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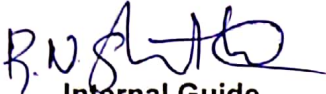
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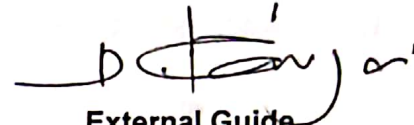
DEPARTMENT OF ARCHITECTURE

BONAFIDE CERTIFICATE

This is to certify that Thesis Report is the bonafide work of **RAJESH BOPPANA (39210065)** who carried out the Thesis entitled "**FLEXIBLE HOUSING FOR THE GROWING FAMILY**" under our supervision from November 2023 to May 2024.


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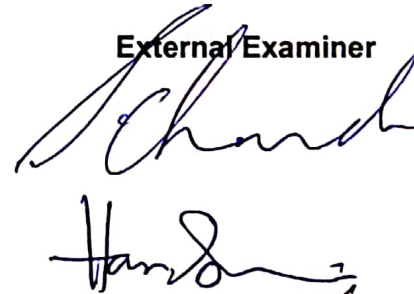

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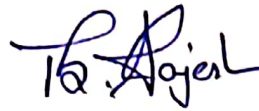

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DECLARATION

I, **RAJESH BOPPANA** hereby declare that the Thesis Report entitled "FLEXIBLE HOUSING FOR THE GROWING FAMILY" done by me under the guidance of **Ar. Shruthi Natarajan** (Internal Guide), **Ar. Juvilasri Vignesh** (Internal Review Member) and **Ar. Ranjan Daniel** (External Guide) Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Architecture Degree.

DATE: 23-05-2024

PLACE: Chennai



SIGNATURE OF THE CANDIDATE

Table of Contents

THESIS SYNOPSIS	v
LIST OF FIGURES	vii
1 INTRODUCTION	1
1.1 NEED FOR THE PROJECT	1
1.2 AIM AND OBJECTIVE	2
1.3 METHODOLOGY	3
2 BACKGROUND STUDY : FLEXIBILITY	4
2.1 FLEXIBILITY AT DIFFERENT LEVELS	4
2.2 TECHNIQUES USED	4
3 LITERATURE CASE STUDY	7
3.1 THE PRISM HOUSE, NEW DELHI	7
3.2 VILLA VERDE HOUSING, Chile	12
3.3 PLUGIN TOWER, CHINA	15
4 LIVE CASE STUDY	18
4.1 GOOD EARTH MALHAR ECO VILLAGE (GEMV)	18
4.1.1 WALK-UP HOMES	19
4.1.2 APARTMENTS	21
4.1.3 VILLAMENTS	23
4.2 Suvidha Retirement Village	24
5 SITE STUDY AND ANALYSIS	29
5.1 SITE STUDY	29
5.2 MORPHOLOGY	30
5.3 SITE ANALYSIS	31
5.4 VEGETATION	31
5.5 CLIMATIC FEATURES	32
5.6 LANDUSE MAP	33
5.7 SITE CONYEXT	33
6 ARCHITECTURAL DESIGN	34
6.1 SPACIAL REQUIREMENT	34
6.2 CONCEPT	36
6.3 AEROCON PANELS	38
6.4 DETAILED DRAWINGS	39

LIST OF FIGURES

Figure 2.2.1 Modular Construction.....	5
Figure 2.2.2 Open Floor Plans	5
Figure 2.2.3 Incorporating Moveable And Multi-Functional Furniture	5
Figure 2.2.4 Sliding Panels	6
Figure 2.3.5 Flexible Dwelling	6
Figure 2.3.6 Plug And Play Connections.....	6
Figure 3.1.1 Prism House Ground Floor Plan.....	8
Figure 3.1.2 Prism House First Floor Plan.	8
Figure 3.1.3 Prism House First Floor Plan.	9
Figure 3.1.4 Prism House.....	10
Figure 3.1.5 Prism House Top View	10
Figure 3.1.6 Prism House Elevation And Section	11
Figure 3.2.1 Villa Verde	12
Figure 3.2.2 Elevations	12
Figure 3.2.3 Ground Floor Plan Op2	13
Figure 3.2.4 Ground Floor Plan Op 1	13
Figure 3.2.5 First Floor Plan Op 1	14
Figure 3.2.3 First Floor Plan Op2	14
Figure 3.3.1 Analysis Diagram	15
Figure 3.3.2 First Floor Plan.....	16
Figure 3.3.3 Second Floor Plan.....	16
Figure 3.3.4 Section	16
Figure 3.3.5 Joinery Details.....	17
Figure 3.3.6 Plugin Joiner.....	17
Figure 4.1.1 Good Earth Malhar Eco Village Site Plan.....	18
Figure 4.1.2 Good Earth Malhar Medley Site Plan	19
Figure 4.1.1.1 Medley Ground Floor Plan.....	20
Figure 4.1.1.2 Medley First Floor Plan.....	20
Figure 4.1.1.3 Medley Second Floor Plan	20
Figure 4.1.1.4 Walk Up Home Section.....	21
Figure 4.2.1 3-Bedroom Apartments Floor Plan	21
Figure 4.1.2.2 2-Bedroom Apartment Floor Plan.....	22

Figure 4.1.2.3 Apartment Section	22
Figure 4.1.3.1 Villament Ground Floor Plan	23
Figure 4.1.3.2 Villament First Floor plan	23
Figure 4.1.3.3 Villament Section	24
Figure 4.2.1 Suvidha Retirement Village.	24
Figure 4.2.2 Master Plan Suvidha Retirement Village.	25
Figure 4.2.3 Suvidha's Cottage.....	26
Figure 4.2.4 Top View Suvidha.	27
Figure 5.1.1 Site Location.....	29
Figure 5.1.2 Site Topography	29
Figure 5.2.1 MORPHOLOGY	30
Figure 5.3.1 Site Analysis.....	31
Figure 5.4.1 Banyan Tree.....	31
Figure 5.4.2 Coconut Tree	31
Figure 5.5.1 Wind Velocity	32
Figure 5.5.2 Temperature Range	32
Figure 5.5.3 Percipitation Table.....	32
Figure 5.6.1 Land use Map of Brookfield.....	33
Figure 5.7.1 Site Context	33
Figure 6.2.1 Concept At Unit Level.....	36
Figure 6.2.2 Houses All Around Recreational Area	37
Figure 6.2.3 Concept for Apartment Block	37
Figure 6.3.1 Key Features of Aerocon Panels	38
Figure 6.3.2 Aerocon Panel Installation	38
Figure 6.4.1 Site Plan.....	39
Figure 6.4.2 Master Plan	40
Figure 6.4.4 PLAY AREA VIEW	41
Figure 6.4.4 Play Area	41
Figure 6.4.3 SITE VIEW	41
Figure 6.4.5 Villa Plan, Section & Elevation.....	42
Figure 6.4.7 Villa Views 1	43
Figure 6.4.8 Villa Front View.....	43
Figure 6.4.9 Apartment Floor plans.....	44
Figure 6.4.10 Apartment Front View.....	44

Figure 6.4.11 Apartment Basement Plan45

Figure 6.4.12 Apartment View45

Figure 6.4.13 Apartment Section BB.....46

Figure 6.4.14 Apartment Section AA46

Figure 6.4.15 Apartment Elevation.....47

Figure 6.4.16 Apartment Elevation.....47

Figure 6.4.17 Club House49

Figure 6.4.18 Club House View50

Figure 6.4.19 Club House View50

Figure 6.4.20 Community Hall & Store.....51

Figure 6.4.21 Community Hall View52

Figure 6.4.22 Store View52

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1 INTRODUCTION

Flexibility, within the context of housing, refers to the ability of a dwelling to adapt to the changing needs of its users. This encompasses various aspects such as the possibility of choosing different housing layouts prior to occupation.

Flexibility at each level allows for different uses and arrangements within the housing complex.

At the building level, flexibility involves accommodating various uses within the entire building complex, such as commercial spaces, residential units, and communal areas. This level of flexibility enables a diverse range of activities to take place within the building complex.

At the unit level, flexibility pertains to the ability of individual residential units to adapt to different requirements or preferences. This can involve customizable layouts, multi-functional spaces, or adaptable features that allow residents to personalize the use of their living areas according to their needs.

At the room level, flexibility focuses on the adaptability and versatility within each room individually. This could include movable partitions, convertible furniture, or modular design elements that allow for easy reconfiguration of the space to accommodate different activities or changing needs of the occupants.

The concept of flexibility at these different levels contributes to the overall achievement of a flexible housing environment, allowing for a wide range of uses and functionalities within the building complex

1.1 NEED FOR THE PROJECT

Financial Burden: Traditional housing often forces expensive relocations or renovations as families change. Flexible housing offers a cost-effective solution, maximizing a space's potential throughout its lifecycle.

Rising Housing Costs: Owning a home, particularly a single-family home suitable for growing families, has become increasingly expensive in many regions. This creates a financial strain on families who may struggle to afford the upfront costs of buying a larger home or the ongoing costs of maintaining one. Flexible housing offers a way to adapt existing spaces to changing needs, potentially avoiding the need for expensive relocations or renovations.

Shifting Demographics: Today's families have diverse needs – multigenerational living, work-from-home spaces, or areas for aging parents. Flexible housing designs cater to this changing landscape.

As the population ages, there is a growing need for age-friendly design. Demographic shifts that are driving this trend, including increasing life expectancy and declining birth rates .In

India, the percentage of people 60 and older was 7% in 2009, and it was anticipated that this number would rise to 20% by the year 2050. In absolute terms, there were around 88 million senior people in the world in 2009; by 2050, that number is projected to soar to more than 315 million

The type of architecture needed for individuals with age-related problems should be:

- Accessible
- Safe
- Socially Stimulating
- Connected To Nature
- Use Of Technology
- Homelike
- Flexible

1.2 AIM AND OBJECTIVE

The overall aim of this thesis project is to explore and propose innovative design solutions for flexible housing that can adapt to the changing needs of growing families.

Research existing flexible housing concepts and residences developed on age related basis. This will involve studying past innovations and identifying best practices for creating adaptable living spaces.

Conduct research to understand the specific needs and preferences of families regarding flexible housing. This might involve surveys, interviews, or focus groups to gather valuable data on family dynamics, space requirements, and desired functionalities.

Develop a framework or guide for implementing the proposed flexible housing design solutions. This could include considerations for construction methods, building codes, and potential challenges or limitations.

1.3 METHODOLOGY

Project Stage	Description in the Thesis
Topic Selection	Flexible Housing for The Growing Family
Detailed Study	Background work on Flexibility and Age Specific Design
Site Selection	Justification for selection
Literature Case Studies	The Prism House.
Live Case Studies	Good Earth Malhar Eco Village, Suvidha Retirement Village.
Comparative Analysis	Analysis of the case studies
Spatial Requirements	Area statement for the site
Site Documentation	Site analysis
Concept Design	Zoning and conceptual zoning
Schematic Design	Single line schematic site zoning and 3D massing with a study model
Design Development	Site plan, floor plans, sections, elevations, 3D model and rendered views

2 BACKGROUND STUDY : FLEXIBILITY

Flexibility, within the context of housing, refers to the ability of a dwelling to adapt to the changing needs of its users. This encompasses various aspects such as the possibility of choosing different housing layouts prior to occupation.

2.1 FLEXIBILITY AT DIFFERENT LEVELS

Flexibility at each level allows for different uses and arrangements within the housing complex.

- 1 **At the building level:** flexibility involves accommodating various uses within the entire building complex, such as commercial spaces, residential units, and communal areas. This level of flexibility enables a diverse range of activities to take place within the building complex.
- 2 **At the unit level:** flexibility pertains to the ability of individual residential units to adapt to different requirements or preferences. This can involve customizable layouts, multi-functional spaces, or adaptable features that allow residents to personalize the use of their living areas according to their needs.
- 3 **At the room level:** flexibility focuses on the adaptability and versatility within each room individually. This could include movable partitions, convertible furniture, or modular design elements that allow for easy reconfiguration of the space to accommodate different activities or changing needs of the occupants.

The concept of flexibility at these different levels contributes to the overall achievement of a flexible housing environment, allowing for a wide range of uses and functionalities within the building complex.

2.2 TECHNIQUES USED

The exact techniques used to make a dwelling unit flexible can vary, but here are some common techniques:

- Modular Construction:



Figure 2.2.1 Modular Construction

Using modular construction techniques, the dwelling is built in small sections or modules that can be easily assembled or disassembled. This allows for easy relocation or reconfiguration of the dwelling.

- Open Floor Plans:



Figure 2.2.2 Open Floor Plans

Designing the interior with an open floor plan allows for flexibility in layout and the ability to easily rearrange or repurpose spaces as needed.

- Incorporating moveable and multi-functional furniture:

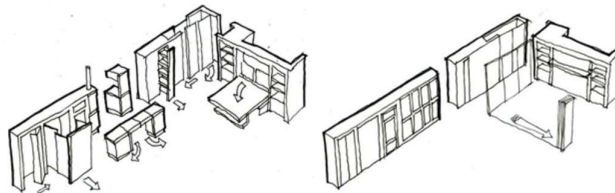


Figure 2.2.3 Incorporating Moveable And Multi-Functional Furniture

Such as collapsible tables, foldable beds, or modular storage systems, allows for quick and easy reconfiguration of the space to suit different needs.

- Partition Walls and Sliding Panels:

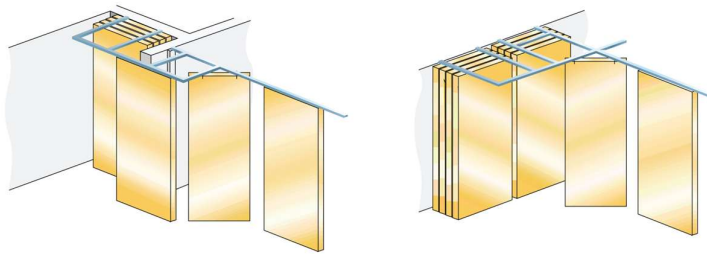


Figure 2.2.4 Sliding Panels

Installing partition walls or sliding panels that can be easily adjusted or moved provides flexibility to create separate rooms or open up the space for larger gatherings.

- Dwelling with the ability to expand or contract in size:



Figure 2.3.5 Flexible Dwelling

Such as through the addition or removal of modular units, allows for adaptability to changing needs or family size.

- Flexible Infrastructure:

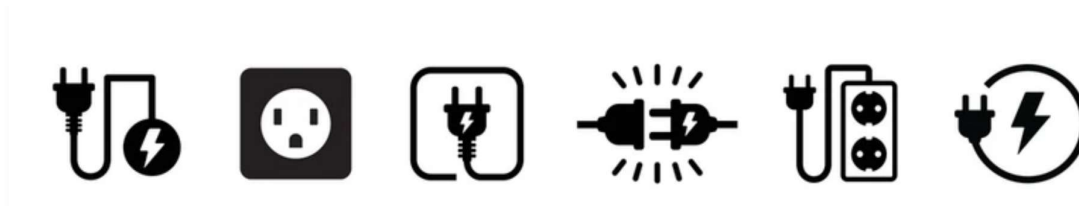


Figure 2.3.6 Plug And Play Connections

Installing flexible infrastructure systems such as plug-and-play electrical and plumbing connections, allows for easier modifications or additions to the dwelling without extensive renovations.

3 LITERATURE CASE STUDY

3.1 THE PRISM HOUSE, NEW DELHI

- City: New Delhi
- Country: India
- Area: 1200 m²
- Year: 2021
- Architects: Matra Architects & Rurban Planners
- Lead Architect: Verendra Wakhloo

“Prism,” a residence built on two amalgamated plots, each of 668 sqm in the south part of Delhi, attempts to dwell on experiential qualities and spatial nuances of living in a “house.” Spaces within the six-bedroom house, mindful of ecology, climate, and Vaastu, defer to the requirements of three generations of the family. The large double-height entertainment & guest block (gazebo), with building-related services located in the basement, has been planned thoughtfully along the north part of the central garden. It faces the central garden and the main house, equipped with formal-informal living areas on the ground floor and bedrooms on the first and second floors. Terraces, a study, and a gym with personalized private courts on the mezzanine/attic floor create a complete and complex living experience.

The design ethos of Prism House pays homage to Indian tradition. Vaastu principles, an ancient system of spatial harmony, subtly influence the layout, ensuring a sense of balance and well-being for the residents.

Sustainability is also woven into the fabric of the house. Passive cooling techniques and natural ventilation minimize reliance on energy-intensive systems, creating a home that's kind to the environment and the family's budget.



Figure 3.1.1 Prism House
Ground Floor Plan.

Figure 3.1.2 Prism House
First Floor Plan.



Figure 3.1.3 Prism
House First Floor
Plan.



HOW THE DESIGN CATERS TO DIFFERENT GENERATIONS:

Grandparents: Perhaps we could discuss dedicated spaces for grandparents, like a ground-floor bedroom with easy access to the garden, or a quiet reading nook near a window.

Parents: We could explore how the house facilitates work-life balance for parents, such as designated workspaces that offer privacy and noise reduction, or open-plan areas where they can supervise children while cooking or relaxing.

Children: Exploring playful and adaptable spaces for children, like flexible activity areas that can transform into bedrooms or study zones, or a safe outdoor play area within the central courtyard.

Honoring Tradition and Sustainability:

The design ethos of Prism House pays homage to Indian tradition. Vaastu principles, an ancient system of spatial harmony, subtly influence the layout, ensuring a sense of balance and well-being for the residents.

Sustainability is also woven into the fabric of the house. Passive cooling techniques and natural ventilation minimize reliance on energy-intensive systems, creating a home that's kind to the environment and the family's budget.

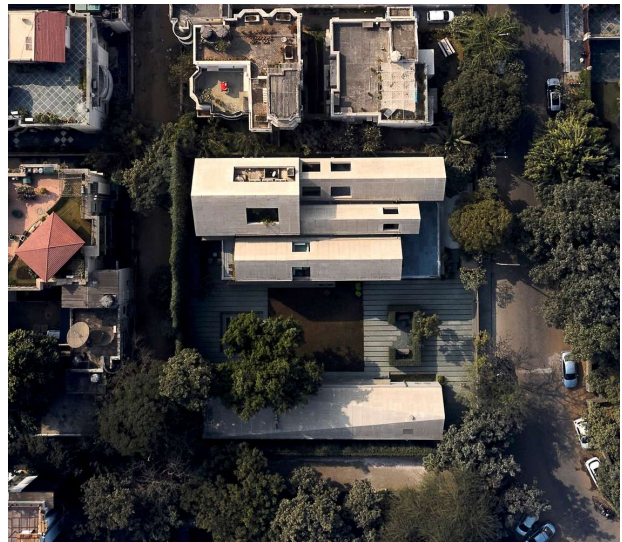
Prism House understands that families evolve. Each space is designed to be adaptable and multifunctional, catering to the changing needs of its inhabitants. Bedrooms can transform into study areas, living rooms can morph into movie theaters, and the central courtyard can host everything from birthday parties to quiet yoga sessions.

Prism House is a testament to the power of thoughtful design to create a space that nurtures not just individuals, but families. It's a home that celebrates differences, fosters connections, and provides a safe haven for generations to come together, grow, and create lasting memories.



Figure 3.1.4 Prism House

Figure 3.1.5 Prism House Top View



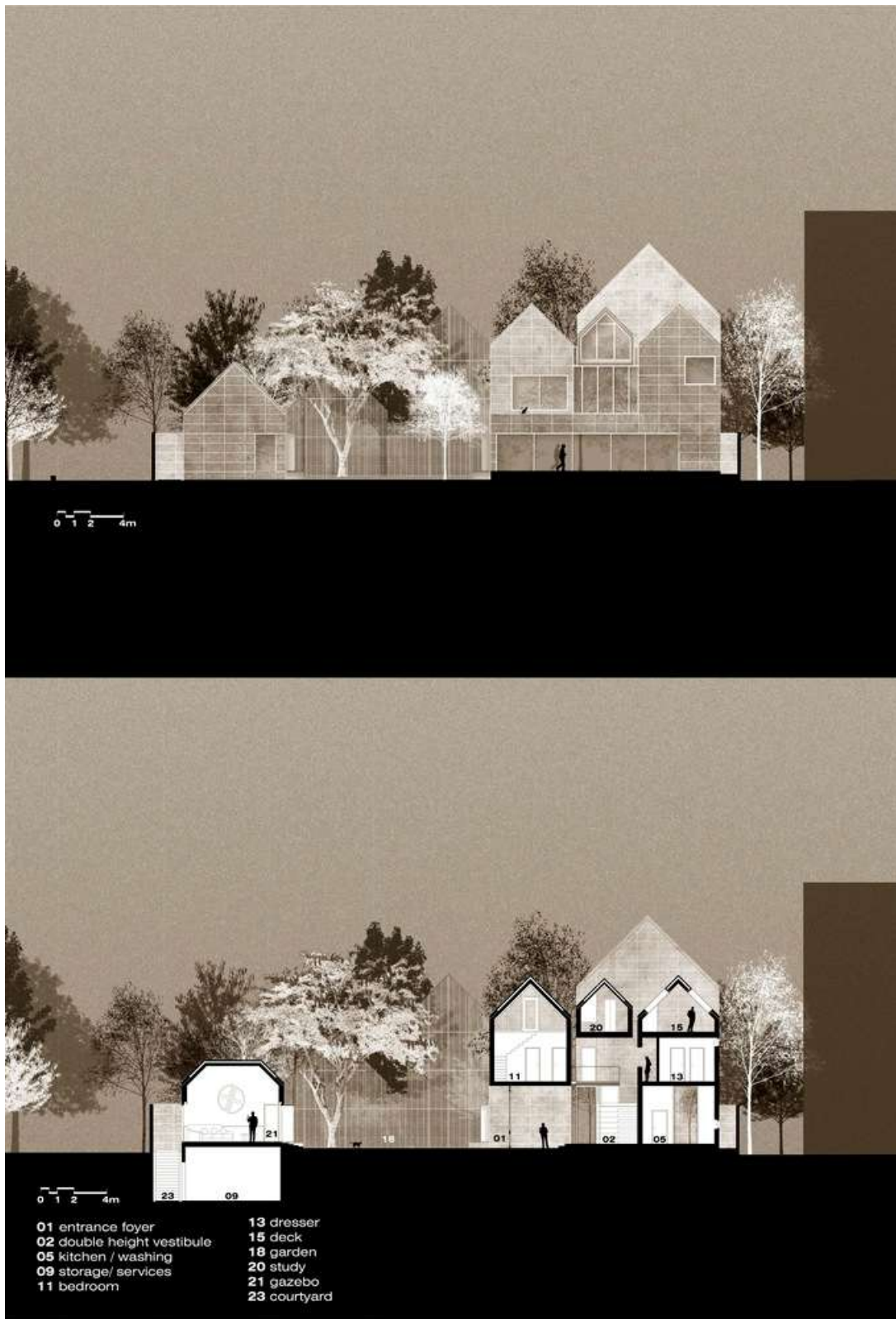


Figure 3.1.6 Prism House Elevation And Section

3.2 VILLA VERDE HOUSING, Chile



Figure 3.2.1 Villa Verde

- City: Constitution
- Country: Chile
- Type : SOCIAL HOUSING
- Architects: ELEMENTAL
- Area: 5688 m²
- Year: 2010

Flexibility is achieved through the concept of "incremental construction." The houses are built using a standardized module system that allows for customization and expansion within the borders of each single house. The modules can be easily added or removed to accommodate changing family sizes or different spatial needs.

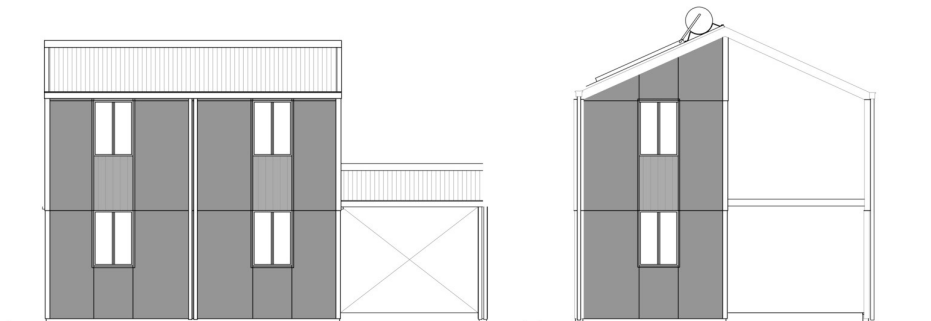


Figure 3.2.2 Elevations

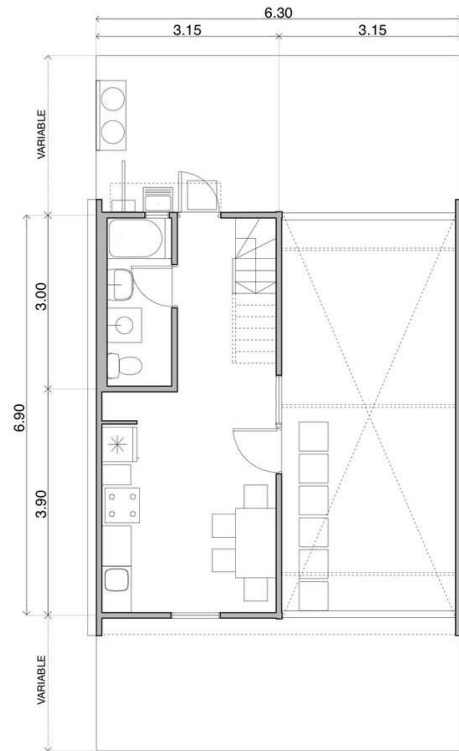


Figure 3.2.3 Ground Floor Plan Op2

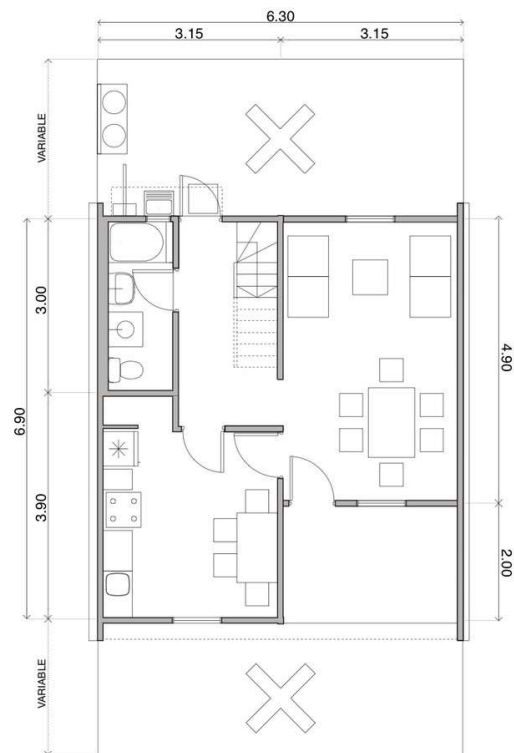


Figure 3.2.4 Ground Floor Plan Op 1

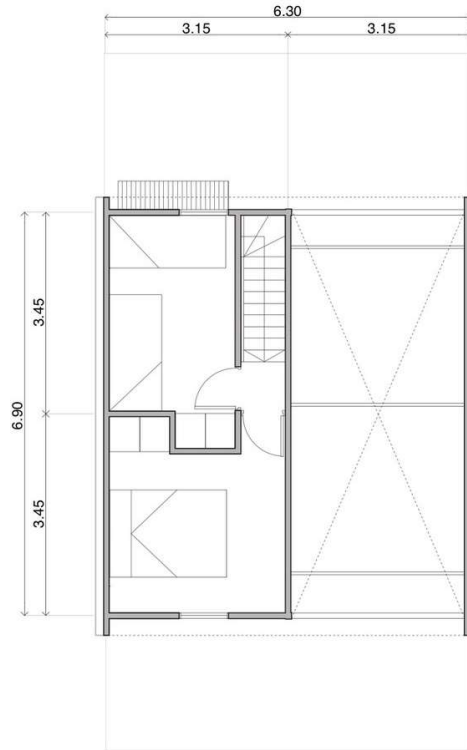


Figure 3.2.5 First Floor Plan Op 1

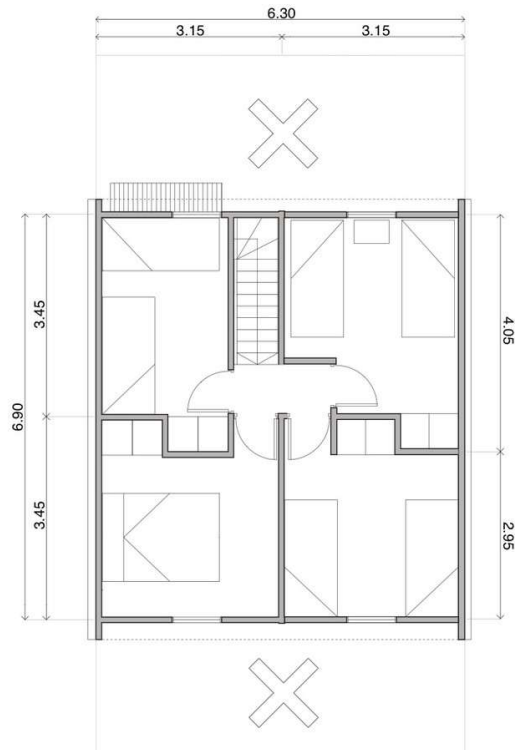


Figure 3.2.6 First Floor Plan Op2

3.3 PLUGIN TOWER, CHINA



Figure 3.3.1 Analysis Diagram

- Type: HOUSES
- City : BEIJING
- Country: CHINA
- Architects: People's Architecture Office
- Area: 470 m²
- Year: 2017

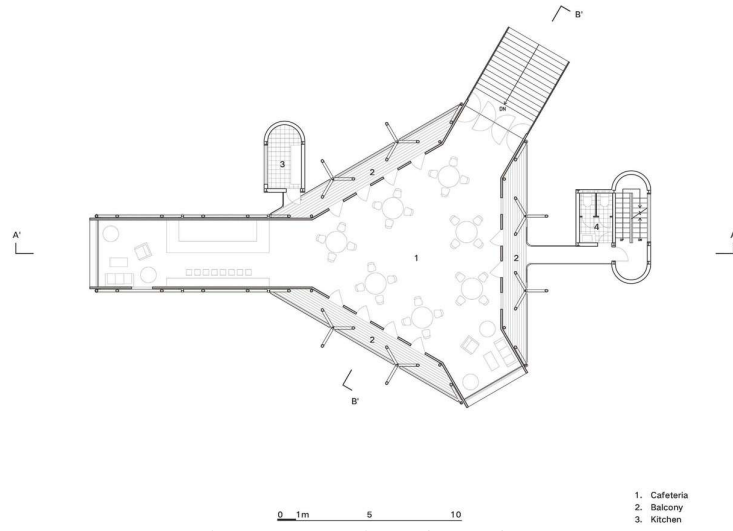


Figure 3.3.2 First Floor Plan

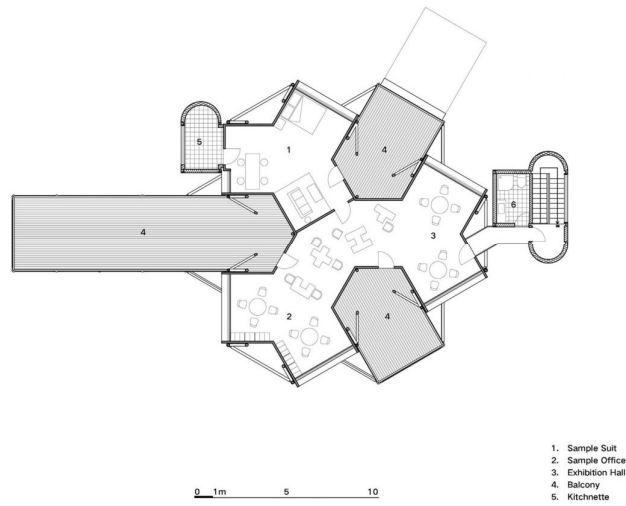


Figure 3.3.3 Second Floor Plan

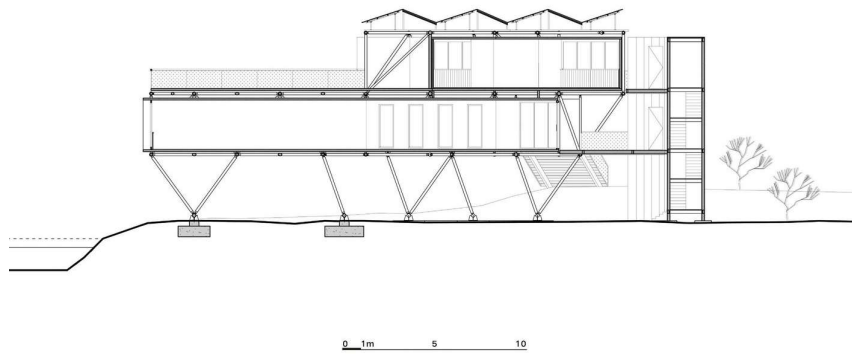


Figure 3.3.4 Section

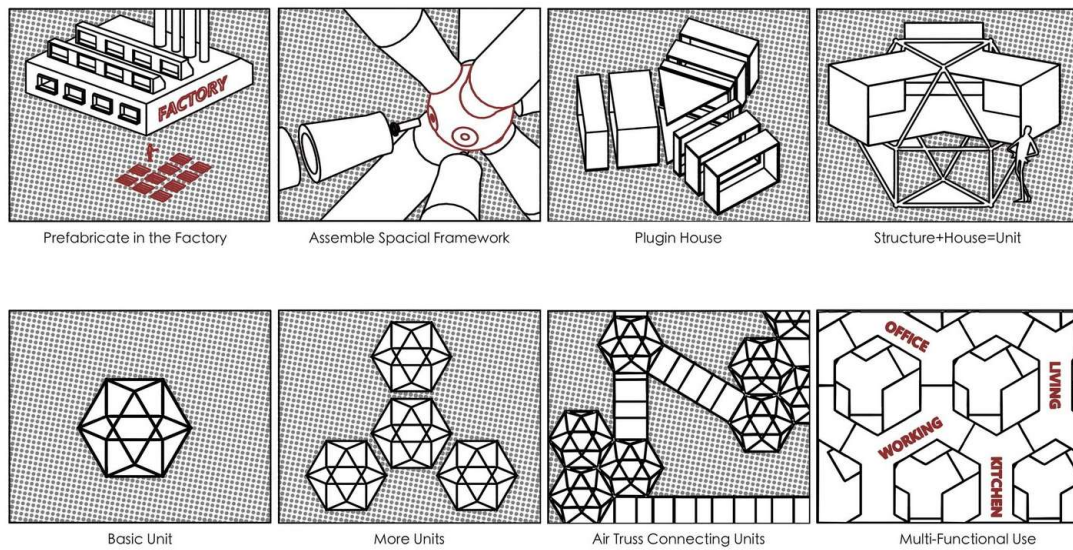


Figure 3.3.5 Joinery Details

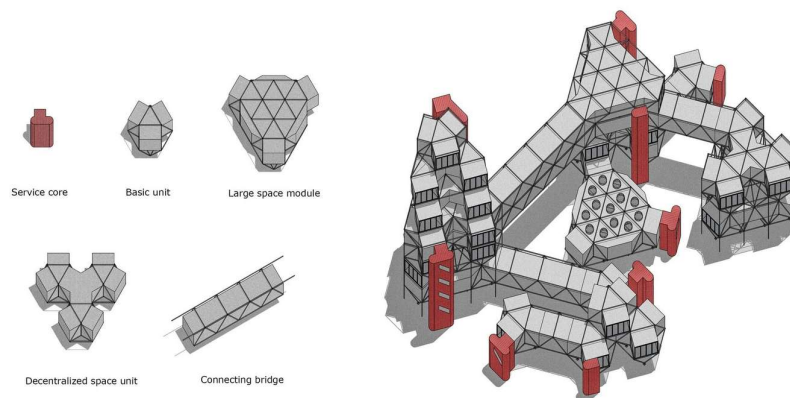


Figure 3.3.6 Plugin Joiner

Flexibility is achieved through a modular design approach. The tower is composed of independent single houses made of lightweight modules, allowing for optimal customization and adaptability. The residents have the freedom to arrange the modules according to their preferences, creating various layouts within their own units. Additionally, the modules can be easily disassembled and reassembled, offering the possibility of relocation. This flexibility caters to the dynamic nature of urban environments and provides residents with the ability to adjust their homes according to changing needs or circumstances.

4 LIVE CASE STUDY

4.1 GOOD EARTH MALHAR ECO VILLAGE (GEMV)

As the name suggests, this latest addition to Malhar is a “Medley” of three typologies – the cluster home, the apartment and the walk-up home. The walk-up home is a new addition to the typologies. Intended for families with multiple generations, or separate nuclear families that would like to stay near each other and yet have their independence, it is designed as two houses one above the other.



Figure 4.1.1 Good Earth Malhar Eco Village Site Plan



Figure 4.1.2 Good Earth Malhar Medley Site Plan

- Project name: Malhar Medley
- Location: Kengeri, Bangalore
- Area: 4 acres
- Principal architects: Jayakumar and Pradeep
- Design team: Good Earth Eco Futures
- Client: Good Earth Eco Communities

Facilities at the Malhar eco-village:

- A community center at the heart of Malhar hosts various services and activities that its members offer.
- A 2-acres organic farm for community based cooperative farming initiative.
- A well set-up club supports a wide range of indoor and outdoor games, fitness activities and has a pool and a spa.
- A large playground, almost the size of a football field, is the pride of the community.
- kilometre long trail undulates along a wooded fringe of the property.

4.1.1 WALK-UP HOMES

Addressing a unique need for families desiring closeness yet privacy, particularly those wanting to live with elderly family members. The ground floor houses the villaments – compact homes with large backyard gardens. Directly above these are the Walk-up Homes – duplexes with separate external entrances. This design effectively allows families to live in proximity to their loved ones while retaining their privacy.

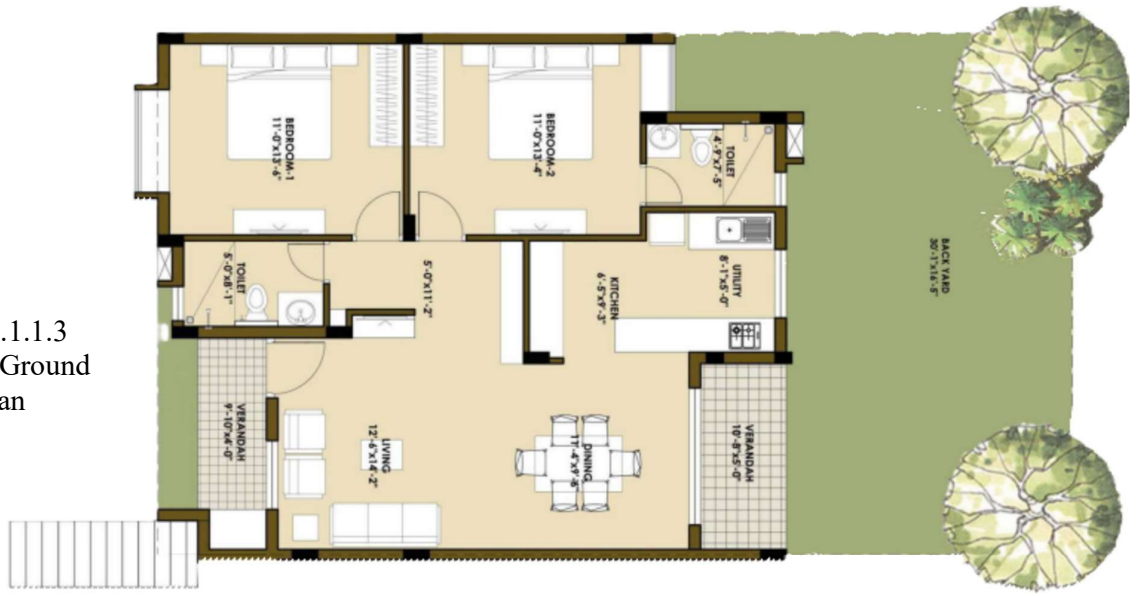


Figure 4.1.1.3
Medley Ground
Floor Plan



Figure 4.1.1.3
Medley First
Floor Plan



Figure 4.1.1.3
Medley Second
Floor Plan

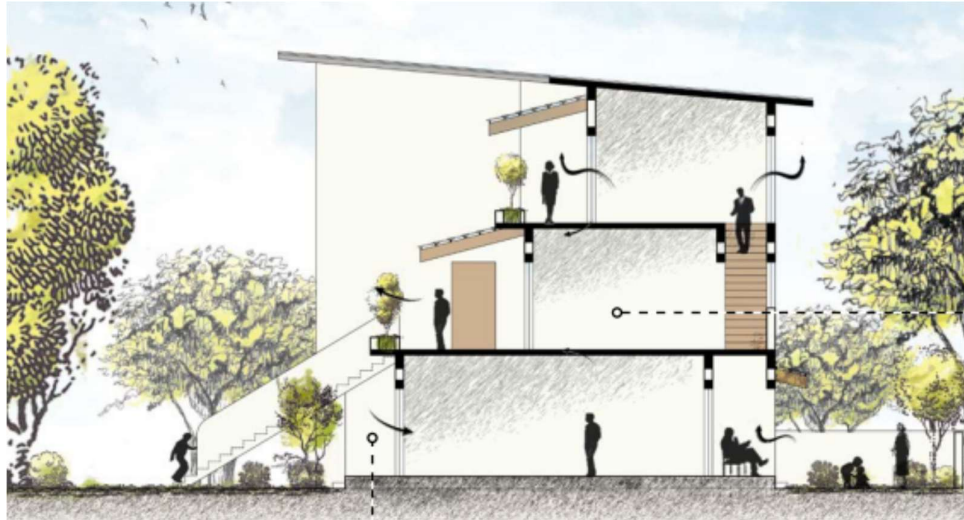


Figure 4.1.1.4 Walk Up Home Section

4.1.2 APARTMENTS

Medley apartments feature 2 /3-bedroom units with individual terrace gardens. The living and dining spaces extend into a verandah which acts as a transitional area to the terrace garden outside. This orientation, as well as the use of bay windows and French windows, allow plenty of light and air into the apartments. Each Apartment consists of 5 floors including ground floor occupied.



Figure 4.2.1 3-Bedroom Apartments Floor Plan



Figure 4.1.2.2 2-Bedroom Apartment Floor Plan

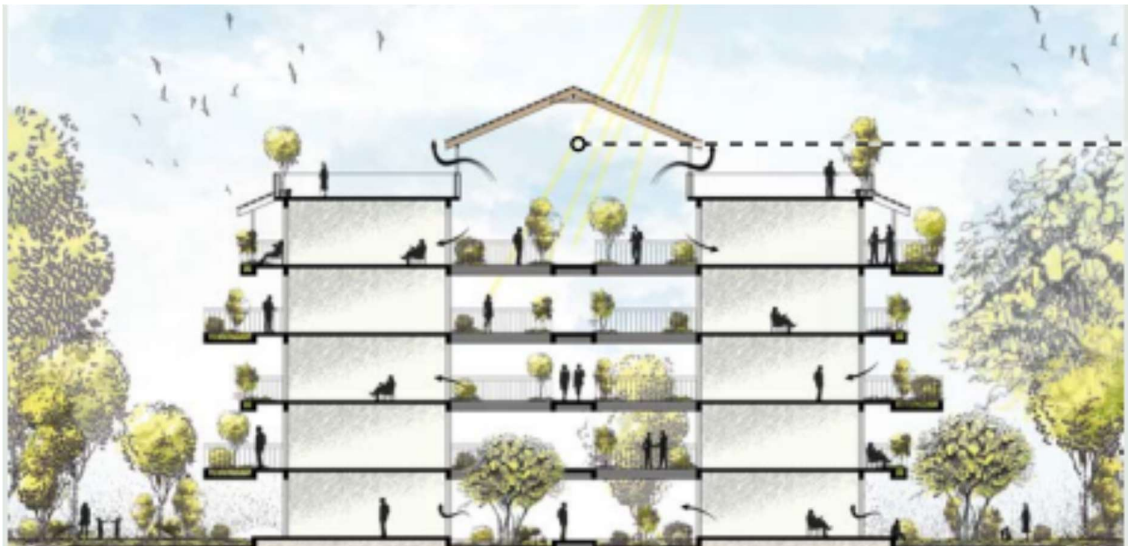


Figure 4.1.2.3 Apartment Section

4.1.3 VILLAMENTS

Villaments are compact units, about 1000 sq ft. with a large backyard garden which measure about 500 600 sq ft., about the same as the gardens in the Townhouses, and is central to the home's living space. Inner spaces flow into one another and open into the well-lit garden providing a sense of light and space.

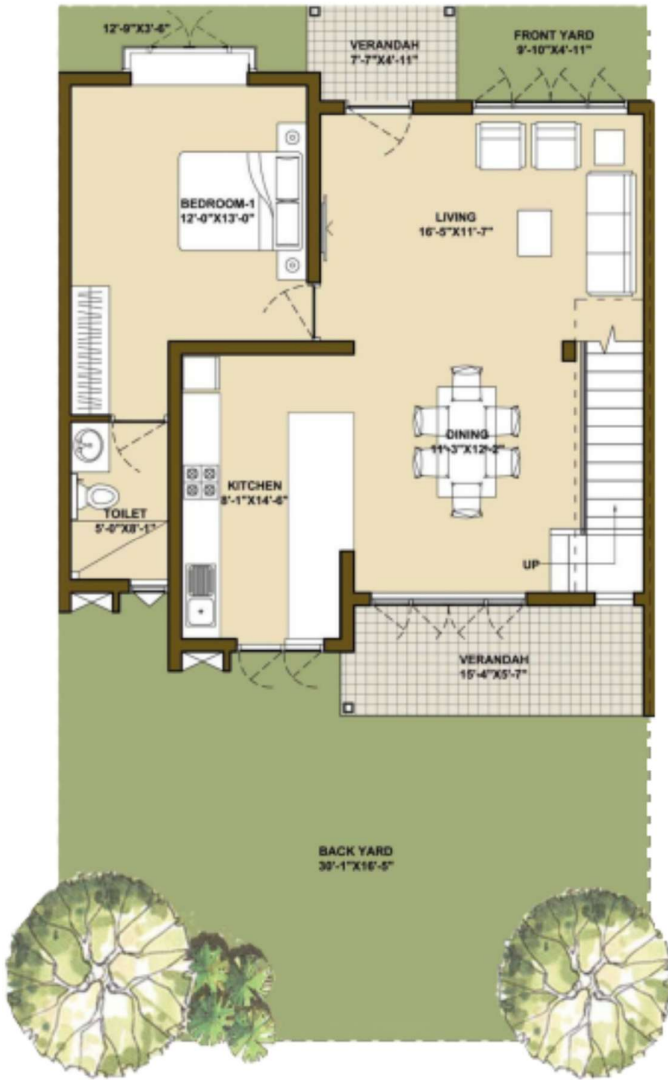


Figure 4.1.3.1 Villament Ground Floor Plan

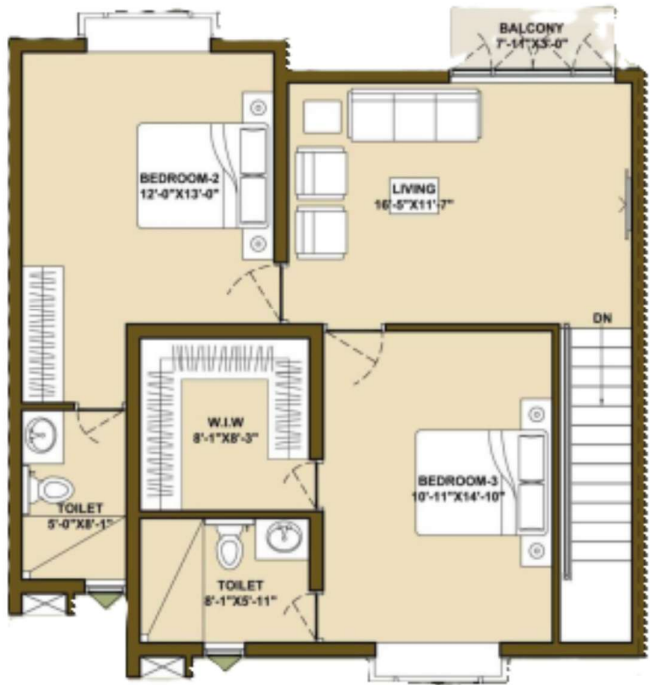


Figure 4.1.3.2 Villament First Floor plan



Figure 4.1.3.3 Villament Section

4.2 Suvidha Retirement Village



Figure 4.2.1 Suvidha Retirement Village.

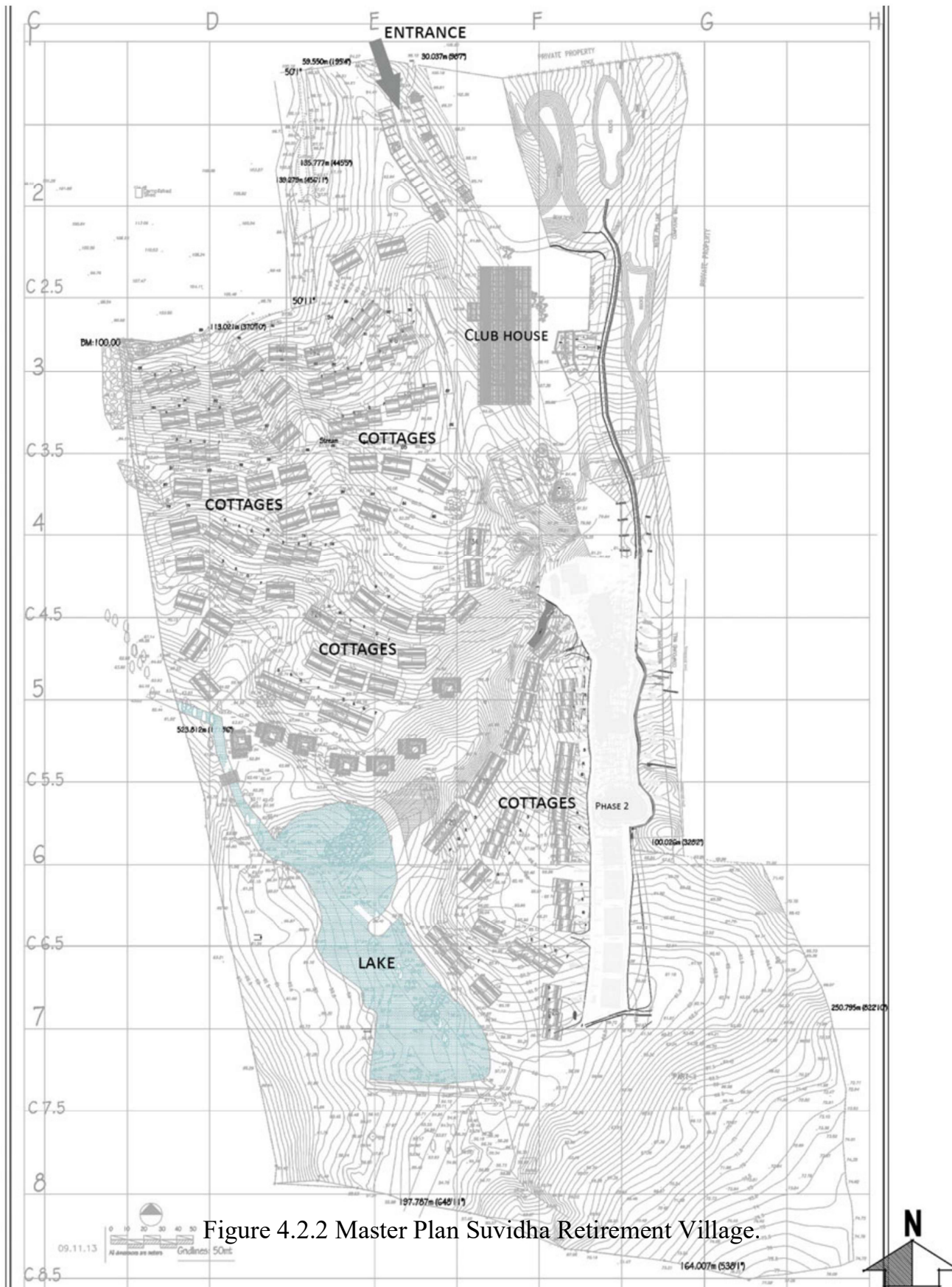


Figure 4.2.2 Master Plan Suvidha Retirement Village.

The village is subject to the regulations governing any non-agricultural activity in the Belt because it is located in the Green Belt outside of Bangalore, which are:

1. It is illegal to divide up and sell land.
 2. Only 15% of the available land may be used for construction.
 3. A building can only rise one story above the ground.
 4. No geological features, such as big rocks or other objects, are allowed to be touched.
- In light of these circumstances, it was agreed to construct these buildings in compliance with the Green Belt Rules.
 - There are just single-family dwelling units in the village.
 - The house appears to be made of glass from the outside.
 - Its inside is lined with bamboo chicks and has clear glass panels on all sides. These aid in providing interior lighting naturally, lowering the need for artificial lighting, and providing residents with a sense of brightness.
 - Large boulders and rocks are strewn throughout the walls; these serve as the pillars, on which steel struts are connected to hold the roof.
 - The roof is not a typical one; instead, it is a tiled roof with glass slats that let in light while blocking heat.
 - It has a medical center, a swimming pool, a golf course, and an arts and crafts center.



Figure 4.2.3 Suvidha's Cottage

- As a contrast to the green of the numerous indoor plants and shrubs, the walls are constructed from exposed bricks, terracotta tiles, and rough-cut stone.

- To create a natural space to feels old, it strives to make the best use of nature because you can never match it.
- Jaisim is recognized for its brick and stone architecture, though.
- "Don't clothe your structures, let them come to life," he feels Jaisim.
- Hollow terracotta blocks have been used.
- These function on three levels: acoustically, aesthetically, and structurally.
- Concrete is used seldom; lime and mud are more commonly used conventional ingredients.
- This method allows the structure to organically breathe, promoting a healthy indoor environment that blends with the surrounding natural environment.
- The buildings are multi-story yet rise softly in levels, accented by courtyards. The design was based on a beehive.
- A stone floor and tables, as well as an earthen pot ceiling, are intriguing additions built by Jaisim.
- The stone, which comes in the form of enormous boulders with awkward shapes, has been collected from construction sites where it was blasted and discarded because it was useless as well as from other locations throughout the countryside.
- A 4-acre lake made of rainwater, solar panels, and windmills are just a few of the environmentally friendly features included in the design.
- Thus, eventually, it will be able to produce enough energy to satisfy up to 60% of its requirements.



Figure 4.2.4 Top View Suvidha.

Image source: Google Earth

Homelike

The village provides a unique living experience for its residents by providing them with customizable cottages that they can modify to their tastes and needs. This sense of customization allows the residents to create their home environment and make it truly unique.

Additionally, the village allows the residents to buy their cottages rather than paying a lease or fee for living, which further adds to the feeling of home likeness.

Accessible

The village is designed with a range of features that make it easily accessible. The site is blended with accessible walkways or tracks, and there is vehicle access within the site for easy movement. The village also has clear signage that directs people to the various features and amenities.

Flexible

The village is designed with moveable furniture, modular fixtures, and other features that allow for flexibility in the layout and design of the cottages. Additionally, the village has a multi-purpose hall that can hold a variety of activities, such as concerts or conferences.

Safe

The village is designed with a range of features that make it safe for the residents. The roads within the village are very thin and can only accommodate one vehicle at a time, which encourages slow driving and decreases the risk of accidents. The walkways are also rough-textured, which helps to reduce the risk of tripping hazards. Additionally, the village has maximum surveillance and other safety features, such as security guards and cameras.

Connected to Nature

The village is designed with biophilic design elements that integrate nature into the site. Each cottage has multiple views of nature, with maximum ventilation and lighting, built with naturally blended materials such as stone and bamboo. The village also has a man-made lake that connects all the stormwater drains in the site for rainwater harvesting, creating a naturally occurring waterfall when it rains. This brings a feeling that they are connected to nature.

Socially Stimulating

The village hosts a variety of activities for the residents, such as communal dining, theatre, and OAT. Additionally, the village has communal spaces and shared spaces that encourage interaction among the residents. However, the village does not support any intergenerational activities.

5 SITE STUDY AND ANALYSIS

5.1 SITE STUDY

- **LOCATION:** Brookfield, Bengaluru, Karnataka
- **COORDINATES:** 12.960497879838343, 77.72868907171735



Figure 5.1.1 Site Location

- Brookfield is a dynamic and multifaceted Bangalore neighborhood that offers a unique blend of greenery, modern amenities, and a vibrant community.
- **SOIL TYPE:** Red Sandy Loam
- **TOPOGRAPHY:** The Site has an elevation from 899m to 911m from the sea level where the length is 367.5m and the slope ratio is 1:30. Which is negligible.

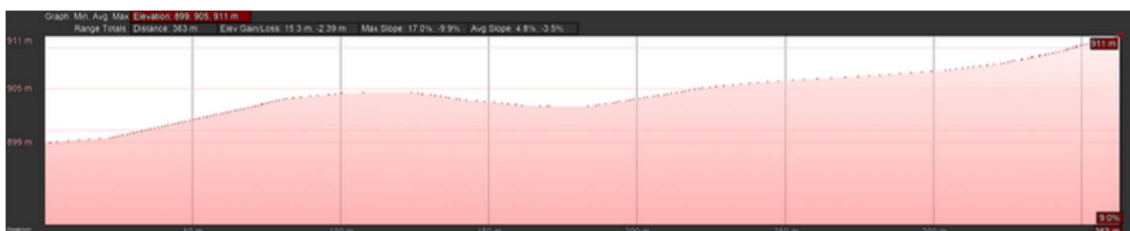


Figure 5.1.2 Site Topography

MORPHOLOGY

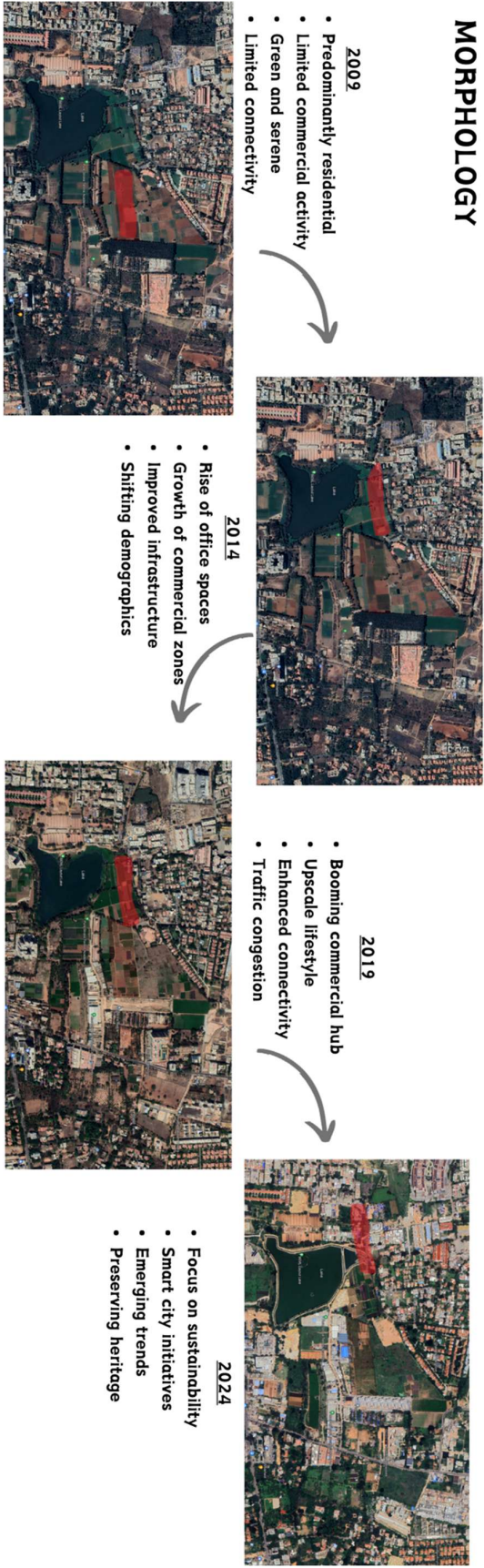


Figure 5.2.1 MORPHOLOGY

5.2 MORPHOLOGY

5.3 SITE ANALYSIS

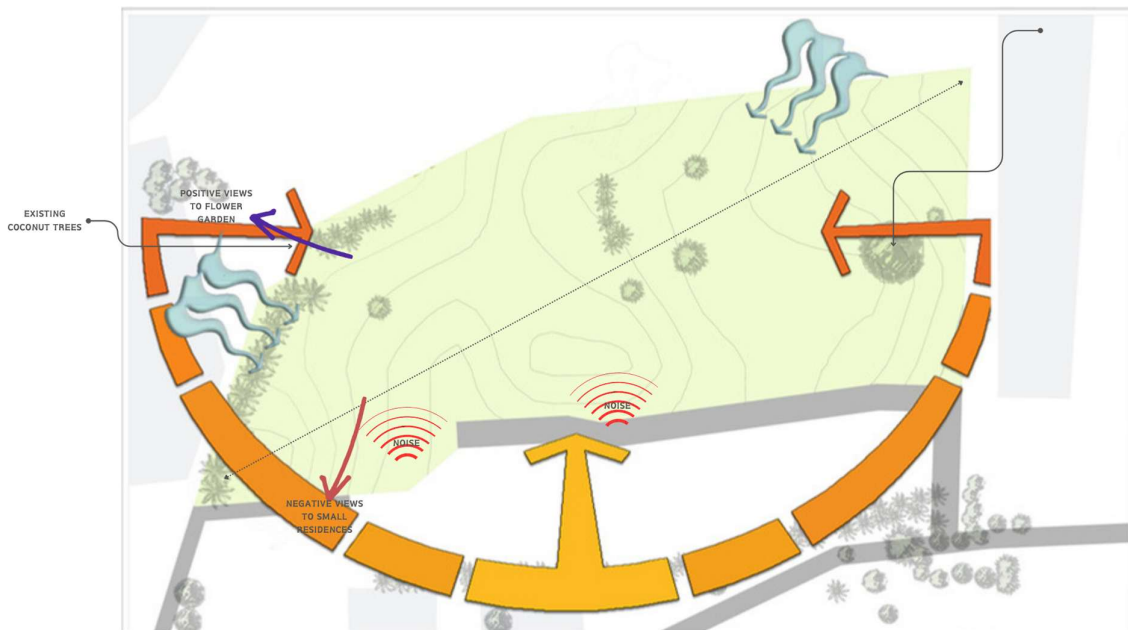


Figure 5.3.1 Site Analysis

5.4 VEGETATION

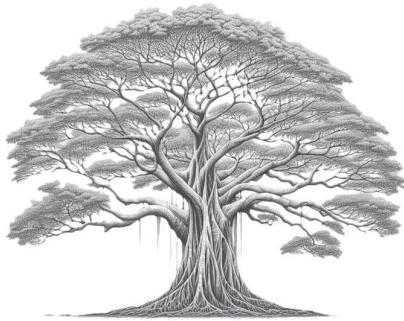


Figure 5.4.1 Banyan Tree

- Common Name : Banyan Tree
- Height (m) : 15 to 30
- Spread (m) : 20 or more
- Rate of Growth : Fast
- Root System : Aerial Prop
- Drought Res : Yes

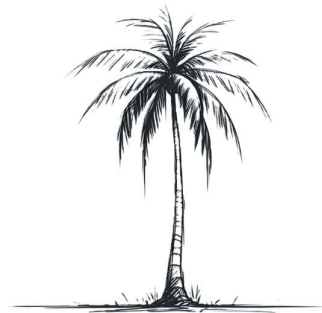


Figure 5.4.2 Coconut Tree

- Common Name : Coconut Tree
- Height (m) : 15 to 25
- Spread (m) : 7 to 10
- Rate of Growth : Slow / Moderate
- Root System : Widely
- Drought Res : No

5.5 CLIMATIC FEATURES

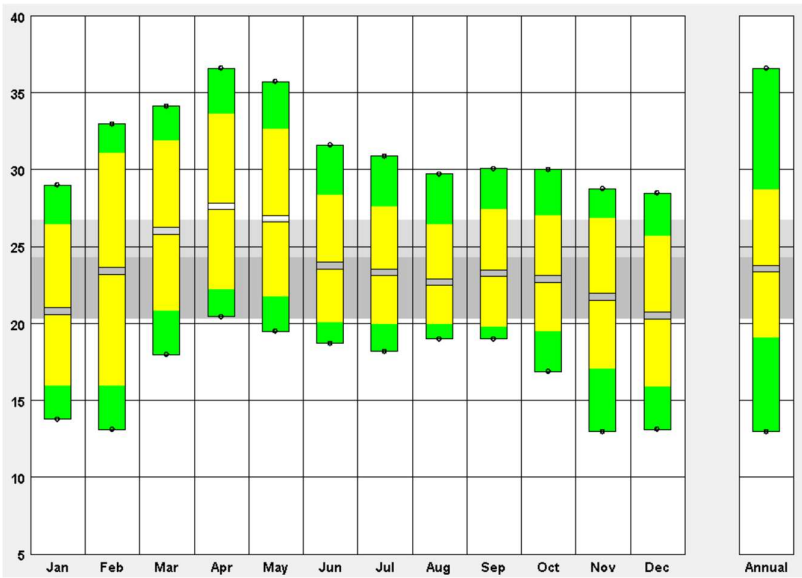


Figure 5.5.1 Wind Velocity

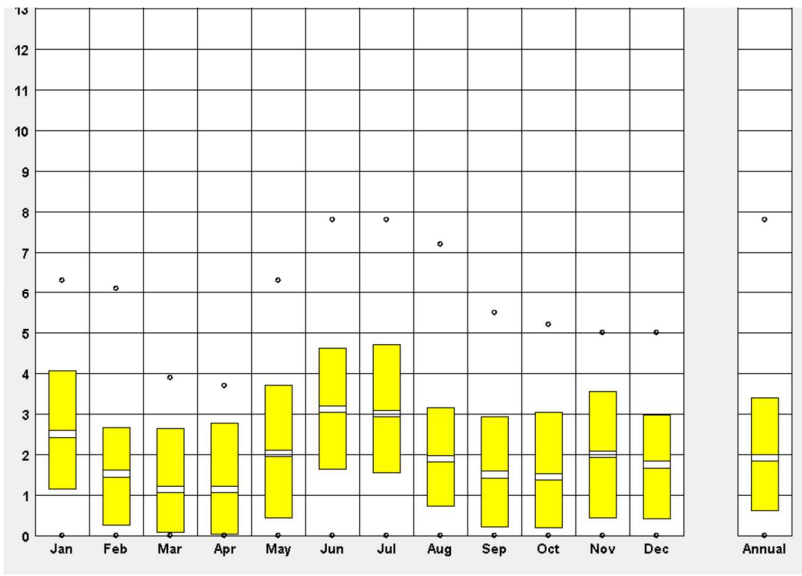


Figure 5.5.2 Temperature Range

Climate Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Average Precipitation mm	1	7	16	32	104	78	106	119	244	127	52	19	905
Probability of rain on a day	1	1	1	5	11	13	18	18	15	15	7	3	108
% of Sunny in Daylight Hours	76	72	80	68	59	36	24	33	42	48	61	70	56

Figure 5.5.3 Percipitation Table

5.6 LANDUSE MAP



Figure 5.6.1 Land use Map of Brookfield

5.7 SITE CONYEXT

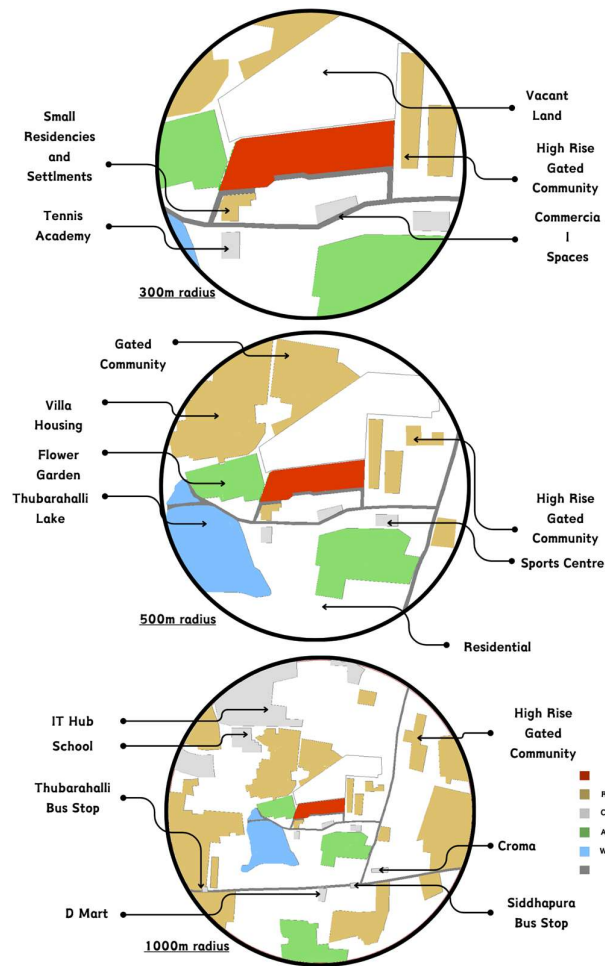


Figure 5.7.1 Site Context

6 ARCHITECTURAL DESIGN

6.1 SPACIAL REQUIREMENT

- COMMUNITY CLUBHOUSE : 750 Sqm
- PLAY AREA : 500 SqM
- OSR : 4160 SqM
- COMMUNITY HALL : 50 SqM
- STORE : 250 SqM
- ROW HOUSING: 257 SqM*28
- APARTMENTS: 8500 SqM*2

VILLA : 257 SQM

DWELLING 1 : 128 SQM

- KITCHEN : 15 SQM
- LIVING ROOM : 20 SQM
- DINING : 14 SQM
- M.BEDROOM : 18 SQM
- DRESSER : 5 SQM
- BEDROOM 2 : 18 SQM
- BEDROOM 3 : 16 SQM
- TOILETS : 5 SQM*3
- POWDER ROOM : 3 SQM
- PANTRY : 4 SQM

DWELLING 2 : 48 SQM

- KITCHEN : 12 SQM
- LIVING / DINING : 14 SQM
- M.BEDROOM : 12 SQM
- DRESSER : 3 SQM
- TOILET : 4 SQM
- PANTRY : 3 SQM

COMMON AREAS : 85 SQM

- PARKING : 35 SQM
- COURTYARD: 50 SQM

APARTMENT: 170 SQM

DWELLING 1 : 102 SQM

- KITCHEN : 12 SQM
- LIVING / DINING : 20 SQM
- M.BEDROOM : 16 SQM
- DRESSER : 3 SQM
- BEDROOM 2 : 14 SQM
- BEDROOM 3 : 14 SQM
- TOILETS : 4 SQM*3
- POWDER ROOM : 3 SQM
- PANTRY : 3 SQM
- BALCONY : 5 SQM*2

DWELLING 2 : 56 SQM

- KITCHEN : 8 SQM
- LIVING / DINING : 18 SQM
- M.BEDROOM : 14 SQM
- DRESSER : 5 SQM
- TOILET : 4 SQM
- PANTRY : 3 SQM
- BALCONY : 4 SQM

COMMON AREAS : 22 SQM

- FAMILY ROOM : 16 SQM
- BALCONY : 6 SQM
-

6.2 CONCEPT

At the unit level: the design prioritizes private courtyards within each residence. On a broader scale, the arrangement of blocks fosters community interaction by offering shared views towards a central recreational area.



Figure 6.2.1 Concept At Unit Level

Unit-level courtyards:

- **Privacy and connection:** these personal outdoor spaces offer residents a tranquil haven while still maintaining a sense of connection to the larger community through shared elements like landscaping or materials.
- **Increased activity:** the presence of outdoor areas can motivate residents to spend more time outside, leading to more incidental encounters and opportunities for interaction.

Shared views of recreational areas:

- **Visual connection:** the deliberate alignment of blocks creates a sense of shared space and encourages residents to connect visually with their neighbors who might be enjoying the recreational area.
- **Shared activities:** the proximity to the recreational area can naturally draw residents together, prompting them to participate in activities or simply observe and engage in conversations.
- **Community identity:** this design reinforces the feeling of belonging to a shared space, fostering a sense of community and encouraging interaction among residents.



Figure 6.2.2 Houses All Around Recreational Area

Apartments concept:



Figure 6.2.3 Concept for Apartment Block

For your specific community's social gatherings, envision a unique recreational space blending the openness of the sky with a natural floor like grass, sand, or pebbles. Partially cover the space with retractable awnings or pergolas for weather protection, and incorporate landscaping for shade and windbreaks. Designate areas for games, performances, or relaxation with comfortable seating options under soft lighting. Encourage community involvement in the design and prioritize safety compliance and accessibility. Remember, tailoring the space to your community's specific needs and preferences will make it truly special!

6.3 AEROCON PANELS

Aerocon Panels are made of two fiber reinforced cement facing sheets on either side of a light-weight concrete core. These ready-to-install Aerocon Panels are poised to revolutionize building construction, taking it to a whole new level. Aerocon Panels have become an ideal solution for dry walls and partitions.

Application Areas

- Prefab structures
- Full and half height partitions
- Mezzanine flooring
- Compound wall
- Fire separation wall
- Residential partitions
- Fins

Key Features



Figure 6.3.1 Key Features of Aerocon Panels

Installation Method

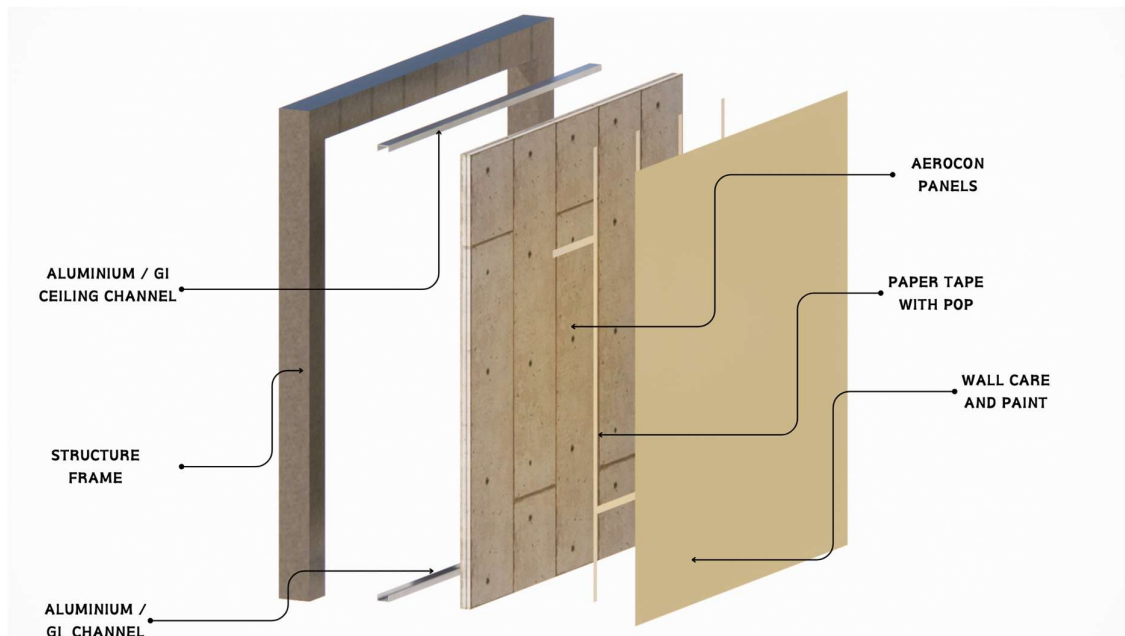


Figure 6.3.2 Aerocon Panel Installation

6.4 DETAILED DRAWINGS



Figure 6.4.1 Site Plan

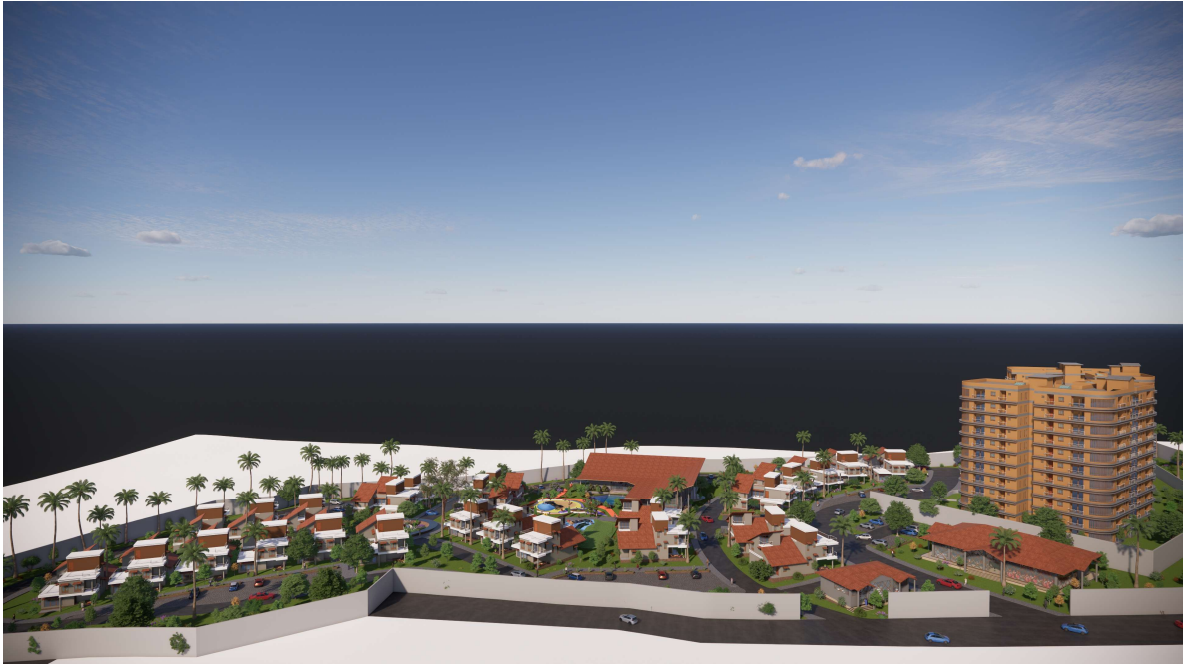


Figure 6.4.5 SITE VIEW



Figure 6.4.4 Play Area

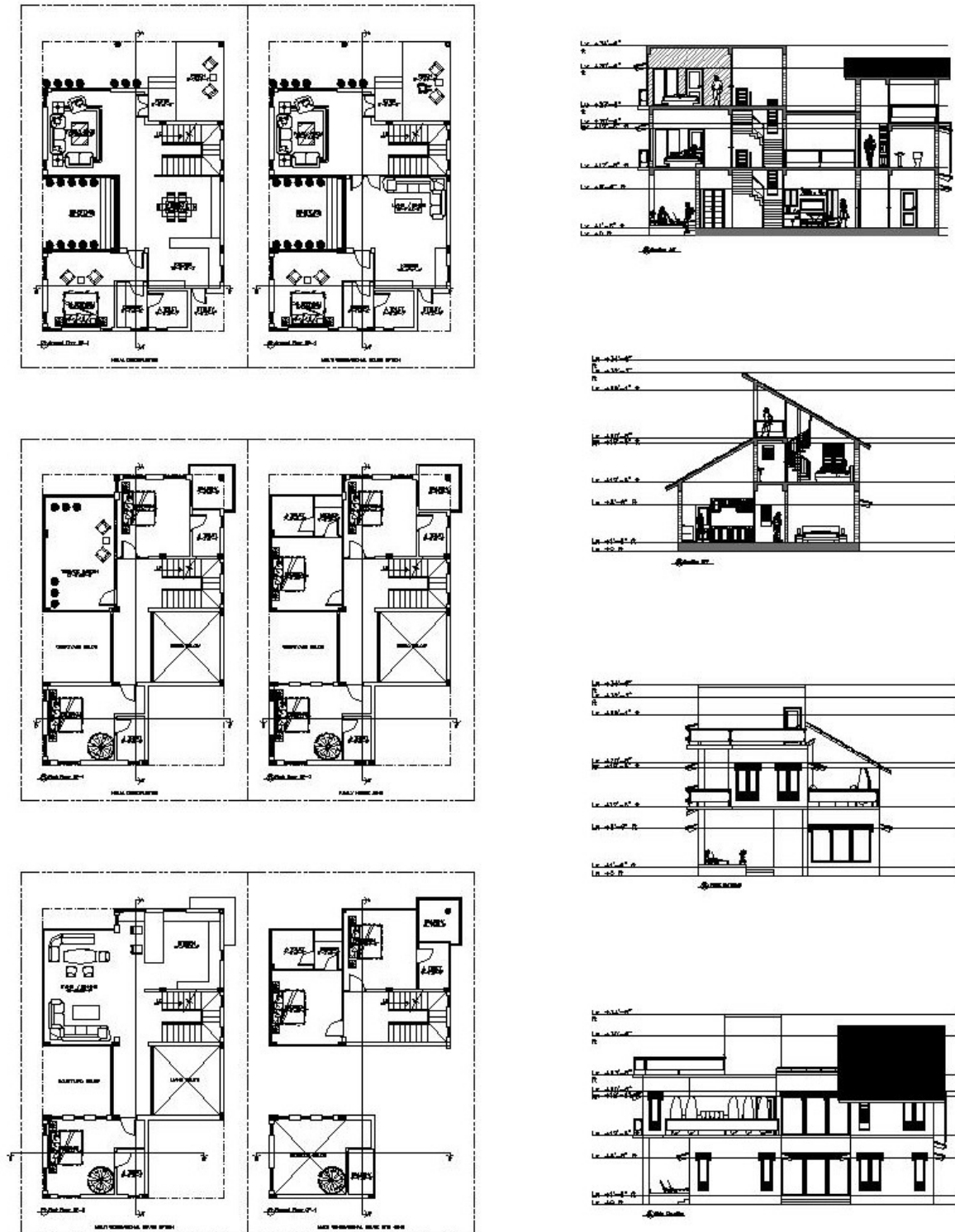


Figure 6.4.6 Villa Plan, Section & Elevation



Figure 6.4.7 Villa Views 1



Figure 6.4.8 Villa Front View

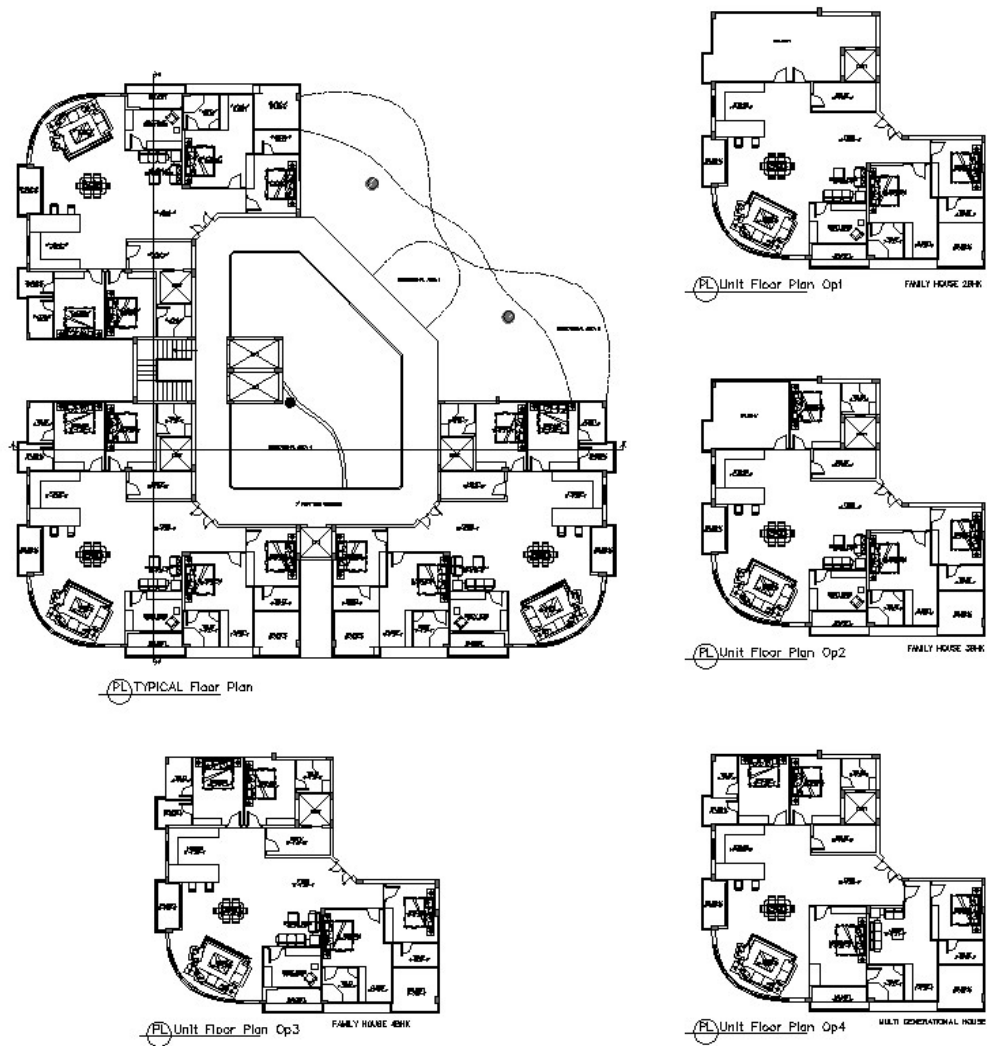


Figure 6.4.9 Apartment Floor plans



Figure 6.4.10 Apartment Front View

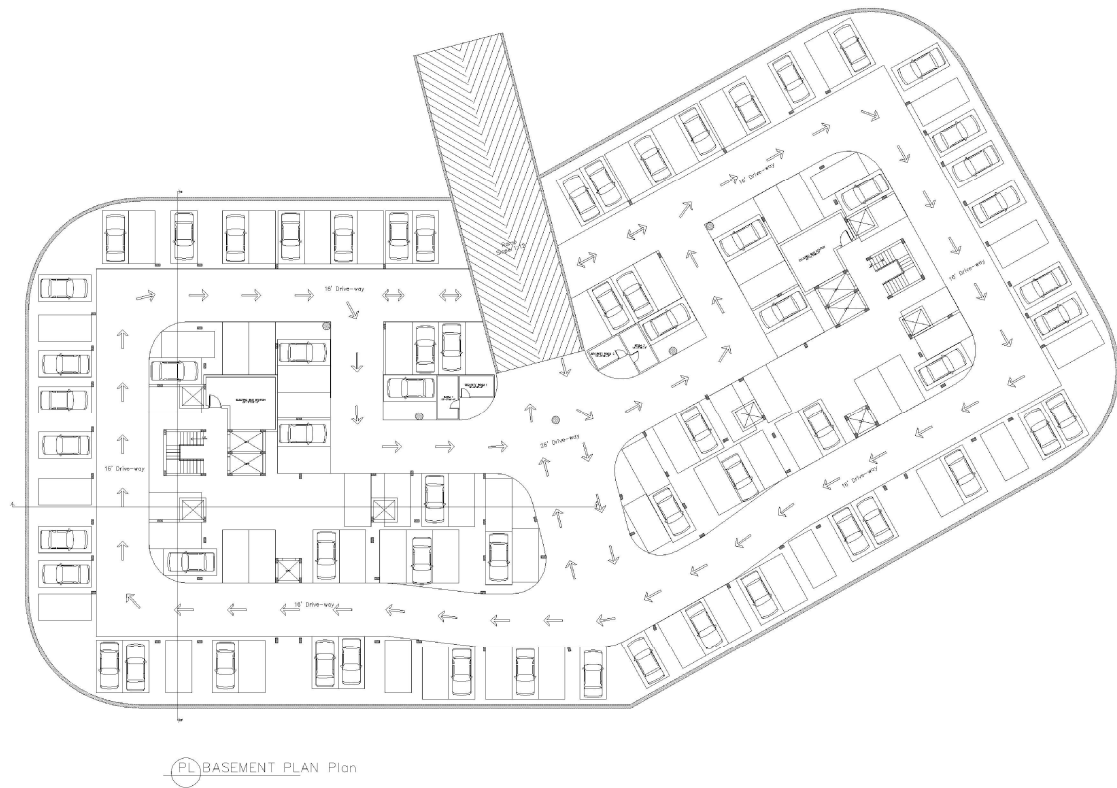


Figure 6.4.11 Apartment Basement Plan



Figure 6.4.12 Apartment View

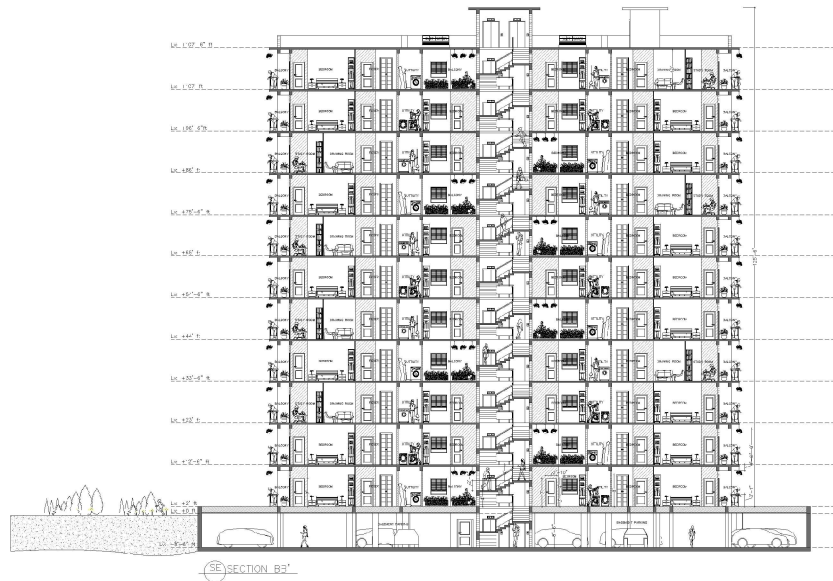


Figure 6.4.13 Apartment Section BB

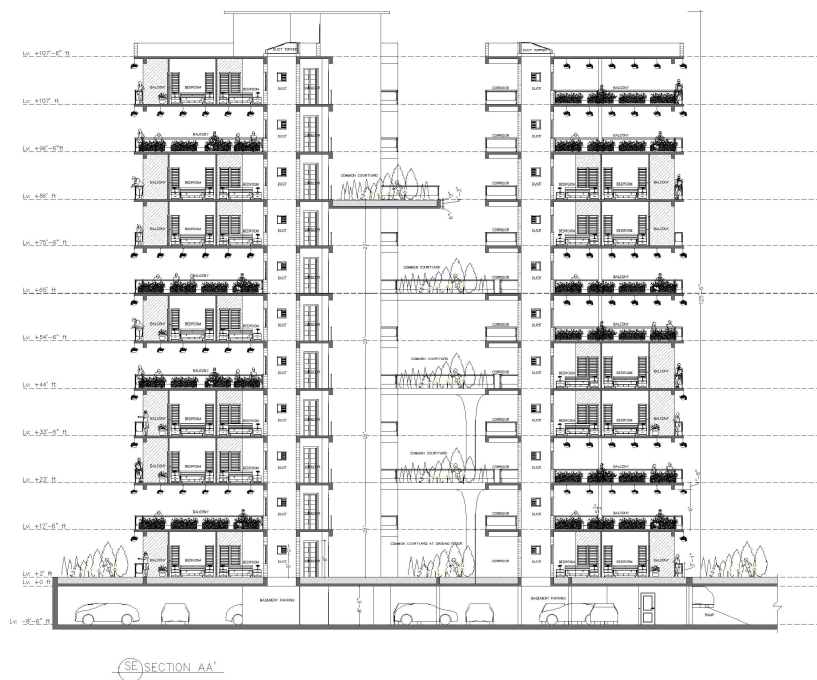


Figure 6.4.14 Apartment Section AA



Figure 6.4.15 Apartment Elevation



Figure 6.4.16 Apartment Elevation

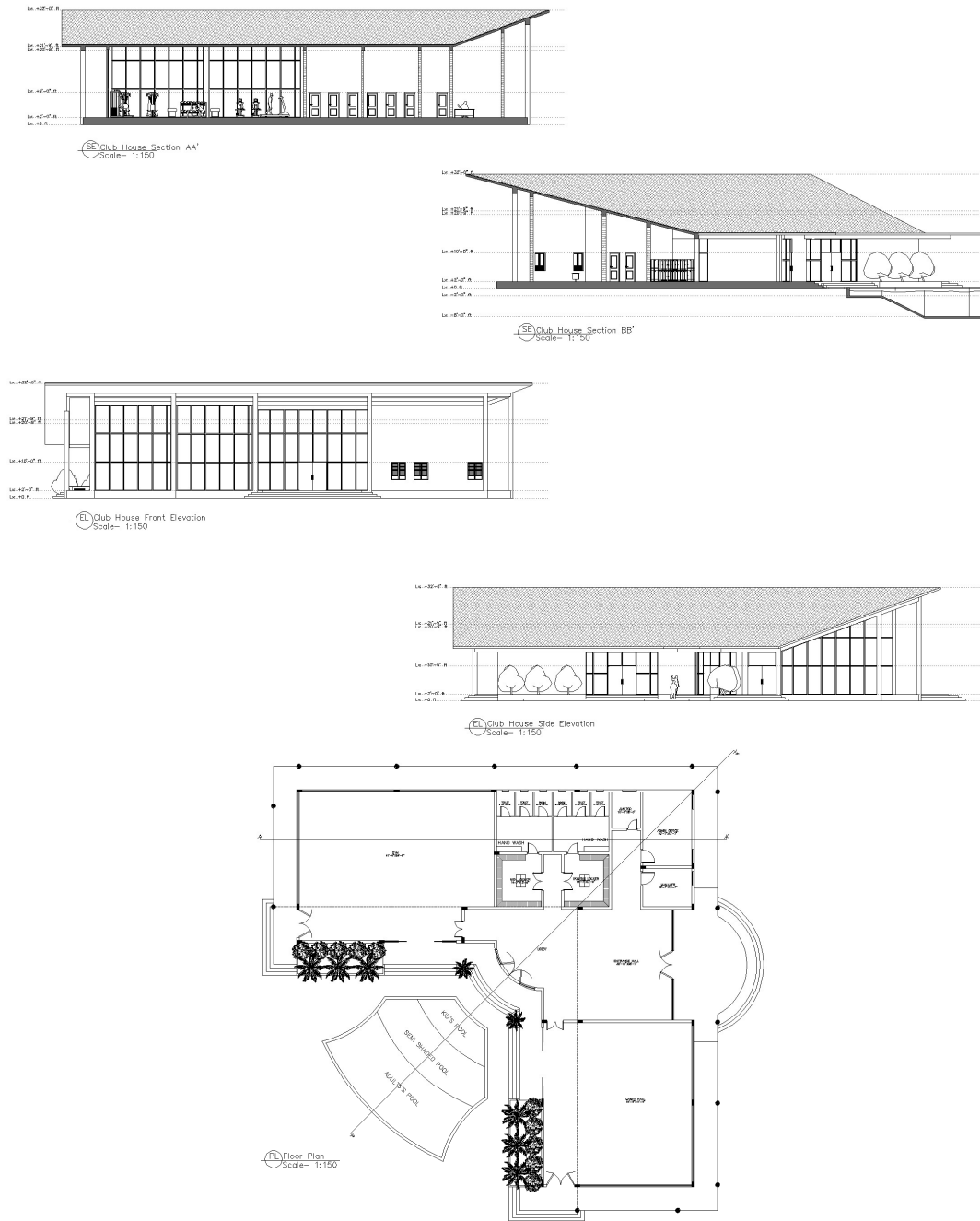


Figure 6.4.17 Club House



Figure 6.4.18 Club House View



Figure 6.4.19 Club House View



Figure 6.4.21 Community Hall View



Figure 6.4.22 Store View

FLEXIBLE HOUSING FOR THE GROWING FAMILY

A THESIS

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Architecture degree

By

**RAJESH BOPPANA
(39210065)**



**DEPARTMENT OF ARCHITECTURE
SCHOOL OF BUILDING AND ENVIRONMENT**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
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MAY 2024



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DEPARTMENT OF ARCHITECTURE

BONAFIDE CERTIFICATE

This is to certify that Thesis Report is the bonafide work of **Rajesh Boppana (39210065)** who carried out the Thesis entitled "**FLEXIBLE HOUSING FOR THE GROWING FAMILY**)" under our supervision from July 2021 to November 2021.

Internal Guide
Ar. Shruthi Natarajan

Internal Review Member
Ar. Juvilasri Vignesh

External Guide
Ar. Ranjan Daniel

Dean and Head of the Department

Dr. DEVYANI GANGOPADHYAY

Submitted for Viva voce Examination held on

Internal Examiner

External Examiner

DECLARATION

I, **RAJESH BOPPANA** hereby declare that the Thesis Report entitled “FLEXIBLE HOUSING FOR THE GROWING FAMILY” done by me under the guidance of **Ar. Shruthi Natarajan** (Internal Guide), **Ar. Juvilasri Vignesh** (Internal Review Member) and **Ar. Ranjan Daniel** (External Guide) Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Architecture Degree.

DATE:

PLACE: Chennai

SIGNATURE OF THE CANDIDATE

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I am pleased to acknowledge my sincere thanks to Board of Management of **Sathyabama Institute of Science and Technology** for their kind encouragement in doing this Thesis and for completing it successfully. I am grateful to them.

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RAJESH BOPPANA

THESIS SYNOPSIS

Traditional housing design often fails to accommodate the changing needs of growing families. As families expand and contract, their spatial requirements shift, leading to cramped living situations, expensive renovations, or the need to relocate entirely.

This thesis proposes the concept of flexible housing, designed to adapt to the evolving needs of a family over time.

Key Points:

- Adaptability: The thesis will explore design strategies that allow for easy modification of the living space. This could include movable walls, modular furniture, and convertible rooms that can transform from a nursery to a home office as the family grows.
- Space Efficiency: Strategies to maximize space utilization will be investigated. This might involve built-in storage solutions, multifunctional furniture, and clever compartmentalization to create separate zones within a limited area.
- Sustainability: The thesis will consider the environmental impact of flexible housing solutions. Prefabricated elements, sustainable materials, and energy-efficient design will be explored to create adaptable spaces with a minimal ecological footprint.
- Reduced Costs: Flexible housing can minimize the need for expensive renovations or relocations as families grow and change.
- Increased Functionality: Adaptable spaces cater to a wider range of activities, fostering a more functional and comfortable living environment.
- Long-Term Investment: Flexible housing provides a sustainable solution that caters to a family's needs throughout its lifecycle.