# WUDIL RURAL HOSPITAL

BY

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DEDICATION

TO MY PARENTS

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## THESIS ABSTRACT

It is evident that health facilities in the rural areas are inadequate. The few provided are ineffective because the planners were not concern so much with the needs of the Community. The author fills that the situation should be improved, subsquently resolved to plan a hospital according to the requirements of the people of the area concern, bearing in mind their customs and religions background.

It is impossible for an individual to satisfy all the rural areas over the Federation, therefore, the author Lmited himself to a particular rural area - WUDIL. Survey conducted revealed that, the need is "RURAL HOSPITAL".

Time limit made it impossible to produce architectural drawing of the whole hospital. However certain sections where certain essentials deserved to be stressed are taken. Included are out-patient department, diagnostic and therapeutic department, nursing unit and Administration Unit.

To prove that the building can be erected working is produced.

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INTRODUCTION

Rural Hospital is a focal point of Community Health and Service to humanity. It consist of Scientific facilities for treating Patients - patients who must be resident and patients who come to hospital regularly. How ever it is smaller and less complex than District or Teaching hospitals. It requires less intensity of medical, nursing and technical services, and have no medical facilities for medical students to learn their trade. In Britain their size range from 50 beds to well over 200 beds.

Rural hospital is provided to serve a group of towns where health centres, Clinics and Dispensaries can not suffice. The extent of service, kind of equipments, teaching and research facilities e.t.c vary with each hospital and is related to the services the hospital is to perform and the needs and demands of the surrounding community. Rural hospital such as this will provide a complete hospital services for the rural population based on area needs, with exception of some highly complex specialities which have to be concentrated in other advanced hospitals, because the number of cases in the catchment area is small. Thus it should certainly have all the ordinary specialist services available. That means it should have in-patient and out-patient Services for general medicine and surgery. It should, also have out-patient services for Opthalmology and

dentistry. Physical medicine will certainly be provided as an out-patient service.

Having analysed the scope and functions of rural hospital, its aims and objectives flows. They are:-

(1) Rural hospital should provide conducive atmosphere in which medical, nursing and auxiliary staffs working as a team could effectively apply their skill and techniques to the service of patients fresh from farm with minimum delay.

(2) Rural hospital should provide the best possible comfort to both patients and staffs, and shall discourage the spread of infection and promote effective nursing care.

(3) Rural hospital should be economically viable and adatable to the climatic condition of the surrounding area.

In order to have a clear conception of rural ho hospital, the author approach the study in the following manner. First, studied hospital planning in general and various hospital components in detail. This is discussed in the Chapters I - V. The site for this project is discussed in Chapter VI. Schedule of acommodation and Design Concept are discussed in Chapters VIII and VII respectively.

# CHAPTER I

## HOSPITAL PLANNING

"THERE IS NO MORE MISTAKEN PRACTICE THAN
TO START PLANNING IN PHYCIAL TERMS
RATHER THAN TO DEVELOP PLANS FROM
PRINCIPLES, PURPOSES AND FUNCTIONS"[1]

### INTRODUCTION

Hospital is a centre of scientific investigation and treatment. It consists of five components. These are out-patient department, Nursing Units, Diagnostic and therapeutic departments, Hospital supporting services and Administrative Unit.

The task ahead of hospital planner is to integrate these components to form a complex which enhance and facilitate modern practice, and save the time of doctors and patients, in the hope that almost certainly different methods in the future will be practicable in it comfortably.

### 1.1 PLANNING PROCEDURE

In any project two kinds of Planning are required - Functional Planning and Architectural Planning.

Functional Planning presents to the architect problems that he has to solve to create the desired hospital. Elements of functional planning are:-

1) Community needs (deficiency in health needs)

2) Demographic survey covering the geographical extent of the catchment area.

3) Climatic data (most important is micro climatic data)

4) Existing health and other social facilities

5) Medical and Administrative structures.

At the Architectural planning stage the architect translates his ideas and the requirements stipulated in the functional plan into workable and acceptable building design.

1:2 DESIGN PRINCIPLES.

a COMMUNITY NEEDS

Treatment given in a hospital is not in any way useful unless it is of the kind patient needs. To this effect a hospital planner must concern himself so much with the estimation of spatial needs. Survey which covers the geographical extent of the Catchment area should be conducted to determine those needs. The survey include demographic survey, People's attitude towards medical care, existing health and other social facilities.

There is no definite rule as regards the amount of accommodation required by a given hospital, because mobidity-that is prevelance of illness, age distribution e.t.c vary from one place to another.

By and large it is purely the job of the medical people of the area concerned to supply the architect with estimates of those needs, (i.e amount of accommodation, number of beds required, estimated number of patients expected e.t.c), from their experience of demand an existing facilities.

An important need which must not be overlooked is the psychological consideration of the people for whom the hospital is planned.

b) SIZE OF HOSPITAL

The size of a hospital is commonly indicated by numbers of beds. A 'bed' in the hospital sense is not abedstead - it implies all the resources for patients. It is essential to reach an agreement on the number of beds required at the initial planning stage. Number of beds determined other supporting services. Moreover accommodation for beds makes the largest single space demand within the hospital building.

Relative number of beds required for any given hospital is calculated in the following way:-

NUMBER OF BEDS = BEDS/1000 OF HEAD OF POPULATION

X

POPULATION OF THE CATCHMENT AREA.

Beds needs vary as a result of Community differences - population growth, age distribution Marital Status, Sex distribution, degree of Urbanization e.t.c. Many countries have standard planning guide. For example, "Egypt recomends 3 beds/1000 of its population. U.S.A recomends 10 beds/1000 of its population, while Nigeria recomends 5 beds/1000"[2]. However in view of low technology and peoples attitude towards Medical care, Nigerian Medical Association recomends 2 beds/1000 and 3 beds/1000 for rural and Urban areas respectively[3].

World health organisation recomends beds to be distributed in the following way:-

| | | |
|---|---|---|
| Medical | .. | 24% |
| Surgical | .. | 33% |
| Obstetric | - | 19% |
| Paediatric | - | 15% |
| Others | - | 9% |
| Total | - | 100% |

c) CIRCULATION

SEPARATE ALL DEPARTMENTS YET KEEP THEM ALL CLOSE TOGETHER; SEPARATE TYPES OF TRAFFIC, YET SAVE STEPS FOR EVERYBODY: THAT IS ALL THERE IS TO HOSPITAL PLANNING[5].

Hospital planner should acquaint himself with various traffic routes and separate them. See fig 1. Separate entrance for different purposes - out-patients, emergency patients, staffs, visitors and service. He should as well make a clear distinction between traffic routes of different density and composition, as they require different priorities.

Circulation should be simple and clearly defined, so that patients and staffs could orientate themselves within the hospital complex without any difficulty.

Crosspoints should be as few as possible and involve as few people as possible crossing as passers by are possible source of cross-infection.

d) PROVISION FOR GROWTH

Hospitals efficiency is determined by its relationship with the community it served, so its function must change with the community needs. It is desirable to determine the size of the project in several stages of future growth in line with the population growth and complexity of the community so that the hospital may not be out of date or decline in efficiency with the passage of time.

In addition to growth resulting from increase of population in the Catchment area, there is growth due to advancement in medical technology. This bring along with it changes in hospital services-preventive, Curative, rehabilitative and diagnostic and therapeutic services, which subsequently create the need for addition of new facilities. In General Hospital planners must take into consideration provision for future growth (to cope with future demand resulting from population growth and new techniques), which will not distrupt hospital functional relationship, rather create new space with the same frame work of coordination.

,e) FLEXIBILITY

Design should be aimed at achieving the possibility of flexibility for future additions and alteration without major structural shake-up. Sizes, shapes, and groupings of rooms should be such as to accommodate as many different operational policy options as possible.

Simple structure which is capable to extend in small increaments should be chosen. In addition the structure should have considerable life span- say well over 100 years. Where modular design is employed wide span structures should be avoided.

" There is a cost penalty usually between 1 and 2 percent of the total building cost in wide span structures as compared with conventional spans of 7 - 10 metres"[6]

1:3 SITE SELECTION

The first problem in hospital planning is to choose the site where the hospital should be located. It is important that, site be selected before any serious planning. The selected site must justify its suitability.

A good site is one which is easily accessible it could be reached without due strain. It should have ideal access to public transportation for the convenience of employees, patients, and visitors. Site should be sufficiently attractive to the surrounding population so that they may turn out in large numbers to permit the hospital to maintain a satisfactory occupancy. The Land must be ample enough to accommodate the project in its totality without being compressed unnecessarily, permit horizontal expansion and provide adequate parking facilities.

Objectionable sites include areas with obnoxious odours, harmful gasses and disturbing noise, areas liable to flood and volcanic eruption, and areas that require expensive foundation work.

FOOT NOTES

1, JOBSON, W.J (1960) "An Outline of Hospital Planning Procedure", RIBA HOSPITALS COURSE HANDBOOK

2,3&4 MOHAMMED AHMED: (1976) Kano Township General Hospital

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6. ANTHONY NOAKES "On Hospitals", New Metric andbook.

## CHAPTER II

## OUT-PATIENT DEPARTMENT

Out-patient department is that section of the hospital that provide medical care to patients who are not registered as in-patients while receiving physician, dentist or allied services. It consists of two main Units. These are out-patient (Clinics) and emergency services Unit (Clinic).

Out-patient units (Clinics) are those various units (excluding adjunct services units) of the out-patient department responsible for general and treatment procedures".[1]

"Emergency services unit (Clinic) of the out-patient department where services are rendered to out-patients in diagnosis or treatment of conditions determined clinically or considered by the patient (or his representative) as requiring immediate Physician, dentist or allied Services".[2]

In 1932 the chief medical officer of the Ministry of Health, Britain, outlined the Units of the out-patient department in a municipal hospital. It was to be:-

a) The reception department, where patients for admission to the hospital can be examined.

b) The casualty department, where emergency treatment is rendered.

c) The Centre at which continuation treatment is provided for patients who had been discharged from the hospital.

d) The consultative centre for specialist investigation and treatment which cannot be efficiently given in the home but does not necessitate the admission of the patient to hospital, and to which Patients from local authority's clinic may be referred.[3]

Major issue in planning out-patient department is the question which functions must be centralized, and which functions should be de-centralized. It is a common practice that administrative and record functions are centralized while medical and to some extent nursing organisation is de-centralized.

For proper and effective planning of this department, total community needs as well as hospital resources must be taken into consideration. Factors relating to community needs include population and community characteristics, vital statistics and deficiency in health needs, and people's attitude towards medical care. Factors relating to hospital resources include pattern of medical practice, quantity and quality of staffs, and programmes and services. Where applicable government policies and programmes along with social and psychological factors

should also be considered.

:1 OUT-PATIENT UNITS (CLINICS).

Clinic is a centre for diagnosis and treatment. It is usually conducted by one or more doctors. In Teaching Hospitals a Professor or a Consultant may be present. Nurses are available for treatment and other tasks.

Number of Clinics provided by a hospital depend on its size. Generally Clinics can be divided into three main groups. These are medical Surgical and Special.

| | | |
|---|---|---|
| Medical | - | general medicine |
| | | Psychiatry |
| | | dermatology |
| | | Cardiology |
| | | Pulmonary disorders etc. |
| Surgical | - | general Surgery |
| | | Special Surgery |
| | | rectal |
| | | genito-Urinary |
| | | orthopaedics |
| | | gynaecology etc. |
| Special | | Ophthalmology |
| | | E.N.T, dental, etc. |

Administration of Clinic is mostly in the hand/of receptionist. Receptionist post should be immediately out-side the consulting rooms of the

Clinic she administers. It is suggested where possible i.e in small clinics one receptionist should be able to control more than one clinic.

II:2 OUT-PATIENT UNITS ACCOMMODATION.

Out-patient units consist of four separate sorts of accommodation. These are reception and waiting, consulting, examination and treatment rooms. In teaching hospital provision for teaching is needed in connection with the last three.

In hospitals where there is Central sterile supply department, instruments, dressing etc. are provided in form of sterile packages ready for individual treatment procedure. This eliminate the need for treatment room at least in the form they are traditionally provided - with fixed equipments, stocks of instruments, sterilizers etc. Treatment can be given in any room thought to be appropriate. Preferably consulting or examination room. This call for increase in space requirement.

No two specialities have the same balance of accommodation. In medicine, it is fairly common to have one consultation and two examining rooms for each physician. No other special treatment is needed. In Surgery, it is common to have one examining room for each surgeon plus two surgical dressing and treatment rooms to serve a group of five or six Surgeons. For Paediatrics the requirements are

for a combination of consulting-examining room to permit both mother and a child to be present at Consultation and examination. In obstetric the pattern is usually a consulting plus one examining room or a combination. Psychiatry calls for a consultation room only. Certain Clinics, Particularly E.N.T, eye and dental may require a measure of built-in equipment or special accommodation. E.N.T requires an audiometry room; Dental requires separeate workroom and recovery room, while eye Clinic requires darkroom for diagnosis of certain cases.

Number of accommodation required by any speciality can be found using the following formula.

If M = average weekly attendance in any Clinic

t = average consulting time in minutes

s = The total length of each session in minutes.

Then, the critical number of sessions required (Y) =

$$y = \frac{M \times t}{S}$$

If r = number of sessions held weekly, then the critical number of consultation suites required C =

$$C = \frac{Y}{r}$$

Note that Y is the critical supply require and which must be exceeded in practice. Modification based on observation and experience should be made to allow for the changing condition.

For example if M = 500

t = 5

s = 180

then $Y = \frac{500 \times 5}{180} = 13.8 \quad 14.$

If r = 6 (i.e held daily)

then $c = \frac{14}{6} = 2.3$ (this is the critical number of Consultation suites required for demand to balance with supply, therefore in practice this number must be exceeded).

II:3 DESIGN PRINCIPLES. (OUT-PATIENT UNITS).

a). FLEXIBILITY

Offer maximum flexibility so that doctors are free to organise their work in the way it suit them best, and future re-arrangement can be done without major structural alteration.

b) ADAPTABILITY.

With the passage of time accommodation of some specialities will need to be expanded while that of another may need to be reduced. It will be much better if accommodation be transferred from the use of one speciality to another. Therefore suites must not be designed to suit the use of one speciality only. It should be designed for multiple user. One must find common functional unit (standard form) in which accommodation is provided. This unit must be

suitable for the use by all or nearly all specialities.

c) SIMPLICITY OF PATIENTS ROUTES

It is essential that patients routes is as simple as possible, and clearly defined so that patients can find their way to the various offices which they must attend within the shortest possible time see fig. 2.

d) PRIVACY.

Provide maximum privacy in both Consulting and examination room. Privacy in these two rooms make patients feel free and release to the doctor their need and fears.

> ".... IT IS EASY TO PROVIDE EXAMINATION CUBICLES WHERE A PATIENT CAN BE SEEN IN IN PRIVACY: BUT IF THERE IS NO DOOR BUT ONLY A CURTAIN THE CUBICLE IS NOT PRIVATE, AND A NURSE MIGHT NOT HESITATE TO PULL THE CURTAIN TO SEE IF THE PATIENT IS UNDRESSED AND REDY; FURTHER IF THE EXAMINATION CUBICLES ARE NOT REASONABLY SOUND-PROOF THE FEEL OF 'PRIVACY' HAS GONE".[4]

II:4 LOCATION (OUT-PATIENT UNITS).

Out-patient department should have direct access from the main hospital entrance and be placed not far from it (hospital entrance), so that if (out-patient department) can be reached without undue strain.

Out-patient department must be adjacent to the diagnostic and therapeutic departments, since many patients attend at the request of the Physician. See fig. 3.

It is a fact that demand for out patient services is increasing very rapidly. Therefore the land must be ample enough to allow for future expansion.

II:5 EMERGENCY SERVICES UNIT.

Emergency services unit provide life saving services needed immediately upon admission before it can be determined which hospital division should receive the patient. Its size vary over a wide range depending largely upon admitting policies and the extent of accident service the hospital expects to give. "The grossfloor area to be assigned to emergency department will vary from nothing to 15 Sq ft per bed according to program requirements"[5].

Elements of emergency services unit can be divided into three main groups. There are:-

1. Reception of patients and attendants and provision for waiting.
2. Examining and treatment rooms.
3. Housing of patients during post-treatment observation.

1. The reception room should be accessible directly from the ambulance entrance and opens immediately into the treatment room. Waiting space should be ample and screened from view of the reception and treatment rooms.
2. Treatment rooms should be very close to the central nurses station and entrance and wide enough to allow freedom of movement of medical Staffs. "These treatment rooms should be at least 80Sq.ft in area and have one dimension of not less than 8 feet".[6]

Emergency patients come from all walk of life. It no longer involves Surgical Services alone. Therefore examining rooms for non-surgical cases are required. These examining rooms are similar to those in the out-patient Units.

3. Emergency Services Unit are often provided with post-treatment observation beds. The reason for this is that, patients could be observed better than in the general ward. Number of beds provided for this purpose depends on experience. If no experience is available the following general rule is employed. "There should be a minimum of four beds in two rooms (for separation of men and women) plus an additional two for each 100 hospital beds over 100".[7]

## II:6 LOCATION (EMERGENCY SERVICES UNIT)

The most suitable place to locate this unit is the ground floor with direct access from the street. Separate entrance for emergency is essential. The emergency entrance must be prominently located, well lighted and attractively designed. It is desirable that x-ray and Surgery are in close proximity to this unit. See fig.4

## II:7 GENERAL DESIGN PRINCIPLES (EMERGENCY SERVICES UNIT)

There are three guiding principles. They are

a) Privacy -- Patients to be examined and treated, with as much privacy as possible.

b) Reception, treatment and examining rooms should be located adjacent to nurses station.

c) The Sick patient should be transported as little as possible.

FOOT NOTES

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4. HUGH GAINSBOROUGH AND JOHN GAINSBOROUGH: Principles of Hospital Design

5. TOOD WHEELER, E. Hospital Design and Function

6. ROY HUNDENBURG: Planning the Community Hospital

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## CHAPTER III

## DIAGNOSTIC AND THERAPEUTIC FACILITIES

These are services established in the hospital for assisting in the determination and confirmation of the Physician's or dentist's diagnosis. The following are included: Pathology department, radiology department, operating suite, delivery suite, and Physical medicine. Supplementary diagnostic and therapeutic aids such as electro-cardiography (EKG), basal metabolism rate (BMR), and electroencephalography (EEG) may be provided as separate service units or grouped with laboratory of radiology.

### III:1 PATHOLOGY DEPARTMENT.

Laboratory fulfills three main functions.

(a) It is a place where investigations are carried out in a routine manner to assist in the establishing of a diagnosis or to asses Progress to control therapy.

(b) A place where test can be performed to detect the spread of epidemic disease

(c) It provde an area where investigations of a research nature can be carried out.

Laboratory test are generally divided into four main sections. These are Haematology, biochemistry, histology and bacteriology.

Haematology Section

It conduct a special study of blood. It is responssible for the enumeration and classification of blood cells, listing and classification of blood into its appropriate groups, and estimation of haemoglobin. Another function of this department is the investigation of the ability of blood to clot.

It provide storage facilities for blood obtained from other sources for transfusion.

Bacteriology Section

The function of this department is identification of organisms causing disease.

Histology Section

Its main function is to process tissues removed from living or dead body. Medical Members of this department are responsible for the performance of post-mortems.

Biochemistry Section

This department carries out the chemical analysis of blood and other body fluids.

SPACE ORGANISATION.

Laboratory consist of four main elements, namely reception and waiting, Privacy rooms, technical areas and auxiliary services areas.

(1) Reception and Waiting

At the reception centre, patients records are filed and specimens are collected and distributed to the various department concern,

Waiting space is normally provided for the patients to wait before specimen is taken. Patient seldom comes alone, he is often accompanied by relatives. This means separate waiting hall for the relatives.

(2) Privacy rooms

Leading from the reception hall, there should be a number of small rooms to provide Privacy whilst the specimen is being taken.

Each room should be equiped with couch as sometimes patient faints.

(3) Technical Areas

This consist of four main departments. These are haematology, biochemistry, histology and bacteriology departments.

(4) Auxiliary Services

This include glasswashing and storage facilities. Others are lockers and toilets facilities for the medical technologist.

LABORATORY SIZE

Size of laboratory should be based on the amount of work provided by the population covered number of doctors and technicians to cover the work,

and the number and types of apparatus necessary for each department.

The square-foot-per-bed ratio is no longer considered a desirable guide, because of the wide variation of such factors as type and size of hospital, pattern of usage, growth of the Community and medical practice.

LABORATORY DESIGN.

- laboratory should be Capable of easy expansion.
- As many as possible of the laboratory rooms should face away from the direct sunlight.
- The design of laboratory should be a flexible as possible.
- Floor finish should be non slip, easy to clean and free of cracks when treated with disinfectants.
- Services should be located where they will be easily accessible for service and repairs with a minimum distruption of normal laboratory services.

LOCATION.

- Ground floor location is always preferred as placing it on second or other floors with not allow for easy expansion.
- Laboratory must be adjacent to out-patient department since many out-patients attend at the request of the Physician.
- Laboratory must have easy access to the main entrance and roadway for two reasons.

(a) Certain test requires the withdrawal of specimen at certain interval of time subsquently patient report to the laboratory accordingly.

(b) disposal of specimen after investigation may be done with ease.

.. laboratory should have direct access to the Maternity department and the operating theatre for two reasons.

(a) Surgeon may require an urgent opinion of tissue removed in an operation.

(b) these two departments often require blood for emergency transfusions.

.. It is desirable to locate laboratory near mortuary.

III:2 RADIOLOGY DEPARTMENT

It is made up of two units, namely diagnostic x-ray unit and x-ray therapy unit.

Radiology department should be located such that it is conveniently accessible to both out-patients and in-patients. The location must permit horizontal expansion.

DIAGNOSTIC X-RAY

The essential function of this unit is to take shadow picture of vital parts of human body, showing the outlines of body organs and revealing abnormalities.

Size of this unit must be related to demand and design layout should be determined by the organisation of function so that economy in both patient and film travel can be achieved. See fig. 5

The operational areas of this unit include x-ray room, dressing or changing accommodation, reception and waiting, dark room, film files, film viewing and offices.

Number of radiographic rooms could be determined as follows.

Number of radiographic rooms

$$= \frac{\text{DTY}}{\text{DW X WKS X HD X DTRH.}}$$

DTY = determinations per year

DW = days per week in operation

WKS = Weeks per year in operation

HD = hours per day in operation

DTRH = determinations per room per hour.

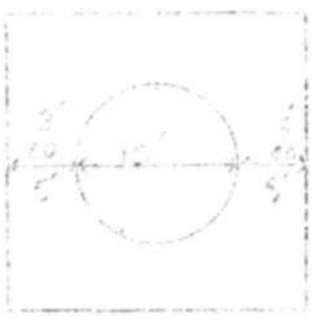
X-RAY THERAPY

The essential function of this unit is to treat patients by means of X-rays. Element of this unit include superficial therapy - to treat skin lesions, radium therapy - to treat disease like cancer, etc.

III:3 OPERATING SUITE

Operating suite is technically a therapeutic aid in which a team consisting of one or more Surgeons, the anaesthetist and Surgical nurses operates upon patient.

Sufficient free floor space is required for this team to carry out proper surgical techniques. It is recommended that, minimum sterile circle diameter should be 10 feet and the space between the wall and sterile circle should be 3 - 5 feet minimum. See figure below.



In teaching hospital students may be present for observation. Therefore viewing gallaries or Surgical amphitheatre is provided. See fig. 6

Number of operating room required is calculated as follows.

$$\text{Number of operating rooms} = \frac{\text{OPY}}{\text{DY} \times \text{OPRD}}$$

OPY = Operation per year.

DY = Days per year Surgery operates.

OPRD = Operation per room per day.

Within operating suite there are four basic zones. / See fig. 7

ZONE A - Protective Zone.

All administrative elements and reception facilities are located in this zone. Changing facilities are also located here. People in this zone should not penetrate to inner zone until after changing shoes and clothing.

ZONE B - CLEAN ZONE

Found in this zone are storage facilities for those items to be used in surgery, scrup-up facilities and anaesthetic room. This zone should be clean and it should not be accessible directly from out-side.

ZONE C - Sterile Zone.

This is where the actual operating rooms are located. It is absolutely essential to maintain the highest level of cleanliness and aseptic condition in this zone.

ZONE D - Disposal Zone

This zone houses the facilities for handling waste, used instruments, drapes, gowns and dressing. Janiterial equipments are also handled here.

OPERATING SUITE DESIGN

Operating theatre design should always be aimed at preventing theatre infection. The following points should be noted.

- Theatre should be sited where there can be no risk of sucking in contaminated ward air.
- Floors and walls should be of such a nature that they do not collect dust and it should be possible to wash them with disinfectant solutions.
- Changing and Scrup rooms should be sited outside the theatre as the process of changing and scrubbing may let loose large numbers of hospital staphylococci.
- Theatre must be properly ventilated so that patient's tissues are opened and exposed to clean bacteria-free air.

LOCATION

It is desirable to locate operating theatre close to X-ray department, laboratories and the Central Sterile supply department.

III:4 DELIVERY SUITE

Delivery suite consist of four areas of activity: reception suite, labour room, delivery room and recovery room. In large size unit an operating suite will be required.

These four areas should be located and re-related for easy movement of patients from one area to another and for good patient observation.

Reception Suite

It is here patients are received, examined and full particulars are taken.

Reception suite consist of space for the nurses desk, consulting and examination rooms and space for carts containing supplies for examining.

Mothers usually have their husbands with them and so a pleasant room for these anxious gentle men to wait.

Labour room.

After reception ritual is over, patient passes to the labour room. This is where she stays while labour progresses.

Labour rooms should provide maximum comfort and relaxation for the patients and should have facilities for preparations. i.e toilet, shower and dressing Cubide.

Single occupancy labour rooms are recommended, and for the interest of privacy each room should be provided with its own toilet, shawer, and dressing cubide. If condition does not favour that, such facilities, should be located in a place convenient to all labour rooms.

The time spent in labour room is about three times as long as the time spent in the delivery room. Therefore numbers of these two types of rooms should be in in that order. "United States of America recommended 1:2 to 1:2.5 labour room to delivery room"[1].

In planning labour rooms one must arrange for good observability and for easy access to all the women in the labour. Consideration should be given to the prevention of sound transmission to adjoining labour rooms.

Floors should be free from crack or space that may labour bacteria.

Delivery room.

This is where delivery takes place. Sufficient space is needed for the obstetrician, perhaps anaesthist and Midwives working around the delivery bed.

Delivery rooms should be easily observed by nursing staff and required to be sound proof.

Every facility for the welfare and safety of the mother and the newborn child should be provided. e.g. supply of pipes oxygen, adequate air-conditioning,

finishes that promote aseptic condition etc.

Number of delivery rooms is calculated as follows.

$$\text{number of delivery room} = \frac{DLY}{365 \times DLRD.}$$

DLY = Deliveries per year

365 = days per year

DLRD = deliveries per room

Recovery room

Mothers are transferred to this room to recover before taken to lying-in ward. Thus patients are concentrated in one place. This facilitates the special nursing care required and frees the delivery rooms for clean up.

Recovery room should be located adjacent to delivery room for immediate accessibility.

III:5 PHYSICAL MEDICINE

It consist of two units: Physiotherapy and occupational therapy.

Physiotherapy.

It is meant to asist the restoration of function after sickness and injury. It has three main components.

(a) Manipulation of various parts of body by message and movement of joints.

(b) Remedial exercise by means of gymanastic apparatus free movement and games.

(c) Hydrotherapy bath.

Occupational therapy

The essence of occupational therapy is the adaptation of craftwork to assist the restoration of function after sickness and injury by mobilising stiff joints, strengthening week muscles and restoring the power of mental concentration.

Design of Physical Medicine Department.

Physiotherapy requires gymnasium, treatment and examination room and an area for hydrotherapy. It is suggested that treatment rooms should be subdivided in to cubicles. See figs. 8,9,10.

Occupational therapy requires a wood and metal workshop and training area.

The two units can share changing rooms, and toilets for patients, waiting space, reception and departmental records and staff common-room.

Physical medicine department should be located centrally to minimized problems of transporting patients.

III:6 SUPPLEMENTARY DIAGNOSTIC AND THERAPEUTIC AIDS.

1. Electrocardiography (EKG) - measuring the resistance to a slight eletric current which reveals pattern of heart behaviour.
2. Basal metabolism (BMR) - essentially a volumetric test of inhalation and exhalation measuring the patients metabolism.
3. Electroencephalography (EEG) - measurement of electrical emanations from the brain which indicates areas of in balance or malfunction.

   Electroencephalography is very complicated and requires special accommodation. See fig. 11.

FOOTNOTES

1. HUGH GAINSBOROUGH AND JOHN GAINSBOROUGH: (1964)
Principles of Mechanical Design

# CHAPTER IV

## NURSING UNITS

This is where patient is put to bed, fed, kept comfortably and provided with necessary nursing attention from the time he/she is admitted to the time he/she is discharge

Nursing Unit is by service divided into:-

- Medical Nursing Unit
- Surgical Nursing Unit
- Maternity Nursing Unit
- Paediatric Nursing Unit
- Psychiatric Nursing Unit.

### IV:1 MEDICAL NURSING UNIT

This is where patients with cases of medical nature are accommodated. Cases of medical nature include dermatology, neurology, cardiology etc. Patients with medical cases are often admitted without proper knowledge of the disease. It is during his stay that the disease is diagnosed ad and treated accordingly. The process of diagnosis and treatment is complicated and requires time. The allergies of the patient may further complicate the process of diagnosis and treatment, subsquently more time required, thus patient in medical nursing unit stay longer than is usual in other nursing unit. This must be reflected in calculating the number of beds to take care of a given number of patients.

Patients in the medical nursing unit require the diagnostic aids of laboratory and x-ray and therapeutic aids of Physical and occupational therapy more often than patients in other nursing units. Therefore locating it (medical nursing unit) in close proximity of these facilities is highly desirable.

IV:2 SURGICAL NURSING UNIT

This is where patients with cases of Surgical nature are accommodated. Surgical cases include gynaecology, rectal, genito-urinary etc. Patients in Surgical nursing unit requires the services of Surgical suite, emergency suite and x-ray, hence the need for direct accessibility to there facilities.

IV:3 MATERNITY NURSING UNIT

It consist of both ante-natal and post-natal beds. Opinion differs as to whether the ante-natal beds should be combined with post-natal beds. It is the author's opinion that, ante-natal beds should be separated from the post-natal beds because the kind of treatment and nursing attention required by mothers before and after having their babies is different. However in small unit the two can be combined as it would be most economical in staffing but caution must be

taken to create physical barrier between them.

Whether combined or not the overriding consideration is that there must be maximum flexibility in the deployment of beds. That is ante-natal beds and post-natal beds should be largely interchangeable to meet urgent needs.

In addition to normal supporting service rooms, maternity nursing unit requires a pleasant sitting room where mothers can engage their interest and probably another room to watch television. Nursery should also be provided.

There are two types of nursery systems: the rooming-in nursery and the central nursery. In rooming-in system, each baby is by the side of her mother. This system requires individual facility for washing the baby by each bedside. Where post-natal beds are in room of four or more beds, there is the possibility that one of the babies may disturb mothers in the night, hence adequate and separate nursery accommodation is required so that mothers could be free from their infants at night. See fig 12.

Central nursery system involves provision of nurseries large enough to accommodate all the babies. Number of infants in such a nursery should not exceed 8 and the minimum space between each bassinets should not be less than 600mm.

Nursery should adjoin a small examining room into which the infants can be carried or passed by the nurse and which the doctor can enter with out passing through the nursery. Nursery should also be provided with a small nurse workroom. Fixed viewing window should be provided between the workroom and the nursery to facilitate observation of infants in the nursery. See fig. 13.

IV:4 PEADIATRIC NURSING UNIT

Patients of this unit are of various age-groups, ranging from infants to adolscent. Therefore infants cribs, youth beds and full-size beds are required. Usual subdivisions of beds in this unit is 20% bassinets, 40% cribs and 40% adult-sized beds.

Apart from the basic supporting service rooms, school room, play room and probably occupational therapy room suitable for children are required.

In planning peadiatric unit provision must be made for mothers who stay with their sick children in the hospital. All facilities must be available for their comfort. These facilities include sitting room where evenings can be spent and meals taken, changing facilities and full toilet and bathroom facilities.

IV:5 DESIGN CONSIDERATION.

Nursing Unit should be designed with following consideration in mind:

- size of nursing unit
- control of cross infection
- Control of Climate
- Gain in privacy
- Control of noise.

Size of Nursing Unit

Size of Nursing Unit is often simply considered interms of the largest nursing unit that can be adequately supervised by one nurse.

It is obvious that there is lack of agreement as regards to the number of beds in such a unit, however there is strong suggestion that the number of beds should be a maximum of 32 taking sanitry and administrative reasons into consideration.

Control of Infection

Nursing Unit design should be aimed at eliminating cross-infection not marely reducing it. Adequate isolation and subdivision of nursing unit are of great value.

Isolation facilities can be provided in a number of ways. There is the possibility of providing side ward (a room forming part of the general ward but separated from it by short corridor),

single rooms within the main nursing unit or isolation ward within the hospital. The author prefers the later because in the first two possibilities, treatment is carried out by the same set of people and that there is therefore a continuing risk that they can convey infection from the patient in isolation to the rest of the patients.

Control of Climate

Nursing Unit design must allow for adequate Control of Climate. Miss Florence Nightingale was quoted saying "No ward is in any sense a good ward in which the sick is not at all times supplied with pure air, light and due temperature."[1]

Gain in privacy.

One of the disadvantages of traditional open ward is lack of privacy. Patients are exposed to each other and see the removal of dead body or the return of a patient from operating theatre unconscious. These conditions are not conducive to comfort and peace of mind. It is also impossible to take a good medical history from patient as he is aware that other patients will heard him.

In view of the above reasons, it become obvious that, Nursing unit design must provide privacy. Adequate ward subdivision will help alot.

Control of Noise

Spread of noise must be checked in the interest of patients comfort.

IV:6 BASIC SERVICE FACILTIES.

Nursing Station

This is the central nursing headquaters for the nursing unit in which it is located. Functions of this station include keeping, medical records of all patients in the unit, handling patients call and controlling the movement of visitors. Facilities to be provided in the station include control desk, chartting desk, nurses locker and toilet. Others are medication room and an enclosed office in which private subjects could be discussed privately. It is desirable to bring utility room in close proximity to this station.

Nursing station should be located bearing in mind that if must provide safe and clear observability and visual supervision of visitors.

Patients bed room

Patient's bed room can be describe as multi-purpose room. It serve as his bedroom, visitors reception, dinning etc. Therefore its size must be studied with care. It is not wise to rely on international standards since need is not universal.

The most reliable way to determine the size of any bedroom is to make a schematic layout of the room with various elements functionally arranged. Elements of patients bedroom are the patient's bed, bedside table overhead-table, chair, facilities for storage of patients clothing, toilet, shawer or bath and lavatory.

Factors that influence the number of beds per room are: level of privacy required, provision for isolation needed, flexibility, construction and running cost and economy in space usage.

Sisters Office

This office is meant for the head nurse who administer and supervise the nursing unit. It can also be used for small meeting of nursing unit personnel.

Treatment room

This is meant for treatment proceduces which can not be performed in the patients bedroom. It should be wide enought to accommodate table, chair, cabinet, scale and a desk.

Toilets and Shawers.

It has become an accepted standard that a private toilet and a lavatory should adjoin each bedroom and probably a shawer. This is quite necessary as far as aseptic requirements and privacy are concern. However construction and maintenance cost should be considered.

Utility Room

Utility room is of two types: clean utility and dirty utility room. In the dirty utility room all pisposable waste are kept before finally taken out of nursing unit. Soiled lien and rubbish cart may be stored here. Clean utility is used for the storage of all supplies except food and drugs.

Kitchen.

At this centre, drinks beverages, and emergency food are prepared and food brought from the main kitchen is received and distributed to the patients.

Day Space

Day room is an important facility. Aubulant patients go to this place to amuse themselves when they find living in their room tiresome.

FOOT NOTES.

1. H and J GAINSBOROUGH.
   Principles of Hospital Design.

# CHAPTER V

## HOSPITAL SUPPORTING SERVICES

### V:1 CATERING DEPARTMENT.

Catering department covers all facilities required to deal with food. It is responsible for supplying food for all meals over a period of twenty four hours. Scale of provision is normally design to meat the peak load. It is very difficult to determined peak load in new hospital as staff complements are either not known or are incomplete. However a useful guide for determination of peak load in new hospital is as follows:-

Nursing Staff - establish less night staff, less approximately percent for absence (leave,sickness, off duty, etc).

Medical Staff - full number of residents plus ½ or ⅔ non residents.

Administrative, Clerical, Professional and technical Staff - 70% to 80%.

Domestic, portering and Maintenance - 25% to 30%

(Provision may also be made for Staff eating their own Sandwiches)[1]

Points of consideration in sitting catering department are:-

(1) Access a) for goods deliveries

b) to the nursing units - the fundamental requirement here is short, direct and rapid connecting link between the Kitchen and the nursing Units.

c) for staff to the dinning room from all parts of the hospital.

(2) Avoidence of noise and odours to other hospital departments.

(3) Give maximum natural light and co crossventilation.

V:2 C.S.S.D.

This department is charged with responsibility of supplying all hospital departments with complete sterile equipments, pre-packed, and ready for immediate use in the treatment of patients for all procedures.

The size of C.S.S.D is determined by the estimated daily requirement of the hospital, and in order to do an efficient and effective job its layout must reflect workflow. See fig 14.

C.S.S.D should be close to laundry Pharmacy and Central stores. Where these four activities are incorporated into one centralized service, they can share the receiving processing, sorting and issuing functions and lend themselves to a single adminstrative control. See fig. 15

V:3 PHARMACY

Pharmacy is the department from which all medications are supplied to various hospital departments. Here drugs are stored, dispensed, companded and sometimes manufactured.

The size and arrangement of Pharmacy department depends upon the type of hospital in which it functions. The division of hospital Pharmacy of the American Pharmaceutical Association and the American Society of Hospital Pharmacists in collaboration with the division of hospital facilities, U.S. public health service have suggested type plans for pharmacies in keeping with current developments in Pharcaceutical practice. See figures 16 and 17. The plans illustrate and explain relationship between elements which may be adjusted to individual needs.

Suggested Area Distribution for General Hospital Pharmacies

| Area in Square meters | 50-BED | 100-BED | 200-BED |
|---|---|---|---|
| Compounding and dispensing laboratory | 205 | 320 | 495 |
| Parental Solution laboratory | | 185 | 200 |
| Active store room | | 125 | 200 |
| Manufacturing laboratory | | | 120 |
| Office and library | | | 105 |
| Circulation | | | 60 |
| Total | 250 | 630 | 1180 |

Areas shown in the table are not areas and do not include walls and partitions. Additional storage space is provided for bulk Pharmacy store in an area directly beneath the Pharmacy and separate from central Stores.[2]

Note In the original text, areas were given in square feet. Conversion done by the author.

V:4 CENTRAL GENERAL STORES.

It is a storage as well as distribution center for all goods both new and used ones. Here hospital supplies of all kinds are received, checked processed and then dispatched to user departments.

Points of consideration in planning this department are:-

a) Access from outside road.

b) Located in a place where no patient or hospital medical staff need to come.

c) There should be direct link between the dispatch room and other hospital departments.

V:5 LAUNDRY

This department is charged with responsibility of processing soiled linen for re-use. Laundry design must promote smooth flow of work throughout the plant without any conflict. e.g press work does not cross with flat work and clean lines have no contact with dirty linens.

Basic flow of work is from collecting sorting washing extracting drying pressing folding storage distributing. Some linen take a side trip to be mended, thus a sweing room should be provided, preferably near flat work ironer, so that torn linens can be mended and put back into circulation immediately.

Laundry should be well lighted and well ventilated. It ceiling should be higher than those in other areas of the hospital so that heat will rise above the employees heads. Exhaust fans should be provided to remove this heat and maintain good air circulation.

V:6 ADMINISTRATION

Under this heading are several functions essential to the hospital operations. Administration unit include offices for hospital administrator and assistants, medical secretaries, medical records and reception. It has also business and admitting offices.

FOOTNOTES

1. WASHINGTON, E. (1960) "On Kitchen and Catering" Summary of lectures on Hospitals given at a Study Course for Architects at Worcester College, Oxford, August - September, 1960.

2. U.S. Department of Health, Education, and Welfare Public Health Service. Planning and Equipping for 50-, 100-, and 200-Bed General Hospital.

# CHAPTER VI

# THE SITE

## VI:1 GEOGRAPHICAL LOCATION.

Wudil's geographical position is determined as follows:- Latitude $12^{o}$N

Longitude $9^{o}$E.

See maps 1,2, and 3.

## VI:2 SITE CHARACTERISTICS.

The site chosen is along Kano-Gaya road with an area of 25 hectres . It is the existing site of the Clinic serving Wudil town. The Clinic will be demolished to give way to the hospital complex. The site has the advantage of being the geographical centre of the community-Wudil walled city is to the north of the site, Wudil new layout to the West of the site and Government reservation area, Government teachers college, Government Secondary Technical and Government Secondary Commercial School to the east. See Map 3.

The site is more or less flat, with scartted trees here and there. It is bounded by reliabilitation centre to the South, farm land to the West, Kano-Gaya road to the north and Utai road to the east. See Map 3. The main approach is by the Kano-Gaya road, and there are abundant

footpaths converging on the site from the surrounding villages.

There are many factors governing the choise of this site. First, lack of hospital aminities for a population of more than 10,000 inhabitants. Secondly, Wudil is a focal point of all villages that this hospital is intended to serve. It is within easy and almost equal reach of the extremities of the area. It has the largest market & palace south of Kano and people converge to it in thousands. There is the availability of pipe borne water, electricity and easy transportation system. See map 4.

VI:3 CLIMATE.

There is no established climatic data of Wudil, therefore general climatic data of Kano State was used. The Climate is characterized by two predominant wind regimes - the harmattan and the passat. The harmattan wind rather known as north-east trade wind is turbulent, dusty and cold. It is prevalent in the dry season. The passat, known as the South-west trade wind is also turbulent and bring along with it dark clouds and rain. See tables 3 and 4.

RELATIVE WIND DISTRIBUTION (DIRECTION) ANNUAL MEAN (1979)

Table 3

| DIRECTION | Calm | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|---|
| PERCENT | 10 | 10 | 19 | 12 | 4 | 6 | 21 | 12 | 6 |

RELATIVE WIND DISTRIBUTION (FORCE) ANNUAL MEAN (1979)

Table 4

| FORCE | CALM | 1-3[a)] | 4-5[a)] | 6-7[a)] |
|---|---|---|---|---|
| PERCENT | 10 | 68 | 22 | - |

a) Scale of Beaufort

SOURCE: Federal ministry of civil Aviation, Meteorological Division, Kano.

Kano State of Nigeria, Statistical Yearbook 1979.

TEMPERATURE

There are two peaks of high temperature, one before rainy season, in the month of April and one after rainy season, in the month of October. Highest mean maximum temperature attained between 1979-1981 is 38.8°C and lowest mean minimum temperature attained in the same period is 11.8°C.

Note that mean values are used so that the information may not be too much influenced by extreme values. See tables 5 and 6.

Table 5 MEAN MAXIMUM TEMPERATURE ($^{o}$C)

| MONTH YEAR | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1979 | 30.0 | 33.7 | 36.6 | 38.6 | 37.5 | 34.3 | 31.1 | 30.5 | 32.4 | 34.7 | 34.2 | 28.3 |
| 1980 | 30.9 | 32.2 | 36.6 | 38.9 | 36.1 | 33.2 | 31.5 | 30.9 | 33.3 | 35.3 | 33.6 | 28.2 |
| 1981 | 27.3 | 32.1 | 36.1 | 38.8 | 37.6 | 36.1 | 31.7 | 31.6 | 33.0 | 36.6 | 30.5 | 30.5 |

Table 6 MEAN MAXIMUM TEMPERATURE ($^{o}$C)

| MONTH YEAR | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1979 | 14.6 | 16.7 | 22.2 | 24.2 | 24.9 | 23.4 | 21.3 | 20.7 | 21.1 | 20.7 | 18.7 | 13.5 |
| 1980 | 14.2 | 17.0 | 20.5 | 24.0 | 24.5 | 22.1 | 21.6 | 20.5 | 22.0 | 20.5 | 17.7 | 14.2 |
| 1981 | 11.8 | 15.9 | 20.7 | 19.5 | 24.3 | 23.1 | 21.7 | 21.5 | 21.2 | 21.1 | 17.5 | 13.7 |

See graph 1.

SOURCE:- Federal Ministry of Aviation, Meteorological Division, Kano.

Rainy season last for about six month. Generally from May to October. Rainfall is not heavy and is characterized by single peak, generally in the month of August. It is also in that period the highest amount of rainfall is normally recorded. See table 7.

TABLE 7 RAINFALL

| YEAR / MONTH | 1979 | 1980 | 1981 |
|---|---|---|---|
| January | - | - | - |
| February | - | - | - |
| March | - | - | Tr |
| April | Tr | - | 19.5mm |
| May | 32.0mm | 93.5mm | 36.2mm |
| June | 111.2mm | 122.8mm | 62.1mm |
| July | 191.9mm | 282.6mm | 142.8mm |
| August | 257.2mm | 310.5mm | 202.5mm |
| September | 111.0mm | 67.6mm | 111.8mm |
| October | 20.1mm | 35.4mm | - |
| November | - | - | - |
| December | - | - | - |
| Annual Total | 723.4mm | 912.4mm | 574.9mm |

See Chart 1

Source:- Federal Ministry of Aviation, Meteorological Division, Kano.

RELATIVE HUMIDITY.

It is generally observed that 75% of the year has mean relative humidity below 70% and 25% of the year with mean relative humidity above 70%. See table 8.

TALBE 8 MEAN RELATIVE HUMIDITY BY MONTH

| YEAR / MONTH | 1979 | 1980 | 1981 |
|---|---|---|---|
| January | 23.1% | 27.5% | 29.8% |
| February | 23.3% | 23.3% | 25.5% |
| March | 27.0% | 20.9% | 30.3% |
| April | 33.1% | 27.5% | 34.8% |
| May | 54.8% | 50.0% | 39.8% |
| June | 66.8% | 70.0% | 59.6% |
| July | 76.1% | 76.9% | 77.1% |
| August | 80.6% | 81.5% | 75.9% |
| September | 73.6% | 72.6% | 74.2% |
| October | 58.3% | 58.8% | 44.5% |
| November | 37.3% | 36.8% | 30.8% |
| December | 31.1% | 32.6% | 27.9% |

See graph 2.

Source:- Federal Ministry of Aviation, Meteorological Division, Kano.

Water Discharge

Wudil is blessed with a river that flows throughout the year.

The water discharge may vary much from day to day, so that high fluctuations are possible. The yearly water discharge may be influenced by engineering works of dam and channel construction"

Extract, from, Kano State of Nigeria Statistical Year Book 1979.

VI:4 EXISTING HEALTH FACILITIES AND OTHER SOCIAL INSTITUTIONS

Existing health facilities found in the area are dispensaries and a Clinic in Wudil. Looking at these facilities Critically non of them deserve the nome given to it and they have outlived their usefulness. The whole area lack hospital amenities. The nearest hospitals are:

| | |
|---|---|
| Kano | 43 km |
| Rano | 94 km |
| Birninkudu | 95 km |
| Jahun | 102 km |

Apart from primary schools there are five Post-SPrimary Institutions, with an estimated Student population of 2,000. These are Government Teacher's College Wudil, Government Secondary Teachnical Wudil, Government Secondary Commercial School Wudil, Government Day Secondary School Wudil and Government Secondary School Garko.

Other amenities such as Cinemas, Theatres, leisure parks etc. are lacking.

# CHAPTER VII

# THE DESIGN

The factors that influence the design of this hospital are: extendibility, environmental factors, Social factors and phase Construction.

## VII:1 EXTENDIBILITY

Hospital is not an isolated entity. Its relationship with surrounding community is widespread and complex, and so its functions change with the needs of the society. The point the author wanted to make here, is that, in hospital design future changes and growth can not be overlooked. And any concept that does not provide that (future changes and growth) is not an ideal hospital design concept. Hence hospital planners, what ever category of hospital they are planning, they must view it from broader perspective. Thus, if one is planning, for instance, a rural hospital, must not rule out the possiblility that it may, in furture, be turned into district or even teaching hospital.

The design of this hospital is based on the concept that, the simplest diagram for an extendible building (that can best accommodate future changes and growth) is one where the Primary Communication route is a straight line from which Secondary Communication links to departments branch

at right angles. These Secondary Communication links are open ended, so that departments may extend differentially. See Site Plan.

Note that diagnostic and therapeutic departments that are enclosed by the two primary Corridors can grow vertically. Thus why concrete flat roof is adopted.

VII:2 ENVIRONMENTAL FACTORS

Severe heat, Sun glare, Monsoon and harmattan winds and natural cross-ventilation are the environmental factors that influence the design. It is evident that temperatures rise as high as 38.8°C during hot season and falls to 11.8°C during the Cold season. See Chapter VI Section VI:3. Thus the problem is how to keep body cool during the hot period and warm during the harmattan. The problem of keeping body cool is achieved by protection of solar penetration-source of heat-by one, fixed concrete sloping hood, see sections and elevations, two, by Orienting the building along east-west axis, thereby exposing sides with less window openings to west and east, particularly the nursing units, and three by employing the use of air-condition. The first device also solve the problem of sun-glare. The problem of keeping body warm during

the harmattan is achieved by means of dense planting that acts as shield against the strong harmattan wind.

Natural cross-ventilation is achieved by means of court-yards and large composite windows with projected hung units which can be left open for ventilation under normal wet weather condition. See sections and plans.

VII:3 SOCIAL FACTORS

In the design I have borne in mind the religious background of the people for whom the hospital is designed. Majority of the people are muslims and housewives remain under 'Purdah' and husbands may not like the idea of living their wives outside where they will mix with other people (males), Hence for the hospital to be inviting and to have maximum turn out as to let the hospital have maximum occupancy the idea of dual circulation is adopted. Male wing is separated from female wing, however they share the services of diagnostic and therapeutic facilities which they approach from different directions.

From the cultural point of view rectangles, squares, court-yards and arches are adopted as they reflect Hausa traditional Architecture, and

reduce the concept of huge Clinical institution and create more humane and re-assuring environment.

Emphasis is placed upon the landscaping of the Court-yards and the surrounding site by the use of planting which ultimately will reduce maintenance cost while giving an ever changing and pleasing appearance.

VII:4 PHASE CONSTRUCTION

As fund may not be available at the Commencement of the Project, the design, structure is capable of to extend in small increaments as finance and medical need demand and the whole project is capable of subdivision into three main phases. See Site Plan.

# CHAPTER VIII

## SCHEDULE OF ACCOMMODATION

### VIII:1 BEDS REQUIRED

| Surrounding Villages | Estimated Population (000) beginning 1981 |
|---|---|
| Wudil | 13.6 |
| Darki | 15.0 |
| Indabo | 12.3 |
| Utai | 10.4 |
| Garko | 14.6 |
| Achika | 10.4 |
| Faragai | 10.6 |
| Gano | 12.0 |
| Hamdullahi | 10.0 |
| TOTAL | 108.5 |

In accordance with the Nigerian medical association recommendation of two beds per 1,000 head of population in rural areas, there would be 217 beds. 250 beds are provided, so that the hospital can cater for future needs. These beds are distributed among medical, Surgical, obstetric paediatric and Isolation/ intensive care nursing units. The distribution is as follows: Medical - 72 beds, Surgical - 72 beds, Obstetric - 36 beds, Isolation/intensive care - 36 beds, and Paediatric - 34 beds.

VIII:2 MEDICAL NURSING UNIT

There would be two of such floors for medical patients, each containing 36 beds. Each floor is subdivided into eight 4 bed-rooms, two single bedrooms and one two-bed rooms.

Accommodation needed for one floor

| Space designation | No of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| 4 Bed room | 8 | 43.2 | 345.6 |
| 2 Bed room | 1 | 21.6 | 21.6 |
| Head Nurse Office | 1 | 10.8 | 10.8 |
| Single bed room | 2 | 21.6 | 43.2 |
| Nurses Station and Medication | 1 | 18 | 18 |
| Treatment room | 1 | 10.8 | 10.8 |
| Clean Utility | 1 | 10.8 | 10.8 |
| Dirty Utility | 1 | 10.8 | 10.8 |
| Doctors room | 1 | 10.8 | 10.8 |
| Day Space | 1 | 43.2 | 43.2 |
| Pautry | 1 | 10.8 | 10.8 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| Class room | 1 | 43.2 | 43.2 |
| Storage room | 1 | 10.8 | 10.8 |
| Waiting Space for relatives | 1 | 12.6 | 12.6 |
| Toilets | 10 | 1.5 | 15 |
| Bath room | 4 | 1.0 | 4 |
| TOTAL | | | 627.4 |

VIII:3 SURGICAL NURSING UNIT

There would be two of such floors for Surgical patients, each containing 36 beds. Each floor is subdivided into eight 4 bed rooms, two single bed rooms and one two-bed room.

Surgical nursing unit have the same accommodation requirements as medical nursing Unit. Area required for one floor = 627.4$m^2$.

VIII:4 OBSTETRIC NURSING UNIT.

Ante-natal and Post-natal beds are combined in this unit to achieve economy in staffing and flexibility in the use of beds. [illegible].

There are 36 beds in all. NORMAN MORRIS recommends 25% of this number to be reserved for ante-natal cases[1]. Thus 27 beds would be for Post-natal cases and 9 beds for ante-natal cases. There would be one bassinet for each Post-natal bed, and E.TOOD WHEELER recommends additional 20% of this number to take care of the overflow conditions and multiple birth[2]. Thus, 33 bassinets are provided.

Facilities for premature infants is provided. E. TOOD WHEELER recommend 5 percent of all Maternity beds in the hospital at Peak load.[3]

Thus two incubators are provided. Isolation facilities is provided in the paediatric unit.

This unit is in one floors, containing 36 beds. Requirement is basically the same as medical or surgical unit with additional space for babies.

Additional Accommodation needed.

| Space designation | No of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Nursery | 4 | 36.0 | 144.0 |
| Work room | 2 | 10.8 | 21.6 |
| Examination room | 2 | 10.8 | 21.6 |
| Incubator | 2 | 5.4 | 10.8 |
| TOTAL | | | 198 |

Total area required for one floor = $631m^2$

VIII:5 PAEDIATRIC NURSING UNIT

There are 34 beds in this unit. The beds are distributed as follows: 20% bassinets, 40% Cribs and 40% adult-sized beds. In other words, 6 bassinents, 14 Cribs and 14 adult-sized.

[illegible] provid[illegible] floors, [illegible]

Accommodation Needed.

| Space Designation | No of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Isolation bassinet | 2 | 5.4 | 10.8 |
| 4 bassinet | 1 | 16.2 | 16.2 |
| Single Crib | 2 | 21.6 | 43.2 |
| Work room for bassinets | 1 | 10.8 | 10.8 |
| 4 Crib | 3 | 43.2 | 129.6 |
| Single bed room | 2 | 21.6 | 43.2 |
| 4 Bed room | 3 | 43.2 | 129.6 |
| School room | 2 | 43.2 | 86.4 |
| Play room | 2 | 43.2 | 86.4 |
| Exam/treatment room | 2 | 10.8 | 21.6 |
| Nurses Station and Medication | 2 | 10.8 | 21.6 |
| Dirty Utility | 2 | 10.8 | 21.6 |
| Clean Utility | 2 | 10.8 | 21.6 |
| Kitchen | 2 | 10.8 | 21.6 |
| Toilet | 12 | 1.5 | 18.8 |
| Shower | 8 | 1.0 | 8 |
| Mother sitting room | 2 | 43.2 | 86.4 |
| Storage room | 2 | 10.8 | 21.6 |
| Doctors room | 2 | 10.8 | 21.6 |
| Visitors waiting space | 2 | 12.6 | 25.2 |
| Cleaners Store | 2 | 5.4 | 10.8 |
| Head-Nurse Office | 1 | 18 | 18 |
| TOTAL | | | 873.8 |

VIII:6 ISOLATION UNIT

This unit can as well be used as intensive care unit. There are 36 beds in this units, all provided in single rooms. Each room is provided centrally. There are two floors each containing 18 beds.

Accommodation needed for one floor

| Space Designation | No of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Single bed room | 18 | 21.6 | 388.8 |
| Nurses Station and Medication | 1 | 18.0 | 18.0 |
| Dirty Utility | 1 | 10.8 | 10.8 |
| Clean Utility | 1 | 10.8 | 10.8 |
| Head Nurse Office | 1 | 18.0 | 18.0 |
| Doctors room | 1 | 10.8 | 10.8 |
| Treatment room | 1 | 10.8 | 10.8 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| Toilet | 1 | 1.5 | 1.5 |
| Shower | 4 | 1.0 | 4 |
| Kitchen | 1 | 10.8 | 10.8 |
| Day room | 1 | 43.2 | 43.2 |
| Storage room | 1 | 10.8 | 10.8 |
| Relatives Waiting Space. | 1 | 12.6 | 12.6 |
| TOTAL | | | 556.3 |

VIII:7 OUT-PATIENT DEPARTMENT (O.P.D)

Expected out-patient weekly attendance is 5010. See table 1 & 2. The author observed that, about 30 percent of the out-patients go to male O.P.D, 30 percent go to female O.P.D, 17 percent go to ante-natal clinic and 23 percent go to Paediatric Clinic.

a) Consultation Suites required in the Male O.P.D.

Average weekly attendance 1500

Average Consultation time in minutes 4

Total length of session in minutes 180

Number of sessions required $\frac{1500 \times 4}{180}$

$= 33.3$

Number of Sessions held weekly = 6

Number of Consultation required $\frac{33.3}{6}$

$= 5.5$

In Practice this figure (5.5 suites) must be exceeded, hence Seven Suites are provided. The same is provided in the female O.P.D.

b) Consultation Suites required in Ante-natal Clinic

Average weekly attendance 850

Average consultation time is minutes 4

Total length of each session in minutes 180

Number of sessions required $\frac{850 \times 4}{180}$

$= 18.8$

Number of sessions held weekly 6

Number of Consultation suites $\frac{18.8}{6}$ =3.1

The figure must be exceeded, hence 4 suites are provided.

c) Consultation Suites required in Paediatric Clinic

Average weekly attendance 1150

Average Consultation time in minutes 4

Total length of each session in minutes 180

Number of sessions required $\frac{1150 \times 4}{180}$

= 25.5

Number of session held weekly 6

Number of Consultation Suites required $\frac{25.5}{6}$ =4.2

This figure must be exceeded, hence 5 suites are provided.

d) Male O.P.D. - Accommodation Needed.

| Space Designation | No of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Reception & records | 1 | 27 | 27 |
| Waiting Space | 1 | 48 | 48 |
| Nurses Station and Sub-waiting | 3 | 18 | 54 |
| Consultation room | 7 | 13.5 | 94.5 |
| Exam/treatment room | 14 | 13.5 | 189 |
| Public Toilet | 2 | 1.5 | 3.0 |
| Staff Toilet | 2 | 1.5 | 3.0 |
| Dispensary | 1 | 36 | 36 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| Staff rest room | 1 | 27 | 27 |
| Storage room | 1 | 13.5 | 13.5 |
| TOTAL | | | 497.7 |

Female O.PD. - Accommodation needed, the same with male O.D.P O.P.D.

Paediatric O.P.D - Accommodation needed.

| Space Designation | No of rooms requires | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Reception & records | 1 | 27 | 27 |
| Waiting Space | 1 | 36 | 36 |
| Nurses Station and Subwaiting | 2 | 18 | 36 |
| Consultation/ Examination room | 5 | 13.5 | 67.5 |
| Public toilet | 2 | 1.5 | 3.0 |
| Staff toilet | 2 | 1.5 | 3.0 |
| Dispensary | 1 | 36 | 36 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| Storage room | 1 | 13.5 | 13.5 |
| Staff rest room | 1 | 27 | 27 |
| TOTAL | | | 251.7 |

f) Ante-natal Clinic-Accommodation Needed.

| Space designation | n No of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Reception & records | 1 | 27 | 27 |
| Consulting room | 4 | 13.5 | 54 |
| Examination room | 8 | 13.5 | 108 |
| Nurses Station and Sub-waiting | 2 | 18 | 36 |
| Instruction class | 1 | 40.5 | 40.5 |
| Physiotherapy room | 1 | 40.5 | 40.5 |
| Nursery | 1 | 36 | 36 |
| Public Toilet | 2 | 1.5 | 3 |
| Staff Toilet | 2 | 1.5 | 3 |
| Dispensary | 1 | 36 | 36 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| Storage room | 1 | 13.5 | 13.5 |
| Staff rest room | 1 | 27 | 27 |
| TOTAL | | | 427.2 |

g) Special Clinic - Accommodation Needed.

| Space designation | No of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Reception & records | 1 | 27 | 27 |
| Waiting Space | 1 | 27 | 27 |
| Consulting room | 1 | 13.5 | 13.5 |
| Exam/treatment room | 2 | 13.5 | 13.5 |
| E.N.T. Audiometry room | 1 | 13.5 | 13.5 |
| Dental work room | 1 | 13.5 | 13.5 |
| Dental recovery room | 1 | 27 | 27 |
| Patient toilet | 2 | 1.5 | 3 |
| Staff toilet | 2 | 1.5 | 3 |
| Dark room | 1 | 13.5 | 13.5 |
| Storage room | 1 | 13.5 | 13.5 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| TOTAL | | | 186.5 |

h) Emergency service Unit - Accommodation Needed.

| Space designation | Number of rooms required | Size of each room $m^2$ | Total area $m^2$ |
|---|---|---|---|
| Ambulance Parking and Unloading | 1 | 25 | 25 |
| Reception area | 1 | 27 | 27 |
| Waiting room | 1 | 27 | 27 |
| Surgical treatment room | 1 | 13.5 | 13.5 |
| Preparation room | 1 | 27 | 27 |
| Exam/Consulting room | 2 | 13.5 | 27.0 |
| Nurses Station | 1 | 13.5 | 13.5 |
| Observation room | 1 | 54 | 54 |
| Operating Theatre | 1 | 36 | 36 |
| Plaster room | 1 | 13.5 | 13.5 |
| Scrub Up and Gown | 1 | 13.5 | 13.5 |
| Anaesthetic room | 1 | 13.5 | 13.5 |
| Sink room | 1 | 9 | 9 |
| Sterile Supply room | 1 | 13.5 | 13.5 |
| Storage room | 1 | 13.5 | 13.5 |
| Stretcher and wheel Chair alcove | | 5.4 | 5.4 |
| Doctor duty room | 1 | 13.5 | 13.5 |
| Nurses duty room | 1 | 13.5 | 13.5 |
| Cleaner Store | 1 | 5.4 | 5.4 |
| Toilet | 4 | 1.5 | 6 |
| Work room | 1 | 13.5 | 13.5 |
| TOTAL | | | 383.8 |

VIII:8 OPERATING SUITE - ACCOMMODATION NEEDED.

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Operating Theatre | 2 | 43.2 | 86.4 |
| Anaesthetic room | 2 | 10.8 | 21.6 |
| Preparation room | 2 | 10.8 | 21.6 |
| Scrub-up room | 2 | 10.8 | 21.6 |
| Sterilising room | 1 | 17.8 | 17.8 |
| Doctors Office | 2 | 21.6 | 43.2 |
| Nurses Office | 2 | 21.6 | 43.2 |
| Nurses Changing room | 2 | 10.8 | 21.6 |
| Doctors Changing room | 2 | 10.8 | 21.6 |
| Disposal room | 1 | 10.8 | 10.8 |
| Reception area | 2 | 21.6 | 43.2 |
| Patient waiting | 2 | 10.8 | 21.6 |
| Sterile Store | 1 | 10.8 | 10.8 |
| Stretcher alcove | 1 | 5.4 | 5.4 |
| Toilet | 2 | 1.5 | 3 |
| TOTAL | | | 393.4 |

VIII:9 DELIVERY SUITE - ACCOMMODATION NEEDED.

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Delivery room | 2 | 36 | 72 |
| Labour room & toilet + Shower | 4 | 18 | 72 |
| Labour/emergency Delivery room | 1 | 27 | 27 |
| Work | 1 | 13.5 | 13.5 |
| Nurses Station | 1 | 18 | 18 |
| Head Nurse Office | 1 | 13.5 | 13.5 |
| Doctors room | 1 | 13.5 | 13.5 |
| Recovery room | 1 | 36 | 36 |
| Relative Waiting | 1 | 36 | 36 |
| Reception & Record | 1 | 18 | 18 |
| Toilet | 4 | 1.5 | 6 |
| Operating Theatre | 1 | 36 | 36 |
| Preparation | 1 | 18 | 18 |
| Scrub Up & Gown | 1 | 13.5 | 13.5 |
| Sterile Supply room | 1 | 13.5 | 13.5 |
| Anaesthetic | 1 | 13.5 | 13.5 |
| Storage room | 1 | 9 | 9 |
| Disposal room | 1 | 9 | 9 |
| Clean Utility | 1 | 9 | 9 |
| Dirty Utility | 1 | 9 | 9 |
| Cleaner Store | 1 | 5.4 | 5.4 |
| TOTAL | | | 317.4 |

VIII·10 RADIOLOGY DEPARTMENT

This hospital will provide only diagnostic Service. Radiotherapy patients will be transferred to more advanced hospital.

Accommodation Needed

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Reception & Records | 1 | 18 | 18 |
| Waiting Space | 1 | 18 | 18 |
| Dressing Cubicle | 2 | 3 | 6 |
| Darkroom | 1 | 9 | 9 |
| Film Files and Collection | 1 | 18 | 18 |
| Film viewing | 1 | 9 | 9 |
| X-ray room | 1 | 36 | 36 |
| Radiographers room | 1 | 9 | 9 |
| Radiologist room | 1 | 9 | 9 |
| Portable Unit Store | 1 | 18 | 18 |
| Toilet | 2 | 1.5 | 3 |
| Storage room | 1 | 9 | 9 |
| Cleaners Store | 1 | 5.4 | 5.4 |
| TOTAL | | | 167.4 |

VIII:11 PATHOLOGY DEPARTMENT

This department consist of four laboratories.

They are:- Haematology

- Biochemistry

- Histology

- Bacteriology.

Accommodation Needed

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Reception & Records | 1 | 18 | 18 |
| Waiting Space | 1 | 18 | 18 |
| Exam and test room | 1 | 13.5 | 13.5 |
| Pathologist Office | 1 | 13.5 | 13.5 |
| Specimen toilet | 1 | 2.25 | 2.25 |
| Technician toilet | 2 | 1.5 | 3 |
| Technician Lockers | 1 | 9 | 9 |
| Sterilizing and Glass-washing | 1 | 13.5 | 13.5 |
| Storage room | 1 | 13.5 | 13.5 |
| Head Technician room | 1 | 13.5 | 13.5 |
| Haematology and Blood bank | 1 | 27 | 27 |
| Biochemistry Lab. | 1 | 27 | 27 |
| Histology Lab. | 1 | 27 | 27 |
| Bacteriology Lab. | 1 | 27 | 27 |
| TOTAL | | | 225.75 |

VIII:12 PHYSICAL MEDICINE

This hospital will provide only Physiotherapy. Occupational therapy is provided in the nearby rehabilitation Centre.

Accommodation Needed.

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Waiting space | 1 | 10.8 | 10.8 |
| Reception & records | 1 | 10.8 | 10.8 |
| Exam room | 1 | 10.8 | 10.8 |
| Utility room | 1 | 10.8 | 10.8 |
| Storage room | 1 | 10.8 | 10.8 |
| Treatment Cubicle | 2 | 10.8 | 10.8 |
| Whirl Pool | 1 | 9 | 9 |
| Exercise area | 1 | 90 | 90 |
| Changing room | 2 | 9 | 18 |
| Tank room | 1 | 36 | 36 |
| Toilet | 2 | 1.5 | 3 |
| TOTAL | | | 210.3 |

VIII:13 PHARMACY

In this hospital the function of Pharmacy will not include manufacturing of drugs.

Accommodation Needed

| Space designation | Number or rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Compounding and Dispensing | 1 | 36 | 36 |
| Volatile liquids Storage | 1 | 10.8 | 10.8 |
| General Storage | 1 | 24 | 24 |
| Distribution Space | 1 | 18 | 18 |
| Pharmacist Office | 1 | 10.8 | 10.8 |
| Clerks Office | 1 | 18 | 18 |
| Toilet | 2 | 1.5 | 3 |
| TOTAL | | | 120.6 |

VIII:14 CENTRAL STERILE SUPPLY DEPARTMENT (C.S.S.D)

The function of this department will be to supply all departments of the hospital with sterile equipments. It will also receive used equipments, instruments and materials from various departments for sterilization.

Accommodation Needed

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Receiving and Sorting room | 1 | 24 | 24 |
| Cleaning and Processing room | 1 | 24 | 24 |
| Assembly room | 1 | 24 | 24 |
| Sterilising room | 1 | 36 | 36 |
| Sterile Store | 1 | 18 | 18 |
| linen Store | 1 | 10.8 | 10.8 |
| Toilet | 2 | 1.5 | 3.0 |
| Office | 1 | 10.8 | 10.8 |
| TOTAL | | | 120.6 |

VIII:15 CATERING DEPARTMENT

This department is responsible for supplying food for all meals. Scale of provision is designed to meet peak load.

Accommodation Needed

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| General Store | 1 | 18 | 18 |
| Cold Store | 1 | 10.8 | 10.8 |
| Day to Day Kitchen Store | 1 | 9 | 9 |
| Preparation area | 1 | 24 | 24 |
| Cooking and Service area | 1 | 36 | 36 |
| Wash up area | 1 | 10.8 | 10.8 |
| Changing room | 2 | 9 | 9 |
| Catering Officers Office | 1 | 12.96 | 12.96 |
| Clerks room | 1 | 12.96 | 12.96 |
| Dietitian's Office | 1 | 12.96 | 12.96 |
| Toilet | 2 | 1.5 | 3 |
| Trolleys Parking | 1 | 9 | 9 |
| TOTAL | | | 168.48 |

VIII:16 LAUNDRY

ACCOMMODATION NEEDED

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Collection & Sorting room | 1 | 24 | 24 |
| Washing area | 1 | 81 | 81 |
| Work area | 1 | 36 | 36.0 |
| Mending room | 1 | 10.8 | 10.8 |
| Clean storage | 1 | 10.8 | 10.8 |
| Changing room | 1 | 9 | 9 |
| Laundry Manager | 1 | 12.96 | 12.96 |
| Clerks Office | 1 | 12.96 | 12.96 |
| Storage for supplies | 1 | 10.8 | 10.8 |
| Toilet | 2 | 1.5 | 3 |
| Staff rest room | 1 | 16.2 | 16.2 |
| TOTAL | | | 227.52 |

VIII:17 CENTRAL STORES

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Receiving area | 1 | 24 | 24 |
| General Office | 1 | 18 | 18 |
| Bulk food store | 1 | 81 | 81 |
| Used equipment store | 1 | 54 | 54 |
| New equipment store | 1 | 18 | 18 |
| Linen Store | 1 | 18 | 18 |
| Printed forms store | 1 | 10.8 | 10.8 |
| TOTAL | | | 223.8 |

VIII:18 ADMINISTRATION

ACCOMMODATION NEEDED

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Administrator | 1 | 18 | 18 |
| Asst. administrator | 1 | 16.2 | 16.2 |
| Secretary | 1 | 16.2 | 16.2 |
| Chief Medical Officer | 1 | 16.2 | 16.2 |
| Principal Nursing Supt. | 1 | 16.2 | 16.2 |
| Snr. Nursing Supt. | 1 | 16.2 | 16.2 |
| Nursing Supt. | 4 | 12.96 | 51.84 |
| General Office | 1 | 36 | 36 |
| Accountant | 1 | 16.2 | 16.2 |
| Finance Officer | 1 | 16.2 | 16.2 |
| Purchase Officer | 1 | 16.2 | 16.2 |
| Pay-Master | 1 | 12.96 | 12.96 |
| Committee room | 2 | 24 | 48 |
| Staff rest room | 1 | 27 | 54 |
| Library | 1 | 36 | 36 |
| Stationery Store | 1 | 18 | 18 |
| Mail Office | 1 | 16.2 | 16.2 |
| Admission Office | 1 | 12.96 | 12.96 |
| Records Officer | 1 | 12.96 | 12.96 |
| Records Clerks | 1 | 18 | 18 |
| Public Toilet | 4 | 1.5 | 6 |
| Staff Toilet | 4 | 1.5 | 6 |
| Pantry | 1 | 10.8 | 10.8 |
| Cleaners room | 1 | 10.8 | 10.8 |
| General Store | 1 | 12.96 | 12.96 |
| Matron | 1 | 16.2 | 16.2 |
| TOTAL | | | 527.28 |

VIII:19 MAINTENANCE

ACCOMMODATION NEEDED

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Chief Engineer's Office | 1 | 16.2 | 16.2 |
| General Office | 1 | 18.0 | 18.0 |
| Head Security Office | 1 | 12.96 | 12.96 |
| Head Labourers room | 1 | 12.96 | 12.96 |
| Carpenters room | 1 | 12.96 | 12.96 |
| Electricians room | 1 | 12.96 | 12.96 |
| Plumber room | 1 | 12.96 | 12.96 |
| Painters room | 1 | 12.96 | 12.96 |
| Telephone exchange | 1 | 12.96 | 12.96 |
| Masons room | 1 | 19.96 | 12.96 |
| Ambulance Parking | 4 | 30 | 120.0 |
| Toilet | 2 | 1.5 | 3 |
| TOTAL | | | 260.88 |

VIII:20 MORTUARY

ACCOMMODATION NEEDED

| Space designation | Number of rooms required | Size of each room $m^2$ | Total Area $m^2$ |
|---|---|---|---|
| Body Storage room | 1 | 36 | 36 |
| Body Washing | 1 | 9 | 9 |
| Autospy room | 1 | 24 | 24 |
| Store | 1 | 10.8 | 10.8 |
| Toilet | 2 | 1.5 | 3 |
| Shower | 1 | 1.5 | 1.5 |
| Medical Officer room | 1 | 10.8 | 10.8 |
| Cleaners room | 1 | 10.8 | 10.8 |
| Trolleys Park | 2 | 1.5 | 3 |
| Reception & records | 1 | 10.8 | 10.8 |
| TOTAL | | | 119.7 |

TABLE 1

DANBATTA GENERAL HOSPITAL WORK LOAD.

O.P.D. ATTENDANCE BY MONTH 1982.

| MONTH. | JAN | FEB | MARCH | APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WEEKLY | 4991 | 4616 | 5758 | 5116 | 4884 | 4889 | 4784 | 4922 | 5017 | 5909 | 4988 | 4289 |
| DAILY | 832 | 769 | 960 | 852 | 814 | 815 | 797 | 820 | 836 | 985 | 831 | 715 |

Average Weekly Attendance 5010

Average daily Attendance. 835

Source:- MEDICAL RECORD OFFICE DANBATTA GENERAL HOSPITAL.

TABLE 2

BIRININKUDU GENERAL HOSPITAL WORK LOAD

O.D.P ATTENDANCE BY MONTH 1982

| MONTH | JAN | FEB | MARCH | APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WEEKLY | 2164 | 3046 | 3577 | 3339 | 4011 | 4107 | 3664 | 3798 | 3425 | 3958 | 3769 | 3382 |
| DAILY | 361 | 508 | 596 | 567 | 668 | 684 | 610 | 633 | 570 | 660 | 618 | 563 |

Average Weekly Attendance. 3515

Average Daily Attendance. 586

SOURCE:- MEDICAL RECORD OFFICE BIRININ-KUDU GENERAL HOSPITAL

FOOTNOTES

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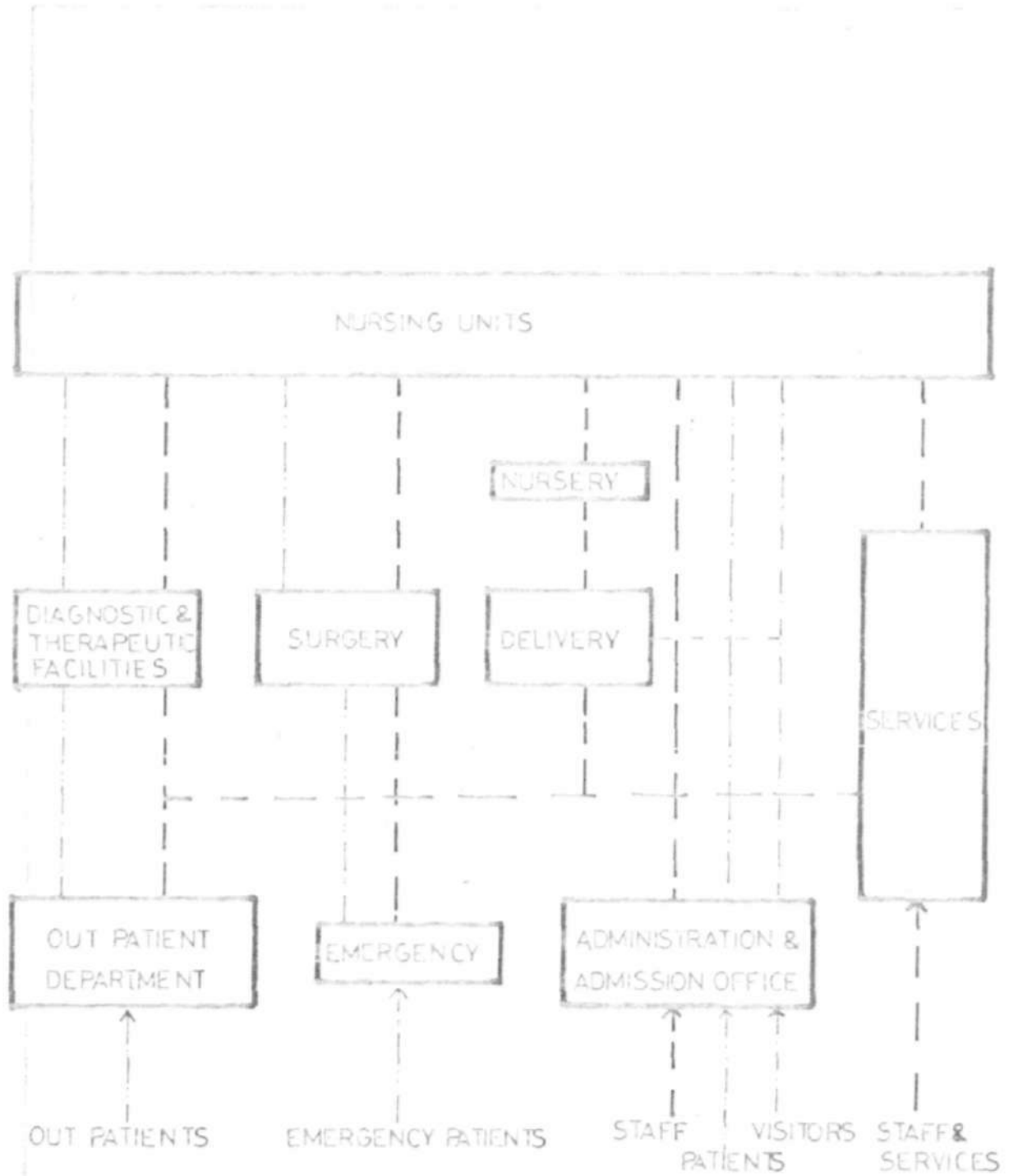



Fig 1 FLOW CHART ACUTE GENERAL HOSPITAL




— — — PATIENT JOURNEY CLEARLY DEFINED

Fig. 2 RECONSTRUCTED OUT-PATIENT DEPARTMENT
LONDON JEWISH HOSPITAL

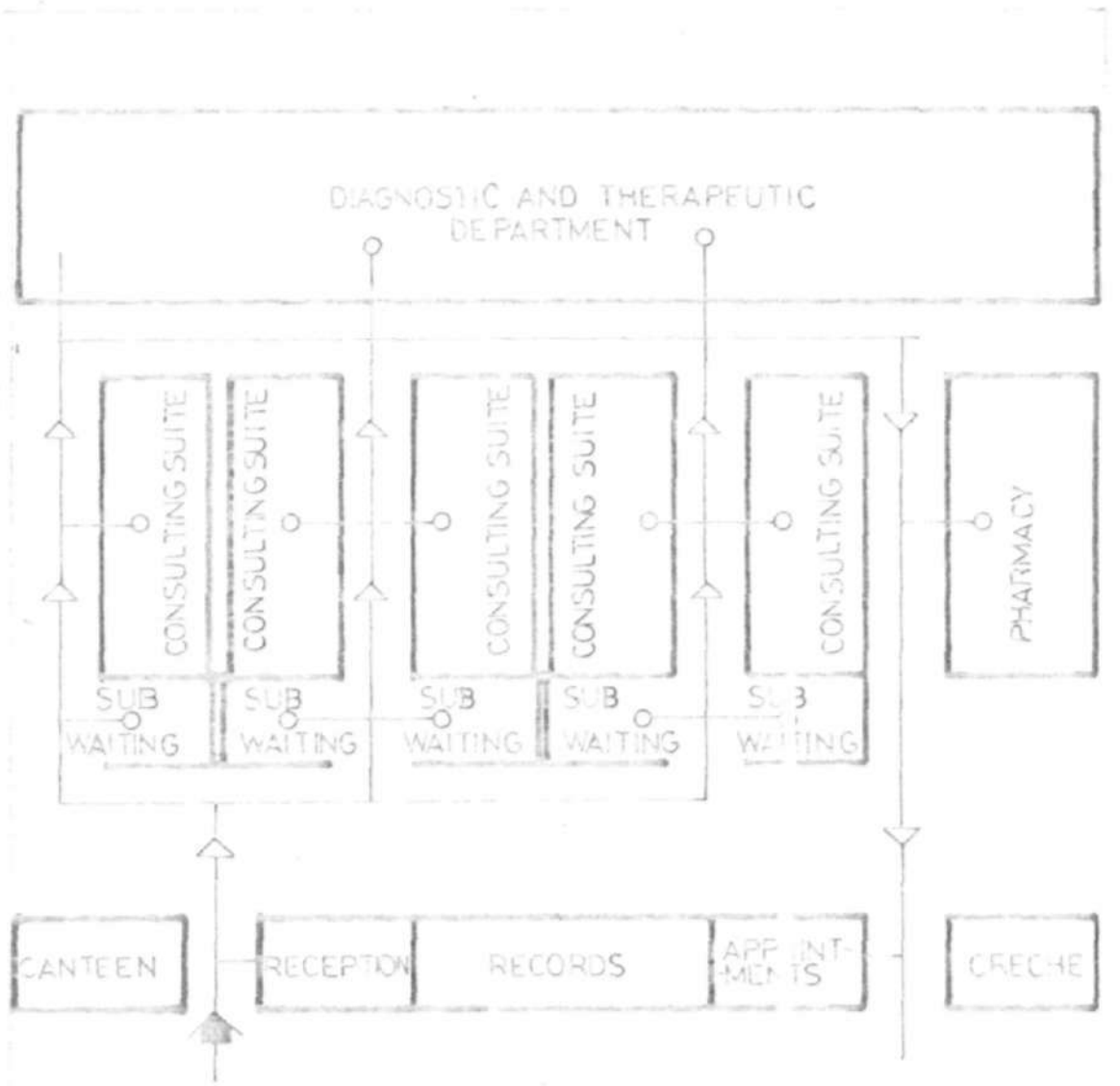



Fig 3 OUT PATIENT DEPARTMENT
FUNCTIONAL RELATIONSHIPS

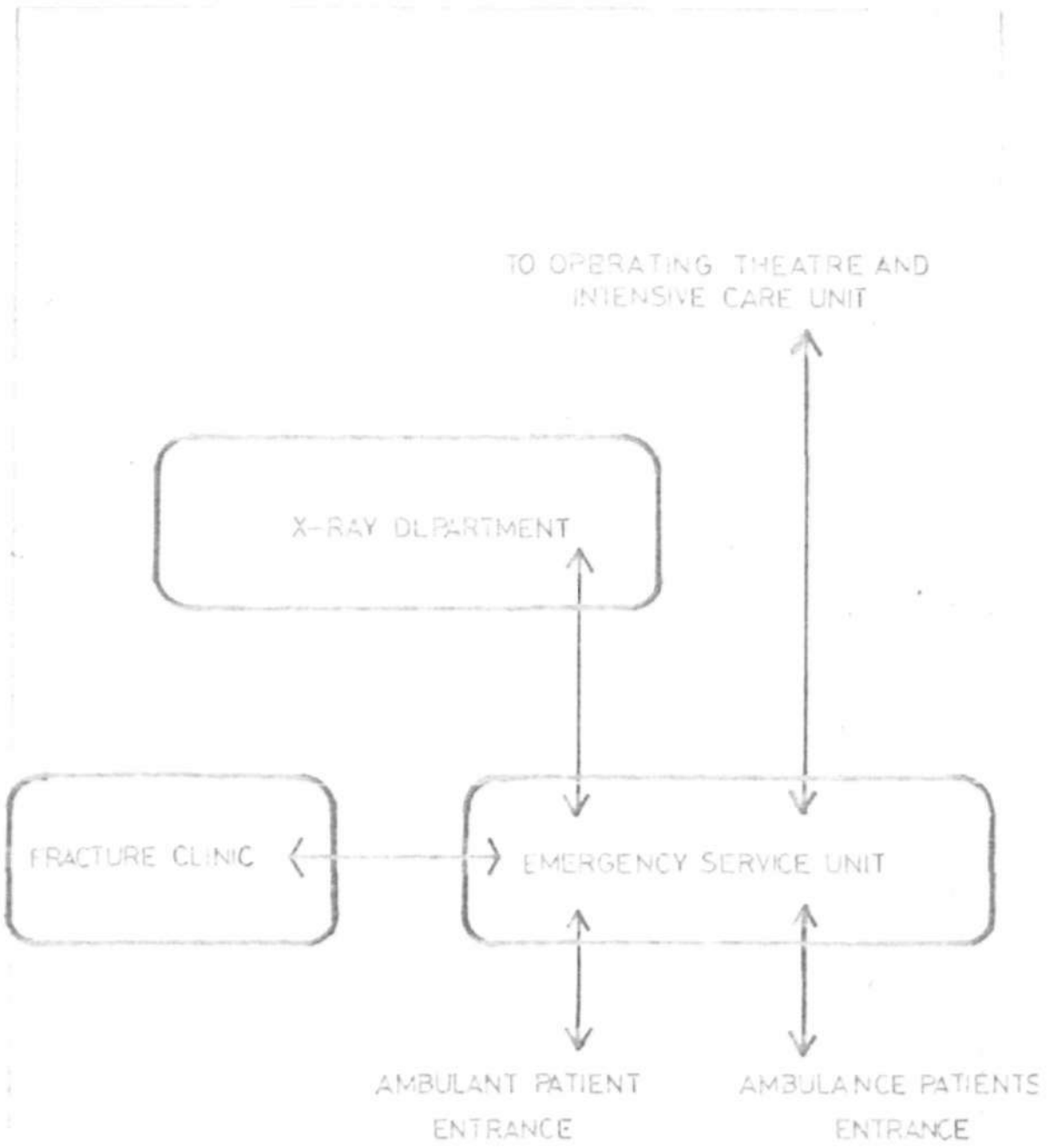
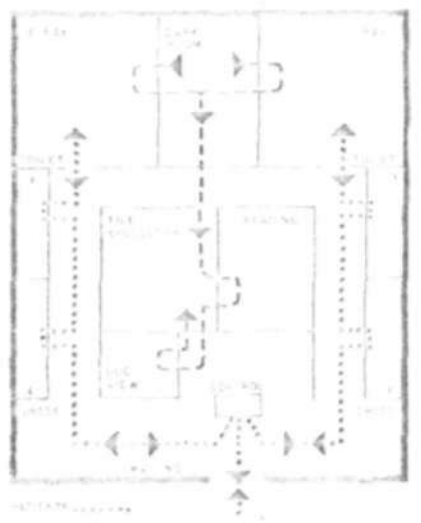



Fig 4 EMERGENCY SERVICES UNIT
FUNCTIONAL RELATIONSHIPS



LEGEND

1. Paper towel dispenser
2. Waste paper receptacle
3. Lavatory
4. Wall-hung water closet
5. Continuous grab bar
6. Emergency calling station (push button)
7. Hook strip
8. Mirror and shelf below
9. Straight chair
10. Cassette pass box
11. Film loading counter
12. Film storage bin
13. Film hanger racks under counter
14. Safelight
15. Ceiling light, white and red
16. Timer
17. Counter with storage cabinets below
18. Cassette storage bins
19. Trash deposit cabinet
20. Cassette cover retainer and wall guard
21. Door with light-proof louver in upper panel
22. Access panel
23. Door with light-proof louver in lower panel
24. Utility sink with drainboard
25. Refrigerating unit under drainboard
26. Developing tank with thermostatic mixing valve
27. Through-the-wall fixing tank
28. Light-proof panel
29. Washing tank
30. X-ray film illuminator (wet viewing)
31. Film dryer
32. Film dryer exhaust to outside
33. Film corner cutter
34. Film pass slot
35. Flush-mounted counter illuminator
36. Film sorting bins above counter
37. Film sorting counter
38. Counter with cabinets below
39. On-wall or mobile film illuminators
40. Temporary film file cart
41. Stereoscope
42. Executive type desk
43. Executive type chair
44. Telephone outlet
45. Intercommunication system outlet
46. Bookshelves, 42 in. by 14 in.
47. Typist chair
48. Typist desk
49. Filing cabinet, letter size

5.05 PATIENTS AND FILM TRAVEL

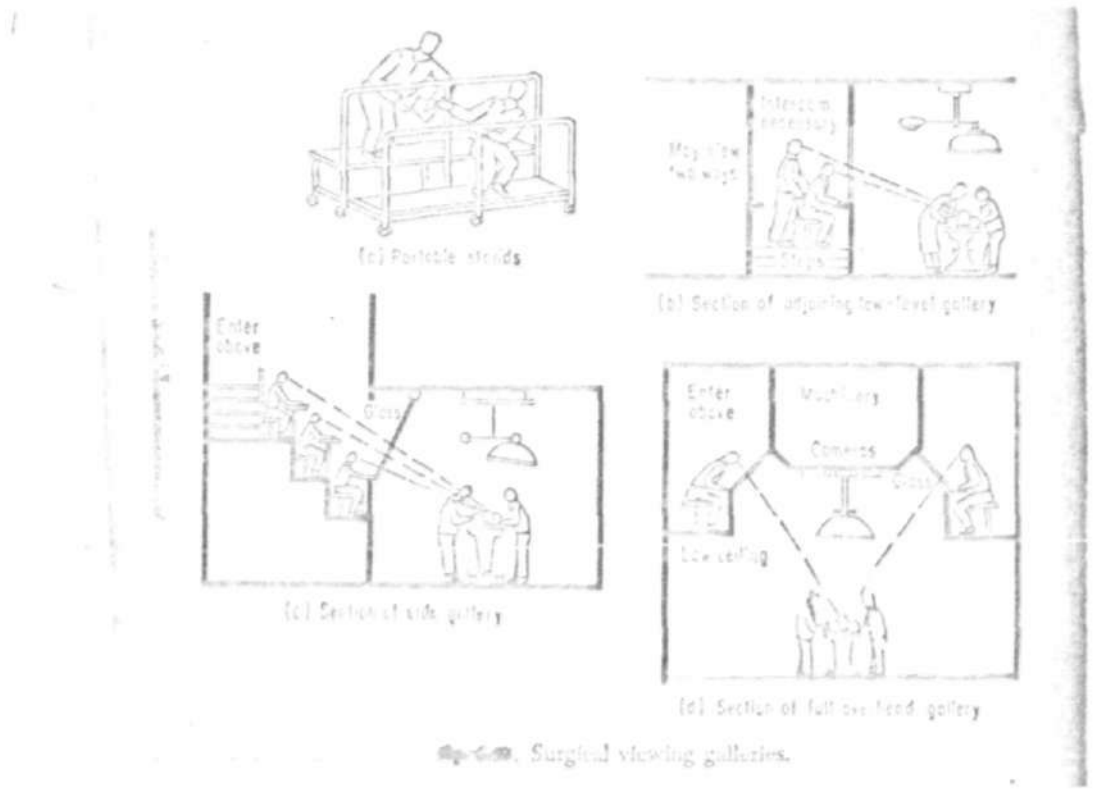
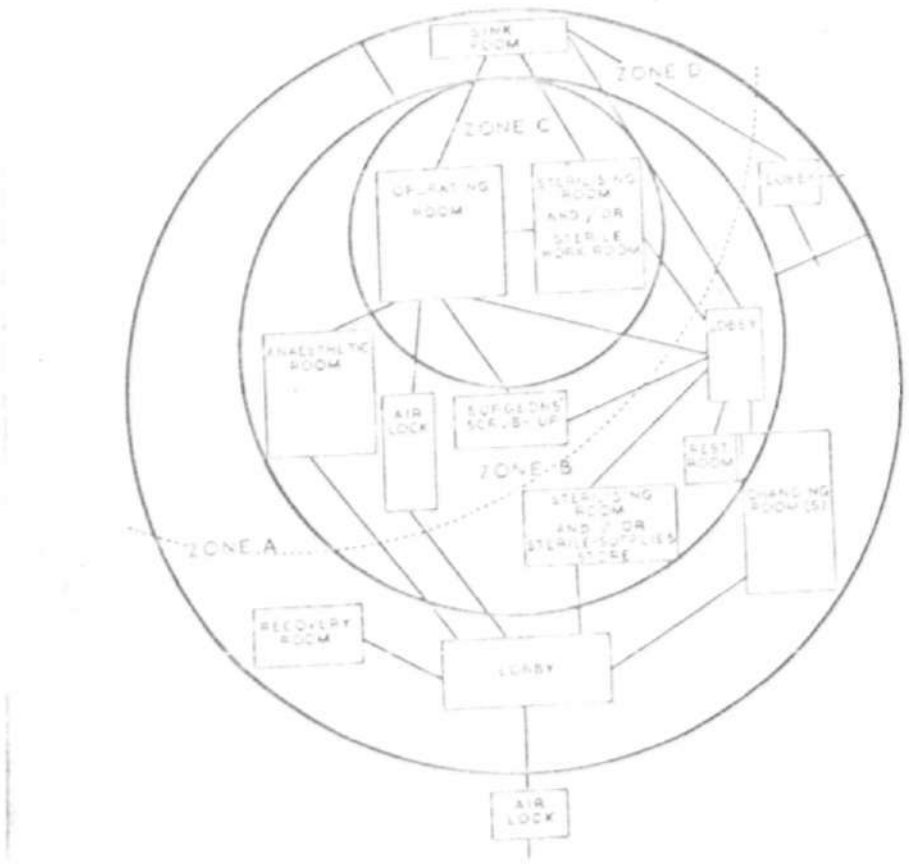



Fig 6 SURGICAL VIEWING GALLERIES

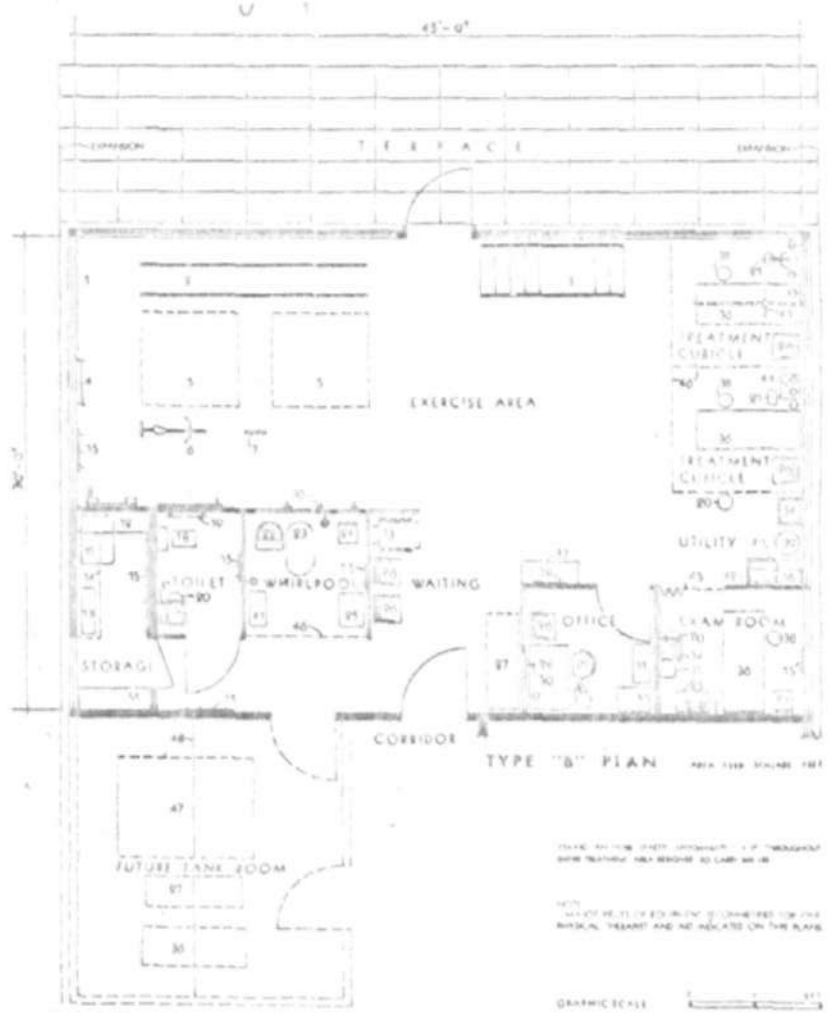


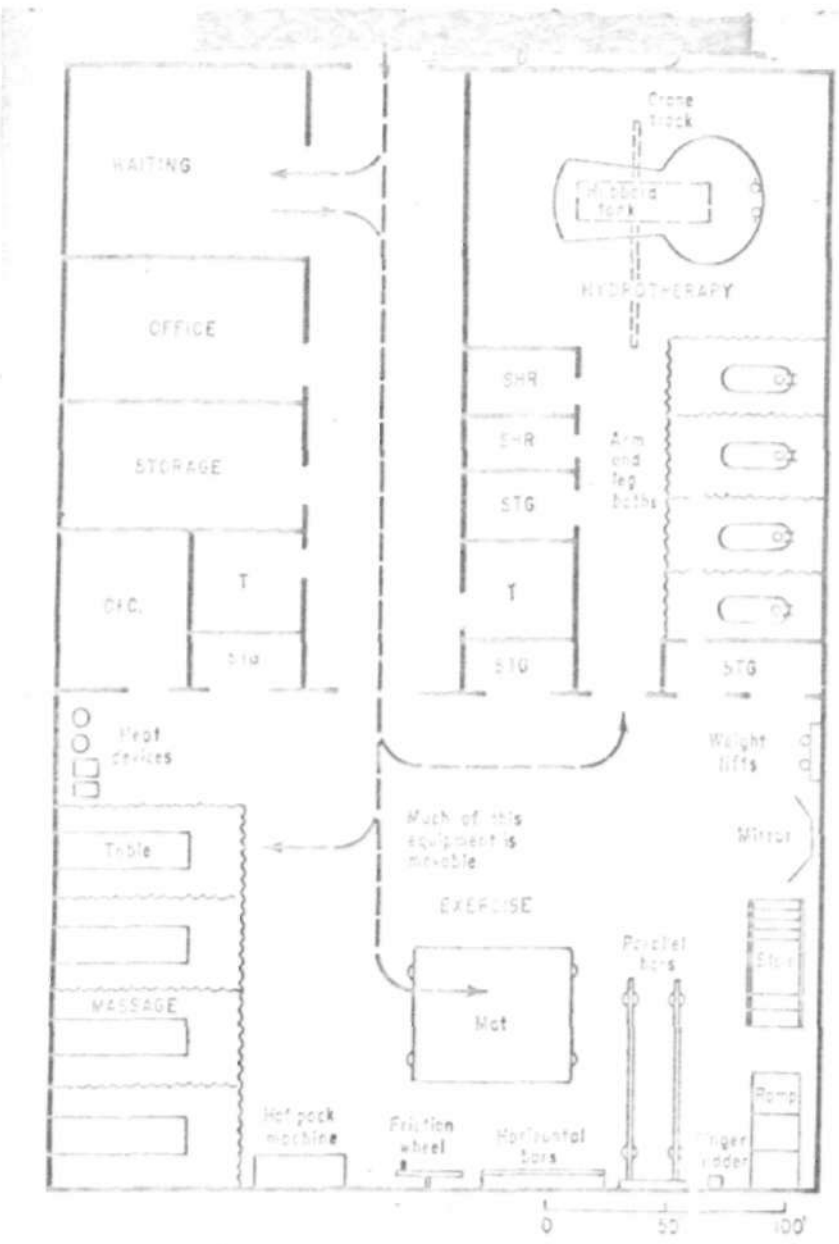

Functional relationships of operating theatre zones according to the MRC report (1962). A = protective zone, B = clean zone, C = sterile zone, D = disposal zone. The rooms above and to the left of the broken line constitute the operating-room unit.

Fig 7 FUNCTIONAL RELATIONSHIPS OF OPERATING THEATRE ZONES ACCORDING TO THE MRC REPORT (1962)

FIG 8 PHYSICAL THERAPY DEPARTMENT TYPICAL PLAN

1. Posture Mirror
2. Parallel Bars
3. Steps
4. Stall Bars
5. Gym Mat
6. Stationary Bicycle
7. Sayer Head Sling Attached to Ceiling
8. Pulley Weights
9. Shoulder Wheel
10. Gym Bag Hooks
11. Cart with Open Shelves
12. Open Shelves
13. Wheel Chair
14. Shelf
15. Wall Hooks
16. Wall Cabinet
17. Lavatory, Gooseneck Spout
18. Water Closet
19. Hand Rail
20. Waste Paper Receptacle
21. Portable Equipment
22. Adjustable Chair
23. Whirlpool
24. Chair
25. Table
26. Chair, preformed with arms
27. Wheel Stretcher
28. Desk
29. Swivel Chair
30. File Cabinet
31. Bookcase
32. Bulletin Board
33. Wall Desk (counter, shelf ledger)
34. Lavatory, Gooseneck Spout and Foot Control
35. Wall Cabinet with Lock
36. Treatment Table, Storage below
37. Mirror 24sq Glass Shelf over Lavatory
38. Adjustable Stool
39. Laundry Hamper
40. Sink with Drainboard
41. Paraffin Bath
42. Glass Shelf over Sink
43. Overbed Trapeze
44. Three Single Outlets on separate branch circuits, 1 outlet 2-pole, 2 outlets 3-pole
45. Folding Door
46. Cubicle Curtain
47. Under Water Exercise Equipment
48. Overhead Lift
49. Coat Rack
50. Telephone Outlet






Flow of patients, physical therapy.

Fig 9 FLOW OF PATIENTS PHYSICAL THERAPY




Physical therapy equipment.

Fig 10 PHYSICAL THERAPY EQUIPMENTS

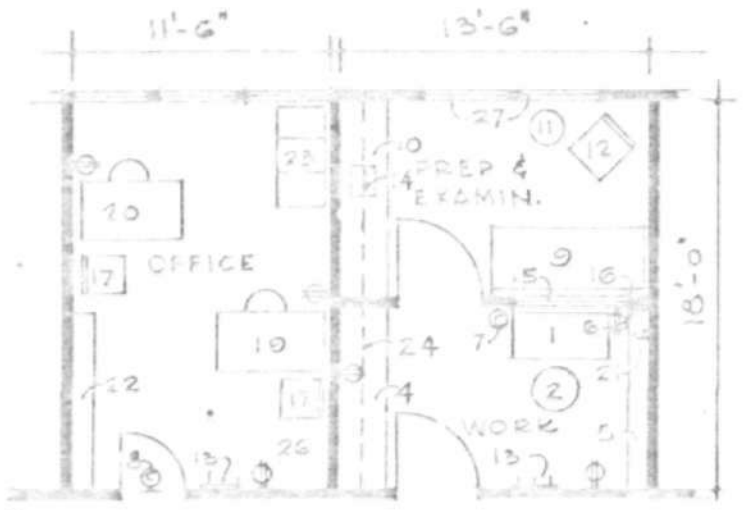
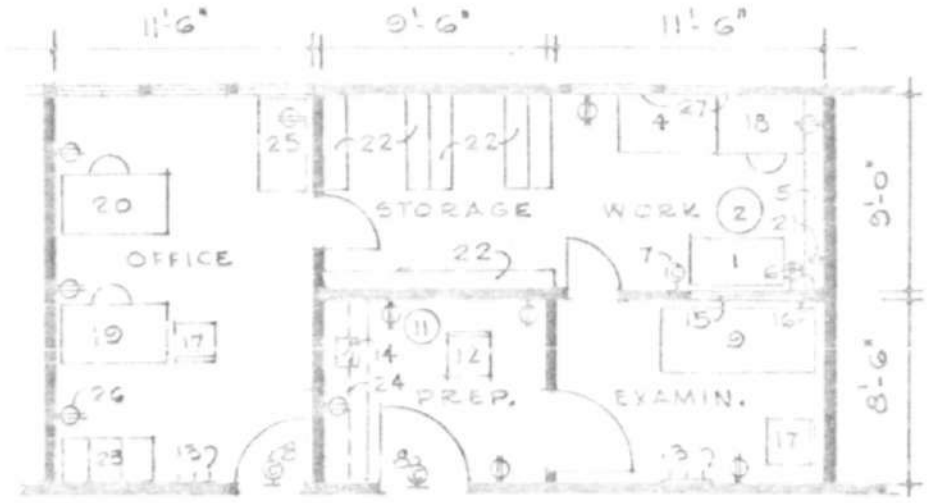



Fig 10 Minimum EEG suite




Recommended suite with separate preparation and examining rooms

Equipment list

1. Electroencephalograph, console type
2. Stool
3. Steel cabinet with shelving and door
4. Work bench, cabinet below
5. Shelf
6. Photostimulator panel (if used)
7. Clock with sweep second hand above glass panel
8. Clock outlet
9. Adjustable hospital bed
10. Sink in counter, cabinets below
11. Sanitary waste receptacle
12. Chair for patient preparation
13. Hook strip
14. Mirror above sink
15. Glass window
16. Two holes through wall, 3 in., 20 in. from floor
17. Armchair
18. General office-type desk and chair
19. Typist's desk and chair
20. Executive-type desk and chair
21. Two-pole switch for light in patient's room
22. Filing compartments for EEG recordings
23. File cabinets, legal size
24. Cabinet above for electrodes, etc.
25. Work table
26. Duplex outlets
27. Venetian blind

Fig 11

ELECTROENCE—

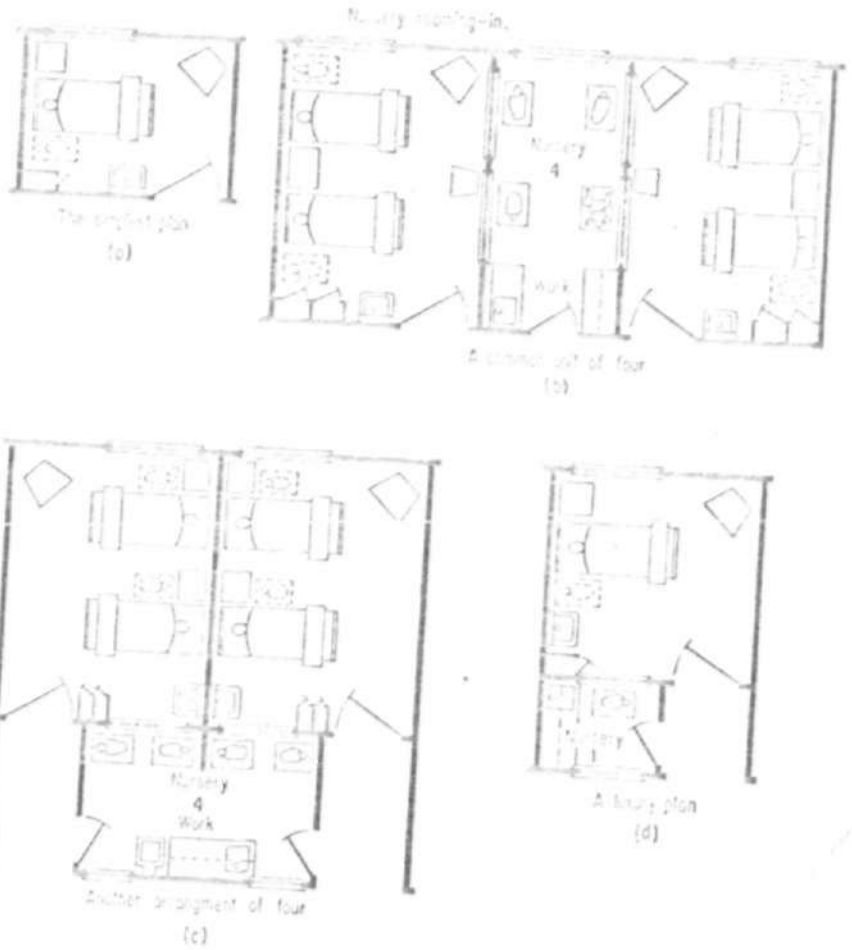



Fig 12 ROOMING-IN NURSERY



Fig 3.44. The infant nursery.

Fig 13 CENTRAL NURSERY

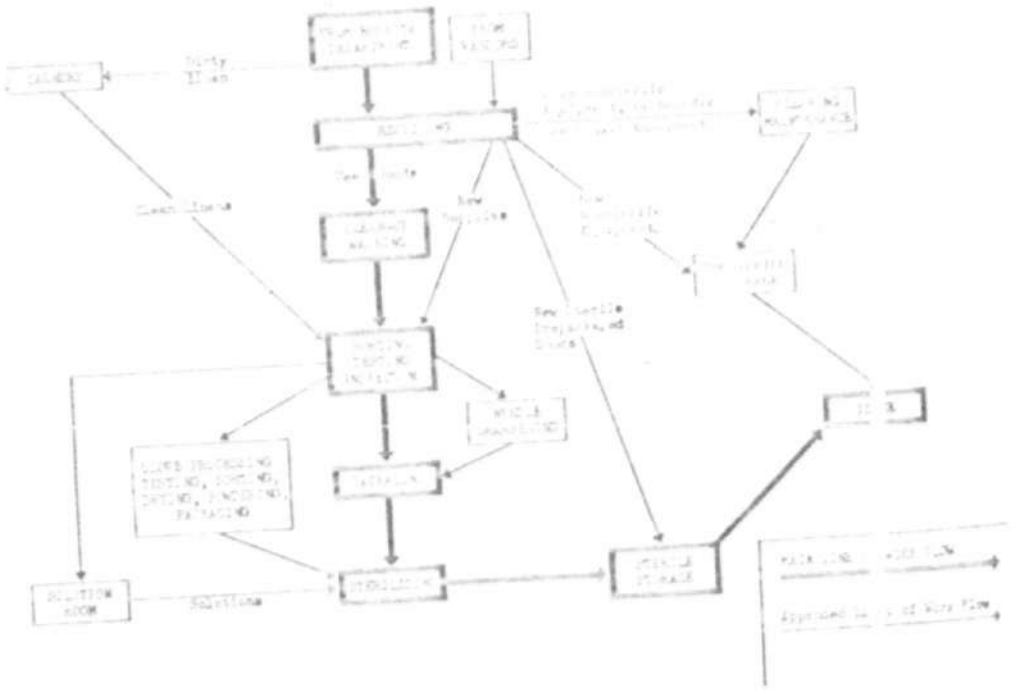
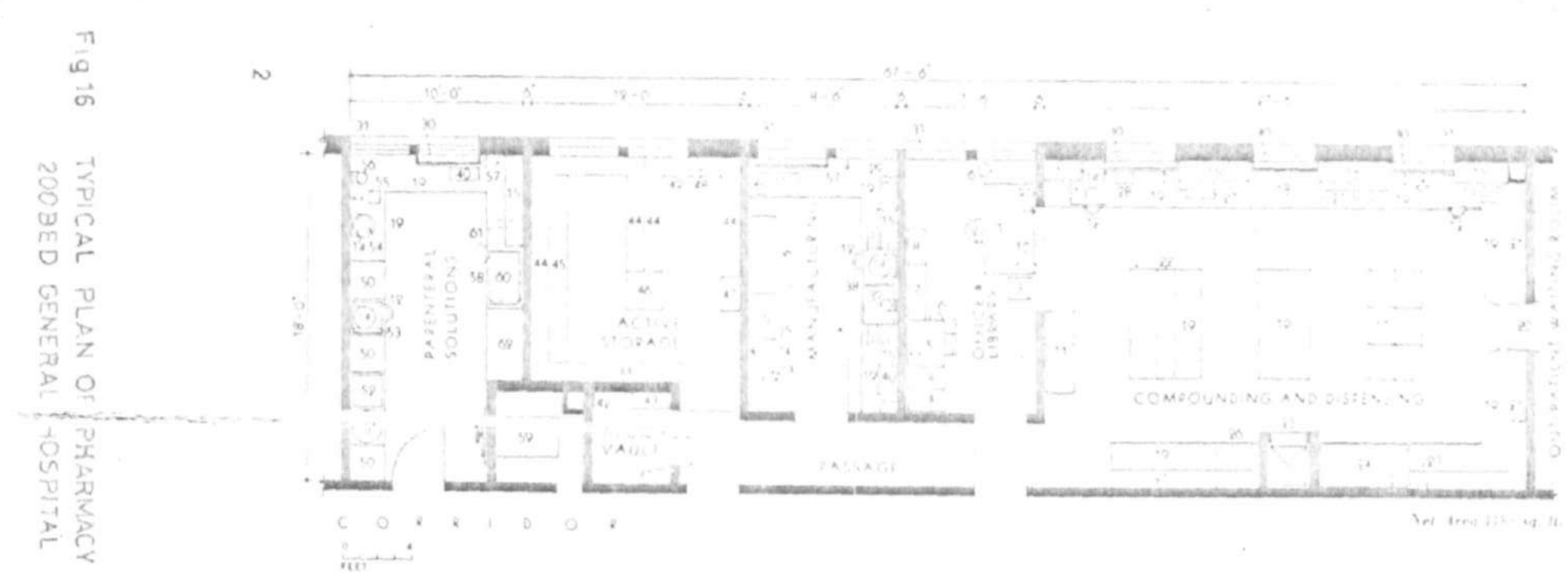


Fig 14 THEORETICAL C·S·S·D WORKFLOW



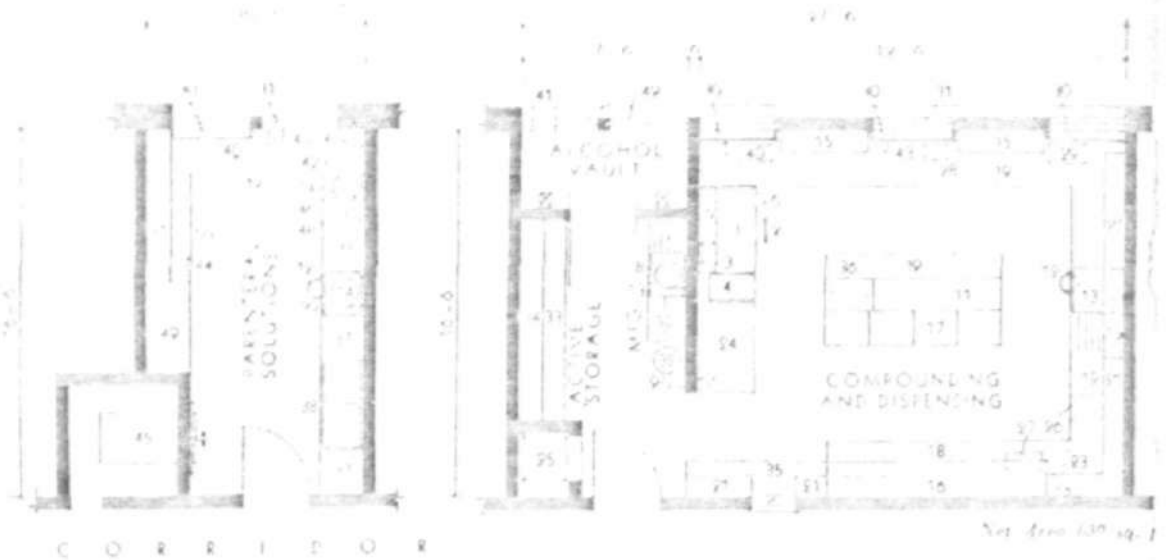

Fig 15 AN INTEGRATED PLAN RELATING RECEIVING AND ISSUE FUNCTIONS OF C·S·S·D LAUNDRY PHARMACY AND STORES




1. Desk, executive
2. Chair, executive
3. Chair, straight
4. File, 4 drawer
5. Table, writing
6. Receptacle, waste paper
7. Case, book
8. Rack, magazine
9. Outlet, telephone
10. Glass panel
11. Rack, cartons
12. Can, sanitary waste
13. Sink, with goose neck spout and drainboard, graduate rack above, cabinets below
14. Tank, glass, distilled water, 12 gallon
15. Cabinets, adjustable shelves
16. Cabinet, drug, sectional type, with shelf above counter
17. Cabinets, drug, sectional type
18. Counter, pressed [illegible] cabinets and drawers below
19. Counter, cabinet and drawers below
20. Window, display
21. Shelves, adjustable open, starting 18 inches above counter
22. Shelf, above counter
23. File, [illegible]
24. Refrigerator, [illegible] original drawers, 52 cubic feet
25. Disinfectant
26. Safe, narcotic, under counter
27. Scale, prescription, [illegible] class A
28. Scale, prescription, [illegible] heavy duty
29. Scale, counter
30. Heat outlet, [illegible] inlet grill in base of cabinet
31. Goods, [illegible]
32. Tank, mixing or [illegible], 50 gallons, mounted on stand with casters
33. Mixer, portable, electric
34. Fluid, press, suction pressure type, mounted on casters
35. Faucet, hot and cold water
36. Rack, floor
37. Mill, colloidal
38. Sink, two compartment, with drainboard, goose neck spout, cabinets below
39. Still, 2 gallon per hour
40. Hot Plate, double element
41. Vent, outlet, 8 inches above floor to atmosphere
42. Vent, inlet, near floor to atmosphere
43. Shelves, starting 12 inches above floor
44. Shelves, 12 inches wide, adjustable open
45. Shelves, 24 inches wide, 36 inches high, adjustable
46. Rack, [illegible]
47. Locker, [illegible]
48. Rack(s), glove shelving
49. Hi-glo cabinet
50. Rack, [illegible]
51. Cleaner, bottle, pressure type
52. Sink with goose neck spout
53. Sink, with distilled water rinser, [illegible] cold water supply
54. Drip pan with waste connection in counter top
55. Pump, suction and pressure
56. Still, 10 gallon per hour
57. Outlet, gas
58. Cartridge, sterilizer, under counter
59. Sterilizer, 21 x 36 x 18 inches
60. Oven, hot air, 24 x 14 x 14 inches, on counter
61. Cabinet, [illegible]
62. Cabinet, storage, open adjustable shelves

Fig. 16 TYPICAL PLAN OF PHARMACY FOR A 200 BED GENERAL HOSPITAL

***Pharmacy for a 200 bed general hospital***

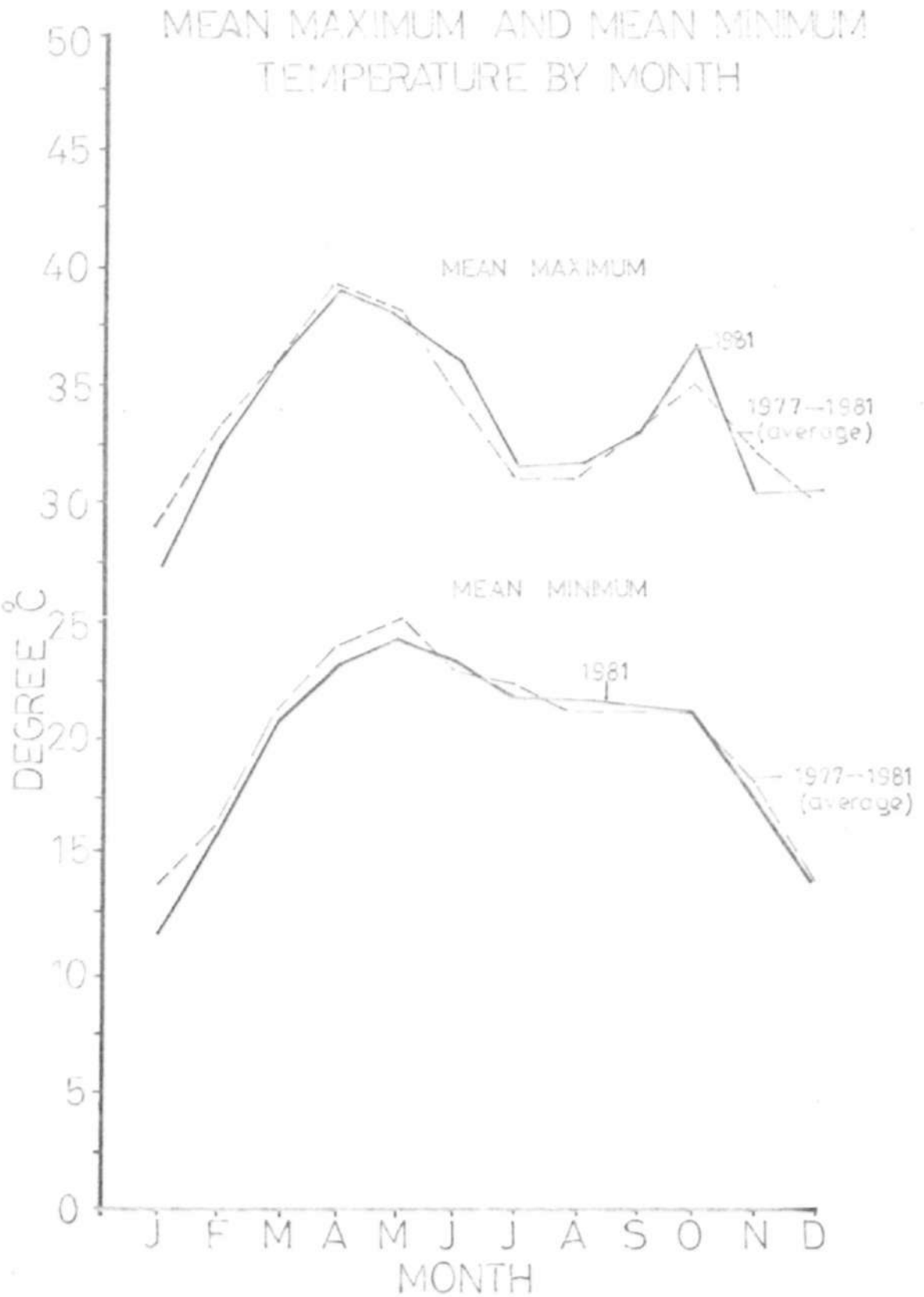



*Pharmacy for a 100 bed general hospital*

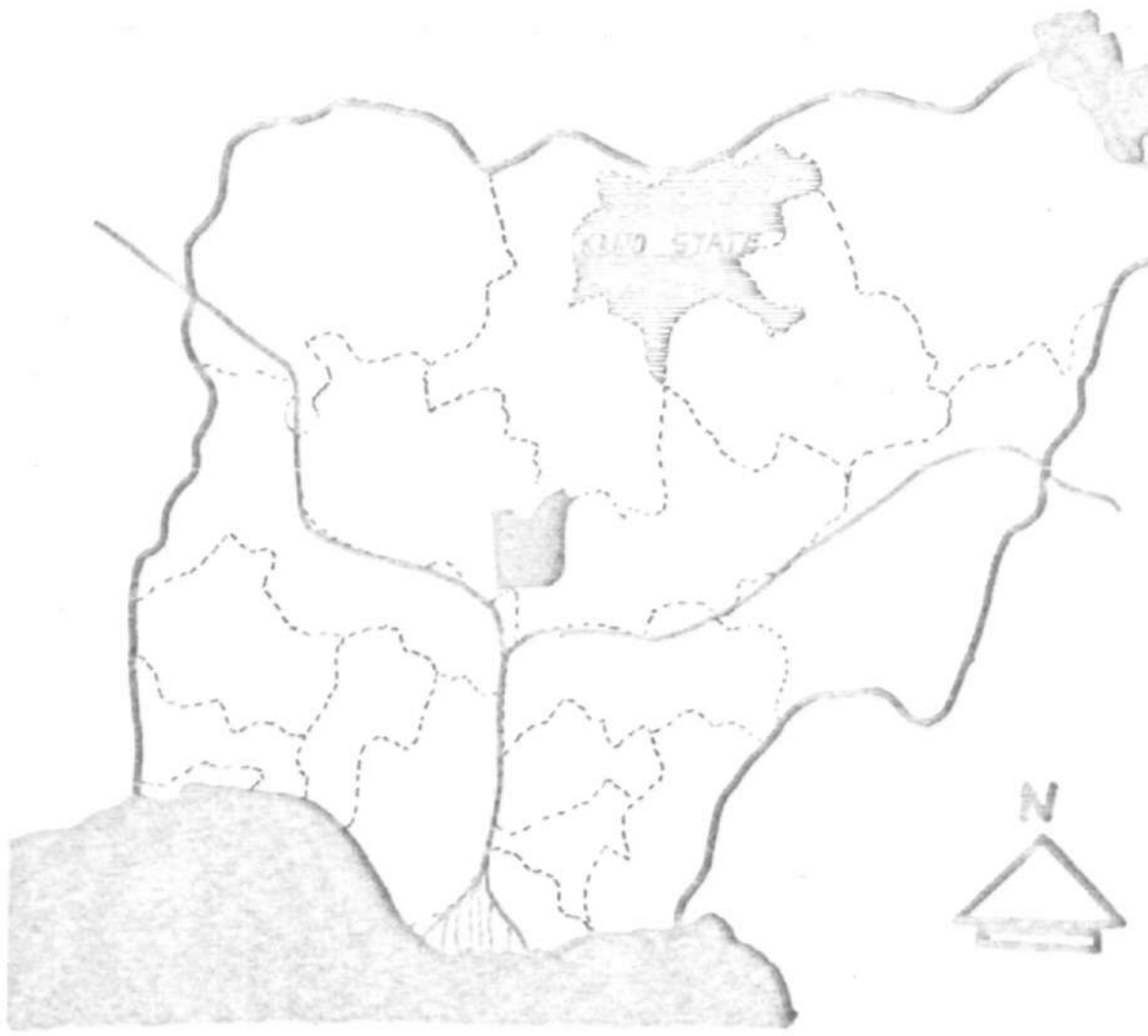



*Pharmacy for a 30 bed general hospital*

Fig 17 TYPICAL PLAN OF PHARMACY FOR A 50BED GENERAL HOSPITAL

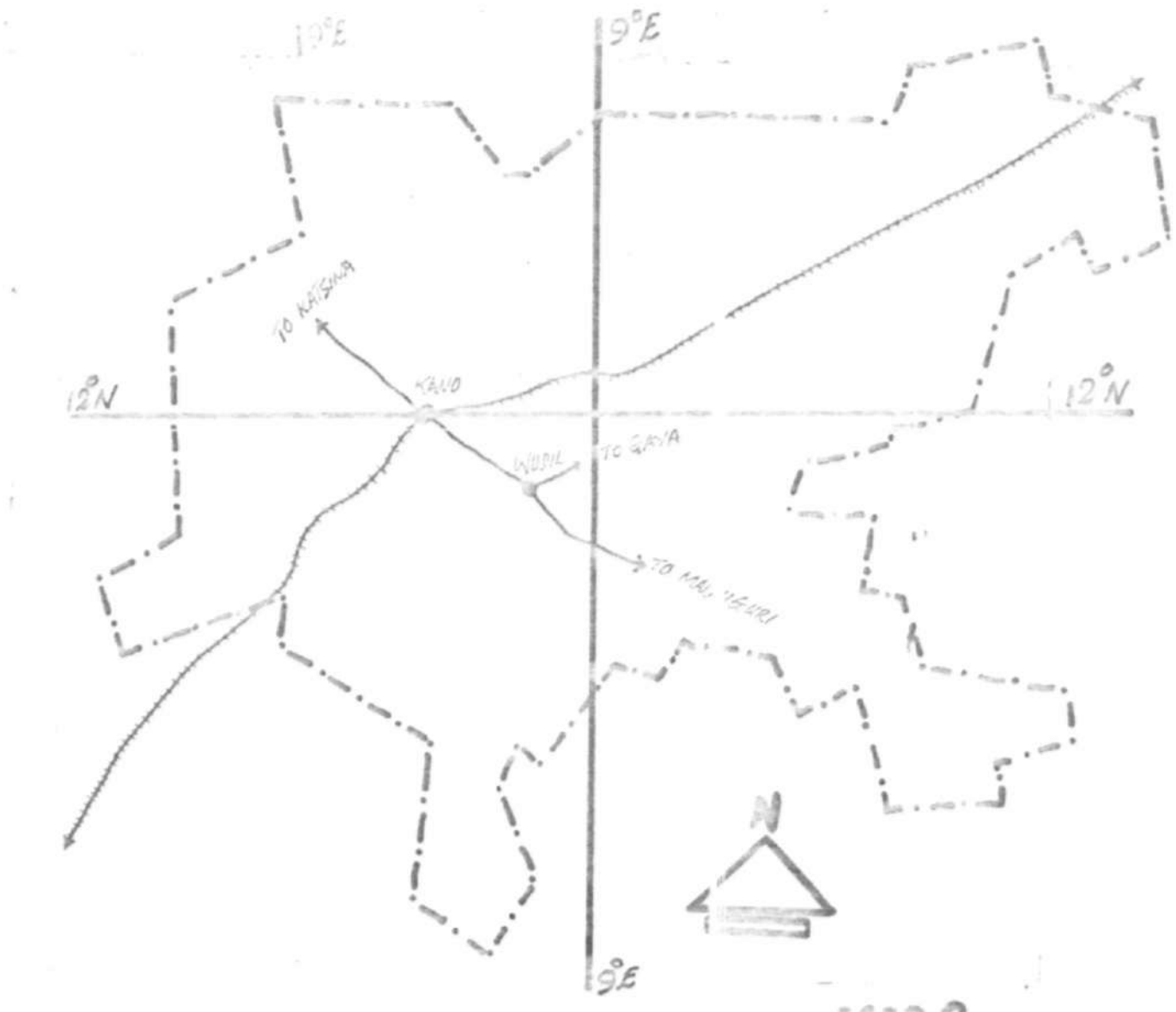

MEAN MAXIMUM AND MEAN MINIMUM
TEMPERATURE BY MONTH
50
45
40
35
30
25
20
15
10
5
0
DEGREE
MEAN MAXIMUM
1981
1977—1981
(average)
MEAN MINIMUM
1981
1977—1981
(average)
J F M A M J J A S O N D
MONTH

GRAPH:1



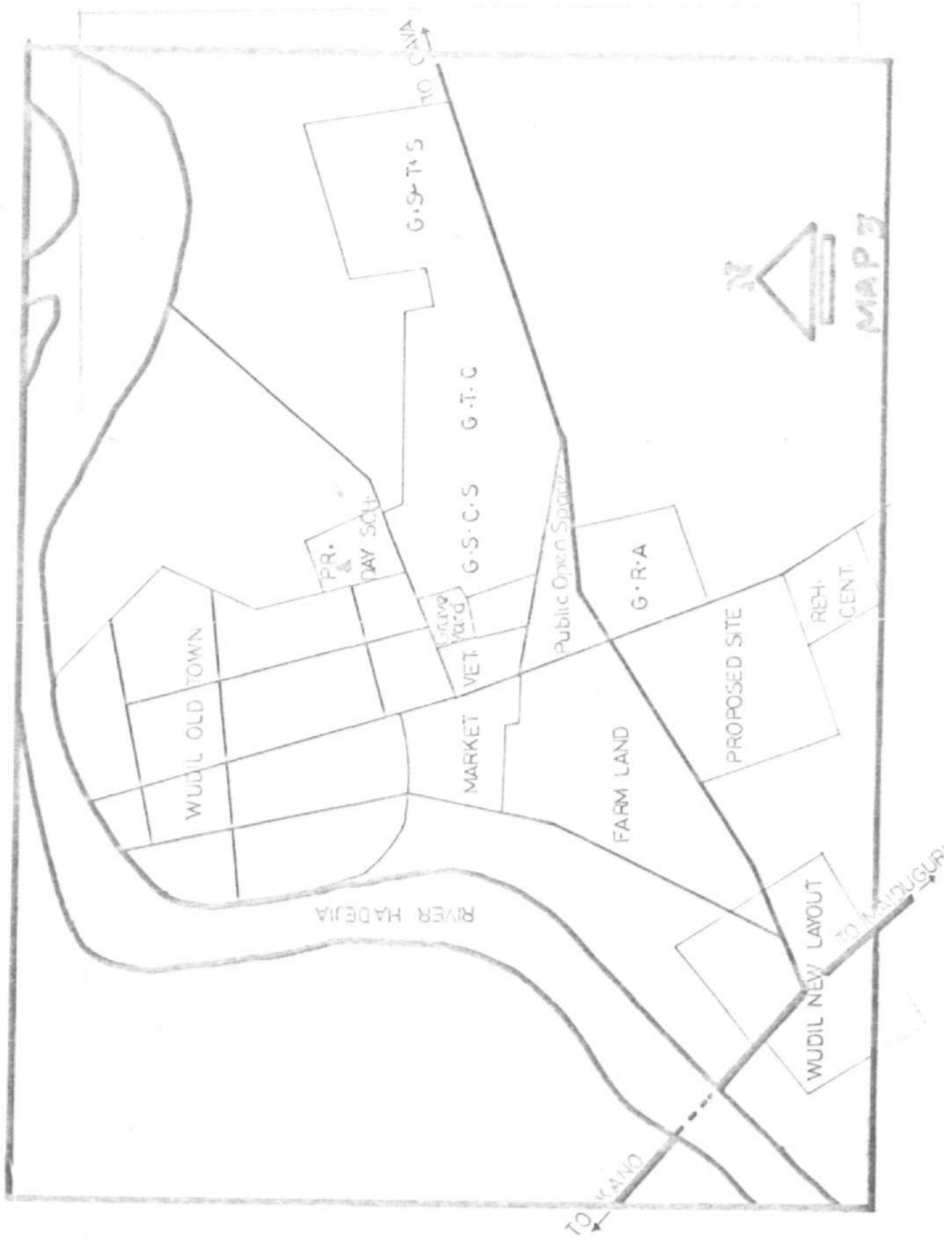

MAP 1

NIGERIA POLITICAL




MAP 2

KANO STATE




WUDIL LAND USE MAP
SCALE 1 : 15,000

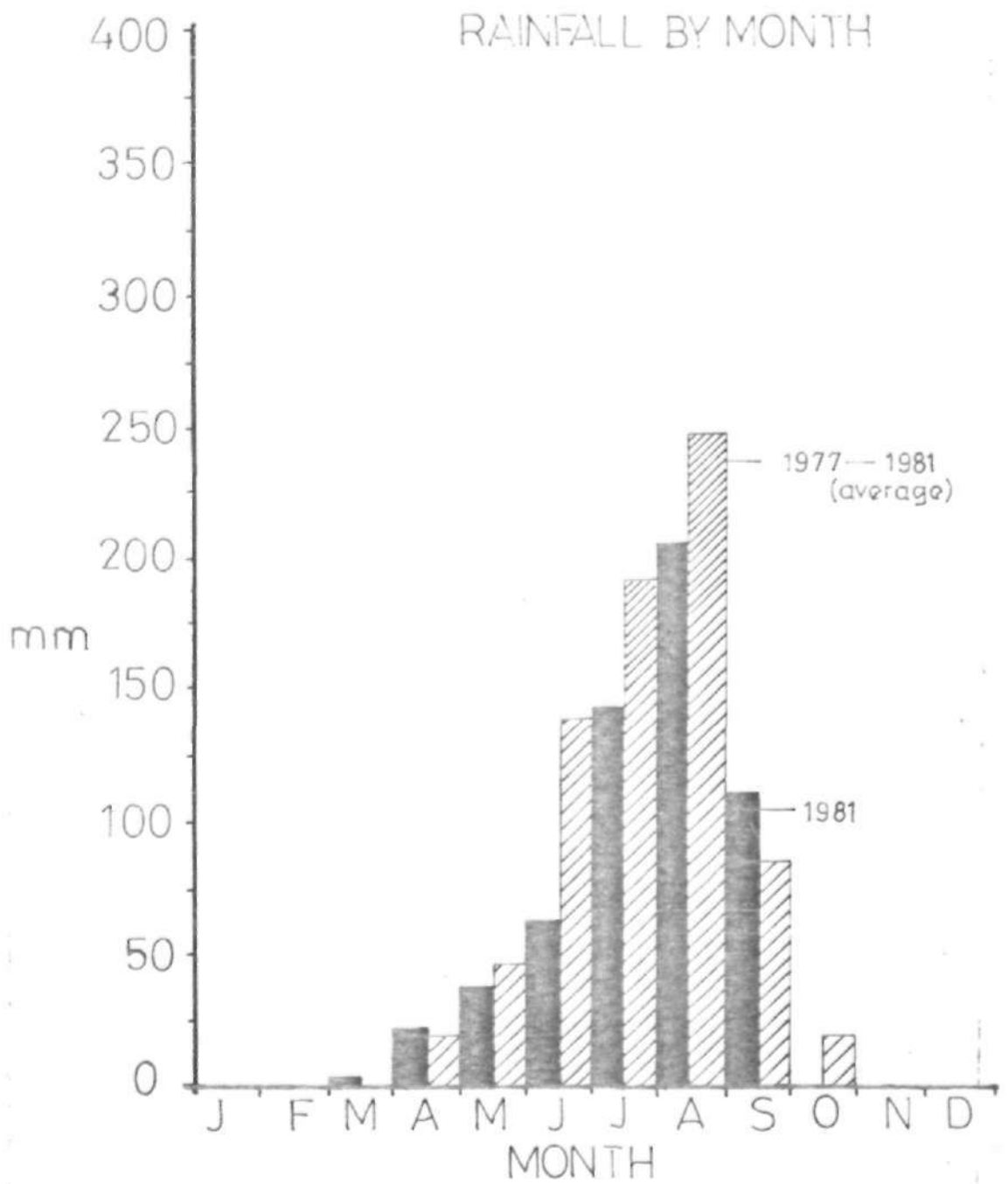
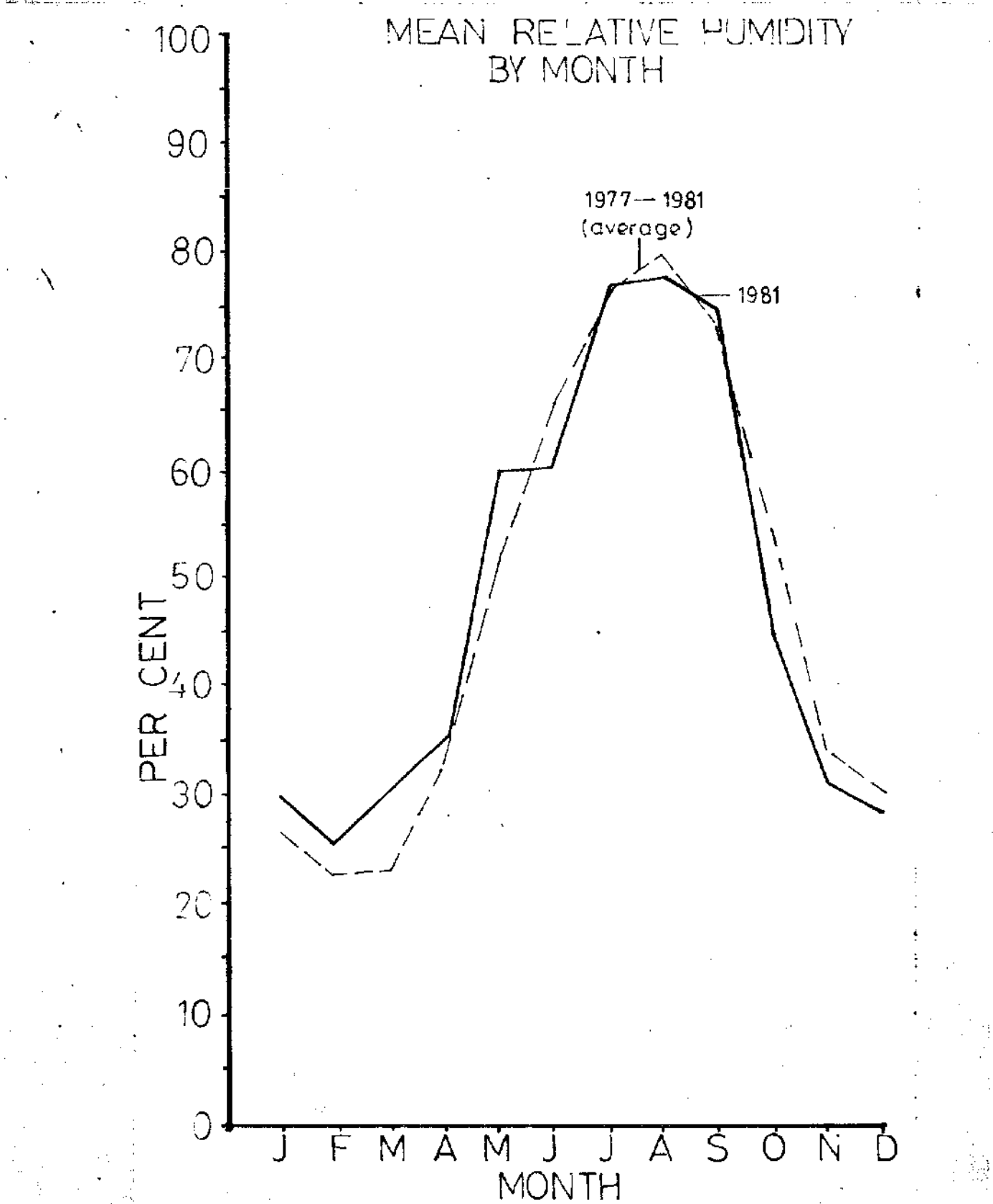

RAINFALL BY MONTH
400
350
300
250
200
150
100
50
0
mm
1977—1981
(average)
1981
J F M A M J J A S O N D
MONTH

CHART:1


MEAN RELATIVE HUMIDITY
BY MONTH
1977 — 1981
(average)
1981
PER CENT
100
90
80
70
60
50
40
30
20
10
0
J F M A M J J A S O N D
MONTH

GRAPH: 2