HEALTH HAVEN. ABUJA

Physical fitness as an antedote to stress build up in an urban set up

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Declaration

I, Ndalolo, M.J. do solemnly declare that this thesis, a purely authentic documentation of research conducted by me for the award of Master of Science degree in Architecture has not been previously presented either wholly or partly for any degree anywhere.

All quotations have been clearly distinguished and sources of information duly acknowledged in the reference.

CERTIFICATION

This thesis entitled HEALTH HAVEN ABUJA by Ndalolo, M.J. meets the regulations governing the award of the degree of Master of Science in Architecture (M.Sc.) of Ahmadu Bello University, Zaria, and has been approved for its contribution to knowledge.

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DEDICATION

In the name of Allah the Beneficient the Merciful, I dedicate this work to my late paternal and maternal grandmothers - Hajiya Hauwa Ahmed and Hajiya Maryamu Koro, may your souls rest in peace, Amen.

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ABSTRACT

This paper is intended to explore through various research reports, and literature review, how physical fitness could reduce tension especially in urban centres, so as to determine as precisely as possible, the degree of attention deserved by physical fitness.

Various tests and observations have shown that physical fitness actually eliminates stress under various working conditions, and monitors that various diseases like cancer, hypertension, arteriosclerosis, athritis or cerebro vascular diseases are kept at bay. This observation has been put to great use in many countries and much experimentation is still going on to further improve on what has been found especially in the United Nations,

Nigerians however, do not appear to give this aspect the attention it requires and where efforts have been made, little consideration is given appropriate scientific guidelines and standards. Although the government has made tremendous efforts to provide physical health services, emphasis is laid on sports participation rather than overall physical fitness for all.

The trend now of people attending commercially established fitness centres, only indicates the need and calls for a review of our sports programmes in

the nation which has reduced a large percentage of Nigerians to sedentary spectators. This development among Nigerians of attending commercial fitness centres should be recognised as part of progressive programs for stimulating Nigerian economy. Evidences available from studies support the concept that healthy citizens make a healthy nation. Experiences with factories and industries which have fitness programs as part of employee benefits showed reduced number of lost working hours (absenteeism) less hospital bills and more people in service for longer years because there are no premature retirements due to one disease or the other,, These consequently increased production and the establishments became more profitable.

The disturbing aspect of commercial based exercise program centres in this country however, is whether the services they provide are worth the money paid them by their clients.

The thesis is aimed at designing the appropriate spaces required in order that the whole concept of physical health be attained in the right way and hopefully make the authorities realise the difference and promote fitness health programs for all.

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CHAPTER ONE

1.0 INTRODUCTION

Physical conditioning was pioneered in 1957 and with the advent of companies like UNIVERSAL which produce universal gym equipments, weight training wasn't just for body builders anymore. Strength conditioning moved from the backroom sweatshops to today's hightech athletic workout rooms and fitness clubs.

Henceforth, we have today so many fitness clubs - both modern and traditional as in China, Korea and other far east countries - scattered all over the world excepting Nigeria which till date has no such club which exclusively caters for fitness, physical therapy and recuperative purposes. Although there are about 2 or 3 places that come up with something close to one, there is still not an outstanding club of such purposes mentioned above and as part of the measures being taken by the Federal Ministry of Health to start a campaign to achieve health for all by the year 2000, this thesis proposal is intended to be a major contribution for Nigeria.

This is in line with the notion which says that curative rather than preventive measures should be taken to stay healthy.

Ideally, health should be something that a community and individuals achieve themselves and not

as in most cases, the misguided notion that doctors should do so for them.

Physical fitness is the major ingredient towards achieving health and is based on the logical premise that the human body must build up itself in resistance to disease and must not only rely on surgery or synthetic drugs to attain good health.

Considering the fact that hardly do we Nigerians take time off for a real holiday to relax or indulge in occassional recreation, stress related health problems such as back aches, high blood pressure, obesity, diabetes not to mention many others, will ensure that our productivity diminishes until it is phased out or we drop dead from exhaustion.

It is in order to reduce and correct the above situation and thereby improve life spans, health problems and productivity that the author proposes a health resort. The resort besides providing treatment for physical laxity - experts advocate exercise as the most natural way to improve health, gain physical fitness and enhance success in life - will have recreational exercise facilities as well as beauty and fashion plaza to boost the moral of users as well as medical care on a small basis and training or lecture/seminar facilities to educate people on the importance of physical fitness and adequate and proper nutrition.

It is hoped that the implementation of such a project as this will help the Government in its efforts on attaining health for most if not all by the year 2,000 AD and widen the scope of awareness that exercise and healthy living habits are important. The importance of health therefore to the human body cannot be overemphasised and with the rate of development of a country like Nigeria, so does the need for a health firm. Although some can afford to fly out of the country for such health needs, most cannot, especially with the economic conditions imposed on the country at present.

The thesis proposed is aimed at providing a prototype health firm that can be situated in the country, to be financed by government parastatals or private owners.

This shall be achieved by trying as much as possible through design, to affiliate every type of health activities or exercises conceivable, into a complex that can be afforded by most people around and hopefully restrain the rates of physical breakdown like insomnia fatigue, nervous breakdown, etc. thereby increasing the rate of productivity and generally decreasing the cases of degenerative diseases in fellow Nigerians.

1.1 Motivation

A most significant observation is that the output rate of most contemporary Nigerians is being

than going out of the country to spend it.

5. To use landscape Architecture to create an environment that would be aesthetically rewarding and favourable to man's well being.

6. To create a community fitness centre, a kind of leisure space whereby everyone could come and train and recreate during leisure. This could be made possible with aid from the government or by private bodies.

1.3 Objectives

1. To design a space into which the above mentioned activities shall fit into.

2. Create an atmosphere conducive for recuperative activities.

3. Provide other facilities that would boost man's morale and give him more confidence in the society to be able to move around and about his duties precisely, e.g. fashion centre, beauty plaza, etc.

4. Co-ordinate functions in the whole complex to give efficiency.

1.4 Scope

1. Accommodation (2-3 months therapy session) including kitchen facilities, stores, services, provisions and incineration routes.

2. Outdoor therapy areas like jogging and sports

fields, swimming.

3. Indoor therapy areas like massage rooms, saunas, jaccuzzis.
4. Beauty areas e.g. facials, manicure, pedicure, saloons etc.
5. Fashion house.
6. Gymnasium.
7. Open air and indoor eating areas.
8. Office for physiotherapist, hydrotherapists and attendants, changing rooms and conveniences.
9. Medicare facilities.
10. Halls for films and demonstrative facilities.

Clients

Every interested person or persons requiring recuperative exercise after illnesses or accidents or for general fitness purposes.

Financiers

Government parastatals or private bodies.

1.5 Architectural Significance

Architecture plays a vital role in all professions not only in providing a conclusive physical environment within which practices of such profession are carried out but arresting the

psychological environment which affects the perception and responses of the people concerned.

In view of this, the thesis proposal has been undertaken to produce a design which would guide the interaction of space (structural and open) and man in meaningful and beneficial patterns that would enhance health rather than lead to tension, stress or frustration, hence lowered productivity rates - a therapeutic community.

Thence the focal point of this thesis will be designing a comfortable and functional space adaptable to the choosen site as well as being a trial at harmonising physical fitness, nutrition education and recuperation.

Bath houses have existed from time immemorial, so have physical training centres but rarely has there been a centre that combines all aspects of health therapy - physiotherapy, hydrotherapy and other outdoor and indoor exercise facilities coupled with good advice on nutrition and medical care in a recreational atmosphere for peoples well being. All these, with the use of Architecture, I hope this proposal will inspire others in seeking ways of using architecture to solve all sorts of problems - social, physical, economical, psychological either directly or indirectly.

CHAPTER TWO

2.0 PHILOSOPHY OF PHYSICAL FITNESS

2.1 Insight into physical fitness

2.1.1 Definitions of physical fitness

Physical fitness is the ability to carry out daily tasks vigorously and alertly without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforseen emergencies (Clarke, 1976).

Physical fitness is static or medical fitness soundness of organs, dynamic or functional fitness efficiency of body in strenuous work and motor skills, co-ordination and strength in carrying out activities (Gallagher and Brouha, 1944).

Cureton in 1947 appraised physical fitness in terms of physique and organic efficiency which he says implies anatomical and physiological soundness.

Generally, physical fitness includes qualities important to the individuals health and well being as opposed to those related to performance of specific motor skills. It is the ability to bear up, to withstand pressure and to survive under difficult conditions where an unfit person would give up. Organically, man is a muscular creature that possesses and organism designed for movement with neuromuscular mechanisms which will produce

a) Health related fitness refers to those aspects of physiological and psychological functioning which are believed to offer the individual some protection against some degenerative diseases such as cardiovascular and musculoskeletal disorders, coronary heart diseases and obesity. These afflictions have been referred to as "hypokinetic" diseases by Hans Kraus and Wilheim Raab because they are often associated with low energy levels common to the sedentary person. This type of fitness should be of primary concern to every individual within our society.

b) Performance related physical fitness includes those qualities of function that provide the individual with the ability to participate in sporting activities with greater power, strength, endurance and skill than would otherwise have been the case.

The major difference between the above two lies in the degree to which each component must be developed in individuals. For example, the Olympic marathon champion must have a heart and circulatory system that function at an extremely high level in order to be able to deliver enough oxygen to the muscles to sustain the level of energy metabolism demanded by the sport. The average individual on the other hand can have a system that functions at 60-70% of the marathoner's capacity and still receive optimum levels of protection from the development of circulatory

diseases.

It should be noted that individuals may be high in certain components of performance related fitness but relatively low in health related fitness and vice versa. An example would be baseball players who train only for their sport. Although these particular set of athletes are often strong, usually exhibit high levels of skill in throwing, catching and batting and may possess exceptional sprinting speed, they are not necessarily high in other components of fitness such as maximal oxygen composition and low percentage of body fat. Baseball is a low energy sport requiring only 5 kilocalories per minute of energy expenditure; less than half the energy cost of handball. The game does not place a very high stress on the circulatory system and it doesn't burn up many extra calories.

Baseball is a sport requiring speed, skill and strength. The largest continuous run a player would be expected to make for an inside the park run is a distance of 120 yards! Football is another popular sport that emphasises strength speed and skill. Analysis of fitness components in football players show them to be similar to non-athletes on tests of body composition and cardiorespiratory function.

The above statements should not be interpreted as an attempt to belittle baseball and football,

these sports are merely used to explain how a person may be fit to perform in an athletic sense but not fit in the health context. They are mentioned also because they are popular spectator sports and because they are participated in by many young people, often, to the neglect of other forms of physical activity.

Basic Components of health related fitness

These are cardiovascular function, body composition, strength and flexibility. They are measured in the new AAHPERD test by the one-mile or nine minute run, sum of subscapular and tricep skinfolds, one minute timed sit ups and sit and reach, respectively.

i) Cardiovascular function

This is the most important component in the health related fitness area. Many cardiologists, physiologists, physical educators and other health professionals are convinced that physical activity at levels sufficiently high enough to promote improved cardiovascular function is a potent factor in either preventing circulatory diseases altogether or reducing their effects if they do occur.

Another facet of cardiovascular function that should not be overlooked is its impact on physical working capacity. The oxygen delivered to working muscles is critical to the energy transformation that

occurs within them, especially when they are called upon to work for any significant length of time. A heart and circulatory system functioning at a higher level - i.e. delivering more blood - is also making more oxygen available to the muscles. This increases the individual's ability to work and or exercise at a greater intensity and hence a longer period of time. The fatigue prevention aspect of this quality is very important.

The criteria for cardiovascular fitness and physical working capacity is the relative level of functioning within the heart and circulatory system. In order to evaluate cardiovascular function, it must be measured. Valid and reliable procedures are available and must be used.

ii) Body composition

Body composition is defined as the relative percentage of fat and fat free mass. It is an important correlate to cardiovascular function as far as health related fitness is concerned. Excess amounts of body fat take the form of "excess baggage" when it becomes necessary to move the body from one place to the other. Therefore, for any given amount of work, the energy expenditure is increased in the obese. The greater demand for energy causes the circulation to work harder. Also an obese person usually consumes a diet high in saturated fats and

cholesterol. The resulting greater level of circulating blood fats increases the probability of developing arteriosclerosis an important precursor to coronary heart disease.

The problem of obesity in the nation is widespread. The National Medical Association has estimated that over 40% of all adults can be considered overweight and surveys among school children indicate that a similar problem exists for at least 30% of that population. Retention of body fat at any age is a health problem of considerable concern but it is especially significant in children and adolescents because obese individuals in those age ranges are much more likely to become fat adults than their non-fat peers. In addition to an increased incidence of coronary heart disease among obese persons, certain other health problems are prevalent. These include greater risk of developing and suffering from hypertension, diabetes, mellitus, gall bladder disease, degenerative athritis kidney disease, adverse postural changes delayed puberty in children and decreased endurance and work capacities. It has been estimated that if all deaths from cancer were eliminated, two years would be added to the life span and if all the deaths related to obesity were removed, the life span would increase by five years! Indeed most medical authorities recommend that one of the best personal preventive and rehabilitative health practices available to an individual is reduction or

prevention of excess body fat.

iii) Strength

A third important component health related fitness is muscular strength. Strength is usually defined as a muscle or muscle groups' relative capacity for exerting force against some external resistance. The importance of strength to high level performance in sport activities is rather obvious to most persons. Everything else being equal, higher levels of strength usually enable the possessor to jump higher, throw farther, push harder and resist the efforts of an opponent to a higher degree.

The more the strength in an individual the lesser his susceptibility to strains, sprains and pulls that sometimes occur when one participates in physical activities. In addition, better tone in the muscles of the trunk aids in preventing some of the more common postural problems that plague us (e.g. sagging, abdominal pains, round shoulders and low back pain).

The strength of the abdominal musculature is of critical importance in the etiology of the low back syndrome, one of the most prevalent health problems. Medical reports indicate that low back pain is experienced by approximately 80% of the population at some point in their lifetimes. Physical fitness experts, physical therapists and orthopedic

surgeons link the high incidence of low back problems with a corresponding lack of exercise. The general logic is that muscles which are easily fatigued and/ or strained cannot support the spine in proper alignment. Weak abdominals and inflexible posterior thigh muscles in particular, allow the pelvis to tilt forward causing a concurrent and abnormal arch in the low back. Shortened inflexible muscles thus result in decreased mobility and increased possibilities of strain spasm and pain. The end result is the "low back syndrome".

In addition to protection from the problems described, persons possessing optimum levels of strength development are likely to derive more satisfaction from recreational sports participation. They should be more successful in the execution of sport skills and less susceptible to fatigue. Because of this success, they are more likely to engage in recreational sport activities and derive the major benefits of cardiovascular conditioning, weight control and tension relief.

iv) Flexibility

The fourth important component of health related fitness is flexibility. In the physical education and sport context, flexibility refers to the degree to which a joint may move through its maximum possible range of motion. The determining factor in joint range of motion is the extensibility of the associated

connective tissue (tendons and ligaments) in and around the joint. Any restriction in the normal extensibility of a joint's connective tissue defines a flexibility problem.

From a health standpoint, loss of joint flexibility often contributes to postural problems. These usually result from the adaptive shortening of connective tissue on one side of a joint concurrent with loss of tone in the muscles on the opposite side of the joint. Examples are:-

1. the condition of round shoulders in which shortened tendons and ligaments in the upper chest area allow the associated muscles to draw the shoulders forward and
2. the common adult problem of an inability to bend forward and touch the toes with the hands while keeping the knees fully extended.

A primary cause of the latter problem is adaptive shortening of the connective tissue in the lower back and the posterior thigh areas. The implications for adequate levels of both flexibility and in strength in the prevention of back problems are obvious.

Adequate flexibility is also an important factor in the performance of many sport skills - both recreational and competitive. If an individual

suffers from loss of flexibility, even high levels of development in the other fitness components such as strength and endurance may not be of any benefit. If there is decreased range of motion in a joint, the individual will be less effective in expressing whatever strength qualities are present within the muscles acting over that joint. Also the reduced range of motion may prevent the individual from observing proper mechanical principles in the execution of a skilled movement, lowering the level of performance. Any resulting misalignment of body segments and/or compensations within other joints can increase the possibility of joint or muscle injury.

Adequate levels of cardiovascular function, body composition, strength and flexibility must form a base for all other components of physiological functioning and they also have a positive effect on one's quality of life throughout childhood and adult years.

In order to adequately learn about health related fitness, we have to learn how to measure the components, evaluate them and hence be aware of our status on each and where to go from there.

2.2 IMPORTANCE OF PHYSICAL FITNESS

While the physical development objective has always been highly regarded throughout man's recorded

history, events of the past several decades have enormously accentuated its importance. The events referred to are the rapid development of automation and mechanisation. Mechanical equipment has largely eliminated the physical effort involved in most work activities. This in turn has had profound effects upon our people.

Automation and mechanisation represent the latest stages of the industrial revolution. For the past 100 years, there has been a steadily increasing replacement of human effort by mechanical devices. Modern western civilisation represents the climax of this development by combining maximum technical perfection of labour saving gadgets with their maximal mass distribution. Labour saving devices have greatly reduced the physical efforts involved in work of every conceivable type including house keeping. Even trivial aspects of life such as walking as a means of moving around have been overridden by the invention of motor bikes, cars and the likes hence, the need for physical training as an alternative to keeping fit.

The year 2000 A.D. has been earmarked as the period when health will be available for all by the United Nations and all other member nations are working hard to meet this goal. Its realization may not be a difficult task if every nation encouraged public health education an aspect that is very

essential in preventive medicine.

Presently, many nations have adopted programs that will improve health conditions of their citizens. Part of the programs being instituted are of physical fitness which involves individuals in regular exercise. This concept is relatively new in Nigeria.

During precolonial days, different groups of people where actively involved in high energy expenditure physical activities such as farming, fishing, long distance working, animal hunting and many other strenuous activities that were advantageous to their health. The intrusion of the colonialists however, together with technological advancement, have significantly reduced very much of energy conserving activities. More emphasis has been on mental capabilities rather than physical even in the manufacturing industries. This condition has changed individuals' lifestyles.

Over the years, there is no doubt that the world has witnessed dramatic improvements in overall health and the quality of life.

Life expectancy has increased to such that some nations are beginning to worry about what to do with very old citizens and how to house them. This country is not an exception, there are now many Nigerians particularly in the rural areas who are in their

eighties or above. The overall health improvement may be due to sanitation, water purification, good housing, proper nutrition and personal hygiene. However, the disturbing fact is the aspect of technological advancement because the major causes of death nowadays relate to the complications of chronic diseases such as cardiovascular and cerebro-vascular diseases, cancer, arterioscleresis, hypertension, athritis etc. rather than the acute infection from contagious diseases that were in the past very common, thanks to available vaccines and antibiotics with modern technology.

At present many modes of treatment have failed to reduce mortality rates caused by the above mentioned diseases significantly, therefore, emphasis is now laid on preventive aspects rather than curative ones.

Many scientists and medical authorities believe that 30-80% of deaths from cardio vascular diseases, cancer etc. that account for more deaths particularly among elites in the urban towns and cities could be prevented if appropriate preventive measures are taken.

In preventive care, what needs to be done concerns primarily the individual's lifestyle (daily routine) while recognising family inheritance, occupational and environmental hazards to be beyond control as causes of deaths from these diseases, regular exercise, good nutrition, appropriate weight

blood pressure, cholesterol levels however are not. Control of these variables have been shown to lower morbidity and mortality rates associated with these diseases. Most have recognised this preventive approach that involves regular exercise programs.

2.3 BENEFITS OF PHYSICAL FITNESS

Regular exercise programs are a major preventive approach which have been found to reduce cases of heart diseases, smoking rates, hypertension, elevated cholesterols, diabetes and obesity. Regular exercise at least 3 days per week and 20-60 minutes per session has been found to be more useful and improve quality of life be it swimming, aerobics, gymnastics, sports or jogging. Smoking and physical inactivity rates have been found to reduce with it. Similarly obesity (overweight) which causes cardiovascular diseases, hypertension diabetes and even cancer have been reported to reduce with regular exercise programs. Evidence is available to support the relationship between regular exercise and longevity, it accounts for 28% lower annual death rate of the regular participants. Also an average of 1:2 additional productivity has been obtained from tests.

This is not all about the benefits of regular exercise or physical fitness. It has proved to be both medically and economically beneficial; medically in the sense that individuals enjoy improved health and a productive lifestyle. Economically, the industry

benefits include a rise in work force, health and improved productivity among workers in offices and athletes on fields. Such establishments also tend to pay less for curative health care and the society as a whole benefits indirectly from the turn out of more productive citizens it holds.

2.4 AVENUES OF PHYSICAL FITNESS

2.4.1 Hydrotherapy

This is the use of fresh waters to aid physical fitness of the body and in recuperative treatments. It involves the use of health spas, saunas jacuzzis, swimming pools (therapeutic) etc. The soothing effect of both hot and cold waters have been venerated for centuries right from the 30th century B.C. with the earliest baths in indus valley to the sauna baths and spa baths provided in ancient Rome. Even today, natural waters are being used at balneo therapeutic[1] centres all over Europe. This is alluded to by the fact that there was and still is medical support for chalybeate,[2] sulphurous and saline waters for prevention and treatment of ailments and convalescence.

It is also generally agreed that the lavish style and ornate architecture of the bathing places and seaside add a psychological tinge to the physical fillip given by water treatment. Enjoying the treatment

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[1] Balneotherapy - Use of medicinal springs/waters in therapeutic treatment.

[2] Chalybeate waters - Salted waters for therapy.

is more than half its success. The importance of such baths can be seen by the number of bath places scattered all over the world; West Germany publicises about 250 Bad[3] towns for water and climatic cures; Italy has at least 100 thermal resorts; France another 100 spas, 1,200 mineral springs and 30 thermal hospitals. Eastern Europe is almost equally served with many state run centres.

Today, the majority who accept the "Fitness Bad" consider spa water the vital asset, more valuable than primeval or even potable stocks. German, Swiss and Japanese epidermists have shown that active agents in the natural spring waters are passed through the skin similar to dissolved substances assimilated within the body to form antibodies which induce beneficial chemical reactions in the blood. Consequently, the blood test is a vital indicator in diagnosis to prescribe appropriate but wide varying forms of balneological therapy.

Nearly one person in every twenty is handicapped in some way. The treatment of disease or debility with water is complimentary to physiotherapy, or kinesitherapy, while mineral spa water therapy is widely accepted in Europe and far east, only hydrotherapy as a facet of physiotherapy or rehabilitation is practised in the U.K. and U.S.A.

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[3] Bad - Bath house.

The specialised hydrotherapy or bath is now an essential component in aiding recovery and normality. Schools, hospitals and church authorities provide treatment pools for the crippled, the blind or mentally retarded and rehabilitation baths for convalescent, paraplegic or disabled patients.

2.4.2 Physiotherapy

This is the treatment of an injury or recuperative measures taken to relieve the body of stress and pain through massage and special exercises. It is usually performed by a professional called the physiotherapist. A massage patient is shown on figure 2.4.1a.

2.4.3 Gymnastics

This involves aerobics and other body building and strengthening exercises. These exercises are performed in a special room called the gymnasium which usually houses all sorts of body building equipment such as those illustrated by figure 2.4.2.

2.4.4 Other Exercises

Exercises are a series of movements designed for bodily, mental or spiritual training. It is the most natural way to improve health, gain physical fitness and enhance enjoyment of life as it is the only means of acquiring the ability to engage in activities requiring sustained physical effort.

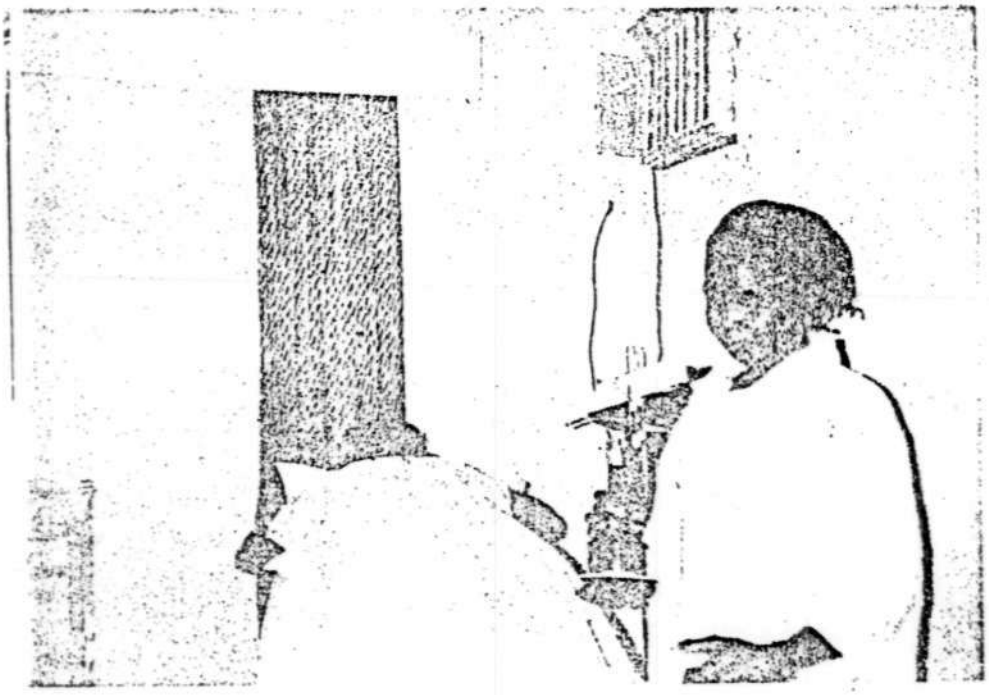


Fig 2.4.1a massoge room.

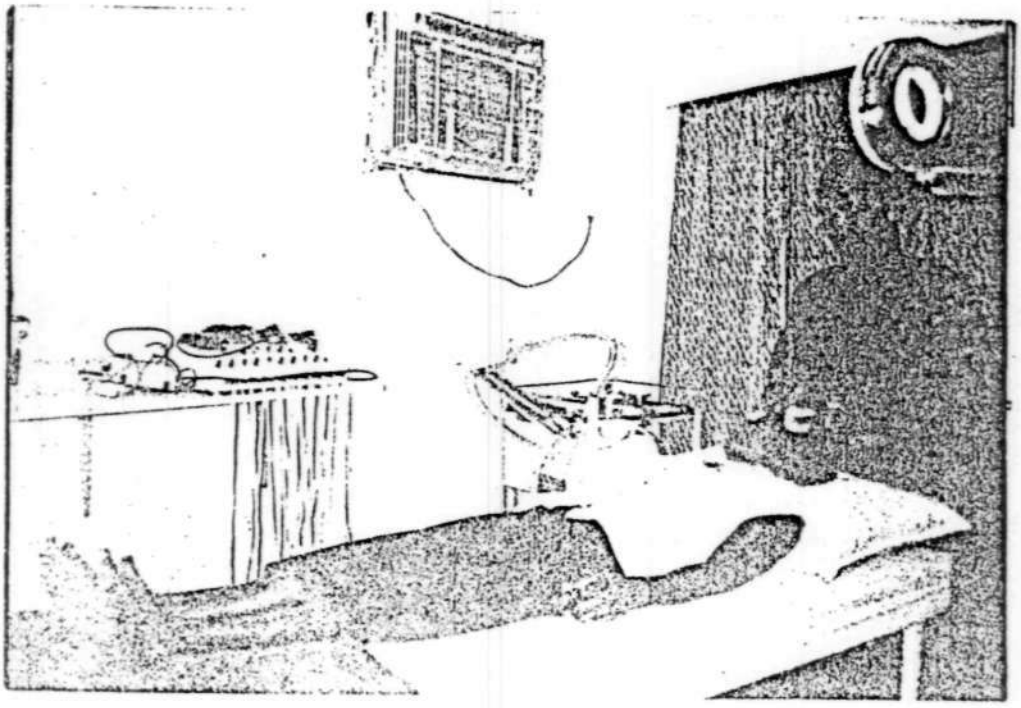
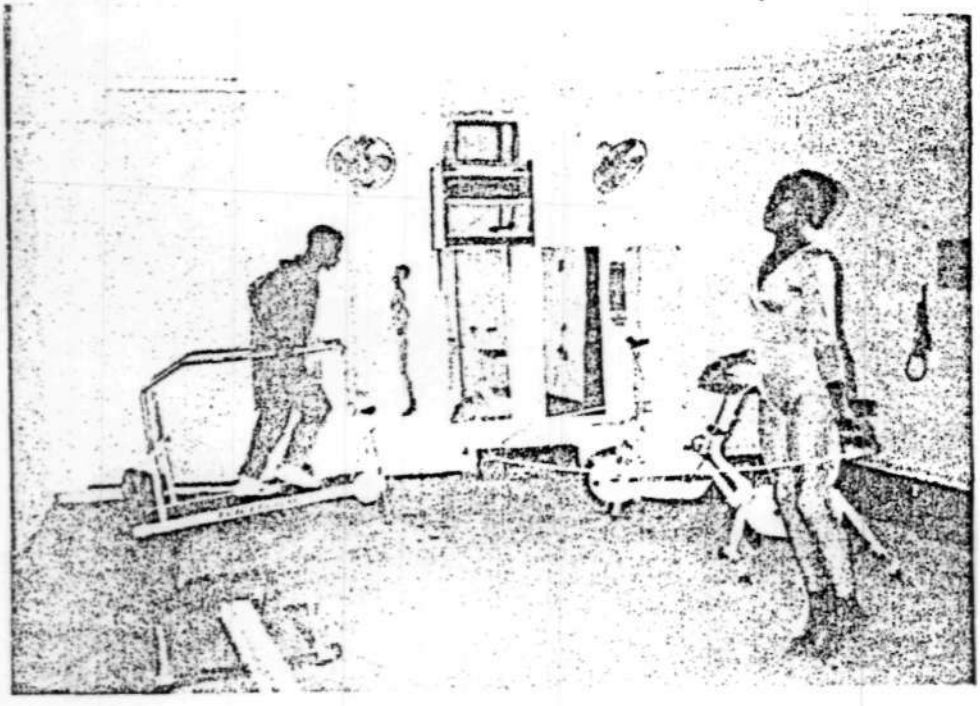


Fig 2.4.1.b facials

Fig 2.4.2 (a)



(b) exercise equipments in a gym.

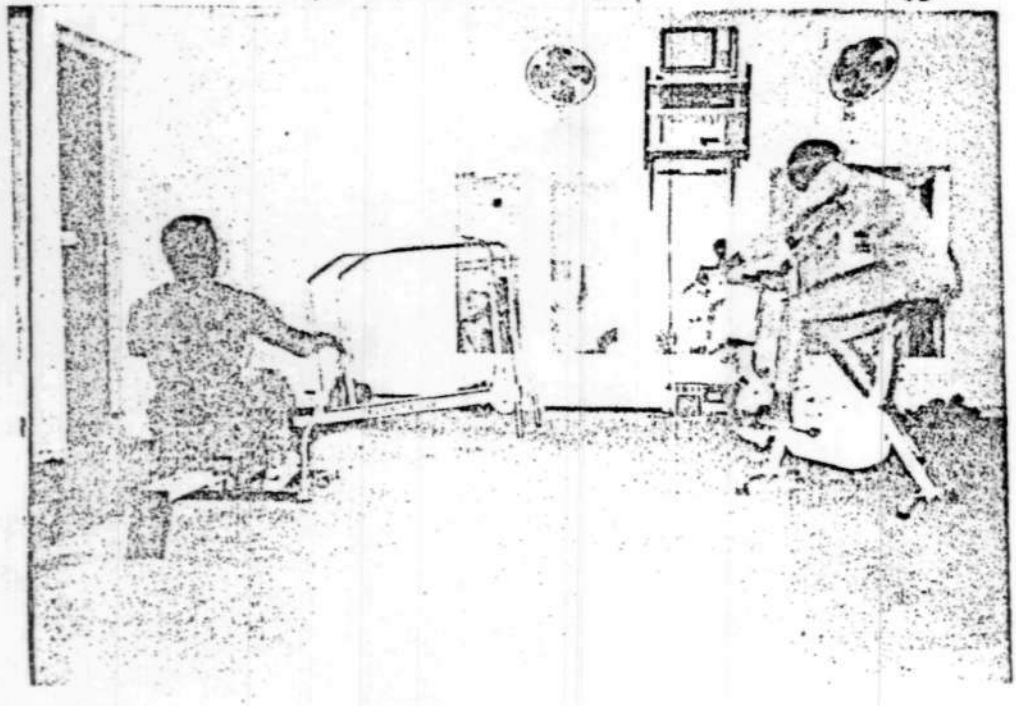
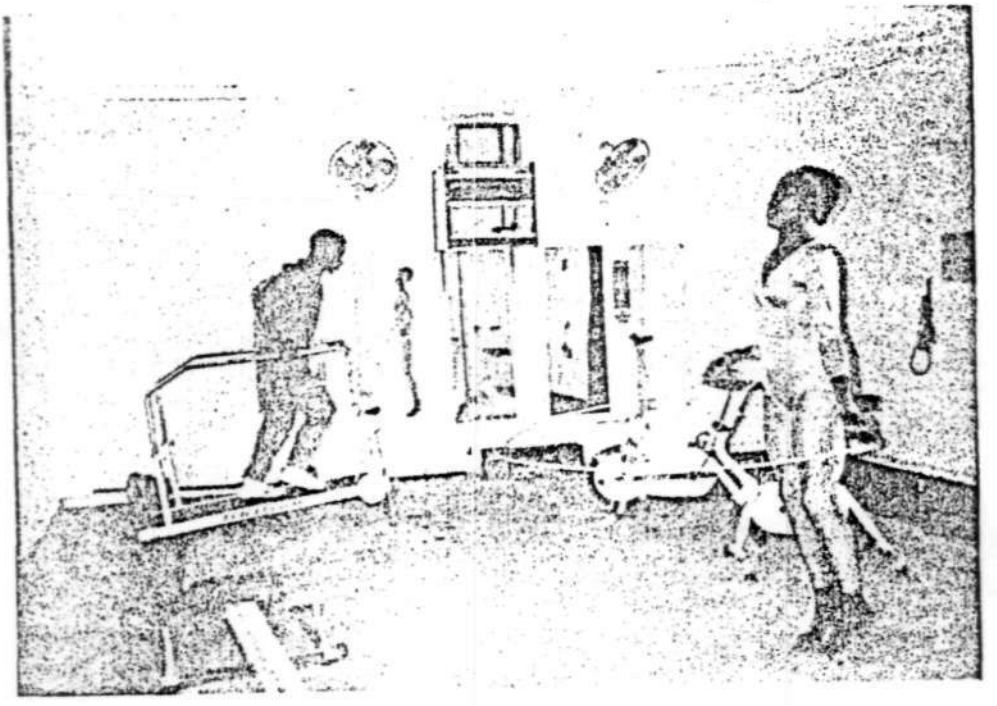
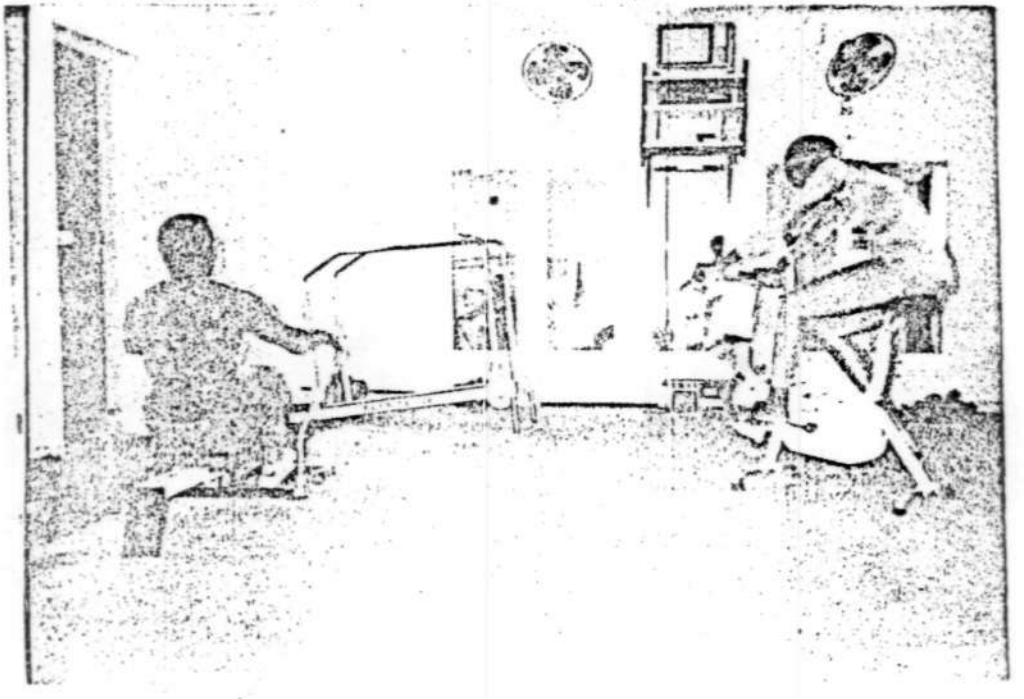


Fig 2.4.2 (a)



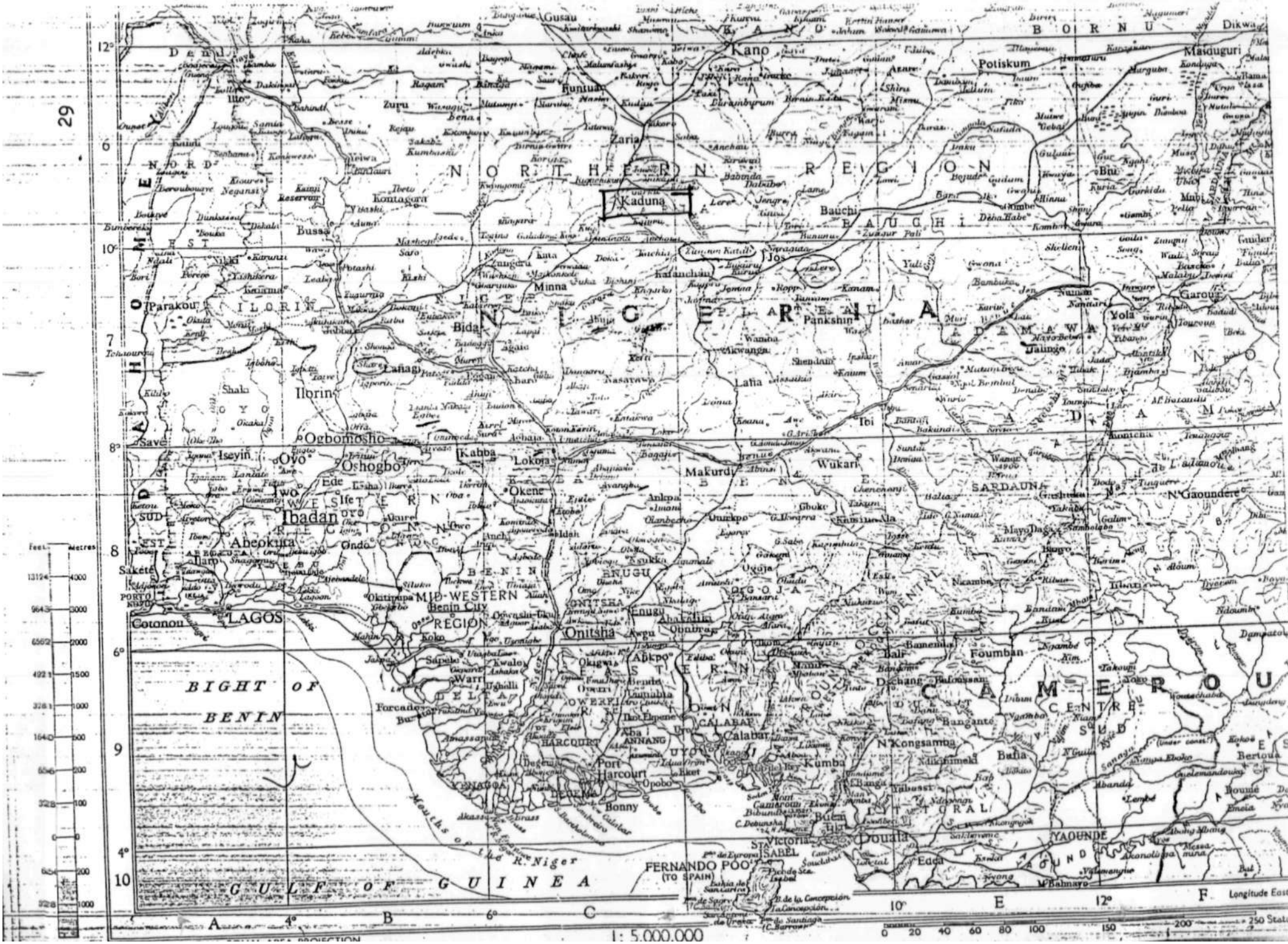
(b) exercise equipments in a gym.



Such activities include jogging, swimming, walking and games like tennis, hockey cricket etc. All these are ways of keeping the body fit and healthy. They act by exercising the body's muscles and ligaments and aid proper circulation of blood and metabolic processes of the body.

2.5 ECONOMIC IMPACT

The economic influences of a fitness centre in our society today would be innumerable. It has been observed that parks, amusement centres and resorts, usually have a positive economic influence on the commerce of an area. A fitness centre should be a source of influx of money to the community just as is obtained in tourist centres. Management of such programmes and the resources generated from them should constitute the greater part of a country's economy.


Kano
Maiduguri
Potiskum
Kaduna
Zaria
Bauchi
Jos
Minna
Bida
Parakou
Ilorin
Lafia
Makurdi
Wukari
Yola
Garoua
Pankshin
Ogbomosho
Oyo
Iseyin
Oshogbo
Ibadan
Abeokuta
Ondo
Okene
Kabba
Lokoja
Ibi
Sakete
Cotonou
Benin City
Onitsha
Enugu
Awgu
Abakaliki
Owerri
Calabar
Port Harcourt
Aba
Umuahia
Warri
Forcados
Bonny
Kumba
Victoria
Douala
Edea
YAOUNDE
Foumban
Bamenda
Banyo
Ngaoundere
Garoua
Mouths of the R. Niger
BIGHT OF BENIN
GULF OF GUINEA
FERNANDO POO
(TO SPAIN)
NORTHERN REGION
WESTERN REGION
MID-WESTERN REGION
EASTERN REGION
BENUE PLATEAU
ADAMAWA
SARDAUNA
BENUE
BORNU
BAUCHI
NIGERIA
DAHOMEY
CAMEROUN
CENTRE SUD
LITTORAL
Feet
Metres
Longitude East
1 : 5,000,000
Statute

CHAPTER THREE

3.0 CASE STUDIES

3.1 Safaha Health Club Kaduna

a) Client/User/Sponsor

Sani Sami together with his wives as partners are the sole clients and sponsors of Safaha health club which is part of a whole plaza in Kaduna. The users are the general public.

b) Site and Location

The project is sited at No. 17 Sultan Road Kaduna in Kaduna State of Nigeria shown on the map.

c) Scope

gymnasium	$40m^2$.
reception/waiting	$30m^2$.
sauna	$2.4m^2$.
massage room	$6m^2$.
facials	$6m^2$.
WC's and showers	
manicure/pedicure lounge	$12.67m^2$.

d) Design concept

A circular plan with different functions being merged together as segments of the circle with a common core which serves as lounge for both male and female customers. The core leads to the various

functions within the health club. Circular flower cases of concrete in the surrounding garden, compliment the main structure.

e) Structure construction and materials

Lightweight construction with the usual strip foundation and of blockwalls and mortar construction. Roofs are of timber trusses, pitched, with asbestos ceiling boards and zinc roofing sheets. The flower cases are of concrete.

f) Special problem or contribution

To a large extent, landscape architecture has been used which quite enhances recovery and feelings of natural well being. Functions are too well hidden within the structure or rather, the structure does not go to define what happens within, as a result, a newcomer has to ask to have an idea of all that goes on and where to go for whatever purpose he or she has in mind.

g) Design drawings

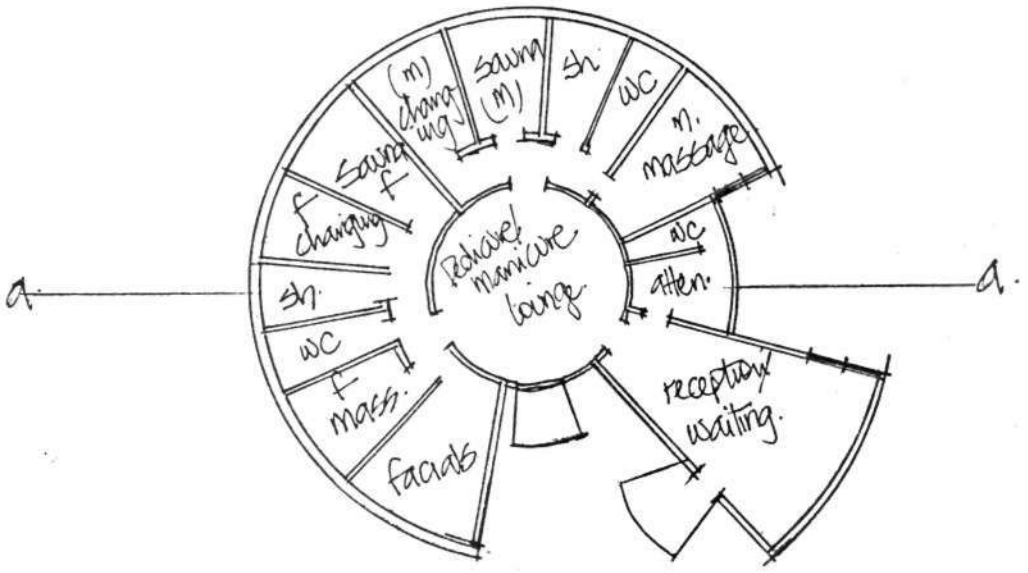
Figure 3.1a shows a plan and section of the health facilities. The preceeding figures are parts or functions within the structure.

h) Design appraisals

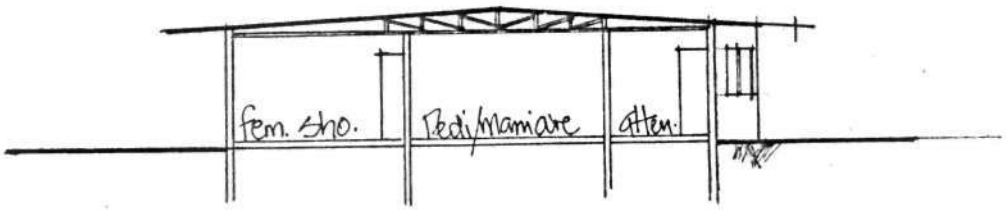
Merits

1. Landscaping has been used to a large extent both on the outside and inside

Fig 3.1.1.



a, plan.



section a-a b,

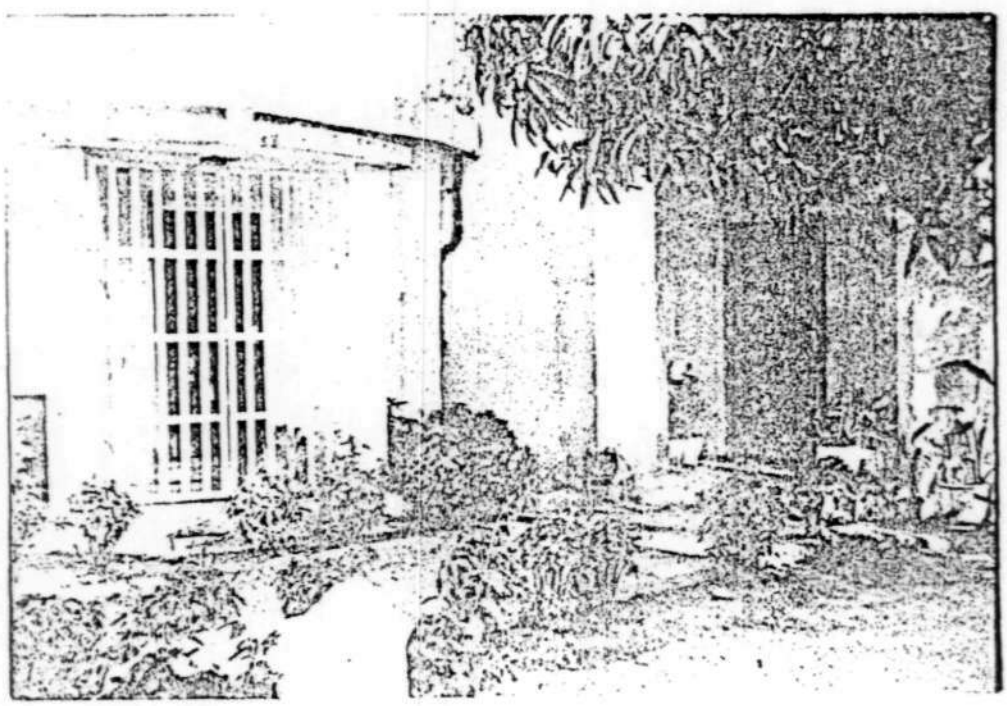
Plan & section of Safata health club.

* plan of health club does not include the gymnasium which was a later addition.

Fig 3·1·2 (a)

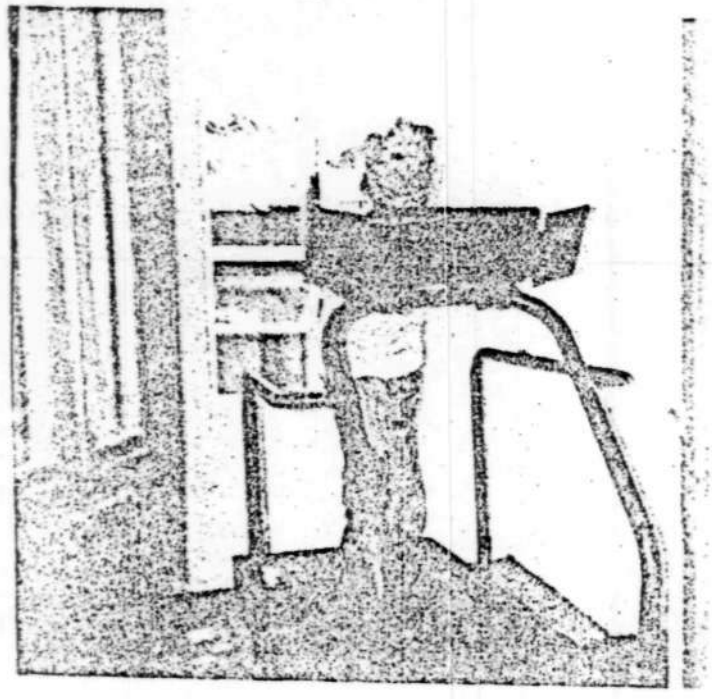


a) approach view of health club



b) entrance

Fig 3.1.3.

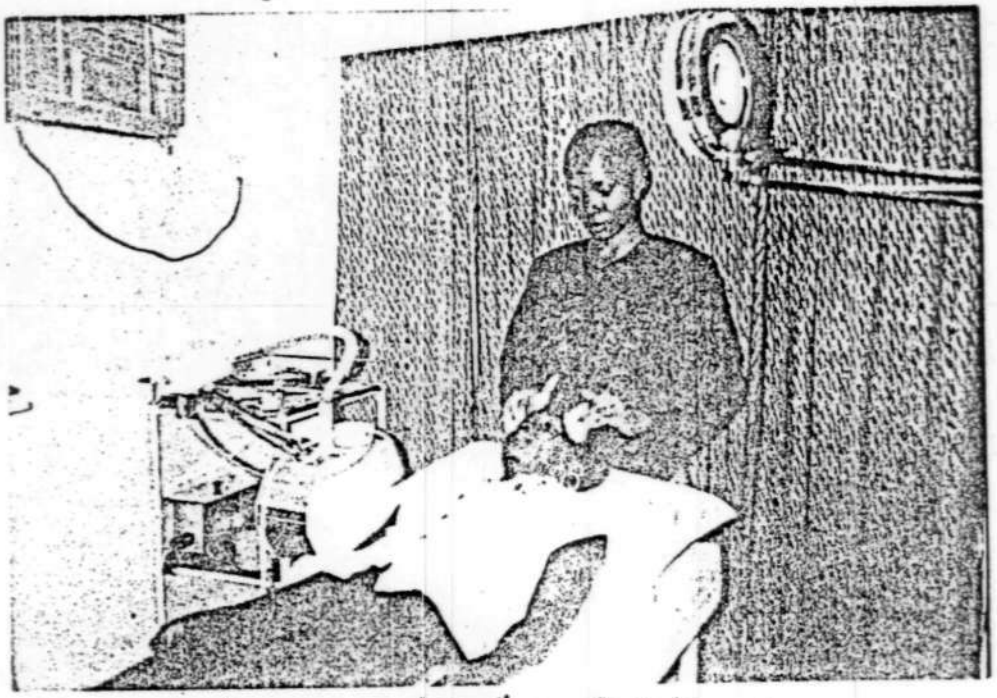


a) Computerized jogging equipment.

b) reception/waiting area.



Fig 3.1.4



a) a customer undergoing facials.

b) exercisers in the gym

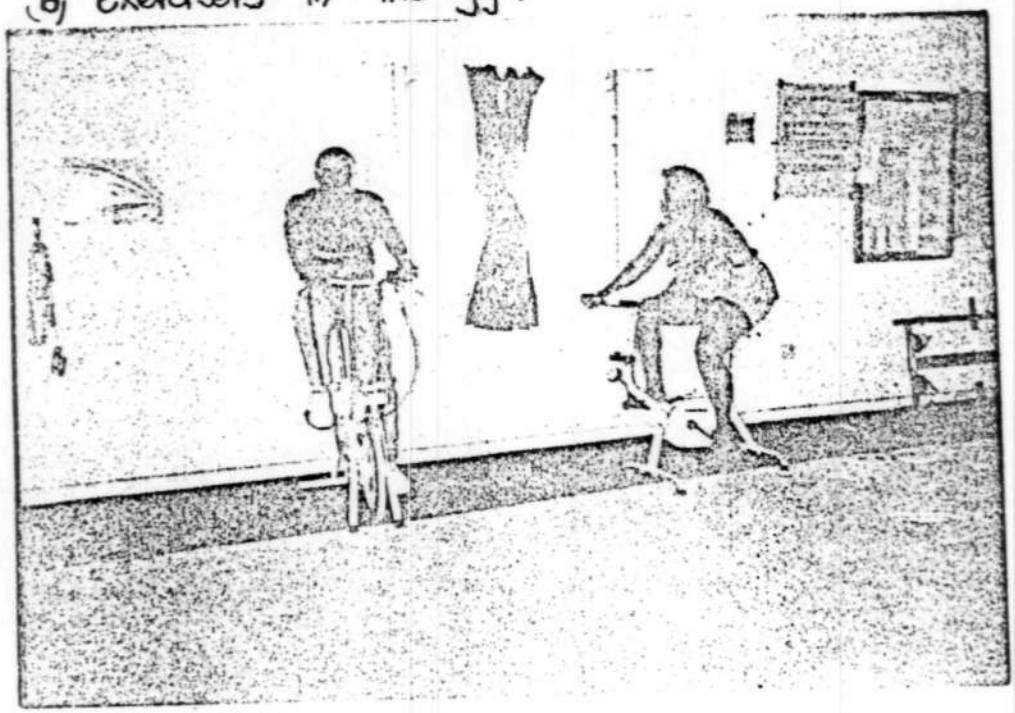
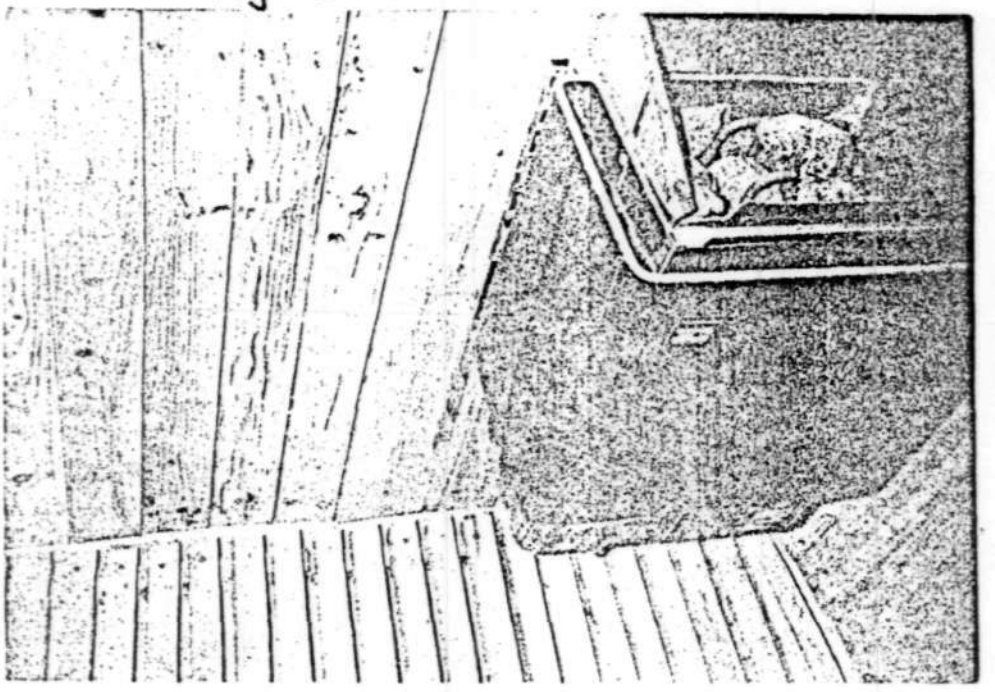
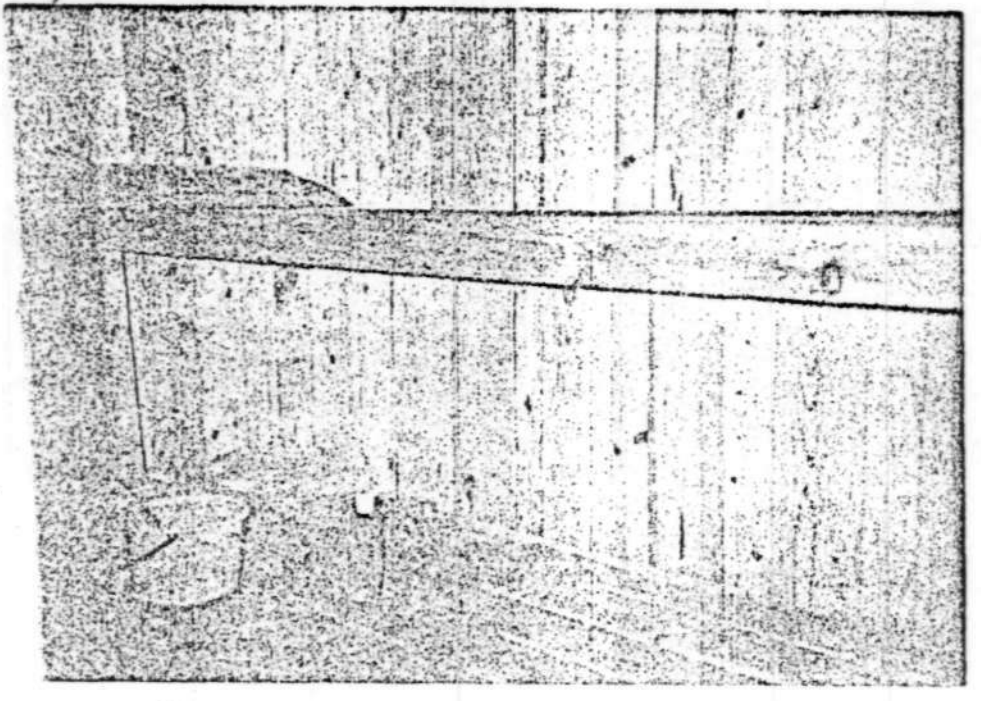


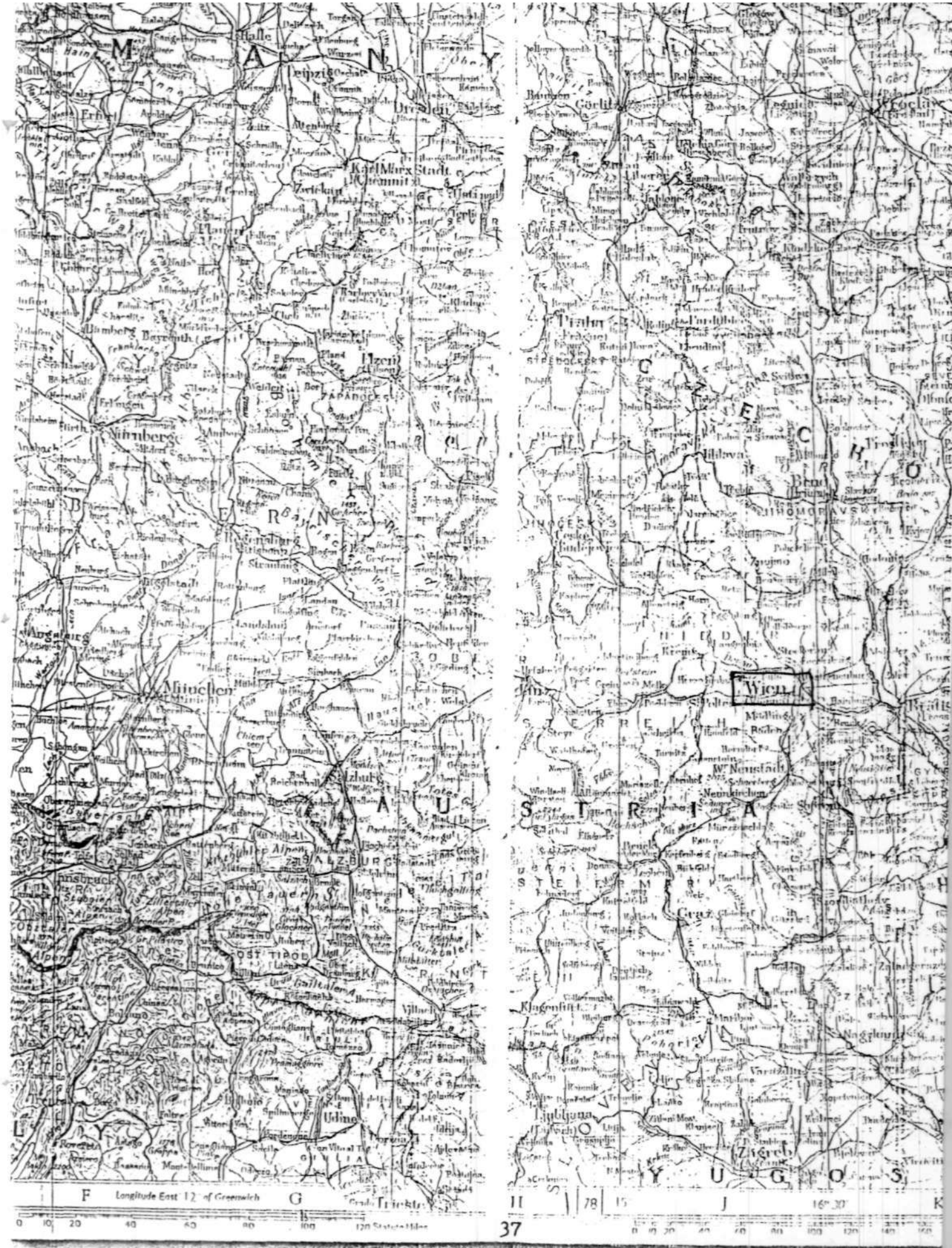
Fig 3.1.5



a, aerial view of sauna stones.

b, sauna beds




Halle
Leipzig
Dresden
Erfurt
Karl Marx Stadt
Chemnitz
Zwickau
Plauen
Görlitz
Wroclaw
Nürnberg
Bayreuth
Regensburg
Straubing
Landshut
Augsburg
München
Salzburg
Innsbruck
Udine
Trieste
Ljubljana
Zagreb
Graz
Klagenfurt
Wien
Wr. Neustadt
Neunkirchen
Brno
Jihlava
Znojmo
Pisek
Budejovice
Jindrichuv
Hradec
Trebon
Tabor
Benesov
Prerov
Olomouc
Zabreh
Ostrava
Opava
Jablonec
Liberec
Zittau
Bautzen
Aussig
Teplice
Jablonec
Tirschenreuth
Weiden
Amberg
Neumarkt
Ingolstadt
Landsberg
Mühldorf
Rosenheim
Kufstein
Zell am See
Villach
Spittal
Lienz
Bruck
Leoben
Judenburg
Knittelfeld
Mürzzuschlag
Wiener Neustadt
Baden
Mödling
Melk
Krems
Horn
Waidhofen
Zwettl
Gmünd
Litomerice
Usti
Decin
Most
Kladno
Rakovnik
Plzen
Cheb
Sokolov
Karlovy Vary
Domazlice
Klatovy
Strakonice
Pisek
Tabor
Kutna Hora
Pardubice
Hradec Kralove
Trutnov
Nachod
Kralupy
Melnik
Mlada Boleslav
Ceska Lipa
Rumburk
Varnsdorf
Zittau
Lubin
Legnica
Jelenia Gora
Walbrzych
Swidnica
Klodzko
Nysa
Opole
Kedzierzyn
Gliwice
Katowice
Bielsko-Biala
Cieszyn
Frydek-Mistek
Karvina
Havirov
Orlova
Ostrava
Opava
Krnov
Bruntal
Jeseník
Sumperk
Zabreh
Olomouc
Prostejov
Prerov
Kromeriz
Uherske Hradiste
Zlin
Vsetin
Valasske Mezirici
Roznov
Frydek
Trebic
Jihlava
Znojmo
Hodonin
Breclav
Mikulov
Lednice
Valtice
Poysdorf
Laa
Hollabrunn
Mistelbach
Gänserndorf
Korneuburg
Tulln
Klosterneuburg
Wien
Schwechat
Bruck an der Leitha
Neusiedl
Eisenstadt
Rust
Sopron
Mattersburg
Oberpullendorf
Oberwart
Güssing
Jennersdorf
Feldbach
Radkersburg
Leibnitz
Deutschlandsberg
Voitsberg
Köflach
Weiz
Fürstenfeld
Hartberg
Birkfeld
Mürzzuschlag
Bruck an der Mur
Leoben
Eisenerz
Liezen
Admont
Rottenmann
Knittelfeld
Judenburg
Murau
Tamsweg
Zell am See
Saalfelden
Hallein
Salzburg
Bad Ischl
Gmunden
Vöcklabruck
Wels
Steyr
Amstetten
Melk
Krems
Horn
Waidhofen
Zwettl
Gmünd
Litomerice
Usti
Decin
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Mikulov
Lednice
Valtice
Poysdorf
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Mistelbach
Gänserndorf
Korneuburg
Tulln
Klosterneuburg
Wien
Schwechat
Bruck an der Leitha
Neusiedl
Eisenstadt
Rust
Sopron
Mattersburg
Oberpullendorf
Oberwart
Güssing
Jennersdorf
Feldbach
Radkersburg
Leibnitz
Deutschlandsberg
Voitsberg
Köflach
Weiz
Fürstenfeld
Hartberg
Birkfeld
Mürzzuschlag
Bruck an der Mur
Leoben
Eisenerz
Liezen
Admont
Rottenmann
Knittelfeld
Judenburg
Murau
Tamsweg
Zell am See
Saalfelden
Hallein
Salzburg
Bad Ischl
Gmunden
Vöcklabruck
Wels
Steyr
Amstetten
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of the garden.

2. This enhances both recreation and naturality in the atmosphere and gives the user a sense of well being.

Demerits

1. The space allocations to the various facilities are rather small and not too many users could be welcome to the facilities at any time.

2. Use is by appointments which is not too convenient for a facility of such purposes that ought to be available at all times and for quite a good number of people who would want to relax or rid themselves of fatigue or stress after a hard day's job.

3.2 AMALIEN BAD WIEN, AUSTRIA

a) Historical Background

Date of project: 1923-1926
Duration : 3 years
Volume : 100,000 cm^3
Capacity : 1,300 spectators

b) Designers: Architects Otto Nagel, Schnalhofer.
Client: Building Authority of Wien.

c) Site and Location: The town of Wien in Austria.

d) Scope

The design scope includes, a reception, draught protected lobbies, halls, cashier cubides, cafetaria, offices, common rooms saunas, massage rooms, cold, warm and whirl pools first aid changing and waiting rooms, galleries,solarium rest rooms, snack bars, saloon, cosmetic, manicure and pedicure rooms, showers and bath basins and the Administrative unit.

e) Design concept

The main rectangular swimming pool is the focal point of this multi-storeyed design with all other functions adjoining to the longer side of it. Galleries on the 1st and 2nd floors surround the pool which is skylighted. Stairs on the 2 shorter sides of the pool lead to the galleries while separate stairs, closed off from the ones mentioned above lead to the other functions which though are an integral part of them have been for some reason unknown separated from the functions below adjoining the pool.

f) Structure construction and materials

The structure, an old but renovated one is of massive construction with mainly bricks for walls, glass, floor and mosaic tiles have been used for interior finishes; wooden battens as well as lighting materials for the ceilings with timber trusses for the roof. Slabs are all of reinforced concrete construction.

g) Special problem or contribution

Functions that should be located close together have been placed either too far apart or on separate floors altogether. This could inconvenience users, e.g. changing rooms (22) being placed so far away from shower rooms, 33 on the second floor and persons intending to use the saloons, pedicure, manicure or cosmetic parlours (30, 31, 32) after sauna and massage (11,12) - which is the usual in health gardens/clubs - having to go all the way to the 3rd floor from the ground floor.

The skylighting in the pool areas are of great assets to the users especially those who believe in heliotherapy as they light up spaces that would have other wise been too dark and also let the sun's rays through, which are a form of healing or medication .....

"The healing effects of sunlight, is one of the oldest schools of medicine. The assyriaus and Egyptians set their sick in the sand under the sun; the greek athletes sunbathed to improve their performances at the olympics; Hippocrates prescribed it and today, many private pools have a sun patio or solanum couch to soak it in".

Culled from Design and Planning of Swimming Pools by John Dawes.

In Design Drawings.

Figures 3.2.1, 3.2.2 and 3.2.3 illustrate views, plans sections and interior perspectives of the health house.

Figure 3.2.3 shows a list of the functions which have been translated as follows:

1. Draught lobby
2. Hall
3. Reception
4. Cashier
5. Cafetaria
6. Office
7. Secretary
8. Common Room
9. Sauna (ladies)
10. Sauna (gents)
11. Massage
12. Sauna
13. Whirl pool
14. Cold pool
15. Cold air room
16. Warm pool
17. Open air courtyard
18. Main pool
19. Prep.
20. Rescue/first aid room
21. Electricity
22. Changing
23. Waiting room
24. Solarium
25. Rest room
26. Snacks, Drinks
27. Gallery
28. Administration
29. Bath Basins
30. Cosmetics
31. Saloon
32. Manicure/Pedicure
33. Shower room

Other functions featured on figure 3.2.2(a) the 6th, 7th, 8th and 9th floors respectively are class-

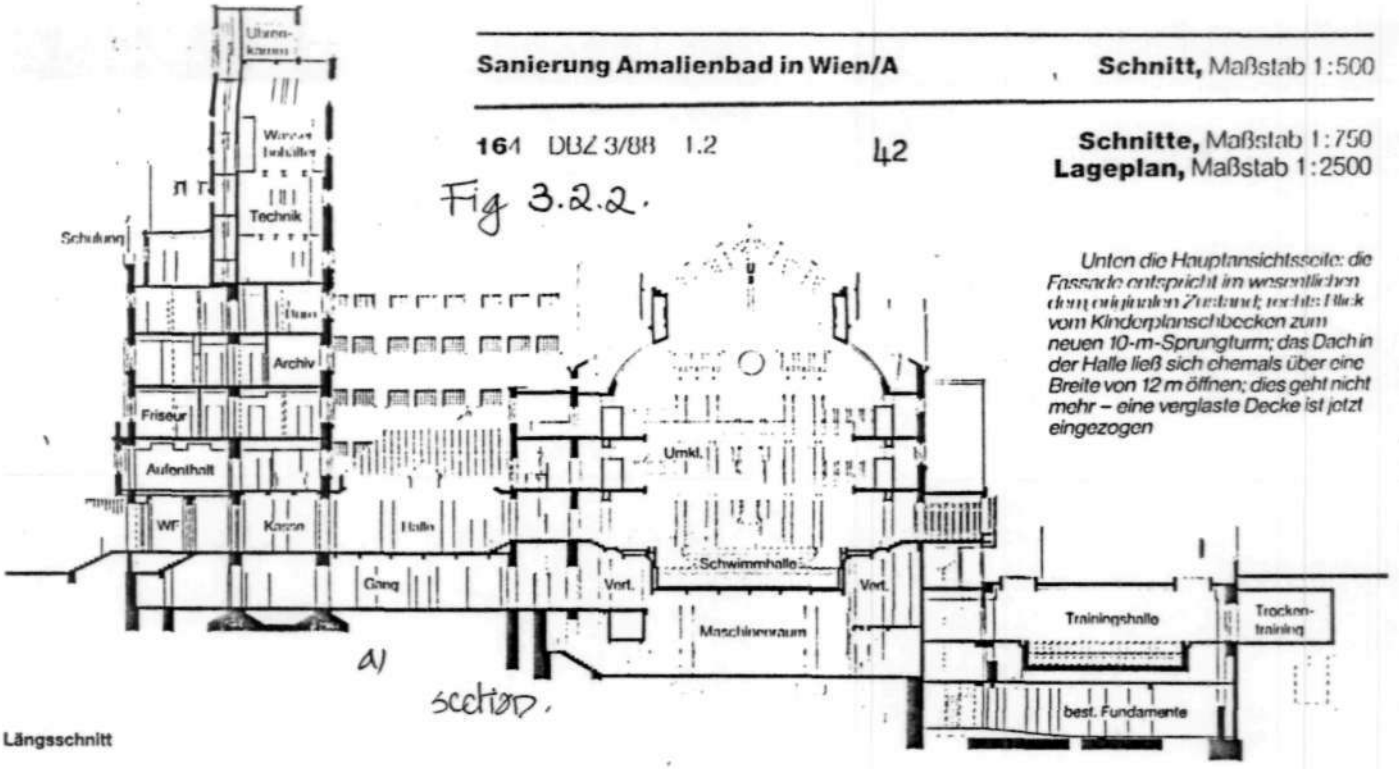
Sanierung Amalienbad in Wien/A , **Schnitt,** Maßstab 1:500

161 DBZ 3/88 1.2 42

Schnitte, Maßstab 1:750
Lageplan, Maßstab 1:2500

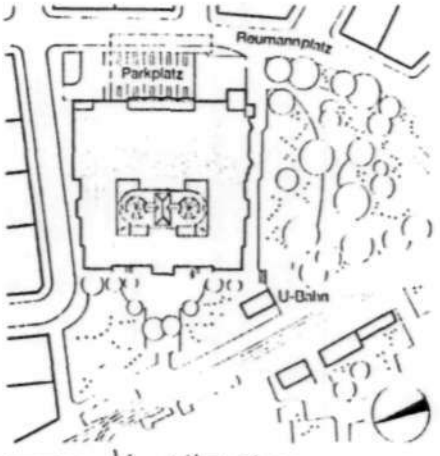
Fig 3.2.2.

Unten die Hauptansichtsseite: die Fassade entspricht im wesentlichen dem originalen Zustand; rechts: Blick vom Kinderplanschbecken zum neuen 10-m-Sprungturm; das Dach in der Halle ließ sich ehemals über eine Breite von 12 m öffnen; dies geht nicht mehr – eine verglaste Decke ist jetzt eingezogen

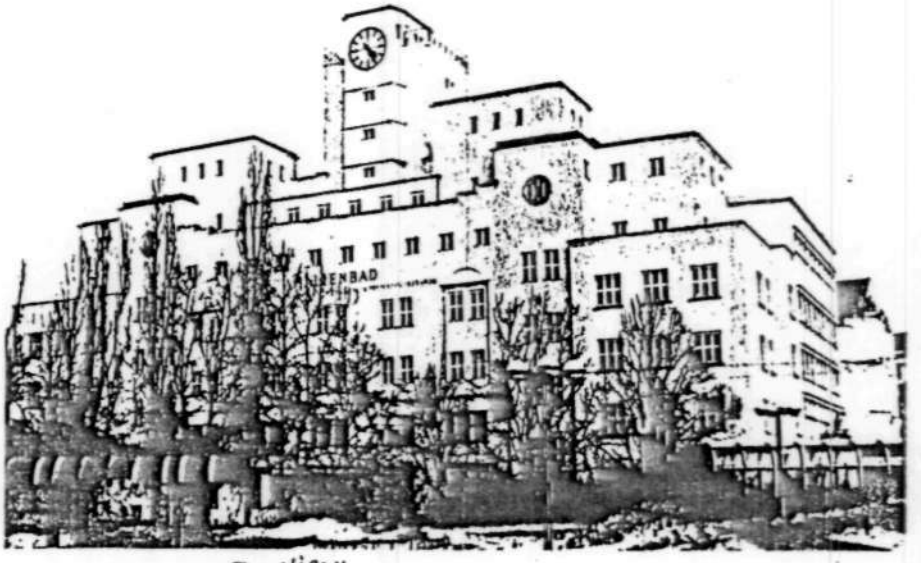


a) section.

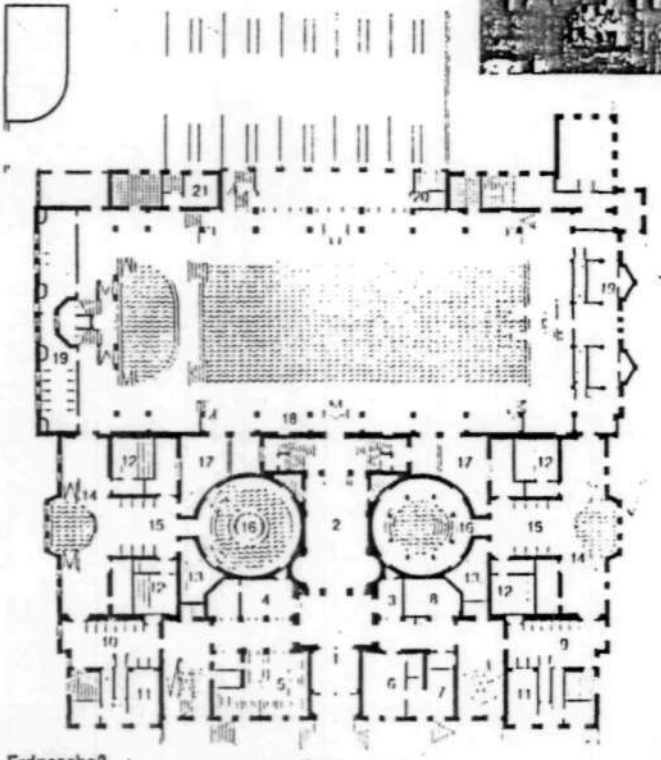
Längsschnitt



Lageplan b) site plan.



c) view.



Erdgeschoß d) ground floor plan.



1. Obergeschoß e) 1st floor plan.

Fig 3.2.3a

43

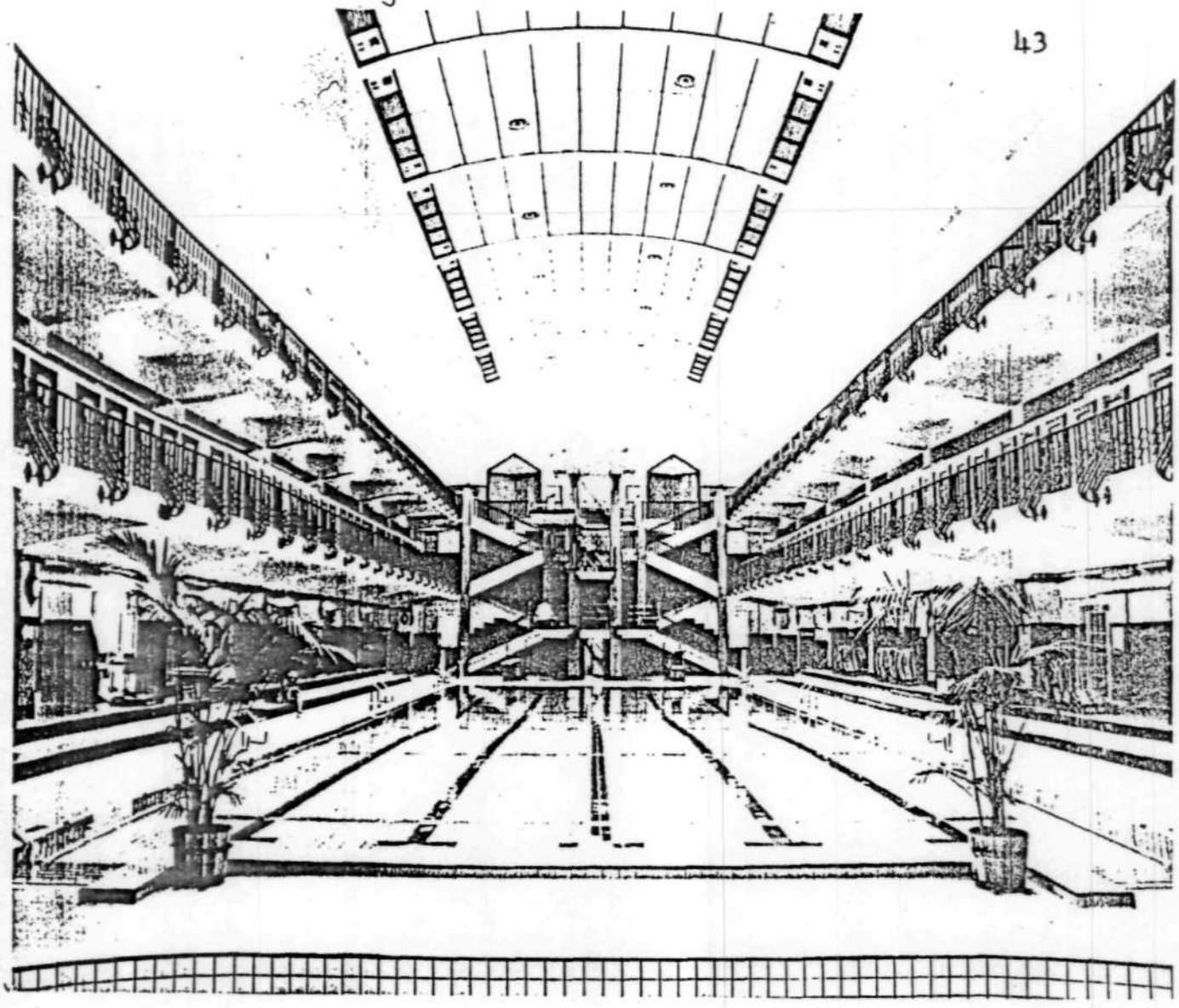
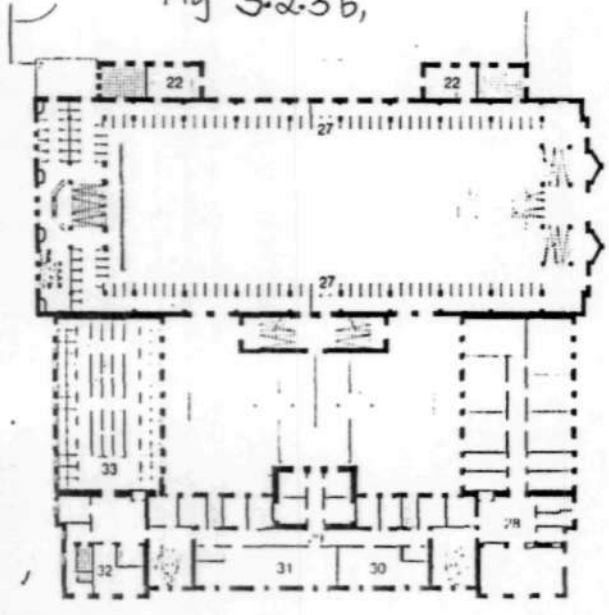


Fig 3.2.3b,



2. Obergeschoß

Grundrisse

1 Windfang
2 Halle
3 Pförtner
4 Kasse
5 Cafeteria
6 Büro
7 Lüftung
8 Personal
9 Sauna Damen
10 Sauna Herren
11 Massage
12 Sauna
13 Whirlpool
14 Kaltbecken
15 Abkühlraum
16 Warmbecken
17 Freiluthof
18 Schwimmhalle
19 Vorbereitung
20 Bademeister
21 Duschen
22 Umkleide
23 Waschraum
24 Toiletten
25 Putzraum
26 Buffet
27 Galerie
28 Verwaltung
29 Wannendesinfektion
30 Keramik
31 Trocken
32 Hand- u. Fußpflege
33 Duschraum

Das Gebäude stellt sich äußerlich als eine monumental wirkende kubische Masse dar. Dekorative Elemente und feine Profilierungen sind durchweg vermieden. Den einzigen Schmuck der Hauptfassade bilden sechs überlebensgroße, zwischen segmentförmigen Erkern gestellte Figuren. Die Architektur des Amalienbades steht in Kontext mit allen Bauten, insbesondere auch den Wohnbauten des roten Wien im dritten Jahrzehnt des 20. Jahrhunderts. In vielen Details tritt der Jugendstil hervor, in härteren Formen mehr »Art-Deco«, das in den zwanziger Jahren zu kommen begann.

Kriegsschäden des Zweiten Weltkrieges und mangelnde Mittel brachten das Amalienbad ziemlich herunter. Die in den Jahren 1980–1986 vorgenommenen Maßnahmen basierten darauf, original Erhaltenes zu bewahren bzw. zu restaurieren und Zerstörtes (aber nicht mehr vorhandenes) neu zu gestalten. Die Veränderungen umfaßten im wesentlichen: An der Stelle des alten Kesselhauses ist unter Straßenniveau eine zweite

Fig 3.2.1a

Schwimmhalle als Trainingshalle eingerichtet, mit eigenen Umkleiden, Duschen usw., und damit auch autark zu betreiben. Der Abbruch des alten Kesselhauses ermöglichte darüber hinaus, die große Schwimmhalle dorthin zu erweitern – diesen Raum natürlich zu belichten, mit Ruheplätzen und Solarien auszustatten. Das Mehrzweckbecken blieb im Grundriß unverändert, der Wasserspiegel ist aber bis auf die Höhe des Umganges angehoben, so daß die Wassertiefe für einen neuen 10-m-Turm erreicht wurde. Die Geländer der Galeriebrüstungen und die originalen Eichentüren der Umkleidekabinen sind erhalten worden, die Verfliesung aber ganz erneuert.

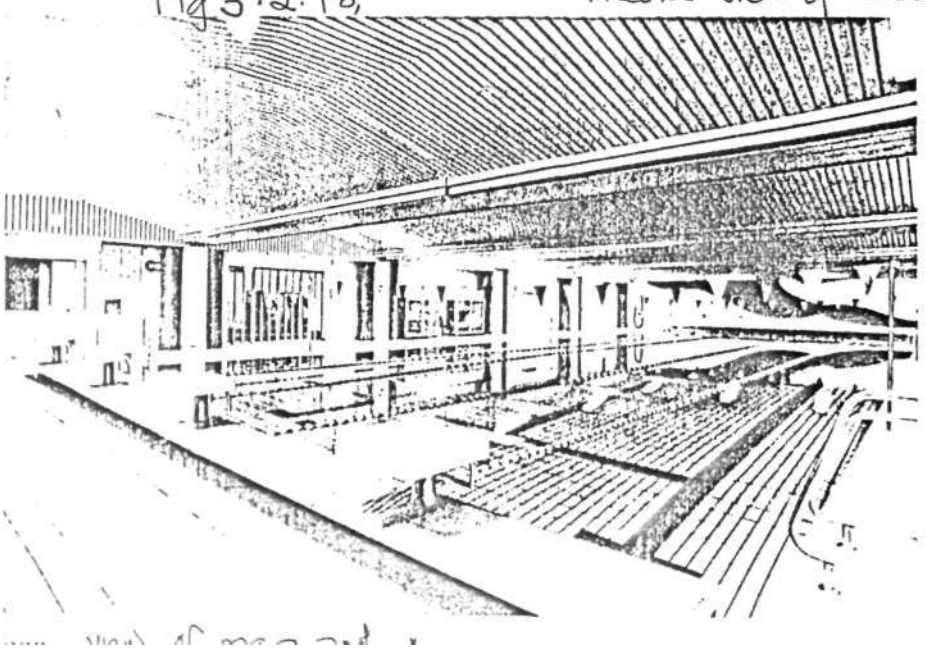
Ursprünglich konnte das große Glasdach über der Schwimmhalle über eine Breite von 12 m geöffnet werden. Auf dieses gut gemeinte Detail wurde mit der Zeit verzichtet. Um bessere thermische Verhältnisse zu schaffen, wurde eine verglaste Decke eingezogen und mit Lüftungselementen versehen. Modifiziert konnte diese Decke beibehalten werden. Überlegt wurden auch Maßnahmen zur Verkürzung des Nachhalls in der großen Halle, wobei aber sowohl aus gestalterischen wie finanziellen Gründen der Urzustand beibehalten wurde. Die ehemaligen, zerstörten Dampf- und Heißluftabteilungen sind neugestaltet, Saunakammern eingerichtet und Liegeplätze geschaffen worden. Die Warmbecken wurden restauriert und die Glasdächer nach neuem Entwurf eingebaut.



Rechts der Warmbaderaum der Damensauna – hier erfolgte eine komplette Restaurierung; nicht mehr vorhanden waren (zum Teil) die Säulenverkleidungen und das Glasdach (Bleiverglasung mit bunten Gläsern), das aufgrund von Fotografien rekonstruiert ist; unten die neue unterirdische Trainingshalle

Interior view of whirl pool

Fig 3.2.1b,

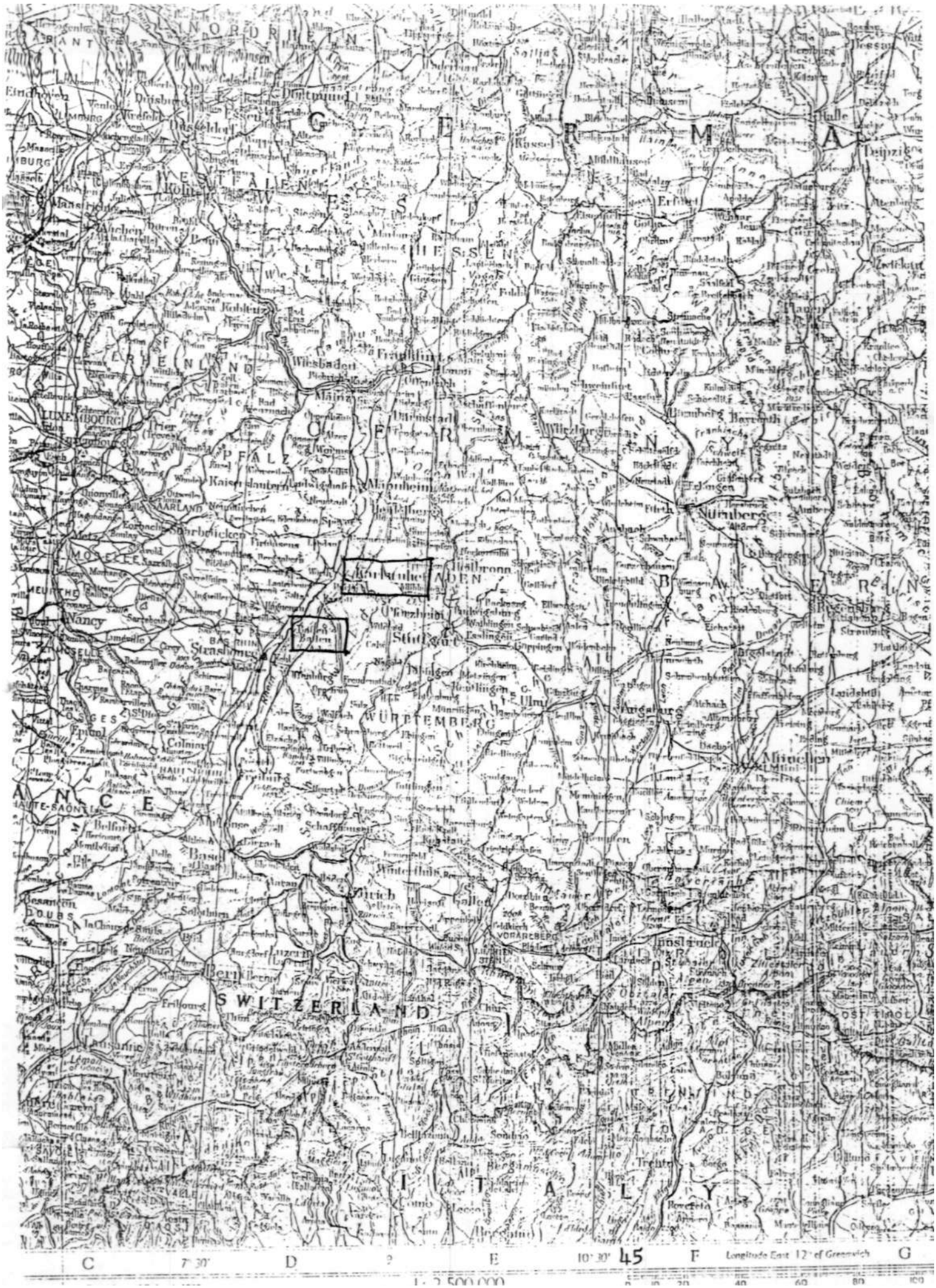


Neben dem restaurierten Mitteleingang – die Außentreppen und ein Vordach sind in Anlehnung an das originale wiederhergestellt – gibt es jetzt zwei Seiteneingänge – einen hiervon behindertengerecht.

Ebenso wie auch innerhalb des Gebäudes sind alle Barrieren beseitigt worden und damit alle Abteilungen von Rollstuhlfahrern zu nutzen. Als restaurierter Teil ist auch die Eingangshalle zu bezeichnen, die noch das originale Kleinmosaik an Fußböden und Wänden aufwies.

Lediglich die Glasdecke fehlte, die aber nach alten Fotografien zu rekonstruieren war.

Die Renovierung des Amalienbades, die mit der Fassadeninstandsetzung abgeschlossen wurde, umfaßte natürlich nicht nur gestalterische und funktionelle Fakten, sondern auch technische wie die Lüftung, die Beheizung, die Wasseraufbereitung und die Beckenhydraulik.


NORDRHEIN
WESTFALEN
HESSEN
RHEINLAND
PFALZ
SAARLAND
LUXEMBOURG
BADEN
WÜRTTEMBERG
SWITZERLAND
VORARLBERG
Dortmund
Wiesbaden
Mainz
Koblenz
Mannheim
Saarbrücken
Nancy
Strasbourg
Stuttgart
Ulm
Augsburg
Nürnberg
Bayreuth
Basel
Zürich
Bern
Innsbruck
Trento
Mittelen
C
D
E
F
G
45
Longitude East 12° of Greenwich

i) Design Appraisal

1. Merits

Landscaping has been utilized to some extent.

2. Courtyards within the structure give a natural feel to the atmosphere and aids relaxation.

1. Demerits

Improper co-ordination of functions and spaces.

3.3 Caracalla - thermae Baden-Baden

a) Historical Background

Date of project: An ancient 3rd century A.D. health complex which has been restored.

Useable floor area: 33 acres.

b) Designers: Architects H.D. Hecker and P.Kratz. Landscape Architect: Prof. H. Luz. Dome design: Fine Artist Martin Erhardt.

Site and Location

Baden Baden. A rehabilitation town in Germany.

d) Scope

This design includes a restaurant, kitchen, rehabilitation home, fountain balconies, changing rooms, showers, rest rooms, cold and hot water areas, warm, whirl, swimming and therapy pools, bathhalls out door and indoor pools, and seating for 1,600. The

main bath which was 1100ft x 1100ft catered for 2000 bathers.

e) Design concept

An old restored health or Bathhouse with a new extension. All the pools are located close together with the rest rooms close to them. Here the restaurant or eating area is central to other functions, like bath areas, changing rooms, drinking fountains and a large landscaped open space with little or no level changes, to facilitate unaided movement of the users who are mainly rehabilitation patients.

f) Structure construction and materials

The old structure bears a resemblance to ancient thermal baths of Rome with colonnaded spaces which were domed and glass in some areas but mostly left with no walls, hence merging outdoor activities with indoor ones to a certain unidentifiable extent. On looking at the view on Fig. 3.3.2a, one hardly can differentiate where indoor activities terminate and outdoor ones commence.

The colonnades or columns are of reinforced concrete, the dome of timber, while glass was used extensively on the new extension pointed out on figure 3.3.1a.

g) Special Problem or Contribution

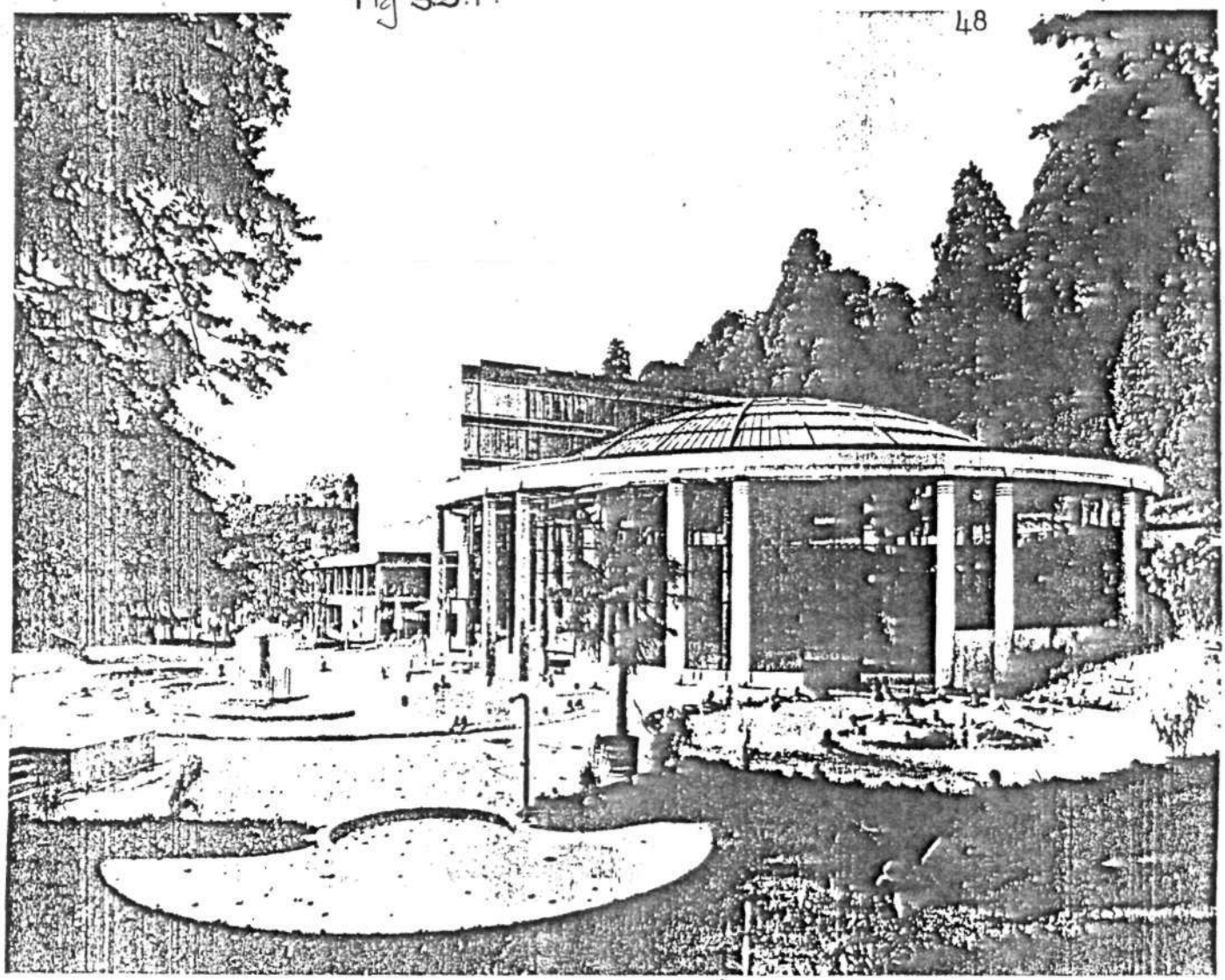
Facilities such as the 2 outdoor pools and the

159 DBZ 11/86 1.2

Grundriß, Schnitt, Maßstab 1:750

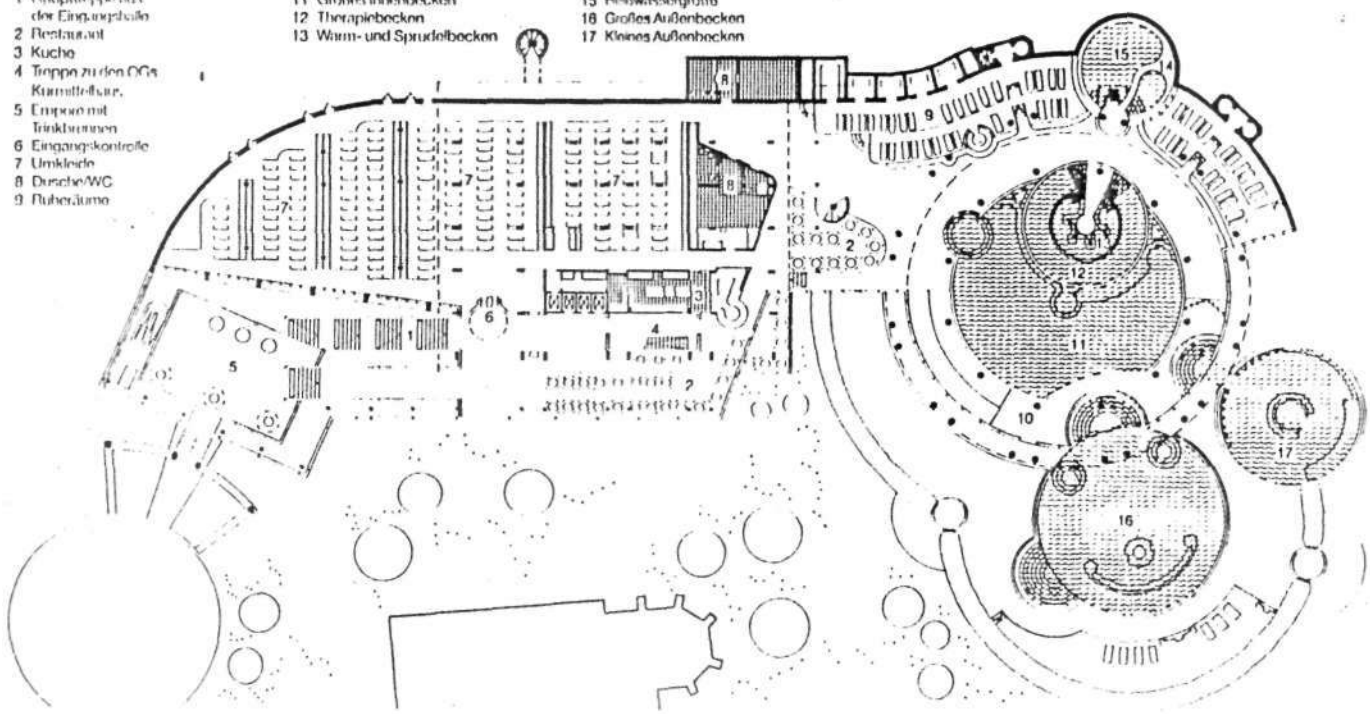
Fig 33.1.

48



Erdgeschoß/1. Obergeschoß

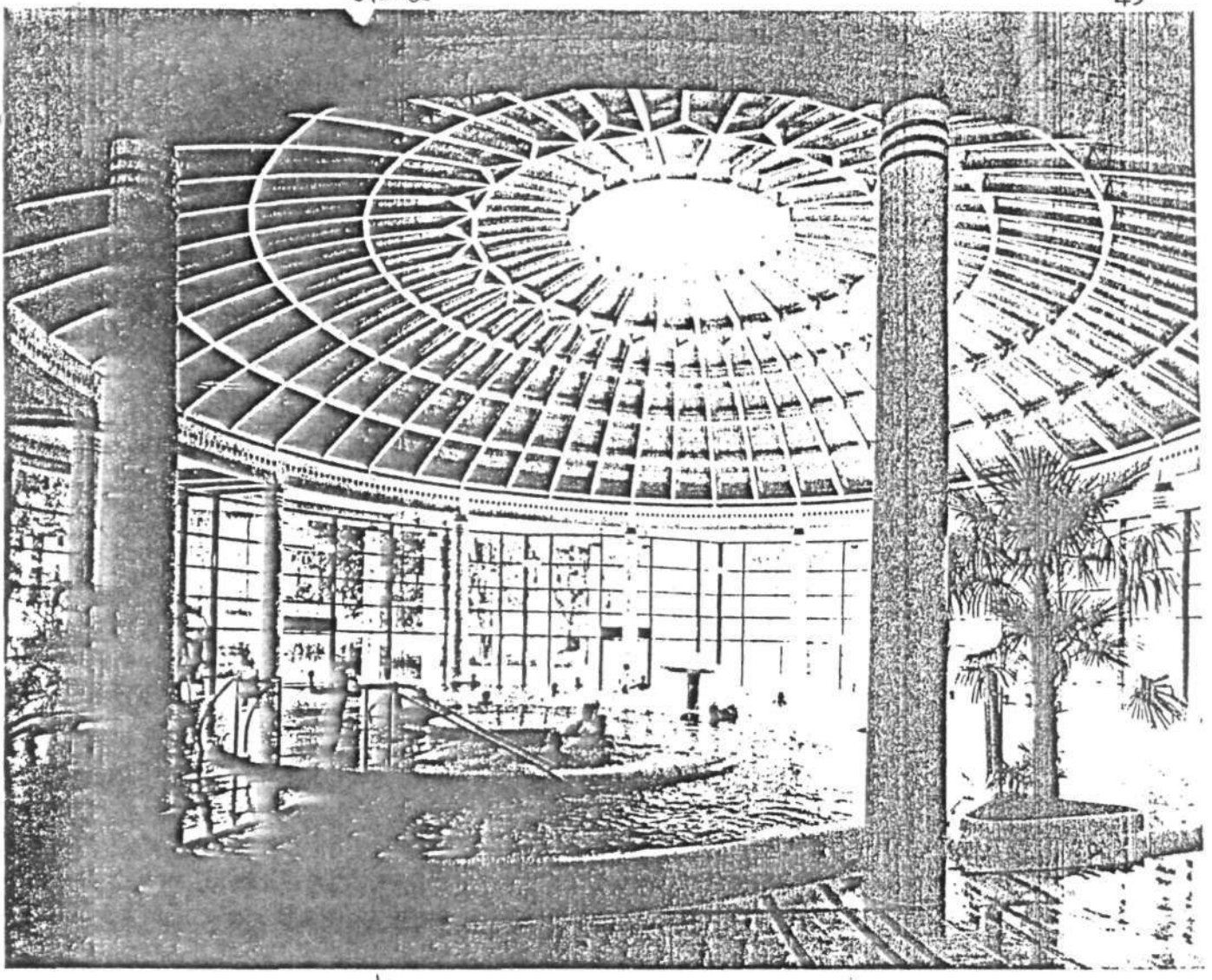
1 Haupttreppe zur der Eingangshalle
2 Restaurant
3 Küche
4 Treppe zu den OGs Kammerfläche
5 Empore mit Trinkbrunnen
6 Eingangskontrolle
7 Umkleide
8 Dusche/WC
9 Ruheräume
10 Thermenhalle
11 Großes Innenbecken
12 Therapiebecken
13 Warm- und Sprudelbecken
14 Kaltwassergrotte
15 Heißwassergrotte
16 Großes Außenbecken
17 Kleines Außenbecken



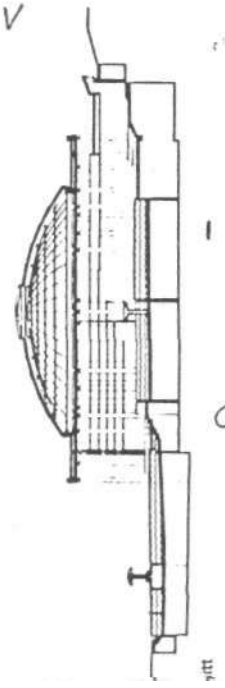
159 11/86 1.3

3.3.2

49



b.



c, section.

Das Foto auf der linken Seite zeigt die Thermenhalle mit den beiden Außenbecken; oben die Halle mit drei in der Höhe gestaffelten kreisförmigen Innenbecken; über der weißen Stahlkonstruktion aus Rechteckrohren liegt eine Schallschluckdecke aus farbig emaillierten Stahllochblechen (Farbgestaltung: Prof. Hans Martin Erhardt, Karlsruhe)

Das Kurmittelhaus in seiner von vornherein schon beengten Situation am Südhang des Schloßgartens zwischen Klosterschule und Altkatholischer Kirche konnte nur nach Osten in Richtung auf das nahe Rheumakrankenhaus erweitert werden. Die Situation wurde noch insofern komplizierter, als der Eingangsbereich des Kurmittelhauses, der nun auch Zugang zur neuen Therme werden sollte, durch eine Tiefgaragenabfahrt entwertet war. Es bestand deshalb die Gefahr, daß die neue Therme zu einem bloßen Anbau an der Rückseite des Kurmittelhauses werden würde – dies um so mehr, als das Augustabad mit seiner starken Höhenentwicklung

Ziele

Die Antwort auf die Situation ist ein Entwurf, der an die Tradition der Baden-Badener Kur- und Bäderbauten anknüpft, indem er die alte Form eines von Säulen getragenen Rundbaus mit zeitgemäßen architektonischen und konstruktiven Mitteln neu interpretiert. Ein Entwurf, der mit der formalen Durchbildung im Detail im Sinne einer Erinnerung an historische Vorbilder den besonderen Charakter einer Therme in Baden-Baden betont. Und ein Entwurf schließlich, der trotz aller Einengungen und Zwänge eines äußerst schwierigen Standortes mit Eigenständigkeit und mit besonderem Anspruch bezüglich Form und Material der Bedeutung der Bauaufgabe gerecht zu werden versucht.

Konzept

Neben den Würfel des Kurmittelhauses ist ein Kreis an Säulen gestellt, die eine Kuppel tragen. Der Kuppelbau ist vom Augustabad gelöst und in das Rotenbachtal vorge-

hot and cold water places cannot be used in areas with harsh weather conditions and even the dome covered pool cannot be used under such conditions as driving rains which is the case in some parts of Nigeria.

Very slight changes in level facilitate 'no hitch' movements especially for disabled users.

h) Design Drawings

Plan, section and views are illustrated on figs. 3.3.1 and 3.3.2.

The list of functional spaces on Fig. 3.3.1 are translated below:

1. Main stair case from hall
2. Restaurant
3. Kitchen
4. Stairs to upper floors
5. Rehabilitation home
6. Fountain/drinking balcony
7. Entrance/control desk
8. Changing room
9. Shower/WC
10. Rest rooms
11. Bath halls
12. Big internal pool
13. Therapy pool
14. Warm and whirl pool
15. Cold water area.

16. Hot water area
17. Big outdoor pool
18. Small outdoor pool

1) Design Appraisals

Merit

An open and friendly atmosphere has been created here by the Architectural integration of space with outdoor environments and the effective use of landscape.

Demerit

Provision has not been made for use of some facilities such as the pools during unfavourable weather conditions.

3.4 FACHERBAD KARLSRUHE GERMANY

a) Historical background

i) Date of construction: April 1980
ii) Date of completion : April 1982
iii) Cost of project : 13.8m D.M.
iv) Total Expenses : 18.9m D.M.
v) Useable floor area : 5681.76m^2
vi) Volume : 36,000m^3

b) Designers: Architects Schmitt, Kasimir and Blanke.

c) Site and Location

Karlsruhe Germany.

d) Scope

The design scope constitutes a springing pool, amongst other pools, sauna, changing rooms, cafetaria entrance hall and showers with a large gymnasium.

e) Design concept

A simple one level building with tunnels linking almost all the pools. Outdoor pools can be warmed when the weather is too cold for use as an alternative to swimming indoors. Main pool is olympic sized with spectator seats overlooking it and sharing a common wall with changing rooms as can be seen in Fig. 3.4.3.

f) Structure, Construction Materials

Roofs are of corrugated fibre cement with thermal insulation and Aluminum foils to insulate against humidity. The end plates of the Aluminum foil are joined together by special Aluminum plates that run the length of the foil to avoid leakages.

Walls are also of fibre cement cladded externally with Aluminum and thermal insulation as well. Internal cladding is of ventilated timber boards. Floors of the building are of wooden boards with tiles on the floors and walls of the pools. Ceilings are of timber boards and battens. Steel railings enable safe movement in wet areas.

g) Special Problems and Contributions

The design portrays efficient use of local and

Fächerbad in Karlsruhe

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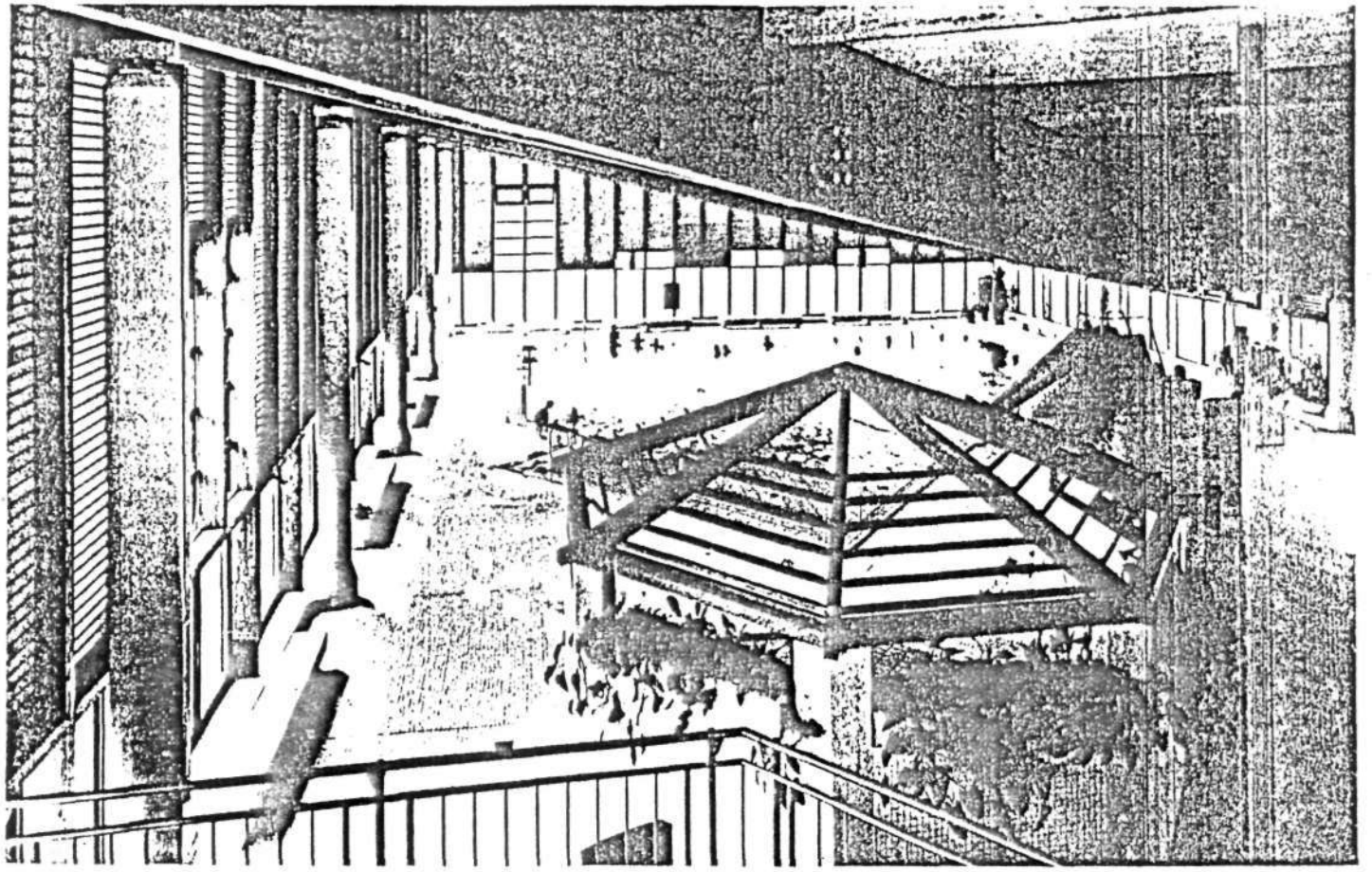


Fig. 3.4.1a

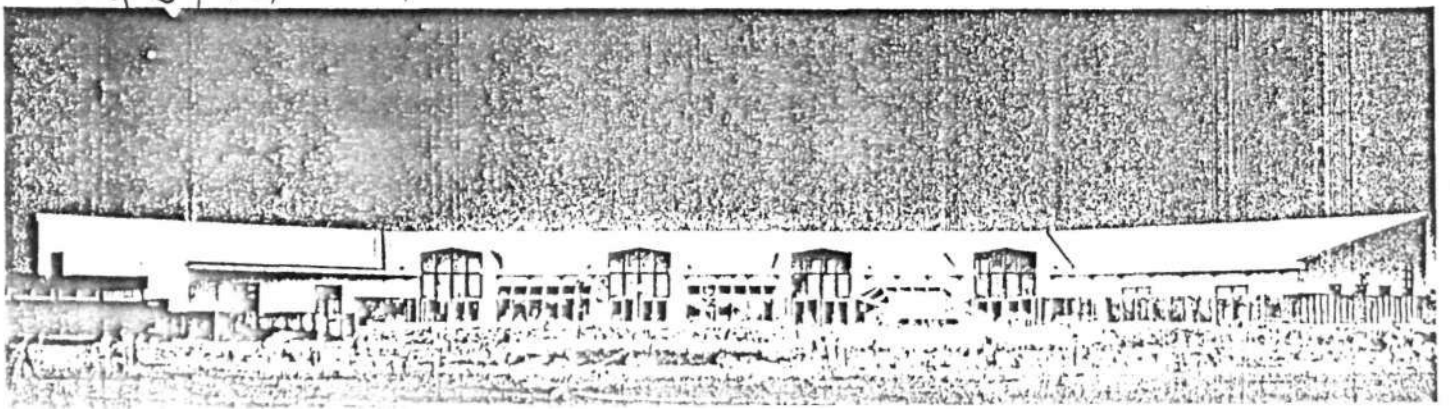
Blick in den östlichen Hallenteil, der ein kleines Becken für Nichtschwimmer mit Rutsche aufnimmt, unten Gesamtansicht der Südseite mit Liegewiese; die Gliederung der relativ großen Baumasse sowie die farbliche Gestaltung trägt dazu bei, daß das Gebäude von außen wesentlich kleiner wirkt als der große innere Zusammenhang erwarten läßt

Projektverfasser: Herbert Schmitt, Georg Kasimir, Rolf Blanke, freie Architekten BDA, Karlsruhe
Mitarbeiter: Reinhold Bauer, Andreas Eiermann, Susanne Neer, Heinz Schenker
Örtl. Bauleitung: Detlef Dix
Bauherr: Sportpark Karlsruhe-Nordost
Standort: Am Traugott-Bender-Sportpark, 7500 Karlsruhe 1

Situation

Aufgrund eines Architektenwettbewerbes für die Erarbeitung von Bebauungsvorschlägen für das ca. 2,3 ha große Gelände und den Neubau eines Hallenfreibades erhielten die Projektverfasser den Auftrag zur Realisierung des Hallenfreibades. Der Bebauungsplan ist so konzipiert, daß eine abschnittsweise Realisierung in beliebiger Reihenfolge möglich ist. Das Erschließungssystem knüpft an vorhandene Straßen und Wege an. Eine schwere »Hypothek« auf das schöne Grundstück stellt der nichtüberbaubare »Hagelgelder Sammler« dar, der das Grundstück in zwei Teile gliedert.

Fig. 3.4.1b



Erdgeschoß

1406

Floor plan.

Querschnitte

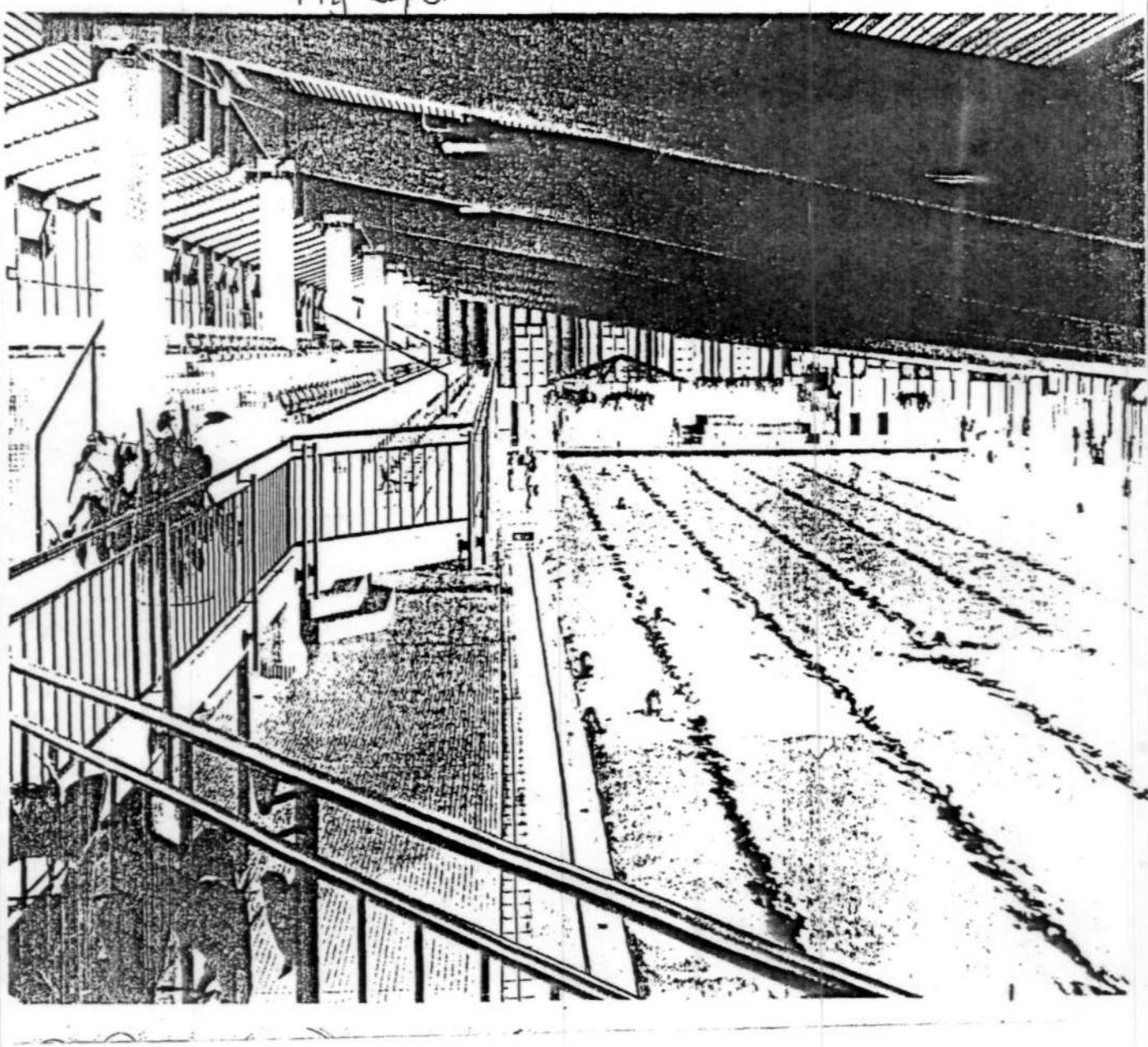
Sections.

Fig. 3.4.2 a

Fächerbad in Karlsruhe

164 DBZ 11/86 2.2 **Grundriß, Schnitt,** Maßstab 1:1000

Fig 343.



natural materials. This is illustrated by the exclusive use of both fibre cement and wood all over the structural elements, i.e. roof walls and floors.

The scope is rather minimal for a health club.

h) Design Drawings

Illustrated on figures 3.4.1, 3.4.2 and 3.4.3 are plan, sections, elevations and views.

The following words are translated as follows:

Omkleide - changing rooms.
Eingangshall. - entrance hall.
Becken - Pool
Sprung becken - Springing pool
Gymnastikhalle- Gymnasium.

i) Design Appraisal

The design is quite a simple one with minimal facilities. Use of local materials mean it can be situated anywhere at all especially with all the weather precautions that have been taken i.e. Aluminum insulation against humidity, thermal insulation and external as well as internal claddings.

3.5 Dietary and Health Clinic Kaduna

a) Historical background

The clinic building was formerly residential before converted and hence retains most of its former functions as little was done to change it. It is

privately owned and used by the public. It is located on Dawaki road in Kaduna, Kaduna State of Nigeria.

b) Scope

Waiting lounge
Reception
Office
Gymnasium
Aerobics room
Massage room
Rest room
W.C./shower
Changing room
Aeromatherapy
Whirlpool
Physiotherapist's Office

c) Design Concept

As was afore-mentioned, the design was intended for residential purposes so possesses no real concept for a health club.

d) Special Problem or Contribution

The whole layout has circulation problems as it was initially meant to be a home. The new function poses both circulation and functional problems as the spaces are not properly co-ordinated.

e) Structure, Construction and Materials

Modern, residential type construction with

corrugated zinc roofing sheets, timber purlins, rafters and noggins and celoters ceiling boards. Walls are of concrete blocks and floors tiled on cement sand screed. Mortar and paint are used in funishing both external and internal walls.

The courtyard is screened by use of perforated bricks.

f) Design Drawings

Sketches of the building are shown on Fig. 3.5. These show the different functions and some of the materials used.

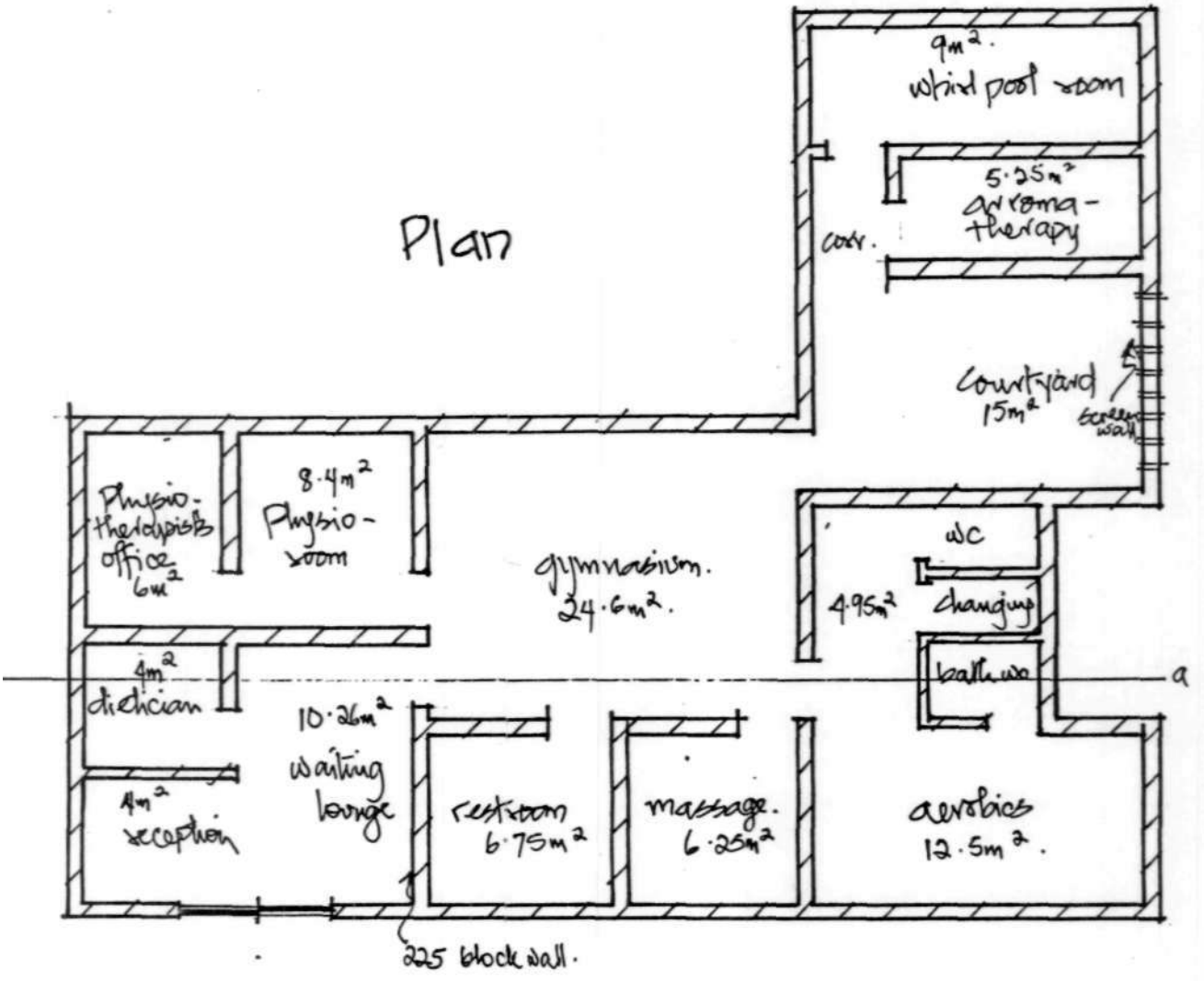
g) Appraisal

Demerits

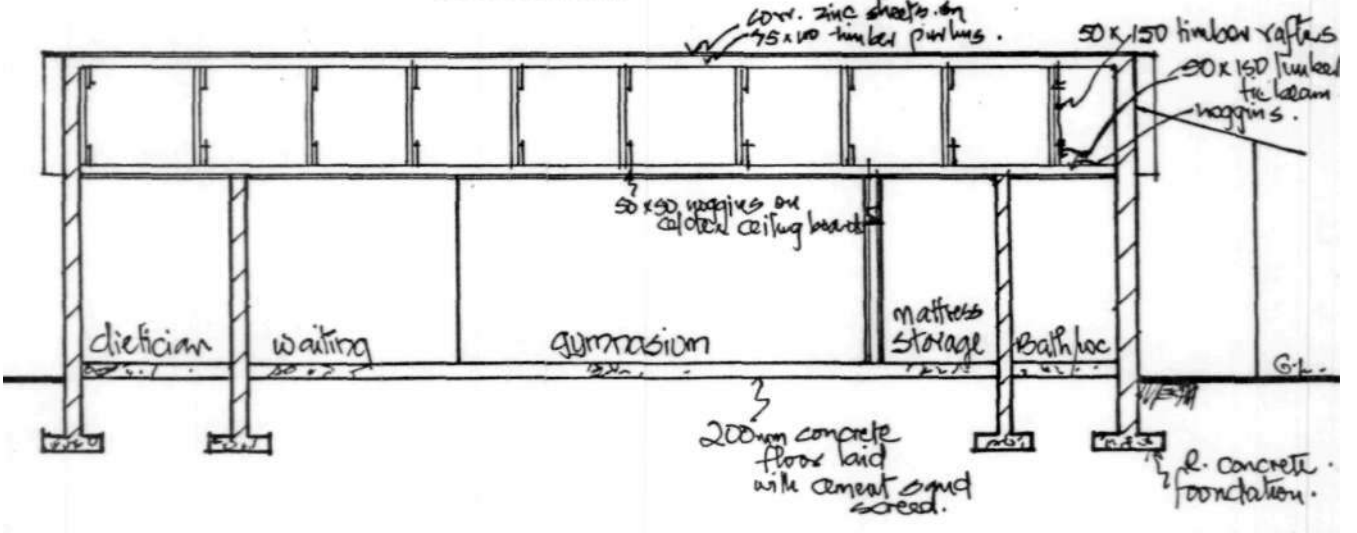
1. Lack of proper coordination of functions
2. Space areas are not quite adequate e.g. changing rooms, circulation areas.
3. Functions not adequate enough for a health club.

fig 3.5.

Plan



section.



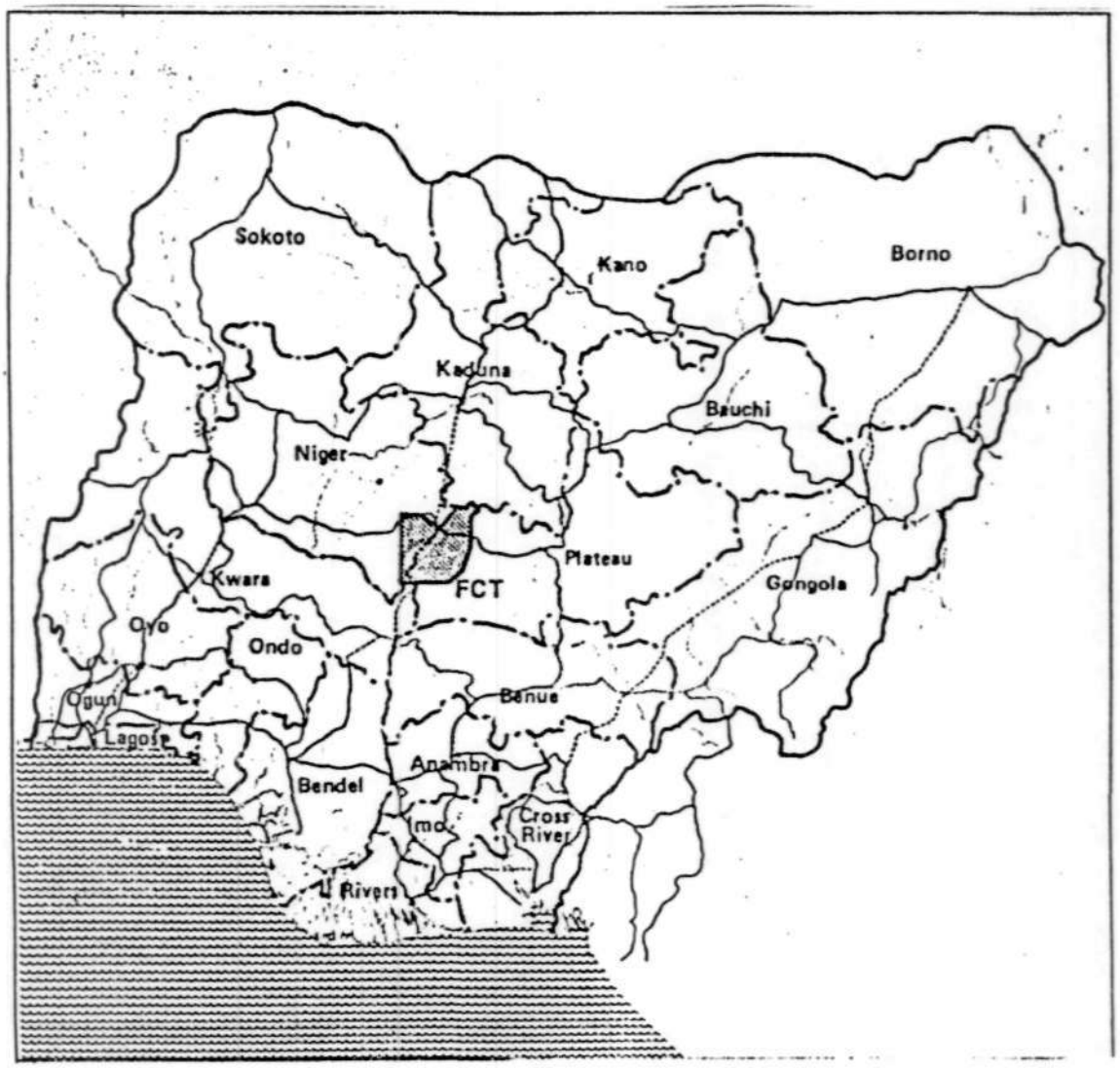


Fig 4.1.1.a The national context.

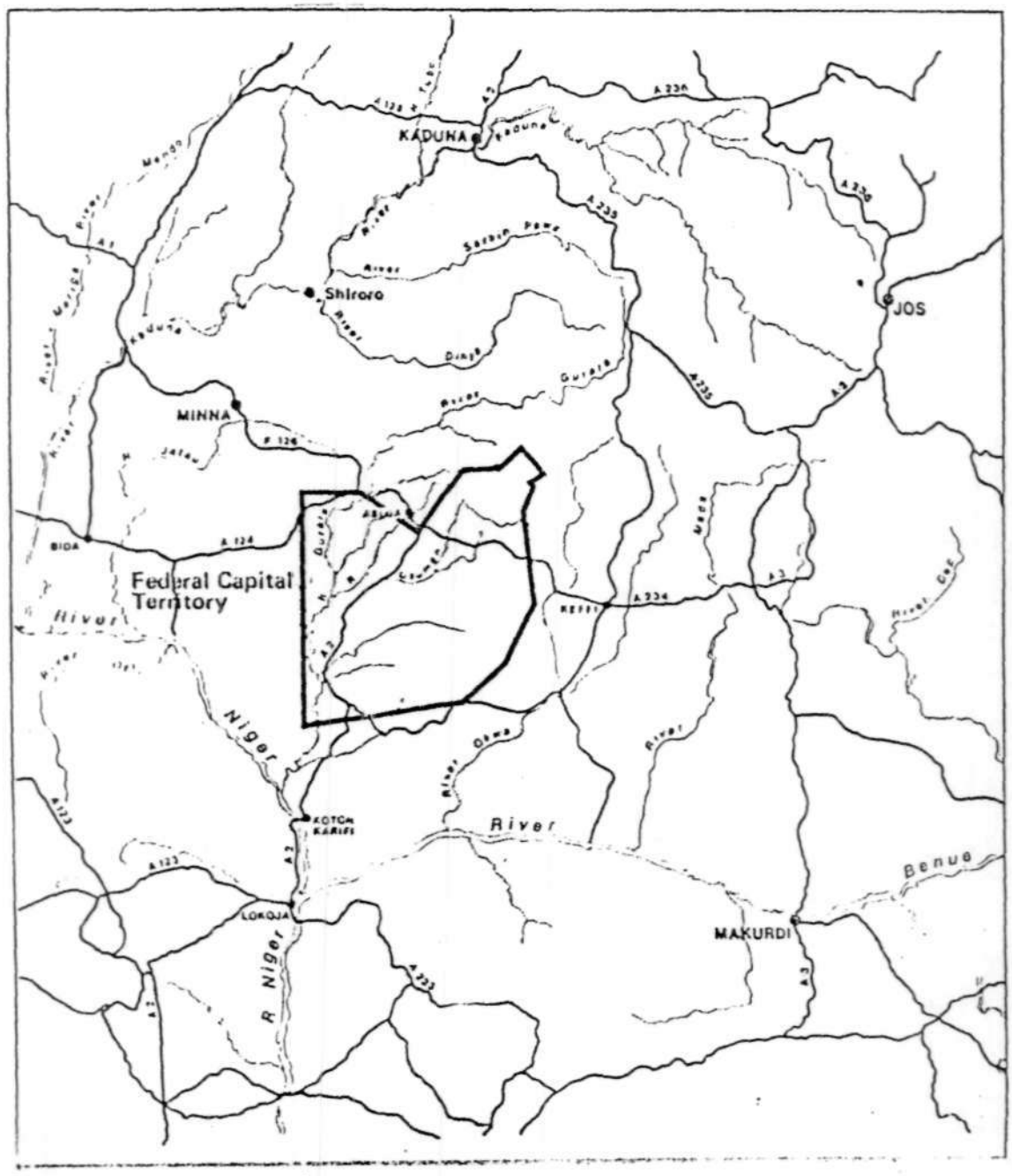


Fig 4.1.1 b The regional context.

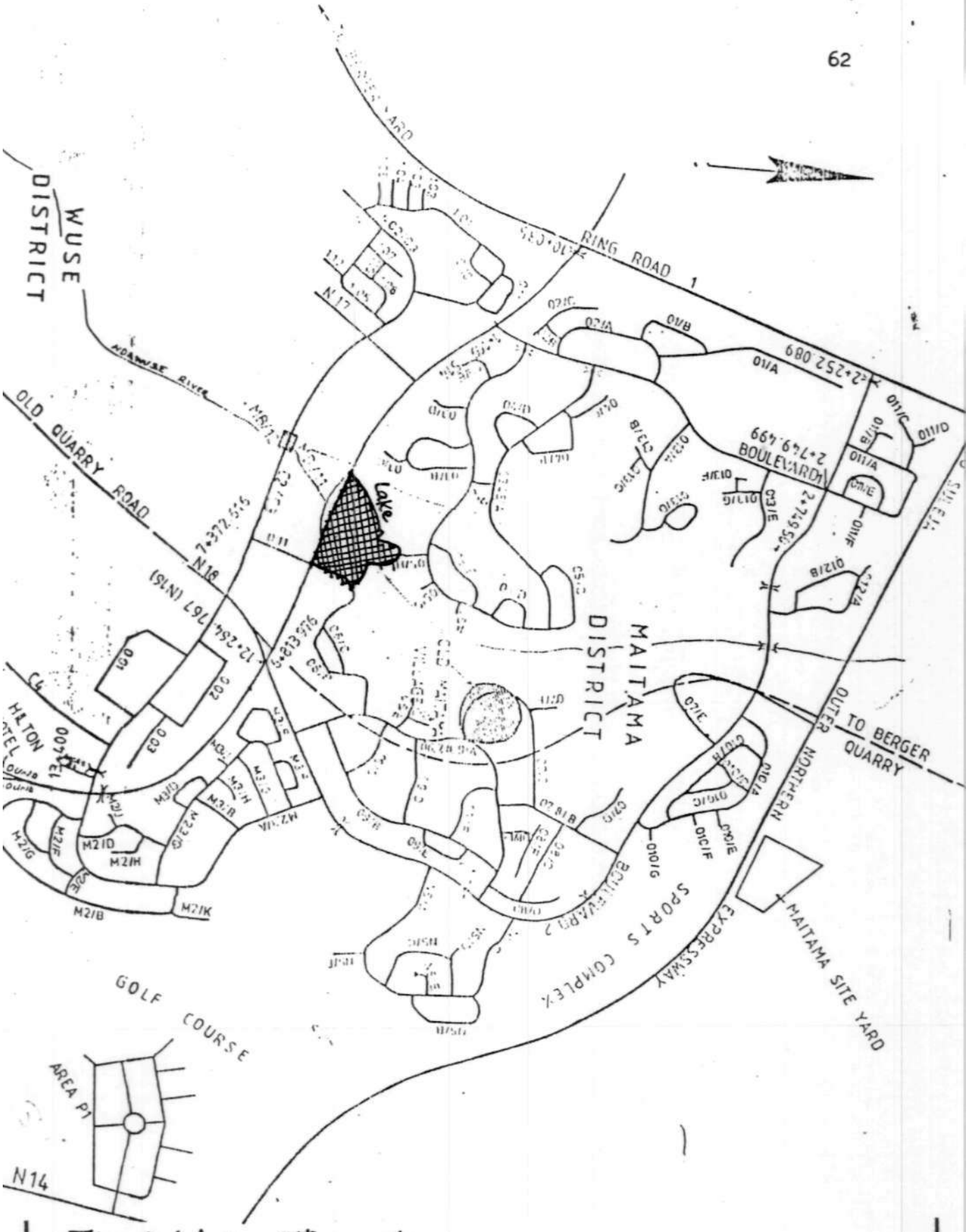


Fig 4.1.1c The site.

CHAPTER FOUR

4.0 THE SITE

4.1 Site Location and Character

4.1.1 Abuja the territory and the city

Abuja, the new federal capital of Nigeria occupies an area of roughly 8,000 sq.km., lying south of Suleja town (old Abuja).

The territory is surrounded by Niger, Plateau, Kwara and Kaduna States. This makes it more or less central to Nigeria. The territory lies just above the hot and humid lands of the Niger Benue troughs just north of the wide alluvial plains formed by the confluence of the Niger-Benue rivers. It consists of a little plain rising from elevation 300ft in the southwest corner to above 2,000ft of the North east corner where the city proper is located. Rising out of the plains are numerous rocky outcrops, inselbergs and several ranges of low mountains which make for the very interesting landscape that characterises the Federal Capital Territory.

Economically and geographically, the location of the Federal Capital Territory and the planned infrastructure improvements will create a context which is the physical embodiment of many national goals for unity. It signifies a commitment to equalise physical assessibility to government and

provide a balanced focus for the nation. The Federal Capital city itself lies to the Northwest quadrant of the Federal Capital Territory in what is now called Abuja Municipal Local Government Area. The city, has its overall landuse pattern confined to a crescent shaped site defined by the developable land above 1,200ft in the Gwagwa plain below the escarpment surrounding the outer area of the site including the promontory of the Aso hills. It is bounded by the Abuja Hills to the west, the Zuma-Bwari Aso hills to the North, the Kanu Agwai hills to the east and the Zango-Kuku hills to the south. From an aesthetic point of view the location of the site has exciting visual potentials. For purpose of development, the city has been divided into 3 phases. This project site falls within the second phase.

4.1.2 Geology, soil and vegetation

Federal capital city site can be broadly classified into three geological categories:

- Metamorphic rock: Includes Biotite-Musconte Schist and limited to four narrow outcrop bands along the ridge tops at the eastern edge of the site. Majority of the city site is underlaid by migmatite.

- Igneous rock: granitic (coarse porphyritic) large intrusive masses commonly elliptical in shape forms. The dissected zones of the Zuma-Bwari-Aso Hills and outcrops of gwagwa plains; Biotite Gravinite, fine to medium grained forms the vidaelines trailing

or heavily wooded areas. The main vegetation type which characterises the proposed site is sparse park savannah which is typically a stratified community of discontinuous canopies, shrubs and grass layer.

4.1.5 Topography and drainage

The bulk of the city, would be concentrated on land with elevations from 360 to 510m above sea level. It has been said that this is so as to capitalise on the climatic advantages of higher altitudes.

Topographically, the city is characterised by greatly undulating terrain, interlaced by riverine depressions. The central area where our site has been located, consists of uplands and plains with numerous inselbergs and other rock outcrops of various sizes.

4.2 Infrastructural Data

4.2.1 Water supply

The wide range of possible water supply considered for the FCT may be grouped into 3 categories:

- Groundwater supplies within the FCT.
- Surface water supplies within the FCT, including potential re-use of waste water; and
- Surface or groundwater sources outside the FCT.

Groundwater Supplies in the FCT

Very little data are available on actual ground water conditions within the FCT. Particular geologic

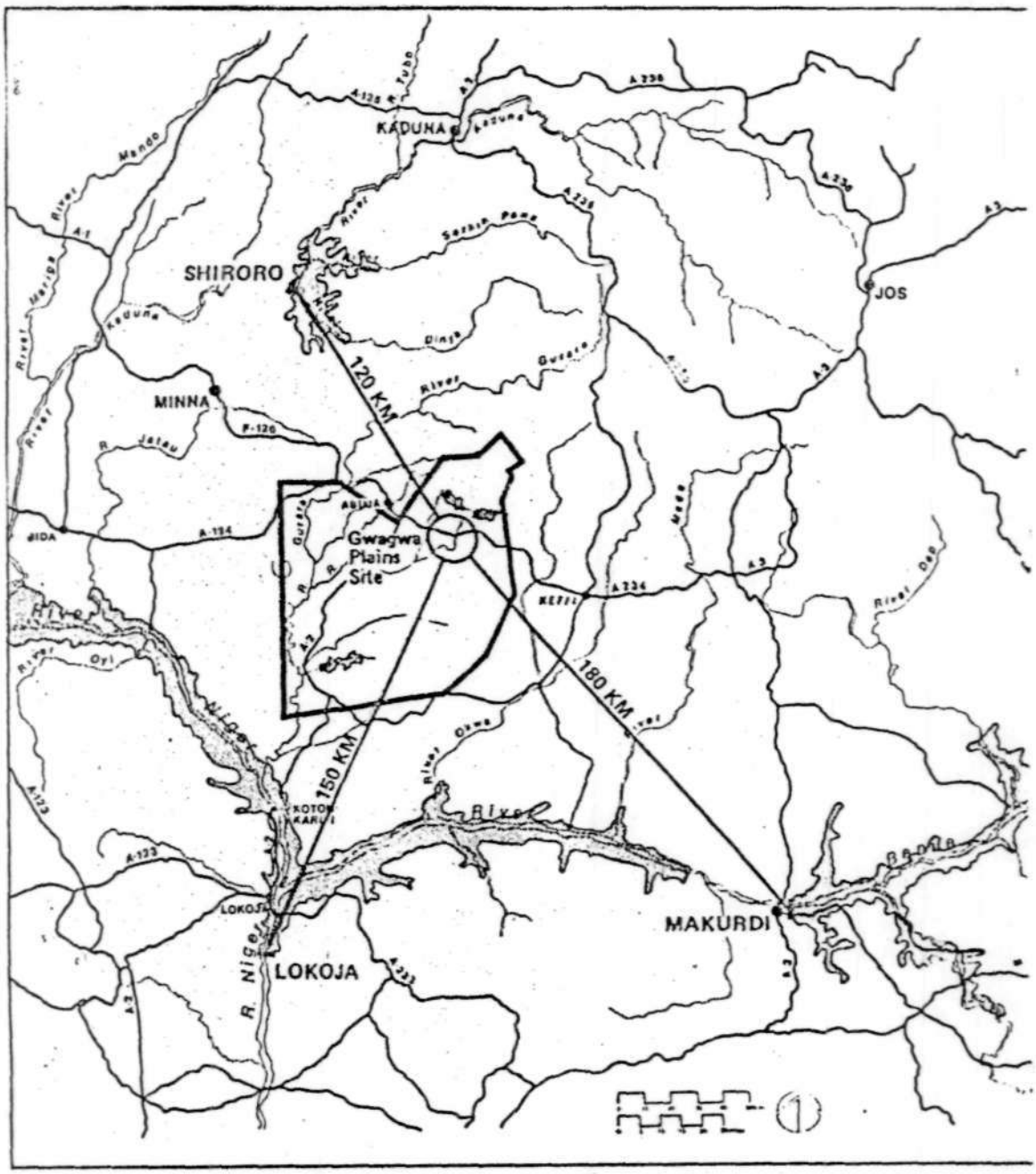


Figure 4.2.1g Power and Water S rces

structures are more likely to be able to provide adequate quantities of water at relatively economic cost.

Three such areas judged to be of sufficient potential are:-

1. The geologic structures of Karu-Agwai hills.
2. The alluvial deposits along the Gurara River and
3. The saprolite basins underlying the gwagwa plains.

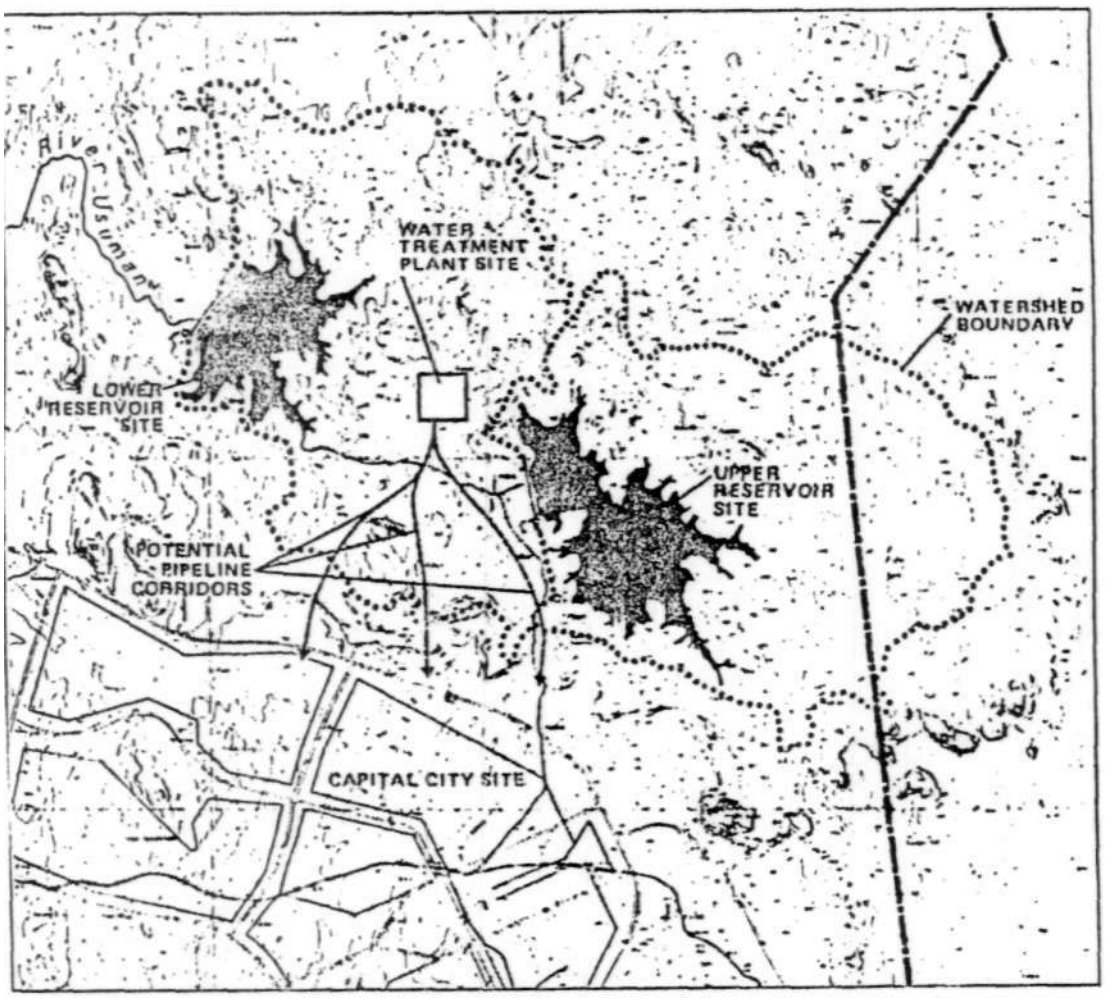
In addition to these suspected areas of potential groundwater, field studies commissioned by the FCDA have discovered groundwater beneath the streambeds of rivers near the capital city site.

Surface Water Supplies in the FCT

Sites are most likely to be found in hilly areas where valleys are steeper, such as the edges of the Bobo plains and the Zuma-Bwari-Aso hills.

Projected demands for water by the new city were equivalent to approximately 710 acre-feet per month in 1986, growing to 7,680 acre-feet per month at the interim population level of 1.6 million.

For smaller towns and villages throughout the FCT, small reservoir sites or direct river withdrawal are feasible sources of surface water and Gurara and



Recommended Reservoir Locations for the FCT

Fig 4.2.1b

CAPITAL CITY MASTE
REGIONAL PLAN CON

Residential Sectors 1-6
Residential Sectors 7-12
National Government
Major Public Facilities
Government Reserve
Major Institutional Res
Business and Commer
Research and Training
General Industry
Railroad
Ann Hills National Mon
Urban Park and Open
Solid Waste Disposal a
Sewage Treatment Pla
Airport
Protected Water Cours
Forestry
Urban Dairy and Stall
Irrigated Cropland
Reservoirs

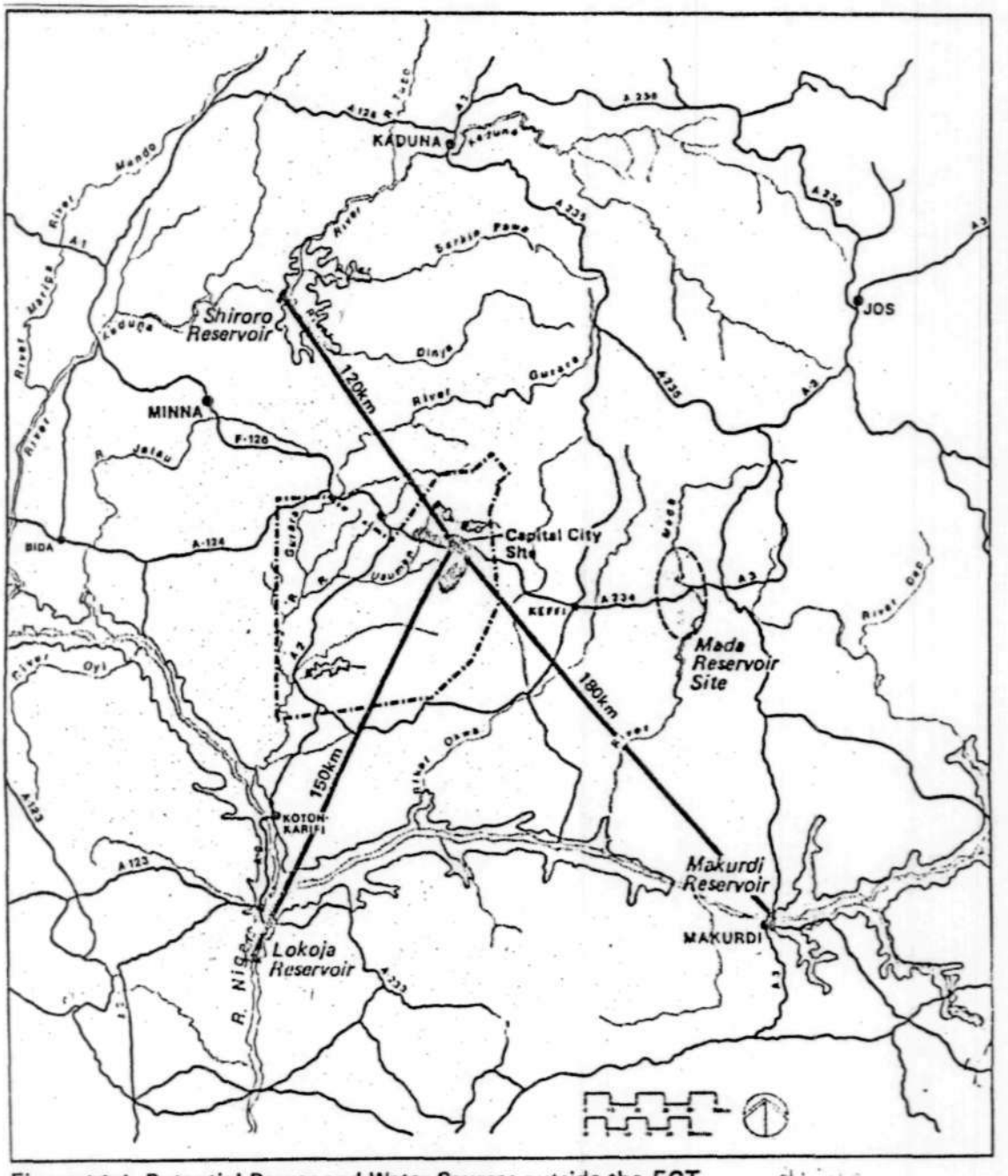


Figure 4.2.1c Potential Power and Water Sources outside the FCT

Usuman Rivers are most likely to provide adequate flows throughout the year.

Supplies outside the FCT

Because of seasonal fluctuations in river flows, the search for constant sources of available water outside the FCT focused upon reservoir sites. Groundwater source considerations were restricted to areas likely to yield high volumes of water. Figure 4.2.1b shows the options identified i.e. Shiroro reservoir, Niger-Benue reservoir, Makurdi reservoir, River Mada reservoir.

But by far, the most potential long term source of water supply is the Shiroro reservoir. The reservoir site is located approximately 120km from and at an elevation approximately equal to that of the city site.

4.2.2 Water Treatment

Only limited information on quality of raw water from any of the sources surveyed is available. If surface supplies within the FCT are employed, it may be anticipated that water will have low total hardness values, as found by Mabogunje in 1977. Alkalinity also is anticipated to be low, with pH measurements ranging from 6.0 to 7.3. The majority of the samples taken from rivers in FCT were below neutral (7.0 pH). Sodium absorption ratios were determined on the samples, and

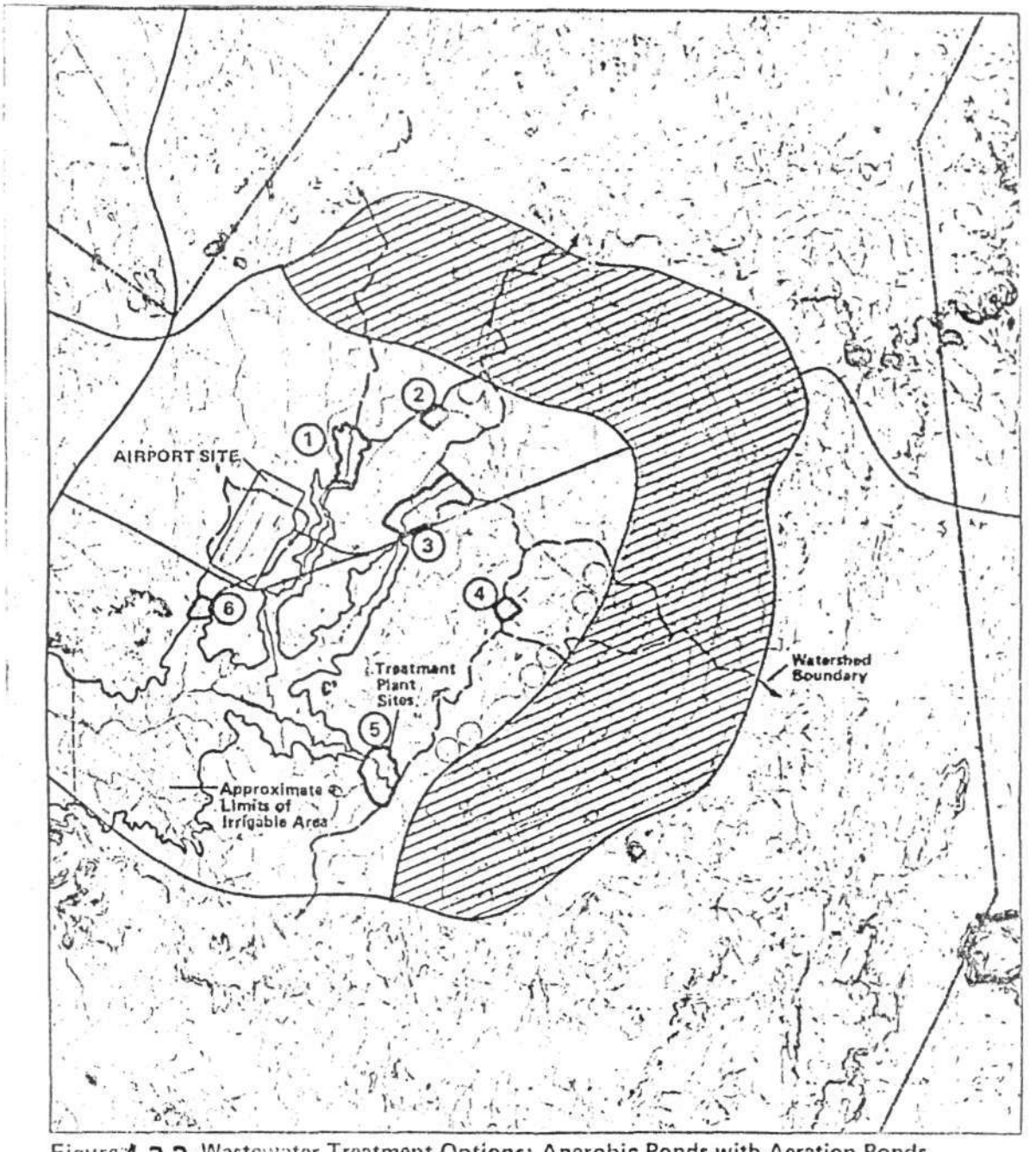


Figure 4.2. Wastewater Treatment Options: Anerobic Ponds with Aeration Ponds

the river water was found to be acceptable for irrigation.

The standard use of residual chlorine for disinfection is generally accepted throughout the world. However, the recent discovery of carcinogenic compounds formed by reaction of free chlorine with organic molecules in water has led to some concern about the use of chlorine as a purifying agent. Although other water treatment solutions such as sand filtration and activated charcoal filtration could be utilized the higher capital and recurrent costs associated with these methods and the loss of disinfectant power through the entire distribution system has resulted in the recommendation that the use of chlorine be retained for use at the treatment facility. Should the suggested hazards of chlorine water treatment proves to be serious, the water treatment plant could be modified to use other treatment technologies.

Figure 4.2.2a shows options for water treatment.

4.2.3 Water Storage and distribution

The sizing and location of the various water storage and distribution network were based on a series of technical factors and the configuration of the plan itself. The principal technical factors are:

- Maximum day demand is equal to 2.0 times the average.



Figure : . Water Distribution Network

Fig 4.2.3

- Peak hour is 150 percent of maximum day.
- Pressure requirements:-

Government areas	21m
Sector centres	12m
Industrial areas	12m
Residential areas	23m
Hydrant coverage	0.7/hectare

- Maximum reliance on gravity flow.

As shown in Fig.4.2.3a, the supply and storage system has been located along the north and east perimeter of the city where existing highlands provide natural settings for storage facilities while still permitting gravity flow from the treatment plant. The storage tank locations were selected to provide sufficient elevations with minimum distance to the distribution system. The tanks were sized to provide 25 percent of the estimated maximum day demand plus fire flow requirements.

Distribution lines consist of a series of loops following the transit spines and the circumferential arterials. It should be noted that for purposes of planning, a line has been shown, serving the airport.

4.2.4 Waste Water Management

Development of waste water management plans for the New Capital City requires consideration of two types of issues. First, treatment and disposal of sanitary wastes must be conducted in a manner to



Trunk Sewer--Single Line
Trunk Sewer--Dualization Possibly Required
Trunk Sewer--Dualization Required

Figure 4-24 Interceptor Sewer Network

control disease vectors and generally to contribute to the objectives of maintaining public health. Major diseases of concern in planning activity in the FCT include schistosomiasis, onchocerciasis and malaria. In addition to the more familiar enteric disorders. Engineering safeguards have been provided in waste water management systems for the control of anopheles and other mosquitoes; Bilharzia snail, Simulium (Black fly), and tse tse fly in additions to provisions for control of pathogenic organisms found in waste waters of human origin.

Secondly, waste water effluent, given adequate treatment, may represent a valuable resource for agricultural irrigation or water supply for other towns.

Waste Water Collection System

The entire area to accentuate 1.6 million persons is located in a single drainage basin which is served by four major interceptors. Preliminary layouts for each of these subwatersheds were prepared for the purpose of sizing the major interceptor conduits which are shown in figure 4.2.4a. The principles guiding these layouts were:

- Trunk sewers would be constrained to locations near active stream channels and smaller collectors would be laid so as to be tributary to the trunks without crossing natural divides.

- Areas tributary to each trunk were determined, based on developable versus undevelopable land. "Developable land" consists of areas for which development is either programmed or in which development might logically be allowed to take place at a later date; "undevelopable land" consists of areas such as rock outcrops, parks and areas where development is to be prohibited.

- A range of pipe sizes from 15cm (6 inch) to 183cm (72 inch) was utilized in developing pipe size versus capacity relationships. Each pipe size was assigned a specific slope from 0.25 to 1.0%, based on general watershed and channel parameters together with an assumed manning "n" factor of 0.015. These parameters were used to calculate maximum pipe capacities. In order to provide for maximum aeration of the sewage, in the system, the pipes were designed to flow half full; it should be noted that this procedure will allow a slight safety factor for actual flows.

- Assuming a uniform population density of 33 dwelling units per hectare, and six persons per unit, the maximum area serviceable by each pipe size was determined; these areas in conjuction with the tributary areas previously determined, were used to assign pipe sizes to the various trunk lines and collectors.

- Building connections are based on 33 such connections per hectare. It has been assumed that collector sewers will be laid in the street right of way but away from paved areas in so far as possible.

4.2.5 Electrical distribution system

Three major components of the electrical distribution are addressed.

- Transmission system for the connection of the national grid system with bulkpower at 132/330 KV to the Federal Capital city and for power supply to the substations within the city.

- Substations, the transition points from the transmission system to the distribution systems within the individual areas of the Federal Capital city, at which voltage is reduced from 132 KV to 11 KV.

- Distribution systems from the substations to individual districts within the Federal Capital Territory e.g. Maitama district.

Figure 4.2.5 illustrates the electrical distribution system for FCT.

4.2.6 Telecommunications Network

Figure 4.2.6 illustrates the telecommunication network proposed for F.C.T. This configuration with its dual secondary centres, has been modelled specifically to accommodate modular growth and flexibility of expansion. The switching machines

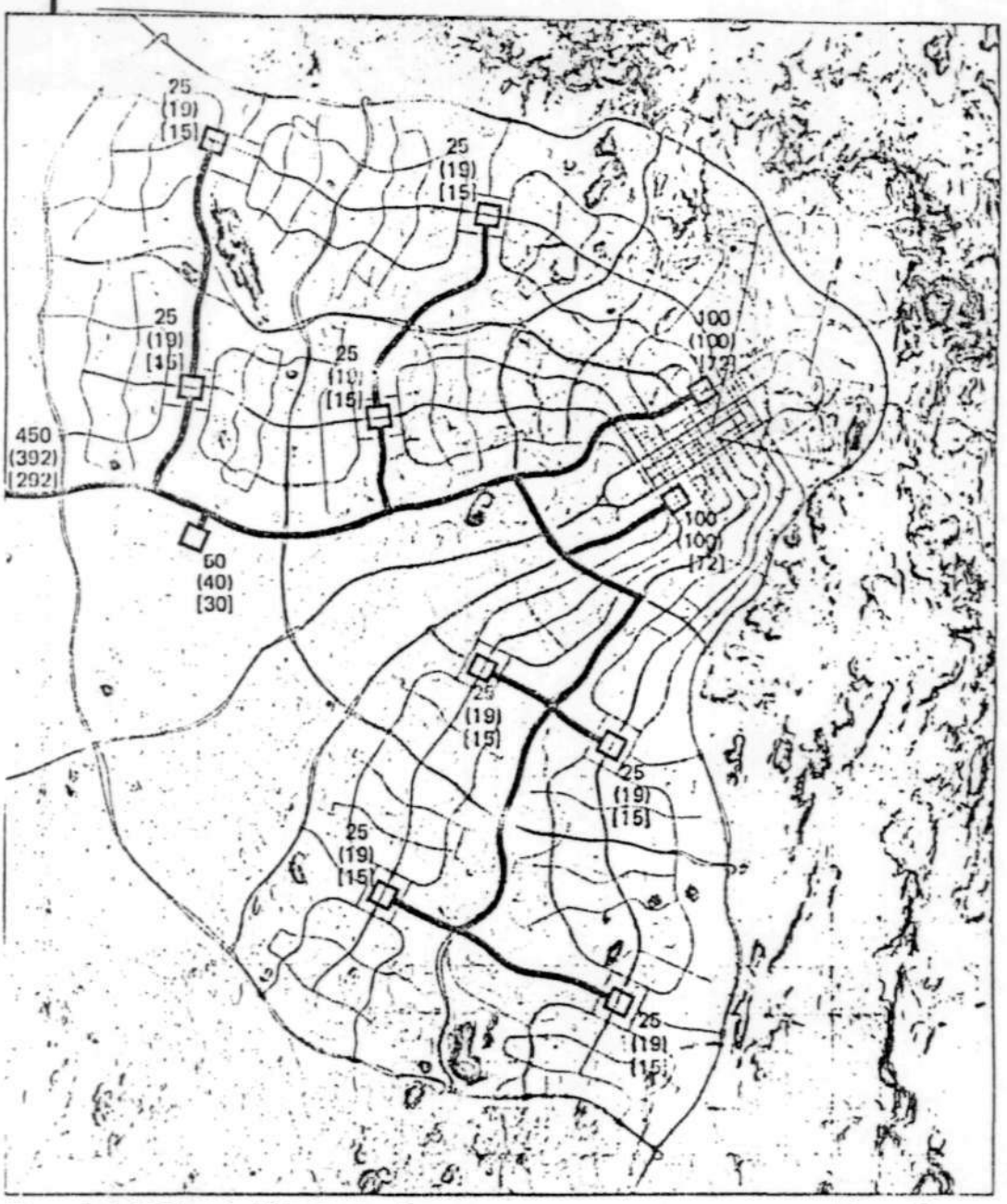


Figure 4.2.5. Electrical Distribution System

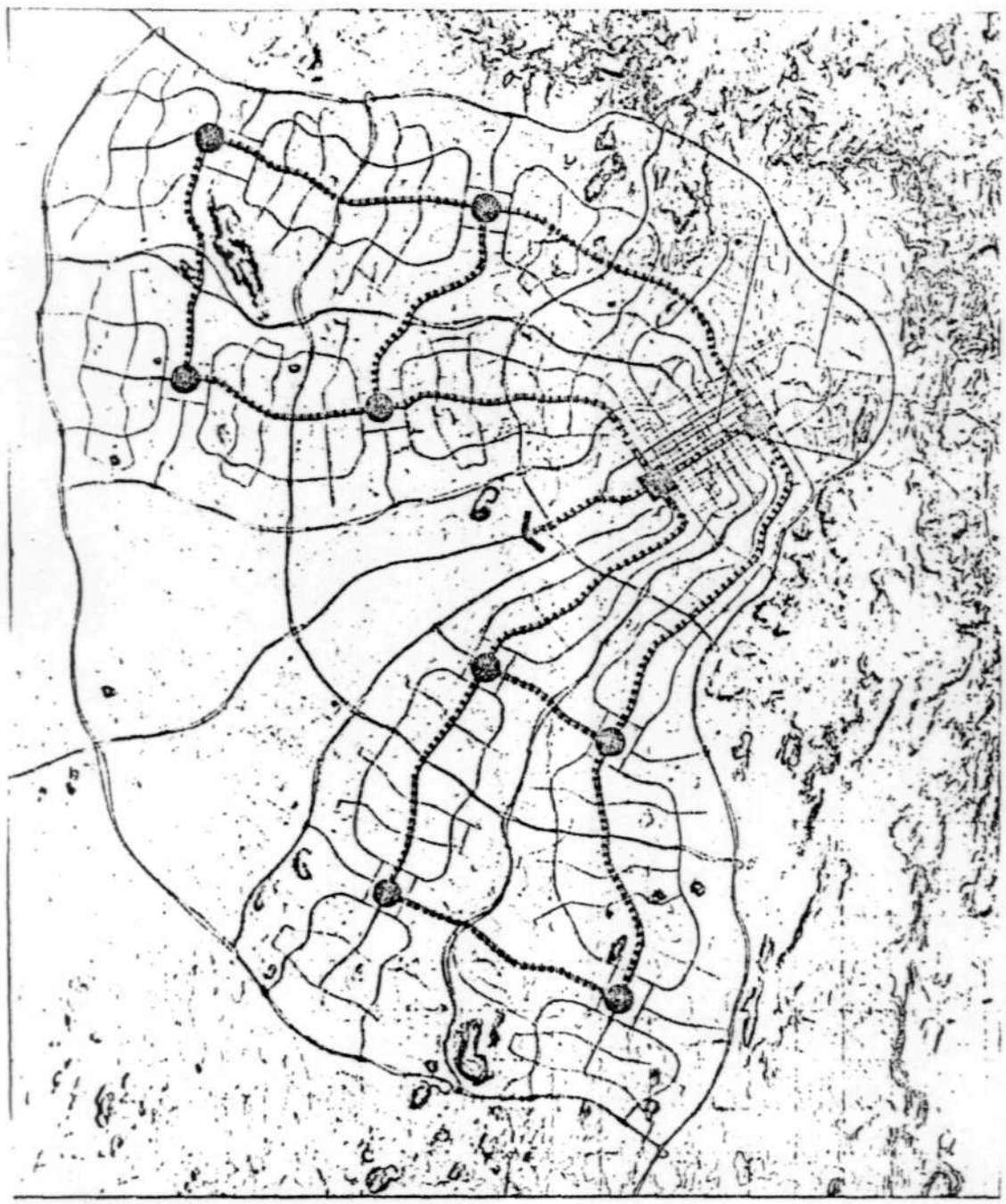


Figure 4.26. Telecommunications Network

are 4-wire and provide both tandem and locally competing traffic and transmission adaptability. The PCM backbone transmission ring should utilize wide band distribution to avoid future capacity limitations yet provide economic near term incremental growth.

4.2.7 Road Network

Several important background factors which shape the context of the highway plan for the federal capital city are:

- Low current levels of vehicle ownership, but with the need to provide for ultimately higher levels.
- A strong central area.
- Provision of strong local neighbourhoods and district structures, minimizing the need for non-work travel.
- A linear/sector overall city form.
- Desire to eliminate thorough traffic from residential areas.

Sensitivity to these factors, have generated the system in Fig. 4.2.7a. The major feature of the highway system is the Expressway system whose major components are

- Central parkway
- Transverse parkway
- Central area connector
- Airport Access Expressway

Within the sectors of the city, a road system, consisting of arterial, collector and local streets

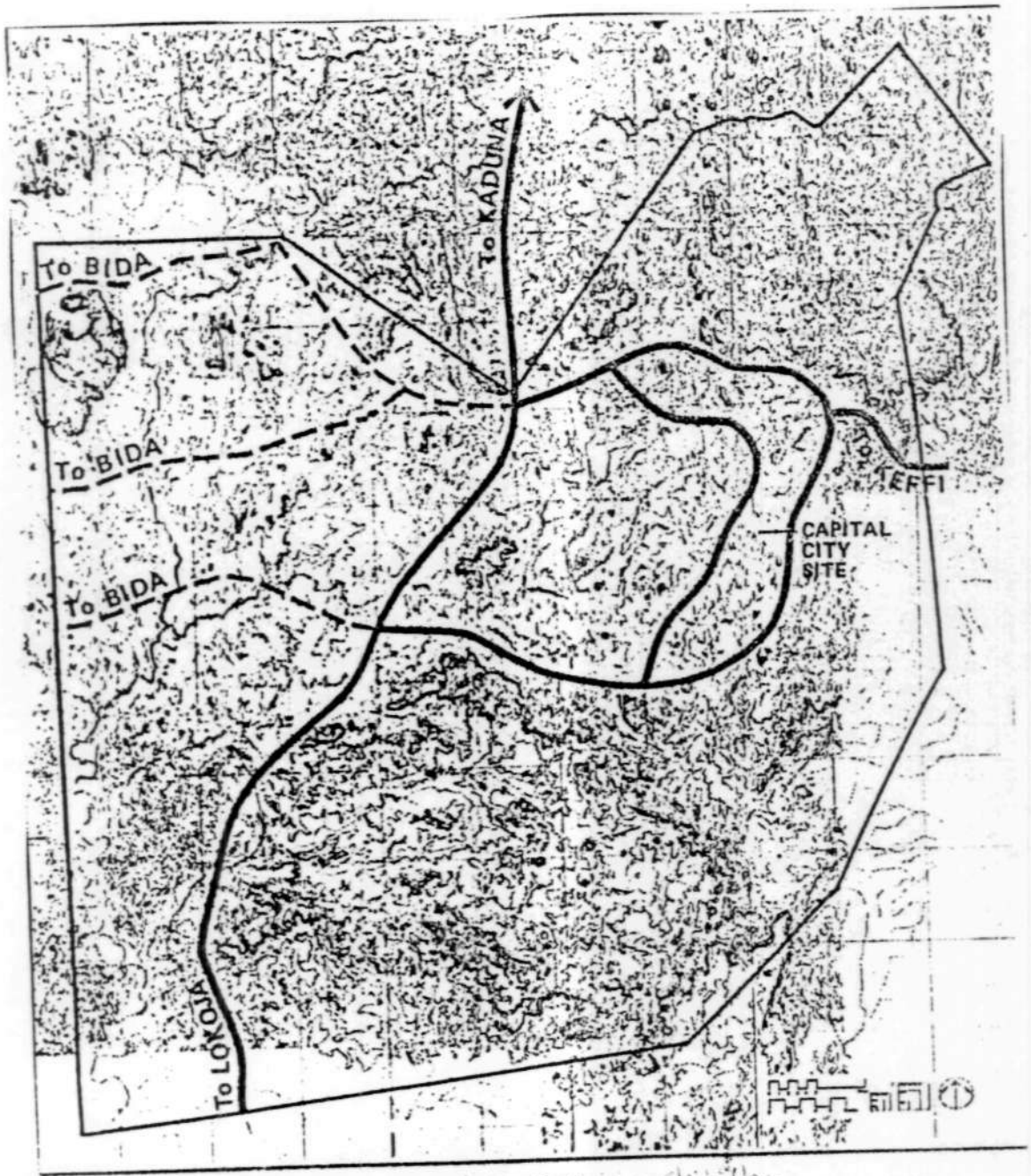


Figure 4.3.7 Inter-Regional Road Connection Options



Figure 4.27c Road and Airport Locations

Fig 4.2.7.c

provides internal access as well as connection to the expressway system.

Within each sector, of the city, a hierarchy of 3 street types is used:-

- Arterial streets; connecting the sector with the expressway system and serving major traffic flows within the sector.

- Collectors, generally connecting the neighbourhood units with the arterial street system and also providing access to minor travel attractions within the sector.

- Local streets; providing immediate access to individual dwelling units and generally connecting them to the collector street system.

4.3 Geographical Data

Climatic Studies

Man's comfort is the measure of the extent to which physical environment should be controlled. Architecture has therefore, to serve man and his living comfort. For a comfortable living environment will most often depend on maximising the aspects of the environment which reduce heat and the effect of humidity and protect from rain and dust. Thus for a successful exercise, one has to plan with climate at all scales. Here attempts will be made to understand the climate of the site (FCT) by studying the phenomenon

under these subtopics:- Humidity, rainfall, sun and cloud cover, temperature wind and dust. The micro-climate of the proposed site will also be considered.

4.3.1 Humidity

Humidity is low during the dry season coupled with high afternoon temperatures. This accounts for the dessicating effect of the dry season. During the rainy season, the relative humidity is high and temperature is slightly lower and this creates a heat trap thereby making the place uncomfortably hot.

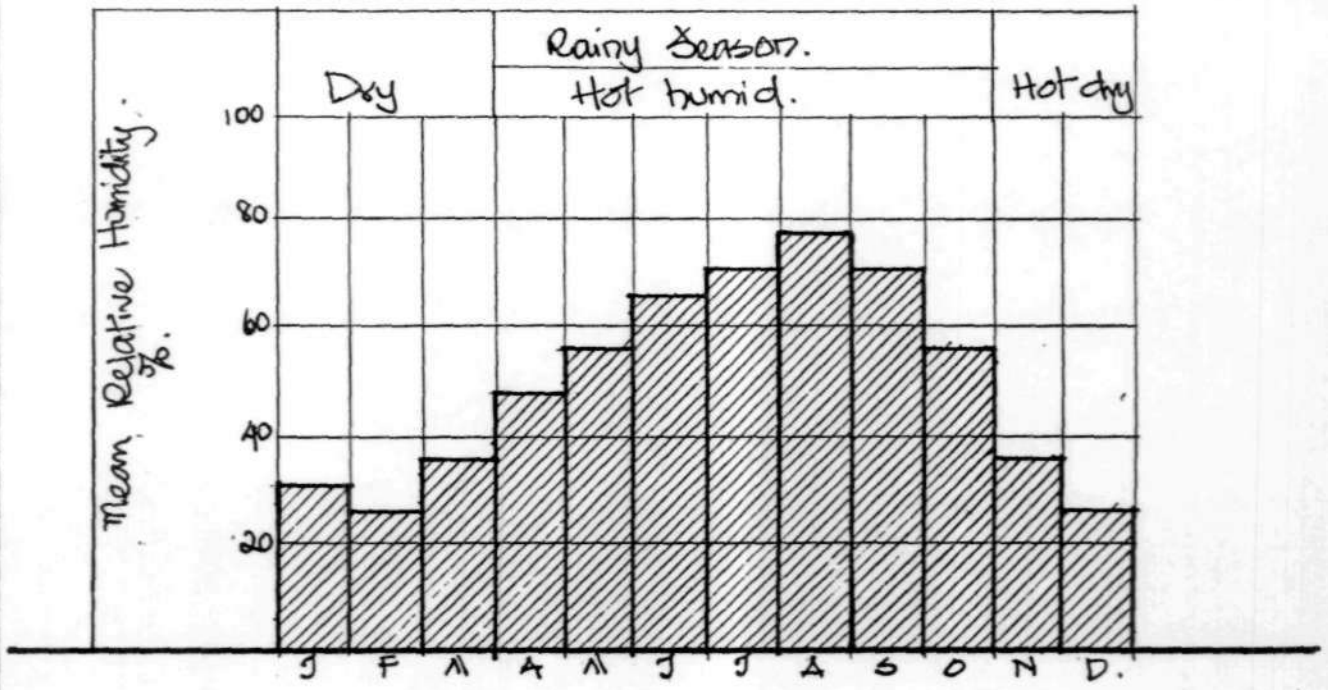
Recommendations

- Design solutions must make for proper ventilation.
- Use of artificial ventilation should be considered.
- Water fountains, pools or ponds and other cooling landscaped elements would aid in heat elimination.

4.3.2 Rainfall

The rain starts in the Federal Capital Territory around the 10th of April and tapers rapidly after the 20th of October. Duration of the rainy season is between 180 and 190 days. Mean monthly distribution shows a tendency for concentration in 3 or 4 months. In Abuja, 60% of the annual rainfall falls within the months of July, August and September.

Squall lines are also frequent with thunder and lightning followed by strong winds and intense rainfall which may last a few hours. The line squalls usually happen in the afternoon and could cause serious property



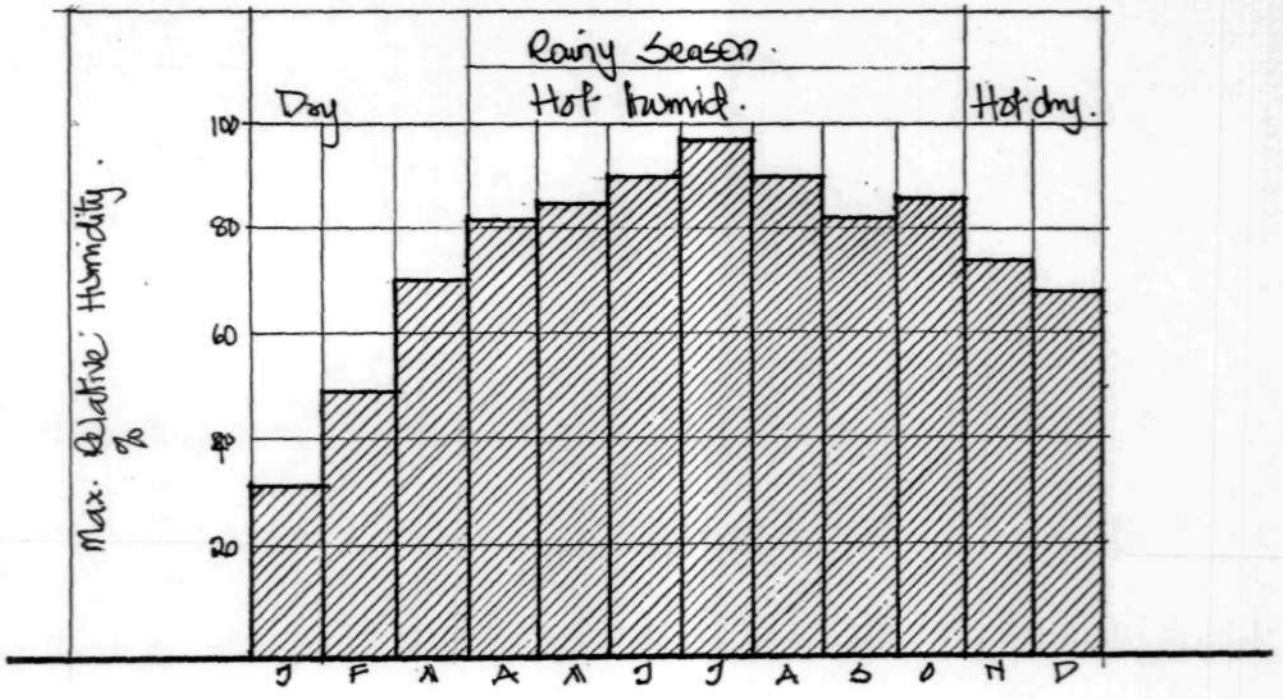


Fig 4.3.1 Monthly Relative Humidity for Abuja.

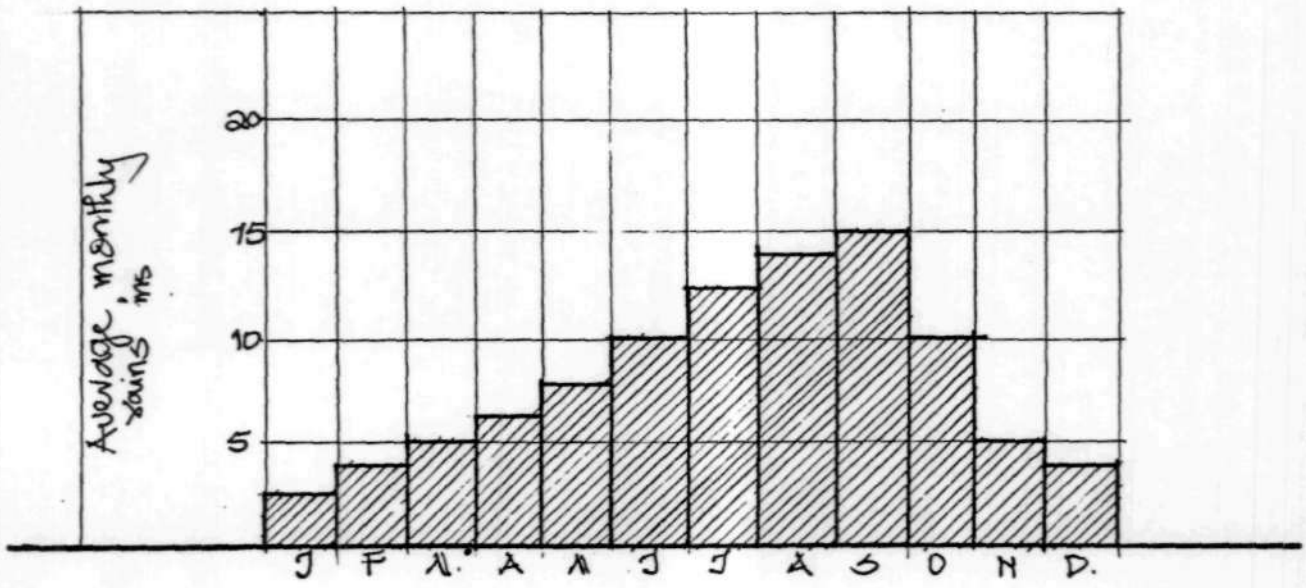


Fig 4.32. Mean monthly Rains for Abuja.

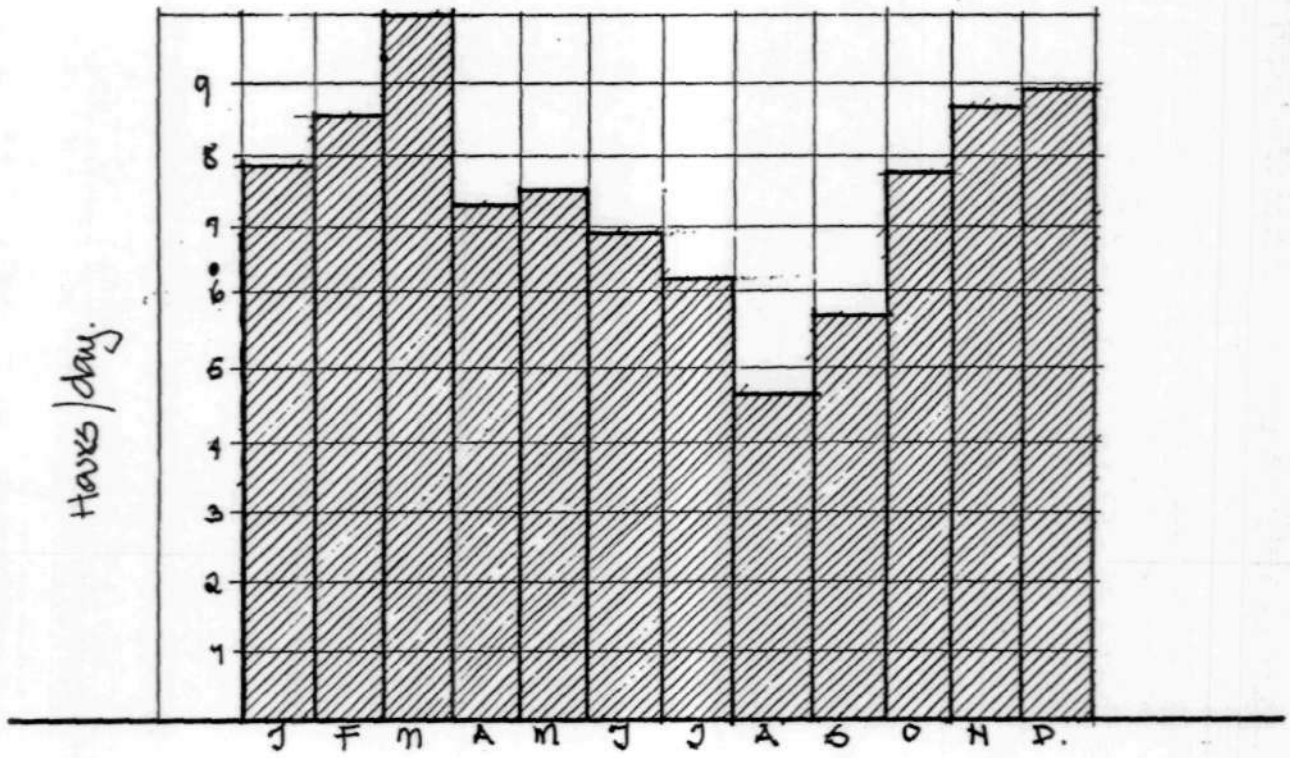


Fig 4.34. Mean monthly Sunshine durations for Abuja.

damage.

Recommendations

- The concentration of rainfall calls for proper drainage design that would handle large volumes of water very rapidly.

- Possible drainage due to the forces of the line squalls must be taken into consideration.

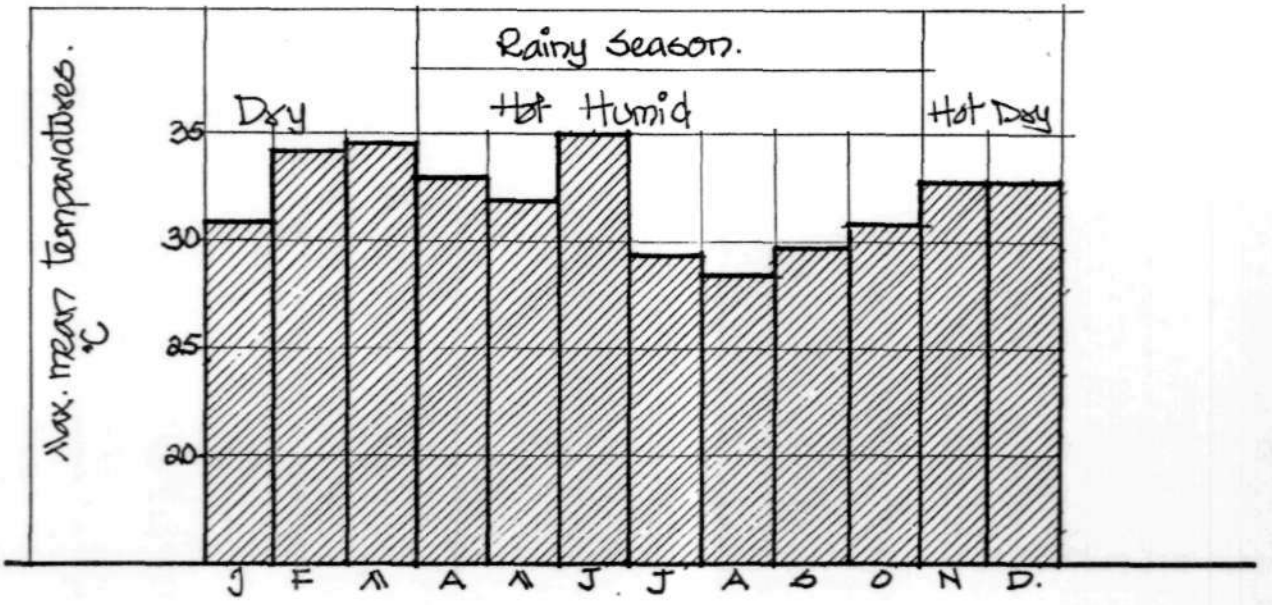
4.3.3 Temperature

The FCT records its highest temperatures during the dry season when there are a few if any clouds. Changes in temperature as much as 17°C have been recorded between highest and lowest temperatures in a single day. During the rainy season, the maximum temperature is lower due to the dense cloud cover. Diurnal ranges are also much lower, sometimes not more than 7°C in July and August.

4.3.4 Sun and Cloud Cover

The further away from the coast a place is, the more the general number of sunshine hours. Abuja is exposed to about 12,500 sunshine hours annually.

During the dry months (November-April), the monthly variation in the amount of sunshine follows the general trend of an increase from 275 hours over the city site. The approach of the rainy season, reduces the sunshine hours due to cloudiness. This decline becomes intense as the rainy season progresses



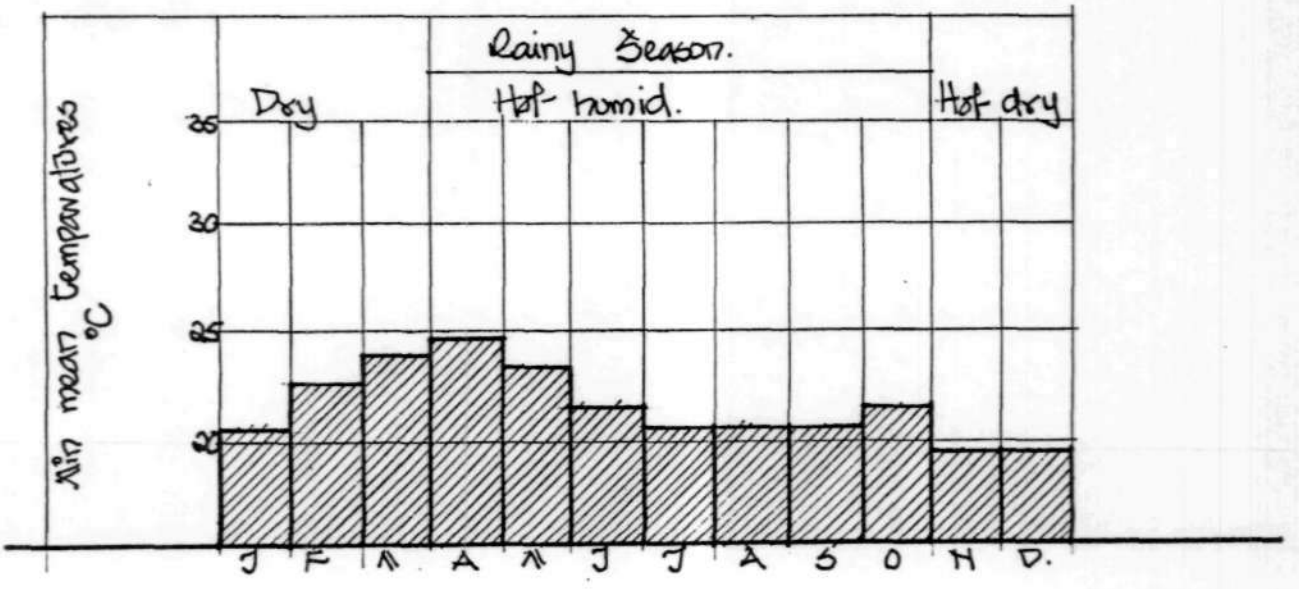


Fig 4.3.3. Mean monthly temperatures for Abuja.

and reaches its lowest in the month of August causing possibly a temperature inversion over the city site.

Recommendation

- Proper orientation eliminates or reduces the amount of offensive sun's rays going into a building.
- Adequate sun shading devices can do the rest.

4.3.5 Wind and Dust

Two major air masses dominate the climate of the FCT. These are the tropical maritime air mass and the tropical continental air mass. The tropical maritime is formed over the Atlantic ocean to the south and is therefore warm and moist. It moves generally inland in a south-west to north-easterly 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. It is the interface between these two airmasses that dictate the intensity and duration of the wet and the dry seasons.

In June, the Northerly flow of air component has weakened and only the southerly flow predominates. Being moisture laden, it brings a lot of rain. In September, the tropical continental begins to intensify over the territory and the north east trade becomes more dominant from October to March bringing with it dry but cloudless dust laden conditions associated with

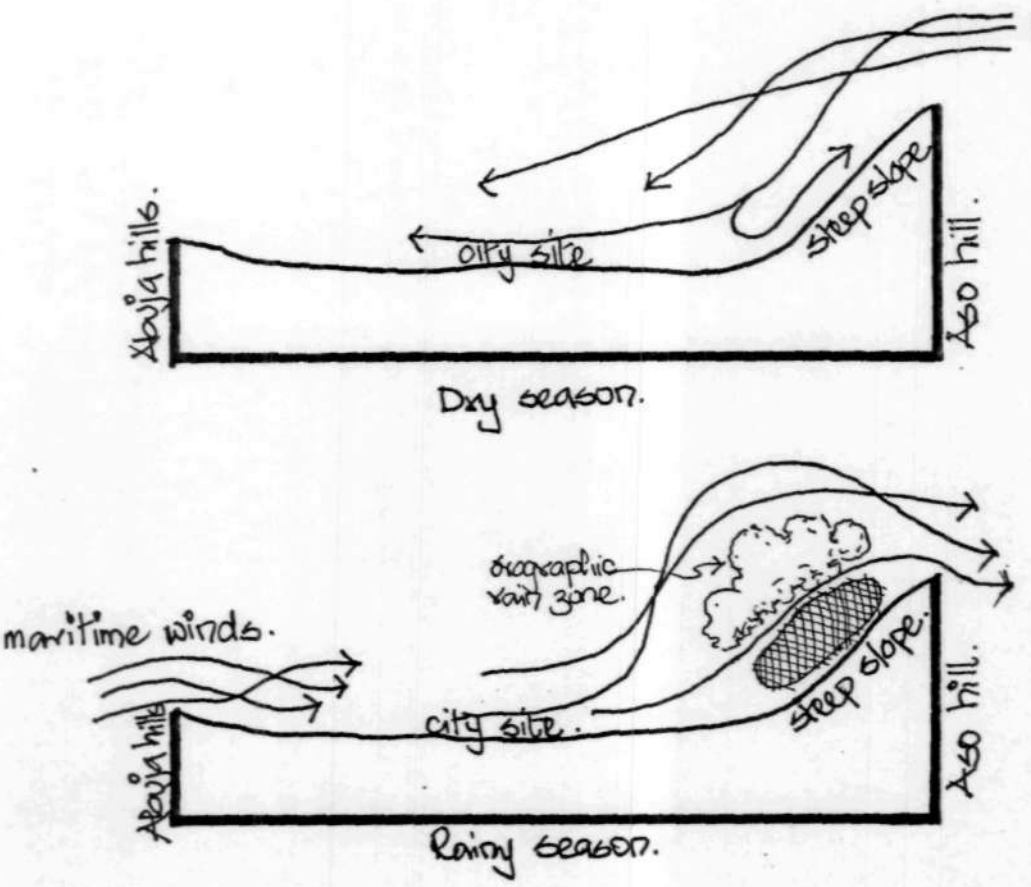


Fig 4.35a Seasonal wind pattern over Abuja.

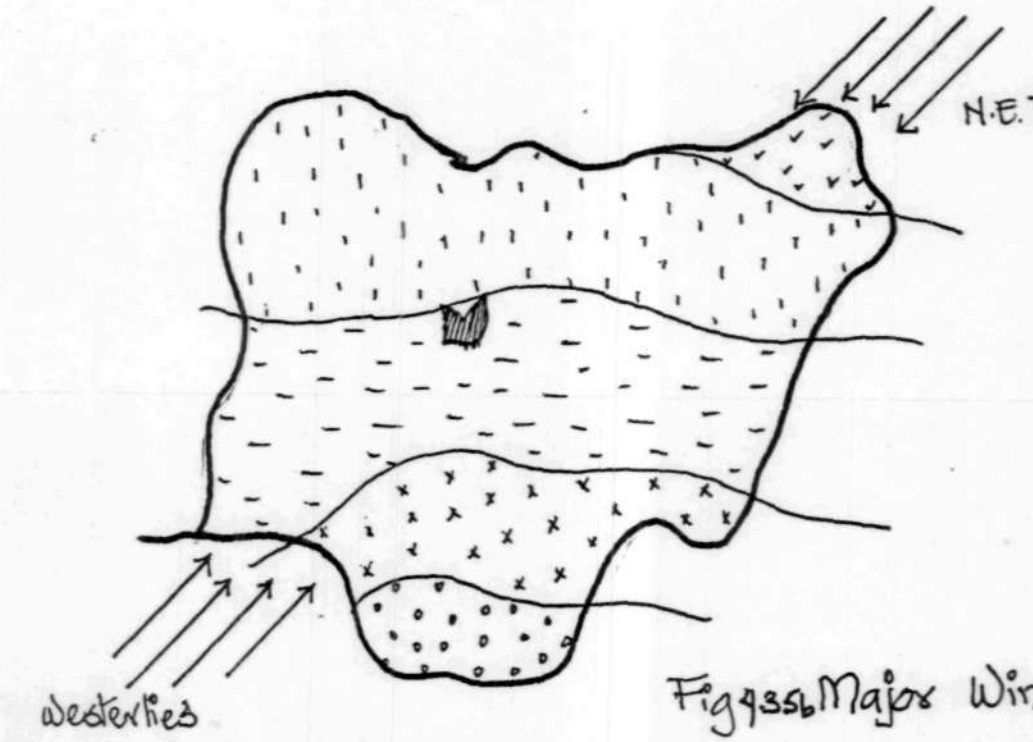


Fig 4.35b Major Winds.

the harmattan. Mist and fog are not uncommon around this period due to temperature inversion reducing visibility at times to below 100m due to dust particles which float in the air or settle as a thin film over the furniture and other objects.

Recommendation

- Trees should be planted as wind breakers on the site.

- Openings should be made with due regards to wind direction, i.e. proper ventilation.

4.4 SITE ANALYSIS

Factors affecting building location and orientation

The location of a building on a site or its relationship to other buildings on site is extremely important. If properly situated, the building achieves harmony with the topography, liveability is enhanced, drainage problems are minimised, and the buildings functional efficiency is increased. If the building is not properly situated, many problems that cannot easily be corrected can and will ensue.

1. Orientation

Orientation of the building to sun, wind and vistas is a basic consideration. Under most conditions, it is desirable to be protected from the hot summer sun and exposed to the sun's rays during the cold winter months. Taking advantage of summer breezes can reduce

or eliminate the need for air conditioning. In winter, maximum protection against northerly winds can substantially reduce heat loss and heating costs.

2. Topography

Siting a building to conform with its topography will result in a minimum of necessary grading, reduce initial construction costs and eliminate continuous drainage problems.

3. Noise Pollution

Exposure of a site to noise pollution has become a serious problem in both urban and suburban areas. This problem can be controlled or minimised by the judicious placement of the structure on the site.

4. Landscaping

Plant materials, both trees and shrubs are an integral part of the design. They serve not only as aesthetic elements but as buffer strips, screens, dividers and wind or sun breakers.

5. Defensible Spacing

Creating greater physical security and street safety through site planning has become in the past few years, a significant new development. The concept, which is known as "defensible space" deals with the placement of buildings, tight control of access to and egress from the site and visual surveillance of all public areas.

4.5 SITE FEASIBILITY AND VIABILITY

The chosen site has a lot of potentials when taking into account the kind of project being proposed. These potentials include:

Accessibility

The site is easily accessible through the collector street bounding it on the right and the Arterial N6 network bounding it on the south end. This makes it easily accessible to surrounding districts and the city centre.

Size

There is enough land to accommodate all anticipated facilities for the project taking future expansion into cognizance.

Infrastructure

The site has high infrastructural potentials in that, water supply, electricity network, drainage systems and sewage disposal systems already exist and can be tapped directly to such points that require them.

Land use

The site is appropriate for and has already been mapped out for such projects as is being proposed.

Physical Characteristics

Nature of the site is such that physical elements like the lake and a good amount of vegetation already

exist and when properly taken care of would provide good scenic attractions.

simple picnic shelter to the complex community recreation building with its variety of special service facilities. Such buildings may vary in design from the rustic, depicting the styles of the early days to the contemporary representing the most modern architectural concepts.

In many neighbourhoods and communities, school facilities are adequately equipped to provide recreation programs for youth, but other existing age groups are not always served. In such instances, the community must depend upon public recreation facilities which are planned and operated independently to accommodate a recreation program for the total community, it should have a part in the planning of public recreation facilities.

The planning and design of a recreation building demand a precise and logical approach. Such buildings reflect the unique needs of a neighbourhood or community. The preliminary plans and continuous re-evaluation of the functional design of the building prior to its construction should be considered in terms of the following questions:

- Does the preliminary plan include all of the essential areas and facilities necessary to fulfil the program objectives?
- Does the design provide for flexibility in use and future expansion?

- Does floor plan permit convenient access to and facilitate circulation within the building?
- Does floor plan provide for ease in supervision and administration of the building?
- Have individual rooms been located and designed so as to facilitate multiple use within safety limits?
- Has the building been designed so as to ensure opportunity for its use by all members of the community including the aging and the disabled?
- Is the building so designed that it will permit economy in construction and maintenance?
- Does the design encompass accepted aesthetic qualities that relate harmoniously with the surroundings?

(i) Planning Considerations

In planning the complex, due consideration should be given to the prevailing economic, social and political situations to reflect realities of time and to satisfy the users needs. Planning guidelines and standards of the concerned planning authority as related to the study field are duly considered. Some of the factors that need proper consideration include:-

- Accessibility
- Security

456323

- Safety users
- Expansion
- Good service network

The planning concept should be based on the following considerations.

- To avoid conflicts or dangerous positions in the juxtapositioning of the various facilities.
- To provide adequate parking areas to accommodate users.
- To provide proper access to the facilities for access and maintainance
- To plan circulation for users, operational services and maintainance including provisions for vehicular traffic with possible total separation of pedestrian and vehicular traffic.
- To locate facilities where they will have the greatest impact and use.

(ii) Planning Concepts

- The fitness centre should occupy a place of prominence in the overall scheme, should be located for easy public access and visual prominence from the approach to the site.

- Utility lines should be shielded from public view and planned for easy expansion to handle future

development requirements.

- Vehicular traffic should be confined to the periphery of the site leaving the interior to be planned exclusively for pedestrian traffic.

- Probable future expansion should be accommodated by the designation of uncommited space on the site.

- Probable concentrations of pedestrian traffic should be identified and traffic flow patterns developed to permit easy movement about the site via wide pedestrian walks. Special ramps should be incorporated to accommodate the physically handicapped.

- Buildings serving community functions should have easy public access from adequate parking areas.

- Natural features to the site should be accentuated.

- Soft and hard landscape should be used to direct flow on the site.

- Activity centres should be concentrated and located away from activities requiring quiet environments.

5.2 Orientation

The orientation of the site and the direction of the prevailing winds are important matters. For in the case of outdoor areas, the question must be

Sun Orientation

Orientation for sun and prevailing summer breezes always merits consideration. Latitude largely determines the former; local conditions, the latter. Orientation for sunlight is most successful when sunshine is made available in kitchens on winter mornings and when some sun reaches living rooms in afternoons. When ideal conditions cannot be secured, a desirable minimum is considered to be achieved if some sun is available in each room at some time of day.

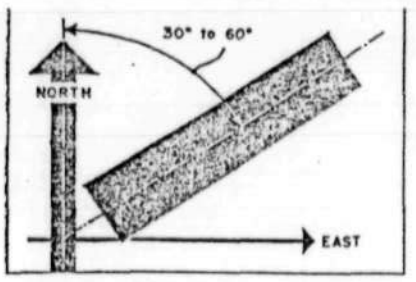


Figure Orientation for sunlight in Northern states. The building angle approaches an east-west line as one goes south.

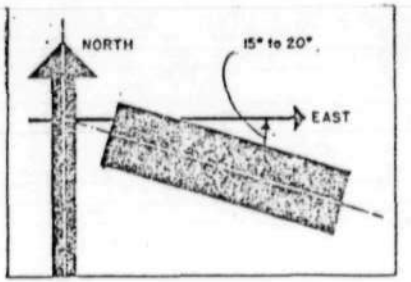
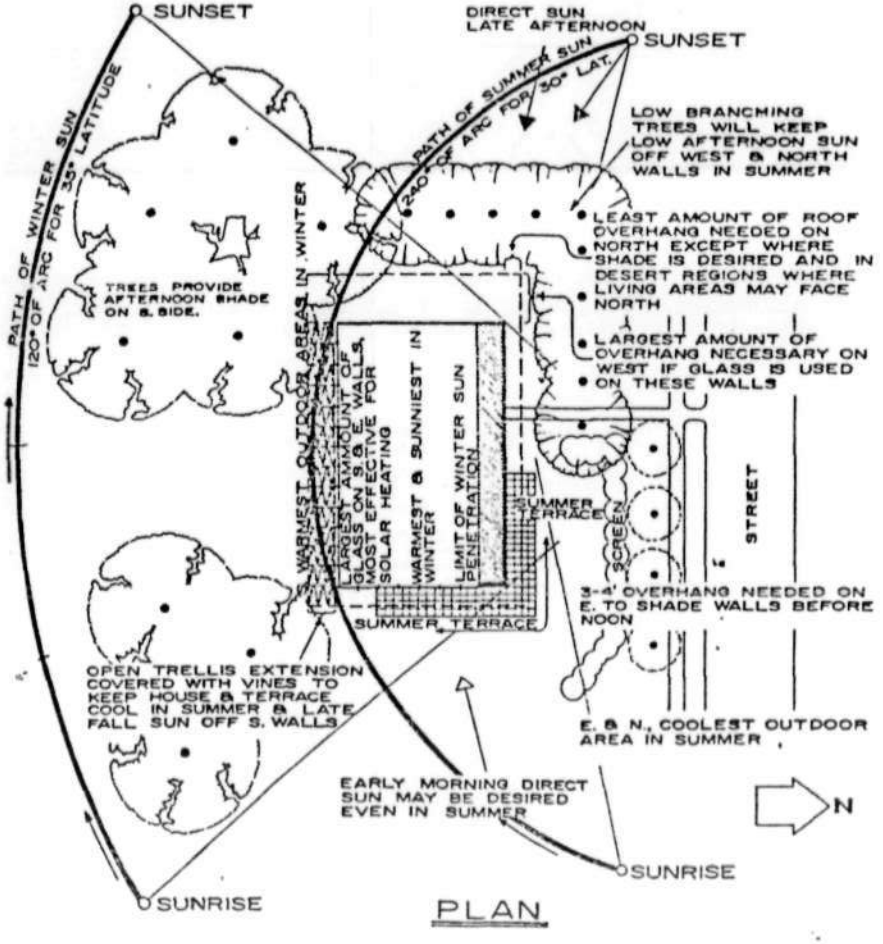
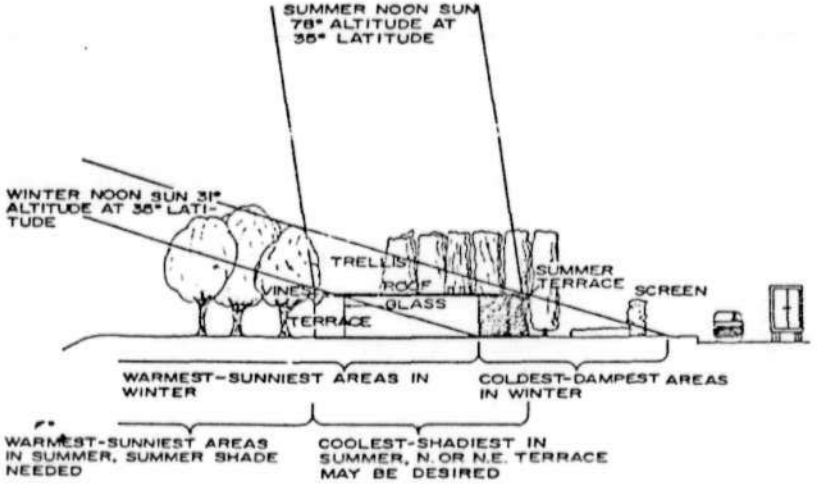


Figure Secondary favorable zone giving good early-afternoon sun in winter and protection from afternoon sun in summer.



PLAN



ELEVATION

Figure

Fig 5.2.1

SOURCE: *Landscape Development*, U.S. Department of the Interior, Field Technical Office, Littleton, Colo.

asked that can the playing fields be so sited that at those hours when play will be in progress, the sun will never shine directly along the length of the performance ground thereby blinding the eyes of the players and spoiling the performances of the players? A further point to be considered is whether the prevailing wind will be of material assistance during the half game to the team playing in a particular direction.

Finally, is the site too open or too sheltered? If it is very open, the wind may be a constant nuisance; if it is in a hollow, wandering breezes, may play strange tricks at times; and if it is too well sheltered; the difficulties may still not be solved for the trees which most likely provide shelter and break the force of the winds.

5.2.1 Sun Orientation

Orientation for sun and prevailing summer breezes always merit consideration. Latitude largely determines the former; local condition, the latter. Orientation for sunlight is most successful when sunshine is made available in kitchens and when some sun reaches living areas in afternoons. When ideal conditions cannot be secured, a desirable minimum is considered to be achieved if some sun is available in each room at sometime of day.

Wind Orientation

Figures _ and _ show the effect of winds on various inland and shore homesites.

Fig 5.2.2.

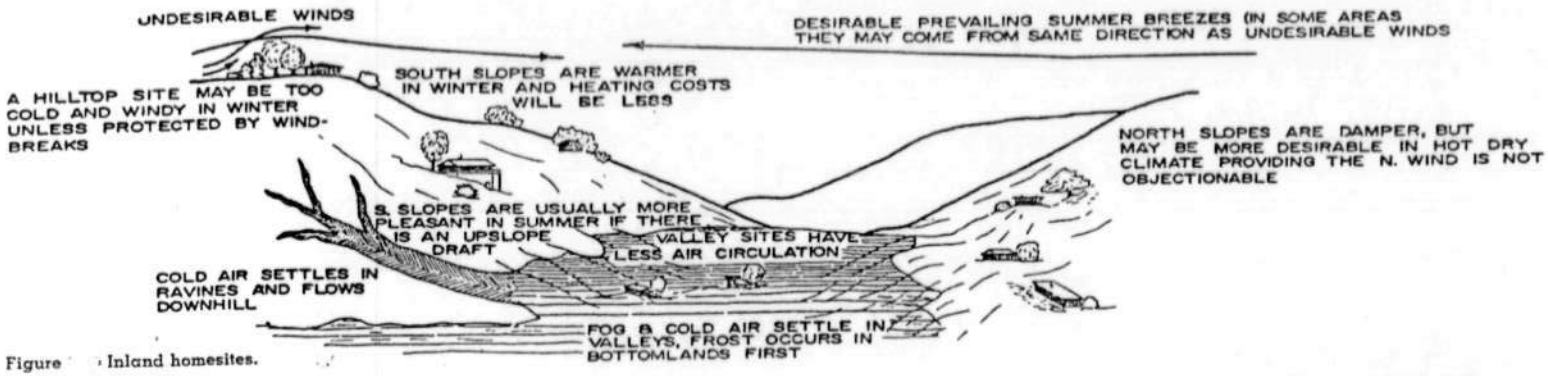


Figure _ Inland homesites.

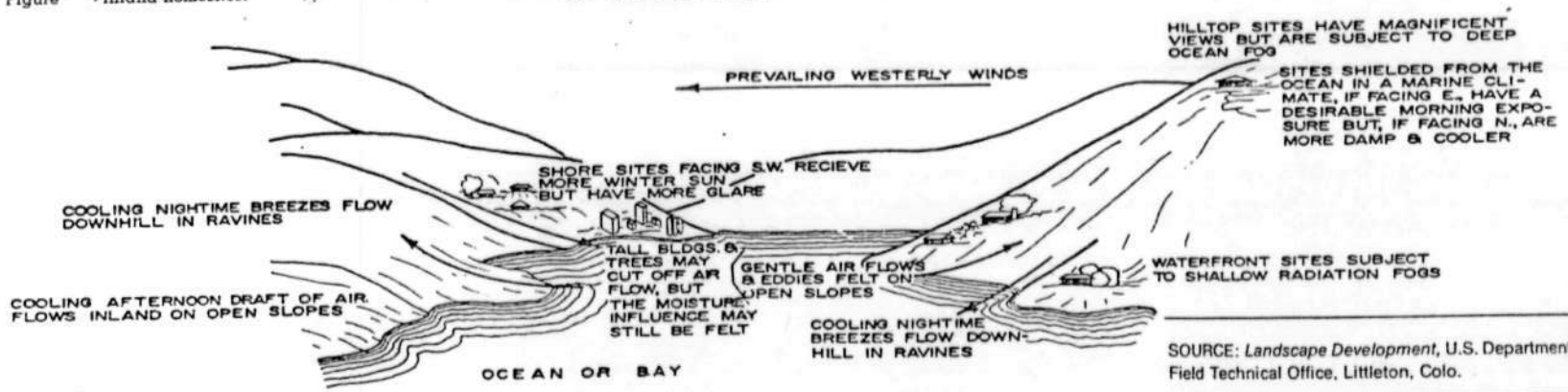


Figure _ Shore homesites.

SOURCE: *Landscape Development*, U.S. Department of the Interior, Field Technical Office, Littleton, Colo.

WINDBREAKS

Control of Wind by Plants Basically, plants control wind by obstruction, guidance, deflection, and filtration. The differentiation is based not only on the degree of effectiveness of plants but on the techniques of placing them. There are books and articles that describe a number of ways in which plants control wind and their effectiveness in doing so. However, plants, as natural elements, are not always predictable in their size, shape, and growth rate and thus in their absolute effectiveness.

Obstruction with trees, as with all other barriers, reduces wind speed by increasing the resistance to wind flow. Coniferous and deciduous trees and shrubs used individually or in combination affect air movement. See Figure 3-12.

Plants may be used in conjunction with landforms and architectural materials to alter the airflow over the landscape and around or through buildings.

Deflection of wind over trees or shrubs is another method of wind control. Plants of varying heights, widths, species, and composition, planted either individually or in rows, have varying degrees of effect on wind deflection.

Coniferous evergreens that branch to the ground are generally the most effective year-round plants for wind control; and deciduous shrubs and trees, when in leaf, are most effective in summer. Wind velocity is cut from 15 to 25 percent of the open-field velocity directly

SOURCE: *Plants, People, and Environmental Quality*, U.S. Department of the Interior, National Park Service, 1972.

5.2.2 Wind Orientation

Though this merits consideration especially with special buildings or functions like factories, animal sheds on farms e.t.c. it cannot always be the determining factor in orientation of buildings and in most cases, plants in conjunction with landforms and architectural elements can be used to alter the airflow over the landscape and around or through buildings.

Plants of varying heights, widths, species and composition have varying degrees of effect on wind deflection whether planted individually or in rows. It is, however, important that the designer finds out what the prevailing winds and sun paths are and should so site the playing grounds that neither of these two will interfere with the users.

5.3 Architectural Character

The outdoor and indoor therapy areas, should have a kind of relationship whereby activities can be transferred from one to the other easily. It should be a matter of principle to have all the buildings in harmony with each other and activities distributed in accordance with their surroundings and the general layout.

In short, the modern scheme of things calls for harmony, comfort, convenience and accessibility in the planning of sports or recreational training fields

and the siting and architecture of the buildings that serve them.

5.4 Materials Utility

Materials to be used on site shall be classified into two broad categories:

a) Hard

These are the construction materials like concrete, steel, glass, stones, tiles e.t.c. The buildings and most of the equipment in the outdoor therapy area constitute the above. Floors walls and ceilings shall all be of such hard materials.

b) Soft

Soft materials are in form of the landscape that shall be used to gradually merge outdoor activities with the indoor ones to create some form of continuity.

This includes shrubs, trees and grasses of all kinds and all require good care in order to be maintained properly.

LANDSCAPING FOR NOISE CONTROL

When external noise cannot be muffled at the source, landscape barriers can provide some control within the site. These barriers generally involve shielding or absorption, or both.

The combination of trees, low foliage, and ground cover provides noise attenuation when significant masses of such absorbing vegetation are involved. Generally, such foliage should be from 500 to 1000 feet deep to diminish properly the intensity of normal traffic noises. While relatively thin barriers serve effectively as a visual barrier or a sunscreen, a sonic barrier must be of much greater dimensions. See Figures _ _ and

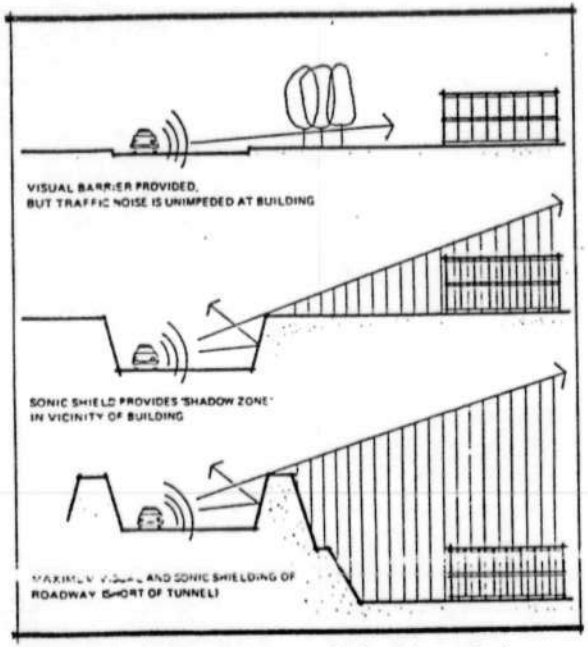
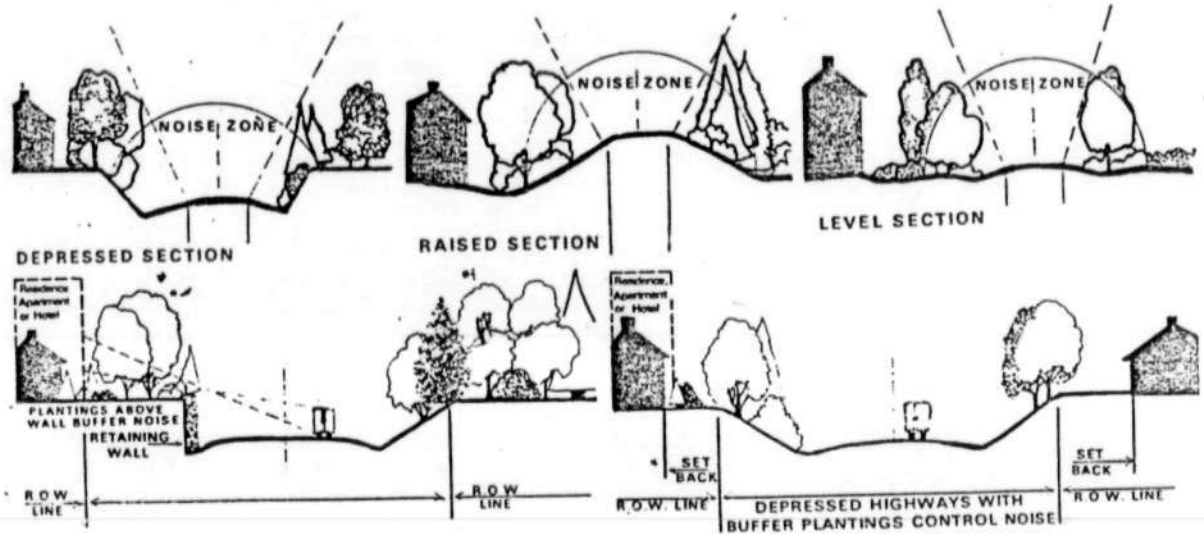


Figure Development of topography for noise control.



Figure

SOURCE: John E. Flynn and Arthur W. Segil, *Architectural Interior Systems*, Van Nostrand Reinhold Company, New York, 1970.

Fig 5.4.1

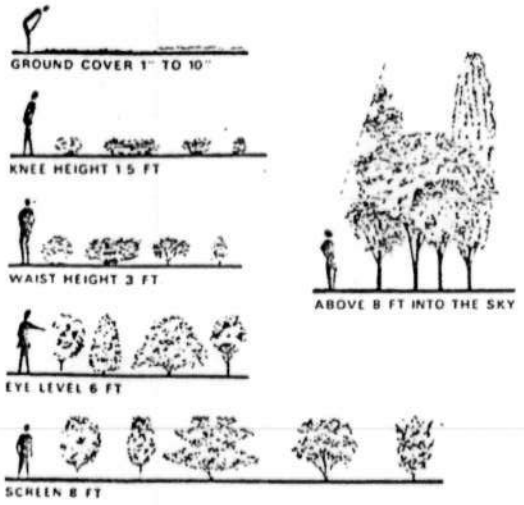
Fig 5.4

Landscaping Elements

PLANT MATERIALS, DENSITY, AND VOLUME

The factors that determine the selection of plant materials, their density, and their volume are illustrated in Figures , and

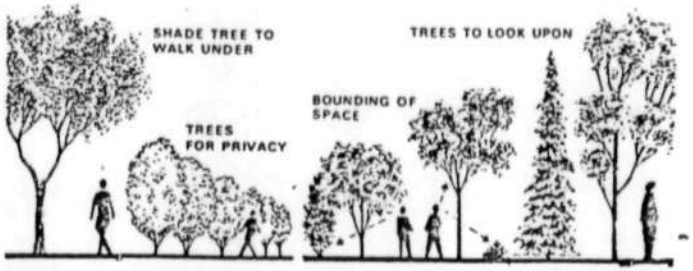
SELECTING PLANT MATERIALS



PEOPLE



PEOPLE–THEIR LINE OF VISION DETERMINES WHETHER A FENCE WILL PROVIDE PRIVACY OR MERELY SEPARATION. THEIR HEIGHT MEASURES FENCES,SHRUBS, TREES AND ALL VERTICAL AND OVERHEAD ELEMENTS.



Figure

DENSITY

PETIOLE SIZE, SHAPE AND LENGTH

SOME PETIOLE SHAPES HAVE MORE STRUCTURAL STABILITY THAN DO OTHERS. ON PLANTS WITH MORE RIGID PETIOLES THERE IS LESS LEAF MOVEMENT, AND THE PLANT APPEARS MORE SOLID AND DENSE.

- SQUARE
- CIRCULAR
- OVAL
- TRIANGULAR
- OCTANGULAR



Figure

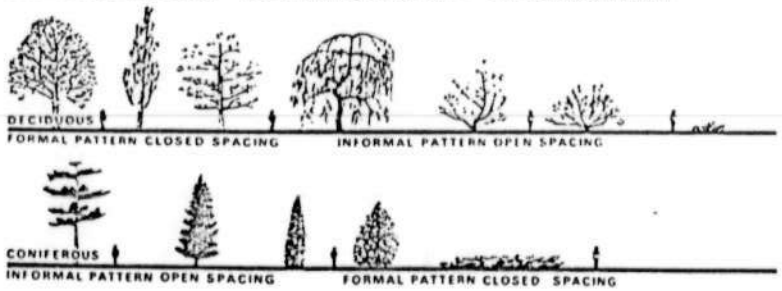
ARRANGEMENT OF LEAVES

LEAVES ARE ARRANGED IN GENERAL ORDER OF INCREASING COMPLEXITY OF FORM AND/OR MARGIN FROM LEFT TO RIGHT. THIS INCREASING COMPLEXITY COMBINED WITH VARIOUS BRANCHING FORMS WILL PRODUCE VARYING DEGREES OF DENSITY.

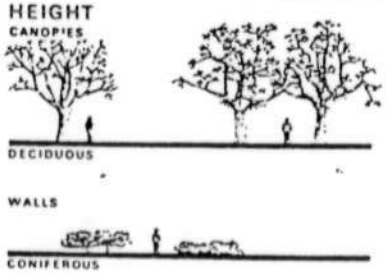


VOLUME

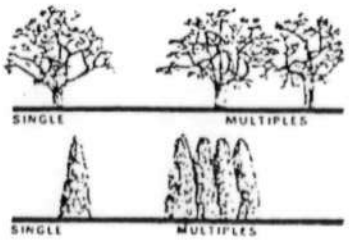
BRANCHING PATTERN — BRANCHING SPACING — BRANCHING HEIGHT



HEIGHT



WIDTH



Figure

SOURCE: *Plants, People, and Environmental Quality*, U.S. Department of the Interior, National Park Service, 1972.

CHAPTER SIX

6.0 Design Requirements

6.1 Brief/space requirements

The thesis as aforementioned is aimed at providing a fully equipped health therapy centre; physical fitness nutrition education and all, in a totally recreational atmosphere to enhance good health, relaxation of nerves and stress build up in an urban setup. The centre in order to be a self maintaining one and also aid in building up the country's economy, shall be commercialised whether publicly owned or privately owned. In order to ensure an efficient, well coordinated complex such as is being proposed, the following functions shall be provided.

6.1.1 Central Administrative Unit

This shall be the controlling wing of the whole complex. It generally deals with management and organisation of all other activities that shall take place in the establishment. Spaces within this unit include the following offices:

General Manager/Director	$24m^2$
Assistant Manager	$18m^2$
Secretary	$12m^2$
Hydrotherapists	$12m^2$

Physiotherapists	$12m^2$
Exercise Instructor	$12m^2$
Aerobic Instructors	$12m^2$
Dietician	$12m^2$
Enquiries and Information	$12m^2$
Accounts	$18m^2$
Accountant	$12m^2$
General Office	$24m^2$
Conference Room	$30m^2$
Kitchenette	$6m^2$
W.C.'s and showers	$6m^2$
Other offices	$12m^2$ each

6.1.2 Accommodation Unit

This unit houses residing users of the facilities and boasts nearly all facilities that go with hotel accommodation on a lesser scale.

These include:-

Spaces	Space Areas
Single room	$16m^2$
Double room	$24m^2$
Launderette	$24m^2$
Linen store	$6m^2$
Cleaners room	$12m^2$
Staff Changing/rest room	$12-18m^2$
Kitchen	$12m^2$
Control/Store	$9m^2$

Spaces	Space Areas
Restaurant	$90m^2$
Lobby/bar	$12m^2$
Service access	-

6.1.3 Clinic/Medicare Facility

Provides services ranging from normal clinical consultations to evaluations and tests of all kinds dealing with the body in such establishments.

Spaces	Space Areas
Doctor	$18m^2$
Nurses	$18m^2$
X-ray	$24m^2$
Treatment	$12m^2$
Laboratory	$9m^2$
Attendants	$12m^2$
Evaluation room	$24m^2$
Waiting	$12m^2$
Restroom	$9m^2$
Ambulance boy	$15m^2$

6.1.4 Indoor Therapy Unit

Gymnasium	$120m^2$
Aerobics room	$36m^2$
Indoor pools	$300m^2$
Whirlpools (2)	$6m^2$
Aronatherapy units (2)	$6m^2$

Spaces	Space Areas
Facials	$6m^2$
Massage room (2)	$12m^2$
Rest room (2)	$12m^2$
Sauna (2)	
Air bath (2)	
Showers/WC, changing (2)	$18m^2$
Attendants	$9m^2$

6.1.5 Beauty and Fashion Plaza

This being a moral boosting constitution to the other facilities includes:-

Fashion parlour	$120m^2$
Changing (2)	$9m^2$
Offices (2)	$12m^2$
Hair salon/manicure, pedicure	$36m^2$
Attendants	$9m^2$

6.1.6 Outdoor (Leisure/Recreational Physical Training Area)

These are the facilities provided outdoors for the physical fitness therapy in a leisurely atmosphere. It shall include outdoor games and play area for all ages and portions of landscaped sitting areas for both young and old. It includes the following:

Badminton court for 7	$240m^2$
Basketball field	$448m^2$

6 lane track with football field	$200m^2$
Lawn tennis court	$480m^2$
Swimming pool	$1250m^2$
Hockey pitch	$792m^2$

*Diving boards of 1m require 9ft of water diving boards, 3m high require 12ft of water both have been provided in the outdoor pool.

6.1.7 Indoor Unit

As part of the Indoor Unit, the research centre has been included. This is for further research and experimentation purposes.

Space	Space Areas
Physiology Department	60^2
Pharchology Department	60^2
Exercise Biochemistry Department	60^2
Nutrition Education Department	60^2
Lecture facilities	140^2

6.1.8 Ancillary Facilities

Water treatment room	$50m^2$
Maintainance room	$24m^2$
Plant room	$18m^2$
Water tank	-
Parking lot	-

6.2 Zone Analysis

Having derived the final functional requirements and space areas an analysis of the zone becomes mandatory for articulate planning. Three main zones that have been identified on the proposed site are:-

1. The more public or noisy zones bounded immediately by the Arterial N16 Road Network and the collector street.
2. The semi-private zone farther into the interior.
3. The private zone bordered by the lake. The three can also be identified as the noisy, semi-quiet and the quiet zones respectively.

The brief can be classified from the above into 3 major categories that fit comfortably in each of the 3 zones identified above, i.e.

1. The Administrative Unit
2. The Indoor Therapy
3. The Accommodation Unit.

- The Administrative Unit by its nature easily lends itself to the public zone restricting vehicular access to that zone too, for safety of pedestrians and other users.

- The indoor therapy easily fits in the semi-private zone as users shall be from both outside the

site and within it.

- The accommodation unit belongs in the more quiet recesses of the site - the private zone. By and by, a relationship begins to exist between the functions, and the functions and the site.

6.3 Design Considerations

6.3.1 Indoor therapy

a) Swimming pool

"The Roman bath should be an appendage of every hospital and dispensary, of every Goal and Reformatory, of every noble man's mansion, and be established in every town in the kingdom as one of the most useful institutions of the country".

Robert Hardwicke 1964
from Dr. R. Wollaston's
Thermae Romano-Britannicae

Swimming and the facilities for swimming, should be an important factor in the life of a nation. The progress that is being made in getting people to take up swimming by affording greater facilities for the population to do so represents perhaps the most successful phase of the work done so far by the national fitness council of Great Britain and should be encouraged by all other nations too.

To ensure maximum, safety and comfort of users in swimming pools, the following measures should be taken:

- Materials used should be very durable as they are subject to hard and continuous heavy wear. Access lines should not be too steep and use of steps should be minimal for the disabled.

- Wet and dry areas should be properly segregated to avoid incoming bathers in outdoor shoes messing up the pool area.

- Tiles are liable to crack at water level (where maximum pressure exists) and should be properly non-slip and acid/abrasive proof.

- Pool lining should be of materials that can cope with poor pH 7 etching and under 100 ppm alkalinity.

- Proper care should be taken to finish areas where pipelines are situated at joints to avoid leaks from settlement or vibration.

- Diving boards should always be located where they can be clearly seen and should not be set against a too bright background.

- There should be adequate vapour barriers, ventilation and space heating when necessary.

There should be good access to clean or change light tubes or ventilation outlets set out over the pool.

- Non-corrosive materials should be used at points that have contact with water like, structural uprights, cubicle stanchions, fitments and hinges etc.

- Surrounding of the pool should be properly finished and landscaped or well kept.

Pools for disabled

Confusion can arise when designers think that disabled people only want treatment. They can enjoy water too and more often than not, accessibility into a normal pool (deep) offers them nobility and means everything. No swimming pool should discriminate between levels of capability by providing solely for the physically able. Moreso, no architectural barrier must exist within a building since even a thoughtless step or narrow doorway can restrict a disabled person.

The disabled become mobile in water and hence care must be taken to provide:-

- deeper not shallow water
- slopes not stairs
- wide handrailed pools without ladders
- ramps and easy parking spaces for wheelchairs near main entrance.
- notices to appear on new buildings indicating whether they are suitable for disabled persons or not and whether accessible toilets have been provided (chronically sick and disabled persons Act 1970, U.K.).

  Changes of level are the worst barrier in any swimming pool hall.

  Changing facilities beside pool are best and body dryers are also useful.

Pools for medical therapy

Pool designs may vary according to their particular requirements for the patients but they all require rapid water treatment services, highly effective circulation and above average water temperatures from 30°C - 35°C. These pools are basically ordinary tanks adjusted for disabled people or people needing Hydrotherapy. They might have raised sidewalls to suit wheelchairs, water access ramps and chutes, safely handrailing, under-water kinesithesic equipment, treatment bays as well as mechanical hoists, operated by motors lever or water lock type weights for special needs of totally disabled bathers.

b) Sauna

- Block or timber construction with good heat insulation.

- bathing area should be as small as possible

- darkwooden linings reduce heat radiation on ceilings and walls.

- Solid wooden walls of soft wood can be used but not in the store area.

- Plank beds of lattice should be used to enable air circulation and at various heights for comfortable sitting and lying. The top bed/bench should be appropriately 1m away from the ceiling.

- Plank beds should be demountable for cleaning

floors to be of gripping materials and no wood frames to be used.

- When stones are used, hot fire door should be self-closing.

Air baths should be provided for breathing in cool fresh air, to balance hot air and to cool the body. If air baths are not possible, then well ventilated areas will do.

Rest room benches should be remote from sauna.

Massage room should allow for 2 persons, 2 massage points (public sauna).

c) Changing rooms

Where these are provided, lockers and other storage facilities must be taken into consideration.

- Durable materials like well treated timber should be considered for hardwear.

- Spaces, doorways should accommodate wheelchairs and people changing.

- Cubicles should be of non-corrosive materials where metals are used.

- Floors and walls should be of non-slip materials and easy to clean.

6.3.2 Outdoor therapy

a) Playing fields

- It is suggested that for whatever sporting purpose playing fields are to be laid out, a site

should, if possible, be chosen in open surroundings but not bleakly open.

- Grounds should be planned in accordance with consideration of rainfall, sun positions and the direction of the prevailing winds.

- Buildings should harmonise with their surroundings and general layout of playing fields.

- Fields should be well equipped and placed in good care for maintenance and for instructions in all forms of sport and recreational physical training activities.

b) Bath houses

Resistance to deterioration and fire is especially important here. The constant dampness which usually prevails causes rapid deterioration and is harmful to many materials therefore materials which may be entirely satisfactory in ordinary buildings may not be desirable for bathhouses.

- Fire hazards must also be considered in selection of materials particularly since the building is generally in an isolated location and without attendants a good portion of the year.

- Adequate dressing and sanitary phombing should be provided for every public swimming pool. An exception to this may be in pools where available facilities are provided in connection with the general development for other purposes of adequate capacity and number in close proximity with the pool.

- Every bathhouse should be provided with separate facilities for each sex with no interconnection between the provisions for male and female.

-The rooms should be well lighted, drained, ventilated and of good construction with impervious materials employed in general, finished in light colours and so developed and planned that good sanitation can be maintained throughout the building at all times.

- Floors should be of concrete, free of joints or openings and should be continuous throughout the area with a very slight texture to minimise slipping but which should be relatively smooth to ensure complete cleaning.

-Floor drains should be provided to ensure complete drainage of all parts of the building with a slope in the floor of not less than ¼ inches per ft toward the drains.

- Doors to bathhouses should be flush types for ease of cleaning. Avoid use of water solube glues and provide toughened protection panels for the lower parts.

c) Walkways

- They should be of hard surfaces and only slightly textured to enhance movement for disable users.

- Routes of travel from parking spaces to buildings must provide ramps at points of pedestrian flow; smooth, hard and slip resistant surfaces with no change in level of more than half an inch or 1.27cm.

- Walkways should have a minimum width of 1.5m if they are to accommodate an able bodied user and a wheelchair at the same time.

d) Play Areas

All play equipments should be designed and built for safety of the participants and:-

1. Have hand or safety rails on all steps and ladders and non-skid treads on all steps.
2. Be placed over suitable surfaces that reduce danger of injury or abrasions in the event that a child falls from the climbing, moving or sliding equipment (safe landing surfaces should be provided at ends of slide chutes).
3. Have sufficient structural strength to withstand the unexpected loads.
4. Be designed to discourage incorrect use and minimise accidents.

Playlots (enclosed area with play equipments and special facilities) including

(a) Play equipments such as climbers and play houses, sculptures, sand area, spray pool

(b) An open turfed area for running and active play shaded area for quiet activities

(c) Miscellaneous elements including benches for supervising parents; walks and other paved areas wide enough for strollers, carriages, tricycles, wagons etc.

(d) Space dividers (walks, shrubs, trees, fences, a step up drinking fountain, trash containers and landscape planting should all be provided.

6.3.3 General

a) Stairs

Considering the fact that all kinds of people, able-bodied and disabled, young and old are going to use the building, then stairs should be generally designed to afford ease in climbing them.

- less steps with more landings can be utilised in the design of stair cases to afford the aged or crutch users to rest in-between flights.
- Risers should be of minimum height so little effort is used in the act of climbing.
- Treads too can be made more comfortable by giving at least widths of 3000mm.
- Handrails should be of non slip materials and easy to grip.

b) Ramps

In order to facilitate movement of the disabled

in any building and more importantly allow them use of facilities like everyone else, ramps must be provided for wheelchair users.

Some measures to be taken include the following:

- Ramps must have a clear flat floor area both at the top and at the bottom.

- Landings or half landings must be wide enough for a wheelchair to spin around.

- Ramps should have handrails and be at least 1.8m wide to enable two wheelchairs pass by each other freely.

- Handrails should be designed to afford adequate support to those using them.

- They should be continuous throughout the ramp length and be securely fixed at a height of not less than 0.840m or more than 1.0m measured vertically above the top surface of the ramp.

- They should be terminated by a scroll or some other means.

c) Parking

Questions that arise here are:-

- Will the parking of cars in the road outside the ground if there isn't enough room for a car park inside cause trouble with the police?

- What facilities are available for a car park?

- How much grounds is there available for this purpose and to what extent may the road become congested on match days or days when there is a large gathering.

Bedford R.U.F.C. has a splendid ground right in the centre of the town an excellent stand and a good seminar hall, but the parking of cars in every side street opening off the golding town road does not provide a happy arrangement. Again, Twickenham presents the best there is on this earth as a Rugby football ground and the car parks are adequate for even the greatest number of spectators attending the international matches but the difficulties and discomfort of getting to and from Twickenham or even out of the car parks on the day of a big match are better described or remembered than experience.

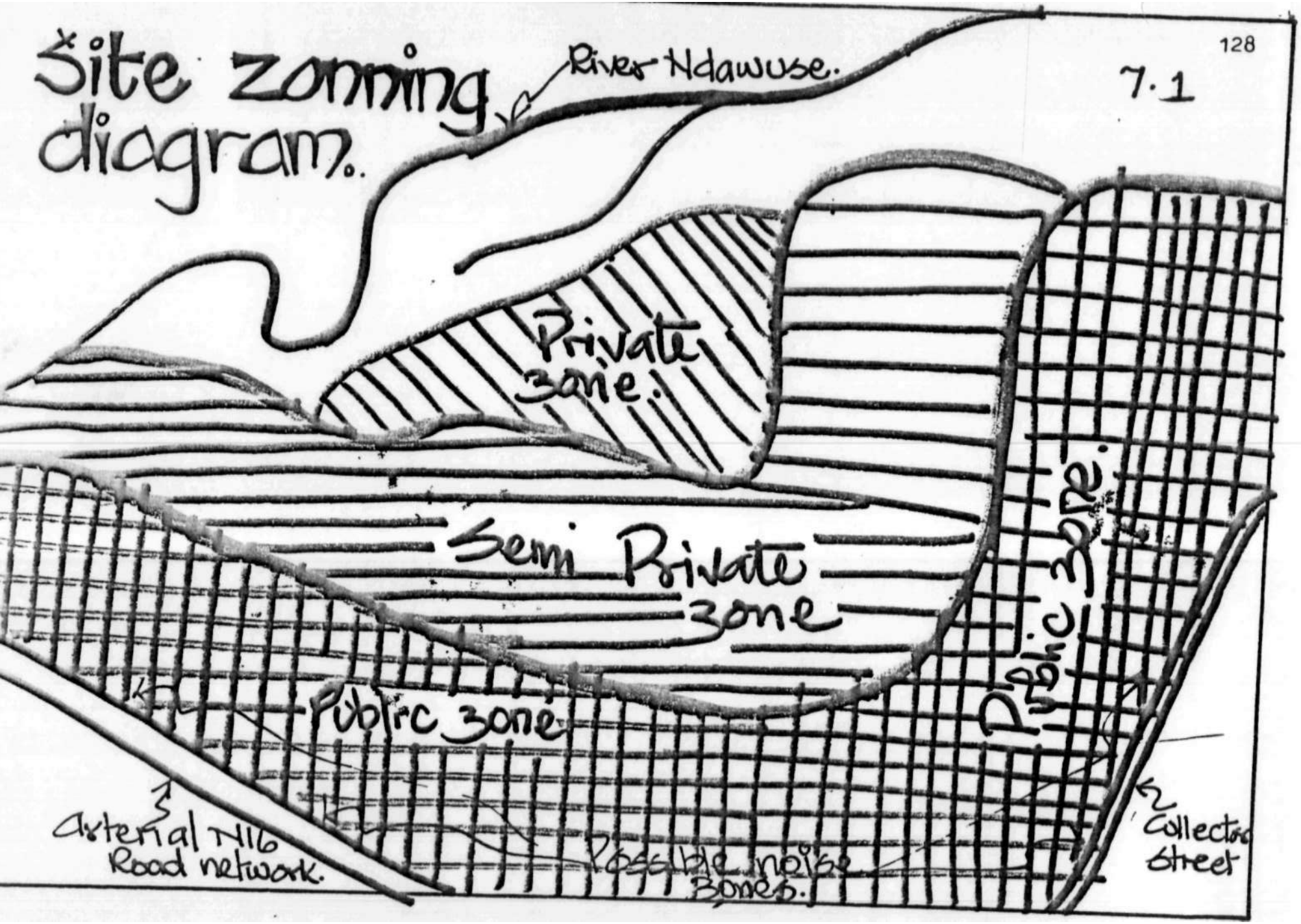
A balance should be striked between carpark spaces provided and ease of driving in and out of them together with distance to the activity areas for those who have to come from outside.

CHAPTER SEVEN

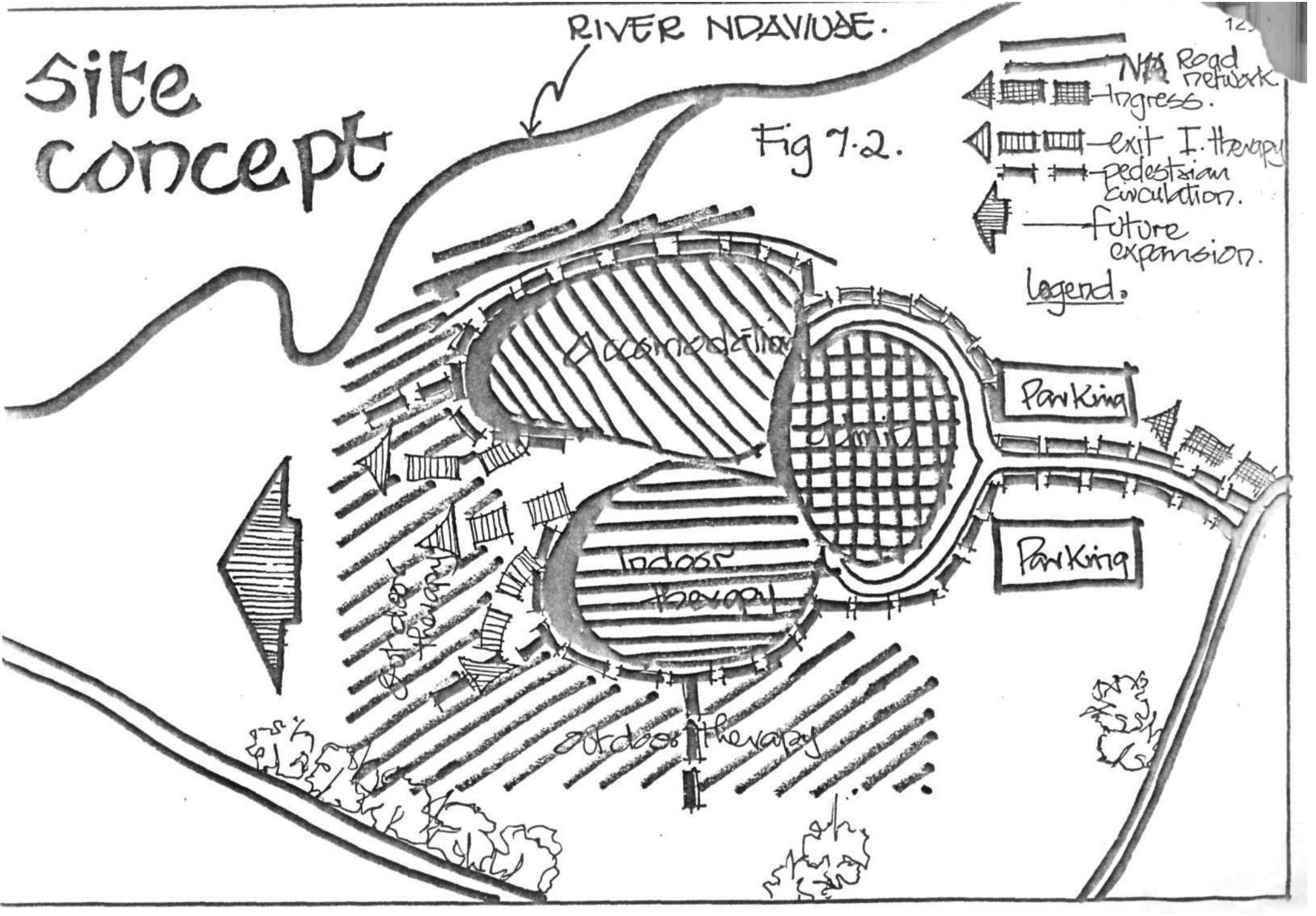
7.0 Problem Synthesis

Site zoning diagram.

7.1



Site concept



Functional relationships

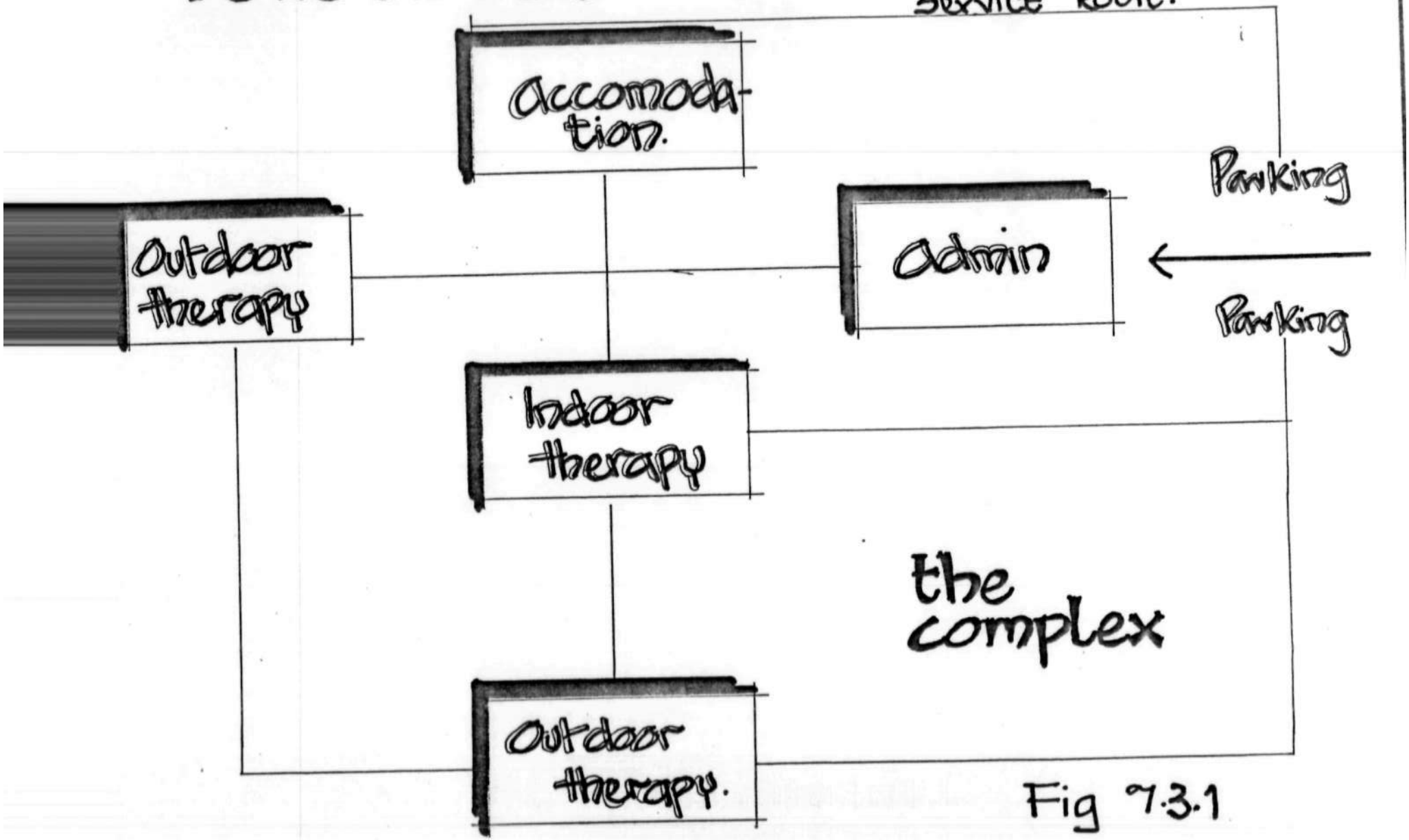
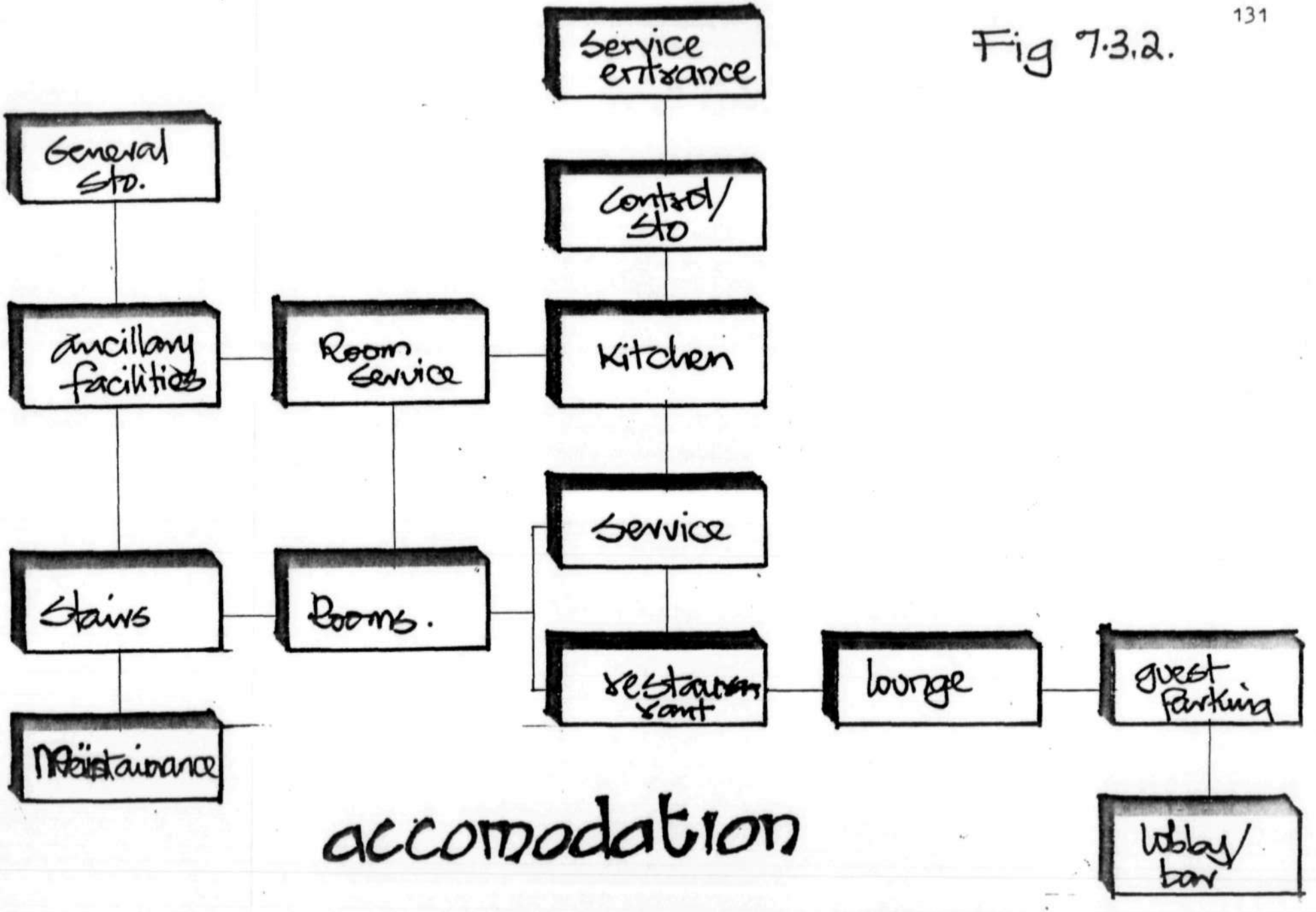


Fig 9.3.1

Fig 7.3.2.



accomodation

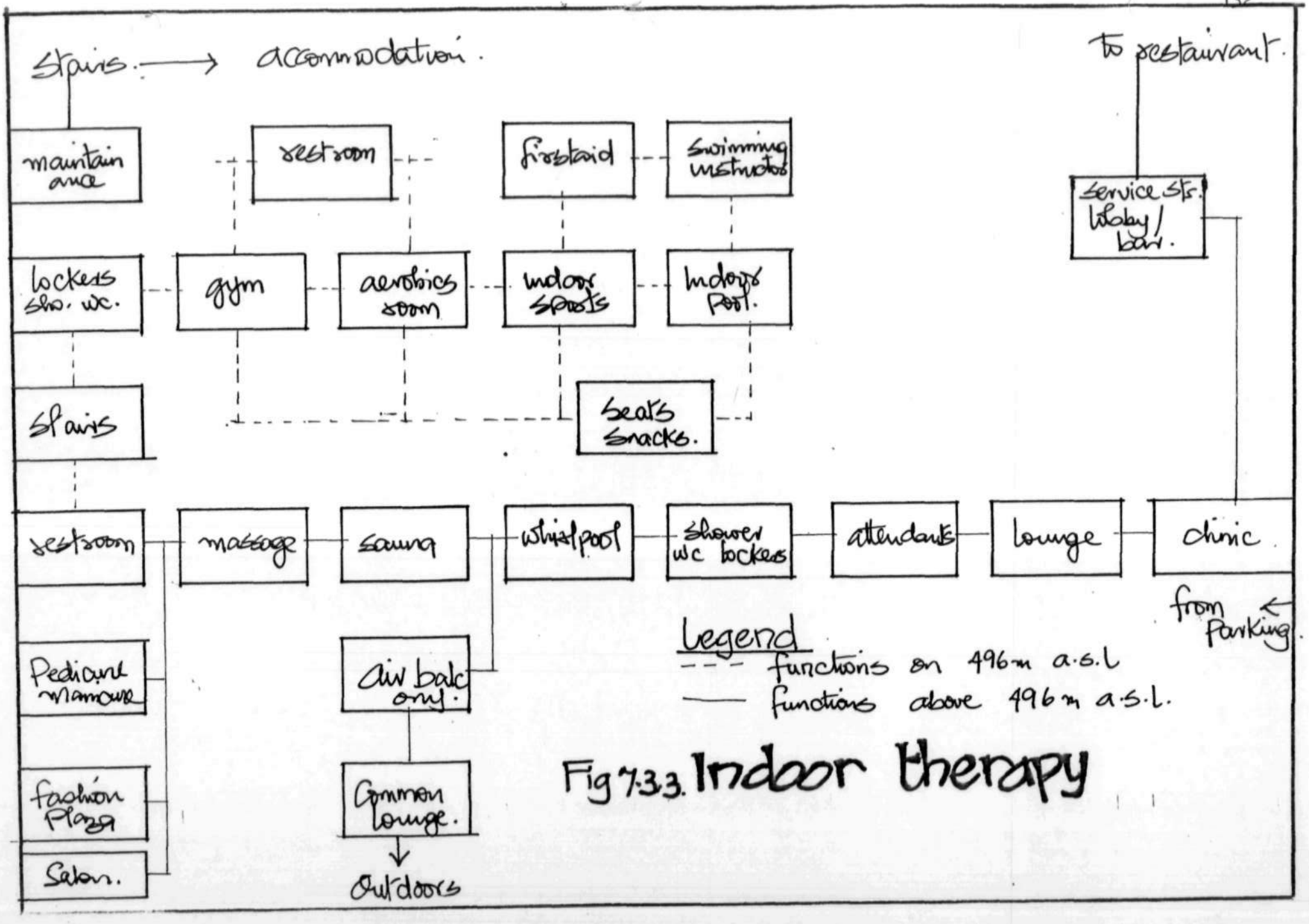


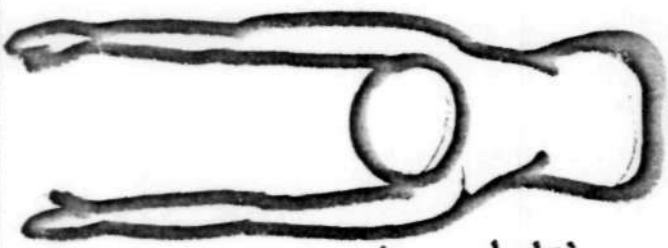
Fig 7.33. Indoor therapy

7.3 Functional Relationships

Having derived the schedule of accommodation and space requirements and as the first step towards bringing out design concept, a functional relationship diagram or diagrams, showing how the various functions relate is drawn.

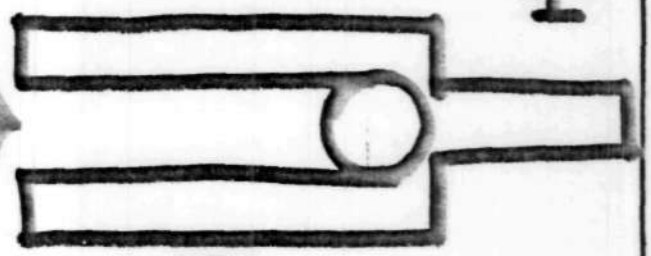
These relationships give first, an idea of how the various groups of activities relate, then goes further to show the relationship between unit spaces within sections or functions. For a good functional relationship between section and units, activities are related taking into consideration the different zones, traffic, points of ingress, noise zones and access and one can have a good idea of what the design will be like. Also, the design problem can actually be solved by a good functional relationship diagram.

Plan. 7.4



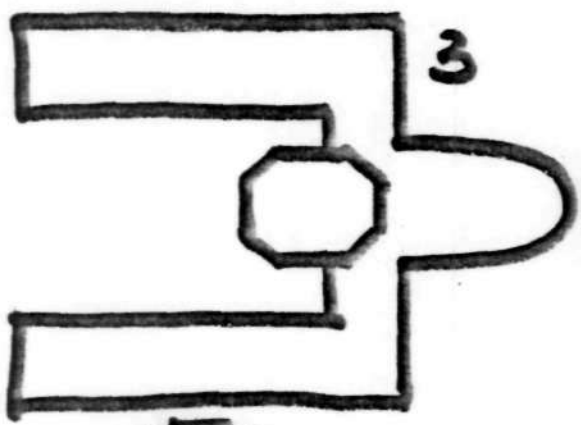
Swimmer contemplating diving.

1



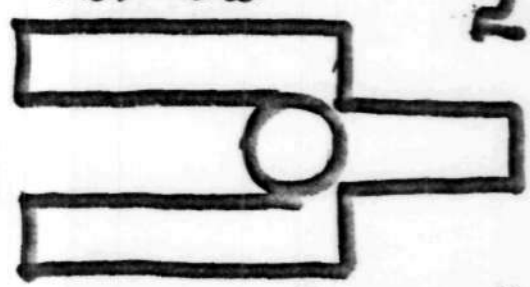
1) elongated form
2, too long corridors.
3, Space configuration not desirable.

3



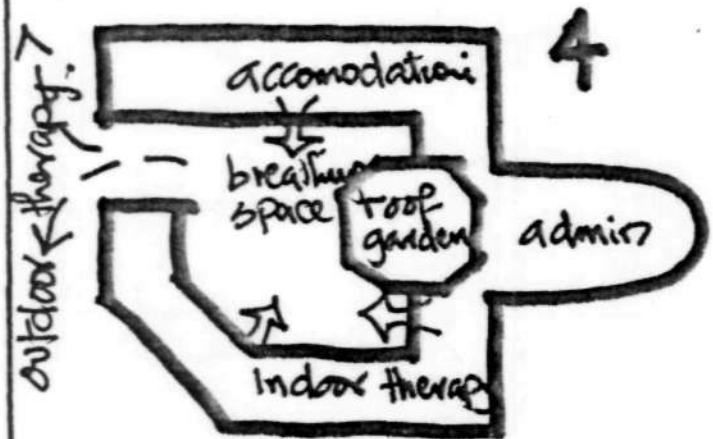
1, wider breathing space.
2, Space config much better.
3,

2



1, more comfortable formy shape.
2, breathing space minimal.
3, Two arms look equal but they are different functions.

4



1, Arm modified, two arms no more equal.
2, Head balanced.

outdoor therapy. Form: Recuperating swimmer about to dive into pool.

form concept

7.5 Concepts in Leisure and Recreational Planning

Several concepts avail themselves to be employed in design of specific programmes and a splendid adaptation of all or a combination of some of these concepts shall help to give the final composition a visual theme or an architectural character.

For the purpose of this project, several concepts have been considered thus:-

a) Total planning concept
b) Building design concept
c) Vehicular parking concept
d) Landscape design concept

7.5.1 Total planning concept

The total planning concept of the complex views the whole complex as a single organism composed of interlinked organs which are the activity cores.

This concept in which similar activities are grouped into activity cores allows the various groups of activities to be housed under a number of interlinking structural envelope which permits phasing and expansion according to priority, profitability and availability of funds. This grouping also allows buildings to be blended by the landscape to the outdoor area and enables fulmilment of environmental requirements such as maximisation of natural lighting and ventilation.

The flattest part of the site carries the more stable non extensive admin. and the entrance facilites. As the sight slopes inwards, an indusive floor is carved into the ground to the extent that the slope allows for a 3m headroom and more indoor activities are located here. This saves for more levelling or filling or creating unnecessary different levels which is the least required feature of this kind of project. The surroundings are then terraced by use of extensive but comfortable 1:12 ramps all over the required areas together with landscaping materials hence minimising the amount of earth movement required. This helps reduce total cost of construction. Locations for the activity areas are determined by taking into account the characteristics of the site and its main resources.

7.5.2 Building design concept

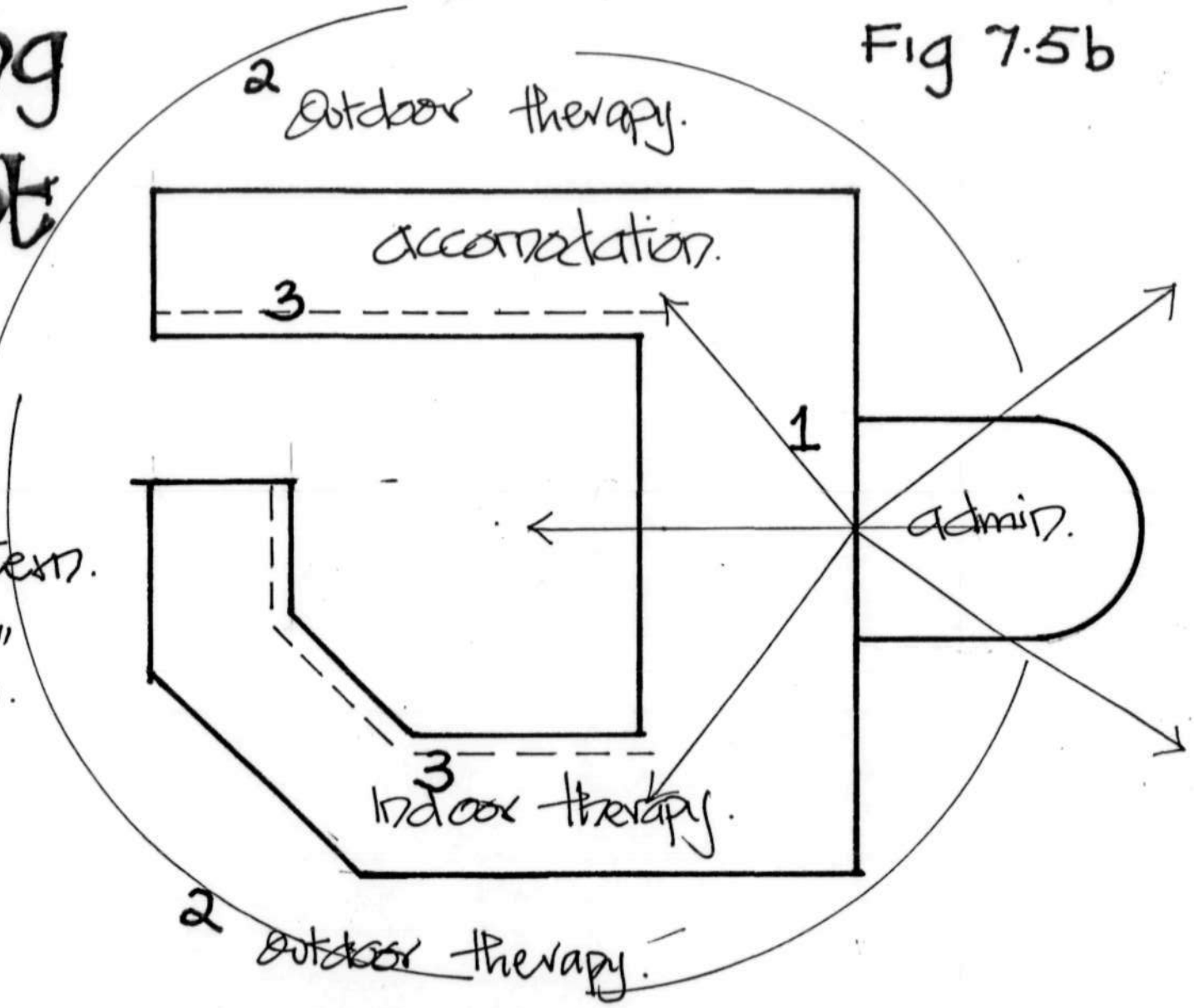
This concept aims to satisfy the design goals and objective and other influencing parameters. This allows for flexibility in the use of spaces within safety limits. The total plan should permit ease of administration and supervision of the complex and ensure opportunity for its use by all the members of the community including the aging and the disabled. The plan concept reflects a combination of the following space ordering patterns.

- axial ordering i.e. along indoor and accommodation cores

Building design concept

Fig 7.5b

movement Patterns



Legend.

1. radial pattern.
2. rotational "
3. axial "

- radial i.e. from entrance and administration to other activity cores
- rotation i.e. in outdoor therapy areas around the indoor activity cores.

The shapes and forms of the built area vary according to these principles but will fit in an order of positioning buildings in space such that the forms of built and open space are indeterminate and based on the unity in diversity norm while fulfilling functional and planning requirements. The resulting envelope is an outdoor area which serves as an intermediary in form of courtyard and pool to the built structure and the open proper outdoor therapy fulfilling the environmental planning requirements of lighting and ventilation without necessarily sacrificing the ability to cope with adverse weather conditions.

7.5.3 Vehicular parking concept

The vehicular storage concept is based upon the following principles:

- Extensive parking lots should be avoided as they are a major cause of glare and should be preferably grouped in landscaped clusters to provide shelter in and around parking spaces.

- One way access should be used and parking outside the parking spaces should be made physically impossible.

- The parking facilities should be within 200-300m maximum 800m of the complex.

- Pedestrian access only should be provided for the picnic area adjacent to the parking lot and within the complex.

- It is a generally accepted policy to regulate entry of cars deep into a site as this helps reduce noise and air pollution, traffic congestion and other hazards. All these, most recreation centres are burdened with and seeking to escape from. It can be achieved by locating parking areas as near to the point of entry as is logically possible.

7.5.4 Landscape design concept

Apart from functional needs, space is generally needed for landscaping to improve the appearance of buildings and add to their aesthetic value. The introduction of landscaping into building interiors helps provide a counter attraction within the enclosure for inward facing rooms to compensate for loss of external views.

Through landscaping, the range of features that can be provided may extend from hard paving and man-made sculptures to gardens, lawns, fountains and pools. In each case, the surroundings are used to enhance individual character and interest to the premise while at the same time satisfying functional requirements.

Landscaping provides a means of extension to the indoor facilities through use of lawns, courtyards, paved areas for dining, refreshments and relaxation. Important factors of consideration include suitable preparation and maintainance methods, drainage of grounds and selection of ground cover that would withstand intensive use. A combination of both hard paving (for paths, terraces and functional areas) with natural vegetation (for perimeter and divisional landscaping) is usually most effective.

CHAPTER EIGHT

8.0 PROBLEM SOLUTION

8.1 The Design Report

The whole of the recreational physical training facilities are located on the same site of approximately 250m^2 with possibilities of further expansion if required in the future.

The built up area constitutes an accommodation wing as well as the indoor therapy unit/research centre and the administrative units. These have a kind of relationship with the outdoor therapy whereby activities can be easily transfered from indoors-outdoors or vice versa. The outdoor constitutes playing areas for kids, multipurpose play fields, and a 17m x 33m outdoor swimming pool which is always fed constantly with freshwater properly filtered and electrically pumped from a water purification and recirculation room and it has its own bathhouse.

Situated at the lowest level of the site (basement level) are the 100m^{2}gym, and indoor games with changing rooms, W.C.'s and showers. At the south east end of the site, a picnic ville is located for such purposes as little gatherings or family picnics. From the ingress point on both sides of the road, parking adequate for all anticipated vehicles on site is provided with a little less than 100 parking spaces.

Stairs and ramps provide vertical access connecting all the facilities throughout the building and common rooms have been provided for indoor games like billard, darts poker and other such activities that adults may like to participate in at any club.

All these in order to create relaxation and leisure after the rigours of a day in an urban set up.

The accommodation wing caters for both single and double occupancies and all facilities required in any accommodative function as well as a 72-seat restaurant which links with an outdoor eating area that seats 68. The indoor therapy unit caters for both outside patronage and for resident users and features a therapy pool as well as indoor learning and swimmers pools with changing rooms. The indoor pool is linked by a channel to the outdoor one for easy transfer of activity during adverse weather conditions.

In summing up, attention may be drawn to the great foresight that has been shown not only in laying out the play fields of the outdoor therapy and in planning the units but also in the choice of a site accessible to users and beyond the precincts of the town and which is safeguarded against being built in and having the leisurely atmosphere and views obscurred at any future time. It is a site

moreover which is well served by amenities like water, electricity, good drainage slopes and an already existing collector street branching out from a major arterial Network.

8.2 Building Services

8.2.1 Water supply

Water is supplied directly to the site through the distribution networks DN500 and DN350 already existing along the arterial N16 and collector streets respectively. The DN350 along the collector street is a ductile cast iron pipe (DN10 150,2531/DIN28600) with outside coating DIN 30674 and tylon sockets.

The DN500 along arterial N 16 is a welded steel pipe (DIN 1626/2458) with outside coating DIN 30670 and inside coating DUGW 342 with welded joints and cathodic protection as directed by the Resident Engineer.

Maximum pressure in the pipes is 90m but in the case of an increase, pressure reducing valves will be required. A water tank for storage is also provided.

8.2.2 Drainage and telecommunications

This network shall be tapped directly from existing ones along the arterial N16 and collector streets.

8.2.3 Electricity

The distribution network along the roads, provide electricity to the site. The voltage of these system has been stepped to 11KV from the initial 132KV/330KV bulkpower of the national grid system.

8.3 Conclusion

In response to the growing evidence that hospital bills, health care costs and degenerative diseases can be reduced by the better and less expensive benefits that could be desired from fitness clubs, more attention should be paid to health care programs by Nigerians as a whole.

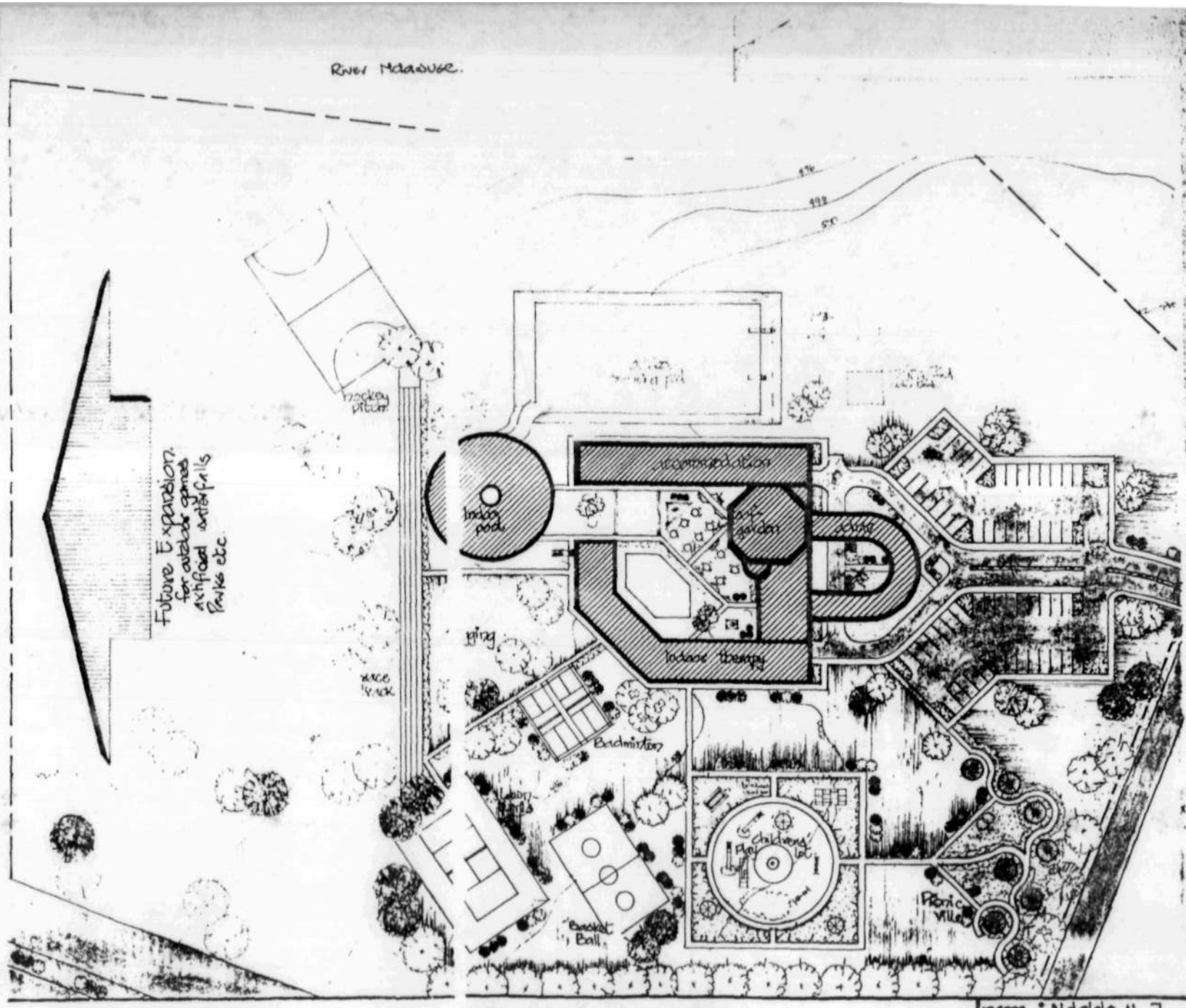
Although almost no data on the long range cost effectiveness of fitness exists as yet, the venture should be considered worth looking into by the Government and to provide as a supplement to already existing campaigns like P.H.C. (Primary Health Care) etc. in order to ensure their complete success in achieving health for all.

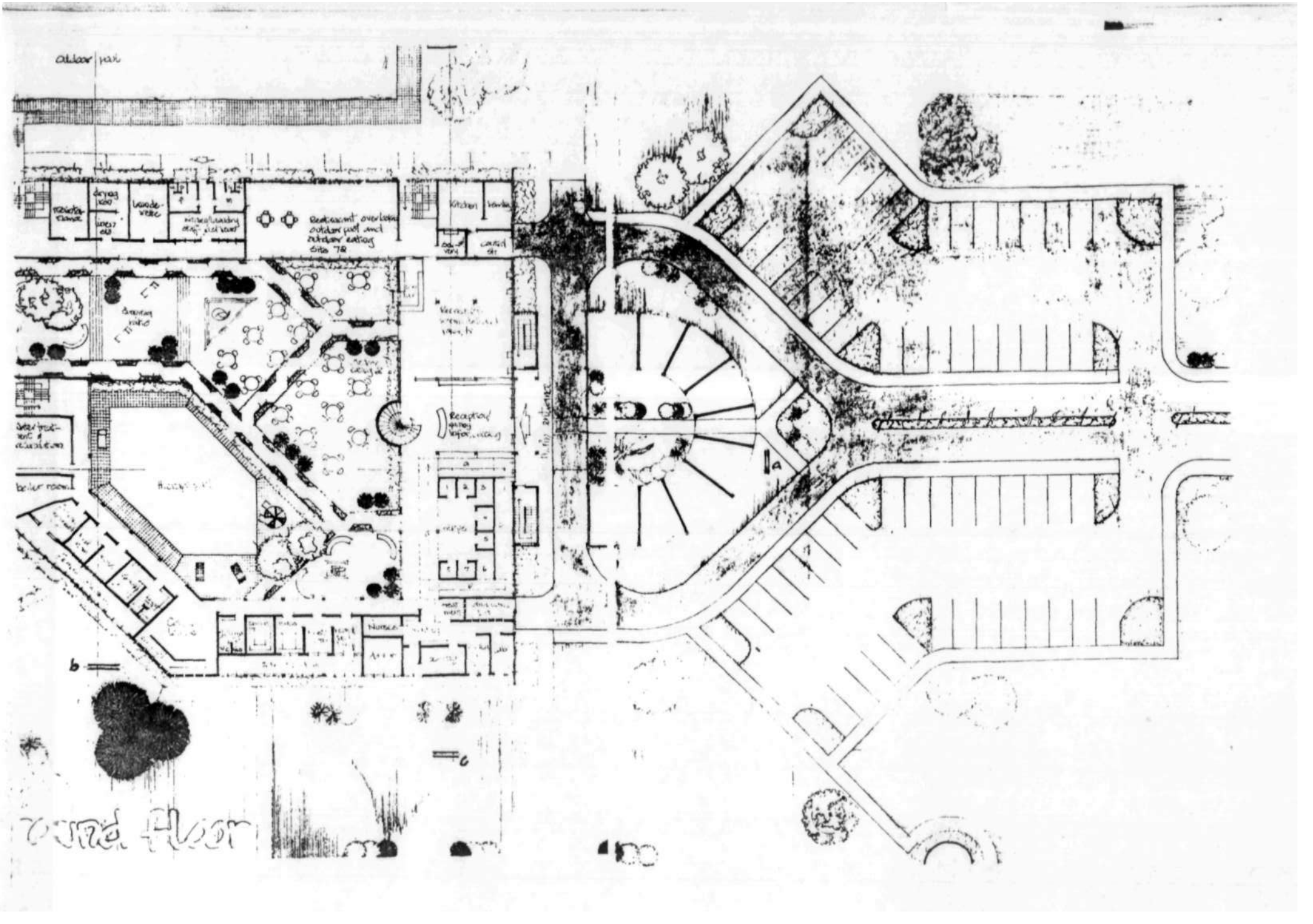
This proposal would provide other benefits such as creating an atmosphere of interaction for youngsters and teenagers and keep them out of mischief rather than hanging out in rowdy joints and falling into remand homes or other such correctional facilities. Working class shall gain a lot too from the stress

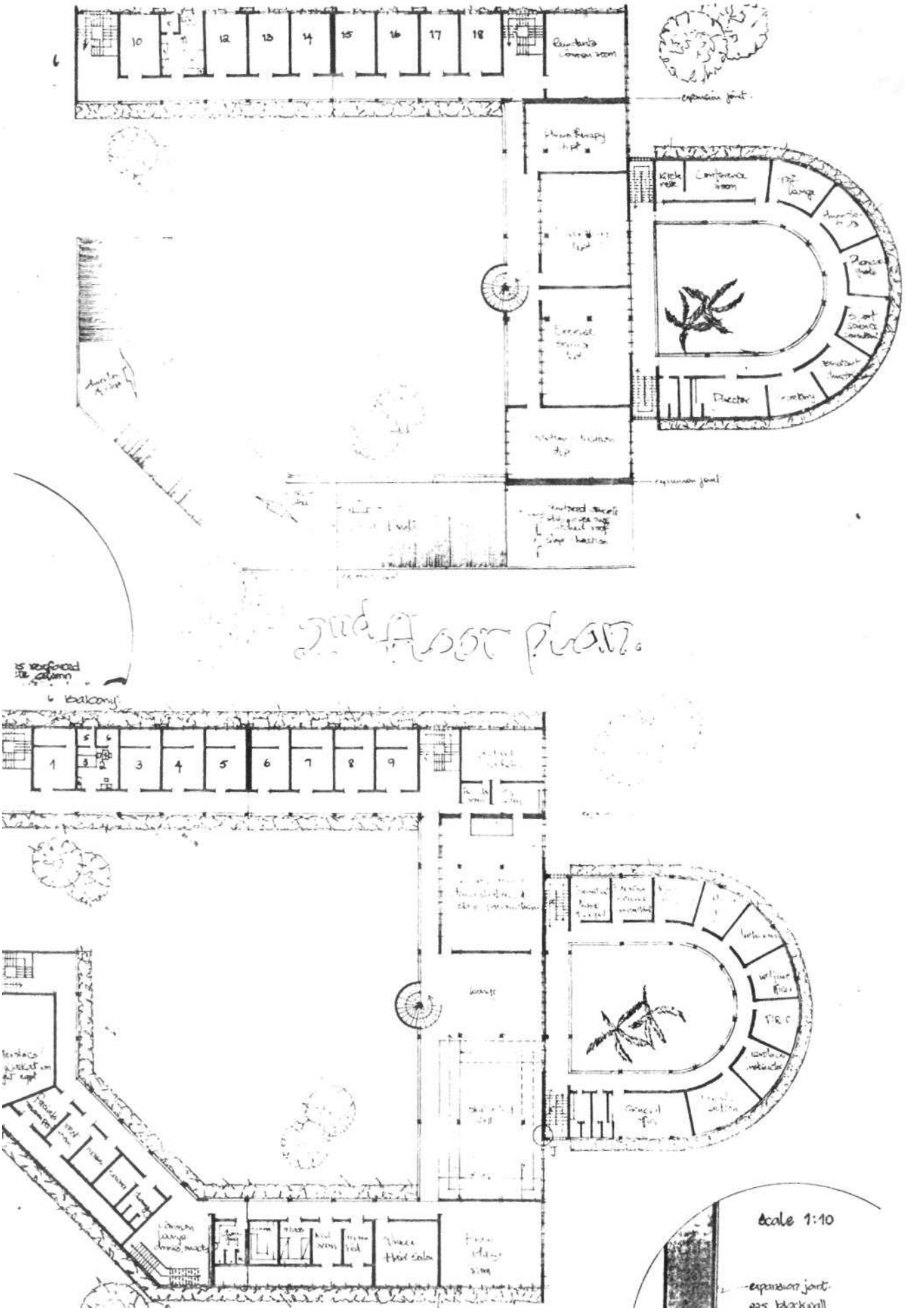
relieving activities especially in the urban set-ups.

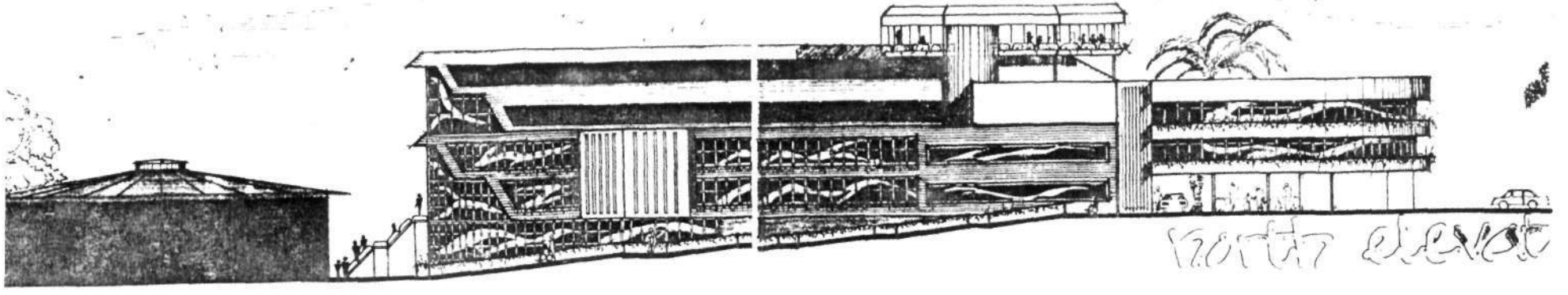
Worksite, stress management programs coupled with well equipped health clubs and gardens if encouraged by companies and private and public offices would reap so much benefits for such establishments too. The program would not be such a bad idea as a public liability venture too.

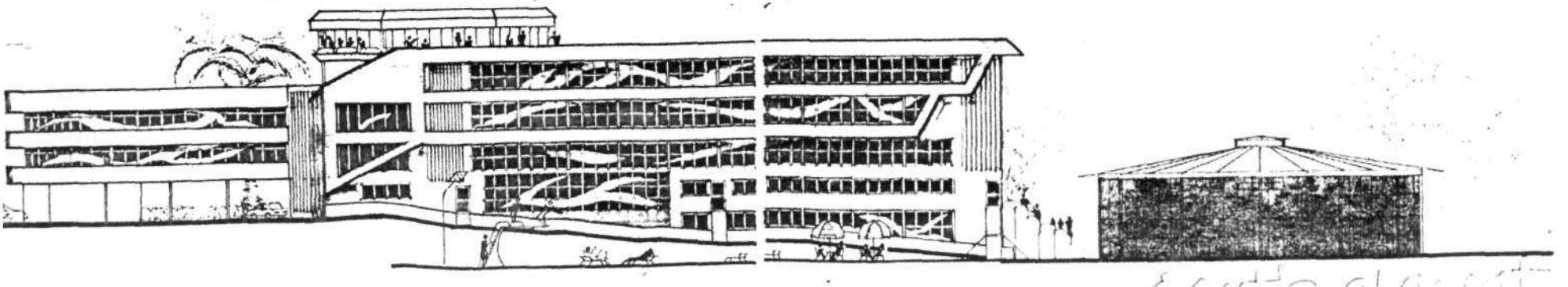
The architect can do a lot in this field in collaboration with the experts in exercise science on how these centres should operate by properly co-ordinating the different relevant functions and in providing the right kind of atmosphere in order to better equip Nigerians as a whole.


River Meadows.
Future Expansion for athletic sports Artificial astroturfs Parks etc.
hockey pitch
indoor pool
accommodation
roof garden
access
Indoor therapy
Badminton
Basket Ball
Children's Play lot
Picnic Area
name : Ndaldo M. J.
project: MSc Thesis
supervisor: Prof. Burt
scale : 1:500


Outdoor pool
Restaurant overlooking outdoor pool and outdoor eating
Kitchen
Reception
Nurses
a
b
c
Third floor


10
12
13
14
15
16
17
18
Director
scale 1:10



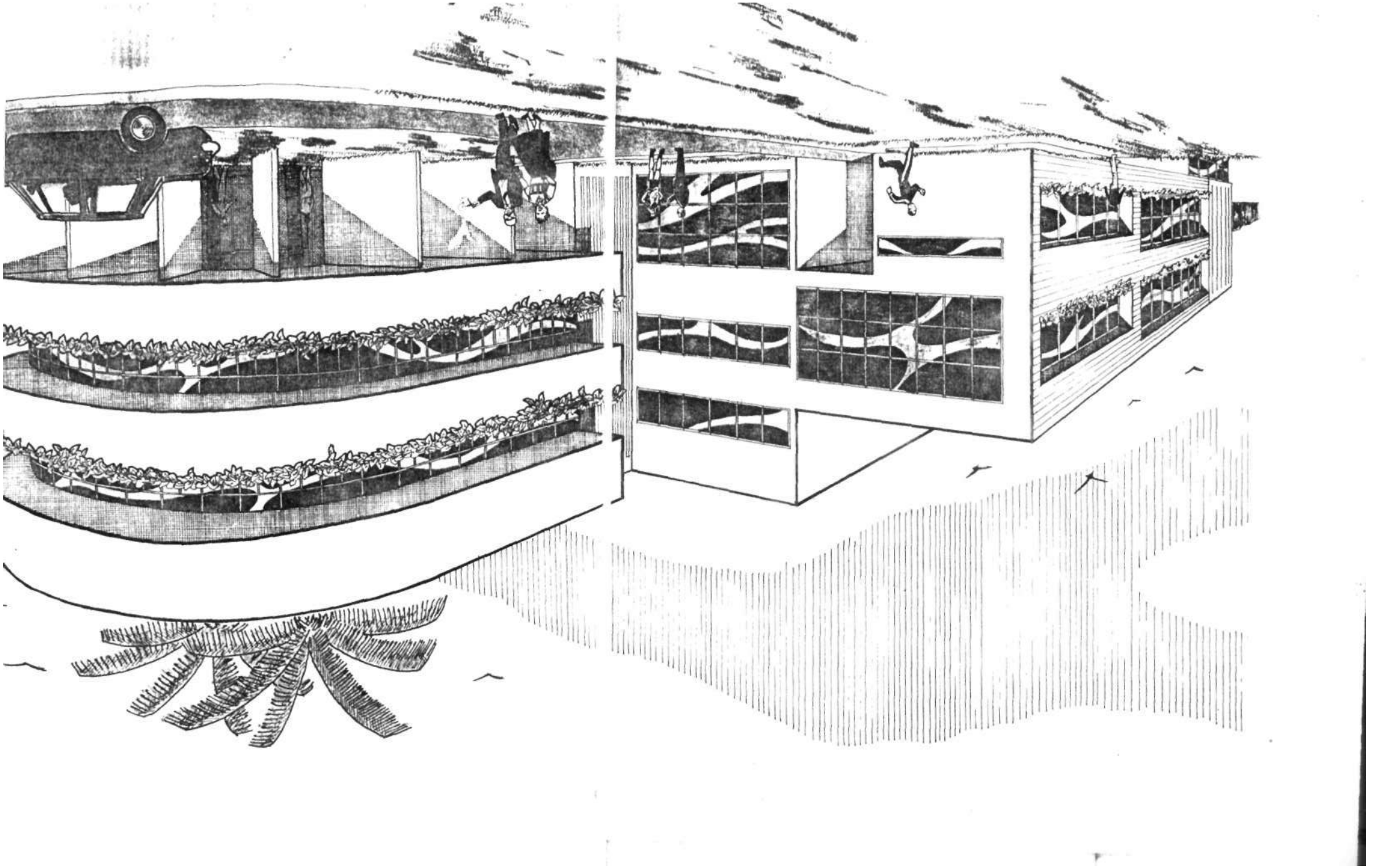


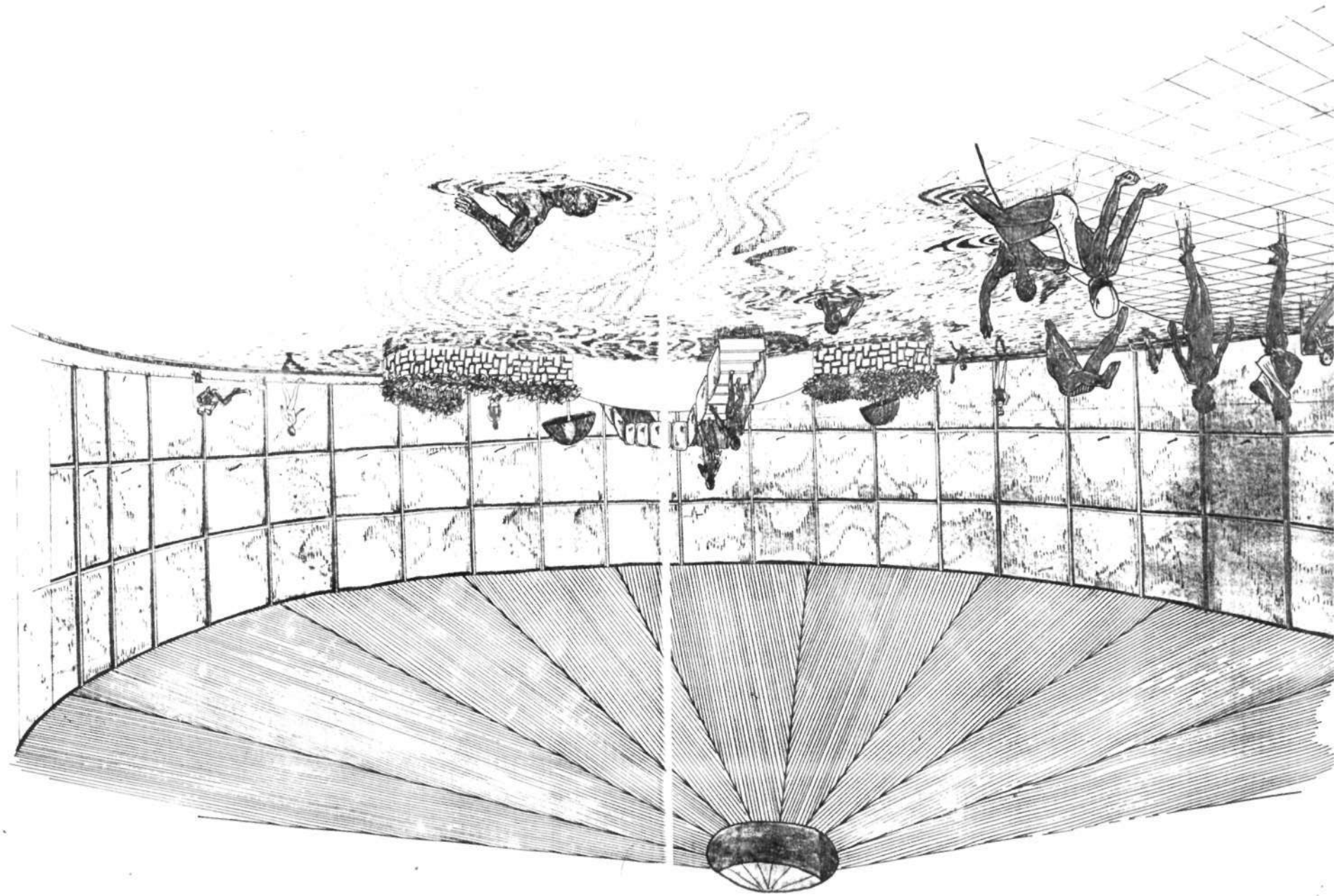
east elevation

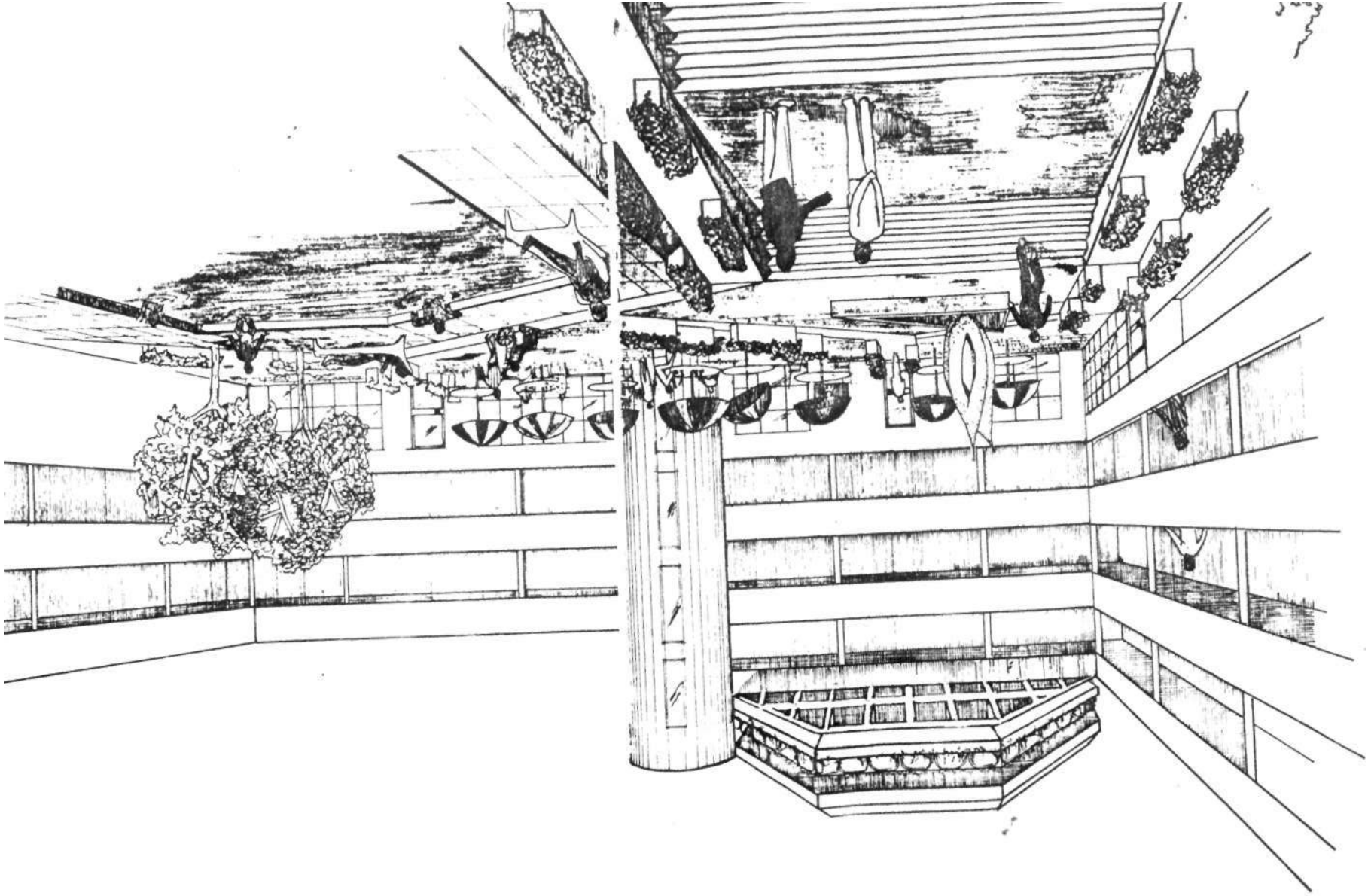
west elevation

Section
Physiology Dept
Lecture
Hall

Section
Lecture Hall







REFERENCES

1. Asun, C.F. (Unpublished Seminar) "Fitness. A Strategy for national survival".

2. Baun, W.; E.J. Bernachi and Tsai, S.P. "Effects of a corporate fitness program on Absenteeism and health care costs. Journal of Occupational Medicine. January 1986.

3. Callender, J. and Dechiara, J. Time Saver Standards for Building Types. 1980 McGraw Hill Book Company, New York.

4. Chado, M.A. "Benefits of a commercial fitness centre". Sunday New Nigeria, July 25, 1984.

5. Dawes, John, Design and planning of swimming pools. 1979. Architectural Press. CBI Publishing Company Inc.

6. De Chiara, J. Koppelman Lee E. Site planning standards, 1978. McGraw Hill Book Company, New York.

7. Douglas McLeod "Experts give tips for wellness plan success". Business Influence, April 1986.

8. Geraint D. and Hellen H. (eds) Hand Book of Sports and Recreational Building Design. 1980. Architectural Press Ltd. London.

9. Hockey V. Robert. Physical fitness: The pathway to healthful living 1977. C.V. Mosby Company.

10. Jarrel, S. Philosophy for Study of fitness. 1972. New York, Houghton.

11. Kaldy, J. "Schools shape up with employee fitness". The School Administrator, April 1985.

12. Klinge, W. Charles, Universal 1989 (c) Copyright Universal Gym Equipment, Inc. Iowa, U.S.A.

13. Landphair Harlow C. & Klatt Fred Jr. Landscape Architecture Construction 1979. Elsevier North Holland Inc., New York.

14. Margaret H. Practical Exercise Therapy 1971. Blackwell Scientific Publication.

15. Michael Wilkens Jane. "All American Spas". Town and Country. January 1990.

16. Neal L.harry. Leisure Today 1972 Association of American Alliance for health, physical education and recreation.

17. Neufert E. Architect's data, 1980. Granada, London.

18. Webster, F.A.M. Sports Grounds and Buildings. 1940. Sir Isaac Pitman and Sons Ltd.

19. Urban and Regional Planning Department. Ministry of Works and Housing Abuja. Abuja Master Plan Report, 1980.