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Heritage Resort

Chorwad, Gujarat, India

Dec, 2025

Heritage Resort

Chorwad, Gujarat, India

BACHELOR OF ARCHITECTURE

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Heritage Resort

Chorwad, Gujarat, India

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B. ARCH

9th Semester, 5th Year

Under The Guidance Of

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DEPARTMENT OF ARCHITECTURE AND PLANNING

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CANDIDATE DECLARATION

The Thesis Project in the subject ARC 511, entitled "Heritage Resort, Chorwad Gujarat**"**, is being submitted in partial fulfilment of the requirement for the award of degree of Bachelor of Architecture by the undersigned for evaluation.

The matter embodied in this project is a record of my own work. If, in future, it is found that the above statement is false, then I have no objection in withdrawal of Bachelor of Architecture Degree awarded to me by the Institute.

Date:1st Dec, 2025

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RECOMMENDATION

Based on the above declaration of the student, the undersigned recommends that the work submitted by the candidate may be considered for the final end term examination of the subject ARC-511, Thesis Project.

Date:1st Dec, 2025

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CERTIFICATION OF EXAMINATION

The Bachelor of Architecture Thesis Viva-Voce examination of Mr. Abhishek Kumar Scholar No.211110244, was held on 1/12/2025 to 2/12/25.

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ABSTRACT

This thesis explores the architectural development of a heritage resort in Chorwad, a coastal town in Gujarat known for its historical significance and royal legacy. The project aims to create a hospitality destination that revives the cultural identity of Chorwad while integrating modern amenities for contemporary travelers. The design focuses on context-responsive planning, incorporating local materials, traditional architectural elements, and sustainable strategies suited to the coastal climate.

The study includes a comprehensive site analysis, documentation of heritage structures, review of relevant case studies, and research on user experience in resort design. The project proposes a master plan and architectural design that balance heritage conservation, landscape integration, and experiential tourism. The intended outcome is a resort that enhances the regional tourism economy, preserves cultural character, and offers an immersive and environmentally conscious guest experience.

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B. Arch, 9th Semester

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CHAPTER 1

INTRODUCTION

OVERVIEW

Chorwad Palace, located along the Arabian Sea in Veraval, Gujarat, is a prominent historical landmark built in Indo-European style. Though once a summer retreat for royalty, the palace has suffered neglect over time. This project aims at the restoration and conservation of Chorwad Palace as a heritage and cultural core, while developing a sustainable coastal resort with newly designed cottages and amenities on the surrounding site. The integration of adaptive reuse, sustainable tourism, and traditional design principles will offer an immersive heritage-driven experience for visitors.

1.1 BACKGROUND

Heritage coastal buildings across India face threats from time, climate, and modern neglect. Chorwad Palace, with its regal past and seafront presence, offers unique potential for heritage-led tourism. However, its fragile condition and lack of adaptive programming limit its current usability.

In parallel, Gujarat's coastline, rich in biodiversity and tourism potential, lacks resort developments that sensitively combine heritage conservation with sustainable coastal hospitality. The palace and its adjoining land provide a valuable opportunity to restore built heritage while creating an eco-sensitive, culturally rich resort through newly designed cottages and public spaces.

1.2 PROBLEM STATEMENT

Despite Chorwad Palace's architectural significance and scenic coastal location, it remains underutilized and physically deteriorating. There is an absence of initiatives that combine historical preservation with eco-tourism in this region. Additionally, existing resorts near coastal zones often disregard local materials, heritage context, and environmental sustainability.

There is a need for a sensitive restoration plan for the palace alongside a climate-responsive, culturally integrated resort master plan that provides modern comfort without compromising heritage integrity or coastal ecology.

1.3 AIM & OBJECTIVES

Aim:

To restore Chorwad Palace as a heritage landmark and design a new eco-tourism resort through vernacular, sustainable architecture that supports cultural tourism and community development.

1.3.1-Objectives:

- Restore Chorwad Palace using traditional techniques and preserve architectural features.
- Design new resort cottages and facilities within the site respecting heritage and coastal climate.
- Use local materials and zero-kilometre philosophy for minimal carbon impact.
- Integrate passive design strategies for ventilation, thermal comfort, and shading.
- Include coastal protection measures and climate resilience in layout and landscape.
- Curate user experiences around heritage tours, local cuisine, wellness, and crafts.

1.4 SCOPE AND LIMITATIONS

1.4.1-Scope:

- Restoration of Chorwad Palace façade, interiors, and public areas.
- Site planning and design of independent resort cottages, spa, dining, and activity zones.
- Landscape design reflecting local ecology and heritage symbolism.
- Integration of rainwater harvesting, renewable energy, and solid waste systems.
- Creating a visitor loop combining history, leisure, and wellness experiences.

1.4.2-Limitations:

- Construction and budget constraints not included.
- Execution may depend on government approvals, coastal regulations (CRZ), and funding.
- Detailed financial feasibility and operations are beyond scope.

1.5 METHODOLOGY

- **Historical study:** Chorwad Palace (archives, gazetteers, material mapping).
- **Site analysis**: Wind, salt spray, sun path, topography, views, and coastal risks.
- **Literature review:** Literature review of resort design, adaptive reuse, and coastal construction.
- **Case studies:** heritage coastal resorts (Goa, Kerala, Neemrana).
- **User profiling:** for different tourist types (heritage, wellness).
- **Design development**: zoning, climate integration, spatial programming.
- **Sustainability strategy**: materials, energy systems, water, and waste design.

1.6 NEED FOR THE STUDY

- Chorwad Palace remains underrecognized and is degrading due to neglect.
- Gujarat lacks examples of restored palaces functioning as cultural tourism hubs.
- Growing demand for experiential resorts blending local culture with comfort.
- Opportunity to set a benchmark for integrating heritage with eco-tourism.

1.7 SIGNIFICANCE OF THE PROJECT

- Revives an important historical monument through architectural conservation.
- Establishes a model for sensitive resort development near coastal heritage sites.
- Encourages local employment and craft revival through on-site cultural programming.
- Showcases sustainable coastal planning adaptable to similar heritage contexts.
- Enhances regional identity and puts Chorwad back on the cultural tourism map.

CHAPTER 2

DESIGN BRIEF

OVERVIEW

3-Star Beach Resort at Chorwad, Gujarat, lies on the Arabian Sea and offers a unique coastal heritage setting characterized by the historic Chorwad Palace, a rocky shoreline, and stretches of open sandy beachfront. Its strategic location provides significant tourism potential, as it is surrounded by cultural and natural attractions, including the Somnath Temple and Gir National Park. The combination of heritage elements, natural beauty, and connectivity makes the site ideal for developing a sustainable and experiential beach resort which foster both relaxation and cultural exchange.

2.1 PROJECT DETAILS

- **Project Title:** Development of Resort at Chorwad, Gujarat
- **Proposing agency:** Tourism Corporation of Gujarat Limited (TGCL)
- **Location:** Chorwad Beach, Junagadh District, Gujarat (approx. 20 km from Veraval, 70 km from Junagadh)
- **Site Context:** Coastal heritage site on the Arabian Sea, featuring a historic palace, rocky shoreline, and open beachfront

1.2 Brief Project Particulars

Brief particulars of the Project are as follows:

Sr. No.	Key Information	Details
1.	Project Title	**Development of Resort at Chorwad, Gujarat**
2.	Location	Land admeasuring about **48,100 sq. m.** located on the Chorwad beach, around 3.6 km from the Chorwad city towards the southwest side at 21.8 km from the Chorwad Road Railway station, 29.3 km from Veraval Railway Station and about 41 km from the Keshod Airport and around 106 km from Porbandar Airport. Location: 21.0004158640739, 70.22745634431269 Brief details of the site is placed at Annexure 3.
3.	Estimated Project Cost	**Rs. 19.50 Crores (Rupees Nineteen Crores Fifty Lakhs Only) including the cost towards restoration of the Chorwad Palace**
4.	Minimum Development Obligations	The Concessionaire shall be required to develop the following facilities:

2.2 PROJECT SCOPE

- **Objective:** Restoration and adaptive reuse of Chorwad Palace with the development of a luxury beach resort.

- **Model:** Public–Private Partnership (PPP) on a DBFOT (Design, Build, Finance, Operate, Transfer) basis.
- **Concession Period:** 35 years from signing of agreement.
- **Construction Period:** 24 months after securing all statutory clearances (which must be done within 12 months of signing).

2.3 TENDER DETAILS

Sr. No.	Key Information	Details
		1. **45 keys** (Luxury Rooms / Cottages / Tents) in 3-Star (or hotel having similar facilities) / Mid-Scale / Budget / Economy Hotel 2. Restaurants (Multi Cuisine Restaurant / Speciality Restaurant / Coffee Shop) – As per requirement 3. Restoration of old building (Old Chorwad Palace) as per prudent restoration practices. o **TCGL has reserved an amount of Rs. 5.00 crore towards restoration of the Chorwad Palace. Concessionaire will be required to restore the building as per prudent practices and will be entitled to get the same amount reimbursed, up to a ceiling of Rs. 5.00 Cr (actual amount spent on restoration or Rs 5.00 Cr, whichever is lower) on initiating Commercial Operation of the Resort.** 4. Reconstruction of other buildings keeping architectural elements similar to the old building. 5. Provision of car parking to be made as per Local Building Bye-Laws or as directed by TCGL. 6. Other common and support facilities such as internal roads, streetlights, water harvesting system, solid waste disposal, storm water drainage system, main sewer line, water supply including storage tank(s), transformer, electrical sub-station, green patches etc.

5.	Optional Facilities	• Additional Tents / Cottages / Rooms • Recreational area with Health Club and swimming pool • Any other development with the approval of TCGL
6.	Special Conditions	1. The land shall not be used for the purpose other than tourism related activities and development. 2. Any demolition in the site, has to be pre-approved by TCGL in writing. 3. Clearance under CRZ, if applicable, needs to be obtained by the Concessionaire on its own. 4. TCGL at its discretion shall engage the services of a Conservation Architect, in capacities of Third-Party Agency, for approval of the Conservation Plan submitted by the Concessionaire. The fee to be paid to such an agency shall be shared equally by TCGL and the Concessionaire.

2.3.1 Land & Lease Details

- **Ownership:** Land leased to developer on "as-is, where-is" basis
- **Lease Term:** Co-terminus with concession (35 years)
- **Lease Rent:** ₹1 per sq./year + applicable taxes
- **Possession:** Formal handover after signing lease deed and agreement

2.3.2 Regulatory Compliance

- **Applicable Regulations:**
    a) Local building byelaws
    b) Coastal Regulation Zone (CRZ) norms
    c) ASI / State Archaeology for heritage conservation
    d) Forest and Environment clearances (if required)
- **All permits and approvals must be obtained by the developer at their own cost.**

2.3.3 Minimum Development Obligations

Component	Description
Accommodation	Minimum 45 luxury rooms/cottages/tents of 3-star or equivalent category
F&B	Multi-cuisine restaurant / specialty restaurant / coffee shop
Heritage Restoration	Restoration of Chorwad Palace (₹5 Cr reserved for reimbursement, subject to documentation and approval)

Reconstruction	Other buildings must retain visual and architectural harmony with the palace
Parking & Infrastructure	As per local bylaws and TCGL direction; includes internal roads, streetlights, STP, water supply, drainage, RWH, solid waste mgmt., etc.

2.3.4 Optional Development Provisions

- Additional rooms, tents or cottages
- Health club, spa, gym, swimming pool
- Any other tourism-related facility approved by TCGL

2.3.5 Prohibited Development

- Any non-tourism development not permitted by Government of India / Gujarat

2.4 LIST OF SPACES & AREA PROGRAMMING

2.4.1 Mandatory Spaces (Minimum Development)

Space	Description
Luxury Rooms / Cottages / Tents	Minimum 45 keys required, 3-star or equivalent category
Restaurant / Dining	Multi-cuisine restaurant or café; flexible per demand
Restored Palace Zones	Adaptive reuse into lobby, reception, suites, lounges, museum or cultural gallery
Internal Roads	Circulation, drop-off, service roads
Parking	As per local building byelaws – both guest and staff parking
Admin Block	Office spaces, reception, staff rooms
Support Services	Electrical substation, STP, water tank, drainage, waste disposal units, fire safety systems
Landscaped Areas	Open green spaces, gardens, buffer areas
Security & Entry Gate	Main gate with security check, CCTV, watchman's cabin

2.4.2 Optional / Additional Facilities (Suggestive)

Space	Description

Swimming Pool	Outdoor, luxury pool with deck and lounge area
Spa & Wellness Zone	Ayurveda centre / massage rooms / meditation area
Banquet / Conference Hall	Indoor event or meeting space (linked with hospitality)
Fitness Centre	Gym, health club
Cultural Pavilion / Amphitheatre	For showcasing local dance, folk music, etc.
Gift Shop / Souvenir Store	For promoting local handicrafts, tourism
Additional Rooms	Tents / eco-cottages / treehouses (subject to approval)

CHAPTER 3

LITERATURE REVIEW

OVERVIEW

This review examines literature on resort design, focusing on architectural principles, sustainability, guest experience, and cultural integration. It defines the research scope around functional design, eco-friendly practices, and luxury tourism. By analysing journals, hospitality studies, and case studies, it establishes a conceptual framework to guide design decisions, ensuring alignment with current trends and best practices.

3.1 GUJARAT TOURISM / CRZ GUIDELINES FOR BEACH RESORT DEVELOPMENT

Requirement	Norm
Setback from HTL	≥ 200 m (or hazard line), no construction within LTL–HTL
Plot size	≥ 0.4 ha
Floor Space Index	≤ 1.8
Max height / Floors	≤ 16.5m; up to 2 floors
Groundwater use	Forbidden within 200 m; permitted 200–500 m w/ NOC
Sand work	No extraction/levelling within 500 m
Waste management	Must meet standards; no discharge to beach
Public access	≥ 20 m gap between properties; min 500 m spacing
Sensitive areas	Construction prohibited
Approvals	GCZMA clearance; Tourism Dept approval; Forest Act if needed

3.1.1-Setback and Development Zone

No construction allowed within 200 m landward from the High Tide Line (HTL) or between the Low Tide Line and HTL.

3.1.2-Plot & Built-Up Limits

- Minimum plot size must be ≥ 0.4 ha (~4,000 m²).

- Floor Space Index (FSI) max = 1.8; total covered area on all floors ≤ 33% of the plot. Open spaces must be landscaped with vegetation.

3.1.3-Height & Floors

Maximum height: up to 16 m to roof ridge, with no more than two floors (ground + one upper)

3.1.4-Architecture & Environment

- Design should mesh with the surrounding landscape and local architectural style.
- No flattening of sand dunes.
- Live fences or barbed wire fencing with plants may be allowed, provided no obstruction to public beach access.

3.1.5-Groundwater & Sand Extraction

- No groundwater tapping within 200 m of HTL. Between 200–500 m zone, tapping only with approval of the State/Central Ground Water Authority.
- No sand extraction, levelling, or digging on sandy stretches (except structural foundations or a pool) within 500 m of HTL.

3.1.6-Waste & Pollution Control

- Must meet applicable effluent, solid waste, emissions, and noise standards.
- No untreated effluents or solids discharged into waters or on the beach. Treatment systems are mandatory.

3.1.7-Public Access & Spacing

Maintain at least 20 m wide public access gap between any two resorts or hotels, and ensure minimum spacing of 500 m between properties.

3.2 EXISTING GUIDELINES FOR 3-STAR PROVISION OF HOTELS IN INDIA

3.2.1-BEDROOM SIZE REQUIREMENTS

The minimum bedroom sizes (excluding bathroom) for each star category are as follows:

- 3-Star Hotels: Minimum of 130 sq. ft.
- For single occupancy rooms, the size may be a minimum of 90 sq. ft.

3.2.2-LIFT REQUIREMENTS

Hotels are required to provide 2+ hour fire-rated lifts if their building height exceeds:

- Ground floor + two additional floors
- This is a necessary (N) requirement for all-star categories (1-Star to 5-Star Deluxe)

Note: If the design is G+1 or G+2, providing a lift is optional but still strongly recommended for accessibility.

3.2.3-ACCESSIBILITY PROVISIONS

Dedicated Accessible Rooms

Hotels must provide at least one room specifically designed for differently abled guests. The room should include:

- Suitable low-height furniture
- Low peephole and clothes hangers
- Audible and visual (blinking light) alarm system
- Accessible bathroom with proper fittings

Ramps and Access

- Ramps with anti-slip surfaces must be provided at entrances.
- Minimum door width: 1 meter to ensure wheelchair access.
- Free accessibility must be ensured in all public areas and at least one restaurant in 5-Star and 5-Star Deluxe hotels.

Accessible Public Restrooms

- Must include a minimum door width of 1 meter
- Must be wheelchair accessible
- Include a low-height urinal (maximum 24”) with grab bars

3.2.3-SAFETY AND FIRE PRECAUTIONS

Fire Exit Signage

- Fire exit signs must be installed on all guest floors
- Must be connected to emergency or backup power
- This is a necessary (N) requirement

Smoke Detectors

- Smoke detectors must be installed in all rooms
- Can be battery-operated

Fire and Emergency Notices

- Fire safety instructions and emergency procedures must be displayed behind the room door

Window and curtain requirements

- All guest room windows must have opaque curtains or screening
- Blackout curtains are mandatory in 4-Star, 5-Star, and 5-Star Deluxe hotels

Water supply

- Hotels must provide hot and cold running water, available 24 hours a day

3.2.4-BALCONY

"**Balcony**" means the horizontal projection, including a hand rail, or balustrade to serve as passage or sitting out place.

5.2(a) Balcony projection may be permitted upto maximum 1.2 meters width only within 3 meters or more wide margins.

(b) Balcony may be permitted on ground floor provided margins to be left is 3 meters or more.

5.(15) a Balcony projection may be permitted upto maximum 1.2 mtrs. width only within 3 meters or more wide margins.

(b) Balcony may be permitted on ground floor provided margins to be left area 3 meters or more.

3.2.5-PLINTH

The plinth height should not be less than 45cm.

WIDTH OF LAY OUT ROAD

For Industrial and commercial Development :

Road length	Width of roads
Up to 150 mtrs.	9.0 mtrs.
Above 150 mtrs. & uptot 300 mtrs.	12.0 mtrs.
Above 300 mtrs. & upto 1000 mtrs.	14.0 mtrs.
Above 1000 mtrs.	20.0 mtrs.

6(2) The shape of the plot, the junction of the roads curves at the corners shall be designed as directed by GIDC.

6(3) In case of Termination of internal road or roads. 13.5 mtr. diameter turning circle or 12 mtrs. turning T shal be enfored.

6(4) There shall be minimum 4.5 mtr. distance between two detached structures open to sky in caso of residential and industrial development and 6 mtr. cleart distance between two detached structure. open to sky in case of commercial development.

3.2.6-FLOOR SPACE INDEX (FSI)

9(1) For residetial and industrial development, the maximum permissible floor space index (FSI) of a building unit shall be 1.6 for law rise building. Maximum built up area on any floor for law rise building shall be 50% of the area of building unit for industrial and 40% for residential and commercial purpose. For commercial development, the maximum permissible floor space index for low rise buiding shall be 1.6.

9(2) Height of Building :- The maximum height shall not be more than 13. mtrs, for building with solid plinth and 15 mtrs. for building on stilts clear from the plot level to the top of the building. In case of building for mdustrial purpose, height of more than 13 meters may be permitted of required for industrial purpose and approved by Factory Inspector.

ROAD SIDE MARGINS

Marginal distance between two detached structures

For residential development	4.5 mtr.
For industrial development	4.5 mtr.
For commercial development	6.0 mtr.

TREE PLANTATION

(i) Building unit having 1000 sq. mtrs. and more area at the rate of 3 trees for every 200 sq. mtrs. of building unit, for all uses, shall have to be planted on the site plan/layout plan and also has to be maintained the same.

3.2.7-COASTAL ZONE MANAGEMENT PLAN

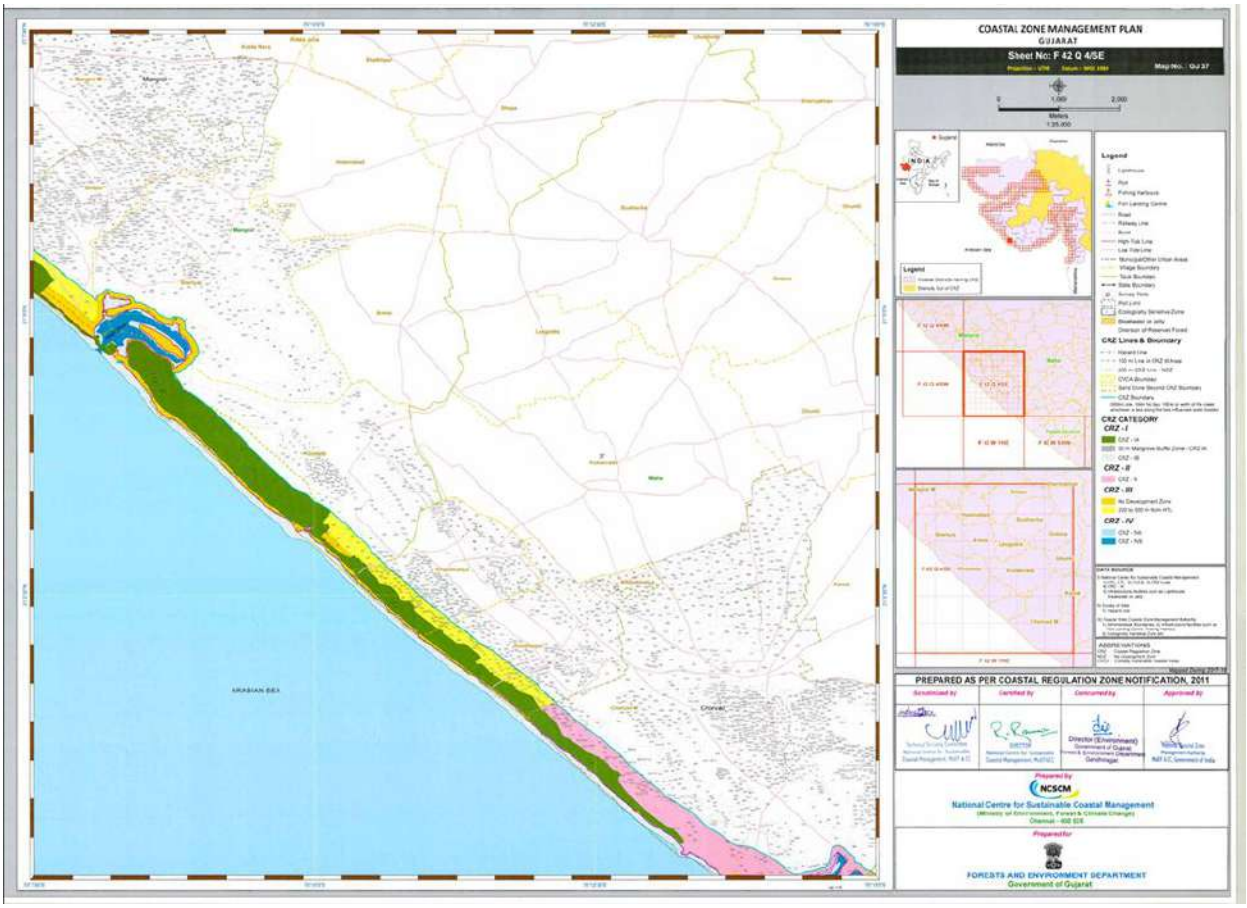


Figure 1- Coastal Zone Regulations

Category-II (CRZ-II) :

The areas that have already been developed upto or close to the shore-line. For this purpose, "developed area" is referred to as that area within the municipal limits or in other legally designated urban areas which is already substantially built up and which has been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains.

CRZ-II

(i) Buildings shall be permitted neither on the seaward side of the existing road (or roads proposed in the approved Coastal Zone Management Plan of the area) nor on seaward side of existing authorised structures. Buildings permitted on the landward side of the existing and proposed roads/existing authorised structures shall be subject to the existing local Town and Country Planning Regulations including the existing norms of FSI/FAR.

(ii) Reconstruction of the authorised buildings to be permitted subject with the existing FSI/FAR norms and without change in the existing use.

(iii) The design and construction of buildings shall be consistent with the surrounding landscape and local architectural style.

COMPOUND WALL

22(1) Compound Wall : The height of compound wall shall not exceed 2 mtrs. from road level and where height exceeding the above is provided spacial approval of Managing Director GIDC shall be obtained.

HEIGHT OF FLOOR

17(1) The minimum height of floors in a building measured from floor finish to bottom of the lowest structural member at any point shall be 2.8 mtrs. for residential development and 3 mtrs. for commercial development.

17(2) For dining space, verandah, bath room, corridor, puja room, coal room, passage, stair cabin and pump room the minimum height shall be 2 mtrs.

17(3) The maximum floor height shall not exceed 3.6 mtr.s for residential development, 4 mtrs. for industrial development and 3.60 mtrs. for commercial development. Also refer section 22. But this limit on height may be relaxed for industrial structures if required by industrial process subject to the fire fighting provision being made as per national building code in 17(4) the loft at a minimum height of 2 mtrs. not exceeding 1/ 4th of the area of room may be allowed in any room in residential development. In

3.2.8-PARKING

	Type of Use	Parking space required	Remarks.
2.	Cinema theater, Public assembly hall, auditorium, stadium etc.	1 sq.mtr. per seat.	50% of the total parking space requirements shall be reserved for cars.
3.	Commercial and business establishments including business office, bank, hostel, guest house, restaurant, institutional building and health facilities including hospital and nursing homes etc.	30% of maximum permissible FSI. Note: 1) The parking space so required shall be provided excluding required marginal space and built up area with solid plinth subject to other regulation, 2)20% of the parking space required at the ground level shall be exclusively earmarked for visitors.	50% of the total parking space requirements shall be reserved for cars.
4.	Community buildings such as community hall/marriage hall/community wadi/recreational club/and religious building, party not, club house etc.	50% of Building Unit.	50% of the total parking space requirements shall be reserved for cars.

Parking reserved to the visitors shall be provided on ground level only.

21(2) The parking layout shall fulfill the following conditions, namely:-

(i) The minimum width of access to the street from parking space shall be 3.0 meters.

(ii) The car parking space shall have two independent accesses leading to street if its area capacity excees 300 sq.mtrs.

(iii) If the parking space is not provide at street level, the gradient of ram pleading to parking space shall not be more than 1 meter over a horizontal distance of 7 meters.

(iv) Clear heading of 2.8 mts shall be provided on every access leading to parking space and at any point in parking

3.2.9-STAIR, LOBBIES & CORRIDORS

In case residential commercial and in public building the width of lobbies or crorridors in a building unit shall be as under.

(i) Minimum clear width corridors shall be 1 mtr. up to 3 mtr. length and for every additional length of 3 mtrs or part thereof, the width of corridors shall be increased by 15 cms. and upto a maximum of 2.5 mtrs.

(ii) The clear width of common stair shall not be less than 1.2 mtrs. Stair case upto 0.9 mtr. minimum width may be permited in single occupational residential bunglow/ apartment.

(iii) Minimum Stair width for more than six units tenaments on each floor shall be 1.5 mtrs.

(iv) The stair case shall be so located that it shall he within accessible distance of not more than 15 mtr. from any entrance of unit.

(v) Cantilever staircase of width upto 0.9 meters may be permitted in minimum 3 meters width margins in residential building.

VENTILATION

20(1) Every room in residential building should be constructed such that the same shall have for the purpose of ventilation.

A window or windows and/or ventilators clear of such frames, opening directly into an interior or exterior open air space or into an open verandah or gallery abutting on such open air spaces having an opening of not less than 1/10th of floor area of the room or an aggregate opening of door opening on outside open space. windows and ventilations of not less than 1/7th of the floor area of the room or kitchen.

3.2.10-RAINWATER HARVESTING SYSTEM

Percolating well and Rainwater Harvesting System:

For the area of building unit above 500 sq.mtr. and up to 1500 sq.mtr., the owner/developer shall carryout water harvesting system as specified by the authority.

In case where the area of building unit exceeds 1500 sq.mtr. and upto 4000 sq.mtr. owner/developer has to provide/construct percolating well with rain water harvesting system in building unit and at the rate of one percolating well for every 4000 sq.mtr. or part thereof building unit.

(I) Conservation and Harvesting of Rain Water in Building:

Having Plinth built up area of 750 sq. mtrs. or more, every such building shall be provided with required facilities and infrastructure for conservation and harvesting of rain water viz;

(ii) Percolation Pits:

The ground surface around the building shall have percolation pit or bore as recommended by competent authority within the building site, or bore recharge. Such pits shall be filled with small pebbles or brick jelly or river sand and covered with perforated concrete slabs.

(iii) Terrace Water Collection:

The terrace may be connected to a sump or well bore through a filtering tank by PVC pipe as recommended by Competent Authority. A valve system shall be incorporated to enable the first part of the rain water collected to be discharged out to the solid if it is dirty.

(iv) Open ground:

(i) whenever there is open ground a portion of top solid should be removed and replaced with river sand to allow slow percolation of rain water.

(ii) Any other methods proved to be effective in conservation and harvesting of rain water may be adopted in each and every construction taken up.

GENERAL DEVELOPMENT CONTROL REGULATIONS

PLINTH:

Buildings are permitted to have a hollow plinth at the ground level, with a maximum clear height of 3.5 metres and a minimum of 0.30 metres from the finished ground level to the finished first floor level.

CLEARANCE HEIGHT:

- All habitable spaces must have a minimum height of 2.9 metres between finished floor levels.
- Circulation and service spaces (e.g., verandas, bathrooms, passages, stair cabins, store rooms) must have a minimum clear height of 2.1 metres.
- Basements used exclusively for parking must maintain a minimum clear height of 2.8 metres and a maximum of 4.5 metres, though greater height may be allowed for mechanical parking systems.
- Hollow plinths for parking must have a maximum clear height of 3.5 metres.

MEZZANINE AND LOFT:

- Mezzanine floors are permitted with a minimum clear height of 2.1 metres and an area not exceeding 30% of the enclosed space. Lofts, with a maximum height of 1.2 metres, are also permitted under similar conditions.

RAMPS:

- Vehicular Ramps: For cars, a minimum ramp width of 3.0 metres and a minimum inner curve radius of 3.0 metres are specified. For trucks, these are 6.0 metres and 4.0 metres respectively. The maximum slope of any ramp is 1:7. A level platform of at least 4.5 metres in length is required at the end of ramps at ground and basement levels. A minimum clear height of 2.6 metres must be maintained throughout.

STAIRCASES:

- The dimensions (minimum flight width, tread, and riser) for staircases depend on the building's use and height. Escape routes leading to basements must have the same width as those used for exit and adhere to Fire Prevention and Life Safety Measure Regulations–2016.

RAILINGS:

- A parapet/railing of at least 1.15 metres in height from the finished floor level is required at all accessible edges, such as roof edges, staircases, terraces, and balconies.

PAVING:

- A minimum of 50% of the total open space (including marginal open spaces and common plots) in a building unit can be paved, with the remainder designed for rainwater recharge.

ACCESS PATH:

- The access path from the building unit entry to the building entry or plinth must have a minimum width of 1.8 metres with one user curve. For people with disability, the ramped path must incorporate guiding tiles and materials (conspicuously different in colour, material, or brightness to adjoining ground surfaces) and have a non-slip surface traversable by a wheelchair user.

DOOR REQUIREMENTS:

- For internal doors of non-detached/semi-detached dwellings, at least one entrance must be accessible by people with a disability. The clear opening of the entrance door must be 900mm, with a level difference at the threshold not exceeding 12mm. Door handles and locks should be located between 900–1000mm above the floor.

VENTILATION:

- All habitable rooms require adequate ventilation from open or semi-open spaces (minimum 1/10th of the floor area), with aggregate openings of at least 1/7th of the room's floor area. Windows should compensate for any deficiency. Basements and all bathrooms/water closets also require adequate ventilation.

AIR-CONDITIONING:

- Air-conditioning in common areas like lobby, restaurants and verandas, particularly those open to nature, may not be mandatory for nature-oriented hotels and resorts.

PARKING

PARKING STANDARDS AND REQUIREMENTS

Cars:

- Minimum Dimension: Each car parking space must have a minimum dimension of 2.5 metres × 5.0 metres.

- Access/Exit Lanes: Parking spaces should be connected to the street via an access/exit lane. The minimum width for a single-sided parking lane is 3 metres, while for double-sided parking, it is 6.6 metres.

Two-Wheelers:

- Minimum Dimension: Each two-wheeler parking space must have a minimum dimension of 0.90 metres × 2.0 metres.
- Access/Exit Lanes: The minimum width of the access/exit lane connecting to the street is 2.0 metres.
- Clear Height: A minimum clear height of 2.6 metres must be maintained at all points.

Trucks:

- Minimum Dimension: When truck parking is required, each space must have a minimum dimension of 4.0 metres × 10.0 metres.
- Access/Exit Lanes: The minimum width of the access/exit lane is 6.0 metres.

Parking for People with Disability:

- Mandatory Requirement: Parking for people with disability is required for all buildings, societies except detached and semi-detached dwelling units.
- Number of Spaces: A minimum of two accessible car parking spaces must be provided for every 25 car parking spaces or less.
- Bay and Transfer Lane: The space must have a minimum bay width of 3.6 metres to the side transfer lane, which can be shared by two successive parking bays.
- Location: Accessible parking bays must be located within 30 metres from the main building entrance.

Basement Parking:

- Basement: Basements can be exclusively used for parking. They must have a minimum clear height of 2.8 metres and a maximum of 4.5 metres, though greater height may be allowed for mechanical parking systems. If a basement is used for utilities or services, it must meet all relevant building code standards.
- Public and Private Garages: The regulations define both private garages (for parking) and public garages (operated for gain, for repairing, servicing, hiring, selling, or exhibiting vehicles)

3.2.11-Mixed Development:

- Mixed Development: In mixed-use developments, loading and unloading spaces are required as part of the application process.
    a) One space of 3.5 metres × 7.5 metres must be provided for every 1000 sq. m of carpet area or part thereof.
    b) Ramp Widths: Ramps leading to loading and unloading spaces must have a minimum width of 6.0 metres and can also be used for general parking access.
    c) Location: These spaces are permitted on the ground level or in the first basement and are considered part of the overall parking area.

Environmental Management:

- Rainwater Harvesting: Mandatory for all buildings with ground coverage of 80 sq.mt and above, with specific systems (percolation pit/bore recharge or percolating well) depending on the building unit area.
- Greywater Recycling: Mandatory for "Hospitality: Hotels, Lodges, Guest houses" with a built-up area exceeding 10,000 sq.mt. This includes provisions for a recycling plant, separate plumbing, and the use of

treated water for non-potable purposes (e.g., toilet flushing, gardening). The recycled water quality must conform to non-potable standards and be tested every six months.

- Solar Water Heating System: Mandatory for "Hospitality: Hotels, Lodges, Guest houses" with a built-up area exceeding 2,000 sq.mt.
- Tree Plantation: Building units larger than 100 sq.mt must provide a minimum of three trees for every 200 sq.mt area or part thereof. Trees should be shade-giving and must not obstruct fire fighting vehicles. A tree plantation deposit may be required

3.3 INDIAN NATIONAL TRUST FOR ART AND CULTURAL HERITAGE (INTACH)

3.3.1-CONSERVATION OBJECTIVES

Adaptive Reuse

The re-use of historic buildings and neighbourhoods is economically sensible. It is an effective strategy to conserve architectural heritage, particularly by using traditional craftspeople in the process. Such re-use distinguishes between preservation as an ideal on the one hand and, on the other, the goal to prolong the useful life of architectural heritage by retaining as much (and not necessarily, all) of the surviving evidence as a vestigial presence.

Priority must be accorded to retaining the continuity of original functions. Any new use must be introduced only after studying its effect on the local context and must conform to the carrying capacity and vulnerability of the architectural heritage. All changes to the original fabric should be preceded and followed by comprehensive documentation. Additions and alterations must respect the coherence of the whole, and must, to the extent possible, engage traditional materials, skills and knowledge in the process.

When it becomes necessary to modernise and comprehensively alter the original internal functional characteristics of the building or site, its external image must be retained. At the outset, the local community must be made aware of the changes envisaged and explained the benefits to be derived.

3.2.2-Restoration/ Replication/ Rebuilding

Restoration is an appropriate conservation strategy to reinstate the integrity or complete the fractured ‘whole’ of the architectural heritage/ site. It must aim to convey the meaning of the heritage in the most effective manner. It may include reassembling of displaced and dismembered components of the structure and conjectural building or replacement of missing or severely deteriorated parts of the fabric. Invariably, restoration work must be preceded and followed by comprehensive documentation in order to base interventions on informed understanding of the resource and its context, and in conformity with contemporary practices of local craftspeople.

In consonance with traditional ideals, replication can be accepted as an appropriate strategy not only to conserve unprotected historic buildings, but especially if such replication encourages historic ways of building.

At the urban level, the objective of rebuilding historic structures should be to enhance the visual and experiential quality of the built environment, thereby providing a local distinctiveness to contest the homogenising influence of globalisation.

In addition, reconstruction/ rebuilding can provide the impetus to develop a parallel market for local buildings materials and new opportunities for the use of alternative systems of building.

Reconstruction based on minimal physical evidence is appropriate where it is supported by the knowledge of local craftspeople, including folklore, beliefs, myths and legends, rituals, customs, oral traditions, etc. The objective of this

practice must be to interpret the original meanings of the resource in the contemporary context and reinforce its bond with society.

Employment generation

Conservation strategy must focus on the potential for employing local raj mistris, labour and materials because this will prolong the economic viability of traditional ways of building. In conditions of resource scarcity, the use of architectural heritage can provide an alternate and more economic strategy to meet contemporary needs as well.

Local material and traditional technology

The use of local materials and traditional technologies must invariably be preferred. Their choice must be based on the availability of traditional knowledge systems. Modern substitutes should be considered only after their use is proven efficient and judicious and must not compromise the integrity and continuity of local building traditions.

It is necessary to recognise that the use of certain traditional building materials may be inadvisable on account of the damage this can cause to the natural ecological systems. Thus, the use of shell lime in coastal areas and wood generally may need to be judicially substituted with alternate materials.

Integrated conservation

Conservation of architectural heritage and sites must be integrated with the social and economic aspirations of society. Conservation-oriented development must be the preferred strategy for social and economic progress. This necessitates the formation of multi-disciplinary teams to undertake integrated conservation projects. Since social aspirations are diverse and often at odds with each other, the conservation team must include social workers to facilitate dialogue and decision-making.

Sustainability

The objective of conservation should be to sustain the building and/or the traditional skill and knowledge system of building. In this context, continuity must be seen as evolving over time. The test of its validity must be the positive contribution it makes to the quality of life of the local community.

Selection criteria

Although interrelated, the following three key attributes will determine whether a property is worthy of listing:

- Historic significance
- Historic integrity
- Historic context

One or more of these attributes need to be present in a building to make it worthy of listing.

Historic significance

Historic significance refers to the importance of a property to the history, architecture, archaeology, engineering or culture of a community, region or nation. In selecting a building, particular attention should be paid to the following:

- Association with events, activities or patterns.
- Association with important persons, including ordinary people who have made significant contribution to India’s living heritage.
- Distinctive physical characteristics of design, construction or form, representing the work of a master craftsperson.
- Potential to yield important information, such as socio-economic history. Railway stations, town halls, clubs, markets, water works etc. are examples of such sites
- Technological innovation represented. For example: dams, bridges, etc.

- Town planning features such as squares, streets, avenues, etc. For example: Rajpath in New Delhi.

Historic integrity

Historic integrity refers to the property's historic identity, evidenced by the survival of physical characteristics and significant elements that existed during the property's historic period. The "original" identity includes changes and additions over historic time.

Historic integrity enables a property to illustrate significant aspects of its past. Not only must a property resemble its historic appearance, but it must also retain original materials, design features and aspects of construction dating from the period when it attained significance.

Historic integrity also relates to intangible values such as the building or site's cultural associations and traditions.

Historic context

Historic context refers to information about historic trends and properties grouped by an important theme in the history of a community, region or nation during a particular period of time.

Knowledge of historic context enables the public to understand a historic property as a product of its time.

Precincts or properties with multiple owners

A historic building complex may comprise of numerous ancillary structures besides the main structure. Each structure of the complex must be documented on individual proformas. For example, Jahangir Mahal, Diwan-i-Aam, Diwan-i-Khas and Moti Masjid all form part of the Agra Fort complex but are also individual buildings in their own right and, as such, must be documented individually.

Methodology

The determination of significance is the key component of methodology. All conservation decisions follow from the level of significance that is assigned to a building or site.

Listing work is comprised of two phases:

- Background research
- Field work

Background research

Before commencing actual fieldwork, the lister should gather basic information from various sources including gazetteers, travel books and other specialised books containing information about the architecture and history of the area to be listed and documented. This work could be done in university libraries, the ASI, the National Museum, the Central Secretariat, the respective State Secretariats, Institutes of Advanced Studies and Schools of Planning and Architecture. In a given area, local experts and university scholars are resource persons who could also provide required guidance and help.

Background research helps to ensure that no important structure or representative style of building is left out of the list. It enables the identification of historic areas, historic development of the area, significant events in the area and important persons associated with the area. In some well-documented areas, distinctive physical characteristics of design, construction or form of building resource can also be identified.

Field work

First and foremost, it is necessary to carry out a field survey to identify the buildings and the areas to be listed. Following this, a detailed physical inspection of the property and dialogues with appropriate local people such as the owners of the property, area residents, local panchayats, etc. need to be undertaken. By physically inspecting the property the lister

can gather information regarding the physical fabric of the building, such as physical characteristics, period of construction, etc. that need to be cross-checked with the literature survey. By conducting a dialogue with area residents, the lister can determine the changes to the property over time, ownership details, historic function and activities, association with events and persons and the role of the property in local, regional or national history.

When gathering information, the lister must be mindful of proforma requirements (Article 5.12). The proforma is, first of all, a record of the property at the time of listing and consists of current name; historic or other name(s), location, approach and accessibility, current ownership, historic usage, and present use.

Claims of historic significance and integrity should be supported with descriptions of special features, state of preservation, relevant dates, etc.

Mapping of vernacular architecture and historic settlements

The major shortcoming of the current list of legally protected architectural heritage is that it does not recognise vernacular architecture and historic settlements as categories of heritage worthy of being conserved. The listing of unprotected architectural heritage and sites must, therefore, include this category. An example of such an inclusive document is INTACH's "Listing of Built Heritage of Delhi" published in 1999.

Sacred sites must be dealt with due sensitivity and knowledge of the local social and cultural imperatives governing their sanctity. Listing must record such characteristics associated with these sites.

Detailed format for all the structures

Information for each building or site should be recorded as per INTACH's standard format as described below.

- Each proforma must contain information about listers and reviewers. Listing must be carried out by or under the supervision of experienced conservation architects.
- At least one photograph of the property/ building should be recorded for identification purposes. All significant elements of the property also need to be photographed. All photographs should be properly catalogued.
- A conceptual plan (if available, a measured drawing) should be given for each building/ area listed.
- Any additional information related to or affecting the built heritage of the city/town/region documented and its conservation should be included as appendices, for example: laws and regulations on planning and conservation, etc.
- A glossary should be provided explaining the technical and the special words used must be provided. For example: "Imambara - a shrine/ religious structure of Shia Muslims".
- A bibliography of all books, publications, articles and unpublished work must be provided. The uniform format should be followed throughout.

Grading

The primary objective of listing is to record extant architectural heritage and sites. But the outcome of this process should invariably be to grade the listed heritage into a hierarchical series. This process must be undertaken in a rigorous and transparent manner by a multi-disciplinary team of experts whose recommendations should be available for public scrutiny. The importance of this process cannot be underestimated because its results determine subsequent conservation decisions. Such hierarchical categorisation facilitates the prioritisation of decisions relating to the future of architectural heritage and sites. This Charter recommends that buildings and sites be classified as Grade I*, I, II and III in descending order of importance.

Grade-I	Grade-I	Grade-I
(A) Definition : Heritage Grade-I comprises buildings and precincts of national or historic importance, embodying excellence in architectural style, design, technology and material usage and/or aesthetics; they may be associated with a great historic event, personality, movement or institution. They have been and are the prime landmarks of the region. All natural sites shall fall within Grade-I.	Heritage Grade-II (A&B) comprises of buildings and precincts of regional or local importance possessing special architectural or aesthetic merit, or cultural or historical significance though of a lower scale than Heritage Grade-I. They are local landmarks, which contribute to the image and identity of the region. They may be the work of master craftsmen or may be models of proportion and ornamentation or designed to suit a particular climate.	Heritage Grade-III comprises building and precincts of importance for townscape; that evoke architectural, aesthetic, or sociological interest through not as much as in Heritage Grade-II. These contribute to determine the character of the locality and can be representative of lifestyle of a particular community or region and may also be distinguished by setting , or special character of the façade and uniformity of height, width and scale.
(B) Objective: Heritage Grade-I richly deserves careful preservation.	Heritage Grade-II deserves intelligent conservation	Heritage Grade-II deserves intelligent conservation (though on a lesser scale than Grade-II and special protection to unique features and attributes).

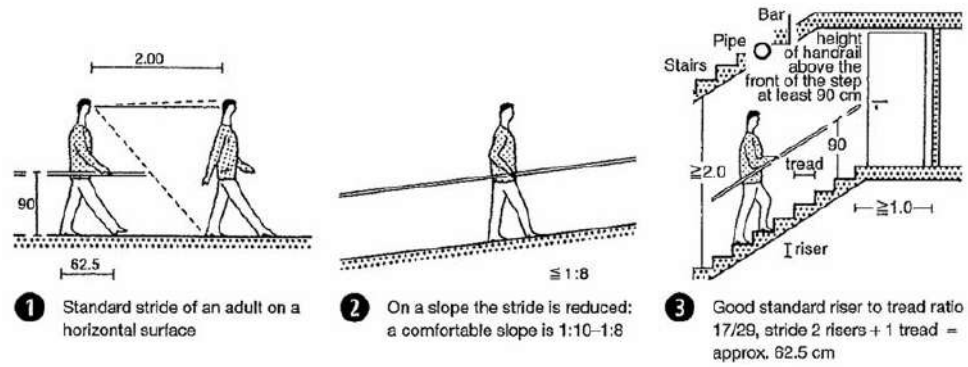
(C) Scope for Changes: No interventions be permitted either on exterior or interior of the heritage building or natural features unless it is necessary in the interest of strengthening and prolonging the life of the buildings/or precincts or any part or features thereof. For this purpose, absolutely essential and minimum changes would be allowed and they must be in conformity with the original.	Grade-II(A) : Internal changes and adaptive re-use may by and large be allowed but subject to strict scrutiny. Care would be taken to ensure the conservation of all special aspects for which it is included in Heritage Grade-II. Grade-II (B) : In addition to the above, extension or additional building in the same plot or compound could in certain circumstances, be allowed provided that the extension / additional building is in harmony with (and does not detract from) the existing heritage building(s) or precincts especially in terms of height and façade.	
(D) Procedure: Development permission for the changes would be given on the advice of the Heritage Conservation Committee.	Development permission for the changes would be given on the advice of the Heritage Conservation Committee.	Development permission for changes would be given on the advice of the Heritage Conservation Committee.
(E) Vistas / Surrounding Development : All development in areas surrounding Heritage Grade-I shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-I.	All development in areas surrounding Heritage Grade-II shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-II	All development in areas surrounding Heritage Grade-III shall be regulated and controlled, ensuring that it does not mar the grandeur of, or view from Heritage Grade-III.

Buildings and sites classified as Grade I*, I and II should be conserved in accordance with the provisions of official and legal manuals of practice (for example, ASI's Works Manual). Some Grade II buildings, however, and all other listed buildings and sites, i.e. Grade III, may be conserved in accordance with principles enunciated in this Charter (Article 2.6). The decision to apply the principles enunciated in this Charter to Grade II buildings must invariably be based on the concurrence of the Advisory Committees of INTACH (Article 7.2.5).

The process of listing should be constantly upgraded and the list updated in keeping with the availability of fresh information, financial and material resources, advances in technology and developments in the understanding of architectural heritage and its constituents.

3.4 NEUFERT ARCHITECTS DATA

Stairs

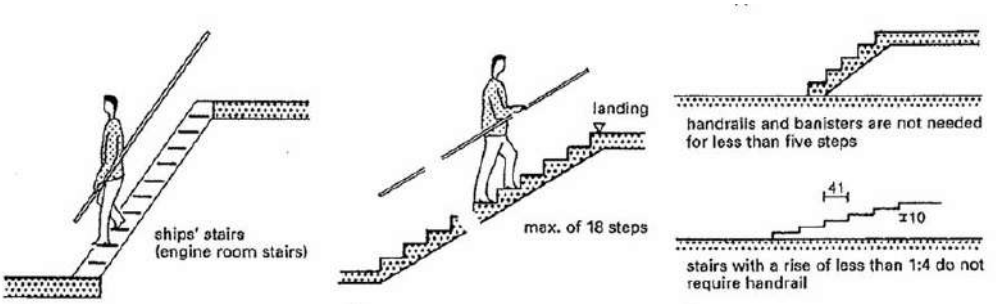


1 Standard stride of an adult on a horizontal surface

2 On a slope the stride is reduced: a comfortable slope is 1:10–1:8

3 Good standard riser to tread ratio 17/29, stride 2 risers + 1 tread = approx. 62.5 cm

Figure 2-Neuferts figure1

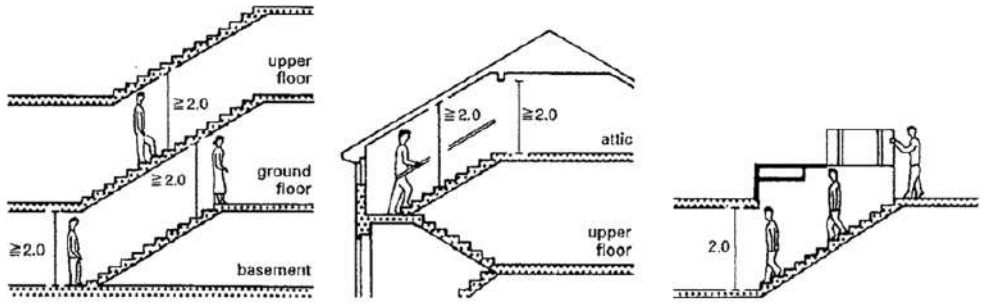


4 Ladder-type stairs with handrail

5 Normal stairs 17/29, landing after max. 18 steps for legally essential stairs. Prestigious-style stairs can climb up to a 4 m storey height without a landing.

6 Stairs without a handrail

Figure 3-Neuferts figure 2



7 Correctly superimposed stairs save space

8 If rafters and beams are arranged in the direction of the stairs, this saves space and expensive trimmers

9 Covered entrances to cellars necks and trapdoors are to be avoided; but the arrangement shown here has advantages and is safe

Figure 4-Neuferts figure 3

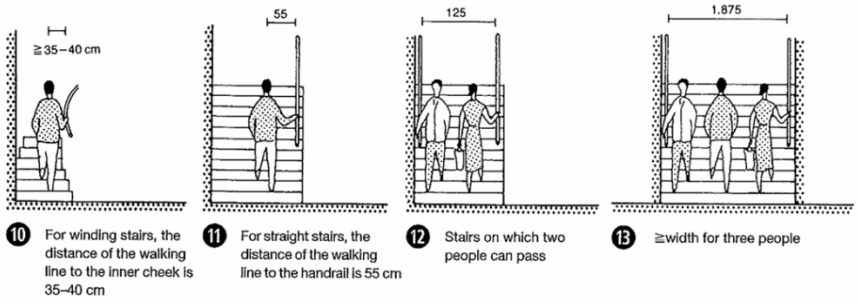


Figure 5-Neuferts figure 4

Type of hotels

According to the classification system of the German Hotel and Inn Association (DEHOGA), there are five categories, essentially determined by the room's size and features:

- 1 Star (Tourist): single room 8m2, double room 12m2 (minimum area for 75% of the hotel rooms, without bathroom), bed, wardrobe, seat, washbasin in the room, reception as a separate area
- Stars (Standard): as before, but single room 12 m2, double room 16 m2 (minimum area for 75% of the hotel rooms, including bathroom and corridor), bathroom in room (for 70% of hotel rooms), seat per bed, colour television (in 70% of the hotel rooms)
- Stars (Comfort): as before, but single room 14 m2, double room 18 m2 (minimum area, see above), bathroom in room (for all rooms in the hotel), telephone, reception area with seating for group, independent reception
- Stars (First Class): as before, but single room 16 m2, double room 22 m2 (minimum area, see above), minibar, armchair/couch with coffee table, lobby with seating and drinks service
- Stars (Luxury): as before, but single room 18m2, double room 26m2, (minimum size, see above), 2% of the hotel rooms as suites (at least two), each with an armchair/sofa per bed, additional washbasin in double rooms and suites, additional colour television in suites, reception lobby.

Swimming pools

Size: Lane width 2.25 m, stroke length approx. 1.50 m, plus body length: 4 strokes = 8 m length. Water depth: chin height for the smallest adult, not the children! Difference between pool depth/ water depth. depends on the type of extractor system.

Types of pool:

- Normal foil pool (foil = waterproof surface) on masonry-bearing construction, concrete, steel (also above ground) or sunk into ground. Polyester pools, seldom locally produced, mostly with pre-fabricated elements, are generally not self-supporting. Lean concrete backfilling is necessary.
- Watertight concrete pool (two-sided in situ concrete, shotcrete with formwork for one side, pre-cast concrete elements); surface mostly ceramic or glass mosaic, occasionally paint (chlorine rubber, cement paint).

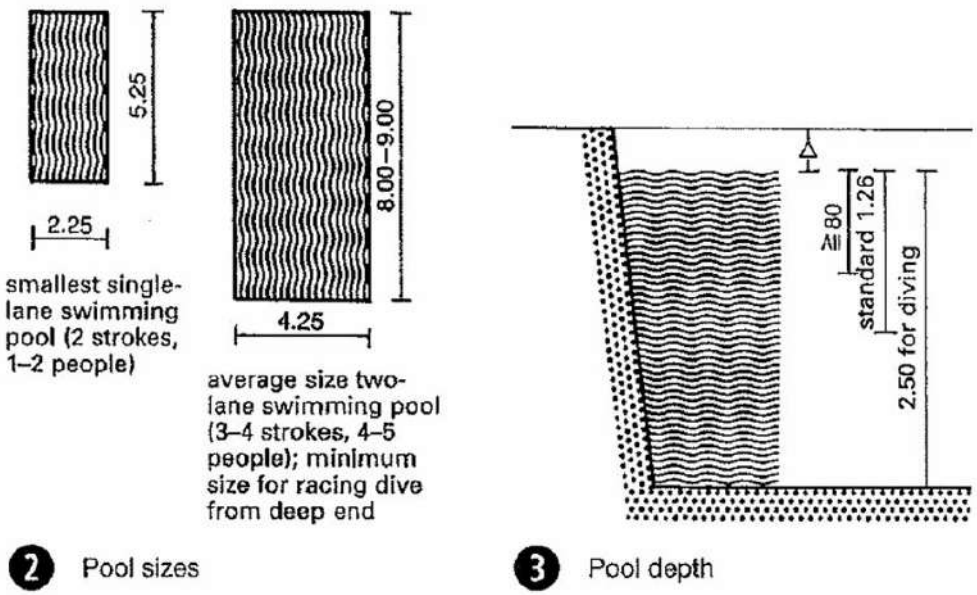


Figure 6-Swimming pool design

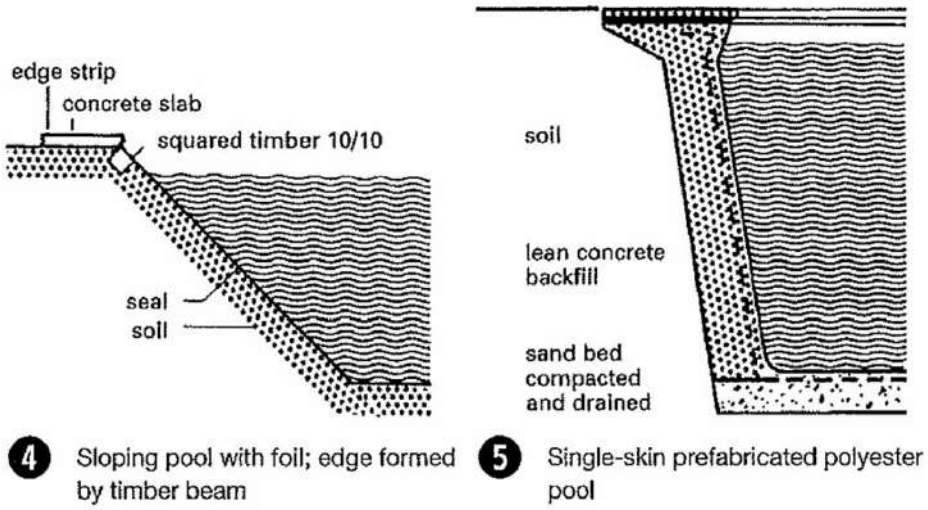


Figure 7-Sloping Pool

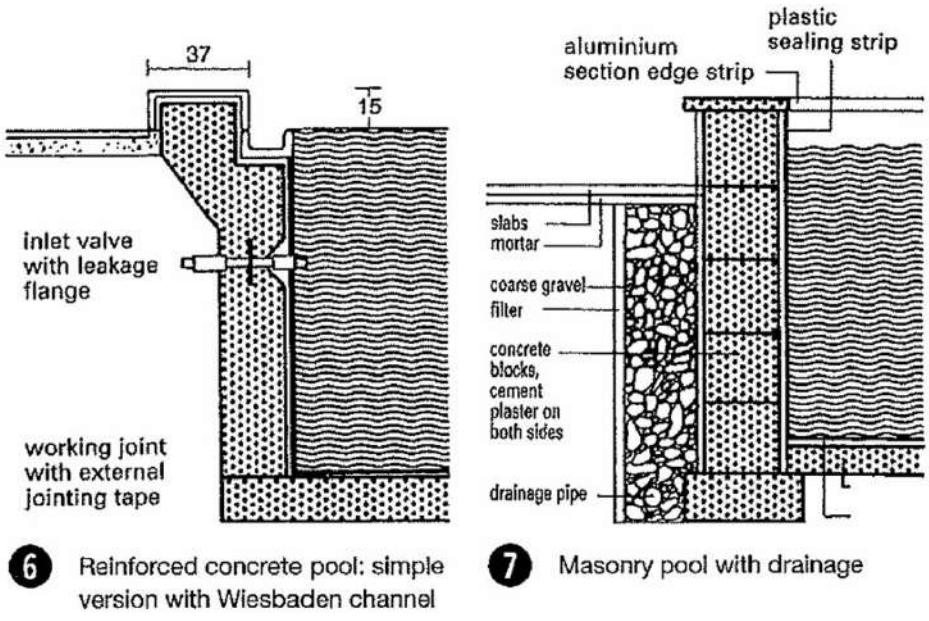


Figure 8-Reinforced concrete pool

Water	Season			Additional months	
temp.	4 Months	5 Months	6 Months	5th Month	6th Month
22°C	1.25/6.5	1.33/7.2	1.55/7.8	1.65/7.2	2.65/7.8
23°C	1.50/7.2	1.70/7.9	2.00/8.5	2.50/7.9	3.50/8.5
24°C	2.08/7.9	2.26/8.6	2.66/9.2	2.98/8.6	4.66/9.2
25°C	2.60/8.5	2.80/9.3	3.20/9.8	3.60/9.5	5.25/9.8
26°C	3.50/9.2	3.75/10.0	4.00/10.5	4.75/10.0	5.25/10.5

8 Heat loss of an outdoor pool (average/maximum) in kWh/m²d according to measurements by energy company RWE. Special influences are not considered, e.g. considerable heat loss of public pools (hotel pool etc.) through the use of heated pool water for filter back-flushing (up to 1.5 kW/m²d or 1300 kcal/m²d).

Spa

Free-standing sauna cabins or facilities (e.g. in the garden) are normally constructed of spruce in log cabin style, and are either self-built or bought pre-fabricated. The log cabins are available in various versions, either as sauna cabins. or also with shower and changing or relaxation room. There are also sauna cabins available as prefabricated or kit elements for installation in existing rooms.

Sauna stove: Sauna cabins for installation usually have electric stoves (which require a three-phase supply above a certain size), while log cabin types mostly have solid fuel stoves (which require a chimney).

Plunge pool-max. depth 1.20 m. An important part of a proper sauna, a (warm) footbath with a seat is required.

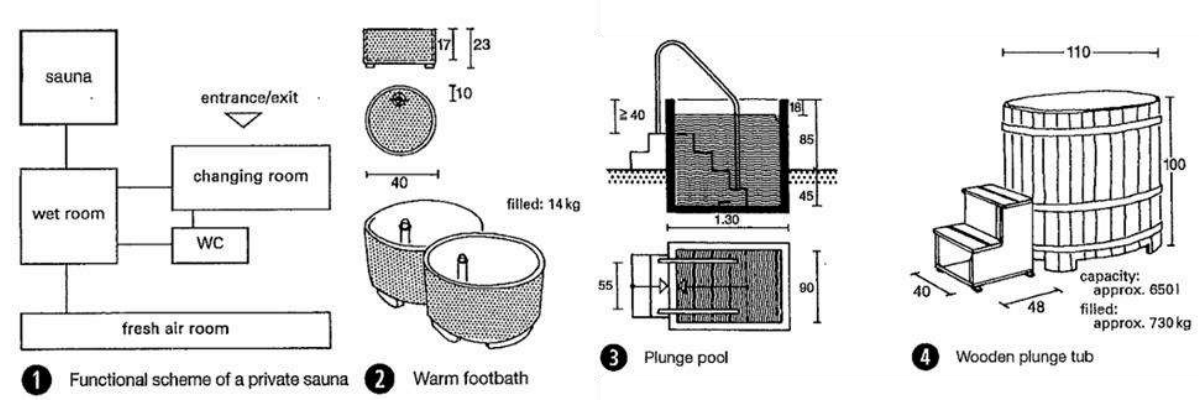


Figure 9-Footbath

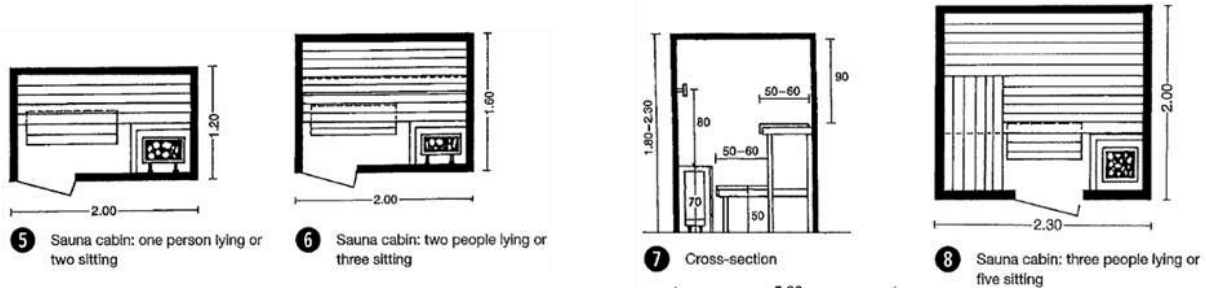


Figure 10-Sauna Cabin

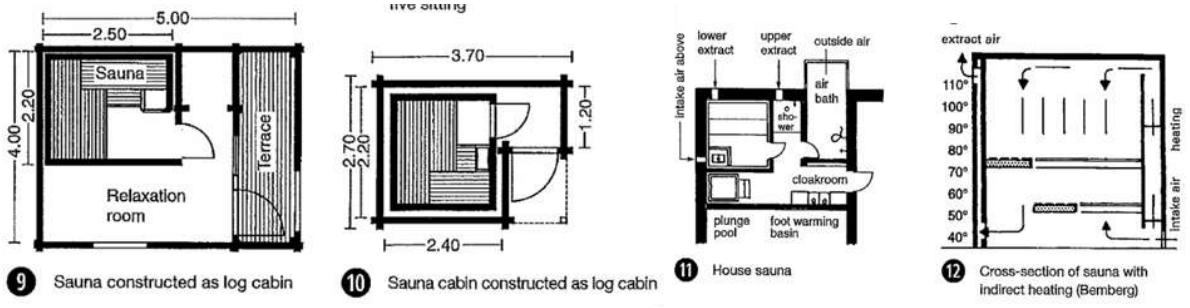


Figure 11-Sauna cabin Details

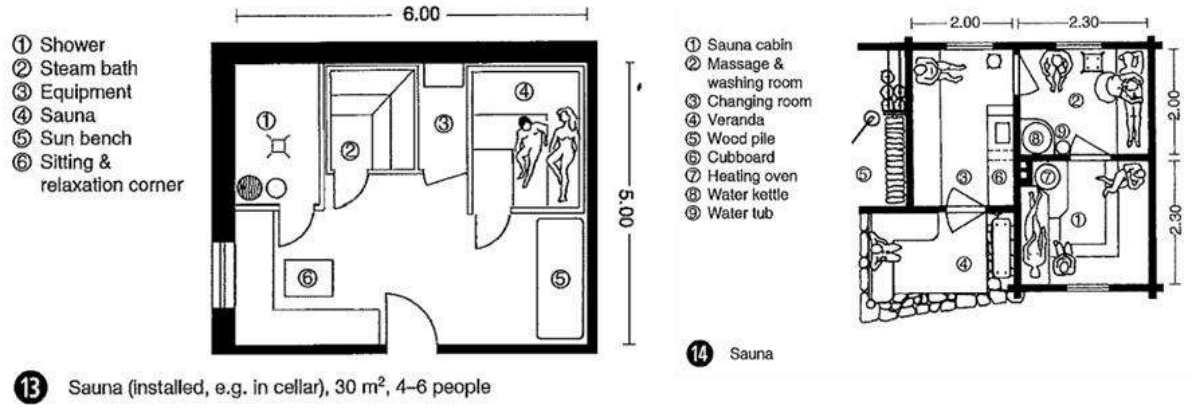


Figure 12-Sauna floor plan

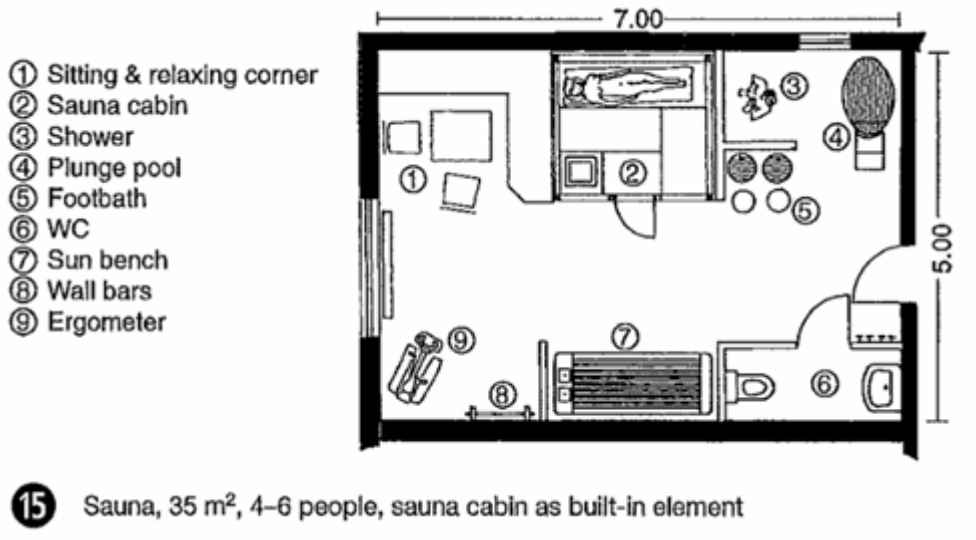


Figure 13-Sauna

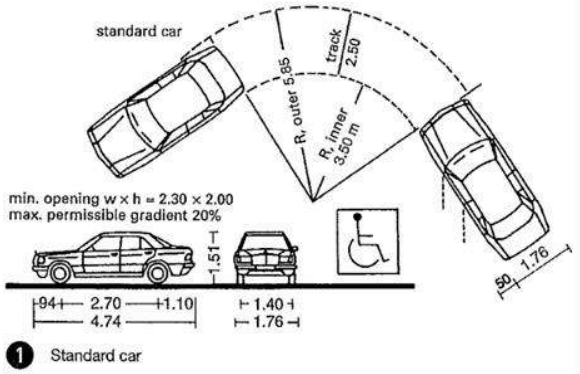
Parking facility

Type of vehicle	External dimensions						
	Length	Wheelbase	Overhang length		Width	Height	External turning circle radius
			Front	Back			
	[m]	[m]	[m]	[m]	[m]	[m]	[m]
Bicycle	1.90				0.60	1.00	
Moped	1.80				0.60	1.00	
Motorcycle	2.20				0.70	1.00	
Car	4.74	2.70	0.94	1.10	1.76	1.51	5.85
HGVs:							
Van/campervan	6.89	3.95	0.96	1.98	2.17	2.70	7.35
HGV (2 axles)	9.46	5.20	1.40	2.86	2.29	3.80	9.77
HGV (3 axles)[1]	10.10	5.30[1]	1.48	3.32	2.50[4]	3.80	10.05
HGVs with trailer:	18.71						
Towing vehicle (3 axles)[1]	9.70	5.28[1]	1.50	2.92	2.50[4]	4.00	10.30
Trailer (2 axles)	7.45	4.84	1.35[3]	1.26	2.50	4.00	10.30
Articulated HGVs:	16.50						
Tractor unit (2 axles)	6.08	3.80	1.43	0.85	2.50[4]	4.00	7.90
Semi-trailer (3 axles)[1]	13.61	7.75[1] 1.61	4.25	2.50	4.00	7.90	
Buses:							
Coach, bus	12.00	5.80	2.85	3.35	2.50[4]	3.70[5]	10.50
Coach, bus[2]	13.70	6.35[2]	2.87	4.48	2.50[4]	3.70[6]	11.25
Coach, bus[2]	14.95	6.95[2]	3.10	4.90	2.50[4]	3.70[6]	11.95
Articulated bus	18.75	5.98/5.99	2.65	3.37	2.50[4]	2.95	11.80
Refuse collection vehicles:							
2 axles (2 MÜ)	9.03	4.60	1.35	3.08	2.50[4]	3.55	9.40
3 axles (3 MÜ)	9.90	4.77[1]	1.53	3.60	2.50[4]	3.55	10.25
3 axles (3 MÜN)[2]	9.95	3.90	1.35	4.70	2.50[4]	3.55	8.60
Highest values permitted in Germany:							
HGV	12.00						
Trailer	12.00				2.55[4][5]	4.00[6]	12.50
HGV with trailer	18.75						
Articulated HGV	16.50						
Articulated bus	18.00						

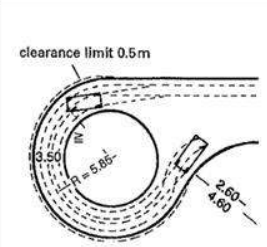
Notes: [1] for vehicles with 3 axles, the rear tandem axle is integrated to a middle axle
[2] for 3-axle vehicles with a trailing axle, the wheelbase corresponds to the distance between the front axle and the forward axle of the rear tandem axle
[3] without tow bar length
[4] without external mirror
[5] additional equipment for air-conditioned HGVs up to 2.60 m
[6] as double-decker bus 4.00 m

10 Basic vehicle data → p. 397–398

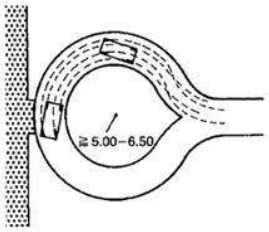
Vehicle turning



1 Standard car



2 Turning circle of a car



3 Entrance drive, car turning circle radius ≧5–6.50 m

Figure 14-Turning radius

Type of vehicle	External dimensions						
	Length	Wheelbase	Overhang length		Width	Height	External turning circle radius
			Front	Back			
	[m]	[m]	[m]	[m]	[m]	[m]	[m]
Bicycle	1.90				0.60	1.00	
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Articulated bus	18.00						

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[6] as double-decker bus 4.00 m

10 Basic vehicle data → p. 397–398

CHAPTER 4

SITE INVENTORY

OVERVIEW

A site inventory overview is crucial in the planning and design phase of a resort project, providing a comprehensive understanding of the site's characteristics and context. Conducting a thorough site inventory allows for informed decision-making, effective design solutions, and an understanding of how the site interacts with its natural, built, and cultural environment



Figure 15-Site visit group photo

SITE INVENTORY



Figure 16Site inventory

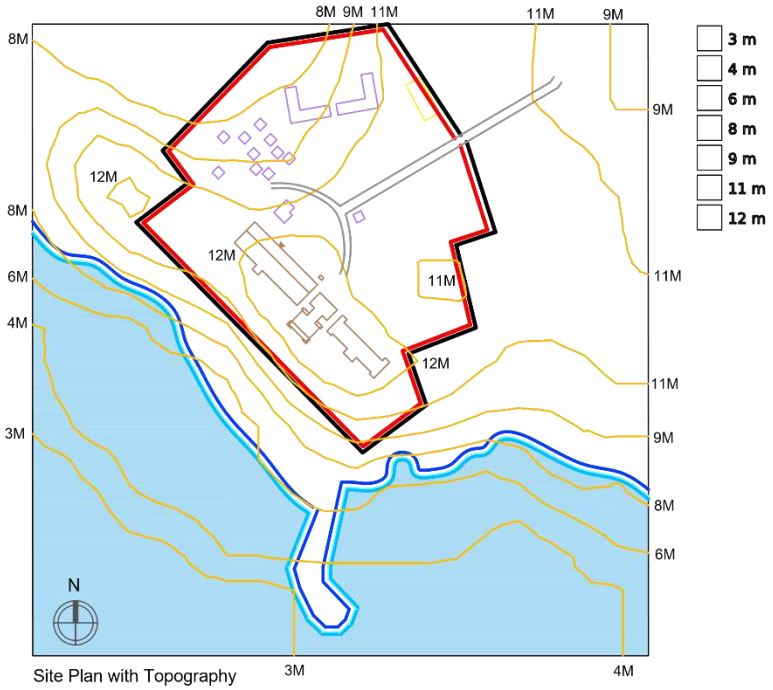


Figure 17-Site plan with topography

1. LOCATION & CONTEXT

Distance: Chorwad Beach is about **20–37 km** south of Somnath and approximately **20 km from Veraval** (Somnath Railway Station)

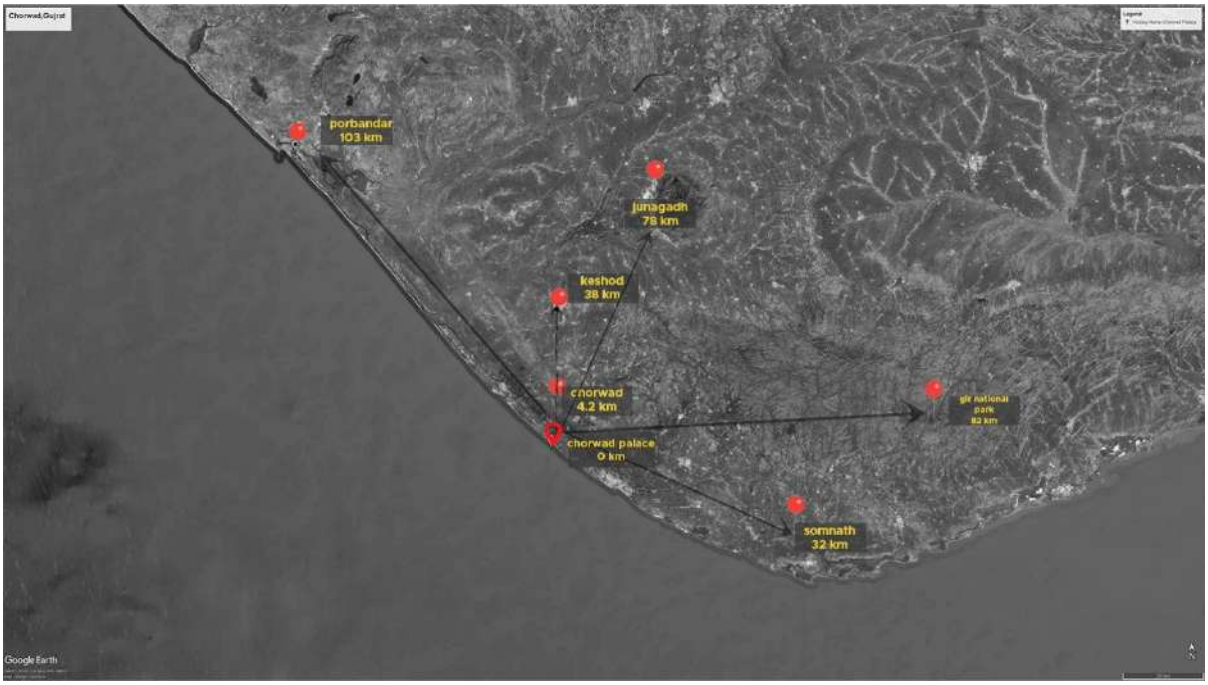


Figure 18Location map 1



Figure 19Location map 2

2. NEARBY INFRASTRUCTURE

Nearest rail access is Chorwad Road railway station (~6 km). Airports: Rajkot (~180 km) and Diu/Keshod (~40–110 km); road access via Somnath or Veraval on NH-51



Figure 20Nearby infrastructure

3. HISTORICAL & CULTURAL HIGHLIGHTS

Chorwad Palace—often referred to as the Summer Palace or Daria Mahal—was built in 1930 by Nawab Muhammad Mahabat Khanji III, the ruler of Junagadh, as his coastal summer retreat on the shores of the Arabian Sea in Chorwad, Junagadh district, Gujarat. Constructed around 1928–1930, the palace blends Italian, Muslim, and

colonial architectural styles, featuring lofty arched windows, balconies, projecting verandas, landscaped gardens and walkways perfect for seaside promenades.



Figure 21Palace photo 1

Originally the exclusive pleasure palace of the Nawab and his entourage, complete with facilities to host royal banquets, horse stables, and lavish displays of luxury, the palace later became the central facility of a government-run beach resort developed by the Tourism Corporation of Gujarat Ltd (TCGL) in the 1970s. It was intended as India's only beach palace resort—a singular destination that combined heritage architecture with seaside relaxation.



Figure 22Palace photo 2

By the late 2000s, the resort and palace were already described as dilapidated. Reports indicated that the palace porch had collapsed, while precious Belgian chandeliers, Italian furniture, and antique **décor** were stolen or vandalized. The adjoining TCGL cottages and support facilities, meant to host beach tourists, also became unusable due to decay and lack of upkeep. Even basic infrastructure such as pathways, gardens, and lighting were left in poor condition, discouraging visitors and creating an image of abandonment.



Figure 23Palace photo 3



Figure 24Palace photo 4

DOCUMENTATION OF BEACH RESORT

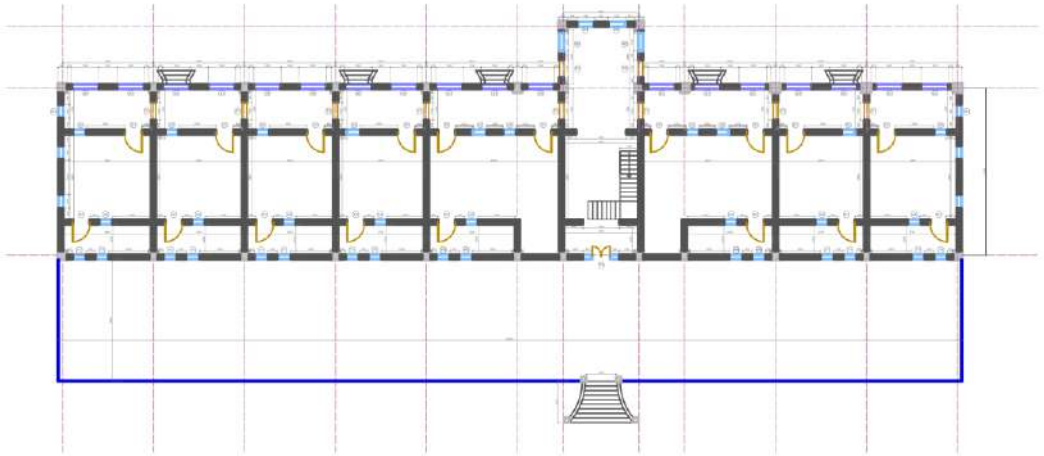


Figure 25 PLAN OF BEACH RESORT

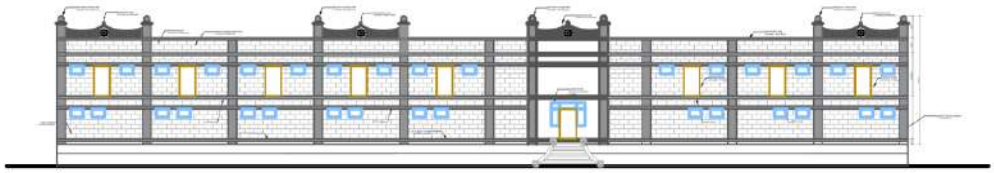


Figure 26 ELEVATION (FRONT SIDE)

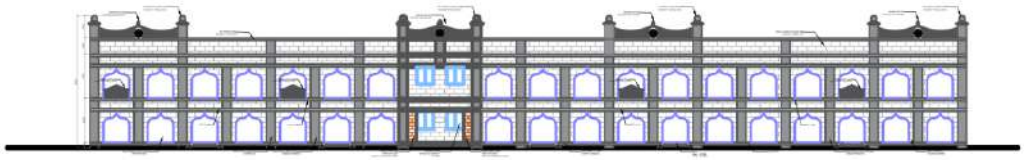


Figure 27 ELEVATION (BEACH SIDE)

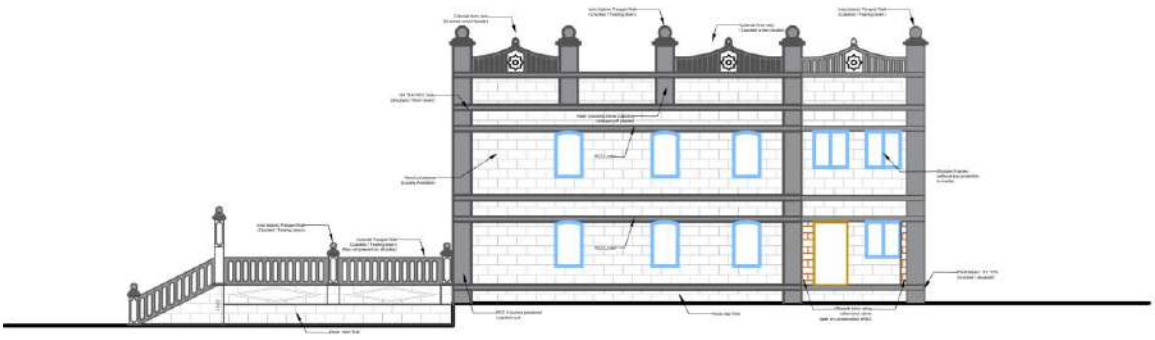


Figure 28 SECTION OF BEACH RESORT



Figure 29 PLAN OF BEACH RESORT

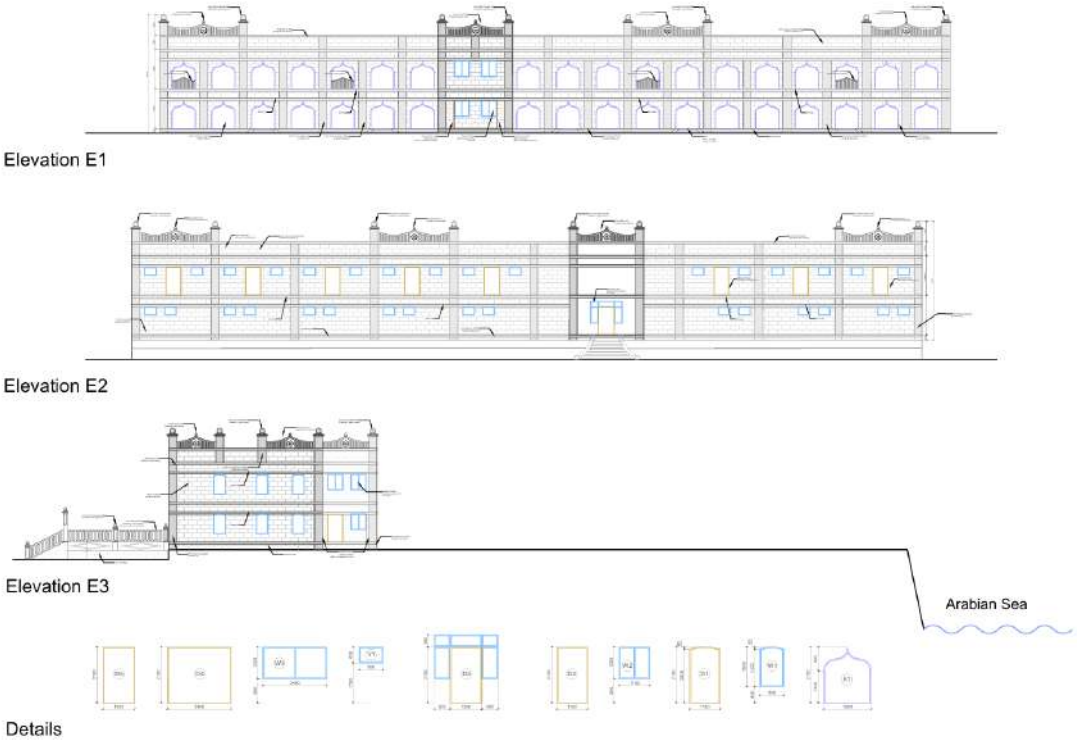


Figure 30 ELEVATIONS OF BEACH RESORT

MATERIALS OF CHORWAD PALACE

A full inventory of materials is assembled from the RFP documents, historical descriptions, and the site photographs. The original structure is primarily stone masonry with lime mortar and plaster (as in other Saurashtra palaces). Key materials include:

- **Stone:** The main walls are hewn from local trap (basalt) or similar volcanic rock; lighter Kaand limestone (a yellow-cream limestone) was used for decorative elements, cornices, and carving
- **Lime mortar & plaster:** Masonry joints and exterior finishes were set with lime-based mortar; surviving surfaces show rough lime plaster typical of period construction.
- **Timber:** Wood beams and joists (now largely collapsed) would have supported floors and roof trusses, as in comparable palaces.
- **Roofing:** The original roof likely had *terra-cotta* tile covering (common in coastal Gujarat). No intact roof survives, but fallen tiles and timber suggest a tiled roof structure.
- **Finishes:** Luxury interiors included marble, as indicated by reports of "marble bathtubs" in Chorwad Palace. Indeed, one source describes the palace's bathrooms as containing marble tubs and high-end decor Modern ceramic floor and wall tiles are visible in ruined bathrooms (Figure 3), but these are later additions. Windows and doors would have had glazed glass with metal or wooden frames and decorative iron grilles, as was customary.
- **Metals & Glass:** Iron grills, hinges, and hardware (typical of Muslim-influenced palaces) and glass (for the large arched windows) were also part of the construction.

These conclusions align with what little documentation exists. The Tender/RFP (2024) emphasizes *restoring* the old palace rather than replacing it, implying all original materials (stone, wood, etc.) should be conserved. In absence of a published materials list, the above summary integrates on-site evidence (photos) with period practice. The key takeaway is that Chorwad Palace was built of basalt masonry with Kaand limestone ornament, bound by lime plaster, and finished inside with marble and tile.



Figure 31Interior materials

Aspect	Recommendation
Orientation	SW-facing views, cross-ventilation NE–SW
Sun Protection	Deep overhangs, Jaali's, shaded courtyards

Ventilation	Sea breeze harnessing with courtyards & high openings
Materials	Local stone, RCC frame, lime plaster, terracotta roof tiles
Roofing	Sloped (30–45°) or flat with drains, cyclone-tied structures
Drainage	Raised plinths, permeable paving, bioswales
Landscape	Windbreak trees, shaded trails, water features
Style	Fusion of **Saurashtra heritage** + **modern eco-luxury**

4. SWOT ANALYSIS

Strengths	**Weaknesses**
Very tranquil & scenic, ideal for relaxing	Not safe for swimming; drowning risk reported
Historic charm vis-a-vis palace & heritage	Minimal on-site infrastructure or amenities
Great sunsets/sunrises with natural backdrop	Limited water access; rough tides

Opportunities	**Threats**
Heritage-oriented tourism via palace resort	Safety hazards at sea; official bans previously issued
Local culture exploration & photography	Weather extremes (summer heat, rough monsoon seas)

5. SITE ORIENTATION & SUN PATH

- **Latitude:** ~20.9° N
- **Sun Path:**
- **Summer (June):** High solar altitude (~85°); sun rises in NE, sets in NW
- **Winter (Dec):** Lower angle (~45–50°); sun rises in SE, sets in SW

6. WIND PATTERNS & VENTILATION

- **Prevailing Winds:**
- **Summer/Monsoon (May–Sept):** Strong SW winds (~25–30 km/h**)**

- **Winter (Nov–Feb):** Mild NE winds (~10–15 km/h)

7. LANDSCAPE & MICROCLIMATE DESIGN

- Use casuarina, palm, neem and other coastal salt-tolerant species as windbreaks.
- Create shaded pathways and green buffers to lower ambient heat.

8. FLORA & FAUNA

A. Flora (plants)

Name	Image	Season / Growth Pattern
Neem (Azadirachta indica)		Evergreen; flowers in spring (March–May)
Coconut Tree (Cocos nucifera)		Evergreen; fruits year-round, peak summer harvest
Casuarina (Casuarina equisetifolia)		Evergreen; withstands coastal conditions all year
Mango (Mangifera indica)		Deciduous; fruits in summer (April–June)
Acacia (Various species)		Deciduous/Semi-evergreen; dry seasons preferred
Banyan (Ficus benghalensis)		grows year-round
Peepal (Ficus religiosa)		Semi-evergreen; sheds briefly in March

Pandanus (Pandanus tectorius)		Evergreen; thrives in coastal areas year-round
Karanja (Pongamia pinnata)		Deciduous; flowers in late spring/summer
Alexandrian Laurel (Calophyllum epiphyllum)		Evergreen; blooms intermittently throughout year
Cerbera manghas		Evergreen; flowers mainly in summer
White Mangrove (Avicennia marina)		Evergreen; thrives in brackish water, year-round
Beach Morning Glory (Ipomoea pes-caprae)		Perennial creeper; flowers year-round
Crinum asiaticum (poison bulb)		Summer or early fall
Indian Aloe (Aloe vera)		Perennial succulent; peak growth in dry season
Bougainvillea (Bougainvillea glabra)		Early summer through fall

Frangipani (plumeria)		Flowering from December to April

B. Fauna (animals)

a) Marine Life

- Mollusks: Pearl oysters and various sea slugs.
- Octopus: Known for their unique color-changing abilities.
- Echinoderms: Starfish, sea cucumbers, and sea urchins.
- Fish: Pufferfish, seahorses, stingrays, mudskippers, and a wide array of other finfish. Studies along the Chorwad Coast have documented diverse fish species, including Indian Mackerel (*Rastrelliger kanagurta*).
- Sea Turtles: Endangered species like Green Sea Turtle, Olive Ridley Sea Turtle, and Leatherback Sea Turtle.
- Sea Snakes: Several species of sea snakes inhabit the coastal waters.
- Mammals: Dugongs (Sea Cows) and smaller cetaceans like Finless Porpoises and various dolphin species.
- Coral: Coral reefs are present on 42 islands near the Gujarat coast.

b) Birds

- Waterfowl: Dalmatian Pelican, White-eyed Pochard, and Indian Skimmer.
- Shorebirds: Greater Flamingo, Crab Plover, Sandpipers, and other shorebirds.
- Other Birds: Teals, fowls, Ibis, Curlews, Herons, Egrets, Ducks, Pelicans, Storks, Gulls, and Terns.
- Threatened Bird Species: The Black-necked Stork, a large wading bird.
- Migratory Birds: Winter Visitors (November - March/April):
    1. Ruddy Shelduck: A medium-sized waterfowl species.
    2. Bar-headed Goose: Known for its high-altitude migration over the Himalayas.
    3. Northern Pintail: A medium-sized dabbling duck.
    4. Northern Shoveler: Another duck species that winters in the Indian Subcontinent.
    5. Common Swallow: Migrates from Europe and Northern Asia to escape the cold.
    6. Siberian Crane: A notable winter visitor to the Rann of Kutch, which is a coastal region of Gujarat.
    7. Summer Visitors:
- Black-Crowned Night Heron: Migrates from Eastern Europe and Western Asia to the Indian Subcontinent.

- Eurasian Golden Oriole: Characterized by its bright yellow plumage.
- Blue-tailed Bee-eater: Primarily found in South and Southeast Asian countries and migrates to southern regions after breeding in North and Northwest India

c) Terrestrial Fauna

- Marsh Crocodiles: Inland wetlands in the Kachchh region, which is somewhat close to the coast, harbour the endangered Marsh Crocodile or Mugger Crocodile (*Crocodylus palustris*).
- Mammals: Depending on the distance from the coast and the presence of nearby protected areas like Girnar Wildlife Sanctuary, you might also find mammals such as:
    1. Nilgai or Blue Bull (*Boselaphus tragocamelus*)
    2. Indian Golden Jackal (*Canis aureus indicus*)
    3. Indian Grey Wolf (*Canis lupus pallipes*)
    4. Jungle Cat (*Felis chaus*)
    5. Mongoose
    6. Indian Hare

CLIMATE ANALYSIS

VERAVAL (25Km from CHORWAD)

- **Location**: Holiday Home Palace, Chorwad, Gujarat (near Veraval)
- **Latitude/Longitude**: 21.03°N, 70.23°E
- **Climate Zone**: Composite (hot-dry in summer, warm-humid in monsoon, mild winter)

1. TEMPERATURE ANALYSIS

Data:

- **Max Temp**: 42.1°C (May)
- **Min Temp**: 11.9°C (January)
- **Mean Temp Range**: 22°C (Jan) to 29.9°C (June)

Design Challenges:

- High summer heat (Mar–June) → Thermal discomfort
- Cold nights in Jan → Slight insulation needed
- Large diurnal variation (day-night) in hot months

Inferences for Resort Design:

a) Use thermal mass (stone/brick) for stable indoor temps
b) Add roof insulation, light-coloured roofing, ventilated attic
c) Courtyards & terraces to enhance night-time cooling
d) Double-glazing or shading to reduce heat gain in rooms

Heating and Cooling Degree Days

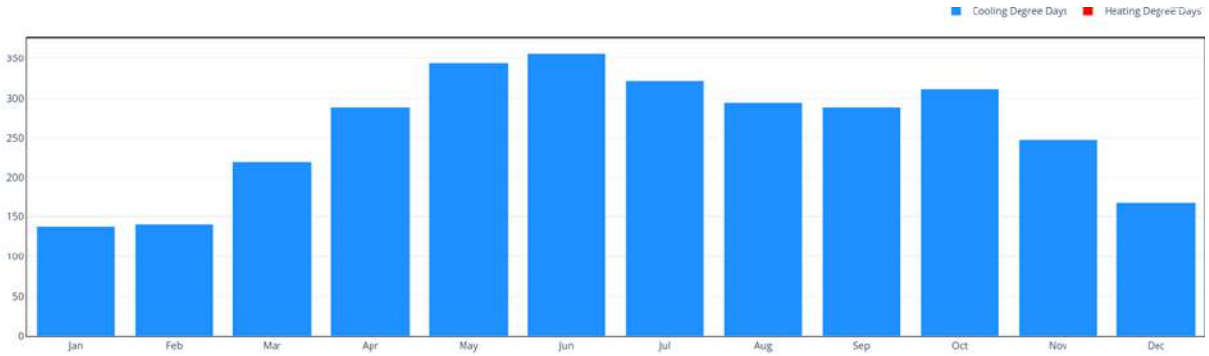


Figure 32Heating and cooling degree days

DRY BULB TEMPERATURE (YEARLY)

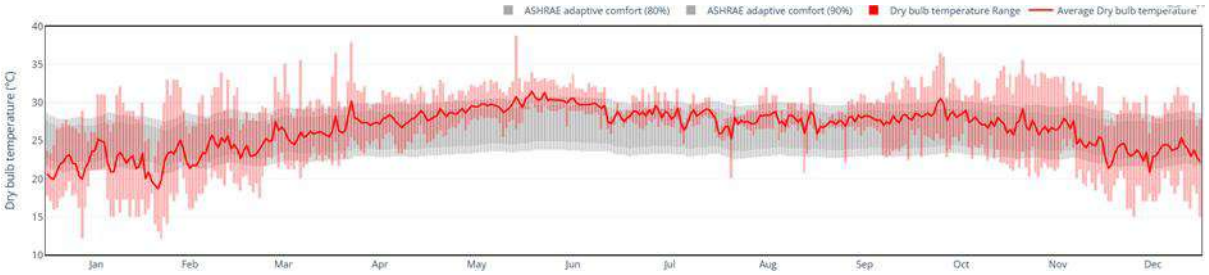


Figure 33Dry bulb temperature

WET BULB TEMPERATURE (YEARLY)

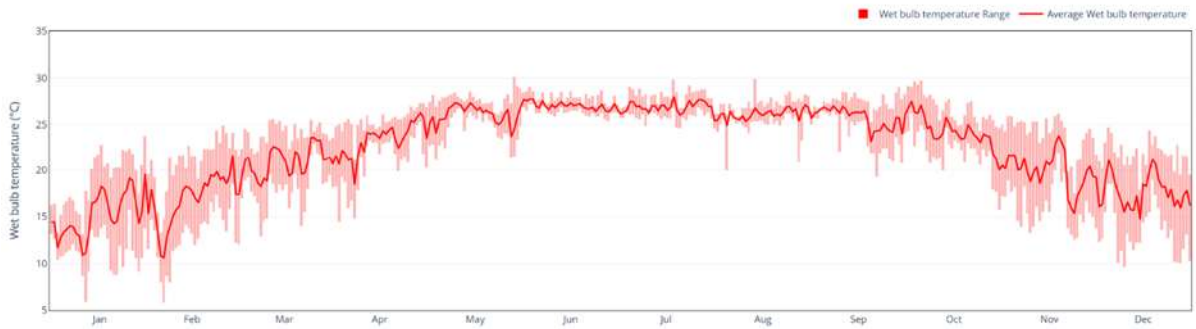


Figure 34wet bulb temperature

DEW POINT TEMPERATURE (YEARLY)



Figure 35Dew point temperature

2. HUMIDITY ANALYSIS

a) **Highest**: 89.7% (Aug)
b) **Lowest**: 35% (April)
c) Humidity rises from May and peaks in July–Sept

Design Challenges:

- Mold, condensation, mustiness in enclosed spaces during monsoon
- Reduced comfort due to high latent heat

Inferences:

- Use cross-ventilation and perforated elements like *jaalis*
- High ceilings, ventilation shafts

Use lime plaster, clay, and moisture-wicking materials

HUMIDITY (YEARLY)



Figure 36Humidity

3. WIND ANALYSIS

Data:

- **Summer Wind**: SW (Sea breeze)
- **Winter Wind**: NE (cool, dry)

Challenges:

- Need to optimize **natural ventilation** in hot/humid months
- Avoid **heat loss** in winter

Inferences:

- Orient courtyards and windows toward SW
- Avoid major openings on NE side in winter

Use **wind towers**, **vent blocks**, **louvres** for guided air flow

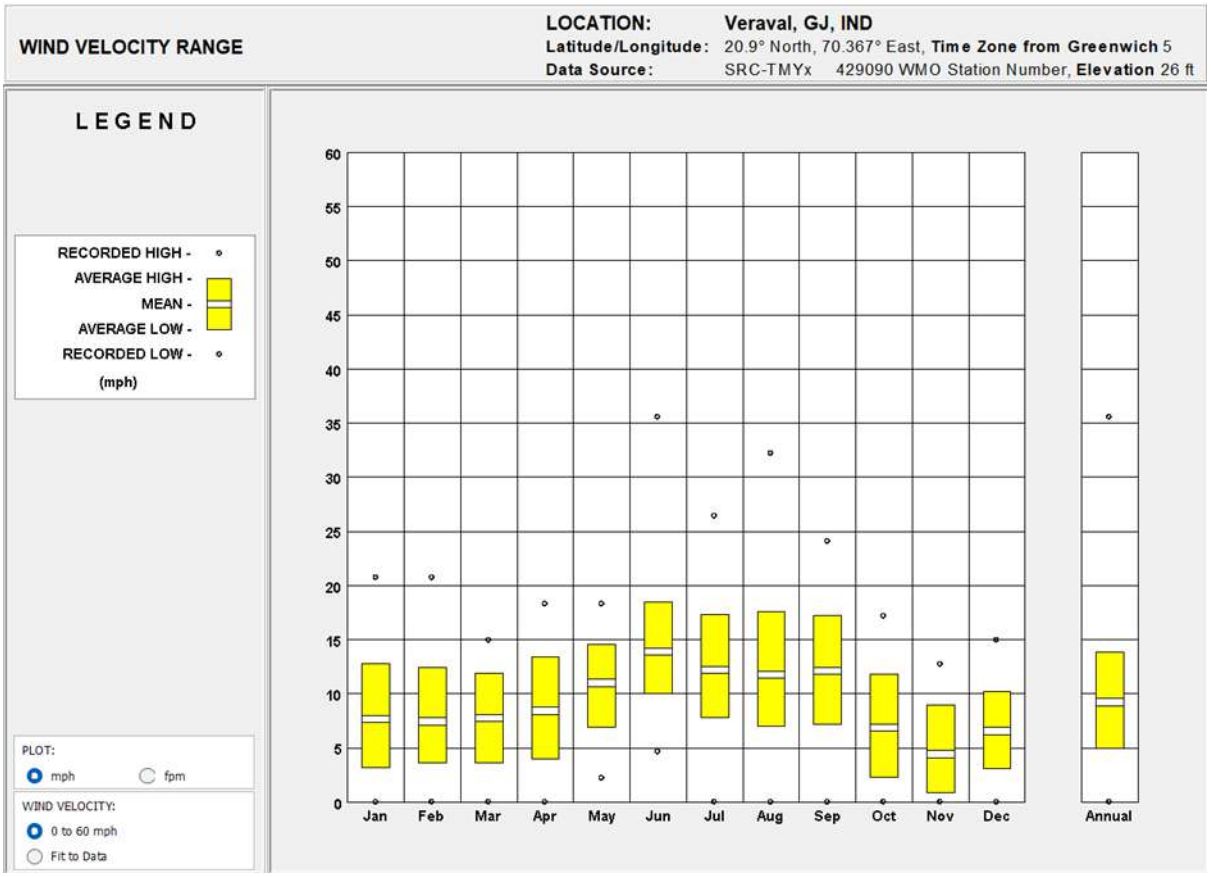


Figure 37wind velocity range

WIND ROSE (ANNUAL + SEASONAL)

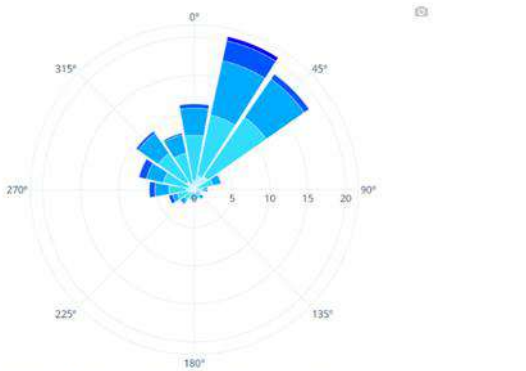
Observations:

- Summer: Predominantly **SW** (favourable for ventilation)
- Winter: **NE**, drier and cooler

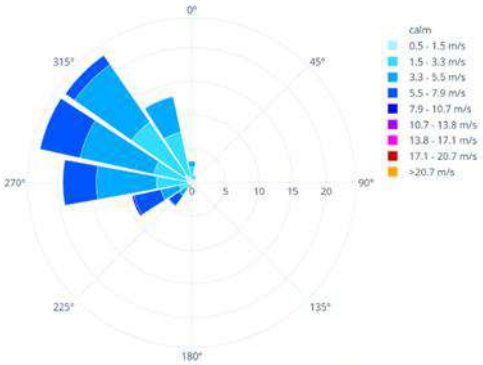
Inferences:

- Locate resort lounges, dining areas, verandas along SW-facing orientations
- Dense planting on NE sides for wind buffering in winter

SEASONAL WIND ROSE

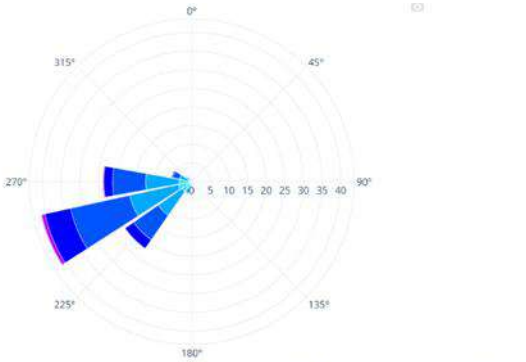


Observations between the months of Dec and Feb between 01:00 hours and 24:00 hours. Selected observations 2160 of 8760, or 24 %. 37 observations have calm winds.

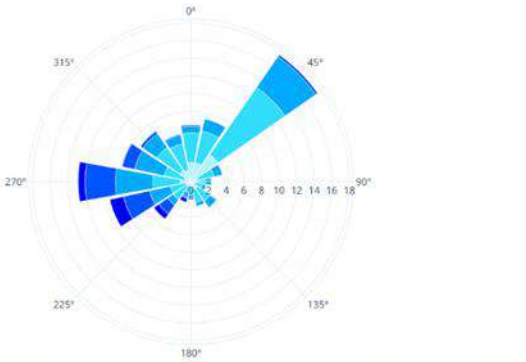


Observations between the months of Mar and May between 01:00 hours and 24:00 hours. Selected observations 2208 of 8760, or 25 %. 21 observations have calm winds.

Figure 38Seasonal wind rose

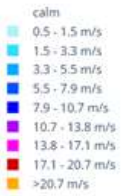


Observations between the months of Jun and Aug between 01:00 hours and 24:00 hours. Selected observations 2208 of 8760, or 25 %. 12 observations have calm winds.



Observations between the months of Sep and Dec between 01:00 hours and 24:00 hours. Selected observations 2928 of 8760, or 33 %. 88 observations have calm winds.





4. RAINFALL AND RAIN DAYS

Data:

- **Total Annual**: ~1100 mm (majority in July–Sept)
- **Peak Rainfall**: July (426 mm)

Design Challenges:

- Water stagnation
- Site flooding due to intense short-duration rainfall
- Soil erosion near coastal edges

Inferences:

a) Sloped roofs, deep overhangs, gutter systems
b) Rainwater harvesting tanks for utility use
c) Elevated plinths, well-drained paving
d) Use gravel channels, bioswales in landscaping

5. SOLAR RADIATION AND SUN PATH

Data:

- High sun angle in summer
- East & west façades get max exposure
- South walls get low sun angle (winter sun)

Challenges:

- Overheating on east & west walls
- Need daylighting without heat gain

Inferences:

a) Horizontal shading (chajjas) on south
b) Vertical fins/louvres on east & west
c) Integrate light shelves, clerestories, and skylights

Use solar control glazing or tinted glass

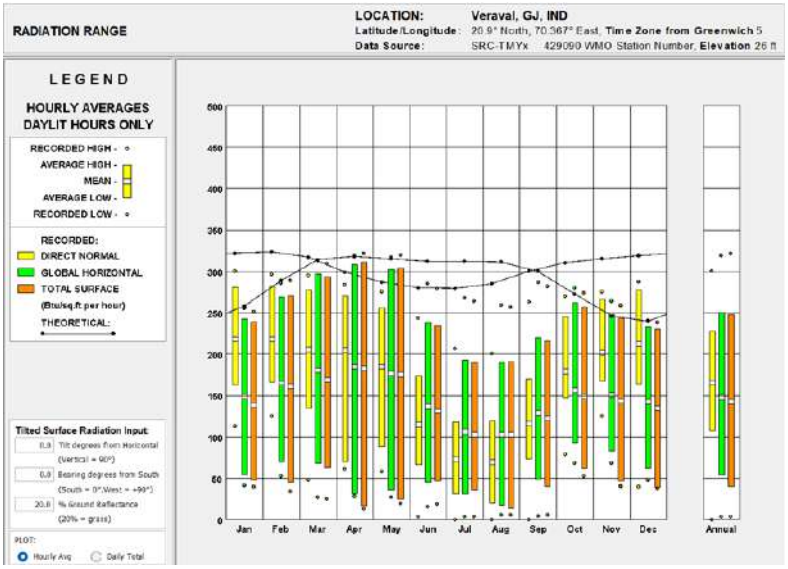


Figure 39Radiation range

SUN PATH

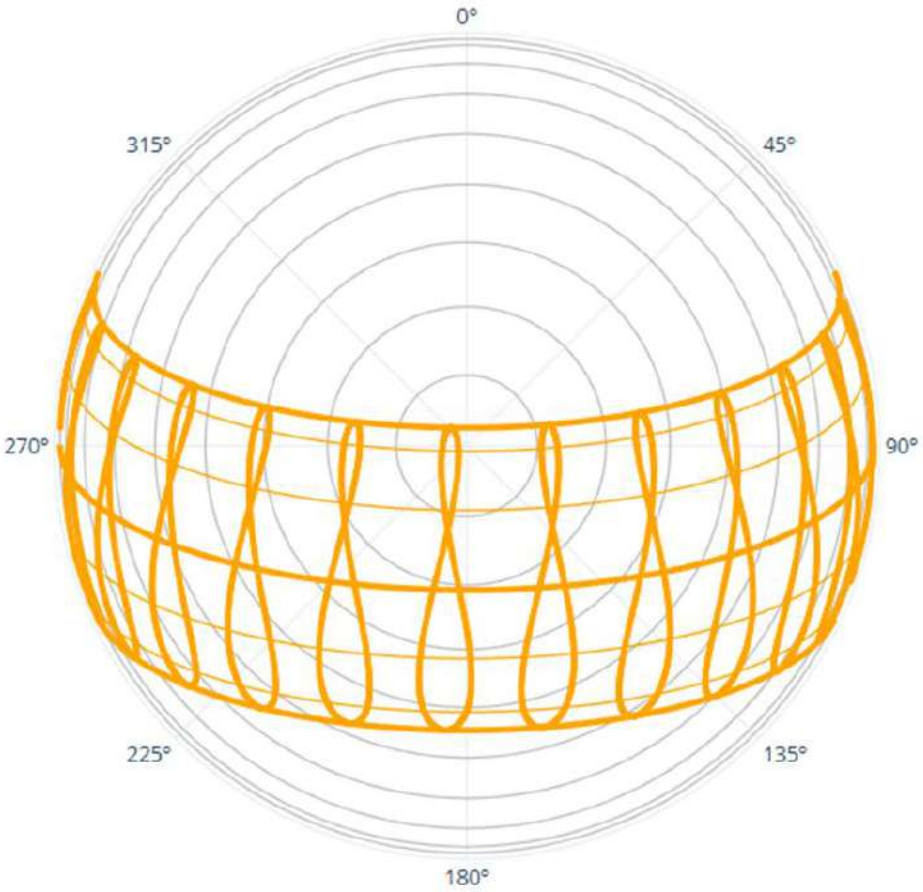


Figure 40Sunpath

6. CLOUD COVER & SOLAR AVAILABILITY

Data:

- July–Sept: cloudiest months → Reduced daylight
- Oct–May: mostly sunny

Inferences:

- Use daylight redirecting devices
- Incorporate skylights, light wells in shaded zones

CLOUD COVERAGE

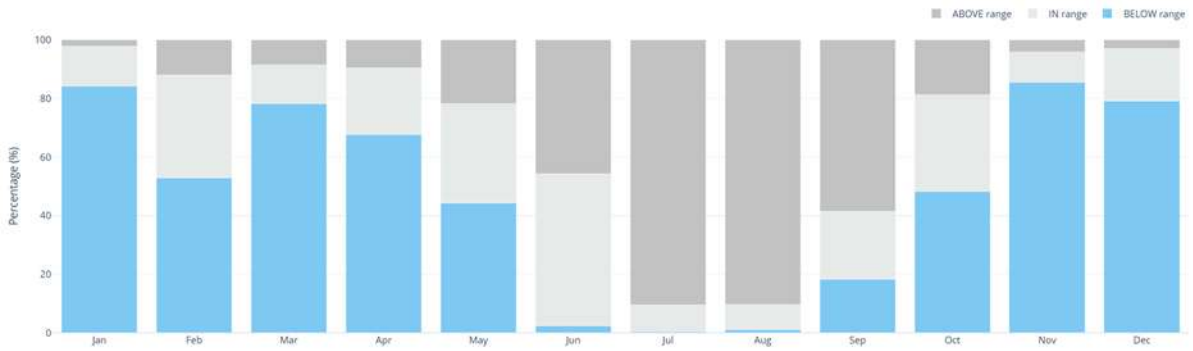


Figure 41Cloud coverage

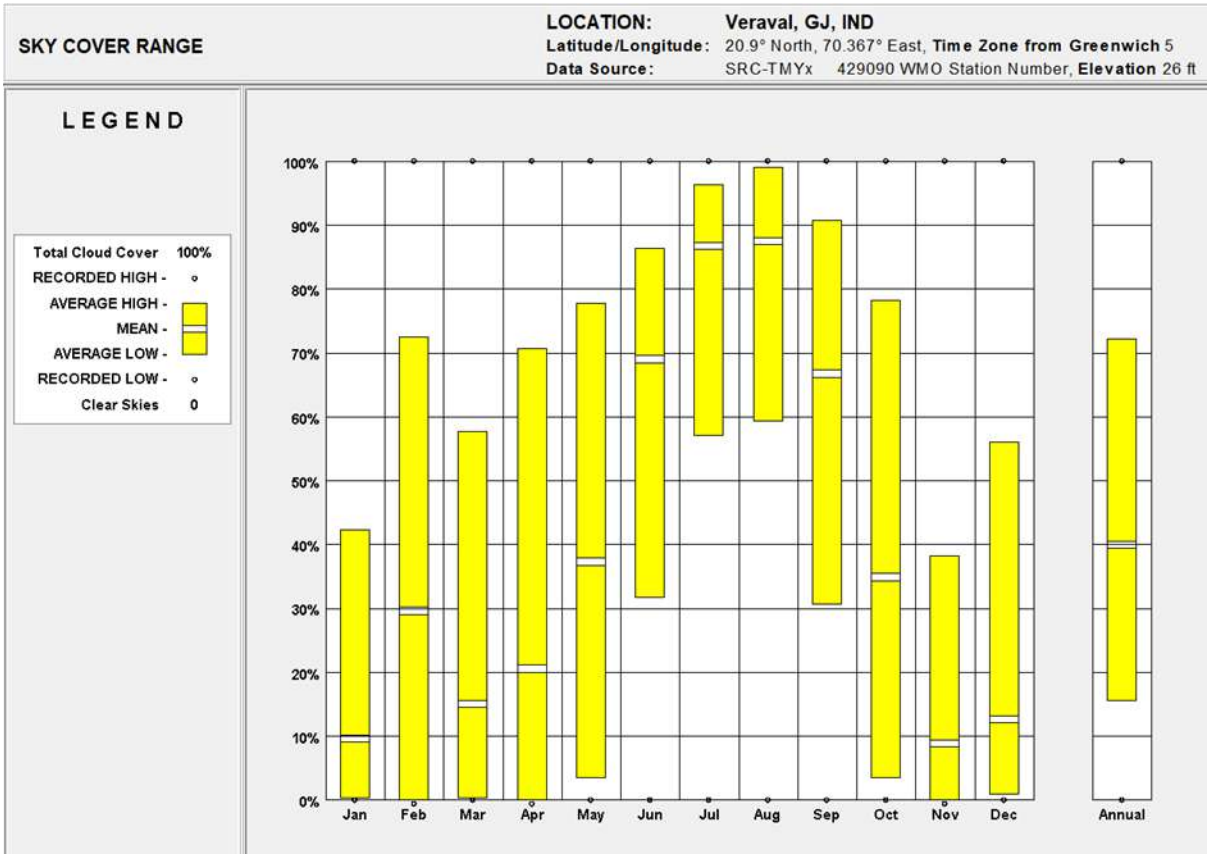


Figure 42Sky cover range

MAHONEY TABLE (Based on Monthly Data from Veraval)

Month	Mean Temp (°C)	RH (%)	Rain	Mahoney Zones	Inferences
Jan	22.23	48.5	No	Comfort (Dry Winter)	Slight heating, open design
Mar–May	25–29.1	70–78	No	Hot-Dry	Thermal mass, courtyards, shade
Jun–Sep	28–29.9	80–89	High	Warm-Humid	Cross ventilation, rain protection
Oct	28.1	74.5	Low	Transition	Combine both strategies

Nov–Dec	23–26	57–58	No	Cool-Dry	Light thermal mass, openable glazing

KEY INFERENCES FOR RESORT DESIGN:

1. Blend of cooling and ventilation strategies across seasons
2. Outdoor-indoor transitions via shaded verandas and pergolas
3. Maximized cross-ventilation for humid months
4. Rainproof but breathable design in monsoon
5. Use of traditional passive cooling: Jaali's, courtyards, water features
6. Materials should be locally sourced, moisture-resistant, and breathable

MAHONEY TABLE-BASED DESIGN GUIDELINES:

Parameter	**Recommendation**
Orientation	Long axis E-W to reduce sun on E/W walls
Openings	Moderate, with shading (louvers/chajjas)
Walls	Heavy (thermal mass) with light finishes
Roofs	Insulated, sloped with overhangs
Courtyards	Yes – shaded, vegetated, with water elements
Rain Response	High plinths, covered walkways, rainwater harvesting
Ventilation	Cross ventilation mandatory in all occupied spaces
Ground Surface	Permeable paving, grass or gravel to prevent runoff
Construction Material	Brick, stone, lime plaster, local laterite

DRAINAGE ANALYSIS



Figure 43Drainage analysis

SITE PHOTOS













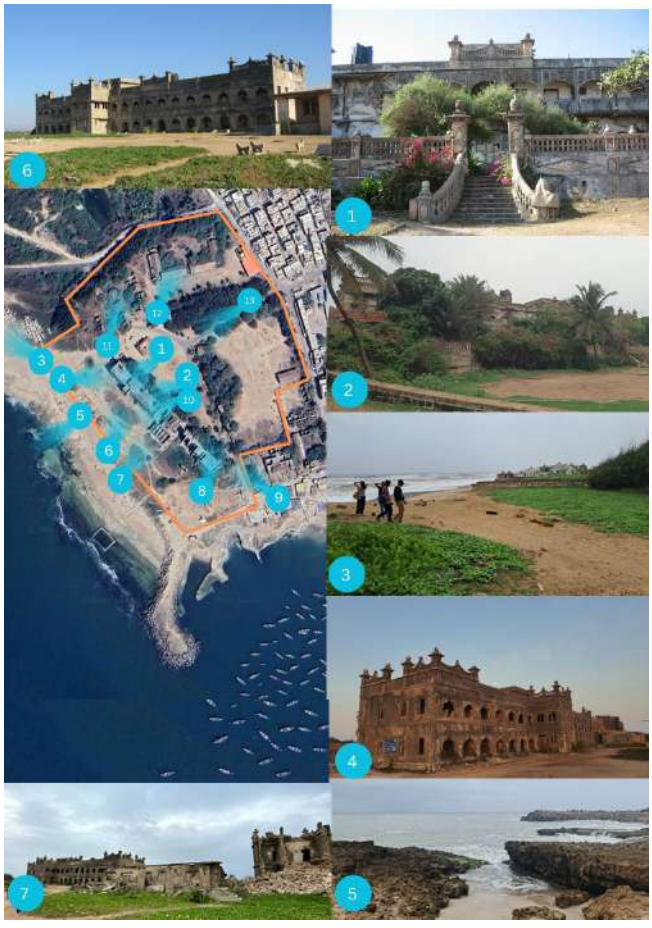




Figure 44Site photos

CASE STUDY & DESK APPRAISALS

OVERVIEW

This chapter analyses four case studies- Kohinoor Resort, Azzaro Resort, - chosen for their beachside locations, climatic responsiveness and integration of historical buildings/elements. Key aspects like site planning, architectural character, climate responsiveness, cultural integration and service planning were studied, providing valuable insights for designing a beachside resort in Chorwad.

CASE STUDY

5.1 KOHINOOR RESORT, DIU



Figure 45Kohinoor resort

OBJECTIVE OF THE CASE STUDY:

The objective of this case study is to analyze the architectural design, spatial planning, and functional aspects of Hotel Kohinoor, Diu, with a focus on its response to climate, cultural integration, and user experience. It aims to evaluate how the resort incorporates sustainable practices, aesthetic appeal, and efficient spatial organization to serve as a successful hospitality model in a coastal context.

LOCATION:

Hotel Kohinoor is situated in the Fudam (Fofrara) area along Nagoa Beach Road on the island of Diu, in the Union Territory of Dadra & Nagar Haveli and Daman & Diu, India. It sits directly opposite Azzaro Resort & Spa, roughly 4 km inland from Nagoa Beach and about 4 km from Diu Fort, offering strategic proximity to major attractions. The property is approximately 6.9–7.7 km from Diu Airport, making it an easy 12-minute drive by car. Located near landmarks such as the Kohinoor Water Park and Gangeshwar Mahadev Temple, the hotel blends accommodation with easy beach and heritage access, suitable for both leisure and pilgrimage visits.



Figure 46Kohinoor site plan

Location, The Kohinoor hotel

HISTORICAL CONTEXT:

Hotel Kohinoor is located in Diu, a former Portuguese colony with a rich maritime and architectural legacy. After Diu's integration into India in 1961, the region gradually developed as a coastal tourism hub. Established in the late 20th century, Hotel Kohinoor reflects this shift, offering modern hospitality while being situated near historical landmarks like Diu Fort and Gangeshwar Temple. Its presence in the Fudam area showcases the town's evolution from a colonial outpost to a growing tourist destination.



Figure 47The Kohinoor view

OWNER & ARCHITECT:

Owner: Yatin Fugro, a Goan entrepreneur and hospitality developer; the property is managed under Hotel Sea-View Pvt. Ltd.

Architect: Rudra Natekar – credited with designing the hotel's resort-style ambiance, blending Portuguese/Mediterranean motifs with local craftsmanship and coastal sensitivity.

Accessibility:

- **By Air:** Located just 4–5 km from Diu Airport
- **By Train: No railway station in Diu**, Nearest station: **Veraval Junction (~90 km)**.

- **By Road:** Well-connected by state transport and private buses**.**

Proximity to Attractions:

- **Naida Caves –** Around 2–3 km, one of the most popular caves on Diu.
- **Diu Museum & INS Khukri Memorial** – About 2 km away, located centrally in Diu town.
- **Diu Fort** – Roughly 2.5–3 km, a significant Portuguese-era landmark.
- **Nagoa Beach** – Approximately 3.6–5.8 km from the resort; less ideal for walking, better accessed via vehicle.

Surroundings and Context:

Hotel Kohinoor is situated in the calm Fudam area of Diu, along Nagoa Beach Road. Surrounded by greenery and low-rise development, it lies close to major attractions like Nagoa Beach, Diu Fort, and Gangeshwar Temple. The setting offers a quiet retreat with easy access to both the natural beauty and historical charm of the island, making it ideal for tourists seeking a balance of relaxation and exploration.



Figure 48The Kohinoor surroundings

Architectural Style:

Hotel Kohinoor features a Portuguese-inspired resort architecture, reflecting Diu's colonial heritage. The design includes arched windows, cream-colored façades, balconies (balcaos), and red-tiled roofs, creating a Mediterranean coastal village feel. The layout emphasizes courtyard planning, open spac**es**, and a central pool, blending heritage aesthetics with modern comfort and functionality.



Figure 49Building facade

Vernacular Elements:

Hotel Kohinoor incorporates several vernacular elements inspired by Diu's regional and colonial past. Features such as arched openings, balcaos (covered porches), sloping red-tiled roofs, and locally sourced materials reflect the traditional Portuguese-Goan architectural language. The use of courtyards, natural ventilation, and shaded walkways also aligns with the local climate and cultural context, blending modern resort design with regional identity.

Modern Design:

While rooted in heritage aesthetics, Hotel Kohinoor incorporates modern design elements to enhance guest comfort and functionality. These include well-planned circulation, spacious interiors, contemporary furnishings, and modern amenities like a swimming pool, banquet hall, and wellness facilities. The architecture subtly balances traditional forms with clean, functional layouts, offering a refined resort experience suited to present-day hospitality standards.

Eco-Friendly Practices:

Hotel Kohinoor adopts several eco-friendly practices to promote sustainability. These include the use of natural ventilation and lighting, landscaped green spaces that reduce heat absorption, and local materials in construction to lower environmental impact. Water-saving fixtures, rainwater harvesting systems, and basic waste segregation measures also contribute to eco-conscious operations, reflecting an effort to harmonize with Diu's sensitive coastal environment.

Inspiration:

Hotel Kohinoor draws inspiration from Portuguese colonial architecture and the coastal charm of Diu. The design reflects the island's historical roots, with features like arched windows, balcaos, and red-tiled roofs, reminiscent of traditional Goan and Diu houses. The aim was to create a resort that blends heritage with comfort, offering guests an immersive experience rooted in the local architectural identity.

Luxury:

Hotel Kohinoor offers a luxurious stay through its spacious rooms, elegant interiors, and premium amenities such as a swimming pool, banquet hall, fine-dining restaurant, and landscaped gardens. The blend of heritage-inspired design with modern comforts creates an upscale resort experience, appealing to both leisure travelers and business guests seeking refined hospitality in a serene coastal setting.




Figure 50 Luxury Rooms

AMENITIES:

Guest Amenities:

- Swimming pool (outdoor) with Jacuzzi for relaxation and recreation
- Splash Water World (on-site water park) and Footloose Discotheque for entertainment
- Casino-style nightlife and party lawn ("Bageecha") accommodating up to ~200–600 people for events and gatherings.



Figure 52Swimming pool



Figure 51Lawn

Business & Events:

- Fully air-conditioned conference hall seating 45–150 people in theatre style.
- Board room for smaller meetings or executive sessions
- Outdoor party lawn "Bageecha", ideal for weddings, social gatherings, or corporate events (200–600 capacity)




Rooms & In-Room Facilities

- 50 well-furnished guest rooms: Classic Deluxe, Royal Deluxe, Royal Executive, and Suites
- All rooms equipped with air-conditioning, satellite TV, mini-bar, safe, telephone, and free Wi-Fi.
- Attached bathrooms with hot and cold running water, complimentary toiletries, and daily housekeeping.

Construction and design features:

- Tiled sloping roofs and canopies to handle coastal rain and heat.
- Centralized layout: buildings arranged around common amenities like the pool and lawns.
- Multiple public amenities: discotheque, water park, spa, banquet hall, and pastry shop.
- Centralized layout: buildings arranged around common amenities like the pool and lawns.

Figure 53Conference room

Lighting & Ventilation

1. **Natural Lighting:**

- Large windows and verandahs allow ample daylight into rooms, reducing the need for artificial lighting during the day.
- Courtyards and open corridors are strategically placed to enable light penetration in inner spaces.

2. **Artificial Lighting:**

- Warm-toned lighting in common areas and guest rooms enhances comfort and hospitality.
- Emphasis on ambient lighting in the reception and lounge areas to create a welcoming mood.

Ventilation Design

1. **Passive Ventilation:**
    - Cross-ventilation is achieved through opposite-facing windows and open corridors.
    - Traditional courtyard planning encourages air movement within the building, especially in hot and humid climates like Diu.
    - The architecture borrows from Portuguese and coastal Indian styles, which favor natural ventilation over air conditioning reliance.
2. **Mechanical Ventilation:**
    - Air conditioning is used in rooms and banquet halls; however, natural airflow reduces HVAC load, improving energy efficiency.
    - Ceiling fans and ventilators support air circulation in semi-open spaces like balconies, dining pavilions, and lobbies.

Sustainability Methods:

- Low-rise bungalow layout reduces energy use (no elevators, less mechanical cooling).
- Courtyard and pool-centric planning promote natural ventilation and passive cooling.

- Large windows and open balconies support daylighting and reduce reliance on artificial lighting.
- Use of Portuguese colonial design possibly includes locally available materials, minimizing transportation emissions and supporting local craftsmanship.

Guest Experiences:

- Smooth check-in/out
- Activities: Swimming pool & Waterpark
- Dining: Local & global cuisine
- Events: Indoor/outdoor venues for weddings & conferences

Events



Figure 55Restaurant in The Kohinoor, Diu



Figure 54The Kohinoor hotel waterpark, Diu

Environmental and Cultural Integration:

- Portuguese-inspired colonial architecture reflects Diu's historical and cultural identity (arches, balconies, pastel façades).
- Event spaces and banquet halls support local cultural events, weddings, and festivals.
- Central swimming pool and open spaces support passive cooling and social interaction
- Low-rise bungalow layout allows better air circulation and reduces energy demand (no elevators needed).

SWOT ANALYSIS:

- **Strengths**

1. Portuguese colonial-style architecture creates a culturally rich and attractive ambiance.
2. Large landscaped area (3.5 acres) with lush gardens, lawns, and open spaces for events.
3. Multiple amenities: swimming pool, discotheque, water park, pastry shop, spa, and banquet hall.

- **Weaknesses**

1. **Aging infrastructure:** visible deterioration in bathrooms, rooms, and furnishings.
2. **Poor maintenance:** broken fixtures, mold issues, and outdated interiors.

- **Opportunities**

1. Renovation and modernization can revive the property and improve guest satisfaction.
2. Sustainability upgrades like solar panels, rainwater harvesting, and waste management can attract eco-conscious travelers.

- **Threats**

1. Strong competition from newer, better-maintained resorts like Azzaro or beachside properties.
2. Coastal wear and tear from Diu's saline environment can accelerate property degradation.

CASE STUDY INSIGHTS:

1. **Responding to Local Culture & Climate**: Designed in Portuguese colonial architectural style, with cream-hued façades, moldings, pilasters, trellises, balconies, and pillared porticoes—reflecting Diu's heritage and creating a strong sense of place.
2. **Bungalow Typology:** Built as single or low-rise bungalow clusters with individual balconies, encouraging privacy while maintaining visual openness around the pool core. This low-rise form helps reduce need for elevators, simplifies service circulation, and improves guest accessibility.
3. **Landscape & Amenity Integration:** Spread across 3.5 acres of lush gardens, lawns, and

outdoor event spaces—making available not only accommodation, but recreation zones like lawns for 600-person gatherings, a discotheque, water-park, spa, pool, pastry shop, and conference rooms.

APPLICATION TO THESIS

- Emphasize cultural identity and environmental consciousness.
- Design multifunctional, user-friendly spaces.
- Adopt detailed sustainability frameworks in resort planning.

5.2 AZZARO RESORT, DIU



Figure 56Azzaro Resort

OBJECTIVE OF CASE STUDY:

The objective of this case study is to analyze Azzaro, Diu as a sustainable and culturally responsive hospitality project. It aims to:

1. Understand the site context and how the design responds to the coastal environment of Diu.
2. Study the architectural planning, spatial organization, and integration of vernacular design elements.
3. Evaluate the use of local materials and sustainable practices like natural ventilation and rainwater harvesting.
4. Assess the user experience, circulation, and functionality of the resort.
5. Explore the project's contribution to local tourism, culture, and economy.

LOCATION:

Azzaro, officially known as *Azzaro Resort & Spa*, is located in the coastal town of Diu, which is part of the Union Territory of Dadra and Nagar Haveli and Daman and Diu, India. The resort is situated on Nagoa Beach Road in the Fudam area, directly opposite Hotel Kohinoor. It lies approximately 4 kilometers from Nagoa Beach and around 7 kilometers from the Diu Airport, offering convenient access for tourists. The location is also close to several key attractions such as the Diu Fort, Naida Caves, and Gangeshwar Mahadev Temple, making it a strategically positioned hospitality destination. Its placement near the Arabian Sea provides guests with scenic views and a coastal ambience, ideal for tourism and leisure activities.



Figure 57The Azzaro resort & spa, Location

HISTORICAL CONTEXT:

Portuguese Legacy: Diu was under Portuguese rule from 1546 to 1961, which left a lasting impact on the island's architecture, culture, and cuisine. The Portuguese influence is evident in structures like Diu Fort, St. Paul's Church, and various other colonial buildings. Azzaro Resort & Spa leverages this historical backdrop, providing guests easy access to explore these historical sites and immerse themselves in the island's unique Indo-Portuguese culture.

CLIMATE:

Diu enjoys a coastal climate influenced by the Arabian Sea.

1. **Temperature:** The weather is generally pleasant throughout the year.
    - Summer (March-May): Hot with temperatures reaching a maximum of 36°C.
    - Monsoon (June-September): South-west monsoon brings rain, but not as heavy as nearby South Gujarat. The average rainfall is around 560 mm per year, with July being the wettest month with an average rainfall of 311.68 mm and approximately 16 rainy days. Humidity averages close to 79% in July.
    - Winter (December-January): Mild with day temperatures around 20°C and nights around 15°C.

2. **Wind:** Diu is windy throughout the year. The average hourly wind speed in Diu experiences extreme seasonal variation. The windiest part of the year lasts for approximately 4 months, from May to September, with average wind speeds of more than 12.4 miles per hour. The windiest month in Diu is July, with an average hourly wind speed of 17.0 miles per hour. The predominant average hourly wind direction in Diu is from the west for most of the year.

3. **Topography**
    - Diu is a small island located near the coast of Kathiawad, separated from the mainland by a narrow channel or creek.
    - Elevation: The altitude of Diu is 6 meters above sea level. There are hillocks that reach a maximum height of 30 meters.
    - Terrain: The topography is generally plain with undulating dips like typical sand-dune deposits.
    - Coastal Features: Diu features several beautiful beaches, cliffs made of limestone, and bays. The beaches are not very deep, making them suitable for swimming and water sports

Accessibility:

- **By Air:** Located just 4–5 km from Diu Airport
- **By Train: No railway station in Diu**, Nearest station: **Veraval Junction (~90 km)**.
- **By Road:** Well-connected by state transport and private buses**.**

Proximity to Attractions:

- **Naida Caves –** Around 2–3 km, one of the most popular caves on Diu.
- **Diu Museum & INS Khukri Memorial** – About 2 km away, located centrally in Diu town.

- **Diu Fort** – Roughly 2.5–3 km, a significant Portuguese-era landmark.
- **Nagoa Beach** – Approximately 3.6–5.8 km from the resort; less ideal for walking, better accessed via vehicle.



Figure 58Azzaro amenities

CONCEPT AND DESIGN PHILOSOPHY:

Architectural Style A blend of elements designed to create a luxurious and comfortable experience, drawing on both modern aesthetics and local context Embodies Victorian and Colonial architectural styles, characterized by pitched roofs, wooden flooring, period-style furnishings, and intricate detailing. The heritage character is maintained through the restoration of original elements and the use of antique décor.

Design Theme

Surrounded by a wide range of green land, Azzaro offers you peaceful, soothing and refreshing view. With gracious hospitality and courteous staff, experience the luxury and make your stay memorable. Every benefit clubbed together, Azzaro in Diu makes in for a perfect beach destination to get away from the hustle of the city.

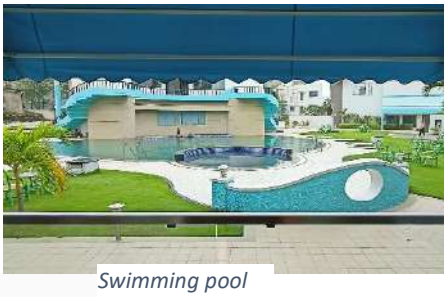
MASTER PLAN AND ZONING



Private Party Space



Water tank tower



Swimming pool



Restaurant



Deluxe Rooms

Figure 59Azzaro site plan and zoning



Entrance



Lawn



Game zone

CIRCULATION:



Figure 60Azzaro site plan .

AMENITIES:

- **Swimming Pool –** Large outdoor pool with sun loungers and poolside service.
- **Spa & Wellness Center** – Full-service spa offering massages, therapies, and sauna.
- **Restaurant & Bar** – Multi-cuisine restaurant and a bar serving Indian, continental, and local dishes.
- **Free Wi-Fi** – Available in rooms and public areas.
- **Parking Facility** – Free private parking for guests.
- **Fitness Center** – Basic gym equipment available for guest use.

LANDSCAPE DESIGN:

- **Poolside Landscaping**: The swimming pool is a central feature, and the surrounding lawns contribute to its beauty, especially at night with thoughtful lighting. This suggests a deliberate effort to integrate the pool area with the natural surroundings.

ROOM TYPOLOGIES:

- **Total Rooms:** There is a total of 38 rooms at the resort.
- **Room Distribution:** These 38 rooms are spread across 1 floor.
- **Club Royal Rooms**: There are 36 Club Royal rooms.
- **Size:** Each Club Royal room is 225 sq. ft (21 sq. mt).
- **Occupancy:** Standard occupancy for a Club Royal room is 2 adults, and 1 extra guest can be accommodated.
- **Suites**: There are 2 luxurious suites.
- **Beds**: Rooms are equipped with King-sized beds. Some sources also mention the possibility of a sofa-cum-bed.



Figure 61Azzaro amenities

CONSTRUCTION AND DESIGN FEATURES:

Exterior Features:

- **Architecture:** Fusion of Portuguese colonial and modern tropical styles.
- **Structure:** RCC frame with local stone, brick masonry, and lime plaster.
- **Roofing:** Sloped tiled roofs with Mangalore tiles for thermal protection.
- **Open Spaces:** Courtyard layout, verandahs, shaded walkways, and landscaped gardens**.**
- **Landscaping:** Native plant species, water features, and paved stone pathways.

Interior Features:

- **Style:** Elegant, minimalist design with natural finishes.
- **Materials:** Use of wood, terracotta, and stone flooring for warmth and durability.
- **Furniture:** Locally crafted wooden furniture with soft furnishings.
- **Lighting:** Soft ambient lighting with natural daylight emphasis.
- **Decor:** Elements of local art, cultural motifs, and traditional crafts.

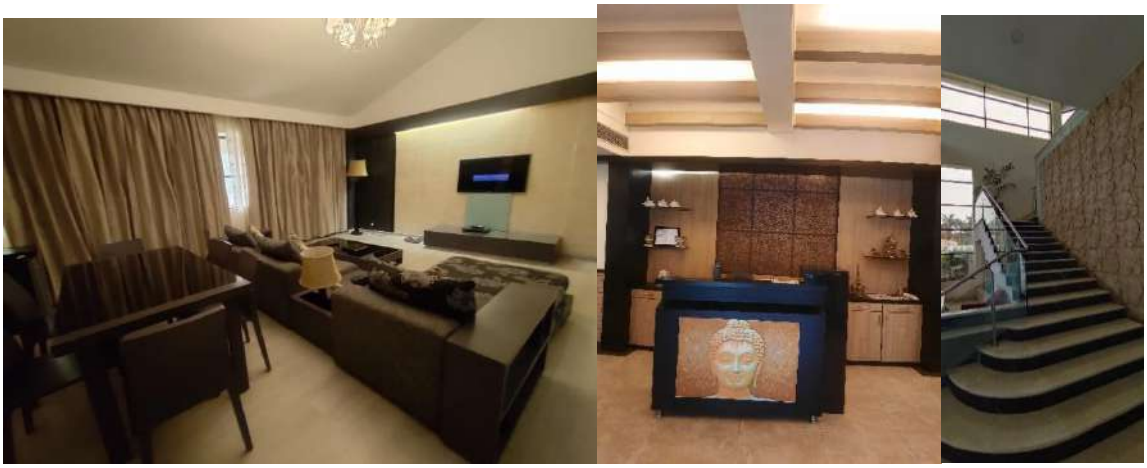


Figure 62Azzaro interior

Sustainable Design Method:

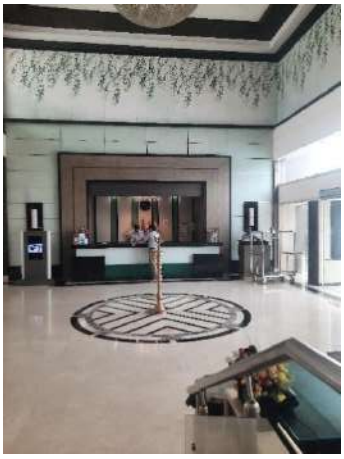
- **Low-Rise Construction:** Spreads horizontally rather than vertically, reducing energy load on lifts and elevators (though it lacks lift access).
- **Natural Lighting:** Rooms and public areas designed with large windows and open spaces, allowing for maximum daylighting and reduced artificial lighting during the day.
- **Courtyard and Pool-Centric Planning:** Central pool and open courtyards enhance natural ventilation and passive cooling, reducing dependence on air conditioning.

Lighting & Ventilation:

- Large windows, verandahs, and courtyards allow abundant daylight, reducing dependency on artificial lighting during the day.
- Indoors, the resort uses warm**,** energy-efficient LED lights to create a cozy and inviting atmosphere.
- Rooms and common areas are planned with openings on opposite walls to allow natural airflow, keeping interiors cool without full-time air conditioning.
- Tall ceilings, shaded balconies, and pergolas help regulate temperature and circulate fresh air.







GUEST EXPERIENCE:

- **Check-In/Out:** Efficient with express service options.
- **Recreation:** Games room, children's play area, tea boutique, library, and fitness center.
- **Dining:** Multi-cuisine restaurant and in-house bar with ambient settings.

EVENTS:




Figure 63Azzaro convention hall

ENVIRONMENTAL & CULTURAL INTEGRATION:

- Use of locally sourced stone, lime plaster, and terracotta reduces environmental impact and supports sustainability.
- Incorporates native plants and water features, blending built form with the natural surroundings.

- Rainwater harvesting, water-efficient fixtures, and waste segregation contribute to a low ecological footprint.
- Combines Portuguese colonial elements with contemporary design, reflecting Diu's rich heritage.
- Interiors showcase local craftsmanship, handmade furniture, and traditional art.
- The resort offers regional dishes and cultural experiences that connect guests to the local lifestyle.

SWOT ANALYSIS:

1. **Strengths**
   - Spacious, pool-facing rooms in a well-laid-out resort across ~10 acres, providing a pleasant ambiance and greenery.
   - Good food (especially breakfast) and decent hospitality highlighted in several reviews.
2. **Weaknesses**
   - Maintenance issues are common: broken tiles, chipped fittings, mold, leaks, faulty geysers—leading to discomfort.
   - No lift—but multiple floors, inconvenient for senior guests or families with luggage.
3. **Opportunities**
   - Renovation and improved infrastructure would significantly boost guest satisfaction—especially in bathrooms, corridors, and communal spaces.
   - Staff training and service upgrades could deliver a more consistent, welcoming experience.
   - Expanding menu options, adding seafood or more cuisine variety, would add value. Several reviews cite limited food choices.
4. **Threats**
   - Competition from newer, better-maintained resorts in Diu where guests expect higher standards at similar or lower rates.
   - High pricing relative to quality leading to poor value perception: many guests felt it's overpriced given current condition.

CASE STUDY INSIGHTS:

- **Importance of Long-Term Maintenance-Friendly Design:** Choosing weather-resistant materials (especially in humid coastal regions like Diu), and ensure the design allows for easy repair and access to plumbing, electricals, etc.
- **Integration of Nature and Built Form:** Design should blend built spaces with nature—gardens, water bodies, and open courtyards can create a luxurious yet calm environment.
- **Room Orientation & Views Enhance Luxury:** Orienting rooms towards best views (sea, garden, pool) using passive design principles (e.g., natural light, cross ventilation).
- **Coastal Context Awareness:** Using marine-grade materials, and design for wind shading and thermal comfort using pergolas, overhangs, and shaded courtyards.

- **Designing for Memory & Identity:** Design should reflect local materials, crafts, and architectural language to make it memorable and authentic, vernacular architecture fused with modern luxury (e.g., Portuguese colonial or Saurashtra coastal influences in Diu).

APPLICATION TO THESIS:

- Emphasize cultural identity and environmental consciousness.
- Design multifunctional, user-friendly spaces.
- Adopt detailed sustainability frameworks in resort planning.

5.3 RAVIZ GOTEL AND RESORT, KOVALAM, KERALA

Objective of the Case Study:

The objective of the case study of Raviz Kovalam Resort, Kerala is to examine how the resort was designed to transform Kovalam from a relatively unknown beach into a major resort destination, while preserving and enhancing the site's natural beauty and supporting future growth. The project, commissioned by the Government of India and designed by Charles Correa.

Location:

It is located in Kovalam, Kerala and designed by Charles correa. Its site area is about 64.5 acres and buildup is 31,525 sqm. To initiate one of the India's most spectacular beaches as a major beach resort area. The master plan does not concentrate all the facilities in one area, but generate a large number of potential growth points, thus allowing a more flexible response to future demands. The resulting concept was a large mass, sloping towards the sea, ensuring each room had a frame to the breathtaking view that lay in front.

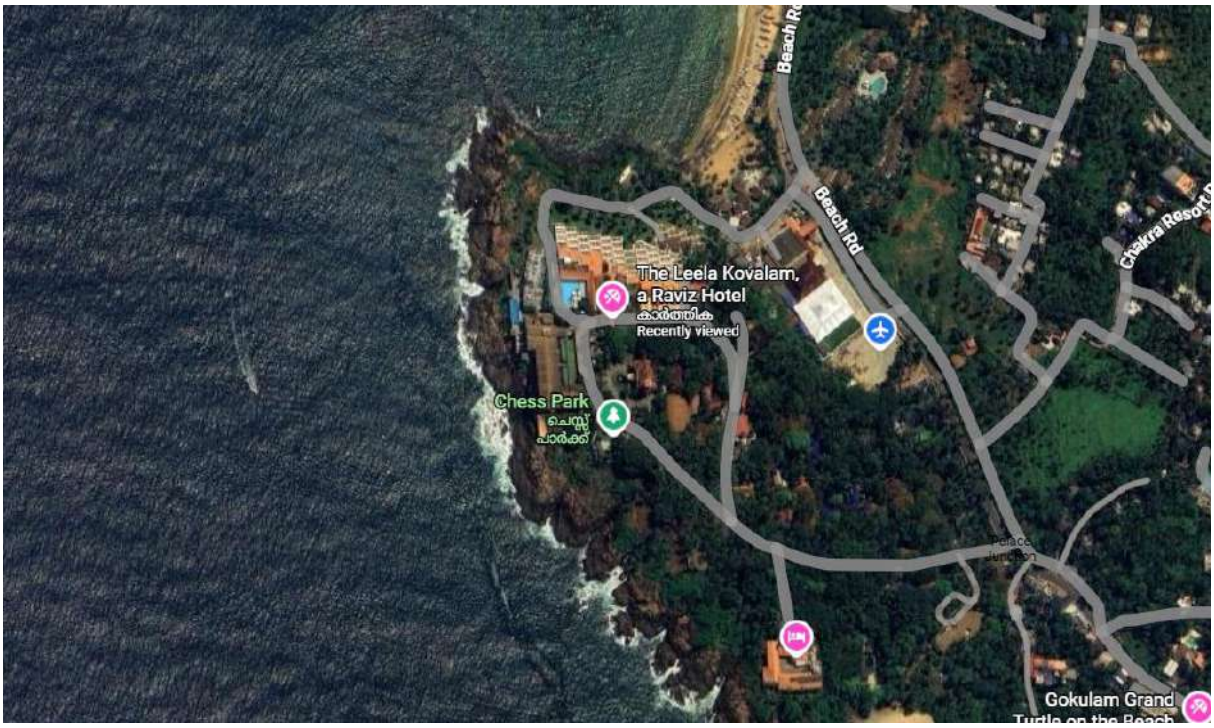


Figure 64Location, The Raviz Kovalam

Historical Context:

- Originally built as the India Tourism Development Corporation’s Ashok Hotel, the resort—designed by legendary architect Charles Correa—opened on December 17, 1972, becoming Kerala’s first five-star beach

resort and igniting Kovalam's transformation from a sleepy fishing village into an international tourist destination

- It incorporated the historic Halcyon Castle (Kovalam Palace)—built in 1932 as a summer retreat for the Travancore royal family—which later changed hands to the RP Group in 2017 and was sensitively restored as part of the resort grounds
- In 2005 it was rebranded as The Leela Raviz Kovalam under the Leela Group and acquired in 2011 by industrialist B. Ravi Pillai's RP Group, which continues to operate it today as India's only clifftop 5-star beach resort

Owner & Architect:

- The resort is owned by the RP Group, founded and chaired by Dr. B. Ravi Pillai (born September 2, 1953), a



Figure 65The Raviz hotel and resort

Dubai-based Indian billionaire and industrialist from Kerala.

- The resort was originally designed by the acclaimed Indian architect Charles Correa (1930–2015), who conceived it in the early 1970s as a sloping-terrace cliff-top structure that seamlessly integrates with the coastal landscape. This design—then under ITDC as the Ashok Hotel—set a template for modern luxury in India's coastal resorts.

Accessibility:

- From Airport: About 13–15 km from Thiruvananthapuram International Airport, roughly a 20-minute drive by taxi.
- From Railway Station / City Centre: 10–16 km to city centre or Trivandrum Central station—accessible by taxi, auto-rickshaw which takes about 30 minutes.
- Within Resort: Cliff-top location with multiple wings; Pavilion Wing offers direct beach access, while other wings use golf carts or short walks along a lane to reach the shore

Proximity to Attractions:

Attraction	Approx. Distance
Lighthouse Beach / Hawa Beach / Samudra Beach	0.3–1.7 km (walking or 5 min drive)
Kerala Arts & Crafts Village	~1.7–2.7 km
Vellayani Lake	~3 km
Vizhinjam Beach & Rock-Cut Temple	~2–3.6 km; temple open 9 AM-6 PM (closed Mondays)
Thiruvallam Parasurama Temple	~6 km south, on Karamana River
Padmanabhaswamy Temple / East Fort area / Chalai Market / Napier Museum / Zoo	Located in Thiruvananthapuram ~10–12 km away

Surroundings and Context: Stepped interlocking of spaces and open to sky, vernacularism. Views Correa incorporated this local wisdom of natural ventilation in the Kovalam Beach Resort. Additionally, in order to preserve the natural beauty of the site, the facilities are all built into the hill slopes. The construction is entirely inthe Traditional style of Kerala—white plastered walls with red tiled roofs. Other pavilions consist of light bamboo chhatris with coir matting on the floor and local Kerala handicrafts.

Architectural Style: Modern Tropical Architecture:

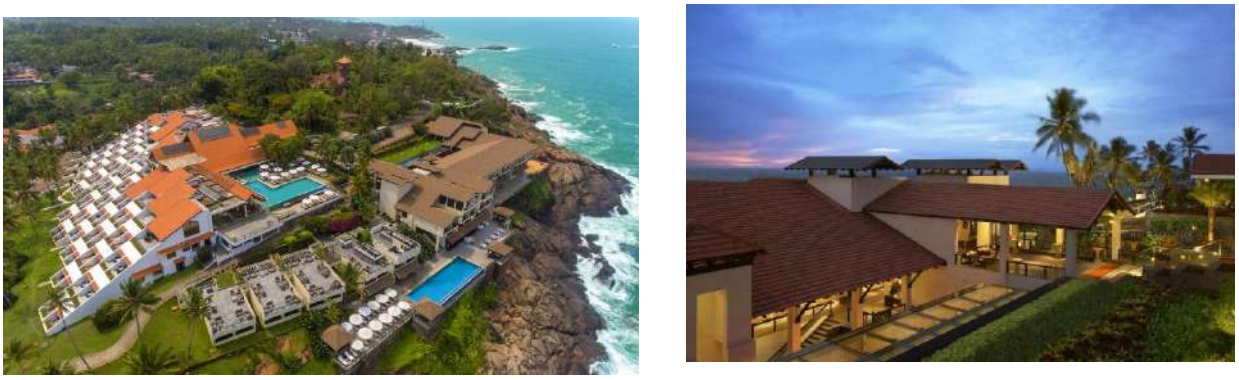


Figure 66The raviz hotel & resort surroundings

- The design embraces open courtyards, sloped tiled roofs, and natural materials suited for Kerala's coastal climate—blending modernism with regional vernacular elements.
- **Site-Sensitive Cliffside Design**: Built into the cliff overlooking the Arabian Sea, the resort follows the contours of the land, offering panoramic sea views from almost every room while maintaining harmony with the landscape.

- **Traditional Kerala Influence**: Subtle references to Kerala's architectural heritage—like inner courtyards, wooden latticework, and local motifs—are integrated into a contemporary luxury resort format.

Eco-Friendly Practices:



Figure 68Traditional Kerala style



Figure 67Sea sensitive cliffside design

- **Climatic Responsiveness**: Designed with natural ventilation, shaded corridors, and overhangs, the resort reduces reliance on mechanical cooling—minimizing energy use in the hot, humid climate.
- **Use of Local Materials**: The resort incorporates locally sourced laterite stone, timber, and terracotta tiles, reducing the carbon footprint of construction and blending naturally with the coastal environment.
- **Landscape Preservation**: The original design respected the natural cliff terrain and native vegetation, allowing the architecture to integrate seamlessly with the landscape without major alterations to the ecosystem.

Accommodation:

Accommodates 300 guests, the guest rooms come in 3 configurations:

- On the edge of the beach hidden under the palm trees, they are suites for longer stay with cooking facilities etc.
- 2. Overlooking the beach there are 100 guests' rooms. here the facilities are such that every room gets its own private sundeck and the rooms itself have been cut into the hill. He has used the slope to create the various stories of the resort. The rooms are accessed from the interior of the slope, and then open out towards the view of the sea
- 3. Between these two there are hotel type rooms having the view of the sea.

Beach view rooms

This is a beach view rooms sits on a cliff offering panoramic views of Kovalam shoreline. Stepped terrace that leads visually to the beach. The roofs form a uniform slope on the facade, leaving only the sundecks exposed. Functionally, this pyramid-like structure also allows each room to be well ventilated and well-lit providing a view towards the sea.

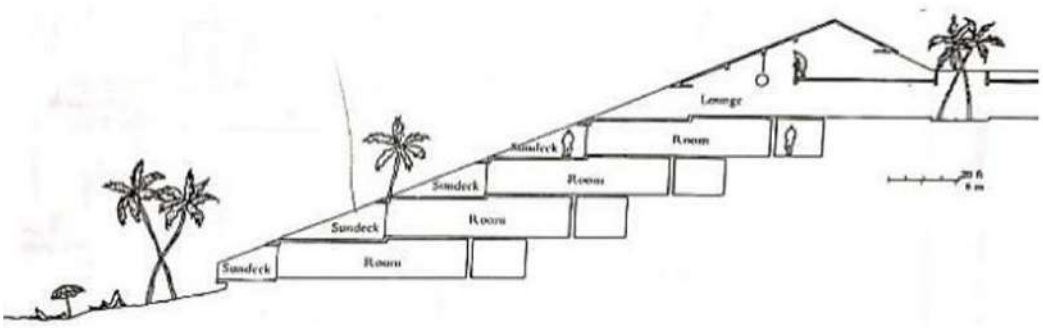


Figure 69Raviz beach view rooms

Section

Club suite: A club suite is nearly twice the size of a club room. The extra space is taken up with expanded work spaces, five – features daylight bathrooms and private decks with sun beds. The suites are spacious, luxurious and other

contemporary luxury in a spacious, open setting. Each suite is part of the Leela.Kovalam club an exclusive hotel within a hotel and use of the gym and ocean rim infinity pool. Complimentary use of gym and ocean rim infinity pool.

Room size: 840 sq. ft

Location: The club

View: Ocean



Figure 70Club suite

Presidential suite:

A two-bedroom suite (king sized beds) with separate living cum dining area. Figure 3. 6 Views Figure 3. 5 Isometric views Dramatically sited on a rocky ledge with private sun decks – just a short walk from the beach. A blend of local tropical architecture and contemporary modern makes these fully equipped rooms both relaxing and functional.

Size: 1506 sq ft

Location: The club

View: Ocean

Presidential suite:

A two-bedroom suite (king sized beds) with separate living cum dining area. Figure 3. 6 Views Figure 3. 5 Isometric views Dramatically sited on a rocky ledge with private sun decks – just a short walk from the beach. A blend of local tropical architecture and contemporary modern makes these fully equipped rooms both relaxing and functional.

Size: 1506 sq. ft

Location: The club

View: Ocean.

Duplex suite:

Perhaps the ultimate in ocean – front luxury, this two-level suite features a living room and private balcony on one level with an opulent bedroom upstairs looking out over the Arabian Sea. The suites come with exclusive access to fine dining, spa and fitness centre, ocean rim infinity pool and library with cigar room. Each suite is part of the Leela Kovalam club, an exclusive hotel within a hotel land use of the gym and ocean rim infinity pool.

Size: 1291 sq., ft

Location: The club

View: Ocean

Club room:

Ocean The club rooms offer a superior level of comfort and service. Each room is equipped with a stocked private bar, plasma tv, DVD and Wi-Fi among a list of extras. The views of the Arabian Sea are stunning while the rooms offer a relaxing, stylish environment. Highly functional work stations and daylight bathrooms are just part of the package. Each club room is part of the Leela Kovalam Club, an exclusive hotel within a hotel. Room

Size: 385 sq. ft

Location: The club

View: Ocean

Garden view rooms:

The ultimate in privacy and relaxation. These rooms are located on the beach level and are separate from the main block. Private sun decks open to manicured lawns leading to a short walk to the beach. Each room is equipped with a stocked private bar, Wi-Fi and a list of extras.

Size: 474 sq ft

Location: near the beach





View: Garden

Figure 71Garden view

The Bar:

The view here is out over the pool to the beach and beyond making the light filled bar a natural meeting place.



Figure 72Raviz hotel& resort Bar

Spa / Salon:

The Divya spa is an extraordinary building occupying 8000 square feet right on the cliff top. Divya itself means “light” and it light that defines and inspires everything here from the rooftop yoga. The primary focus of the spa is on Ayurveda treatments with 3 doctors and 20 therapists. The experience is personal and unique. Medicinal plants come fresh from the spa greenhouse.

Dinning:

The Terrace - The terrace sits between sea and sky opposite the infinity pool.

The Sky bar - sky bar is perched on the cliff top, making it one the great locations along the coasts to watch the sun set.

The Tides - The open air, a thatched roof and a fresh seafood grill make eating by the beach a breeze.

The Café at the Club - Interior café with no view







Figure 73Dining spaces

Construction and design features:

- **Terraced Cliff-Side Layout:** The resort is built along the natural slope of a cliff, allowing tiered structures that offer uninterrupted views of the Arabian Sea from most rooms and public spaces.
- **Blending Indo-Modern Architecture:** Designed by Charles Correa, the resort combines modernist spatial planning with traditional Kerala elements like open courtyards, sloping tiled roofs, and verandahs.
- **Integration of Kovalam Palace (Halcyon Castle):** The historic royal retreat from 1932 is preserved within the resort complex, now restored and used as a premium heritage wing—offering guests a blend of colonial-era architecture with modern luxury**.**

Lighting & Ventilation

- **Natural Ventilation & Cross-Breeze Design:** The resort's layout—with open corridors, large windows, and shaded verandahs—allows for effective cross-ventilation, reducing the need for air-conditioning in many public areas.

- **Abundant Daylighting:** Architectural elements like skylights, inner courtyards, and open-air pavilions bring in ample natural light, enhancing interior brightness while cutting down on artificial lighting during the day.
- **Climatic Orientation:** Buildings are oriented to face the sea and are designed with deep overhangs and pergolas that provide shade and reduce solar heat gain, improving thermal comfort and energy efficiency.

Sustainability Methods:

- **Water Conservation & Rainwater Harvesting**: The resort integrates rainwater harvesting systems and efficient plumbing fixtures to reduce freshwater consumption and promote sustainable water use.

- **Eco-Friendly Landscaping**: Native and drought-resistant plants are used in landscaping, minimizing irrigation needs and supporting local biodiversity while preserving the natural coastal ecosystem.

- **Energy Efficiency**: The resort employs LED lighting, solar heating systems**,** and passive cooling techniques (like natural ventilation and shading) to reduce energy consumption and carbon emissions.

Guest Experiences:

- **Warm, Personalized Hospitality:** Guests consistently praise the staff for their exceptional service—from thoughtful gestures like anniversary room décor or complimentary refreshments to anticipating individual preferences. Reviewers often mention attentive staff like Rekha Nair, Kumar, and pool attendants, who delivered a truly memorable stay
- **Spectacular Coastal Settings & Relaxation Zones:** The resort's private cliff-top infinity pools, beach houses, and terrace/sunset bars offer breathtaking views of the Arabian Sea. Especially highlighted are the Royal Club rooms with exclusive pool and lounge access, ideal for peace and panoramic sunset views**.**

- **Holistic Wellness & Unique Leisure Offerings**

The in-house Ayurvedic spa—often described as among the best in Kerala—offers traditional treatments in serene settings, complete with guided yoga and beachside meditation. Activity options include boutique kids' playrooms, buggy services, and curated local excursions designed for immersive experiences**.**

SWOT Analysis:

Strengths

- Prime Cliff-Top Location with panoramic Arabian Sea views and direct beach access—unique among Indian coastal resorts.
- Heritage Integration with Kovalam Palace and design by Charles Correa adds cultural and architectural value.
- High-End Amenities & Personalized Service including Ayurvedic spa, Royal Club, infinity pools, and exceptional staff hospitality.

Weaknesses

- Limited Public Transport Access—reliance on taxis or private vehicles from Trivandrum city.
- Seasonal Demand Fluctuation, with off-season (monsoon) potentially affecting occupancy and beach activity.

Opportunities

- Eco-Tourism & Wellness Expansion by promoting sustainable retreats and Ayurvedic packages for global health-conscious travelers.
- Cultural Programming & Events leveraging the palace setting for destination weddings and local festivals.

Threats

- Coastal Erosion & Climate Change may threaten the cliffside structures and beach ecosystem.
- Rising Competition from newer luxury resorts in Kerala and Goa offering modernized experiences at competitive prices.

Case study insights:

1. **Design with the Land, Not Against It**

- The resort's terraced cliff-side layout by Charles Correa respects the natural slope and contours of the site, offering sea views without aggressive land alteration—an ideal model for sustainable coastal design.

2. **Blend Tradition with Modern Luxury**

- The integration of Kerala vernacular elements (like tiled sloped roofs, courtyards, and verandahs) with modern materials and planning creates a culturally rooted yet globally appealing resort.

3. **Climate-Responsive Architecture**

- The use of natural ventilation, shaded walkways, and passive cooling techniques shows how local climate can shape energy-efficient and comfortable guest experiences without overreliance on artificial systems.

5.4 LE PONDY BEACH RESORT – PONDICHERRY, TAMIL NADU

Location:

The resort is located on Lake View Road, at Nallavadu Post, Pudukuppam, in Pondicherry, a coastal union territory in South India known for its French colonial heritage and serene beaches. Positioned between the Paradise Beach backwaters and the Bay of Bengal, the site offers tranquil lake views on one side and private access to a pristine stretch of beach on the other. Its location is well-connected via Lake View Road, making it easily accessible from both central Pondicherry (approx. 15–20 minutes) and the Pondicherry Airport. The surrounding area is rich in natural beauty, with coconut groves, coastal dunes, and eco-sensitive zones enhancing the resort's exclusivity and peaceful ambience.



Figure 74Le Pondy site

Historical Context:

Located in Pudukuppam, Pondicherry—a coastal village with a rich colonial past—the resort reflects the region's blend of French and Tamil heritage. Pondicherry was a French colony from 1674 to 1954, and its architectural legacy still influences local design. Pudukuppam, once a quiet fishing village, has transformed with the growth of tourism. The resort incorporates Indo-French and Chettinad architectural styles, connecting colonial elegance with traditional Tamil craftsmanship. This fusion offers not just luxury but a cultural experience rooted in history and place.

Climate: Pondicherry experiences a tropical coastal climate characterized by hot summers, high humidity, and moderate to heavy monsoon rainfall. Temperatures range between 25°C to 38°C, with peak heat during May–June. The southwest and northeast monsoons bring rainfall between June and November, making flood resilience and proper drainage essential in design. The proximity to the sea moderate's temperature slightly, and coastal breezes provide natural ventilation—features often harnessed through open courtyards, shaded verandahs, and sloped roofs in regional architecture.

Accessibility:

- **Nearest Bus Stop:** Pondicherry New Bus Stand – approx. 13 km (25–30 minutes by road)
- **Nearest Railway Station**: Pondicherry Railway Station – approx. 12 km
- **Nearest Airport**: Pondicherry Airport – approx. 18 km

Proximity to Attractions:

- **Paradise Beach –** approx. 2 km
    1. A popular, clean beach known for water sports and scenic beauty

2. Accessible via Chunnambar Boat House ferry or direct road access

- **Chunnambar Boat House** – approx. 3 km
    1. Offers boating to Paradise Beach, jet skiing, pedal boating, and more
    2. Major tourist hub for adventure and leisure activities
- **Sand Dunes Pavilion** – approx. 1.5 km
    1. Activity centre with options like banana boat rides, jet skis, camel/horse rides, and beachside events

Surroundings and Context:

The resort is nestled in the serene coastal village of Pudukuppam, surrounded by lush greenery, inland water bodies, and the Bay of Bengal. To the east lies Paradise Beach, offering a direct beachfront experience, while the Chunnambar River runs nearby, enhancing the ecological and scenic value of the site. The surrounding area features low-rise residential structures, fisherfolk communities, and a growing number of eco-resorts and activity zones, creating a blend of local culture and tourism. The natural landscape and calm environment make it ideal for a peaceful, immersive resort experience.





Figure 75Surroundings

Concept and Design Philosophy:

The resort's concept is rooted in creating a harmonious blend of traditional coastal living and modern luxury, inspired by the serene natural setting of Pudukuppam. The design draws heavily from Indo-French and Chettinad architectural styles, emphasizing open courtyards, sloping tiled roofs, thick walls, and locally sourced materials like laterite stone and terracotta tiles. The layout prioritizes natural ventilation, shaded walkways, and visual connectivity to the sea, offering guests an immersive and tranquil experience. Sustainability, cultural sensitivity, and a connection to the coastal landscape form the core of its design philosophy.

Master Plan and Zoning:

The resort is master-planned to reflect a village-like layout, using clustered zoning that separates private, semi-private, and public areas while ensuring smooth circulation. Entry zones feature reception, parking, and administrative blocks. Central areas host guest villas and cottages, oriented to maximize sea views and natural ventilation. Recreational zones, such as the pool, spa, and activity areas, are located toward the beachfront, while service areas (staff quarters, maintenance, kitchens) are tucked behind landscaped buffers. Wide green corridors, shaded pathways, and water features tie the zones together, maintaining both privacy and openness throughout the site.



Figure 76Le pondy master plan

Circulation:

- The pathways as seen in the pictures have an interlocking concrete blocks.
- The either side of the pathways have plants and trees to provide shade.
- These pathways are around 2.5 to 3 m wide.
- There are 3 entrances, main entrance and back entrance on the west and the beach entrance on the east.



Figure 77Le pondy surroundings

Amenities:

- **Reception & Admin Block:** Centralized check-in, concierge services, and staff coordination.
- **Ayurvedic Spa & Massage Center:** Traditional wellness therapies for rejuvenation.
- **Gymnasium:** Fully equipped fitness center with modern equipment.
- **Souvenir Shop:** Local handicrafts and memorabilia.

- **Restaurant SMAAK & Bars:** Multi-cuisine dining with indoor and outdoor seating.
- **Swimming Pools:** 17 pools (1 public, 16 private) designed for guests of all ages.
- **Private Beach Access:** Direct entry to Paradise Beach for guests.
- **Recreational Area:** Includes activities like boating, indoor/outdoor games, and children's play zones.
- **Parking Zone:** Ample space for guest and staff vehicles.




Figure 79Le pondy interiors

Landscape Design:

The resort's landscape design embraces a tropical coastal aesthetic, enhancing natural features while ensuring sustainability and guest comfort. Native species like coconut palms, frangipani, and neem are used extensively to provide shade, reduce heat gain, and require minimal irrigation. Meandering stone-paved pathways, water features, and courtyards connect the different zones of the resort, encouraging exploration and relaxation. Green buffers are strategically placed around villas for privacy, while open lawns and flowering shrubs add vibrancy to public spaces. The landscape seamlessly integrates with the existing topography and coastal breeze patterns, creating a calm, immersive environment.




Figure 79Le pondy surroundings

Room Typologies:

- **LAKE FACING**
    1. These are standard G+1 rooms.
    2. Bedroom area: 240 sq. ft
    3. Bathroom area: 60 sq. ft
    4. Sit out area: 110 sq. ft

5. These are air-conditioned rooms. The sit out is well shaded using bamboo curtains.
6. There is a small pantry space under the stairs for the staff's easy accessibility to the 1st floor without interrupting the guests.
7. They have a lake view and grass courtyard around for kids to play.



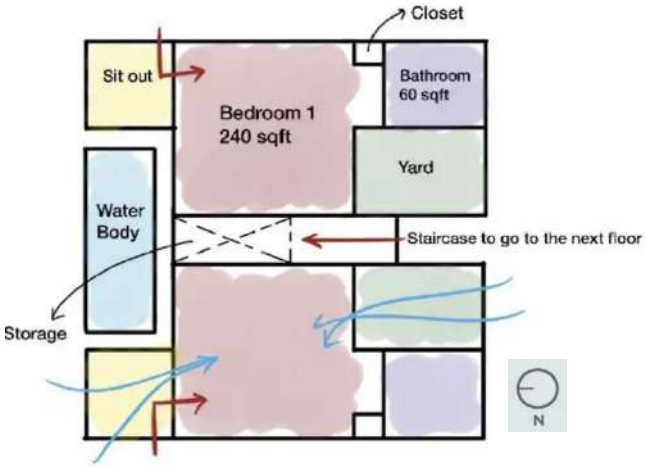
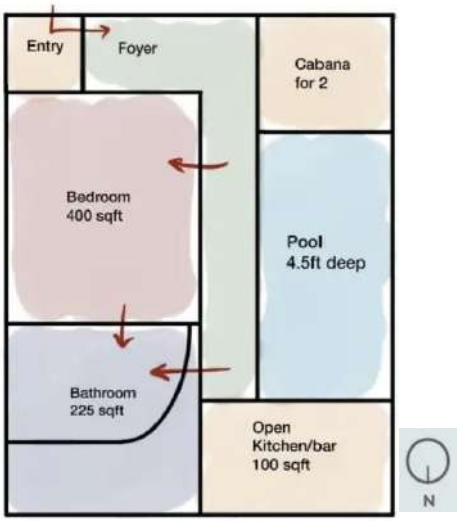


Figure 5

Figure 80 Luxury pool villa plan

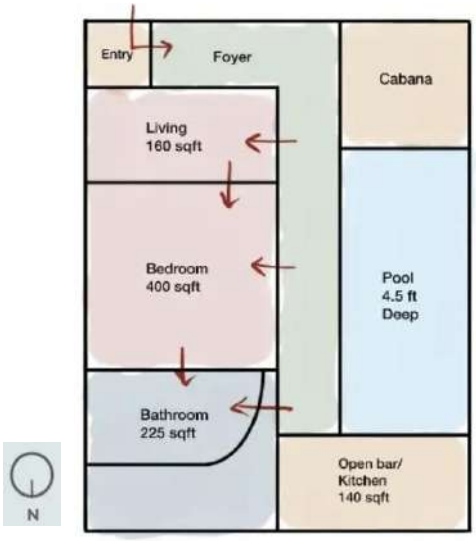
- **LUXURY POOL VILLA**
  1. Bedroom area: 400 sq.ft
  2. Sit out area: 150 sq.ft
  3. Bathroom area: 225 sq.ft
  4. Kitchen/bar: 100 sq.ft
  5. Pool area: 6.25 m * 2.6 m * 1.35 m
  6. These private villas have the thatched roofs with matt covering.
  7. The bedrooms are larger and spacious.
  8. The bathroom has an open shower and is connected to the pool area to avoid wet rooms after showers.
  9. These villas permit 2 people only.
  10. There are stone columns throughout.





- **PRESIDENTIAL POOL VILLA**
    1. Bedroom area: 265 sq. ft
    2. Living room area: 160 sq.ft
    3. Sit out area: 185 sq. ft
    4. Bathroom area: 225 sq. ft
    5. Kitchen/bar: 140 sq. ft
    6. Pool area: 6.85 m * 2.55 m * 1.35 m
    7. These are more spacious and luxurious.
    8. There is an extra room added i.e., the living room.
    9. These have thatched roof covered with matt too like the pool villas.





- **AYURVEDIC MASSAGE CENTRE**
    1. Totally 10 rooms. Ayurvedic massage – 5 and western massage – 5
    2. There's a reception and waiting space at the entrance.
    3. The roofs are mostly open to sky.
    4. There are small man-made water bodies inside.
    5. The ayurvedic rooms have a sauna, private washroom, shirodhara and a massage bed.
    6. The western rooms have an open shower, tub and a massage table.

7. The open spaces, water bodies, and subtle colors create a calm, breezy and serene environment.





Figure 81Le pondy Ayurvedic

Material Used:

Main Building & Villas (Structural + Architectural)

- **Foundation:** Reinforced Cement Concrete (RCC) with anti-saline treatment.
- **Walls:**
    - Laterite Stone / Fly Ash Blocks: Eco-friendly, thermally stable.
    - Exposed Brick: Traditional touch, breathability.
- **Roof:**
    - Mangalore Clay Tiles / Bamboo Thatch: Excellent insulation and rain protection.
    - RCC Slabs with Insulation: For flat-roof portions like terraces or balconies.
- Beams & Columns: RCC or Timber (in exposed areas for aesthetics).
- Plaster: Lime Plaster / Mud Plaster in eco-zones for breathability.

Guest Rooms & Interiors

- **Flooring:**
    - Kota Stone / Jaisalmer Stone: Cool and rustic.
    - Polished Red Oxide / IPS: Traditional and affordable.
    - Teakwood / Bamboo Flooring: In luxury suites.
- **Walls:**
    - Lime Plaster + Natural Paints (like Mitticool).
    - Wood Paneling or Jaali Screens for ventilation and privacy.
- **Furniture:**
    - Locally crafted Teak / Neem / Mango Wood.
    - Cane and Rattan: For chairs, lighting fixtures, and loungers**.**
- **Fabrics & Soft Materials:**

- Handwoven *cotton* or *khadi* with natural dyes.

Ayurvedic Spa & Wellness Centre

- **Floors:** Terracotta Tiles, Stone, or Red Oxide for cool, non-slip surfaces.
- **Ceiling & Roof**: Thatched or Clay Tile Roofs for a rustic ambiance**.**
- **Walls:** Lime plaster with organic pigments; Herbal aroma infusions.
- **Furniture:** Reclaimed wood massage tables, brass urulis, clay pots.

Landscape & Outdoor Pathways

- **Pathways**:
  - Stone pavers (cobblestone, laterite)
  - Interlocking tiles with grass strips (softscape + hardscape)
- **Decks & Gazebos**:
  - Bamboo / Timber Decking
  - Thatched Roofs with coconut fronds
- **Seating**:
  - Stone benches, Wooden pergolas with creepers
- **Planters & Edging**:
  - Brick, laterite, or concrete edging with natural soil beds
- **Water Features**:
  - Natural stone for ponds and basalt for fountains
  - Copper or brass spouts




Figure 82 Le pondy Outdoor

Inference and Analysis:

Merits

- The place gives a sense of calmness and peace.
- The vegetation is well retained.

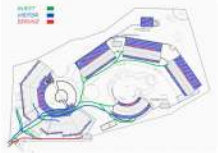
- There are ample open spaces and courtyards for ventilation.
- The place has man-made pools and ponds to create a cool environment.
- They have a private beach; this allows the guest to enjoy without interference from the public.
- The rooms and villas are well shaded using overhangs and trees.
- The resort is spacious and lets the wind flow around.
- Privacy of the guest is well maintained.

Demerits

- The admin office is in the centre and not at the resort entrance. This might be disadvantageous as the guests have to walk all the way after a long journey to check in.
- The parking is outside the compound.
- The resort is in an isolated location; this causes a difficulty in catching cabs or autos for the guests.
- There is no provision made in the villas to keep the birds, mosquitoes or insects from going in. Some guests may not be okay with it.
- Ramps aren’t provided.

CASE STUDIES - COMPARATIVE ANALYSIS

3 ★ HERITAGE RESORT

PARAMETER	LIVE CASE STUDIES		DESK APPRAISAL			INFERENCE FROM CASE STUDIES
	KOHINOOR RESORT,DIU	AZZARO RESORT,DIU	RAVIZ,KOVALA, RESORT, KERALA	LE PONDY BEACH RESORT PONDICHERRY	TIJARA FORT PALACE, ALWAR RAJASTHAN	
SITE AREA	3.5 Acres	2.5 Acres	65 acres	14 acres	8 acres	-
ARCHITECT	Rudra Natekar	Dipak Kamat & Associates	Charles Correa	-	Vani Bahl	-
SITE LOCATION	Fudam, Diu	Fudam, Diu	Kovalam, Thiruvananthapuram, Kerala	Nallvadu Post, Pudukuppam, Puducherry	Tijara, Alwar district, Rajasthan	-
CLIMATE	Coastal Diu climate- hot summers, windy (May-Sept), monsoon peak July; mild winters.	Coastal Diu climate hot summers, windy (May-Sept), T monsoon peak July; mild winters.	Warm humid tropical climate	Hot and humid tropical coastal climate	Hot semi-arid : very hot summers, short monsoon, cool winters.	• Composite Coastal: very hot pre-monsoon, humid monsoon (SW sea breeze May-Sept), mild winters Design for cross-ventilation + monsoon rainproofing.
SITE PLANNING	Low-rise bungalow clusters arranged around central;pool/lawns; courtyards, shaded walkways and event lawn; centralized amenity core. 	Courtyard+pool-centric masterplan: Entrance Lobby Pool Clustered Deluxe Rooms, lawn, restaurant and private party spaces 	Zoning with terraced levels along the cliff; maximum sea view orientation; landscaped gardens 	Linear layout along water edges, landscaped courtyards, integration with natural surroundings 	•Separate guest pedestrian circulation from service/vehicular access. •Restore terraced gardens as primary public/ event spaces. 	• Low-rise, Courtyard + Pool • E-W building axes • SW-facing public terraces to capture breeze • Elevated plinths near shore and parking at entry.
ACCOMMODATION (TYPES& NO OF COTTAGES)	**4 Blocks** B1-Blue, 18 deluxe rooms, B2-Red, 14 deluxe, 2 suite C1-Green, Executive Deluxe 4 rooms C2-Pink, Premium Deluxe 4 Rooms 	**Total 38 rooms** 36 Club Royal rooms @225 sq.ft each) + 2 suites Single-storey, one-floor distribution 	184 keys – heritage cottages, sea-view rooms, suites, premium villas 	70 rooms – including Luxury Pool Villas, Sea View Rooms, Lake View Rooms, Presidential Suites. 	109 suites and rooms named after Indian artists and designers 	**Rooms Typologies:** Reconstruct Roytal Suites (Replica Building) 45 low-rise cottages (stilted where near tide/rock) Private sit-outs and verandahs.
AMENITIES IN RESORT	Central pool, waterpark, banquet hall, restaurant.	Large outdoor pool, full-service spa & wellness, restaurant & bar, fitness centre, parking, poolside lawns and private party spaces.	Infinity pool, Ayurveda spa, multiple restaurants, bar, banquet halls, conference facilities, amphitheatre	Swimming pool, Ayurveda centre, bar, restaurant, banquet hall, conference rooms, private beach access	•Arcaded dining halls, lounges and restored courtyards. •Pool on lower terrace, spa/wellness within adaptive spaces.	• Central pool + courtyard Baradari / Cultural pavilion • Wellness (Gym / Spa) Yoga & Meditation • Restoration of Palace as a Museum and heritage restaurant Restaurant with SW promenade
ARCHITECTURE FEATURES	Portuguese-inspired arched openings, balcaos (balconies), colorful façades, red-tiled pitched roofs, verandahs and courtyards. 	Modern tropical: pitched tiled roofs, verandahs, courtyards, landscaped pool setting 	Kerala vernacular style – sloping tiled roofs, verandahs, wooden brackets, integration with cliff edge for sea view 	Blend of French colonial + traditional Tamil architecture; sloping tiled roofs, courtyards, verandahs. 	•Thick sandstone masonry, arched verandahs, octagonal turrets, ramparts. 	• Deep overhangs • Jaali screens • Foldable jharokhas for privacy & shading • High ceilings • Shaded transition verandahs • Framed temple and sea views
INTERIOR DESIGN	Warm ambient lighting, contemporary furnishings; emphasis on natural daylight via large windows and verandahs. 	Elegant-minimal interiors with natural finishes-wood, N terracotta/stone floors, locally crafted furniture; ambient lighting and local art motifs. 	Rich wood finishes, traditional Kerala motifs, muted earthy tones with luxurious detailing 	Traditional wooden furniture, pastel wall shades, French-inspired interiors with coastal influence 	•Themed suites referencing artists/crafts; mix of local craft (carving, painted doors, textiles) + discreet modern amenities. 	• Warm, local palette: • Hand-crafted, stone flooring, terracotta roofs, minimal finishes in wet zones • Use of mosaic tiles to prevent salt erosion.
BUILDING MATERIALS &TECHNIQUES	Brick masonry, tiled sloping roofs, vernacular detailing.cres	RCC frame + local stone/brick masonry; sloped Mangalore-tiled roofs, lime plaster and natural flooring.	Laterite stone, timber, clay tiles, lime plaster, locally sourced granite	Local laterite stone, Mangalore tiles, lime plaster, timber for detailing	•Primary: local sandstone masonry, lime mortars, reclaimed stone for repairs. •Craft-led repairs using local masons and traditional joinery/carpentry.	Conserve Kaand limestone and lime mortar in palace; for new constructions: stone infill, lime plaster where possible, raised plinths, corrosion-resistant metal, treated timber, fiber-cement
SUSTAINABILITY MEASURES	Passive ventilation (cross-ventilation, courtyards), landscaped buffers, rainwater harvesting, water-saving fixtures; low-rise layout to reduce HVAC loads	Low-rise footprint, natural daylighting and cross-ventilation, courtyard & pool passive cooling, use of local materials, rainwater harvesting	Passive cooling, rainwater harvesting, use of local resources, natural daylight optimization	Natural ventilation, orientation to capture sea breeze, local material use, landscape buffers	•Shaded arcades, orientation and terraced landscaping for cooling.&local materials, phased restoration funded by early reuse.	On-site STP + greywater reuse, Rainwater Harvesting tanks, solar-heated water, local sourcing of labour & materials ≥70%, passive cooling (courtyards + cross-ventilation).
INFERENCE	Strong cultural identity + low-rise, pool-centric planning supports passive cooling and event programming: maintenance and coastal material durability are key	Compact, well-zoned plan that uses courtyards/ pool for passive comfort; room sizes are modest efficient for mid-market hospitality, good example of climate-responsive colonial vernacular fusion.	Strong connection to Kerala's vernacular architecture; cliff-top planning maximizes views while blending luxury with tradition	Harmonizes French colonial legacy with Tamil culture; designed to enhance coastal living experience while retaining resort luxury	•Use terraces as high-value guest/public spaces and event platforms. •Anchor interiors in local craft to strengthen sense of place and guest experience	Low-rise, landscape-first masterplan will: Reduce HVAC/embodied carbon,Use salt-resistant construction & build with corrosion-proof finishes Require CRZ approvals and staged phasing to minimise risk.

CONCEPTUAL DESIGN

3 ★ HERITAGE RESORT

Seaside Royalty – A Fusion of Nawabi Grandeur & Gujarati Vernacular.

The design will recreate the grandeur of Chorwad Palace while blending in local climate-responsive features and modern comfort.

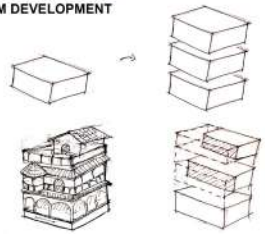
It will feel like a luxurious heritage retreat, but without being a literal copy of the palace.
Embrace a contextual fusion—the palace's Italian-Muslim-colonial grandeur with Gujarat's deeper vernacular and temple traditions to create a resort that resonates culturally and climatically.

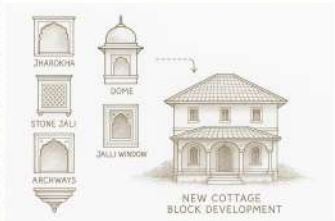
CONCEPT

Impressive façade, projecting porticos, balconies, and large arched windows—a blend of European (Italian/colonial) and Muslim traditions.

1. Maru Gurjara (Solanki) Detailing
2. Indo islamic Elements
3. Vernacular 'Pol' or Bohra Woodwork
4. Chhatri pergolas or rooftop pavilions

FORM DEVELOPMENT







ARCHITECTURAL ELEMENTS FROM HISTORY

COASTAL HERITAGE & FISHING CULTURE

Design Incorporation:

1. Pavilions or lobby structures inspired by waves,boats,etc.



2. Decorative net-patterned railings or ceiling panels



3. Murals or mosaic art showing marine life and fishing scenes



NAWABI & COLONIAL ERA ARCHITECTURE

1. Arched doorways and colonnades for public spaces



2. Balconies with intricate stone jaali (lattice) work



3. Grand veranda-style entrances for reception and restaurant areas

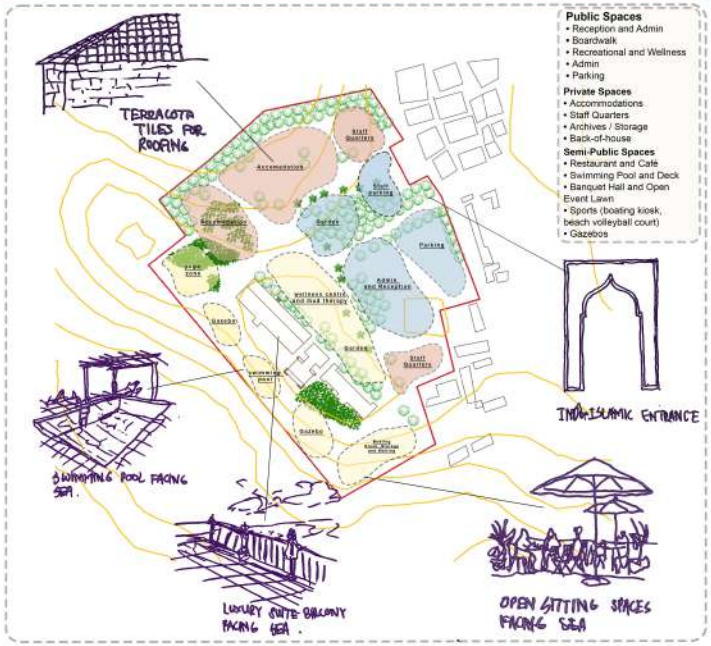


ZONING DIAGRAM

Zoning: Based on public, semi public and private areas.
Public Zone; Open to all users(outsides, guests, staff)
Semi Public Zone; Includes services, utilities and staff quaters(accessible to staff)
Private Zone; Reserved for guests(cottages)



SPACE ALLOCATION



INFERENCE FROM CASE STUDIES

A. Incorporation of Local Activities

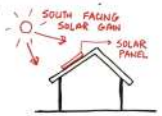
1. Sea pavallion for boating puposes
Why: Adds a unique recreational attraction, making the resort a complete leisure destination.
Features: Open pavilion structure for maximum ventilation and sea view.



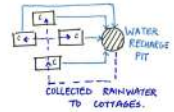
2. Local Art and Crafts Studio
Why: Promote and preserve local craftsmanship
Features: Cultural Connection – Promotes Gujarati handicrafts such as bandhani.

B. Sustainability Measures

1. Intergation of Solar Panels
Solar Panels: Installed on south facing roof for maximum efficiency.



1. Rain-water Harvesting
Collected from cottage cluster,stored in a water pit ,and resused for cottage supply.



C. Use of Building Materials

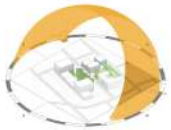
1. Dhrangadhra Sandstone (Local Natural Stone)
Why: Locally sourced, salt-resistant, historically used in Saurashtra palaces.
Benefits: Minimal maintenance, natural thermal mass, ages gracefully in sea air.
Use: External cladding, plinth, façade accents,landscape paving.



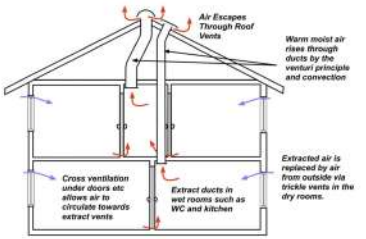
2. Lime Plaster with Silicate Mineral Paint
Why: Breathable, prevents moisture entrapment, traditional yet high-performing.
Benefits: Self-healing micro cracks, allows salt migration, heritage look.
Use: Wall finish over masonry or stone, integrates well with coastal vernacular design.



PASSIVE DESIGN STATERGIES



Orientation: Rectangular form with a longer axis alongthe north-south is the preferred orientation for composite climates





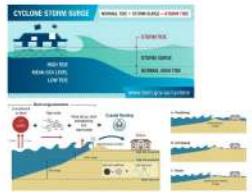
Ventilation: Removal of warm air from the inside while bringing cool air inside usong stack ventilation.

HIGH TIDE MITIGATION MEASURES

1. Raised Plinths / Stilts
Main resort buildings at least 1.5–2 m above recorded highest high-tide level.

2. Landscape & Drainage Design
Sloped Landscaping – Gentle grading so rain or tidewater drains away from structures.

3.Early Warning & Emergency Measures
Integration with IMD (Indian Meteorological Department) tide and cyclone alerts.



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EXISTING BUILDING ANALYSIS

HISTORICAL BACKGROUND

- **Year of construction -** 1930
- **Original use -** Built as a summer retreat for the Nawabi rulers, it reflects the grandeur and coastal l ifestyle of the princely state.
- **Architectual Style-** The palace combines Indo-Islamic architecture with colonial seaside resort planning, symbolizing the cultural blending during the Nawabi era under British influence.

BYE- LAWS AND RESTRICTION

- **Heritage Status:** Grade-II
- **Reference Act:** AMASR Act, 1958
  Defines 100 m “prohibited zones” and 200 m “regulated zones” around protected monuments. Any restoration or construction within these zones requires approval from the Competent Authority and experts.

Permitted Changes	Interior changes, adaptive reuse, sensitive extensions/additions (Grade II-B), structural strengthening, renewable installations
Prohibited Actions	Demolition, reconstruction, façade alteration, removal of original artwork (unless cleared by HCC)
Approval Process	Must obtain clearance from HCC (or Vice-Chairman) based on HCC advice; decisions usually within 30 days
Surroundings	Development nearby must preserve views and not diminish building's grandeur
Zone-specific Rules	No basements, limited height (max 9m), no road widening, transparent low compound walls, maintain FSI limits

CRACK MAPPING

SEVERITY LEVELS





LEGEND

HIGH

MODERATE

LOW

(THE EXACT MEASURES AND APPROACHES TO BE TAKEN CAN BE DETERMINED BY Laboratory tests SUCH AS: Mortar analysis / petrography / salt analysis / paint analysis)

COMMON STRUCTURAL PROBLEMS NOTICED

1) **Salt Air Damage (Seaside location):** Lime mortar joints between stones are wearing away.
2) **Cracks and Collapses:** Arches and walls show cracks due to missing stones, no side support, or movement in foundation.
3) **Corroded Iron:** Metal rods and beams are rusting badly, especially in RCC slabs.
4) **Plant Growth:** Vegetation is growing through cracks, breaking the structure more.
5) **Plaster Damage:** Decorative plaster is peeling, falling, or missing.
6) **Foundation Issues:** Some parts are sinking—maybe due to bad drainage or soil erosion.
7) **Rainwater Problems:** No visible rainwater pipes, so water might be collecting and damaging the walls.

CRACK MAPPING

ELEMENT	LOCATION	DEFICIT	SEVERITY	URGENCY
Foundation	Seaward/ground contact beneath plinth (visible rubble at base)	Stones and soil at the base are exposed and washed away.	Moderate	Medium term
Plinth	Bottom perimeter and entrance steps	Stones missing, crumbling mortar , gaps.	Moderate	Medium term
Wall material	External façades and internal partition walls	Mortar falling out, loose and broken stones	Moderate	Short term
Flooring	Ground-floor interiors / entrance areas	Layer of debris and rubble; original floor finishes not collapsed/missing	High	Immediate (restrict entry); repair after structure stabilized
Roof	Roof slab & parapet , internal ceiling plaster	Large cracks, plaster falling	High (safety hazard)	Immediate — danger of collapse
Joinery	All openings (arch ed windows, doors, frames)	Missing/broken timber frames, shattered/boarded openings, unsecured openings.	Medium–High	Short term (security & weatherproofing)
Plaster	Internal & external wall surfaces	Plaster peeled or missing; salt stains and mould growth.	High	Short term
Finishes	External façade ornament, interior finishes, tiles (toilet)	Decorative elements eroded, paint/finishes lost, tiled WC intact but dirty; overall finish failure.	Medium–High	Medium term (rehabilitation after structure)
Drainage	Ground around building, entrance approach, vegetation zones	No visible functioning drains, blocked channels, surface ponding, vegetation against walls accelerating moisture ingress and deterioration.	High	Short term — urgent to re-route/runoff

EXISTING PHOTOS







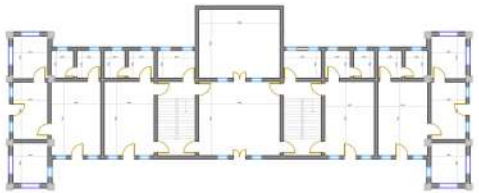




DOCUMENTATION - PLANS OF EXISTING BUILDING



Replica Building



Heritage Building - Palace



Dining Hall

DOCUMENTATION - ELEVATION OF EXISTING BUILDINGS



Elevation E1



Elevation E2



Elevation E3

Arabian Sea



Details

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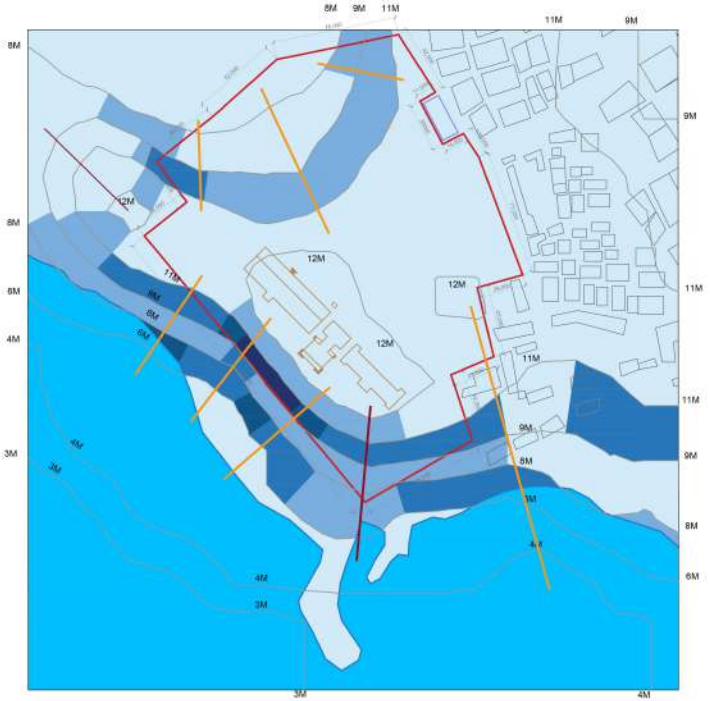
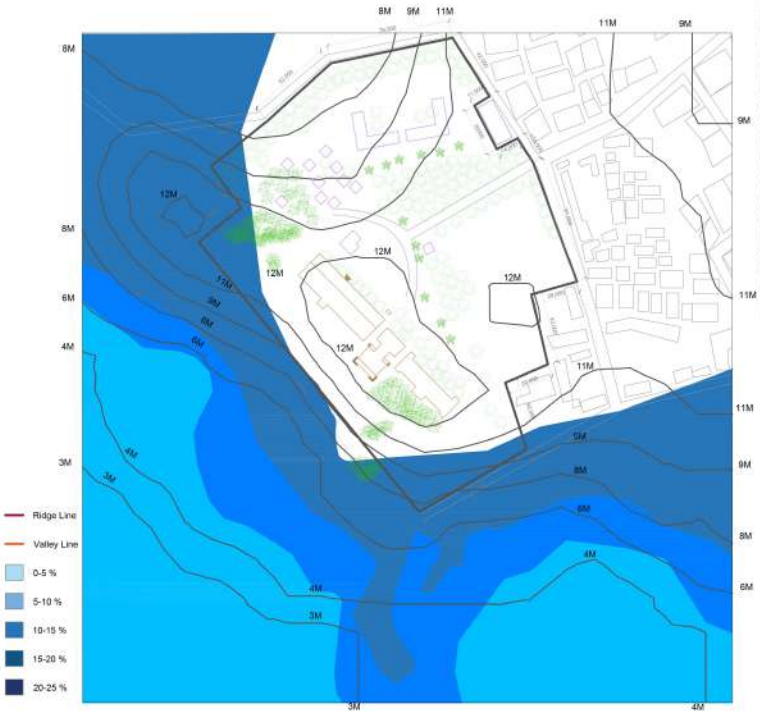
SITE ANALYSIS

ARCHITECTURAL THESIS 2025

CONTOUR ANALYSIS (RIDGE,VALLEY LINES)



HIGH TIDE AND LOW TIDE



SITE INVENTORY

1.Physical and Spacial Analysis

• Topography	• Central flat plateau at ~12 M where existing structures are present. • Steep seaward descents to 3-4 M with a small drainage channel. • The NE and SE having gentler undulating slopes with access road.
• Contours	• Highest Contour - 12 M Height • Lowest Contour - 8 M Height
• Accessibility	• A single 6 M wide Approach Road • Accessible by G.S.R.T.C. Chorwad as well as by private vehicles. • Absence of existing pedestrian circulation and footpaths.
• Surrounding Landmarks and Views	• Unobstructed views from all directions clockwise • N, NE - Chorwad Village • E, SE - Chorwad Dock • S, SW, W - Arabian Sea • NW - Dadheswar Mahadev Temple
• Existing Structures and Boundaries	• Heritage Chorwad Palace(a) • Royal Dining Hall (later addition)(b) • Replica Building (later addition)(c) • Cottages (may be demolished)(d) • Existing boundary wall in some places

2. Cultural and Social Analysis

• Community Engagement	• Visited by the local villagers and adjacent towns for leisure. • People spending time with their families in the shaded areas with their children asleep on hammocks.
• Ethnic and Demographic Profiles	• Population of 21,196 in village • About 1200-1500 people visit on weekends (as per the maintenance staff)
• Languages and Dialects spoken	• Gujrati (widely spoken), Kathiawadi, Hind, Sindhi

3. Environmental Analysis

• Flora	• Neem, Coconut, Mango, Casuarina, Acacia, Banyan, Peepal, Pandanaus, Karanja, Alexandrian Laurel, Beach Morning Glory, Bougainvillea, Cirnum Asiaticum, Plumeria
• Waterbody	• Site overlooking the Arabian Sea.
• Adjacent Marine Life	• Bangda (Indian Mackerel), Paplet (Pomfret), Khechi (Catfish), Kunga (Flying Fish), Rawas (Indian Salmon)
• Migratory Birds	• Moto Hanj (Greater Flamingo), Dhongli (Kentish Plover), Samanya Tutvari (Common Sandpiper), Kalo Pet Kichadiyo (Dunlin)
• Soil Type	• Calcerous white sand soil with sandy-clay loam
• Noise and Air Quality	• AQI - 37, Good • Sea Breeze carrying mist during high tides during monsoon season. • Steady, rhythmic rush of water breaking against sand and rocks.

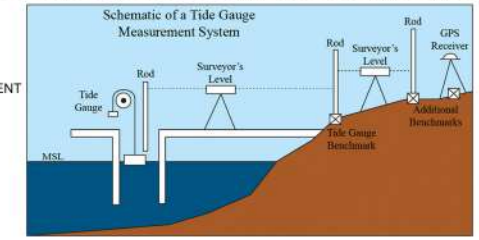
4. Infrastructure and Utilities Analysis

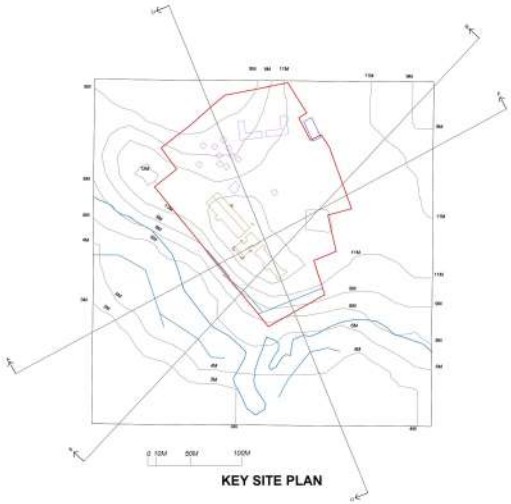
• Water Supply	• Water is supplied from the storage at the Meghal Tidal Regular Check Dam, located on the Vrajmi River.
• Electrical Supply	• 66KV Adri (GETCO) (8.5 KM)
• Wastewater Management	• No existing facilities

4. Infrastructure and Utilities Analysis

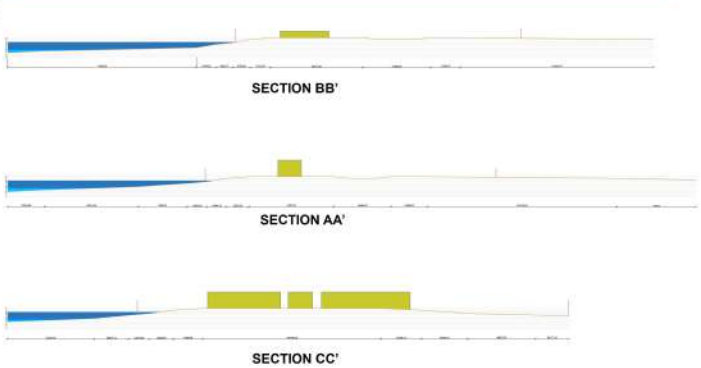
• Zoning and Land-use	• Site is not under municipal limits.
• Regulatory Guidelines Followed	• Gujarat Bye-Laws : CGDCR-2017 GCDCR-2017, GCZMA-Junagadh -2023, CRZ-2001
• Ownership and Rights	• Owned by the Tourism Corporation of Gujarat Limited (TCGL)

TIDE MESUREMENT SYSTEM





SITE SECTIONS



SWOT ANALYSIS

STRENGTH

- **Scenic Views:** Direct frontage to the Arabian Sea, offering panoramic sea views and sunsets.
- **Natural Features:** Presence of sandy beach, rocky shoreline, and coastal vegetation enhancing the resort's natural appeal.
- **Cultural Heritage:** Chorwad was the summer retreat of the Nawab of Junagadh, giving historical importance and storytelling value for hospitality branding.
- **Peaceful Setting:** Compared to crowded beaches, Chorwad is relatively serene and less commercialized.

WEAKNESS

- **Infrastructure Deficiency:** Limited urban facilities (healthcare, shopping, nightlife) in immediate vicinity.
- **Public Transport:** No direct railway/airport connectivity; nearest airport is Rajkot (~100 km).
- **Noise/Pollution Risks:** Fishing activities nearby can sometimes create noise/odor issues.
- **Seasonal Accessibility:** During monsoon, coastal roads and sea access may face disruptions.

OPPORTUNITIES

- **Tourism Growth:** Gujarat Government's focus on coastal tourism, heritage, and religious circuits (Somnath–Dwarka–Gir).
- **Eco-Tourism Potential:** Resort can be positioned as a sustainable coastal retreat, integrating local culture, seafood, and handicrafts.
- **Event & Destination Tourism:** Potential to develop as a wedding & conference destination, given the sea-facing location.
- **Proximity to Attractions:** Gir National Park, Somnath Temple, and Junagadh fortifications can boost tourist inflow.

THREATS

- **Coastal Erosion & Flooding:** Being on the seashore, site is prone to high tide and cyclone risks.
- **Legal Constraints:** Falls under Coastal Regulation Zone (CRZ), which may limit construction height, land use, and setbacks.
- **Encroachment Risk:** Informal settlements and fishing communities along the shore could cause land conflicts.
- **Competition:** Nearby resorts in Somnath and Diu may capture tourist share.

INFERENCES

Zoning

- **Location of Accommodations** - North, East and North- West
  - Maximizes ventilation throughout the day
  - Provides views of Arbian Sea, Dock and Garden
- **Recreational Activities** - Central to the site
  - Creates a niche of existing + new structures
  - Ensures daylight and accessibility
- **Existing Structures** - Restoration and Reconstruction
  - Heritage Restoration of Chorwad Palace
  - Reconstrucution of other buildings
- **Wellness Centre and Spa** - North
  - Accessible and Peaceful between the foliage of trees

Climate Inferences

- **Orientation** - Long axis E-W to reduce glare on E-W walls
  - Maximizes ventilation throughout the day
  - Openings and shaded courtyards on SW oriented.
- **Prevailing Winds** - SW - NE
  - Summer W / SW sea breezes and westerly flow
  - Winter N / NE cooler and calmer winds
  - Staggered Layout to reduce wind obstruction and smoother air flow
- **STP** - Located at lower elevation for efficient drainage
- Use of traditional passive cooling: jalis, courtyards, waterscapes

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Bhopal, M.P.

Abhishek kumar | 211110244 | 9th Semester
Thesis Guide - Dr. Anuj Jaiwal

SITE ANALYSIS

3 ★ HERITAGE RESORT

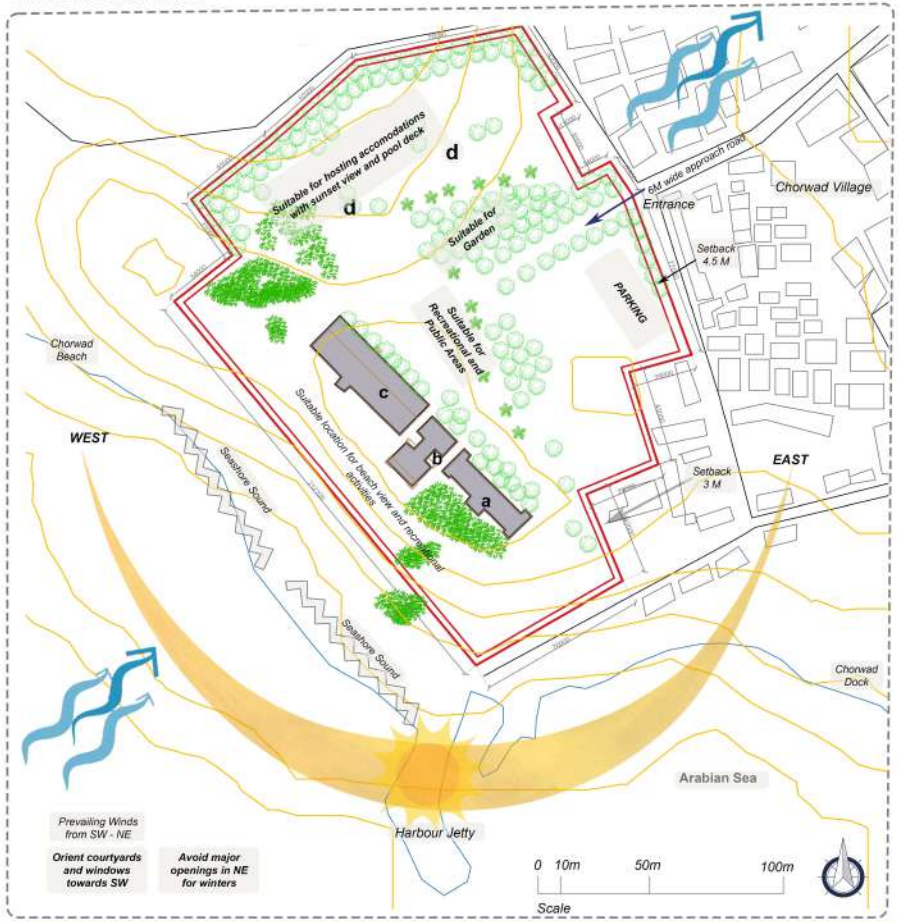


Chorwad At Junagad In Gujrat

PROPOSED SITE



Google Earth Site Demarcation in Yellow



PROJECT BRIEF

Chorwad Resort, Chorwad

Authority: Tourism Corporation of Gujarat Limited (TCGL)

Objective: New Construction of Resort and Heritage restoration of The Chorwad Palace

Expected Impact: The project will preserve cultural heritage, boost local economy, generate employment, promote sustainable tourism, and position Chorwad as a premier heritage-coastal destination.

LOCATION ANALYSIS

Site Description

Proposed Project : Development of Resort at Chorwad, Gujarat

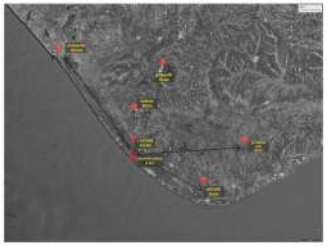
Site Location : Chorwad, Gujarat

Site Area : 11.88 acres (48,100 sqm)

Site Coordinates : 21°00'04"N 70°13'41"E

Tender Publish Year : January, 2024

SITE CONNECTIVITY



Site Demarcation

Site Connectivity

- **Chorwad Village Center** - Approx. 4.2 KM
- **Airport - Keshod Airport** - Approx. 38 KM
- **Railway - Chorvad Road** - Approx. 11 KM
  Veraval Junction - Approx. 29 KM
- **Bus - G.S.R.T.C. Chorwad** - Approx. 4 KM

Landmarks and Tourist Spots

- Dadheswar Mahadev - Approx. 01 KM
- Somnath Temple - Approx. 32 KM
- Prabhas Patan Museum - Approx. 31 KM
- Triveni Sangam, Somnath - Approx. 31 KM
- Bhalka Tirth - Approx. 25 KM
- Veraval Fishing Harbour - Approx. 18 KM
- Sasan Gir National Park - Approx. 57 KM
- Junagadh - Approx. 71 KM
- Girnar Hill - Approx. 77 KM

HIGH TIDE MITIGATION MEASURES

1. Raised Plinths / Stilts
Main resort buildings at least 1.5–2 m above recorded highest high-tide level.

2. Landscape & Drainage Design
Sloped Landscaping – Gentle grading so rain or tidewater drains away from structures.

3.Early Warning & Emergency Measures
Integration with IMD (Indian Meteorological Department) Tide and cyclone alerts.

BYE- LAWS DATA

Gujarat Comprehensive Development Control Regulations - 2017

- **FAR and Ground Coverage -**
  Chorwad Category for development - D7
  Site Area - 11.88 Acres / 48,100 SQM
  For building Units with area more than 1500 SQM, Ground Coverage = 65%
- **Total Permissible Built-up Area -**
  Site Area x FAR = 48,100 x 1.8
  = 86,580 SQM
- **Ground Coverage - 65%**
  Site Area x 65%
  = 48,100 x 0.65 = 31,265 SQM

Zone	Permissible FAR	Maximum Permissible Height
Residential-Commercial	1.8	16.6 M

Use	Plot Size(PS), Building Height(BH)	Rear	Side
Residential and Others	PS=1000SQM BH≤16.5M	4.5 M	3M

- **Parking Requirements**

Type of Use	Minimum Parking	Visitor's Parking
Commercial	50% of utilised FAR	20% of required

FLORA AND FAUNA AND ROAD ACCESSIBILITY





CLIMATE ANALYSIS

Type of Climate - Composite (hot-dry in summer, warm-humid in monsoon, mild winter)

Temperature

- Summers - Average Range: 25°C - 31°C
- Winters - Average Range: 20°C - 25°C
- Maximum Temperature: 42.1°C
- Minimum Temperature: 11.9°C

Season	Months	Avg. Temperature (°C)	Typical climate / notes
Winter	Dec – Feb	20°C – 24°C	Mild, dry and pleasant. Clear skies, low humidity, comfortable days, cooler mornings.
Summer	Mar – May	24°C – 31°C	Gradual warming; humidity rises towards May. Afternoons get hot (peak in May), but sea breeze moderates temperatures compared with inland Gujarat. Thunderstorms/heat-haze possible late in the season.
Monsoon	Jun – Sep	25°C – 29°C	Southwest monsoon — majority of annual rainfall. High humidity, overcast skies, frequent heavy showers and brief thunderstorms.
Autumn	Oct – Nov	23°C – 28°C	Humidity falls, mostly clear skies and pleasant conditions — warm days and comfortable evenings.

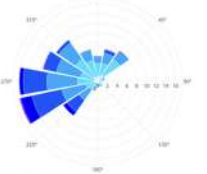
Rainfall

- Annual - 1100 mm (July–Sept)
- Peak Rainfall: July (426 mm)

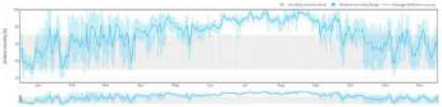
Wind Analysis

- Summer: Predominantly SW
- Winter: NE, drier and cooler

Wind Rose Di



Humidity



VIEWS FROM THE SITE



North- East View View



North- East View View



View



Approach Road



South-West View



Replica Building view



View in front of Replica Building



View in front of dining hall



South-West View



Jetty View



South East View

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Thesis Guide - Dr. Anuj Jaiswal

SITE PLAN



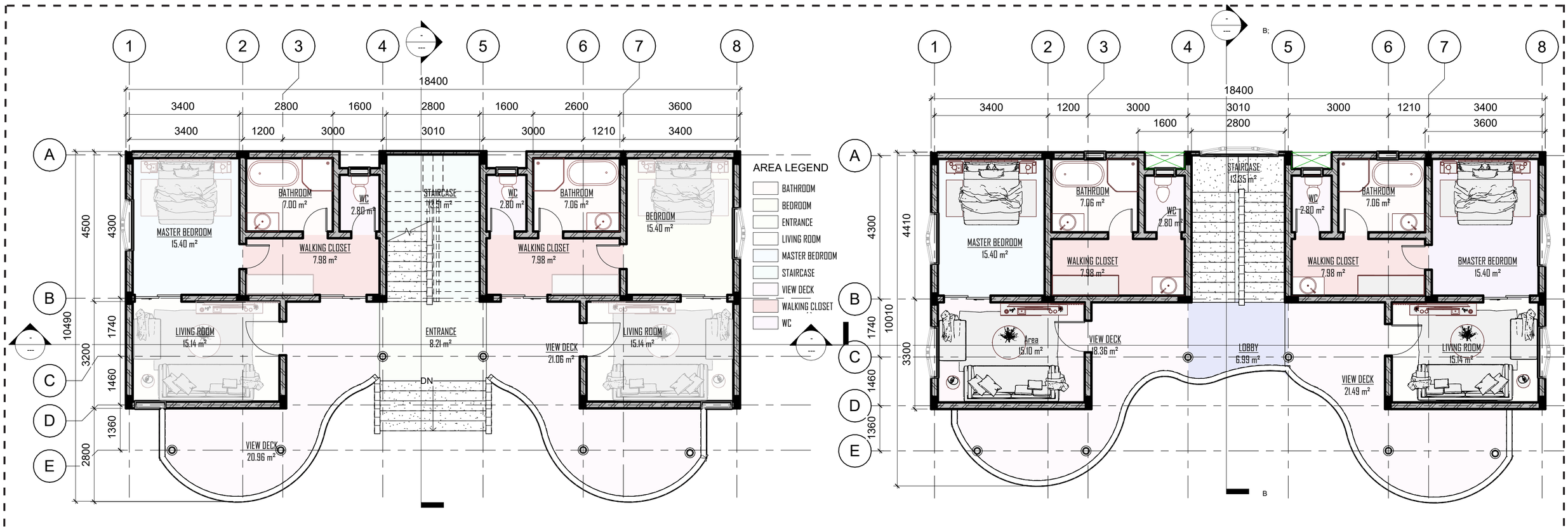
Garden Room	Wellness & Spa
Pool Deck View Room	Green Space
Sunset / Sea View Room	Bicycle / EV Track
Family Duplex Villa	Paved Road
Water Body	Deck
Admin + Plaza	F&B Restaurant + Cafeteria
Staff Quarters	Service Areas
High Tide	Low Tide
Heritage Building (Restored)	Circulation Space

SCALE-1:800

N

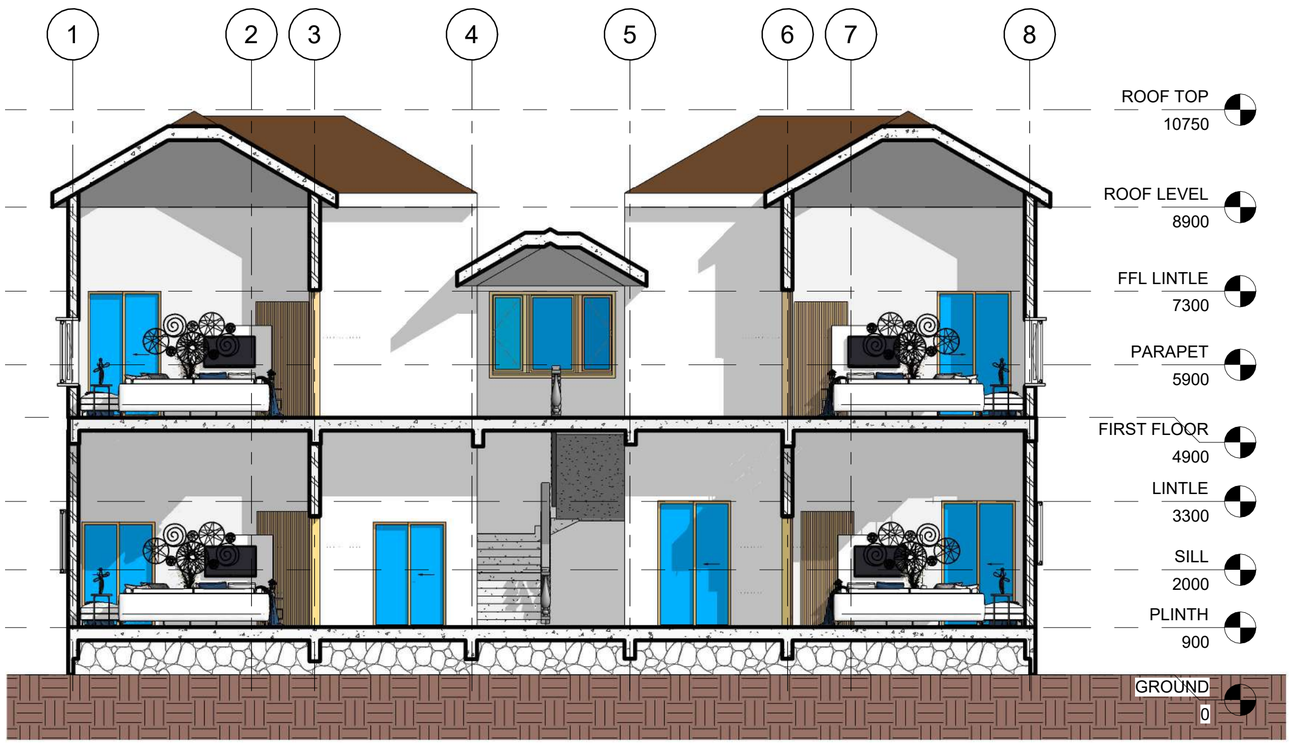
3 STAR RESORT,CHORWAD,GUJARAT

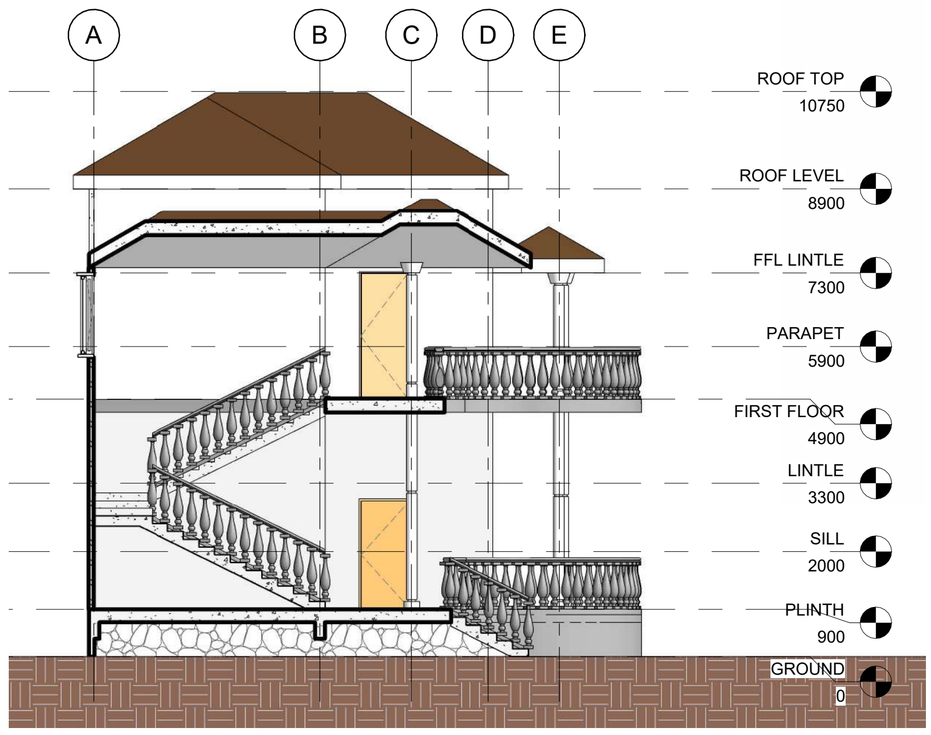
ABHISHEK KUMAR
SCHL NO:211110244



GROUND FLOOR PLAN

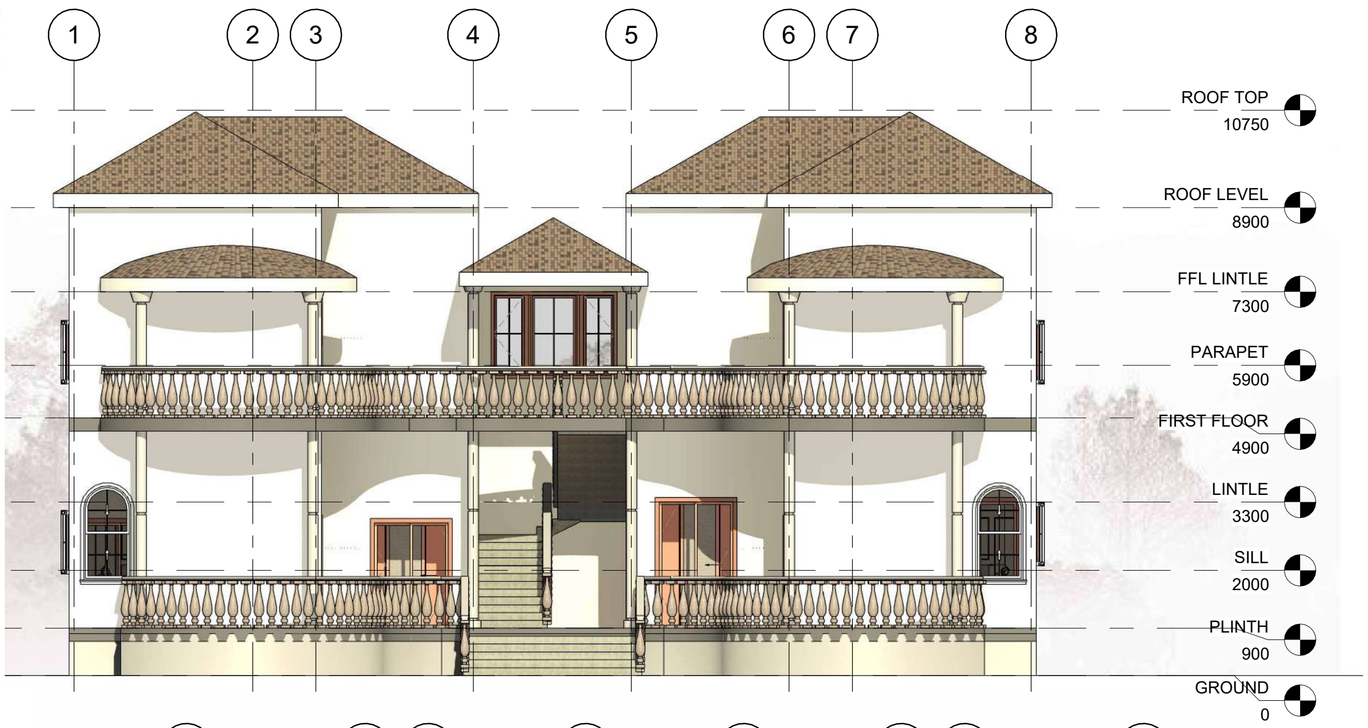
FIRST FLOOR PLAN

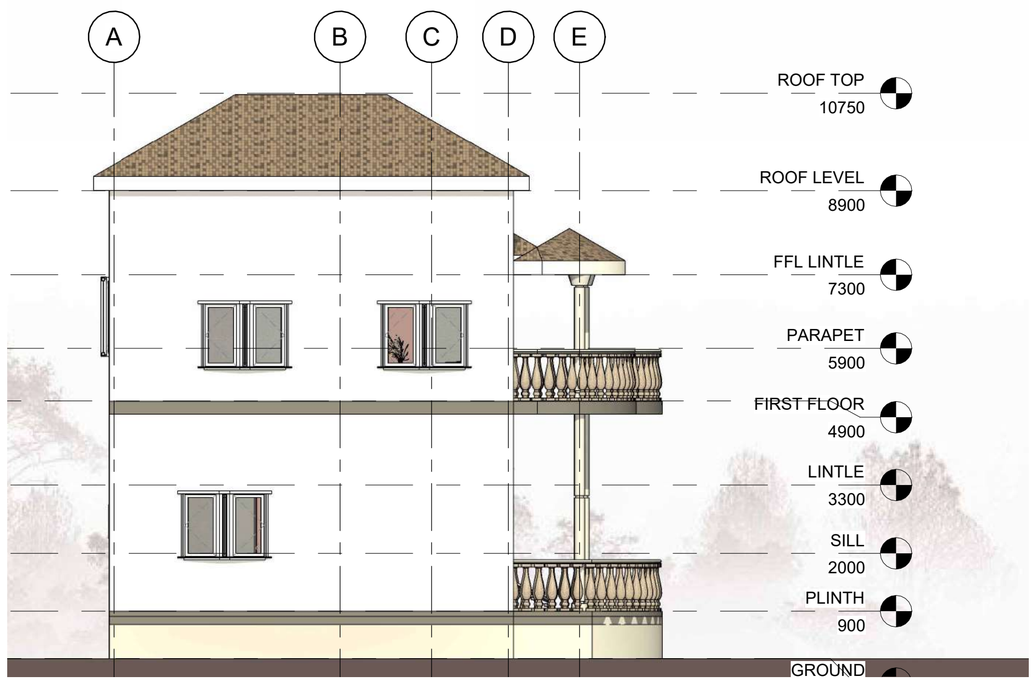




SECTION AA'

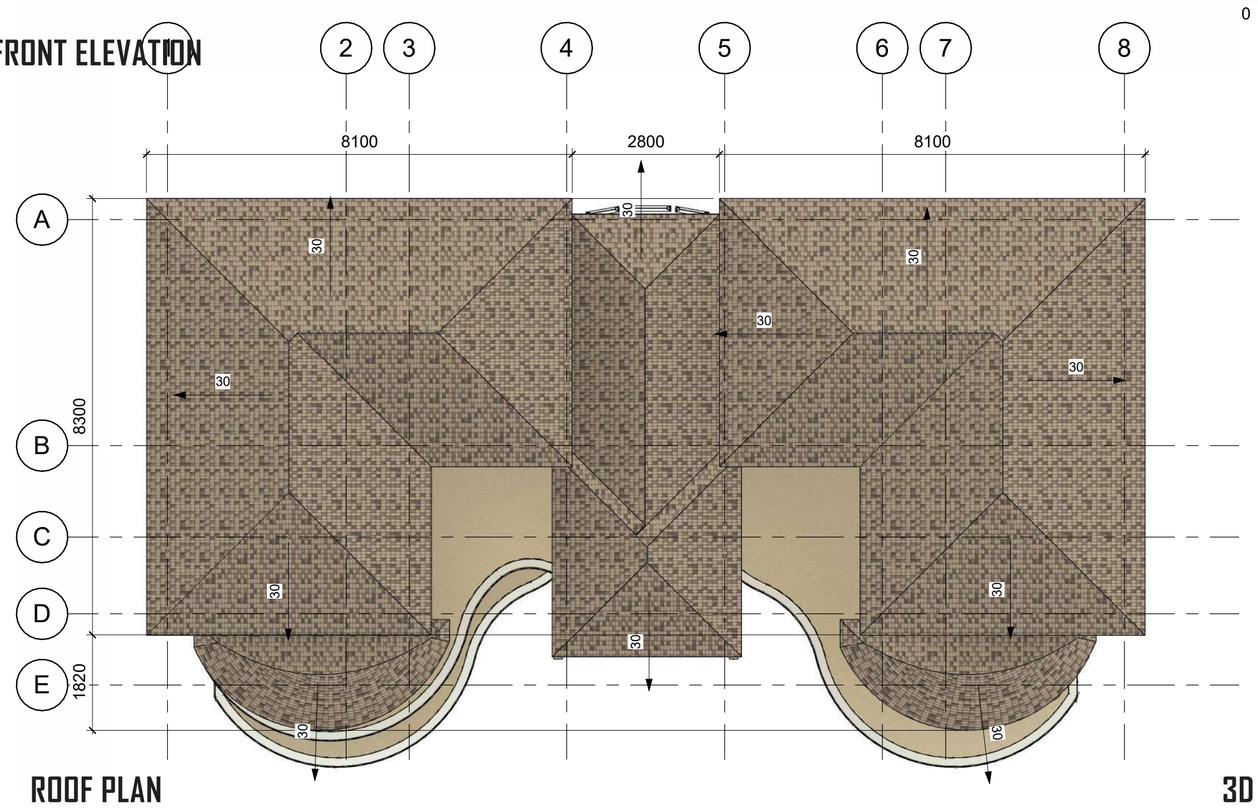
SECTION BB'





FRONT ELEVATION

SIDE ELEVATION



ROOF PLAN



3D VIEW

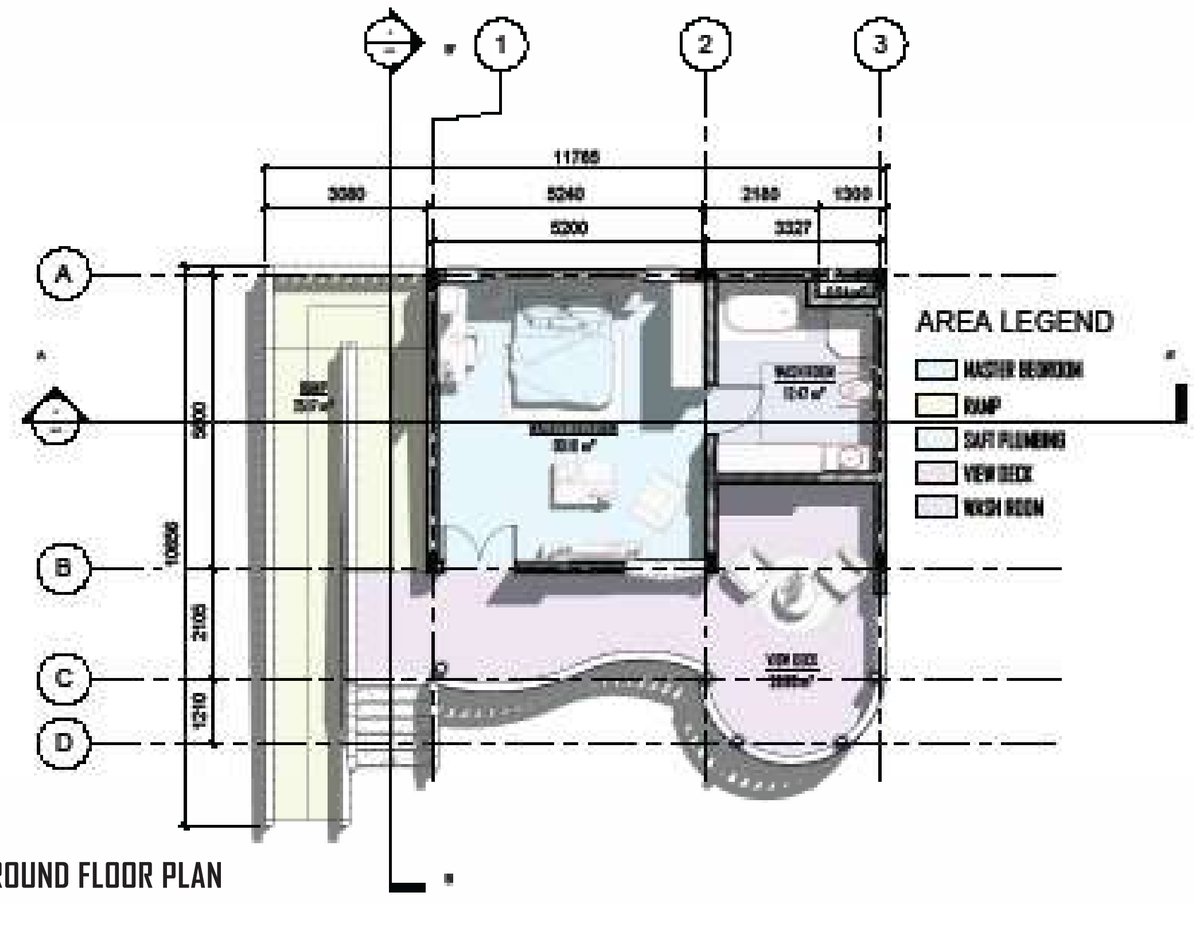
BEACH RESORT - POOLVIEW SIUTE

CHORWAD GUJRAT

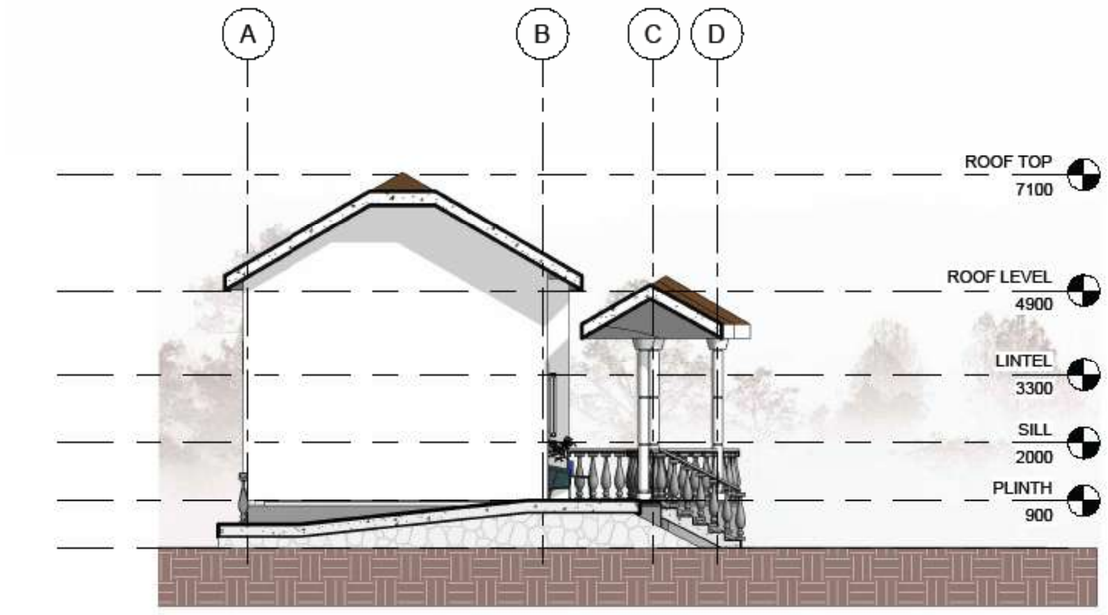
NAME : ABHISHEK KUMAR
SCHOLAR NO : 211110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

SCALE : 1:75
ALL DIMENSIONS ARE IN MM



GROUND FLOOR PLAN



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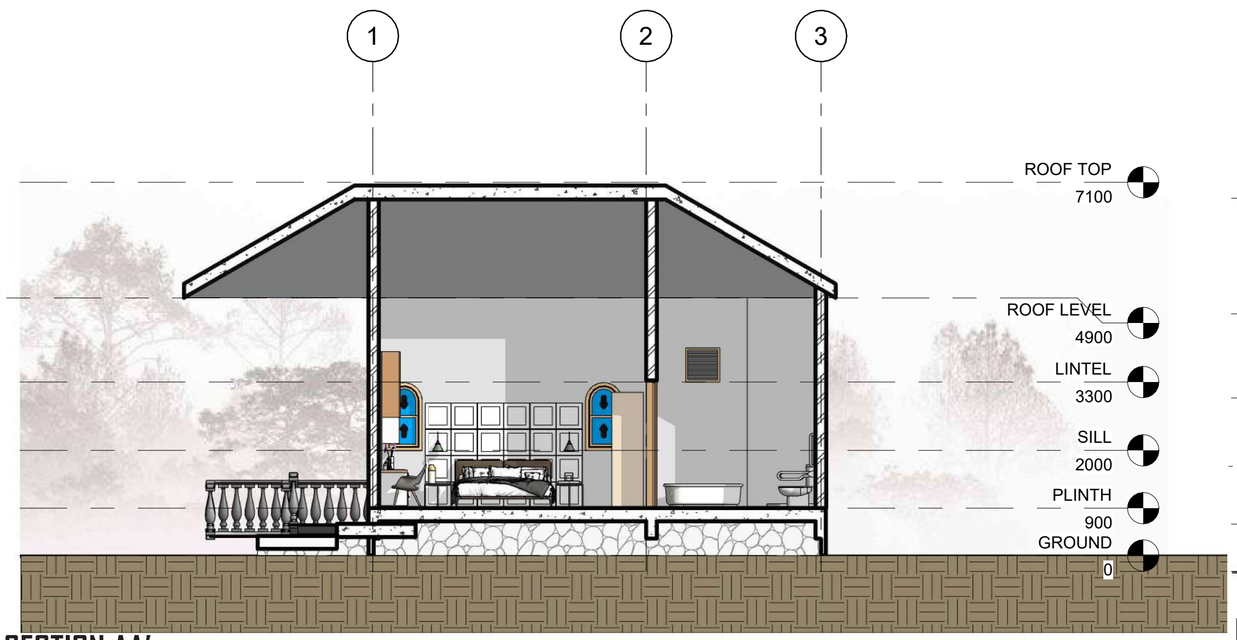

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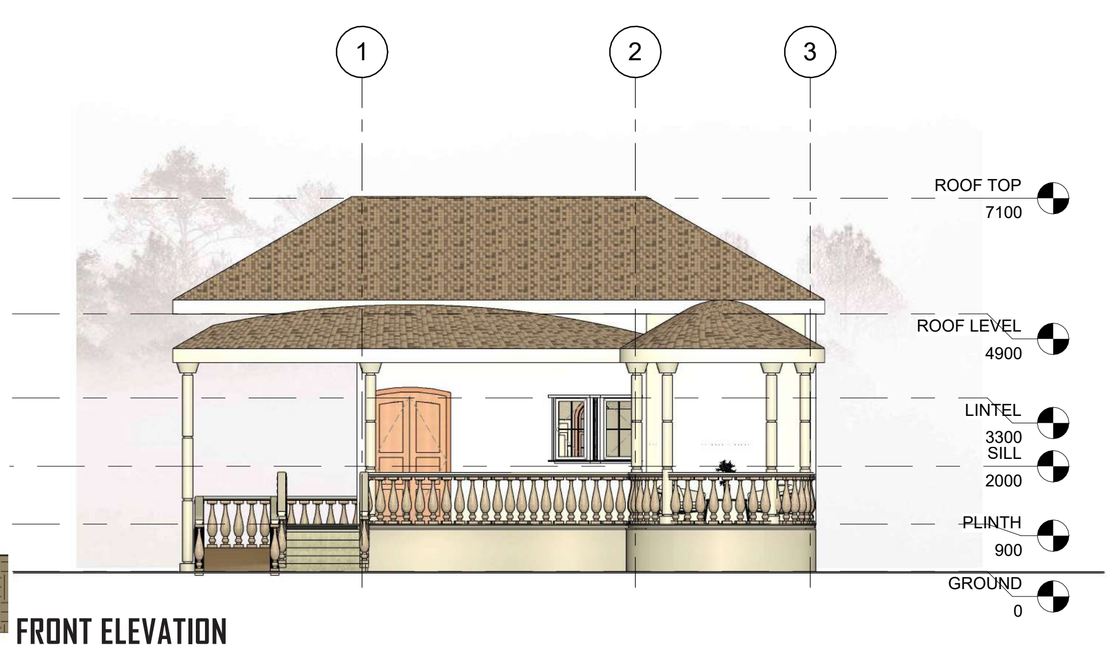
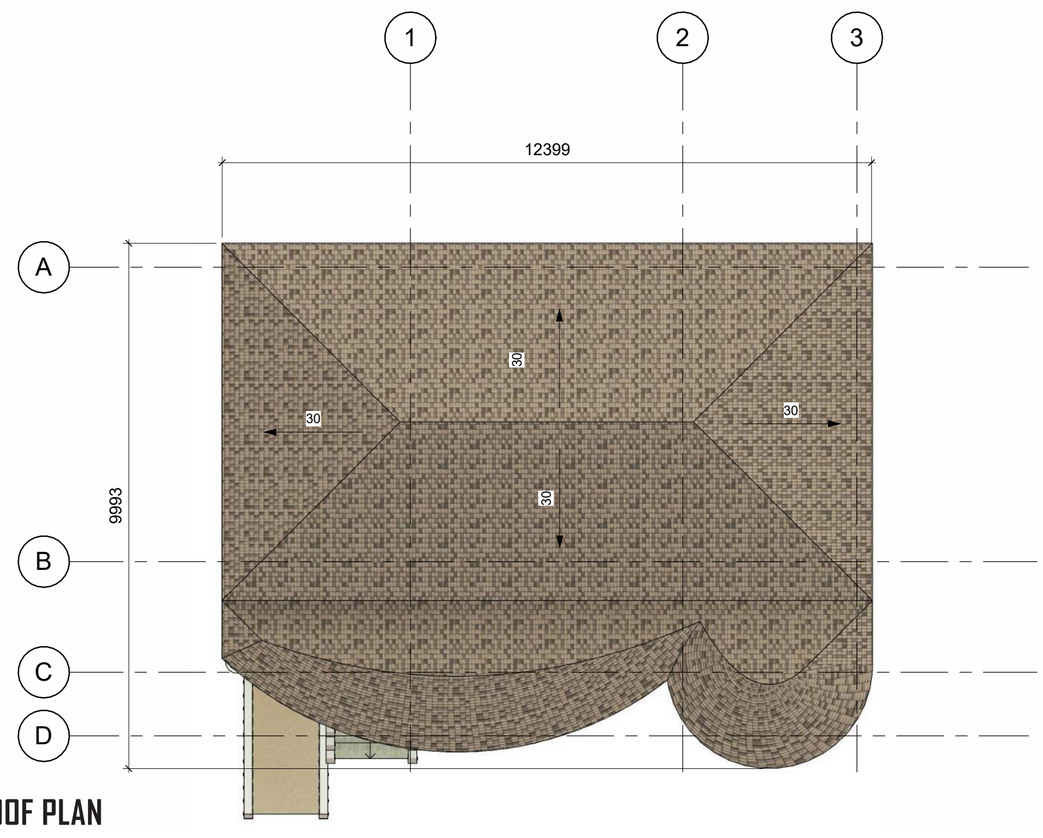
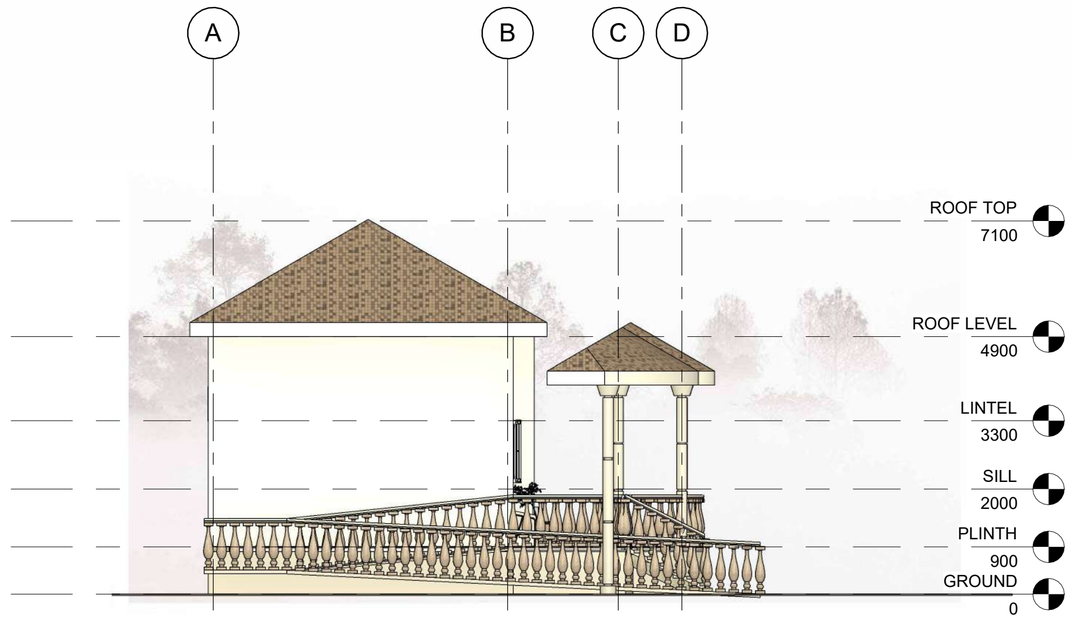


FRONT ELEVATION



ROOF PLAN



SIDE ELEVATION



3D VIEW



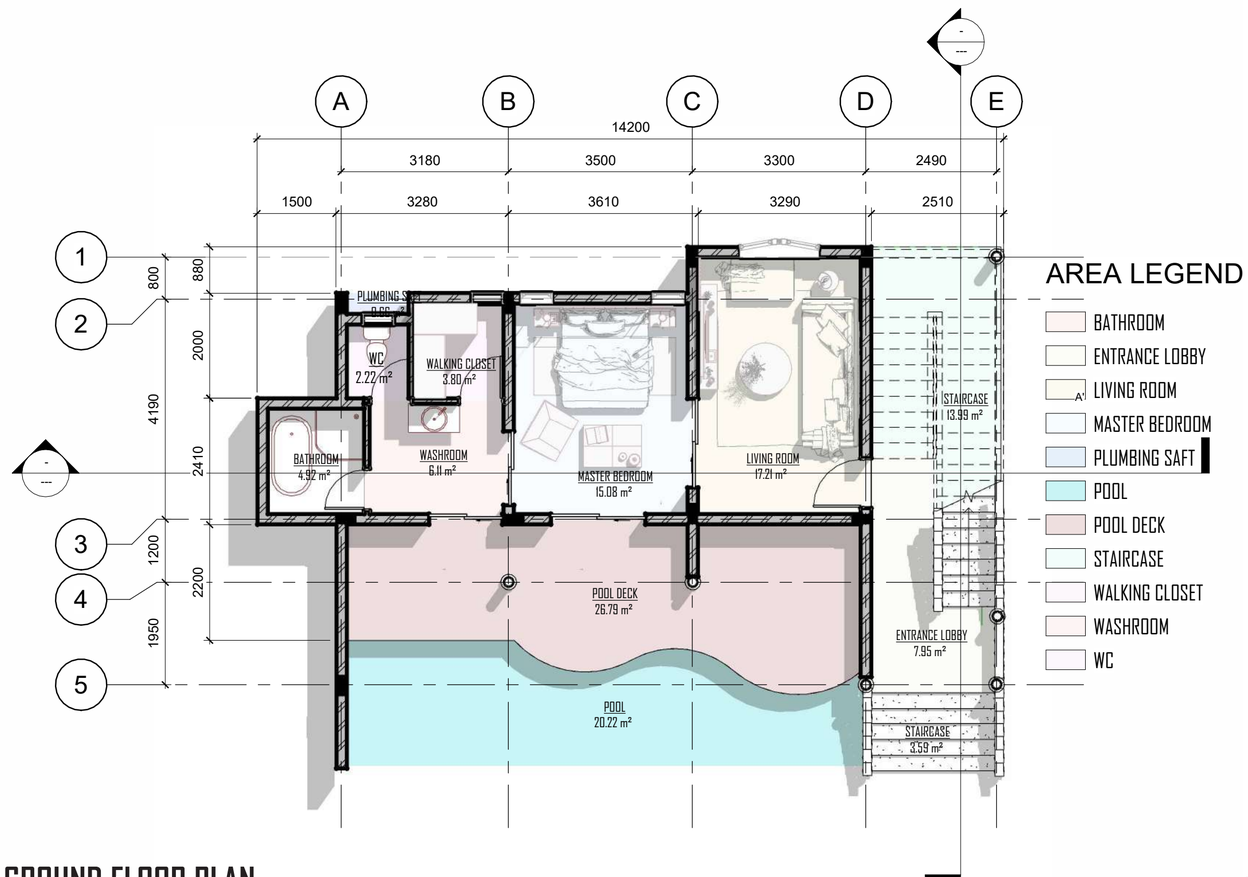
3D VIEW

BEACH RESORT - ACCESSIBLE SIUTE
CHORWAD GUJRAT

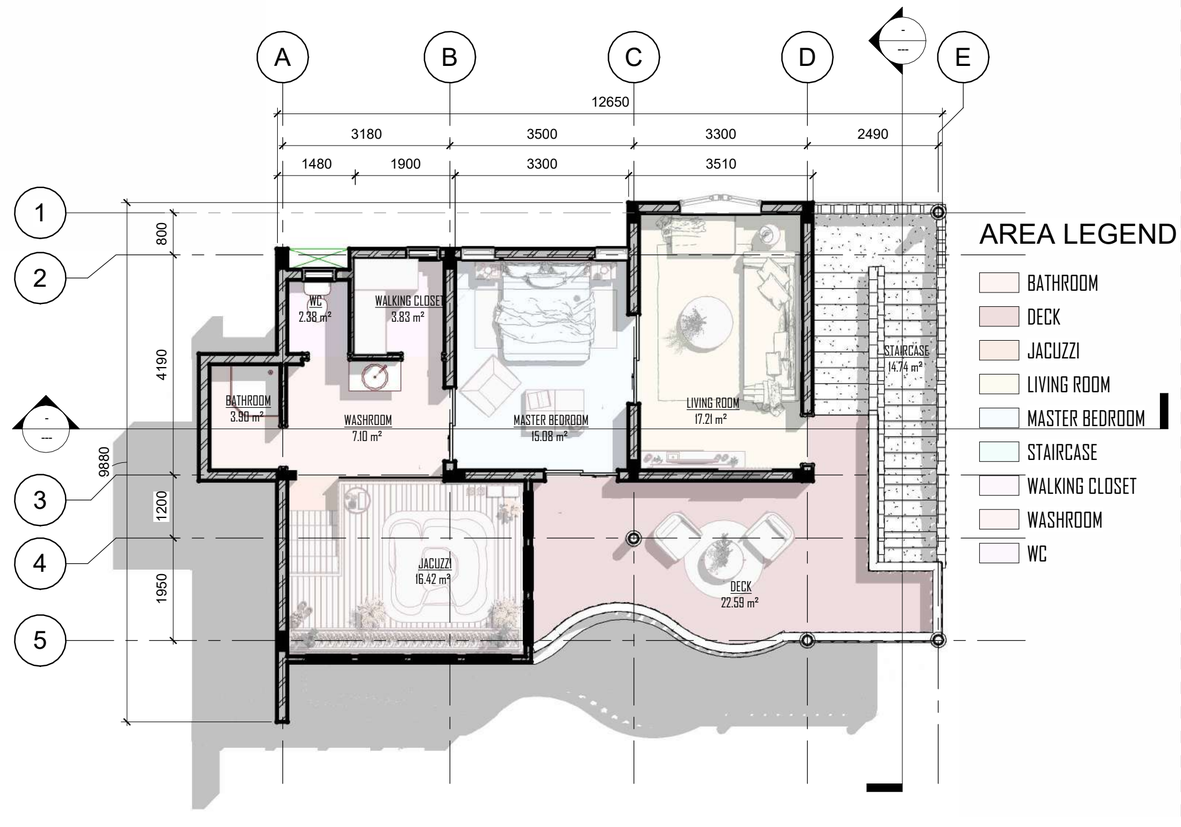
NAME : ABHISHEK KUMAR
SCHOLAR NO : 211110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

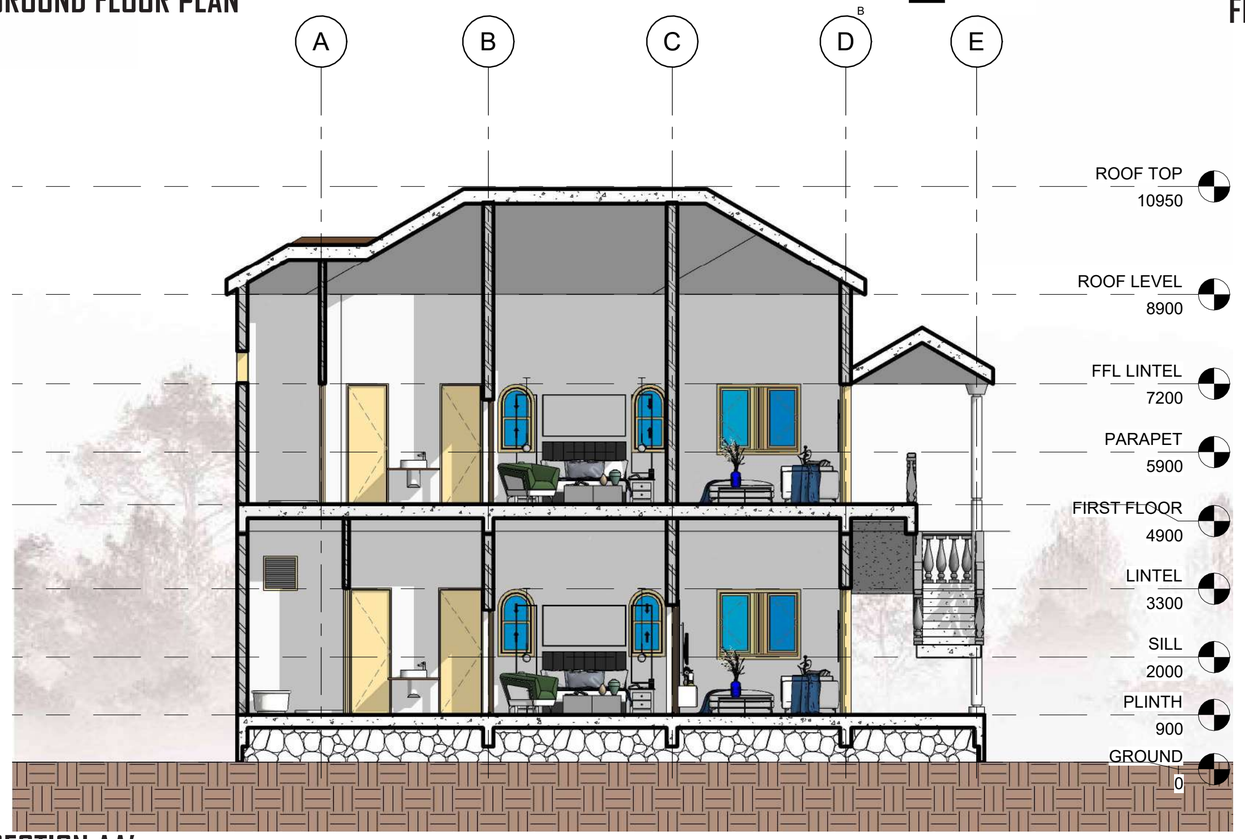
SCALE : 1:75
ALL DIMENSIONS ARE IN MM



GROUND FLOOR PLAN



FIRST FLOOR PLAN



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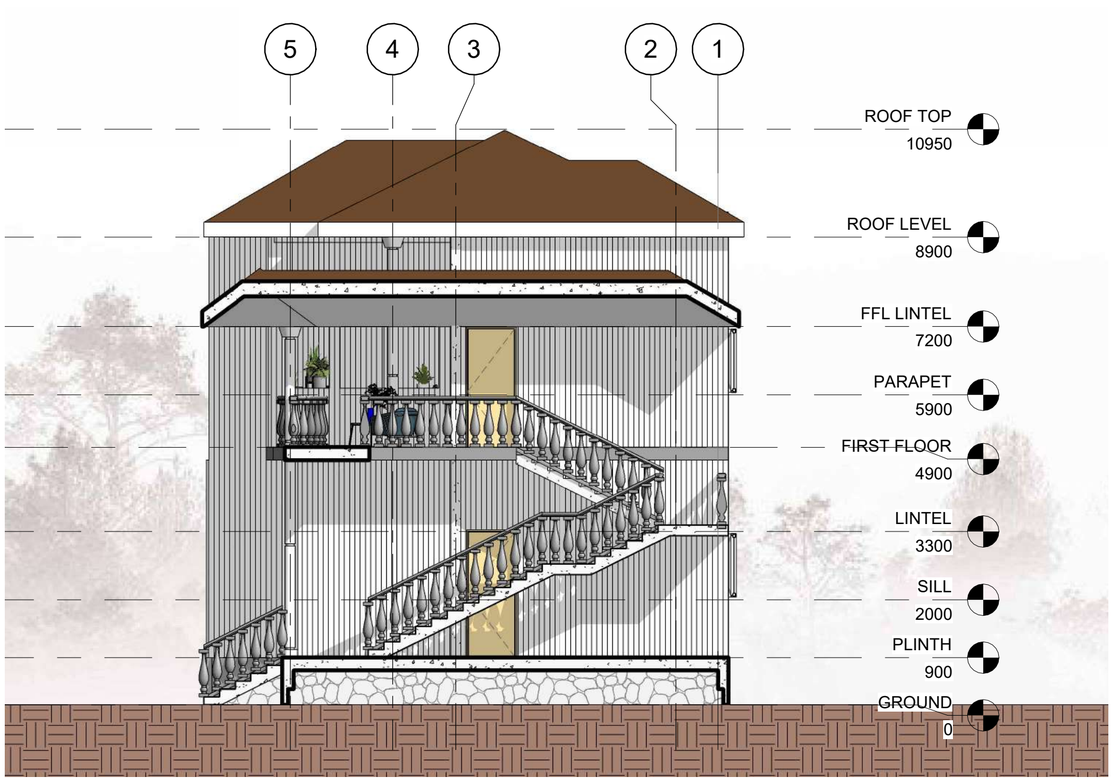

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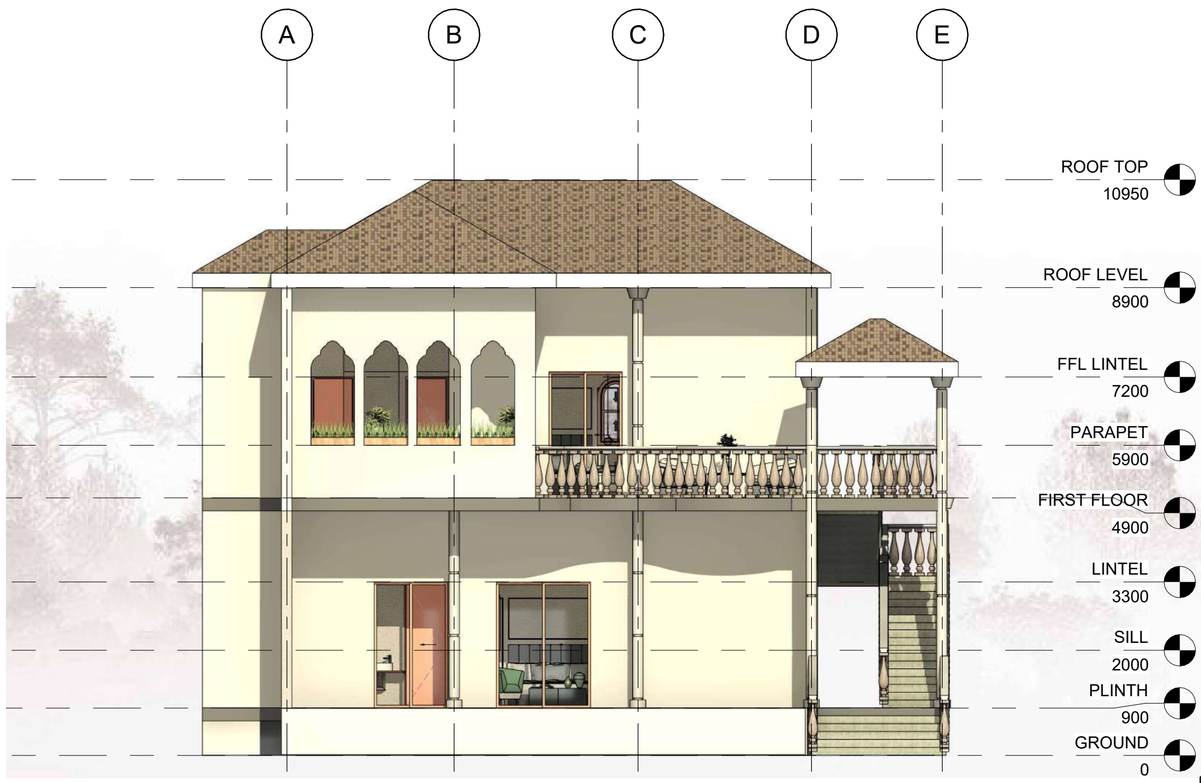
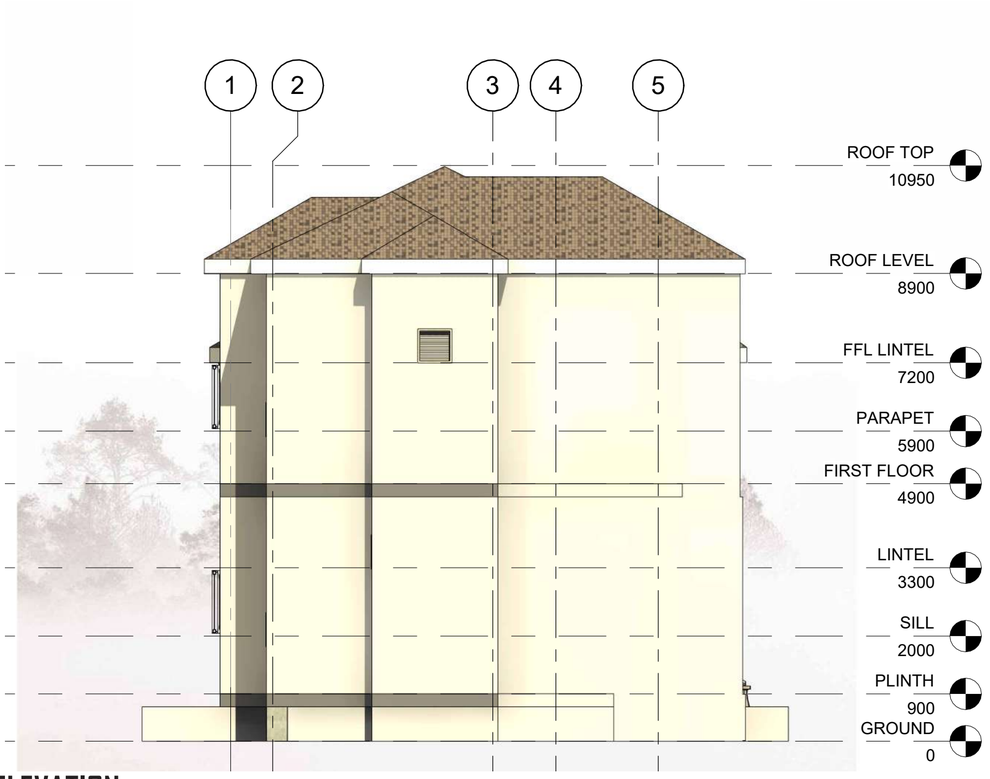
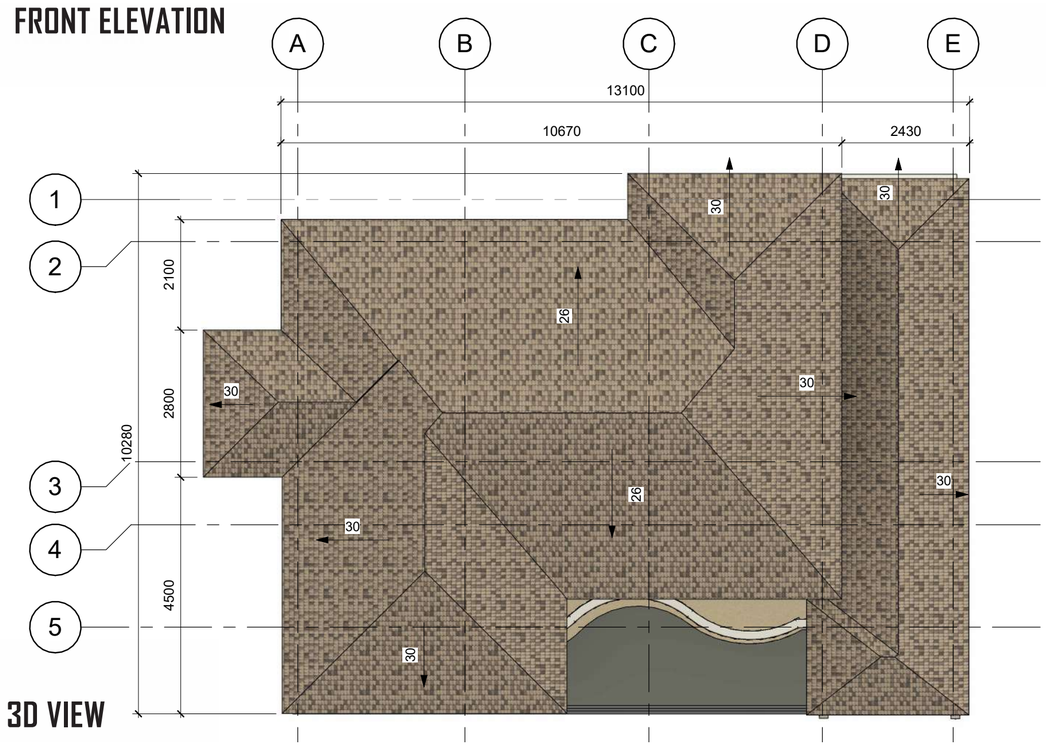


FRONT ELEVATION



SIDE ELEVATION



3D VIEW



3D VIEW

BEACH RESORT - PRIVATE LUXURY SIUTE

CHORWAD GUJRAT

NAME : ABHISHEK KUMAR
SCHOLAR NO : 211110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

SCALE : 1:75
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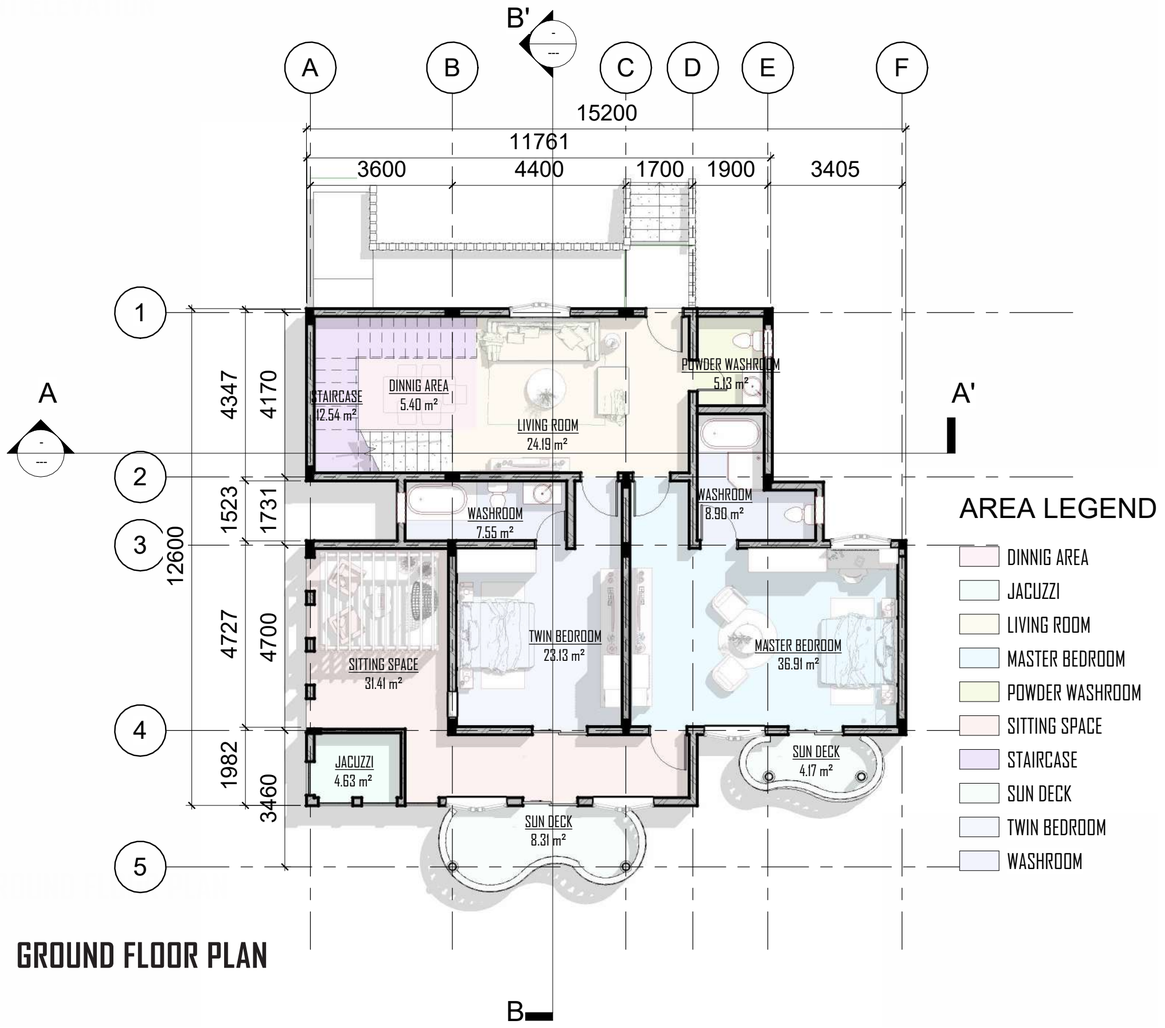
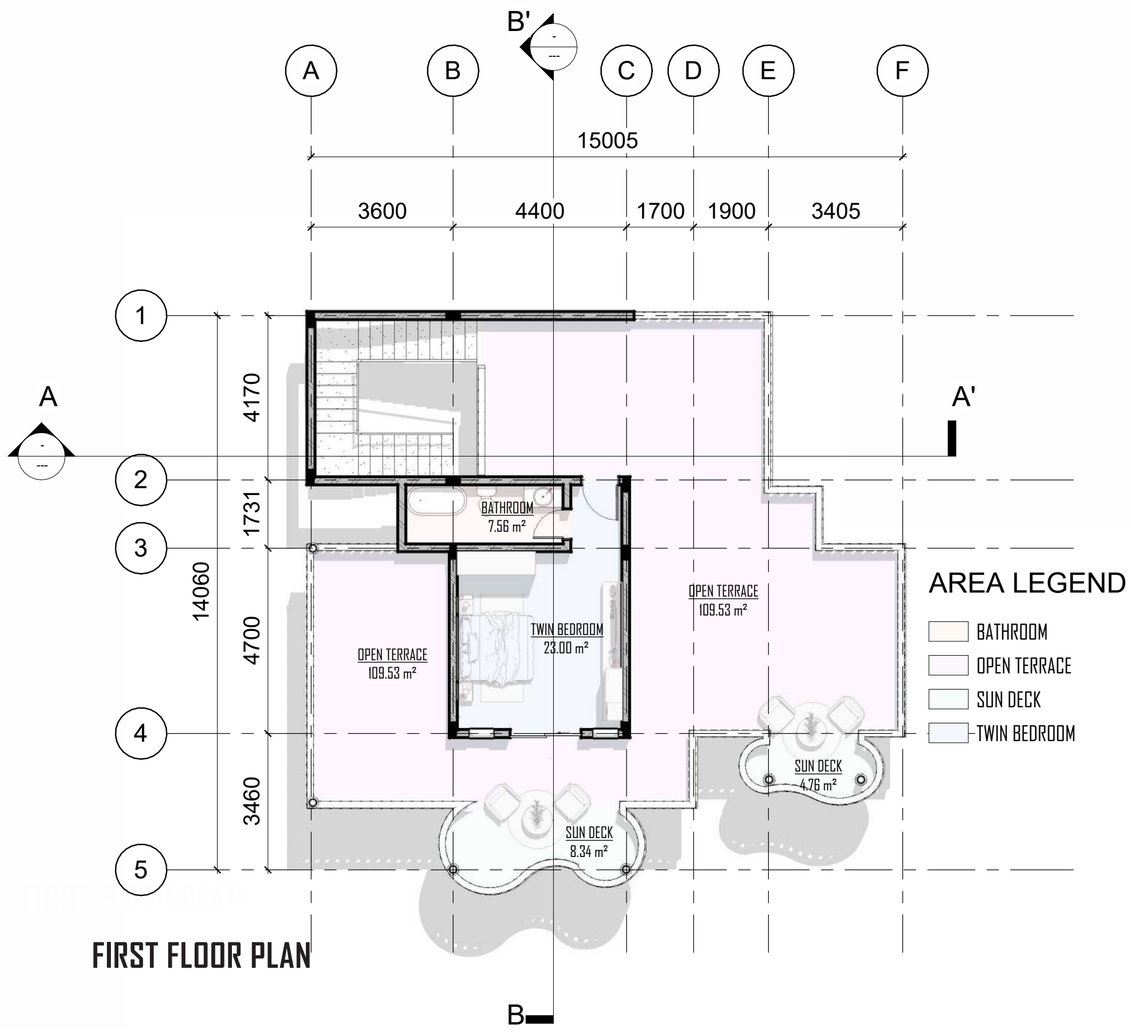
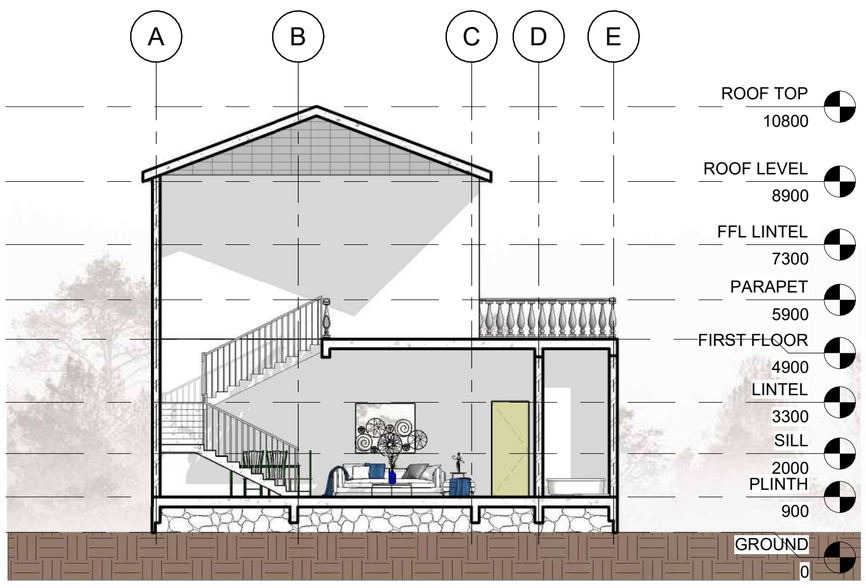


GROUND FLOOR PLAN



FIRST FLOOR PLAN



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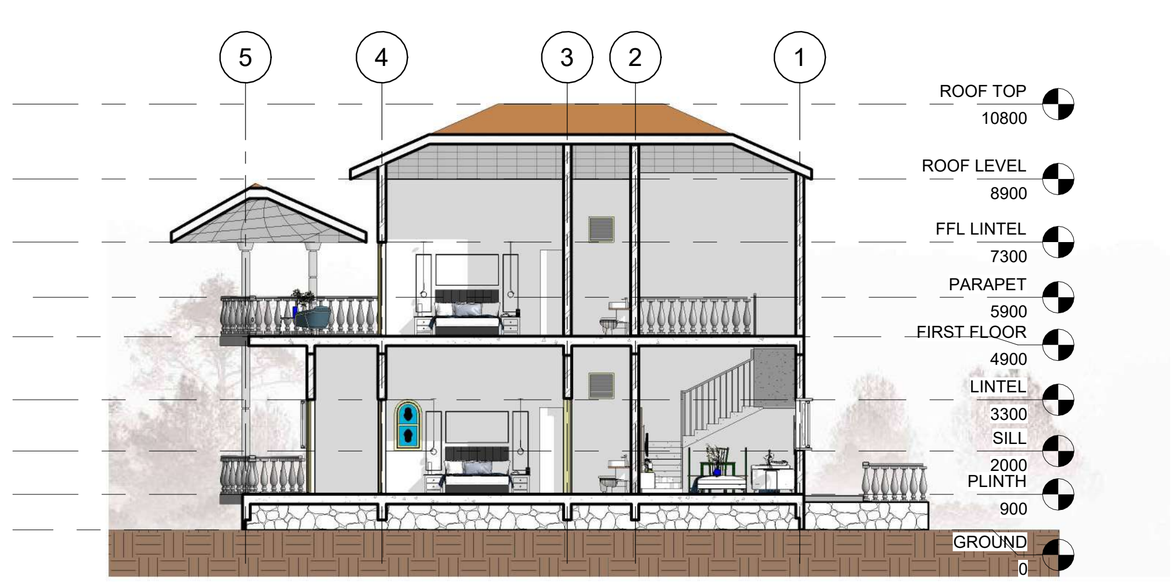

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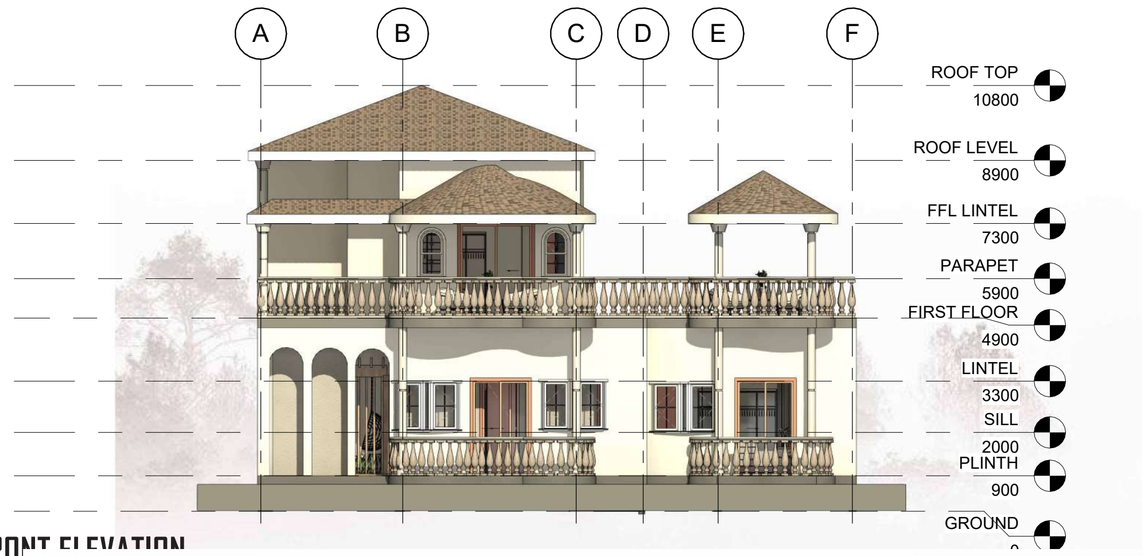
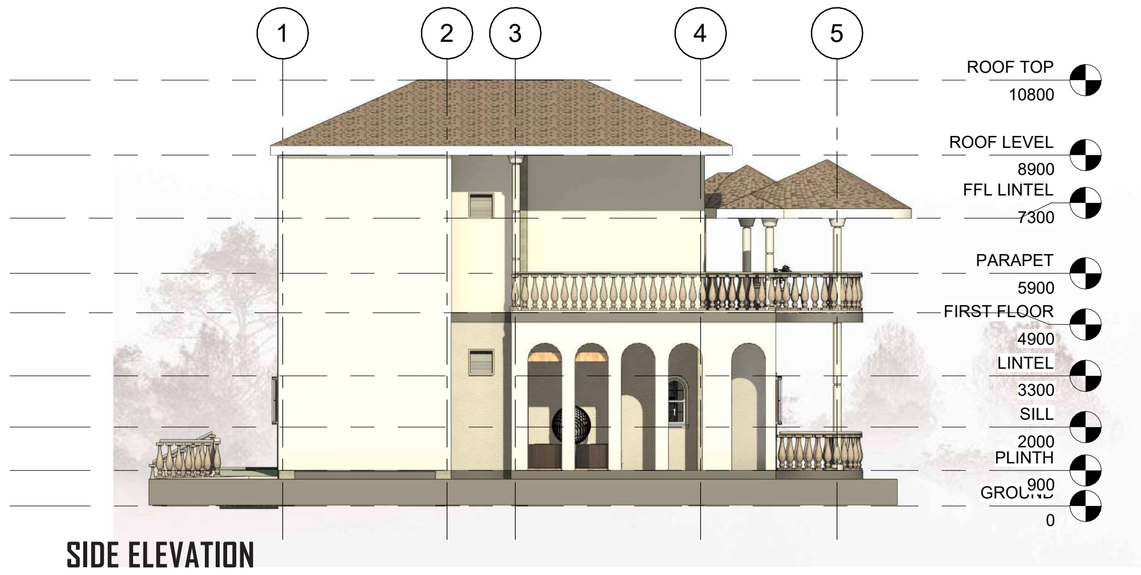
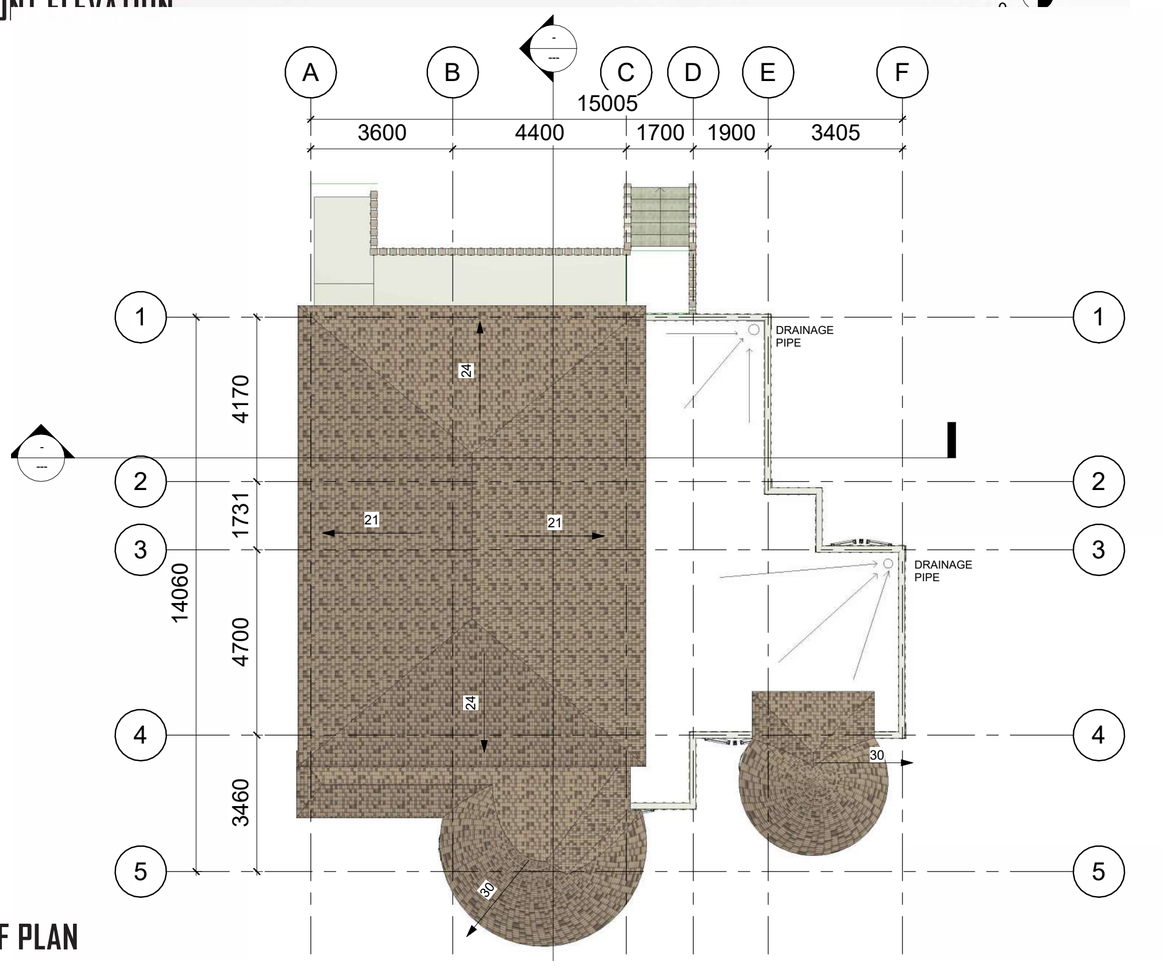


FRONT ELEVATION



SIDE ELEVATION



ROOF PLAN



3D VIEW

BEACH RESORT - FAIMLY VILLA

CHORWAD GUJRAT

NAME : ABHISHEK KUMAR
SCHOLAR NO : 211110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

SCALE : 1:75
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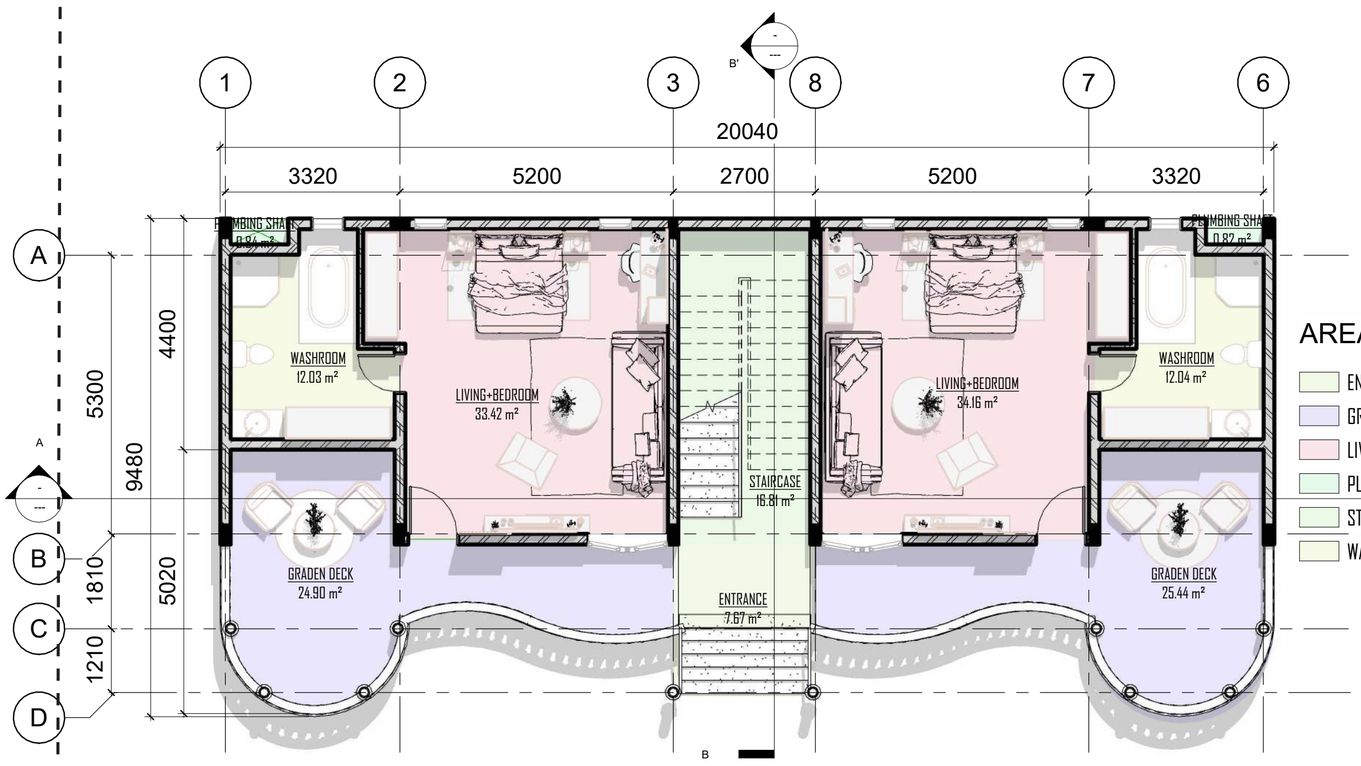
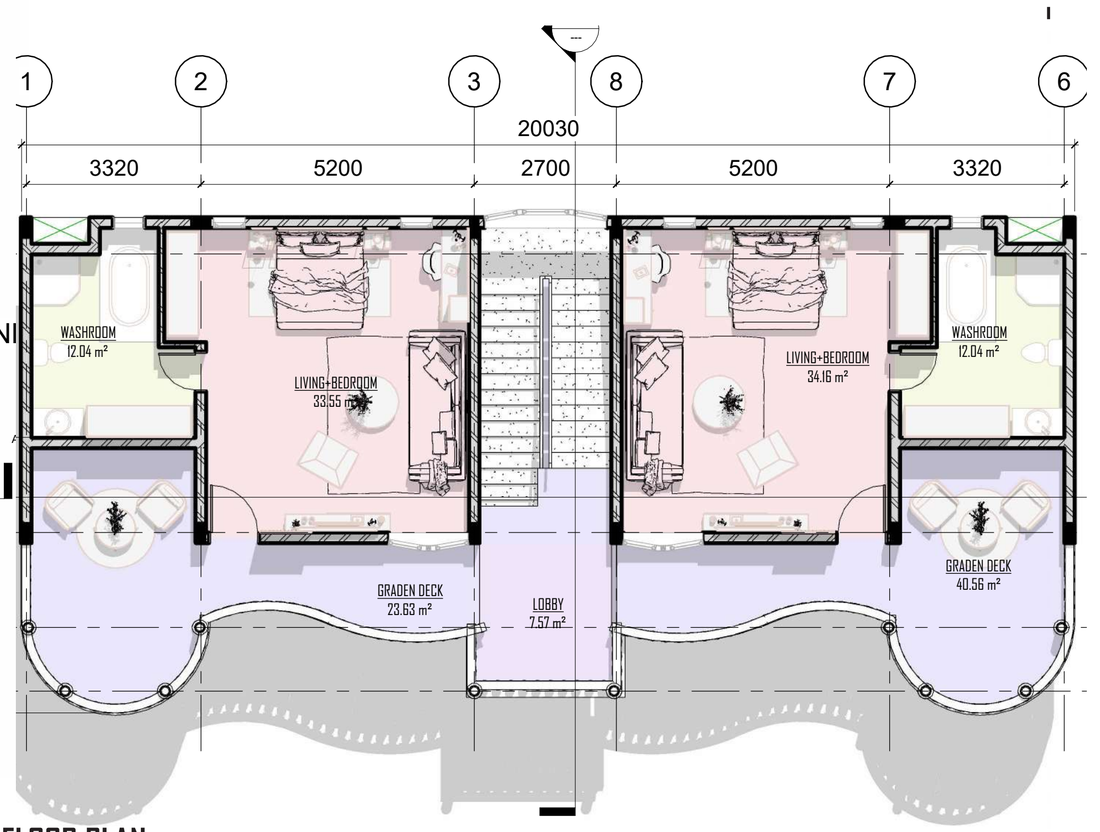


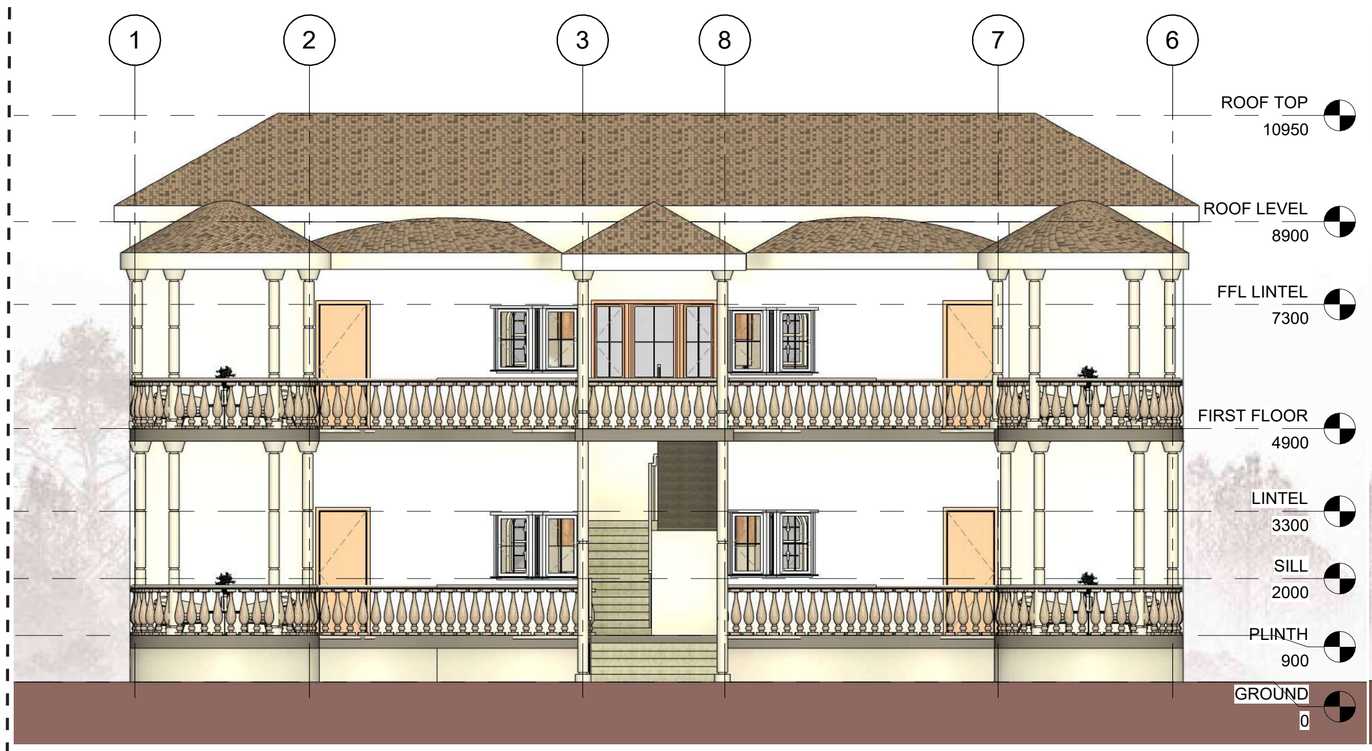
GROUND FLOOR PLAN

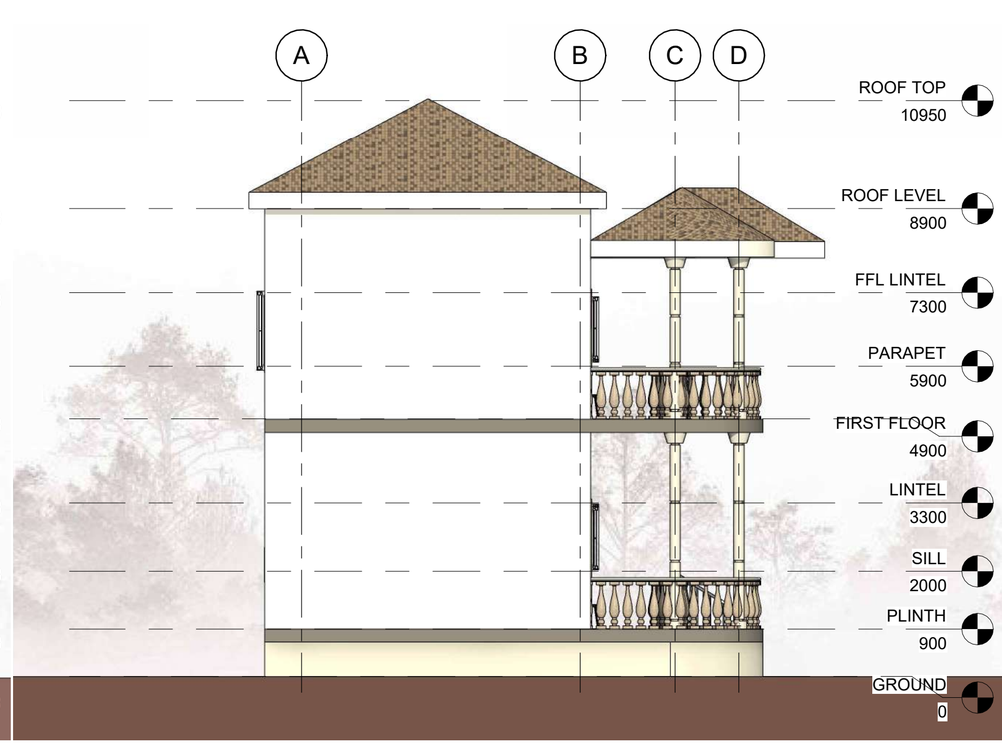
AREA LEGEND

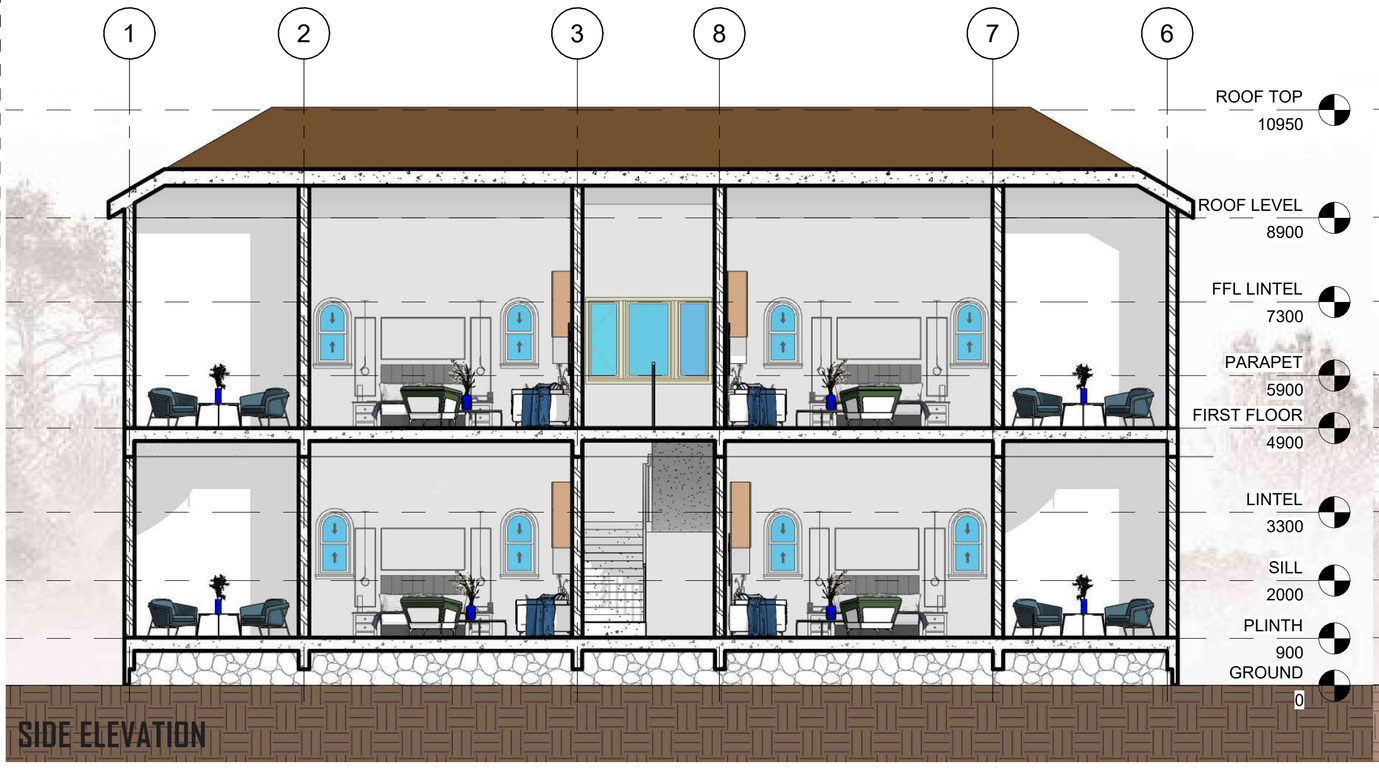
- ENTRANCE
- GRADEN DECK
- LIVING+BEDROOM
- PLUMBING SHAFT
- STAIRCASE
- WASHROOM



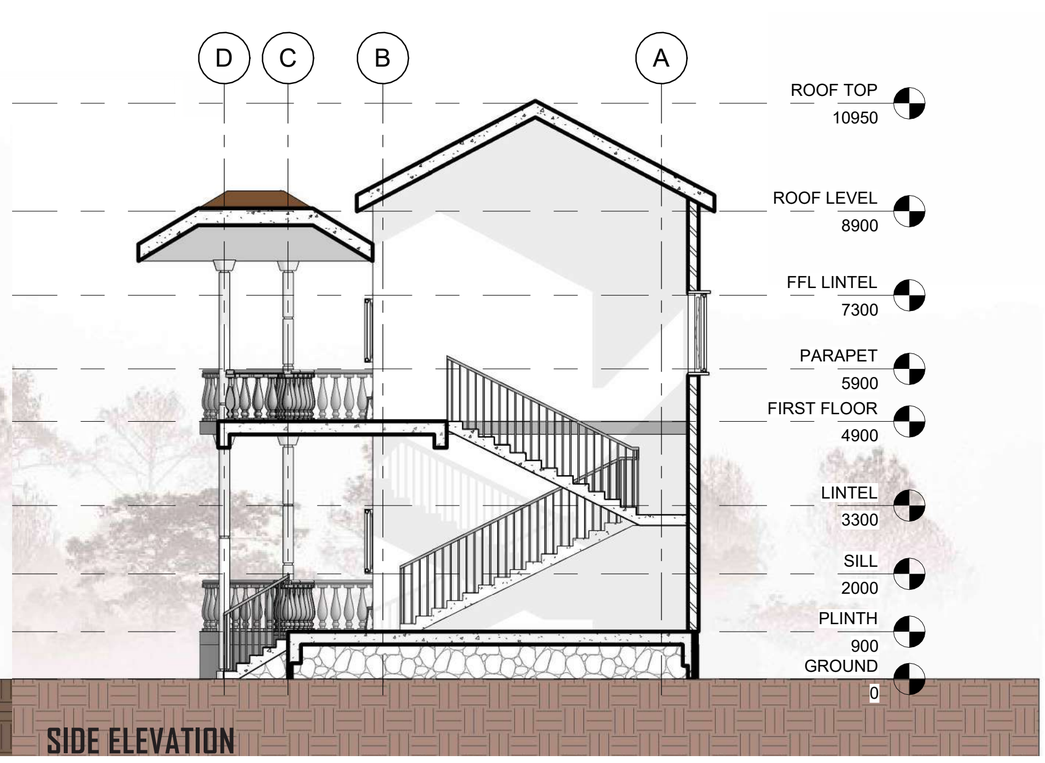
FIRST FLOOR PLAN



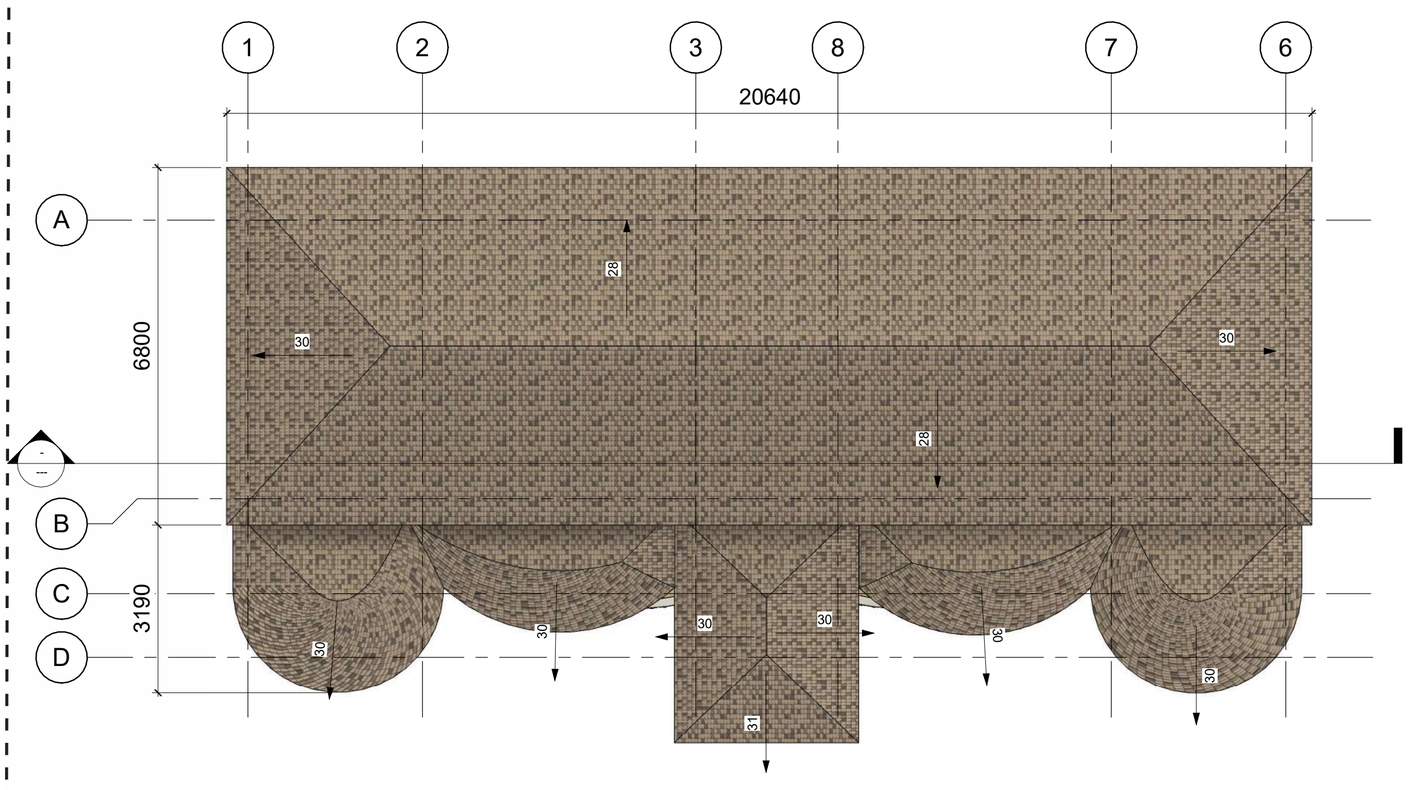




SIDE ELEVATION



SIDE ELEVATION



ROOF PLAN



3D VIEW

BEACH RESORT - GRADEN VIEW SIUTE

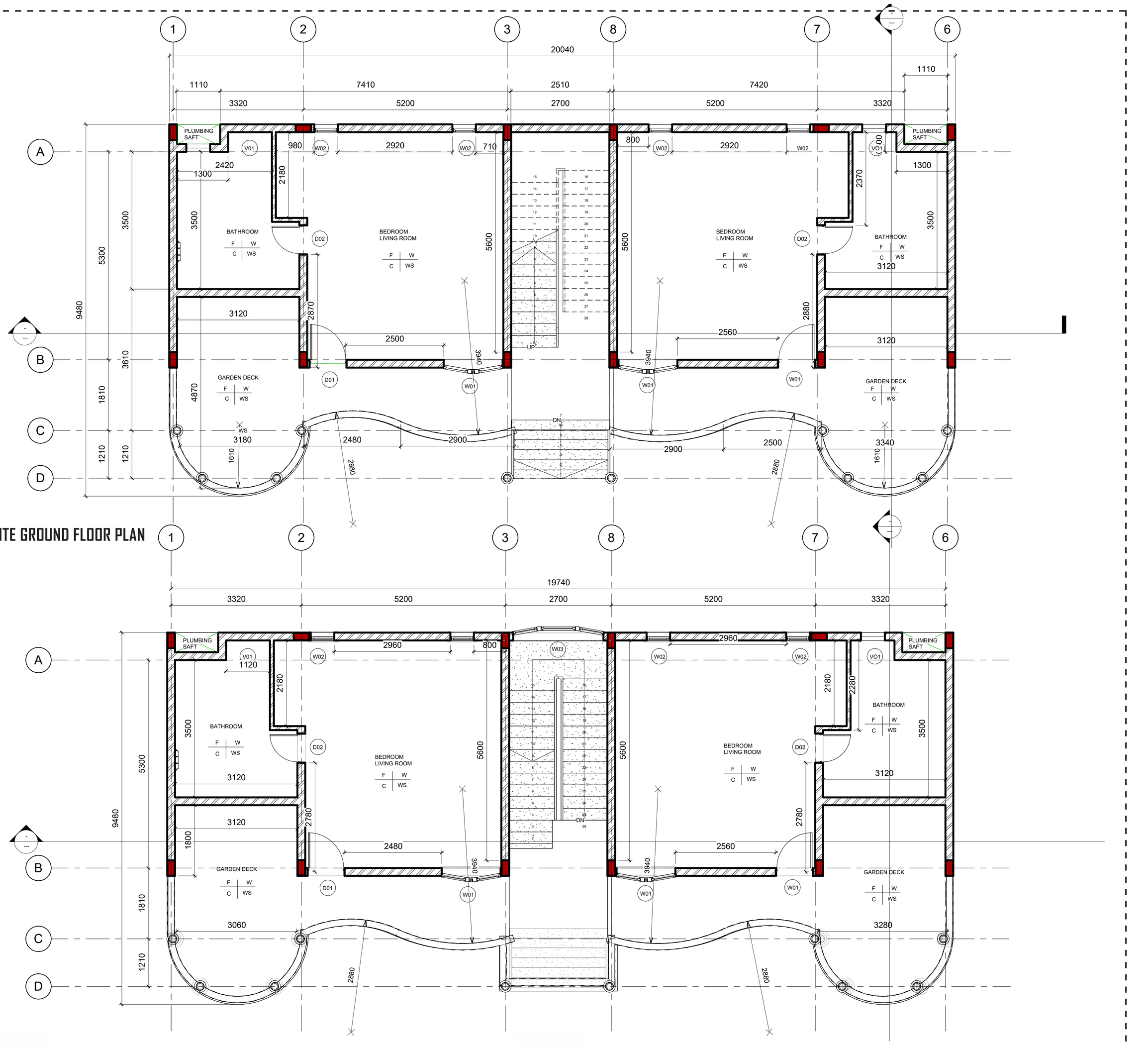
CHORWAD GUJRAT

NAME : ABHISHEK KUMAR
SCHOLAR NO : 21111O244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

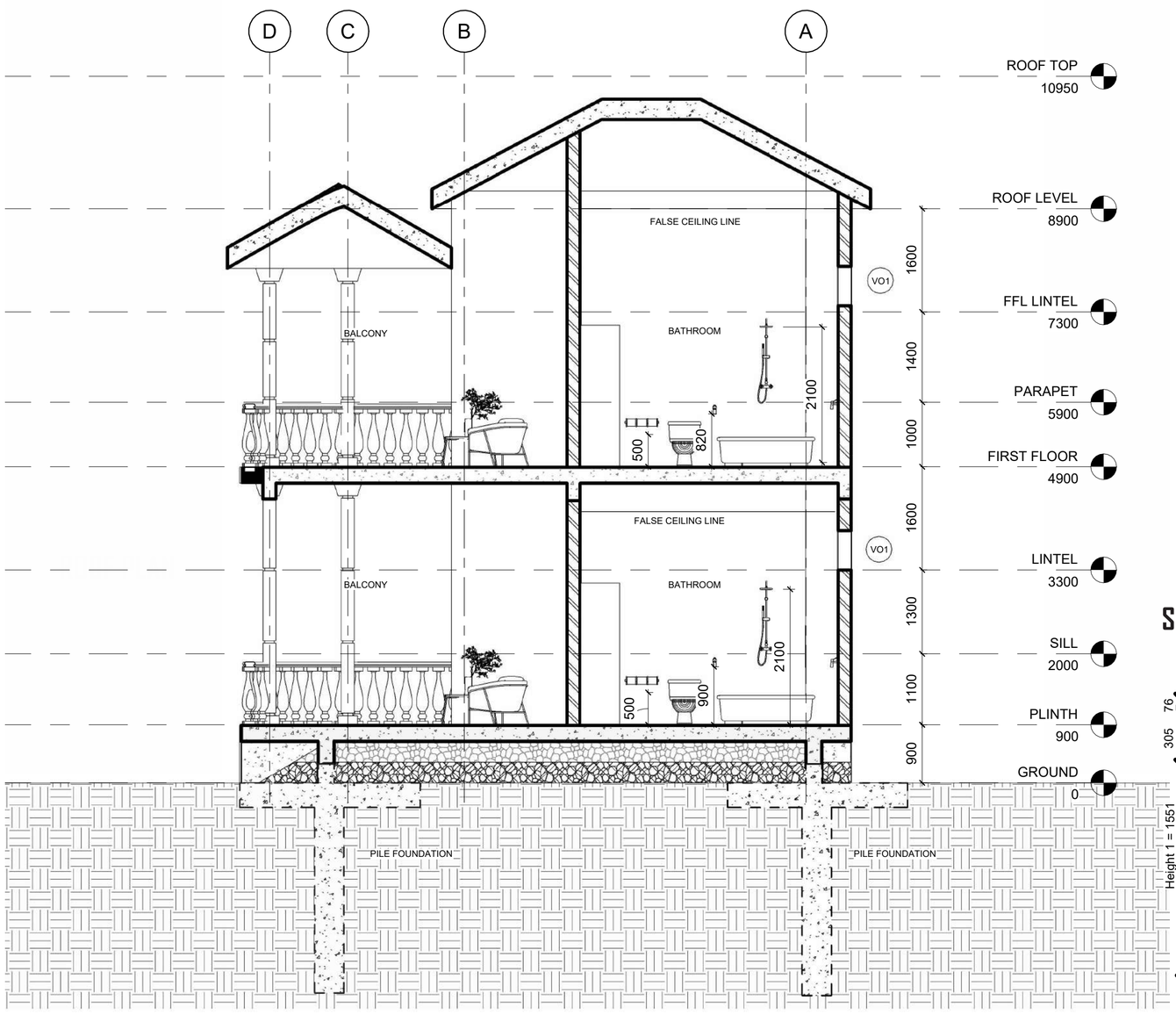
SCALE : 1:75
ALL DIMENSIONS ARE IN MM

GRADEN SUITE GROUND FLOOR PLAN



GRADEN SUITE FIRST FLOOR PLAN

GRADEN SUITE FIRST FLOOR PLAN



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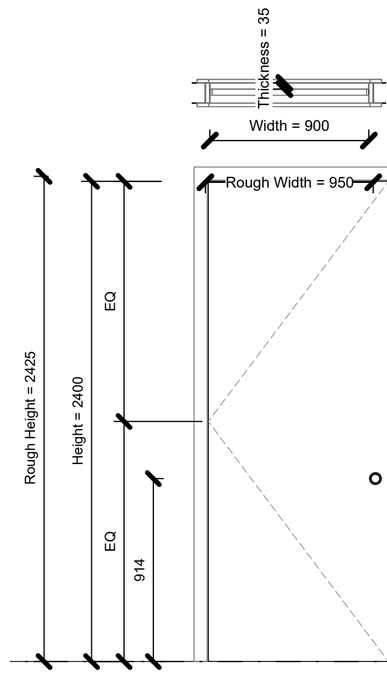
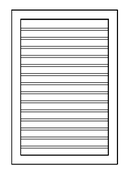
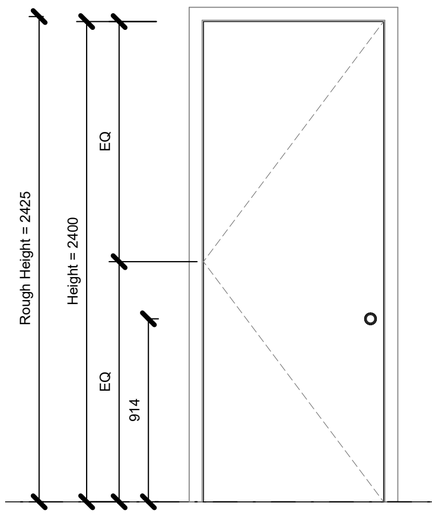


SINGLE FLUSH DOOR DETAIL (D01)



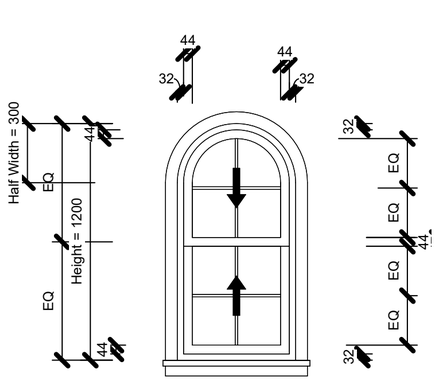
VETILATION (01)



SINGLE FLUSH DOOR DETAIL (D02)



BYE WINDOW DETAIL (W01)



DOUBLE HANG ARCH WINDOW DETAIL (W02)

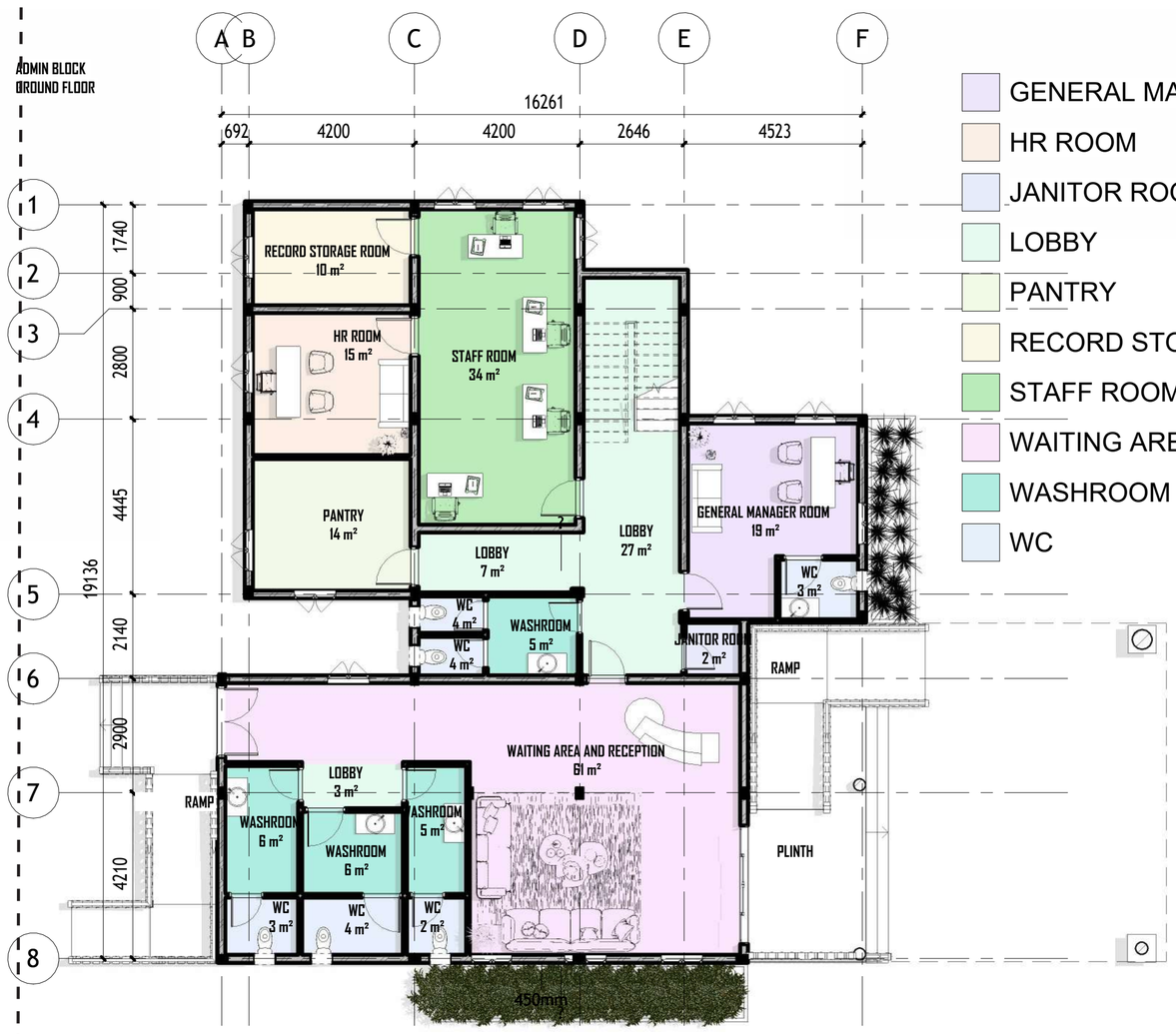
BEACH RESORT - WORKING DRAWING

CHORWAD GUJRAT

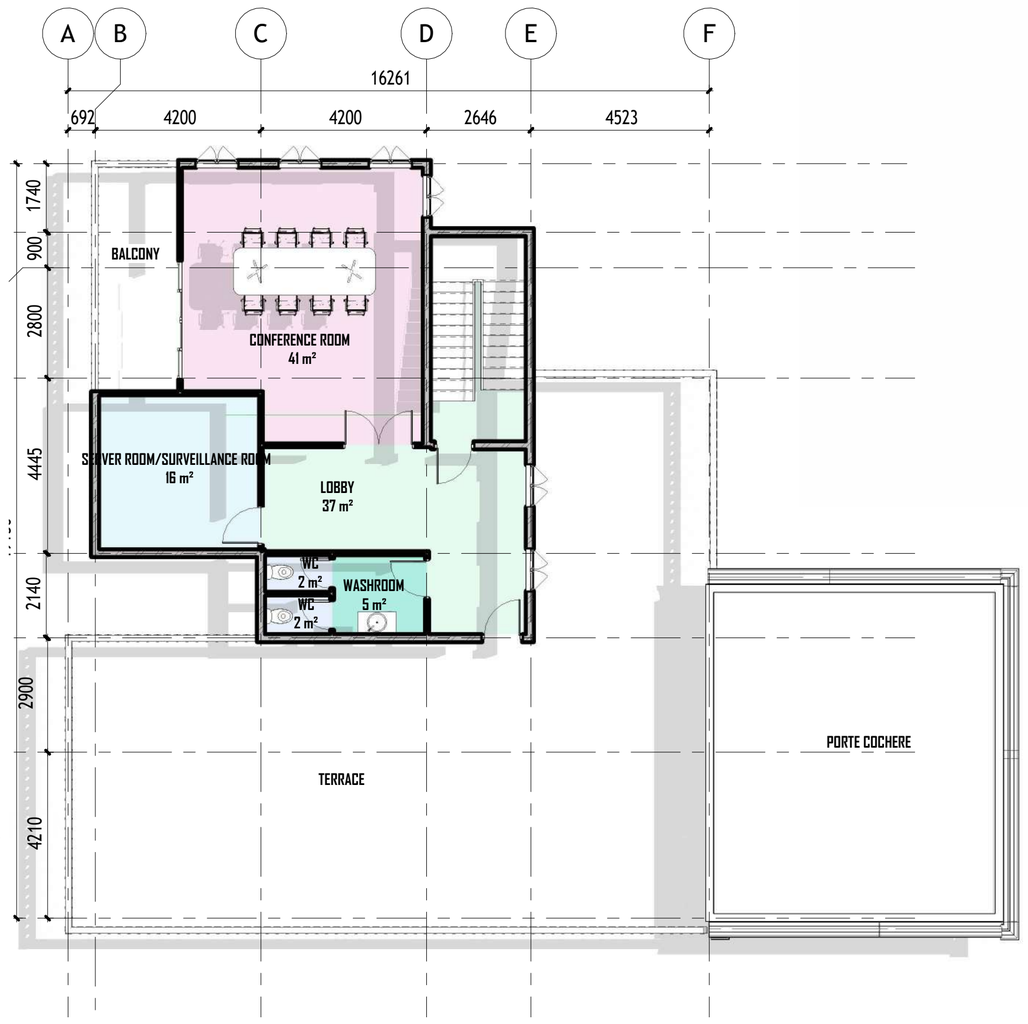
NAME : ABHISHEK KUMAR
SCHOLAR NO : 21110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

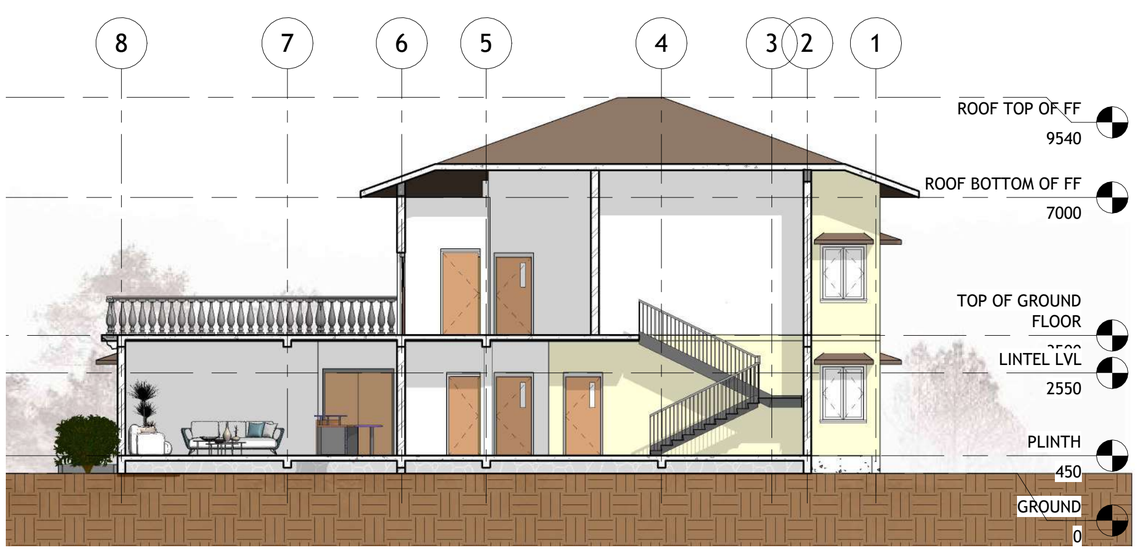
SCALE : 1:50
ALL DIMENSIONS ARE IN MM



GROUND FLOOR PLAN



FIRST FLOOR PLAN



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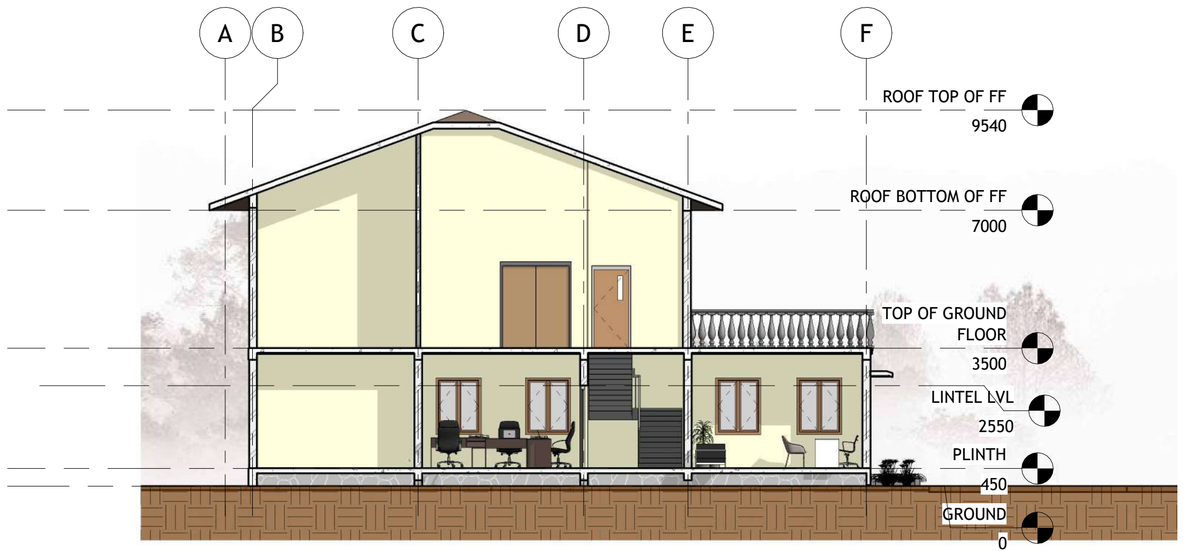

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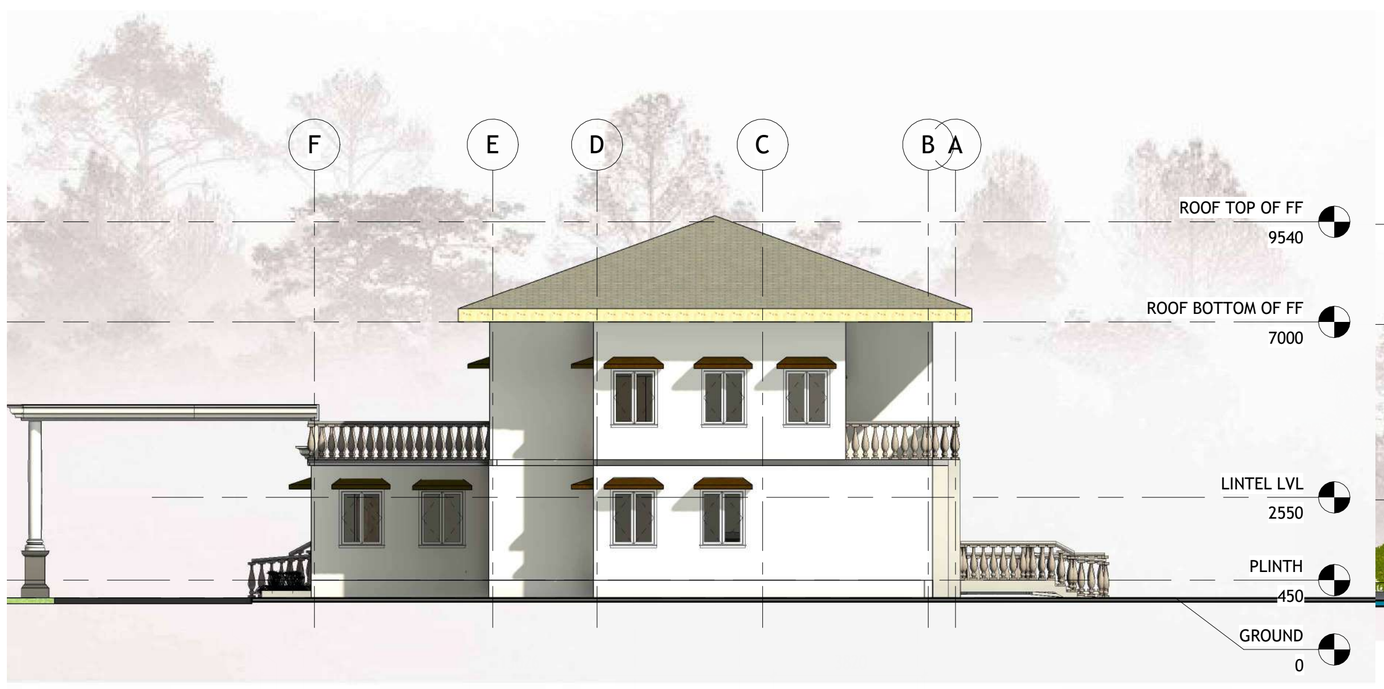
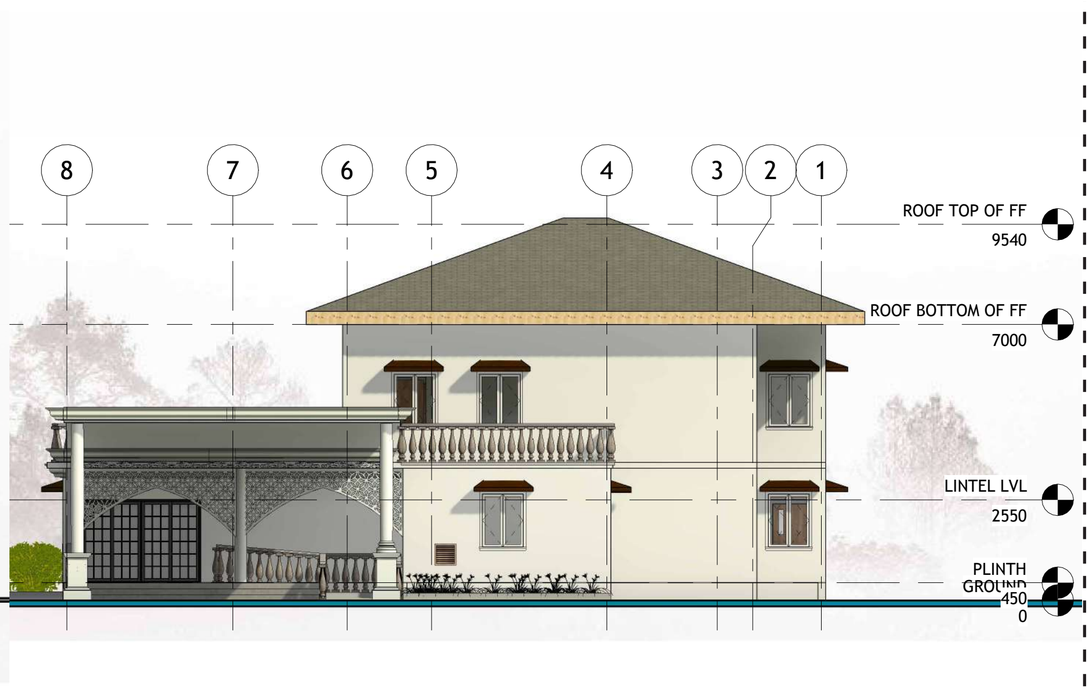
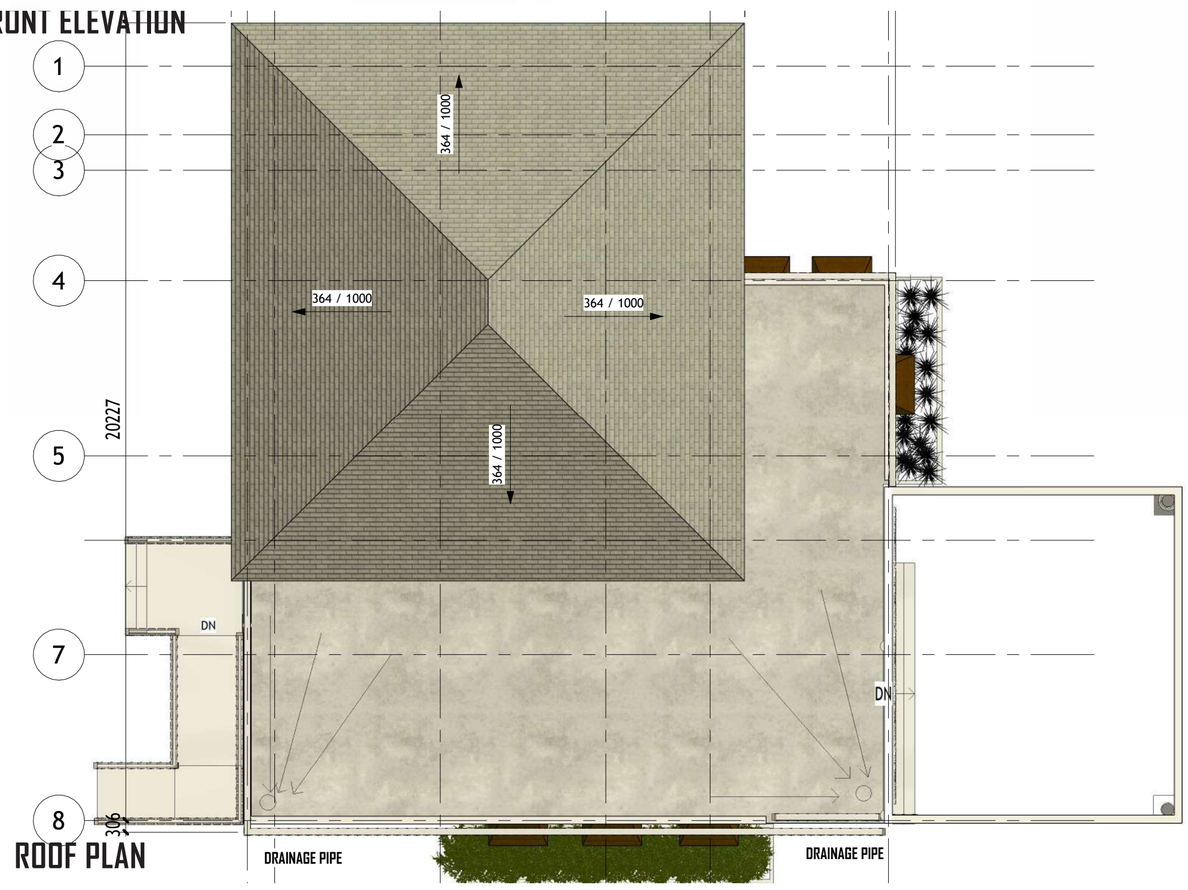




FRONT ELEVATION

SIDE ELEVATION



ROOF PLAN



3D VIEW

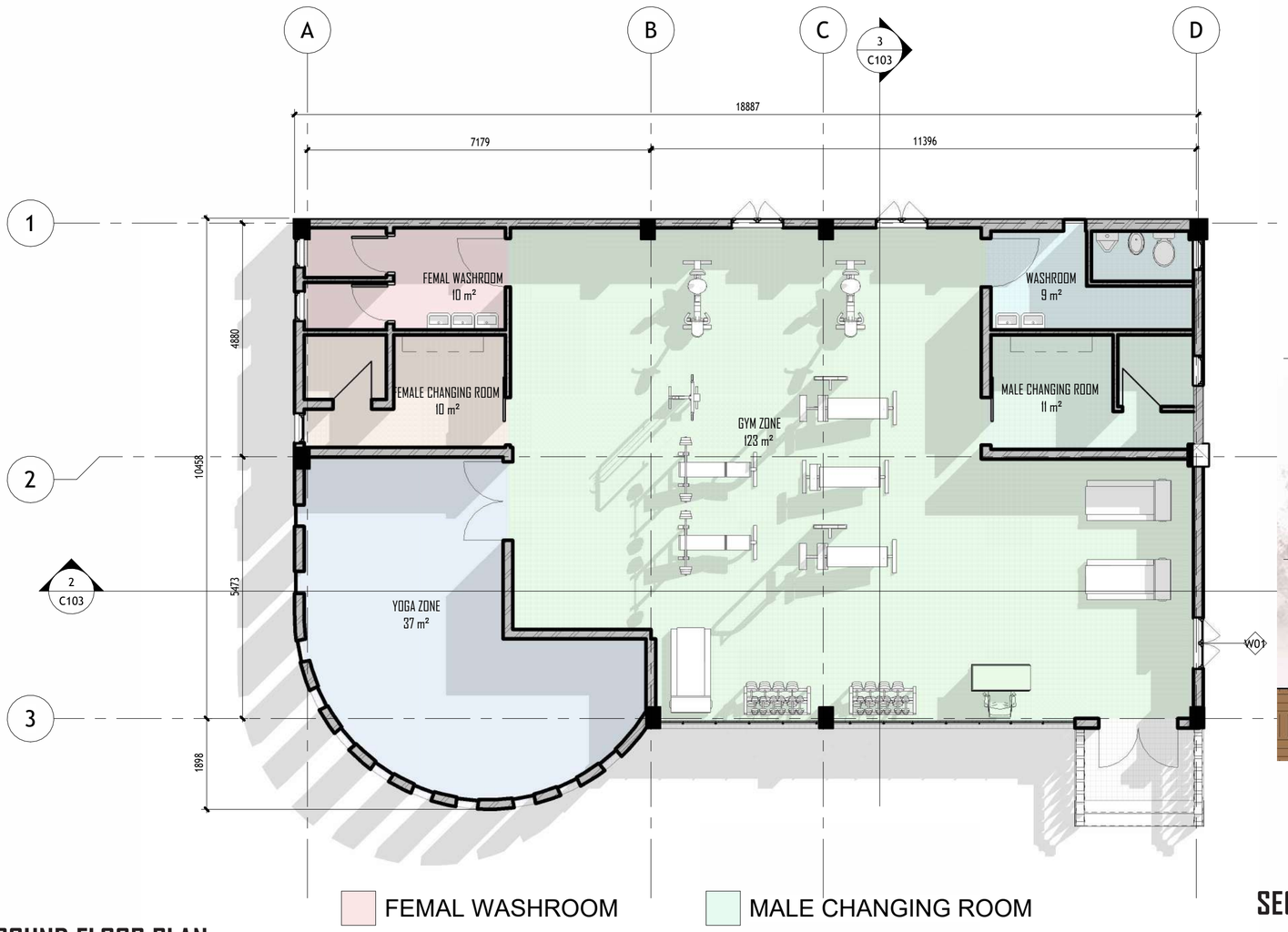
BEACH RESORT - ADMIN BLOCK

CHORWAD GUJRAT

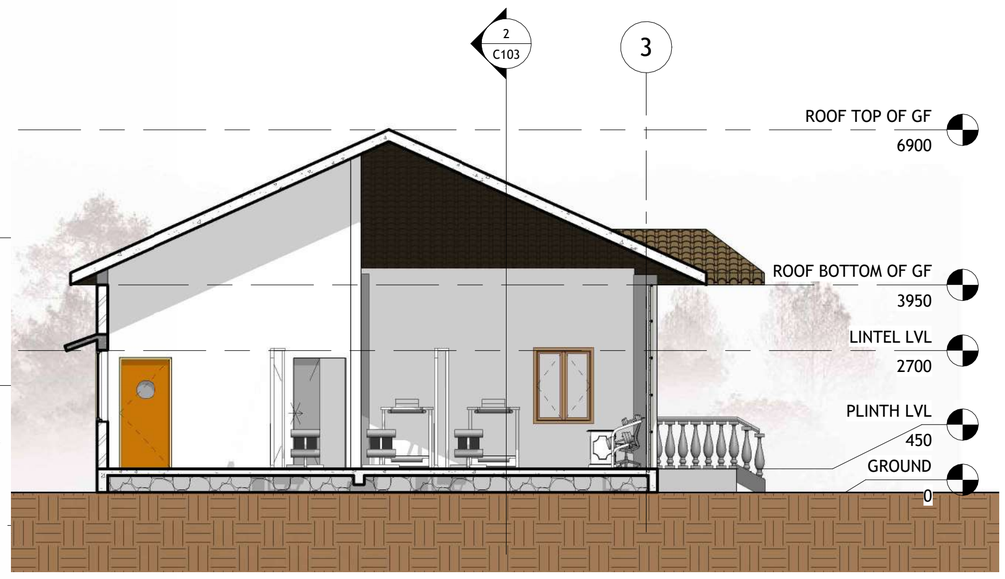
NAME : ABHISHEK KUMAR
SCHOLAR NO : 211110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

SCALE : 1:100
ALL DIMENSIONS ARE IN MM



GROUND FLOOR PLAN



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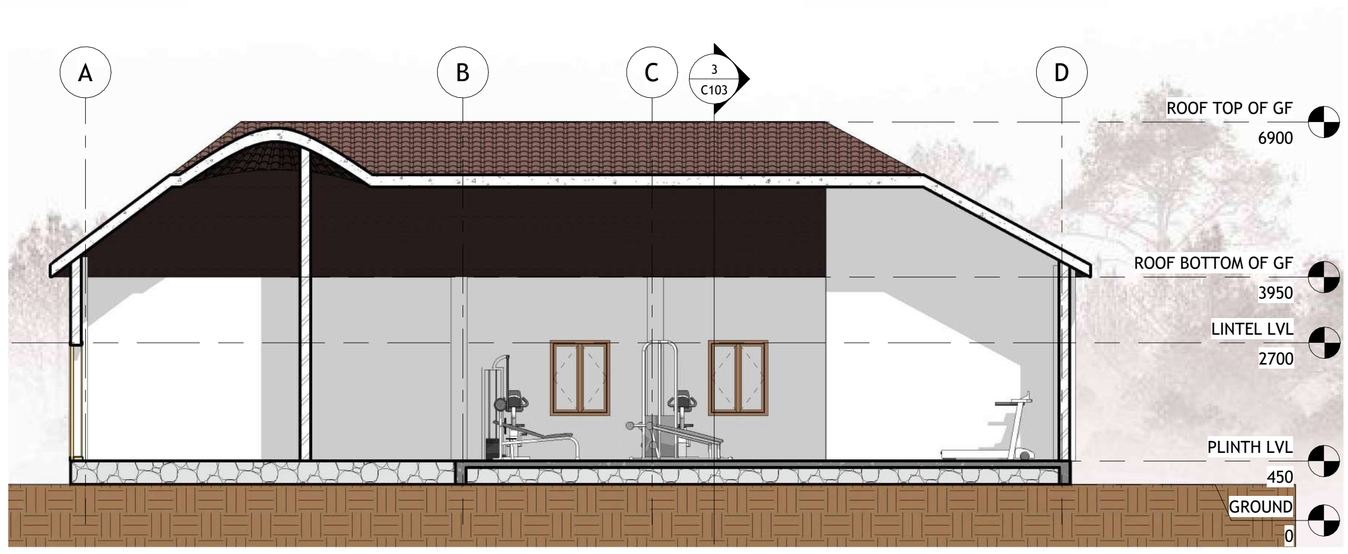
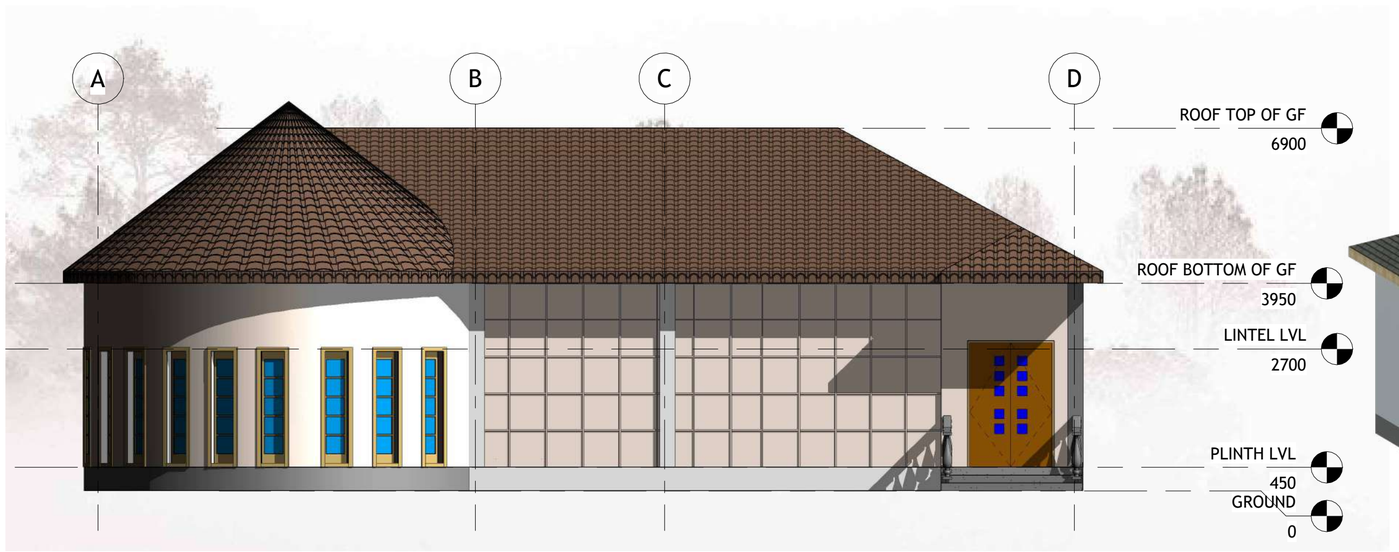


SECTION 03



SIDE ELEVATION



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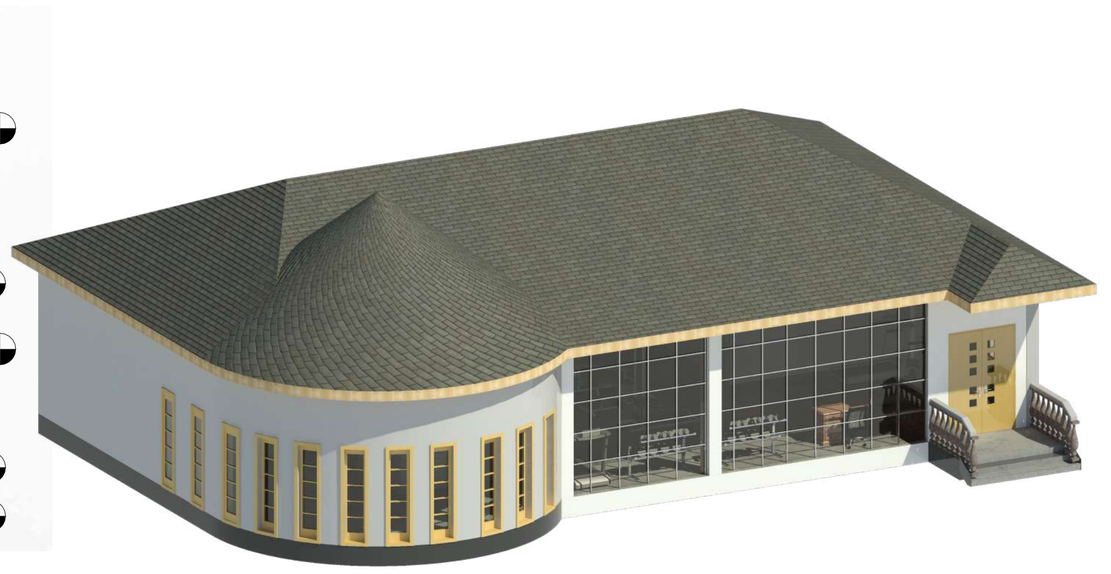
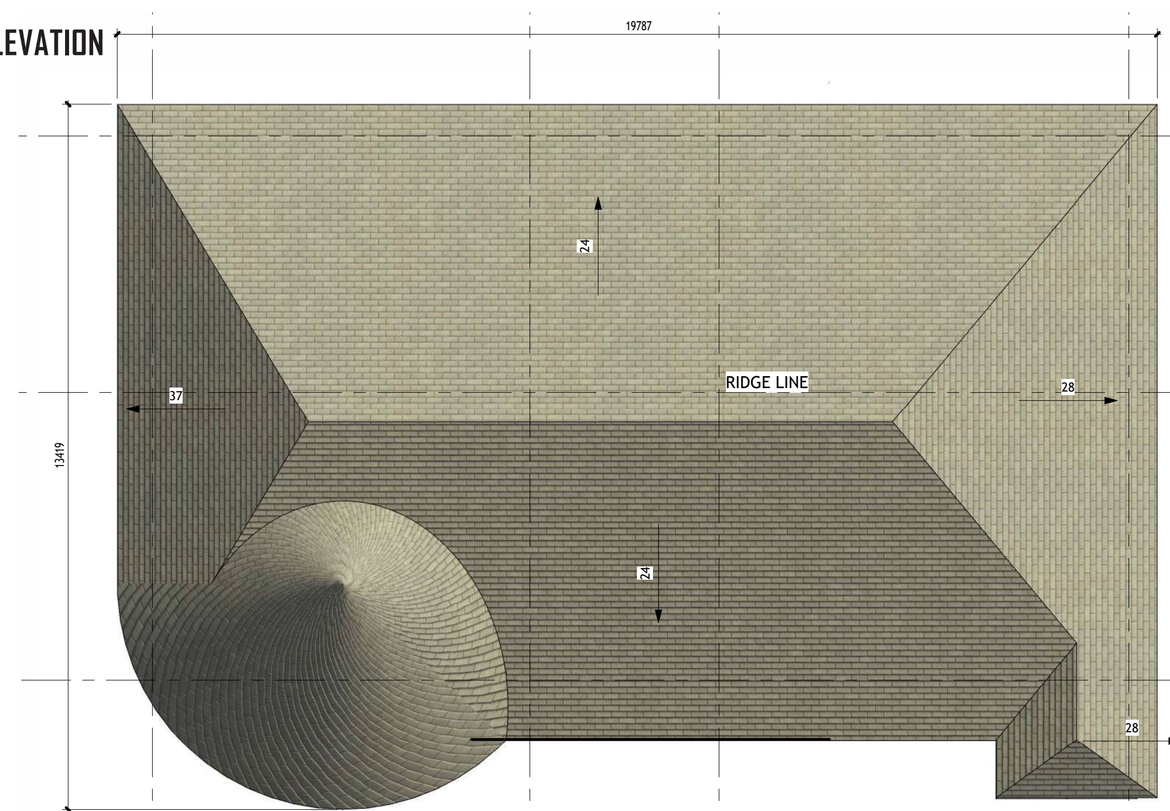


3D VIEW



ROOF PLAN



3D VIEW

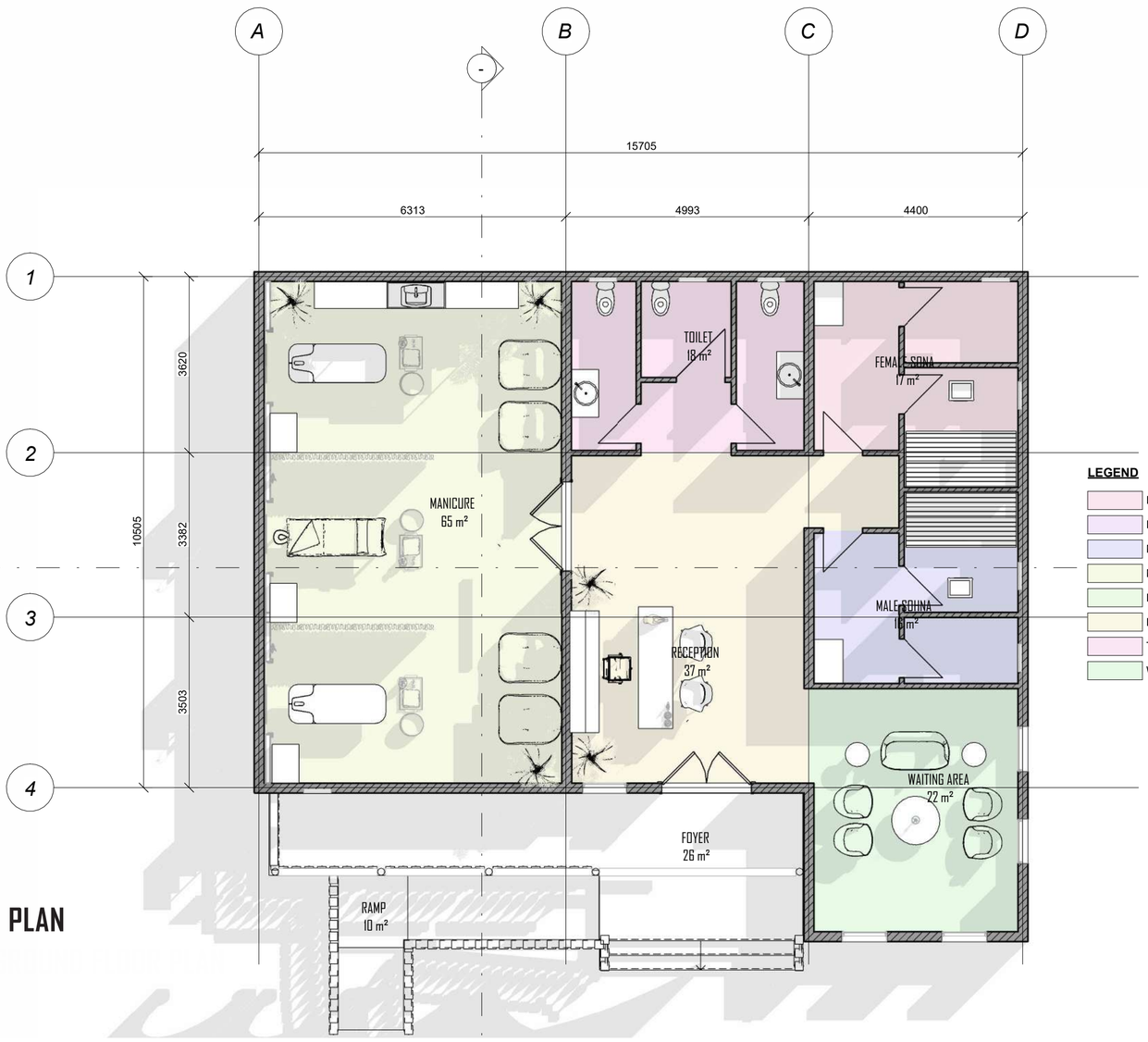
BEACH RESORT - WELLNESS

CHORWAD GUJRAT

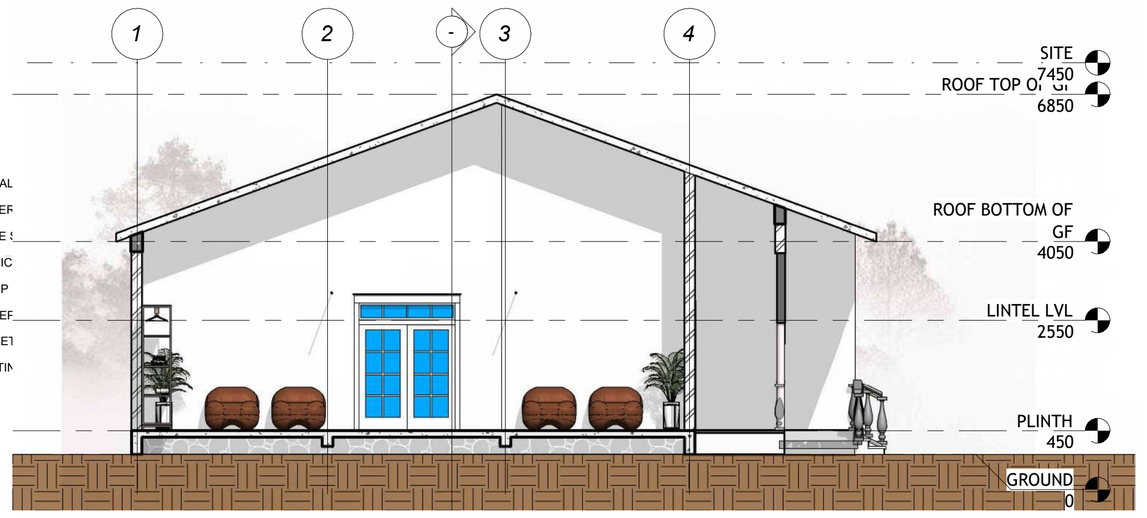
NAME : ABHISHEK KUMAR
SCHOLAR NO : 21111O244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

SCALE : 1:75
ALL DIMENSIONS ARE IN MM



PLAN



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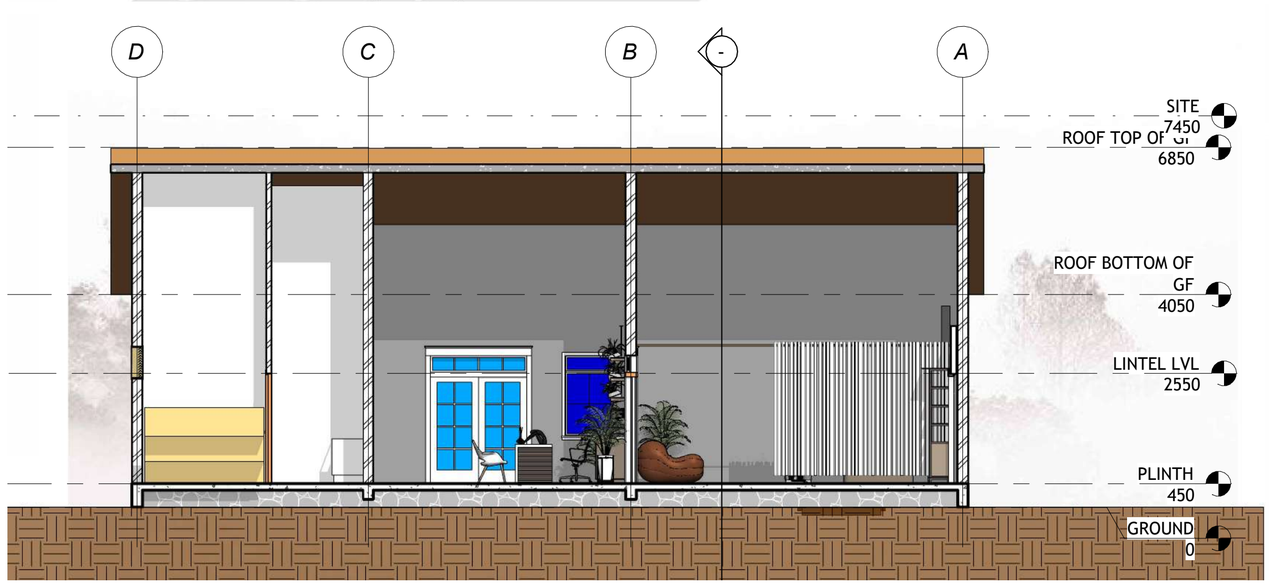

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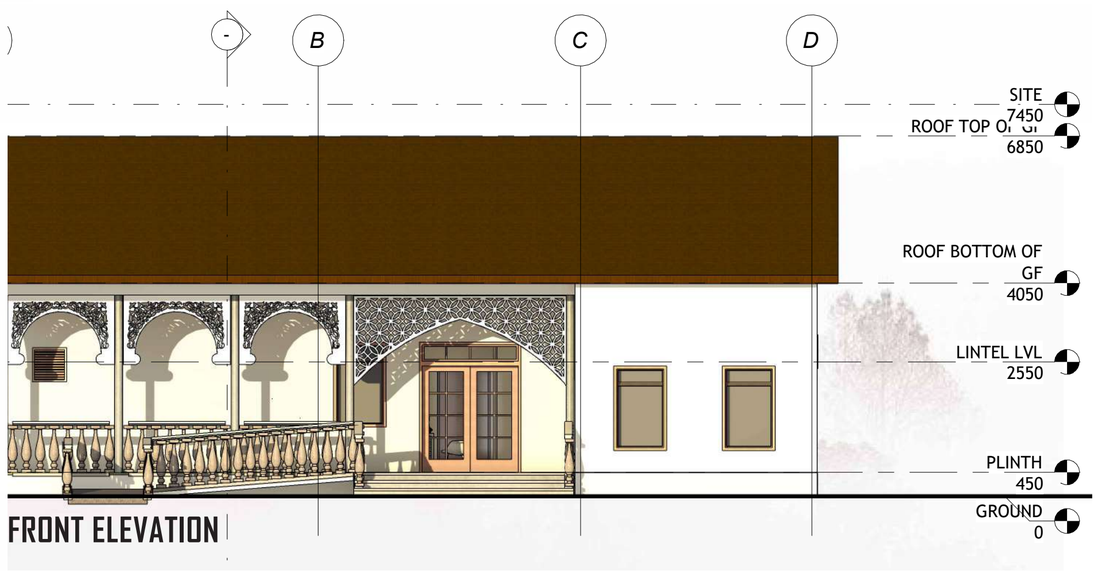
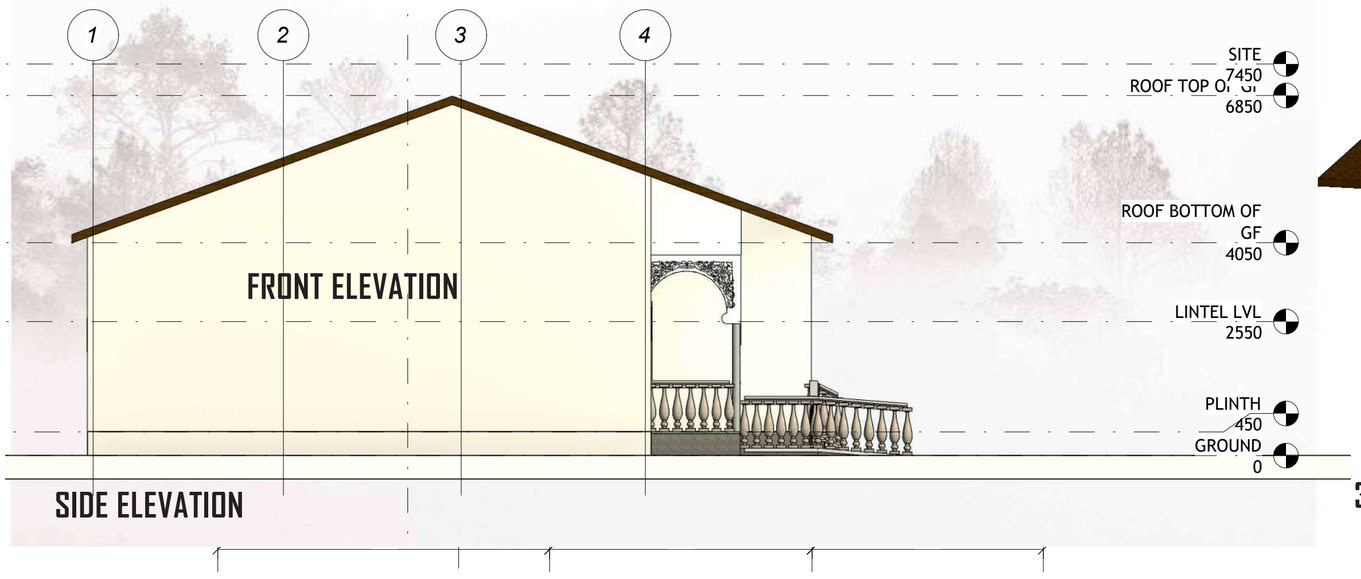


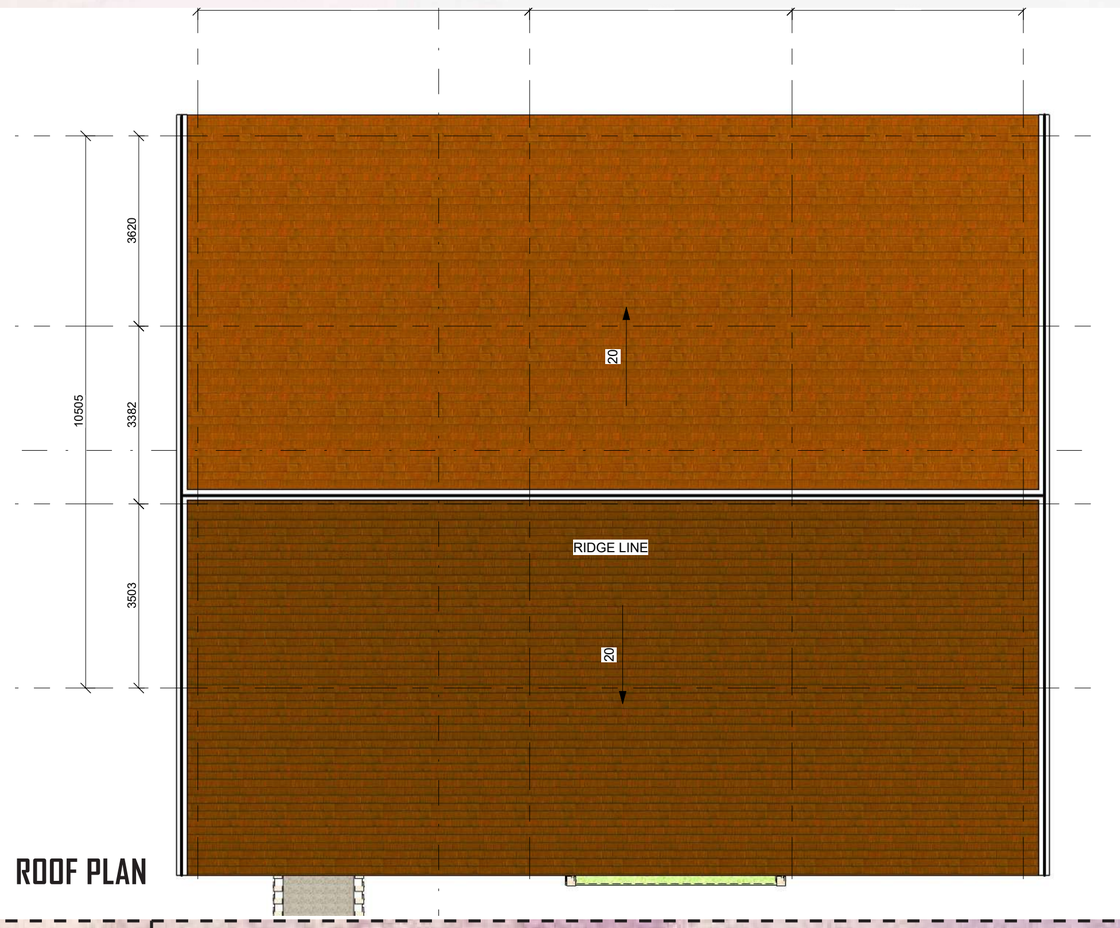
FRONT ELEVATION



SIDE ELEVATION



3D VIEW



ROOF PLAN



3D VIEW

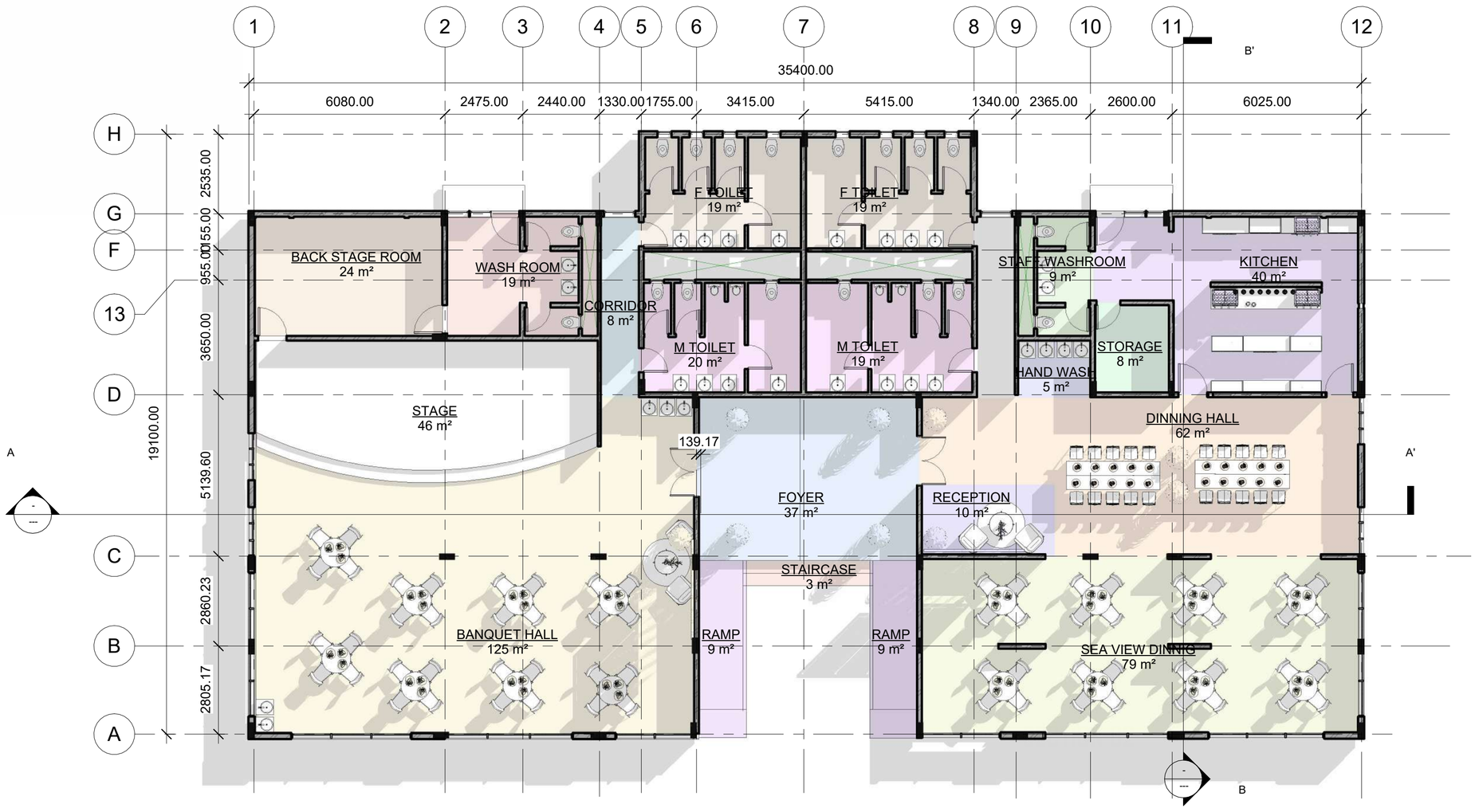
BEACH RESORT - SPA

CHORWAD GUJRAT

NAME : ABHISHEK KUMAR
SCHOLAR NO : 21110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

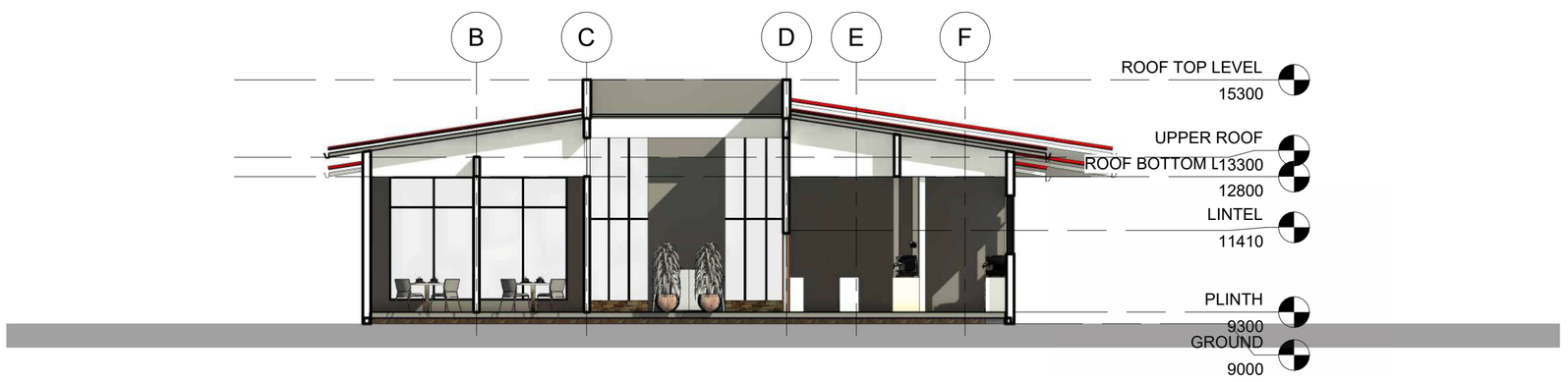
SCALE : 1:75
ALL DIMENSIONS ARE IN MM



Area Legend

- BACK STAGE ROOM
- BANQUET HALL
- CORRIDOR
- DINNING HALL
- F TOILET
- FOYER
- HAND WASH
- KITCHEN
- M TOILET
- RAMP
- RECEPTION
- SEA VIEW DINNIG
- STAFF WASHROOM
- STAGE
- STAIRCASE
- STORAGE
- WASH ROOM

GROUND FLOOR PLAN



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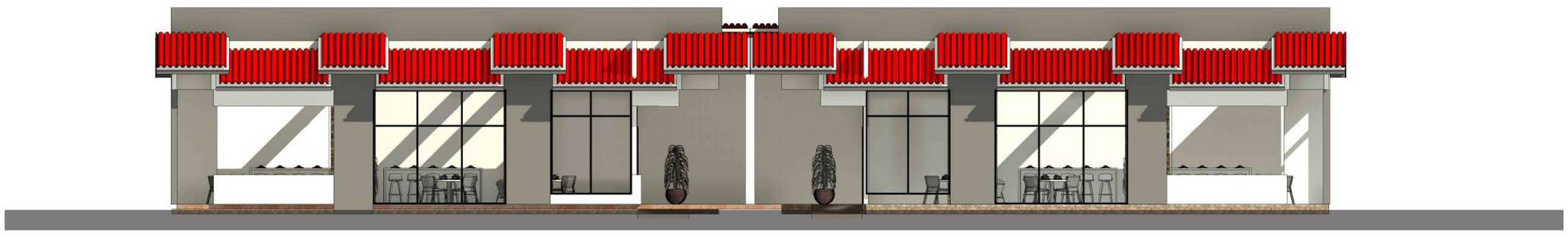


FRONT ELEVATION



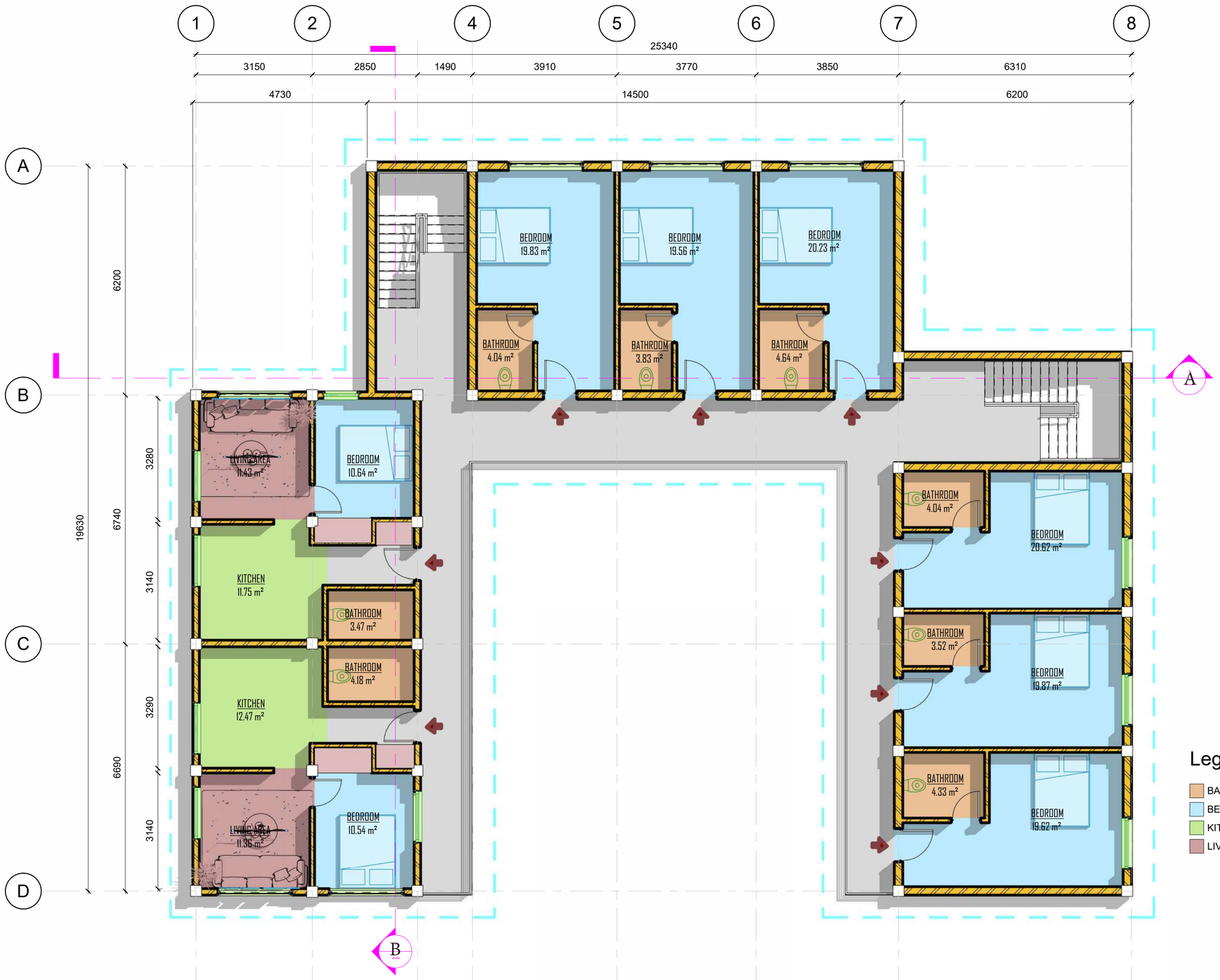
GROUND FLOOR PLAN

BEACH RESORT - RESTURANT AND BANQUET HALL
CHORWAD GUJRAT

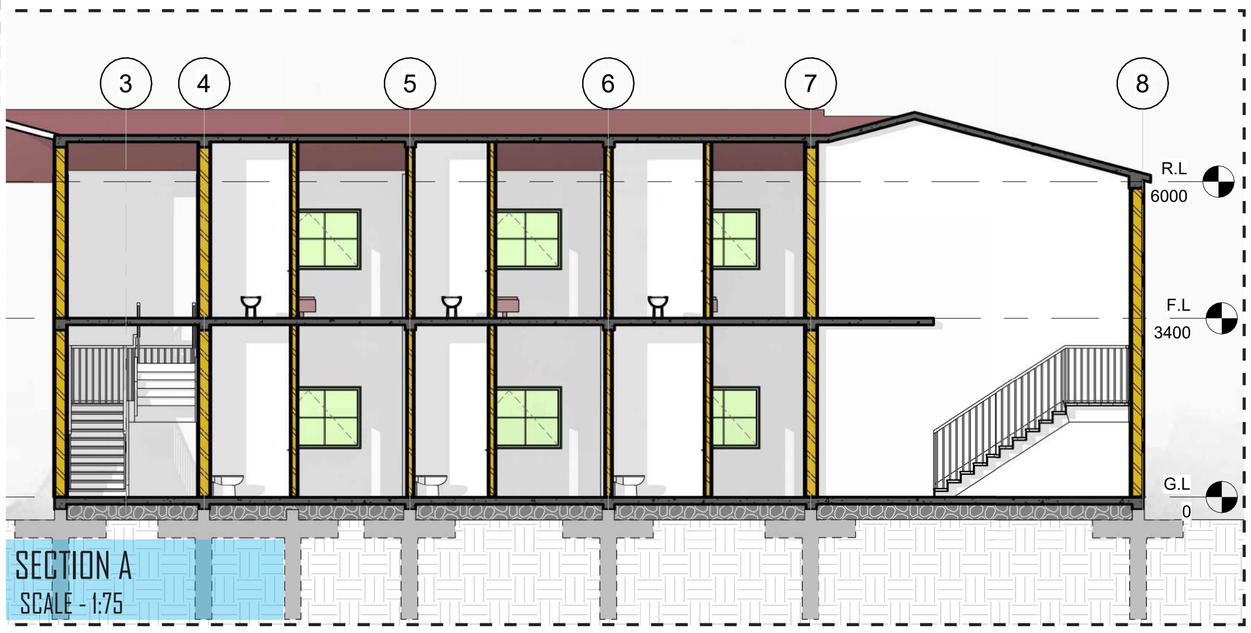
NAME : ABHISHEK KUMAR
SCHOLAR NO : 211110244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

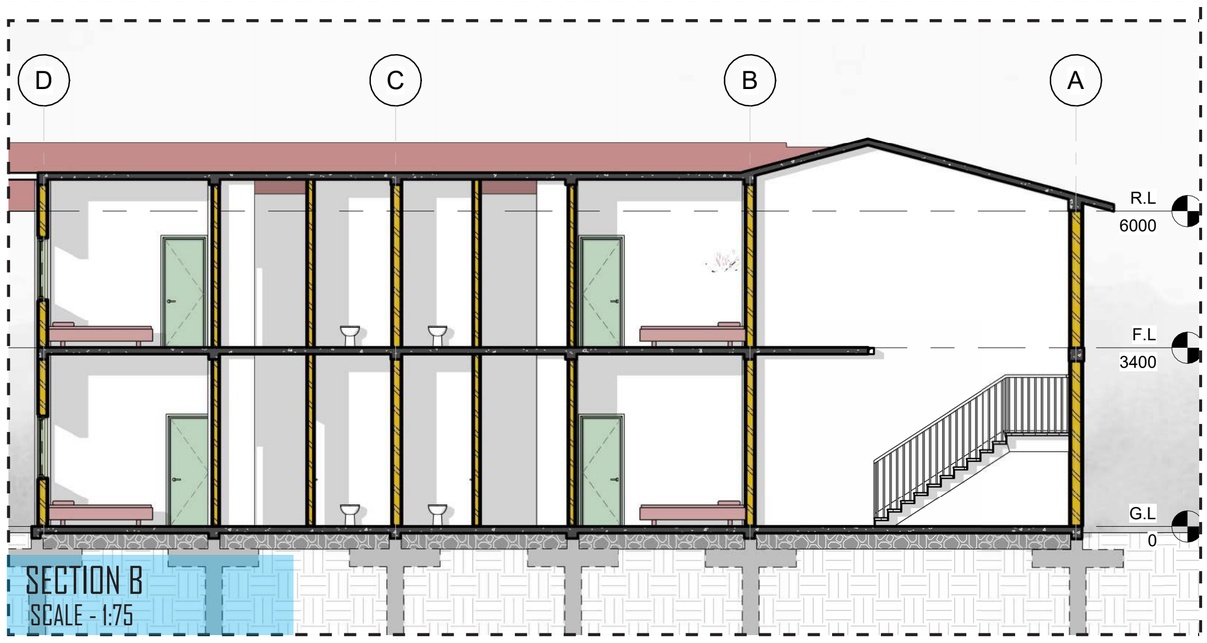
SCALE : 1:100
ALL DIMENSIONS ARE IN MM



STAFF QUARTERS PLAN
SCALE - 1:75



SECTION A
SCALE - 1:75



SECTION B
SCALE - 1:75



ELEVATION A
SCALE - 1:75





ELEVATION B
SCALE - 1:75

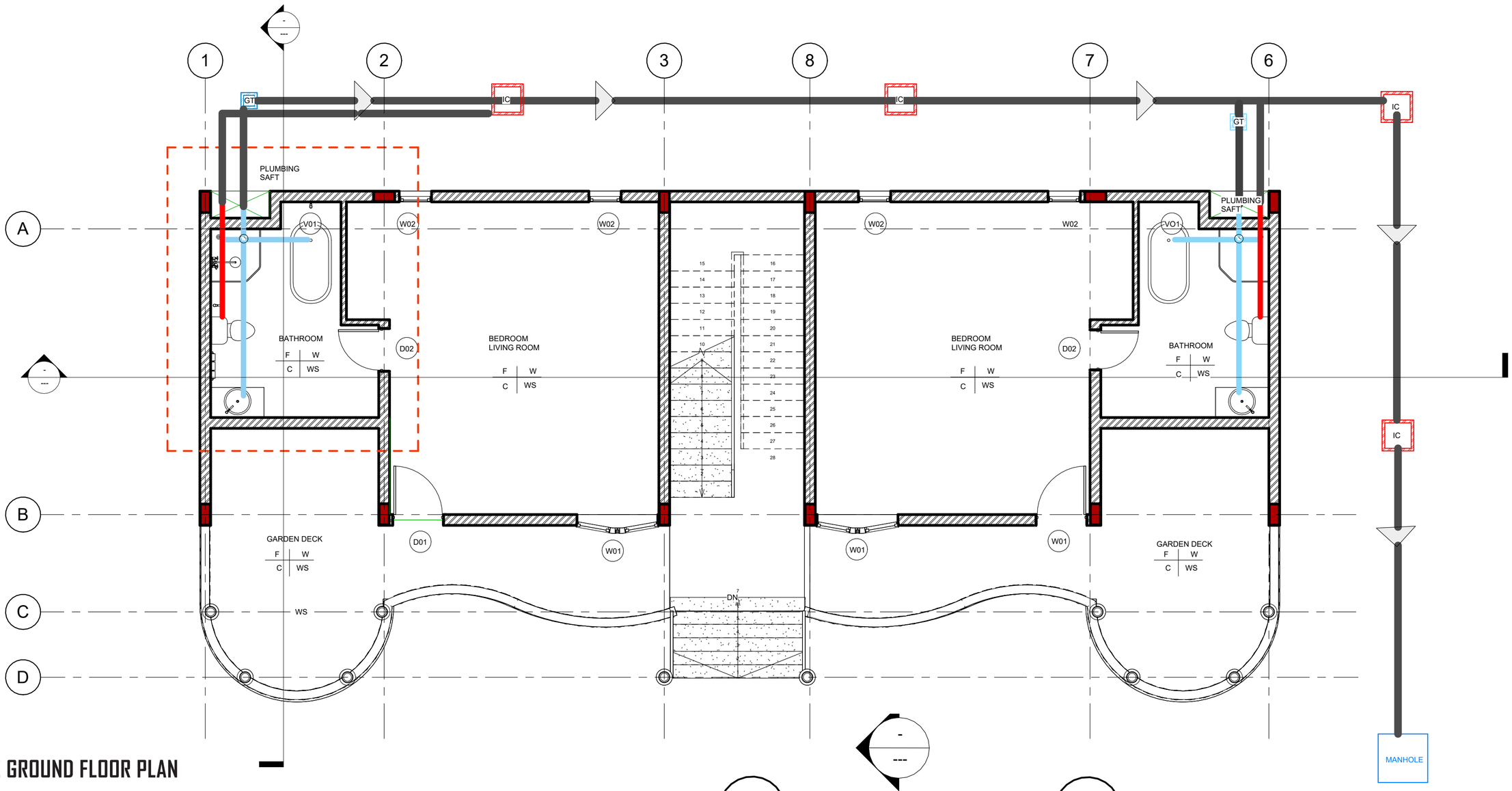


BEACH RESORT - ELECTIVE PLUMBING
CHORWAD GUJRAT

NAME : ABHISHEK KUMAR
SCHOLAR NO : 21111O244
SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
THESIS COORDINATOR : DR. VICKY LALRAMSANGI
STAGE : FINAL REVIEW

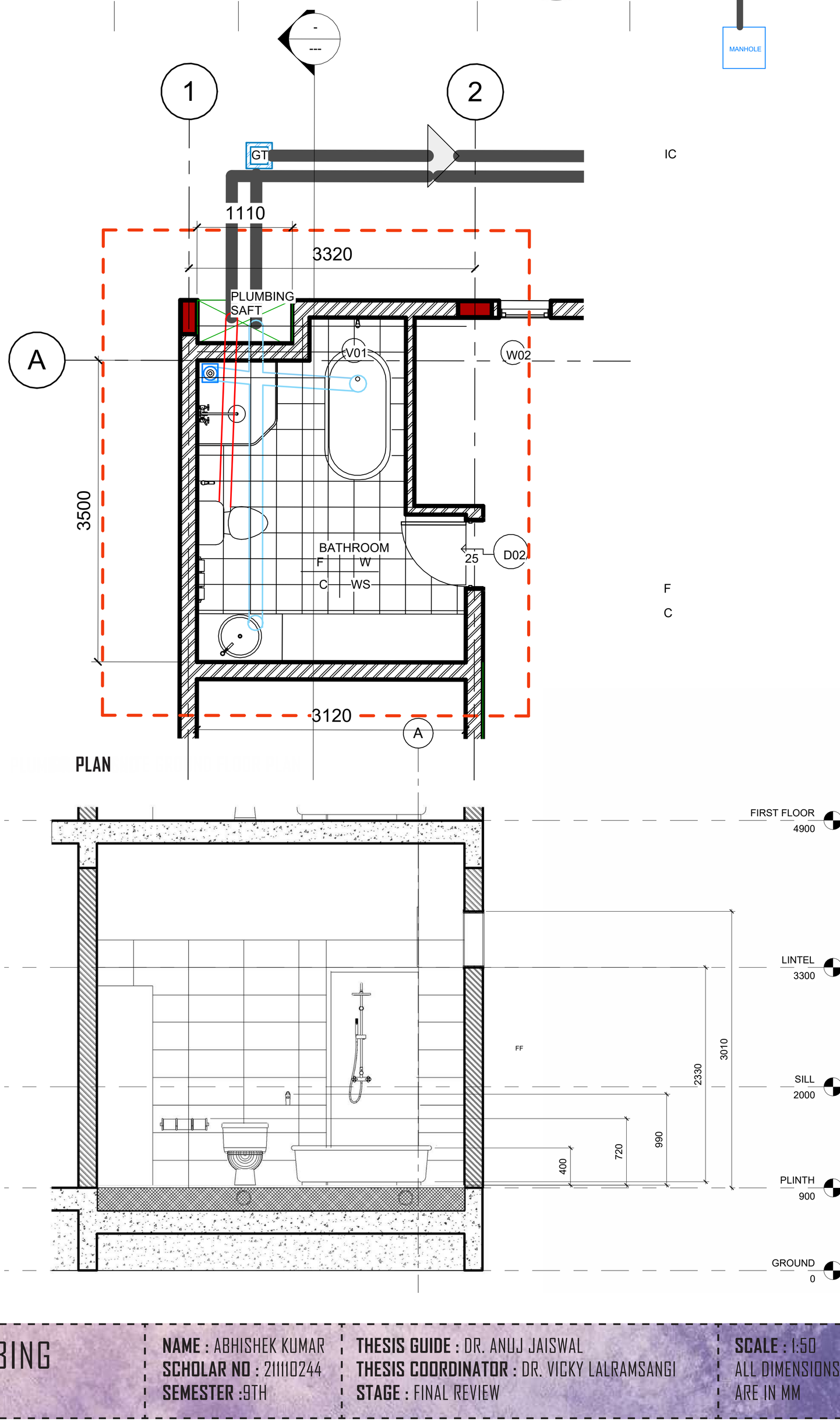
SCALE : 1:50
ALL DIMENSIONS ARE IN MM



GRADEN SUITE GROUND FLOOR PLAN

PLUMBING LEGEND

LEGENDS	
MANHOLE	MANHOLE
I.C.	600 X 600 INSPECTION CHAMBER
GT	300 X 300 GULLY TRAP
	NAHANI TRAP
	5" SOIL PIPE
	5" WASTE WATER PIPE



PLAN

FIXTURE DETAILS

FIXTURES			
S.No.	Appliance / Fixture	Brand	Product Code
1	Washbasin	Jaguar	SLS-WHT-6801
3	Water Closet	Jaguar	ITS-WHT-89851S300PP
4	Overhead Shower	Jaguar	OHS-CHR-1667
6	Tap (Bath)	Jaguar	CQT-CHR-23217UPR
7	Tap (Washbasin)	Jaguar	ARC-CHR-87189
10	Bath Enclosure	Jaguar	Kretana BKE-SLM-0542039X

TILES			
S.No.	Tiles	Brand	Product Code
1	Anti-Skid Floor Tiles	Orientbell	HFM Anti-Skid tile (300mm x 300mm)
2	Dado Tiles	Orientbell	ODG Williams Grey LT (600mm x 300mm)
3	Highlighter Tiles	Orientbell	SDH Famous Mosaic HL (600mm x 300mm)

SECTION

BEACH RESORT - ELECTIVE PLUMBING
CHORWAD GUJRAT

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SEMESTER :9TH

THESIS GUIDE : DR. ANUJ JAISWAL
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STAGE : FINAL REVIEW

SCALE : 1:50
ALL DIMENSIONS ARE IN MM


SITE PLAN
AREA CALCULATIONS
8M
9M
11M
12M
6M


ARCHITECTURAL THESIS
12M
12M
11M
9M
212100


33300


33300

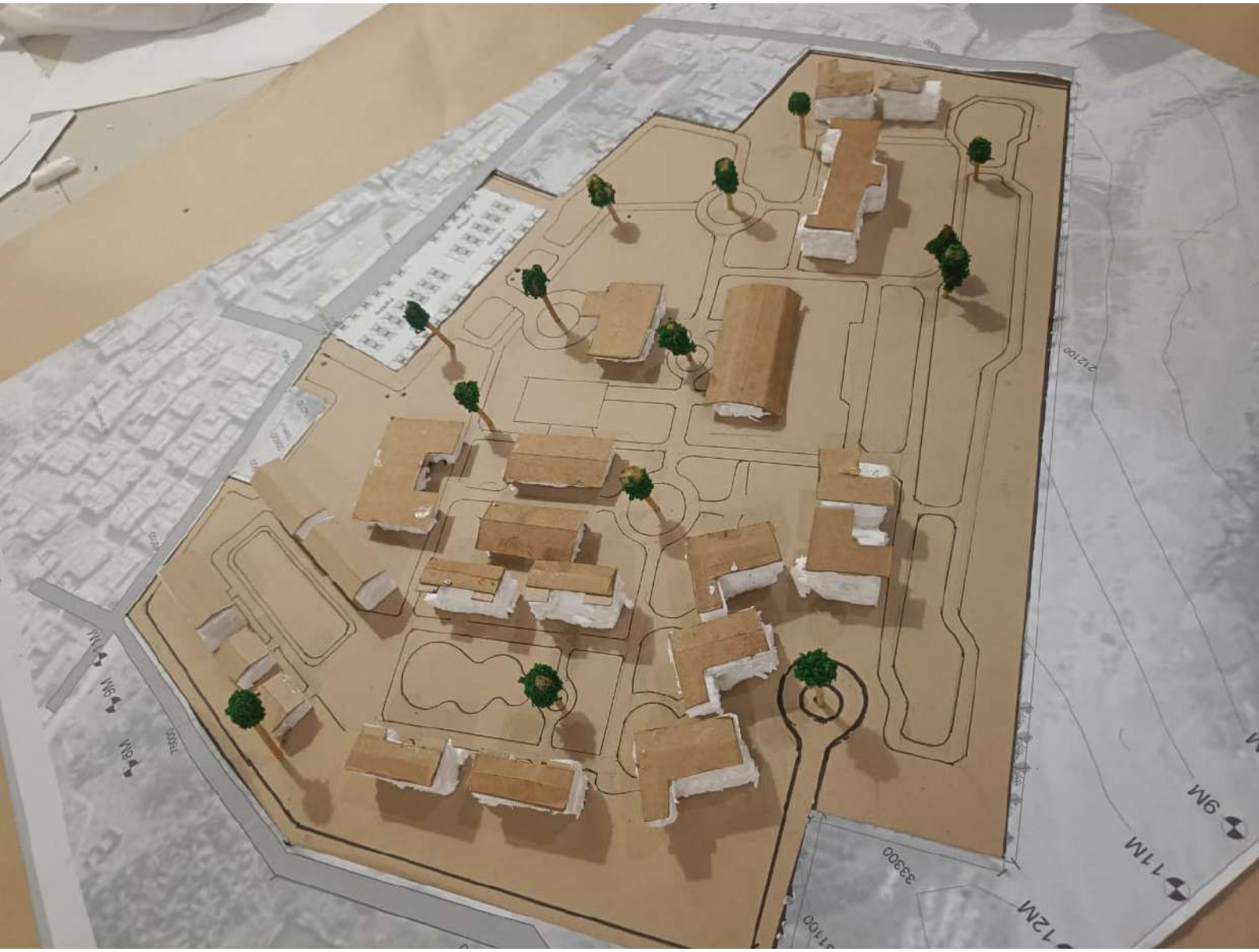
SITE PLAN

ARCHITECTURAL THESIS 202



AREA CALCULATIONS

SPACES	AREA	NO OF UNITS	GROUND COVERAGE	TOTAL BUILTUP



SITE PLAN
Parking
Parking
Parking
Parking
42240
23400
43500
29000
75000
11M
9M
8M
6M