A PROJECT REPORT

ON

PROPOSED DENTAL CLINIC

AT OKO ERIN, ILORIN WEST LOCAL GOVERNMENT,

KWARA STATE

BY

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ND/23/ARC/FT/0011

SUBMITTED TO

THE DEPARTMMENT OF ARCHITECTURAL TECHNOLOGY, INSTITUTE OF ENVIROMENTAL STUDIES (IES), KWARA STATE POLYTECHNIC, ILORIN.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF NATIONAL DIPLOMA (ND) IN ARCHITECTURAL TECHNOLOGY.

JULY, 2025

DECLARATION

This is a work carried out by me Olorunmojo Darasimi Emmanuel, with the matriculation number ND/23/ARC/FT/0011 of the Department of Architectural Technology, Kwara State Polytechnic, Ilorin under the supervision of ARC. CHUKUWUMA NMOM. All the sources of information are specifically acknowledged by means of reference.

_____ _____

DATE **SIGNATURE**

CERTIFICATION

This project report on the Proposed Dental Clinic Center by Olorunmojo Darasimi Emmanuel with the matriculation number ND/23/ARC/FT/0011 has been certified as meeting the requirement for the award of National Diploma (ND) in Architectural Technology, Institute of Environment Studies, Kwara State Polytechnic, and Kwara State, Ilorin.

28/7/2025

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(Head of Department) **DATE**

EXTERNAL SUPERVISOR **DATE**

DEDICATION

I would relish dedicating of this report to the Almighty God, who has been my ultimate source of bliss, vigor, sapience, good health and sustenance for visually perceiving me throughout my National Diploma (ND) Programme in one piece. I would additionally want to dedicate this report to my parents Pastor J. T. and Dcns. E. F. Olorunmojo.

ACKNOWLEDGMENT

Everything that has beginning must have an end; therefore, all praises and adoration is unto God for the strength and courage he has accorded me in the process of this project.

Special thanks to my supervisor ARC. CHUKWUMA NMOM for taking his time to go through my research work, may Almighty God bless you abundantly.

Also I appreciate my H.O.D. ARC. MRS. TOMORI J.M. my project coordinator ARC OLAREWAJU and other lecturers in my department, staff both teaching and non-teaching staff of Architectural Technology for their impact in my life during my course of study.

My deepest appreciation goes to my parents PASTOR J. T. AND DCNS. E. F. OLORUNMOJO for their moral and financial support towards my education.

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ABSTRACT

This project presents the architectural design of a Proposed Dental Clinic located in Oko Erin Area of Ilorin, Kwara State. The design aims to provide a functional, safe, and patient-friendly environment for dental care services. Key considerations include accessibility, efficient space zoning, natural lighting, cross ventilation, hygiene, security, and structural durability. The clinic layout promotes smooth workflow for dental professionals and a comfortable experience for patients. The design also reflects sensitivity to the local climate and urban context, and adaptable solutions suitable for future expansion. This project demonstrates a practical approach to healthcare architecture within the Nigerian setting.

Sustainable materials and energy-efficient systems are incorporated to reduce the environmental footprint, while the façade design aims to reflect transparency and trust, key values in healthcare architecture. Accessibility is addressed through barrier-free design compliant with universal standards. Overall, the project demonstrates how thoughtful architectural solutions can elevate healthcare experiences, promote wellness, and support efficient clinical operations.

CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND OF THE STUDY

Architecture plays a critical role in healthcare delivery by shaping the environments where patients receive care. Among these, dental clinics serve a unique function in promoting oral health, diagnosing dental conditions, and performing both preventive and surgical treatments. Dental care is an essential component of public health, yet many facilities in Nigeria are still designed without consideration for modern dental workflow, patient comfort, or safety regulations.

Oko Erin Area of Ilorin West Local Government, is one of the fast growing urban centers of Kwara State. While the city hosts several hospitals and healthcare centers, purpose-built dental clinics remain limited. Many dental units in the city operate within general hospitals or are adapted from residential buildings. These settings often lack proper zoning, accessibility features, ventilation, infection control systems, and updated dental technology infrastructure.

This project explores the design and development of a contemporary dental clinic in Ilorin, aimed at meeting modern standards for oral health facilities. It focuses on patient-centered care, architectural functionality, environmental responsiveness, and future adaptability. The clinic will serve both preventive and curative roles in a community-friendly, professional, and hygienic setting.

1.1 DEFINITION OF DENTAL CLINIC

A **Dental Clinic** is a healthcare facility specifically designed and equipped for the diagnosis, prevention, and treatment of oral diseases and conditions. It provides a range of dental services, including routine check-ups, cleanings, restorative procedures, orthodontics, oral surgery, and cosmetic treatments. Dental clinics are staffed by licensed dental professionals such as dentists, dental hygienists, and dental assistants. The clinic is typically organized into dedicated zones such as reception, waiting area, consultation rooms, treatment areas, sterilization rooms, and administrative offices. The design and functionality of a dental clinic prioritize hygiene, patient comfort, efficient workflow, and adherence to medical regulations and standards.

1.2 PROBLEMS OF THE DESIGN

The primary design challenge is the lack of adequately designed dental clinics in Ilorin that support both functional dental procedures and patient comfort. Most existing clinics

operate in poorly zoned structures with inefficient layouts that hinder workflow and patient movement. This leads to issues such as cross-contamination, overcrowding in waiting areas, poor ventilation, and inadequate space for equipment or staff operations.

1.3 AIM AND OBJECTIVES

AIM:

To design a functional, hygienic, and patient-friendly dental clinic that meets contemporary healthcare design standards and enhances both patient care and staff workflow.

OBJECTIVES:

- To analyze and implement effective zoning for public, clinical, and staff areas.
- To create an architectural design that enhances user comfort, safety, and hygiene.
- To integrate accessibility, sustainability, and modern building services.
- To reflect a contextual design that responds to the climate, culture, and urban structure of Ilorin.
- To ensure spatial flexibility that allows for technological advancements and future expansion.

1.4 JUSTIFICATION OF THE PROJECT

Ilorin is experiencing increasing urbanization and population growth, which in turn increases the demand for quality healthcare facilities. However, the city lacks a dedicated, state-of-the-art dental clinic that is purpose-built for efficient operation and patient comfort.

This project is justified by the need to:

- Improve access to dental care in a clean and efficient environment
- Promote better dental hygiene and public health in the region
- Replace outdated or makeshift dental facilities with a modern, code-compliant building
- Showcase how architectural design can enhance clinical outcomes and operational efficiency

By addressing these needs, the project contributes not only to the field of architecture but also to healthcare development in Kwara State.

1.5. CLIENT'S BACKGROUND

Mr. Ajibade is a private healthcare provider planning to expand its services in North-Central Nigeria, with a focus on dental and oral health.

Philosophy: The client believes that quality dental care should be accessible, efficient, and delivered in a safe and calming environment that reduces patient anxiety and promotes healing.

1.6 SCOPE OF THE STUDY

The scope of this project includes the architectural design and planning of:

- All clinical areas such as treatment rooms, operating rooms, sterilization rooms, and X-ray areas
- Public and administrative spaces including reception, records, offices, waiting rooms, and restrooms
- Environmental considerations like natural lighting, ventilation, acoustics, and landscaping
- Space planning and circulation for staff, patients, and equipment
- Provision of accessibility features such as ramps and disabled-friendly toilets
- Site planning including parking lots, access roads, and green spaces
    - **Exclusions:**
- Structural, electrical, and mechanical engineering details (beyond general provisions)
- Interior decor, branding, and equipment specifications (unless necessary for layout)
- Construction execution or material procurement

1.7 LIMITATION OF THE STUDY

Due to time constraints and project scope, the study will be limited in the following areas:

- Structural and engineering systems will only be considered at a conceptual level
- Feedback from fully functioning dental hospitals may be limited due to access restrictions
- The project will not include physical construction or procurement of dental equipment

1.8 RESEARCH METHODOLOGY

Selection of an appropriate site and good conducive environment, Means to source information:

- Direct interview and inquiries from people
- Personal observations.
- Case studies carried out on an existing similar project(s) in and outside Nigeria
- Reference to textbooks, journals, newspaper, published and unpublished Master's thesis reports.
- Internet Search Engines

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. EVOLUTION OF THE BUILDING TYPOLOGY:

Dental clinics are a specialized form of healthcare architecture that have evolved significantly over time. Historically, dental practices were often conducted in small, repurposed spaces such as private homes or sections of general hospitals. These early settings lacked appropriate spatial zoning, sanitation, and patient comfort considerations.

In the 20th century, the architectural design of dental clinics began to evolve alongside advances in dentistry and public health awareness. Clinics became more specialized, with clearer functional divisions between treatment areas, sterilization rooms, and waiting areas. The introduction of radiology, oral surgery, and digital dental technologies led to the need for more complex, efficient layouts.

In recent decades, “state-of-the-art” dental clinics have adopted patient-centered designs, combining functional efficiency with comfort. These facilities emphasize infection control, accessibility, technological integration, and environmental sustainability. Contemporary dental clinics now reflect high architectural standards, using clean, modular forms, smooth finishes, and well-zoned spaces to promote hygiene and ease of maintenance.

ii. VARIANTS AND TYPOLOGY CLASSIFICATION:

Dental clinics can be classified under the broader category of healthcare buildings but are a distinct typology within this group due to their specific functions. Variants of healthcare buildings include:

- General Hospitals
- Specialist Clinics (e.g., Eye, ENT, Dental)
- Health Centers / Primary Healthcare Facilities
- Teaching Hospitals
- Mobile Clinics

DENTAL CLINICS MAY BE CLASSIFIED INTO THE FOLLOWING TYPES:

- Private Dental Clinics – Typically smaller, serving local communities, often run by individual practitioners.
- Public Dental Clinics – Often attached to government hospitals, usually serve large populations with subsidized services.
- Specialist Dental Centers – Larger facilities offering services like oral surgery, orthodontics, prosthodontics, etc.
- Teaching/Research Dental Hospitals – Attached to medical schools; include lecture halls, laboratories, and research departments.

CLASSIFICATION IS BASED ON:

- Scope of services
- Size of facility
- Patient volume
- Ownership (public vs. private)
- Integration with other healthcare services

2.2. REVIEW OF LITERATURE ON THE SUB-TOPIC OF THE REPORT

i. **SPECIAL AREA OF INTEREST:** Patient-Centered Dental Design. The sub-topic of this project focuses on "patient-centered dental clinic design" — a design philosophy that prioritizes patient comfort, privacy, safety, and overall experience.

ii. **ISSUES AND RELEVANCE OF THE SUB-TOPIC**: In traditional dental clinics, architectural design often prioritizes function over comfort, resulting in environments that can be cold, clinical, and anxiety-inducing. However, research shows that patients are more relaxed and responsive to treatment in facilities that provide visual comfort, privacy, and clear navigation.

KEY ISSUES ADDRESSED IN THIS SUB-TOPIC INCLUDE:

- **DENTAL ANXIETY AND DESIGN**: Many patients experience stress during dental visits. Introducing warm lighting, calming colors, natural views, and acoustic insulation can significantly reduce anxiety.
- **PRIVACY AND COMFORT:** Design elements such as acoustic partitioning, separate waiting areas, and well-planned consultation rooms improve patient dignity and reduce embarrassment.
- **WAYFINDING AND CIRCULATION:** Clear signage, open corridors, and logical zoning help patients feel in control of their movement, which is psychologically reassuring.
- **CULTURAL AND LOCAL CONTEXT:**
- Incorporating local materials, art, or familiar design elements creates a sense of belonging and acceptance, particularly in Nigerian communities.
- **SUSTAINABLE DESIGN IN HEALTHCARE:**
- Use of energy-efficient systems, natural lighting, and ventilation promotes both environmental health and long-term cost savings.

RELEVANCE TO THE MAIN TOPIC:

- Enhancing patient comfort improves the reputation and trustworthiness of the clinic
- It encourages regular dental checkups, improving community oral health
- Promotes user satisfaction, which is critical in private healthcare services
- Supports the goal of creating a model dental clinic that stands out in Ilorin and can serve as a blueprint for others

CHAPTER THREE

3.0. CASE STUDIES

3.1. CASE STUDY ONE

- **HERITAGE DENTAL CLINIC**

HISTORICAL BACKGROUND

Heritage Dental Clinic is a privately owned dental facility located at 163 Ibrahim Taiwo Road, Ilorin, Kwara State. It was established as part of the city's growing need for modern dental care and is positioned in a central, easily accessible location. The clinic operates within a highly active healthcare corridor and contributes to improving oral health services in Ilorin. Its presence reflects the broader development of private healthcare in response to increasing demand and improvements in state-run dental facilities.

Fig. 1. FRONT VIEW

Fig. 2. SIDE VIEW

Fig. 3.

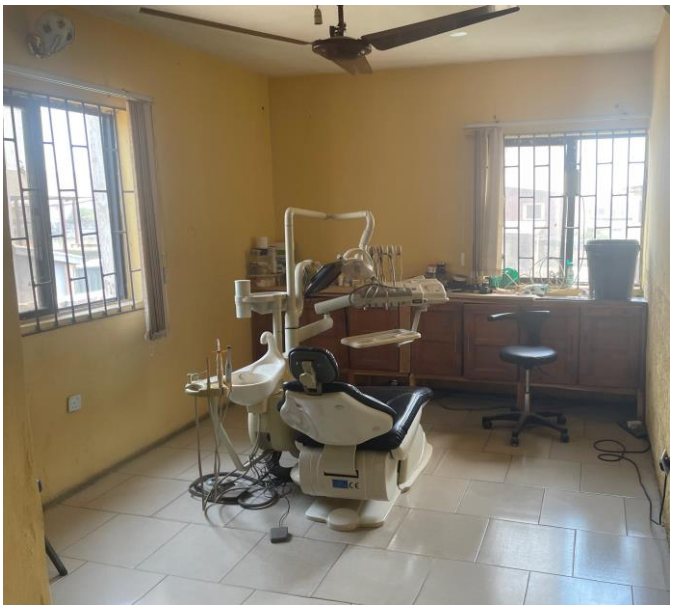


Fig. 4.

TREATMENT ROOMS

Fig. 5. DENTIST OFFICE

Fig. 6. RECEPTION

CASE STUDY ONE

- **HERITAGE DENTAL CLINIC**

MERITS

- It is well oriented
- Very good access
- Provision of natural ventilation

DEMERITS

- No dark room
- No ramp for the handicap and disable person
- It is not aesthetical enough.

3.2 CASE STUDY TWO

- **GENERAL HOSPITAL (DENTAL UNIT), ILORIN, KWARA STATE**

HISTORICAL BACKGROUND

The Dental Unit of General Hospital Ilorin, located on Surulere Road, has long served as part of the hospital's public healthcare services. In 2022–2023, it underwent major renovation under Governor AbdulRahman AbdulRazaq's healthcare transformation project. The upgraded dental clinic now features modern equipment, improved hygiene standards, and expanded capacity. It is currently regarded as the most advanced dental facility in Kwara State, playing a key role in providing affordable oral care to the public.

Fig. 7. FRONT VIEW

Fig. 8. SIDE VIEW

Fig. 9. SITE VIEW

Fig. 10. RECEPTION

Fig. 11. WAITING AREA

Fig. 12. STERILIZATION ROOM

Fig. 13. RESTORATIVE SURGERY ROOM

Fig. 14. TREATMENT ROOM

CASE STUDY TWO

- **GENERAL HOSPITAL (DENTAL UNIT), ILORIN, KWARA STATE**

MERITS

- It as a sufficient waiting area for patient
- Very good position rest room
- Very good accessibility
- It is well ventilation

DEMERITS

- No provision for x-ray room
- It is not properly landscape.

3.3 CASE STUDY THREE

- **ADEWOLE SPECIAL DENTAL CLINIC**

HISTORICAL BACKGROUND

Adewole Special Dental Clinic, located at No. 25 Oko-Erin Road, Ilorin, Kwara State, was established to provide quality oral healthcare to the community. Over the years, it has expanded its services to include general dentistry, oral surgery, and diagnostics. The clinic has built a reputation for professionalism, patient care, and community trust, serving as one of the notable private dental facilities in Ilorin.

Fig. 15. FRONT VIEW

Fig. 16. SIGNANGE

Fig. 17.

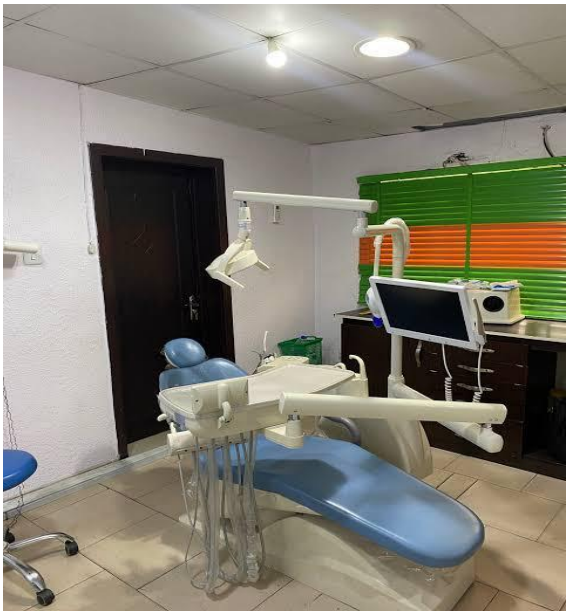


Fig 18.

TREATMENT ROOMS

Fig. 19.

CASE STUDY THREE

- **ADEWOLE SPECIAL DENTAL CLINIC**

MERITS

- It is well oriented
- It is well functionally related
- It is well spacious

DEMERITS

- No easy of accessibility for disabled people
- Poor Landscape.

3.4 ONLINE CASE STUDY ONE

- **RICHMOND DENTAL CENTRE**

HISTORICAL BACKGROUND

The Richmond Dental Centre, located at 294 Richmond St E, Toronto, was founded by Dr. Afif and Dr. Poulos in Toronto's Old Town neighborhood, near Corktown and the Distillery District. It's a modern, patient-centered clinic offering general and specialist dental care like oral surgery, pediatric dentistry, and laser treatments. The facility is tech-driven, clean, and designed for comfort, with top-rated reviews. It reflects a shift from old-style clinics to modern, friendly dental environments in a central Toronto location.

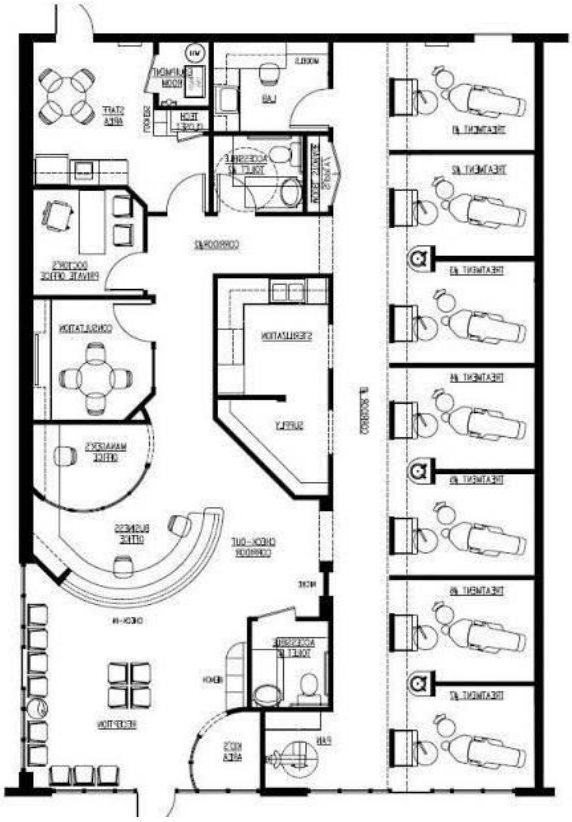


Plate 1.0. FLOOR PLAN

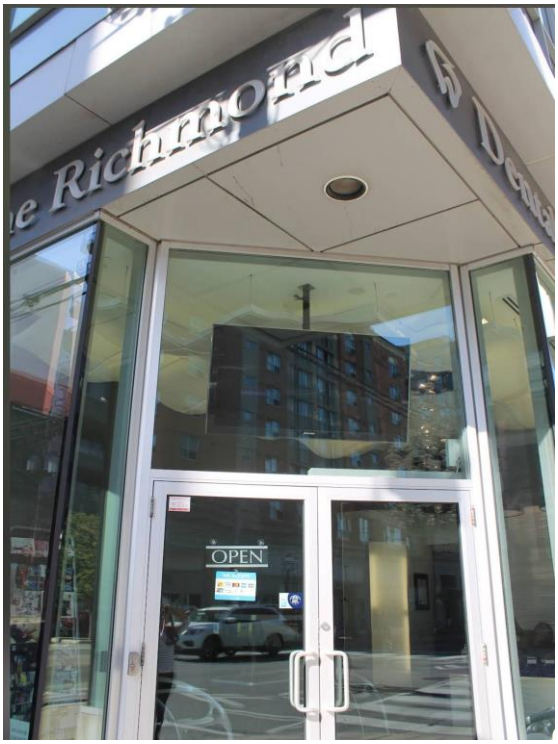


Fig. 20. ENTRANCE VIEW

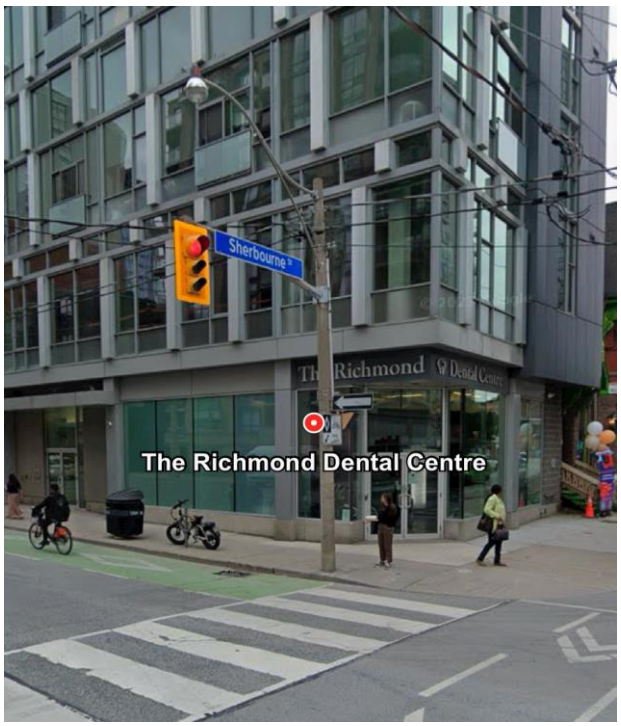


Fig. 21. FAÇADE

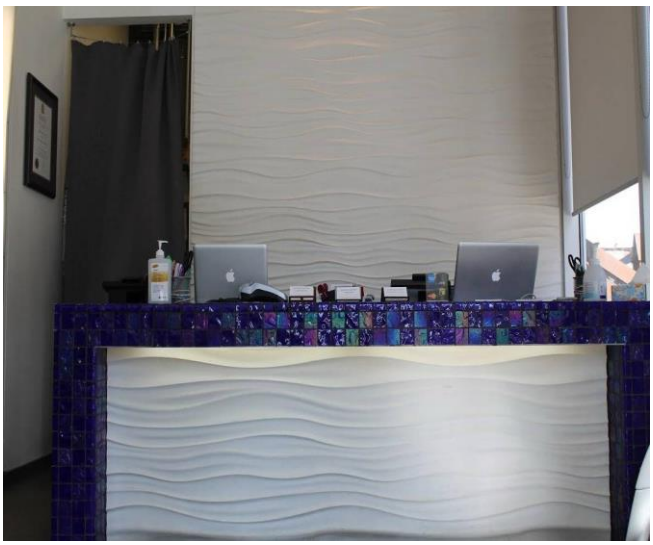


Fig. 22. RECEPTION

Fig 23. TREATMENT ROOM

ONLINE CASE STUDY ONE

- **RICHMOND DENTAL CENTRE**

MERITS

- Central location (easy access)
- Spaces offers both general and specialist care
- Clean and patient-friendly environment
- Modern aesthetic

DEMERITS

- No room for future expansion
- Limited parking space
- Limited natural ventilation
- Relies heavily on artificial lighting.

3.5 ONLINE CASE STUDY TWO

DENTAL CLINIC VIENNA DÖBLING (ZWD)

HISTORICAL BACKGROUND

The Dental Clinic Vienna Döbling (ZWD), located at Sieveringer Straße 17, 1190 Vienna, Austria, is a modern private dental facility established in the early 1990s. The clinic has evolved into a leading center for advanced dental care, offering services such as dental implants, ceramic restorations, digital volume tomography (3D X-ray), and in-house dental prosthetics. With a focus on high-quality treatment and patient comfort, ZWD is known for its efficient service, modern equipment, and professional expertise. The clinic is designed to meet high aesthetic and hygienic standards, providing a calm and welcoming environment for patients. Although it operates as a private facility not covered by Austrian public insurance, it supports reimbursements through private billing.

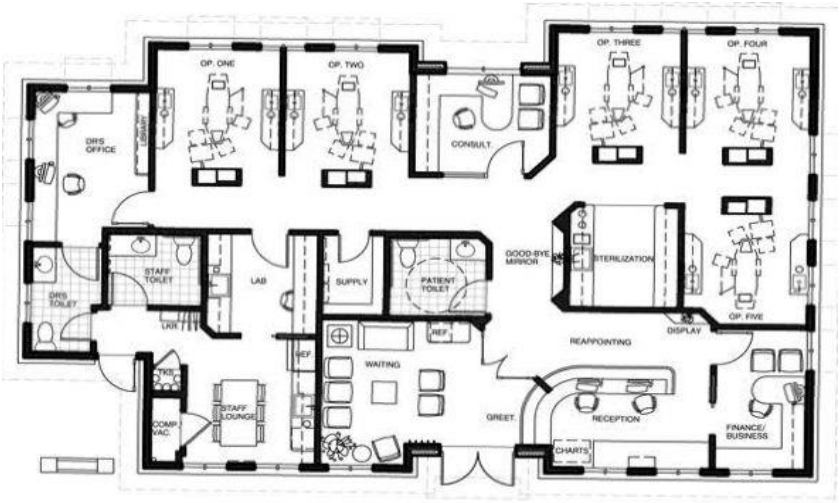


Plate 1.1. FLOOR PLAN

Fig. 24. APPROACH VIEW

Fig. 25. SITE VIEW

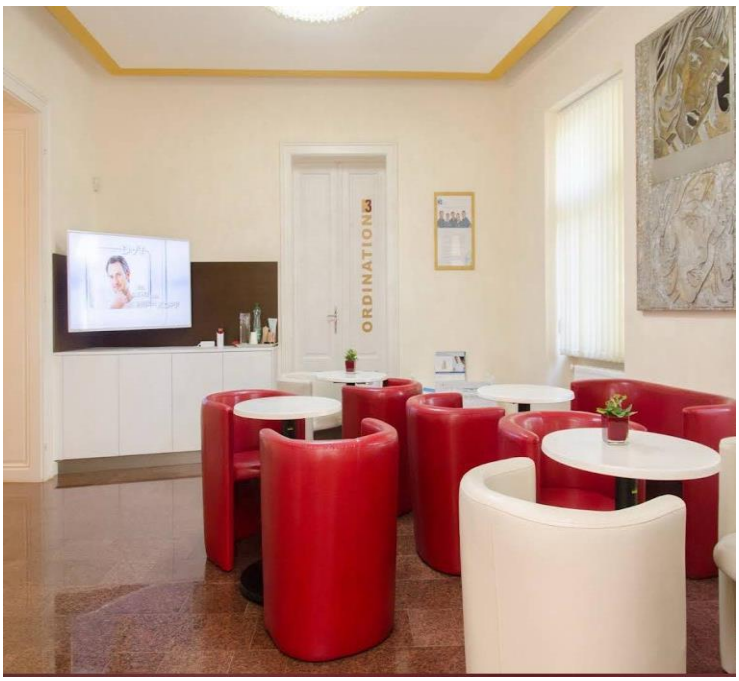


Fig. 26. WAITING ROOM

Fig. 27. STERILIZATION ROOM

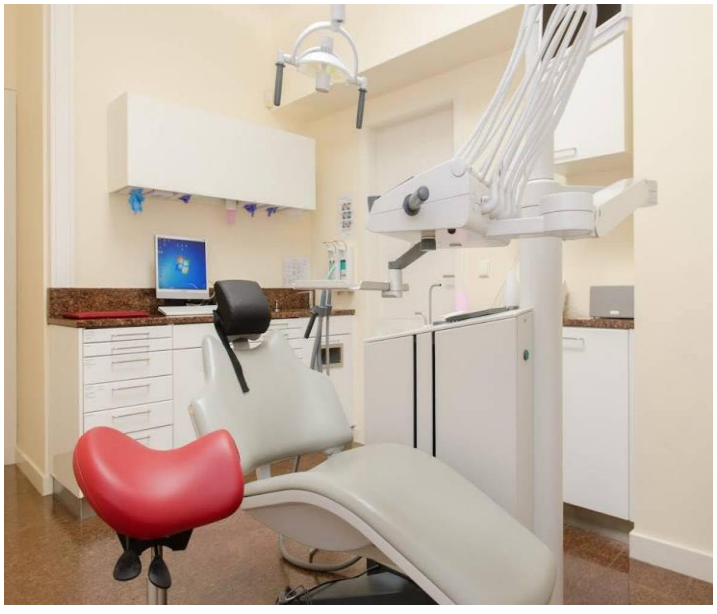


Fig. 28. TREATMENT ROOM

ONLINE CASE STUDY TWO

- **DENTAL CLINIC VIENNA DÖBLING (ZWD)**

MERITS

- Efficient space zoning for smooth workflow
- Accessible design (ramps, wide doors, etc.)
- Use of hygienic, easy-to-clean materials
- Good natural lighting and ventilation
- Organized circulation for staff and patients

DEMERITS

- Limited expansion on small urban sites
- High energy use if not sustainably designed
- Complex zoning reduced flexibility.

CHAPTER FOUR

4.1 INTRODUCTION OF STUDY AREA / SITE SELECTION

The selected site for the proposed dental clinic is located along New Yidi Road, in the Oko Erin area of Ilorin, the capital city of Kwara State, Nigeria. This location was chosen due to its accessibility, population density, and proximity to both residential and commercial zones, which ensures ease of access for patients and staff. The site falls within an urbanizing corridor of Ilorin with growing health infrastructure needs.

The choice of this site aligns with the objectives of the project to provide a modern and well-equipped dental clinic within a developing yet underserved community.

4.2 SITE DESCRIPTION AND SELECTION CRITERIA

- **Location:** The site is situated along New Yidi Road, Oko Erin, Ilorin West LGA, Kwara State. It lies within a mixed-use zone, surrounded by residential buildings, small businesses, educational institutions, and religious centers.
- **Shape:** The plot is rectangular providing sufficient space for a single-story clinic with room for landscaping, parking, and future expansion.
- **Selection Criteria:**
  - Proximity to densely populated neighborhoods (to attract foot traffic and meet community needs)
  - Access to major roads and public transportation routes
  - Availability of basic infrastructure (water, power, drainage)
  - Suitable topography and soil condition for construction
  - Safety and low environmental risk (e.g., no flooding or erosion zones)

4.3 SITE INVENTORY / ANALYSIS

Accessibility:

The site has direct access from New Yidi Road, a major tarred road that connects several parts of Ilorin. The road is motorable year-round and supports both pedestrian and vehicular traffic.

Surrounding Land Use:

- North: Residential buildings
- South: Small-scale commercial outlets
- East: Open undeveloped land
- West: Religious institution and local clinic

Utilities:

- Power: Supplied by the national grid via nearby transformers
- Water: Boreholes and public water supply accessible
- Drainage: Open roadside drains present, though improvements are needed

Vegetation:

Sparse grasses and scattered shrubs; not heavily wooded.

Topography:

Generally flat terrain with gentle slope for surface water runoff. Suitable for foundation work with minimal earthwork.

4.4 GEOGRAPHICAL / CLIMATIC DATA

- **Coordinates:** Approximate location: 8.5014° N, 4.5380° E
- **Climate Zone:** Ilorin falls under the Guinea Savannah climatic zone of Nigeria.
- **Rainfall:** Annual rainfall ranges between 1,200mm – 1,500mm, with the rainy season between April and October.
- **Temperature:** Mean annual temperature ranges from 26°C to 34°C, with peaks during the dry season.
- **Humidity:** Moderate to high, especially during the rainy season.

- **Wind:** Prevailing wind direction is southwest, which should guide building orientation for cross ventilation.

- **Sun Path:** The sun rises in the east and sets in the west. The northern and southern façades receive less direct heat, making them ideal for glazing or waiting areas.

4.5 ANALYSIS OF THE SITE ENVIRONMENTAL CONDITIONS

1. **Noise Levels:** Moderate noise from road traffic and nearby commercial activities. Proper buffering and landscape barriers are needed.
2. **Air Quality:** Generally good, with minimal industrial pollution in the area. Dust may be present during the dry season.
3. **Security:** The area is relatively peaceful, with low crime rates and proximity to police stations and community patrol teams.
4. **Flood Risk:** Low. The site is not within a known floodplain. Slight slope supports natural drainage.
5. **Socio-Economic Impact:** The clinic will serve as a healthcare boost in the community, creating employment, improving oral health awareness, and attracting related businesses (e.g., pharmacies, labs).

4.6 PROJECT GOALS (DESIGN BRIEF)

The goal of this project is to design a fully functional and purpose-built dental clinic that will serve as a comprehensive oral healthcare center for the people of Oko Erin Area of Ilorin West Local Government. The facility is intended to deliver a wide range of dental services from diagnostics to surgery while providing a safe, hygienic, and patient-centered environment.

i. THE PROJECT BRIEF INCLUDES:

A main building housing consultation rooms, surgical suites, laboratories, diagnostic areas, administrative spaces, and support facilities.

A recreational center to improve staff well-being and create a relaxing area for patients in waiting.

A private ward for patients requiring short-term observation after complex procedures.

A gatehouse for access control and security.

A generator house (Gen House) for alternative power supply and operational reliability.

The architectural objective is to create a clinic that combines functionality, aesthetics, comfort, and technology, aligned with best practices in healthcare design.

ii. **FUNCTIONAL / SPATIAL CRITERIA**

To ensure smooth operation and user comfort, the design must meet the following criteria:

1. Zoning of public, clinical, and private/service areas
2. Privacy and acoustic control in all clinical and consultation zones
3. Natural lighting and ventilation wherever possible
4. Universal accessibility across all spaces (ramps, wide doors, signage)
5. Infection control standards through finishes, layout, and ventilation
6. Efficient circulation patterns to reduce congestion and promote intuitive navigation
7. Durable and hygienic finishes suited for medical use

iii. **APPRAISAL OF PROPOSED SCHEMES IN TERMS OF SPACES, SIZES, AND RELATIONSHIPS**

The proposed layout divides the dental clinic into clearly defined zones:

1. **Public Areas:** Entrance, Reception, Card Room, Pharmacy, Male & Female Waiting Areas
2. **Clinical Core:** X-ray Room, Dark Room, Sterilization Room, Laboratory, Surgical Suites (Prosthetic, Periodontic, Orthodontic, Restorative), Dentist and Practitioner Offices
3. **Support Facilities:** Utility Room, Control Room, Break Room, Store, Toilets
4. **Administrative/Private:** Manager’s Office, Private Ward, Gate House, Generator House
5. **Wellness Area:** Recreational Center for patients and staff

Spaces are arranged to support direct access from public to semi-private zones, and then restricted access into core clinical or staff-only areas.

For example:

- The reception links directly to the card room, pharmacy, and waiting areas, while maintaining controlled access to treatment rooms.
- Sterilization and laboratory rooms are centrally placed to serve multiple surgery rooms efficiently.
- Restrooms are strategically located near waiting and treatment zones.

iv. EQUIPMENT AND OPERATIONAL / PERFORMANCE REQUIREMENTS:

The clinic will accommodate specialized dental and medical equipment, necessitating specific architectural and service provisions:

- Dental Chairs with task lighting and overhead suction
- Digital X-ray Equipment (requiring shielding and radiation safety design)
- Autoclaves and Ultrasonic Cleaners in the Sterilization Room
- Dental Laboratory Equipment including casting units, polishing wheels, and model trimmers
- Computer systems for electronic records, diagnostics, and imaging
- Clean water supply, drainage, and compressed air systems
- Backup Power System (located in the Gen House)
- Medical Gas Supply System (if applicable in surgery rooms)
- Air-conditioning and mechanical ventilation in enclosed or critical zones
- Secure storage for dental materials and medications

Each room will be designed to meet its technical, ergonomic, and performance needs while maintaining user safety and hygiene standards.

v. **BRIEF AND SCOPE:**

BRIEF	SCOPE
Entrance Lobby	Toilets (Male/Female)
Reception Area	Private Ward
Card Room	Recreational Center
Male & Female Waiting Areas	Gate House
Pharmacy	Generator House
X-ray Room	Toilets (Male/Female)
Dark Room	Private Ward
Sterilization Room	Recreational Center
Laboratory Room	Gate House
Manager's Office	Generator House
Prosthetic Surgery Room	
Periodontic Surgery Room	
Orthodontic Surgery Room	
Restorative Surgery Room	
Dentist Office	
Practitioner Office	
Utility Room	
Break Room (Staff)	
Control Room	
Store	

Tab. 1.0.

vi. **CONCEPTUAL DEVELOPMENT**

The design concept is built around the idea of "Flow, Comfort, and Cleanliness" which goes in line with the shape of a toothpaste. The spatial form reflects modular and flexible units that can expand or adapt to future needs.

KEY CONCEPTUAL ELEMENTS:

- **Linear Flow:** Patient movement flows from public zones into treatment, then exits through separate paths when needed (reducing congestion).
- **Natural Light & Calm Aesthetics:** Integration of windows, light wells, and soft finishes to reduce stress.
- **Climate Responsiveness:** Orientation and ventilation aligned with Ilorin's climate to minimize mechanical cooling.
- **Infection Control by Design:** Zoning, material selection, and airflow patterns support a hygienic environment.
- **Green Spaces & Recreational Area:** Landscaping elements around the recreational center promote healing and relaxation for both staff and patients.

CHAPTER FIVE

5.0. DESIGN APPRAISAL

5.1 DESIGN IDEAS/CONCEPTS:

The proposed dental clinic is designed around the concept of "Functional Wellness in Healthcare Space", focusing on seamless movement, hygiene control, and a stress-free patient environment.

5.2 SITE DESIGN CONCEPT:

The site planning is guided by the idea of zoned accessibility, ensuring that vehicular and pedestrian access is safe and separate. The gatehouse controls entry, while parking zones are placed near the entrance to reduce walking stress for patients. The recreational garden is situated towards the rear, providing a peaceful view from waiting areas.

5.3 BUILDING DESIGN CONCEPT:

The clinic layout is organized around zoning principles—public, semi-private, and private—laid out in a radial or modular arrangement. Circulation is intuitive, with minimal cross-traffic between patients and staff. Treatment rooms are placed on one wing, with support and utility spaces behind them for direct service access. Natural light, passive cooling, and soft color tones are prioritized to create a healing atmosphere.

5.4 **CONSTRUCTION METHODOLOGY:** Reinforced concrete frame structure with blockwork partition walls for durability and resistance to wear.

MATERIALS:

- **Exterior:** Sand Crete block wall with smooth plaster, painted with weather-resistant emulsion.
- **Interior:** Washable, antibacterial wall paint and ceramic tile cladding in wet areas (e.g. toilets, sterilization rooms).
- **Flooring:** Non-slip ceramic tiles in treatment rooms; vinyl flooring in offices and waiting areas.
- **Roofing:** Long- Roofing: span aluminum roofing sheets with insulation against heat.

- **Ceiling:** Suspended gypsum ceiling with acoustic panels in consultation and surgery rooms.

5.5 SERVICES REQUIRED:

- **Circulation:** Clear circulation routes for patients and staff with directional signage. Ramps and wide corridors ensure accessibility for people with disabilities.
- **Ventilation:** Combination of natural ventilation (via operable windows and cross-ventilation) and mechanical ventilation in critical rooms like X-ray and surgery rooms.
- **Lighting:** Daylighting through glazed windows and skylights. Task lighting for treatment zones. Energy-efficient LED lights for artificial illumination.
- **Plumbing:** Standard plumbing fixtures and fittings, with continuous water supply from a borehole and overhead storage tanks.
- Wastewater from sterilization and labs will be treated before disposal.
- **Electrical Installation:** Proper wiring for medical-grade equipment, emergency lighting, smoke detectors, and backup generator integration.
- **Acoustics:** Sound insulation in consultation and surgery rooms to protect patient confidentiality and reduce noise disturbance.
- **Waste Disposal:** Medical waste management system with designated collection points for biohazard, sharps, and general waste.
- **Fire Protection:** Smoke detectors, fire extinguishers, fire-resistant doors, and emergency exits. Fire alarm system in place.
- **External Works:** Landscaping with shaded seating, paved walkways, perimeter fencing, gatehouse, and generator house.

5.6 ENVIRONMENTAL CONDITIONS TO BE ACHIEVED

- Thermal comfort through cross ventilation and roof insulation
- Daylighting in general spaces to reduce power consumption
- Hygiene control through use of sterile finishes and material separation
- Noise reduction in private treatment zones
- Controlled patient and staff movement to reduce stress and infection spread

5.7 PERFORMANCE STANDARDS

The design targets the following performance goals:

- Compliance with National Health Infrastructure Standards
- Universal accessibility (compliance with disability access code)
- Optimum infection prevention through planning and material use
- Energy efficiency via natural ventilation and daylight use
- Durability for high-traffic zones and clinical operations

5.8 LEGAL ISSUES AND PLANNING REGULATIONS

- **Zoning Laws:** The site falls within a mixed-use area, which permits health-related infrastructure.
- **Building Setbacks**: Setbacks of 3 meters (sides), 4.5 meters (front), and 3 meters (rear) will be maintained.
- Kwara State Physical Planning Authority approval will be obtained prior to construction.
- Environmental Impact Assessment (EIA) will be submitted for review.
- Healthcare regulations will be followed for spatial hygiene, waste disposal, and structural standards.
- Fire safety codes and National Building Code guidelines are strictly adhered to.

5.9 BEHAVIORAL PATTERN AND CONSIDERATION

The clinic is designed with human behavior and comfort in mind:

- Patients move from reception → consultation → treatment → pharmacy or exit, with minimal stress.
- Staff have access to secluded offices, sterilization, break room, and circulation paths that don't intersect with patient routes.
- Gender-sensitive and family-friendly facilities (e.g. separate restrooms, waiting zones) are included.
- Recreational spaces reduce anxiety and promote mental wellness.

- Behavioral studies also influenced the placement of calming colors, visual openness, and seating arrangements that foster ease, privacy, and dignity.

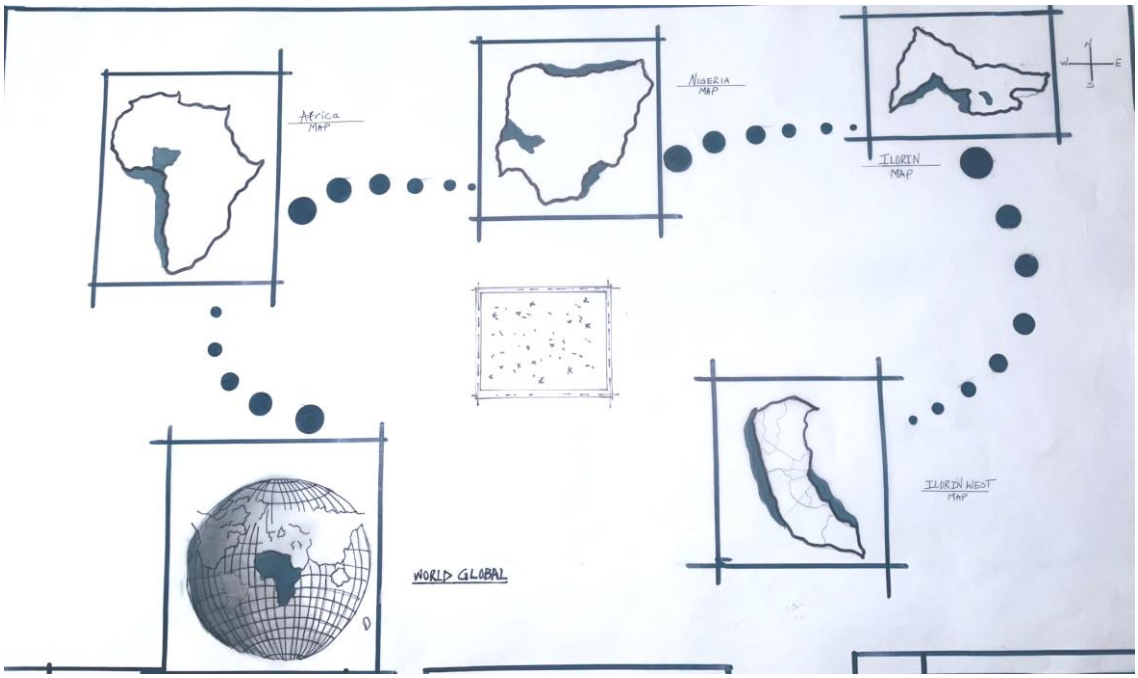
5.10 CONCLUSION

The research and design development of the proposed dental clinic reveals the growing need for modern, well-equipped, and user-friendly healthcare spaces in Oko Erin Area of Ilorin West. The project answers this need by combining functionality, hygiene, comfort, and aesthetics in one integrated facility. The application of zoning principles, medical space planning, and sustainable architecture supports efficient service delivery while improving patient experience.

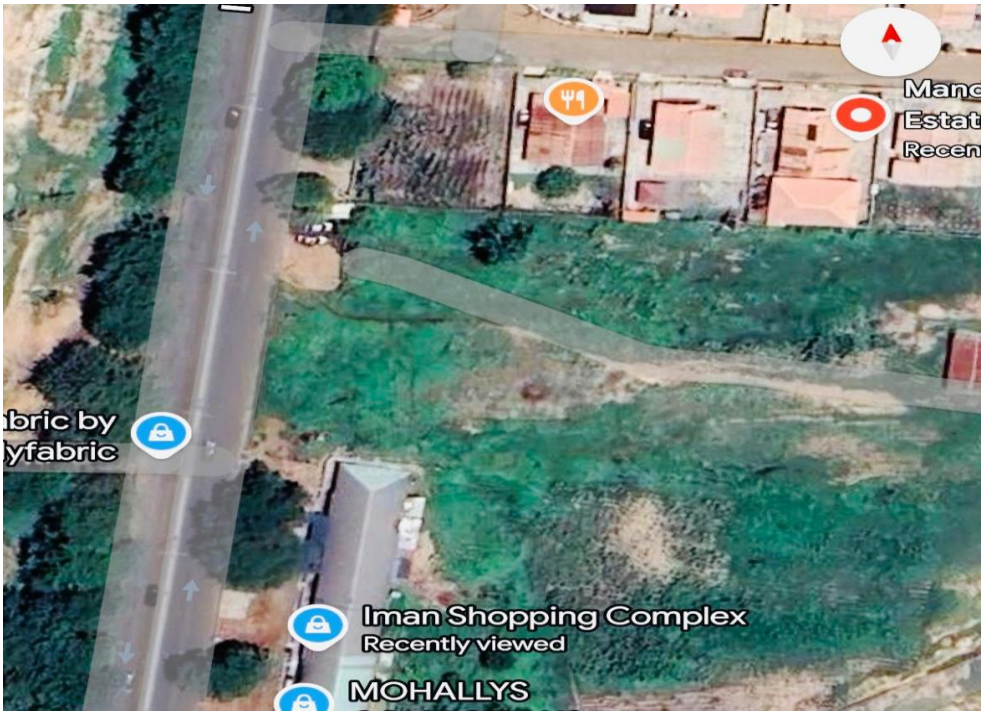
5.11 RECOMMENDATIONS

- Future studies may focus on modular dental clinic designs for rural expansion.
- Integration of digital systems such as smart diagnostic equipment and telemedicine tools should be explored.
- Energy alternatives like solar power should be considered to reduce dependency on generators.
- Further research is recommended on post-occupancy evaluation to monitor clinic performance and user satisfaction over time.

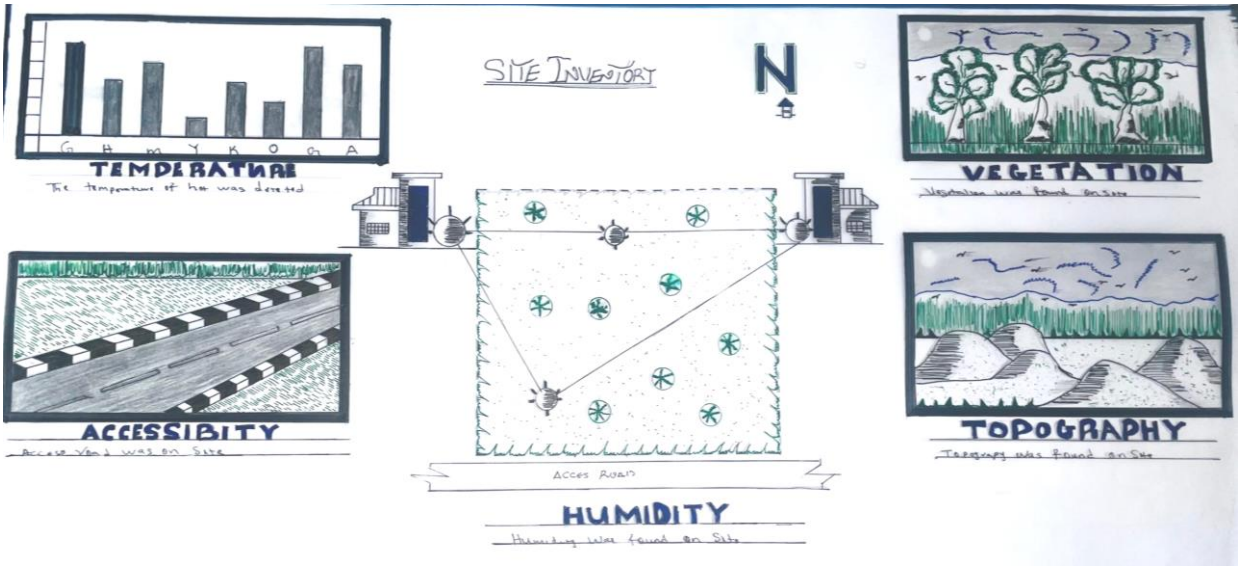
APPENDICES



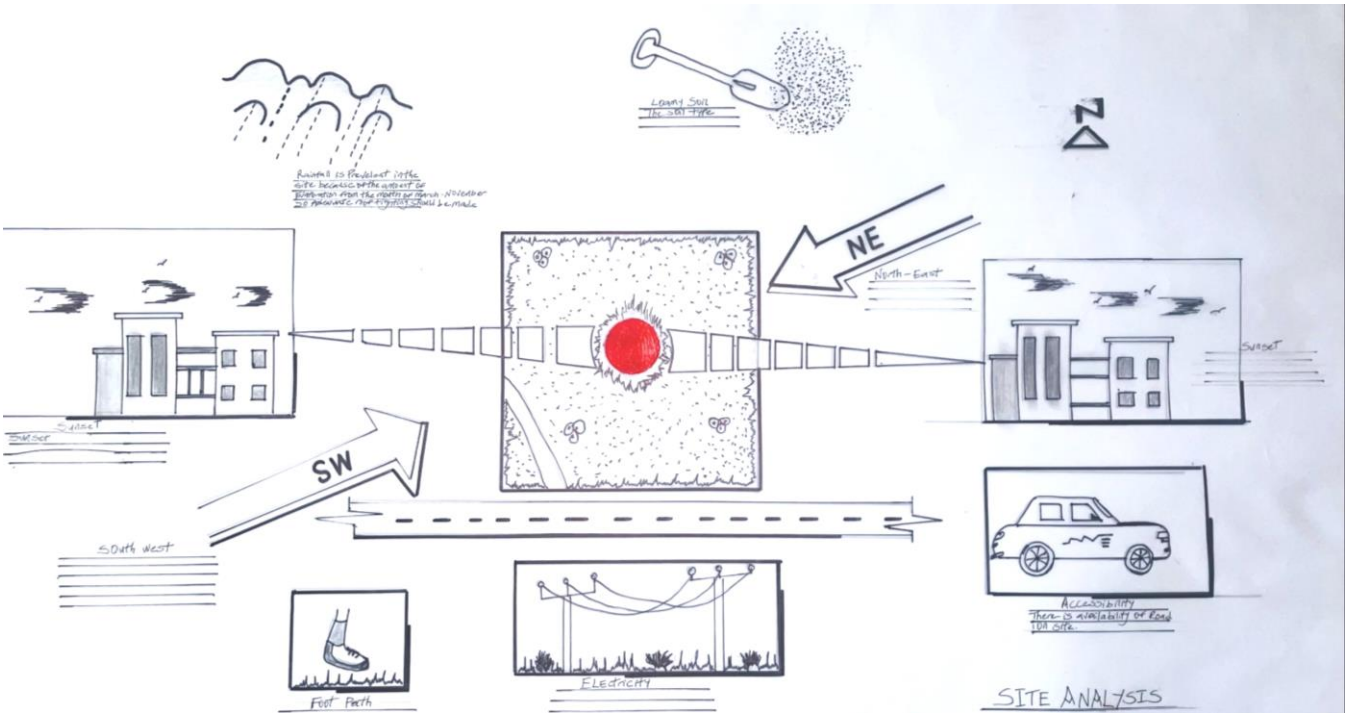
1.0. LOCATIONAL MAP



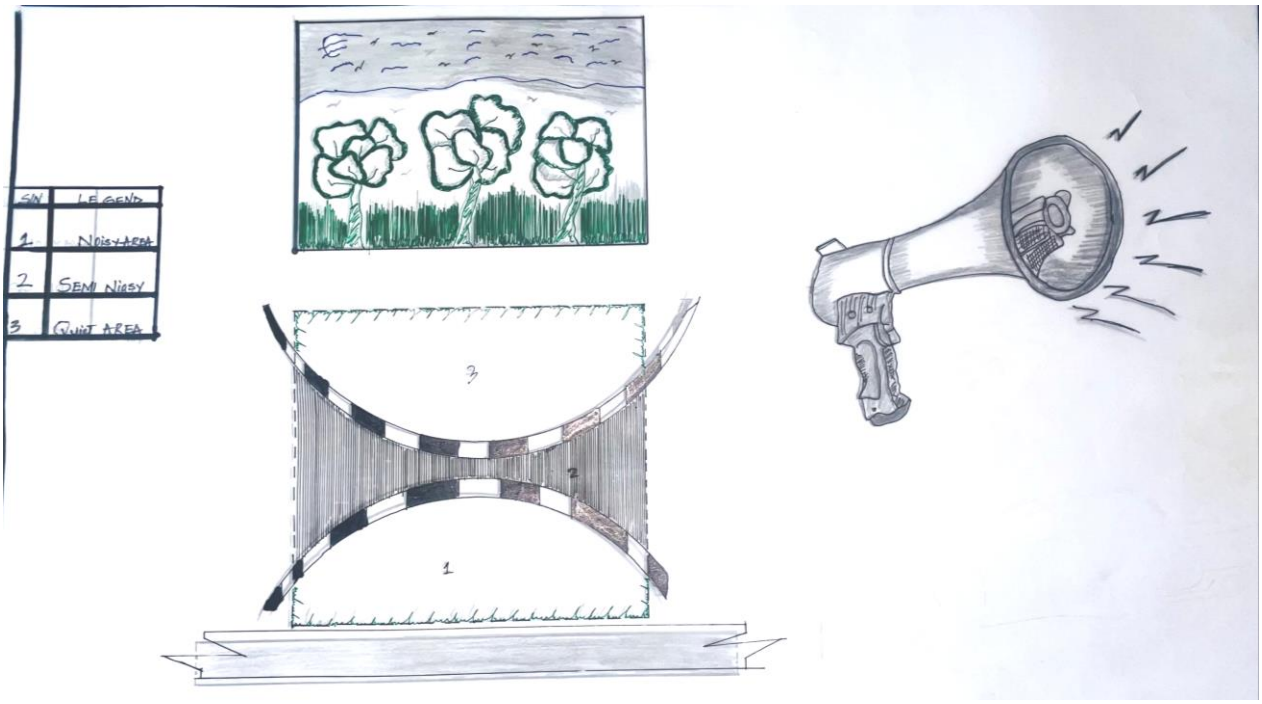
1.1. GOOGLE MAP



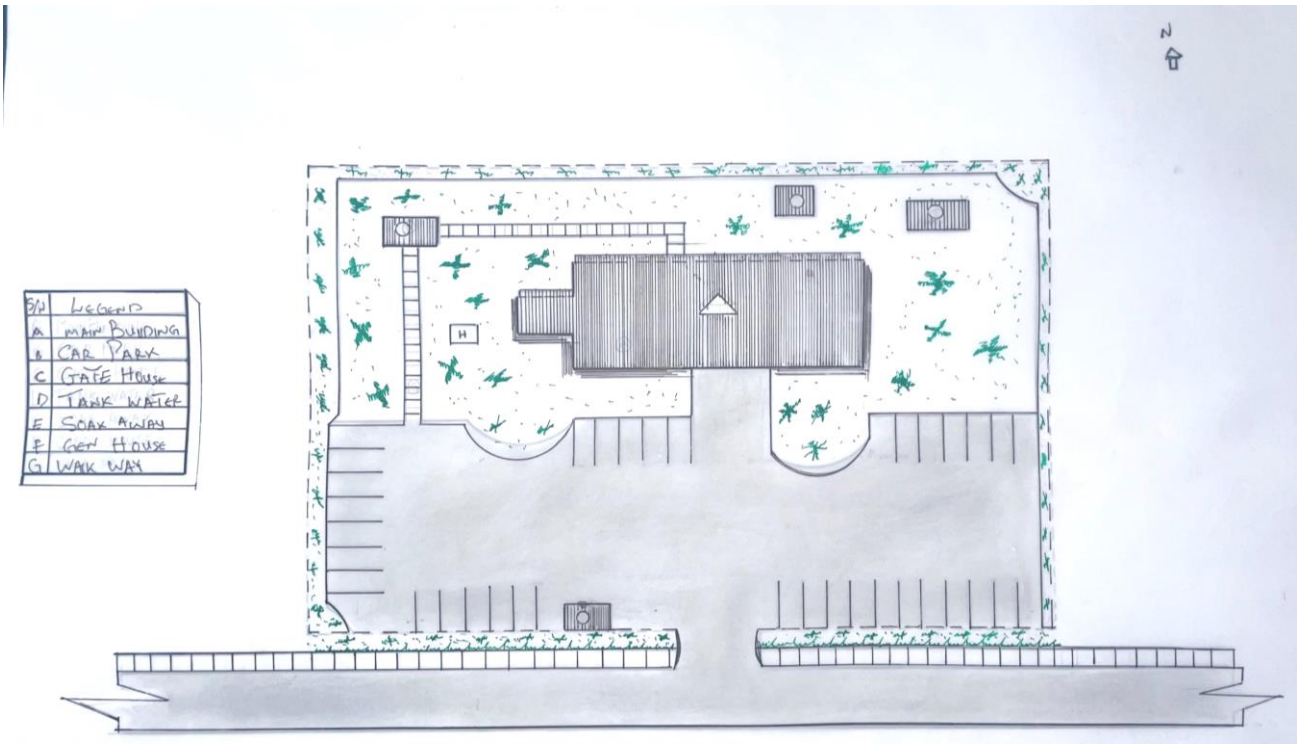
1.2. SITE INVENTORY



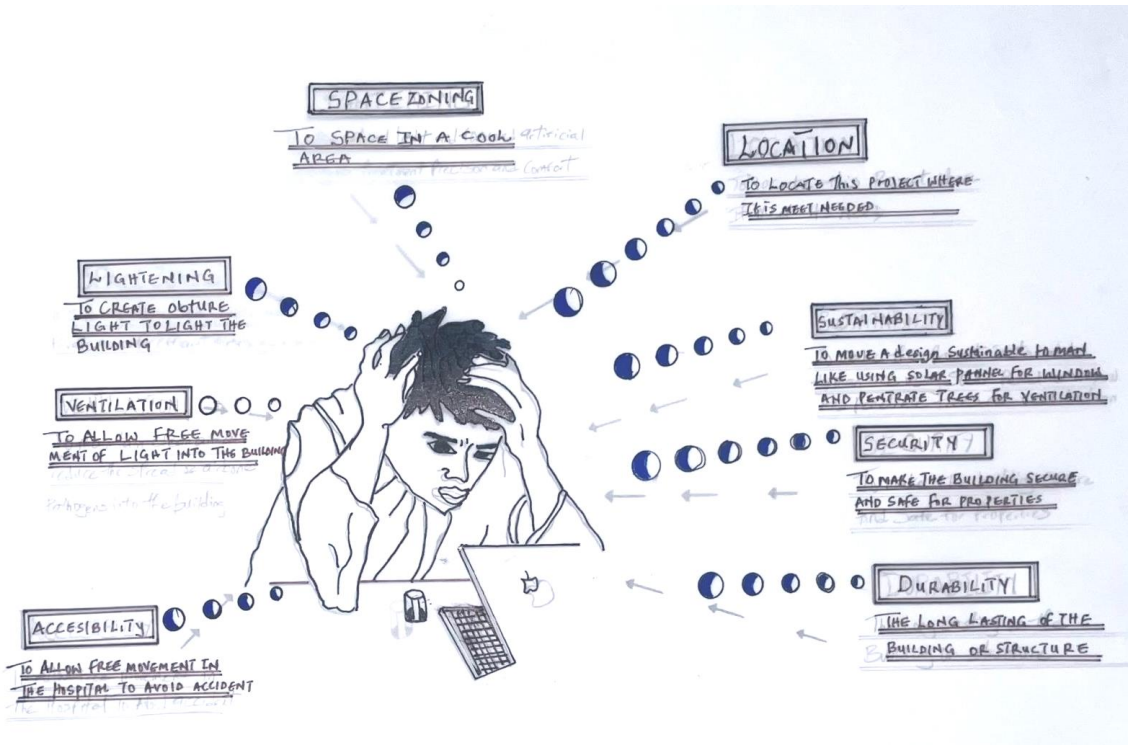
1.3. SITE ANALYSIS



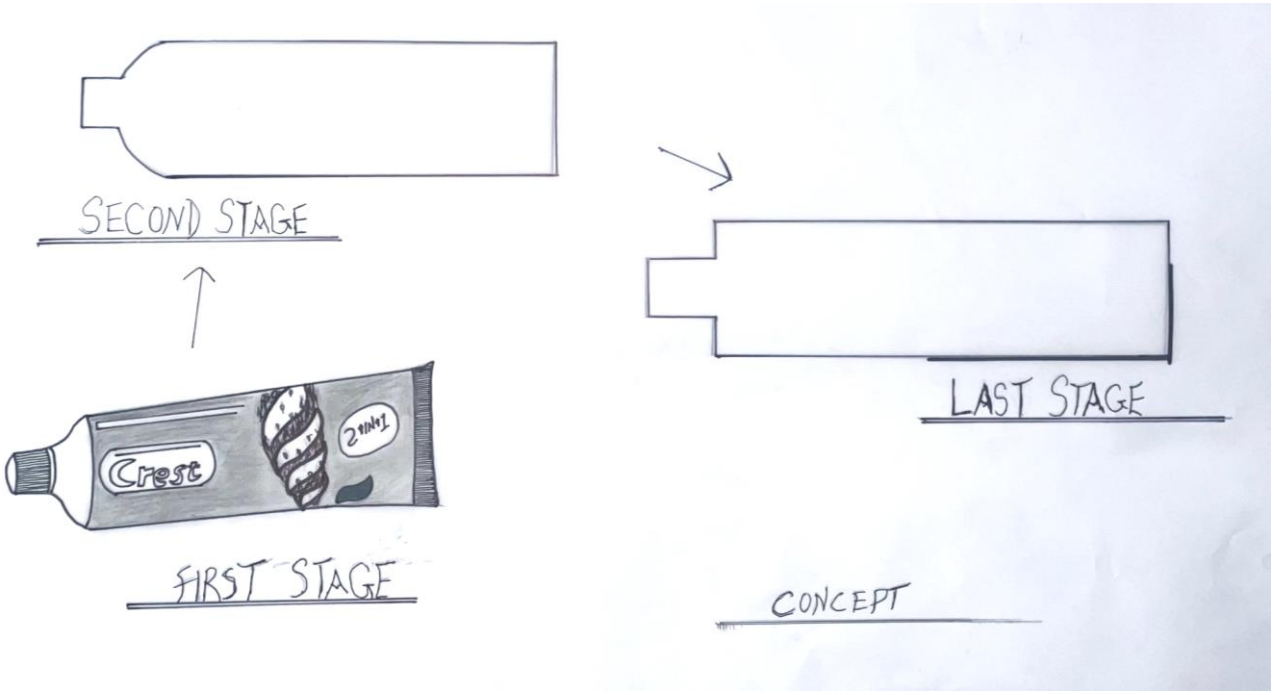
1.4. SITE ZONING



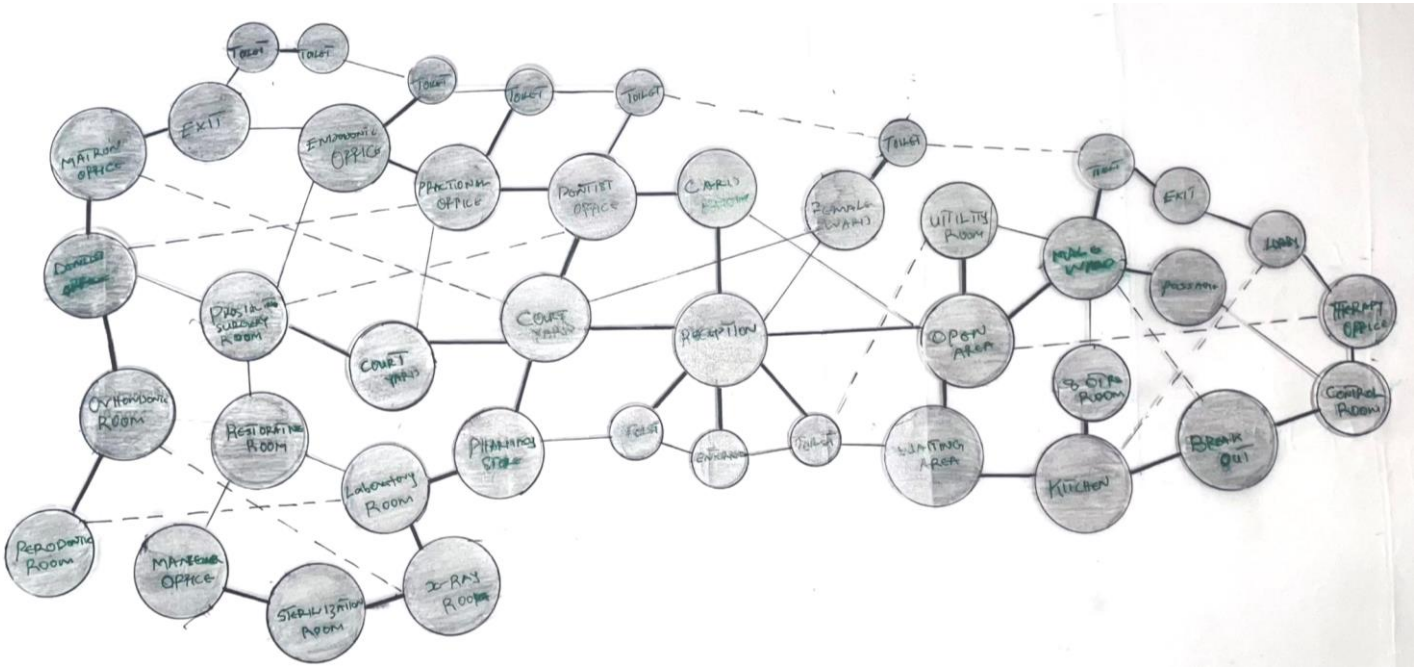
1.5. SITE PLAN



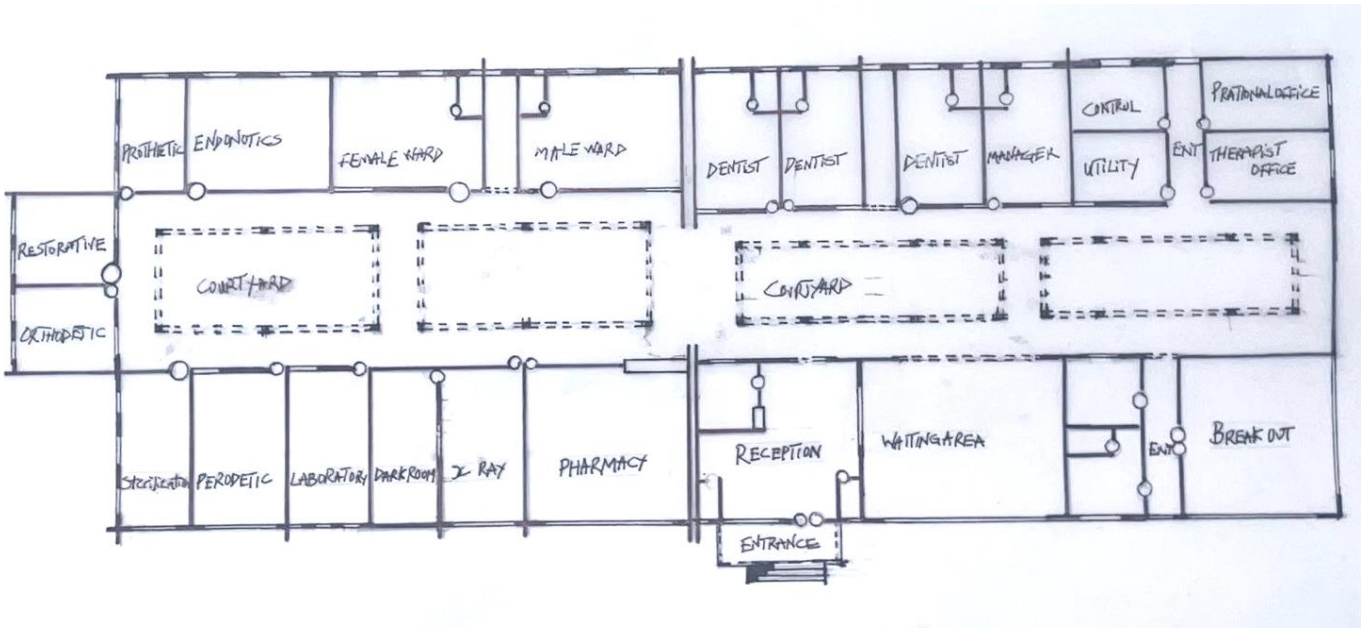
1.6. DESIGN CONSIDERATION



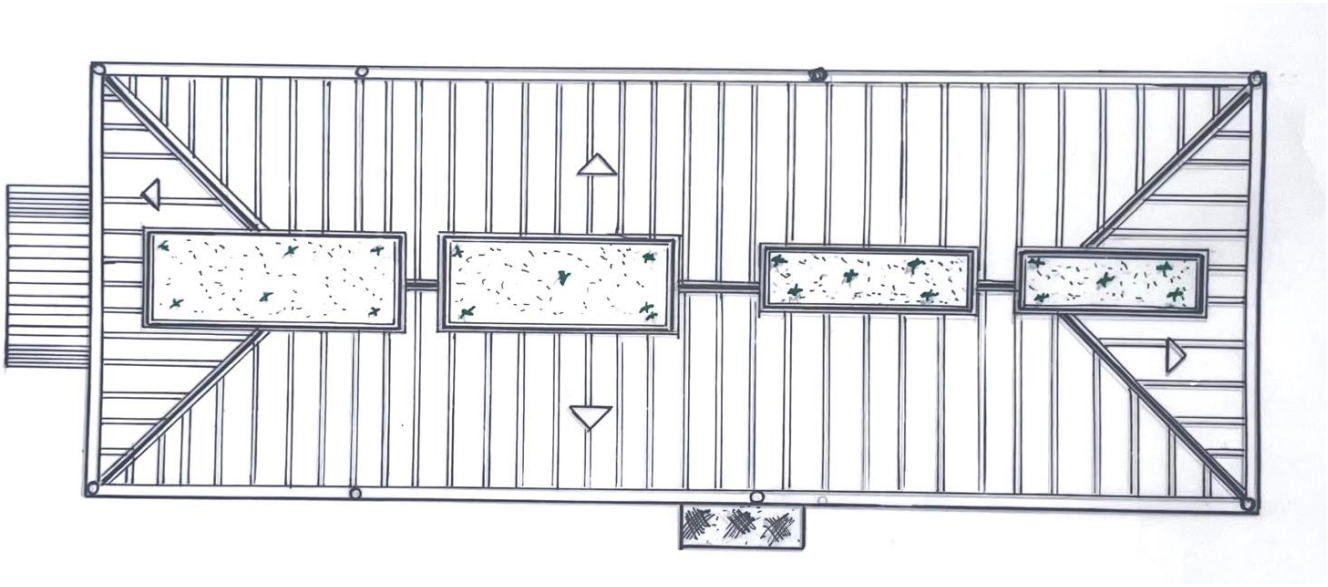
1.7. CONCEPT DERIVATION



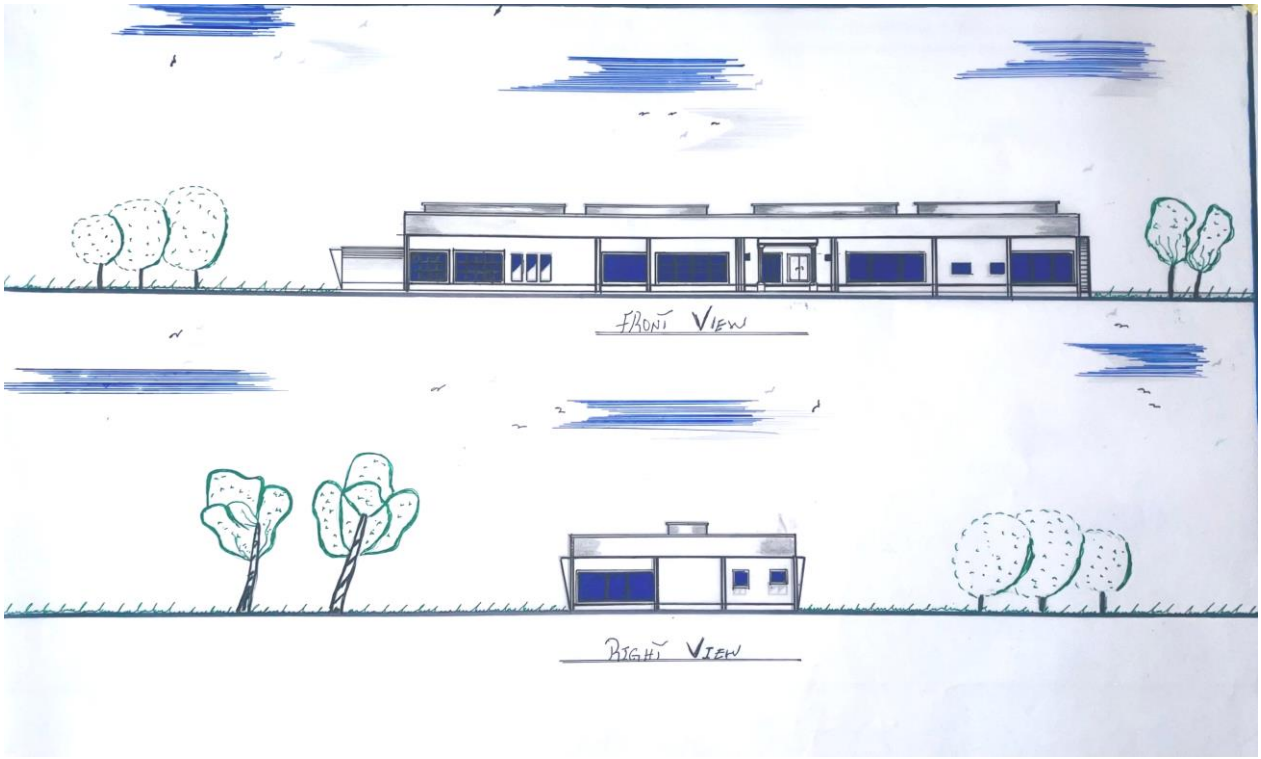
1.8. BUBBLE DIAGRAM



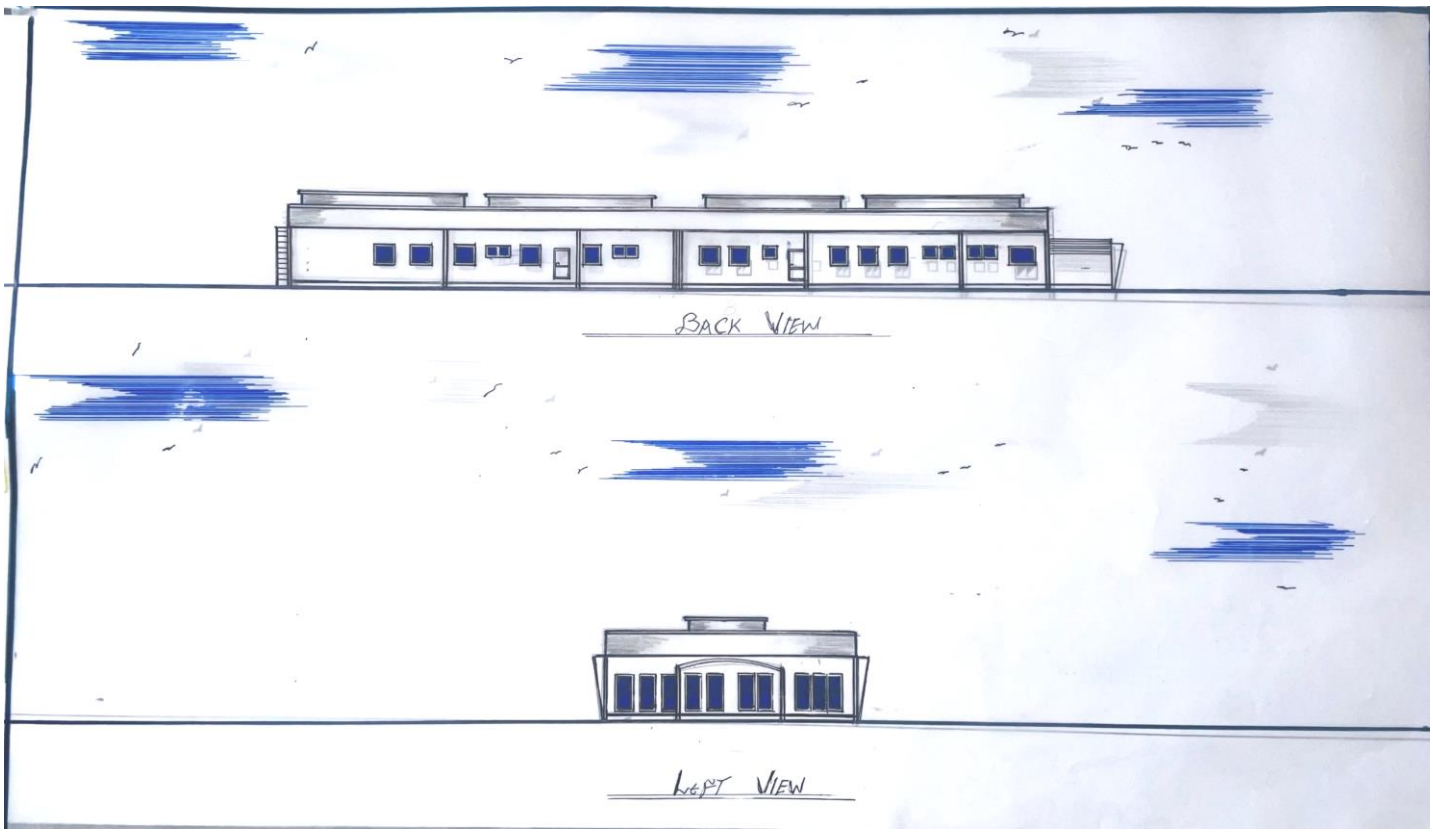
1.9. FLOOR PLAN



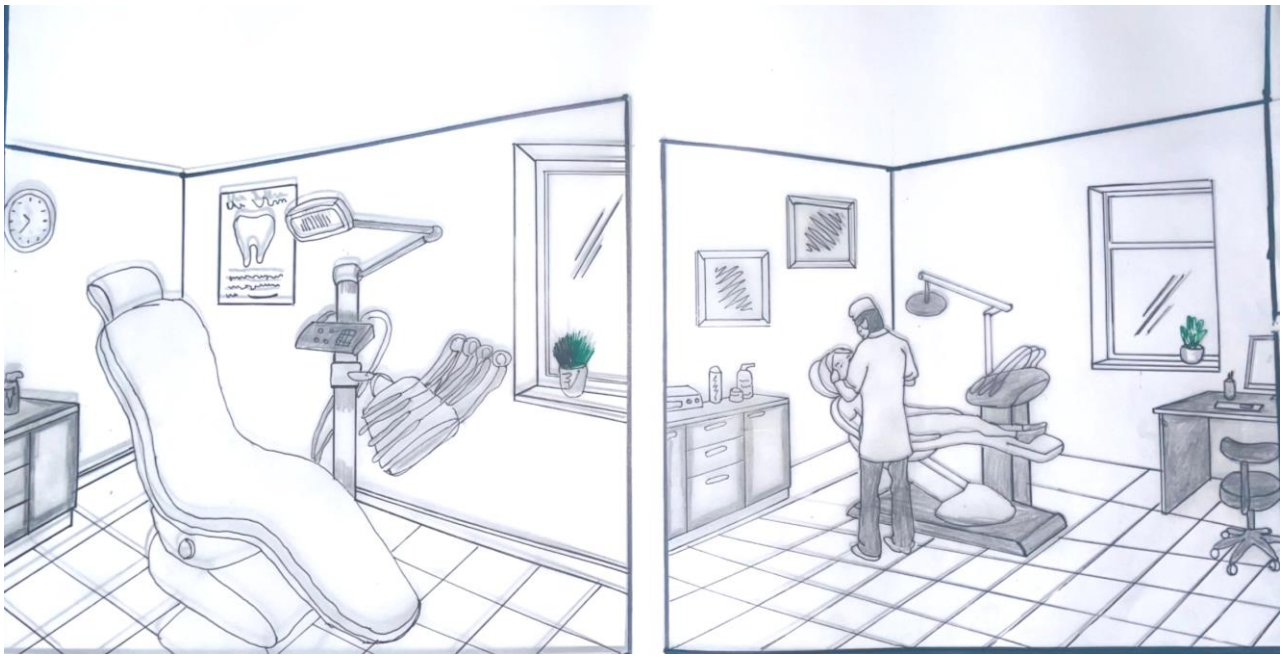
1.10. ROOF PLAN



1.11. APPROACH AND RIGHT-SIDE ELEVATIONS

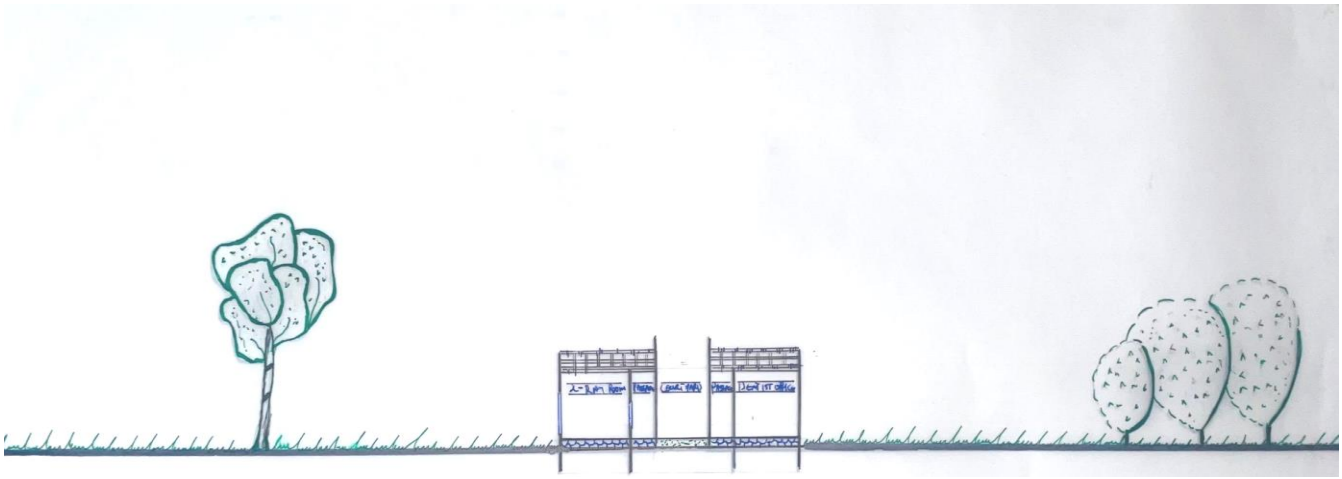


1.12. BACK AND LEFT SIDE ELEVATIONS



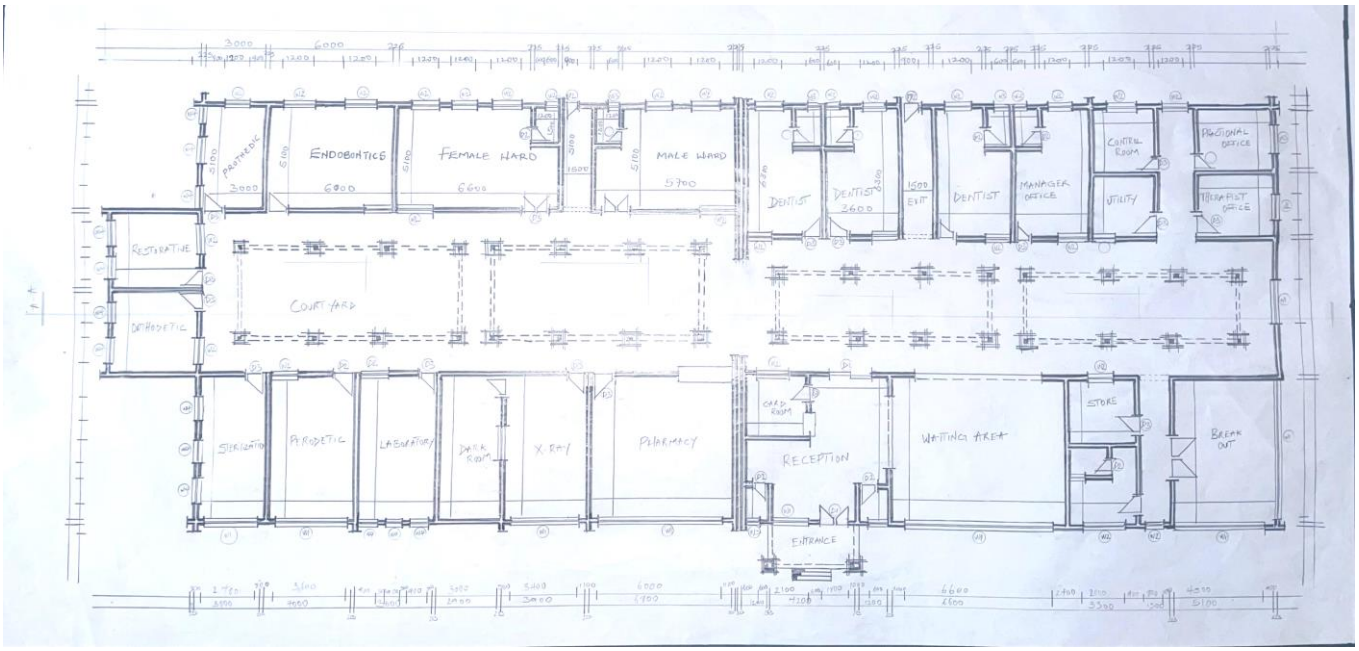
1.13. INTERIOR PERSPECTIVE

1.14. LONGITUDINAL SECTION A - A

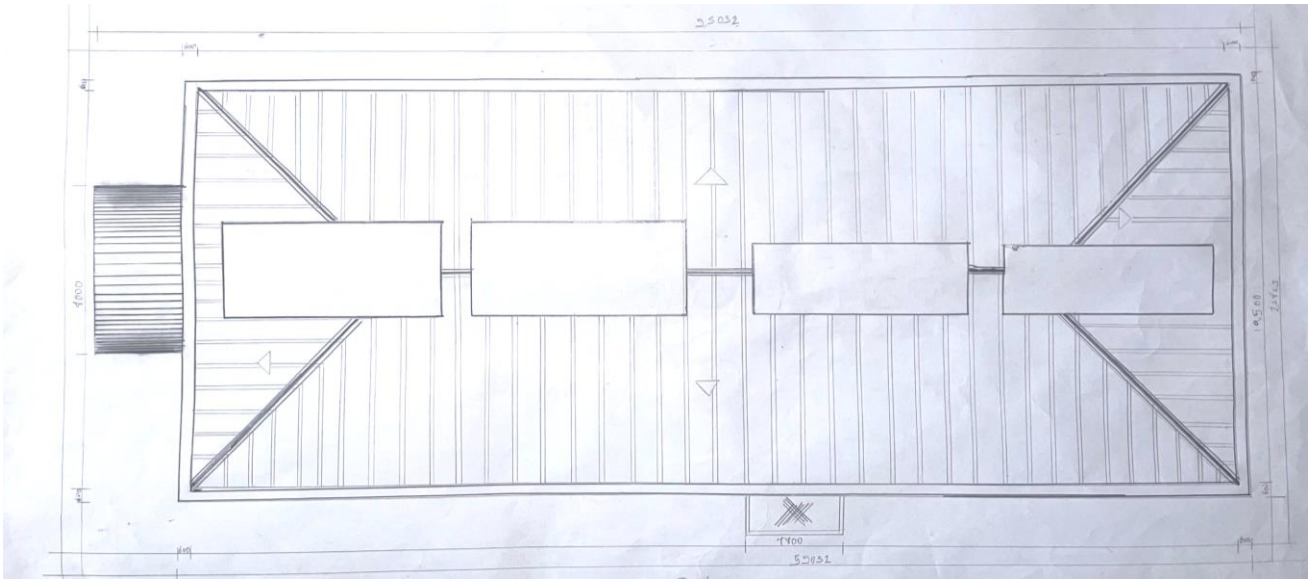


1.15. CROSS SECTION X - X

WORKING DRAWINGS



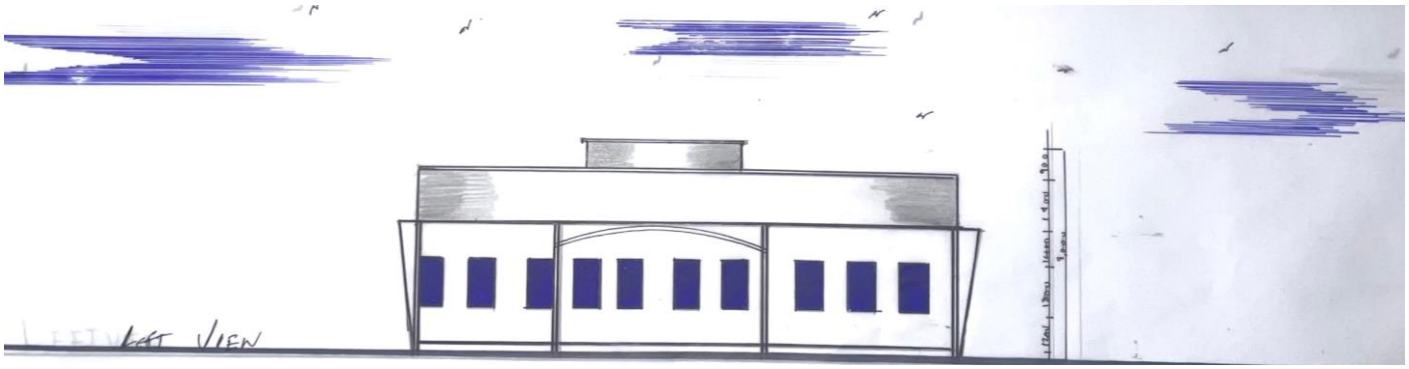
2.0. FLOOR PLAN



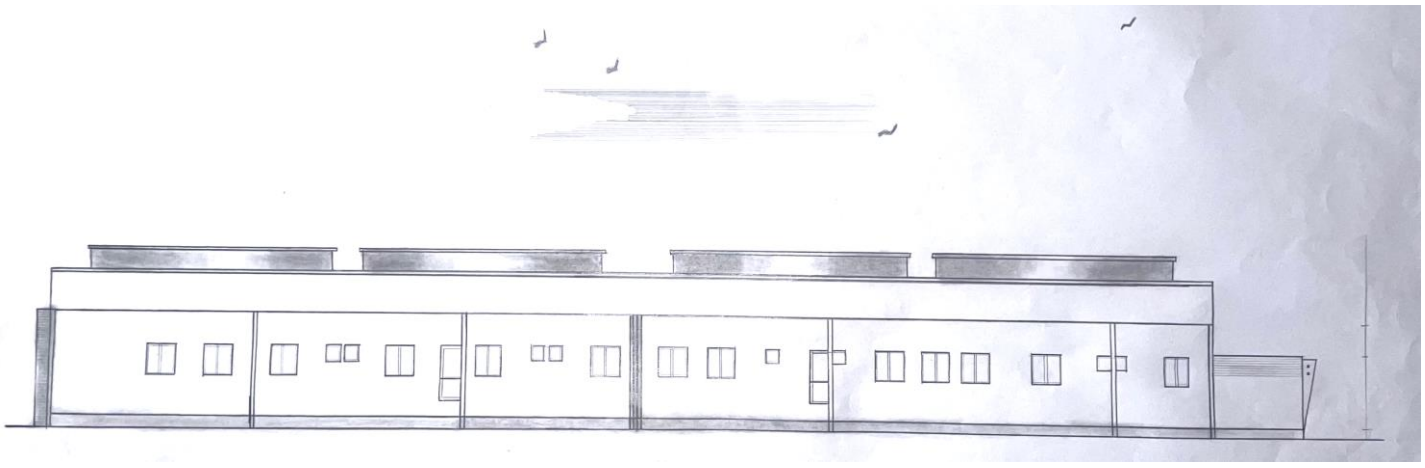
2.1. ROOF PLAN

2.2. FRONT ELEVATION

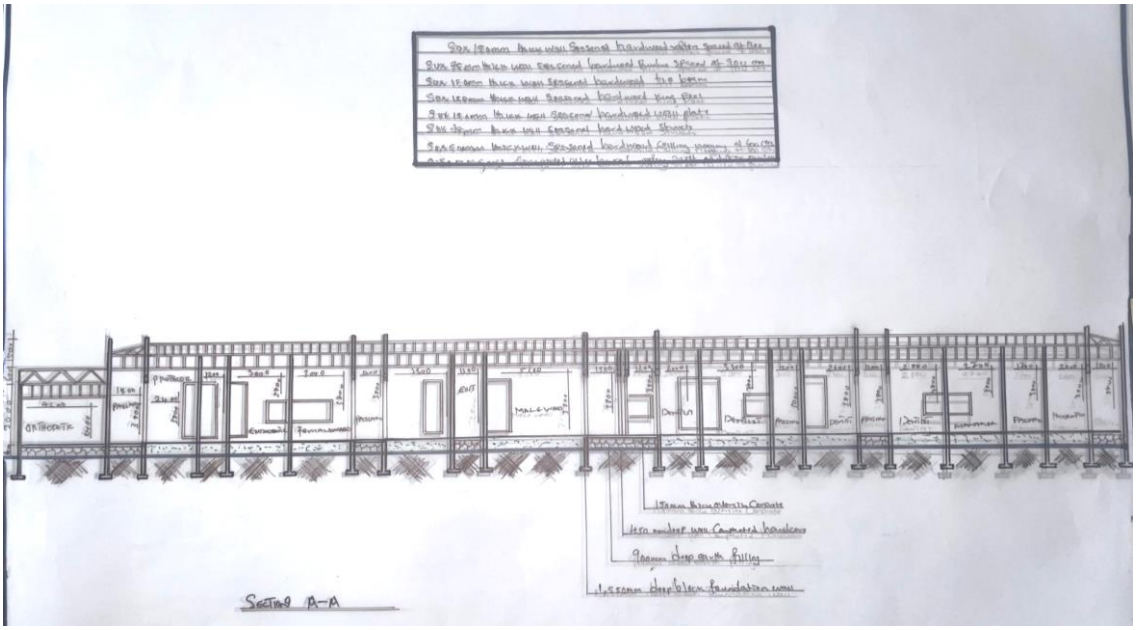
2.3. RIGHT SIDE ELEVATION



2.4. LEFT SIDE ELEVATION



2.5. BACK ELEVATION



2.6. SECTION A-A

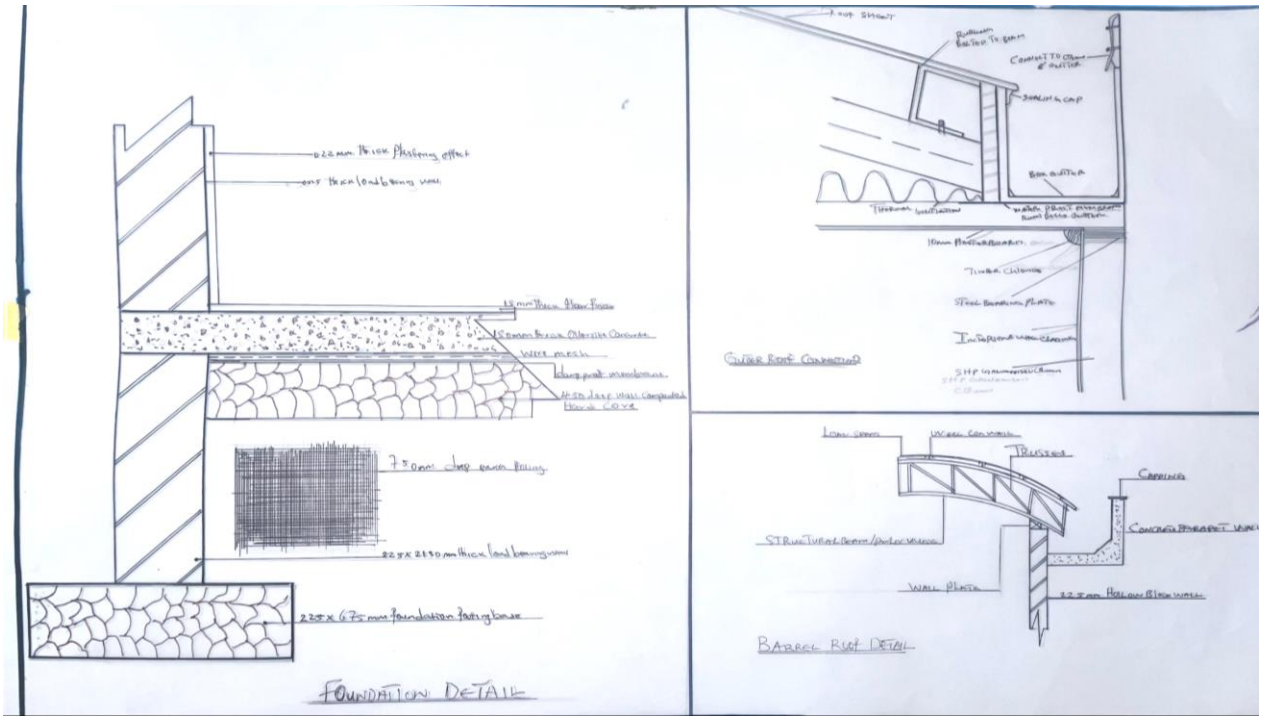
WINDOW SCHEDULES

DETAILS	W3	W11	W12	W5	W1	W6
DIAGRAM						
DESCRIPTION	ALUMINIUM WINDOW WITH FIXED LIGHT	ALUMINIUM WINDOW WITH FIXED LIGHT	ALUMINIUM WINDOW WITH FIXED LIGHT	ALUMINIUM WINDOW FIXED LIGHT	ALUMINIUM WINDOW FIXED LIGHT	ALUMINIUM WINDOW WITH FIXED LIGHT
NO REQUIRED	9	10	32	15	4	3

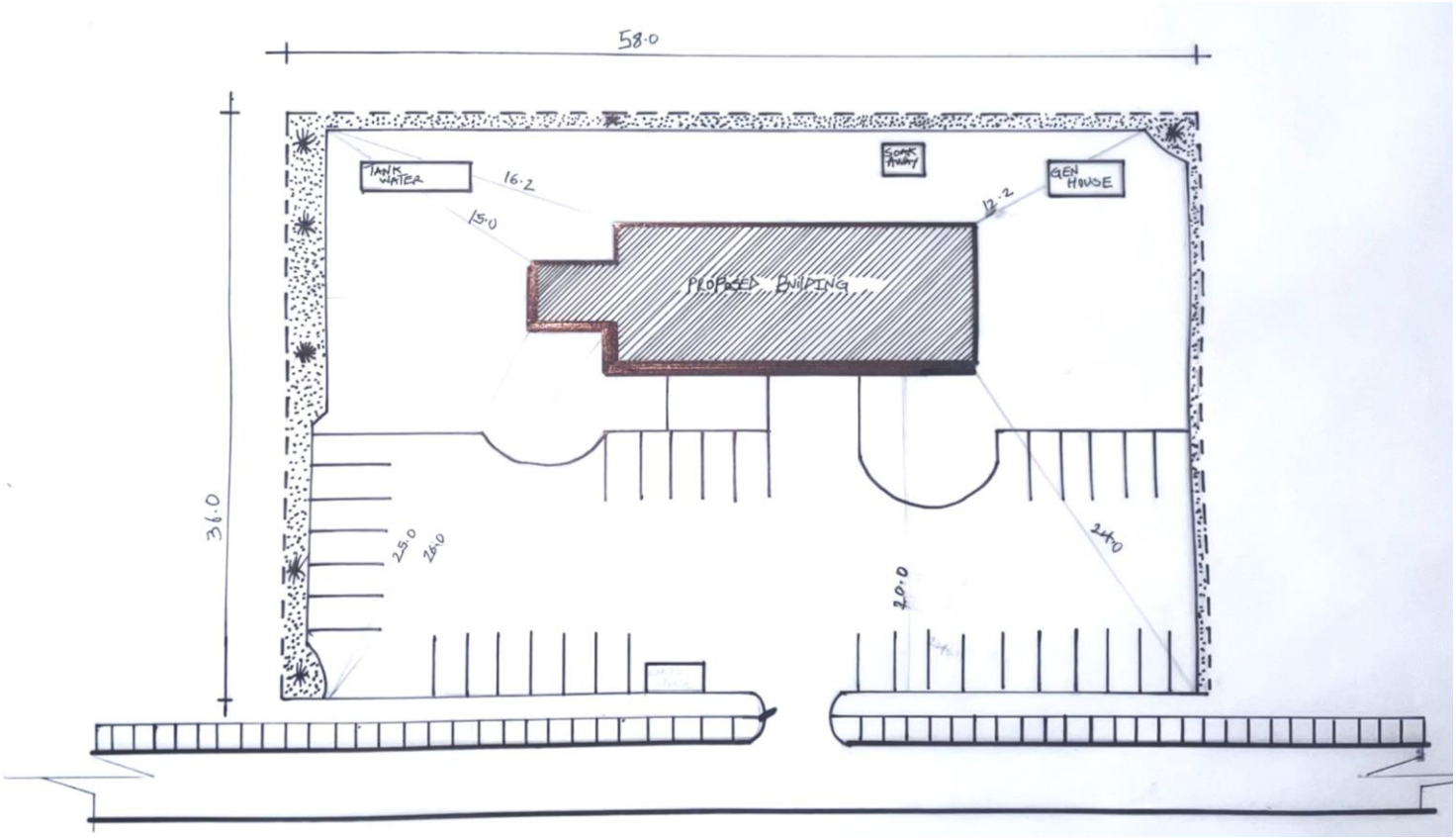
DETAILS	D2	D2	D	D
DIAGRAM				
DESCRIPTION	WOODEN PANEL	WOODEN PANEL	WOODEN PANEL	WOODEN PANEL

DOOR SCHEDULES

2.7. WINDOW AND DOOR SCHEDULES



2.8. DETAILS



2.9. SITE PLAN

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