SPATIAL ORGANISATION IN CORPORATE BUILDINGS

(A case of the proposed Nigerian Export Promotion Complex, Abuja)

BY

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A thesis submitted to the Postgraduate School, Ahmadu Bello University, in partial fulfilment of the requirements for a degree of Master of Science (M.SC.) in Architecture

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SEPTEMBER 1989

DECLARATION

I hereby declare that this thesis is an original work of my own intense research in the field of architecture. It has not been accepted in any previous application for a higher degree, and has been under the supervision of my supervisor W.B. Qurix. All quotations are distinguished by quotation marks and the sources of information are specifically acknowledged by means of references.

MOJISOLA A. Sule

28/9/89

September 1989

CERTIFICATION

The thesis titled "Spatial Organisation in Corporate Buildings (A Case of the proposed Nigerian Export Promotion Complex, Abuja)" meets the regulations governing the award of the degree of Master of Science in Architecture (M.Sc. Arch.) of Ahmadu Bello University and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to LORD GOD AIMIGHTY for bringing me to this stage, and also for HIS strength, guidance and protection.

My mother for everything possible

Mojisola A. Sule

ACKNOWLEDGEMENTS

Having spent five years in the school of architecture, I have gone through a phase in my life which is unforgetable. Despite the ups and downs I have to express my profound gratitude to people who made it worthwhile.

Firstly I would like to thank my family for always being there and also for their support, love and inspiration. To my relation's up North, thanks for everything.

My sincere gratitude to Dr. Oguntona, Mr and Mrs Adesina and Mr Ogunsina for seeing me through at the onset of my studying architecture.

My gratitude also goes to the various members of staff of the Nigerian Export Council, Apapa, World Trade Center of Nigeria and Federal Capital Development Authority particularly Mr Austin Ike, Mrs Fiberesima and Ronke Giwa for assisting me in the course of my data collection.

To my lecturers in the Department of Architecture, my former Head of Department, Professor E.A. Adeyemi for his fatherly advice, my supervisor Arch. W.B. Qurix for his contributions and criticisms, Dr Oyediran from University of Lagos. Thanks for the useful criticisms and corrections at presentations and consultations.

Lastly I would like to thank all my friends in the University for making it one hell of a place, and fun while it lasted. Amsa, Maimuna, Ebaide, Irene, Vicky, Taiwo, Segun, Dimeji, Yakubu, The Abus, Ibrahim, Aliyu, Ibe, Ayo, Sani, Aminu, Bashir and others to mention a few.

To those left, my gratitude to Bidemi, Zainab, Funke, Dupe, the Oloyedes, Morenike, Lizzy, Evelyn, Halima, Sani, Samaila, Awwal, Lanre, Peter, Chinedu, ABU Jaycees and Saadiq.

My thanks to Mr. Titus Ubagu for taking the time to type this thesis. I finally thank God Almighty for his faith in giving me meaning and purpose to human life.

A B S T R A C T

The rising concern for the effective and smooth operations of corporate institutions is a consequence of the various problems which occur in terms of operational procedures, rules and regulations and finally obligations within them.

These institutions are usually finance oriented and have a marginal bearing on the economic development, of their country, their main function is a leadership role in restructuring, improving and managing the financial system, but with the recent trends, these functions are now questionable. The disheartening feature of Nigeria's economy has been its poor growth performance and despite the well articulated policies and strategies, there still exists crises at the domestic and particularly international front.

This deficiency is as a result of corporate institutions inability to achieve positive output in their functions, these exogenous functions include management and administrative) psycological, welfare, transportation and design functions.

The design of corporate architecture is wholly based on the organization of spaces to suit each relative activity. Architecture is an embodiment of socio-economic institutions whose form serves as the main restructuring organ is it controls the physical environment that people as individuals and groups can work and be together, seen as a means of accommodating and expressing the spaces for sound living.

Source: Central Bank Review, November/December, 1988

In view of the fact that Nigeria's continued net indebtedness is as a result *of* the inability of this institutions to function effectively particularly those that are involved in international trade i.e. export oriented, there is a need to re-examine their roles and see how effectively they have performed.

(i) Identify the problems which deter the operational procedures in terms of the spatial organisation in corporate institutions.

(ii) Fropose a well balanced system of organisation of spaces at the same time incorporate non-existing facilities for their effective functioning.

(iii) Incorporate these spaces by proposing a design which not only exhibits flexibility *in* design but also focuses coherence with the environmental setting and finally seen as a symbolic aspiration of Nigeria's desire in the international business community in the decade ahead.

Scope and Limitations

Emphasis would be placed on the operational procedures and aspects as this forms the basis of the thesis however there would be limitations in the economic theories involved as the former would serve as a tool for forming the design brief.

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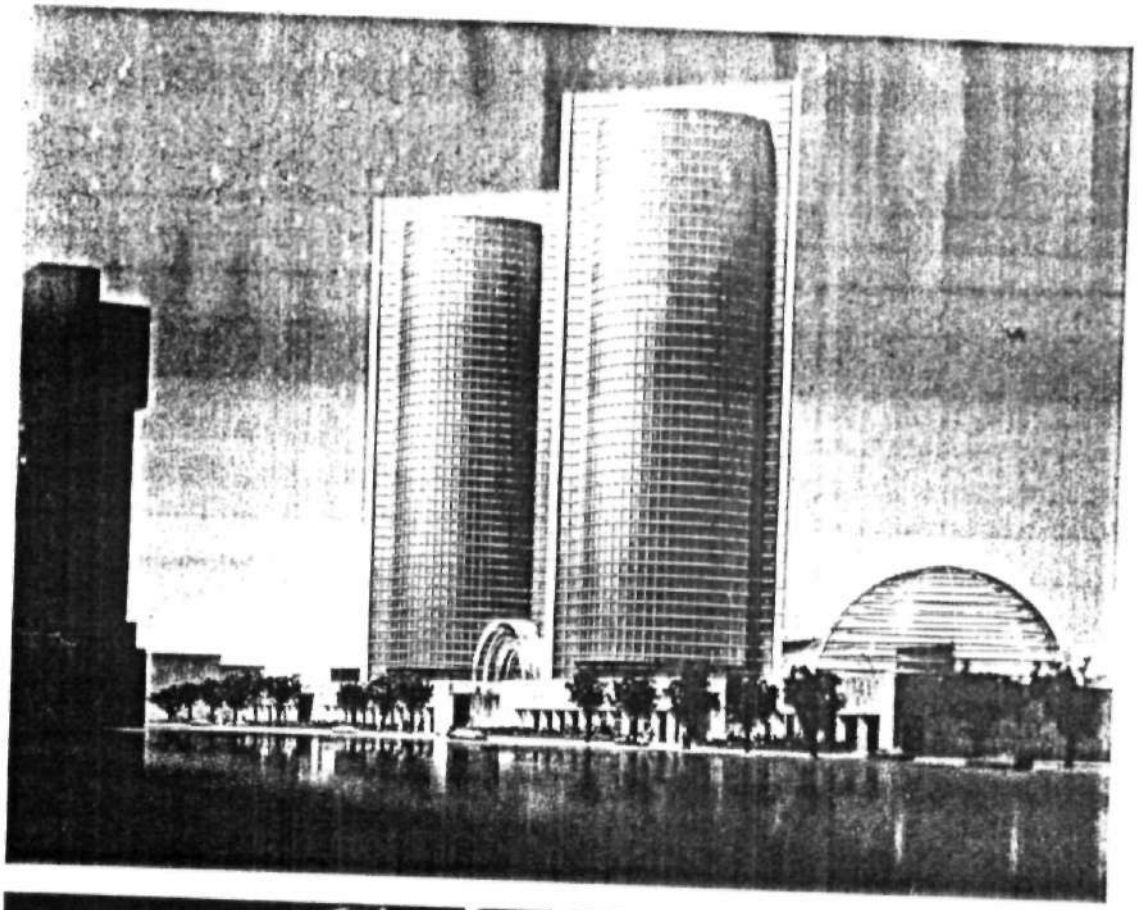
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LISTS OF DEFINITION

NFPC	-	Nigerian Export Promotion Council
GDP	-	Gross Domestic Output
FEM	-	Foreign Exchange Market
SED	-	Shippers and Export Declaration
WTCN	-	World Trade Centre of Nigeria

LIST OF APPENDIX

1. Schedule of Accommodation for space requirements



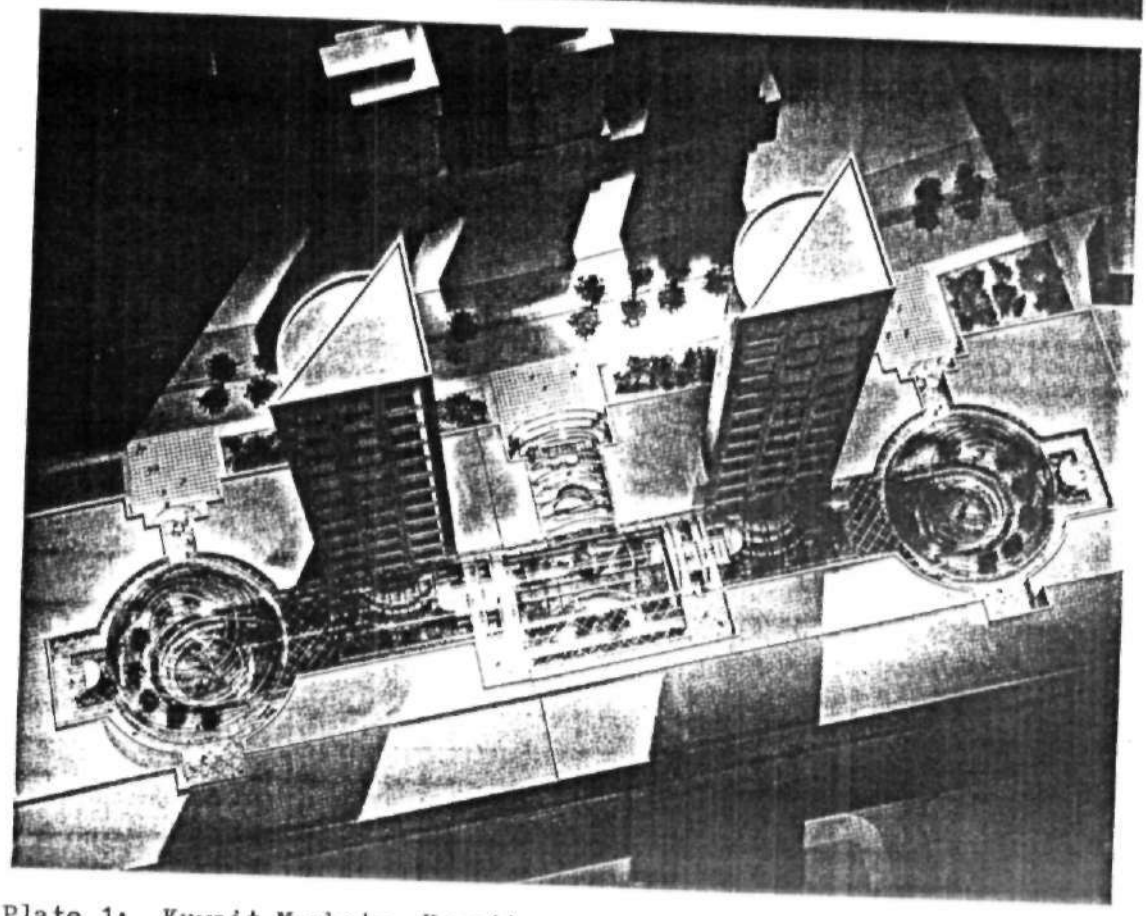
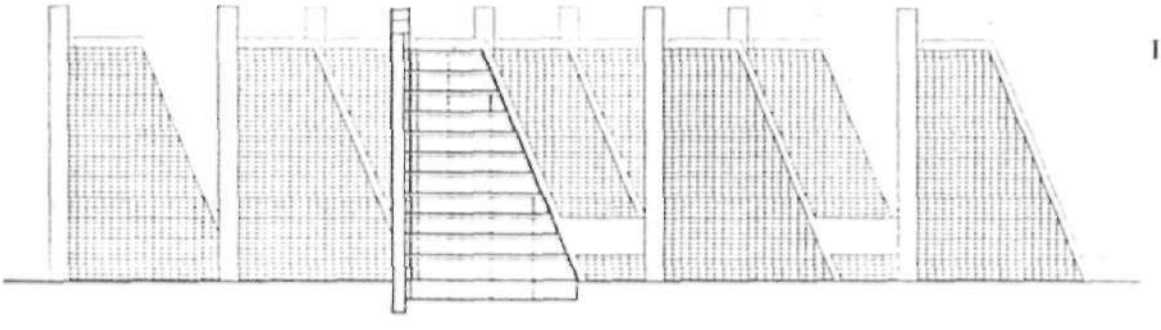


Plate 1: Kuwait Markets, Kuwait.

College Life
Insurance Company,
Indianapolis, USA



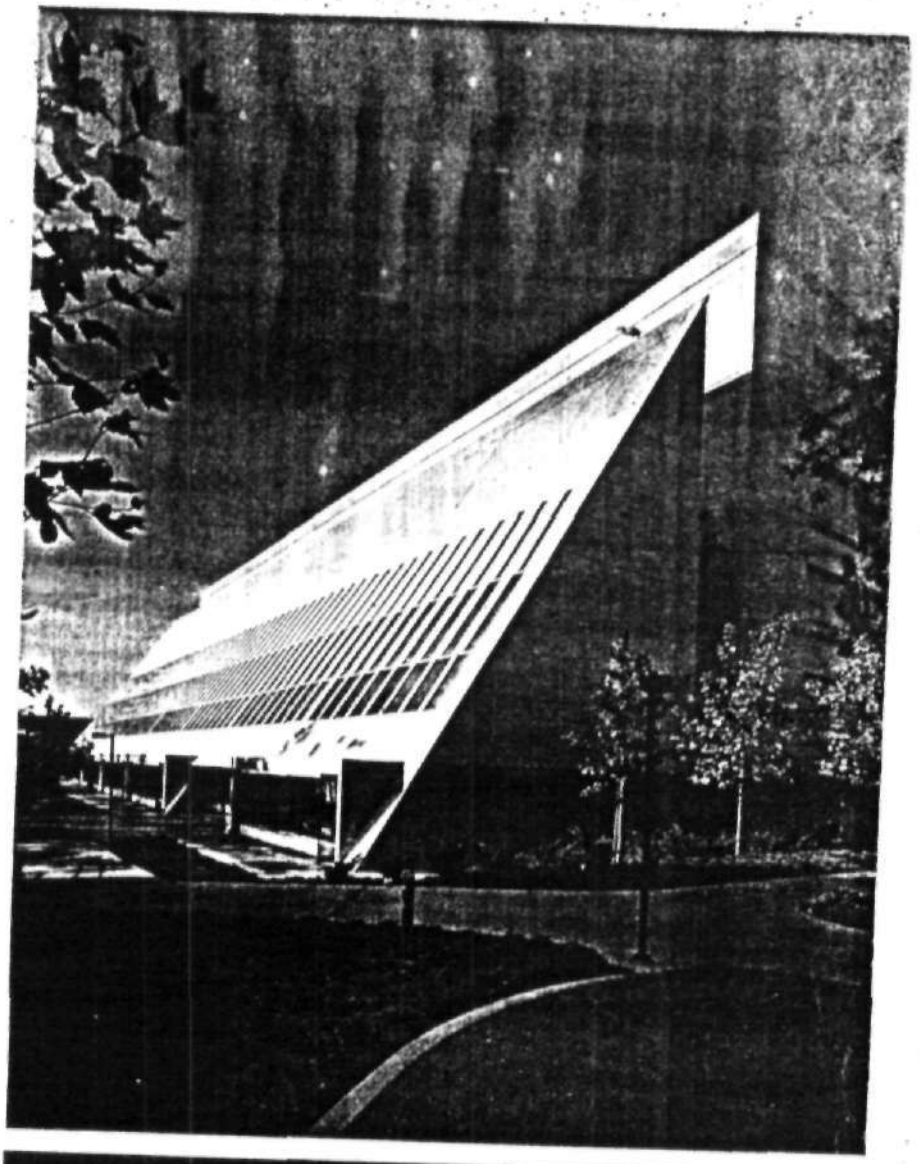
Oben: Schnitt
1:2500
Die höheren Kerne beherbergen die Aufzüge mit den Überfahrten
Unten: Blick in die Cafeteria

Top: Section
1:2500
The upper cores enclose lifts with overrun space
Bottom: View of cafeteria

En haut: Coupe
1:2500
Les noyaux les plus élevés abritent les ascenseurs avec leurs volumes supérieurs de sécurité.
En bas: Vue dans la cafétéria



Fig. 2: College Life Insurance Company, Indianapolis USA



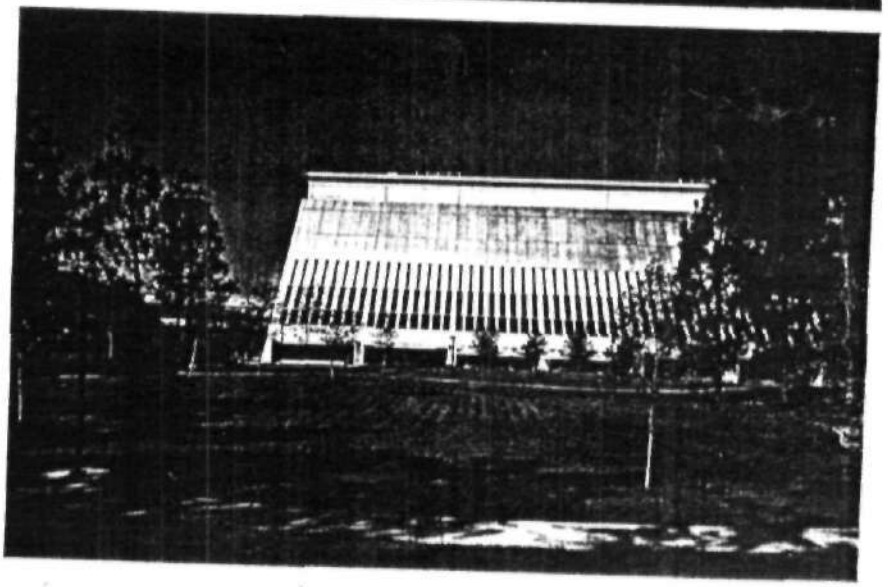


Plate 3: Wells Fargo Company, USA

CHAPTER ONE

1.0 INTRODUCTION

1.1 PHENOMENON OF CORPORATE ARCHITECTURE:

The corporate style of luxurious, prestigous sculptured and landscaped filled occupancy has been on for over two decades, corporate architecture is seen to have originated in Chicago following the building boom which followed the fire[1].

It provided architects with spectacular opportunities in the commercial field and it was between the period 1885 and 1900 that the new style or corporate architecture was born - the steel frame "skyscrapper" office block, e.g. the Wainwright and Guaranty Buildings, whose concern was to achieve expression for the tall building.

The corporate image is expressive in both form and function, it actually conveys a message of dominance and strength when compared to domestic and industrial buildings, with its stainless steel glass and curtain walling, this corporate architecture embodies a fundamental articulation of space, structure, materials and utilities in a manner true to contemporary industrialized technology.

The decade 1973 to 1980's was a period when there was rapid expansion of urban office towers, which were built by developers who invested in office construction and simultaneously supplied rental office spaces resulting in major cities having splendid forms blending into their sklyline. Dinstinctive tower's included San Francisco's Crocker tower, Miami's South East centre.

---

[1] Office buildings by W.D. Hunt

International Merchant Bank, Femi Johnson house, First Bank all of Nigeria, Lloyds Bank in England, etc. These buildings are significant in their forms and functions in terms of urban growth as they are now leading commercial, educational and cultural centres.

The modern corporate architecture unlike the preceeding ones that existed before like the New York Lever House and Chicago's Inland steel whose buildings confined narrow sunlighted slabs to the edges of the site were modest in land coverage and heights were prisonatic and elusive attentive to adjoining streets, buildings and vistas. There has been a gradual shift resulting in new trends in corporate architecture instead of buildings being dull obvious to energy conservation and significantly occupied, there now exists architecture which relies on mass ryhthms, textures and colours without exaggeration to structural system to gain formal impact.

It incorporates public spaces and circulation, also combines retail, office and residential spaces thereby revealing a change in urban goal functions and aesthetic forms.

There is a global response to corporate architecture as financial centers with burgeoning banking houses, financial institutions, insurance and advertising firms, real estate firms demands for office towers, whose symbol of ultimate achievement is automation.

However despite the tremendous growth of corporate architecture and the client's concern for efficient space and economic pattern, a lot of constraints still exists which

It would also act as the bridges, the mediator, and connection between the physical form and society's concern to socio-economic form in the corporate world.

1.2 Historical Background of Export Trade:

In the early sixties Nigeria was primarily an agricultural economy where seventy percent of labour was farmers who expanded their production of food and cash crops.[2]

Nigeria was then the world's leading exporter of groundnut, palm kernels, palm oil and cocoa, the income generated supported both service and manufacturing industries and also the foreign exchange realised was used to build roads and other instructures.

However all this ended with the advent of the oil boom in the 1960 and was further disrupted by the civil war, effects of droughts, non implementation of policy incentives and instable world prices for commodity exports.

1.2.1 Features of the Economy:

As total exports increased in absolute and relative terms with respect to Gross Domestic output (GDP) the structure of the exports went from a diversified balanced agricultural base to one dominated by oil exports.

In the early sixties, 80 percent of Nigeria's earnings was made up of commodities like oil palm products, palm oil, kernels and oil, rubber, timber but today more than ninety percent is accounted for by petroleum.[3]

---

2 Central Bank Review, Dec. 1988

3 World Bank Review on Non-oil Export in Nigeria

By the 1970s Nigeria's role as an exporter changed instead of exporting more and importing less, she was doing the reverse and thereby made her a net import of agricultural produce she had exported before. With the discovery of crude oil came a period of oil boom in the early 1970s and total neglect of agricultural produce.

The country was producing almost about two million barrels a day thereby became a major foreign exchange earner.

In the period 1970-1985, there was a big expansion in the socio-economic infrastructures even though the level is still low in terms of quantitative and qualitative measures.

Educational infrastructures, health, transportation and communication networks were expanded; power, water supply and housing was also vastly expanded. The financial system also witnessed great expansion as well as a high level of sophistication with about a sharp increase in the banking sector.

The capital market also expanded in terms of stocks quoted and traded in (See Table 1, in Appendix). From the Table shown, oil earnings as a proportion of export earnings grew from 57.6% in 1970 to the peak of 98.6% in 1982 and its contribution to the total export earnings stood at 9n.2% in 1985, this sharp increase was largely due to the downward trend in non-oil earnings, with a fluctuation from N670 million in 1978 to N120.9 million in 1982.[4]

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[4] Central Bank Review, Dec. 1988

However the huge dependency on one single commodity has resulted in continued domestic and external instability as regards the external sector, the following were experienced:

(a) The rapid growth in imports resulted in Nigeria exporting less and importing more, from Table 2, percentage change in total imports was 114.2% in 1975 to -31.1% in 1986.

(b) Sharp Fluctuations in earnings from exports. These exports when compared with total imports of goods and services resulted in the current account balance. The current account was balanced for a while and was followed by a deficit in the mid 80s resulting together to ₦7,158.4 million and a loss of ₦4,4191 million in total reserve earnings.

By 1985, the external indebtedness had climbed to ₦17,290.6 million and a sharp increase in debt service ratio from 0.7010 in 1980 to 33.2% in 1985, this statistic then showed that unless some appeal was sought with the creditors, Nigeria would not be able to sustain the idebt service burden without a major reduction in living standards, investments and consequently long term growths.

With the following compounded problems within the economic sector:

(i) Slow economic growth

(ii) Unemployment

(iii) **Domestic** and external instability

(iv) Debt burden

(v) Fundamental structure of production and consumption.

There is a need to re-examine the management of the economy by now shifting back to the agricultural base and manufactured goods and also review developments affecting the foreign exchange markets (FEM), monetary policy, debt rescheduling and governments finance.

This diversification from oil earnings to agricultural base can be easily facilitated and controlled by the Nigerian Export Promotion Council.

The complex is being proposed in this thesis to help improve our role in international trade by encouraging non-oil exports to improve the poor economy.

This complex will then be a "focal point" institution capable of coordinating the nation's exchange programs by means of seminars, conferences, exhibitions, research, trade fairs and record reports.

1.3 Aims and Objectives:

After an analysis of corporate architecture and the ailing economy this thesis and the design proposal shall seek to:

i. identify the problems which deter the effectiveness of the operational procedures, concerning the spatial organisation analyse and propose architectural contributions to elevate these problems;

ii. synthesize this contributions in the architectural design of the proposed corporate building;

iii. create a complex that would be a permanent residence for the export council at against the temporary buildings being occupied at Lagos and "Open University Complex, Abuja" respectively;

Review of relevant literature about corporate architecture and the financial system from journals and publications would serve as a guideline for the thesis and provide the essential background for the design. Where possible, dialogues, interviews and questionnaires would be used and documentations in terms of photographs, sketches would finally play great roles of existing corporate architecture for the thesis.

1.5 Scope and Limitations:

In view of the nature of this thesis, much attention would be placed on the operational aspects of corporate architecture as this would form the main backbone of the thesis. Appraisal of corporate architecture within and outside Nigeria will help form the brief and the survey of the operational procedures will concentrate more on the export council but if necessary, references would be made to other corporate buildings with similar operations.

1.6 Users and Clients:

The design project proposed would be financed by the Nigerian Export promotion council which is an arm of the Federal Government, but as a corporate building whose aim is for a quick return of investments, the complex is expected to be leased to tenants within the business community. The users would include government officials, public and private business community and financial institutions.

1.7 Architectural Contribution:

The ultimate contribution in the field of architecture is to effectively organise office spaces, incorporate non-existing facilities and in the advent bring together all the diverse units into organic unity under a given set of environmental circumstances. Owing to the function and organisation set up, it is hoped that the thesis would be able to provide a structure befitting the 20th century corporate image and at the same time achieve the heights of the symbolic aspirations intended for the nation.

1.8 Thesis Structure:

The first two chapters of the thesis are concerned with corporate architecture, and its relationship to the economy and export council, subsequent chapters involves detailed studies of relevant existing cases and an examination of relevant literature, identification and solving of the thesis problem in Chapter Four. Chapter Five deals with the environmental analysis and existing infrastructures. Chapter Six and Seven deals with concepts developments and sketch design based on the preceeding chapter and finally Chapter Eight is the Summary and Conclusion.

TABLE I: NIGERIA'S EXPORT 1970-1986 (₦ MILLION)

Year	Total Export earnings	Total Oil earning	Total Non-Oil earnings	Proportion of oil to total export earnings	Proportion of non-oil to total export earnings
1970	885.6	509.6	376.0	57.6	42.4
1971	1,293.4	953.0	340.4	73.7	26.3
1972	1,434.2	1,176.2	258.0	82.0	18.0
1973	2,277.4	1,893.5	383.9	83.1	16.9
1974	5,794.8	5,365.7	429.1	92.6	7.4
1975	4,925.5	4,629.9	295.6	94.0	6.0
1976	6,751.1	6,196.2	554.9	91.8	8.2
1977	7,064.4	7,080.4	550.3	92.8	7.2
1978	6,064.4	5,652.9	411.5	93.2	6.8
1979	10,836.8	10,680.5	196.3	98.2	1.8
1980	14,186.7	13,523.0	663.7	95.3	4.7
1981	10,876.8	10,680.5	196.3	98.2	1.8
1982	8,722.5	8,601.6	120.9	98.6	1.4
1983	7,502.5	7,201.2	301.3	96.0	4.0
1984	9,088.0	8,840.6	247.4	97.3	2.7
1985	11,214.8	10,890.6	324.2	97.1	2.9
1986	8,513.0	8,273.0	240	97.2	2.8

Source: Central Bank Review, Dec. 1988

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1. 10 Decades of Skidmore, Owings and Merrill

2. Architectural Record (1961). Office buildings: An architectural record book. Magraw-Hill, New York.

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4. W. Nigeria (1982). Nigeria, Non-oil export prospects, World Bank Publications.

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6. Nigerian Export Promotion, Newsletter (1987). Vol. 25, March, NEPC Publication.

CHAPTER TWO

2.1 THE NIGERIAN EXPORT PROMOTION COUNCIL AS A CORPORATE BUILDING

Like any other financial institution, the Expert Council has many inadequacies which affects its role in the economic recovery process.

Many facilities existing in corporate buildings which help to improve their functions must also be provided in the Export council.

These include a computer room/communication unit, library, conference, research and seminar facilities.

The corporate image of the council is non-existence, despite being finance oriented, the existing building's image is contrary to the image of corporate architecture.

It has been preoccupied with organisational and financial matters and therefore not been able to function as expected as a "focal point corporate institution".

The secretariat in Lagos is a temporary accommodation ceased from the National supply Company (NNSC) for an undisclosed amount, so it is now high time that the council has to own its own corporate headquarters like other existing financial organisations.

As a leading arm of the Export industry, a corporate image must be created to ascertain Nigeria's role in international trade as its going to be the seat of linkage point forum for almost all relevant institutions concerned with trade development.

If there has to be a significant impact of Nigeria in the international market, it must start from the architecture of the

building which would house all the various financial institutions that work hand in hand with the export council.

As a corporate building, the NEPC's managerial capability must be strengthened by recruiting adequate number of skilled staff and providing them with adequate office occupancies, and also solve the overlapping problems with other agencies directly or indirectly dealing with export matters.

As a complete corporate building, the NEPC must incorporate a systematic communication and bridge the gap between it and business circles as well as commodity boards. There must also exists trade information service facilities and equipments and finally act quick returns on their investments.

2.2 INTERNATIONAL TRADE AND ITS FEATURES

International trade focuses on the international side of economic activities in a country. It is a branch of international relations apart from cultural and political elements that affect the daily lives and welfare all over the world.

International economic position of a country bears directly on the political power position of that country and it is not surprising that the two great power blocs in the world today possess the greatest national aggregations of economic strength as the power status of USA has international responsibilities in keeping the free world economically stable and strong and helping underdeveloped economies to achieve a higher standard of living.

The objectives of international trade is made up of millions of individual transactions across national boundaries and are classified into three main groups:

(i) goods and services

(ii) capital and labour

(iii) persons

The main substance consists of import and export of goods and services, capital stock of reproductive goods usually in the form of bonds, stocks and other evidences of debt, persons involves the movement of population purely on economic condition and motives like employment and better standard of living.

2.2.1 ECONOMIC SIGNIFICANCE OF INTERNATIONAL TRADE

The international trade is made up of a considerable volume of international trade "invisibles" which is services, shipping and freight, insurance, banking and broker services. The level of real income, pattern of production and general economic welfare are closely linked to foreign trade, the proportion of world export to world income is as low as ten percent due to the skewness of data caused by unusual position of United States in the world economy.

Of the world's total production of goods and services one-half is produced by the United States and the Soviet Union and they export only a small fraction of their national income other significances includes
(a) promotion of international specialization by making a country produce goods for which it is best known and opens the country to international capital inflows.
(b) In terms of foreign goods, capital and consumers have been acquired and paid from the export earnings.

2.2.2 COMPOSITION AND PATTERN OF INTERNATIONAL TRADE

Thousands of products enters the world trade and this include products of virtually every country, for the purpose of data collection and international comparison. This commodities traded in have been classified into three broad groups:

(i) food (including tobacco and beverages)

(ii) Raw materials

(iii) Manufactured goods

A few items account for the great bulk of commodity traded, viz:

(i) Food and related items: This includes threat, meat, fruits, sugar, edible oils, coffee, cocoa, tea, alcoholic beverages and tobacco.

(ii) Raw materials: This include petroleum, wool, cotton, wood pulp, timber, coal, copper, rubber, jute, tin, lead, etc.

(iii) Manufactured goods - includes machinery, iron and steel products, transport equipment, chemicals and textiles account for a large proportion of the total world's trade in manufactured goods.

The pattern is basically affected by the economy e.g. agricultural countries export foodstuffs and raw materials and are importers of manufactured goods where it's the reverse for high industrialised countries.

The level of real income also affects the pattern of the trade because countries with very low income cannot import much due to their limiting purchasing power, the distribution of this income is markedly unequal.

2.3 ORGANISATIONAL AND INSTITUTIONAL SETTING OF EXPORT PROMOTION ORGANS

International trade as already explained plays a crucial role in a country's development by expanding her potential market beyond her borders.

Promotion of exported products is very important and with the general world economic recession each country now devices ways of improving her promotional techniques.

Export promotion policies can be formulated and implemented by both government and non-governmental organs.

2.3.1 GOVERNMENT ORGAN

This is the main governmental organ and its role is usually to set up a central agency that looks after her economic and commercial interests and also serves as a "focal point" institution capable of coordinating trade expansion program.

This agencies are usually ministry of commerce whose responsibility is the formulation of trade policies, Industrial ministry is in charge of identification and development of export oriented industries, and also works hand in hand with the standard organisation council.

Additional agencies include ministry of foreign affairs, customs and national planning, apart from this governmental arms, most countries have trade commissioners in her embassies worldwide who deal in promotional and publicity aspects of the trade.

2.3.2 NON-GOVERNMENTAL ORGAN

These are usually private organisation established as an additional arm of export promotion council.

They are representatives of the different export industries that make up that country's total export community and are (i) Associations of Chamber of Commerce, Manufacturers, industry mines and agriculture.

(ii) Commodity boards usually coordinated by both Governmental and private organisations and are responsible for both production and marketing at the same time enjoying monopolistic export rights in terms of their products and geographical areas as

Nigeria Cotton Board - Funtua

Nigeria Cocoa Board - Ibadan

Nigeria Grain Board - Minna

Tea and Coffee Board - India

Malaysian Rubber Board - Kuala Cumpur

(iii) Other organisations indirectly engaged in trade trade promotion activities include Central Bank of Nigeria and Financial Institutions. Their responsibility is in the control of balance of payments, situations foreign exchange. CBN regulates the country's financial flow patterns through a set of trade-related guidelines and monitor operation of commercial banks with respect to repraitraition proceeds.

(iv) World trade Associations - whose responsibility is to protect its members interests in export matters.

2.4 EXPORT RESEARCH OBJECTIVES

With the large amount of trade information available, the establishment of research objectives is essential inorder to prevent excessive use of time and effort. The main approach is divided into three basic elements of identification:

(i) products export potential

(ii) How to get necessary export information

(iii) How to analyse export information

(1) Products export potential: This is basically development of a detailed checklists of all international marketing areas and data pertaining to each selected area of the foreign market under consideration.

(ii) Necessary export information: This is done after the exporter has determined the specific information he needs for his selected markets; information and assistance on foreign markets can be obtained from many sources e.g. export councils, chambers of commerces, foreign investment and buyer service and business counselling services.

(iii) Analyzing export information: After collecting the dates, the researcher then does a preliminary screening of potential markets, depending on political geographical or climatic factors, potential demand in each country by trade statistics to uncover unlikely markets and competitors.

(iv) Seminars - particularly those technically oriented. This event is aimed at high technology markets and combine discussions of a given product or field with private appartments to meet company representatives. Papers presented are pragmatic and problem solving and is followed by product-related plant visits official reception, briefing, interviews and is effective in rapidly developing markets where a broader dispersion of technical know-how and product is possible. Effective publicity implies efficient public relations by government for statistical purposes such as commodity description, numbers consignee must agree with the license.

2.4.1 Measures must be introduced to restrict trade in various countries. Trade restrictions consists of the fixed policies of a country applied to international trading activities. Since foreign trade affects a country's internal economy, each government must impose a degree of of regularity on it.

The four most important are tarrifs, quotas, licenses, and foreign exchange restrictions.

(i) Tariffs - is a tax assessed by the foreign government on products imported into its country. It is usually based on the quantity or value of the goods. The basic purpose is to generate government revenue and also give domestic industry on advantage over foreign competitions.

2.5 EXPORT PROMOTIONAL SERVICES

This is important if the exporter is entering the market for the first time or increase the penetration of a market. These promotional services include advertising, trade fairs, exhibitions, seminars and incentives by governments.

(i) Advertising: This is the most important tool of trade promotion. It is the best form of publicity and has indirectly led to the flourishing of advertising firms in the business world.

(ii) Trade fairs: Participation in trade fairs is another form of publicity and are categorized into permanent or temporary in terms of their structures, general or specialized in terms of the goods whether foodstuffs, textiles, machinery and equipment. It provides opportunities to introduce new products, find agents and distributors, compile lists of contacts and prospects and observe competition.

(iii) Exhibitions: This is basically to test the products in foreign markets, develop sales leads and locate agents and distributors through catalogue exhibitions. They are usually organised by commerce departments and feature displays of product catalogues, sales brochures, and other graphic sales aids at embassies and trade.

(ii) Quotas - are quantitative limitations placed on the amount of a certain item imported during a specific period of time. They usually apply to imports from specific countries, certain classes of goods, so exporter must determine whether quotas in his markets are established on a bilateral, regional or global basis. A combined tariff quota may also be imported where specified quantities of goods may be imported duty-free or at reduced rate of duty.

(iii) Licenses - permits exportation and importation of commodities under specific limitations. Foreign exchange restrictions complex restrictions usually in countries which use multiple exchange rates or currency auctions. They may be protective restrictions designed to prevent flight of capital, exchange depreciation or depletion of gold reserves.

2.6 MECHANICS AND MEASURES OF EXPORT PROMOTION

There are various export-related activities and procedures that have to be done before an exporter can successfully complete an export transaction. The would-be exporter has to know a lot about export documents, sales terms, quotations before embarking on any transaction.

2.6.1 Export documents:

Man documents involved many transaction are the proforma invoice, letter of credit, export license, import

certification, packing lists, shippers export declaration.

(I) **Proforma invoice** - is a provisional, preliminary and temporary document covering the intended shipment order. It is basically a quotation which enables the buyer to determine his landed cost, obtain foreign exchange and import incense, and at the same time meet special requirements concerning importing requirements of his government.

(ii) **Export licenses** - a permit which the importer secures from his government in order to receive shipment of a specified export order. They exists for various purposes, usually a form of formality to main records of imports or regulate the level of imports or used to encourage nationals to enter or increase their participation in an import business previously dominated by foreign trading companies.

(iii) **Import Certificates:** This is issued by the importer's government and certifies that importer, is allowed to bring the desired mechandise into his country.

(iv) **Packing lists** - a document describing all the items contained in the shipment.

(v) **Shippers Export declaration (SED)** - a document to develop cordial associations with the many faceted publicity world. It informs both local and overseas markets about products available and alerts exporters to sales opportunities existing in foreign markets.

2.7 EXPORT FINANCING

This is the most important decision an exporter must make and it is usually advisable to seek such from institutions that have a deep knowledge of the different methods.

Factors to be considered include type and amount of merchandise, importers credit standing market customs, trade restrictions, and methods involved are working capital loans, short-term advances, against documents evidencing shipment of goods, and credit extension to overseas buyers, other types of financing are extension of direct loans by banks, maturities lengthened.

Exports are usually financed by government and commercial banks and would assume credit and political risks in case of a credit worthy customer and stable country of destination.

2.7.1 **Methods of Financing:** This is in the form of letters of credit and is issued in favour of the seller and opened by the importer through his bankers. It offers protection to the exporter and eliminates the credit risk and risk involved in obtaining foreign exchange.

(i) **Drafts:** Are presented in accordance with the terms of credit by exporters to banks with the terms in the credit clear both to buyers and sellers. Shipping documents, insurance certificates, sanitation or standard inspection certificates and sales contract must accompany the letter of credit.

2.7.2 EXIMBANKS (EXPORT-IMPORT BANKS)

This is an agency that is a branch of the government. Its function is to assists in financing the export trade. It acts as a supplementary arm to private capital, and its basic operating principles is that loans should be for specific purposes and offer assurance of repayment: fees and premiums charged by Eximbank.

References:

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CHAPTER THREE

3.0 CASE STUDIES

3.1 WORLD TRADE CENTER OF NIGERIA

3.1.1 Historical Background:

The world trade center of Nigeria was founded in 1984 by Chief John Adeleke and some businessmen. It is a private organisation financed by private investors to promote and encourage foreign trade in Nigeria.

3.1.2 Location

WTCN is located in Western House and owned by Wembabod ltd. It occupies the eighth floor and situated along Marina. It is flanked on either sides by NCR offices and Banks and infront by General Hospital.

3.1.3. Organisational Structure:

The world trade center of Nigeria is a private organisation aimed at promoting export trade in Nigeria. It is headed by a chairman, assisted by a president, who is nominated by the late founding president's lineage.

The Executive Director is assisted by assistant directors, with the company secretary coordinating all the day to day affairs of the centre. Unit staff are each attached to the various departments within the organisation.

1. **The Research and Project Unit:** This department incorporates the WTCN library, production of world-trade bulletin as a column in the Business concord to disseminate trade and business information and reflects interesting developments

associated with the center. This department oversees the various researches into goods for export.

ii. **Computer services and Training Department:** Computer systems and training facility with experience in Management, consultancy, Training and service is available in the center. This department offers WTCN members services at a discount rate with full back ups which include

(a) computer system recommendation and consultation;

(b) system design, installation and maintenance;

(c) management and Executive courses and seminars;

(d) Operators and supervisor training;

(e) Information Management;

(f) Payroll and Accounting services;

(g) Word processing services.

iii. **Trade link Department:** Main responsibility is in coordinating enquiries concerning markets, buyers, sellers and new business partners, with other trading and commercial information serviced through WTCA Network system. There is a computerised Bulletin board to which more than 75% of WTC's are directly connected, which receive network enquiries simultaneously.

iv. **Export Counselling and Business Consultancy:** Free services to members and general business community at a small charge where necessary. The business consultancy works through affiliate management consultants, and undertakes market research, provides feasibility reports and numerous management and financial services.

3.1.4 OBJECTIVES

(i) To promote export activities of members by providing links with over 167[1] other world trade centers around the world.

(ii) To organise exhibitions and fairs in Nigeria, encourage her participation in trade fairs abroad and establish permanent stands in major cities e.g. New York and Taipel Taiwan.

(iii) To organise seminars and training sessions as forums focussing on countries and their trade and commerce.

(iv) To promote trade by publishing journals, newsletters for WTCN members as well as the business community.

3.1.5 The Design:

The world trade center is located in Western House. It is a nineteen storey building and the organisation occupies the eight floor.

The main access is through the Broad street and is on the first floor level. The entrance is approached by a flight of stairs, with a cantelevered canopy supported by triangular steel frames acting as a shading element; this leads to the entrance foyer.

The eighth floor accommodates a reception/conference room, a library with the librarian's office, a computer room with offices for unit staff.

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[2]Source: WTCN Newsletter, Sept./Oct. 1988

3.1.5 Structure:

The structure of the building is based on beam and column grid. The external columns are triangularly reinforced and overlap with thin concrete slabs that run horizontally.

These columns apart from being load bearing act as vertical shading devices to the elevation and also gives expression to their strength.

3.1.7 Finishes:

World trade centre building's facade is made up of vertical shading devices, which is the main type of finishing. The external walls is made up of grey paint spatter dashed on the walls. The wall leading to the basement is also textured with ceramic files laid out under the grey wall.

Apart from the shading devices, walls round the windows are made up of brown paint and are also textured.

The side elevations are made up of well decorated murals, in mosaic blue and white tiles. The last floor has orange vertical shading device to shield the windows fromsusunlight.

Flooring in public areas is terrazo which include the entrance hall, reception areas corridors, with square carpets placed on top. Executive offices are rugged according to the taste of the officers.

Interior walls are cream painted while the partitions are wood panelled, with openings above the door lengths. Ceilings are plastered and/or made up of various acoustic materials.

The ceilings have grille airshafts with wooden circular motifs on blue square ceiling materials. Interior walls are also wood panelled with african prints as mortifs on them,

various artefacts are found at strategic locations within the offices which help to promote culture in the country.

3.18 Crittique:

Various problems were apparent in the world trade center of Nigeria. The most important was the spatial organisation of the building.

(i) **Design:** There is the general non-availability of adequate office spaces; this resulted in the partitioning of the whole floor.

Other spaces were generally about $10m^2$ and considering the type of clerical work involved by various departments is seen to be inadequate. Work tops and shelves are cramped up, within the offices and so limits communication amongst personnel and departments.

(ii) **Circulation:** This has been greatly reduced; the corridor has a width of about 900mm and so it is quite impossible for two people to comfortably move. The general lack of storage spaces and filing system has led to the piling and scattering of documents, papers, etc on the floor of the corridor. It is also illuminated by artificial means due to its length.

(iii) **Communication:** Contacts between personnel is quite low, and this can be seen as earlier explained to have been caused by the kind of partitioning employed

by the center; also there are no adequate facilities particularly in the provision of floor spaces for the communication and switchboard units. The computer room is about $8m^2$ and when considering the types of equipments, activity is really very small services.

This include reception areas, sanitary facilities. The reception due to inadequate space serves as a conference room while the chief executive's office serves as a board room. This is seen as improper and unfavourable as visitors will probably have to find places to go while seminars, etc are being held.

Noise transmission is unavoidable as the partition are not absorbing and so workers are subjected to noise from typewriters, printers, so damping of noise peak is impossible.

3.2 FEMI JOHNSON BROKING HOUSE IBADAN

3.2.1 Historical Background:

An office block completed in 1986, it is owned by a firm of insurance brokers and serves as the headquarters of the company.

It is a modern corporate building in Nigeria located in Ibadan, Oyo State, and thought as a pacesetter in office buildings in the country.

3.2.2 Objectives:

(i) To provide adequate office occupancies for the insurance firm;

(ii) To ease office accommodation problems in Ibadan.

3.2.3 Design team:

Architects: Design Group Nig. Ltd.
1 Eleyele Road, Ibadan

Contractor: G Cappa and Alberto

Duration of Project: Three Years

Subcontractors: ETCO NIG. LTD.

3.2.4 General Description:

The building as already explained is a private investment, and is made up of ten floors with the firm occupying the ninth floor and tenth floor pent house.

The remaining floors are occupied on rental basis and tenants include United Bank for Africa, First Bank of Nigeria, and an interior decorating and furniture company.

There is also mezzanine floor which houses "Segis restaurants", with each floor being partitioned according to the tenants tastes and desires.

3.2.5 Accessibility:

Broking house is accessible from a major roads which bound the whole site. Buildings which also flank it include a Petrol Station, vehicle workshops on the right side and residential building on the left and back respectively.

The area is generally slopy with absence of landscaping elements except for concrete flower beds at the sides. The first floor is supported by pilotis upshooting from the basement, creating spaces for parking underneath it.

3.2.6. Structure:

The building is made up of precast and reinforced concrete in aluminium framed curtain walling. These curtain walling is double glazed with a special sun protective reflective glazing.

The planning is of "the open plan" type with the service core located in the middle. It consists of lifts, staircase, airconditioning plant and spaces for the ducts.

Two water tanks are located in the basement, with the tenth floor made of clear glass aluminium extruded sections in plasterboard panels. The ceiling is pannelled and textured with concealed flourescent light encased, a central airconditioning unit supplies through grilled outlets fitting on the ceiling and finally water sprinklers are located here for fire protection.

3.2.7 Finishes:

Internal finishes are of white emulsion textured paint while circulation areas round the service zone and mezzanine, floor is made up of marble. Both executive and non-executive offices are rugged.

The typical floor visited was the 10th floor which houses the client's firm, and is partitioned to provide ample spaces for executives, non-executives, reception, computer room and typing pool.

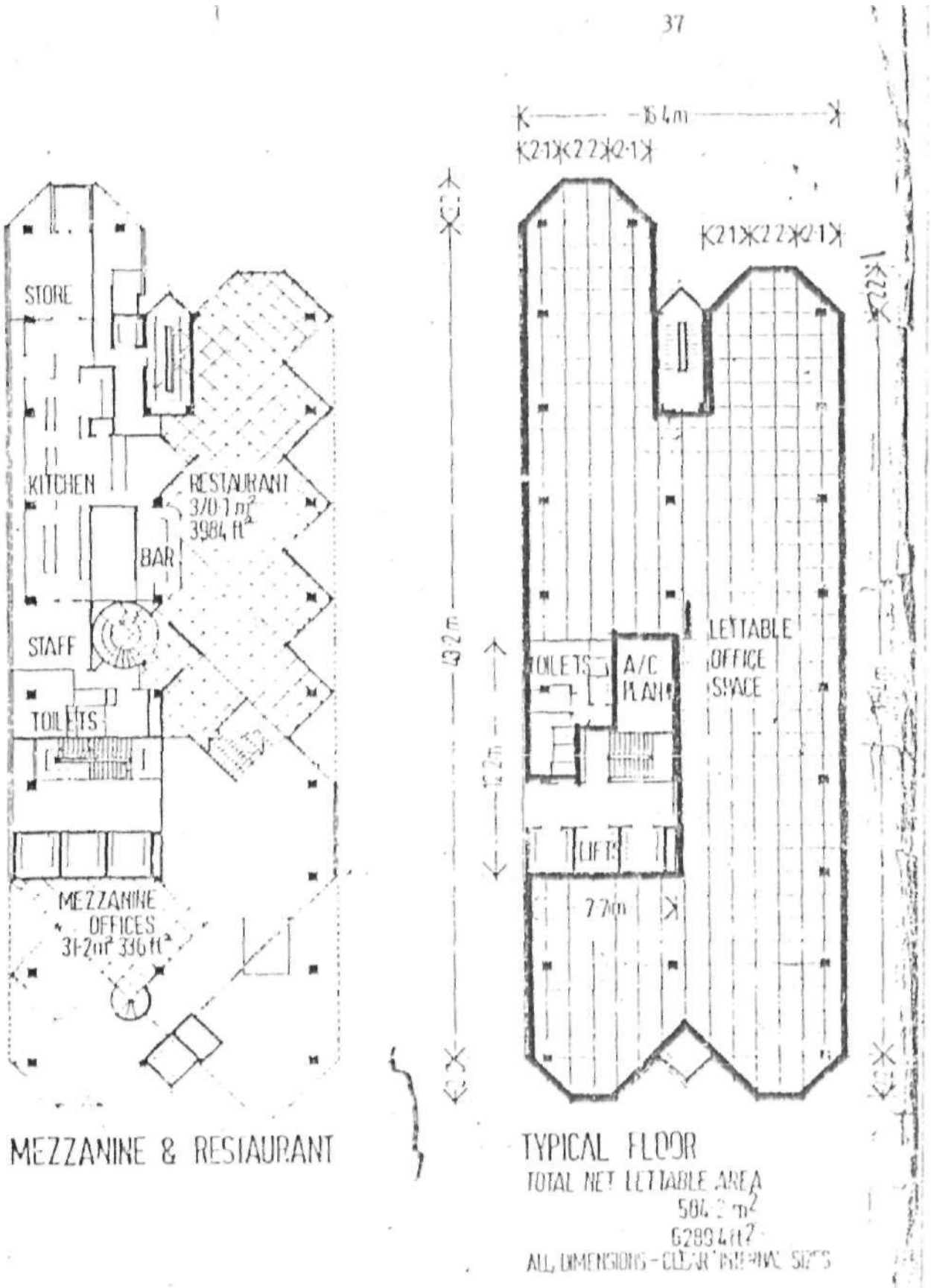


Fig. 2: Floor plan and typical floor plan of Femi Johnson building, Ibadan.

3.2.8 Crittique:

As earlier said the building is pacesetter of corporate architecture in Nigeria particularly Oyo State. It is relatively knew and so far more of technical problems are being encountered; however, a few problems exists:

(i) **Design:** The design is the open plan type and so ensures flexibility but constructional flaws exists where there are corners. The non-availability of adequate space also affect the location of the sewage plant in the basement and boreholes.

(ii) **Access:** The site although easily accessible, has no provision for cars at peak periods, particularly when the restaurant on the mezzinine floor is full to capacity.

3.3 NIGERIAN EXPORT PROMOTION COUNCIL, APAPA:

3.3.1 Historical Background:

It is pertinent to note that this case study was taken to enable the author know more about the activities, functions, etc of the council so as to arrive at a comprehensive brief, as it does not directly relate to the subtopic since its not a corporate building.

Nigerian Export promotion council was formed on the 24th June, 1976 and is a product of a joint Nigerian Government/International Trade Center (UNTAD) to develop the necessary infrastructure for trade promotion in Nigeria. However, a decree No. 41 was promulgated in 1988 reorganising

the council in its structural set-up, functions and responsibility of spearheading and sustaining a dynamic export drive, implementing the various components of export packages incentives.

3.3.2 Location and Access:

The council is located on numbers 15A and B. Ladipo Oluwole Road, Apapa and Dakar road respectively.

3.3.3 Organisational Structure:

NEPC is made up of representatives from both the private and public sector; although being a principal apparatus of the federal government, it constitutes a linkage point forum for all relevant institutions concerned with trade development. The main governing body is presided over by:

(i) Minister of Trade who is also the chairman.

Others include:

(ii) Alternate chairman appointed by the president of the federal republic of Nigeria.

(iii) Director - External Trade, Ministry of Trade.

(iv) President of Nigerian Association of Chambers of Commerce and Industries, Mines and Agriculture.

(v) President manufacturers association of Nigeria, farmers association.

(vi) Executive director from the council

(vii) One representative each from ministry of External Affairs, department of customs and excise.

The board is finally assisted by a virile staff management board which oversees the day to day affairs of the council. The council is headed by Director-General with five departments, viz:

(i) Finance and Administrative which coordinates the activities of finance and administrative units, ensuring proper auditing of its accounts in all offices.

(ii) Trade publication and Publicity Department

(iii) Product and marketing development Department

(iv) Export Finance and Incentives Department

(v) Trade Enquiries/Replies services Department

3.3.4 Objectives:

(i) To advise the government on necessary policies and measures by undertaking studies of economic conditions with particular attention to export and promoting the implementation of export policies.

(ii) Promote the development and diversification of Nigerian export trade, export orientated industries.

(iii) To collect and disseminate information on products available for exports, to exporters information on foreign markets.

(iv) To Provide technical assistance to local exporters in such areas as export procedures and documentation, transportation, financing, marketing techniques, quality control and trade arbitration.

(v) Provide directly or indirectly training sessions with institution and assist the manpower development for export community.

(vi) Engage in export promotion publicity by establishing facilities in Nigeria and other countries organising trade fairs and exhibition both at home and abroad.

(vii) Lastly perform functions conducive to the advancement of the council.

3.3.5 The Design:

The entire council is made up of three blocks of residential buildings adjacent to each other. Basically a lot of partitioning has taken place and is leased from the National Supply Company. Each block is a dupex made up of various department.

Block A	Block B
Director	Assistant Director
Conference Room	Accountants
reception	
Computer Room	Protocol Office
Secretary's office	Main Reception

Block C	Block D
Duty Drawback	Assistant Director
Export Registry	Advisory Services
Enquiry Reply Service	Export Marketing
Reception	Finance and incentives
	Costing and pricing
	Duty drawback reception

Project Unit

Is the main educational arm of the council and consists of

Trade Information Unit

Duty Drawback

Export Finance and Incentives

Librarian

Library

Typing Pool

Conference Room

Director's Office

Secretary's Office.

3.3.6 Structure:

The structure is made up of reinforced concrete with timber upper floors and stair-cases and timber roofing system. Each block has a pergola before reaching the main entrance.

3.3.7 Finishes:

Exterior walls are painted green while interior wall is made up of white emulsion paint. Executive offices are carpeted on a cement screed finish while the junior staff have terrazo and pvc tiles.

3.3.8 Crittique:

Not much can be said because firstly because as a residential building it can not serve the purpose of a corporate building. The main flaws exists in the duplication and triplication of various units, there are reception areas

in all the blocks while some offices are located in the blocks particularly the duty drawback off.

(i) **Communication** - This is seen as the main constraint of the council, the location of the various departments on different streets has declined the flow of personnel, working, etc. It is quite infurating as visitors have to spend quite some time before they can get to their destination.

(ii) **Access** - This is not well defined and very inadequate. The parking spaces is really small and can be seen to accommodate about 10 cars at peak periods.

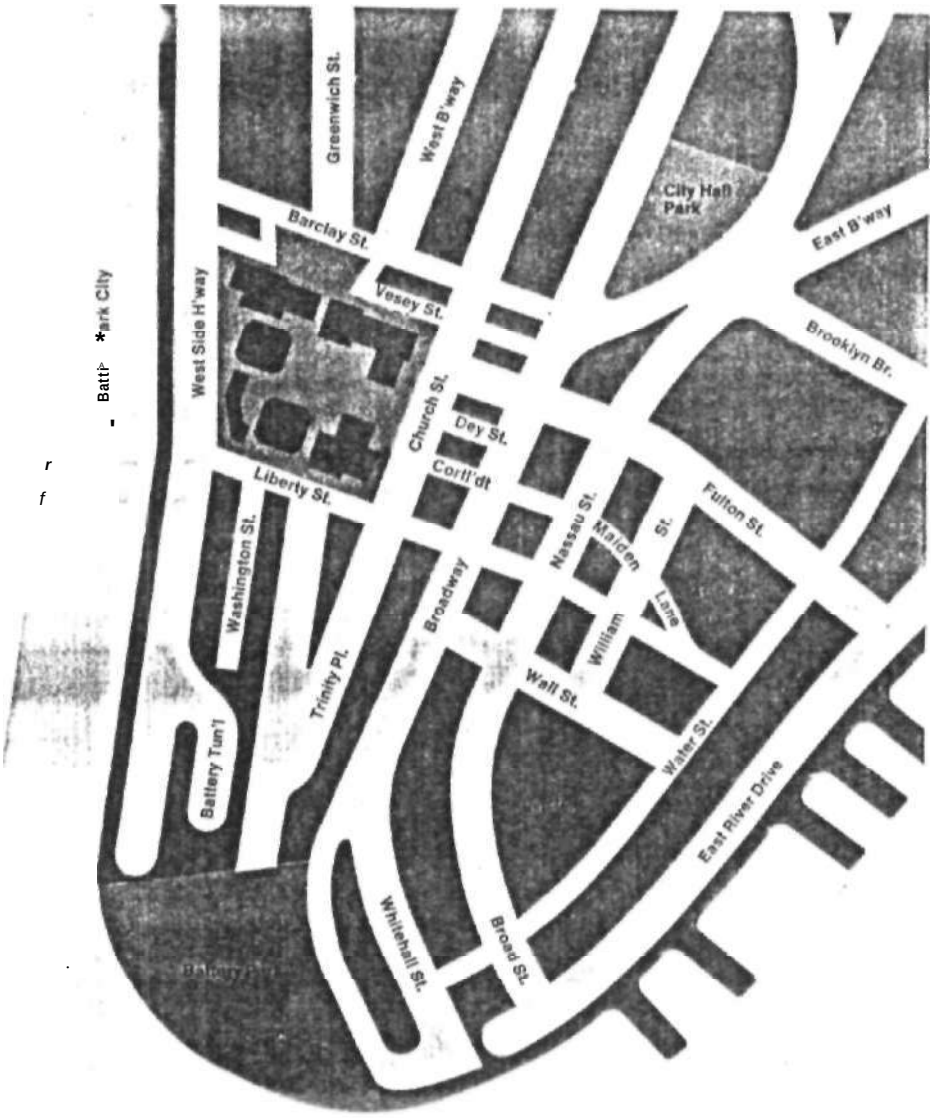
3.4 WORLD TRADE CENTRE, NEW YORK

3.4.1 Historical Background:

The world trade centre, New York project was completed in 1974. It is owned by the ports authority of New York and New Jersey.

It is the largest single international trade community ever developed where participants will share in the market opportunities which the community generates. Firms representing every essential world trade service and activity are housed here, this include exporters, importers, freight forwarders, custom house brokers, international banks, transportation lines, overseas government trade development offices, trade associations. The concentration of these agencies in the centre enables the terants to transact business more spedily and efficiently.

The World Trade Center
Location Plan



F.9 ***-0** World Trade Center, New York, Location Plan

3.4.2 Objectives:

(a) To create a greater convenience - no more shuttling back and forth to transact business at various centres.

(b) To create a world market place under one roof at the same time symbolizing the importance of international trade and the opportunities this trade offers to American and Overseas business firms.

3.4.3 Organisational Structure

It is owned by the port authority of New York and New Jersey created in 1921 to serve the Bi-state port district. At the helm of Affairs is the chairman, assisted by a vice chairman, commissioners, and an executive director.

The various departments are each headed by a director each, these include "the World trade department", Development and Rentals Departments, Administration and Accounts, Maintenance Department, etc.

Location - From an access point, the world trade centre is an ideal location. Subway facilities interstate rapid transit, vehicular access and on-site parking assures quick and convenient transportation to and from the site, and bounded by Westside, Highway, Liberty Street, Churchstreet, Vessey Street and Barclay Street on all sides.

3.4.4 Project Description:

The world trade centre soars to a highest of 1,350ft. The 16 acre six buildings includes twin tower buildings, and four low size buildings all surrounding a five acre landscaped plaza.

United States Custom House, commodities trading centre, world trading institute, world trade club, world trade information centre, are all located here.

(a) United States custom house activities plays a significant role in administrative processing of international trade. It aims at consolidating the custom's activities in the centre. It is at the northwest corner of the complex. Customs eight storey building in front of the landscape plaza was designed to enable the general public transact their custom business in one convenient location.

(b) Commodities trading centre is made up of:

(1) New York cotton exchange Inc.

(2) New York coffee and sugar Exchange Inc.

(3) The commodity Exchange Inc.

(4) New York Mercantile Exchange

These four exchanges share a single trading floor in the Ultra Modern South East Plaza Building. They are located on the eight floor and provides convenience wide clearing facilities, offices for individual exchanges, counges, meeting rooms.

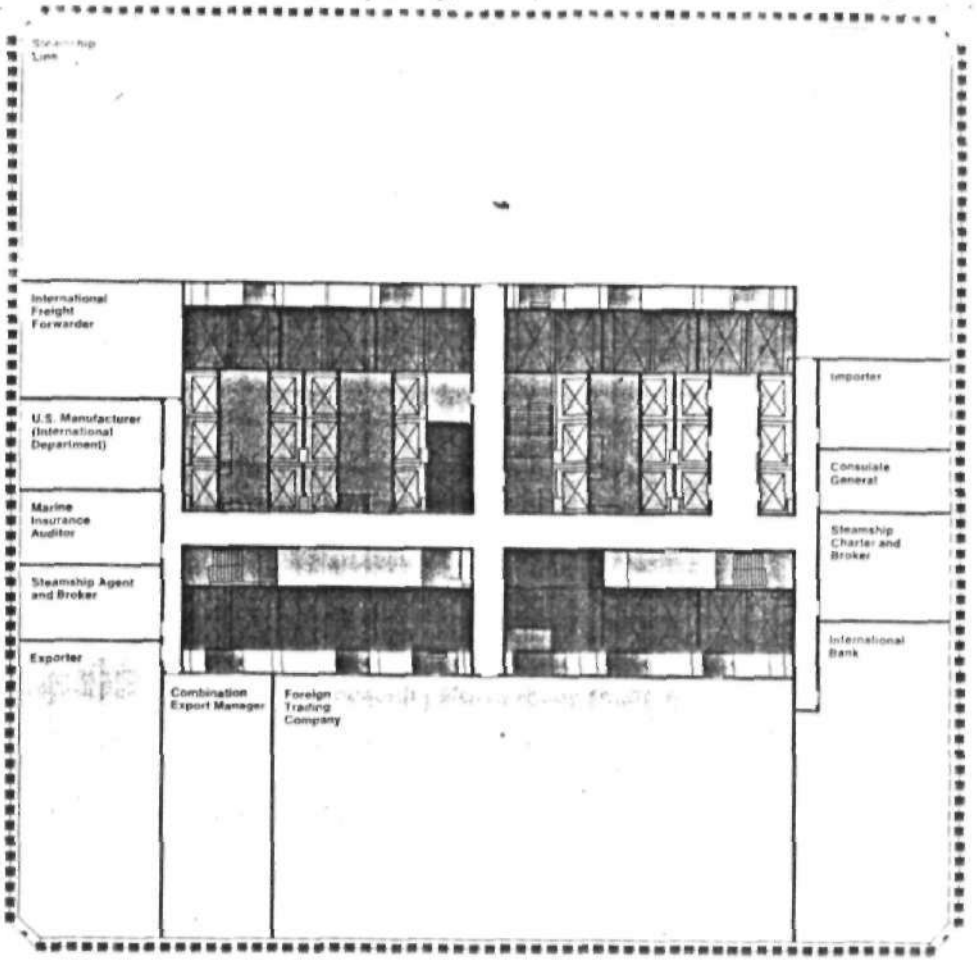
Flexibility And Efficiency

Column-free floor space of World Trade Center tower buildings provides utmost flexibility and efficiency. Conference rooms, private offices, reception, and open areas can be placed in the most efficient locations, without concern for obstructions.

The tower floors of The World Trade Center can accommodate tenant requirements ranging from full floor occupancy (approximately 40,000 rentable square feet) to areas as small as 500 rentable square feet. Single-floor occupancy of areas larger than 40,000 feet can be accommodated in low-rise plaza buildings.

Floor loads—100 pounds per square foot.

Oversize lamp fixtures (20" x 100"), each with six lamps, offer superb illumination of all working surfaces.



Plan of a typical tower building floor indicating areas occupied by world trade firms and organizations. Column-free design of tower floors offers complete flexibility and efficiency of space layout regardless of office size.

Key
- Express elevators to skylobbies
- Local elevators
- Freight elevators, service areas
- Rest rooms
- Electrical, janitorial and mechanical areas
- Stairs
- Storage areas

Fig 3.1 Floor plan of world trade Centre, New York.

The main concept is the service core concept, where the various service units e.g. express lobbies, elevators, vest-rooms, storage areas, electrical, mechanical and so. Janitorial areas and storage are located in the middle of a square plan.

Conference rooms, private offices, reception and open areas are located without concern for obstructions. Each floor in the tower accommodates tenants from full floor occupancy of 40,000 rental square feet to areas as small as 500 rentable squarefeet. Single floor occupancies of higher areas larger than 40,000 feet can be accommodated in low rise plaza buildings. The structural system is made up of glass and marble walling.

The 73 foot high stainless steel lobbies attest to the architect's concern for the creation of an unmatched business environment. The glass is tempered and heat absorbing so as to provide additional comfort in terms of glare reduction and greater airconditioning efficiency.

There is a decorated, airconditioned, convenient shopping and service area one level below the great plaza. "The concourse" is the principal pedestrian circulation area and provides covered access to all buildings on the site. It has a concentration of retail services, gifts and service stores, retail banking services, airline ticket offices and other essential ammenities. The plaza buildings is made up of eight floor with six floors being cantilevered out and supported by pilottis. It is also made up of curtain walling with reflecting glass.

3.4.6 Services:

The main entrance of the trade centre on church street has a specially commissioned sculpture at the entrance and on the plaza, these is also a magnificent plaza fountain in the middle of all the buildings.

Under floor duct system facilitates rapid installation of power and telephone lines for tenant expansion. Computerized building controls for heating ventilating and airconditioning assure optimum operation efficiency as well as a comfortable environment.

Fire control system includes automatic detectors for heat, smoke, pressure build up, voice communications via emergency phones in all corridors.

Transportation is by a unique controlled elevator syste in each tower to sky lobby on the 44th and 78th floors. 72 local passenger elevators offer access to floors in each zone. Four freight elevators facilitate move-in and delivery of office supplies and materials to tenant floors.

From Plate it shows a pioneering translation into the vertical of the horizontal mass transportation principle by separating express and local runs for maximum performance.

3.4.7 Access:

There is a complete separation of vehicular and pedestrian traffic on the site. The parking area can accommodate 2,000 vehicles located on three floors of the subgrade areas and served by direct ramps connections from adjoining streets.

3.4.8 Crittique:

The main problems lie in the planning and the concept involved. The concept is based on the central service core location, this gives rise to corridors which cannot be naturally lighted and ventilated, however it can be reduced due to the advance of United States in technology but will in the advent have psychological stress on the occupants because of the general difference from the outside and inside.

The open plan system is employed here with single banking of corridors and office arrangement at the perimeter.

3.5 EUROPEAN FREE TRADE ASSOCIATION HEADQUARTERS, GENEVA

3.5.1 Historical Background:

This is jointly run by countries within the European Economic Community, and located in Geneva on a site made available by FIPOL, a foundation responsible for housing international associations in the city.

3.5.2 Project Description:

It is a nine-storey building, built to accommodate a staff of 500, the 9000m^2 project contains 6500m^2 of offices, 450m^2 of storage of records and 2300m^2 of conference rooms and hall areas. Accommodation on each floor is made up of:

(i) 1st floor-basement services and parking for 70 cars

(ii) 2nd floor-basement services and air raid shelter

(iii) Ground floor-reception, coffee bar and conference rooms.

(iv) Mezzinine level - exhibition gallery, interpreters and press offices.

(v) 1st to 6th floors - offices

(vi) 7th floor - staff club, porters flat, services.

3.5.3 Structure:

The structure is principally made up of reinforced concrete columns forming double free standing portal frames which pass into the roof top service areas. Stability laterally is achieved by placing an escape stair tower and a five tower structure at the ends of the elongated structure. The facade consists of aluminium framed curtain walling with anodised infill panels. Pivot windows are used throughout the ground level, while exhibition areas etc are made of heating arbsobing glass. Two eight person lifts and a document conveyer serves all floors.

Proper zoning was done as courtyards, acts as buffers and screens for the conference rooms.

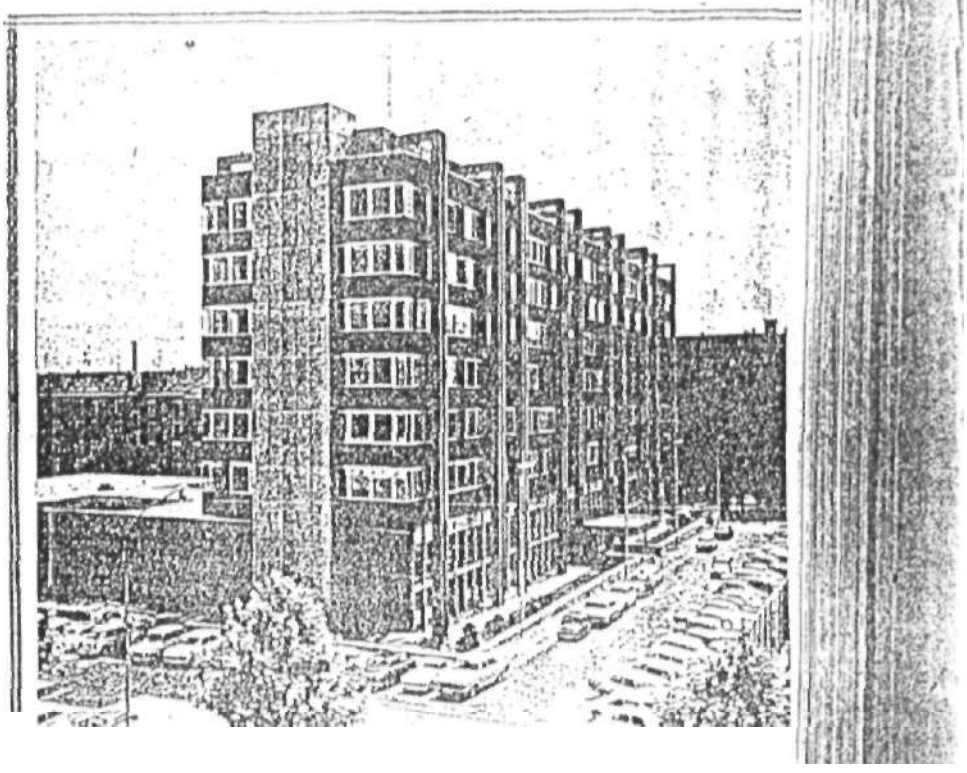
3.5.4 Finishes:

Finishes employed include glass, granite and reinforced concrete.

3.5.5 Access:

There is a clear definition of the whole complex as ingresses and outgress facilitate easy movement and interaction.

Fig. U.O: **Plan for** European free trade association's headquarters, Geneva.



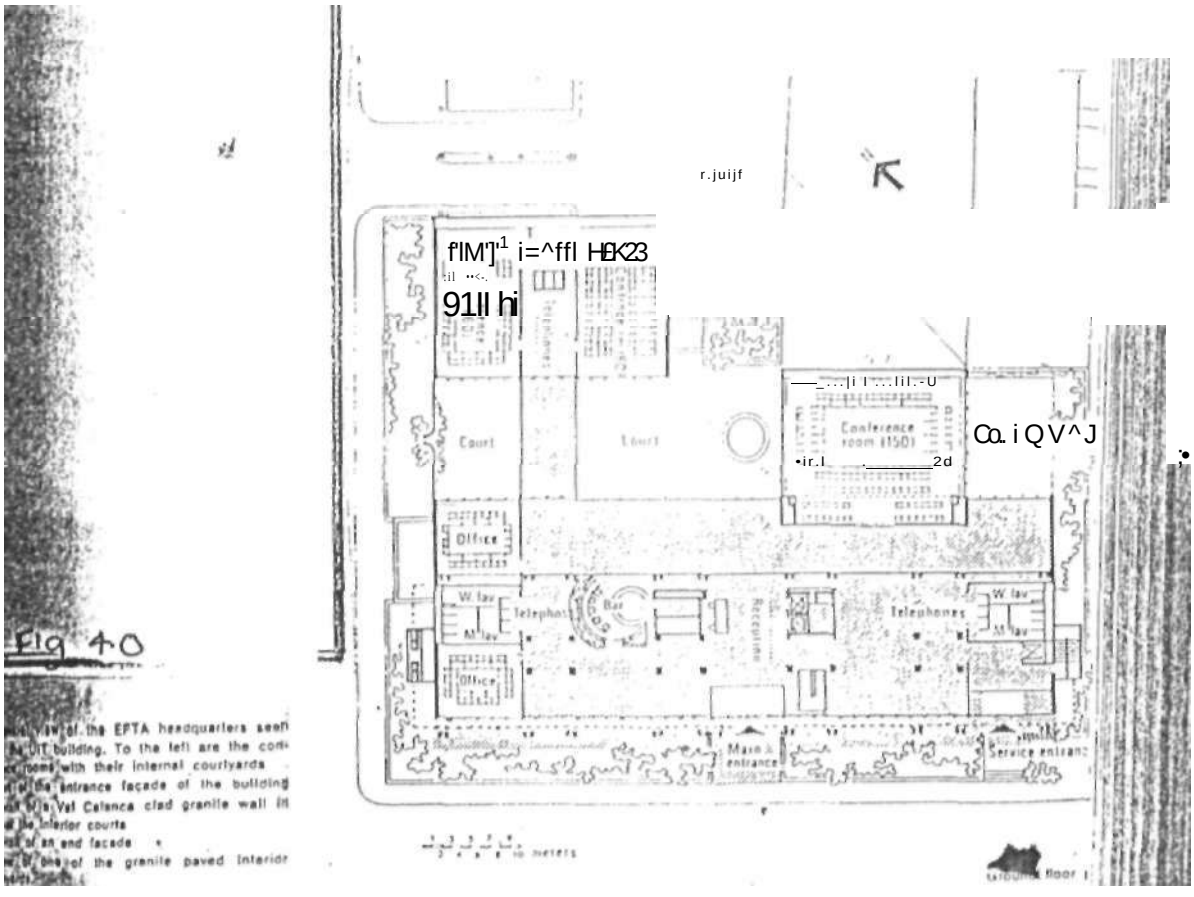
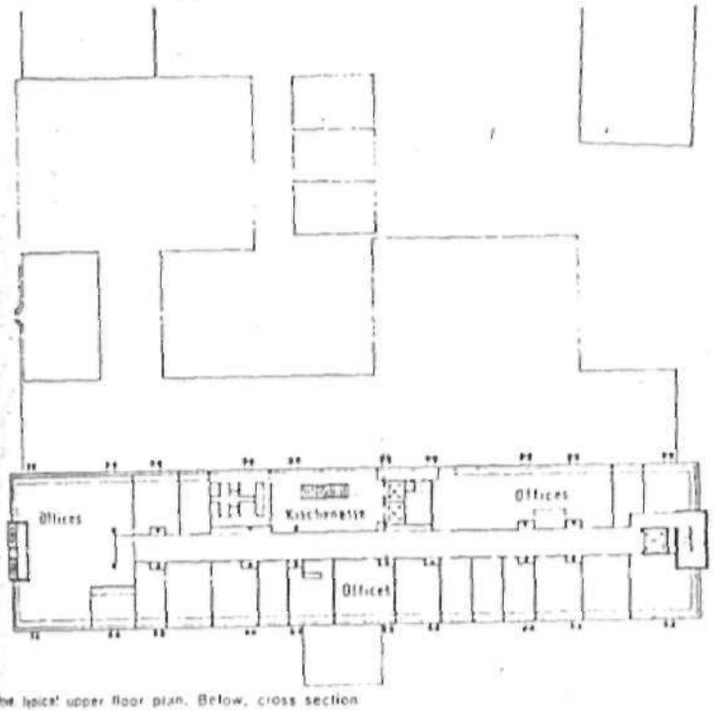


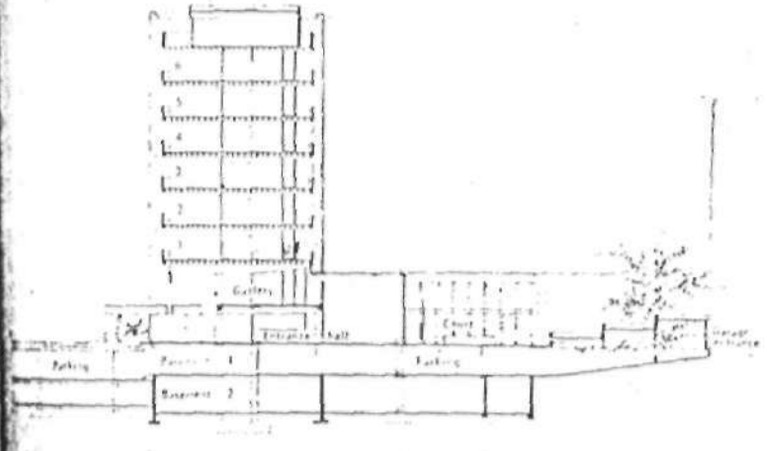
Fig 40

...w of the EPTA headquarters seen ...DIT building. To the left are the con... ...rooms with their internal courtyards ... ...the entrance facade of the building ... ...Val Celanca clad granite wall th ... ...interior courts ... ...of an end facade ... ...one of the granite paved interior

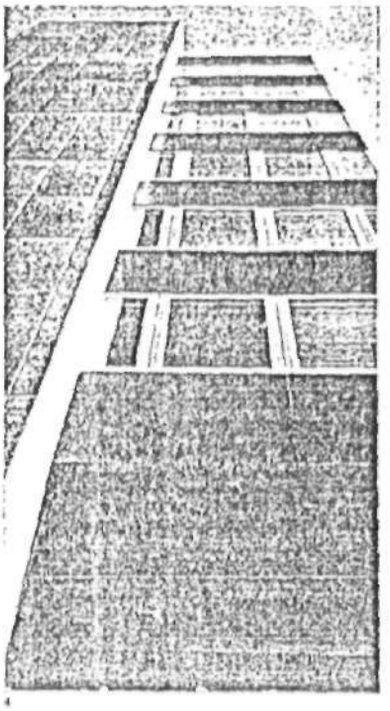
F1



the latest upper floor plan. Below, cross section



3



4



5



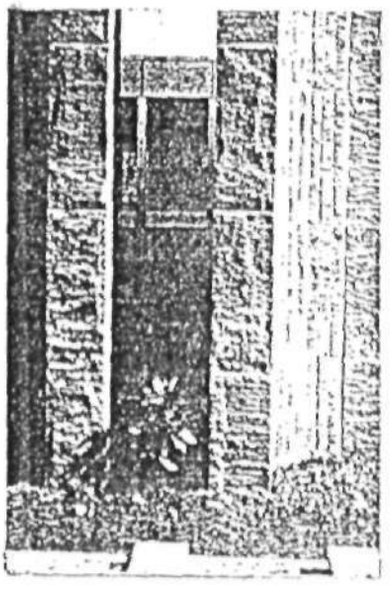


Fig 4.1

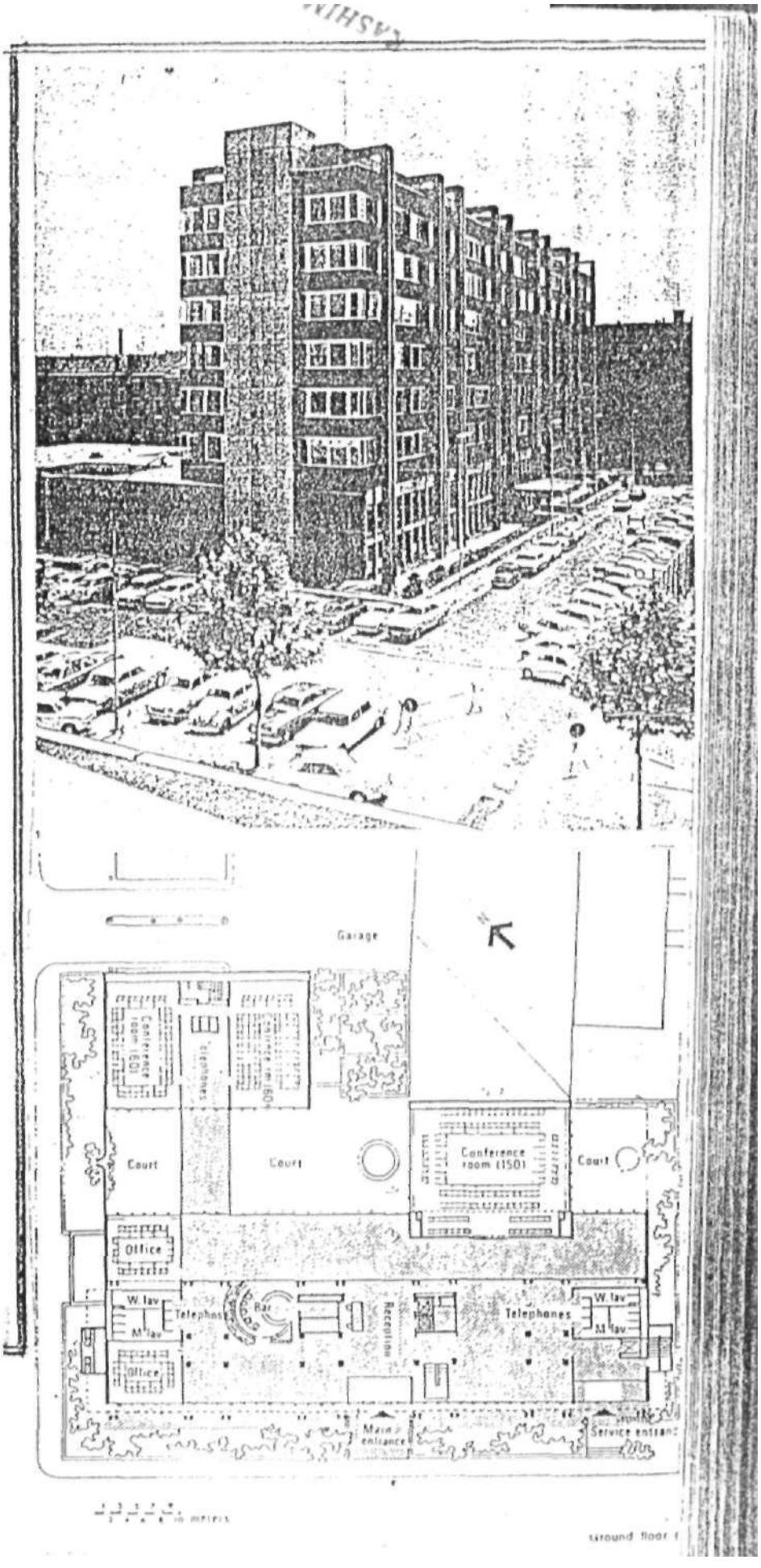


Fig 4.2

1 General view of the EFTA headquarters seen from the City building. To the left are the conference rooms with their internal courtyards
2 Part of the entrance façade of the building
3 Detail of a Val Calenca clad granite wall in one of the interior courts
4 Detail of an end façade
5 Part of one of the granite paved interior

3.5.6 Criticism:

This is largely due to the composition, which lacks coherence and unique character. Landscape elements are seen to be largely absent on site.

3.6 COPLEY PLACE BOSTON, U.S.A.

3.6.1 Historical Background:

Copley place is a new landmark in a city known for its historic site, unique and fascinating neighbourhoods. It is a major financial, administrative, trade and cultural centre for New England region and also serves as a focus for insurance, finance, government, education, medicine and research.

3.6.2 Objectives:

(i) A new multi-use complex that offers corporate tenants an atmosphere for business unparalled in the city of Boston.

(ii) A place that provides and promotes commercial activities.

3.6.3 Project Description:

Copley place is the dramatic mixed use complex situated on a 9.5 acre site at Copley place presidential centre in Boston. The offices are an integral part of the complex and made up of seven storey offices located above two levels of exquisite retail shops and exciting entertainment facilities The other components in the 3.5 million square foot development include:

(a) The luxury 804 room Westin hotel.

(b) A convention-oriented 1145-room Marriot Hotel

(c) A Neiman-Marcus high fashion speciality department store (104,000 sq. ft.).

(d) A two level retail gallery of 100 exclusive shops and boutiques comprising 242,000 sq. ft. of shopping area.

(e) Fire restaurants, bistros, gourmet foodshops, a nine-screen sack theatre complex total area of restaurant and entertainment is 40,000 sq. ft.

(f) Indoor parking for 1,432 cars

(g) 100 in town residences

Both Hotels offer excellent accommodations and also out-of-the office meeting plans for copley place tenants are simplified with easy accessibility to the Westin and Marnot conference facilities. The Nerman Marcus anchors and sets the tons for the copley place shops where local and international merchants offer their goods in a richly designed and carefully managed environment.

3.6.4 Location:

Copley place is located in Boston's Back Bay, and a neighbourhood rich in history and architectural landmarks architectural structures include J.M. Pei's John Handcock Towers, World's Famous Boston Public library of Mckion Mead and White, not too far is one Bostom Common the state house and Financial District and Government centre and the aby's

finest residential area. Hence with its strong institutional office base, exciting retailing opportunities, dazzling new hotels and fine residential environment, Back Bay is Fast becoming the place to do business in Boston in the 80's.

3.6.5 Design:

Copley place is distinguished by an uncompromising dedication to excellence in concept, design, construction and management.

Concept: The concept is "planned with sensitivity" to its historical surroundings and blends effectively into its environment, taking full advantage of the market utility, cultural attractions and vigorous lifestyle of this great American city. Copley place presents a unique synergism of the best elements of urban living.

3.6.6 Structural System:

The offices are constructed with a structural steel system including a perimeter frame to compensate for wind and sesmic loads. They consists of four contiguous office buildings located directly above the two-level retail male and indoor parking facility. Two mid-rise central structure is twelve storeys providing excellent views from all levels. The interior column form large

All floors consists of light weight concrete poured over sheet-metal decking and reinforced panels with an exposed granite aggregate attached to the steel frame. The central area is constructed on a multi-level platform with the service docks

and mechanical equimpent rooms located on the lowest level with three levels of parking above. The two-level retail mall sites above the parting levels with seven office building floors rising above the retall mall.

The central Atrium is the focal point, and soars 125 ft from its base at the first floor and culminates in a multifaced sklylight stretching across the 90 foot diameter of the Atrium.

The four office buildings incircles the atrium and provides fapunating, interior views from the offices to the heart where abundant landscaping and floral displays create a park-like setting at the Atrium's base.

Also striking is a granite water full sculpture which cascades down 50 feet from the first floor office to the retail levels below.

The sky lobby is the first office floor and also the direct assess to the office's fouf separate elevator cores at each sky lobby, each building entrance proceeds down a carpeted corridor framed in soft marble to its own bank of four elevators each with brass doors.

The offices contain a total of 845,000 rental square feet, above the first office floor, the four building floor plans can be united to provide a single floor plan of about 126,000 rentable square feet. The contiguous design of the four buildings produces enormous flexibility for office space planners with opportunities for creative layouts horizontally and vertically. The configuration of the offices round the central Atrium offers unique features to tenants, the step-back design as it proceeds upwards creates terraced balionies along certain levels of the offices.

Heating, ventilation and airconditioning systems incorporate "state of art" engineering providing flexible climate control and energy conservation. Each floor of the office building includes washroom facilities, janitorial closet and a refrigerated drinking forntain.

3.6.7 Services:

Vertical transport: A bank of three elevators provides service from the parking garage levels to the offices at the sky lobby, with access to intervening retail gallery levels. Escalators and cantilevered stairway also connects the retail levels at the sky lobby.

Passenger transportation is by sixteen elevators, one bank of four elevators in each of the four office buildings, and also provides frieght requirements access to the loading dock.

Fire detection, supression, smoke control and evaluation are incorporated in the life-safety system. The major components include a full sprinklering system, complete automation fire detection system, manual pull stations, emergency voice communication system, automatic smoke control and presurized system, pressurized star-wells and a stand-by diesel driven generator.

3.6.8 Security is controlled by latest surveillance and monitoring devides with highly trained personnel. Internal partitions are constructed in 1 layer of S/8" system board encased in metal stud. They will include sound altenuating and insulation partitions that terminates exterior walls, meets a mullion or column at right angles.

Ceilings is made up of high quality mechanically suspended system complete with acoustical, flush finished mineral fibre, lay in ceiling-tile 8.6" above the floor.

Finally the External View or Facade is clad with finely detailed buft-coloured precast concrete panels, with bands of exposed granite aggregate. It is accounted with solar bronze thermopane glazing and bronze anodised aluminimum window frames.

The innovative design and planning of copley place creates a high quality professional business atmosphere. The first class office spaces combined with commercial activities and parking all in a single climate controlled, integrated environments provides the setting that will accent and enhance the corporate image of the most discriminating business.

3.6.9 Crittique:

The main criticisms lie in the form of the design.

(1) The presence of too many corners results in wasted spaces, no matter how they would be partitioned.

Generally this case study was taken as a basis for foreign corporate buildings with particular interest in the way the services have been dealt with.

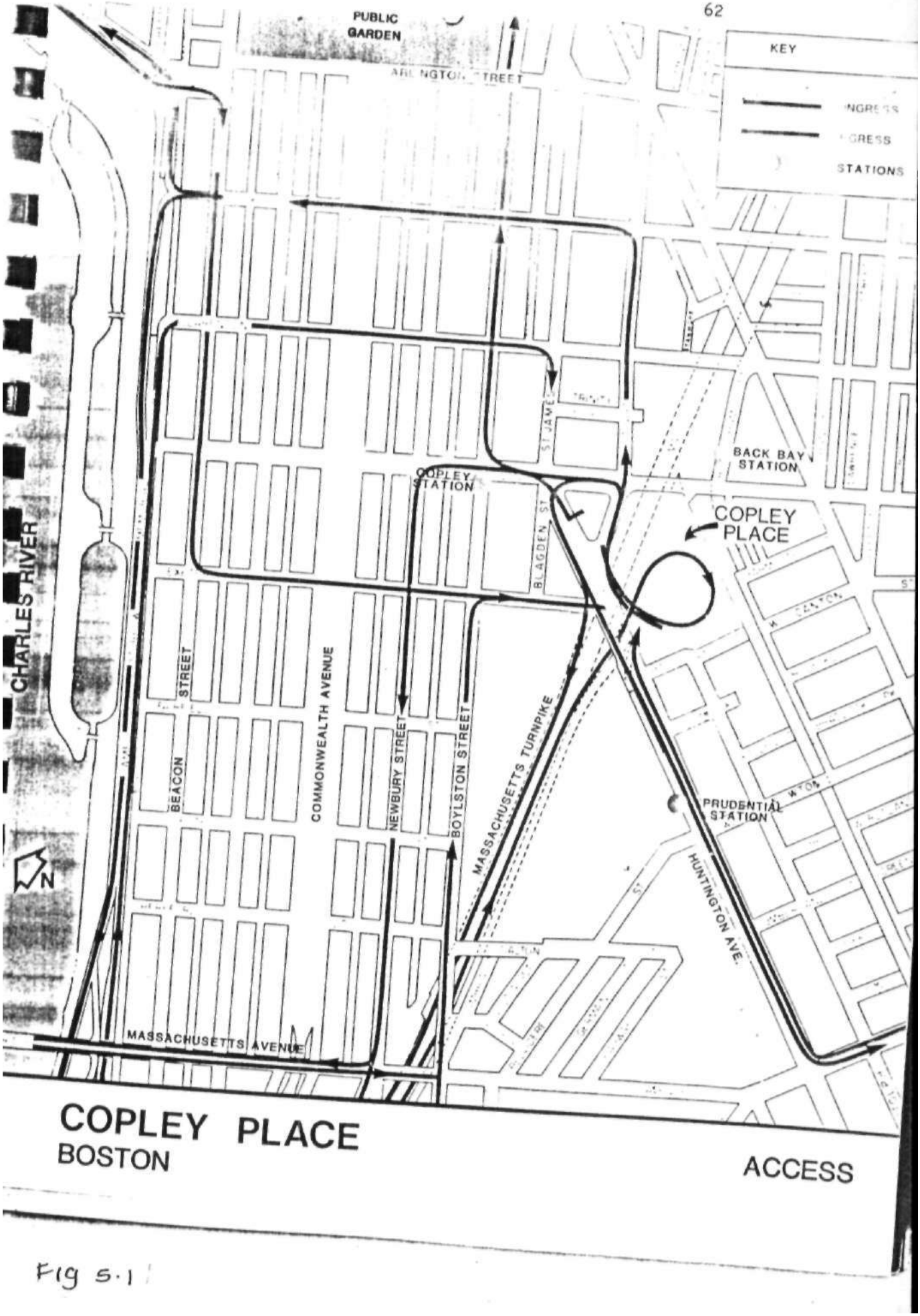
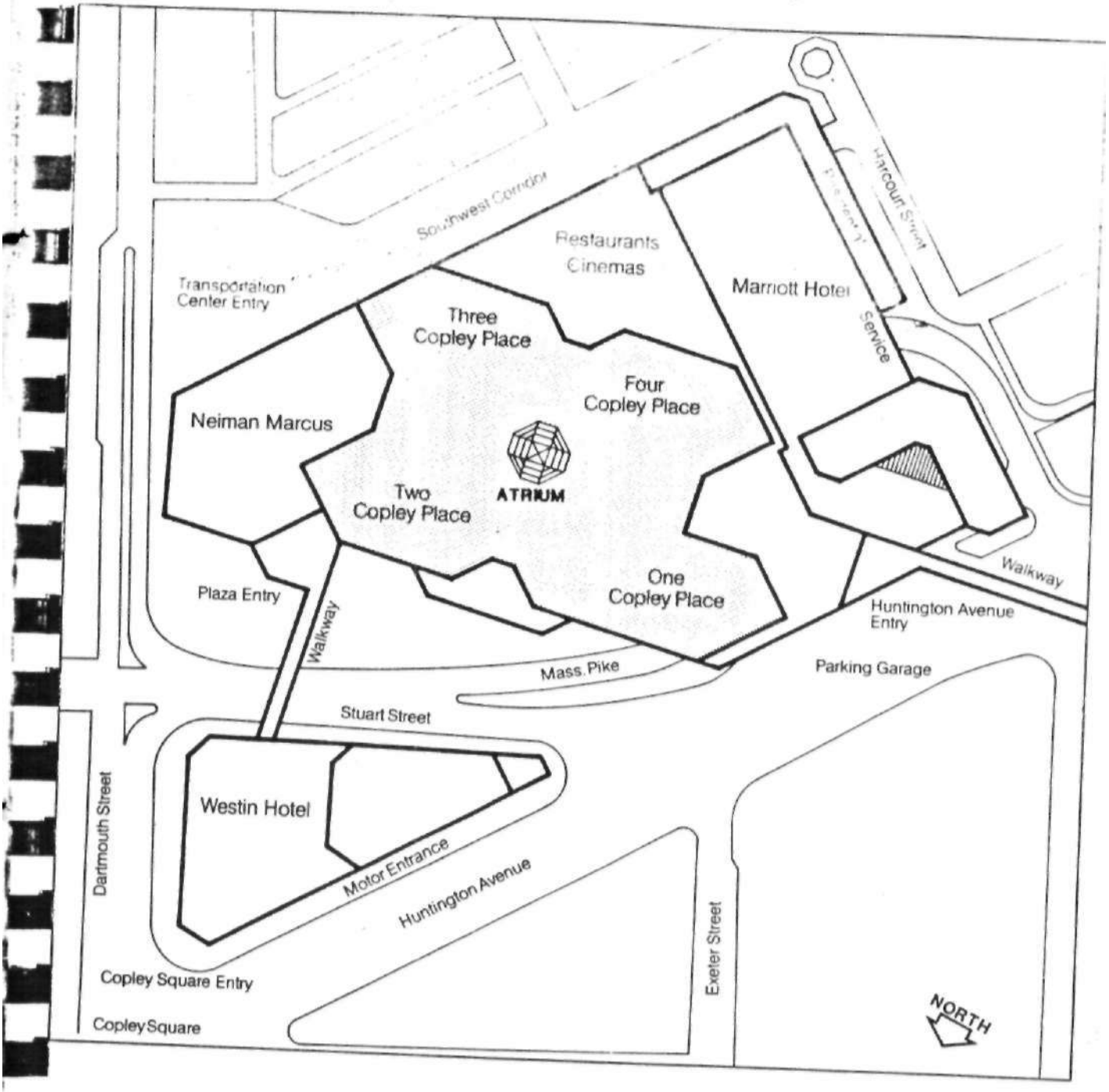

PUBLIC GARDEN
KEY
INGRESS
EGRESS
STATIONS
CHARLES RIVER
BEACON STREET
COMMONWEALTH AVENUE
NEWBURY STREET
BOYLSTON STREET
MASSACHUSETTS TURNPIKE
BLAGDEN ST
COPLEY STATION
BACK BAY STATION
COPLEY PLACE
PRUDENTIAL STATION
HUNTINGTON AVE.
MASSACHUSETTS AVENUE
N
COPLEY PLACE
BOSTON
ACCESS

Fig 5.1



Note: The parking garage and retail mall are situated beneath the the office towers.

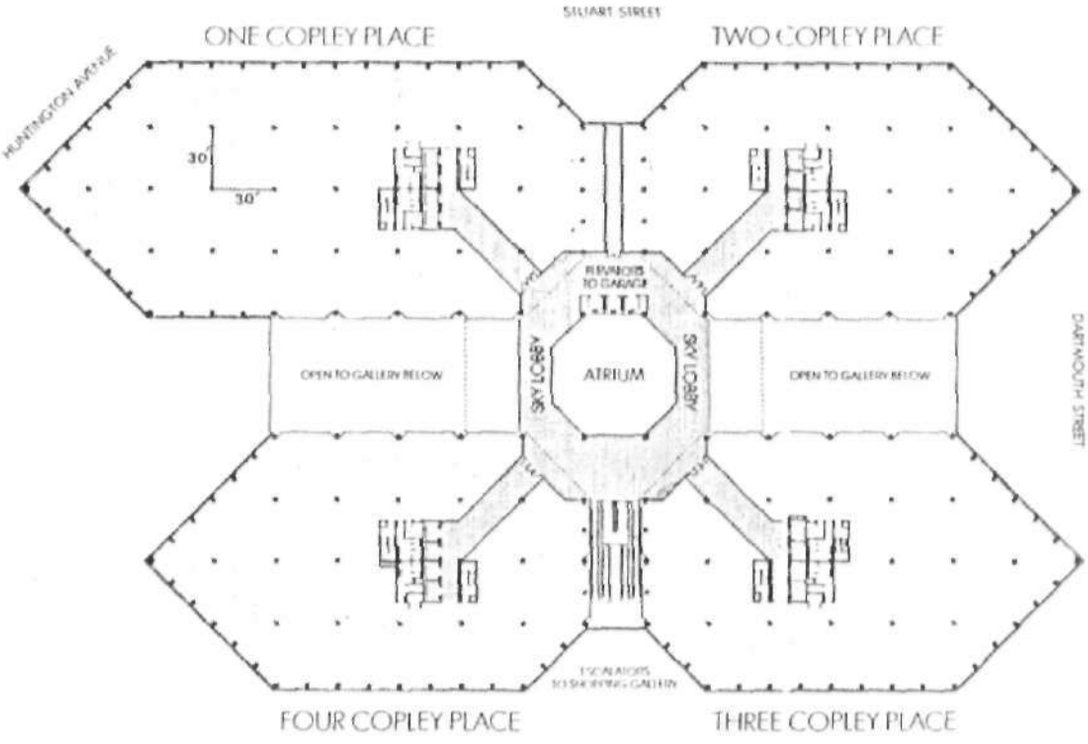
COPLEY PLACE
BOSTON

PROJECT PLAN

Fig 5.3

COPLEY PLACE

OFFICE FLOOR 1
(SKY LOBBY / LEVEL 8)

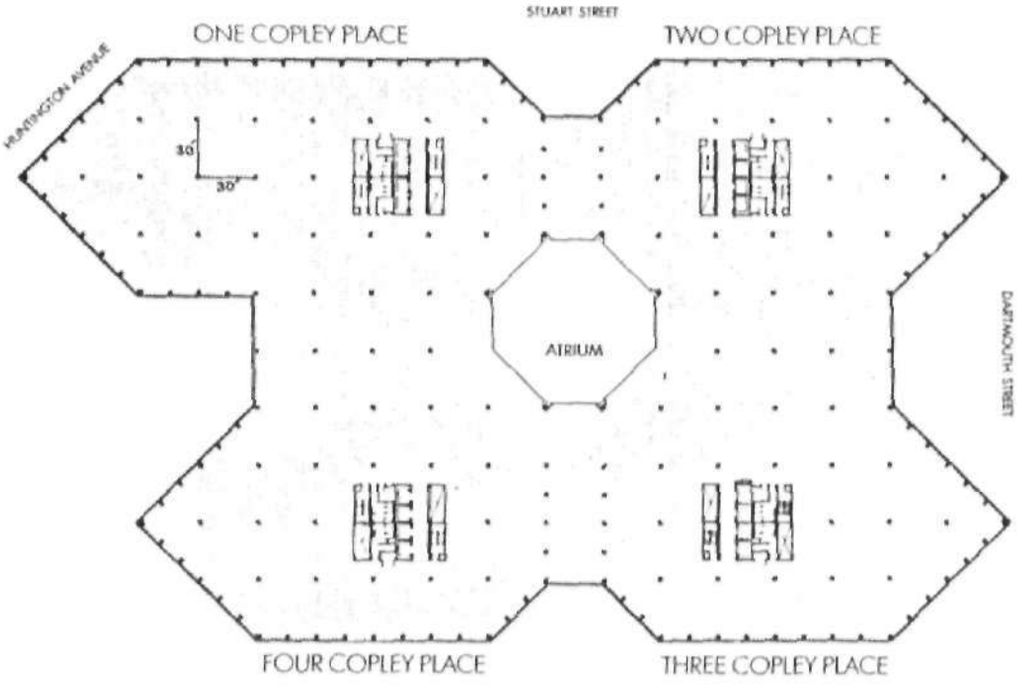


COPLEY PLACE BOSTON

Fig 5.3

COPLEY PLACE

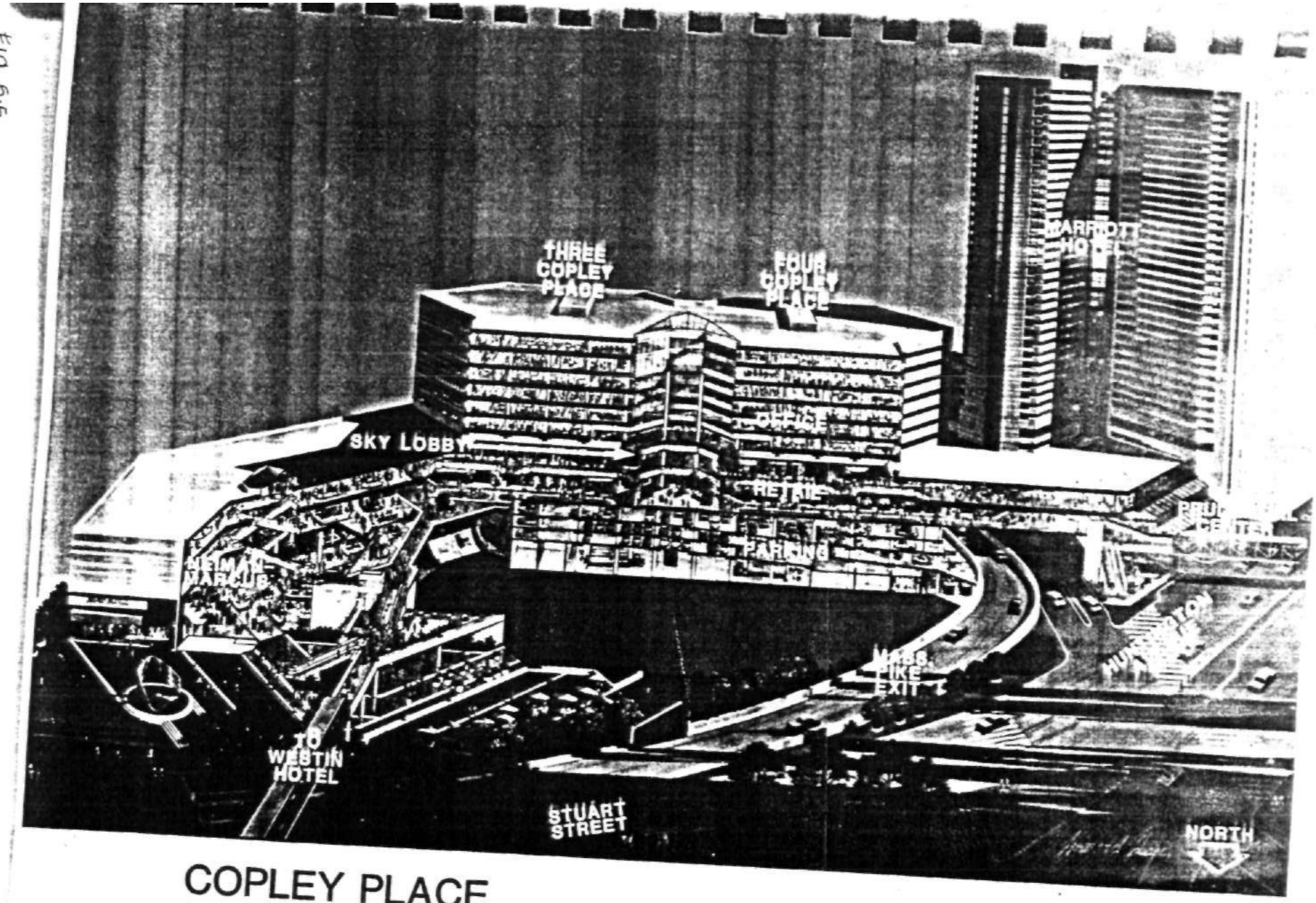
TYPICAL OFFICE FLOORS 2 THRU 7
(LEVELS 9 THRU 14)



COPLEY PLACE **BOSTON**

Fig 5.4

Fig 6.5



COPLEY PLACE
BOSTON

CROSS-SECTION VIEW

CHAPTER FOUR

4.1 THESIS PROBLEM

The smooth and effective functioning of corporate buildings is marred by constraints based on the operational procedures. The existence and occurrence of these problems particularly the organisation and arrangement of spaces makes it impossible for financial institutions to achieve the desired goals and objectives.

In highly industralized countries, more people work at the desk, which is predominantly concerned with managerial decisions or with combinations subject to certain rules of facts and figures, so the creation of a suitable environment, offering favourable conditions for creative thinking, communication and storage of results is as a result of manipulation of spaces to suit different functions at the same time made to relate to one another in the social realm.

Space has been defined as "emotional charged zone around each person which helps to regulate spacing of individuals".[1] Spaces where people mark out and specialize, the spaces which they inhibit. So architecture must enclose space where certain activities can take place comfortably and efficiently.

Architecture controls the physical environment that people as individuals or groups can live, work and be together. It is seen as a means for accommodating and expressing the spaces for social living and also an embodiment of a socio-economic institution.

A building is the physical form of a social institution, an enabling mechanism which houses its occupants, accomplishes its objectives and relates to ideas and operations in the social

realm, this architectural form in the advent becomes a major investment and an instrument of development, particularly urban growth. Corporate architecture provides accommodation for financial and non-financial organisations, despite their different goals and objectives they all aim at improving and encouraging the financial system.

The modern office building is unique, and is differentiated from all other types of construction in the audience it exists to serve, in a way it is a symbol of the ultimate achievements of a machine age - a building which serves an administrative and planning centre for a machine society, built solely for human beings and to answer human needs.

Thus an office space must be planned so that its spaces if broken into separate units can function as a cohesive whole. These spaces can be ancillary spaces, administrative-executive and non-executive spaces, service spaces, etc and they must all be planned so that these they are flexible and can be changed rapidly to meet varying needs.

It must allow for extreme fluidity within its walls and more often today built so that future additions can be made to the building itself. The main factor that has affected spatial organisation in corporate building has been the general world economic recession, during the twenties, there was a boom and great overbuilding of office space - but that space was created according to the formal and rigid tenets of earlier architectural principles, within the Depression, clerical staff shrank and so did office occupancy, then came the expansion with world war II followed by a booming prosperity in which pressure for office

spaces and demand exceeded anything ever before. At the same time, offices with larger staff now had more complex organisation than before, resulting not only in more space requirements but more individualized design and layout of that space.

New concept in office spaces is a shallow structure with rental spaces constructed around a centre service core containing elevators, stairways, utilities and toilet facilities, such structures gives offices maximum possible exposure to exterior light and air, but with improvements in artificial lightningand airconditioning, different building concepts can now be evolved, making it possible to build deep spaces in buildings with interior working spaces uninterrupted by service facilities - which can be located off to one side and still make office space in such building efficient, functional, comfortable and healthful.

Space according to Edward Hall and R. Sommer should be flexible and have variety, the former an anthropologist the later a psycologist each have their own concept of space.

Edward Hall in "Hidden Dimension" talks about fixed feature space and semi-fixed space. Fixed space "is that mould into which a great deal of behaviour is cast".[2] In essence what he means is that every activity had to adapt itself into that space that had fixed boundaries.

Semi fixed space is that space that is defined but has no permanent character".[3] He went on to introduce two other concepts concerning space -

1. sociofugal space
2. sociopetal space

1. **Sociofugal space** - is that space that tends to "isolate individuals thereby making them self existence.

2. **Sociopetal space** - is that space that brings activities together, seeks to intergrate people while at the same time gives the privacy needed.

Sociofugal space is not bad, neither is sociopetal space good, what is desirable is flexibility and congruence between design and function so that there is variety of space and people can be involved not as the occasion and mood demands".[4] While R. Sommer has this to say of personal space ".... if two rooms are intended to serve the same function, it is desirable to make them slightly different unless the cost is prohibitive . One conference room can be long and narrow, the other short and squat, this provides the user with greater flexibility in assigning space".[5] These can then be concluded that to achieve very effective organisation of spaces especially in corporate buildings, there must be

1. semi fixed feature space (flexible partitions except where desirable);
2. variety of spaces all inter-related to one another.

The aim of producing an intergrated atmosphere conducive for cohesive existence and comfort is the ultimate for the architect and the designer.

As earlier explained, this is based on the manipulation of spaces which in turn has a marginal effect on the final output of the organisation.

Inadequate, badly designed and too much space affects the working capacity of the users, because a financial organisation or corporation is that "complex organisation consisting of structured, functional and social component in which people behave in an inter-related fashion according to the norms, values and roles existing in the context of the goals of that organisation", and since high rise and low rise corporate building environment is unique in its physical and functional nature the architect can more systematically expose alternatives to achieve the required performance.

4.1 Spatial Organisation in Corporate Buildings:

These spaces can be sub-divided into -

1. reception/public spaces
2. ancillary spaces/semi public
3. service spaces/circulation spaces
4. non-executive spaces/semi private
5. executive spaces/private spaces

4.1.1 Reception/Public spaces:

This is the first port of call of all visitors and first impressions of the organisation is usually made here. Interior public spaces like reception and lobbies are usually too small and so do not accommodate people particularly at peak periods.

There is the general lack of interior office landscaping which might have created a sense of belonging to visitors. lounges, commercial spaces are usually not well zoned and located.

4.1.2 Ancillary/semi public spaces:

These are spaces which serve as a link between the public and private spaces. They serve as a support arm for the organisation and are usually the staff canteen, or cafteria, clinic or sick bay, kitchen, cloakroom, meeting rooms, etc.

The human factor is predominant in corporate buildings and the best way to achieve increased productivity for clients is to respond to the needs of the users, so they can have the ability to work efficiently and in the end achieve individual goals.

Welfare of users is important but most corporate buildings do not have spaces for facilities associated with it e.g. there is the general lack and non-availability of adequate kitchen and dining facilities within hygienic surroundings, for users, staff have to commute few kilometres away in order to eat which in the end affects their working output as they would have been exhausted by the time they get to the office.

4.1.3 Service spaces/circulation spaces:

This is usually the main support system of all corporate buildings. It provides access to all parts of the buildings and subsequent floors; however these accesses are not appealing, while connecting bridges like stairs and lifts are monotonous. Most of them generally have lightning and ventilation problem they therefore rely on artificial means. Spaces (horizontal and vertical) for ducting of office services are usually a problem in corporate buildings and so must be organised in a way that it won't affect the planning layout or stability of the building.

Circulation spaces do not permit easy ingress and outgress to work areas while corridors are not well ventilated and lighted, they depend on artificial means.

4.1.4 Non-executive spaces/semi private spaces:

These are spaces occupied by junior and managerial staff, they depend in most cases on the hierarchy within the organisation, and consists of work space, file space, storage space and circulation. Good space utilization allots more space to those positions whose activity justifies it, but in most corporate buildings, it is the reverse, with offices being partitioned indiscriminately.

4.1.5 Executive spaces/private spaces:

These are spaces occupied by executives within the organization, and also vary according to the hierarchy within the organisation; however, generally their location is greatly dependent on the fact that

CHAPTER FIVE

5.0 SITE AND ENVIRONS

5.1 The new Federal Capital City, Abuja

5.1.1 Origin:

In October 1975, the Federal Government of Nigeria established a body - Federal Capital Development Authority and charged it with the responsibility of developing a new Federal Capital of Nigeria as Lagos, the present capital had become impracticable to function as a capital, problems associated with Lagos included intractable traffic, housing and sanitation problems, inadequate land space for development as it was now incapable of functioning both as a federal capital and a state capital.

Consequently, Abuja was chosen not because it provided solutions to these problems but because of its centrality and as a neutral ground it would create a sense of national unity and serve as a symbol of Nigeria's inspiration.

5.1.2 Geographical Location:

The Federal Capital Territory, Abuja is situated between latitude 8^{o} and 10^{o} North of the equator, and 6^{o} and 8^{o} East of the Greenwich Meridian. It is surrounded by Niger, Kaduna, Plateau and Kwara States with an area of 80,000km^{2}. It lies in the north eastern quadrant of the territory. The city has an overall land use pattern confined to a crescent shaped site defined by vast land 1,200ft above Gwagwa plains below the escarpment surrounding the outer area of the site. It is bounded by Abuja hills to the west, Zuma Rwari - Aso hills



Fig. 6: Showing National Context and Centrality

to the north, Kanu-Agwai hills to the east and Zango-kuku hills to the south.

5.1.3 Design Concept of the Central area:

Attempt would be made to discuss the sector of the federal capital city where the site is located before it would be analysed in the micro and macro scale.

The Central area has been designed around the axis focussing on Aso hill and the cultural axis diagram . These two axis are very important as the depete the shape of the central area. The Aso hill is the most domineering piece of natural relief feature so the axis is towards it and seems to be organic in its growth outwards.

The whole central area is symmetrical about its axis in the way it was designed. All governmental public facilities for e.g. National Assembly, Municipal building, the National Square, National Hall have their axis towards Aso hill.

The cultural axis is along the cultural zone and perpendicular to the main axis of Aso hill and an intersection with it occurs at the National square.

Important cultural buildings particularly municipal building, National Museum, Central Mosque, National Library, F.T.A. headquarters and National Theatre are situated along this axis.

5.2 Site Location:

The site is located in the Maitama district of the Phase One development process. Due to the nature of the project, the site designated for the project is within the parastatal zone, although attempts were made to find other sites after undue analysis, this site was seen as most suitable and appropriate in terms of the criteria's considered.

It is trapezoidal in shape with a vast area of 9672.1km^2 and situated in the northern part of the capital territory. The site is bounded on all sides by a collector road C_3, two minor aterial roads and a plot of land.

5.2.1 Accessibility:

The site is highly accessible from all three sides, however thorough access is ensured from the central business district through the inner northern expressway N15 through a tee-junction to the collector road C_3.

5.3 Geotechnical Data:

5.3.1 Physiography:

The site forms part of the Gwagwa plains with an eastern slope rising from 305m to 610m above sea level west to east. This elevation makes use of climatic advantages on higher altitude.

The central area consists of uplands and plains with iselbergs, wavebacks and rock outcrops like Bwari-Aso hills, Abuja hill, granitic features, etc. The area is typified by

an undulating terrain interlaced with riverine depressions with dominating outcropping usually rising as high as 50m above the general landscape. This produces dramatic views with the park savanna vegetation of the site.

5.3.2 Geology:

The site is characterised metamorphic and sedimentary rocks with small variations of igneous intrusions Migmatite, granite gneiss and bortite gronite found in Zuma, Bwari and Aso hills while phyorite underlie the majority of gite rocks of medium to high strength.

Alluvium is located in streambeds within the territory. These rocks are expected to present some mild engineering problems.

5.3.3 Soil:

The soil type underlying the site is from granite gneiss and Migmatite rock. They are deep and well drained and range from well to imperfectly drained, they are high in clay or iron pan content which affects their run off potential.

The deep soils of the site exhibits a moderate constraint for ground utilities, foundations and roads while design or construction techniques may be required to minimise severe flooding and sedimentation since the run off potential varies from slight to severe during localised rainy season.

5.3.4 Vegetation:

The site is characterised by park savanna of discontinuous canopy, shrubs and grass layer which may include tall grasses of hyparrhenia and andopogon species, while canopy species include Albiza Butyrosperum, Damilla and Parkia.

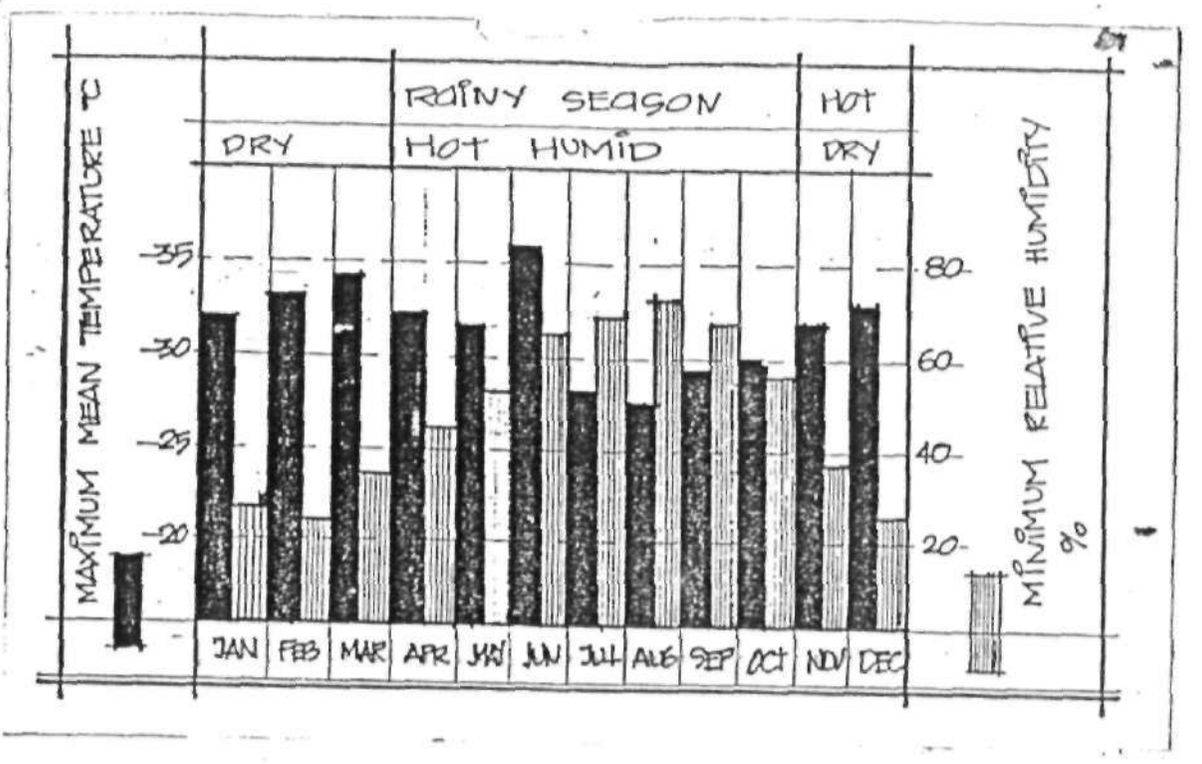
However, preservation of woodland areas would be considered for their aesthetic, recreational resources and ameliorating effect on the climate.

5.4 Climate:

Creating a comfortable environment suitable for habitation depends on the overall environment and how it can be maximised to suit this function. This however depends on how the various components which deter comfortability can be reduced e.g. heat, protection from rain and dust and effect of humidity for the purpose of this thesis, detailed climatic data is not available yet but extrapolations from existing metrological stations have formed the basis of climatic parameters for the site selection.

5.4.1 Temperature-Humidity:

FCT has its highest temperature as 17°C in the dry season when there is little or no cloud cover in the sky to absorb the rays from the sun, while during the rainy season due to the effect of dense cloud cover, the maximum temperature is rather low. This alternating high and low temperature record results in duirnal variations as high as 17°C.



Highest Temperature and Low - Relative Humidity

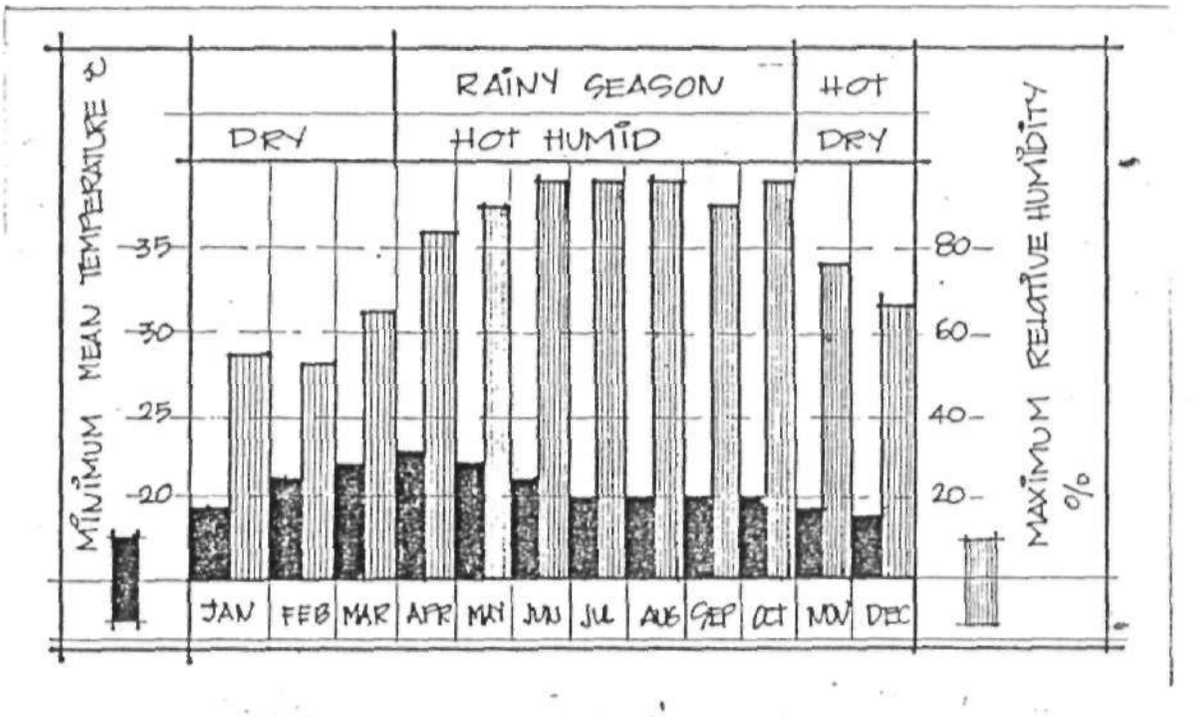
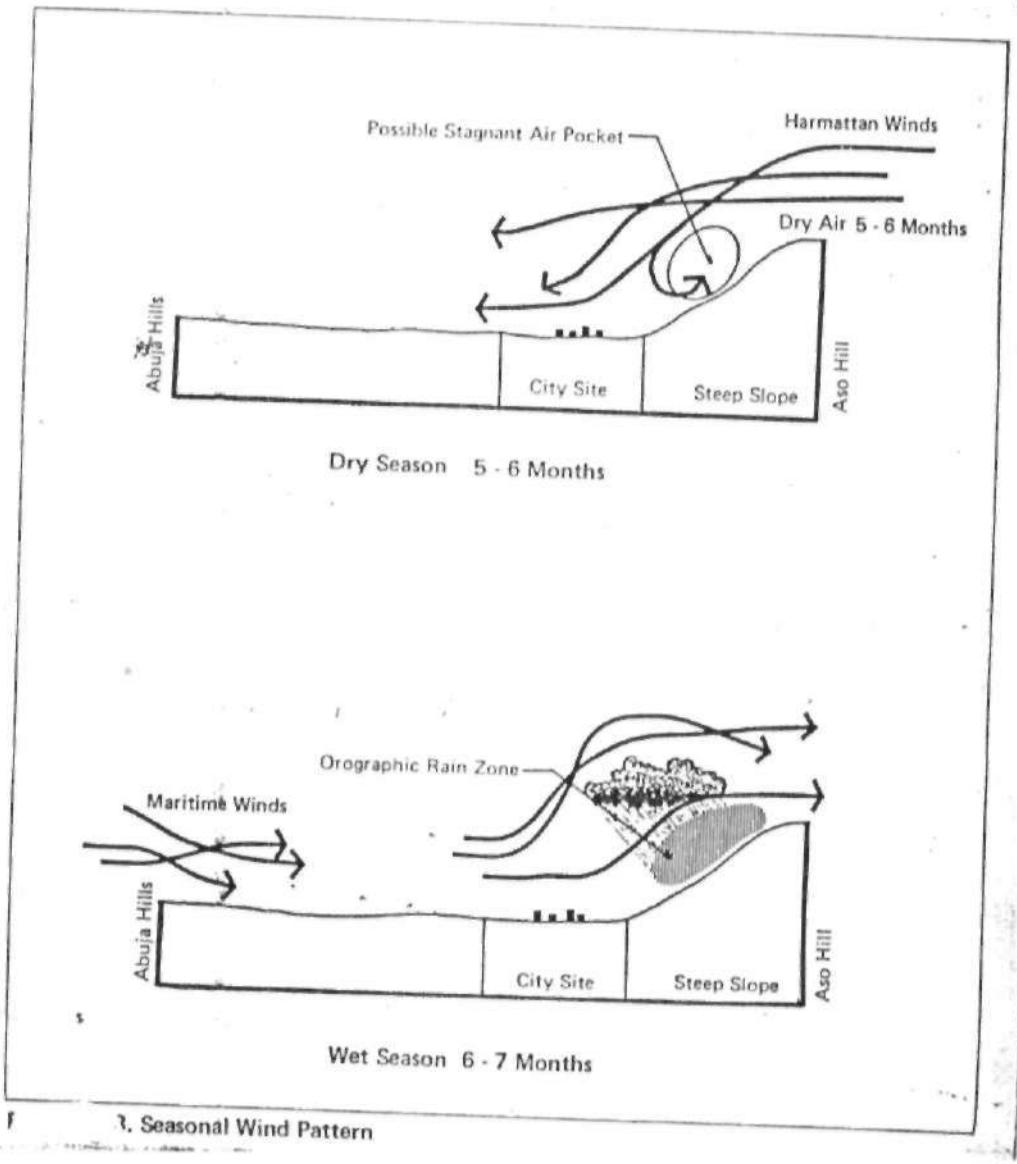


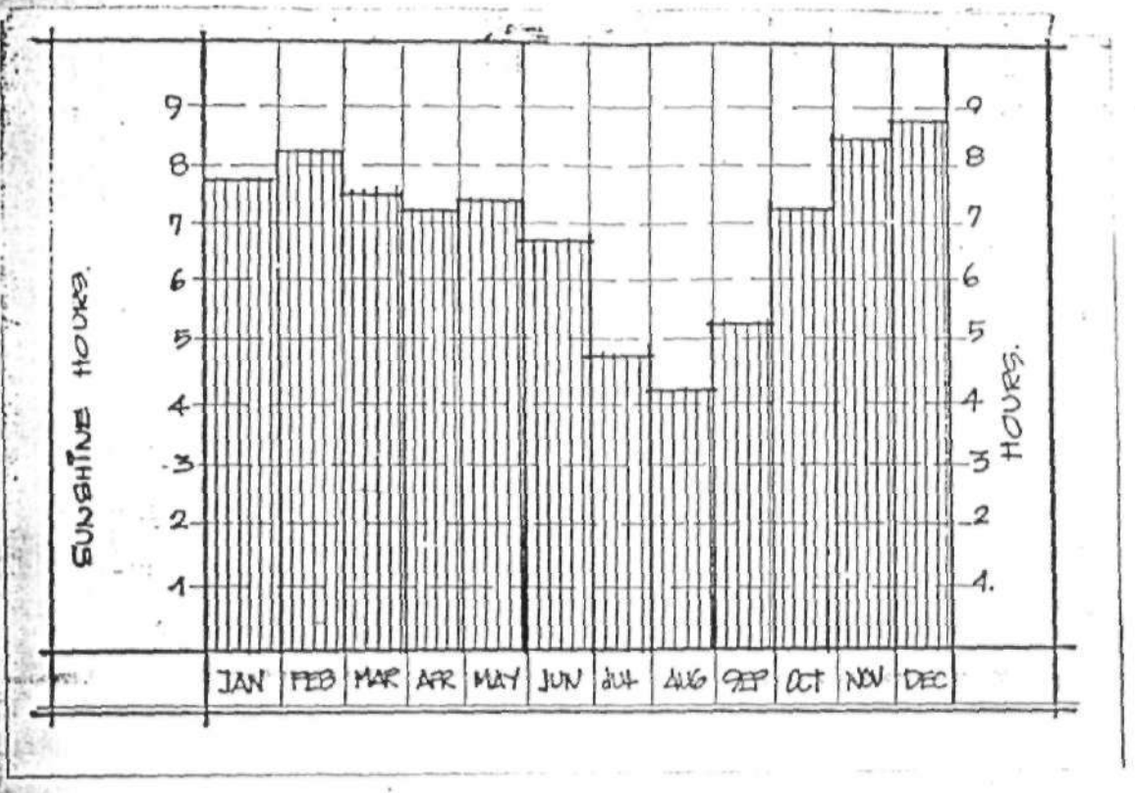
Table 4: Lowest Temperature and High Relative Humidity

MEAN MONTHLY TEMPERATURE AND HUMIDITY

Source: Master Plan for Abuja



3. Seasonal Wind Pattern



Mean Monthly Sunshine Duration

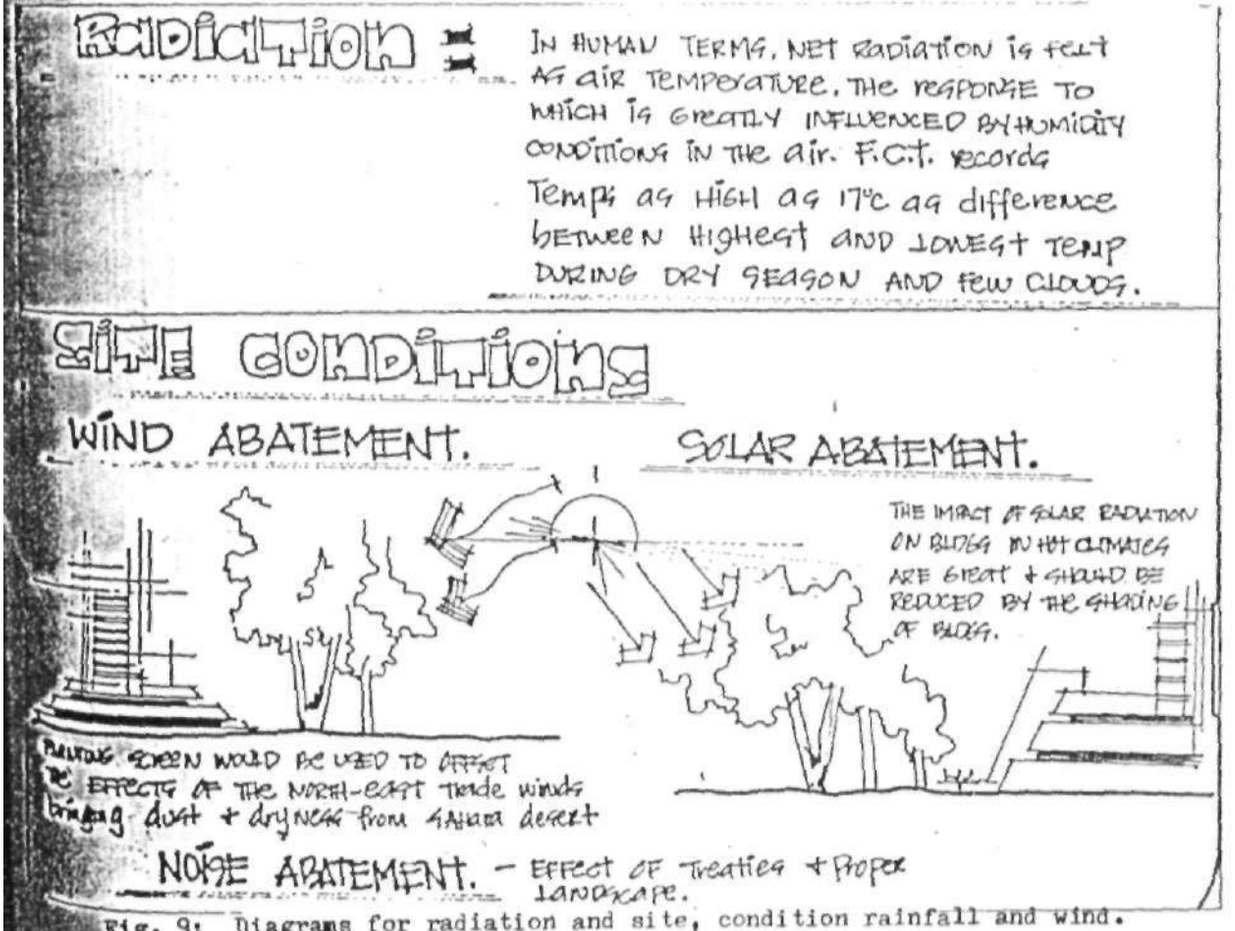


Fig. 9: Diagrams for radiation and site, condition rainfall and wind.

Sensitivity to temperature is greatly affected by its response to relative humidity. Relative humidity falls as low as 20% in the afternoons in the dry season, and results in the adverse drying effects with the high afternoon temperatures while it soars as high as 95% in the afternoon in the rainy season.

As earlier said this two climatic factors determines the relative level of human comfort and the high temperatures and low humidity in the dry season results in dryness while the reverse in the rainy season results in "heat trap" with little or heat loss by evaporative cooling.

Diagrams for temperature and humidity variations are shown in Figs. .

5.4.2 Rainfall:

The rain season commences early in April with a duration of about 6½ months and ends in October. Much of the rainfalls between the months of July, August and reaches its peak in September as shown in Fig. .

5.4.3 Wind:

Two major air masses namely The Tropical Continental and Marimitime air masses dominate the climate of the Federal Capital Territory.

The Tropical Continental otherwise known as the North-east trade winds originates from the Sahara and is therefore dry and dusty, while the Tropical Maritime is associated with

the moisture laden monsoon south west winds originating from the atlantic ocean and is therefore warm and moist. Oscillation between these two winds produces marginal variations in seasonal character within the country particularly middle belt and northern region where the site is located. These winds are responsible for the dry and rainy season respectively. Highest dryness and rainfall occurs in September and June. September has the North-east trade winds blowing intensely and dominates the whole territory for the months between October and March bringing dry, cloudless and dust laden conditions associated with harmattan.

June is the period when the south west winds dominates the region, brings cooler conditions and being moisture laden brings a lot of rain.

5.4.4 Sun and Cloud Cover:

The capital territory experiences about 2,500[1] sunshine hours annually. In the dry season, its hours increases from over 075 hrs with increased cloudness towards the rainy season resulting in a decline in sunshine hours when the rainy season eventually comes. The lowest value occurs in August and highest in December. Monthly sunshine variations are shown in Fig.

5.4.5 Comfort zone:

Range for comfort conditions are 29°C - 32°C temperature and 30% - 70% for relative humidity, and the charts for the various climatic parameters shows that conditions in the FCT

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1 Maboguje, 1977. Source: Master Plan for Abuja

hardly fall within the comfort range hence proper control measures through design have to be provided.

5.4.6 Design Implications for Site Conditions:

Condition I:

High temperatures with little cloud cover during the dry season and low humidity as against low temperatures, presence of cloud cover with high humidity during the rainy season.

Implication:

(i) Effective shading particularly vertical and horizontal shading devices can be used to counteract the effect brought by high temperature, low humidity condition.

(ii) Adequate cross ventilation of habitable areas is required for all year comfort.

(iii) High heat capacity construction.

Condition II:

Concentration of rainfall in July, August and September. Line squalls resulting in strong winds and intense rainfall causing damages to property.

Implication:

(i) Drainage systems which can handle large volumes of water is required.

(ii) Presence of iselbergs located near site particularly Aso hill can cause relief rainfall (microclimatic effect).

(iii) Proper detailing of roof sections is required for stability in roof structures.

Condition III:

Dry and dusty conditions brought by the north east trade winds against the cooler conditions brought by the South, East winds.

Implications:

(i) Planting screen would be used to offset the effects that bring dust and dryness from Sahara desert.

(ii) Proper orientation of building would take advantage of the tropical maritime winds.

(iii) Openings and glazed areas will face north or south where the effect will not be really felt.

(iv) Courtyard effect to give shade and protection.

5.5 Population and Employment Projection:

Forecasting the size and economic variables for the new Federal Capital with undue consideration of the development guidelines proposed by the Federal Capital development authority and is as follows:

(i) The Master Plan target year is the year 2000.

(ii) The new capital would be permitted to grow to a maximum population of approximately 3 million after which population growth will be accommodated in satellite towns.

(iii) The capital city will be an administrative centre and will not be oriented to developing broad economic base characteristics of other large cities of Nigeria or that would be typical of a primate city.

(iv) The new capital and capital territory will have a limited quantity of light industrial agricultural research and development and housing activities to provide a city building industry, foster and provide social diversity, support service facilities related to unique capital city needs, such non-administrative, institutional, or industrial activities that take place to build and serve the city will be compatible with the environment.

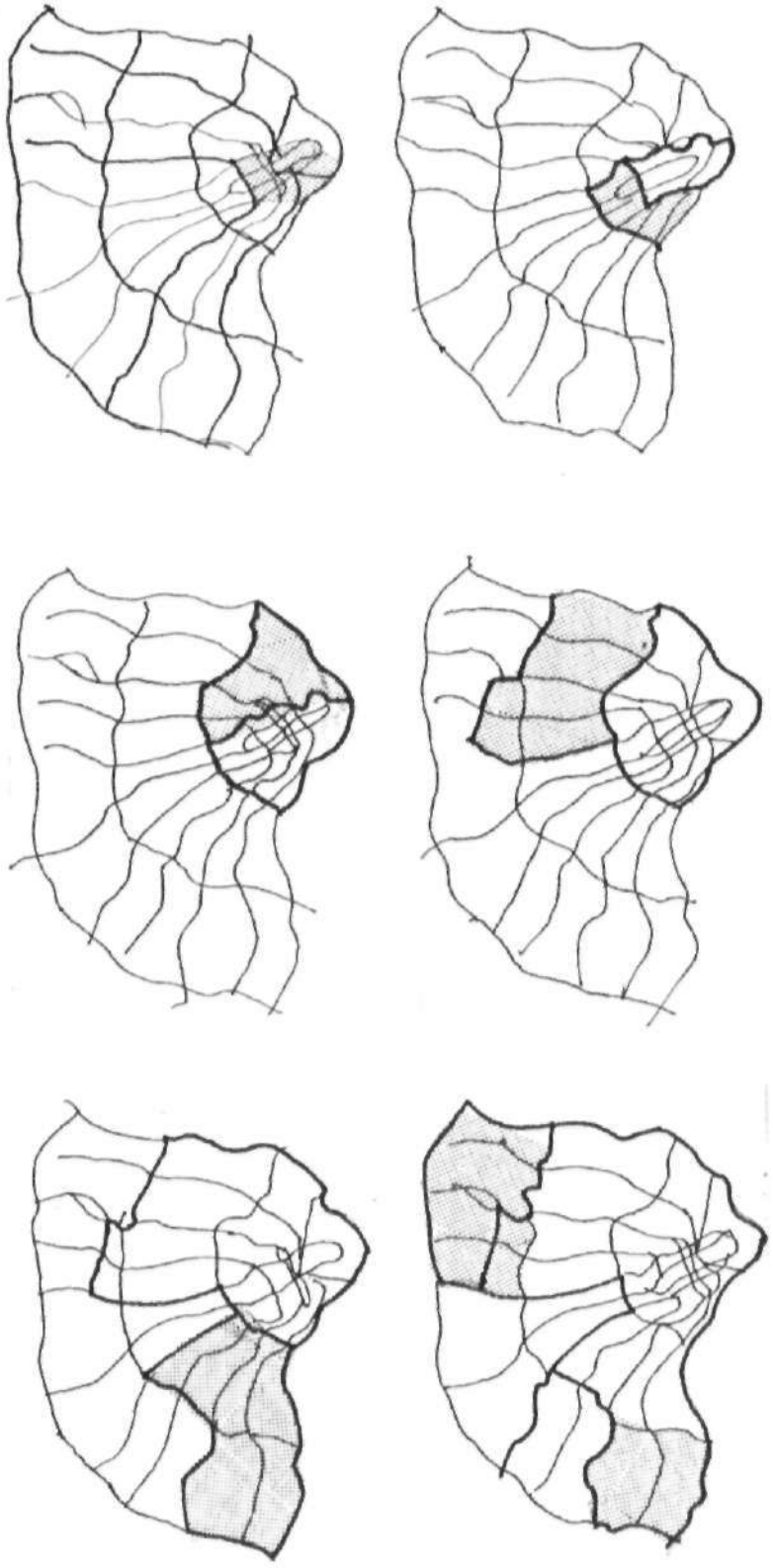
Population development projection of the Federal Capital city is organic in nature with linear growth from the inner core spreading its tentacles in two opposite parallel development corridors.

In 1986 the estimated population projection was 230,000 people, who were to occupy the public sector employment and construction labour force forming the majority of the population.

The development processes are within designated ring roads which serve as incremental growth identification limited to different development phases I - 6.

The projected population that will occupy the areas within Ring Road No. 3 with variable economic sectors fairly distribution for the year 2000 will be 1.6 million people.

Table 4: Showing the development sequence of Abuja



Source: Master Plan of Abuja, New Federal Capital Territory.

Below is the incremental growth in population according to phase development in the Federal Capital city.

Phase I	-	Population	50,000
Phase 2	-	Population	92,000
Phase 3	-	Population	230,000
Phase 4	-	Population	610,000
Phase 5	-	Population	1,050,000
Phase 6	-	Population	1,600,000

5.6 As a new developing capital, basic support infrastructure must be developed to aid its functioning. These utility systems are water supply waste water disposal, drainage, solid waste management, telecommunications and power. They have all been planned in response to the expected demand of the future population.

5.6.1 Transportation:

Two distinct types of transportation services are provided in the Federal Capital Territory to make sure it becomes a viable and efficient national capital; they are:

(i) Those that accommodate the daily functioning of the capital e.g. Roads, streets, public services and a myriad of ancillary facilities.

(ii) Those that allow the New Capital interact with the rest of Nigeria e.g. air services, inter-regional highways, railroad and trucking system. However, because of the nature of the project, discussion is limited to the road systems around the site.

(i) **Collector Roads:**

The side is bounded on the North eastern axis by the collector Road C_3. Collector roads generally connect the neighbourhood units with the arterial street system and also provide access to minor level attractions within the sector. They provide movement within district, movement to district centre, with ultimate destination of sector centre. They are usually paved, 2-4 lanes street not continuous for longer distances with parking generally provided with 28m right of way.

(ii) **Local Street:**

The site is bounded on the north and north eastern sides by local streets still under construction. These local streets provide immediate access to individual dwelling units or buildings and generally connects these units to the collector road system. They are usually two lanes and can be either be or unpaved, stabilized shoulders and parking generally permitted. They also provide movement to neighbourhood centres, emergency and service vehicle access to building properties, and are 21m right of way.

(iii) **Aterial Roads:**

The aterial road is linked with the collector road C_3 by the local street; it does not bound the site but it provides thorough access and is a surface

road with 39m right of way. Provides movement within the sector, from sector centres and access to expressway systems. They are usually 4-6 lanes with median and side walks and parking generally provided.

5.6.2 Water Storage, Supply and Distribution:

Water supply sources in the FCT are divided into three major groups:

(i) Ground water supplies within the FCT

(ii) Surface water supplies within the FCT

(iii) Surface or ground water sources outside the FCT

(i) Ground Water Supply:

These are relief areas that have sufficient potential, they include the geological structures of Karu Agwai hills, alluvial deposits along Gurara river and Saprolite deposits underlying Gwagwa plains.

(ii) Surface Water Supplied:

Due to the unavailability of a detailed stream flow data of rivers in the FCT, field observations and available rainfall data shows that the stream flows in dry season is very low and cannot provide dependable source of water for consumption in urban areas. However deep reservoir sites with limited free surface area, large, steep catchment to maximize rain water in flow and relatively inaccessible to man to prevent any likelihood of contamination by disease are very difficult to located.

This is due to the general flat topography of the FCT therefore sites used for reservoirs are found in steep and hilly areas of Bobo plains, Zuma-Buari-Aso hills, Karu-Agwai hill areas.

(iii) Surface and Ground Water Supply Outside FCT:

The seasonal fluctuations in river flows causes the search for sources of constant surface water outside the FCT. The Table shows the options for the supply of water outside the territory.

Table 5: showing preliminary identification of reservoir sites in the FCT.

River Site	Dam cost		Reservoir		
	height (ft)	length (ft)	pool elevation)	volume (AC-FT)	monthly average flow (AC-FT)
Afara-Bowol	200	4000	500	500,000	7,000
Usuman Upper	100	3000	2100	200,000	5,000
Usman Lower	100	5000	1900	200,000	4,000
Tapa	100	3000	2200	200,000	2,000

Note: All statistics are preliminary estimates, used in initial screening.

Source: Master Plan of Abuja

5.6.2 Water Storage and Distribution:

The location and sizing of various water storage and distribution facilitiesaare based upon a series of technical factors and the configuration of plan itself. These factors include:

- maximum day demand is equal to 2.0 the average.
- peak hour is 150.0 percent of maximum day
- pressure requirements - Government areas 21m, sector centres 12m, industrial areas 12m, residential areas 23m, hydrant coverage 0.7/hectare.

Note: Maximum reliance on gravity flow.

The supply and distribution of water has its system along the north and east perimeter of the city where highlands provide natural settings for storage facilities at the same time permitting gravity flow from treatment plant. These storage tank location provide sufficient elevations with minimum distance to distribution system while the tanks provide 25 percent of the estimated maximum day demand plus fire requirements.

Distribution network consists of transmission lines, feeder mains, distribution mains and water storage tanks. They are all loops following transit spines and circumferential arterials.

§.6.3 Waste Water Management:

Waste water management plans for the capital city is based on two considerations. Firstly treatment and disposal of sanitary wastes must be conducted in such a manner to the objectives of maintaining public health. Secondly waste water effluent represents a valuable resource for agricultural irrigation or water supply for other towns and villages in FCT.

Collection System:

Preliminary design of the sanitary sewerage system in FCT is based on the following objectives and rationale:

- The system should be gravity collection with no lift stations, force mains or other powered devices.
- There should be separate systems for storm run offs and sanitary sewerage in order to reduce loads on the treatment plant.
- Construction should be in stages in order to match the growth of the city.
- Isolation of industrial and domestic sanitary sewer system wastewater outputs for future reuse.

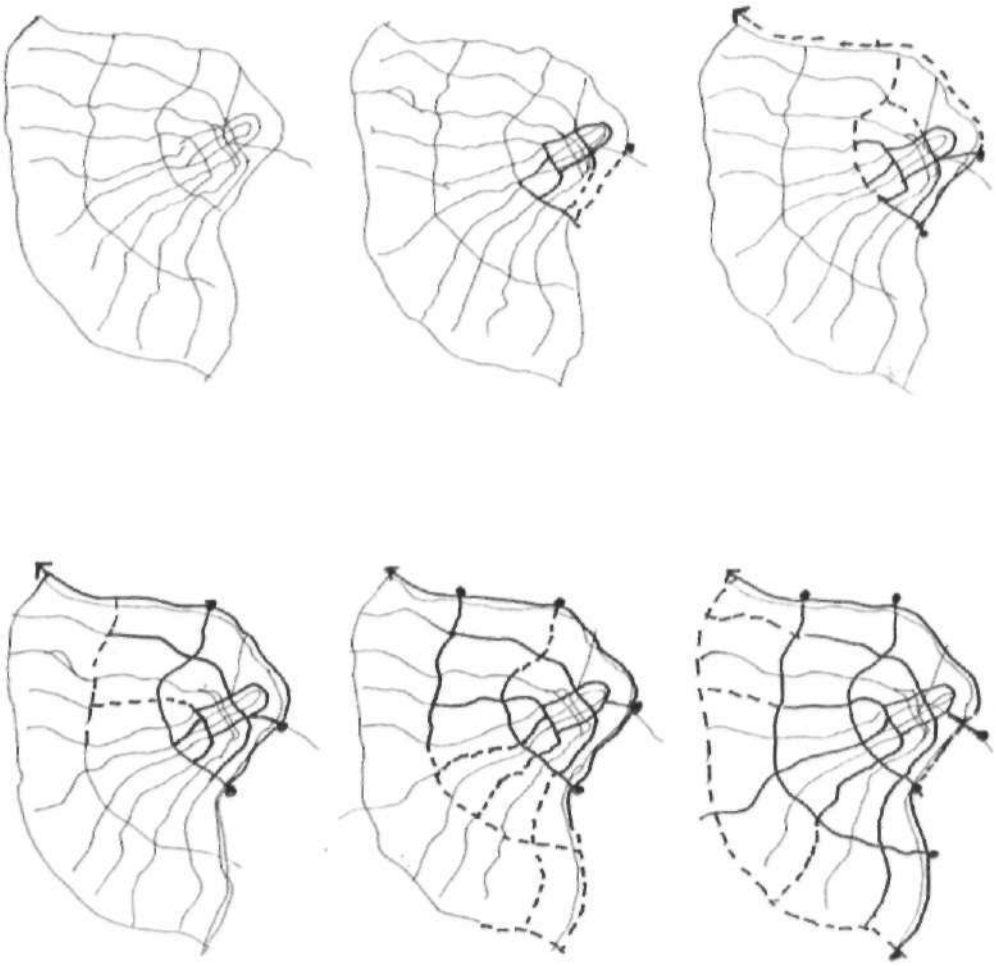
Apart from the above objectives, technical city of the preliminary design is also based on:

(i) Each building site will be provided with sewer distribution.

(ii) Depth of non-rippable rock has been assumed to be approximately two metres.

(iii) Minimum pipe size used in house connections regardless of level of size is assumed to be 10cm with manholes at junctions and intervals of 90m.

Fig. showing waste water system phasing.



Source: Master Plan of Abuja, New Federal Capital Territory

Table 6 showing supply options for the new city out FCT

Source	Distance	Pumping requirement Elevation[1]	Availability[2]
Shiroro Reservoir	70-80	-30-0	Inexcess of 117 x $10^6 m^2/yr^3$
Niger Benue	100-130	350-400	Likely in excess of $200x10m^3/yr^4$
Makurdi	180-200	350-400	Unknown (high)[4]
Mada River	70-80	Approx. 200	Unknown (high)[4]

Source: Master Plan for the Federal Capital Territory

Notes: 1. Surface elevation at source is approximately city elevation.

2. Anticipated average demand approximately $11x10^6 m^3$/ year in 1986, 115 x $10^6 m^3$/year in the year 2000.

3. Based upon NEPA statements

4. Based upon basin size

5.6.4 Run Off Management Systems:

An urban centre of the size of the FCT has its construction causing an increase in stream channel degradation/aggradation rates as run off is increased in both magnitude and velocity by the construction of roads, buildings and stream channelization. Removal of top soil and creation of impervious built areas increases the volume and rate of storm water run-off from urban areas and if adequate care is not taken the development of the urban centre will increase stream flows and eventually result in local flooding and erosion problems.

Therefore the overall runoff management plans which must have an optimal balance between protection, cost and flexibility and will not preclude the future growth and changes of the capital city include:

(i) Piped storm drainage systems should be avoided in all phases of construction of the city for both health and cost reasons;

(ii) Where required, pipe slopes should be kept as flat as possible with net reduction in conveyance system sizes in downstream reaches because of the larger diamer pipes required.

(iii) Ditch and open-channel systems with culverts and bridges at appropriate pedestrian and vehicular crossings should be employed while modifications of channels, crossings should be sized to minimise disturbance of the natural stream regions.

(iv) Acquisition of meterological data on an event specific basis should be initiated immediately to support the required detailed design of the system.

5.6.5 Social Waste Management:

Main focus of social waste management objectives is on management of solid residuals in a way that would utilize the residuals as a resource, protect public health and utilize management systems which can be easily maintained and operated solid wastes sources can be residential, commercial, municipal, industrial, open areas and treatment plant, and each source has different facilities, location, activities and types of wastes. Food wastes, rubbish, demolition and construction wastes, litter, treatment plant waste are few examples of the waste expected in FCT. Hence the preliminary program is based on

(i) The inplace (compacted) solid waste density at landfill sites will be $450kg/m^3$.

(ii) Collection will be twice weekly.

(iii) Collection points will be highly accessible to collecttion equipment.

(iv) The composition of solid waste stream will be compactible with the use of metal or plastic containers and can be hauled by tractors-traller combination or loaders.

(v) Waste paper produced by government will be recycled.

Collection:

Collection of solid waste is a two-step functional system involving an on-site handling, storage and processing system and a coorcinated collection system to transport the waste to disposal area. The following recommendation is made concerning the collection of solid waste:

1. Non-Residential Waste - Curbside or alley collection; putrescible waste in covered 75 litres containers or larger and non-putrescible waste, in similar containers with no requirements.

Collection should be twice a week with special collections from specific customers. The equipment should consists of front, side or rear loading trucks with tilt off frames and compaction mechanism.

5.6.6 Telecommunications:

Development of telecommunications system is an integral part of the development plan of the modular sectors from the governmental and public facilities to institutional and residential and based on a concept which develops in phases, as the federal city grows.

5.6.7 Electrical Energy:

Current consumption of electrical power on a per capita basis is low in Nigeria. However the most feasible and economical option of supply is by direct connection to the national power grid through double 132kv (kilvolts) lines to Abuja.

The electrical distribution system is based on:

1. Transmission system - involves connection of national grid system with bulk power at 132/330kv to the capital city and for power supply to substations within the city.

(ii) Substations - transmission points from the system to distributive systems within areas of city at which voltage is reduced from 132kv to 11kv.

(iii) Distributive systems - from substations to individual districts within the FCT.

CHAPTER SIX

6.0 DESIGN CONCEPTUALIZATION

6.1 Brief and Users Requirements:

Project - NIGERIAN EXPORT PROMOTION COMPLEX

Site - ABUJA

The thesis is an architectural proposal for the establishment of a financial institution that will coordinate all trade and related activities which include promotional services, research and consultancy services, concentrating particularly on export trade, in view of the prevailing poor economic growth of the country.

6.1.1 Brief Development:

The Nigerian Export Promotion Complex would consists of core departments which have several units within them.

(i) Administrative core: This core comprises of the management and general administrative unit. It is made up of facilities that are concerned with the day to day running of the institution and coordination of the various zonal offices.

(ii) Management Offices: This core is made up of units that give services to the general public, they include trade enquiries and replies services, export finance and incentives, product and market development.

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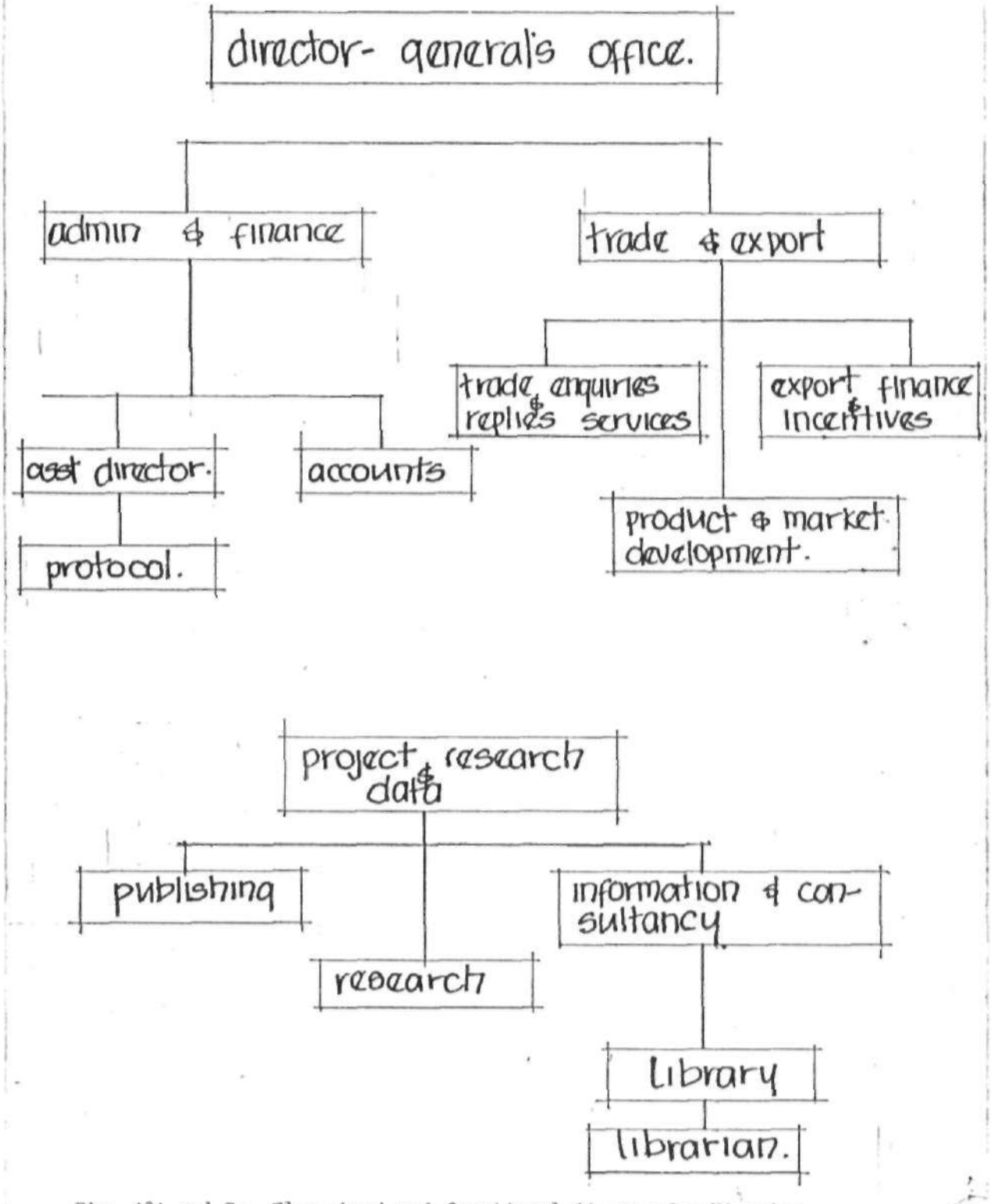


Fig. 13A and B: Flow chart and functional diagram for Nigerian export promotion complex

(iii) Ancillary core: This comprises of services for both the general public and staff. They are the lounge, canteen, kitchen, shops, etc.

(iv) Service Core:

6.2 Design Proposal:

The proposal for the thesis is based on facilities existing in the council and those identified from the various case study that would improve the effective functioning of the complex.

Facilities:

1. Vehicular parking for visitors and staff
2. Management offices
3. Exhibition gallery/multipurpose hall
4. Auditorium/conference facility
5. Services - lift shafts, stairs, toilets and stores.
6. Ancillary - kitchen, canteen, lounge, etc.
7. Concource/reception plaza
8. Service bays/service entrances

6.2.1 Vehicular parking:

This should accommodate a maximum of about cars, and would be divided into visitors and staff parking respectively in order to minimise noise and disturbance. and proper definition of vehicular traffic pattern.

6.2.2 Management offices:

Management offices is made up of two parts: the Directorate which comprises of private offices of executives and support facilities which attend to the general public namely the finance and administrative, library, data unit, information, consultancy services.

6.2.3 Exhibition gallery/Multipurpose:

This is a public area, due to the nature of the activities of the complex, a permanent exhibition area is required, and since its going to be flexible, it can be partitioned or left open and rented out for functions to tenants and general public. Because of the various conferences and seminars which would be held, it can also be used as a banquet hall.

6.2.4 Auditorium:

This should accommodate a maximum of 150 people, support facilities would also be provided. It is also expected to be flexible, with the rise of seating tiers taking cognisance of sight lines.

The main activities expected to take place are seminars, international conferences, training sessions, etc, so strong reflectors would not be required as electroacoustic appliances would be used by delegates.

6.2.5 Services:

Is made up the main vertical transportation, and consists of lift, stairs with male and female toilets, Janitor's store. Other facilities e.g. airconditioning, water supply, sanitation, ventilation, air cooling, refrigeration, electrical distribution and equipment, telecommunication and transmission security would depend on engineering services for the building.

6.2.6 Ancillary:

This is made up of facilities which are public orientated and have to do with the welfare of the workers. It is made up of a staff canteen, lounge supporting kitchen, etc.

6.2.7 Concourse/Reception area:

This is the main approach of the complex and so entrances must be clearly defined with a good view to the interior.

It is the place where the visitor gets the first impression of the building, and also where circulation would be distributed to other parts of the complex.

6.2.8 Service Bays:

This should be provided for the ancillary area, and should have enough space for full manoeuvring of vehicles and trucks for delivery services.

6.3 Schedule of Accommodation:

Office layout is based on several factors which include antropometrics, file space, storage space, equipment and furniture spacing, however the layout in general is always based on one fundamental grid dimension: the planning module or basic dimensional unit for the internal layout of the building.

Before a planning grid system or module is decided upon, actual requirements and anticipated requirements that subsequent changes will likely produce must be considered.

6.3.1 Grids:

There are four types of grid:

1. Structural grid
2. Constructional grid
3. Servicing grid
4. Planning grid

(i) Structural Grid - the grid that regulates the placement of the main structural columns of the shell.

(ii) Constructional grid - the grid that regulates the placement of window mullions and also governs all other grids to a large extent.

(iii) Servicing grid - This grid regulates the distribution of services throughout the structure.

(iv) Planning grid - This regulates and considers partitioning systems especially when dealing with deep office spaces.

Structural, servicing, and planning grids are usually multiples of the constructional grid, so a constructional grid of 6.0m x 6.0m was chosen, with offices being multiples of this dimension.

STAFF BREAKDOWN

I.	BOARD OF DIRECTORS	
	Office of the Chairman	$54m^2$
	2 Statutory appointees	$42m^2 \times 4$
		$= 168m^2$
	2 members of board	$36m^2 \times 2$
		$= 72m^2$
	Secretaries (2)	$20m^2/24m^2$
II.	DIRECTOR GENERALS OFFICE	
	Director General	$42m^2$
	Confidential Secretary to D.G	$30m^2$
	Secretary/Typist	$20m^2$
IIIa	ADMINISTRATIVE AND FINANCE	
	Deputy D.G	$42m^2$
	Confidential Secretary	$30m^2$
	Principal Protocol Officer	$30m^2$
	Assistant Protocol Officer	$30m^2$
	Departmental Secretary	$20m^2$
	General Office (6)	$20m^2$
IIIb	Principal Finance Officer	$50m^2$
	Principal Accountant	$24m^2$
	Internal Auditor	$24m^2$
	Executive Officers (2)	$20m^2$
	Accountant I	$20m^2$
	Confidential Secretary	$20m^2$

	Typist/Secretary	$20m^2$
	General Office (2)	$20m^2$
	Messengers (2)	$18m^2$
IV	TRADE ENQUIRIES/REPLIES:	
	Director/Head of Division	$36m^2$
	Assistant Director	$30m^2$
	Secretary (Confidential)	$24m^2$
	Secretary/Typist	$20m^2$
	Export Registrar (2)	
	Duty drawback officers (2)	
	Enquiry replies (3)	
	Messengers (2)	
V	EXPORT FINANCE/INCENTIVES	
	Director/Head of Division	
	Assistant Director	
	Confidential Secretary	
	Secretary/Typist	
	Export Officers (2)	
	Accountant II	
	Costing and pricing	
	Clerical Officers (4)	
	Messengers (2)	
VI	PRODUCT AND MANAGEMENT	
	Director/Head of Division	
	Assistant Director	
	Confidential Secretary	

Typist

Clerical Officers (4)

Messengers (2)

VII PROJECT RESEARCH

Librarian

Data unit (4)

Computer Analysts (2)

Receptionist

Project Supervisors(2)

VIII TRADE INFORMATION

Publishing Unit

Printing Unit

Public Relations Officer

Switch Board Operators (2)

6.4 General Office Planning Principles:

The design of corporate buildings is based on a lot of factors. These factors have to be considered when designing office buildings and they are:

(i) office layout types

(ii) Structural systems

(iii) External wall construction

(iv) Airconditioning

(v) Fire protection in buildings

(vi) Acoustic in buildings

6.4.1 Office layout types:

There are different types of layouts based on two principles:

(i) Office spaces are accessible from corridors in which case single, double and triple layouts may be distinguished.

(ii) Office spaces are accessible from a utility or service core with corridors being dispersed with.

The single, double and triple layouts are based on the provision of corridors providing access into offices and the economy of these layouts depends on the ratio of office space to circulation and also ratio of utilised space to the available space itself. However these layouts are relatively high in construction cost and the continuous corridor associated with it results in inadequate lightning and ventilation of rooms whose depths cannot be varied.

Single zone layout: Single zone layouts have corridors on one side with offices on the other side, but this layout is usually suitable for public buildings like schools than offices where requirements of hygiene rather than economy are the determining factors (See Fig. 16).

Double zone layout: This is good for a medium sized office building. It is extremely economical and satisfactory access can be provided in the form of a main and a secondary staircase, or a central utility core. Both double and triple

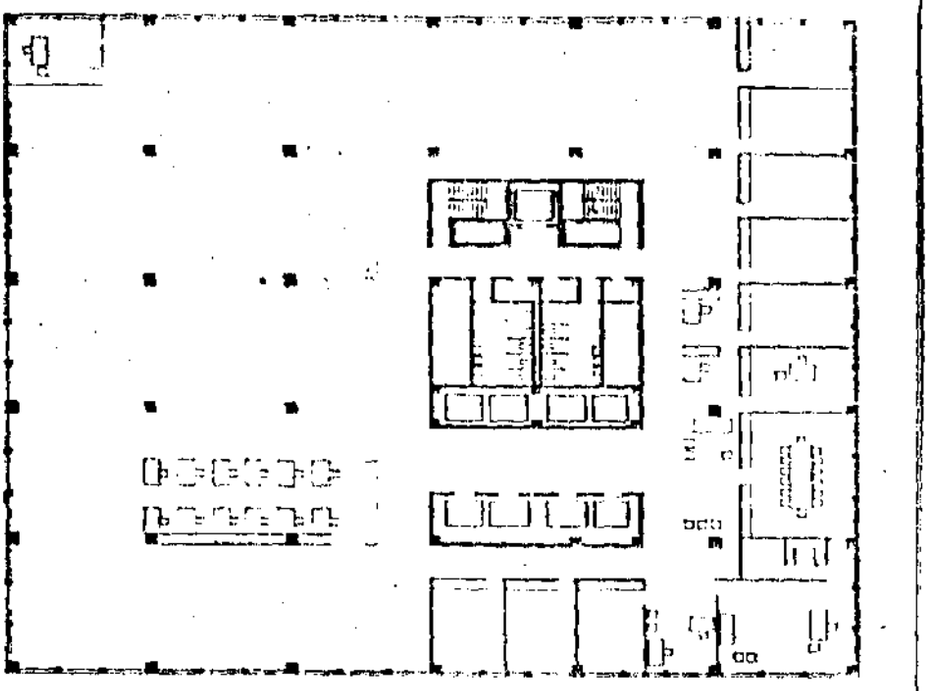


Fig. 17: Typical Open Office Layout Plan

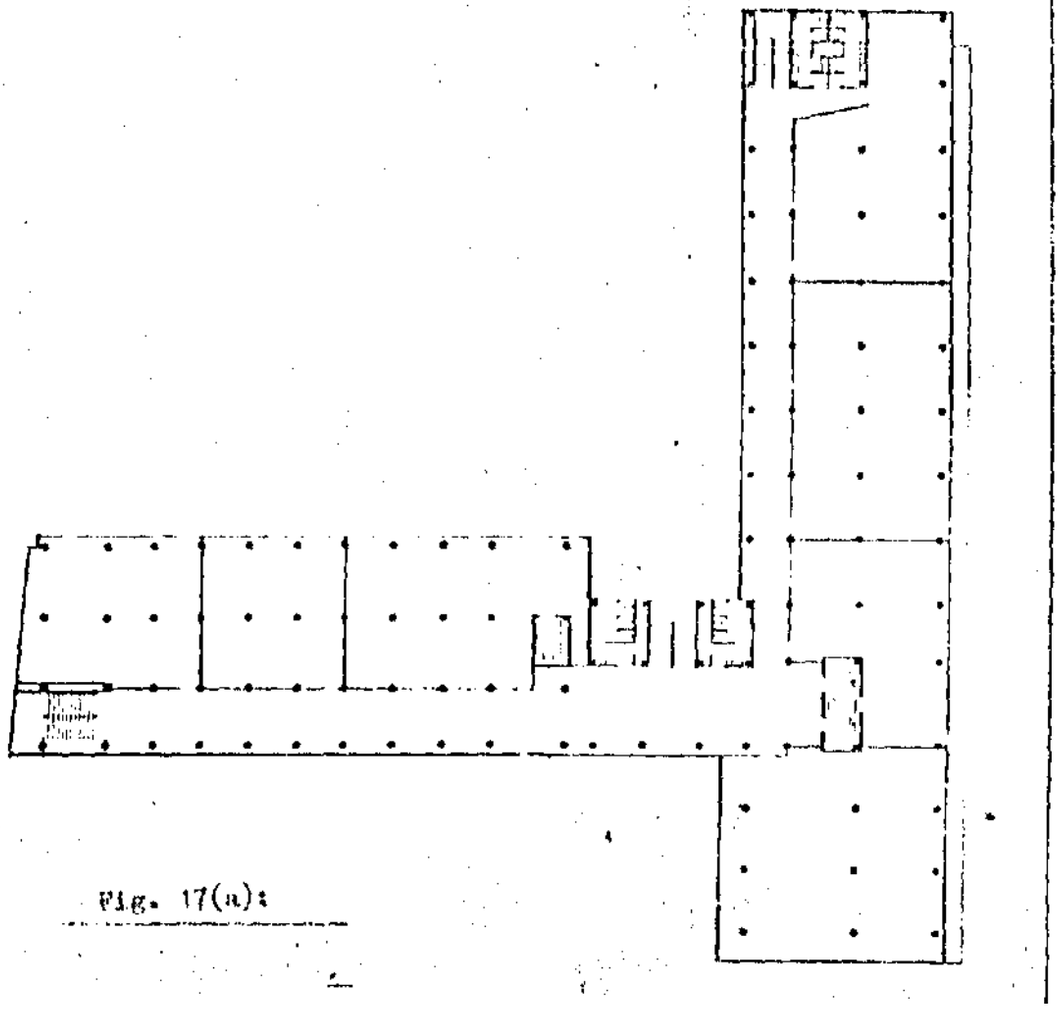


Fig. 17(a):

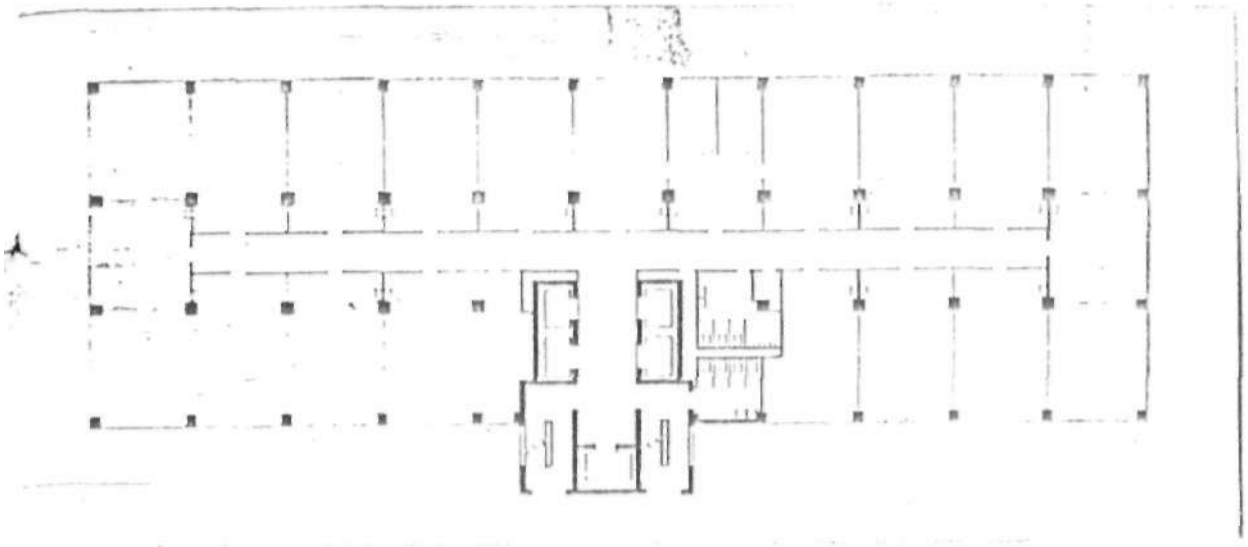


Fig. 15 - Typical Double Zone Layout Plan

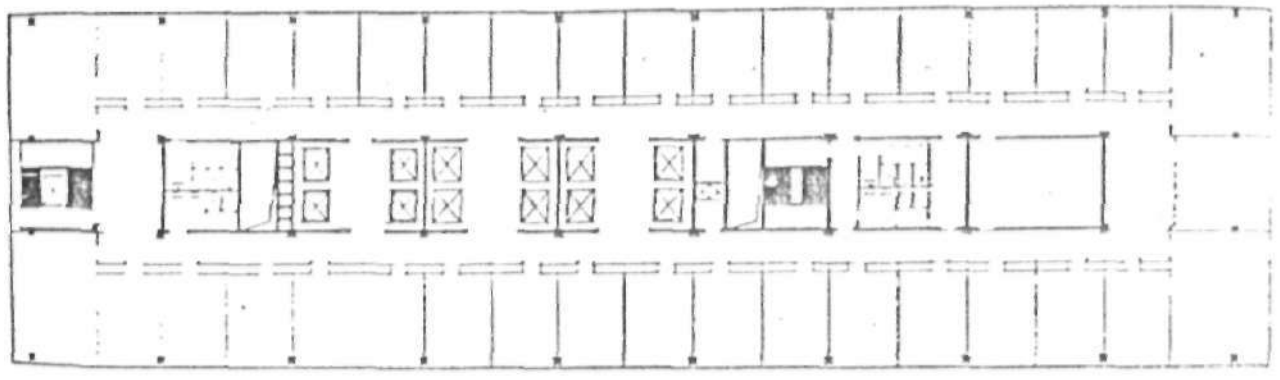
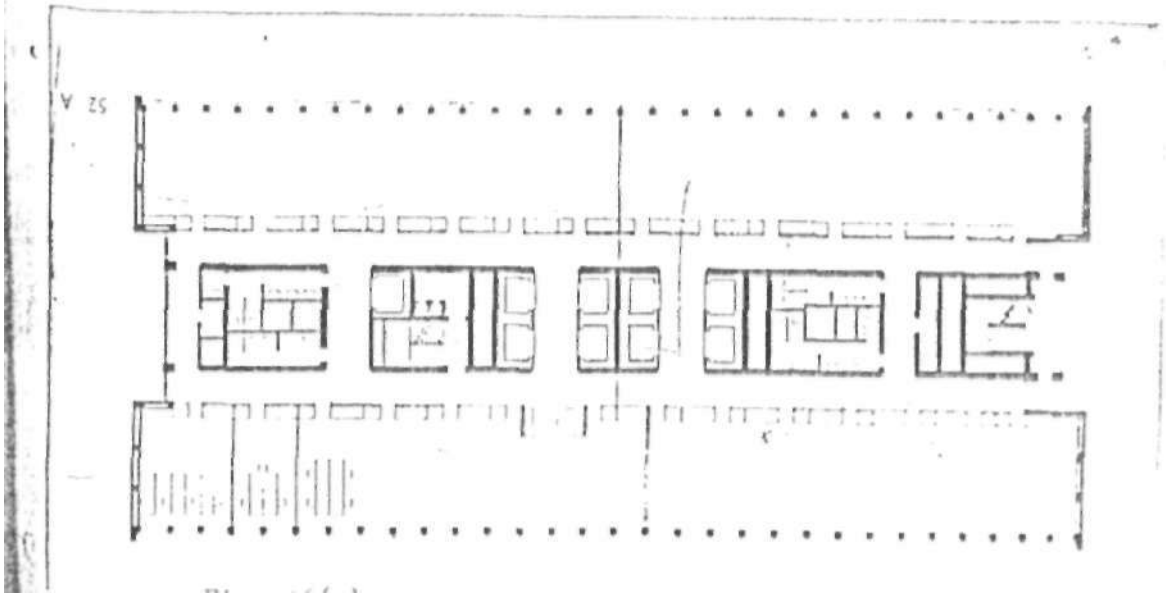


Fig. 16 (a) Typical Triple Zone Layout Plan



layout should be orientated so that the longer sides of the offices have northern and southern exposure while offices facing east and west have shading devices or sun blinds.

Triple zone layout: This is modification of the double zone layout, where all circulation facilities and sanitary accommodation are placed in the central zone in the interior of the building.

The offices are arranged without interruption along the external walls which makes it possible illuminate and venticate corridors from the end walls.

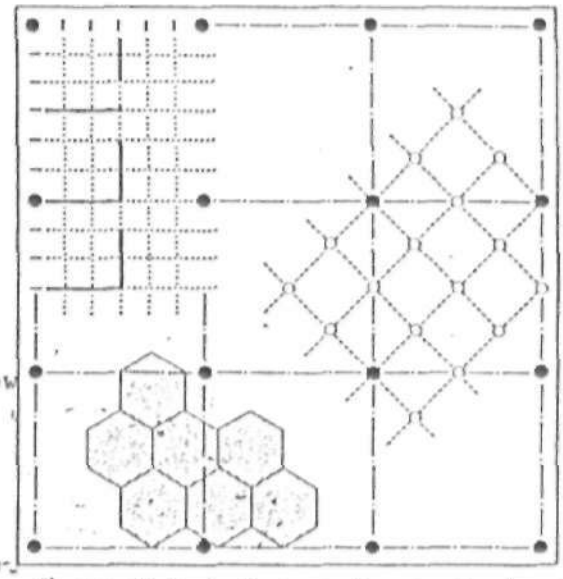
The triple zone layout is not only economical but offers many advantages e.g. aesthetics and structural design.

Open Plan Office:

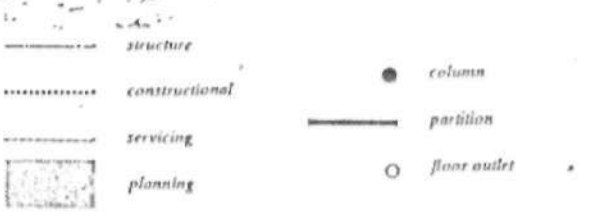
This layout is without corridors and permits rational utilisation of the entire floor space available for offices. The absence of partitions makes it a cheaper form of construction.

This system cuts out the high cost of installing and rearranging movable partitions, facilitates supervision and interaction of the entire staff. It permits large open layout office area with vertical circulation elements being centrally located. However an efficient airconditioning and lightning system is required so artificial means can be a permanent adjunct

Fig. 14: Illustration of how grids affect corporate design

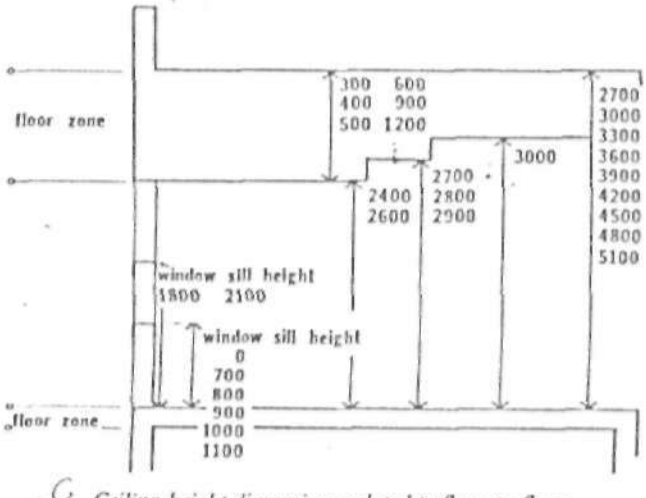


A. Four kinds of grid: structural, constructional, servicing and planning





B. Grids cannot be considered in plan alone—the section must be considered



C. Ceiling-height dimensions related to floor-to-floor heights and floor thicknesses. Window sill height to be considered for visual comfort of workers sitting at desks

to natural lightning and ventilation. Noise is a disadvantage of the layout but can be mitigated by suitable design of ceilings and walls.

6.5 Site and Design Concept:

These two concepts development forms the framework of the thesis; these processes deal with the existing natural features on the site and the evolution of forms for the design.

6.5.1 Site concept:

This is the first part of the sketch design process and is the combination of both the physical and natural elements on the site, the whole concept development takes into cognizance -

Flexibility

Efficiency

Adaptation.

The main objectives of the site concept is to design an architectural functional layout by:

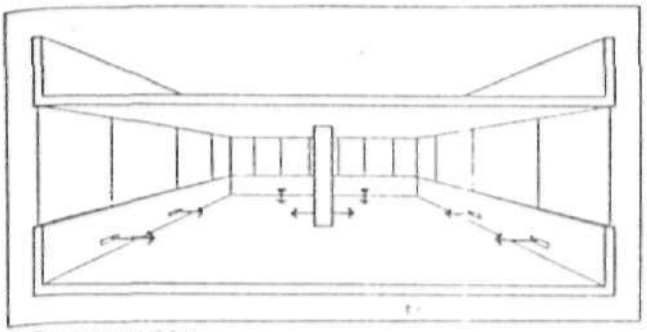
(i) producing a halmonious and organic flow of architectural entities;

(ii) taking proper advantage of the existing views and vistas;

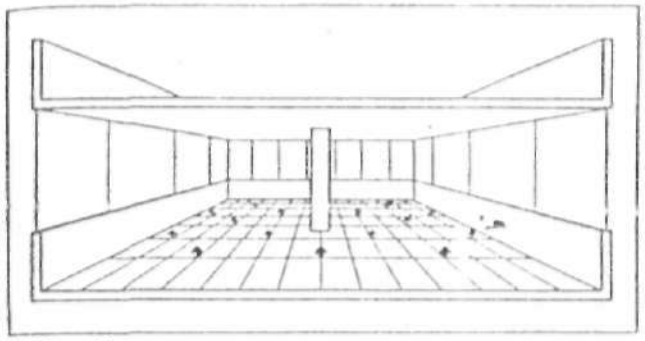
(iii) organise the natural elements of orientation, and circulation round the site;

(iv) produce a concept which will adapt itself to the existing constraints of noise levels, expansion, etc.

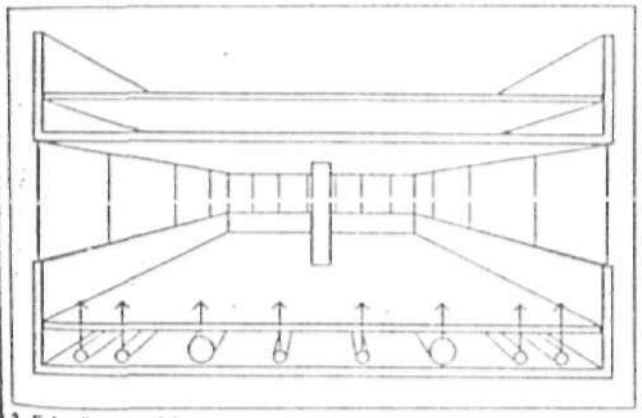
Office buildings



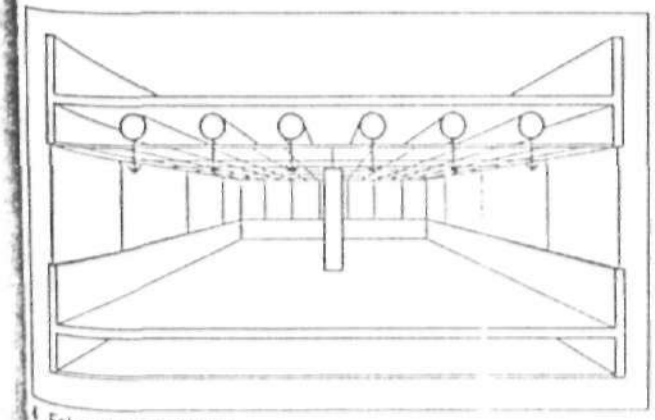
1 Perimeter servicing



2 Floor grid



3 False floor servicing

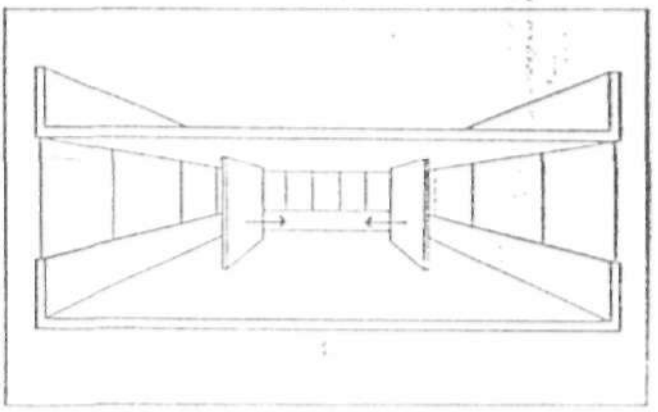


4 False ceiling servicing

OFFICE SERVICES

Demand for services in offices increasing. Each work place must be next to outlets for power and telephone. Coaxial cable access for terminals frequently required: with increasing automation and telecommunications will become common see work stations with 6 or even 8 wires of various kinds. Already some organisations provide 1 terminal for every 2 work stations. Precise need for connexions cannot be predicted: essential provide grid to which each work station can have easy access without dangerous, trailing wires. Such grid can be provided in following ways:

distribution at perimeter and through partitions
distribution through floor grid (usually 1800–2000 centres)
distribution through false floors (height should be 50–500)
distribution from ceiling (NB problem with safety)
distribution through fin walls (points at desk top height)



5 Distribution through fin walls

Fig. 19: Showing inservice distribution of offices

6.6 (i) Airconditioning: An airconditioning system system must perform the following functions:

a) heating and cooling

b) regulation of humidity (i.e. moisture content to suit temperature maintained in the room.

c) cleaning the air.

There are different methods of airconditioning and the most suitable for office block is the vapour compression method. Vapour compression method is divided into:

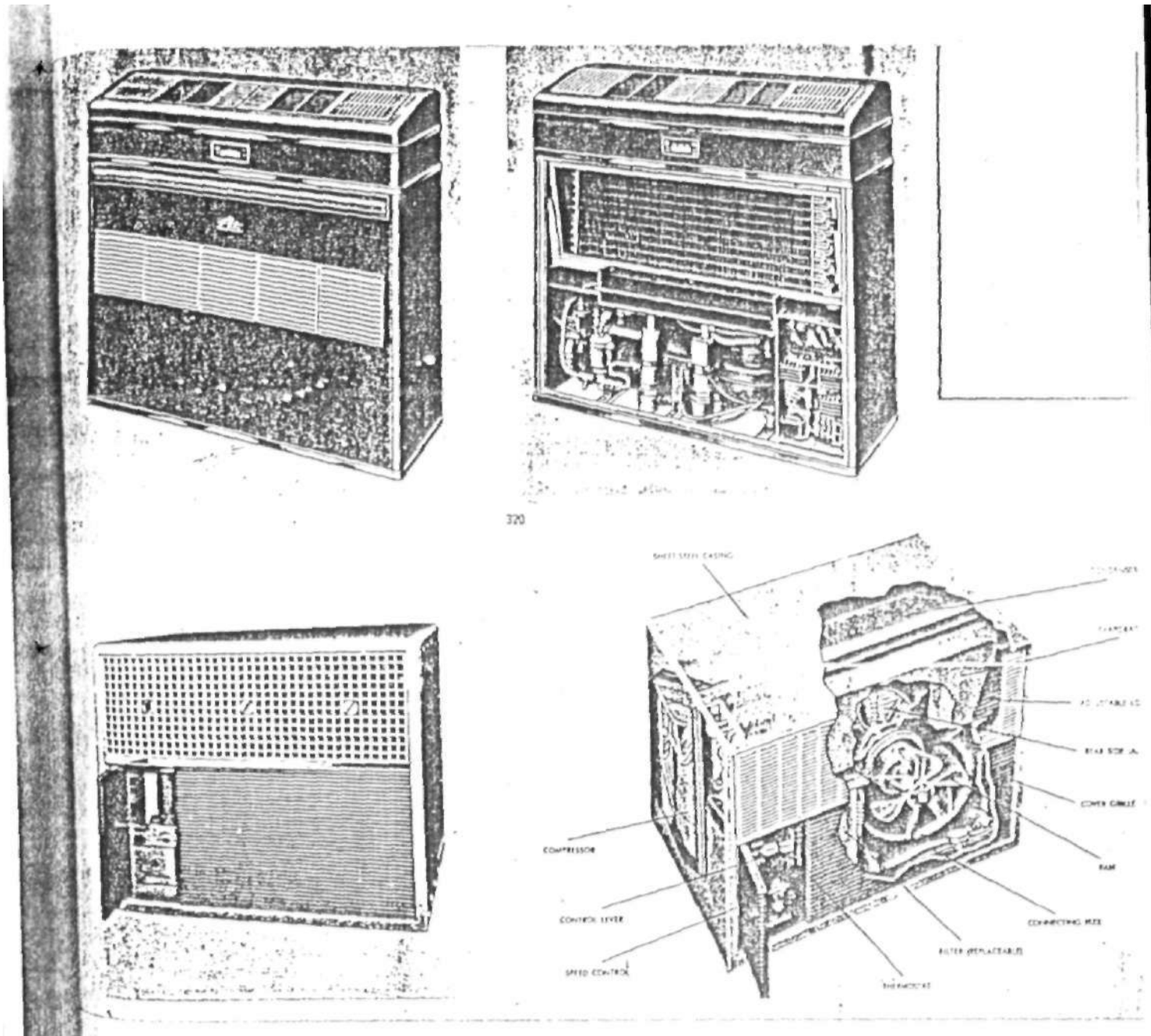
(i) Unit air conditioning system

(ii) Central air conditioning system

I. Unit airconditioning: These are self contained cabinets or box type. In this type, the air is drawn directly from outside the building into the air conditioner where it cooled, humidified or dehumidified cleaned and delivered into the room.

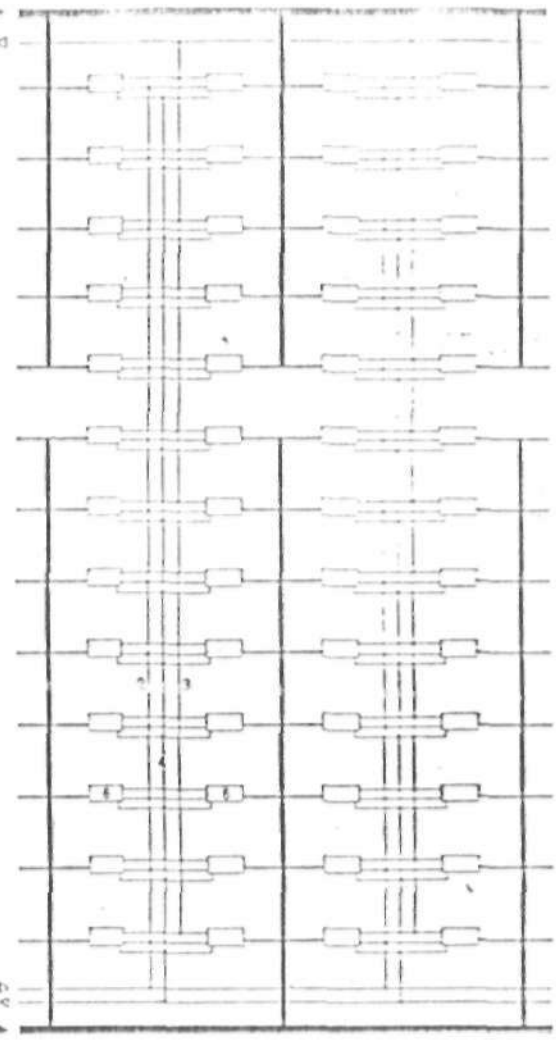
An advantage of this system is that the supply and return air ducts, which are expensive are eliminated, besides, the atmospheric condition of each room can be individually controlled.

II. Central airconditioning unit: This may be of the low pressure or high pressure type. The range of application and the potentialities of the two systems are determined by the difference in velocity.

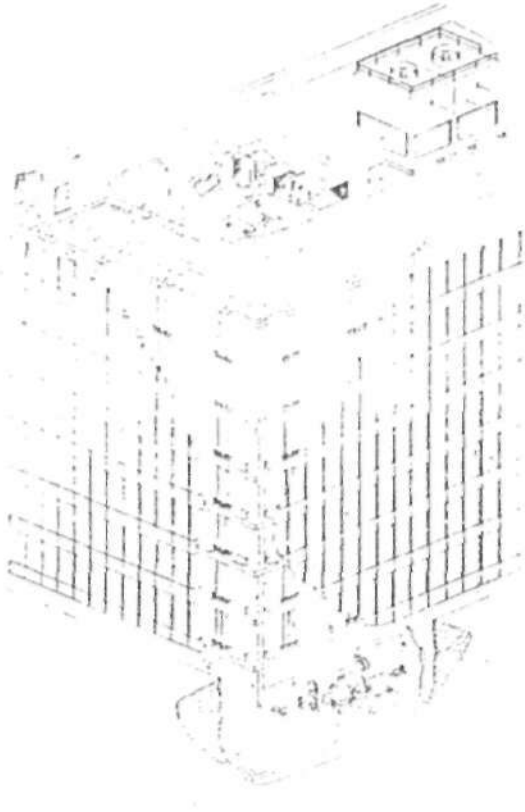


Unit - Air Conditioning Systems

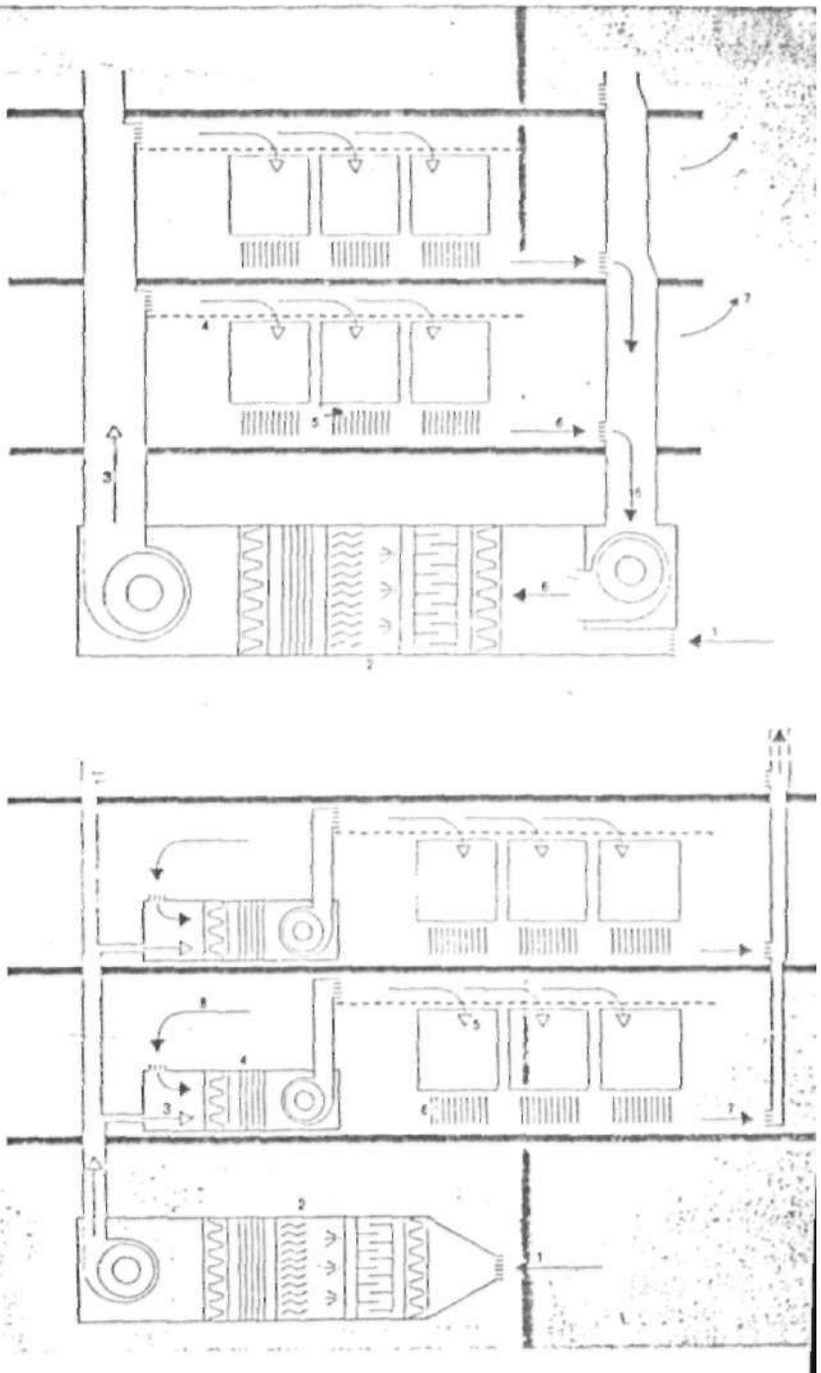
Plate 6: Airconditioning System



3.2 Diagram of a high-pressure air-conditioning system with convectors for a 13-storey office building. The building is served by two central air-conditioning plants, in the basement and on the top storey respectively. The central heating plant and refrigerating plant are installed in the basement only. The convectors on all floors are supplied with hot water (or cold water, if cooling is required) from the basement (flow and return pipes).
1 conditioned air supplied by plant in basement, 2 flow pipe; 3 return pipe; 4 condensate return pipe; 5 conditioned air supplied by plant in top storey; 6 convectors (induction units).



3.3 High pressure air-conditioning system with convectors for a seven-storey building (American example). The central conditioning plant and cooling tower are installed on the roof of the building; the refrigerating plant is in the basement. In the United States, office buildings are often heated by a district heating system.



1 Conventional low-pressure air-conditioning system: fresh air intake (approx. 20 %); 2 air-conditioning plant (spray preheater, filter, humidifier, dehumidifier, eliminator to remove surplus moisture, cooler, reheater; 3 supply air fan; 4 conditioned air delivered to room through perforated ceiling; 5 additional heaters at windows to prevent draughts; return of part of exhaust air to central plant (approx. 80 %); discharge to open air (approx. 20 %).

2 Improved low-pressure air-conditioning system: fresh air intake (approx. 20 %); 2 air-conditioning plant; supply air (approx. 20 %); 4 subsidiary plant with reheater and recooler; 5 conditioned air delivered to room through perforated ceiling; 6 additional heaters at windows to prevent draughts; 7 discharge to open air (approx. 20 %); 8 exhaust air returned to subsidiary plant (approx. 80 %).

Fig. 21: Low Pressure Air Conditioning Systems

6.6.2 Fire service and control:

Modern buildings require not only means of escape, access for fire brigade and structural protection but also first aid treatment.

Expert advice should be sought on appropriate provisions and maintenance of special installations. Common equipments for fighting fire e.g. buckets with water, sand, soda-acid fire extinguishers, foam extinguishers should be movable and placed at strategic points.

Fixed apparatus e.g. rubber hose reels, should be sited near means of escape and sprinklers.

Sprinklers are automatic installations and consists of grid of water pipes fixed under the ceiling with delivery heads on a 3m square grid. The water is prevented from emerging by glass or quartzoid bulb containing liquid with the liquid designed to expand and break the bulb when the temperature rises.

The bulbs are available which break at temperatures ranging from $68^{o}C$ to $180^{o}C$.

A spray of water is then delivered over an area of about $10^{2}m$.

Vertical escape facilities are imperative and should not be interrupted on flows. They have to be vented to prevent smoke accumulating in case of fire. Staircases are now pressurised and automatically increases when any fire detector registers an outbreak.

In summary, the following should be considered.

1. Provision of fire fighting equipment on all floors and ensuring that they function at all times.
2. Proper design solution of all high fire-risk areas, especially in terms of materials.
3. Security check to discourage prospective arsonists.
4. Adequate escape possibilities.

6.6.3 Acoustics in Buildings:

Acoustical problems can be avoided in buildings by considering the broad requirement early in the design process:

(i) Room shape and Quality: For large auditoria, halls depending on the use, where early sound reflectors are preferred, room shapes becomes a significant determinant factor on acoustics. Halls should be rectangular both in plan and section, while auditoria for speech and drama should be horse shaped on fan shaped because of the shorter reverberation time desired.

(ii) Internal Noise: Noise producing areas should be sited away from sensitive areas while buffer zones should be introduced e.g. corridors and storage areas.

(iii) External noise: This is usually transport noise from road traffic aircraft and railways. These noise sources cannot be controlled but can be reduced if the noise level is assessed and considered at the initial stage of design.

6.6.4 Sound Insulation:

There are two ways by which sound is transmitted:

(i) impact noise

(ii) airborne noise

Impact Noise: This is transmitted through material impact and affected by the density of the material the denser the material, the lower the transmission, so for building purposes concrete is the most suitable material against impact borne noise.

Airborne noise: This is transmitted through the air, and is affected by openings . Also considerations should be given to doors and windows since they are usually the weakest part of the envelope where sound insulation is concerned. Floors usually have direct structural excitation of a hard surface floor by footsteps. Thick carpets are an effective solution or floating floors. While insulation can be improved by suspending an impermeable ceiling below its walls.

Special consideration should be given to the thickness of the walls e.g. in committee roos, conference hall, etc while materials e.g. woodslats, thick curtains should be used.

6.6.5 Structural System:

There are five basic structural systems, namely:

(i) Bulk Active Systems - short rigid element monolitically connected and can span spaces by

by redirectingroads by means of their bulk e.g. column and beams.

ii. Vector Active systems: Short elements connected by pins and trangulated so that loads transmitted by members are either tensile or compressive e.g. trusses.

iii. Form Active Systems: Long flexible elements that must be achored at both ends, can span space and transmit loads either by tensile or compressive forces e.g. cables.

iv. Surface Active Structure system: Surface in particular shapes and can redirect forces to support and span spaces e.g. shells.

v. Vertical structure system: Solid rigid elements in vertical extension secured against lateral stresses and firmly anchored to the ground, collecting loads or horizontal r ans at high altitude. They can be -

i. Bay system where collecting points are easily distributed on the floor plan.

ii. Free span system - collecting points are arranged peripherally on the floor plan.

iii. Cantilever system - collecting points are centrally located.

examples of combinations of different systems of load transmission

systems of indirect vertical load transmission in bay type collection

suspension systems in vertical structures

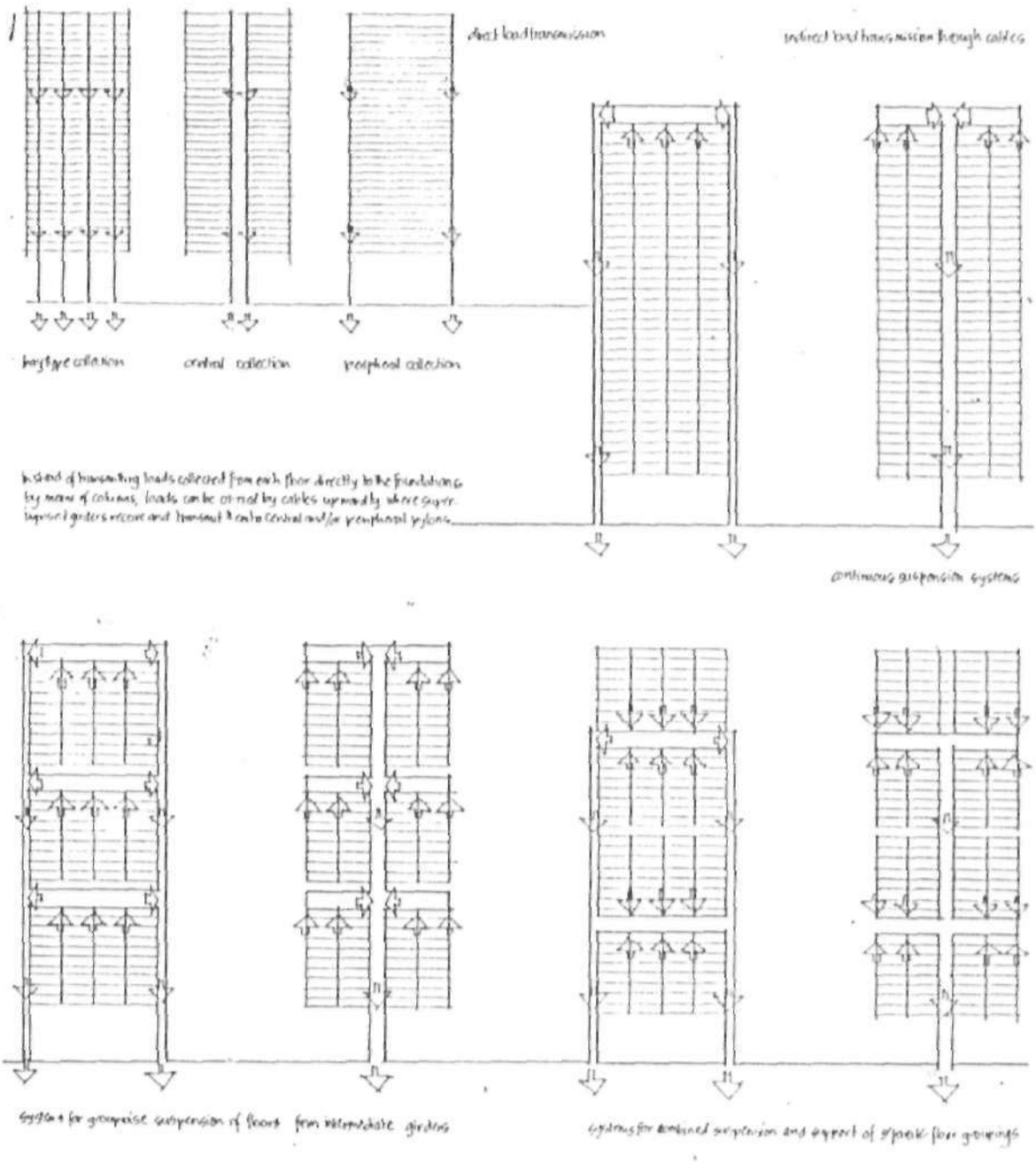


Fig. 21: Types of structural systems

systems of load transmission for vertical structure systems

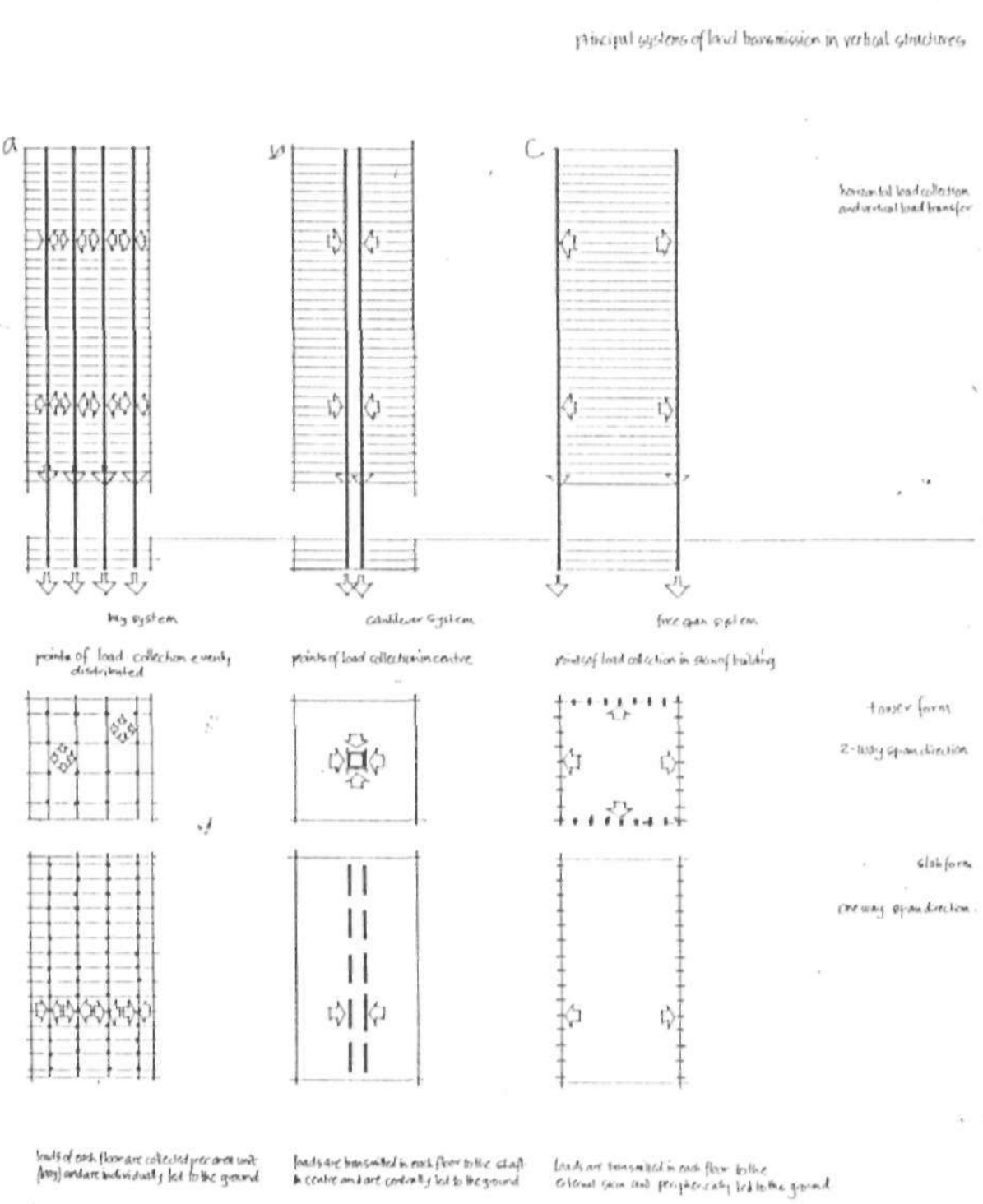


Fig. 21A: Types of structural systems

CHAPTER SEVEN

7.1 DESIGN REPORT

The form of the building was based on several factors namely

1. function
2. symbol and expression
3. aesthetic appeal.

The whole complex was divided into three separate units, all inter-related by lobbies and entrance foyers, they are:

1. The office tower
2. The ancillary areas
3. Main administrative areas
4. Reception area/entrance plaza.

The complex is approached from two points of ingresses/egress, a visitor parks at the visitors park provided and enters, the complex by means of concrete pavement, drop off facilities has been provided for very important guests.

7.1.1 Reception/entrance Plaza:

The reception area is the main receiving area, and a receptionist's desk is easily visible from the entrance plaza. This is the main point of distribution of traffic network into the various parts of the complex.

To the left is the main administrative areas, straight ahead the service core comprising the stairway, two lifts and toilet facilities is located while to the right are the entrance foyers to the auditorium, exhibition and lounge areas, however commercial activities consisting of light partitioned shops have been incorporated in the reception area and serves exhibition and entrance plaza.

Various commercial activities e.g. newspaper stands, telephone booth, postal services, airline reservation desks are expected to take place here.

Office landscaping elements e.g. water fountain and flower troughs provide cool atmosphere for people.

7.1.2 Main administrative area:

This is located on the left hand side of the entrance plaza, and access into this area is provided by two revolving doors.

Because of the heavy traffic required in the finance and administrative units all offices associated with it were located on the ground floor.

This offices have been arranged round a central atrium which provides day lightning and ventilation. Staff access is provided on the eastern part of the complex, because of the nature of the organisation, there was the need to define staff and visitors accesses.

Around the open atrium is the data unit, which is sealed against external environment and depends on artificial lightning and ventilation due to the complex nature of the activities, machines and equipments.

7.1.3 Ancillary Areas:

This are public areas and consists of

i. exhibition gallery/multipurpose hall

ii. lounge

iii. auditorium.

As earlier explained access into this areas is from the reception area.

I. The exhibition area - is an open space with rectangular columns spaced on a grid of 60m apart. However the nature of the functions of this complex has made this exhibition space a multipurpose hall, which can be partitioned or left open for dinners and banquets and also rented out to tenants for various functions. An entrance foyer distributes traffic into the exhibition area and lounge.

II. The lounge - is open for light snacks and refreshments, a severy connects it with the kitchen.

The kitchen is easily accessible from the outside by the provision of a service bay, and a connecting staircase links this floor to the upper floor.

III. The auditorium: The auditorium has been designed to seat a maximum capacity of 180 people at peak periods of international conventions and seminars. Accesses is through an entrance foyer well landscaped and a side entrance from the service bay. A central aisle and two gangways ways provided to easy circulation within it.
A transition zone was provided on the upper level - a roof terrace which can be accessible from the upper level. It is covered with space frame, opened on all sides and supported by steel structure. It serves as a semi public space for businessmen to discuss, make appointments and arrange meetings after heavy seminar or conference sessions. This facility was incorporated due to the international nature of the complex.

7.2 Floor Plans:

7.2.1 First floor:

This is also zoned like the ground floor into administrative and ancillary areas. Administrative offices are arranged round the central atrium and include enquiry replies services, library and trade information unit.

Large office bays have columns spanning 6.0m internal acting as supports for the structure, here the librarian's office and store act as buffer between the printing and

publishing unit and the library. The service floor distributes traffic into the administrative areas, meeting room and staff canteen.

7.2.2 Third floor:

This consists of the service core and a roof terrace, which provides an openness into the built up environment.

7.2.3 Tower block:

This is the most domineering structure within the complex and houses the seat of power. However three floors would be leased out to tenants in other financial organisation while the remaining floors would be distributed according to the length of offices required with demountable partitions used for flexibility of space utilization.

7.3 CONSTRUCTION MATERIALS

Structural form

Mode of construction

Reinforced concrete or structural steel frame has become the standard solution for office building construction. Principle of flexibility in plan has led architects from the traditional type of construction with load bearing walls.

Structural form

The first two levels are based on the structural principle of beam and columns. The imposing office tower is based on the vertical system and cantilevered principle. The supporting framework of the building consists of a core from which floors cantilevered out on either sides.

Wall enclosing all stairs, lifts, and ducts for sanitary and electrical installations between the various floors perform structural functions in helping to provide the necessary rigidity for resisting wind loads. The ribbed floors also helps to take care of the load which is in turn transmitted to the walls of the vertical core down to the ground.

7.4 Services:

This is made up of vertical and horizontal services. They include storm, sewage, water, airconditioning, electrical services.

Vertical services consist of staircases, lifts and toilets while horizontal services are taken care of by the provision of 600mm above each suspended ceiling and ribbed floor to allow for the passage of electrical, telecommunication and air-conditioning services.

7.4.1 Sewage disposal:

This is taken care of by the provision of a network of soil piping connected to inspection chambers for onward transportation to the central sewage treatment plant.

Abuja has a good network of waste disposal as discussed in Chapter Five (see Fig.).

7.4.2 Water Supply:

This is from an 80mm service pipe which takes itsorigin from a 150mm main water supply pipe. A water tank reservoir is located on top of the building which can be utilised during water shortage.

Storm water drainage: This is by means of water spouts and pipes from roof gutters, to a bottom channel covered. Storm water is then transferred to outlet drains which is in turn drained to the main storm water gutter binding the site. Drains are located along service roads and are adjoining along the slope of the site.

Fire services: Stand pipes fire extinguishers have been provided at strategic points. Fire detectors e.g. ionization smoke detectors have been installed on all floors.

Air conditioning: This would serve as an alternative to natural ventilation considering the climatic conditions of the site. Box units are located infront of concrete panels on all office spaces with ducts running horizontally on each floor, which vertical service wires are carried and sheilded by concrete panels and venetian blinds.

7.5 Materials of Finishes:

The whole complex is made up of a variety of finishes, which would be prefabricated. The main materials are"curtain wall" installed on the north and south facades of the building in between aluminium sections, and precast concrete panels.

I. External Facades: The external facades are interplayed with series of projections and recessions which offer good aesthetic appeal to the onlooker.

The lower floors consists of external columns interwired with glazing, while parapets have been broken just before they meet these columns. Flower beds projections have also been incorporated with the alternate external column and windows.

The exhibition area has two bands of windows alternating with wall cladding on the northern facade.

The external facade of the tower as earlier said is made up of curtain wall on two sides while opening have been limited on the east and western wall respectively. The walls of the auditorium have been so designed to achieve a dynamic form with its rythmic alternations of walls and windows.

II. Internal finishes: Public and circulation areas have hard bearing surfaces. Executive offices, chairman's suit, board room will be carpeted.

Typing pools, junior offices and general offices would be tiled because of the fact that they are semi-public areas.

Revolving doors, panelled doors with murals and mortifs have been suggested for public activity areas.

Landscaping:

Considering the location of the site and existence of greenery, landscaping has been extensive and varied elements like paved plaza, sculpture piece, hedges, flowers have been proposed to improve the complex and provide an inviting integrated natural climate to users within the complex.

8.0 SUMMARY

An attempt has been made to identify the problems related to corporate buildings especially those to the design of NEPC headquarters.

First the phenomenon and trend of corporate architecture was laid with relevant data and journals references, next its relevance to the ailing economy identified.

Next a general survey of related corporate buildings were studied, this was done in order to know the various functions, spaces in each department with the demerits and merits highlighted.

The next chapter was the brief and users requirement and was a combination of existing facilities in the NEPC and those identified from other case studies which might help to improve that operational procedures.

The site for the proposed project was analysed and studied taking into consideration natural elements of climate and environment, finally a design was proposed to suit the functional and site demands of the project.

Conclusion:

The thesis has succeeded in examining the spatial organisation of corporate buildings, how these spaces despite their diverse activities relate to one another and how they suit the requirements of the organisation's

bureaucracies and users.

It has demonstrated that social architecture is generally made of corporate buildings with heights soaring into the skyline.

Finally this thesis has succeeded in being a proposal based on the organisation and arrangement of different spaces e.g. public, semi-public and private spaces to form a cohesive whole at the same time creating and integrating administrative and social functions to produce a conducive human environment tailored for easy and faster business transactions for human needs.

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Appendix Space requirement for facilities

Facility	Case studies	Standard	adopted	required
entrance plaza	varying	6 x 12	72m^2	72m^2
Reception lobby	3.0 - 4.0m^2	5m^2/pp	5.0m^2/pp	5.0x12 = 60m^2
exhibit on	1.5-2.5m^2/pp	2.5m^2/pp	length not accurated determined, approx. no of people at peak period is = 150	
corridors	1.0-1.4mm width	1.2-2.0mm width	2.0-2.4mm width	-
Junior offices	10m^2	9-18m^2	20m^2	-
Intermediate offices	10m^2-12m^2	18-24m^2	24-30m^2	-
Executive offices	30-36m^2	18-24m^2	36-42m^2	-
Typing Pool	2.2m^2/pp	2.5m^2/pp	20m^2	20m^2 for = eight people
Speculative offices				
Photocopy and switchboard	2.0	2.5m^2/pp		dependant on type of equipment etc.
audio visual			18m^2	
Stores	3x2m^2	-	4x3m^3	12m^2
Kitchen store		30-35% of kitchen area	16.5m^2	16.8m^2
Kitchen		40% of dining space	48m^2	48m^2
Canteen	1.2	1.2m^2/pps if 100 people served	120m^2	120m^2

Facility	Case studies	Standard	adopted	required
Shops	varying	length 2.2m	varying width	-
Library	1.0m^2/pp	-	1.5m^2/pp	to seat 25 peop + storage shelves 80m^2
Librarian	20m^2	4x5m^2	48m^2	48m^2 + storage space
Parking	2.5x5.0m^2	2.8x5.0m^2	3.0x6.0m^2	1800 for 100 cars (visitors + staff)
Meeting room				
Conference room	-			
Height of floor	3.0m	-	3.6m	3.6m, 600mm for horizontal ducts of services
Toilet WC	1.2x1	0.9x1.2	1x1.2	50m^2, 4 per floor - 2 males 2 females
Stairs	2.2m^2 width	2.14m^2	varying	varying
Lifts	2.1x1.9m	2.1x1.9m	2 lifts from calculation	80m^2
Lift lobby		-	16m^2	16m^2

Office buildings

OFFICE CONSTRUCTION

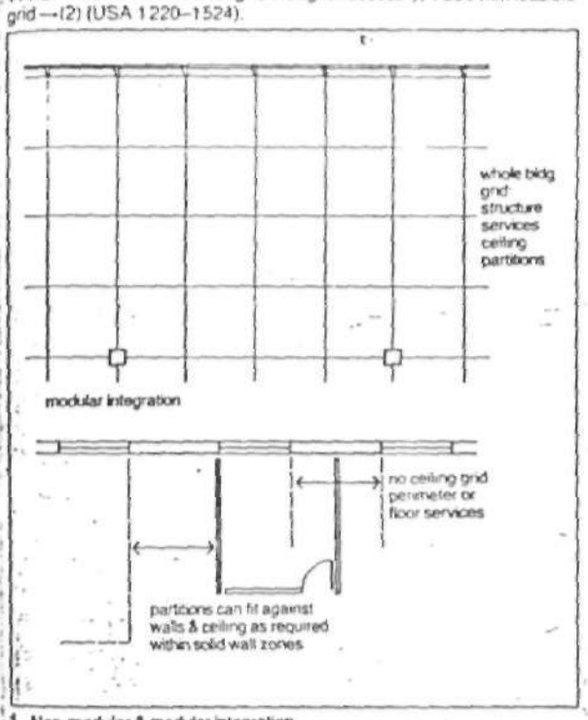
3 critical constructional elements affect office layout: partitions, ceiling, window module. 2 basic choices: complete modular integration and its opposite, avoiding precise modules →(1).

Test of any office planning: how well range of small rm sizes can be accommodated. Small rm usually found in following approx sizes: 15 m², 20 m², 25 m², 30 m² (smallest size USA: 7.4 m²). Single rm depth should not exceed 6000 otherwise unusable space created towards back of each rm. Acceptable rm proportions should not exceed ratio of 1:1.5. Thus if strict modular grid thought necessary, 1500 min feasible grid →(2) (USA 1220–1524).

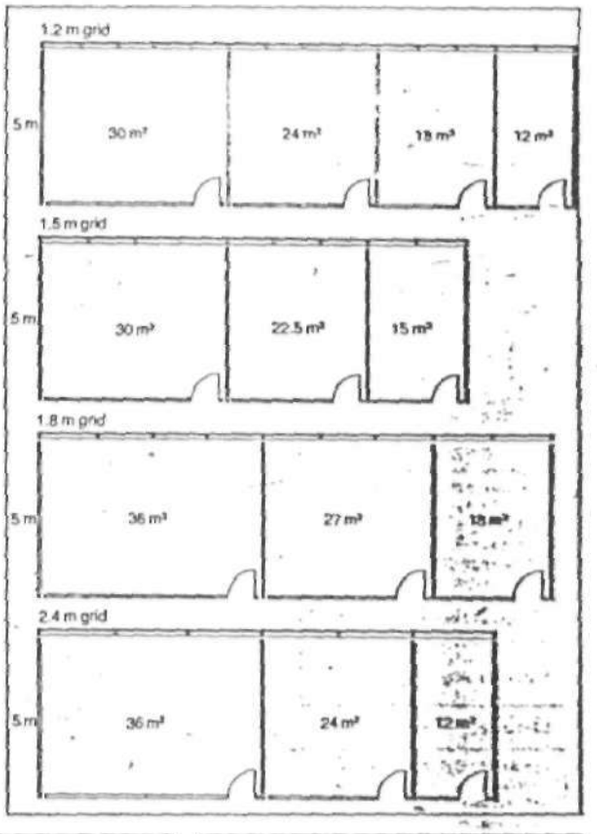
Ceiling grid can affect single rm design in similar way. Single most critical dimension: standard size of fluorescent tubes (1200, 1800, 2400; USA 1220, 1830, 2440)

Wide variety of possible types of ceiling light fittings set in ceiling:
diagonal patterns
movable fittings
waffle grids
large coffers

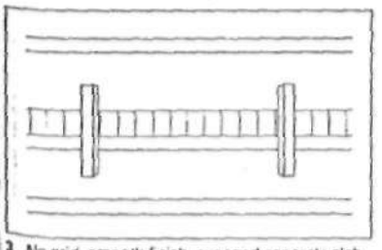
All can be made compatible with planning small rm. Discipline of ceiling grid relaxed when task lighting used because fewer lights needed in ceiling.



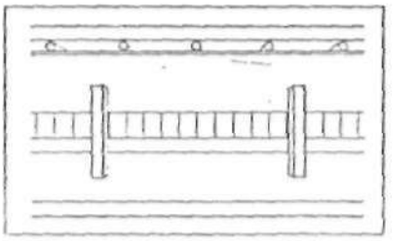
1 Non-modular & modular integration



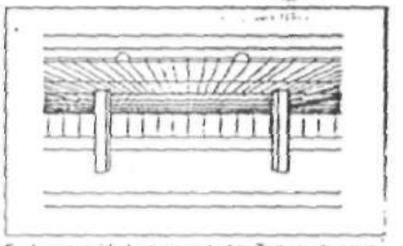
2 Range of rm sizes at constant 5000 depth with various window grid modules



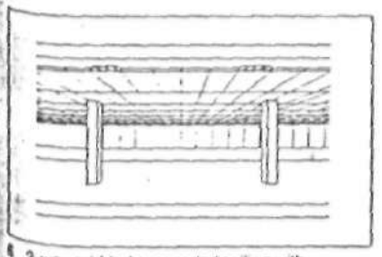
3 No grid, smooth finish, exposed concrete slab or direct finish ceiling, surface mounted light fittings



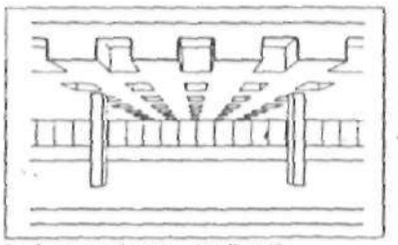
4 No grid, smooth finish, suspended ceiling, surface mounted light fittings



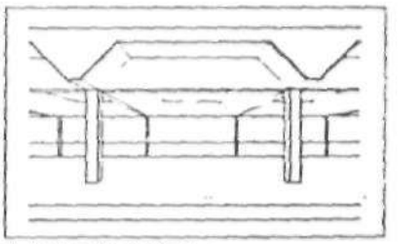
5 Linear grid, dry suspended ceiling, continuous 1-directional recessed light fittings



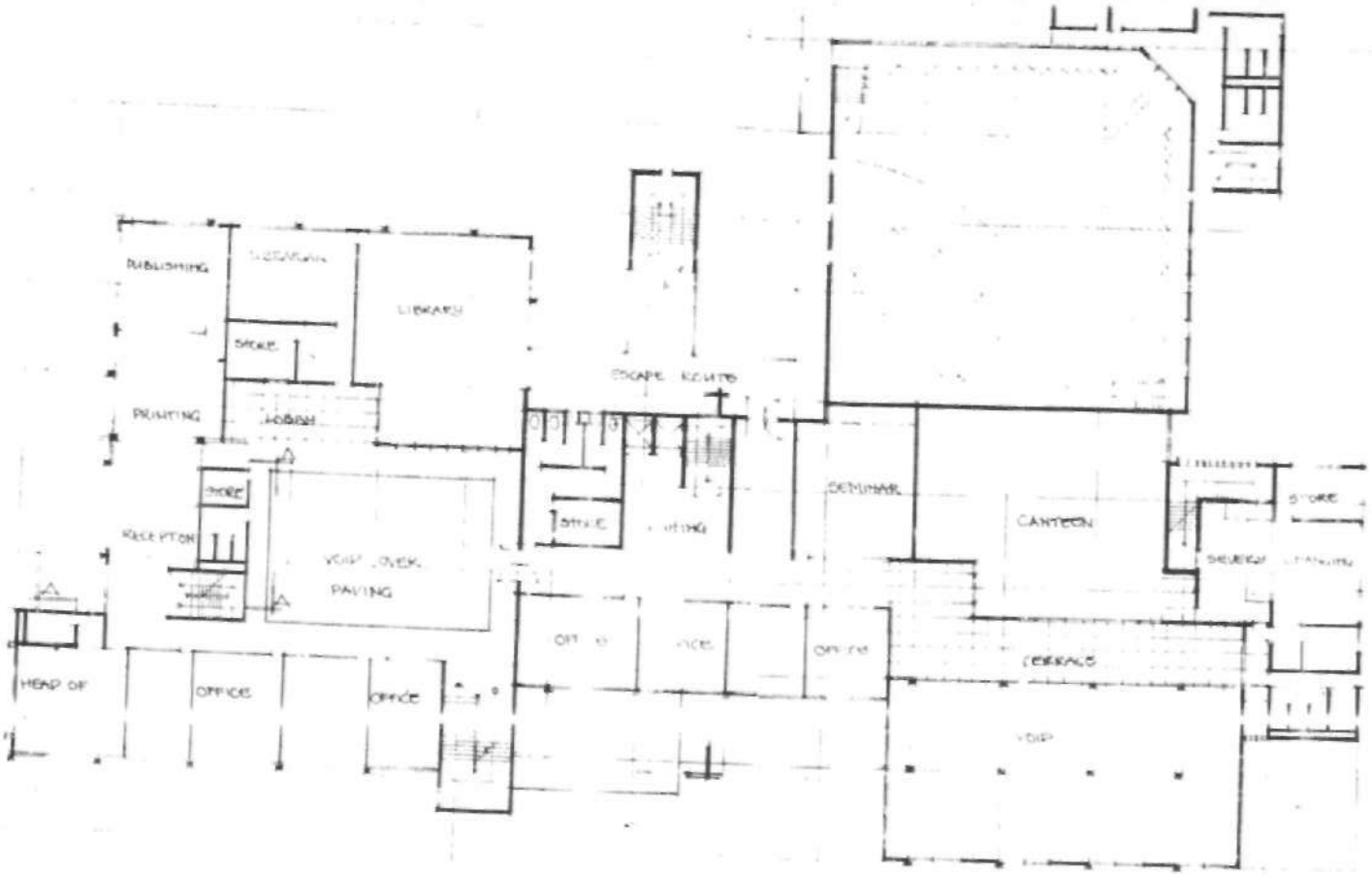
6 2-way gridded suspended ceiling with recessed light fittings



7 2-way small structural waffle grid

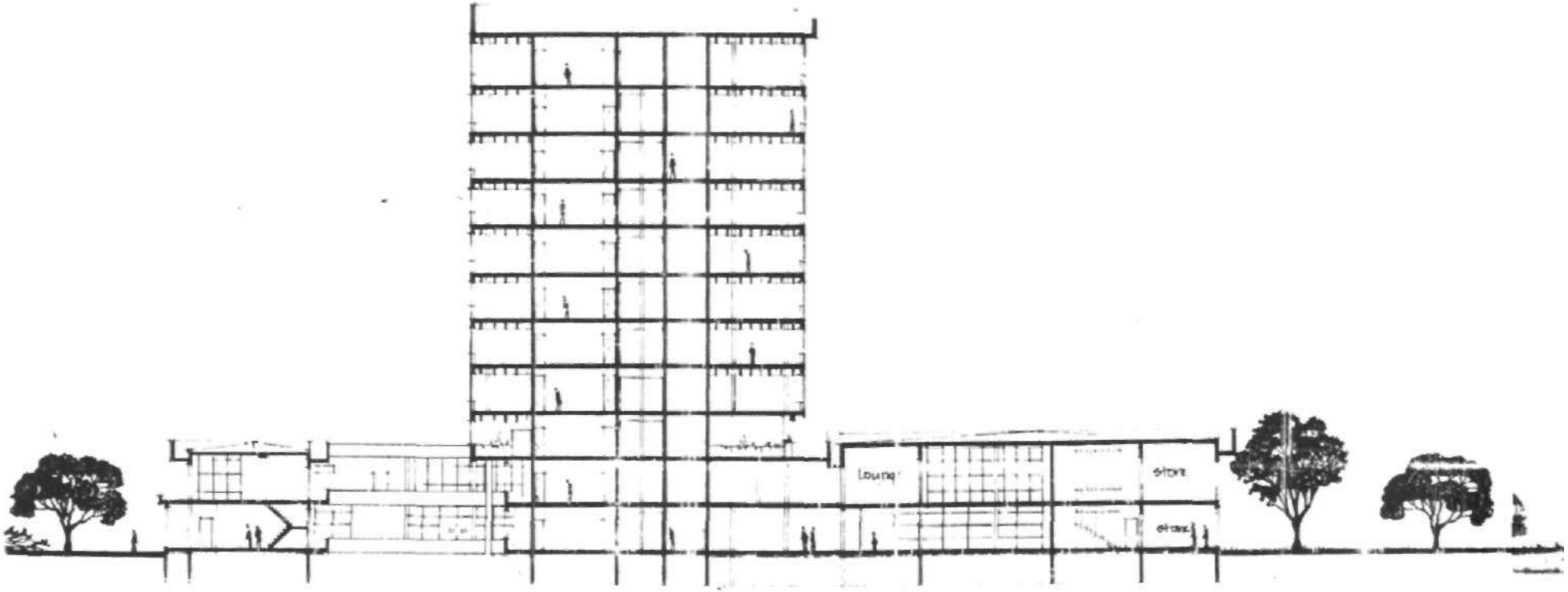


8 Large coffer/bay grid

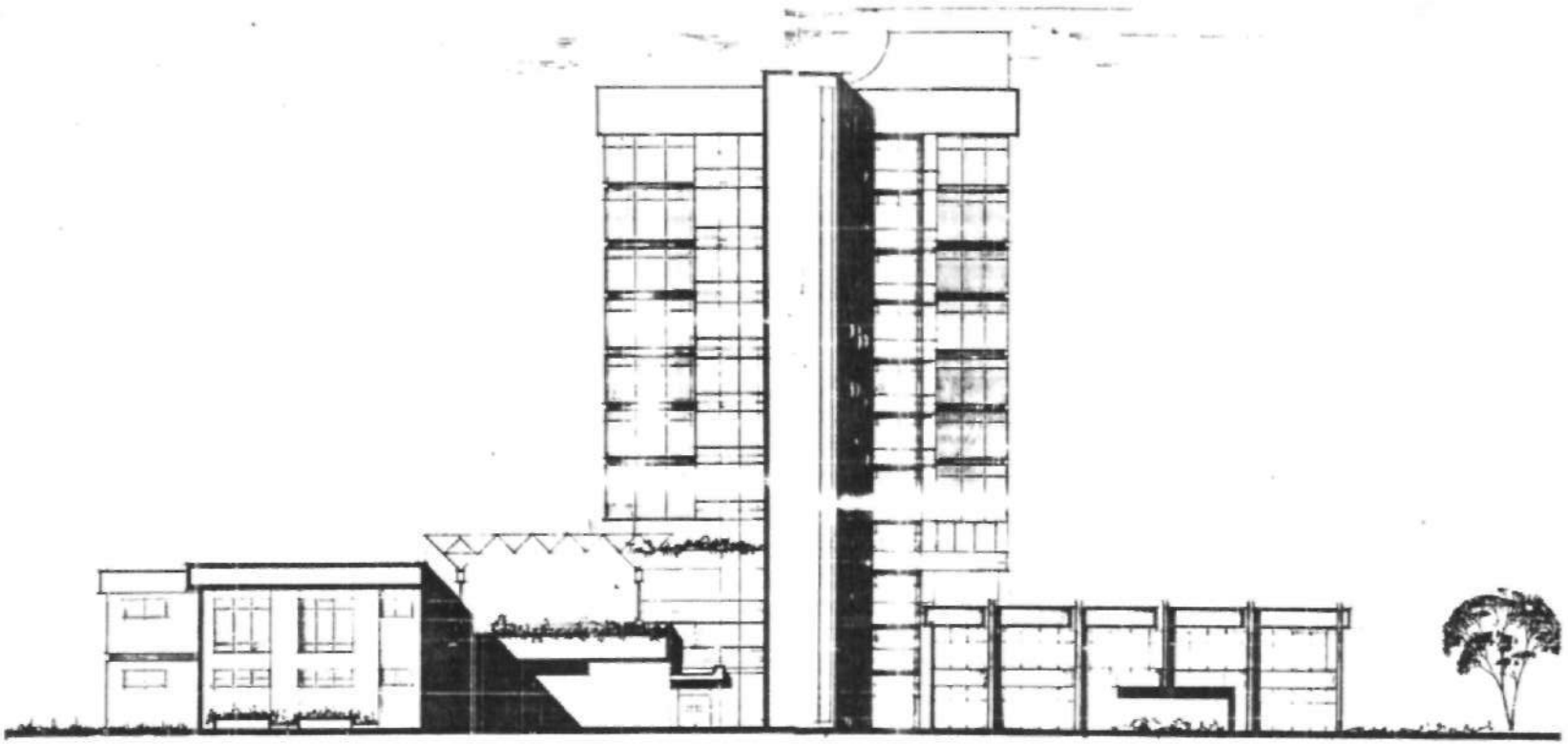


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

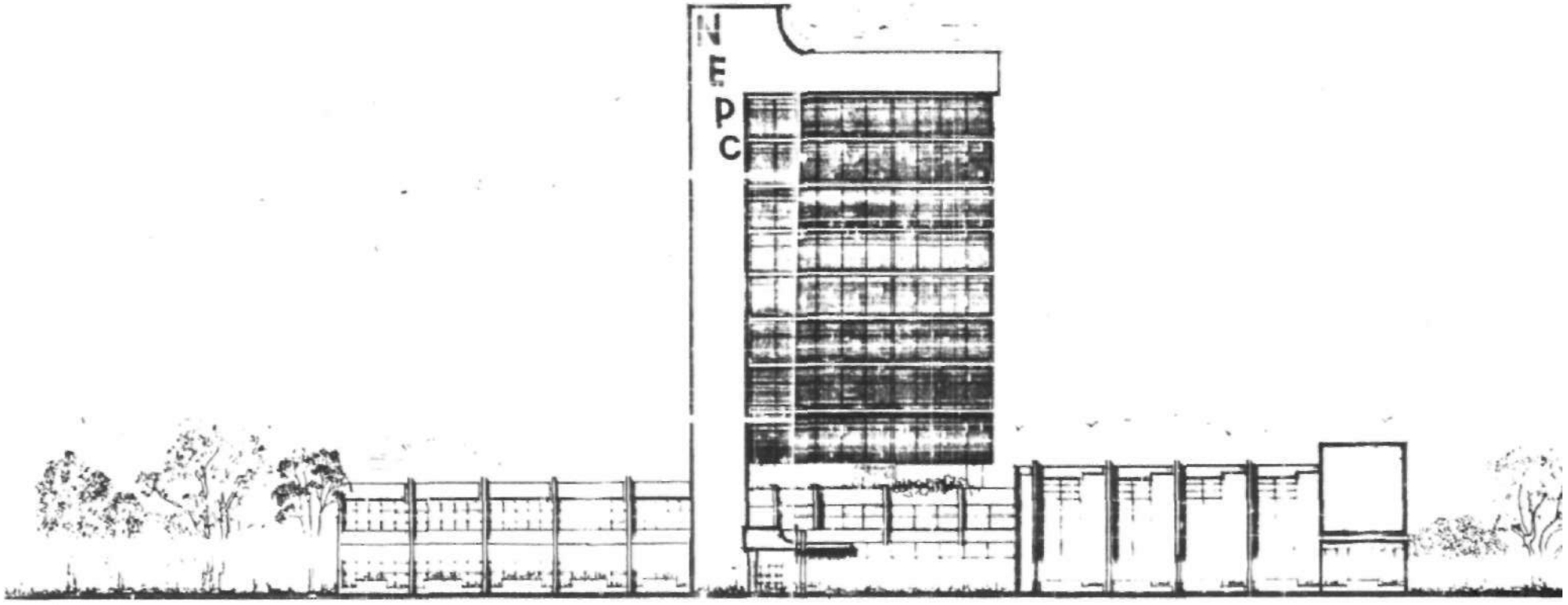
FIRST FLOOR PLAN 1:100



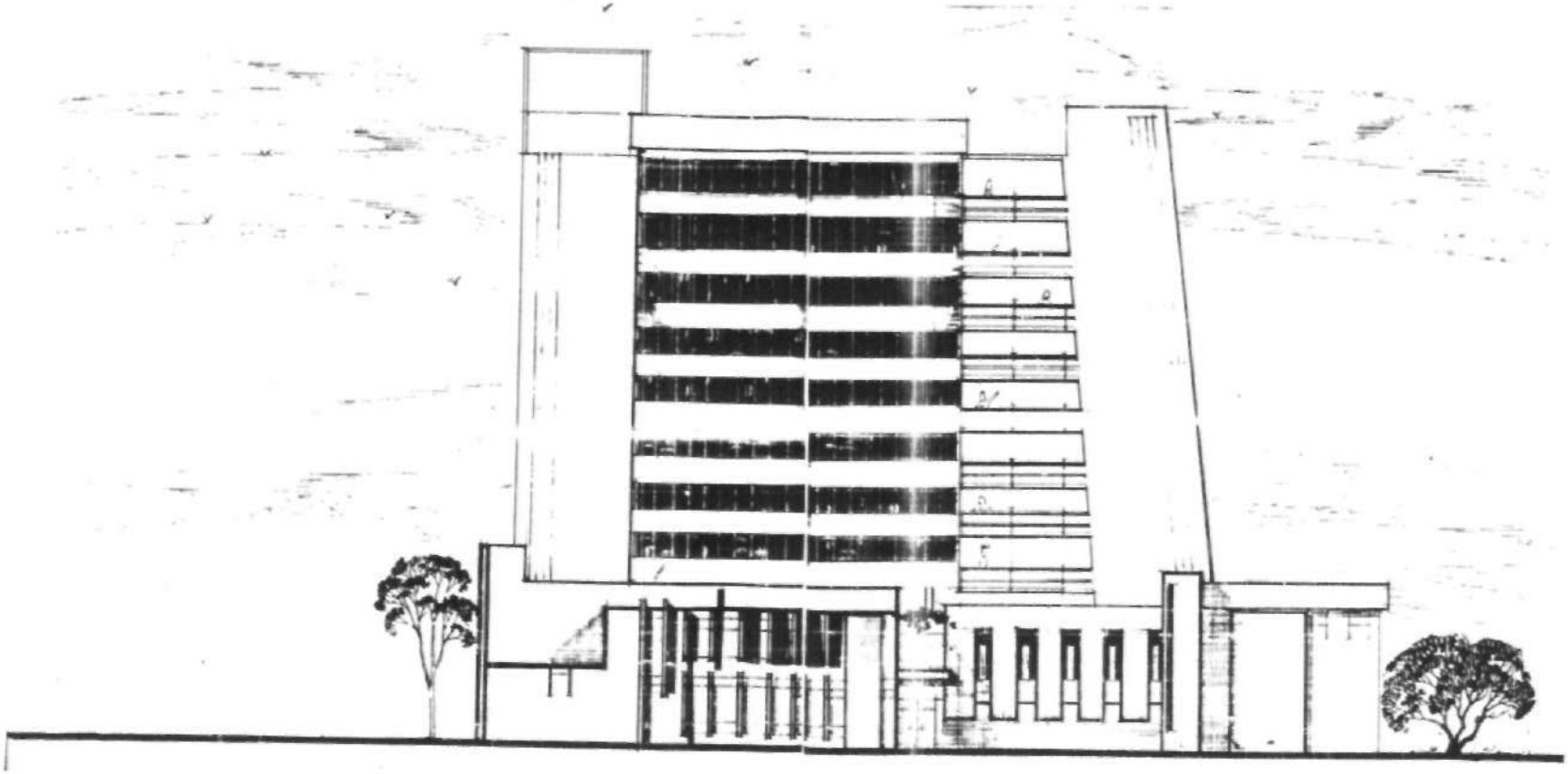
SECTION A-A



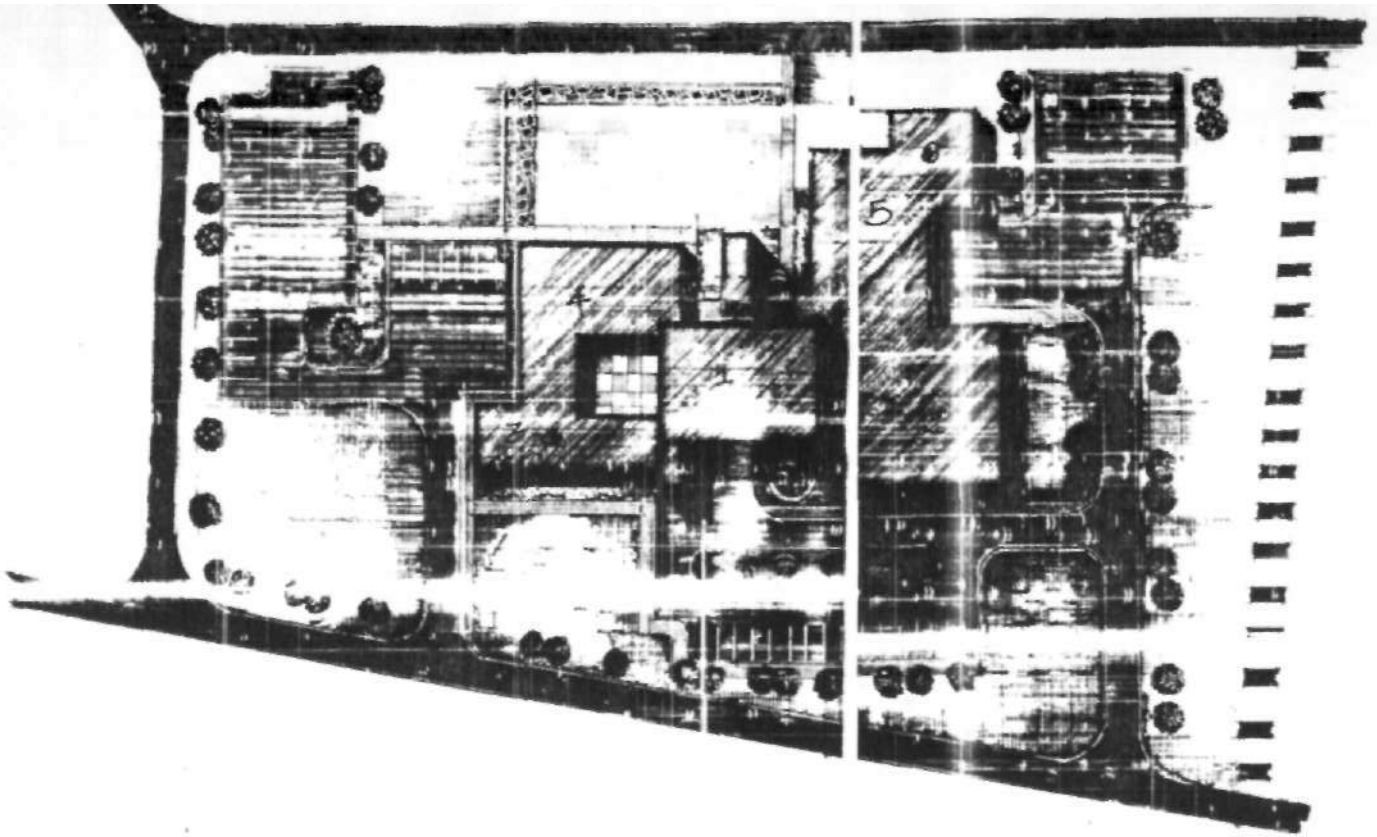
SOUTH ELEVATION



NORTH ELEVATION



WEST ELEVATION



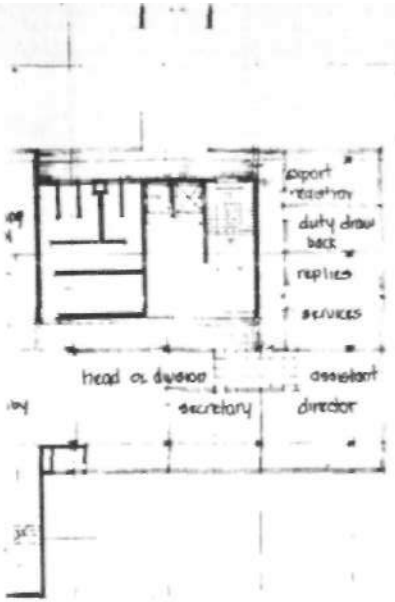
KEY

1 OFFICE TOWER
2 ANCILLARY ACTIVITIES
3 MANAGEMENT OFFICES
4 PROJECT / DATA UNIT
5 [illegible]
6 AUXILLARY FACILITIES

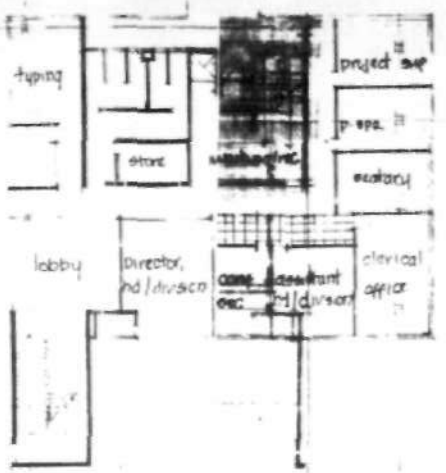
SITE PLAN
1-500

N

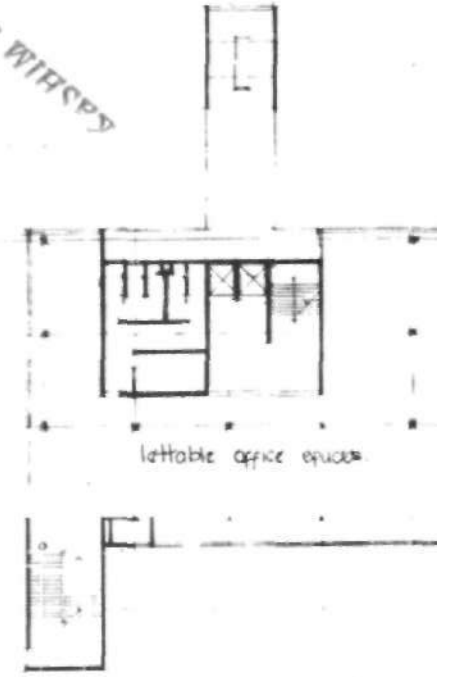
RERIAN · EXPORT ROMOTION COMPLE



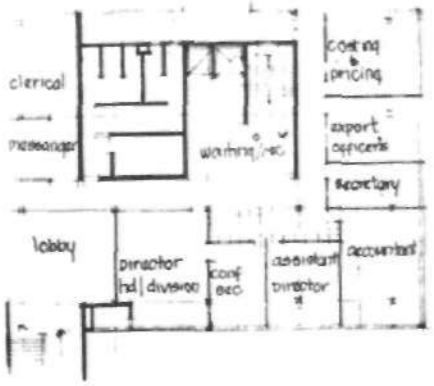
TRADE ENQUIRIES / REPLIES
4th FLOOR. 1:200

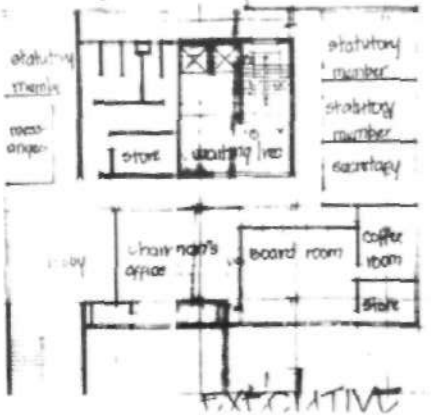


PRODUCT AND MARKETING
6th FLOOR



TYPICAL FLOOR PLAN
1:200





EXECUTIVE FLOOR

CARLETON UNIVERSITY LIBRARY