

**FORTUNE BANK HEAD QUARTERS,  
LAGOS.**

**(ENHANCING SECURITY IN BANK BUILDINGS  
THROUGH ARCHITECTURAL DESIGN)**

**M. TECH THESIS**

**BY**



**AKINPELUMI O. FRANKLIN.**

**(ARC 01/0463)**

**JUNE, 2005.**

# **FORTUNE BANK HEAD QUARTERS, LAGOS.**

**(ENHANCING SECURITY IN BANK BUILDING THROUGH ARCHITECTURAL DESIGN)**

**BY**



**AKINPELUMI OLUSHOLA FRANKLIN**

**A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE  
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**NOVEMBER 2005.**

## DECLARATION

I, AKINPELUMI O. FRANKLIN (ARC/01/0463) declare that information contained in this thesis are product of honest and independent research undertaken by me under the supervision of Arc. (Prof.) Ogunsote O. O. and Arc. (Dr.) J. A. Fadamiro. It is original and has not been submitted in part or full for publication in any journal, or magazine or for the award of any other diploma, degree of this or any other university.




*Student's Signature*



## CERTIFICATION

This thesis entitled: FORTUNE BANK HEADQUARTERS, Lagos (Enhancing security in bank buildings through architectural design)- by AKINPELUMI O. FRANKLIN meets the regulations governing the award of degree of Master of Technology (M.Tech.) Architecture of the Federal University of Technology, Akure and is approved for its contribution to the body of knowledge and literary presentation.



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## **DEDICATION**

This project is dedicated to the Almighty God with whom nothing shall be impossible and to whom belong all powers.

It is also fondly dedicated to Funmilayo, Sunkanmi, Kolade, Adeola, Folaranmi, Akinpelumi and all who believe in the dignity of honesty and work.



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## ABSTRACT

The banking industry constitute one of the pivots around which the wheel of progress of the nation revolves. It represents the nations treasure house because a sizeable quantum of the wealth of the nation are locked up in the vaults of the banks. To the extent, whatever has the capacity to affect the fortune of the bank either positively or negatively has the potential to affect the progress of the nation likewise.

There is specialization in various areas of human endeavors, and this is also appreciable to robbery. There are syndicates specializing in bank robbery. But an assault upon the banking industry is an assault on the economy of the nation because of the principal role which the banks play in the development and sustenance of the various sectors of the economy. This calls for specialization on the part of the key players in the planning, design and total delivery of a bank. Project in order to minimize the incidences of bank robbery while eliminating opportunist crimes.

A project designed principally from the view of security will take the form of a purely utilitarian and dumb architecture of defence like the Italian pallazzoes. Yet this is the 21<sup>st</sup> century, the information age, era of the international and post modern styles in architecture, and of course the era of glamorous banking.

What all these call for is the design of an "intelligent building".

A building which is not only aesthetically pleasing, but functional, efficient, structurally sound and compliant to the requirement of the information age with its myriad of electrical, cum electronic gadgets in various shapes.

Additionally, a building which is also customer friendly and enhances workers productivity by being comfortable and secure.

The research work that leads to this thesis is motivated by the need for the socio-cultural relevance and contribution of the architectural profession to glaring societal problems. Security in bank relies on other security sensitive building an expository study of building related crimes. Their levels and metamorphosis have been analyzed.

The role of architects and architectural solution has been proffered. Also that which constitute basic components of secure design have been itemized for easy digestion.

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## SYNOPSIS OF THE PROJECT

The thesis is made up of six chapters. The first chapter contains the Introductory aspect of the thesis and parades the need for study, aim and objectives, scope of the project, definition of problems and research methodology.

- Chapter two deals mainly with review of related literature and contains definition of the project topic 'Bank', Genesis of banking, banking in Nigeria, classification and function of banks.
- The third chapter is based on Analysis of study and it entails case studies, carried out on various existing bank building and from literature review. Also included in this chapter are planning consideration for office (bank) design, office equipment and furniture. Design considerations regarding circulation in office (bank) building, lighting, ventilation, fire protection, building material etc.

The need for security, types and levels of security role of architects and place of architecture in building security and the society are highlighted.

The fourth chapter concerns synthesis of study and issues treated include the location and description of project town, climatic features, site analysis, design philosophy and design concepts.

The fifth chapter features the design proposals in the planning design and construction stages of the building project. It gives the site planning and design criteria necessary for a secured design, the design brief and brief development, space analysis, schedule of accommodation, functional analysis, functional relationship, the structural system and services.

The sixth and last chapter summarizes the findings in the research work, made recommendation suggestion and conclusion.

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 IN THE BEGINNING

The word bank has its origin in the Italian word Banco, meaning- a bench- Perry (1965). Amongst the ancient Jew Bankers, or money speculators, apart from the money itself, the bench stood for the only instrument or tool of monetary transaction.

During the time under reference, the money merchants were often seen doing their transactions on benches in the market places. This idea is similar to the; modern day black market situations in the city centers.

When a merchant becomes insolvent or bankrupt, the only tool which the creditors could hold a lien upon was the bench. And because of its uselessness to the creditors, this was usually broken or rupted in anger, hence the genesis of the word Bankrupt.

While the word "Bank" is defined in chambers 20<sup>th</sup> century Dictionary as either a bench, an office or Institution for keeping, lending and exchanging money, the same is defined in 'Oxford Advanced Learners Dictionary of Current English as 'an establishment for keeping money, and Valuables safely. The money being paid out on

Customers order by cheques.

This presupposes that monetary transaction in its various shades form the principal basis for establishing banks. But what is this Phenomenum called money? Money has been defined as a legal tender. Meaning that which is generally acceptable in the settlement of debt or payment for goods enjoyed or services rendered.

## **1.2 EVOLUTION**

From the ancient times, which is associated with trade and barter when goods were either exchanged for another goods or for services rendered and vice versa, to modern times, money has assumed different forms and shapes.

Each stage has always been an improvement over the former with the sole intention of serving mankind better. Money as a legal tender, has graduated from level of bulky Cowry shells, the heavy copper metal coins to the lighter, portable and less perishable paper money in its various names – notes, cheques, money order, bank draft etc. The metamorphosis continues adinfinitum just as science and technology is improving and new discoveries are being made.

## **1.3 IMPORTANCE**

The holy book of the Christians the bible... paints the picture of the importance of money in the life of man when it says “Money answereth all things” Proverb... literally meaning, most tangible; and intangible physical things as opposed to the Spiritual are purchasable with money. Additionally the bank is currently occupying an adapted building and has a need to enhance its own corporate image.

As a measure of the importance accorded money in the scheme of things, everyone goes to work daily in search of the golden fleece- money. Such is the magnitude of its influence that the quantum of money in your kitty determines the type, quantity and quality of services material and humorously, the comfort procurable.

## **1.4 THE EVIL**

The strive for money takes both legal and illegal pursuits by all and sundry. The legal pursuit entails all legitimate of earning money, while the illegal means refer to the illegitimate methods as carried out by the hoodlums, thieves and robbers.

The robbers motive is to have easy access to money at the shortest possible time; hence the bank has always been their target.

## **1.5 AIM AND OBJECTIVES**

### **AIM**

The aim of this project is to evolve a corporate (bank) building which would not only respond to functional and technological requirement of an intelligent building, but a good blend of comfortability, and security. All carried out with cost consciousness and value for money.

## **1.6 OBJECTIVES**

It is intended that the project will as much as possible

1. Contribute to efficiency of the work environment on the bank
2. Create knowledge of security in building industry operatives
3. Proffer an efficient parking solution.
4. Assist in solving the planning and designing of the new structure
5. Production of an intelligent office building which is compliant with the information technology requirements.
6. Evolving an overall architecturally sound bank headquarter that satisfies the client requirement and meet statutory requirements.
7. Contribute to civic responsibility of prevention of crime in buildings.

## **1.7 JUSTIFICATION OF STUDY**

The Banking industry constitute one of the pivots around which the wheel of progress of the nation revolves; The bank represents the nations treasure house because a sizable quantum of the wealth of the nation in form of personal and corporate savings are in the vaults of the banks.

Whatever has the capacity to affect the fortune of the bank either positively or negatively has the potentials to affect the progress of the nation likewise.

Lengthy hours of queue in the banks is a waste of nations resources and assault upon the banking industry is an assault on the economy of the nation because of the principal roles of the banks in the development and sustenance of the various sectors

of the economy. Additionally the bank is currently occupying an adapted building and has a need to enhance its own corporate image.

From the foregoing, a project aimed at enhancing efficiency and well being of the bank workers, improving security in planning and design and solving allied architectural problems stimulates need for a purpose built bank design with the overall objective of evolving an efficient architecturally sound bank headquarter that satisfy the client requirement and conform with statutory requirements.

## **1.8 SCOPE OF STUDY**

The headquarter building will be composed of five principal arms namely: - The Administrative arm, the headquarters branch office, speculative lettable office spaces and auxiliary supportive accommodation and facilities.

To effectively house the enumerated functions and be in tune with structures of other banks and offices in the neighborhood, a structure of between 8- 10 floors high is being proposed. The need for land economy cost consciousness in a highbrow area like Victoria Island, Nigeria dictate a high rise building.

This will also be in line with the architecture of the neighbourhood, which is largely populated by bank offices.

## **1.9 RESEARCH METHODOLOGY**

According to Oxford Advanced Dictionary of English, Research is a careful study or investigation in order to discover new facts or information. These findings are formulated into principles by which future projections can be made, existing problems solved and new directions in the identification of other inherent problems opened.

"Architectural research should be geared towards forces that create and influence the habitable environment and subsequent analysis of how these forces can be manipulated for the convenience of man, the central figure and focus of all design."Fadairo (1997). Research takes various forms but the methodology to be adapted in this project will comprise the following

- (i) **LITERATURE REVIEW:** This involves consulting libraries for relevant books, journals, seminar papers, and newspaper cuttings to acquire a broad understanding of the project topic.
- (ii) **OBSERVATION AND PHOTOGRAPHY:** The external view of relevant office and bank headquarter and branch office buildings recorded by photography. Photography of the interiors is not allowed for security reasons.
- (iii) **PERSONAL OBSERVATION:** Visits were made to existing buildings of similar use and sketches of the site plan, floor plan, e.t.c. were made while the use of materials were noted. And above all areas of likely problems identified using professional hindsight and experience.
- (iv) **INTERVIEW:** Oral interview were sought with resource persons in various departments of the banks, namely Property, Administration and Personnel, branch worker and managers, with a view to knowing their likes, preferences and problems in their existing working environments.
- (v) **QUESTIONNAIRE:** The banking sector is a highly secretive zone therefore most workers secure a culture of secrecy. Hence, responses to questionnaires on security issues were not encouraging.

## 1.10 PROBLEM STATEMENT

Crime in whatever form has always been a source of concern and anxiety to a large number of the population. The statistics of both reported and unreported criminal activities justify this mood. The fear of crime especially burglary has negative effect on ability to think right and by extension on productivity. Security has also been on record to have been a boom business since the second half of the twentieth century. This means an aggregate of several millions of money in different currencies are being expended on security gadgets year in year out. This money could have been spent to better the lot of mankind.

Moreso, fortune Bank Plc, one of the new breed banks in Nigeria has been operating from rented accommodations and has a need to construct own corporate headquarter

to reflect her coming of age and to increase the confidence imposed in her by the customers as a bank with secured vaults.

The aftermath of every strike by the hoodlum is rightly depicted in the Bible thus, the thief cometh not, but to steal, to kill and to destroy. ..(KJV Jn. 10:10)

To reduce such wanton destruction of human lives, non productivity, waste of resources, every member of the society, the architects inclusive has a role to play. That is the reason for the design proposal to enhance security in (Bank) or Similar sensitive buildings through appropriate architectural design.

## CHAPTER TWO

### **2.0 REVIEW OF RELATED LITERATURE**

#### **2.1 DEFINITION OF TERMS**

#### **2.2 WHAT IS A BANK?**

Over the years, it has been a difficult task to find an acceptable definition of a bank. Several attempts have been made to offer a comprehensive and acceptable definition; starting from the time of Gilbart (1968), His definition which is illustrative states that- A banker is dealer in capital, or more properly, a dealer in money. He is an intermediate party between the borrower and the lender. He borrows off one party and lends to another.

Several attempts by other authorities on banking laws such as Hart and Paget though considered not comprehensive, serve to summarise the functions of a bank or banker.

While Longman dictionary of contemporary English defines a bank as a place in which money is kept and paid out on demand and where related activities go on. The same is defined as an establishment for keeping money and valuables safely; the money being paid out on customers order by means of cheque.

The two definitions agree on the fact that any place, or establishment which could be as small as a shop or as big as an elaborate office building where money or other prized objects exchange hand for the purpose of safe keeping or kept in trust for another person who has a right or access to his money on demand as a bank. Therefore, a bank is an organization, which provides safe keeping and money creating functions. It deals in debts or legal tenders which are generally accepted in settlement of other peoples debt or payment of services enjoyed or (money).

The term 'Bank' is said to have its origin in the Italian word 'Banco' which literally means a bench. Perry (1965) an instrument on which the earliest bankers (the

Jews in Lombardy) transacted their banking business actually in the market place. This has the semblance of the modern day black market or bureau de change.

**2.3 HEADQUARTER:-** A quarter represents the division of a town or organization while the head is that part of the body which contains the eye, nose, mouth, and brain. It is also variously described as the upper end, the top, the front and above all the ruler or position of command.

The headquarter of any organization is therefore that main office that has the function to see, smell, speak and take decision for the whole organization. In essence, all corporate goals, aspirations, mode of operations are programmed and controlled from the main office called the headquarter.

From the foregoing definitions, the bank headquarters is the topmost level of the banking structure where various activities including decision are carried out for smooth administration of the entire system. It represents the domain of the principal organs of the bank.

## **2.4 GENESIS OF BANKING**

### **2.4.1 ANCIENT TIME:**

Safekeeping culture is endemic in every society no matter how naïve. A retrospective look into the termite and ant colonies, to the more civilized human societies reveals that this is a more natural way of life. Safekeeping of valuable objects for the rainy days or avoid catastrophies such as fire, flood and insect attacks e.t.c. are common occurrences.

Though the primitive setting was spared of the menace of robbery, it was not without its own share of social miscreants; such as petty thieves.

For these and other reasons, valuables were kept in caves, barns, bored holes, and stone clefts. This was the height of safe keeping of valuables among men. During the period under reference, goods and services were used in exchange for other goods purchased or services enjoyed or rendered in a system reffered to as 'Barter system' or trade by barter.

However, modern banking set in with the people's disenchantment with the drudgery and cumbersomeness of the system. Its displacement brought about the use of money in its various forms. Hence the need for bank which in the earliest time was as big as a transaction "bench".

This is where the surplus wealth of individuals are kept for safekeeping and for use by others who have opportunities for its profitable use at a price called "interest".

The bank acts as the agent between the depositor and the borrowers who hardly get to know themselves.

## **2.5 MODERN BANKING:**

The commencement of modern banking is traceable to Venice, Italy. This is where according to Munn (1965) Banco di Rialto was established in 1587 and from where the spreads to other parts of Europe started. The goldsmiths pioneered the banking service in England because of the valuable nature of their raw and finish products which require safekeeping in impenetrable strong vaults, Crick (1965)

Soon citizens started keeping valuable objects with them for safekeeping and receipts were issued to the depositors. Because of the lightness and portability of these receipts, it was preferred to the cumbersome coins. Before long it was possible to purchase goods and services using the receipt as evidence. Though payment on deposits could be effected strictly in favour of the depositor at the beginning, with time, arrangement was put in place whereby depositors could authorize payment of part of their deposits be paid their creditors on presentation of their note to the 'banker' blacksmith. This was the humble beginning of the use of cheques. This was in the 17<sup>th</sup> century. Tenney (1965).

It is worthy of note that the blacksmiths were not alone in the pioneering and development process of the bank. Other notable names working simultaneous or at various times are the monarch of Britain who kept the deposits for the people within the fortress of his palace and had full confidence of the depositors until his repayment programmes could not meet the demands of the depositors.

Around the 11<sup>th</sup> century, the abode of the Jews and the temple of gods provided another haven for depositors' valuables and money. These perfected the act of money lending from the deposits in their custody and thereby pioneered the bank advances or loan scheme.

All these are forerunners of the bank of England which came into being in 1694. Because of the legal status of the bank, vis-à-vis ability to sue and be sued, the people had infinite confidence in them.

## **2.6 BANKING IN NIGERIA**

The supply of banking services in Nigeria dates back to 1892 when Elder Dempster Company was engaged in the business of moving silver coins up and down the country. Later that year, Africa banking corporation (ABC) was formed to provide banking services to Elder Dempster Company. The bank failed in 1892 and was taken over by Bank of British West Africa in 1894.

Up to 1928, more banks, all of them oversea banks- opened offices in Nigeria and monopolized the banking business. To counteract the discriminating practices by the foreign banks, some notable Nigerians grouped themselves together with the sole aim of breaking the monopoly and Bank of Nigeria Limited came into being in 1899. The bank failed and was also taken over by BBWA in 1912. Between 1929 and 1957, many indigenous banks were opened but many if them collapsed with the rapidity with which they were opened.

Mismanagement, aggressive competition from the foreign banks and under capitalization was the main reasons for their failures.

The British bank of West Africa (BBWA) was the solitary actor from 1894 to 1917 when Backlays Bank Dominion, Colonial and Overseas (Backlays Bank DCO) was born.

The two banks with their headquarters in Britain were primarily set up to protect the British commercial interest and as it were to fortify the colonial administration operating in the country then. Therefore their major preoccupation then, was to facilitate the evacuation of produce from the West African coast and the supply of manufactured goods from overseas to the same coast.

The names of these two banks have undergone many changes in governmental policies and circumstances of their time but their structure remain and they are amongst Nigeria biggest three banks today. Their third counterpart being the former British and French Bank now known as United Bank for Africa (UBA). They maintained an overbearing monopoly over the Nigerian Commercial Bank landscape with a joint control of close to 90% of all bank deposits.

This trend is being challenged by the new generation banks with their no-nonsense, aggressive, enterprising packages. Most of these sprang up as a result of the indigenisation decree and the oil boom of the 1970's. Amongst the banks that sprang up but which later folded up are – The Nigerian Mercantile bank (1931), The National bank of Nigeria (1933).

Between 1945 and 1947 – as a result of the post second world war activities and commerce; four indigenous banks were established out which only African Continental Bank (ABC) and Agbonmagbe bank survived. Agbonmagbe bank is now known as Wema bank Nig Ltd.

## **2.7 BANKING BOOM**

The period 1951 – 1952 witnessed an unprecedented banking boom with about eighteen (18) banks springing, up. Unfortunately they failed with the exemption of the merchant bank. This also had its license withdrawn due to misuse of Government funds.

Apart from mismanagement and stiff competition from the older and well grounded banks, lack of experience and direction was also contributory to the downfall of these indigenous banks. To reverse this ugly trend, the central bank of Nigeria was established on 1<sup>st</sup> July 1959.

The central bank has the role of organizing; regulating and supervising the banks to maintain sanity and check cut throat and unprofessional practices.

## **2.8 LEGISLATION**

The first banking legislation in Nigeria was the banking ordinance (ACT) enacted in 1952 and amended in 1958 and 1962. As mentioned earlier, prior to this time was a period of free for all banking with its attendant colossal failures and losses to depositors. This Act, which was finally repealed and replaced with a new banking Act in 1969 with some minor amendments in 1970, 1972 and 1979, remains the main banking legislation in Nigeria today.

The structure of banking in Nigeria is patterned after that of the United Kingdom, which favors branch, banking system as opposed to unit banking operated in the United States of America.

This can be attributed to colonial heritage, as the first two banks to operate in Nigeria were of British origin and the few surviving indigenous banks acquired their expertise and bulk of their staff from the two pioneer British banks.

## **2.9 CLASSIFICATION AND FUNCTIONS OF BANKS**

**2.9.1 Central Bank:-** The central bank is the apex of the financial system in every country, and this is same in Nigeria. The central bank, which has the principal role of coordinating the activities of other bank and making them to tow the line of sanity came into being on 1<sup>st</sup> July 1959, courtesy of the Nigerian banking ordinance of 1958. Prior to this ordinance, the West African currency board was saddled with the mother bank role.

### **2.9.2 Function of central bank**

Functions of central bank are as listed below

1. Acting as banker to other banks in the country and abroad.
2. Promotion of monetary stability
3. Performance of developmental functions
4. Acting as bankers and financial advisers to Government.
5. Issuance of legal tender currency
6. Receival of cash and liquid asset reserves from the commercial banks

7. Assembling of various type of economic and financial statistics essential for objective planning.
8. Formulation of financial policies for the banks and the nations
9. Acting as watch dog for the financial industry and the national economy.

**2.10 Commercial Bank:** - By definition and activities, the commercial bank is the traders' bank. Every area of commercial activity falls within its clientele. It is one of the grassroots banks in Nigeria. The British bank of West Africa, which is a commercial bank, pioneered the banking landscape.

### **2.10.1 Functions of Commercial Bank**

Its functions are as follow: -

1. Receival of money from customers either on current account or on deposit account, and in the former care to pay cheques drawn by the customers.
2. Discounting of bills and promising notes.
3. Acting as treasurer for a local authority
4. Acceptance of bills for customers.
5. Collection of cheques, dividends, coupons and foreign bills.
6. Effecting purchases and sales of securities.
7. Conduction of foreign exchange business
8. Managing the issue of a loan for a foreign government or for a corporation
9. Taking charge of securities and other valuables for customers
10. Undertaking the function of executor and trustee
11. Remittance of funds to almost any part of the world.
12. Making periodical and other payment
13. Making of advances either by way of a loan or an overdraft.
14. Payment of customer's acceptances, issuance of drafts, circular notes and letters of credit.

## **2.11 Development Bank: -**

This refers to banks whose major preoccupation is the provision of finance for industrial, agricultural and housing activities in order to ensure rapid and even development of the nation's economy. These banks are specialist banks carrying out banking functions to the segment of the society clearly mapped out for them.

They include Nigerian Industrial Development Bank (NIDB), which replaced former Investment company of Nigeria (ICON) formed in 1959, Nigerian Agricultural & Cooperative Bank Limited (NACB), Nigerian Bank for Commerce and Industry (NBCI) formed in 1973, Federal Mortgage Bank of Nigeria (FMBN).

### **2.11.1 Functions of Development Bank**

Its functions are as follow: -

1. Providing farmers with soft loans whose duration of maturity ranges from medium to long term.
2. Provision of funds for establishment of industries and expansion of the existing ones
3. Provision of mortgage facilities for potential house owners
4. Encouraging development of commercial activities through provision of soft loans.
5. Encouraging cooperative activities among the various strata of the society.

**2.12 Merchant Bank: -** The banking Acts 1969 defines a merchant bank as a wholesale banking institution whose activities centers around medium and long term financing. Although there may be overlapping of functions with time, the role of the merchant bank is somehow different from that of the commercial banks. While the commercial banks carry out retail banking system targeted at the lower segment of the society, the merchant bank carry out wholesale banking system targeted at the corporate clients as its target. This bank operates the unit banking system and there about 25 merchant banks operating in Nigeria with only a few branch office outside their base which are Lagos/ Abuja.

The earliest known merchant bank in Nigeria was Phillip Hill Nigeria limited. A merger with Nigerian acceptance limited gave birth to what is now known as merchant bank.

#### 2.12.1 Functions of Merchant bank

1. Medium and long term loans to corporate investors.
2. Equipment Leasing
3. Debt factoring
4. Investment management
5. Issuance and acceptance of bills
6. Management of unit trust
7. Financing import and export trade through opening letters of credit, discounting bills of exchange and remittance.
8. Involvement in other corporate finance services such as project finance, financial counseling.

#### 2.13 NOTABLE TERMS IN OFFICE DESIGN

1. Work place area or useable area: - This is a term referring to the ratio of useable office space to gross area of building. These are spaces in which it is possible for people to work at desks and it also include secondary circulation spaces.
2. Primary Circulation: - These are spaces of circulations that are essential to provide access and means of escape to and from work stations. They are generally linked to the access and egress point.
3. Secondary circulation: - These spaces connects groups of work stations which *are not directly linked to the primary routes to them.*
4. Tertiary circulation: - These are the circulation within the working groups.
5. *Special areas:* - These are spaces which cannot be used for office workers but is dedicated to particular functions. E.g. archives, restaurants.

6. Core: - A core is a space where facilities required for the support of the building are located. e.g. lifts, stairs, ducts, etc.
7. Gross outside area (GOA): - This is the sum of all constituent office areas including core, structure and perimeter walls.
8. Net Usable Area (NUA): - This is what remains when core, structure and perimeter walls are subtracted from gross outside area. (GOA).

Core in multi – Storey office building should occupy no more than 20% of (GOA) gross outside area. Primary circulation usually takes up between 10 and 15% of that useable area. Special areas vary enormously depending upon function of office organization. Working groups will be arranged to follow patterns of work floors and interaction.

## CHAPTER THREE

### 3.0 CASE STUDIES

#### INTRODUCTION

There are myriad of ways of learning but one of the shortest route is through the knowledge of those who have experienced it before.

The creator has endowed mankind with the five powers of the body commonly called the five senses, with these and sometimes with the further assistance of the sixth, mankind has been able to subdue his environment.

Case study is one of such ways of learning involving the senses. It is a practical demonstration of the dictum of 'who feels it knows it'.

It is a detailed study of existing situation (project) with a view of assessing and documenting their perceived merits and demerits (high and low points) and applying the demerits or a deviation thereof in present or future proposal. This brings it to the class of research of historical nature. Research having been defined as a careful study or investigation in order to discover new facts or information.

Architecturally, case studies are carried out on existing projects which have similar use or background to the proposal on hand. Its execution involves the studying of different aspects of the existing project and this include but are not limited to the following:

1. The site planning in micro and macro setting
2. The space planning as reflected in the floor plans taking note of functionality.
3. The construction technique
4. The treatment of elevations (aesthetics)
5. The style and setting of architecture
6. Economic use of land and space.
7. Orientation of structure in relation to climatic element.
8. Adequate or inadequate provision of basic amenities that provide comfort
9. Services

10. Study of general performance in real life through administration of questionnaire to users.

Case study are carried out through personal observation, administration of questionnaires, interviews of resource persons etc. and it is usually to spread the study over many projects for the need of the researcher.

Indepth study as analyzed above might be possible on a number of projects that demand little attention to security.

However, because of the nature of bank business, especially transaction in money in its various forms, security must of necessity be high and detailed study of bank premises are hardly allowed for security reasons. This indefinitely impact on the number and in depth study of interior spaces and accounts for few photographs found in this thesis. ,Thus; this means that the studies are internalized and would reflect in the real life project. Sketches are provided where necessary to make up.

The case studies used in this thesis are broadly classified into major and minor case studies, and each has been chosen for its own peculiarity. Even though foreign case studies are used, the tendencies to over rely on foreign case studies only have been dispensed with. Rather structures which reflect good architecture and lie in the same environment as the proposals have been embraced.

### 3.1 CASE STUDY ONE

#### NIGERIAN INTERCONTINENTAL BANK HEADQUATER

##### INTRODUCTION

Nigerian Intercontinental bank, is one of the new breed banks built on traditional value has its corporate head office building located in Victoria Island Lagos. Victoria Island is one of the high brow central business districts in Nigeria. It is located on a narrow site of 36mm X 73mm.

##### 3.1.1 DESCRIPTION

The rectangular building which rises to twelve levels from the basement level was designed with its rapid growth in mind as well as to express confidence and corporate decisiveness. It stands impressively tall alongside its other high-rise neighbours and it is built on a narrow site measuring 36mm X 73mm.

The building sits on pile foundation and the spaces are divided into structural grids with 900mm square columns that reduces in sizes to about 450mm square on the upper floor.

A diaphragm wall was adopted around the basement to curtail water ingress. The construction is of in situ cast, normal reinforced concrete and the suspended floors made use of waffle system.

The building houses the car parks at the back of the lower and upper ground floor. Entry into the building is straight off the road and up a grand staircase that ushers visitors to the upper ground floor.

##### 3.1.2 FACILITIES PROVIDED

Lower ground floor-----	Car parking
Upper ground floor-----	Car parking
Mezzanine floor	
First floor-----	Commercial bank facilities
Second floor -----	Commercial bank facilities
3 <sup>rd</sup> to 5 <sup>th</sup> floor-----	Lettable office space

6 <sup>th</sup> to 8 <sup>th</sup> floor-----	Bank head office
9 <sup>th</sup> floor-----	Executive level
9 <sup>th</sup> Mezzanine-----	Executive level
10 <sup>th</sup> floor-----	Helicopter pad

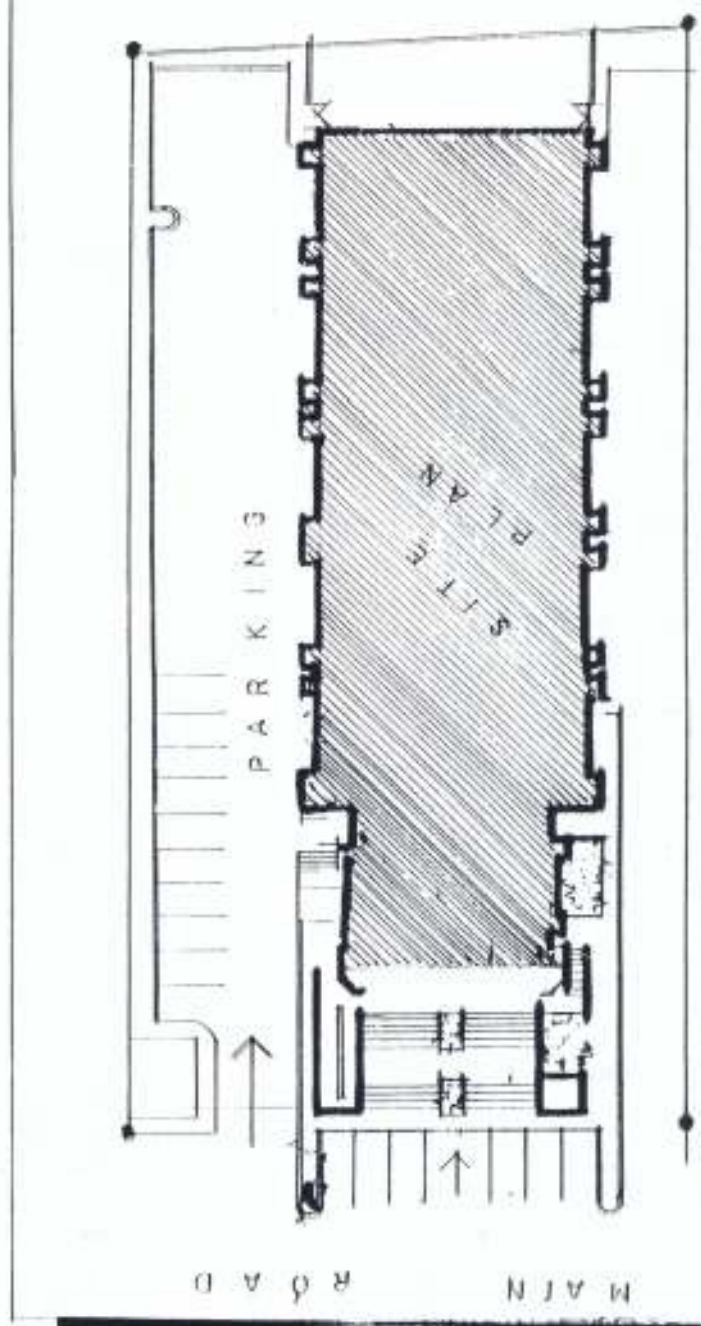
### 3.1.3 APPRAISAL

#### 3.1.4 MERITS (HIGH POINTS)

1. Optimum use of site
2. Flexible space planning
3. Use of sandcrete block projections and glass façade to bring about architectural master piece
4. Adequate natural lighting of interior
5. Combination of services core for efficiency and economy.
6. Good attempt at solving parking problems through creating lower and upper ground floor parking spaces.
7. Adequate attention to security.

#### 3.1.5 DEMERITS (LOW POINTS)

1. Escape route not well defined
2. Discharge point alternative staircase is still within building
3. Some creative features projection reduces useable spaces in the interior.
4. Inadequate setback from road.
5. Little consideration for landscaping features.



# Site plan

FIG 3.1.1



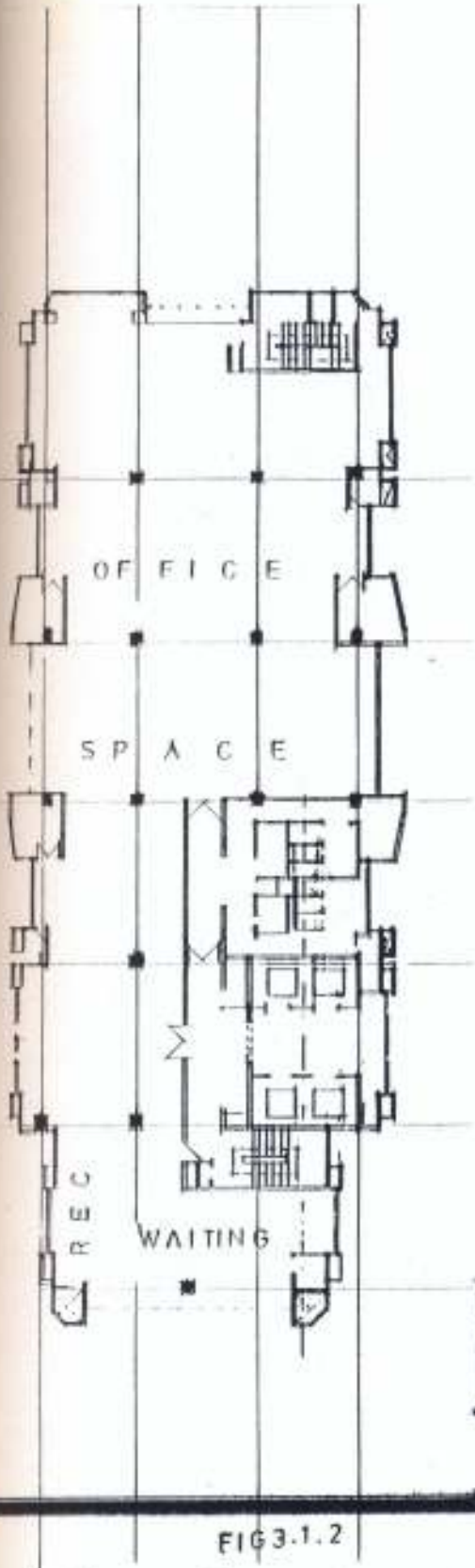


FIG 3.1.2

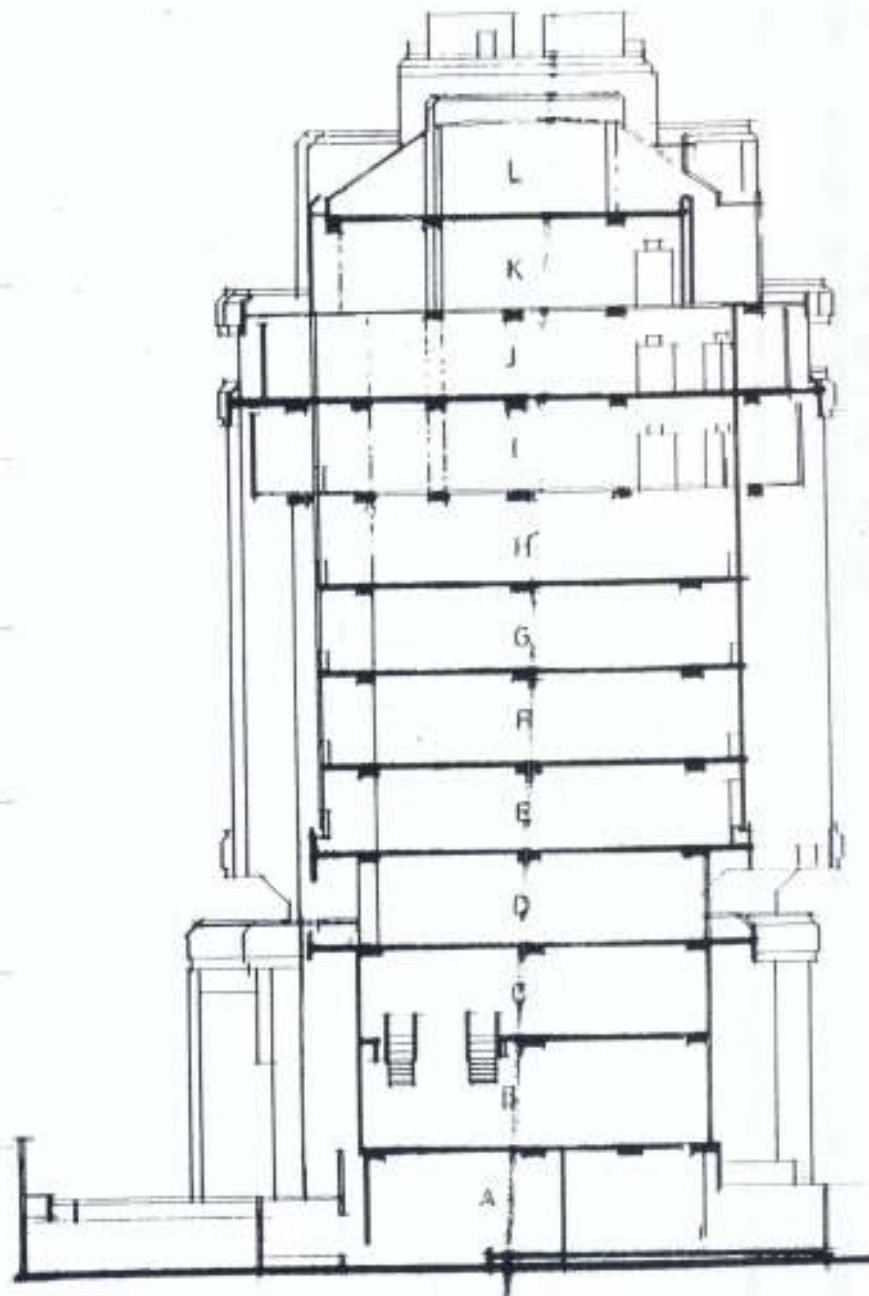
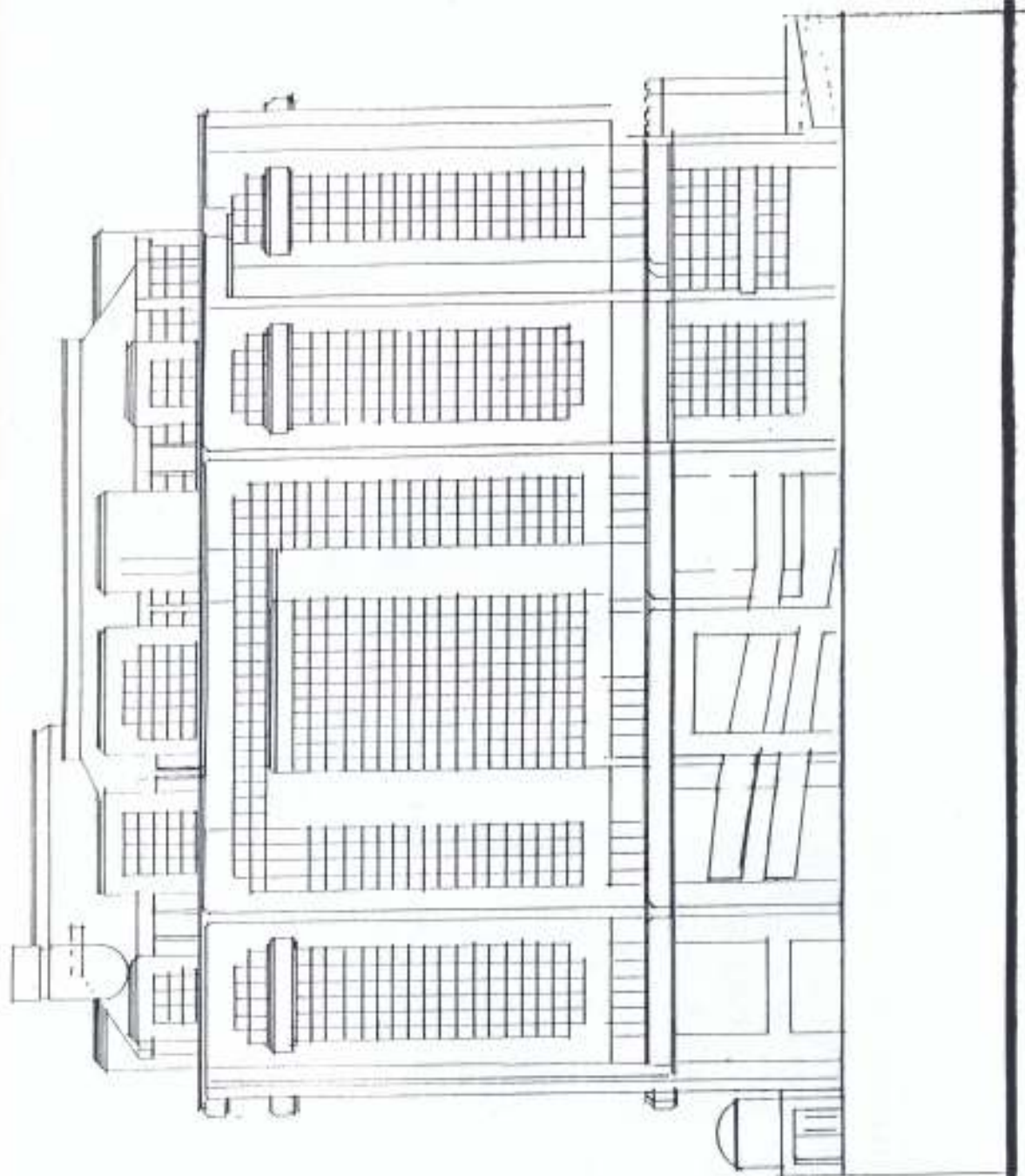


FIG 3.1

*typical floor plan*

*sec*





**PLATE 3.1: INTERCONTINENTAL BANK V.I LAGOS**  
**SOURCE:: FIELD SURVEY.**

## **3.2 CASE STUDY TWO**

### **3.2.1 UNION HOMES SAVINGS AND LOANS HEADQUATER**

#### **INTRODUCTION**

Union homes Plc. is a subsidiary of union bank plc. Its area of specialization is savings and loans for future house owners (mortgage banking).

The corporate headquarter which also houses the head quarter branch is located along Ikorodu road, Onipanu, Lagos. Nigeria and it consists of two mid rise block of offices constructed in two phases.

The one being under studied is the six floors corporate headquarter building constructed between year 2001 – 2002.

#### **3.2.2 GENERAL DESCRIPTION**

The boundary of the site is demarcated by high sand Crete block wall fences on the rear, right and left sides, while the front side is protected with a see through metal grille of appreciable height. The site is approachable through a set of vehicular and pedestrian entrances which pass through the security point and the gatehouse.

A good set back from the main road results in an open forecourt which serves as parking spaces for the staff and a limited number of customers.

The six floor square shaped structure is an exhibition of the international style of architecture in its use of reinforced concrete, steel, glass etc.

The elevated ground floor is accessible via a number of steps which lead to a celebrated entrance porch, which is located to the left side of the building. The porches are two giant columns projecting to the underneath of the second floor, thereby creating a remarkable height at the entrance.

Two large manned entrance doors ushers visitors to the main banking hall which has a double headroom immediately at the entrance and the whole of the customer area.

The open plan banking hall consists of spaces for workers at the rear, provision for eight teller cubicles and a continuous work top finished in marble to match the floor finishes.

A staircase provide an access from the main hall to the mezzanine floor and the first floor which houses other departments of the headquarter branch.

The administrative sections of the headquarter is approached through an equally celebrated entrance which leads to the reception hall on the ground floor from where staircases leads to the upper floors.

The front elevation of the structure is finished in blue color curtain walling in glass giving the bank headquarter an impression of solidity.

### **3.2.3 FACILITIES PROVIDED**

#### **Ground floor**

- Banking hall
- Teller cubicles
- Note counting rooms
- Savings/ current Accounts
- Entries department

#### **Mezzanine floor**

- Loans/ Advances department
- Fixed Deposits
- Mortgage

**First floor** - Loans/ Mortgage department

**Second floor**- Personnel Department

**Third to Fifth floor**- Offices

**Pent house**- Staff Restaurant

### **3.2.4 APPRAISAL**

#### **3.2.5 MERITS**

1. Celebrated entrance porches defined the access points.
2. Good colour combination registers finess and grandeur.
3. Adequate setback from road for secure staff parking space
4. Adequate security/ surveillance system

5. Good finishings generally help to register the strength of the bank.

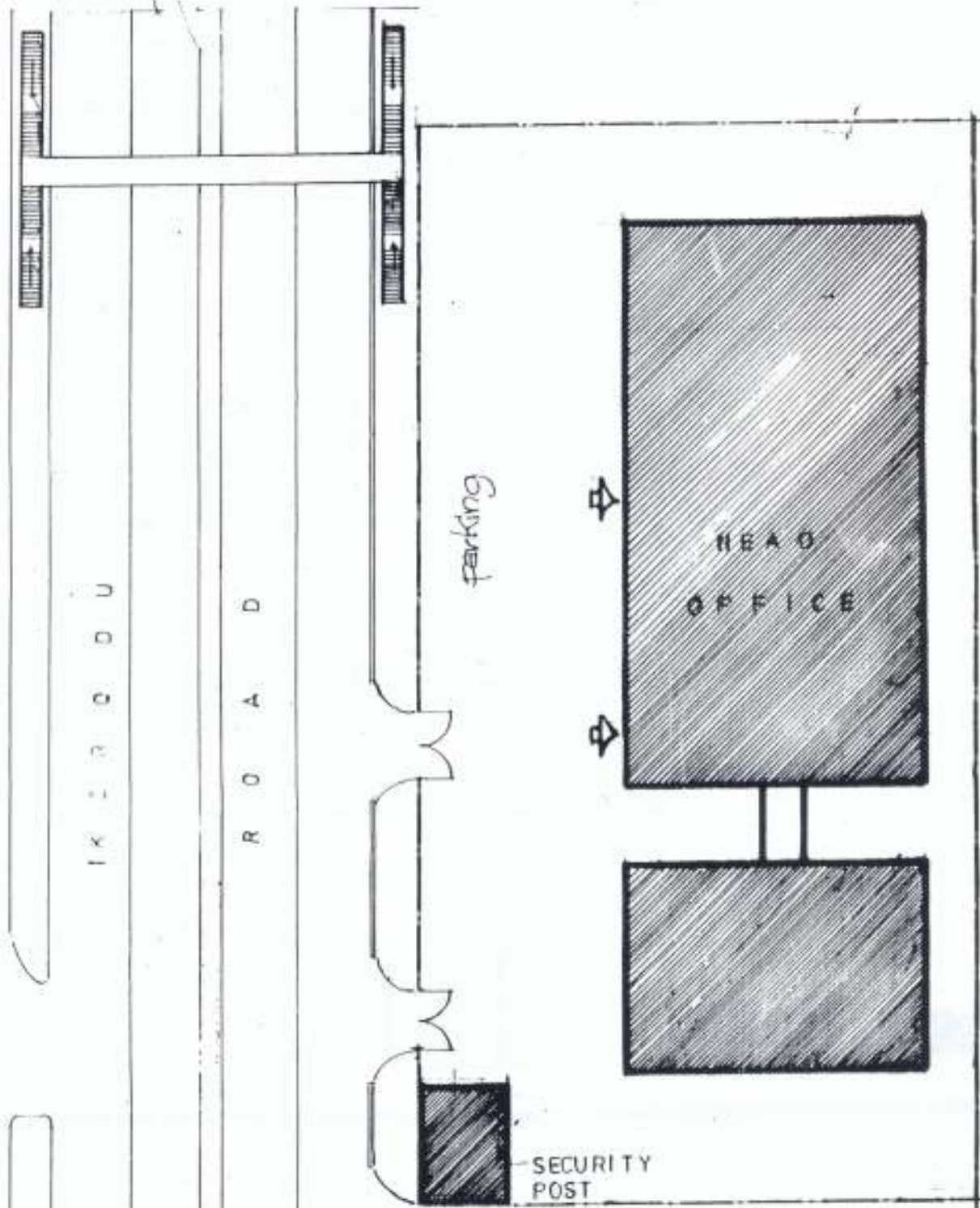
### 3.2.6 DEMERITS

1. Inadequate parking spaces for customers
2. Services not well concealed as the ducts were directly behind the glass facade in the front of the building.



UNION HOMES HEADQUARTERS LAGOS

*artist impres*  
PLATE 3



filling station

# site plan

FIG 3-2-1

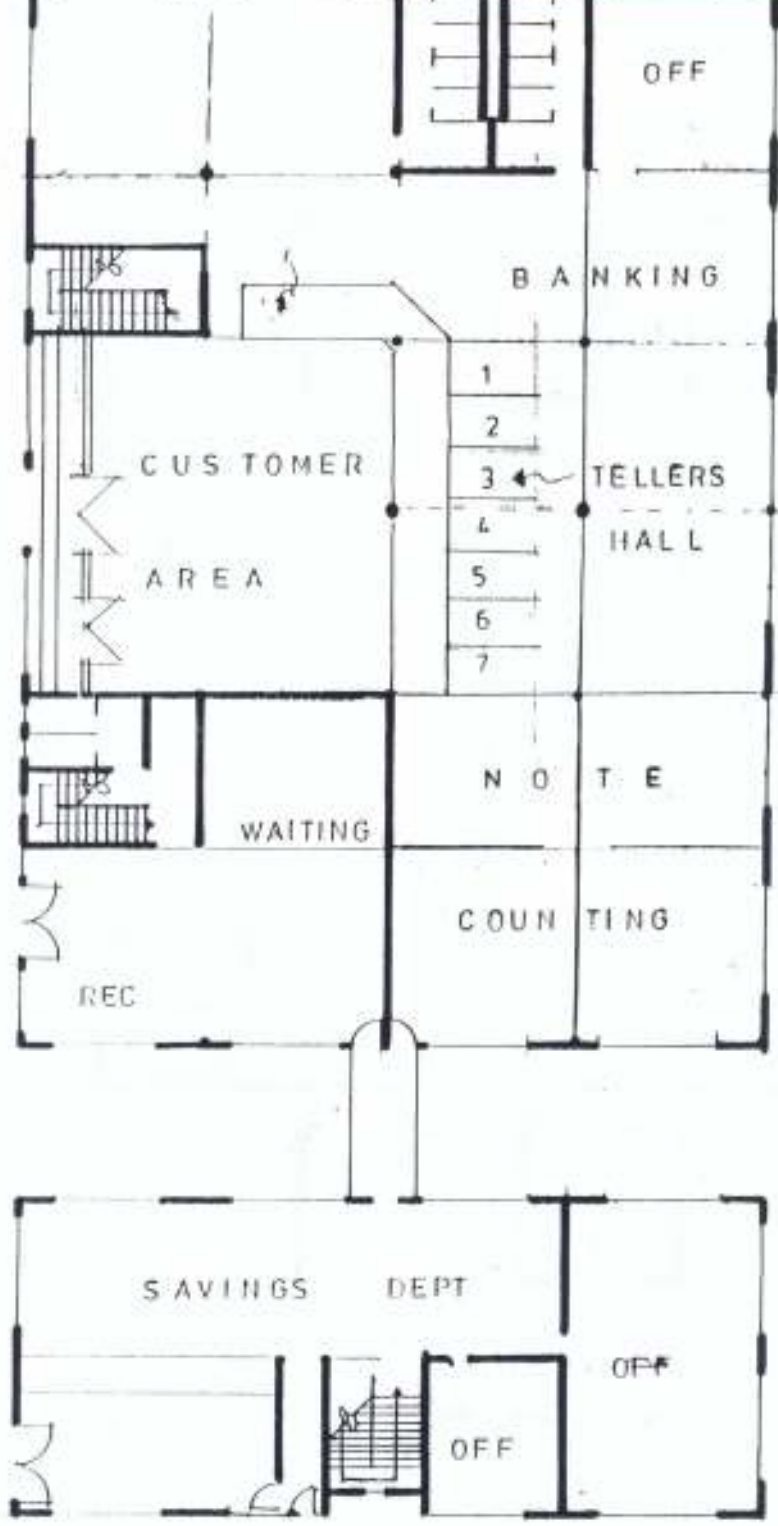


FIG 3-2-2  
*grd floor*

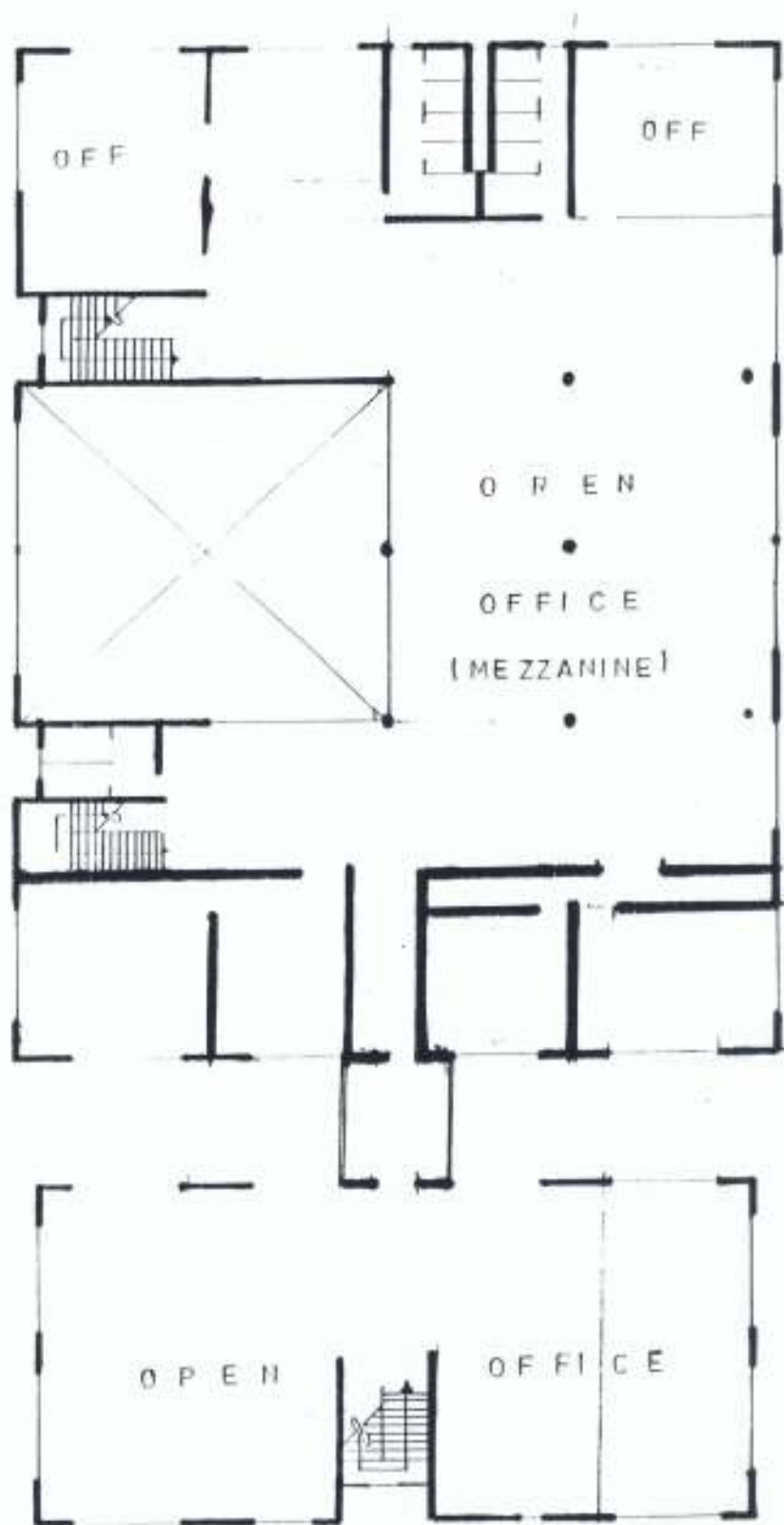
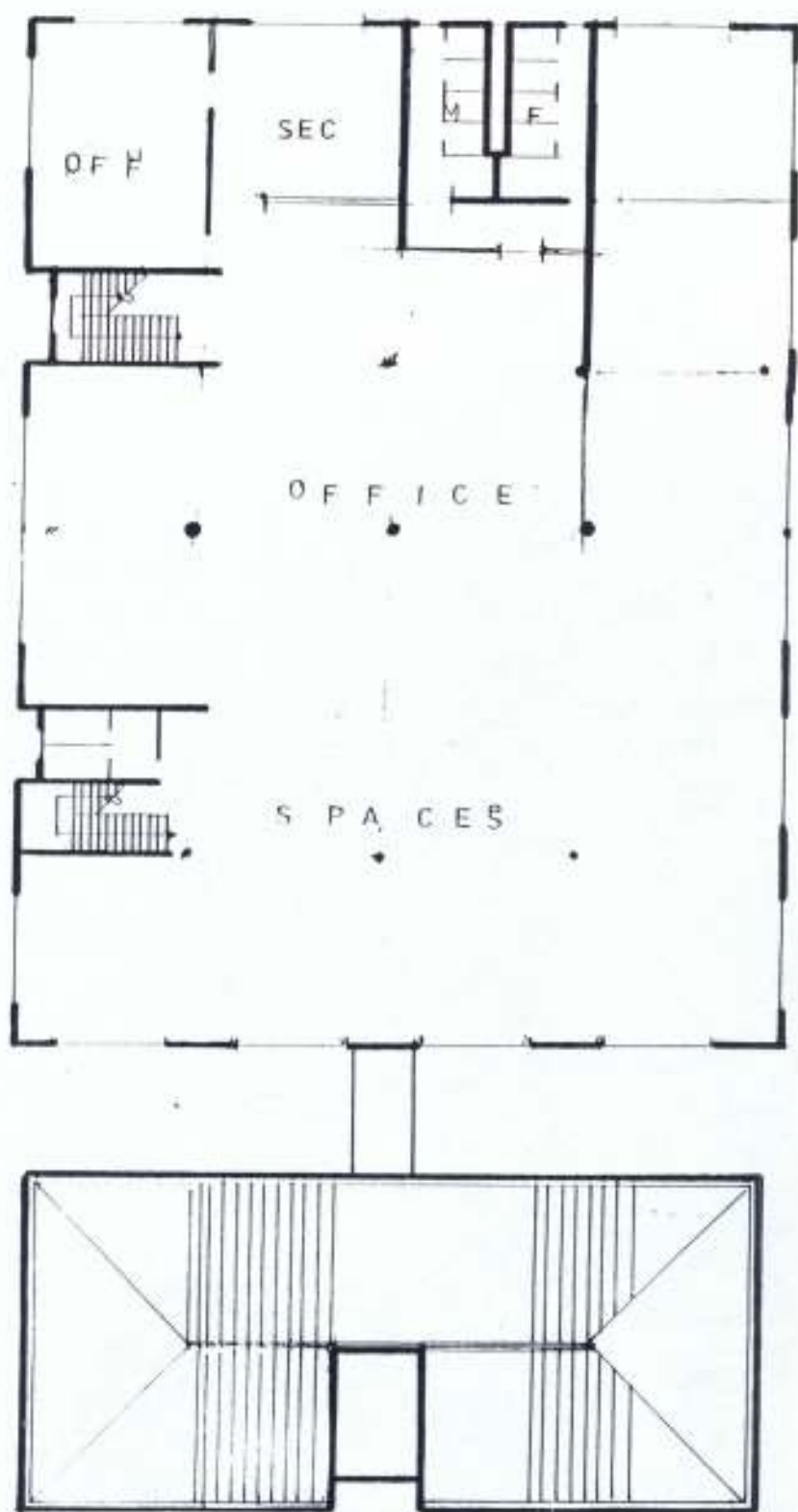


FIG 3-2-

*first floor pl*



*upper floor*

FIG 3-2-4



**PLATE 3.2: UNION HOMES HEADQUARTER LAGOS**  
**SOURCE: FIELD SURVEY**

### **3.3.0 THE BANK OF LUXEMBOURG**

#### **3.3.1 INTRODUCTION**

The bank of Luxembourg located in central Boulevard Royal was designed by the reputable bank architect Messrs Arquitectonica International Corporation.

The structural drawings and services were designed by a group Ingenieure Alsace and Schroeder and associates while the construction was by Campaigned de constructions.

#### **3.3.2 GENERAL DESCRIPTION**

The prominence of this bank lies on its design which centers on security and grandeur. It is in keeping with his goal of provision of private banking service which calls for privacy or secrecy.

It is reputed to be second only to the Swiss bank in provision of secret banking to high networth individuals and corporate clients.

The bank of Luxembourg is a multi level building made up of two towers of 13 storey and nine respectively connected together by a tower structure rising to 4 blocks. The complex serviced by lifts and ramps and designed to reflect the strength in addition to carry through the bank's philosophy of privacy and excellence.

The simply designed rectangular structure is a solid mass of punctual only by equally simple rectangular windows. The aesthetic comes in form of use of materials notably marble finish, and in colour combination which when blended with the well landscaped surrounding provide a well attractive environment for customers.

The massiveness and use of marble stows of contrasting colour exude strength. The seemingly window lessness of a portion basement parking and entrance level located at the fourth floor, serve to create impression of secrecy and help to maintain security.

The curvilinear structure of the front elevation is derived from the curves of the main access road.

### **3.3.3 FACILITIES PROVIDED**

1. Car park on four levels made up of two basement levels, ground and first floor level. - basement, ground floor and first floor
2. Lifts and ramps for vertical movement  
Entrance to bank- 4<sup>th</sup> floor
3. Private banking facilities- 1<sup>st</sup> to 4<sup>th</sup> floor
4. Entrance to bank facilities – 4<sup>th</sup> floor
5. Offices – 5<sup>th</sup> to 8<sup>th</sup> floor
6. Boardroom – 9<sup>th</sup> floor
7. Auditorium – 2<sup>nd</sup> floor and mezzanine
8. Reception and dining – 5<sup>th</sup> to 7<sup>th</sup> floor
9. Roof garden
10. Site

### **3.3.4 APPRAISAL**

#### **3.3.5 MERITS**

1. Security consciousness in design
2. Clients philosophy is carried through in design.
3. Exquisite finishings
4. Adequate parking on grade and in basement levels
5. Excellent landscaping
6. Blending of office work with excitement and comfortability.

#### **3.3.6 DEMERITS**

1. The use of expensive materials does not always translate to good design.



**PLATE 3.3: BANK OF LUXEMBOURG**  
**SOURCE: LITERATURE REVIEW**

## **CASE STUDY FOUR**

### **3.4.0 WEMA BANK ZONAL HEADQUARTER ABULE EGBA LAGOS**

#### **3.4.1 INTRODUCTION**

Wema bank is one of the oldest indigenous bank in Nigeria. It is jointly owned by the Yoruba speaking states of Western Nigeria.

The zonal headquarter is located at Abule Egba in the outskirts of Lagos and all zonal headquarter facilities including a training school are provided.

#### **3.4.2 DESCRIPTION**

The Wema bank building is rectangular in shape, rises to four floors and is built on a corner piece of land measuring 27mmX50mm.

The site is accessible through a separate vehicular and pedestrian entrances, both of which passes through a security point manned by security personnel.

The giant electricity generator house is located to one extreme end of the site within the front setback.

The service yard and staff parking are located at the rear of the site behind the main zonal headquarter building structure.

The main structure is an open plan measuring about 18mX45m separated into two wings by two stair cases located centrally and serving as major means of vertical movement and escape route respectively for both staff and customers.

The access to the banking hall is through an entrance into which the circle lock security door has been incorporated for screening of customers. The circle lock door which allows only one person at a time to either go in or come out of the hall, also serve to detect any metallic object concealed on customers.

The entrance to the upper floor is located to the side of the building near the main stair case. There is conspicuous absence of a reception hall in this design.

#### **3.4.3 FACILITIES PROVIDED**

Ground floor - bank branch banking facilities

First floor - ditto

Part first floor } Offices

Second floor } Training school facilities

Third floor} Conference rooms, Management offices level

#### 3.4.4 APPRAISAL

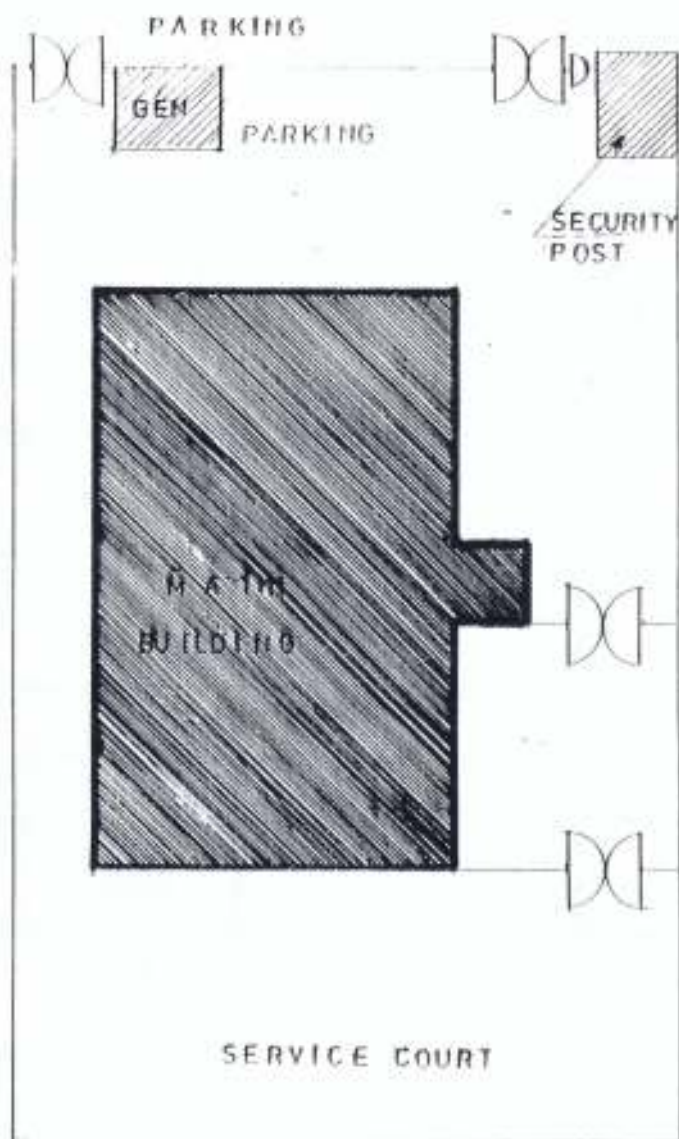
#### 3.4.5 MERITS

1. Access control at three points prior to entry signifies adequate attention to security
2. Use of circle lock door serve as an innovation in the of design of bank building from the view point of security
3. Optimum use of site
4. Adequate natural lighting cuts on running cost
5. Adequate natural cross ventilation if need be
6. Sound structural design

#### 3.4.6 DEMERITS

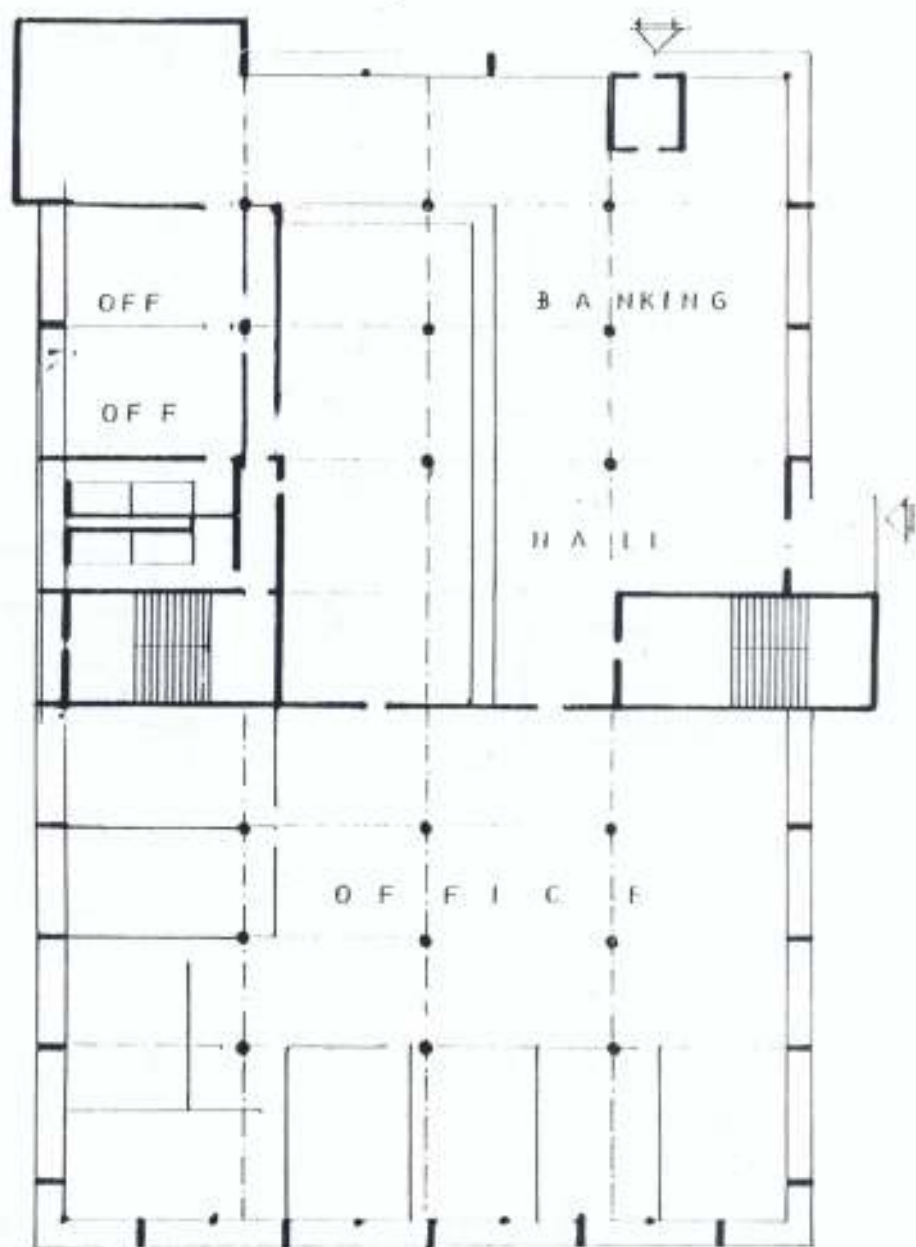
1. Design does not incorporate separate internal connecting staircase between the banking facilities on the ground floor and those on the first floor for staff.
2. Escape staircase is not accessible to customers and does not open.
3. Inadequate parking for customers
4. Separate bullion van route and bullion bay not provided
5. Poor attention to landscape
6. Design does not incorporate elaborate reception adherent security point on each floor
7. The entrance is not well celebrated for a building of its type.

R O A D.

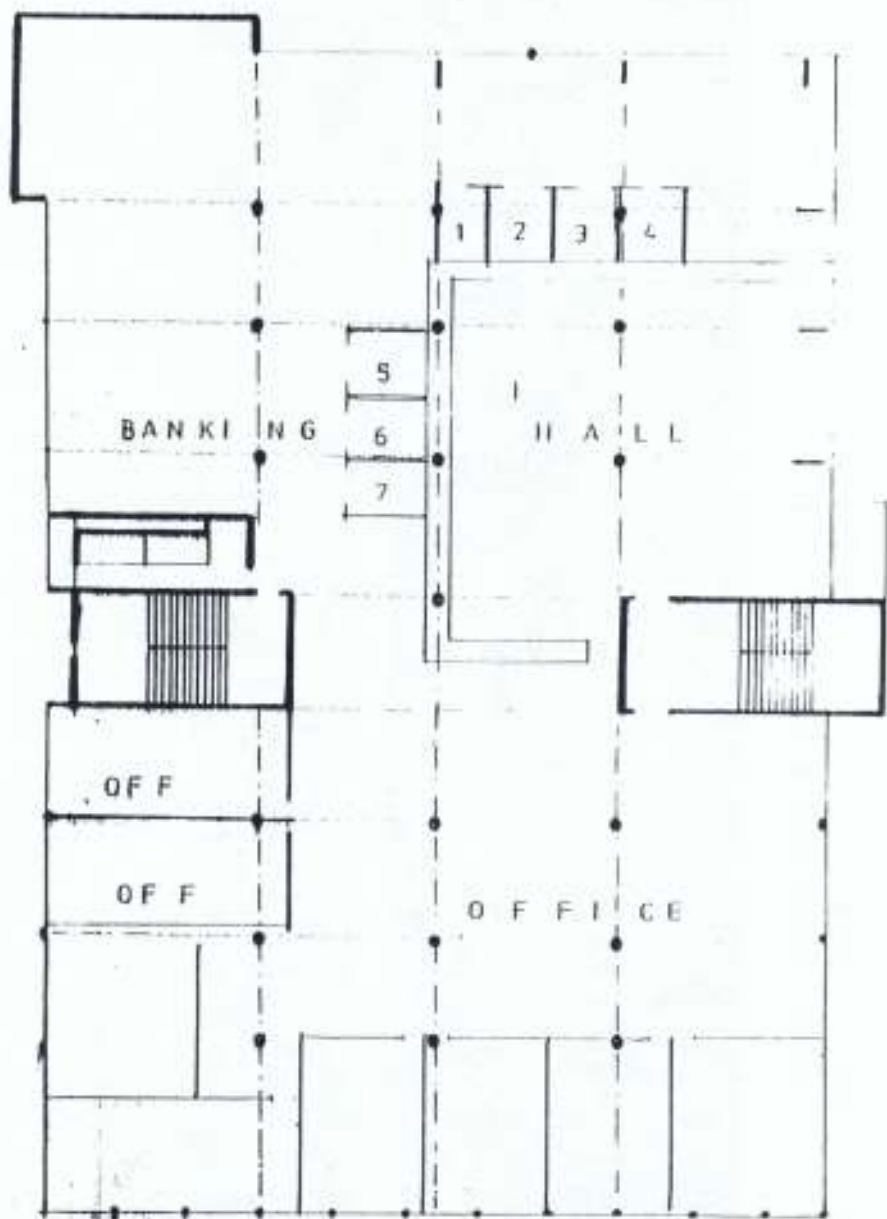


*site plan*

FIG 344



*ground flr*  
FIG 3-4-2



*typical upper flr*

FIG 3-4-3



**PLATE 3.4: WEMA BANK ZONAL HEADQUARTERS, ABULE-EGBA LAGOS**  
**SOURCE: FIELD SURVEY**



### **3.5.0 PARAMETER FOR CHOICE OF CASE STUDIES**

The projects used as case studies were carefully selected for the following reasons:

1. Similarity in function to project at hand
2. Similarity stature of the client
3. Scale of the project Vis a Vis the project at hand.
4. Ownership structure and philosophy
5. Location
6. Special features of interest

### **3.6.0 FINDINGS**

From each of these, different lessons were learnt as enunciated in the merits and demerits. The positive and the negative features serve as a guide to the design proposal.

## CHAPTER FOUR

### 4.0 SITE/ PLANNING CONSIDERATION

#### 4.0 SITE/PLANNING CONSIDERATION FOR OFFICE DESIGN. (BANK)

##### 4.1 SPACE PLANNING

Generally, The development of an office layout which conforms to and complements the predominant work flow pattern of a particular office, is deemed to be the most important phase of space planning.

This can only be brought about by the systematic study of the work operations processes and procedures involved in individual or group tasks. Armed with this knowledge, a good space planner or designer assists the management by providing work station layouts, which allows for a smoother, and straight line flow of work. Duffy (1976).

##### 4.2.0 MODERN DEVELOPMENT IN OFFICE DESIGN

New speculative and custom built offices present a greater range of office sizes for various kinds of users than was previously the case.

New experiments are also being performed in the layout of plan form and in exploring the consequences of locating fixed elements in various ways in order to enhance utility of space for various kind of users. At the same time, attempts are being made to achieve a "reversible space." This phenomenon refers to a situation whereby spaces in a floor whether in an open plan or cellular form are divided into useable units by new devices which may sometimes be part of the building structure thereby eliminating the limitations created by older forms of partitioning and ability to change work layout formats in conformity with new and better innovations.

##### 4.2.1 OFFICE DESIGN STAGES

There are two stages in the office design process. They are

1. The strategic level of building design
2. The tactical level of office layout.

##### 4.2.2 THE BUILDING DESIGN STAGE (STRATEGIC)

This level involves making broad decisions about the building as an entity. The shell, which consists of the structure, core and the skin and which constitute the major determinant of the durability of the building is given adequate consideration.

Decision to be made also include determination of the overall space requirement based on the users population. To arrive at an appropriate and realistic figure, consideration must also be given to spaces for growth, circulation, special equipment etc.

This stage also deals with the long term considerations bordering on different users, adaptability to changes in technological processes or work pattern of users, environmental comfort, changes in organization structure, type of finishings, and the broad and pertinent question of what the developer is able and willing to expend on the structure i.e. 'cost'.

#### **4.2.3 THE OFFICE LAYOUT/ SCENERY ARRANGEMENT STAGE**

##### **4.3.0 PLAN LAYOUTS**

This stage deals with functional arrangement of work stations within internal spaces. The two types of layout that are common include the Open and Cellular plan layouts. However, most offices adopt both in proportions to suit their work pattern or organization structure.

##### **4.3.1 OPEN PLAN LAYOUT**

Open plan layout is another way of laying out an usually deep space. There is usually a complete absence of any form of sub – division and the work stations are arranged to suit individual users. This layout is advantageous in that it allows group size fluctuations, it aids supervision, and informal interaction. It also allows for flexibility and easy communication as well as flow of work.

On the other hand, open plan could be untidy if not well planned. There is no privacy, and it encourages communal noise which could be detrimental to the health of worker. It is prone to distractions and incompatible with status management style. It sometimes bring about an unusually deep space prone to insufficient natural ventilation and lighting.

Open plan is necessary in machine intensive area, where there is need for highly interactive groups and this area in bank design include the banking hall and clerical office

##### **4.3.2 Cellular plan layout**

This is traditional form of layout often found in narrow buildings up to 12m deep. It is characterized by spine corridor with many small rooms leading off them. The room

varies in sizes, but is unlikely they contain more than 5 persons. Cellular plan layout permits privacy and confidentiality.

#### **4.4 OFFICE FURNITURE AND BANK EQUIPMENT**

The amount of office space to be provided and the sizes of individual office depend largely on the number and status of users, type of furniture and working equipments, consideration for visitors or customer's spaces, circulation and special equipment spaces.

Generally there are rules for specific furniture arrangements. Usually, furniture are arranged such that no worker will directly face either a circulation route, another person or storage furniture; Rather each person should be able to see an approaching person.

Functions with the highest visitor contact will be placed closest to primary or secondary routes, planning should always satisfy a particular functional need such as landmark, screening, or as holding element on circulation routes to block or direct traffic.

##### **4.4.1 (a) OFFICE FURNITURE**

Office furniture composed mainly the desk, table and chairs. The choice of a specific office furniture depends on the function which it is expected to perform and the status of the officers whom it is intended to serve.

Tables come in wooden or metal units and in wood, metal, plastic and glass composites. These are the upholstery chairs and padded tables for the top executive officers, while the lesser quality furniture are meant for junior and intermediate officers. Pedestal desk are available with dictating equipment installed in the lower drawers.

However, new kind of furniture for the open plan concept have been developed, to serve the function of particular offices.

##### **4.4.2 (b) BANK EQUIPMENT**

Bank equipment consists of those machines and devices used by the teller clerks (teller equipment) in facilitating the efficiency of their activities, and those employed in the day-to-day transaction of the banking service.

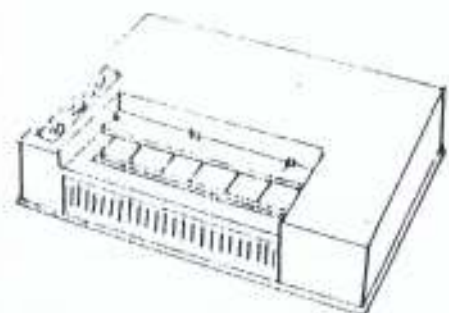
Modern equipment used by the teller clerks includes: -

1. Cash dispenser: - this is a machine employed for counting of both old and new bills in a bank. It counts up to 15 bills in a second, thereby eliminating the problem of committing and recounting of cash by the tellers. This machine reduced delay in banking transactions. It also supplies tellers with running total amount dispersed during the day, so speeding up balancing and saves end of day frustrations.
2. Cash handling equipment: - there are assorted types of cash handling equipment. They are generally pedestals with drawers, with or without combination locks, trays, shells and safes for storing cash and document.
3. Protectograph machine: - These are usually portable machine placed on top of tables, used for authenticating charges.
4. Computer index machine: - It consists of a set of key boards like the typewriter and a display screen like the television. With these indexing machine, an account located several kilometers away or in another branch can be sorted out without need of going to the records or file room to check through series of documents.
5. Franking machine: - It is a portable machine, usually placed on counter or table top used in stamping on a roll of money.
6. Rigiscope or micro check camera: - It is a camera or machine installed above the withdrawal counter, with the contrast within an easy reach of the teller clerk in the withdrawal cubicle. The camera is used in snapping customers withdrawing more than a specific amount. It helps the bank to cross check the picture of the withdrawal with his initial passport deposited during the process of opening an account. It forestalls impersonation or fraud of any sort.
7. The insider: - this is a pneumatic tube system that transports cash and documents from one point to the other desk level to floor level and propelled towards its pneumatically to working height where the teller clerk does the necessary checks. This system avoid filling up of documents and saves transaction time.
8. Micro – computer: - Micro- computer replaces the former accounting machines used in most banks. Micro- computer makes the jobs of preparing documents from punched and sorted cards much easier and faster.

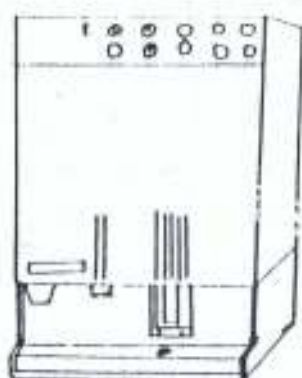
Audit – 4- micro computer is used for savings account while audit – 5- micro computer used for current account.

9. Micro filling equipment: - This is used to reduce storage space for volumes of record of cheques passing through a bank which ordinarily would be shown in book entries.
10. Cabinets: - Cabinets used a bank for housing different bank equipment and records.
11. Currency detector: - This is used to detect counterfeit currency.
12. Safe deposit: - These are storage and safe keeping facilities provided for the use of customers during or outside normal banking hours.
13. Close circuit television    14. Vault equipment    15. Vending machine
16. Telephone switchboard    17. Photocopier    18. Telex    19. Typewriter

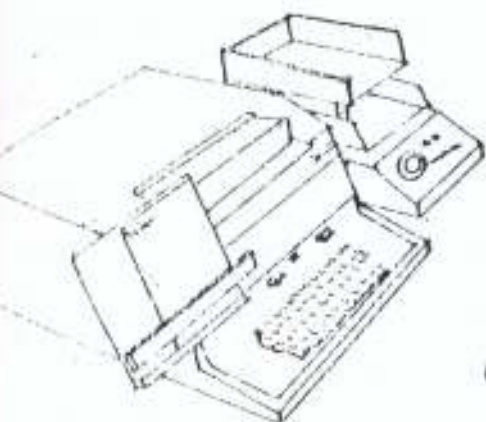
FIG 40 B OFFICE EQUIPMENT\*



6. TELECOPIER.



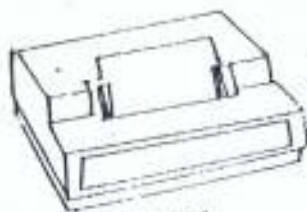
7. VENDING MACHINE.



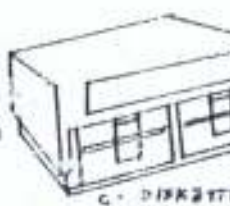
4. TLEX.



4. TERMINAL



6. PRINTER



C. DIRECT

8. MICRO COMPUTER

## 4.5 CIRCULATION IN BANK

The two major circulation routes in the design of office complex and bank are the vertical and horizontal circulation routes.

### 4.5.1 THE VERTICAL CIRCULATION

One of the most important decision to be made by an architect designing a multi – storey building is the selection of appropriate vertical transportation equipment, which include: - Stairways, Elevations, Lifts, Escalators.

Generally, the vertical circulations system of a multi – storey structure in conjunction with the service ducts – telephone cables, air – condition system, plumbing, electrical devices, lavatories and cleaner cupboards are normally located within the core unit of the design.

However, location of this core unit could be central, detached, or one sided, depending on the building form and the design concept adopted by designer. In a building with symmetrical form, the core units is better located at the center, since this forms the strategic center of attraction of the public while in an irregular and/or asymmetrical form, the core could be located on the sides or within the building structure. However, a cellular office arrangement concepts will function better with the core unit situated at the center, while the core is better located away from the center in the open plan and landscaped layout systems. This is to avoid interruption of circulation pattern or users interaction and work flow. However, in this project where the whole arrangement system are being combined, the location of the core unit is better left for the building form, functionality and general workability of design to decide.

### 4.5.2 Stairways

Staircases in corporate or public buildings such as banks must possess the following requirement: - easy location by the public, ease of travel, must have landing at top and bottom with going not less than width of stair, landing must be unobstructed and maximum of 14 risers allowed in each flight, , clear headroom of 2100mm minimum must be maintained, , risers must be same height throughout stairway .Escape stairhall should be located within outer wall, entry into the staircase must be from a floor level in the direction of the flow towards the exit from the building, maximum height of riser is 150mm and tread not less than 250mm wide measured cleared of nosing,

noising projection must not exceed 15mm, handrails should be provided on both sides of a stairs more than in wide, and on side less. An outer handrail should continue round all landing. Exit door ways from stair cases, when fully opened should not be less than the width of the stair concerned and fire resistant requirement should be strictly adhered to.

#### **4.5.3 Elevators**

Several types of elevators available to choose from include, the passenger, service, Electro- hydraulic elevator and electric elevator.

Passenger elevator can be sub divided further into general purpose or commercial, institutional, residential and store elevator.

Elevator equipped to manufactures standard specification is less expensive than customized elevators or those with special finishes.

Therefore selection of elevators and their controls system require specialist advice. Among pertinent considerations are the type and volume of traffic intended to cater for, the total vertical distance, the average round trip time, speed desired, appropriate structural support etc. Principally too the spatial requirement.

#### **4.6.0 Horizontal Circulation**

Horizontal circulation may be divided into primary, secondary and tertiary circulation depending on their mode of formation and area of services.

Primary circulation generally links access and egress point, secondary circulation connects groups not adjacent to primary routes, while tertiary circulation is within the working groups.

However, horizontal circulation can either serve as single or double loaded corridor, with width depending on the volume of traffic, the design grid used, size of furniture and equipment to be transported; but primary circulation is usually not less than 1.2m wide.

#### **4.7 LIGHTING AND VENTILATION**

Lighting and ventilation are important factors for the design of a comfortable office environment De Chiara (1980) and it may be classified into natural and artificial.

**4.7.1 Lighting** Lighting is an integral part of the planning exercise in office design, since it plays an important role in achieving the flexibility required by an office space to serve different purposes such as receptions, conventions, conferences, etc.

#### **4.7.2 Natural lighting**

Natural lighting comes from the sky as in daylight and sunlight. Day lighting is the light originating from the overcast sky which acts a diffuser of the light reaching it from the sun; while sunlighting refers to the light which comes directly from the sun when there is no cloud cover.

#### **4.7.3 FACTORS AFFECTING NATURAL LIGHTING**

The factors that affect the effectiveness of natural lighting in building includes: -

1. Solar radiation: - which is the radiating effect of the sun energy on the structure. Excessive radiation heats up the interior of the building and creates an uncomfortable working environment.
2. Glare effect: - Which results from the effect of an excessive amount of light admitted into a building, also causes discomfort for the occupants.

#### **4.7.4 SOLAR RADIATION AND GLARE CONTROL**

Excessive solar radiation and glare in buildings may be controlled in the following ways:

1. Orientation: - the effect of solar radiation is felt more along the east – west axis. So building should therefore as much as possible be oriented with its shortest sides along this axis. This reduces the building area subjected to direct solar radiation.
2. Sun shading devices: - these are designed to disallow direct solar radiation into the building, and also to reduce the amount of light intake, thereby reducing the effect of the glare.
3. Projection: - Projected roofs, balconies and wide eaves offer good protection against direct penetration of sunrays.
4. Planting: - Planting of trees, shrubs and flowers (landscaping), deflect radiation away from the building and reflection from the surroundings.

#### **4.7.5 Artificial lighting**

Artificial lighting includes all unnatural sources of light , such as the incandescent lamps, luminaries, fluorescent lamps,etc. .

This type of lighting system can be classified into two, according to its method of illumination. 1. Direct: - Here, the illuminated surfaces or room is directly lighted from the source.

2. Indirect: - Illumination is from multiple sources or by reflecting from surfaces.

#### 4.7.6 Guidelines for effective lighting system

The following guidelines ensure efficient and effective lighting in offices and banks.

1. Elimination of glare through indirect lighting system because glare reduces the comfort of the occupants and eventually their efficiency.
2. Use of up – lighters to offer a comfortable, low glare environment.
3. Troffer, luminaries and luminous panels are recommended for electrical and administrative areas.
4. Quality and quantity of illumination should be even across working planes.
5. High intensity discharge lamps with improved colours, appropriate wattages are generally suitable for office lighting.
6. Fluorescent lighting offers greater efficiency, and improved colour rendering coating should be used for accents and effects especially in the banking hall.
7. Layout and orientation of work stations should be such that operation derive their source of light from the front or the sides to avoid shadow casting across the working surface.

#### 4.7.7 Ventilation

Ventilation is defined as the rate of change of air per hour. An adequate ventilated space is thus, that whose rate of air change is maintained above a certain minimum level. This attainment should be reached either naturally, through an appropriate design consideration or artificially, through mechanical efforts. However, both systems aim towards optimum comfort of users.

Avoidance of stagnant pockets should be ensured in the interior.

#### 4.7.8 Natural ventilation

Natural ventilation is achieved by encouragement of natural breeze through proper design consideration. This is affected by the following factors:

1. Wind direction: - The two conventional winds dominating the equatorial region are the South West monsoon wind, which blows across the Atlantic sea thereby resulting in the warm and wet season (summer period) and the North East trade wind, which blow across the Sahara desert, thereby resulting in the dry, cool and dusty season, (winter period).

Table 4-3 Types of fire detector — main characteristics

Type	Sub-type	Activated by —	Mode of operation	Standards applying
Heat detectors	Point detector	Hot gas immediately adjacent	(a) Fixed temperature (static) elements; and/or	(a) or (a) plus (b) detectors comply with BS 5445: Part 5-2. Detectors with (b) alone do not comply and should not be used.
	Line detector	Hot gas anywhere along the detector line.	(b) Rate-of-rise temperature element	
Smoke detectors	Ionization chamber detector (point type)	Smoke particles restricting flow of current through an ionization chamber	Note: Sampling detectors take air from several of positions to a point smoke detector.	BS 5446: Part 1 covers residential applications; BS 5445: Part 7 for industrial and commercial. The former is adequate when facts similar to domestic. Not covered at present by standard. Can be safely used when approved by recognised body.
	Optical detector (point or line)	Scattering or absorption of light by smoke particles in a light beam.	Some can also detect thermal turbulence.	
Radiation (flame) detectors	Ultra-violet type	U.V. radiation emitted from flames in frequency range 220 - 270 nm	Radiation-sensitive cells which 'see' the fire directly or its reflection in mirrors	Other comments: Do not respond to gas/oxygen flames, may respond to gas fire if gas contaminated or badly mixed. Are sun-blind.
	Infra-red type	I.R. radiation with a flicker frequency between 5 to 50 Hz		Newly introduced sun-blind I detectors are not disturbed by sunlight.

Table 4-4 Guide dimensions in positioning fire detectors

	Point-type heat detector	Point-type smoke detector	Line-type heat detector (point response)	Integr. line-type heat detector	Optical beam smoke detector and turbulence detector	Radiation detector
Height (m)	5.3*	7.5*	5.3	5.0 perp. to beam	7.0 perp. to	Must be able to 'see' the fire or its reflection
Clearance (m)	50	100	—	—	—	—
Distance (m)	500	500	500	500	500	—
Beam diameter (mm)	not more than 3 m of beam within this distance					
Mounting height (mm)	Max 150 Min 25	Max 600 Min 25	Max 150 Min 25	Max 150 Min 25	Max 600 Min 25	—
Beam height (m)	Grade 1: 9.0† Grade 2: 7.5† Grade 3: 6.0†	10.5 High temp. type 6.0	—	—	—	—
Beam height (m)	Grade 1: 13.5† Grade 2: 12.0† Grade 3: 10.5†	15.0 High temp. type 10.5	—	—	—	—
Beam diameter (mm)	—	—	—	—	Max 25 Min 2.7	—
Distance between beams (m)	—	—	—	—	Max 14	—
Beam length (m)	—	—	—	—	Max 100 Min 10	—
Beam to flat surface (mm)	—	—	—	—	Max 600 Min 300	—
Beam to parallel surface (mm)	—	—	—	—	Max 8	—

\* In corridors (widths below 5 m) these dimensions can be increased  
† Grades defined in BS 5445: Part 5

The types and the amount of openable fenestration (glazing) area in a building also determines the value or degree of natural ventilation. Conventionally for adequate natural ventilation, a room should have at least 10% of its wall area open (glazed) preferably on two sides.

#### **4.7.9 Artificial ventilation**

Artificial ventilation is achieved through mechanical means of forcing air movement and circulation through spaces. This is done by the use of exhaust fans, air intake fans, air condition and ordinary fans.

The most effective of these vent system, which offers the greatest level of comfort within the interior space of a building is the air conditioner system.

It conditions the air to a required temperature and sent it from the plant unit through supply ducts to air handling units, which further distribute the condition air within spaces. Vitiated air is forced through return ducts. The functionality of this system depend on its control of air speed, temp, humidity and purity. The three types of air – conditioners are Unit air conditioning system, Split air conditioning system, and the Central cooling system

Factors that determines the choice of an efficient air conditioning system are: -

Types, size and location of cooling equipment, Space requirement for equipment and distribution, Capacity of the equipment, Cost or economy of maintenance, Preference and efficiency, Distribution and return system, Noise and vibration control, Availability of spare parts and technological know – how (in case of repair), Power source intended for the operation, Aesthetic appearance of the equipment.

### **4.8 FIRE PROTECTION**

The need for prevention of outbreak in public building especially commercial institutions, cannot be over emphasized. In view of this, the bank being looked up to by the public as a reliable institution for the safe keeping of their important valuables, including money, must surely be protected from hazard. In addition, the need to save human lives and prevent the detrimental effect of fire structures call for the protection of the bank and its premises from fire disaster.

#### **4.8.1 Fire prevention and detection devices**

This largely rely to electronic and automated devices in performing the task of detecting fire outbreak rather than depending solely on human effort.

Table 4.4 Recommended emergency lighting systems

Type of premises	Mode of emergency luminaire	Duration (hrs)
Residential hotels, clubs, schools, hospitals, nursing homes	Maintained or non-maintained	3
Small premises as above, with not more than 10 bedrooms and not more than one floor above or below ground	Maintained or non-maintained	1
Licensed theatres, concert halls, public houses, restaurants	Maintained	2
Unlicensed theatres, concert halls, restaurants	Maintained or non-maintained	2
Libraries, offices, shops	Non-maintained	1
Multi-storey dwellings up to 10 storeys	Non-maintained	1
Multi-storey dwellings above 10 storeys	Non-maintained	3

(Derived from the recommendations contained in BS 5266: Part 1)

Table 4.5 ICEL recommendations for emergency lighting

Type of premises	Lighting level on escape route (lux)	Additional recommendations	Duration (hrs)	Remarks
Hotels/boarding houses	0.2	0.4 lux at changes of direction, in dining halls, public areas and kitchen working areas	3	2 or even 1 hour permitted by BS for small premises
Offices	0.2	0.4 lux on routes where obstacles can be anticipated	1	Except when associated with higher risk premises
Warehouses and general industrial	0.2	Higher levels recommended in dangerous areas	1	Projector fittings more appropriate in large areas
Hospitals	Grade a: as normal lighting Grade b: one third to one half normal (Hospital Technical memorandum no. 11)		Nursing homes 3 Hospitals - c/b generator	
Schools and colleges	0.2	0.4 in workshops and kitchens	1 (day school) 3 (boarding)	
Shops	0.2	0.4 where obstructions likely	1	Extra lighting at c/b points
Meeting halls	0.2 (whole area)	—	1	
Multi-unit dwellings	0.2	—	1 3	Up to 10 storeys 10 storeys and over
Shopping precincts	0.2	General areas have to be well lit to allow free movement	1 to BS 5266 2-3 better	Projector fittings may be better

2. Interruption of the transmission part of construction systems which employ resilient connections and supports to various elements of the structural systems. It avoids the existence of long continuous rigid transmission.
3. Choosing construction systems which minimize energy transmission, this involves avoiding light, continuous, un interrupted diaphragm construction which, by means of shear waves transmit energy for long distances.
4. Minimizing radiation from the surfaces this involves, damping vibrating surfaces by changing their configuration or applying dampening materials.

#### **4.9.3 Design Consideration (acoustic)**

In designing an acoustically functional office building, the following factors must be given due consideration:

1. Choice of site: - wherever possible, site should be in consistence with the use of building.
2. Building location: - buildings should be located away from the noisy zones.
3. Orientation: - building should be oriented such that the less critical areas shield the more critical areas from the direct exposure to the noise.
4. Proper layout and arrangement of spaces.
5. Choosing the appropriate acoustical building and construction for the exterior.
6. Appropriate choice of the interior construction
7. Shape and configuration of spaces
8. Selection of quiet equipment (mechanical).

#### **4.10 SECURITY**

##### **4.10.1 ROLE OF THE ARCHITECT IN SECURITY IN THE SOCIETY**

Architecture is simply defined as the art and science of design and construction of buildings. Architecture is about people; It is for the people. Therefore it is defined, created and appreciated by the people. Without the people and their need for decent shelters, there may be no need for architecture and architects.

In addition to maintaining an international status, the architect is required to be conversant with the immediate environment and be versatile in the political system of his place of origin or immediate environment.

He must also be responsive and contribute knowledgeably to the need of the society in order to remain relevant and appreciated.

Some of the fire detective devices in use today includes manual – mechanical fire alarm, manual – electrical fire alarms, Automatic fire alarms, automatic fire detectors, manual personnel attack points, plant Surveillance systems, watchman's clocking systems, internal communication systems, sprinkler systems, local smoke perception method (See table 4.3 and 4.4). Fire regulation (means of escape) requirements include

1. Maximum travel distance with escape possible in one direction only 12.2m except for ground and first floor, where it may be 30.5m if: opening windows in all offices 840X 535mm wide minimum, lower level of opening light more than 3800mm above ground and 915mm above finished floor level, and ground beneath window free of obstruction for 1830mm from building.
2. Maximum travel distance with escape possible in alternative direction – 46m with no point in an office more than 12.2m to nearest exit door unless second exit door provided.
3. Maximum distance between two adjacent exits from a storey 60m.
4. Fire fighting stair (at least one) is required in building rising above one floor level which should be continued throughout building, have access at ground level direct to open air, have openable windows at each landing level, have permanent ventilation at the top of the enclosure of minimum 5% of enclosed air, and have protected and ventilated lobby at each floor.
5. Design of access from building to street controlled.
6. Office must have direct access to mean of escape.
7. Fire fighting or escape stair cases must be built within an enclosed shaft with walls of 1hour fire resistance and self closing door.
8. Door wings must not obstruct flow of people.

Strategic fire preventive areas in bank are control room, computer room, the vault, etc.

#### 4.9. ACOUSTICS REQUIREMENT

There is need for acoustical control in building from the disturbances emanating from unwanted sounds and vibrations. High levels of noise can lead to hearing problem. At lower levels noise interferes with verbal communication, which may be

disturbing and annoying. Acoustic design controls intrusive noise by choice of materials, dimensions and shape of space.

#### **4.9.1 Acoustical environment determination**

To determine an acoustical environment architecturally is to define spaces in order of their sensitivity to noise. There are many noise indices for predicting noise effects, for variety of building and environmental situations and their equivalent continuous sound level expressed. Spaces can be defined as follows: -

1. Quiet spaces: These are spaces where a minimum of background sound is acceptable e.g. radio and television stations, sleeping room etc.
2. Hearing spaces: These are spaces where listening alternatively to the source is the principal activity within the room. E.g. theatre, concert and lecture hall, churches, etc.
3. Normal spaces: These are spaces where normal communications but not human noisy activities are conducted, typical examples are Bank, and office spaces.
4. Noisy places: These are spaces where a general impression of loudness or elevated sound is immediately apparent when entering the room e.g. factory
5. Very noisy areas: These area include Airports, rail road, stations and other environments in which conversation often takes place at elevated levels.

#### **4.9.2 Types and control of noise in office buildings**

Two major types of noise available in office blocks are the air borne noise and the structure borne noise.

**Air borne noise:-** This is the common type of noise generated from point source. It is normally transmitted by air. it can be controlled by means of absorbent, reflectors, and barriers.

**Structure borne noise:-** This is the type resulting from the installation of mechanical equipment in the building. It is normally in the form of impact and/ or vibrational noise transmission through the structures/ members of the building.

This noise type can be controlled as follows:

1. Preventing acoustical energy from getting into the structure by means of resilient support for vibrating equipment and the like.

The role of the architects in the society in recent times has become unidentifiable or more modestly put nebulous. “ How can the society honour and reward him when the society cannot quite see what contribution, emanates exclusively from him” – Daini (1995)

“He now practices in a society which is becoming more complex by seconds, hence go beyond what is described as an enterprise of imagination.” –Adeyemi (1995). Yet he has stripped himself of all traditional roles such that all the architect who was formally a “master builder” is now left with is a narrow and indefinite field called “design”.

The work of the architect from time to time immemorial has been to write the history of the society in three dimensions. Hence the defence Architecture of the city walls and the palazzos, denoting a period of intertribal wars, and the refined architecture of the Greek Agora and Roman Forum, symbolizing the level of civilization, and liberal art and of course a period of relative peace.

The architect is expected to use his knowledge of lifestyle of the people and his broad based education to contribute meaningfully to the life of the people. This being further enhanced by his keeping abreast of most modern technology for use in his housing, commercial and industrial projects.

In order not to have a breakdown in communication with the society, he must react to the socio-cultural changes and need of people more rapidly.

Building security is one of such areas where architects can touch the lives of their clients and the society in general.

Accordingly, this view is reflected by Thomas Vionier (AIA) in his statement – “building security is now a concern at some levels for most architects. Public concern over security particularly for public buildings, have reached unprecedented levels”. He went further to observe that only few contemporary design examples that reflect both good practices and good architecture has been published.

The truth is that architects are paying more attention to issues of enhancing security for expanding range of public and private facilities as only few professionals can argue that heightened concerns over security are warranted.

Hitherto, security has been an issue for buildings that house the sensitive or vital operations of government agencies and multinational corporations, and for facilities

that can contain intrinsically valuable or dangerous materials and products. Increasingly however, security is fast becoming a matter of vital importance for everyday buildings. But why security? The need for security is depicted in table 4.5 and 4.6.

#### **4.10.2 COMPONENTS OF SECURE DESIGN**

Designing with security in mind is not merely a matter of remembering to include in the specification of the building such items as will prevent unauthorized access, door and window, locks, shutters and fences or access control systems; nor is it early warning of attempted illegal entry or outbreak of fire. Important as these aspects are, they are more obvious methods of providing security for a building occupants and their possessions. A secure design aims at the less obvious ways the design of a building will enhance or diminish its chances of attack. From home office research study No. 34 crime as opportunity it has been discovered that a large proportion of crime is of an opportunist nature. A secure design therefore seeks to reduce the situational inducement that favours opportunist crime.

Study has shown these situational inducements to be three namely:-

1. The abundance/ availability of goods/ money that fall into coveted category. Deliberate policy of supplying in small quantum lessens the chances of opportunity crime. (stealing)
2. The physical security woven around such object will encourage opportunity stealing when found to be weak. While on the other hand, the fear of apprehension created by tight security would discourage opportunity crime.
3. Level of surveillance. Low level of surveillance encourages opportunity crime which include stealing, vandalism, shop lifting etc.

Many client and architects are wont to think that security concerns will dominate all other programmes needs and goals in buildings for which security is a prime consideration. It is equally erroneous thought that most amenities, particularly visual appeal will be sacrificed in the interest of security or safety. Furthermore, many anticipate that security will mean expensive materials and strange equipments throughout. An increasing number of recent projects have served to dispel these myths.

Design issues and approaches encountered in such buildings such as banks which seeks to retain skilled professionals and attract customers to a reasonable extent bear similarity to normal buildings and as such security must share attention with other factors which include appropriate architectural image, occupants safety and comfort, economy of construction, and ease of maintenance amongst others.

Happily too, many architects are finding that except perhaps in the most tightly secured and utilitarian of military installations, security conscious designs need not result in buildings that are either grim or exotic.

A measure of careful attention to technical detail can make relatively normal ordinary building systems serve higher security purposes thereby bringing about a secure design with good value for money. With additional security gadgets. Secure design is attainable to taste and need. Most secure designs lay emphasis on four key areas namely

1. Physical security – they include measures required to control access and prevent unauthorized personnel from entering restricted areas.
2. Visual security – Required for certain internal spaces to protect visitors and personnels working in sensitive positions and to safeguard classified information.
3. Accoustical protection and isolation – Required for similar reasons to safeguard classified informations.
4. Protection from radio frequency interference sensitive communications and data processing facilities must be protected from electromagnetic and radio-frequency interference (otherwise referred to as EMI and RFI)

Types of security devices must be chosen from amongst the following; those intended to preclude unwanted entry into buildings; those that detect and give warnings when intrusion occurs, those that safeguard valuables after intrusions and those that make record of intrusion.

Example are: -

1. Contact system: -which uses wires, pads, metallic tape, magnetic switches and other devices that set off alarm or give warnings when they are touched.
2. Photo electric cell: - Performs similar functions when a light beamed on a receiver is interrupted.

3. Proximity devices: - Are generally used to safeguard items such as – files or safes, they trip alarm or give warnings when a person comes near.
4. Radar system: - Emit signals which give alarms when motion occurs in their paths, some employ ultrasonic signals or magnetic fields which when interrupted gives warning. Close circuit television is also often used for detecting and warning of intrusions.

Therefore security components in buildings include but are not limited to the following

1. Such items as fences and barriers.
2. Entry system which provide selective access to various parts of a building by some people and the exclusion of others.
3. The means and equipment to stop unauthorized entry onto land and buildings whether with the intention to commit felony or not.
4. Doors and windows locking systems
5. Security glazing materials
6. Special electrical and electronic equipment devised to protect occupants, valuables or money inside the building. The list is enormous but the most common ones are the following
  - i. closed circuit television (cctv)
  - ii. Video
  - iii. Fire alarm system
  - iv. Burglar alarm system of various types (acoustic, optical, silent, internal alarms)
7. Equipment to protect vandalism and willful damage to building structure and finishes.
8. And most importantly design of building to prevent the exposure of its occupants and the building itself to unnecessary security risk.

Offences in England and Wales in 1981

	Estimated total	Rate per 10k	Percentage recorded
<i>Household offences</i>			
Vandalism	2,650,000	1,494	8
Theft from car etc	1,240,000	700	29
Burglary	726,000	410	48
Theft of car etc	277,000	156	100
Bicycle theft	209,000	118	60
Theft in dwelling	139,000	78	33
Other household theft	1,480,000	835	—
<i>Personal offences</i>			
Common assault	1,490,000	196	—
Theft from the person	422,000	112	8
Wounding	368,000	98	21
Robbery	160,000	42	11
Sexual offences	30,000	16	26
Other personal theft	1,560,000	413	—

Note: Estimated from the British Crime Survey compared to those appearing in the *Criminal Statistics* TABLE 4.5

Value of theft losses in burglaries

Value	BCS percentage	Kent sample (1979) (%)	Rest of England and Wales (1979) (%)
Attempt only	39	14	20
Nil or under £5.00	16		
£5 to £99	22	55	69
£100 to £499	13		
£500 +	9	31	11

Note: Expressed as a percentage of total incidents: BCS statistics compared to Kent survey and general 1979 statistics. TABLE 4.6

#### **4.10.3 THE NEED FOR SECURITY**

The need for security arises because of the criminal activities of the hoodlum. Crime being that morally wrong acts punishable by law. They come in various forms. Crime in whatever form has always been a source of concern to large section of the population. The statistics of crime justify this mood (table 4.5 and 4.6). Security has being a booming business since the second half of the twentieth century, all over the world. This is due largely to development and sophistication which brings in its wake unprecedented level of criminal activities. To curtail this, technological advancement has provided the means to produce ever more sophisticated ways and devices of defeating the criminal and protecting that which belong to him from his unwelcomed attention. This has resulted in plethora of devices whose cost soars in proportion to the level of sophistication. Several millions of money in different currencies is being expended on these gadgets year in year out and it is becoming fashionable to see the newest in the series of security systems as the safest.

This needs not be so. With a little dose of knowledge in criminology which involves understanding the types of abuses and crimes related to buildings – especially those housing valuables. The motive behind the crimes and the method of operations of the hoodlums involved in the crimes; the right type of security system could be put in place saving a lot of money, energy and anxiety.

#### **4.11 TYPES OF BUILDING RELATED CRIMES**

The types of building related crimes include are not related crimes include but are not limited to the following, Theft, Burglary, Robbery, Vandalism, Terrorism, Sexual assault



Table 4.10 Locations of crime in different sizes of apartment block

Location of crime	3 storey building (mean felony rate 9 per 1000 popul.)	13 storey + building (mean felony rate 20 per 1000 popul.)
Grounds	42.4%	23.8%
Apartment interiors	40.4%	21.3%
All interior public spaces	17.2%	54.8%
Subdivided into:		
lobbies	7.2%	8.1%
halls	3.3%	10.8%
elevators	1.3%	22.6%
roofs	1.3%	4.0%
stairs	1.3%	5.9%
social spaces	2.8%	3.4%

Note: Statistics relating to the location of crime in two sizes of apartment block, compiled by the New York City Housing Authority Police and quoted in *Defensible space* by Oscar Newman

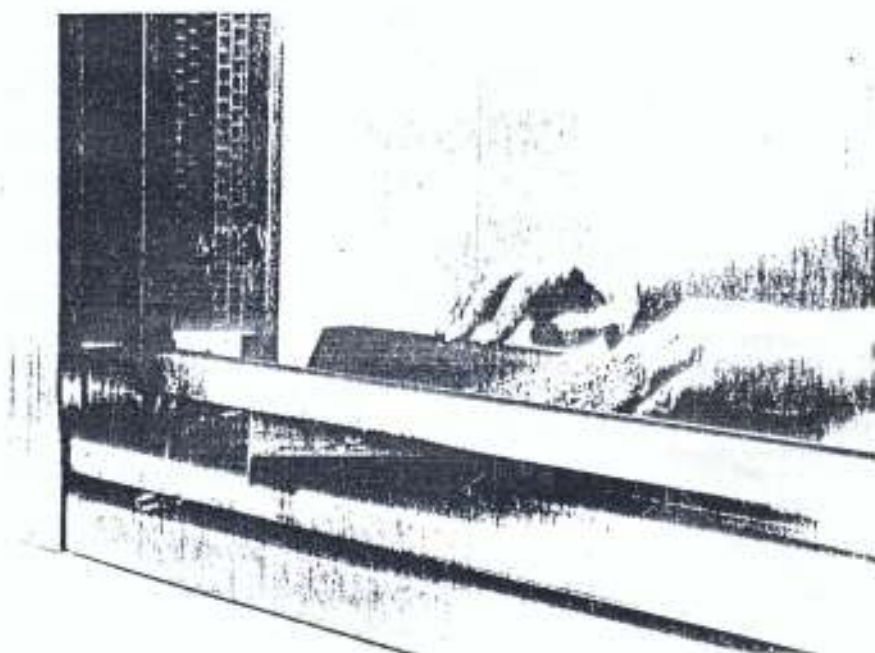


Figure IV. Pay Window from Chubb Security Installations PLATE 4.0.4

**4.11.1 THEFT:** - A theft is an act or crime of stealing especially without violence. They fall into two categories, namely – planned theft and opportunity theft. Theft also includes advanced espionage and theft of state or bank secrets or electronically stored and managed information and confidential data through remote monitoring signal in the radio frequency range. Solution is found in enclosures designed to be impervious to leak signals or signal attenuation.

**4.11.2 BURGLARY:** - The crime of entering a building especially by force in order to steal. Burglary may also take place without forceful entry but through scheming.

**4.11.3 ROBBERY:** - The act of taking property from a person or place illegally. The actors (robbers) have been classified into armed and unarmed.

**4.11.4 VANDALISM:** - A deliberate act of destroying or damaging works of arts, public or private properties, the beauties of nature for no good reason. The electronic vandalism by competitors or robbers is also possible. Therefore computers and other electronic device must be protected.

**4.11.5 TERRORISM:** - Use of violence for political aim in order to force a government to act; especially because of the fear created among the people.

#### **4.12 STAGES OF CRIME AND THE PLACE OF ARCHITECTURE**

##### **CRIMINOLOGIST VIEW**

According to criminologist Patricia Brantingham, Crime prevention in efforts in the late 1960's and early 1970's, were categorized as Punitive, corrective and mechanical.

##### **4.12.1 PUNITIVE**

The punitive effort of crime prevention borders on the use of threat of punishment of various levels in order to deter the criminal minded.

##### **4.12.2 CORRECTIVE**

This method to prevent crime through amelioration of the personal, social or economic condition that engenders crime.

##### **4.12.3 MECHANICAL**

The erection of physical barriers that thwart the execution of the criminal act is the pre occupation in this category.

#### **4.12.4 STAGES OF CRIME**

Useful as these methods are till today, more recent thinking has seen the need for identification of the stages of crime with the hope of finding opportunity to intervene where necessary in order to nip crime in the bud.

It has been discovered through careful study by criminologists that the crime process passes through three stages namely, the decision, search and act stages.

It was also discovered that crime could fall into two categories namely, the unplanned or opportunist crime or planned crime carried out by rationalists.

#### **4.12.5 INITIAL DECISION STAGE**

This is the first stage of every planned crime. Every step necessary for the successful outing is planned in advance. Crime prevention at this stage includes lawmaking, the assumed deterrence of punishment, education, social programme etc. All these aim at enlightening the would be offenders and also to discourage them.

#### **4.12.6 THE SEARCH STAGE**

The search stage refers to the second stage in the crime process and it entails searching for targets; reconnaissance survey of targets, loopholes and escape routes are clearly marked out for easy operation. The clues, clue clusters, clue sequences, (spatial, physical, social, temporal etc.) are compared with make up template and a final decision whether to act or not based on this. The search stage represents the backbone of criminal process and any effort which succeeds in frustrating the search stage has the potential of preventing crime.

#### **4.12.7 PLACE OF ARCHITECTURE**

Architectural and urban design comes handy at this stage to prevent crime through conscious design and target hardening of the sensitive zones in the bank-building project. Other effort such as street lighting, security patrol, neighbourhood block watches and other efforts aimed at increasing the risk of exposure of the would be attackers combine with the architectural concepts to prevent crime and ensure security.

#### **4.12.8 THE DEFENSIBLE SPACE**

The "defensible space" Theory of Newman(1972) has a good role to play in preventing crime through design. If it is well coordinated into the design, even though Newman theory was developed against a residential background, it has been

discovered to be effective even in non residential design and environments. The theory is worth repeating here.

a. Crime within given residential environments was related to

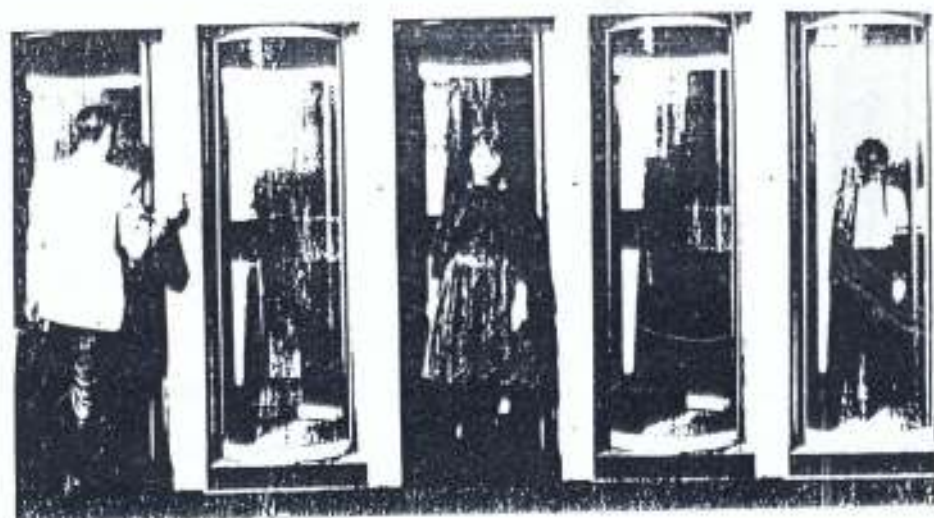
1. How well the physical environment enables residents/ occupants to develop a sense of territory within which they can identify and assume the authority and community duty to defend against trespassers by question, confrontation, or calling the police.
2. What opportunities the environment offers for surveillance of intruders by residents (occupants).
3. The location of the site with respect to surrounding land uses and transportation.
4. The image of the environment and its integration into the neighbourhood at large and how it affects residents' perception of satisfaction with and sense of control over their surroundings.

The defensible space theory as seen above is a act of postulations about how people perceive personal and community territory and are willing to intervene against social or criminal trespass on it.

#### **4.13 SECURITY IN PLANNING**

Even though there is no shortage of seminar and workshops on the general subject of building security especially in the more advanced economies of the world, the profession remains hard pressed for good examples of completed or planned architectural solution, understandably because of the secrecy in which such solution must be shrouded in order for it to maintain its integrity. This accounts for few or lack of case study in this very important area. However, a single but important principle which unifies most projects designed with security in focus is the planning and architectural concepts. These having been used to serve as the fundamental elements of the security system. Conversely too, security issues have helped to guide and shape design because the design process must be carried through with every step being guided by consideration of security implications.

7. Equipment to protect vandalism and willful damage to building structure and finishes.
8. And most importantly design of building to prevent the exposure of its occupants and the building itself to unnecessary security risk.



Circlelock door from GHPA Contract Services **PLATE 4.03.**

#### 4.14 PLACE OF GADGETS AND HARDWARES

Although electronic security devices and physical hardware items abound and remain indispensable, they remain secondary part of the overall security system. Buildings themselves if designed well are primary security assets in

1. Their siting
2. Functional plans
3. Circulation schemes
4. Access points
5. Details of construction
6. Use of materials

This is carried through in this project as follows

1. Creation of access control to site and buildings.
2. Target hardening of sensitive zones/ components on site and within buildings
3. Creation of security zones or levels
4. Creation of defensible spaces
5. Increasing real risk of apprehension of would be attackers in the site planning, landscaping and creation of cul de sacs and loop roads.
6. Discourage multiplicity of escape routes.
7. General layout of the office environment in ways to reduce crime opportunity.
8. Creation of inspection panels thereby discouraging solitary confinements.
9. See through window for surveillance of surroundings
10. Specification of materials and method of construction.
11. Prevention of duct spaces having a cross sectional area big enough for human passage from penetrating the security zones of the building.
12. All ducts, pipes, conduit wires and any other electrically conductive path are made to have electrical break when they approach the sensitive areas.
13. Provision for a central security office which houses monitors for closed circuit televisions (CCTV) Cameras and a wide variety of status indicators for building space and access control systems.
14. Interior partitions which are low cost modification of steel stud and gypsum board assemblies are devised in response to varying types and degrees of security needs.



Audio-visual entry system from Knobs and Knockers PLATE 4-0-2

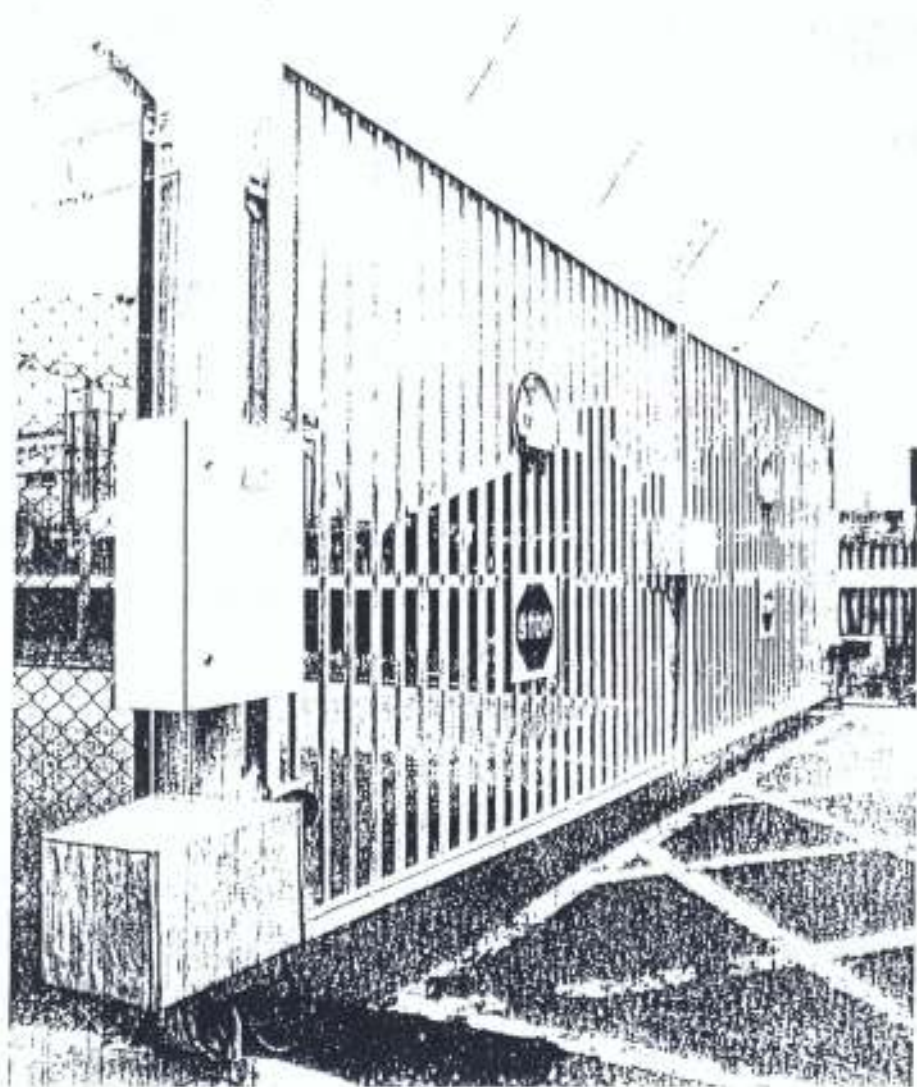


PLATE 4.0.1 Broughton Controls automatic gate

A security fence is much more difficult to scale or cut through when it is bathed in light. The criminal is never certain whether he is being observed or not. What is more, light helps to deter criminal acts inside the building, as well as outside. The dimly lit shop on a shopping street is less likely to be broken into than the totally unlit shop, because the former is so much more easily supervised by the general

15. Windowless security vaults and bullion vans
16. High level windows to create privacy in sensitive zones
17. Precast planters serving as crash resistant vehicle barriers.

On the other hand, if done poorly they become security liabilities for which no amount of hardware and gadgetry will compensate.

#### **4.15 THE ACT STAGE OF THE CRIME PROCESS**

This stage comes after a successful outing has been carried out and final decision taken carried out. It refers to the act of committing the building related crimes mentioned previously. It involves full mobilization to the "target."

Efforts made at prevention of crime at this stage are generally referred to as "target hardening". They include all measures put in place to make a building or site more difficult to penetrate by the hoodlum. They generally increase the risk of exposure and apprehension of the attackers.

Included in this category are locks, window bars, laminated glass, fences, walls, and other hardware.

The hardware available in the security market are numerous and vary in operation according to the manufacturers specification. The architectural role at this stages centers on being conversant with the available hardware, their sizes, uses, method of installation, and the provision or clearance necessary for their successful installation and to include this on his specifications. Hardwares in this category include but are not limited to the following

1. Closed circuit television (CCTV)
2. Sensor system with alarm "(Indoor and Outdoor)

It has been suggested by knowledgeable professionals Architects that regardless of the project scale or phase, some means, for occupants and neighbors to monitor activities outside and within the buildings should always be provided.

The architect must also embrace the situational approach in order to understand the crime characteristics of the neighborhoods surrounding building site.

#### **4.16 LEVEL OF SECURITY**

The range of security needed in building varies and it is constant with the skill and dedication of the criminals involved in attacks on people in buildings, which has been discovered to be wide.

It is often said that the subject of security is very much a question of horses for the courses. In essence it is easy to over estimate or under estimate the need for security.

In more advanced countries, advice is obtainable from crime prevention officers or criminal statistics and this is because either of them have their repercussion.

Over estimation may lead to overspending on security while underestimation may be at the risk of losing valuables to the notorious ones.

The level of security is also graded using the following as a guide

1. Type of occupancy – Private residential, block of flat apartments, commercial buildings, high rise buildings, industrial etc.
2. Location of building – Remote or centrally within the town.
3. Type of buildings in the surroundings – Public pubs, motor parks etc.
4. Nearness to police stations – Level of street surveillance.
5. Record of crime in the locality – Noting the successful and unsuccessful ones.

These and others would give a rough guide as to the level of security required by a building.

From the foregoing, three levels of security has been established namely low, medium and high levels. The area of application are as follows

1. Low level ----- Average protected dwellings/ small sized commercial properties.
2. Medium level ----- Small to medium sized industrial/ medium sized commercial buildings
3. High level ----- Largest size commercial and industrial complexes, military bases and military installations.

## **4.17 LEVEL OF SECURITY AND DEVICES APPLICABLE**

### **4.17.1 LOW LEVEL**

Security devices in this category consists of the following

1. Adequate locks on entrance doors supplemented by mortise bolts, door chains etc.
2. Opening windows with either lockable catches or independent window locks.
3. Some form of one or two intruder alarm especially in partially occupied premises or those which combined domestic and sales area.

### **4.17.2 MEDIUM LEVEL**

Security devices consists of the following

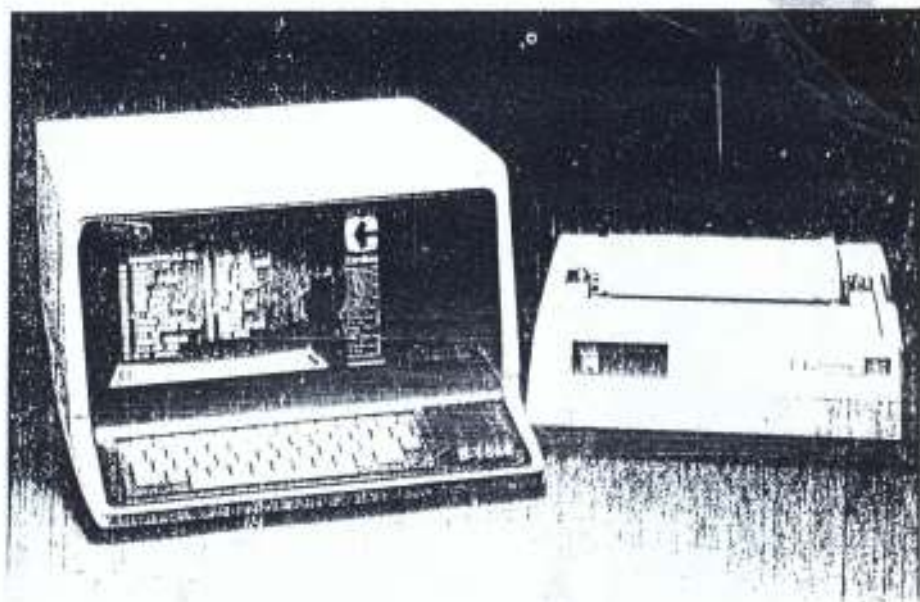
1. A proportion of the internal doors are lockable and controlled by a master key system
2. The locks are likely to be thief resistant locks as defined in BS3621: 1980 and distribution of keys will be carefully monitored and controlled.
3. Simple form of access control possibly stand alone card readers controlling access to certain parts of the site or building.
4. Some form of fire detection and alarm system
5. Intruder alarm system
6. Other specialist security equipments depending on the specific nature of the business and its location e.g.
  - i. Anti vandal protection in form of anti bandit glazing in vulnerable areas such as shop display windows, museum showcases etc.
  - ii. Close circuit television surveillance of sales area
  - iii. Access point and cash dispensing equipments.

### **4.17.3 HIGH LEVEL SECURITY**

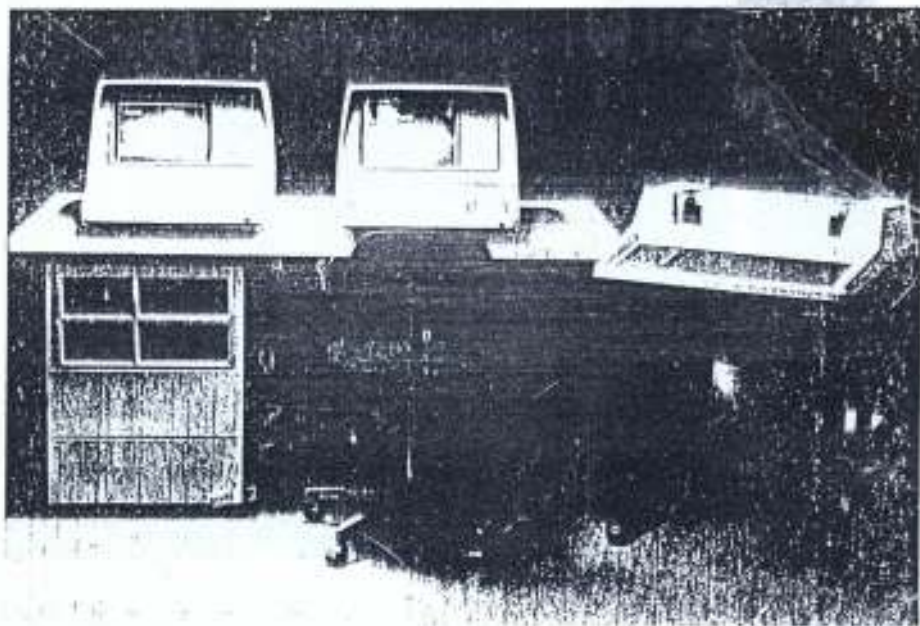
Security devices in his category would include amongst others

1. sophisticated and comprehensive access control and recording system probably integrated into a comprehensive security and management control installation which include fire alarms, public address and energy management.
2. The centralized systyem may have direct links to the fire brigade and the police or the other intelligent services
3. The system that will supply information for a number of management functions, such as personnel absence record, hourly paid staff wages etc.

4. System contain highly sensitive automatic activating devices on both intruders and fire alarms systems.
5. Closed circuit television in highly sensitive areas
6. Bomb card and other types of protection against ballistic weapons necessary in military bases and installations.



**PLATE 4-05** Cardkey Systems' D2000 system controlling up to 4000 programmable Cardkeys. It also can control other features of an integrated security system, such as alarms and closed-circuit television.



**PLATE 4-07** Cardkey Systems' MD4000 attendance-recording system.

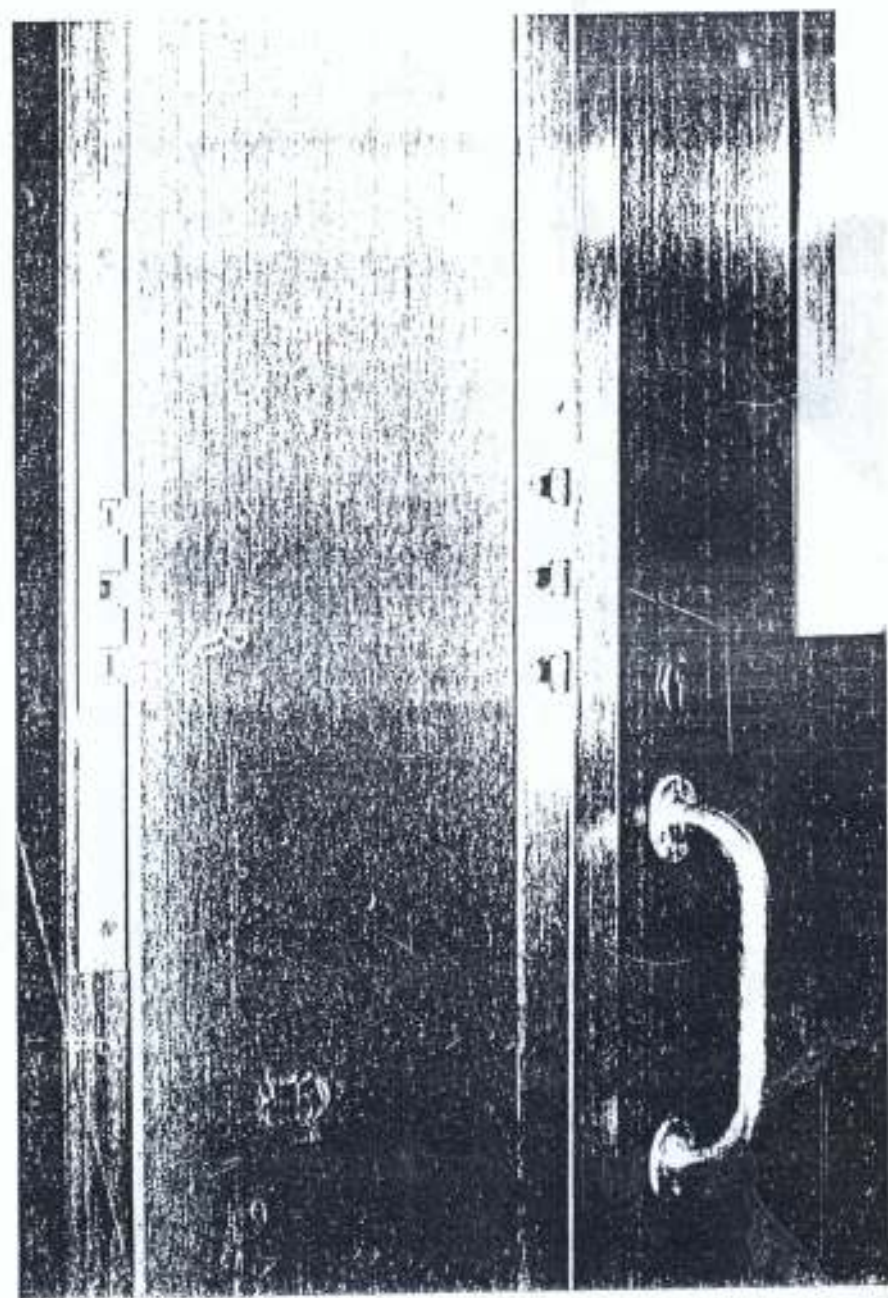
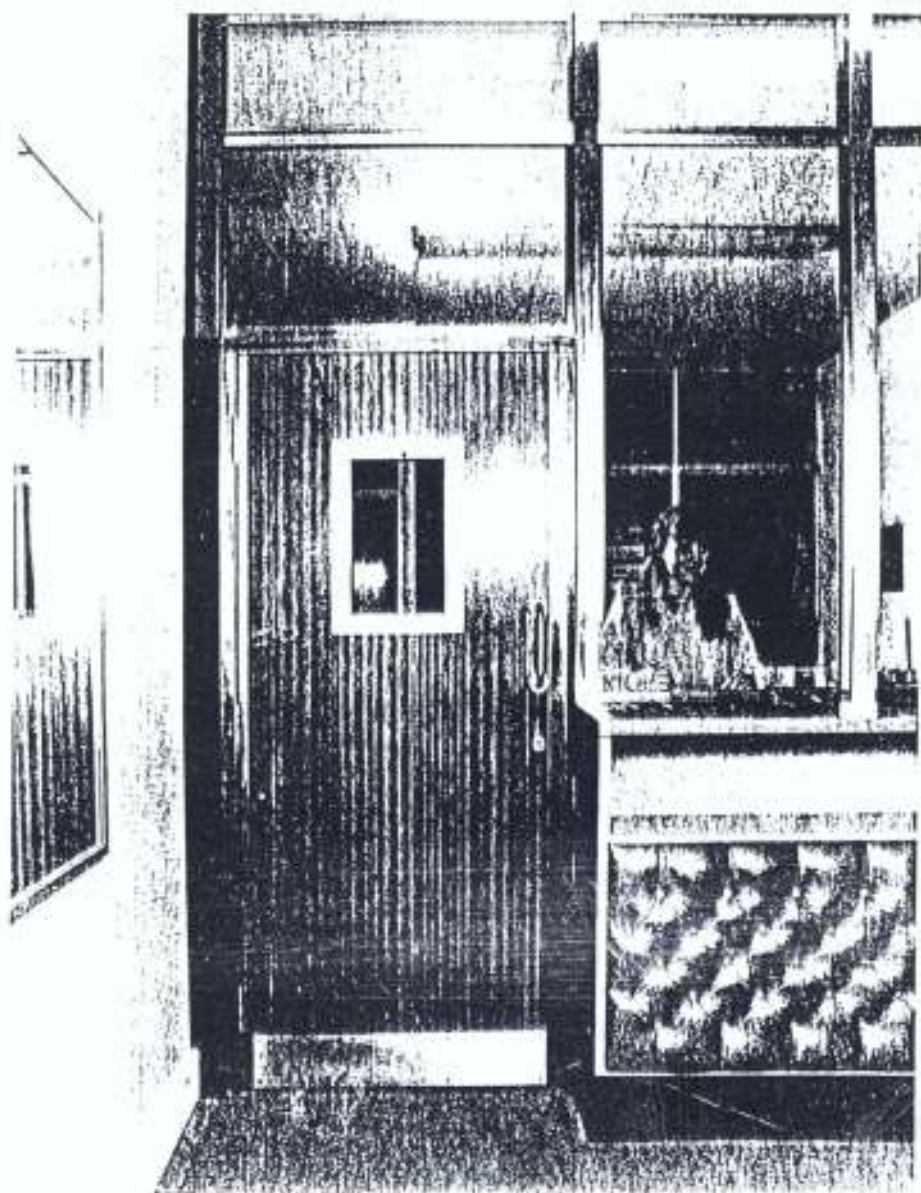


PLATE 408 25 2000 electric solenoid release and lock from Chubb Security Installations PLATE 408

*Entrance doors with a difference*



Chubb staff security door PLATE 4.09

#### **4.18 TYPES OF SECURITY**

Security which in our context has been previously defined as protection of a building and its occupants and its effects are broadly categorized into four. They are as follows.

##### **4.18.1 DEFENSIVE PROTECTION**

This form of protection involves creating barriers between would be assailants and the interior of the building or the site. Barrier devices include Locks, access system, security fencing, strengthening of portions of the building shell in order to impede illegal entry.

##### **4.18.2 FAIL SAFE PROTECTION**

Whenever the defensive or barrier devices prove ineffective, the next available category is fail-safe. When the defenses have been breached, as it were, then the incursion must be signaled and alarm raised. The intruder detection and alarm as well as fire detection and alarm are included in this category.

##### **4.18.3 SPECIALIST DEVICES**

As the name suggests, specialist security equipments which are not in general use in most buildings fall under this category. They include

1. Cash point security screens
2. Pay counter & domestic wall and floor safes
3. Close circuit Television (CCTV.)



PLATE 4.010 Type II Counter Screen from Chubb Security Installations

This pay window has a spring loaded steel transaction tray which, when opened by the cashier, allows a 25 mm gap only - sufficient for the exchange of cash, tickets, receipts, etc., but preventing hands or weapons passing through.

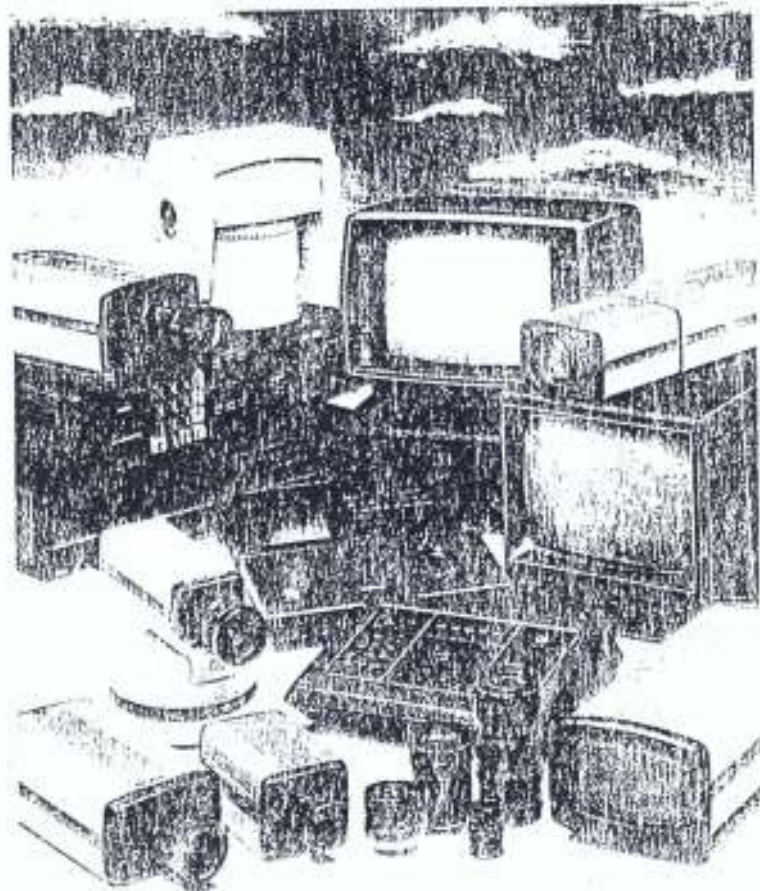


PLATE 4-0-11 *Closed-circuit television*

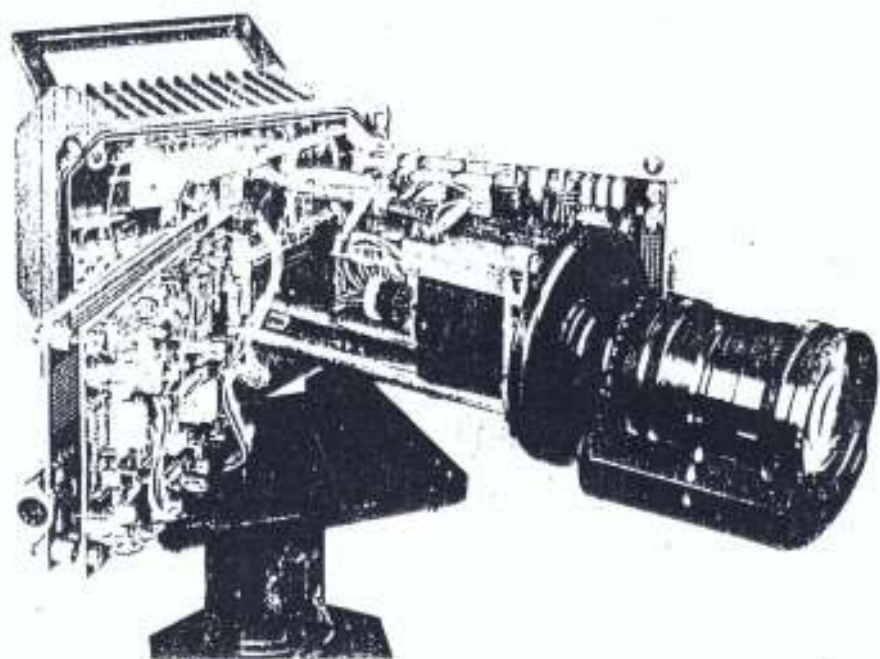


PLATE 4-0-12 Philips' Video 50 cctv camera

#### 4.18.4 PASSIVE PROTECTION

This category of protection has nothing to do with the devices or systems imposed on the building. Rather, it has to do mainly with the design of the building itself, its layout, materials specification and construction.

It entails the ease with which a building can discourage attackers by creating in its design areas which are automatically policed and choice of materials which can discourage vandal attacks.

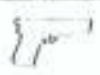
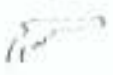
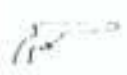


This is more a question of gauging the sociological trends correctly and designing accordingly than in dealing with security devices and systems only. Other materials considered to be secondary in order of priority and come in when all the ingenuity of the designer has been exhausted because the passive protection probably costs the building nothing or next to nothing, the skillful designers makes the most out of this irrespective of type of occupancy and thus ensuring best value for money in a high crime business environments.

However, depending on circumstances and type of buildings, there may be need to apply a cross breed of the various categories as analyzed in varying doses. Calling on experience, Holton (AIA) reflects that technical requirement of security for the people, information properties and buildings can be accommodated smoothly and economically within established larger process of architectural design.



PLATE 4.0.10 Philips' Night Lynx camera

TABLE 4.11 Impactex Bullet resistant glasses

BS 5051 classification	Details of weapon		Details of ammunition		Range	Number of strikes*	Thickness of Impactex required to satisfy Standard
	type, calibre etc	striking velocity	type	mass			
G0 	Handgun, 9 mm military parabolium; 254 mm barrel	405 m/s 115	9 mm MkZ2 Standard	7.5 g	3 m	1	26 mm BS, 30 mm RS, 26 mm], 30 mm]
G1 	Handgun, 0.357 magnum; 222 mm barrel	450 m/s 112	Soft point, flat-nose bullet	10.2 g	7 m	1	35 mm BS, 35 mm]
G2 	Handgun, 0.41 magnum; 222 mm barrel	471 m/s 119	Soft point, flat-nose bullet	15.6 g	7 m	1	40 mm BS, 40 mm]
G3 	Rifle, 7.62 mm; 533 mm barrel	830 m/s 119	7.62 mm ball Nato standard	9.5 g	10 m	1	50 mm BS, 50 mm]
S 	Shotgun, 12 bore magnum (full choke); 711 mm barrel	360 m/s ±30	76 mm magnum cartridge, BB shot	46 g	3 m	2	35 mm BS, 35 mm]

\*Pattern of strikes: for classifications G0, G1, G2 and G3, equilateral triangle, strikes 100 mm apart within a 200 × 200 mm square in centre of sample; classification S, two shots coincidental in centre of sample.

[To conform to BS 5051 these glasses must be fitted with a secondary splinter screen.

TABLE 4.11

## 4.19 FURTHER SECURITY PROPOSAL

### 4.20 THE PRINCIPLE OF "OPEN ENCLOSURE" OR "INVINCIBLE OBSERVER"

This principle motivated by a folklore adage and the daylight states in the first principle that everyone who occupies an unsupervised solitary enclosure (private) has an innate tendency or develops one towards misdemeanor.

Second Principle: That tendency can be curtailed (deterred) by real or imagined crowdedness, real or imagined exposure and the resultant fear of apprehension. This is the principle of "open enclosure" or invincible observer.

#### 4.20.1 Explanation:

- (1) Most crimes occur in solitary confinements, dark places or dark hour of the day. This is because every space is a potential crime spot in the dark illumination makes spaces-open.
- (2) Misdemeanor in enclosed spaces ranges from idling away precious time, gossiping, dozing, vandalisation of properties, documents, archival materials, sexual assaults and other general opportunity crimes.
- (3) One of the greatest fear is the fear of the unknown
- (4) Misdemeanors are applicable in homes as they are in the offices
- (5) They can be curtailed by the principle of open enclosure which is built on culture of passive and unconscious supervision of spaces

#### 4.21 ARCHITECTURAL SOLUTION

Architectural proposition would manifest inform of open enclosures. These are spaces (enclosed) but open which are supervised generally and unconsciously by either co-workers, passer by or casual observer through deliberately designed

features. This then obviate the need for expensive electronic gadgets in surveillance or it may be used in conjunction with some.

## **4.22 ARCHITECTURAL SPECIFICATIONS/DETAILING**

Architectural specifications to this effect include the following:

**4.22.1 A. General Office Layout:-** Open layout or multiple workstation (shared offices) to be imbibed in offices and the partitioning should discourage solitary confinement except in offices of very senior executives who are self supervisory to some extent.

**4.22.2 B. FLOOR DETAILING:-** To discourage "shrinking" or "theft by employee" especially when a business enterprise's occupancies spreads to more than one floor, purpose built suspended floor should be designed incorporating glazed (see through) panels at intervals. This gives the impression of supervision from the ceiling (top).

This principle is similar to that of double volume. Its advantage lies in ability to see through to the lower floor without compromising on the useable area of the upper floor. The detailing must be done with the structural stability of the floor in mind. Fire safety must also be borne in mind in specification of material for the openings.

**4.22.3 C. INSPECTION PANELS:-** These are see through inspection panels with security glazing in doors which are small enough to prevent unauthorized entry yet big enough to permit view of the interior space.

**4.22.4 D. PARTITION WALL:-** Partition walls with reinforced see through inspection panels used between semi enclosed or enclosed work stations.

**4.22.5 E. GLASS BLOCK WALL:-** When glass block is used as partition in external walls for similar reason, they should be bullet resistant.

**4.22.6 F. GLAZING:-** All glazing to be reinforced and bullet resistant impactex glass or magnifying glasses, in high risk occupations.

#### **4.22.7 OTHER AREAS OF APPLICATION:**

(i) Stairhall with open stairwells large enough to encourage inter floor visibility or visualization

F. ii. Use of double volume planning of office

G. Use of atrium

H. Courtyards

I. Profuse lighting (daylighting and supplementary artificial lighting)

#### **4.22.8 APPLICABILITY**

The principle is applicable in both residential homes, office environment, super markets, shops and generally where risk of theft, or security is certain.

#### **4.22.9 CONTRIBUTION OF PROFUSE LIGHTING**

1. It lessens the incidences of induced crimes through environmental design.
2. It create an opportunity for early exposure and resultant apprehension.
3. Increased working spaces found in the open stair wells and atrium for fire service workers in fire incidences especially incases of failure or Sabotage of the installed fire safety devices.
4. The open enclosure increase the environmental comfort of the occupants through natural and unrestrained ventilation and lighting through the open wells atrium and courtyards

**4.23 NEGATIVE SIDE EFFECTS AND REMEDY:-** The negative side effect noticeable are the loss of privacy and risk of fire. These can be corrected by the selective use of this principle only in sensitive and high security areas. The high executive office may be discretionally exempted and materials with high fire resistance should be selected in use.

## **4.24 SYNTHESIS OF STUDY**

### **4.24.1 THE PROJECT TOWN (LAGOS)**

#### **4.25 GENERAL DESCRIPTION**

The project town is Lagos in Nigeria and it lies in the belt extending 15°N of the equator. Lagos has been the political and commercial capital of the Nigerian nation since her independence in 1960 until recently when the political capital status was ceded to Abuja the new capital.

By all reckoning, this town still remain one of the principal center of commercial/Industrial activities in Nigeria courtesy of the Lagos port and multiplicity of industries. A city reputed for its aquatic splendour, it is subdivided shaped and defined by the lagoon into islands of which are interconnected by bridges and the likes. Victoria island is one of such islands that make up Lagos and connected to its mainland. A substantial part of these Islands have undergone reclamation such that the menace of the sea has been largely curtailed and the river routes channeled. This is partly to ensure safety of lives and also to increase the liveable sand buildable area of the towns. All these islands have merged to give Lagos its metropolitan status.

Lagos, which is reputed to be the smallest in terms of landness in comparison with other states of Nigeria, in contrast probably the most populous and the most densely built up city in the West African sub region.(Fig 4.1)

## **4.26 GEOGRAPHICAL DESCRIPTION OF PROJECT TOWN**

### **4.26.1 NATURAL SETTING**

As stated above, Lagos Town is subdivided, shaped and defined into Islands by meandering rivers. Additionally the town is bounded in the south by the Atlantic ocean. Hence it is rightly classed among the coastal towns.

### **4.26.2 CLIMATE**

Geographically, it lies in the belt extending to about 15°N of the equator. Therefore it falls within the warm humid climate and there is very little seasonal variation throughout the year. The only punctuation being that of period with more or less rain and gusty winds. The climate of a place, or city has been described as the weather conditions of the area studied over a long period of time.

These weather conditions are influenced by a host of indices leading to variability in weather. Among the most prominent climatic features of Lagos which also extend to the project site are those stated below.

#### **4.26.3 AIR TEMPERATURE**

The dry bulb temperature (DBT) in the shade reaches a mean maximum during the day between 27°C and 32°C, but occasionally it may exceed the latter value.

At night the mean minimum varies between 21°C and 27°C. Both the diurnal and annual ranges of temperatures are quite narrow. Hot discomfort which can be experienced for most part of the year makes provision of permanent ventilation essential (Fig 4.9 and 4.10)

#### **4.26.4 HUMIDITY/VAPOUR PRESSURE**

The relative humidity (RH) is usually the expression of the ratio of the amount of moisture present in the air to the amount of moisture which the air could retain at a given temperature. This is expressed in percentage. The relative humidity remains high all year round standing at about 75% most of the time but it may vary from 55% to almost 100%. Vapour pressure is steady in the region of 2500 to 3000N/m<sup>2</sup>. (Fig 4.11)

#### **4.26.5 PRECIPITATION**

Precipitation refers to the sum total of rain, snow, hail, dew, frost, which a particular area experiences. The tropical nature of Nigeria means only the rainfall and dew are in context.

Precipitation is high throughout the year, generally becoming more intense for several consecutive months. (Table 4.1 and Fig 4.8)

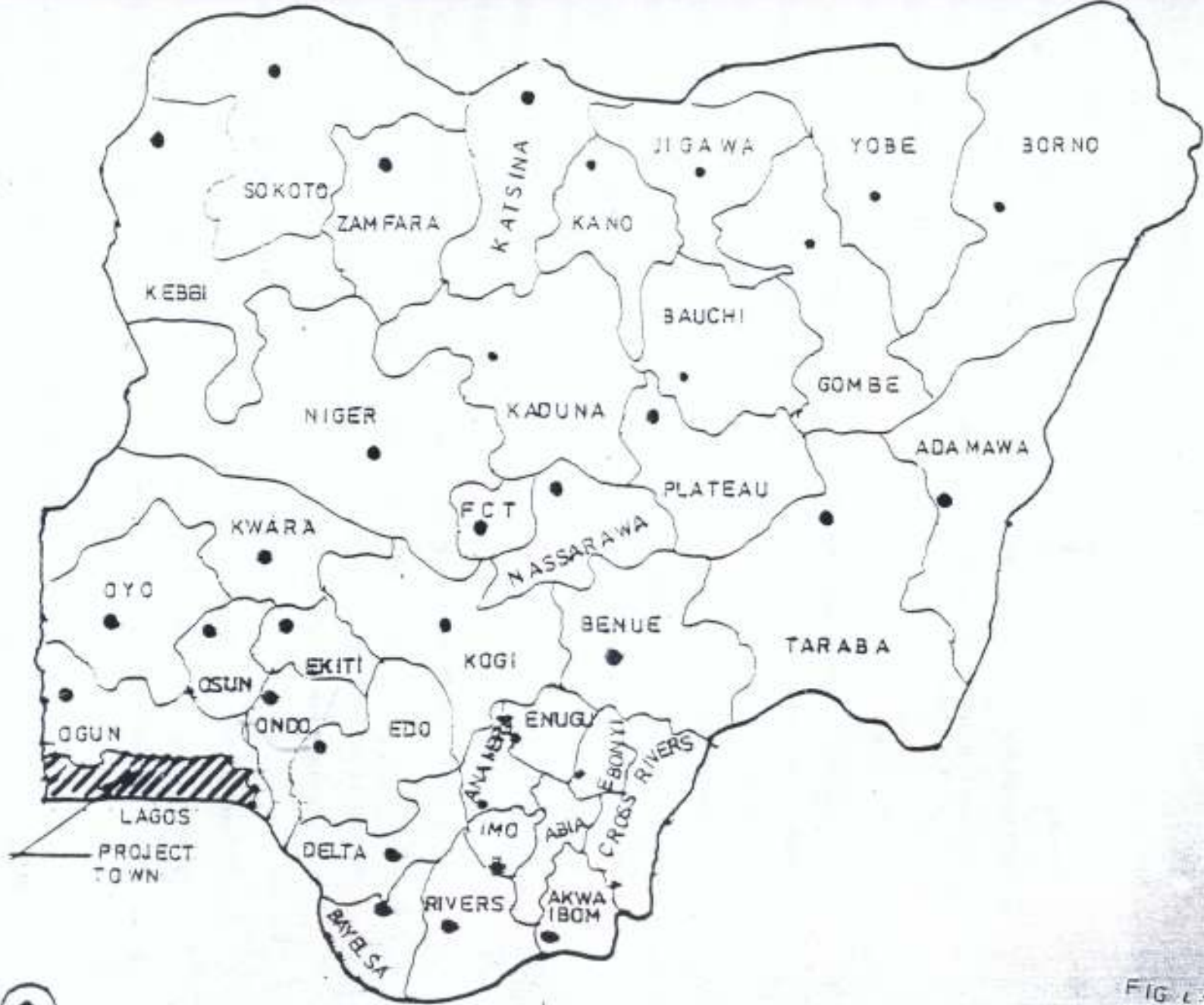


FIG. 1.1

#### **4.26.6 SOLAR RADIATION**

This is partly reflected and partly scattered by the cloud blanket or the high vapour content of the atmosphere. Therefore the radiation reaching the ground is diffused but strong and can cause painful sky glare. Cloud and vapour content also prevents or reduces outgoing radiation from the earth and sea to the night sky, thus accumulated heat is not readily dissipated. This is partly source of hot discomfort and must be given consideration in the design of the project.

#### **4.26.7 WIND**

The prevailing winds are North East and South West trade winds. Because of the location of Lagos in an extreme edge of Nigeria. The harshness and harmattan effect of the North East trade wind is little felt except for the purpose of cross ventilation. However, the town feels the greatest impact of the cool moisture laden South West trade wind. Wind velocities are low and ranges between 6.7m/s, calm periods are frequent but strong winds can occur during rain squalls. This could be as high as between 30-70m/s (150mph or force12) occasionally. Building structure must be designed to withstand this.

#### **4.26.8 VEGETATION**

Lagos is located within the mangrove swamp. The natural vegetation is made up of coconut palm, date palm, grassland, lightly built fruit trees in areas close to the lagoon. Heavily built trees are common in the hinterland. Vegetation grows quickly due to frequent rain and high temperature and little light is reflected from the ground.

#### **4.26.9 WATER TABLE**

The subsoil water table is generally high especially around the Island. This must be borne in mind in the choice of foundation types, construction method and materials. Generally when high rise is envisaged, the use of raft or drive pile is favoured.

#### **4.26.10 SPECIAL CHARACTERISTICS**

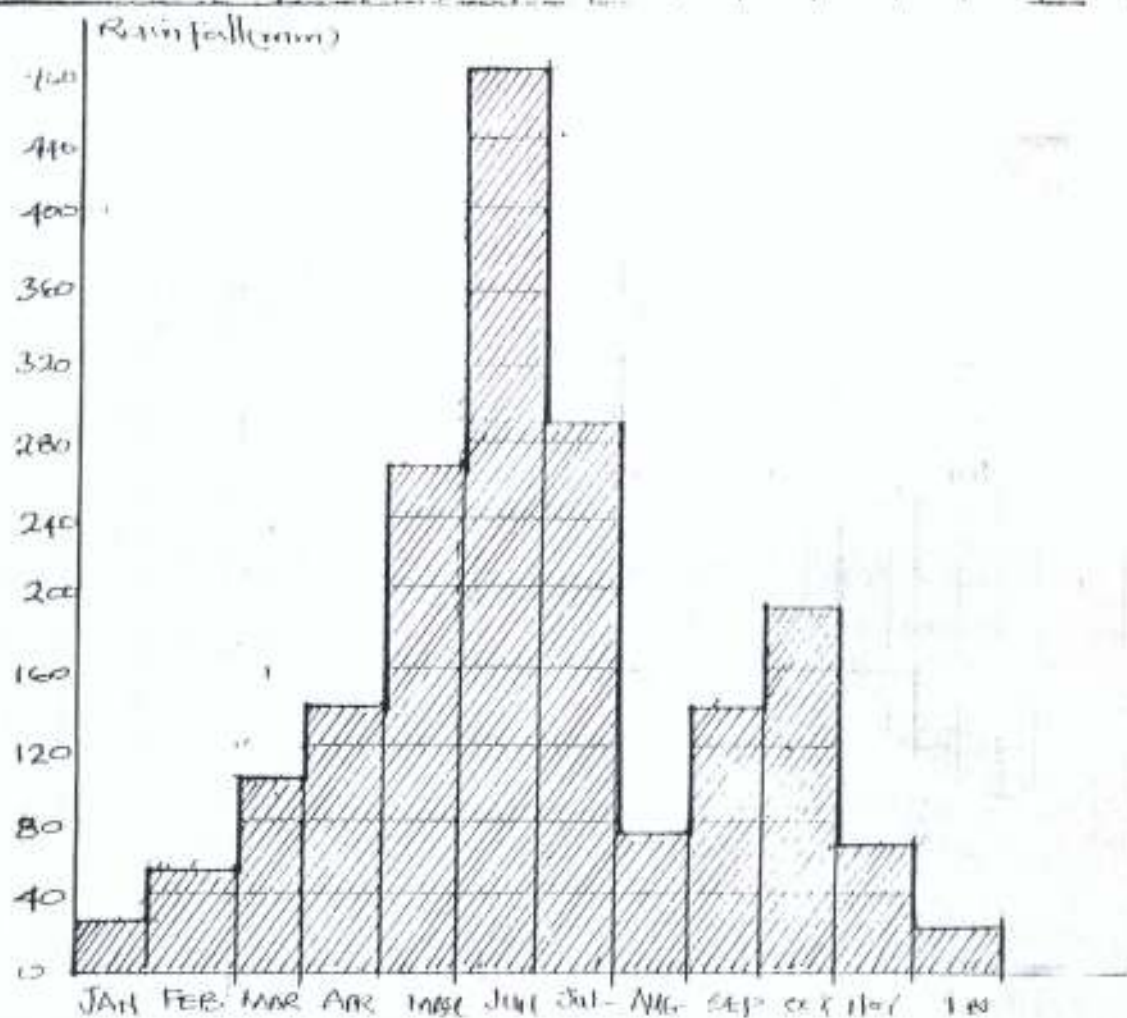
High humidity accelerates mould and algal growth, rusting and rotting. Organic building materials tend to decay rapidly. Mosquitoes and other insects abound. Thunder- storms are frequent and they are accompanied by air -to air electrical discharge.

## 4.26.60 SPECIAL CHARACTERISTICS

High humidity accelerates mould and algal growth, rusting and rotting. Organic building materials tend to decay rapidly. Mosquitoes and other insects abound. Thunder-storms are frequent and they are accompanied by air-to-air electrical discharge.

TABLE 4.12

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
RAINFALL	31	45	93	148	271	460	280	18	111	197	28	21



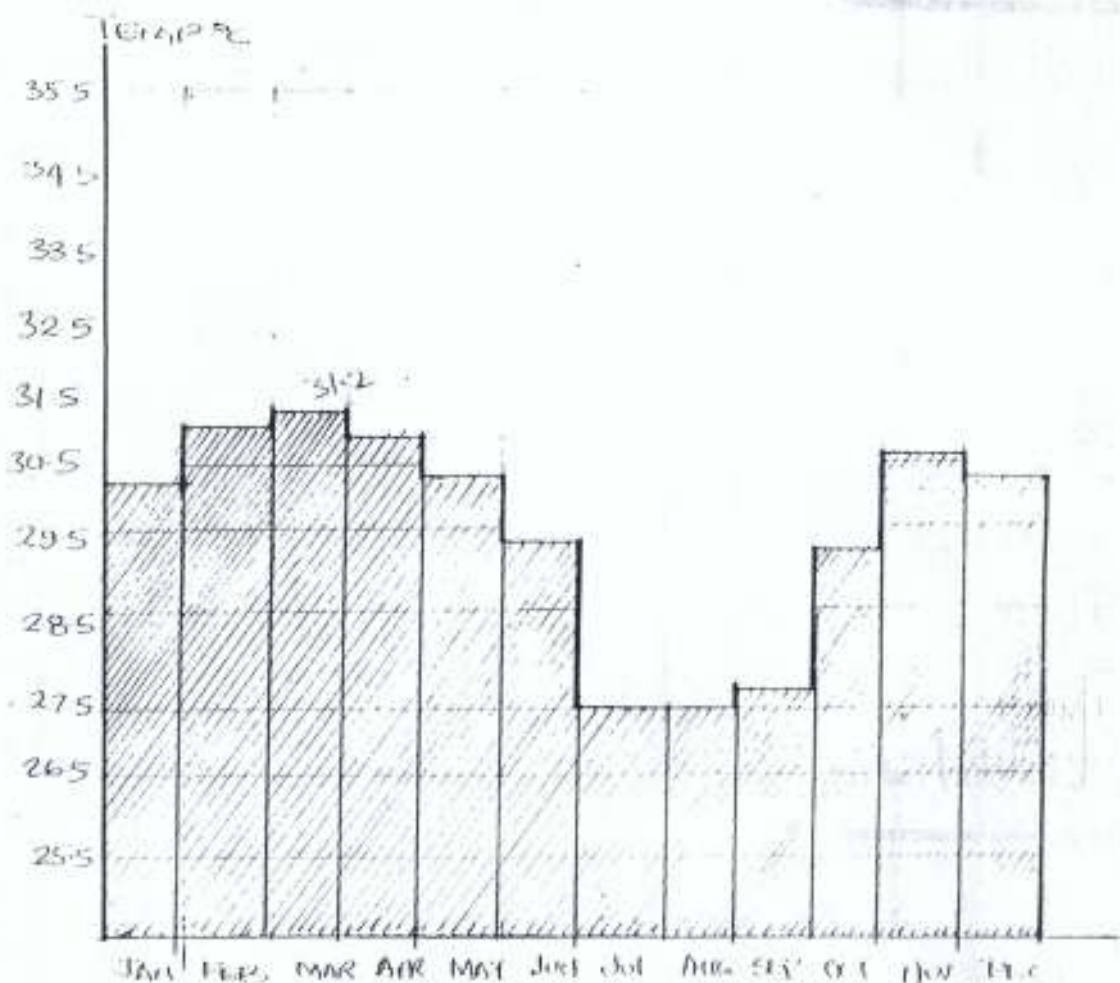
**MEAN MONTHLY RAINFALL FOR LAGOS 1952 - 75**

FIG 4.8

FIG 4.8

413  
TABLE 413

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	30.3	30.9	31.2	31.0	30.4	28.9	27.5	27.7	29.1	30.1	30.4	30.4



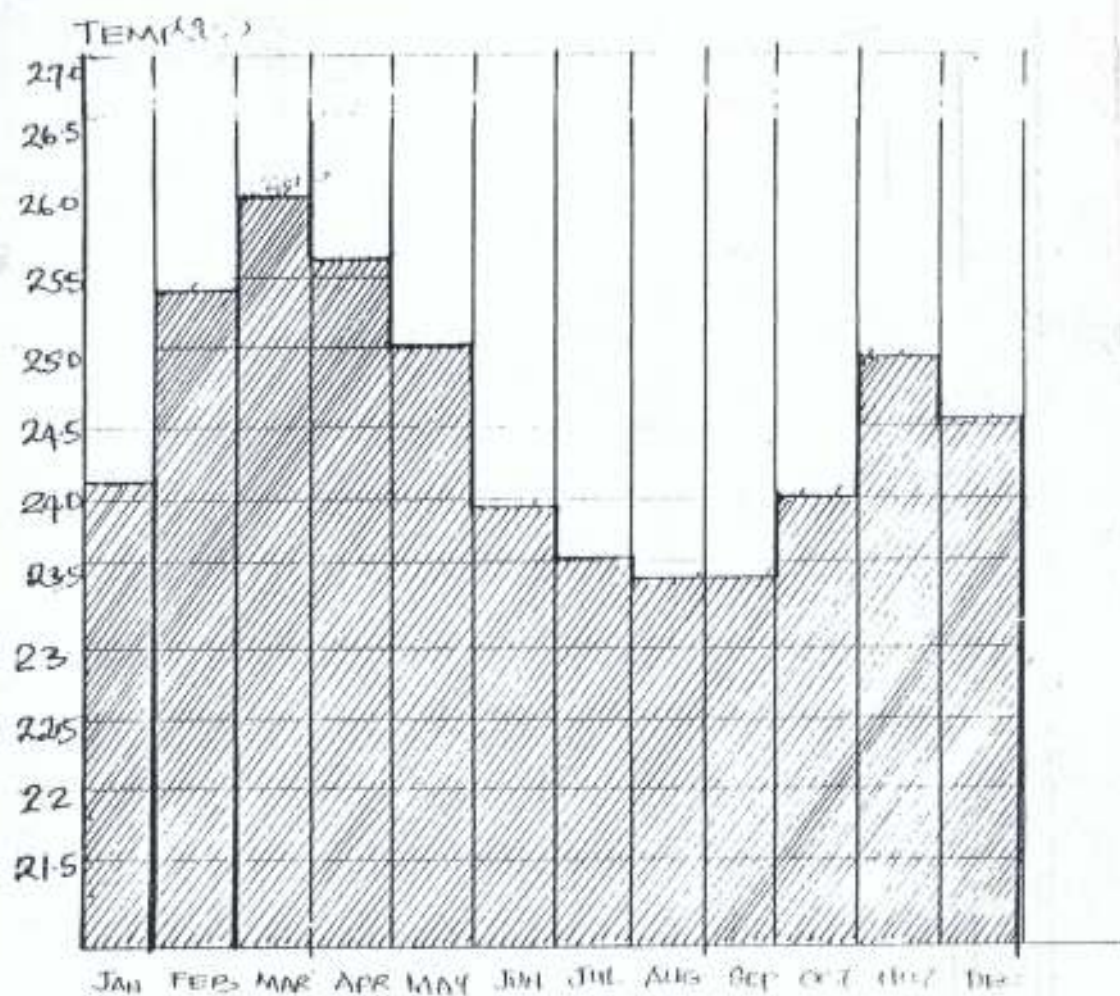
MEAN MONTHLY MAX TEMPERATURE FOR LAGOS (1956-75)

FIG 49

FIG 49

TABLE 44

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MIN TEMP	24.1	25.4	26.3	25.7	25.0	23.9	23.6	23.5	23.5	24.0	24.9	24.5

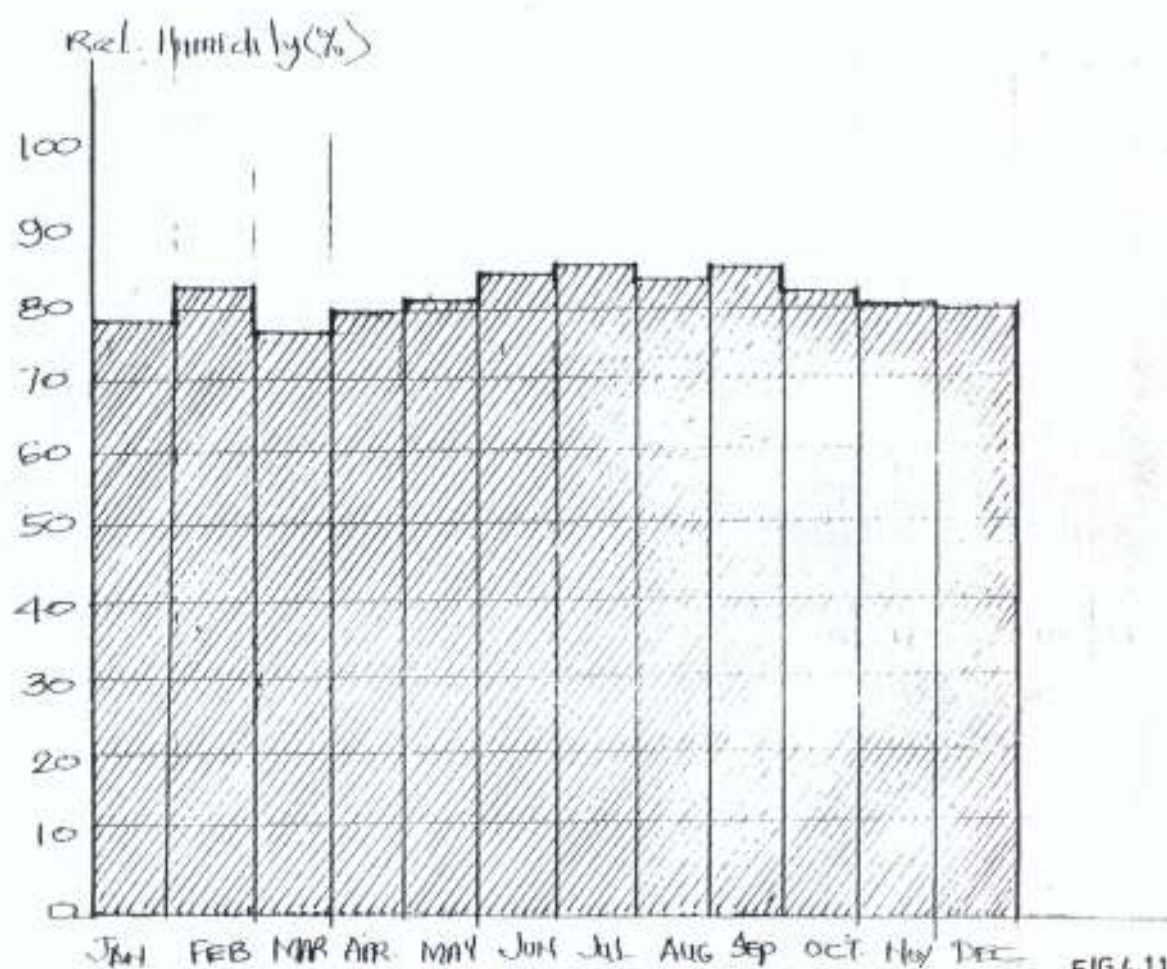


**MEAN MONTHLY MIN TEMPERATURE FOR LAROS**

FIG 4-10

TABLE 415

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
REL. HUMIDITY	79.5	80.5	79.0	80.0	81.5	84.5	85.0	84.0	85.0	83.5	81.5	80.5



MEAN MONTHLY RELATIVE HUMIDITY FOR LAGOS 1956-75



**PLATE 4.1: PHOTOGRAPH OF COWRIE HOUSE PRESENT HEAD OFFICE  
SOURCE: FIELD SURVEY**

# MAP OF LAGOS STATE

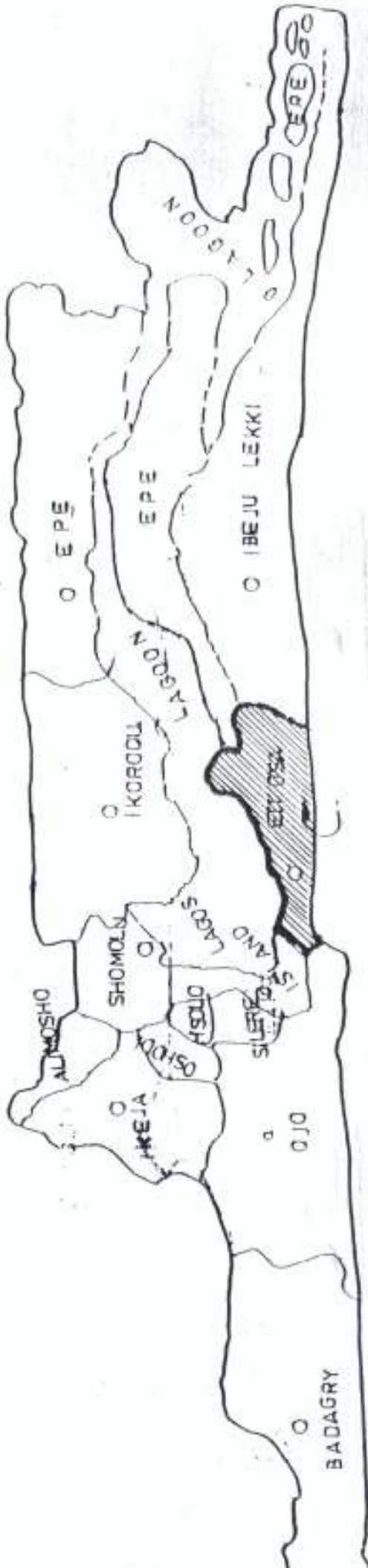


FIG 4-2

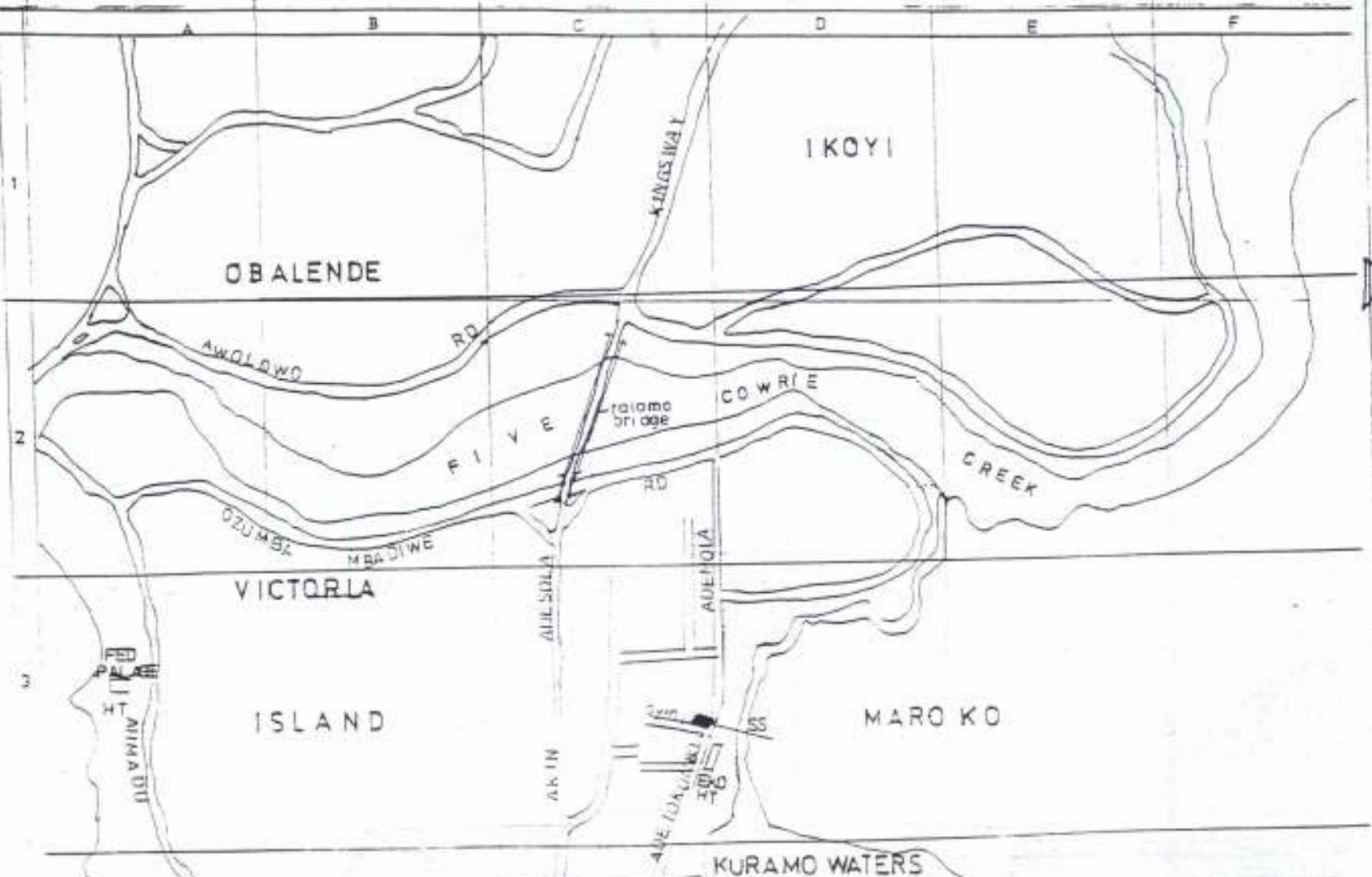
## **4.27 SITE ANALYSIS**

### **4.27.1 LOCATION**

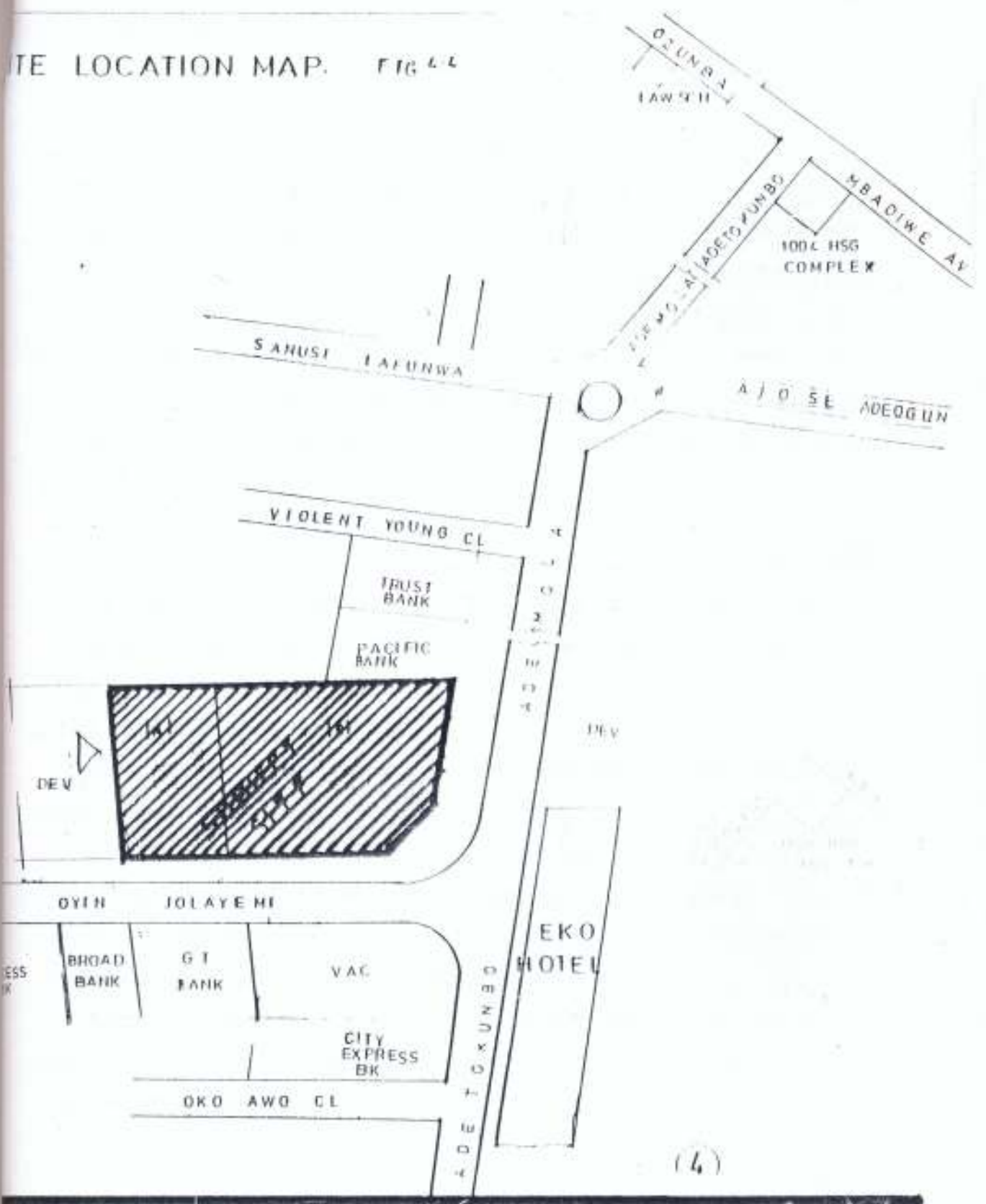
The project site is a corner piece of land, located along Adetokunbo Ademola and Oyin jolayemi streets in Victoria Island, Lagos.(fig 4.3 and 4.4)

Adetokunbo Ademola Street veers off the popular Ozumba Mbadiwe way immediately after the Law school at the junction of the 1004 housing estate. Through the same Ozumba Mbadiwe way, the site is linked to the Obalende and by extension mainland by the bridges on the three cowrie creek at different points.

# STREET MAP-ETIOSA LGA



TE LOCATION MAP. FIG 4-2



#### **4.27.2 DESCRIPTION**

The site which is defined by beacon Nos S3660, S3661, S3298, C13076 and C13077 and covers a land area of 2782M<sup>2</sup> is slightly sloppy and irregular in shape. It is situated within a well developed portion of the city and its fronting into Oyin Jolayemi is of note. Oyin jolayemi being a street which stretches over about 200 metres parades about ten bank offices of different names among other offices dotted along both sides of the street. It clearly represents one of the corporate zones of the city and it could be nicknamed "Bank Avenue". (Fig 4.12)

The site is bounded on the north side by pacific bank office, on the south by Oyin jolayemi street and immediately opposite of which is a vacant land which is to house the Bank Headquarter of Guarantee Trust Bank.

On the West of the site is a two storey office building while it is bounded on the East by the Adetokunbo Ademola Street on the other side of which lies the Eko hotel and suites. ( plate 4.3)

#### **4.27.3 ACCESS**

Access to the site is provided by the two adjoining roads both of which are two carriage ways. However vehicular access is proposed to be brought into the site through the less busy roads from the junction for security reason and to avoid traffic problem at the traffic node.

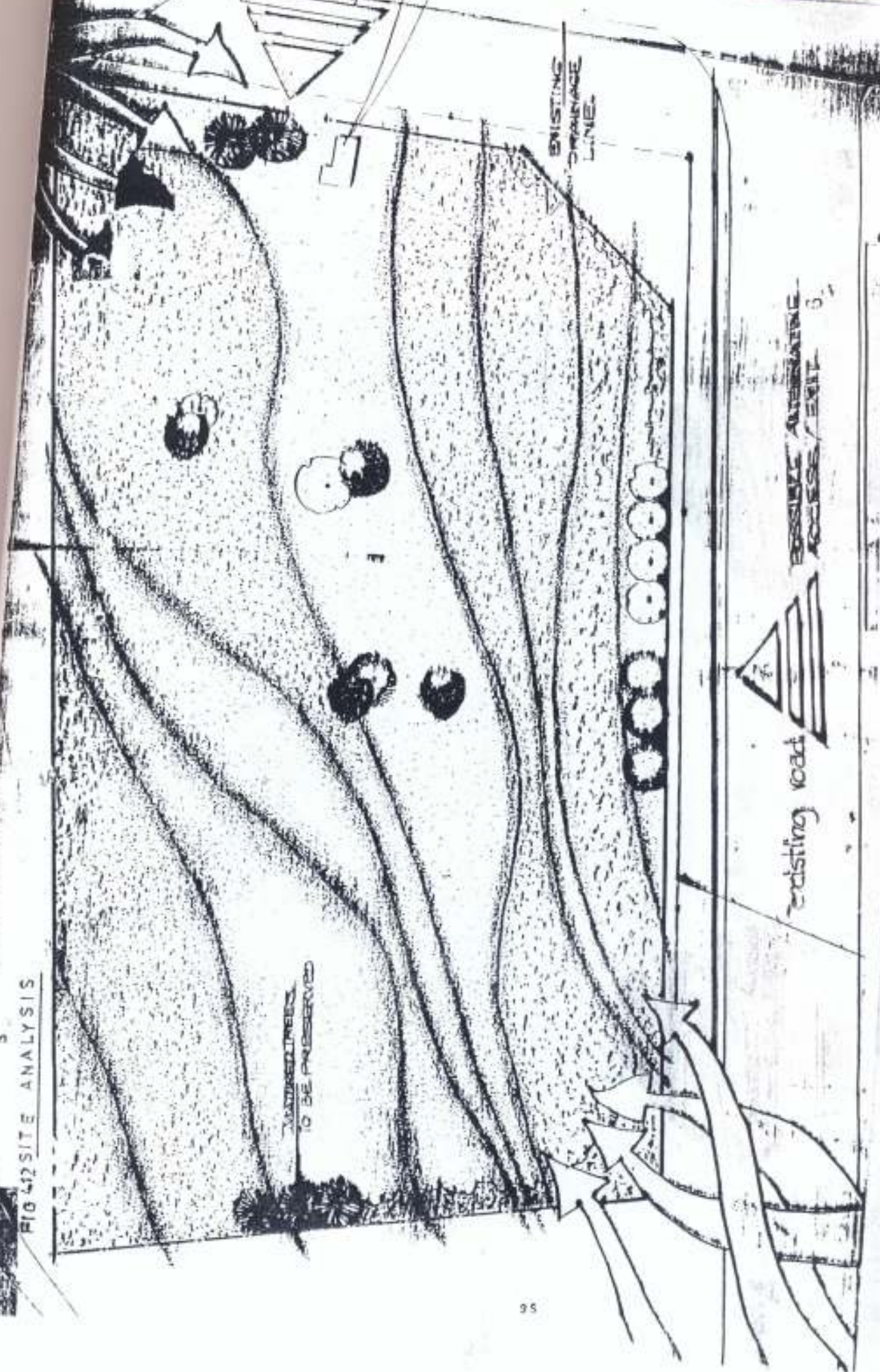
#### **4.27.4 TOPOGRAPHY/DRAINAGE**

The site topography is described as a flat terrain with slight undulations and a slight slope to the east.

Since the slope is not substantial, it is not likely to pose a constraint to development, it does not call for wholesale remodeling of the site either. Since cut and fill operation during site clearing will be sufficient. The terrain makes the site drainable, alignment of road network on site is feasible.

Drainage is influenced by the topography of the site. The site is not well drained naturally but could be made drainable through laying sand filling. There is a public drain that runs parallel to the main road.

FIG 412 SITE ANALYSIS





**PLATE 4.2: PHOTOGRAPH OF SUBJECT SITE SHOWING EXISTING BUNGALOW TO BE  
DEMOLISHED SOURCE: FIELD SURVEY**

the site has been stripped of its natural vegetation, because it now falls within well developed portions of the town. However, the existing landscape is a patchy grassland with unkept shrubs and lends itself to easy landscaping after design due to its location

#### **4.27.6 ASPECT/ORIENTATION**

The site runs approximately North- South thus allowing for a reasonable degree of orientation of structures to take advantage of the prevailing North- East (NE) and South West (SW) trade winds for cross ventilation where necessary. However in high rise structures as the one being proposed, this natural ventilation is a complement of the artificial one generated via cooling chambers.

The site is a corner piece. Therefore design and orientation of building would be such that the advantage of the double frontage is utilized.

#### **4.27.7 EXISTING LANDUSE**

Even though Victoria Island was to be a residential district, later development has changed this zoning. It is now officially zoned as one of the central business districts (CBD) of Lagos. The site which is presently vacant is surrounded on two sides by office buildings while it fronts on two sides to adjoining roads.

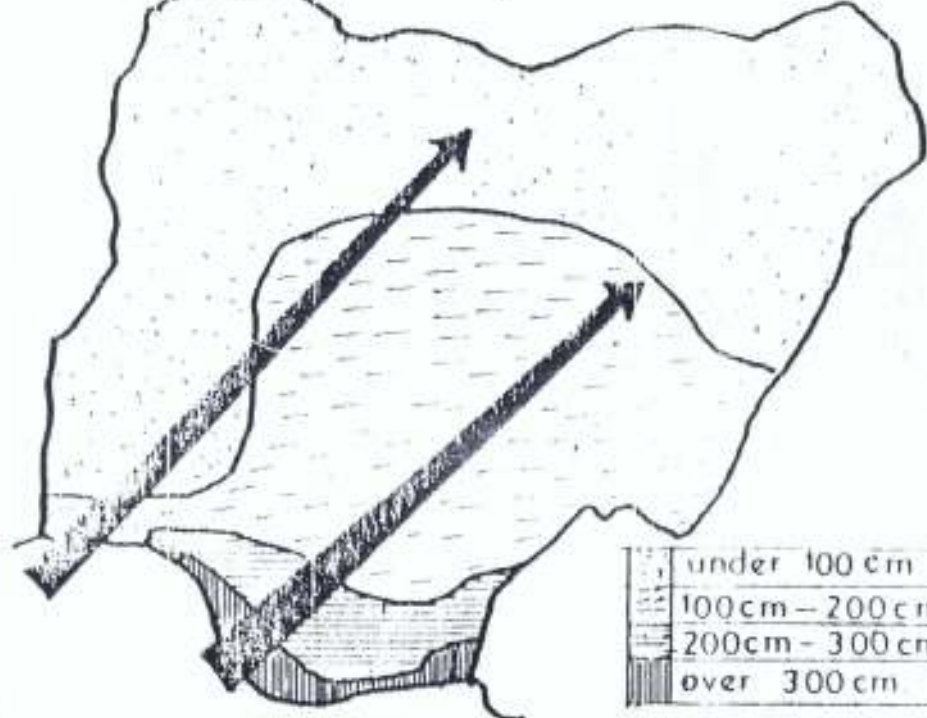
#### **4.227.8 EXISTING INFRASTRUCTURES**

Lines of basic city infrastructure such as electricity, water supply main, telecommunication, waste water drainage outlets etc. lie in close proximity to the site.

**4.27.9 SITE ASSETS/LIABILITIES** The site assets refer to those valuable or useful things that can be attached to it. The site which are beneficial to the proposal.

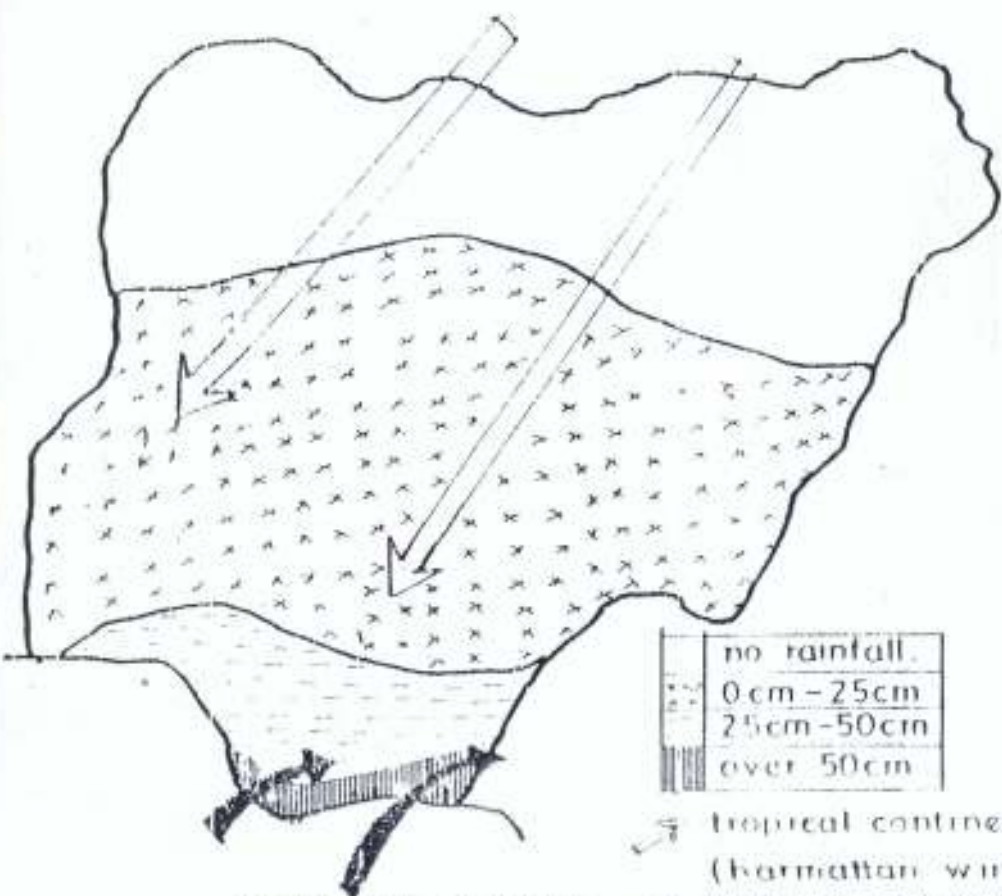
The most prominent amongst the site assets are its location

1. Its location at the junction of two roads as this creates publicity, allows easy publicity and access to site, encourages good vista and landscaping
2. Location within a central business district creates easy access to customers thereby making the project marketable.
3. Location within precinct of other banks allows for shared burdens of security.



**SOUTH - WEST  
TRADE WIND.**

↘ tropical maritime air mass.  
(S.W. Trades).



**NORTH - EAST  
TRADE WIND**

↘ tropical continental air mass  
(harmattan winds).

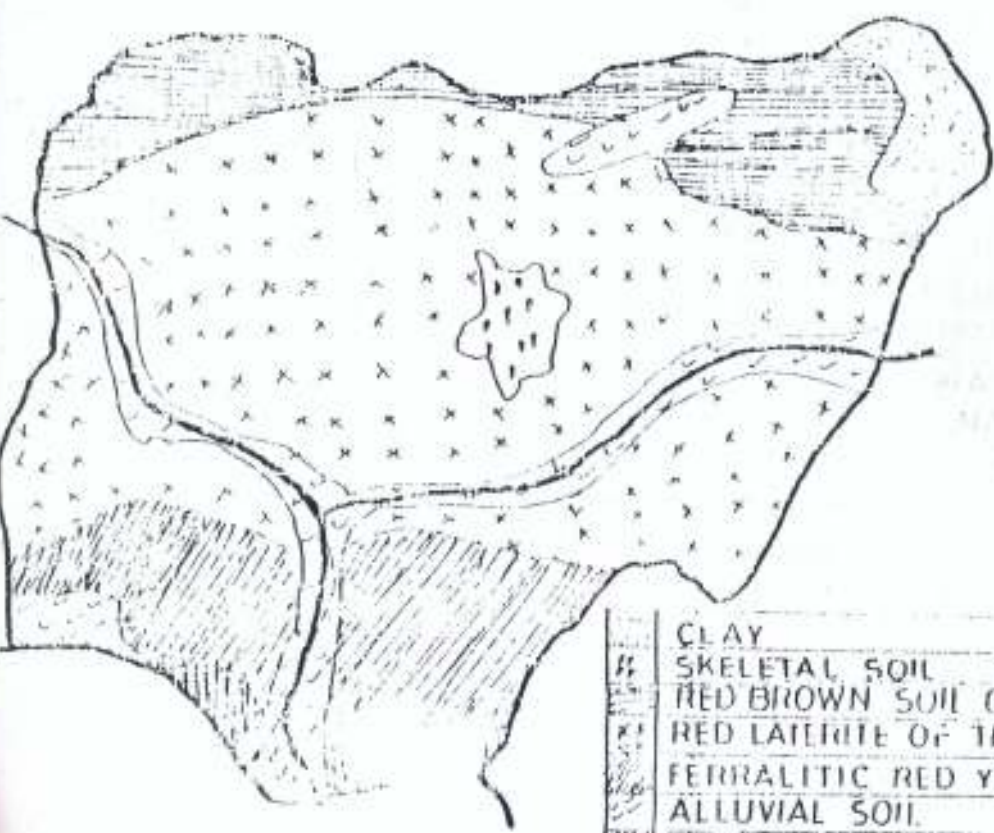
↘ tropical maritime air mass.



[Pattern: Vertical lines]	MOUNTAIN GRASSLAND
[Pattern: Dotted]	SAHEL SAVANNAH
[Pattern: Horizontal lines]	SUDAN SAVANNAH
[Pattern: Vertical lines with dots]	GUINEA SAVANNAH
[Pattern: Horizontal lines with dots]	DRY WOODLAND
[Pattern: Vertical lines with dots]	MOIST WOODLAND
[Pattern: Horizontal lines with dots]	RAIN FOREST
[Pattern: Vertical lines with dots]	FRESH WATER SWAMP
[Pattern: Horizontal lines with dots]	MANGROVE SWAMP

NATURAL SOIL

FIG 4.6 B



[Pattern: Dotted]	CLAY
[Pattern: Horizontal lines]	SKELETAL SOIL
[Pattern: Vertical lines]	RED BROWN SOIL OF DRY TROPICAL AREA
[Pattern: Horizontal lines]	RED LATERITE OF TROPICAL AREA
[Pattern: Vertical lines]	FERRALITIC RED YELLOW SOIL OF H.
[Pattern: Horizontal lines]	ALLUVIAL SOIL
[Pattern: Vertical lines]	MANGROVE SWAMP SOIL

Figure 4.7A

RELIEF AND DRAINAGE

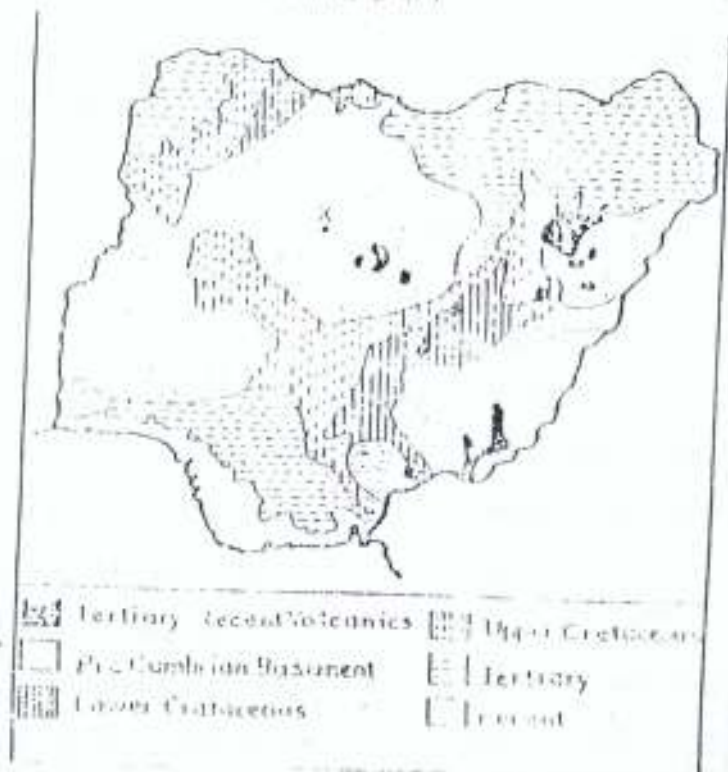
FIG 4.7 A



FIG 4.7 A

GEOLOGY

FIG 4.7 B



## **(B) SITE LIABILITIES**

### **i. SECURITY**

Unfortunately, the location of the site between two adjoining roads that stand as an asset, also constitute a liability when viewed from the point of view of security and access for pedestrians who have to cross busy roads.

### **ii. STATUTORY REQUIREMENT**

When the statutory requirements regarding set back from roads are duly observed, the buildable portion of the site becomes smaller.

#### **4.27.10 AMELIORATIVE MEASURES FOR LIABILITIES**

The liabilities could be turned to assets thus

- i. Accessing the site through the less busy of the two roads to prevent accident and traffic jam and for security.
- ii. Internal noise control measures taken in design of structure.
- iii. The open area could be landscaped to attract customers

#### **4.28 DESIGN PHILOSOPHY**

The design philosophy is reflected in buildable creative work of architecture which is functional and flexible. Special love for large span in order to give value for money.

#### **4.29 DESIGN CONCEPT.**

A concept can be simply defined as the underlying idea that informs a creative work. There are five basic concepts namely analogy, essence, ideal, pragmatic and metaphor. Additionally, there are derivative concepts. Most creative work (architectural) involve a blend of these in various forms and in different areas of design to achieve the aims of the designer.

The design concept of this project is a combination of some of the concepts

i) **The Analogy Concept:-** Refers to an idea patterned on similarity to an existing project. This concept is chosen because there is need to make the project at hand sympathetic to the surrounding city scape. The project site is located in Victoria Island dotted with high rise buildings and also for land economy, the proposed project is necessarily a high rise building.

ii) **Essence:-** This refers to the basic or most important things that make a project. What it is and by which it can be put into a class. A bank building apart from satisfying basic requirements of an office building namely, functionality, structural

stability, aesthetics must also be dignifying and exude confidence in would be customers. This concepts informs the elevational treatment and finishings.

**(iii) Dynamism:-** Defined as the physical power and forces producing motion. For a number of reasons, the power of any design lies not only in its ability to accommodate the present need, (functionality) but also in its adaptability to other and future uses. This concept of dynamism informs the adoption of open plan office layout for flexibility and use of vertical growth arteries for future expansion. The seeming surplus spaces created being offered out as lettable space in the interim.

**(iv) Security (Impregnability):-** The site concept and overall concept are anchored in security and it is denoted by either a cylinderlock or a master key. Since this duo are synonymous with security.

#### **4.30 ABOUT THE CONCEPT**

Indistinct as the dividing wall between the two words safety and security may be, it is true that they are not synonymous except in relation to fire. Safety means the protection of the occupants of the buildings (and to less extent their possessions) from accidents. However security means protection of those occupants, their possessions and actual property, which they occupy from willful attacks. Security is more encompassing.



FIG. 4.13 CONCEPT FOR M

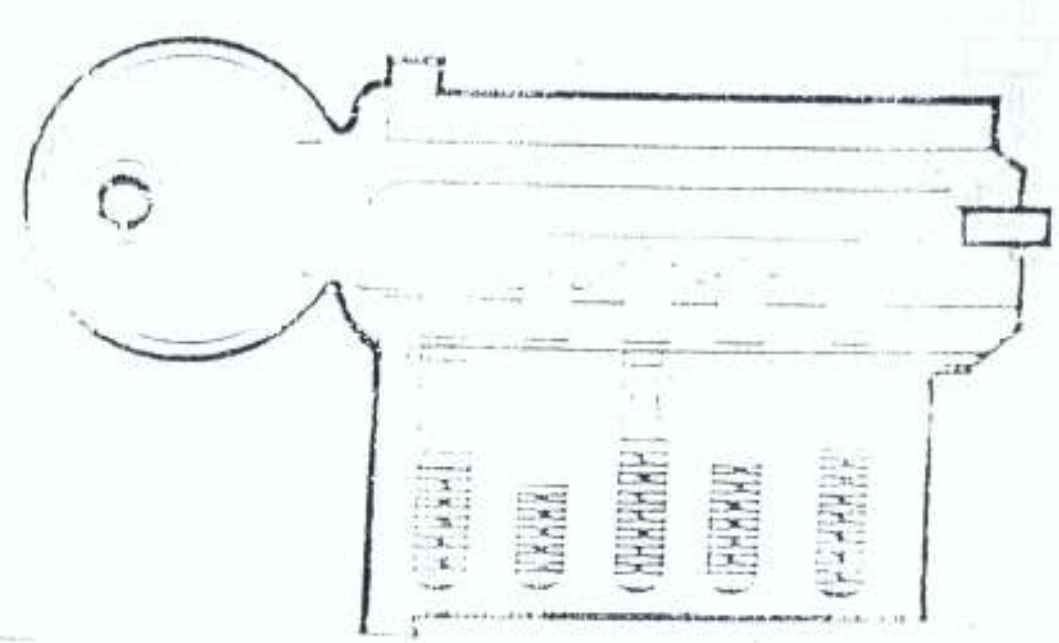
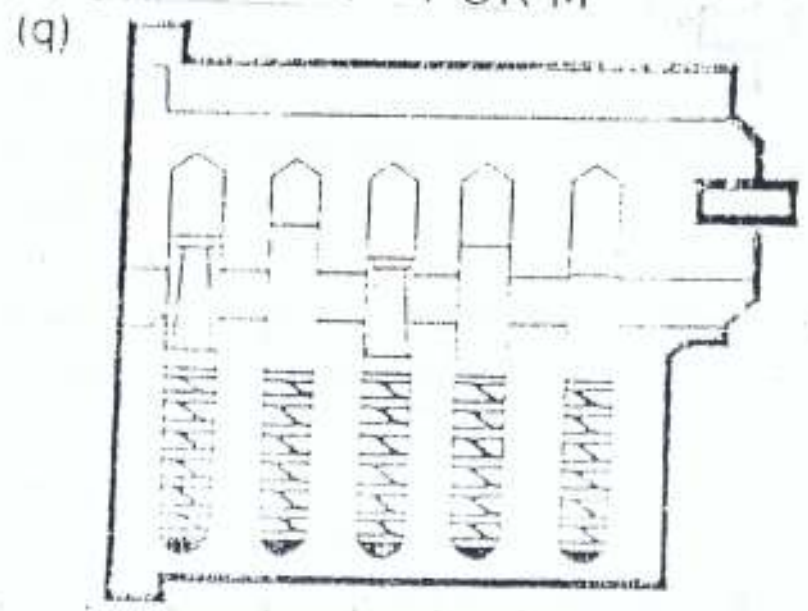


Fig. 4.13. Diagram of a cylinder lock (a) with and

### 4.30.1 CYLINDER LOCK AS A CONCEPT (3'S + A)

#### i). Symbolism

The simplest and commonest, form of security equipment known by the common man in protecting self and property from unlawful entry is the Lock and key.  
(Analogy Concept)

#### ii). Strength:

There are varieties of locks, but the cylinder lock represents the strongest (strength) metaphor. The design of the bank is usually an opportunity to display the financial strength of the client bank and this also translate to structural soundness.

#### iii). Simplicity:

In spite of the strength of the cylinder lock, its architecture or basic design is simple. Meaning there is strength in simplicity (functionality)

#### iv) Appeal

Aesthetically appealing though small in size

**Use:** The external form is adopted in plan configuration. The simplicity finds use in simple open plan layout. The inner details are adopted as elements on the elevation which emphasis verticality, changes in level and fortification.

### 4.30.2 SUMMARY OF CONCEPT

**Metaphor:-** Strength and security of the cylinder lock

**Dynamism:-** Open plan layout of the office spaces

**Analogy:-** High rise building in keeping with accommodation of the necessary facilities ; economic use of land and sympathy with the environment (City scape)

## CHAPTER FIVE

### DESIGN REALIZATION

#### 5.0 THE DESIGN PROPOSAL

In this chapter, the design proposal of the bank will be highlighted. In keeping with sound architectural principle the proposed fortune Bank headquarter will be seen to meet the client and users requirement fulfill statutory demands and be in line with restrictive ordinances; and above all be architecturally up to date.

According to the subtopic, it is intended that this design proposal will seek ways of enhancing security in Bank buildings in addition to giving adequate attention to pertinent architectural considerations in area of flexible and effective spatial organization, provision of adequate ventilation, lighting, thermal control, noise control, sound building construction technology, aesthetics e.t.c.

It will also be the focus of this project to evolve an intelligent building in keeping with the information technology era. To achieve the above, the proposal shall be tackled through the first three phases of a building project namely- planning, design and construction.

#### 5.1.0 SITE PLANNING/ DESIGN CRITERIA

The art of site planning is a deliberate or conscious positioning of the various functions or activities expected on the site in an economical way to achieve the following goals:-

Prevent accident, Enhance performance, Achieve harmony, Evolve aesthetics and Enhance security.

As a measure of good site planning, the following criteria shall be considered

1. Access Control: This refers to the consideration of control of access to and from site for both vehicular and pedestrian traffics. Harmonisation of the ingress and egress points for both traffics to avoid accidents and to enhance security. This calls for the use of manned gate houses and security fences and the use of complementary surveillance gadgets and the deliberate creation of hardlines at the gate house to check intruders.

#### 5.1.2 SET BACK AND BUILDING LINE



**PLATE 4.4: VIEW OF IMMEDIATE ENVIRONMENT OF SITE**  
**SOURCE: FIELD SURVEY**

The statutory requirement with regard to set back from road, observation of building line and preservation of improvement line to be observed.

### **5.1.3 LANDSCAPING**

As indicated under car park, the buffer zone earmarked for improvement is to be properly utilized through appropriate landscaping and temporary usage as complementary split second parking for customers to prevent the portion growing bushy. The whole of the site is to be given a well thought out landscaping scheme. From the walkways, through car park area, lobbies, waiting sit outs etc, the green shall be introduced either in the natural setting or form of potted planters as an indispensable complement of the building project.

### **5.1.4 ORIENTATION**

Building is to be oriented on site to take the advantage of the prevailing wind. Effective ventilation is said to occur when the prevailing winds namely southwest trade wind and North East trade wind are incidented on the building envelope at 45°.

### **5.1.5 CAR PARK:**

Proposal to ensure proper planning, designation and monitoring of the car park to ensure, easy flow of traffic on site, convenience and security in parking for both staff and customers and the operation vehicles such as the bullion van, refuse collection, stationery supply vehicles between the site. An ample buffer zone is provided between the site boundary and the road; and this can be used for additional short time parking for customers in keeping with the practice prevalent among neighbouring banks and offices.

### **5.1.6 SERVICES**

Entry points for the supply of services such as electricity, pipe borne water, telecommunication etc. to be marked. The lines of this services run close to the proposed site and all that is required is to tap therefrom for the use of the site. Location of the borehole for complementary use with the pipe borne water supply.

### **5.1.7 DRAINAGE SYSTEM**

Good drainage to ensure easy outward flow of wastewater. Because the drainage system in Victoria Island is not too enviable, there is need to provide complimentary or alternate means of wastewater drainage in form of purpose built soak aways.

### **5.1.8 WASTE DISPOSAL SYSTEM**

There is no provision for public sewer system in this area, hence the use of septic tanks and save away to ensure good handling of solid wastes emanating from the water closets and sanitary fittings.

Since the use of incinerator may not be encouraged, an adequate provision will be made for handling of wastes emanating from the offices, such as used papers, fast food wrappers, cellophane etc. though placement of disposable waste baskets in every office space, visitors lobbies and waiting areas. All these will end finally at the refuse bin either through refuse chute of garchey system or by effective office cleaning management.

### **5.2.0 BUILDING DESIGN CRITERIA**

Design is interpreted as conscious arrangement of parts or organization of parts of an object to reflect a preconceived appearance or to perform a predetermined function.

Basically, design evolves through three methods namely knowledge, experience and intuition.

The three methods will come to play in the design of this project which seeks to enhance security in buildings using bank administrative headquarter building in a high brow area in Lagos as a case study.

The building design proposal shall as much as possible be tailored to meet the users requirement as spelt out in the brief. This will be developed further by the Architect in the light of the following;

- (i) Statutory requirements
- (ii) Prevalent site conditions and constraints
- (iii) Technological (know how)
- (iv) availability of material
- (v) The ideal or expedient

#### **5.2.1 THE ANATOMY OF DESIGN PROCESS**

- (1) Design brief development
- (2) Space analysis
- (3) Site analysis
- (4) Schedule of accommodation
- (5) Functional analysis (including preparation of functional relationship diagram)
- (6) Functional flow diagram or
- (7) Flow chart (staff, customer, vehicles, furniture)
- (8) Boxing of functions (zoning)
- (9) Generation of plan configuration
- (10) Formulation of concepts

The above will be followed through the design proposal.

The building shall be designed to accomplish amongst other things the following.

**Functionality:** This is the ability of the design to lend itself to the performance of the function/activities for which the project was commissioned.

**Flexibility:** Multiple use of space or adaptability to variety of usages such that it can accommodate growth in population of users and appeal to variety of would be users.

**Structural soundness:** Conscious and scientific design of structural members in the light of predetermined loads and forces such that they can maintain their sanity and stability while performing their assigned function throughout the life span of the building bearing minor maintenance.

**Aesthetic:** This is a measure of the degree of pleasantness or attraction exuded by an object toward observers. Pure aesthetic is an intrinsic, non-tangible, yet captivating attribute of a work of art or an endowment of nature.

Aesthetics is brought about architecturally through conscious, careful and premeditated juxtapositioning of parts to achieve a coherent, functional and beautiful whole.

**Maintainability:** Careful detailing of parts and selection of materials such that they can be easily worked upon or replaced when worn out thereby keeping the structure in sound condition and enable it to have full life.

Also, design measures are to be put in place to inculcate the culture of cleanliness and hygiene in work place in the users. This serves to prevent decay in facilities while enhancing protection of the environment.

**Economy:** Cheapness in itself is not a virtue. It is worth while if by paying a little more, the resultant gain in value exceeds the extra cost.

Nevertheless, conscious effort is required at the various stages of design through construction and commissioning to ensure optimum cost to the client by costing alternative designs and options. By this good economy and value for money would have been achieved.

### 5.2.2 FORM AND PLANNING

As movement of air is the only available relief from climatic stress, therefore vital to indoor comfort, the building will have to be opened up to breezes and orientated to catch whatever air movement there is. Failure to do this would produce indoor conditions which are always warmer than a shaded external space which is open to air movement therefore leading to hot discomfort.

### **5.2.3 PLAN SHAPE**

Elongated plan shapes with single banking arrangements to allow cross ventilation is suitable to this climate. Rooms and offices may be accessible from open verandahs or galleries which also provide shading. Door and window openings should be as large as possible allowing a free passage of air.

### **5.2.4 ORIENTATION**

Extended plans, in a line across the prevailing wind direction afford low resistance to air movement and is therefore the ideal solution. A balance is struck between orientation for wind and that for solar heat gain. The high rise building orientation consideration is converse of that of low rise building while the latter is orientated for optimum wind and cross ventilation, the former is opposite and avoidance of sun is the decisive factor.

### **5.2.5 SHADING**

Openness and shading will be a dominant characteristic of buildings. Shading of all vertical surfaces of both openings and solid walls will be beneficial. Trees and planting can also be relied on for shading, as plants carry full foliage all year round.

### **5.2.6 CONSTRUCTION MATERIALS**

Because the temperature of the outside air remains almost the same throughout the day and night, a building cannot cool off sufficiently at night to allow storage of heat during the day. This means that the principle of thermal storage cannot be relied upon in this climate. It is therefore ideal to adopt light weight construction and building materials with low thermal capacity.

The roof and ceiling materials should be of low thermal capacity with highly reflective upper surfaces and the ceiling materials. This means alloy should have a good resistive insulation double roof construction whereby the roof space is ventilated.

### **5.2.7 CEILING**

It has been suggested as a performance standard that the ceiling temperature should not exceed the air temperature by more than 4deg Centigrade. This is achievable by using some kind of insulation board with a U- value around 1.5W/m<sup>2</sup> deg C. this will produce a roof ceiling overall U- value of 0.8 W/m<sup>2</sup> deg C.

### **5.2.8 PITCH**

The roof is of very great significance for the aid of prevention of rain and excessive heat into the interior. As rainfall is rather high in these region a pitched roof will be ideal but where otherwise a flat roof is used, it should be provided with adequate slope with provision for gutters taking the water to well designed drainage systems.

### **5.2.9 WALL**

Naturally for protected solid walls, insulation is not necessary, however, in cause of high-rise which expose the walls to solar radiation, effort will be made towards preventing the inner surface temperatures from rising above the air temperature. This can be achieved through the use of materials or finishes with good reflective qualities on the unshaded walls.

### **5.2.10 HARDLINES:** points created in design to control movement

such that only legitimate entrants are allowed.

### **5.2.11 ZONING:**

The functions of the building will be zoned to deliberately create:

- a. Public area
- b. Semi public area
- c. Private area
- d. Private, private or A defensible space

### **5.2.12 TARGET HARDENING:**

This is to refer to measures taken in design to protect the sensitive functions and zones from intentional and unintentional assault.

## **5.3.0 DESIGN BRIEF AND BRIEF DEVELOPMENT**

The bank administrative headquarter proposal comprises the following:

1. Administrative facilities,
2. Bank Branch facilities, and
3. Lettable office wings
4. Public or communal facilities
5. Ancilliary Accommodation
6. Supportive facilities

### 5.3.1 ADMINISTRATIVE FACILITIES

Administrative facilities tailored towards accommodating the various head office departments namely:

1. Saving/ Special products
2. Financial control
3. Internal control
4. Risk managements
5. Human Resources
6. General Internal services
7. Processing (operation)
8. Information Technology
9. Audit and Inspection
10. Treasury
11. Energy
12. E. Banking
13. Legal Department
14. Corporate planning and Development
15. Training
16. Property/ Maintenance

**5.3.2 EXECUTIVE OFFICE SECTION:** - Adequate provision has to be made to accommodate the top echelon of the work force. Apart from spatial provision to accommodate the functional requirement of every department, enclosed, semi enclosed office spaces of various sizes graduated according to status and function are to be provided for the head of units, higher executives officers, Technical officers and their supportive staff, namely secretaries, clerks, typist, personal assistants etc.

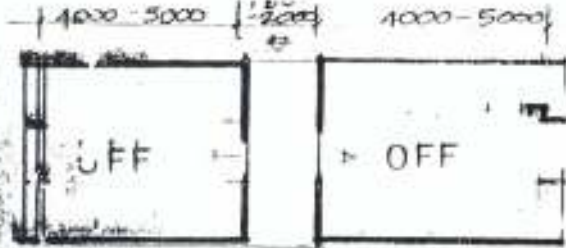
The staff strength of the present head office is about 750 workers of various grades- Population projection is based on an annual growth rate of between 5 & 10%.

### 5.3.3 HEADQUARTER BRANCH FACILITIES

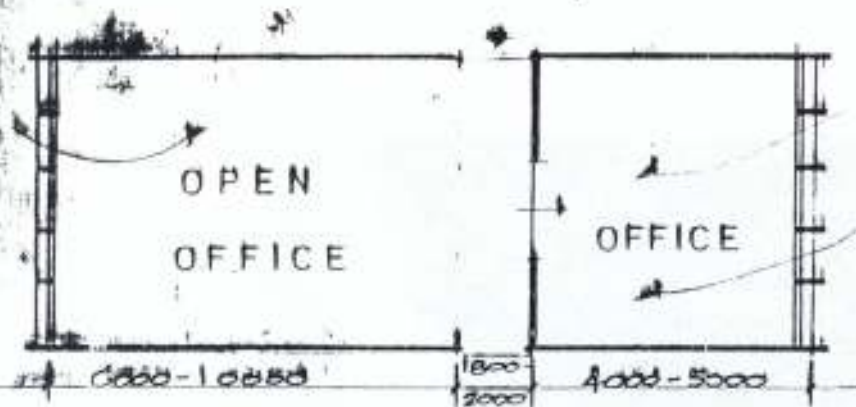
- (1) Banking Hall – customers area
- (2) Banking Hall – operatives area
- (3) Automatic teller machine (ATM)
- (4) Night safe facilities
- (5) Departmental offices/spaces
- (6) Bank vault and bookrooms
- (7) Parking facilities – (staff, customers and services)
- (8) Conveniences
- (9) Bullion bays
- (10) Managers office
- (11) Accountant pedestal

# OFFICE LAYOUT

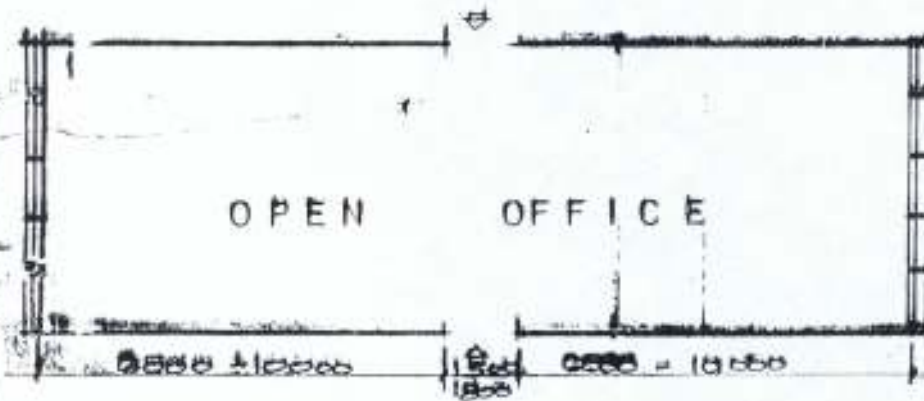
FIG 5.1 A



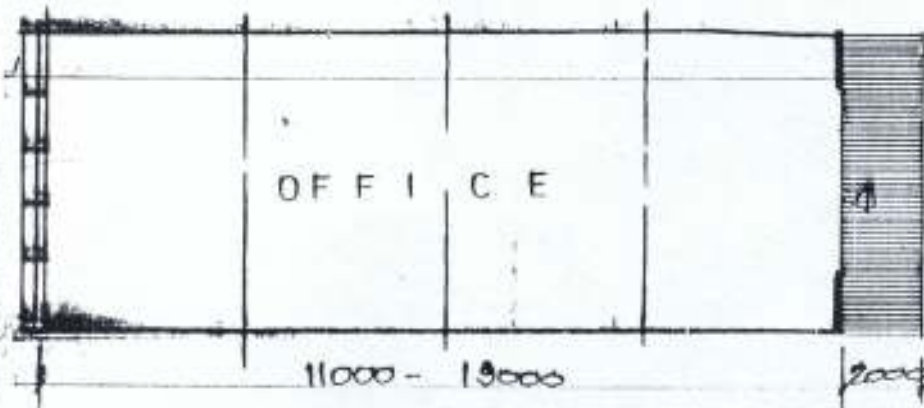
SHALLOW DEPTH



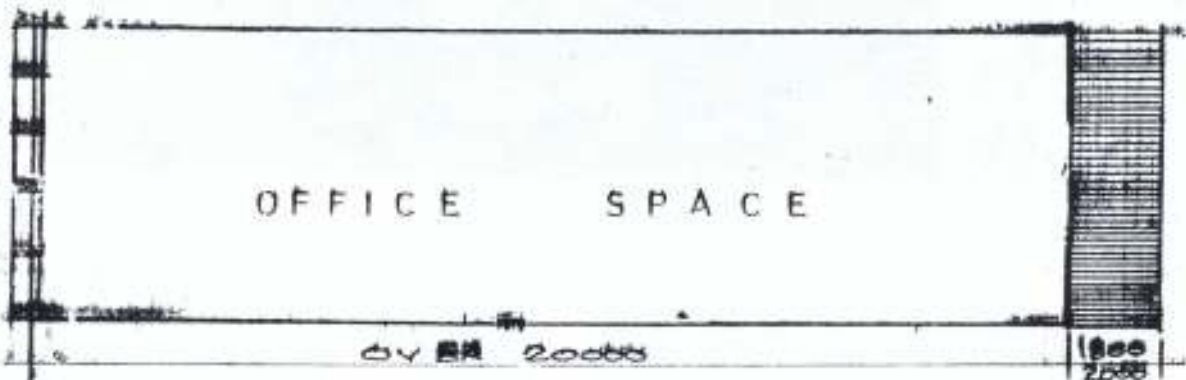
MEDIUM DEPTH



MEDIUM DEPTH



DEEP SPACE



VERY DEEP SPACE

SITUATION 2 AND 3 IDEAL FOR GOOD LIGHTING, ECONOMICAL LAYO



**PLATE 4.5: VIEW OF TRAFFIC SITUATION AROUND SITE**  
**SOURCE: FIELD SURVEY**

### 5.3.4 LETTABLE OFFICE WING

The idea behind the provision of lettable office wing emanated from the need to plan for;

- (i) Future expansion
- (ii) Joint responsibility in project financing
- (iii) Joint responsibility in maintenance
- (iv) Need for comradeship
- (v) Security reasons

The spatial requirement of the bank in next 20years has been projected. When built, this space which will serve future need will be leased out to corporate tenant to augment the bank finance and prevent facilities decay.

## USERS POPULATION PROJECTION

OPEN OFFICES SPACE PLANNING TABLE 5.1

Baseline	Year	population	
0	2004	500	750
1-5 years	2009	550	825
6-10 years	2014	605	908
11- 15 years	2019	666	999
15- 20 years	2024	735.6	1099
Absolute Population		736	1100
Safety factor		114	100
Design Population		850	1200

TABLE 5.2 SPATIAL REQUIREMENTS

Population projection	Space per worker (m <sup>2</sup> )		Information Tech requirement 13.5m <sup>2</sup> /worker
	9m <sup>2</sup>	12m <sup>2</sup>	
750	6750	9000	10125
825	7425	9900	11138
908	8172	10896	12258
999	8991	11988	13487
1099	9891	13188	14837
1100	9900	13200	14850
100	900	1200	1350
1200	10800	14400	16200

## ASSUMPTIONS

1. Spatial requirement is 9m<sup>2</sup> to 12m<sup>2</sup> per worker
2. Allowance of additional 1.5m<sup>2</sup> to accommodate information Technology spatial requirement.
3. Annual growth rate of 7- 10%
4. No fractional human being, figures rounded up appropriately.

### ENCLOSED OFFICE SPACES (EXECUTIVE)

5% of design population (1200) nos.

5% of Annual growth rate.

**TABLE 5.3**

Baseline	Year	population	Spatial requirement
0	2004	38	Varies according to status Executive (1- 3) 4.8
1-5 years	2009	40	
6-10 years	2014	42	
11- 15 years	2019	44	
15- 20 years	2024	47	
Absolute Population		47	
Safety factor		13	
Design Population		60	

**TABLE 5.4 GRADING**

STATUS	DESCRIPTION	No required
EXECUTIVE 1	Director, general manager, Assistant general managers	10
EXECUTIVE 2	Managers, assistant managers	15
EXECUTIVE 3	Head of units, supervisors	35

#### **5.4.0 DESIGN/ PLANNING PROPOSALS**

##### **5.4.1 MAIN DESIGN (SPACE BUDGETING)**

- i. Main design capacity- Take off staff strength of 750 to maximum of 1200 persons.
- ii. Head quarter branch capacity- Take off staff strength of 50 to 100 persons.
- iii. Building type- High Rise because of the plot size in comparison to total users space.
- iv. Office space distribution
  - a. Open office spaces
  - b. Enclosed office spaces
  - c. Communal space
  - d. Service spaces
- v. Office sizes

Open-  $9\text{m}^2 - 12\text{m}^2$  per worker.

Enclosed – varies with status and use. - See space analysis

#### **5.50 COMMUNAL FACILITIES**

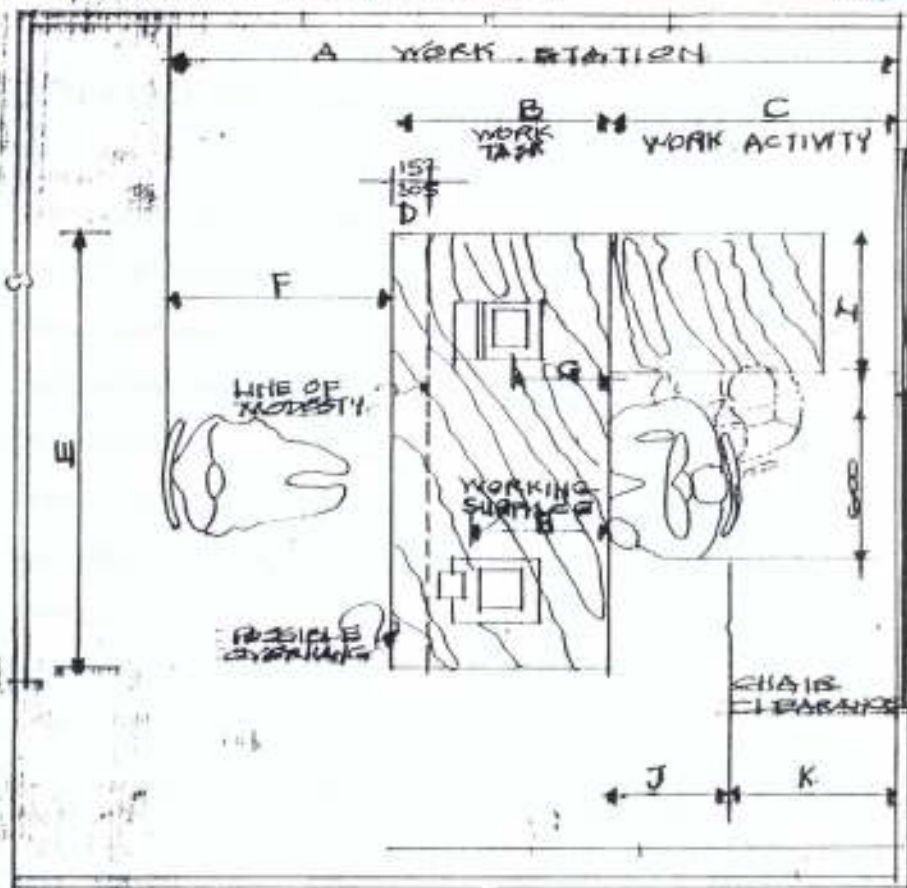
- i. Seminar/ conference Room - Capacity 50 persons
- ii. Staff dining - Capacity 48 persons
- iii. Staff training/ Libraries – Capacity 50 persons

#### **5.60 SUPPORTIVE FACILITIES**

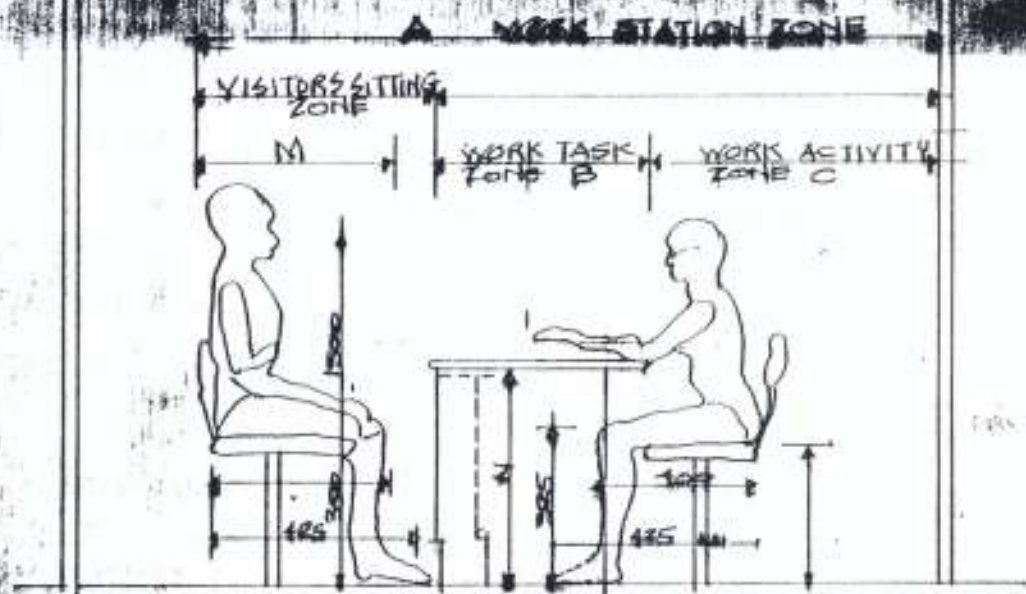
- i. Automatic teller machine space
- ii. Night safe
- iii. Staff clinic
- iv. Parking facilities
- v. Security points
- vi. Fire points
- vii. Standby generator
- viii. Bore Hole
- ix. Waste Disposal
- x. Helicopter landing space
- xi. Expansion space (vertical)

#### **5.70 PLANNING GUIDE (MODULE)**

- i. Office planning module - Individual Worker seated at his workstation + Clearances + Visitors space + special equipment space.
- ii. Open office layout – Standard furniture space + Clearances for circulation and attending to customers + special equipment space.
- iii. Special Rooms - standard equipment space + clearances for manipulation.



**plan**



**section**

A	2206 - 3200
B	762 - 814
C	762 - 1214
D	152 - 305
F	1524 - 1829
E	762 - 1057
G	356 - 457

I	457 - 559
J	450 - 600
K	150 - 600
L	1525 - 2135
M	610 - 762
N	737 - 762
O	381 - 457

## **5.71 COMMON SPATIAL REQUIREMENT GUIDE FOR OFFICE (BANK) BUILDING**

- i. Office space – Open and Enclosed.
- ii. Filing space – File cabinets and built in facilities.
- iii. Storage space –used and unused Stationeries items, others.
- iv. Special equipments space- spaces for computers, reprographic machines, typewriters, surveillance machines etc.
- v. Special Rooms- security vaults, book vaults, note counting rooms, proof rooms, Automated teller machines (ATM), Night safe, Bullion bay, mail opening room etc.
- vi. Conveniences – W/c , m/e ducts, Fire points
- vii. Circulation space – waiting area, lobbies, queuing area.
- viii. Service core – Lift space, stair halls, lift lobby, queuing space.

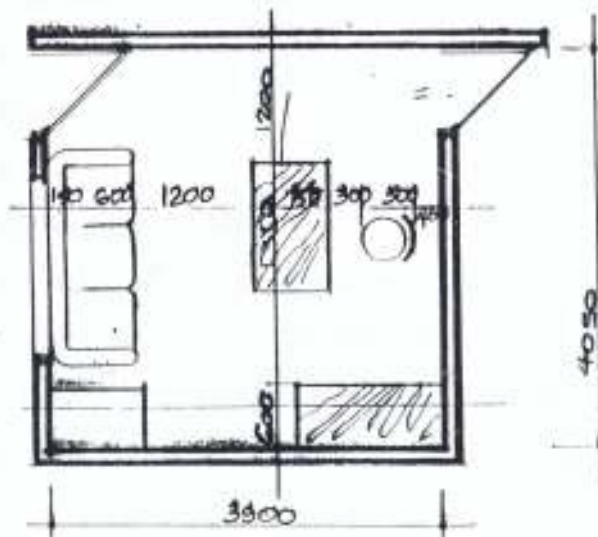
## **5.8 TYPICAL BANKING HALL SPATIAL REQUIREMENT/ PROVISION**

### **5.81 CUSTOMER'S ZONE**

- i. Entrance Lobby
- ii. Seating Area
- iii. Inbuilt writing desk
- iv. Ample circulation and queuing space
- v. Convenience

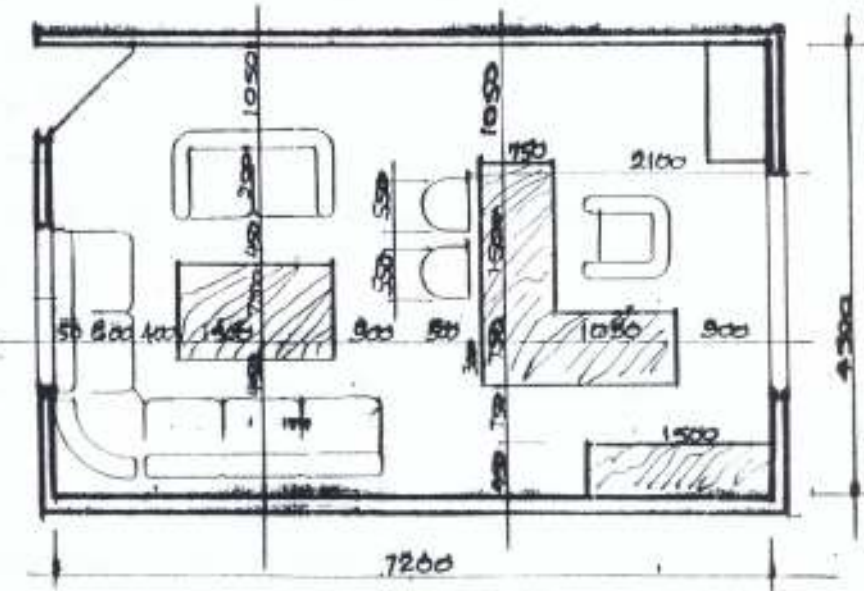
### **5.82 WORKER'S ZONE**

- i. Officers desk + visitors seat – conspicuous with controlled access to customers.
- ii. Workers desks + business counter
- iii. Reference area + ledgers desk with computers
- iv. Cashiers' cubicles
- v. Filing space
- vi. Circulation spaces
- vii. Conveniences.



(A)

SECRETARY II OFFICE



(B)

TYPICAL EXECUTIVE I OFFICE

SYM	SPACE	AREA	OTIF
A	SECRETARY II		
B	GEN. MANAGER		

5.83	TYPICAL	EXECUTIVE	OFFICE	SPATIAL
	<b>REQUIREMENT/PROVISION</b>			
i.	Officers desk + chairs		)	Sizes varies
ii.	Visitors chairs (2 or 4 in number)		)	according to status.
iii.	Mini conference corner – central table + 4- 6 chairs		)	
iv.	Filling space		)	
v.	Secretary's alcove		)	
vi.	Convenience		)	

#### 5.8.4 SPACE ANALYSIS/ALLOCATION

Comprehensive space analysis takes cognizance of people and non people spaces to arrive at conducive working spaces. The office planning module used, is the individual worker seated at his workstation with necessary clearances. This is derived from the necessity for providing the furniture needs of the worker and space for the use and service of the same.

Clearances, are needed to further for carry out other functions such as attending to customers and engaging in intra/ inter- departmental circulation and working interaction. From the foregoing, a spatial provision of between  $9\text{m}^2$  -  $12\text{m}^2$  per worker plus  $1.8\text{m}^2$  per visitor is considered reasonable.

#### 5.8.5 ZONING OF FACILITIES

Apart from zoning on grade for privacy etc, it is pertinent to carry out effective vertical zoning of functions in high rise building since all functions cannot be accommodated on the same level.

The functional relationship of the various department must be borne in mind while carrying out this exercise. Below is the floor to floor distribution of facilities

a) Basement level

Staff parking

Ground floor (Wing A reception and communal facilities)

Ground floor (Wing B)

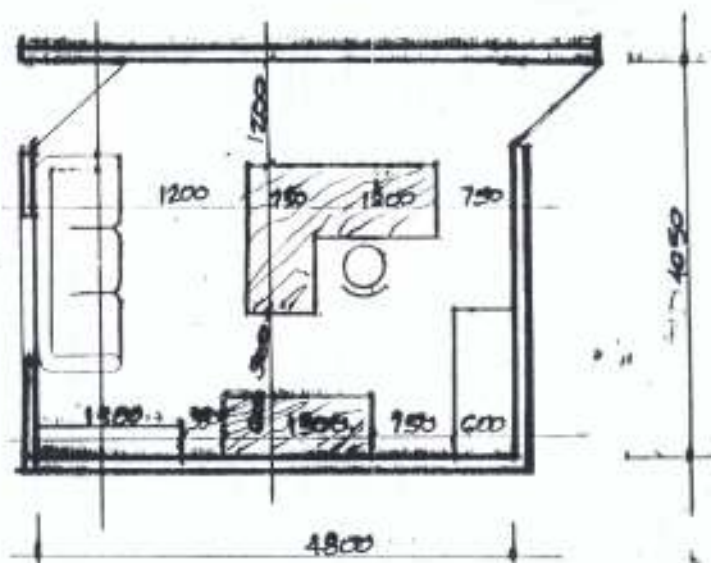
Reception Hall

Maintenance department

Waiting lobby/stair hall

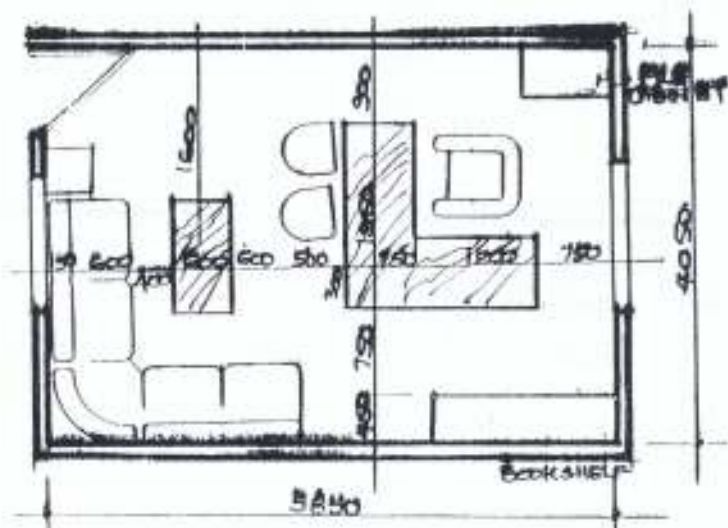
Convenience

FIG 5.1 D



(C)

SECRETARY I OFFICE



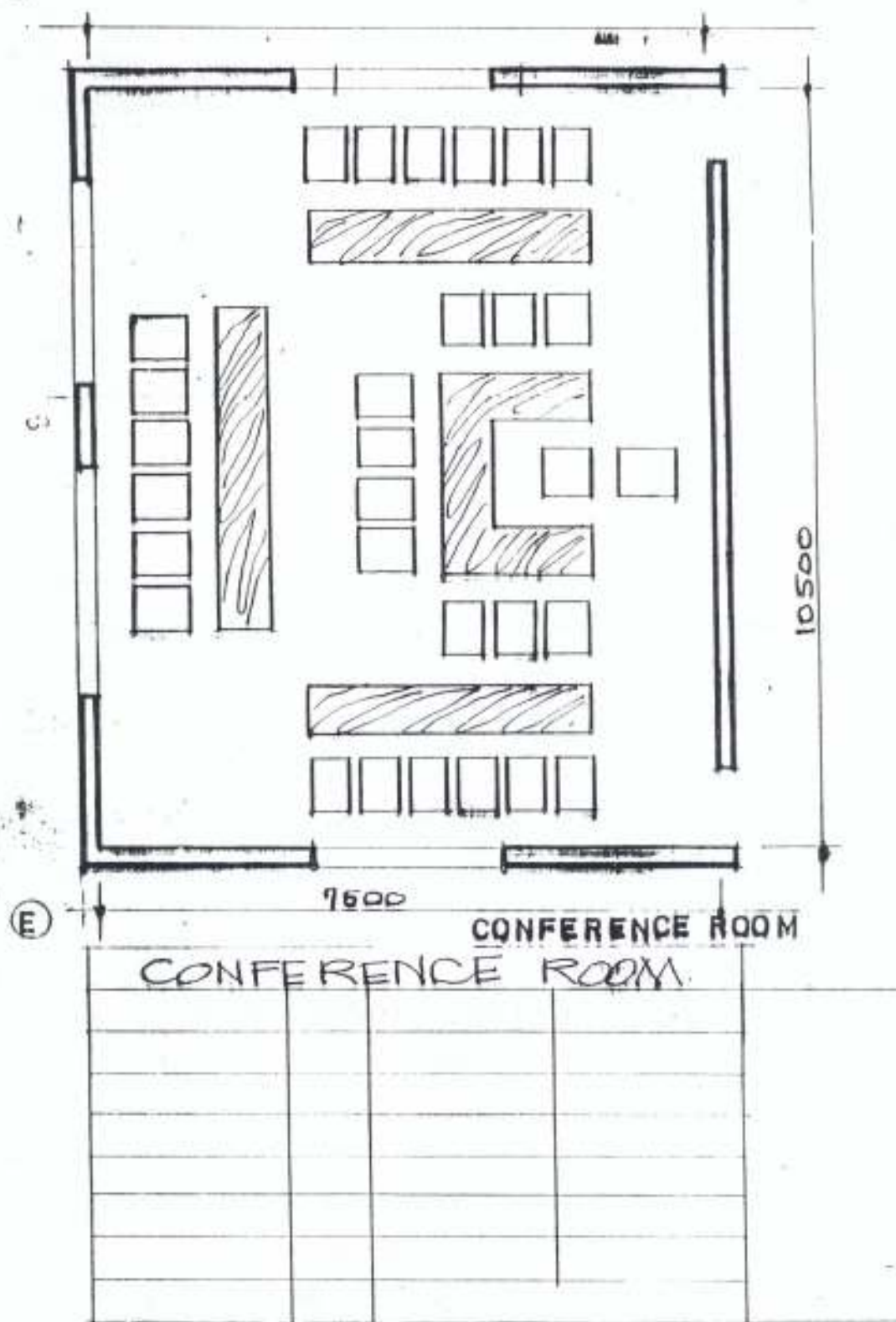
(D)

TYPICAL EXECUTIVE II OFF

SYM	SPACE	AREA	QTY
(C)	SECRETARY I		
(D)	MANAGER		

G

FIG 5.1E



Staff canteen

1<sup>st</sup> floor (wing A)

Wing A: Bank managers office

Commercial Bank facilities.

**Wing B:**

2<sup>nd</sup> floor

Staff clinic

Training school

3<sup>rd</sup> – 6<sup>th</sup> – Lettable office spaces

7<sup>th</sup> – 9<sup>th</sup> Fortune Bank head office

10<sup>th</sup> – Executive level

Board Room.

Guest chalet

Roof Garden.

#### 5.8.6 FUNCTIONAL ANALYSIS/FUNCTIONAL RELATIONSHIP DIAGRAM

Functional and effective layout of spaces is usually a product of thorough study and recording of functional relationship (functional analysis) which exist between the various activities and departments. A sound analysis establishes three categories of relationship namely strong, weak and none relationship. From this, functional relationship diagrams can be produced which can form the basis of a functional plan.

The relationship which exists between the various components of this design has been analyzed.

#### 5.8.7 FUNCTIONAL FLOW DIAGRAM/FLOW CHART

The functional flow diagram details the most appropriate or natural routes (traffic) in a given work environment.

The identified traffics for the bank branch are:

- 1) **THE CUSTOMERS ROUTE (FLOW)** from the street to lobby-banking hall - Tellers/clerk, officer and back to the street.
- 2) **THE STAFF FLOW** (i) Through staff entrance to individual work station  
(ii) Work station → work station (working interaction)      (iii) Work station → communal facilities and conveniences.

- 3) **CASH FLOW** in (i) bullion bay → security lobby → strong room  
 (ii) strong room → Teller → payment to customers/staff (iii) strongroom
- 4) **DOCUMENTS FLOW** –
  - (i) Manager → Accountant → Officer concerned
  - (ii) Officer → file/Bookroom (after action)
- 5) **SERVICES** as in bullion van movement.

**Head Office:** The identified traffic flow for the head office are as follows:

1. **CUSTOMERS ROUTE** (i) Street/parking → security post → main reception/waiting → stair/lift lobby → upper floor reception  
 (ii) floor reception to individual offices → reception/lift or stair lobby  
 main reception → security post → street.
2. **STAFF ROUTE** – (i) Street → Security Post → Parking → Reception → Stair/lift lobby → upper floor reception  
 (ii) Reversal of movement is made at close of business  
 (iii) Staff working route are as identified for Bank branch above.
3. **DOCUMENT ROUTE** – ditto for Bank branch
4. **SERVICES ROUTE** (i) Service van → Reception/ loading Bay → Store

Provision must be made to separate the identified traffics, as much as possible, though occasion for minor criss cross of traffics may occur in real working situation. This must not be intentional.

### 5.8.8 BOXING OF FUNCTIONS

Boxing of function when properly used assist in derivation of plan form or forms. Forms can be derived from this method in two ways namely working from components to the whole or from whole to the individual components using the building functions in a variety of ways.

The second approach of working from the whole to the component is adopted by this researcher hence the use of the design concept from which the forms are derived and other components take route and also the design can be further developed.

**5.8.9 SCHEDULE OF ACCOMMODATION** Based on the space analysis and the resultant individual space standard, the following facilities or spaces are intended for the design of the Fortune Bank Headquarter building.

**ADMINISTRATIVE OFFICES TABLE 5.5**

<b>A) DESIGNATION OF FACILITIES</b>	<b>SPACE ALLOCATED (M<sup>2</sup>)</b>
<b>CHIEF EXECUTIVE OFFICE</b>	
Office and mini Lounge	40.0
Personal secretary/waiting	15.0
Personal assistant - 2 Nos	10.0
Board room	50.0
Reception/ waiting	20.0
<b>B) EXECUTIVE OFFICE</b>	
Directors office	27.5 - 30.0
Secretary/waiting	30.0
Personal Assistant/2Nos	25.0
Assistant General Managers 10	30.0
Secretary/waiting	25.0
Personal Assistant	10.0
<b>C) TRAINING SCHOOL</b>	
Training Coordinator/Secretary	24.0
Training officer office	24.0
Classrooms (with collapsible partition)	76.0
Library stationery store	40.0
Reception/waiting	48.0
<b>D) OFFICE DEPTS;</b>	
Open office to suit need	
<b>E) SERVICES DEPARTMENT</b>	
Generator House	10.0
Air condition room (chiller)	30.0
Water Reservoir	30.0
Maintenance managers office	18.0
Facility Engineers office (Electrical)	18.0
Engineers office (mechanical)	36.0
General supervisors office	16.0
Secretary waiting	15.0
Drivers Bay	15.0
<b>F) SECURITY</b>	
Gate House/store	12.0
Chief security officer	12.0
Security office	24.0
Changing room	7.2
Store	3.6
<b>G) CANTEEN (48 people)</b>	40.0-50.0
Delivery bay	
Caterers office	
Kitchen	
Secretary	
Dry/wet store	

Cloak room	Total space provided 40.0- 50.0
Shower water closet	
Wash hand basins	
Dining space	
Senior staff	
Junior staff	
<b>H) SICK BAY</b>	
Office consultation room	9.0
Treatment Room	10.0
Resting Room	12.0
Shower/W.C	3.6
<b>I) UTILITIES</b>	
Cleaner/Jawtors Room	6.0
Utility store	6.0
Female toilets	13.5
Male toilets	13.5
<b>J) LETTABLE OFFICE FACILITIES</b>	
<b>DESIGNATION</b>	<b>SPACE ALLOCATED (M<sup>2</sup>)</b>
Reception	
Lattable office (open plan) largest type	Varies
Largest office medium type	
Lettable office small (type)	13.5-27.0
Water closet (WC)	4.0- 4.5 each
Wash hand Basins (WHB)	
<b>K) BRANCH BANK</b>	
<b>DESIGNATION</b>	<b>SPACE ALLOCATED (M<sup>2</sup>)</b>
Reception/Customers Area (	90.0
Banking Hall (Gird first floor)	216.0
Accountants corner (Pedestal)	18.0
Strong room	36.0
Book room	24.0
Note counting	12.0
Bullion Bay	24.0
Treasuring	
Tellers Cubicles (12Nos)	6.0- 7.5 each
Automatic Teller Hall	24.0
Night safe	12.0
Mail/correspondence	12.0
Computer Room	24.0
Proof room	12.0
Archives	24.0
Bank Branch Manager	18.0
Secretary/waiting	12.0
Assistant Manager	12.0
Conference room	46.0

## 5.9.0 THE STRUCTURAL SYSTEM

In the design of high rise and skyscrapers, three principal elements are of decisive importance from the view of structural stability. They are:

- (1) The structural system
- (2) The vertical access system
- (3) The horizontal force (wind) load

The economic and sound structural system for a particular building is a factor of the function, it is required to perform. The structural frames of most buildings are expected to perform the following functions :

- (1) Safely bearing the load of the building which is a combination of the dead, live, wind, seismic loads.
- (2) Transmission of this load to safe soil strata below
- (3) Maintenance of integrity

It has been discovered that economic efficiency depends on the sway factor i.e. the ratio of the maximum allowable horizontal deformation at the top to the total height of the building (max. 1:600). Also 90% of horizontal deformation (shear sway) results from shifting of the frame. While 10% come from the leaning of the building as a whole.

**5.9.1 EARTHWORK AND FOUNDATION STRUCTURE:** Due to the massive load characterized by high rise buildings and skyscrapers, the conventional strip and pad foundation are inadequate to bear the load safely to the substrata below.

It is common to use pile or raft foundation depending on load to be transmitted and the subsoil condition. The raft foundation with upstand beam is to be used in this design and the basement which is the product is to be economically utilized as staff parking.

**5.9.2 BUILDING FRAME:** A frame construction of steel or reinforced concrete is the standard structure for high rise buildings. However, the following has been established.

TABLE 5.6

Types of frame		No of floors
1	Frame construction without wind bracing	10 storeys
2	Reinforced concrete frame work with wind bracing	20 – 30 storeys
3	Concrete pipe or double pipe construction	30 floor and above

**5.93 FLOOR AND BEAM:** The effective span of beams depends on material and design. But, generally the following has been established as standard spans;

TABLE 5.7

No	MATERIALS	EFFECTIVE SPAN	SPACE BTW BEAM
1	Solid reinforced concrete, floor slab	2.5m – 5.5m	12.5m Max
2	Ribbed floor slab	5.0m – 7.5m	12.5m Max
3	Prestressed concrete (0.75m structural depth)	25.0m	

**5.9.4 WALLING/PARTITIONING:** In order to lessen the dead load of the building as a whole it will be in order to use light weight walling materials for partitioning of the interior spaces where adequate and curtain walling of glass in steel or aluminium frame on the external envelopes. Light weight partitioning material would be Gypsum boards in steel or aluminium frames.

**5.9.5 ROOF STRUCTURE/PITCH:** Because of the unusually high wind load at higher altitudes, it is good practise to adopt reinforced concrete flat roof in the construction of high rise building. Where conventional gabel roof is to be used, this must be enclosed within parapet walls for same reason of safety from horizontal forces (wind load). The former is to be adopted in this design.

**5.9.6 SERVICES:** The mechanical and electrical services to be concealed conduit system. Service rooms to be located on every floor. Floor to floor connection will be carried out via service ducts while best of material to be utilized. False (suspended ceiling) will be used to conceal overhead service lines in the office spaces.

## **5.10 FACTORS INFLUENCING THE CHOICE OF BUILDING MATERIALS**

The choice of building material is influenced by the following factors: -

1. Their significant physical characteristics
2. Availability of materials
3. Available technical know how
4. Economy of cost and maintenance standardize sizes.
5. Resistance to fire and general damages.
6. Strength and adaptability to use.
7. Aesthetical requirements, adequate protected with concrete
8. Adaptability to possible changes in future (flexibility).
9. Highly susceptible to rust, if not well protected with content.
10. High flexure due to thin sections, hence it is more liable to buckling.

## **5.11 PROPERTIES OF SOME BUILDING MATERIALS**

### **5.11.1 Concrete Properties: -**

Concrete possess high plasticity, therefore able to take any shape. It provides fire proof construction. Adaptable to a variety of surface finishes, texture and pattern. It can easily be pre fabricated and has high compressive strength.

Concrete has a very low tensile strength except when reinforced with steel. It has high dead weight which makes it unsuitable for high-rise structures.

However, the quality of concrete may be improved by the use of light weight aggregates e.g. expanded shale, cinder, and vermiculite. This actually reduces the dead weight, increase thermal insulation value, increase fire resistance, and increase workability of nailing. The disadvantage of this development is that, the strength of the concrete is eventually reduced.

### **1.2 Glass properties: -**

Glass is chemically inert, transparent and brittle. Glass inability to withstand structural load. It reduces privacy except when tinted. Glass is fragile, hence difficult to handle during placement.

However, modern development on the make of glass has yielded a huge success in the use of glass block to control solar radiation: glare; lighting transmission; Use of safety (laminated glass) where the glass is susceptible to impact;

Use of wired glass where there is need for high impact resistance, high fire resistance, therefore, it is good for glazing openings which are susceptible to fire hazard, e.g. Lift shaft, controlling shatteredness after breakage; Use of bullet – resisting glass where there is danger of burglary.



**PLATE 4.6: VIEW OF EKO HOTEL AND SUITES (ADJACENT BUILDING)**  
**SOURCE: FIELD SURVEY**

## CHAPTER SIX

### 6.0. SUMMARY OF FINDINGS

This chapter summarizes the findings in this research work, which seeks to proffer solutions to security problems in bank or related buildings through appropriate architectural design.

From book review, case studies and personal observation. The following were the findings.

1. A good percentage of bank branch facilities are accommodated in rented buildings, which are not customized. Hence, no separate bullion circulation routes are provided and this sometimes results in locking the customers out when the bullion vans are being loaded or offloaded. This itself constitutes security problems for the customers, who may be attacked by robbers in pursuit of bullion vans.

2. For the same reason, the strong rooms are located in awkward places which make them easy target.

3. Except in the headquarters and the new breed bank buildings, most bank branches dispense with security provision in form of access control to site. This need not be so since target hardening must commence from without.

4. Natural landscaping elements were generally absent but there were conspicuous use of hard landscaping elements both can be selectively blended together for good effect.

5. Average worker was unaware of security provision

6. Facilities for customers' convenience were absent in some places.

Solution to the above findings can be found in the recommendation and the proposed design.

### 6.1 AREA FOR FURTHER RESEARCH INFORMATION SECURITY

Information has become a particularly prized commodity in certain sectors of commercial, governmental activity and military installations and this require special systems to ensure the confidentiality of information. Whether it be personal data or scientific information.

Such security system would aim at securing the computer systems and information they contain. This is an extremely complex business and one which is undergoing change not merely on a day to day basis, but almost minute by minute and by implication money consuming.

### **6.1.1 PRIVACY OF THE SPOKEN WORD**

Another mundane aspect of information security is the "Privacy of the spoken word". Without any sinister overtone it can be simply a matter of allowing the manager of an office to be able to carry out private discussion e.g. discussion on salary, private assessment etc. with subordinate or members of staff without the rest of the personnel overhearing. This problem emanating from the open plan layouts of offices has not been solved by the ubiquitous re-locatable partitions with low sound attenuation. Because the use of heavy partitioning is incompatible with concept of dynamism entrenched in the open plan, the available solution is the use of special equipment to emit white sound to disturb speech intelligibility. The background hums are sometimes disturbing and unpleasant, and an architectural solution may be necessary.

It is glaring that the subject enumerated above especially those bordering on military installation and buildings are far beyond the scope of the general treatment of security in buildings as covered in this research work and further work is required to ensure cost effective architectural inputs or solutions.

## **6.2 RECOMMENDATIONS**

A good security system need not be a forest of wires, proliferation of electron; security gadgets, sky high walls etc. Desirable as these are, they are certain circumstances. They do not on their own constitute a perfect security system. Rather a good security system is a combination of the various grades of protections enumerated in this thesis with human effort and vigilance. In the height of the foregoing, the following recommendations are germane to security.

6.2.1. Every user or occupants of buildings should not only be security conscious, but should also be sensitive and be prompt in taking action.

6.2.2. Workers/ occupants should be given security related orientation on how to act in the face of breach of access control, security arrangements by hoodlum. This is in addition to orientation on safety in fire incidences.

6.2.3. In high crime areas and specifically in buildings that house valuables such as a bank, the vaults should be constructed of materials to withstand minimum of 18 hours pressure or more.

6.2.4. Addition to the recommendation in three above, occasional visits and check should be made to the site and building during weekends and public holidays by assigned security staff where there is no permanent security staff on all round duty or where working days does not extend to weekends.

6.2.5. Lines of electronics security system could also be connected to the security point or police station to convey minutest sound in the sensitive area during weekends and holidays.

6.2.6. Members of staff working in enclosed places and handling cash, must have self latching security system operatable with legs in their cubicle. This need not be the alarm type in order to minimize risks to life. It could be connected to the security point through remote security control.

6.2.7. The external surroundings of building should be supervisable or visible through provision of windows or adequate external vandal resistant lighting.

6.2.8. Enclosed office spaces should be supervisable through glazed inspection panels.

6.2.9. Target hardening must start from without and be carried through.

6.2.10. Selection landscaping features should be done in a way to deter hiding places for criminals and both pre planning of site and design of every type of building, natural and hard landscaping can be creatively adopted.

6.2.11. Zoning for privacy and design induced passive protection which cost the little or nothing should be the aim of every designer and for obvious reason, security

should be given same attention as other factors, such as ventilation, lighting, acoustics, which make for good design.

6.2.12 The principle of 'open enclosure' or 'invisible observer' as enumerated in chapter three is highly recommended for passive nature, cost effectiveness, effectiveness in curtailing opportunity stealing and other crimes.

### 6.3 CONCLUSION

The world around us is dynamic as Technology is advancing and Civilization is in high gear. The products are both good and bad. The good products must be savored while the bad be converted to useable form or be curtailed in whatever way possible.

An unnecessary but inevitable products of the fore mentioned are criminals and their activities.

A closer look of crimes indicates that the largest quantum occur within building structures and enclosures created by them. Lesser members of crimes are committed on the highway.

This then suggests that every building require security in whatever form in consonant with level of crime perceived in the area and every designers of building must of necessity be a key player in its provision through passive security design features which must not necessarily make the building look grim.

The bank or corporate buildings of the future would not only respond to the functional and technological requirement that call for an intelligent building, rather it must be a good blend of comfortability, excitement, attraction and security. Additionally, the bank design must exude dignity and a feeling of solidity in keeping with her image.

This is one of the silent roles which the architect owe the society and he must not shack the responsibility.

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