SHORT TITLE

A Requirements Investigation.

H.B Miovski

M.Arch. H.B. Miovski

"A Requirements Investigation, Functional Programme and Architectural Design Study for a Community Hospital of 524 Beds, with Particular Emphasis on Coronary, Intensive and Burns Units."

This thesis contains a preliminary architectural design of a multi-storey general hospital, the main building of a hospital centre. It is based upon a functional programme of each department showing activities and desirable relationships, from which an architectural programme showing room areas has been derived.

The site for the hospital is an actual plot in Ottawa, consequently a careful survey in the field was necessary before commencing planning and deciding upon the orientation of the building. The actual physical contours of the site make possible the use of two lower floors in which essential services are accommodated in partial basements. These matters are described in Chapters I to IV.

Three special departments providing coronary care, intensive care and burns care have been studied in greater detail, because of recent important developments in these fields. Their programmes have been based upon recommendations found in accounts of medical conferences and other publications pertaining to hospital design which form the topics of Chapters V, VI and VII.

A summary of miscellaneous items pertaining to hospital design in Canada is made in the final chapter.

A set of eighteen prints of preliminary architectural plans, sections and elevations of the building are included in an envelope attached to the text.

HRISTO BLAGOYEFF MIOVSKI

"A Requirements Investigation, Functional Programme and Architectural Design Study for a Community Hospital of 524 Beds, with Particular Emphasis on Coronary, Intensive and Burns Units"

School of Architecture M. Arch.

August, 1968 Copy #I

ACKNOWLEDGMENTS

The author wishes to express his gratitude to the following who have helped him in his work,

George W. Peck, Chief of Health Facilities, Design Division, Department of National Health and Welfare, Ottawa, for many hours of criticism and constructive advice;

Robert Fleming, Architect, Montreal, for his careful review of the hospital plans;

The Administrative Staff, School of Nursing, McGill University, and the Administrative Staff, Montreal General Hospital, for their expert suggestions;

Gaudet and Roy, Architects and Engineers, Moncton, for the use of their office during the evenings to prepare the drawings that accompany this thesis and for their moral support in undertaking the work in the first place;

Lakis Ellinas, Professional Engineer, Gaudet and Roy, Moncton, for his special help;

And finally Professors John Bland and Radoslav Zuk and Miss Maureen Anderson of the McGill University School of Architecture for their guidance and encouragement.

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14. TYPICAL BED ROOM
15. WEST ELEVATION
16. SOUTH ELEVATION
17. NORTH ELEVATION
18. EAST ELEVATION

LIST OF ABBREVIATIONS

ICU	INTENSIVE CARE UNIT
CCU	CORONARY CARE UNIT
OPD	OUT PATIENT DEPARTMENT
SPD	SUPPLY PROCESSING AND DISTRIBUTION
LAB	LABORATORIES
BMR	BASAL METABOLISM READINGS
EKG	ELECTROCARDIOGRAPHIE SUITE
EEG	ELECTROENCEPHALOGRAPHIC SUITE
CGS	CENTRAL GENERAL STORES
X-RAY	RADIOLOGY DEPARTMENT
OR	OPERATING ROOM SUITE
TCC	TEAM CONTROL CENTRE

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Federal Hospital Construction Grant

Renovation projects

INTRODUCTION

I am a Bulgarian, originally trained in Architecture at the University of Istanbul. After graduation, I was involved for over four years in Hospital Design, first in Istanbul and Ankara, and later in Berlin. In all cases I was an assistant to an architect who was designing general hospitals. When I came to Canada a year ago, I again happened to find employment with architects engaged upon hospital design.

To complement the experience I had gained in Asia and Europe, and to improve my usefulness in this office, I was given the opportunity to attend the McGill University School of Architecture, to study hospital planning in Canada. There I had the good fortune to investigate aspects of Canadian Hospital Building Practices under the direction of Mr. George W. Peck, Chief of Health Facilities, Design Division, Department of National Health and Welfare in Ottawa. Mr. Peck undertook to guide my reading and to criticise my tentative proposals for the solution of various hospital departmental design problems which were part of an Architecture course I was doing with Professor Bland, the Director of the McGill University School of Architecture.

At the same time, I enrolled in the School for Graduate Nurses, to take a course in Ward Management, in order to become acquainted with internal aspects of the problem of hospital planning.

In addition to that I have attended a special course in Ottawa held at the National Health and Welfare Department. Lectures were given by Canadian and United States Hospital design authorities.

My thesis is the design of a multilevel general hospital, the principal part of a complex of nursing elements to provide the hospital needs of a Canadian Community. It is, therefore, the result of a combination of study and practical experience, and by no means a scholarly study alone.

Where possible, I have noted the published sources of material that I have depended upon and used, but my shortcomings in the English language and my tendency to be graphic rather than literary in the evaluation of possible arrangements must be admitted. The reader is asked therefore, to consult the drawings in all cases where my workds are inadequate to convey my meaning. Where statements have not been documented entirely satisfactorily, I beg the reader to believe that I am often relying upon memory of Turkish or German custom which I have assumed to be Canadian as well.

The chief sources of information, however, that I must acknowledge in an overall sense have been:

1. U. S. Department of Health, Education and Welfare, Public Health Service.
2. "The Current Status of Intensive Coronary Care", a symposium presented by the American College of Cardiology and Presbyterian University of Pennsylvania Medical Center, published by the Charles Press.

3. The "Modern Hospital", a monthly magazine, published by McGraw-Hill.
4. "Hospital Administration in Canada", monthly magazine published by Southam Business Publications Limited.

CHAPTER I

THE HOSPITAL NEEDS OF A CANADIAN COMMUNITY

While Florence Nightingale's remark that "the mode of construction in hospitals is to be determined by that which is best for the recovery of the sick" is true in a primary sense, the modern hospital design problem is the integration of a most complex web of services and service departments around this primary core.

How is the Canadian hospital evolving? How can provision for greater efficiency, growth and change be made even when future requirements are unknown?

Here it is submitted a design can be developed to allow change, specialization and logical future growth of hospital departments in a manner that will minimize the high cost and confusion associated with renovation programs. Furthermore, as it is known that every three years, more dollars are spent in operating a hospital than were spent in the capital cost of the original building and equipment, and that at the present time, about four-fifths of every dollar spent in the hospital is for labor, it is obvious that in order to control operating costs, rising labor costs must be met by methods and systems using less labor. Moreover, in a large hospital it is essential to plan the building around the movement of staff and materials and to understand that time wasted by labor consumes enormous sums of money.

The Argument that there is no incentive to spend precious capital dollars to reduce future operating costs must be combatted. In most cases the original installation of automation devices can be proved wise. For example, the introduction of an automatic vertical supply conveyor will definitely reduce the number of elevators required, and at the same time make the remaining elevators more dependable for the medical staff and thus waste less of their valuable time. Similarly, the centralization of many functions can be demonstrated to reduce operating costs and at the same time provide more dependable and efficient service resulting in better patient care at little or no increase in capital cost.

Moreover, as a fortunate by-product of centralization, it is known that the well-organized, efficient hospital has the effect of greatly improving working conditions both for medical and non-medical staff. This situation will prove to be related to the retention of qualified personnel, which is extremely important, since the training of personnel can be an immense expense.

Here it is submitted that the best plan to meet the hospital needs of a Canadian Community consists of a group of independent buildings, connected, possibly by tunnel, rather than one mammoth structure. The principal building in such a group would be the least structure to provide the required highly specialized treatment and nursing services, the essential items of the general hospital. Long-term and self-care units would be provided in another building, and a nursing home could be accommodated in a third.

All of these buildings could have different structural patterns and mechanical systems specially related to their particular function; therefore, more economical to build and more easily changed or expanded as needs arise. Their presence together in a group permits the best and most intensive use at all times of the extremely valuable beds in the general hospital and for the others, the convenient shared use of the general hospital's treatment facilities and services which need not be duplicated.

CHAPTER II

THE GENERAL HOSPITAL

This is the highly specialized central unit intended to provide convenient and modern technical facilities for medical and surgical treatment, related nursing and auxillary services. It is the main building of an ideal hospital centre.

In the design concept submitted here, it contains 524 beds; arranged on 13 levels, 11 above ground and 2 partly below ground. Its gross area is about 372,000 sq.ft. The first three levels which I call the chassis, are large enclosed floor spaces approximately 225 ft.square. They accommodate the treatment and service area. Out of this chassis rises a slab having an approximate dimension of 88 ft. x 225 ft. It is the nursing section. The gross floor area of the whole building per nursing bed is 708.57 sq. ft.

This building is the subject of my study, and information pertaining to it is included in all the following chapters. One sixteenth scale plans and elevations for it have been prepared and are included in an attached envelope. Among these plans there is one which shows the siting of the central unit in relation to the other parts of the hospital centre.

Three particular departments or units in the hospital, Coronary Care, Intensive Care and Burns Care have been given special emphasis. This has been done because of recent exceptional developments in their special facilities, stimulated by the use of new electronic and mechanical devices in several

of the leading hospitals in the United States, which have set entirely new standards for them so far seldom encountered in this country.

1. The Long-Term and Self-Care Units

At this time, probably no other problem in health care in Canada is more significant than the provision of Long-Term and Self-Care. Unfortunately such services have been stigmatized in the Canadian public mind as "inferior" and are often provided in buildings that are both isolated and inadequate. The aphorism "out-of-sight, out-of-mind" can well be applied to typical long-term and self-care patients in this country. Traditionally, facilities for these services have been under private auspices and represent small, uneconomic operations. Although patients needing "extended care" come from all age groups and income levels, "senior citizens" with modest resources make up the largest single group.

For many years, it has been advocated that Long-Term and Self-Care should be brought closer to the so-called "mainstream" of health services in Canada and, as the general hospital has gradually become the focus of community health service, it has been suggested that "extended care" should be brought in to the hospital's orbit. Therefore, it is submitted, Long-Term and Self-Care Units should be provided as a part of a new hospital, and patients who need the use of the diagnostic and treatment facilities but do not need to be admitted to the General Hospital can be conveniently cared for.

A tunnel or covered walk-way connection with an extended care unit provides that full and immediate use can be made of all the diagnostic, treatment and supportive services available in the general hospital. Long-term and Self-care units must be expandable.

Studies for these units are not included except as indicated on the site plan referred to above.

II. Nursing Home

In order to provide a full range medical care program, it is submitted consideration should be given to a 50-100 bed nursing home, which would be a separate unit, tied into the general hospital complex by tunnel or covered walkway so that full and immediate use can be made of all diagnostic, treatment and supportive services available for nursing home patients. It also should be expandable. It also has been indicated only upon the site plan.

CHAPTER III

FUNCTIONAL AND ARCHITECTURAL PROGRAMME OF THE GENERAL HOSPITAL

PART I. FUNCTIONAL PROGRAMME

Grouping of Hospital Departments

I. ADMINISTRATION

- Admitting
- Public Areas
- Business areas
- Professional areas
- Medical records
- Auxiliary (library, coffee shop, gift shop, chapel)

II. SERVICE DEPARTMENTS

- A. Dietary
- B. Housekeeping
- C. Laundry
- D. Supply processing and distribution (SPD)
- E. Central general stores (CGS)
- F. Employee facilities
- G. Maintenance Power plant and Mechanical equipment
- H. Ground maintenance and parking control

III. ADJUNCT DIAGNOSTIC AND TREATMENT FACILITIES

- A. Laboratories, including EKG (electrocardiography), EEG (electroencephalography), BMR (basal metabolism), autopsy
- B. Radiology
  - 1. Diagnosis
  - 2. Therapy

C. Physical medicine

1. Physical therapy

1. Hydro therapy

2. Electro therapy

3. Corrective therapy

2. Occupational therapy

D. Pharmacy

IV. NURSING SERVICES

A. Patient care division

1. Medical and Surgical Care Units

2. Maternity Care Unit

3. Pediatric Care Unit

4. Psychiatric Care Unit

5. Coronary Care Unit and Intensive Care Unit

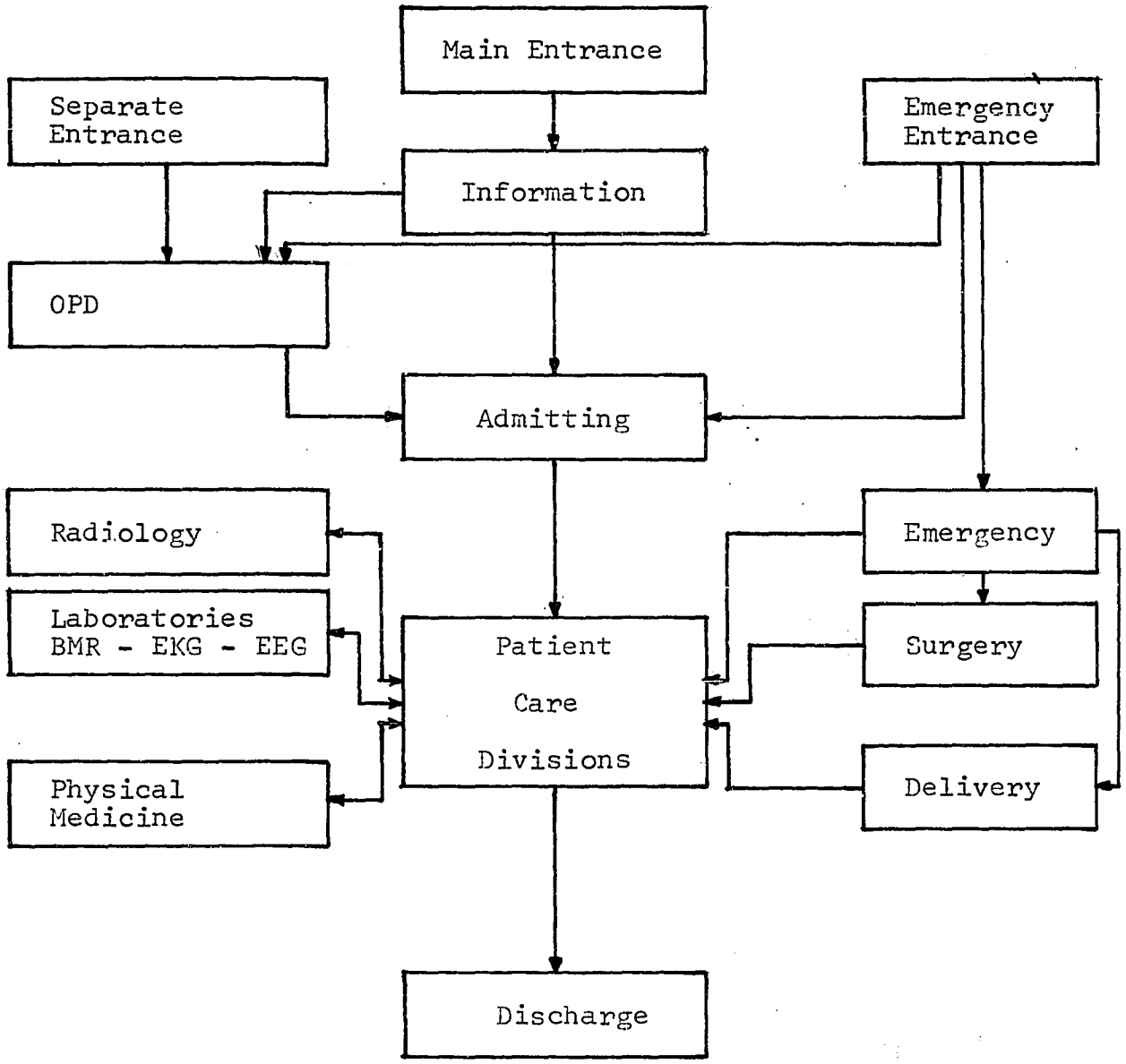
6. Burns Care Unit

B. Operating Suite, including Recovery

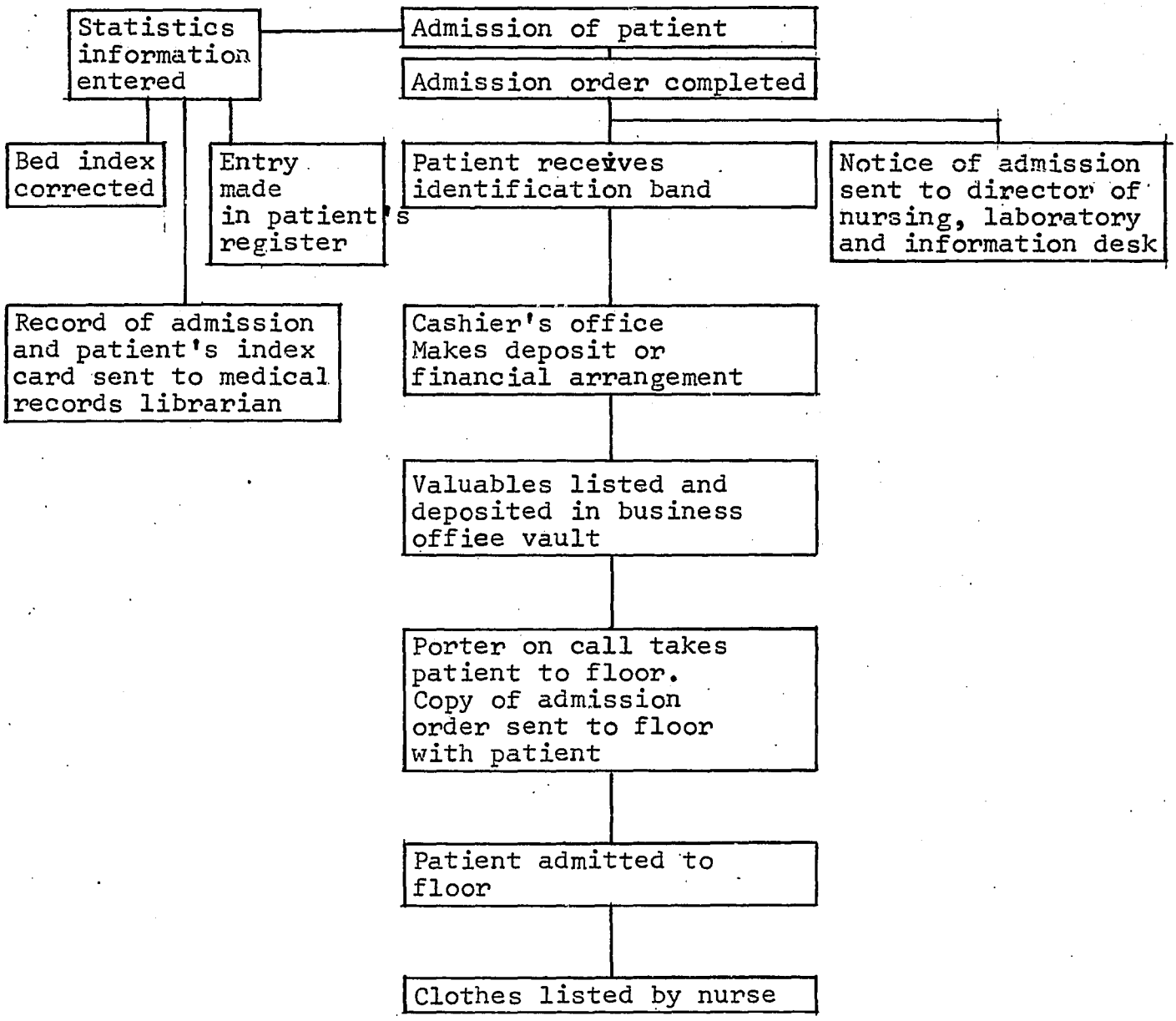
C. Delivery Suite, including Labour Rooms, Recovery and Nursery

D. Emergency, including Observation Beds

V. OUT PATIENT DEPARTMENT (OPD)



THE HOSPITAL PATIENT'S TRAVEL



FLOW DIAGRAM FOR ADMITTING DEPARTMENT

DISCHARGE

1. Discharge order written by physician
2. Business department notified by receptionist
3. Admitting department notified
4. Patient's clothes secured
5. Patient taken to business department
6. Bed index corrected by admitting clerk
7. Account settled. Valuables secured
8. Patient accompanied to door by porter.

DIVISION OF BEDS

	Total no.	In singles	In doubles	In fours	In multiples
Medical-Surgical	334	48	122	264	-
*Maternity	58	10	20	28	-
Pediatric	82	6	12	20	44
Psychiatric	32	4	12	16	-
ICU	4	-	-	4	-
CCU	4	4	-	-	-
Burns unit	10	10	-	-	-
	524 beds				

* Not including bassinets

I. ADMINISTRATION

Admitting and discharge offices, including counseling,
Library, coffee shop, gift shop, chapel
Business office, incldding billing, accounting,
purchasing, cashiers and central stenographic pool
Personnel office employment procedures and public
relations
Social service offices
Nursing board
Medical board

II. SERVICE DEPARTMENTS

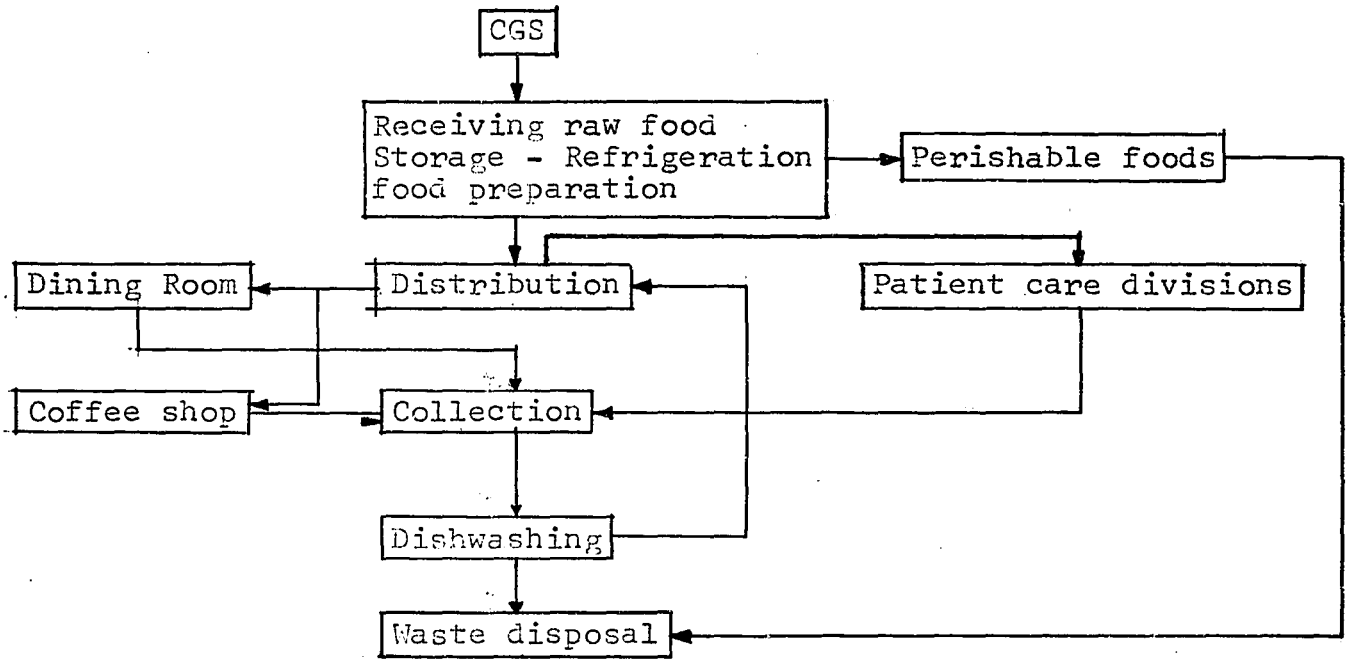
A. DIETARY

Purpose:
Receiving raw food
Storage - Refrigeration
Meat preparation
Vegetables preparation
Salads preparation
Desserts preparation
Sandwich preparation
Bakery
Personnel:

Dieticians (including assistants)	5
Kitchen employees	50

Dishwashing employees	10
Secretaries	2
Others	10
Total staff	77

Boxes show Functional Program: DIETARY



Arrows show Functional Relationships: DIETARY

B. HOUSEKEEPING

Purpose:

Housekeeping

Cleaning

Maid service

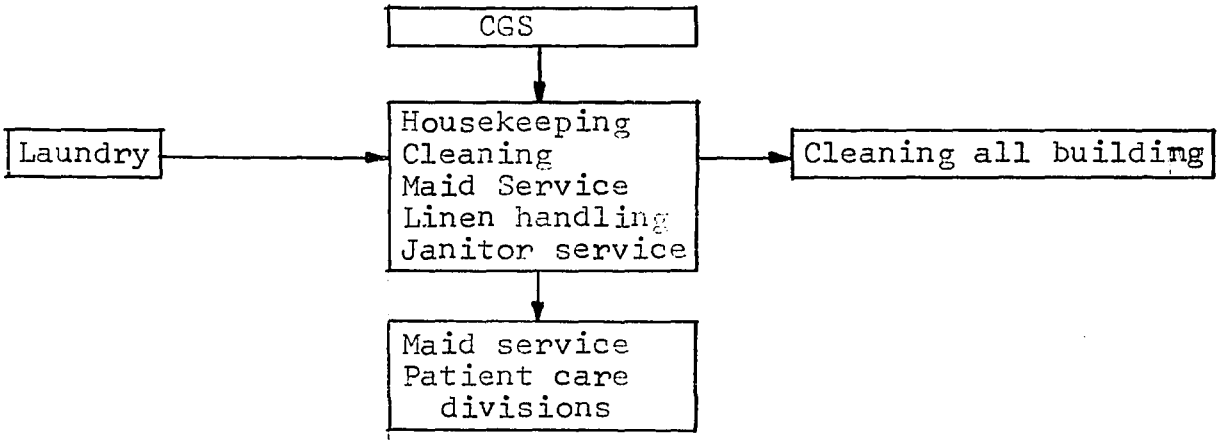
Linen handling

Janitor service

Personnel:

Housekeeper and his assistants	4
Maids	28
Janitors	24
Clerks	2
Total staff	58

Boxes show Functional Program: HOUSEKEEPING



Arrows show functional relationships: HOUSEKEEPING

C. LAUNDRY

Purpose:

Collecting

Sorting

Washing

Extracting

Drying

Ironing

Sewing

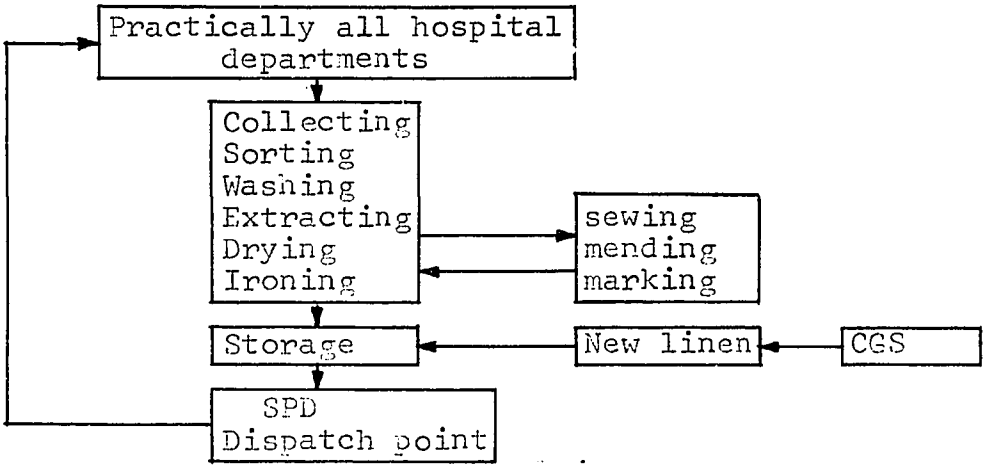
Mending

Marking

Personnel:

Manager and assistants	3
Washers	6
Ironers	7
Others	6
Total staff	22

Boxes show Functional Program: LAUNDRY



Arrows show Functional Relationships: LAUNDRY

D. SUPPLY PROCESSING and DISTRIBUTION

Purpose:

Collection room (chutes)

Soiled holding area

Decontamination area

Sterilizers

Glove room

Preparation area

Mail room

Flowers room

Active supply storage

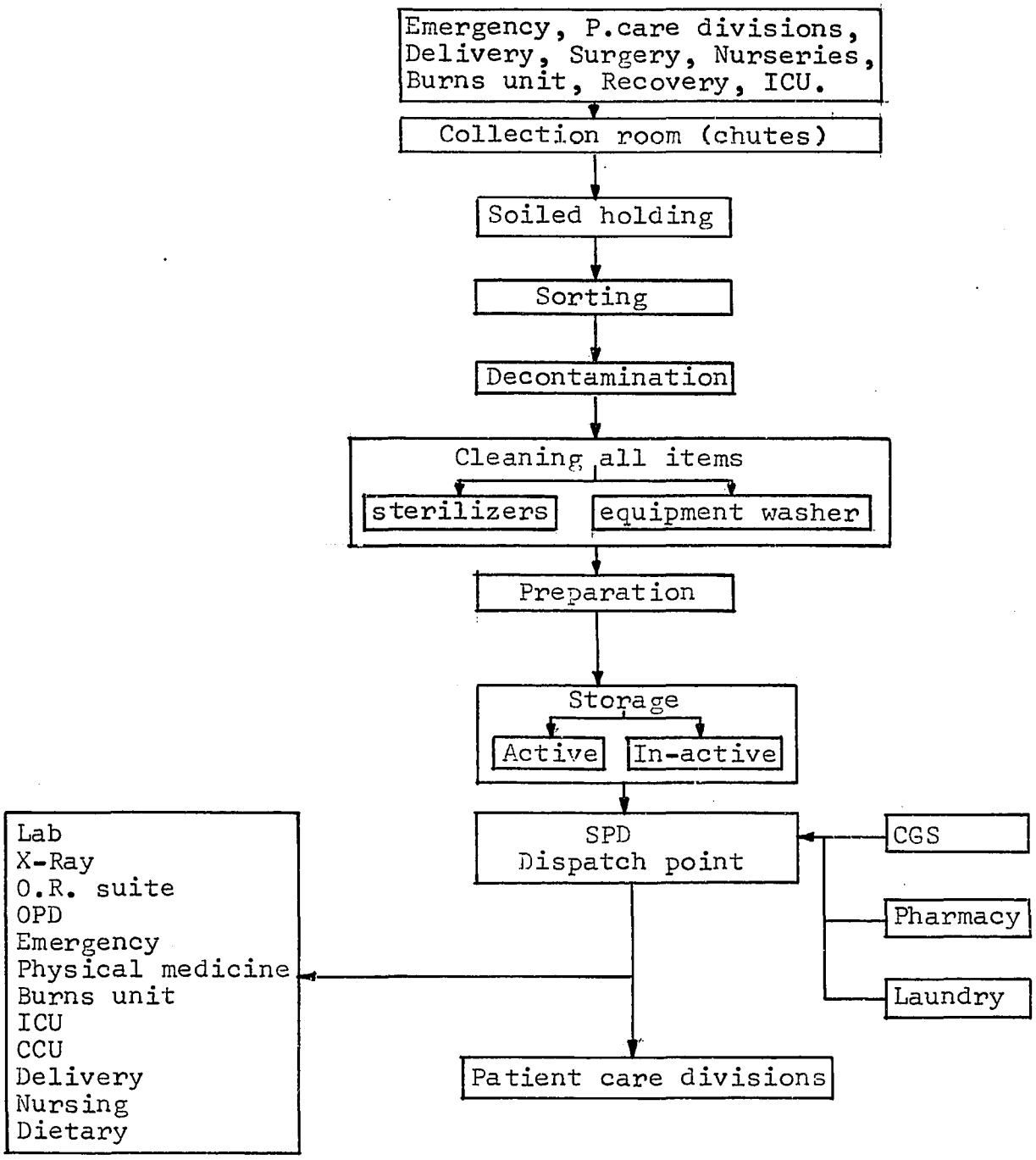
In-active storage

Dispatch point

Personnel:

Dispatcher and assistant	3
Supervisors	3
Secretaries	2
Others	22
Total staff	30

Boxes show Functional Program: SPD



Arrows show Functional Relationships: SPD

E. CENTRAL GENERAL STORES (CGS)

Purpose:

Receiving and uncrating

Checking

General bulk storage

Bulk food storage

Used equipment and furniture storage

Flamable liquid storage

Paper billing storage

Administrative paper storage

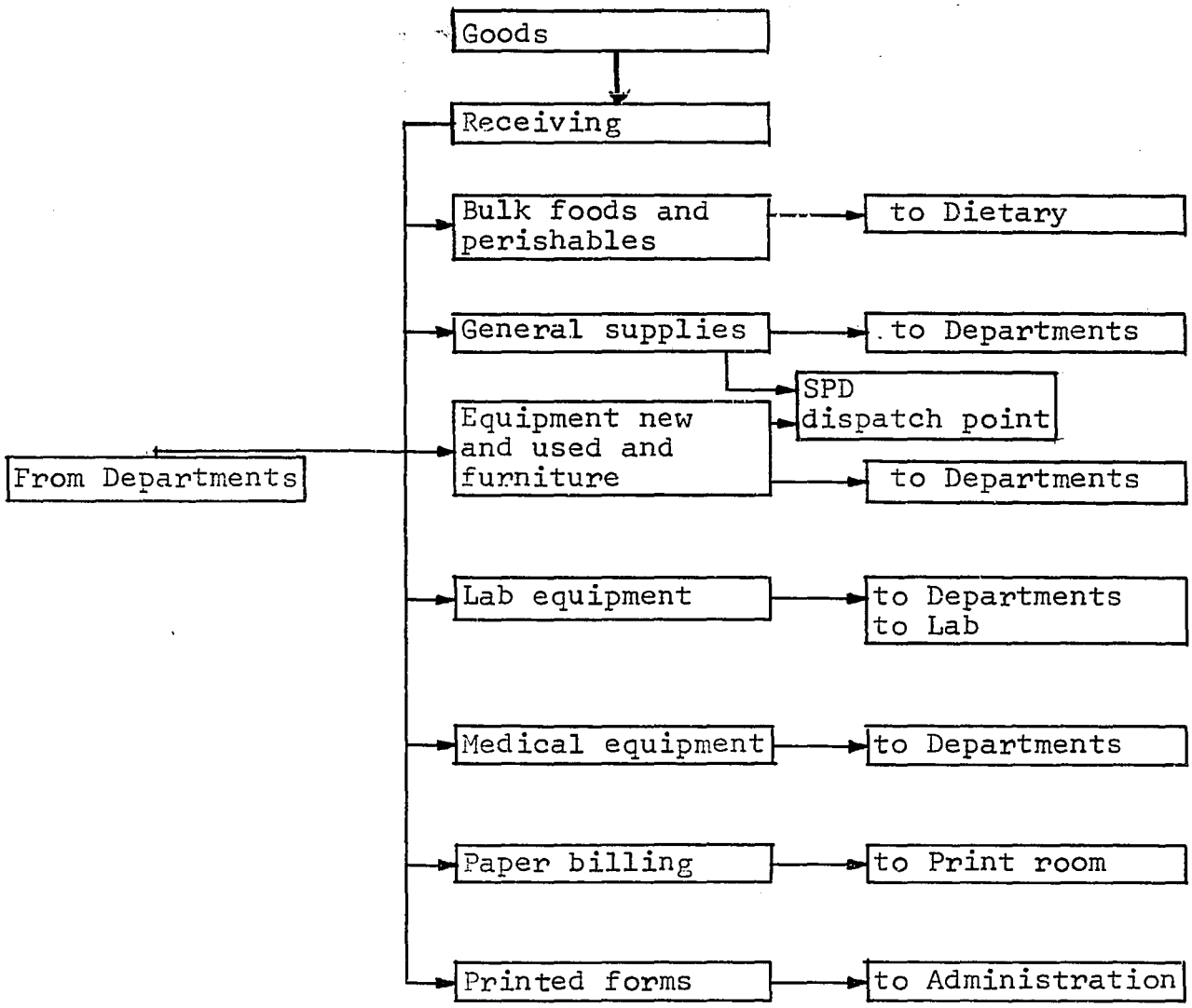
Medical equipment storage

Lab equipment storage

Personnel:

Clerks	3
Helpers	7
Total staff	10

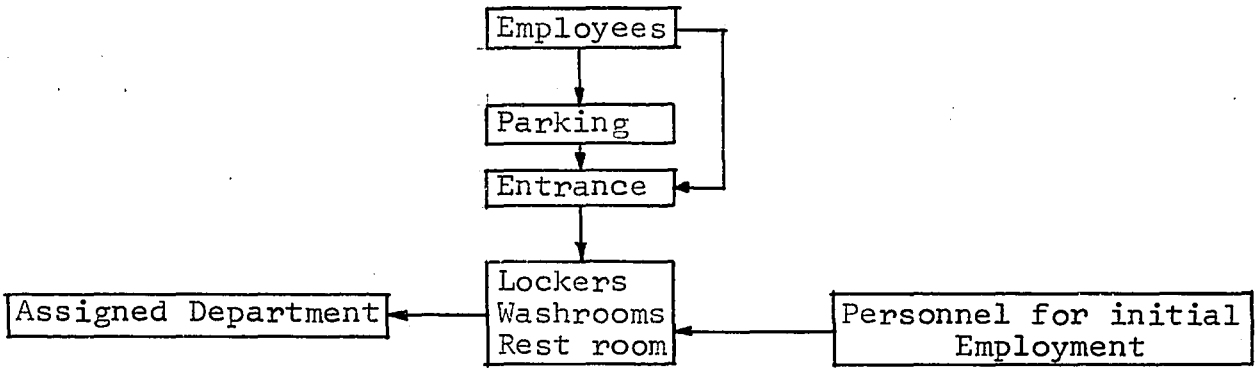
Boxes show Functional Program: CGS



Arrows show Functional Relationships: CGS

F. EMPLOYEES FACILITIES

Boxes show Functional Program Employees Facilities.



Arrows show Functional Relationships, Employees Facilities

G. MAINTENANCE' POWER PLANT AND MECHANICAL EQUIPMENT

Purpose:

Maintenance of building and equipment

Carpentry, plastering, floor coverings

Painting and furniture refinishing

Plumbing, heating, ventilating, air conditioning refrigeration

Electric systems, lighting, communications, motors and controls

Elevators

Operation of Building Equipment

Boilers, pumps and heavy equipment

Rubbish disposal

Telephone switchboard

Elevator operation

Watchman service, fire and safety protection

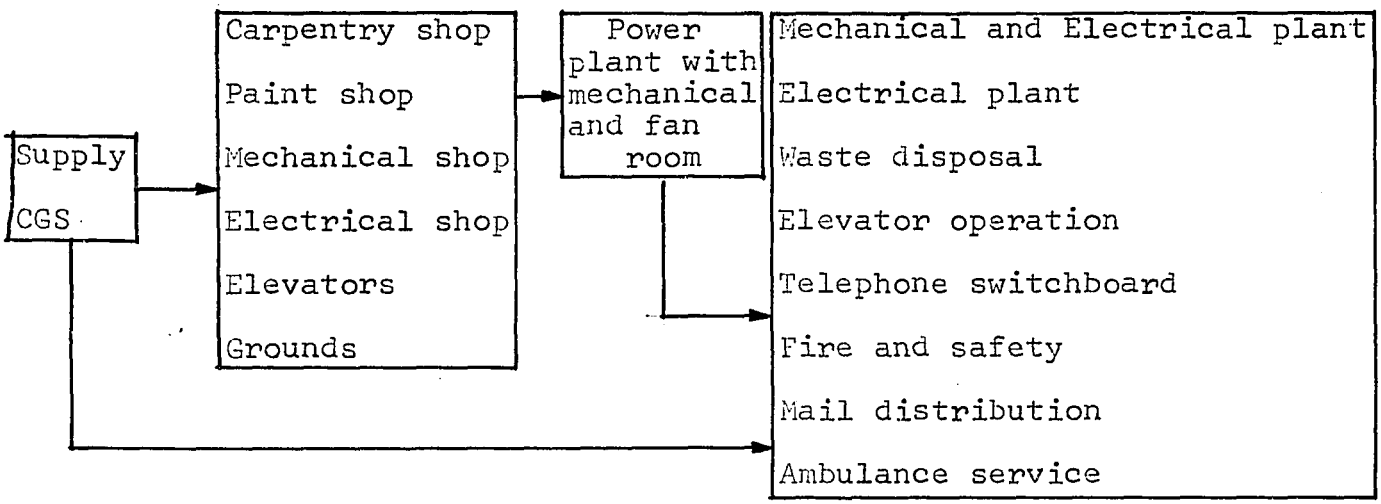
Mail service

Ambulance service

H. GROUNDS MAINTENANCE AND PARKING CONTROL.

Personnel:	
Chief Engineer	1
Secretary	1
Carpenters	2
Painters	4
Pipe fitters	2
Electricians	3
Labourers	6
Grounds men	3
Power plant men	6
Telephone operators	4
Ambulance drivers	4
Total staff	36

Boxes show Functional Program: MAINTENANCE



Arrows show Functional Relationships: MAINTENANCE

III. ADJUNCT DIAGNOSTIC AND TREATMENT FACILITIES

A. LABORATORIES:

Purpose:

Waiting

Examination and specimen collection rooms

Hematology

Biochemistry

Microbiology

Chemistry

Histology

Media prep

Glass washing

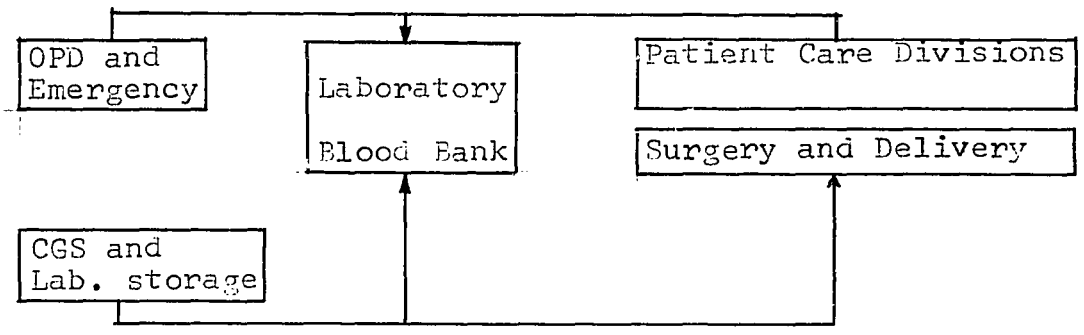
BMR - EKG - EEG

Blood bank

Personnel:

Pathologists	3
Technologists	17
Helpers	11
Secretaries	2
Total Staff	33

Boxes show Functional Program: LABORATORIES



Arrows show Functional Relationships: LABORATORIES

B. RADIOLOGY

Purpose:

Reception

Waiting

Dressing rooms

Diagnostic x-ray

Radiographic - Fluoroscopic

Work room

Film viewing

Reporting

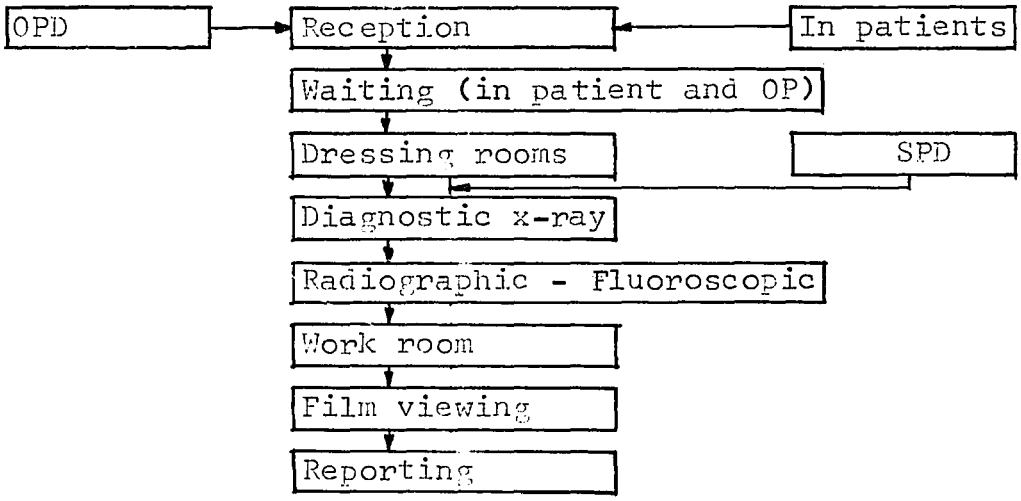
Files

Offices

Personnel:

Technologists	20
Radiologists	4
Secretaries	4
Total staff	28

Boxes show Functional Program: RADIOLOGY



Arrows show Functional Relationship: RADIOLOGY

C. PHYSICAL MEDICINE

Purpose:

1. Physical therapy

Hydro therapy

Electro therapy

Corrective therapy

2. Occupational therapy

Kitchenette

Dining room

Work rooms

Personnel:

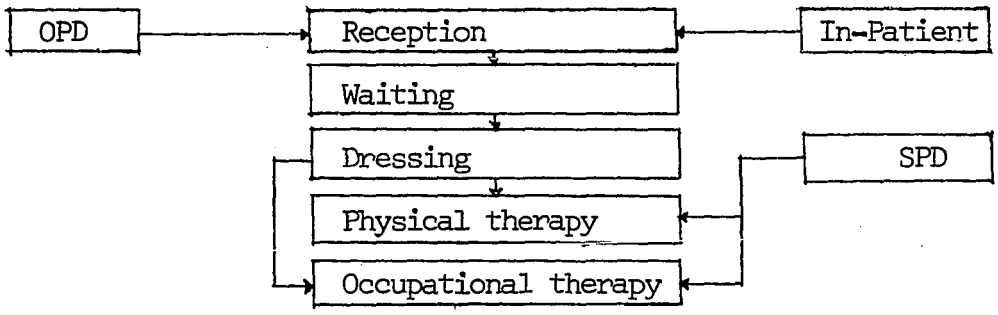
1. Physical therapy

Physiotherapist (Medical Doctor)	1
Physical therapists	9
Helpers	3
Secretary	1
Total Staff	14

2. Occupational therapy

Therapists	3
Helpers	2
Total Staff	5

Boxes show Functional Program: PHYSICAL MEDICINE



Arrows show Functional Relationship: PHYSICAL MEDICINE

D. PHARMACY

Purpose:

Reception

Waiting

Dispensing

Storage

Volatile liquids storage

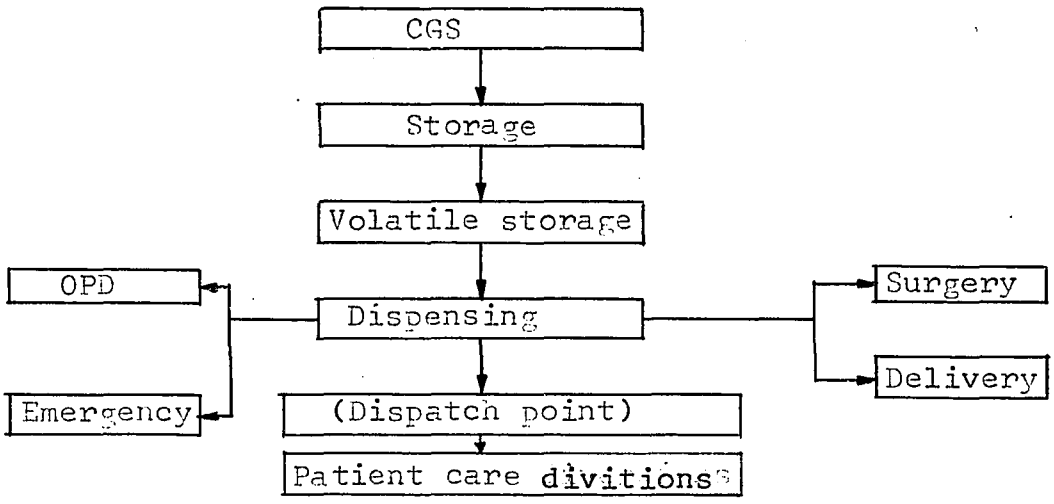
Conference room

Offices

Personnel:

Pharmacists	3
Helpers	4
Secretaries	2
Total staff	9

Boxes show Functional Program: PHARMACY



Arrows show Functional Relationship: PHARMACY

IV. NURSING SERVICES

A. PATIENT CARE DIVISIONS

1. Medical - Surgical care units.

Purpose:

Sixty-six beds per floor as follows:

- Two private wards (isolation) per floor
- Eight standard wards (four beds each) per floor
- Twelve semi-private wards (two beds each) per floor
- Eight private wards per floor

Major Nursing station

- Doctor charting (four doctors)
- Two head nurses offices
- Work space
- Medication alcove and sink

Four team control centers. (TCC)

Two utility rooms

- Clean utility room (clean supply)
- Soiled utility room (soiled holding)

Day and waiting room

- Two toilets for visitors (Male and Female)

One conference room

One serving pantry

Two treatment and examination rooms

Public and service elevators lobbies

Storage alcove for stretchers and wheelchairs

Washroom facilities for patients

- Six showers
- One treatment bath
- One tub bath

Staff facilities

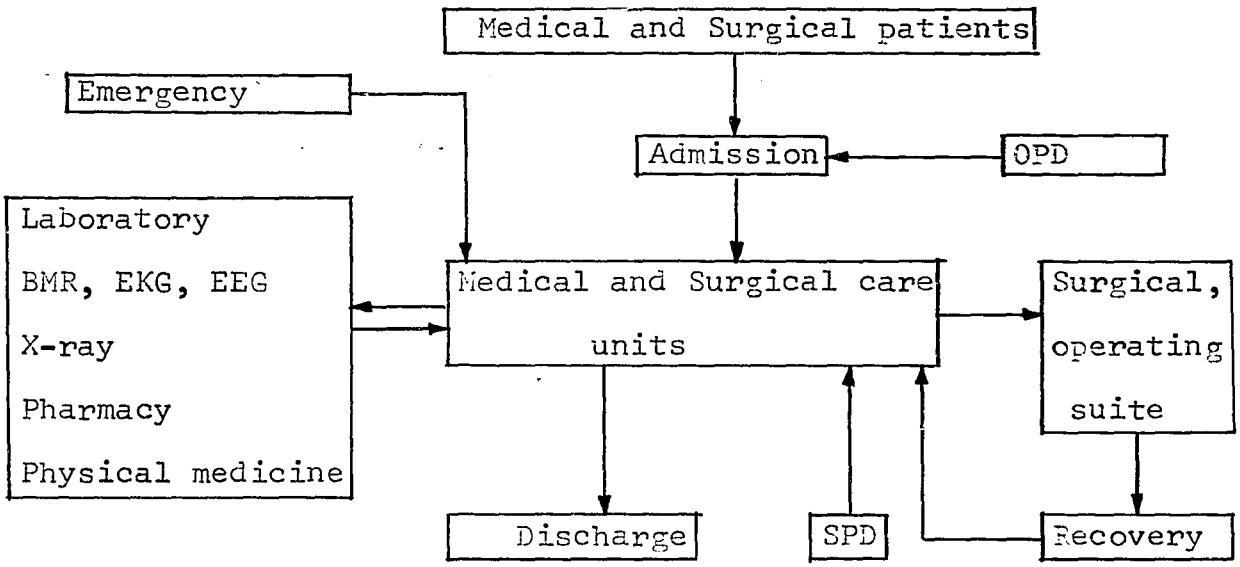
Staff locker room

Staff toilet

Four drinking fountains

Janitor's closet (entrance from soiled holding)

Boxes show Functional Program: MEDICAL-SURGICAL CARE UNITS



Arrows show Functional Relationships: MEDICAL-SURGICAL care units

2. Maternity Care Unit.

Purpose:

Fifty-eight beds as follows:

- Two private wards (isolation)
- Seven standard wards (four beds each)
- Ten semi-private wards (two beds each)
- Eight private wards

Major Nursing Station

- Doctor charting (four doctors)
- Two head nurses offices
- Work space
- Medication alcove and sink

Four team control centers (TCC)

Two utility rooms

- Clean utility room (clean supply)
- Soiled utility room (soiled holding)

One day room

One relatives and father's waiting room

- Two toilets for visitors and for fathers
- Payable telephones

One conference room

One serving pantry

Two examination rooms

Public and service elevators lobbies

Storage alcove for stretchers and wheelchairs

Washrooms - facilities for patients

- Two tub baths

Staff facilities

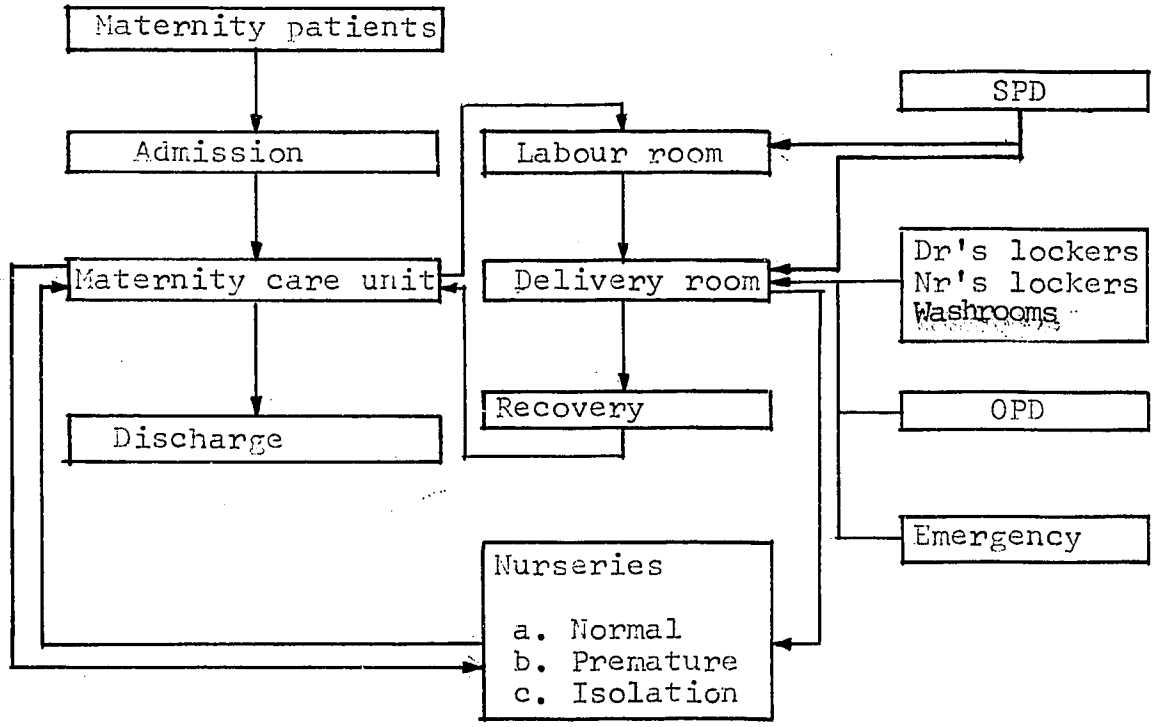
Staff locker room

Staff toilet

Four drinking fountains

Janitor's closet (entrance from soiled holding)

Boxes show Functional Program: MATERNITY CARE UNIT



Arrows show Functional Relationships: MATERNITY CARE UNIT

3. Pediatric care unit:

Purpose:

Eighty-four beds as follows:

- Four private wards
- Thirty-six cribs
- Three bassinets
- Four standard wards (four beds each)
- Eight semi-private wards
- Four isolation cubicles (bassinets)

Major nursing station

- Doctor charting (four doctors)
- Two head nurses offices
- Work space
- Medication alcove and sink

Four team control centers (TCC)

Two utility rooms

- Clean utility room (clean supply)
- Soiled utility room (soiled holding)

One waiting room (two toilets for visitors)

One playroom (one toilet)

One conference room

One serving pantry

Two treatment and examination rooms

Public and service elevators lobbies

Storage alcove for stretchers and wheelchairs

Washroom facilities for patients

Six showers

One treatment bath

One tub bath

Staff facilities

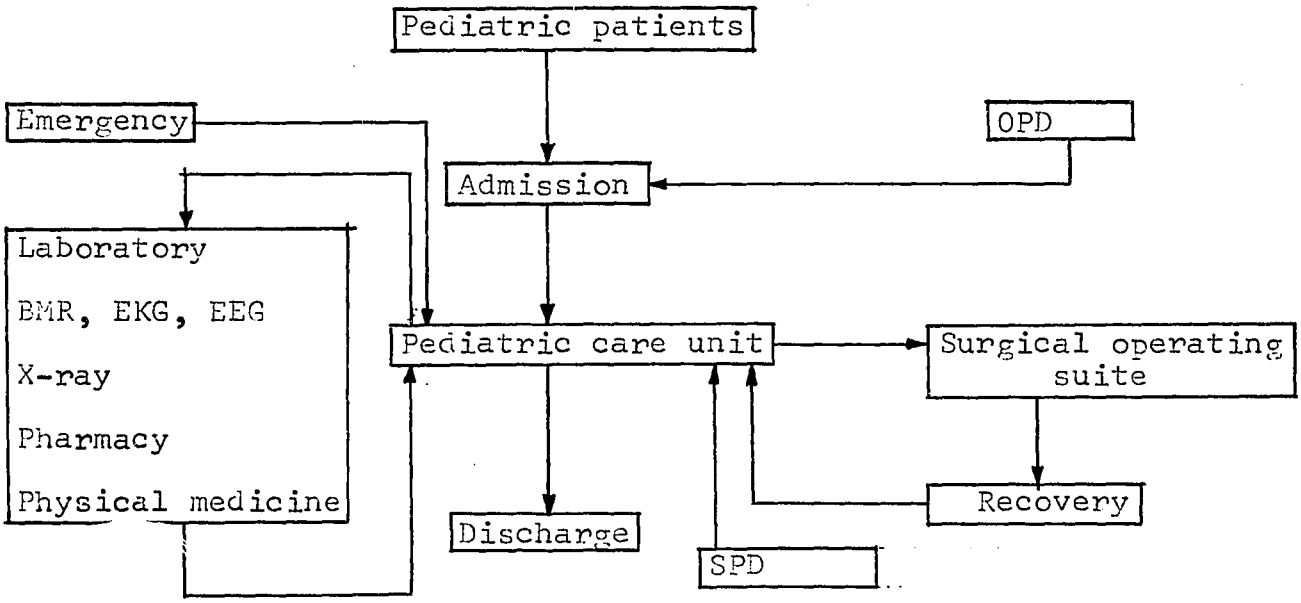
Staff locker room

Staff toilet

Four drinking fountains

Janitor's closet (entrance from soiled holding)

Boxes show Functional Program: PEDIATRIC CARE UNIT



Arrows show Functional Relationships: PEDIATRIC CARE UNIT

4. Psychiatric care unit

Purpose:

a. Inpatient area

b. Out-patient area

c. Day care area

a. In patient area

32 beds as follows

Four private wards

Six semi-private wards (two beds each)

Four standard wards (four beds each)

Major nursing station

Doctor charting (two doctors)

One head nurse office

Work space

Medication alcove and sink

Two team control centres (TCC)

Two utility rooms

Clean utility room (clean supply)

Soiled utility room (soiled holding)

One waiting room (two toilets for visitors)

One serving pantry

Therapy room

Electro-therapy room

Electro-therapy recovery room

Public and service elevators lobbies

Washrooms facilities for patients

Each ward has shower

One tub bath

Staff facilities

Staff locker room

Staff toilet

Two drinking fountains

Janitor's closet (entrance from soiled holding)

b. Out-patient area

Fourteen offices (for teams of social workers, and psychiatrists and psychologists)

Reception

Waiting room

General office

Storage

Washrooms (Male and Female)

Library and conference room

Storage

c. Day care area

TV and music rooms

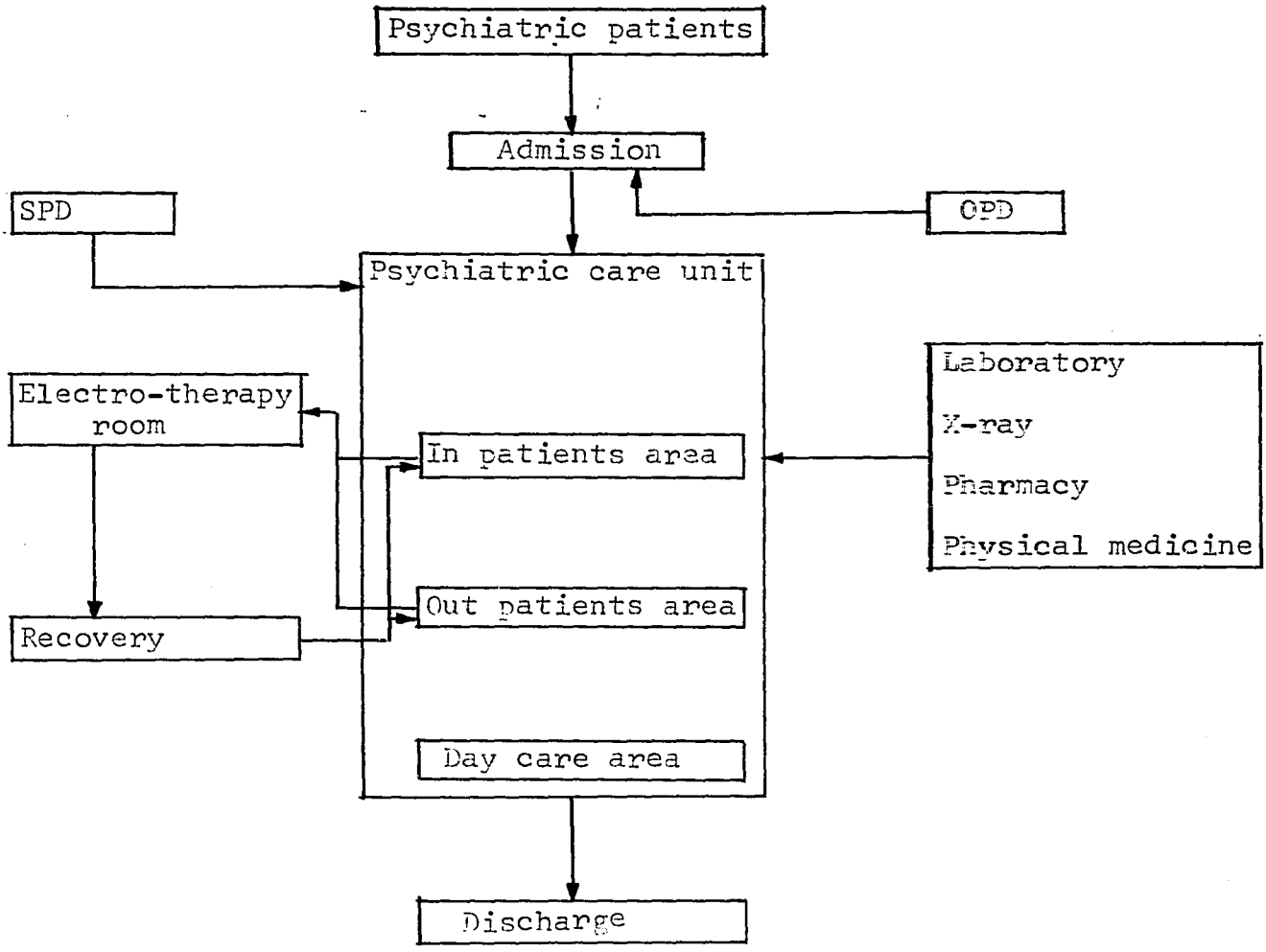
Occupational therapy

Living room

Dining room (with its own food servery)

Work room

Boxes show Functional Program: PSYCHIATRIC CARE UNIT



Arrows show Functional Relationships: PSYCHIATRIC CARE UNIT

5. CCU and ICU

Purpose:

a. CCU

Four coronary care beds (divided with glass partitions)

Work area

Nurses station

Staff washroom

Medication preparation area

Equipment storage

Six flexible beds

One standard ward (four beds)

One semi-private ward (two beds)

b. ICU

Four intensive care beds (divided with glass partitions and with curtains)

Work area

Nurses station

Patient and staff wash room

Medication preparation area

Equipment storage

Four flexible beds (one standard ward, four beds)

CCU and ICU share the service facilities on the floor such as:

Heavy equipment storage

Patient storage

Nurses' lougge

Nurses' locker room and washroom

Special shower

Dr. sleeping room

Relatives waiting room

Dr's office

Soiled holding

Clean supply

Janitor's closet (Entrance from soiled holding)

CCU and ICU shares same facilities with thirty-two beds

Medical - Surgical beds unit on the same floor such as:

Major nurses station

Doctor charting (four doctors)

Two head nurses offices

Work space

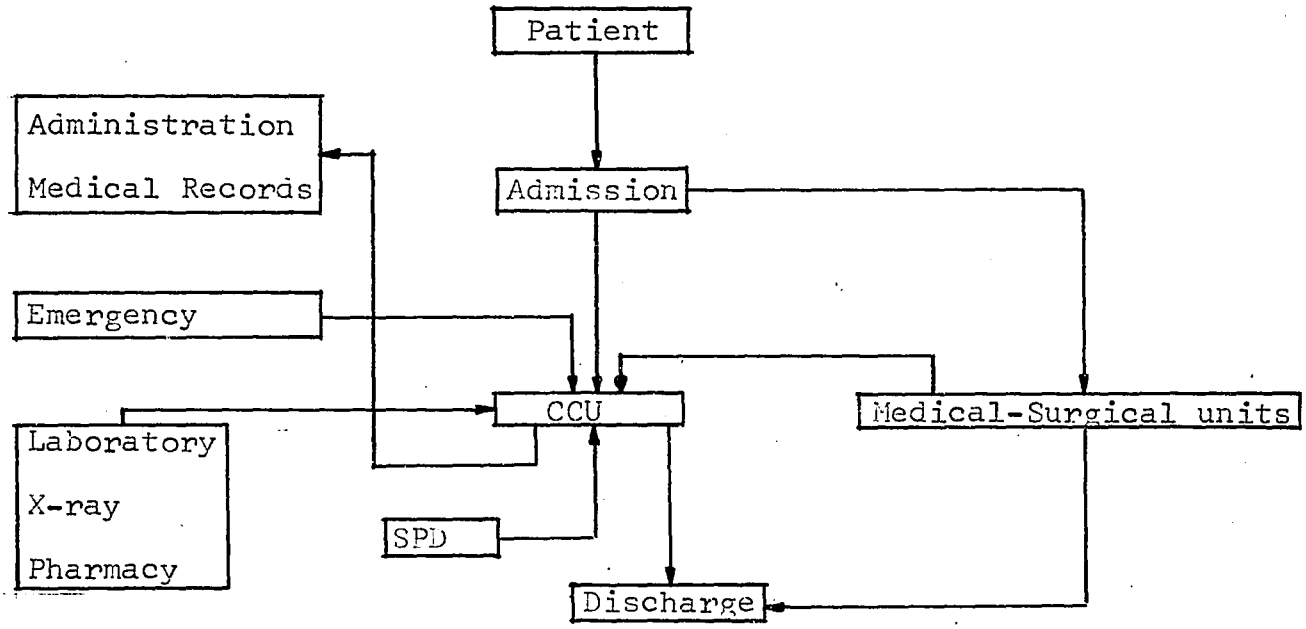
Medication alcove and sink

One serving pantry

One conference room

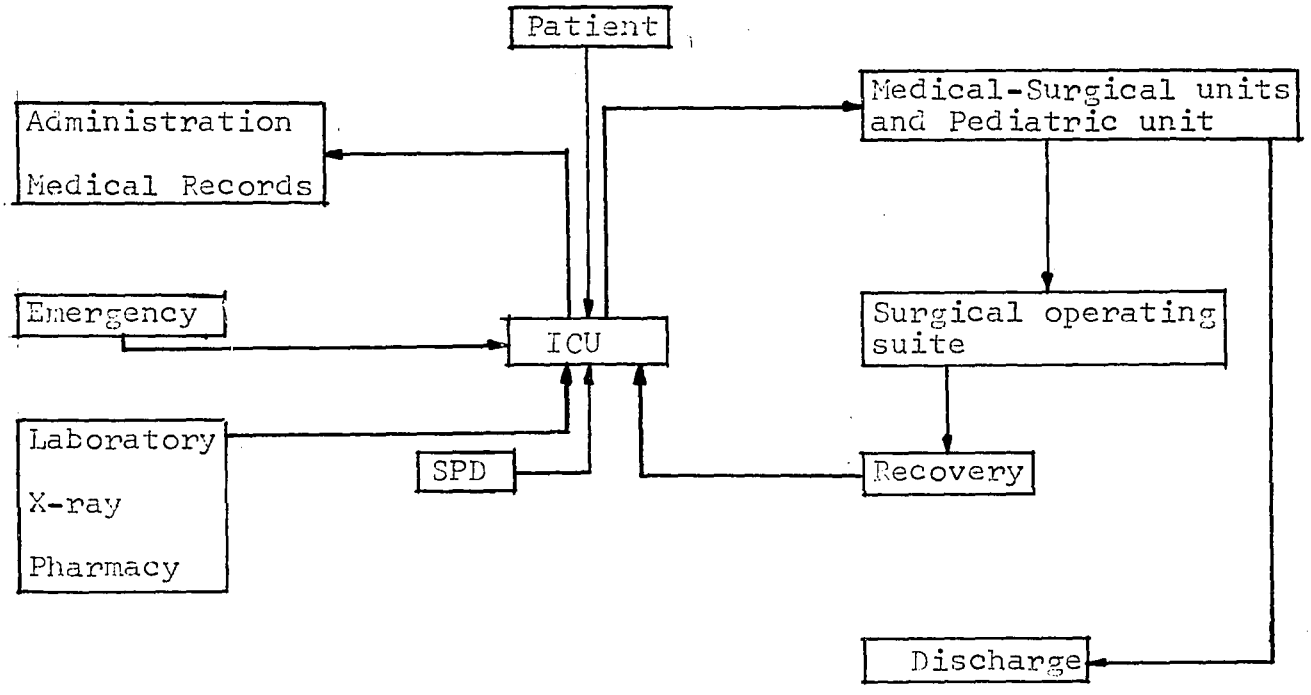
One treatment bath

Boxes show Functional Program: CCU



Arrows show Functional Relationship: CCU

Boxes show Functional Program: ICU



Arrows show Functional Relationship: ICU

6. Burns Unit

Purpose:

Ten private beds

Reception

  Waiting

  Visitors toilets (Male and female)

Staff facilities

  Female staff, lockers, washrooms, scrub-up area,

  boots area

  Male staff, lockers, washrooms, scrub-up area, boots area

Two nurses station with medication preparation area

One head nurse's office

Two utility rooms

  Clean utility room (clean supply)

  Soiled utility room (soiled holding)

One lab

One sub decontamination area

Two dressing areas

  One tub bath

  Storage (sterile and clean supply)

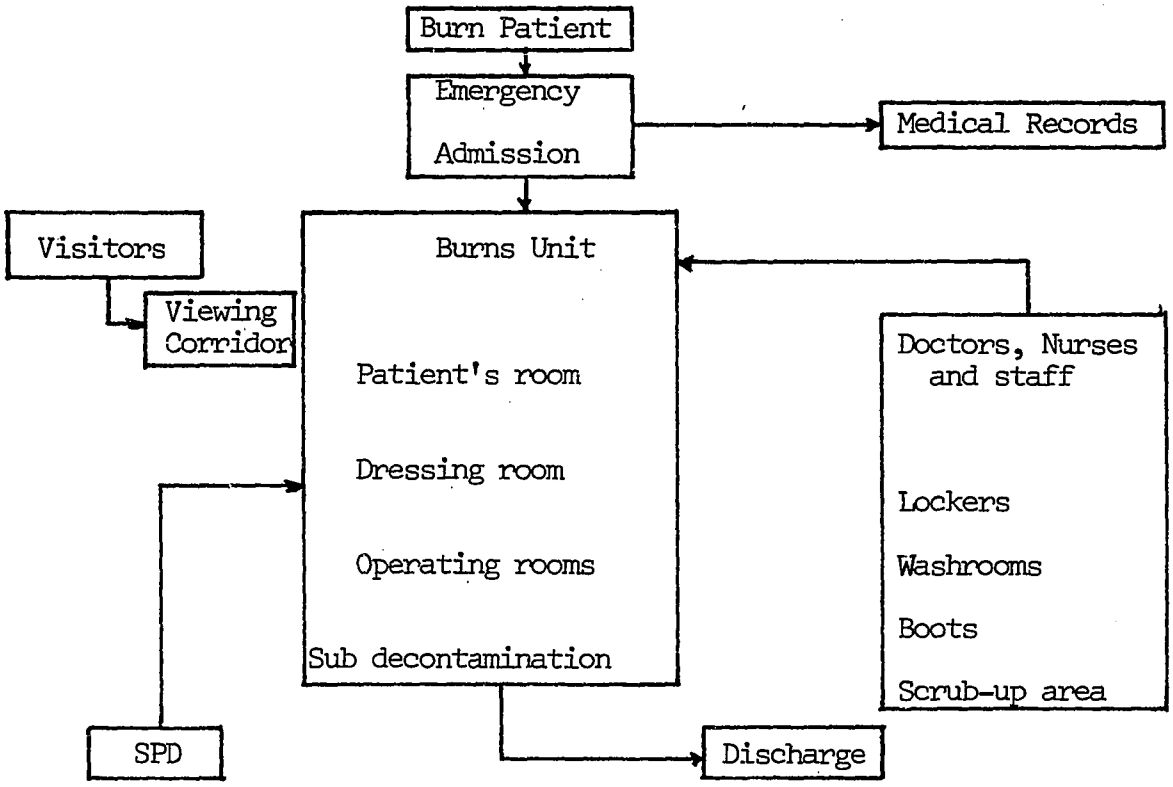
Two operating rooms

  Scrub-up

  Air-lock

Janitor's closet (entrance from soiled holding)

Boxes show Functional Program: BURNS UNIT



Arrows show Functional Relationship: BURNS UNIT

B. OPERATING SUITE

Purpose:

Unrestricted area

OR control point

Medical stenographer

OR supervisor office

In patient waiting area

Dr. dictation area

Chief surgeon' office

Chief surgeon's secretary

Anesthesist's office

Anesthesist's secretary

Interchange area

Drs. suite

Lockers

Washrooms

Boots

Nurses suite

Lockers

Washrooms

Boots

Orderlies suite

Lockers

Washrooms

Lounge

Dr.'s lounge

Nurses lounge

Semi-restricted area

Recovery beds (twelve beds and nurses station)

Two soiled holding areas

Janitor's closet

Restricted area

Four scrub-up stations(scrub-up area located so that physicians can observe preparations in operating room during scrub-up process)

Four major operating rooms

One neuro surgery operating room

One organ transplant operating room

Two cystoscopic and urology rooms

Two orthopedic operating rooms

Work room for cystoscopies

Two toilets for cystoscopic rooms

Two x-ray viewing rooms for cystoscopic rooms

Plaster room for orthopedic operating rooms

Two exit and transfer rooms for neuro surgery and organ transplant surgery

Two anethesia rooms for neuro surgery and organ transplant surgery

Two set-up rooms for neuro surgery and organ transplant surgery

Staff work area

Sterile supply storage

Clean supply (on the carts)

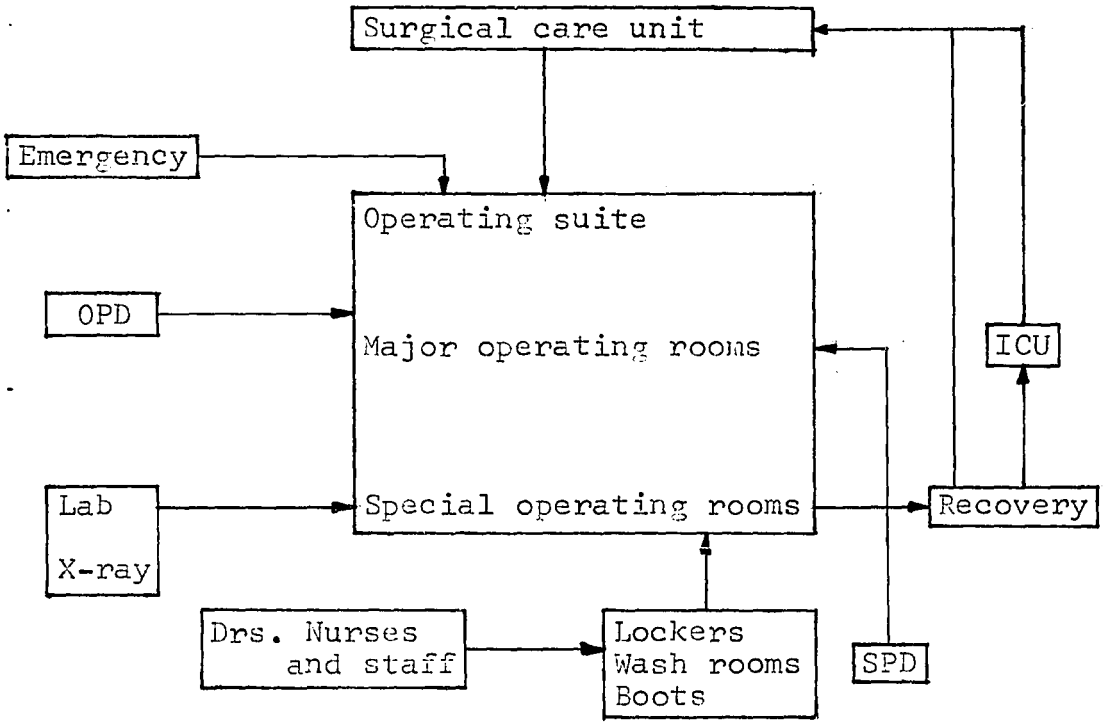
Work area (two high speed sterilizers)

Monitors and equipment storage

One drinking fountain

Two janitors closets

Boxes show Functional Program: OPERATING SUITE



Arrows show Functional Relationship: OPERATING SUITE

C. DELIVERY SUITE

1. Delivery unit

Purpose:

Eight labour rooms with shower, toilet, hand basin and nurserver

Nursing station

Doctor charting (three Doctors)

One head nurse office (unit supervisor)

Medication area

Work space

Doctor's washrooms, lockers and boots room

Nurses' washrooms, lockers and boots room

Four delivery rooms

Two soiled holding rooms

One operating room (for caesarian deliveries)

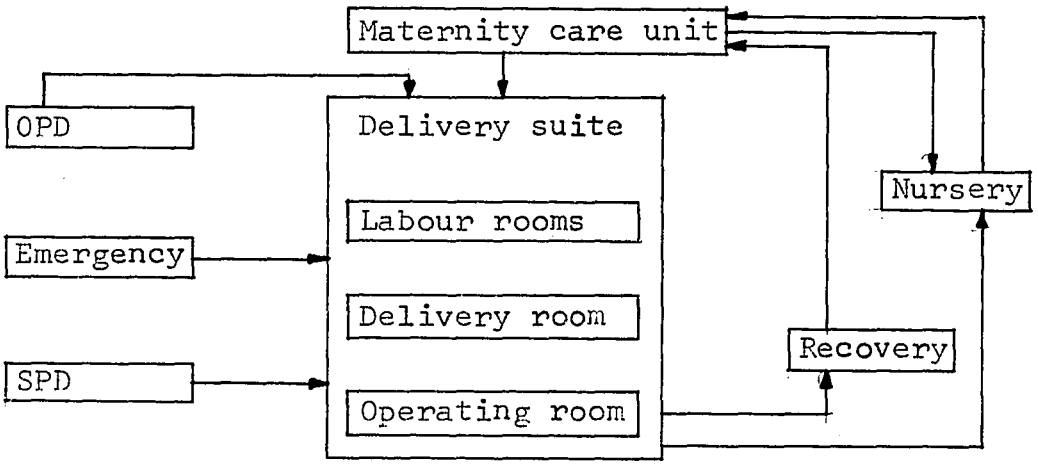
Anesthesia storage and work room

Recovery room

Three scrub-up stations (scrub-up area located so that physicians can observe preparations in delivery room (or operating room) during scrub-up process

Sterile and clean supply will be on the sterile work area

Boxes show Functional Program: DELIVERY SUITE



Arrows show Functional Relationships: DELIVERY SUITE

2. Nursery

Purpose:

Fifty bassinets as follows:

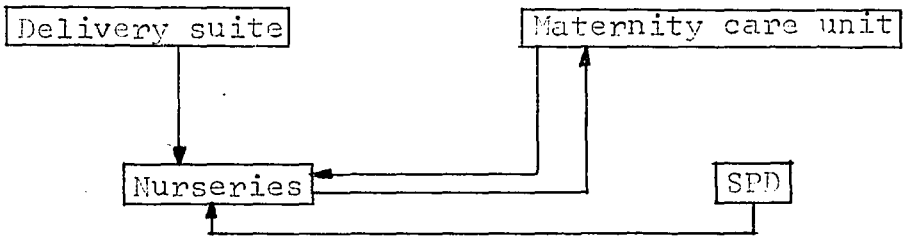
Premature nursery	4 bassinets
Intensive care nursery	4 bassinets
Normal nursery	38 bassinets
Isolation nursery	4 bassinets on pediatric floor

Examination and work area

Scrub-up and gowning facilities

Visitors' viewing corridor

Boxes show Functional Program: NURSERY



Arrows show Functional Relationships: NURSERY

D. EMERGENCY DEPARTMENT

Purpose:

Sub-admitting and control (nursing station)

Washroom facilities

- Shower
- Bath
- Toilets (Male and female)

Relatives waiting room

- Washrooms (Male and female)

Three emergency examination rooms

Three emergency treatment rooms

Observation room

Two emergency operating rooms

Two utility rooms

- Clean utility room (clean supply)
- Soiled utility room (soiled supply holding)

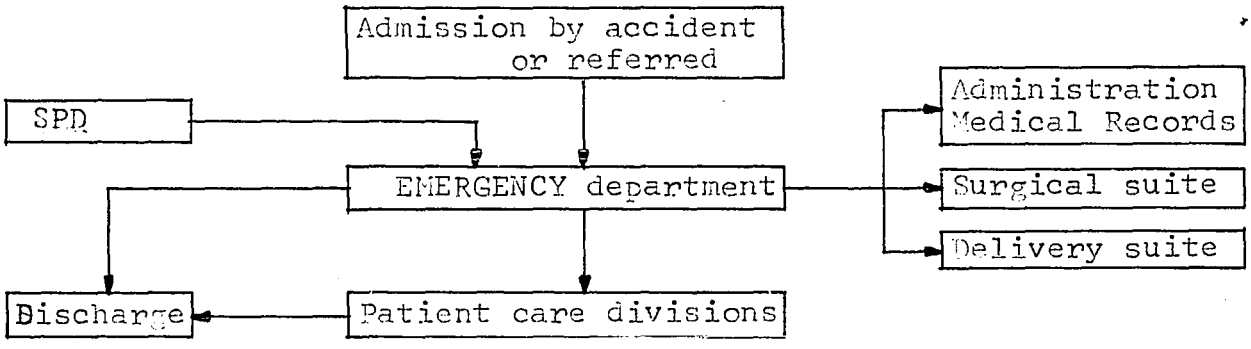
Clean and sterile E.Q.P. store

Work room

Two Doctors' on call rooms (incl. washroom)

Janitor's closet

Boxes show Functional Program: EMERGENCY DEPARTMENT



Arrows show Functional Relationships: EMERGENCY DEPARTMENT

V. OUT PATIENT DEPARTMENT

Purpose:

Control

- Sub-admitting
- Nursing station
- Head nurse' office

Sub-control

OPD waiting area

- Washrooms (Male and female)

Dental facilities

- Sub-waiting
- Examination and treatment room
- Storage

Six general examination - consultation rooms

One eye examination room

One ENT examination room

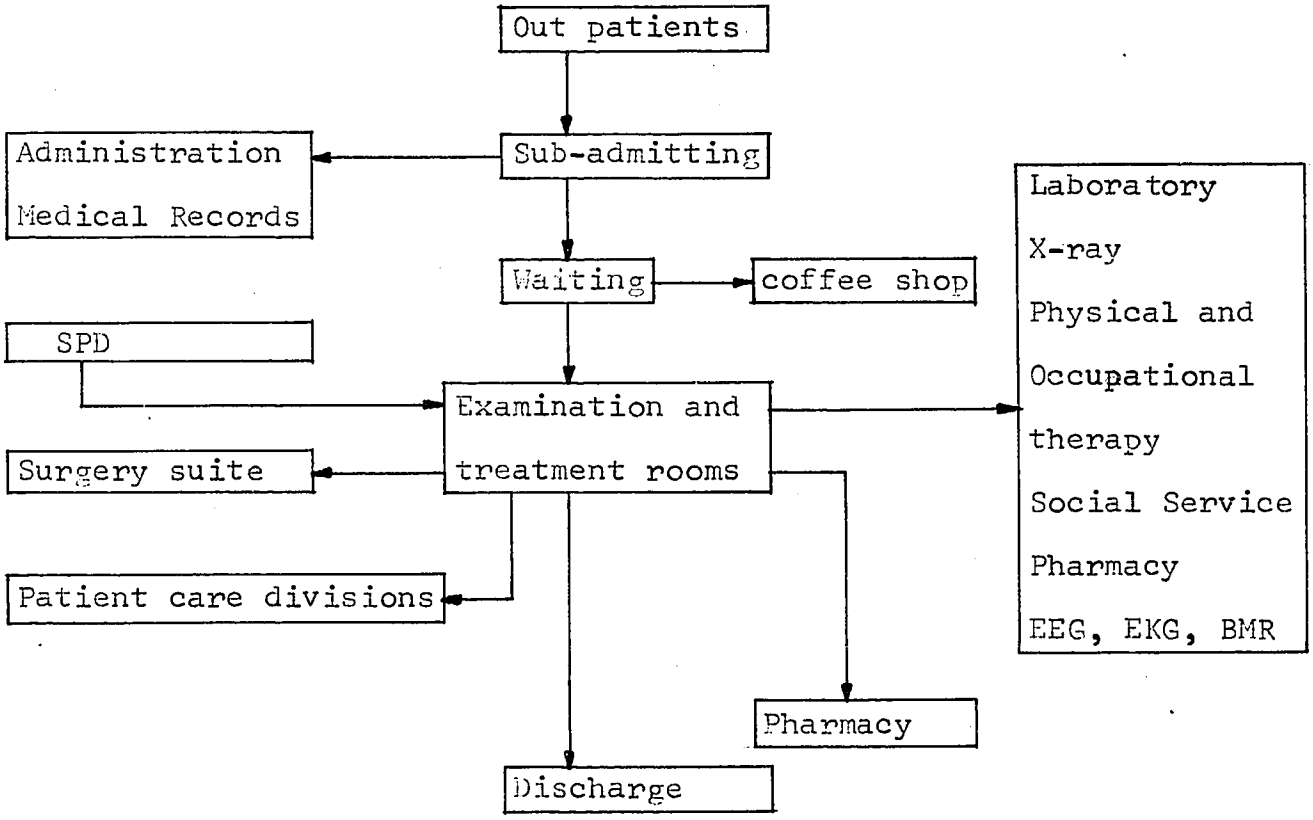
Work area

- Clean
- Soiled

Security office

Janitor's closet

Boxes show Functional Program: OPD



Arrows show Functional Relationships: OPD

PART II. ARCHITECTURAL PROGRAMME

I. ADMINISTRATION

A. Admitting:

Reception and waiting area	500
Six interviewing cubicles (small & private)	240
Two cashier cubicles	120
General office (Accounts receivable)	1500
Three private offices	360
Three social workers offices	360
Chest x-ray	120
Credit and insurance manager office	300
Public washrooms (male & female)	200
Gift and flower shop	350
Gift and flower shop storage	180
Bank	200
Net sub-total	4430 sq.ft.

B. Public Areas:

Public entrance	175
Lobby, public waiting	3000
Enquiry desk	80
Chapel	550
Chapel storage	80
Clergy office	150
Hospitality lounge	250
Beauty shop	400
Coffee shop	960
Net sub-total	5645

C. Business Areas:

Administrators office	300	
Administrators assistants three offices	500	
Secretaries and waiting	200	
Board room, coats and washroom	1500	
Director of nursing	200	
Asst.director of nursing office	240	
Director of medical staff	200	
Medical directors assistans three offices	360	
Reception, secretaries and waiting room	2000	
Isolated equipment room	120	
Director of personnel and public relations	140	
Director of personnel assistants four offices	600	
Secretary and waiting area	240	
Purchasing director	140	
Purchasing directors assistants three offices	360	
Accounts payable director	140	
Accounts payable directors assistants three offices	360	
Secretaries and waiting area	240	
Staff conference room (class room, including storage and projection room)	1000	
Janitor's closet	40	
Net sub-total	8880	sq.ft.

D. Professional Areas:

Doctors' entrance, lounge, locker rooms, washrooms (separate for male & female doctors)	1750	
On call rooms four (including washrooms)	780	
Net sub-total	2530	sq.ft.

E. Medical Records:

Active records area	700	
Micro film area	380	
Inactive records area	1200	
Doctors' dictation and transcription	300	
Central dictation and transcription	600	
Librarian's office	140	
Net sub-total	3440	sq.ft.

F. Medical Library:

Medical library (located next to doctors' lounge)	600	
Librarian's office and storage area	200	
Net sub-total	800	sq. ft.
NET TOTAL	25,725	sq. ft.

II. SERVICE DEPARTMENTS

A. Dietary:

Food service system will be centralized. All food except bread will be prepared in the kitchen. Frozen foods will form part of the meals, but frozen meals are not considered practical at this time. The hospital Coffee Shop will be operated by the Auxiliary.

Storage area:

Bulk storage in Central Stores

Weekly supplies under control of Dietician

Perishable supplies under control of Dietician (refrigerated)

Kitchen space allowance based 22 sq. ft./pat. for 750 patients.

Meat Refrigerator (walk-in)

Meat Refrigerator (deep freeze walk-in)

Meat preparation area

Dairy refrigerator (walk-in)

Vegetable refrigerator (walk-in)

Vegetable refrigerator (deep-freeze walk-in)

Roots refrigerator (walk-in)

Salad prep. area

Sandwich prep. area

Baking area

Dessert prep. area

Special diets area

Cooking area

Set up line area

Cart parking area

Dishwashing area

Bottle and pot wash area

Garbage cool storage

Storage area - week's supplies

Soiled and clean linen

Dietician's office

Chief's office

Staff washrooms and showers (male & female)		
Janitor's closet		
Clerical office		
Dietician's work room		
Cart washing (including		
Including Dining and Cafeteria		
	GROSS NET TOTAL	19,400 sq.ft.

B. House keeping:

Housekeeper's office	180
Asst. housekeeper's office	150
Secretary's office	120
In active storage room	500
Active storage room	340
NET TOTAL	1290 sq.ft.

C. Laundry:

Collection room (chutes)	100
Soiled holding	300
Washer extraction - double doors	500
Tumble dryer	600
Work area	600
Ironer	540
Press ironing	350
Board ironing	300
Supervisors office	120
Preparation (packing)	280
Sewing room	180
Storage	240
Janitor's closet	40
Washrooms (male & female)	240

Cart washing	200
NET TOTAL	4560 sq.ft.

D. Supply Processing and Distribution (SPD)

Collection room (chutes	100
Soiled holding area	700
Decontamination area	800
Sterilizers (double doors)	140
Equipment washing	120
Sterile fluids storage	250
Glove room	280
Formula preparation	160
Dispatch point	150
Dispatcher's office	200
Mail room	120
Active supply storage	500
Processed storage	480
Carts parking	500
Supervisor's office	120
Preparation area	280
Washrooms and lockers (male & female)	400
Janitor's closet	40
Flowers room	200
NET TOTAL	5540 sq.ft.

E. Central General Stores (CGS)

Receiving room and break-out	250
Clerk's office	200
Paper baling and returnable containers stores	500
General storeroom	1500
Kitchen stores and refrigeration	600

Garbage room	120
Administrative paper storage	300
Flamable liquid	240
Staff washroom	120
Furniture stores and used equipment inventory stores	1000
Medical equipment storage	500
Laboratories equipment storage	500
NET TOTAL	5830 sq.ft.

F. Employee Facilities:

All hospital staff except doctors, interns, nurses, student nurses and volunteers will enter the building through main employees entrance for time control.

Medical staff: a. Doctors
b. Interns
c. Nurses (female & male)
d. Nurses aides

Facilities for (a) and (b) to be provided in conjunction with the doctor's entrance.

Facilities for (c) and (d) and volunteers include separate lounge, lockers and washrooms near the separate entrance.

Service staff: Dietary
Housekeeping
Laundry
Maintenance and engineering
Central stores

Facilities: lounge, lockers and washrooms.

G. Maintenance Power Plant and Mechanical Room

Maintenance Shops:	
Mechanical shop and plumbing shop	600
Electrical shop	400
Carpentry shop	600
Paint shop	400
Telephone equipment rooms	400
Maintenance shop for ground equipment	500
Plant Superintendent's Office	140
Secretary's Office	120
Washrooms	100
Electrical facilities:	
Emergency diesel room	500
Transformer vault	500
Switch room	200
Trash collection room & incinerator	625
Pneumatic tube room	600
NET TOTAL	5685 sq.ft.

Heating plant, cooling plant and fan rooms on roof location; approximately 18,000 sq. ft.

No. 2 Fan Room, (for Operating Suite, Delivery Suite, Nursery and Emergency Operating Room) on basement location; approximately 2800 sq. ft.

III. ADJUNCT DIAGNOSTIC AND TREATMENT FACILITIES

A. Laboratories:

1. Lab.
2. Special services
3. Autopsy

1. Lab:

Control point and typing	420
Waiting (public)	300
In-patient waiting	120
Examination and specimen collection room	120
Pathologist Office	200
Assistant Pathologist Office	150
Blood bank	250
Hematology	400
Biochemistry	700
Two special test rooms	380
Balance and solution room	150
Instrumentation room	150
Microbiology	500
Media preparation room	200
Urinalysis (twelve toilets, male & female)	400
Net sub-total	4540 sq.ft.

2. Special services:

EEG examination room	120
EEG examination room	100
BMR room	120
EKG room	150
Isotope uptake room	150
Isotope work room	150
Net sub-total	790 sq.ft.

3. Autopsy:

Autopsy room	600	
Refrigeration room (for six bodies)	200	
Washrooms, lockers	160	
Museum	150	
Net sub-total	1110	sq. ft.
NET TOTAL	6660	sq. ft.

B. Radiology:

Four radiology rooms combined with film loading and control, dressing rooms and washrooms	1920
Four radiology and fluoroscopic rooms combined with film and control, dressing rooms and washrooms	1920
One special procedures room combined with film loading, control, dressing rooms and washrooms	500
Radiology department control point	540
Film filing	
Stenographers	
Reception Desk	
Janitors closet	60
Dark room	190
Sorting room	80
Reading	80
Reporting	80
Staff lockers and washrooms	100
In-patient waiting bay	100
Mobile X-ray storage	120
Chief Radiologist's Office	240
Therapist's Office	120

Two offices (Asst. Radiologist)		240
Waiting (public)		300
Chief Technician's office		90
	NET TOTAL	6680 sq.ft.

C. Physical Medicine

1. Physical therapy

2. Occupational therapy

1. Physical therapy:

Corrective therapy		560
Hydro therapy (three whirlpools)		800
Electro therapy		600
Office		120
Dressing cubicles		180
Waiting room		200
Washrooms		80
Net sub-total		2480 sq.ft.

2. Occupational therapy

Work room		500
Kitchenette		200
Dining		200
Net sub-total		900
	NET TOTAL	3380 sq.ft.

D. Pharmacy:

Pharmacy bulk stores	500
Active store room	200
Alcohol Storage unit pharmacy	120
Chief Pharmacist's office	200
Asst. Pharmacist's office	180
Secretary's office	180

Dispensing Pharmacy		500
Prepackaging		500
Waiting and reception		400
Library and conference room		480
Washrooms (male and female)		200
Janitor's closet		40
	NET TOTAL	3500 sq.ft.

IV. NURSING SERVICES

A. Patient Care Divisions:

1. Medical and Surgical Care Units:

Sixty ~~six~~ beds per floor as follows:

Two private wards (isolation) per floor

Eight standard wards (four beds each) per floor

Twelve semi-private wards (two beds each) per floor

Eight private wards per floor

Major Nursing Station	800
Doctors charting	
Two head nurses offices	
Medication alcove	
Work space	
Staff toilet and locker room	
Day room and waiting	600
Clean supply room	240
Soiled holding room	240
Conference room	380
Treatment bath	140
Tub bath	80
Stretchers and wheelchairs storage	70
Treatment and examinations rooms	360

Servers pantry		140
Six showers		120
Visitors' toilets		40
Janitor's closet		40
	NET TOTAL	3250 sq. ft.

2. Maternity Care Unit

Fifty-eight beds as follows:

Two private wards (isolation)

Seven standard wards (four beds each)

Ten semi-private wards

Eight private wards

Major Nursing station		800
Doctor charting		
Two head nurses offices		
Medication alcove		
Work space		
Staff toilet and locker room		
Day room		600
Relatives and fathers' waiting room		600
Clean supply		240
Soiled holding room		240
Conference room		380
Two tub baths		220
Stretcher and wheelchair storage		70
Two examination rooms		360
Serving Pantry		140
Six showers		120
Visitors' toilets		40
Janitor's closet		40
	NET TOTAL	3890 sq. ft.

3. Pediatric Care Unit

Eighty-four beds as follows:		
Four private wards		
Thirty-six cribs		
Eight bassinets		
Four standard wards (four beds each)		
Eight semi-private wards		
Four isolation (bassinets)		
Major Nursing station		800
Doctor charting		
Two head nurses offices		
Medication alcove		
Work space		
Staff toilet and locker room		
Day room and waiting		600
Play room and dining room		600
Clean supply room		240
Soiled holding room		240
Conference room		380
Treatment bath		140
Tub bath		80
Stretchers and wheel chairs storage		70
Two treatment and examination rooms		360
Serving pantry		140
Six showers		120
Visitors' toilet		40
Janitor's closet		40
	NET TOTAL	3850 sq.ft.

4. Psychiatric Care Unit

A. In patient area:

Thirty-two beds as follows:	
Four private wards	
Six semi private wards	
Four standard wards (each four beds)	
Major nursing station	500
Doctor charting	
One head nurse office	
Medication alcove	
Work space	
Staff toilet and locker room	
Waiting room (including washrooms)	280
Clean supply room	240
Soiled holding room	240
Electro-therapy room	200
Electro-therapy recoveryroom	300
Serving pantry	140
Tub bath	80
Janitor's closet	40
Net sub-total	2020 sq.ft.

B. Out Patient Area:

Fourteen offices	1680
Reception	1000
Waiting room	
General office	
Storage	
Washrooms (Male and female)	
Library and conference room storage	640
Net sub-total	3320 sq.ft.

C. Day care unit:

TV and music room	600
Occupational therapy	2200
Living room	
Dining room (with its own food servery)	
Work room	
Net sub-total	2800 sq. ft.
NET TOTAL	8140 sq. ft.

5. Coronary and Intensive Care Units

A. Coronary Care Unit:

On this part of the floor six flexible beds are combined with CCU; four beds CCU ward divided with glass partitions to four private bedrooms.

Four-bed CCU ward with work area	1200 sq. ft.

B. Intensive Care Unit:

On this part of the floor four flexible beds are combined with ICU. Four-bed ICU ward divided with curtains and glass partition to four semi-private bedrooms.

Four-bed ICU ward with work area	1200 sq. ft.
Net sub-total	2400 sq. ft.

CCU and ICU shared the service facilities on the floor, such as:

Heavy equipment storage	240
Patient storage	240
Nurses lounge	300
Nurses locker and washroom	300

Special shower	80
Doctors' sleeping room	300
Relative waiting room	300
Doctors' office	300
Clean supply room	240
Soiled holding room	240
Janitor's closet	40
Net sub-total	3580

CCU and ICU shared some service facilities with thirty-two bed Medical/Surgical Unit

Major Nurses Station	800
Doctors' Charting	
Two head nurses offices	
Medication alcove	
Washroom	
Staff toilet and locker room	
Serving pantry	140
Conference room	380
Treatment bath	140
Net sub-total	1460 sq. ft.
NET TOTAL	7440 sq. ft.

6. Burns Unit

This unit is located away from the general flow of the hospital traffic. The wards are private wards. The visitor's corridor runs around the private wards and it is fully isolated without access to the main body of the centre.

Each private ward has its own washroom, shower and nurse utility room.

Ten private beds	
Reception	400
Waiting	
Visitors toilets (male & female)	
Female staff; lockers, washrooms, boots, scrub-up area	500
Male staff; lockers, washroom, boots, scrub-up area	500
Two nursing station with medication preparation area	340
Head nurse' office	100
Clean supply room	240
Soiled holding room	240
Lab	300
Heavy equipment storage	140
Patients' storage	140
Sub-decontamination	280
Two dressing rooms (with tub bath)	640
Two operating rooms (with scrub-up and air locks)	800
Janitor's closet	40
NET TOTAL	4660 sq.ft.

B. Operating Suite

Unrestricted area:	
OR control point	180
In patient waiting room	100
OR supervisor's office	120
Doctors' dictation area	100
Chief surgeon and his secretary's office	380
Anesthesist's office	250
Net sub-total	1430 sq.ft.

Interchange area		
Doctors' suite (lockers, washrooms & boots)	400	
Nurses' suite (lockers, washrooms & boots)	400	
Orderlies' suite (lockers, washrooms & Lounge)	360	
Doctors' Lounge	300	
Nurses' Lounge	300	
Net sub-total	1760	sq. ft.
Semi-restricted area:		
Recovery room	1500	
Two soiled holding areas	500	
Three janitors' closets	60	
Net sub-total	2060	sq. ft.
Restricted area:		
Four scrub-up stations, (scrub-up area located so that physicians can observe preparations in operating room during scrub-up process)		
Four major operating rooms	1600	
One neurosurgery operating room	420	
One organ transplant surgery operating room	420	
Two cystoscopic and urology rooms	640	
Two orthopedic operating rooms	640	
Work room for cystoscopic rooms	180	
Two toilets for cystoscopic rooms	80	
Two X-Ray viewing rooms for cystoscopic rooms	70	
Plaster room for orthopedic operating rooms	130	
Two exit and transfer rooms for neurosurgery and organ transplant surgery	200	
Two anesthesia rooms for neurosurgery and organ transplant surgery	280	

Two set-up rooms for neuro surgery and organ transplant surgery	160
Staff work area	1000
Sterile supply holding and storage	
Monitors and equipment storage	
Two janitor's closets (large)	160
Net sub-total	6180 sq.ft.
NET TOTAL	11,430 sq.ft.

C. Delivery Suite:

1. Delivery unit:

Eight labour rooms (shower and washroom)	1760
Nursing station	500
Doctor charting (three doctors)	
One head nurse office (unit supervisor)	
Medication prep. area	
Work space	
Doctor's suite (washrooms, lockers & boots room)	270
Nurses' suite (washrooms, lockers & boots room)	270
Four delivery rooms	1280
Two soiled holding rooms	300
One operating room (for caesarian deliveries)	350
Anesthesia storage and work room	160
Recovery room	360
Three scrub-up stations	150
Staff work area	1000
Sterile supplies holding and storage	
Net sub-total	6400 sq.ft.

2. Nursery

Premature nursery	4 bassinets	
Intensive care nursery	4 bassinets	
Normal nursery	38 bassinets	
	46 bassinets	

Twelve bassinets on the pediatric care unit

(Four of them isolation)

Examination and work area, scrub-up and gowning facilities

Per bassinets 40 sq.ft. 46 x 40	1840	sq.ft.
Sub net total	1840	sq. ft.
NET TOTAL	8240	sq. ft.

D. Emergency Department

Sub-admitting and control (nursing station)	180	
Shower, bath and toilets	110	
Waiting and washrooms	580	
Stretcher and wheelchair storage	135	
Three emergency examination rooms	600	
Three emergency treatment rooms	600	
Observation room	300	
Two emergency operating rooms	660	
Clean and soiled holding facilities	320	
Clean and sterile, EQP store	150	
High speed sterilizer	100	
Doctors' on call room - two (incl. washrooms)	450	
Janitor's closet	40	
NET TOTAL	4225	sq.ft.

V. OUT PATTENT DEPARTMENT

Sub-admitting and Control (Nursing Station)	180
Supervising nurse's office	180
Sub control	100
OPD waiting area	1700
Dental facilities 2 chair ante-waiting	350
Six examination - consultation rooms	720
One eye examination room	220
One ENT examination room	160
Patient washrooms (male & female)	360
Clean and soiled holding facilities	800
Security office	100
Janitor's closet	40
NET TOTAL	4910 sq. ft.

CHAPTER IV

SUMMARIZED COMMENTARY ON THE FUNCTIONS OF THE VARIOUS LEVELS OF THE GENERAL HOSPITAL

Located on the First Level are the majority of the supporting services. This Level will be connected, in the future, by underground tunnels with a Nursing Home and Long-Term and Self-Care Units.

On the Second Level, the diagnostic and treatment areas are located.

The Third, or street Level, contains the Administration, Executive areas and Dietary Department. The Main Hospital Entrance and the Main Lobby are located on this floor.

The Fourth Level, where there are the Maternity and Delivery Units Level, is the first nursing floor.

The Fifth Level is the Pediatric Nursing floor.

The Sixth Level is the Psychiatric floor and contains a Psychiatric Out-Patient Department, A nursing Unit and a Day Care Centre for the use of Psychiatric in-patients and out-patients.

The Seventh Level is a Medical/Surgical floor. The Coronary and Intensive Care Units are also located on this floor.

The Eighth, Ninth, Tenth and Eleventh Levels are for Medical/Surgical nursing.

The Twelfth Level is the Burns Care Nursing floor.

The Thirteenth Level contains Air Handling equipment; the Boiler Room and Elevator equipment are also located on this floor.

First Level

The fundamental concept of the Hospital is that all supplies shall be concentrated for dispatch at the first level and distributed to all upper floors, using a vertical automatic ejection conveyor system. The First Level therefore, contains a supply service complex which centralized the receiving, processing, sorting and issuing of all supplies for the institution. Incorporated in this complex are the decontamination, preparation and processed stores area; the laundry, the printshop, the pharmacy, general kitchen and bulk storage, medical equipment storage, garbage refrigerator and incinerator.

Also on this Level is the staff entrance, with adjoining lockers and washroom facilities, maintenance shops, housekeeping department, morgue and autopsy facilities, mechanical and electrical areas and a garage for three cars is located on this floor.

Here also are nurses lockers, washroom facilities and lounges. To complete this floor, the volunteers and Women's Auxiliary have facilities for their activities, including lounge, lockers and washroom, workroom and office. They relate well on this floor to their functions where they will be active in some aspect of receiving and supply processing and distribution.

Space for an automatic food vending canteen with seating capacity for about 30 is provided. This facility is planned to be open at all times.

Second Level

This is the level where diagnostic and treatment facilities used by both in-patients and out-patients are located. These facilities are grouped into zones so that staff and patient traffic is simplified and separated.

Careful planning has greatly reduced hospital traffic confusion and great emphasis has been placed on separation of clean and soiled traffic to reduce the incidence of cross-contamination. The plan of this floor has also been laid out to facilitate the future expansion of all departments in an orderly and functional manner with the least amount of disruption to the continuing operation of the hospital.

There are two major entrances to the hospital on this Level. The Emergency Entrance is located on the south. The Out-patient Entrance is located on the north.

The Emergency Department is located in the south-east quadrant. The Out-patient Department is located in the north-west quadrant. Out-patients may enter these departments from the Emergency or OPD Entrances.

The Physical Medicine Department is located between the OPD and Emergency Department.

In the north-east quadrant are located the following: the Special Services Department, which includes the electrocardiogram suite, the radioactive isotope suite and the electroencephalogram suite, the Laboratory Department, the Radiology Department and the cystoscopic and orthopedic suites.

The departments in the quadrant serve in-patients, out-patients and emergency patients may also be cared for there. This accounts for their close relationship to the Emergency and OPD, the coffee shop and the elevator bank.

Located in the south-east quadrant are the following: the surgical suite, including 6 operating rooms and related recovery area; all the supporting service areas including changing facilities for doctors and nurses and lounges for both.

Upon inspection of the plan, therefore, it will be discovered that there are three distinct zones on this level. The facilities in the south-west, such as OPD, physical medicine and emergency form the first. Here occur out-patient consultations, treatments and referrals to the second zone, which provides lab tests, x-rays, hydrotherapy, electrotherapy and so on. As indicated earlier, the second zone serves out-patients as well as in-patients. The third and final zone is the surgical suite and is reserved for in-patients.

Each department is capable of expansion in a logical way. On the eastern half of the floor, all departments run in a west-east direction. Thus, by merely extending the corridors, additional diagnostic and treatment rooms can be added to the east. On the south, the emergency can expand and OPD can expand to the north.

Examination of each department will demonstrate how traffic has been separated by the use of peripheral patient corridors and interior staff corridors.

Third Level

This is the main entrance level.

This level houses the admitting, executive and administrative offices and related facilities and the Dietary Department.

At the main entrance is a spacious lobby. To the left upon entering is the reception/information desk, behind which is the Admitting Department. Immediately ahead are the elevators and the flower shop is paced directly opposite.

In the north-west quadrant the following facilities are located: admitting, accounts receivable, social service, chapel and clergy facilities; a classroom, with seating capacity of about 60; the Credit and Insurance Manager's Office, the bank, the Hospitality Lounge and the Beauty Parlour.

In the south-west quadrant the following facilities are located: doctors' entrance, washrooms, locker room and lounge. The facilities for the doctors are located very close to their entrance and car parking lot. The doctors' facilities are also well related to medical records and to the medical library. Also in this quadrant are sleeping rooms for the doctors who are on call.

Among the facilities in the north-west quadrant are offices for the Administrator, the Assistant Administrator, the Comptroller, the Director of Nursing Services, the Medical Director, the Director of General Services and others; a general office and a reception area; a board room, small committee and dining-meeting room.

The Personnel-Public Relations Department; the Accounts Payable Department and the Purchasing Department are located on this quadrant of the floor, where they are very close to senior administrative and medical staff.

The Dietary Department which serves the in-patients on upper floors and all the staff in the hospital is placed on this level, thus giving it a central location. A dining room, with seating capacity of approximately 300, is provided. The servery is an "open square" type, which will allow diners to obtain their meals in the shortest possible time.

The kitchen is sized to serve the ultimate hospital of 550 beds, and all related facilities in the master plan. With the addition of more equipment, the kitchen is capable of serving a future Long-Term Care Unit, Self-Care Unit and also a Nursing Home.

Fourth Level

This is the first nursing level, the maternity floor. It is not a typical level.

This level has 58 maternity beds and 46 bassinettes. It will be seen that this floor has two zones, the maternity nursing unit and the obstetrics unit. The two zones are connected to one another by short corridors.

The obstetrics group contains 8 labour rooms; 4 delivery rooms; one operating room, recovery area and the supporting service areas, including changing facilities for the doctors and nurses.

The facilities are grouped into zones so that staff, patient and visitor traffic is simplified and separated.

Fifth Level

This level contains the pediatric-ephebiatric nursing service. The pediatrics are located on the north end of the floor and the ephebiatrics or adolescents are located on the south. In practice, an accordian principal can be used as the occupancy of each service fluctuates.

A total of 84 beds is included on this floor which is made up of 12 bassinettes, 36 cribs and 36 adult beds.

Sixth Level

This is the psychiatric unit shich includes in-patient facilities and out-patient facilities and a day-care area. The in-patient provisions contain 32 beds, which are divided between men and women and further classified into three categories:

a. Intensive Care

b. Standard Care

c. Self-Care

An electro-convulsive therapy area, service rooms and a lounge are included on this level. Four of the 32 beds are provided in separate isolation rooms and are specially equipped for the safety of the patient.

The out-patient provisions contain several offices for teams of psychiatrists, psychologists and social workers. A waiting area, general office space and a large library-conference room are also included. These facilities serve both the out and in-patients.

The day care centre contains a TV and music room, and occupational therapy facilities and a flexibly used living-dining room with its own food servery.

Seventh Level

This level contains the coronary care unit (CCU) and intensive care unit (ICU). CCU and ICU are each four bed wards. They are located very close to each other, to share services such as: major nursing station, doctors' consultation and sleeping room, nurses' lounge and locker room, family waiting room, clean supply room and soiled holding room, medication preparation, dietary facilities and equipment storage room.

The rest of the floor has 32 beds for surgical-medical nursing.

Eighth Level

This is a typical medical/surgical nursing floor.

It has double corridors. All of the supporting services are provided in the interior core in groups. Thus, bedrooms on the periphery open only off one side of the corridor.

The passenger elevator bank is separated from the service elevator bank, segregating patients and visitors. The passenger elevator bank opens onto the floor reception area where the major nursing station is located. A waiting room, or day room, is also adjacent to this area.

A nursing team concept is used throughout the hospital. The 66 bed floor is divided into four 16 or 17 bed nursing units. The team control centre (TCC) is located very close to each nursing unit.

Clean supply cores and soiled receiving rooms are centrally located on all patient floors, as they are on the second level. These floor supply cores are large enough to hold stocked supply carts and contain the outlets for the automatic ejection vertical supply conveyor.

Examination rooms, bathrooms and shower rooms are also located in the core. A conference room, for 16 persons,is also located in this area.

Patients' rooms on this level, and on all nursing levels, are designed alike, with no major distinction between facilities for medical, surgical, maternity, pediatric, ephebiatric or psychiatric patients. This design provides maximum flexibility for fluctuation of nursing services.

Each bedroom is equipped with a service alcove, containing a shower, or roughed-in shower, a toilet, a vanity with washbasin and mirror, locker and nurseservers. These are special supply units, or double door pass-through cabinets, which permit replenishing of supplies from outside the patient's room.

Prepackaged clean supplies can be removed from inside the service alcove by the nurse as required and conversely she places soiled items in the soiled cabinet. All used material is considered contaminated and is placed in disposable plastic bags which are sealed and later taken from the corridor side to the decontamination area located on the first level. Here they are opened, sorted and processed through washers and sterilizers.

Soiled linen is picked up periodically from the soiled nurseserver, from whence it is transported to the soiled holding room on the floor and placed in the linen chute, or transported by cart to the laundry room.

With the facilities that are provided in the nursing alcove, and an excellent communications system, the nurse can spend much more time with the patient at the bed-side.

Good patient care is the primary purpose for the existence of a hospital and with better communications, improved methods of material handling, better organization, with supplies and facilities close to the bedside, the professional staff can provide 50% more care and with fewer people.

As mentioned before, the service alcove is equipped with, or will eventually have a shower. This is located in the toilet room and thus allows the patient to bathe without leaving his room. This can also save the nursing staff considerable time as the patient can bathe while the nurse, or aide, is in the room

performing other duties.

The vanity and washbasin are located outside the toilet room in the alcove. In addition to providing a surface for unloading and loading the nurseserver, the vanity counter top acts as a surface for toilet articles for the patient while shaving, applying makeup or fixing hair and so on. The vanity is also used by the nurse for charting and requisitioning and while communicating with the major nursing station or TCC at supply core. An intercom is provided in the alcove for the use of the staff. A swing-out stool can be located under the vanity for the use of the nurse and patient alike.

The hand basin is located in the vanity and is equipped with wrist action fittings. With the washbasin in this open position rather than in the toilet room, which is often in use by one of the patients, greater use can be made of it. While the toilet room is in use, the other patient, the nurse or the doctor can all use the basin for washing. The nurse also has sufficient space to assist a patient, if required. An important feature is that the doctor and nurse can wash before examining another patient, or before leaving the room, which they may do without touching doors and door knobs.

Every single bedroom in the hospital can be used for isolation because basic isolation technique is provided in all.

All beds are equipped with suction and oxygen outlets. A nursecall system, a telephone, and a central radio and TV control outlet are located in a specially designed bedside table for each patient. The patient has space in the bedside table for personal

items and the nurse uses the unit when giving bed baths and other treatments.

Each bedroom in the hospital is double glazed with grey, glareresistant glass.

Ninth, Tenth and Eleventh Levels

These floors are identical to the Eighth Level.

Twelfth Level

This level contains the burns unit, this unit will be used for the initial treatment of very serious burns cases, burns estimated at more than 40% of body area.

The unit is located away from the general flow of the hospital traffic.

Ten single-bed wards are arranged against the outside wall. The service rooms such as: laboratory, staff changing and scrub-up rooms, nurses stations, clean and soiled holding rooms, small decontamination area are located in the core.

Two operating rooms are on the end of control core and two dressing rooms accompany them.

Visitors' corridor is fully isolated and without access to the main body of the centre, visitors' corridor runs around the single wards with windows looking on to each ward, where visits can be arranged without any fear of contamination.

Thirteenth Level

This level contains air conditioning, fan rooms, cooling tower, elevator machine room and the boiler room.

The boiler room is sized to allow for an additional boiler for all the related master plan facilities such as the long-care, self-care unit and the nursing home.

THE SITE PLAN

In the initial stage of construction, the site will provide parking for approximately 800 cars.

The general hospital requires extensive parking space for personnel and visitors as well as for both the attending and courtesy medical staff. Parking spaces are provided on a 1.75 to 1 to a 2-to-1 cars per bed ratio.

The pedestrian traffic flow from the parking spaces to the various principal entrances such as main, emergency, and outpatient, and personnel, will be as direct as possible so that unauthorized entrances are not used.

Ultimately, a heliport might be developed on the site if local ordinance permits for the handling of accidents, or emergency patients, who might be brought to the hospital by helicopter.

OUTLINE SPECIFICATIONS

1. MAIN STRUCTURE

This is to be of reinforced concrete and shall comprise columns, slabs and beams.

2. EXTERIOR WALLS AND CLADDING

Cladding to be modular precast concrete above third level. Windows to be aluminum split frame, double glazed, with integral blinds for sun and glare control and for privacy.

3. INTERIOR PARTITIONING

Interior partitioning to be steel stud, dry-wall with resilliant clips for sound control, generally with a proportion of pre-cast concrete block walls as appropriate.

4. INTERNAL FINISHES

Ceilings, generally to be suspended and of gypsum acoustic plaster. Corridor ceilings to be suspended metal tray.

Finish to walls to be vinyl, paint or ceramics as appropriate, together with protective guards as required.

Floor surfacing to be resilliant sheet, tile or carpeting with quarry tile in locations subject to heavy wear and ceramic in wet service areas. Conductive flooring to be provided in areas requiring this precaution.

5. ELECTRICAL

1. Bus duct feeders to panels on each floor and for each area of service required. Bus duct and feeders sized for additional power requirements of future equipment. Circuit breaker panel boards.
2. Emergency power unit for all essential services.
3. Lighting shall be mainly fluorescent with incandescent in mechanical and storage areas.
4. Special lighting units for bedrooms.
5. Parking lot lighting.
6. A Bell Telephone Centrex system.
7. A pneumatic tube system serving all departments and with connections to all floors.
8. A "hands-free" push button dial intercommunications system for all major departments with interconnections between departments.
9. A Doctors' Registry system, with provision for voice message pocket paging and memory system.
10. Provision for wireless pocket paging to lay personnel and nursing team leaders.
11. Provision for physiological monitoring throughout the critical areas of the hospital (see particularly Coronary Care Unit).
12. Provision for closed circuit television in certain areas.
13. A separate supply core intercommunications system from all bedrooms and key areas in the hospital to the Dietary Department and the distribution centre.
14. A comprehensive fire and smoke detection system.

6. HEATING

Oil fired boilers to be located on the roof and to serve the entire hospital complex.

7. VENTILATION' AIR CONDITIONING' AND COOLING

All the hospital to be fully air conditioned with separate systems for surgical suite, emergency OR's, delivery suite, nursery, burns unit and the kitchen.

Central mechanical refrigeration machine and cooling tower located on the roof providing chilled water for building air conditioning system.

8. BUILDING SERVICES

1. It is proposed to provide vacuum and oxygen on central systems.
2. Compressed air to be available as needed.
3. Automatic vertical supply conveyor.
4. Garbage and linen chutes serving all floors.
5. Six high speed elevators.

CHAPTER V

CORONARY CARE UNIT

The Seventh Level of the General Hospital

General.--Dr. Clarence A. Imboden, Chief of the Coronary Section Heart Disease Control Programme, U.S. has written in the Medical Annals 1964 that:

> in the U.S.A. at this time, coronary arterial disease kills one adult every minute of every day of the year - the appalling total of 528,000 annually. In World War I, casualties cost America 126,000 men of military age but now the U.S.A. loses 150,000 men under the age of 65 each year to coronary atherosclerosis. This is the sinister impact of a disease that produces an estimated 1,500,000 acute myocardial infractions annually, with a general mortality rate of about 30 percent.[1]

Medical leaders agree that the development of the "Intensive Cardiac Care Unit" is very important and that more and more hospitals must add such units in the future.

A coronary care unit is a specialized unit within the hospital, wherein constant, intensive observation and immediate emergency treatment can be provided to the acute coronary patient. This is achieved by a concentration of specially skilled personnel and equipment in one area where the patient may receive constant electronic monitoring, coupled with continued specialized medical observation, resulting in anticipation, early detection and prompt aggressive treatment of any complication, aimed at prevention through observation.

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[1]Dr. Clarence A. Imboden, Jr., M.D., Chief, Coronary Section Heart Disease Control Program, Division of Chronic Diseases, U.S. Public Health Service, Department of Health, Education and Welfare, Medical Annals of the District of Columbia, 1966. p. 442.

Selection of Patients.--In a U.S. Public Health Service Publication the following is stated concerning the selection of patients for coronary care:

> All patients in whom acute myocardial infarction has been suspected or established should be admitted to the coronary care unit. Logically, patients with other forms of acute coronary heart disease manifestations and serious disturbances of cardiac rhythm and conduction that may lead to sudden death, should also be admitted to the unit. Included in this category are patients with acute coronary insufficiency (impending myocardial infarction), Stokes-Adams syndrome, and ventricular ectopierhythms. Admission to the unit is based on the established or suspected diagnosis and not on the clinical state of the patient. In other words, a patient with acute myocardial infarction should be admitted even though at the time of arrival, he is in no distress and appears physiologically stable; he is still a candidate for cardiac arrest and requires constant observation. Patients needs for remaining in the unit should be reviewed daily because duration of stay will affect the availability of beds and the size of the unit.[2]

Dr. Kitchell of Abington Memorial Hospital speaking in Philadelphia at a symposium on intensive coronary care stated:

> My own opinion is that every patient suspected of having an acute myocardial infarction should be admitted to a special unit. If facilities are strained, a problem may arise concerning the admission of so-called "goodrisk" versus "badrisk" patients. If a "goodrisk" patient is one without obvious complications, and a "badrisk" patient is one with serious failure, shock or arrhythmia, it can be shown that the mortality in these two groups is impressively different by a factor of five or six or more. Certainly the patient in shock and pulmonary edema has the highest mortality of all. I am not aware that anyone has shown that coronary or any other kind of care actually improves themortality of the patient in shock. The Coronary Care Unit (CCU) is designed for the patient who may have unexpected electrical failure of the cardiacrhythm. Therefore, if there are problems in terms of the number of available

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[2]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965, p. 1.

beds versus the number of patients, one could argue that the "goodrisk" patient should be in the CCU and the patient with severe complications, particularly those relating to inadequate ventricular function, should be in an ICU.[3]

Dr. Unger of the University of Miami, at the same symposium stated:

> Generally then, the patient with shock or congestive failure goes to the Intensive Care area rather than to the Coronary Care Unit. In this way the Coronary care unit becomes an observation unit where trained nursing and medical personnel are able to anticipate and treat complications before they become overt.[4]

Length of Stay.--Approximately 18% of all patients with infarctions die within 72 hours after admission. This percentage seems constant in most hospitals and can serve as a baseline for evaluating the effectiveness of a given program.

Dr. Meltzer of the U.S. Public Health Service, at the above symposium stated:

> If one relates our original data regarding mechanism of death with total mortality, it is found that 30 deaths would be anticipated per 100 admissions with acutemyocardian infarction; 14 of these deaths should be due to arrhythmias; 13 from a circulatory failure and 3 from other causes.
>
> Before we initiated our program, we were also aware that approximately 70% of all deaths occurred within the first five days after admission. This was an important point, since the practicality of continuous monitoring would have been limited if the death rate was distributed evenly and not concentrated in the first few days. We had three facts at our disposal. First, that 70% of the deaths occurred within the first few days after admission; second, that 47% of these fatalities were due to arrhythmias; and lastly, sound evidence that arrhythmic deaths were indeed preventable.

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[3]J. Roderick Kitchell, M.D., F.A.C.C., Abington Memorial Hospital, Abington, Pa. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966. (New York Charles Press 1966). p25

[4]Paul Unger, M.D., F.A.C.C., Universityof Miami School of Medicine, Miami, Fla. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian - University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966) p.30

> Reviewing our first 200 proven acute myocardial infarctions, the mean duration of stay in the Unit was six days. Seventy percent of our mortalities occurred within the first six days and thirty percent of the remaining mortalities in the subsequent two weeks. I do not believe that monitoring would have substantially reduced the incidence of late deaths. As has been indicated, coronary care units presently do not provide effective means for combatting deaths other than those that result from arrhythmias.[5]

Dr. Lown, from the National Heart Institute at the same symposium stated:

> Our practice is the following: if the unit is full, with patients who have been in three or four days, we will move out the patient who has been most free of rhythm disorders and appears least ill. When there is no pressure for admission, we will not discharge any patient for the first 10 days. This policy is highly flexible and is adjusted to the inflow of patients. In this way, the unit's unique services are optimally employed.[6]

Dr. Paul Unger, F.A.C.C., University of Miami, again in the same symposium stated:

> In our first 100 patients, 40% of the total deaths occurred 24 hours after admission, 57% within the first 72 hours and 74% by the seventh day. In these first 100 cases, 75% of all arrhythmias occurred in the first 72 hours after which the incidence decreased rapidly. Between the fourth and seventh day, the occurrence of arrhythmias (including blocks) was 15%. In the event of a breakthrough arrhythmia in a previously stable patient, we count this as the first day, regardless of when it occurred. On the average, we prefer a stay in the Unit of from five to seven days.[7]

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[5]Lawrence E. Meltzer, M.D., Presbyterian University of Pennsylvania Medical Center, Philadelphia, Pa. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966). p. 29.

[6]Bernard Lown, M.D., F.A.C.C., Harvard University School of Public Health, Boston, Mass. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966). p. 30.

[7]Paul Unger, M.D., F.A.C.C., University of Miami, School of Medicine, Miami, Fla. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966). p. 31.

Location of Coronary Care Unit.--On the question of the location of the Coronary Care Unit in the hospital, Dr. Kitchell has this advice:

> Where should Coronary Care Units be located within the hospital? I believe they are best placed as close as possible to the admitting area; this eliminates valuable time lost in transit. A patient may be in ventricular fibrillation when he is brought through the door, and something must be done in a hurry to save his life. It will be pointed out many times during this meeting that the first hours carry the highest mortality, and so speed of transport and treatment is of the essence.
>
> About 70% of established units have been built-in to the general Intensive Care area of the hospital. This concentrates supplies and ancillary equipment, which can then be used in either area. Also it furnishes ready access to extra hands of both nurses and physicians when these are needed quickly. Combining these areas is popular and makes sense.[8]

In the U.S. Public Health Service Publication on this matter the following is written:

> The unit may be located on any patient floor, but is preferably located within a general intensive care, or other patient care unit, where other services such as Nursing Stations, Doctors' consultation and sleeping rooms, nurses' lounge and locker room, family waiting room, utility rooms, medication rooms, dietary facilities and equipment storage rooms are readily available.[9]

It should also be possible to use the general intensive care area as an overflow for certain patients with myocardial infarction, if the Coronary Care Unit is at full capacity.

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[8]J. Roderick Kitchell, M.D., F.A.C.C., Abington, Memorial Hospital, Abington, Pa. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian-University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966) p.9.

[9]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965). p.4.

On the question of how large a coronary care unit should be, Dr. Kitchell stated:

> The size of the 100 functioning units in the U.S.A. seems to vary between four and 16 beds with four beds the most common size in most hospitals. One hospital has already constructed a 32-bed unit but only 16 of these beds are currently functioning.[10]

The U.S. Public Health Service proposes,

> Determination of whether to establish a four or five-bed unit might be predicated upon previous two or three year admission rates for coronary cases. Two hundred admissions per year, based on an average patient stay of 7 days, could keep a four-bed unit at nearly full occupancy the year round. Three hundred admissions per year would keep a five-bed unit at about 80 percent occupancy.
>
> In planning a unit it is clear that in the future we will be using these beds not only for Coronary Diseases, but also for other acute cardiac situations, so one might contemplate more space than is needed for infarctions alone. In this connection, it is wise to plan conduits and electrical wiring for future use. This will save money in the long run since rebuilding existing areas is expensive.[11]

The Architects and hospital planners, have to know future needs before beginning costly building programs.

Physical Design:

A. Communications.--On the question of communication, the U.S. Public Health Service states:

Because prompt treatment is vital for a coronary patient in

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[10] J. Roderick Kitchell, M.D., F.A.C.C., Abington Memorial Hospital, Abington, Pa. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian-University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966) p.7.

[11] U. S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965). p.4.

distress, a communications system is needed that will enable the nurse to report her needs in an emergency situation without leaving the patient. This requires an audio/visual intercommunication system connecting each patient room to the main Nursing Station on the patient care floor, and other areas such as staff lounges and utility rooms, from which assistance may be obtained. It should also be possible to call these areas from the nurses' desk. This system should be connected to the main nurses' station and to the hospital paging system to summon the cardiac arrest team. Usual electrical and telephone outlets will also be required. A 60 amp. 250 volt single phase outlet should be provided for X-Ray equipment.[12]

B. Air Conditioning and Ventilation.-- According to the U.S. Public Health Service,

> The air conditioning system should be designed to maintain recommended ventilation rates, temperatures and humidities within reasonable limits regardless of outdoor weather conditions. The system should include filters with a minimum of 90 percent efficiency in the retention of particulates in the 1 to 5 micron range. These filters should be located as close as possible to the unit. They should be preceded in the system by a medium-grade filter.
>
> The temperature of the Coronary Care Unit should be maintained at approximately 75 degrees F. with a relative humidity of 40 percent. A minimum ventilation rate of three room volumes of air per hour should be provided. Positive air pressure relative to the air pressure off the corridor should be maintained to prevent infiltration of contaminated air. Individual temperature controls should be provided for each cubicle as well as a ventilation air supply inlet and an exhaust air outlet. The system should be balanced to provide the same air pressure throughout. It may be desirable to design the system with no recirculation of air so that the unit may be adapted for isolation should the need arise.[13]

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[12]U. S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U. S. Government Printing Office, 1965). p.5.

[13]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U. S. Government Printing Office, 1965). p.8.

C. Work Area.-- The nurse in the coronary care unit will need to observe each patient closely, to plan adjustments in his treatment as the need changes. Thus it is recommended that the beds be so located that the nurse can view all patients from the central monitoring station. The nurses' monitoring console should be elevated, and a high stool provided to enable her to view the patients while seated. The desk should be large enough to provide sufficient work space as well as to accommodate the central monitoring equipment and charts. A separate table should be provided to facilitate doctors' charting. A crash cart, with emergency supplies and drugs, respirators, resuscitators, defibrillator and pacemaker should be kept conveniently close to the nurses desk for use in cardiac arrest of cardiac emergencies. Similar crash carts may be provided in the surgical suite, emergency room and other areas as needed.

A counter and sink with knee, foot or wrist control and gooseneck type spout; a wall cabinet with a narcotics compartment, and a small refrigerator should be provided. Receptacles for soiled linen and waste materials could be kept under the counter. Low doors to the corridors may provide for emptying these without entering the unit.

The use of carts is recommended by the U.S. Public Health Service for the miscellaneous small items of equipment and supplies such as diagnostic instruments, sterile tray sets, linen and parenteral solution flasks. Supplies stored in the unit will be governed by the frequency and volume of use, and their accessibility from Central Supply, Pharmacy and other sources with

safety factors duly considered. An equipment storage area is required for bulky equipment such as commodechair, patient lift, wheel chair and electrocardiograph, if the monitoring system is not provided with a direct writing attachment. Additional equipment may be kept in a storage room located elsewhere on the floor.[14]

D. Patient Room.--With respect to patients' rooms Dr. Kitchell states:

> One of the most important aspects or unit design concerns the peace of mind of the patient in the unit. This is essential for his recovery. In this respect, private room facilities are important to ensure that the patient is not a "captive audience" to catastrophic events which may occur from time to time. Semi-private units can be used, but they will subject the patient to the mental trauma of watching what is going on in the next bed, which may be distressing to him. While the patient should be so isolated in this sense, he should not be made to feel alone. He should be able to see the nurse, but not see or hear his monitor. Patients become apprehensive if they watch the flashing of the monitor, or listen to the "beep" sound, because irregularities in these may be frightening. Some patients may become very perturbed over this. So much so that arrhythmias may be triggered.[15]

Most patients are usually alert and aware of their surroundings. Ideally the beds should be enclosed by glazed partitions for nurse supervision, quiet and to prevent patients from being disturbed by activities in other rooms, opaque curtains should be provided when privacy is needed.

On this question the U.S. Public Health Service recommends:

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[14]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965). p.6.

[15]J. Roderick Kitchell, M.D.' F.A.C.C., Abington Memorial Hospital, Abington, Pa. At a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian-University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966) p.10.

Each bed location should have an oxygen outlet with flowmeter and humidifier attached. Two suction outlets with a regulator and pressure gauge and one-quart vacuum bottle, lavo duplex convenience outlets, an examination light and a call system for the patient's use in calling coronary care unit. It would be wise to provide additional empty conduits between the patients bedside and the nurses' desk for the installation of future equipment, much of which is currently in the development stage. Intravenous rods should be provided at each bed, suspended from a track or ceiling mounted hook.

Toilets should be equipped with bedpan flushing attachment, for cleaning bedpans and for disposing of fluids. Lavatory spouts should be mounted five inches above the floor rim and have knee, foot or wrist controls.

Bed lighting suitable for patient reading should be provided, and should be so designed as to not disturb other patients. Provision should be made for a small T.V. outlet or radio with earphones or pillow speaker.

The major movable equipment in the room includes variable height electric beds with Gatch springs and safety sides; bedside cabinet with compartments for bedpan, washbasin, emesis basin and other equipment necessary for the individual care of the patient, overbed table, and a locker for the patient's clothing if no closet is available.

Because there may be as many as five people attending a patient at times, it is desirable to limit the amount of furniture within the cubicles.[16]

Summary.-- Rooms should be large enough to provide adequate, uncluttered space around the bed for the equipment and the large number of personnel sometimes involved (approximately 5 depending on whether the Hospital is a Teaching Hospital) in the emergency care of the patient. Rooms of approximately 11 feet x 12 feet seem adequate, but a minimum area of 150 sq. ft. is better.

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[16]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965) p.5-6.

Each bed location should have the following:

1. Patient Monitoring.

2. Oxygen and suction outlets.

3. Ceiling support for intravenous administration and other equipment.

   This will reduce obstruction at the bedside.

4. Adequate lighting including an examination light and bed lighting suitable for patient reading designed not to disturb other patients.

5. Intercommunication signal and alarm systems between the patient and the nurses' desk.

6. A minimum of 8 electrical outlets.

7. Provision should be made for a small T.V. and radio, with earphones or pillow speakers. Often patients become disoriented after two or three days and the provision of a radio, clock and calendar have calmed their fears.

Dietary Practices.--On this question, the U.S. Public Health Service recommends:

> Mealtime for the coronary patient should provide enjoyment and a psychological lift as well as the all-important nutrients. Extra care in the preparation and service of the food will be beneficial in the patient's steady progress even though his activity may have to be restricted for several weeks.
>
> The Dietetic Department should be versatile in its service to provide for the special requirements of patients in the coronary care units. Some patients will be restricted to liquid diets and others will receive several small meals a day. Still others will receive regular meals. Therefore, it is most important that the dietitian visit patients in coronary care units and talk with the attending physicians daily to adapt the diet to the patient's progress.[17]

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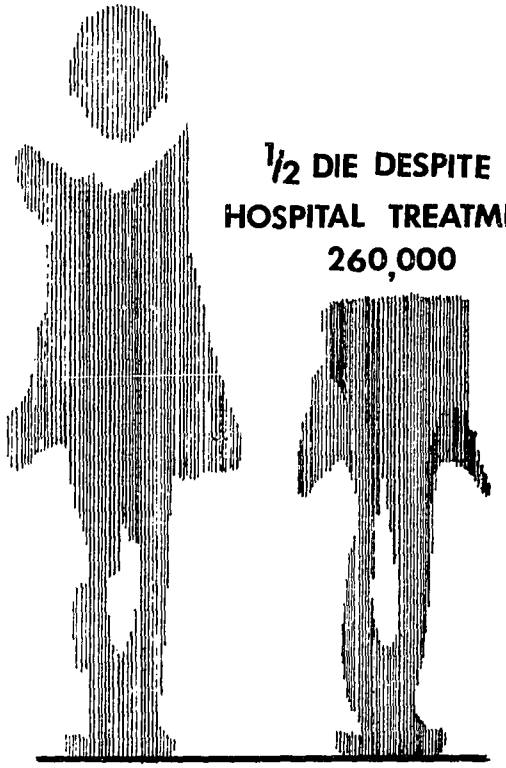
[17]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965) p.4.

CORONARY HEART DISEASE ATTACKS 2 MILLIONS OF THESE ONE OUT OF FOUR DIE

ANNUAL DEATHS
525,000



1/2 DIE DESPITE
HOSPITAL TREATMENT
260,000

OF THESE 80% DIE
IN THE HOSPITAL OF

- ARRHYTHMIAS
- SHOCK
- CONGESTIVE FAILURE
- OTHER CAUSES

THESE LETHAL COMPLICATIONS ARISE SUDDENLY

SURVIVAL IS DIRECTY RELATED TO PROMPT DIAGNOSIS AND IMMEDIATE VIGOROUS TREATMENT IN

CORONARY CARE UNITS

FIGURE I

Nursing & Medical Personnel.-- Dr. Thomas Lillip writing in "Hospital Topics" states:

> The Nurse plays a key role in the operation of the coronary care unit. Selection should be based on dedication, interest, motivation, initiative and demonstrated skill.
>
> Selection and training of personnel may be the most important decision in setting up a unit. There are two key people: the physician in charge and the head nurse. Training nurses is the single most important aspect of establishing a unit. The nurse is the only person present at all times. She can learn to read electrocardiograms, to recognize arryhthmias and to initiate treatment. In many units, registered nurses are actually defibrillating patients, a proper and necessary responsibility. Most nurses are better cardiographers than some second-year residents, simply because they see so many more tracings.[18]

In an article written by Drs. Eliot Corday and David Littauer, it is stated that:

> Persons responsible for such units suggest that the following personal attributes are important to considering selecting staff:
>
> 1. Desire to give bedside nursing care;
> 2. Ability to identify emotional needs of patients and develop possible solutions;
> 3. Attitude of inquiry and desire to learn;
> 4. Aptitude in acquiring new knowledge;
> 5. Ability to function purposefully in emergency situations;
> 6. Willingness to accept responsibility;
> 7. Desire to participate in research studies (if research is to be carried out in the unit).[19]

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[18]Thomas Lillip, III, M.D.' Assoc. Professor of Medicine, Cornell University, New York City, "Coronary Care Units improve Heart Patients' Survival Chances", Hospital Topics (June 1966). p. 144.

[19]Corday Eliot, M.D., and Littauer Davdd, M.D., "Guidelines For the Design and Operation of a Coronary Care Unit", Hospitals, J.A.H.A. (February 1, 1966) p.79.

Staff.-- The following is proposed by L. E. Meltzer:

> The most important part of the coronary care centre is the staff, which should not only be trained in routine nursing care but also in electrocardiography; in the use of the mo-- itor and resuscitative equipment, and in the principles of resuscitation. Several centres have already demonstrated that nurses can be trained to read the rapidly moving electrocardiographic pattern of the oscilloscope with proficiency.[20]

Unit Director.-- This unit should be organized under the direction of a cardiologist or an internist, who has the devotion, interest and time to coordinate the entire program. The Unit Director may be a full time or practicing staff member of the Hospital, who is responsible to a committee of practicing physicians.

A cardiologist should be selected by the staff to become Unit Director responsible either to the Chief of Staff or to a committee of practicing physicians.

The Director and this committee should set policies for admission, length of stay and methods of care and treatment in the unit. All final decisions concerning operational problems and procedures should be the responsibility of the Unit Director. Each physician should be allowed to write orders for his own patient, but if a sudden complication arises when the attending physician is absent, the full time staff should be authorized to attend the patient until the crisis is over.

Attending Physicians.--The attending physician is responsible for the basic treatment of his one patient in the coronary care unit. He will be helped by the Director and other team

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[20]Lawrence E. Meltzer, M.D.' Presbyterian University of Pennsylvania Medical Center, Philadelphia, Pa. at a symposium on Current Status of Intensive Coronary Care. Presented by the American College of Cardiology and Presbyterian University of Pennsylvania Medical Center in Philadelphia, Pennsylvania, 1966 (New York Charles Press 1966) p.31.

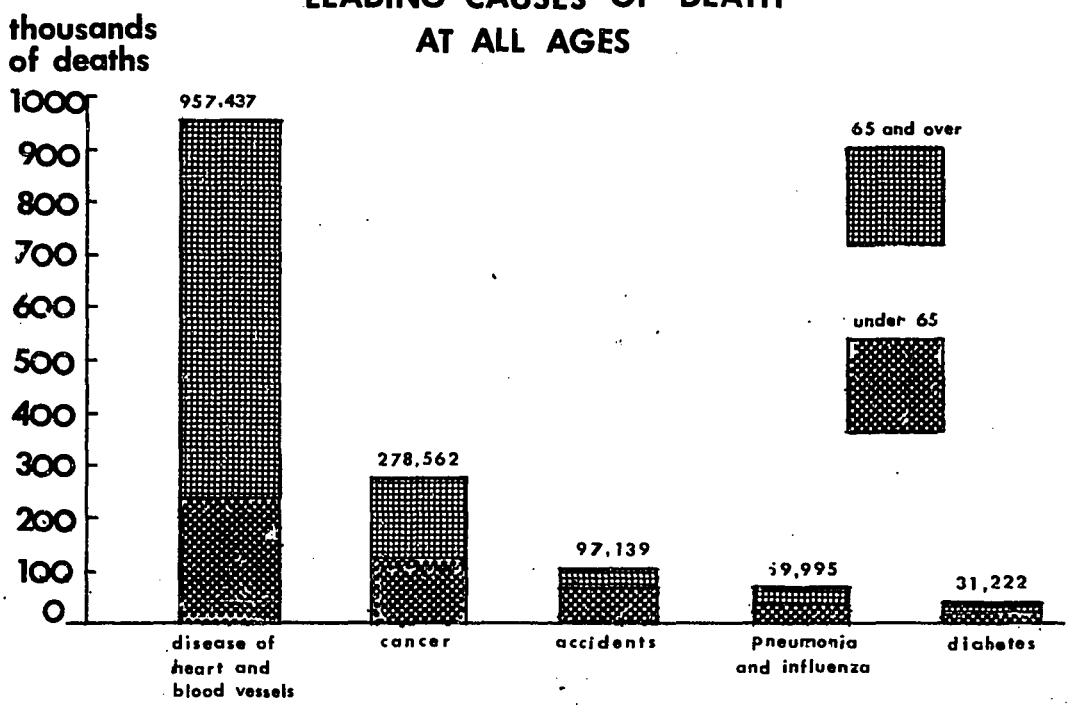

FIGURE II

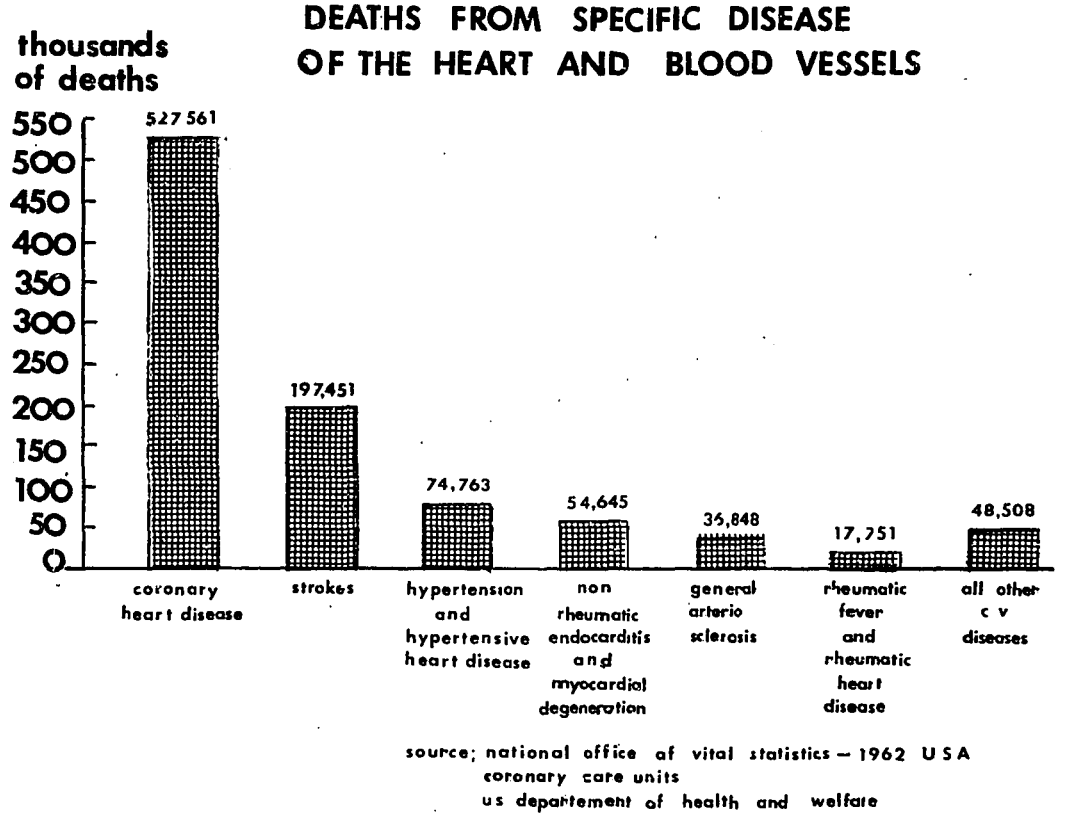

FIGURE III

members when cardiac emergencies arise. The responsibilities of the attending physician in relation to the unit will vary from one hospital to another, but should be set down in writing.

Training Program.-- The coronary care committee must organize and supervise an educational program for the resident physician, house staff, nurses and other paramedical personnel who are in attendance in the coronary care unit. These individuals must be drilled well ahead of time in coronary care procedures. When a cardiac arrest occurs, it is too late for them to learn where the equipment is standing and which way to turn dials. Everything must be handled with dispatch in a matter of seconds.

Resident House Officer.-- In an article written by Drs. Eliot Corday and David Littauer, it is stated that:

> House officers in training should relate through the unit for a specific period, but at least one House Officer or Staff Physician should be on call for emergency duty at all times. The House Officer must receive detailed instructions in the operation of the coronary care unit and must be acquainted with all the electronic equipment, such as the monitor, pacemaker and countershock, and should be trained in resuscitative techniques.[21]

Nurses.--On this question the U.S. Public Health Service recommends:

> Patients in this unit should be cared for by professional nurses because of the skill and judgment required. Some hospitals are using carefully selected licensed practical

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[21]Corday Eliot, M.D., and Li tauer David, M.D., "Guidelines For the Design and Operation of a Coronary Care Unit", Hospitals, J.A.H.A. (February 1, 1966) p.79.

> nurses to supplement the graduate staff. This proves satisfactory where close supervision is given. Nursing service administrators recommend a ratio of one nurse to two patients, and at night in larger units a 1 - 3 ratio has been used. At least two nursing personnel should be in the unit at all times, as cardiorespiratory resuscitation is much more effectively carried out by two people.[22]

The assignment of a head nurse and ward secretary for the coronary care unit will depend on the number of patients served, the need for supervision and the placement in the service of the hospital. Incoming calls should be screened at the floor nursing station.

In this connection Drs. Eliot Corday and David Littauer, have stated that:

> The hospital should allow special consideration for nurses in this unit, possibly including higher salary and opportunity for continued education.
>
> Experience shows that nurses will often spend their off-time hours training in coronary care techniques without expecting special remuneration.[23]

VISITORS.--Acute coronary patients need not be denied visitors. However, their number and the length of the stay should be kept at a level consistent with the patient's condition and the effective operation of the unit as a whole.

Many hospitals have found that the practice of admitting a few close family members for five minutes every hour is satisfactory.

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[22]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965). p.3.

[23]Corday Eliot, M.D., and Littauer David, M.D., "Guidelines For the Design and Operation of a Coronary Care Unit", Hospitals, J.A.H.A. (February 1, 1966). p.80.

Equipment

A. Electrical Requirements.-- Dr. Rosalie J. Silverberg of Bethesda Hospital speaking in Bethesda at the Second Bethesda Conference of the American College of Cardiology:

> Each room in the CCU should contain an absolute minimum of eight electrical outlets, to avoid total power loss in the event of equipment failure. Two independent electrical circuits, one on emergency power, with circuit breakers, should be available in each room.
>
> Three-ground wiring is mandatory for all electrical equipment in the unit. The third ground wire and the "hot line" ground should be of the same potential.
>
> A clock with a second sweephand can be mounted on the wall above the patient. This is connected to the monitor and starts as soon as cardiac arrest occurs and denotes the duration of the attack.
>
> The unit should be designed with conduits of adequate size to accommodate future needs for power lines not initially included in the present unit equipment.
>
> Dust and lint are the biggest enemies of electronic equipment.[24]

B. Monitoring.-- On the question of monitoring Dr. Silverberg continues:

> The Monitor contains amplifiers to transform the very weak electrical signals from the sensing devices into signals having sufficient strength to drive the indicating meters, the oscilloscope or chart recorder, and to permit the signals to be transmitted from the bed to the central monitor. The amplifiers and the meters and oscilloscope or chart recorder are contained in individual modules which plug into the monitor cabinet so that they are interchangeable for servicing and to permit alternative functions to be monitored.

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[24] Rosalie J. Silverberg, M.D., Bethesda Hospital, Second Bethesda Conference of the American College of Cardiology" American College of Cardiology. (December, 1965). p.6.

When the patient is to be moved to another location where monitoring is to be continued, the electrical connections between the patient and the junction box are left undisturbed.

Electrocardiograph recorders with magnetic tape or permanent recording are available. The latter seems to be the more satisfactory, providing a continuous visual record which is valuable for teaching, research, medical-legal proceedings and intermittent physician visits, as all deviations are available for examination.

Every unit should be equipped with both audio and visual alarm signals, installed in such a manner as to prevent inadvertant turn-off. The system will require modulations of tone and of audible signal volume, and must be so constructed that any of the unit staff is able at a moment's notice to determine the source of the alarm.

These monitoring units can be equipped with an external cardiac pacemaker which can be set to function automatically when the heart rate is disrupted.[25]

C. Defibrillators.-- On the question of the defibrillators Dr. Keith Averill of the Research Hospital, Kansas City speaking in Bethesda at the second Bethesda Conference of the American College of Cardiology:

The cardiac arrest is a major problem. Personnel must be prepared to defibrillate within 60 seconds. This speed is mandatory. The elderly patient cannot tolerate cardiac arrest for more than a few seconds and cannot survive three - four minutes. Immediate defibrillation must be emphasized. There must be two defibrillators per unit to allow for breakdown and repairs.

As to the type of apparatus, from experience in existing units, the most efficient is the D.C. Defibrillator.

Non-synchronized equipment is adequate for defibrillation.

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[25]Rosalie J. Silverberg, M.D.; Bethesda Hospital, Second Bethesda Conference of the American College of Cardiology" American College of Cardiology. (December, 1965). p.6.

> A device which applies the simplest shock is sufficient to deliver a satisfactory defibrillating pulse during the shortest period of time. Synchronization is recommended, however, for those devices that use electric termination of arrhythmias by electric shock.[26]

D. Respiratory Resuscitation Equipment.—Respiratory apparatus of various types should be available within the unit, as well as devices for intermittent positive pressure breathing and for facilitating mouth-to-mouth breathing.

An emergency cart, well stocked with drugs and appropriate instruments should be available for immediate utilization at the bedside. The emergency drug cart or tray must be checked at least once daily, preferably several times. Pacemaker - internal or external.

On the question of the pacemaker, Dr. Lawrence E. Meltzer, speaking at the same conference at Bethesda, states:

> Internal pacing is accomplished via intracardiac catheters or myocardial electrodes. External pacing is accomplished by holding electrodes on the chest manually or with a chest strap. In cases of ventriculator standstill, or systole, the electrical stimuli of the pacemaker are used to supplant, augment or restore the stimuli of the heart's intrinsic pacemaker and thus to reestablish adequate circulation of the blood.[27]

E. Mobile Units (Crash Carts).--Dr. Lawrence E. Meltzer, speaking at the same conference,on the question of mobile units:

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[26]Keith Averill, M.D., F.A.C.C., Director, Cardiovascular Section, Research Hospital, Kansas City, "Second Bethesda Conference of the American College of Cardiology". American College of Cardiology, (December, 1965). p.7.

[27]Lawrence E. Meltzer, M.D., Presbyterian University of Pennsylvania Medical Center, Philadelphia, Pa. "Second Bethesda Conference of the American College of Cardiology", American College of Cardiology (December, 1965). p.6-7.

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[27]Lawrence E. Meltzer, M.D., Presbyterian University of Pennsylvania Medical Center, Philadelphia, Pa. "Second Bethesda Conference of the American College of Cardiology" American College of Cardiology (December, 1965). p.6-7.

> As there has been an increase in the amount and complexity of the equipment used in the care and treatment of cardiac patients, a need was demonstrated for a practical, defibrillating, synchronizing and pacing, into an effective and reliable mobile unit. There are several reputable ones on the market which, in addition to the defibrillating, pacing and monitoring modules have ample drawer space for storage of emergency instruments, drugs, syringes, etc., as well as respiratory resuscitation equipment. Thus all necessary equipment, accessories and supplies are available at the physicians' immediate demand.[28]

F. Recommendations.--

a. It is unwise to establish a coronary unit until a group of nurses have been recruited and trained for this specialized type of nursing care. The nurse is the key to the whole program.

b. Nurses are capable of assuming charge of such units after adequate preparation. It is anticipated that hospitals, even those without "house staff", could nevertheless have coronary care units if they had "specialist" nurses.

c. Equipment, regardless of its elegance, is of much less importance than personnel, and should be the last consideration in establishing a unit.

d. Such units are expensive to operate (probably five nurses are needed for every two or three patients) but the costliness with reference to the saving of lives will prove to be worthwhile.

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[28]Lawrence E. Meltzer, M.D., Presbyterian University of Pennsylvania Medical Center, Philadelphia, Pa. "Second Bethesda Conference of the American College of Cardiology" American College of Cardiology (December, 1965). p.6-7.

The new 110-bed Institut de Cardiologie de Montreal (Montreal Heart Institute) is presently the most active cardiac centre in Canada. It was opened in January 1966. It has a 13-bed Surgical Intensive Care Unit, located adjacent to the operating theatres. Two small Coronary Care Units are planned for patient floors to be constructed in the near future.

During the first six months of 1967, 382 cardiovascular operations were performed and all of the patients involved passed through the Surgical Intensive Care Unit for periods ranging from three to seven days.

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[2]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965). p.1.

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[14]U.S. Department of Health, Education and Welfare, Public Health Service, A Facility Designed for Coronary Care, (Washington: U.S. Government Printing Office, 1965) p.6.

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[23]Corday Eliot, M.D., and Littauer David, M.D., "Guidelines For the Design and Operation of a Coronary Care Unit", Hospitals, J.A.H.A. (February 1, 1966) p.80.

[24]Rosalie J. Silverberg, M.D.; Bethesda Hospital, "Second Bethesda Conference of the American College of Cardiology" American College of Cardiology (December, 1965) p.6.

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[26]Keith Averill, M.D., F.A.C.C., Director, Cardiovascular Section, Research Hospital, Kansas City, "Second Bethesda Conference of the American College of Cardiology". American College of Cardiology (December, 1965) p.7.

[27]Lawrence E. Meltzer, M.D., Presbyterian University of Pennsylvania Medical Center, Philadelphia, Pa. "Seoond Bethesda Conference of the American College of Cardiology" American College of Cardiology (December, 1965) p.6-7.

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CHAPTER VI

INTENSIVE CARE UNIT

The Seventh Level of the General Hospital

General.--Many authorities believe that intensive patient care units are likely to become the most rapidly developing general hospital service in the next few years. The reasons, they think so are unpretentious and logical. It simply makes good sense to assemble into units specialized equipment and nursing personnel to help patients who require continuous skilled care.

> Five years ago, there were perhaps twenty-five hospitals in the United States with intensive care units, according to Public Health Service estimates. Now, a Public Health Service official states that more than 20% of all short-term community hospitals larger than 100 beds have them.[1]

Originally introduced in hospitals as a primary level of care in a concept known as progressive care, the intensive care unit has now won a solid place in the Canadian hospital scene in its own right.

In the U.S. Public Health Service Publication, the following is stated concerning the function of the unit:

> The function of this unit is to minister to the needs of the critically and seriously ill patients who are unable to communicate their needs or who require extensive nursing care and observation. These patients are under close observation of nurses who have been selected because of their special skills, training and experience. All necessary lifesaving emergency equipment, drugs and supplies are immediately available.[2]

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[1] "How to Provide the Best Intensive Patient Care", Modern Hospital, (January 1963) p.67

[2] A report based on findings of a Hill-Burton intramural research project (Washington: U.S. Government Printing Office 1963) p.13

Selection of Patients.--In "Hospital Administration in Canada" the following is stated by D. N. Teasdale, concerning the selection of patients for the Intensive Care Units.

> In general, the criteria for admission to an Intensive Care Unit is based on the needs of critically ill patients for nursing and medical care. This type of care will involve continuous observation and detailed treatment by highly trained personnel using specialized equipment. The basis for admission is, therefore, need for special care rather than establishing a particular diagnosis. Need is most often based upon the degree of acuteness, severity or complications of an illness, but many hospitals, because of their previous experience, have included a list of conditions for admission in their policy statements.
>
> Such a list might contain the following ten conditions:
>
> 1. Acute medical or surgical coma.
> 2. Acute and massive bleeding.
> 3. Severe electrolyte and metabolic derangement.
> 4. Acute poisonings.
> 5. Acute burn cases (if hospital does not have Isolation Ward).
> 6. Acute renal shutdown.
> 7. Acute pulmonary adema.
> 8. Emergency tracheotomy.
> 9. Complicated Cardiac conditions.
> 10. Pre and post operative patients who require intensive observation and treatment.[3]

The following is stated in the "Modern Hospital" (a survey from 106 Hospitals) in regard to admitting children to the intensive care units:

> About thirty-five hospitals with operating ICU's answered the question on the admission policies regarding children. Four said that all ages were admitted. Another said this would be an exception to policy. Five or six hospitals admit children over two years of age, three years or six years. The rest drew the line, in approximately even proportions, at 10, 12, 14 and 16 years of age.[4]

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[3]D. N. Teasdale, Public Hospitals Sections, Ontario Hospital Services Commission, "OHSC survey shows that an ICU is essential to good patient care", Hospital Administration in Canada, (May 1963) p.25.

[4]"A Mosaic of ICU experience in Canada", Hospital Administration in Canada, (August, 1966). p.55.

The value of the intensive care unit could be enhanced, both for the patient and the physician, if arrangements could be made to permit direct admission of emergency patients to the unit. The physician should be able to call the head nurse of the unit without going through the Admitting Office, be assured that a bed is available, give emergency orders, and know that things will be in readiness for the patient on arrival and just where the patient will be located. The saving of time between the physician's call and the actual beginning of treatment in the hospital bed may be the difference between life and death to the critically ill patient.

Length of Stay.— In "Hospital Administration in Canada", the following is stated concerning the length of stay in the ICU:

> The average length of stay varies from about four or five days in the smaller and medium sized hospitals to about 5.3 days in our larger hospital. It varies from eight days in two medium sized hospitals to as low as one day in annother. In about 80% of the hospitals of the 200 to 499 beds size, however, the average length of stay is between 3.5 and 6 days.
>
> The largest group of hospitals, on the other hand, reports an average of 13.68 hours of nursing care per patient day. Most of these are teaching hospitals, and one would expect the cases could be more complex on the average, requiring both longer stay and more hours of care per patient day.
>
> Nevertheless, there are also wide fluctuations here; from a low of five hours to a high of 14.1 hours per patient day in the medium sized hospitals. The range in the 500-bed and over category is from a low of five to high of 20 hours per patient day. The latter was reported by a large children's hospital although two or three general hospitals were quite close to this figure.[5]

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[5]"Reveals growing popularity of ICU's in our hospitals", Hospital Administration in Canada, (August, 1966). p.29

Location and Size of ICU.—It is advantageous to have the intensive care unit as close as possible to the emergency entrances and to the coronary care unit (to share facilities) and the transportation system, without losing quietude and other necessary aspects.

A location which allows for a flexible zone in which an overflow of intensive care patients may be cared for in intermediate care facilities and certainly accommodation for the less critically ill patients, who no longer require 24 hour observation and nursing care, but should still be easily accessible to a receiving emergency entrance. The movement of patients into this zone results in making more beds available to accommodate those requiring emergency intensive care.

Rated bed capacity	No. of IC beds	% of IC beds	% occupancy of ICU
1043	16	1.5	62
936	7	0.7	-
638	30	4.7	-
608	14	2.3	75-80
600	10	1.7	77-89
598	15	2.5	40-50
495	8	1.6	79
381	13	3.4	38
381	11	2.9	-
340	14	4.1	-
328	6	1.8	50
309	6	1.9	-
228	13	5.7	26-35
173	7	4.0	64

TABLE I.-- Statistical data related to ICU's in selected general hospitals.[6]

[6]D. N. Teasdale, Public Hospitals Sections, Ontario Hospital Services Commission, "OHSC survey shows that an ICU is essential to good patient care", Hospital Administration in Canada, (May 1963), p.25.

Hospital size	No. of hospitals with ICU	No. Hosp. more than one ICU	Total no. ICU's	Average size of hospital	% of ICU beds	Average length ICU stay	Hours nursing care in ICU per patient day	Totals	Years of experience with ICU
100-199 beds	11	0	11	155	3.76	4.50	8.95	10.25	.75
200-499 beds	35	7	42	321	2.03	4.45	8.86	9.95	3.23
500 and over	19	9	28	734	2.02	5.31	11.2	13.68	4.55

DESIGN FEATURES					FUTURE PLANS				
New wing or hosp.	renovated	Air-conditioning Fully	partly	not	No. of Hosps.	No. of ICU's	Av. size of hosp.	Av. size of ICU	Percent ICU beds
4	6	3	2	5	13	13	84	4.4	5.24
12	23	18	10	7	18	19	231	7.8	3.39
12	11	13	4	6	35	41	374	8.1	2.55
					13	19	848	12.4	2.19

TABLE 2.--Statistical summary of intensive patient care facilities in Canadian Hospitals.[7]

[7] "Statistical summary of intensive patient care facilities in Canadian Hospitals", Hospital Administration in Canada, (August 1966), p.29.

Physical Design

A. General.-- The basic conception of intensive care suggests an open plan (which permits within limits, surrounding the nurse's station with bed areas) for three very important reasons:

a. Visual observation;

b. Direct and unencumbered access to any patient's bed; and

c. Economy in space as the bed centres can be closer due to shared space between in case of emergencies.

The objective must be to satisfy all basic planning requirements and to avoid as many negative aspects as possible. It appears that the enclosed room concept has proven to be too restrictive and the completely open plan is too open. The suitable compromise appears to be glazed partitions between patients with open sides. Such planning offers privacy, reduced noise levels and ready accessibility.

Noise is disturbing to patients who are seriously ill, as their senses are usually at an acute level, and thus every effort should be made to keep the noise level low by location of the unit, by its actual planning and by its finishes.

The patient service console should also include electrical convenience outlets, with enough of these outlets having a proper voltage to allow use of any needed equipment without overloading.

Anthony J. J. Rourke states in regard to the electrical requirements:

> Two 20 amp. circuits should be provided so that two duplex outlets per bed are possible, with one circuit each. Some equipment, such as a hypothermia unit, alone will require 20 amperes. In addition a second source of current from an emergency generator should be available in the event of a power failure of the primary source.[8]

In addition to the beds in the ICU, an adjoining flexible zone is advisable, to provide for the overflow of critically ill patients who no longer require round-the-clock observation and care. The movement of patients into this zone results in making more beds available to accommodate emergency intensive care patients.

Intercommunication system must be provided between the nurses station and patient. In addition a communication system must be provided between the nursing station and appropriate physicians and other personnel who must assist in treatment and/or resuscitation.

A communication system with the kitchen is desirable as the unit caters for service ranging from regular diets to tube feedings.

ICU should be air conditioned, which will provide controlled temperature, humidity, air movement and air purity throughout the year. A temperature of 75 degrees F. and a relative humidity of 40% is most desirable.

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[8]Anthony J. J. Rourke, M.D., and others, "Details are Critical in ICV Design", Hospitals, J.A.H.A., (May, 1966) p.83

A minimum ventilation rate of three room volumes of air per hour with no recirculation should be provided here - The intensive care rooms should be maintained at a positive air pressure relative to the air pressure of the corridor to prevent infiltration of contaminated air, and to permit variations in temperature and humidity within the individual glazed cubicles, which will be required from time to time for the treatment of different clinical conditions, individual temperature and humidity controls should be provided for each cubicle.

B. Work Area

1. Nurses Station.-- Beds should be so located that the nurses can view all patients from the work area as well as from the central monitoring station. The arrangement should include desks, counters, chart racks and chairs for nurses. A crash cart with emergency supplies and drugs, respirators, resuscitators and defibrillators and pacemaker should be kept convenient to the nurses' desk for use in emergency.

A medication preparation center should be adjacent to the nursing station. A nourishment preparation center should be located adjacent to the nursing station as well.

2, Supervisor's Office.-- The Head Nurse must have her own office with an adequate intercommunication system between that and the nursing station desk -

Calls for or from physicians or relatives are taken at the phone in her office and only essential messages are relayed to the patient area.

3. Clean supply.--This should contain a counter and a sink. Ideally, this area should have direct access to a main corridor to minimize traffic and noise within the Intensive Care Unit.

4. Soiled Holding.--This should contain a counter and a sink. A clinical sink, a two compartment sink with a double drainboard and a dome light and buzzer are recommended. No sterilizing should be done in this unit, which is provided only for the cleanup of equipment and disposal of waste materials. Janitor's closet should be provided for this unit.

5. Nurses' Lockers and Rest Room.--A location within the unit will reduce the amount of time the nurses have to be away from their patients. The room should have enough lockers to take care of personnel needs for three shifts. This rest area should provide easy chairs, lamps, tables, and a vanity bench and table. A toilet room with handwashing facilities is essential. A dome light and buzzer should be provided.

6. Storage.--A storage room is needed in the Intensive Care Unit for bulky equipment which must be available for immediate use. Examples include resuscitating equipment, EKG apparatus and Stryker frames. The requirements for shelving and hooks need to be determined.

Storage is required for the personal belongings of each patient and in a larger unit, this could be planned as part of the storage room.

7. Sleeping room.--A sleeping room for an intern, or a member of the medical staff, should be provided on the periphery of the unit, so that medical assistance will be available at all times when required.

8. Consultation Office.--A room is required for the use of the medical staff and should be furnished with a desk, several chairs and other necessary furniture. A dome light and buzzer should also be installed.

This room serves a definite purpose for private conversations between the physician and the relatives of the patients.

9. Relatives Waiting Area.--A waiting area in the ICU permits relatives to be physically near the patients without interfering with treatment. Furnishings, patterned after the typical waiting room should include sofas, easy chairs, lamps and tables. Toilet facilities should be provided. A booth telephone for privacy should also be nearby.

C. Patient Room.--The actual size allowed within each cubicle is a matter for discussion. Figures quoted in articles range from 11 foot to 13 foot centres. Each bed location should have oxygen and suction outlets, intercommunication signal and alarm systems between the patient and the nurses desk. Adequate lighting for examination and bed lighting designed not to disturb other patients and conduit for monitoring system are all necessities.

On the question of choosing a bed to be used in the recovery or in ICU, Dr. K. E. Hanzen says:

> 1. Must be comfortable enough to allow a person to occupy it for three or more days.
> 2. Must have a high degree of mobility.
> 3. Must be small enough so that space utilization can be optimized.
> 4. Must contain all the features of a regular hospital bed (high, low and all positions).
> 5. Extension of side rails and frame to increase mattress width to 32".
> 6. Addition of storage compartment on underside of bed frame for patient's clothes and personal possessions.
> 7. Addition of chart holder at foot of bed.
> 8. Addition of laminated plastic head and foot boards to improve esthetic appearance.[9]

Shelving for equipment storage should be provided behind the beds. The beds must be so arranged that in an emergency the anesthetist can work at the head of the bed with all his required equipment.

Anthony J. Rourke, M.D. in regard to the question of toilet facilities states:

> The need for, and placement of, toilet facilities are subjects of controversy. It is frequently maintained that the intensive care patient is too ill to use such facilities and that it is, therefore, unnecessary. Although this is true for most patients, a few may have bathroom privileges throughout their stay in the ICU, and many more may have them during the final day or two before transfer to another unit. Therefore, unless the hospital policy dictates retention of bedfast patients only, planning to include toilets in the Intensive Care Unit is worthwhile. They provide the added advantage to the nurse of a readily accessible bed pan flushing facility which, if properly fitted, reduces steps to the soiled utility area and lessens the chance of cross-contamination throughout the unit.[10]

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[9]K. E. Hanzen, M.D., Administrator of the Jewish Hospital of St. Louis, "How Intensive Care Beds were Selected", Modern Hospital, (January 1963). p.81.

[10]Anthony J. J. Rourke, M.D., and others, "Details Are Critical in ICU Design", Hospitals, J.A.H.A.,(May, 1966). p.63.

Dietary Practices.--The dietitian and her department should be available to serve dietary requests from the Intensive Care Unit at all times. Although the dietary needs of critically ill patients are not significantly different from other critically ill patients scattered throughout the hospital, their concentration in one unit provides an opportunity for the dietitian to give special attention to their needs.

This unit does not lend itself to routine dietary service because of constant needs and demands of the patients. Therefore, the dietitian must plan for this service on an "on-call" basis.

Nursing and Medical Personnel.--In the U.S. Public Health Service Publication on this matter there is the following:

> Personnel for this unit should be carefully selected for their technical skill in handling complicated equipment and in carrying out procedures; ability to make accurate observations on the patient's condition and to interpret these correctly in terms of the need to notify the physician or the institution of emergency procedures; ability to work effectively under pressure in emergency situations; the type of personality which is not bothered or rendered insensitive by caring for a continuing succession of seriously ill patients. Since patients are grouped on this Unit regardless of the diagnosis, the nurse should be well prepared with respect to the special care of a wide variety of post operative cases, as well as medical, pediatric and psychiatric nursing problems presented by patients. This may require supplementary instruction to familiarize the nursing staff with special signs to look for in caring for unusual types of patients, and with new or highly specialized procedures or equipment to be used on the Unit.[11]

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[11]U.S. Department of Health, Education and Welfare, Public Health Service, Elements of Progressive Patient Care, (Washington: U.S. Government Printing Office (February, 1959). p.4.

Policy and Control in the Unit.--The ICU will be under the direction and direct control of the Chief of Surgery or the Chief of Medicine, or their deputies. Policies concerning the Intensive Care Unit will be decided upon from time to time by special committee of the Hospital Medical Conference Committee. This Committee should consist of:

1. The Chief of Surgery or his deputy.
2. The Chief of Medicine, or his deputies.
3. The Director of Nursing.
4. The Superintendent of the hospital, or his deputy.
5. Another clinical representative from the Medical Conference Committee.
6. Other consultants as may from time to time be needed.

The Head Nurse is responsible for the nursing of the patients within the Unit. The techniques and equipment used are also her responsibility. She should be empowered to refuse admission to any physician, surgeon or intern, or to any visitor who fails to comply with approved policy or technique.

Each physician writes orders for his own patient, but if a sudden complication arises when the attending physician is absent, the full time staff should be authorized to attend the patient until the crisis is over.

Resident House Officer.--At least one house officer or staff physician trained in resuscitative techniques should be on call for emergency duty at all times.

Training.--The ICU Committee must organize and supervise an educational program for the resident physician house staff, nurses and other paramedical personnel who are in attendance in the ICU.

Nursing.--In the U.S. Health Service Publication in regard to the above the following is stated:

> The team concept of nursing used in many hospitals works well in an Intensive Care Unit, using professional nurses, practical nurses, nursing aides and others. The staffing pattern will depend on the type of patients being cared for, and the amount of nursing care required. A unit taking care of open-heart surgery or neurosurgery patients may require one nurse for each such patient per shift, but the run of patients in the usual general hospital may be cared for by one professional nurse and one practical nurse or nursing aide per unit of five or six patients per shift. This team should be under the direction of a head nurse. If the Intensive Care Unit is a segment of a nursing unit as might be the case in a small hospital, the team should be under the direction of the Head Nurse of that Unit.
>
> In considering the level of staffing required, it should be borne in mind first, that special duty nurses should not be required on the ICU and second, that the unit will be taking a large amount of the load in nursing hours from the intermediate care unit so that the latter will need relatively less staff than the usual general hospital, medical, surgical or pediatric nursing unit.[12]

Regarding personnel for each shift in the ICU, the Administrator of the Battle Creek Hospital suggested:

> 7:00 A.M. to 3:00 P.M.
>
> Head Nurse
> Two registered nurses
> Two licensed practical nurses
> Ward Clerk

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[12]U.S. Department of Health, Education and Welfare, Public Health Service, Elements of Progressive Patient Care, (Washington: U.S. Government Printing Office,(February 1959). p.4-5.

3:00 P.M. to 11:00 P.M.

Two registered Nurses
Two licensed practical nurses

11:00 P.M. to 7:00 A.M.

One registered nurse
Three licensed practical nurses[13]

In existing units a general staffing pattern is of a minimum of one nurse per three patients per shift, but then registered nurses should make up 70-80% of this number.

Special Routines and Forms.--Special routines may be established to save the trouble of the physician when ordering and the nurse when recording the order for procedures that are needed with nearly every patient who requires the services of the unit.

Equipment.--An ever expanding range of complex and sophisticated electronic equipment is being introduced to the medical field, much of it being designed for use in treating patients requiring intensive care during hospitalization.

"Hospital Administration in Canada" carried out a survey of Intensive Care Units in Canadian Hospitals of over 200 beds and the following figures were published in the August, 1967 issue.

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[13]"The Planning and Operation of an ICU", W.K. Kellog Foundation Battle Creek, Michigan, 1961, p.27.

Electronic Equipment Reported by Hospitals over 500 beds.

INFORMATION REQUESTED	500 or more ACTIVE TREATMENT BEDS Average per Hospital	No. of Hospitals Reporting
No. of active treatment beds	737	17
No. of ICU beds	15.8	17
No. of ICU beds assigned to cardiac patients	6.2	12
Is cardiac unit separate from ICU facilities	8	12
No. of ICU beds equipped for remote monitoring	11.3	11
TYPE OF EQUIPMENT		
ECG monitor	8.3	17
Heart Rate monitor	8.9	14
Pulse Rate monitor	7.1	10
Defibrillator	3.2	17
Pacemaker	4.3	17
Respirators	10.2	17
Hypothermia unit	1.7	12 [14]

A. Electrical Equipment.--Each room in the ICU should contain an absolute minimum of eight electrical outlets, to avoid total power loss in the event of equipment failure. Two independent circuits, one on emergency power, with circuit breakers, should be available in each room.

Three-ground wiring is mandatory for all electrical equipment in the unit. The third ground wire and the "hot line" ground should be of the same potential.

A clock with a second sweephand can be mounted on the wall above the patient. This is connected to the monitor and starts as soon as the cardiac arrest occurs and denotes the duration of the attack.

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[14] "Survey of ICU's in Canadian Hospitals of over 200 beds." Hospital Administration in Canada (August 1967), p.22.

The unit should be designed with conduits of adequate size to accommodate future needs for power lines not initially included in the present unit equipment.

Dust and lint are the biggest enemies of electronic equipment.

B. Monitoring.--The main value of electronic monitoring is that data on the physiological state of the patient is immediately and continuously available to the attending nurse and doctor, and it remains available even when the staff is completely occupied with other tasks.

George Heggie, Chief of Medical Equipment Division of the J. F. Hartz Company said:

> The need for electronic patient monitoring equipment varies with the application within the Hospital. The need is imperative in cardiovascular surgery and usually 5 to 10 parameters are monitored in other surgical theatres. The need reduces proportionately for the less complicated procedures. The highest level of medical and nursing care in the ICU and the post-operative recovery room is not possible without electronic patient monitoring. While electrocardiographic monitoring is currently most widely practised, easiest and probably most useful and reliable, the gradual improvement in monitors for the variables is increasing the scope and value of patient monitoring.
>
> The problems involved in developing a satisfactory monitoring system are both engineering and biological. On the engineering side, perhaps the most difficult is in the field of transducer design, i.e., conversion of pressure to electrical energy, wherepatient compatability, comfort, reliability and freedom from antifacts are prerequisites. The psychological implications for the patient, when he is hooked up to a formidable array of apparatus also requires consideration.[15]

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[15]George Heggie, Chief of Medical Equipment Division of the J. F. Hartz Company Limited - Toronto Surgical and Medical Supplies (November 1967) p.4.

The following description of patient monitoring is an extract from "Hospital Administration in Canada", August, 1967, as reported by an 800 bed teaching hospital on the Prairies. Based on lengthy experience with monitoring and other equipment of this type, they quote as follows:

a. Blood pressure monitors: An electrical transducer connected to an intra-arterial catheter is best for patients with blood pressure below 80 millimeters mercury. The equipment requires frequent attention from highly skilled nursing personnel to maintain the catheter patent with Heparinized Saline and to maintain calibration. Minor and major complications in seriously ill patients are frequent. We have had two patients in the last six months with bronchial artery occlusion following intra-arterial catheters.

b. Venous pressure: We have used electrical transducers connected to a central venous catheter to continuously record central venous pressure. Major disadvantage of this system is that the patient must be properly positioned with a transducer at the right arterial level before the pressure measurements are meaningful. This is therefore an intermittent measurement and our conclusion is that in most cases a simple Saline manometer is superior to the electrical method of recording venous pressure. at least until catheter tip transducers are generally available.

c. Temperature monitors: For our temperature monitors the thermister rectal temperature probe has proved extremely useful, particularly in unconscious patients.

d. Respiration rate monitors: Two respiration rate monitors with high-low alarms have been in use for eight months. Respiration is measured between two EKG type electrodes by transthoracic impedence. The units have worked well particularly with unconscious patients. In conscious patients artifacts are produced due to muscle movement. When combined EKG and respiration rate are recorded through one set of electrodes, the EKG and respiration rate are recorded, but the EKG may be a poor quality because of the necessity of placing the electrodes on the lateral chest wall, on the left and right, to obtain good respiration rate recording.

e. EEG monitoring is useful only in unconscious patients. The high amplification necessary produces large amounts of muscle artifact in conscious patients.

f. Respirators: Over the past five years we have used six different types of respirators. Although more expensive, the constant volume respirator has proved much more reliable despite an increase in the complexity of the controls.

g. Hypothermia units: We have had a poor experience with one particular type of unit employing plastic blankets due to (1) stiffening of the blanket when used in the colling mode, and (2) the constant occurrance of leaks at the seams of the plastic blankets.[16]

C. Treatment Equipment.--The Intensive Care Unit requires a "Crash Cart" which has respiratory resuscitation equipment, defibrillation, pacemaker, ECG monitors, synchronizers, ample drawer space for storage of emergency instruments, drugs, syringes and all necessary equipment and supplies for emergencies.

An adequate storage area is of vital importance to the efficient functioning of the Intensive Care Unit.

Staff Training and Maintenance.--"Hospital Administration in Canada" carried out a survey of ICU Units in Canada and the following is published in the August, 1967 issue:

> A large proportion of the hospitals surveyed reported that they were experiencing major problems in recruiting personnel to operate their equipment, but indicated "no problems" in training staff to handle this function. This would imply that many hospitals are attempting to recruit personnel who have already received special training in the operation of electronic equipment for intensive care.

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[16] "Survey of ICU's in Canadian Hospitals of over 200 beds", Hospital Administration in Canada .(August 1967) p.23

> If this is the case, most of the time and energy they are putting into recruitment efforts will be wasted because this type of training is not generally available. In fact, the lack of formal educational training programs in the field of medical electronics, appears to be one of the major problems. As one hospital expressed it: "The reason this is a major problem area is that at the present time, no centralized facilities are available for the overall responsibility of organizing, coordinating and teaching of a program."
>
> The returns indicated that a majority of the personnel now working with electronic equipment received their training in courses conducted by the suppliers.
>
> Some hospitals reported that they are conducting inservice educational programs. Typical of these is the inservice program described by a B.C. hospital (547 beds): "We have set up an informal training program in our ICU for the nurses. It consists of a two-week orientation program, an inservice program with lectures once a week by various doctors and incidental teaching by interns and residents at ward rounds and team conferences. Other hospitals send nurses to our unit for observation and training courses in preparation for work in their own ICUs.
>
> We are presently working on a post-basic formal program leading to a diploma in intensive and coronary care nursing."[17]

One hospital, 966 beds, reported that it is currently offering a one year course in intensive care nursing designed to accommodate 30 students. Two small hospitals had solved their problems of training staff by making arrangements with larger centres to send nurses to spend a week or longer in the intensive care unit at the larger hospital.

The fact that training programs are not generally available constituted the deciding vote against purchasing equipment for four small hospitals.

Rather than relying on supplier service, several large

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[17] "Survey of ICU's in Canadian Hospitals of over 200 beds." Hospital Administration in Canada (August 1967) p.26

hospitals have met the need by training a staff electrician to develop the required specialized skill. As a result, the hospitals have been able to organize an active prevention and trouble maintenance and equipment breakdowns are kept to a minimum. However, this is expensive training and only a limited number of large hospitals are able to tackle the maintenance problem from within.

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[16]"Survey of ICU's in Canadian Hospitals of over 200 beds", Hospital Administration in Canada (August, 1967) p.23

[17]"Survey of ICU's in Canadian Hospitals of over 200 beds", Hospital Administration in Canada (August, 1967) p.26.

CHAPTER VII

BURNS UNIT

The Twelfth Level of the General Hospital

General.--Each year in the U.S. alone more than 8000 persons die from burns, and approximately 300,000 are hospitalized. Forty percent of these victims are children under ten years of age. Many are crippled and scarred for life.

A severe burn is not only an injury it is also a severe illness. The charred tissues create changes involving chemistry, proteins and an unusual susceptibility to infection. When a patient is burned, the efficiency of many other organs of his body is disturbed. The care of these patients requires intensive care from nurses, physicians and other attendants.

In burn patients in particular, emotional aspects can be as important as physiological factors. Early involvement in a rehabilitation program and often psychiatric consultations are indicated. While modern facilities help greatly in the care of burns, co-ordinated team effort of experienced medical and para-medical personnel alone can assure success.

Selection of Patient.--This unit will be used for the initial treatment of very serious burns cases, such burns are estimated at more than 40% of the body area.

On the question of length of stay, Dr. Gerald Brown O'Connor, chairman of the plastic surgery committee of the

Plastic and Reconstructive Surgery Center said:

> In one emergency following a fire at a church benefit early in 1964, in Denver, seven burned patients were admitted to the center for treatment, one transferred from another hospital. The burn center ward could not accommodate all these patients, so another ward on the floor was made ready. Two of the patients with second or third degree burns covering 60 percent or more of the body, died. The remaining five patients were treated from two to more than 60 days, with a total of 18 skin graft operations and more than 50 transfusions.[1]

The average stay in the unit is 13 days depending upon the burns degree, 2nd and 3rd degree burns covering 40 - 60% or more of the body, for the average stay in the unit is 6 - 8 weeks.

Location of the unit.—The burn unit should be located away from the general flow of the hospital traffic. If the unit hasn't its own operating room, it should be located close to the operating rooms and as close as possible to intensive care and recovery units.

Physical Design. — The architects should take special care to reduce the risk of cross infection to an absolute minimum in the design of this unit. The wards, treatment and operating areas of the unit should be contained in a sterile zone, entered only through air locks, and there should be no direct access to this zone from the public section of the floor. Supervision should be provided at the entrance to each single bed unit, and the burns unit door must be opened only from the inside.

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[1]Gerald Brown O'Connor, M.D., Chairman of the Plastic and Reconstructive Surgery Center, San Francisco. "How One Hospital Planned Its Burn Center." Modern Hospital, (January, 1965) p.77.

Visitors should have a separate visitors' corridor, fully isolated and without access to the main body of the burns unit; it should run around the perimeter of the single bed rooms, windows looking into each. The only access to this corridor should be through a separate visitors' entrance and the only contact between the visitors' reception and waiting area and the main body of the hospital should be by the hospital's internal communication system.

Because of the nature of their injuries, every patient in the burns unit will be classified as an "emergency", the immediate identification of each individual patient's condition and requirements, and the subsequent direction of the nursing and medical staff, are of the utmost importance.

Communication.--Call and direct speech communication facilities should be provided between the central nurses' station and each individual single bedroom, the treatment and operating theatre. The system should make provision of a nurse communications and signalling system throughout the burns unit areas which should be fully integrated with the patient call system and controlled from the nurses' station. This facility is of particular value when a patient requires immediate nursing assistance, since the operator at the nurses' station can locate and direct the nearest available nurse to the patient to deal with the call. At the same time, she can be advised of the patient's needs and this enables the nurse to collect whatever equipment she may require on her way to answer the call.

The unit should have a special patient visitor communications system between the isolation rooms and the visitors' corridor. Suitable telephone handsets should be provided in the visitor's corridor, immediately outside the window to every room and connected to a separate speaker microphone unit above the window inside the room. This arrangement enables a visitor and a patient to carry on a normal two way conversation in full view of each other but in complete isolation. The system does not interfere in any way with the general hospital communications system, since it is on a different circuit and uses separate speaker-microphone units.

A communication panel should be provided at each patient's bedside table and in addition to a call button, it should incorporate radio program and T.V. selector buttons and sockets for a remote hand hold call button and acoustic earphone.

Air conditioning and ventilation.--On question of the Air conditioning and ventilation, R.A.J. Krizanc building coordinator for the building program of the Scarborough General Hospital, Toronto, Ontario said:

> Basically, the system consists of a console with a series of pre-filters, after-filters and activated carbon filters which remove dust and organisms of greater than one micron-size, and an ultra-violet tube. The turbulent flow of air forces the micro-organisms into the ultraviolet high intensity field and kills them. Using room air, the Robins unit sterilizes it and its carbon filter deodorizers it. Through the plenum ceiling it supplies an even stream of asceptic air at the rate of 70 c.f.m. in downward fashion pushing any

micro-organisms which are air borne to the floor level. Dust particles on the floor are prevented from drifting upward. The contaminated air at the floor is then recirculated through the unit.

With proper nursing technique, the patient's environment can be kept close to sterile - if the patient is not disturbed for 10 minutes, the air reached 99.9 percent sterility.[2]

The air supply ducts to the patients' rooms must include special dampering so that the rooms can be maintained under positive or negative pressure with respect to their adjacent areas. During normal use, the rooms will be under positive pressure to insure exfiltration of room air to minimize contaminating the patient, but the air supplied can be automatically adjusted to place the room under negative pressure, limiting spread of air-borne bacteria. This is accomplished by a manually controlled switch at the door. This switch will close an orifice damper in the supply duct to restrict air flow into the room. The switch also turns on a pilot light above the door to indicate that the room is occupied by a contaminated patient, and energizes a microswitch installed in the door jamb.

Each singl bedroom receives 24 air changes an hour and has individual control of temperature and humidity.

Work area.—It is easier to work and to treat the patient if the treatment room and dressing room are combined.

The tub should be free standing and have adequate space around it for four to six people to assist the patient in and out of the tub and to work with him.

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[2]R.A.U.Krizanc, Building Coordinator for the building program at the Scarborough General Hospital, Toronto, Ontario. "New Burns Unit Heightens Sterile Techniques". Canadian Hospital, (October, 1967) p.64.

The tub should be approximately 7 ft. long 3 ft. wide and 28 - 30 inches off the floor with temperature regulator, hand rails (bi-lateral), attachment for head halter, shower attachment with long hose, water agitator, and slipping protection.

On the question of what happens in the treatment room, Mr. Krizane, Building coordinator for the building program at the Scarborough General Hospital, Toronto, Ontario said:

> The patient is wheeled in on a stretcher on the "dirty" side of the bath. Here the major part of the dressings are removed. The patient is then put on a litter and with the aid of the overhead hoist, lowered into the bath. After soaking the remaining dressings are removed, loose dead tissue and debris cleaned off, the patient is hoisted onto a stretcher covered with sterile linen, the burn area dressed and, when indicated, temporary homographs are applied to speed up healing. The patient is then returned to his room.
>
> The "dirty" side of the burn bath contains a large utility sink, a hamper with plastic bag into which dressings and tissues are put, and a built-in cupboard for non-sterile supplies. The bath itself consists of a rectangular tub 84 inches long, 40 inches wide and 20 inches deep with a thermostatic mixing valve, a turbine agitator and two thermostatically controlled electric heaters which keep the solution in the bath at a pre-set temperature, usually 100 degrees F.
>
> At the head of the bath oxygen and suction are piped into the wall and space is provided for an anaesthetist to administer the anaesthetic. The "clean" side has a built-in cupboard for sterile linen, a scrub sink, a SS dressing table and two stools, in addition there is a chart desk, a work counter with supply cupboard above and a skin bank refrigerator.[3]

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[3]R.A.U.Krizanc, Building Coordinator for the building program of the Scarborough General Hospital, Toronto, Ontario. "New Burns Unit Heightens Sterile Techniques". Canadian Hospital, (October 1967) p.64.

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[3]R.A.U.Krizanc, Building Coordinator for the building program of the Scarborough General Hospital, Toronto, Ontario. "New Burns Unit Heightens Sterile Techniques". Canadian Hospital, (October 1967) p.64.

Procedures have to be carefully devised to prevent cross-infection. The floor and the walls must be easily cleaned. The air in the burn bath must be filtered and should provide 18 air changes per hour.

Staff access to the dressing area is by a foot-operated electronic door from the scrub-up.

Private room entry is via an individual nurse gowning room with a utility area for the patient's toilet and nursing requisites.

The operating room is kept under the highest pressure to prevent infection, and there is pressure in the corridor between the wards and other areas also to prevent contamination. The effect of differing pressures on cross infection can be determined by varying the pressure in areas of the unit.

On the question of the linen, Nurses of the Barnes Hospital, St. Louis, U.S., Nurses Maxwell, Linss, Mcdonough and Kinder have reported in "The American Journal of Nursing":

> The linen should be kept and laundered separately. We find it less unsightly to dye our linen a deep chocolate brown. This, of course, helps to keep it separate and eliminates the need for bleaching. Bleaching to remove silver nitrate stains decreases the useful life of a material from 300 wash cycles to only six. When bleaching is necessary, our laundry uses Speedex bleach.
>
> The personnel in our unit wear dyed scrub-gowns and old shoes. The nursing school caps, pins and other emblems of the professional nurse are not worn in the unit as they would soon be ruined. The personnel wear rubber gloves whenever they are in contact with silver nitrate, but for accidental staining despite this, skin, undergarments and stockings except the support type, can be washed with Wescodyne. The Wescodyne itself leave the usual iodine stain which is easily removed

by any oxidizing agent. Sunshine is the least costly. Those of us who wear support stockings have to use a mild bleach on them as they retain the iodine stain and turn yellow.

Wescodyne is used to cleanse equipment - sinks, cabinets, Circolectric beds, stainless steel basins, and so forth. The floors in our unit are terrazzo and the silver nitrate is simply allowed to cover it and it is then buffed to a luster. Zing, a detergent, cleans floors and walls, if hard rubbing accompanies it. This can ruin paint and other finishes. A tile covering from the floor up to six feet high or a flat brown paint is probably the best for walls.[4]

Patient Room. — Floor finishes in all wards are of 1/8" linoleum tile.

Each single bed ward should receive 24 air changes an hour and it should have individual control of temperature and humidity.

Every patient's room should have a pass through access for clean and dirty supplies and should be designed to resist noise. Room entry should be via an individual nurse gowning room planned en suite with a utility area for the patient's toilet and nursing requisites.

The upper portions of the walls and patient's room should be glazed to facilitate observation by the staff.

The same finish is on the visitor's corridor. This arrangement enables a visitor and patient to carry on a normal two-way conversation with a speaker in full view of each other but in complete isolation.

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[4]Patty Maxwell and Others, "Routines on the Burn Ward", American Journal of Nursing. (March, 1966) p.522

Each patient has a "no-hands" telephone built into the bedside table for outside calls. TV sets are sometimes donated by the hospital's friends and patients may also have radios. In each patient room, there are oxygen and medical suction points at every bedhead, plus four power outlets and a socket for a razor (electric). Other essential facilities are washbasin and toilet in every adult patient's room, the toilet having pedal operation. There is also a hose for rinsing bed pans.

The patients' rooms are 12' x 15' and 9 ft. high. The beds in this unit should be the Circolectric bed to rise upward progressively to help the patient tolerate standing prior to ambulation.

Dietary Practices.— The Dietitian and her department should be available to serve dietary requests from the Burns unit at all times.

This unit does not lend itself to routine dietary service because of constant needs and demands of the patients. Therefore, the dietitians must plan for this service on an "on call" basis. The nurse encourages the patient to eat additional foods that are rich in protein. The meals are supplemented with various vitamin and mineral preparations.

Sometimes, when patients won't eat, tube feeding is necessary.

The food service to patient is on special plates, which, after mealtime, are destroyed by the nurse. Each patient has his

own spoon, fork, and knife in his room and after mealtime they are cleaned by the nurse in the small utility area which is located in the nurse gowning area.

Nursing and Medical Personnel.--Personnel for this unit should be carefully selected for their technical skill in handling complicated equipment, ability to make accurate observations on the patient's condition and to interpret these correctly in terms of the need to notify the physician or the institution of emergency procedures.

Policy and Control in the Unit.--The burns unit should be under the direct control of the Chief of Surgery or his deputies.

The head nurse is responsible for the nursing of the patient within the unit. The techniques and equipment used are also her responsibility.

Training.--The hospital should organize and supervise an educational program for the resident physician house staff, nurses and other paramedical personnel who are in attendance in the burns unit.

Nurses.--The team concept of nursing used in many hospitals works well in a burns unit. The team should be under the direction of a head nurse.

In considering the level of staffing required, it should be borne in mind that special duty nurses not be required in the burns unit.

Treatment.--On the question of the treatment of burns the nurses of the Barnes Hospital, St. Louis, U.S., Maxwell and Others have reported:

> When a patient is admitted, the doctors remove any emergency dressings or ointments that have been previously applied. The wounds are cultured, and clinical photographs are taken. Intact bullae are opened and all loose skin is removed, if possible, patients are weighed on the stretcher before the dressings are applied. They are weighed thereafter daily for seven days, twice weekly for two weeks, and then weekly until no longer necessary.
>
> All the wounds are then covered with thick, gauze dressings which have been saturated with 0.5 per cent silver nitrate solution. Spiral dressings are applied to the extremities, keeping fingers and toes wrapped separately, the dressings are served with bias-cut stockinette and safety pins. We purchase a factory-cut stockinette. Since all the dressing materials must be absorbent, we prebleach our stockinette, as the dye decreases absorbency. This and increased washing give it the desired absorbency. Kling or nevro head rolls are too expensive and do not launder well for reuse.
>
> Trunk and face dressings are usually laid on. Bandages cover the axillae, groins, scrotum, and neck, if necessary, to prevent excoriation and maceration. The dressings should be at least an inch thick, and must be in contact with the burns, but they must not impair circulation. The dressings are then kept continually wet by pouring the 0.5 per cent nitrate solution directly on.
>
> An Asepto syringe is used to apply the solution to the facial dressings to prevent excessive contact with the eyes and insure that the patient does not swallow any silver nitrate. A neomycin sulfate ephthalmic ointment may be ordered, if there is a corneal burn. The silver nitrate solution is kept at a tepid temperature (00° to 100°F). Patients suffer greatly from chilling if the solution is not warmed. However, they cannot tolerate a solution warmer than 95°F. It is essential that the top covering always be a dry one. Additional dry layers of covering over the inner wet ones may be added up to six layers, unless high fever develops.
>
> The patient's temperature, pulse, respirations, fluid intake and output, and the venous pressure are measured and recorded hourly for the first 24 to 36 hours. Twenty-four hour urine samples are collected for sodium determination. Capillary hematocrits are determined every four hours and serum electrolytes every eight hours during this time. It is often imposs-

ible to measure the blood pressure of a patient who has burns of extremities and we rarely have patients for whom we take it. This requires additional caution while measuring the other vital signs.[5]

The following are parts in the procedures followed by the medical team, primarily in the order of treatment given by Dr. Gerald Brown O'Conner, Chairman of the Plastic Surgery Committee of the Plastic and Reconstructive Surgery Center:

1. Give intravenous medication to prevent shock and kidney failure (medication includes plasma, morphine and body chemical supplements.)
2. Measure hourly kidney function
3. Clean burned area and remove dead tissue
4. Apply plaster splints to hands, if burned
5. Perform tracheotomy if lungs are burned
6. Put patient on circular electric bed in order to change body posture because pain limits patient from turning over in bed.
7. Within first few days, begin physical therapy to eliminate stiffening of tissue and joints and to prevent specific muscle weakness from prolonged bed rest.
8. After about 10 days, begin tub baths with agitated water for cleansing. Bath water has constant temperature measurement.
9. Daily care includes:
   a. Laboratory tests on blood and urine.
   b. Special sterile linen in whole room changed often
   c. Special duty nurses around the clock for nursing care and hand feeding
   d. Intravenous supplementary feeding of high protein and high calorie diet
   e. Stomach feeding through tube, if necessary
   f. Oxygen and special breathing equipment used for burned lungs
   g. Administration of antibiotics for burned lung and infections.
   h. Trips to surgery for skin grafting when necessary.
   i. Physical therapy treatments at frequent intervals to prevent joint stiffening.

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[5]Patty Maxwell and Others, "Routines on the Burn Ward", American Journal of Nursing. (March 1966) p.522.

Recommended Supplies for Burn Unit

1. Treatment Room
   Gurney or treatment table
   Large cart for dressings
   Small cart for irrigation equipment
   Mayo stand
   Arm bath
   Adjustable surgical light
   Suction equipment
   Cupboard for supplies
   Scrub sinks
   Bulletin board
   Weighing scale desirable
   Small sterilizer or autoclave

2. Tub Room - May be combined with treatment area if desired. Tub, approximately 7 ft. long, 3 ft. wide and 28-30 inches off the floor. With, temperature regulator hand rails (bilateral), attachment for head halter, shower attachment with long, hose, water agitator, protection against slipping.

Hoist - Trapeze attachment to aid patient in sitting position and attached ladder for use of ambulatory patients.

3. Patient's Room:
   Electric high-low bed
   Comfortable chair with footstool
   Bedside table, overbed table
   Toilet and bath facilities (including shower with precision temperature and water pressure adjustments)
   Lavatory in room
   Piped in oxygen suction
   Adequate space for: bedside dressing change, patient ambulation
   Air conditioning according to sterile air current engineering principles
   Built in T.V. desirable.

Note: Patient's rooms should have direct access to treatment and tub rooms, if possible, to avoid the necessity of transporting patients through general hospital corridors.

General Supplies and Equipment:
   Circular electric beds
   Overbed frames for orthopedic equipment
   Attachment for nurses' call system for use of patient with burns of both hands
   Several adjustable height tables for use in treatment of patient
   Sterile gowns, gloves, masks, caps

Tracheotomy set
I.V. sets (including cut-downs)
I.V. solutions: Ringer's lactate, slo glucose in dextrose, slo glucose in saline, salina dextrose
Emergency drugs
Dressings, ABD's fluffs 2 x 2, 4 x 4 and 4 x 8
special large burn dressings, furacin gauze
Telfa Sheets, plastic strip splints
Antiseptics; alcohol, zephiran, wescodyne, betadine
Instrument sets
Foley Catheters F16-20
Walkers

General Considerations:

1. Provision should be made in all areas for "reverse" isolation
2. Separate housekeeping equipment and supplies should be maintained for the unit.[6]

Severely burned patients still present a major challenge for medicine. Complications caused by smoke damage to the respiratory system are often fatal. When this and other complicating factors are more understood, medical men predict, death rates from burns will be further reduced.

> "It is a long road" says Dr. Price of Phoenix, but more progress has been made in the reduction of burn mortality in the past year than in the three previous decades.[7]

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[6]Gerald Brown O'Connor, M.D., Chairman of the Plastic and Reconstructive Surgery Center, San Francisco. "How one Hospital Planned Its Burn Center." Modern Hospital. (January 1965) p. 76

[7]William R. Price, M.D., Co-Chief of the Burn Research Unit at Marrcopa Country Hospital, Phoenix, Ariz. "Medicine's Dramatic Strides Against Burns". Modern Hospital. (March 1967) p. 46

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[2]R.A.U.Krizanc, Building Co-ordinator for the building program at the Scarborough General Hospital, Toronto, Ontario. "New Burns Unit Heightens Sterile Techniques", Canadian Hospital (October 1967) p.64.

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CHAPTER VIII

SUMMARIZED COMMENTARY AND MISCELLANEOUS ITEMS PERTAINING TO HOSPITAL DESIGN IN CANADA

A. Health Resources Program

The health resources program is concerned with the human resources in the health fields in Canada. The main purpose is to help meet the great and increasing need for trained people to provide more and better comprehensive health services.

The health resources program is composed of three closely related parts.

1. The management of expenditures from the $500 million health resources fund to meet the national needs for new and improved health, educational and research facilities.
2. Health resources studies to examine all aspects of the supply of health manpower and to develop practical and positive recommendations for other action to improve human resources in the health professions and allied health disciplines.
3. The provision of a consultation service in the fields of health, manpower and education.

B. The Health Resources Fund:

This fund provides assistance to Provinces in meeting the capital costs of construction, renovating, acquiring and equipping health training and research facilities. A sum of $500 million has been appropriated for contributions of up to 50% of these costs during the 15-year period 1966 to 1980. This fund is divided into three parts:

1. $300 million - allocated to Provinces on a per capita basis.
2. $ 25 million - A special additional allocation to the Atlantic Provinces for joint projects.
3. $175 million - To be allocated by the Governor in Council.

The money is being spent on new and improved health training and research facilities which are defined in the act as school, hospitals or other institutions, or any portion thereof, for the training of persons in the health professions, or any occupations associated with the health professions, or for conducting research in the health fields.

The costs of planning and designing the facility and of all basic equipment required for its operation are also eligible for support, but costs of land, interest charges and residential accommodation are excluded.

The fund will pay up to 50% of these capital costs, while some other agency such as the Provincial Government or the University provides the remainder. Payments are made from the fund to the Provinces as work proceeds on the projects.

Operating costs of education and research are not eligible under the health Resources Fund, but other Federal funds are available for these purposes. Among these are the post-secondary education assistance Program, the National Health Grants program, Medical Research Council Grants and Defense Research Board Grants.

C. Federal Government Hospital Construction Grant Programme

Largest expenditure category in the National Health Grants programme.

Currently $20 million/year, including approximately $5 million for renovations and $15 million for new construction and additions.

Conditional upon Provincial consent - matching grant - fire marshall approved.

Objectives: while leaving "exclusive powers" to Provincial authority,-

1. To assist the Provinces, local municipalities and private philanthropy to carry the financial burden of hospital construction.
2. To stimulate (renovation grant) the improvement of obsolete or inadequate hospitals and community health centres, measured against good standards.
3. To assist the development of diagnostic and treatment facilities for community health services, and the development of hospital training facilities for health and hospital personnel.
4. To assist the provincial health departments to maintain a reasonably good standard of hospital plant.
5. To supplement, but not supplant, Provincial and local expertness in hospital planning.
6. To keep the suitability of standards upon which the grant is based under continual review.

D. Federal Hospital Construction Grant

An outline of the General Provisions

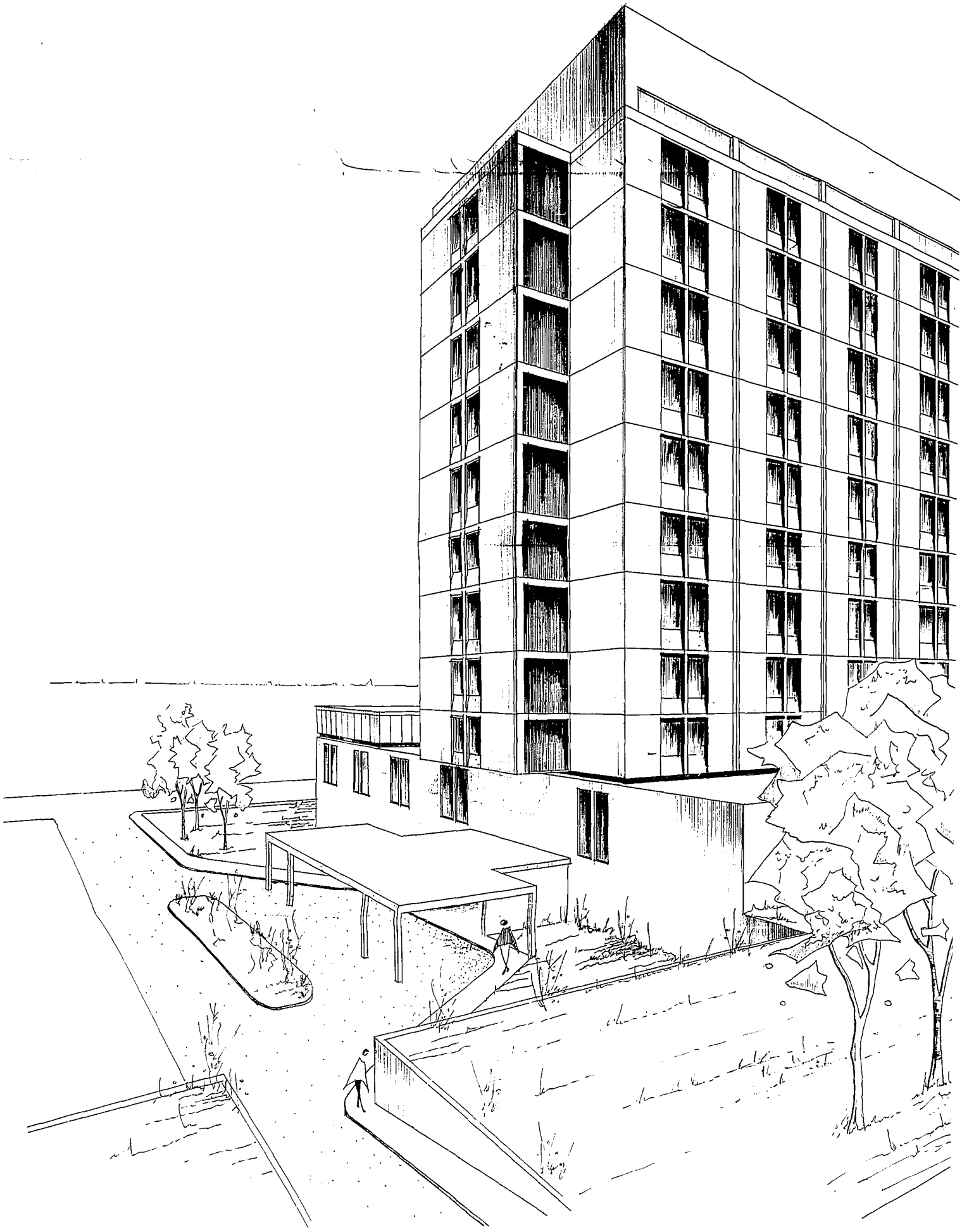
"New Construction" projects	Grant Amount
To each approved bed (adult or pediatric, in-patient, recovery, observation, labour, 3 newborn bassinets equal 1 adult bed)	$2000
To each approved nurses' bed and interns' bed	$ 750
Community health centre services including radiology, laboratory (animal rooms and research areas) medical rehabilitation, pharmacy, dispensary, autopsy and morgue, occupational and physical therapy, local public health services, emergency services, for each approved "bed equivalent" area of 300 sq. ft.....	$2000
Training facilities for health and hospital personnel, including lecture rooms demonstration rooms and labs., assembly rooms for student body, teaching staff offices and trainee libraries, for each approved "bed equivalent" area of 300 sq. ft.	$2000

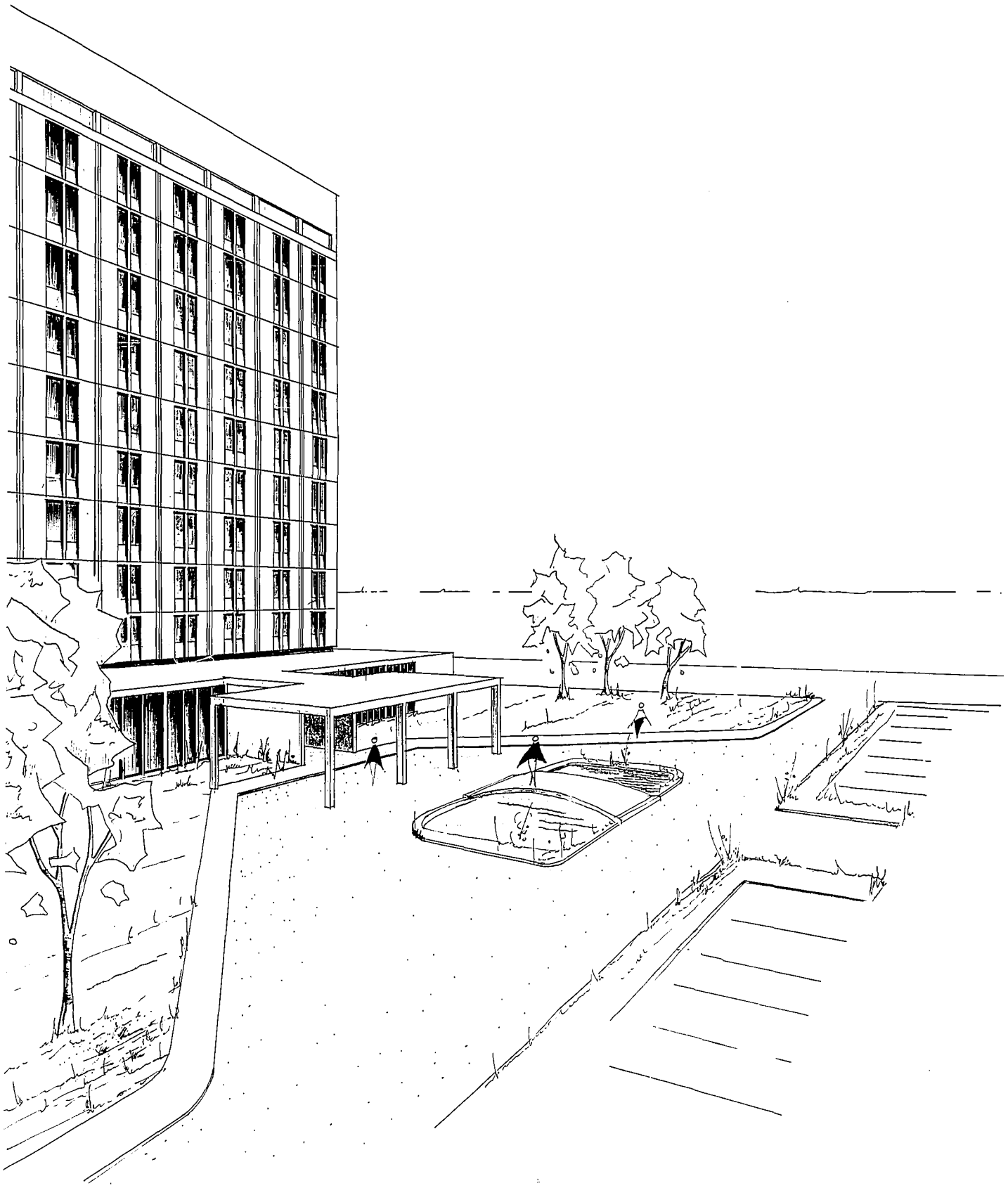
Total grant not to exceed 1/3 of total costs.

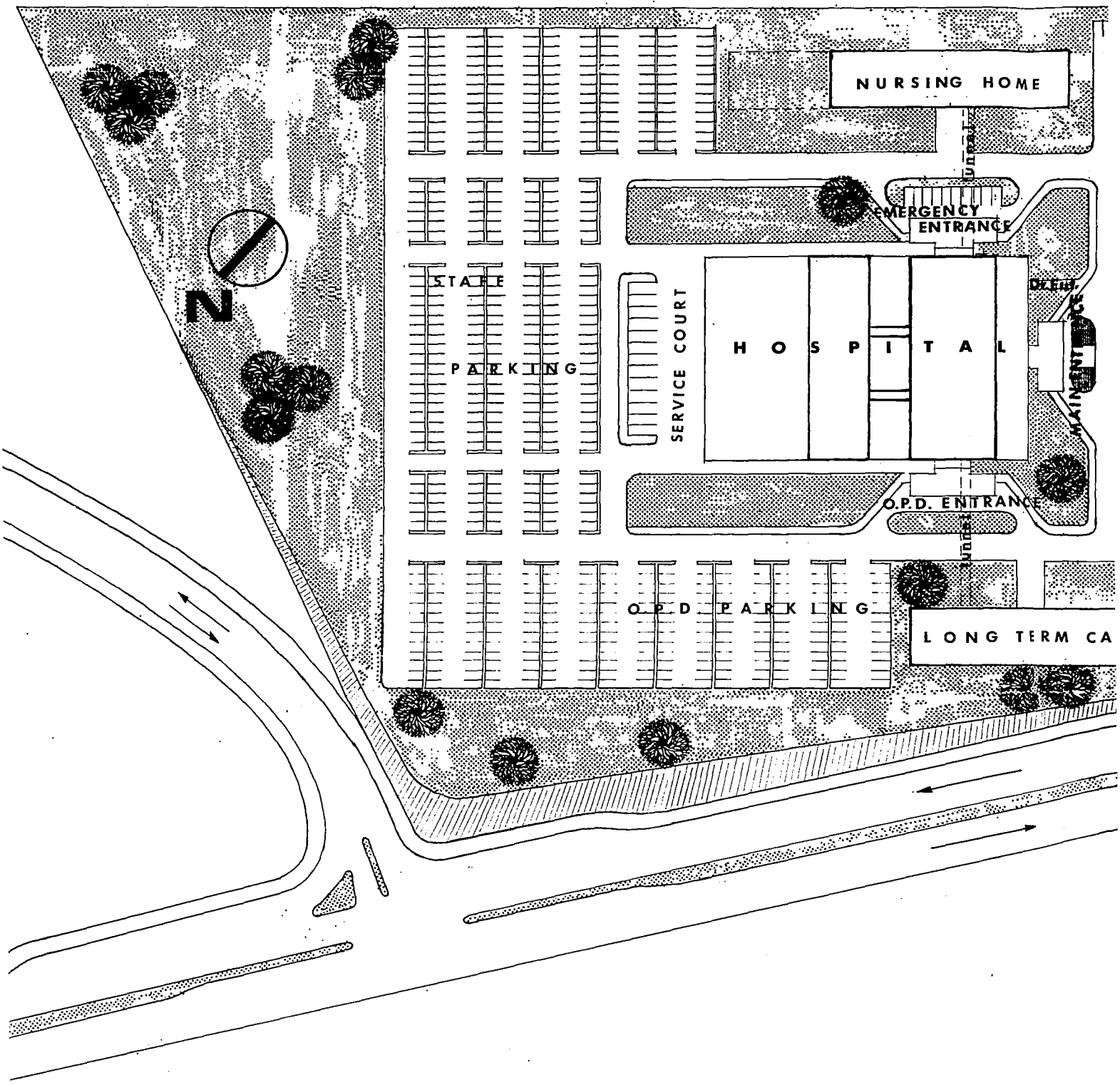
E. Renovation projects

For each approved project to renovate, modernize or alter existing hospital buildings, or listed health facilities "to provide adequate accommodation therein .....1/3 of cost

Total grant not to exceed grant based on "new construction" project basis.






NURSING HOME
EMERGENCY ENTRANCE
STAFF
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SERVICE COURT
H O S P I T A L
MAIN ENTRANCE
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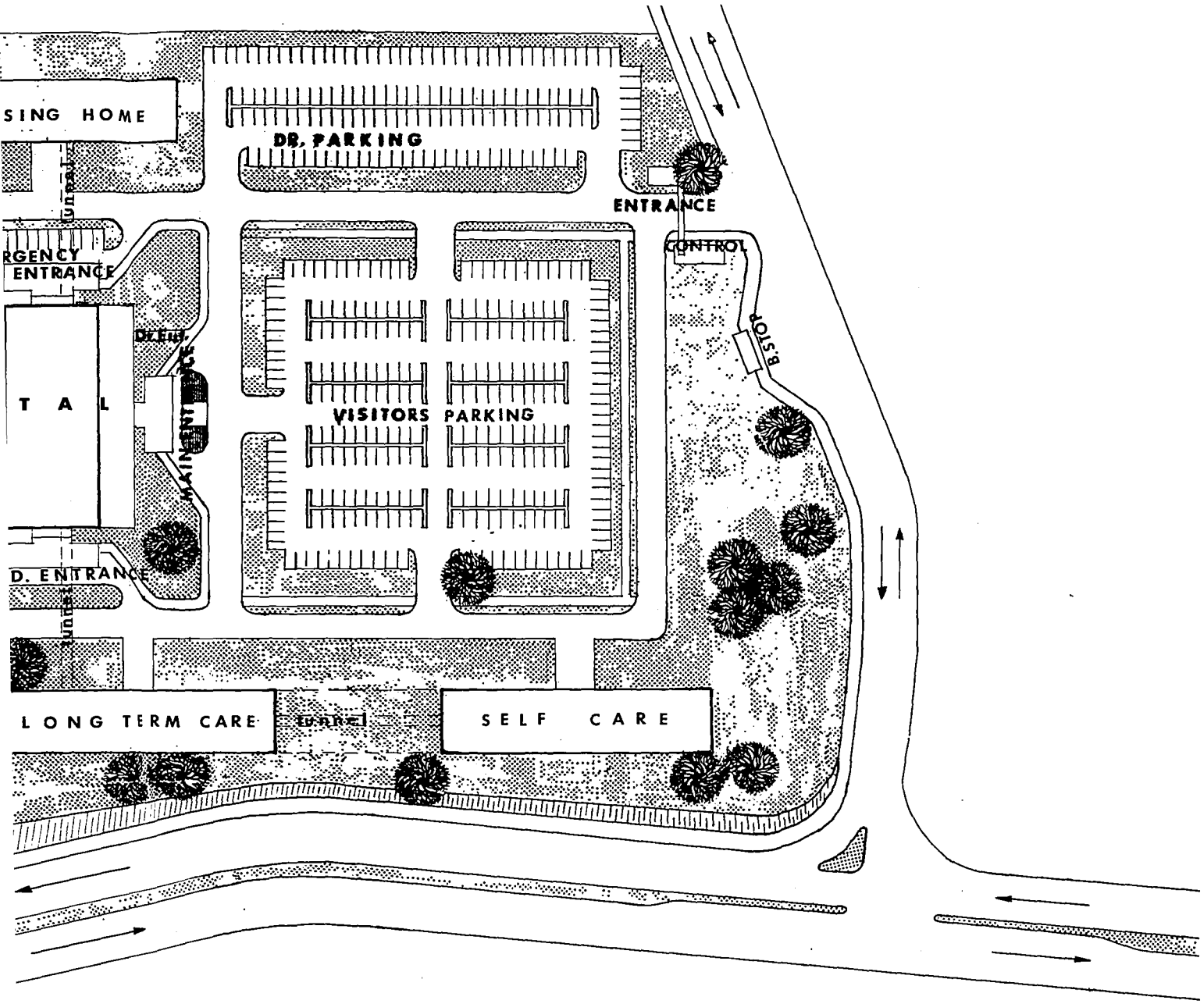
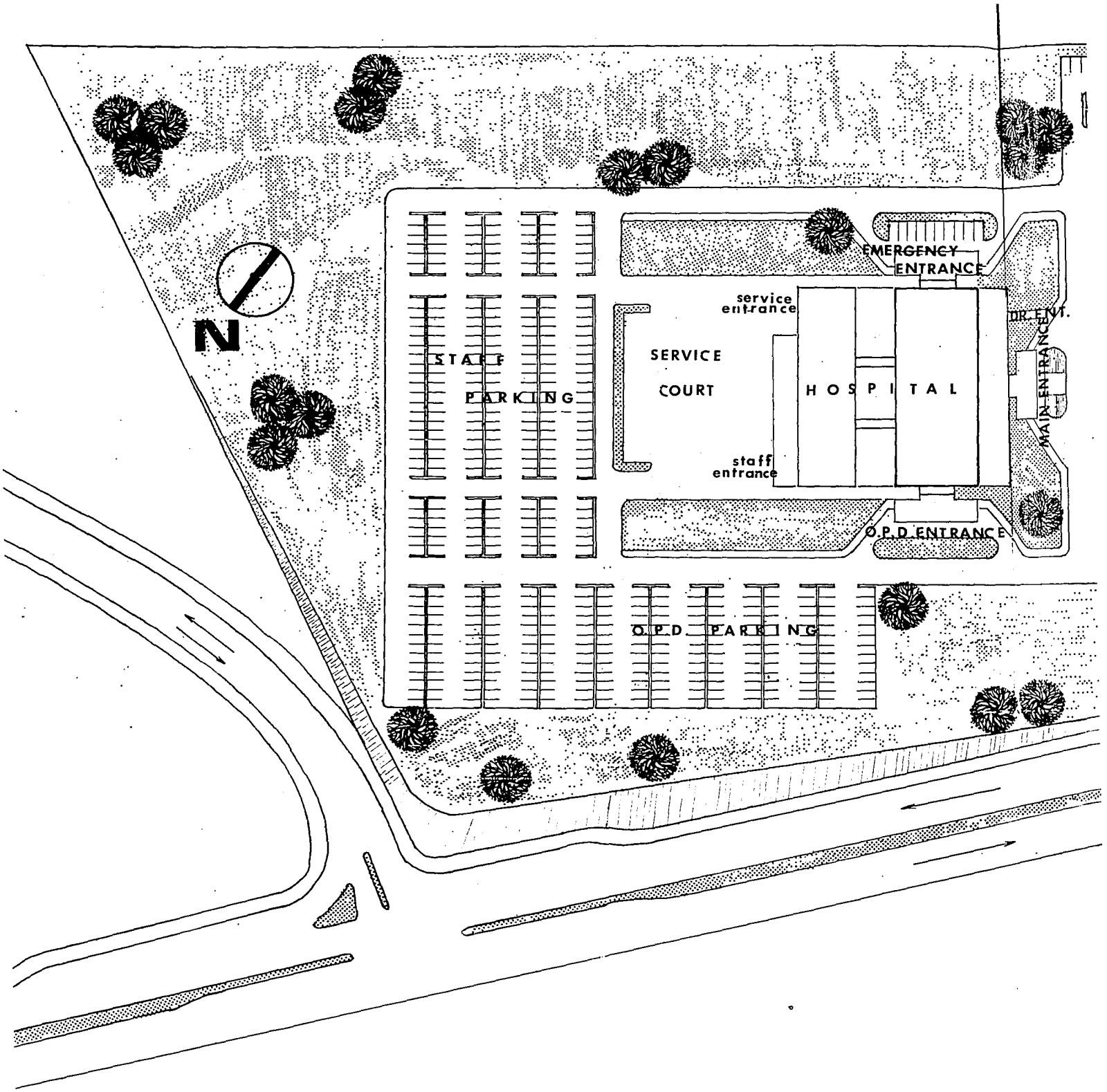
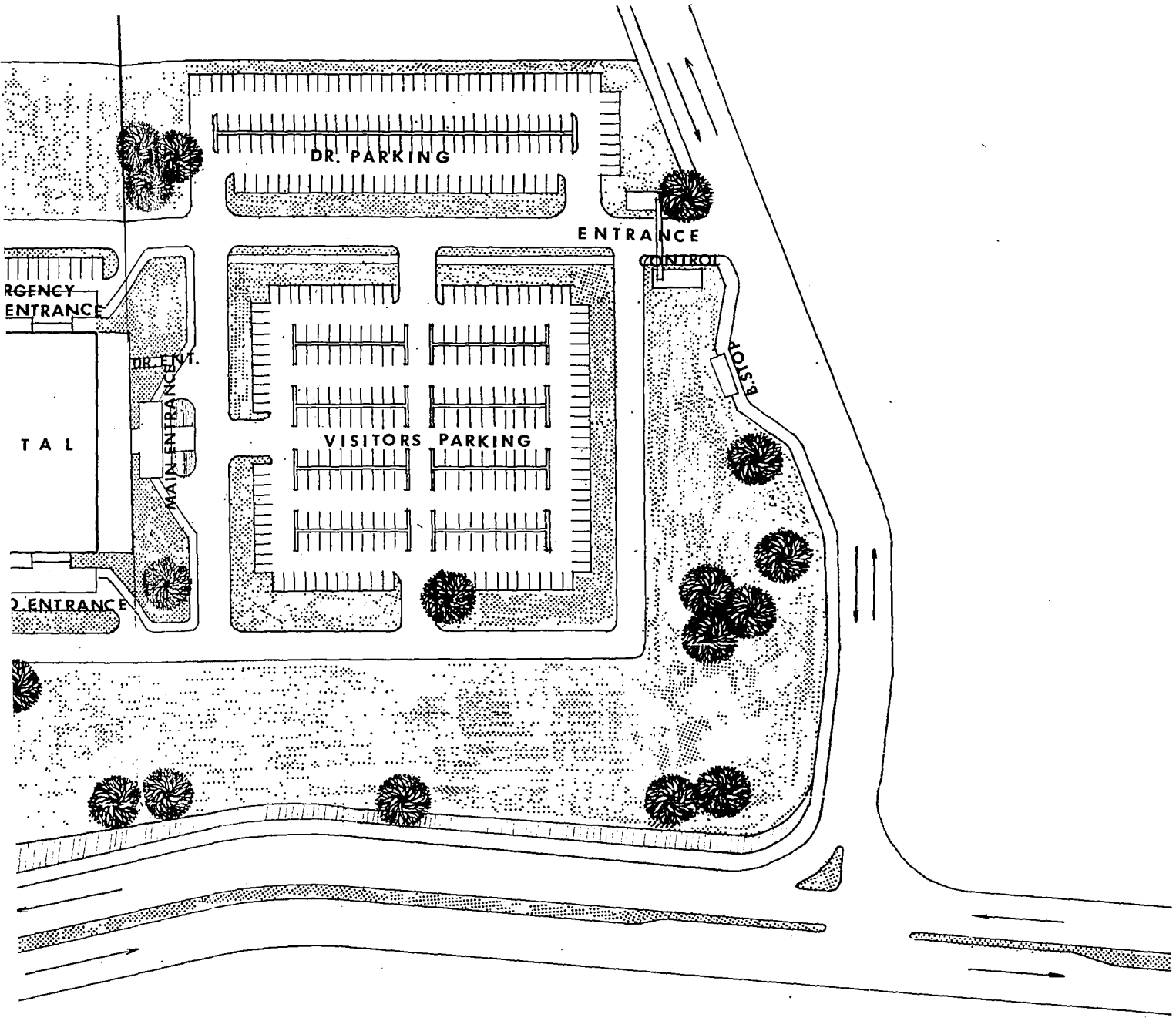


MASTER SITE PLAN

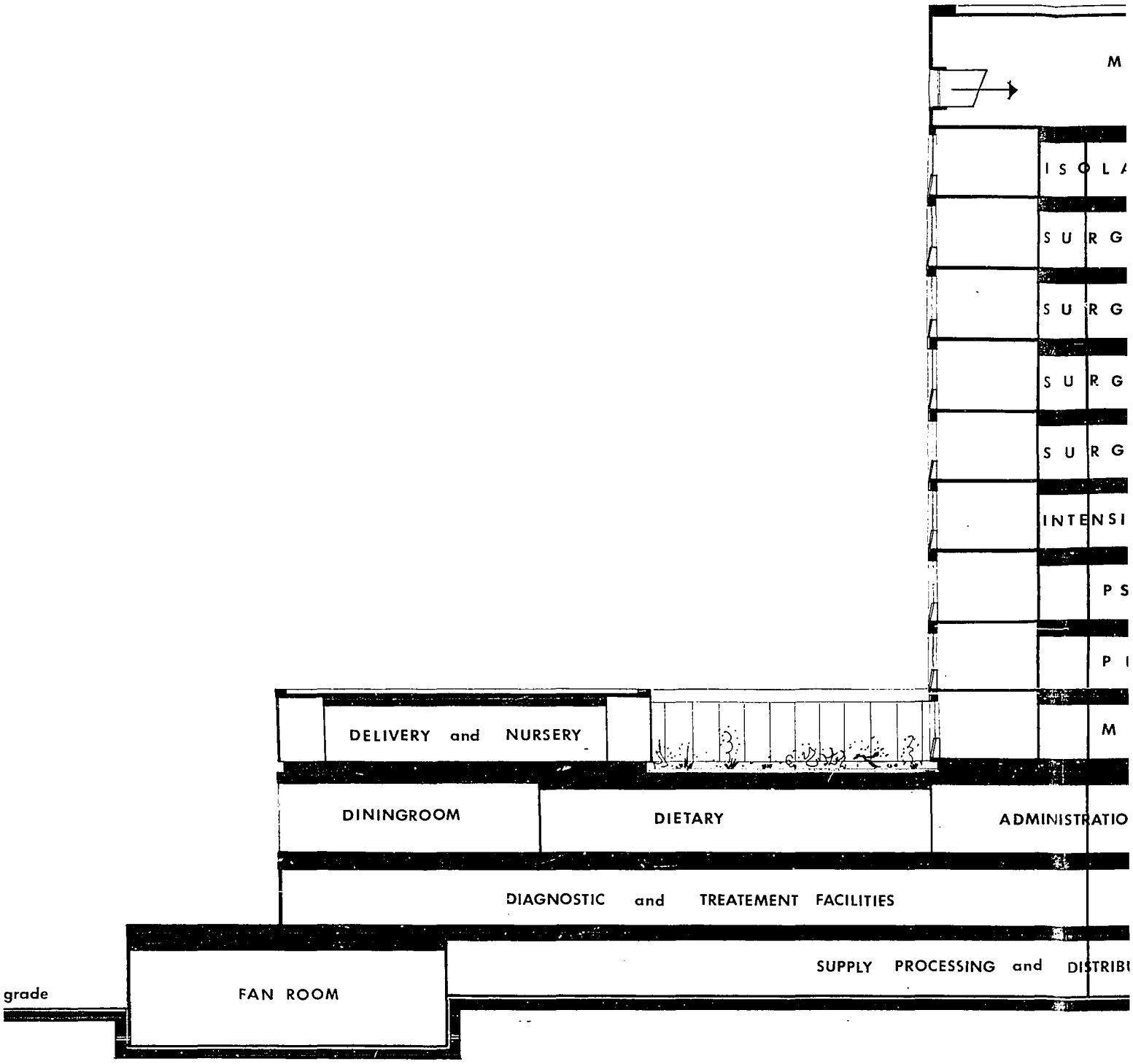
0 50 100 150 200

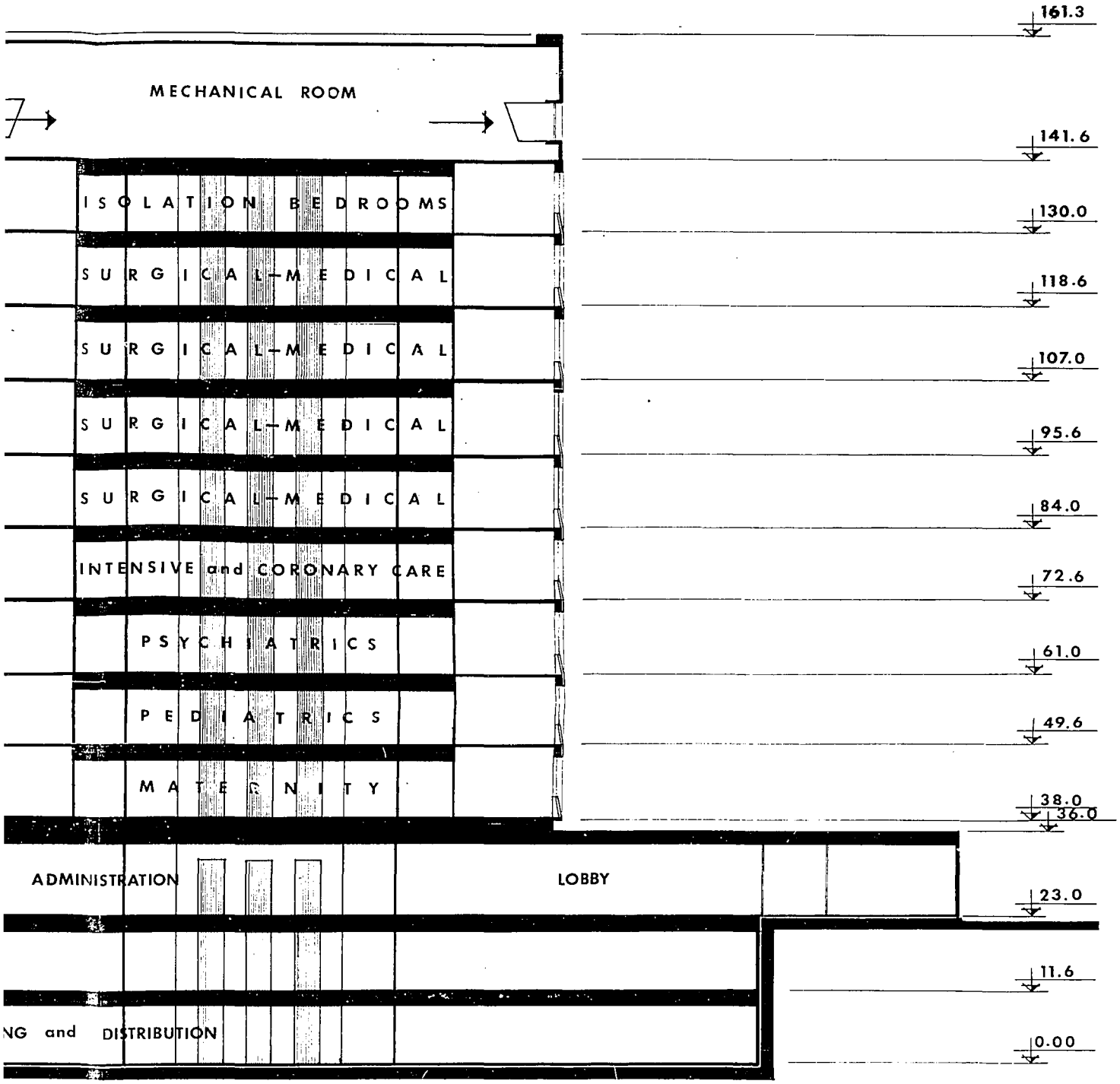

N
STAFF
PARKING
EMERGENCY
ENTRANCE
service
entrance
SERVICE
COURT
HOSPITAL
DR. ENT.
MAIN ENTRANCE
staff
entrance
O.P.D ENTRANCE
O.P.D PARKING



SITE PLAN

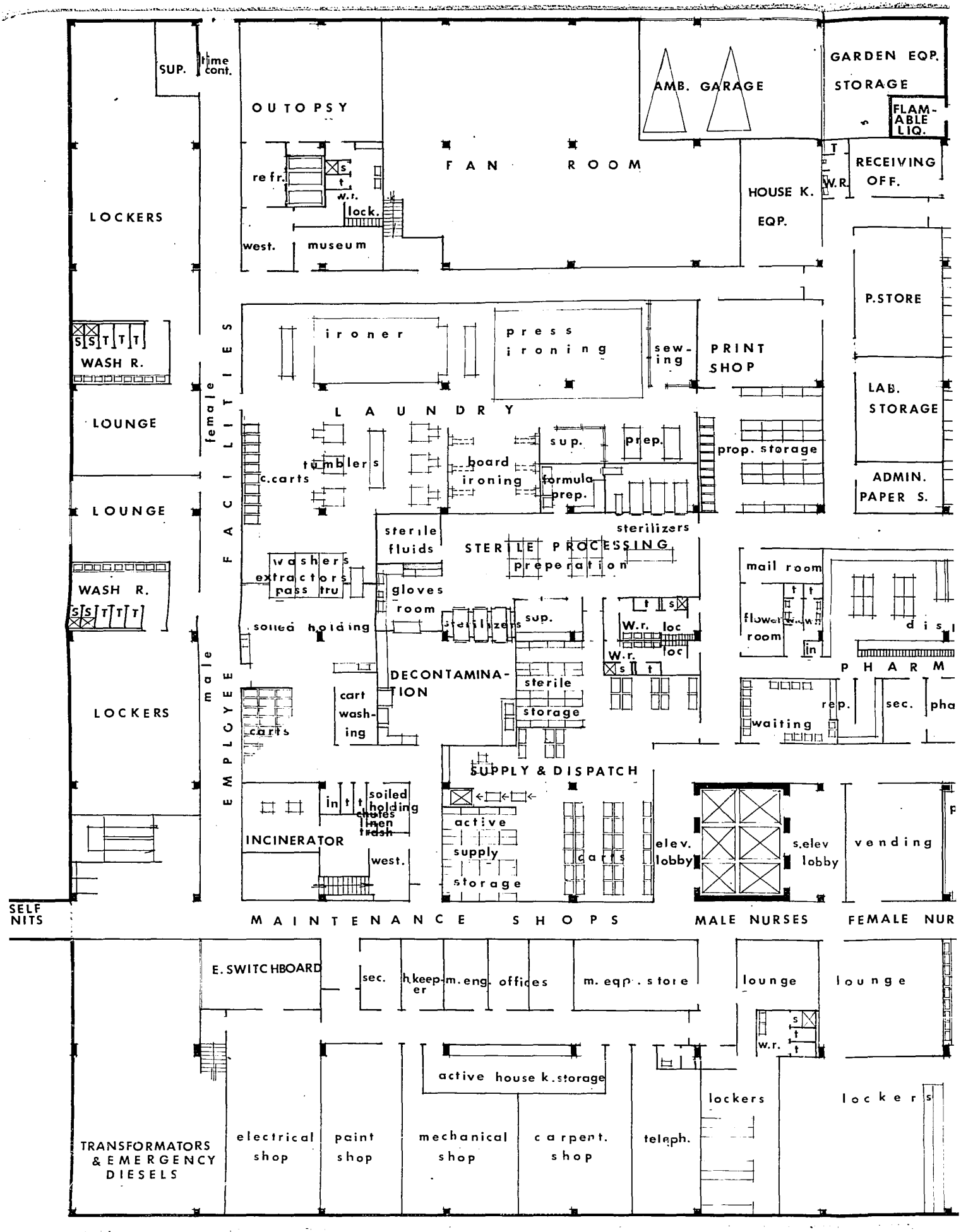
0 50 100 150 200

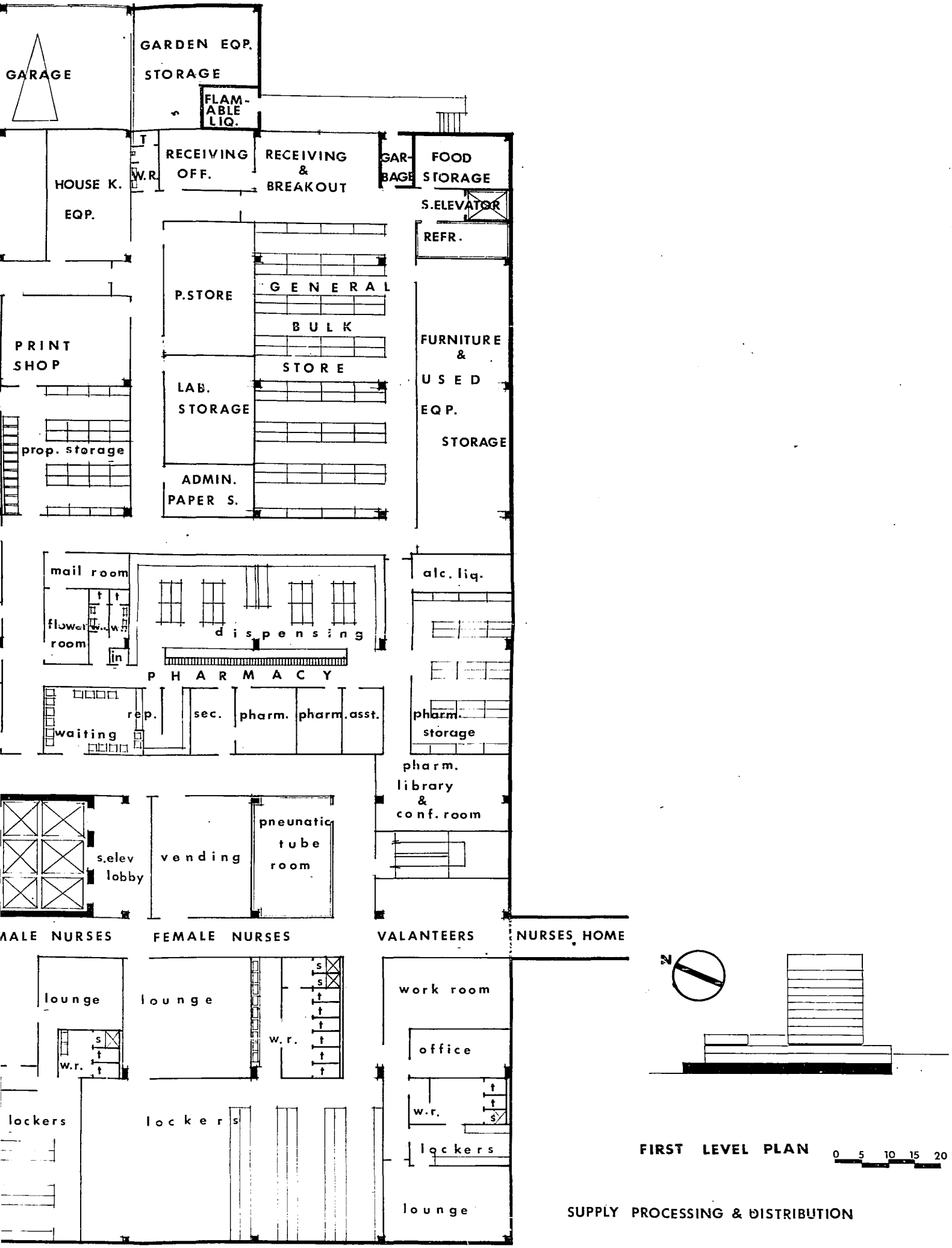

M
I S O L A
S U R G
S U R G
S U R G
S U R G
INTENSI
P S
P I
M
DELIVERY and NURSERY
DININGROOM
DIETARY
ADMINISTRATIO
DIAGNOSTIC and TREATEMENT FACILITIES
SUPPLY PROCESSING and DISTRIBU
grade
FAN ROOM



SECTION

0 5 10 15 20

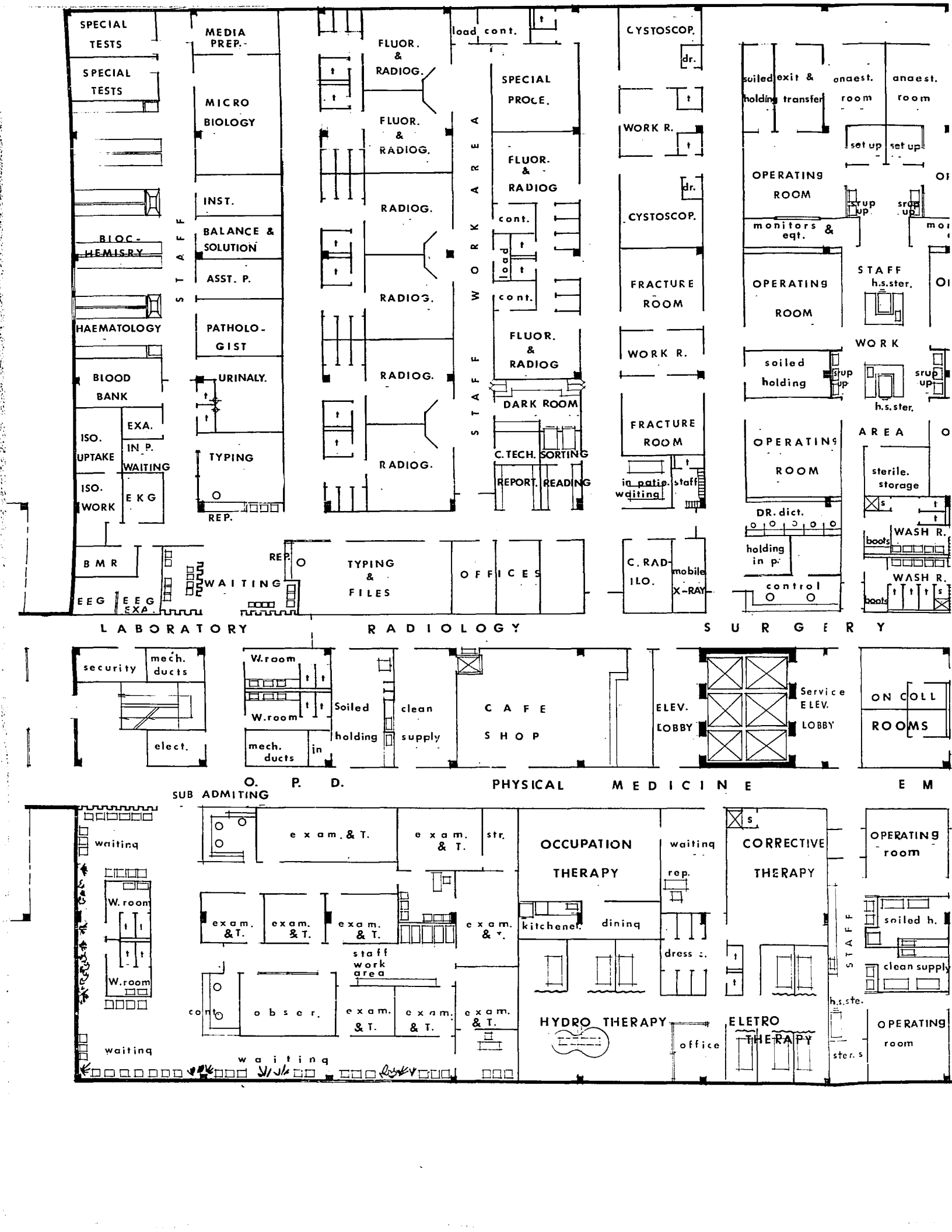

SUP.
time cont.
OUTOPSY
refr.
s
t
w.r.
lock.
west.
museum
AMB. GARAGE
GARDEN EQP. STORAGE
FLAM-ABLE LIQ.
F A N R O O M
T
W.R.
RECEIVING OFF.
HOUSE K. EQP.
LOCKERS
P.STORE
S S T T T
WASH R.
female FACILITIES
ironer
press ironing
sew-ing
PRINT SHOP
LAB. STORAGE
L A U N D R Y
LOUNGE
tumblers
c.carts
board ironing
sup.
prep.
formula prep.
prop. storage
ADMIN. PAPER S.
LOUNGE
sterile fluids
sterilizers
STERILE PROCESSING
preperation
WASH R.
S S T T T
washers extractors pass tru
gloves room
mail room
flower room
soiled holding
sterilizers
sup.
W.r.
loc
male EMPLOYEE
DECONTAMINA-TION
cart wash-ing
sterile storage
carts
LOCKERS
SUPPLY & DISPATCH
soiled holding
chutes
linen
trash
INCINERATOR
west.
active supply storage
carts
elev. lobby
s.elev lobby
vending
SELF NITS
M A I N T E N A N C E S H O P S
MALE NURSES
FEMALE NUR
E. SWITCHBOARD
sec.
h.keep-er
m. eng. offices
m. eqp. store
lounge
lounge
w.r.
active house k. storage
lockers
lockers
TRANSFORMATORS & EMERGENCY DIESELS
electrical shop
paint shop
mechanical shop
carpent. shop
teleph.

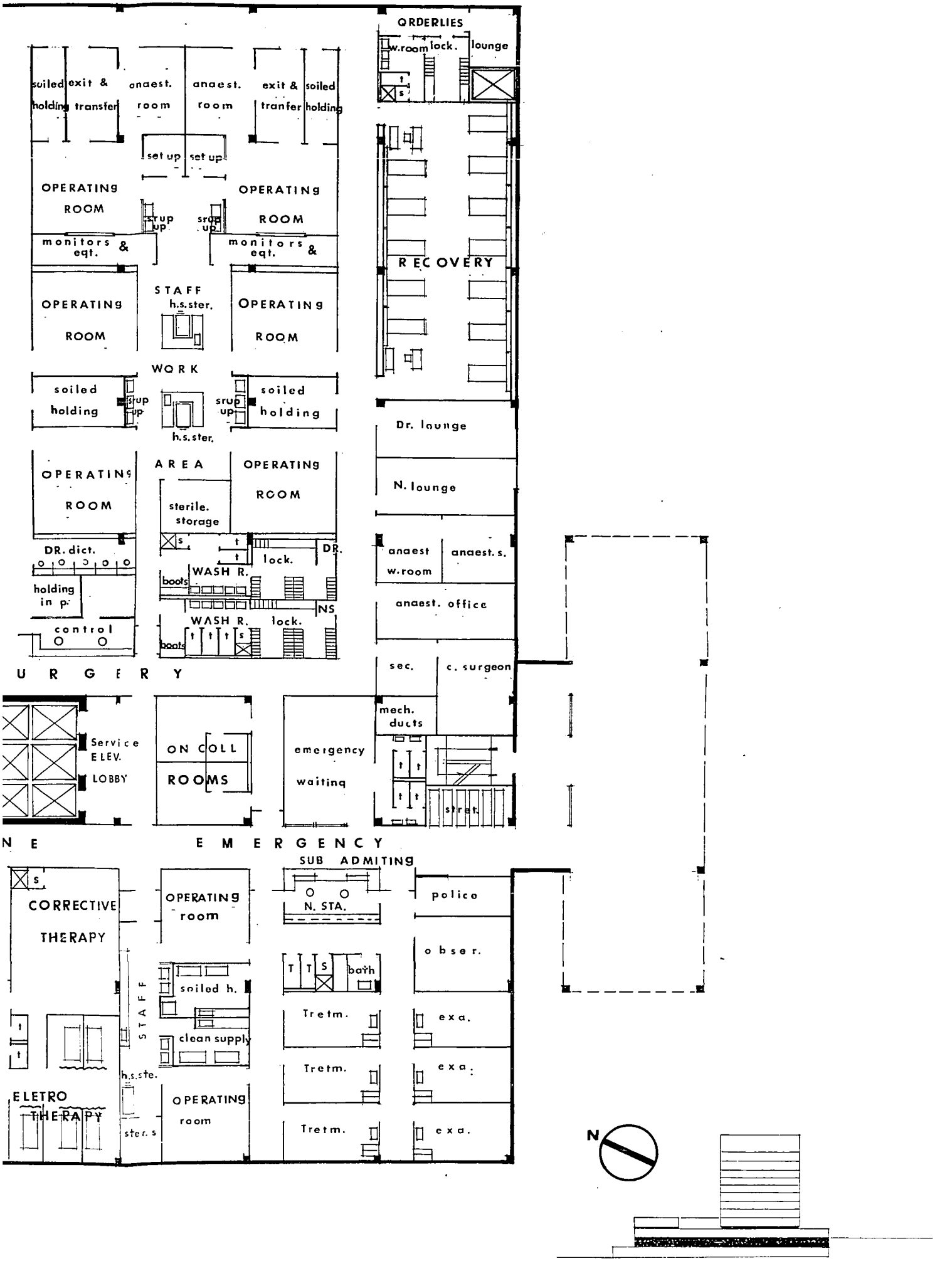


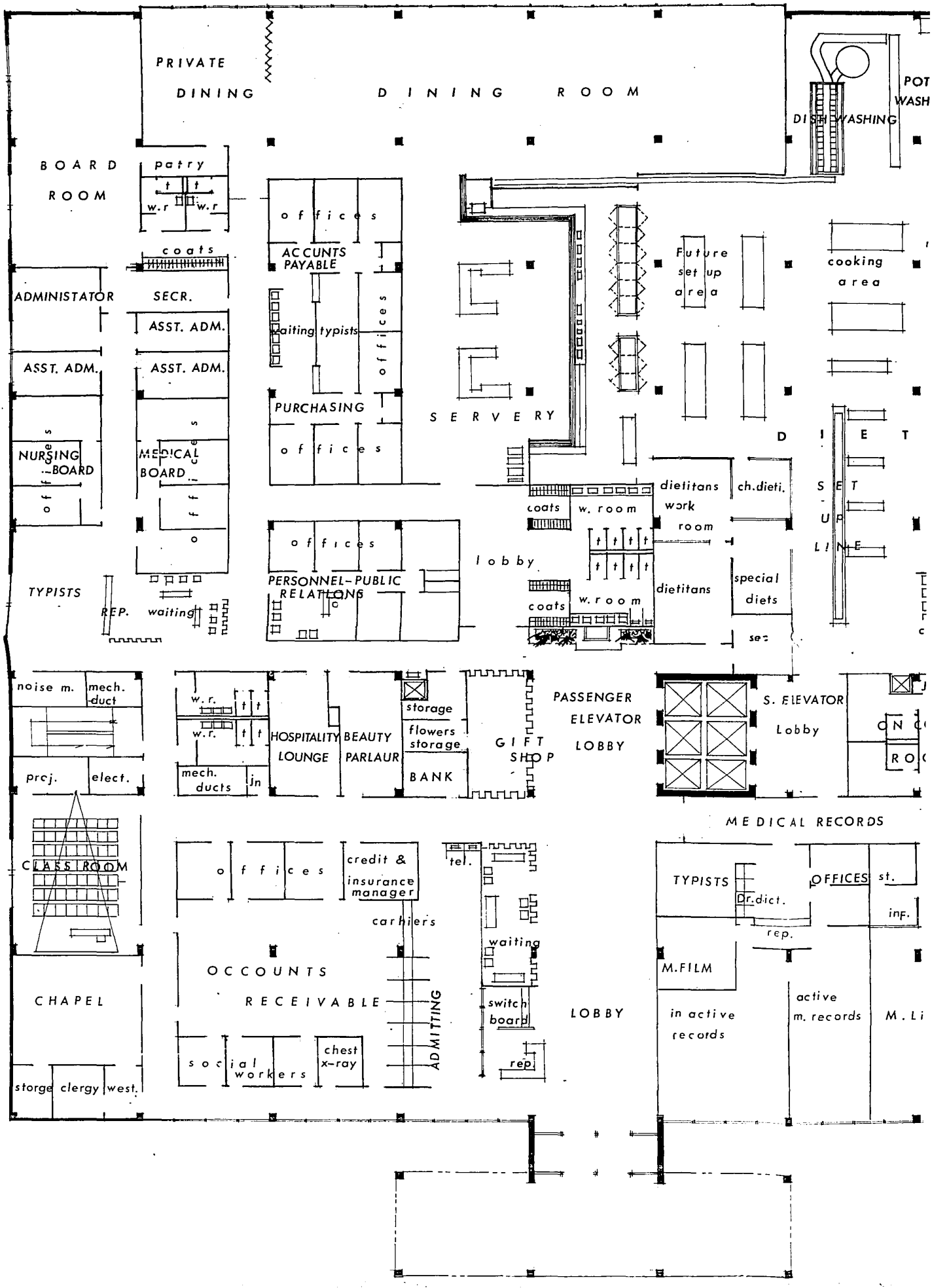
FIRST LEVEL PLAN

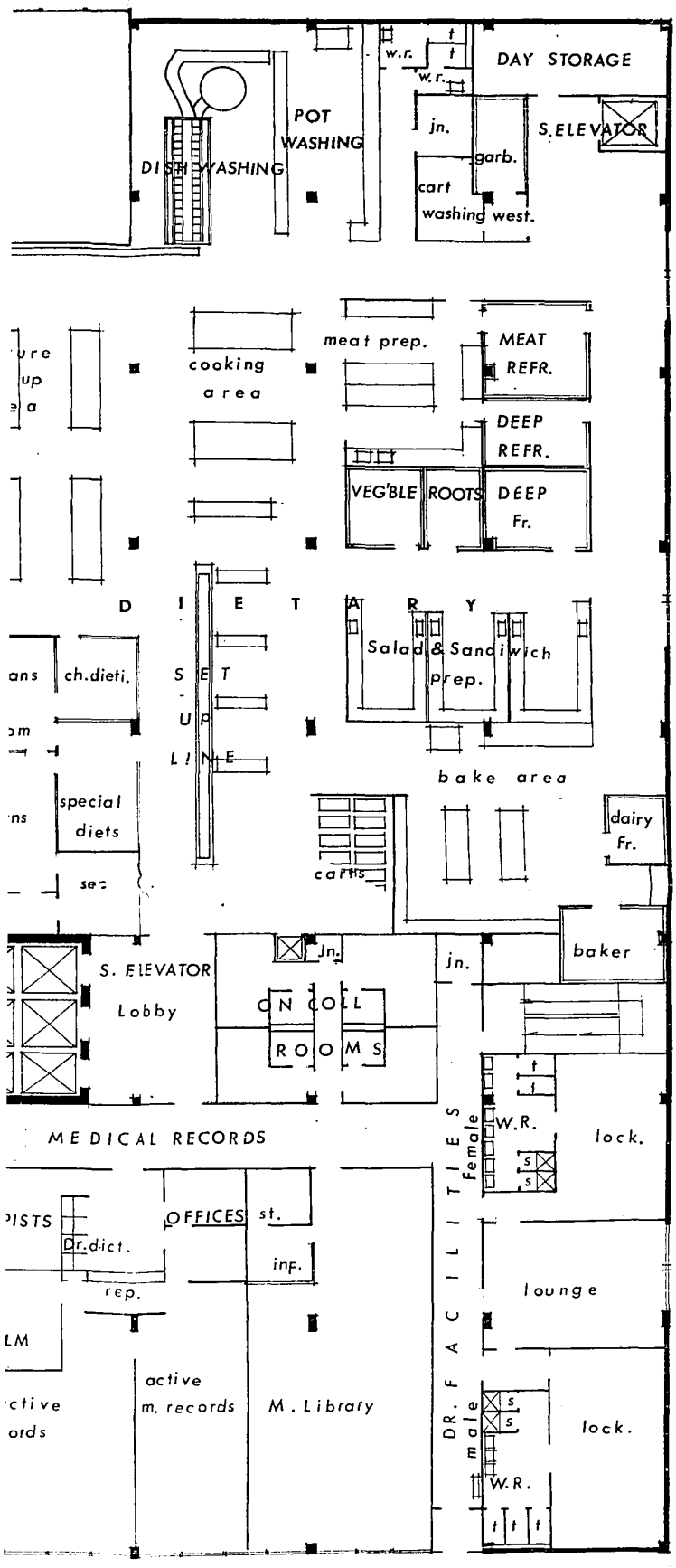
0 5 10 15 20

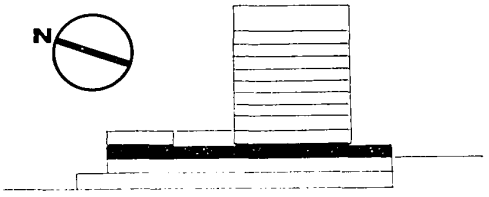
SUPPLY PROCESSING & DISTRIBUTION


SPECIAL TESTS
SPECIAL TESTS
MEDIA PREP.
MICRO BIOLOGY
INST.
BALANCE & SOLUTION
ASST. P.
PATHOLO-GIST
URINALY.
TYPING
REP.
STAFF
BIOC-HEMISRY
HAEMATOLOGY
BLOOD BANK
EXA.
IN P. WAITING
ISO. UPTAKE
ISO. WORK
E K G
BMR
EEG
EEG EXA.
WAITING
REP.
TYPING & FILES
OFFICES
LABORATORY
RADIOLOGY
FLUOR. & RADIOG.
FLUOR. & RADIOG.
RADIOG.
RADIOG.
RADIOG.
RADIOG.
load cont.
SPECIAL PROCE.
FLUOR. & RADIOG
cont.
load
cont.
FLUOR. & RADIOG
DARK ROOM
C. TECH. SORTING
REPORT. READING
STAFF WORK AREA
CYSTOSCOP.
dr.
WORK R.
dr.
CYSTOSCOP.
FRACTURE ROOM
WORK R.
FRACTURE ROOM
in patie. waiting
staff
C. RAD-ILO.
mobile X-RAY
soiled holding exit & transfer
onaest. room
anaest. room
set up
set up
OPERATING ROOM
srup up
srup up
monitors & eqt.
OPERATING ROOM
STAFF
h.s.ster.
WORK
soiled holding
srup up
srup up
h.s.ster.
OPERATING ROOM
AREA
sterile. storage
DR. dict.
holding in p.
WASH R.
boots
control
WASH R.
boots
SURGERY
security
mech. ducts
elect.
W.room
W.room
Soiled holding
clean supply
mech. ducts
in
C A F E
S H O P
ELEV. LOBBY
Service ELEV. LOBBY
ON COLL
ROOMS
O. P. D.
PHYSICAL MEDICINE
E M
SUB ADMITING
waiting
W. room
W.room
waiting
e x a m. & T.
e x a m. & T.
str.
exam. & T.
exam. & T.
exam. & T.
e x a m. & T.
staff work area
cont.
o b s e r.
exam. & T.
exam. & T.
exam. & T.
w a i t i n g
OCCUPATION THERAPY
kitchenet.
dining
HYDRO THERAPY
waiting
rep.
dress c.
office
S
CORRECTIVE THERAPY
ELETRO THERAPY
STAFF
h.s.ste.
ster. s
OPERATING room
soiled h.
clean supply
OPERATING room


ORDERLIES
w.room
lock.
lounge
soiled holding
exit & transfer
anaest. room
anaest. room
exit & tranfer
soiled holding
set up
set up
OPERATING ROOM
OPERATING ROOM
srup up
srup up
monitors & eqt.
monitors & eqt.
RECOVERY
STAFF
h.s.ster.
OPERATING ROOM
OPERATING ROOM
WORK
soiled holding
srup up
srup up
soiled holding
h.s.ster.
Dr. lounge
N. lounge
AREA
OPERATING ROOM
OPERATING ROOM
sterile. storage
DR. dict.
lock.
DR.
anaest w.room
anaest. s.
WASH R.
boots
holding in p.
NS
anaest. office
WASH R.
lock.
control
boots
sec.
c. surgeon
U R G E R Y
mech. ducts
Service ELEV.
LOBBY
ON CALL ROOMS
emergency waiting
stret.
N E
E M E R G E N C Y
SUB ADMITING
CORRECTIVE THERAPY
OPERATING room
N. STA.
police
obser.
T T S
bath
soiled h.
Tretm.
exa.
clean supply
STAFF
Tretm.
exa.
h.s.ste.
ELETRO THERAPY
OPERATING room
ster. s
Tretm.
exa.
N
SECOND LEVEL PLAN
0 5 10 15 20
DIAGNOSTIC & TREATEMENT FACILITIES

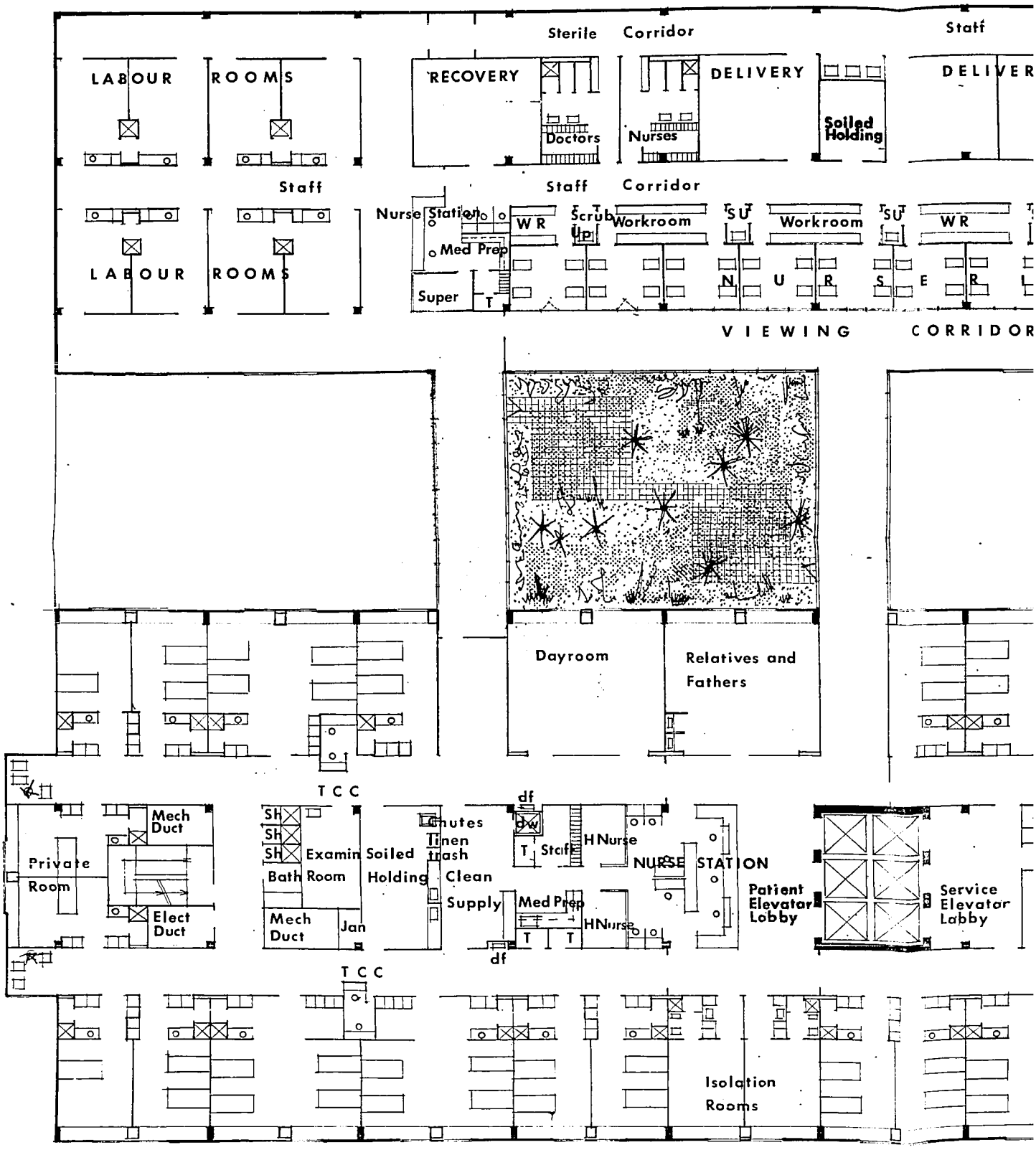

PRIVATE
DINING
D I N I N G R O O M
POT WASH
DISH WASHING
BOARD ROOM
patry
t t
w.r w.r
coats
ADMINISTATOR
SECR.
ASST. ADM.
ASST. ADM.
ASST. ADM.
offices
NURSING BOARD
MEDICAL BOARD
TYPISTS
REP.
waiting
offices
ACCUNTS PAYABLE
waiting typists
offices
PURCHASING
offices
offices
PERSONNEL-PUBLIC RELATIONS
lobby
SERVERY
Future set up area
cooking area
D I E T
S E T - U P L I N E
dietitans
ch.dieti.
coats
w. room
work room
dietitans
special diets
coats
w. room
noise m.
mech. duct
prcj.
elect.
CLASS ROOM
CHAPEL
storge
clergy
west.
w.r.
w.r.
mech. ducts
jn
HOSPITALITY LOUNGE
BEAUTY PARLAUR
storage
flowers storage
BANK
GIFT SHOP
PASSENGER ELEVATOR LOBBY
S. ELEVATOR
Lobby
MEDICAL RECORDS
offices
credit & insurance manager
tel.
cashiers
waiting
OCCOUNTS RECEIVABLE
ADMITTING
switch board
rep
social workers
chest x-ray
LOBBY
TYPISTS
OFFICES
st.
Dr.dict.
inf.
rep.
M.FILM
in active records
active m. records
M. Li

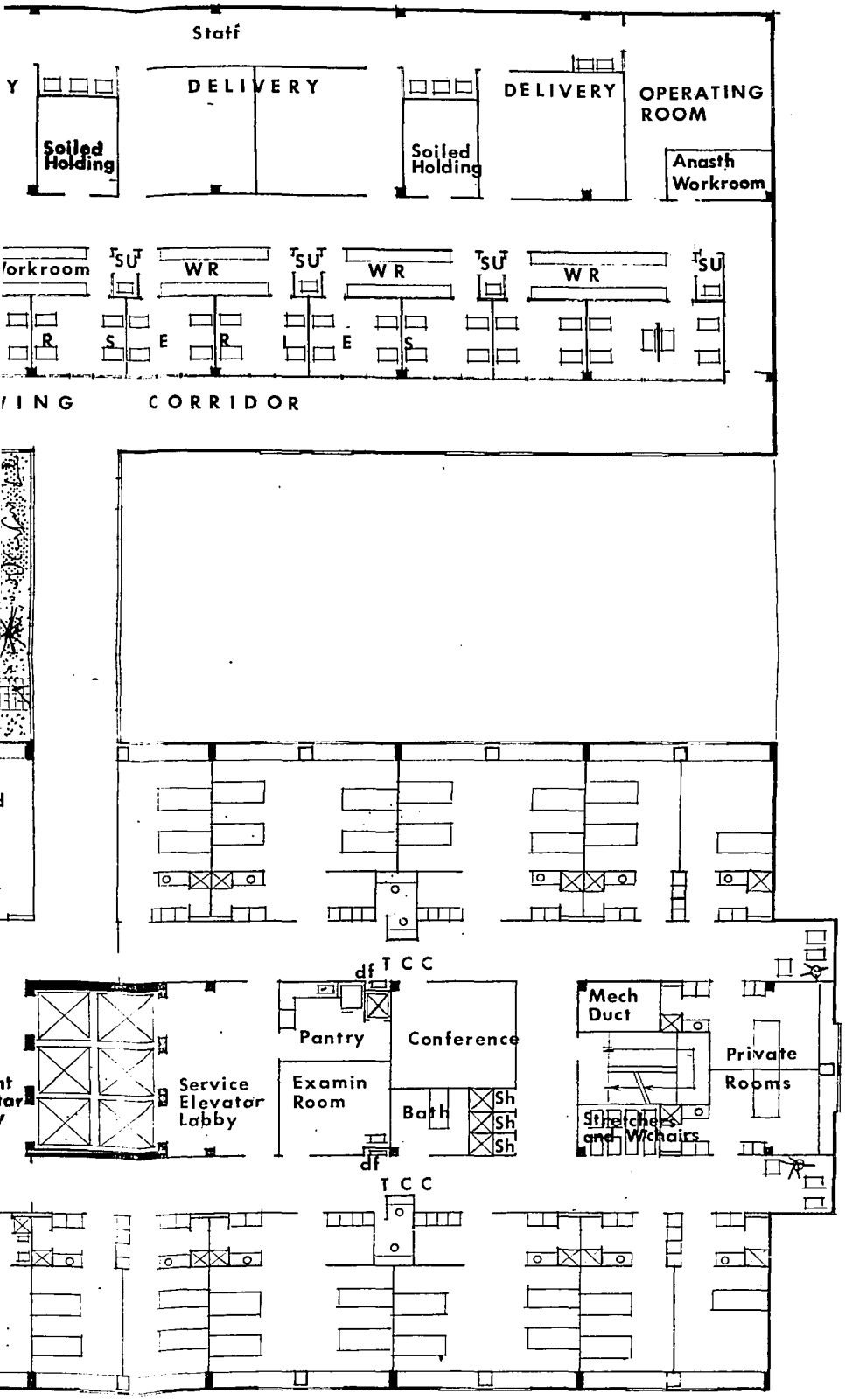


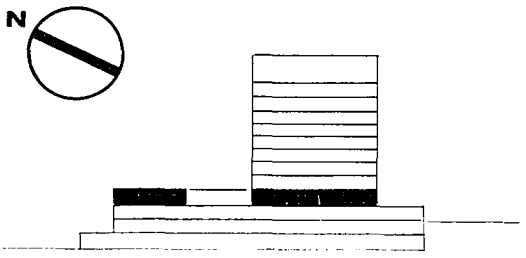


THIRD LEVEL PLAN

ADMINISTRATION & DIETARY

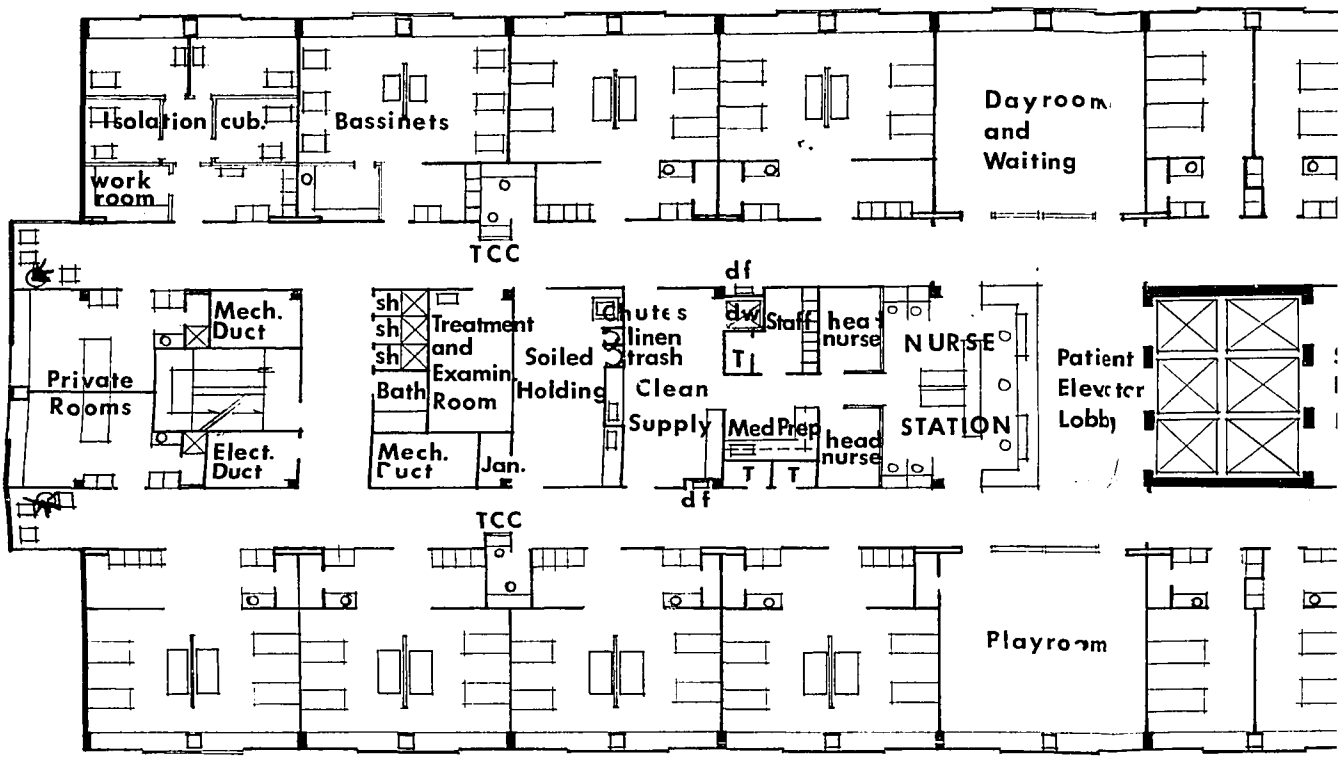

Sterile
Corridor
Staff
LABOUR ROOMS
RECOVERY
DELIVERY
DELIVER
Doctors
Nurses
Soiled Holding
Staff
Staff
Corridor
LABOUR ROOMS
Nurse Station
WR
Scrub Up
Workroom
SU
Workroom
SU
WR
Med Prep
Super
T
NURSERY
VIEWING CORRIDOR
Dayroom
Relatives and Fathers
TCC
Mech Duct
Private Room
Elect Duct
SH
SH
SH
Examin
Bath Room
Soiled Holding
Chutes
Linen
trash
Clean
Supply
Mech Duct
Jan
df
dw
T
Staff
H Nurse
Med Prep
HNurse
T
T
df
NURSE STATION
Patient Elevator Lobby
Service Elevator Lobby
TCC
Isolation Rooms

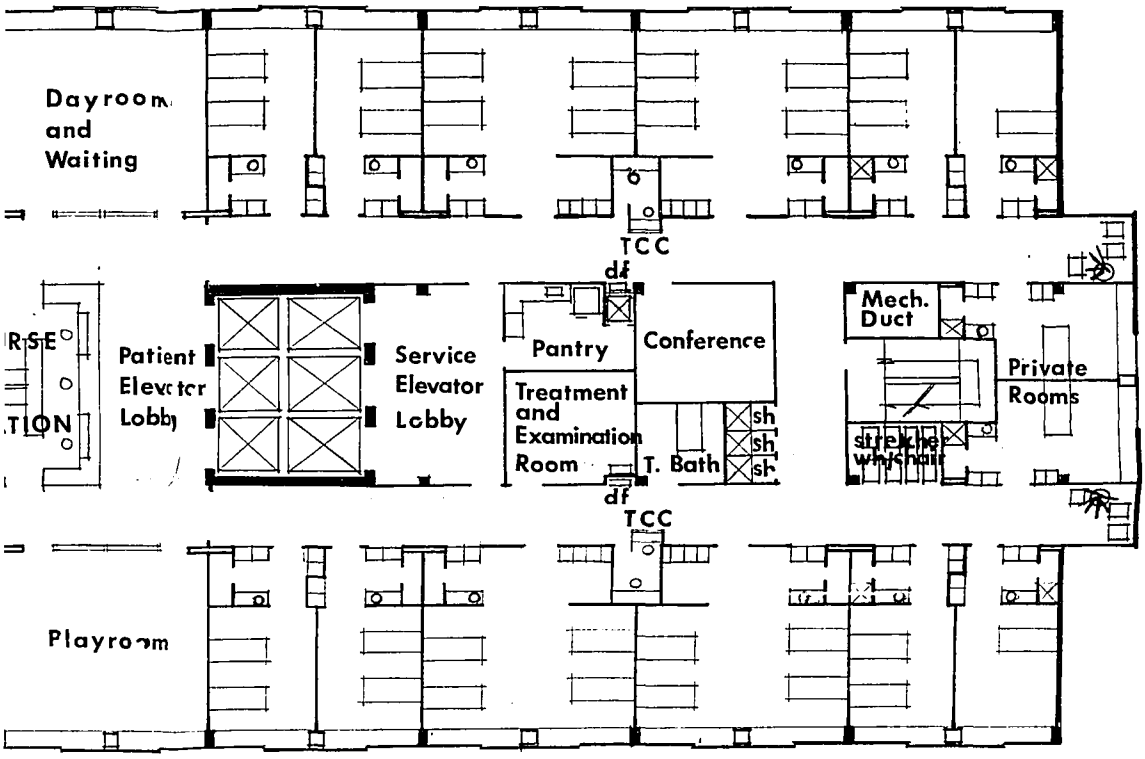


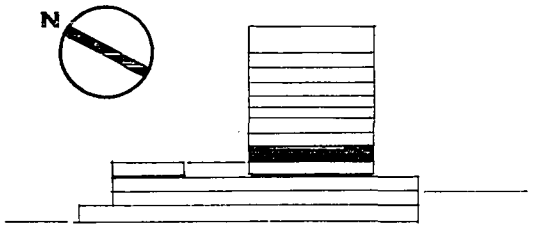


FOURTH LEVEL PLAN 0 5 10 15 20

MATERNITY & DELIVERY


Isolation cub.
Bassinets
work room
Dayroom and Waiting
TCC
df
Mech. Duct
Private Rooms
Elect. Duct
sh
sh
sh
Treatment and Examin. Room
Bath
Mech. Duct
Jan.
Soiled Holding
Chutes
linen
trash
Clean Supply
dw
Staff
T
heat nurse
NURSE STATION
Med Prep
T
T
head nurse
df
Patient Elevator Lobby
TCC
Playroom

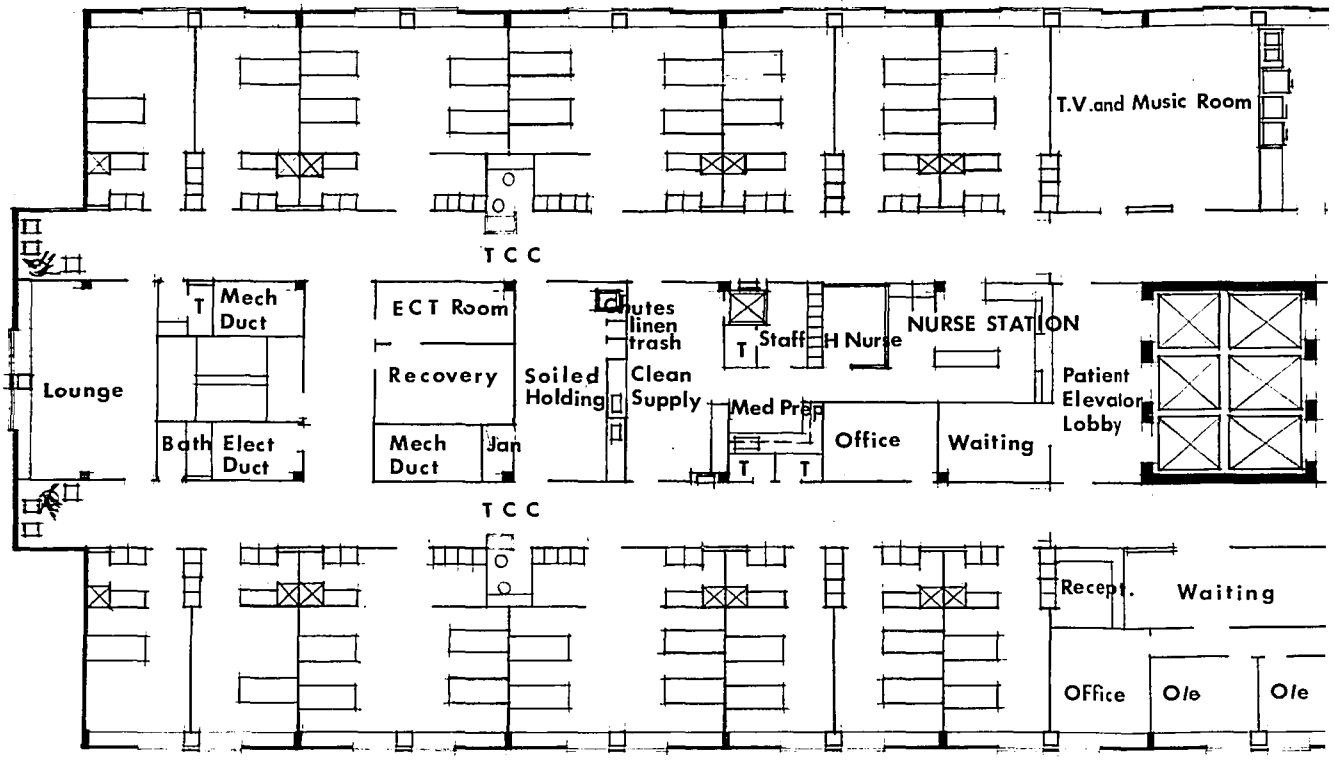


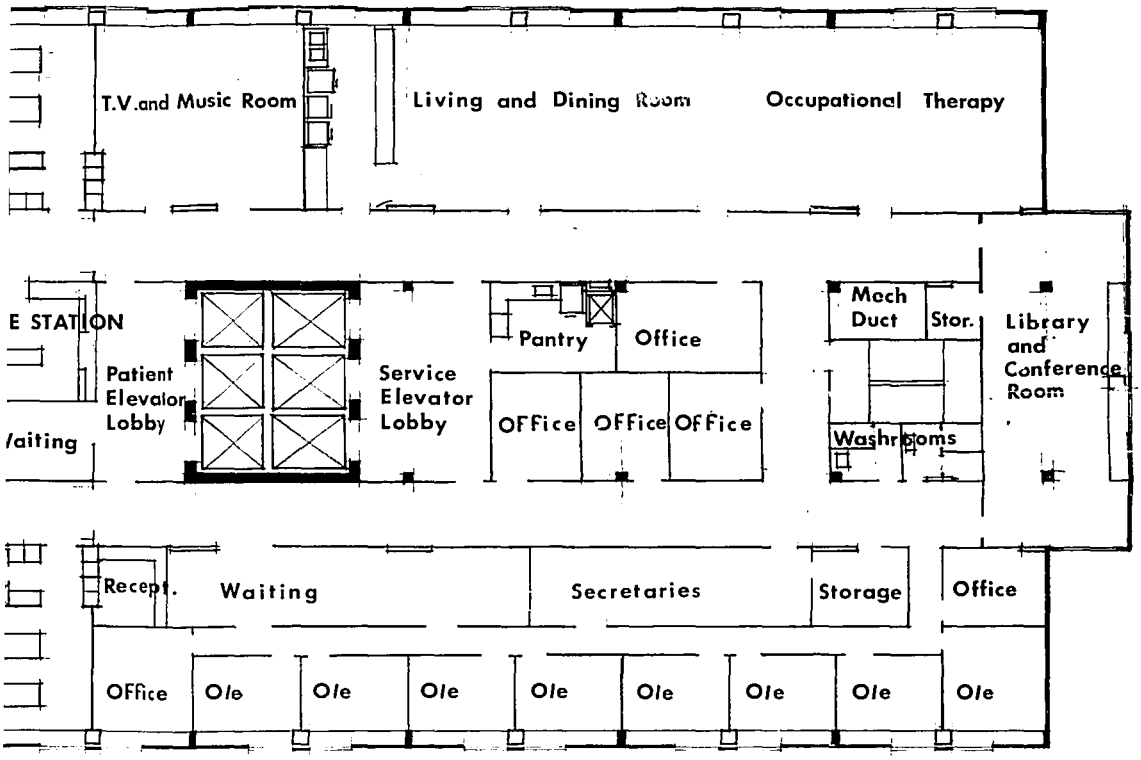


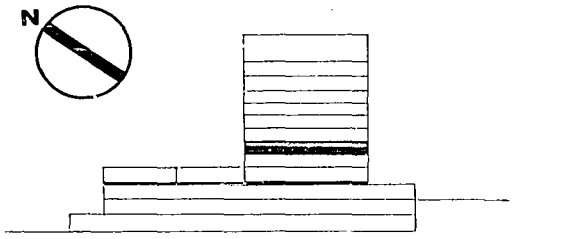
FIFTH LEVEL PLAN

0 5 10 15 20

PEDIATRICS


T.V.and Music Room
T C C
Lounge
T
Mech
Duct
Bath
Elect
Duct
ECT Room
Recovery
Mech
Duct
Jan
Soiled
Holding
Chutes
linen
trash
Clean
Supply
T
Staff
H Nurse
NURSE STATION
Med Prep
T
T
Office
Waiting
Patient
Elevator
Lobby
T C C
Recept.
Waiting
Office
Ole
Ole

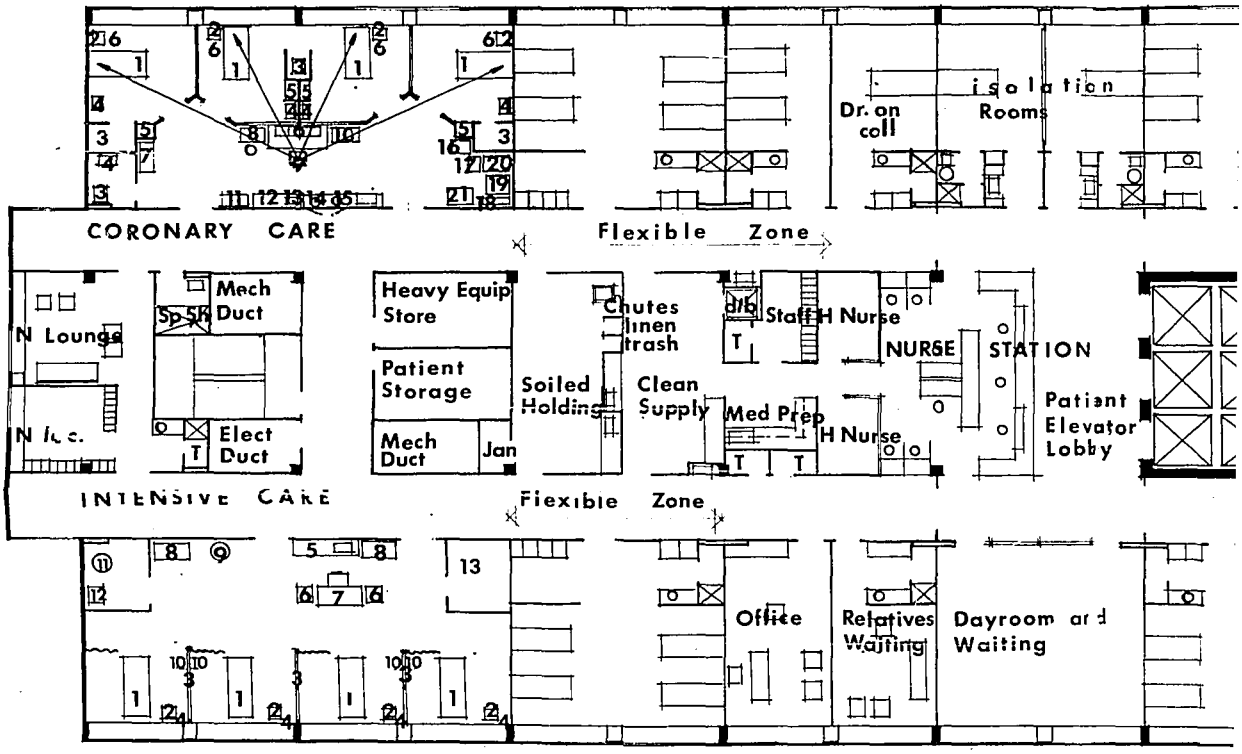




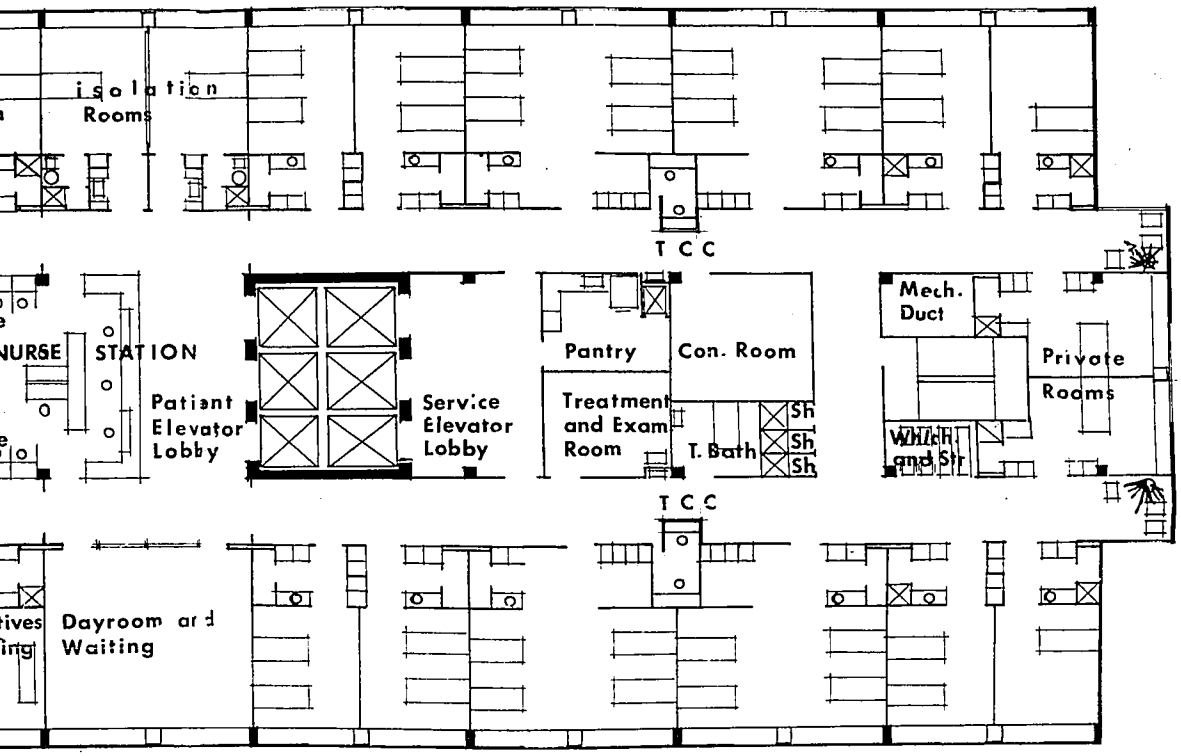
SIXTH LEVEL PLAN 0 5 10 15 20

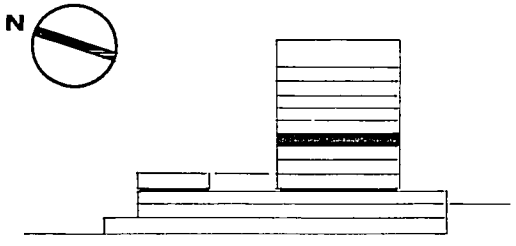
PSYCHIATRICS

1 Bed
2 Bedside table
3 WC
4 Lav
5 Locker
6 Monitor
7 Patient Lift
8 Doctor's Table
9 Nurse
10 Crash Cart
11 Supply Cart
12 Linen Cart
13 Med. Cabinet
14 Trash
15 Soiled Linen
16 Utility Cart
17 ECG
18 Heart Massage
19 Rescus.
20 W/Ch
21 Commode



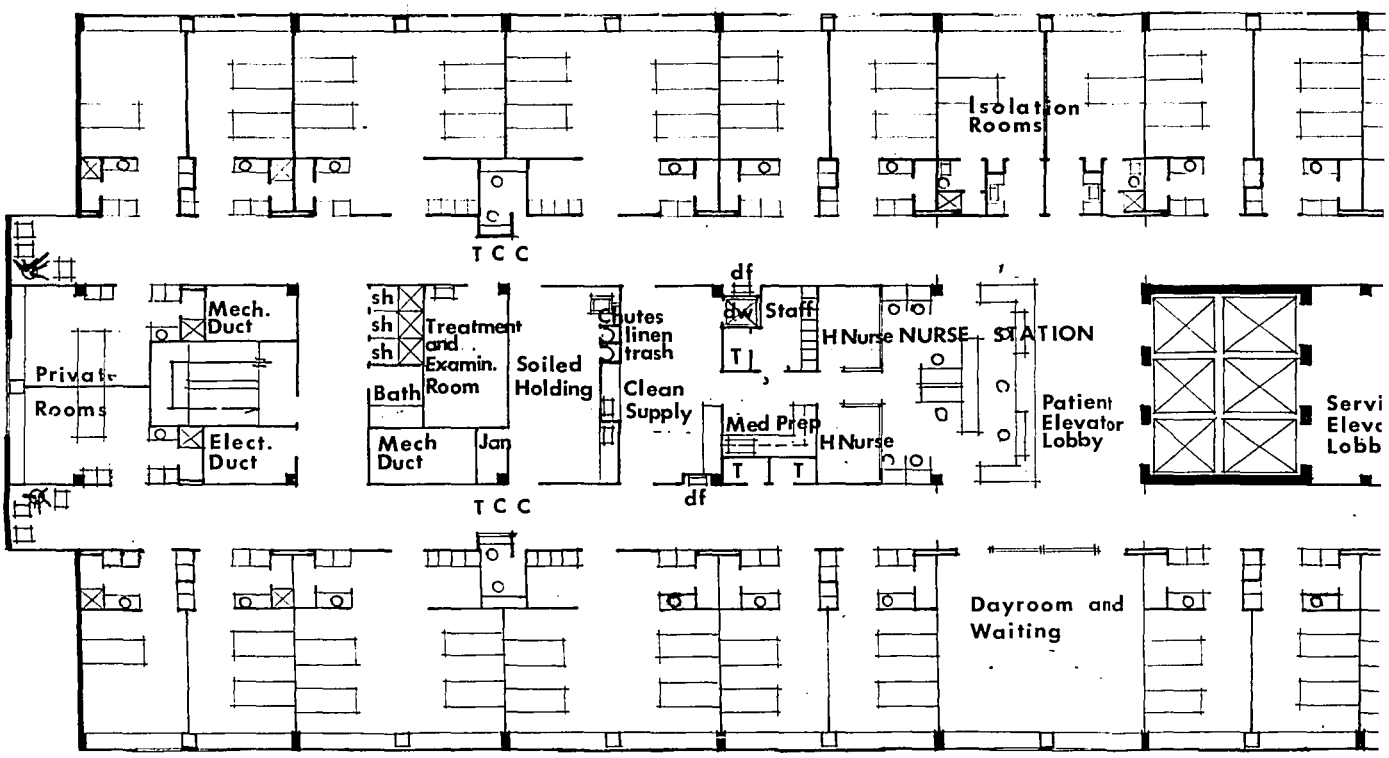
1 Bed
2 Bedside table
3 Glass 40" above floor
4 Oxy. surtion & elect. outlets
5 Counter 36" high, open below
6 Utility table with casters
7 Charting desk 42" high
8 Utility supply cart
9 Laundry hamper
10 Lav. (foot control)
11 W.c.
12 Lav. (foot control)
13 Storage

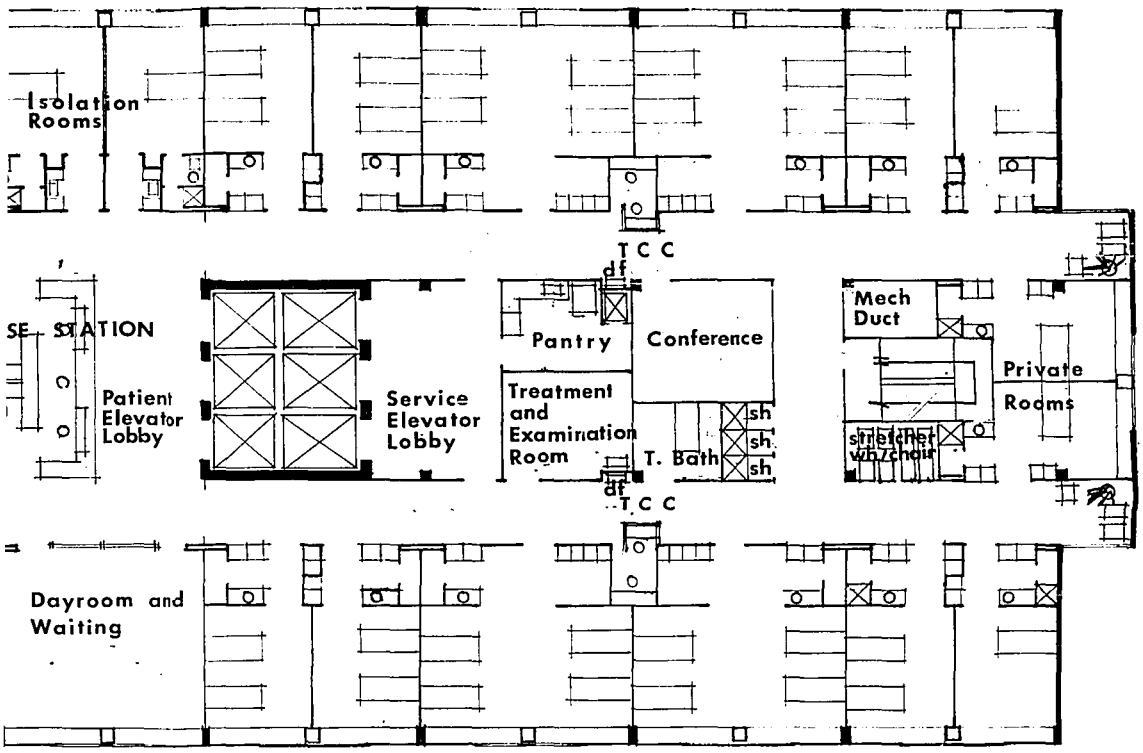


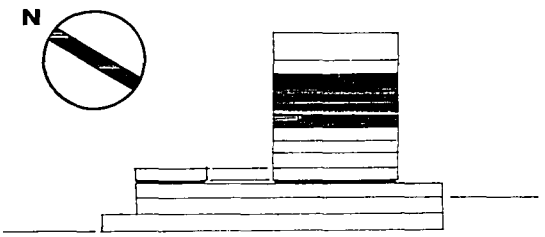


SEVENTH LEVEL PLAN 0 5 10 15 20

CORONARY & INTENSIVE CARE UNITS

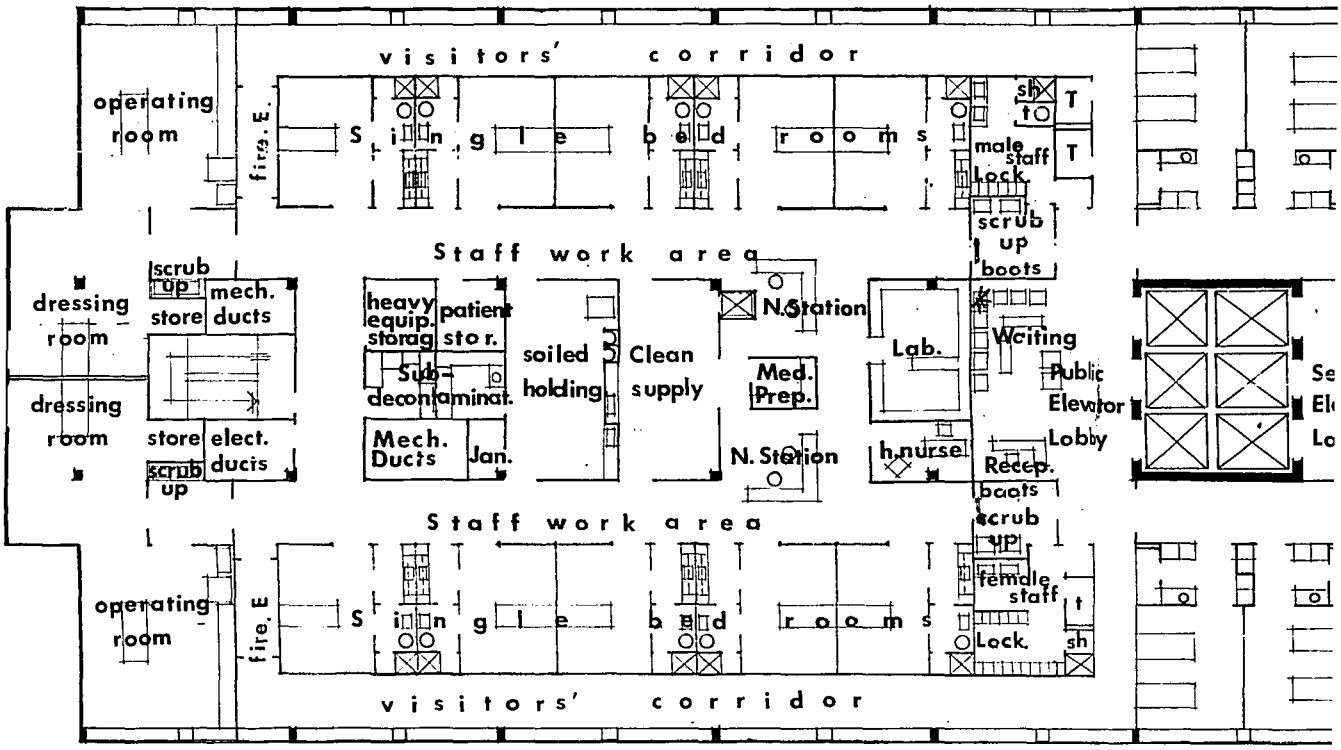

Isolation Rooms
T C C
Mech. Duct
Private Rooms
Elect. Duct
sh
sh
sh
Treatment and Examin. Room
Bath
Mech Duct
Jan
Soiled Holding
Chutes linen trash
Clean Supply
T C C
df
Staff
H Nurse
NURSE STATION
Med Prep
H Nurse
T
T
T
df
Patient Elevator Lobby
Servi
Elevc
Lobb
Dayroom and Waiting

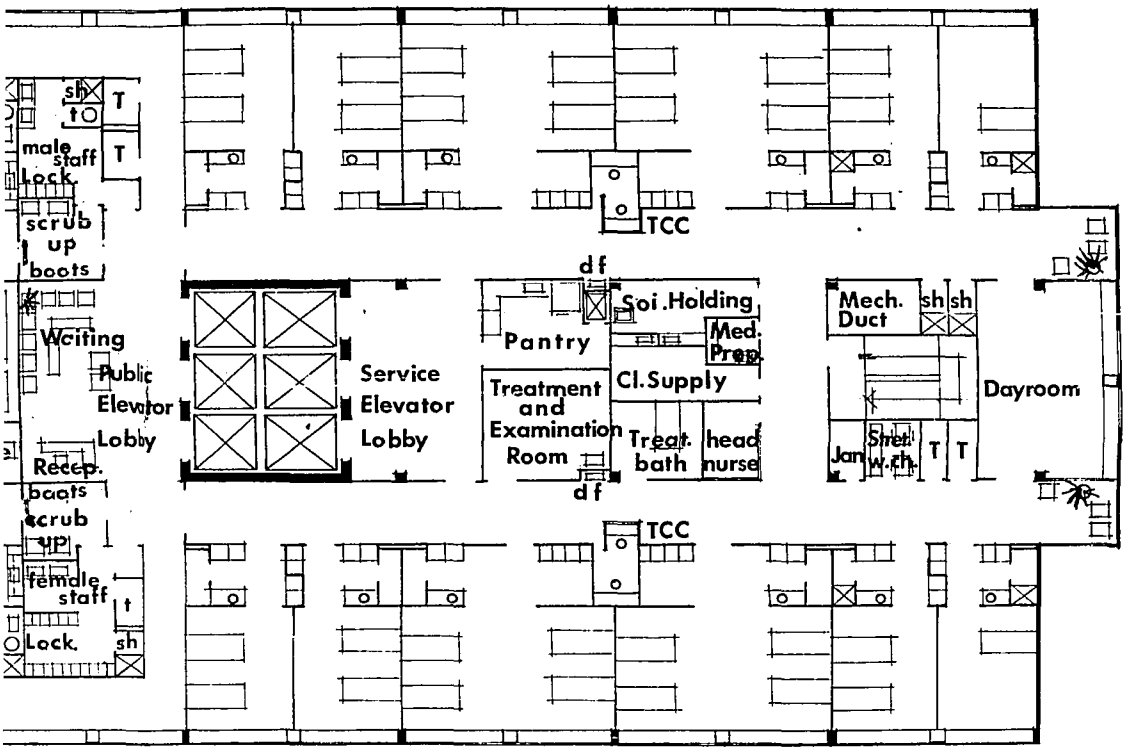


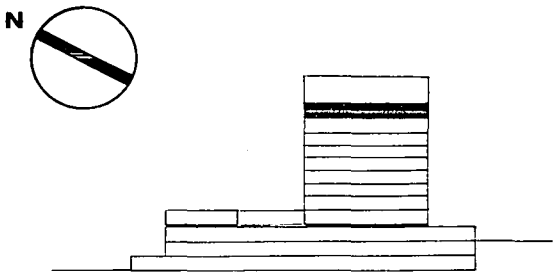


TYPICAL LEVEL PLAN 0 5 10 15 20

66 MEDICAL & SURGICAL BEDS

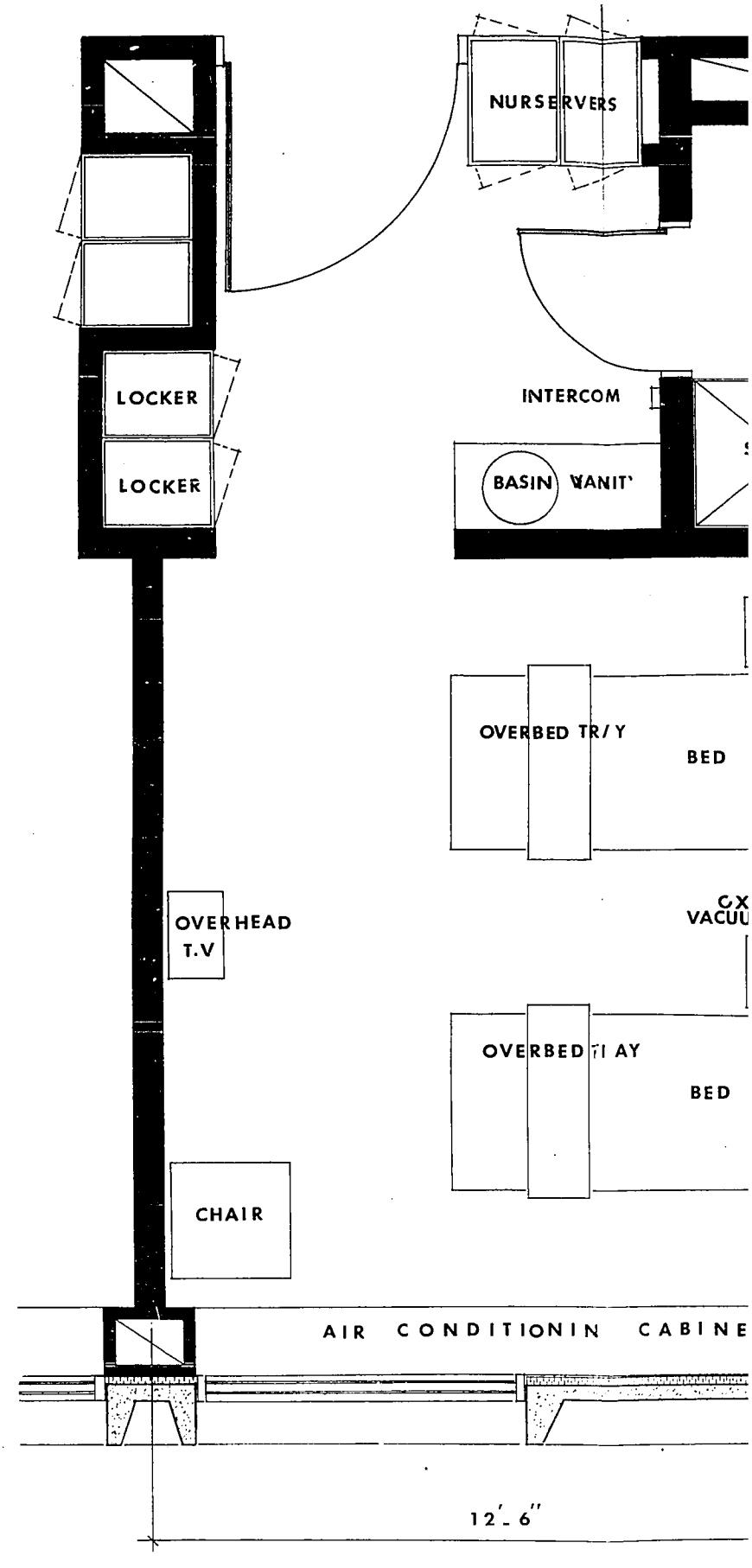

visitors' corridor
operating room
fire. E.
Single bed rooms
sh
t
T
male staff Lock.
T
scrub up
boots
Staff work area
scrub up
dressing room
mech. ducts
store
heavy equip. storag
patient stor.
N. Station
soiled holding
Clean supply
Med. Prep.
Lab.
Waiting
Public Elevator Lobby
dressing room
store
elect. ducts
Sub-decontaminat.
Mech. Ducts
Jan.
N. Station
h. nurse
Recep.
scrub up
boots
scrub up
Staff work area
operating room
fire. E
Single bed rooms
female staff Lock.
t
sh
visitors' corridor

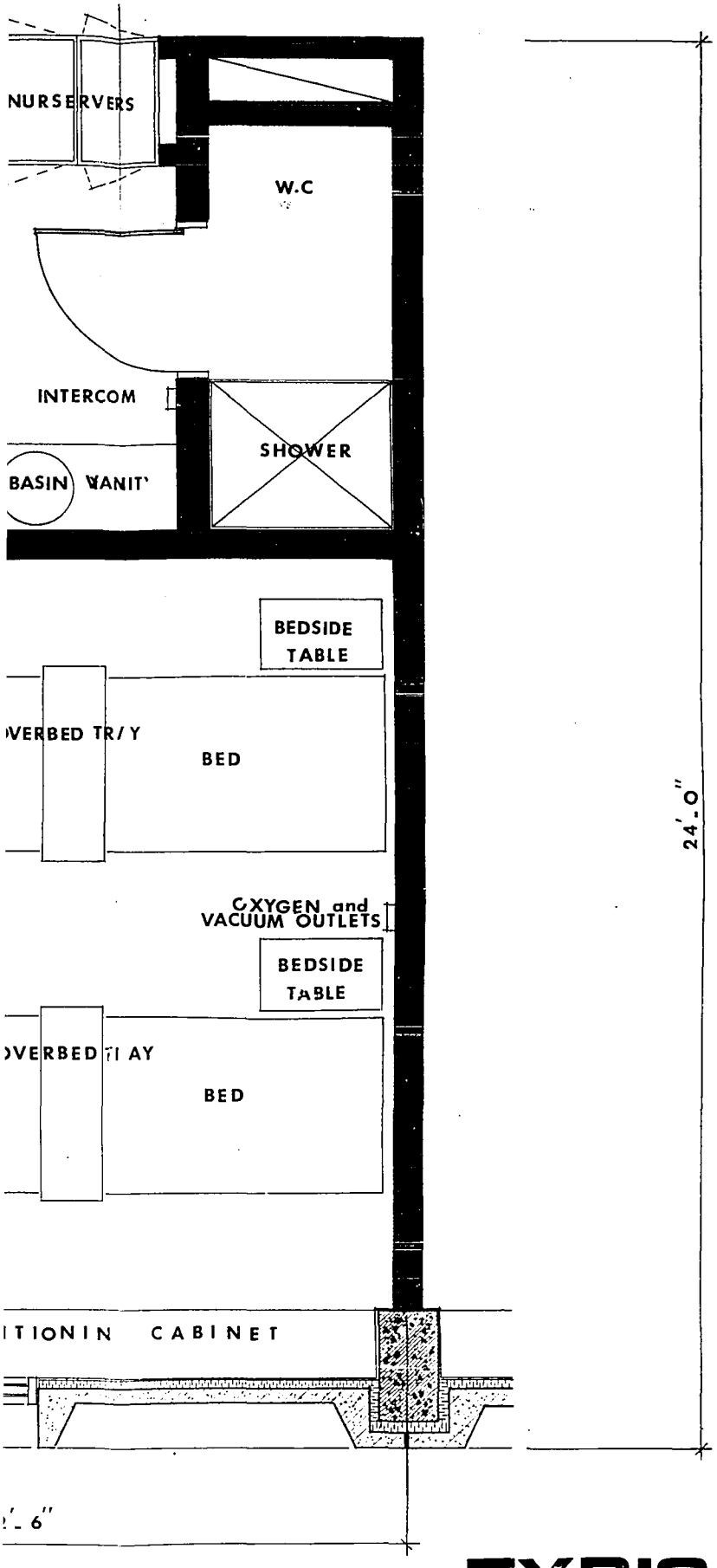




TWELFTH LEVEL PLAN 0 5 10 15 20

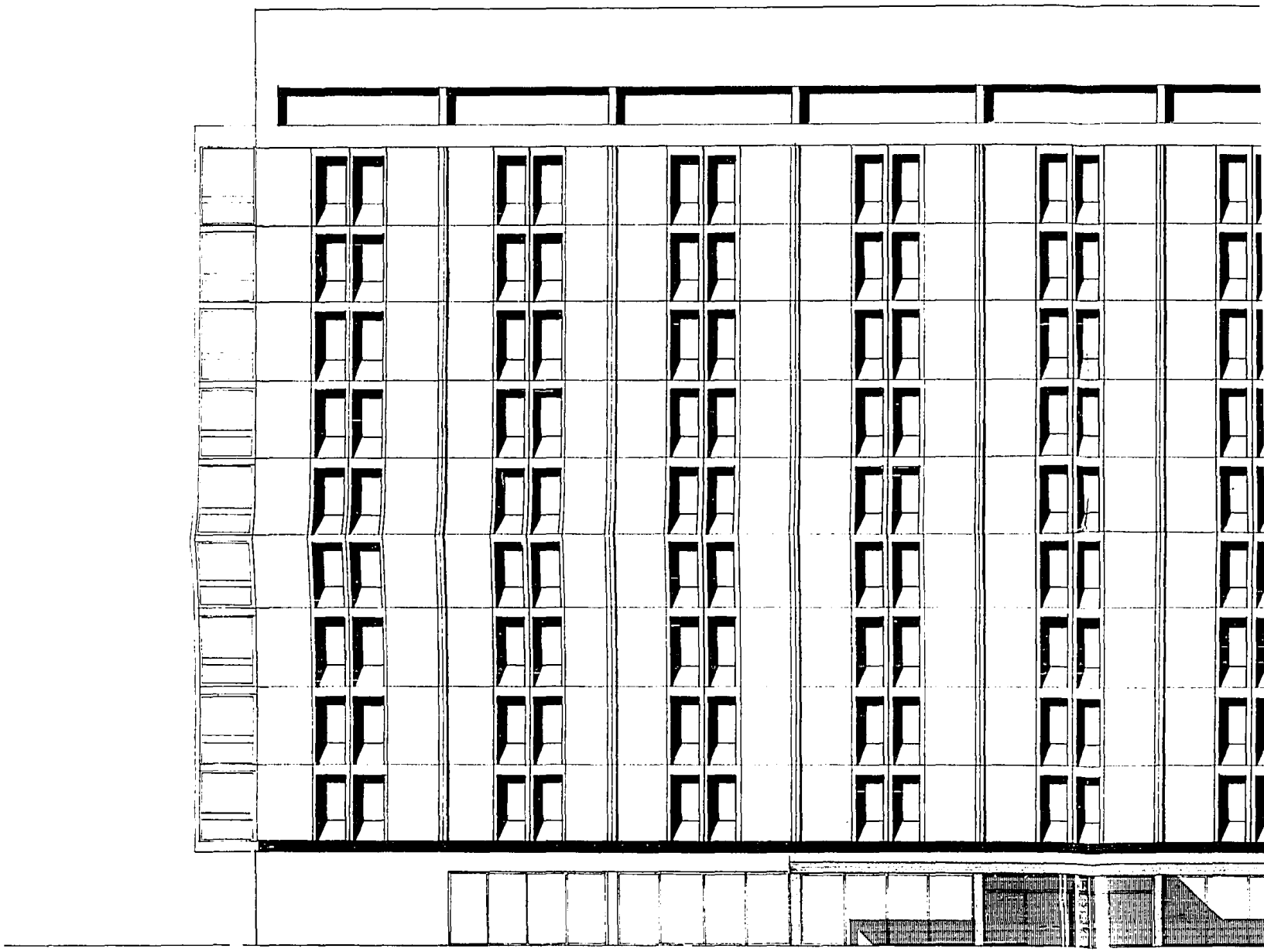
BURS UNIT

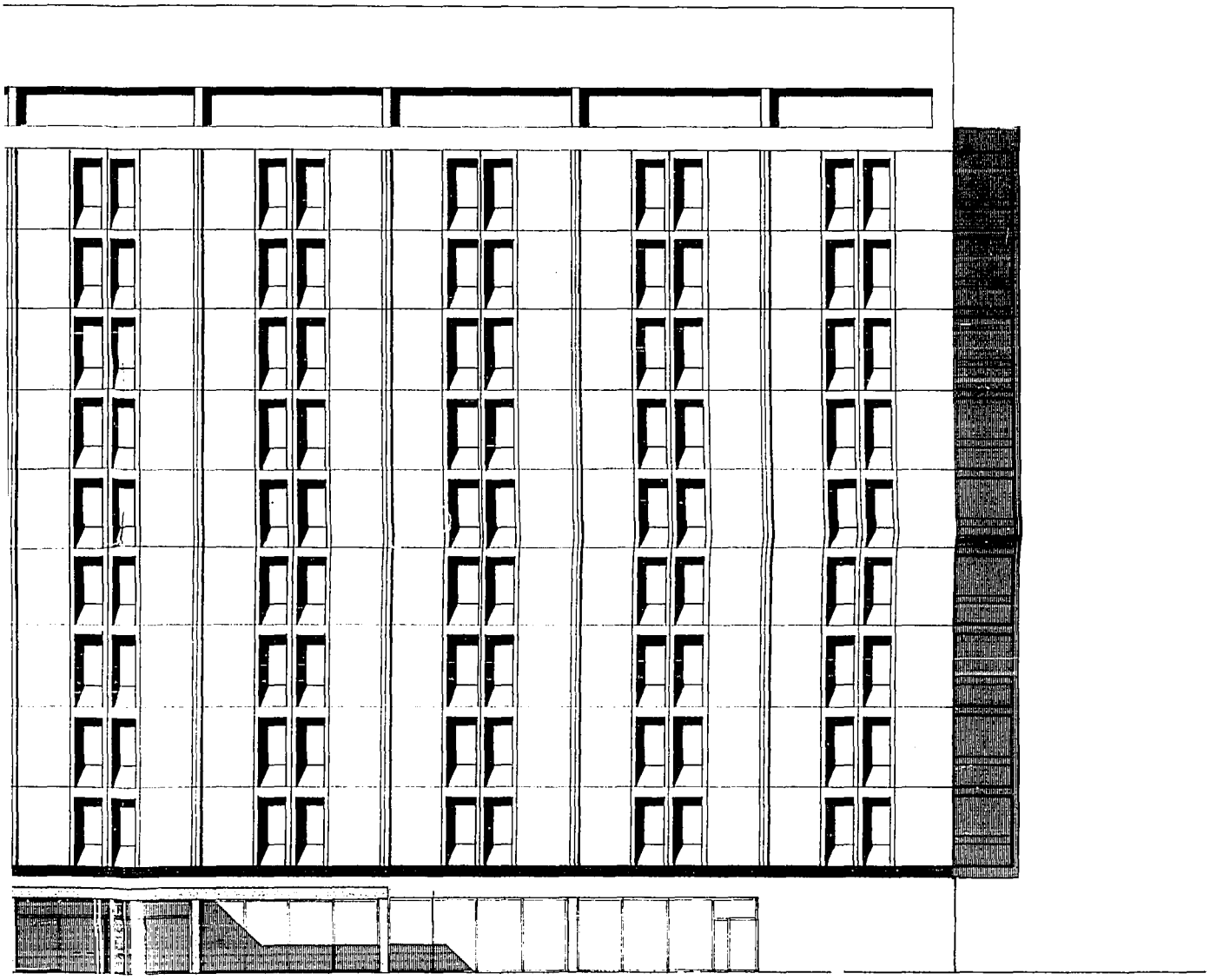

NURSE
RVERS
LOCKER
LOCKER
INTERCOM
BASIN
VANIT'
OVERBED TR/ Y
BED
OVERHEAD
T.V
OVERBED TI AY
BED
CHAIR
AIR CONDITIONIN CABINE
12'-6"



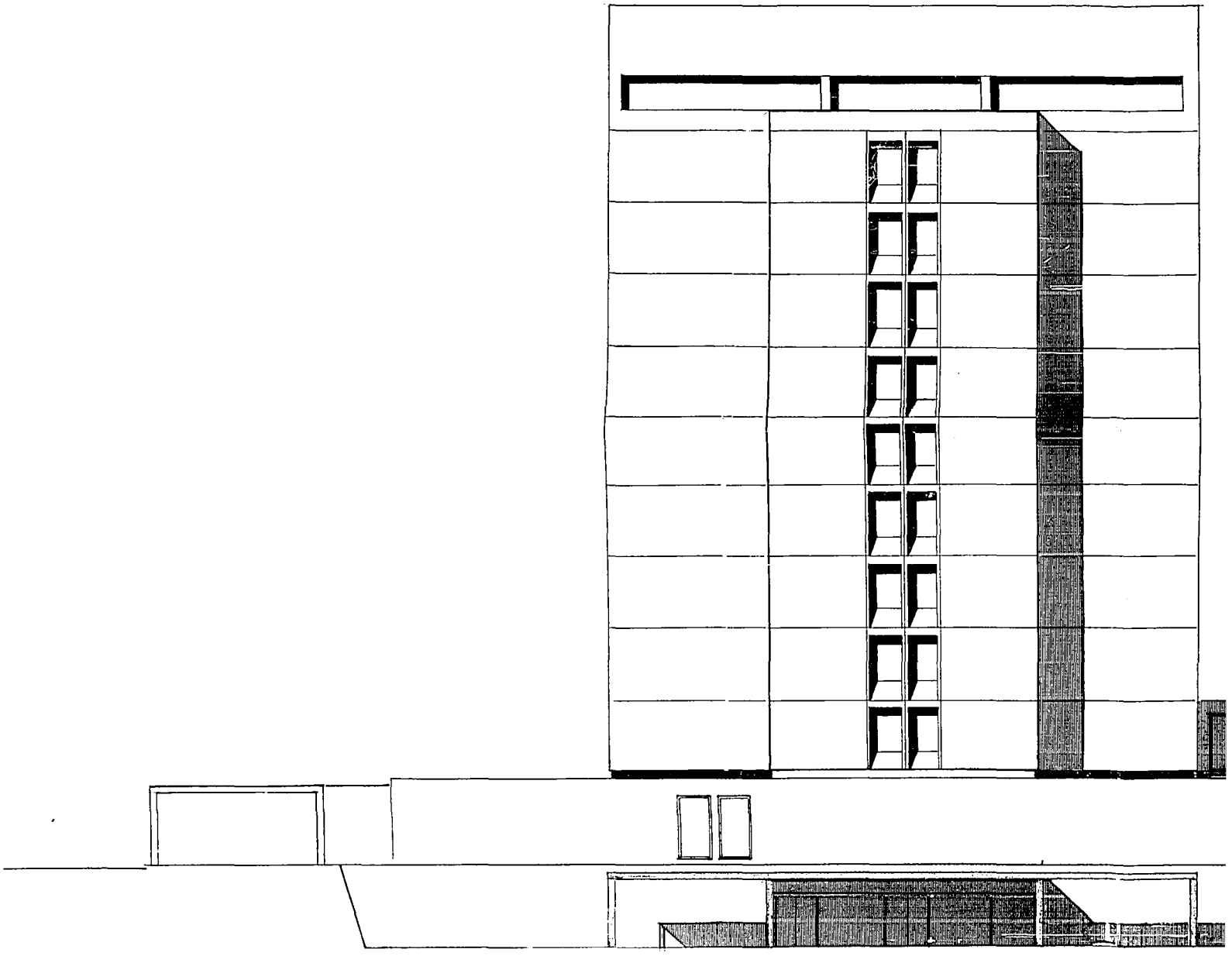
TYPICAL BED ROOM

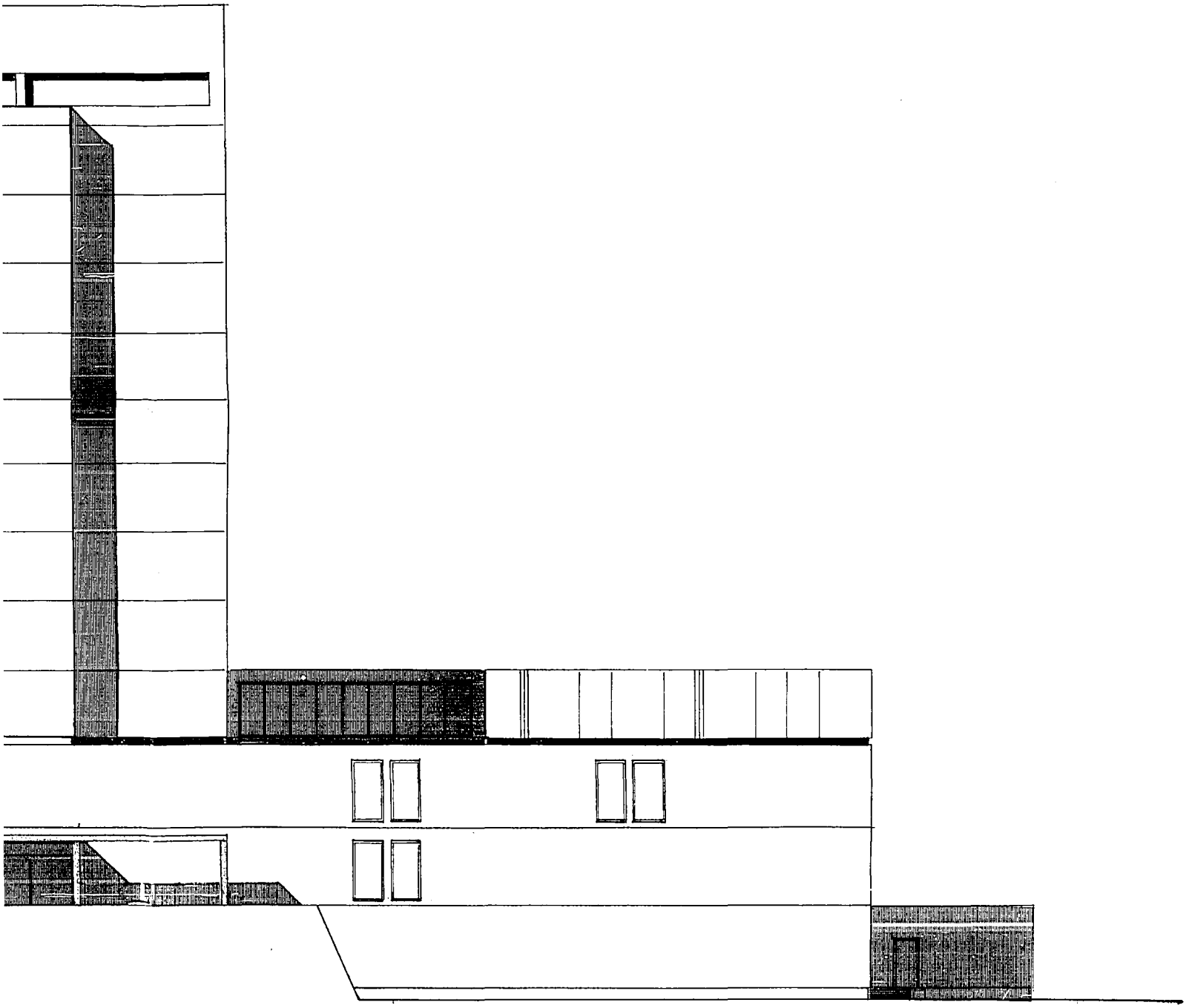
0 1 2 3 4 5 6 7 8 9 10



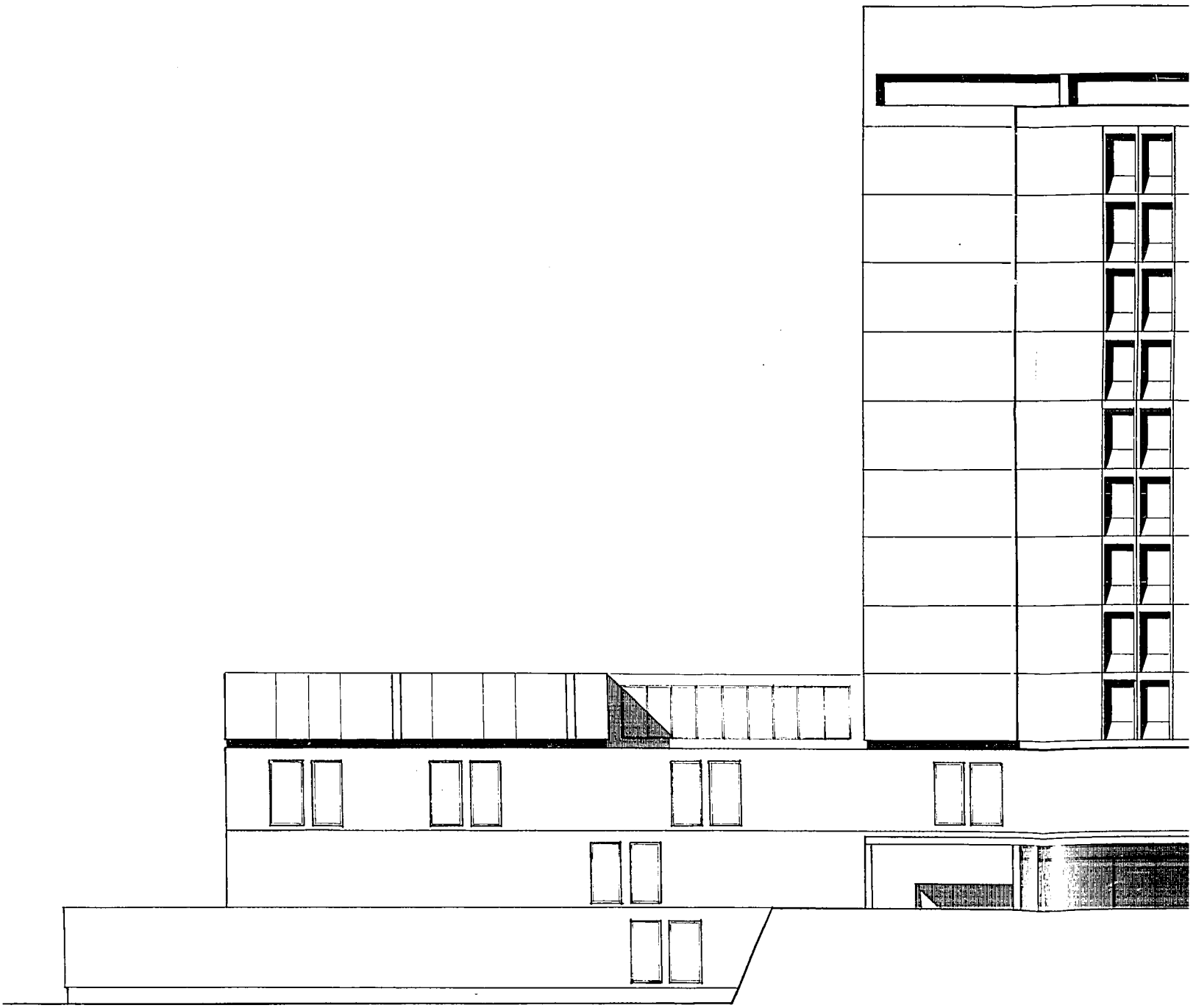


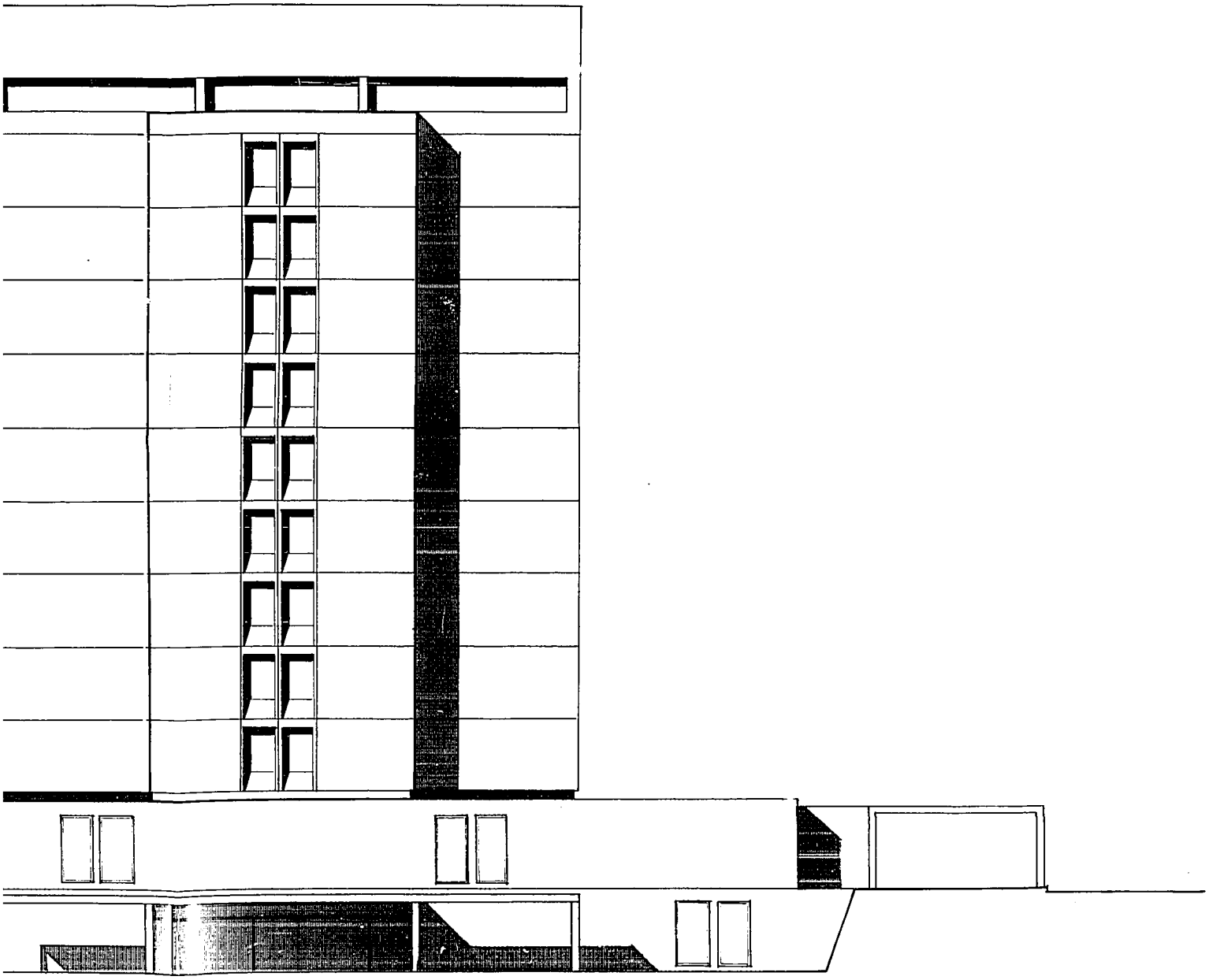
WEST ELEVATION



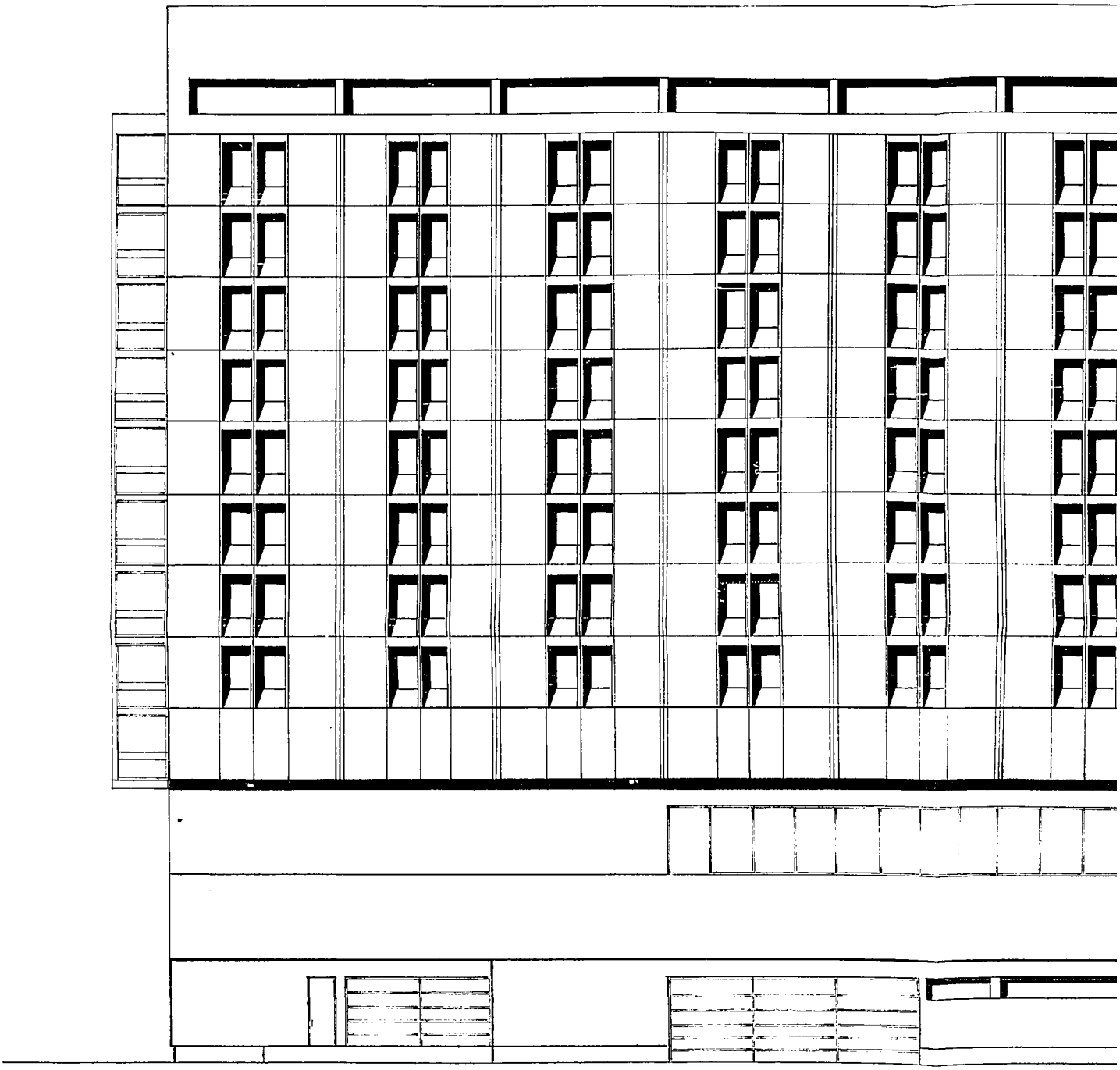


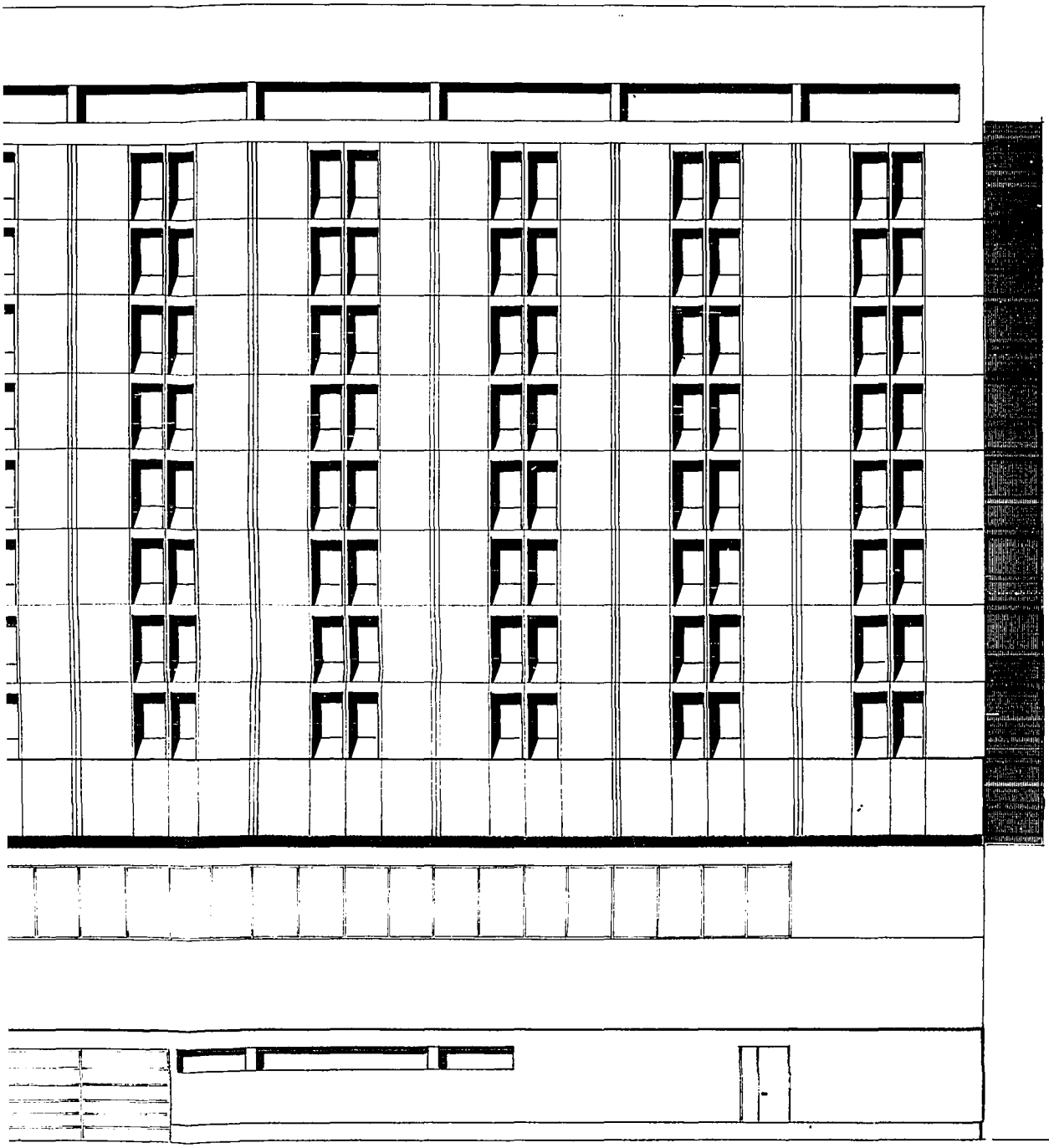
SOUTH ELEVATION





NORTH ELEVATION





EAST ELEVATION