INSTITUTE OF ADVANCED ARCHITECTURAL STUDIES. ABUJA:

- Towards Evolving Appropriate Environment for Continuing Education in Architecture

By

ADEWOLU, ADEOYE OLUGBENGA

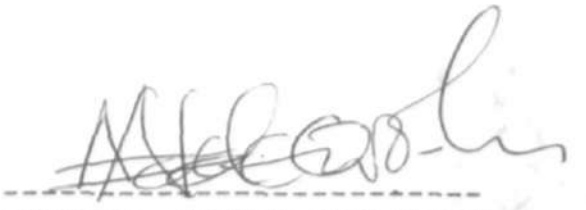
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the requirements for the degree of Master of Science in
Architecture

Department of Architecture
Faculty of Enviromental Design
Ahmadu Bello University, Zaria.

November, 1992

DECLARATION

I hereby declare that this thesis topic, the first of its kind has no beaming to any work done by any person or group of individuals which has ever been presented and accepted for a higher degree in the Department of Architecture, Ahmadu Bello University, Zaria. It has been composed by me and is a record of my research work. Sources of information are specifically acknowledged by means of references.



ADEWOLU, ADEOYE OLUGBENGA

NOVEMBER, 1992.

DEDICATION

This work is dedicated to God almighty, for his abundant provisions at all times.

And to all those who are engaged in the course of securing a better place for mankind - the ordinary man.

CERTIFICATION

This Thesis Entitled INSTITUTE OF ADVANCED ARCHITECTURAL STUDIES: Towards Evolving Appropriate Environment for Continuing Education in Architecture

By

ADEWOLU, ADEOYE OLUGBENGA

meets the regulations governing the award of the degree of

MASTER OF SCIENCE (ARCHITECTURE)

of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

S.S. Tulpule Chairman, Supervisory Committee	18031993 Date:
Member, Supervisory Committee	18/3/93 Date:
Member, Supervisory Committee	Date
Head of Department	Date
Dean, Post-Graduate School	Date

ABSTRACT

Architecture — in Nigeria is in a serious dilemma, especially when it is evaluated as one of the oldest and foremost vocations in the country- There are lots of threats to the existence of successful practice of the "High—Art". The threats range from professional Malpractices to gross misrepresentation and misinterpretation by laymen as well as other professionals in the building industry- This is not all!

A greater problem lies in the architect considering his graduation from a recognised school of Architecture as well as membership of the Architectural body (NIA) to be exhaustive for learning.In fact, some architects do not read beyond casual glances of newspapers and journals-

Lack of commitment by the practising architect to properly and adequately inform himself — and consequently the public of the Myriad of architectural alternatives and options are highly disappointing.

Architecture, from the earliest times, is known to be giving direction to Technology- However, for architecture to be acceptable to both the rich and the poor, the practitioner Must understand the complex variables, user needs and requirements, as well as options and alternatives for a descent and habitable environment.

No architect can lay claim to exhaustive understanding of the various problems in the society- The problems are more noticeable in the large population – the low–income earners- It has been shown that over 70 per cent of Nigerians are in the low–income group. Since the low–income group characteristically have large family sizes, their housing demands are usually higher.

Moreover, if architecture has to lead technology to true greatness, learning and doing architecture has to take a new dimension.

With due regards to the modest efforts of the Nigerian Institute of Architects, the Nigerian Building and Road Research Institute, and the various schools of Architecture in the country, a lot more need to be done.

The Institute of Advanced Architectural Studies, Abuja shall function as a social and intellectual focus for the profession and the building industry in general.

A centre for architectural excellence, the Institute shall lend itself to intensive research, development and information dissemination on issues of architecture.

Architects, engineers, surveyors, scientists, and clients shall contribute and benefit from the various programmes of the Institute.

The design being proposed shall be of an institutional

typology, with a slight accent of cultural facilities- The emphasis of the design is to encourage continuing education through informal learning process.

A.O.A

NOVEMBER, 1992.

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There is a category of people, whose ways of life has shaped the course of this study; justice will not be done to history if their contribution is not duly acknowledged. First on this list is Dr. Olajide Solanke, the Head of Department at Zaria. His perception of Architecture and commitment to its leadership in the building industry is a great source of inspiration. My supervisor, Arc. Mbina, whose criticism helped immensely throughout the period of my research., Also, the senior members of Architectural

profession in Nigeria, especially the 1989/91 President of the Nigerian Institute of Architects, Arc. Frank Mbanefo (- with whom I served as President of the National Association of Architecture Students), my darling friends, especially Jemiyotan Ogisi, Biodun Bello and Toyin Afolabi Gbede.

They are people of vision, their contribution to this work in particular, and to architecture in general, is timely and appropriate for the challenges facing the architecture of this era.

Lastly, the members of my family, my sister and my brother Mrs. D.O. Olorode and Mr. Olumide Adewolu for their love, understanding and sacrifice.

God bless you all, Amen

ADE ADEWOLU
ZARIA, 1992

CHAPTER ONE

INTRODUCTION

1.1 PROBLEM IDENTIFICATION: THE UNDERLYING FACTS

1.1.1 PREAMBLE

Architectural discourse is as volatile and touching as any political or socio-cultural issue, because of the dynamic nature of architecture itself as a subject.

In a developing society like Nigeria, where technological advancement is a topical issue, architecture is usually at the forefront of the matter. The thesis cannot claim an exhaustive treatment of the issues at hand due to the dynamic nature of the subject (ARCHITECTURE) but efforts are made to highlight salient issues with a view to proposing realistic solutions within the socio-cultural set-up that the architecture is being discussed.

1.1.2 PROBLEM DEFINITION

The thesis takes an overview of the established institutions within the framework of our educational system and anticipates (by proposing) a reformation, a gradual but conscious change in the perception and utilization of Architecture and architectural resources (both methods and men).

The thesis intends to "preach" a gradual and

systematic transformation of those values which are indigenous to the community.

Similarly, the function, role and responsibilities of the architect must change from the present form where he waits for commissionings and is contented with "design-and-draw", leaving the actualisation of his dreams in the hands of the other members of the building team. The emergence of "new vocations" in the building industry is largely due to the changing times, tasks, demands by the clientelle, which the contemporary architect has not been able to adequately fulfil. The issue of "armchair" leadership is no longer valid!

Whoever offers the necessary services and convincingly too, shall be adequately recognised. In attending to this crucial issue, the salient point is how to improve the lot of the rural dweller and the urban poor by generating and educating a new set of architects who will be equipped and willing to respond to the changing realities.

The changing role of the profession at the instance of the demands upon it by other professions in the building industry on the one hand, and by the user needs and requirements which is rapidly changing as a result of technological advancement, on the other have called for a reappraisal of the profession as an entity, its relationship to the members of the various

groups constituting it - practising architects, students and trainee architects, as well as the lay-public (the consumers of architectural products).

The ability to fulfil the functional requirements requires a new image and identity from the profession which can only materialise in an environment which will itself testify to the changing functions, values and attributes, as wall as justify the existence of the architectural profession.

According to Odeleye (1991), the downturn of African Economies and the economies of developing nations of the world demand an expansion of the role of the architect from an executor of commissions to an originator by assuming a more realistic and positive posture in the field of project financing and project management. He is of the opinion that young architects must be trained to be responsive to the emerging needs of their communities, and architects in practice must be retrained, through "continuing education programmes to respond more rapidly to the national hopes and aspirations of their people".

Crucial decisions are taken by leaders and practitioners in medium and large practices, and it is this group of practitioners whose lapses are mostly responsible for the dwindling image of the profession, especially as an aftermath of the "oil-boom" impact on the construction industry in Nigeria. The thesis

posits that such practitioners with long-standing exposure on the field need to revitalize their knowledge with an update in the basic elements of modern architectural practice.

The focus now is on bridging the educational and professional gap between architects and the other professionals within the building industry, to avoid and prevent misrepresentation. The modern day architect needs to be properly groomed for his leadership functions on the changing times; with the curriculum being expanded to include RELEVANCE as a concept, and open-ended to allow for freedom of expression and continuity within the accepted norms of practice.

The cultural values and user-needs and requirements must be understood and demonstrated at all times by the architect in his professional duties.

The architect-planner must also re-examine local materials which the vernacular architecture employs, but which are often "eclipsed" in the minds of developers by concrete, glass and steel, and suggest a blend which is viable aesthetically, technically and in price.

The local artisan as well as the users must have a clear understanding and appreciation for the values of indigenous materials as valid substitutes in the face of ever-soaring prices of imported building materials.

A meeting point (forum) must be reached!!!

In the final analysis, it is necessary to state that the changing trends require a changing function and a new essence of being for the profession, which can only be accommodated by a dynamic environment where 'change' will be a constant attribute.

The citizenry may remain laymen as far as the architectural practice is concerned, but as consumers of architectural products, they deserve to be familiar with the merits of employing the values, virtues and concepts of indigenous architecture, as well as partake in the necessary processes. This is a sure way of architecture functioning as a social reformer, appropriate and relevant to the modern day requirement - especially in the "societies-in-change".

Unless the craftsmen and the artisans-on-the-job are trained to understand and appreciate the logic and wisdom, as well as the economic import of using indigenous materials and methods of construction, the efforts of the Universities, Research Institutes and other tertiary institutions may not have its desired effects on the rural masses and the urban poor.

The major pre-occupation and object of this thesis is to investigate the necessary factors and parameters that could evolve on appropriate environment for the continuing study, demonstration and appreciation of a valid architectural trend as a legacy for the people.

The study is intended to propose necessary amenities, activities and programmes for the making of affordable architectural products and architectural services available for the reach of the masses.

The Institute of Advanced Architectural Studies being proposed shall function to evolve an appropriate environment where:

* Internationally recognised academicians and researchers shall be able to make significant contributions to tropical architecture - especially in the developing nations of the world. The results of such research works shall be available through seminars, exhibitions as well as information storage and retrieval systems;
* Successful practitioners shall be able to exchange ideas and revitalise their knowledge in management, contract administration and modern technology;
* Experts in various fields of the art, building industry and environmental planning and technology, shall be able to discuss issues of national and regional importance to the practice of the "high art".
* An annual celebration in form of a colloquium, exhibitions, seminars, symposium or a combination of any or all of these, with the

active participation and representation of the consumers of the architectural products, the clients and the public: This is very important to project the image of the profession in the proper perspective. Such a forum will offer the users of architectural services and products an opportunity to see and know the role and duties of the architect to the society, and the relationship of the architect to the other professionals shall be clearly expressed.

* Continuing Education for high and middle-level architectural officers in the public and private sector shall be given a boost. The continuing education programme of the NIA shall be fully expanded and integrated in the regular activities of the Institute.
* Archi-Built and other national festivals and activities of the NIA, AARCHES, ARCON, and NAAS can be adequately held.

The Institute is perceived as a centre of professional/academic excellence, - especially in areas of Tropical Architecture; a place where the dignity of indigenous architecture, both in the national and regional context shall not be in any doubt. Where the leadership position of Architecture in the building industry and related art shall be properly expressed.

1.2 MOTIVATION

The problems facing the teaching and practice of contemporary architecture, especially in the developing countries of the world seems to focus more on the formal schools of architecture, with attendant efforts on how to produce the "seasoned" architects. The solutions in current practice almost totally ignore the practising architects, the academicians, as well as the intending students of architecture in the preparatory school.

This study shall attempt to give an architectural expression to the views expressed by all the concerned parties in the architectural environment - the clients, students of architecture, practitioners and researchers alike, as well as producers and consumers of architectural products, towards restoring the dignity of the profession in a developing society.

Furthermore, a lot has been said about low-cost (affordable) building materials: people need to see it done!

No one wants to be the experimentalist; at least not with his money!

There is need to educate the people, clients, students, artisans, craftsmen and architects on the prospects and potentialities of the low cost building materials and construction methods.

Considering the needs and taste pattern of the

ordinary house dweller, thatch and mud houses are fast becoming obsolete. In spite of the comfort being offered in these pieces of "local architecture", the most fanatical student of rural architecture would still want some more!

There are research institutes established to investigate and provide solution to the high-cost of basic components of habitable architecture. The institutes are struggling to convince the governments and the people to look inward for the solution to architectural problems; CULTURAL REVIVALISM: To search from basic indigenous methods of construction and materials, and upgrade them to certain standards for aesthetic and functional appeal to the clientelle.

Orthodox schools of Architecture are battling seriously with the issue of materials and men that will be able and willing to provide adequate services for the societies in change! Architects that will be able to lend his knowledge to salvage the urban ecological problems as well as adequately cater for the rural masses.

The Institute of Architects is battling with its own enormous duties of running a stable "family" as well as maintaining an enlightened community, where ignorance shall be a thing of the past and a "Twentieth Century professional elites" shall constitute the bulk of its membership.

All said and done, each arm is struggling to fill in a gap which has been noticed, within the framework of its functions and available resources. Even among the aforementioned factors, there are series of disagreements over who should do what. This cannot continue.

The study at hand is motivated by the need for all forces concerned to work as a team, without one infringing on the other as members of the same "family" struggling for excellence in their common vocation. Considering the in-fighting in the architectural profession and its attendant breakdown of norms and decorum in the field of practice; and the threat by the sister professions in the building industry, the author believes that the thesis could not have been more timely than now.

1.3 ARCHITECTURAL SIGNIFICANCE OF STUDY

For any architecture to be valid within the framework of a specific culture, such must recognise and incorporate the values and taste of the people, as well as be considerate enough for the needs and requirements of the consumers of the Architectural product. The people must be involved to a large extent, through formal and informal communication of the need for adaptation into the new indigenous architectural language giving adequate allowance for

"dialectic" variations.

By this, the thesis proposes a complex whose design concept shall be based on the virtues and values of the people, and the implementation shall be by those craftsmen and artisans who shall spread the gospel of the new era of modern appropriate architecture - as a testimony to the revivalism of an indigenous and culturally valid architecture of our time. The existence of the Institute shall itself be a constant reminder to the members of the noble profession of the need for them to strive into greater heights and achieve the leadership position through hardwork and sincerity of purpose.

The Institute in its physical entity shall continually lend itself as a lasting monument, an everlasting museum through which it shall be said that a truly indigenous architecture is born with the 'spirit of the age'. Flexibility and adaptability shall be the keyword in the design.

.4 STATEMENT OF INTENTIONS

.4.1 AIMS

The study aims at bringing together all members of the architectural profession for effective exchange of ideas and rapid development capable of matching the demands of the rapidly changing society.

It is also intended to evolve an environment for enlightenment and promotion of the need for

architectural services to the consumers of architectural products and the public at large.

Another aim of the thesis is to establish a lasting relationship within architecture profession students of Architecture, other members of the building industry, the building materials research and producers, the intending students as well as the clients.

The project will also seek to eliminate the factor of doubt and suspicion which has consistently 'plagued' the building industry as a whole.

It is also intended to celebrate the Institute as a centre of excellence in Architecture and to use the proposed design to celebrate architecture as the practise of the high-art.

1.4.2 OBJECTIVES

The objective of the study includes setting out appropriate design parameters and proposing a model institute that would lend itself to addressing salient issues on architecture.

The study shall also attempt "to preach" the use and acceptance of improved indigenous materials with a view to developing their aesthetic and functional values such that the materials shall be able to favourable compete with imported ones - in aesthetics and durability.

1.4.3 SCOPE OF WORK

Considering the magnitude of the scope of operations and the range of users to be addressed by this institute, the scope of design is almost limitless. However, for a realistic thesis to evolve from this topic, the design shall focus on the academic and administrative areas of the Institute for detailed design and specifications. Nevertheless, the thesis shall briefly discuss low-cost building materials and their potentialities.

1.5 METHODOLOGY OF STUDY

The approach to the thesis shall consist in oral, physical documentation, review of published literature and unpublished theses. In other words, questionnaires, interviews and participant observations shall form the major sources of information and data collection.

Documentation of related architectural values shall be properly done within available resources.

Historical documentation and analysis of architectural precendence of the people and the society *in focus* shall be undertaken to fully appreciate the trends and the multifarious parameters at work.

A study of the Nigerian architectural heritage shall be undertaken with the aim of understanding their values and taste pattern. The study intends to

mention/propose cost-saving alternatives to the high-cost building materials and methods of construction.

Case-Studies of institutions with comparative status within Nigeria and abroad shall be used to evaluate the pattern of the functioning being proposed - as it obtains in similar institutions offering continuing education in Architecture and other social fields.

The thesis shall also attempt to introduce a functional strategy by proposing programmes of action for the Institute, based on the socio-cultural values of the people. (See Appendix A).

CHAPTER TWO

HISTORICAL DEVELOPMENT OF ARCHITECTURE

PREAMBLE

Architecture in its purest form is the human effort at providing shelter and related activities. Functionally, shelter is second only to food-in the priorities of mankind. This goes to show that architecture is as old as pre-historic man.

Shelter, whether in the form of caves, burrows in the wood or rocks, topical aboriginal settlements, squatter settlements in the urban areas, villages and hamlets in the rural areas as well as the high-rise modern and post-modern concepts of international architecture - all fall within the scope of ARCHITECTURE.

The chapter attempts to reflect on the means and mode of solutions employed by the series of generations as far back as 'time map' can reveal. Attempts shall also be made to draw on methods of improvement of techniques, technologies and styles as used by successive generations of the various cultures in the zoned group.

Nigeria, and indeed the developing nations of Africa were befallen by the fate of colonization which variously influenced their pattern of growth and technological advancement. The resultant architecture

and pattern of development was pre-colonial in style and direction.

The appropriateness of the various styles and tastes developed as a result of the colonization shall be discussed, while the true spirit of the contemporary architecture shall be examined to determine its impact on the culture and the ease of adaptability by the users and consumers of the architectural creation.

2.1 ARCHITECTURE AS A CULTURAL PHENOMENON

Being a dynamic vocation, architecture gives an essence to the cultural activity of man in the society-in-change. In other words, architecture marks stages in human activity, usually by dating them.

Without prejudice to contending schools of architectural thought, a look at the various cultures of the world today shows a lot of architectural emblems which could be associated with human activities. These could be either as a result of technological limitation or handicap. For example, thatch and mud is merely a stage above the cave and wood burrows of pre-historic man's architecture. The "thatch-and mud-architecture cannot be said to be indigenous to any culture, but rather, it is a product of available material in the face of need, and limited technological know-how and resources. The "thatch and mud trend keeps repeating itself in the various cultures that history was able to

reveal as the springboard for technological take-off. The available materials lend themselves to construction of pitched roof upon a square-, or circular-based plan of mud walls depending on taste and needs.

The earliest recorded history shows a similarity in the mode of architectural approach to solving shelter problems, which, as indicated, is a result of technological and material limitations.

It could be said that a uniform architectural grammar was prevalent in the whole known world. The common idiom of expression was uniform technological base, or in other words, technological limitations.

From this stage of development, other local or regional factors such as climate, taste, ornament, perception of space, as well as cultural and religious beliefs started reflecting obvious differences. In Egypt, for instance, the influence of Nile River, as well as the religious beliefs manifested itself in the use of stone for their buildings as well as the evolution of strong design concepts of their pyramids and tombs as a reflection of their commitment to "life-after-death" of their Pharaoh and the "well-to-do's". The settlement pattern and the resulting cities on the bank of River Nile is also as a result of the "local" factors. The regional architecture of Egypt of this time was quite distinctive, and it revolved around solving shelter problems as well as attending to the

cultural and socio-cultural requirements of the area.

The architecture of any era can best be viewed within the climatic and socio-cultural context of the people it is serving. On a larger scale, regionalism or regional zoning of the various parts of the world easily offers useful explanations for the pattern of architectural evolutions of the people.

The climatic determinants include the form and pattern of building structures, the use of materials as well as pattern of settlement. On the other hand, socio-cultural factors usually include the occupational patterns of the people, their religious belief, tastes and values, the social hierarchy and pattern of rulership among others. All these, when critically analysed, makes it necessary to examine people's architecture on a regional scale as a prelude to identifying their problems and strong points.

On a general note, the appropriateness of a regional architecture cannot be dictated by a thesis: it relies upon the intuition of what will suit best the natural order of a particular place. It is possible to translate regional principles for dealing with climate and cultural patterns into a vocabulary that will be able to handle a range of modern conditions by blending modern architecture with indigenous wisdom.

The inward-turning courts with their geometrical water courses, gardens and covered thoroughfares of

Ministry of Foreign Affairs in Riyadh amount to an emblematic reinterpretation of both "Arab house" and "Arab city".

Charles Correa, for example, has evolved an entire system around the linkage of courts, platforms, varandahs and terraces that recalls the open air rooms and ambiguous connections of the Indian village without deviating from the requirements of modern tradition.

Similarly, the successful reflection of Japanese culture in their contemporary architecture makes for a valid and easily adaptable indigenous architecture which is acceptable and relevant to the consumers and users of the architectural products. More specifically, the adaptable spaces, the transient nature of the Japanese as well as the influence of Buddhism. The space psychology has gone a long way in identifying and regionalising the Japanese indigenous architecture, thus creating an identity.

It is interesting to note the pattern of development of the various cultures of the developing world. In Nigeria and other third world nations which had colonial administration from Western European countries at one time or the other, the socio-cultural factors variously influenced the pattern of shift in the growth of the indigenous architecture and local technology. This was partly due to the changing taste and "culture-conflict", which resulted from people

wanting to live the style and taste of the 'colonial masters' without due consideration for their indigenous values.

Another factor is the imposition of prevailing architectural style in the home country of the colonialists in their colonies, thus making such a "model" for the local builders, artisans and the "well-to-dos" among the indigenous population. The architecture and attendant technology so introduced may adequately attend to the immediate needs of the colonial administrators, but shall impose a lot of "inconveniences" on the local dwellers trying to imitate and adapt to the new-found values.

The problem is more compounded as trainee architects and artisans begin to undervalue the truly indigenous values of their heritage. They design and specify materials that are not reflective nor sympathetic of the situation, but rather, celebrating the values of a foreign civilzation to the detriment of their own. An architecture of this type can only be sustained by a limited number of people who can afford, and are willing to pay its price.

The high cost of the imported materials notwithstanding, the culture conflict has now replaced the true culture, and the average citizen now regards any talk of indigenous building materials and method of construction with resentment. The usual reaction is:

"who will live in thatch and mud houses?".

It is a well known fact that any architecture that is devoid of the consideration for local environment and which does not take into cognisance user's needs and requirements is doomed to fail. But efforts must be geared towards identifying the user needs and requirements as well as virtues and values of the indigenous culture - for the architecture to be relevant and appropriate for the intended users' needs.

2.2 GLOBAL TRENDS, STYLES AND PEDAGOGIES

The peculiarities in the training of an architect have taken so many dimensions in the development of the practice of the "high-art".

Generally, the earliest form was the era of "architecture without architects". This era saw architecture developing as the need arose within the limits of available human and material resources. Everywhere, the human perception was almost the same as regards the basic concept of shelter. Throughout the known world, basic shelter in moderate climates reflected similarity of approaches. This range from square-based plan or other rectilinear forms to circular based plan. This resulted in simple structures of huts and granaries of various types and dimensions as needs and functional requirements could determine. Other factors of distinction include ornamentation and other local determinants of climates

and available materials.

Being one of the earliest forms of innovative vocations, architecture of the various regions of the world later enjoyed wide-spread acceptance through conquest by wars, religious pilgrimages, colonization and trade voyages.

A close look at the era of modern architecture shows the 20th Century as being filled with pluralism of approaches towards solving the problem of shelter based on people's needs and available technology. This is evident from the analysis below:

2.2.1 "EPILOGUE:" TO THE 20TH CENTURY MODERN ARCHITECTURE

When in the early 20th century the machine metaphor invaded the technological world, especially with the acceptance of "avant-garde" European architects, a new order appeared. All the creative movements in the early twenties shared in the craze for machine production.

Notable among these groups are De Stijl in Holland, Expressionism and Utopianism in Germany, Dada - and Surrealism in large American cities. The New criticism and poetry in England and the United States, as well as formalism in Czechoslovakia. It was an explosive fission of the European spirit! This marked a very significant phase in the history of architecture of the modern world.

The era featured most of the world's most-creative and innovative architects whose ingenuity gave lasting direction to the practice and pedagogy of architecture to date.

THE IDEALIST TRADITION

The centre of what is known popularly as "Modern Architecture" is the IDEALIST TRADITION. It is championed by architects LeCorbusier, Mies Van der Rohe and Walter Gropius. These architects clearly defined a common position based loosely around such social ideals as humanitarian liberalism, reformist pluralism, and a vague social Utopianism. Jencks (1973).

These men were committed to the ideals of their style. They saw it as an obligation to propose alternative visions to the existing social order. They did not concentrate on historical agencies for change, and they seemed to carry through their buildings to perfection as if they represented some underlying cosmic order. They shared with Le Corbusier, the belief that architecture could socially transform man, as well as the idea that it (architecture) should reflect certain ordering principles found in nature.

THE SELF-CONSCIOUS TRADITION

This is another coherent movement in architecture that takes the idealist premise to extreme lengths, placing so much emphasis on will-power.

The self-conscious tradition of architecture often shows an attention to its own actions, which is self-reflective and sometimes "paralysing". There are two ways of looking at this: the submission to past models of architecture in the belief that these contain some universal ordering principles, or the obession with past ages and previous buildings, with the idea that these may confer some kind of earthly immortality on the builders.

According to Jencks (1973), the politics of the self conscious tradition are "conservative", "elitist", "centralist" and "pragmatic" with occasional element of mystical fundamentalism thrown in to catalyse or brutalise the masses.

During this era, architecture suffered racist interpretation, especially from world politicians, whose views were not accepted by the great architects of the time. The Banhaus architects, Congress Internationaux d'Architecture Moderne (CIAM) and Le Corbusier were tagged "Jewish" and "communist conspirators".

DOLCE VITA OR THE SUPERSENSUALISTS

This architectural style, which came into existence by the mid-sixties, was a product of the unusual tastes and values of the aristocratic class of the time.

This movement was based on the double aspect of

attacking the industrial environment for its monotony and at the same time, living off the most advanced fruits of its technology.

The supersensualists were dependent on the kind of sophisticated outlets which supported Art Nouveau. For instance, they produced prestigious commissions for the pampered sophisticates of the urban elite: night clubs, candle shops, boutiques, private houses for art lovers, exhibitions and consumer products varying from polychromatic furniture to "Dream Beds".

Hans Hollein, Haus Rucker and Superstudio Architects are famous "apostles" of this movement.

THE INTUITIVE TRADITION

The intuitive tradition celebrated creativity at its best. Autonomy of the artists' imagination was the order of the day. Architects and even structural engineers such as Moandi, Nevi, and Castiglom demonstrated the extent of structural capabilities of basic concepts.

THE LOGICAL TRADITION

A peculiar feature of the logical tradition is that they take many of their ideas from other sources and systematically perfect them so that they are often superior to their origins. The Metabolist Movement in Japan - led by Kenzo Tange, Kiyonari Kikutake, Peter Cook, Kisho Kurokawa, and Buckminster Fuller, are

popular architects of this tradition. The emphasis on systematic planning, continuous growth and the impact of the cybernetic revolution was characteristic of the logical tradition.

The philosophy of the logical tradition was based on the nature of universal truths and the doctrine of FUNCTIONALISM: Form should follow function without deviation!

Some of the legacies of the logical tradition are the methods of solving complex problems with systematic design methods and the writing of "performance requirements" as opposed to concentrating on the finished object. This idea crystalized in the formation of the Parametric School of Design and the "New Bauhaus" which opened in Ulm, Germany in 1955.

THE UNSELFCONSCIOUS TRADITION

This tradition emanated from the appointment of Stirrat Johnson - Marshal and his architectural practice in 1948, when they were appointed by the Ministry of Education to centralize research and formulate official policy. The "Official Policy" emphasized a "simple and unselfconscious" architectural expression. This was expected to naturally grow out of group design as a self conscious attempt to invent a new vernacular architecture, which would be restrained, anonymous and dignifying.

The other model of the unselfconscious tradition was the common vernacular of the nineteenth-century industrial buildings, - the "Functional Tradition".

THE ACTIVIST TRADITION

The activists recognise that a large part of the environmental problem comes from the nature of society. They seek to transform that society by concentrating on the social means and agencies of change.

The tradition underwent its great period during the early twenties with Communist-Constructivism, before this was exterminated by the Stalinist reaction from within and by conservative and liberal reformism from without, New groupings were formed to give life to the activist tradition thirty years later, with the rebirth of the New Left, the Student activists, "drop-out communities and other fragmented revolutionary groups.

2.2.2 PEDAGOGIES

The earliest forms of architecture education lied in the art of "learning by doing". This started with the improvised methods of the Early Man and reached its most advanced phase in history during the Arts and Crafts movement which was very popular throughout the known world.

The most significant step in architectural pedagogy occurred with the appointment of Walter

Gropius as the director of the BAUHAUS in 1919. According to the School's first manifesto, it was to teach crafts, and all artists and architects were to work together towards the great goal of "the building of the future".

This noble objective has since formed the chore programme of all schools of Architecture to data.

2.2.3 THESIS POSITION

In the various traditions discussed above, there are some shared assumptions which cut across the traditions and have positive implications. For instance, the idea of artistic freedom and autonomy is shared by the self-conscious, idealist and intuitive traditions, while the idea of social equality is common to the activist, unselfconscious, logical and idealist, traditions.

The basis of the reflection on these traditions is to draw from their experiences and use them as springboard for greater heights. The lessons of the various traditions in the Twentieth Century Modern Architecture should be used by developing nations of the world in formulating architectural philosophies that are relevant and appropriate to their needs.

2.3 ARCHITECTURAL EDUCATION AND ARCHITECTURE PROFESSION IN NIGERIA

The practice of Architecture and the method of transferring its knowledge has evolved through three major stages in Nigeria, namely: The Pre-colonial Architecture (before 1860); The colonial Architecture (1860 - 1960); and the current Trends (1960 - Date).

The Pre-Colonial Architecture (Before 1860)

The first stage was before the advent of colonialists on Nigeria's shores. Every household incorporated an "architectural practice", Domestic structures were erected according to user needs and requirements.

The art of learning by doing was transferred from generation to generation.

For large individual buildings and communal structures, a group of house hold heads and opinion leaders constituted a team of "designers" and other members of the community lend their human and material support for the implementation of the building project.

This period saw the ancient cities and towns practising architecture within the realm of available technology and reflecting the spirit of the time. Commitment to the indigenous architecture was total and vary sincere!

"Colonial" Architecture (1860 - 1960)

Architecture witnessed another phase of its evolution with the advent of Colonialists. The territory of Nigeria was colonised by British explorers who brought their style of prevailing English Architecture, and constructed houses, schools, and administrative offices to reflect their tastes, cultural values, and space perception. This marked the beginning of cultural conflict in the practice of architecture in Nigeria. The local craftsmen and the artisans who later acquired the basic skill of the "new" art now saw little need to employ the indigenous technology any further. This marked the beginning of a decline of the rich building art and indigenous architectural grammar of the territory.

Along with other imported values, the educational programme of the colonial administrators concentrated more on the training of basic literacy programme, to get able-bodied servants and clerks to assist in their domestic and administrative functions. The children of the well-to-do's as well as the local chiefs who had the privilege of attending schools were taught with the concept of "3-Rs" - Reading, writing and Arithmetic. The educational structure had no place for technology-based courses. Fourah-Bay College in Sierra-Leone was the only Institution for tertiary education in Law and Art-oriented courses at that time.

With the growing pressures on the colonial administration, the University College, Ibadan became a reality in 1948 as a campus of the University of London. The University College was structured to train manpower in areas of classics, Linguistics, Administration and Medicine.

Technology and Science based courses were pursued overseas by the very few families who were privileged enough to be able to afford it, and who were enlightened enough about its advantages.

Throughout the colonial period, architectural education was pursued only in overseas institutions. The few nationals who completed their architecture programmes abroad were offered jobs as assistants in the colonial office departments under the guidance of the European Superiors. The bulk of exposure of these architects and the local craftsmen was on the prevailing British Architecture of that era.

Examples of the architectural edifices of the colonial era include the regional headquarters of the then Barclays Bank (Union Bank), the "Victorian" houses as well as the colonial houses in Government Reservation Areas (G.R.As).

1960 - DATE: CURRENT TRENDS

As at Independence in 1960, there was only one full-fledged school of Architecture operating at the

degree-awarding level in the federation. That was the Nigerian College, Ibadan, which was established in 1952 and moved to Zaria in 1955. It was later named the Ahmadu Bello University, Zaria.

At the same time, [the same year the Nigerian Institute of Architects was formed] the total number of indigenous architects was below fifteen and all of them were trained in European countries. Up till very recently, the architects and schools of Architecture in Nigeria were "Euro-Centric" in ideas and operation, until the awareness came for the schools to focus more on the values and virtues of the indigenous culture of the people. These reforms led to series of papers on the need to search for what the "Nigerian Architecture" really stands for. The situation is not much helped as the wealthy and the privileged in the society has developed artificial taste for the foreign values of the colonialists. The situation was worsened by the "oil-boom" era in the country, and imported building and finishing materials became the vogue.

In the present-day Nigeria, there are about fourteen Universities offering Architecture at Degree level, about twenty Polytechnics and well over three thousand architects on the list of the Nigerian Institute of Architects and ARCON. Considering the boom enjoyed by the building industry in Nigeria in its first quarter of a century as an independent nation,

one begins to wonder why the sudden stagnation in the process of modernization of our indigenous ideas especially concerning the building industry.

Certain things must be done! No responsible citizenry will fold his arms and watch things go out of order. As at today, the Nigerian Institute of Architects, the AARCHES, ARCON, and the Federal government are making efforts to revive a true spirit of our indigenous technology, arts and architecture. there is a lot more to be done!

2.4 THE NEED FOR CHANGE IN ARCHITECTURAL EDUCATION AND PRACTICE IN NIGERIA

Architectural Education and Practice is at a stage in Nigeria where no specific pattern can be used to name-tag it. At best, what we have is a babble of contending voices proclaiming to understand and practice appropriate architecture. Obviously, there is need for a change of attitude and proper definition of direction. The issue at hand is, who should effect the change, and, along which path should the change be directed.

2.4.1 ELEMENTS OF CHANGE: CONTENT, CONTEXT, AND STRUCTURE

For a comprehensive diagnosis to be conducted, there is need for an understanding of the problem. An overview of the various civilizations and accompanying architectural trends have shown a lot of disparities

and inconsistencies of our claim for the search of an Architectural heritage. It is easy to understand the pluralism of architectural ideas and expressions that are open to a nation that has been colonised for a period of one hundred years. The structure of education, the socio-cultural values as well as perception of life are prone to gross misinterpretations.

At independence, oil, a naturally occurring mineral material bestowed upon the nation a huge foreign reserve. This prompted high taste for foreign goods to the detriment of local technology. Our schools suddenly became foreign-oriented, both in manpower (brain-drain) and curriculum. this was as a result of graduates fleeing into the management and private sector of the economy. Little attention was paid towards research and development of the abundant indigenous materials at the nation's disposal.

In the global trends analysed, as well as in the nation's pre-colonial architecture, the scene was filled with people who were sincerely committed to true greatness of their era.

A nation need not wait for a global economic recession for its technological potentials to be tapped. The Nigeria's situation is pathetic! A lot of valuable building materials are left untapped while huge sums in foreign reserve is being wasted on

importation of foreign ones which have little or no relevance to our climatic and cultural values.

The time for change is now! With the global economic recession and the need to revamp the nation's particularly depressed economy, architecture is seriously challenged to redeem the building industry by researching into local sourcing of viable alternative materials. These materials will definitely be more appropriate and will readily adapt to the indigenous climate and socio-cultural influences than the imported ones.

Everyone in the society needs to contribute to this process of change. The government needs to change by putting greater premium on indigenous values and encouraging research into local sourcing of building materials and relevant technology. This will, no doubt reduce wastage on the nation's foreign reserves, and reduce dependence on foreign technology - which, often times is not sympathetic towards the peoples' needs and requirements.

The architect's role need to change by being more research-oriented than at any other time. He must celebrate the prospects and potentialities of the indigenous building technology and materials, and use all the persuasive means at his disposal to justify their use. The architect must also encourage the artisans and craftsmen to understand the improved local

technology and apply them to the improved materials with greater ingenuity. It is only when this is done that an acceptable level of aesthetics which will be appealing to the clientelle and users of architectural products will have been reached.

Professional bodies in the building industry, especially the architects owe it as a duty to organize training programmes for enlightenment of the consumer public of the need to patronise indigenous technology and materials. This can be implemented by making available the advantages and potentials of the need to look inward for the local sourcing of appropriate materials and technology. By these, the leadership position of architecture in the building industry will be justified, and the issue of affordable shelter for all will be a reality in the near future.

2.4.2 AWARENESS AND ENLIGHTENMENT FOR THE PROFESSION

By the code of Professional conduct, of the Nigerian Institute of Architects, an architect must not advertise his professional services through print or electronic media. This is being abused by sister professions and even the draughtsman! Usually by misinterpretation and misrepresentation of the architectural services to the public.

The layman is confused when the services to be performed by an architect is being "offered" by an "ARCHITECTURAL DRAUGHTSMAN". Incidentally, the

Draughtsman has a large, wall-displayed signpost, while the architect does not.

The argument here is to emphasise the need for the various bodies of the architectural profession to organise series of enlightenment programmes for the vocations in the domains of exclusive architectural practice. Architecture must be understood by the consumers of architectural products, or else the efforts in the professional circle will not achieve its desired results.

It is equally important for the architect to insist on the other "sister professions" in the building industry to engage only the services of a fully qualified architect for their specialized services, rather than working with quacks, whose knowledge oftentimes are not grounded enough for a safe and healthy environment.

2.4.3 THE WIDENING GAP BETWEEN THINKING AND DOING

The present problems in the architectural environment is not restricted to the practice world. Much as the effects are manifesting themselves through the outputs of the practitioners, the schools have a big role to play.

Formal or informal, the gap between "thinking-and-doing", "Design Studio and site" must be reduced. A culture is never static! And, if Architecture has to

assist the culture-in-change, then, architecture must itself undergo continuous self-examination and critical evaluation.

It has been said that the seasoned architect has to be an all-round research-oriented professional who must bring results and products of research activities to the knowledge of the consumers of his architectural creation. Ordinarily, this might seen difficult to combine with the daily cores of office practices, but periodic renewal and update of his knowledge by patronising reviews, journals, seminars, workshops and sandwich-courses on current trends in architecture related programmes will mould a seasoned architect that the society needs.

Moreover, participating in programmes of these kinds would create a forum for the architects and other related professionals as well as the clients to exchange ideas, so that producers and consumers are working mutually in each other's interests.

This is the essence of the thesis!

CHAPTER THREE

CREATING AWARENESS FOR COST-CONSCIOUS BUILDING MATERIALS AND CONSTRUCTION METHODS

PREAMBLE

This thesis may not be conclusive without emphasis on the appropriate material culture of today's architecture - especially in the developing world.

Since the physical manifestation of the Design thesis is to celebrate the prospects and potentialities of the use of affordable and cost-conscious building materials and method of construction, it is only proper to do justice to the topic at this stage of the study.

The thesis posits that there are numerous materials being developed daily as solutions are being sought to escalating cost of building materials, most of which are yet to be documented. Efforts have been made to highlight those materials that have been documented in order to propagate their potentials.

It is an accepted fact that the availability and supply of low cost building materials is one of the major obstacles to improved housing conditions in developing countries, whether in the cities or in the rural areas. This is a great challenge to the architecture.

Research has shown that the capital costs of

establishing high-technology building materials industries in developing countries are too great. This is very difficult especially if the model of the industrialised countries have to be followed. It results in the production of materials at prices which the ordinary citizen may not be able to afford. As a result of the awareness and growing interest in the use of materials which can be produced almost entirely from local resources, this study attempts to highlight various indigenous materials. It also encourages the use of simple small-scale production technologies to provide durable building materials at a cost which can be afforded by potential house-builders and home owners alike (Habitat, 1988).

Five different categories of building materials are the focus of the study:

Soil, timber, fibre, stone and cementitious materials.

3.1 BURNT CLAY BRICKS AND TILES

Burnt-Clay bricks and tiles are made by forming a plastic mixture of a suitable soil and water into appropriately shaped units, drying the units and than firing them or burning them in a kiln.

3.1.1 Raw Materials

Many types of soils are suitable, but clay and silt must not be in excessive proportions to avoid shrinkage, which may lead to cracking and distortion.

TILE MAKING

This requires a higher dry strength and a lower porosity than for brick making, as well as a soil with more clay particles.

3.1.2 Production Technologies

The principal stages of production for both bricks and tiles are:

.Winning: Brick-earth is normally won from workings not exceeding 3 meters.

.Preparation: Preparation of the soil involves screening, crushing, weathering and tempering, crushing may be required for heavy clay soil.

.Moulding: Bricks are traditionally moulded by hand in simple, wooden moulds. Moulding can be either slop moulding or sand-moulding.

In either methods, multiple or gang moulds can be used to speed production.

.Drying: Bricks and tiles are sun dried in dry climates.

.Firing: Clamp is the simplest technique for firing.

A clamp is a large pile of bricks carefully stacked to leave spaces for fuel and for distribution of hot gases.

.Fuel and Energy Consumption

The amount of fuel needed for the production of clay bricks and tiles depends on the Kiln type, on the type of fuel being used, and on the type of bricks or tiles produced.

3.1.2 PERFORMANCE STANDARDS

Bricks: Standards for solid bricks normally specify limits on dimensional tolerances, compressive strength, water absorption, and the extent of efflorescence.

3.1.3 USES IN CONSTRUCTION

CLAY BRICKS:

Bricks walling are usually made from burnt clay bricks.

It is strong and durable, and will lend itself to a variety of configurations, surface treatments and textures through the use of different brick bonds.

It can also be reinforced longitutinally by mesh in mortar courses for earthquake areas.

Burnt-clay bricks are also usable for load-bearing walls for multi-storey buildings.

CLAY-TILES:

Life span may exceed 50 years with little or no maintenance, and their colours are better maintained than pigmented concrete tiles.

3.1.5 INNOVATIONS IN MANUFACTURE AND USE

Recent innovation has tended to be more concentrated on bricks, rather than tiles.

3.2. SOIL CONSTRUCTION

INTRODUCTION

Soil is used in construction in a huge variety of ways, but emphasis will be on the three predominant methods which have the greatest potential for future development.

These are: . ADOBE BLOCKS

. PRESSED-SOIL BLOCKS, and

. RAMMED-EARTH WALLING

ADOBE BLOCKS

These are building blocks formed by making a liquid mixture or slurry of earth and water, which is poured into moulds and then air-dried.

PRESSED-SOIL BLOCKS

These are building blocks or bricks made by compaction of a suitable soil in a mould under pressure.

RAMMED-EARTH WALLS

Rammed-Earth Walls are formed in place by compacting earth or soil between temporary forms. The forms are generally of timber, sometimes connected by steel ties.

3.2.1 RAW MATERIALS

Essential raw materials for soil construction are a suitable soil and a stabilizer where appropriate.

SOIL SELECTION

For a soil to be considered suitable as a building material, three principal properties are crucial;

- Its grading or particle size distribution;
- Its plasticity or behaviour when mixed with water; and
- Its behaviour under compaction.

STABILIZERS

Most widely used stabilizers are cement, lime and bitumen.

Organic fibrous materials such as chopped straw and cow dung are also sometimes added to adobe blocks.

3.2.2. PRODUCTION TECHNOLOGIES

The three principal methods of soil construction involves the following production stages:

- Excavation and soil preparation;
- Mixing;
- Moulding;
- curing

*In all the cases, manual or mechanised excavation may be used.

ADOBE BLOCKS

Mixing:

Mixing for Adobe production requires the addition of water to soil to bring it to a semi-liquid

consistency or paste if the mixture is to be thrown or poured into the moulds, or a plastic consistency if the mixture is to be extruded.

Moulding

Adobe blocks are moulded by throwing or pouring the paste into open-bottomed moulds on the ground.

Curing:

There are two stages to the drying process for Adobe blocks. In the first stage, the blocks are left where they have been cast until they are dry enough to handle. They may subsequently be stacked for further drying when sufficient strength has been achieved.

The length of these two stages depends on the climate and on the type of soil used.

PRESSED-SOIL BLOCKS

Mixing

Adequate mixing is carried out in two stages and is vital to the performance of pressed-soil blocks.

First, the dry ingredients are mixed. The addition of water and any liquid stabilizer is a separate stage.

* The water needs to be added gradually.

Moulding:

The simplest method is by hand-ramming in a wooden or metal mould.

Curing:

The appropriate method depends on the stabilizer used.

RAMMED-EARTH WALLING

Mixing:

Same soil preparation and equipment as for pressed soil blocks may be used.

Since Rammed-Earth walls are generally thicker than pressed-block walls the quantities involved may be larger.

Moulding:

The formwork for Rammed-Earth walling is generally made of timber, though other materials have been used.

Curing:

Curing or drying of a rammed-earth wall should be slow to avoid cracking. The walls should be sprayed with water, or wrapped in plastic or covered with grass screens to prevent rapid drying.

3.2.2 PERFORMANCE STANDARDS

For all types of soil construction, the important properties to be considered in formulating standards are:

- Compressive strength.
- Water Absorption.
- Weather Resistance, and

. Dimensional Accuracy - for brick and block manufacture.

Compressive Strength

Compressive Strength test is required in order to ensure that a soil wall is able to sustain its load without failure or local crushing at points of high stress.

Water Absorption

The water absorption test is conducted to measure the porosity of a masonry unit.

Weather Resistance

Weather resistance of a pressed soil block may be measured by a water-spray test, or by the more severe abrasion test.

For Rammed-Earth walling, these tests may be carried out either on a sample cut from a completed section of wall, or on specially made test block which is compacted to the same density as the wall.

Other Tests

Include Modulus of Rupture Test, Specific Density Test and test for Surface Appearance.

3.2.4 USES IN CONSTRUCTION

ADOBE BLOCKS:

These usually have longer plan dimensions than

pressed-soil blocks.

The mortar used in construction is normally of the same soil as used for making the bricks.

PRESSED-SOIL BLOCKS

Pressed soil blocks will tolerate treatments applicable to other similar masonry materials such as concrete blocks and burnt-clay bricks.

RAMMED-EARTH WALLING

The thickness of a rammed-earth wall depends on both the soil and the climate and is usually determined by local tradition.

RENDERS

Renders for soil walls need to be carefully considered to ensure adhesion and limit subsequent cracking, spalling and disintegration.

3.2.5 INNOVATIONS IN SOIL-CONSTRUCTION TECHNOLOGY

ADOBE BLOCKS

In the comprehensive study of the manufacture of Adobe blocks by the International Institute of Housing Technology at Frasno, California, Standard procedures have been set for stabilizing with bitumen (or asphalt).

Developments in adobe manufacture have been largely in the organisation of production to improve output.

Procedure for manufacturing sun-dried earth bricks

have been developed which involve the use of a mortar reinforced with cow dung.

PRESSED SOIL BLOCKS

One remarkable achievement has been to extend the range of soils which can be effectively stabilized using block presses and economical stabilizer contents.

A process of stabilization of laterite with lime has been developed.

*Lateritic soils and Fibre reinforcement for stabilized soil blocks have been investigated in Nigeria.

RAMMED-EARTH WALLING

Innovations in rammed-earth walling technology has been principally concerned with the design of the formwork.

3.3 LOW-COST BINDERS

INTRODUCTION

Low-cost Binders refer to materials other than Portland Cement, which have cementitious properties - they have the property of binding concretes, mortars, and so on.

Four types of low-cost binding materials will be discussed here Lime, Lime-Pozzolana mixtures, Blended cements, and Gypsum plaster.

LIME

Lime is derived from limestone or other forms of calcium or Magnesium carbonate.

POZZOLANAS AND BLENDED CEMENTS

Pozzolanas are siliceous materials with little or no binding property on their own, but when mixed with lime in the presence of water, will set and harden like cement.

GYPSUM

Gypsum plaster is a traditional product made from heating mineral gypsum, which is used as a wall and decorative render for buildings, and as a binding material to make mortars and concrete.

3.3.1 Raw Materials

LIME

Limestone suitable for lime burning occurs in a wide variety of forms. The most common is consolidated sedimentary limestone. Other usable forms include sea shells and coral, chemically precipitated limestones such as travertine and marble.

CALCINED CLAY POZZOLANA

The raw material required is a suitable clay.

FLY-ASH POZZOLANA

Fly-ash is a finely divided residue resulting from the combustion of ground or powdered bituminous coal or

lignite which has been extracted from the flue gases of boilers fired by these fuels. It is generally obtained as a wasted material from thermal power stations or other industrial plants.

RICE-HUSK ASH POZZOLANA

The use of ricehusk ash as a pozzolana is a relatively new development, and no formally approved standard exists.

VOLCANIC-ASH POZZOLANA

A wide variety of volcanic materials have been used as pozzolanas.

Physical and chemical requirements depend on the processing and end-use proposed, and no generally agreed standards exist.

GYPSUM

The raw material used to make gypsum is Hydrous Calcium Sulphate, a calcium-based mineral which is found naturally in a number of forms.

The most commonly found is Rock Gypsum, which is found in sedimentary rock formations.

3.3.2. Production Technologies

LIME

There are three essential aspects:

. Quarrying and stone preparation

. Burning (or firing)

. Hydration

Quarrying and Stone Preparation

Involves quarrying or extracting operations, transporting to the kiln, eliminating undersized and oversized material and removing contaminating materials.

Lime-Burning

Takes place in a lime Kiln where limestone is heated to a temperature of between 900°C to 1250°C at which dissociation takes place.

Hydration

Is the addition of water to quicklime, the lumps of burned limes which are discharged from the Kiln, to cause it to expand and disintegrate into very fine particles.

POZZOLANAS

The technology for producing pozzolanas varies with different types of pozzolana.

LIME-POZZOLANA BINDERS

Lime-Pozzolana binders are produced by integrinding or blending the separate raw materials, lime and pozzolana as a masonry cement. Periods of integrinding of up to eight hours are used.

BLENDED CEMENTS

Blended cements are produced by intergrinding or blending Portland cement or cement clinker, pozzolana and other ingredients.

GYPSUM PLASTER

CALCINATION:

Gypsum plaster is produced by heating raw gypsum to between 100°C and 200°C, which is a relatively lower production temperature than required for most other low-cost binders. This makes the production technology simpler and the energy costs of production much lower than for comparable materials.

FIRED GYPSUM PRODUCTS

When gypsum is fired, the end result is a mixture of burned gypsum with the ash of the fuel used. these are mixed together and ground up to make a basic quality of plaster which is grey-white.

PRESSURISED GYPSUM PRODUCTION

The hemi-hydrate produced by the above methods of heating in a vessel that is open to the air, that is, in a dry environment at atmospheric pressure, is known as Calcium Hemi-Hydrate Variety Beta. A stronger variety of hemi-hydrate, known as Variety alpha, can be produced by heating the raw gypsum in a closed container, building up a higher pressure in a saturated

atmosphere, usually with a saline solution.

Pressure vessels to produce the hemi-hydrate Alpha are known as KETTLES.

3.3.3 PERFORMANCE STANDARDS

LIME:

Limes can be divided into three different types, according to their chemical composition, thus: High calcium Limes, Magnesium Limes, and Semi-Hydraulic Limes.

Certain physical requirements are specified for limes: fitness, soundness (expansion is setting), Workability, and Hydraulic Strength.

POZZOLANAS

The essential requirements for a pozzolana is its ability to combine with lime or with Portland cement and to develop cementitious properties.

BLENDED CEMENTS

National standards exist for the performance of Portland-Pozzolana cements. Apart from this, no formally approved standards for other blended cements exist, at least for now!

GYPSUM PLASTER

The standards for the production of gypsum products in developing countries are based mainly on the standards published in industrialised countries.

3.3.4 Uses In Construction

LIME

Lime is used in building as an ingredient of lime-based mortar and plasters.

Lime is also used for soil stabilization, in lime washes, in the manufacture of sand-lime bricks and other lime-based building blocks.

3.3.5 Innovations In Low Cost Binder Technology

LIME

RAW MATERIALS

Recent innovations in the lime technology have included methods of using unconventional raw materials, the design of innovative Kilns to reduce fuel consumption - or use locally available fuels.

BLENDED CEMENTS

Blended cements in which materials other than Portland Cement dominate the mixture are in production using a variety of pozzolanic mixtures.

GYPSUM PLASTER

Localization of gypsum deposits in some countries means that use will be regional without the transporting of calcined plaster to national markets.

3.4 FIBRE-CEMENT ROOFING (FCR)

Fibre is popular in application to improve the properties of a cement-based product.

The *fibre-concrete roofing* (FCR) is the use of low-modulus vegetable fibre mixed with cement and sand to form a roofing material.

3.4.1 RAW MATERIALS

CEMENT:

Ordinary Portland cement (OPC) is the cementing material in the production of FCR products.

SAND:

Sand is a very important raw material. The use of poor quality sand will result in a weaker and often porous FCR products.

FIBRES:

A wide range of vegetable fibres have been tested and found to produce an acceptable quality FCR products.

*Preparation of fibre involves washing, drying and separating.

Boiling may be necessary to remove cement-retarding chemicals.

WATER:

Potable water should be used for the manufacture of any cement based product.

OPTIONAL ADDITIVES

Range of optional additives that can be included are similar to those used in conventional concrete technology. They include accelerators, plasticisers, water proofing agents, and colouring pigments.

3.4.2 Production Technologies

The production technologies for FCR tiles and sheets are very similar, but differ slightly.

TILES: PREPARATION OF MATERIALS

The sand is sieved using a 2mm size. Only the fraction passing is used. The fibres are chopped to an average length of 15mm - 20mm (max): 10mm (min).

Output Range and Costs

The output range in terms of tiles per day depends largely upon the number of moulds available - each tile must cure on a mould for 24 hours.

SHEETS: PREPARATION OF MATERIALS - Same as for tiles

Production Procedure

The same as for tiles except that the cement: sand ratio is 1:1 by weight and the fibre content is 1 percent by weight.

Energy Requirements

Only human power is needed!

Output Range and Costs

Daily outputs using the method available range from 10 to 30 sheets per day.

FCR sheet cost per square metre of roof cladding varies from US $3.00 to US $5.00.

COMMERCIAL TECHNOLOGIES

Presently there are only two suppliers of FCR tile production equipment.

SHEET PRODUCTION

There is no known commercial equipment supplier for sheet production on a small scale.

3.4.3 Performance Standards

Technical Specifications

The technical specifications of FCR sheets and tiles vary slightly depending upon the manufacturing process involved.

Performance Standards

In general, properties that should be specified for FCR products are: Transverse strength, Permeability, Impact Strength, Surface Defects, Colour, and Nib Strength.

Other properties that might be specified are: Dimensions and tolerance, Fixing devices, water

absorption, markings, Quality and types of raw materials used and surface coatings.

3.4.4 Uses In Construction

TECHNOLOGY CHOICE: SHEET VERSUS TILES

In a research study on sheets and tiles, SKAT (1987) and Boonstra (1985) concluded that FCR Tiles are a superior product: but the SKAT report suggested that in some cases, sheets may be a more appropriate choice.

Design and Practice:

For the design and construction of buildings using FCR tiles and sheets, normal construction practices for a similar product should be allowed.

Roof Structure:

Tiles have this advantage of being able to take up unevenness in a roof-structure and therefore require less exacting craftsmanship, as well as being more suitable for the use of uncut timber.

FCR Tile and sheet Laying

This is not different from that for conventional roof cladding materials.

The construction of hips and valleys is possible with FCR tiles. Ridge tiles should be fixed using a weak cement: Lime: Sand mortar.

Transporting: FCR sheets are not easily transported, particularly over unsurfaced roads, and losses may be quite high. It is therefore advisable to produce FCR sheets on the site where they are to be used.

3.4.5 Innovations In FCR Technology

TILES

Vibrating Tables: The vibrating equipment supplied by Parry and Associates is the most tried and tested available with over 450 electrical and 50 hand powered versions in use.

Moulds: The early tile moulds were made from concrete, but improved versions have since been researched into.

Tile shapes: FCR Tile production has been exclusively of the pantile design; two new designs have been recently developed "Romantile" and "Semi-sheet".

Ridge, Hip, Verge and Eaves Details: Redges and Hips can be visually improved by the use of ridge tiles with performed over-lapping joints.

Additional Equipment: Parry and Associates produces a range of additional equipments including handling trucks, accelerated solar curing bins and fibre cutters.

SHEETS:

Parry method of producing FC Roofing sheets is different from the other processes in that Parry uses randomly distributed chopped fibre, whereas other methods use long fibres interlaid with mortar.

Fibre Versus Non-Fibre:

Recent research has shown that thin concrete tiles can be produced without the addition of fibre. This has led to a debate on whether the addition of fibre in concrete roof tiles is advantageous.

3.5 TIMBER

INTRODUCTION

Timber is one of the most valuable resources and it conforms to the most varied requirements. It is easily worked with tools and machines and it has a very high "Strength: Weight" ratio. It is very elastic. Wood is resistant to mild chemicals and it does not corrode.

3.5.1 TIMBER RESOURCES

Appropriate Technology for timber Utilization:

Some of the current techniques for using wood are very wasteful and can be improved upon. Timber could be more efficiently used by the introduction of simple techniques for the prevention of decay and insect attack.

Nomenclature:

Timbers are botanically classified into two groups - "softwoods" and "hardwoods". Softwoods are produced by coniferous trees whereas hardwoods are produced by brood leaved trees.

Tropical forests:

The most significant feature of the tropical moist (rain) forest is the heterogeneity of its botanical composition.

Forestry Plantations:

In the modern world, the policy of the foresters is to plant at least enough land to compensate for extraction and natural wastage.

Bamboo:

Bamboo is one of the oldest building materials in common use. It has many advantages as a construction material - it is light, strong and elastic.

Coconut wood:

The coconut palm occurs in all tropical and most sub-tropical regions.

Rubber Wood:

When rubber outlive their useful life (of 25 to 30 years) as far as "tapping" latex for processing into rubber is concerned they are replanted continuously

representing an important source of raw material.

3.5.2 PROCESSING TECHNOLOGY

TECHNIQUES OF SAWING

The pattern in which timber is converted from a log has some influence on its appearance and behaviour. Two methods of converting timber are known:

- Through-and-through sawing;
- Quarter-sawing.

Through-and-through Sawing:

The boards are cut to the desired thickness, parallel to each other on the longitutional axis of the log. when a log is Quarter-Sawn most of the boards are cut on the radius of the log.

GRADING

Grading may be carried out to assess the appearance of the timber simply by considering the size and position of characteristics such as knots in relation to decorative requirements.

When designing and implementing low-cost housing, simple trusses, prefabricated buildings and bridges in developing countries, selection of materials should be based strictly on basic tests. At the same time, selection must be efficient to avoid waste of valuable resources.

STRENGTH GROUPING

The use of a limited number of strength classifications is of considerate value as the designer can easily specify timber by a strength group rather than by species.

TIMBER DEFECTS

Defects in timber such as shakes, splints, and checks are caused either when the tree is felled or by bad seasoning. Stains and discolourations, due to surgical attack, occur before the timber is fully seasoned. Most common defects are knots, shakes, fissures, interlocked grain, honey combing, cupping, springing, bowing, twisting and distortion.

MOISTURE CONTENT AND SEASONING

Timber in the wet - "green" condition contains a large amount of moisture. To enable the timber to give satisfactory service in use, most of the moisture has to be removed - SEASONING.

The two most-practical methods of drying timber are air drying and Kiln seasoning.

Air Drying:

In air drying, green timber is stacked in open sheds on a well-drained site. Stacks are erected on good solid foundations, and in order to allow ample ventilation, the bottom layers are raised above the ground.

Kiln Seasoning:

In Kiln seasoning, the timber is placed in chamber or a Kiln in which the temperature, humidit and the flow of air can be controlled to achieve th maximum rate of drying and to reduce the development o defects. The timber has to be carefully stacked s that a uniform air circulation can be achieved.

Other Methods of Drying:

Solar drying uses the sun to heat the air insid the Kiln where timber is already stacked.

There are many other methods of drying timber suc as salt seasoning, solvent seasoning, boiling in oi liquids, vacuum drying, drying in superheated steam vapour drying, radio frequency, etc.

PRESERVATIVE TREATMENT

As timber is liable to attack by wood-destroyin organisms, fungi, insects and marine borers, all timbe used in structural work which is not of a naturall durable type is usually treated, using an appropriat preservative.

Wood preservatives may be divided into three mai groups, namely tar oils, water borne and organi solvents.

METHODS OF TREATMENT

There are two main methods of treatment; pressur - and non-pressure methods.

FIRE

Although the timber chars at a rate of 30 to 40mm per hour, the low thermal conductivity of both the timber and the char protects the unburnt wood, and thereby retains most of its original strength.

TIMBER JOINTS

The use of sawn and round timber in a range of structural applications is largely governed by the availability of suitable fastening systems or components which permit the joining of members in a reliable and efficient manner.

NAILS:

There are very many varieties of nail shapes and materials. Round, plainwire nails are by far the most commonly used fasteners for timber.

SCREWS:

There are many types of screws including counter sunk, round head, raised countersunk phillips and coach-screws.

BOLTS:

The commonly used bolts are made out of mild steel and are much stronger than nails. Factors determining the strength of a bolted connection includes timber species, bolt size and slenderness, width of members in the joints, number of sheer planes, space requirements

and quality control in fabrication.

TIMBER CONNECTORS:

Timber connectors used with bolts are toothed plates, splitrings or sheer plates. Toothed plate connectors may be double-sided or single-sided.

FINISHING PROCESSES

The type of finish applied to an article depends on the kind of timber that has been used and the purpose for which the finished article is intended. timber exposed to the weather and unprotected by some kind of finish will "weather" and quite rapidly become bleached and grey.

MANUFACTURED PRODUCTS OF WOOD

The additions to the three basic types of panels: plywood, particle-board, and hardwood are - oriental strand board (OSB), Medium Density Fibre board (MDF), Structural Flakeboard and waferboards, composite panels as well as innovations within the conventional products.

PLYWOOD:

Plywood consists of thin layers of timber called veneers glued together. The layers, or plies, are glued with the grain directions perpendicular to each other. Plywood is made up from an odd number of veneers, the most commonly used being three - ply.

HARDBOARD:

Hardboard is made by mixing wood-pulp with water. Hardboard is used as door panels, partitions, and also for curved surfaces.

MEDIUM DENSITY FIBREBOARD (MDF):

Medium Density Fibreboard is a panel product manufactured from ligno cellulose fibre combined with synthetic resin or other suitable binders. These boards are commonly used for partition.

Oriental Strand Board (OSB)

Oriental Strand Board is a specialised particle board product. They are commonly used for light frame construction.

Glued Laminated timber:

Glued laminated timber (Glulam) is formed by gluing together thin Laminae to form structural members - the grain in all the pieces run in the same direction. Glued laminated timber can be used for long spans in construction work.

3.5.3 PERFORMANCE STANDARDS

It is essential that the costs of both erection and maintenance for any building material are contained within competitive limits. One way of doing this is to specify correctly.

DIMENSIONS:

It is important that there is no cause for ambiguity when stating dimensions and tolerances.

GRADING:

Grading is usually carried out for appearance or structural purposes. Standards are being worked out stating the specifications or the grading rules.

SEASONING:

A code of practice or a standard in seasoning should cover the classification of timber for seasoning purposes, preliminary treatment, storage, seasoning methods, and Kiln schedules for seasoning different species of timber.

PRESERVATION:

While preparing local standards on wood preservation in a country, it is worthwhile consulting standards and specifications employed in other countries as well as international standards.

DESIGN AND CONSTRUCTION:

It is essential to have knowledge of the maximum stress which can be allowed in the timber in order to design any structural timber component. Major requirements for the designer are the strength of the local species of timber and a suitable code of practice.

3.5.4 USES IN CONSTRUCTION

Timber as a construction Material

In most developing countries where labour is freely available, the techniques used to produce a component must involve a high labour content.

Principles of Design

The preliminary choice of structural forms by a structural design engineer, which is largely a matter of intuition, experience, and engineering judgement shall be followed by a systematic review of functional requirements before detailed design of individual components is under taken.

Protection by Design

Problem of deterioration of structural timber are usually associated with excessive moisture or water in direct contact with the timber. At the planning stage, building orientation should be considered to reduce exposure of vulunerable components.

Construction Practice

Construction practice is very important in the case of timber structures.

Timber for Sheathing

Any timber sheathing, with the exception of naturally durable timber, can decay fairly rapidly if left unprotected. Wood preservatives may not be

required if the foundation sills (timber) are kept out of contact with the soil, and the roof overhangs are adequate to keep water off the side walls.

Timber for roof Structure

Significant advances have been made on design and construction of roofs, especially with the use of bolts and other timber connectors at joints where previously mortise and tenons half-lap or straight-nailed or pegged joints would have been used.

Timber for Roofing

When the timber suitable for the manufacture of shingles and shakes is available in appropriate sizes, these offer an advantageous solution for roofing. They are traditionally applied over open timber deck and roofing battens.

3.5.5 Innovations In Timber Technology

There have been a few innovations during the last few years. Among then the most important are solar drying, jointing methods, and the use of timber poles, bamboo, coconut wood and rubber wood.

SOLAR DRYING:

As a result of successful researches and small scales experimentation with solar timber drying design, solar Kilns are fast becoming accepted as a viable alternative.

JOINTING METHODS:

The development of efficient means of jointing has been a major factor in the advance of timber engineering, and has permitted progressive reductions in member sizes of structures.

POLE CONSTRUCTION:

Pole frame construction has shown several advantages over other forms of framing for all types of buildings. Poles are robust and can withstand the impact damage likely to be caused by heavy vehicles or farm machineries.

BAMBOO CONSTRUCTION:

Bamboo may be used alone to make all parts of a house except the fireplace. However, bamboo is more suitable when used in combination with other materials such as wood, clay, lime, and cement according to their relative suitability, availability and cost.

COCONUT WOOD:

Innovations have shown that almost the entire range of coconut wood can be used in appropriate functions in the construction of buildings, particularly houses.

RUBBER WOOD:

Rubberwood is a non-durable timber and it is very prone to attack by a wide variety of insects and fungi.

It is extremely important, therefore, to exercise proper care and treatment at every stage of processing.

3.6 CONCLUSION

The study and awareness of building materials and method of construction cannot be isolated from the general education of the 'functional' architect.

The taste of the consumer of architectural products is fast-changing, and the aesthetic appeal of the affordable materials must improve and correspond to the changing tastes of the ordinary man.

The relevance of the topic at hand in architecture education cannot be negotiated in the light of cost-conscious architecture that the society and the profession of architecture (itself) is yawning for. In the light of the above, continuing education in Architecture cannot be of any effect if the designs and specifications are devoid of thorough consideration of cost-conscious materials and construction technology.

As earlier indicated, the thesis intends to display the possible application of the indigenous materials in the complex being proposed while the traditional/conventional materials of high strength, transparency and other peculiar characteristics shall be given due consideration and priority to make the various parts of the complex functional and purposeful.

CHAPTER FOUR:

CASE STUDY

PREAMBLE

The peculiarity of the scheme at hand with special reference to the developing nations of the world is such that there seems to be very few institutions of comparable status in function, to which easy reference could be made. This lack of precedence makes it imperative for the exercise of thesis-writing under the topic to take a very wide range of establishments and institutions for study and reference purposes. However, the institutions selected, both within the country and abroad, have the task of informing and enlightenment both at the academic and professional spheres of the selected disciplines.

The various institutions and establishments have been zoned to evaluate their tasks and various contributions to their immediate environments as well as their target audience.

4.1 THE EUROPEAN SITUATION

4.1.1 Institute of Advanced Architectural Studies, University of York, U.K.

The Institute of Advanced Architectural Studies at the University of York is a centre of research and education in the built environment. As a research

organisation, it attracts funds from government and other bodies to further architectural design and practice, and building conservation.

The Institute's wide range of educational opportunities in the field of postgraduate study and continuing professional development includes many short, intensive programmes. It also enables postgraduate students to undertake programmes of research and directed study leading to higher degrees.

The Institute:

The Institute is now the only architectural school of continuing and post graduate education in the United Kingdom with a number of mature students working towards higher degrees and reaching more than 3000 participants annually through its office-centred and York-based short course programme. It has an active research and development wing and also provides direct services to the building industry. The Institute is a post-graduate department of the University of York.

The physical facilities include post-graduate research facilities commonly shared with the other arms of the University.

The principal areas of interest which the Institute offers in addition to the study of Architecture through its Third World-One World studies include:

- Conservation of buildings
- Architectural History
- Historic landscapes and Gardens
- All aspects of Housing
- Architectural Education
- Building Law and Regulations
- Health and Educational Buildings

The Institutes operations are world-wide, it is not addressing specific regional area. The facilities are provided based on broadly outlined features. They are adequate for its functions, but there is little to bestow on the planning of a specialised establishment as the one being addressed by the thesis.

4.1.2 BUILDING RESEARCH INSTITUTE, - UNITED KINGDOM

INTRODUCTION:

The Building Research Establishment (BRE) is the body carrying out research and development on fire control, building and construction in the United Kingdom. The scope of the Establishment includes conducting background research into the behaviour of materials and structures, practical studies of construction methods and the performance of buildings in use. The BRE is also charged with the investigation of immediate problems as they arise, offer advice on particular design and construction problems, and activities of disseminate and encourage application of the knowledge gained.

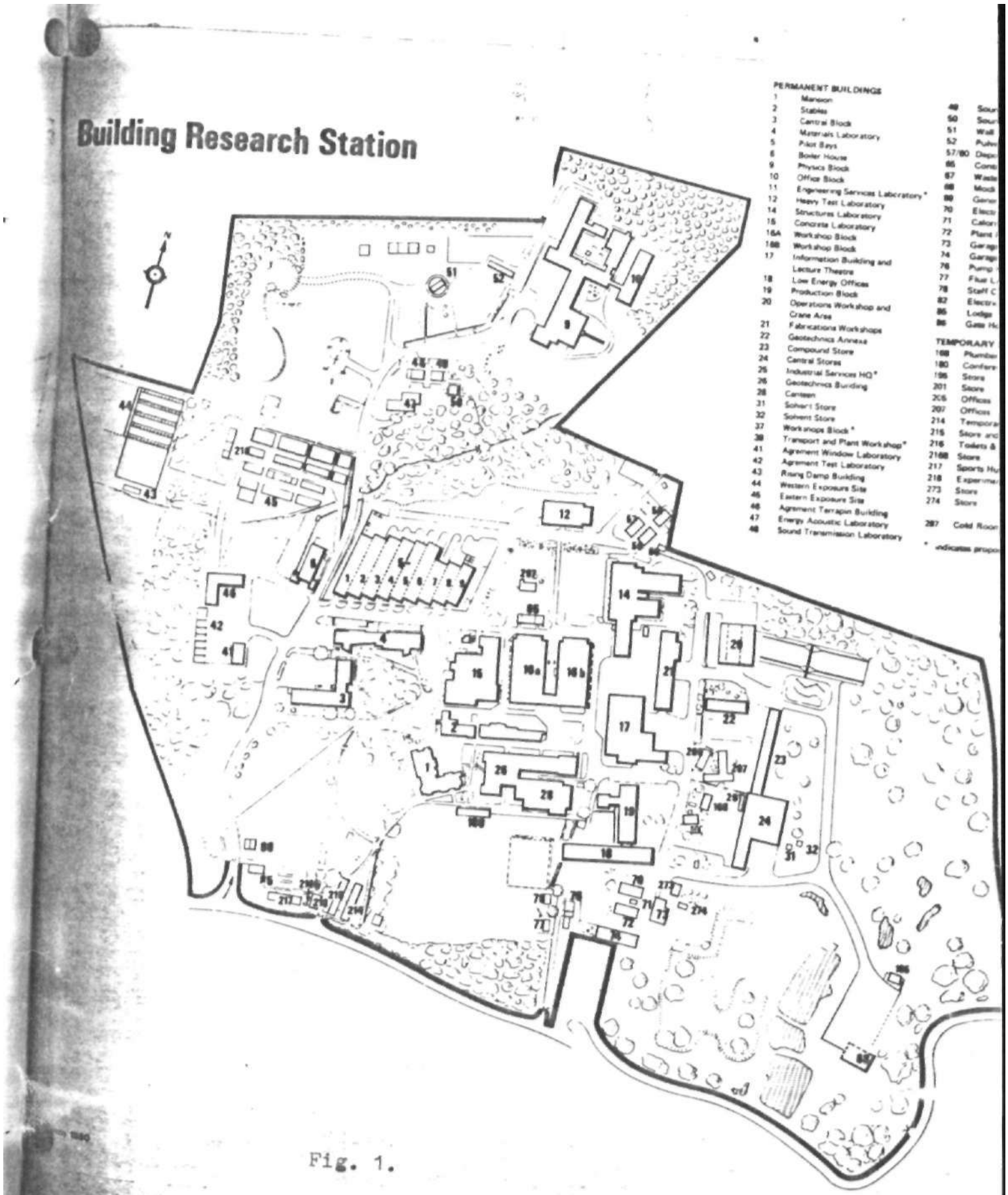

Building Research Station
PERMANENT BUILDINGS
1 Mansion
2 Stables
3 Central Block
4 Materials Laboratory
5 Pilot Bays
6 Boiler House
9 Physics Block
10 Office Block
11 Engineering Services Laboratory*
12 Heavy Test Laboratory
14 Structures Laboratory
15 Concrete Laboratory
16A Workshop Block
16B Workshop Block
17 Information Building and Lecture Theatre
18 Low Energy Offices
19 Production Block
20 Operations Workshop and Crane Area
21 Fabrications Workshops
22 Geotechnics Annexe
23 Compound Store
24 Central Stores
25 Industrial Services HQ*
26 Geotechnics Building
28 Canteen
31 Solvent Store
32 Solvent Store
37 Workshops Block*
38 Transport and Plant Workshop*
41 Agrement Window Laboratory
42 Agrement Test Laboratory
43 Rising Damp Building
44 Western Exposure Site
45 Eastern Exposure Site
46 Agrement Terrapin Building
47 Energy Acoustic Laboratory
48 Sound Transmission Laboratory
TEMPORARY
* indicates proposed

Fig. 1.

Formed in 1972, the Establishment is part of the Department of the Environment, which is the main customer for its works. However the BRE also works for other government departments and for industry.

From separate, well - established laboratories were been brought together to function as the Building Research Establishment. They include:

BUILDING RESEARCH STATION

Founded in 1921, it was the first organisation of its kind in the world. It is located in Garston, near Natford, and is the main centre for construction research within the establishment.

PRINCESS RISBOROUGH LABORATORY

Located in Buckinghamshire, it was started in 1926 as the forest products laboratory, and has become a centre of expertise on timber, especially in relation to buildings.

FIRE RESEARCH STATION

The Fire Research Station commenced operations in 1947. It is situated at Borehamwood, Hertfordshire. The station is responsible for research on the prevention, detection and extinction of fires, and the safety of life and mitigation of damage in fires.

SCOTTISH LABORATORY

The Scottish laboratory was opened in 1949 at East Kilbride, near Glasgow, and it provides a focus through

which BRE contributes, and keeps in touch with building and construction in Scotland.

STAFF STRENGTH

The staff strength is about 800 scientists and other professionals such as: Chemists, Physicists, Mathematicious, Geologists, Architects, Engineers, Builders, and Economists. There is a wide range of technical support staff like - Computer Scientists, Instrument and Electronic Engineers, Information Scientists, Draughtsmen and Photographers. Administrative personnel and extensive workshops are other sources of support services.

THE STATION'S BUILDINGS

The layout shows buildings that were erected at the Building Research Station between 1921 and 1980. At a glance, no conscious planning concept is dissemble. However, decentralization seems to be the guiding principle. The various departments and laboratories were designed with full compliments of separate support services - making inter-departmental dependency and sharing of facilities minimal. Obviously this leaves much to be desired in terms of functionality and efficiency.

However, a lot of foresight was exhibited in the spatial planning of the Research Station. The buildings were p-lanned not only to accomodate the

present requirements, but were made flexible enough to allow for changes in the direction of work in the future. Sufficient space was provided around the buildings for future expansion. The principle of ground level laboratories was also adhered to.

4.1.3 BUILDING RESEARCH CENTRE, DOKKY - GIZA, EGYPT

INTRODUCTION:

The Building Research Centre was founded in 1954 and it is responsible for scientific research and technical development in the fields of Housing, Building, and Physical Planning Research.

The Centre's objectives are briefly summarised in performing organised research on the main problems arising from the different aspects of buildings and structures with the aim of improving the quality, decreasing the cost and fulfilling the requirements of safety, health and use.

FACILITIES

The Centre has a Main Laboratory, prototype (structure) laboratories for Acoustics,. Heat Transfer, Fire, Building Stones and Wood. There is a Power Station, a Test Field, Printing Department, Stores all set on a spatious compound (see site layout).

There is adequate space for the functions, there is harmonious working relationship between the various spaces provided.

Relatively, the Institute's functions are too narrow in scope.

4.2 THE WEST AFRICAN SITUATION

Outside Nigeria, the West African subregion is grossly inadequate in terms of architecture education, both in terms of formal and informal education. In the pursuit of this research, it was observed that the whole French-speaking countries in West and central Africa jointly own a single school of Architecture- EAMAU, which is located in LOME, Togo.

Ghana, with only one (but well-equipped) school of Architecture at Kumasi has fewer than three hundred registered architects to date! The acute shortage is mostly felt when the major cities of the countries visited is analysed in view of their reflection of "non-aligned" and "eurocentric" architectural trends.

4.2.1 Ecole Africaine et Mauricience d'Architecture et d'Urbanisme (EAMAU)

Located in a very modest residential area of Lome, Togo, EAMAU is a campus of the Universite du Benin. EAMAU is jointly funded by the Franco-Phone Governments in Africa, and the school's programme is closely monitored from France.

Facilities provided at EAMAU includes three (3 No) comprehensive but modest studio, Art room, Classrooms, Photographic laboratory, Darkroom and Staff facilities.

For the scope of its coverage, facilities

provided at the school is adequate. However, there is every need to expand the scope (and thus the facilities) if any meaningful impact is to be felt on the Franco-phone African countries.

4.2.2 BUILDING AND ROAD RESEARCH INSTITUTE, KUMASI, GHANNA

The idea of establishing an Institute to cater for applied research to support the building and road construction industries in West African subregion was raised at the West African Public Works conference held in Accra, Ghana, in 1948. By 1952, the West African Research Organisation had established the West African Buildling Research Institute (NABRI).

WABRI was taken over by Ghana in October, 1962 and was renamed Building Research Institute with the National Research Council.

The organisational set-up of the Institute has been structured to reflect the main areas of its research and development operations, namely:

- Building Materials Development Division
- Construction Division
- Consultancy Division
- Geotechnical Division
- Structures, Design and Planning Division
- Traffic and Transportation Division
- Information Dissemination Division

The Building and Road Research Institute is housed

within the School of Architecture at the University of Science and Technology, Kumasi. Manpower and equipment for the Institute and the School of Architecture are sometimes transferred or jointly utilized.

There are well over 100 Ghanian research grade and non-research senior technical staff at the Institute.

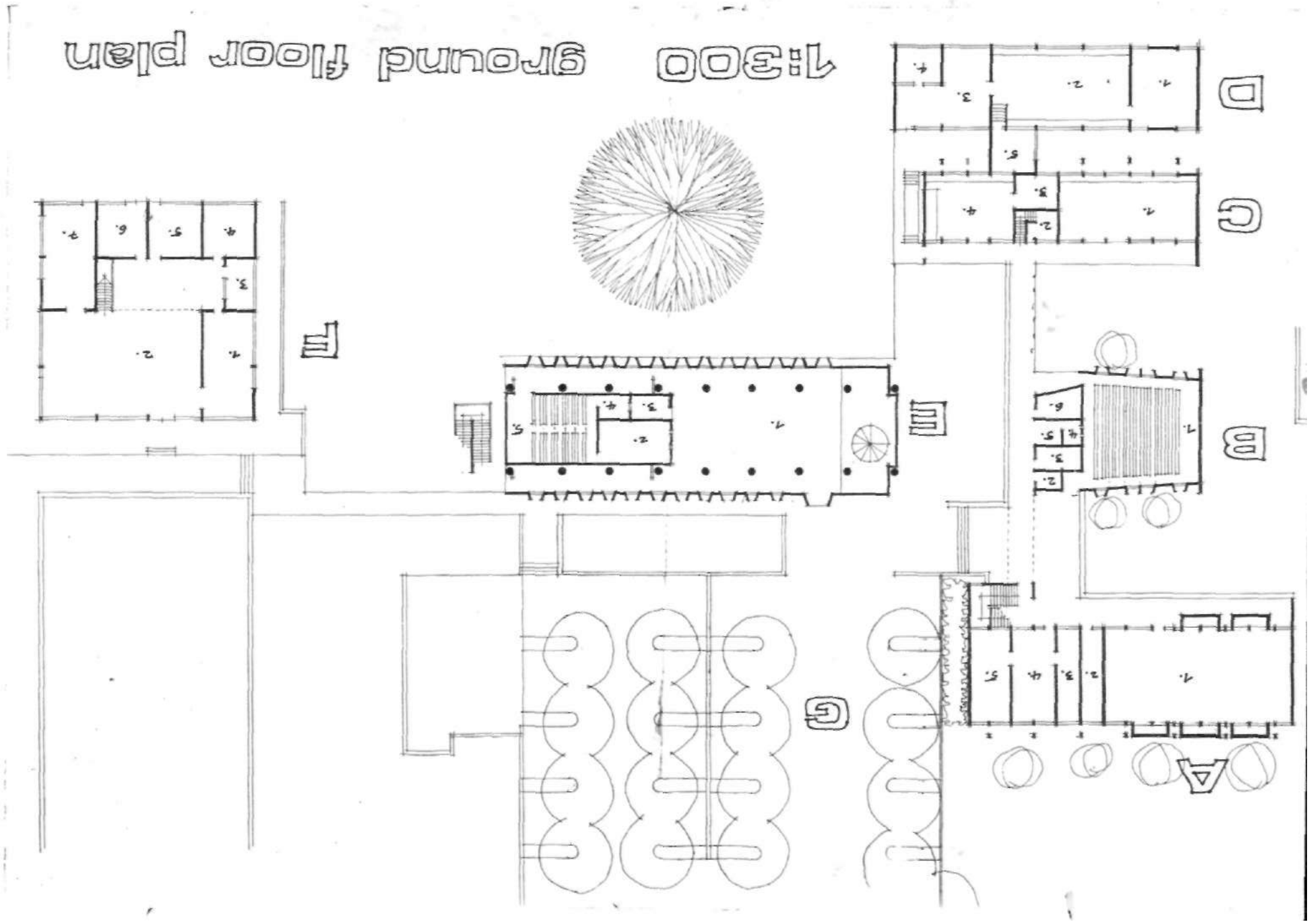
4.2.3 DEPARTMENT OF ARCHITECTURE, UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

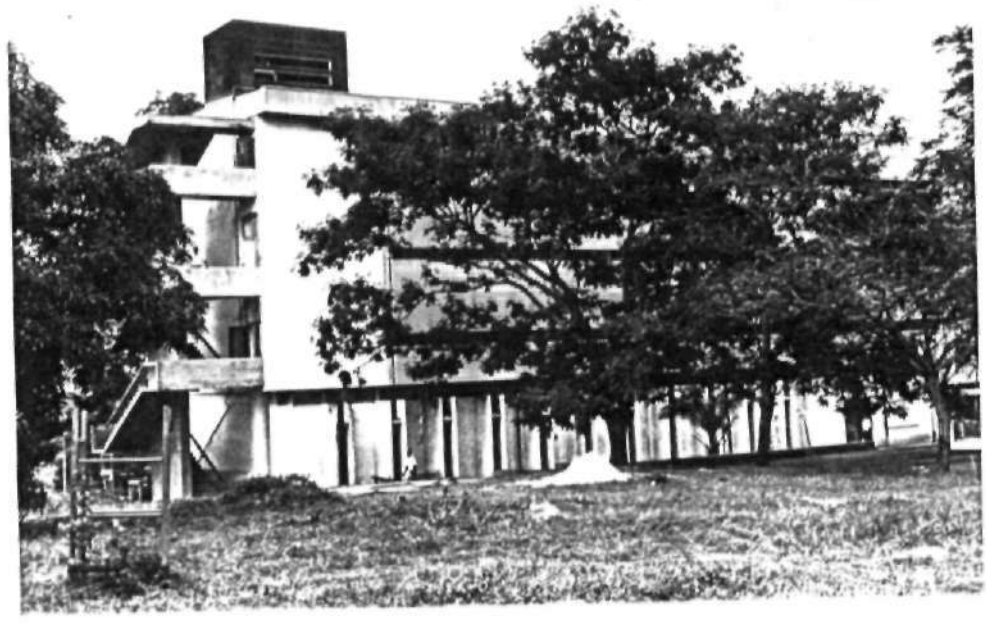
The School of Architecture at the University of Science and Technology, Kumasi, Ghana was established in 1952. The Faculty of Architecture (as it was then known), consisted of Planning, Building, Architecture and other related disciplines of the building industry. Brain-drain to the private-sector and other "greener-pastures" forced the policy-makers to restructure the University system. The new structure has converted the school of Architecture to the Faculty of Environmental Design and Planning. Architecture now exists as a department alongside sister professions of the Building industry within the Faculty.

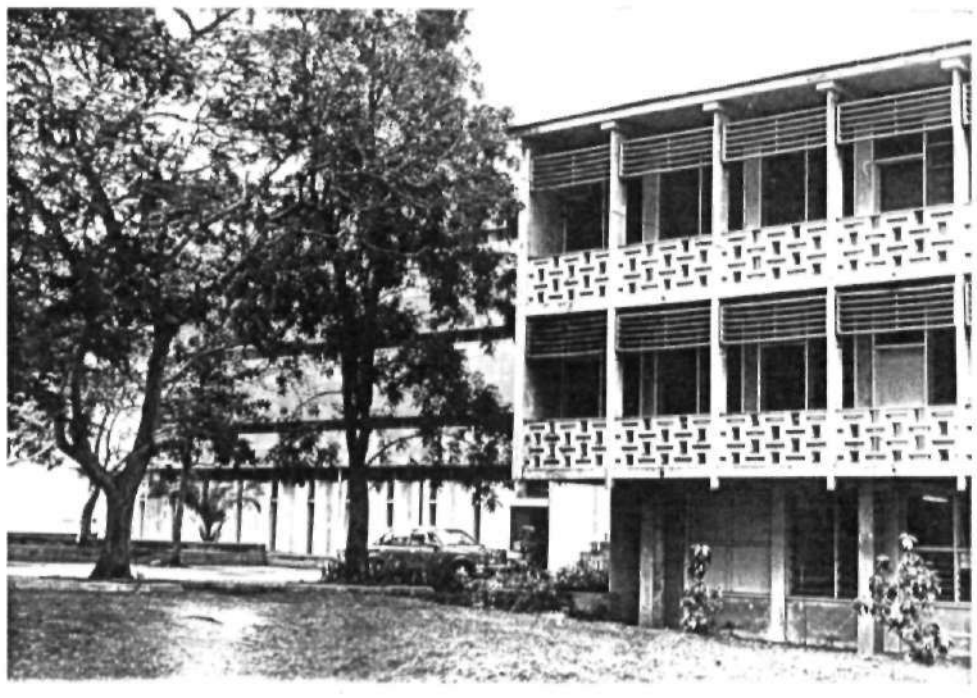
Facilities

Infra-structural facilities include Staff Common Rooms, well-furnished studios, a richly-furnished Building Research laboratory/Workshop, Staff facilities, Departmental Library/Data Room, Lecture Rooms and other facilities commonly shared with other Departments on the Campus.

1:300 ground floor plan







Deductions/Inference

The Department of Architecture at Kumasi is adequately furnished for the formal mode of "regular" architecture education.

However, the school, being aware of the threats of funding and manpower, is encouraging young graduates to take-up employment for further research and academic development. The school does not run any formalised post-professional programme such as M. Phil, or Ph.D. Course. It offers a joint programme of research and training with the Building and Road Research Institute as well as the Ghana Institute of Architects.

4.3 NIGERIAN SITUATION

4.3.1 Nigerian Building and Road Research Institute, Lagos

Research activities in the building and construction industry in Nigeria started during the colonial era under the West African Building Research Institute (WABRI). WABRI was an institution for collaborative regional research in the then British West African colonies of the Gambia, Sierra-Leone, Ghana and Nigeria. The arrangement came to an end after the independence of Ghana who pulled out in 1962. No significant progress was made in Nigeria until the Federal Government approved the establishment of a National Construction Building and Road Research Institute (NCBRRI) on 24 July, 1975. On 1 April, 1978,

the Nigerian Building and Road Research was established by the Federal Government.

Mandate:

The Nigerian Building and Road Research Institute was Established to conduct integrated applied research and development in the diverse related fields of building and construction industries.

Location:

The NBRRI is temporarily located at 15, Awolowo Road, S.W. Ikoyi, Lagos, Nigeria. The permanent site is an area of fifty hectares, located along Ota-Idiroko road. The first phase of providing infrastructures in the virgin area is in progress.

Finance:

The Institute is a semi-autonomous corporate body, and is mainly financed by the Federal Government of Nigeria.

Facilities

NBRRI is moving out of its present site as a result of inadequacy of space, both for its basic operations as well as for future expansion. Although the new site has adequate provisions for research and development, the specifications are not reflective enough of the materials the Institute has researched into.

Detailed layout and drawings were not available for documentation.

4.3.2 THE NIGERIAN INSTITUTE OF ARCHITECTS, LAGOS, NIGERIA

Formerly the Nigerian Society of Architects, The Nigerian Institute of Architects (N.I.A) was founded on 1 April, 1960 in Lagos, Nigeria.

Located in a modest accommodation at 2, Idowu Taylor Street, Victoria Island, Lagos, the N.I.A is responsible for projecting the image of the architect and architectural profession in Nigeria.

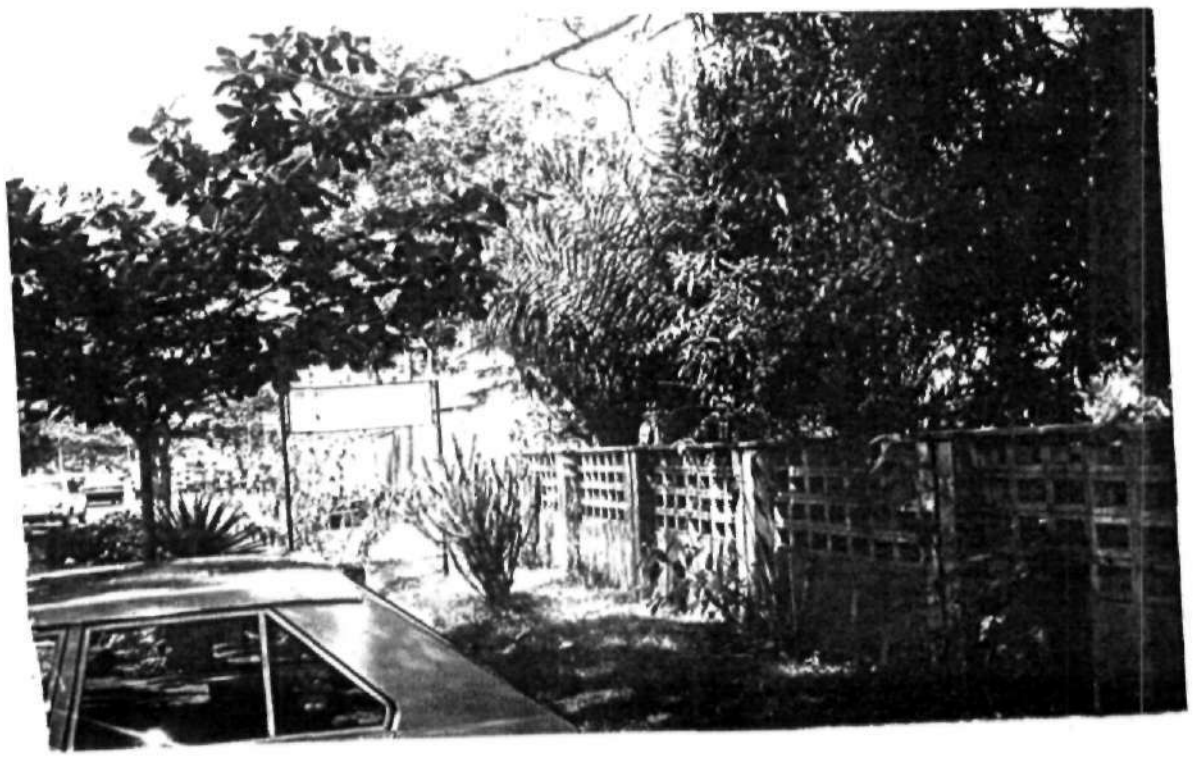
As part of the Institutes efforts to make continuing education available for middle level and senior Management Officers, the N.I.A offered a wide range of courses with classes at various levels of competence for architects and members of allied professions.

FACILITIES:

The Institute is accommodated in a bungalow with provision for administrative functions, Council Chamber and permanent exhibition courtyard. Facilities at the Institute are grossly inadequate for continuing education programme in Architecture. The N.I.A always rents hotels and conference halls to be able to implement this much-needed task.







4.3.3. Other Institutions of Similar Status

THE NIGERIAN INSTITUTE OF INTERNATIONAL AFFAIRS, VICTORIA ISLAND, LAGOS

The Nigerian Institute of International Affairs was established in 1961 as an independent, non-official, non-political and non-profit making organisation. In August, 1971, the Institute was taken over by the Nigerian Government, but its character as an independent, non-political and non-profit-making organisation remains unchanged.

The entire complex comprises of two sections:

The three-storey complex - comprising of Administrative Offices; Research and Conference rooms. Two well-equipped residential flats which has been converted to offices. The library wing has a main reading room, a stack area, a press section and adjoining workshops for binding and repairs. The library has a book capacity of over 100,000 volumes and offers seating space for 120 readers. There is a lecture Theatre for 400 persons and a Conference Hall for 80 participants with equipments for simultaneous translation.

The rich Nigerian Art is expressed in the "Art of Understanding", a large sculptured mural in tooled granite concrete set on a blue-coloured mosaic background.

The other section of the complex is the two-storey

new extension which was designed in 1981 (see Diagrams). The ground floor consist of the Directorate Affairs, the Reception Lobby, Offices, Committee Rooms, and the Courtyard layout. There are the Chairman's and the Director-General's offices. Accommodation and Catering Services occupy the second floor.

Comments

Presently, NIIA has a near monopoly on international conferences because it is equipped with facilities for simultaneous interpretation and speech recording. Generally, NIIA is adequately furnished for its basic functions.

Site limitation, pedestrian and vehicular traffic flow, are part of the major set-backs of the complex. Due to site limitation, effect of landscape is not remarkable except for some green areas and courtyard. Parking is another serious problem as delegates have to park their vehicles outside the premises during conferences and seminars.

In order to achieve its objectives, the Institute is charged with promoting the scientific study of International politics, Economics and Jurispudence, and providing facilities for the training of Nigerian Diplomats and personnel and those of other countries whose vocations relate to International Affairs.

THE INSTITUTE OF ADVANCED LEGAL STUDIES, LAGOS

Presently situated on the Akoka Campus of the

University of Lagos. The Institute of Advanced Legal Studies acts as a "Think-Tank" for Legal Practitioners and Researchers in Nigeria. The Institute of Advanced Legal Studies is a semi-autonomous Government organ, monitoring continuing education in the field of law in Nigeria.

Inspection of physical facilities at the Institute shows a well-equipped library with library and Technical Staff, a modern lecture-theatre, offices and computer room. Detailed sketches of the Institute was forbidden for "Security" reasons.

4.4 THESIS POSITION

In the European experience analysed, the various efforts of the Institute of Advanced Architectural Studies, as well as other notable international organisations are highly commendable.

While the efforts of the various groups analysed are genuinely aimed at improving the lot of the dwellers of the Third world countries, there is every need for the people concerned to be fully aware of the problems "first-hand". A more efficient information network is essential.

In the West African situation analysed, the quality of formal architectural education is adequate, but the infra-structural facilities - studio, manpower, laboratories, and equipment - are grossly

inadequate. Little or no attention is paid to the aspect of informal architecture education, the awareness of the people is solely through the formal mode of education.

Finally, on the local scene, the NBRRI and the N.I.A. are struggling to fill the gap of ignorance. There are many constraints and limitations. There is unhealthy rivalry among the various professional bodies in the building industry due to lack of commitment to the set-goals of the institutions considered. Apart from inadequate physical facilities, it is shocking to note that NBRRI cannot boast of using indigenous building material in substantial quantity to repose public confidence in the indigenous materials.

The need for a forum where indigenous materials and technology would be celebrated cannot be over-emphasized. The time is ripe to highlight the virtues and values of the truly indigenous art and architecture of the people.

CHAPTER FIVE:

DESIGN BRIEF AND CRITERIA

5.1 SYNTHESIS OF AN IDEA

The Institute of Advanced Architectural Studies is intended to create an appropriate environment for continuing education in Architecture. The Institute is *perceived as center of professional and academic* excellence, where "Thinking and Doing Architecture" shall be the slogan. It shall create a forum for interaction and exchange of ideas for the Architects, Builders, Quantity Surveyors, Engineers, Contractors, Clients (and users of architectural creation), as well as the Students of Architecture. It is expected that products of research findings shall be stored in the data bank of the Institute for reference and further development.

The idea is to create an Institute where contemporary issues of architectural import shall be given a serious thought, a meeting point for thinking and doing - for all times, towards evolving a culturally valid architecture for the region.

In other words, the Institute shall create an assembly where the truly indigenous - oriented architectural concepts reflecting the spirit of the age shall be "preached".

The Institute in its physical entity shall be a

living testimony to the affordable and appropriate architecture it is supposed to serve. It shall be a research body, a museum, a data bank, and a centre where issues of architecture shall be in constant and continuous discourse.

PHYSICAL FACILITIES

- Administrative Area
- Academic Area - Educational Facilities
- Recreational facilities
  - Informal Educational Facilities
- Space for Nature - Parks and Gardens and other landscaped areas.
- Accommodation Facilities - space for Living
- Storage of Equipment - Workshops and Research Facilities.

SYNTHESIS OF FUNCTIONS

In an Institute of this type, the working of the organs is usually interrelated.

(a) ADMINISTRATIVE COMPLEX

The Administrative complex acts as the centre of its nervous system by coordinating and organising/ initiating the long and short programmes of the Institute.

The Administrative Complex shall consist of Office Facilities for the permanent and administrative staff, Government and Professional liaison offices,

Committee Rooms, Council Chamber as well as a small Conference room.

Besides day-to-day functioning of the Institute, it is charged with disseminating and giving adequate publicity to the discoveries and innovations at the Institute through its programmes. These include lectures, symposia, sandwich courses, workshops, seminars, as well as independent and group research and continuing education programmes.

The functions of the Administrative Complex makes it necessary for it to be located at a strategic point for easy and proper coordination of other related facilities of the Institute as well as properly project the befitting image of Architecture in Nigeria.

(b) ACADEMIC AREA

This is the area earmarked for formal mode of education at the Institute. Facilities to be provided shall include library, classrooms, lecture theatres, Audio-visual rooms, Research laboratories, and exhibition areas. Medium sized museum shall also be attached. Information storage and retrieval facilities shall be provided for the effective functioning of the Institute's data-bank.

The Academic area of the Institute is to function as a meeting point for the exchange of ideas by the various groups in the building industry. This area also caters for research, teaching and demonstration

spaces for participants of all cadres at the Institute. The scope of operation include catering for the peculiar needs of independent researcher, to the programmed research study like the Doctoral programmes and the Master of Philosophy in selected areas of Architecture. The academic area also caters for preparatory programme of study for those taking the qualifying examinations for the professional practice of the Nigerian Institute of Architects at various stages of the examination. Other areas of concern for the academic area are the short courses for qualified practitioners who need to update their knowledge in the vast areas of contract administration, construction management and computer technology. Students of Architecture are continually exposed to the realities of architecture problem - solving through series of enlightenment programmes of the Institute. Finally, the consumers of architectural products as well as other members of the building industry are invited for discussions on current trends in architecture from time to time. This forum shall enable concerned parties to air their views on architectural education and architectural profession, and it is intended to be a form of colloquium from which valid and sincere position of architecture shall be established from time to time.

(c) RECREATIONAL FACILITIES

The recreational facilities to be provided shall strive to bring together the various categories of participants as well as the resident staff of the Institute. This is considered a crucial aspect of design to further boost the informal aspect of continuing education at the Institute. The recreational facilities are intended to create a relaxed atmosphere during which the "teacher" and the "taught" are capable of exchanging ideas as matured people.

The facilities to be provided shall include the regular sporting facilities such as table-tennis, lawn-tennis, badminton, billiard and snookers, squash court, swimming-pool, pool-bar, museum kitchen and associated facilities.

The idea is to instruct through recreation and other physical facilities of the Institute at "affordable-architecture".

ACCOMMODATION FACILITIES

Accomodation shall be provided for short duration occupancy by participants of short courses at affordable rates.

Provision here is for homely living for participant of the various programmes at the Institute.

(e) STORAGE FOR EQUIPMENTS

Adequate storage spaces in the laboratories and

research units shall be generously provided. workshops shall also be provided for protection of large equipments against environmental hazards.

BRIEF

NOTE: Figures and areas here are only pre-design guides. The actual figures can be verified from the drawings - see Appendix B.

UNIT DEFINITION	NUMBER		AREA(M2)
	ROOM	INDIVIDUAL	
COUNCIL CHAMBER	1	-	-
COMMITTEE ROOMS	4	-	-
DIRECTOR-GENERAL	1	1	30
PERSONAL ASSISTANT	1	-	15
ADMINISTRATIVE SECRETARY	2	2	20
SHORTHAND/TYPIST/CLERK	1	3	24
ACCOUNTS SECTION			
CHIEF ACCOUNTANT	1	1	24
ACCOUNTANTS (Senior)	2	2	40
ACCOUNTING ASSISTANTS	2	2	12
ACCOUNTS CLERKS	1	5	24
SECRETARIES	3	3	15
MESSENGER	1	1	6
LIAISON OFFICE			
LIAISON OFFICER	1	1	24

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ADMIN ASSISTANT	1	1	24
SHORTHAND/TYPIST/CLERKS	1	3	24
LIBRARY AND DOCUMENTATION			
DIRECTOR OF LIB. & DOC. SERVICES	1	1	24
ASSISTANT DIRECTOR	2	2	40
TECHNICAL STAFF	2	4	40
SECRETARY	1	4	24
COMPUTER SECTION			
COMPUTER ROOM			240
OFFICES			90
STORAGE			45
LIBRARY:			
PUBLIC READING ROOM	1	–	225
BOOK STACKS	1	–	96
LIBRARIAN	1	1	20
SECRETARIAL STAFF	1		48
TOILETS			36
STORAGE			96
MUSEUM:			
RECEPTION HALL	1	–	72
TOILETS	–	–	54
SECURITY	1	–	36
TEMPORARY EXHIBITION	1	–	360
LOBBY	1	–	18
GALLERY	1–3	–	240
PICTURE GALLERY	1	–	120
OFFICE	1	–	36

ABUBAKAR TAFAWA BALEWA UNIVERSITY LIBRARY
BIBLIOGRAPHIC SERVICES
ZARIA

AHMADU BELLO UNIVERSITY
ZARIA
LIBRARY SERVICES

PHOTOGRAPHIC UNIT	1		36
<u>RESEARCH ND ACADEMICS</u>			
DIRECTOR OF RESEARCH	1	1	24
ASSISTANT DIRECTORS	1	1	20
ADMINISTRATIVE OFFICER	1	1	15
RESEARCH TECHNICAL STAFF	8	8	26
RESEARCH OFFICERS	6	6	60
RESEARCH ASSISTANTS	6	6	48
CLERKS/SHORTHAND/TYPISTS	8	8	50
DESIGN LABORATORY	1	–	120
DESIGN ROOM	3	–	360
WORKSHOP	1	–	250
STORAGE	–	–	70
OFFICES	–	–	240
SEMINAR ROOMS	4	–	240
COMMON ROOMS	2	–	90
LECTURE THEATRE	1	–	–
LECTURE ROOMS	6	–	63
AUDIO-VISUAL	2	–	–
<u>ACCOMMODATION UNIT</u>			
EXECUTIVE SUITES	6	–	–
ORDINARY SUITES	72	–	–
LOUNGE	1	–	–
RESTAURANT	1	–	–
BAR	2	–	–
INDOOR SPORTS ROOM	3	–	
MUSEUM KITCHEN	1	–	–

5.2 CONCEPT FORMULATION AND SYNTHESIS

IN SEARCH OF AN ARCHITECTURAL IDENTITY:

An honest appraisal of Nigerian architecture must take cognisance of the great variety of cultures. This, obviously is due to the geographical factors and the vast ethnic diversity of the country.

It is is no doubt therefore that the dialectic variations of the pure indigenous architectural grammar were determined by the natural (local) factors of the particular place, especially climate, building materials and socio-cultural values.

The Socio-Cultural Factors:

The typical Nigerian indigenous architecture is influenced by both religious and secular factors.

The traditional North design their mosques merely as places of communal prayer. Hausa Palaces were designed purely as residence and quarters for administration and social ceremonies.

In the south, the shrines sheltered sacred objects or symbolised super natural beings.

The palaces in Bini and Yoruba Kingdoms perform of greater functions in their setting: They were the residences of sacred kings of divine descent, the local point of religious rituals, and the object of mystical awe. Dmochowski, (1972).

In Igboland, Obu houses possess similar

characteristics but in a vary different context.

Geographical Factor:

This is a major determinant of the local building craft of a place. It usually manifests itself in form of building material and technology available. Two major types of building materials available in Nigeria are building earth and timber. Due to climatic zoning of the different areas, the types of materials vary sharply from one place to another. The building earth exists in form of clay of Benin and Habe-Hausa areas to the sandy soils of large parts of Igboland, which dictated the technique of wattle-and-daub constructions to their buildings. Timber also vary by the regions: Iroko, a very hard wood is readily available in the rain forest areas, while Gongola, palm ribs, which are more fragile but beautiful in their natural setting are more readily available in the upland areas of the country.

Due to the transient nature of commercial activities in the country, the multi-cultural influences of the various cultures that inhabit the area began to reflect in the indigenous architecture of each identifiable zones.

In the final analysis, it is crucial to enumerate the salient factors that identify with the numerous cultures, social and geographical zones that described Nigeria.

According to Dmochawski (1972), the most striking feature is the competent practice of the art of significant forms in space - a clear understanding and expression of building art in three - dimensions.

The sense of rhythm, constantly featuring in Nigerian music, painting, carving, poetry, weaving and drumming, which found material expression in the design of Nigerian buildings and is also feasible in the total planning of village and city settlements. This search can continue; from the tiny but beautiful huts of the Jaba tribe to the monumental mosques and palaces of the mighty; the feeling of unity for art and Architecture is constantly evolving.

The faithfulness and sincerity with which architecture attends to human needs is beyond comparison with the other arts, and this is reflected in the building - the most popular unit of architectural creation.

The building, and indeed architecture must be seen as an activity. It is not an end in itself, but rather a means to an end. Any functional and valid architecture must satisfy the spiritual and material needs of the people.

In attempting to create modern cultural forms, the thesis is inspired by the love and regard for the nation's own cultural past. According to Dmochowski, "Buildings are improved only by the influence of

spiritual and intellectual factors". These include a well organised labour force, progress in technological and religious convictions.

When viewed in respect of culture and social values, architecture creates constantly escalating standards of human desires which gradually leads to improved conditions of social life.

In the search of a truly indigenous architecture, the thesis is of the opinion that the society as a whole has a crucial role to play. A well-organised labour-force, an inward-oriented and culturally-valid planning concepts as well as the total support of the total architectural society - which comprehends and appreciates its own achievements and develops them constantly and lovingly are the basic components to mould a lasting legacy for a true architecture.

Any architecture, whether indigenous, aboriginal, vernacular, anonymous, traditional, spontaneous, or rural - refers to a style or mode of architecture occurring naturally in the area.

This work is inspired by the challenge left behind by Professor Z.R. Dmochowski. Among other things, the veteran traditionalist insists that "they (Nigerian Youths) should seek inspiration from the glorious past of their (ancestral) building art". Dmochowski (1972).

The tireless efforts of such scholars will only have meaning after a critical study of the functional

planning, remarkable construction and splendid, indigenous forms are carefully undertaken and synthesized which constitute the lasting legacies for the creation of a raw architecture.

The thesis finds its philosophical expression in EKISTICS- the science of human settlements. It is the synthesis of economics, social sciences, political and administrative sciences, technology and aesthetics into a logical and coherent whole leading to the creation of a new type of human habitat. Doxiadis (1963). The position of the architect among the disciplines enumerated cannot be other than that of the cooridnator. If architecture, and indeed building has to be perceived as an activity, the architect must adequately enrich his knowledge to be able to cope with the rising tide of problems today. It is necessary to emphasize the heterogeneous nature of the various characteristics presented by the cultures that constitute the Nigerian society. In this regard, it is essential to note the wide range of communities each with its own history, occupying diverse ecological zones, having unique local environmental conditions and existing under varying degrees of pressure from the processes of urbanisation and modernisation.

Philosophy Evolution and Conceptual Deductions

The study psits that regionalism is the only effective medium through which an architecture can be

properly perceived. In other words, architecture must be seen in the light of its origin, its roots. Architecture cannot exist in void!

Then the aforesaid can only be found in the characteristic West-African setting. It is therefore easier to identify an architectural expression along regional boundaries.

It is common knowledge that Nigeria is a vertical slice through the natural horizontal ecological grain of West Africa. In West Africa, the identified zones run east-west parallel to the coast and the Sahara. The three main identified climatic patterns are the tropical wet in the south with uniformly high temperatures and heavy rainfall evenly distributed throughout the year; tropical wet and dry, or savanna in the middle belt; and dry steppe in the extreme north. However, man has radically changed the climatic zoning in Nigeria - with the introduction of the oil-palm bush in the south and derived savanna on its northern edge.

From the foregoing, further categorisation or regionalism can still evolve around the territory of Nigeria - based on the derived climate zones which in itself is a peculiar feature of the country.

Research has shown a generalised feature of the physical characteristics of the typical Nigerian architecture thus:

- All compounds are surrounded by a high wall or fence which provides security and family privacy.
- The compound is entered through one main gateway - usually in the form of a gate house, a feature which gives both visual security and physical control of movement into and out of the private spaces in the settlement.
- Accommodation is arranged formally or informally around one or more outdoor spaces or courtyards.

It is remarkable that dynamic growth in technology, and pressures on land, coupled with large migrations to the cities have brought about some changes to the typical Nigerian house type, in design and in total form. Moughtin, (1988).

The common features outlined above are totally independent of location, social organisation or religious affiliation of the inhabitants.

Without any attempt at categorising architecture into a purely artistic or scientific vocation, it is still necessary to make certain categorical statements in respect of the profession.

Architecture, in whatever context it is perceived usually aims to provide a material frame for human life: for work and rest, for religious, social and artistic activities.

For any architecture to satisfactorily attend to

the basic needs of the users, it must be strong to assure reliable shelter. It must also be well-planned, to reflect the ordering of spaces as perceived by the users of the spaces created. It must satisfy the aesthetic requirements: a quality usually elusive and psychological.

CHAPTER SIX: TECHNICAL INFORMATION AND SITE DATA

6.1 THE SITE: ABUJA - FCT

6.1.1 LOCATION:

Abuja is the New capital designed as available urban environment for the seat of Federal Government with the full range of supporting and complementary activities.

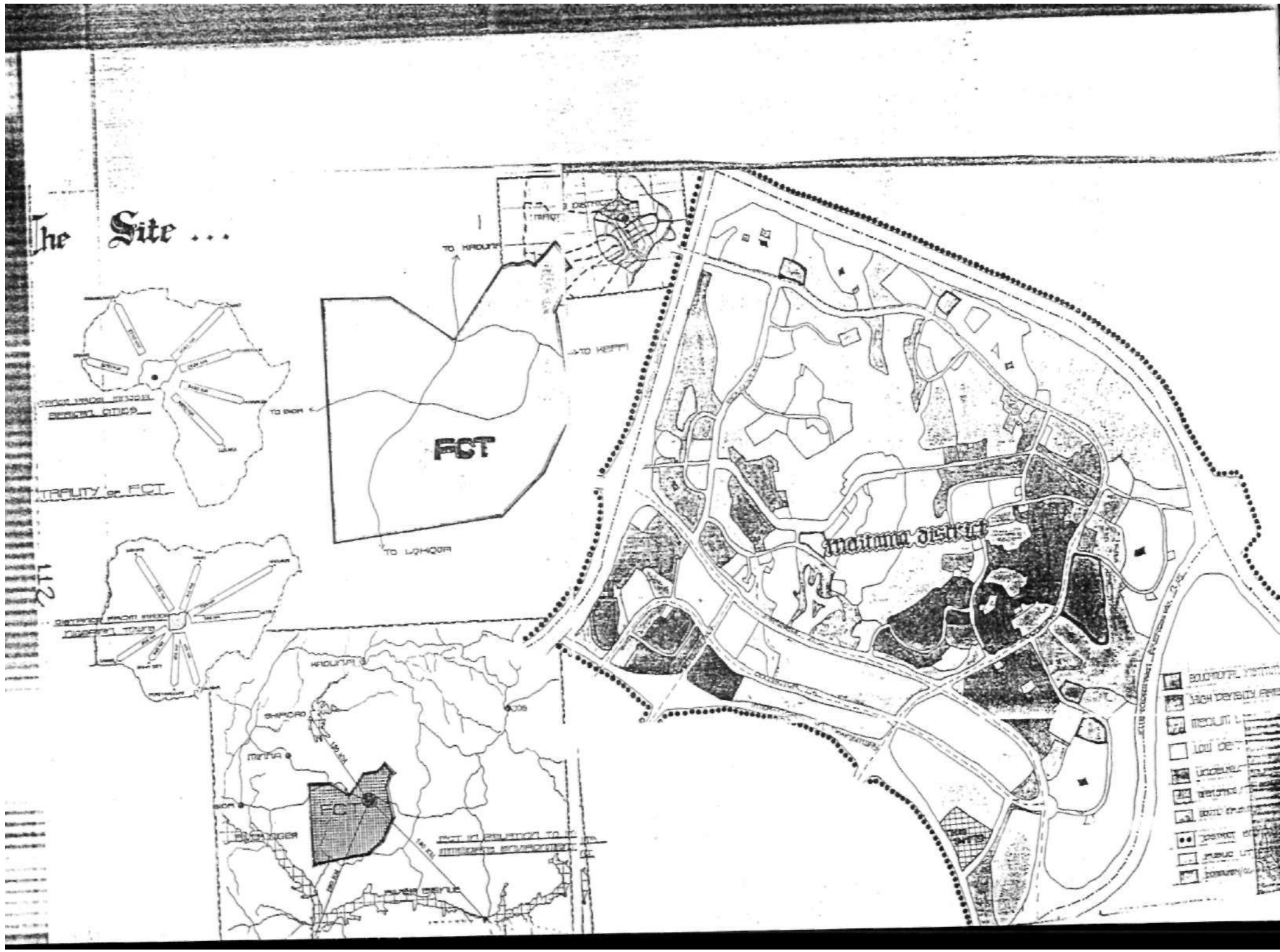
On an elevation of over 1,200 feet above the sea level, the developable land of Abuja in the Gwagwa Plains included the famous Aso Hill.

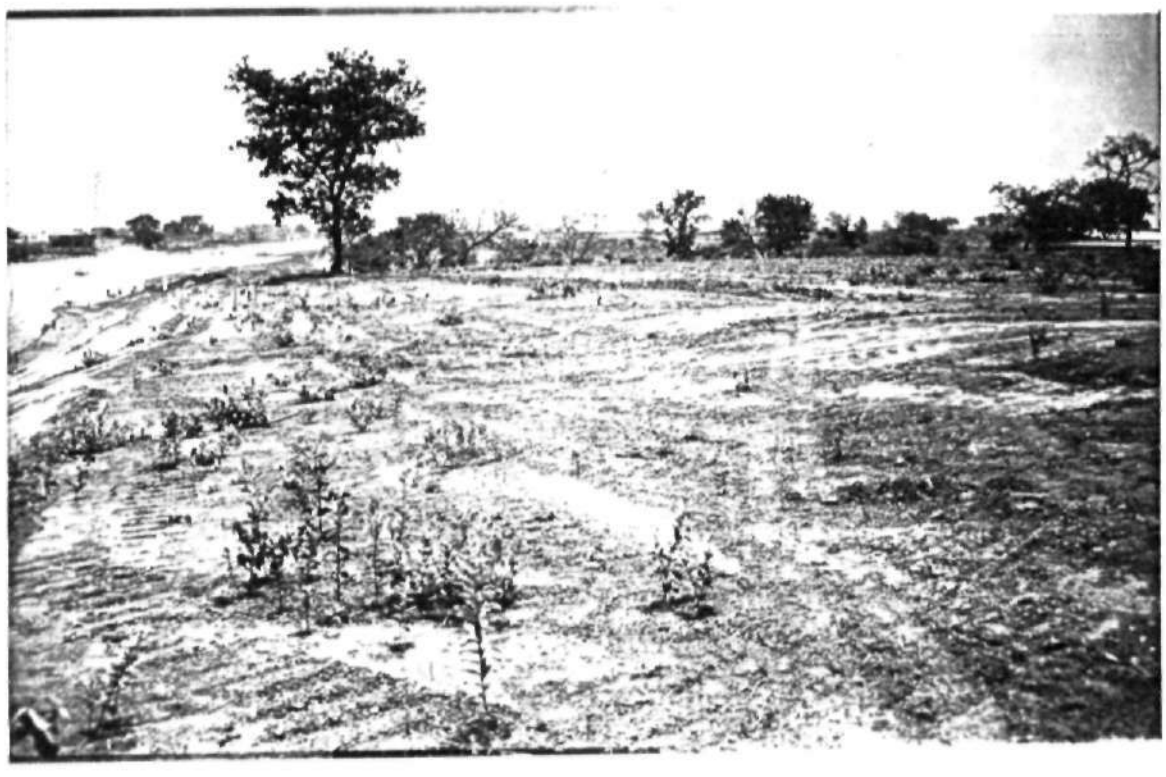
6.1.2 MACRO-ORGANISATION:

- A central-oriented city plan structure focusing on the location of Federal government;
- A city-wide open space structure based on a longitudinal parkway system internal to the city; preservation of the surrounding escarpment of Hills and the inselbergs;
- A linear transportation system consisting of parallel transit corridors each forming the central spine of development corridor and interesting at the central spine.

6.1.3 URBAN DEVELOPMENT CORRIDORS

The city has been proposed as an efficient and attractive environment at each stage of growth - both at Phase I, when it will accommodate 150,000 residents, as well as when it must accommodate 1.6


The Site ...
FCT
Maitama District





million around year 2000 AD. The ultimate limit is 3 million residents.

6.1.4 INFRASTRUCTURES

. A network of water, sewage and drainage infrastructures complement the road network, preserving the natural landscape and respecting existing drainage patterns.

. An international airport is located on the plain to the east of the central Area connected by a limited access expressway.

6.1.5 CENTRAL AREA PLAN

The Central Area houses the chief governmental and business activities of the city. It has been divided into two functionally distinct zones. One containing the governmental and ministerial functions, the other containing business, parastatal, and commercial functions.

6.1.7 GOVERNMENT RESERVES

Three types of Federal facilities are provided for in the proposed plan of the Federal Capital Territory (FCT).

These are:

. Training Centres;

. Research centres; and

. Military uses.

These are in addition to the governmental uses

programmed for the new city.

6.1.3 EXTRACTIVE AND OTHER INDUSTRY

The FCT is rich in certain types of building materials, in particular - sands, clays, crushed stone aggregate and granite for cut stone. Extractive industry in the FCT will concentrate almost entirely on the production of building materials for construction of the capital city.

6.1.9 SOILS

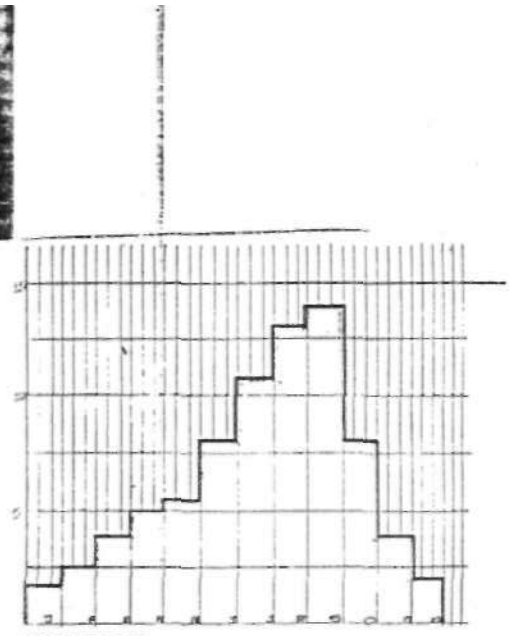
The soils of Abuja FCT are generally suitable for most urban uses. They are typically deep and well-drained, having only local constraints where they are high in clay or stone contents, shallow, or where iron-pan outcrops as sheets or scraps. Soils constrained because of depth are limited to inselbergs, hilltops, and escarpments in the vicinity of the city.

6.1.10 CLIMATE

Comfortable living environment will depend on planning with the climate and environment to reduce heat and the effect of humidity, as well as protect from rain and dust.

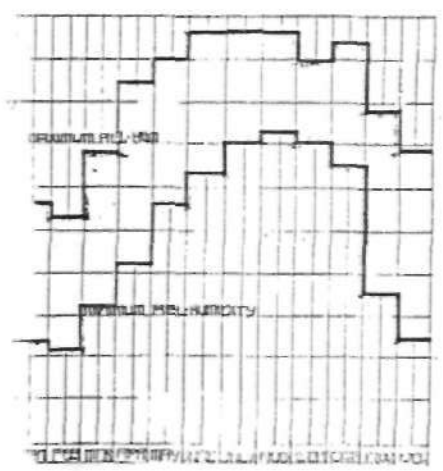
TEMPERATURE/HUMIDITY:

Net radiation is felt as air temperature, which is usually influenced by the humidity conditions. The air records its highest temperatures during the dry season



RAINFALL: AVERAGE MONTHLY RAINFALL (mm)

- RAINY SEASON: APRIL TO OCTOBER, EARLY YEAR;
- HIGH INTENSITY RAINFALL OCCURS FROM JULY TO SEPTEMBER;
- RAINFALL USUALLY CHARACTERISED BY STRONG WINDS, THUNDER AND LIGHTNING.



RELATIVE HUMIDITY:

- RELATIVE HUMIDITY IS LOW IN THE DRY SEASON AND REACHES THE PEAK IN THE RAINY SEASON.

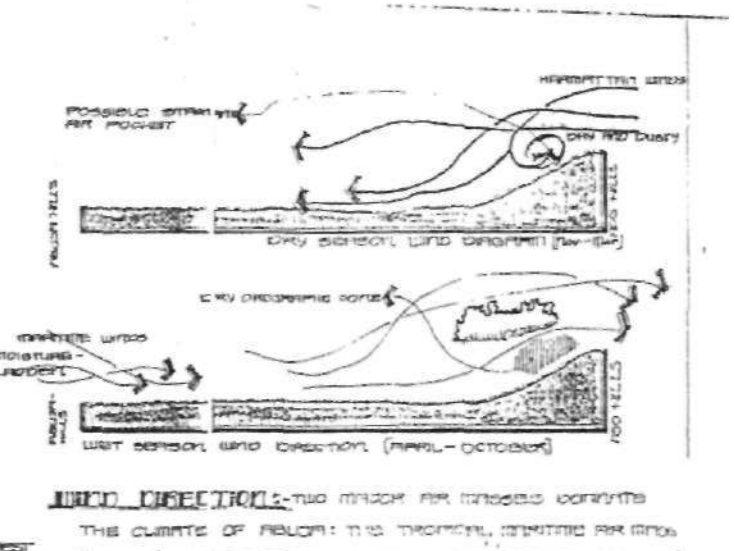


TEMPERATURE: THE SITE RECORDS ITS HIGHEST TEMPERATURE DURING THE DRY SEASON WHEN THE SKY IS CLEAR OF CLOUDS;

- TEMPERATURE IS LOWER DURING RAINY SEASON DUE TO DENSE CLOUD COVER.



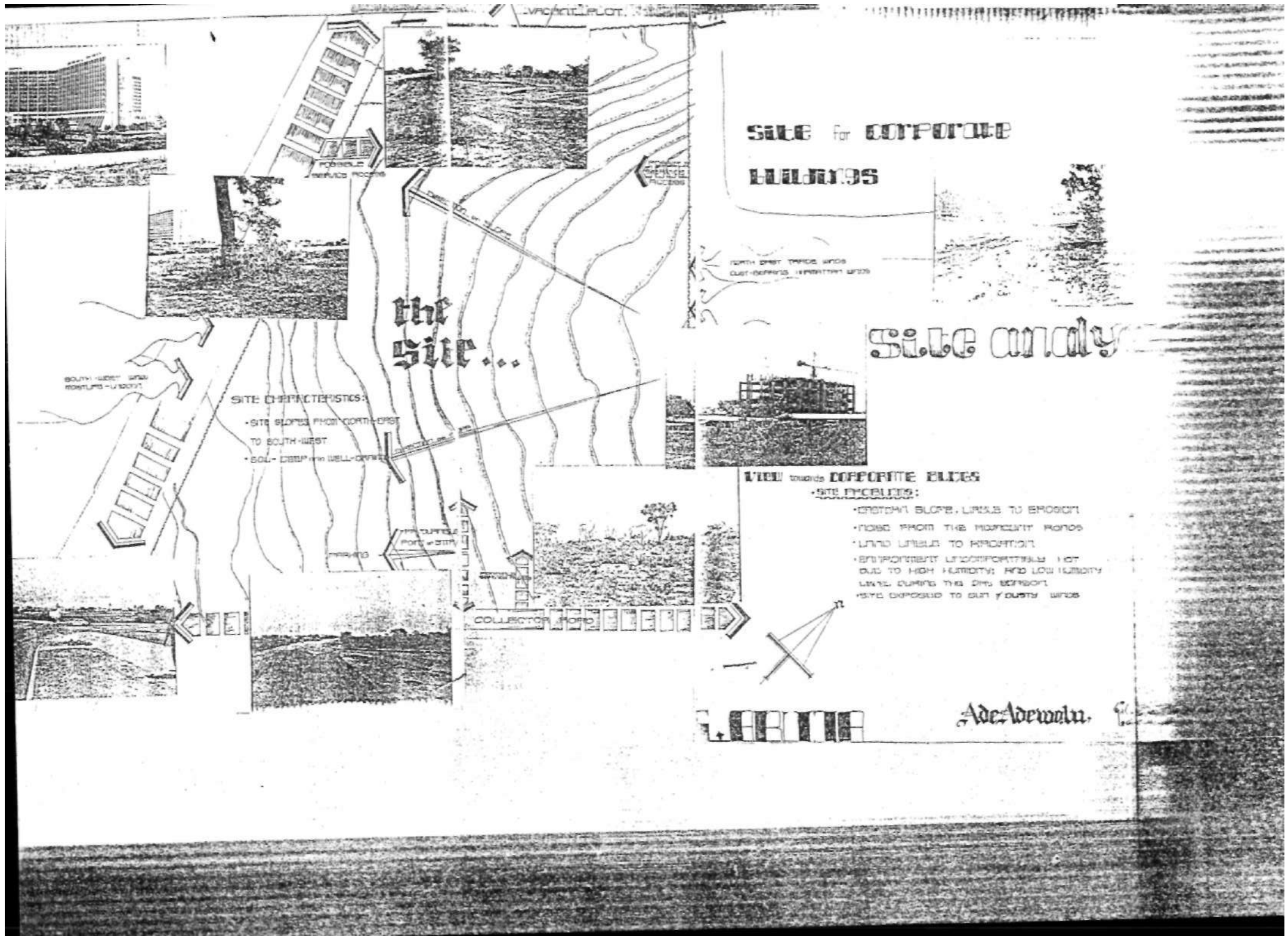
SUNSHINE: DURING THE DRY SEASON (NOV – MARCH), THE MONTHLY VARIATION IN THE AMOUNT OF SUNSHINE SHOWS A TREND OF AN INCREASE FROM OVER 270 HOURS ONWARDS



WIND DIRECTION: TWO MAJOR AIR MASSES DOMINATE THE CLIMATE OF PERLIS: THE TROPICAL MARITIME AIR MASS (SW-WIND) AND THE TROPICAL CONTINENTAL AIR MASS (NE-WIND).

inference/observation

- DUE TO HIGH TEMPERATURES AND SHARP DIURNAL VARIATION OF THE ENVIRONMENT, THERE IS NEED FOR AIR-CONDITIONING SYSTEM IN OFFICES AND ROOMS FOR THE STORAGE OF THERMO-SENSITIVE EQUIPMENTS.
- POSSIBILITY PROVISION FOR DRINKING SYSTEMS REQUIRED FOR LARGE FLOW OF WATER.
- RELATIVE HUMIDITY IS A STRONG DETERMINANT OF HUMAN COMFORT. WHERE OPTIMUM COMFORT IS REQUIRED, MECHANICAL VENTILATION IS REQUIRED.
- THE TROPICAL MARITIME AIR MASS (SW-WIND) CAN HELP IMPROVE HARSH WEATHER CONDITIONS. IDEAL FOR NATURAL VENTILATION


Site for corporate
Buildings
the
Site...
Site analy
SITE CHARACTERISTICS:
•SITE SLOPES FROM NORTH-EAST
TO SOUTH-WEST
COLLECTOR ROAD
VIEW towards CORPORATE BLOCKS
•SITE PROBLEMS:
•EROSION SLOPE, LIABLE TO EROSION
•NOISE FROM THE MARKET ROADS
•LAND LIABLE TO EROSION
•ENVIRONMENT UNCOMFORTABLY HOT
DUE TO HIGH HUMIDITY AND LOW HUMIDITY
LEVEL DURING THE DRY SEASON
•SITE EXPOSED TO DUST & DUSTY WINDS
Ade Adewolu.

when there are few clouds - if any! Diurnal variations of up to 17°C have been recorded.

During the rainy season, maximum temperature is much lower due to cloud overcast. In July/August, Diurnal annual range may fall to 7°C.

Rain fall:

Rainy season starts around 10 April and tapers off very rapidly after 20 October (see figure on Rainfall). Rainy season lasts about 180/190 days. The FCT has frequent occurrences of equal lines which is thought to originate from the Jos Plateau region travelling East-West. The phenomenon begins with dense, dark, cumulo-nimbus clouds with thunder and lighting, followed by strong winds and intense rainfall. The intense rain may last for up to 1 hour giving way for drizzling of several hours duration. This is then followed by a few days of bright, clear skies.

The inselbergs exert an influence on local weather starting off conventional activity causing intense relief rain in their immediate surroundings.

Wind-Dust:

Two major air masses dominate: The tropical maritime air mass and the Tropical continental air mass.

The Tropical Maritime is formed over the Atlantic Ocean to the South of the country and is therefore warm

and moist (South-West wind). It moves inland in a South West - North East direction.

The Tropical continental air mass is developed over the Sahara Desert and therefore is warm and dry and blows in the opposite direction (North East - South West). The oscillation between these two air masses produces the highly seasonal characteristics of weather conditions in the country as a whole.

Sun and Cloud Cover:

In Nigeria, there is a general increase in the total hours of sunshine further north from the Atlantic coast. this sunshine hours range from 1,300 hours in the Niger Delta to over 3,200 hours in the extreme North East of the country. The Federal capital at Abuja is exposed to 2,500 sunshine hours annually. As the rainy season approaches, the trend is to increased cloudiness. There is decline in sunshine hours and this is at its lowest in the months of August during the rainy season.

6.2 DETERMINANTS OF FORM (FORM CONCEPT).

The basic planning decisions relative to the overall form of the city resulted from a rational analysis of alternatives.

Study of recently constructed capital cities and new town planning experience as well as review of previous experience are vital parameters in form

determinants of the capital city.

The general form of the city is conceived for and under the following:

. IMAGEABILITY:

Perception by the observer of a city's purpose, organisation, and symbolism;

. EFFICIENCY:

The ease of implementing the purposes of government business and individuals.

. FLEXIBILITY:

The ease with which growth and change can be accommodated.

THESIS POSITION

All these factors have a relevance and meaning in the design and form concept for the Institute of Advanced Architectural Studies being proposed.

IMAGEABILITY:

The visitor or any observer should be able to perceive the Institute's purpose from its physical and organisational structure and its symbolic expression: It should create an identity for a true Nigerian Architecture.

EFFICIENCY

The Institute should be efficient and implement its programmes with dispatch and precision.

FLEXIBILITY:

The design and construction should reflect flexibility and adaptable architecture on the whole. Imageability, efficiency and flexibility must be well synthesized to give meaning and expression to a valid indigenous architecture of the sub-region.

6.3 DESIGN REQUIREMENTS

A well synthesized design control and parameters usually leads to a harmonious and well integrated urban fabric as well as revolutionizing a good spatial order.

In implementing this scheme, it is essential to note the following.

Parking Space

Recommendations for parking space should follow the approved urban design of Abuja City.

0.0109 x Floor Area = No of parking spaces.

OR Conference Area: 1 car park to 5 seats.

Safety Devices

Site planning should allow for free circulation of firefighting vehicles around the site.

- Provision of adequate fire protection devices.
- Volume of traffic in building should be carefully controlled.
- Welfare facilities should be adequately provided.

Mechanical Aids to Comfort

- Mechanical rooms should be located on external walls.
- Several mechanical rooms should be provided to enable zoned air supply.
- Roof extract fans should be provided for atriums and large open spaces.
- Economic construction system to be used and optimum use of underground space.

Wall Line

Location of principal exterior should be determined by set back area, boundary and building envelope.

Building Height Requirement

Highest point of the building should not exceed the stipulated height of 8 floors measured vertically from the established grade by the FCDA.

Efforts should be made to reduce vertical over crowding of the site.

Level Control and Floor Area Ratio

Homogeneous horizontal floor line and elevation should be established to reduce irregular level gap of continuous buildings located in slopped site. The maximum projected area of the building at ground floor level relative to the total parallel area should not exceed 60%.

Penetration Requirement

Relationship between the building frontage and the public walk-way and road should be established and maintained.

Provision should be made for formal entrance, staff entrance and service entrance.

6.4 SITE SELECTION CRITERIA

Two sites were evaluated and selection was based on the following parameters.

- Easy accessibility
- Sufficient size to accommodate future growth
- Minimum topographic restrictions
- Good perceptual characteristics
- Natural setting

SITE I

Site I is located within the area earmarked for professional bodies in Maitama District of the FCT. It is situated on the North-East and South-West part of the Federal capital - and faces a transit way. The prevailing winds are from the South West and North East. The site has an approximate area of 31125sq m.

Comments:- Merits -

- It is accessible by the use of transport way.
- Site configuration lends itself to flexibility of land allocation.

Demerits -

. Site is a standard plot and cannot accommodate future expansion.

. Site is liable to flooding.

. There is possibility of site being overcrowded in a short time.

SITE II

Site II is also located within the earmarked area for professional bodies in Maitama District. It is situated in the North-East and South-West zone of the Federal capital. The site is bounded by a transitway, a collector road and an arterial road. The site is very close to the Nicon Noga Hilton International Hotel and the Site Coordinates are:

1000362S; 334,523

1003400; 334,350

1003600; 334,228

1003660; 334,300

1003600; 334,523

The prevailing winds are from the South-West and North-East. The site has an approximate area of 15,500 sq m.

COMMENTS:-

Merits

- Has exclusiveness of site
- It has the advantage of being a corner plot
- It is easily accessible from transitway, collector road and arterial road.
- Good views towards the road

- Site configuration lends itself to flexibility
- Site can accommodate future growth
- Minimum typographical restrictions.

Demerits

- Noise likely from the surrounding activities.

THESIS POSITION

Site II is the most preferable based on the analysed qualities and the nature of the project at hand.

6.5 SITE ANALYSIS

The site Analysis will be based on physiographic factors and perceptual characteristics of the site.

. The physiographic factors include - climate, topography, vegetation, drainage, soils and geology.
. Perceptual analysis is aimed at identifying visual or perceptual assets and liabilities as a basis for determining major opportunities and constraints for design process.

The analysis shall explore areas of aesthetically positive qualities such as;

Topography of the site, scenic views, land marks, wood land; while perceptual liabilities are defined by the negative qualities such as noise intrusion, dust/vehicle pollution and highway access.

6.6 OTHER ELEMENTS OF THE PHYSICAL EXPRESSION OF NIGERIAN ARCHITECTURE

In any architecture, house forms are usually determined by socio-cultural factors: Ways of life, shared group values, virtues, etc.

Climatic factors, use of available materials and construction technology are modifying factors used in shaping and achieving an ideal environment.

In Nigerian indigenous architectural set-up, the use of courtyard is a recurring factor in the rural architecture. Such courtyards are usually juxtaposed to form a complex that relates the outdoor activities with indoor activities on a uniform, continuous and smooth transmission without any shock that would have been expected. Courtyards, along with the other transitional open spaces are now redefined to mean shelter, - or better still, architecture without the usual encasements.

Courtyards define positive spaces for family meetings, relaxation areas, playing ground as well as other socio-cultural activities of the family.

The general Architectural characteristics of Nigerian indigenous architecture could be summarised as follows:

- Flexibility and Adaptability
- Compactiveness
- Organic
- Complacency.

CHAPTER SEVEN:

CONCLUSION AND RECOMMENDATIONS

7.1 DESIGN REPORT

The Institute shall lend itself to the actualisation of its set objectives by the logical organisation of the spaces provided.

The Institute houses the following functional units which are categorized by the level of accessibility and the nature of activity.

ADMINISTRATIVE COMPLEX

This is the "power-house", accommodating all the policy-makers of the Institute - both research and administrative.

Nature Semi-public, private

ACADEMIC/RESEARCH AREA

Library, Research Area, computer Area, Design Laboratories and lecture rooms.

Nature - Private, Semi-Public

SOCIAL AREA

Lecture theatre, Restaurant, Plaza, Sports Area.

Nature - Public, commercial

ACCOMMODATION AREA

Resident Staff Accommodation, Chalets, suites.

Nature: Private

URBAN INTEGRATION

The activities of the Institute shall be integrated into the urban fabric by providing pedestrian routes from the Eastern and Western part of the site which shall be related to the heart of the design:- The Plaza, the symbolic "Engawa" space-to provide an environment for interaction and efficient communication network within the Institute. Vehicular access shall be from the collector road and the service road on the boundaries of the site.

UNITY: A SYMBOLIC EXPRESSION OF FORM

Main traffic on the site shall be brought in through the main focus - "en-space", from where various activities are approached.

The Administrative Complex, the Academic/Research Area, the museum as well as the exhibition plaza shall be organically integrated for ease of circulation.

STRUCTURAL SYSTEM

Structural system of the building being proposed shall be of composite nature; post-and beam.

Retaining walls as well as waffle slabs and space decks are also specified. Space frame and solar panel glass are also featured.

MATERIAL CONSIDERATION

Emphasis shall be on composite use of appropriate materials. Structurally sound materials like steel, concrete and timber shall be used in the load-bearing sections while low-cost materials shall be specified in the non-load-bearing sections and partitions.

The materials used in the Institute shall themselves testify to the low-cost claim in the teachings of the various programmes of the Institute.

Expansion joints shall be provided at strategic points of contact between the raw materials and the more popular ones to allow for expansion and thermal differences.

SERVICES

Plumbing system for toilets in plumbing shafts assisted by door latch for maintenance.

STORM/RAW WATER DRAINAGE

Water drainage will be by gravity top the site drainage pipes and connect with the FCDA pipes.

Electrical services are fed central and through ducts beside inner steps to help serve the various

levels.

Fire fighting systems shall be provided at strategic positions within the complex for maximum protection.

FINISHES

Moral relief, decorative motifs and painting are to be used meaningfully on the walls.

Innovative use of locally available materials are to be specified to complement the interior setting of the building.

THERMAL CONTROL

The use of natural and artificial means of control shall be emphasised for maximum comfort within and outside the building. Courtyards and mechanical devices as well as design solutions to thermal problems shall be vigorously pursued.

LANDSCAPE

Trees, shrubs, grass and other landscape elements are incorporated to achieve and complement a pleasant environment.

SCALE

Appropriate use of scale in every space considered

to achieve the desired effect on users of the space.

- SITE PLAN
- SITE CONCEPT
- SITE PLAN
- FLOOR PLAN(S)
- SECTIONS AND DETAILS
- ELEVATIONS

O. PERSPECTIVES

- MODEL PHOTOGRAPH

7.2 CONCLUSION

In a thesis of this nature where the problem encountered is multi-dimensional, involving all members of the entire architectural family, conclusion on the various issues touched upon can only be based on inferences. However, recommendations will be based on available data and feasible solutions to problems facing architecture. The Thesis is not an end in itself, but a means towards pursuing a greater goal for a better organised society.

It is necessary to categorically state that issues of Architecture are no longer solely determined by the architect, but in conjunction with many other views. These views, which are also referred to as "forces" are appearing for the first time in an unprecedented

fashion. The new forces in the architectural arena are-economic forces, social forces, political, administrative, technological and aesthetic forces.

The Thesis seeks to establish he role and justification for architecture in a developing world - as well as determine a new direction and redefinition of purpose for the profession. The only justification for architecture in a developing world is its connection with the overall evolution of society. For the purpose of clarification, architecture can be explained as the expression of all the forces which influence the creation of buildings.

The raging question is: What model do we hope to produce from the Institute being proposed? The answer, is very simple. The Institutes primary purpose is to fashion a new outlook for the entire building industry and Nigerian Architecture in particular. So, the primary model is an Architect - of - relevance". The architect must be seasoned enough to excellently perform his professional duties as a coordinator of several efforts.

He is to influence industry for the production of the best type of elements, use social sciences for the formation of a better human habitat, and he has to urge and help governments to conceive proper housing

policies.

The Design being proposed is intended as a physical manifestation of the author's prescribed solution to the problems facing the building industry in general, and the profession of architecture in particular.

If fully implemented, the Institute shall be a forum for professional interaction, a place to do business, to learn and to recreate. The academic areas have been carefully blended with the cultural facilities for the optimum enjoyment of the participants, staff and visitors to the Institute.

The architecture employed is of Institutional typology with a slight accent of cultural expression. A material essence is being celebrated to give an imagery of cultural and regional identity and expression. There is no doubt that the architectural design of the Institute seeks to leave an expression of the abundant resources of indigenous building materials. However, the emphasis is on the composite usage of the affordable materials with the more modern (imported) ones. It is the desire of this thesis to make the Institute an avenue to propagate the improvement, awareness and use of local building

materials as a preference to imported ones.

The thesis posits that no indigenous technology can evolve without the consistent efforts at improving the aesthetic and functional appeal of locally available materials and method of construction.

ARCHITECT'S ROLE

The role of the architect is to create the best6 possible human habitat by coordinating conception, design and building in one harmonious whole. In order to cope with the general problems of human settlements, the modern architect will have to follow the new approach of EKISTICS - the science of human settlements.

To create an environment that is appropriate for the society's needs, the architect will have to understand the new types of urban settlements which are developing dynamically. The architect must recognise the human sector as the unit of his work, and must evolve proper solutions for building and construction. Lastly, the architect must understand that the synthesis can no longer be two-dimensional or three-dimensional, but will necessarily have to become a four-dimensional one.

7.3 RECOMMENDATIONS

7.3.1 FUNDING

Like every tertiary institution of comparable status, the initial funding of the Institute shall be by direct assistance from the Federal Government of Nigeria. Ultimately, the Institute shall be self-sustained (autonomous) through contributions from various governmental and non-governmental sources, educational development agencies, cultural and other organisations, corporate bodies and interested individuals, as well as building materials manufacturers.

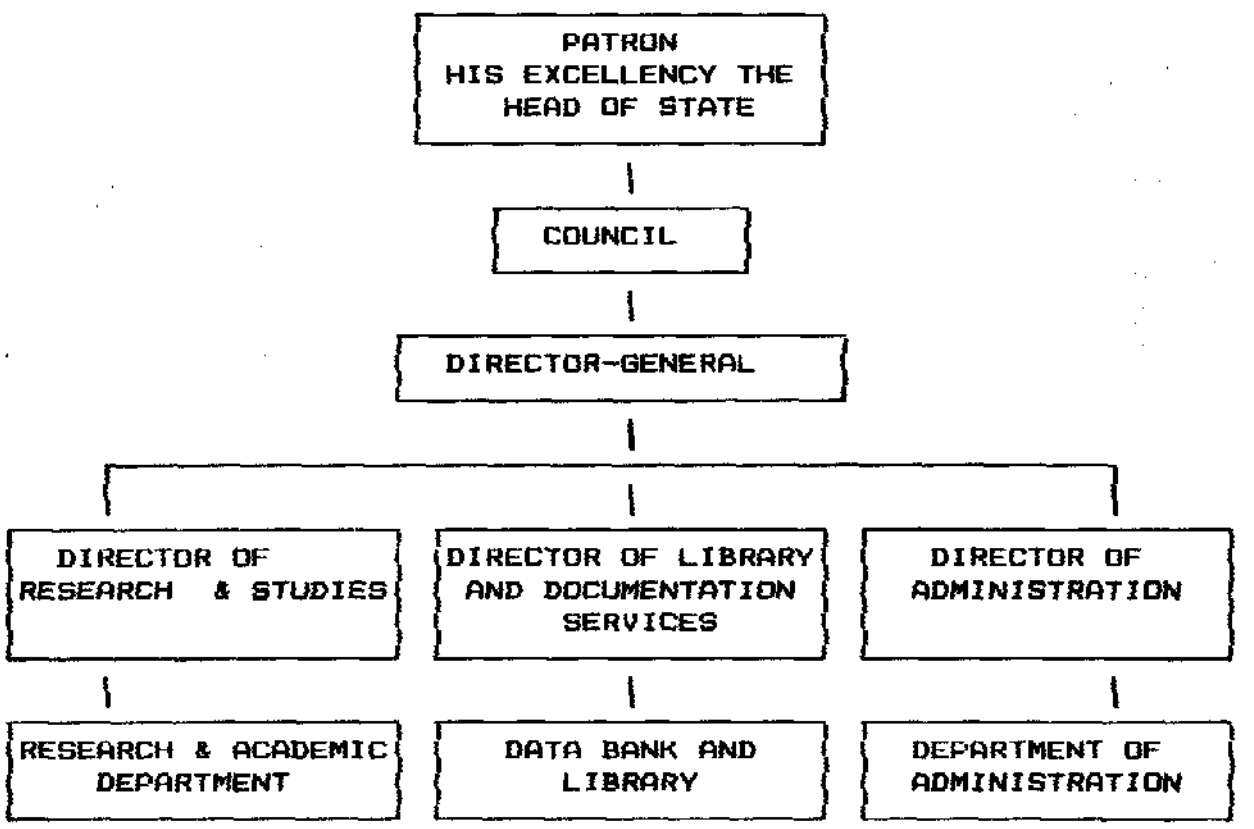
7.3.2 OPERATIONAL STRATEGY

Any office, and indeed individual within the professions knows that the activity of building has changed significantly in recent years, and signs are that it will continue to change. New techniques of building procurement, increasing demands by client bodies, the discipline of quality assurance and he need to manage the affairs more effectively as margins become tighter call for new attitudes and new skills of the industry is to maintain its role and status.

The management shall be by the council constituted by the Federal Government on the recommendations of the

Ministers of Education and Housing. The Institute shall be encouraged to be self-sufficient through undertakings in Research, Patenting, Consultancy Services, and other academic and research assignments.

ORGANISATIONAL CHART



7.3.3 COURSE STRUCTURE

For the Institute of Advanced Architectural Studies to justify its existence, it is necessary for it to embark on series of post-graduate and post-

professional educational programmes. In the light of this, studies leading to the award of NIA/ARCON professional membership certificates as well as M. Arch, MPhil and Ph.D degrees can be undertaken. However, such in-depth study programmes shall be tailored to meet the needs of individual candidates. These can be built up to consist of a mixture of short courses, tutored projects, dissertations and essays as appropriate to the field of interest. Research studies shall be aimed at clarifying developing issues in practice/management which can then be addressed through the short course programme and the consultancy service.

The continuing education programme of the Institute aims to help architectural and other building professional practices in both the public and private sectors to meet the new demands on practice management arising from the changing environment in which professionals work within the building industry. The programme shall link with a wide network of versatile architects, internationally recognised academicians, other building professionals, experts from other disciplines and management consultants who shall advice on its activities and teach on its courses.

The programme of short courses at the Institute

shall focus on different aspects of practice management and different levels of individual and office experience. The courses offer the invaluable opportunity to share experience and make contacts. The short courses are evolved out of demands by practising architects, and to bridge the gap of professional communication at the various stages and levels of interaction. They are however listed after careful consideration of the specific areas of urgent attention, while the existing institutions of similar status were also examined. The scope of operational coverage can be adjusted to suit the future needs as such may arise. (See Appendix A).

APPENDIX A

. SPECIAL COURSES AND CONFERENCES

From time to time the centre shall participate in the organisation of special national and international conferences and symposia.

. INSTALLATION OF SERVICES IN HISTORIC BUILDINGS

3 DAYS

- A number of selected leading practitioners shall explain their approach to the tension between the necessity to preserve and if possible, enhance the character of historic buildings and at the same time to bring them thoroughly up to date.

. LIGHTING OF HISTORIC BUILDINGS: 2 DAYS

- The skilful lighting of historic buildings, externally through forms of floodlighting and internally through techniques which enhance atmosphere and contribute aesthetically and yet do not damage fragile objects or works of art, demands a radical new approach. A number of distinguished practitioners shall be invited to present their own special approaches to these problems.

. CONSERVATION OF INTERIORS AND DECORATIVE FINISHES (4 DAYS)

- A thorough knowledge of art and design, and of traditional decorative finishes, is required in order to embark upon the successful conservation of interiors. Aspects such as painted decoration, marbling, gliding mural painting, polychrome woodwork, and wallpapers shall be extensively analysed and discussed.

. VIRTUES AND VALUES: CULTURAL HERITAGE (2 DAYS)

- SEMINAR TO EXPLORE The role of culture and Tradition in the evolving modern architectural idioms.

. NON-DESTRUCTIVE ANALYSIS OF HISTORIC AND LISTED BUILDINGS (2 DAYS)

- The course shall examine can important aspect of investigating historic buildings: how to identify problems, and to assess them, without causing damage.

. CO-ORDINATED PROJECT INFORMATION: 1 DAY

- This course shall deal with the principles behind the common arrangement and show its relationship with the specification code; the Drawings code and the Standard Method of Measurements (SMM 7).

. BUSINESS MANAGEMENT IN THE SMALL/MEDIUM PRACTICE

(3 DAYS)

- A practical course for people running small/ medium-sized practices. It will examine aspects of financial management, time management and team management.

. THE ARCHITECTURAL PRACTICE ADMINISTRATOR (2 DAYS)

- The course is aimed at practice administrators in the private sector office. It shall examine what architects in practice are to produce and at the office systems they need to support this. The course outlines the administrator's activities and they they systems like time recording, accounts and practice documentation.

. PERFORMANCE SPECIFICATION: (2 DAYS)

- The course will discuss the use of performance specification, identify its discipline and function and consider requirements under the contract for insurance schemes and the division of design responsibility.

. RUNNING THE TEAM: 2 DAYS

- A course for project team leaders running large jobs with large teams. It shall explore the skills involved in keeping jobs on time, to cost, and

obtaining the commitment of the team.

. TIMBER CONSERVATION: (4 DAYS)

- The seminar shall examine the use of timber from first principles and shall seek to explain and illuminate repair techniques and to explore related issues.

. METALWORK CONSERVATION (4 DAYS)

- The use of metals, whether structurally or decoratively, in buildings is something that has evolved an architectural expression for itself all over the known world since the early years of industrial revolution among the topics to be covered will be the use and repair of cast and wrought ironwork, the repair of lead roof coverings, and the conservation of lead sculpture.

. BRICK, TERRACOTTA AND TILES (4 DAYS)

- This course traces the history of making bricks, tiles and terracotta and also highlights their prospects and potentialities in the tropics. It also casts an overview of other cultures where these materials are traditionally used. There will be a guided visit to look at traditional brick-making process, and then to improved low-cost manufacturing

processes in the various plants in the country.

. EARTH (INCLUDING COB, PISE, CLAYLUMP, WATTLE AND DAUB): (3 DAYS)

- The most fundamental of all building materials shall be studied, and the repair and conservation of structures using earth as a principal materials, or mud as a mortar, will be taught through examples, demonstrations, and some practical work.

. COBBLES, PEBBLES AND FLINTS: 1 DAY

- These materials occur in many parts of the country and in other cultures in various related forms. Their special problems will be studied, and solutions described.

. STONE CONSERVATION: (4 DAYS)

- The course shall start from basic principles, studying the geology and morphology of stone. It shall examine the various causes of stone decay, the decay mechanisms, and the methods, and the methods available to inhibit decay or consolidate friable stone. Visits shall be organised for quarry and to selected monuments, and a lecture on sculpture conservation.

. PAVING AND HARD SURFACES IN HISTORIC AREAS AND SITES (1 DAY).

- The one day seminar shall examine a crucial aspect of the4 successful preservation and presentation of conservation areas and individual historic buildings and sites, especially the attention which needs to be given to the choice, design and texture of paving and all other forms of hard surfacing.

. PROTECTING THE RURAL HERITAGE: DEVELOPMENT CONTROL: (2 DAYS)

- The course shall examine, within the context of the official planning system, a range of current issues such as the re-use of agricultural buildings, in full design, development in areas of natural beauty, and catering for tourism.

. THE TRADITIONAL REPAIR OF OLD BUILDINGS: (4 DAYS)

- A four-day course, aimed at both professionals and enthusiastic owners, shall be jointly organised with the National Commission for Museum and Monuments (NCMM). Lectures shall be delivered on the principal aspects of caring for historic buildings, demonstrations, and visits to work in progress.

. PLANTING AND THE UPKEEP OF OLD GARDENS: 4 DAYS

- The course is designed to survey some of the practical techniques and areas of special knowledge that are required for the upkeep of old, historic and high quality gardens. The course shall include sessions on the history of planting design and garden flora, the conservation of garden plants, planning the upkeep of gardens, maintenance techniques, and renewal of planting schemes.

. TREE AND WOODLANDS IN THE LANDSCAPE: 3 DAYS

- The history of woods and tree planting, aesthetic attitudes of trees, traditional and present day practice in relation to the planting and management of woods and trees, the policies of the local governments and government agencies all come within the scope of this course.

. PROTECTING THE RURAL HERITAGE: LANDSCAPE: 4 DAYS

- This course shall be concerned primarily with the historical and manmade elements of the rural landscape rather than ecological aspects. Amongst the topics to be discussed are the anatomy and characteristics of rural landscapes, identification,. survey work and recording, administrative and practical

means of protection.

. EXTRA - SPECIAL RESEARCH UNDERTAKINGS

In conjunction with other National and International organisations, it is hoped that the Institute will extend its research facilities to areas of wall construction technology, Materials (especially polymer technology), Continuing Education for practitioners of allied professions, computer technology, and professional knowledge.

. THE BUSINESS PLAN: (2 DAYS)

- This is a two-day course for senior professionals in both public and private practice. A business plan is not just about financial projections and cash flow, it also defines the nature of the service, establishes market demand and tests the variables and assumptions that have been made.

. COMMUNICATION SKILLS: (1 DAY)

- A one-day course intended for young building professionals covering presentation skills, oral and written communication. It will include hints and tips on meetings, minutes, letters, reports and notes.

. CO-ORDINATED PROJECT INFORMATION (1 DAY)

- This course deals with the principles behind the

common arrangement and show its relationship with the specification code' the Drawings code and the Standard Method of Measurement (SMM 7).

. TECHNOLOGY; 5 DAYS

- Technology is examined with reference to appropriate technology, computer appreciation and application, and fundamentals of computer-aided design.

. BUSINESS MANAGEMENT IN THE SMALL/MEDIUM PRACTICE:

(3 DAYS)

- A practical course for people running small-medium sized practices. It will examine aspects of financial management, time management and team management.

. THE ARCHITECTURAL PRACTICE ADMINISTRATOR: 2 DAYS)

- The course is aimed at practice administrators in the private sector offices. It shall examine what architects in practice are to produce and the office systems they need to support this. The course outlines the administrator's activities and the key systems like time recording, accounts, and practice documentation.

. PERFORMANCE SPECIFICATION: (2 DAYS)

- This course will discuss the use of performance specification, identify its discipline and function,

and consider requirements under the contract for insurance schemes and the division of design responsibility.

. RUNNING THE TEAM: 2 DAYS

- A course for project team leaders running large jobs with large teams. It shall explore the skills involved in keeping jobs on time, to cost, and obtaining the commitment of the team.

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- Seminar to explore the role of culture and tradition in the evolving modern architectural idioms.

. NON - DESTRUCTIVE ANALYSIS OF HISTORIC AND LISTED BUILDINGS (2 DAYS)

- The course shall examine an important aspect of investigating historic buildings; how to identify problems, and to assess them, without causing damage.

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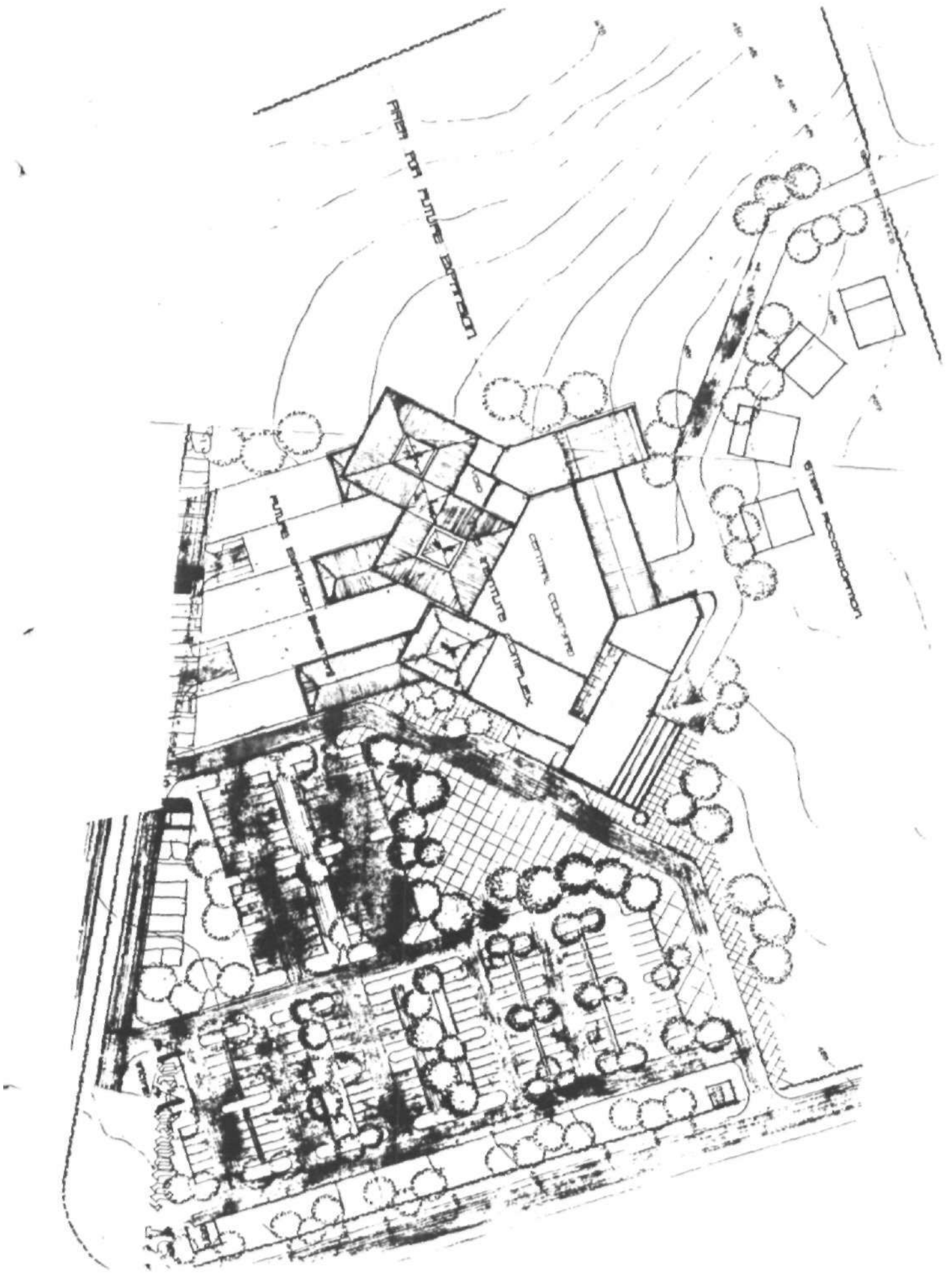
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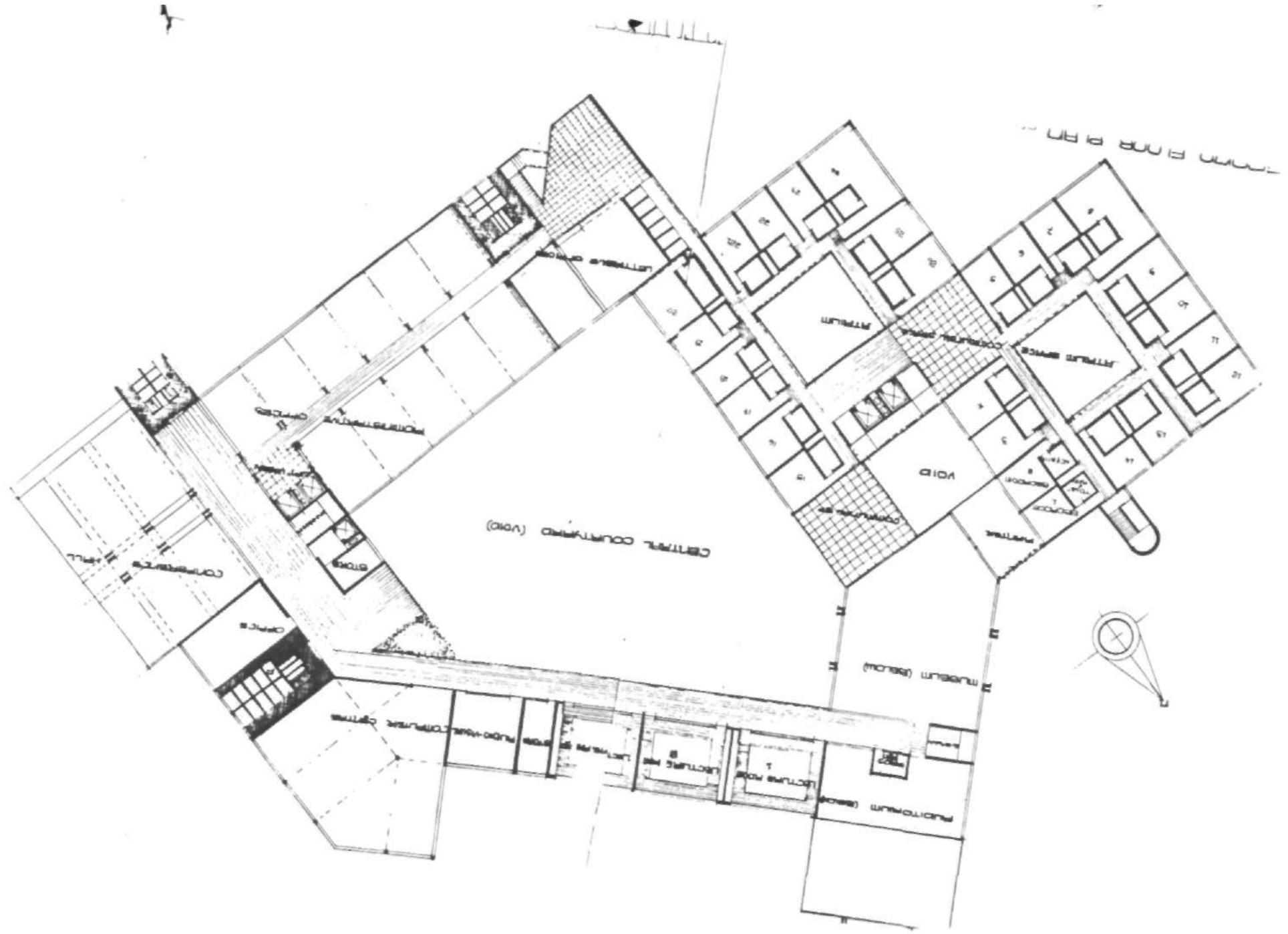
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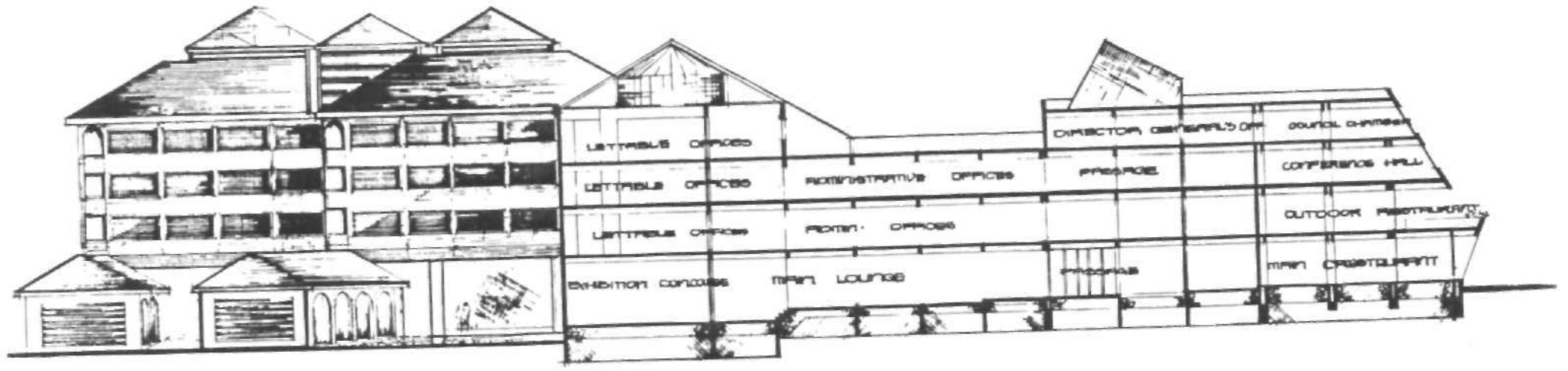
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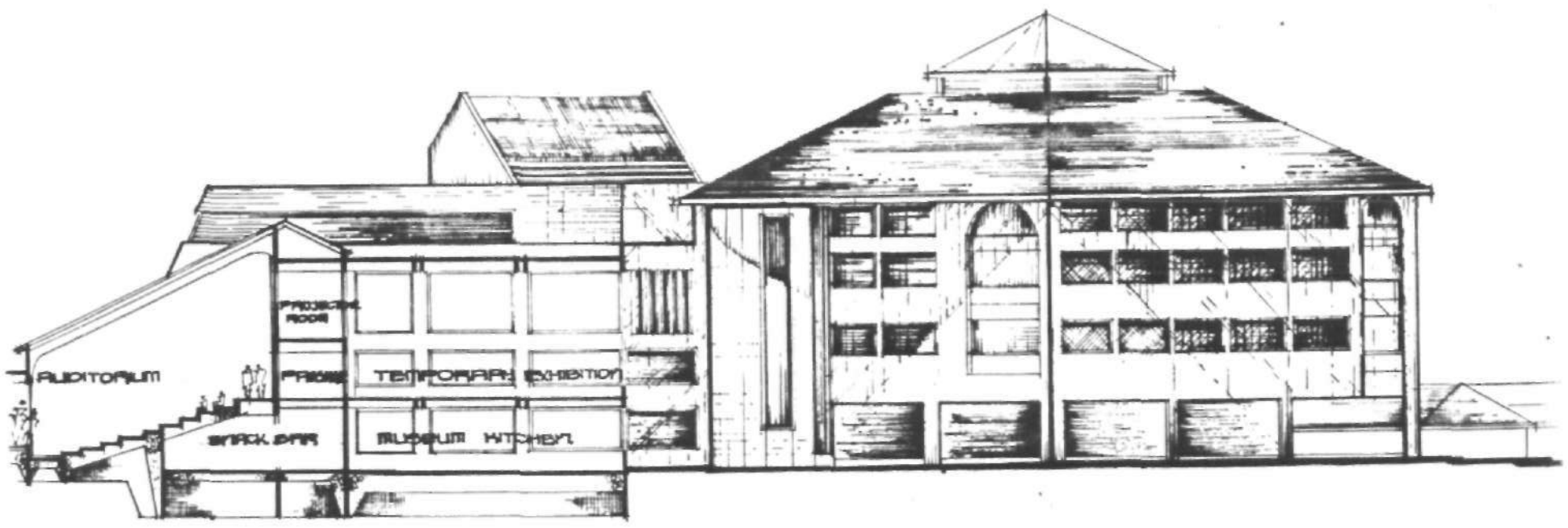
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AREA FOR FUTURE EXPANSION
FUTURE EXPANSION
CENTRAL COURTYARD COMPLEX
FUTURE EXPANSION





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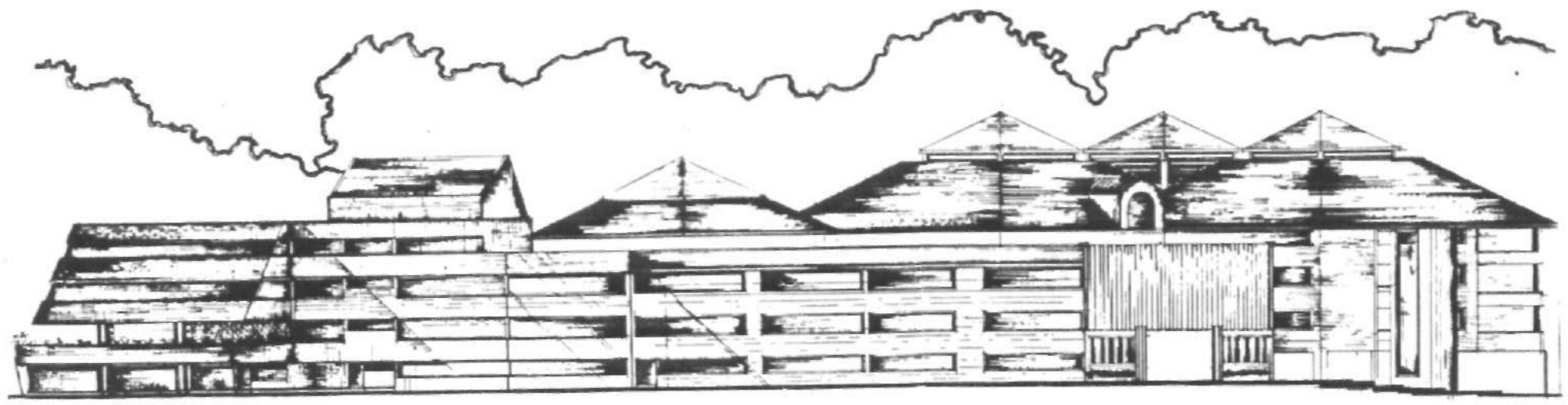


SECTION C-C SC: 1:200



SOUTH ELEVATION

INSTITUTE FOR AFRICAN STUDIES, ABUJA



NORTH-EAST ELEVATION