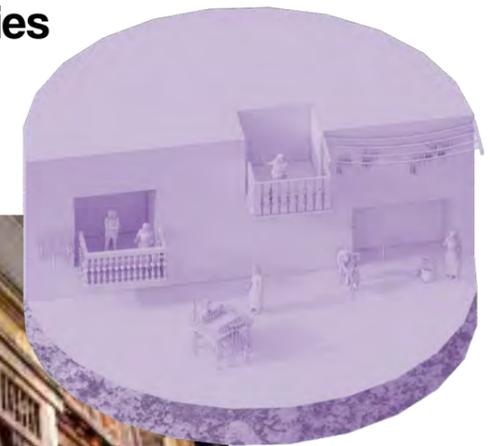
Play field



River

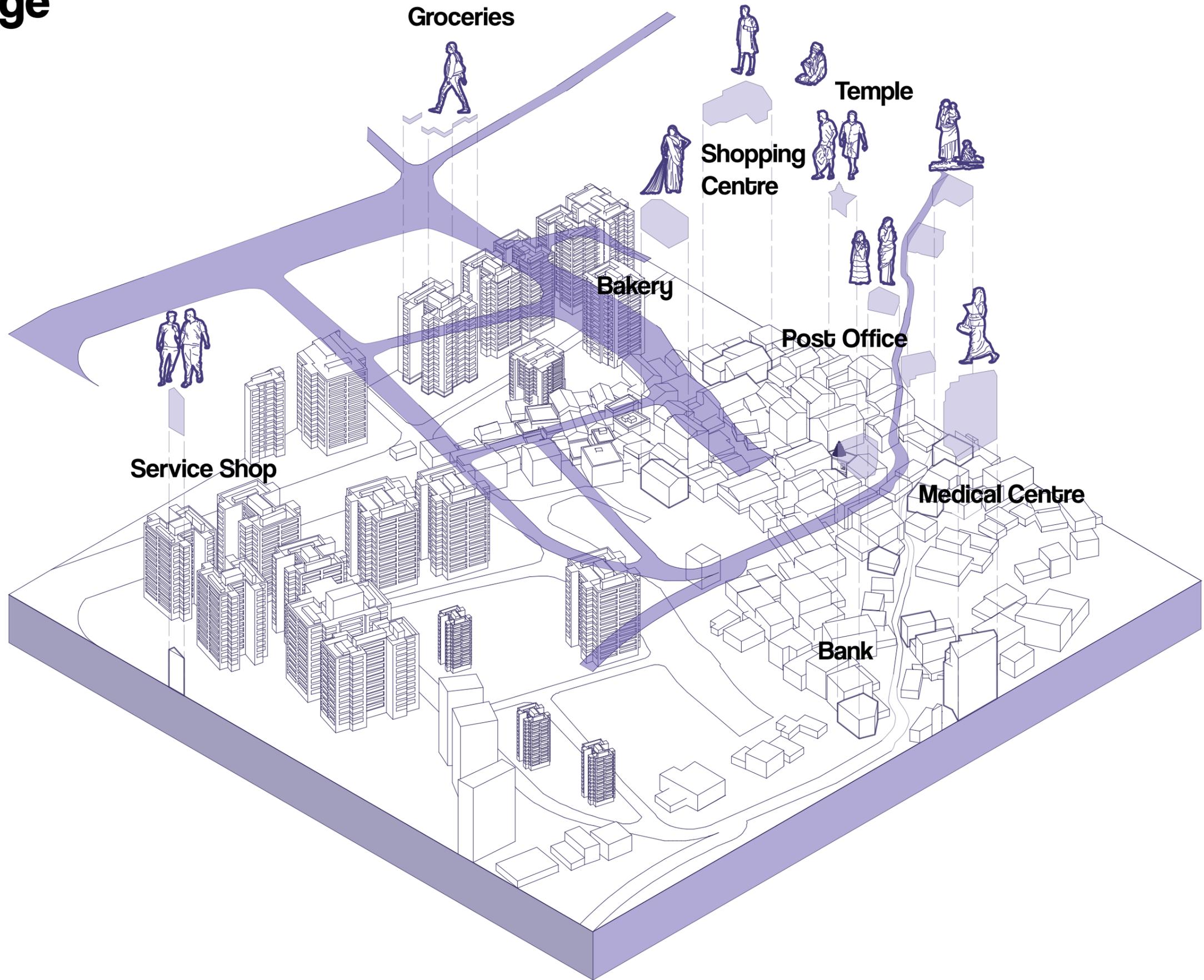


Balconies



Shop

Social Village



Income Groups



EWS



LIG

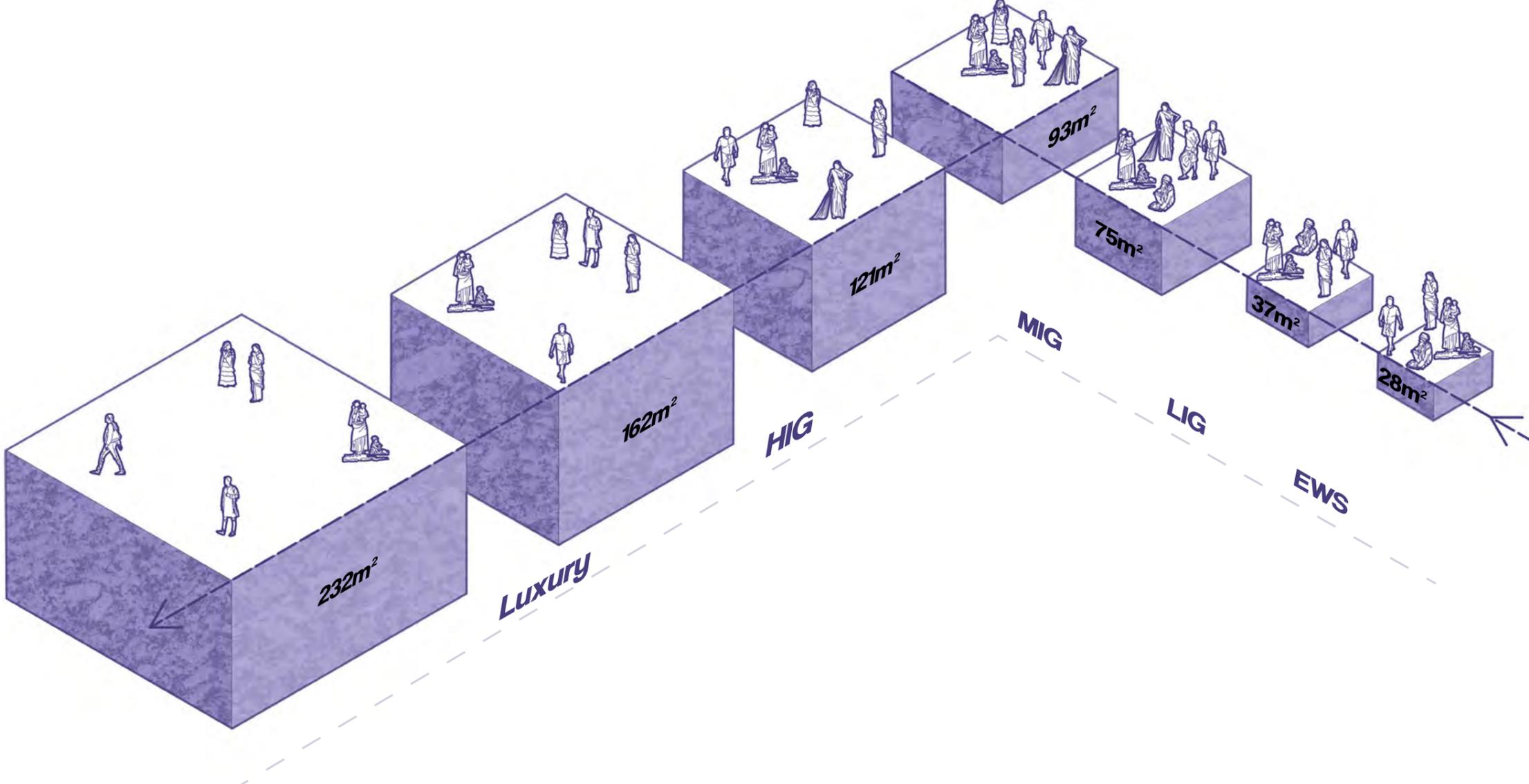


MIG

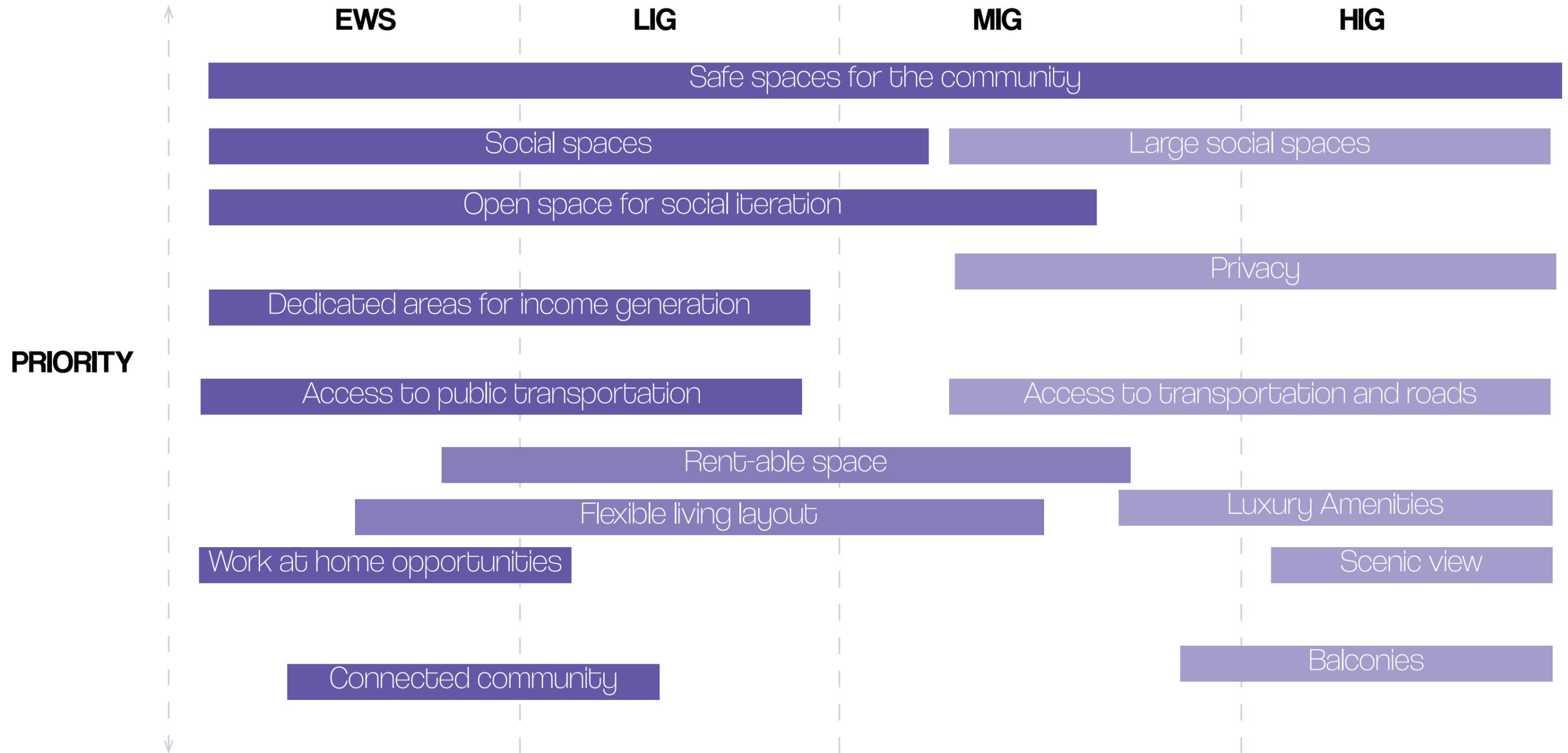


HIG

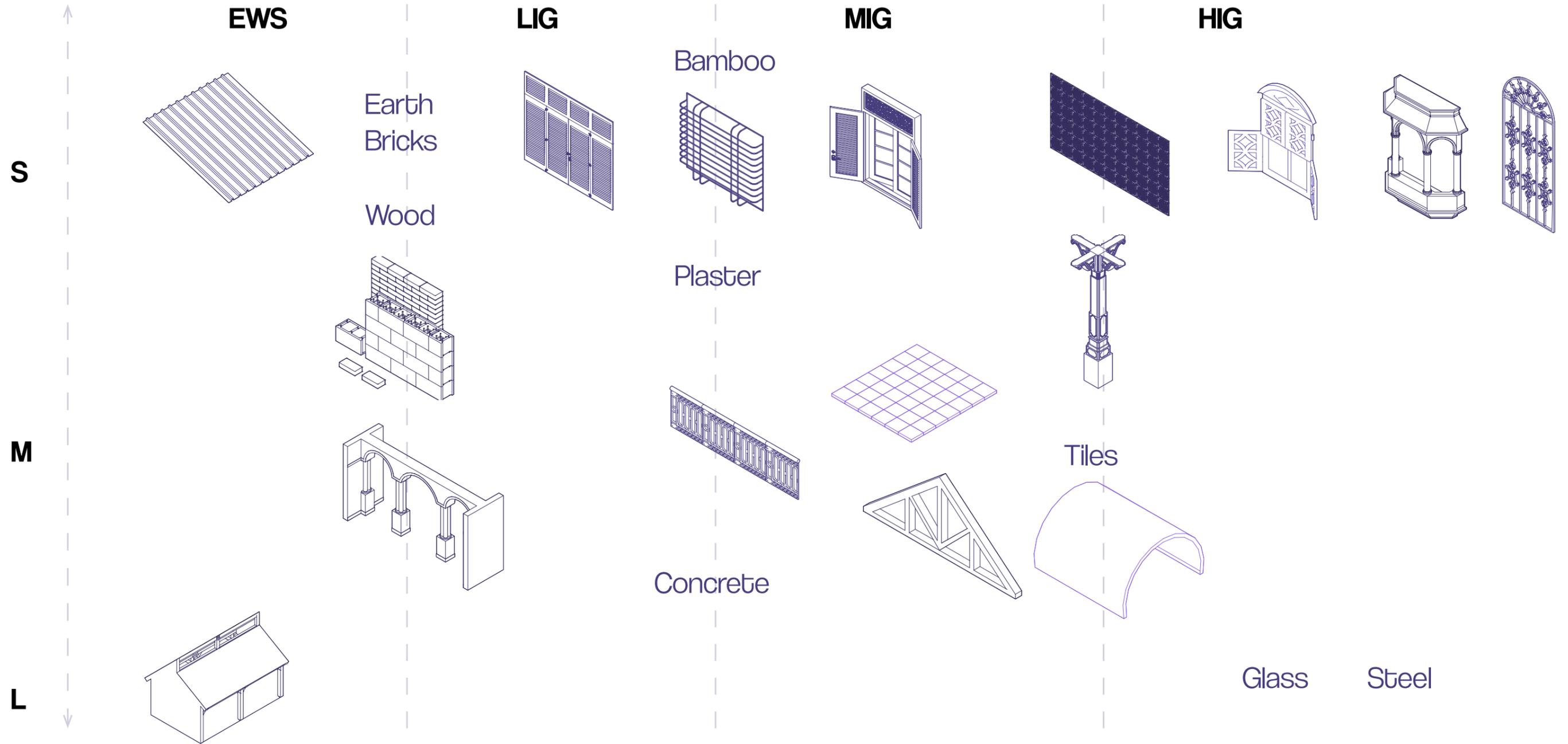
Income Group Classification



Group Aspirations

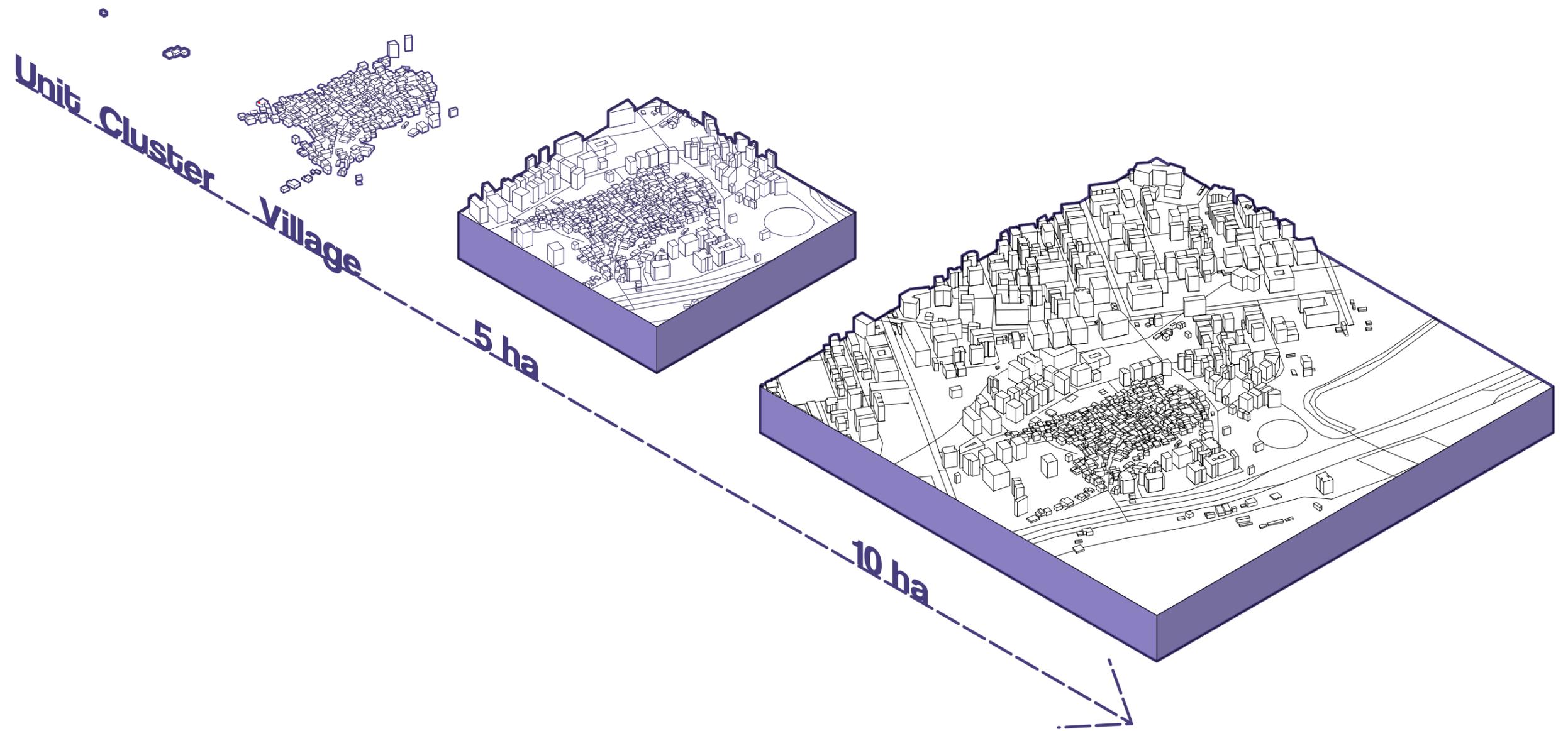


Qualities in each scale



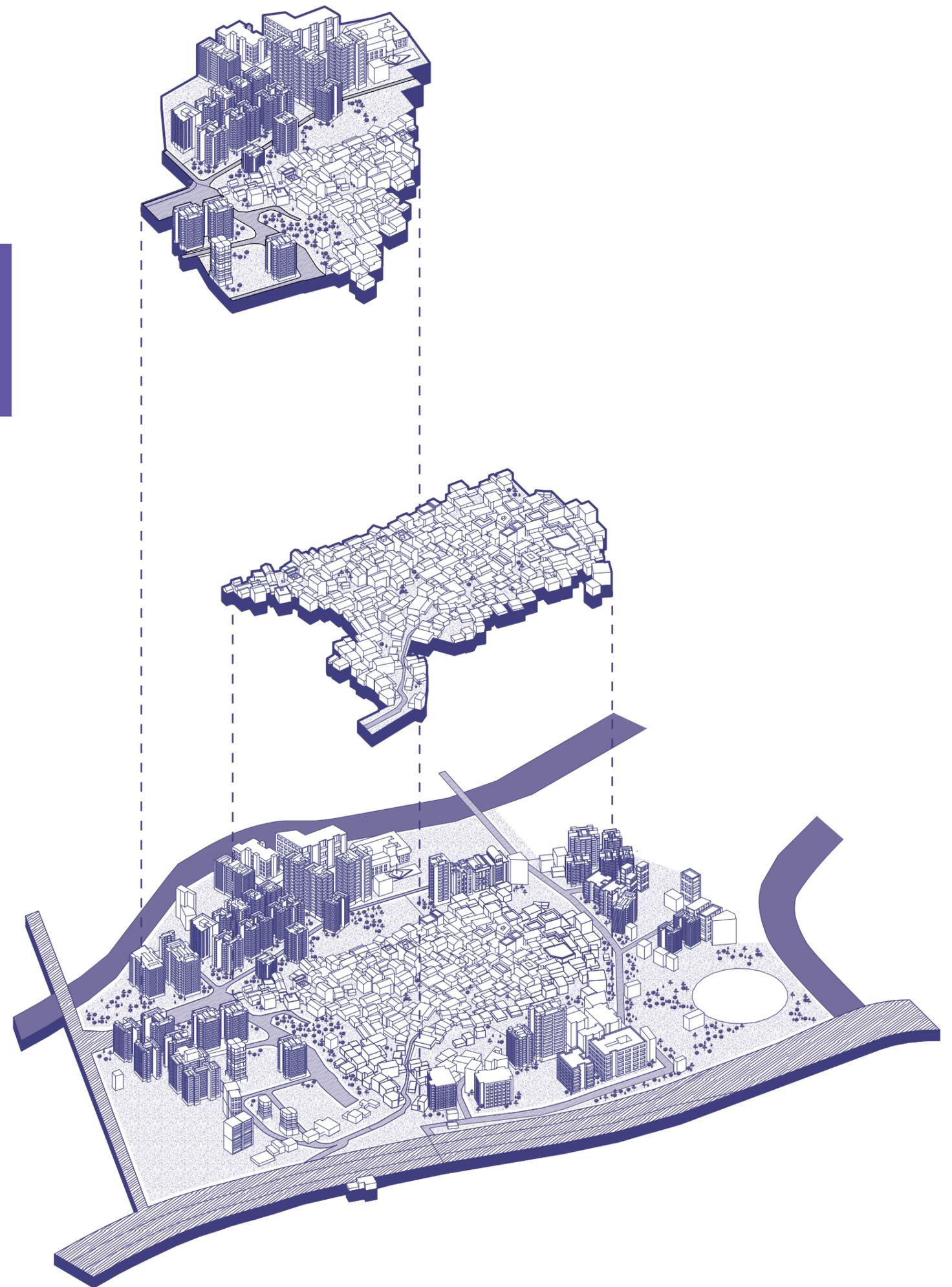
Design Hypothesis

Design Hypothesis



Urban

Conditions



Urban Conditions Characteristics

CIDCO boundary

Pros

- Communal Entry
- Collective Point of Communication
- Higher Ground Views

Cons

- One point of entry/exit
- Services
- Maintenance
- Surrounding Landscape
- Tall Buildings/Wind?



Urban Conditions Characteristics

CIDCO boundary

Pros

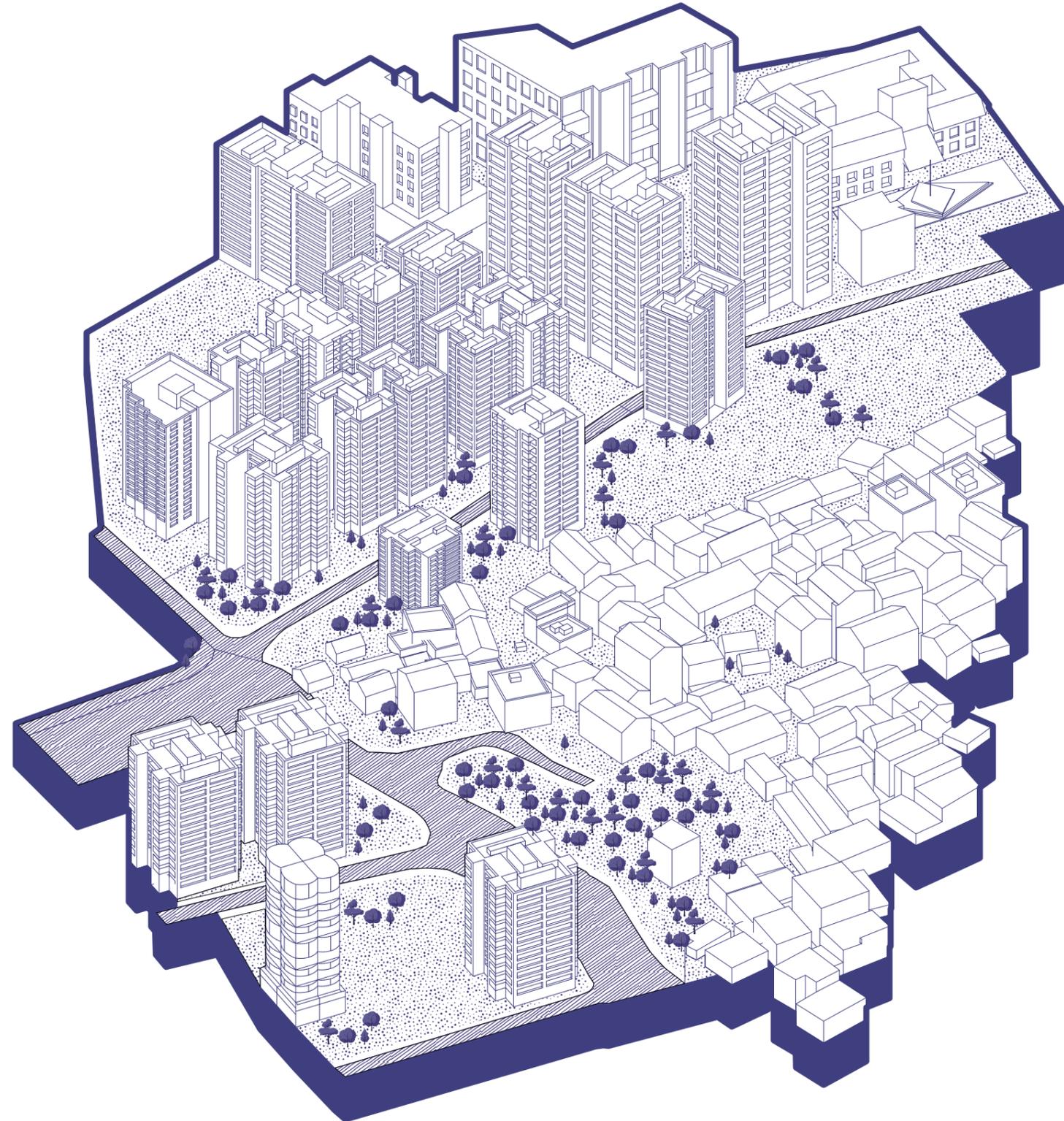
- Communal Entry
- Collective Point of Communication
- Higher Ground Views

Cons

- One point of entry/exit
- Services
- Maintenance
- Surrounding Landscape
- Tall Buildings/Wind?

Maker Housing Principles

- To provide a quantity of dwellings in the surrounding boundary area
- To bring social amenities to area
- To make the surrounding land more attractive and approachable
- To create a community atmosphere outside of the village.



Urban Conditions Characteristics

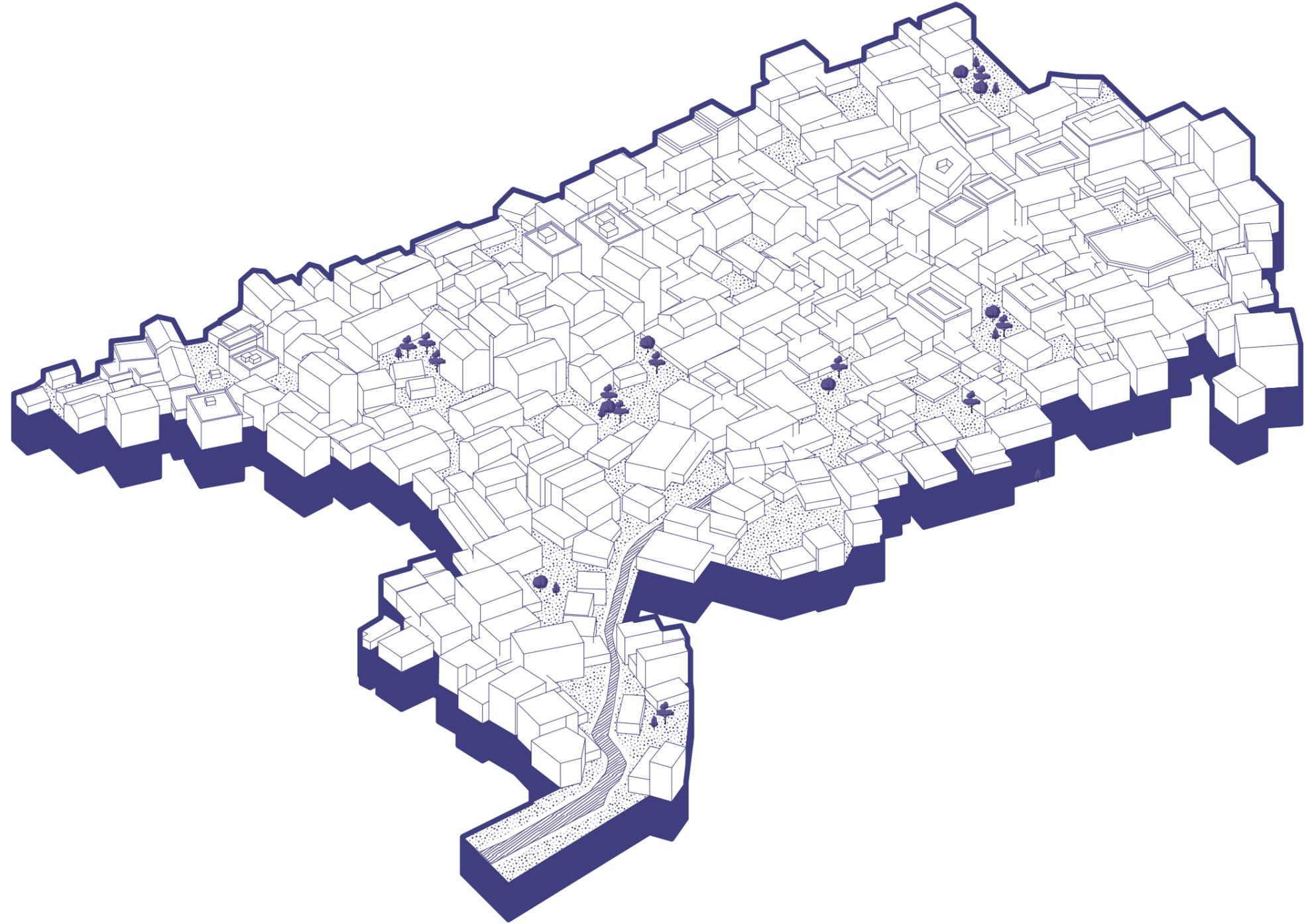
Inner Village

Pros

- Collective Community
- Access to services
- Network

Cons

- Connectivity to outside
- Access to Public/Private Space
- Maintenance
- Safety



Urban Conditions Characteristics

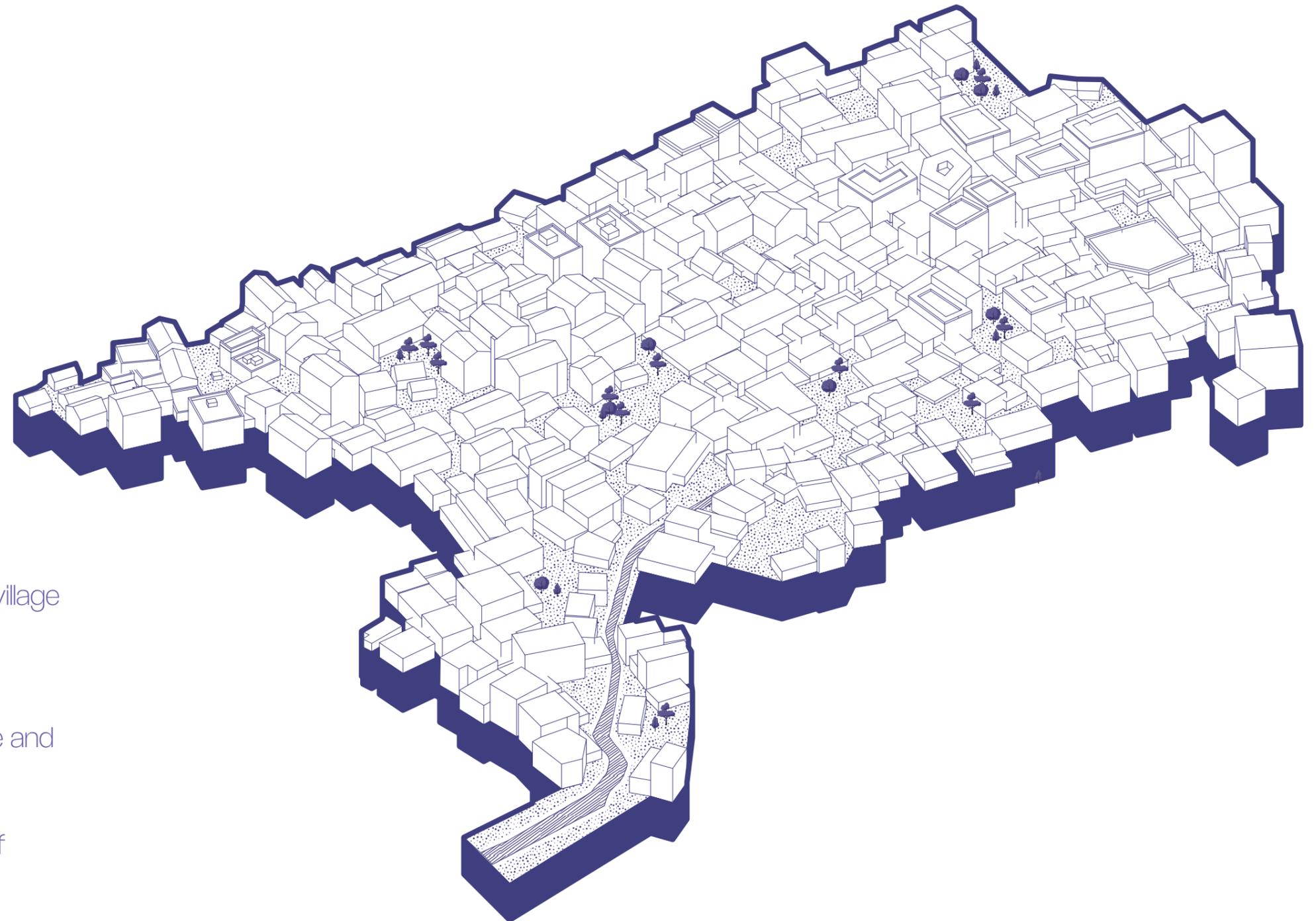
Inner Village

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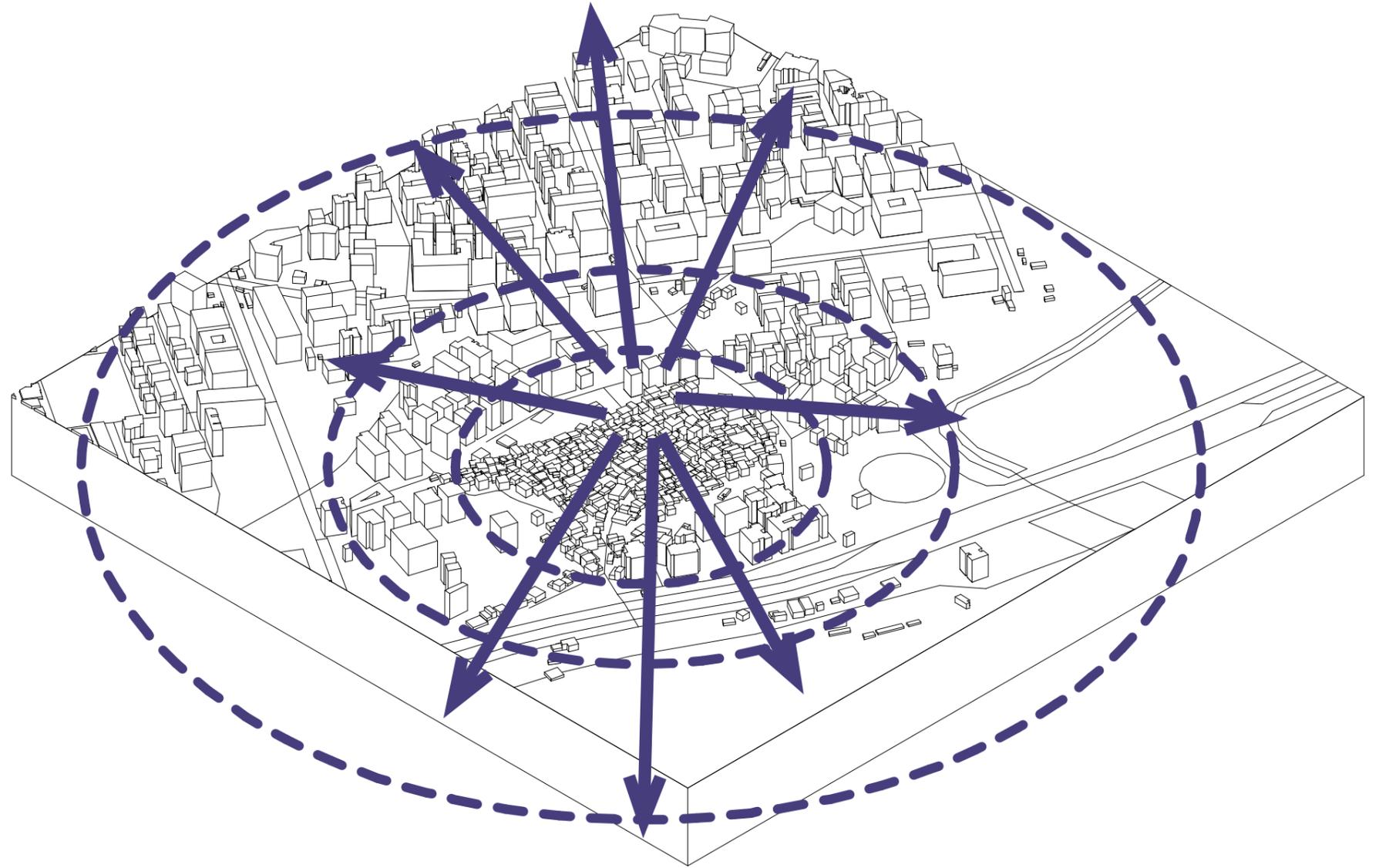


Maker Housing Principles

- To provide replacement dwellings in the village
- To repair social amenities to area
- To make the village more accessible/ safe and to disperse density pressure
- To solidify community beyond extents of village

Aim

Using vernacular construction materials and methods to promote sustainable architecture and traditional craftsmanship



Research

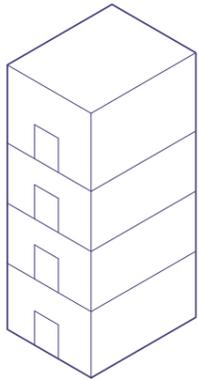
Question

How can the design of affordable community-built housing contribute to a better integration of Urban renewal and craftsmanship back into Navi Mumbai Gaothans?

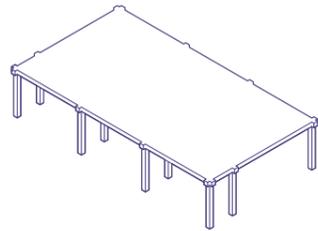
Design Approach

Design Toolkit

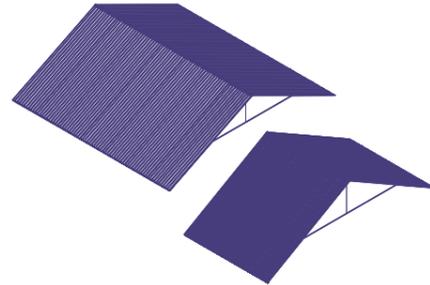
X 3 Key Elements



Core

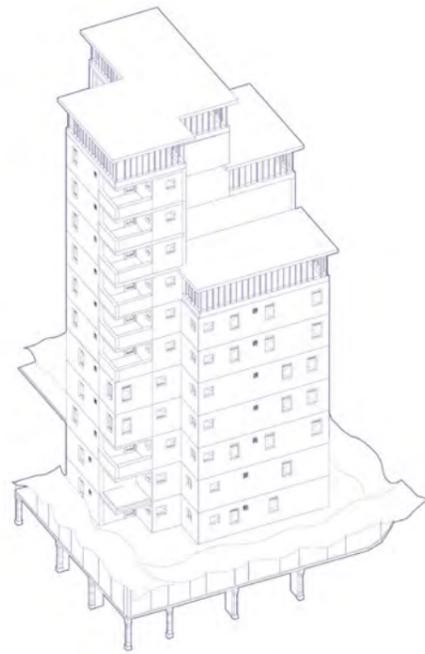
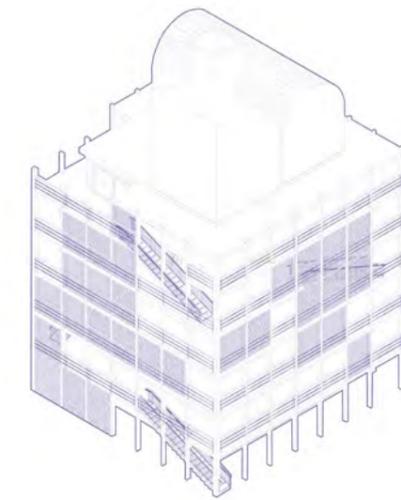
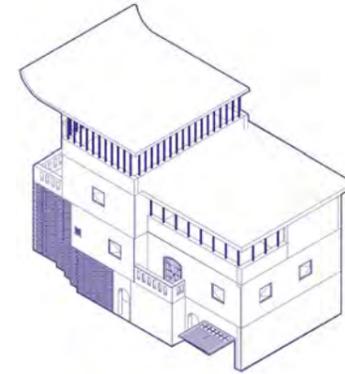


Plinth



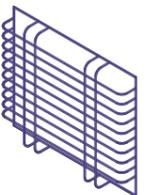
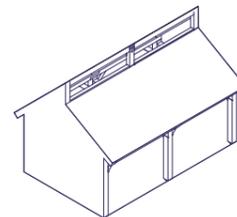
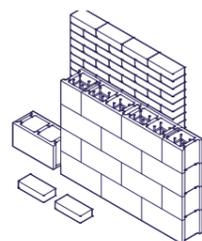
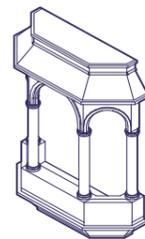
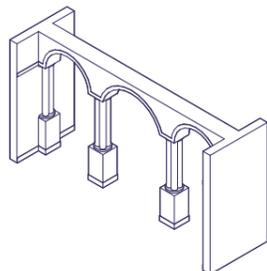
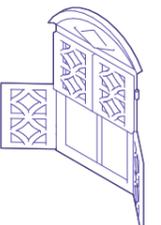
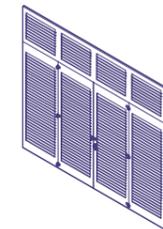
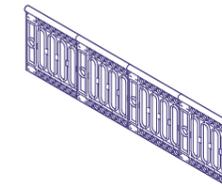
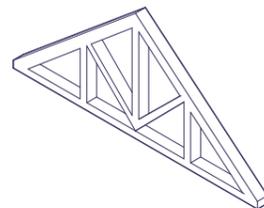
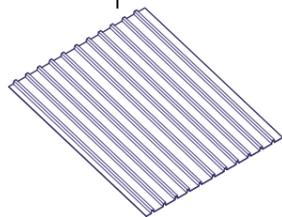
Roof

X 3 Scales

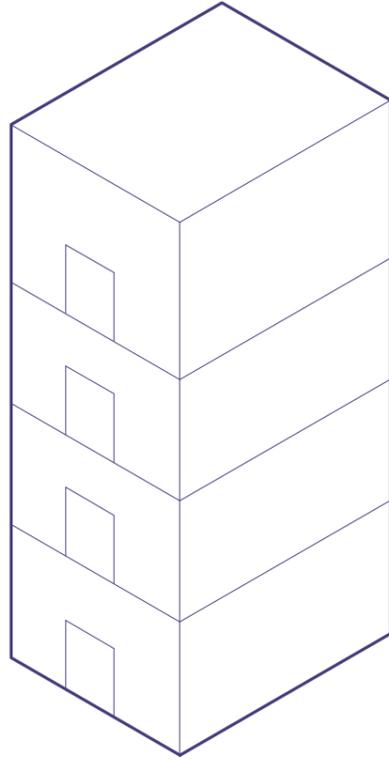


X ... Components

- Vernacular elements specific to village



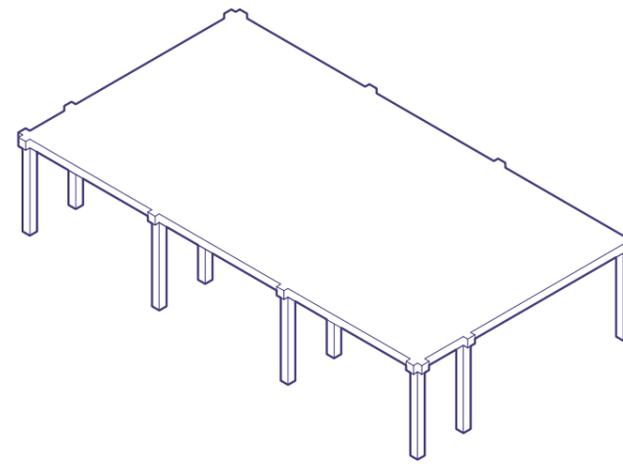
Elements



Core

A Core will provide a stable base for construction

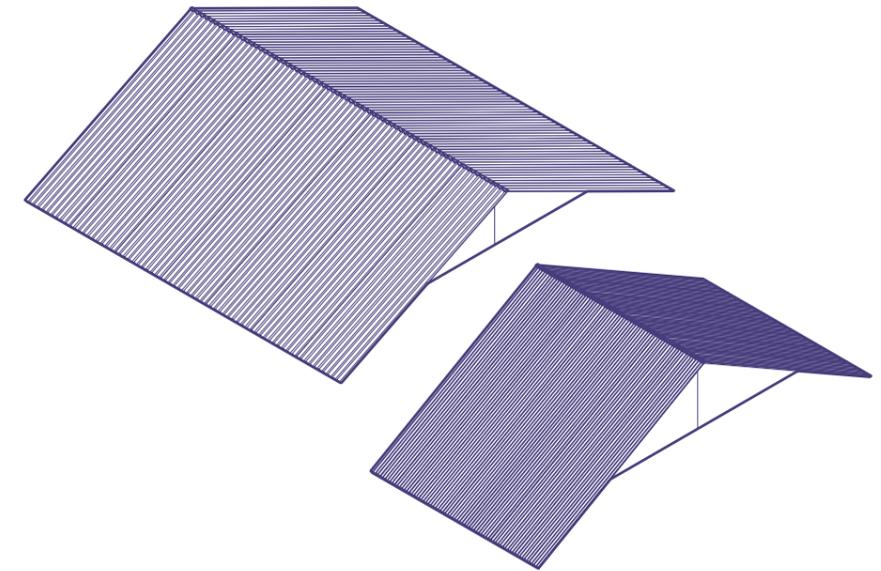
- Connection space between dwellings, additional social area



Plinth

A plinth will provide social amenities available for the community and residents

- Provide a income for residents
- Creative space
- Areas can become specific
- Public area

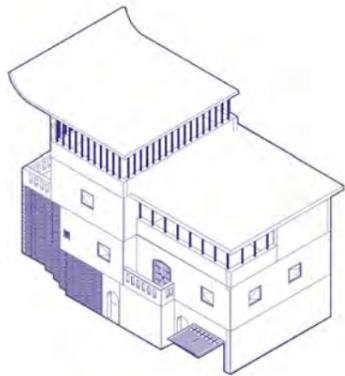


Roof/Terrace

By utilizing the roof space it will allow tenants to have essential energy, water but also a added social amenity

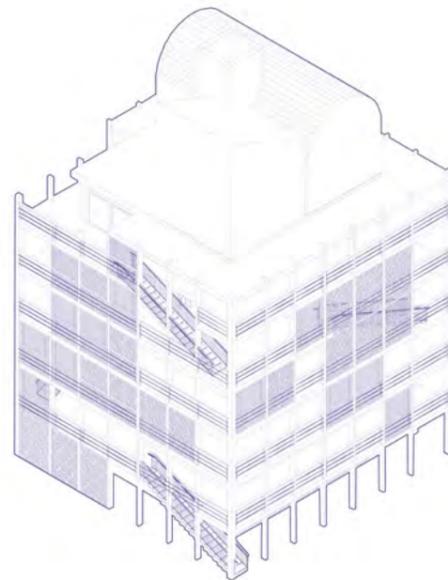
- Community space for private residence

Scales



Small

- To provide a individual dwelling
- Incrementality process
- Ownership
- Essence of place



Medium

- To provide a community based set of dwellings
- Add a social dynamic
- Create vernacular typologies
- Keep moderate scale to village

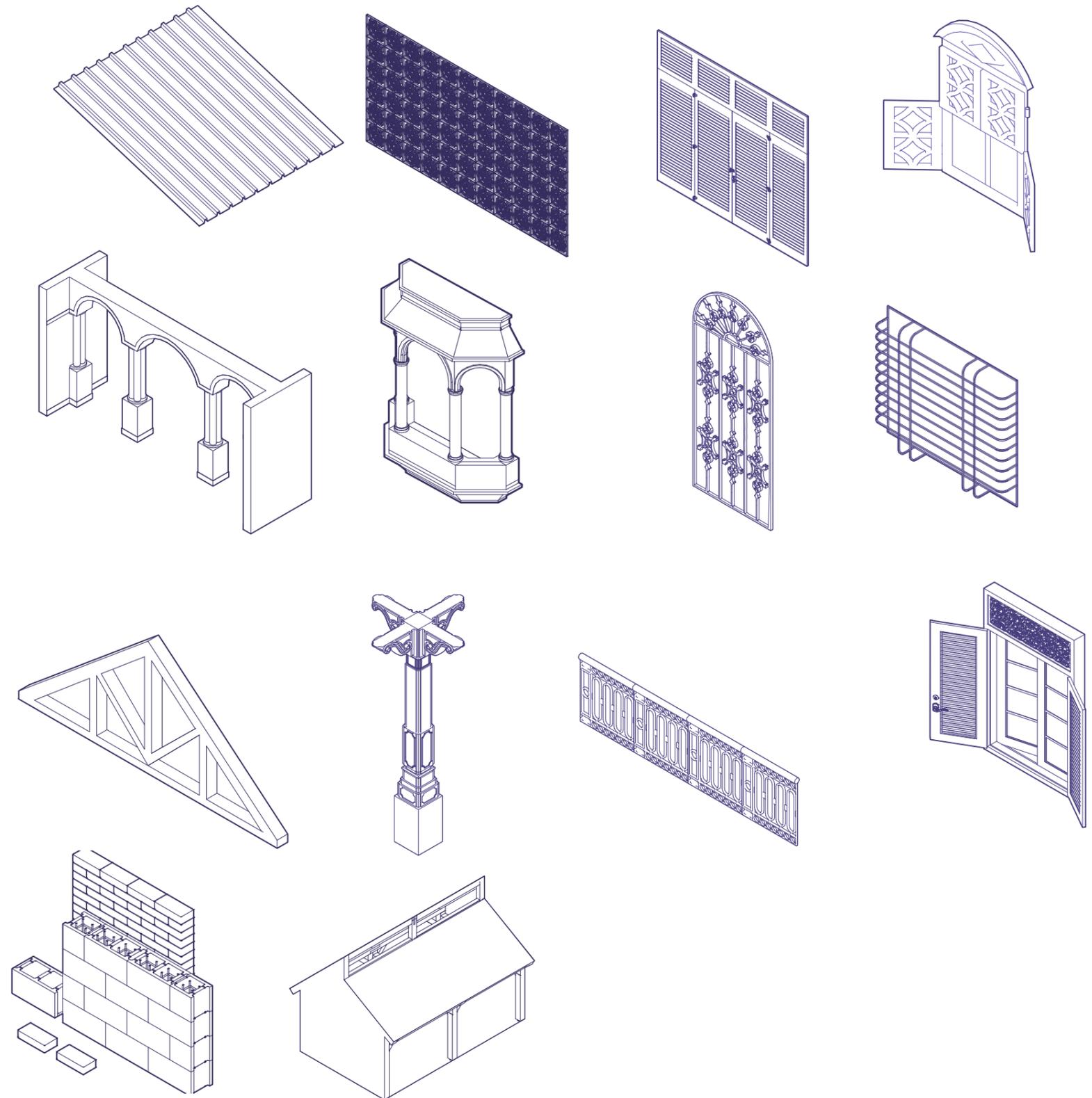


Large

- To provide a large quantity of dwellings
- Add a wider range of amenities
- Fit to density
- Bring larger clientele to village

Components

Vernacular - Elements specific to context
to intertwine new and existing



Scale role



URBAN Strategy

To intervene into the
village context



URBAN Strategy

To intervene into the
village context

Typological Strategy

To integrate with
existing typological
architecture



URBAN Strategy

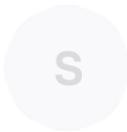
To intervene into the village context

Typological Strategy

To integrate with existing typological architecture

Managerial Strategy

To accommodate both lower and higher income groups with a commercial front



URBAN Strategy

To intervene into the village context

To intervene into the removed context

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URBAN Strategy

To intervene into the village context

To intervene into the removed context

Typological Strategy

To integrate with existing typological architecture

To mediate between scales

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URBAN Strategy

To intervene into the village context

To intervene into the removed context

To intervene into CIDCO boundary

Typological Strategy

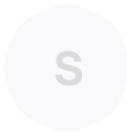
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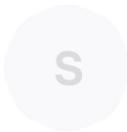
To mediate between scales

Accommodate a larger number of dwellings whilst providing a good quality of life

Managerial Strategy

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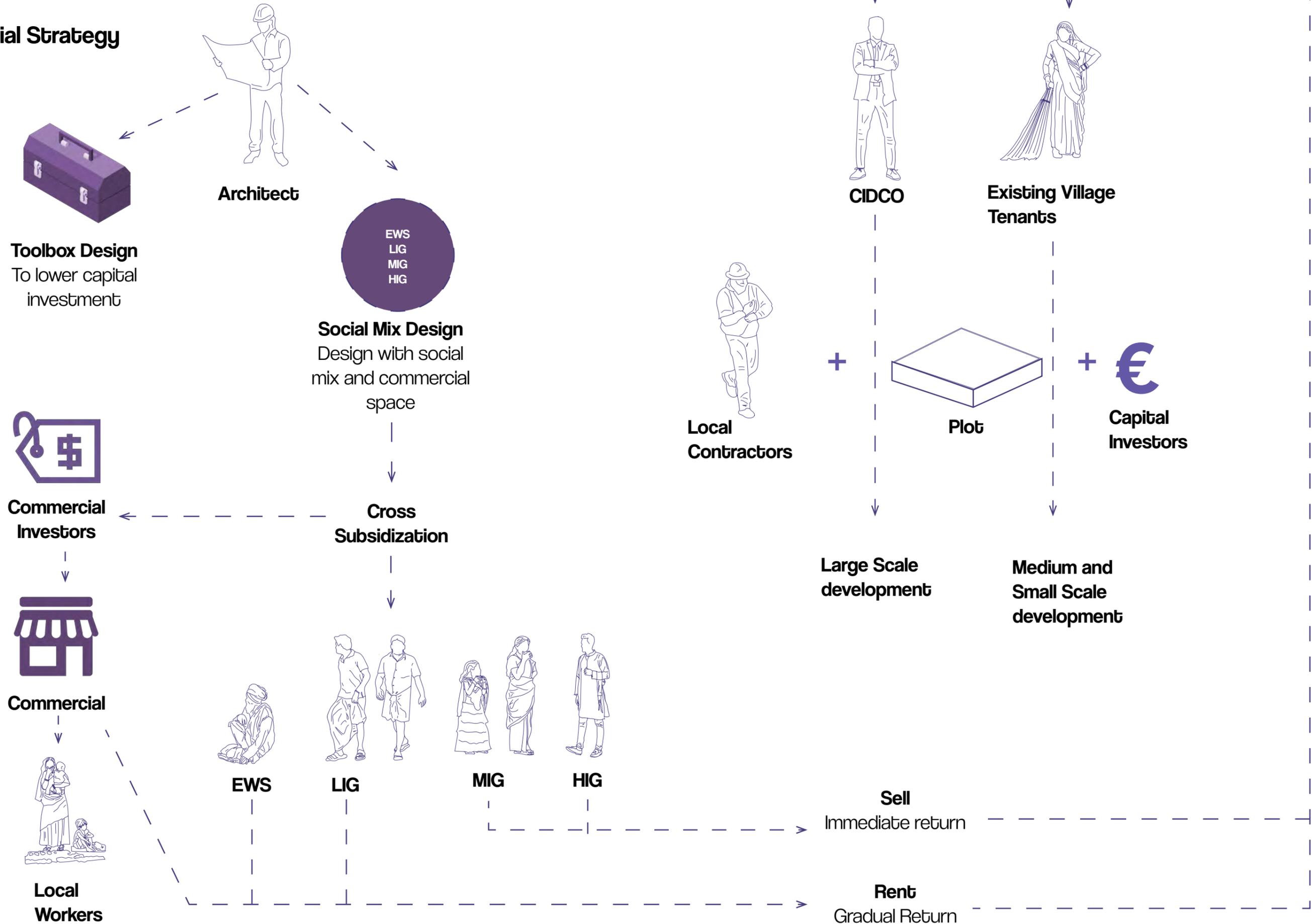
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Managerial Approach

Operational Model

Managerial Strategy



Village Renewal Scheme



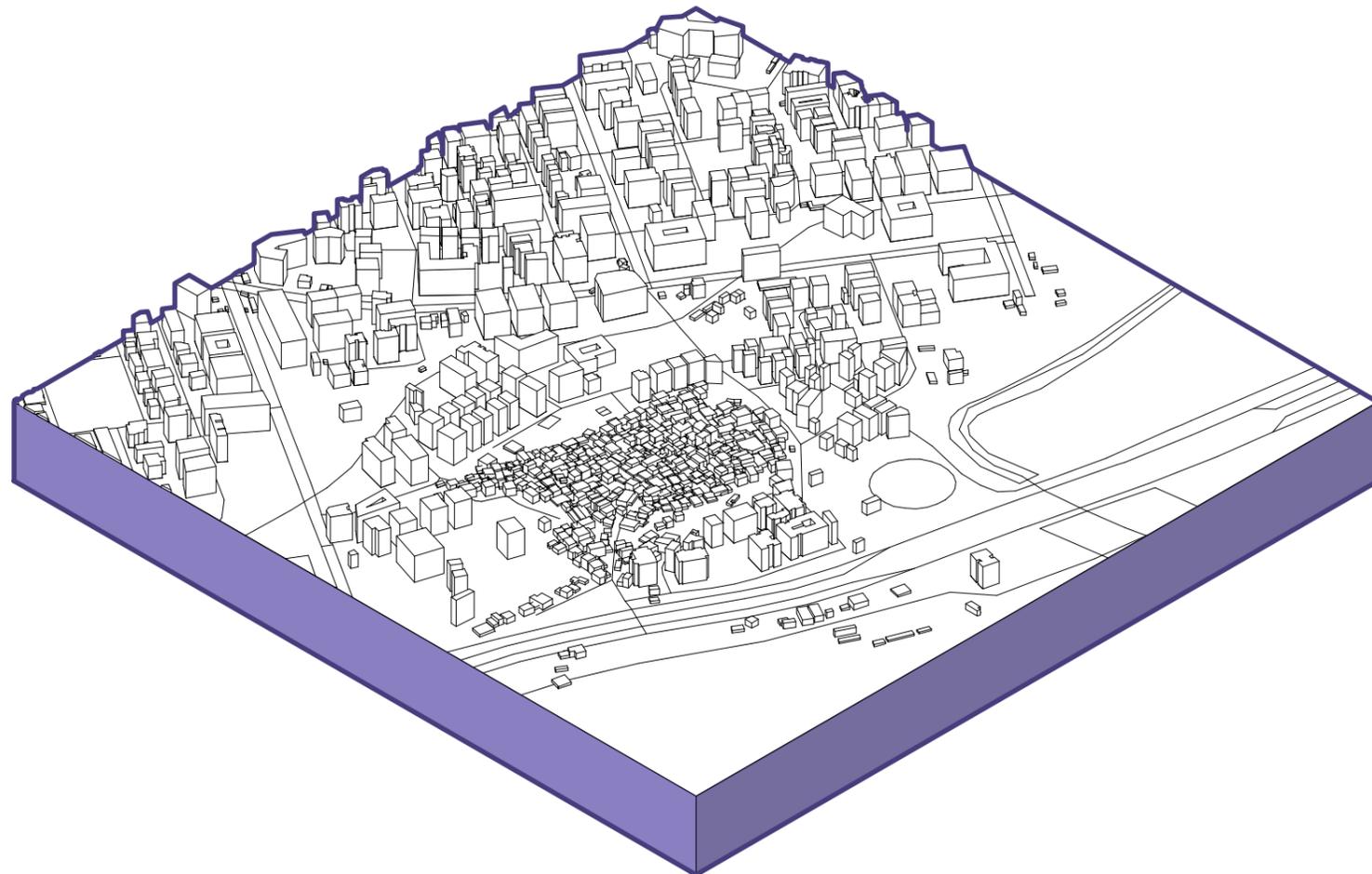
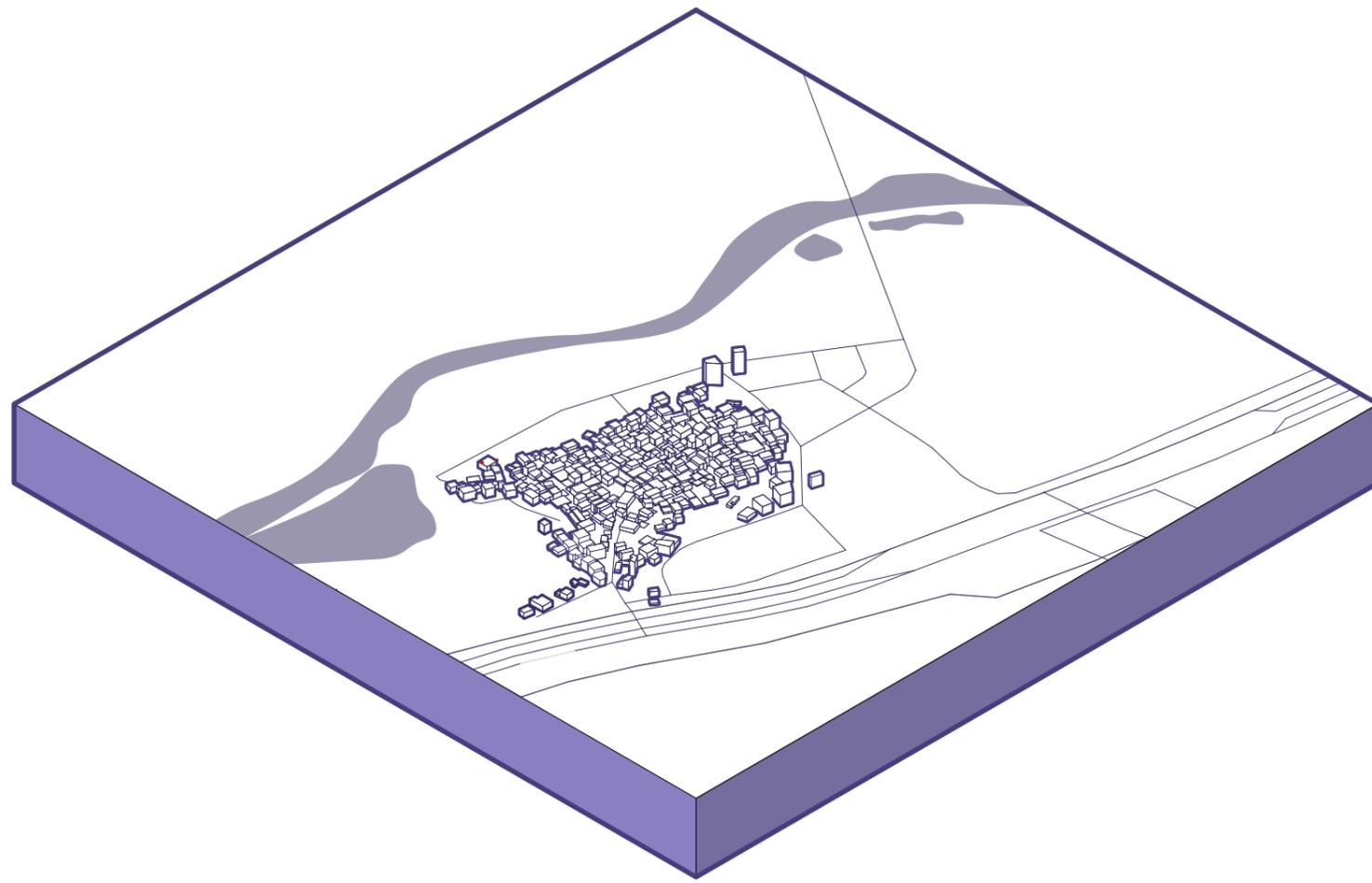
Urban Village shareholding



Cidco Urban renewal Scheme

Urban cooperative

Why a Cooperative is needed?

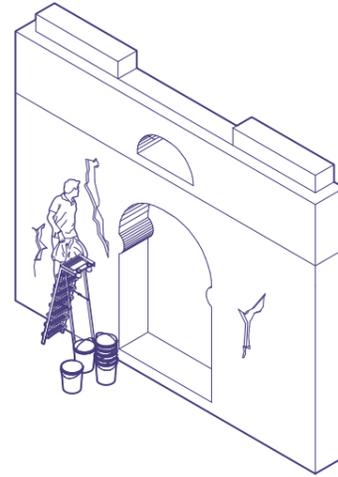


Urban cooperative

How will the village benefit from the Cooperative?

Maintenance

A individual typically takes care of what he/she owns, meaning if the residents own a percentage of the village amenities they are more inclined to maintain public resources.



Urban cooperative

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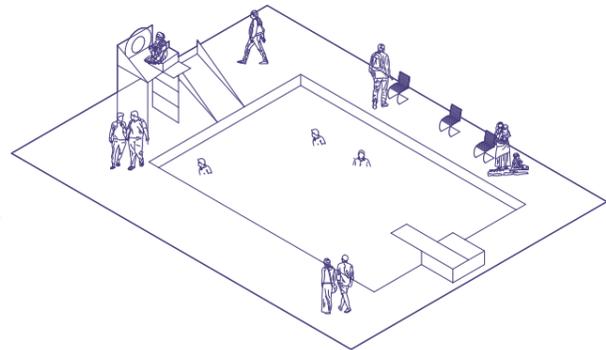
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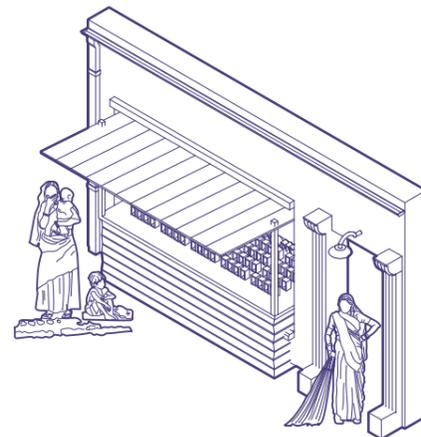
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Income

By renting a diversity of small firms rather than allowing a city to be dominated by a larger companies. The villagers also have priority for the jobs provided by collectively owned enterprises

Compensation for leasing land, the village the income and invest in upgrading buildings built on collectively owned land and lease these buildings to obtain profits.



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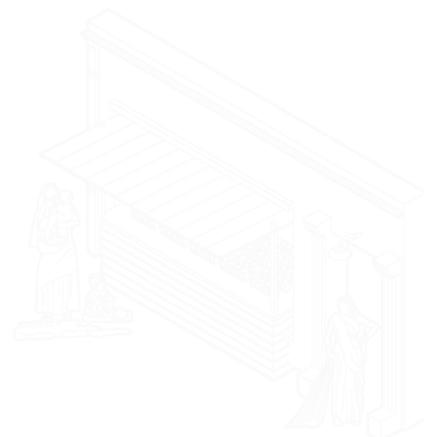
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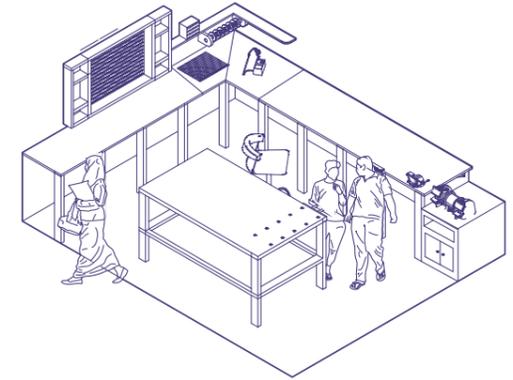
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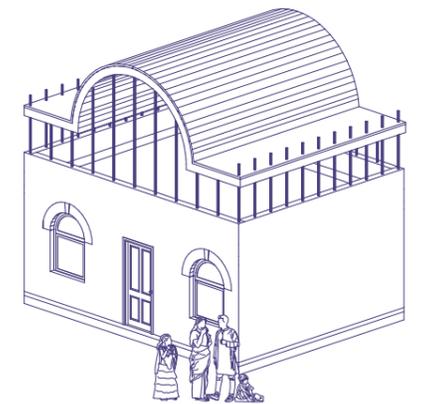


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Ownership

By having a cooperative council dedicated to organizing the village =it will allow EWS and LIG to progress in owning property breaking the cycle of one family being stuck to an income group. Regarding income groups no matter how many shares the villager has, her/his vote only counts as one vote, even though the distribution of profits is based on the number of shares. All groups will be limited to a certain amount of shares based on income group and amount of time spent in village.



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Collective memory

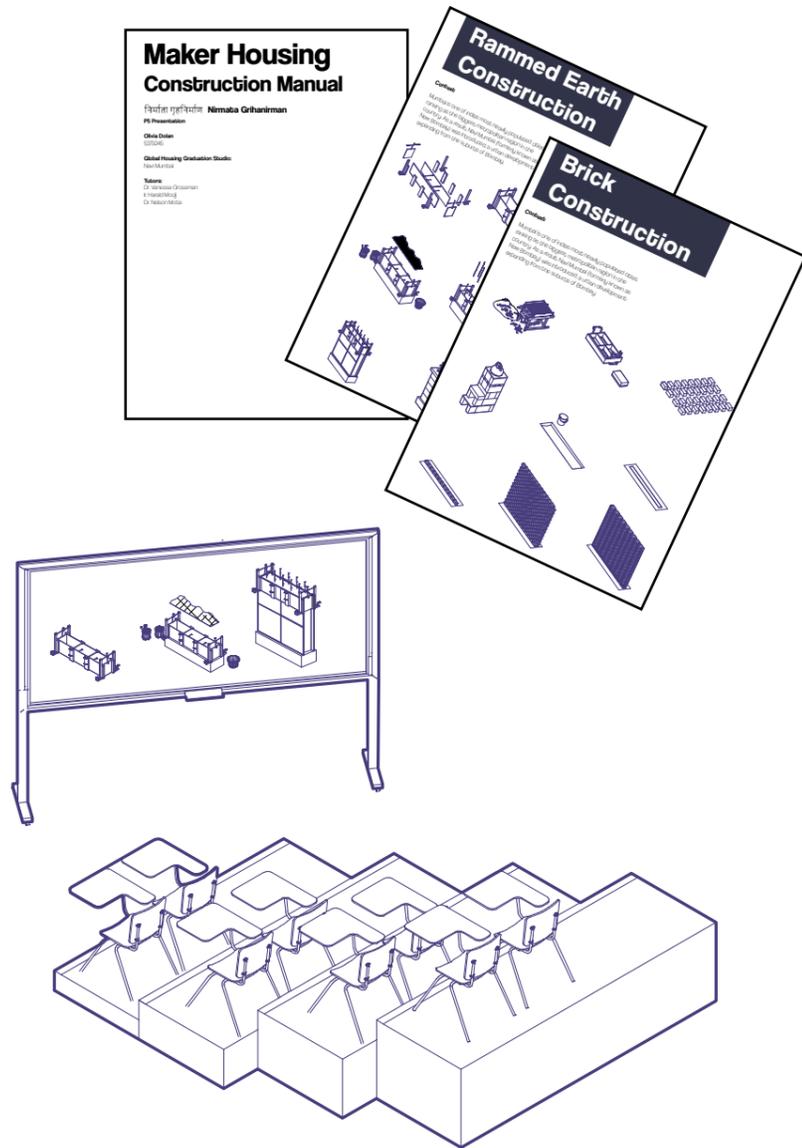
The cooperative reinforces the collectivity of the village because it ensures the interests of villagers as stakeholders alongside maintaining its identity as a gaothan.



Makers cooperative

Learn

By providing local amenities for educational purposes it allows the villages to gain knowledge in a trade.

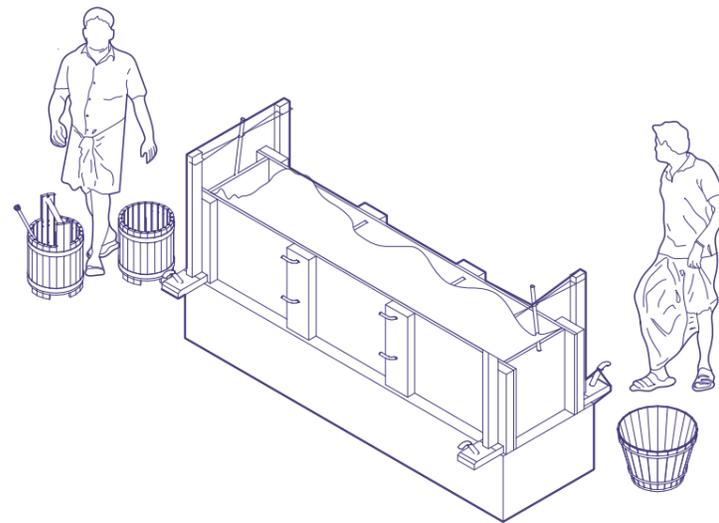


Craft as a Building technique

Educational institutions on local techniques example. Rammed earth construction.

Make

To reinstate craftsmanship within the village. Residents will be encouraged to make local crafts and building techniques to provide income.



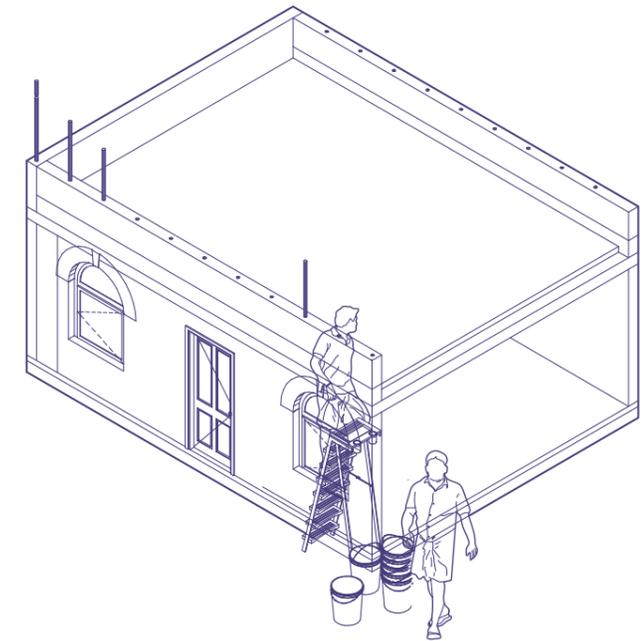
Craft as a Building technique

Skilled villages can earn a wage participating in community building

Example. Rammed earth construction.

Sell

By introducing community enterprises these products can be sold with a percentage of the profits being reinstated into the repair and maintenance of the village. Meanwhile skillful persons can be hired for building purposes.



Craft as a Building technique

Community built projects can be rented or sold to new stakeholders in the village

Example. Rammed earth construction.

Urban Strategy

Situated Approach + Replicable strategy

Urban Strategy:

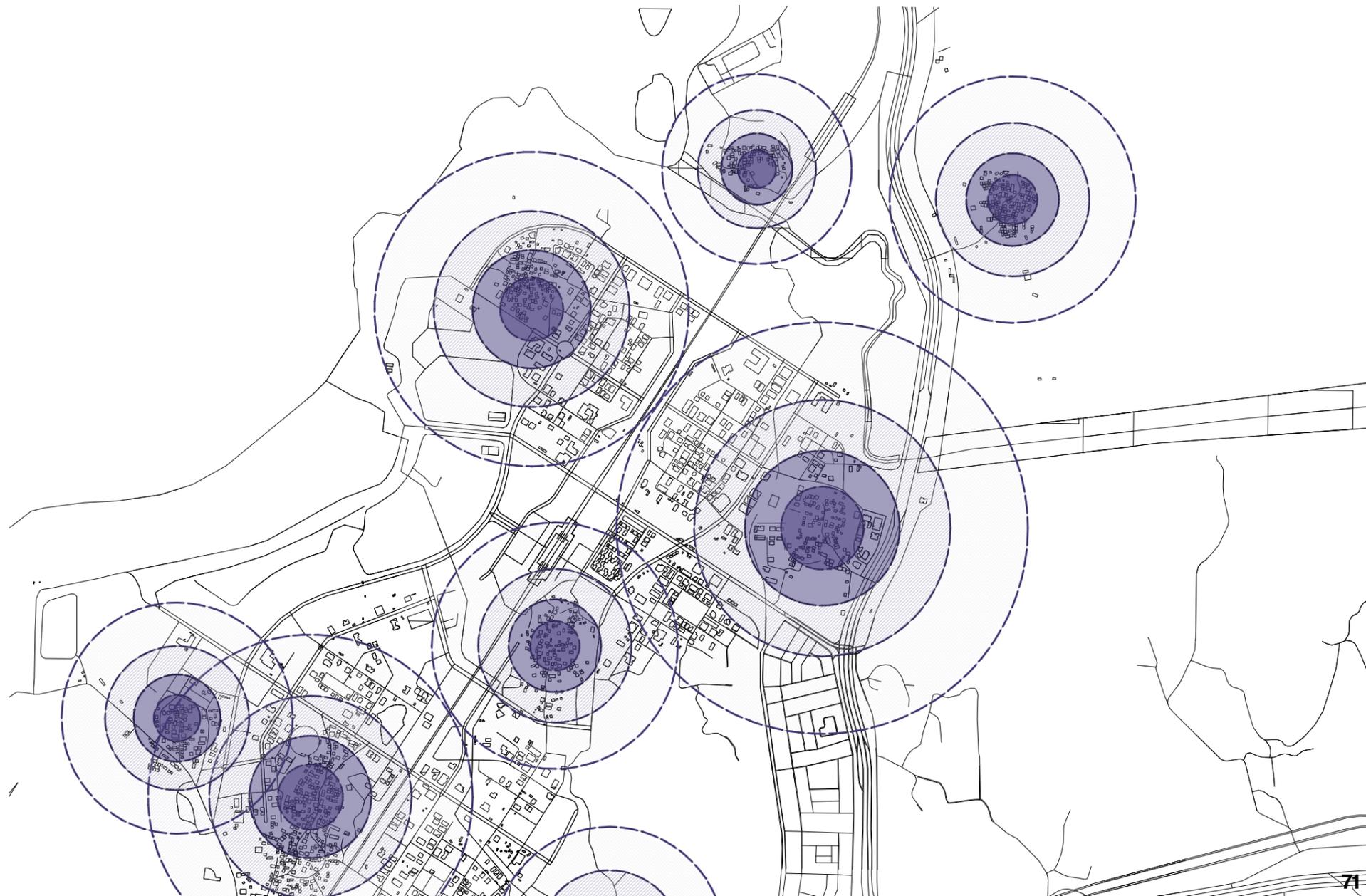
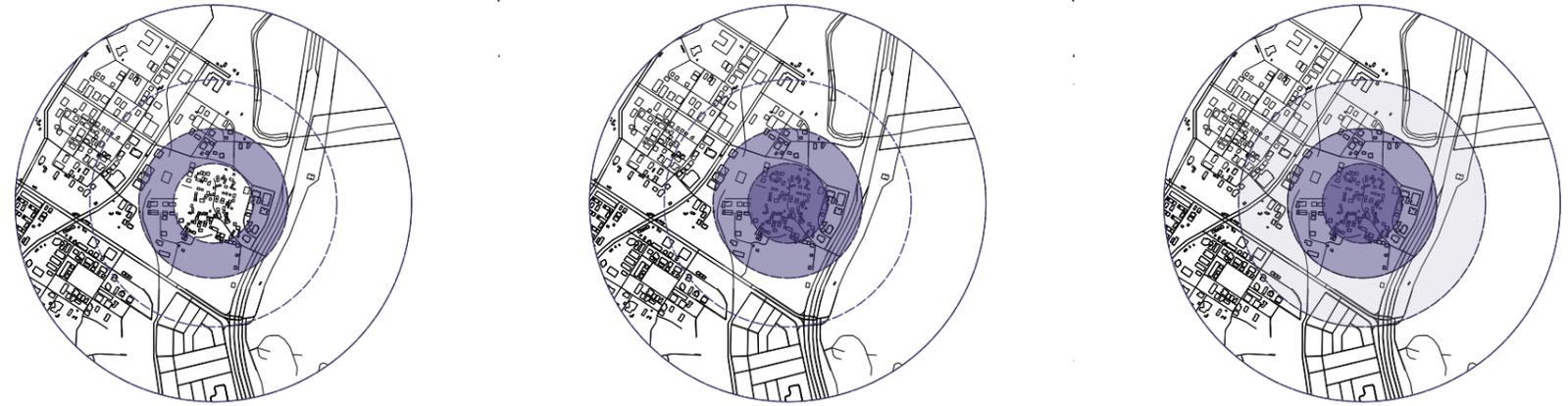
Radial approach in phases, situated around gaothans.
This Approach to urban renewal of villages can be replicated not only in Navi Mumbai but in other similar contexts.

The research question will be approached through a set of design principles that can be altered and reproduced to fit the surrounding context appropriately.

01: Create a vernacular toolkit typology with set of principles/ rules for the urban area.

02: Implement the constructions in incremental phases

03: Reproduce principles in other villages in need of urban renewal



Situated Approach + Replicable strategy

Housing Strategy:

By using three different scales the project interacts with the different urban conditions of the village

Repair: Intervene and repair existing buildings

Small: 1-2 individual dwellings

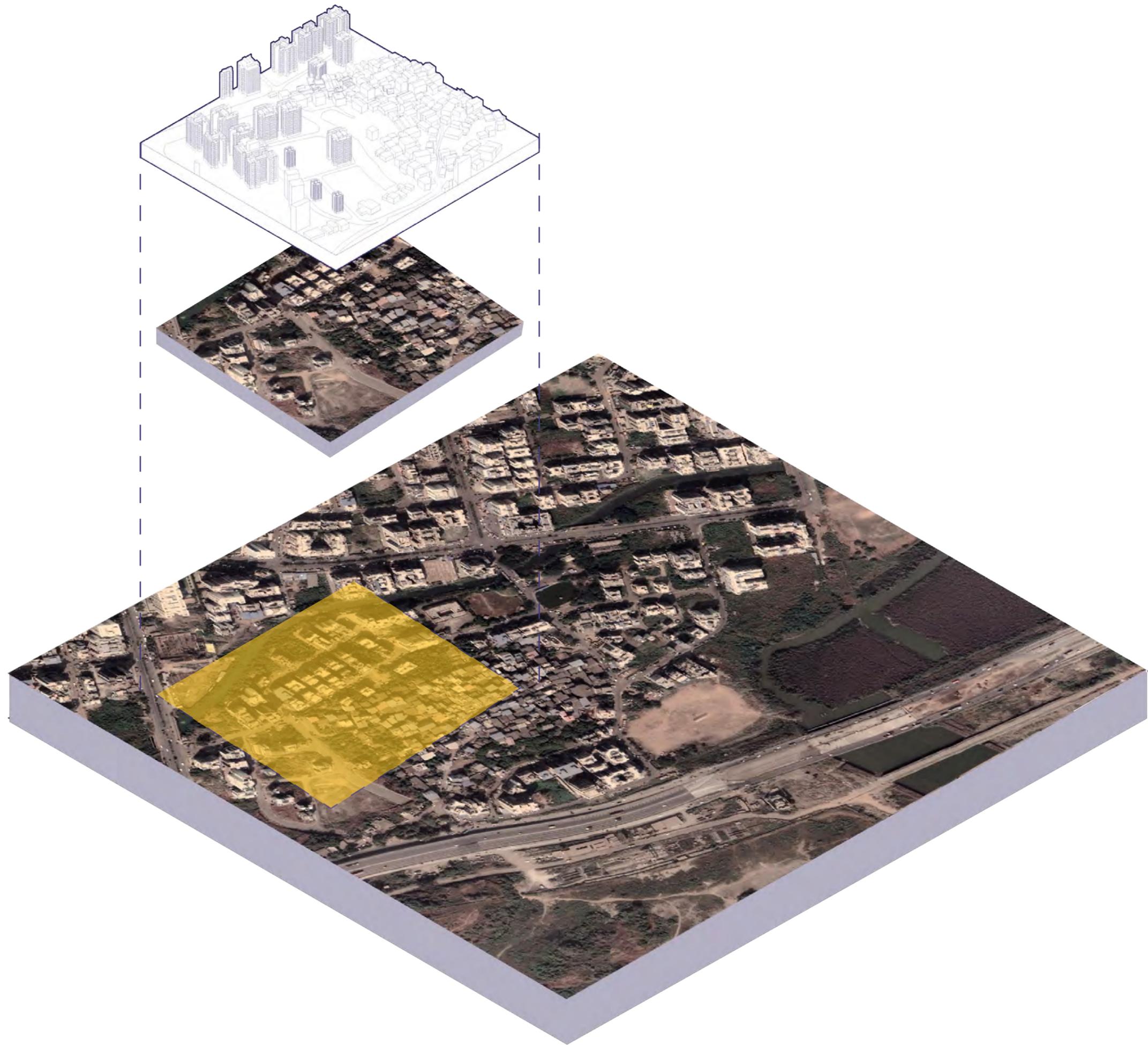
Medium: A cluster of dwellings

Large: A stack of Dwellings

Income groups are not defined by typology but by Life-style



Phasing

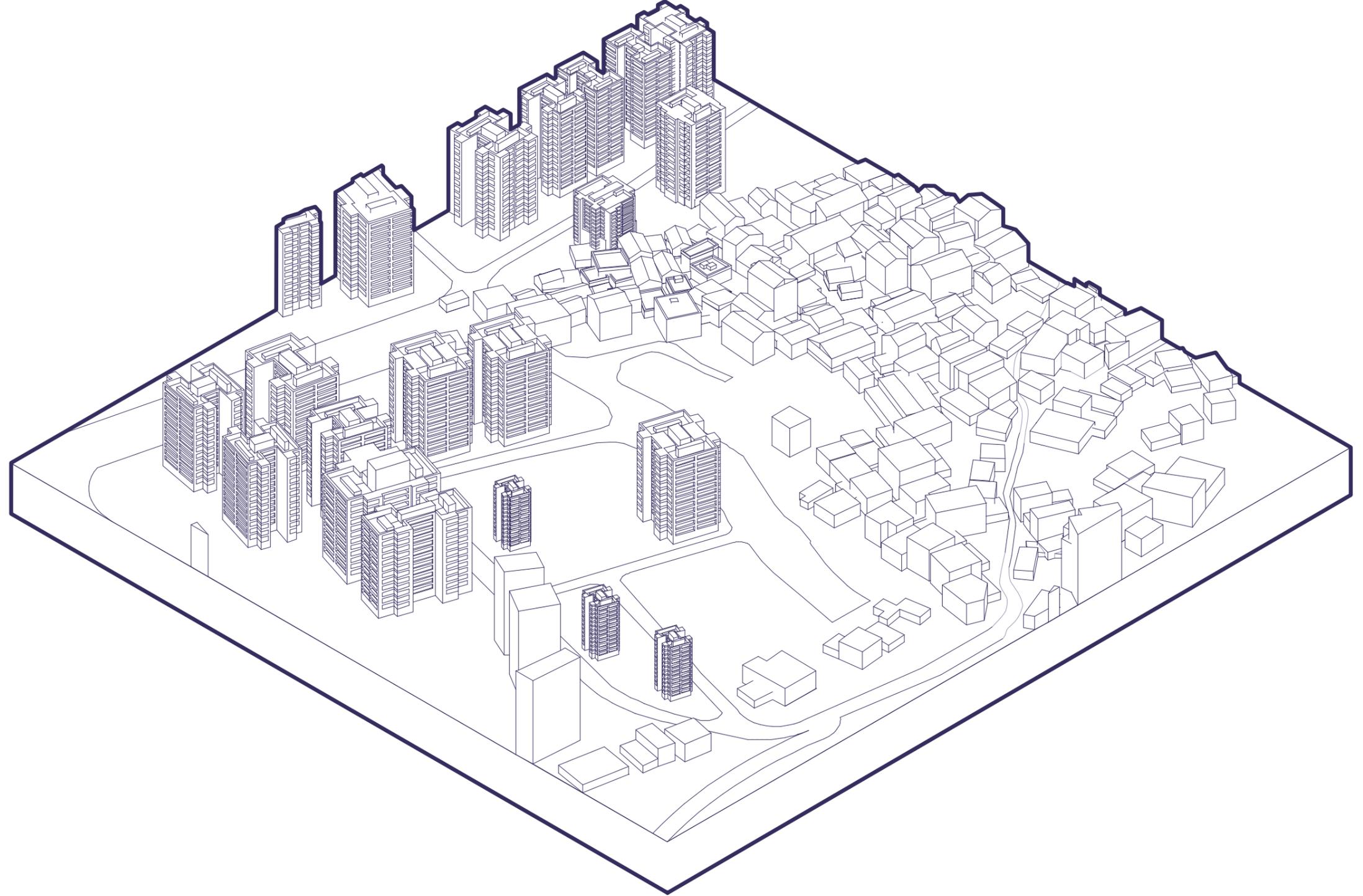


Existing

The Village is clearly separated from the CIDCO Developments

Existing Context

Stakeholders Included

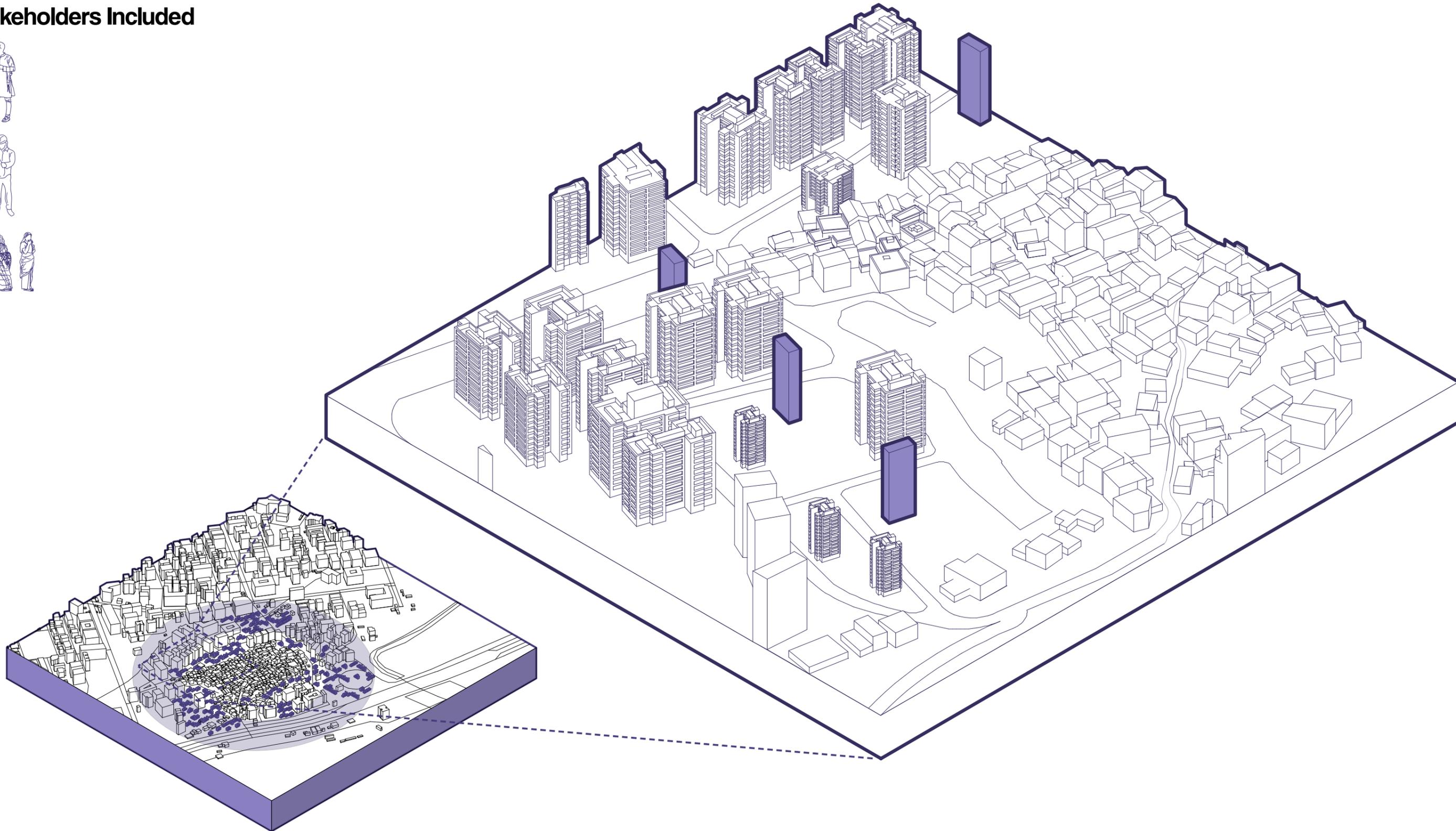


Core Phasing

Cores will start in construction around the border of the village.

Phase 01

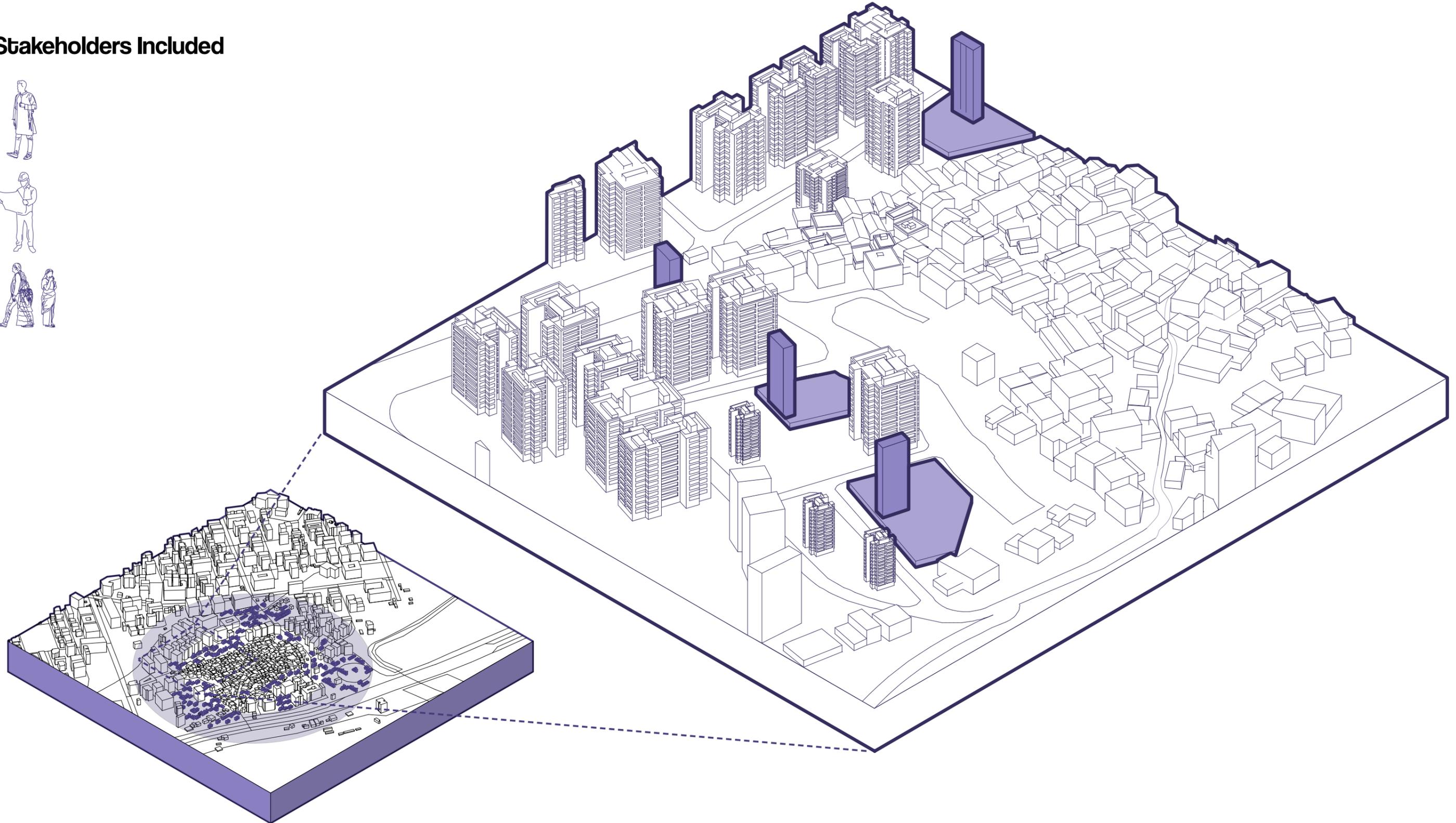
Stakeholders Included



Plinth Additions

Plinths for commercial use will start to attract attention and bring value to the land

Stakeholders Included



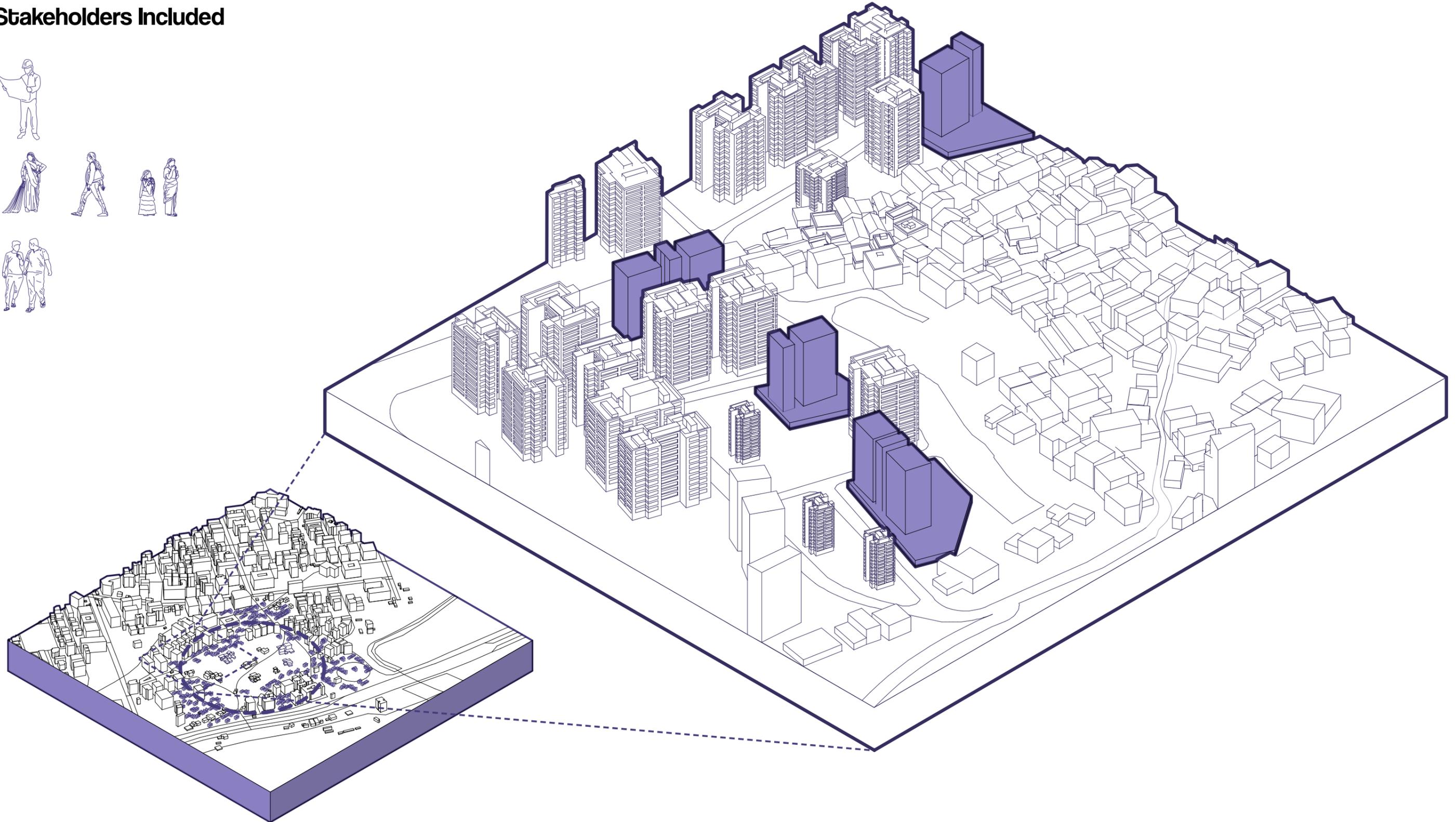
Phase 02

Large typology

Large developments will be built on top of the plinths

Phase 03

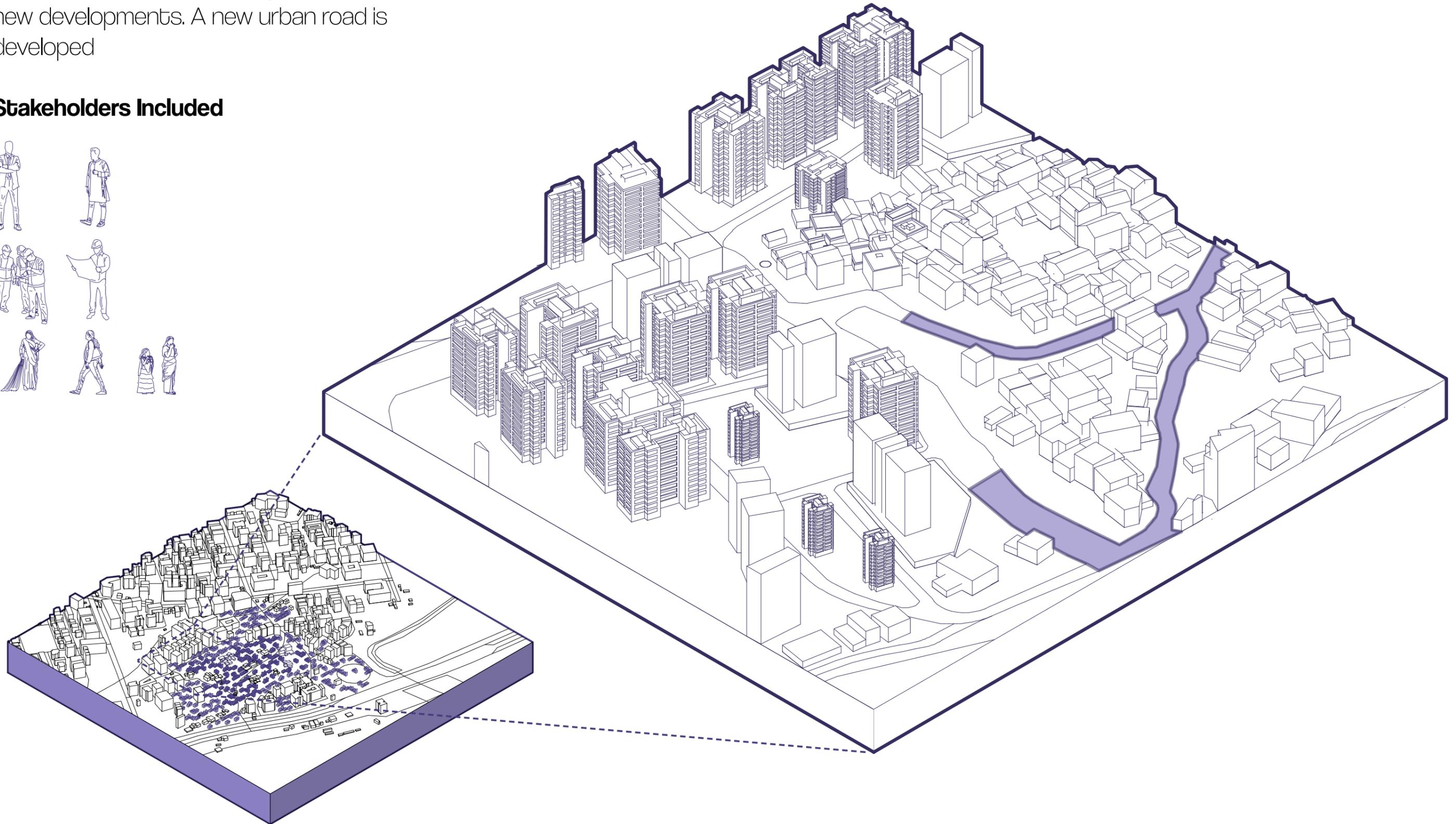
Stakeholders Included



Road Infrastructure

Problem areas will be removed via demolition whilst residents are moved to the outskirts of the village in the new developments. A new urban road is developed

Stakeholders Included

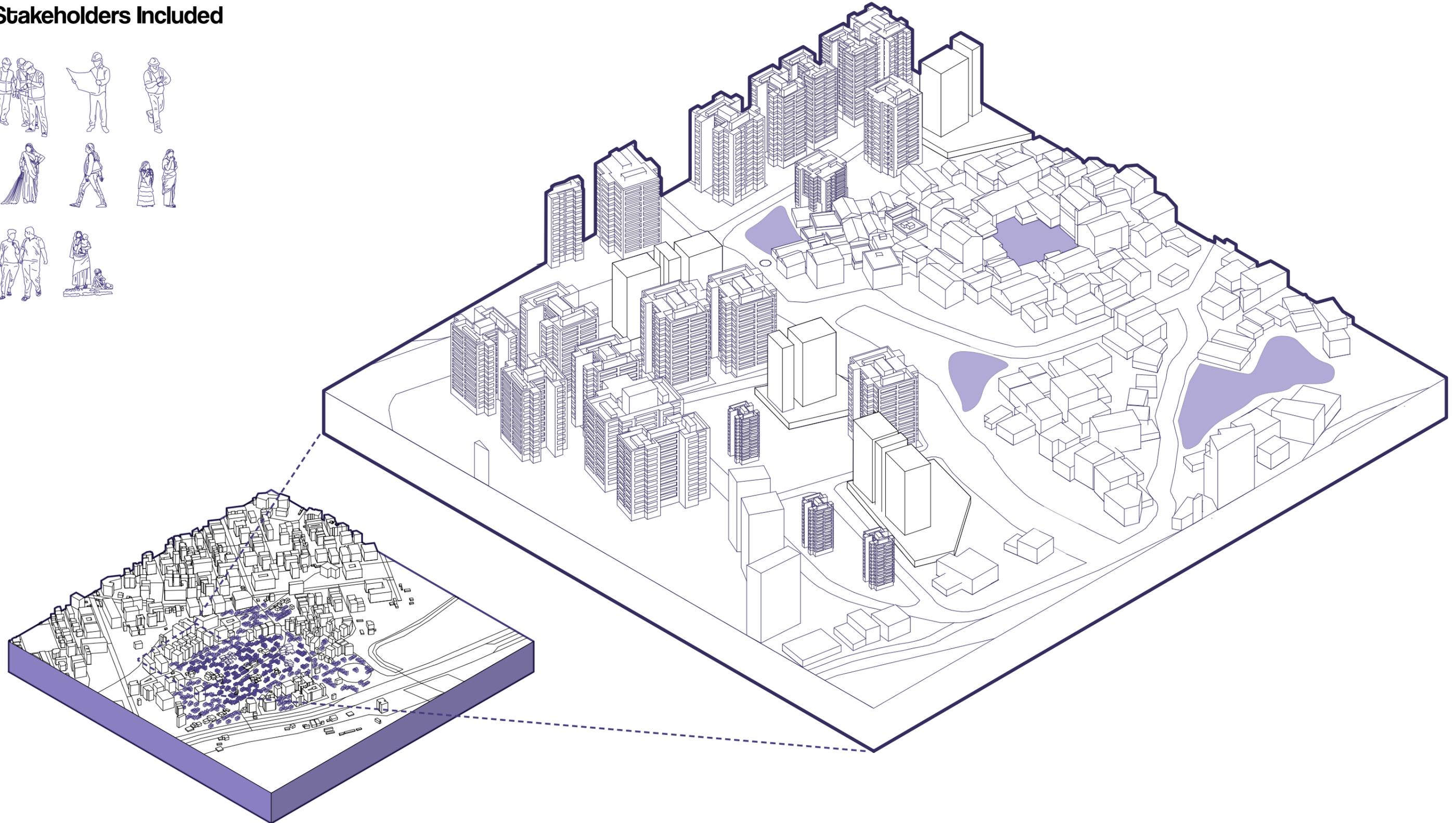


Spacing

Demolition will occur in needed areas opening up the village

Phase 05

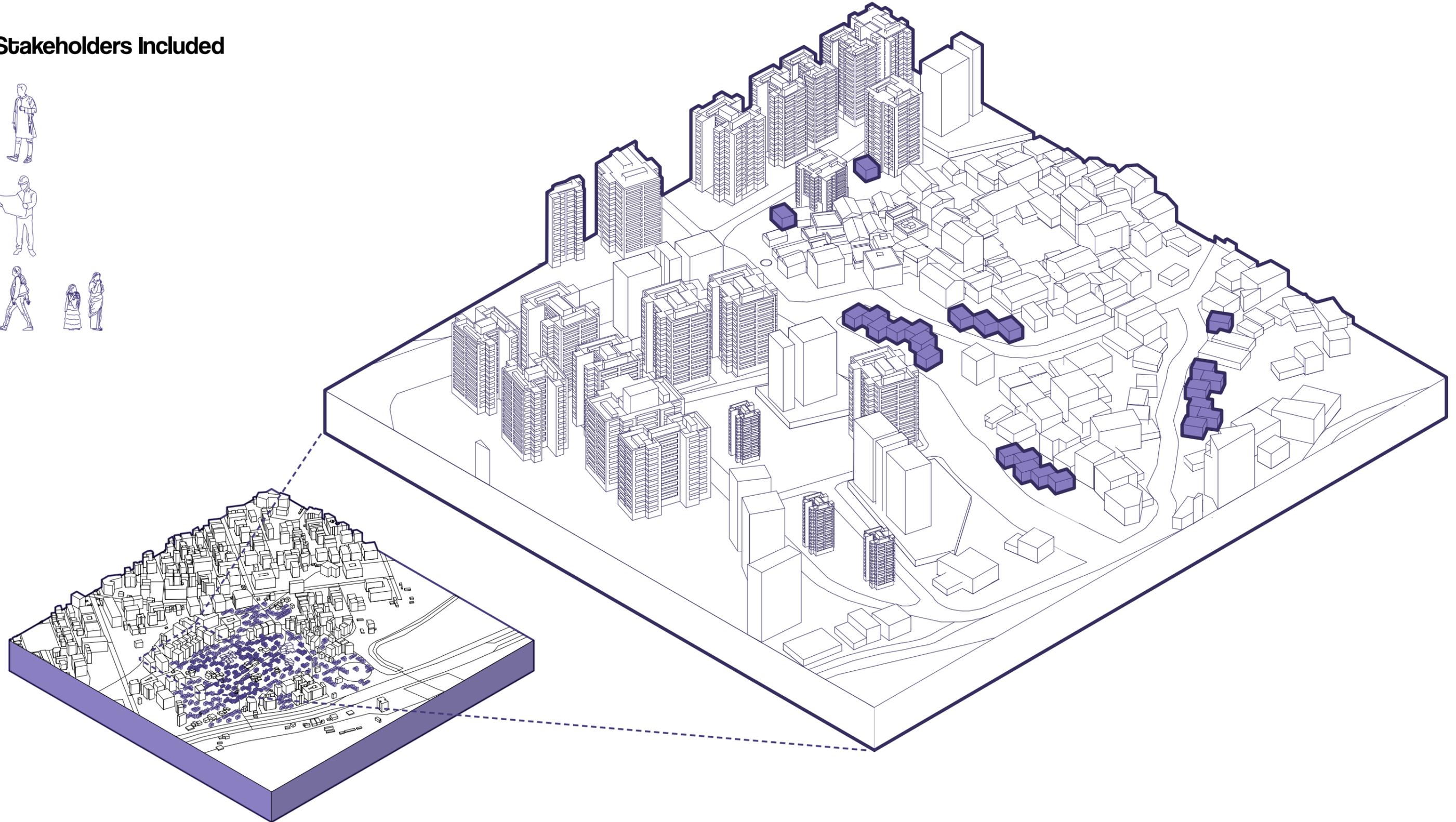
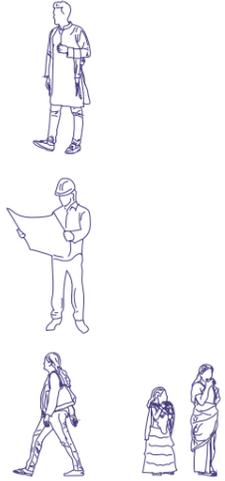
Stakeholders Included



Phase 02

Small Dwellings will start to fill in the gaps, this will mainly occur alongside the new road infrastructure through the village

Stakeholders Included



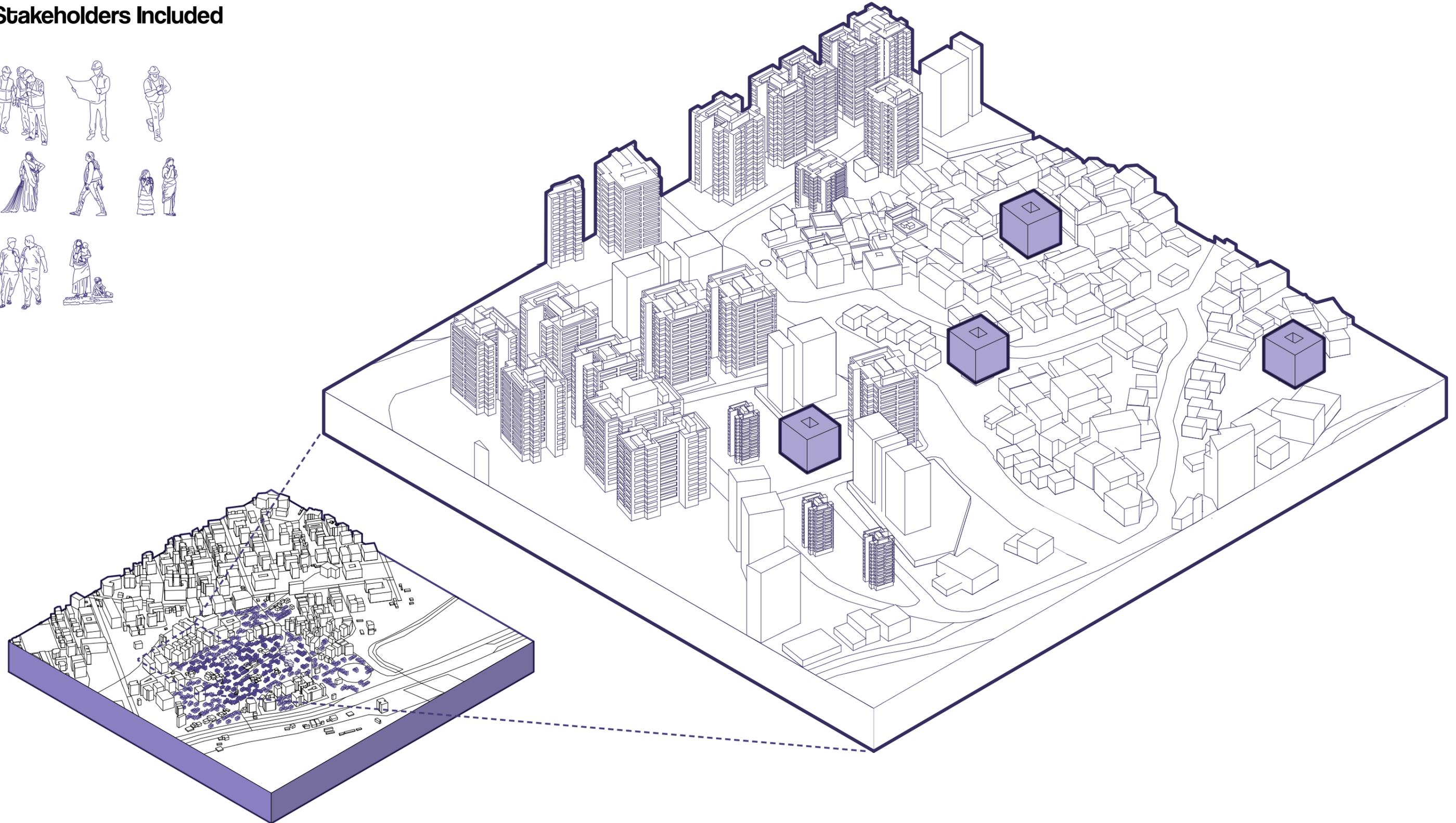
Phase 06

Medium Dwellings

Medium typologies will be implemented in larger openings in the village.

Phase 07

Stakeholders Included

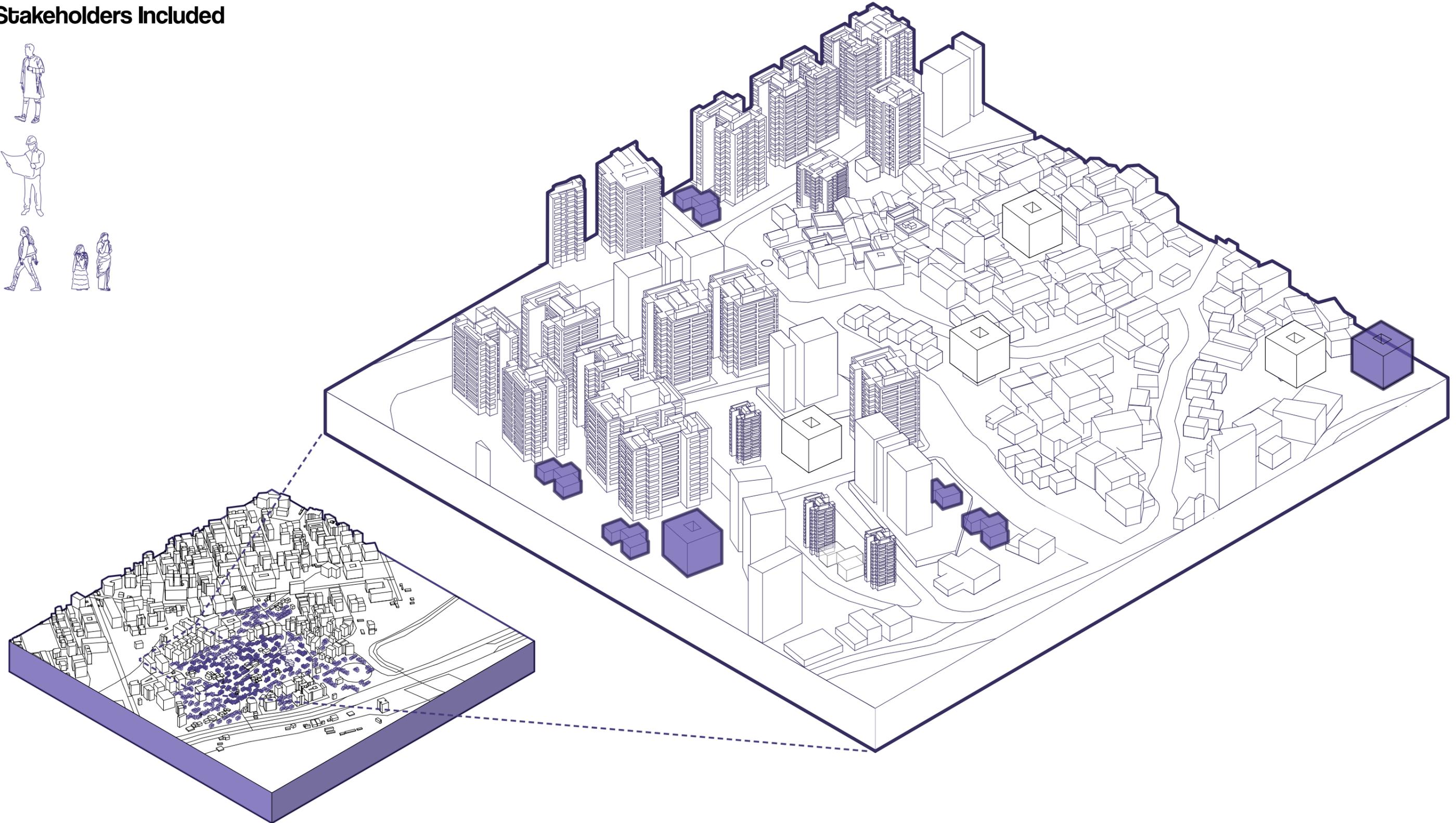


Extra Phasing

Additional dwellings will occur when needed and placed where suited

Phase 08

Stakeholders Included

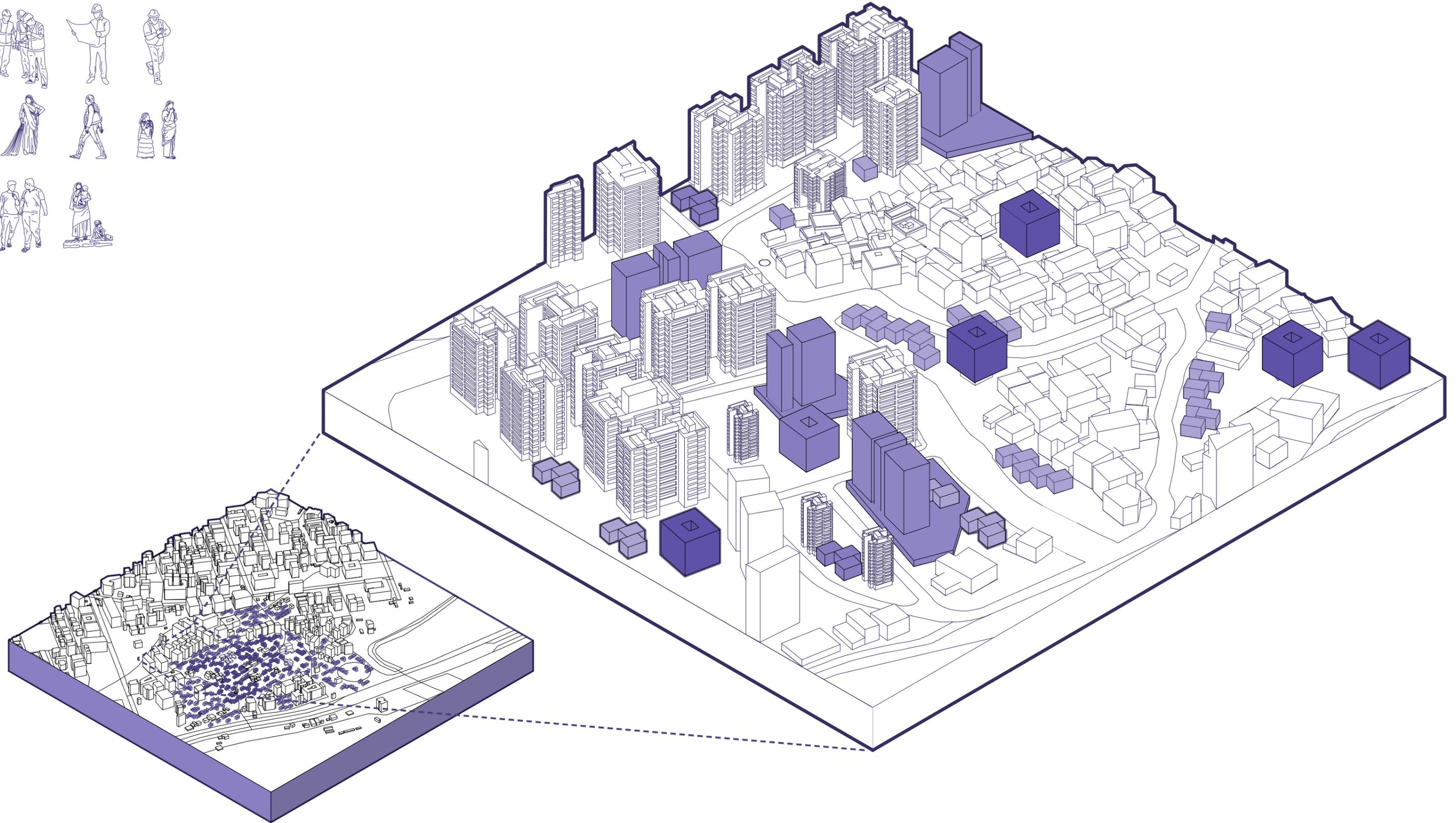


Phasing Complete

Complete

Village and boundary phasing complete

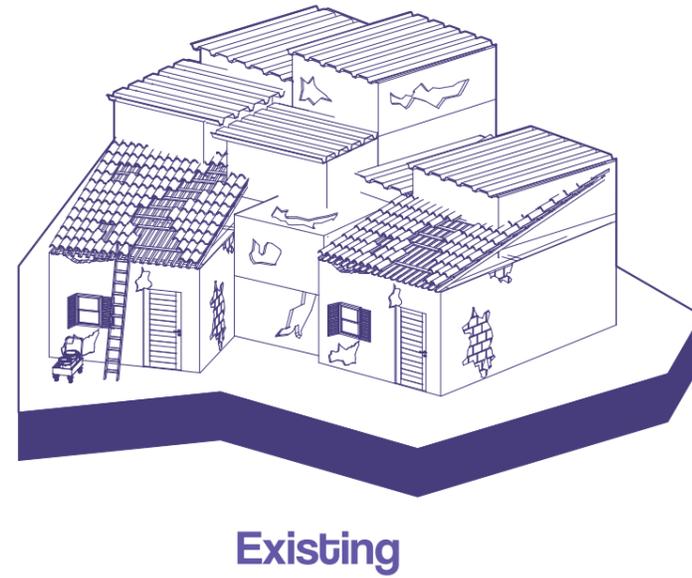
Stakeholders Included



Process of Demolition and Rebuild

Repair

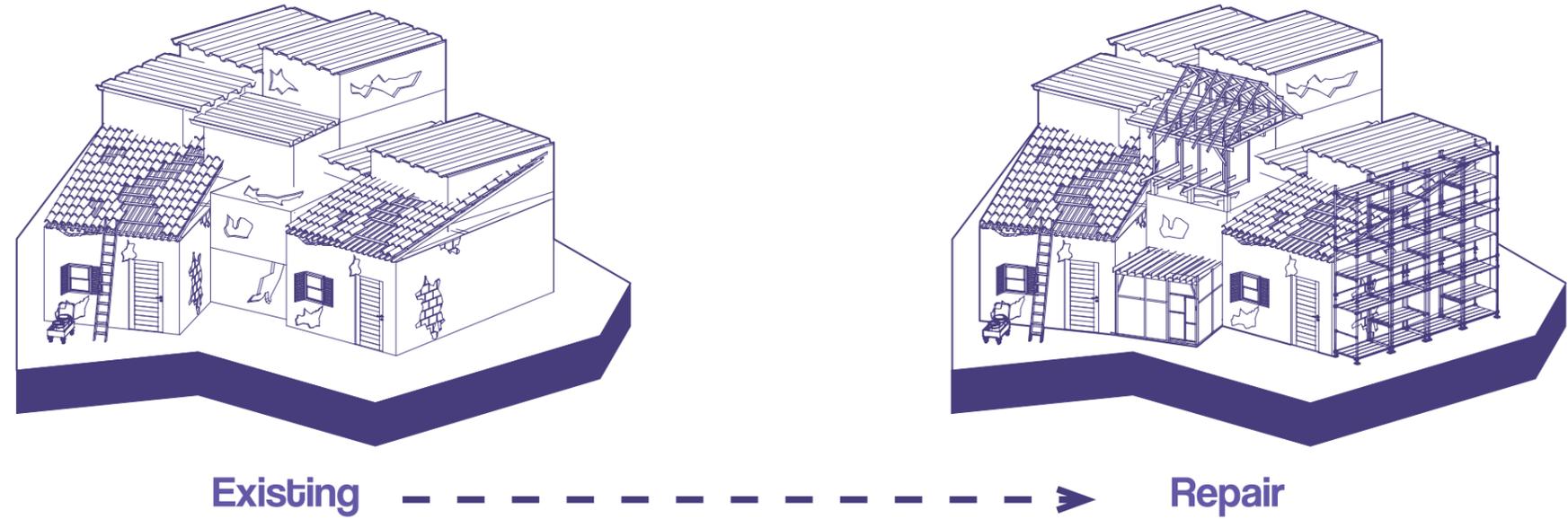
A analysis of the village will determine which buildings are safe to repair. The repairs to the homes will be done in a vernacular construction



Process of Demolition and Rebuild

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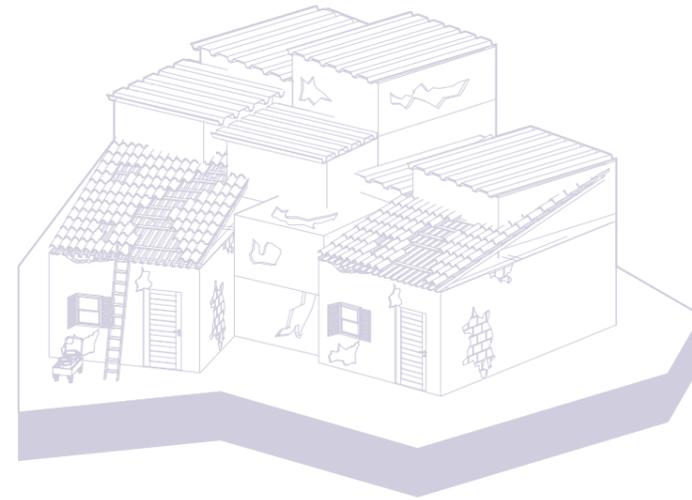
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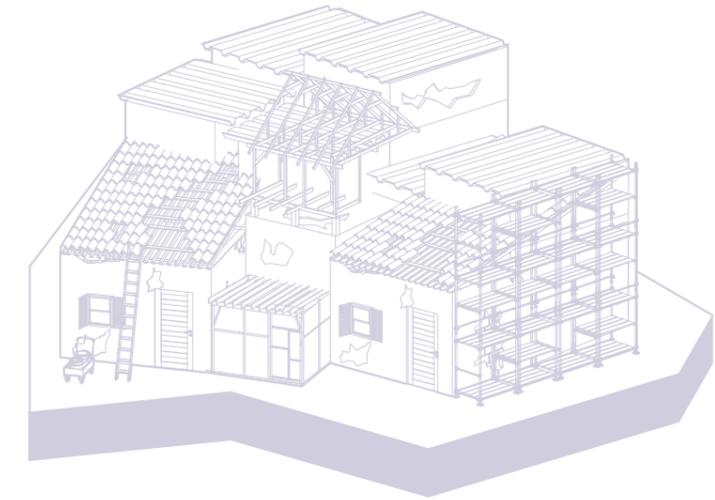
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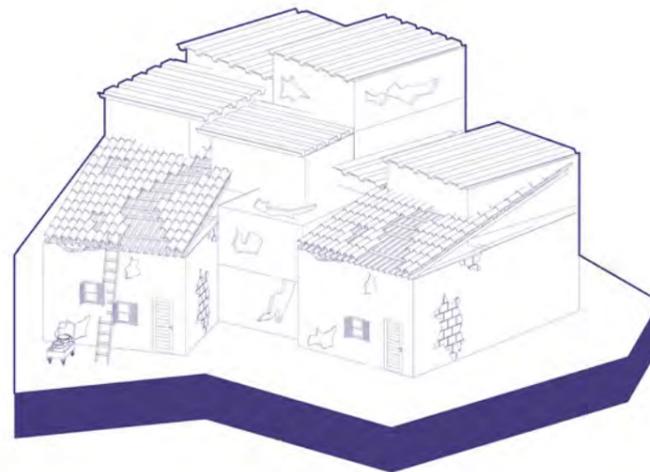
Existing



Repair

Demolition and Rebuild

If deemed structurally unsalable the buildings will be demolished and rebuilt with either S,M,L scale pending on urban conditions.

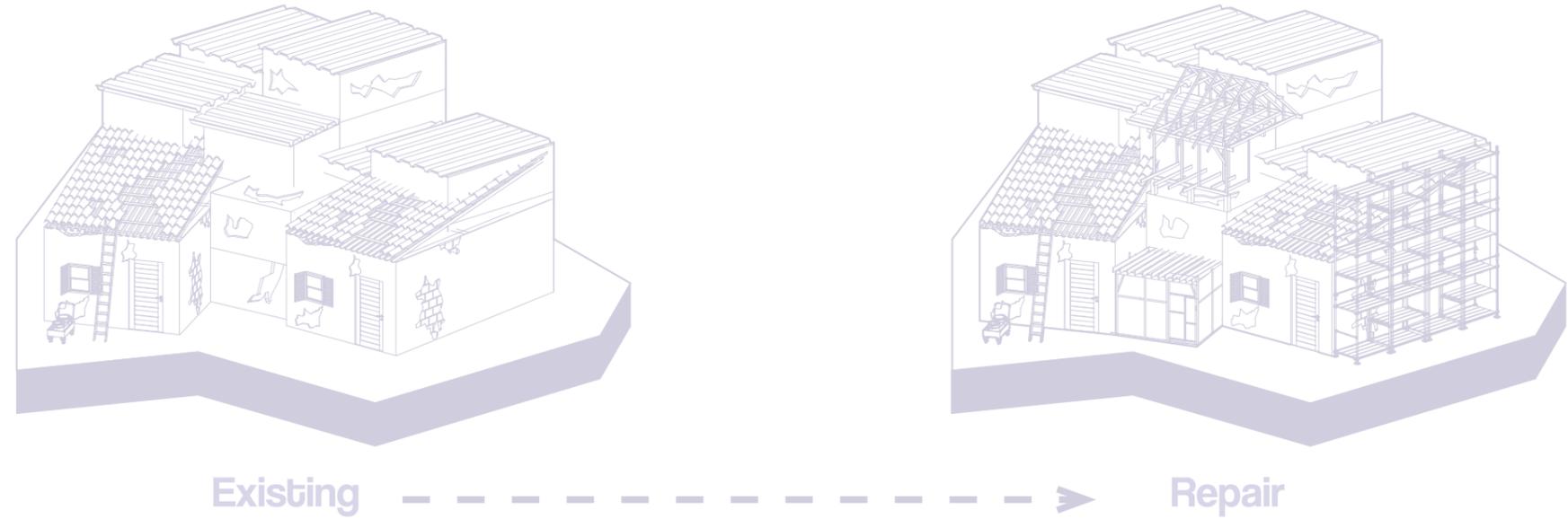


Existing

Process of Demolition and Rebuild

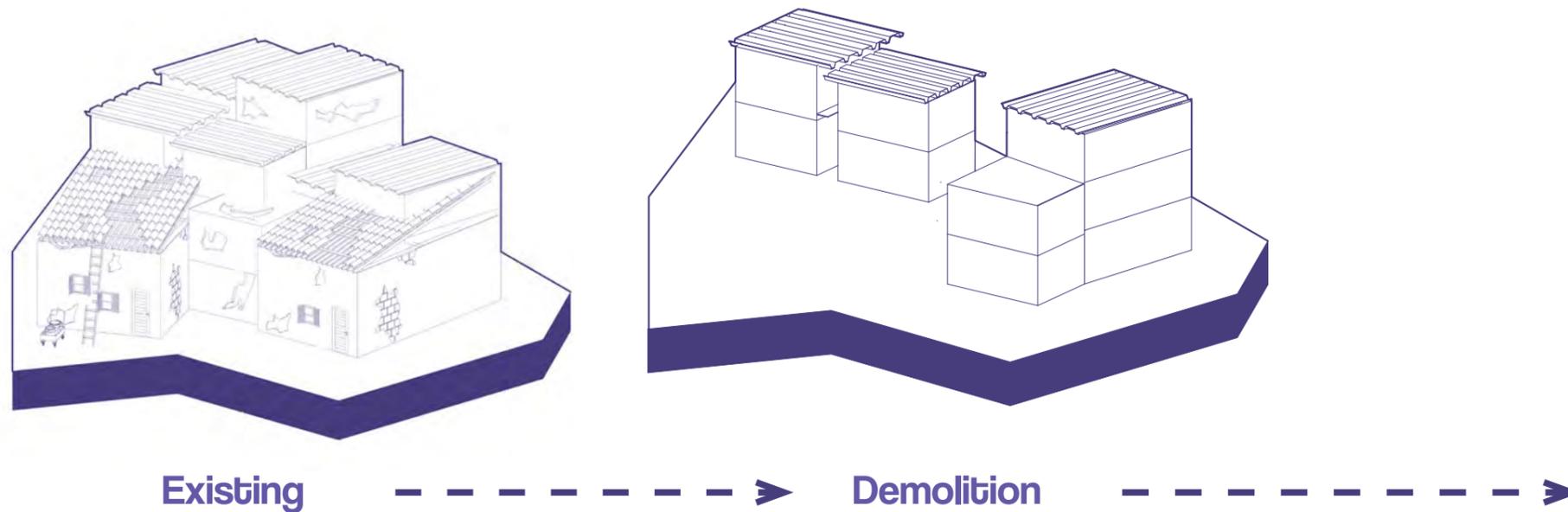
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Demolition and Rebuild

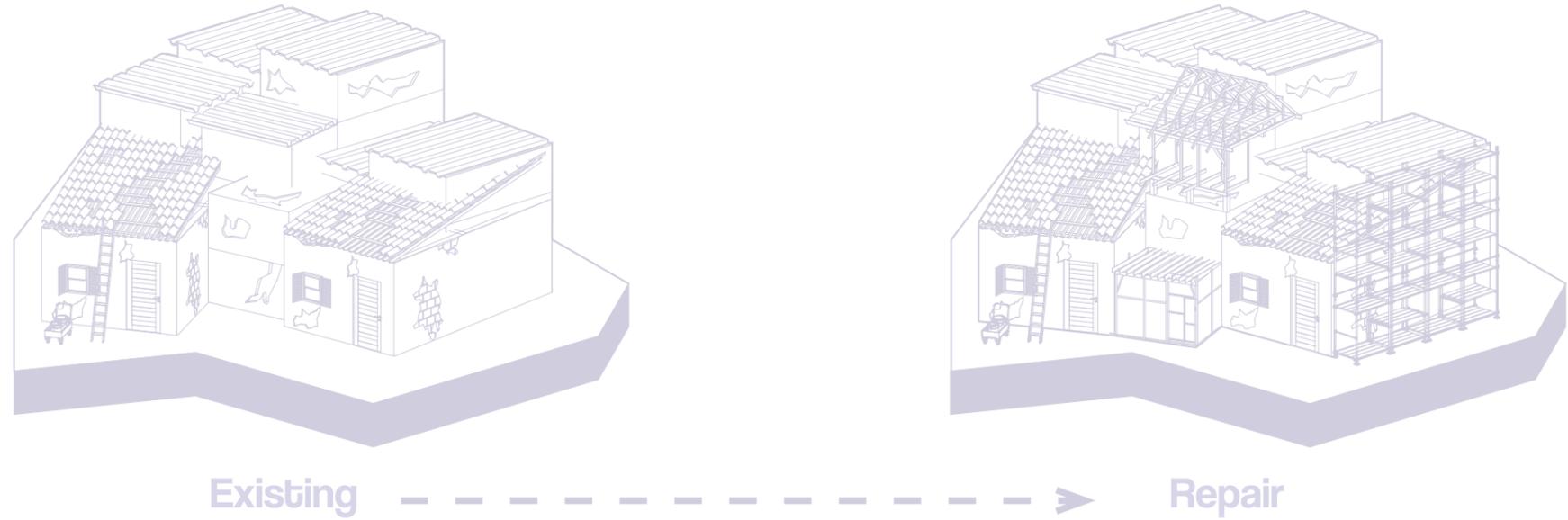
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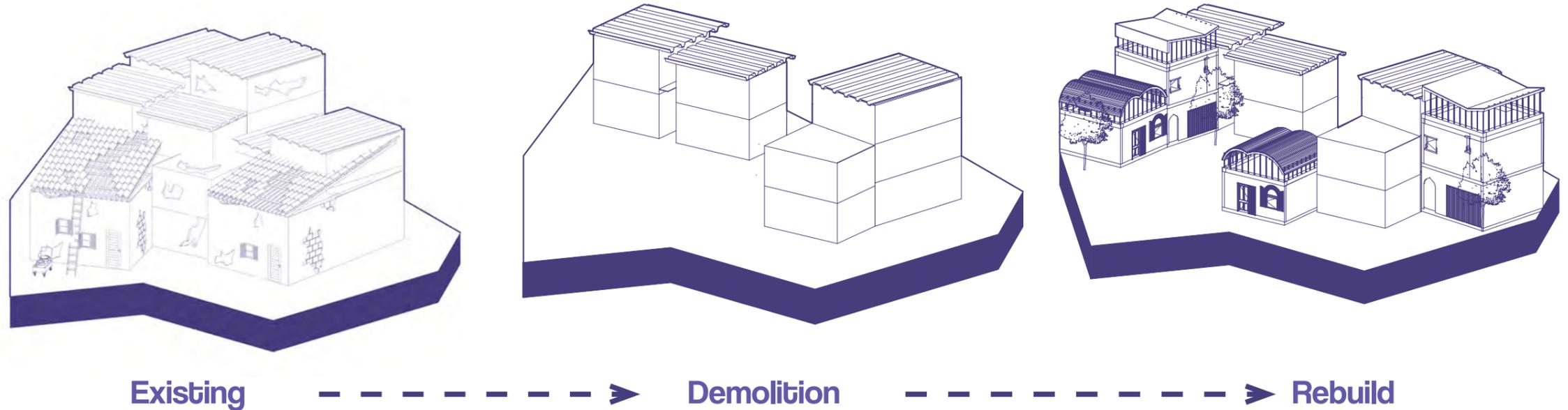
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Program

Existing Road Infrastructure

Existing Roads- Poor existing road conditions and access to the village



New Road Infrastructure

New Roads- By introducing new roads it reintegrates the spine of the village. Only pedestrian except for emergency vehicles.



Existing Amenities

Existing Amenities- The village lacks a range of social amenities leaving villagers to go elsewhere to seek them.



Legend:

- Services ■
- Store ■
- Grocery ■
- Restaurants ■
- Medical ■
- Health ■
- Post Office ■
- Religious ■
- Office ■

1:2000

Amenities Disrupted

Disrupted facilities- When constructing the new road, dwellings and amenities will be interrupted.



Legend:

- Services
- Store
- Grocery
- Restaurants
- Medical
- Health
- Post Office
- Religious
- Office

1:2000

Amenities Added

New Amenities- New

Amenities added in the Large and Medium dwellings in the Plinth segment of the buildings.



Legend:

- Services ■
- Store ■
- Grocery ■
- Restaurants ■
- Medical ■
- Health ■
- Post Office ■
- Religious ■
- Office ■

1:2000

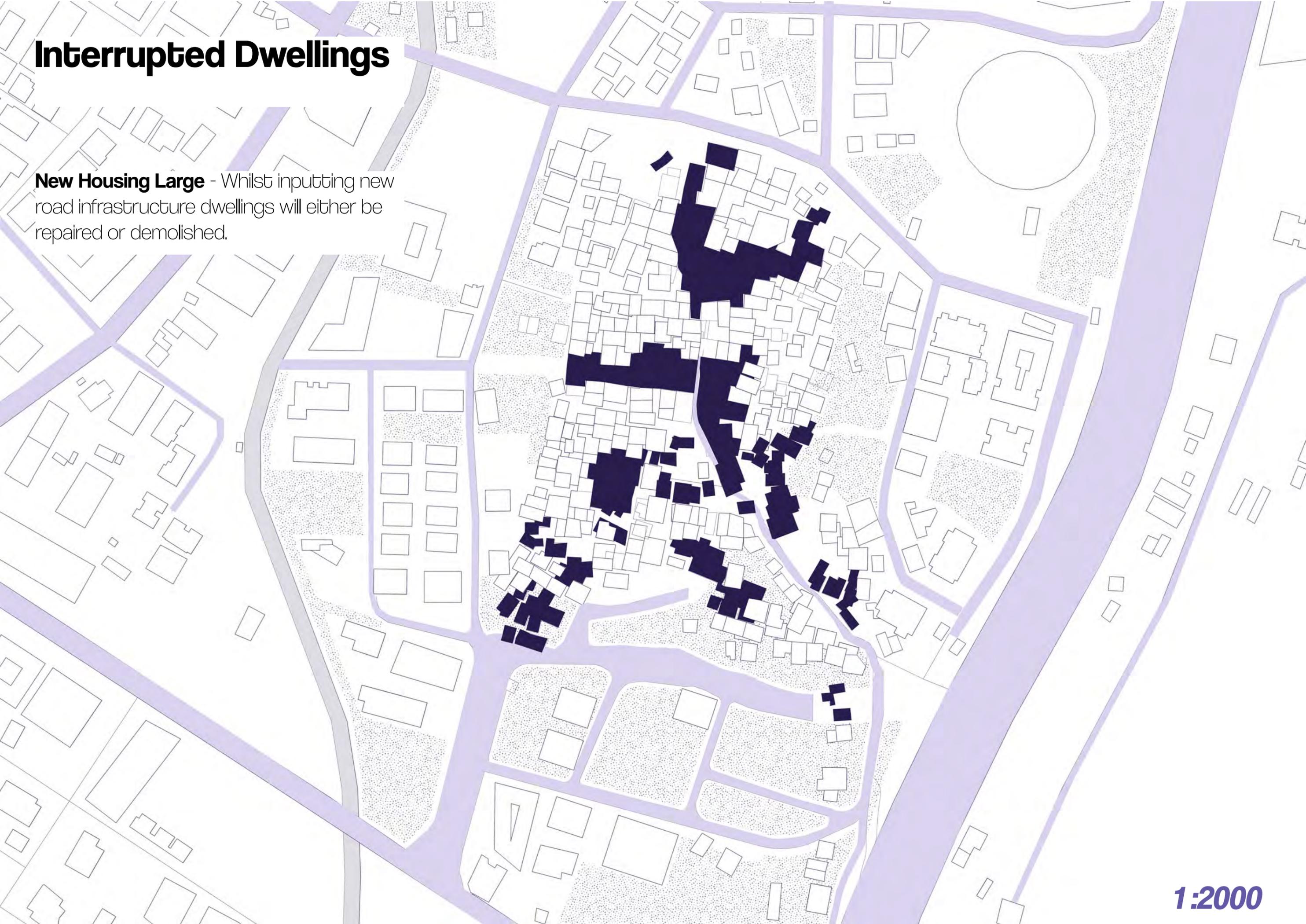
Existing Housing

Existing Housing - This village is comprised of several typologies clustered into highly dense areas



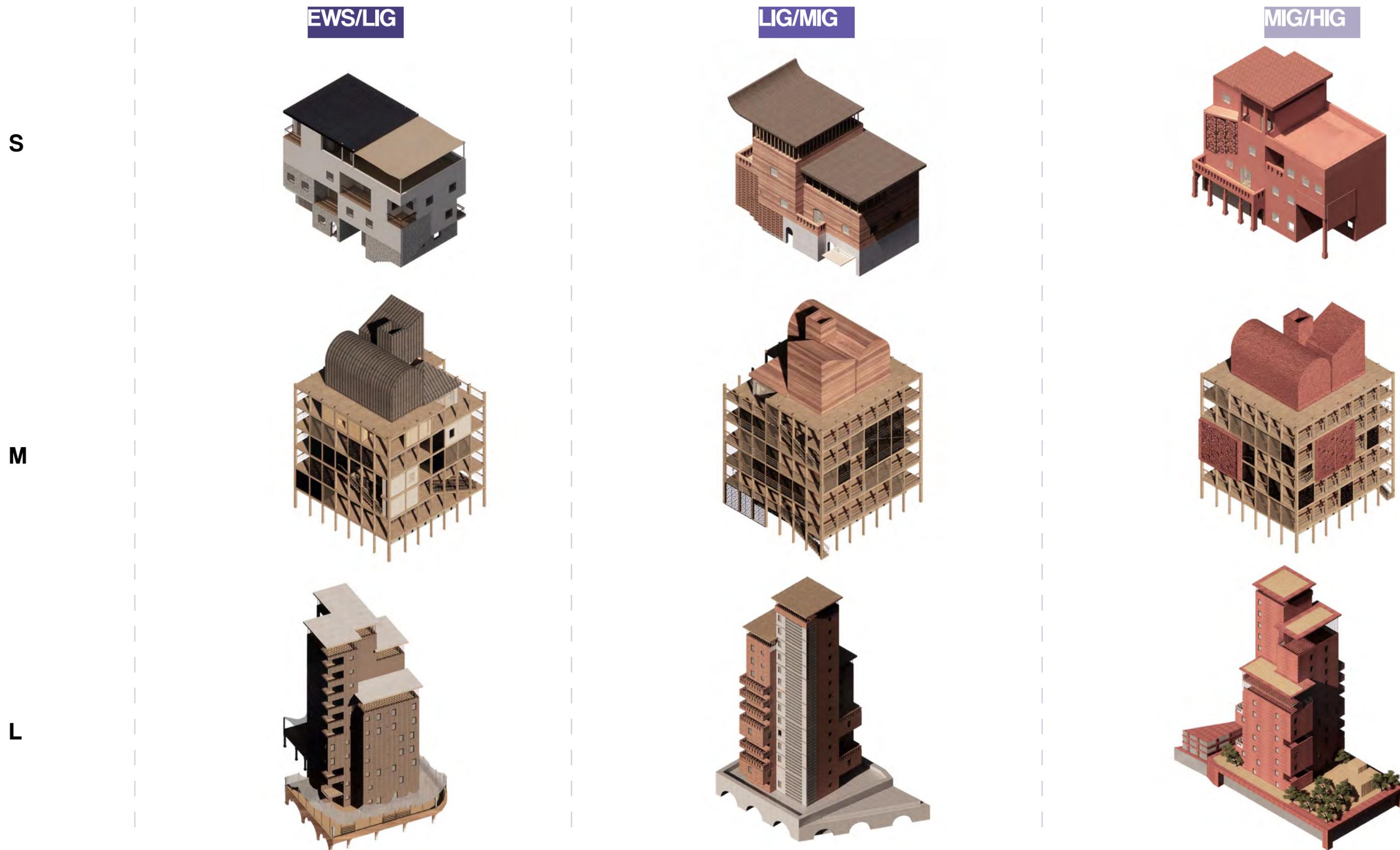
Interrupted Dwellings

New Housing Large - Whilst inputting new road infrastructure dwellings will either be repaired or demolished.

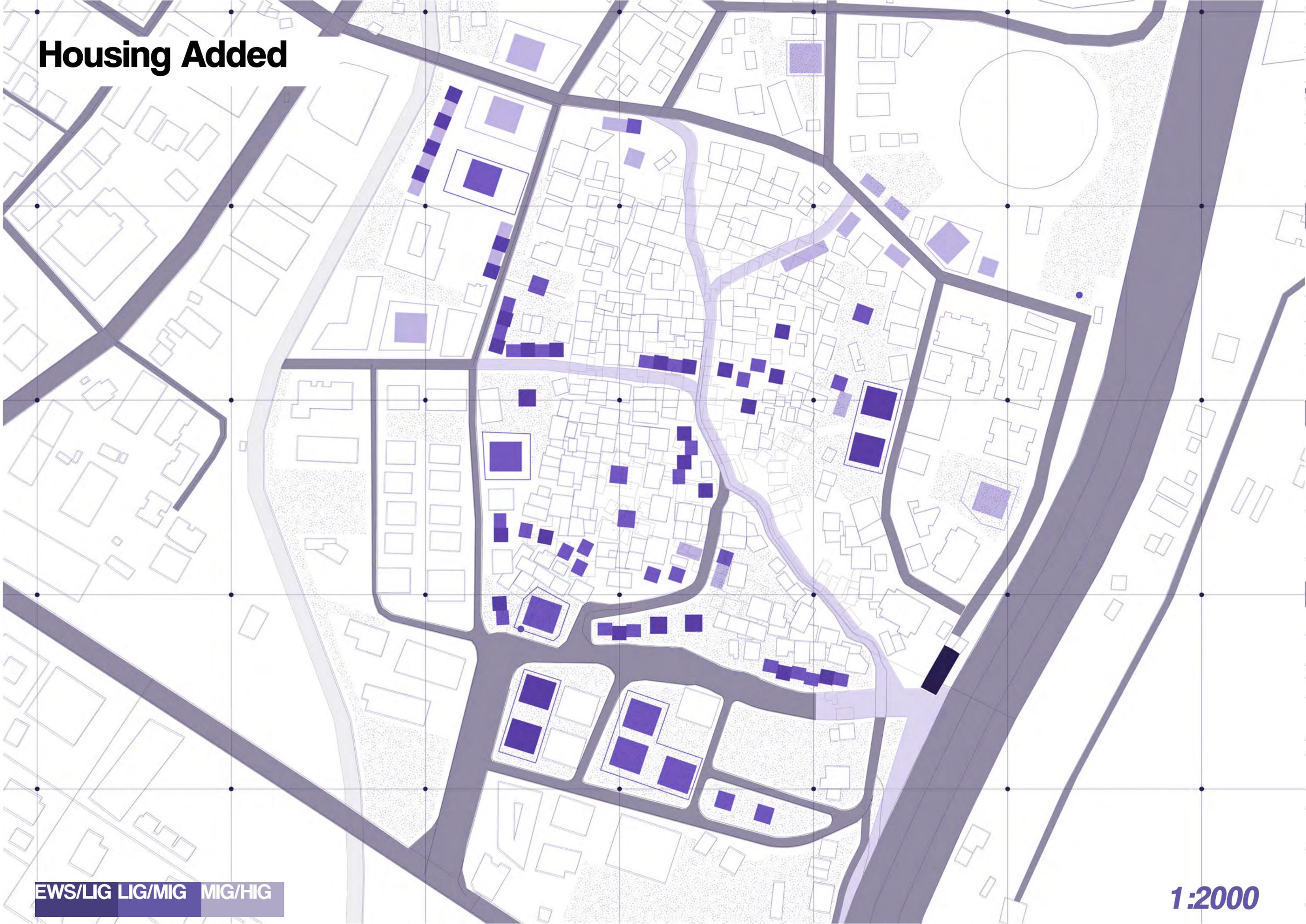


Building Strategy

Housing Matrix



Housing Added

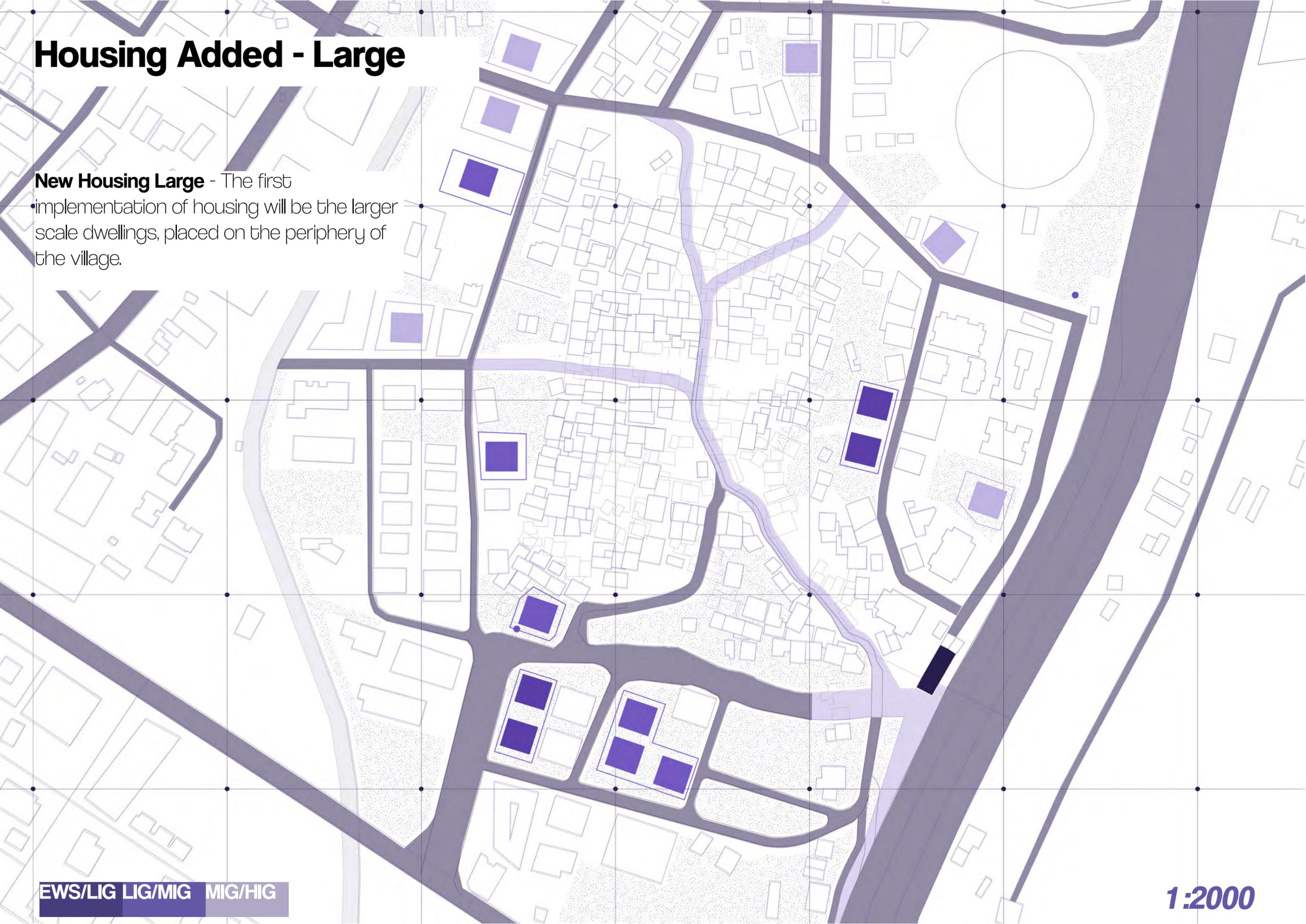


EWS/LIG LIG/MIG MIG/HIG

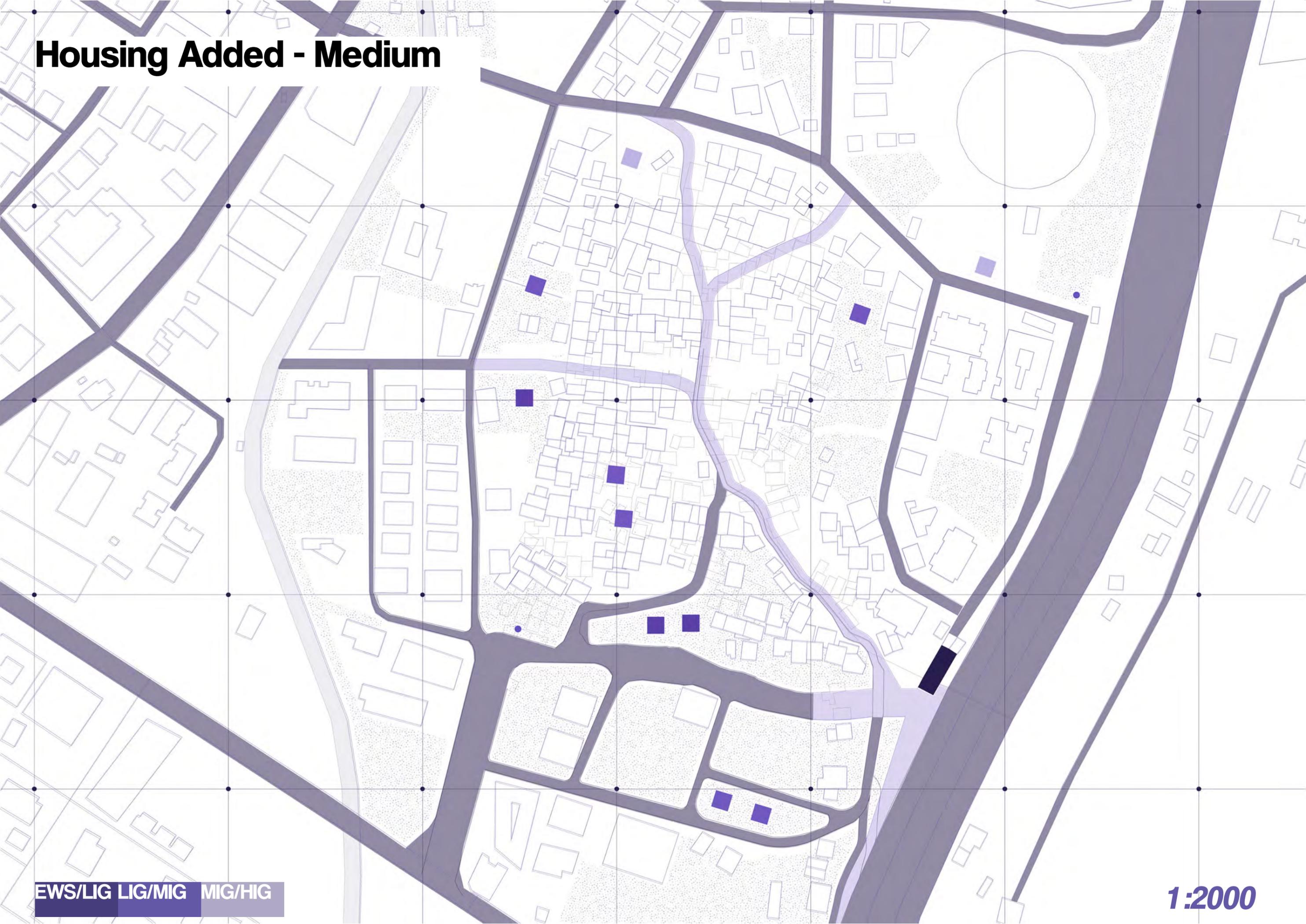
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Housing Added - Large

New Housing Large - The first implementation of housing will be the larger scale dwellings, placed on the periphery of the village.



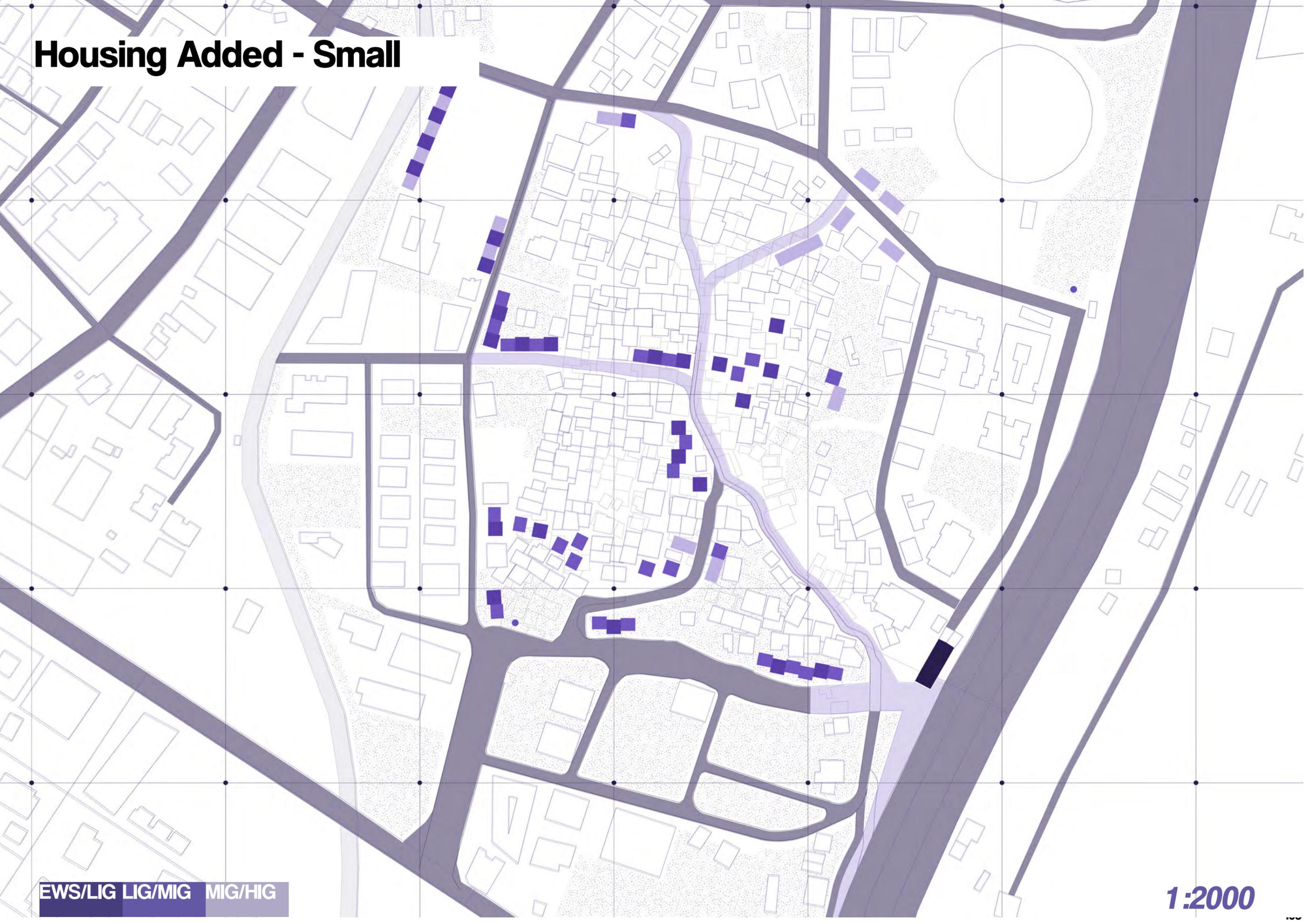
Housing Added - Medium



EWS/LIG LIG/MIG MIG/HIG

1:2000

Housing Added - Small



EWS/LIG LIG/MIG MIG/HIG

1:2000

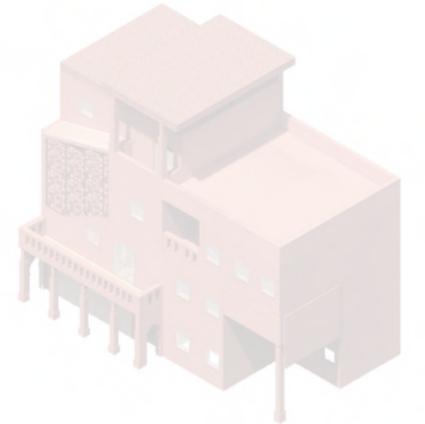
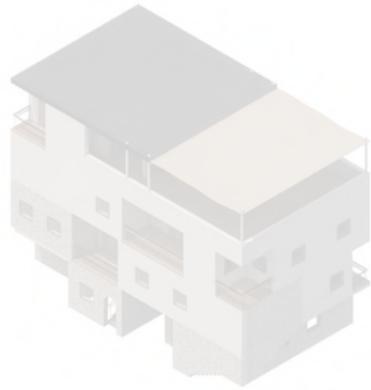
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EWS/LIG

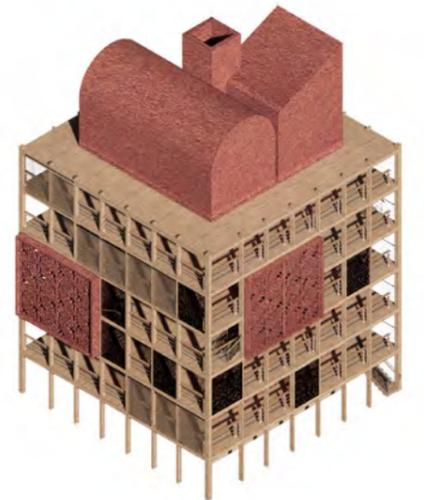
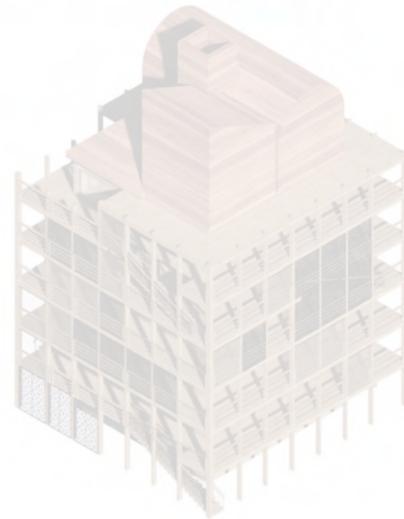
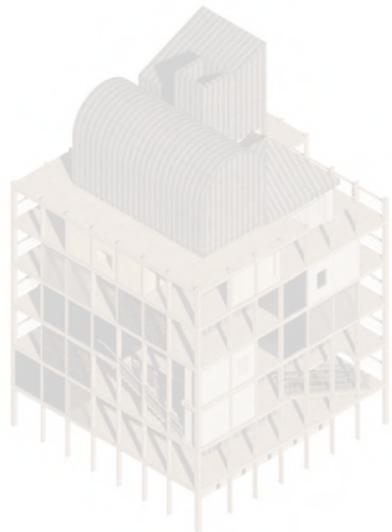
LIG/MIG

MIG/HIG

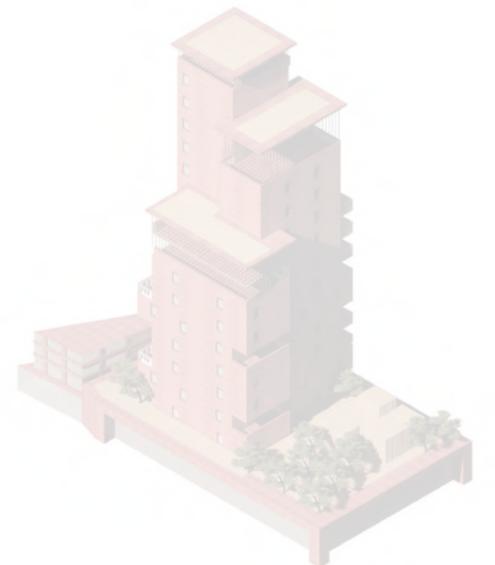
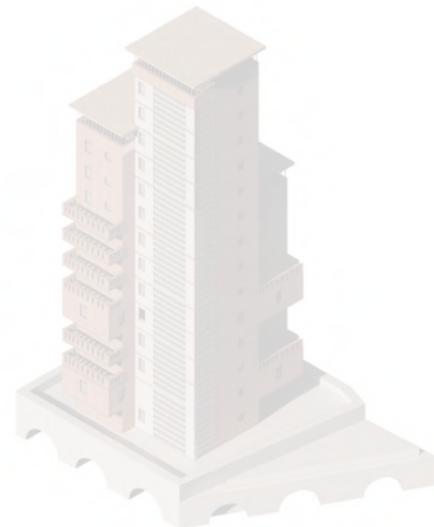
S



M



L





Small



Construction -
Concrete Plinth
Rammed Earth
Timber Roof

1:500 Plan

GSI - 0.5
FSI - 0.8
DENSITY- 50

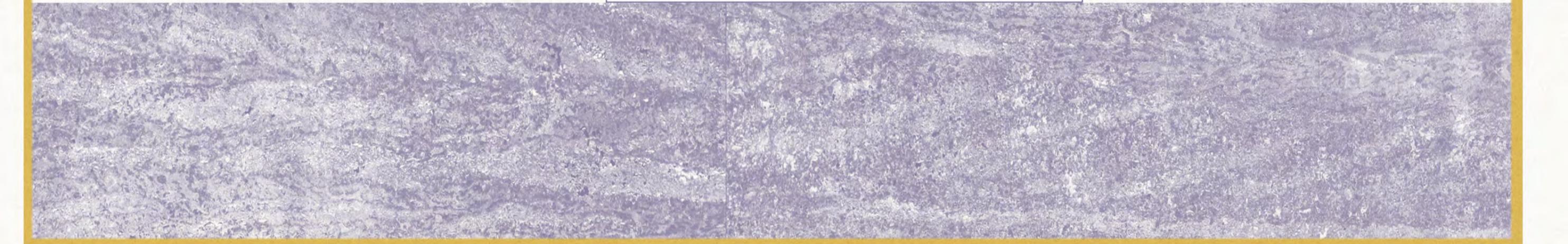


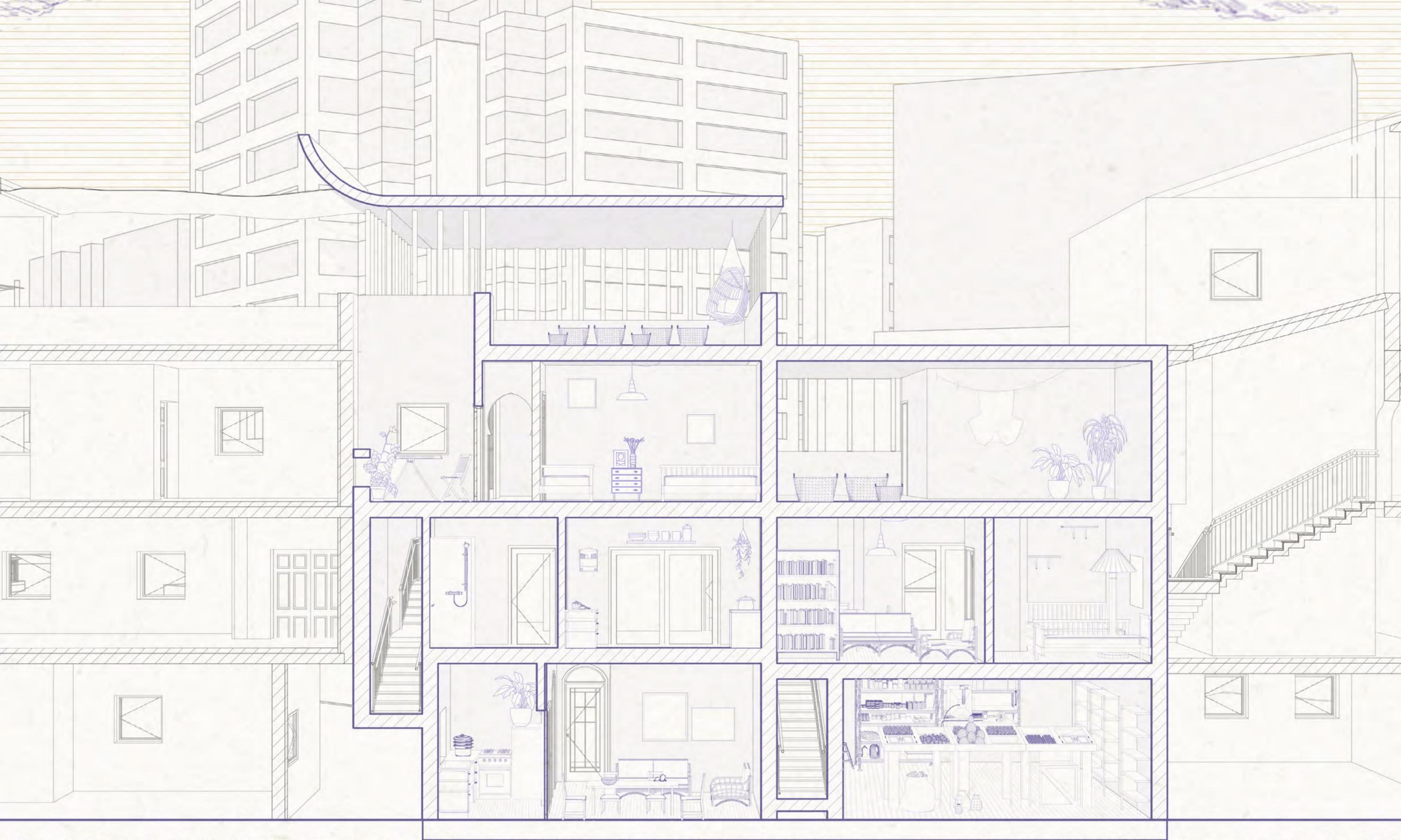
1:250 Plan

GSI - 0.5
FSI - 0.8
DENSITY- 50

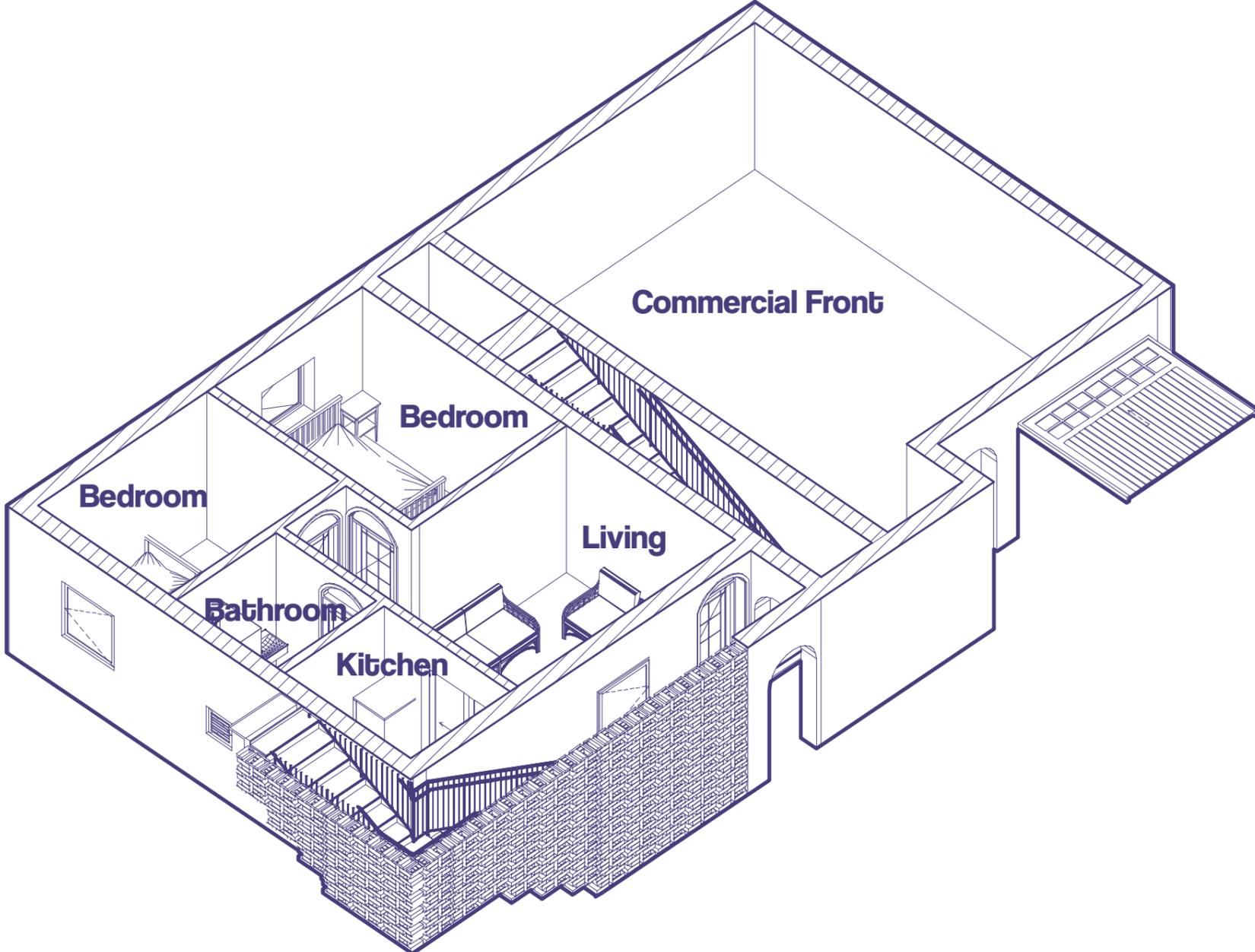


1:100 Section

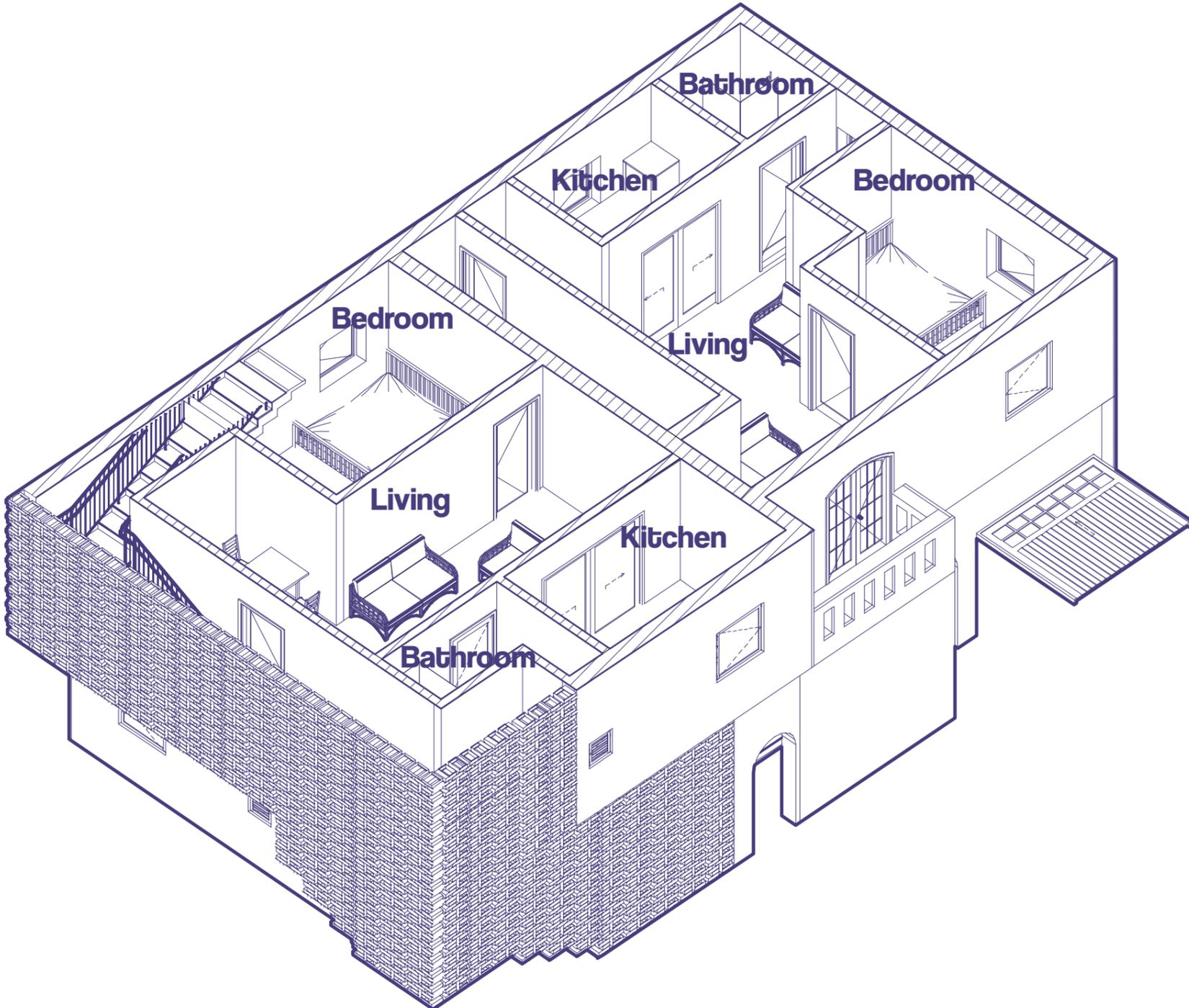




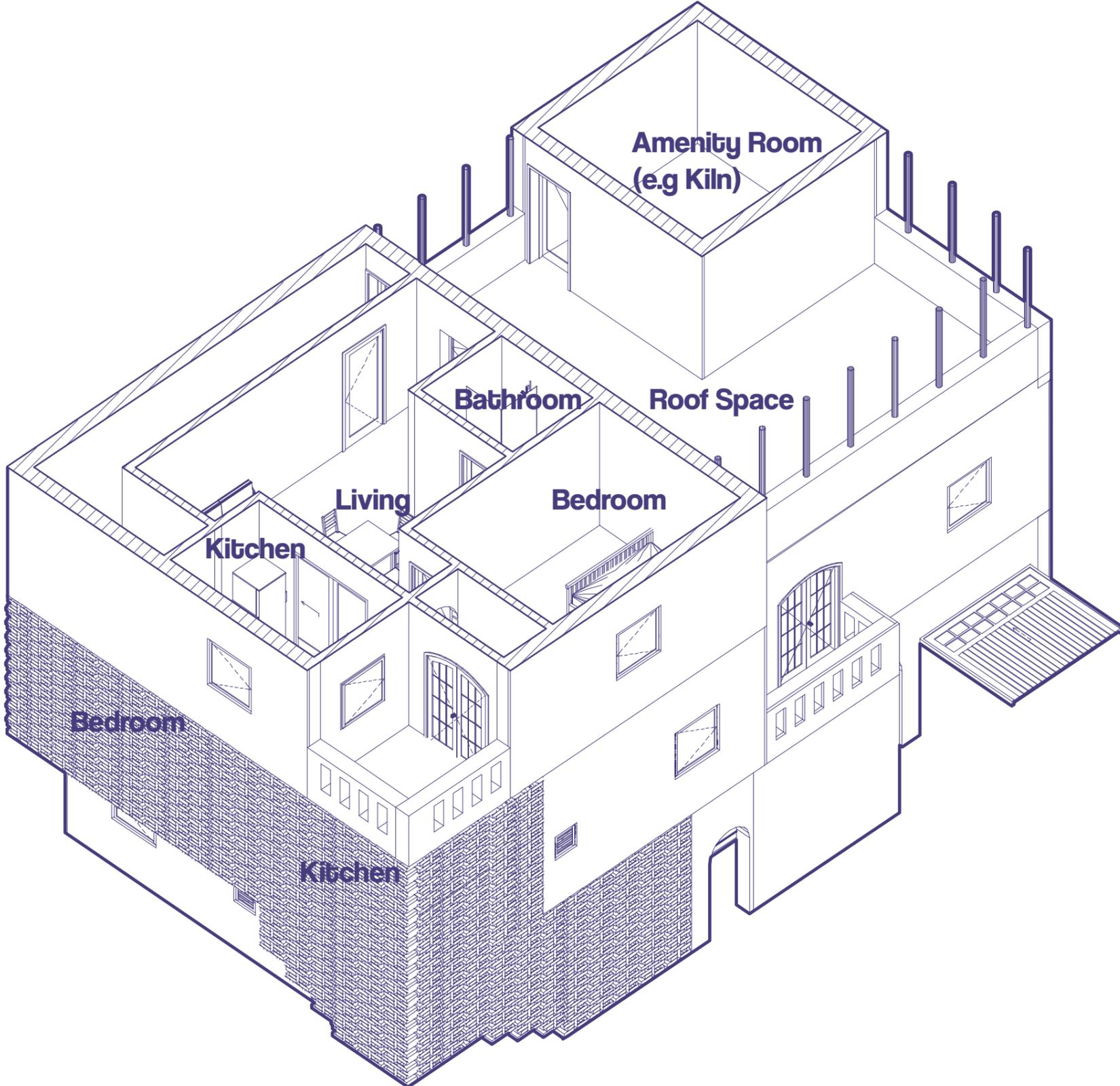
Isometric Ground Floor

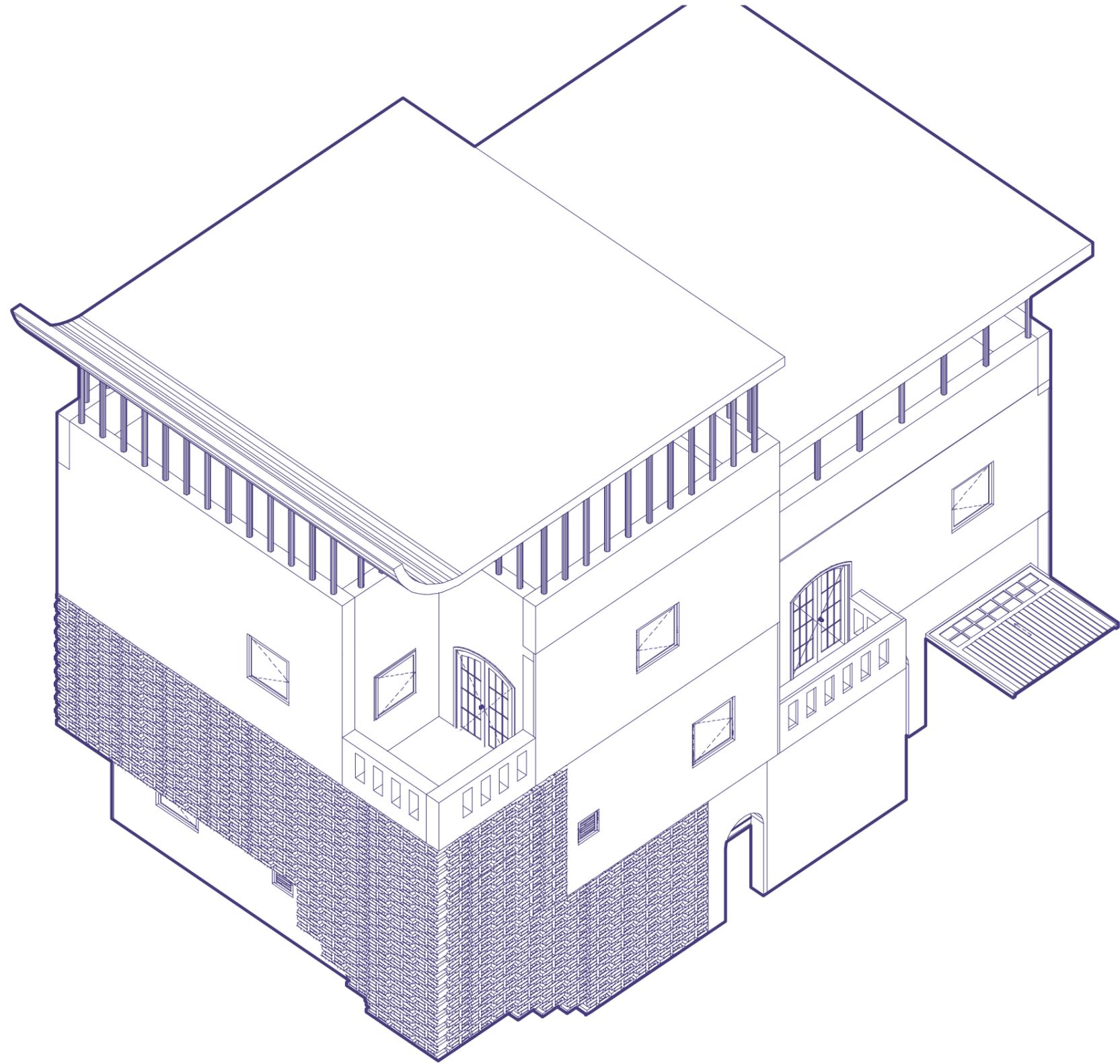


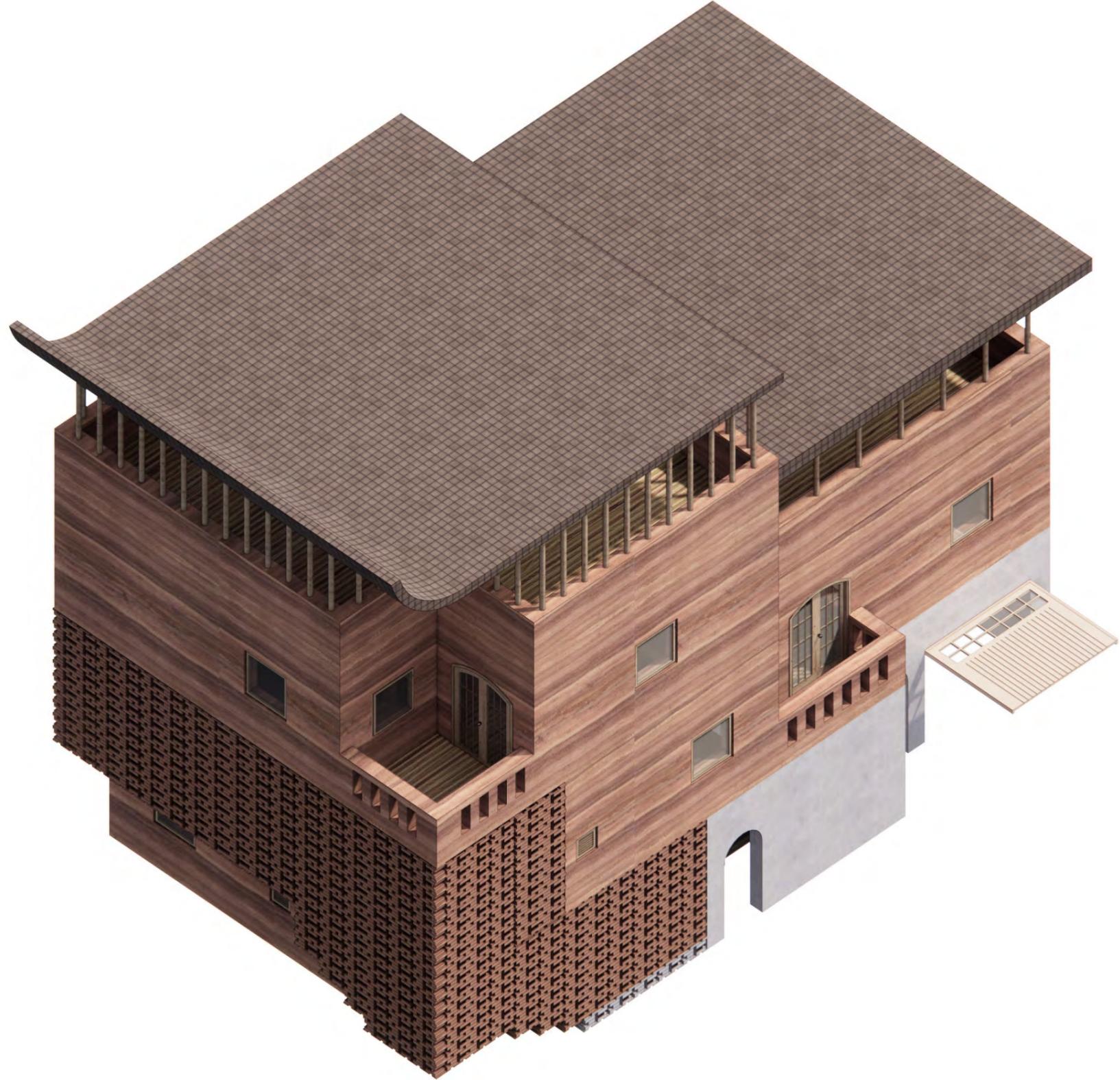
Isometric First Floor



Isometric Second Floor







Current Situation



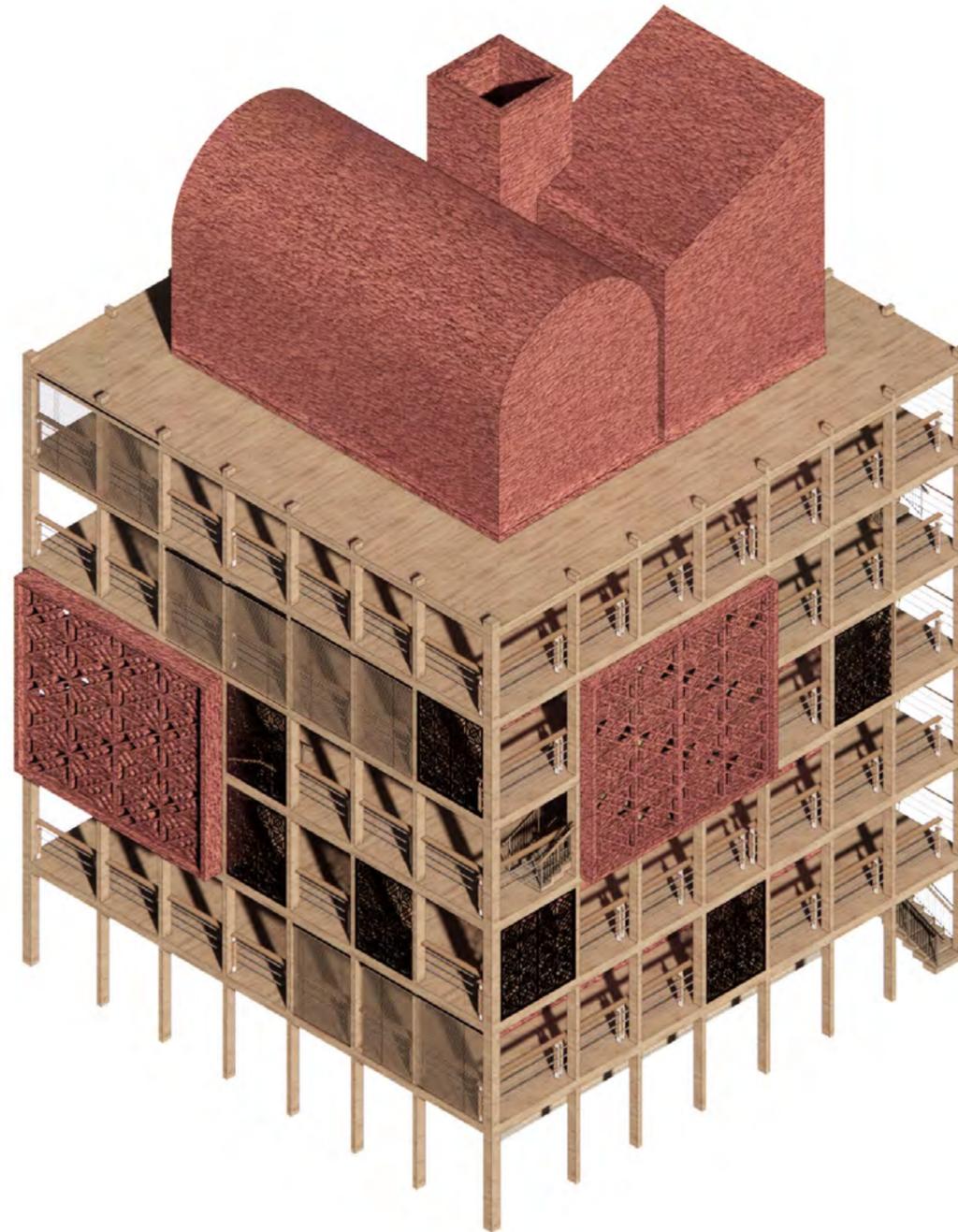
Future Situation



Maker Housing Situation



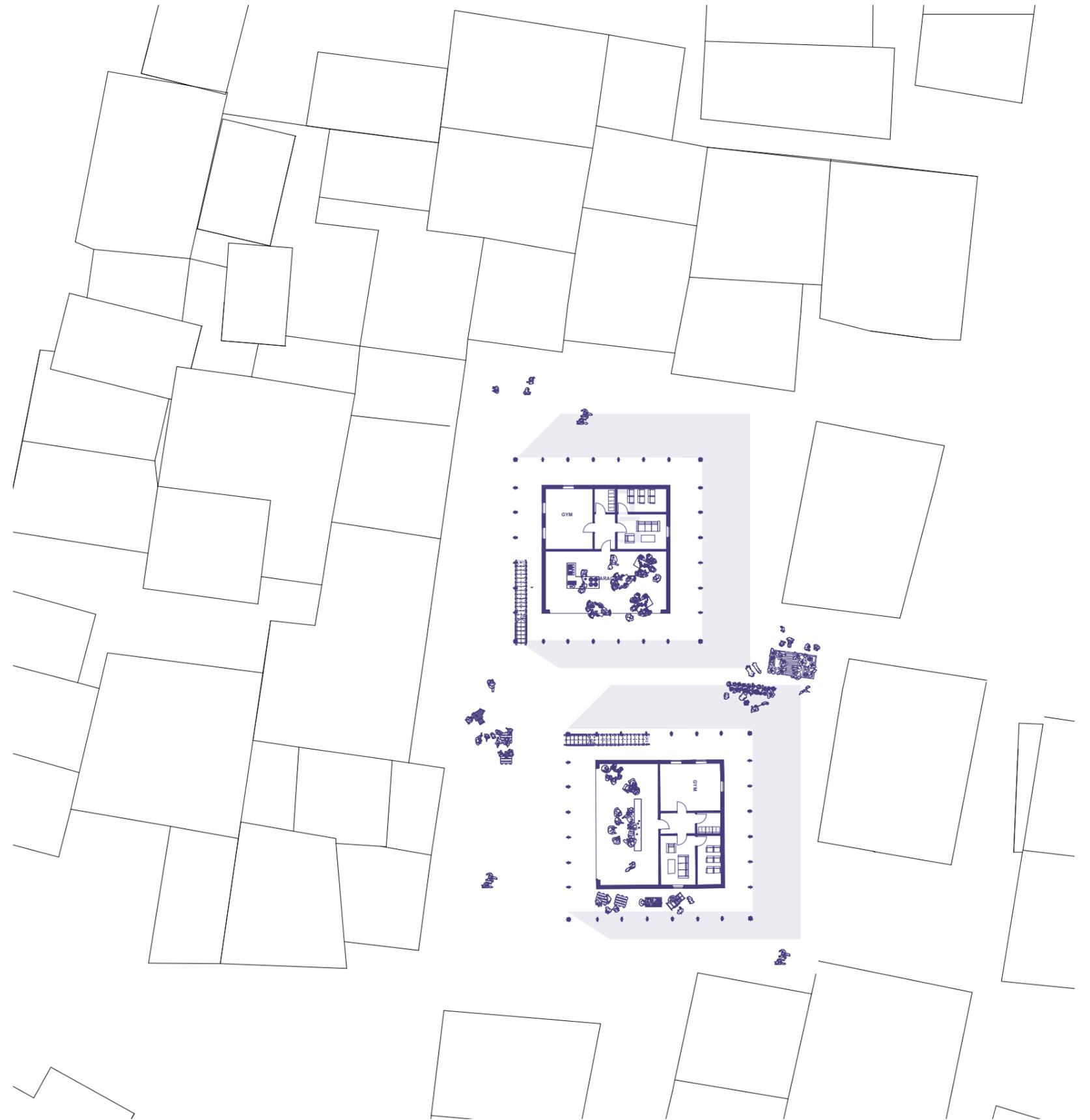
Medium



Construction -
Concrete Plinth
Rammed Earth

1:500 Plan

GSI - 0.3
FSI - 0.4
DENSITY- 8



1:250 Plan

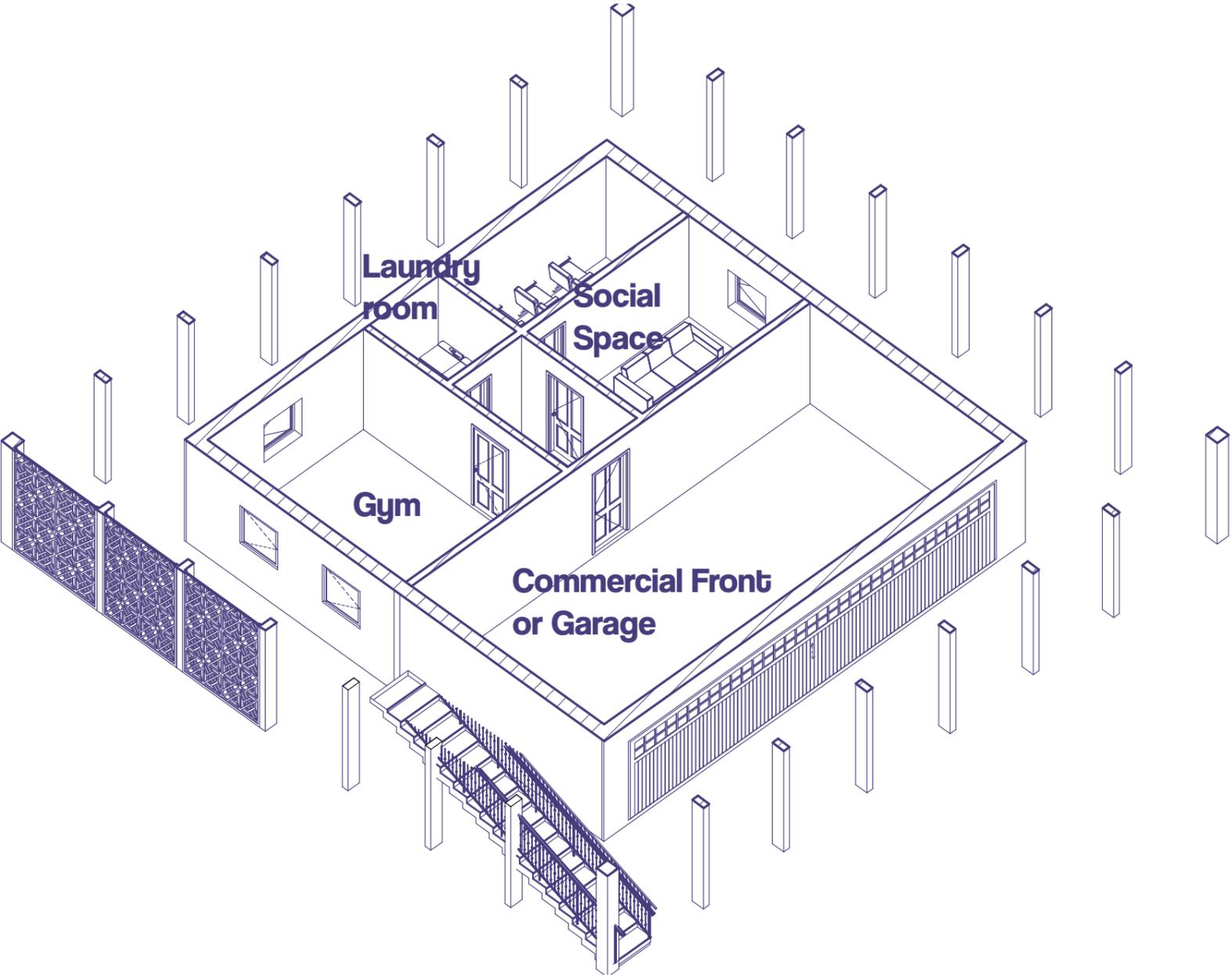
GSI - 0.3
FSI - 0.4
DENSITY- 8



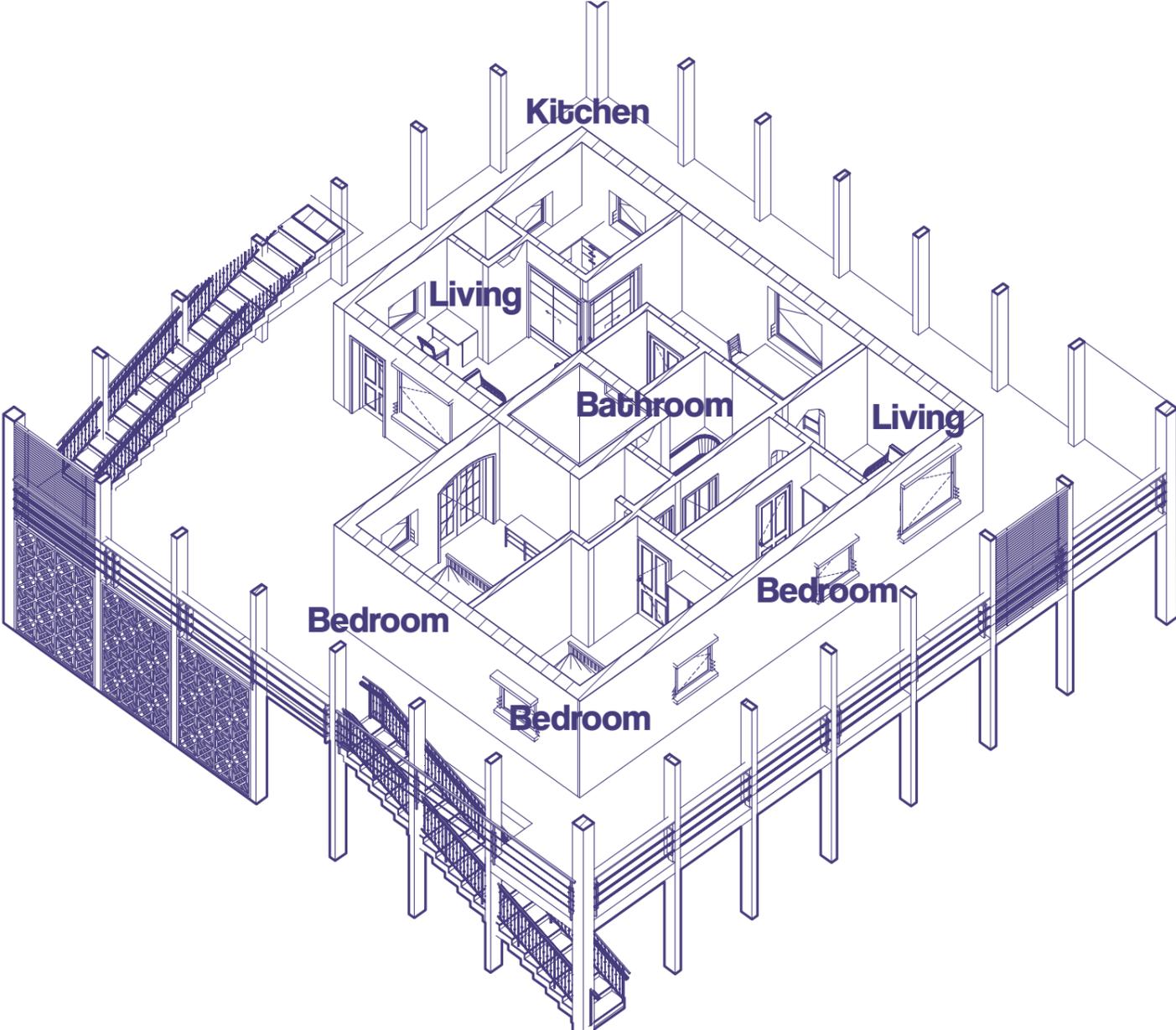




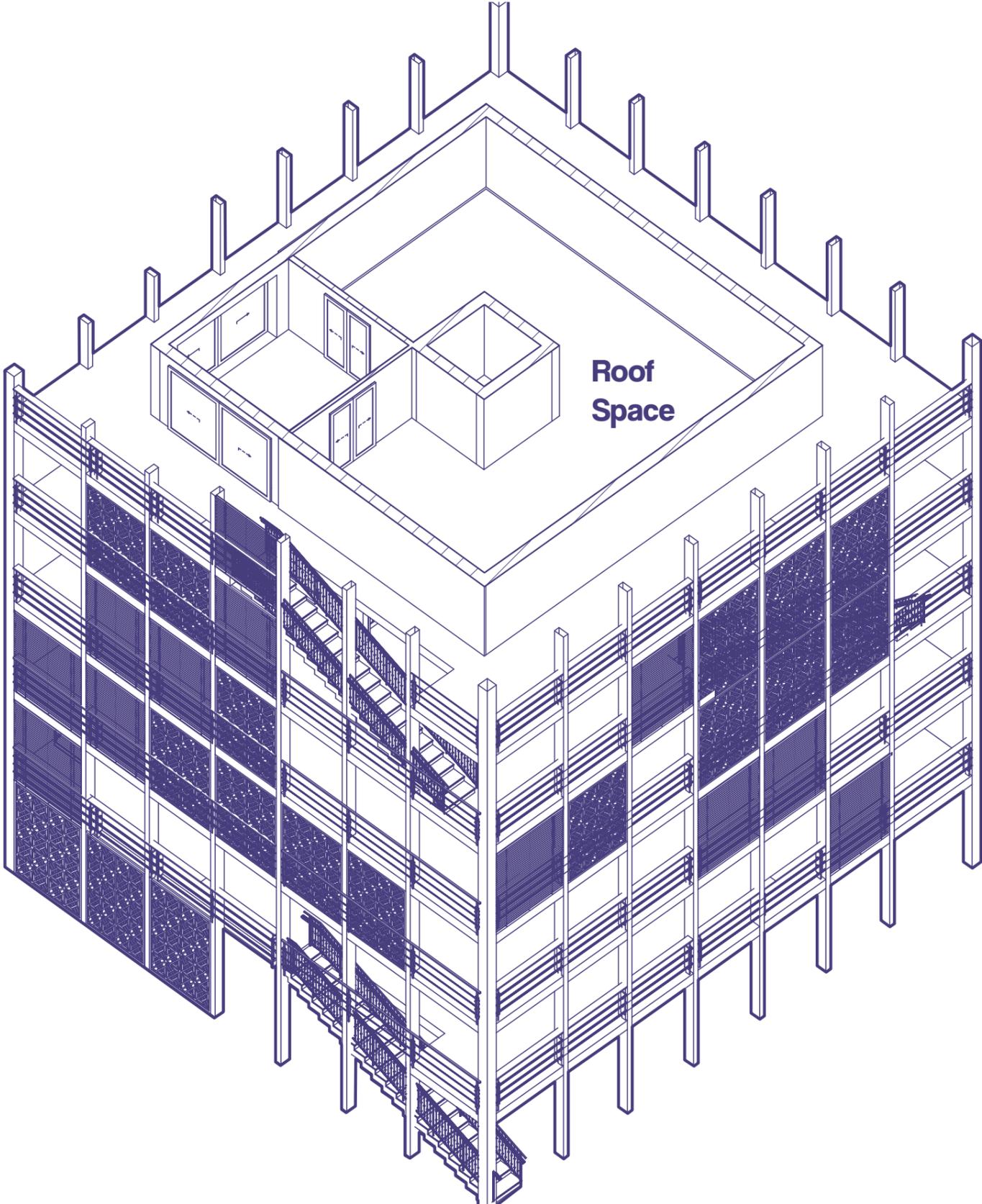
Isometric Ground Floor

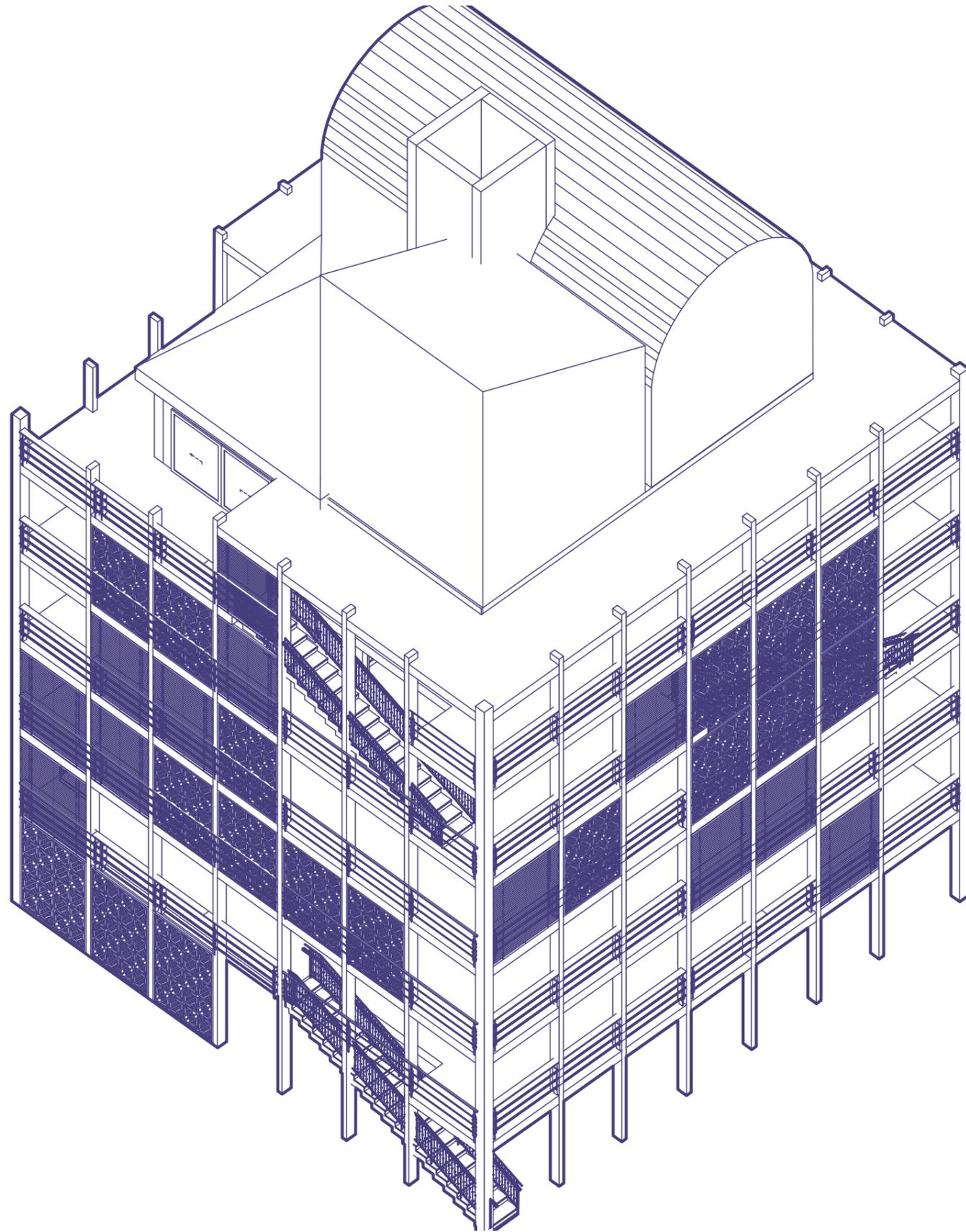


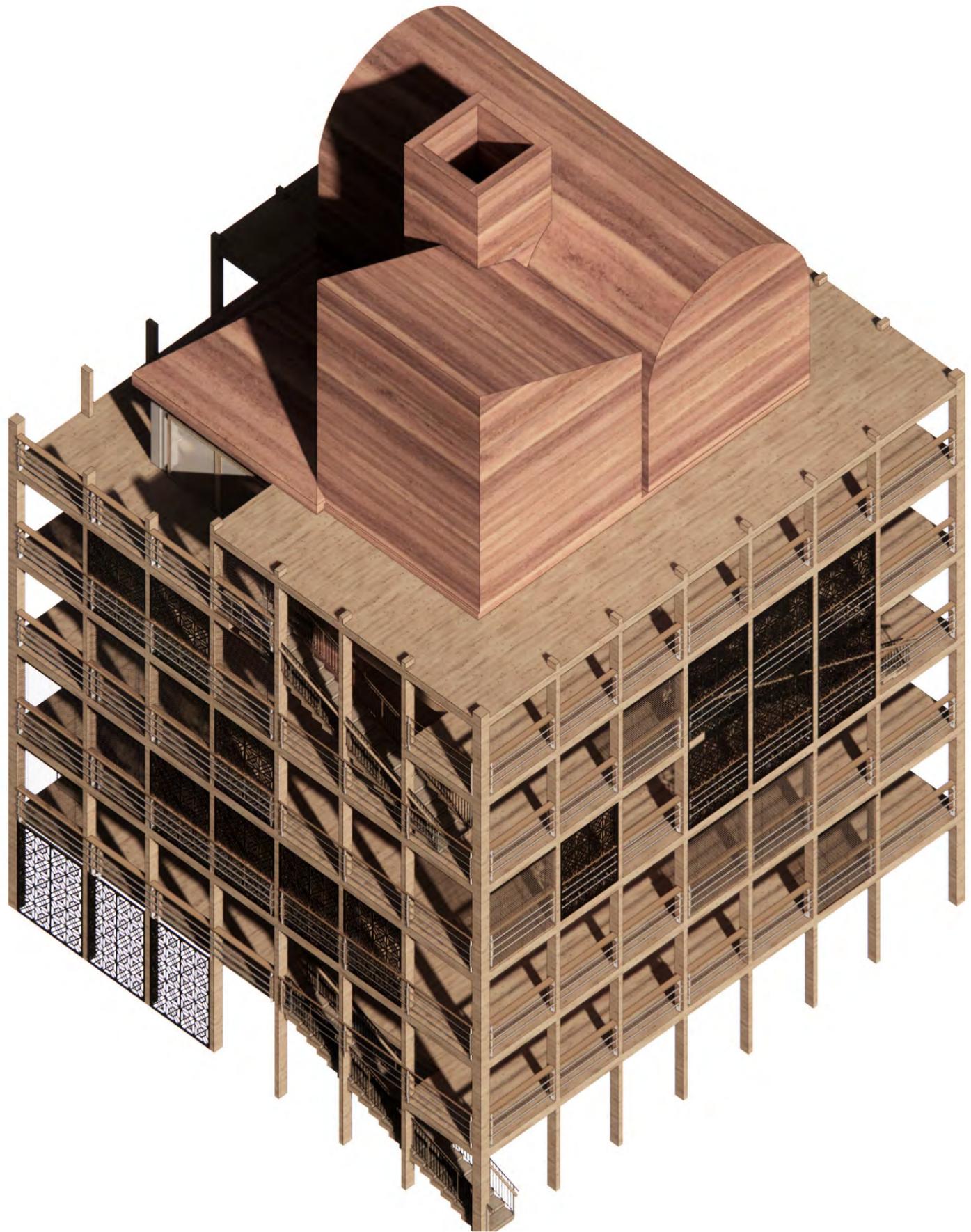
Isometric First Floor



Isometric Roof







Current Situation



Future Situation



Maker Housing Situation



Large



Construction -
Timber Plinth
Brick Fill
Concrete Structure

1:500 Plan

GSI - 0.5
FSI - 0.8
DENSITY- 108



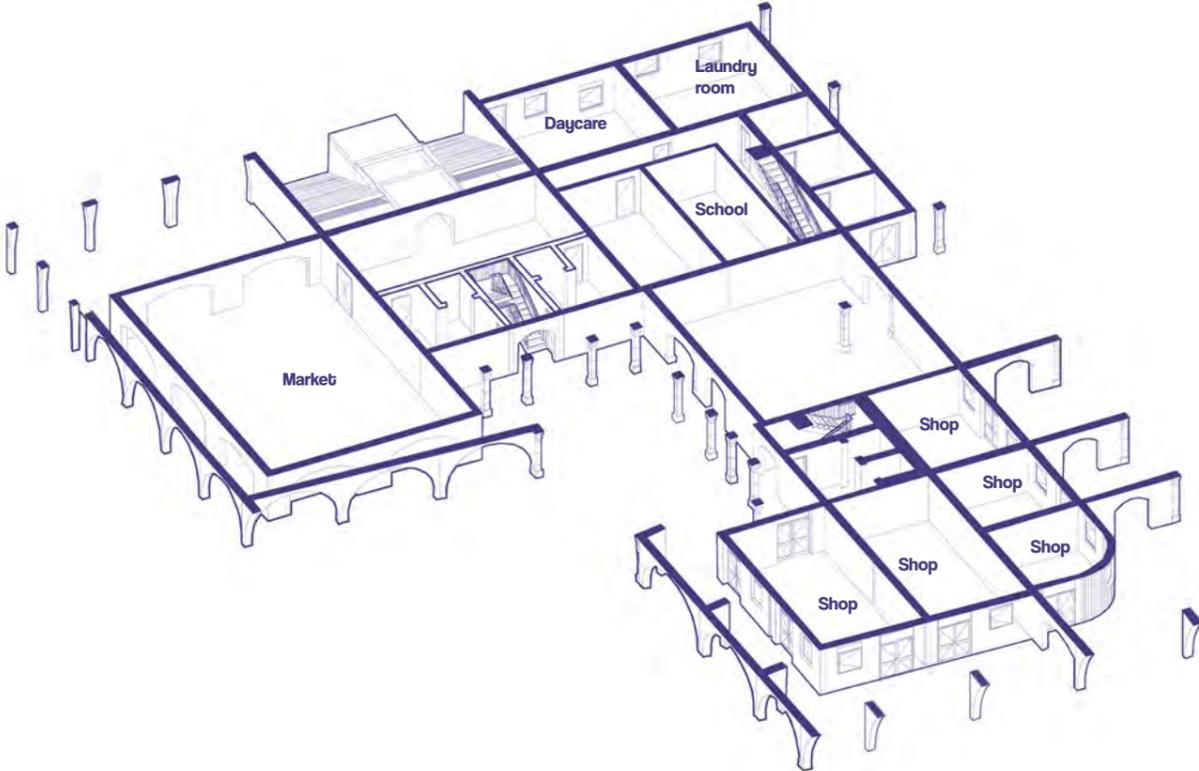
1:250 Plan

GSI - 0.5
FSI - 0.8
DENSITY- 108

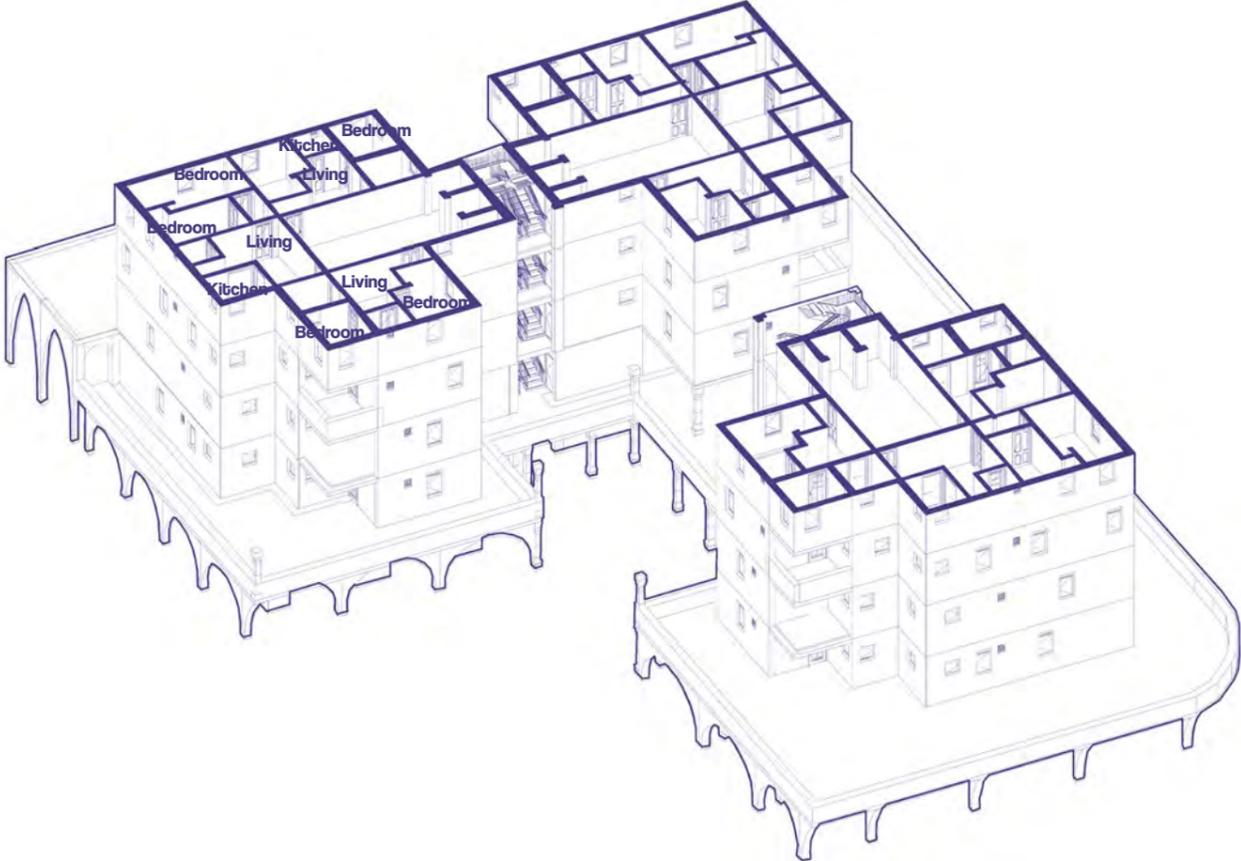




Isometric Ground Floor



Isometric Typical Floor



Isometric Roof Floor





Current Situation



Future Situation



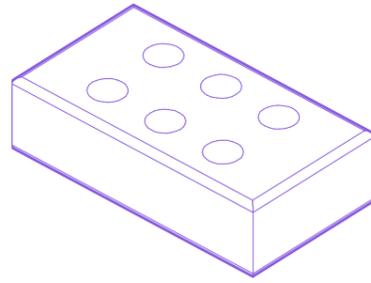
Maker Housing Situation



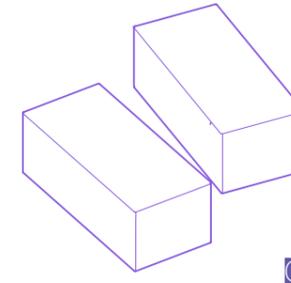
Materialization

Vernacular Material

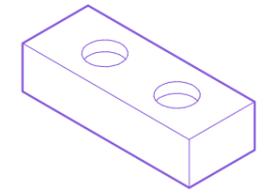
Local Materials - Environmentally friendly building materials that can be used in affordable housing schemes.



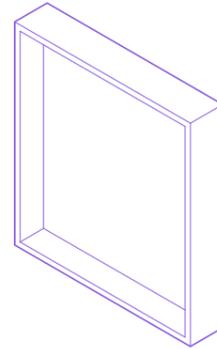
Fly Ash Brick



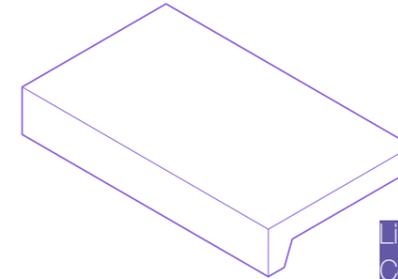
Compressed Earth Brick



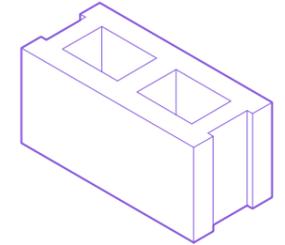
Clay Flyash Burnt Brick



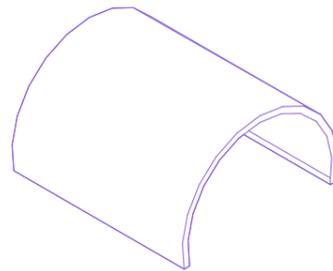
Ferrocement Wall Panels



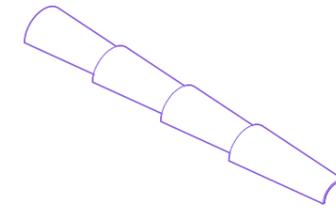
Lightweight Concrete



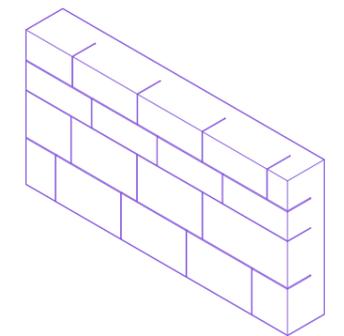
Concrete Blocks



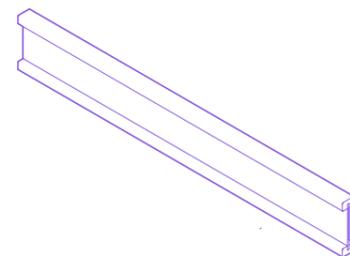
Ferrocement Roof Channel



Micro Concrete Tiles



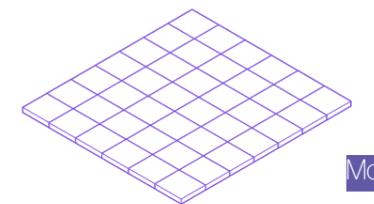
Reinforced Brick Panel



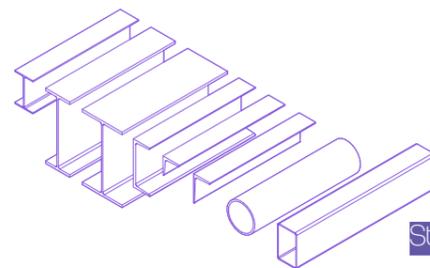
Planks and Joists



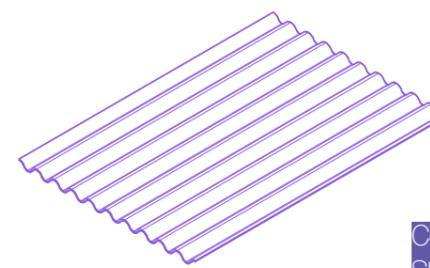
Bamboo



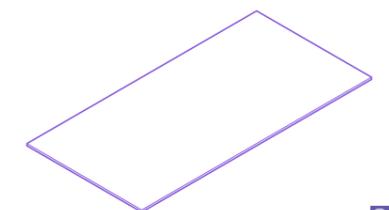
Mosaic Tiles



Steel Beams



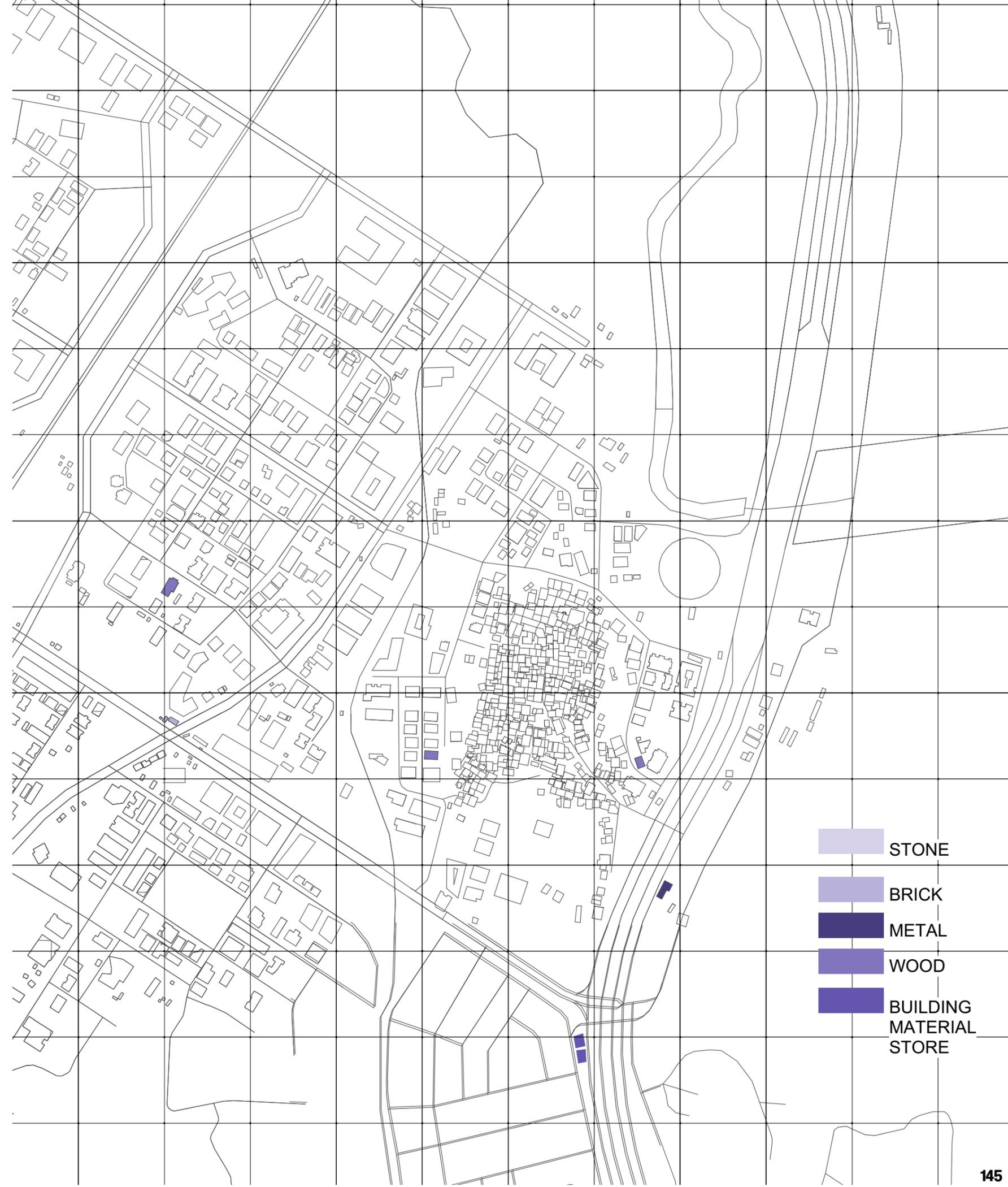
Corrugated Steel



Composite Boards

Local Strategy

Availability - Vahal has various Building supply stores on the outer edge of the village alongside a Brick and sand and stone quarry to the East.



1:50 Detail

Floor to Floor detail



1:20 Detail

Ground Floor

Timber Sun shading

Timber Handrail
Cast Iron Railing

Upper Floors Build Up
Timber Flooring
Wooden Plank
Timber Joists

Upper Floors Build Up
60mm Wooden Floor
25mm Insulation
25mm Wood Plank
Timber Beams
50mm sound insulation
25mm Hung ceiling
5mm Plaster

40mm Timber Beam

400mm Rammed Earth
400mm Timber Beam

Glass window with wooden frame

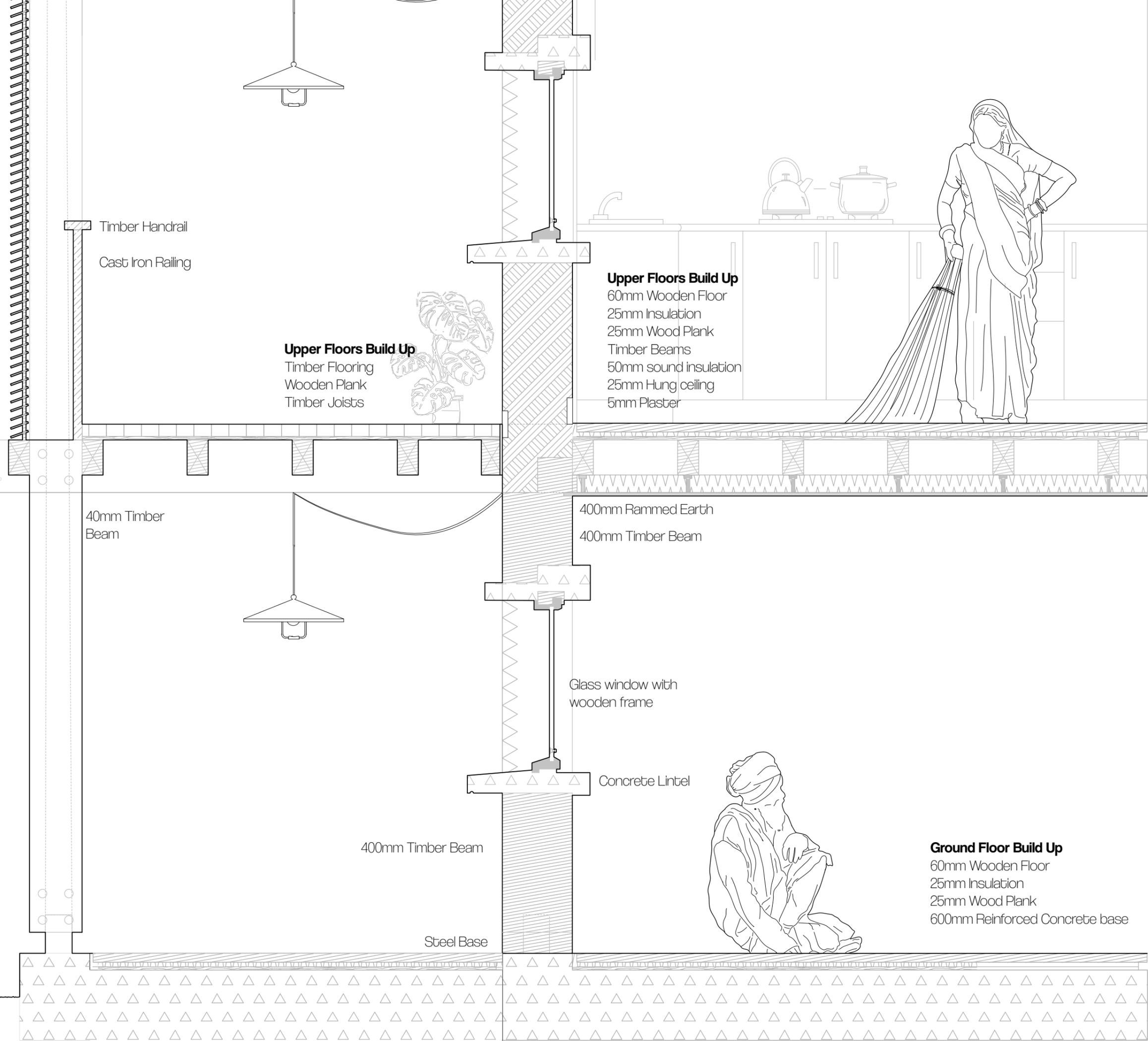
Concrete Lintel

400mm Timber Beam

Ground Floor Build Up
60mm Wooden Floor
25mm Insulation
25mm Wood Plank
600mm Reinforced Concrete base

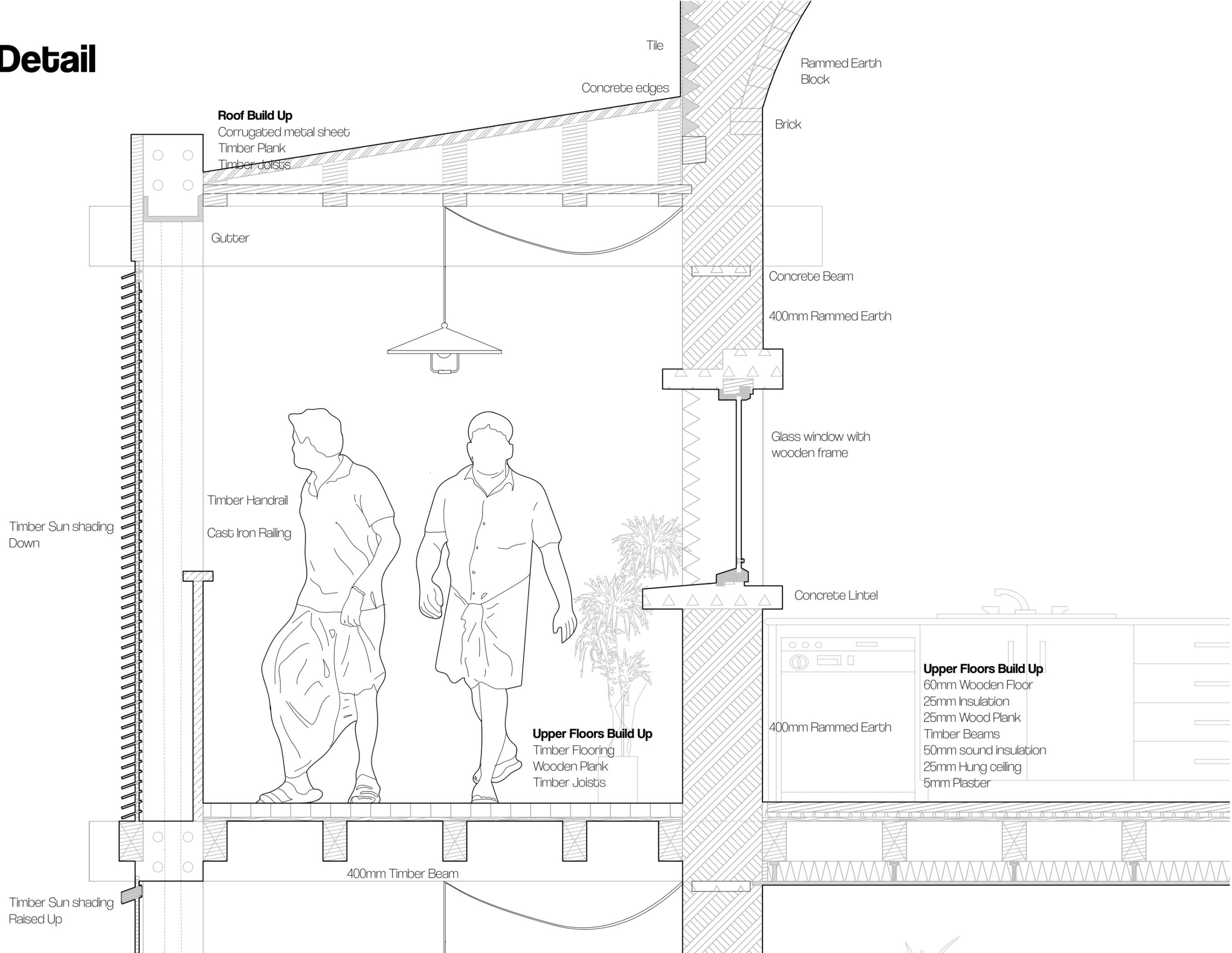
Steel Base

Concrete Base



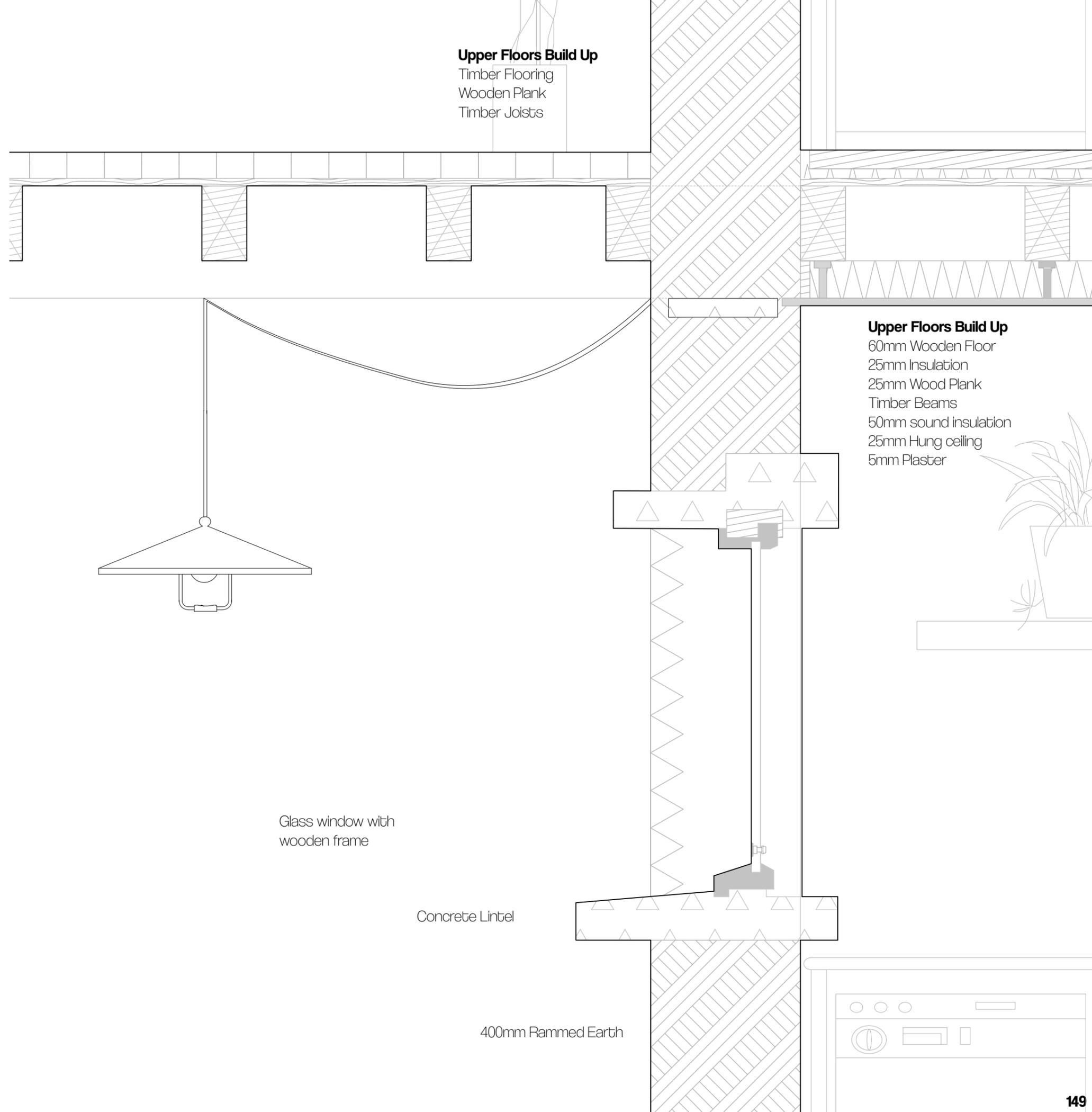
1:20 Detail

Roof



1:10 Detail

Window Detail



Upper Floors Build Up

Timber Flooring
Wooden Plank
Timber Joists

Upper Floors Build Up

60mm Wooden Floor
25mm Insulation
25mm Wood Plank
Timber Beams
50mm sound insulation
25mm Hung ceiling
5mm Plaster

Glass window with
wooden frame

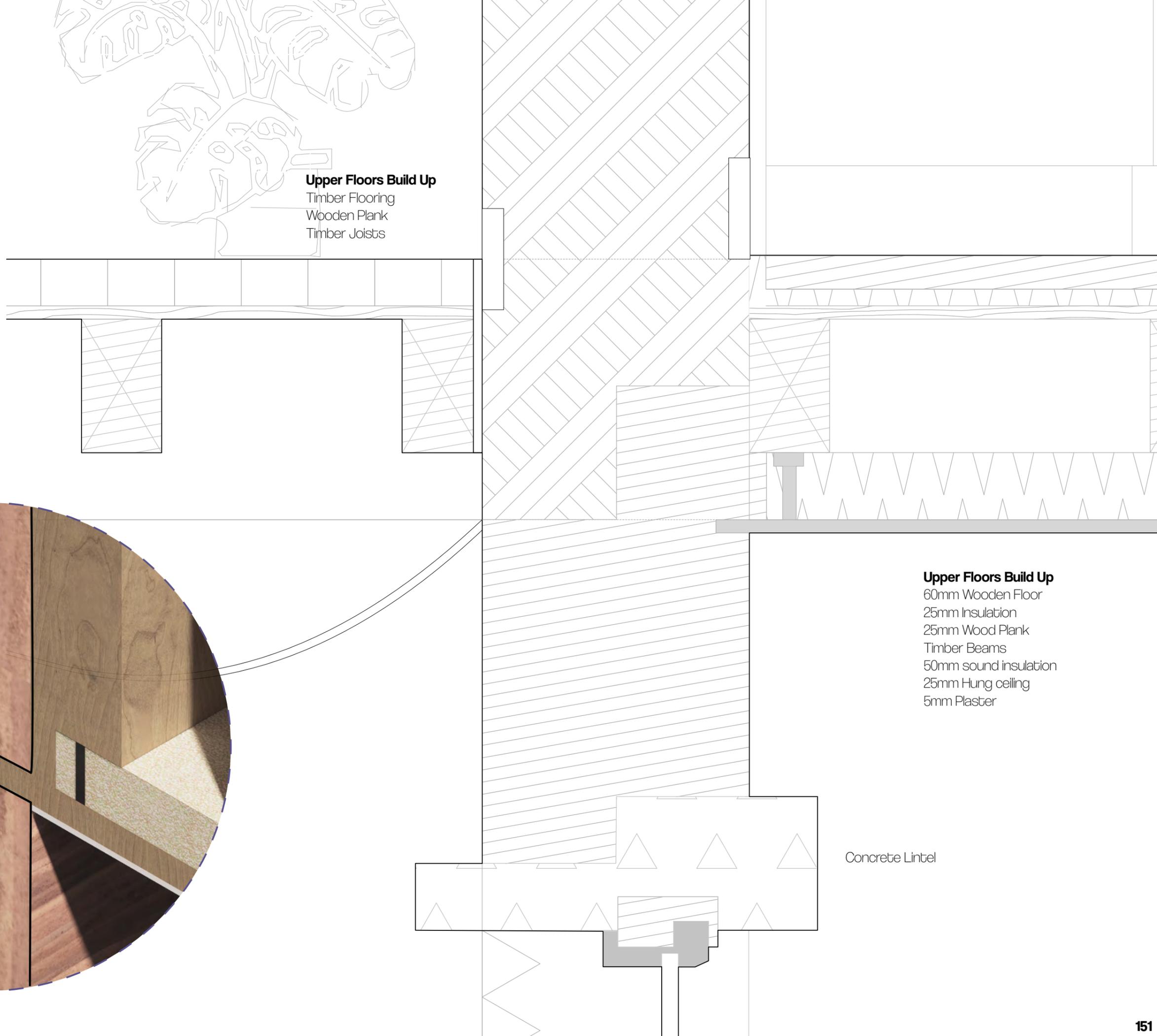
Concrete Lintel

400mm Rammed Earth



1:5 Detail

Rammed Earth Benefits



Upper Floors Build Up

- Timber Flooring
- Wooden Plank
- Timber Joists

Upper Floors Build Up

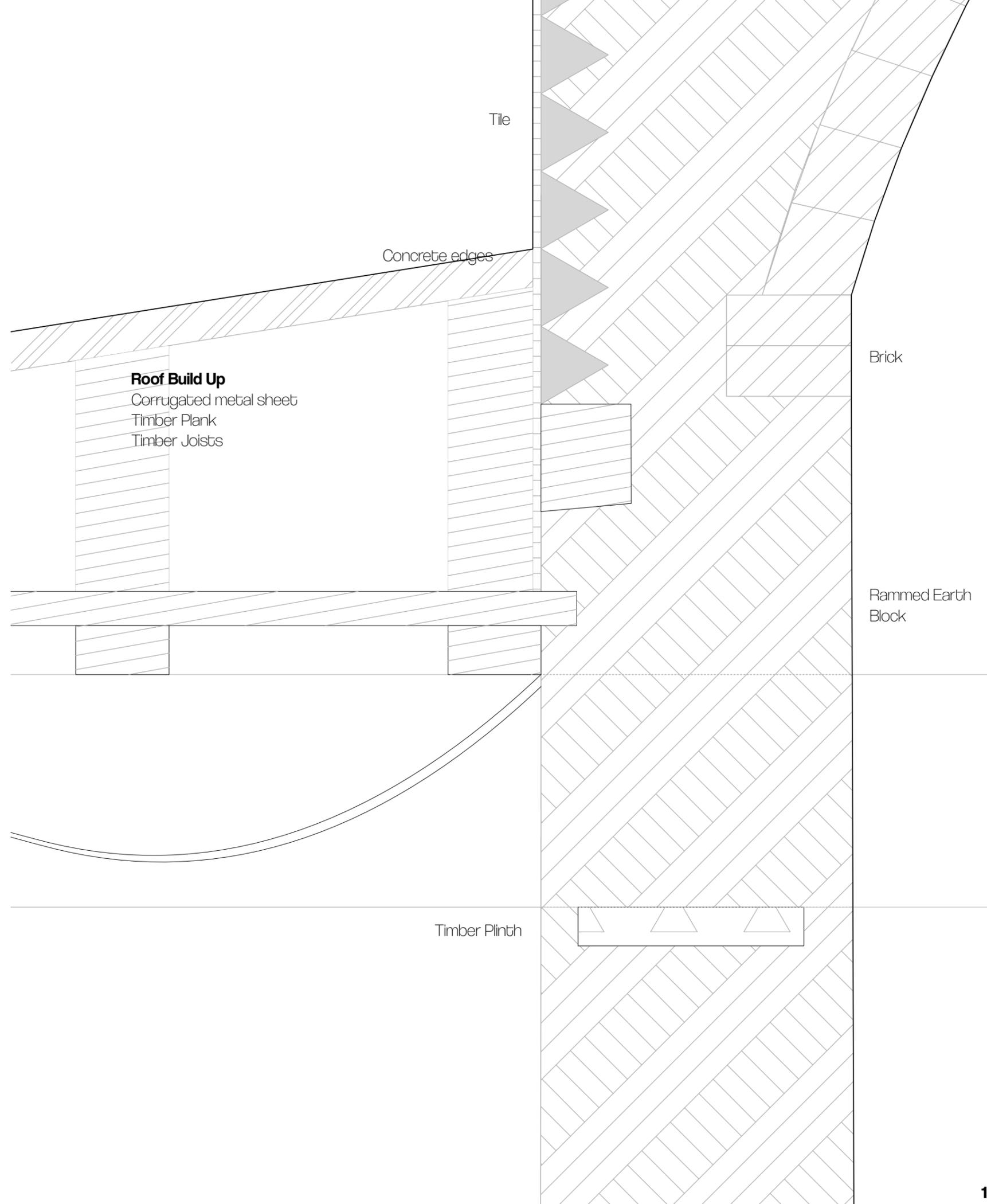
- 60mm Wooden Floor
- 25mm Insulation
- 25mm Wood Plank
- Timber Beams
- 50mm sound insulation
- 25mm Hung ceiling
- 5mm Plaster

Concrete Lintel



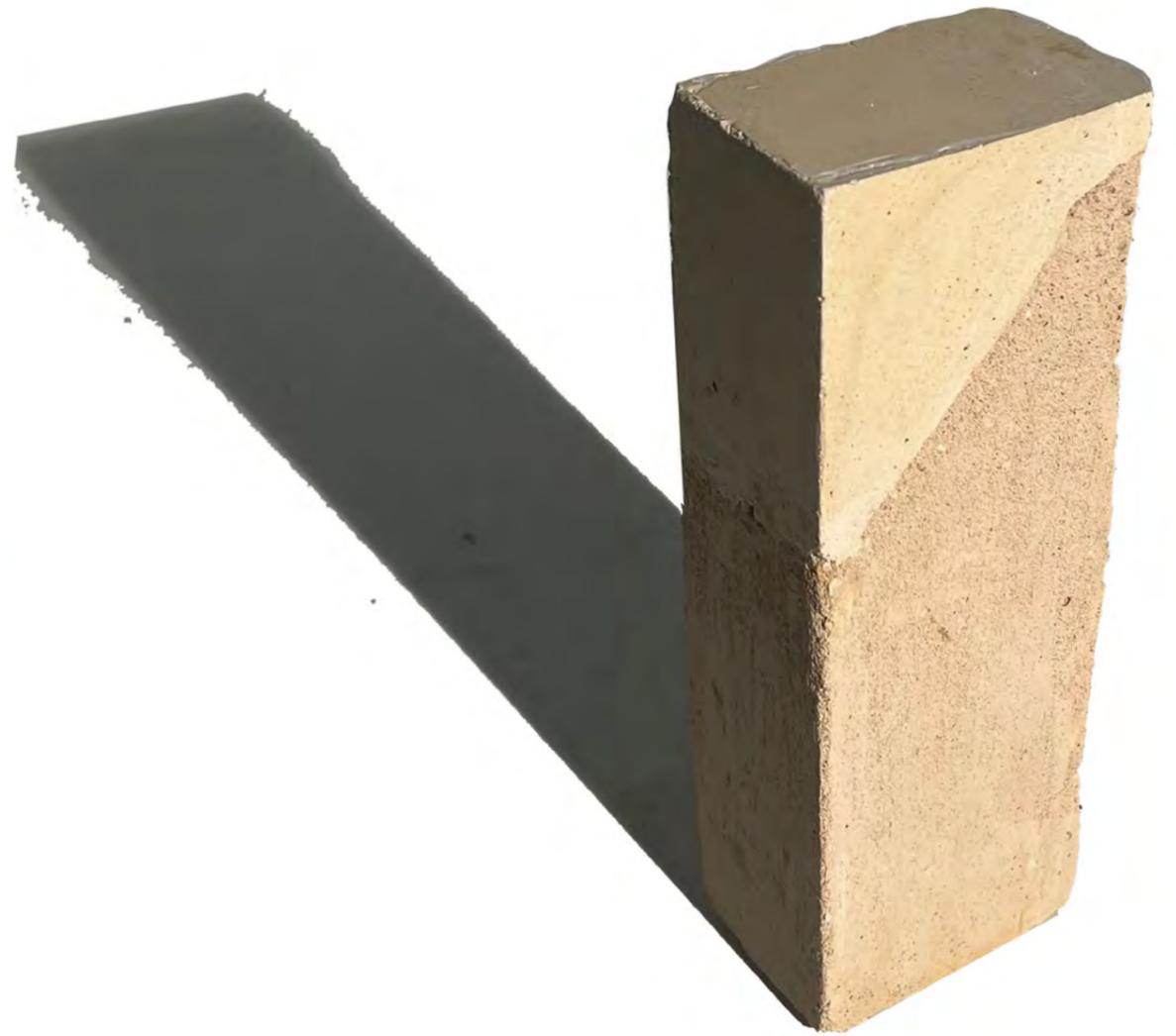
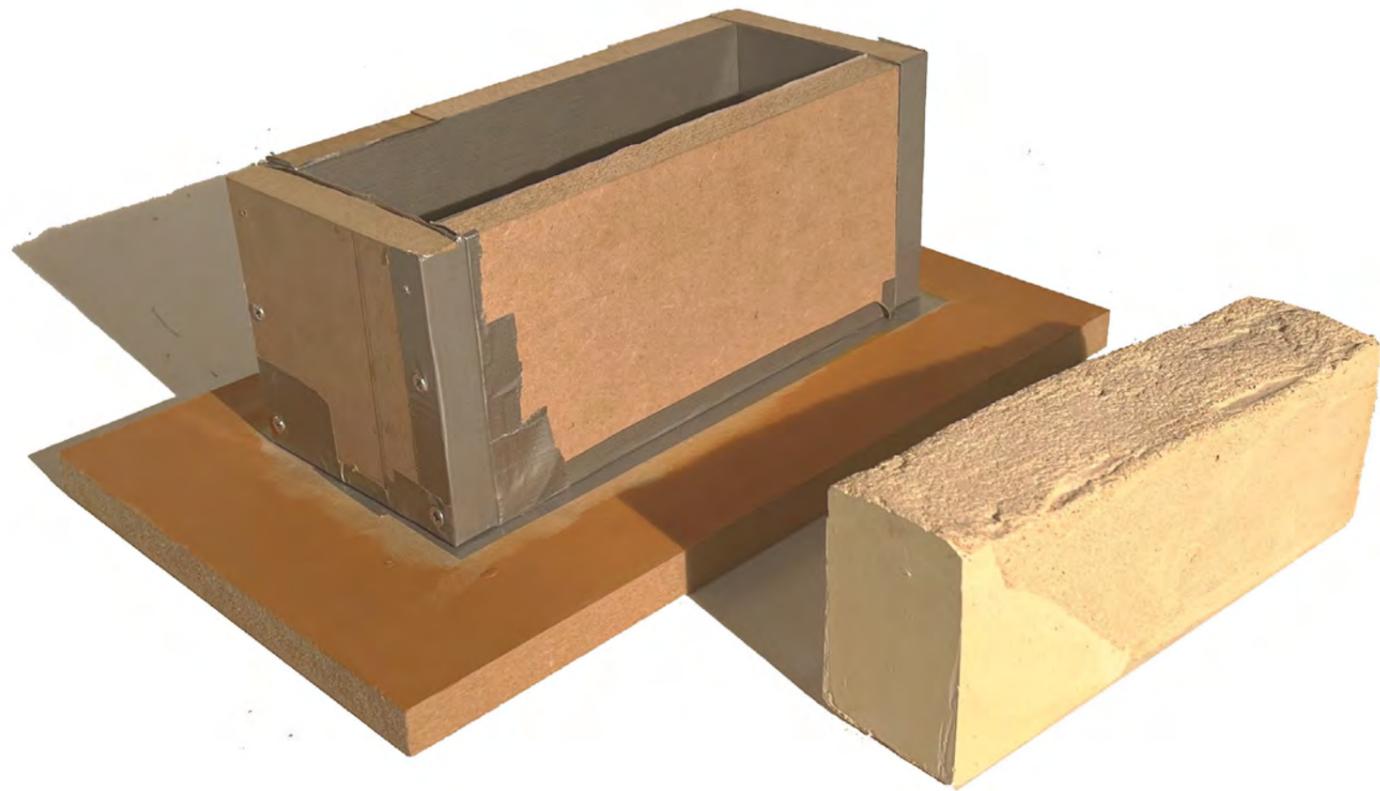
1:5 Detail

Structural Concrete when needed





1:1 Detail



1:5 Detail

Sun shading

Timber Sun shading
Closed

Timber Handrail

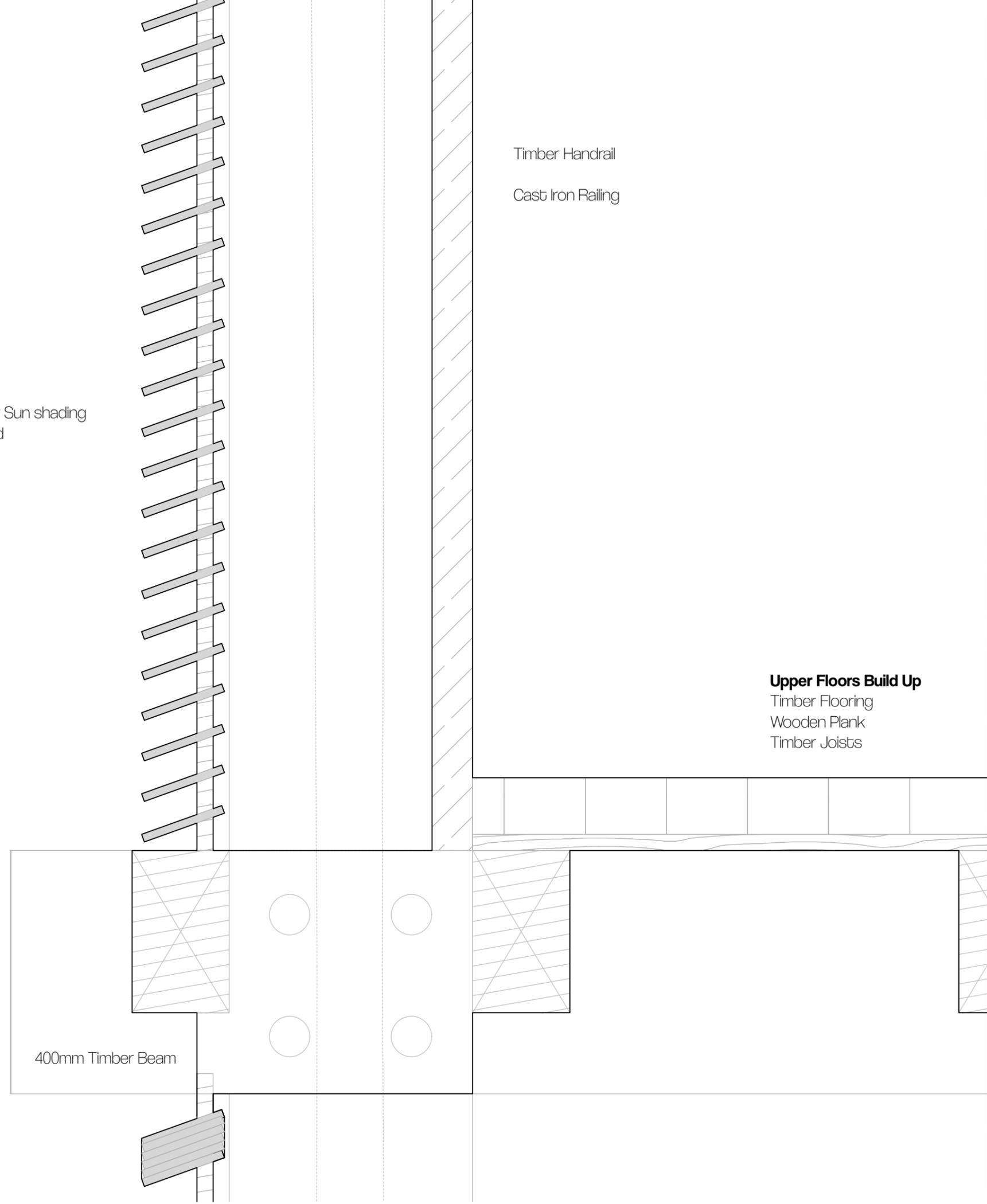
Cast Iron Railing

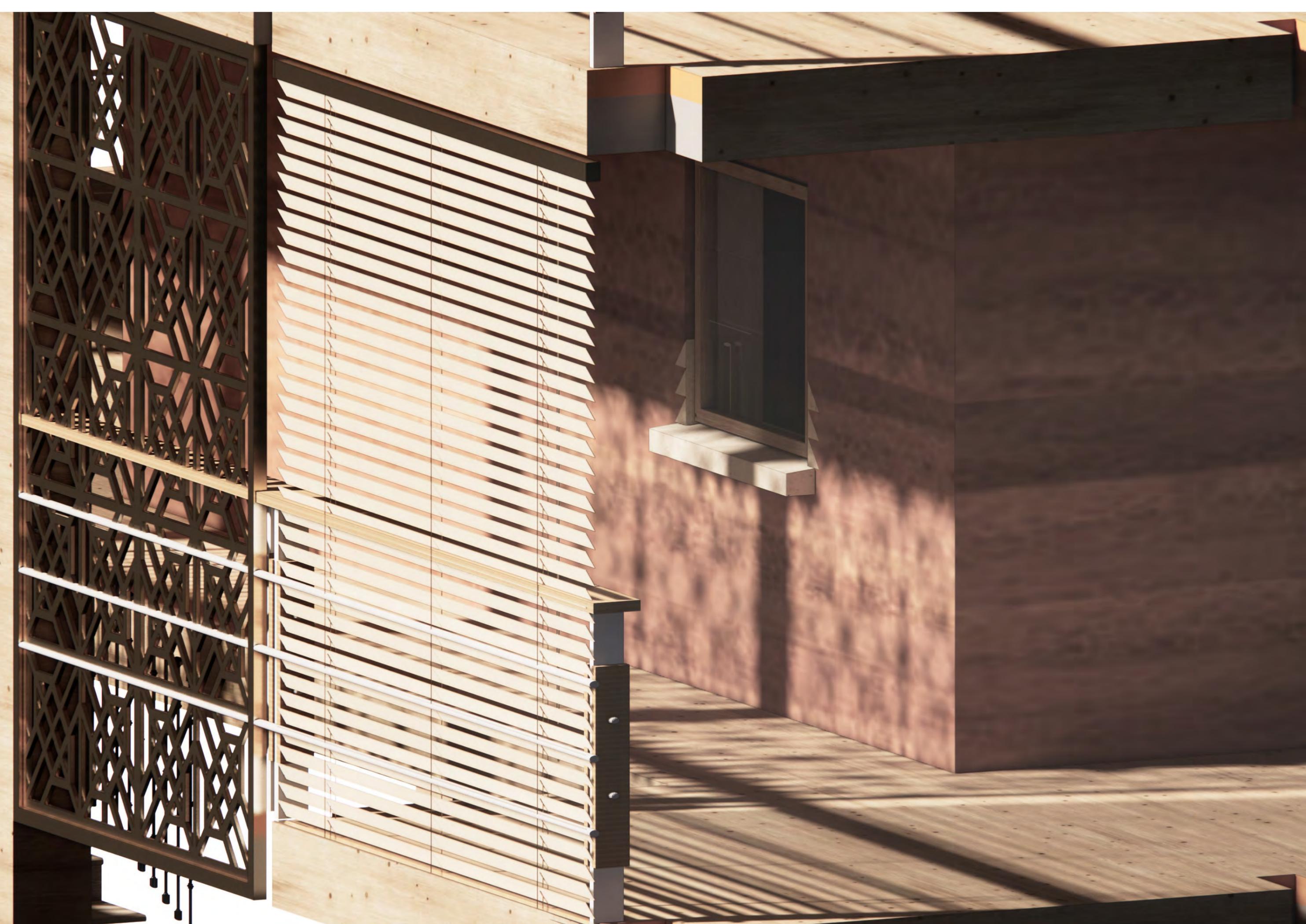
Upper Floors Build Up

Timber Flooring
Wooden Plank
Timber Joists

400mm Timber Beam

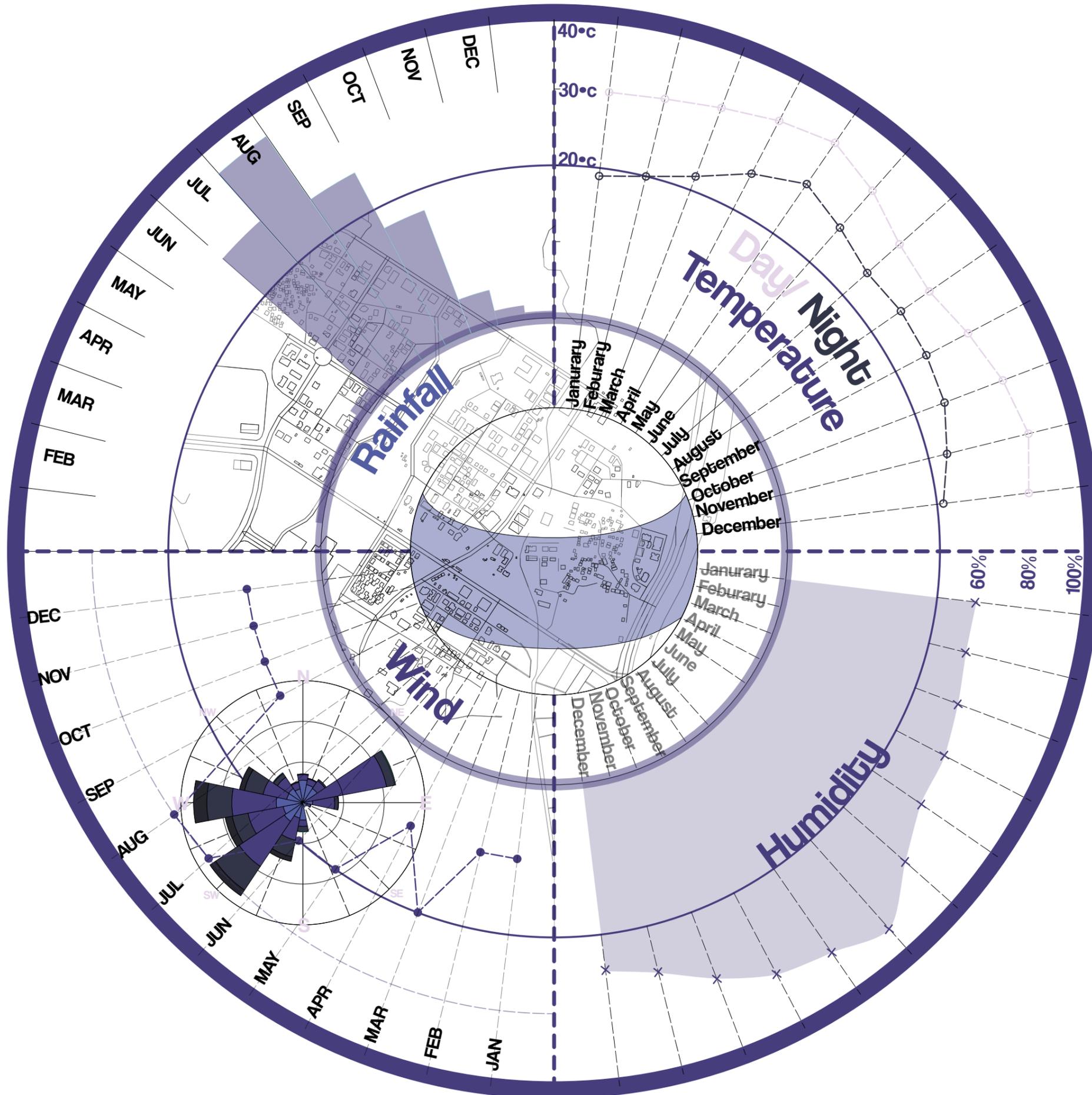
Timber Sun shading
Open





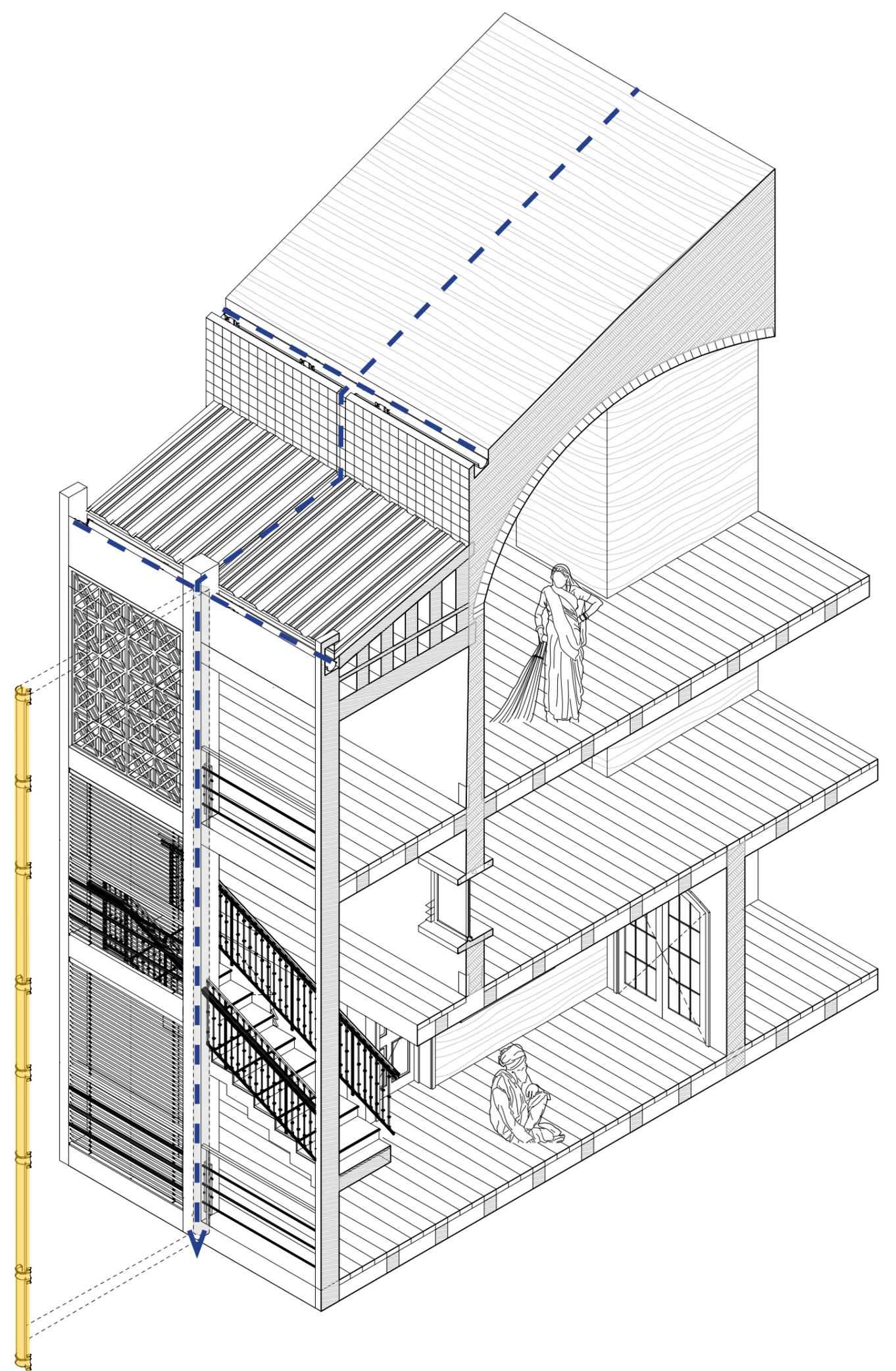
Climate Strategy

Climate



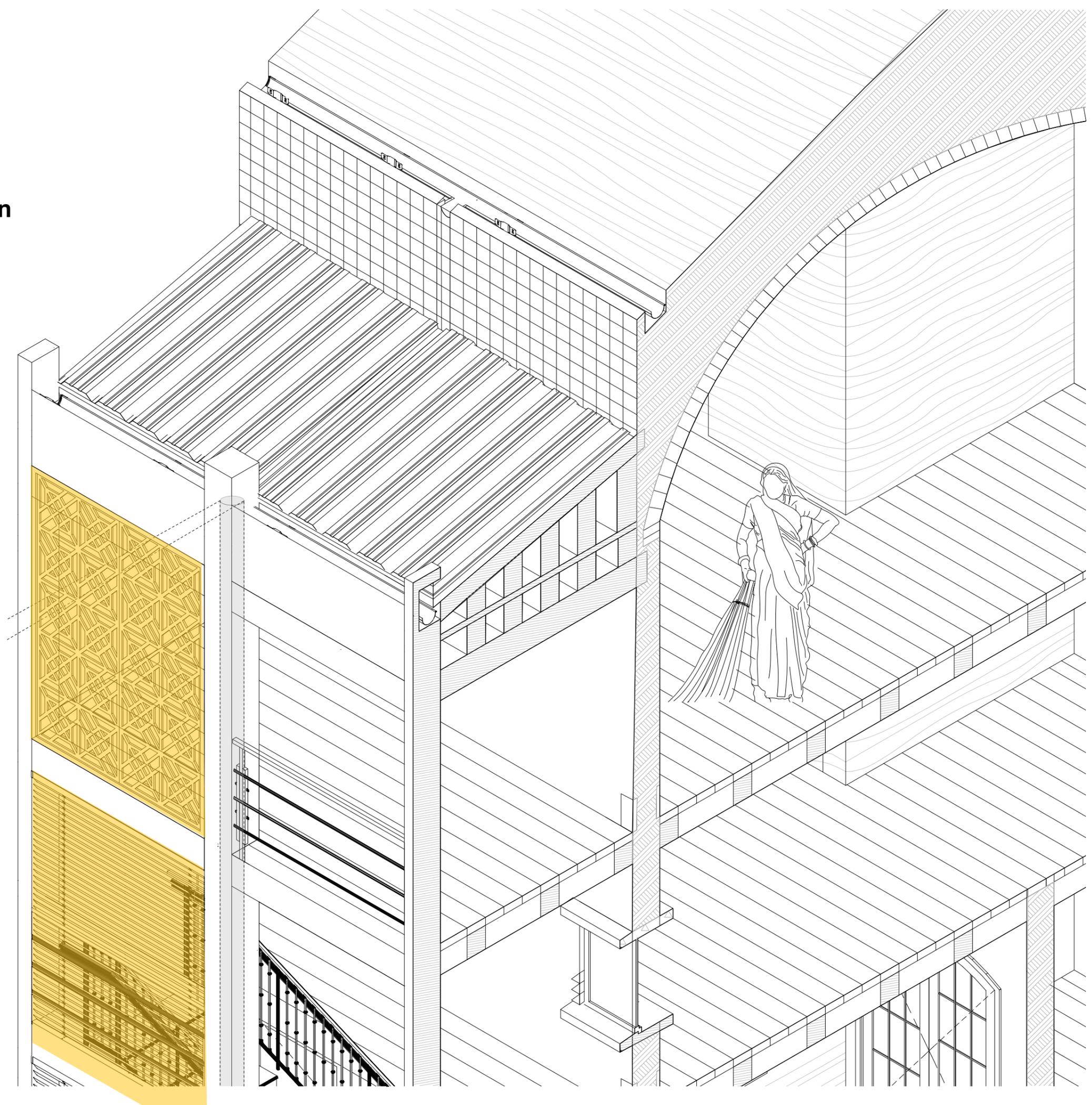
1:50 Detail Water Management

Waterflow

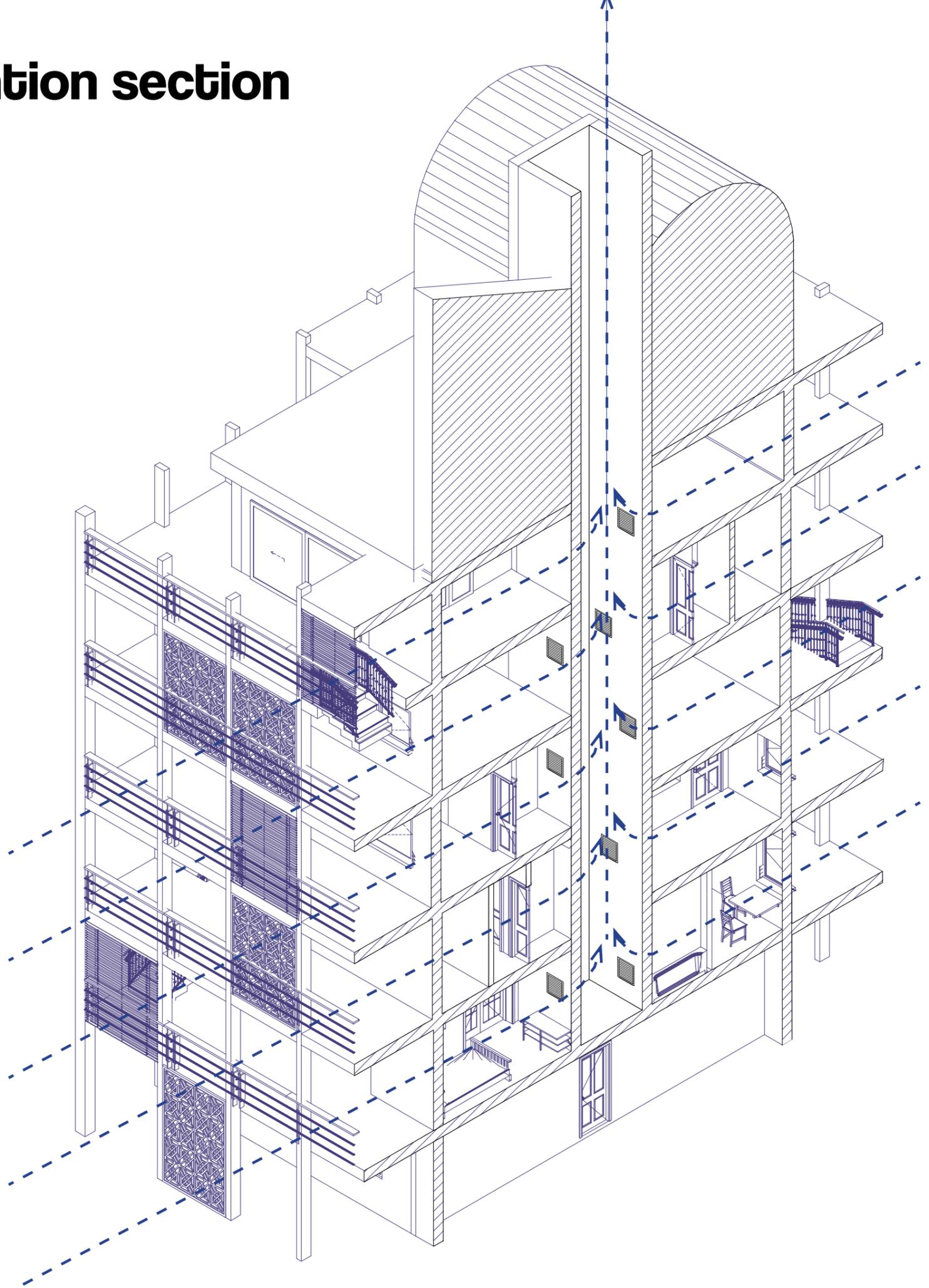


1:20 Sun shading

Sunshading can be used as expression



1:50 Detail Ventilation section



Conclusion











