

**DESIGN PROPOSAL FOR NIGERIA UNION OF
LOCAL GOVERNMENT EMPLOYEES'
NATIONAL SECRETARIAT, ABUJA
WITH EMPHASIS ON FIRE SAFETY MEASURES
IN OFFICE BUILDINGS**

BY

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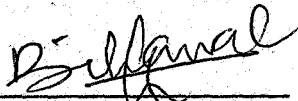
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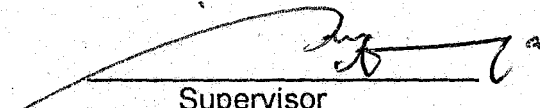
CERTIFICATION

This thesis titled "DESIGN PROPOSAL FOR NULGE NATIONAL SECRETARIAT ABUJA WITH EMPHASIS ON FIRE SAFETY MEASURES IN OFFICE BUILDINGS", by LAWAL BILYAMINU has been read and certified by the undersigned as having satisfied the conditions for the award of a master of Technology Degree in the department of Architecture, Federal University of technology, Minna.



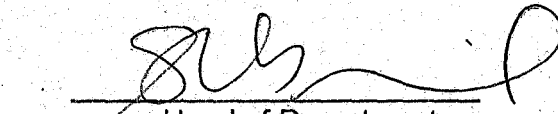
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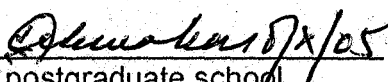


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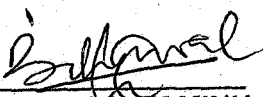
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DECLARATION

I LAWAL BILYAMINU of the Department of Architecture, school of Environmental Technology, Federal University of technology, Minna, Nigeria, hereby declare that this thesis is the meticulous and painstaking research conducted by me which has not been presented either wholly or partially by anybody or group of bodies for any degree anywhere.


LAWAL BILYAMINU

DEDICATION

This project is dedicated; to the Almighty Allah for his mercies, guidance and favour upon me in particular and all other living soul of the universe in general.

To Dad and Mum who opened the doors for learning.

To all Nigerians. 'Our struggles and perseverance shall not be in vain'

To all trade unions in Nigeria. Your efforts for the well being of workers are appreciated.

To My friends, for being by my side.

To all my well-wishers.

ACKNOWLEDGEMENT

I am grateful to Almighty Allah for sustaining my life through all these years of study and painstaking research for the product of this project.

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To the Dean; Prof. S.O. Solanke, H.O.D. Dr. (Mrs.) S.N. Zubairu and other lecturers of the department of Architecture, Federal University of Technology, Minna. Passing through you is a privilege. Thank you and God bless you.

To my entire family, the Lawals, my appreciation cannot be expressed by any amount of words, considering the daily roles you have played and the roles you will still play. Thank you.

To my friends, your encouragement was captivating. My colleagues you are all wonderful despite the upsets, I love you all.

To all those that I came across during the course of this project. Your various assistance is appreciated.

ABSTRACT

Democratisation in the fourth Republic in Nigeria has enhanced the general performance of the labour movement, which in turn has streamlined the activities of some of the trade unions such as the Nigerian union of Local Government Employees (NULGE). The provision of a national office for the union is therefore, inevitable. It is also a clear fact that most public buildings in Nigeria especially multi-storey do not have proper fire protection measures incorporated in them at their early design stages looking at the rate of uncontrolled fire hazards in Nigeria.

This research is desired to provide a unique head office complex for NULGE, to facilitate the high performance of the union administratively and enhance the protection of lives and properties at the instance of fire outbreak by emphasising fire safety measures in the design.

The research method used for the collection of data is the descriptive survey type. This informed the review of related literatures, the discussion with related authorities and the carrying out of case studies. Information from this survey facilitated the approach to the design.

The concept used to approach this design is the 'canonic design approach', which is based on a triangle of functions projected from the organisational chart of NULGE. Services to be provided in the complex are such that will enhance the efficiency of workers and hinder rapid deterioration of the building.

It is desired that the office complex be located in Abuja to reduce the demand for office spaces and to subsequently develop and glorify the new Federal Capital.

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CHAPTER ONE

1.0 INTRODUCTION

It is the opinion of many in Nigeria today that, democracy has come to stay and the desire to have a reasonable degree of commitment for the electorates by our leaders paved way for the recognition of the Nigeria Union of Local Government Employees (N U L G E); joining the chain of the performing trade Unions in Nigeria. This expression of hope is paramount in the minds of the Local Government Employees, considering the federal government economic policy on the grass root and the success of other trade unions like the Nigeria Labour Congress (NLC), Academics Staff Union of University (ASUU), National Union of Teachers (NUT) just to mention a few, despite the ups and downs of the struggles.

The importance of NULGE can not be over emphasized. The modern trade union especially industrial unions have remained the vocal voice and the conscience of the labouring masses for which they are determined to put an end to all forms of exploitation, nepotism, corruption, abuse of office, divided interest, hoarding and all anti social acts.

With the influx of people into Abuja due to the movement of the federal capital from Lagos to Abuja, and the subsequent development of Abuja into an administrative and commercial centre, there is the need for the national secretariat to be located in Abuja

The proposal would help in the organization of the union and remedy the intrusion of government into its affairs through the provision of congenial atmosphere

- iv. To create a conducive environment for the people and government relationship

1.3 RESEARCH METHODOLOGY

Before embarking on data collection, after being motivated to carry out this project, the researcher had a pre-conceived idea of what the design for a National Secretariat for a trade Union like NULGE entails. However, more realistic facts gathered during data collections.

Descriptive survey method of research was adopted in collecting data. This includes,

- i. Data from books, journals, newspapers, magazines, internet and unpublished thesis.
- ii. Oral interviews with members of the union.
- iii. Case studies on existing related situations were also carried out to study the characteristics and the rational behind the design of such proposal.

The final design proposal shall be as a result of conclusion drawn from the proper analysis of data collected.

1.4 SCOPE AND LIMITATION OF STUDY

1.4.1 Scope

Without underemphasizing the functional aspects of an office design, this project proposal shall concern itself with how architecture can be used to integrate

different functions into one site. A survey of organizational structure and space requirements as it relates to office design will be carried out and provision shall be made for these design components:

- i. A main office complex
- ii. Conference hall
- iii. Training units
- iv. Restaurants
- v. Abuja branch of the union
- vi. Library
- vii. Gate house

1.4.2 Limitations

The lack of adequate literature, case studies on related existing complexes on the proposed project and current hardship in the Country limiting the source of funding for the research were major constraints during the course of this project.

1.5 IMPORTANCE OF STUDY

It is anticipated that this project shall propose an architectural design that will symbolize the activity of the Nigerian union of local government employees as well reassuring the grass root; the direct beneficiary of the local government employee of the authenticity of the National government policy on the grass-root development.

In essence, the need to create an environment for better discussion with the federal government and state government on all matters concerning the local electoral shall be enhanced.

CHAPTER TWO

2.0 LITERATURE REVIEW.

2.1 TRADE UNIONISM

Section 1(1) (2) of the Nigerian industrial relations decree of 1977 defines trade union as "any combinations of workers or employers whether temporary or permanent, the purpose of which is to regulate the terms and conditions of employment of workers"

A trade union has also been described as "an association of labourers in a particular trade, industry, or plant, formed to obtain by collective action improvement in pay, working condition, and social and political status"

It can therefore be deduced that any association of labourers of workers that does not involve itself in any kind of collective action or bargaining with the aim of improving pay, working condition and social status among other things for the benefit of its members, is not a trade union.

2.2 ORIGIN OF TRADE UNIONISM

The labour movement or trade unionism, the product of the industrial revolution, began in Britain and in continental Europe as a fraternal and self-help association of working men. Trade unions arose in direct defence against the exploitation to which the largely defenceless individual wageworkers is subject in an industrial society. Trade unionism has become implemented across the world wherever the process of industrialization has taken place.

.The tumultuous onrush of industrial growth at first produced no visible counterpart in the field of labour organization. A kind of psychic delay factor intervened, a time of adjustment to the mood of anomie and helplessness induced in those plunged into the urban maelstrom of industrial employment. The individual worker, pitch forked into a strange, rapidly changing urban environment, badly informed, if informed at all, about the labour market situation, was confronted, not with a multitude of individual employers, but with a relatively small number of larger undertakings. Such employers could readily dispense, with any single element in their labour force. The labourer stood in the position of a forced seller, whose commodity, the power to work, on the sale of which he depended for very existence, was irretrievably lost when not used. It was to remedy this inequality of bargaining power that labour set out to organise.

The labour movement in short is not a thing in itself but a social organism responding to particular social circumstances. These circumstances differ a great deal between one place and another. It is only to be expected that where social circumstances differ, labour movement should differ too.

2.3 TRADE UNIONISM IN AFRICA

Ananaba, (1979) classified the development of trade unions in Africa under three main periods. The first is the period before the end of the Second World War; the second is from 1945 to 1960, and the third covers what has been happening since 1961. Before 1939 trade unions of African employees existed in only a handful of countries such unions were few in each country, and were craft-or plant-based. There were hardly any national trade union centres. Organization on a broader basis and the creation of national trade union centres were a later development.

The low level of industrial activity in most African countries then under colonial rule could be attributed to the devastating world war from 1914 to 1918. This was followed by the great depression of 1929-1935, which left millions of people unemployed all over the world. Its consequences were felt in other parts of the world including Africa.

The colonial policy of racial segregation and discrimination also played part. Colonial authorities looked at every attempt by Africans to organise with suspicion and did whatever they could to discourage it.

The growth and structure of trade unions in Africa during the period of colonization was conditioned on the one hand by the legislation and policies of the colonial powers, and by the close links with the nationalist movement on the other hand. While having to conform to the colonial legislation and to struggle within the colonial framework, African trade unions did their best to overcome the limitations of that framework. The result was not, as far as trade union structure is concerned, uniform. On Independence Day, in some countries, the pattern of trade unions imported from the metropolitan countries had already given way to a structure adapted to African conditions, but in many other countries the structure was still very closely modeled on that of the labour movement in France, Belgium or Britain.

2.4 TRADE UNIONISM IN NIGERIA.

Trade unions generally emerge from the efforts of workers to seek an improvement of existing condition through collective action. These conditions may relate to wages, hours of work, and other conditions of employment. There is some doubt as to whether this was the reason for founding the first trade union in Nigeria,

the southern Nigeria civil service union, which was inaugurated on August 19, 1912. The unions later change its name to the Nigerian civil service union after the creation of modern Nigeria in 1914 by the amalgamation of the protectorates of Northern and Southern Nigeria.

The cost of living allowances (COLA) agitation of 1941 showed the strength and influence of organized labour, but it also underscored the need for an organization representing all sections of labour in Nigeria. The African Civil Servants Technical workers' Union (ACSTWU), the civil service Union and the Nigerian Union of Railway men represented a considerable number of workers, but they suffered from the fact that they represented only public employees in the central government. The large army of public employees in the local authorities was not represented by any of them, and were not even organized. The need for an organization that would speak for all sections of organized labour inspired the leaders of the ACSTUW to organize a meeting in Lagos in November 1942, which inaugurated the Federated Trade Unions of Nigeria (FTU).

Soon after its inauguration, the FTU published a manifesto stating the ends to which it will use its good offices and defining tersely its method of approach in furthering the cause of Nigerian labour movement. It further pledges itself to be loyal to and co-operate with the Government so long as the latter acted in the best interest of the people. In April 1943 the FTU published the maiden issue of its official slogan 'The Nigerian Worker'. The maiden issue contained brilliant articles and an aspiring editorial captioned 'We Must Unite'. In July of the same year the organization organized a conference, which adopted a resolution changing the name of the FTU to the Trades Union Congress of Nigeria.

The period between 1950 and 1967 witnesses various splits in the TUC (Trades Union Congress) as a result of the question of international affiliation. The splits saw the formation of Trade union like the ANTUF (ALL Nigeria Trade Union Federation) in 1953, TUCN (Trades Union Congress of Nigeria), NCTUN (National Council of Trades Unions of Nigeria) and ANTUF again in 1959.

In 1960-62 there were NTUC (Nigeria Trades Union Congress) and Independent United Labour Front (IULF). The IULC also split into about three splinter groups and the IULC changed its name back to the NTUC. By the end of 1964 there were four national centres in the country; the United Labour Congress (ULC), the Nigeria Workers Council (NWC), the Nigeria Trade Union Congress (NTUC) and the Labour Unity Front (LUF) (an amorphous grouping of individual union leaders who believed that they could promote labour unity by their unions remaining unaffiliated to any of the other national centres). The unity promoters eventually became a national centre and were recognized as such by the Federal Ministry of Labour.

Bickering and rivalry continued among the centres until 1974 when the Apena Cemetery Declaration issued at the burial of J.A. Oduleye, former Treasurer of the ULC, formed the basis of achieving yet another unity. Unfortunately the Nigerian Government refused to register the NLC or accord it recognition, arguing that it was undemocratically set up and workers' representatives were not given the opportunity to elect its leaders.

In responding to the yearnings of labour leaders for labour unity in Nigeria, government, in 1977 set in motion the machinery for its attainment. This led to the inauguration of the industrial union in 1977. There were the promulgations of the

labour (Amendment) Decree now (ACT) No. 21 of 1978 and the Trade Unions (Amendment) Decree now (ACT) No. 22 of 1978, which provided for:

- i) One central labour organization
- ii) 42 industrial unions
- iii) 18 senior staff Associations
- iv) 9 Employer's association and
- v) Automatic 'check-off' with provision of contracting out voluntarily.

The promulgations of the labour decrees in 1978 led to the inauguration of a new national centre, the Nigeria Labour Congress, at Ibadan on 28 February 1978. Hassan Sunmonu was elected president and Aliyu Musa Dangiwa was appointed General Secretary.

2.4.1 Developments

A remarkable development in Nigeria in recent Years is the growth and spread of trade unions to different sections of the community. For instance, in the country today, there are four types of industrial organizations, which are trade unions, so to speak. They are:

- i) Employers' associations
- ii) Senior staff associations
- iii) Unions of professionals, and
- iv) Unions of junior employees.

for proper union activities. The fire safety measures in office buildings considered by the researcher shall also help in protecting a money-consuming secretariat and its prospective occupants and their properties so as to prevent the failure of office complexes due to fire outbreaks.

1.1 MOTIVATION

The research was motivated by the desire to provide for a befitting National headquarters for the Nigerian Union of Local Government Employees (NULGE) in the Federal Capital Territory, Abuja to serve as a symbol of Unity of all local government workers in Nigeria, considering its roles to the new Nigerian democracy.

1.2 AIMS AND OBJECTIVES

1.2.1 Aims:

This project aims at providing a befitting structure to serve as the National Secretariat for the Nigerian Union of Local Government Employees in Abuja, and ensuring fire safety measures in this same proposal by the dictates of the researcher's design concept.

1.2.2 Objectives:

- i. To create a congenial atmosphere, in terms of planning, functionality and aesthetics, for effective organization of trade union activities in Nigeria
- ii. To unify all the trade unions and provide an avenue for interaction amongst them.
- iii. To further enhance the training of local government employees.

Until recently, trade unions of employers and senior staff were a rarity. However, of late they represent the new growth points in trade unionism in the country. Similarly, the trade unions of junior employees existed and were most active in government employment and the major commercial, industrial service, and agricultural organization. Today they can be found in small, medium, and large organizations through out the country. The unions of junior employees claim among themselves, a total of about 4 to 6 million.

2.4.2 Organization

Following the re-organization of the unions, a tidy and well-knit trade union structure, capable of serving the needs of the members and the nation from local to international levels, emerged. The power of the unions at the national level is wielded by the NLC even though the industrial unions have a moderating effect on the NLC. The power of the unions at the industrial levels is wielded by the industrial unions. And at state/zonal and local levels, there are subordinate organs of the unions.

2.4.3 Activities and Methods

Before the re-organization of unions between 1976 and 1978, the intensity and range of activities in Nigeria trade unions were limited. Bargaining unions as well as unions that provide benefits of any sort to their members were very few.

There have been improvements in finance, leadership, and recruitment and training, to mention a few areas. Some all organised sectors have been transformed to organised sectors. Raiding and unnecessary rivalry have been reduced. Finally, at

the national level they have challenged 'economic lunacy' with varying degree of success.

2.5 THE NIGERIAN UNION OF LOCAL GOVERNMENT EMPLOYEES.

The N.U.L.G.E was registered in the 1987 and adopted a constitution, which among other things aims to achieve the following objectives:

- i. The organization of workers who are qualified for membership
- ii. The regulation of relations between workmen and employers and between workers and workmen.
- iii. Establishment and maintenance of just and proper hours of work, rates of pay and condition of service.
- iv. Establishment and maintenance of a high standard of workmanship and professional practice
- v. Advancement of the education and training of members and employees of the union
- vi. Promotion of welfare of members
- vii. Encouragement of participation of members in decision making process at local, state and national levels.
- viii. Protection and advancement of the socio-economic and cultural interest of members.

- ix. Promotion and fostering of legislation on local government matters and advancement of career prospects of members employed in the local government and allied services.
- x. Co-operation with other trade union organizations with similar aims and objectives.

2.5.1 Membership and organization of N.U.L.G.E

Any person who is employed in the following local government and Allied services is deemed to be a member of the union:

- i. Local government or municipal government service
- ii. Public utility service
- iii. Town and country planning service
- iv. Local government service commission
- v. Local government pension board
- vi. Waste disposal services.

And any other undertaking established under local government edict or law enacted by any state of the federal republic of Nigeria.

2.5.1.1 INTERNATIONALIZATION: The Nigeria union of local government employees (NULGE) is in bilateral relationship with some foreign countries such as local government municipal council workers of South Africa (SAMINU) Local Government workers of Ghana, UNISEN of Britain, Sweden etc. the countries

engage in cross fertilization of ideas in labour related matters such as trade union education, seminars and workshops etc through bilateral agreements.

2.5.1.2 Organization

The National Delegates Conference holds the supreme authority of the union. It delegates its powers, responsibilities and authority to be exercised by the National Executive Council. This National Delegates Conference is composed of:

- i. All national officers
- ii. All state presidents
- iii. Ten delegates elected by the state executive council of each state branch of the union.

The National Executive Council is the main organizing body of the union at National level. At the state level, the state executive councils are the organizers. While the local executive committee takes charge of the local branches of the union.

2.5.2 The structure of the union

The Nigerian union of Local Government Employees operates at three major levels thus: the National, the state and Local branch level. The power of each level is according to the hierarchy (Fig. 2.1) and is in descending order. However, the governing bodies of the union are vested in the following organs.

- I. **NATIONAL DELEGATES CONFERENCE:** The supreme authority of the union is vested in the National Delegates Conference, which also

- delegates its powers, responsibilities and authority to be exercised by the National Executive Council in between National Delegates Conferences, it is composed of all National officers, all state presidents and ten delegates elected by the state executive council of each state branch. (Fig. 2.2)
- II. **THE NATIONAL EXECUTIVE COUNCIL (NEC):** Is the highest decision making organ of the union and is made up of twelve (12) elected National officers, thirty-six elected state presidents plus FCT Abuja and the General secretary. (Fig. 2.3)
- III. **THE STATE EXECUTIVE COUNCIL (SEC):** Is the highest decision making organ of the union at the state level and it is made up of all elected state officers and branch chairmen.
- IV. **CENTRAL WORKING COMMITTEE (CWC):** The central working committee is made up of all elected National officers, the General Secretary, Deputy General Secretary and 3 state presidents – one representing each zone of the union. The committee meets in between NEC or as the need arises and is presided over by the National president.
- V. **STATE DELEGATES CONFERENCE:** The state delegates conference is held once every four years on a date, time and at a venue to be decided by the state executive council. It is made up of state officers and ten members elected from each local branch. It elects state officers of the union.
- VI. **LOCAL BRANCH EXECUTIVE COMMITTEE:** The local branch executive committee is made up of elected branch officers and one member elected

from each department of local government at its triennial meeting. It is the highest decision making organ of the union at the local level.

VII. STAFF AND ESTABLISHMENT COMMITTEE: The staff and establishment committee is made up of eleven (11) members drawn from National and State officers. The Deputy National President is the chairman while the deputy general secretary is the secretary. The committee is in charge of staff welfare covering promotions, advancement, conversion, discipline etc.

NATIONAL DELEGATES CONFERENCE



NATIONAL EXECUTIVE COUNCIL



CENTRAL WORKING COMMITTEE



STATE DELEGATE CONFERENCE



STATE EXECUTIVE COUNCIL



LOCAL DELEGATES CONFERENCE



LOCAL EXECUTIVE COMMITTEE

FIG. 2.1 ORDER OF HIERARCHY IN N.U.L.G.E.

NATIONAL PRESIDENT

NATIONAL DEPUTY PRESIDENT

3 NATIONAL VICE PRESIDENTS

NATIONAL TREASURER

2 NATIONAL AUDITORS

3 NATIONAL TRUSTEES

PUBLICITY SECRETARY

FIG. 2.2 PRINCIPAL NATIONAL OFFICERS
ELECTED AS MEMBERS OF THE
NATIONAL DELEGATES CONFERENCE

NATIONAL OFFICERS: ALL MEMBERS
OF THE NATIONAL DELEGATES CONFERENCE



GENERAL SECRETARY



ALL STATES PRESIDENTS OF STATE BRANCHES.

FIG. 2.3: MEMBERS OF THE NATIONAL
EXECUTIVE COUNCIL N.U.L.G.F.

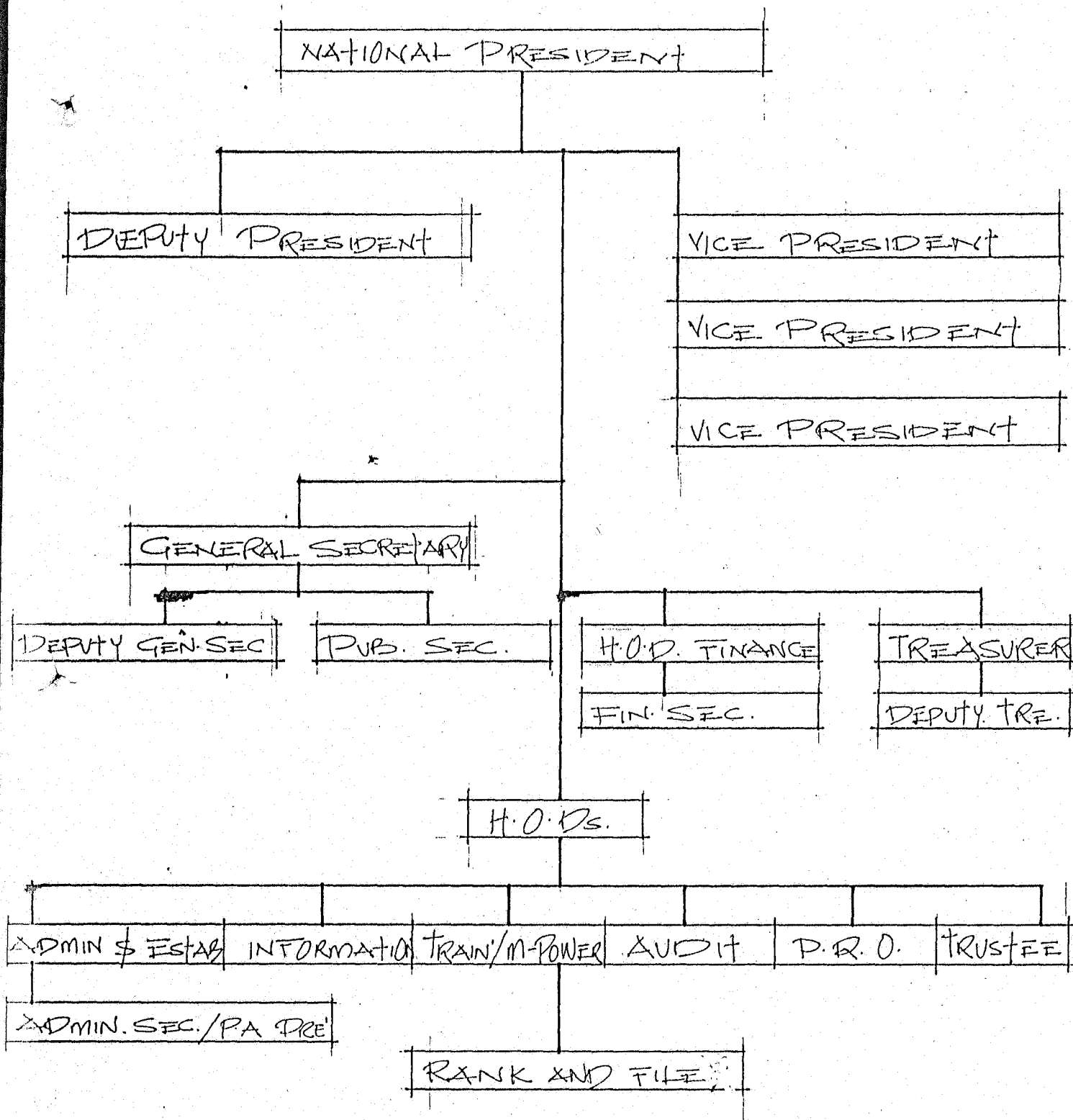


FIG. 2.4: ORGANIZATION CHART OF N.U.L.G.E.

2.5.3 Departmentalisation

The union has six (6) departments thus: Department of Administration and Establishment, Department of Information and publicity, Department of Training and manpower, Legal Department, Department of Accounts and Internal Audit and Executive Department. This took effect under the leadership of chief Dr. Deji Akinwalere the National President.

I. ADMINISTRATIVE ZONES: The union is divided into three administrative zones for the purpose of electing three state presidents who shall be member of the central working committee (CWC). The three zones and their constituent states are as follows:

- i. **ZONE I** Shall consist of Adamawa, Bauchi, Benue, Borno, Jigawa, Kaduna, Kano, Kebbi, Katsina, Kogi, Kwara, Niger, Plateau, Sokoto, Taraba, Yobe, Nasarawa, Gombe, Zamfara and FCT.
- ii. **ZONE II** Shall consist of Akwa-Ibom, Anambra, Bayelsa, Cross River, Enugu, Ebonyi, Imo, Abia and Rivers.
- iii. **ZONE III** Shall consist of Delta, Edo, Ekiti, Lagos, Ogun, Ondo, Oyo and Osun states.

Although, the country is presently sub-divided into six geo-political zones, the above arrangement still subsists in the union as stipulated in the constitution.

2.5.4 Officers and their duties (NULGE Constitution)

2.5.4.1 THE NATIONAL PRESIDENT.

- i. The national president shall be elected by secret ballot at the national delegates conference of the union. He shall serve for four years and shall be subject to re-election for another one term only.
- ii. He shall preside at all national delegates conferences. Meetings of the national Executive council, the central working committee and any other organ of the union in which he participates as a member.
- iii. He shall be responsible for the proper conduct of the business of all the meetings that he presides over and shall sign the minutes of the meetings and other important documents of the union once they are approved by the appropriate organ of the union.
- iv. He shall together with the national treasurer and other trustees be one of the signatories for the operation of the union's bank accounts.
- v. He shall give leadership and direction for the attainment of the aims and objectives of the union.
- vi. He shall keep himself in close touch with the activities of the national secretariat and perform all other duties pertaining to his/her office as the president.

2.5.4.2 THE DEPUTY NATIONAL PRESIDENT

- i. The deputy national president shall be elected at the national delegates conference of the union. He shall serve for a period of four years and shall be subject to re-election for one term of four years only.
- ii. He shall co-operate and assist the national president in the performance of his duties and shall act in the absence of the national president.

2.5.4.3 THE VICE PRESIDENTS.

- i. The three vice presidents shall be elected at the national Delegates Conference of the union. They shall serve for four years and shall be subject to re-election for another term of four years only.
- ii. The vice presidents shall assist the president and the deputy president in the smooth running of the union and the union and any of the vice president shall act for the Deputy president during his absence.

2.5.4.4 THE GENERAL SECRETAY

He shall be a full-time appointed officer. He shall attend all the meetings of the national Executive council and the national Delegates conference, and shall keep accurate records of these meetings. He shall be in charge of all the paid staff of the union. He shall attend to all correspondence addressed to the union and shall from time to time submit reports on the audited accounts of the union to the national executive council. He shall administer the affairs of the union in accordance with the provisions of the union's constitution and the laws of the land, subject to the over-all

control of the national president. He shall keep the nominal roll of all the members of the union.

2.5.4.5 THE DEPUTY GENERAL SECRETARY

The Deputy General Secretary shall be on full time appointment. He shall assist the General Secretary to ensure smooth administration of the union and shall perform such duties as the General Secretary may assign to him from time to time. He shall act for the General secretary during his absence.

2.5.4.6 THE NATIONAL TREASURER

The national treasurer shall be elected at the quadrennial national delegates conference of the union. He shall hold office for four years and shall be subject to re-election for another term of four years only. He shall have responsibility for the general supervision of the finances of the union and shall from time to time submit reports on the position of the accounts of the union to the National executive council. He shall together with the General secretary sign vouchers for payments approved by the national executive council. He shall ensure that all monies received on behalf of the union are promptly paid in to the union's bank accounts and that true and accurate records of all receipt and payments are kept in accordance with the provisions of the constitution and the laws of the land. He shall together with the National president and other Trustees be one of the signatories for the operation of the union's bank accounts. He shall comply with all directives and regulations made by the National Executive council to safeguard the funds of the union.

2.5.4.7 THE AUDITORS

- i. The Duly Appointed Auditors and internal Auditors shall thoroughly examine all documents and books of account kept by the union and shall check all receipts and payments and certify them accordingly.
- ii. The Auditor(s) shall have access to all books, accounts, vouchers and other documents of the union which he/they may consider necessary for purposes of probity and accountability.
- iii. The Auditor(s) shall prepare reports on the financial position of the union, the manner in which the accounts have been kept, having regard to the provisions of the trade unions act, 1973 concerning the Accounts of the union.

2.5.4.8 STATE BRANCH OFFICIALS

All staff posted to a state branch shall work under the close supervision and directives of the state Branch union. The state secretary shall however be answerable to the General secretary on all administrative matters.

2.5.4.9 STATE OFFICERS

State officers shall perform similar duties as their national counterparts at state level.

2.5.4.10 TRUSTEES

- i. The trustees shall be elected at quadrennial delegates conference. They shall serve for four years and shall be subject to re-election for another term of four years only.

- ii. The Trustees for the time being shall have invested in them all real and personal estate and whatever belongs to the union, and they shall deal with them in such ways and manner as the national executive council may direct from time to time.
- iii. A Trustees may be remove from office by the National Executive Council on grounds of ill-health, unsoundness of mind, prolonged absence from the country, or for any other reason that renders him/her unsuitable to perform the duties of the office.

2.6 THE UNION'S FUNDS

- i. The funds of all units of the union shall be the property of the national union and nothing in these rules shall prejudice the right of the National Executive council to institute proceedings to recover any money or property belonging to the union.
- ii. All property acquired for the union in whatever custody, and of whatever nature, shall belong to the national union.
- iii. The national Delegates conference or the National Executive council acting on its behalf shall have the power to employ the funds of the union in such manner, as may be fund necessary and expedient.
- iv. The funds and property of the union shall be applied for the purpose of attaining the objectives of the union as defined in the constitution.
- v. The main sources of the funds of the union shall be monthly subscriptions; levies' and proceeds of economic and social activities.

vi. The funds of the union from monthly check-off dues shall be allocated as follows;

Local Branch 20%

State Branch 35%

National Body 35%

Central Labour organization 10%

100%

vii. All check-off dues shall be paid to the national union which shall have the power to make allocation/rebates to branches as prescribed in the rule.

vii. All deductions from the wages/salaries authorized by members under the check-off system shall be made payable to the Union, and shall remain in force during the period of employment of the member in the industry which the Union caters.

2.6.1 Wage Negotiation:

Unlike the other tiers of the public service which has its civil service Negotiating councils I, II and III, the Local Government Service have no such official forum. However, that is not to say that the union has not been successfully handling workers disputes/grievances in the case of salaries and wages, the central labour organisation. The Nigeria Labour Congress (NLC) negotiates with the federal Government on behalf of all workers in the public sector. After that, the NULGE

directs the state and local levels that in tier discuss with the appropriate organ of government for effective implementation.

CHAPTER THREE

3.0 RESEARCH AREA: FIRE SAFETY MEASURES IN OFFICE BUILDINGS

3.1 INTRODUCTION

Incidences of fire outbreak in buildings within the country have received much publicity in the past couple of years. This is mainly due to the fact that fire incidences have devastated several public buildings of great magnitude and social economic value.

Basically, it is very expensive to construct such public buildings because of their need to be structurally stable, beautiful and the consideration of the number of people and expensive electrical equipments that are always housed in these buildings. But unfortunately, there haven't been proper fire protection measures for the design of these buildings. This is a clear fact looking at the rate of uncontrolled fire hazards in the country. In October 2003, a substantial portion of the ABG communication house Kaduna was consumed by fire, which is one of the latest in the series of infernos raging.

This research therefore aims at establishing basic principles a designer can follow to ensure fire safety measures in the design of an office building such as the proposed NULGE National secretariat Abuja where by the occupants can reach safety without assistance when using the escape routes, easy evacuation from area of incipient the control of the spread of fire and the quick extinction of fire at the instance of fire.

3.2 FIRE

Fire or combustion is the rapid oxidation of combustible substances and gasses resulting in the evolution of heat and light.

Three elements are therefore essential for fire to start viz combustible substances (fuel), oxygen and heat. Charles et al (1981)

I. COMBUSTIBLE SUBSTANCES

They exist in three states.

- i. Solid fuel: paper, wood, clothing, furniture.
- ii. Liquid fuel: petrol, kerosene, mentholated spirits.
- iii. Gaseous fuel: propane, butane, hydrogen etc.

II. HEAT

This is the attainment and maintenance of certain minimum temperature. Heat is therefore defined as the degree of hotness (or coldness) of a body. In all cases, heat is necessary to raise the temperature of all substances before they ignite and result to fire.

III. OXYGEN

Oxygen otherwise known as a supporter of combustion cannot continue to burn if the atmosphere surrounding it is deficient of oxygen. Oxygen tends to turn on fire and causes rapid spread but much of this depends on the amount of oxygen/air present.

The three main elements of combustion could be represented on a triangle called the; ***triangle of combustion***; with each element representing one of the three sides of the triangle. Removal of one of the three sides of the triangle of combustion would automatically extinguish the fire.

3.2.1 Causes of fire

Fire could be said to have three principal sources of origin namely:

I. ACCIDENTAL ORIGIN

The accidental fire sources are those causes as a result of acts of commission left to develop due to carelessness of the occupants of the building.

Cigarettes not properly handled could cause serious fire. Bars, restaurants or such places where cigarettes are easily used often encounter this problem.

Also electrical sparks due to over-heated components or wires or even wrong wiring could trigger which latter develop to full fire incident if not checked early enough.

II. INCENDIARY ORIGIN

This is the type of fire that occur due to ignition of certain components of inflammable liquids. Also places where inflammable materials are dumped of dustbins, staircase, toilers, a careless disposition of inflammable materials could be a source of origin of fire. Example, cigarette dumped carelessly in a paper or dustbin could later be a serious source of fire to the building concerned. Also, criminal of intentional fire planting in buildings fall under incendiary origin or source of fire.

III. ACT OF NATURE

This is the fire source that is due to natural tendencies or phenomena. This includes lightening, rays of the sun, spontaneous heating etc.

When appliances are not duly protected against lighting and thunder for instance, the great heat, infused by this could result in fire situation in the component or appliance, mostly electrical appliances. It is observed that the causes of fire in offices are often by faulty electrical wiring and equipment and seldom by act of criminal intention.

3.2.2 Classes of fire

Fires are categorized into four broad groups according to the combustible substances involved.

- i) Fires involving carbonaceous materials likely to burn freely i.e. wood, papers, textiles.
- ii) Fires involving flammable liquids i.e. petrol, fat, oil, grease.
- iii) Fires involving gases such as acetylenes propane
- iv) Fires involving metals such as magnesium, aluminium or potassium.

3.2.3 Elementary Fire Prevention Activities

When fire breaks out, certain people believe that the extinction of such fire is the job of the fire fighters only, even if the fire is a small flame. Fires occurring in buildings are often characterized by panic and lost of ideas confusion by the occupants and this subsequently lead to rapid spread of the fire within the building and spreading to other adjacent properties.

Obedience of simple fire prevention rules has a vital role to play in the minimization of occurrence of fire. Cleanliness in premises is very essential while daily disposal of waste is a primary requirement. It is important for all employers of labour to endeavour to train their employees on simple fire precautions, and to see to the maximum utilization of such training by organizing mock fire drills for the employees at least twice in a year.

3.3 FIRES AND OFFICE BUILDINGS.

Generally, all buildings require high standards of the fire safety measures as lives and properties ought to be protected. Causes of fire in office buildings are observed to be often by accident (faulty electrical equipments and wiring) and seldom by incendiary (Arson) (Plate 3.1 and 3.2)

Notable extensive fire accident in office buildings in Nigeria include:

- (i) **Republic Building:** Which housed the External Affairs Ministry, the defence Ministry and part of the Federal Department of information before it was razed on December 15th 1981.
- (ii) **Netcom House:** The national showpiece and head office of the Nigerian Telecommunication Limited. A towering high-rise structure which boasted of being the tallest building in the land, it fell to flames during the second republic on January 24, 1983.
- (iii) **Independence building:** This high-rise structure housed the Federal Ministry of Education, which was moved to Victoria Island to give way to the Defence Ministry after its own complex suffered a fire incident. Independence Building caught fire on April 15, 1995.
- (iv) **NNPC Building:** This high riser also fell to flame in 2001.

Office buildings particularly the multi-storey offices deserve careful planning in order to make it safe for its inhabitants and for the administrative documentations to be safe guarded in the event of fire outbreak, and easy rescue operation by fire fighters to be possible. Conscious design should be made effective which could reduce the wide spread of fire to a barest minimum at the event of outbreak.

3.3.1 Fire Spread

This is the dispersal or diffusion of the fire flames from the point of incipient to other parts of the building. This spread is basically in two ways: Internal and external spread which are Vertical and horizontal.

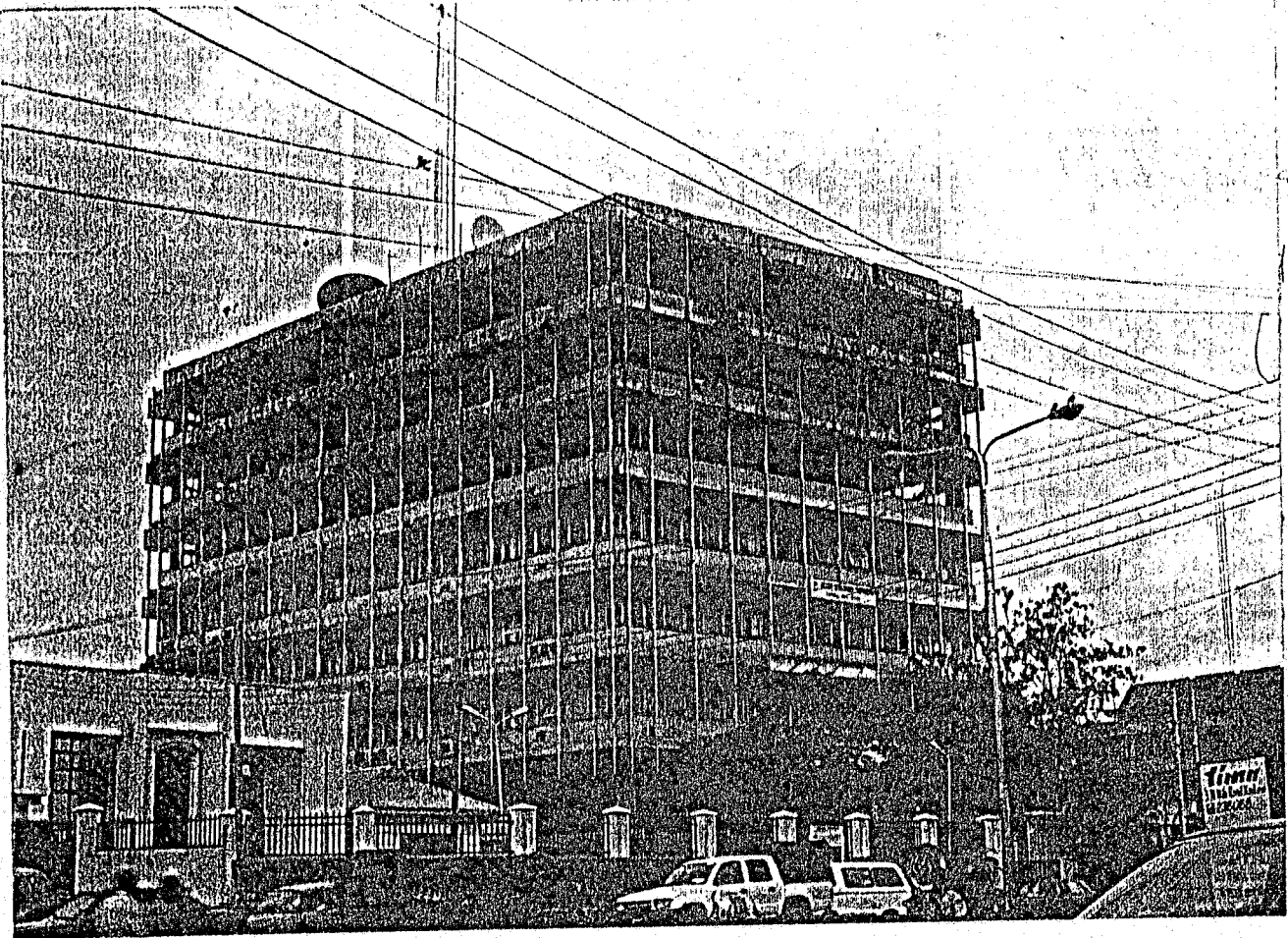
I. INTERNAL FIRE SPREAD (surface): the linings of walls and ceilings can be an important factor in the spread of a fire and its gaining hold. This can be particularly dangerous in circulation areas, where it might prevent people escaping. Two factors relating to the property of materials need to be taken into account: the resistance to flame spread over the surface and the rate of heat release once ignited. Various testing methods are used to establish these qualities.

II. EXTERNAL FIRE SPREAD: This is the spread of fire from one building to another through walls and roofs. The distance between buildings (or between the building and the boundary) is obviously an important factor, as it is the likely severity of the fire, which is determined by the fire load of a building (i.e. the amount of combustible material contained within).

- i. **Vertical spread:** The fire flame moves rapidly in upward direction as convection heat accelerates or facilitates burning by pre—heating fuel above it. Where this is flammable, vertical component; for example ducts of combustible materials, the flame vertically is very much pronounced.
- ii. **Horizontal spread:** This spread is less rapid. This is because of the convection away situation with the heat from the incombustible material. This explains why the rapidity of spread of fire along the ceiling is more pronounced

FIRE AND OFFICE BUILDING

SOURCE: FAULTY ELECTRICAL WIRING (ACCIDENTAL)

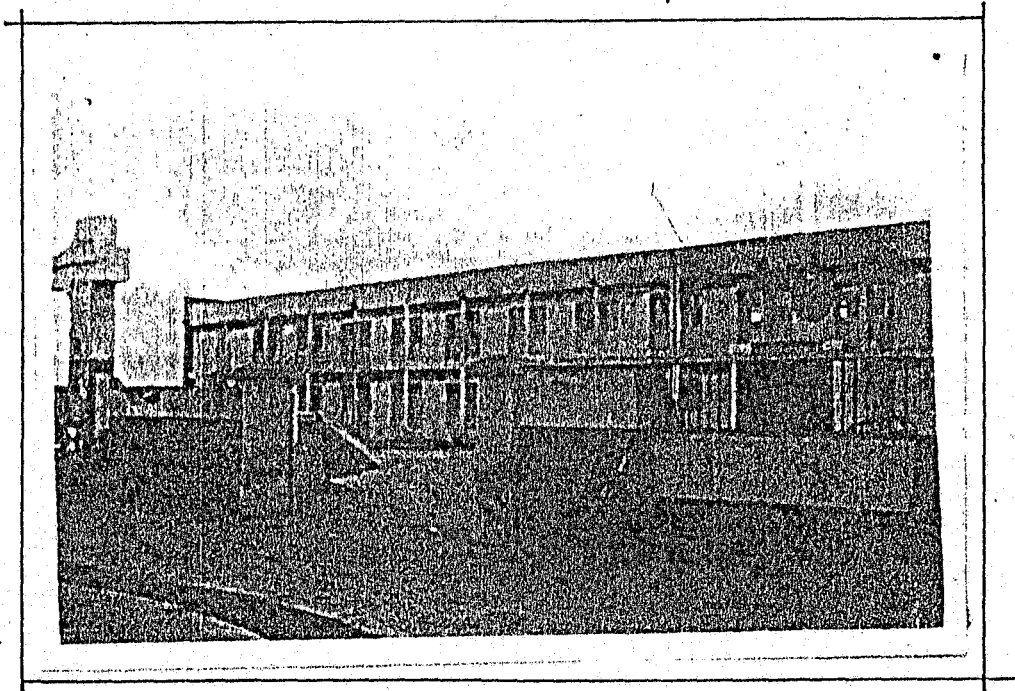


PICTORIAL VIEW.

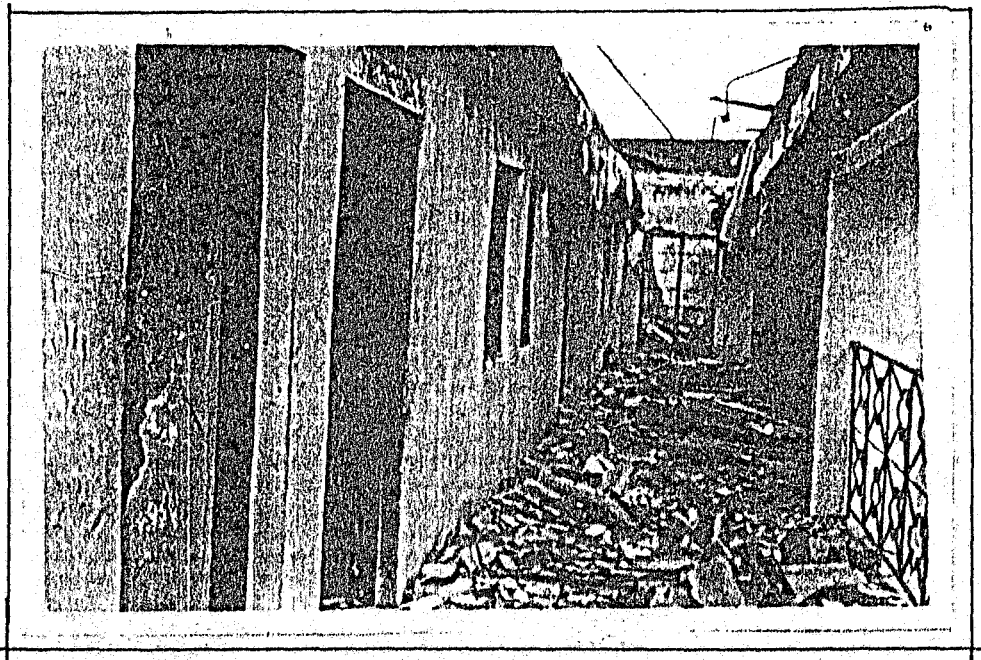
PLATE 3.1: ABC COMMUNICATION HOUSE KADUNA.
KADUNA STATE (2003)

FIRE AND OFFICE BUILDING

SOURCE: ARSON ATTACK (INCENDIARY)



APPROACH VIEW



INTERIOR VIEW

PLATE 3.2: KONTAGORA LOCAL GOVERNMENT AREA,
SECRETARIAT MINUK. NIGER STATE: (2004)

than on the floors, except where the floors are made of combustible materials such as timber.

3.4 SAFETY MEASURES IN OFFICE BUILDING

The office buildings emphasised in this text are multi storey buildings because the proposed design project on which the research finding and recommendation shall be based is a multi-storey building.

Multi-storey buildings consist of many floors and subsequently assume great heights from the ground level; therefore, it deserves serious attention in its design in respect to fire safety measures. This is because if such building height with poor safety measures are integrated into designs, there is bound to be difficulties in fighting fire and rescuing during fire outbreak.

Obviously designers and builders alike cannot be held responsible for the action or non action of the occupants of the buildings they create but they can ensure that these structures are designed and constructed in such a manner that they give the best possible evacuation means and resistance to the action of fire should it occur.

The safety measures a designer can integrate to its design at the occurrence of fire outbreak or of containing it within the region of the outbreak is, providing easy means of escape for people in the immediate vicinity and means of fighting the fire. This can be studied under the following sub-headings, fire triangle, site planning, design consideration and fire-fighting measures.

3.4.1 The Fire Triangle

As stated earlier, combustion occurs in the presence of fuel, heat and oxygen. They are represented by triangle as triangle of fire with each element representing one side of the three sides of the triangle. The removal of any one of the three sides makes the triangle incomplete, which in essence means fire would not be formed. Therefore, there is the need for measures that would disallow the formation of a complete triangle. (Fig. 3.1)

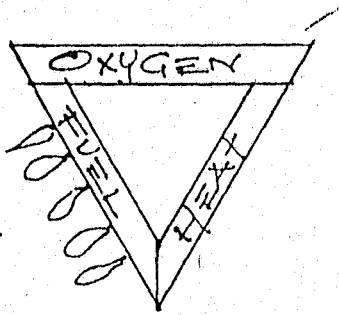
An architect can do very little to reduce the oxygen content of the buildings because human lives depend on it for survival. (Natural ventilation)

The fuel (i.e. combustible materials such as timber) would be excluded in roofing trusses and replaced by steel trusses. Heat flow would be excluded from the materials likely to burn or deform when in contact with fire. The materials such as the steel stanchions would be embedded in burnt brick for protection.

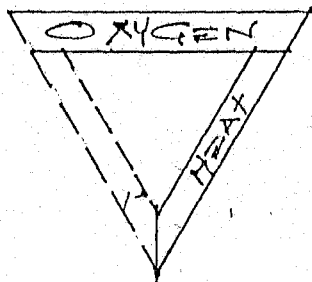
3.4.2 Site Planning Consideration

Access for fire fighters and their vehicles must be given serious considerations at the early stage of the design. Obstructed movements of the fire brigade may cause serious delays and result in greater loss.

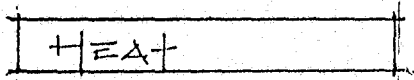
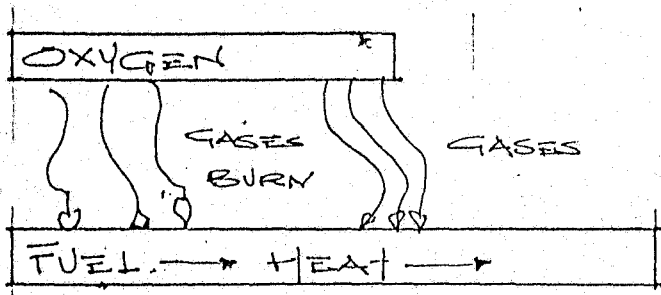
Sufficient access to the site for vehicles must be provided to allow fire appliances to approach the building. Principal appliances are ladders, hydraulic platforms and pumping appliances. Access roads for fire appliances should be at least 3.7m wide with gates not less than 3.1m. Headroom of 3.7m for pumps and 4.0m for high-reach appliances is required. The respective turning circles of these



FIRE TRIANGLE.

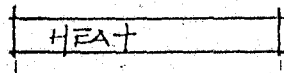
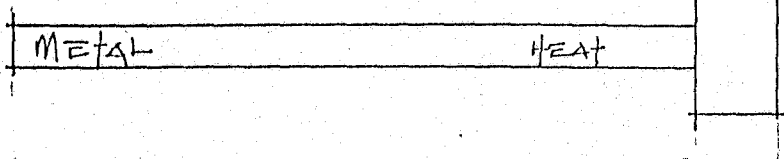


COMBUSTION NOT POSSIBLE

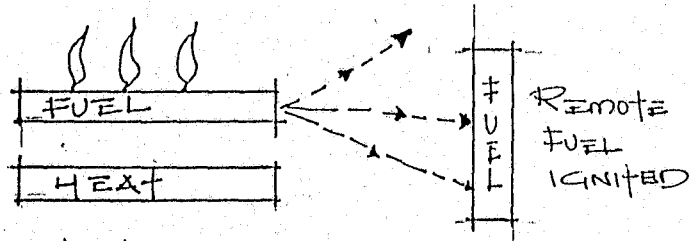


FUEL IS HEATED AND GASES ARE GIVEN OFF.

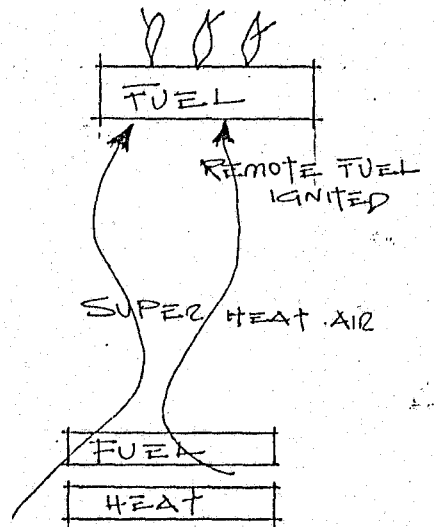
INITIAL SOURCE OF HEAT.



HEAT TRANSFER BY CONDUCTION



HEAT TRANSFER BY RADIATION



HEAT TRANSFER BY CONVECTION

FIG. 3.1: FIRE TRIANGLE AND HEAT TRANSFER

appliances are 17m and 26m between curbs. Allow 5.5m wide hard standing adjacent to the building, as level as possible (not more than 1:12), with a clearance zone of 2.2m to allow for the swing of the hydraulic platform.

Fire fighters must be able to gain access to the building. The normal escape routes are sufficient in small and low buildings, but in high buildings and those with deep basements additional facilities such as fire fighting lifts, stairs and lobbies, contained within protected shafts, will be required.

As it has been up till today, water has been and continues to be the most widely used fire-extinguishing agent because of its low cost and its cooling, smouldering, diluting and emulsifying characteristics. Its availability for fire protection is a prime concern. Its adequacy and reliability are some of its quality determining whether it would be enough for fire fighting. Therefore, there is the need for the provision of a reservoir by the design.

3.4.3 The design Consideration

It is probably impracticable to design buildings so that under no circumstances will any person be trapped by fire. This is not because adequate and suitable precautions cannot be provided, but generally because of human failure to use and maintain these or to do the right thing in an emergency. This does not restrict the building designer from planning, constructing and finishing his building in such a way that every person has a fair chance to escape to open air by their own unaided efforts via a predetermined route.

The design consideration for fire safety should be based on: -

- i. **Egress provision:** Provide for adequate exits without dependence on any one single safeguard
- ii. **Control of fire spread:** To ensure that construction is sufficient to provide structural integrity during a fire outbreak while occupants are exiting.
- iii. **Eescape route:** Routes of escape are to be clearly marked so that there is no confusion in reaching an exit and adequately lighted.

3.4.3.1 EGRESS

i. **EXIT:** A means of egress or exit is defined as a continuous and unobstructed way of exit travel from any point in a building or structure to a public way. It comprises the vertical and horizontal ways of travel and shall include intervening spaces door ways, hallways, corridors, passageways, balconies ramps, stairs, lobbies, escalators, courts and yards. Means of egress include exit access, the exit and the exit discharge.

Exit access is that portion of a means of egress that leads to an entrance to exit. This includes the room or space in a building which a person is located, the aisle, ramps, passage ways, corridors and doors that must be traversed on the way to an exit. Exit is that portion of a means of egress that is separated from all other spaces of the structure by construction or equipment. It may include part of the corridor, stairs; smoke proof towers, outside balconies, ramps and doors. In its

simplest form, the exit is simply a door leading to the outside. The entrance to an exit is usually a fire door that provides a protected entrance into a protected area.

The fire check doors should be made and maintained self-closing and kept closed.

Exit routes must therefore be:

- i. So located that exits are readily accessible at all times, properly maintained and kept free from destruction.
- ii. Properly protected from the menace of weather.
- iii. Kept devoid of slippery surfaces. (E.g. highly polished floors, oil etc. on escape routes should be avoided.)
- iv. Maintenance of lighting on internal and external escape routes is essential
- v. There should be adequate width.
- vi. There should be at least two escape routes in opposite directions requiring no one to travel more than 30m to reach the open air or smoke-free fire-resisting corridor, stair or lobby.

Additional precautions include distinct marking of exit and non thorough-fare, signs because of likelihood of mistaking doors, passage ways or stair ways which lead to dead-end spaces for exits. All doors on escape routes, with exception of sliding doors, constructed to open outwards.

Means of escape which form an integral part of a building whereby a person can escape from fire are further classified into two:

i. **Comparative:** This is the escape within the building only e.g. along the passage.

ii. **Ultimate Safety:** Escape from the building on fire to an open yard otherwise known as a place of complete safety.

II. **DOORS:** Doors serve three purposes related to comfort and safety of building occupants and their properties. They provide protection from (i) weather, noise and disturbance from adjoining areas (ii) Trespass by unauthorized people and (iii) Fire and smoke.

There are 3 broad categories of doors providing varying degrees of protection from fire.

i. The non-fire rated door such as in residential buildings.

ii. The tested fire door that has passed the standard fire test and it includes the half hour fire doors, the one to two hour fire doors. These doors will withstand a severe fire and hose stream exposure for a definite period of time (half an hour to two hours). These doors will be used at areas of fire prone discussed above.

iii. The smoke stop door is usually of lighter construction than the fire door. Its function is to provide a temporary barrier against the passage heat, smoke and gases. The staircases here shall be of permanent fixed construction. The doors shall be self-closing fire resistance doors.

3.4.3.2. CONTROL OF SPREAD OF FIRE:

In the control of fire spread, the internal and external spreads are the basic consideration.

I. INTERNAL FIRE SPREAD (STRUCTURE)

There are three factors to be considered under this heading:

i. **Structural Integrity:** unprotected structural elements such as steel beams or steel columns soon reach high temperatures. Some members reach 500⁰c in 10 minutes and at 40 minutes some of the primary beams are up to 800⁰c (British Research Establishment 1982 Annual Report). These temperatures are much in excess of the 550⁰c normally considered safe for steel. Thus the protection of these elements becomes very necessary in order to allow people to escape, to make it safe for fire fighters to enter the building to rescue victims and tackle the fire, and also to protect nearby people and adjacent buildings from the effect of collapse.

The steel beams and truss members will be coated with fire retardant paints by spraying. This would retard and possibly control flame spread or smoke development of interior spaces.

The steel columns would be encased in concrete cover or brick mullion to reduce heat to the steel column. Brick mullion is more preferable to concrete cover because the bricks had already been subjected to higher temperatures during the process of cooking. Moreover, brick mullion gives better aesthetical perception of the member.

The level of fire resistance required depends on a range of factors; an estimation of the potential fire severity (depending on the use and content of the building); the height of the building; type of building occupancy; the number of floors and the presence of basements.

ii) **Compartmentalization within building:** One design philosophy of preventing the rapid spread of fire throughout the building is compartmentalization (i.e. many rooms on a floor separated by fire resisting structural walls). This is to slow and contain the growth of fire in reaching adjacent spaces and to allow sufficient time for evacuation of the occupants and properties. In general, floors in multi-storey buildings form a compartment division, as do walls that divide different parts of multi-use buildings. The use of sprinklers can allow an increase in the compartment size in non-residential buildings.

Careful attention should be paid to construction details of compartment walls and floors, particularly the junction details between walls, floors and roofs, such that the integrity of fire resistance is maintained. Strict rules apply to openings permitted in compartment walls and floors, these being restricted to automatic self-closing doors with the appropriate fire resistance, shafts and chutes with the requisite non-combustible properties and openings for pipes and services, carefully sealed to prevent fire spread.

There is a wide range of constructions, each of which offers a specific duration of resistance. (Fig. 3.2 and Fig. 3.3) show examples of some compartment floors and walls.

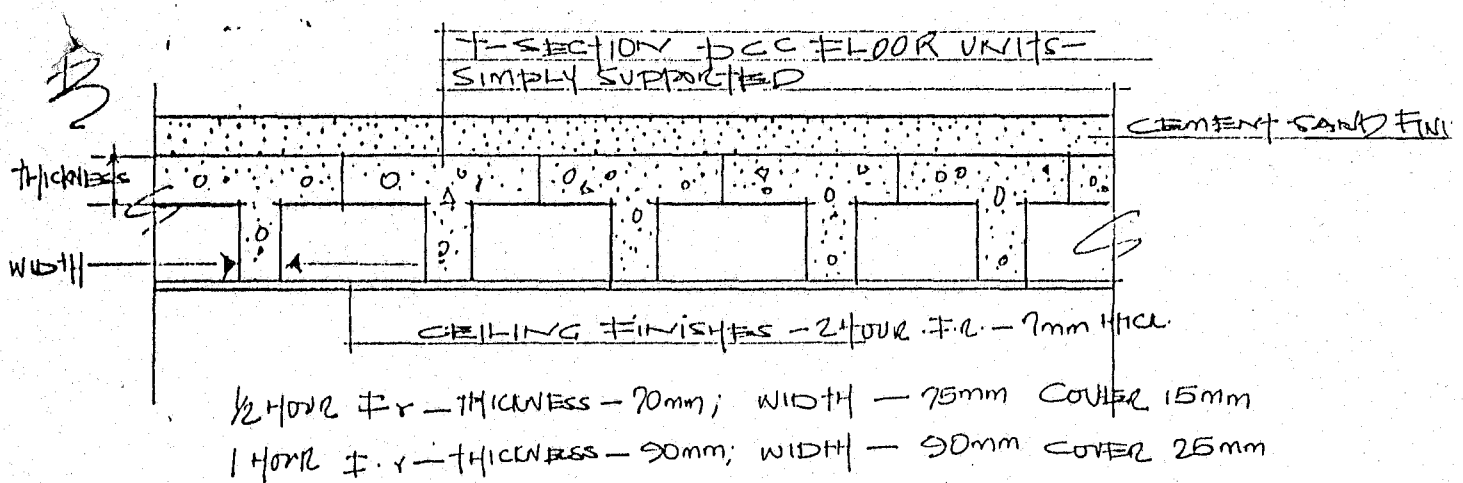
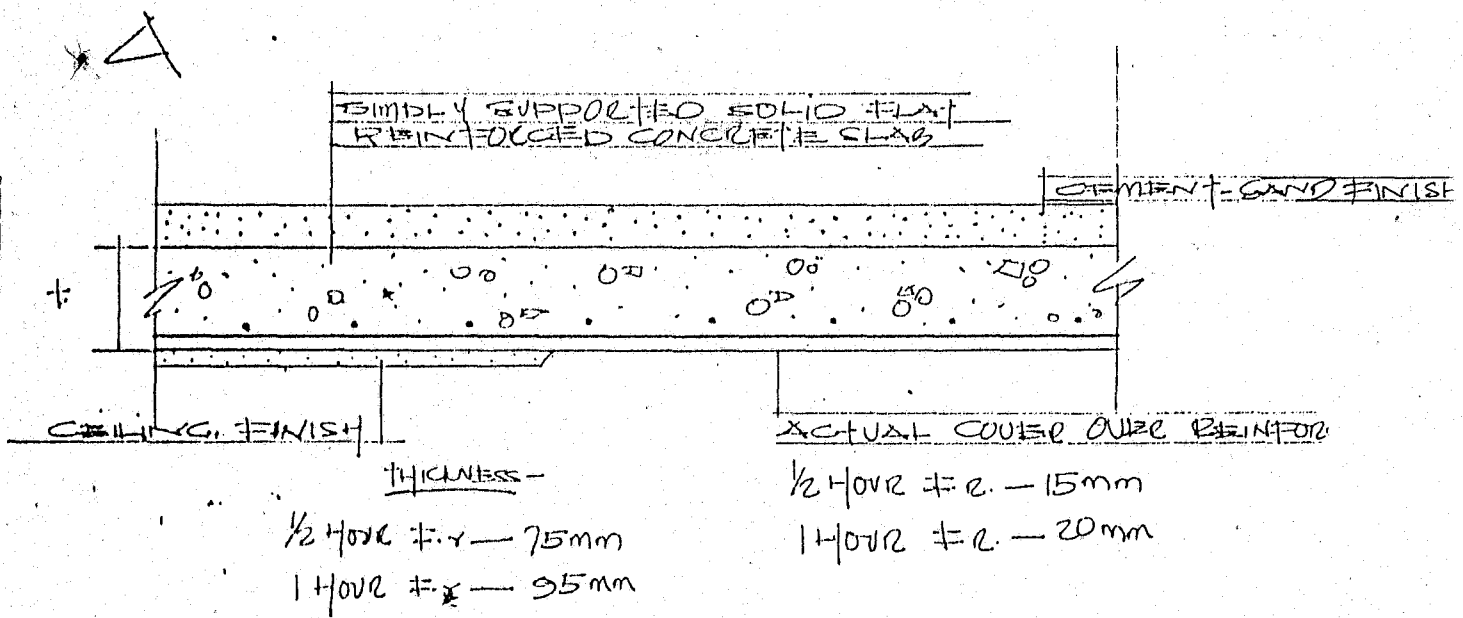


FIG 3.2: COMPARTMENT FLOOR DETAILS

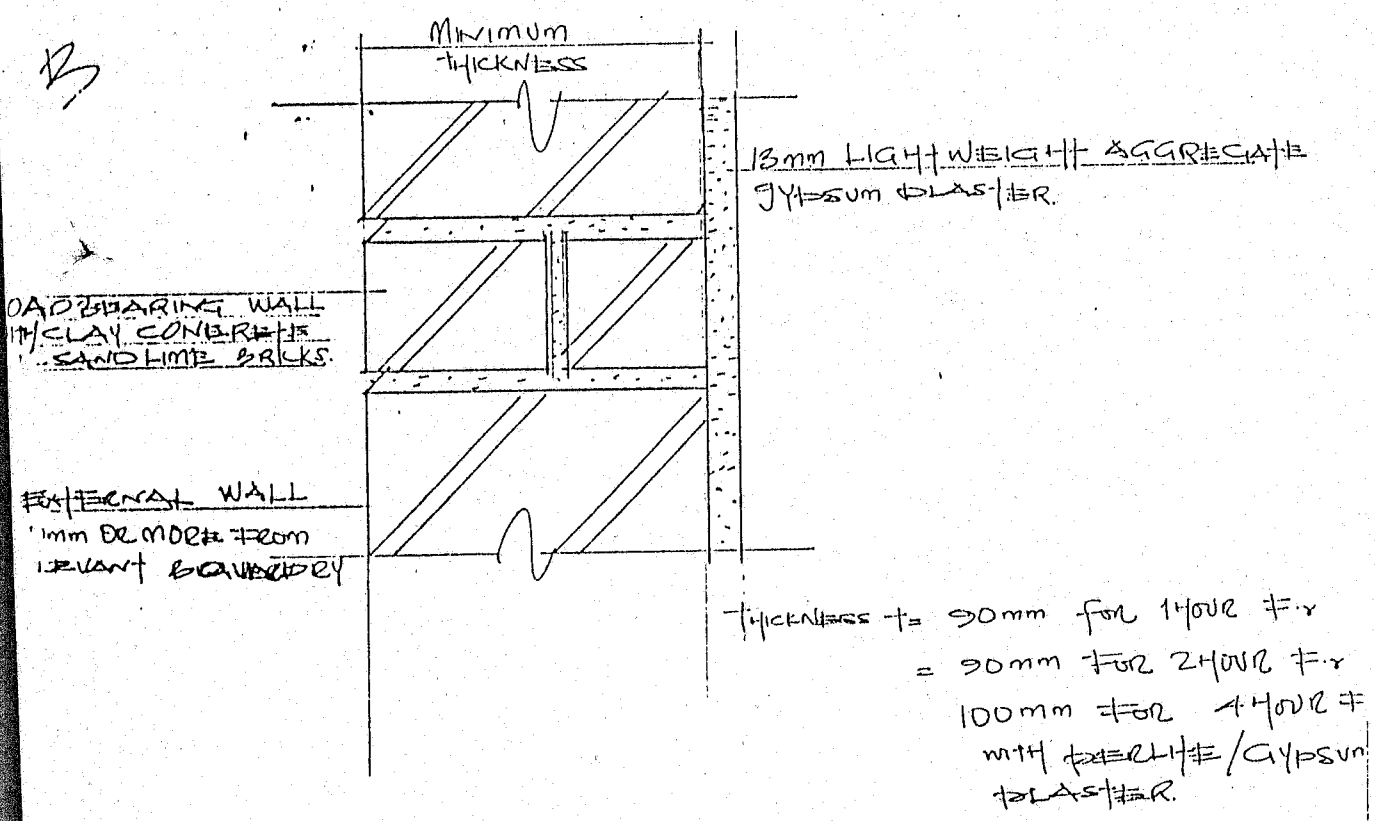
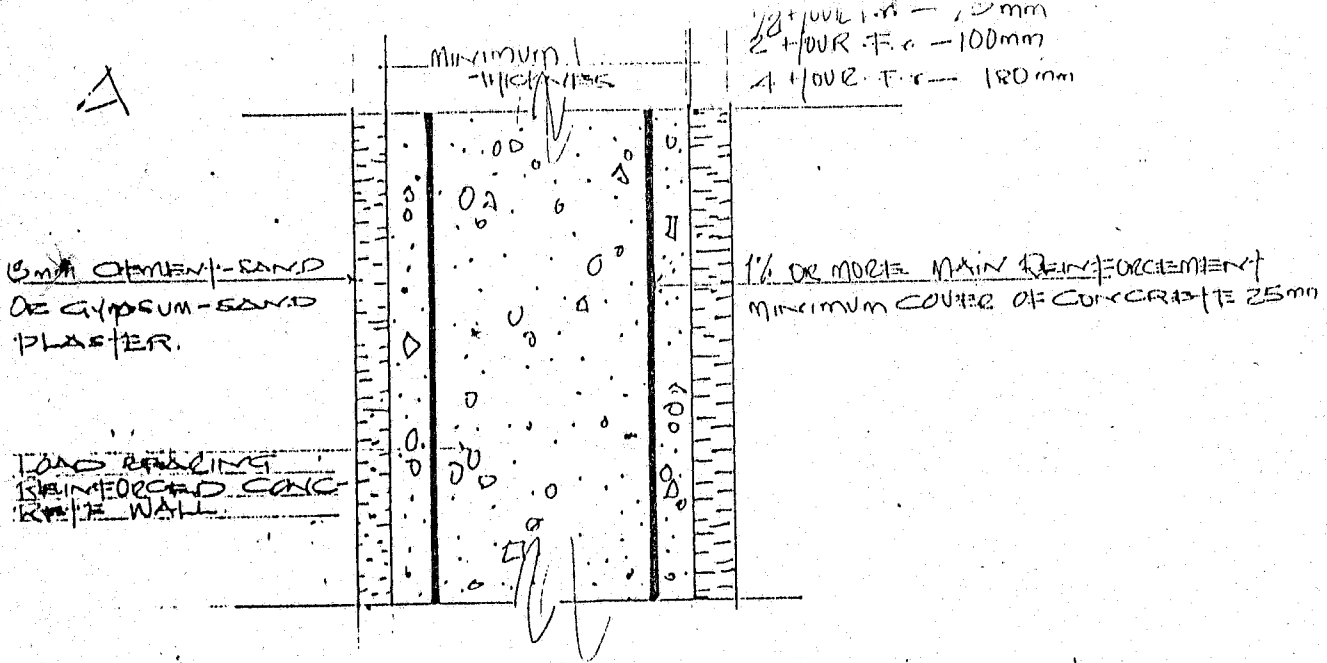


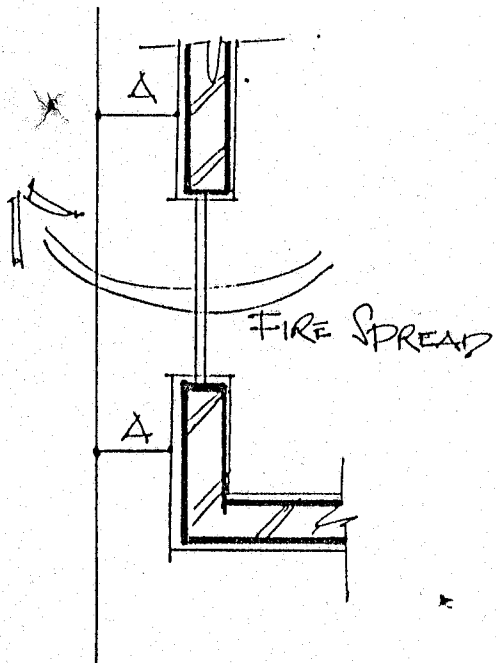
FIG 3.3: COMPARTMENT WALL DETAILS

- iii. **Fire and smoke in concealed spaces:** With modern construction methods there can be many hidden voids and cavities within the walls, floors and roofs. These can provide routes along which fire can spread rapidly sometimes even by passing compartment walls and floors these increases spread of fire and smoke is a particularly dangerous hazard. Steps must therefore be taken to break down larger extensive cavities into smaller ones and to provide cavity barriers, fire resistance barriers across cavities at compartment divisions.

II. EXTERNAL FIRE SPREAD

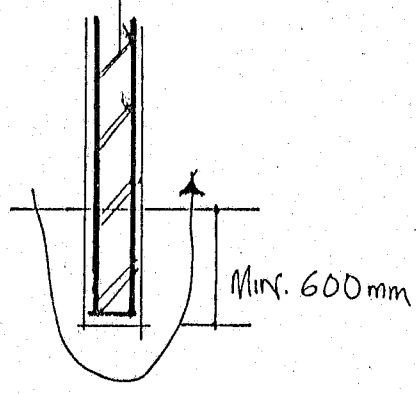
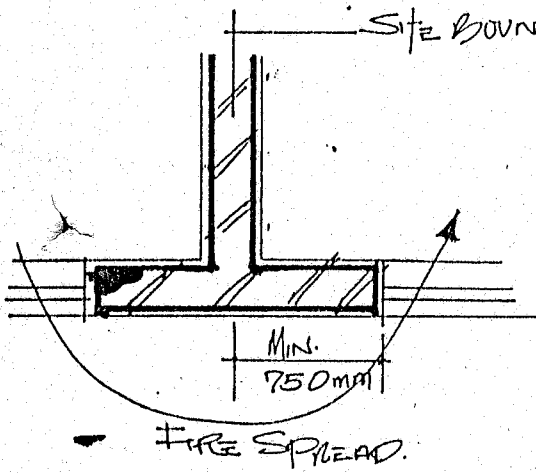
The spread of fire from one building to another is prevented by the fire resistant qualities of external walls and roofs. They must provide a barrier to fire and resist the surface spread of flame. The distance between buildings (or between the building and the boundary) is obviously an important factor, as is the likely severity of the fire, which is determined by the fire load of a building (i.e. the amount of combustible material contained within). Regulations therefore stipulate the required fire resistant qualities of external walls and the proportion and size of allowable unprotected areas (e.g. windows, doors, combustible cladding, etc.) depending on the type of building and the distance of the façade from the boundary. (Fig. 3.4 and Fig. 3.5)

Table 3.1 shows the relationship of distances from boundary to the percentage of opening allowed. There is also a method of calculating the boundary spacing known as the **ENCLOSING RECTANGLE METHOD** (plate 3.3)



PERMITTED DISTANCES
OF OPENINGS FROM BOUNDARY.

- $\Delta = 1.5\text{ m}$
- $\Delta = 1.75\text{ m}$
- $\Delta = 3.0\text{ m}$

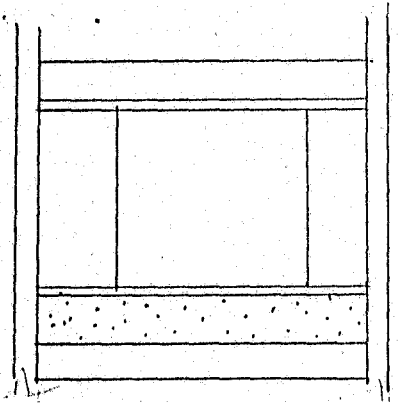


HORIZONTAL SEPARATION

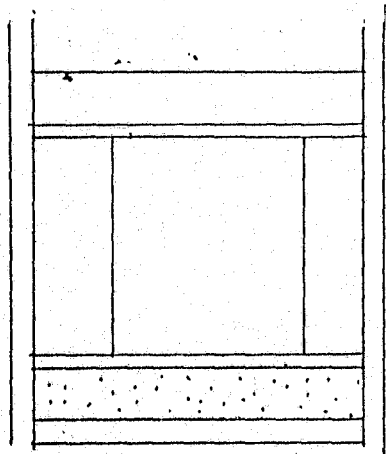
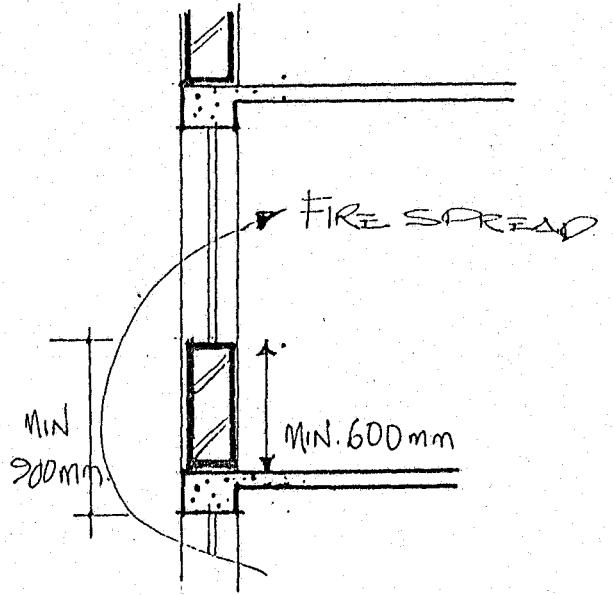
FIG. 3.4: HORIZONTAL SEPARATION OF OPENINGS
ALLOWABLE FOR FIRE PROTECTION

SOURCE:

SECTIONS.



WINDOW ELEVATION



WINDOW ELEVATION

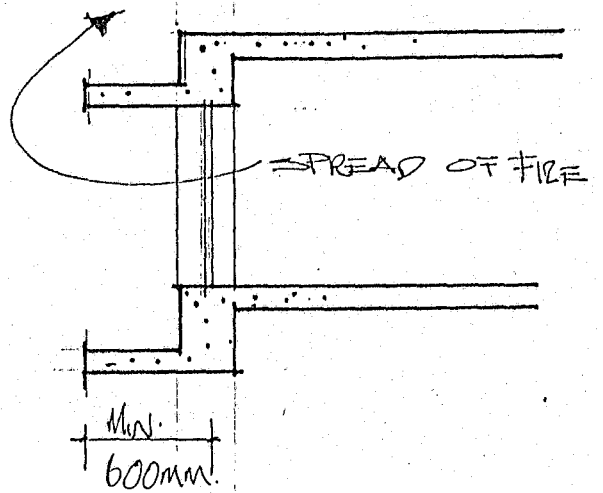
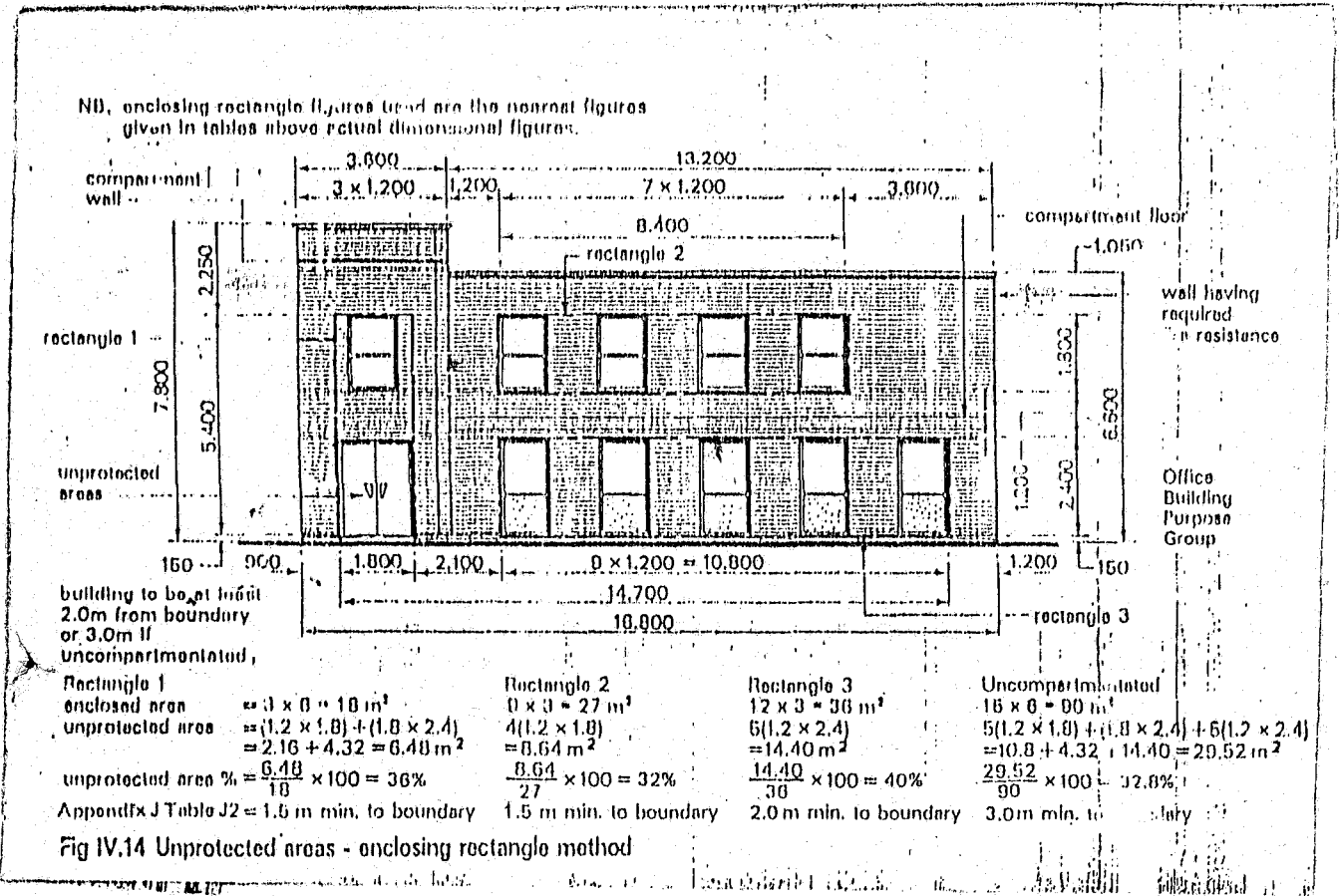


FIG. 3.5: VERTICAL SEPARATION OF OPENINGS ALLOWABLE TO PREVENT FIRE SPREAD.

TABLE 3.1: MINIMUM BOUNDARY SPACING

S/NO	DISTANCE FROM BOUNDARY	% OF OPENING
1.	1M	8%
2.	5M	40%
3.	12.5M	100%



ENCLOSING RECTANGULAR METHOD OF % CALCULATION

PLATE 3.3: BOUNDARY SPACING IN RELATION TO PERCENTAGE OPENING IN BUILDING

Generally, roofs do not need to be resistance to fire from inside the building, but should be resistant to fire from outside, and also resist surface flame spread. Again, the type of roof construction permitted depends on the type of building. Its size and its distance from the boundary. Different roof coverings are rated as to their resistance to fire: on pitched roofs; slates, tiles, profiled metal sheet are in the highest category, bitumen strip states in the lowest. Sheet metal flat roof coverings perform the best, whilst the performance of various bitumen felt roof coverings depend on the types of layers, under layers and supporting structure.

3.4.3.3 ESCAPE ROUTES.

When escape routes are being planned the type of person likely to be involved must be considered. Occupants of flats will be familiar with the layout of the premises whereas customers in a shop may be completely unfamiliar with their surroundings. In schools the fundamental principle is the provision of an alternative means of escape and in hospitals the main concern is with the adequacy of the means of escape from all parts of the building.

In the context of means of escape in case of fire the building and its contents are of secondary importance. The provision of a safe escape route should, however, allow at the same time an easy access for the fire brigade using the same routes, and since these routes are protected the risk of fire spread is minimised. In practice the provision of an adequate means of escape and structural fire protection of the building and its contents are virtually inseparable. Each building has to be considered as an individual exercise but certain common factors prevail in all cases.

- i. An outbreak of fire does not necessarily imply the evacuation of the entire building.
- ii. Rescue facilities of the local fire brigade should not be considered as part of the planning of means of escape.
- iii. Persons should be able to reach safety without assistance when using the protected escape routes.
- iv. All possible sources of an outbreak and the course the fire is likely to take should be examined and the escape routes planned accordingly.

I. STAIRCASES

Escape staircases generally serves as manual means of transportation of people in a vertical direction. Special considerations are taken on staircases that serve as escape routes.

To achieve this planning objective there must be sufficient exits to allow the occupants to reach an area of safety without delay. It is not always necessary to plan for the complete evacuation of the building since compartmentalization of the building will restrict the fire initially to an area within that compartment.

Two important factors to be considered in planning escape routes are width and travel distance. The width is based upon an evacuation time of 2.5 minutes through a storey exit on the assumption that a unit exit width of 500 mm will allow the flow of 40 persons per minute. The code gives tables for assessing the likely population density and clear widths of escape routes related to the maximum number of persons.

Travel distances are considered under two headings, namely: direct distance and travel distance. A direct distance is the shortest distance from any point within the floor area to the nearest storey exit measured so as to ignore walls, partitions and fittings. Generally the maximum direct distance is 12.000 for escape in one direction or 30.000 for escape in more than one direction. The travel distance is defined as the actual distance travelled from any point within the floor area to the nearest storey exit having regard to the layout of walls, partitions and fittings. Generally the maximum travel distances are 18.000 for escape in one direction and 45.000 for travel in more than one direction. It should be noted that both maximum distances must not be exceeded and that if alternative exits subtend an angle of less than 45° with one another and are not separated by fire-resisting construction they are classified as exits in one direction only.

II. HORIZONTAL ESCAPE ROUTES

The number of escape routes and exits required depends on the maximum travel distance that is permitted to the nearest exit and the number of occupants in the room, area or storey under consideration. (Table 3.2a) The minimum width of horizontal escape routes are also determined by the number of people using them. (Table 3.2b).

Generally, alternative escape routes should be provided from every part of the building, particularly in multi-storey and mixed use buildings. If at the design stage, the layout of the room or storey is not known (for instance, in a speculative office building) then the direct distance measured in a straight line should be taken. Maximum direct distances are two thirds of the maximum travel distance.

TABLE 3.2a: TYPICAL REQUIREMENT FOR NUMBER OF EXITS AND ESCAPE ROUTES PER PERSONS IN BUILDINGS.

S/NO	NUMBER OF PEOPLE	NUMBER OF EXITS
1.	500	2
2.	1000	3
3.	2000	4
4.	4000	5
5.	7000	6
6.	11000	7
7.	16000	8
8.	16000+	8+1/ Extra 500 persons

TABLE 3.2.b: MINIMUM WIDTH OF HORIZONTAL ESCAPE ROUTE

S/NO	NUMBER OF PEOPLE	WIDTH (mm)
1.	50	800
2.	110	900
3.	220	1100
4.	220+	Extra 5/person

Source: (Architect's data 2000)

Note how the travel distances are much reduced where escape is possible in only one direction. However, this is only suitable where the storey or room contains few people (e.g. less than 50) rooms at the beginning of an escape route may only have one exit into the corridor; in this case the single directional travel distance should apply within the room and the two directional travel distance should apply to the distance between the furthest point in the room and the storey exit.

The layout of the exits from a room or storey may be such that from certain parts of the room they do not offer alternative escape routes (Fig. 3.6) shows regulations as applied to two types of room configuration. If the angle of 45 degrees cannot be achieved, then alternative escape routes separated by a fire-resisting construction should be provided, or the maximum travel distance will be that allowed for one direction of travel

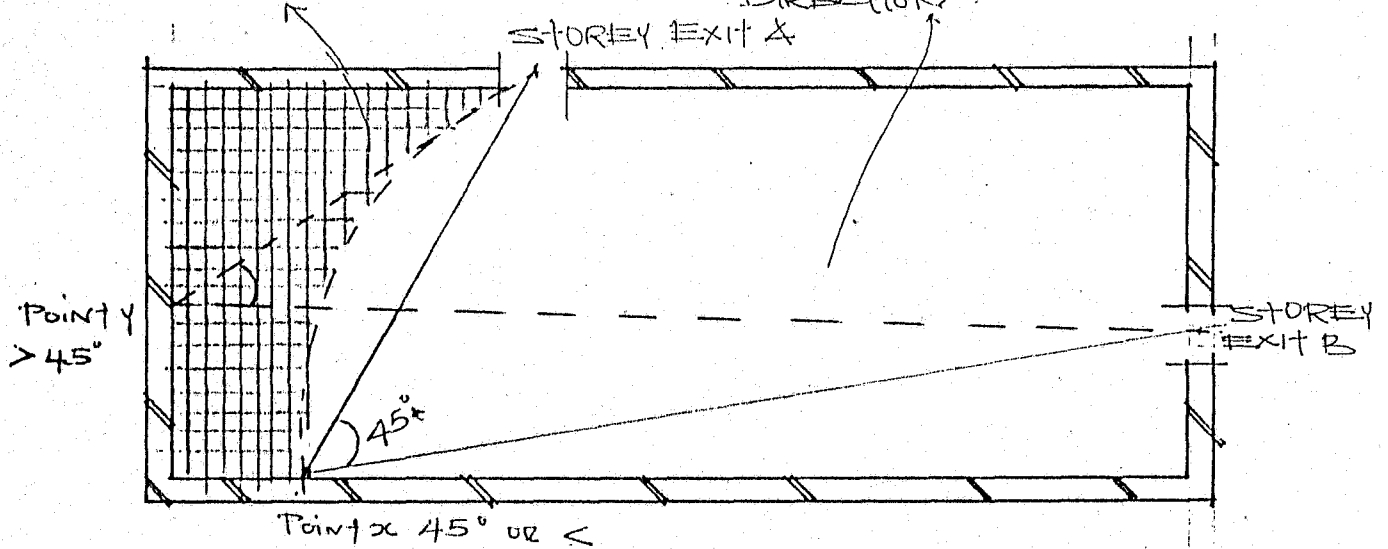
III. VERTICAL ESCAPE ROUTES

These are provided with protected escape stairs of sufficient numbers and adequate sizes. Generally, the rules requiring alternative means of escape mean that more than one stairway is required. The width of the stairs should allow the total number of people in the storey or building subjected to fire to escape safely. Wide stair halls must be divided by a central handrail. The width should be at least that of the exits serving it, and it should not reduce in width as it approaches the final exit. Typical minimum escape stair widths, depending on the type of building and the number of people they serve (Table 3.2b)

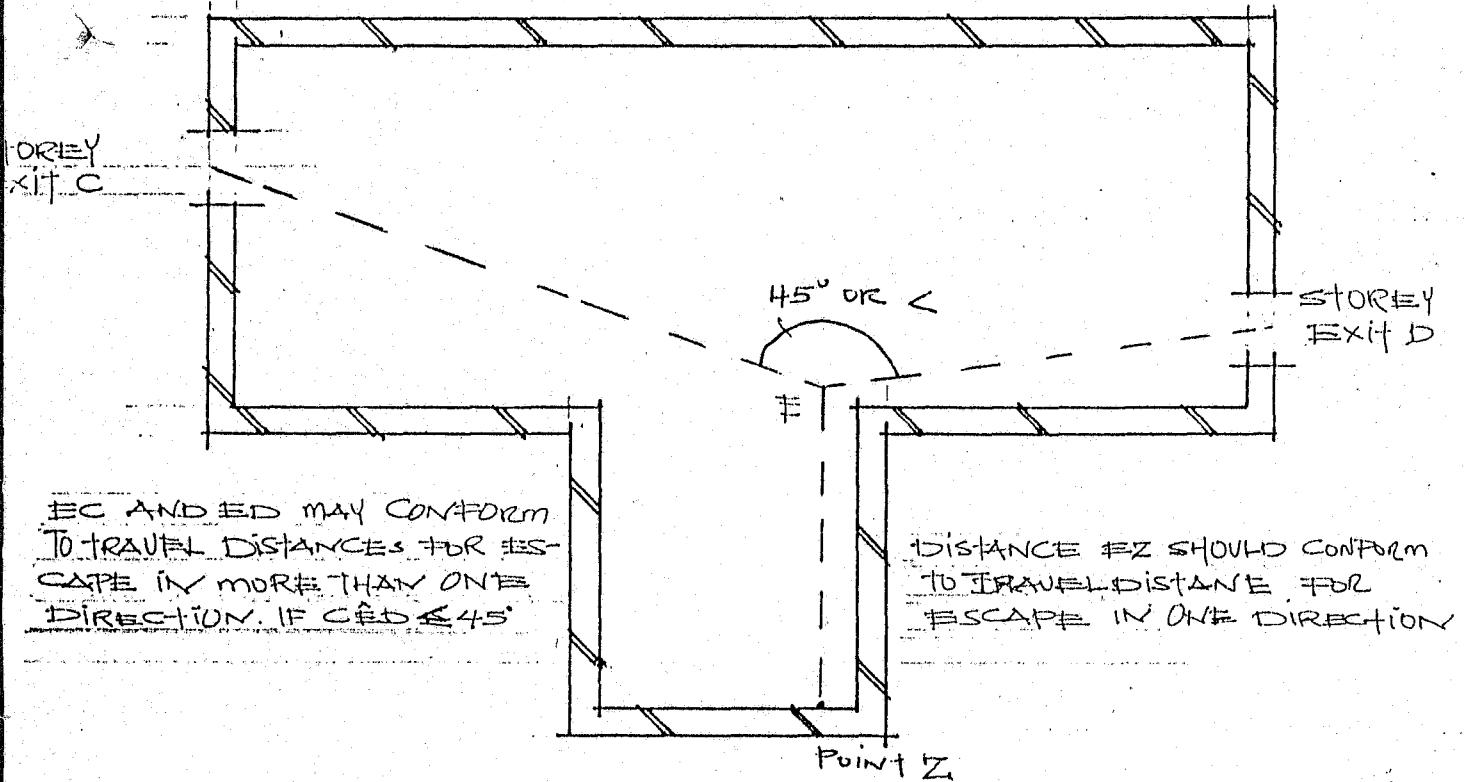
Each internal escape stair should be contained in its own fire-resisting enclosure and should discharge either directly, or by means of a protected passageway, to a final exit. As protected stairways must be maintained as a place of relative safety, they should not contain potentially hazardous equipment or materials.

ALL POINTS IN THE SHADED AREA SHOULD CONFORM TO TRAVEL DISTANCES REQUIREMENT FOR ESCAPE IN ONE DIRECTION

ALL POINT IN THE UNSHADED AREA MAY CONFORM WITH TRAVEL DISTANCES FOR ESCAPE IN MORE THAN ONE DIRECTION



IF 45° CANNOT BE ACHIEVED, THEN SEPARATE ALTERNATIVE ESCAPE ROUTE FROM EACH OTHER WITH FIRE RESISTING CONSTRUCTION



EC AND ED MAY CONFORM TO TRAVEL DISTANCES FOR ESCAPE IN MORE THAN ONE DIRECTION. IF $\angle CED \leq 45^\circ$

DISTANCE EZ SHOULD CONFORM TO TRAVEL DISTANCE FOR ESCAPE IN ONE DIRECTION

FIG 3.6: ALTERNATIVE ESCAPE ROUTES; REGULATION AS APPLIED TO 2 TYPES OF ROOM CONFIGURATION.

TABLE 3.3 SUMMARY OF DETECTOR APPLICATION CONSIDERATION.

DETECTOR TYPE	RESPONSE SPEED	FALSE ALARM RATE	COST	APPLICATION
HEAT	Slow	Low	Low	Confined Spaces
SMOKE	Fast	Medium	Medium	Open or Confined Space
FLAME	Very fast	High	High	Flammable materials storage

Sprinkler System: Sprinkler system combines fire detection, suppression, and contains the initial alarm associated with fire. It is the most desired of all fire detecting devices.

3.5.2 Fire Alarm System: These are manual and automatic fire alarm system to be installed in all the buildings. It consists of a protective signalling system made of three important devices viz.

- i. **Signal Initiating Device:** This is a device which may be manually or automatically used to initiate an alarm signal. It could be inform of bells or drums.
- ii. **Signal Control Panels:** These are control units which receive alarms signals from the signal initiating devices and systematically convert and

transmit them to signal indicating devices. They are located in the control room.

- iii. **Signal Indicating Devices:** They are those devices which audibly and or visually warn occupants or authorized personnel of the presence of an alarm. They include lighted bulbs, horns, loud speakers and screens. They must be located at strategic points and noticeable by all. The sounds and alarm should be distinct from other sounds such as break time siren.

A manual fire alarm box shall be provided in the natural path of escape from fire near each exit from an area and shall be readily accessible unobstructed and at visible points.

3.5.3 Fire Extinction: Fire extinction remains the duty of everyone at site.

Water and sand remain the most noticeable form of fire extinction.

I FIRE EXTINGUISHERS

However the use of portable chemical fire extinguishers has been dominating in fighting incipient fires. They are less functional once the fire has gone out of proportion. They fall broadly under four types:

- i. Extinguishers which expel water or dilute chemical solution e.g. water / CO_2 ; water / air charge or Soda acid extinguisher. Can be used with less risk on fabrics, wood, paper, and cloth. This is called class A type.
- ii. Foam Extinguishers: contains 13% of aluminium sulphate in water. It is used in class B type comprising liquids, petrol, oil, greases and fats.

- iii. Dry Powder Extinguishers: Used in fighting carbonaceous fire involving wood, paper, textiles, flammable liquids and electrical fires, metal fires.
- iv. Carbon Dioxide Extinguishers: used in fighting fires involving highly inflammable liquids and live electrical equipments.

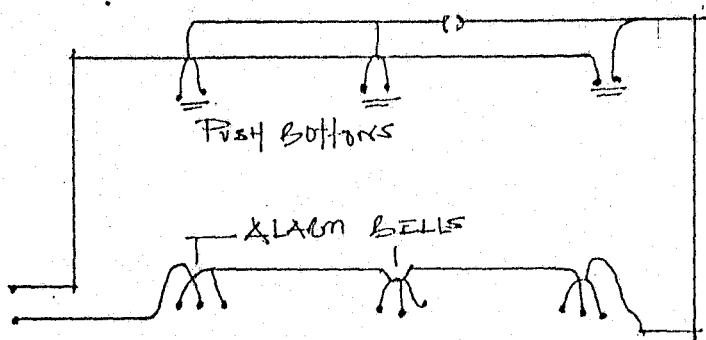
Maximum travel distance to an extinguisher is 24m. The area to be protected per extinguisher should be about 250m². However, for a building where there is extra-hazard fire, e.g. Auto-repair workshop, wood making factory, ware houses, a greater number of extinguishers would be needed depending on the fire hazard of the job in the building.

- II. **AUTOMATIC SPRINKLERS:** The sprinkler system is an engineered arrangement of underground and overhead piping, with sealed valves that open automatically to discharge water on a nearby incipient fire and its immediate vicinity and to signal an alarm.

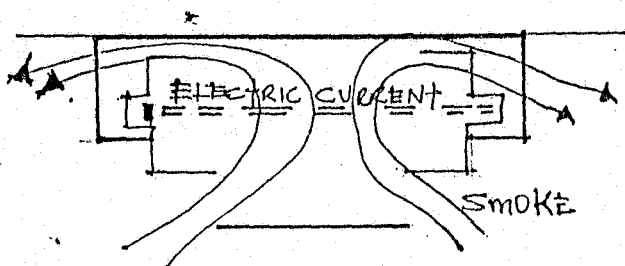
The systems if properly installed and maintained are the most effective of all detecting and extinguishing devices. It gives a psychological and physical assurance to occupants as any fire will be detected and found at its origin , gives time to escape from the building before escape routes are closed.

This is the system chosen to be installed at the secretariat complex

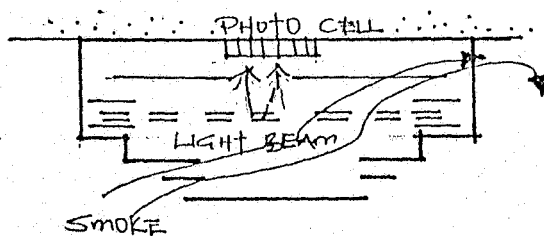
- III. **DRENCHERS:** While a sprinkle system protects a building from internal fire, drenchers are placed on roofs and over windows and external openings to protect the building from damage by exposure to a fire in adjacent premises.



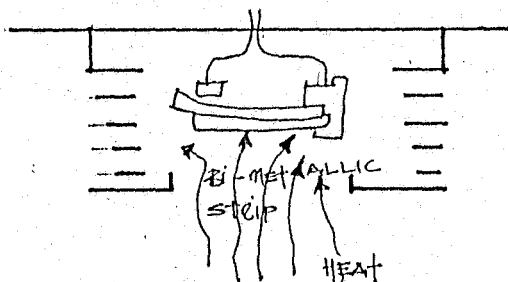
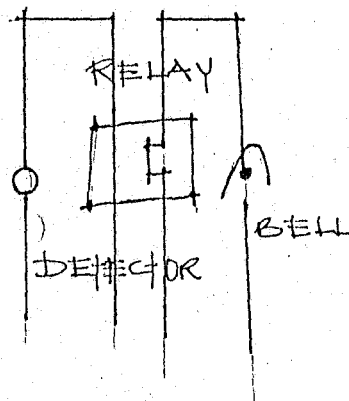
ALARM BELL CIRCUIT



SMOKE DETECTOR

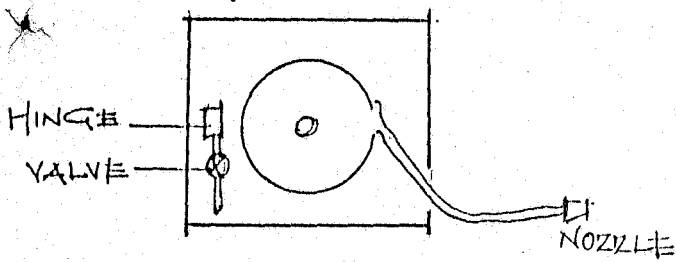


SOME DETECTOR

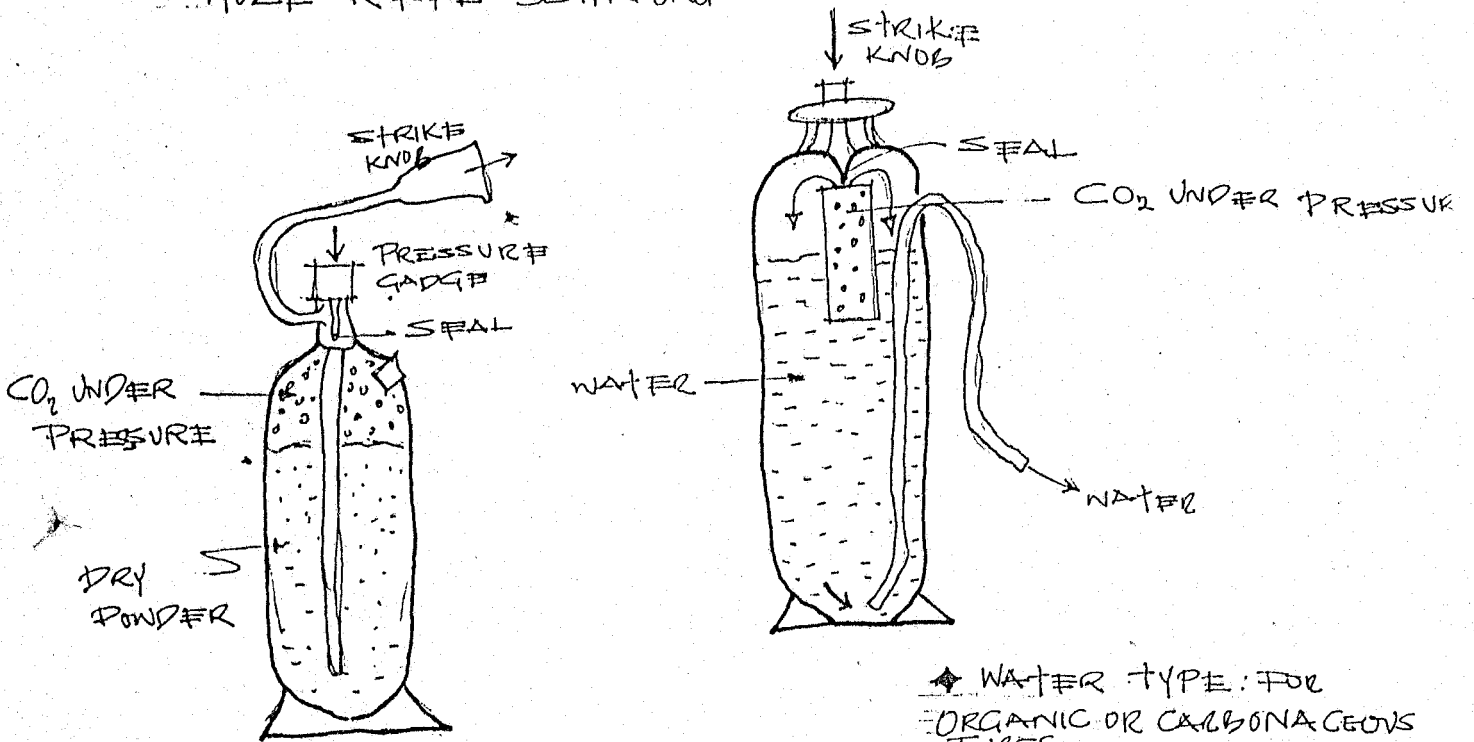


HEAT DETECTOR.

FIG. 3.7: FIRE DETECTION AND ALARM DEVICES

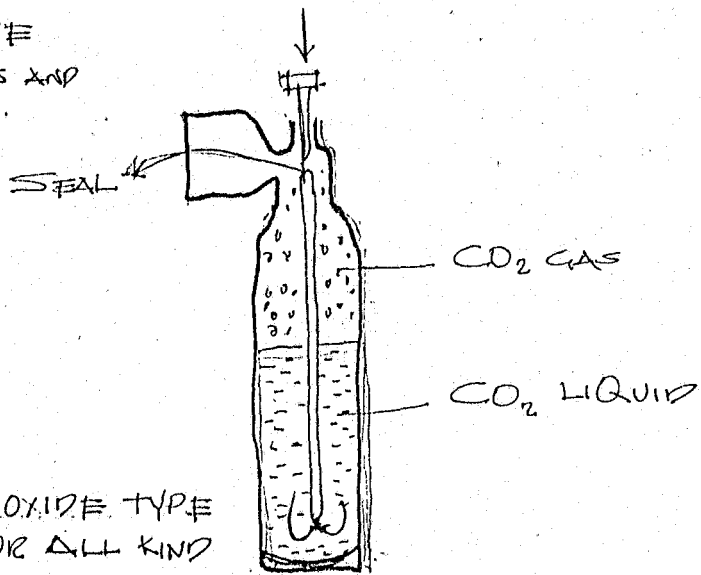


→ HOSE REEL. 35m LONG



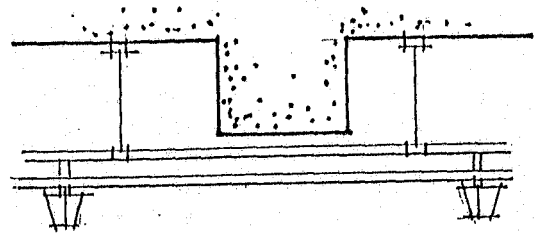
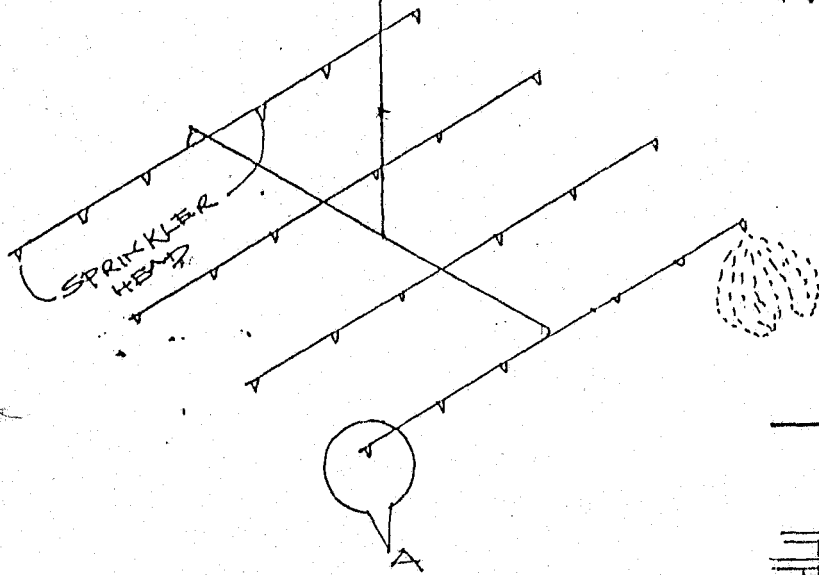
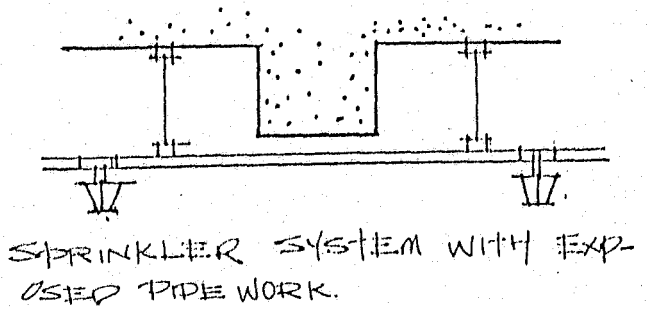
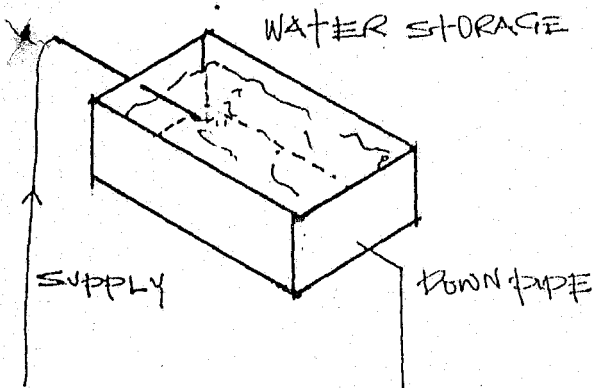
◆ WATER TYPE: FOR ORGANIC OR CARBONACEOUS FIRES

◆ DRY POWDER TYPE
BEST FOR LIQUIDS, GASES AND ELECTRICAL FIRES.



◆ CARBON DIOXIDE TYPE
SUITABLE FOR ALL KIND OF FIRE.

FIG. 38: PRIMARY FIRE FIGHTING EQUIPMENT



SPRINKLER WITH PIPE CONCEALED ABOVE SUSPENDED CEILING.

DETAIL A

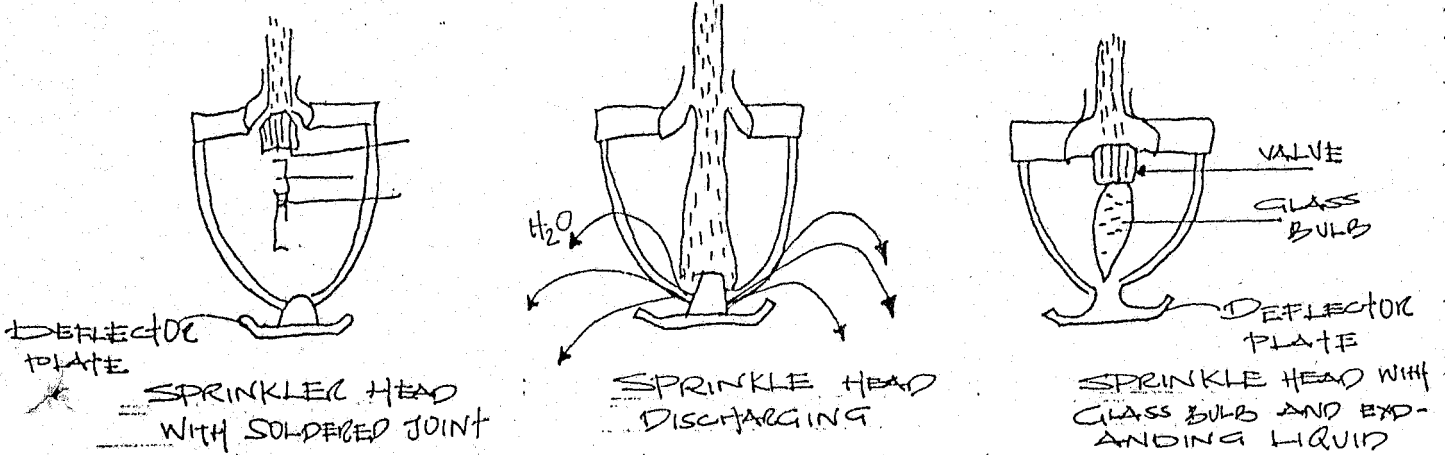


FIG. 3.9 : SPRINKLERS' INSTALLATIONS.

A drencher system is comprised of water-heads somewhat similar to those of sprinklers; these may be sealed or unsealed (open drenchers) but in the latter case the water is turned on manually. In a few instances, drenchers may be controlled by quick-opening valves operated by loss of air pressure in a detector line system in a similar manner to high velocity water spray systems.

Drenchers are of three main types namely:

- i. Roof drenchers
- ii. Wall or curtain drenchers
- iii. Window drenchers

Other implements that would help in fighting fire here include provision of vehicles i.e. water tanker, personnel car, an ambulance; fire hose reels fixed, and swinging types to be located at designated places, ladders, fire blankets, breathing apparatus.

3.6 RECOMMENDATION

The danger which threatens occupants and property in the event of fire outbreak depends on many different factors. Consequently it would be probably impossible to design and construct a building which is fire proof, or to construct a model procedure for action in the event of fire which would be suitable in all premises. This is due to partly, natural forces and human carelessness, negligence, ignorance and arson.

However, the duty remains with the designer to prearrange plan which will enable occupants to be familiar with the escape route to be used in the

event of fire, and also with an alternative route in case the main escape route should be impassable. This could be done in terms of provision of places of refuge. **Place of Refuge:** This provides a haven for people while escape routes are over crowded or while people are waiting to be rescued. It should be constructed with elements of high fire rating. This shall be located along the escape routes and it should be big enough to accommodate occupants of respective floor areas.

Since life safety depends upon proper human action at the time of an emergency such as fire, no system or component of the building should be left for chance. Every exit access and exit discharge shall be continuously maintained free of all obstructions such as furniture or decorations. Every automatic sprinkler system, fire detection and alarm systems, fire hydrant points, vehicles, communication gadgets, fire doors shall be inspected and tested continuously.

Apart from the provision of those necessary precautionary and safety measures, there is also the need for maintenance. Human and mechanical failure necessitates the need for maintenance and testing. General cleanliness of the environment must be enforced.

A yearly refreshers' course for the firemen is advocated. This is to acquaint them with the latest fire fighting techniques.

Above all recommended measures, there is also the need for emphasis on human security measures, which involves the provision of security observers to security observation room (gate house) and around the premises to help monitor and curb Arson and act of sabotage.

3.7 DEDUCTION

With the integration of all the safety measures as recommended by this design of the proposed National Secretariat of NULGE Abuja, then the building would pass any standard fire test any day any time.

These restrictions do however allow the inclusion of sanitary facilities, a lift well, a small enquiry office or reception desk, fire protected cupboards and gas meters.

3.5 FIRE FIGHTING MEASURES

3.5.1 Fire Detectors

In the past the detection of fire in buildings had been by human senses until the introduction of: -

- (i) **Heat Detectors:** They are the oldest type of automatic fire detection devices. They have the lowest false alarm rate of all fire detectors, slowest in detecting fire and the least expensive. They are best used in small confined spaces.
- (ii) **Smoke Detectors:** They provide faster detection times and subsequently higher false alarm rates due to their increase sensibility. They cannot be installed in places like the production halls and kitchens due to constant smoke generated in these places.
- (iii) **Flame Detectors:** Flame detectors optically sense either the ultraviolet or infrared radiation given off by flames or glowing embers. They have the highest false alarm rate and the fastest detection times than any type of fire detector.

CHAPTER FOUR

4.0 CASE STUDIES

In Architecture, a case study is said to be the detailed examination of an existing structure similar or related to a new design proposal in order for the designer to discover the realistic facts, the general trends and problems associated with such designs so that these can be adequately considered in the new proposal to achieve an improved design.

4.1 CRITERIA FOR CASE STUDY

The major criterion for case study is the similarity in character and function. Therefore, for the purpose of this project, the researcher did not restrict his studies to only union buildings (similarity in function), office building (similarity in character) were also studied to get acquainted with the principle of designing an office complex.

4.2 CASE STUDY 1: NIGERIA LABOUR CONGRESS, ABUJA.

4.2.1 Introduction

The decree 22 of 1978 established and recognised the Nigeria Labour Congress (NLC) as the only central labour organisation in Nigeria by the Federal Government. All trade unions other than association of the senior staff of employers, were deemed to be affiliated to it. The Nigeria Labour Congress (NLC) adopted its constitution during the inaugural conference of 42 industrial union held in Ibadan on the 28 February 1978.

The National groups of the trade unions owe allegiance to the National congress of the NLC while the state branches of the trade unions also owe allegiance to the state council of the NLC. The NLC have been very active in the pursuit of the course of Nigerian workers until 2004 when a bill for labour reform (Democratisation of labour) was introduced by president Obasanjo and sent to the National Assembly for debate and subsequent passage into law.

4.2.2 Location: The Nigerian labour house is located in the central area of Abuja, besides the finance building. The NLC is located on the 10th and 11th floor of the building.

4.2.3 Function:

- i. Promote the economic and conditions of Nigerian workers.
- ii. Promote, defend and maintain the rights and interests of all members.
- iii. To completely organise all workers into trade unions
- iv. To assist in settlement of dispute between affiliated members themselves.
- v. To advance Nigerian workers' education programme
- vi. To print and publish literature and other information materials which would help to achieve this function.

4.2.4 Design report

The labour house building is a twelve-storey structure characterised by modern building materials ranging from the use of glass for glazing to the use of marble wall finish and granite floor finish. The plan of the building is a uniquely shaped (dynamic form). This form is interesting in the way the complex ground floor changes to the simplicity of the upper floors by recesses.

4.2.5 Observation

I. MERITS.

- i. The structure is aesthetically appealing
- ii. The maximization of the glazing of the building, which can help in the reduction of fire spread.
- iii. The horizontal and vertical spacing of opening on the building with the protrusion of each floor serving as window hoods also helps in controlling fire spread.
- iv. Adequate staircases for vertical movements considering the number of floors.
- v. Location of lift in this building is strategic
- vi. Egress and escape in case of fire outbreak is given adequate consideration.

II. DEMERITS

- i. Inadequate landscape: which if adequate could add to the glamour of mighty structure of this nature.
- ii. Parking spaces is inadequate
- iii. The closeness of property (the structure) to the boundary is a disadvantage at the instance of fire outbreak because this can aid spread of fire.

4.3 CASE STUDY TWO: THE NIGERIA INVESTMENT PROMOTIONS

COMMISSION. ABUJA

4.3.1 Introduction

The decree establishing the Nigeria investment promotions commission (N.I.P.C) as the successor to industrial development coordination committee (IDCC) is the Nigeria investment commission decree No 16 of 1995. The NIPC is charged with the principle laws regulating foreign investments in Nigeria, which is the Nigeria investment promotion commission. Decree 16 of 1995 and the foreign exchange (monitoring and miscellaneous provisions) decree No 17 of 1995. It is an agency of the federal government with perpetual succession and a common seal which is specially established to promote investment in Nigeria.

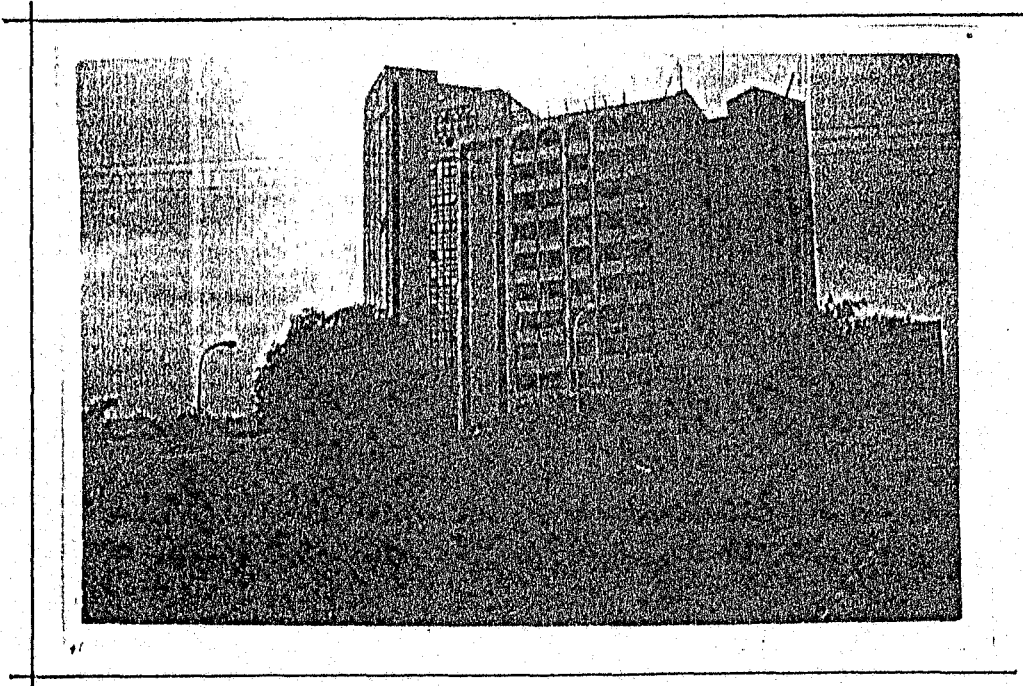
4.3.2 Location

The Nigeria investment promotion commission is located in the central area Abuja at Aguiyi Ironsi Street, plot 1181, Maitama district. It is sited close to the N.E.P.A. headquarters building opposite the Nicon Hilton hotel. The main entrance

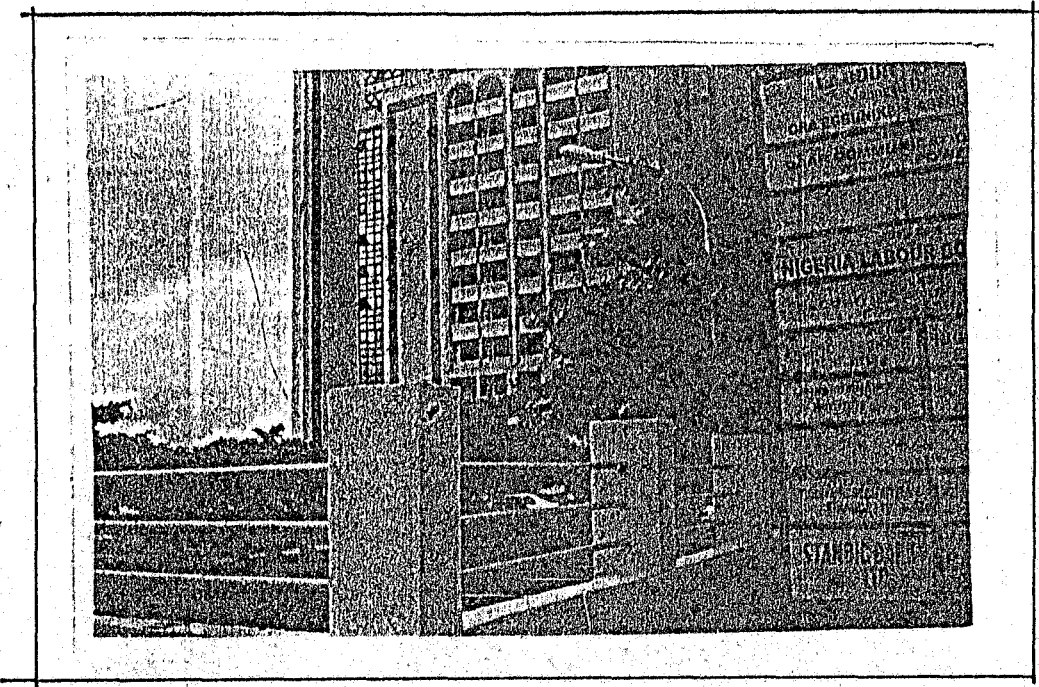
into the N.I.P.C is linked up with the major Aguiyi Ironsi Street that makes the building visible from the major road.

4.3.3 Functions

- i. Co-ordinate, monitor, encourage and provide necessary assistance and guidance for the establishment and operation of enterprises in Nigeria.
- ii. Initiate and support measures which shall enhance the investment climate in Nigeria for both Nigerian and non-Nigerian investors;
- iii. Promote investments in and outside Nigeria through effective promotional means
- iv. Collect, analyse and disseminate information about investment opportunities and sources of investment capital and advise on request, the availability, chance or suitability of partners in joint-venture projects
- v. Register and keep records of all enterprises to which the NIPC decree legislation applies
- vi. Identify specific projects and invite interested investors for participation in those projects
- vii. Assist incoming and existing investors by providing support services.
- viii. Advise the federal government on policy matters, including fiscal measures designed to promote the industrialisation of Nigeria or the general development of the economy.



PICTORIAL VIEW



PICTORIAL VIEW

PLATE 4.1: LABOUR HOUSE ABUJA.

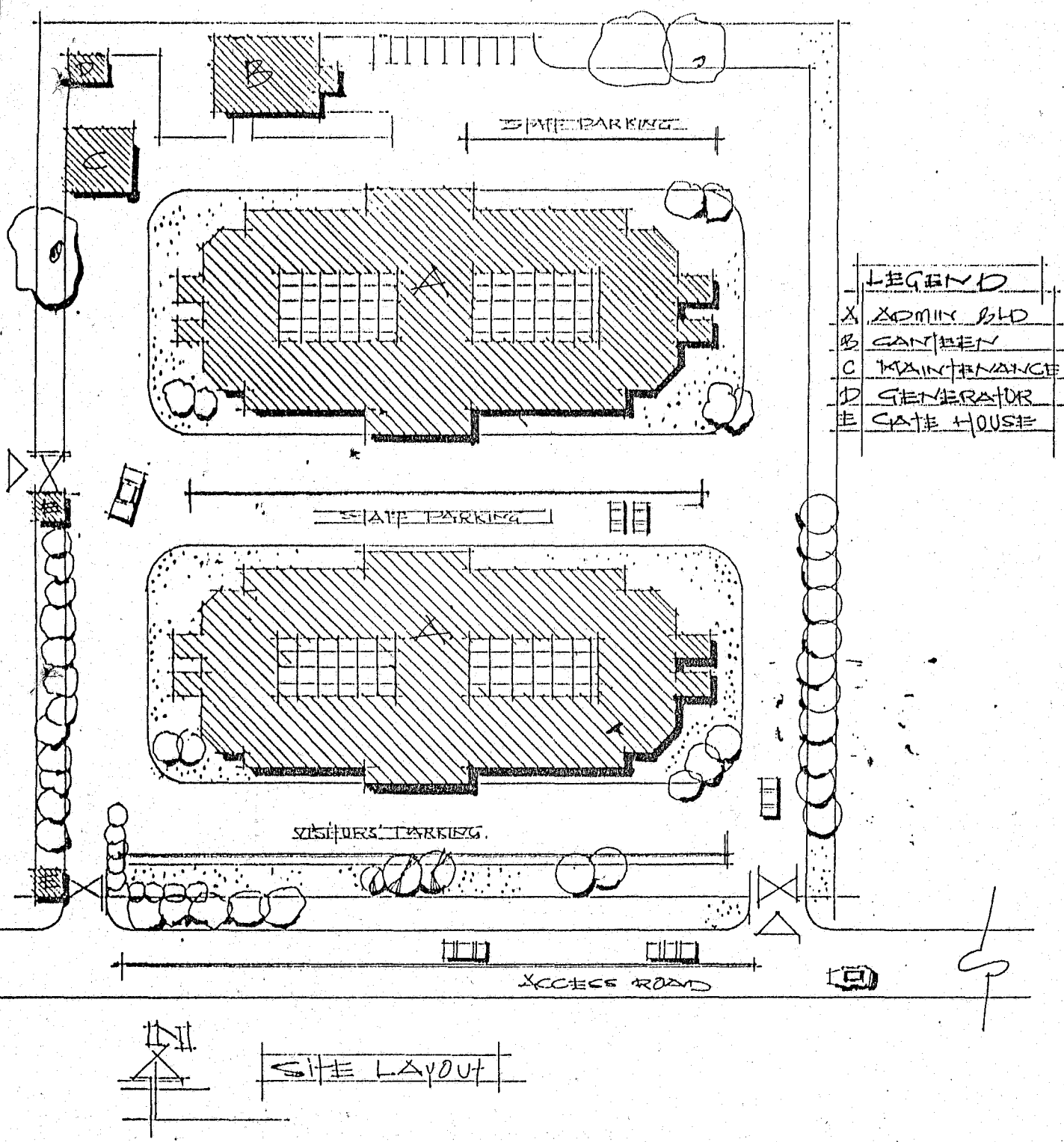
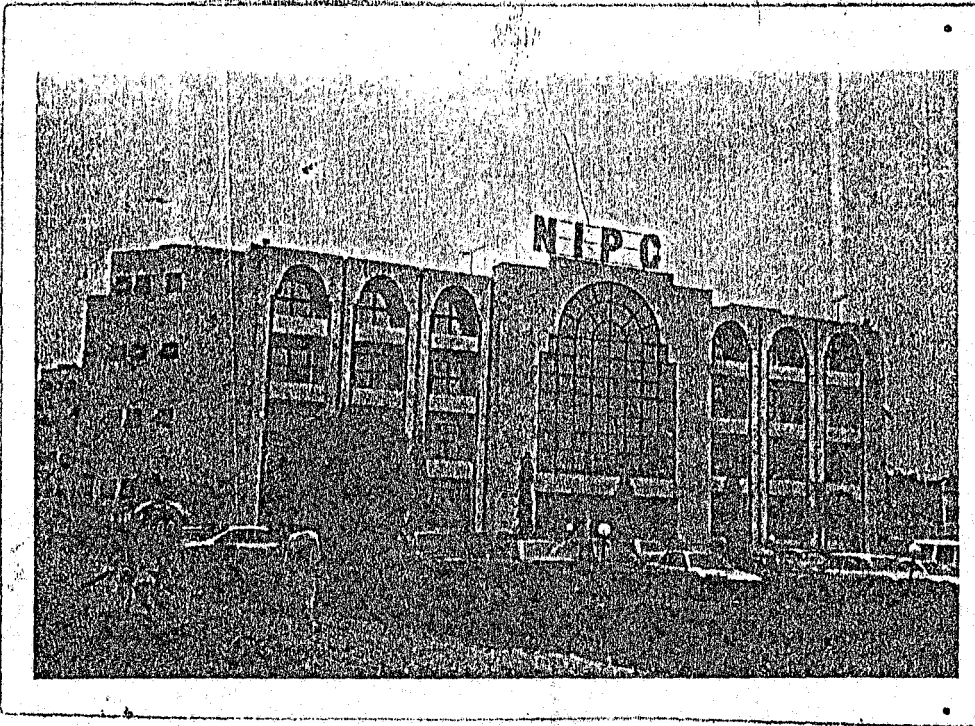
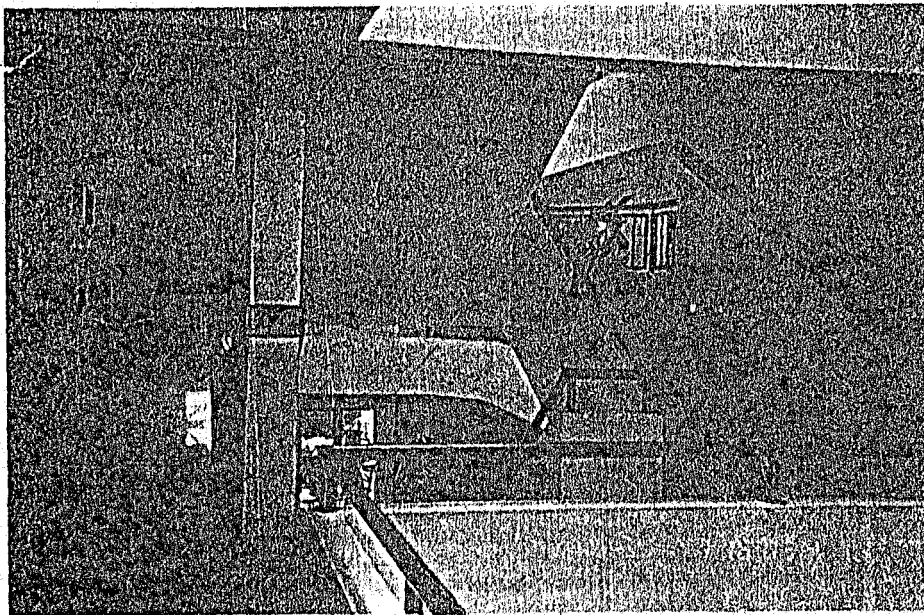


FIG 4.1: SITE LAYOUT OF THE NIGERIA (N.I.P.C) INVESTMENT PROMOTION COUNCIL, ABUJA



PERSPECTIVE VIEW



INTERIOR OF THE COMPLEX

4.3.4 Design report

Functionality and aesthetics are the main architectural characteristics achieved in the buildings by means of adoption of modern architectural material such as the extensive use of glass at the facades of the building, the use of marble finishes at the exterior walls of the building and the use of granite floor finishes. The interior and exterior is landscaped even though much space was not left for proper landscape of the premises.

4.3.5 Observations

I. MERITS

- i. The building plan is functional, properly ventilated and well lit.
- ii. The building form is aesthetically impressive.
- iii. Both interior and exterior premises of the building are well landscaped.
- iv. The building has adequate provision for both staff and visitors parking spaces.
- v. There are adequate number of staircases and strategically located at different locations in the building.
- vi. The interior temperature of the building is very conducive and controlled, via the use of atriums and other control devices.

II. DEMERITS

- i. No space provided on the site for future expansion.
- ii. Main entrance to the building is not properly defined (No entrance porch)
- iii. Reception area/waiting lounge not large enough.
- iv. No provision for escape staircase/route.

4.4 CASE STUDY 3: UNITED EDUCATION, SCIENTIFIC AND

CULTURAL ORGANIZATION, GENEVA

4.4.1 Introduction

United nation education, scientific and cultural organization was established by the United nations members to help develop and enhance the literacy, scientific researches and cultural orientation of member countries and also to establish cordial relationship between member countries on the area under this umbrella body.

4.4.2 Location

The United nation education, scientific and cultural organisation headquarters is located at Geneva the Switzerland capital in Europe.

4.4.3 Function

UNESCO sanitizes nations to the types of national policy directions required, and sets priorities in the areas of global research focus which willing member countries can adopt or adapt as guides to setting National research priority. It has

structures that enable the various National Scientific Academics in the world to collaborate and work towards expanding the frontiers of knowledge through research. UNESCO also recommends some ratios to guide National Policy action in the areas of allocation of funds to education, lecturer student ratio in higher education, amongst others.

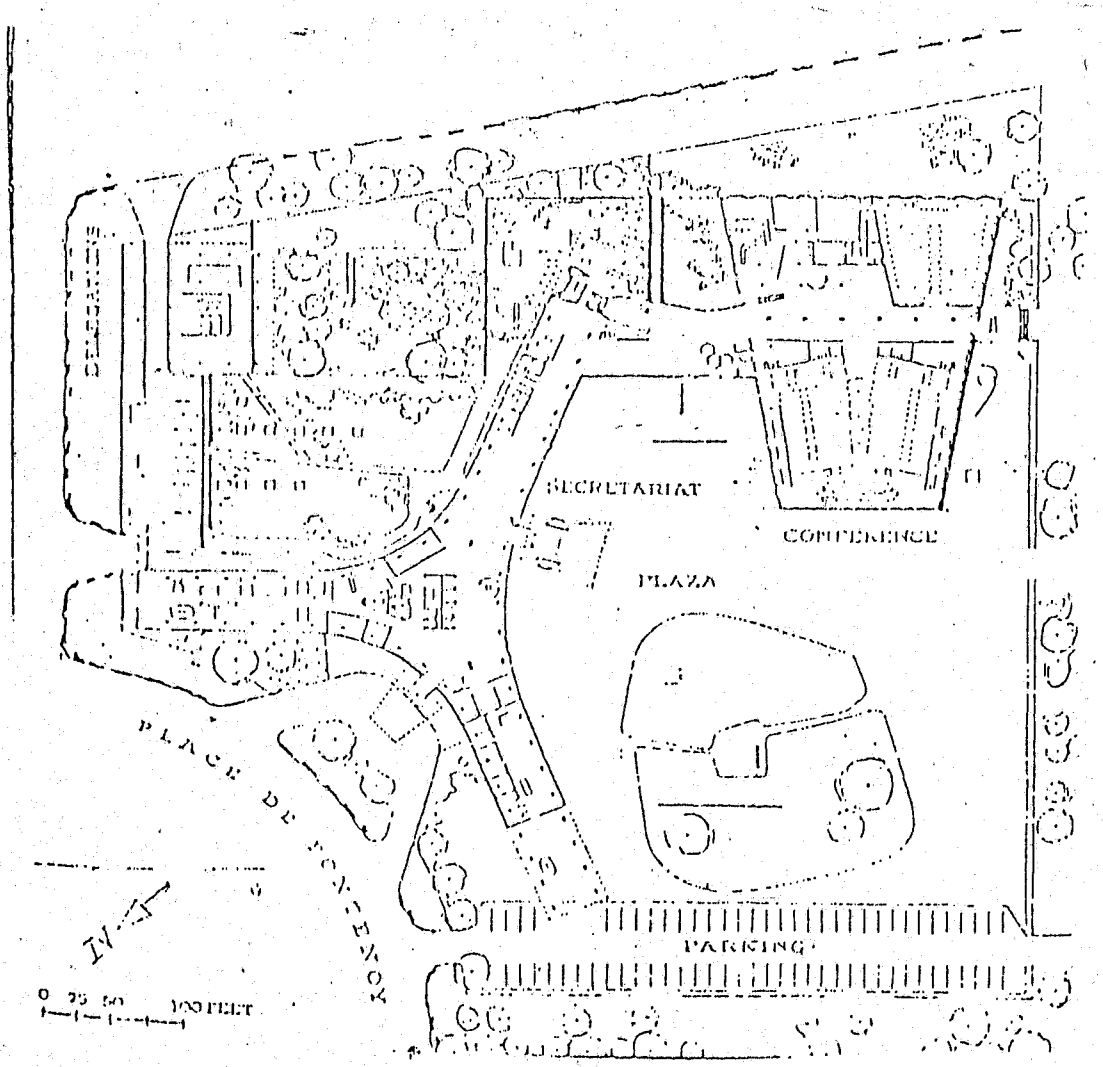
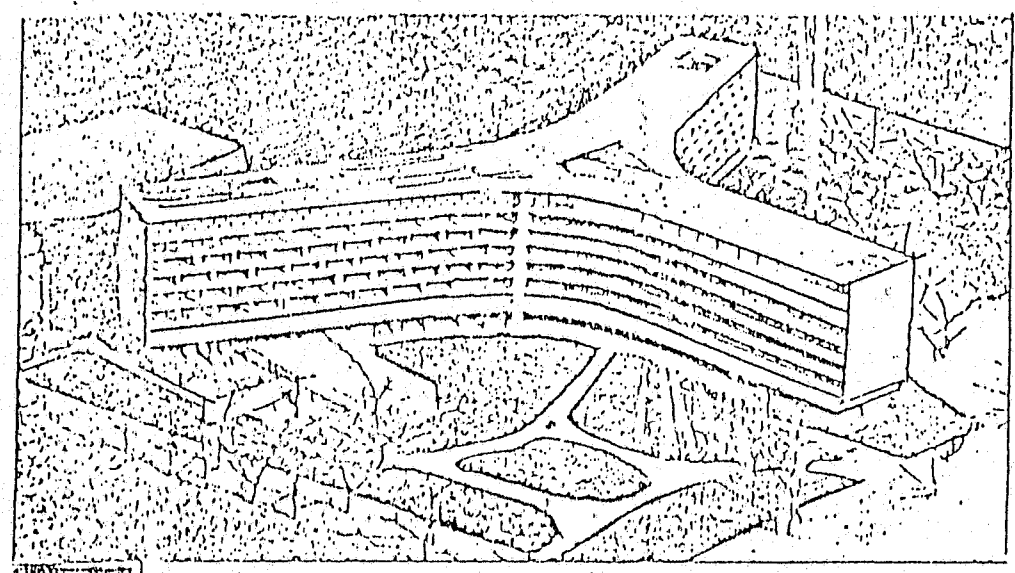


FIGURE 4.6 PLAN OF UNESCO HEADQUARTERS



AERIAL PHOTOGRAPH OF UNESCO. H.Q.

PLATE 4.3: UNESCO HEADQUARTERS,
GENEVA.

4.4.4 Design report

The U.N.E.S.C.O building is a seven-story structure with the following functions-secretariat for UNESCO, a conference hall, restaurant, a library, car parking spaces and maintenance facilities. The plan of the building is Y-shaped on a grid of 6 meters. The building has a reinforced concrete frame, with its main girders running in transverse direction.

These girders are each supported by only two columns (set back from the facades) and are cantilevered at both ends. The form though simplistic, is interesting in the way the complexity of the ground floor changes to the simplicity of the upper floors. Circulations between offices and conference are direct on the ground floor. The elevation is typical of the modern style with repetitiveness of elements and the expressive use of concrete as the main building material.

4.4.5 Observations

I. MERITS

- i. Direct link between the offices and the conference hall is commendable
- ii. Vehicular and pedestrian circulation properly defined
- iii. Spaces for each function are well zoned and properly linked.
- iv. Adequate provision and positioning of staircases for vertical movements.
- v. Adequately landscaped.

II. DEMERITS

- i. The site has two many entrances, which is a security risk.
- ii. No direct link to the conference hall for outsiders except through the office complex.
- iii. The connection between the main building and the conference hall looks like an after thought.

4.5 CASE STUDY 4: NIGERIA INSTITUTE OF INFORMATION

TECHNOLOGY, SURULERE.

4.5.1 Introduction

Nigeria Institute of Information technology is an organisation responsible for the study and use of electronic equipment, especially computers for storing, analysing and distributing information of all kinds, including words, numbers and pictures for the technological advancement of the country.

4.5.2 Location

Nigeria Institute of Information technology is located at Iponyi, Surulere local government area of Lagos state.

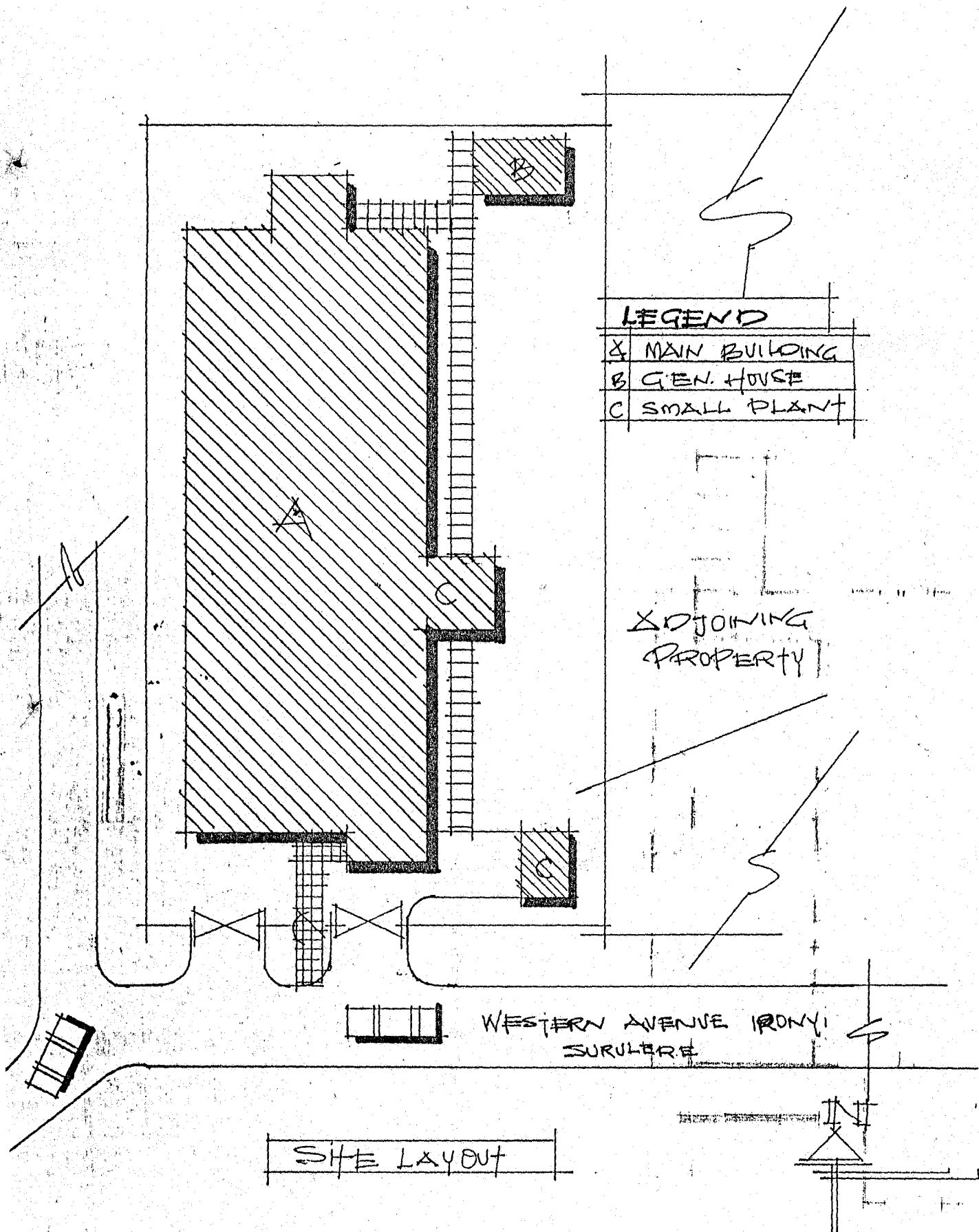
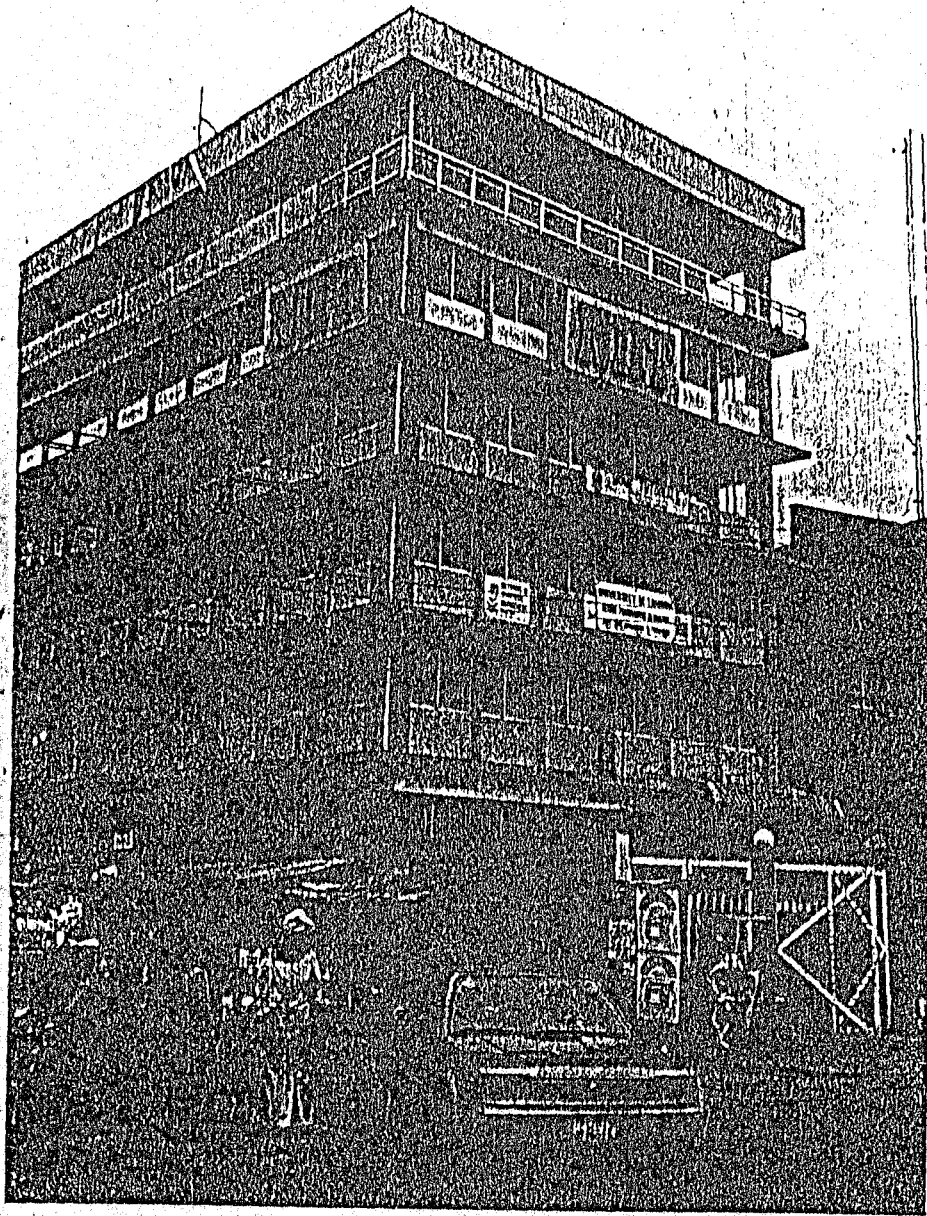


FIG 4.2: NIGERIA INSTITUTES OF INFORMATION (N.I.I.T) TECHNOLOGY, SURULERE.



PERSPECTIVE VIEW

PLATE: 4.4, THE PICTORIAL VIEW OF N.I.I.T. L
SURULERE.

4.5.3 Design report

The N.I.I.T building is a five-storey structure. It is constructed of lift slab construction with extensive use of glass. The building shape is rectangular with square protrusion at both ends. Other facilities attached to this site are generator house and a small plant, all connected by wall ways. The site is so congested that it could only accommodate few parking. Two entrances access the site with a pedestrian gate.

4.5.4 Observations

I. MERITS

- i. The site is easily accessible
- ii. The office partitions are well planned and constructed to minimise noise from adjoining properties.
- iii. The provision for fire-escape staircases
- iv. The use of advanced construction technique (lift slab construction)

II. DEMERITS

- i. The building lacks adequate airspace to building boundary.
- ii. Lacks landscape
- iii. No maintenance.

4.6 DEDUCTION

From the foregoing, it can be deduced that most of the buildings are lacking in evocative character. The lacking in articulate planning, subtle interrelation of functions are major deficiencies.

The Nigerian union of local government employees National Secretariat Abuja in view will take advantage of the above deficiencies and propose a design, which would be a landmark to promote the importance of the union movement and enhance recognition of the NULGE as an important and trustworthy organisation.

Symbolic planning will be carried out so that spaces will be flexible and reflect user requirements and so that the size and the grouping of the units can adapt to varying needs.

CHAPTER FIVE

5.0 DATA COLLECTIONS

5.1 GEOGRAPHICAL LOCATION OF THE FEDERAL CAPITAL TERRITORY

The Federal Capital Territory has gradually been engraved in the consciousness of Nigerians and visitors alike, located in the centre of Nigeria. It has a land area of 8,000km². It is bounded on North by Kaduna State on the West by Niger State, the east and Southeast by Nassarawa State and the Southwest by Kogi State. It falls within latitude 7° 25' and 7° 20' North of the equator and longitude 6° 45' and 7° 39' (Fig. 5.1)

Abuja is at home with nature, its rolling hills, isolated highlands and other enduring and endearing features makes it a delightful scenario. (Fig. 5.2) the unique feature of the Federal Capital Territory, is that it combines the savannah grassland of the North and the middle belt with the richness of the tropical rain forests of the south. The overall effect is the Federal Capital Territory has rich and fertile soil for agriculture cultivation and enjoys an equable climate that is neither too hot nor too cold all year round.

5.2 THE CLIMATIC CONDITION

As it is experienced in the tropics, the Federal Capital Territory experiences two weather conditions in the year. These are the raining season (the equivalent of winter in temperate regions) and the dry season (the equivalent of summer in temperate regions). The raining seasons begin around March through October while

the dry season usually characterized by bright sunshine, begins from October and ends in March.

Within this period, there is a brief interlude of harmattan occasioned by the north-east trade wind with the main feature bringing dust haze, intensifies coldness and dryness. Fortunately, the high altitude and undulating terrain of the Federal Capital Territory acts as a modulating influence on the weather of the Territory, which is always clement.

5.2.1 Wind

The Federal Capital Territory reflects the territory's location on the wind side of the Plateau and at the zone of rising air masses.

There are two major air masses, which are:

- i. ***Tropical Maritime Air Mass:*** This is formed over the Atlantic Ocean to the south of the country. Warm and moist, it moves in the southwest and northeast direction, which creates wet season.
- ii. ***Continental Air Mass:*** This develops over the Sahara desert and is warm and dry. Blow in opposite of northeast to southwest, it creates the dry season.

Two air masses are characterized by the presence of prevailing winds (Fig. 5.3)

5.2.2 Rainfall

Rainfall in the Federal Capital Territory reflects the territory's location on the windward side of the Jos Plateau and at the zone of rising air masses. The annual

total range of rainfall is 1100mm – 1600mm. it exhibits a spatial pattern, showing an increase from the southwest to the northeast. The duration of the raining season however decrease from about 240 days in the southern parts to 190 days in the northern areas.

The monthly distribution of rainfall shows a tendency towards a high concentration in 3 months of July – September. This situation which is pronounced in the north-eastern part, is an important consideration of the drainage system of the Federal Capital Territory. Frequent occurrence of squall lines with its accompanying heavy and cumulus clouds, strong winds and rainfall of very high intensity is another phenomenon. (Fig. 5.4a)

5.2.3 Temperature

The high temperatures and relative humidity in the Niger-Benue trough gives this part of the country a heat trap effect. The uncomfortable hot weather experienced in places like Lokoja tends to the southern and southwestern parts of the Federal Capital territory. The highest temperature is experienced during the dry season when there are few clouds in some cases up to 30⁰c between the highest and lowest temperature in a day changes in temperature of 17⁰c is been recorded.

During the raining season, the maximum temperature is lower due to dense cloud cover at 17⁰c. Diurnal annual range is also not more than 17⁰c in July and August. (Fig. 5.4b)

5.2.4 Humidity

Human sensibility of temperature is greatly affected by relative humidity during the dry season, which falls between 35 – 55% between October – March.

The low relative humidity coupled with high afternoon temperatures accounts for the desiccating effect of dry season.

However, the relative humidity during the raining season is between 25 – 95% which can be described as high, especially during the morning hours when it is as high as 95%. The effect is to create a heat trap, even though the temperature is low. (Fig. 5.4b)

5.2.5 Sunshine

During the dry season (October – March), the monthly variation in the amount of sunshine follows the general trends of an increase from over 275 hours. As the rainy season approaches, the cloudiness increases. The Federal Capital Territory is exposed to approximately 2,500 sunshine hours annually. The decline in sunshine hours becomes more intense as the rainy season progresses and it gets to its lowest value in August, with the highest values in December.

At this period there is an inversion where the sunshine hours are much less compared with the southern parts of the country.

5.3 GEOLOGY AND TOPOGRAPHY

The underlying rocks are the most essential factors in determining the nature and spatial distribution of soil in the Federal Capital Territory. There are two broad geological provinces.

- i. The sedimentary belt in the southern and south-western extremities of the territory, and

- ii. The pre-Cambrian basement complex rock country, which account for more than 80% of the territory.

The rocks of the Federal Capital Territory are generally quartz-rich, acidic types which account for the generally sandy nature of the soil. The area is typified by gentle undulating terrain. The height variations from crest of hill to watercourse varies around 50cm; more or less. In the immediate vicinity of someone on the ground, it produces short views of a mile or less. The visual scale is intended to be used as a design focal point to convey the sense of the larger scale of the city.

The city site consists of uplands and plains with numerous icebergs whalebacks and other rocks outcrops of various sizes. Icebergs and other granite cluster occupy about 8% of the total plain area and are generally bare and rocky varying in size and occupying as isolated masses or in groups rising from the plains. The linear pattern on these out cropping contributed to the decision to develop parallel bends of residential sectors on either side.

5.4 SOCIO-CULTURAL LIFE

Before 1976, there was no single secondary school in the whole area of the Federal Capital Territory; the few primary schools were established as part of the Universal Primary Education (UPE) programme of 1978. In the area of health care, there was no standard hospital or health care.

A few ill-equipped dispensaries existed in Gwagwalada, Garki, kwali, Bwari and Karu. At present however there are numerous schools, primary, secondary and tertiary institutions. The health institutions have also developed. The tradition architecture style common in the Federal Capital Territory was the round Sudanese

type, however these are now fast disappearing and being replaced by the rectangular "West Coast" type, which reflect modern architecture.

With regards to religious beliefs, there is a good spread of adherents of the major religions; Islam and Christianity although the traditionalists still exists.

5.5 ECONOMY AND COMMERCE

The indigenes of the Federal Capital Territory are chiefly subsistence farmers. The major food crops include yam, maize guinea corn, beans and millet. Fishing activities are also prominent among the people and villages along rivers Usuma, Jabi and Gurara.

Besides farming, wood and craftwork was still a notable occupation of the people of the territory, especially the Gbagys. Products derived from woodwork include mortars, pestles, masks, musical instruments and other household utensils. The Ganagana are renowned in iron works, producing such items as knives, Dane guns, arrows and ornaments, women practice cloth weaving as well as pottery.

5.6 DEMOGRAPHIC DATA

Cities remain as always the hubs of our civilization magnified, intensified version of both good and bad in the way of life. Shifting the seat of Federal Government from Lagos to Abuja had the immediate effect of shifting intensive central activities, and the long-range pact of anticipated attractions of the country as a whole to the central.

As a result the population growth rate has been massive 378,671 people in 1991, 800,000 in 1997 and it was estimated that in the year 2000 it would quadruple.

The master plans of Abuja however has put the ultimate population of the city of the tune of three million inhabitants.

5.7 TRANSPORTATION AND TRAFFIC FLOW

The master plan provided an elaborate transportation network which enhances effective link up with the city and within the city. The government has also help in complementing the private bus services in alleviating transportation problems of the city. States also have bus services that commute between their states and the Federal Capital Territory. The plan has design provisions for other modes of transportation such as railway and air.

The traffic flow pattern is usually between the suburbs, satellite town and the city centre.

5.8 EXISTING LAND USE AND FUTURE TRENDS

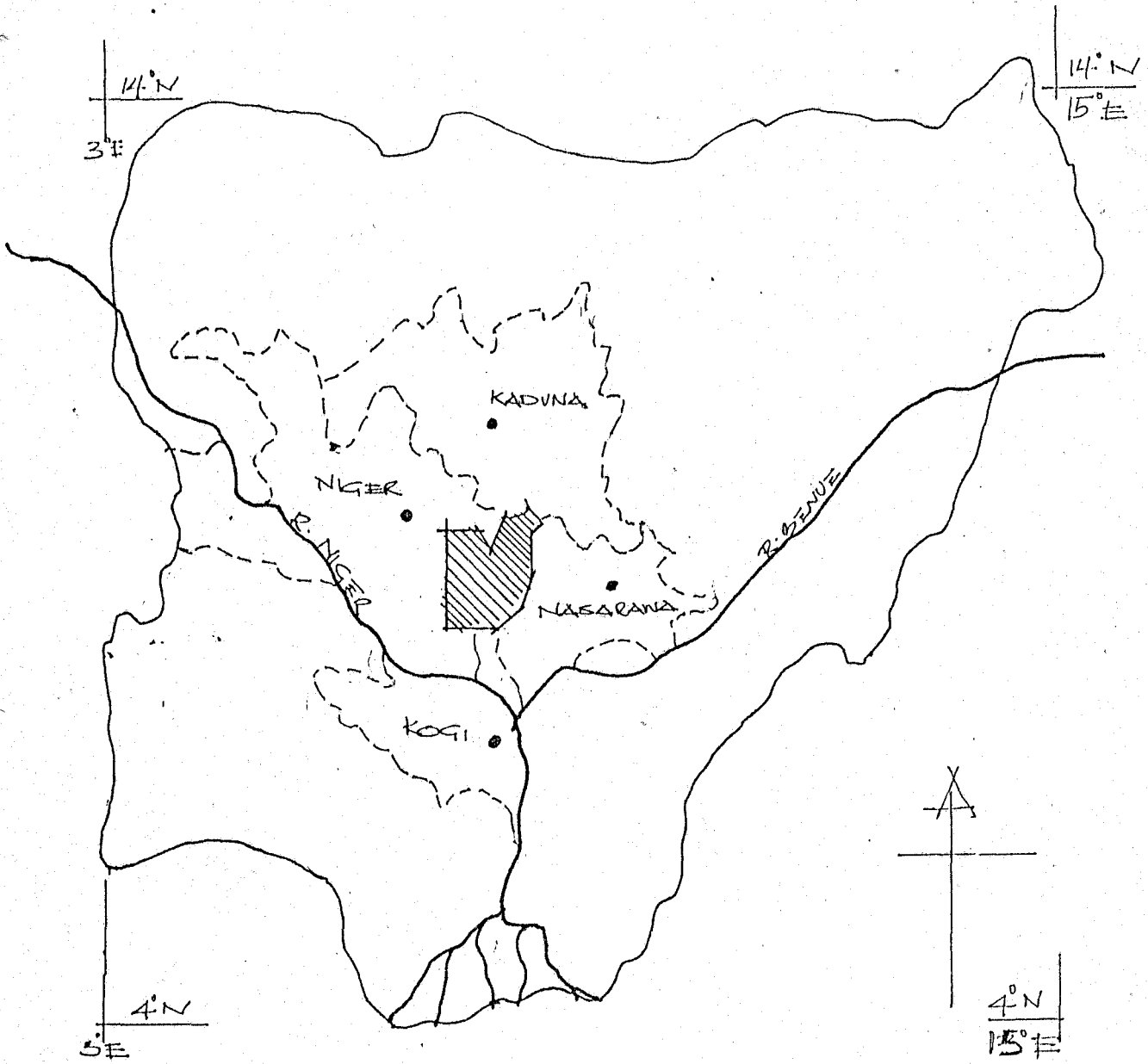
The development of the city is in four phases. Phase 1 of the city consists of the central business districts, the three-arm zone, Maitama, Wuse I and II, Garki I and II and Asokoro Districts. Phase II consists of Mabashi, Utako, Wuye, Durumi, Gudu, Jahi, Kado, Jabli, Gawduwa and Kukuwaba national park. The detailed land use plan of phase III and IV are not yet completed.

The development of the city is an efficient and attractive environment in stages. The city the end of the stages one and two will accommodate about 150,000 and 1.6 million residents, respectively with a projected population limit of 3.1 million.

TABLE 5.1: LAND USE OF ABUJA

Category of land use	Land budget (hectares)	Percentage of total (%)
Government	500.00	1.96
Services	891.00	3.49
Light industries	920.00	3.61
Infrastructures	1840	7.22
Residential	12486	48.97
Commercial	561	2.20
Open space and Recreation Facilities	8300	32.55
Total	25498	100.00

Source: (Documentation Land Use Analysis for Abuja the new Federal Capital of Nigeria)




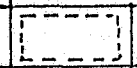
- KEY
-  FEDERAL CAPITAL TERRITORY
 -  STATES SURROUNDING ABUJA.

FIG. 5.1: MAP OF NIGERIA SHOWING THE CENTRAL POSITION OF ABUJA.

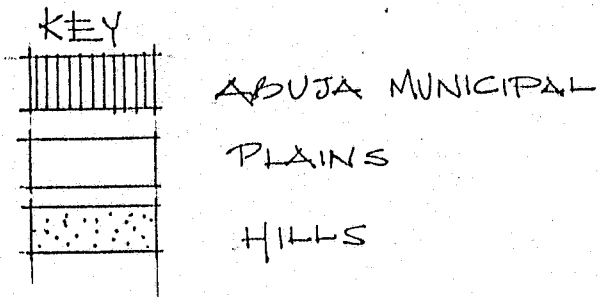
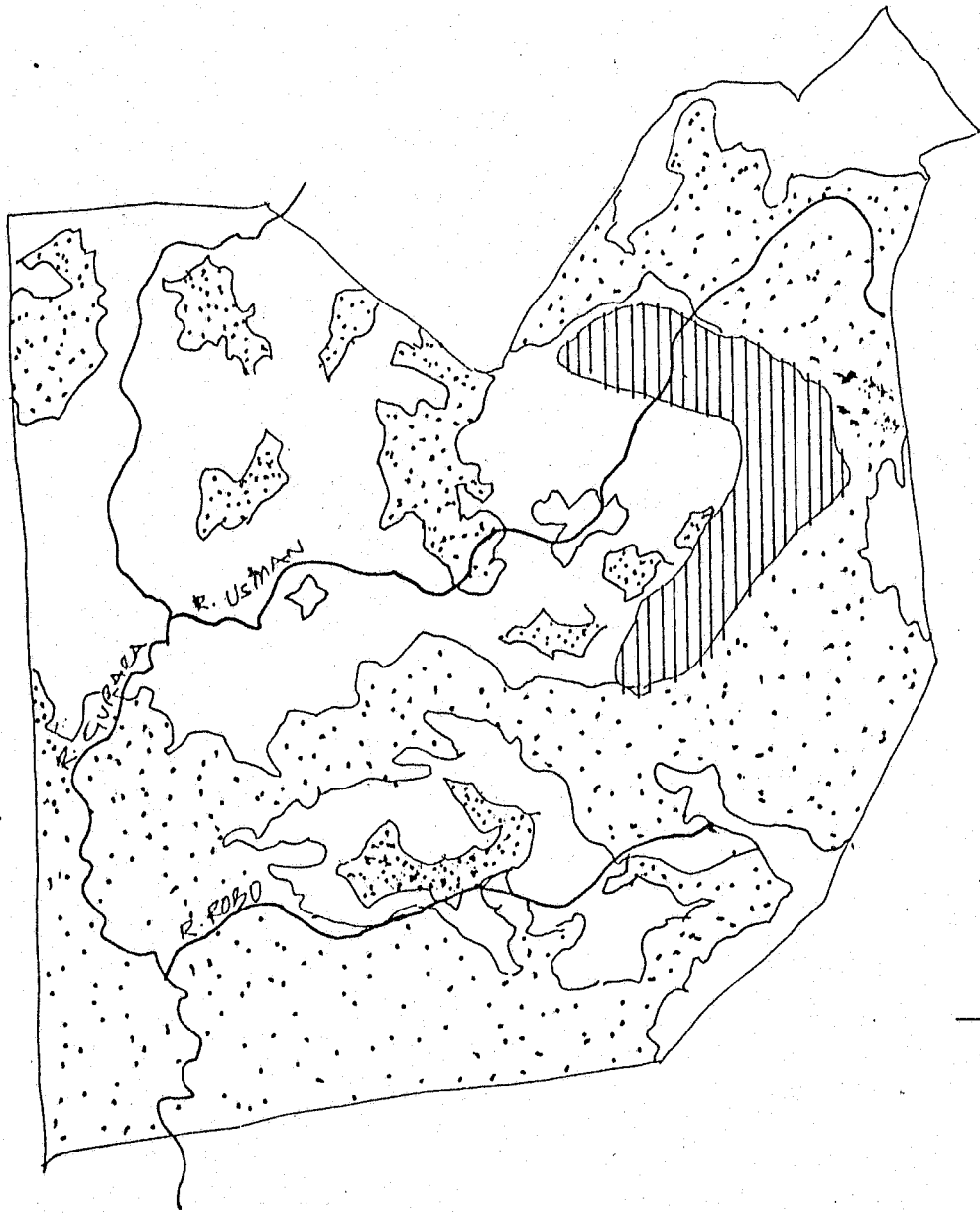
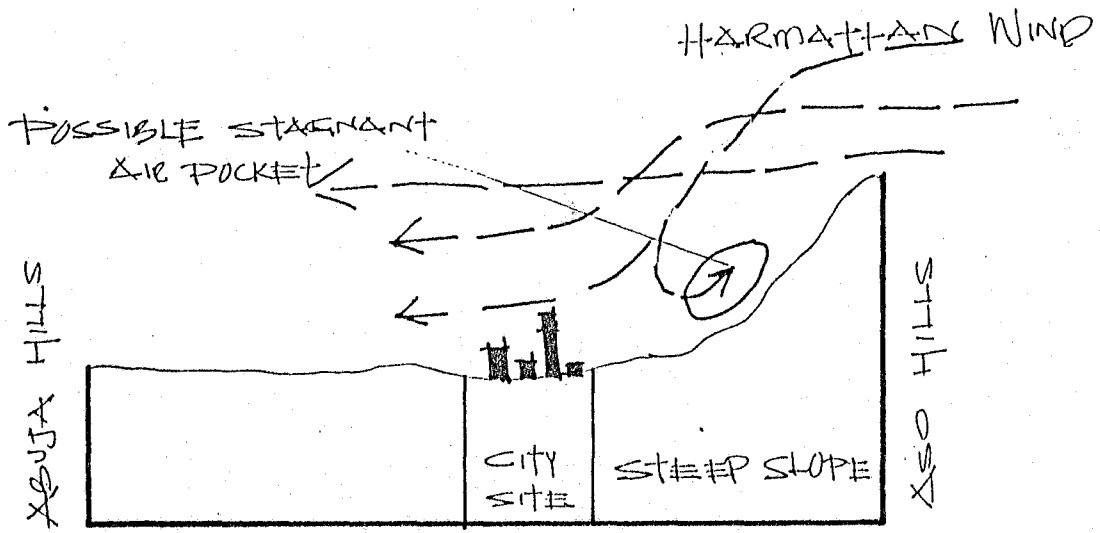
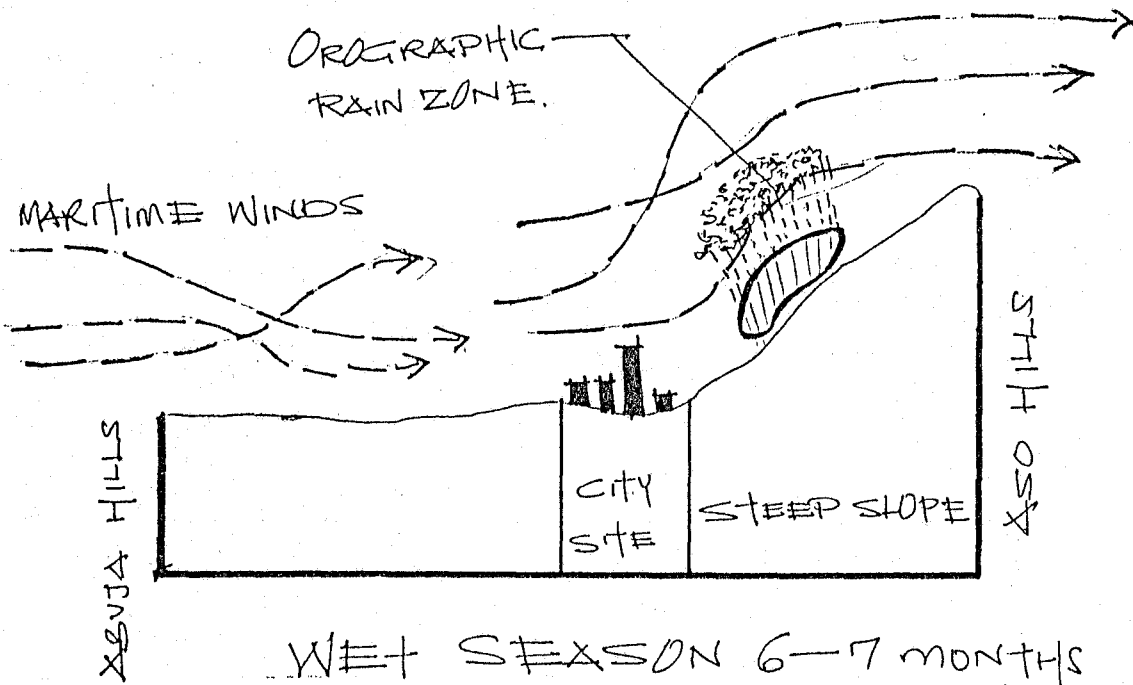


FIG. 5.2: RELIEF MAP OF F.C.T. SHOWING THE DEVELOPED ABUJA MUNICIPAL



DRY SEASON 5-6 MONTHS.



WET SEASON 6-7 MONTHS

FIG. 5.3: SEASONAL WIND PATTERN

5.9 DEDUCTION

Federal Capital Territory: Being the new National capital has facilitated movement of the seat of governance from Lagos to Abuja and its subsequent development into an administrative and commercial town due to movement of government parastatals and institutions. This accounts for the increase in its population and has led to a greater demand of office spaces. However, since NULGE presently has no national secretariat to its credits, there is the need for this design proposal to be located at Abuja to join other institution in the development of Abuja.

CHAPTER SIX

6.0 SITE ANALYSIS

A careful study of the site to be used was taken to determine its potentials, important factors for development of the site such as access and drainages, views, noise sources, wind directions.

6.1 CRITERIA FOR SITE SELECTION

The selection of site for this project was basically informed by two major factors namely: **MACRO SELECTION FACTORS** and **MICRO SELECTION FACTORS**.

The macro selection factor consist of I. **Urban Habitability**: The combination of environmental factors including soil characteristics, vegetation quality, geological characteristic, probable conservation zones quality of climate and suitability of terrain. But it is clear that no environmental factor is particularly meaningful to accredit location for habitation, unless it is interpreted and made relative to some other factors which may transform such factors either into useful or useless measures for site selection. Olajide, (1998).

For this assertion, the following factors were considered in selecting a site.

- i. Most comfortable and healthy site
- ii. Suitable climatic condition
- iii. Sufficient land to accommodate the design requirement and allow for future expansion

iv. Build able soil not requiring special engineering measures for construction

II. **Accessibility:** This criterion is preferably treated on its own, though, it may look small in scope but it is very important because some site may be habitable but not accessible.

The micro selection factors are the availability of infrastructures like water supply, electricity and waste disposal, drainage

6.2 SITE LOCATION

The site is located along the Nnamdi Azikwe international Airport expressway, northwest of the Federal Capital territory City gate, Abuja

Site Analysis.

SUN RISE

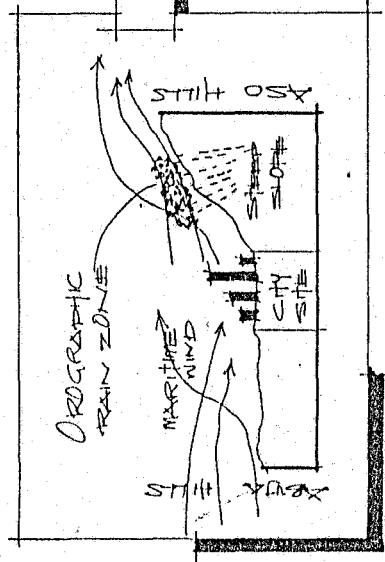
SUN RISES AT ABOUT 6.00 EVERY MORNING

SUN RISE

N.E. TRADE WIND
THIS WIND IS USUALLY DRY AND COLD IT IS CALLED THE WIND. IT BLOWS BETWEEN THE NOVEMBER AND MARCH YEAR

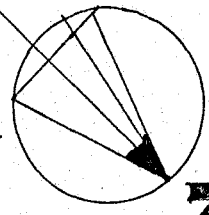
S.W. MARITIME WIND

THIS WINDS ARE USUALLY MOISTURE LADEN, COOL AND GENERALLY MORE DESIRABLE I.E. RAINING SEASON



VEGETATION

VEGETATION ON THE SITE IS CHARACTERISED BY GUYANA SAMANINA WITH SCATTERED TREES AND TALL GRASSES.

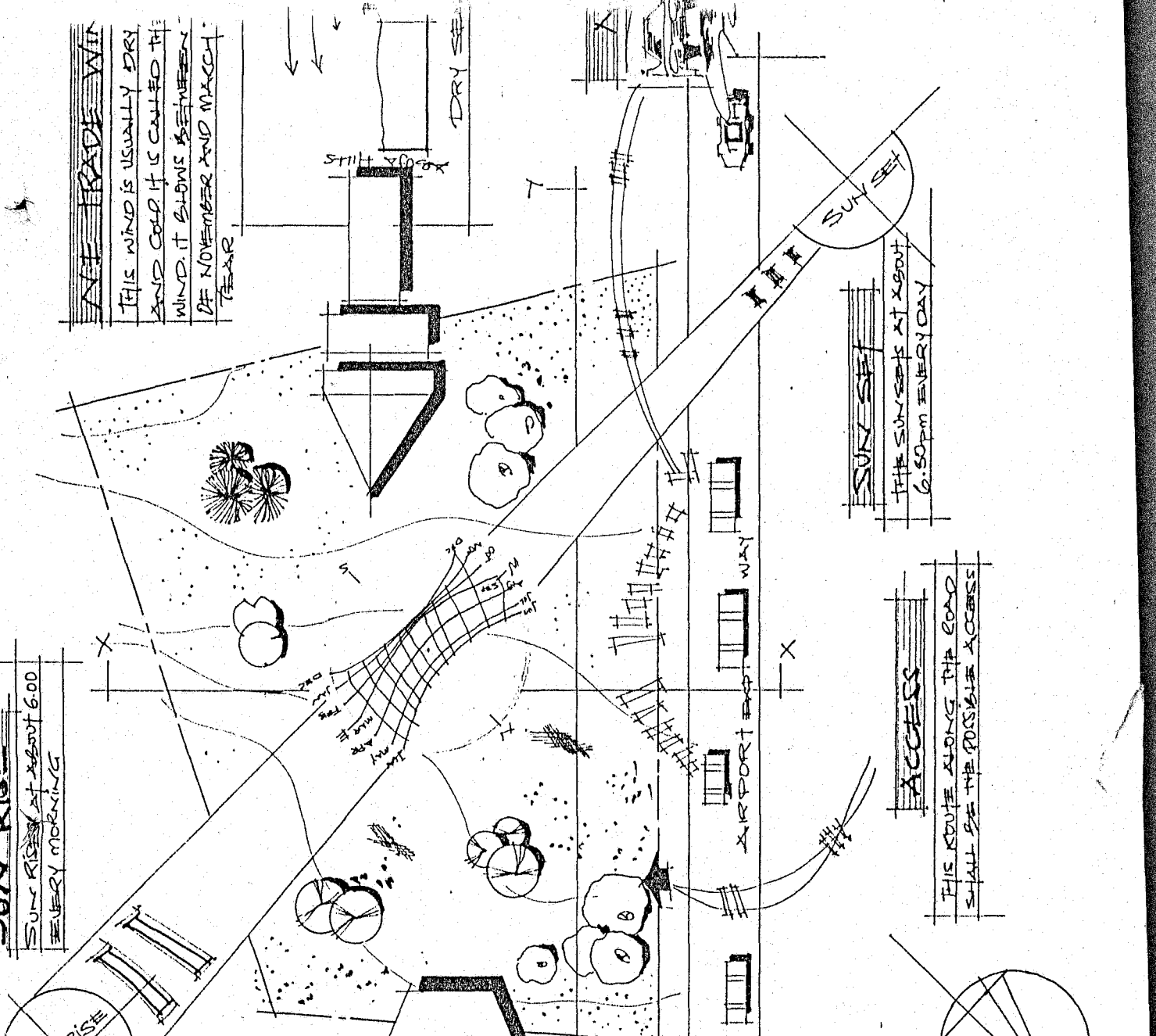


N

ACCESS
THIS ROUTE ALONG THE ROAD SHALL BE THE POSSIBLE ACCESS

SUN SET
THE SUN SETS AT ABOUT 6.50 PM EVERY DAY

SUN SET



6.3 SITE INVENTORY

- i. **Size:** The site takes a trapezium like shape determined by adjoining boundaries and surrounding creatures. The site is reasonably adequate capable of accommodating the intended facilities for the project.
- ii. **Soil:** The soil type is characterised mainly by high bearing capacity soil which is the loamy soil and suitable for construction
- iii. **Topography:** The site is typified by a gentle undulated terrain as shown by section x-x and section y-y are typically skipped by fringes and thickets.
- iv. **Vegetation:** The site is characterised by park savannah, which are typically skipped by fringes and thickets.
- v. **Climate:** The prevailing winds over the site are the northeast trade and southwest maritime winds, which are characterized by dry air that carries hamattan along and wet breeze that carries rain along respectively.

6.4 ACCESS AND CIRCULATION

The site has a direct access from the airport express road without any obstructing features whether natural or manmade. Circulation is also easy because the express road is well designed and constructed with a dual carriage.

6.5 UTILITIES

Infrastructures like electricity, water supply, drainages and a central sewage system planned for; by the master plan of Abuja already exist.

6.6 SCENERY / MAN-MADE FEATURES

The natural features in and around the site are the luxuriant vegetation with an overview of mountains. There are no man-made features on the site except the features bordering the site. These bordering features include, existing express roads pedestrian slabs, kerbs and streetlights.

6.7 ENVIRONMENTAL PROBLEMS

The site is free from environmental pollution except for the penetration of noise from speedy cars on the high way.

6.8 DEDUCTION

With all the characters possessed by the site, it can be said to be suitable for both construction of building and planting. The scenic of luxuriant vegetation and mountains of the area, the available infrastructure like electricity, water supply, drainages and planned central sewage system for Abuja makes the area suitable for the design proposal.

CHAPTER SEVEN

7.0 DESIGN CONCEPT AND CONSTRUCTION

7.1 CONCEPT AND DESIGN

7.1.1 Concept

The design approach for this project was based on the canonic design approach (form follows function) because function of the building is the most paramount factor in an office design.

A triangle of function was projected from the organisational chart of the Nigeria union of local government employees with three different colours in the triangle formation showing the degree of relationship between various functions. These colours are red, green and blue representing hot, warm and cold relationship respectively.

This method has help in the zoning of functions and it has formed the basis of the design.

7.1.2 Design

The design of such project was conceived with due considerations to the basic need of a modern office facilities and careful planning for National glory as it is to be located in the nations capital. Analysis and detailed studies carried out prompted the provision of the following facilities:

- I. **A complex:** A nine-storey structure provides for the running of the administrative activities of the unions according to the number of

departments that exist in the organization. In some situations, two different departments share a floor. These floors and their departmental allocations are as follows:

i. **Ground floor:**

Maintenance and services

Museum and Archives

Library

ii. **First floor:** Federal capital branch/chapter of the union

iii. **Second floor:** Administrative department of the National body

iv. **Third floor:**

Education department

Training and man power department

v. **Fourth floor: fifth floors (prototype)**

Information department

Finance and Audit department

vi. **Sixth floor:** Legal department

vii. **Seventh and eight floors (prototype)**

National General Secretary department

National chief executive department

II. Restaurant

III. Auditorium

IV. Reservoir

V. Gate house

VI. Generator house

VII. Landscaping element

7.2 MATERIAL AND CONSTRUCTION

All building unit on site shall be oriented and related to ground plane with interior space layout strongly considered during their construction, so as to achieve a stable structure.

The choice of materials, construction techniques and site planning help to control natural ventilation, lightening, heat, view, noise pollution and other environmental factors by providing access to favorable weather condition and screen to unfavourable weather condition to the building and its users.

7.2.1 Building Material

A good knowledge and understanding of building materials are of great importance to Architects, Builders and other professionals whose activities are related to construction industry. With this, the designer could be flexible, contemporary and explosive in his design since he is knowledgeable about building materials.

The availability of building materials for use is extensive but the choice of using a particular building material depends on its characteristics and on some factors. These characteristics may include:-

- i. Strength
- ii. Durability
- iii. Fire resistance
- iv. Weather resistance

The factors on which the choice of building materials depends are:-

- i. Availability: The material must be readily available for use whenever it is needed.
- ii. Cost: The cost of obtaining any material specified must be affordable
- iii. Suitability and Aesthetics: This depend wholly on the designer's desire.

Most building materials are manufactured in standard sizes. These sizes may vary slightly between manufacturers, so the verification during design and planning is necessary to avoid unnecessary waste of materials during construction. Some of the basic building materials used in the design of this project include:-

- i. Concrete
- ii. Timber

- iii. Glass
- iv. Steel
- v. Aluminum
- vi. Sandcrete block
- vii. Ceramic tiles
- viii. Paints
- ix. Pre-stressed concrete ribs
- x. Landscape elements.

I. CONCRETE

Concrete is a mixture of sand, gravel held together by a hardened paste of cement and water. This mixture in the first place is a plastic mass that can be cast insitu or precast, and can also be reinforced. The characteristic of concrete can vary through a wide range, depending on characteristics of ingredients and proportion of mixture. The technique used for mixing, placing, finishing and curing can also affect the quality of the concrete.

The design of the secretariat employs the use of concrete in the construction of foundations, walls, floors, stairs paves, roof slabs (deck) and columns.

II. TIMBER

Timber is a wood sawn and ready for use in construction. It possesses qualities like strength, durability, light weight, natural beauty and warmth to sight and touch which makes it to be used in various ways. There are two major classes of Timber namely; soft wood and hard woods.

Softwoods are the evergreen and are used for general construction such as scaffolding, form work and general temporary structures during construction, while

I. SUBSTRUCTURE

This basically involves the digging of foundation trenches and the construction of foundation footings. This is done after the soil type and condition has been analysed, the resulting recommendation is the use of strip foundation which has to anchor the super structure of the building against uplift and racking forces.

Materials used for the construction of the foundation shall include; crushed aggregates, steel for reinforcement, and concrete. Allowance should be given for the expansion and contraction of the building materials to prevent distortion, cracks and breaks where applicable.

II. SUPER STRUCTURE

This is basically the building components above ground level up to the headroom. This includes; walls, column doors and windows. In the construction of this part, ventilation, lightening and comfort is strongly considered. Some of the parts of the structures have their shells made up of domineering sandcrete blocks, concrete wall and curtain walls.

Materials used here, include glass for glazing linked together by Aluminum frames, steel, concrete and reinforced concrete.

III. ROOFING

This is basically the covering of the built up structures. The construction of this involves the roof trusses, roofing sheets, roof slabs (deck), water proofing elements and draining.

The materials used in this design for roof trusses are steels and timbers while those used as roofing sheets is mainly long span aluminium and in few cases,

skylight are used. Roof slabs where they are used are basically made up of concrete and reinforcement furnished with bitumen felt.

IV. FINISHES AND LANDSCAPING

This can be applicable to both internal and external part of the structure on site, which includes material finishes of fire resistance on partition walls, floors, footpath, lawns and paved areas. These materials ranges from wood panels, glass, alloy frames for wall partitions to marble, terrazzo, ceramic tiles, concrete slab for floors.

The provided finishes for ceiling surfaces are inform of boards or tiles that may be applied directly or suspended from the underside of the roof. The material to be used may be of wood, perforated mineral fibre or texture surface that absorb sound.

For the landscape, the green areas shall be finished with surfaces such as kerbs, pavings projecting 20mm above the lawn. It is also advisable to provide 225mm wide strip of gravels or ballast treated with weed killer between grassed area and walls.

Foot path and paved areas can be constructed of a variety of materials and the choice will be determined largely by such factors as initial cost, maintenance cost, aesthetics and wearing qualities. Precast concrete paving slabs shall be used for walkways linking the various units.

7.3 SPACE REQUIREMENT

The total floor area of each function on every floor unit of the secretariat complex, considering minimum standard space requirements with permissible working area are as follows:

I. THE COMPLEX

FUNCTION	FLOOR AREA (M ²)
i. GROUND FLOOR	
Entrance	20
Reception area	40
Waiting area	42
Corridor	50
Telephone and mail exchange	84
Rescue area	42
Maintenance unit	84
Chief maintenance	30
Store	105
Store	30
Store keeper	30
Office	35

Museum and archive 345

Lift 4

ii. **First floor: Federal capital chapter of the union**

Stair hall 18

Corridor 50

Circulation 96

Conveniences 50

Rescue area 42

Library 50

Records 42

Voids 223.5

Accounting section 84

Accountant's office 35

Chief auditor 30

Chapter secretary 35

Sec's WC 3

Vice president	35
Vice president's WC	3
President	40
President's WC	4.5
Hall of fame	345
General office	40
Lift	4

iii. Second floor: Administrative department

Stair hall	18
Corridor	50
Circulation	96
Conveniences	50
Rescue area	42
Open registry	50
Voids	223.5

Establishment	84
Establishment chief	35
P.R.O	35
P.R.O's WC	3
Deputy H.O.D	35
Deputy H.O.D's WC	3
H.O.D	40
H.O.D's WC	4.5
Hall of fame continues	345
General office	40
Lift	4

iv. Third floor: Education, Training and man power department

Stair hall	18
Corridor	50
Circulation	96
Conveniences	50
voids	223.5

Rescue area	42
Computer centre	50
Coordinators	42
Deputy H.O.D	35
Deputy H.O.D's WC	3
H.O.D	40
H.O.D's WC	4.5
General office	40
Secretary and visitor's waiting	40
Training unit	84
Chief instructor	35
Trainer	30
H.O.D man power	40
H.O.D's WC	4.5
General office	40

v. **Fourth floor:**

Information department

Stair hall	18
Corridor	50
Circulation	96
Conveniences	20
Rescue area	42
Information center	84

Voids	223.5
General office	40
Secretary and Visitors	40
Sec's WC	3
Deputy H.O.D	35
Deputy's WC	3
H.O.D	40
H.O.D'S WC	4.5
Lift	4

vi. Fifth floor: Finance, Audit departments.

Stair hall	18
Corridor	50
Circulation	96
Conveniences	20
Rescue area	42
Voids	223.5
Accounting	84
Chief Accountant	35
Secretary and visitors	40
Financial secretary	35
Fin Sec. W.C	3

National treasurer	35
Treasurer's W.C	3
Deputy treasurer	35
Deputy's W.C	3
Chief Auditor	35
Auditor's W.C	3
General office	40
Lift	4

vii. Sixth floor: Legal department.

Stair hall	18
Corridor	50
Circulation	96
Conveniences	20
Rescue area	42
Voids	223.5
General office	40
Legal officer 1	35
Legal officer 2	35
Legal officer 3	35
Secretary and Visitors	40

Chief legal adviser	40
Adviser's W.C	4.5
Chambers	84

viii. Seventh floor: National general secretary department

Stair hall	18
Corridor	50
Circulation	48
Conveniences	10
Rescue area	42
Voids	65
P.A general secretary	30
General secretary	40
Secretary's W.C	4.5
Deputy Gen. Sec	40
Deputy's W.C	4.5
Publicity Sec	35
Secretary's W.C	3
Secretary and visitor	40
Visitors W.C	3
Office	35
Lift	4

ix. Eight floor: National chief executives' floor

Stair hall	18
Corridor	50

Circulation	48
Conveniences	8
Rescue area	42
Void	65
National president	65
President's W.C	4.5
Secretary to president	30
Deputy president	48
Deputy's W.C	4.5
Secretary to deputy	24
Vice president 1	35
Vice president 2	35
Vice president 3	35
Board room	84
Lift	4

CHAPTER EIGHT

8.0 DESIGN SERVICES

The main aim of environmental control is human comfort, which is paramount such that the psychology of human sensation and perception must be regarded as one of the basis of environmental work. Sometimes controlled conditions of temperature, humidity and light are needed. This means any improvement in environmental conditions is regarded as worthwhile –achievement.

If satisfaction is to be achieved, it is vital to take into account the pattern of the use of the building and the ways the fabric of the building will react to the natural environmental conditions, installations, form, spaces occupied by installation and location and distribution of duct. Not only must environmental consideration be taken into account in the fundamental design of the building, there should also be balance amongst them.

8.1 ELECTRICITY AND LIGHTING:

Supply of electricity will be from the national grid of which is easily accessible to the complex. Nevertheless, backup-generating sets will be provided in case of failure from National Electric Power Authority (NEPA). Electric wiring system used here is the conduit system. The positioning of electric outlets within offices workstations and other areas has been based on occupancy plan.

Wiring, basically considered as a major design element of any office facility. It has been best thought that wires have to be separated based on their voltage. Based on the recommendations of telecommunications workers telephone wires

have also been separated from the data and signed wires. Thus, here wire ways or septums are typical: one for line voltage wires, one for telephone wires, and one for data wires.

With the wires being in conduit, the wires are insulated with normal PVC. Wires that are managed, or otherwise travel throughout the space between the ceiling and underside of the floor slab above, must be either in conduit, if telephone or data wires, insulated with Teflon and run in the ceiling chase space.

At destination provisions have been made for junction boxes, which will enable management of wires. The junction box is fixed to the architecture and tied of connected with the appropriate plugs, amphenols, or convectors,. The computers, telephones and appliances (task lights and other office machines) are plugged in from the junction box.

8.1.1 Lighting

The lighting of the interior and exterior spaces has undergone special considerations. The use of natural lighting, popularly known as day lighting has been given special considerations. This has been done using a lot of opening to the shell of the building and presence of courtyards.

Ambient lighting: here much emphasis has been channelled to fluorescent ambient lighting. Since the energy crisis of the mid 1970s fluorescent ambient lighting has become a major design determinant. In general, more compute terminals have come into use at office desks and workstations and the need to avoid glare on these terminals has gained special concern.

Based on research findings 25 to 30 foot candles is the range recommended for most casual and business conferences and meetings, with a reduction to 10 to 15 foot candles for taking notes during a slide presentation meeting. Thirty five to 50 foot candles is the required for most office functions, including reference to text and spreadsheet while inputting data into computer terminal. Individuals who perform accounting or drafting tasks and older employees may require a level of illumination of 65 to 85 foot candles. This also has been considered. Based on cost consideration ambient lighting improved technologies have been chosen, thus allowing for use of one fluorescent tube to replace two or three as been used in the past in one fixture, thus reducing overall energy consumption and providing a glare proof overall blanket of illumination required for modern video display tube and P.C. environment.

Technically foot-candles are expressed both as to the quantity of light and quality of light. The qualitative aspect provides the basis for evaluating glare conditions, by reducing glare, a given quantity will appear easier on the eyes, allowing one to see more clearly with less eye strain.

8.2 HEATING VENTILATION AND AIR CONDITIONING (H.V.A.C.)

These have been taken care of by the provision of a plant room to house the compressors, large vertical ducts and horizontal ducts within the suspended ceiling.

The duct system above the ceiling or below the access floor should travel in a reasonable uninterrupted path both horizontally and vertically sharp bend or jogs to avoid an obstruction created by another infrastructures element may cause air

turbulence, which will result in constriction of flow of air. All these have been carefully avoided.

The modular approach to air supply has been applied so that the flow of air will be evenly balanced throughout the space. Future consideration have been given in mechanical analysis and planning such that occupants should be able to re plan the space in the future without need for revision of the basic duct distribution system or infrastructure of the facility.

The HVAC equipment selected is to be silent, effective and easy to control, and provides the moisture, the ant fungus, and antibacterial agents, and the increased fresh air changes needed to respond to the "sick building" issue; electronic controls that monitor performance at critical points in the overall office environment and automatically adjust supply to changing demand while reducing overall energy consumptions.

8.3 WATER SUPPLY

Cold and hot water will be needed here since there is a mains, water is drawn from the mains and is controlled via a stop clock sited close to the boundary of the property. A further control valve just inside the building which can stop the supply. Theses two controls are used to isolate the supply for different reasons. The stop-clock can be operated by the water authority to stop the supply in the event of:

- i. A burst in the main;
- ii. A burst between the stop cock and the property;
- iii. A leakage causing contamination of the supply;

iv. Non-payment of water rates or meter supply authority consents to.

The stop valve can be operated by occupants of the building, to stop the supply in the event of:

- i. A burst of leakage within the system;
- ii. Extension or adoption of the system, e.g. additional hand basin
- iii. For refurbishment of the system, e.g. a new water storage tank;
- iv. Vacating the building for an extended period, such as a holiday, as a precautionary measure.

The water supply inside the building is then routed to provide service to the users. Three pipes are taken off this rising mains to provide drinking water.

8.3.1 Water treatment

A treatment plant consisting of filtration where water is filtered through the sand by simple percolation and of necessary small amount of aluminium added and stored in a water tank on the roof floor of the multi-storey building.

8.4 DRAINAGE AND SEWAGE DISPOSAL

Provisions have been made for the control of water in and around the building, by construction of roof gutters and drainage pipes to carry water from the roof to the drainage system around the building. This drainage system has also been linked to the city drainage.

Sewage disposal have also been taken care of through the use of duct system within the building. This have been carefully connected to the inspection chambers, septic tanks and finally to the soak away pits.

8.5 REFUSE DISPOSAL

Disposal of refuse, basically considered as an important area in building services have been handled through the provision of waste baskets within the buildings. Without the buildings strategic location of refuse collecting PVC containers have been made. It is also expected that the city's sanitation unit should come from time to time to empty these refuse collecting tanks for onward management from activities.

8.6 ACOUSTICS

By definition, it is the scientific study of sound. Based on research finding, a noise coefficient index (NCI) of at least 35 to 40 should be considered the minimum standard or acoustic isolation from core to user spaces. This has been taken care of through the use of acoustic materials.

Ceiling products that absorb vibration and sounds, providing speech privacy from room to room or workstation to workstation; sound masking products that introduce white noise into the office environment to drawn out voices and further enhance speech privacy have been used.

Sound masking recently developed audio system, employed in ceiling design, generates a type of noise known as "white noise" which masks or draws out the audible portion of human speech and produces "speech privacy". The concept of

speech privacy does not eradicate sound. Its goals are simply to eliminate specific sounds and to allow neighbours to conduct their individual business without interrupting the work of others. See figure below.

The sound masking speakers are typically placed on 5 meters centre lines and tuned individually to provide the level of speech privacy required.

8.7 FIRE SAFETY

The safety of the entire building as regards fire outbreak has been specially considered in the design. Reference to chapter three of this text. But based on these considerations the following provisions have been made.

i. **Interior Finishes:** The interior finishes have been so chosen to retard the outbreak of fire. Fire rated wood finishes glass and other materials have been installed.

ii. **Other Fighting facilities:** Advanced fire, smoke, panic, and security monitors, including sprinklers system, next generation Halon fire suppressor system for electronic environment, central alarm controls, annunciation panels with automatic police and fire department dialler, sequencing multi station, video monitors, motion sensor, "bug" sensors, and other electronic eavesdropping sensors and controls have been provided. Sprinkler systems, based on fire code recommendations using the United State Standard will be most efficient if a module of 4.5 meters by 4.5 meters, with partitions located on the half module and a sprinkler head in the centre of each room.

iii. **Escape Facilities:** Provisions have been made for escape of occupants in case of fire outbreak by the provision of stair ways very close to the doors to serve as escape stairs. The provision of these is to allow for controlled evacuation of occupants.

8.8 SECURITY

Quite frankly, there is truly no security building. As new buildings are designed and constructed to resist attacks such as terrorists' attacks, the resources and resourcefulness of adversaries increase as well. This prompts another round of escalating counter measures in the built environment. In spite of the fact that terrorists can actually trump the best efforts of the design community, the resistance of public buildings to malevolent actions can be increased. In this context, considerations have been well channelled to find ways of been a harder target than other buildings in the same category, while simultaneously providing a creative and efficient workplace. The theory of crime displacement says that an increase in security at a specific facility will divert the adversary to equally attractive but less resistant targets.

Some basic considerations have been put into play in this study:

i. **Personnel Control:** For most building owners, security is primarily related to personnel. Therefore, personnel access control is fundamental to a sound security program and is greatly influenced by facility design.

Nowhere is more evident than in the facility lobby. In this location, the population consists of individuals authorized access to the facility,, visitors who will be allowed into the facility either escorted or unescorted, and potentially, individuals who, for a

variety of reasons, will not be granted access. In addition, the lobby becomes the first point where the reception person/security officer greets all people entering the building. Especially for visitors, that person becomes the commission's ambassadors and chief representative. The lobby has been therefore designed to accomplish the following:

ii. **Effectiveness:** a balance between the aesthetics of the lobby and its ability to provide a natural flow of personnel past the security/reception desk. Personnel traffic is to flow past a minimum number of security/reception desks from a pure economic standpoint.

iii. **Efficiency:** the security/reception desk have been designed to provide the utmost efficiency in performing a wide range of required tasks such as everything from assisting lost to helping long-time employees with malfunctioning access credentials. Space provision have been made for closed-circuit television monitors, a P.C. tied to the facility's Local Area Network (LAN), a PC monitoring the facility access control system, badge printers and various communication devices.

iv. **Convergence:** the lobby is also a common traffic-flow point between the above grade and below the grade floors.

v. **Keep the doors locked:** use of electromagnetic locks has been employed. They work by securing or holding a door in closed position through the use of an electromagnetic field between the coil and receiver plate. Upon presentation of a valid access credential power is interrupted to the coil, causing the magnetic fields to dissipate and thus releasing the door.

vi. **CCTV Surveillance:** closed Circuit Television (CCTV) has been installed to monitor and record activities at key locations, such as controlled doors, large space, hallways and lobbies.

8.9 COMMUNICATION SYSTEM

The sophistication level involved here has therefore made it necessary to split the telephone layout into 'external' and 'internal' services. In order not to allow for overloading of the system, a small bank for external telephones has been located. Extension lines have been provided to link different sections with the external lines. Using modern electronic control, systems, provisions have been made for programming of individual extension telephones. These include; automatic re-routing, transfer of calls, open-conversation (on more than extension for an outside call), automatic search and memory bank of regular numbers in use. Obviously, the wiring is more complex for such system and a boxed PVC ducting is used. As a result of the flexibility of ceiling location of the duct, it has been used as shown in the figure.

An additional communication system used here is computer terminals for Visual Display (VDUs) where centrally stored information can be called up to a screen some distance from the data store. Computer terminals should be networked with the provision of internet facilities. Provisions have been made for closed circuit television (CCTV) for monitoring purposes.

8.10 MAINTENANCE

The buildings have been so designed to allow access ease for the sake of maintenance. A maintenance department has been provided to see to the maintenance requirements of the buildings. Materials used in construction have been so selected to allow for easy maintenance of buildings.

8.11 SOLAR CONTROL

A critical factor in achieving a lower level of illumination while avoiding glare, window wall design necessitates lowering the light transmitted from the outside the buildings' window wall to approximately the level in the insider illumination.

In lowering the intrusion of daylight and direct sunlight and to lower glare and solar heat gain inside the buildings. In some areas window treatment such as mini-blinds, vertical blinds are used to further reduce the intrusion of light to below the level of the ambient lighting provided for the office facility.

GENERAL DESIGN APPRAISAL

In carrying out this project basic research process had been followed to produce a unique structure facilitating the activities of workers of the union.

The major goal of architecture is the harmonious combination of functionality and there is no design when functionality are backing in Architectural drawing. The commission has been so designed to tackle the problems imminent within the site. Noise, Solar and traffic control have been properly taken care off. Within the building careful selection of materials and construction, techniques have been made to create a very conducive working environment and for safety at the instance of fire outbreak with circulation having two branches, the horizontal and the vertical been taken care of. The horizontal within the building with the lobby and balcony links, and outside with the walk way and road networks.

The landscaping have been uniquely planned to combine a great deal of natural scenery with the artificial. The use of hedges along the sides of roads and parting spaces gives the entire environment a unique level of organisation and an aesthetic for visual pleasure.

The structure is designed to a projected future trend and serve as a source also as a source of fund to the union by leasing out some floors for office use if the need arises.

CONCLUSION

The importance of any project is its fulfilment of its original scope. This design proposal through its concept and philosophy and scope is a step towards harmonising symbolising the activities of the union for better enhancement of the relationship between the governments of the day and the local government employees.

It is note worthy that the design aside of emphasizing the safety measures for fire at fire instances has sought and made provisions for the structural stability and aesthetics of the building as well as the beauty of the entire site via landscape.

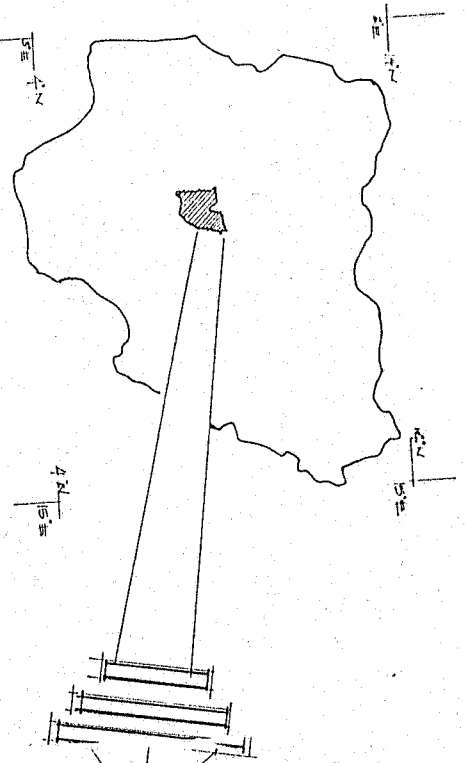
The location of this project to Abuja shall help glorify and subsequently develop the nations capital and reduce the demand for office spaces due to the influx of people, institutions and parastatals from Lagos as a result of the movement of the seat of government from Lagos to Abuja.

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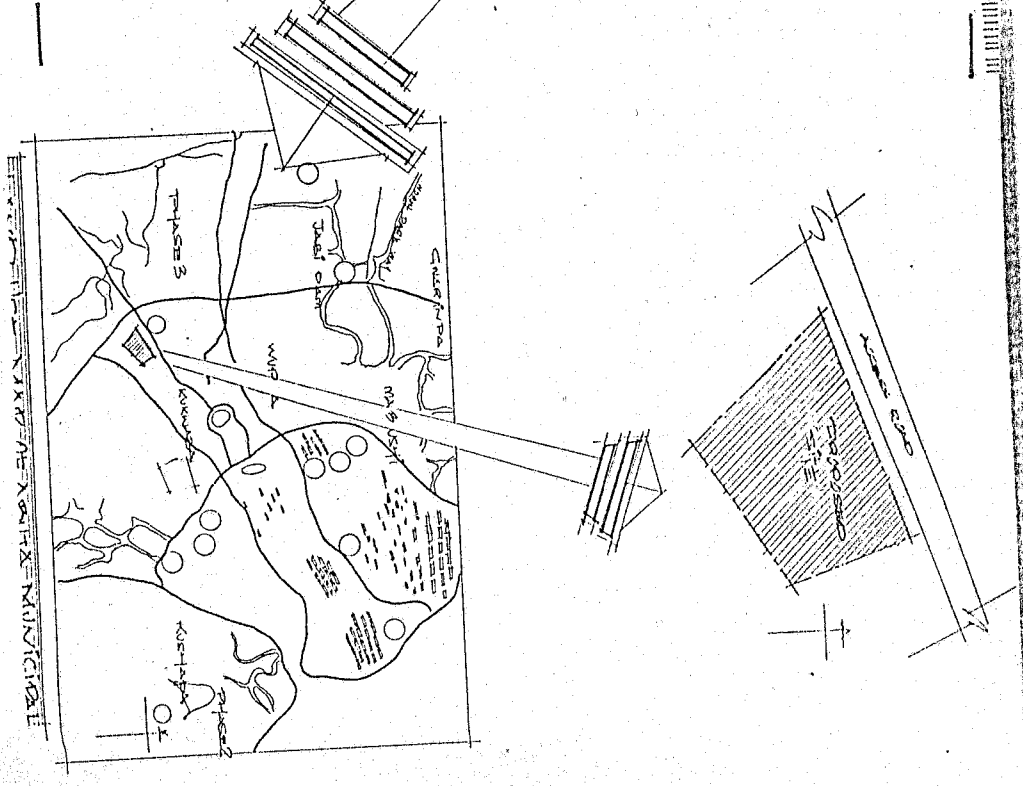
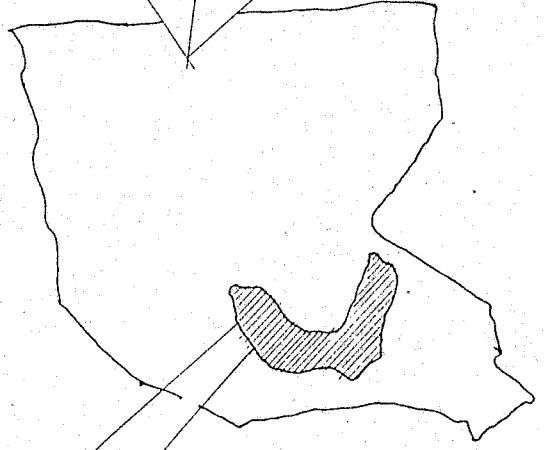
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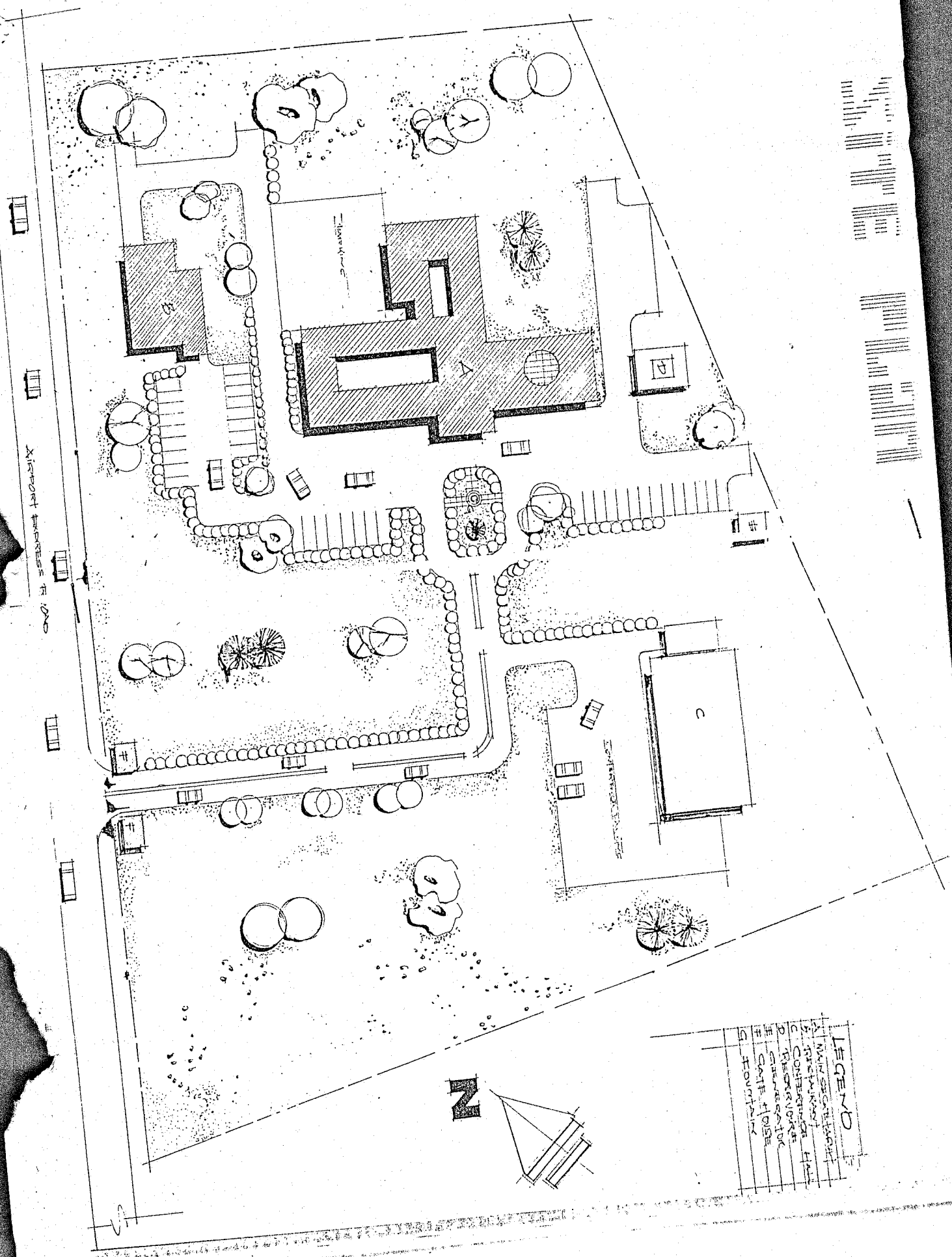
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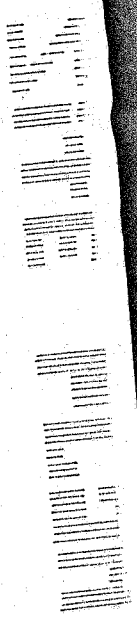


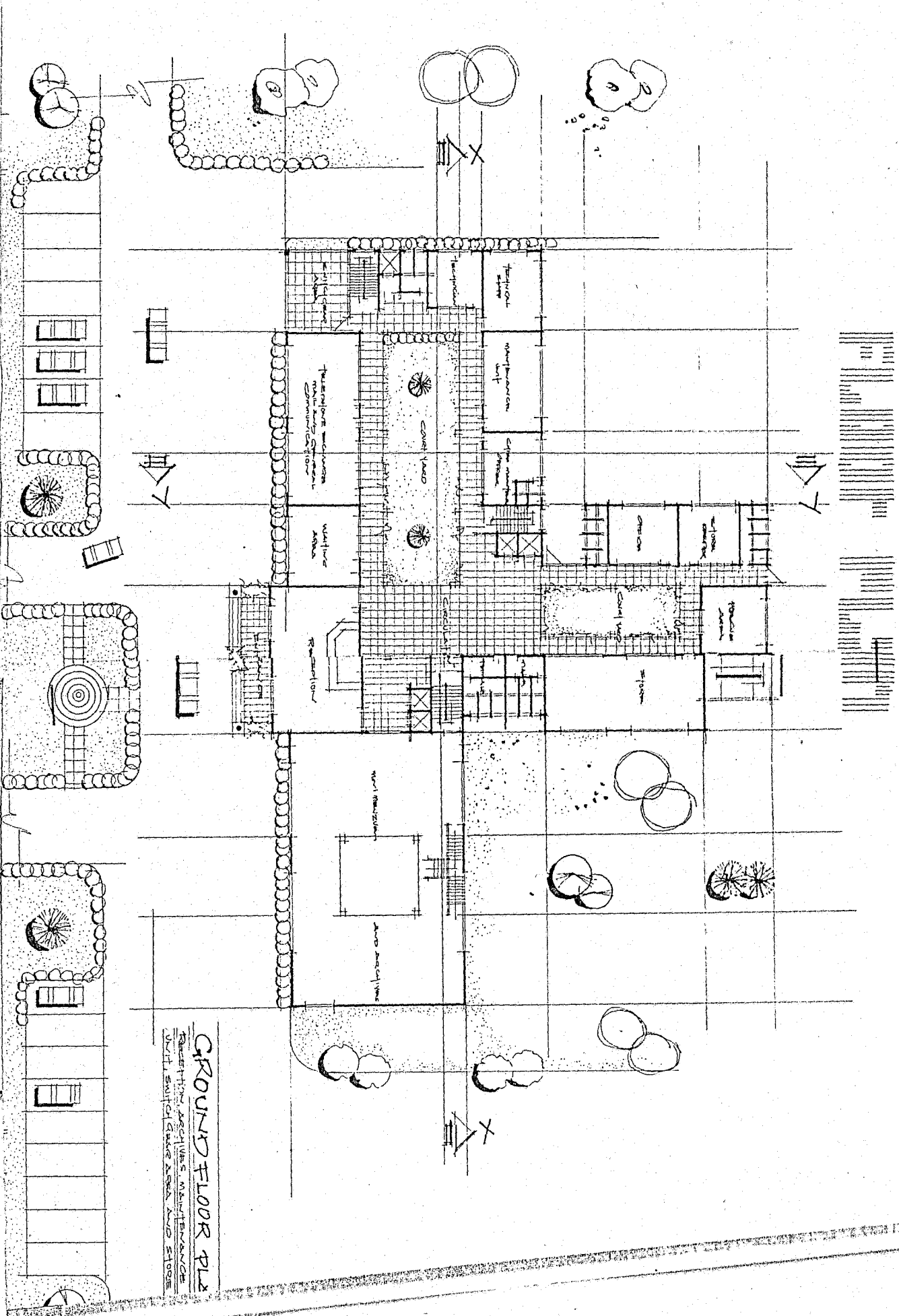


Airport Access Rd

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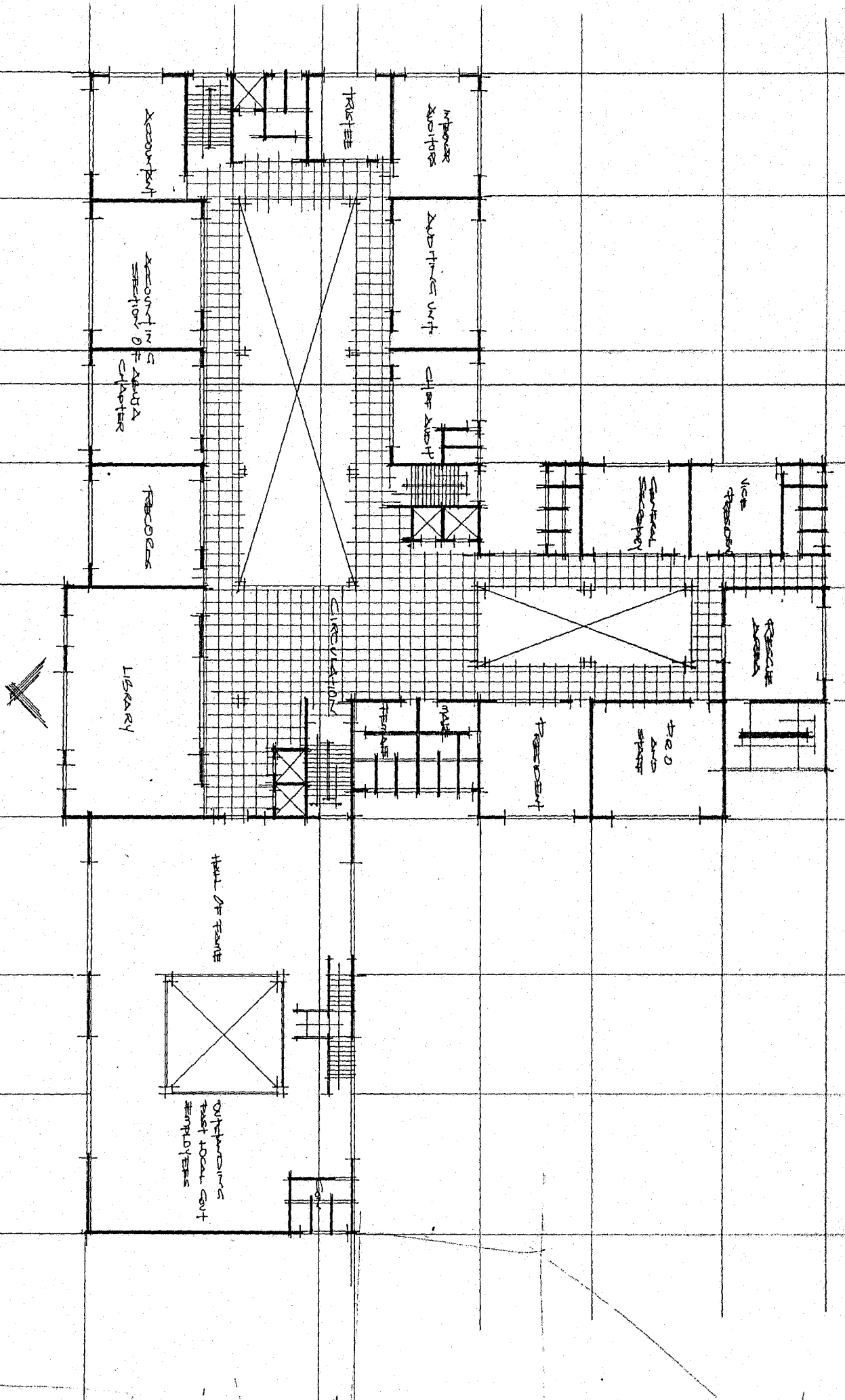
LEGEND	
A	Main Structure
B	Structure
C	Structure
D	Structure
E	Gate House
F	Structure
G	Structure



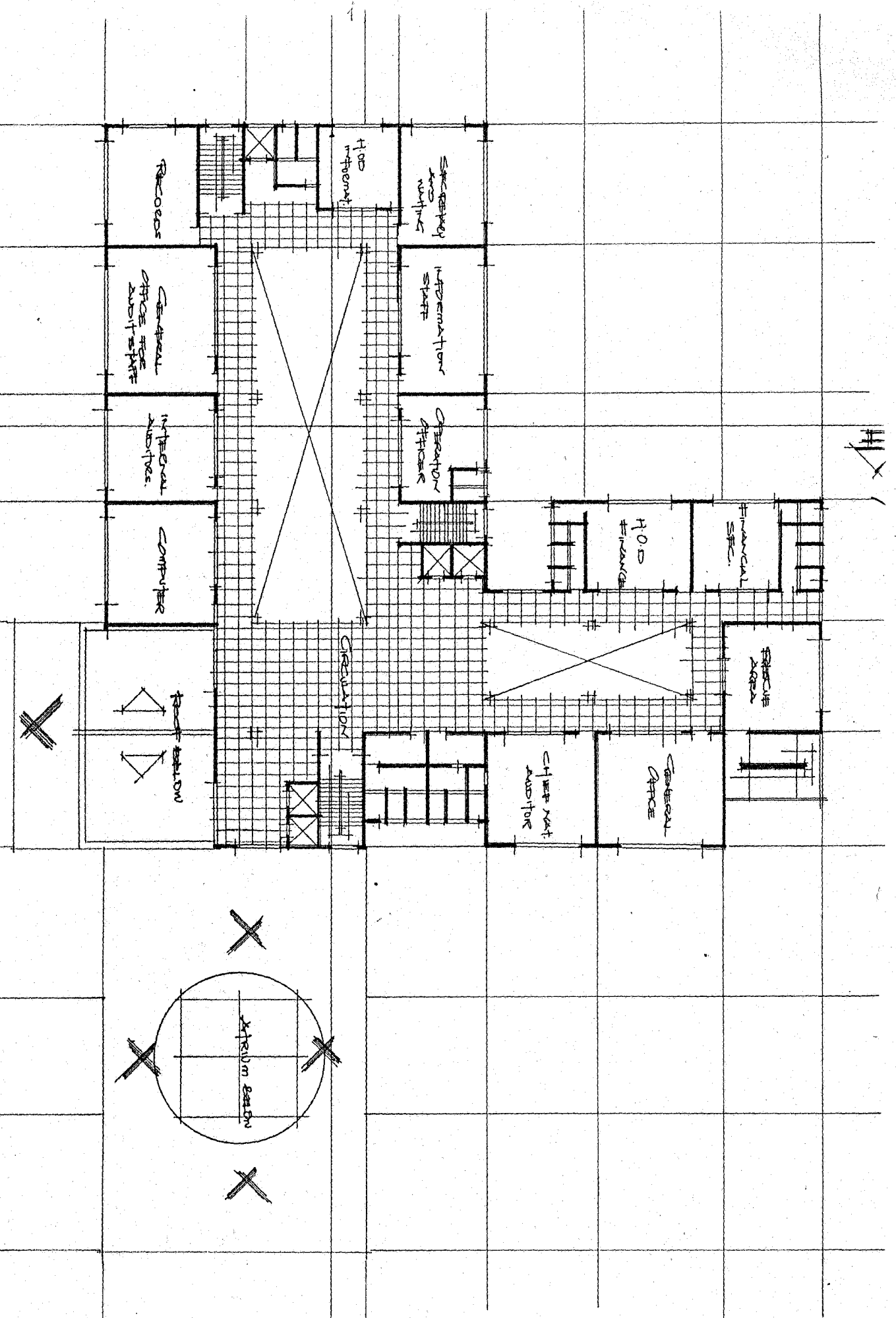


GROUND FLOOR PL
 RESTAURANT, OFFICES, MAINTENANCE
 WITH SURFACE AND AREA AND STAIRS

117



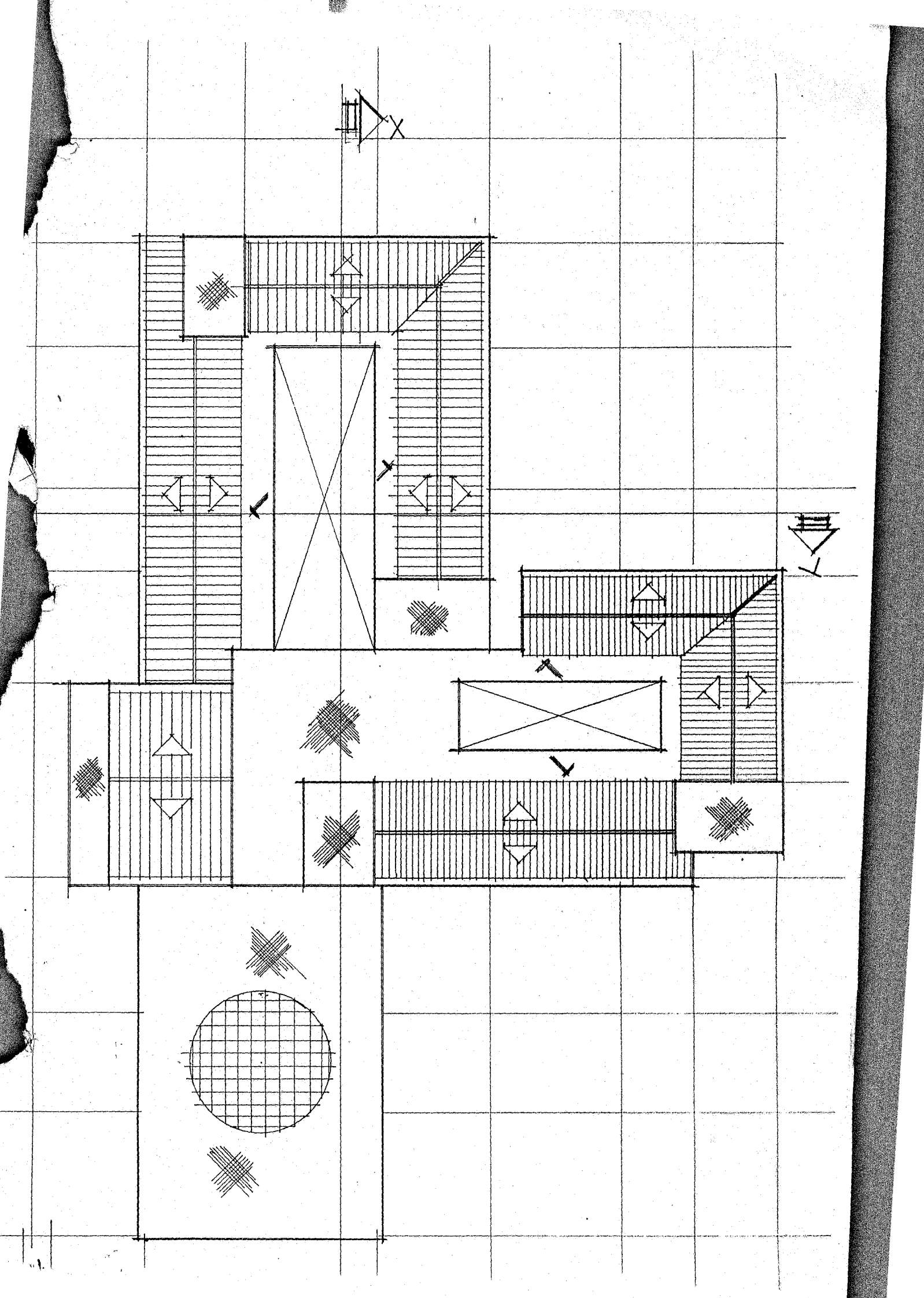
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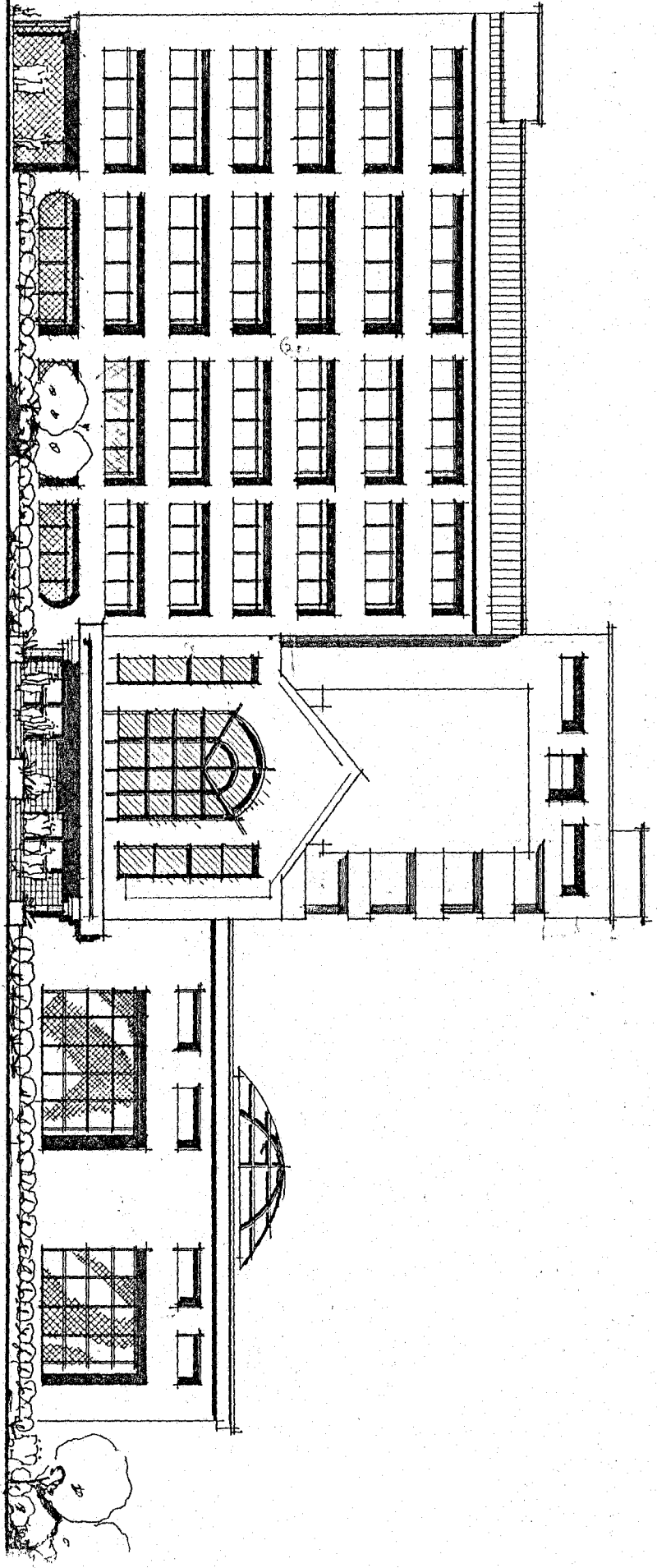
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4-2

FOURTH & INFORMATION



APPROACH ELEVATION



RIGHT SIDE ELEVATION

