

# INCREMENTAL HOUSING, BAPROLA

ANANT SAREEN

AMITY SCHOOL OF ARCHITECTURE AND PLANNING, NOIDA



THESIS GUIDED BY: AR. RAJEEV SINHA

# INTRODUCTION

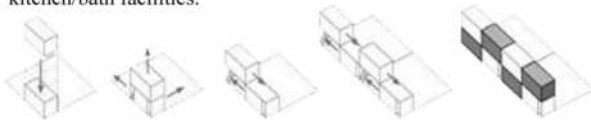
## WHAT IS INCREMENTAL HOUSING ?

It is a step-by-step process. It goes by different names (starter house, phased-development house, owner-driven house), but fundamentally, incremental housing is an integral urban development process, building housing communities and citizens.



### CONCEPT AND PARAMETERS:

- The concept offers external as well as internal flexibility of the housing units.
- It is not quick or complete, but choice remains with the owner.
- It starts with a starter core shelter which may be a kitchen/bathroom unit or just a bare lot with utility connection potential but recommended is a multi-purpose room with basic kitchen/bath facilities.

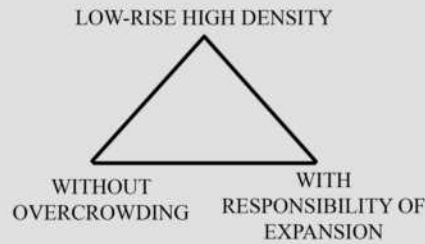


1. Good location
2. Harmonious growth in time
3. Urban layout
4. Provide structure for the final scenario of growth
5. Middle-class DNA



1 PLOT = 1 HOUSE  
UNDERUTILIZATION  
THEREFORE,  
SCARCITY OF LAND  
INCREASES

1 PLOT = 2 HOUSE  
UTILIZATION  
THEREFORE,  
A SOLUTION TO  
SCARCITY OF LAND



### AIM:

To design an affordable housing using the principals of incremental design in order to make the dwelling units more affordable for Lower Income Group (LIG) means households with annual household income between Rs. 3-6 Lakh as fixed by the Ministry of Housing and Urban Poverty Alleviation, Government of India.



### OBJECTIVE:

1. A system of modular units that can be expanded through time, vertically or horizontally.
2. To design a hybrid of Cluster court and row housing to build community through shared space.
3. To design different typologies to fit different topography, this will encourage social integration and offer choice and diversity.
4. To optimize the use of materials and technology to reduce the cost.

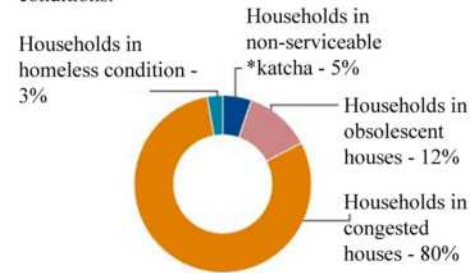


### USP:

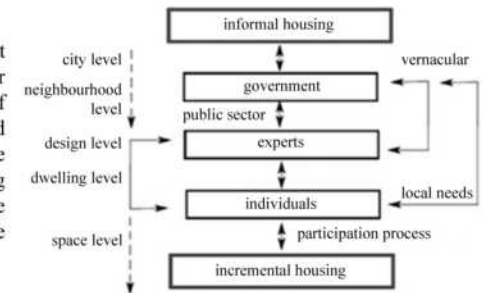
The project offers innovation in passive design approach for the future dwelling solution for low cost housing.

### NEED:

India's urban housing shortage is estimated at nearly 18.78 million households in 2012. Other than those living in outdated houses, 80 percent of these families are living in congested houses and are in necessity of new houses. The report likewise features that almost one million families are living in non workable kaccha houses, while over a large portion of a million families are in destitute conditions.



Tenure	Families living in old houses	Families living in kaccha houses	Families living in congestion	Families without homes	Total urban housing shortage
Self-owned	13,95,735	7,70,817	91,88,746	3,26,430	1,16,81,728
rented	8,70,417	2,19,183	57,00,019	2,03,570	69,93,189



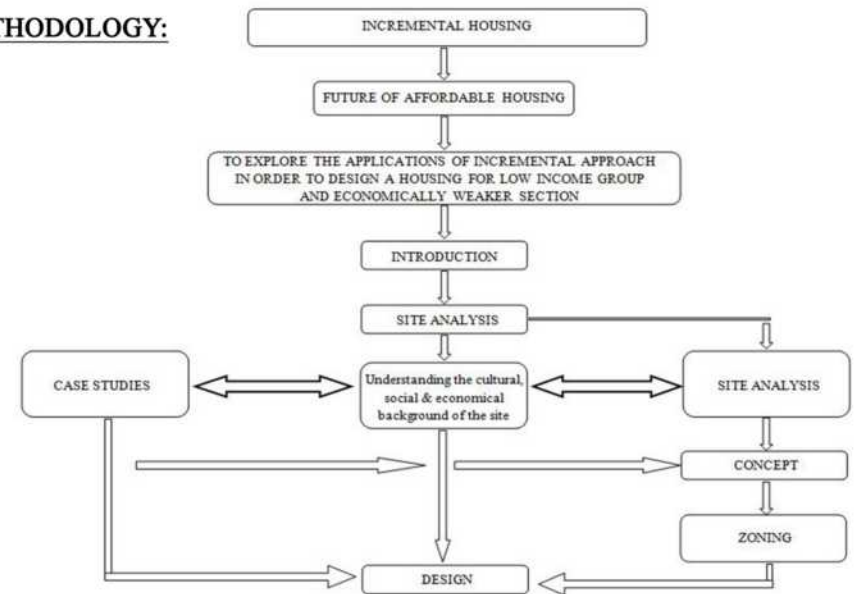
### The structure of participation process solution for informal housing

**SCOPE:** As the approach of Incremental Housing is still at an emerging stage in the country, there is an opportunity to solve the affordable housing problem.

### LIMITATION:

1. It is only for lower income group and economically weaker section.
2. It emphasis on social housing only.
3. Due to limited resources and time, the statistical data is limited.

### METHODOLOGY:



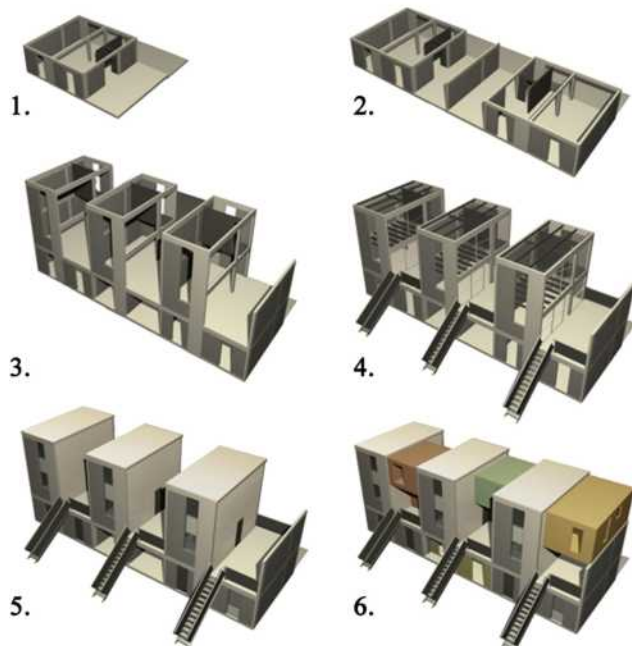
1. QUINTA MONROY - IQIQUE, CHILE



**PURPOSE**

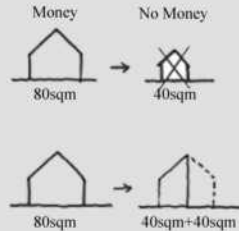
To settle the 100 families of the Quinta Monroy, in the same 5,000 sqm site that they have illegally occupied for the last 30 years which is located in the very center of Iquique, a city in the Chilean desert.

**CONSTRUCTION PHASES**



ARCHITECT - Alejandro Aravena, Elemental  
 SITE AREA - 5000 sqm  
 GROUND COVERAGE - 3500 sqm  
 NO. OF FAMILIES - 100  
 EXECUTION TIME - 9 Months

ELEMENTAL rephrased the answer and thought, instead of building smaller homes, why don't we build half of a good, comfortably sized one?



The challenge was how to build decent homes for these families, when following the purchase of land there was almost no money left for the housing itself.

$$X = \frac{100 \text{ families} \times 40 \text{ sqm} \times \text{US\$ } 7,500}{1 \text{ ha}}$$

**GROUND FLOOR - MAX 6 DU/BLOCK**

INITIAL AREA - 40 SQM  
 FULL EXPANSION - 90 SQM

**DUPLEX - MAX 6 DU/BLOCK**

INITIAL AREA - 80 SQM  
 FULL EXPANSION - 160 SQM



FULL CONSTRUCTION



SOLD PEDRO PRADO



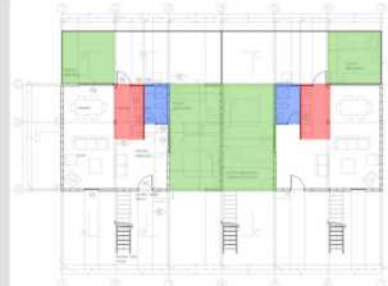
IQIQUE



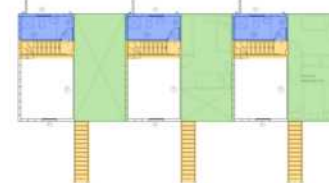
Cluster housing is being used to develop homes which are situated in groupings relatively close together, while larger areas of open space within the development form a buffer with adjacent land uses. Often this is accomplished through small individual lots, with the remainder of the land becoming social spaces.



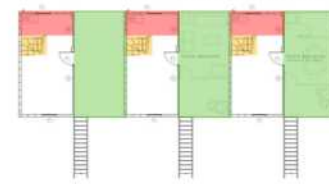
SITE PLAN



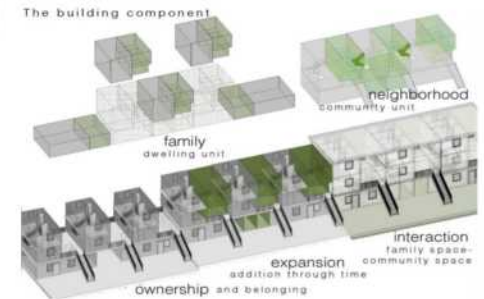
GROUND FLOOR



FIRST FLOOR



SECOND FLOOR



**CONSTRUCTION DETAIL**

- Concrete and cement blocks
- Loadbearing walls
- Core structure built by contractor and interior to done by owner
- The initial building was provided with a supporting, (rather than a constraining) framework in order to avoid any negative effects of self-construction on the urban environment over time, but also to facilitate the expansion process."



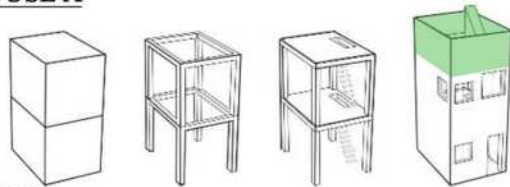
## 2. INCREMENTAL HOUSING STRATEGY - PUNE, INDIA



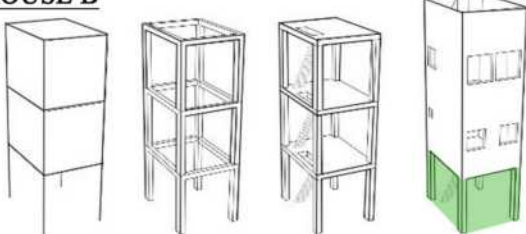
### PURPOSE

The project's main idea is to develop a strategy in order to turn informal slums into permanent urban districts through a process of gradual improvement to existing dwellings instead of demolition rebuilding.

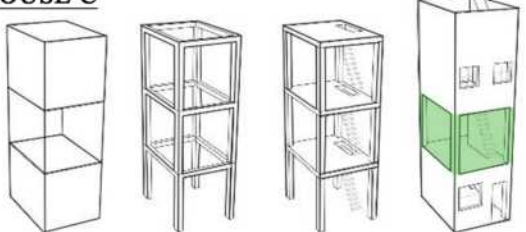
### HOUSE A



### HOUSE B



### HOUSE C



ARCHITECT - Filipe Balestra & Sara Göransson & SPARC

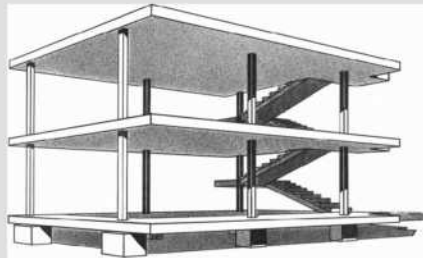
TOTAL SITE AREA - 79.62 skm  
TOTAL POPULATION - 3,37,040  
CONSTRUCTION - 4000 Families  
DU AREA - 25 sqm/ floor in 3 different options

The aim was to offer better living conditions, to people who live in these slums and an effort to set up a strategy which uses the existing urban formations as starting point for development.

### PRINCIPALS OF STRATEGY:

- Preserve the existing social networks
- Neighbours remain neighbours, local remains local.

### INSPIRATION FROM LE CORBUSIERE'S MAISON DOMINO



CORE HOUSE MODEL



- 1- The multi-level structure of a skeleton free-standing concrete pillar and rigid floor
- 2- Floors are connected by concrete stairs and in some cases ladders can be used up the front to open up the interior for more flexible use
- 3- Using reclaimed material from the previous kachha house or items such as cheap bamboo mats or tarpaulin
- 4- The house is consolidated with more walls for increased privacy triggered
- 5- Alternative infilling can be used can offer partial segregation and better air



YERAWADA SLUM

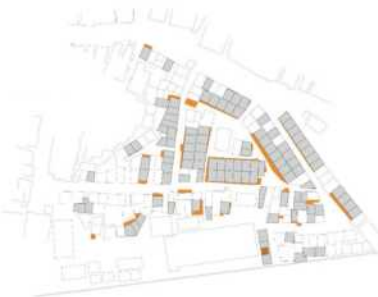


PUNE



City In-Situ Rehabilitation Scheme for Urban Poor Staying in Slums in City of Pune Under BSUP, JNNURM was implemented with a grant of Rs. 3,50,000/family for the incrementation of their homes at a national scale.

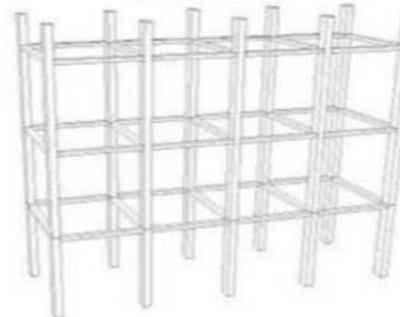
- Existing cluster footprint
- Proposed cluster footprint
- G+1
- G+2
- Expansion



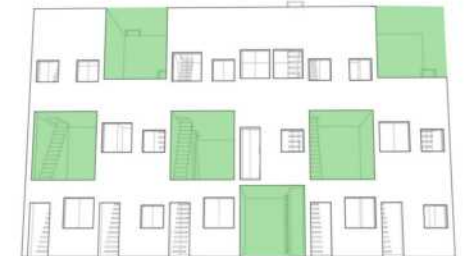
MASTER PLAN



PROPOSED HEIGHT PLAN



SHARING STRUCTURE

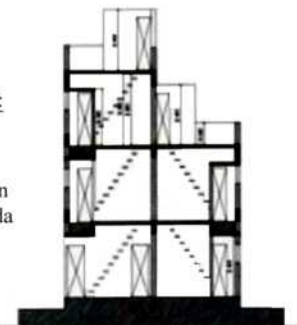


MIXED CLUSTER- A+B+C



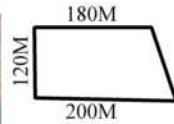
DUs consists of:

- Private stairs
- Private toilet
- Private kitchen
- Private veranda



# SITE ANALYSIS

## SITE FOR PROPOSED HOUSING IN BAPROLA



**LATITUDE:**  
28°38'25.18"N

**LONGITUDE:**  
77° 1'14.50"E



SUN PATH

### SITE PROXIMITIES

The site is connected via **nangloi chowk** onto main **najafgrah road**. The nearest metro station is **Nangli Metro Station** along with construction of a new station. **Railway station is 8.8 km** from the site and **IGI is 27 km**. Most of the people living in Baprola use **shuttle service** and **e-rickshaw** or **private mode** of transportation.



### LOCATION PLAN OF SITE

**DISTRICT** - South West Delhi  
**STATE** - New Delhi  
**ELEVATION** - 218 mts  
**PINCODE** - 110043

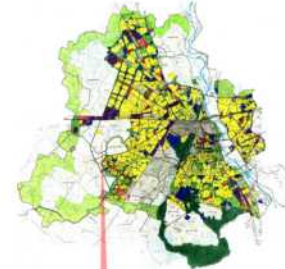
The site is located in Baprola, New Delhi and measures 25414 sqm. the east side of the site has 28 m wide ROW. The is under DDA and has RWA, EWS Housing on its south and east. The site faces **Rajeev Ratan Awas(Phase 1)** bus stop.

### BY LAWS

**SITE AREA** = 25,414 sqm (6.27 acre)  
**PERMISSIBLE HEIGHT** = 30 m  
**PERMISSIBLE FAR** = 38,121 sqm (1.5)  
**PERMISSIBLE GC** = 10,165.6 sqm (40%)  
**PERMISSIBLE PARKING** = 0.5/100 sqm  
**SET BACKS** = FRONT - 12 m  
                    REAR - 8 m  
                    SIDE - 8 m  
**PERMISSIBLE DENSITY** = 225 DU/ha.

### TYPOLOGY

**EWS** - 21 sqm to 27 sqm  
**LIG TYPE A** - 28 sqm to 40 sqm  
**LIG TYPE B** - 41 sqm to 60 sqm



DELHI MASTER PLAN 2021

Site landuse:  
Urbanisable Area



2007



2010



2014



2019

### EWS HOUSING

**Landuse** - Urbanisibale  
**Owner** - DDA  
**Total Site Area** - 27.5 Acres  
                    - 11.7 Acres  
**Height** - 15 m  
**Dwelling Unit** - 1BHK(27sqm)  
**No. units** - 3500



### SITE CONDITIONS & DESIGN RESPONSE

#### SLOPE AND EXISTING TREES

The site is sloped towards east to drain water. The trees are only present on the south and west side of the site which can act as a buffer.



#### NOISE GENERATION

EWS housing is present at the south and east therefore noise is generated.



#### VIEWS FROM SITE

The site has farm lands on he north and west side therefore views can be generated.



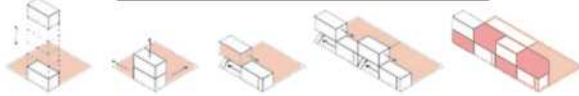
# CONCEPT

- The concept offers external as well as internal flexibility of the unit.
- It is not quick or complete, but the choice remains with the owner.
- It starts with a starter core shelter which may be a kitchen/bathroom unit or just a bare lot with utility connection potential not recommended is a multi-purpose room with basic kitchen/bath facilities.

## UNDER UTILISATION OF



## EFFICIENT UTILISATION OF LAND



### WHY THIS FORM?

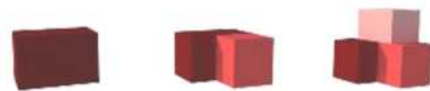
1. It allows to develop 'co-housing' as the dwelling units are inward as well as outward.
2. A courtyard is automatically formed which allows social interaction which encourages a sense of social housing.

### PARAMETERS

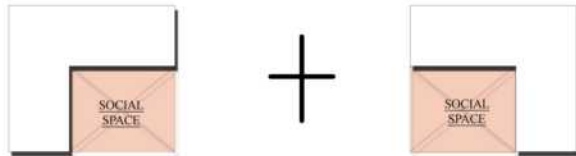
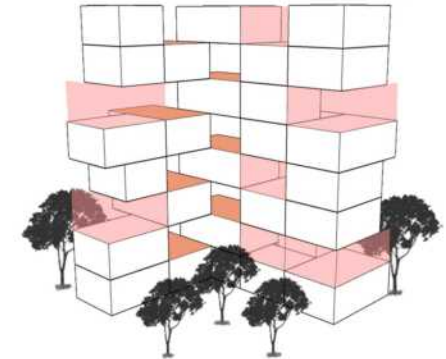
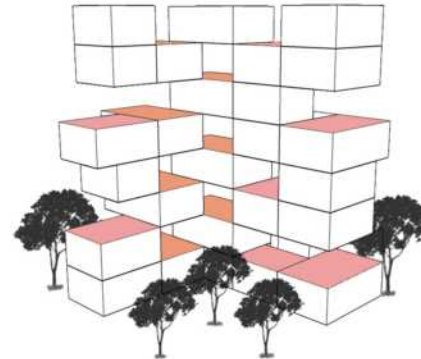
1. There should be harmonious growth with time.
2. Structure for the final scenario of growth should be provided.
3. The design should be of middle class DNA.



### STACKING OF CLUSTER

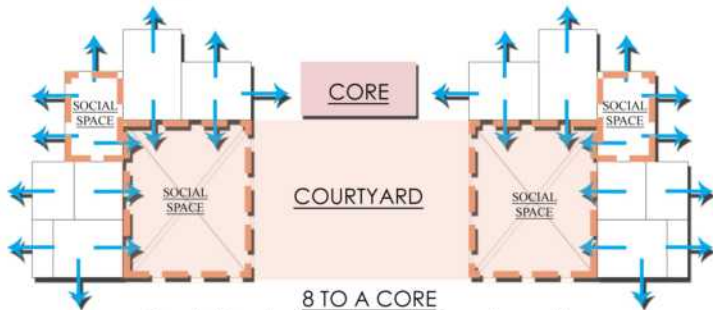


1. Uses land efficiently
2. Provides safe outdoor space
3. Builds community through shared space
4. Shared courtyard creates responsibility
5. Encouraging vertical and horizontal neighbourhood



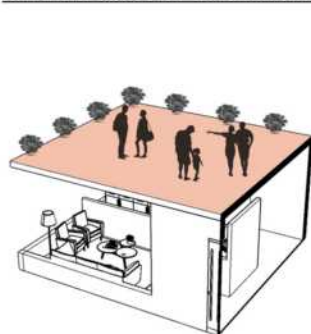
### ATTACHED HOUSING

### COURTYARD HOUSING



8 TO A CORE  
Combining to 2 clusters into 1 and creating courtyard for social space

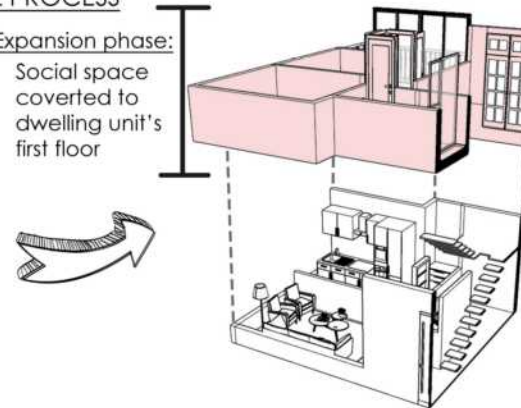
### DWELLING UNIT INCEMENTAL PROCESS



Initial phase:  
First floor being used as temporary social space

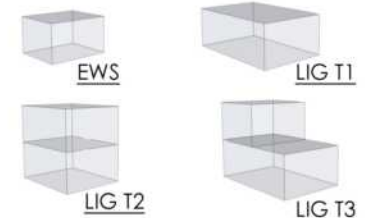
### Expansion phase:

Social space converted to dwelling unit's first floor



### DWELLING UNIT PROGRAM

- EWS - 21 sqm [ 5m X 4.2m ]
- LIG T1 - 39 sqm [ 5m X 7.8m ]
- LIG T2 - 60 sqm [ GF-30sqm+FF-30sqm ] [ 5m X 6m ] [ 5m X 6m ]
- LIG T3 - 60 sqm [ LIG T1 + EWS ] [ 39 sqm + 21sqm ]



Permanent social space



Temporary social space/Future expansion



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**SITE PLAN**



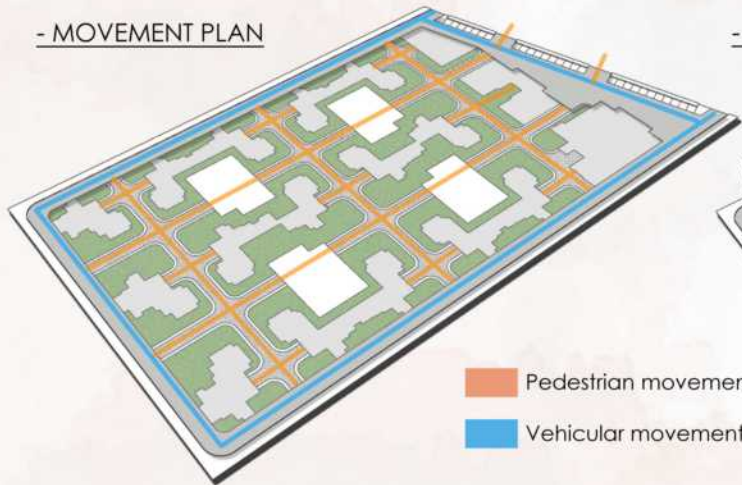
**PROPOSED**

- Total site area: 25,414 sqm (6.27 acre)
- Max. ground coverage: 33% (8,462 sqm)
- Max. built up: 38,121 sqm
- F.A.R: 1.5
- E.C.S 0.5/100 sqm: 180
- Density: 225/hectare ± 15%
- Set back: Front - 12 m  
Rear - 8 m  
Side - 8 m

**ACHIEVED**

- Total site area: 25,414 sqm (6.27 acre)
- Gound coverage: 22% (5,916 sqm)
- Built up: 35,808 sqm
- F.A.R: 1.4
- E.C.S 0.5/100 sqm: 180
- Density: 480 D.U
- Set back: Front - 20 m  
Rear - 8 m  
Side - 10 m & 8 m

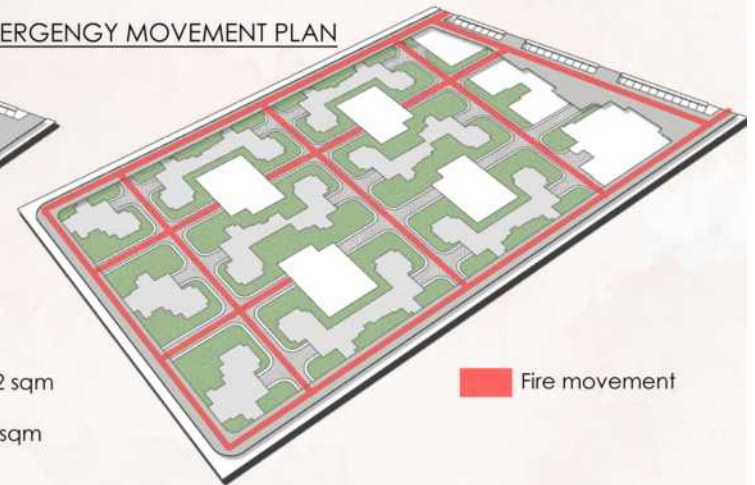
**- MOVEMENT PLAN**



**- MASSING PLAN**



**- EMERGENCY MOVEMENT PLAN**



SCALE: 1:500

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# GROUND FLOOR PLAN



RETAIL



COMMUNITY CENTER



SECTION AA'



SECTION BB'

Typologies	C.A	G.C	B.U
EWS	21	782	1,564
LIG T1	39		
LIG T2(GF)	30		
LIG T2(FF)	30		
LIG T3(GF)	39		
LIG T3(FF)	21		
Retail		1,138	2,276
Community center			



WALKWAY

SCALE: 1:500

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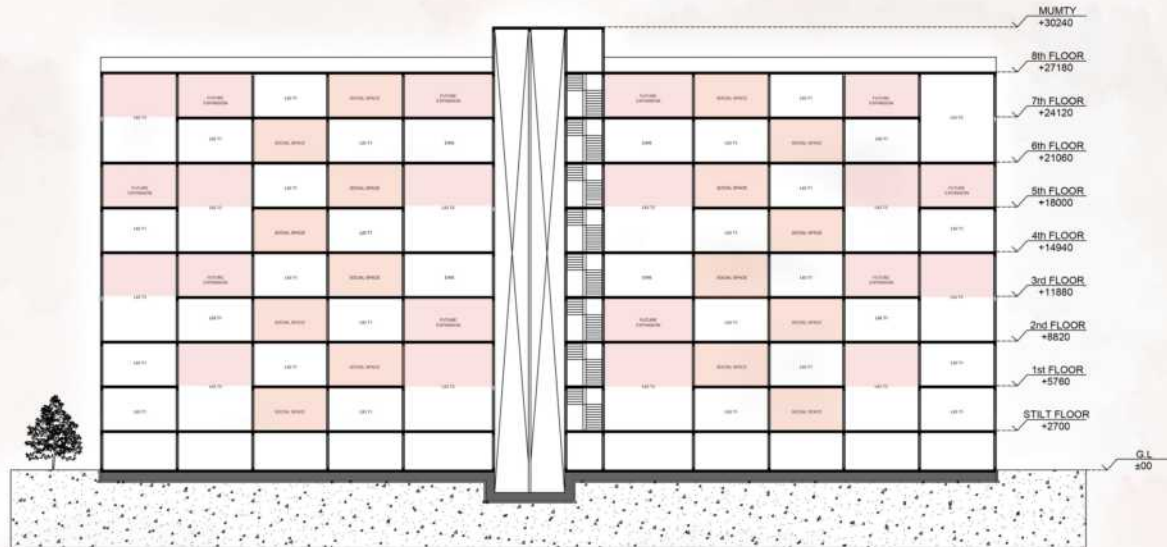
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FIRST FLOOR PLAN



COURTYARD FOR SOCIAL INTERACTION



CONCEPTUAL SECTION

Permanent social space ■  
 Temporary social space/Future expansion ■



ELEVATION

SCALE: 1:500

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 AT1904015082

# INCREMENTAL PROCESS



## COMPONENTS

AREA FOR FUTURE EXPANSION / TEMPORARY SOCIAL AREA  
400mm BIO-FILLED SITTING FOR PLANTATION WHICH CAN BE  
INSTALLED ON SITE AFTER FUTURE EXPANSION

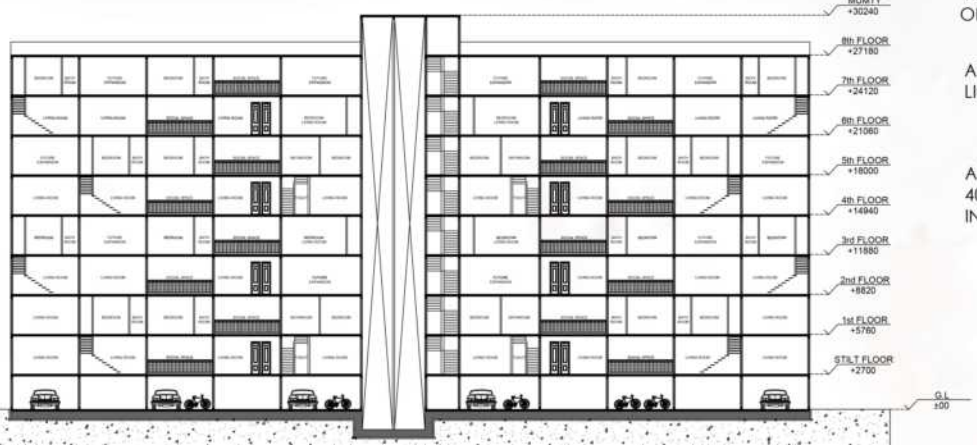
AREA FOR FUTURE EXPANSION / TEMPORARY SOCIAL AREA  
LOUVERS PROVIDED TO ALLOW VENTILATION

PERMANENT SOCIAL AREA  
ON EVERY FLOOR TO MAKE INTERACTIVE NEIGHBOURHOOD

AREA FOR FUTURE EXPANSION / TEMPORARY SOCIAL AREA  
LIG TYPE 1 CONVERTED INTO LIG TYPE 3

AREA FOR FUTURE EXPANSION / TEMPORARY SOCIAL AREA  
400mm BIO-FILLED SITTING FOR PLANTATION WHICH CAN BE  
INSTALLED ON SITE AFTER FUTURE EXPANSION

Permanent social space ■  
Temporary social space/  
Future expansion ■

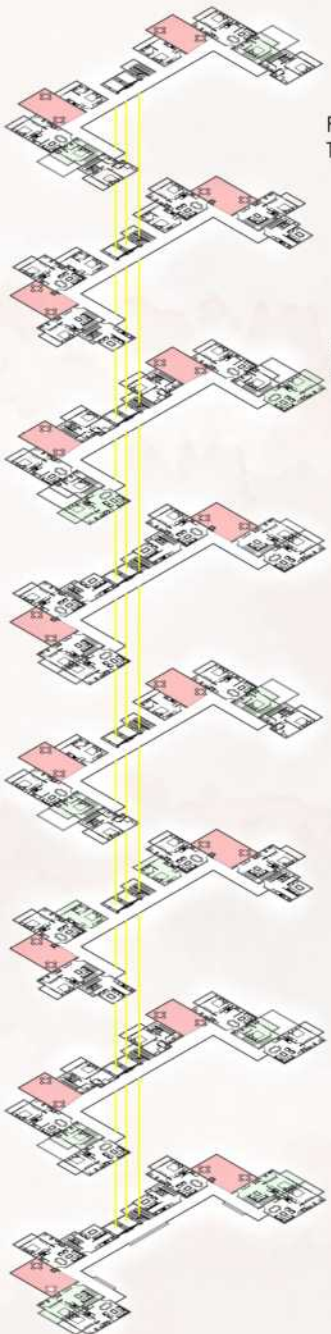


SCALE: 1:200

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INCREMENTAL PROCESS



EXPLODED PLANS



SECTION -1 SHOWING FUTURE EXPANSION/TEMPORARY SOCIAL SPACE



SECTION -2 SHOWING PERMANENT SOCIAL SPACE



WALKWAY

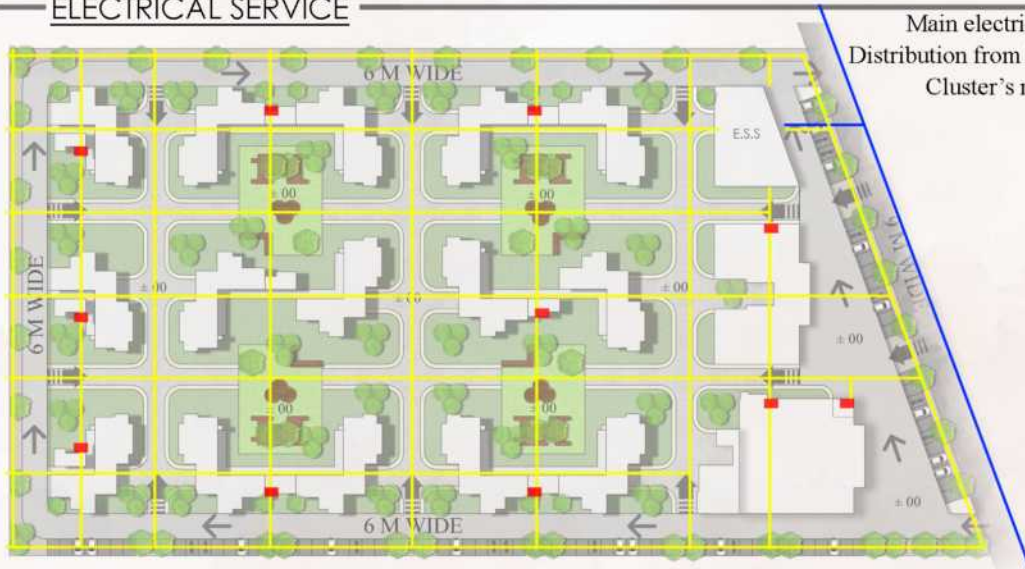


FUTURE EXPANSION/TEMPORARY SOCIAL SPACE

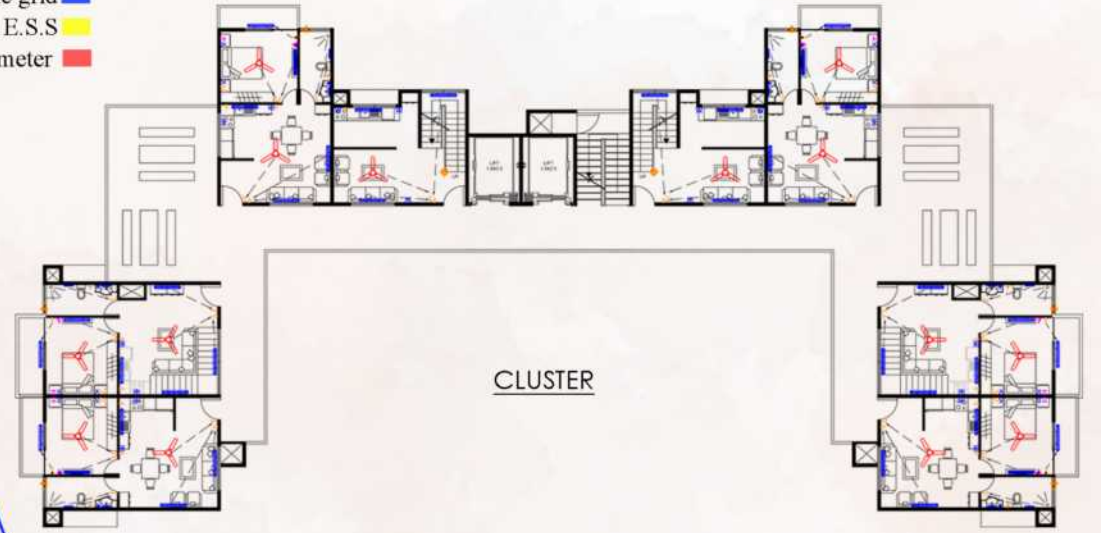




# ELECTRICAL SERVICE



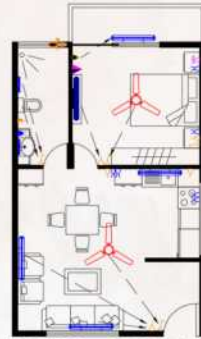
Main electric grid ■  
 Distribution from E.S.S. ■  
 Cluster's meter ■



ELECTRICAL LEGEND			
CEILING FAN		LIGHT PLUG	
TUBE LIGHT		TELEPHONE POINT	
SWITCH BOX		TV POINT	
EXHAUST FAN		AC POINT	
POWER PLUG		SOCKET FOR EXHAUST	
BELL BUZZER		GYSER POWER PLUG	

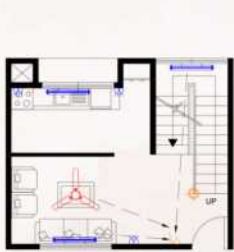


EWS - 21 SQM

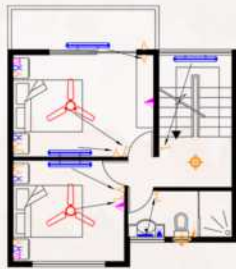


LIG T1 - 39 SQM

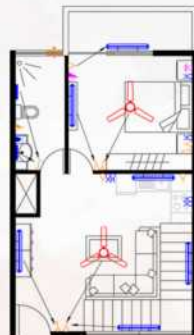
LIG T2 - 60 SQM



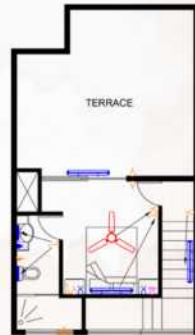
GROUND FLOOR - 39 SQM



FIRST FLOOR - 30 SQM



GROUND FLOOR - 39 SQM



FIRST FLOOR 21 SQM

LIG T3 - 60 SQM



CORE

SCALE 1:50

GUIDED BY: RAJEEV SINHA

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