SUGGESTIONS AND DEMONSTRATION PLANS FOR HOSPITALS FOR SICK CHILDREN*

BY

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The fundamental unit in a hospital is the individual sick person. Any study of a hospital must start from consideration of the needs of the sick individual, and the complexity of a hospital is the result of the many needs of many individuals suffering from a variety of diseases. The children's hospital has three other factors which must be ever present in the minds of the organizers and designers, and which make the task of satisfying all the needs ever more difficult. They are: (1) the prevention of infection from patient to patient and from staff to patient (this aspect alone introducing elements which have a most important effect on the plan); (2) the need for constant supervision of the relatively helpless child; (3) the provision of companionship to counteract home-sickness. These three overriding problems must be faced in the ward unit, and are the crux of the problem in designing hospitals for sick children. The relationship of the ancillary departments to the ward units is, by and large, the same for general as for children's hospitals. The ward unit will, therefore, be considered first and in most detail.

The ward block at the Hospital for Sick Children, Great Ormond Street, London, has been in use for eight years, and there has, therefore, been time for criticism and assessment of the original conception of the ward unit, which represents the attempt to interpret the requirements of the Building Committee in terms of bricks and mortar. Fig. 1 is a plan of a typical ward unit of twenty beds, as at Great Ormond Street; and fig. 2 is a plan of a ward unit such as we would build now, embodying the improvements resulting from our experience in the use of the previous example, and based on the assumption that we might have a better and less congested site on which to build.

Early Wards

Before proceeding with a critical examination of the new ward unit, let us refer for a moment to earlier examples, and eliminate the features which

do not subscribe to our programme. Plate IIIa shows a ward built in 1862. Several such wards were built on different floors. After seeing this photograph it is easy to understand that large wards, after the common fashion in adult hospitals of the period, were a step in the right direction.

Plate IIIb shows a large ward of thirty-five beds built in 1880. Some time later ten or fifteen permanent beds were placed on the balcony. The aspect was east and west; the long slits of windows helped to create a large, gloomy, and overbearing ward for children. There was no attempt to prevent cross infection, and no means of controlling any outbreak of infection from spreading to thirty-five patients. A nursing staff of probably six all had to use one room of approximately 80 sq. ft. for disposal of waste, dirty and soiled linen, mackintoshes, storage of specimens, and ward cleaning materials. Open fires radiated as much dust as heat. Treatment had to be at the bedside behind screens.

Plate IIIc shows a ward built ten years later. No appreciable change had taken place, except that the aspect was south, and the ward generally more cheerful. Plate IIId shows a similar ward of 1900, the aspect having reverted to east and west. The hoods to the cots are worthy of notice. There was more light and ventilation, but otherwise the wards remained much the same as before. It would be easy to add many other criticisms of these illustrations, but the herculean work of the staffs of that period produced miracles even under such conditions. In none of these examples was full account taken of all the three factors special to children's wards, especially the prevention of cross infection and the need for constant supervision; though provision was made in all of them for companionship.

Modern Wards

Ward units

Criticism and analysis must now be directed to the more modern experiments in the planning of the ward units, which aimed at much higher standards of hygiene, convenience, and efficiency. Returning to fig. 2, it will be seen that the ward unit is based on twenty beds under the supervision of one sister, subdivided into two sub ward units of ten beds each. Each ten-bed unit is further divided into four single-bed wards and one six-bed ward. The

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FIG. 1.

Key:

1. 6-Cot Wards.	13. Cleaners.
2. Bathrooms.	14. Lifts.
3. Sink Rooms.	15. Medical Ward Sister's Office.
4. Treatment Rooms.	16. Men's Cloaks.
5. Clinics.	17. Women's Cloaks.
6. Waiting Rooms.	18. Waiting Room for Laboratory Section.
7. Media Preparation.	19. Secretary and Records.
8. Wash up.	20. Bio-chemist.
9. Main Laboratory.	21. Director.
10. Bio-chemical Laboratory.	22. Assistant Pathologist.
11. Single-cot Wards.	23. Technicians.
12. Ward Kitchens.	24. Surgical Ward Sister's Office.

FIG. 2.—Ward Unit, 20 beds.

advantages claimed for this layout are: (1) prevention and control of cross infection; (2) constant supervision, by arranging for all the patients to be seen from the focal points in the units; (3) companionship, by associating patients of similar ages in six-bed wards; (4) isolation of infant, infectious or very ill cases in single-cot wards; (5) special treatments, i.e. iron lung, can be administered without disturbing other patients; (6) a flexible arrangement of patients which allows for the grouping of cases to each consultant; (7) reduction of the scale of rooms, to inspire and induce confidence in children on admission.

The main services and utility rooms are duplicated in each unit. This apparent extravagance can be justified on the following grounds: (1) in the event of an epidemic, any of the sources of cross infection are limited to ten beds; (2) the time spent by the nursing staff in movement between patients is halved, and much additional time can, therefore, be devoted to the supervision and care of patients.

The wards can now be considered in greater detail by examining each of the major rooms.

Fig. 3 shows a single-bed ward, with a south or

FIG. 3.—Single Cot Ward.

south-east aspect. The bed is arranged so that the patient can be approached from the right-hand side, and examined, nursed, or treated from either. There is sufficient space for a cot or bed for the older child. The area is 99 sq. ft. This is greater than the minimum usually recognized, 70 sq. ft., but is based on the space required round the bed for examination and nursing at the bedside. In sequence from left to right are the following facilities: (a) the surgeon's lavatory, with babies' bath, soap, lotion bowl; powder and oil, and towel

rail; (b) a bedside locker, with the patient's towel, mug, tooth brush, toys, clothes, etc.; (c) oxygen point; (d) a 15 amp. power point, for portable x-ray apparatus, cardiograph, or electric fire; (e) a bedpan stool; and (f) a bed table. There will also be the medical record card holder, the nurse's gown, curtains, and chairs. There are windows and cross ventilation; blinds are necessary; and there is a smooth run-out on to the balcony, with no steps. The balcony is 5 ft. 6 in. wide, screened to 6 ft. 6 in. with a close steel mesh. Other points to be noted are: (1) the glazed screens, made of steel, flush to the wall, and cork-filled; and with plate glass, and round, easily cleaned corners; (2) the doors, a minimum of 3 ft. 3 in. wide, on check-action floor springs, with a simple bolt on the outside only, and an ample rubber kicking plate; (3) soft water, mechanical or natural, should be available as an essential requirement at all nursing points; (4) the ward can be cleaned by vacuum; (5) the walls and ceiling are finished with acoustic tiles, the floor with terrazzo; (6) the heating is by a panel in the ceiling; (7) artificial lighting by a multi-purpose telescopic fitting is suggested, the alternative choice being high-intensity fluorescent tubes.

Plate IIIe shows a single-bed ward at the Hospital for Sick Children, Great Ormond Street, and Plate IIIf a surgeon's lavatory, with babies' bath containing a recess for soap, powder, oil and thermometer; the lotion bowl, and towel rail. The lavatory is in fireclay with a surround of tiles, and the fittings fold flat to the wall. For those unfamiliar with what is meant by 'panel heating,' Plate IIIg gives an example of the system as installed at Great Ormond Street.

Plate IIIh shows the six-cot ward, which is designed to run across the full width of each end of the unit, in order to obtain direct cross-ventilation. The patients are partly isolated by glazed partitions 6 ft. 6 in. high. There is direct access to the balcony. Otherwise the services, finishes, etc., are as in the single-cot ward.

Supervision. The second of the special factors affecting the planning of the children's ward is constant supervision. It is important, therefore, that facilities should be arranged in a planned sequence so that the organization and routine of all the aspects of examination, treatment, and nursing can be accomplished with the greatest efficiency. Throughout these plans the left-to-right-hand sequence has been adopted as the basis for the arrangement of fittings and services. The most important services, or those to which there is the most traffic, are placed in the central position relative to the patient, and priority in position is given in turn according to the relative density of movement. The focal point of supervision is the nurses' station (fig. 4). From this position the nurse can see at a glance all the patients in the unit. This space is a ventilated lobby with built-in furniture, open to the corridor, and with a glazed partition to the six-bed ward. The following

FIG. 4.—Nurses' Station.

facilities are provided: (1) a nurse's locker; (2) a recess for fire apparatus; (3) a blanket-warmer and operation clothes; (4) linen cupboards; (5) a nurse's W.C.; (6) a mirror, lavatory basin, towel rail, soap holder, and lotion bowl; (7) a notice board and blackboard; (8) poisons and narcotics; (9) facilities for the preparation of medicine; (10) a flower bench and laboratory sink, with cupboards underneath for vases, and a waste bin; (11) a writing desk and stationery holder; (12) an electric clock, paging and lighting switches, radio control, and house telephone; (13) a pneumatic tube to the records department.

Cupboards with steel fronts are used for heated linen, and cupboards throughout should be standard units which can be easily removed for maintenance.

The sink room. Fig. 5 shows the sink room, which has been designed with a dirty side and a

FIG. 5.—Sink Room.

clean side. On the left is: (1) an incinerator for burning soiled dressings and waste; (2) a bed-pan washer of the built-in foot-operated type; (3) a porcelain slab and soil sink for washing mackintoshes, and storage racks underneath; and (4) space for a laundry trolley. It should be noted that a hood is placed over the sterilizers, and an extract fan provided to ensure the speedy evacuation of moisture-laden air and a flow of air from the corridor; a fly screen is provided to the window. Bed-pan washers are built-in. Plate IVj shows a bed-pan sterilizer and bed-pan rack. This should be contrasted with a sink room of 1880 (Plate IVk), in which all the utilities for thirty-five patients had to be carried to the one and only household sink.

Treatment room. Fig. 6 shows the treatment

FIG. 6.—Treatment Room.

room designed for the treatment of patients, clinical examinations, and the preparation and storage of medical and surgical supplies. The couch is arranged for right-hand treatment. An instrument panel on the wall is fitted with air pressure (particularly for ear, nose, and throat wards), suction apparatus, oxygen, and a 15 amp. plug. There is a work bench with store cupboards underneath for medical and surgical supplies, dressing drums, etc.; a view box for wet and dry plates; a laboratory bench, with a bunsen sink, and a microscope point with ventilator, and cupboard beneath; a surgeon's lavatory, and the now usual accompaniment of soap holder, lotion bowl and towel rail; and lotion cupboards and hot water bottle store; a water boiler with a fomentation boiler in the top; instrument and bowl sterilizers; and a refrigerator for penicillin and pack ice.

Plate IVl shows the treatment room at the Hospital for Sick Children, Great Ormond Street. It is too small, but is indicative of the type of fittings to be used. Plate IVm shows the hot water boiler and instrument sterilizer. From our experience at Great Ormond Street the following 'do's' and

Bath room. Fig. 7 shows the patients' bath room

Fig. 8 shows the ward kitchen, where the same left-to-right sequence is maintained as kitchen specialists are advocating for domestic purposes, i.e. reception, holding, preparation, delivery: to which we must add sterilization. The ward kitchen is, therefore, laid out as follows: (1) refrigerator; (2) cooker; (3) work bench with a pot rack beneath and a shelf above, and a hot towel rail; (4) a sink with a recess for soap and solvents, and garbage cans beneath (this is the same size as the sink room); (5) a sterilizer for crockery; (6) crockery storage space, with sufficient cutlery for the trays in the drawers under the bench; (7) grocery storage space; (8) a toaster, mincer, and mixer; (9) a tray rack; (10) a notice board, and diet sheets, etc.; (11) a towel rail; and (12) a food trolley. The walls are tiled, the floor terrazzo, and the ceiling painted. There are fly screens to the windows. This plan

FIG. 8.—Ward Kitchen.

Circulation. With the above arrangement, in an area of 4,000 sq. ft. we can nurse twenty patients and ensure that (1) we have taken action to reduce and control cross infection; (2) all patients will be under constant supervision; and (3) adequate

arrangements have been made for companionship of the older and less ill children. The main limitations of this plan are (1) the points of support are unusual; and (2) the disposition of services is involved. The plan does not readily lend itself to superimposition on other accommodation. These limitations are overcome if the wards are planned vertically. The maximum number of beds, therefore, in any block, is 180, as the heights of buildings are generally controlled to a maximum of 80 ft. A vertical circulation is, of course, dependent on an efficient lift service. The essential point about a lift service is that all the lifts should be concentrated in a central position so as to offer the maximum opportunity for serving callers on different floors. It is also important to arrange for separate lifts for passengers, patients, and service. A device called 'automatic collective intercept control' should be fitted, to overcome the exasperating performance of lifts continually passing the intermediate floors. The bed lifts and service lifts should be interchangeable and capable of manual operation. Lifts should be self-levelling, and the motor rooms and motor supports carefully insulated and treated to prevent transmission of noise throughout the building. Plate IVp gives an idea of the services required for a plan of this type, and shows at once how economical vertical development is achieved. Plate IVq is an external view of the ward blocks at Great Ormond Street, showing a method of expressing the balconies.

Analysis of Accommodation

In order to introduce the problems of piecing together the ancillary, administrative, and mechanical services, an appendix has been added giving schedules of accommodation for each department, together with the relative sizes of each room. The schedules have been correlated, grouped and summarized, to show the total area of the hospital divided by the number of beds for hospitals of various sizes, as follows: a forty-bed hospital, 700 sq. ft.; an eighty-bed hospital, 500 sq. ft.; a hundred and sixty-bed hospital, 460 sq. ft.; a two hundred-bed hospital, 431 sq. ft. It is hoped that they may be of use to those who are intending to build new wards, both in framing requirements and in giving instructions to the architect.

It will be seen from the summaries that the additional 30 sq. ft. per bed in the single-bed wards represents a very small fraction of the total area of hospital per bed; also how relatively extravagant in floor area a small hospital of forty beds is, compared with one of two hundred beds. If plotted, the graph straightens after two hundred beds, and it is doubtful if larger hospitals can effect a saving below the 400 sq. ft. per bed.

Ancillary Departments

It is impossible here to discuss the ancillary departments in the same detail as the wards, and a very brief reference will be made to the major

problems, and to any problem peculiar to a children's hospital in these units.

Plate Vr takes us back again to the close of the nineteenth century, and shows an operating theatre of that period. It is a very good one, except that the ancillary rooms are inadequate. Plates Vs and Vt show the theatre at Great Ormond Street, which was planned by the hospital staff with the same open-mindedness and originality used on the ward units. It is probably not important for the theatres to be planned on the top floor. Plate Vu shows the sterilizer room.

Plate Vv shows the kitchens, which are unresolved problems in nearly all hospital plans. The greatest density and volume of inter-department movement takes place between the kitchen and the wards. The former should, therefore, be as central as possible. The choice can usually be narrowed down to a central position in a semi-ground floor or on the top floor. A better kitchen plan and circulation can be designed in the first case where freedom of space allows for difficulties arising from such a complex circulation as in the modern kitchen, e.g. the Hospital for Sick Children. A top-floor kitchen gives the best ventilation and light, both important factors in kitchen design; but the plan is handicapped by the space available for the plans of the departments underneath, for example, Westminster Hospital.

The varied dietetic requirements of many sick children create a different problem from that obtaining in an adult or general hospital. There is the addition of the milk laboratory, and the question arises whether it is economical to cook the bulk food for the staff and nurses in the same kitchen as the many individual preparations for the children, or whether it is best to divide the kitchen staff and have two separate kitchens—one for patients, the other for staff.

Plate Vw shows the laboratories at the Hospital for Sick Children, Great Ormond Street. This is another essential and important department, and a keen competitor for an area in a central position in the plan. If in this article the laboratories, radiology, and physiotherapy departments are not commented on, since there are no difficulties in planning them which are peculiar to children's hospitals, it is not to be inferred that they should not receive the closest attention and study in plan, circulation, and detail.

The out-patients' department, too, is a subject in itself, with a special claim to attention and comment from paediatricians, because the out-patient treatment of children is a different problem from that of similar treatment in a general hospital.

The hospital site, whether in town or country, will have a most important influence on the planning and inter-relationship of the various departments. It is necessary, in selecting a site, to consider: (1) accessibility for patients, visitors, staff, and personnel, and the relation of the site to public transport; (2) accessibility and circulation on the site of traffic and deliveries of supplies, bulk stores,

and fuel; (3) availability of public utilities, such as water, electricity, gas, telephones, and sewage disposal; (4) freedom from nuisances, noise, and noxious businesses; (5) size, availability, and preservation of trees; (6) topography; (7) town planning acts relating the site to the requirements of a local region.

We should like to acknowledge the unfailing interest and many ideas which have been contributed by the physicians, surgeons, nursing and administrative staffs at the Hospital for Sick Children, Great Ormond Street, London, to the planning problems that have been discussed.

APPENDIX

TABLE 1
NURSING SERVICES: AREA DISTRIBUTION

No. of beds	40	80	160	200
Patients' areas (nursing units)	8,008 sq. ft. (2)	16,016 sq. ft. (4)	32,032 sq. ft. (8)	40,040 sq. ft. (10)
Bed areas	3,628	7,256	14,512	18,140
Nurses' station	468 (4)	936 (8)	1,872 (16)	2,340 (20)
Sick room	468 (4)	936 (8)	1,872 (16)	2,340 (20)
Treatment room	792 (4)	1,584 (8)	3,168 (16)	3,960 (20)
Bathrooms and Patients' W.Cs.	468 (4)	936 (8)	1,872 (16)	2,340 (20)
Ward kitchen	468 (4)	936 (8)	1,872 (16)	2,340 (20)
Demonstration room	792 (4)	1,584 (8)	3,168 (16)	3,960 (20)
Sister's office	468 (4)	936 (8)	1,872 (16)	2,340 (20)
Visitors	288 (2)	576 (4)	1,152 (8)	1,440 (10)
H.M.C.	56 (2)	112 (4)	224 (8)	280 (10)
Stores	112 (2)	224 (4)	448 (8)	560 (10)
Total	8,008	16,016	32,032	40,040

(continued on next page)

TABLE 2
NURSING SERVICES (continued): AREA DISTRIBUTION

No. of beds	40	80	160	200
Operating suite	1,775 sq. ft.	2,855 sq. ft.	3,640 sq. ft.	4,205 sq. ft.
Major operating theatres	310 (1)	620 (2)	930 (3)	1,240 (4)
Minor operating theatres	260	225	225	225
Cystoscopic room	—	150	150	150
Local sterilizing rooms	100 (1)	100 (1)	200 (2)	200 (2)
Scrub-up room	50 (1)	90 (2)	100 (2)	130 (3)
Central sterilizer rooms	400	520	640	750
Instrument room	—	—	100	120
Utility room	125	125	125	125
Cleaners	20	20	20	20
Sister's office	—	75	100	120
Doctors' lockers and changing room ..	240	300	350	350
Nurses' lockers and changing room ..	160	160	220	280
Laboratory	—	50	50	50
X-ray and dark room	—	130	130	130
Plaster room	—	130	130	130
Splint store	—	50	60	75
Anaesthetic equipment store	110	110	110	110
Total	1,775	2,855	3,640	4,205

TABLE 3
NURSING SERVICES (continued): AREA DISTRIBUTION

No. of beds	40	80	160	200
Admission	665 sq. ft.	730 sq. ft.	810 sq. ft.	830 sq. ft.
Admission room	275	275	275	275
Observation room	200	200	200	200
Office and waiting room	—	70	70	70
Bathroom	60	60	60	60
Lavatories and W.Cs.	20	20	20	20
Utility	—	—	70	70
Storage	65	70	80	100
Stretchers and trolleys	35	35	35	35
Total	655	730	810	830

TABLE 4
ANCILLARY SERVICES: AREA DISTRIBUTION*

No. of beds	40	80	160	200
Pathology	620 sq. ft.	940 sq. ft.	1,260 sq. ft.	1,580 sq. ft.
Laboratory	250	400	525	650
Mortuary (including refrigeration storage)	250	300	325	350
Office	100	120	150	200
Waiting room	—	100	100	120
Lavatories and W.Cs.	20	20	40	60
Chapel	—	—	120	200
Total	620	940	1,260	1,580
Radiology	400 sq. ft.	600 sq. ft.	850 sq. ft.	1,200 sq. ft.
Physiotherapy	160 sq. ft.	180 sq. ft.	200 sq. ft.	250 sq. ft.
Pharmacy (bulk pharmacy storage included in central stores area) ..	185 sq. ft.	380 sq. ft.	555 sq. ft.	645 sq. ft.
Pharmacy	185	260	260	260
Solution room	—	120	120	120
	—	—	175	265
Total	185	380	555	645

* No area has been given for specific research departments.

TABLE 5
ADMINISTRATION SERVICES: AREA DISTRIBUTION

No. of beds	40	80	160	200
Administration	1,875 sq. ft.	2,635 sq. ft.	3,150 sq. ft.	3,760 sq. ft.
Main lobby and waiting room ..	320	420	520	620
Public lavatories	90	90	90	120
Telephones	10	10	15	15
House physician	150	150	150	150
Social service	—	160	200	250
Information and telephone	90	100	100	130
Superintendent	160	200	200	250
Secretary	125	125	125	125
Business offices	250	440	630	780
Staff lavatories	90	90	90	90
Record room	200	260	320	320
Matron's office(s)	140	160	260	320
Staff common room	250	250	250	300
Library and conference room	—	180	200	220
Total	1,875	2,635	3,150	3,760
Staff facilities	580 sq. ft.	940 sq. ft.	1,320 sq. ft.	1,660 sq. ft.
Nurses' locker room	320	500	680	860
Porters' locker room	130	220	320	400
Female staff	130	220	320	400
Total	580	940	1,320	1,660
Storage	2,175	4,300	5,500	6,300
Record storage	175	300	500	800
*Central lines	2,000	4,000	5,000	5,500
Total	2,175	4,300	5,500	6,300

* This does not include bulk fuel storage.

TABLE 6
SERVICE DEPARTMENTS: AREA DISTRIBUTION

No. of beds	40	80	160	200
Kitchens	2,800 sq. ft.	3,760 sq. ft.	5,175 sq. ft.	6,000 sq. ft.
Main kitchen and preparing room ..	1,500	1,800	2,500	2,750
Diet kitchen and office	140	200	230	260
Milk preparation and milk stores ..	130	150	175	200
Dishwashing	120	170	200	250
Refrigeration:				
Meat	30	30	30	35
Dairy	30	30	45	45
Fruit and vegetables	30	30	45	60
Larder stores	100	150	200	250
Garbage and can ward	70	100	150	200
Dining rooms, staff	400	700	1,000	1,200
Dining rooms, employees	250	400	600	750
Total	2,800 sq. ft.	3,760 sq. ft.	5,175 sq. ft.	6,000 sq. ft.
Housekeeper's Department	1,250 sq. ft.	2,090 sq. ft.	2,550 sq. ft.	3,070 sq. ft.
Housekeeper's office	110	140	150	170
Central linen room (sewing room in- cluded)	200	250	300	350
Soiled linen (including disinfecting chamber)	140	200	300	350
Laundry	800	1,500	1,800	2,200
Total	1,250 sq. ft.	2,090 sq. ft.	2,550 sq. ft.	3,070 sq. ft.
Mechanical Department (no fuel storage included)	1,180 sq. ft.	1,650 sq. ft.	1,950 sq. ft.	2,220 sq. ft.
Boiler House and pump room ..	900	1,200	1,400	1,500
Electrical intake	80	120	150	200
Engineer's office	—	80	100	120
Works	200	250	300	400
Total	1,180	1,650	1,950	2,220

TABLE 7
CIRCULATION SPACE

No. of beds	40	80	160	200
Circulation space*	5,770 sq. ft.	9,630 sq. ft.	13,820 sq. ft.	15,640 sq. ft.
Corridors	4,450	7,550	10,700	11,740
Lifts	240	640	960	1,200
Stairs	1,080	1,440	2,160	2,700
Total	5,770	9,630	13,820	15,640

* These figures are approximate only and are based on two stories and lower ground floor for forty beds; 4 stories and lower ground floor for eighty beds; eight stories and lower ground floor for one hundred and sixty beds; eight stories and lower ground floor for two hundred beds.

TABLE 8
AREA AND PERCENTAGE AREA DISTRIBUTION

No. of beds	40 Area sq. ft.	80 Area sq. ft.	160 Area sq. ft.	200 Area sq. ft.
Nursing Services :				
Patients' areas	8,008	16,016	32,032	40,040
Operating suite	2,775	2,855	3,640	4,205
Administration	665	730	810	830
Total	10,438	19,601	36,482	45,075
Ancillary Departments :				
Pathology	620	940	1,260	1,580
Radiology	400	600	850	1,200
Physiotherapy	160	180	200	250
Pharmacy	185	380	555	645
Total	1,365	2,100	2,865	3,675
Administration Services :				
Administration	1,875	2,635	3,150	3,760
Staff facilities	580	940	1,320	1,660
Storage	2,175	4,300	5,500	6,300
Total	4,630	7,875	9,970	11,720
Service Departments :				
Kitchen	2,800	3,760	5,175	6,000
Housekeeper's department	1,250	2,090	2,550	3,070
Mechanical department	1,180	1,650	1,950	2,220
Total	5,230	7,500	9,675	11,290
Circulation area	5,770	9,680	13,820	15,640
Total hospital area	27,744	44,626	70,930	86,220
Area per bed	685	583	455	437

DEPARTMENTS AND SERVICES NOT INCLUDED IN ANALYSIS

1. Out-Patients' and ancillary departments.
2. Doctors' private consulting rooms.
3. Research departments.
4. Students' accommodation.
5. Bath fuel stores.
6. Garages.
7. Resident doctors' quarters.
8. Nurses' home and nurses' training school.
9. Staff home.
10. Matron's quarters.

PLATE III

PLATE IV

PLATE V