



towards a humane housing for the poor

Vijay Narnapatti Director & Design Principal

mayaPRaxis design + architecture

housing for all PEPSCON 2017

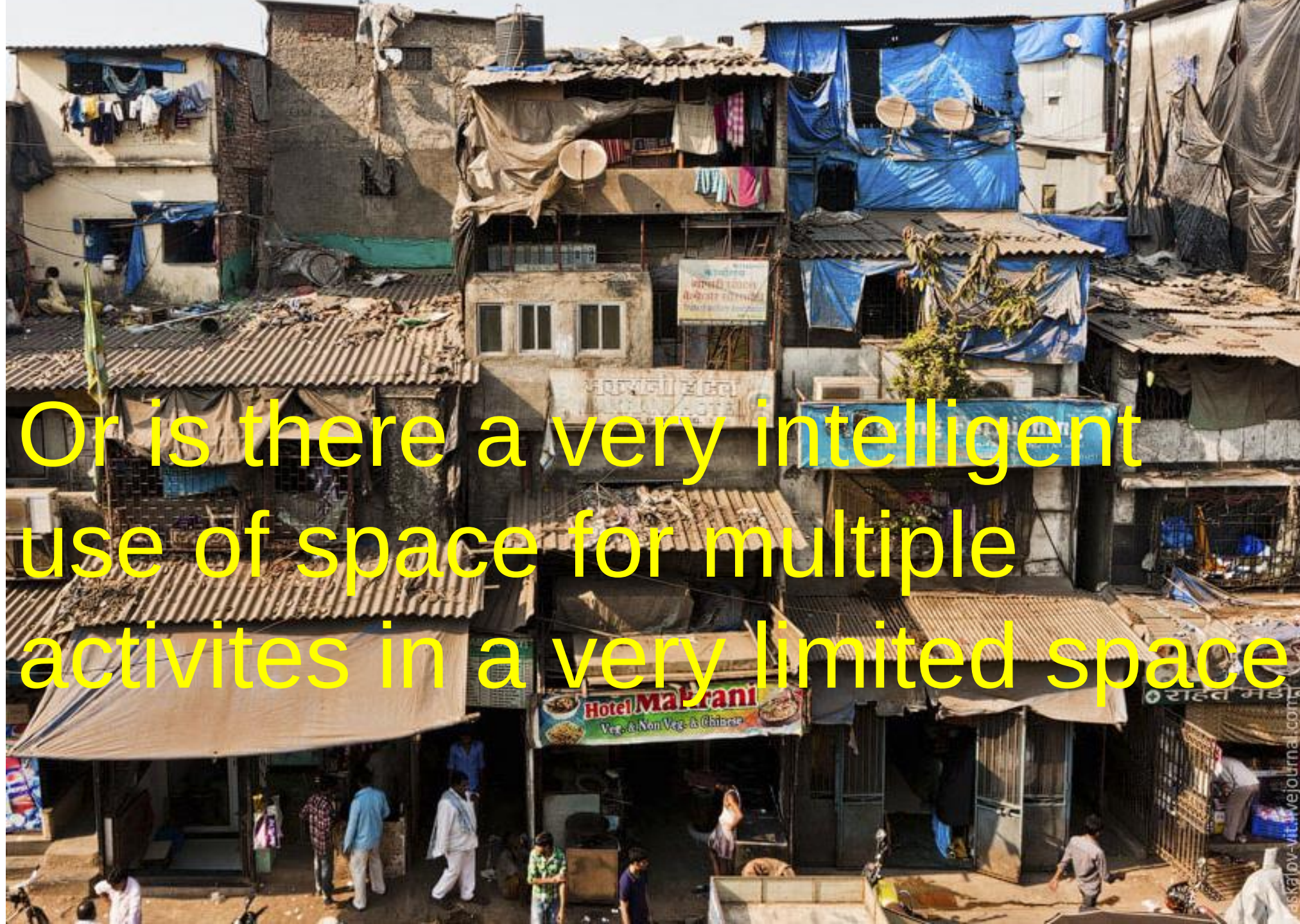


the 'mess'

the cleanup?



is this really only a mess ?



Or is there a very intelligent use of space for multiple activities in a very limited space



house

house

house

house

house

tailor

Furnishing
shop/tailor

hotel
/restaurant

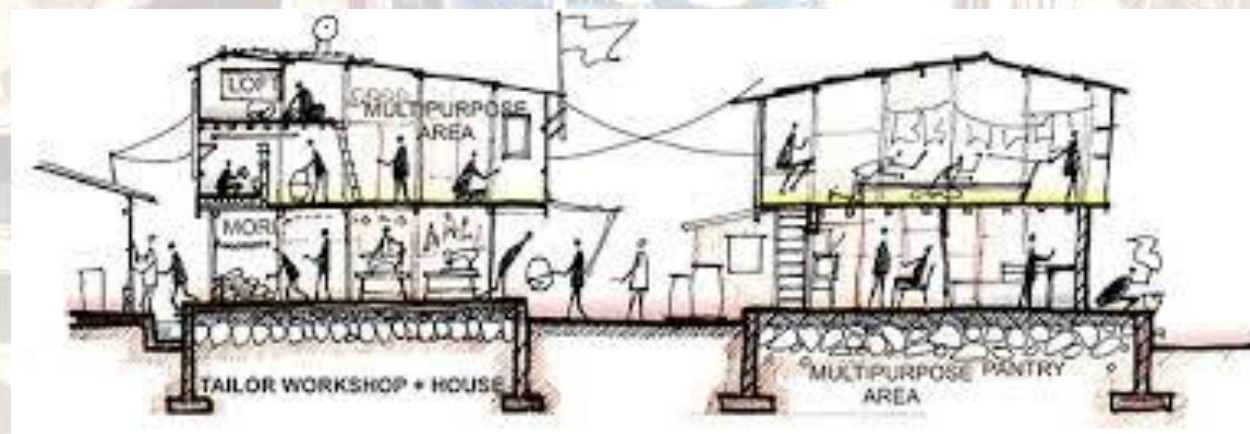
house

Hotel /
restaurant

2-wheeler
mechanic

General
store/shop

Housing colonies are social and economic habitats which are integrated and mixed use developments



**Liveability
Livelihood
Location
Limited resources**

CHALLENGES

FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Housing estates are **isolated, peripheral and away from city centers.**
- Older housing is now centrally located and **land value is under utilized.**



CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Residents are forced to **commute to access daily needs** [workplaces, services, shopping, recreation].
- Results in **urban sprawl** and creates **larger environmental footprints**.



Los Angeles, California

CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Inflexible planning houses **do not respond to the changing needs of families**



CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Open Spaces are **mostly neglected, underutilized and even unsafe.**



CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Lack of financial resources lead to **lack of maintenance**

CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Young as well as Aging inhabitants need **better designed accessible spaces.**



CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Mass housing often results in **social segregation**.
- **Social ills such as gangs, traffickers** tend to move into mass housing complexes.



CHALLENGES FACED by EXISTING PUBLIC/SOCIAL HOUSING ESTATES

- Lack of tenure of residents results in **a poor sense of responsibility/belonging.**



STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Improve the **quality and utilization of public space.**



Public space is used as a dumping ground



Multiple uses of space in the market place - ahmedabad

STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Improve **mobility** by introducing a rich variety of urban uses.
- Promote **cultural vitality and street life**



Vehicles dominate the bulk of public space

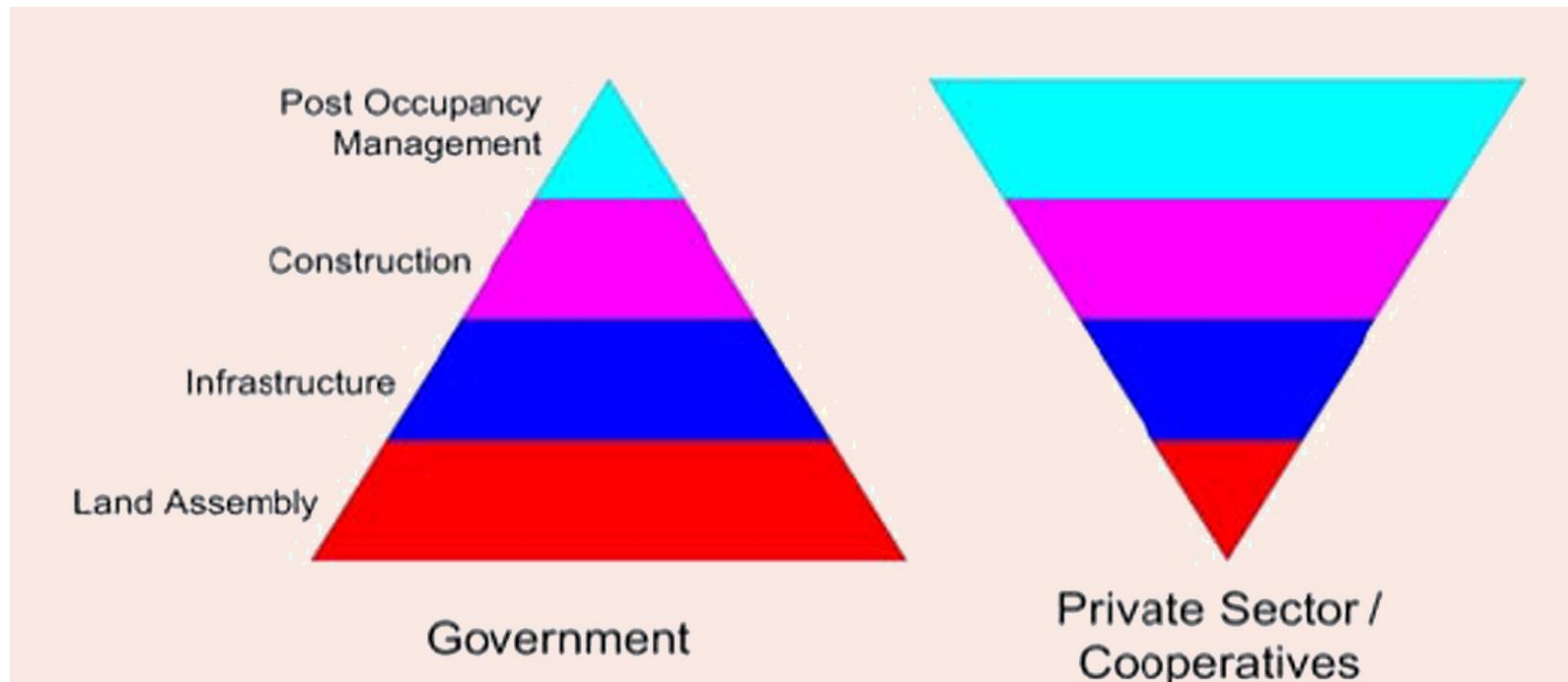
STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Introduce **economic activities** to generate new jobs and income opportunities.
- **Accommodate existing livelihoods** within the neighbourhood or risk ad-hoc, messy development.
- Ensure that proposals are **gender responsive**



STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Encourage investment from the **private sector** through incentives
- **Share land values** to finance neighborhood and housing improvement



A proposal showing relative investments models between governments and private sectors..

STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Seek to invest in **existing residential areas** and improve conditions



STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Accommodate **incremental growth**



KUCCHA 1

Estimated cost
1500 - 2000 Rps.
10%

KUCCHA 1

Estimated cost
20 - 30,000 Rps.
10%

SEMI PUCCA 1

Estimated cost
45 - 50,000 Rps.
31%

PUKKA 1

Estimated cost
100,000 Rps.
8%

PUKKA 1.5

Estimated cost
130,000 Rps.
10%

PUKKA 2

Estimated cost
150,000 Rps.
5%

PUCCA 2.5

Estimated cost
200,000 Rps.
9%

STRATEGIES TO IMPROVE PUBLIC/SOCIAL HOUSING ESTATES

- Introduce **rights based concepts** focused on **consensus based decision making**.



Urban Design

- Improve the quality and utilization of public space,
- Improve mobility by introducing a rich variety of urban uses,
- Promote cultural viability and street life.

Economic stimulation

- Introduce economic activities, by including mixed uses, to generate new jobs and income generating opportunities,
- Encourage, through incentives, the private sector to invest in the area,
- Introduce urban agriculture for job creation, food production and security,
- Share land value to introduce solutions to finance neighborhood and housing improvements,
- Identifying high value areas based on location or possibility of utilization to accommodate new uses without adversely impacting on the residential units and the living conditions of inhabitants.

Social integration

- Address social mobility through improved tenure security and encouraging social interaction with the surroundings and the rest of the city,
- Introduce rights-based concepts avoiding relocations except through consensus and with well-designed win-win solutions to improve the living conditions of those relocated such as say to reduce extremely high densities or to make way for high return investments to improve the whole area, including those relocated,
- Ensure that the proposals are gender responsive.

Environmental improvement

- Achieve neighborhood environmental sustainability,
- Improve microclimate through vegetation preferably productive urban agriculture and urban elements/furniture.

Governance and partnership

- Initiate a dialogue with key actors including central and local government, private sector, civil society, professionals and academia.
- Encourage corporate social responsibility to improve the living conditions in the urban environment through urban revitalization by contributing to implementing some of the proposals,
- Introduce academic social responsibility whereby students, recent graduates and academia provide policy advice and technical knowhow to local and central authorities as well as communities on urban revitalization.

CRITICAL ANALYSIS OF EXISTING HOUSING TYPES [AFFORDABLE]

CRITICAL ANALYSIS of EXISTING HOUSING TYPES

Objective of Analysis:

- **2 housing scenarios** to be analyzed – **Rural** and **Urban**
- **3 criteria** of analysis -
 - **Planning** issues – Issues pertaining to location, infrastructure and public participation.
 - **Design** issues – Issues pertaining to climate response, light and ventilation.
 - **Technology** issues – Issues pertaining to materials, cost, structure.
- Conclusions of this analysis to form design basis for the Rural, Sub urban and Urban scenarios.



Rural

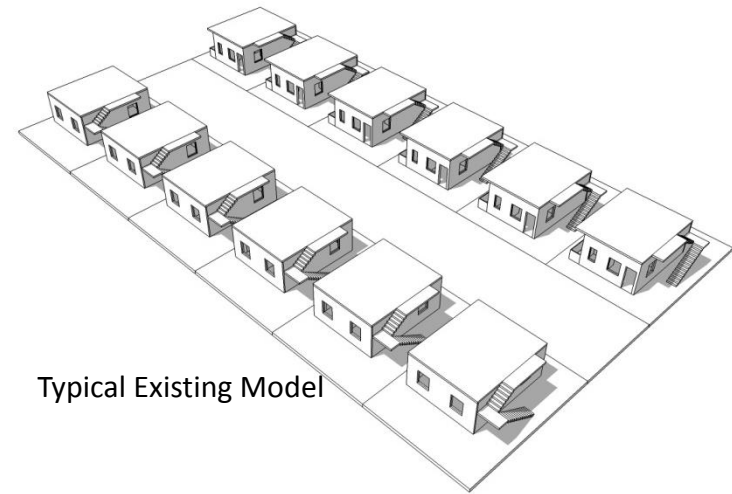


Urban

Generic government rural housing projects:

Existing case considered -

- Detached housing typology.
- Grid Iron pattern arrangement.



Typical Existing Model

Planning Issues

1. **Location** is decided on the grounds of social divisions and not the proximity of places of occupation.
2. Lack of **amenities** and **mobility** options.
3. Poor planning of **resource mobilization** leading to wastage during construction.
4. No **participation** from target groups in the planning/design process.
5. Lack of **community spaces** for social interactions.

Design Issues

1. Building design doesn't respond to the **Climate**.
2. The design of the house doesn't capture the family growth and **occupation**.
3. No scope for **expansion**.
4. Lack of **outdoor spaces for occupational activities**.

Technology Issues

1. Poor **quality management** and testing parameters for construction practices.
2. Post construction **cost** is much higher as compared to the estimated cost of project.
3. Structural design is not **site specific** leading to wastage of materials.
4. One **standard generic model** is repeated everywhere without considering the context.
5. The **thermal resistance of materials** and technology adapted for construction is not addressed.

Analysis of existing Rural Habitats

Planning Issues

1. **Location** is decided on the grounds of social divisions and not the proximity of places of occupation.
2. Lack of **amenities** and **mobility** options.
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5. The **thermal resistance of materials** and technology adapted for construction is not addressed.



Generic government High Density urban housing projects:

Existing Case considered -

- Apartment typology.

Planning Issues

1. **Location** is decided on the grounds of socio-political influences and not the proximity of places of occupation.
2. Lack of **amenities** and **mobility** options.
3. Poor planning of **resource mobilization** leading to wastage during construction.
4. No **participation** from target groups in the planning/design process.
5. Lack of scope for **social spaces** and community interaction.
6. Improper planning of stages for **evacuation, rehabilitation and resettlement** of beneficiaries during construction phase.

Design Issues

1. Building design doesn't respond to the **Climate**.
2. No adequate spaces between building blocks leading to **poor light and ventilation**.
3. No scope for **customization**.
4. No spaces are allotted for **outdoor activities**.
5. Because of **standardization** there is no sense of ownership and belonging.
6. Design is **rigid and inhuman** in scale and proportions.

Technology Issues

1. Poor **quality management** and testing parameters for construction practices.
2. Post construction **cost** is much higher as compared to the estimated cost of project.
3. Structural design is not **site specific** leading to wastage of materials.
4. One **standard generic model** is repeated everywhere without considering the context.
5. No **post-operation maintenance** e.g. elevators, community spaces. Lack of innovative ideas to reduce the post-operation cost.
6. Poor **service management** e.g. water supply, sanitation, etc.
7. The **thermal resistance of materials and technology** adapted for construction is not addressed.

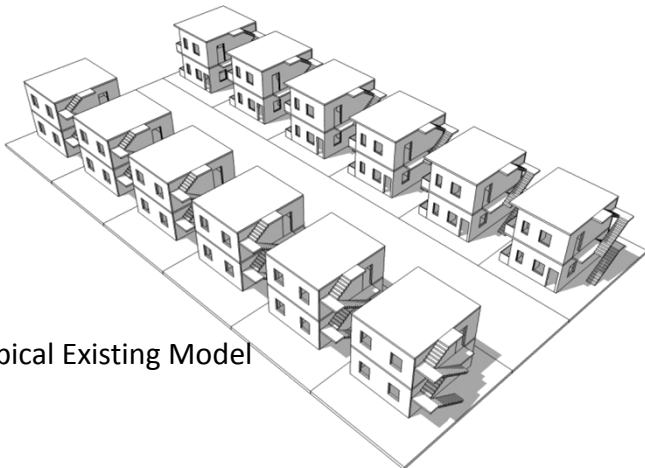


Typical Existing Model

Generic government Medium Density Urban housing projects:

Existing Case considered -

- Detached housing typology.
- Grid Iron pattern arrangement.



Typical Existing Model

Existing analysis of Urban Habitats

Planning Issues

1. **Location** is decided on the grounds of socio-political influences and not the proximity of places of occupation.
2. Lack of **amenities** and **mobility** options.
3. Poor planning of **resource mobilization** leading to wastage during construction.
4. No **participation** from target groups in the planning/design process.
5. Lack of scope for **social spaces** and community interaction.
6. Improper planning of stages for **evacuation, rehabilitation and resettlement** of beneficiaries during construction phase.

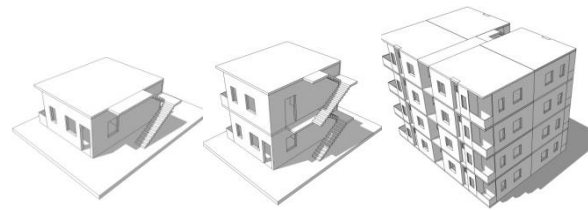
Design Issues

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Technology Issues

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3. Structural design is not **site specific** leading to wastage of materials.
4. One **standard generic model** is repeated everywhere without considering the context.
5. No **post-operation maintenance** e.g. elevators, community spaces. Lack of innovative ideas to reduce the post-operation cost.
6. Poor **service management** e.g. water supply, sanitation, etc.
7. The **thermal resistance of materials and technology** adapted for construction is not addressed.





		RURAL	SUBURBAN	URBAN
PLANNING ISSUES	1. LOCATION of PROJECT – SOCIO-POLITICAL 2. PLANNING at MACRO LEVEL – INFRASTRUCTURE, TRANSIT 3. PLANNING at MICRO LEVEL – COMMUNITY SPACES 4. PLANNING of RESOURCE MOBILIZATION 5. PARTICIPATION from BENEFICIARIES			
DESIGN ISSUES	1. DESIGN response to CLIMATE 2. DESIGN response to FUNCTIONAL REQUIREMENTS 3. DESIGN response to LIGHT AND VENTILATION 4. DESIGN scope for EXPANSION 5. DESIGN scope for CUSTOMIZATION			
TECHNOLOGY ISSUES	1. QUALITY MANAGEMENT – TESTING PARAMETERS 2. SERVICE MANAGEMENT – WATER SUPPLY, SANTITATION 3. CLIMATE SPECIFIC MATERIAL TECHNOLOGY 4. SITE SPECIFIC STRUCTURAL DESIGN 5. POST OPERATION MAINTENANCE			
SUMMARY THE DESIGN SHOULD ADDRESS TO	1. PLANNING of COMMUNITY SPACES 2. PARTICIPATIVE DESIGN PROCESS 3. DESIGN response to CLIMATE, LIGHT, VENTILATION 4. SCOPE for CUSTOMIZATION and EXPANSION 5. CLIMATE SPECIFIC TECHNOLOGY			
		LOW DENSITY		HIGH DENSITY

LEGEND:

- MODERATELY RESPONSIVE
- MINIMALLY RESPONSIVE
- NOT RESPONSIVE

Existing Material and Building Technologies

Applicable in Rural conditions			Applicable in Urban conditions			
Foundation	Brick-arch foundation		Rubble Masonry		Pre-cast RCC Footings	
Columns	Pre-fab RCC Columns		Pre-fab RCC Beams			
Walls	Fal-G Blocks		Soil-cement blocks		lightweight concrete wall panels	
Slabs	Ferro-cement roofing channels		RCC hollow core panels		Joist and RCC plank	
Doors	RCC door and window frames		Coir polymer composite board			

Applicable in Rural conditions				Applicable in Urban conditions				
Foundation	Stone Rubble Masonry			Pre-cast RCC Footings				
Columns	Pre-fab RCC Columns	 		Pre-fab RCC Beams				
Walls	Fal-G Blocks		Soil-cement blocks		lightweight concrete wall panels			
Slabs	RCC hollow core panels			Joist and RCC plank				
Doors	RCC door and window frames	 		Chipboard door panel			Coir polymer composite board	

Best Practices – National Standards [BIS]

Design Guidelines – Dwelling Units

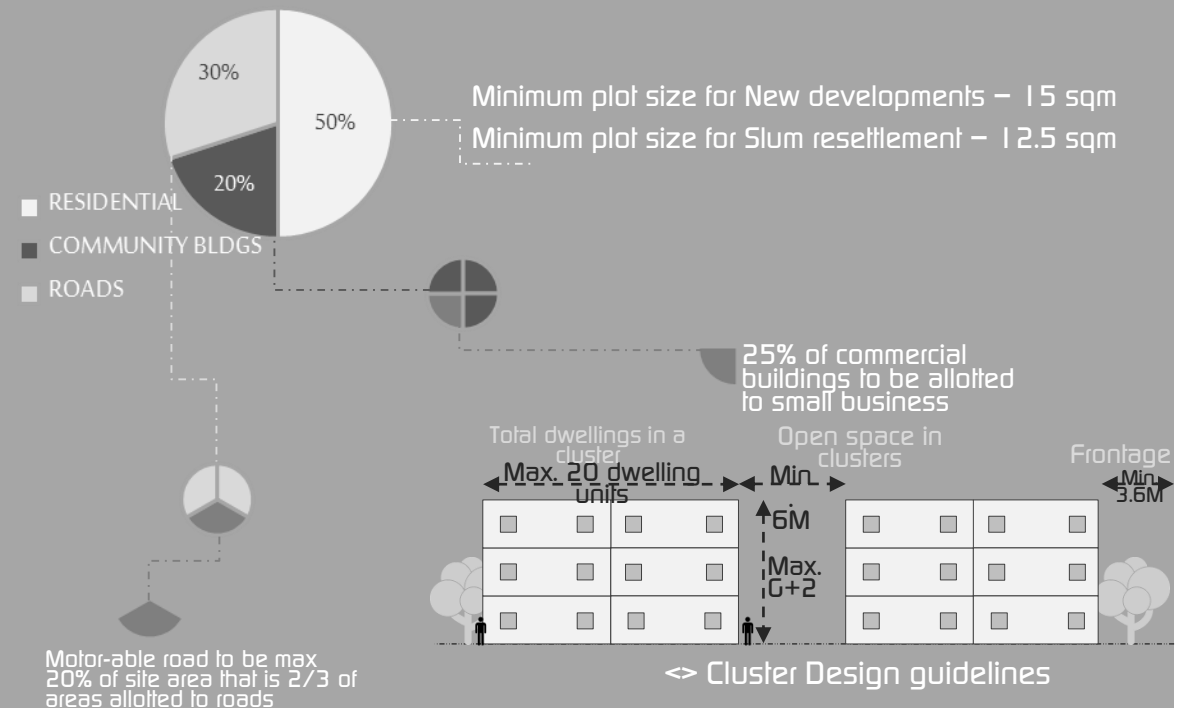
	WIDTH (METER)	HEIGHT (METER)	AREA (SQUARE METER)
Kitchen	1.5 (min)	2.6 (min)	3.3 (min)
WC	0.9 (min)	2.1 (min)	2.1 (min)
Bathroom	1.0 (min)	2.1 (min)	2.1 (min)
WC+Bathroom	1.0 (min)	2.1 (min)	2.1 (min)
Balcony	1.2 (min)	-	-
Circulation Areas	-	-	8.0 (max)
Windows	-	-	10% (min)
Staircases	Width	Tread	Riser
2-storey straight	0.6 (min)	0.225 (min)	0.2 (min)
2-storey winding	0.75 (min)	0.225 (min)	0.2 (min)
3-storey straight	0.75 (min)	0.25 (min)	0.2 (min)
3-storey winding	0.9 (min)	0.25 (min)	0.2 (min)

Source: IS 8888 (part 1) : 1993 Reaffirmed 2005

Design Guidelines – Cluster Planning

<> Layout shouldn't have one generic plot size.

<> Area distribution in cluster planning



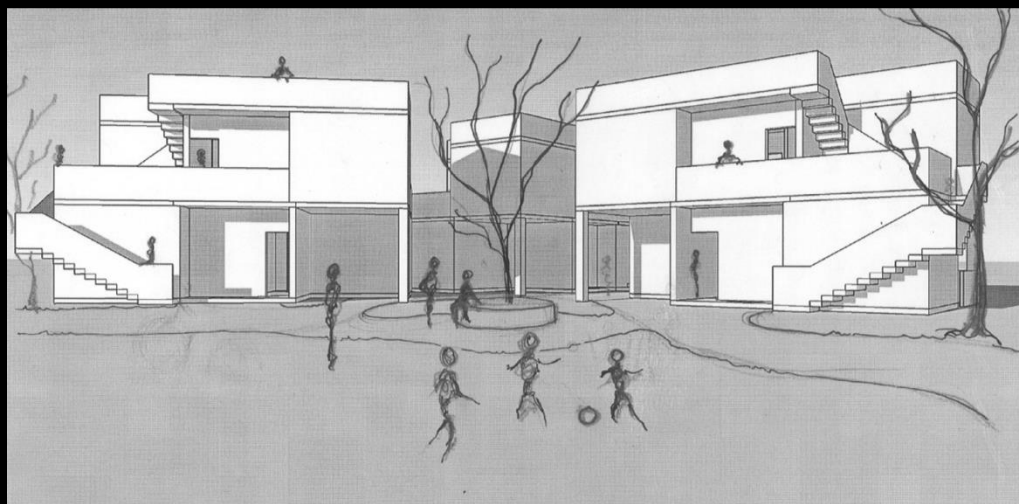
<> Road design guidelines

<> Right to build in sky guidelines

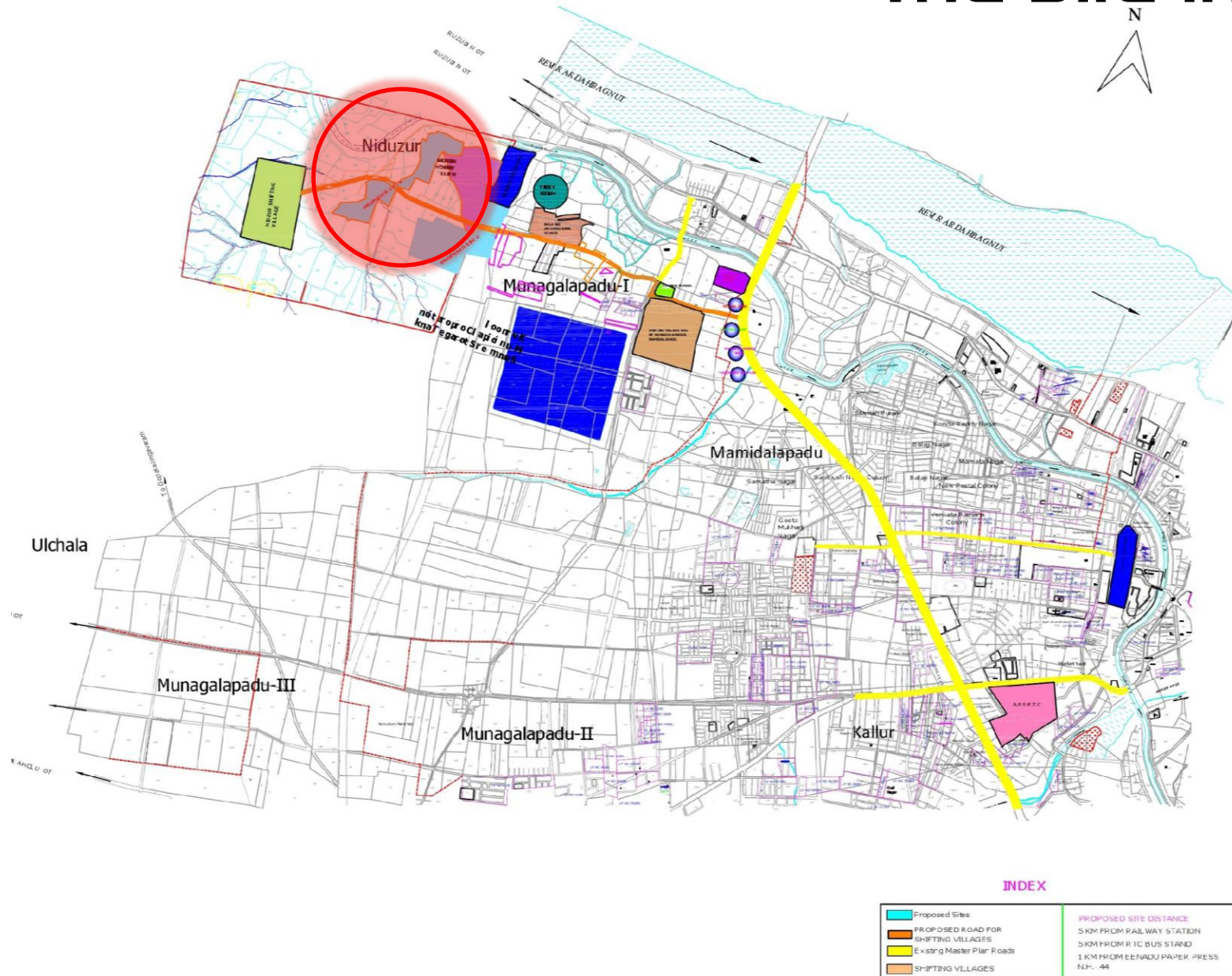
Source: IS 13727 : 1993 Reaffirmed 2009

DESIGN PROPOSAL

FOR A POPOSED AFFORDABLE HOUSING PROJECT IN KURNOOL



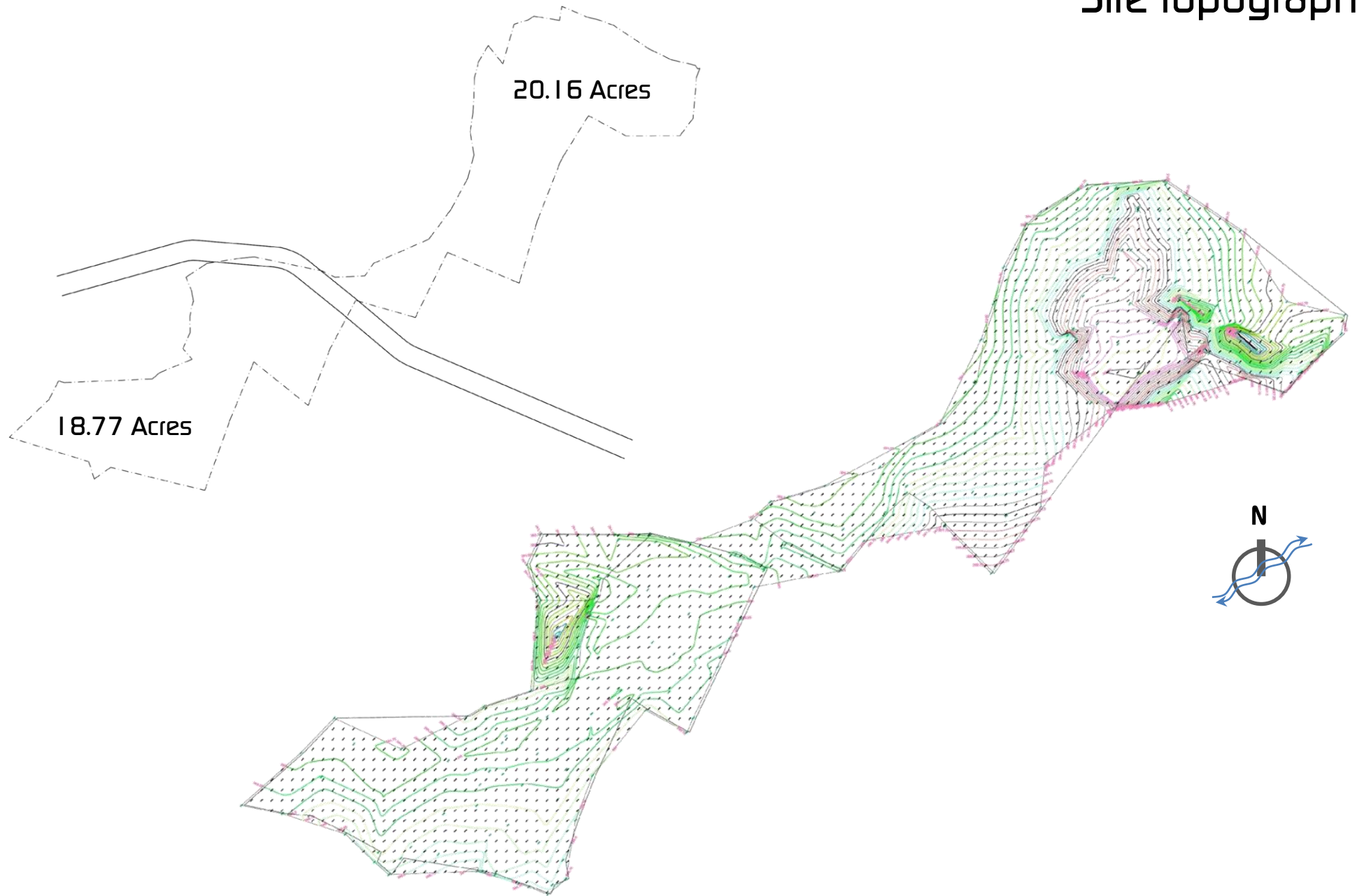
The Site in Kurnool



Site Location

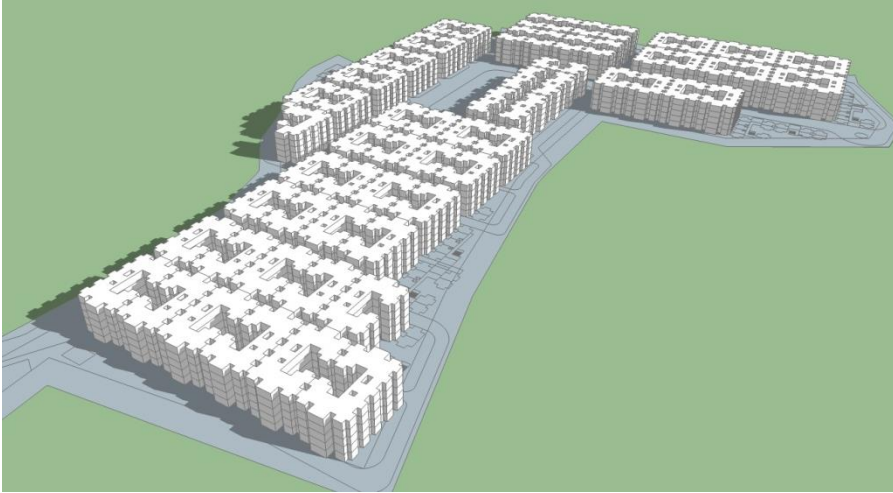


Site topography



Development Options

Low Rise – High Density



High Rise – High Density

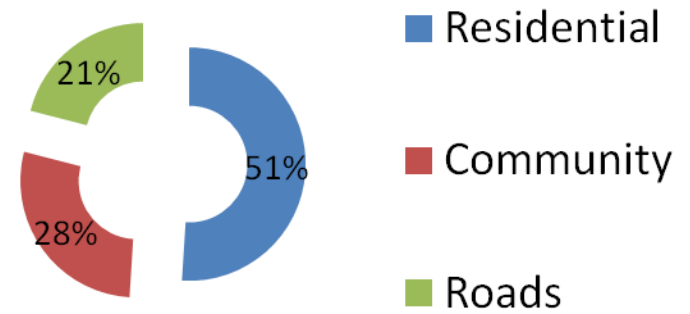


High Rise



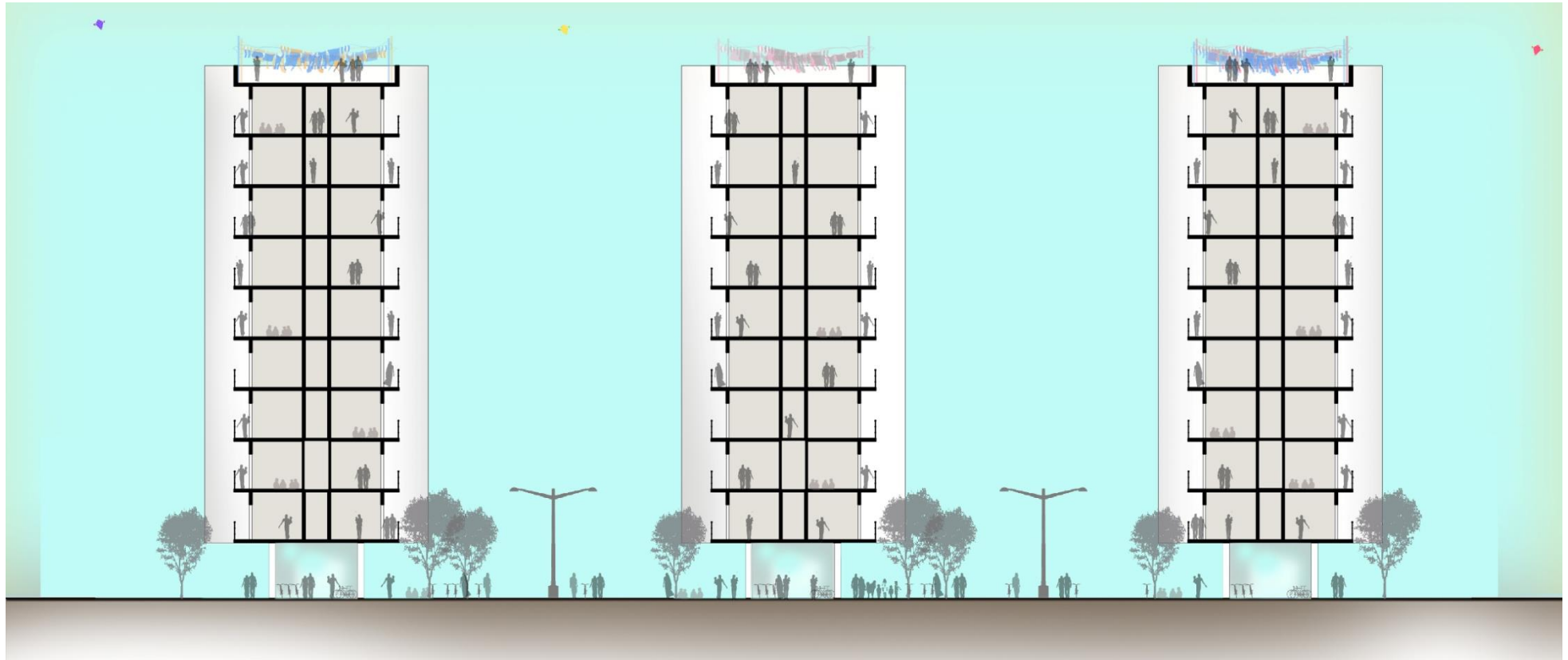
- Site Area - 20.16 Acres
- No of Units - 3616
- Density - 427 units /Ha

Land Use Pattern

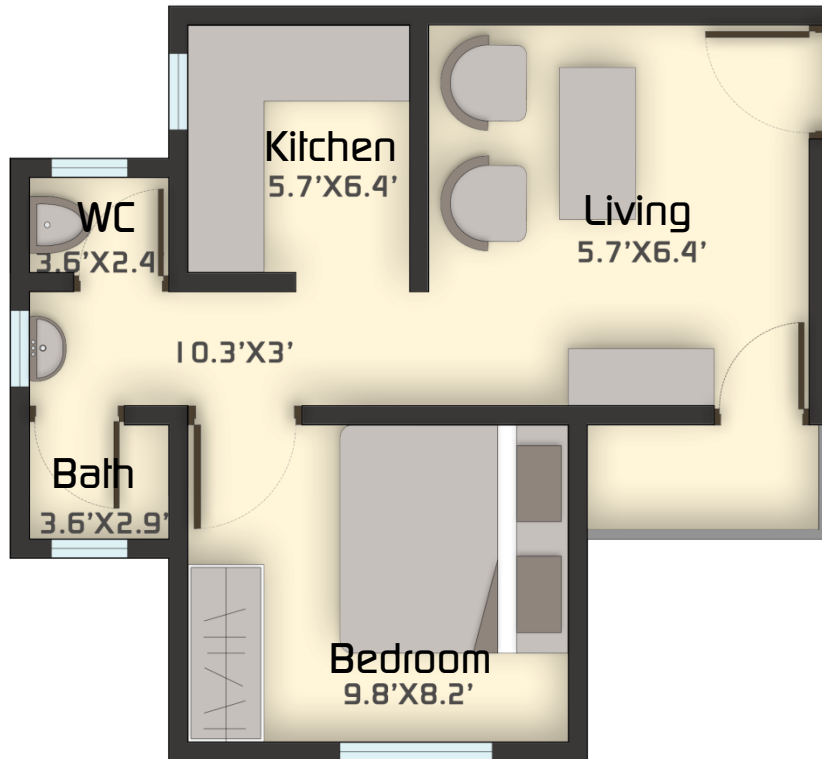


High Rise Cluster

High Rise – High Density



Typical Units



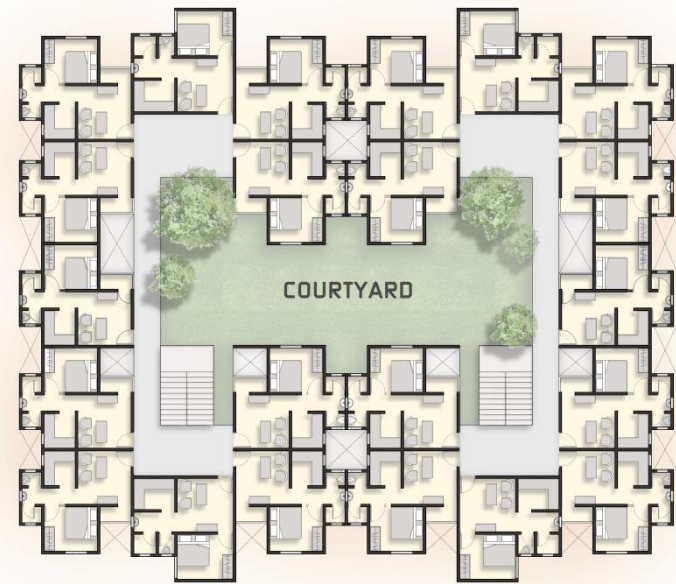
Module 1



Module 2

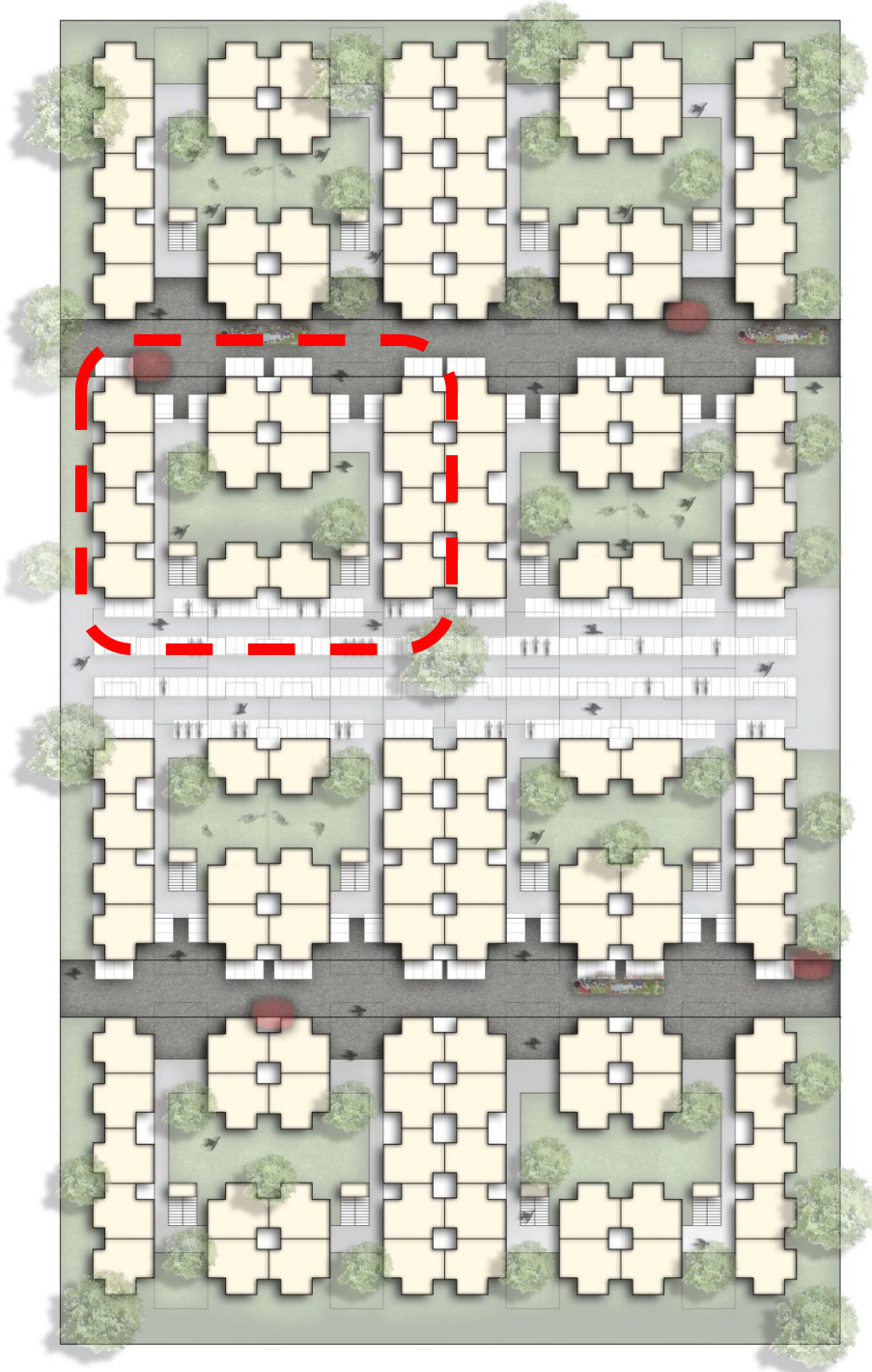
Low Rise Cluster

Low Rise – High Density



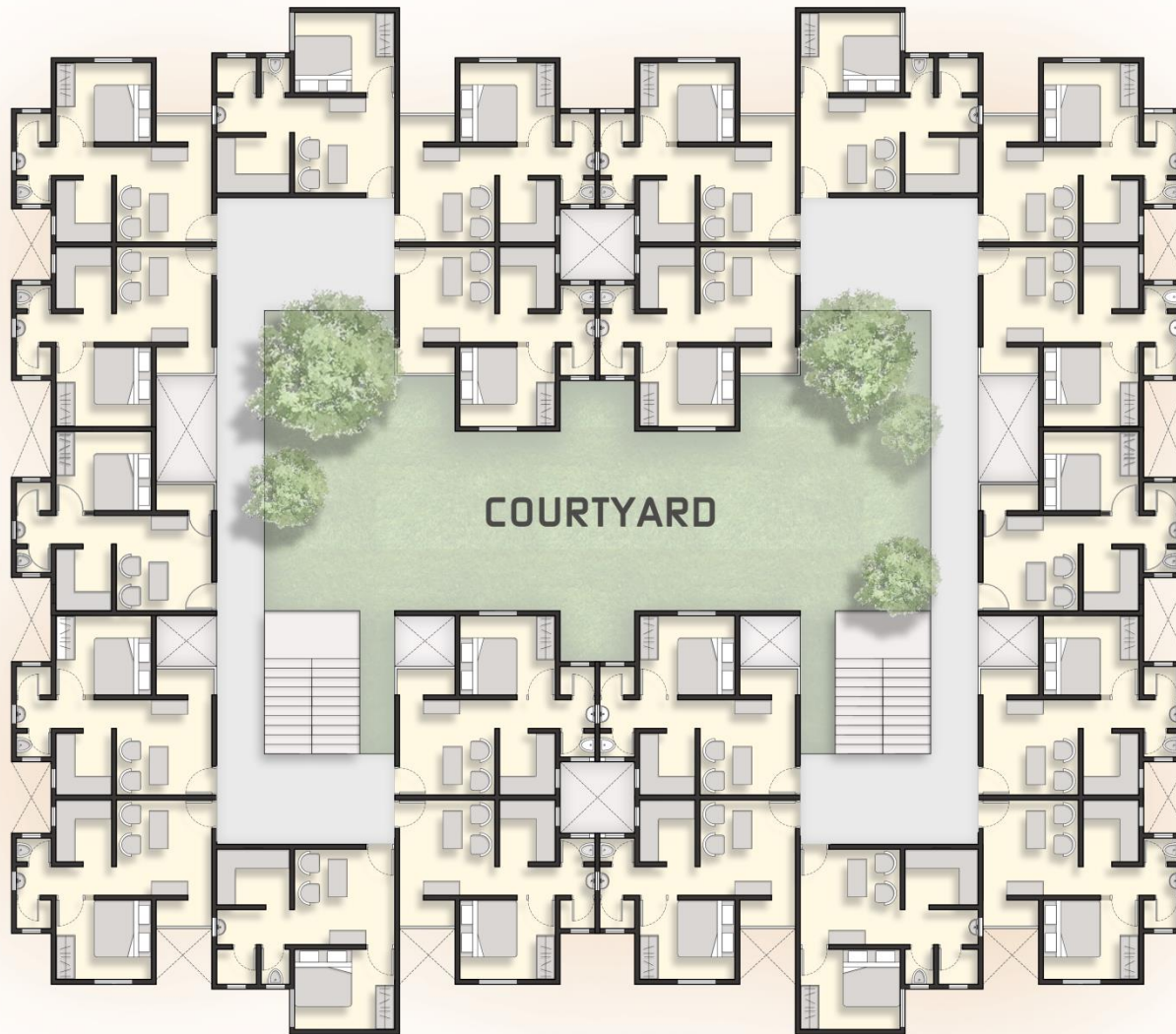
Low Rise Cluster

Low Rise – High Density



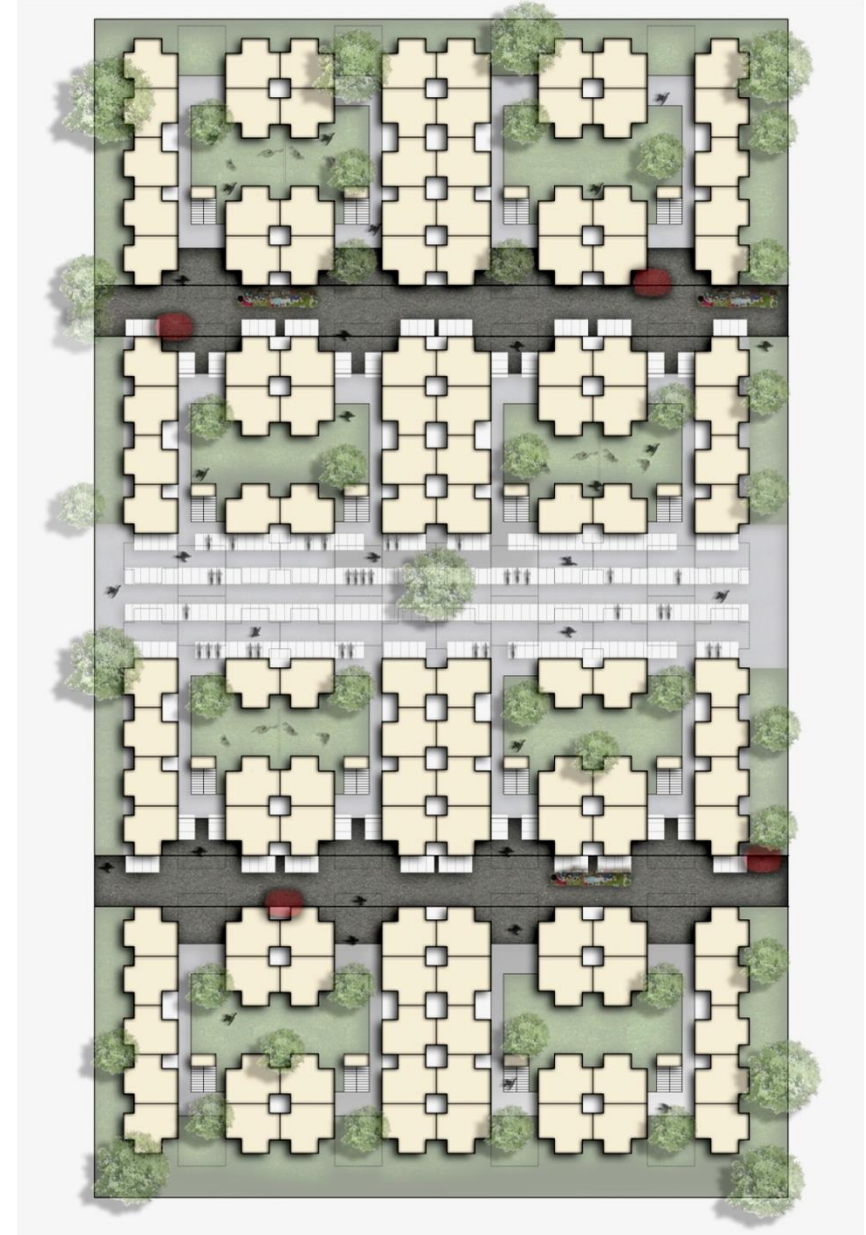
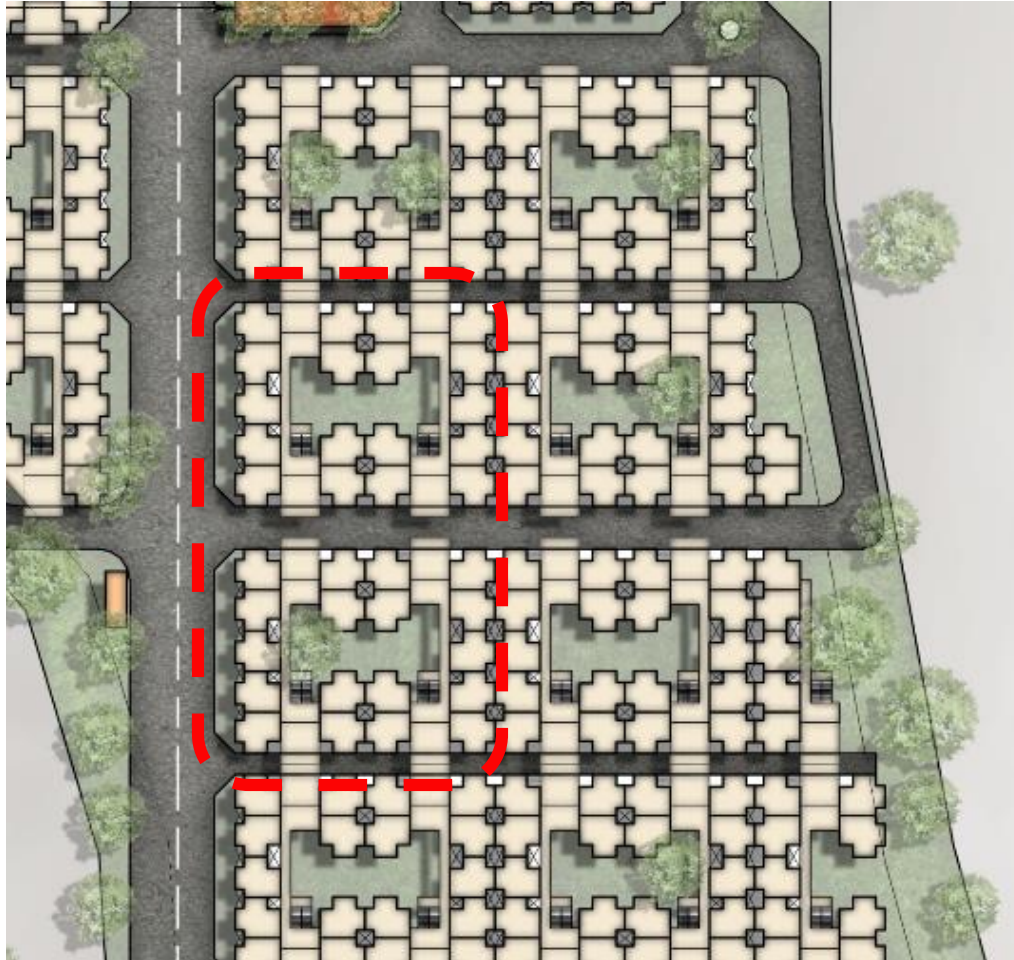
Low Rise Cluster

Low Rise – High Density



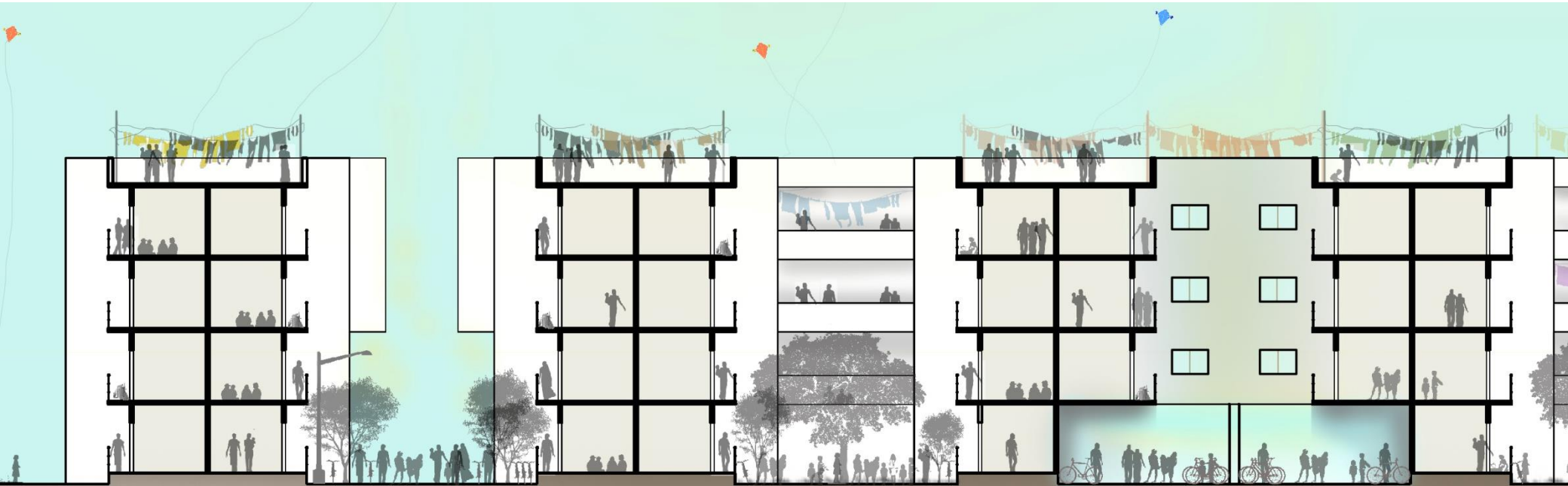
Low Rise Cluster

Low Rise – High Density



Low Rise Cluster

Low Rise – High Density



Low Rise Cluster

Low Rise – High Density



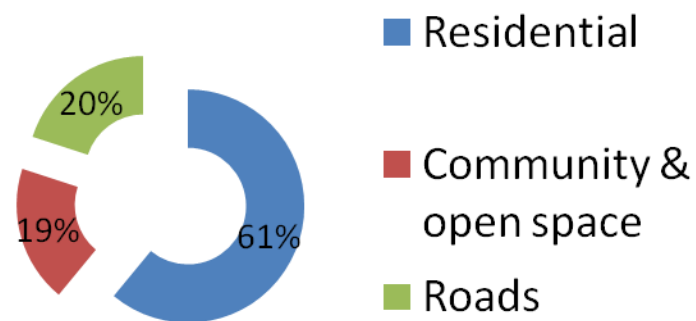


Low Rise- Masterplan

Low Rise – High Density

- Site Area - 20.16 Acres
- No of Units - 3560
- Density - 420 units /Ha

Land Use Pattern



Comparison

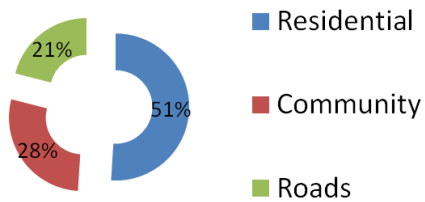


High Rise

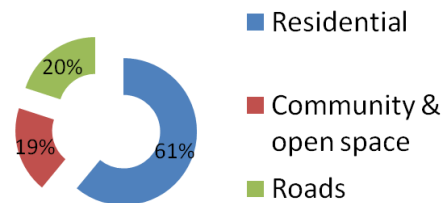


Low Rise

Land Use Pattern



Land Use Pattern



Parameters \Type

Low Rise

High Rise

G + 4

G + 8

No. of units

3560

3616

Density

420 units / Ha

427 units / Ha

LAND USE PATTERNS

Residential

61 %

51%

Open spaces

19 %

28%

Roads

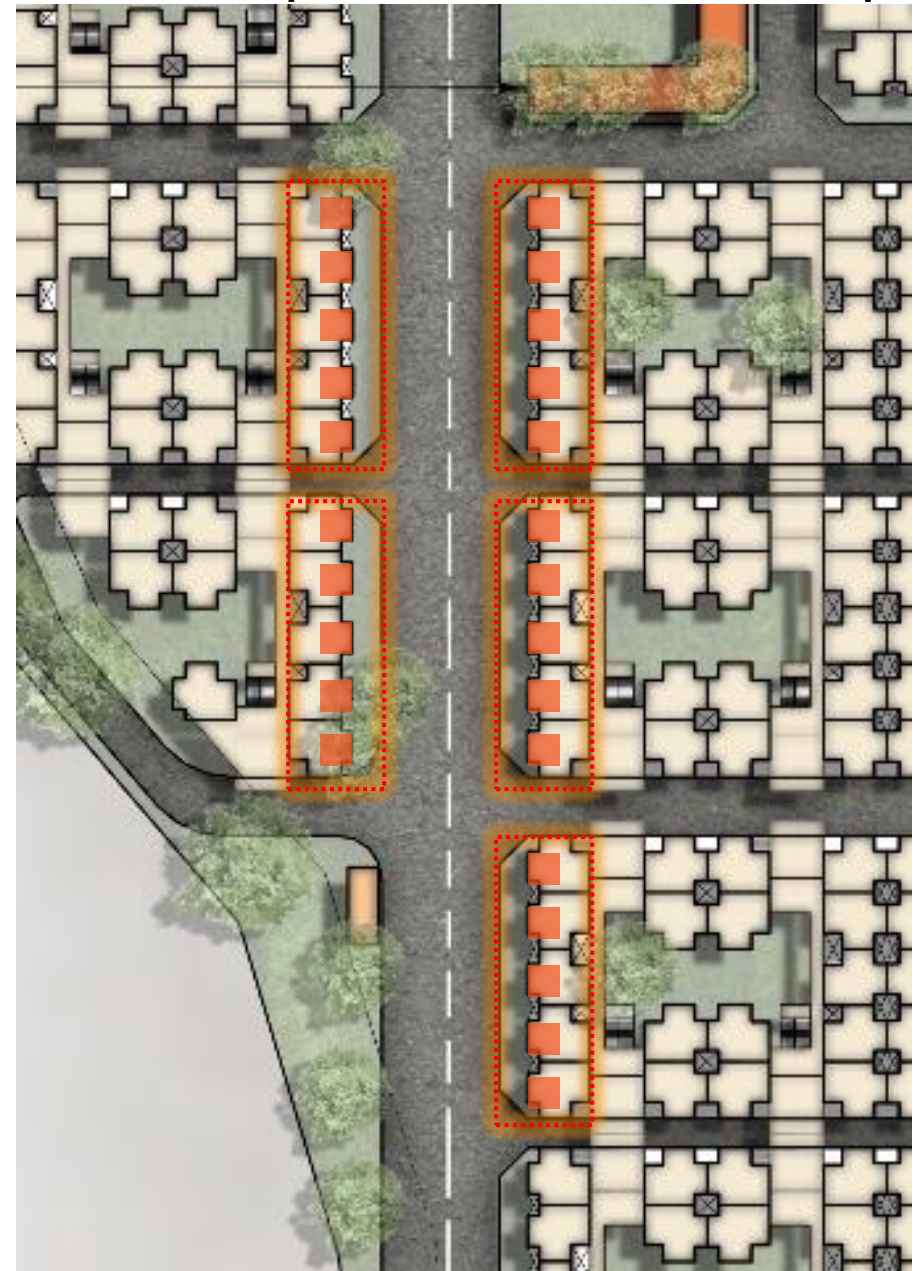
20%

21%

Scope for Street side shops



Ground floor apartments abutting the main road can be converted to shops catering to the neighbourhoods



Principles to Facilitate Safety and Accessibility:

- A) **"Eyes on the street"** – Mixed uses for round the clock activity, built-to-edge buildings with no setbacks and no opaque boundary walls ensure that streets remain active and watched, and therefore safe throughout the day.



Avoid boundary walls and setbacks of buildings from the street as it creates lonely 'unwatched' sidewalks.

- B) **"Legible Streets"** – Different streets have different functions and therefore different levels of vehicular and pedestrian traffic. A legibly designed street with well defined sidewalks, bicycle lanes and appropriate signage would ensure greater safety for all.



Primary Commercial "Main" Street

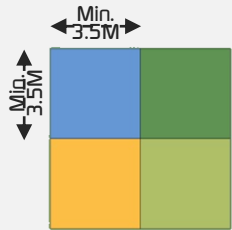
Vehicular, Pedestrian and Bike zones clearly defined.



Primary Residential Street:

Pedestrians and bicycles have priority, cars go slow.

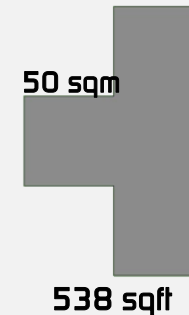
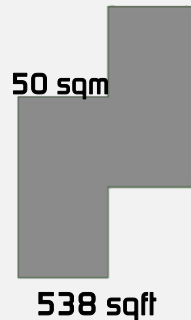
Permutations and combinations



- Living Room
- Kitchen + Toilet
- Bed Room 1
- Bed Room 2

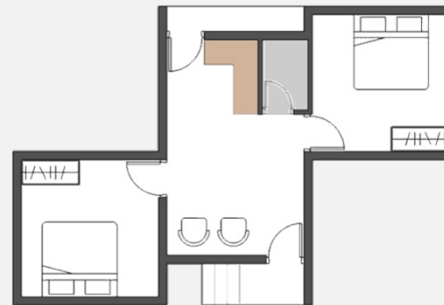
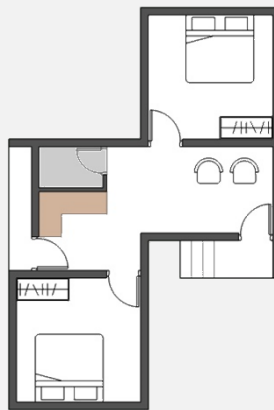
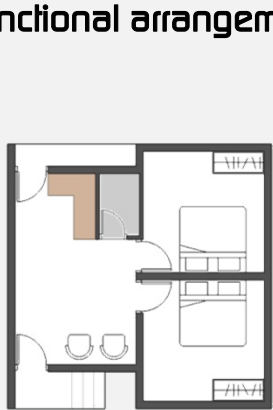
Four 3.5x3.5m squares are arranged in four different combinations

Area evaluation



Since the shapes are an outcome of square permutations, the overall areas of all the options are same

Functional arrangement



The random shapes are made functionally viable for a housing typology.

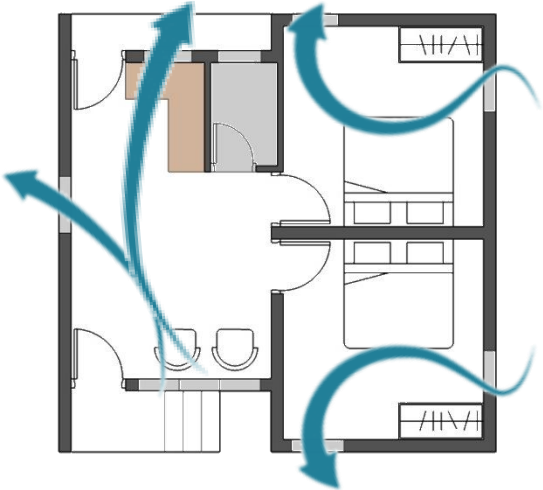
TYPE 1

TYPE 2

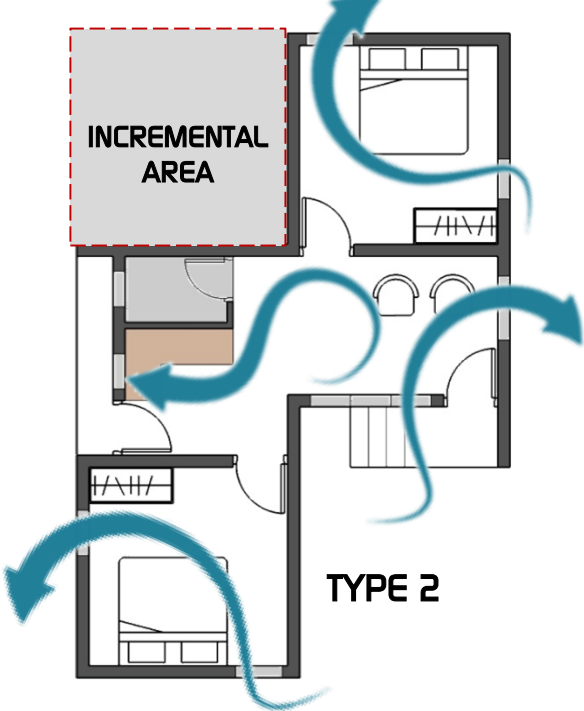
TYPE 3

TYPE 4

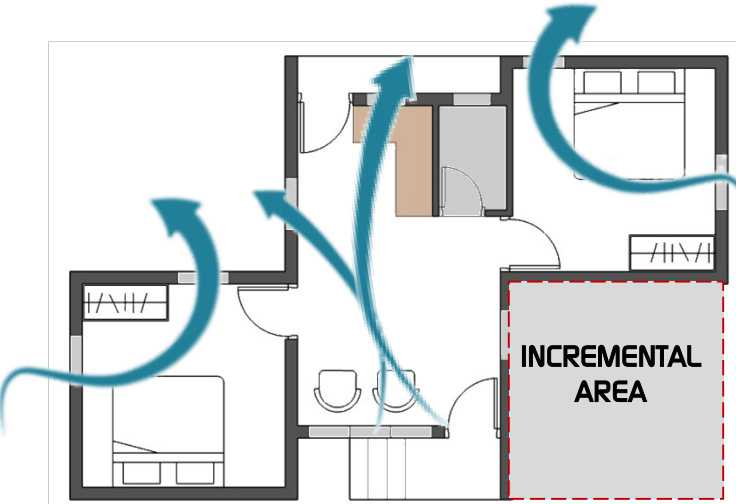
This approach gives us 4 different types of houses, which can be used in clusters as per the necessity of geometry, functionality and climate response.



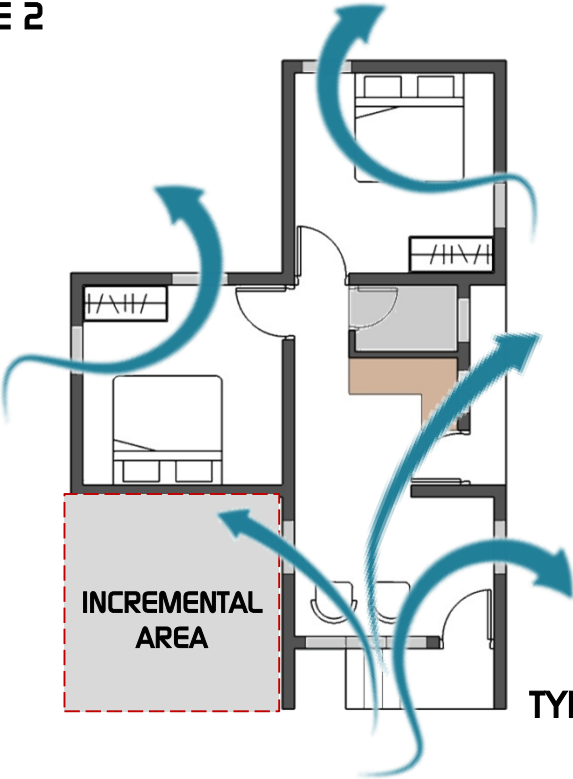
TYPE 1



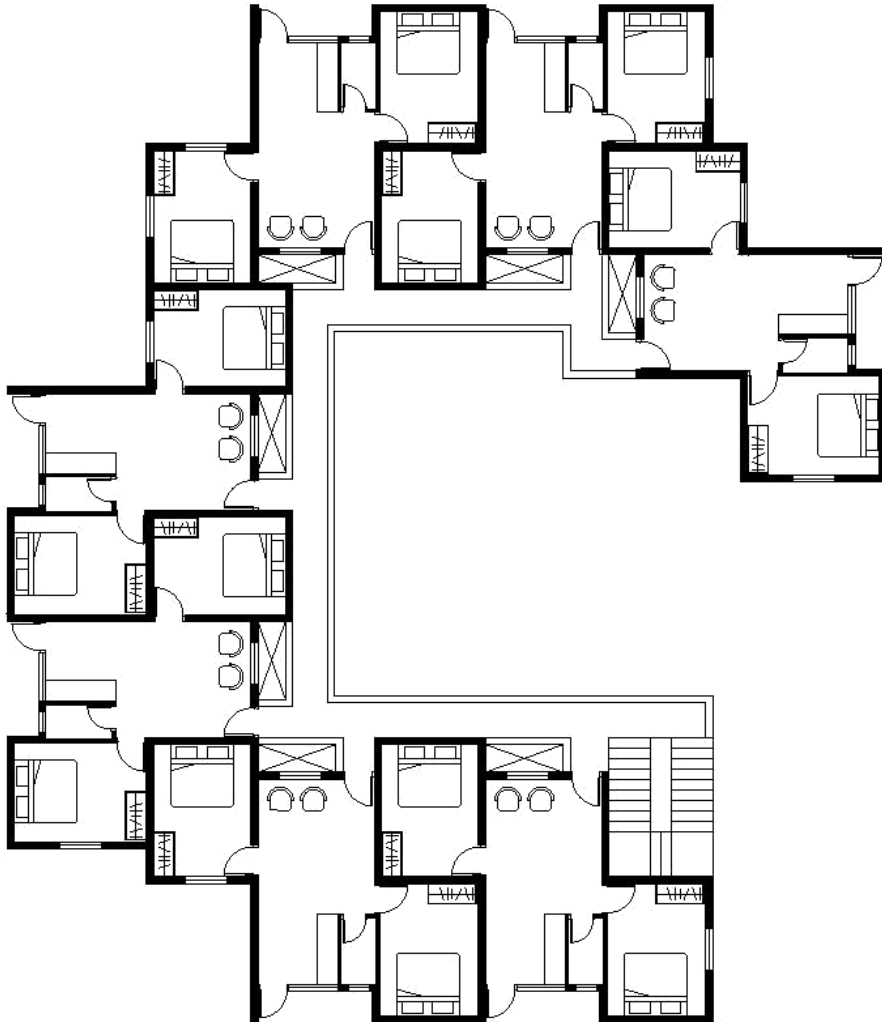
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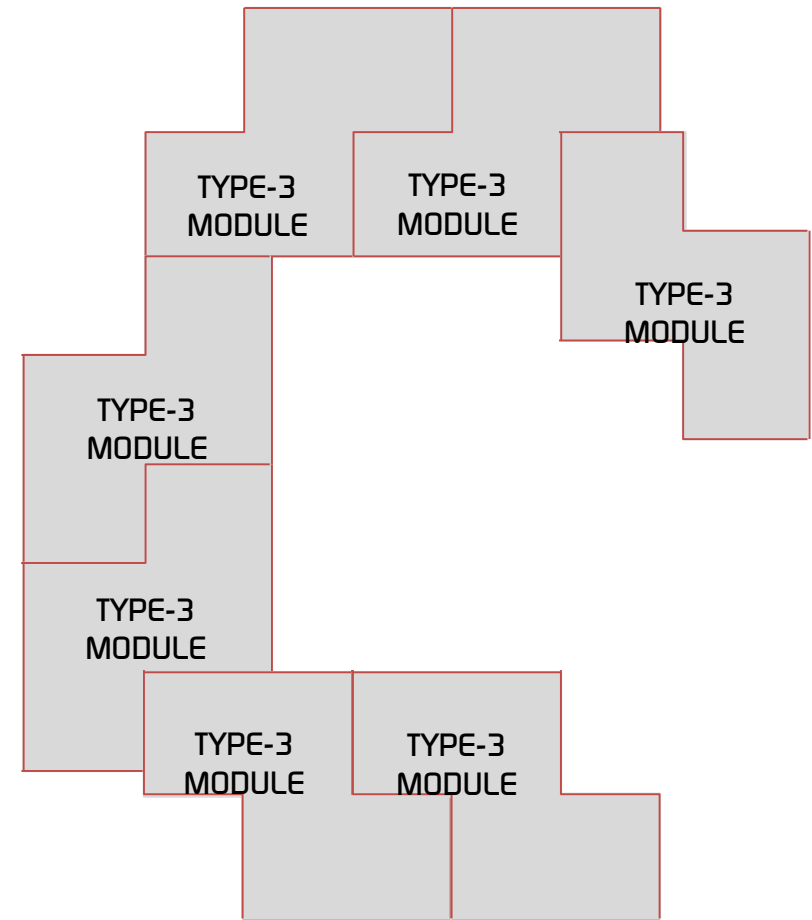
TYPE 3

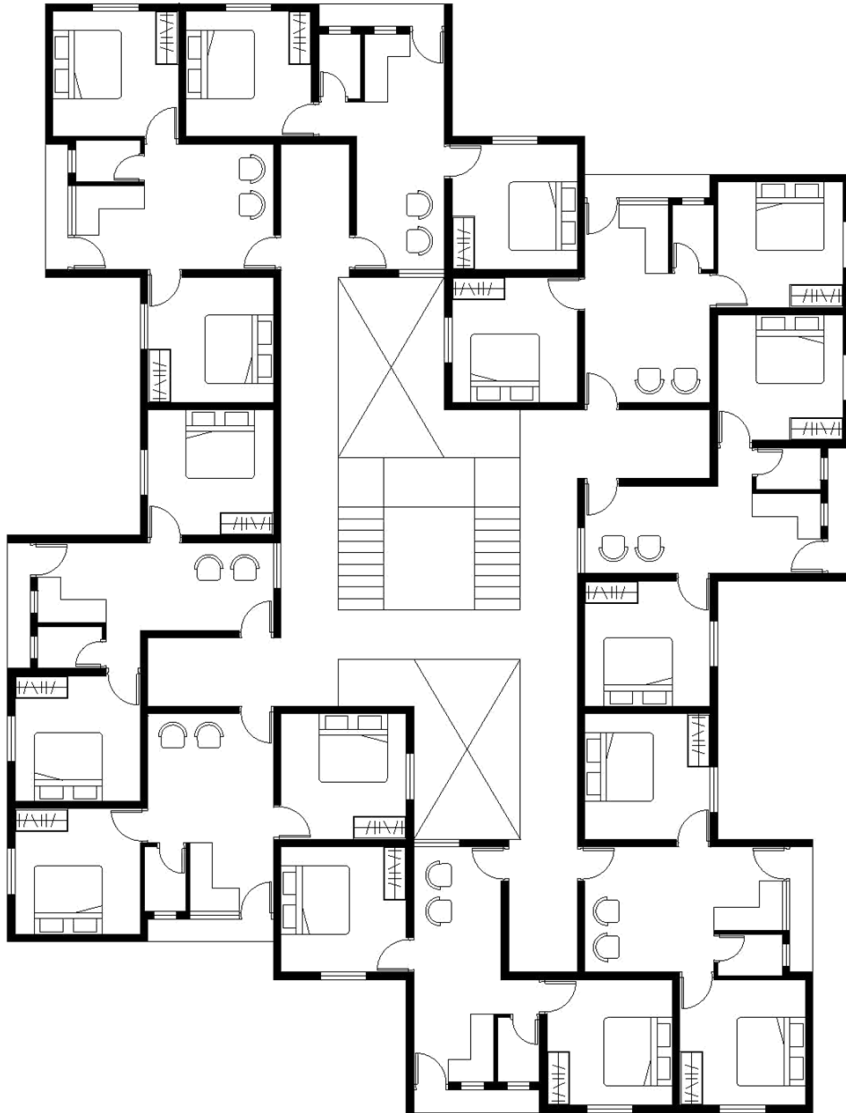


TYPE 4

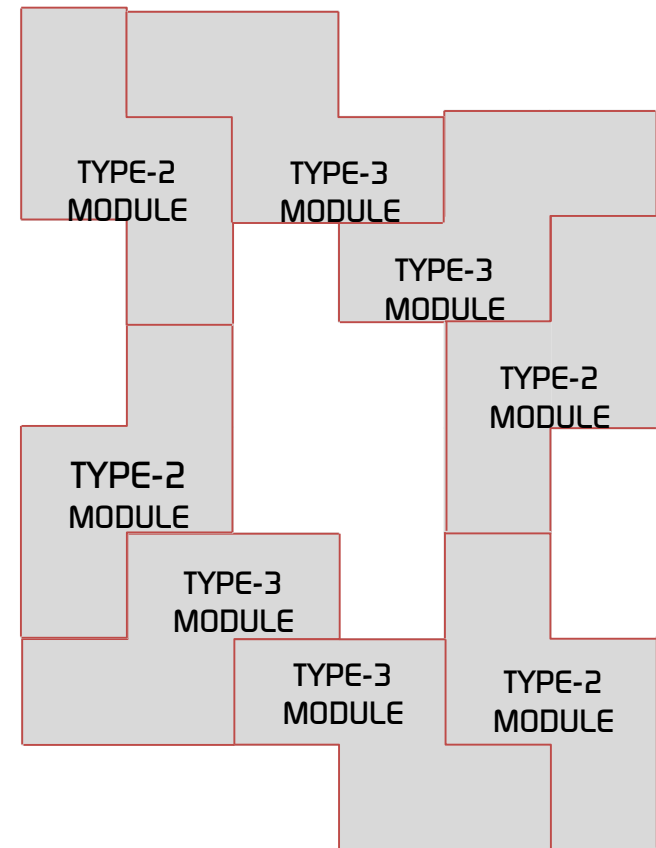


CLUSTER PLAN – using TYPE 3
MODULE

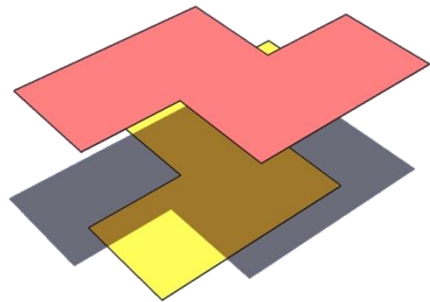




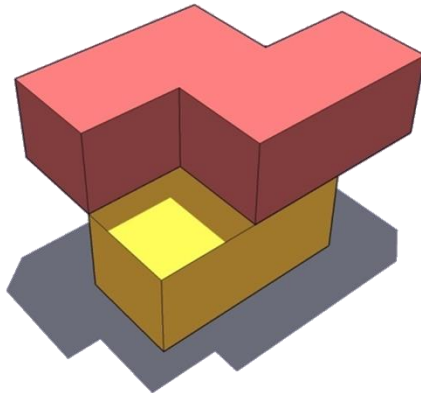
CLUSTER PLAN- using TYPE-2 AND TYPE-3
MODULES



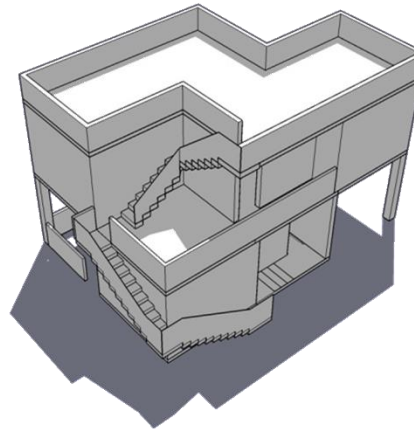
Cluster arrangement – Low density [Rural]



2 Type-2 blocks placed above each other



The roof slab of ground floor block becomes terraces for 1st floor block



Both DUs become a composite block which can be used for various cluster arrangements

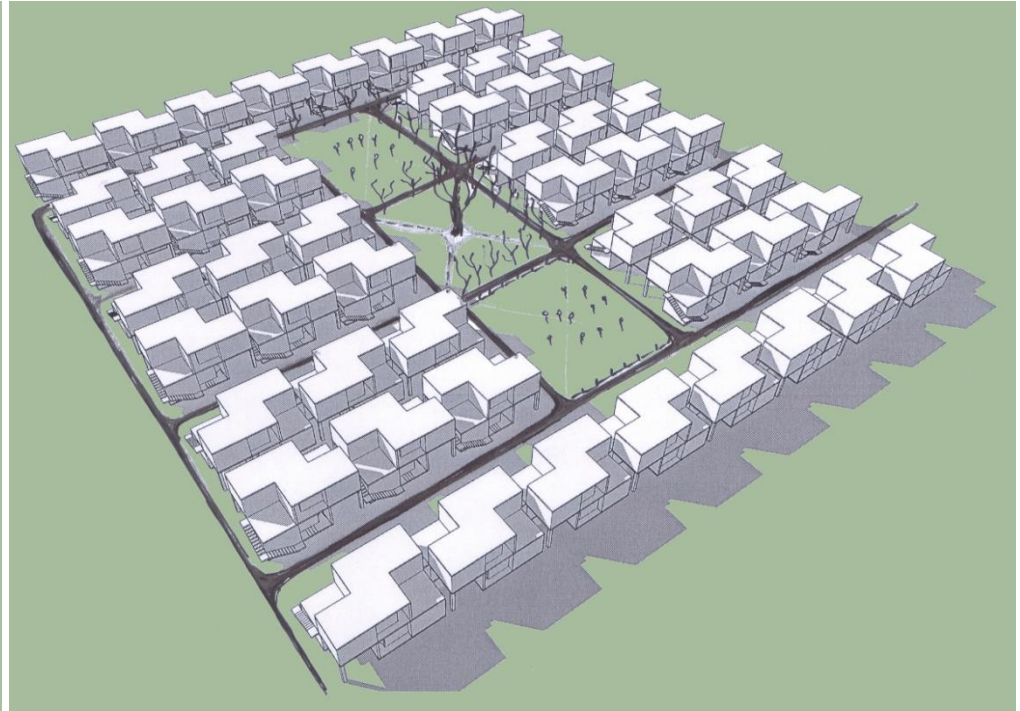


Cluster arrangement – Low density [Rural]



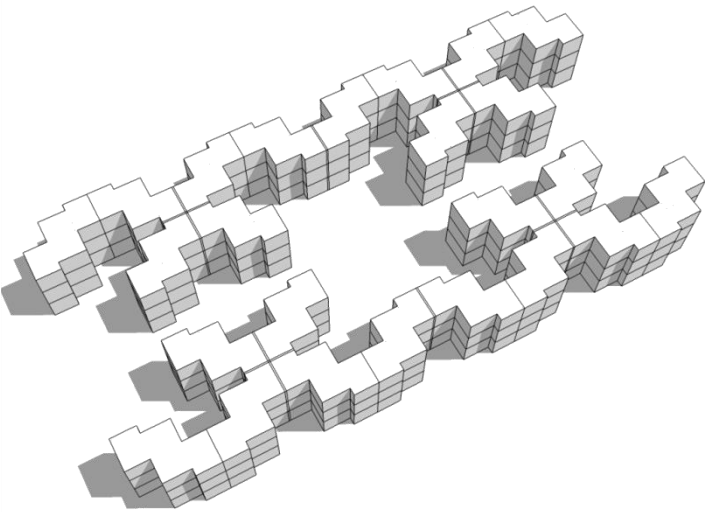
Clustered Courtyard Arrangement

96 DUs / Hectare



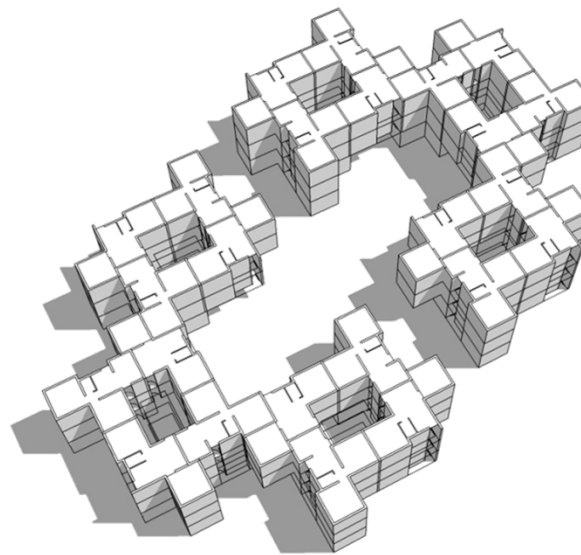
Linear Grid-Iron Arrangement

104 DUs / Hectare



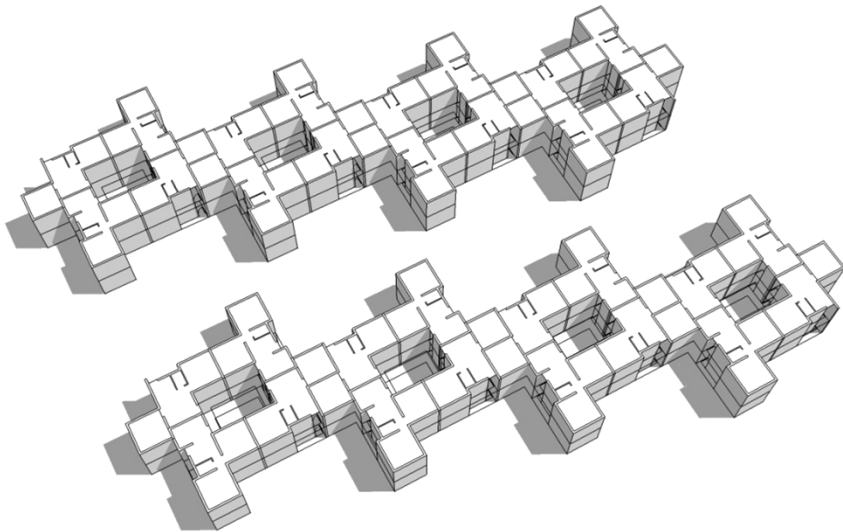
Linear Courtyard Arrangement

215 DUs / Hectare



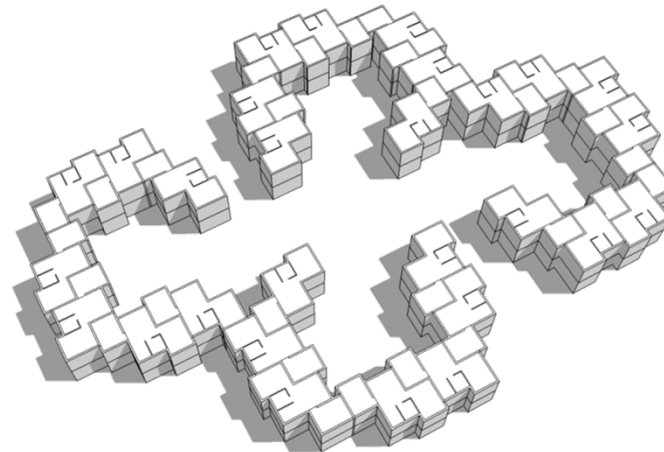
Single Staggered Courtyard Arrangement

195 DUs / Hectare



Multiple Staggered Courtyard Arrangement

205 DUs / Hectare



Clustered Courtyard Arrangement

195 DUs / Hectare

Cluster arrangement
- High density [Urban]



People centric

Bottom up

Collaborative

process

Architect / Urban Designer
Engineers
Sociologist / Social Scientist
Urban Ecologist
Local political representatives



mayaPRAXIS is an architectural design firm with an interest in making well-designed spaces to live, work and enjoy modern life. This begins from strong concepts – of place & climate, materials & technology, beauty & culture. We work on architecture and its related design fields - urban design, interior, landscape, etc. We have been working on a wide variety of projects providing creative design, more liveable and delightful spaces. We take up both the creative and technical design from concept to finish in association with specialist design consultants.



Concerns of sustainability, building process, theoretical understanding of architecture come into both our work at mayaPRAXIS and outside of it. A strong interest in teaching continues till today and we participate in teaching and reviewing architectural works at various architectural colleges. Along with other colleagues, we are part of research and interest groups that look into these aspects in the context of Bangalore.

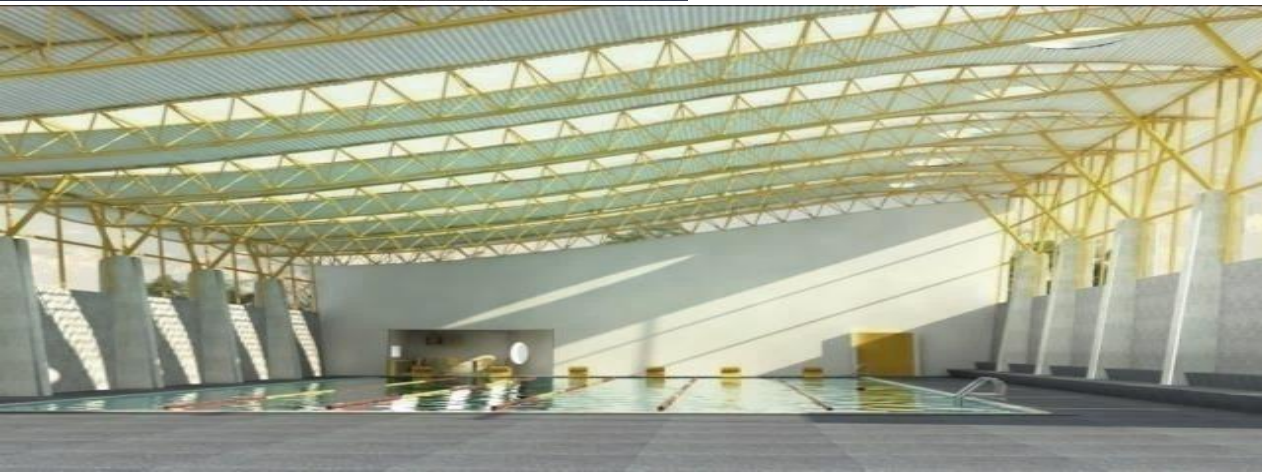
Vijay Narnapatti & Dimple Mittal
Directors & Design Principals



188, 3rd cross, Panduranga Nagar, Bangalore 560076
+91 80 26483693 | 26481881 | 41713787
www.mayapraxis.com | www.facebook.com/mayapraxispraxis@mayapraxis.com

Vijay Narnapatti - +91 9902002425 | vijay@mayapraxis.com
Dimple Mittal: +91 9972582425 | dimple@mayapraxis.com

mayaPRaxis
design + architecture



Thank You

For any other information please contact:

Vijay Narnapatti

Director + Design Principal



E mail : vijay@mayapraxis.com

tel : +91 80 26483693 / 26481881 / 41713787