

NEW HOUSING STRATEGY
FOR THE URBANISING VILLAGES OF NAVI MUMBAI

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GRADUATION BOOKLET

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The assignment of the studio is to explore possibilities to develop affordable and adequate housing for all in Navi Mumbai, rethinking housing as a resource for a more equitable city.

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RESEARCH

GLOBAL HOUSING GRADUATION STUDIO 2021-22
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RESEARCH PLAN/
PROTOTYPING INFORMALITY:
MASS HOUSING AS URBAN VILLAGES IN NAVI MUMBAI

Background/
INFORMAL SETTLEMENTS IN NAVI MUMBAI

Mumbai has experienced rapid urbanisation in the 20th century maintaining its southern city centre and expanding northwards. In 1947, British planners published a study depicting the creation of a satellite city east of Mumbai and beyond the Thane Creek (Shaw, 1999). In 1964, Charles Correa, Shirish Patel and Pravina Mehta recommended the formation of this independent satellite city called Navi Mumbai. It was imagined that the new city could diffuse the problem of high population density in Mumbai, host governmental offices as a nucleus of employment, and offer decent living and housing for all the classes of society; a socialist vision that captured the post-Independence aspirations of the country. The project was finally initiated in 1971 by the Maharashtra administration and the founding of the City Industrial Development Corporation (CIDCO), responsible for acquiring 344 square kilometres of land and integrating 96 existing villages (Correa, 2000). The city was planned along 14 nodes and for 2 million inhabitants. It currently hosts a population of 1.1 million concentrated in 7 nodes while around 40% lives in informal settlements. A complementary statistic that illustrates the reality of the city indicates that 75% of the population are literates. By the 1990's reports of mushrooming squatter settlements started to surface (Shaw, 1999). Thus, contrary to the imagined egalitarian vision of Navi Mumbai, 3 types of distinct settlements are found in the city: the township/ node, the village and the slum (Vedula, 2007).

Navi Mumbai is somewhat antagonistic to Mumbai, a global competitor city that developed similar spatial patterns of inequality (Vedula, 2007). Another contradiction with the original intent of the architects is shown by the fact that 60% of the population migrated to Navi Mumbai from outside the Greater Mumbai area instead of Mumbai. Formal settlements in the nodes generally cater to the middle and upper classes while in the richer nodes, the target groups are Non-Resident Indians (NRIs) and other international investors. Mass housing for the lower classes does exist but in general these schemes end up in the hands of the privileged in India (Urban, 2012a), including in Navi Mumbai (Shaw, 1999). The reality is that the poorest of the city live in informal settlements, in a *peripheral urbanisation* outside of the planned environments (Caldeira, 2017). Informal urbanism manifests complex spatial patterns developed independently of official structures and regulations (Leuder, 2018; Roy, 2009), activated by the demand for labour supply and a parallel informal economy (Skinner & Watson, 2018; Shaw, 2003). The poorest residents of Navi Mumbai live in the original villages of Navi Mumbai which have experienced extensive informal growth and in more recent informal settlements.

Background/

TYPES OF INFORMAL SETTLEMENTS

Original villages; 29 of the original villages situated within Navi Mumbai borders experienced gradual urbanisation and absorbed rural migrants, the majority of whom come from within the Maharashtra state (Shaw, 1999). The bulk of the development of the villages can be classified as informal, although there have been approved constructions as well. Some villages located near the West coast and at crossroads had shown signs of urbanisation prior to the Navi Mumbai project. Urbanisation of these villages translates to a transition from agricultural to non-agricultural work. In hindsight, it is remarkable that the masterminds behind Navi Mumbai did not incorporate these villages in the planning of the city.

Permanent shanty settlements attached to the original villages; Available open spaces near the original villages mentioned above were squatted by rural migrants who constructed informal shanty settlements. These sites were ideal for the squatters since water and electricity supply originating in the original villages could be appropriated (Raju et al, 1996). In their majority rural migrants residing in permanent shanty settlements come from outside the Maharashtra region. Both the original villages and the permanent shanty settlements expanded incrementally in the last decades, sometimes shoulder to shoulder with planned developments to define their territories.

Non-permanent shanty settlements attached to permanent shanty settlements or temporary construction sites; Shanty settlements developed in the form of non-permanent shelters attached to construction sites or other permanent shanties and original villages (Shaw, 2003). High numbers of construction workers are required in the construction industry since there is no prefabrication in India (Urban, 2012a). When constructions are completed the non-permanent shanty settlements are sometimes reclaimed by workers servicing the buildings such as guards and cleaners. The predominantly rural male construction workers are seasonally employed outside of the monsoon period (November to May) and hence their stay in the city is temporary (Shaw, 2003). Often construction workers are employed in the industry through third parties and are brought in the city in groups. The same construction workers move back to their rural villages and transition to farming during the monsoon season. Crop cultivation cannot sustain them and their families throughout the year, nor is it economically viable to sell their land and move permanently to the city. Limited labour for construction is also provided from the original villages, however, 50% of villagers work in other villages and 20% in the planned nodes (Shaw, 2003).

Problem/

THE PROBLEM WITH FORMAL HOUSING TYPOLOGIES

Gated communities aimed at investors and the upper class are built in Navi Mumbai and arranged in a series of detached high-amenity privileged areas. Many apartments stand uninhabited and their owners/ investors wait for property values to increase. This *enclave urbanism* follows a history of social segregation in India (Sharma, 2010) and accelerates inequalities that are already in place (Mehrotra, 2020). On the other extreme of the formal spectrum, mass housing schemes are inspired as the absolute solution for the middle and lower classes. These schemes are based on outdated early modernist planning, present standardised solutions, lack of imagination and typically deny any user-involvement (Shah, 2021; Enchanove & Srivastava, 2014). They are often mono-functional housing blocks placed in remote locations or disconnected from services and places of work (Burdett, 2018). As mentioned in the introduction, even in more successful housing schemes intended for the lower classes, it is common that houses are sold to the more privileged and the initial tenants move back into informal settlements (Urban, 2012a). Maintenance is frequently problematic, rendering living conditions difficult since the focus is on immediate efficiency, or quick fixes, typical of neoliberal economics (Mota, 2021).

The gated communities and the questionable mass housing schemes form a *neoliberal landscape* where housing is essentially a commodity rather than a human right (Shah, 2021). Price of land and density are used as urbanisation tools to inflate housing prices regardless of the dispersion and segregation of different social groups (Clos, 2018; Harper, 2019). Gameren and Varma (2016) indicate that fast paced urban development and increasing segregation have a direct relationship with each other. Under this logic, the high-rise is always projected as the solution and apartment blocks of maximum heights are copy-pasted without any regards to topography or approximation to public transport hubs (Mehrotra, 1994). There is a pragmatic threat of marginalisation of the poor in the outskirts of the city, away from any community ties possibly developed within informal settlements. The real estate market takes advantage of the distressed rural migrants moving to the city to project an unlimited demand for housing and fuel speculation (Mehrotra, 1997). Without a doubt, current mass housing schemes as coordinated by CIDCO will not substitute the more affordable and operational informal settlements.

Effects on informal settlements

The aspired model for change in regard to informal settlements is relocation of dwellers in mass housing schemes. Sections of informal settlements are demolished and evacuated, more notably in the richer nodes of the city as market rental prices are threatened by the proximity to the informal settlements (Song & Zenou, 2012). Authorities exploit sanitation and aesthetic issues

to raze buildings and occasionally rehouse informal dwellers in mass housing schemes (Huang, 2016). The author of this essay predicts intensification of these processes with the increasing urbanisation of Navi Mumbai as experienced in Mumbai, a process of accumulation of capital by dispossession and displacement (Harvey, 2008). Appropriate help can be offered to informal settlements in the form of upgrades, restorations, provision of piped water, sewers, healthcare and collection of waste (Shah, 2021; Satterthwaite, 2018), a type of aid also referred to as sites and services provision (Urban, 2012a). These methods avoid framing the housing problem in terms of shortage which in turn legitimises formal economic interests and construction (Bhan, 2019). On the other hand, mass housing is a tool that can be employed to facilitate a more sustainable and healthy urbanisation for the city that considers the urban poor as labourers and humans, disregarding unsustainable quick profit-making and real estate speculation.



Fig.4. The NRI complex in Nerul



Fig.5. CIDCO mass housing scheme



Fig.6. Demolition of informal construction

Research Question/

PROTOTYPING INFORMALITY: How can urban villages be designed and prototyped after informal settlements in order to be introduced in Navi Mumbai as mass housing schemes and contribute to an organic growth of the city?

Power can be found in and extracted from informal urbanisation (Rocco & Ballegooijen, 2019).

The notion of prototyping the informal is borrowed from academic literature negotiating the future of urban villages in Shenzhen and other cities of Mainland China (Huang, 2016). Prototyping the informal also draws parallels with Gautam Bhan's (2019) idea of theorising squatting as a mode of state practice in terms of policies, programmes and plans. Finally, the term urban village specifically corresponds to the local context of Navi Mumbai and avoids dissemination of the stigmatising word 'slum' (Rao, 2019).

The research question considers the design of mass housing as urban villages modelled after the informal settlements in Navi Mumbai. Urban villages can anticipate, absorb and develop alongside future rural-urban migration and growth of the city, equipped with fundamental infrastructure from the outset. The potential behind this concept lies with the affordability of the dwellings for the urban poor and their proven functionality. Urban villages allow space and time for rural migrants to adjust to city conditions by learning new non-agricultural skills. Meanwhile, original or established villagers transition from crop cultivation to minor entrepreneurial activities such as renting rooms and running shops; the urban village is a learning ground (Wang et al, 2009). Rural migrants can possibly identify themselves better within these low-rise environments and feel somewhat part of a community (Abreu, 2016). Indeed, the rural-urban division is blurred. In terms of sustainability, urban villages are low carbon emitters, reusing materials is standard practice and small-scale production is generally less harmful towards the environment (Skinner & Watson, 2018). In addition to that, urban villages contribute heterogeneously to the ecology of urban networks by reducing reliance on public transport and by utilising close proximity to work (Huang, 2016). In terms of architectural typology, homes and public space double-up as workplaces (Skinner & Watson, 2018). Architect Yang Sang refers to the urban villages in Shenzhen as the biggest contributors for the growth of the city (Abreu, 2016). Huang (2016) points to the importance of high-density informal settlements in sustaining the economy of a city and one can imagine the significance of informal settlements in Navi Mumbai for its growth.

Designed urban villages require a paradigm shift where the problem of housing the urban poor is seen as a *fragile metabolism* (Burdett et al, 2018). By prototyping the informal, it is envisioned that early design considerations can be outlined to reduce commonplace problems of informal settlements such as fire hazard threats, a general lack of infrastructure and the spread

of contagious diseases. Designed urban villages can replicate the transformation of rural villages from traditional to urban with local businesses and manufacturing (Wang et al, 2009). These planned settlements can also account for transient rural and seasonal workers. At later stages, the urban villages can become *erstwhile villages* and assimilate into the city (Kumar, 2015). The anticipated transformations of the villages should be regarded as incremental by imitating informal developments and their reactionary nature towards the formal city.

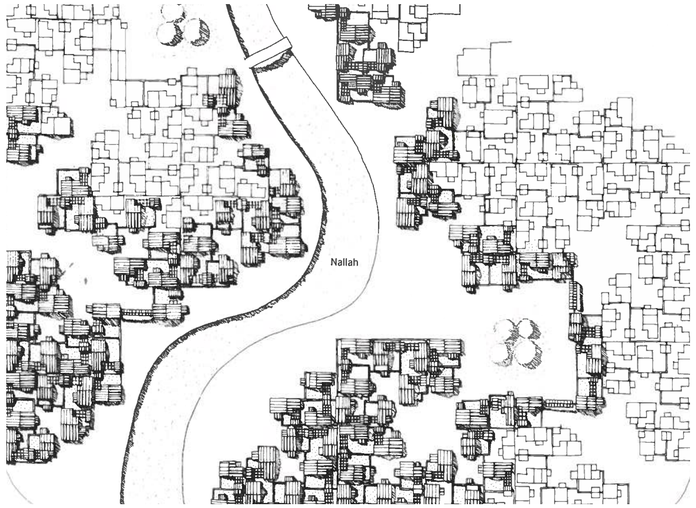


Fig.7. Belapur Housing designed by architect Charles Correa, New Bombay (1983-86)

Theoretical Framework/

LEGITIMISATION OF THE INFORMAL

Prototyping informality finds ground in the growing interdisciplinary fascination and concern of researchers to understand slums, while it is rooted in the Indian urban context through the lens of Rahul Mehrotra's concept of the Kinetic City.

Slums revisited

The complexity of slums and their persevering organic incremental growth combined with the failure of slum rehabilitation schemes in the Global South intrigues the imagination. Slums are unique examples of intensive mixed-use districts (Verma, 2013). The infamous Dharavi slum of Mumbai has a fascinating 1 million dwellers and produces an extraordinary amount of $1 billion worth of products every year. Informality does not mean poverty since the urban poor can manage a living (Roy, 2009). With its high-density and low-rise morphology, it is not a surprise that Dharavi is described as a vibrant *urban village* (Varma & Sha, 2019). The flux of slums is reflected in their urban morphology that shifts and adapts through time. The crowded streets, bustling markets, domestic workshops and small-scale sweatshops contradict formal mass housing schemes. Slums demonstrate diversity of people, of various modes of subsistence and aspirations (Enchanove & Srivastava, 2014). Numerous social and commercial interactions connect dwellers and devise unique socioeconomic fabrics, always in negotiation with the city's formal economy and ethos.

The Kinetic City

Mehrotra (2008) describes the spatial manifestation of public everyday social and commercial interactions as *bazaar-like urbanism*, a negotiation between the formal elite and the informal subaltern. He points to the ephemeral qualities of religious festivals and other public gatherings to distinguish between the static built environment and the counter kinetic theatricality of the city. Mehrotra (2017a) constructs the concept of the Kinetic City upon revising Ravi Sundaran's notion of *pirate modernity* and Richard Sennett's concept of *open urbanism* which is incomplete, unorthodox, antagonistic and non-linear. The static and the kinetic coexist and are both valid as seen in the *dabbawala* lunch delivery system which utilizes informal and formal modes of production and transportation (Mehrotra, 2008). The dabbawala system dissolves the binary setup of the ephemeral and stable elements in the city. Flux is the new normal, the built environment must bridge, allow for flows, be malleable and reconfigured according to agents and problems (Mehrotra, 2017a, 2017b). Architects and urbanists must envision protocols that can be adaptive, re-evaluated and re-projected (Mehrotra & Vera, 2018). Prototyping mass housing as urban villages is positioned in between the static and the kinetic, welcoming the informal social and

economic pulses of Navi Mumbai. Urban villages are not master plans and are less ambiguous than CIDCO mass housing schemes. Master plans are static and out of synchronisation with different urbanisation paces (Mehrotra & Al-Asad, 2016). Finally, Mehrotra (2020) calls for a flexible 'grand adjustment' for the city aspirations instead of an absolute grand vision that glorifies high-rises for all typologies and contexts.



Fig.8. Dharavi street market



Fig.9. Ganpathi festival

Methodology/

RESEARCH FOCUS AND LAYOUT

1. Case studies

Case study research must be carried out on housing projects in India that exhibit distinct components of informal settlements:

1.1 Incremental; the growth of the built environment over time, vertically in the form of stacking new rooms/ units and horizontally.

1.2 High-density and low-rise; the specific morphological condition is evidently associated with informal settlements.

1.3 Mixed-use; informal settlements of thousands of dwellers incorporate more functions than housing.

The aforementioned components are preliminarily recognised by the research carried at the time of writing and others might be added retrospectively. It is important to study such housing schemes since they will indicate how urban villages can be designed with informal qualities in mind. Designing using the informal as inspiration connotes a paradox which is expected to surface during the research of these case studies.

2. Digital fieldwork with archival aid

The following types of informal settlements found in Navi Mumbai are to be studied:

2.1 Original villages; a set of conditions can determine which villages, or 'special' villages can be selected depending on the availability of digital material.

2.2 Other shanty settlements; attached to the existing villages, permanent and temporary.

3. Research outcomes

The case studies and the digital fieldwork is to be compared and correlated to indicate possible characteristics for the proposed mass housing as urban villages concept.

3.1 Urban morphology; the composition of buildings and how they are divided by streets.

3.2 Architectural typology and dwelling units; which houses have other secondary functions and what other typologies stand out.

3.3 Public realm; how users animate public space.

4. Limitations

There is embodied knowledge on behalf of the author presented in the methodology chapter which can be questioned upon a hermeneutic interpretation of the research findings (Oehlmann, 2021). Likewise, the methodology presupposes a solid argument in favour of using informal settlements as inspiration which resonates personally with the author (Farthing, 2015). Research findings can stir the argument away and change the course of action.

RESEARCH/ RESEARCH PLAN

Relevance/

EQUITABLE CITY

The research plan challenges the notion of housing as a final product, considers its flux over time, user activities and transient inhabitation. Housing is contemplated as a system that is generated by the city and vice versa. The term mass housing specifically demands an answer to the question of which parts of society it is intended for and it must be designed for the poorest urban dwellers living in informal settlements. The intent is to support a more equitable housing equilibrium for Navi Mumbai. Social segregation is a fact in the city and by designing mass housing based on informal settlements stigmatisation of the ‘slum’ and the ‘slum dweller’ is considered. Of course, informal settlements present many advantages which are to be utilised while their drawbacks attempted to be mitigated. Moreover, the project aims to encourage a resilient social fabric where its members are less susceptible to formal capitalist aspirations. The informal settler is considered a citizen with rights to decent and liveable housing recognised from an architectural and urban planning perspective; rights that are critically discussed and proposed through urban villages prototyped after informal settlements.

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CONCEPT VS REALITY

Navi Mumbai was a city designed to diffuse the overpopulation problem of Mumbai. However, there were villages in the area with ancestral lifestyles related to agriculture and fishing. These villages indicated in blue in the map on the right developed informally alongside the formal city.

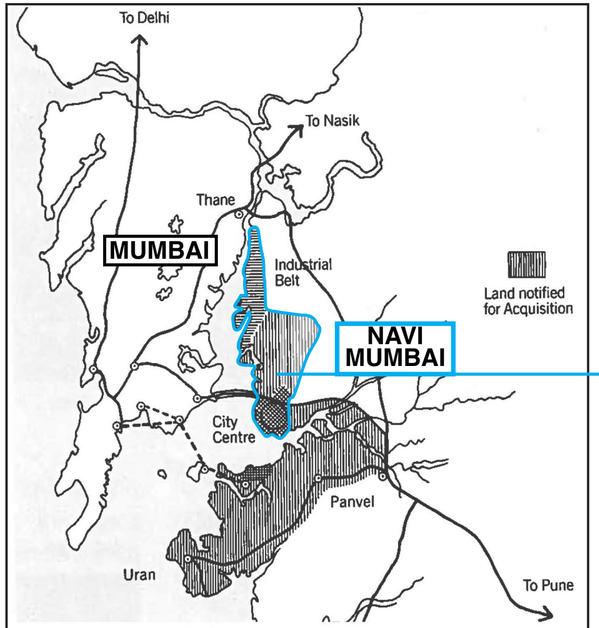


Fig.1. Land acquisition map for expansion of Navi Mumbai

Source:
Correa, C. (2000). Housing and Urbanisation. London: Thames & Hudson.

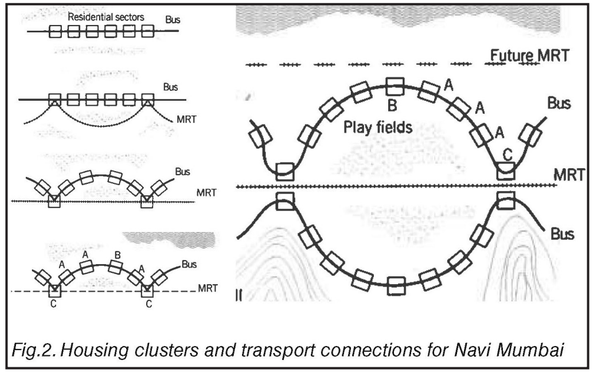


Fig.2. Housing clusters and transport connections for Navi Mumbai

Source:
Correa, C. (2000). Housing and Urbanisation. London: Thames & Hudson.

Navi Mumbai concept plans

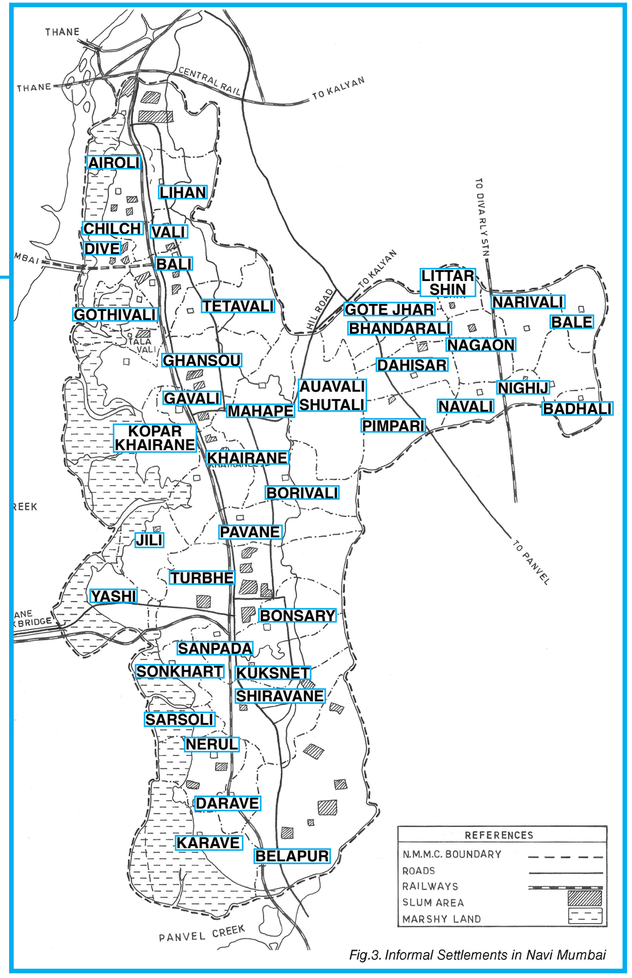


Fig.3. Informal Settlements in Navi Mumbai

Source:
Shaw, A. (1999). The planning and development of new bombay. Modern Asian Studies, 33(4), 951–988. Retrieved from: https://www.jstor.org/stable/313106

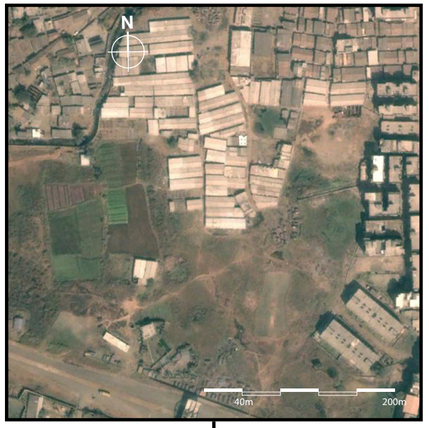
Informal settlements in Navi Mumbai

TYPES OF INFORMAL SETTLEMENTS

There are different kinds of informal settlements, but I will be focusing on the mentioned pre-existing villages that develop informally. My interest in these villages, sometimes referred to as urban villages, stems from the fact that informal settlements such as shanty towns gather more attention; they are the first thing that comes to mind when people refer to informal settlements. Looking at the urbanising villages instead can shed light to urbanisation issues from a different perspective.

2003:

2021:





CONSTRUCTION SQUATTED SHANTIES





PRE-EXISTING VILLAGE





ATTACHED SQUATTED SHANTIES

Source:
Images captured using Google Earth software

URBAN VILLAGES IN NERUL NODE

Highlighted in yellow you can see the villages in the Nerul district characterised by their anarchic forms in contrast with the formal city. Researching the Nerul district of Navi Mumbai, the richest area of the city, pointed me towards these villages. Their anarchic forms indicate their informal development, outside the realm of the planning authorities and any top-down planning developments for the city. The main reason they are left to develop on their own is based on the fact that the land ownership was never transferred to CIDCO but remained in the hands of the villagers. Furthermore, many villagers whose land was acquired by CIDCO bought land in these villages leading to their growth.

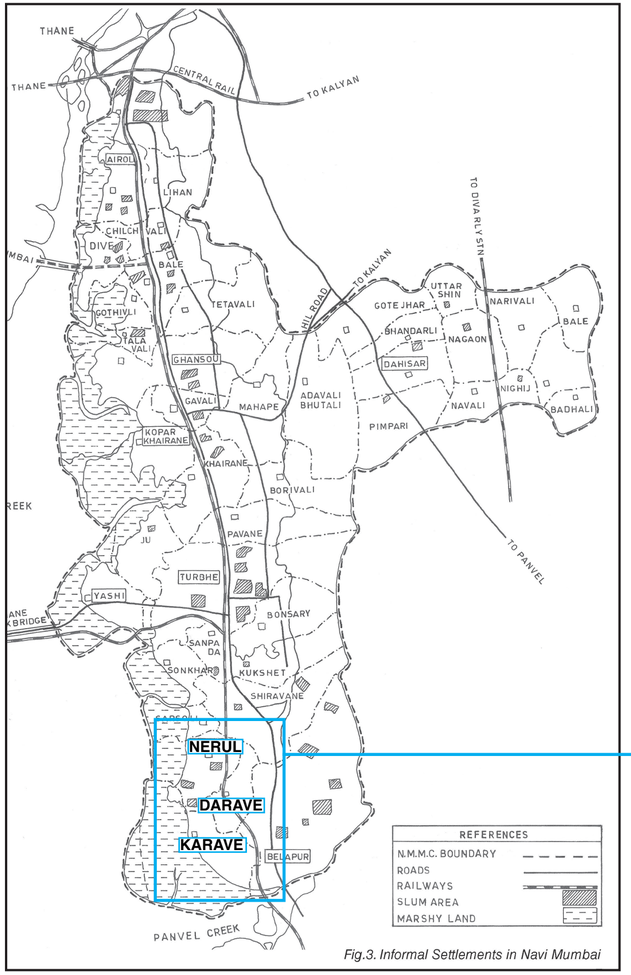
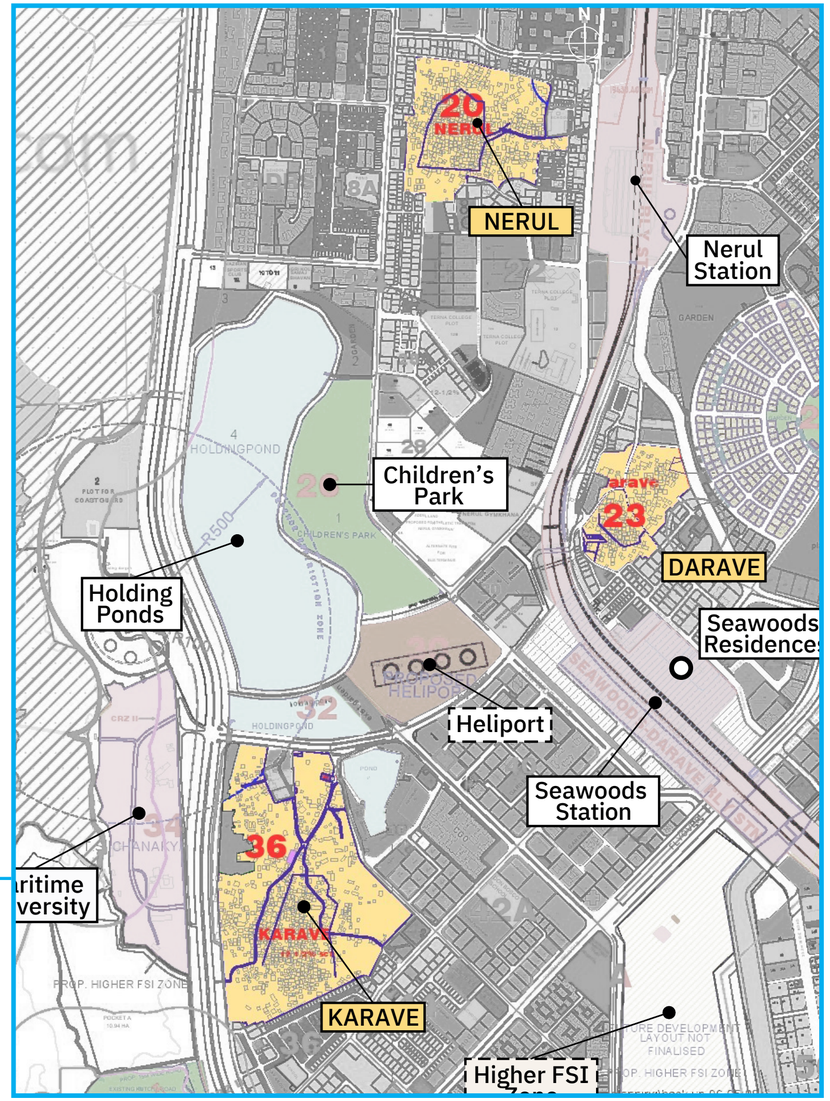


Fig.3. Informal Settlements in Navi Mumbai

North Navi Mumbai

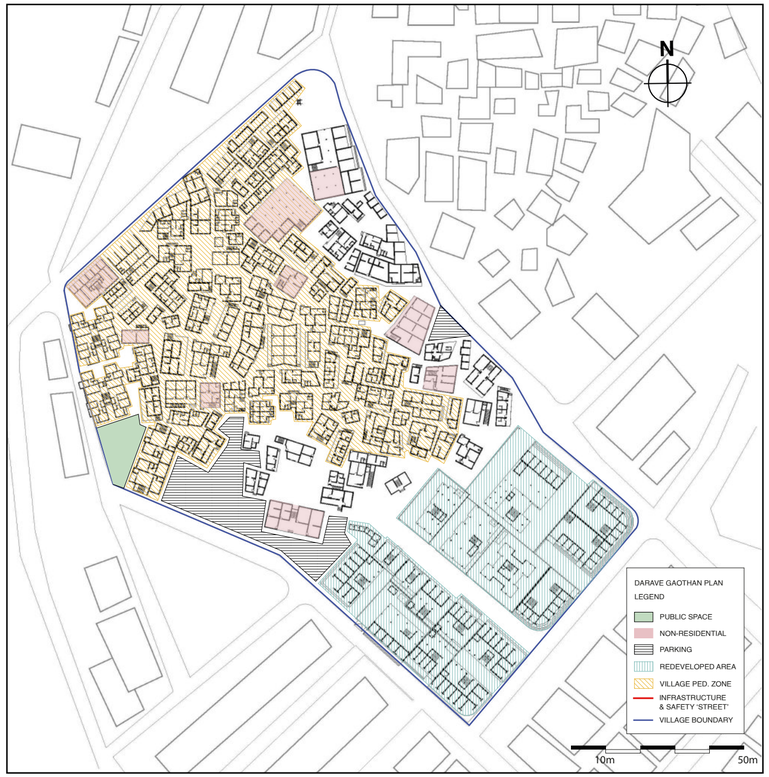


Source: https://nmmc.gov.in/navimumbai/development-plan

Nerul node plan

DARAVE VILLAGE STUDY

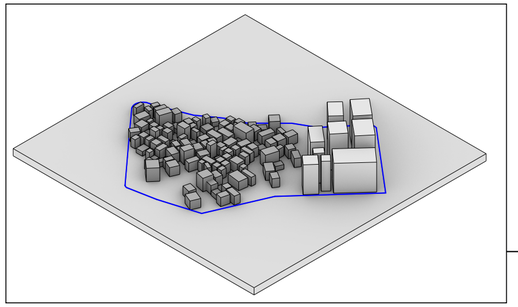
I studied the village of Darave more closely and I understood that informal development presents many problems. On the urban level first, there is the problem of inaccessibility of cars inside the village which can be very dangers if ambulances and fire trucks cannot go inside the village. Public space is also limited within the village, it is actually non-existent besides the narrow streets accessible by pedestrians. Streets that are wide enough for vehicular access become occupied by parked vehicles. The lack of coordination of public space is a major problem for the urbanising villages, a problem that can be tackled with early on planning. It is important to note that the Darave village can be considered a developed urban village. The pre-existing village can be traced to around 2003 before mid-rise buildings are erected.



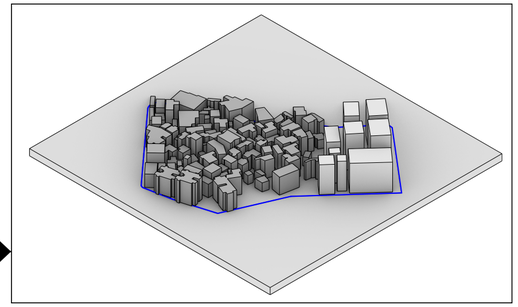
Darave 2021 plan



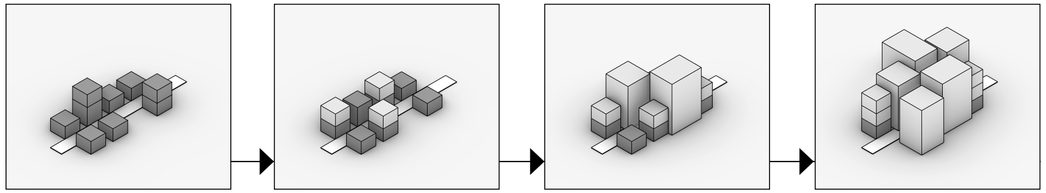
Darave 2021 figure ground map



Darave 2003 axonometric



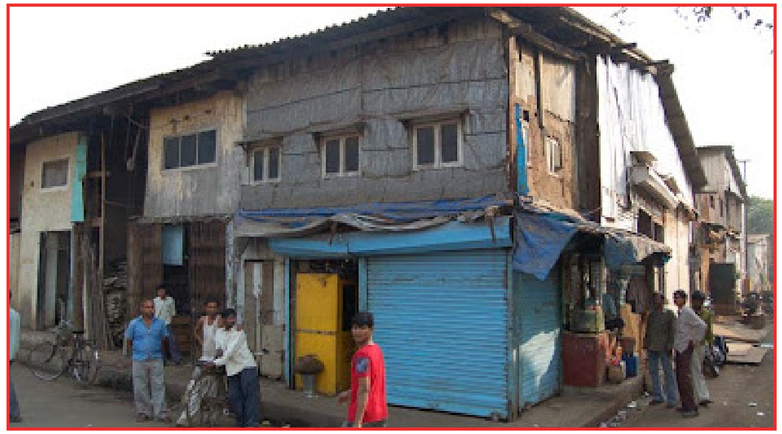
Darave 2021 axonometric



Development diagram

PROBLEMS OF URBAN VILLAGES

Further to the urban problems explained in the previous page. Informal development showcases inadequate housing for its residents, inadequate housing meaning housing of poor construction. Further to inadequate housing there is the problem of identiy loss since original village structures are eliminated for new constructions. There is lack of infrastructure such as sewage, but also lack of infrastructure for specific industries such as fishing. In general, there is a sense of overcrowding which can lead to poor ventilation of houses lack of public space as mentioned previously.



0. Inadequate Housing



1. Identity loss



2. Lack of instrastructure, eg. sewage



3. Lack of infrastructure for industries



4. Overcrowding



5. Narrow streets, incaccessibility, safety issues

ADVANTAGES OF URBAN VILLAGES

However, urban villages offer many advantages for Navi Mumbai, such as affordable rent, and absorption of rural migrants. The proximity of the urban villages to the formal city allow people to work within walking distance, thus, public transport is not required or burdened. The villages showcase strong community ties because of their existence of families for decades, if not centuries. This is a unique element of urban villages in contrast with other informal settlements. Furthermore, small scale industries that are present in the urban villages are sustainable, or more sustainable that large-scale industries found elsewhere. Finally, urban villages are vital to the formal city, in our case Navi Mumbai, since they provide a major source of labour force.

- Affordable rent.
- Absorption of rural migrants.
- Proximity to work in the formal city.
- Walkability within the village/ for work = relief of pressure from public transport.
- Strong community ties.
- Small scale sustainable industries eg. recycling, crafts, fishing.
- **Vital to the formal city eg. labour.**

Sources:

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Huang, W. (2016). Power, Rights and Emerging Forces: New Models of Urban Planning Practice in China. In Shaping cities : emerging models of planning practice. (Al-Asad, M. & Mehrotra, R.,Eds.). Berlin: Hatje Cantz Verlag GmbH.

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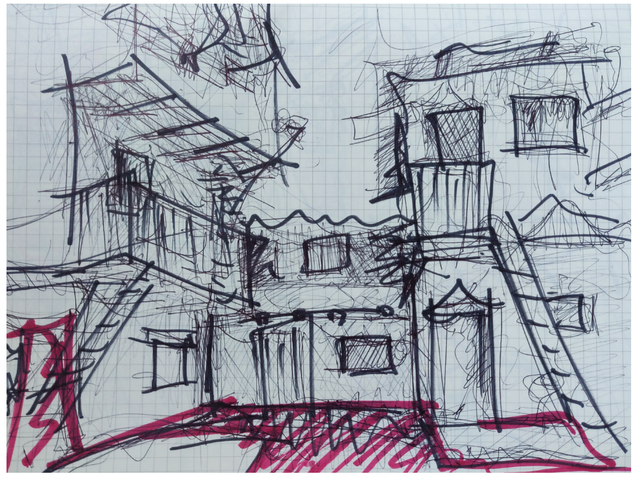
Lueder, C. (2018). Urban villages and informal settlements as protagonists of urban futures. Urban Design International, 23(1), 4–21. Retrieved from: https://doi.org/10.1057/udi.2016.12

Wang, P. W., Wang, Y., & Wu, J. (2009). Urbanization and informal development in china: urban villages in shenzhen/ International Journal of Urban and Regional Research, 33(4), 957–973. Retrieved from: https://doi.org/10.1111/j.1468-2427.2009.00891.x

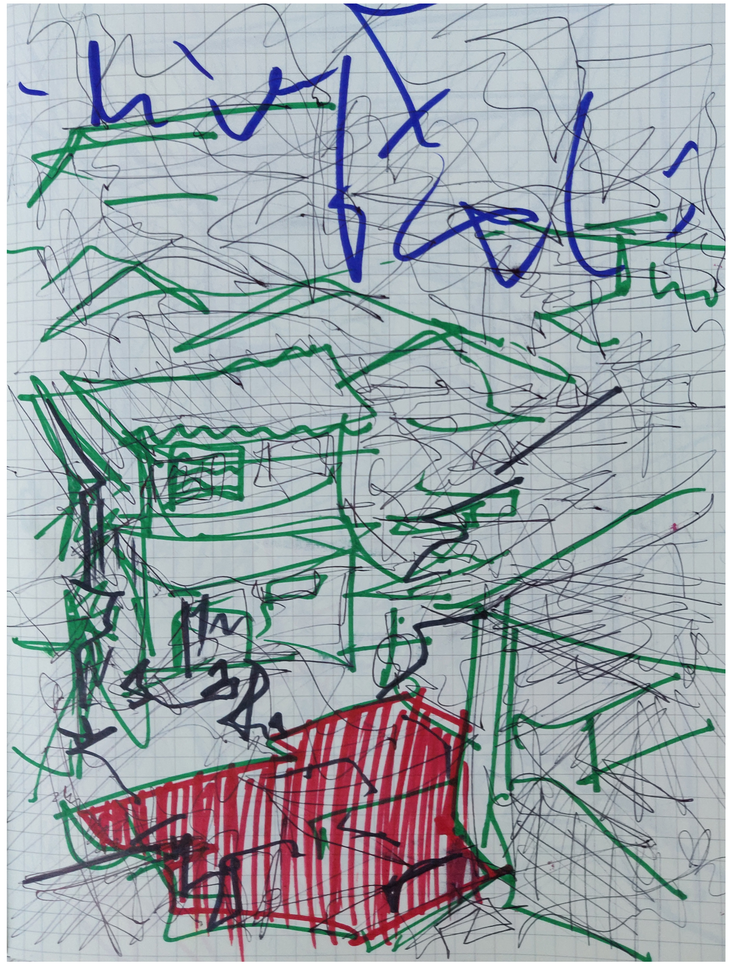
Skinner, C. and Watson, W. (2018). The Informal Economy in Cities of the Global South: Challenges to the planning lexicon. In Bhan, G., Srinivas, S., & Watson, V. (Eds.). The Routledge Companion to Planning in the Global South

INTIMATE CHARACTER & SCALE OF URBAN VILLAGES

Beyond the advantages of the urban villages, I find that they carry an intimate character and scale which can be pleasant for its residents, the feeling of community and belonging. Even in the villages that are urbanised these qualities might still exist and I tried to capture them with some sketches that I did over online images. Leftover spaces become courtyards for young people to play during the day.



Houses of a village

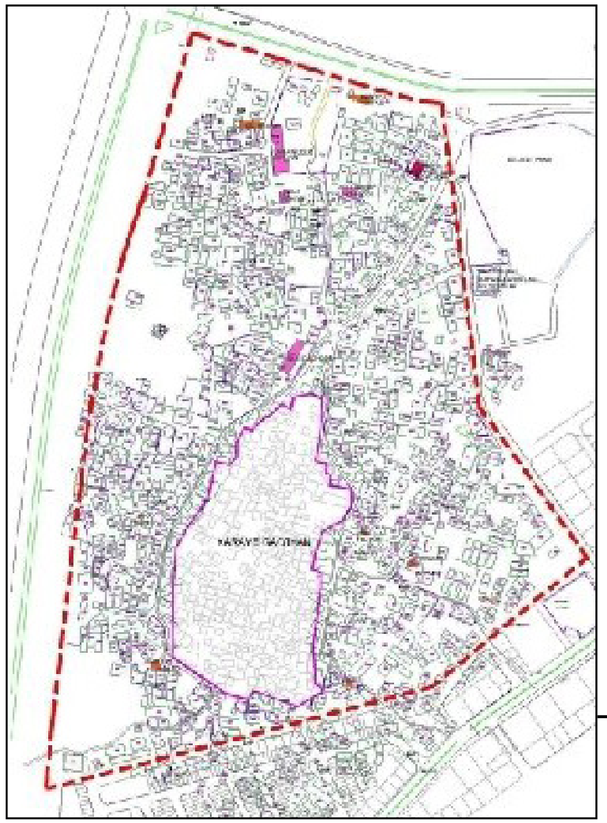


Leftover courtyard space

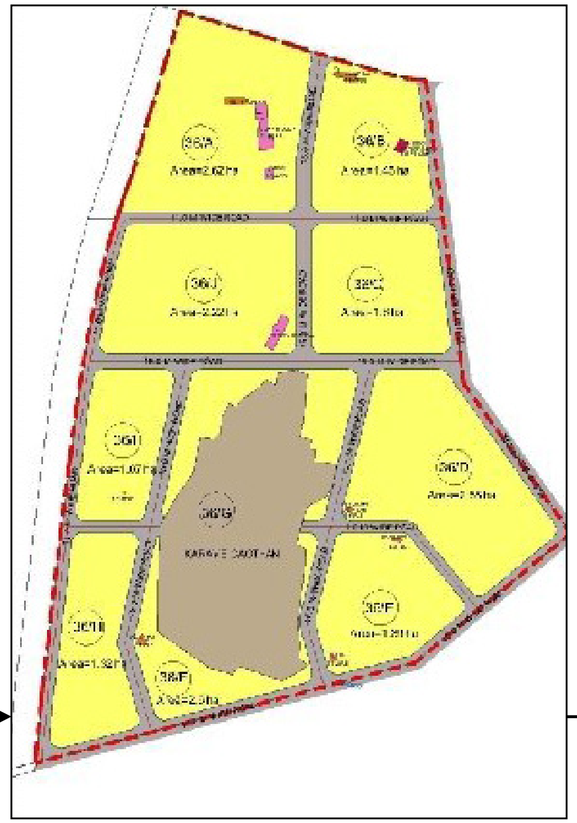
CIDCO PLAN FOR THE VILLAGES - ERASURE & REDEVELOPMENT

CIDCO plans to erase the villages, superimpose new streets, and divide the plots for new construction to take place. This is an example of a village and its plan for its total erasure for new construction to take place. Isn't there a different way to allow these villages to urbanise, maintaining some of their qualities and trying to fix some of the issues we know will be raised?

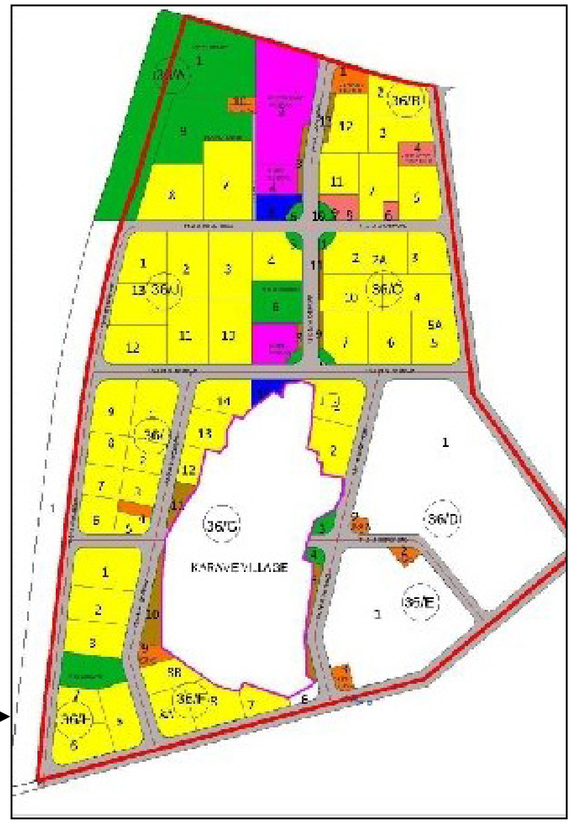
Source: https://present5.com/redevelopment-in-a-young-city-the-navi-mumbai/



Urban village plan



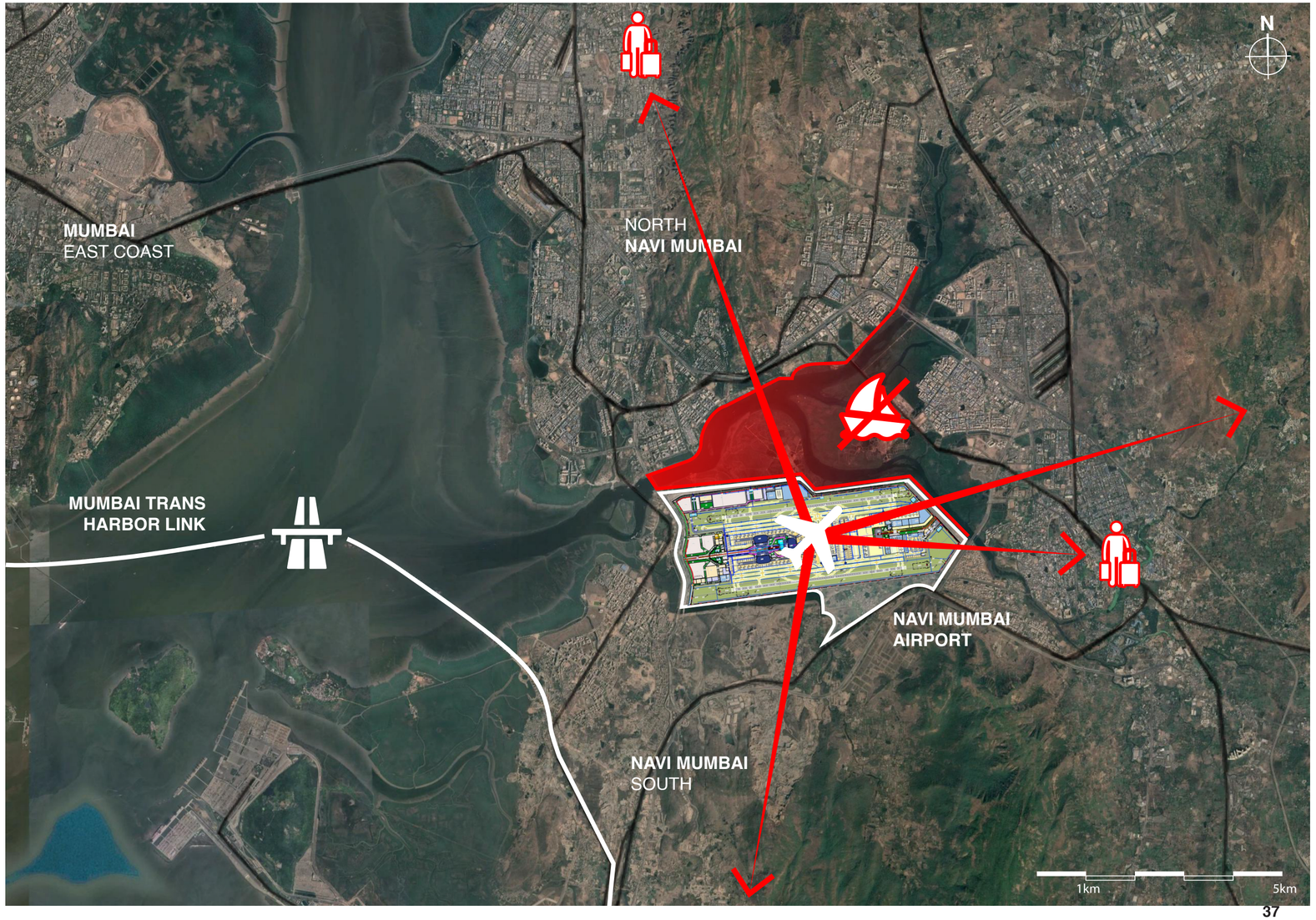
New sectors proposed



Plot division proposed

NEOLIBERAL GLOBALISATION - A THREAT TO THE VILLAGES, ITS RESIDENTS & THE ENVIRONMENT

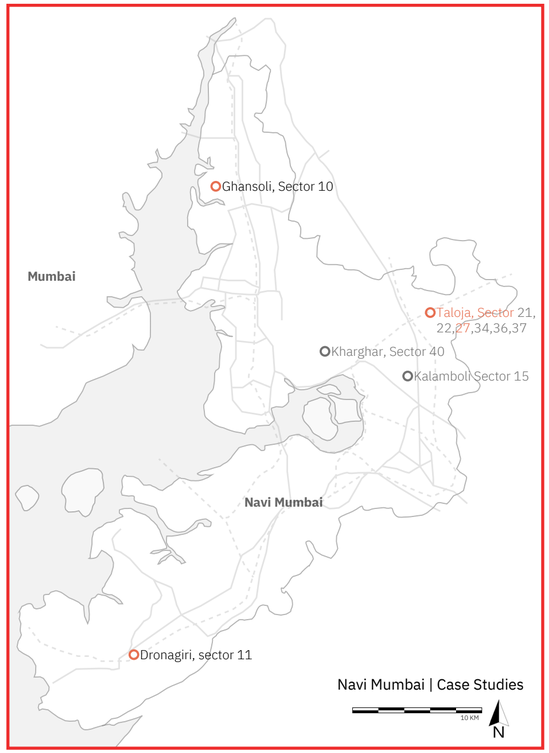
An even greater threat to the villages is posed by globalisation and major infrastructure works such as the Navi Mumbai airport which forces villages to be demolished entirely and their residents dispossessed. There are financial reparations for the residents and the author does not question the necessity of these major infrastructure works. However, what can be done for the remaining villages? Could we envision that they attract some of the dispossessed villagers as well? Further to the problem of erasure we notice that these infrastructure works can block access to the sea for fishermen, but maybe the solution lies with the creation of fishing facilities in the remaining villages.



Navi Mumbai New Airport
& Trans Harbor Link

MASS HOUSING SCHEMES FOR THE URBAN POOR

At the same time, generic mass housing schemes are presented as the sole solution to affordable housing for the city, a model that is intended to replace informal settlements such as the urban villages. Their sheer scale and repetitiveness give the feeling of inhumanity and I find them to be the opposite of the urban villages. It should be noted that many poor people aspire to own an apartment in such developments but I feel that these aspirations should be questioned as influenced by top-down planning of the formal city and the related aesthetic qualities.



Location Plan

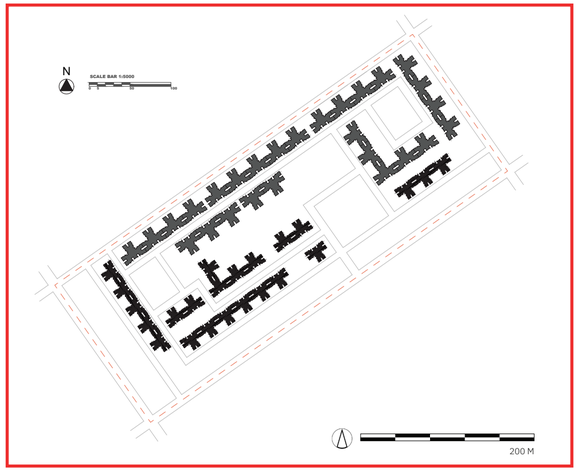
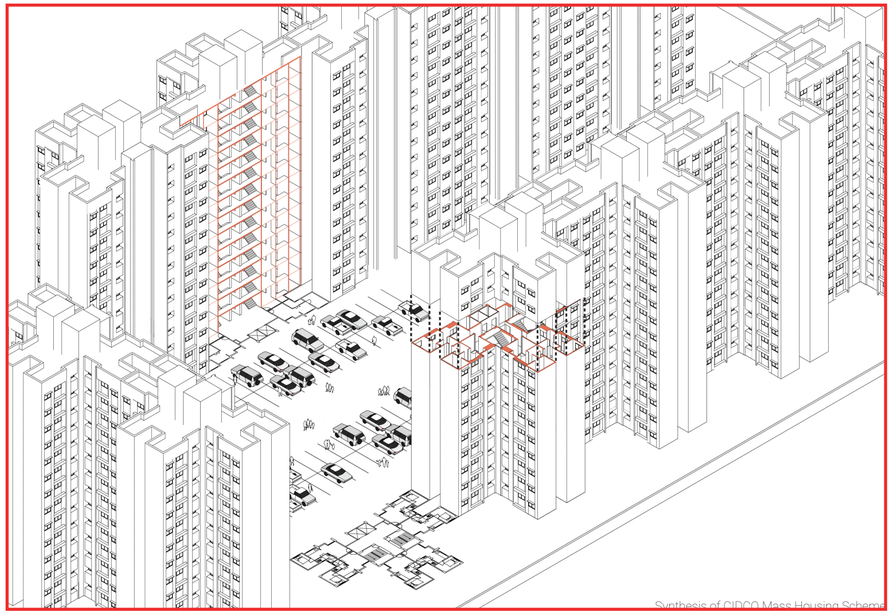


Figure Ground Plan



Source: Global Housing Graduation Studio Research (2021/2022)

DISADVANTAGES OF MASS HOUSING SCHEMES

These schemes showcase many disadvantages such as their location away from job opportunities, the reliance of people on public transport for their functionality, their lack of amenities, the lack of association with the ground, the poor quality of materials and their application other than the structure and the lack of maintenance after their construction. Maybe more importantly, they are still unaffordable for the poorest living in informal settlements and even those who can afford them typically resell them to resettle in informal settlements due to the already mentioned problems.

- Peripheral locations, displacement of people, bad proximity to work.
- Reliance on limited, burdened public transport by payment.
- Typically no amenities provided.
- No ground association for residents of the towers.
- Poor quality in anything but the structure.
- No maintenance or unaffordability of maintenance lead to quick dilapitation.
- Unaffordable appartments to buy/ rent for too many.
- Even those who can afford resell and go back to informal settlements eg. urban villages.

Sources:

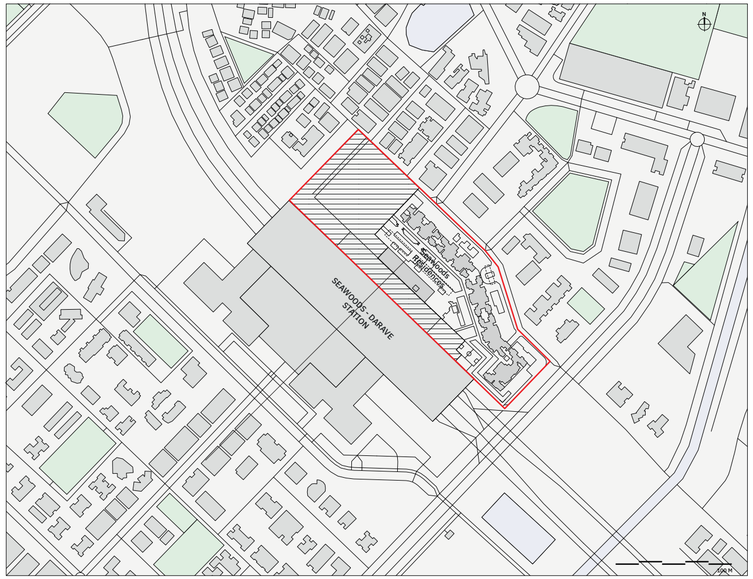
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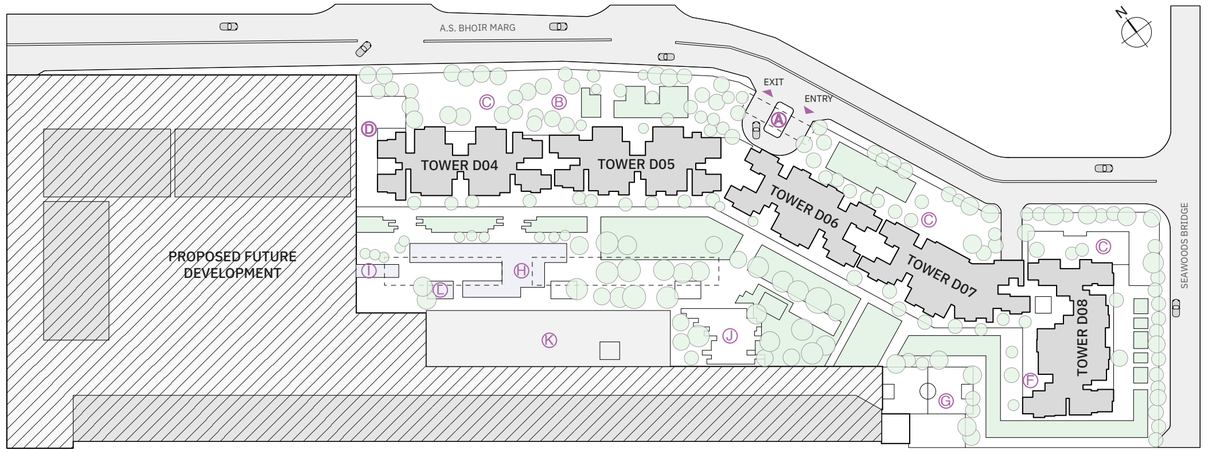
Shaw, A. (1999). The planning and development of new bombay. Modern Asian Studies, 33(4), 951–988. Retrieved from: https://www.jstor.org/stable/313106

URBAN ENCLAVES FOR THE RICH

On the other end of the spectrum, urban enclaves are designed for the rich where all amenities are found within housing complexes. This is exemplified by the Seawoods residential complex shown in these drawings. These schemes make no intention to contribute meaningfully to the city on an urban level. Only those privilaged enough to buy an apartment can benefit from the amenities included and the public space provided within the complex. This housing complex is found adjacent to a train station which is ideal for privilaged commuters that can use it to reach Mumbai and other parts of the two cities.



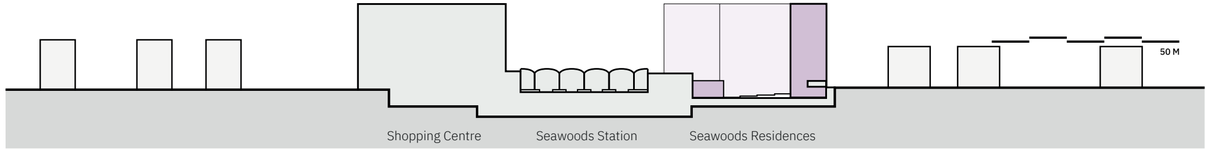
Location Plan



LEGEND

- Ⓐ MAIN ENTRY
- Ⓑ GROVE WALK
- Ⓒ RETAIL PLAZAS
- Ⓓ SEAWOODS STATION ENTRANCE
- Ⓔ JOGGING TRACK
- Ⓕ KID'S SPACE
- Ⓖ SPORTS COURT
- Ⓗ LAP POOL
- Ⓘ KID'S POOL
- Ⓙ AMHITHEATRE
- Ⓚ CLUBHOUSE
- Ⓛ JACUZZI

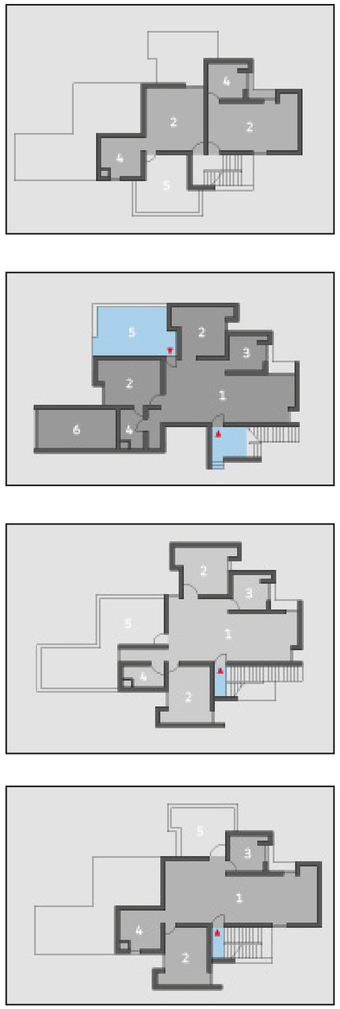
Ground Floor Plan



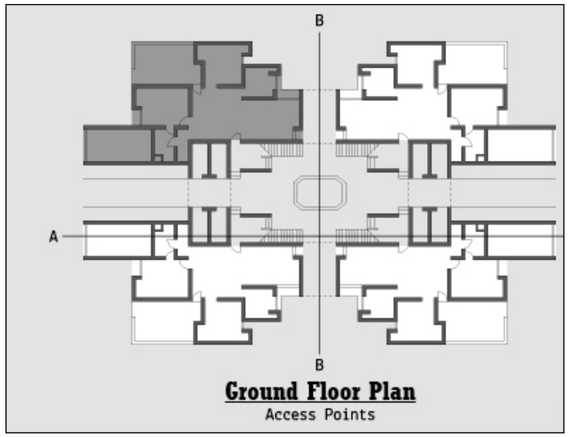
Schematic Section

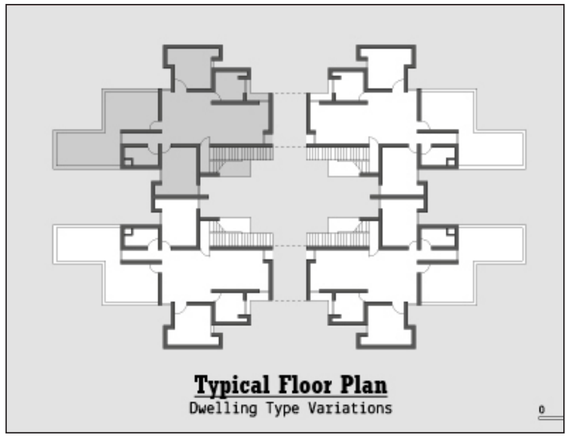
INSPIRATION FROM INDIAN MODERNISM - SHEIKH SARAI HOUSING, RAJ REWAL ARCHITECTS, 1970

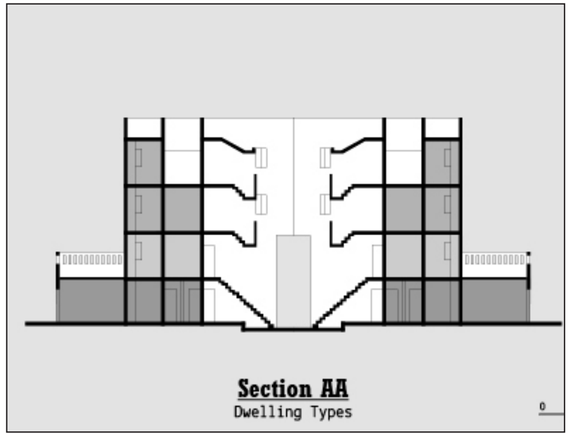
For an appropriate architecture for the villages that remain in the city, I draw inspiration from Indian modernism and more specifically the Sheikh Sarai Housing, designed by Raj Rewal in 1970. This housing scheme employs repetitive blocks that are connected to each other to form courtyards in a compact manner where housing is used to orchestrate live public space, streets, and neighbourhoods. This design strategy can yield high density of dwellings in a more humane manner than the high-rise towers.

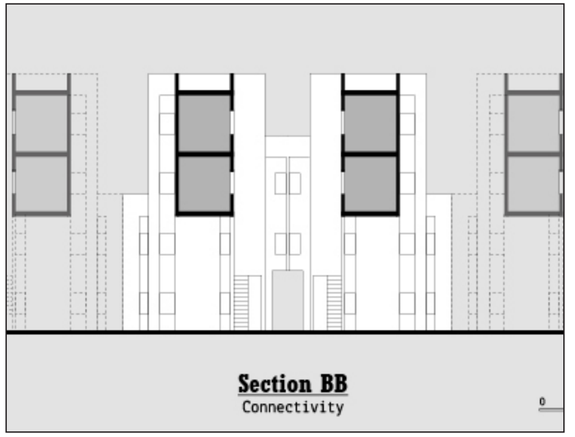


Dwelling Units



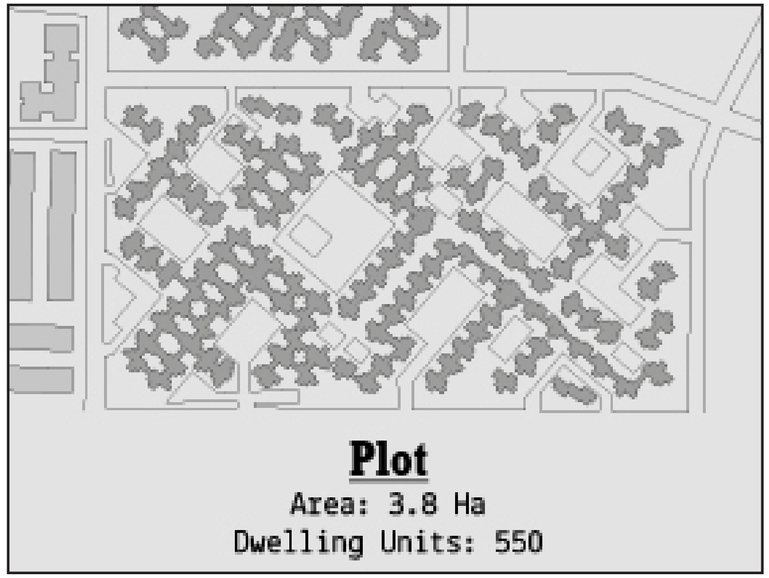


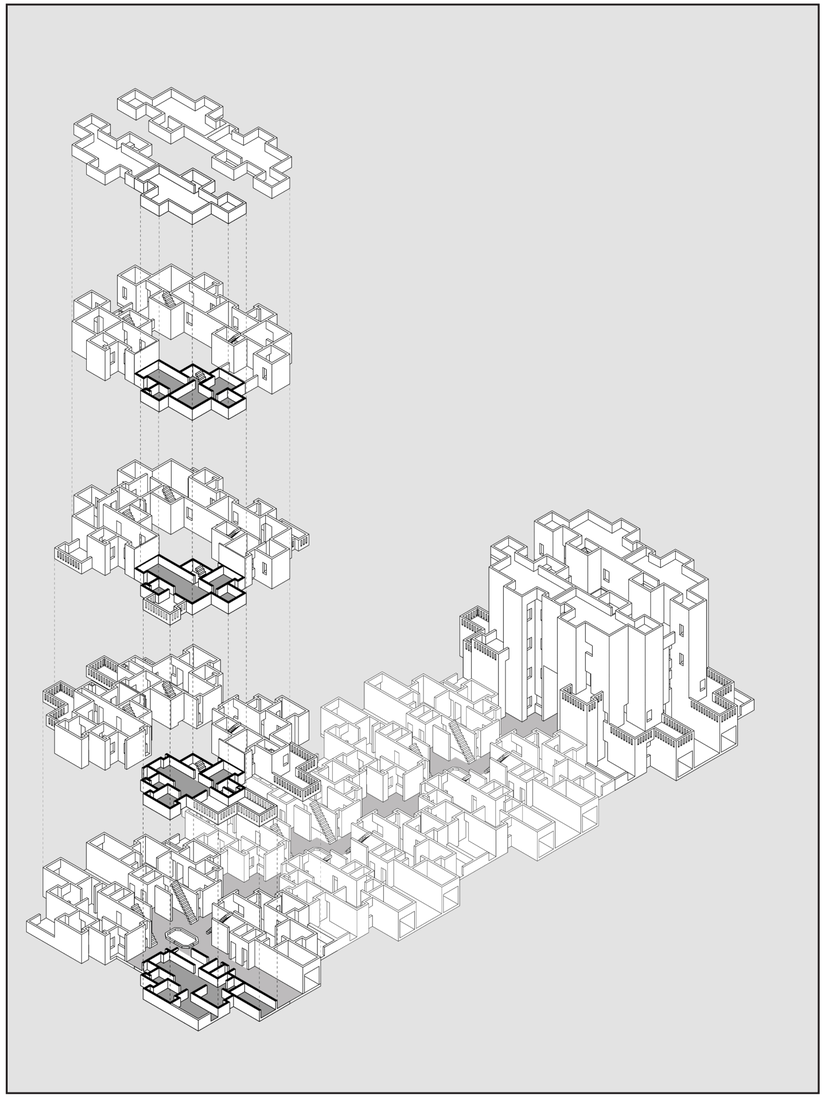




INSPIRATION FROM INDIAN MODERNISM - SHEIKH SARAI HOUSING, RAJ REWAL ARCHITECTS, 1970

The design borrows from historical medieval Indian cities like Udaipur and Jaisalmer in Rajasthan, in terms of morphological and programmatic elements. The characteristic element of the housing scheme lies with the continuous courtyards, also known as havelis, an attempt of the architect to showcase an ‘Indian’ architecture, politically suitable for the young independent country. It attempts to redefine the colonial architectural language of New Delhi and deviates from the British-influenced bungalow or terraced house. The courtyards belong to a designated pedestrian zone in the heart of the housing complex which is distinctively separated from any automobile traffic and parking space.





Axonometric

RESEARCH/ **THE HAGUE**

SITE PLAN

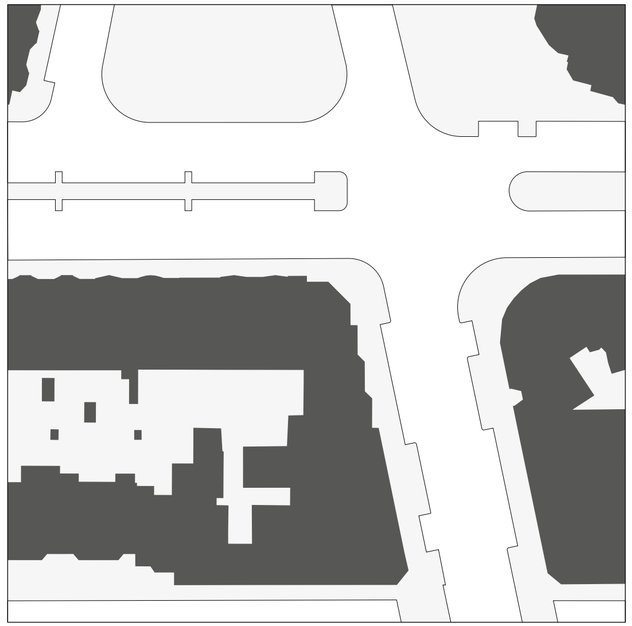
As part of our research, we were asked to investigate dwellings in the Hague, as well as their neighborhood. We were meant to create sets of drawings for the dwellings and in parallel gather samples to be tested in laboratories. The occupants of the dwellings were also asked to answer a questionnaire in regard to their health. The aim of the research was to investigate dwellings and neighborhoods in relationship to the health of the owners and see if any correlations arise. In the map on the right you can see the location map of one of the dwellings my group investigated.



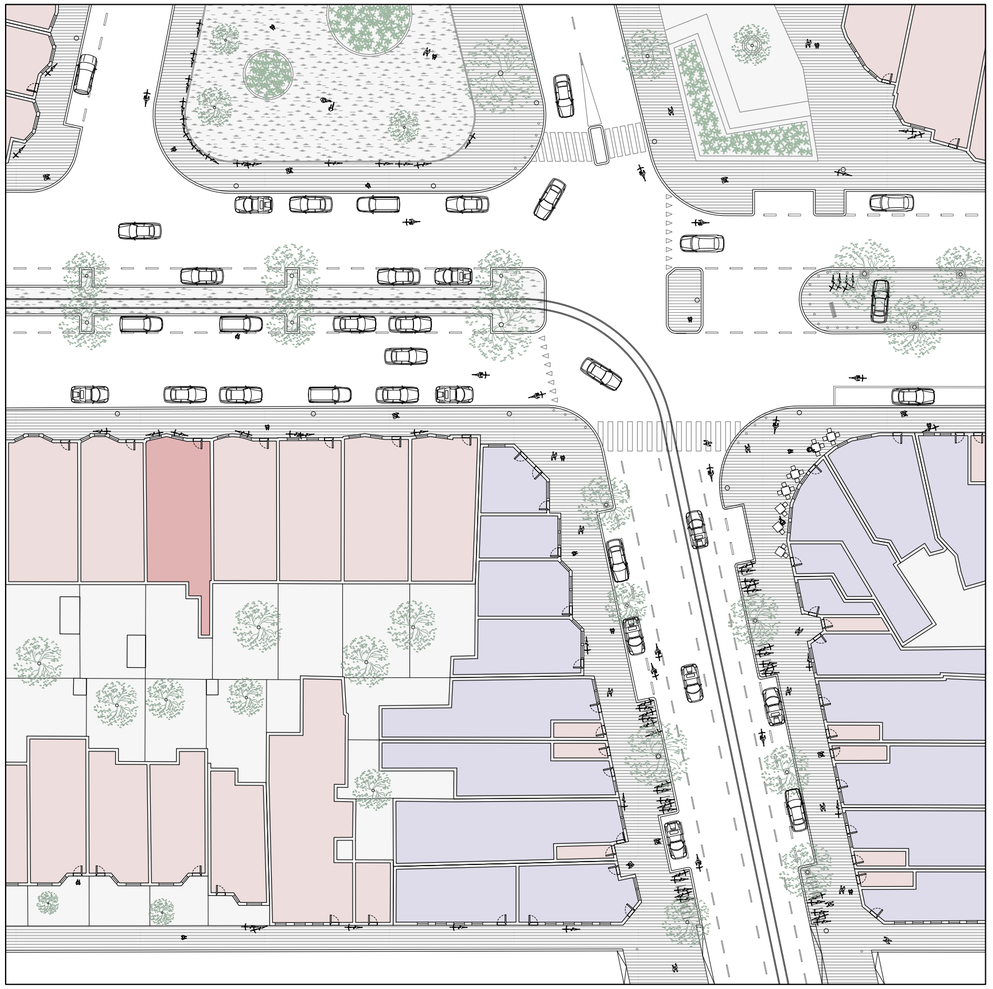
Location Plan

FIGURE GROUND & GROUND FLOOR MAP

We drew a figure ground map of the neighborhood and then a ground floor map of it. We wanted to understand how density figures for the neighborhood (dwellings per hecatere, FSI and GSI) responded to its layout. We depicted the ground floor map into residential and commercial areas to further understand its use by residents.



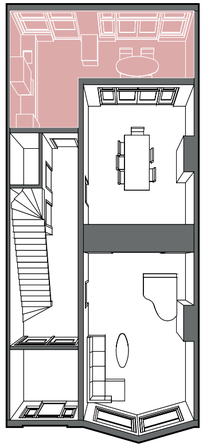
DENSITY: ***48da/ha***
FSI: ***1.25***
GSI: ***0.32***



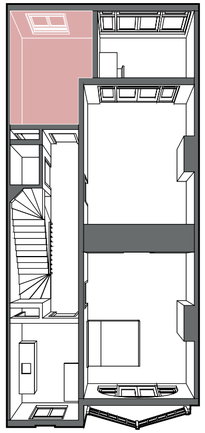
DENSITY: ***48da/ha***
FSI: ***1.25***
GSI: ***0.32***

HOUSE USE DURING THE DAY

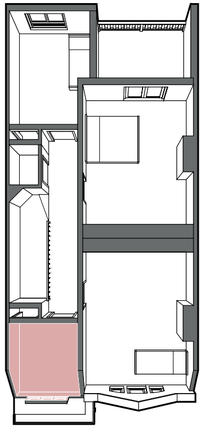
We highlighted the areas used in the dwelling per time of the day in order to help us think how a dwelling is used.



Ground floor

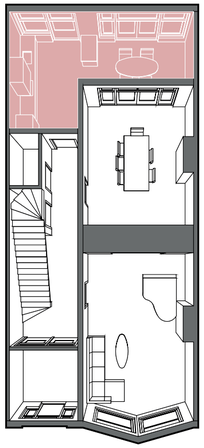


1st floor

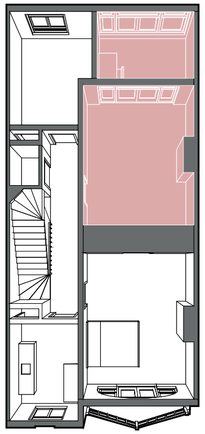


2nd floor

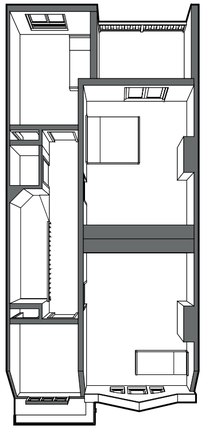
Morning



Ground floor

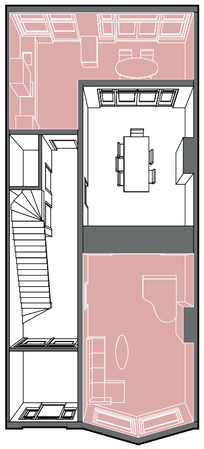


1st floor

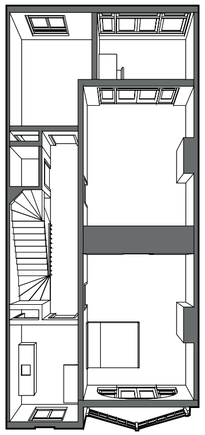


2nd floor

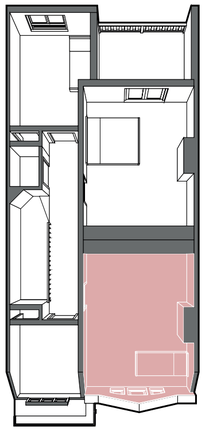
Mid day



Ground floor



1st floor

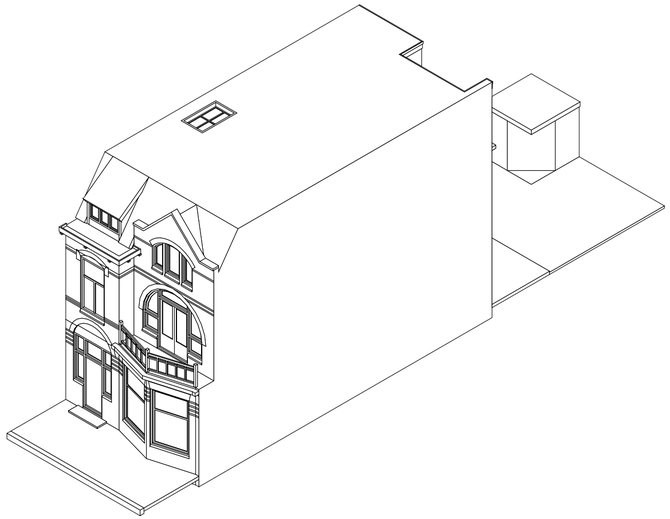


2nd floor

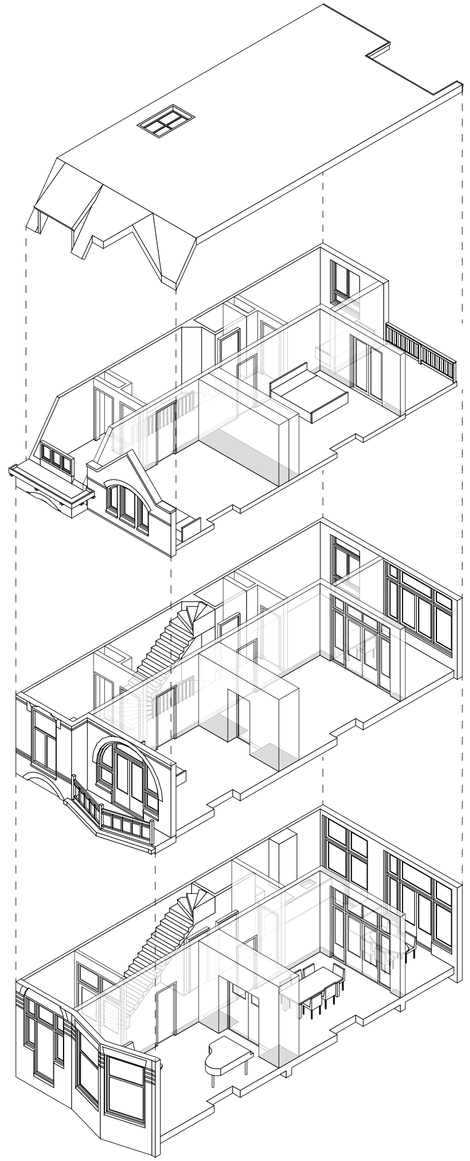
Evening

AXONOMETRIC

We drew an exploded axonometry of the dwelling so that we could compare it with other dwellings in a better way. We gathered information about the dwelling in regard to its area, volume, numbner of residents, window surface area, area of openable windows, total area of interior facade and the existence of mechanical ventilation.

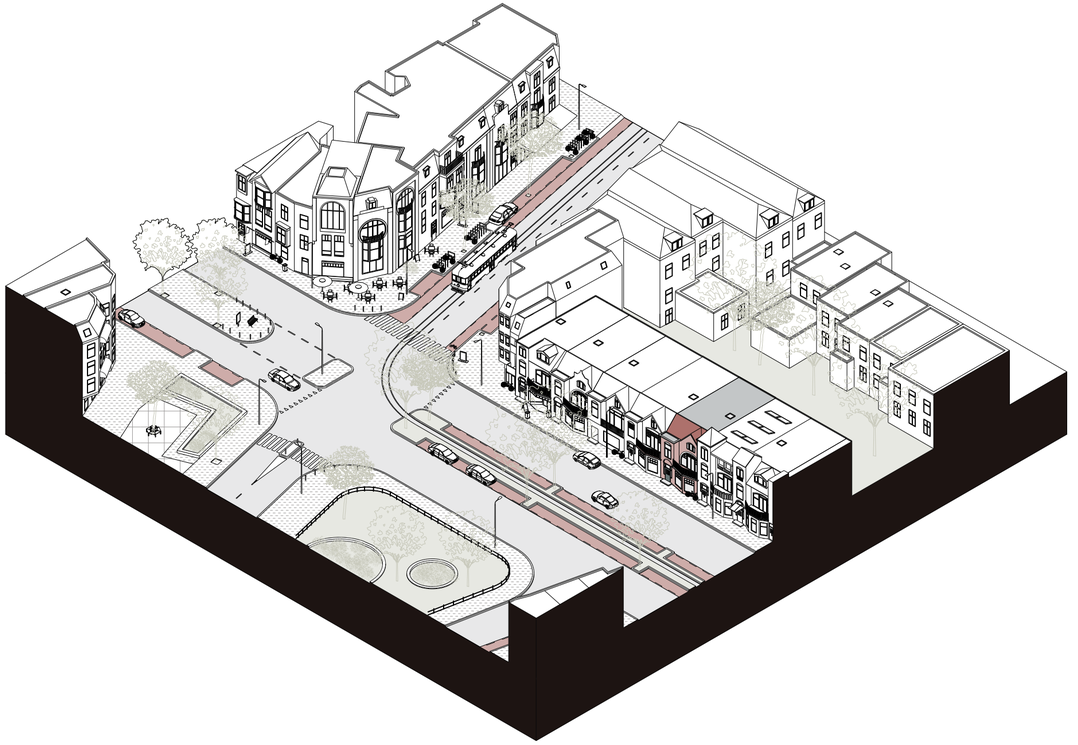


AREA: ***278m²***
VOLUME: ***865m³***
NO OF RESIDENTS: ***3***
AREA PER RESIDENT: ***93m²***
FIXED WINDOW SURFACE AREA: ***39m²***
OPENABLE WINDOW SURFACE AREA: ***26m²***
TOTAL AREA OF (INTERIOR) FACADE: ***XXm²***
MECHANICAL VENTILATION: **Y/N**



URBAN AXONOMETRIC

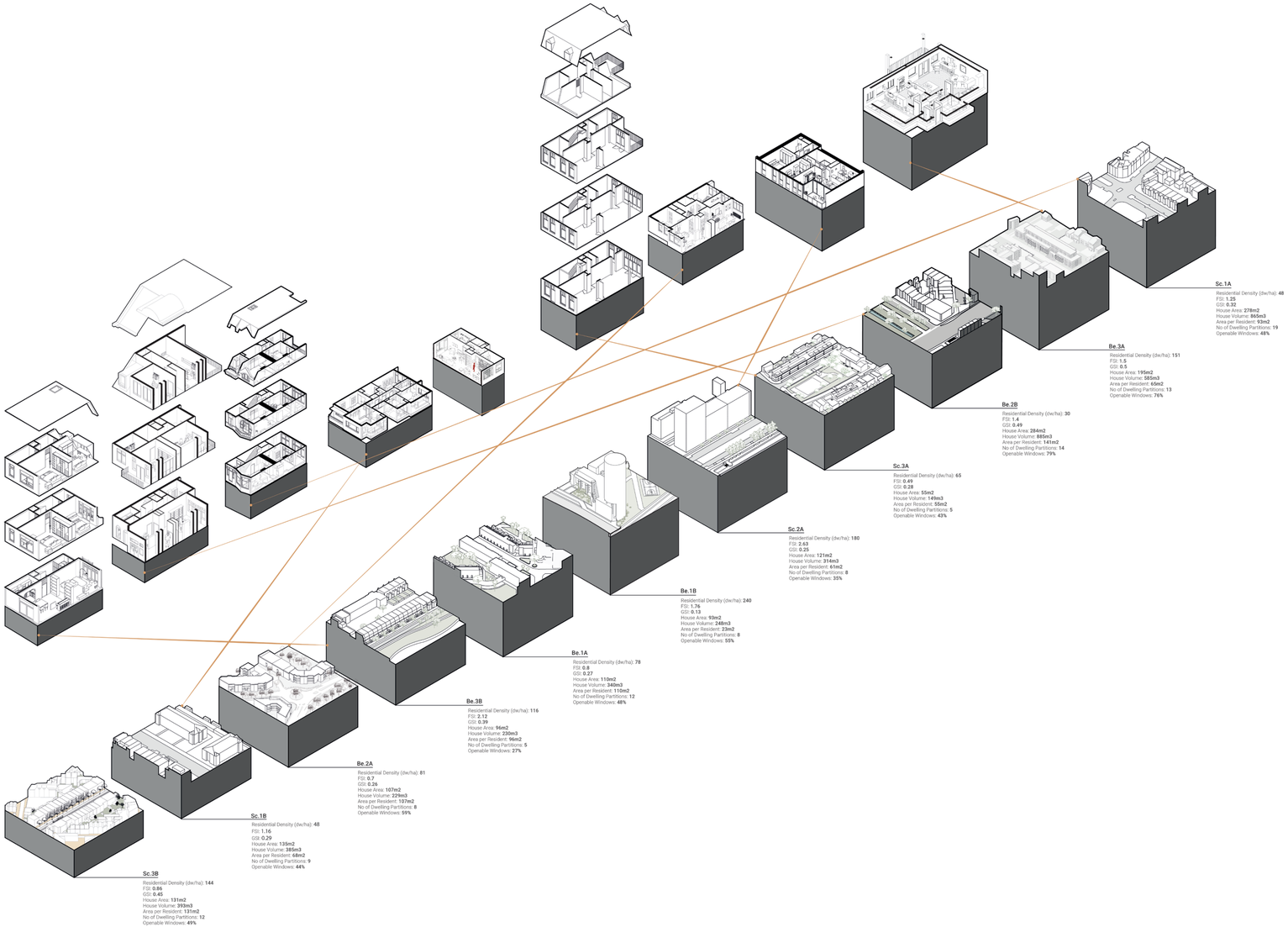
We drew urban axonometries of the neighborhoods in order to be able to compare them later. We did want to investigate and depict the type and quality of public space that existed in the neighborhood.



DENSITY: ***48da/ha***
FSI: ***1.25***
GSI: ***0.32***

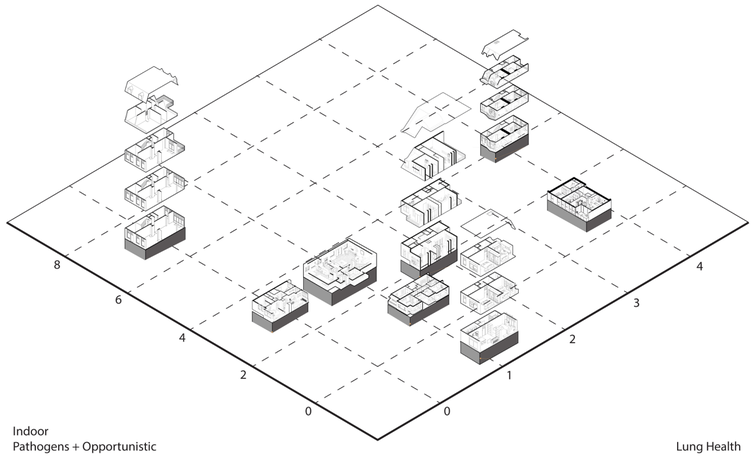
COMPARISON

Finally we drafted a comparison graph with all neighborhoods and dwellings. We sorted the neighborhood and above the dwellings according to the number of bacterial species found indoor or outdoor.



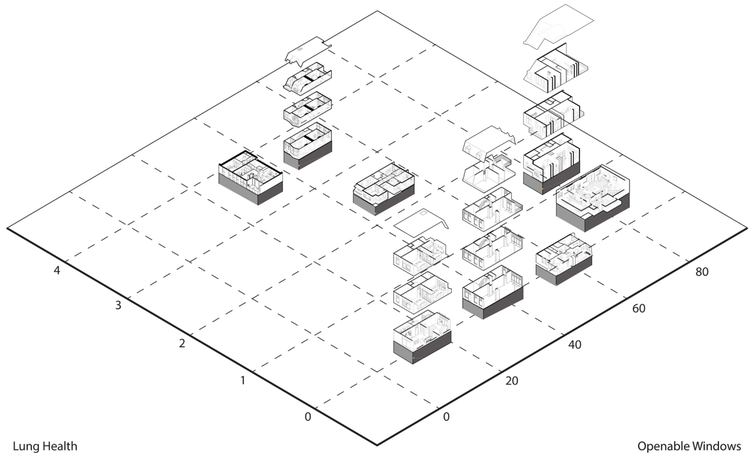
COMPARISON

Further diagrams were created using different variables in order to compare the dwellings and the neighborhoods. The idea is that these drawings can be used for a longer study to investigate relationships between health and living spaces.



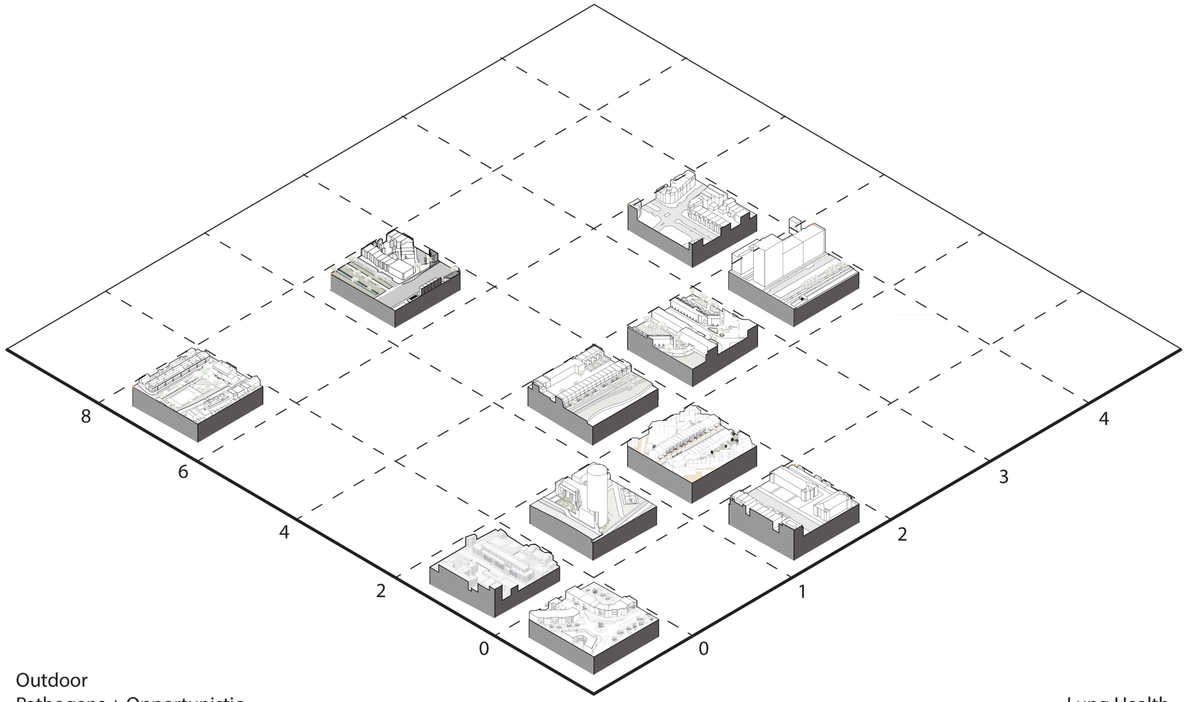
Indoor
Pathogens + Opportunistic

Lung Health



Lung Health

Openable Windows



Outdoor
Pathogens + Opportunistic

Lung Health

DESIGN HYPOTHESIS

Around 40% of the 1.1 million residents of Navi Mumbai live in informal settlements because of their affordability - whether by renting or squatting. Informal dwellers consitute a large body of people that require better housing with improved living conditions. It is aspired that mass housing schemes of high-rise residential buildings can be provided for informal dwellers and solve this problem.

PROBLEM STATEMENT

Currently, informally developed villages provide a substantial amount of affordable housing for the urban poor but of a substandard quality. Meanwhile, high-rise buildings designed for mass housing schemes prove to be inadequate too for a number of reasons.

How can architecture and urban planning guide villages to plan better for their urbanisation, in anticipation of informality, and provide quality housing for all their future residents?

DESIGN HYPOTHESIS

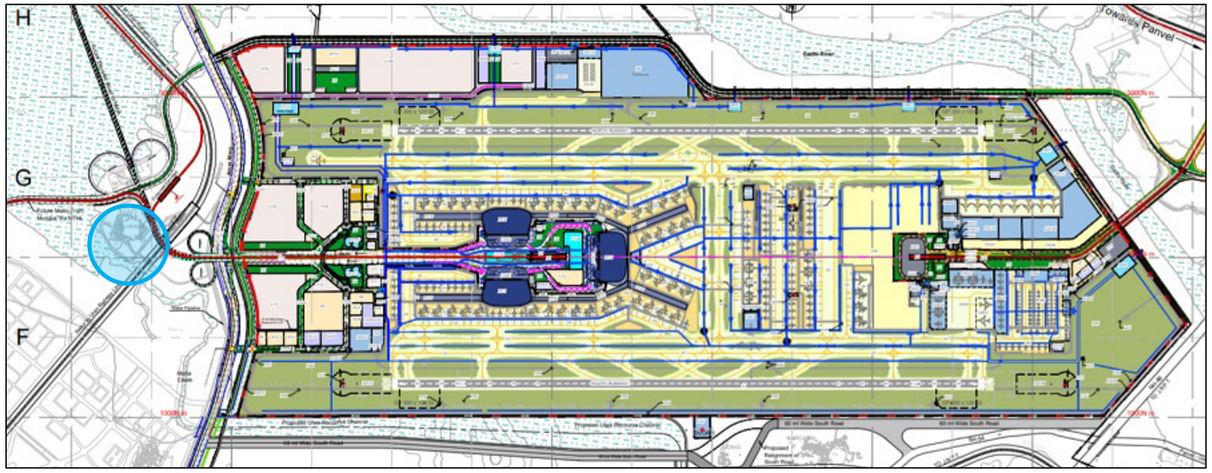
To design an appropriate housing typology and strategy for the currently urbanising villages that can provide better quality of life for all future residents while respecting their ancestral lifestyle and therefore, contest the notion that the high-rise building typology and the mass housing schemes are the solution for informal dwellers.

If the design proposal is deemed promising this would signify that urbanising villages can be worthily pursued as sites of providing both afforable and adequate in terms of quality housing for the urban poor; an alternative to the aspired model of the mass housing schemes and the high-rise building typology.

MOHA KOLIWADA

MOHA KOLIWADA/ **SITE**

My chosen site is a fishing village marked in blue, located adjacent to the new Navi Mumbai airport. The village has already seen development in the last two decades, development that is anticipated to accelerate. The village can become an accessible point for fishing for many fishermen in the area, besides the residents of Moha Koliwada.



2003:



2021:



MOHA KOLIWADA/ **KOLI PEOPLE**

KOLI CALENDAR

The community that lives in the village belongs to the Koli fishermen. They follow their own calendar based on fishing and believe in multiple faiths. Fishing is still a major source of income for a lot of families and that is why it is important to preserve and promote this sustainable activity. The calendar of the fishermen indicates their respect towards nature, for example, they pause fishing activities when fish are breeding. Moreover, the multiple faiths of the Koli people testify to their multicultural nature.

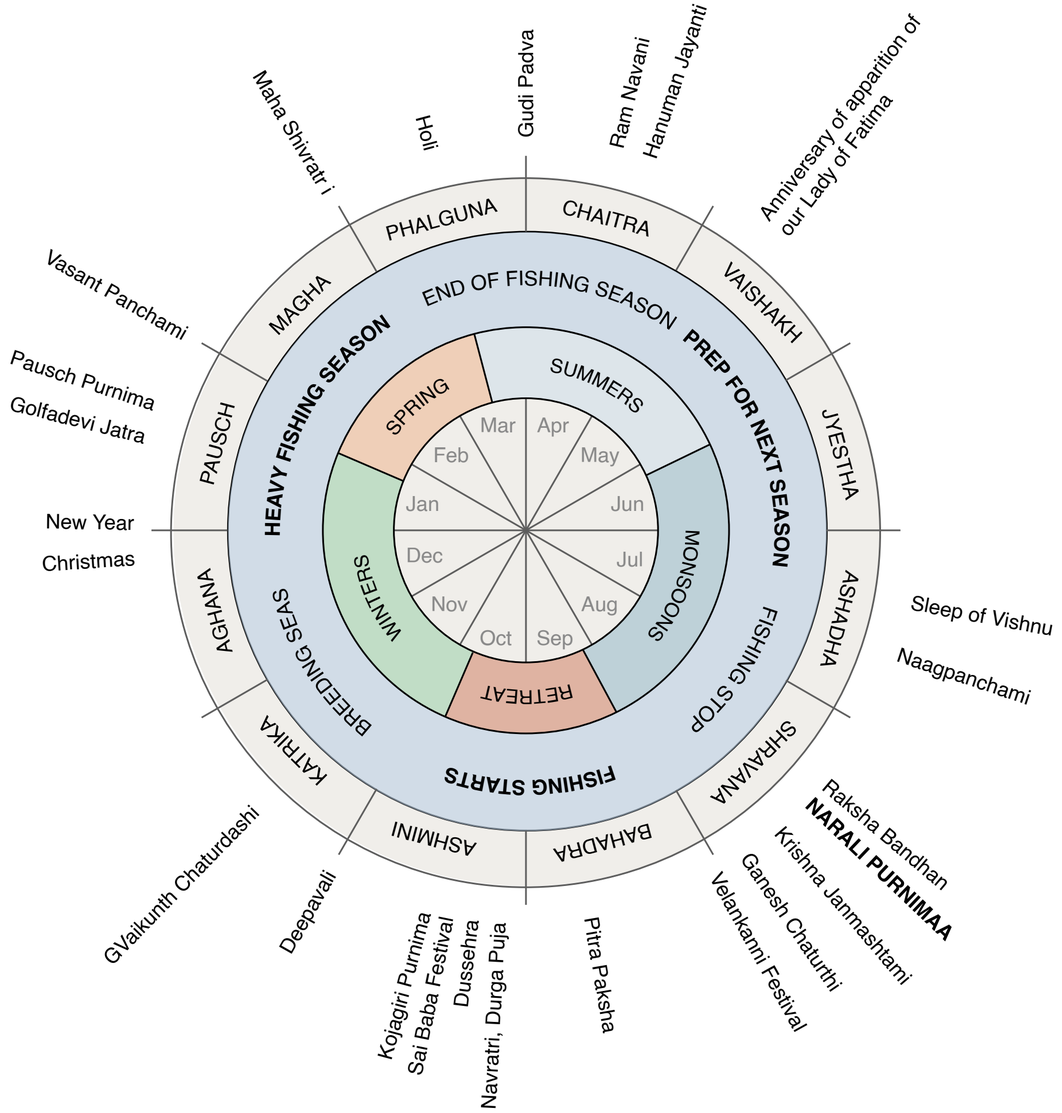


Diagram redrawn from source: https://portfolio.cept.ac.in/archive/an-urban-village-in-mumbai-worli-koliwada/

MOHA KOLIWADA/ **KOLI PEOPLE**

FISHING

It was important for me to create a timeline of the fishing activities to understand what kind of facilities are needed. Fishing activities are kinetic that nonetheless requires static built forms to come alive. The sea is very significant to the Koli people and care must be taken to celebrate this aspect. The Koli people have a history going back centuries in the region and their relationship with the sea is very strong.

The Kinetic City, bazaar-like in form, can be seen as the symbolic image of the emerging urban Indian condition... an ever-transforming streetscape - a city in constrant motion, where the physical fabric is characterised by the kinetic (*Negotiating the Static and Kinetic Cities - The Emergent Urbanism of Mumbai*, Rahul Mehrotra, 2008).



Boats set sail,
nets are laid.
Dinghys head out first.

4.00 AM



First batch of fresh sea
catch is brought in.

8.00 AM



Cleaning of nets,
detangling,
and collection of fish.



Catch is sorted,
sent of to market
or drying yards.



Bigger motorised boats
leave the jetty
to place wider nets.

10.00 AM



Fish market opens.
Koli womenfolk sell the fish.
Active days are Mondays,
Wednesdays, Fridays
and weekends.



Boats return from the sea
with more fish.

12.00 PM



Fish market spaces
are allocated
by the Market Committee
on rental basis.



Fish taken for drying, storing
and selling in other markets.
Boats and allied equipment
parked by Jetty.

2.00 PM



Vans transport stock
to markets and homes.
Fishing is wrapped up
for the day.



Fish market closes for the day.
Cleaning and maintenance
is carried out.

Timeline recreated from source:
https://portfolio.cept.ac.in/archive/an-urban-village-in-mumbai-worli-koliwada/

MOHA KOLIWADA/ **KOLI PEOPLE**

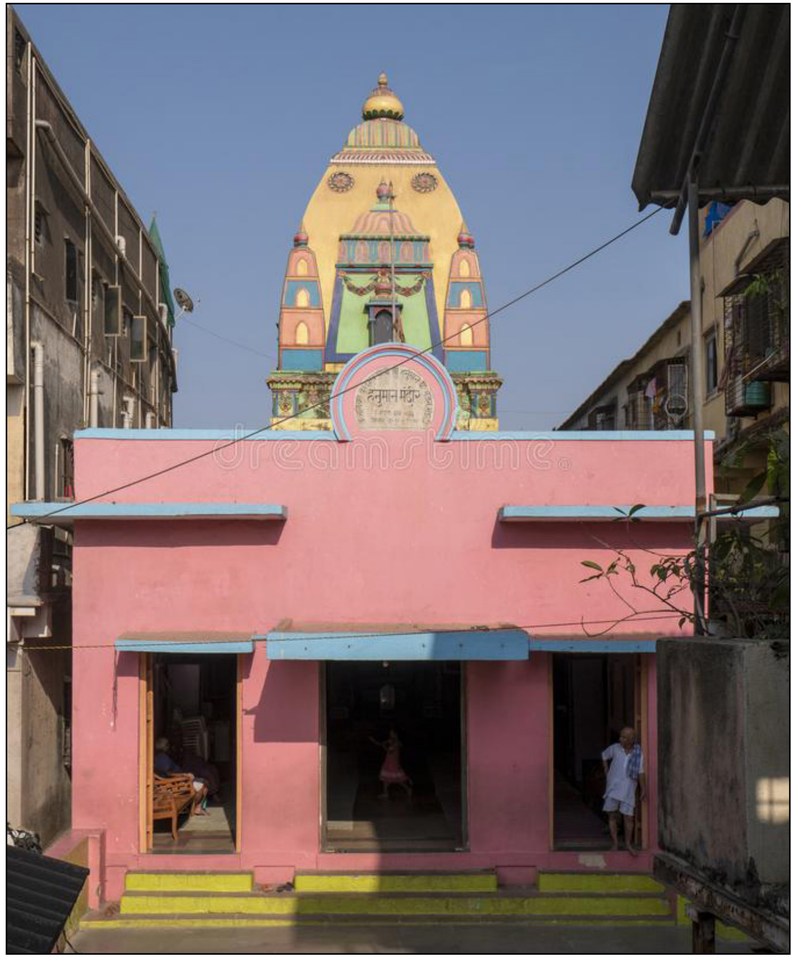
VIBRANCY & COLOUR

Interestingly, a common thread in the Koli culture is the vibrant colour of their boats, their clothes, their houses, and their temples. An element which I intend to use in my design too. It is my belief that colour is used by the poor in many countries as a monetarily cheap aesthetic element which sometimes only requires paint for its application. I want to celebrate this aesthetic.









MOHA KOLIWADA/ **EXISTING SITE**

FUNCTIONS & PROBLEMS

Moving on to the site plan, I identified the problems on site such as flooding in coastal area, possible identity loss in the centre of the village, lack of infrastructure such as sewage but also for fishing, possible future overcrowding, narrow streets and inaccessibility issues, and possible future enclave-like borders. I mapped out the existing functions and the already developed buildings to decide the intervention areas cleverly. For example, buildings that are already mid-rise will remain as such and require no further planning from me.



MOHA KOLIWADA/ **EXISTING SITE PLAN**

STREETS

Important for the planning of the new housing is the tracing of the existing streets indicated in blue, in order to come up with plots to work with and also dedicate some streets for vehicles and others for pedestrians. This method contradicts the CIDCO method of erasing the villages to superimpose new street grids. It is an important step to ensure that new planning for the village will allow its character to be retained to a certain extent. Landowners can have the responsibility to chose if they develop their structures and can decide not to participate in any new constructions. It is important for the new streets to be constructed in the village reagrdless for their accessibility and new infrastructure they bring along. The planning of new streets carries similar characteristis with the sites and services method of developing informal settlements.



URBAN PLAN

URBAN PLAN/ **PROPOSED PLAN**

INFRASTRUCTURE

I start by indicating the new infrastructure near the site, the airport, the rail station and an elevated motorway. The airport poses a significant problem of noise and air pollution to the village while the train station will allow commuters to live in the village.



URBAN PLAN/ **PROPOSED PLAN**

HILLS & MANGROVES

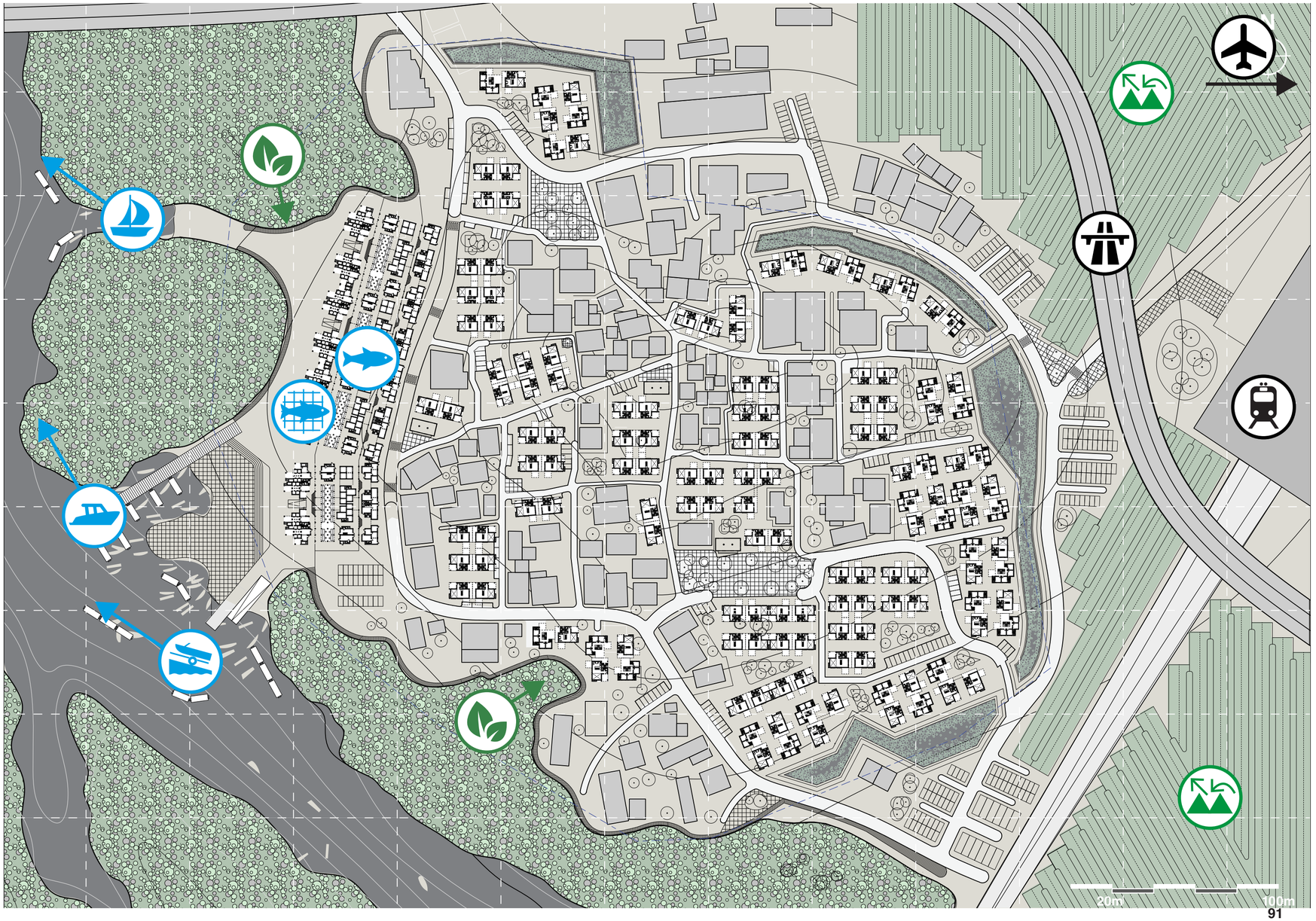
I decided to build hills in the East near the airport in order to reduce the noise from the airport while combatting the air pollution as well. This is a method employed for Schiphol airport in Amsterdam. Another important move is to increase the area of the mangroves that was previously cleared by people in effort to increase the green area of the village and provide greater biodiversity. Nature and especially mangroves are important for the river ecosystem and the health of fish and thus important for the Koli fishermen. The mangoves are also a natural protector of the village from floods.



URBAN PLAN/ **PROPOSED PLAN**

FISHING FACILITIES

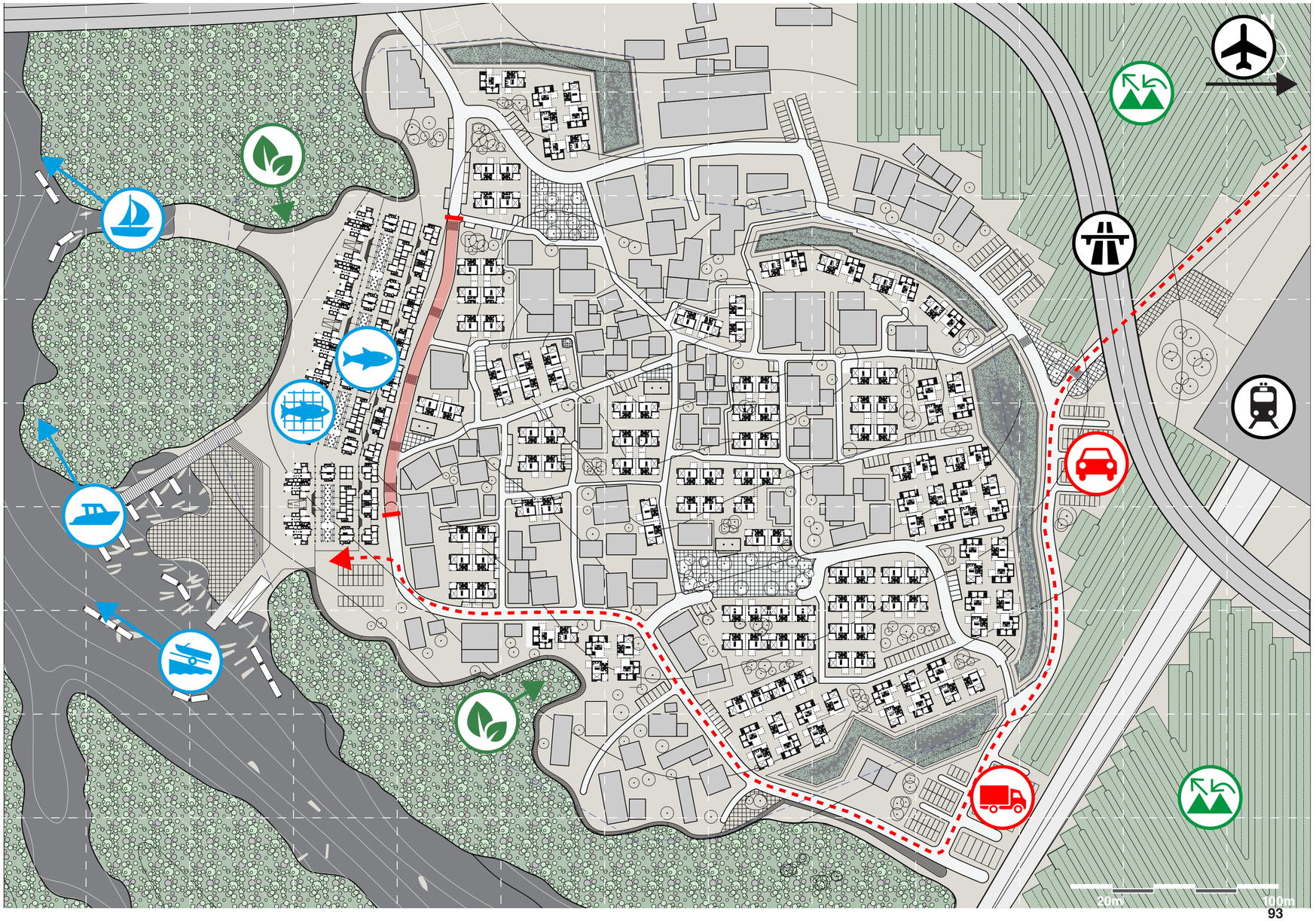
I dedicated three different access points to the sea for various kinds of boats and planned for the fishing facilities in the West. The provision of these facilities allows us to increase the mangrove area respectively. There are different access points for fishermen to the sea since various sized boats are used for fishing. Furthermore, acccess for fishermen that live outside the village is allowed and for this reason a parking plot is dedicated near these access points. The fishing facilities on land are related with storage space for fishing nets and tools, an open plan fish market and enclosed shops.



URBAN PLAN/ **PROPOSED PLAN**

VEHICULAR ARRANGEMENT

I dedicated parking places outside the village and a slow street hatched in red to serve as a retail/ office street. I decided it is important to allocate spaces for retail and office spaces in order to create a mixed-use ground floor area that is vibrant and used by all members of the community. The parking spaces outside the village intend to reduce the vehicle use within its borders and encourage pedestrian friendly streets.



URBAN PLAN/ **PROPOSED PLAN**

PEDESTRIAN ACCESS

I placed a pedestrian route around the seafront of the village and indicated entry points to the village. The pedestrian route around the village is an enhancement to the pedestrian friendly outlook for the village. It is thought it can be used by everyone but especially the people that visit the village to maybe shop or have a pleasant stroll around.



URBAN PLAN/ **PROPOSED PLAN**

WATER RESERVOIRS

I also planned for water reservoirs in the East and surrounding the village that can be used to grow bamboo trees which can be later used in construction. The water reservoirs will thus be another aspect of the village that boosts a healthy ecosystem and increases biodiversity while catering for the instrastructural needs of the village.



URBAN PLAN/ **PROPOSED PLAN**

GATHERINGS SPACES

Finally, I dedicated 2 squares within the village and another one at the beach in the West, all to be used as public spaces. The most important public space is located in the West and is a basically a beach. There is space for festivals and prosessions to take place, a space that is needed for the villagers and the health of the community. The public spaces within the village can be used as gathering spaces with green space and they are meant for everyday use rather than special occasions.

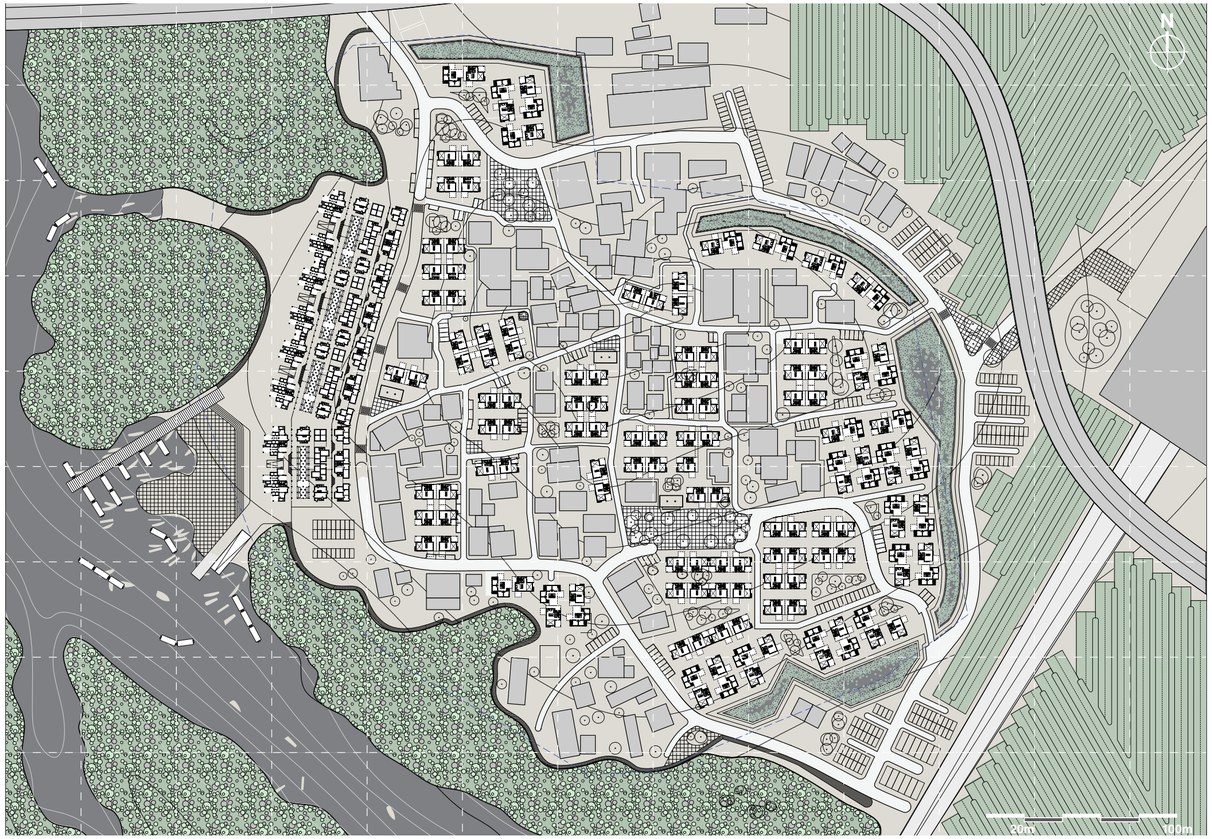


URBAN PLAN/ **PROPOSED PLAN**

COMPARISON

Overall, the major interventions to the village are the new streets and the infrastructure they bring along, the fishing facilities and the increased green areas for greater biodiversity.





URBAN PLAN/ **PROPOSED PLAN**

THREE TYPOLOGIES/ URBAN CONDITIONS

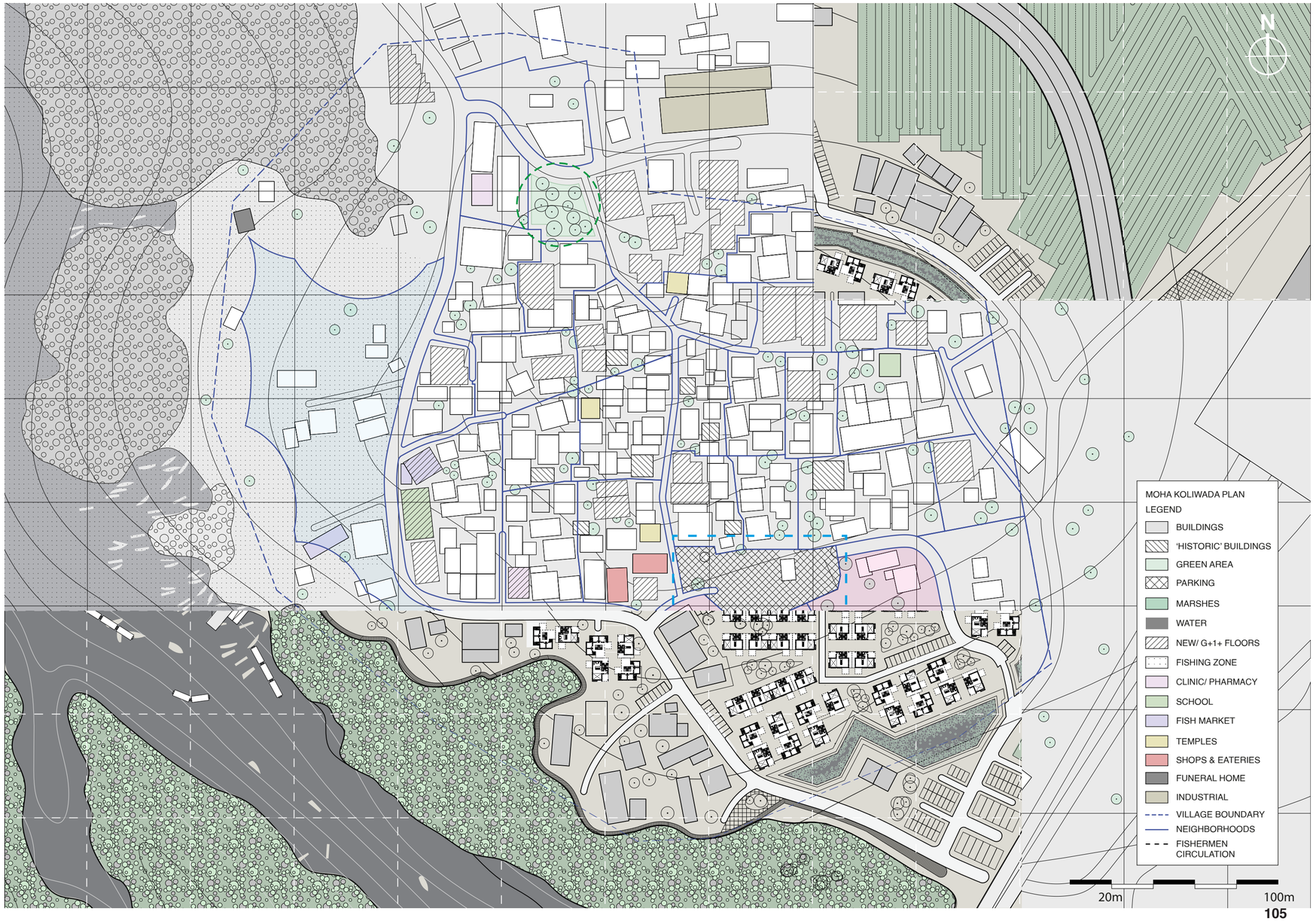
To serve this urban plan, I designed three residential typologies that serve three different urban conditions. In the West, the village seafront indicated in blue, in yellow the village centre typology and finally the village edge typology indicated in pink.



URBAN PLAN/ **PROPOSED PLAN**

PHASING

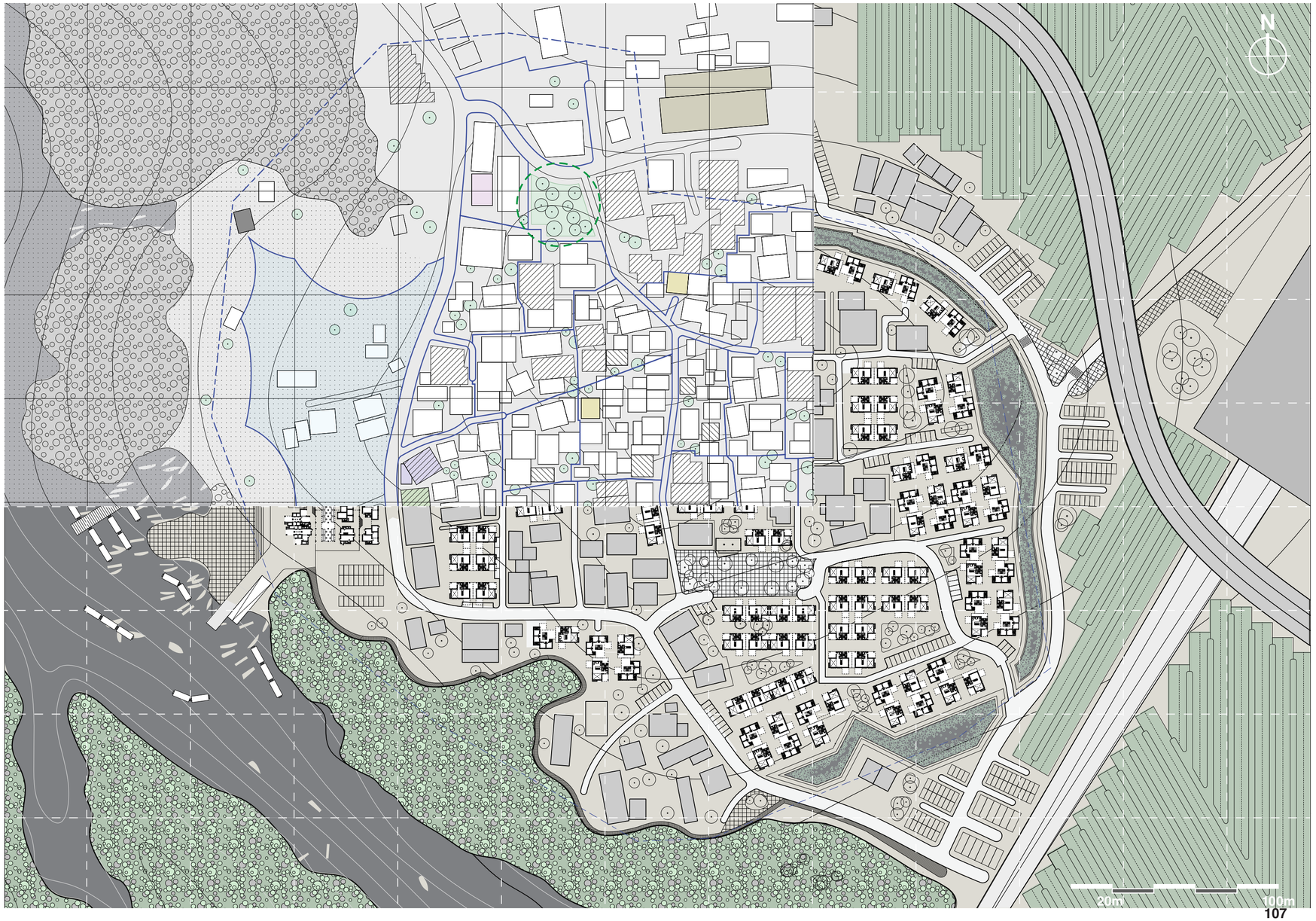
The plan is to start building in the areas that already have space for construction, in the South of the village, in the West and outside of it.



URBAN PLAN/ **PROPOSED PLAN**

PHASING

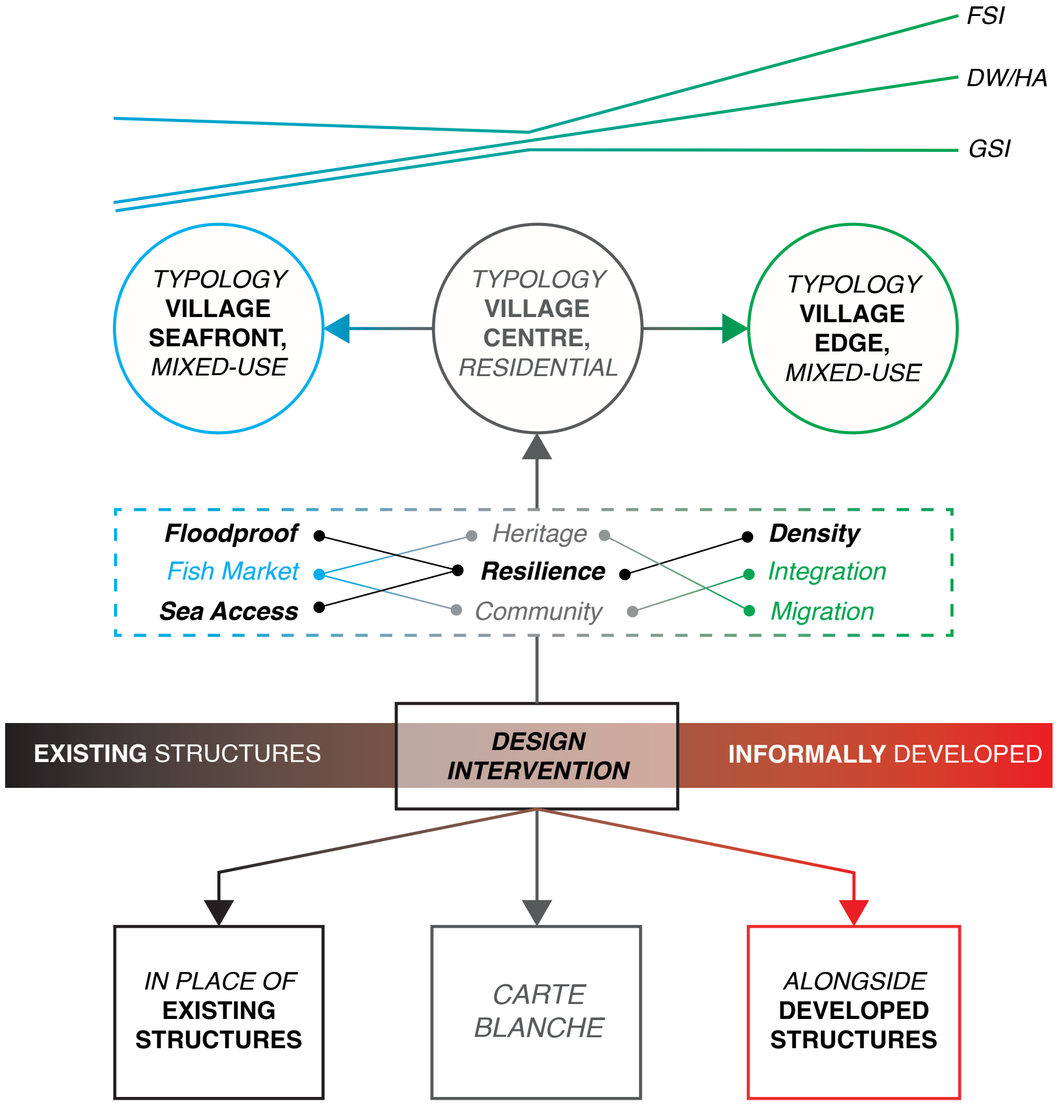
And then slowly move inside the village for further construction.



URBAN PLAN/ **TYPOLOGIES**

APPLICATION, FUNCTIONS & DENSITY

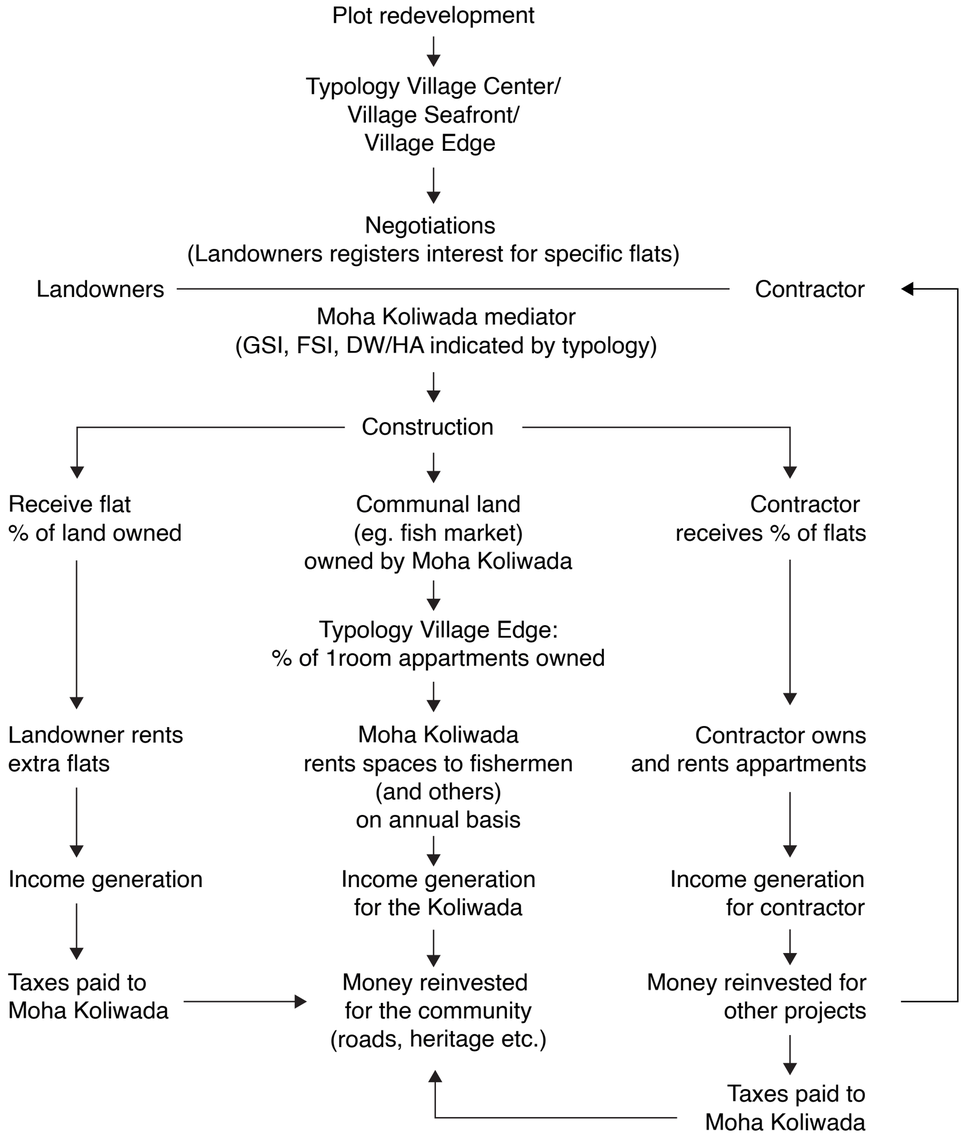
My plan is to intervene before the village is informally developed. Therefore, the designs can exist in place of existing structures, within empty plots and alongside already developed structures. Each housing typology has its own purpose. The Village seafront is mixed-use and is dedicated in providing the important sea access to the community. The village centre typology is residential and is dedicated to building resilience within the community. The village edge typology is aimed at providing the necessary density to the village. Therefore, each typology provides different FSI, DW/HA and GSI to achieve these aims.



URBAN PLAN/ **STAKEHOLDERS**

LANDOWNERS, CONTRACTORS & MOHA KOLIWADA

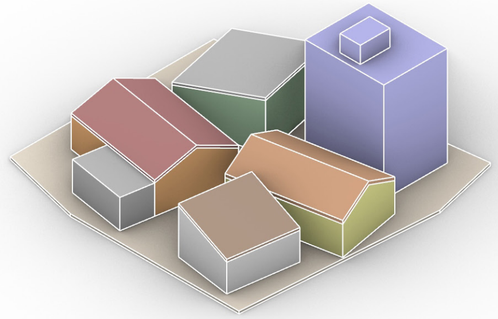
In regard to the stakeholders involved, the plan is for Moha Koliwada to act as a mediator between the landowners and the contractors to coordinate the new developments. Both landowners and contractors will receive property as a reward whereas moha koliwada will manage heritage buildings and communal areas and buildings. I find the use of a body such as Moha Koliwada to be necessary for the provision and care of public spaces such as the fishing facilities but also for the overall achievement of major works such as the new streets and the water reservoirs.



URBAN PLAN/ **TYPOLOGIES**

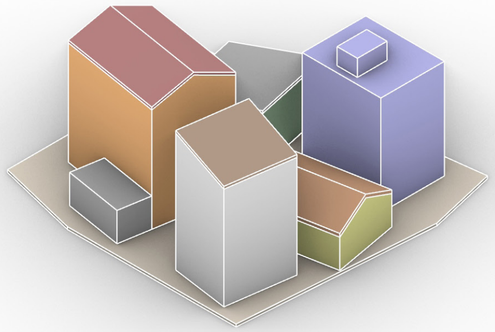
EXAMPLE PLOT

To explain the typologies I take an example plot with existing houses.



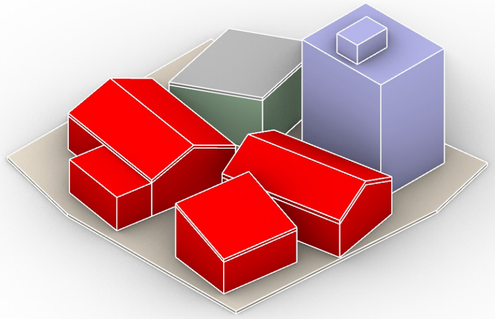
INFORMAL DEVELOPMENT

I indicate the possible informal development



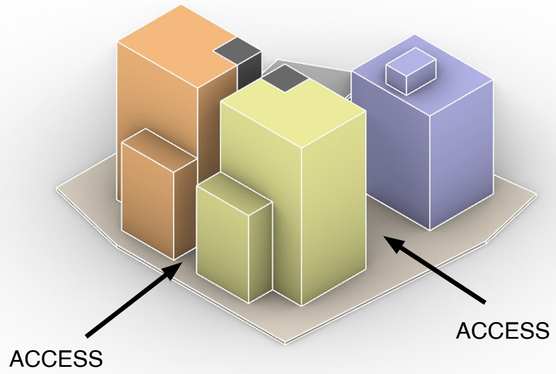
DEMOLITION INSTEAD

and I propose instead the demolition of houses.



ORGANISED DEVELOPMENT

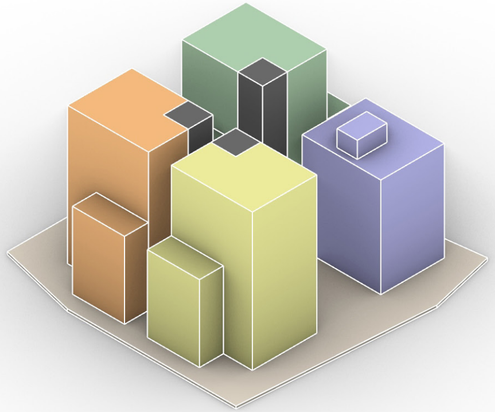
I plan for organised buildings to be erected alongside other developed buildings. Vertical circulation indicated in black connects the two buildings. The plot remains permeable and accessible from all sides.



URBAN PLAN/ **TYPOLOGIES**

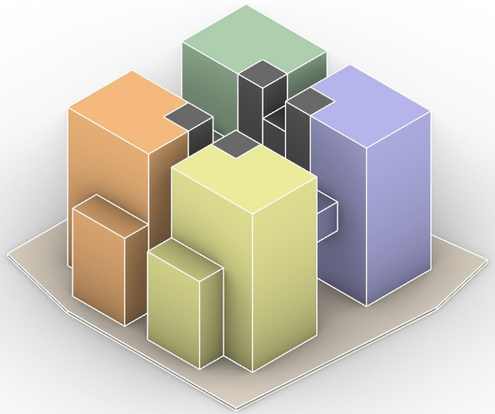
ORGANISED DEVELOPMENT

Three buildings can be built instead, or…

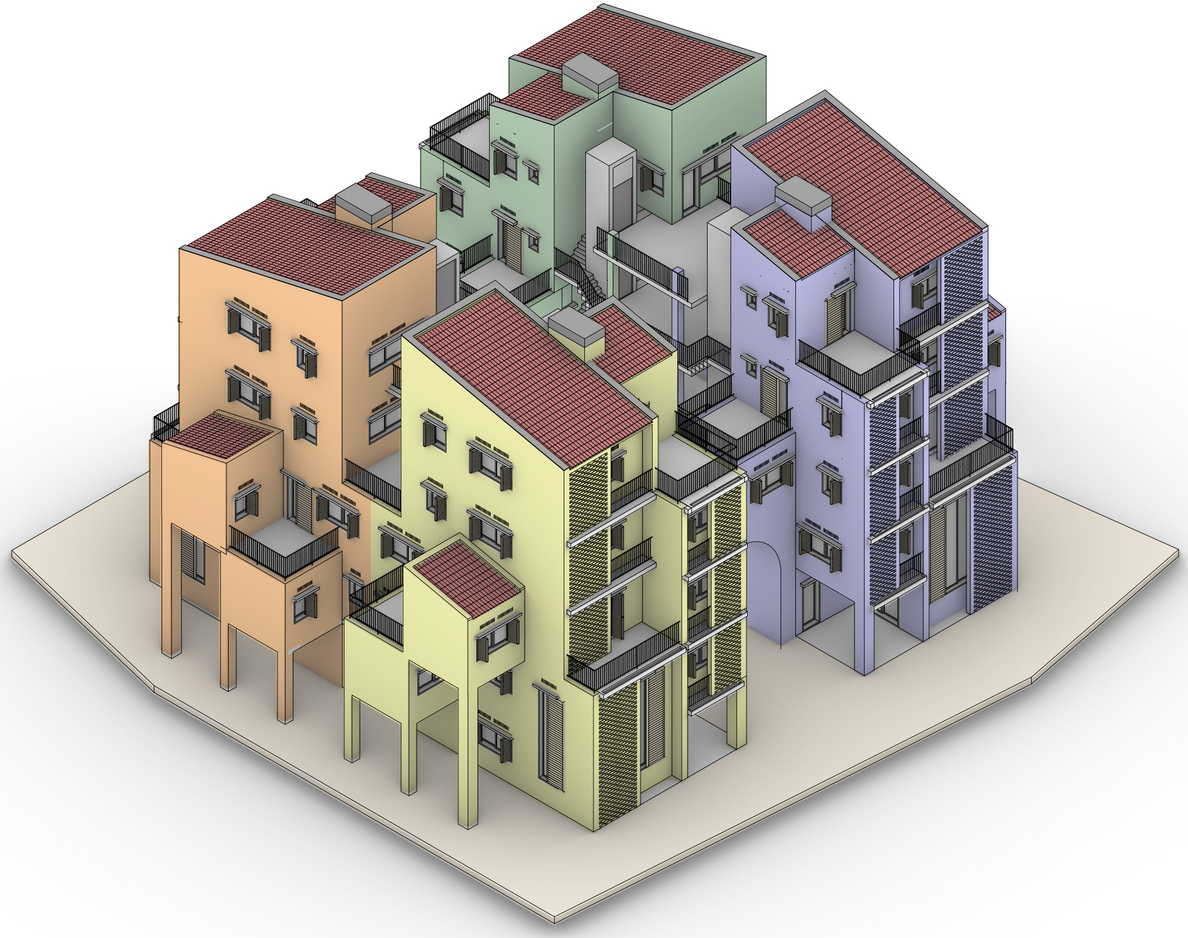


NEW CLUSTER

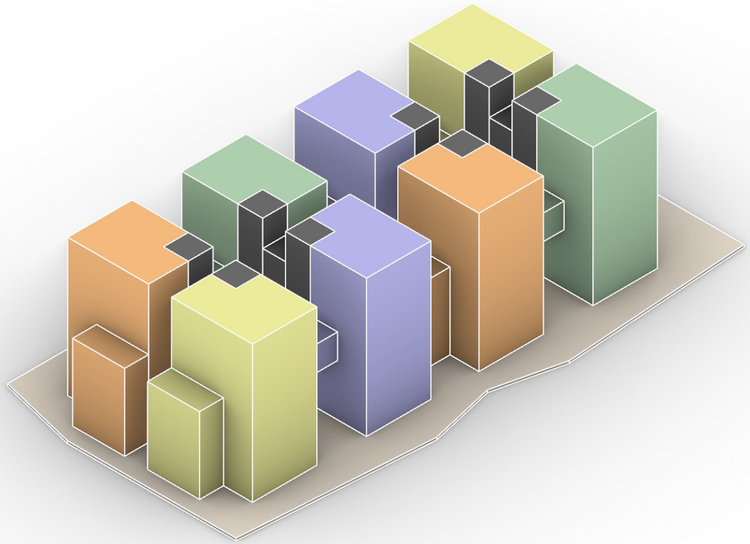
Four to form a wholly new-built cluster. And this is how we arrive to the village centre typology as seen on the right.



VILLAGE CENTRE

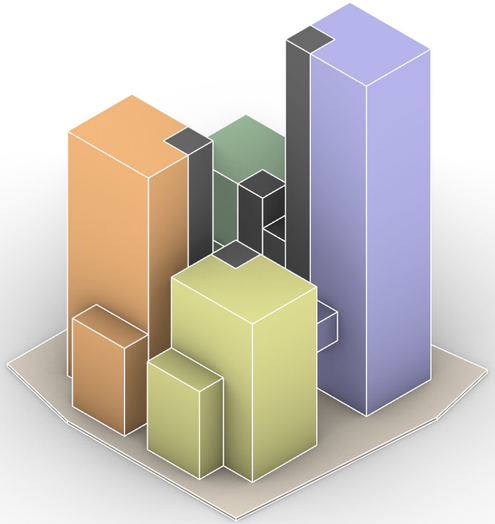


These blocks can be replicated
to form a neighbourhood.



URBAN PLAN/ **TYPOLOGIES**
NIEHGHBORHOOD

Or floors can be added to them…



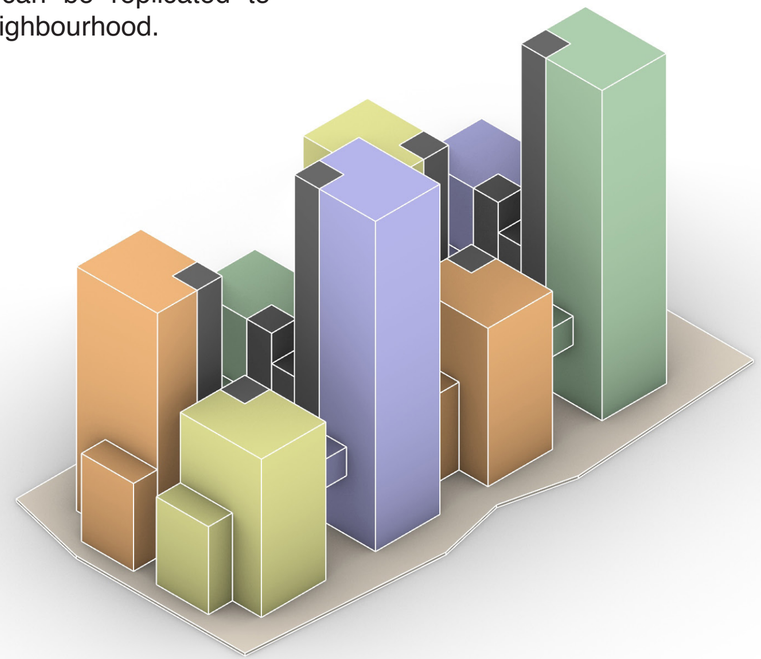
VILLAGE EDGE

... to construct the village edge typology.



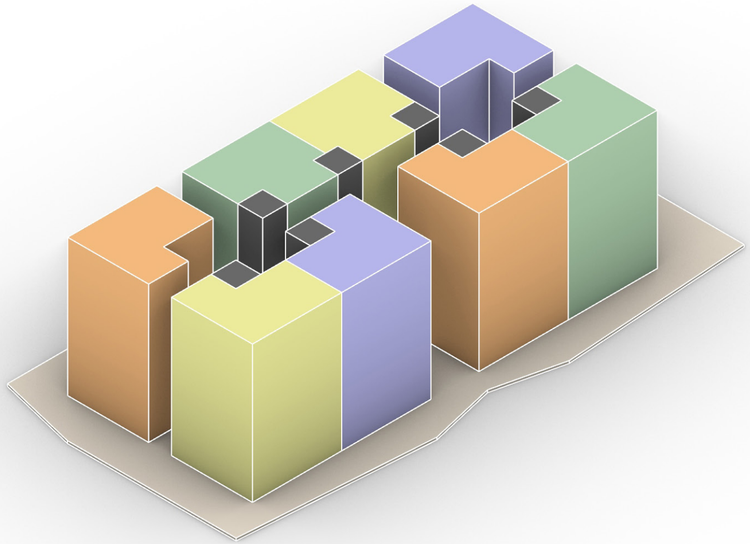
NEIGHBORHOOD

Similarly the village edge typology can be replicated to form a neighbourhood.



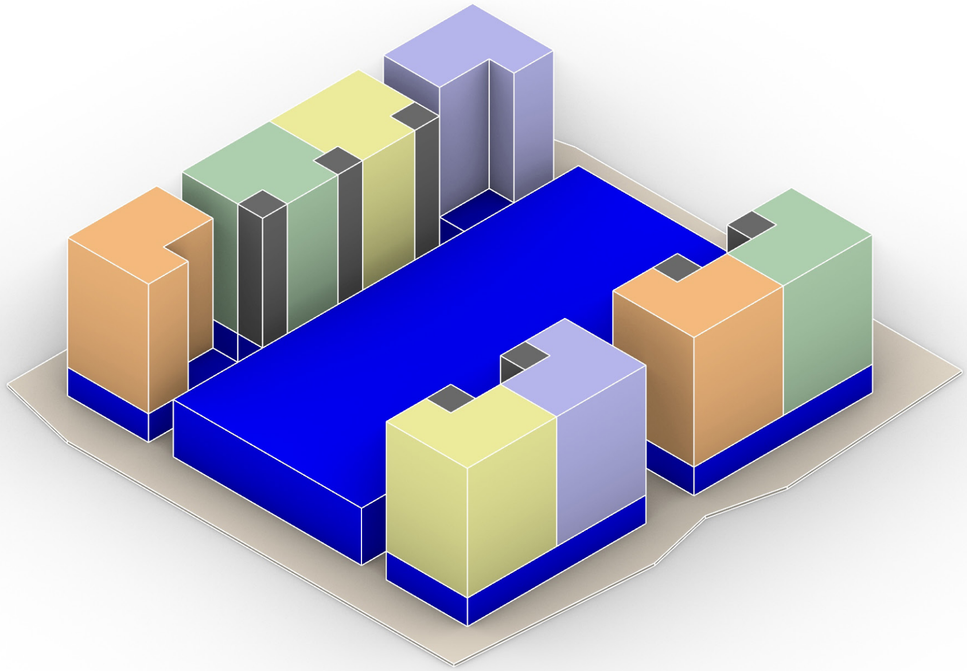
SHUFFLE CIRCULATION

And if we shuffle circulation...



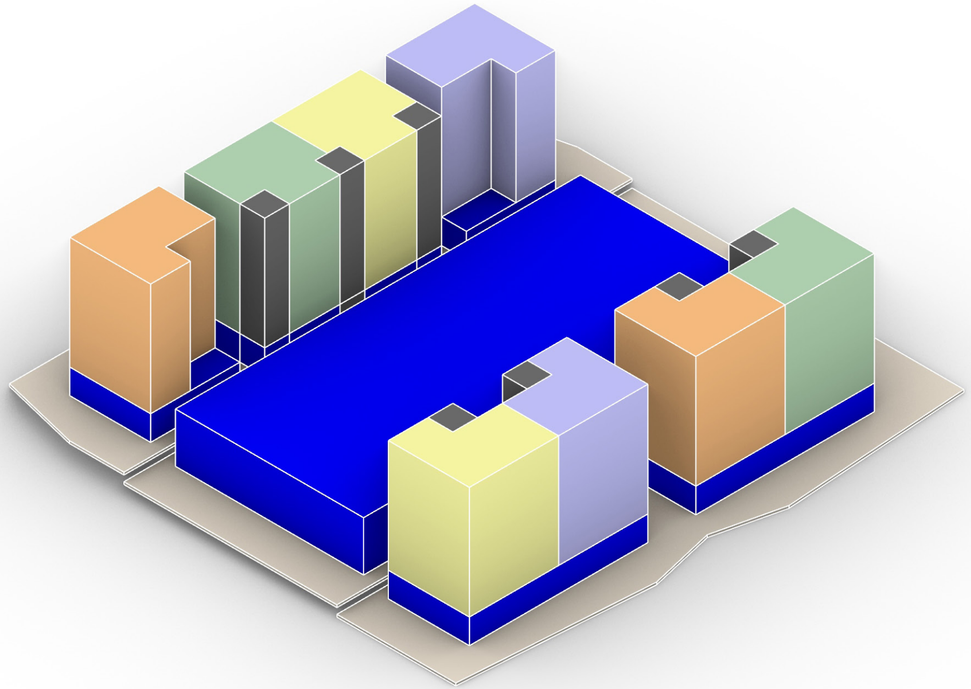
OPEN FOR FISH MARKET

...and also open the blocks to host the fish market indicated in blue.

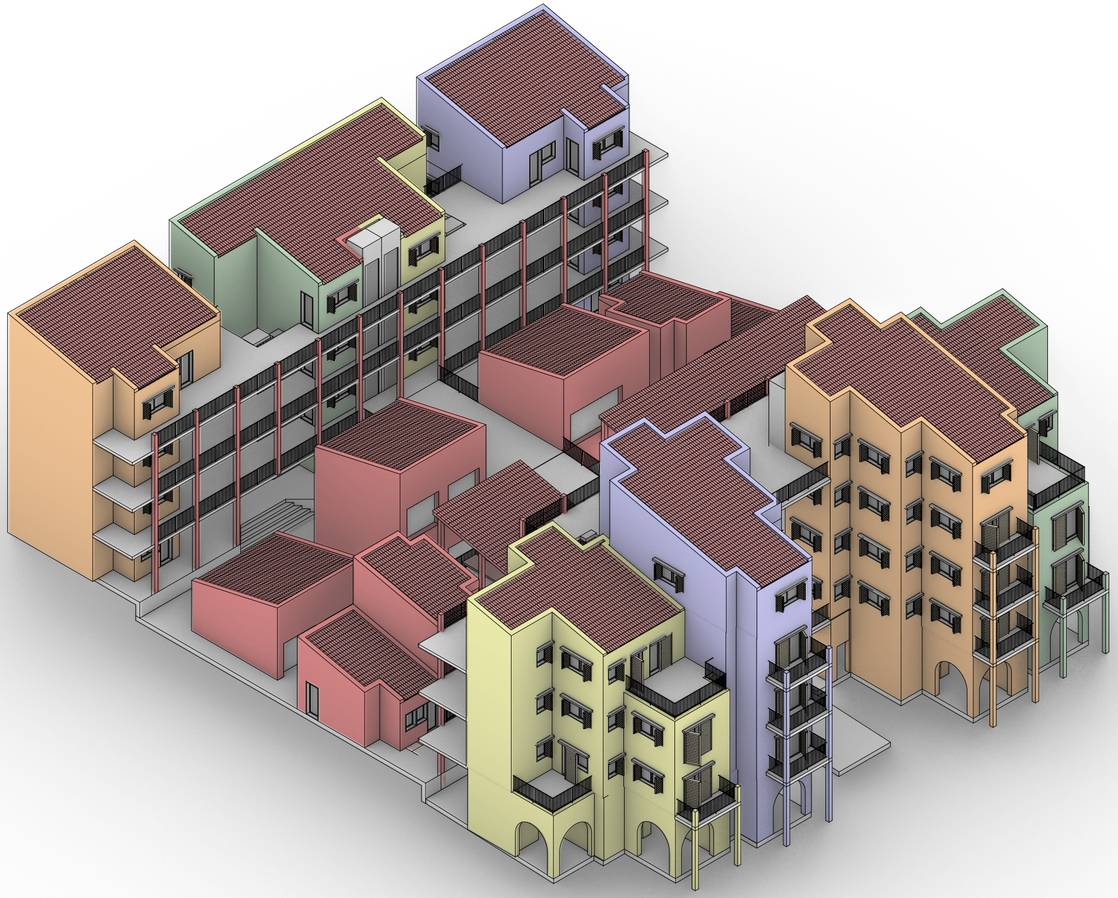


SPLIT FLOORS FOR FLOODING

As well as split the floors to accommodate flooding, we arrive at the village seafront typology.



VILLAGE SEAFRONT



VILLAGE CENTRE TYPOLOGY

VILLAGE CENTRE/ **DESIGN**

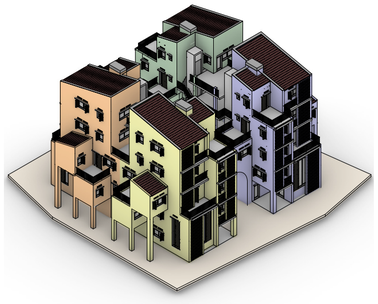
LEVEL 0 PLAN

The ground floor plan indicates the four ground floor apartments which are two stories high. They are meant to be occupied by families from the village. The preferred orientation is indicated in this plan, with the West and East sides having a secondary brick wall for sun protection.

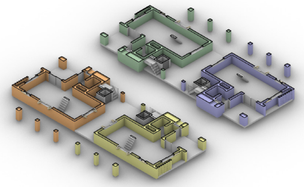
Each staircase and elevator is connected with another one and the centre remains free for a small accessible courtyard. There are 4 entrances to the courtyard, 2 large and 2 smaller ones while the entrance to the ground floor apartment is tucked away below a canopy.



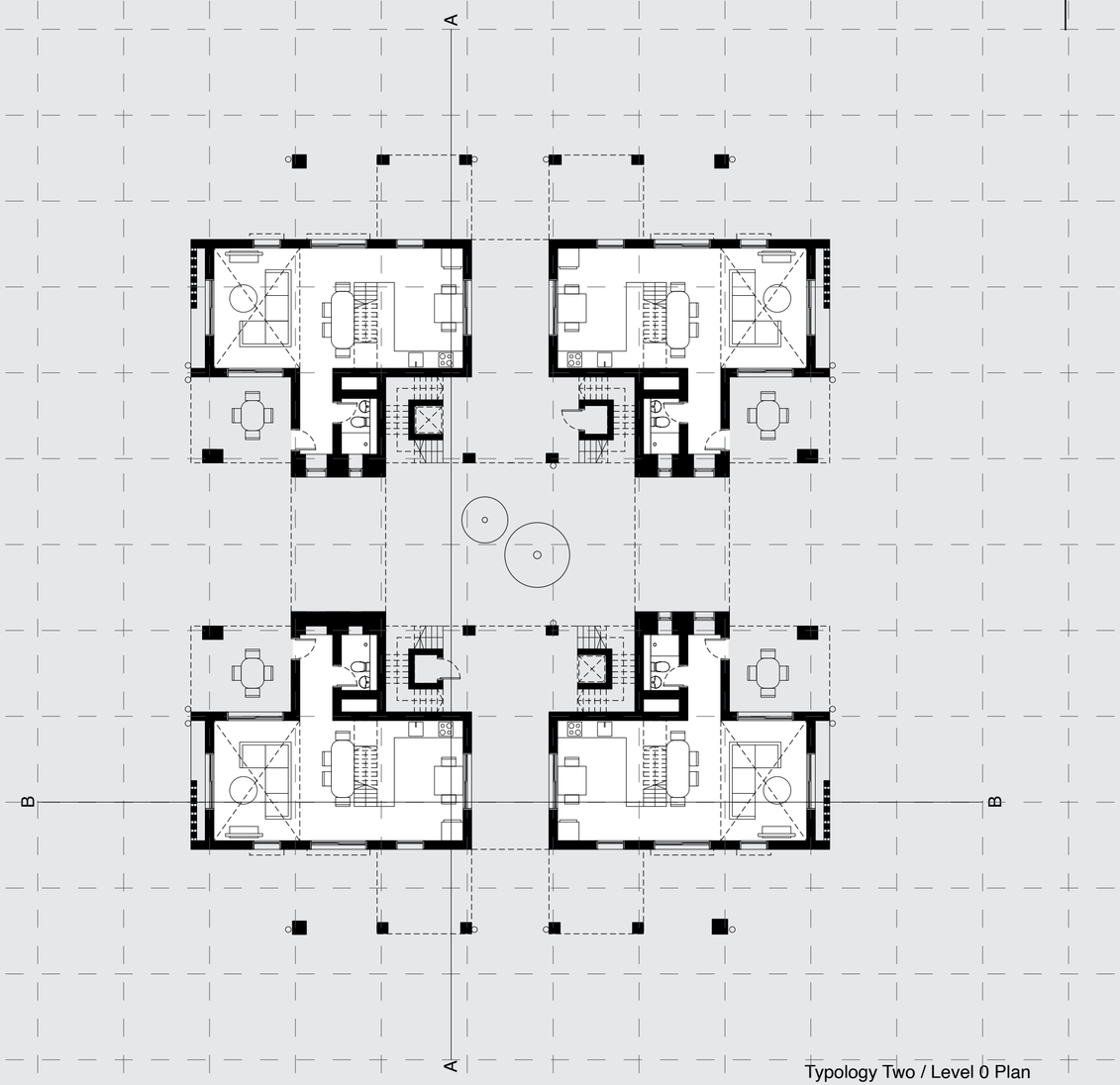
Urban plan



Axonometric



Floor axonometry



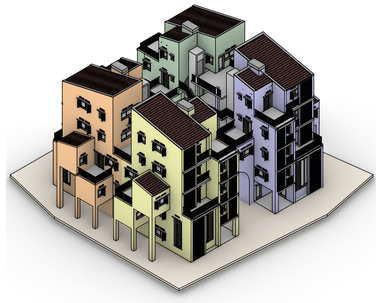
VILLAGE CENTRE/ **DESIGN**

LEVEL 1 PLAN

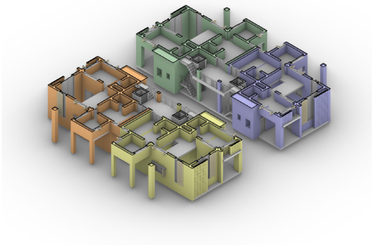
On the first floor you can see the secondary entrance to the apartments. The doors open to the corridor to assist with the cross ventilation of the rooms. Care is taken to include windows on at least 2 sides of each room for proper ventilation.



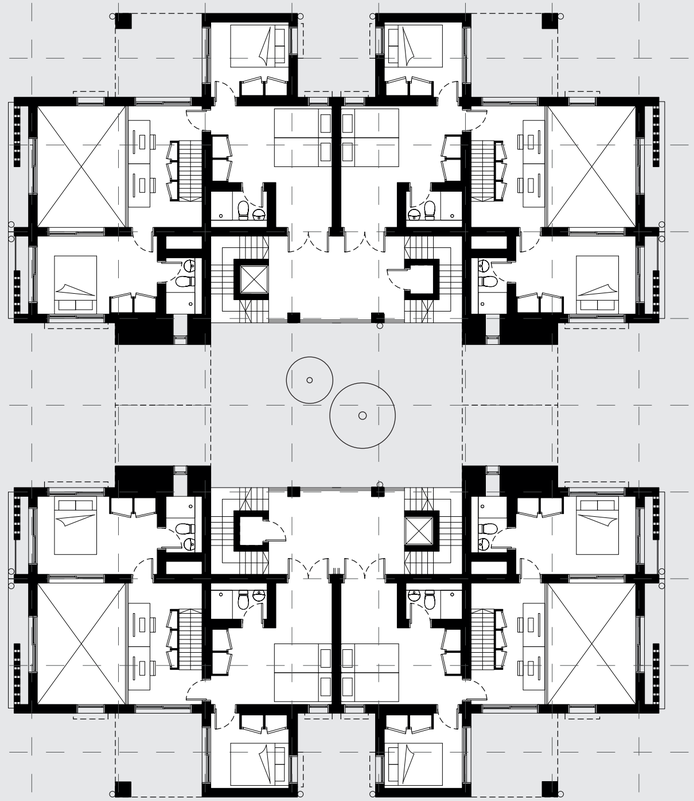
Urban plan



Axonometric



Floor axonometry



Typology Two / Level 1 Plan

3m 15m

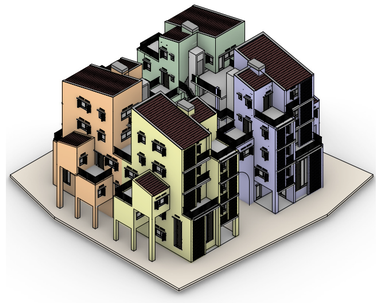
VILLAGE CENTRE/ **DESIGN**

LEVEL 2 PLAN

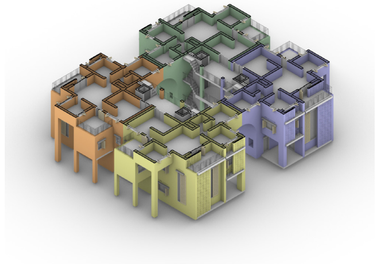
Going up to the 2nd floor, new volumes spring out to form bedrooms and volumes from the lower floors become terraces.



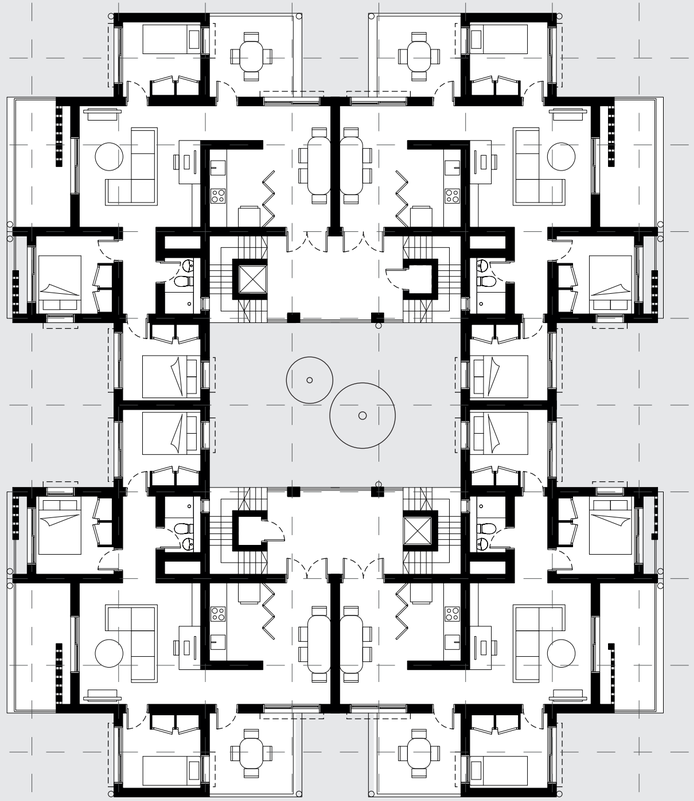
Urban plan



Axonometric



Floor axonometry



N

Typology Two / Level 2 Plan

3m 15m

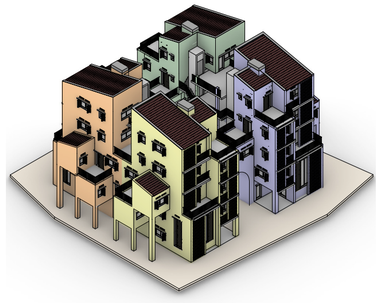
VILLAGE CENTRE/ **DESIGN**

LEVEL 3 PLAN

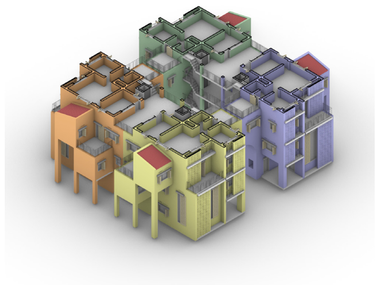
A similar pattern continues in the 3rd floor to form smaller apartments.



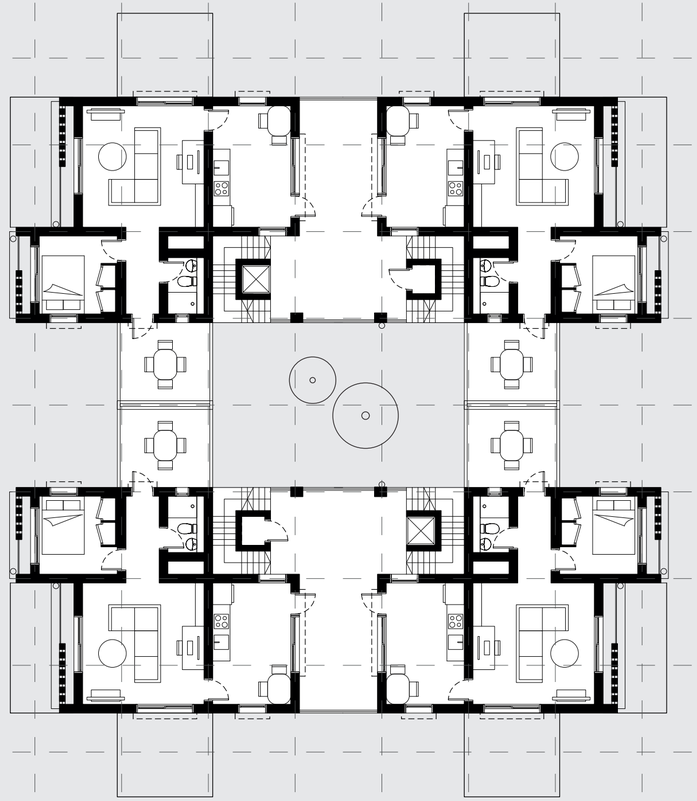
Urban plan



Axonometric



Floor axonometry



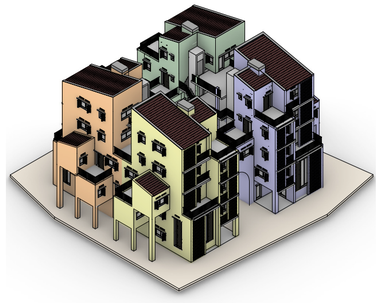
VILLAGE CENTRE/ **DESIGN**

LEVEL 4 PLAN

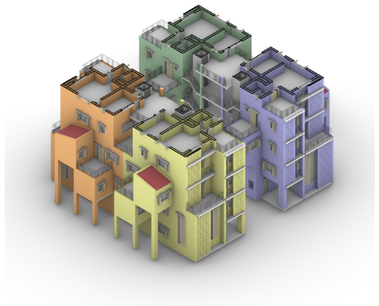
And finally on the 4th and last floor there is a one-bedroom apartment repeated over four times.



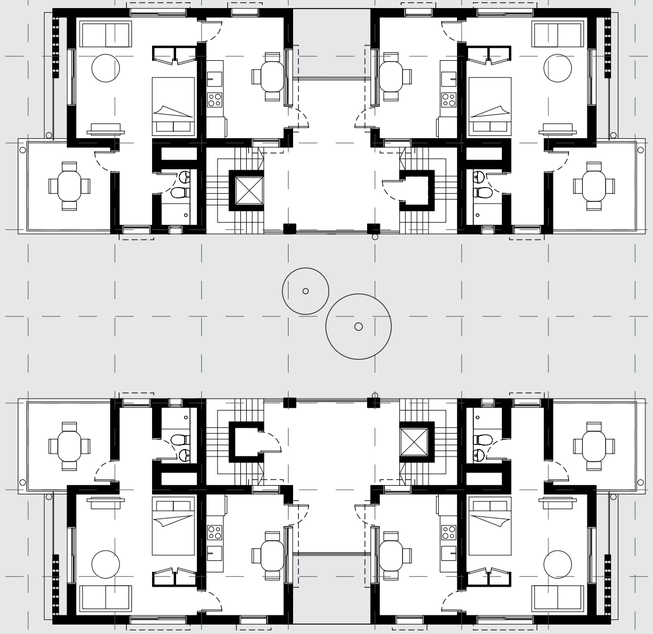
Urban plan



Axonometric



Floor axonometry



Typology Two / Level 4 Plan

3m 15m

VILLAGE CENTRE/ **DESIGN**

SECTION

The sections indicate the compactness of the design, compactness aimed at giving the necessary density without limiting the comfort of the residents while maintaining the intimacy of the village. On the right you can see how the vertical circulation of each block connects to the other one. Different colours indicate the different apartments and the intention for the residents to decorate their house according to their wants. This section cuts through the bedrooms.



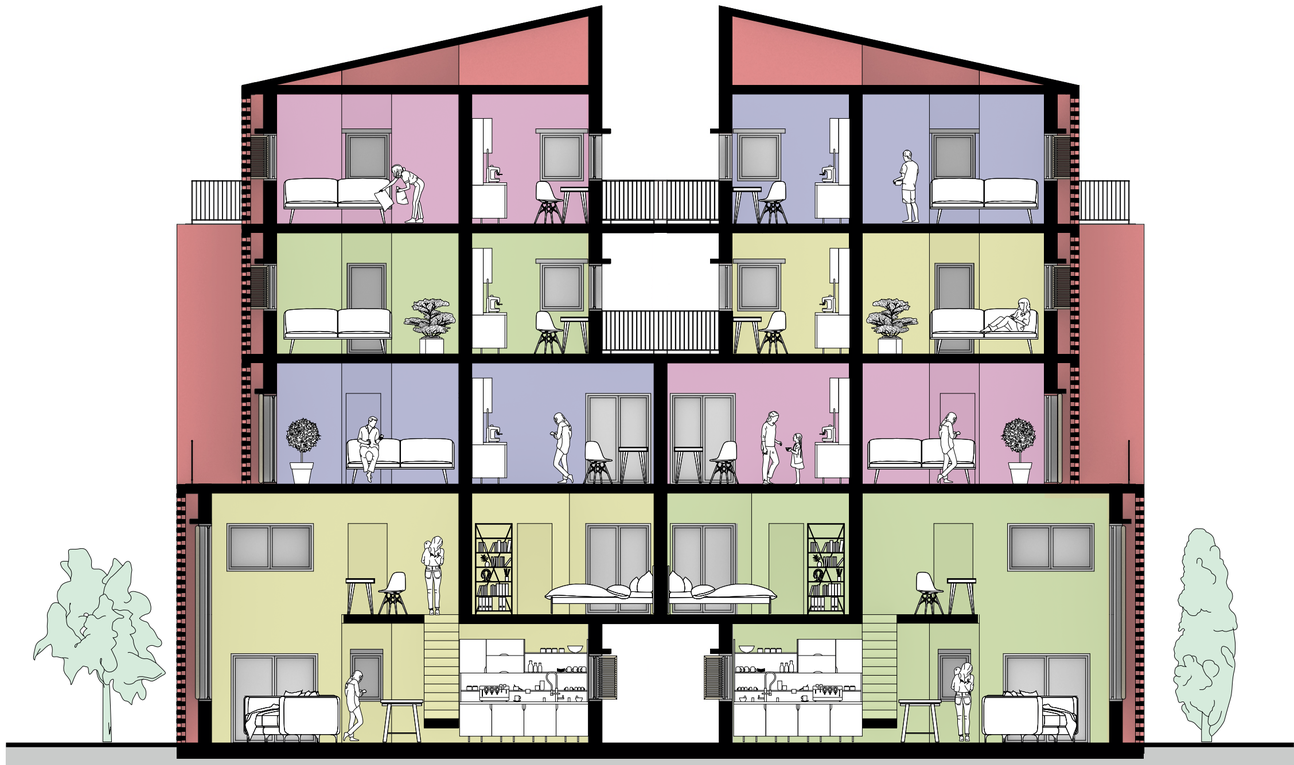
Typology Two / Section AA

1.5m 7.5m

VILLAGE CENTRE/ **DESIGN**

SECTION

This section cuts through the living rooms and shows how they can all relate with the street level. A stronger connection with the street is of course maintained at the ground floor but also at the levels that have a balcony further above.



Typology Two / Section BB

1.5m 7.5m

VILLAGE CENTRE/ **DESIGN**

SECTION

And here is a section cut from the opposite direction showing the kitchens. A generous arch connects the two blocks of buildings to guide the residents to their interior courtyard. Unique bedrooms lie on top of the arch and on the level above two generous terraces are placed.



Typology Two / Section CC

1.5m 7.5m

VILLAGE CENTRE/ **DESIGN**

SECTION

This section again cuts through the living rooms and the arch leading to the interior courtyard. The 4.2m wide spaces are only found in this typology and rpovide residents with more generous living rooms and kitchen spaces.



Typology Two / Section DD

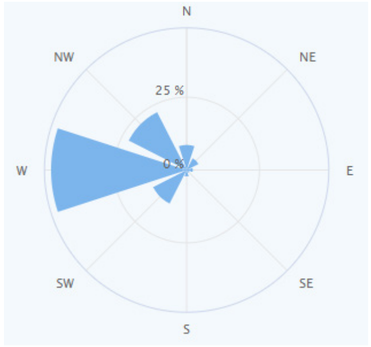
1.5m 7.5m

VILLAGE CENTRE/ **TECHNOLOGY**

VENTILATION & DAYLIGHT

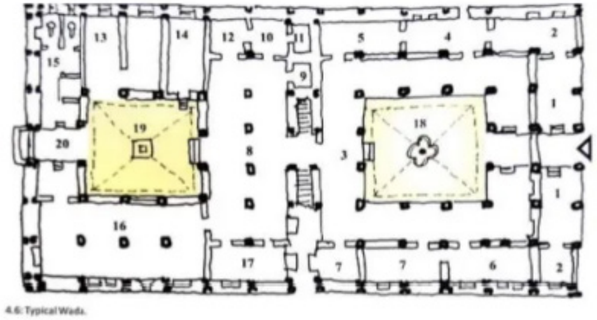
The design borrows from the vernacular wada house to employ a courtyard in order to allow for Western winds to penetrate the block and daylight to reach all apartments. The vernacular house is more compact and is designed to draw out warm air through the courtyards. In my design the air is allowed to flow through the block in order to have effect in the interiors. In addition, the way the volumes of the block are arranged and with the help of the couryard, daylight is allowed to enter the interiors at all sides.

WIND ROSE IN NAVI MUMBAI



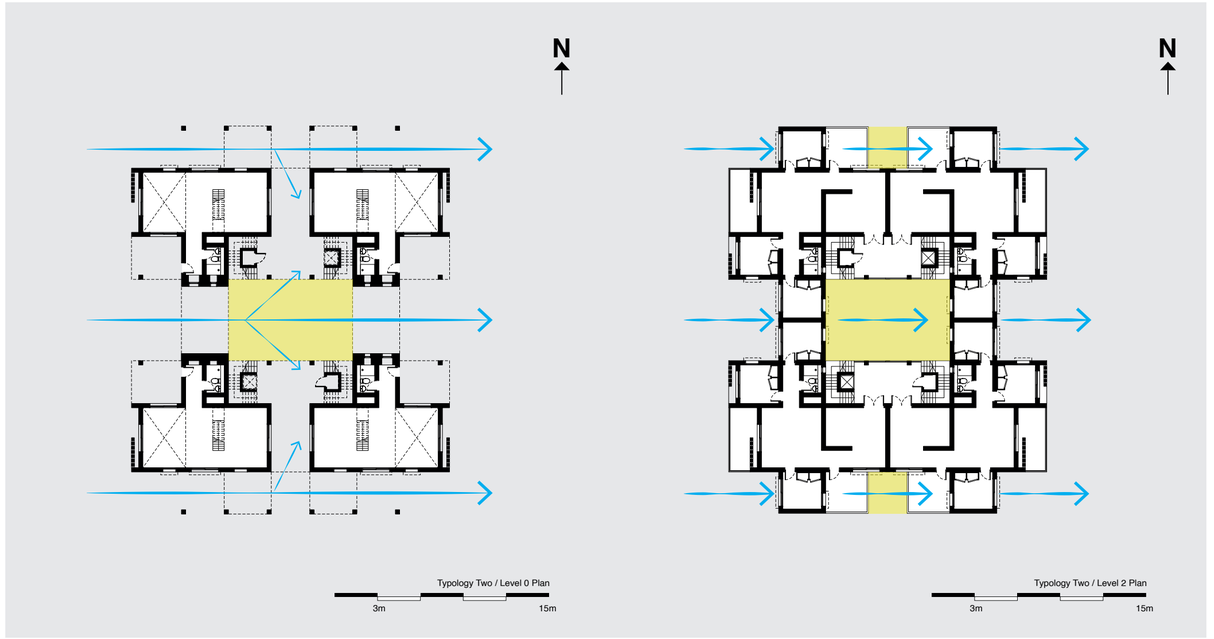
SOURCE: https://world-weather.info/archive/india/navi_mumbai/

VERNACULAR WADA HOUSE



4.6: Typical Wada.

SOURCE: https://www.slideshare.net/MansiJain34/vernacular-architecture-of-mahrashtra-west



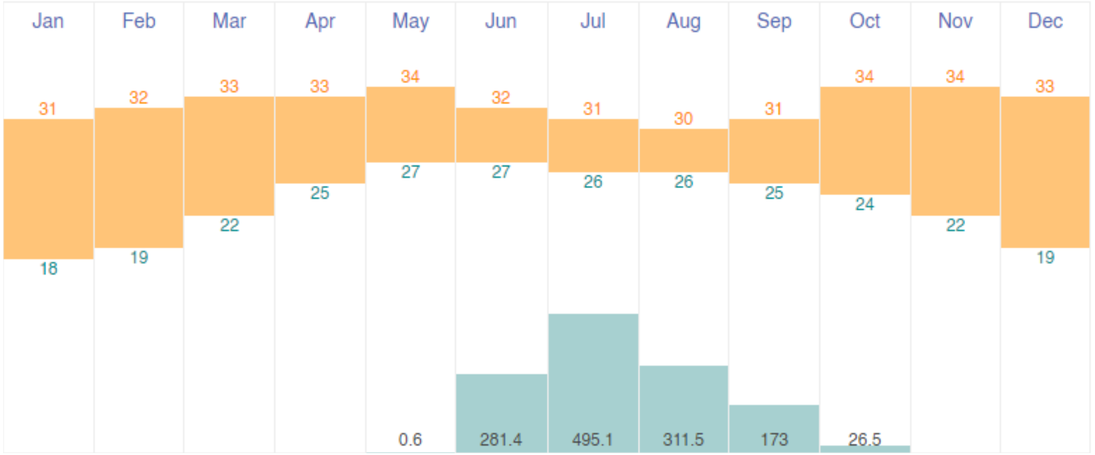
Plan diagrams

VILLAGE CENTRE/ **TECHNOLOGY**

TEMPERATURES & HUMIDITY

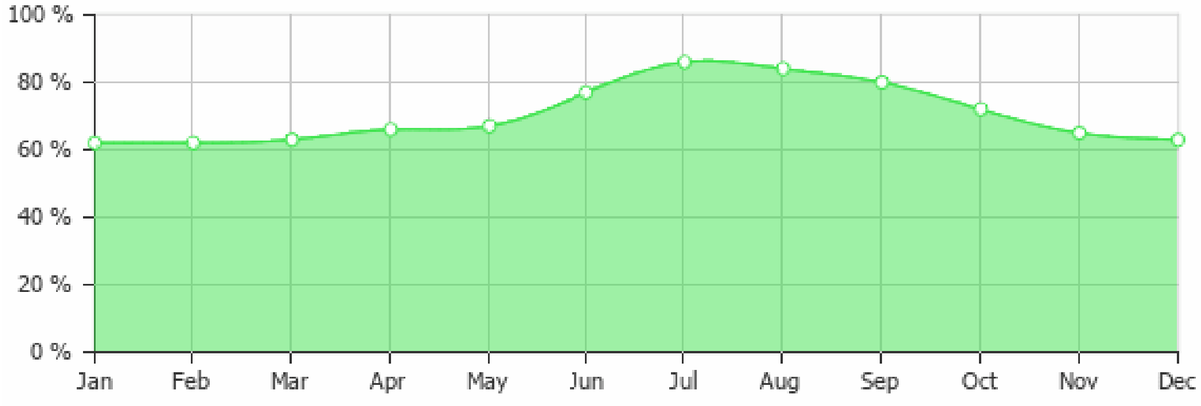
Navi Mumbai has warm temperatures throughout the year and high humidity which calls for ventilation throughout the year, except at night-time, to cool the apartments in a passive manner. At night-time the windows can be closed if the temperatures are too low.

NAVI MUMBAI AVERAGE TEMPERATURES



SOURCE: https://www.slideshare.net/MansiJain34/vernacular-architecture-of-mahrashtra-west

NAVI MUMBAI HUMIDITY LEVELS

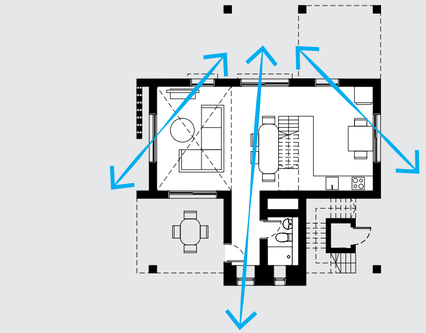


SOURCE: https://weather-and-climate.com/average-monthly-Humidity-perc,mumbai,India

CROSS VENTILATION PER APARTMENT

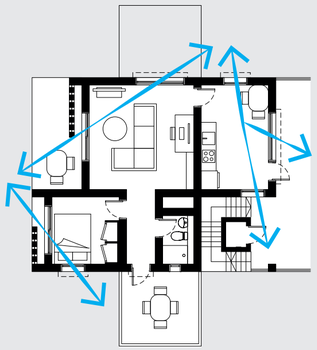
This is why care is also taken to include at least two openings per room for wind to penetrate and cool the apartments. The diagrams show the apartments per floor which are then replicated to form blocks.

Plan diagrams



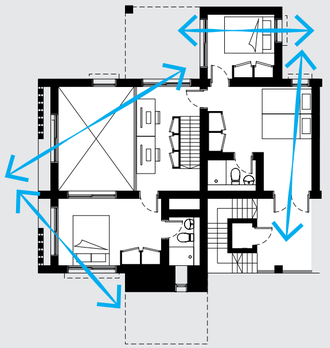
Typology Two / Level 0 Plan

3m 15m



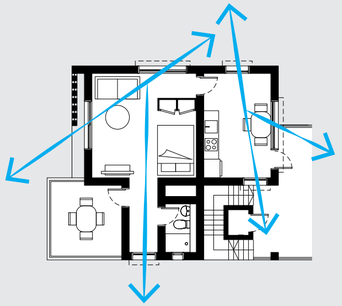
Typology Two / Level 3 Plan

3m 15m



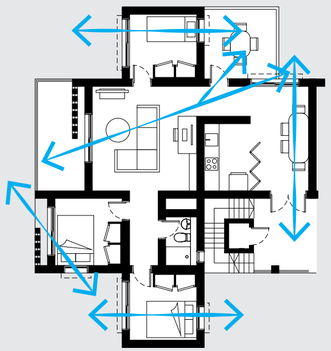
Typology Two / Level 1 Plan

3m 15m



Typology Two / Level 4 Plan

3m 15m



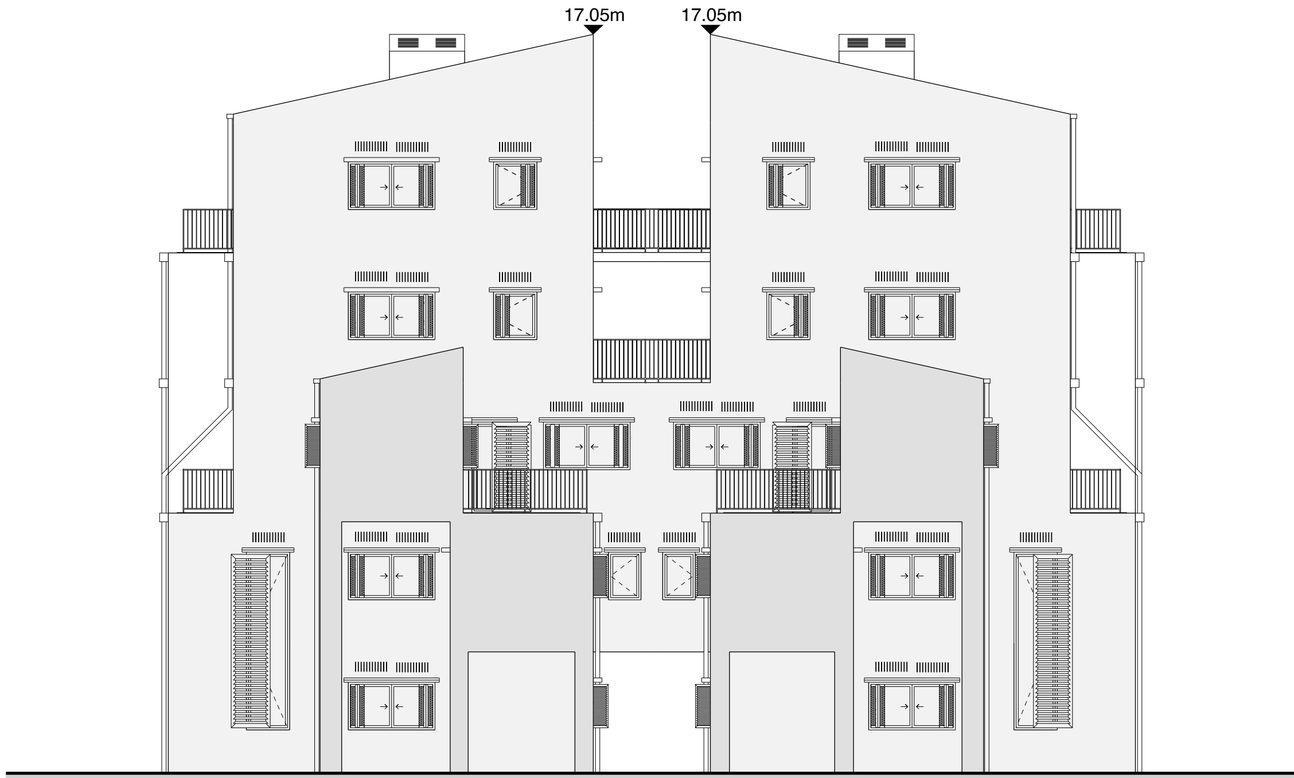
Typology Two / Level 2 Plan

3m 15m

VILLAGE CENTRE/ **TECHNOLOGY**

NORTH/ SOUTH ELEVATION

Excessive sunlight is to be blocked through bamboo shutters as seen in the elevations. The typical windows are sliding so as to avoid desruption of usable interior space. However, the smaller windows and the bigger two floor high windows are hinged. All windows have tiny vertical openings above them to allow for some ventilation even when they are closed.



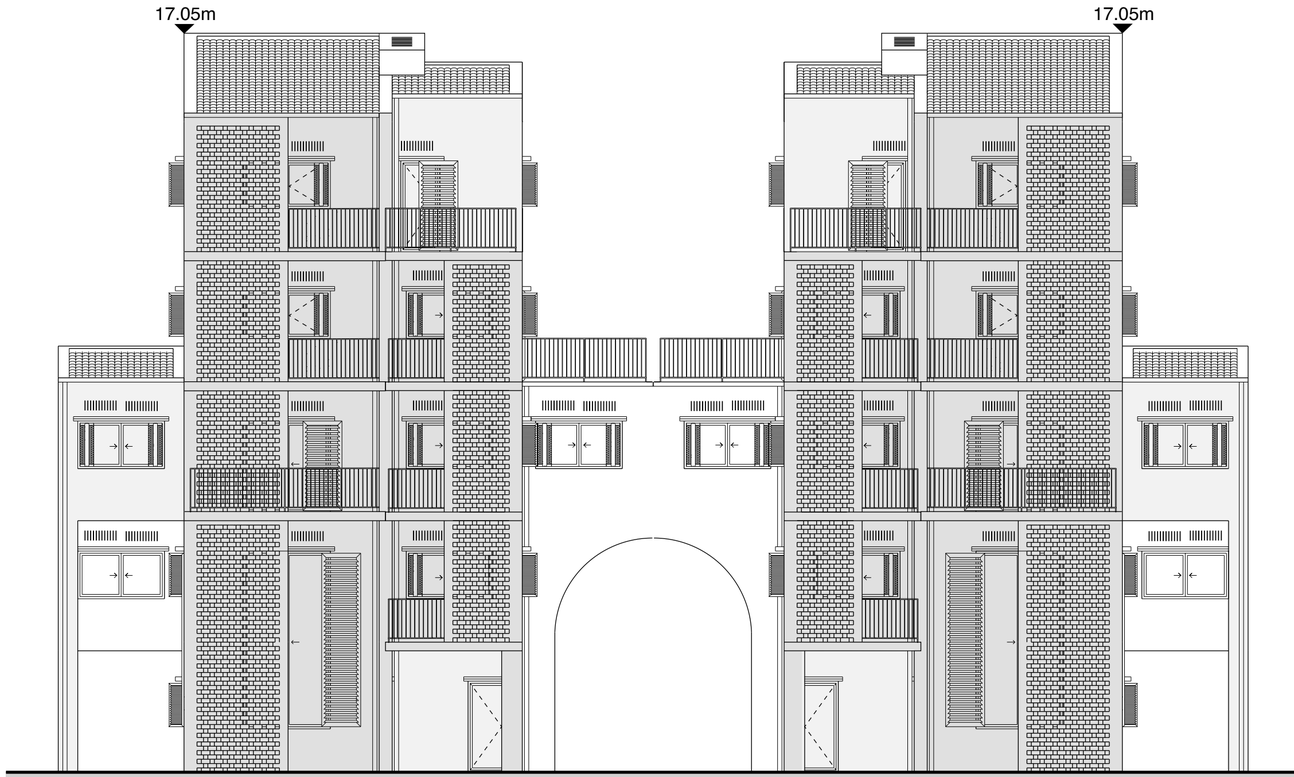
Typology Two / Elevation One

1.5m 7.5m

VILLAGE CENTRE/ **TECHNOLOGY**

WEST/ EAST ELEVATION

On the right, the West and East elevations which are identical, employ secondary brick walls designed to block excessive sunlight while adding character to the village centre typology. All external areas are covered with railings, even those that are not usable, to have a similar effect with french balconies.



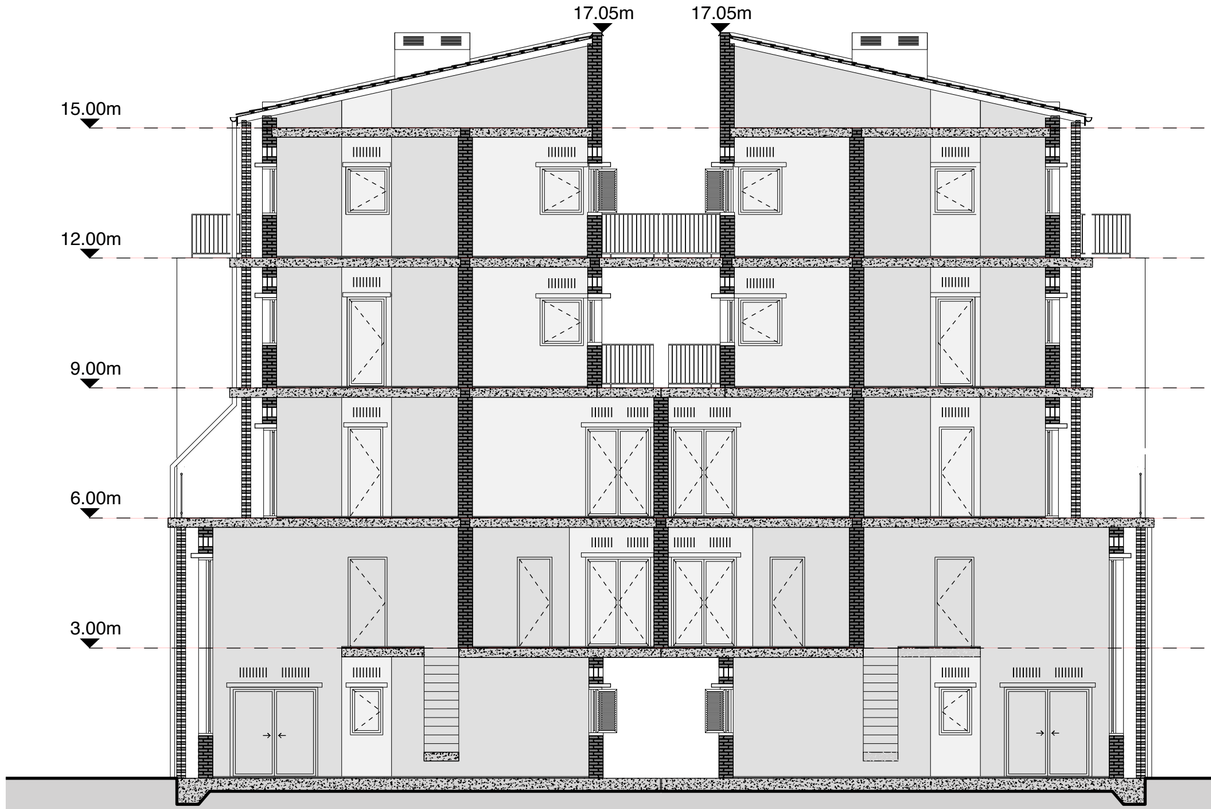
Typology Two / Elevation Two

1.5m 7.5m

VILLAGE CENTRE/ **TECHNOLOGY**

SECTION AA

And here is a construction section cutting through the living rooms. You can notice double doors in the centre of the section which are meant to provide ample ventilation of the rooms and an extension of the interior space towards the exterior circulation areas.



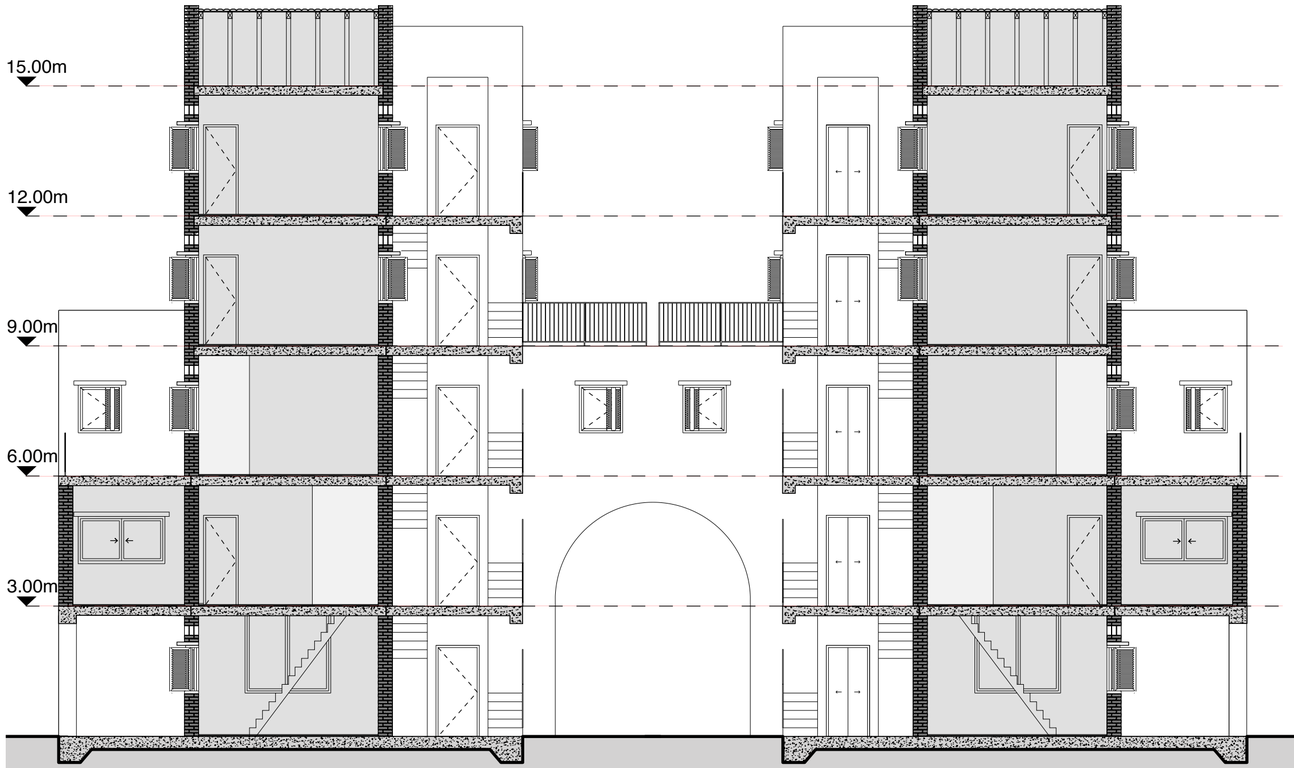
Typology Two / Section AA

1.5m 7.5m

VILLAGE CENTRE/ **TECHNOLOGY**

SECTION BB

And another section cutting in the opposite direction and through the load bearing walls. You can notice the reinforced concrete beams for the protruding volumes and the outdoor circulation space.



Typology Two / Section BB

1.5m 7.5m

VILLAGE CENTRE/ **TECHNOLOGY**

MATERIALS - WALLS & FLOORS

The load bearing and non-load bearing walls are made out of compressed earth blocks. This material is the main used for the construction of typology village centre and is very envrionmentally friendly because there is no heat required for production and the materials can be found locally. 9% of cement is used for stablization. This material is sound resistant, important for this project due to the proximity of the airport. It is also fire and insect resistant.



Compressed earth blocks

The material choice for floors is cast in-situ concrete and several beams are required that are also made from the same material. The materials for the concrete are sourced within India as well as the steel required for its reinforcement. Although reinforced concrete is not considered an environmentally friendly material, the alternative of using timber would also be problematic since it is imported to the country, and therefore having a high carbon footprint.



Cast in-situ concrete floors and beams

Waterproofing plaster is a great envrionmental solution to waterpoof the exterior wall surfaces of this typology. It is produced by a company named Evercrete that operates in India, although the production site is unknown.

Clay plaster is an even more environmentally friendly material that will be used to cover the interior walls that will not come in direct contact with rainwater. The materials can be sourced locally. Cracking of the clay plaster can be easily repaired after initial application.

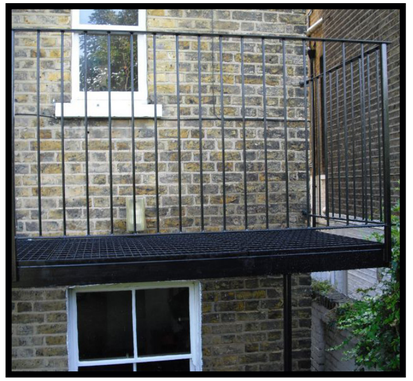


Exterior: Waterproofing plaster



Interior: Clay plaster

Steel railings will be used throughout the project for balconies, staircases and other circulation areas. There are local factories that can produce this product reducing the carbon footprint of the material. With special paint coating it will be durable in the humid weather of Navi Mumbai. It is easily maintained with new layers of paint after its initial application to prevent corrosion.

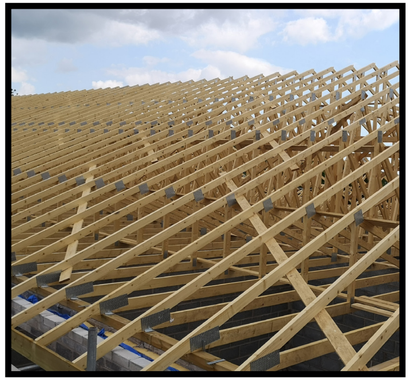


Steel railings

VILLAGE CENTRE/ **TECHNOLOGY**

MATERIALS - ROOF

In order to balance the use of steel in the project I opted for the use of timber for the roofs. Timber is imported in India but is otherwise very environmentally friendly especially if sourced responsibly. To dress the timber rafters, timber sheathing and battens will be used on top of it.



Timber structure

For the cladding of the roofs, clay roof tiles will be used that are produced within the Maharashtra state. Clay is environmentaly friendly although it does require high temperatures of heat for its production. They are fire and weather resistant able to withstand the heavy rainfall of Navi Mumbai. They are prone to wind but the sloping roof design should allow them to remain intact.



Local clay roof tiles

TYPOLOGIES/ **VILLAGE CENTRE**

MATERIALS - OPENINGS

Aluminium frame windows and doors are chosen because of their production within the Maharashtra state and their recyclability. The main disadvantage of the aluminium frames is that it required high temperatures to be molded. In addition, corrosion can occur due to salty humid air in Navi Mumbai. However, maintenance of the hinge systems after initial installation can prevent corrosion. Sliding windows and doors are at smaller risk of corrosion. Combined with double glazing aluminium frames have good heat insulating properties, ideal for night-time use in Navi Mumbai when temperatures can drop significantly.



Aluminium frame windows



Aluminium frame sliding doors for balconies

VILLAGE CENTRE/ **TECHNOLOGY**

MATERIALS - OPENINGS

Bamboo shutters are an environmental solution in providing shading devices for the windows of the project. The bamboo trees that are planted in the village can be used as a raw material, although they need to be transported to a factory for their processing. An advantage of bamboo over timber or aluminium shutters is their greater resistance to weathering from salty humid air. Thus, the shutters do not only provide sun protection but also protection to the aluminium frame windows.



Bamboo shutters

For the entrance and interior doors, timber is used. Raw timber is imported in the country, however, there are carpenters in Navi Mumbai that can produce these doors and their frames.



Timber doors for entrances and the interior

TYPOLOGIES/ **VILLAGE CENTRE**

MATERIALS - FLOORS

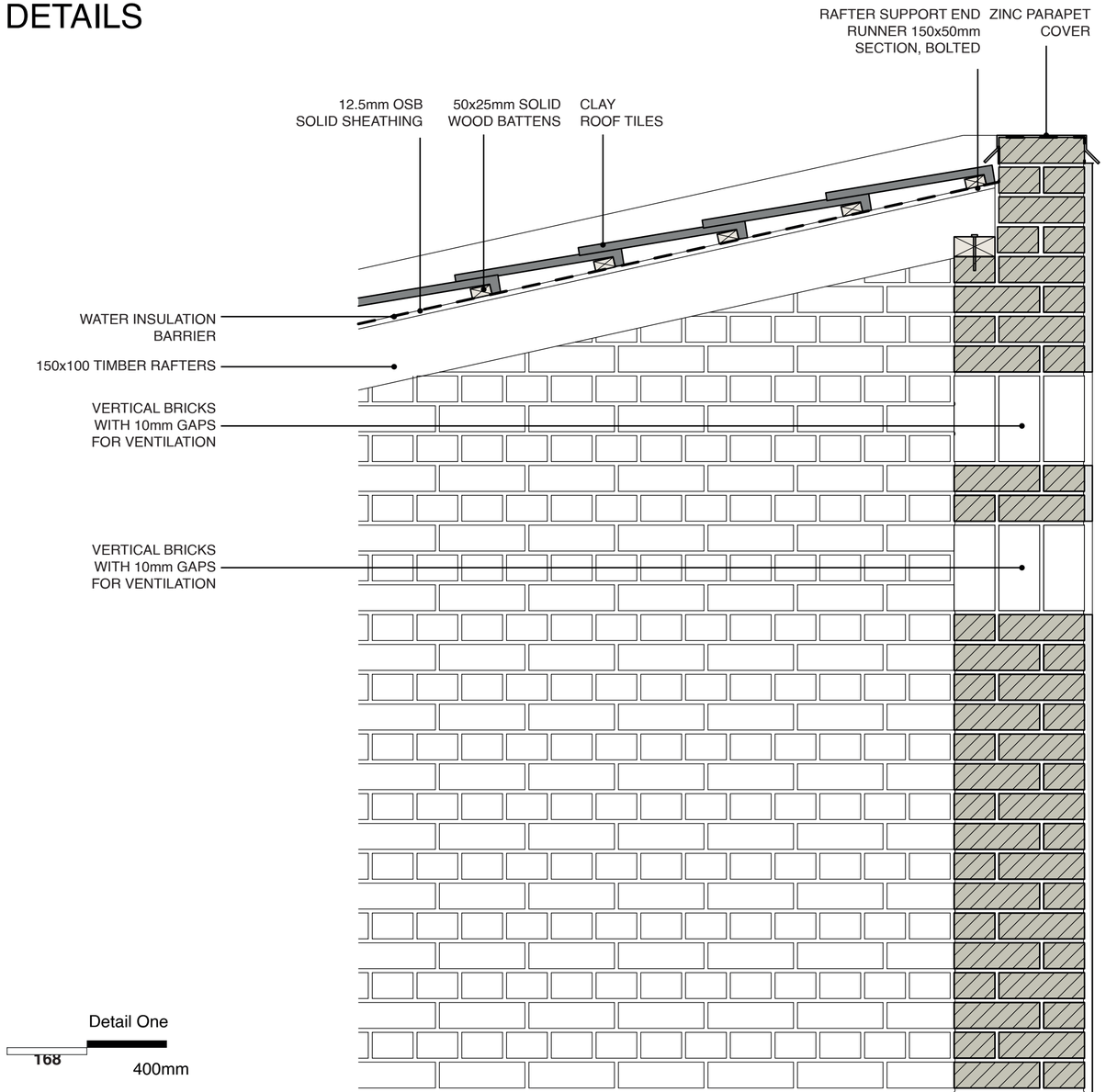
These clay floor tiles are environmentally friendly because of their raw material. They can be imported from Tamil Nadu, a state in the South of India. They are not the cheapest solution to flooring but I believe they will add a distinct and unique character to the interiors of the dwellings.



Clay floor tiles

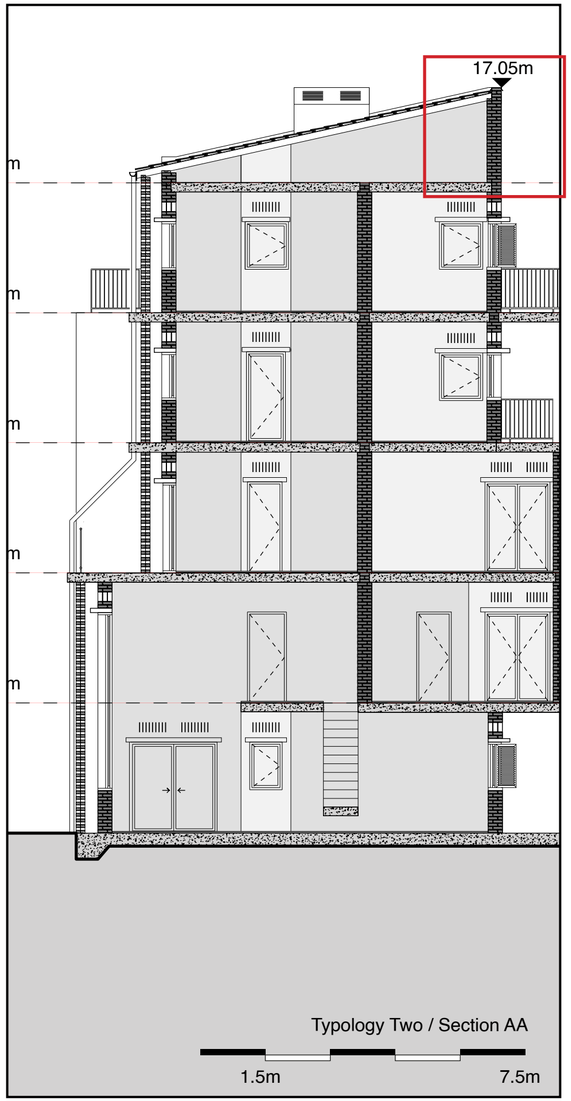
VILLAGE CENTRE/ **TECHNOLOGY**

DETAILS



Detail One

400mm

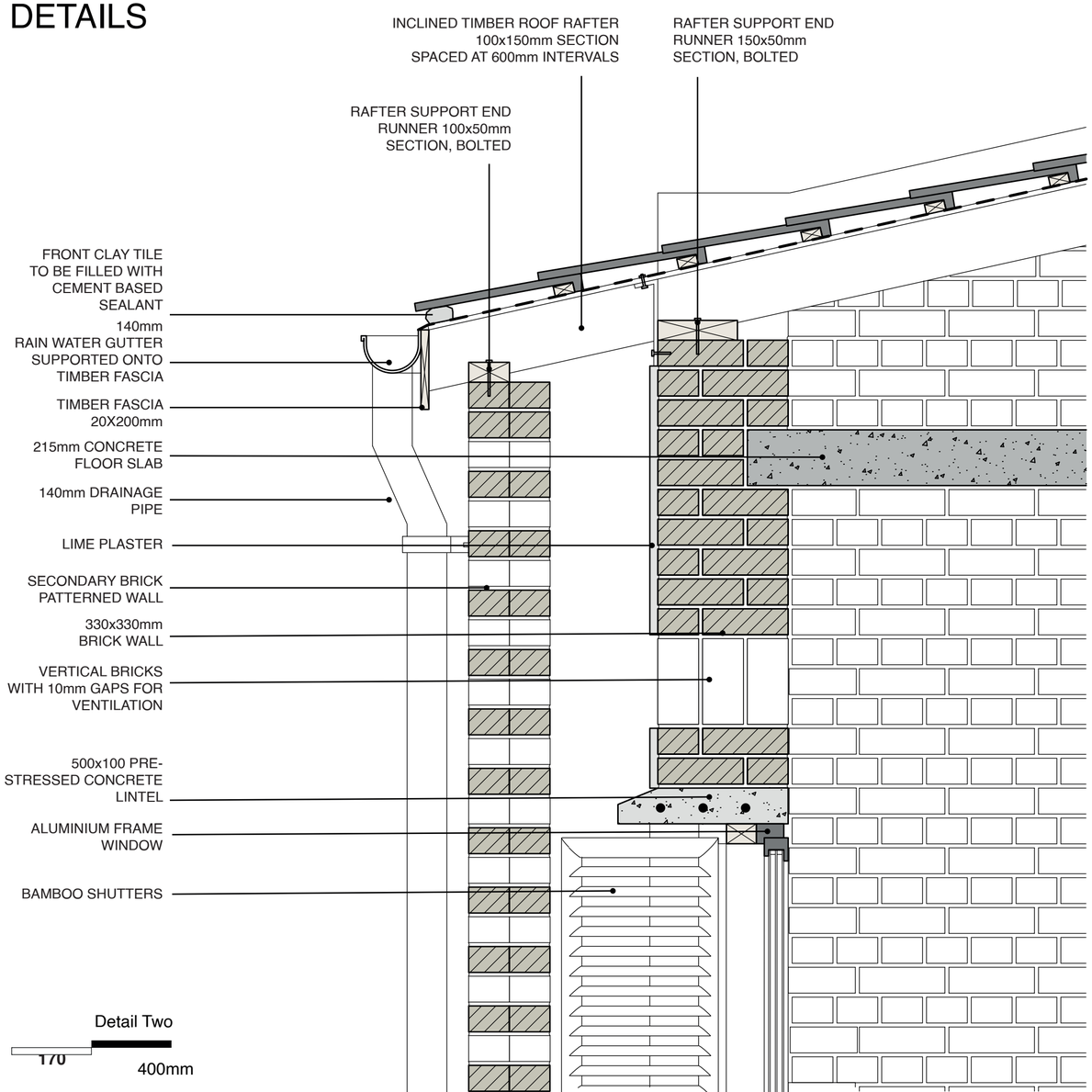


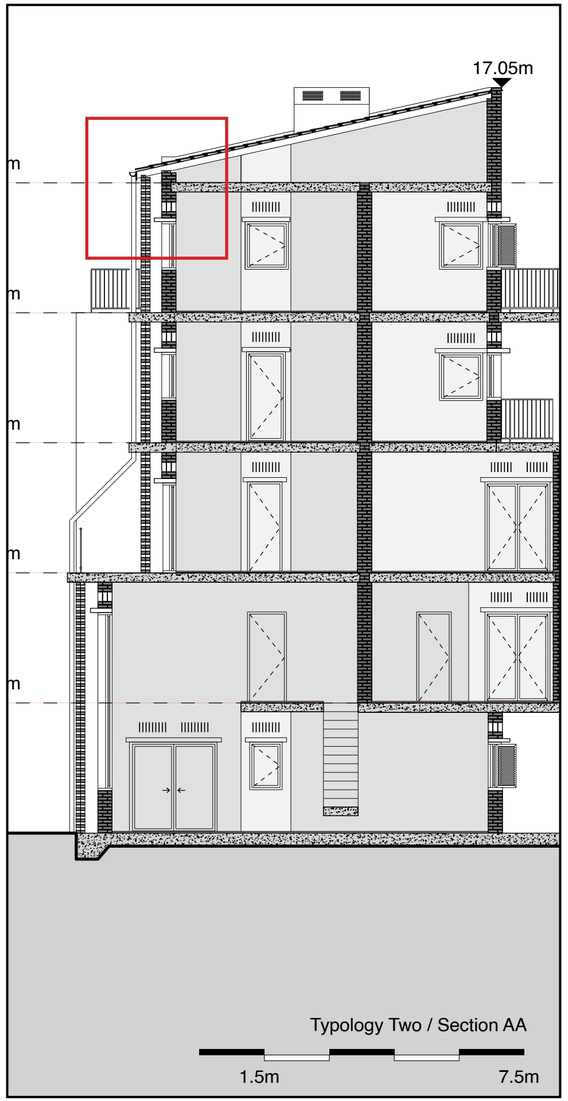
Detail callout

In the first detail we see the timber rafters used for the roof clad with sheathing, water insulation barrier and local clay roof tiles. Vertical bricks are placed with openings to allow for ventilation.

VILLAGE CENTRE/ **TECHNOLOGY**

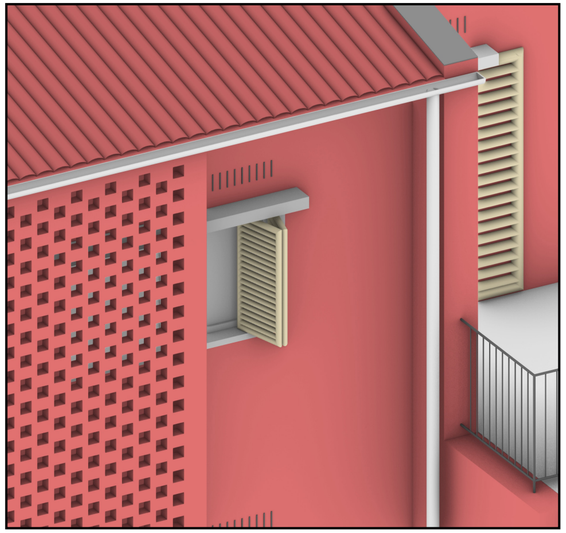
DETAILS





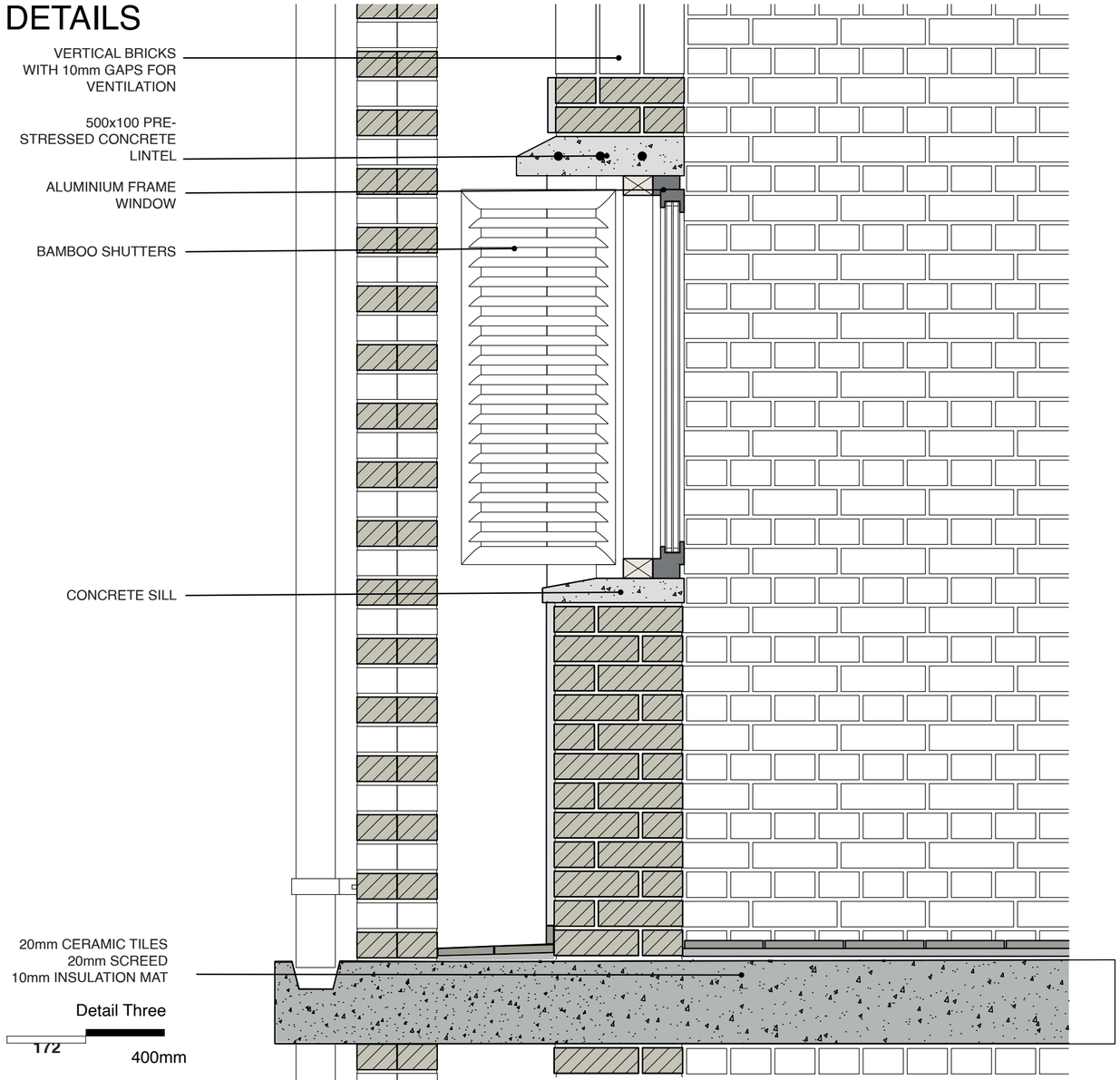
Detail callout

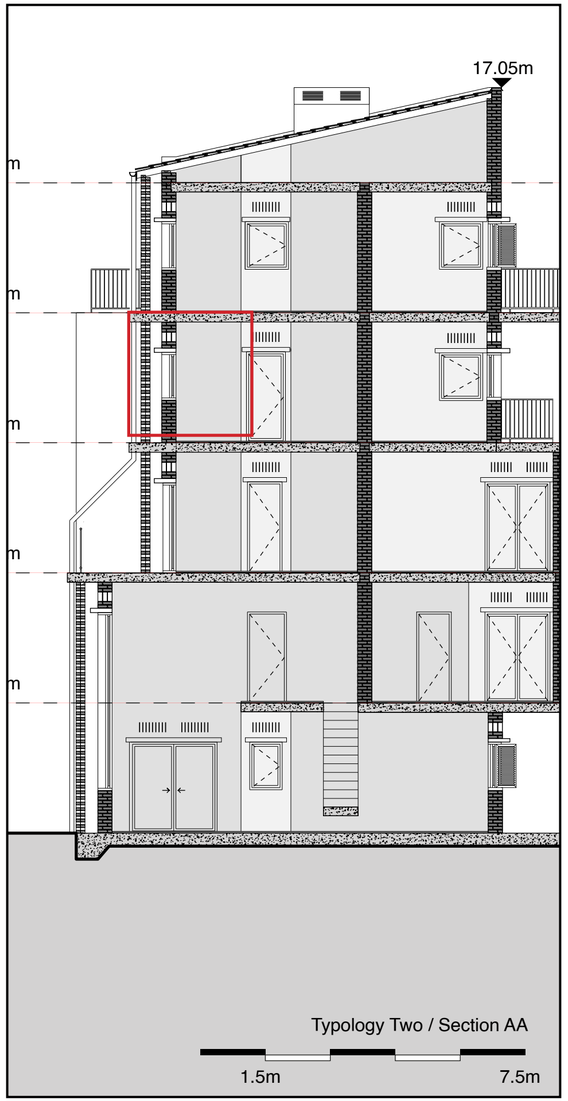
The rafters are supported on the brick walls, and a gutter is supported on the secondary brick wall to drain water. Concrete lintels reinforced with steel bars are used to support the wall for the windows below.



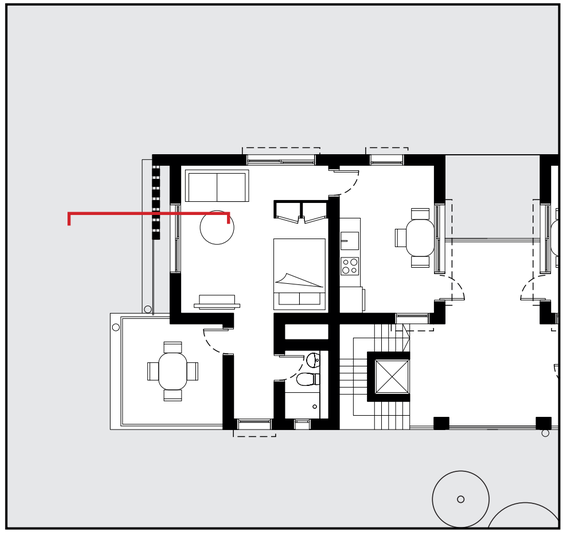
3D view

DETAILS

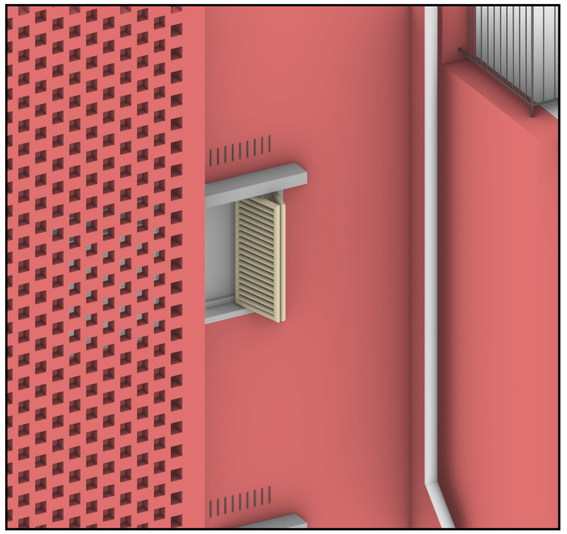




Detail callout



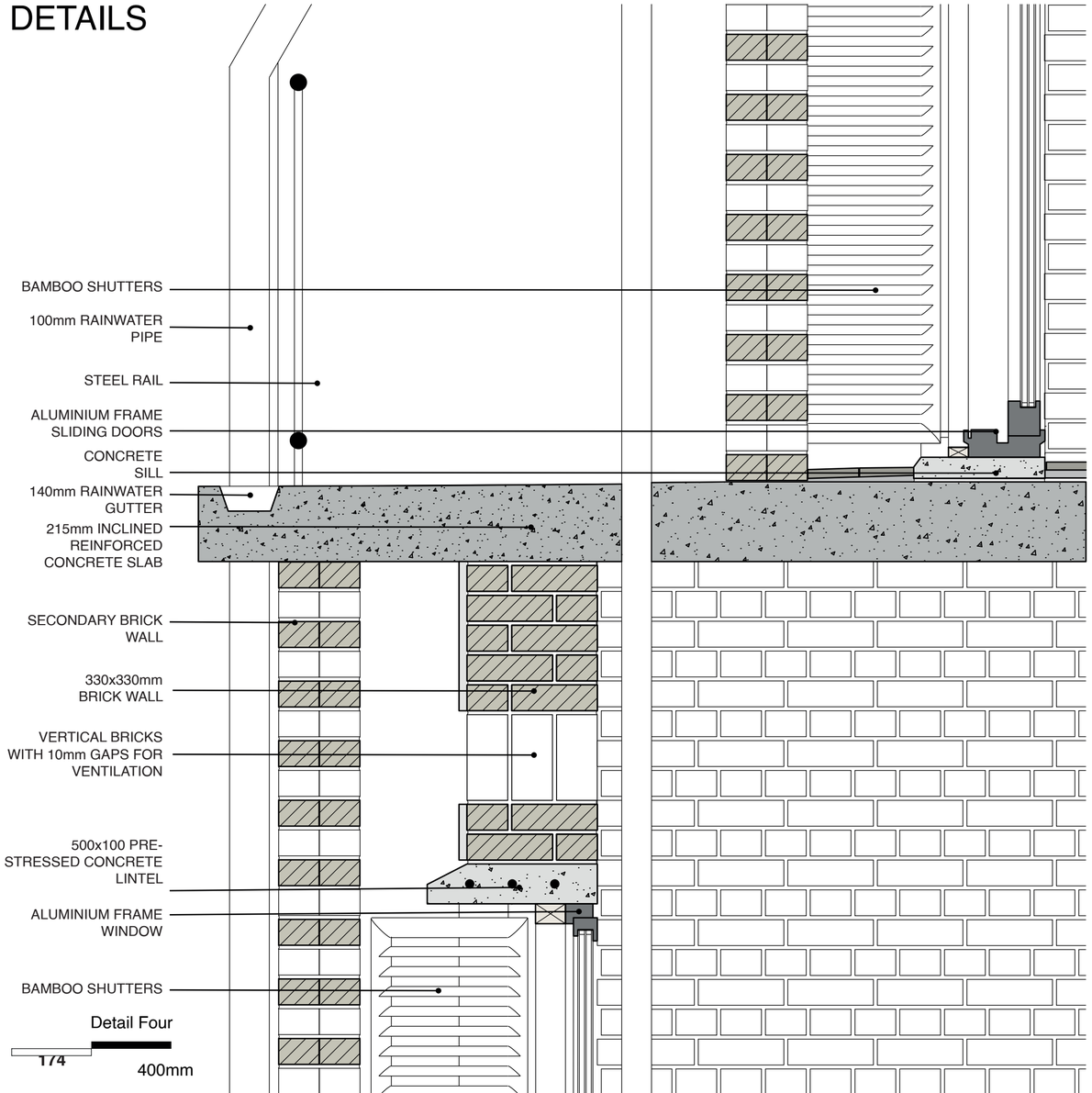
Detail section line



3D view

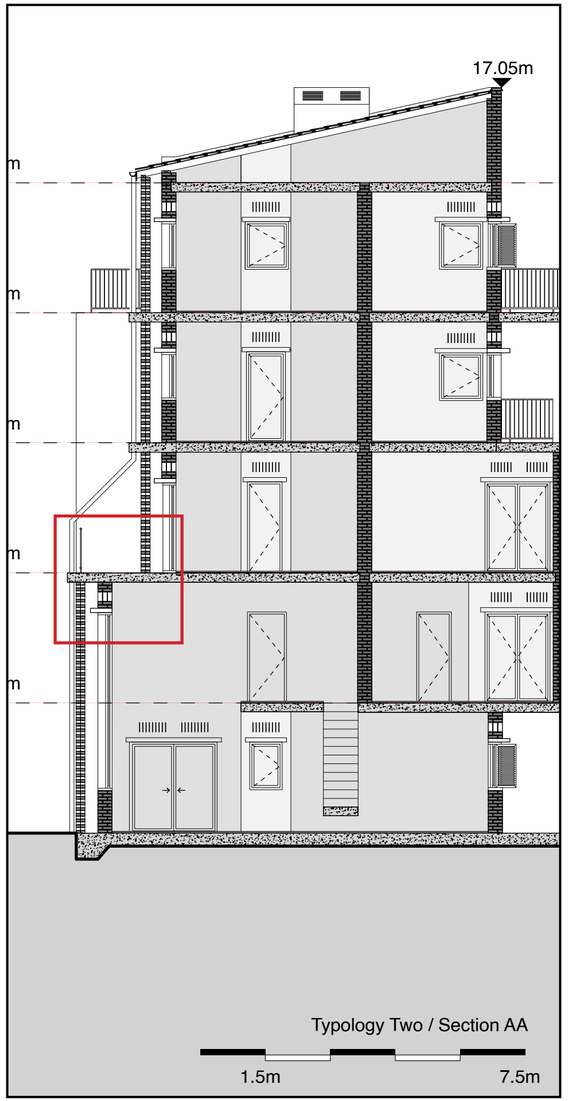
VILLAGE CENTRE/ **TECHNOLOGY**

DETAILS

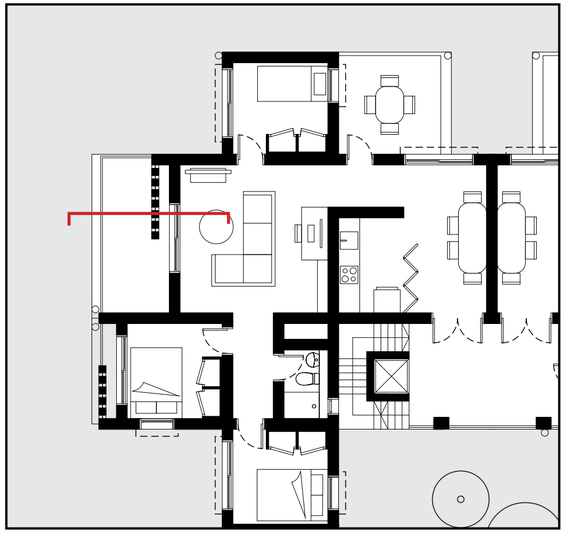


Detail Four

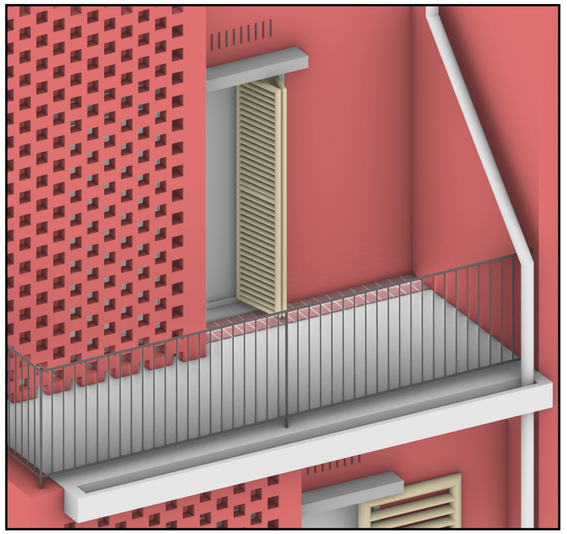
400mm



Detail callout



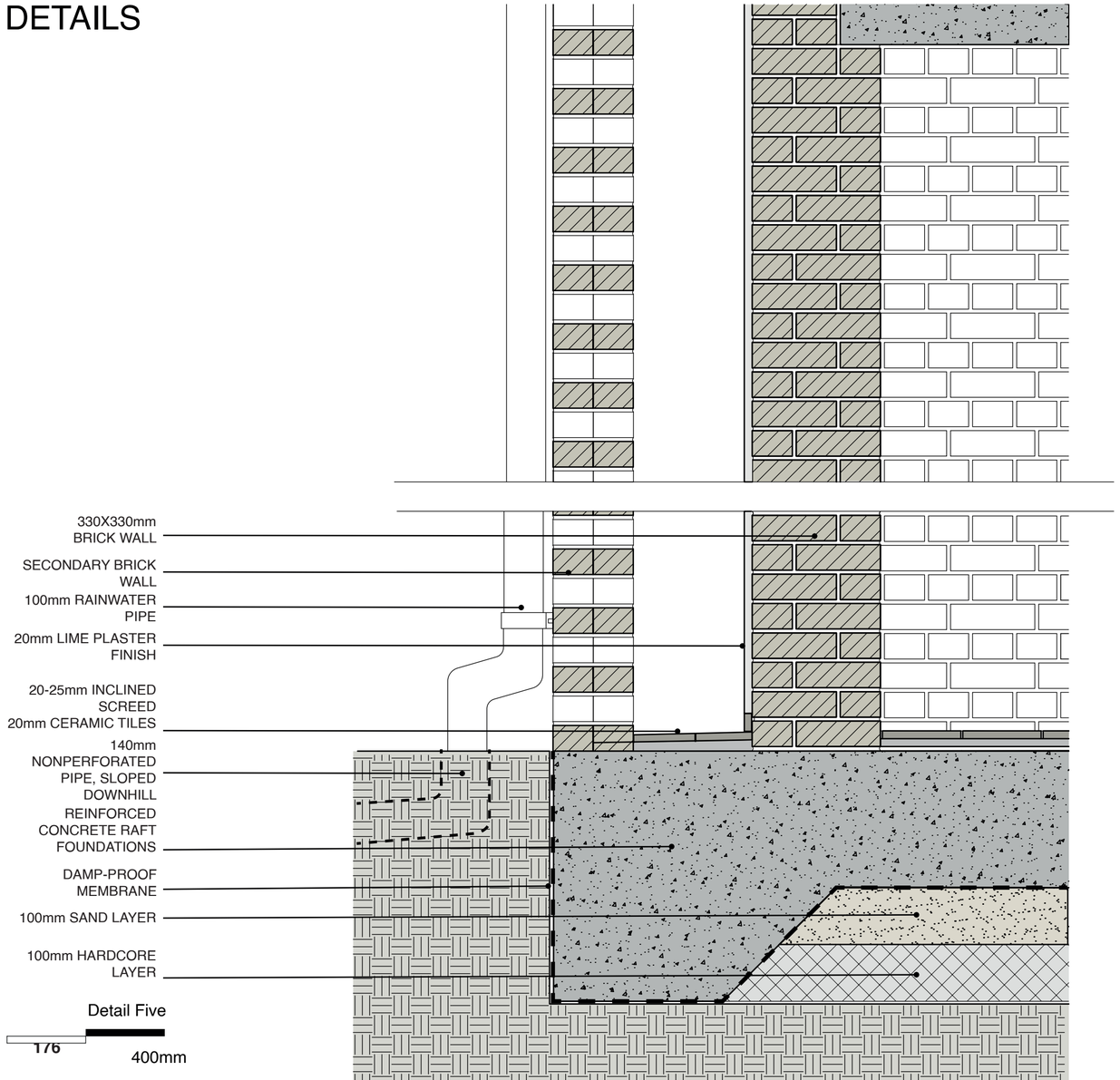
Detail section line

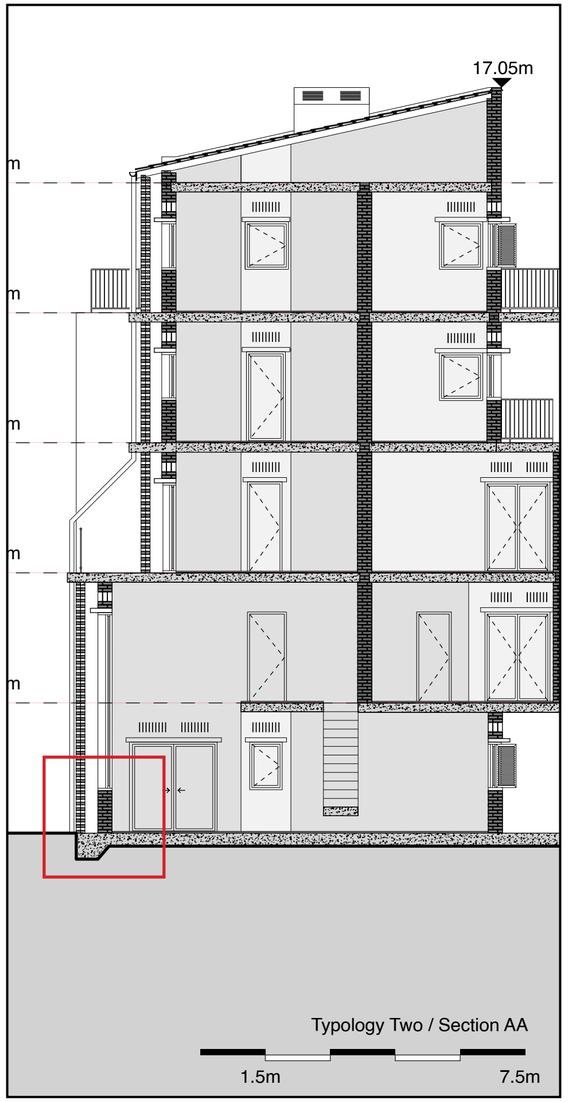


3D view

VILLAGE CENTRE/ **TECHNOLOGY**

DETAILS

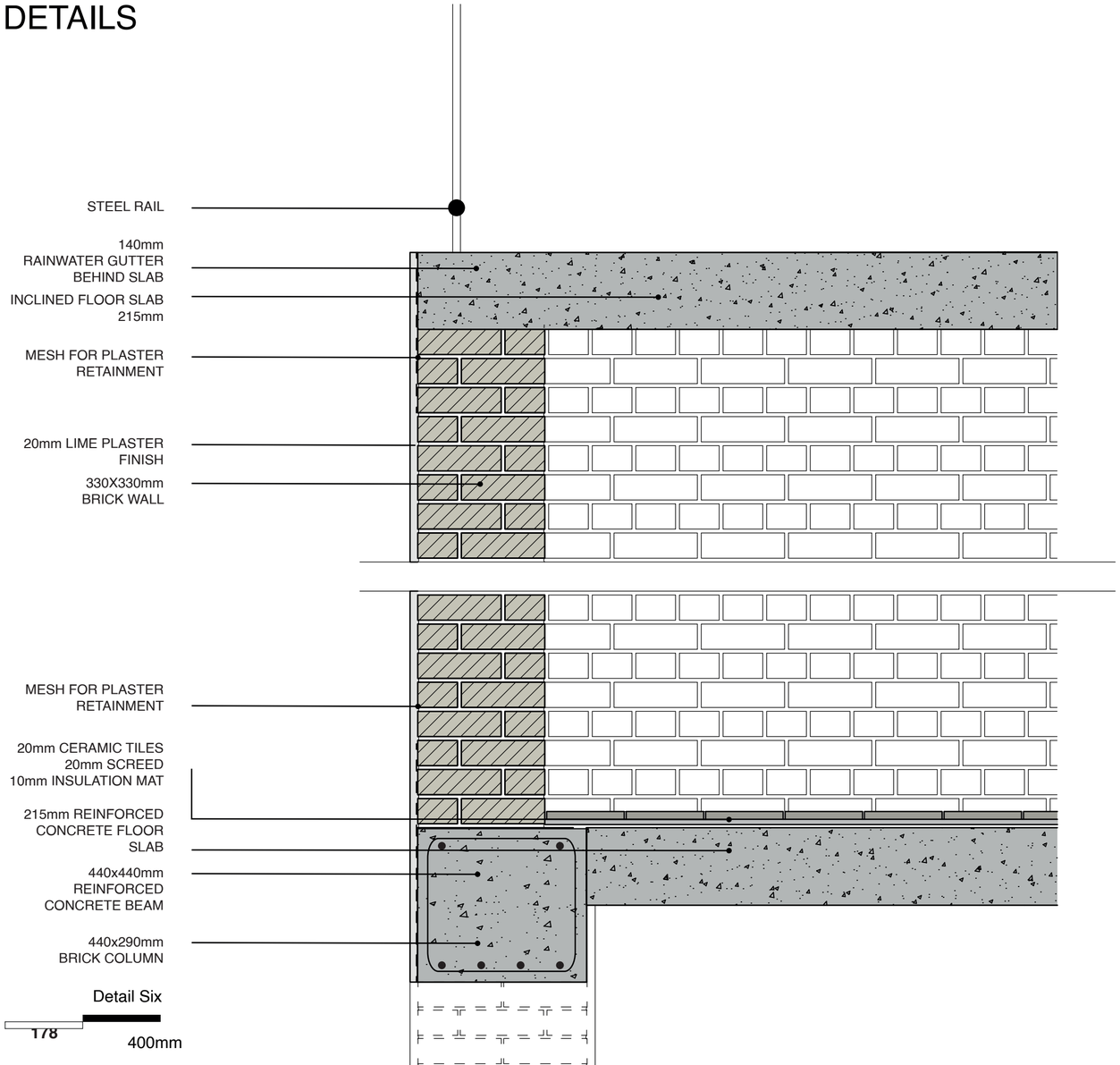


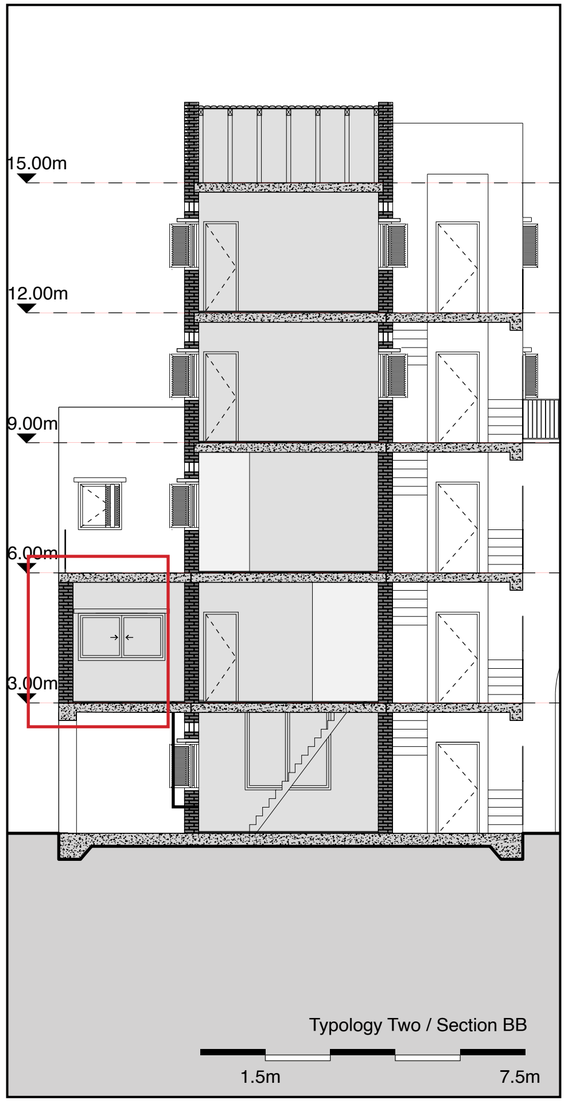


Detail callout

The foundations are built on a layer of hardcore and sand while a damp-roof membrane surrounds the foundation slab for water protection. Drainage downpipes are connected with underground non-perforated pipes which are sloped downhill to drain water off the site.

DETAILS





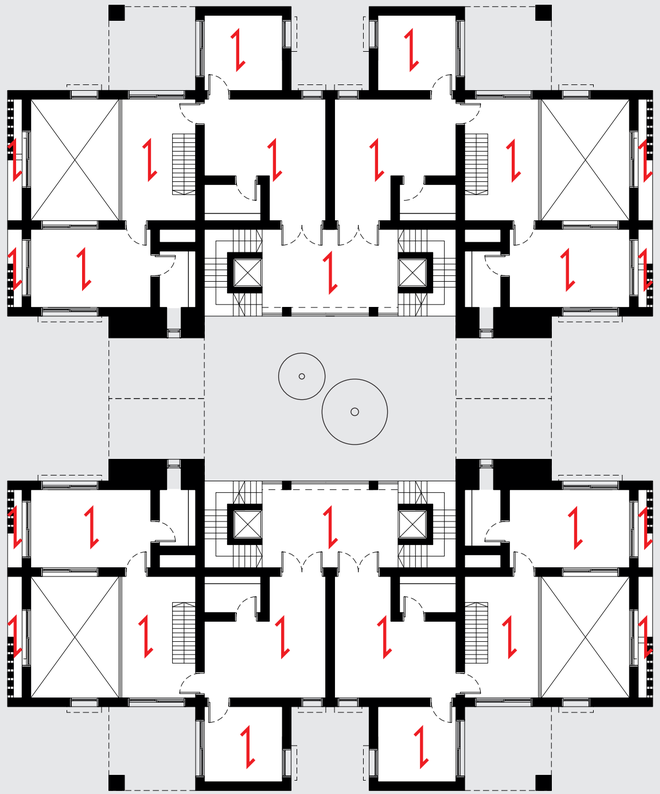
Detail callout

Reinforced concrete beams are used to support the protruding blocks on brick columns as seen in this detail. Wire mesh is added where floors and walls meet to support the waterproofing plaster and prevent cracking.

VILLAGE CENTRE/ **TECHNOLOGY**

STRUCTURAL PLAN

The structural plan indicates the parallel load bearing brick walls, while a concrete beam supports the external corridor space on two brick columns. This setup is similar on the rest of the floors.



N

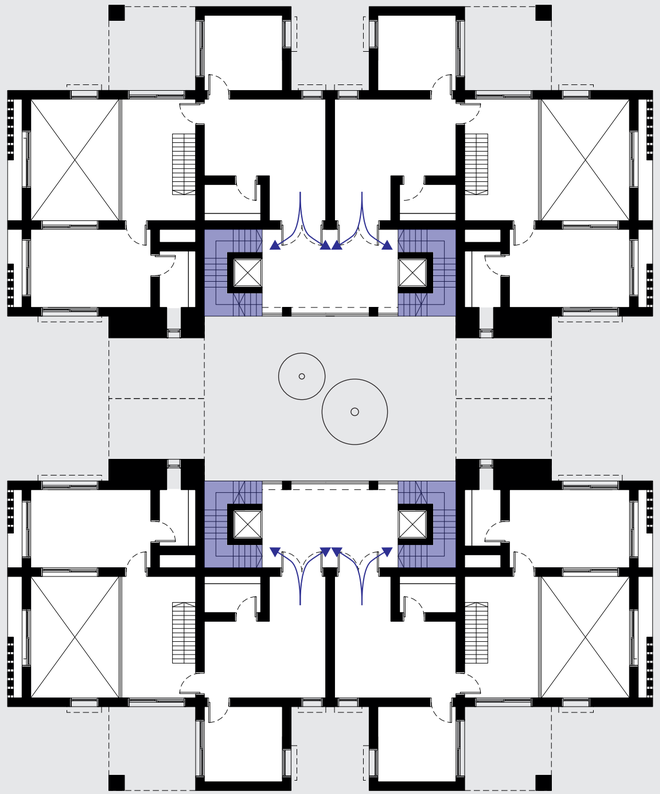
Typology Two / Level 1 Plan

3m 15m

VILLAGE CENTRE/ **TECHNOLOGY**

ESCAPE PLAN

There are two escape routes at all floors as indicated in blue here. If one of the exits is blocked the other one can be used for escape.



N

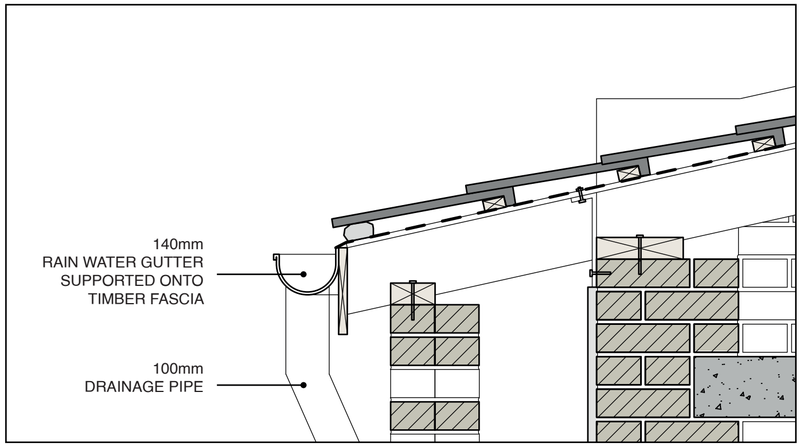
Typology Two / Level 1 Plan

3m 15m

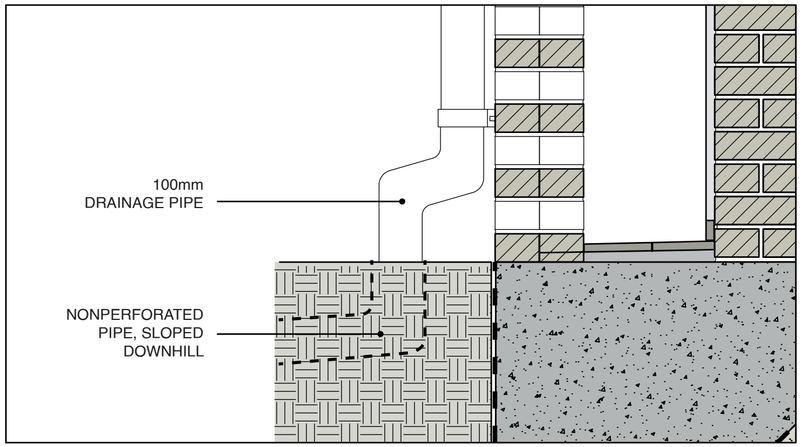
VILLAGE CENTRE/ **TECHNOLOGY**

RAINWATER & DRAINAGE SCHEME

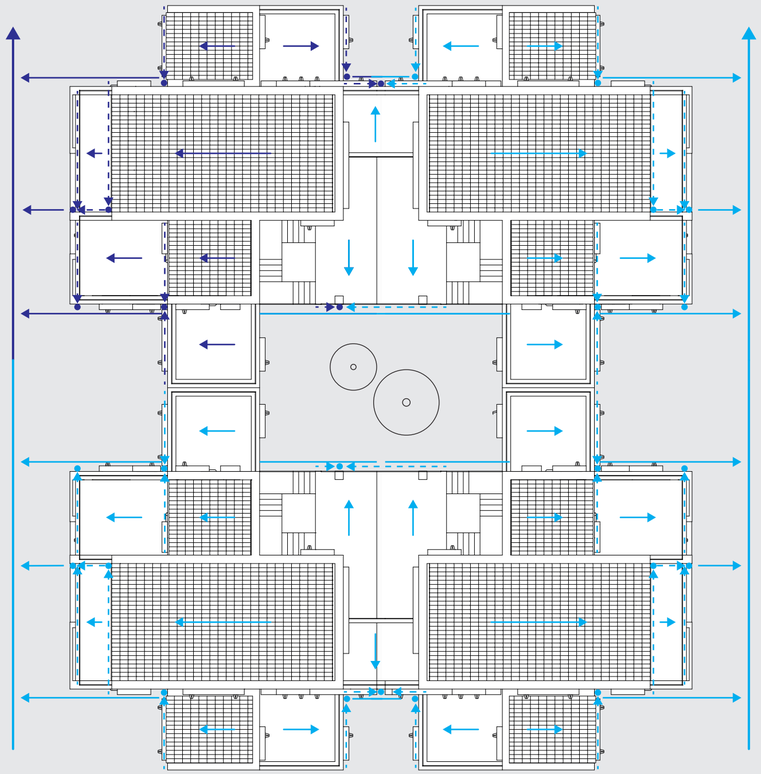
Water is drained from the buildings using gutters and downpipes as well as inclined floor slabs to support water movement. The water ends up in underground pipes for water to be drained through the main drains under the newly built streets.



Gutter detail



Rainwater pipe detail



DIMENSIONS OF GUTTER & RAINWATER PIPE AS PER DETAIL B

Typology Two / Roof Plan

3m 15m

VILLAGE CENTRE/ **TECHNOLOGY**

RAINWATER & DRAINAGE SCHEME URBAN LEVEL

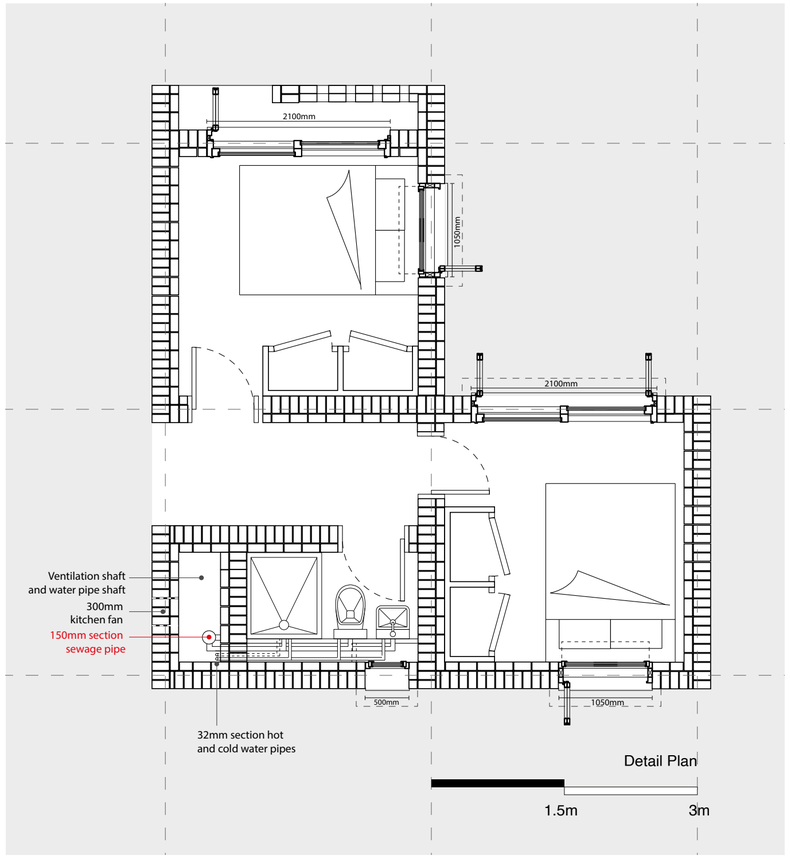
And here is the plan for these newly built drains which follow the natural landscape as indicated by the contour lines so that water is drained in the water reservoirs and the mangrove area of river.

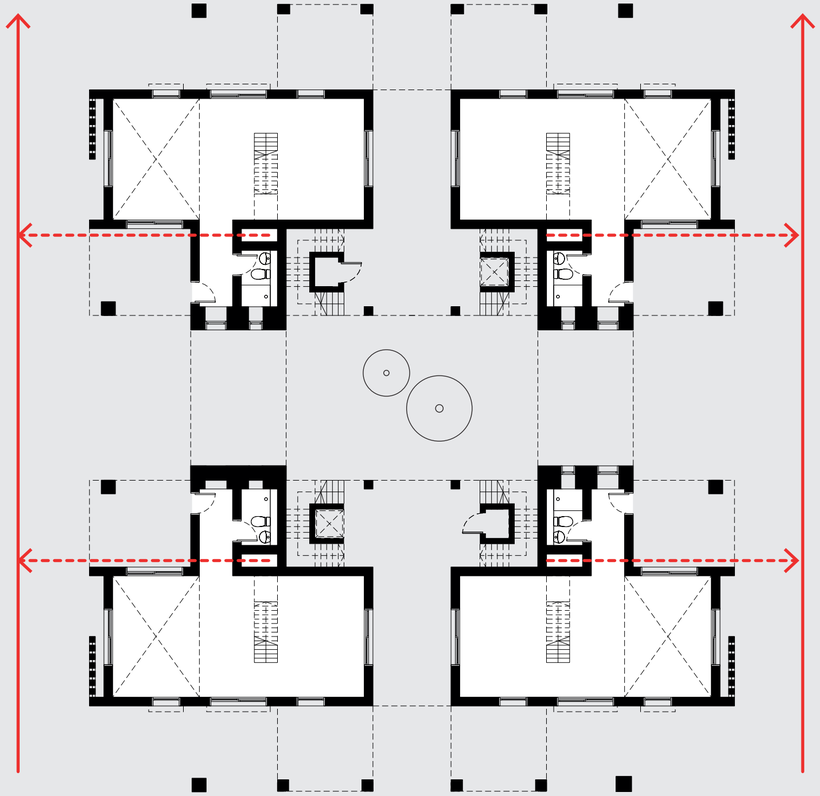


VILLAGE CENTRE/ **TECHNOLOGY**

SEWAGE SCHEME

The sewage scheme follows a similar logic, sewage pipes run through all the apartments from the shaft towards underground pipes under the new streets.





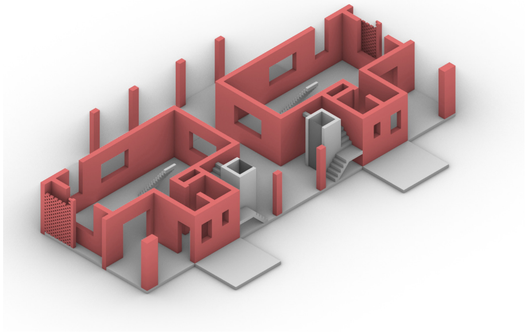
Typology Two / Level 0 Plan

3m 15m

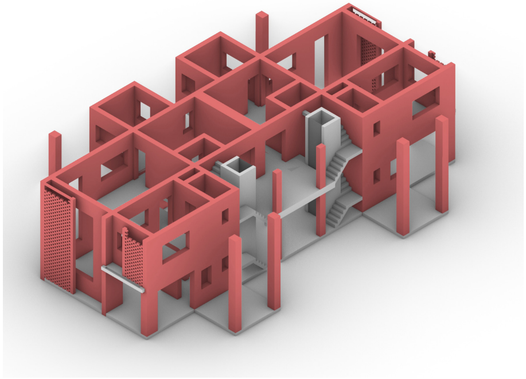
N

VILLAGE CENTRE/ **TECHNOLOGY**

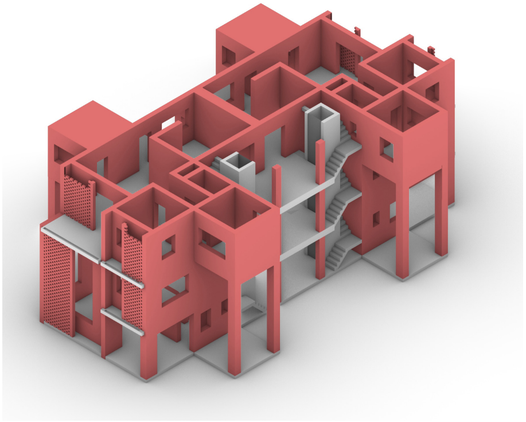
CONSTRUCTION SEQUENCE



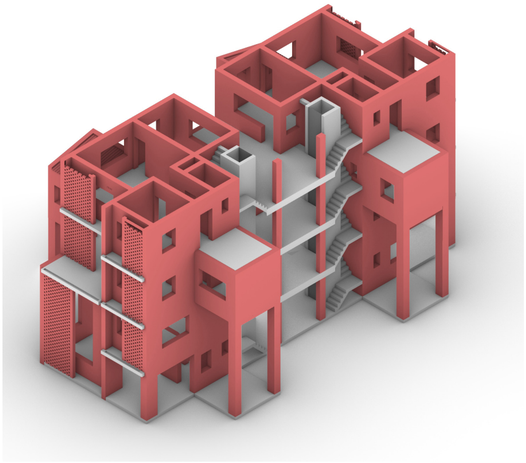
GROUND FLOOR - FOUNDATIONS & WALLS



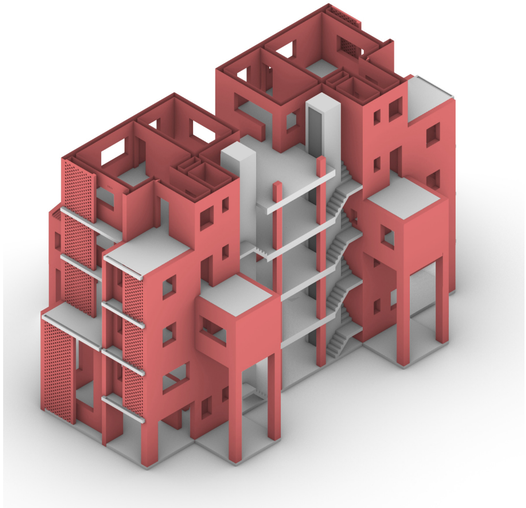
FIRST FLOOR - FLOOR & WALLS



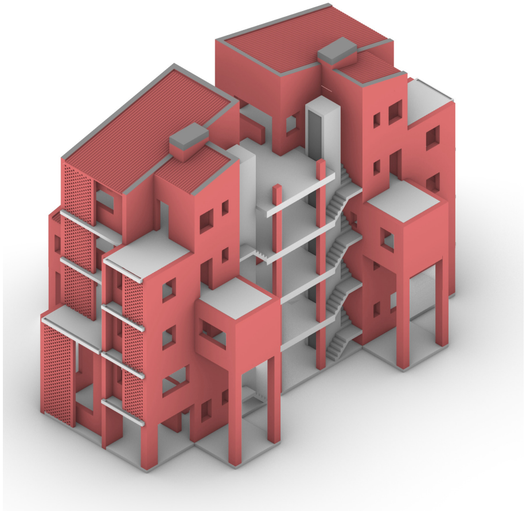
SECOND FLOOR - FLOOR & WALLS



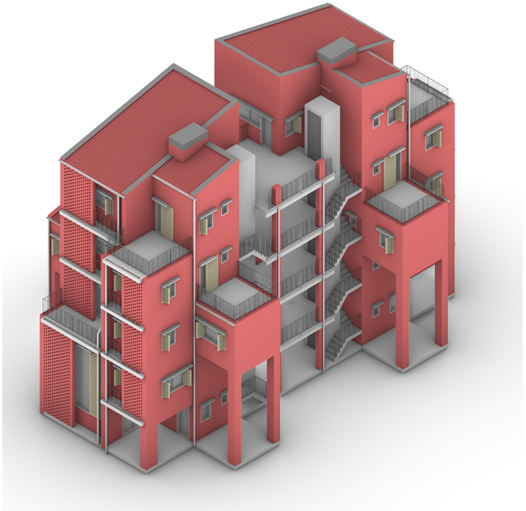
THIRD FLOOR



FOURTH FLOOR - FLOOR & WALLS



ROOFS



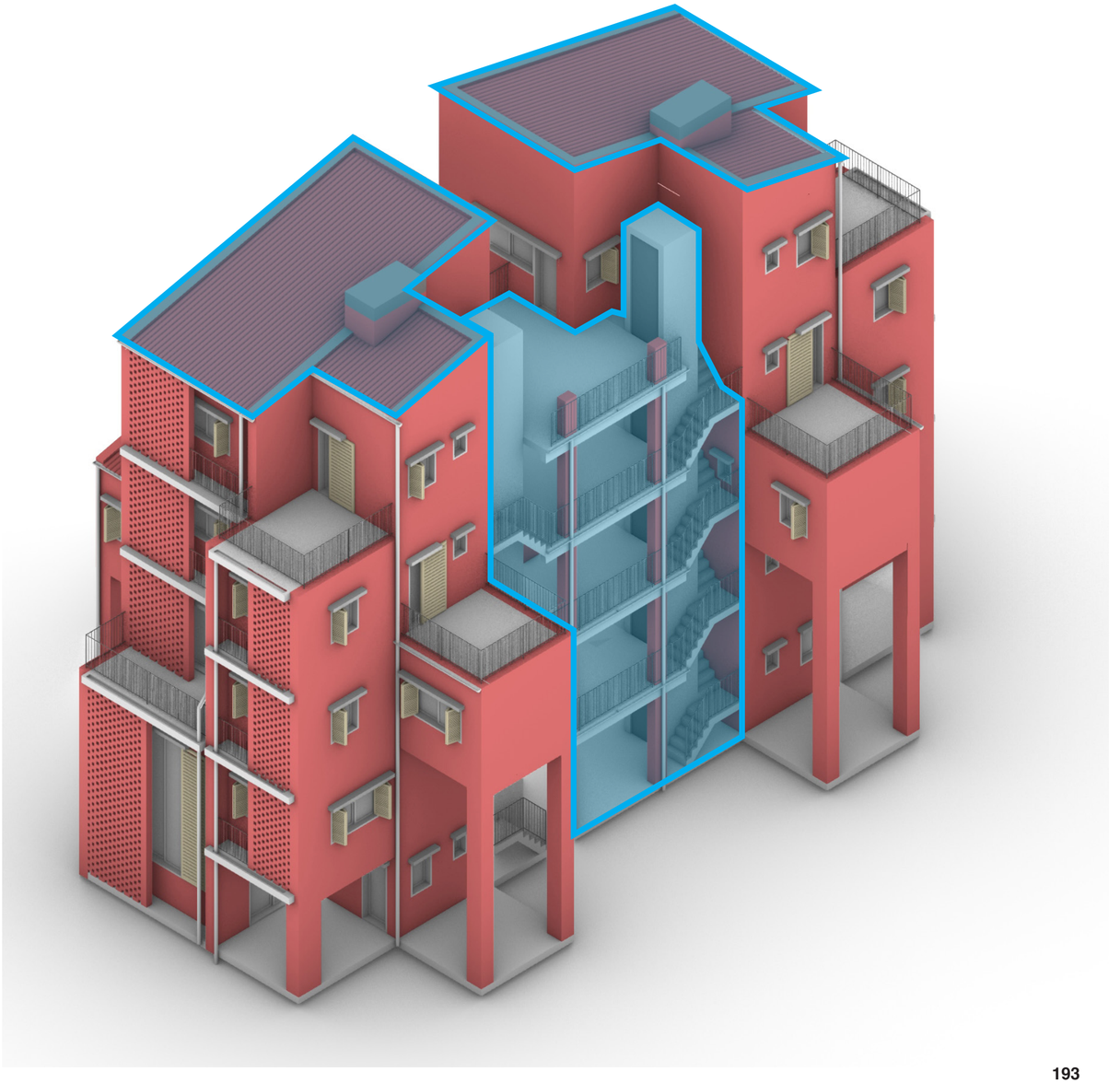
WINDOWS, DOORS, RAILINGS, GUTTERS

The construction sequence follows floors and walls that are build first, followed by the roofs and finished with the windows, gutters and railings.

VILLAGE CENTRE/ **TECHNOLOGY**

STAKEHOLDERS

The idea is that the roofs, elevator, stairs and public terraces are under the collective management of the owners of the two blocks.



VILLAGE CENTRE/ **VISUALS**

STREET

Here you can see the blocks as seen from the street, with tucked away entrances to the ground floor dwelling, the entrance to the courtyard from the arch and some balconies. The scale and proportions of the buildings are intended to create a connection with the street.



VILLAGE CENTRE/ **VISUALS**

EXTERIOR

Here is a temple that is preserved alongside a sacred tree behind, surrounded by new buildings. The new constructions and the existing temple and the sacred tree coexist.



VILLAGE CENTRE/ **VISUALS**

EXTERIOR

And on the right another existing building adjacent with the new ones. It is understood that not all new constructions will be built at once. A lady hangs her clothes from the railing of the second floor balcony.



VILLAGE CENTRE/ **VISUALS**

EXTERIOR

This is the arch between two blocks leading to the interior courtyard. The arch is meanth to bridge the two blocks of buildings but also guide the residents to the interior courtyard. A family and another lady are using the terraces above the balcony while a family is enjoying the view from the balcony of the second floor. Another man is sitting in a chair at the entrance of his ground floor apartment.



VILLAGE CENTRE/ **VISUALS**

EXTERIOR

On the right you can see the smaller passage intersecting the courtyard in the opposite direction to the arch. This passage is meant to connect the courtyards of two blocks or at least provide a simple passage from a single block.



VILLAGE CENTRE/ **VISUALS**

EXTERIOR

This is an image of some balconies and the public corridor showing a neighbourly arrangement even on the upper floor apartments. You can notice the beams of the corridors sitting on two brick columns.



VILLAGE CENTRE/ **VISUALS**

INTERIOR

And here is an image of the interior double floor apartment showing the living room behind a large dining table. A large window provides vision towards the street while other windows help ventilate the space. Behind the television is a set of sliding doors creating an access with an exterior covered area. The walls are decorated with religious paintings. The aim of this image is to show a spacious living room suitable for the apartment owned by existing landowners of the village.



VILLAGE CENTRE/ **VISUALS**

INTERIOR

And here is another image of the double floor space showing the study space above the living room. The door on the left leads to one of the bedrooms.



VILLAGE EDGE TYPOLOGY

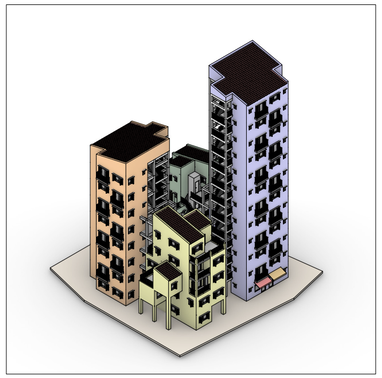
VILLAGE EDGE/ **DESIGN**

LEVEL 0 PLAN

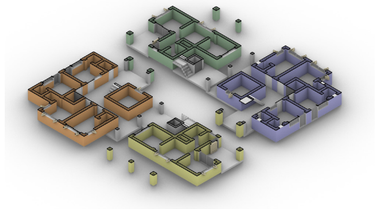
The village edge typology employs 4 buildings, each pair with connected vertical circulation as seen in village centre typology. The houses here are generally smaller than the previous typology but there are still multiple bedroom apartments. On the ground floor there are communal washrooms and small shops.



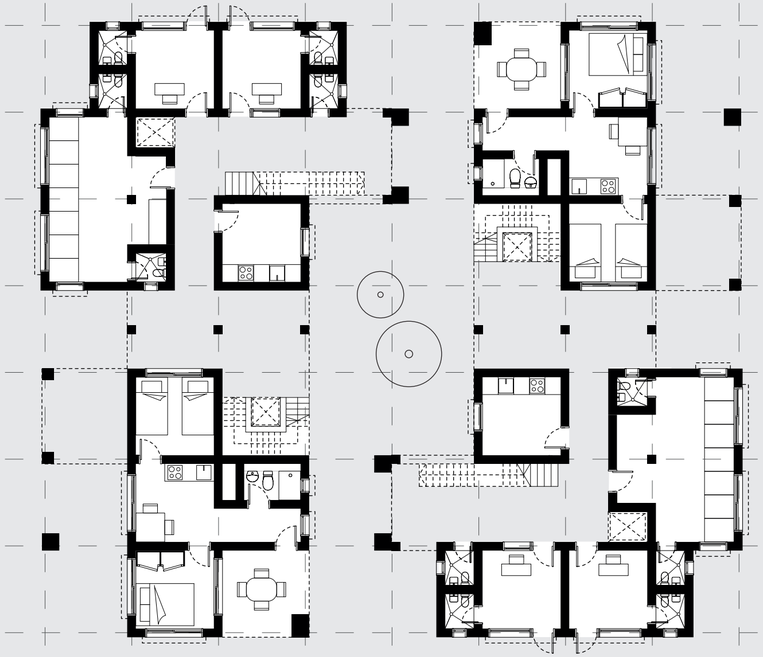
Urban plan



Axonometric



Floor axonometry



Typology Three / Level 0 Plan

3m 15m

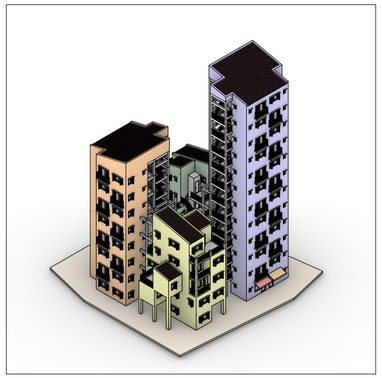
VILLAGE EDGE/ **DESIGN**

LEVEL 1 PLAN

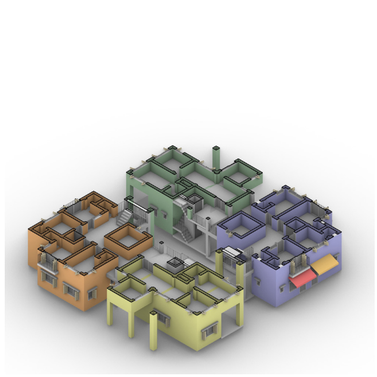
What is mainly different in this typology are the 1 room apartments as seen on the top left and bottom right blocks. These apartments are intended for migrants from the rural areas, temporary workers, and students. They do have shared kitchens.



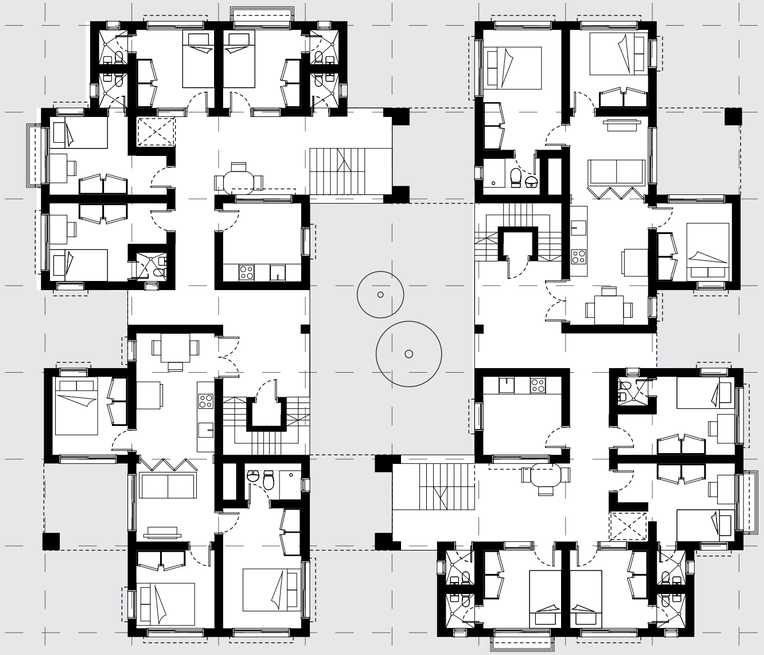
Urban plan



Axonometric



Floor axonometry



Typology Three / Level 1 Plan

3m 15m

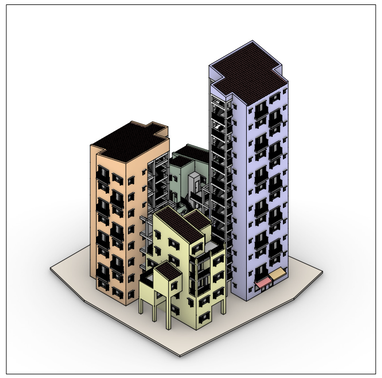
VILLAGE EDGE/ **DESIGN**

LEVEL 2 PLAN

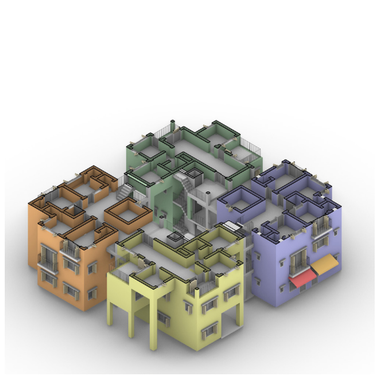
Again as you go up the floors, volumes from the previous floors become terraces for the apartments and the four blocks leave a void in the middle that becomes the interior courtyard.



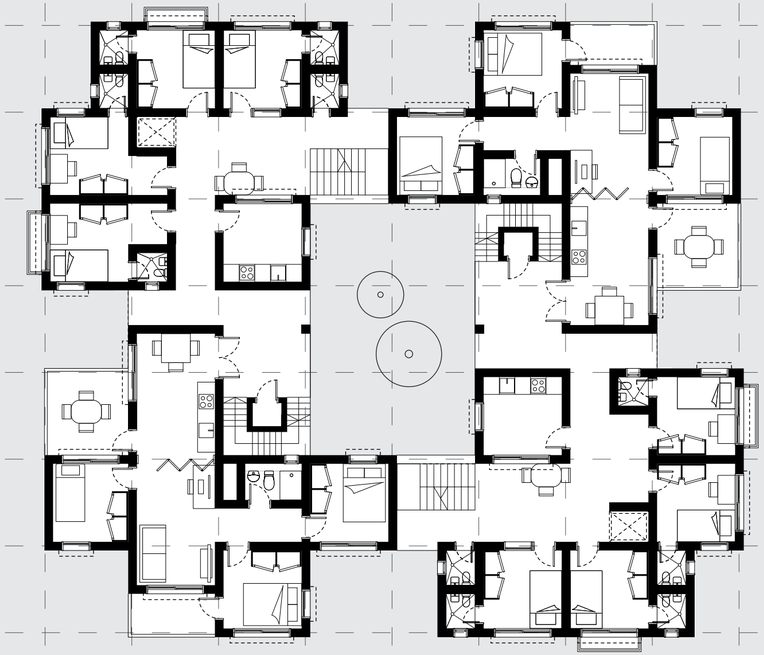
Urban plan



Axonometric



Floor axonometry



Typology Three / Level 2 Plan

3m 15m

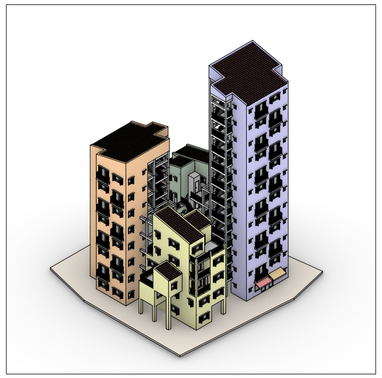
VILLAGE EDGE/ **DESIGN**

LEVEL 3 PLAN

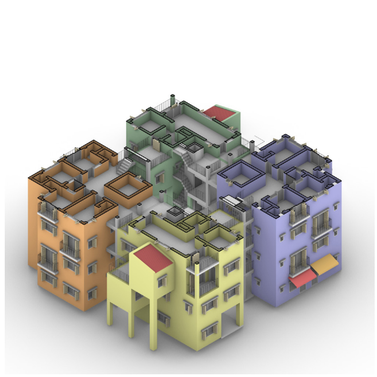
The volumes of the bottom left and top right blocks shrink from level 3 and upwards.



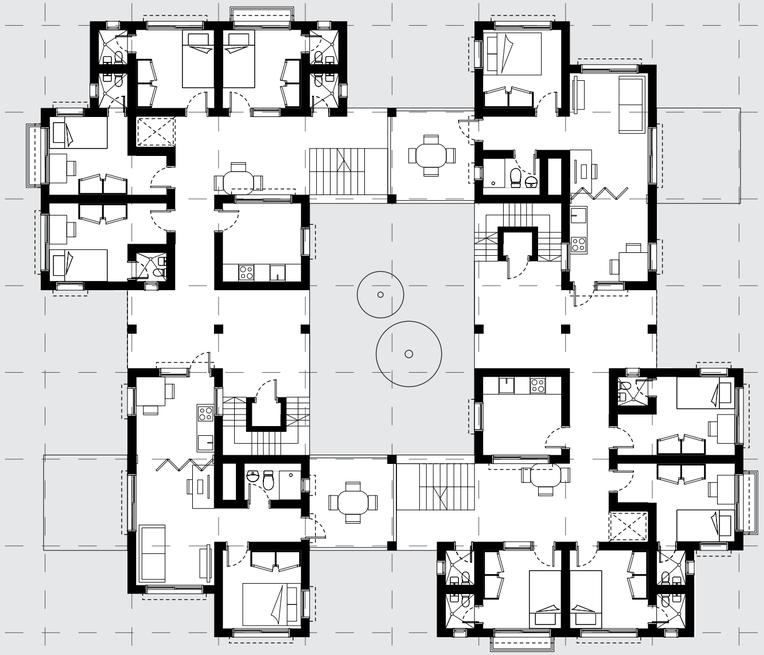
Urban plan



Axonometric



Floor axonometry



Typology Three / Level 3 Plan

3m 15m

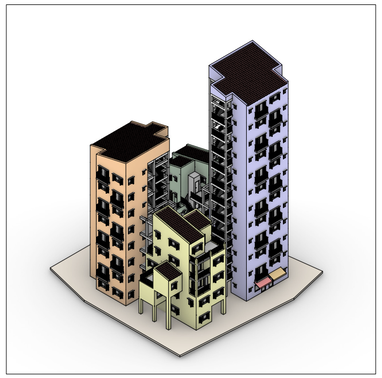
VILLAGE EDGE/ **DESIGN**

LEVEL 4 PLAN

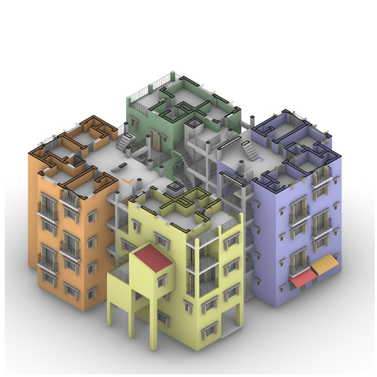
Level 4 is the final floor for the bottom left and top right volumes where a 1 bedroom flat is placed. The top left and bottom right blocks continue to rise with a similar layout as before.



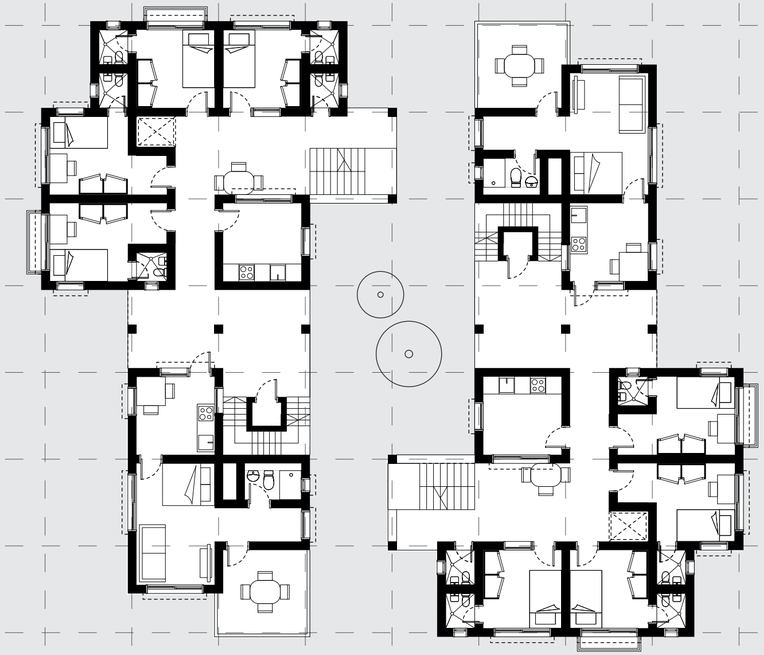
Urban plan



Axonometric



Floor axonometry



Typology Three / Level 4 Plan

3m 15m

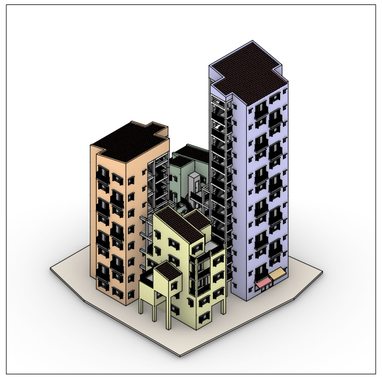
VILLAGE EDGE/ **DESIGN**

LEVEL 5 PLAN

From the 5th floor upwards only these two blocks continue to rise with 1 bedroom apartments this time. These 1 bedroom apartments have the best views of the village and beyond due to their high position. They are menat for commuters, students and young couples. Two escape routes are maintained throughout the floors, including at this level and above.

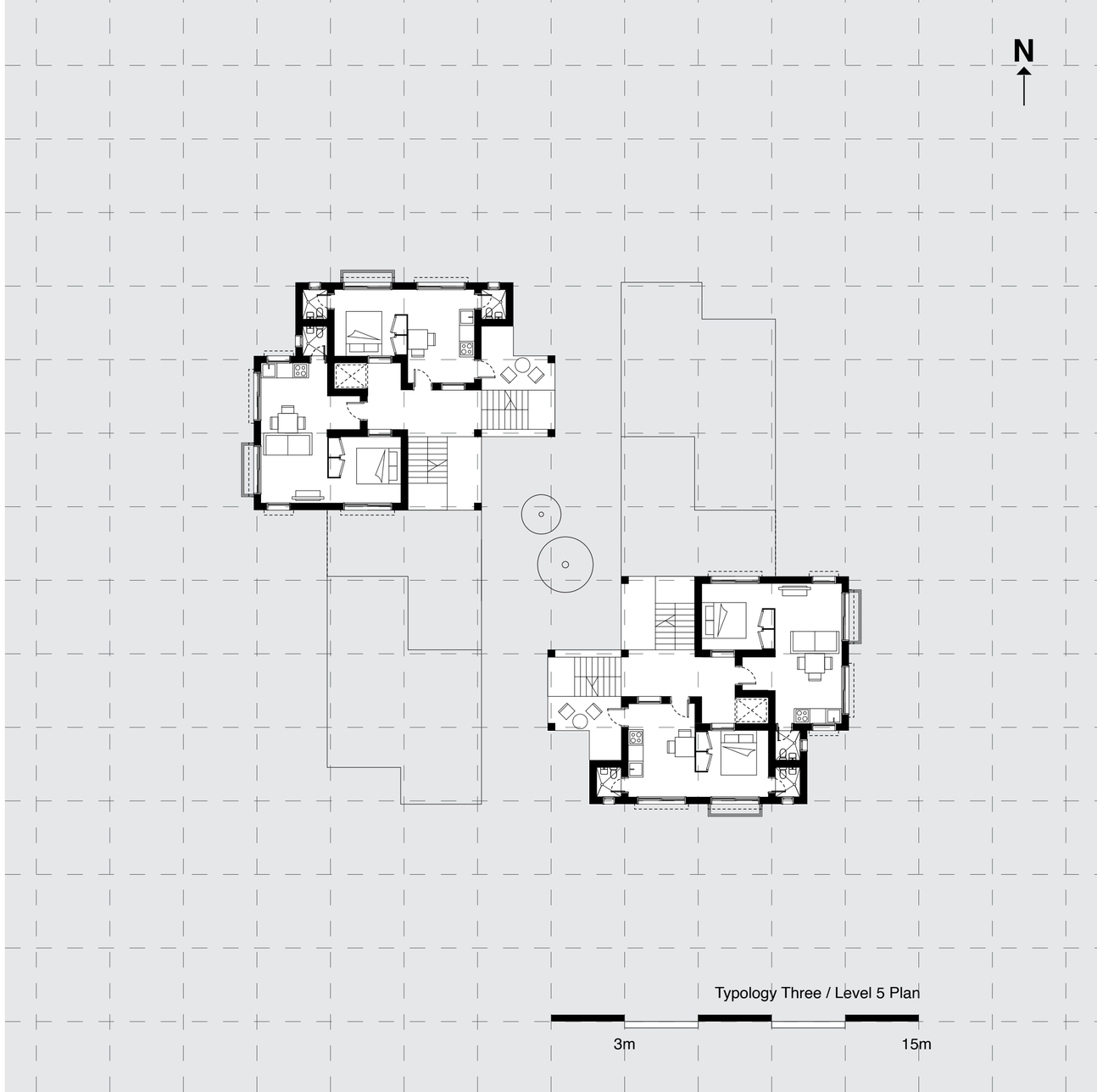


Urban plan



Axonometric

Floor axonometry



VILLAGE EDGE/ **VISUALS**

STREET

Here you see a street view for this typology, with its shops and the small streets leading to the interior courtyards. Again, proper and French balconies create a connection with the ground level and the street. A man is sitting outside the shop on a chair, another man is walking towards the interior courtyard and two men stroll in front of the shops. We can expect the streets near this typology to be alive with people walking due to the volume of dwellings per hectare provided.



VILLAGE EDGE/ **VISUALS**

EXTERIOR

Here is a view of the tower looking towards the new elevated highway leading to the airport. The view from these ‘towers’ should be exclusive. Below the bridge, the bamboo trees planted in the water reservoirs can be seen. A man is standing at one of the French balconies enjoying the view.





VILLAGE EDGE/ **VISUALS**

EXTERIOR

This visual depicts one of the shops on the ground floor level and the entrance to the interior courtyards. Again, a lot of people are strolling around, the shop owner is standing at the shop's entrance expecting customers and one man is standing on his French balcony.



VILLAGE EDGE/ **VISUALS**

EXTERIOR

This is the smaller street connecting the courtyard of the block with the outside world. It is meant to be more private than the main entrance to the courtyard and its main purporse is to provide a passage.



VILLAGE EDGE/ **VISUALS**

EXTERIOR

And here is a view of some balconies, again trying to maintain a neighbourly feeling amongst residents through their terraces.



VILLAGE EDGE/ **VISUALS**

EXTERIOR

Fianlly, an image showing the tower coexisting with existing structures on the right hand side. A woman is walking in front of one of the shops while another man is walking towards the opposite direction.



VILLAGE EDGE/ **VISUALS**

INTERIOR

This is an image of one of the interior 1 bedroom apartments. You can see the kitchen space first, on the left the cupboards, sink and stoves and on the right a small table for dining. The table becomes an extension of the limited kitchen space in order to be used for preparing meals. Behind you see the living room space with a sofa and a coffee table. Finally, even further behind you can see the balcony of this apartment with a nice chair to the left.



VILLAGE EDGE/ **VISUALS**

INTERIOR

This is an interior visual of one of the studio spaces. There is a bed on the left, a wardrobe on the right and a desk just in front of the French balcony. The kitchen facility is found outside this studio and it is shared amongst other people living on this floor.

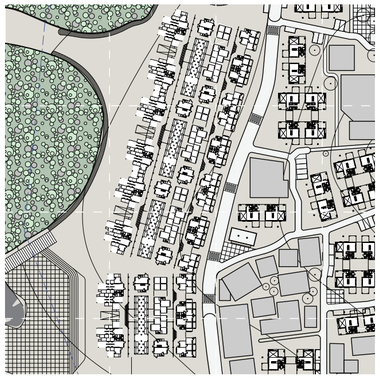


VILLAGE SEAFRONT TYPOLOGY

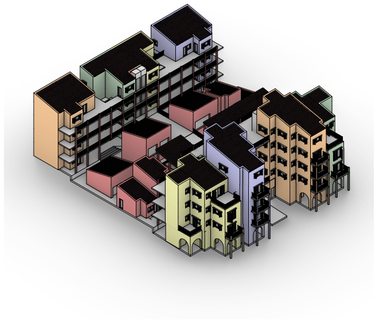
VILLAGE SEAFRONT/ **DESIGN**

LEVEL 0 PLAN

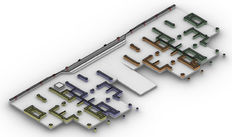
Last typology to present is the village seafront. The ground floor plan faces West towards the sea and accommodates storage spaces for the fishermen for tools and nets, as well as sheltered work areas.



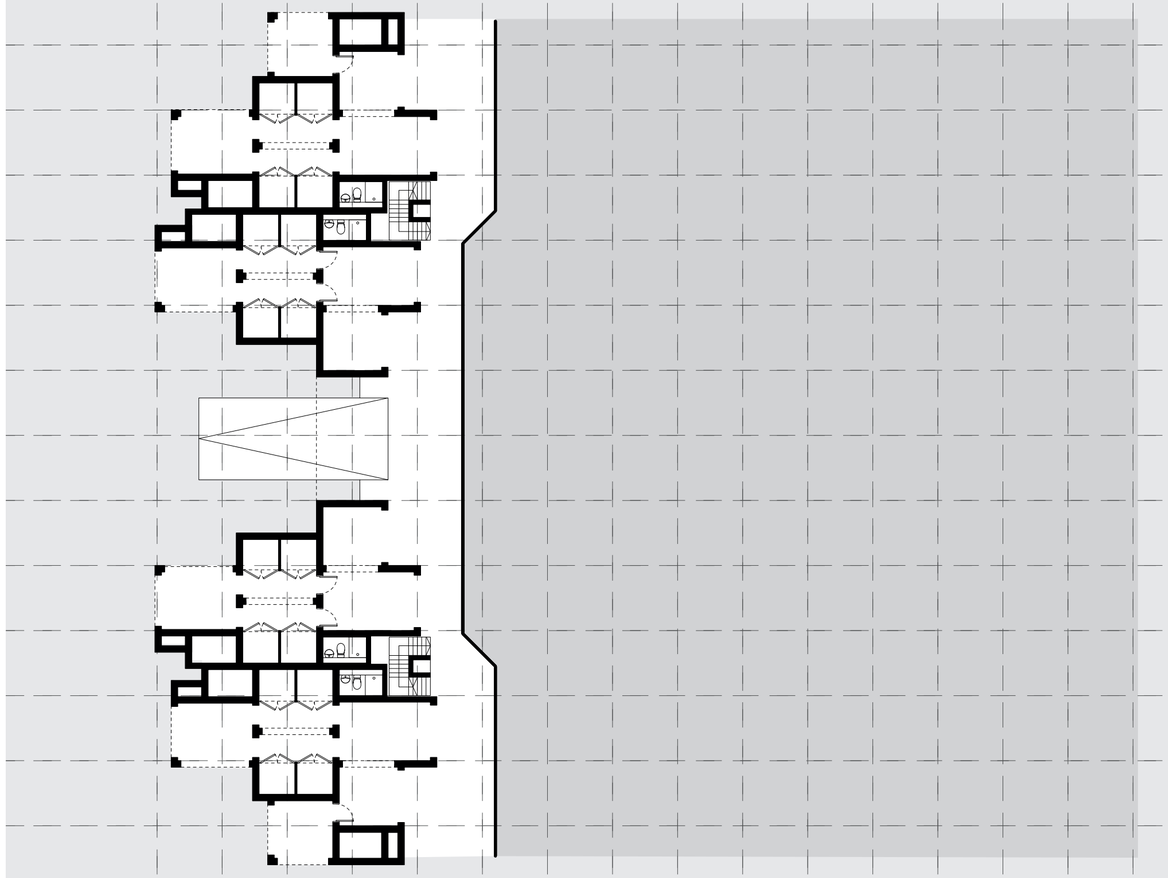
Urban plan



Axonometric



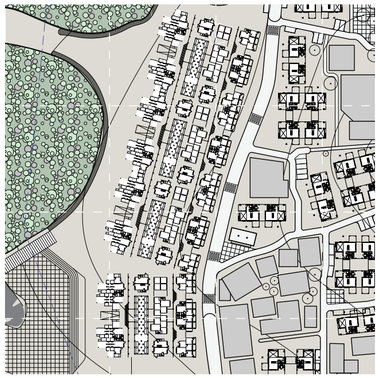
Floor axonometry



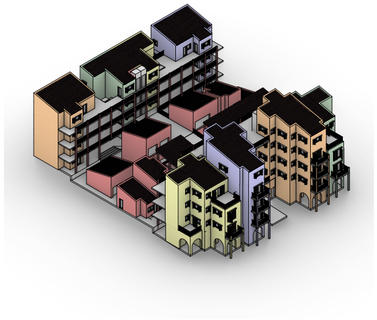
VILLAGE SEAFRONT/ **DESIGN**

LEVEL 0.5 PLAN

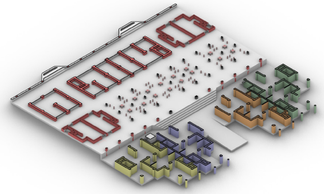
Moving on one level up we have the fishmarket, partly open plan for tables and chairs and partly enclosed with small shops. Some small residential units are dedicated for artists and craftsmen as well.



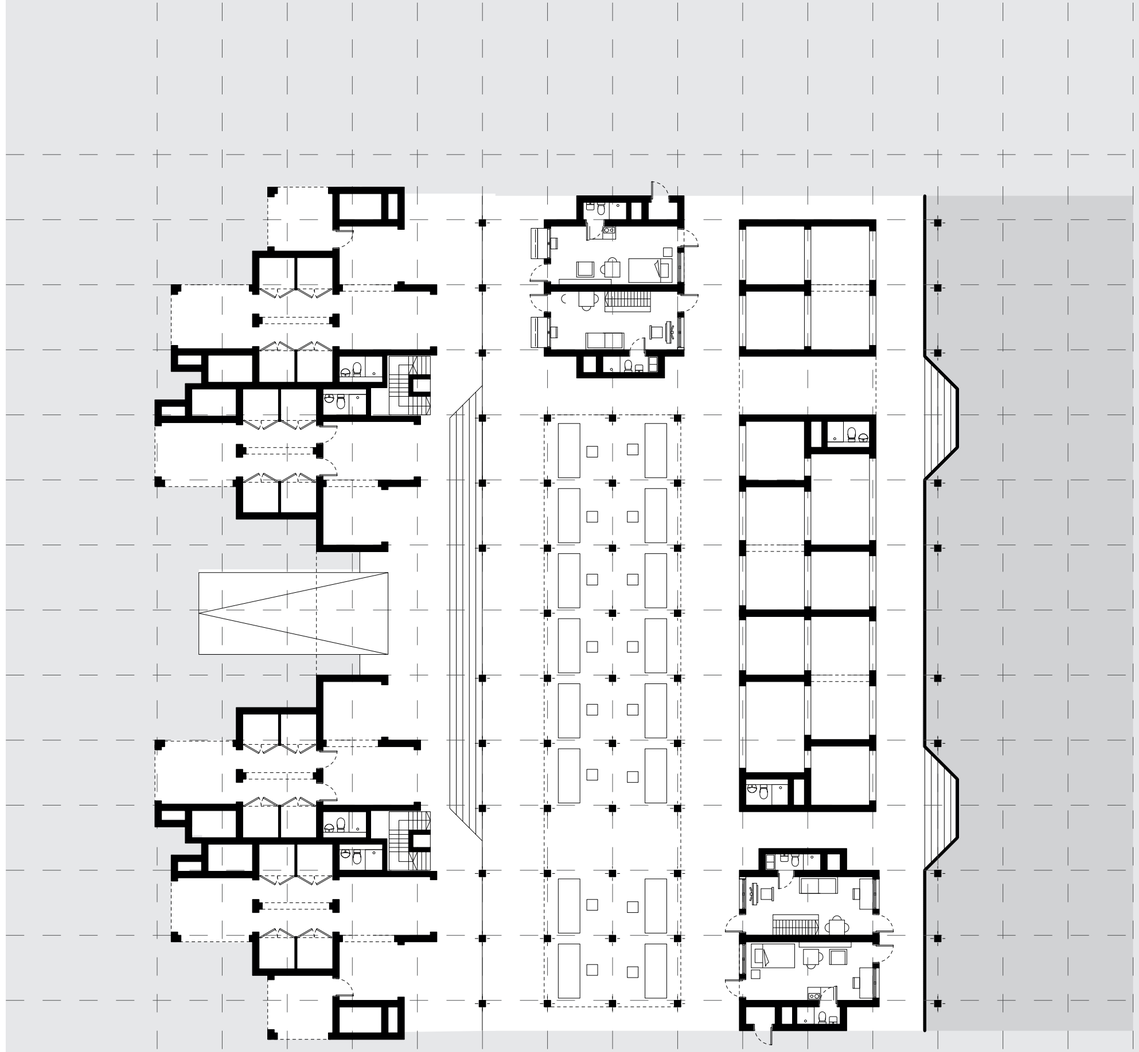
Urban plan



Axonometric



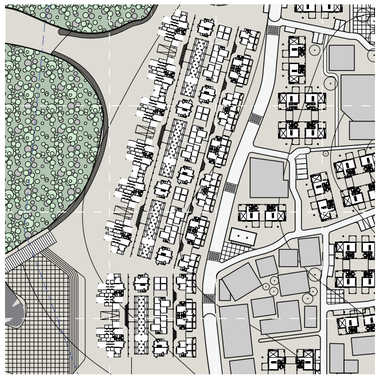
Floor axonometry



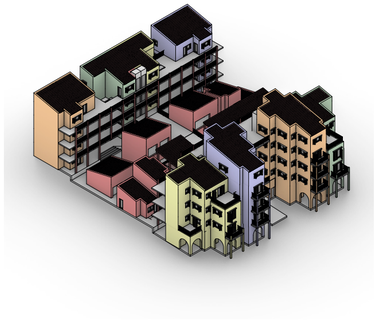
VILLAGE SEAFRONT/ **DESIGN**

LEVEL 1 PLAN

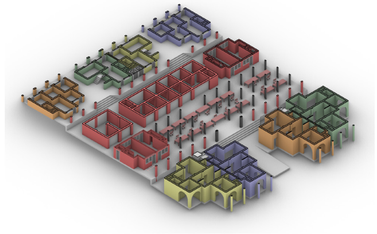
Moving up another level we get to some office spaces and shops. The whole ground floor is connected through streets and staircases.



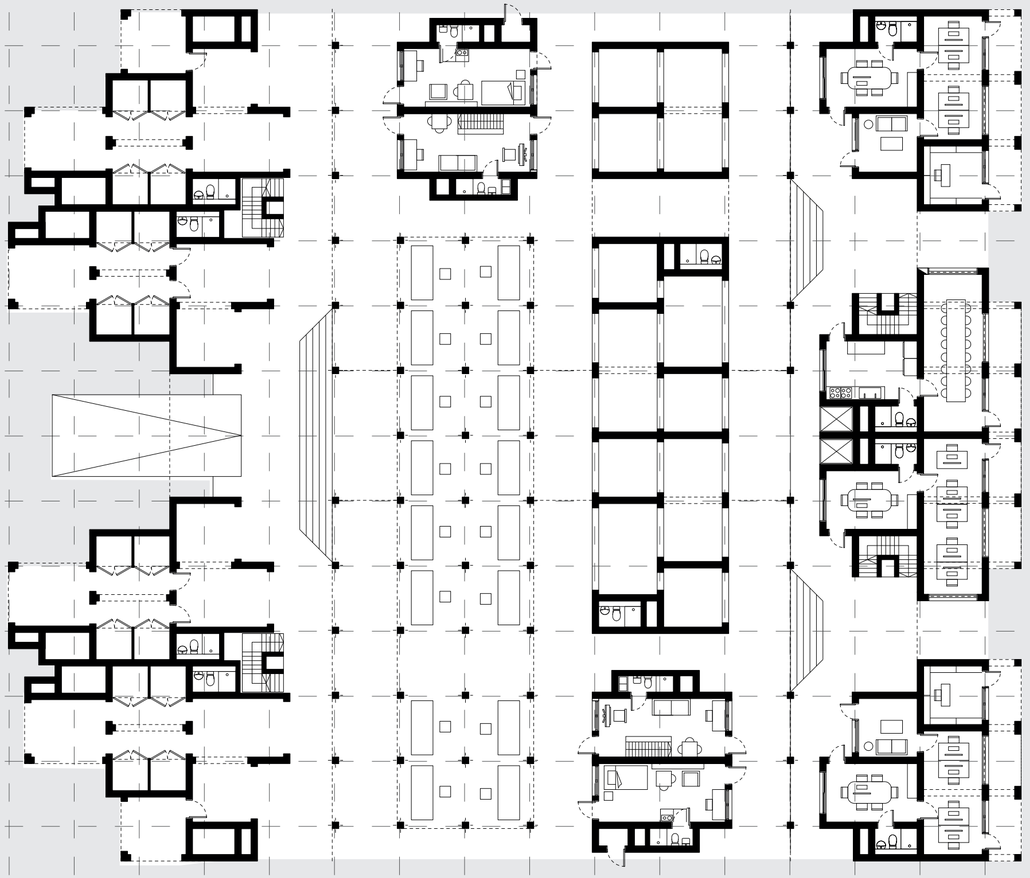
Urban plan



Axonometric



Floor axonometry



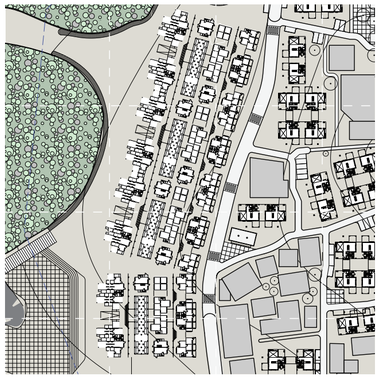
Typology One / Level 0.5 Plan

3m 15m

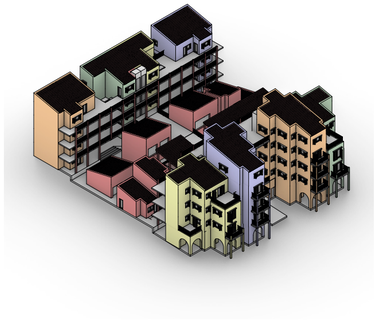
VILLAGE SEAFRONT/ **DESIGN**

LEVEL 2 PLAN

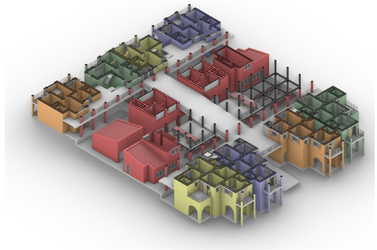
Moving to the first floor we have another level of the fish market surrounded by residential apartments. This floor is connected through a large ramp that connects everything and is to be used in case the ground floor is flooded. The residential units are intended for middle income families and young professionals, because of their prime location.



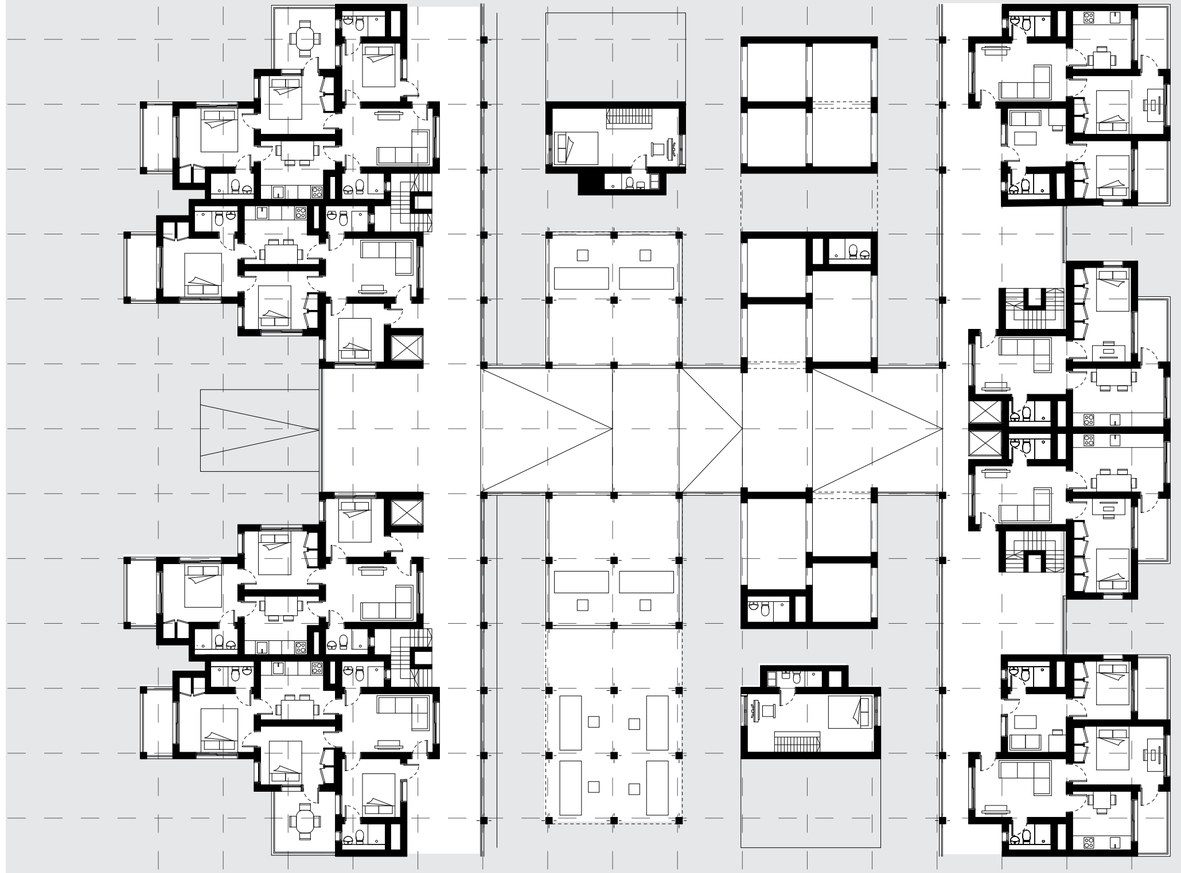
Urban plan



Axonometric

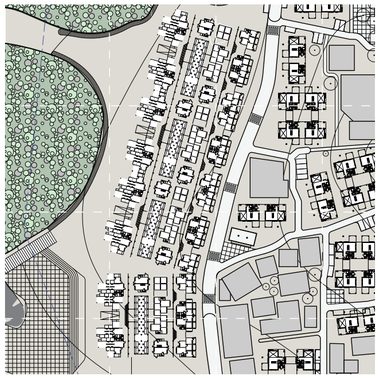


Floor axonometry

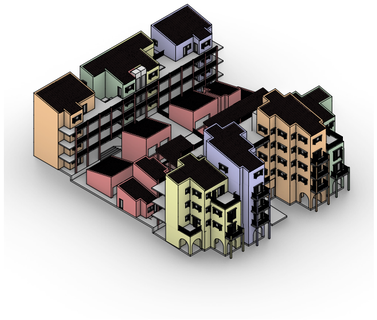


LEVEL 3 PLAN

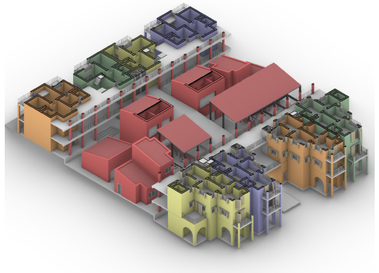
Moving up the floors, only residential apartments remain and those that do not have balconies can use the galleries instead. Care is taken to allow the dominant Western winds to enter this typology to provide ventilation for all apartments.



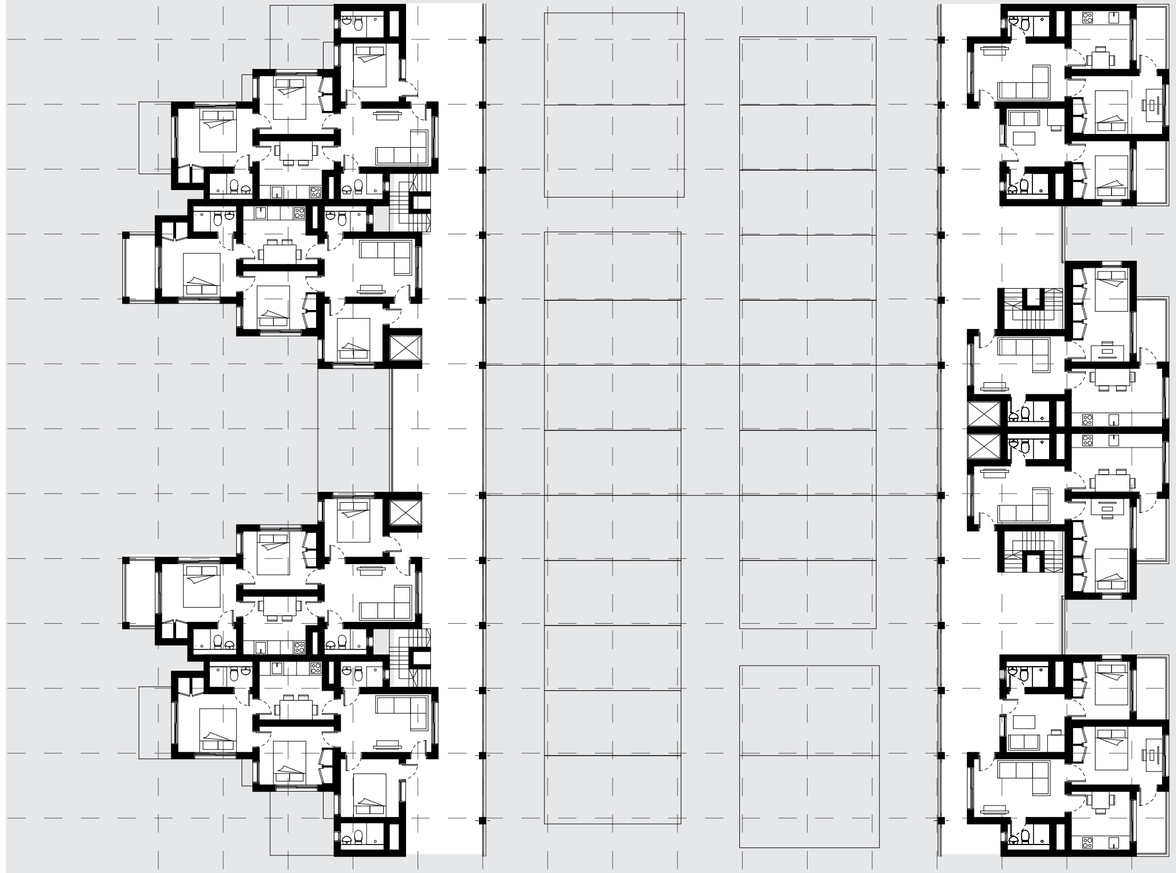
Urban plan



Axonometric



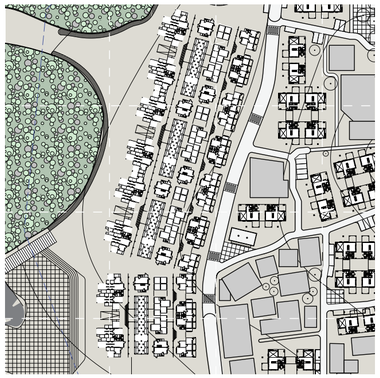
Floor axonometry



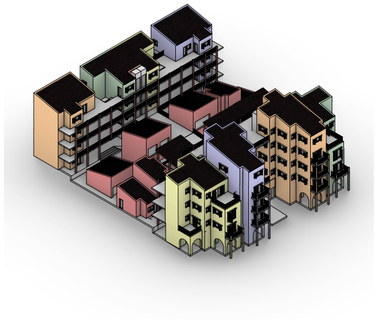
VILLAGE SEAFRONT/ **DESIGN**

LEVEL 4 PLAN

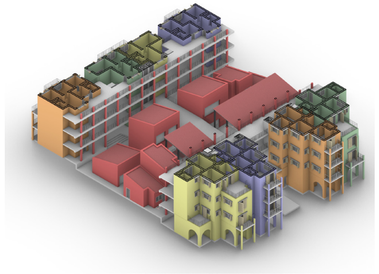
Moving on another level the same types of apartments are replicated with the floor below. Again, galleries are extended as terrace space for the residents that do not have a balcony.



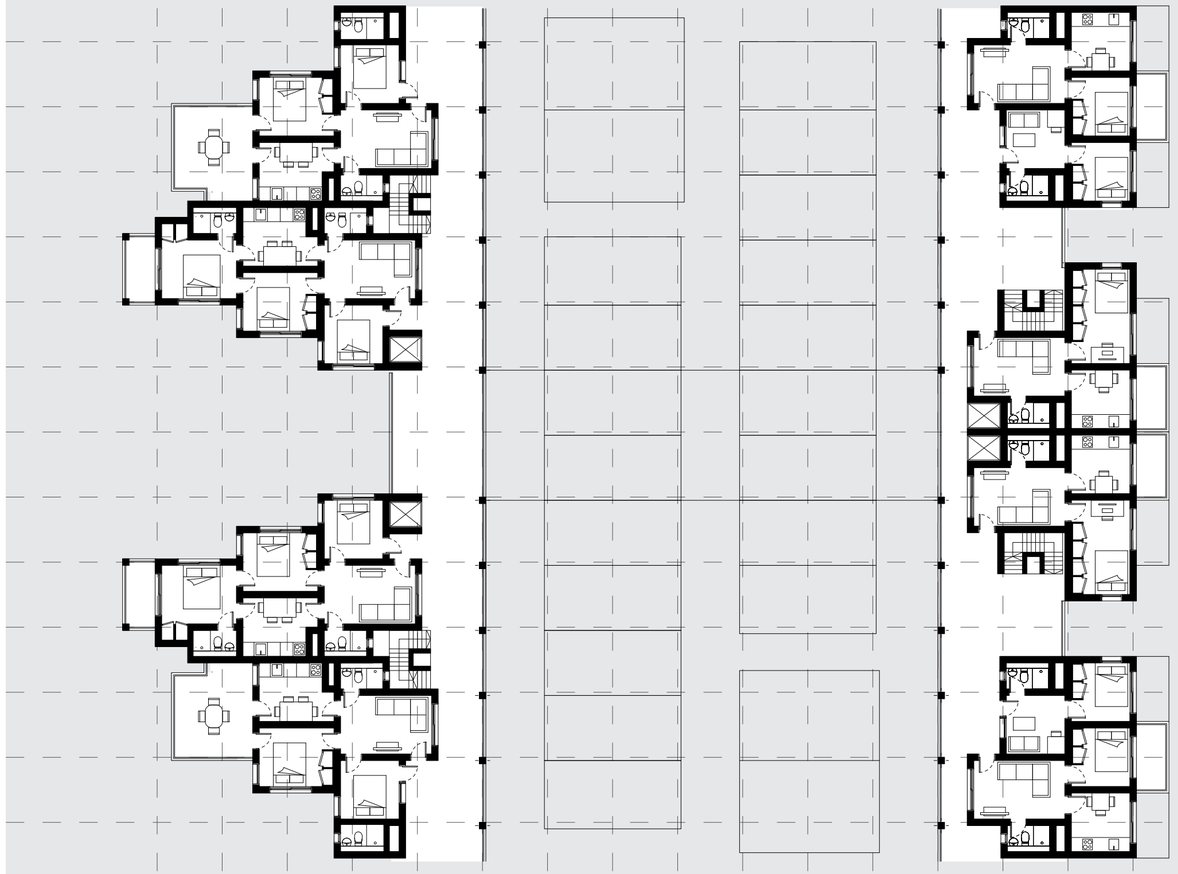
Urban plan



Axonometric



Floor axonometry



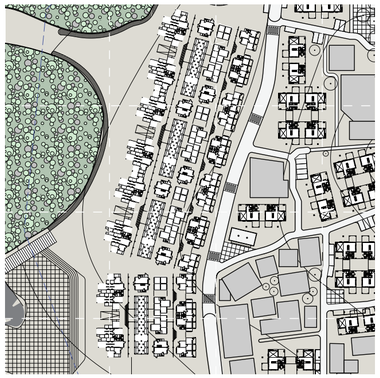
Typology One / Level 3 Plan

3m 15m

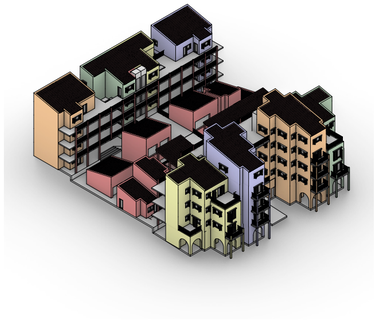
VILLAGE SEAFRONT/ **DESIGN**

LEVEL 5 PLAN

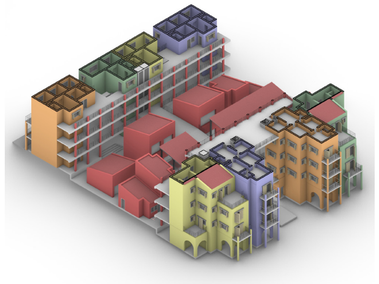
Lastly, on the 5th floor, there are some two 3 bedroom apartments left on the Western flank of this typology. The East side follows the apartment arrangement of the previous floor.



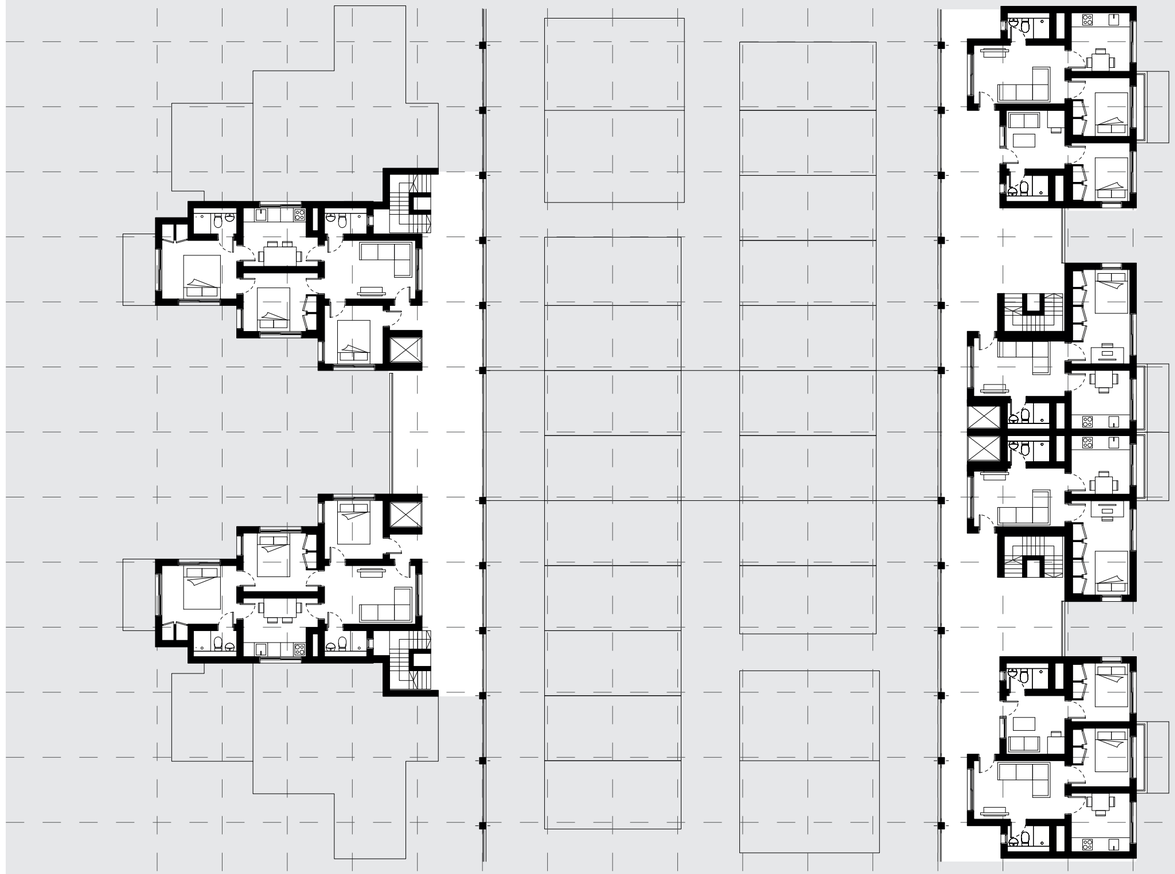
Urban plan



Axonometric



Floor axonometry



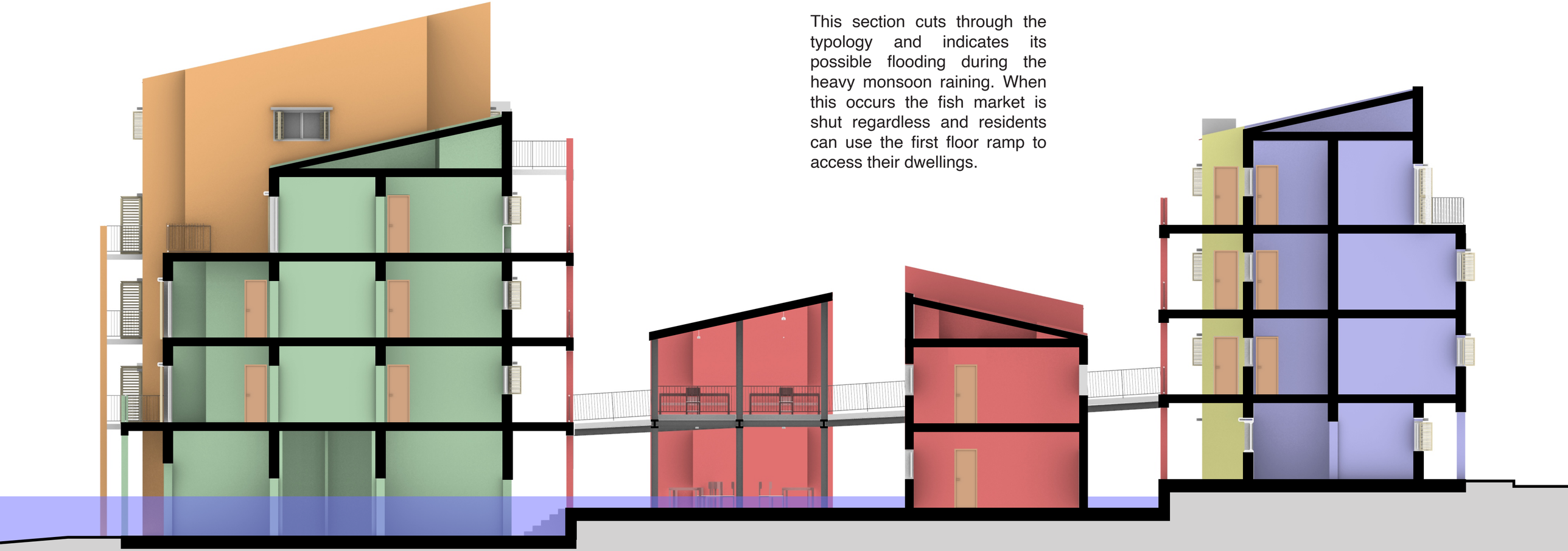
Typology One / Level 4 Plan

3m 15m

VILLAGE SEAFRONT/ **DESIGN**

SECTION

This section cuts through the typology and indicates its possible flooding during the heavy monsoon raining. When this occurs the fish market is shut regardless and residents can use the first floor ramp to access their dwellings.



Typology One / Section

1.5m 7.5m

VILLAGE SEAFRONT/ **VISUALS**

STREET

This is a view of the street with the ground floor offices and an entrance to the fish market. The arches create a welcoming feeling for the users and the balconies above create a vibrant connection with the street and the existing buildings. This is the slow street where vehicles are meant to drive slowly so that the street remains pedestrian friendly.



VILLAGE SEAFRONT/ **VISUALS**

FISH MARKET

Here is a view of the fish market with its heavy I-beam steel structure indicating the importance of fishing for the community. On the left you can see the corridor in front of the storage space, in the middle you can see the tables where fish is exhibited for sale. The fish market continues on the right with closed shops.



VILLAGE SEAFRONT/ **VISUALS**

EXTERIOR

This is a view of the seafront typology as seen from the water. The volumes of the typology protrude towards the river and with their balconies create a connection with the river.



VILLAGE SEAFRONT/ **VISUALS**

EXTERIOR

On the right you can see the arches leading to the storage spaces and fishermen and untangling their nets at the beach in front.



VILLAGE SEAFRONT/ **VISUALS**

EXTERIOR

This is an image of the street leading inside the typology as seen from the street in front. You can also notice one of the offices behind the arch and a man hanging his clothes from the balcony above.



VILLAGE SEAFRONT/ **VISUALS**

EXTERIOR

On the right you can see an image of the dwellings as seen from the public gallery. The scale of the buildings and the relationship between dwellings testifies to the intention to maintain a communal feeling amongst the residents.



VILLAGE SEAFRONT/ **VISUALS**

INTERIOR

This is an interior visual showing the bedroom of one of the 3 bedrooms appartment. It has a view of the river and the mangroves. On the left you can see the door leading to the bathroom, some wardrobes and further ahead the balcony of the room.



VILLAGE SEAFRONT/ **VISUALS**

INTERIOR

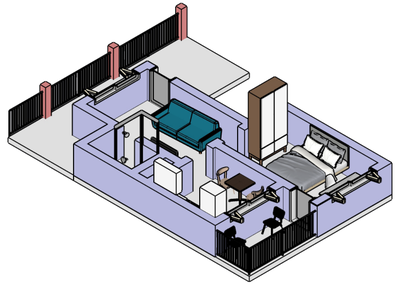
This is an interior view of a living room from the smaller apartments looking towards the interior of the typology. On the right behind the television is the door leading to the bathroom.



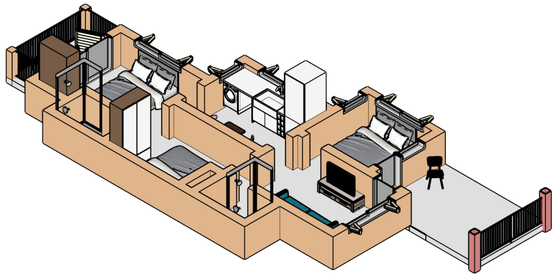
CONCLUSIONS

APARTMENTS PER TYPOLOGY

Here I put together different apartments from the three typologies to indicate the different users intended to inhabit the village. Middle income users for the village seafront typology, existing villagers for the village centre building resilience and newcomers for the village edge to increase density.

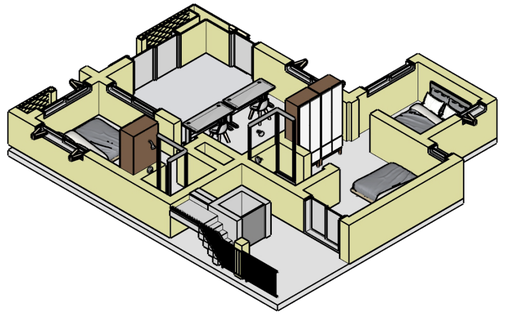


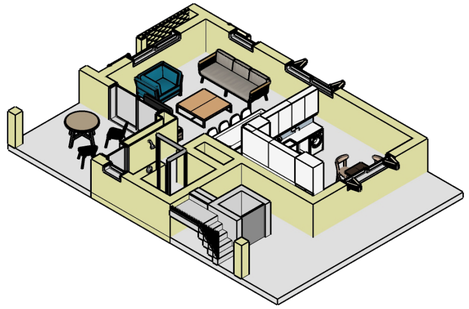
Apartment A
Area: 36.7m2
Bedroom: 1
User: Young couple



Apartment B
Area: 55.4m2
Bedrooms: 3
User: Family (commuters)

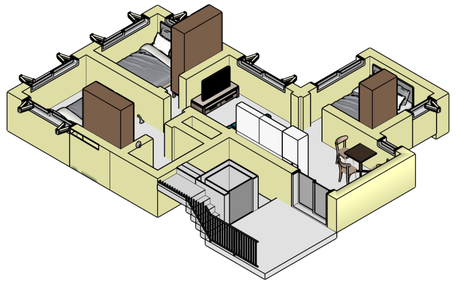
TYPOLOGY VILLAGE
SEAFRONT



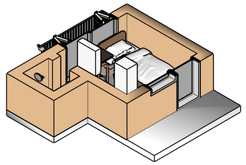


Duplex A
Area: 109.8m2
Bedrooms: 3
User: Family (existing landowners)

TYPOLOGY VILLAGE
CENTRE



Apartment A
Area: 52.4m2
Bedrooms: 3
User: Family

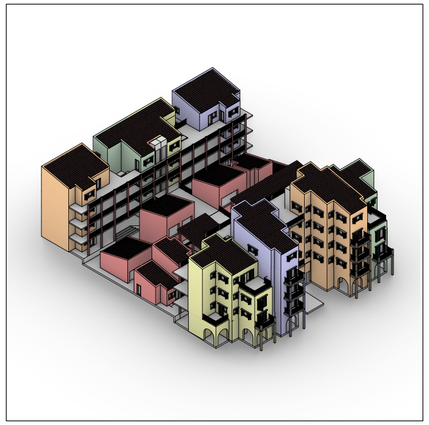


Apartment B
Area: 10.4m2
Bedrooms: 1
User: Rural migrants, Students

TYPOLOGY VILLAGE
EDGE

CONCLUSIONS/

DENSITY BENCHMARKS



AXONOMETRIC

Typology Village Seafront

Types of dwellings

8 x Type A 1Bed (22sqm)
≈ 176sqm
8 x Type B 1Bed (40sqm)
≈ 320sqm
16 x Type C 1Bed (45sqm)
≈ 720sqm
14 x 3Bed (75sqm)
≈ 1050sqm

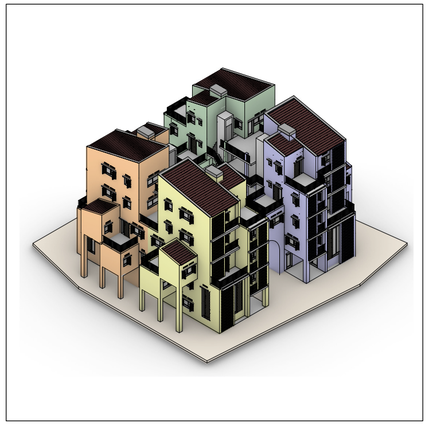
Total Area of Dwellings
≈ 2270sqm (60%)

Total Number of Dwellings
= 46

Non-Residential Area
≈ 800sqm (21%)

Additional Area
≈ 675sqm (18%)

Total Built Area
≈ 3745sqm



AXONOMETRIC

Typology Village Centre

Types of dwellings
4 x Type 1Bed (40sqm)
≈ 160sqm
4 x Type 2Bed (60sqm)
≈ 240sqm
4 x Type A 3Bed (90sqm)
≈ 360sqm
4 x Type B 3Bed (120sqm)
≈ 480sqm

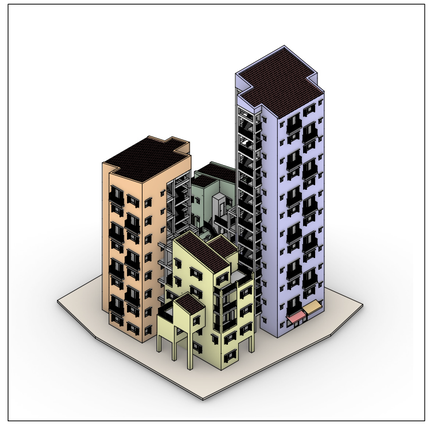
Total Area of Dwellings
≈ 1240sqm (92%)

Total Number of Dwellings
= 16

Non-Residential Area
= 0sqm (0%)

Additional Area
≈ 100sqm (8%)

Total Built Area
≈ 1340sqm



AXONOMETRIC

Typology Village Edge

Types of dwellings
16 x Type A Studios (11sqm)
≈ 176sqm
16 x Type B Studios (14sqm)
≈ 224sqm
48 Type A 1Bed (30sqm)
≈ 1440sqm
2 x Type B 1Bed (40sqm)
≈ 80sqm
2 x 2Bed (50sqm)
≈ 100sqm
2 x Type A 3Bed (60sqm)
≈ 120sqm
2 x Type B 3Bed (75sqm)
≈ 150sqm

Total Area of Dwellings
≈ 2290sqm (71%)

Total Number of Dwellings
= 88

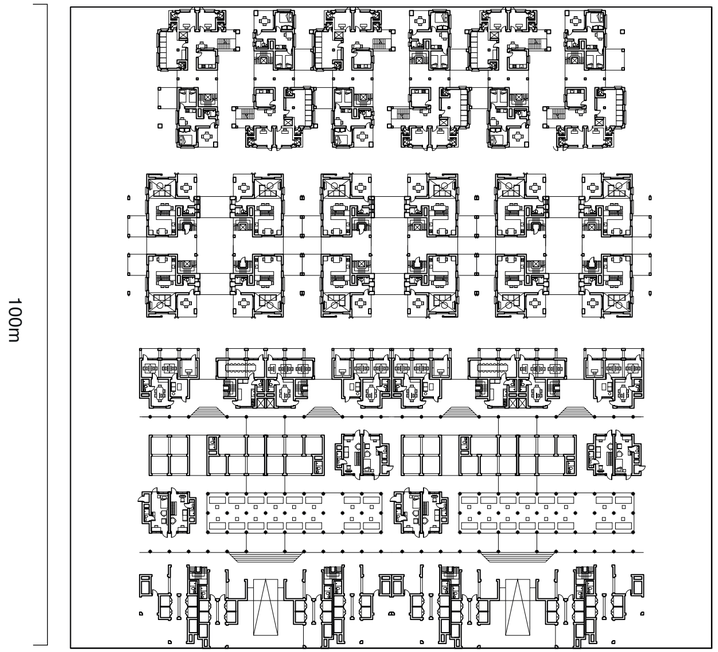
Non-Residential Area
≈ 200sqm (6%)

Additional Area
≈ 760sqm (23%)

Total Built Area
≈ 3250smq

DENSITY BENCHMARKS

I calculated the areas for the three typologies. In order to come up with the dwellings per hectare which is at 404 dwellings, 2.1 FSI and 0.44 GSI.



LAYOUT USED FOR CALCULATIONS

DW/HA breakdown

Typology Village Seafront
2 x 46(Dwellings) = 92
Typology Village Centre
3 x 16(Dwellings) = 48
Typology Village Edge
3 x 88(Dwellings) = 264

Total = **404 DW/HA**

FSI breakdown

Typology Village Seafront
2 x 3745sqm (Built Area) = 7490sqm
Typology Village Centre
3 x 1340sqm (Built Area) = 4020sqm
Typology Village Edge
3 x 3250sqm (Built Area) = 9750sqm

Total Area = 21260sqm/10000
= **2.1 FSI**

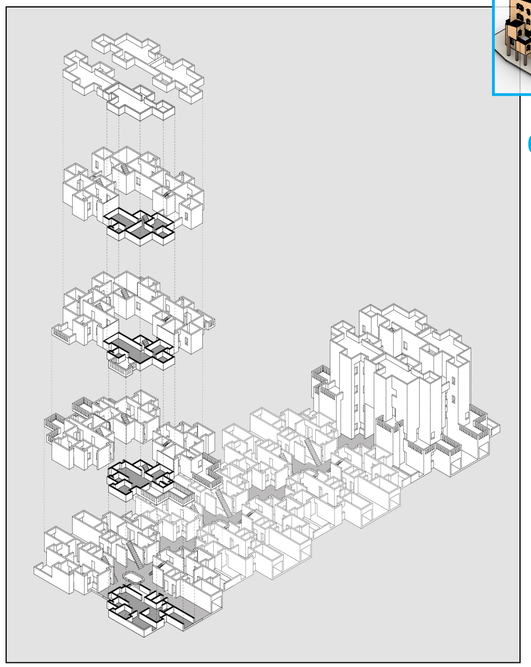
GSI breakdown

Typology Village Seafront
2 x 1152sqm (Ground Floor) = 2304sqm
Typology Village Centre
3 x 360sqm (Ground Floor) = 1080sqm
Typology Village Edge
3 x 342sqm (Ground Floor) = 1026sqm

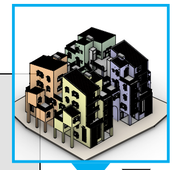
Total Area = 4410sqm/ 10000
= 0.44 GSI

DENSITY COMPARISON

And then compare it with the Sheikh Sarai housing and the CIDCO mass housing scheme. What we can draw from this comparison is that with a GSI close to Sheikh Sarai and and an FSI equal to the mass housing scheme we can have a number of dwellings close to the mass housing scheme. Of course, the different types of dwellings can very between any typology, but this is a sign that we can imagine different solutions from the mass housing schemes as suggested in my design hypothesis. Also, I do believe that to house the urban poor that live in informal settlements very small apartments as seen in the village edge typology are needed.



POST-INDEPENDENCE VILLAGE
LOW-RISE - 'HIGH-DENSITY'



0.44

GSI:
0.4

FSI:
1.1

DW/HA:
145

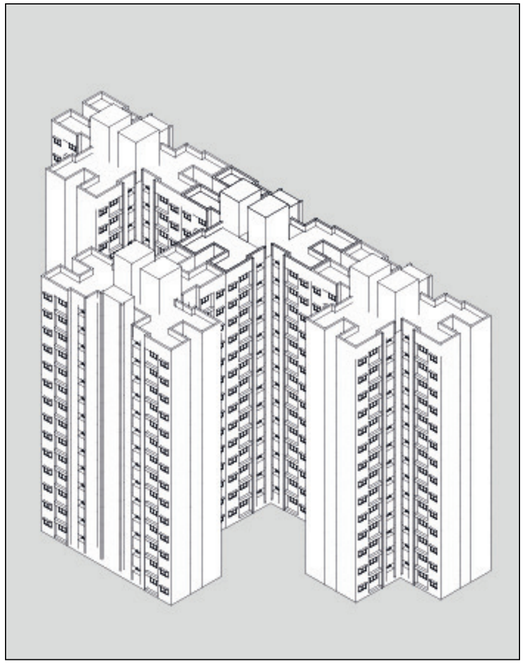
GSI:
0.14



FSI:
2.1



404 *DW/HA:*
410



CIDCO MASS HOUSING BLOCKS
HIGH-RISE, HIGH-DENSITY

URBAN VILLAGE DEVELOPMENT

URBAN PLANNING

1. An urban plan should be first worked out in order to manage the specific location problems and characteristics eg. flooding.
2. Plots should be defined based on existing streets. New streets bring safety, accessibility, water drains & sewage pipes.
3. Space and buildings should be dedicated to the local industries, fishing in our example.
4.Some heritage buildings should be preserved.
5. Proximity to transport infrastructure must be taken into consideration.
6. Clever allocation of functions other than residential according to context.

STAKEHOLDERS

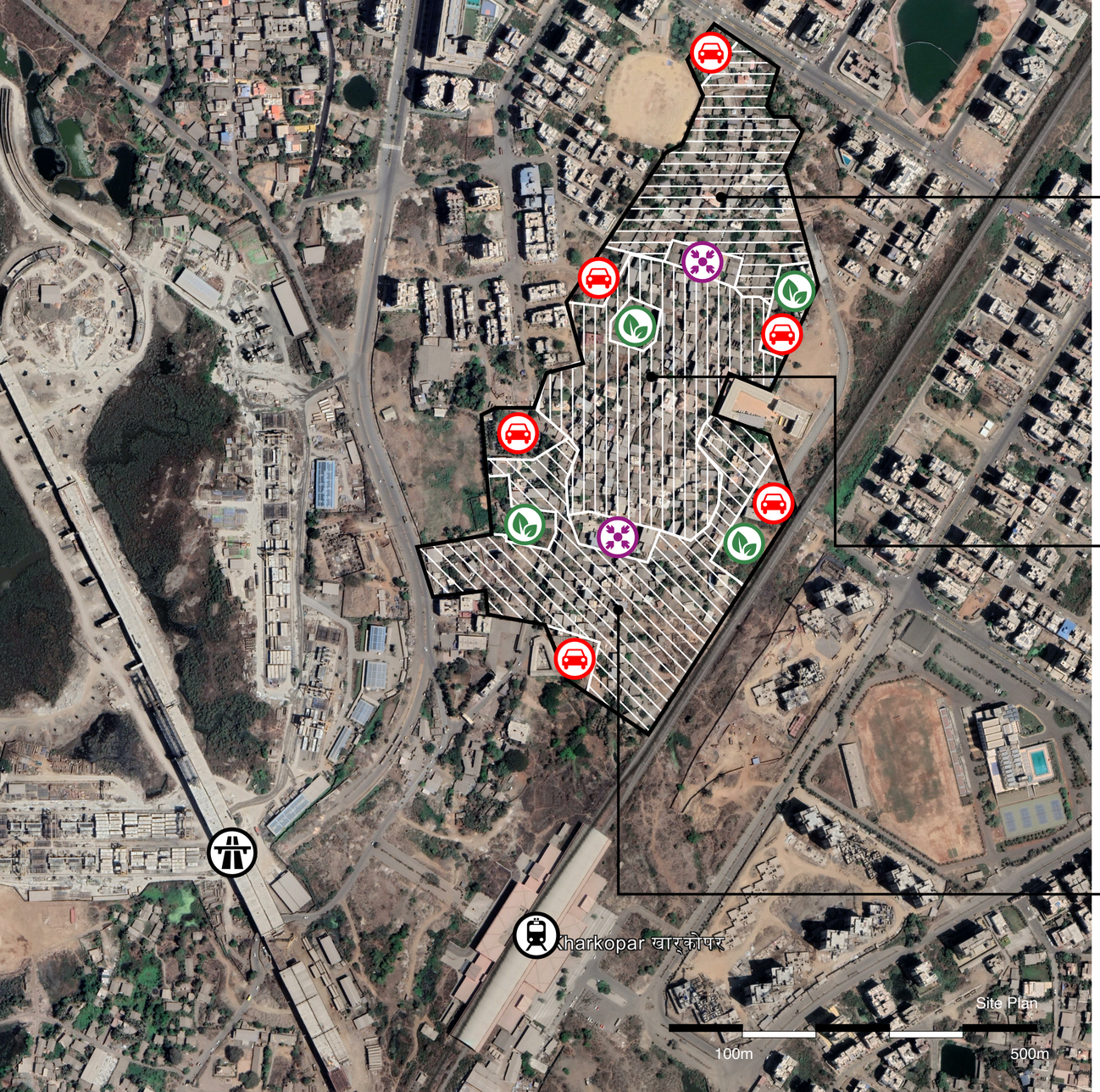
1. The community council or other authority should mediate between landowners and contractors, manage communal land and raise money from rent and taxes for its services.
2. Landowners should receive property according to the amount of land they own and an estimation of the property they would own based on individual development.
3. Contractors receive property as reward payment for their services.

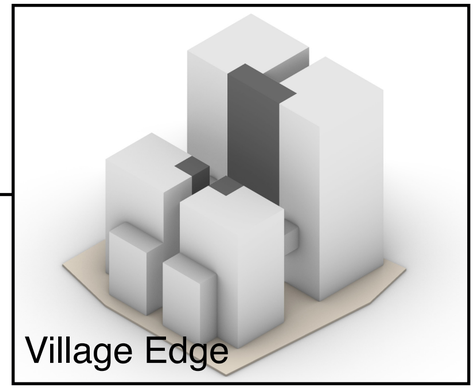
RESIDENTIAL

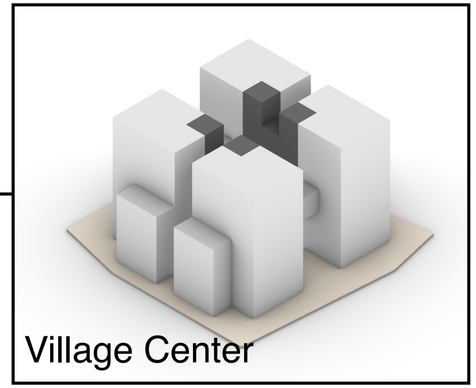
1. Residential typologies should be cleverly allocated to achieve a balance between wanted density and maintenance of the urban village character.
2. Different kinds of dwellings should be provided according to who is aimed at inhabiting them.
3. Village intimacy and scale should be achieved through organised developement with ‘compact’ designs.
4. Higher densities should be achieved with mid-rise but also higher-rise buildings, without compromising the intimate street conditions and remaining competitive to the mass housing schemes.
5. It is ideal that buildings remain porous and accessible for pedestrians replicating the urban village street character.
6. Ground floors should include other functions where it is appropriate in order to support vibrant streets.

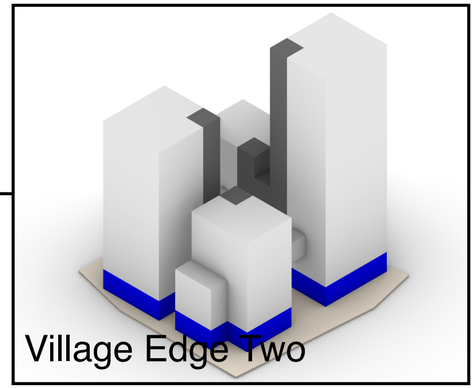
PRINCIPLES APPLICATION
- SAI MANDIR VILLAGE

This is a simple attempt to apply the principles I have developed for another village in Navi Mumbai. There is parking dedicated around the village, green areas and gathering spaces. The village is split into 3 different sections with 3 different typologies. Village Edge Two typology has ground floor space dedicated for a new Red Light District since it is situated near a new major railway station. The aim is for the villages to be connected with the formal city.











DESIGN HYPOTHESIS

To design an appropriate strategy and housing typologies for the currently urbanising villages that can provide better quality of life for all future residents, while respecting their ancestral lifestyle.

If the design proposal is deemed promising this would signify that urbanising villages can be worthily pursued as sites of providing afforable and quality housing for the urban poor; an alternative to the aspired model of the mass housing schemes of high-rise buildings.

Housing Typologies

Affordable and of good quality

Support different purposes and urban conditions

Fishing, village life, densification

Pragmatic sizes follow the competitive housing market

Question Mass Housing Scheme

As a model for housing the urban poor

As aspiration stemming from marketisation of housing for NRI's and other foreign investors

Problematic model for a number of reasons we are familiar in the West

Mass housing does not reach EWS anyway

Urban Planning

Community benefits as a whole

Supports healthy planned growth

Follows the concept and spirit of Navi Mumbai

Supports healthy informal development (sites and services approach) infrastructure is provided

Heritage

Respect heritage buildings and preserve them

Managed alongside other communal space by the grassroots authority

Community

Usually excluded from participation politically, disregarded in urban planning

Problematically find support in regionalist party Shiv Sena

Support New Influx of Residents

Existing grassroots community taken care of first

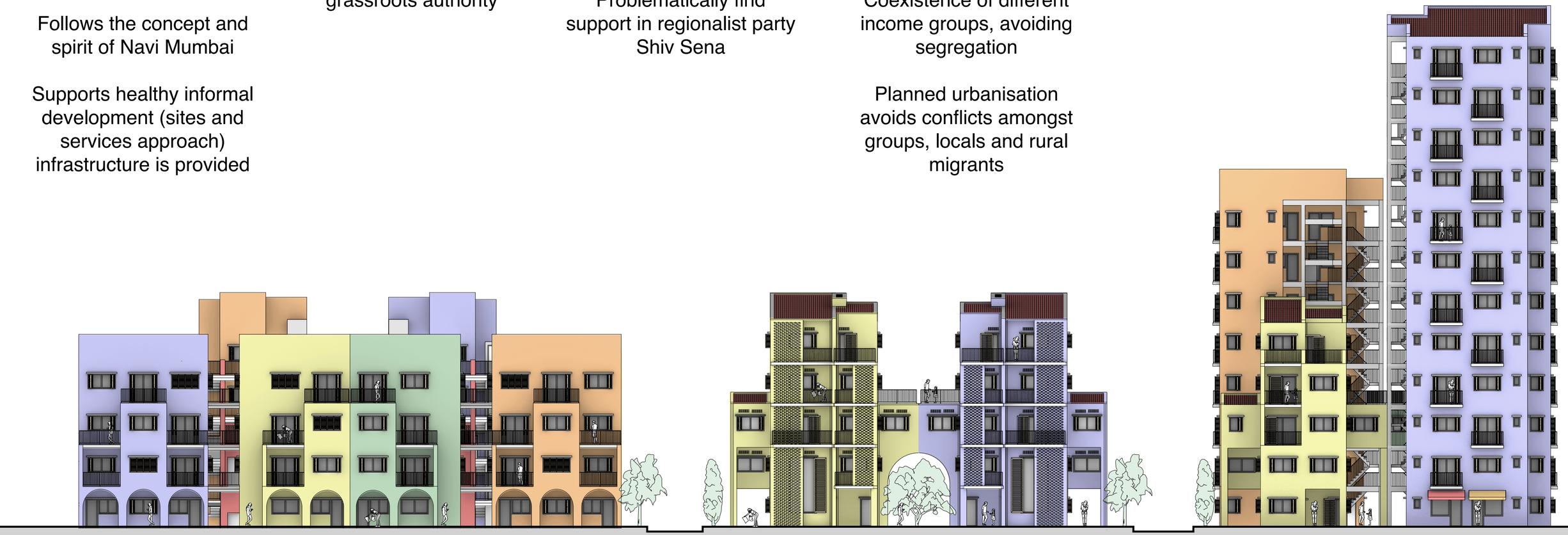
Coexistence of different income groups, avoiding segregation

Planned urbanisation avoids conflicts amongst groups, locals and rural migrants

Density

Contest mass housing schemes

Create vibrant neighborhoods



Informal economy - fishing

Respects ancestral lifestyle

Non destructive for the ecosystem

Employment of both men and women of the community

Support the ecosystem

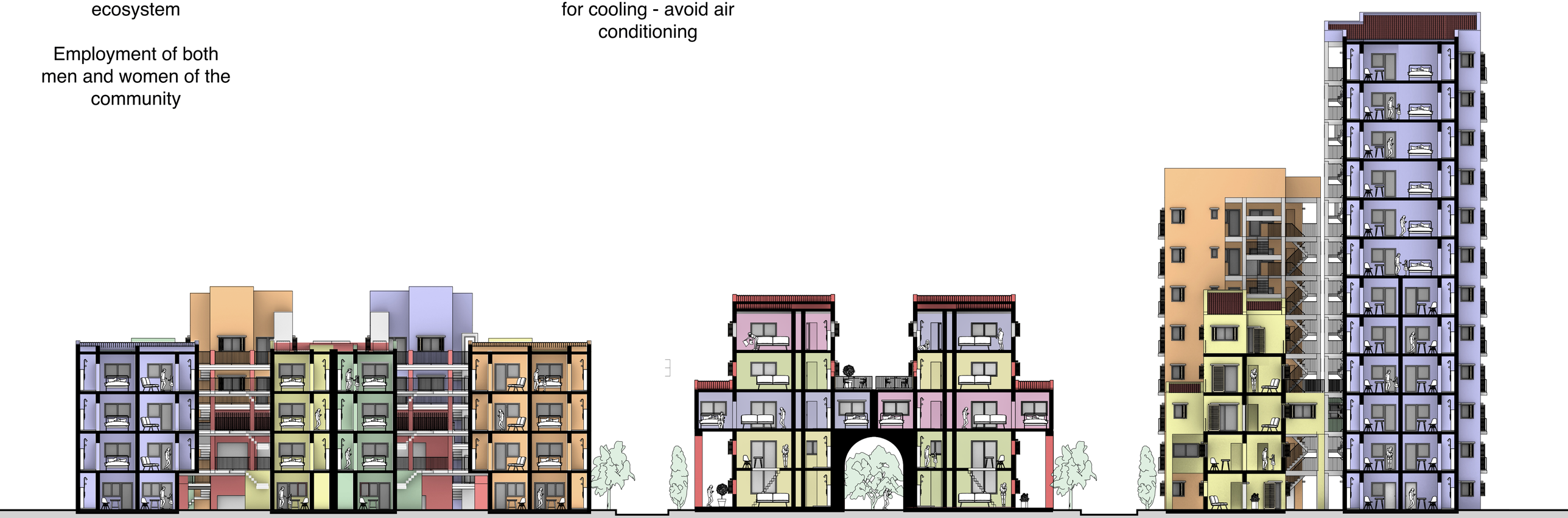
Respect and increase the mangrove area

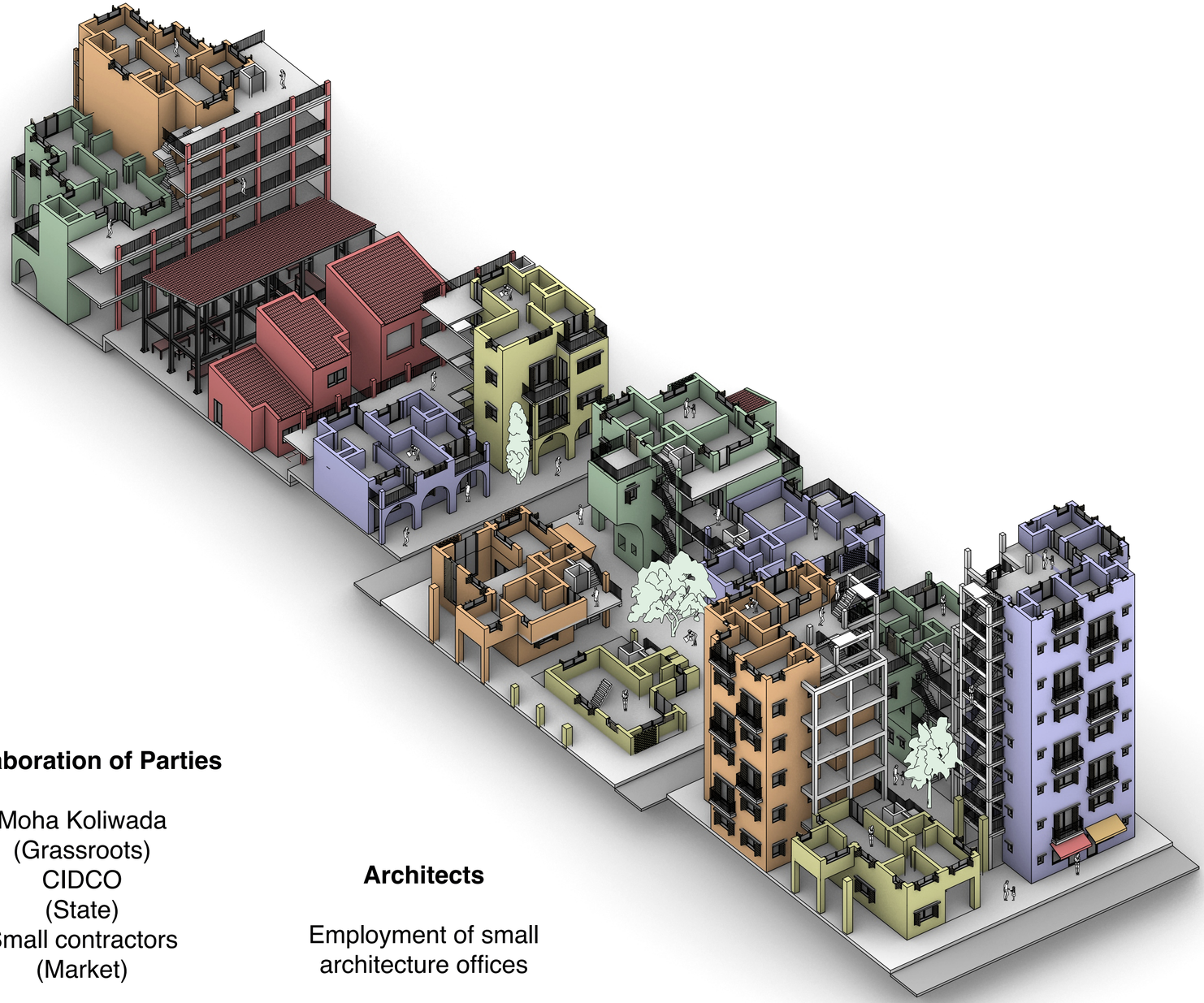
Incorporate trees and vegetation

Sustainability

Use of materials friendly to the environment as much as possible

Use of natural ventilation for cooling - avoid air conditioning





Inspiration from India

Inspiration from Indian modernism for housing typologies

New stakeholders involved to address grassroots groups and different political and economical reality

Collaboration of Parties

Moha Koliwada
(Grassroots)
CIDCO
(State)
Small contractors
(Market)

Architects

Employment of small architecture offices

Colour

Part of the aesthetics of the community and celebrated

Part of the aesthetics of numerous low income communities around the world

Criticise black and white aesthetics found in academia

Informality

Basis of new planned developments, eg. existing streets, functions

Coexists with planned developments within the villages

Lesson to plan for mixed-use developments

Inspiring but should not be romanticised by our Western eyes as ideal

Address its problems



Association with the Formal City

Urbanised villages that grow alongside the city

Not leftover from planned city and just informally developed

Avoid their eradication as much as possible, there is space for them and they can contribute to the city

Thank you