

ARMY HOUSING

A THESIS

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

By

RISHA J

(39210068)



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

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY (DEEMED TO BE UNIVERSITY)
Accredited with Grade "A++" by NAAC | 12B Status by UGC | Approved by AICTE
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119**

MAY - 2024



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BONAFIDE CERTIFICATE

This is to certify that Thesis Report is the bonafide work of **Risha J (39210068)** who carried out the Thesis entitled "**ARMY HOUSING**" under our supervision from January 2024 to May 2024.

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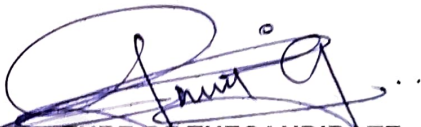
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DECLARATION

I, **RISHA J** hereby declare that the Thesis Report entitled "Naturopathy wellness centre" done by me under the guidance of **Ar.Juvillasri Vignesh** (Internal Guide), **Ar.Anitha** (Internal Review Member) and **Ar.Stanley Clement 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

ACKNOWLEDGEMENT

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.

I convey my thanks to **Dr.Devyani Gangopadhyay**, Dean and Head of the Department, School of Building and Environment, Our Design Chair **Ar.Sarath C. Kanth**, Thesis Coordinator **Ar.Gopiraj** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Thesis Internal guide **Ar.Juvilasri Vignesh**, Internal Review member **Ar.Anitha** and External Guide **Ar.Stanley Clement Daniel** their guidance, suggestions and constant encouragement which paved the way for the successful completion of my Thesis work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Architecture**, all my family members, friends and also my juniors helpful in many ways for completion of the Thesis.

RISHA J

THESIS SYNOPSIS

Matching Civilian Trends: Military housing styles generally mirror what's popular in the civilian world at the time. For instance, Craftsman bungalows were common in the early 1900s, while Colonial Revival was popular in the first half of the 20th century in the US.

Types of Housing:

Single Family Homes: Offered to officers and families.

Townhouses/Row Houses: Provide more privacy than apartments with front and back yards, but the terminology can be interchangeable.

Apartments: Mostly for enlisted personnel.

In the realm of army housing architecture, the design principles extend beyond mere functionality to encompass resilience, community, and adaptability. These structures serve not just as shelters but as environments conducive to the well-being and operational readiness of military personnel and their families.

The architecture prioritizes durability and security, with materials and construction techniques chosen to withstand harsh climates and potential threats. Efficiency in space utilization is paramount, optimizing living areas while maintaining a sense of comfort and privacy.

Moreover, army housing architecture fosters a sense of community, with communal spaces strategically integrated to encourage interaction among residents. These spaces, whether they be parks, recreational facilities, or shared amenities, promote social cohesion and support networks vital to military families.

Flexibility is another key aspect, recognizing the dynamic nature of military life. Designs accommodate changing family sizes and needs, with modular elements allowing for easy adaptation and expansion.

Ultimately, army housing architecture goes beyond mere structures; it serves as a foundation for the well-being and cohesion of military communities, providing a safe, supportive environment for those who serve

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Army housing stands as a testament to the commitment of nations to care for those who serve in their armed forces. More than just a collection of buildings, army housing represents a vital component of military infrastructure, providing not only shelter but also a nurturing environment for service members and their families.

In the complex tapestry of military life, where duty often requires sacrifices and uproots, the concept of 'home' takes on profound significance. Army housing architecture endeavors to create spaces that offer solace, stability, and a sense of belonging amidst the rigors of military service.

This introduction explores the multifaceted role of army housing, delving into its historical evolution, its impact on military communities, and the design principles that shape its form and function. From barracks to modern family residences, army housing reflects the values and priorities of nations, serving as a cornerstone of support for those who dedicate their lives to defending their country.

1.2 AIM

The aim of army housing is multifaceted, encompassing various objectives that collectively serve the well-being and operational readiness of military personnel and their families.

1.3 OBJECTIVE

1. **Security and Safety:** Designing structures that prioritize the safety and security of residents is paramount. This includes incorporating features such as perimeter fencing, security systems, and robust construction materials to mitigate potential threats.
2. **Comfort and Livability:** Creating living spaces that are comfortable and conducive to well-being is essential. Army housing architecture aims to provide amenities, natural light, ventilation, and efficient layouts that enhance residents' quality of life.
3. **Community Integration:** Fostering a sense of community among residents is a key objective. Design strategies include incorporating communal spaces, such as parks, playgrounds, and community centers, that encourage social interaction and support networks.
4. **Flexibility and Adaptability:** Army housing architecture should be flexible and adaptable to accommodate the changing needs of military families. Modular design elements, configurable spaces, and expansion possibilities enable adjustments for evolving family sizes and requirements.
5. **Sustainability and Resilience:** Promoting environmental sustainability and resilience is increasingly important in army housing architecture. Designing energy-efficient buildings, incorporating renewable energy sources, and implementing resilient construction techniques help reduce environmental impact and ensure long-term viability.
6. **Operational Readiness:** Army housing architecture should support the operational readiness of military personnel. Proximity to military installations, efficient transportation access, and considerations for deployment schedules contribute to maintaining readiness levels.
7. **Cost-Effectiveness:** Achieving cost-effectiveness in design, construction, and maintenance is a key objective. Balancing quality with budget constraints ensures that resources are allocated efficiently while still meeting the needs of residents.
8. **Cultural Sensitivity:** Recognizing the diverse backgrounds and cultural identities of military families, army housing architecture aims to be inclusive and respectful of different traditions and preferences.

1.4 SCOPE OF THE PROJECT

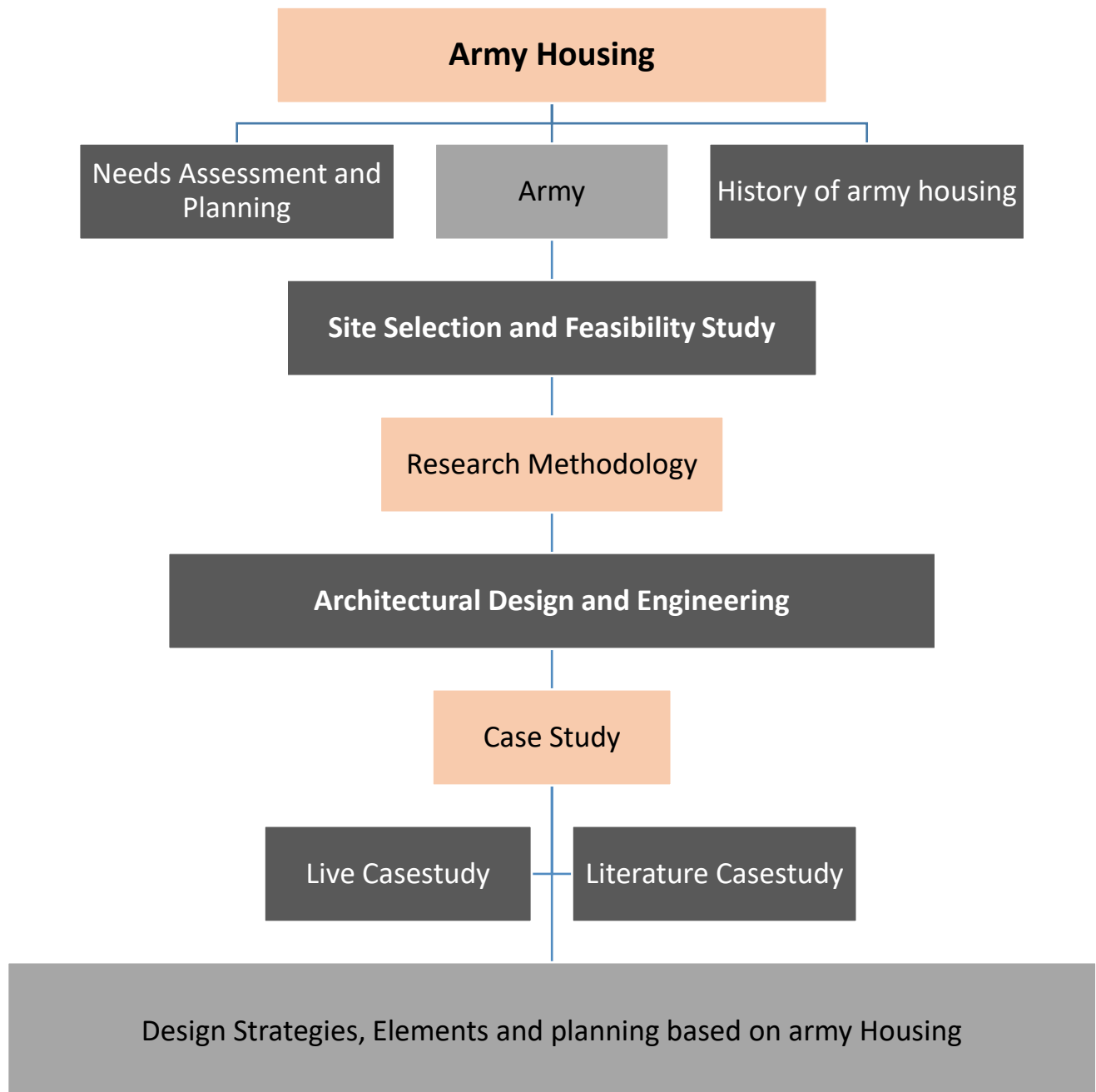
- **Needs Assessment:** Conducting a thorough assessment of the housing needs of military personnel and their families is essential. This involves analyzing factors such as family size, demographics, preferences, and any specific requirements related to duty assignments or deployments.
- **Site Selection and Planning:** Identifying suitable locations for army housing developments and conducting site assessments to determine feasibility and suitability. Factors such as proximity to military installations, transportation access, local amenities, and environmental considerations are taken into account.
- **Architectural Design:** Developing architectural designs for housing units and associated facilities that meet the needs of residents while adhering to relevant building codes, regulations, and military standards. Design considerations include layout efficiency, security features, sustainability, and flexibility for future expansion or modification.
- **Construction and Infrastructure:** Overseeing the construction of housing facilities, including infrastructure such as roads, utilities, and landscaping. Coordination with contractors, subcontractors, and other stakeholders is crucial to ensure timely completion within budgetary constraints.
- **Quality Assurance and Compliance:** Implementing quality assurance measures to ensure that construction meets specified standards for safety, durability, and functionality. Compliance with applicable regulations, environmental standards, and military guidelines is essential throughout the construction process.
- **Community Development:** Fostering a sense of community among residents through the design and development of shared amenities, recreational spaces, and community facilities. This may include parks, playgrounds, community centers, and social programs aimed at promoting camaraderie and support networks.
- **Sustainability and Resilience:** Integrating sustainable design principles and resilient construction techniques to minimize environmental impact and enhance long-term viability. This may involve incorporating energy-efficient features, renewable energy sources, water conservation measures, and disaster-resistant building materials.
- **Logistics and Operations:** Planning for the logistical requirements of housing operations, including maintenance, repairs, utilities management, and resident services. Developing protocols for addressing maintenance requests, emergencies, and community events ensures smooth operations and resident satisfaction.

1.5 NEED OF THE PROJECT

- **Supporting Military Personnel:** Military service often requires frequent relocations and deployments, which can make it challenging for service members and their families to find suitable housing in civilian communities. Army housing projects provide a reliable and supportive housing option that is specifically tailored to the needs of military families, offering stability and continuity amidst the demands of military life.
- **Ensuring Operational Readiness:** Housing projects located near military installations help to ensure that service members are readily available to fulfill their duties. By providing convenient access to military bases and training facilities, army housing projects contribute to maintaining high levels of operational readiness, enabling swift response to emergencies and deployment requirements.
- **Enhancing Quality of Life:** Well-designed army housing projects offer amenities and services that enhance the quality of life for military families. These may include recreational facilities, community centers, childcare services, and access to healthcare and educational resources. By creating supportive and thriving communities, army housing projects contribute to the overall well-being of military personnel and their families.
- **Promoting Cohesion and Camaraderie:** Living in close proximity to fellow service members fosters a sense of camaraderie and support among military families. Army housing projects facilitate interactions and connections among residents, creating opportunities for socializing, networking, and building friendships that endure throughout military careers.
- **Addressing Housing Shortages and Affordability Challenges:** In some regions, particularly areas with high costs of living or limited housing availability, military families may struggle to find affordable and suitable housing options. Army housing projects help to alleviate these challenges by providing subsidized or low-cost housing options that meet the needs of military families, reducing financial burdens and housing-related stressors.
- **Ensuring Security and Safety:** Military housing projects are designed and managed with security considerations in mind, providing a safe and secure environment for residents. Features such as perimeter fencing, controlled access, and security patrols help to ensure the safety of military families, providing peace of mind amid security concerns.
- **Meeting Regulatory and Policy Requirements:** Military organizations are often subject to regulatory requirements and policies regarding housing standards, accessibility, and environmental sustainability. Army housing projects must comply with these regulations and policies to ensure that housing facilities meet established standards for quality, safety, and environmental responsibility.

1.6 METHODOLOGY

The research process undergoes the collection of data from the internet, books, articles, research papers, case studies. Then it result in finding of all aspects...



CHAPTER 2

2.1 UNDERSTANDING OF THE PROJECT

Understanding army housing design involves recognizing the unique requirements, challenges, and considerations that shape the planning, layout, and construction of housing facilities for military personnel and their families.

- **Functional Efficiency:** Army housing design prioritizes functional efficiency to optimize space and accommodate the needs of residents within limited footprints. Layouts are carefully planned to maximize living space while ensuring privacy and comfort for occupants.
- **Security and Safety:** Security considerations are paramount in army housing design. Features such as controlled access points, perimeter fencing, and security cameras are incorporated to enhance safety and deter unauthorized access.
- **Flexibility and Adaptability:** Army housing designs are often modular and adaptable to accommodate changing family sizes, preferences, and operational requirements. Flexible floor plans and modular construction techniques allow for easy modifications and expansions as needed.
- **Community Integration:** Creating a sense of community is an important aspect of army housing design. Shared amenities, communal spaces, and recreational facilities are strategically located to encourage social interaction and foster a supportive community environment among residents.
- **Resilience and Sustainability:** Army housing designs prioritize resilience and sustainability to minimize environmental impact and ensure long-term viability. Sustainable building materials, energy-efficient systems, and disaster-resistant construction techniques are often employed to enhance durability and reduce operational costs.

Accessibility and Inclusivity: Army housing design considers the diverse needs of residents, including accessibility requirements for individuals with disabilities. Features such as barrier-free entrances, wheelchair-accessible pathways, and adaptable living spaces are incorporated to ensure inclusivity for all residents.

2.2 HISTORY

The history of army housing is a reflection of the evolving needs, priorities, and challenges faced by military organizations throughout history. Here's an overview of the history of army housing:

1. **Ancient Times:** Military encampments and barracks have existed since ancient times, providing basic shelter and accommodations for soldiers during campaigns and military expeditions. These early forms of army housing were often temporary structures made from simple materials such as wood, mud, or tents.
2. **Medieval Period:** During the medieval period, fortified military garrisons and castles served as both defensive structures and housing for soldiers and their families. These fortified settlements provided protection from external threats and housed military personnel as well as support staff and their families.
3. **18th and 19th Centuries:** The rise of professional standing armies in the 18th and 19th centuries led to the establishment of more permanent barracks and military installations. Army housing during this period was characterized by simple, utilitarian buildings constructed from stone or brick, often arranged in orderly rows or blocks.
4. **World Wars:** The World Wars brought about significant changes in army housing. Mass mobilization efforts required the rapid construction of large-scale military installations and housing facilities to accommodate the influx of troops. Temporary barracks, prefab housing units, and military camps were constructed to meet the urgent housing needs of soldiers.
5. **Post-World War II Era:** Following World War II, there was a renewed focus on providing improved housing conditions for military personnel and their families. The GI Bill of Rights in the United States, for example, provided assistance for veterans to purchase homes and access education, leading to the growth of suburban communities near military bases.
6. **Cold War and Beyond:** During the Cold War era and beyond, military housing continued to evolve in response to changing geopolitical dynamics and military strategies. The construction of military housing complexes, such as family housing areas and officer quarters, became more common, providing modern amenities and services for military families.
7. **Privatization and Modernization:** In recent decades, many military organizations have turned to privatization initiatives to modernize and improve army housing facilities. Public-private partnerships have been established to develop and manage housing projects, leveraging private sector expertise and resources to enhance the quality and efficiency of military housing.
8. **Focus on Quality of Life:** Today, there is a growing emphasis on providing quality of life amenities and support services for military personnel and their families. Modern army housing projects incorporate features such as community centers, recreational facilities, and childcare services to enhance the well-being and satisfaction of residents.

2.3 TYPES OF ARMY HOUSING

1. **Barracks:** Barracks are multi-story buildings that provide living quarters for enlisted personnel. They typically consist of individual rooms or shared dormitory-style accommodations, along with communal facilities such as bathrooms, kitchens, and common areas. Barracks are often located on military installations near training areas or operational facilities.
2. **Family Housing:** Family housing is designed to accommodate military service members and their dependents. These homes range from single-family detached houses to townhouses or apartments and are often located in residential neighborhoods on or near military installations. Family housing units may include amenities such as yards, playgrounds, and community centers.
3. **Officer Quarters:** Officer quarters are residences specifically designated for commissioned officers and their families. These homes are typically larger and more spacious than enlisted housing and may include additional amenities such as private yards, garages, and upgraded finishes. Officer quarters are often located in exclusive neighborhoods or gated communities on military bases.
4. **Temporary Lodging:** Temporary lodging facilities provide short-term accommodations for military personnel and their families during relocations, deployments, or temporary duty assignments. These facilities may include hotels, guesthouses, or furnished apartments equipped with essential amenities for temporary stays.
5. **Privatized Housing:** Many military installations have implemented privatized housing initiatives in partnership with private sector companies. Privatized housing projects involve the construction, renovation, and management of housing units by private developers, often with input from military organizations. These projects aim to improve the quality of housing available to military families while leveraging private sector expertise and resources.
6. **Military Camps:** Military camps are temporary or semi-permanent encampments that provide housing and support facilities for deployed troops during military operations or training exercises. These camps may consist of tents, prefabricated structures, or temporary buildings and are designed to be quickly established and dismantled as needed.
7. **Transitional Housing:** Transitional housing programs provide temporary housing and support services for military personnel and their families facing housing instability or homelessness. These programs may offer short-term accommodations, counseling, job training, and other resources to help individuals and families transition to stable housing situations.
8. **Senior Leader Residences:** Senior leader residences are upscale homes designated for high-ranking military officials, such as generals or admirals, and their families. These homes are often located in prestigious neighborhoods or gated communities on military bases and may feature luxurious amenities and extensive security measures.



Barracks



Family Housing



Officer Quarters



Temporary Lodging



Privatized Housing



Military Camps



Transitional Housing



Residences



Senior Leader Residences

Fig : 2.3.1 (Types of Army Housing)

By offering a range of housing options tailored to the needs and preferences of military personnel at various stages of their careers and personal lives, army housing ensures that service members and their families have access to safe, comfortable, and supportive living environments wherever duty calls.

2.4 CHALLENGES

Army housing faces several challenges that can impact the quality of life for military personnel and their families. These challenges include:

1. **Aging Infrastructure:** Many army housing facilities are aging and may require significant maintenance and renovation to address issues such as deteriorating infrastructure, outdated amenities, and inadequate living conditions. Upgrading aging housing stock can be costly and time-consuming, posing challenges for military organizations with limited budgets and resources.
2. **Overcrowding and Demand:** High demand for army housing in certain locations can lead to overcrowding and long waitlists for military families seeking housing accommodations. Limited availability of suitable housing options near military installations can exacerbate this challenge, particularly in areas with high costs of living or limited housing inventory.
3. **Quality and Maintenance Issues:** Quality and maintenance issues, such as pest infestations, mold, plumbing problems, and electrical issues, can affect the livability of army housing units. Ensuring timely and effective maintenance and repairs is essential to address these issues and maintain the safety and comfort of residents.
4. **Deployment and Mobility:** Military personnel often face frequent relocations and deployments, which can disrupt housing arrangements and pose challenges for families in terms of stability and continuity. Coordinating housing assignments, transfers, and deployments can be complex and stressful for military families, particularly when facing short notice or unexpected changes.
5. **Accessibility and Inclusivity:** Ensuring accessibility and inclusivity in army housing can be challenging, particularly for individuals with disabilities or special needs. Providing accommodations such as wheelchair-accessible units, adaptive features, and support services can require additional resources and planning to meet the diverse needs of residents.
6. **Community Integration:** Fostering a sense of community and belonging among residents of army housing can be challenging, especially in transient or geographically dispersed communities. Providing opportunities for social interaction, recreational activities, and support networks is essential to promote community integration and well-being.
7. **Security and Safety:** Maintaining security and safety in army housing facilities is a priority, given the unique security risks associated with military installations. Addressing issues such as perimeter security, access control, and emergency preparedness is crucial to ensuring the safety and security of residents and their families.
8. **Budgetary Constraints:** Limited budgets and competing priorities can constrain investment in army housing infrastructure and services. Balancing the need for housing improvements with other critical military readiness requirements can be challenging, particularly during periods of fiscal austerity or resource constraints.



Aging Infrastructure



Overcrowding and Demand



Quality and Maintenance



Deployment and Mobility



Accessibility and Inclusivity



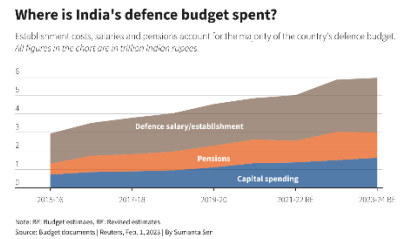
Community Integration



Security and Safety



Budgetary Constraints



Budgetary Constraints

Fig : 2.4.1 (Challenges of Army Housing)

By addressing these challenges through strategic planning, investment, and collaboration with stakeholders, military organizations can work to improve the quality, accessibility, and sustainability of army housing and enhance the well-being of military personnel and their families.

CHAPTER 3

LIVE CASE STUDIES AND ANALYSIS

Live case studies and analysis of army housing provide valuable insights into the current state, challenges, and opportunities in providing housing for military personnel and their families. Here are some potential areas for live case studies and analysis:

1. **Evaluation of Housing Conditions:** Conducting on-the-ground assessments of army housing facilities to evaluate the quality of housing conditions, identify maintenance issues, and assess resident satisfaction. This analysis can help identify areas for improvement and inform prioritization of resources for renovations and upgrades.
2. **Community Integration and Well-being:** Examining the social dynamics and community integration within army housing developments to understand the factors that contribute to resident well-being, social support networks, and overall satisfaction. This analysis can inform strategies for promoting community engagement, fostering social connections, and enhancing resident resilience.
3. **Sustainability and Resilience:** Assessing the sustainability and resilience of army housing infrastructure to determine its capacity to withstand environmental hazards, reduce energy consumption, and minimize operational costs. This analysis can inform strategies for incorporating green building practices, renewable energy sources, and climate-resilient design features into future housing projects.
4. **Partnership Models and Best Practices:** Studying successful public-private partnership models in army housing development to identify best practices, lessons learned, and opportunities for replication. This analysis can inform strategies for leveraging private sector expertise, resources, and innovation to improve the quality and efficiency of army housing initiatives.
5. **Impact of Deployment and Mobility:** Investigating the impact of frequent relocations, deployments, and mobility on housing stability, family well-being, and community cohesion among military personnel and their families. This analysis can inform strategies for supporting families during transitions, providing continuity of services, and enhancing resilience in the face of mobility challenges.
6. **Budgetary Constraints and Resource Allocation:** Analyzing budgetary constraints and resource allocation decisions in army housing initiatives to understand the trade-offs between competing priorities and the implications for housing quality and availability. This analysis can inform strategies for optimizing resource allocation, prioritizing investments, and maximizing efficiency in housing operations.
7. **Policy Implications and Legislative Changes:** Examining policy implications and legislative changes affecting army housing programs, such as changes in housing allowances, eligibility criteria, and privatization initiatives. By conducting live case studies and analysis in these areas, military organizations, policymakers, researchers, and

ARMY CAMP, TRIVANDRUM

ARMY HOUSING

Location : Trivandrum, kerala

ABOUT THE SELECTED SITE

NATURE OF THE PROJECT

AIM:

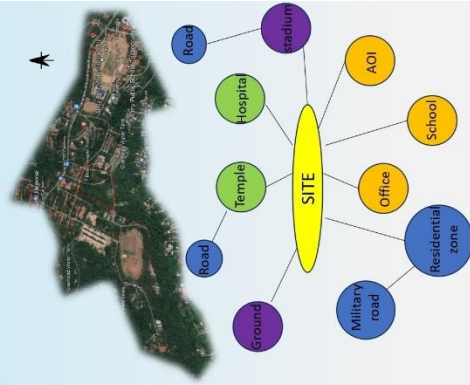
I N T R O D U C T I O N

- To understand the motivations of people who choose to live in gated communities.
- To assess the impact of gated communities on social, economic, and environmental factors.
- To examine the role of gated communities in promoting or hindering social inclusion and cohesion. Do gated communities create a sense of community among residents, or do they contribute to social segregation and exclusion?
- To explore the legal and ethical implications of gated communities.
- To develop recommendations for how to mitigate the negative impacts of gated communities and promote more inclusive and sustainable forms of community development.

SITE DOCUMENTATION



SITE JUSTIFICATION



AMENITIES WHICH SHOULD BE GIVEN FOR THE MILITARY CAMP

Commissaires
In the Military, a commissary is just another word for a tax-free grocery store. They carry most things that you would expect to find in the civilian supermarket, like familiar brand-name products, fresh produce, toiletries and other essentials.

Chapels & Places of worship
On-base chapels, the chaplains who serve them, and other religious operations personnel aim to provide service members from all religions and denominations a place to worship, observe their faith and seek personal counseling.

The safety and security of residents on base is taken very seriously. That's why many installations have their own police, firefighting and emergency response forces.

On military installations, service members are able to grow as individuals through various adult learning facilities, including education centers, libraries and even satellite college campuses.

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3.2 CASE STUDY

BOAT CLUB APARTMENTS/VILLAS IN THE SKY

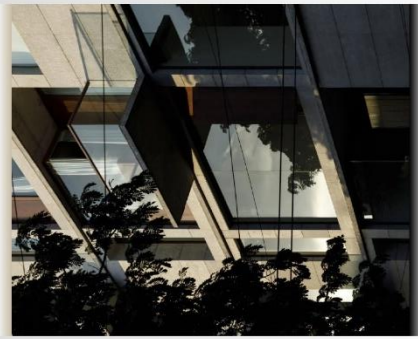
ARMY HOUSING

PROJECT DETAILS :

Project Name: Boat Club Apartments
Office Name: SJK Architects
Completion Year: September 2020
Gross Built Area: 2200 SQ.M
Project Location: Chennai, India
Program: 4 Duplex residences
Lead Architects: Shimul Javeri Kadri, Sarika Shetty

CONTEXT

A luxurious apartment complex that combines the sense of privacy provided by independent homes with the interconnectedness of communal living. Multi-story apartment living is one way that today's space-starved cities can accommodate growing populations while addressing ever-increasing land expenses. But this style of architecture hasn't quite taken off at Chennai, India's bustling metropolis of Boat Club Road, the affluent residential area known as "Billionaires Row" is still distinguished by opulent, standalone mansions. Situated on a 10,000-square-foot trapezoidal corner plot, the building has four 4-bedroom duplex residences with distinct levels and private entries, with sizes varying from 3500 to 4500 square feet. In addition to offering inhabitants a sense of seclusion and the chance to interact with others and connect with nature, the apartments include naturally ventilated and illuminated interiors.



CONCEPT

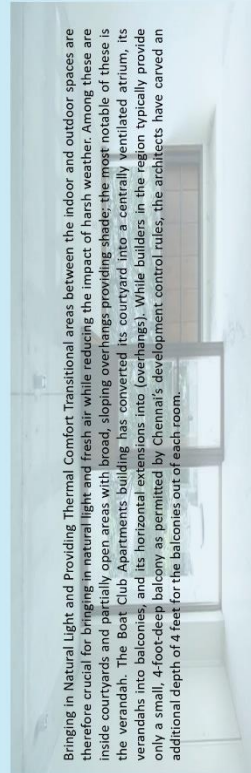


Connectivity and seclusion in balance - Sky Villas The public component of apartment life and the private nature of separately owned villas are combined in the architecture of the units.

The five-story building has four duplex units on the upper stories and stilt parking on the lowest level.

Each floor contains two residential apartments due to the interlocking arrangement of the apartment units around a shared central core. However, each duplex is accessible from a separate floor via a unique door, resulting in the creation of "villas in the sky."

The atrium in the middle, which receives plenty of natural light, has a staircase with deep landing slabs for every floor and an elevator to take place via a shared central core in order to promote a more inclusive way of life.



SECTION



FLOOR PLANS



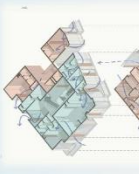
EAST ELEVATION



SOUTH ELEVATION



WIND FLOW

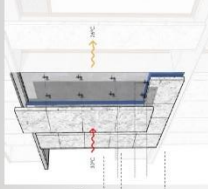


EXPLODED DETAIL OF EXTERNAL FACADE
The air gap of 40mm between the concrete shear wall and dry cladding system, together with the wall and the cladding creates a thermal mass that decreases indoor ambient temperature by 4 degree Celsius.

30MM THK SADARHALLI STONE SLABS IN 750MM HT AND VARYING LENGTHS
GI ANGLE CLEAT SECTION ANCHOR FASTENED INTO CONCRETE WALL DOUBLEDOWEL PIN ANCHORED INTO 30MM THK GRANITE.



Using Vastu Shastra to Aid Spatial Planning - The layouts of these 4-BHK duplex units have been designed keeping in mind the principles of Vastu Shastra



Taking into account the prominent wind flow from east and south-east direction, strategically located fenestrations ensure that all internal spaces in the Boat Club Apartments are cross-ventilated.

While Chennai's development rules only allowed for 4 feet or 1.2 meters of balcony projection, an additional 4 feet was carved from the rooms to allow sufficient room for people to sit down and relax in.



3.3 CASE STUDY

APPASWAMY GREENSVILLE, DUPLEXES APARTMENT

PROJECT DETAILS :

NAME : APPASWAMY GREENSVILLE
LOCATION : OLD MAHABALPURAM ROAD, RAJIV GANDHI SALAI, NSHOLLINGNALLUR, CHENNAI
DEVELOPERS : APPASWAMY REAL ESTATES, CHENNAI
AREA : 602 Sq.ft to 2317 Sq.ft

CONTEXT :

- Situated on Old Mahabalipuram Road, Sholinganallur, Appaswamy Greensville offers easy access to schools, hospitals, shopping centers, and other essential services.
- Well-connected to OMR and other major roads, ensuring convenient commute. Appaswamy Greensville in Sholinganallur, Chennai boasts an impressive array of features designed to cater to a luxurious and comfortable lifestyle.

TYPICAL FLOOR PLANS



Building Amenities:

- **Clubhouse:** Enjoy a recreation space with party hall, gym, and other facilities.
- **Swimming pool:** Take a refreshing dip in the sparkling pool after a long day.
- **Landscaped gardens:** Immerse yourself in the greenery with beautiful gardens and water bodies.
- **Power backup:** Stay comfortable with 1000 watts power backup for each unit.
- **Security:** Rest assured with 24/7 security, video door phone, intercom, and fire alarm systems.
- **Convenience:** Additional amenities like visitor parking, maintenance staff, waste disposal, laundry service, and DTH television facility are available.



No of Flats

323
Car Parking
Lower, Upper & Stilt
Balcony + bathroom
Anti-skid tiles Tiles up to false-ceiling Height Shower partition in Master Bed bathroom.

Apartments:

- **Variety of configurations:** from 1 BHK (602 sq. ft.), 2 BHK (upto 1293 sq. ft.), 3 BHK (upto 2317 sq. ft.), and 4 BHK (penthouse, options).
- **Elegant design:** Vitrified tile flooring in living/dining areas, bedrooms, and kitchens. Concealed plumbing, provision for geysers, and designer tiles in toilets. Emulsion painting on interior walls and weatherproof paint on exteriors.
- **Semi-finished kitchens:** Modular kitchens with dishwasher provision are given



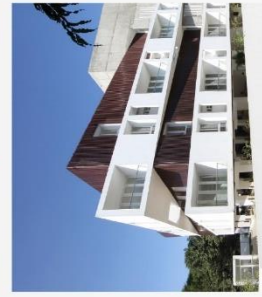
Type of Flats

1 BHK : 71
2 BHK : 40
3 BHK : 176
4 BHK : 33
Penthouse : 3

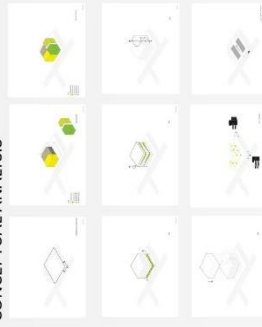


INTRODUCTION:

The name of the project is DUPLEX which is located in Chennai. The total area is around 17000sqft and its designed by architecture red. This corner plot benefits from being one of the first notable residential buildings to be seen upon entering the neighborhood, drawing attention as it passes by. It is situated in a quieter area of the city of Chennai, adjacent to key arterial routes that traverse the city. The purpose highlights how important it is to establish a tiny, diversified community inside the structure. The building's 17,000 square feet of floor space accommodates 11 luxurious apartments, of which five are roomy three-bedroom duplexes and six are smaller three-bedroom flats. Because each residence varies in terms of size, volume, orientation, and placement within the structure, each one gives its residents a sense of place. Residential buildings tend to focus more on the living spaces, leaving little thought for opportunities for community interaction. Here, entrances to all units face each other and semi-private entry courts have been created, that are bathed in light from the adjacent light wells, serving as luxurious foyers for chance interaction between neighbours and others.



CONCEPTUAL ANALYSIS



Another layer of material contrast, a louvered mass plugged into the volume along the marginally twisted axis, heightens the sense of identity by producing a dramatic demarcation along the exterior, where light and shade create a dynamic, unique experience inside that varies from unit to unit. The duplexes' double-story living volumes make use of these staggering masses with louvers, which alter their pattern during the day on the wall surfaces.



CHAPTER 4

LITERATURE CASE STUDIES AND ANALYSIS

Army housing serves as a cornerstone of support for military personnel and their families, providing not only shelter but also a sense of stability, community, and well-being amidst the demands of military life. The literature surrounding army housing encompasses a diverse range of studies, analyses, and case studies that offer insights into the challenges, strategies, and impacts of providing housing for service members and their families.

This literature review aims to explore the multifaceted landscape of army housing, examining key themes such as housing conditions, community integration, sustainability, partnerships, and policy implications. By synthesizing findings from existing literature and case studies, this review seeks to provide a comprehensive understanding of the current state of army housing and identify opportunities for improvement and innovation in meeting the housing needs of military communities.

Through an exploration of relevant research, reports, and case studies, this review will delve into the complexities of army housing, shedding light on the factors that shape housing conditions, influence resident experiences, and drive policy decisions. By critically analyzing the literature, this review will contribute to a deeper understanding of the challenges and opportunities in providing quality housing for military personnel and their families, ultimately informing strategies for enhancing the effectiveness and resilience of army housing initiatives.

Policy implications were also a prominent focus of the literature, with studies examining the impact of housing allowances, eligibility criteria, and privatization initiatives on housing outcomes for military personnel and their families. Insights from these studies can inform strategies for adapting to policy changes, navigating regulatory requirements, and advocating for reforms to improve housing accessibility and affordability.

the literature case study provides a comprehensive understanding of the complexities and challenges associated with army housing, while also highlighting opportunities for improvement and innovation. By synthesizing findings from existing research and case studies, this review contributes to a deeper understanding of the factors that shape housing conditions, influence resident experiences, and drive policy decisions in military housing initiatives.

4.1 CASE STUDY

SWEDISH TIMBER ROW HOUSES

project info:

The name of the project is vertical village II and it is located in wendelstrand, gothenburg, Sweden designed by architect Tham and Videgard, total built area: 2.550 sqm floor area/unit: 140 sqm (150 sqm GFA) number of units: 17



FLOOR PLANS



Swedish customs for Gothenburg, Sweden, Tham and Videgard Arkitektier created a line of colorful timber dwellings. The project was envisioned as a "vertical village" that rethinks the row house typology and is a part of a bigger site development along Landvetter Lake. A collection of small, three-story houses with spherical plots and private gardens encircled by towering hedges. The solid timber design is a reworking of the firm's initial Stockholm site plan.

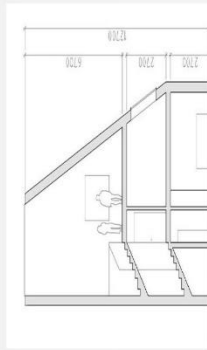
Compact living: The row houses make the most of their limited space with clever design choices. Open floor plans, built-in furniture, and efficient storage solutions maximize functionality and create a sense of spaciousness

the result is a green small scale urban environment with qualities close to the historical garden cities. a network of meandering pathways is shaped between winter green hedges. these pathways create a clear definition of private and public space and connect the neighborhood internally, as well with the wider community.

Lifestyle and community:

Living in a row house often comes with a strong sense of community. Neighbors socialize in shared gardens, gather for barbecues in communal courtyards, and lend each other a helping hand.

SECTION



each home has 140 square meter floor area and offers 1-4 bedrooms a network of meandering pathways is shaped between the green hedges

The firm created a network of pathways around private and public spaces that draw connections between the neighborhood and the larger community

2 UNIT 3 UNIT 4 UNIT



ARMY HOUSING



Focusing on vertical massing, This design hopes to create more dense single family housing. The firm created a network of pathways around private and public spaces that draw connections between the neighborhood and the larger community. formed as a small scale urban environment, the project will be built from cross-laminated timber. To create diversity and varied spatial types, the identical houses feature a range of colors.

Focus on outdoor living: Most row houses have small private gardens or balconies, perfect for enjoying the fresh air and greenery. Public parks and playgrounds are also readily available, encouraging an active lifestyle for residents of all ages.

GENERAL STUDY

The reimagined colored row houses will include integrated greenery and landscaping with the hope of increasing biodiversity. The 140 square meter homes are organized around a spatial sequence that moves between the social ground floor and garden, to more secluded bedrooms with views above. On top, a studio space was designed with a large sky light and can be made with either a roof terrace or extra sleeping loft.

Sustainable living: Sustainability is a key aspect of life, and row houses often reflect this. Many are built with energy-efficient materials and incorporate environmentally friendly features like solar panels and rainwater harvesting systems.

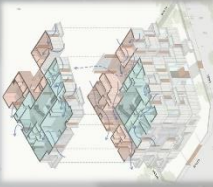
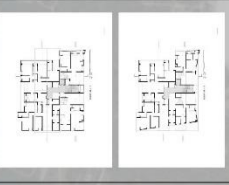


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5.1 COMPARITIVE ANALYSIS

ARMY HOUSING, PANGODE, TRIVANDRUM, KERALA

ARMY HOUSING

PROJECT STRUCTURE			
NAME	BOAT CLUB APARTMENTS/VILLA IN THE SKY	VERTICAL VILLAGE II	BOAT CLUB, CHENNAI
LOCATION	BOAT CLUB, CHENNAI	WENDELSTRAND, GOTHENBURG, SWEDEN	BOAT CLUB, CHENNAI
AREA	2200SQM	2550SQM	1579SQM
ARCHITECT	SJK ARCHITECTS	THAM AND VIDEKARD	ARCHITECTURE RED
STRUCTURE/PLANNING			
CONCEPT	- Interlocking Duplexes - Personalized Entries - Sun-Filled Atrium - Integratable Design - Luxury Amenities	- Compact, Stacked Houses - Private Gardens and Shared Green Spaces - Sustainable Design and Materials - Private balconies - Reduces noise pollution - Creates a sense of belonging	- Solid and void, open and closed spaces. - Dual Nature of Dwellings - Shared Entry Court - Raised Building and Open Ground Floor
INFERENCE	Innovative design: The apartments are arranged in an interlocking manner around a central core, creating a sense of community. Each duplex has its own private entry on a different floor, ensuring privacy while still offering the benefits of communal living.	By stacking different functions vertically, the Vertical Village makes efficient use of land and reduces the need for sprawl. The combination of residential, commercial, and public spaces in the Vertical Village contributes to a more active and engaging urban environment.	Innovative Approach to Urban Living Prioritization of Individuality and Community Commitment to Sustainability Adaptability and Future-Oriented Design

SPATIAL PROGRAMME

- Lobby
- Bedroom
- Hall
- Kitchen
- Balcony
- Waiting Area
- Corridor
- Bathroom/Toilet

AREA STATEMENT FOR 3 BEDROOM APARTMENT

- Living Room: 400 sq ft
- Dining Room (optional): 150 sq ft
- Kitchen: 200 sq ft
- Master Bedroom with en-suite bathroom: 300 sq ft
- Bedroom 2: 150 sq ft
- Bedroom 3: 120 sq ft
- Bathrooms (excluding en-suite): 75 sq ft each
- Hallways and Entryway: 150 sq ft
- Storage: 100 sq ft

- Club House Amenities
 - Entrance lobby
 - Reception
 - Office area
 - Gym
 - Theatre
 - Restaurant
 - Writing area
 - Business centre
 - Meeting Rooms
 - Indoor Courts
 - Meditation Hall
 - Grocery
- Other Amenities
 - Spa
 - Steam Room
 - Saloon
 - Change Room
 - Aerobics
 - Health Clinic
 - Multi Purpose Hall
 - ATM
 - Outdoor Games court
 - Swimming pool
 - Tennis court
 - Elders Corner
 - Cafe
- Landscaping
 - Parks
 - Walkways
 - Jogging Track
 - Cycle track
 - Children Play area
 - Outdoor Games
 - Amphitheatre
 - Terrace garden
 - Basement and silt parking

	QUANTITY	AREA (SQM)
CLUBHOUSE		
Lobby	1	100
Party hall	1	500
Toilets	10	3
Restaurant	1	200
Play area	1	300
Banquet hall	1	400
Theatre	1	100
Conference Room	4	10
Meditation	1	300
Café	1	40
Spa	1	30
Services	1	30
Clinic	1	100
Gym	1	400

CHAPTER 6

6.1 SITE SELECTION

ARMY HOUSING PROJECT

TYPE OF THE PROJECT : RESIDENTIAL

SCALE OF THE PROJECT : 15 ACRES (44515 SQM)

A **military building** is any structure designed to house functions performed by a military unit.

General types include:

- Administrative Facilities
- Ammunition Storage Facilities
- Commissary Facilities
- Correctional Facilities
- Fortifications
- Hospitals



AIR PORT RAILWAY STATION BUS STOP



PROPOSED SITE

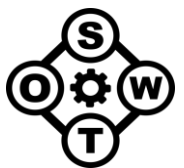


6 km from the Thiruvananthapuram Central Railway Station Site is at a distance of around 12 km from the Trivandrum International Airport 4 min (1.8 km) via Thiruvananthapuram - Neyyar Dam Rd and Poojappura Main Rd

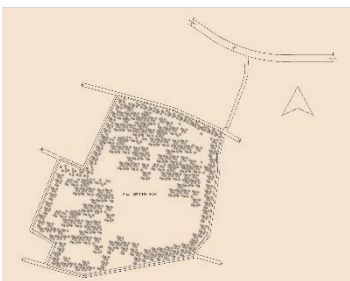


According to the analysis Site is surrounded by residential area which are midrise buildings and is located in highly dense green area.

The place is clean because it is occupied only by the army and its establishments. Pangode is so tidy, the entire area was carved from paradise and was dropped in Trivandrum.



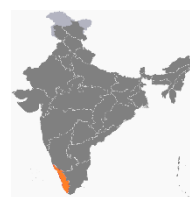
SITE LOCATION



- MAIN ROAD
- INTERIOR ROAD



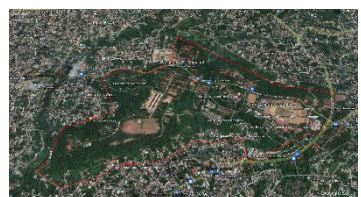
INDIA



KERALA



TVM



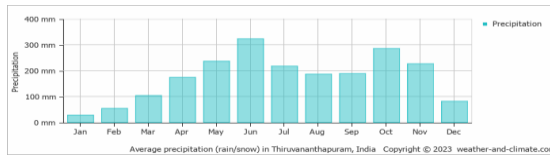
PANGODE

6.2 SITE ANALYSIS

PROPOSED SITE



In the case of residential zone, **noise pollution is high in Thampanoor Railway colony which is nearby to the site.** The sound levels will be different in all zones. Since the site is inside the army campus there won't be much noise pollution inside the site area.

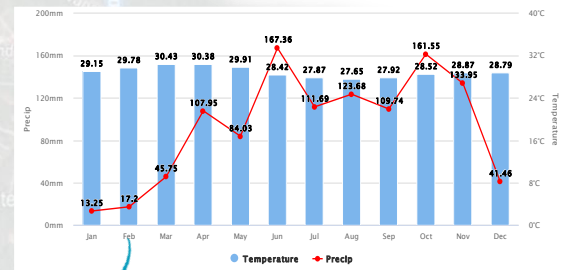


- A lot of rain (rainy season) falls in the months: March, April, May, June, July, August, September, October and November.
- On average, June is the wettest month with 323 mm of precipitation.
- On average, January is the driest month with 28 mm of precipitation.



SITE

AREA : 11 ACRES (44515 SQM)



CLIMATIC CONDITION

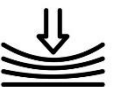
Weather forecast data

AIR PRESSURE: 1011hpa

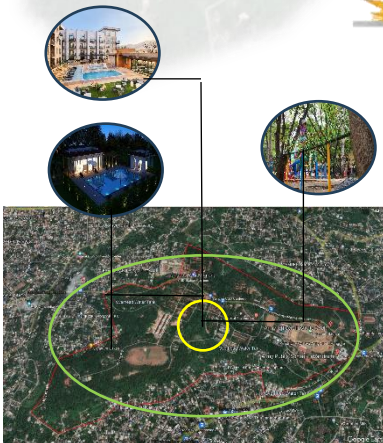
Precipitation: 18%

Humidity: 69%

Wind: 10 km/h



WIND DIRECTION : The wind direction in the site is from northeast to southwest



CHAPTER 7

ARCHITECTURAL DESIGN

7.1 CONCEPT

1. **Site Analysis:** Conduct a comprehensive analysis of the site, considering factors such as topography, climate, vegetation, soil conditions, utilities, and surrounding context. Understanding the site's opportunities and constraints is essential for informed decision-making in site design.



Fig: 7.1.1 Site



Fig: 7.1.2 Site model view 1

2. **Site Planning:** Develop a site plan that optimizes the use of available space while respecting natural features and site characteristics. Consider the arrangement of buildings, open spaces, circulation routes, parking areas, and utilities to create a well-organized and efficient layout.



Fig: 7.1.3 Main Entry of the



Fig: 7.1.4 site view from the top

3. **Site Grading and Drainage:** Incorporate appropriate grading and drainage strategies to manage surface water runoff, prevent erosion, and minimize the risk of flooding. Implement grading techniques such as swales, berms, and retention ponds to promote site stability and environmental sustainability.

4. **Site Access and Circulation:** Ensure safe and convenient access to and within the housing development by designing well-defined circulation routes for vehicles, pedestrians, and cyclists. Provide clear signage, designated parking areas, sidewalks, bike paths, and traffic calming measures to enhance mobility and connectivity.



Fig: 7.1.5 Site circulation

5. **Site Orientation and Solar Design:** Orient buildings and outdoor spaces to maximize solar access, daylighting, and passive solar heating and cooling opportunities. Consider the site's solar exposure, prevailing winds, and microclimate conditions to optimize building orientation and reduce energy consumption.



Fig: 7.1.6 Site orientation

6. **Open Space Design:** Integrate a variety of open spaces and green areas into the site design to promote outdoor recreation, social interaction, and ecological diversity. Designate parks, playgrounds, courtyards, plazas, and community gardens as focal points for residents to gather and engage with nature.

7. **Sustainability and Resilience:** Incorporate sustainable design principles and resilient strategies into the site design to minimize environmental impact and enhance long-term viability. Implement features such as green infrastructure, permeable paving, native landscaping, and rainwater harvesting to enhance site sustainability and resilience to climate change.



Fig: 7.1.7 Sustainable features

8. **Community Engagement and Participation:** Involve stakeholders, including residents, community groups, and local authorities, in the site design process to solicit feedback, gather input, and build consensus. Foster a sense of ownership and pride among residents by incorporating their ideas and preferences into the design of public spaces and amenities.



Fig: 7.1.8 Roofing

9. **Aesthetic Integration:** Ensure that the site design harmonizes with the surrounding landscape and architectural context, creating a cohesive and visually appealing environment. Use materials, colors, textures, and forms that complement the natural setting and contribute to the overall character of the housing development.

7.2 MATERIAL STUDY

1. **Brick:** Brick is a traditional and durable wall material known for its longevity, fire resistance, and low maintenance requirements. It provides excellent thermal mass, helping to regulate indoor temperatures and reduce energy consumption. Brick walls can also enhance the aesthetic appeal of housing projects with their timeless appearance and variety of colors and textures.

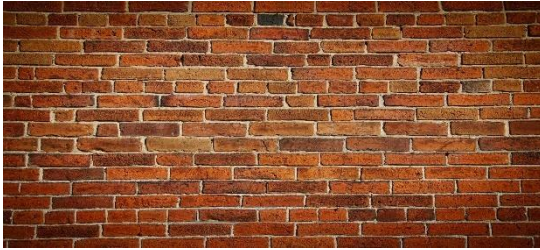


Fig: 7.2.1 Texture of Brick wall

2. **Concrete:** Concrete is a versatile and widely used wall material known for its strength, durability, and fire resistance. Concrete walls can be cast in place or prefabricated off-site, offering flexibility in design and construction. They provide excellent thermal insulation and soundproofing properties, contributing to energy efficiency and occupant comfort.



Fig: 7.2.2 How concrete is used in construction

3. **Wood:** Wood is a renewable and sustainable wall material that adds warmth and natural beauty to housing projects. Timber framing and wood stud walls are common construction methods for residential buildings, offering flexibility in design and construction. Wood walls can be finished with a variety of treatments, such as paint, stain, or natural finishes, to achieve desired aesthetics.



Fig: 7.2.3 Wood as a construction material

4. **AAC Blocks:** Autoclaved aerated concrete (AAC) blocks are lightweight, insulating, and fire-resistant wall materials made from sand, cement, lime, and aluminum powder. AAC blocks offer thermal comfort, sound insulation, and moisture resistance, making them suitable for housing projects in diverse climates. They are also durable, low-maintenance, and environmentally friendly.



Fig: 7.2.4 Autoclaved aerated concrete

5. **Fiber Cement:** Fiber cement siding panels are composed of cement, sand, and cellulose fibers, offering durability, fire resistance, and low maintenance. Fiber cement walls provide a modern aesthetic with a variety of textures and finishes, including wood grain and smooth surfaces. They are resistant to rot, pests, and weathering, making them suitable for exterior wall applications.



Fig: 7.2.5 Fibre Cement cladding

6. **Gypsum Board:** Gypsum board, also known as drywall or plasterboard, is a versatile and cost-effective wall material commonly used for interior partitions and finishes. Gypsum board walls offer easy installation, smooth surfaces for painting or wallpapering, and good fire resistance. They are lightweight, economical, and readily available in various sizes and thicknesses.



Fig: 7.2.6 Gypsum Board as a versatile material for interior and ceiling

7. **Insulated Concrete Forms (ICF):** Insulated concrete forms are prefabricated wall systems made from foam insulation sandwiched between two layers of reinforced concrete. ICF walls offer superior thermal insulation, energy efficiency, and soundproofing compared to traditional wall systems. They provide airtight construction, reducing energy costs and enhancing indoor comfort.

CHAPTER 8

8.1 DETAILED DRAWINGS

Architectural drawings serve as essential communication tools in the design and construction process, providing visual representations of building designs, layouts, and specifications. From conceptual sketches to detailed construction documents, architectural drawings play a crucial role in conveying design intent, documenting project requirements, and guiding the realization of architectural visions.

This introductory overview explores the diverse types, purposes, and elements of architectural drawings, highlighting their significance in the architectural profession and the built environment. By delving into the fundamentals of architectural drawing, this overview aims to provide a foundational understanding of how drawings are used to communicate ideas, convey information, and facilitate collaboration among stakeholders in the architectural industry.

Through an exploration of key concepts, techniques, and applications, this overview will demonstrate the importance of architectural drawings in shaping the form, function, and aesthetics of built structures. From hand-drawn sketches to computer-generated renderings, architectural drawings serve as a medium for creativity, innovation, and problem-solving in the field of architecture.



Fig: 8.1 Entrance to the Site



Fig: 8.2 Overall view 1

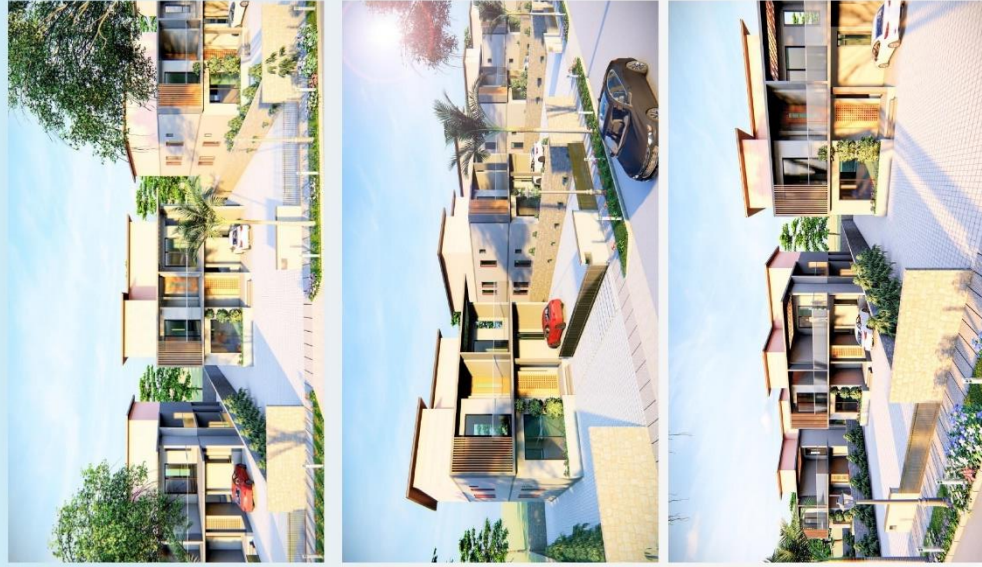


Fif: 8.3 Overall view 2

ARMY HOUSING



TYPOLGY 1

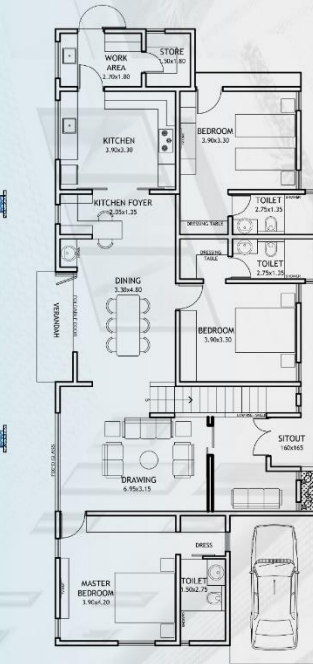
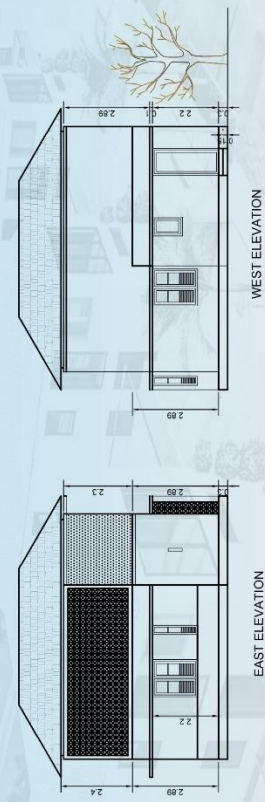


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8.1.2 ARCHITECTURAL DRAWINGS

TYPOLGY 2



GROUND FLOOR PLAN



SCALE : 1:100

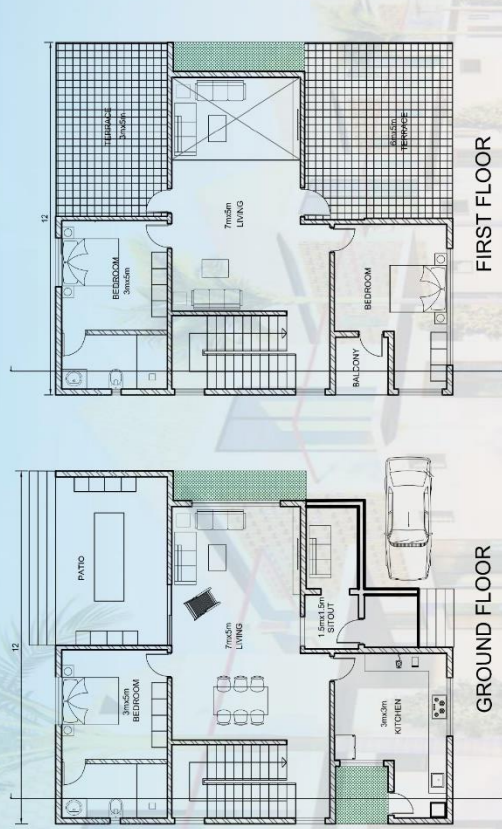
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8.1.3 ARCHITECTURAL DRAWINGS

ARMY HOUSING, PANGODE, TRIVANDRUM,
KERALA

ARMY HOUSING



GROUND FLOOR

FIRST FLOOR

TYPOLGY 3



ELEVATION

SECTION

SCALE : 1:100

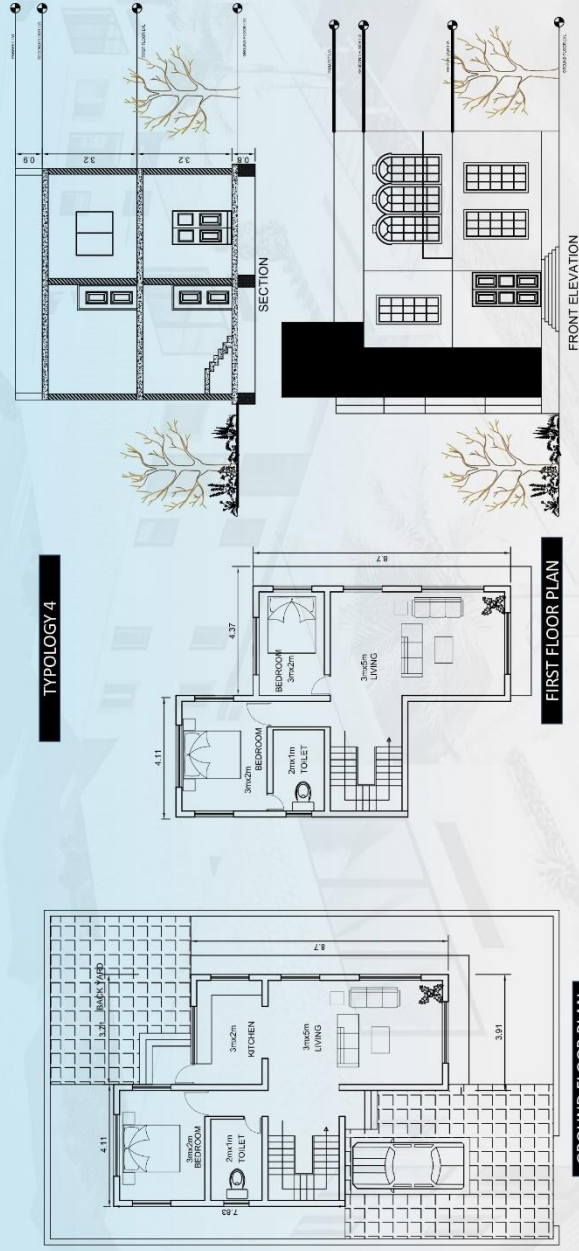
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8.1.4 ARCHITECTURAL DRAWINGS

ARMY HOUSING, PANGODE, TRIVANDRUM,
KERALA

ARMY HOUSING



Facade Design: The elevation drawing should accurately depict the design of the building's façade, including the arrangement of windows, doors, balconies, and other architectural elements. Pay attention to symmetry, balance, and proportion to create visually appealing elevations.

SCALE : 1:100



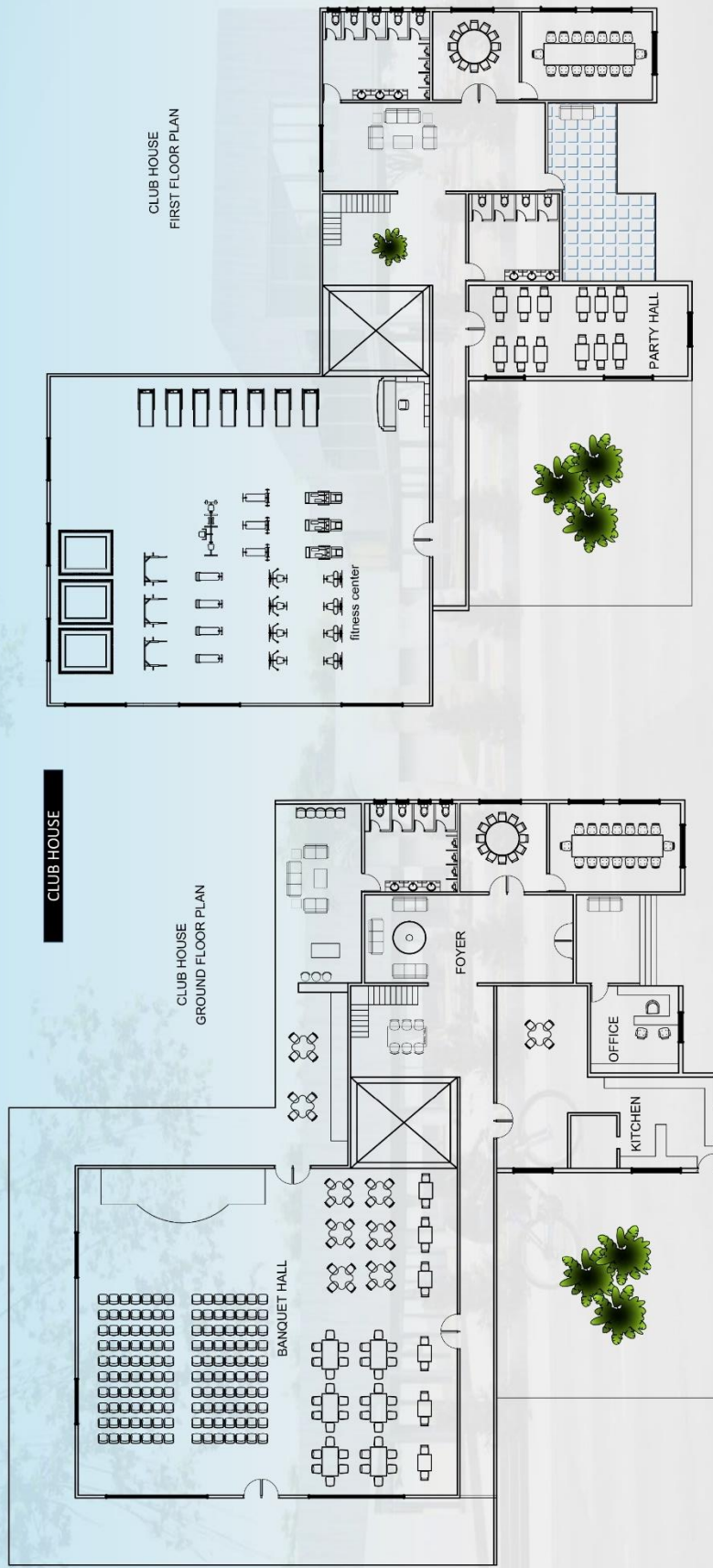
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BATCH : 2019 - 2024
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8.1.5 ARCHITECTURAL DRAWINGS

ARMY HOUSING, PANGODE, TRIVANDRUM,
KERALA

ARMY HOUSING



SCALE : 1:50
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BATCH : 2019 - 2024
REG NO : 39210068
BARCH SEM : 3D THESIS

8.2 3D VIEWS



Fig : 8.2.1 Typology 1



Fig : 8.2.2 Typology 2



Fig : 8.2.3 Typology 3



Fig : 8.2.4 Typology 4



Fig : 8.2.5 Club House Views



Fig : 8.2.6 Club House Pool View



Fig : 8.2.7 Overall views

8.3 DRAWING RENDERS



Fig : 8.3.1 Section 1 Render

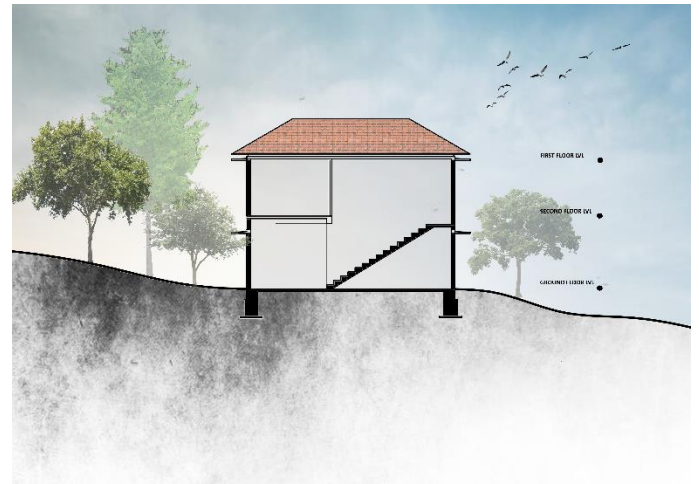


Fig : 8.3.2 Section 2 Render



Fig : 8.3.3 Elevation 1 Render

CHAPTER 9

MODEL



Fig : 9.1 Top views of the site



Fig : 9.2 Main Entrance



Fig : 9.3 Open spaces



Fig : 9.4 Ground views



Fig : 9.5 OSR views



Fig : 9.6 Overall Building Orientation

CHAPTER 10

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10.2 Websites:

1. <https://www.archdaily.com/search/projects/categories/houses/country/sweden>
2. <https://www.archdaily.com/930788/3-in-1-housing-street-monkey-architects>
3. <https://www.archdaily.com/908397/tham-and-videgard-reinvent-swedish-timber-row-houses>
4. <https://www.archdaily.com/category/residential>
5. <https://www.archdaily.com/search/projects/categories/social-housing>
6. <https://www.archdaily.com/913816/sonata-housing-arkham-projects>
7. <https://www.archdaily.com/913999/social-housing-45-examples-in-plan-and-section>