A PROJECT REPORT

ON

PROPOSED ICT CENTAL

FOR

LATEEF JAKANDE ROAD IKEJA, LAGOS STATE.

By:

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ND/23/ARC/FT/0026

Submitted to:

THE DEPARTMENT OF ARCHITECTURAL TECHNOLOGY

INSTITUTE OF ENVIRONMENTAL 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

I declare that this design project/Dissertation is a project of my personal work. It has been presented for the award of any National Diploma in any Polytechnic. The ideas, observation, comment, suggestions herein represent my own convictions, except quotations, which have been acknowledged in accordance with conventional academic traditions.

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_____

DATE/SIGNATURE

CERTIFICATION

I certified that this design entitled "**ICT CENTAL**" was carried out by **SALAU BABATUNDE ISMAIL** with Matric Number **ND/23/ARC/FT/0026**, under the supervision of **ARC. MOHAMMED SHERO** and has been approved as meeting the requirements for the award of **NATIONAL DIPLOMA (ND)** in ***Architectural Technology***, Kwara State Polytechnic, Ilorin. Kwara State.

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ACKNOWLEDGEMENT

Everything that has beginning must have an end, I express my deepest gratitude to Almighty God for granting me the strength, wisdom, and perseverance to successfully complete this project. His guidance and blessings have been my greatest support throughout this journey.

I extend my heartfelt appreciation to my parents

(MR WASIU ISMAILA) and (MR. MUSTAPHA IMAM) for their unwavering love, encouragement, and sacrifices. Their constant support and belief in me have been a source of motivation.

A very special thanks to my supervisor, ARC.

MR. MOHAMMED SHERO), for their invaluable guidance, patience, and constructive feedback.

Their expertise and mentorship have played a crucial role in shaping this project, and I am truly grateful for their support.

I would also like to thank my lecturers ARC. MRS. JM TOMORI and mentors for their invaluable guidance, constructive feedback, and knowledge that have contributed immensely to my growth in architecture.

my sincere appreciation goes to my friends and colleagues who have provided encouragement, advice, and companionship throughout this project. Their support has made this experience more fulfilling.

DEDICATION

Dedicate this project to Almighty God, the source of my wisdom, strength, and inspiration. His grace has guided me through every challenge, and His blessings have made this achievement possible. and l also to my beloved parents MR WASIU ISMAILA and MR. MUSTAPHA IMAM whose unwavering love, sacrifices, and support have been my greatest motivation. Their prayers, encouragement, and guidance have shaped me into the person I am today.

This project is a testament to their endless efforts and belief in my dreams

ABSTRACT

Information and Communication Technology (ICT) has transformed the way individuals, organizations, and governments access, process, store, and transmit information. This study explores the impact, development, and integration of ICT in various sectors such as education, healthcare, business, and governance. It examines how ICT enhances communication, increases productivity, and supports innovation in the digital age. The research also highlights the challenges associated with ICT adoption, including digital divide, cyber security risks, and infrastructure limitations. Through qualitative and quantitative analysis, this study provides insights into the effective use of ICT tools and recommends strategies for maximizing its benefits in a rapidly evolving technological environment.

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CHAPTER ONE

INTRODUCTION TO ICT CENTRE

An Information and Communication Technology (ICT) Center is a facility designed to provide access to modern digital tools, resources, and training for individuals, schools, businesses, and communities. In today's rapidly advancing technological world, ICT centers play a vital role in bridging the digital divide by offering infrastructure and services that support computer literacy, internet access, data processing, and communication.

The purpose of an ICT center is to create an environment where people can learn, innovate, and develop digital skills that are essential for academic, professional, and personal growth. These centers often house computers, internet facilities, projectors, servers, printers, and other technological equipment. They also provide training on software applications, coding, digital marketing, cyber security, and other relevant ICT skills.

In educational settings, ICT centers enhance teaching and learning by integrating technology into the curriculum, promoting e-learning, and facilitating research. In the wider community, they contribute to economic development by empowering users with the tools needed to access information, apply for jobs, start businesses, and participate in the digital economy.

As technology continues to shape the future, the establishment of well-equipped and efficiently managed ICT centers becomes crucial for sustainable development and global competitiveness.

1.1 HISTORICAL BACKGROUND OF THE PROJECT

The evolution of Information and Communication Technology (ICT) dates back to the mid-20th century, when the development of computers and telecommunications began transforming how information was processed and shared. Initially, ICT was limited to large organizations and research institutions due to the high cost and complexity of the technology. However, with the invention of personal computers in the 1980s and the rise of the internet in the 1990s, ICT became more accessible to the general public.

As the digital age advanced, many countries, including Nigeria, began to recognize the importance of ICT in driving socio-economic development. Governments and private organizations started establishing ICT centers in schools, universities, and communities to

promote digital literacy, bridge the knowledge gap, and empower people with essential technology skills.

The need for ICT centers grew rapidly in the early 2000s, especially with the introduction of e-governance, online education, and digital businesses. In response to global digital trends, Nigeria developed national ICT policies aimed at improving infrastructure, expanding access, and encouraging innovation.

This project on the development of an ICT Center is part of the broader effort to support national and global goals for digital inclusion and technological advancement. It aims to provide a platform where students, professionals, and local residents can gain access to modern ICT tools, training, and opportunities, thereby contributing to human capacity development and sustainable growth in the community.

1.2 DEFINITION

Information and Communication Technology (ICT) refers to the use of digital tools, systems, devices, and resources that enable the creation, storage, processing, and exchange of information. This includes technologies such as computers, the internet, mobile devices, software applications, and telecommunications systems.

An ICT Center is a dedicated facility that provides access to these technologies and offers services such as computer training, internet access, digital literacy programs, and other ICT-related activities. The primary purpose of an ICT center is to enhance digital skills, support education, promote innovation, and improve access to information and communication tools within a school, organization, or community.

1.3 STATEMENT O F THE RESEARCH PROBLEM.

In today's digital age, access to Information and Communication Technology (ICT) has become essential for education, employment, and socio-economic development. However, many communities, especially in developing countries like Nigeria, still suffer from limited access to ICT facilities, poor digital literacy, and inadequate infrastructure. This digital divide creates significant barriers for students, educators, and the general population in acquiring the necessary skills to thrive in a technology-driven world.

Despite the growing demand for digital knowledge, many schools and institutions lack functional ICT centers, modern equipment, or qualified instructors to deliver ICT training effectively. As a result, learners are left behind in a rapidly advancing global economy where digital competence is increasingly critical.

This project seeks to address the problem of limited ICT access and training by proposing the development of a well-equipped ICT center. The goal is to provide a conducive environment for learning, innovation, and community empowerment through modern information and communication technologies.

1.4 AIM AND OBJECTIVES

1.3.1 AIM OF THE STUDY

The primary aim of this project is to design and establish a functional ICT Center that will provide access to modern digital tools, promote computer literacy, and support educational and technological development within the target community or institution.

1.3.2 OBJECTIVES

- To provide a well-equipped facility with modern ICT tools such as computers, printers, projectors, and internet access.
- To enhance digital literacy by offering training programs in basic computer skills, software usage, and internet navigation.
- To support teaching and learning through the integration of ICT into educational activities and curriculum delivery.
- To create opportunities for research, innovation, and entrepreneurship through access to online resources and digital tools.
- To bridge the digital divide by ensuring equal access to ICT resources for students, staff, and members of the community.

1.5 JUSTIFICATION.

In the modern world, Information and Communication Technology (ICT) plays a critical role in education, communication, and economic development. The need for digital literacy is no longer optional—it is essential for academic success, job opportunities, and active participation in the global digital economy.

Despite the growing importance of ICT, many schools and communities still lack access to basic computer facilities and internet services. Students are often left without the necessary tools and skills to compete with their peers in better-equipped environments. Teachers also face challenges in integrating technology into teaching due to the absence of training and resources.

Establishing an ICT center is a necessary step toward bridging this gap. It will provide a platform for learning, research, innovation, and capacity building. It will empower students with 21st-century skills, support teachers in delivering more effective instruction, and offer community members access to valuable digital services.

This project is therefore justified by the urgent need to improve ICT access, promote digital inclusion, and support national goals for educational and technological advancement.

1.6 SCOPE OF THE STUDY

This project focuses on the design, development, and implementation of an Information and Communication Technology (ICT) Center aimed at improving digital access and literacy within an educational or community setting. The study covers the planning, architectural design, layout, space allocation, and specification of required ICT equipment such as computers, internet facilities, power backup, and training areas.

It also includes research into the functional requirements of ICT centers in schools or communities, as well as the environmental, technical, and economic factors that influence their effectiveness. The study will consider user needs—especially students, teachers, and local residents—and recommend appropriate facilities for training, learning, and general ICT access.

However, the scope does not extend to the full implementation or management of the ICT programs after construction. It also excludes the design of complex server infrastructures or advanced software development labs that are beyond basic digital training requirements.

1.7 LIMITATIONS OF STUDY

While this project aims to provide a comprehensive design and proposal for an ICT Center, there are several limitations that may affect the depth and extent of the study:

- Financial Constraints – The study does not account for detailed cost analysis or budgeting required for the full construction, furnishing, and long-term maintenance of the ICT center.
- Technical Limitations – The research is limited to basic ICT facilities and does not include the design of advanced infrastructure such as high-level data centers, cyber security systems, or complex networking technologies.
- Time Constraints – Due to the time-bound nature of the academic calendar, the research was conducted within a limited period, which may have restricted broader fieldwork, interviews, or case studies.
- Access to Data – Limited access to real-life examples of fully functional ICT centers, especially in rural or underdeveloped areas, restricted the depth of case study comparisons.

1.8 RESEARCH METHODOLOGY

This research adopts a qualitative and descriptive methodology to guide the planning and design of an Information and Communication Technology (ICT) Center. The methods used are aimed at gathering relevant information on the needs, standards, and best practices for establishing a functional and sustainable ICT facility.

1. Literature Review

A comprehensive review of books, journals, online articles, and government policies related to ICT development, design standards, and implementation in schools and communities was conducted. This provided a theoretical foundation and helped identify key elements required in a modern ICT center.

2. Case Studies

Selected existing ICT centers within educational institutions and communities were analyzed to understand their design layout, functional spaces, equipment, and challenges. These case studies helped identify what works and what can be improved.

3. Site Analysis

The physical characteristics of the proposed project site were examined, including location, accessibility, topography, climate, and availability of utilities. This ensured the design is well-suited to its environment.

4. Interviews and Surveys

Informal interviews and questionnaires were used to gather data from potential users such as students, teachers, and administrators to understand their needs, expectations, and challenges regarding ICT facilities.

CHAPTER TWO

2.1LITERATURE REVIEW ICT CENTRE

2.1.1 Introduction

The advancement of Information and Communication Technology (ICT) has significantly influenced education, business, communication, and community development across the world. As societies become increasingly digital, the need for functional and accessible ICT centers has grown more urgent, especially in developing countries like Nigeria. These centers serve as critical platforms for digital literacy, access to information, and technology-driven learning and development.

This literature review explores previous studies, reports, and publications related to the planning, design, and impact of ICT centers. It examines global and local perspectives on the role of ICT in education and community empowerment, the essential components of a modern ICT center, and the challenges faced in implementing such facilities. By analyzing relevant scholarly works and case studies, this review provides a foundation for understanding the principles, standards, and practices that inform the design and development of an effective ICT center.

2.1.2 IMPORTANT ISSUES AND PROBLEMS PECULIAR TO ICT CENTAL TYPOLOGY

Designing and operating an ICT center involves unique challenges and issues that affect its functionality, accessibility, and long-term sustainability. These problems are specific to the typology of ICT centers due to their dependence on technological infrastructure, power supply, user skill level, and environmental factors. Below are key issues commonly encountered?

1. Inconsistent Power Supply

ICT centers rely heavily on constant electricity for computers, servers, and internet connectivity. In many developing regions, unreliable power supply poses a serious limitation to the effective operation of these centers.

2. Limited Internet Connectivity

Many ICT centers suffer from slow or unstable internet connections due to poor network infrastructure or high subscription costs. This affects access to online resources, communication, and real-time collaboration.

3. Lack of Skilled Personnel

The success of an ICT center depends not only on its equipment but also on trained staff who can manage, maintain, and teach users. In many cases, there is a shortage of qualified ICT instructors or technical support personnel.

2.1.3 TECHNOLOGICAL AND ENVIRONMENTAL APPROACHES FOR DESIGNING A ICT CENTRE.

The effectiveness of an ICT centre depends on how well it integrates appropriate technology and responds to environmental conditions. A well-planned ICT center must balance technological advancement with sustainable design principles to ensure long-term functionality, user comfort, and environmental responsibility.

TECHNOLOGICAL APPROACHES

1. **Modern ICT Infrastructure**
   - Use of up-to-date hardware such as desktops, laptops, servers, routers, and switches that meet the needs of users. Preference should be given to energy-efficient devices and scalable systems.

2. **Reliable Internet Access**
   - Provision of high-speed, secure, and stable internet connection using fiber optics, broadband, or satellite, depending on availability and location.

3. **Backup and Power Solutions**
   - Installation of uninterrupted power supply (UPS) systems, solar panels, and/or generators to ensure continuous operations despite power outages.

CHAPTER THREE

3.0 CASE STUDY

A case study involves an up-close, in-depth, and detailed examination of a particular case or cases, within a real-world context. Case study research is to establish a firm research focus to which the research can refer over the course of a complex phenomenon or object.

Case study can be view as the study of an existing project for a reference purpose in order to determine adjustment point of that particular building. Case study research is to establish a firm research focus to which the research can refer over the course of a complex phenomenon or object.

According to researcher Robert K. Yin, defined case study method as an empirical inquiry that investigate a contemporary phenomenon within its real-life context,

3.1 OUTLINES OF THE CASE STUDIES

1. Agege Local Govt. Lagos State
2. OOU University Ogun State
3. Okoerin Kwara State.

3.1.1 CASE STUDY ONE (1): Agege Local Govt. Lagos State

Date of Establishment: 1966

Architect: Unknown

Location: Lagos State

Brief Description:

The Agege Local Government ICT Center is one of the grassroots initiatives established to promote digital literacy and bridge the technology gap in public schools and among youths in the Agege area of Lagos State, Nigeria. The center was set up in partnership with NGOs such as the Lions Club International and supported by the Lagos State Government to provide basic computer education and internet access to pupils, teachers, and community members.

Merits:

1. **Promotion of Digital Literacy**
    - The center enables students and teachers to develop foundational computer skills, such as typing, using educational software, and navigating the internet.

2. **Educational Support**
   - The ICT center helps integrate technology into classroom learning, making lessons more interactive and enhancing teaching quality.

3. **Youth Empowerment**
   - Young people within the community can use the center to gain employable digital skills, reducing the rate of digital exclusion.

Demerits:

1. **Limited Equipment**
   - The number of computers is often insufficient compared to the number of users, leading to overcrowding and reduced learning efficiency.

2. **Inconsistent Power Supply**
   - Frequent power outages limit the hours the center can operate unless supported by a generator or solar backup system.

3. **Lack of Advanced Training**
   - The training offered is usually limited to basic computer operations; more advanced ICT skills like programming or digital design are often not included.

4. **Maintenance Challenges**
   - Over time, the equipment may become outdated or faulty due to limited funding for repairs and upgrades.

LOCATION PLAN

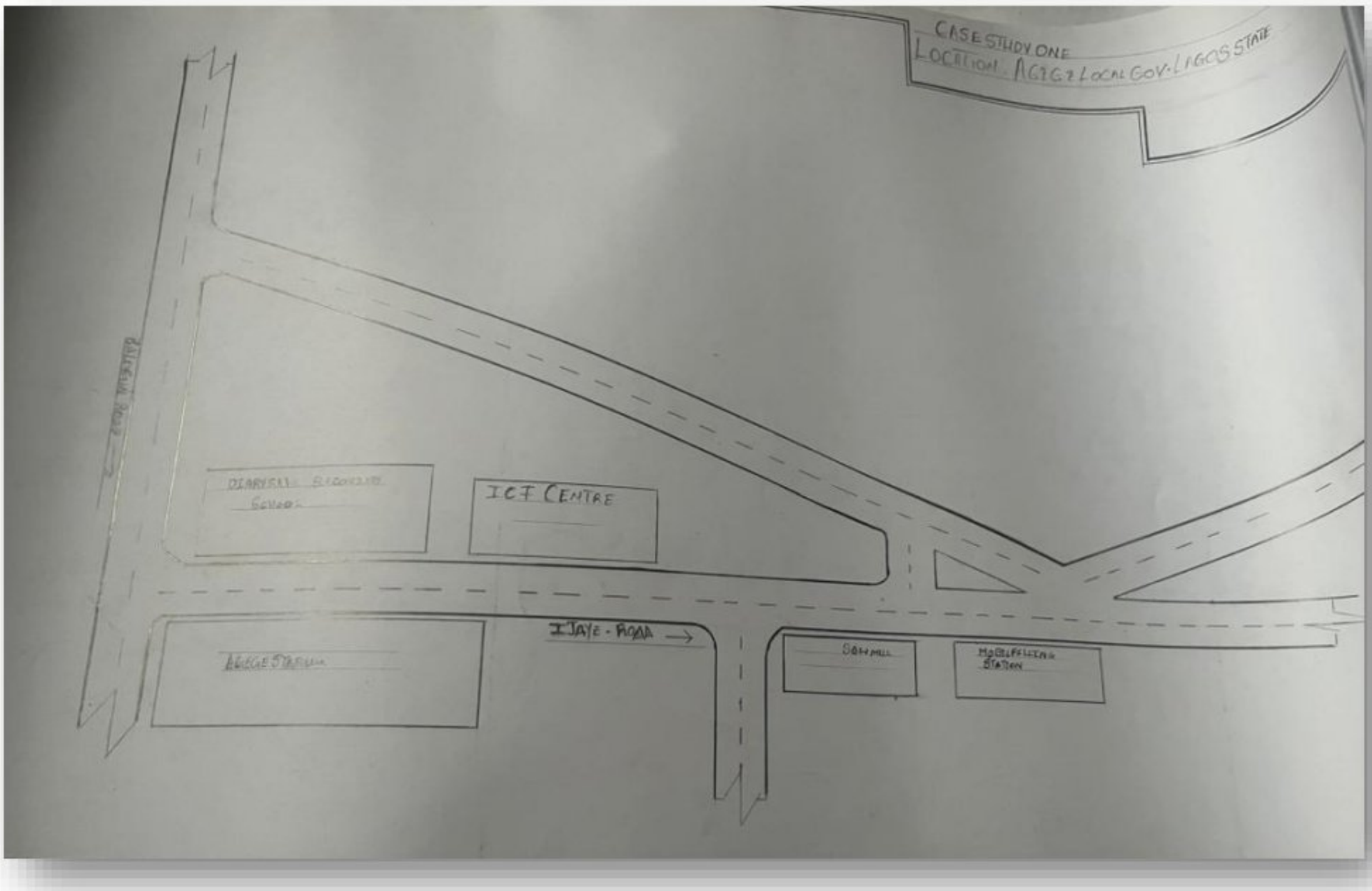

Figure 3:1:1 Location Plan

Plate 3:1.1Geographical Layout

FLOOR PLAN

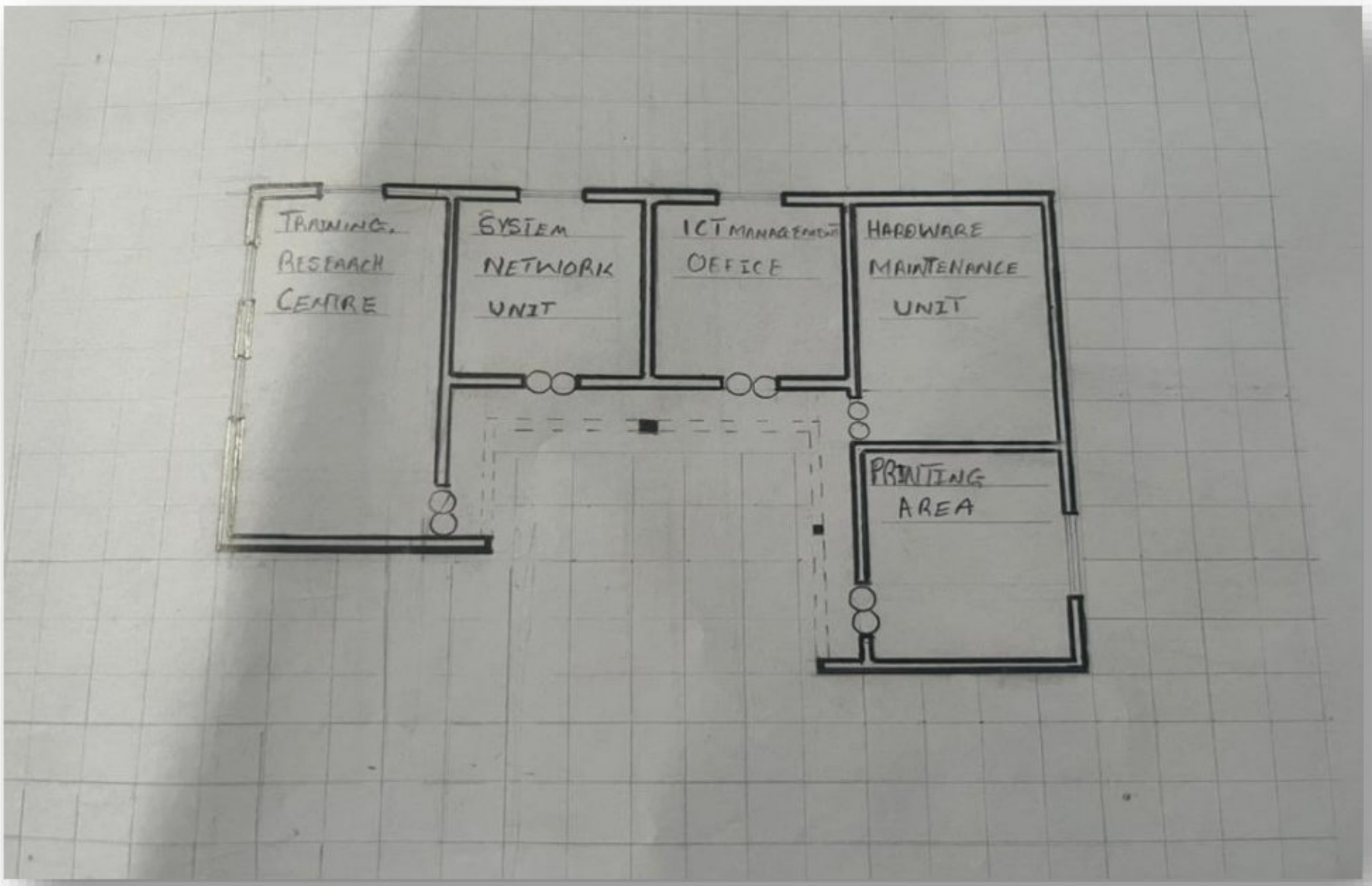

Figure 3:1.2Floor Plan

PICTURES

Plate 3.1.2Elevation

Plate 3.1.3 Elevation

3.1.2 CASE STUDY TWO (2): OOU University Ogun State.

Date of Establishment: 2020

Architect: Unknown

Location: Ago-Iwoye Ogun State.

Brief Description:

In February 2020, Ogun State's Governor, Prince Dapo Abiodun, officially inaugurated what was announced as the largest ICT centre in any Nigerian university. The expansive complex at OOU can accommodate up to 3,000 users at once, and features modern computer labs, printers, free Wi-Fi, and training zones to support research, staff, and student learning

Merits

1. High Capacity & Accessibility

- With space for 3,000 simultaneous users and robust Wi-Fi, the facility significantly improves digital access for students and staff.

2. **Comprehensive Digital Services**

- The ICT Resource Centre supports essential academic operations like online exams, course registration, transcript processing, and e-library services, streamlining university processes.

3. **Enhanced Learning Infrastructure**

The integration with ODLC allows delivery of flexible blended learning programs, starting with BSc Accounting, enabling broader access to tertiary education.

Demerits

1. **Limited Documentation of User Engagement**

- While capacity is high, there is minimal public information on actual usage rates, attendee demographics, or impact assessments on student outcomes.

2. **Maintenance and Sustainability Concerns**

- Long-term functionality depends on consistent funding for hardware upgrades, electricity, and technical support—these details are not clearly documented.

3. **Digital Divide Within the Institution**

- Although the technology hub is expansive, access disparities may remain—for instance, undergraduate students outside engineering or those on satellite campuses might find it difficult to utilize these resources.

LOCATION PLAN

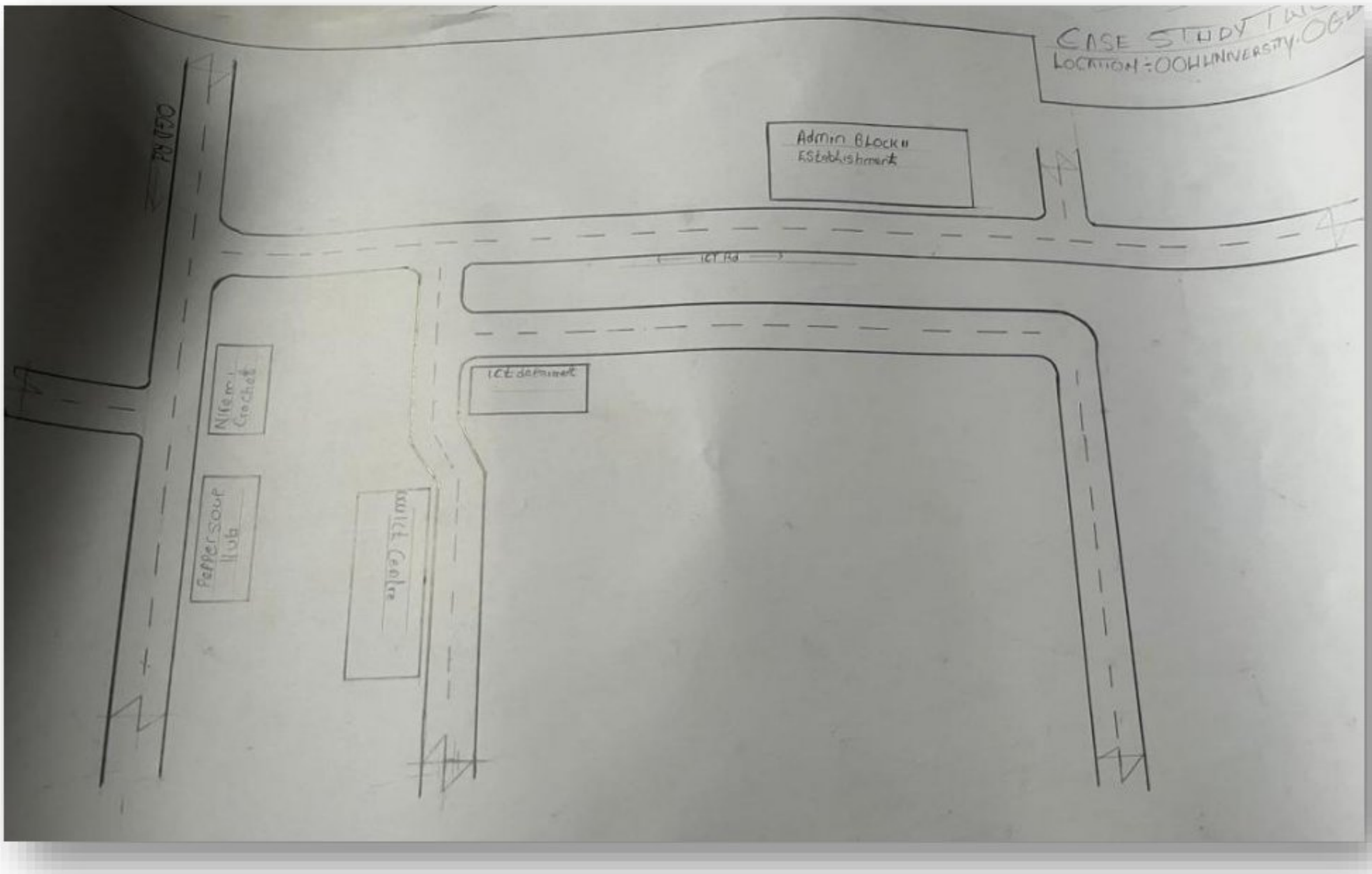

Figure 3.2.1 Location Plan

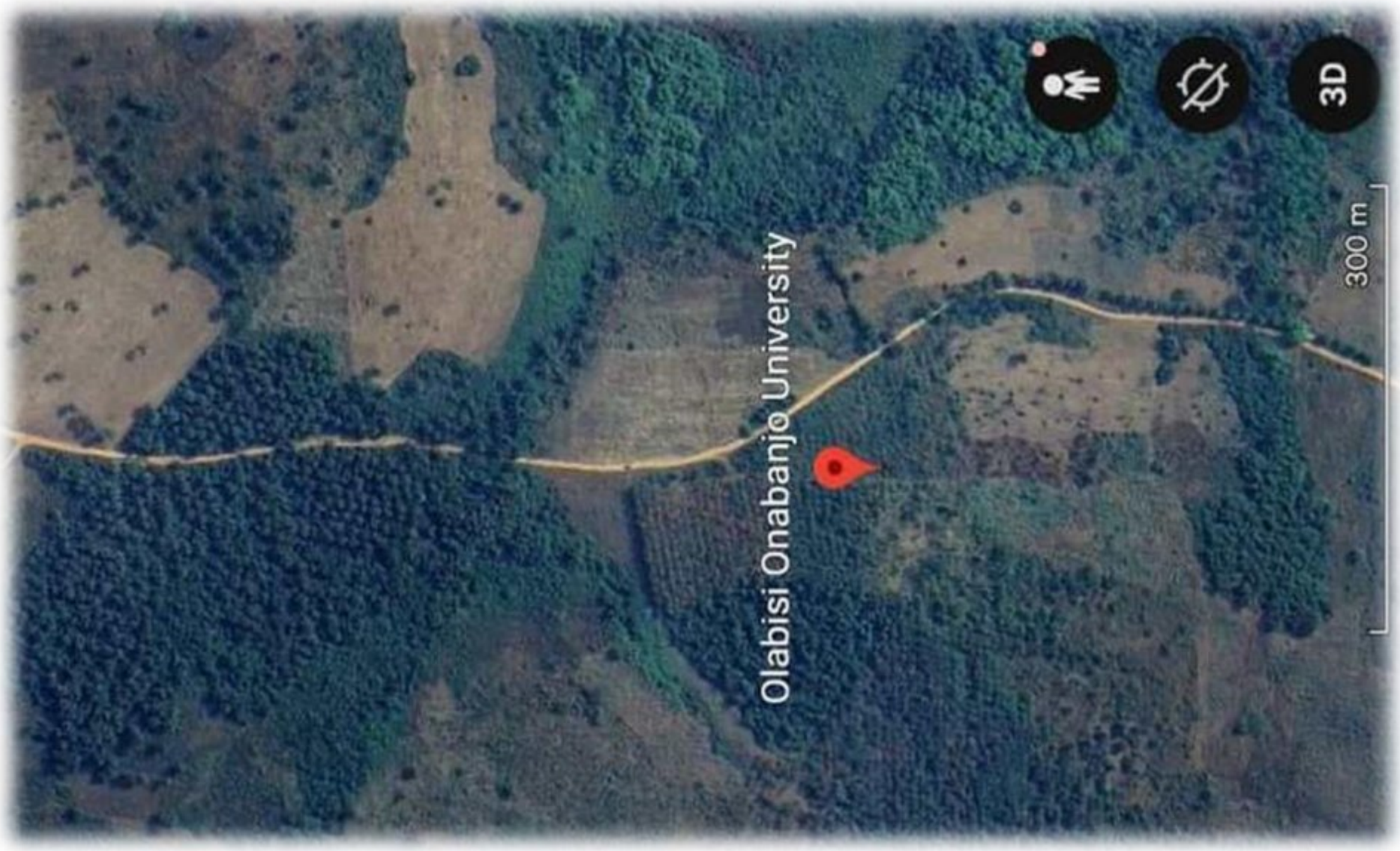

Plate 3.2.1 Geographical Layout

FLOOR PLAN

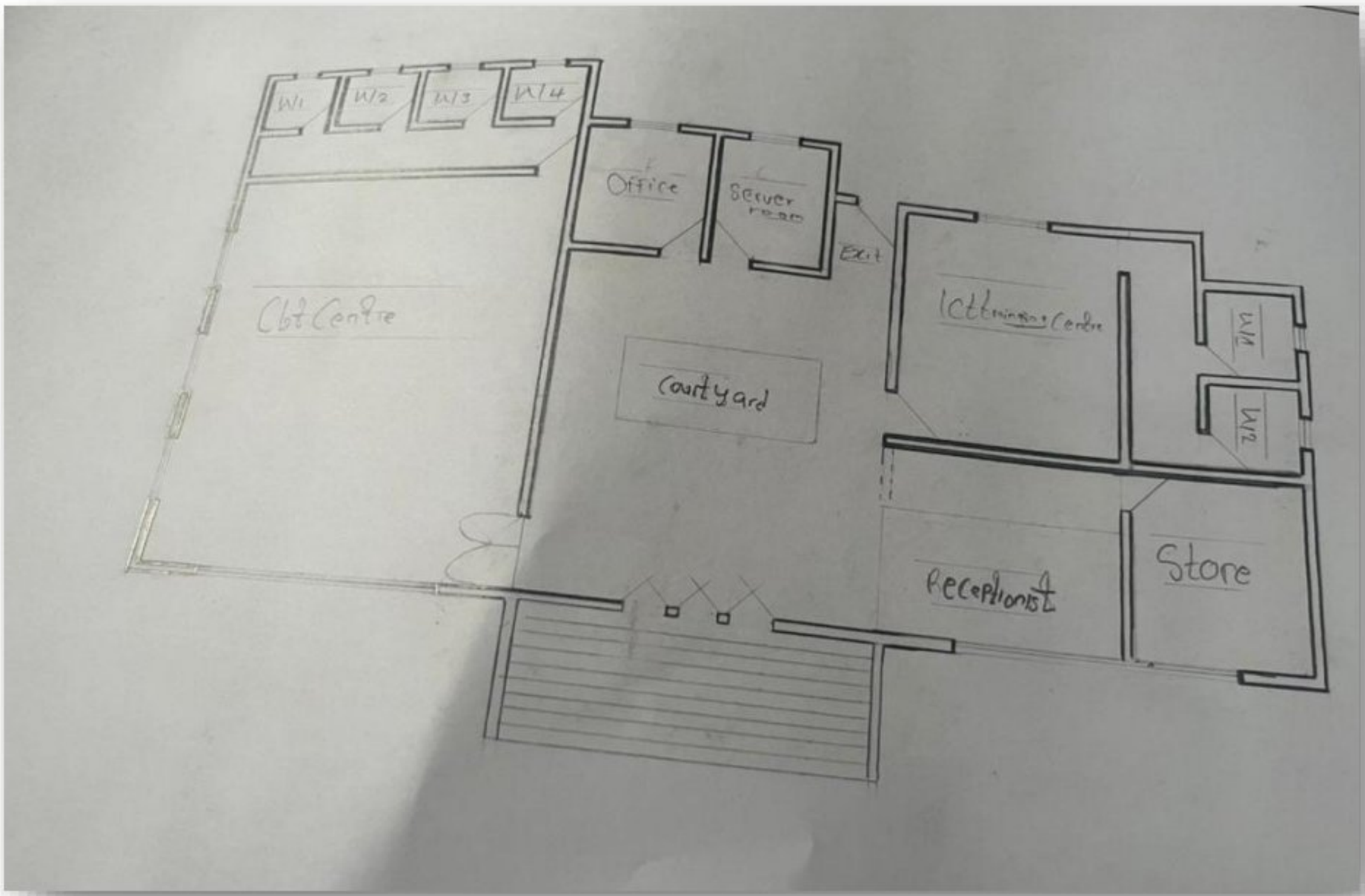

Figure 3.2.2 Floor Plans

PICTURES

Plate 3.2.2 Elevation

3.1.3 CASE STUDY ONE (3): Okoerin Kwara State.

Date of Establishment: 2022

Architect: Unknown

Location: Ilorin Kwara State.

Brief Description:

In October 2017, the Imode Development Association (IDA), in collaboration with indigenes of Imode town in Oke-Ero Local Government Area, launched a community-based ICT facility known as the Digital Literacy Centre (DiLiCe). It is intended to make the ancient township a digitally smart hub within Kwara State. Notably, the center is powered by solar energy, making it functional even in remote areas with unreliable grid power.

Merits:

- Solar-Powered Infrastructure

The center runs entirely on solar power, addressing the challenge of inconsistent electricity supply in rural Kwara .

- Bridging the Digital Divide

It brings ICT access to remote communities that previously had little or no exposure to computer literacy and online tools .

- Youth and Student Empowerment

It facilitates digital learning for students ahead of high-stakes national exams (e.g., post-JAMB computer-based testing), preparing them for technological environments.

Demerits:

- Limited Public Documentation and Transparency

There's limited open information about training content, user statistics, curriculum scope, or impact metrics over time.

- Restricted Reach and Scale

Initially set up in Imode, the DiLiCe center may not be easily accessible to all communities in Oke-Ero LGA due to distance and transport constraints.

- Reliance on Local Funding and Volunteerism

Long-term sustainability may be threatened by limited budgets for hardware upkeep, expanded operations, or hiring qualified trainers.

LOCATION PLAN

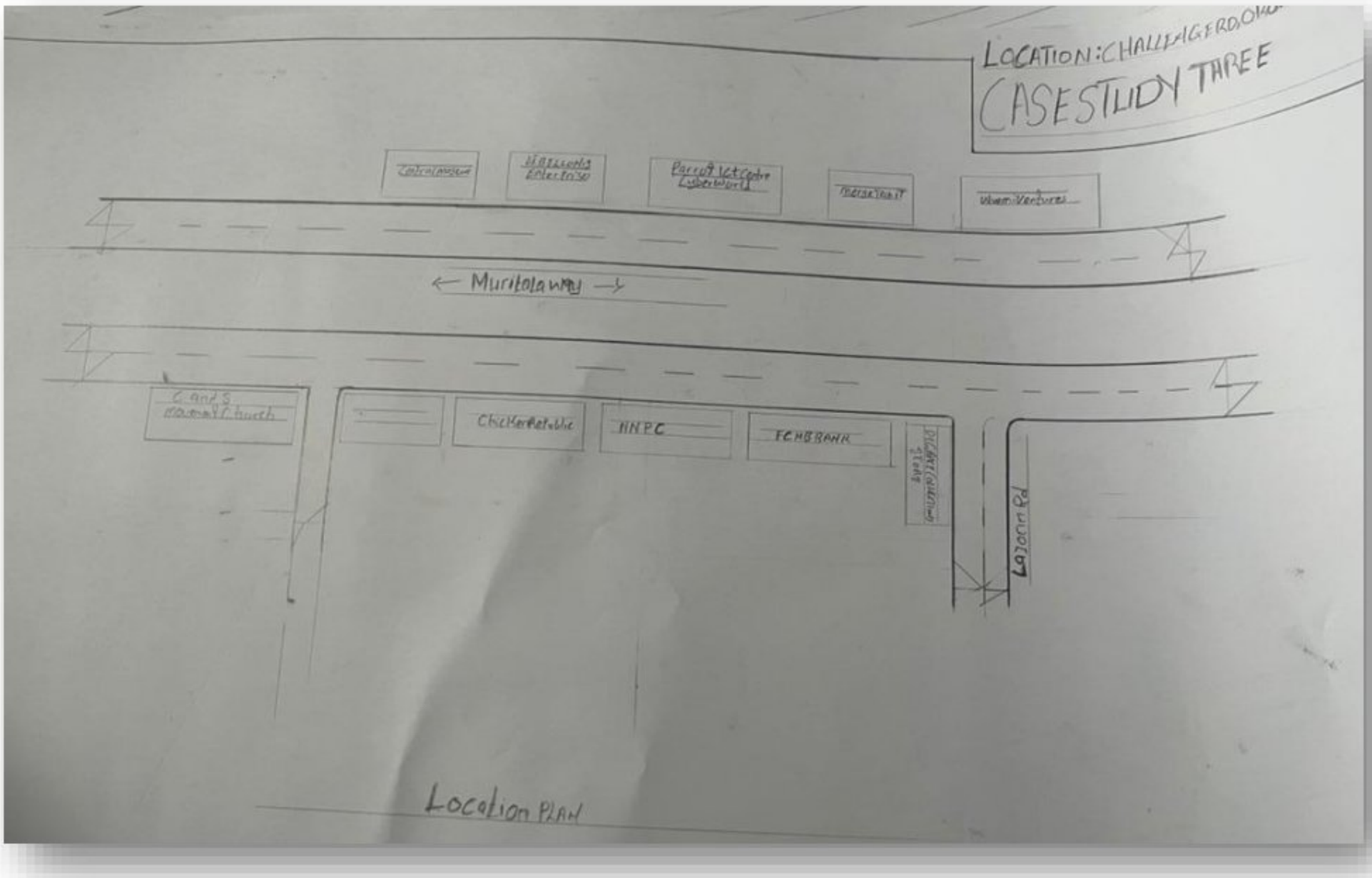

Figure 3.3.1 Location Plan

Plate 3.3.1Geographical Layout

FLOOR PLAN

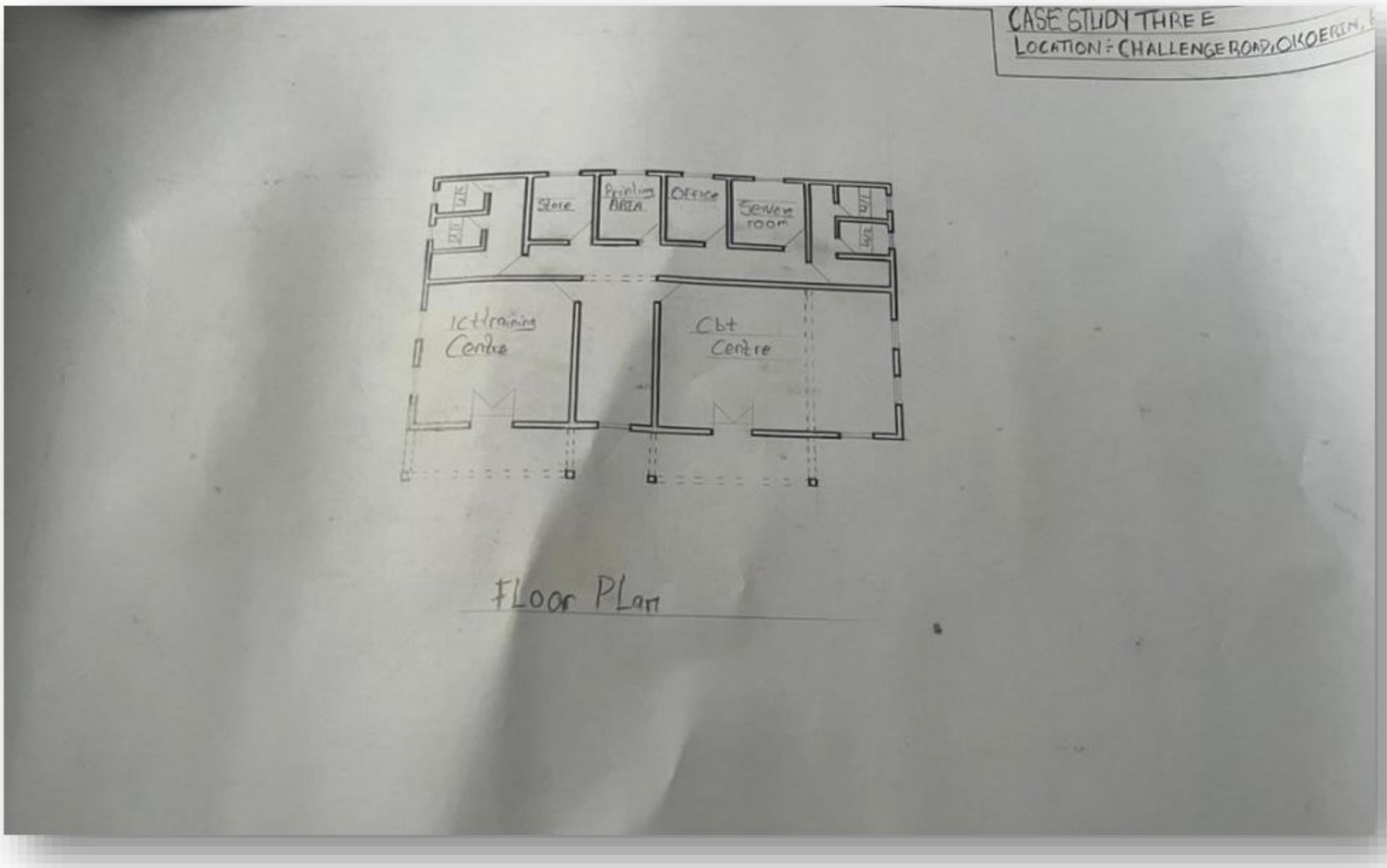

Figure 3.3.2 Floor Plan.

PICTURES

Plate 3.3.2 Elevation

CHAPTER FOUR

4.1 ANALYTICAL STUDY OF THE PROJECT LOCATION

4.1.1 INTRODUCTION

The selection of a suitable site is a critical factor in the success of any architectural or infrastructural project. The location must support the functional goals of the building, respond to the needs of its users, and align with environmental, social, and infrastructural realities. In this case, the proposed ICT Center is to be situated in the Lateef Jakande area of Lagos State, a region known for its dense population, growing youth population, and strong demand for educational and digital empowerment services.

4.1.2 SITE LOCATION

The proposed site for the ICT Center is located in the Lateef Jakande area, within the Eti-Osa Local Government Area of Lagos State, Nigeria. This area is one of the numerous urban communities named after the late Alhaji Lateef Kayode Jakande, a former Governor of Lagos State known for his contributions to education and infrastructure development.

The site is situated in a well-populated, mixed-use environment that includes residential buildings, public schools, religious centers, markets, and small-scale businesses. It lies within close proximity to major roads and public transport routes, making it easily accessible to students, teachers, job seekers, and local residents.

Figure 4.1.11.1 Map of Nigeria, 36 States and FCT.

Figure 4.1.11.2 Lagos State Map

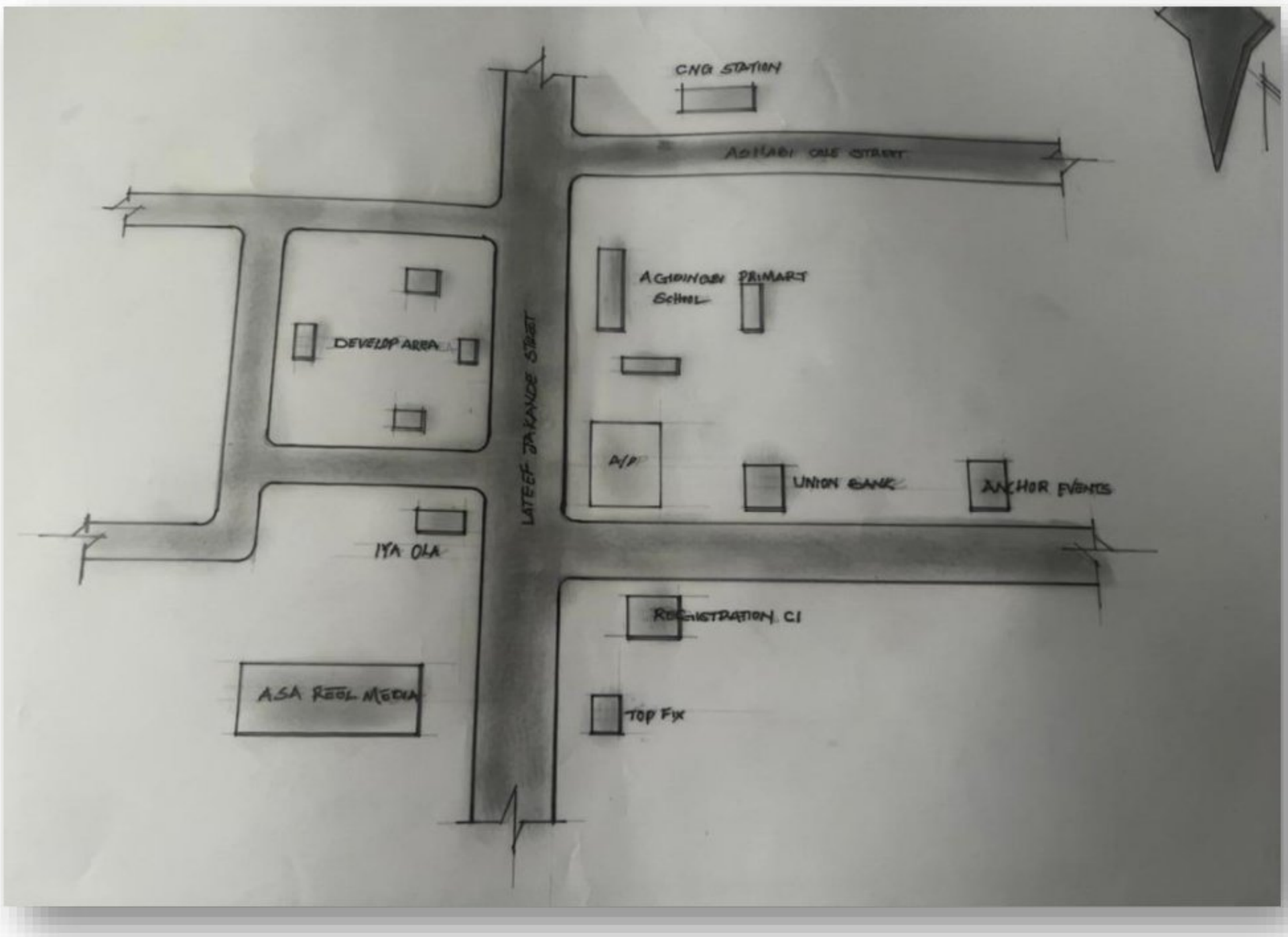

Figure 4.1.11.1 Location Plan

4.1.3 SITE INVENTORY

Site analysis is the synthesis of the physical feature and facilities that are present on the site and over the site such as trees, footpath, soil, topography, vegetation, stream and shrubs etc.

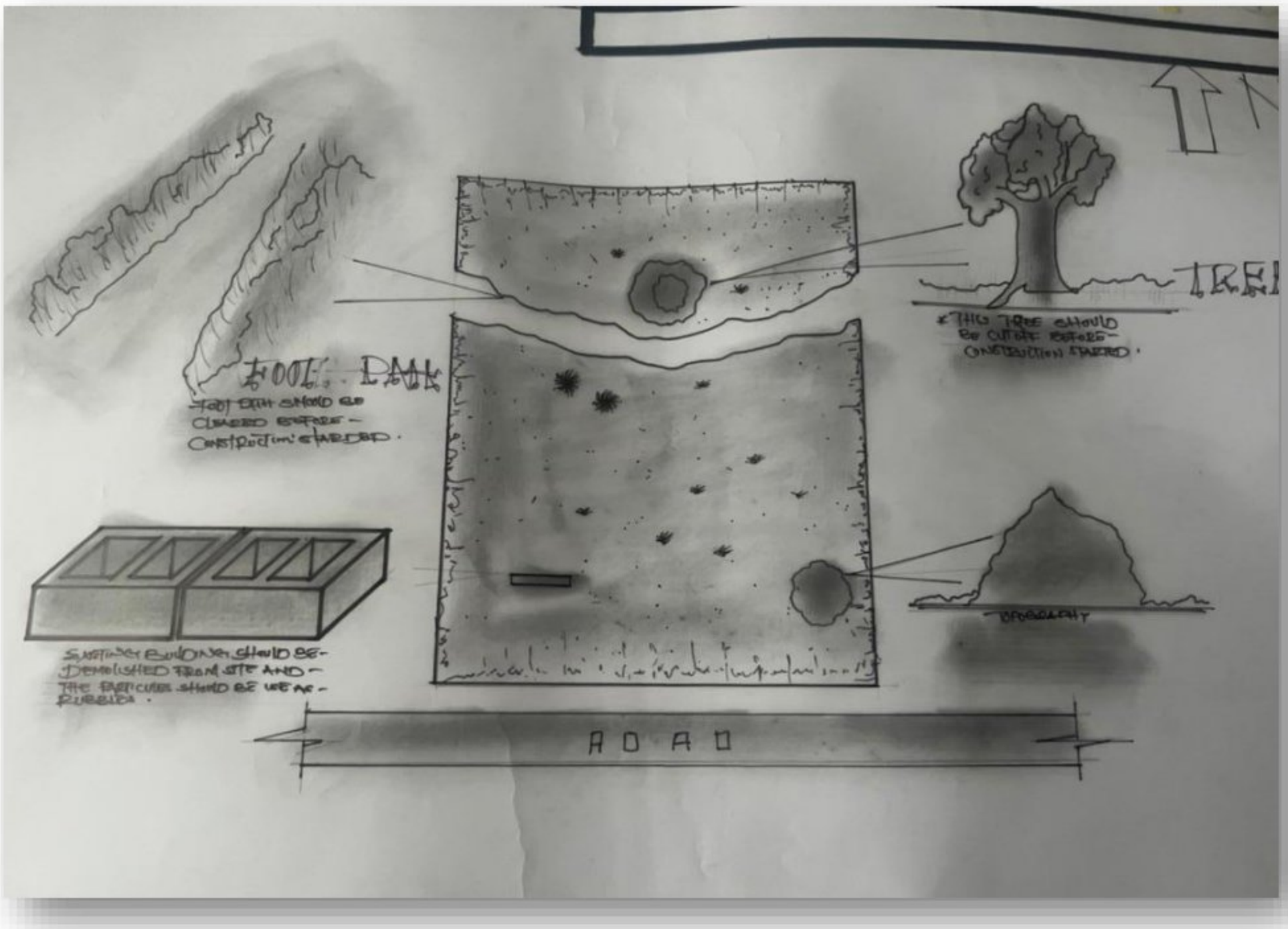

Figure 4.1.12.1 Site Inventory

4.1.4 SITE ANALYSIS

Site Analysis is the process of evaluating how a proposed site system will integrate with the existing site infrastructure by assessing physical obstructions, electrical interference, and noise to identify suitable interrogation zones for coexistence with the infrastructure.

The site selected for the project is a very gentle slope, it is a site that has never been used for any form of building construction i.e. it has not been developed in the past which make it an abode for several trees and shrubs, it is also observed during the course of inventory that some of the trees are to be removed as it could obstruct the construction process during the project, while some are to be retained to help control the adverse of the wind storm.

The soil is well compacted Soil in nature with good soil texture. The sun rises from the eastern part of the site and sets on the western part. The Construction does not need a special type of foundation due to the fact that the site is having a good bearing capacity and strength.

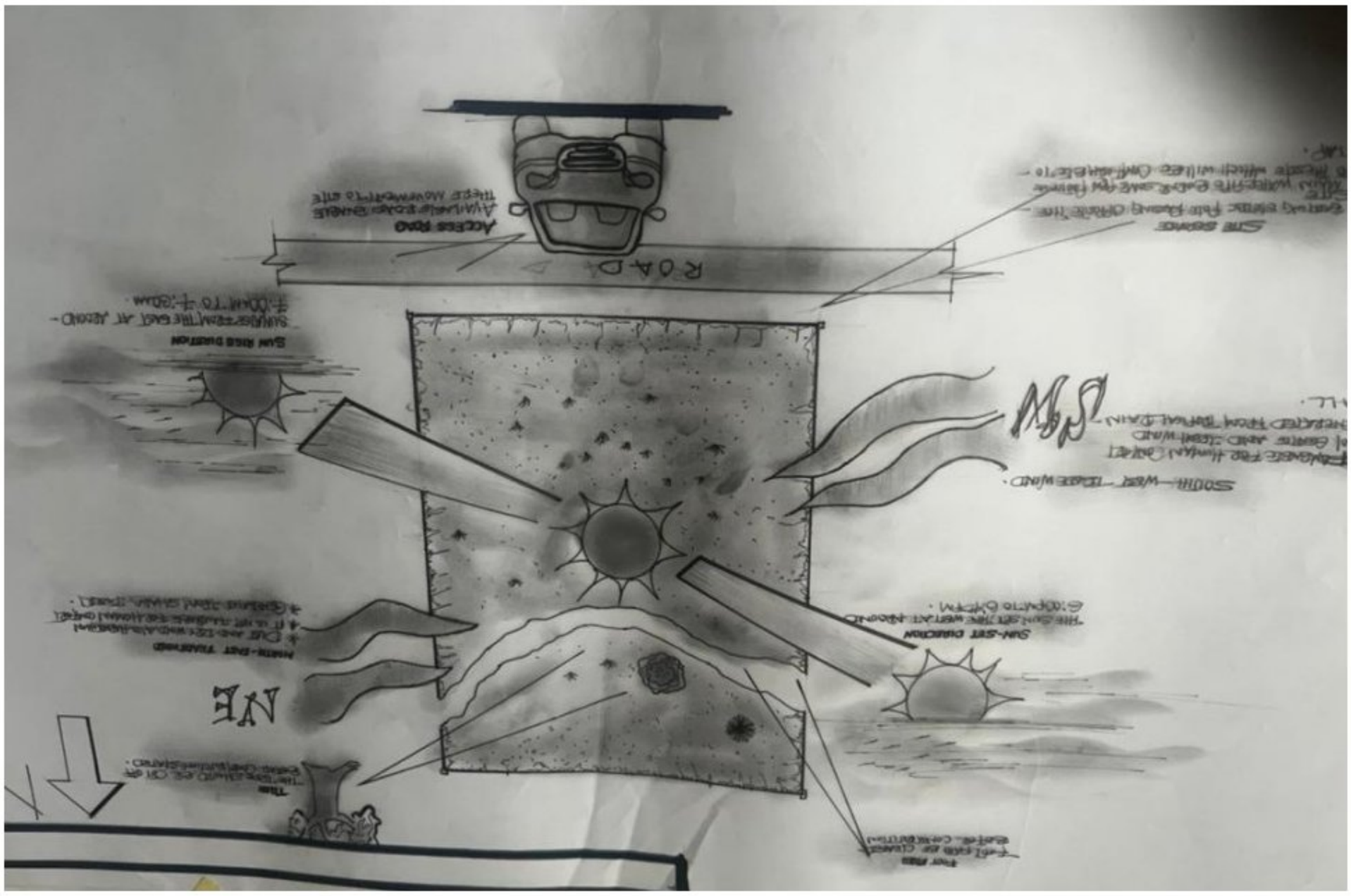

Figure 4.1.12.2 Site Analysis

4.1.5 GENERAL GEOGRAPHICAL CONDITION

Lateef Jakande area is located in Lagos State, situated in the southwestern part of Nigeria. Lagos lies on the narrow coastal plain of the Bight of Benin, making it a low-lying area with an average elevation of less than 50 meters above sea level. The area is urbanized, densely populated, and features flat terrain with limited vegetation due to massive development. The soil composition in this zone is mostly sandy-loam, suitable for light to medium construction projects. It is easily accessible by road and connected to other parts of Lagos through expressways and local roads.

4.1.6 CLIMATE:

Lagos, including the Lateef Jakande area, falls within the tropical wet and dry climate zone (Aw according to Köppen climate classification). The climate is heavily influenced by the Atlantic Ocean, resulting in high humidity levels and significant rainfall during the wet

season. There are clearly defined wet and dry seasons, and the atmosphere is often warm year-round.

Temperature:

- Average Annual Temperature: Between 26°C and 32°C
- Hottest Months: January to March (can reach up to 34°C)
- Coolest Months: July and August (around 24°C to 27°C)
- The area experiences minimal temperature variation due to proximity to the Atlantic Ocean.

Rainy Season:

- Starts: April
- Peaks: May to July
- Ends: October
- Average Rainfall: 1,500mm to 2,000mm annually
- During this period, the area experiences heavy rains and flooding risks, especially in low-lying areas like Jakande.

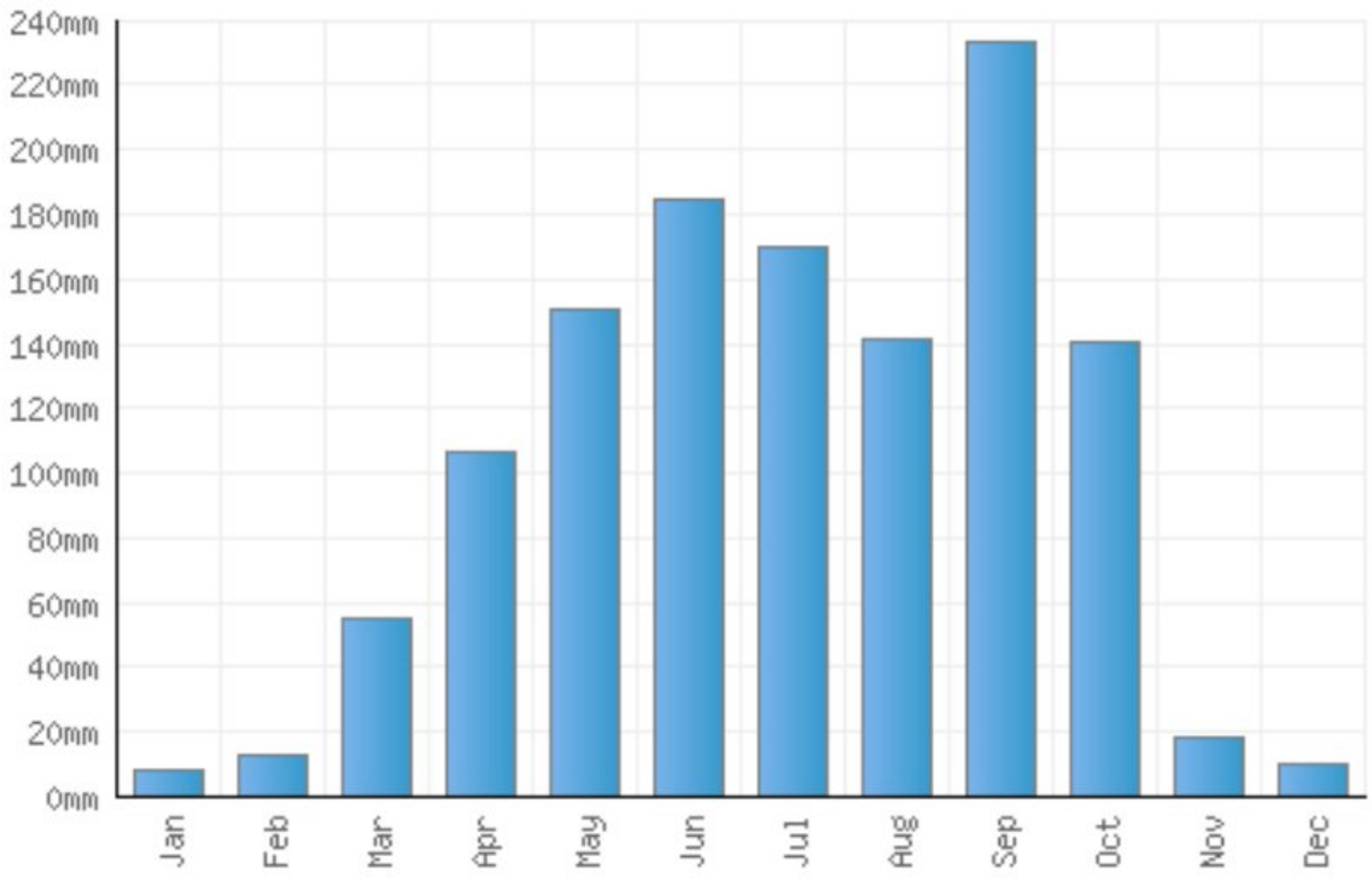

Figure 4.1.3.1 Average Monthly Rainfall in Lagos State.

Dry Season:

- Starts: November
- Peaks: December to February
- Ends: March

Dominated by Harmattan winds which bring dry, dusty air from the Sahara, causing reduced humidity and cooler early mornings.

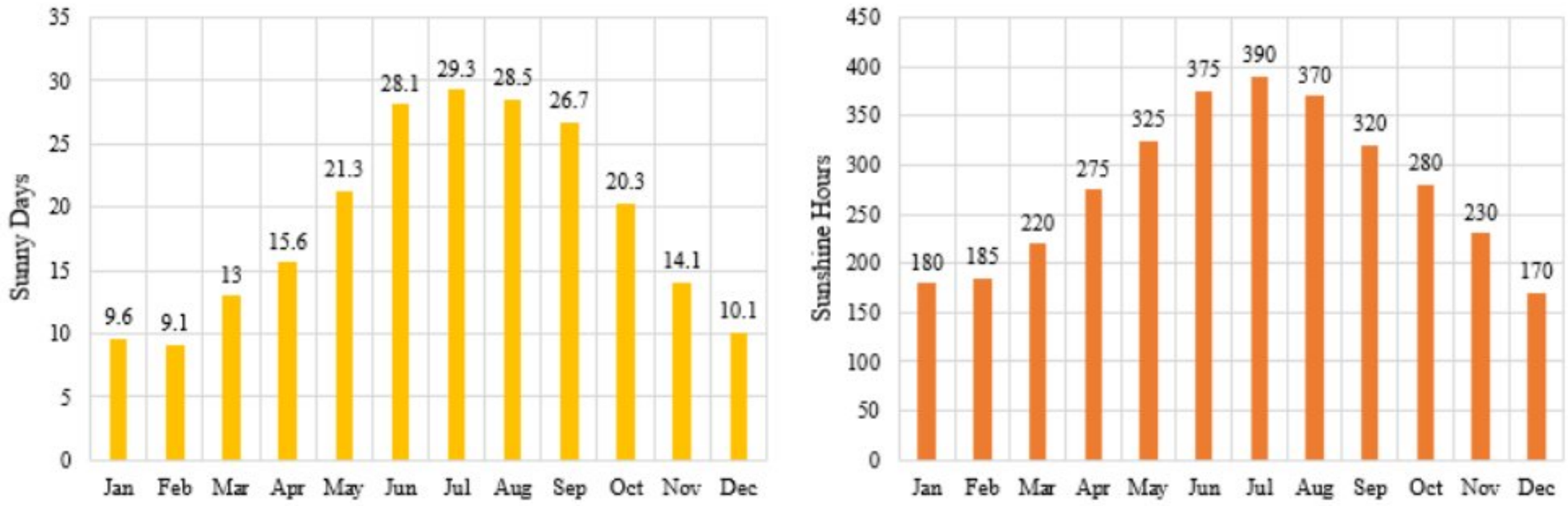

Figure 4.1.3.2 Sunshine Duration in Lagos State.

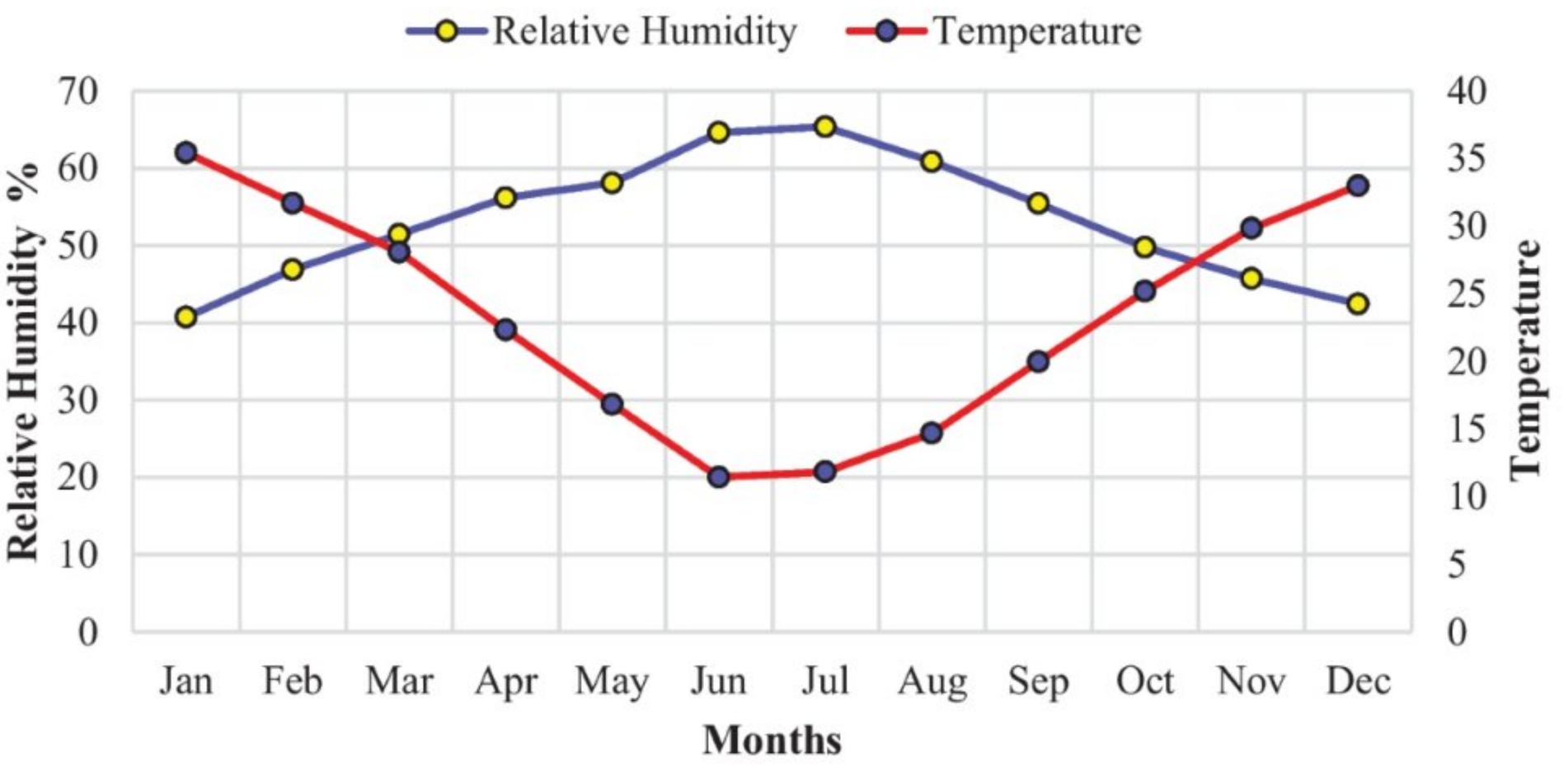

Figure 4.1.3.3 Relative Humidity in Lagos State.

4.1.7 VEGETATION

The Lateef Jakande area is a highly urbanized environment, so natural vegetation is limited. However, some roadside trees and landscaped areas exist, especially within housing estates and school compounds. Any remaining green areas are typically covered with grasses and

small shrubs. Landscaping within the ICT center compound will help reintroduce vegetation for aesthetic and environmental benefits.

4.1.8 TOPOGRAPHY

The topography of the site is generally flat with minimal slope, typical of coastal Lagos areas. This makes the site suitable for construction with little need for land modification or extensive grading. The flat terrain also simplifies access and movement within the site.

4.1.9 NATURAL RESOURCES

There are no notable extractive natural resources directly within the site. However, sand and laterites—used for construction—are available in nearby areas, reducing the cost of materials. The presence of sunlight is abundant year-round, making the site ideal for integrating solar energy systems.

4.1.10 ENVIRONMENTAL CHALLENGES

The area faces typical environmental challenges of Lagos urban zones, including:

- Flooding during heavy rains, especially in low-lying areas with poor drainage.
- Air and noise pollution from road traffic.
- Inconsistent power supply, which can affect ICT services if not backed up with alternative energy sources.

These challenges will be addressed through proper site drainage, soundproofing where necessary, and renewable energy integration.

4.1.11 SITE SERVICES

The site is supported by basic urban infrastructure, including:

- Electricity supply (PHCN grid)
- Public water supply (Lagos Water Corporation)
- Drainage channels (though some areas may need improvement)
- Telecommunication services with strong mobile and internet network coverage
- Access roads and public transport links

4.1.12 SITE UNIQUENESS AND BENEFIT

What makes this site unique is its strategic location within a densely populated community, close proximity to schools, and central positioning within public housing estates. The ICT center will stand out as a landmark for digital learning and youth empowerment, especially for those with limited access to technology.

4.1.13 SITE SUITABILITY

The site is highly suitable for an ICT center due to:

- Its flat and accessible terrain
- Proximity to the target users (students, teachers, small business owners)
- Presence of existing services (roads, power, internet, etc.)
- The community's growing interest in digital literacy and education

4.2. DESIGN CRITERIA

The design of the ICT Center will be guided by the following criteria:

- Accessibility for all users, including people with disabilities
- Flexible interior layout for computer labs, admin offices, training rooms, and reception
- Adequate lighting and ventilation for user comfort and energy efficiency
- Integration of renewable energy sources (e.g., solar panels)
- Effective drainage systems to prevent flooding
- Modern aesthetic and functional architecture to reflect innovation
- Security features like fencing, CCTV, and fire alarms

4.2.1 SITE SELECTION

A number of factors necessary for site selection for a farmstead are outlined below:

- Access Road
- Water
- Utilizes and services (electricity, telephone, access drives etc.)
- Orientation (air drainage and maximum sunshine may require orientation on a gentle Southerly slope).
- Expansion.

4.2.2 BUILDING ARRANGEMENT

The arrangement of facilities for maximum efficiency of operation should be a prime concern. Proper arrangement increase efficiency by reducing walking distance to a minimum and providing adequate drive ways and turn around. It is important to note that five protections, safely and security and all influenced by the design planning.

4.2.3 DESIGN SCOPE

The scope of this design project is focused on the architectural planning and development of an Information and Communication Technology (ICT) Center that meets modern digital needs and fosters efficient technological learning and administration. The project will cover the following key aspects:

1. **Site Planning and Layout**
   - Proper site zoning for academic, administrative, service, and support areas.
   - Orientation to maximize natural lighting and ventilation.
   - Provision for circulation and accessibility (including for people with disabilities).

2. **Building Components**
   - Reception / Waiting Area
   - Visitor check-in
   - Information desk
   - Offices
   - For administrators, IT managers, and technical staff
   - Server Room / Data Center
   - Houses servers and networking equipment
   - Requires strong cooling and security systems
   - Computer Labs / Training Rooms
   - Equipped with computers for students, staff, or visitors
   - Projectors, interactive whiteboards, etc.

4.2.4 DESIGN BRIEF9ANALYSIS

- ICT Laboratories (Computer Lab 1 & 2)
- Server Room and Power/UPS Room
- Library / E-Learning Resource Center
- Classrooms and Training Rooms
- Multipurpose Hall or Conference Room

- Toilets (Male, Female, and Accessible)

4.2.5 SPACES DERIVATION ANALYSIS/SCHEDULE FOR ADMINBLOCK

S/N	SPACE	UNIT	LENGTH (M)	BREADTH (M)	L x B	AREA (M^2)
1.	Entrance	1	3000	2500	3000x2500	7.5
2.	Reception/Waiting Area	1	5000	4000	5000x4000	20
3.	Admin Office	1	4000	4000	4000x4000	16
4.	Instructor's Office	1	3500	3000	3500x3000	10.5
5.	Computer Lab 1	1	9000	5000	9000x5000	45
6.	Computer Lab 2	1	9000	5000	9000x5000	45
7.	Server/Control Room	1	3000	2500	3000x2500	7.5
8.	E-Library/Resource Room	1	5000	3000	5000x3000	15
9.	Multipurpose Room	1	6000	4000	6000x4000	24
10.	Store Room	1	3000	2500	3000x2500	7.5
11.	Power/UPS Room	1	3000	2000	3000x2000	6
12.	Toilet (Male)	1	4000	2500	4000x2500	10
13.	Toilet (Female)	1	4000	2500	4000x2500	10
14.	Circulation (20% Total)	1	-	-	-	**~43**

Table 4.2.5: Space Allocation

4.2.6 FUCTIONAL ANALYSIS AND RELATIONSHIP

The Main Building plan is well function; the units are so well related to each other,

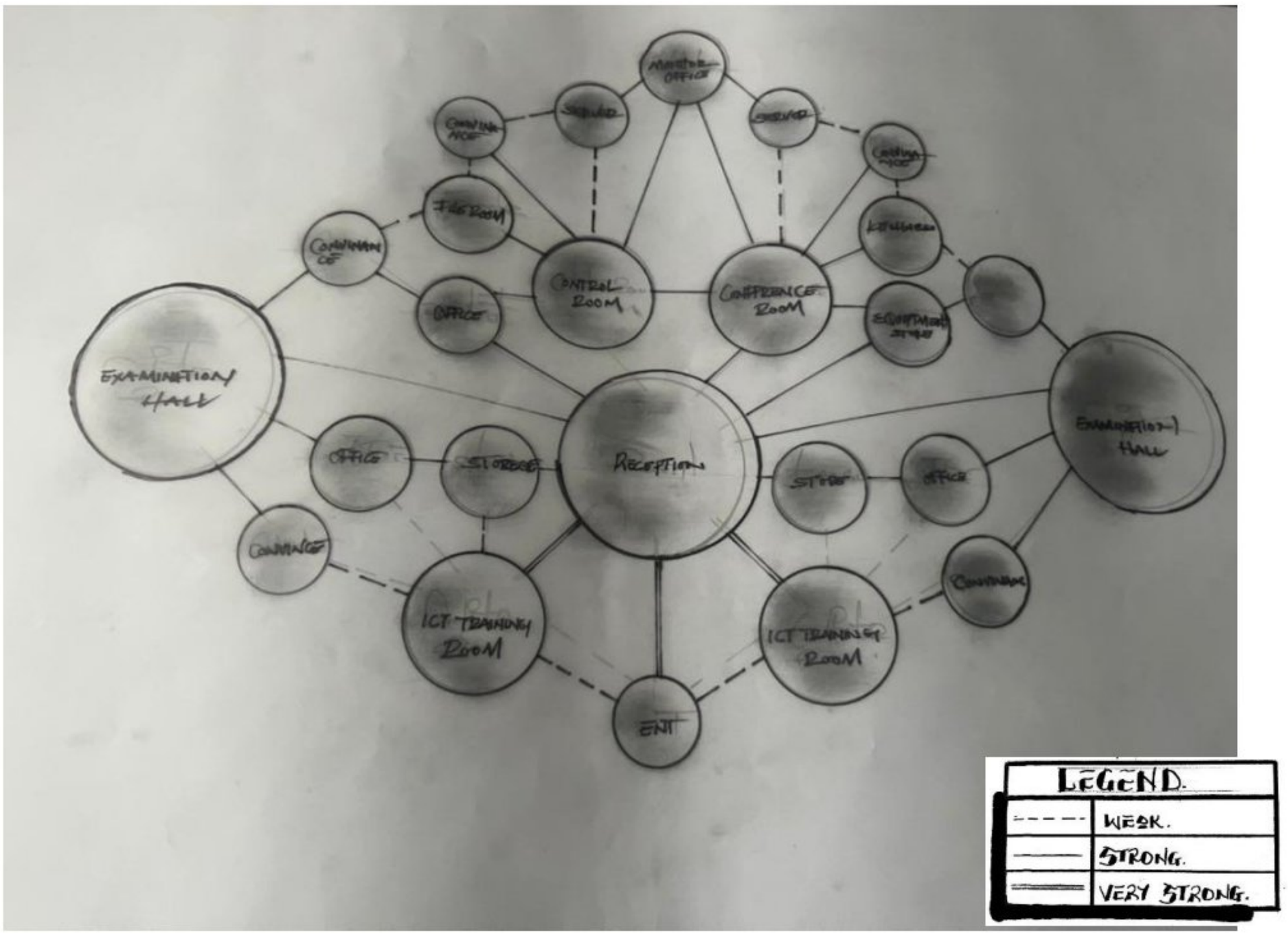

Figure 4.2.6.1: Bubble Diagram

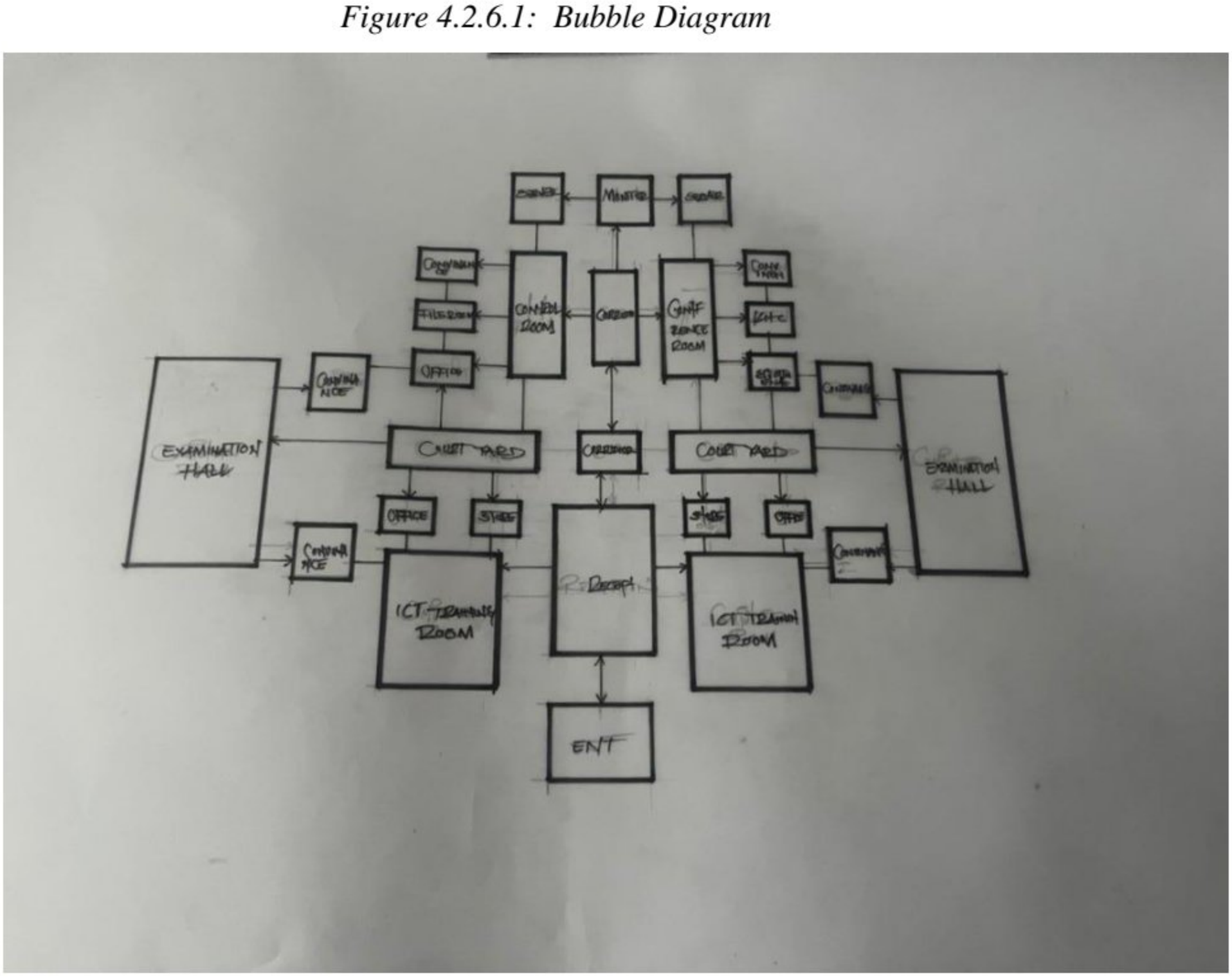

Figure 4.2.6.3: Functional Relationship

CHAPTER FIVE

5.1 APPRAISAL OF PROPOSED SCHEME

The proposed Project is to satisfy the appropriate building regulations. The design is to confirm the aid intended use of building taking into consideration with both natural factors and human factors that earn us a threat on the validity and stability of the building.

5.2 CONSTRUCTION METHODOLOGY AND MATERIALS.

The construction is to be carried out following the due process of construction ranging from:

- Preliminary: This involves the clearing of the site, setting out and excavation of foundation trench and foundation works.
- Sub-Structure: This process also entails the positioning and erection of Columns and beans, masonry works etc.
- Post Structure Stage: Is the stage which has to do with the application and installation of the paints, tiles, other finishes and construction of external works etc.

5.21MATERIALS FOR CONSTRUCTION

1. Sustainable and Eco-Friendly Materials

- Bamboo and Timber: Renewable and low-carbon materials, suitable for non-structural interior elements like ceiling finishes and decorative wall panels.
- Recycled Materials: Recycled steel, glass, and concrete will be considered to minimize environmental impact.
- Insulating Materials: Eco-friendly insulation such as cellulose or sheep wool may be used in walls and ceilings to enhance indoor thermal comfort.

2. Traditional and Cultural Materials
   - Clay and Adobe: Where applicable, these can be used in landscaping features or accent walls, reflecting cultural identity and promoting thermal comfort in hot climates.
   - Stone: Locally sourced stone may be used for external cladding, boundary walls, or pathways to reflect cultural relevance and add durability.
   - Tiles and Ceramics: Geometric ceramic tiles with Islamic patterns can be applied in interior decor, particularly in waiting areas, ablution spaces, and reception zones, for both aesthetic and cultural expression.
3. Modern Materials
   - Concrete: Reinforced concrete will be used for the main structural framework—foundations, slabs, beams, and columns—for strength and longevity.
   - Steel: Steel will be used for reinforcement and roof framing, offering structural reliability and adaptability.
   - Glass: Aluminum-framed windows with glazed panels will allow natural lighting while maintaining privacy and energy efficiency. Double-glazed options may be used in specific zones to enhance insulation and sound control.

5.2.2 CONSTRUCTION METHODOLOGIES

1. Green Building Practices
   - Passive Solar Design: The clinic is oriented to take advantage of natural sunlight and ventilation, reducing reliance on artificial lighting and cooling systems.
   - Green Elements: Landscaping around the building and potential use of green wall features will enhance the environment, support insulation, and promote healing.
   - Rainwater Harvesting: A system will be integrated to collect and reuse rainwater for landscaping and cleaning purposes, minimizing water waste.
2. Energy-Efficient Construction
   - Thermal Insulation: High-performance insulation materials will be used in walls and roofing to reduce indoor temperature fluctuations and improve energy efficiency.

- LED Lighting: The building will utilize LED lighting for all spaces, ensuring long-term energy savings and low maintenance.
- Solar Energy: Solar panels may be installed to power essential services like lighting and ventilation, reducing dependency on grid electricity.

3. Cultural and Functional Considerations

- Building Orientation: The layout ensures proper orientation of designated prayer spaces towards Mecca, respecting religious needs.
- Islamic Architectural Features: The design may incorporate subtle Islamic elements such as arches, patterned screens, and courtyards, enhancing both identity and aesthetics.
- Community Engagement: Input from local stakeholders, healthcare workers, and community members will be considered to ensure the facility reflects cultural expectations and serves practical healthcare needs

5.2.1 SERVICE

A building can be said to be good when it performs the service required by it. In order to have well-functioning building. There calls for an installation of underground water pipes in other to provide water to all the restrooms and other necessary units in the building. A borehole system of water supply is to be adopted alongside the government supplied services and a storage facility is to be provided for effective management of water supply.

5.2.2 CIRCULATION

As a healthcare facility designed to serve a significant number of patients and staff daily, effective circulation within the proposed dental clinic is essential. The layout has been carefully planned to ensure smooth movement, reduce congestion, and maintain privacy where necessary.

The building is a single-story structure, making navigation easier and more accessible for all users, including the elderly and physically challenged. Public areas such as the reception, waiting area, and consultation rooms are positioned near the main entrance for easy access, while more private zones like treatment rooms, sterilization units, and staff offices are strategically placed to limit unnecessary traffic.

Clear separation between public, semi-public, and private spaces ensures a logical flow and enhances both functionality and hygiene control within the clinic.

5.2.3 VENTILATION

As it relates to architecture, is the intentional introduction of outside air into a space. It is mainly used to control indoor air quality by diluting and displacing indoor pollutants. It can also be used for purpose of thermal comfort of dehumidification when the introduction of outside air will help to achieve desired indoor psychometric condition.

This could be either mechanical or natural ventilation. As a regard the proposed project design, there is an introduction of a very spacious courtyard in other to make cross ventilation in most of the building units. There should also a provision of wide passage to allow free movement of air, patient and materials. Artificial ventilation is also provided through the installation of air conditioning system and fans.

5.2.4 LIGHTING

The dental clinic is designed to make use of both natural and artificial lighting. Large windows allow natural light into waiting and consultation areas, creating a calm and energy-efficient environment. Artificial lighting, using LED fixtures, is provided in all spaces—especially treatment rooms—ensuring clear visibility, safety, and compliance with healthcare standards.

5.2.5 PLUMBING

The plumbing system in this proposed building is made easy since the building has a courtyard. Water drained pipes are to be installed underground right from the courtyard to the soak away in other to discharge rainwater.

All water or sewage from the toilets are also channeled into their various inspection chambers using good and appropriate diameter PVC pipes, and taken from the inspection chamber to septic tank and soak away pit.

Rain water is also collected from gutter if the roof using 100mm diameter PVC rain water pipes and channeled into various drainage or soak away pits. There shall be no ponding; the size of any channel shall effectively discharge rain and water without causing any over lowing stagnation and mosquito breeding. All rain water channeled shall be laid to fall and shall not cause any pounding or splashing unto the committers neighboring area.

5.2.6 ELECTRICAL INSTALLATION

The type of wiring system chosen should be full conduit system of wiring. Office and other operation areas should be wired with strong, durable and light current resistance cable because of the careless operate by the students. Also, electrical installation is to be done to allow for the use of quality electrical fittings and fixtures in the whole building.

5.2.7 WASTE DISPOSAL

Waste disposal bins are to put every office of the building and also in some specific necessary area. These water bins should dispose in the incinerator which will be provided within the compound of the station. The waste should therefore be burnt in the incinerator.

5.2.8 FIRE PROTECTION

Electrically, fire alarms and sensors are to be installed in the Dental Building. This should be done in case of fire occurrence; fire extinguisher is to be placed at certain distances in the cobbles and some other necessary area. It is also serving as protector in case of fire.

5.2.9 EXTERNAL WORKS

The external works are to be carned out uncrate Krebs laid and shrubs, flowers grasses and trees planted.

Concrete interlocking tiles to be adopted of hard landscape and parking spaces both for visitors and staffs have been provided on the site.

5.3 CONCLUSION AND RECOMMENDATION

Conclusion

This project was undertaken to design a modern, functional, and sustainable dental clinic that meets the needs of patients and dental professionals alike. Through critical literature review, site analysis, and case study exploration, the design addressed challenges such as poor spatial organization, lack of comfort, infection control, and operational inefficiencies common in existing clinics.

The proposed clinic achieves clear spatial zoning, ease of movement, natural lighting, and integration of technology to enhance service delivery and patient experience. Environmental considerations such as passive ventilation, daylighting, and noise control were embedded in the design. In addition, attention was given to hygiene, accessibility, and regulatory compliance—core requirements for any healthcare facility.

Ultimately, this design proposal represents an academic contribution toward improving healthcare architecture in Nigeria, especially in the area of dental care delivery.

Recommendation

Based on the findings and experiences throughout this project, the following recommendations are made:

- Future dental clinics should be purpose-built with architectural input from the earliest planning stage, rather than converting residential spaces.
- Architects and health professionals should collaborate closely to ensure functional efficiency and regulatory compliance in design.
- Universal accessibility features (e.g., ramps, handrails, signage) must be included as standard in all healthcare facilities.
- Sustainable design strategies should be applied to reduce energy consumption and long-term maintenance costs.
- Further research should be done on the psychological effect of spatial design on dental patients, especially children and people with dental anxiety.
- Government and private developers should invest more in the modernization and expansion of oral healthcare infrastructure across Nigeria.

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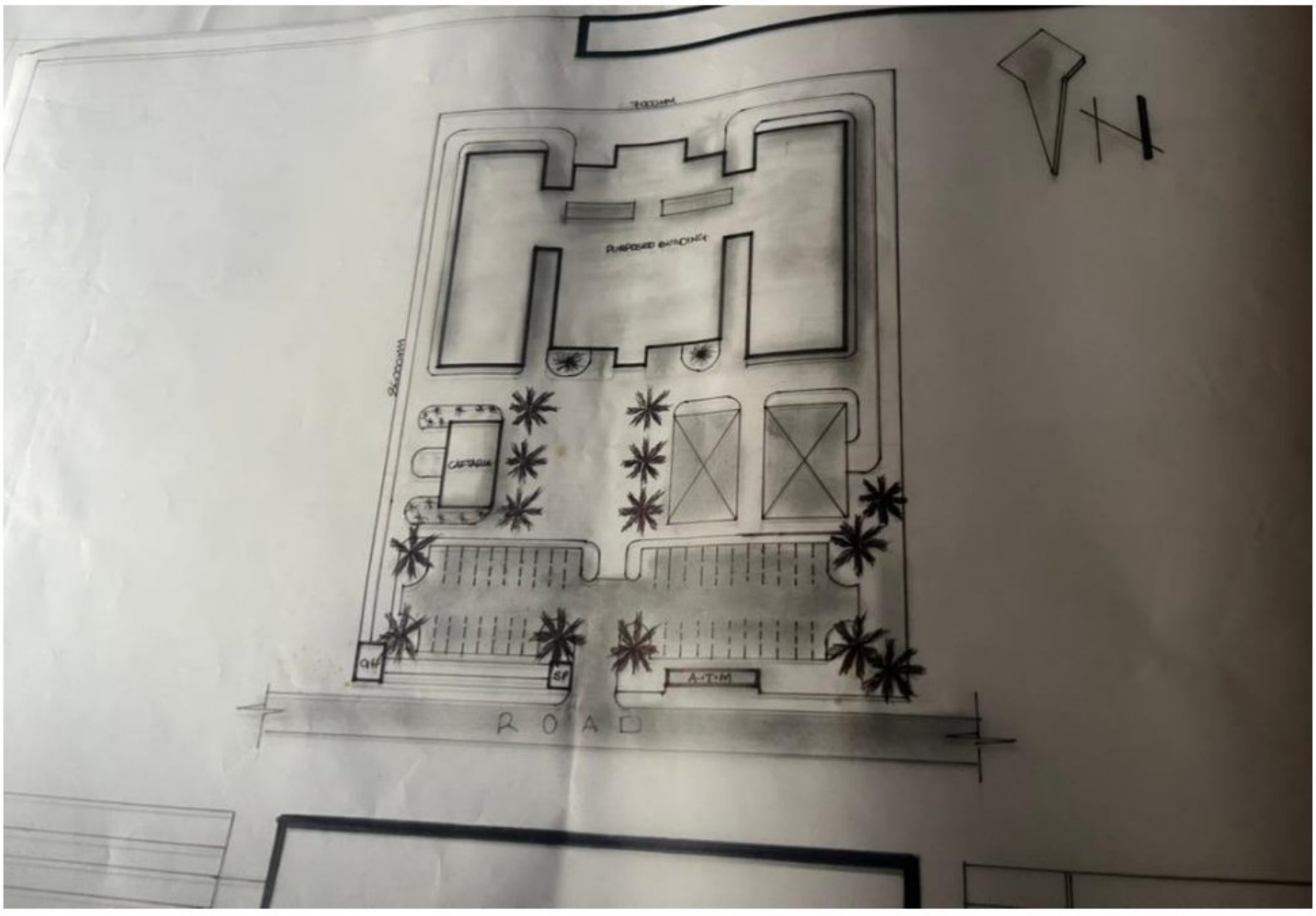
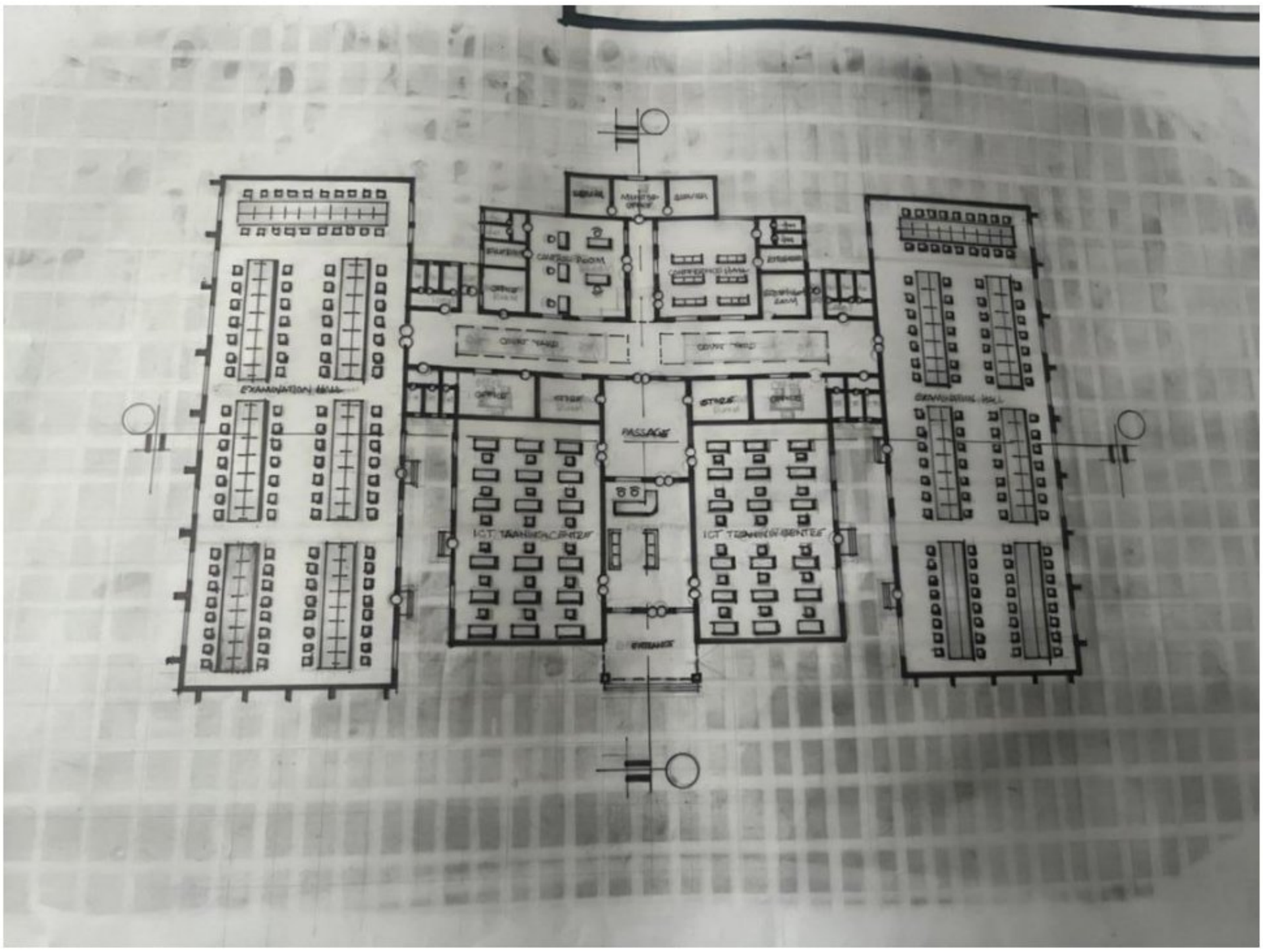
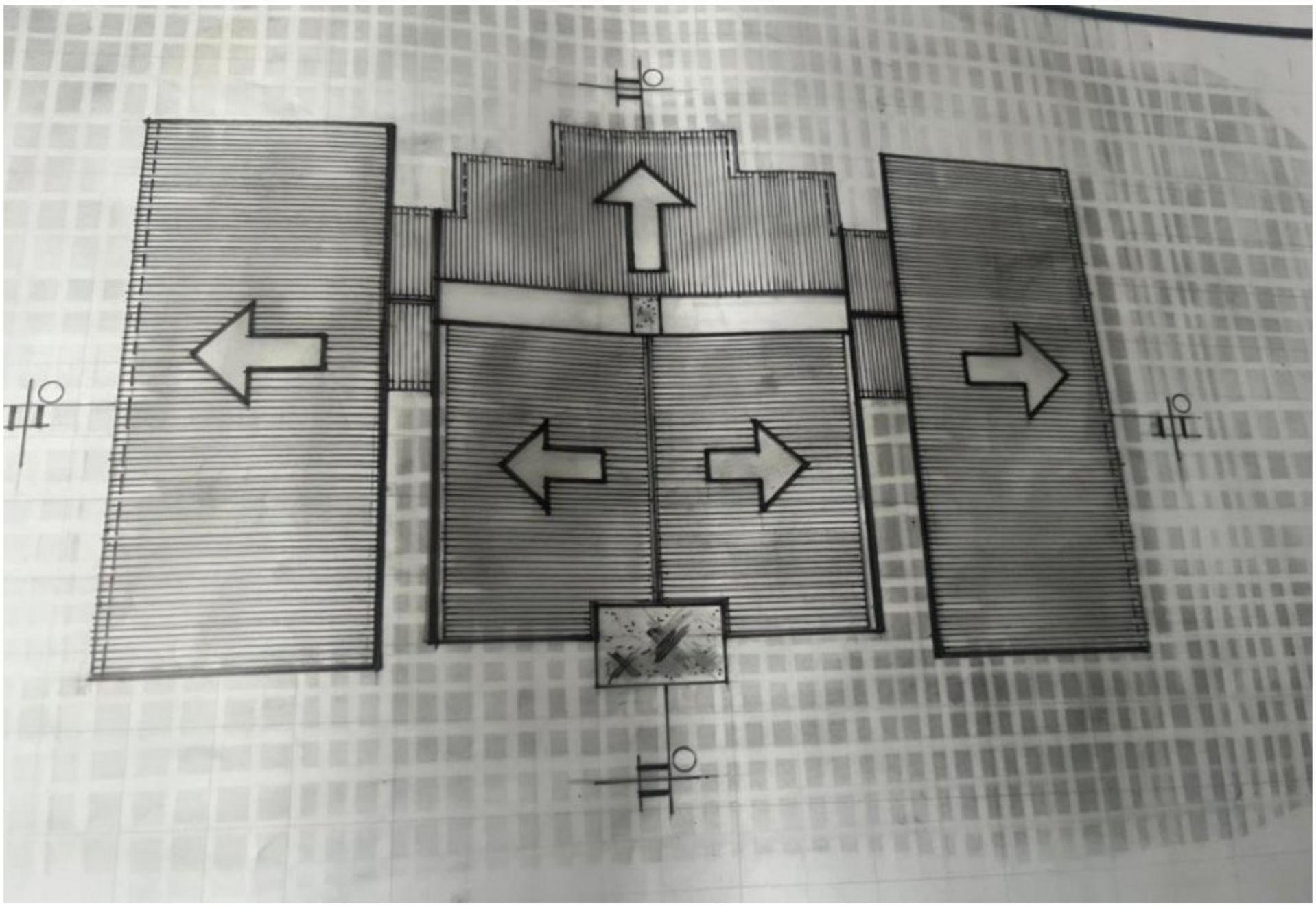


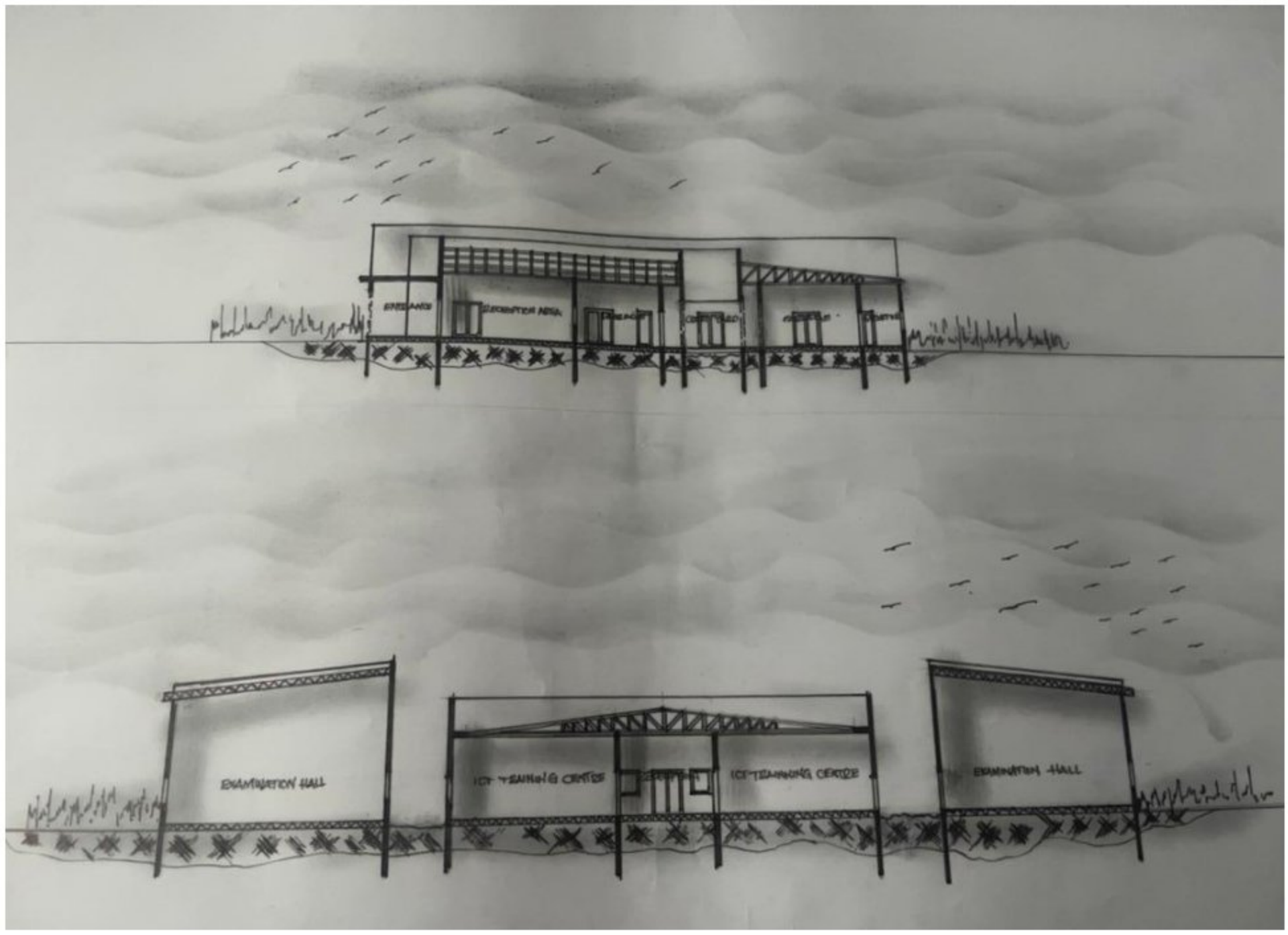
Appendix 5.1: Site Plan



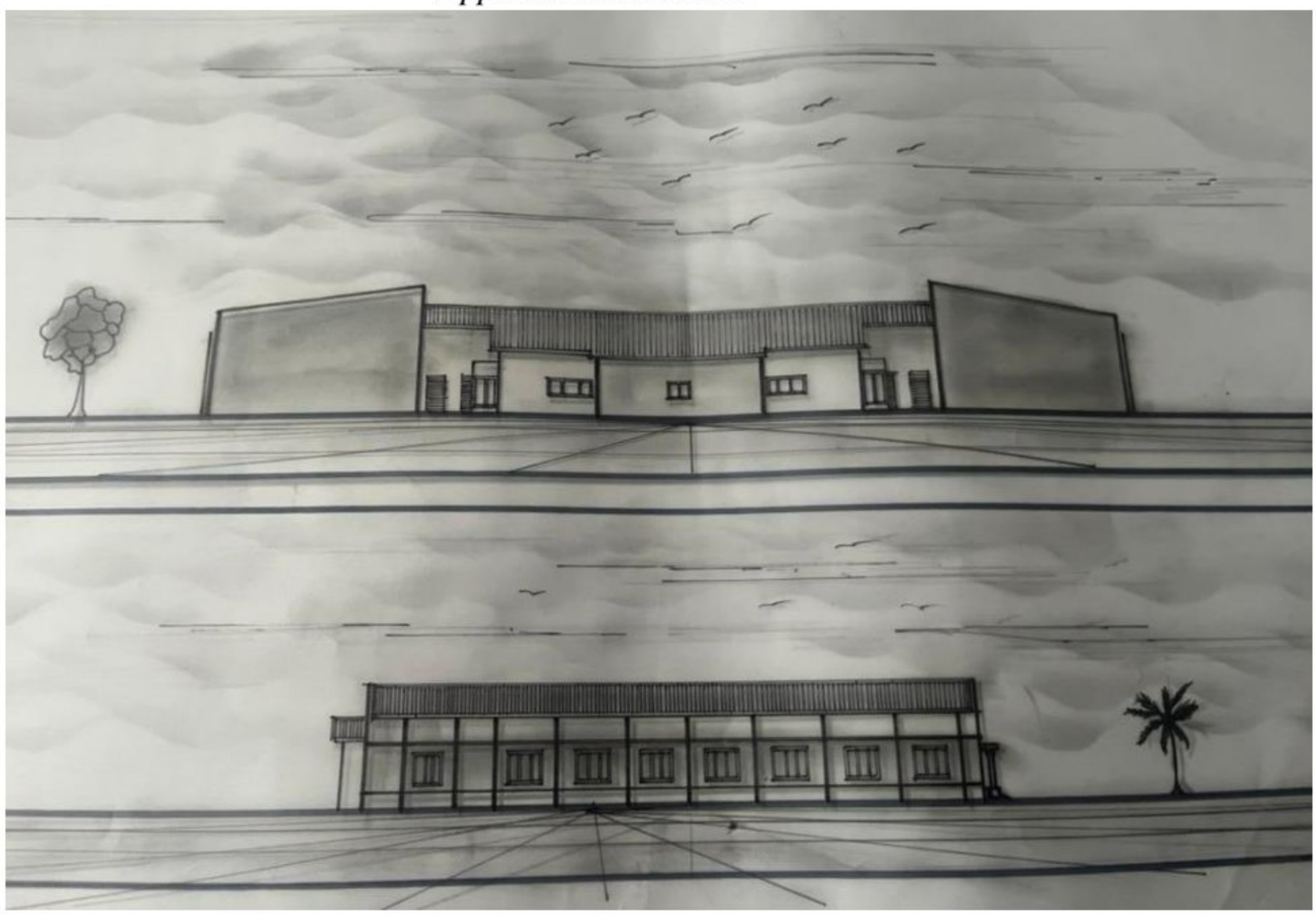
Appendix5.2: Floor Plan.



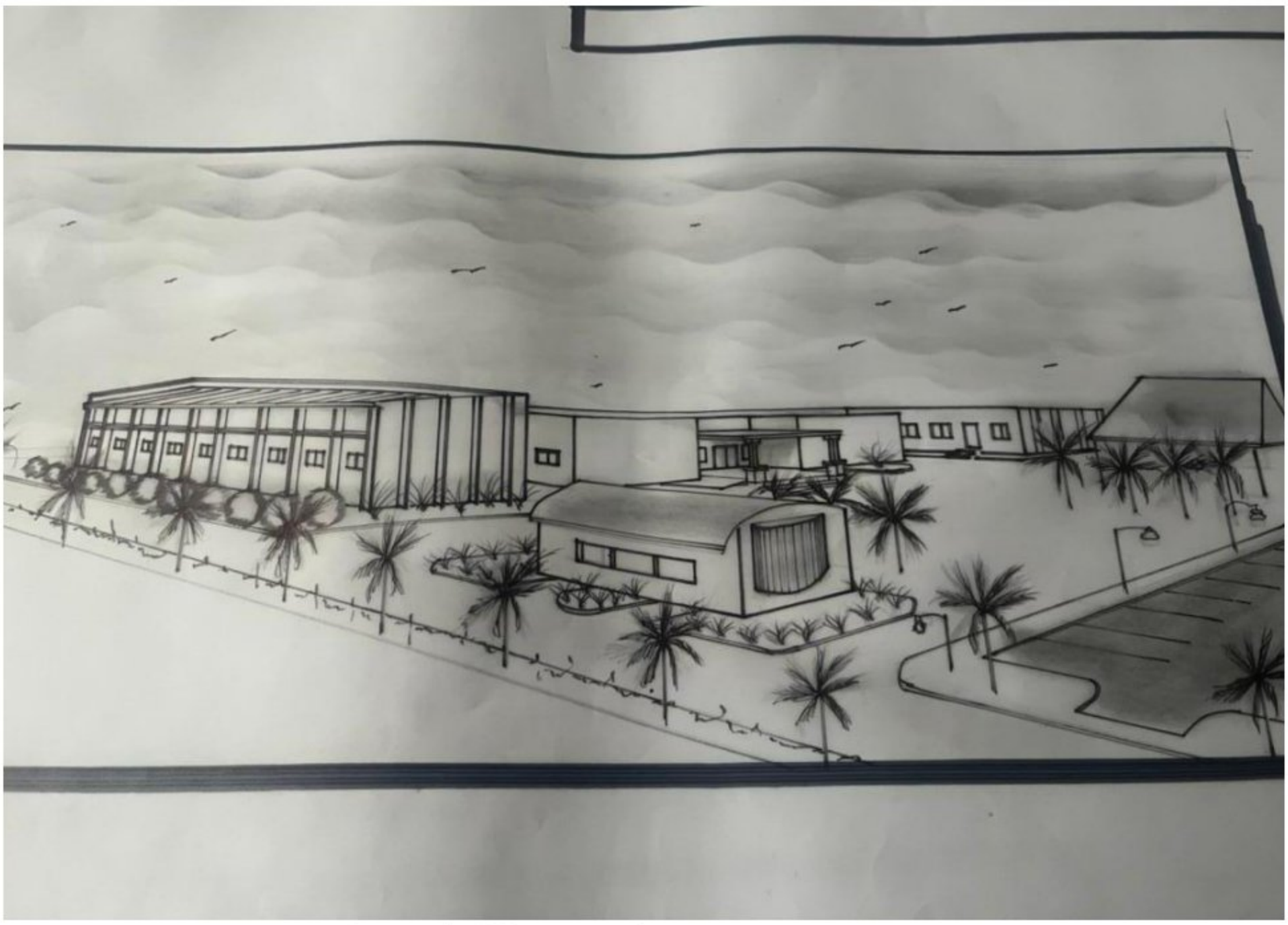
Appendix 5.5: Roof Plan



Appendix5.6: Sections



Appendix5.7: Elevation



Appendix5.8: Internal Perspective.