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Architect's Brief of an Health Care Centre in the Sub Urban Area of A Metropolitan City

KEYWORDS

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INTRODUCTION

The hospital is an integral part of a social and medical organization, the function of which is to provide for the population complete health care, both curative and preventive, and whose outpatient services reach out to the family and its home environment; the hospital is also a centre for training of health workers and bio-social research.[1] The hospital is an organization that mobilizes the skills and efforts of a number of widely divergent groups of professional, semi-professional and non-professional personnel to provide a highly personalized service to individual patients.[2] Owing to the increasing complexity of the medical sciences, it is very necessary that medical practitioners and specialists should be able to rely on a sound hospital service. Furthermore, the general agreement on the active role the modern hospital has to play in health and social welfare programmes, and on its influence on economic development. [3]

The main objective of the hospital is to provide adequate care and treatment to its patients within the limits imposed by present medical knowledge and organizational resources. However, a hospital may have many additional objectives, including its own maintenance and survival, organizational stability and growth, medical and nursing education and research, employee related objectives and last but not the least, maintenance and continuous improvement of its own image [4].

AIM

To develop an architect's brief for a health care centre in the sub-urban area of a metropolitan city.

OBJECTIVES OF ARCHITECT'S BRIEF

To provide guidelines for construction of a healthcare centre in the suburb of a tier-two city in India near the airport, providing high quality healthcare to the local inhabitants. The centre will serve as a base for receiving and providing primary care to casualties that reach the airport.

ESTIMATED WORKLOAD [1]

OPD

Direct population	Consultation per person/ year	No. of direct population consultation	Total consultations expected in a year	Consultations per day	Average no. of new patients	Consultation Time - New Patients	Total patients time required	Total no. of OPD rooms for 300 consultations
25,000	2	25, 000 X 2 = 50, 000	1, 00, 000	1, 00, 000 / 300 (working days) = 333.33 ie. ~ 300	20% (60 patients)	15 mins	60 x 15 = 900 mins	Total time = 3300/60 mins = 55 hours 55/6 = 9 (6 hours of work excluding breaks)
Indirect population	Consultation per person/ year	No. of indirect population consultation			Average no. of old patients	Consultation Time – Old Patients	Total patients time required	
1, 00,000	0.5	1, 00, 000 X 0.5 = 50, 000			80% (240 patients)	10 mins	240 x 10 = 2400 mins	

OBSERVATION & DISCUSSION

PROPOSAL

Based on study of the available healthcare infrastructure in the area and relevant data from census report and demographic surveys a need was felt to construct a state of the art healthcare centre for providing high quality patient care. The previously existent health facility was a 60 years old building. With the advent of new technology and medical facilities, the infrastructure and layout of the healthcare centre was not able to optimally utilize the resources and provide required medical facilities to the inhabitants of the area.

STATISTICAL ANALYSIS

Population served
Direct population – 25,000
Indirect population – 1,00,000
Age profile - all age groups, majority being between 20 - 50 yrs

Beneficiaries –

Serves as a first point of contact for emergencies brought in by Air Ambulances

Local population - Lower-middle income group category

Women of child-bearing age

PURPOSE & FUNCTION

The purpose of the brief is to establish guidelines that will help architects and engineers in designing and constructing a new health care facility that will enable the hospital to fulfill its objectives in terms of provisioning of comprehensive health care including; outpatient care, in-patient services, laboratory and diagnostic facilities, emergency medical facilities and maternity and child health services. Thus the brief will provide developmental advice regarding layout of the health care centre which would be acceptable and the design principles to be adopted.

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IPD

A hospital bed is one that is regularly maintained and staffed for the accommodation and full time care of a succession of inpatients and is situated in wards or areas of the hospital in which continuous medical care for inpatient is provided [3].

Bed requirement [5]:

Bed population ratio	Average length of stay	Total no. of admissions per year =	Bed days per year	Total no. of beds required when occupancy is 100%	Total no. of beds required when occupancy is 80% =
1 bed per 50 population	5 days	1,25,000 population/50 = 2500	2500 x 5 = 12500	12500/365 = 34 beds	34 x 80% = 27 beds.

REFERRAL

All cases needing care beyond the scope of services provided by the health care centre will be referred to a regional hospital in the city for further care.

FUNCTIONAL PARAMETERS

The health care centre is proposed to have the following:

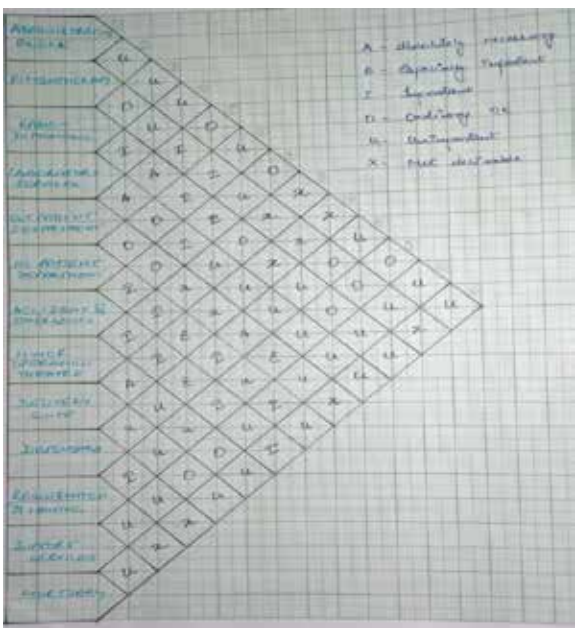
Departments	Support Services	Engineering Services	Additional Facilities
Accident & Emergency	CSSD	Fire Safety	Information kiosks
Outpatient Department	Dietary	Electricity	Guide maps
Inpatient Departments (Male & Female Wards including Intensive care facility & isolation room)	Linen and Laundry	Water (cold & Hot)	Layout plan on floors
Operation Theatre (Minor)	Biomedical Waste Management	Security	Signage
Delivery Suit	Ambulance Services	HVAC	Cafeteria
Laboratory Services		Lighting	Vending machines
Diagnostic Services		Medical Gas	Xerox facilities
Physiotherapy & Rehabilitation		Alarms system	Prayer room
Dispensary & Medical Stores		Lift	May I Help you counter
Mortuary		Communication - telephone, television, alarm, internet, patient/ nurse call, music, etc	Intelligent lighting system
		Landscaping and pollution control	Provision store/flower shop/fruit shop
Accommodation for staff – nurses rooms, doctors rooms, attached pantry, relative waiting rooms			

AREA AVAILABILITY

The hospital is a new centre which will be constructed at a site already under possession of the government. The total area to be provided for a hospital complex depends on availability of land and is a function of the hospital bed compliment. Indian Standards on Basic Requirements of General Hospital Buildings recommends an area of one hectare (10, 000 sqm) per 25 beds (400 sqm per hospital bed) [5].

Land requirement also depends on factors like horizontal or vertical development, FAR (floor area ratio) regulations and ground coverage regulated by Municipal Corporation/ District regulation.

INTER DEPARTMENTAL RELATIONSHIP



In designing a hospital, it is very important to keep the heuristics in mind. The term heuristic is used for algorithms that find solutions among all possible ones, without guaranteeing that the best solution will be found. Therefore, they may be regarded as near-optimal algorithms [7].

Facility layout planning algorithms are divided into manual and computer-aided algorithms. There are several commercially available packages that implement these algorithms. A manually constructed matrix is presented (Figure 1 a) to illustrate the inter-departmental relationships in order to optimize the utilization of resources & reduce staff fatigue. This method does not offer an optimal solution but compares between alternative designs.

CORELAP is one of the first construction algorithms by Lee and Moore in 1967 [8, 9]. It converts qualitative inputs data into quantitative data and uses this information to obtain the first space to enter the layout. Subsequent spaces are then added to the layout, one at a time, based on their level of closeness with spaces already in the layout. The qualitative input of CORELAP algorithm is a relationship matrix that establishes the defined spaces and assigns a closeness priority rating for each pair. Figure 1 shows the relationship matrix with the rating for each space pair entered at the point where their columns intersect. The relationship matrix uses the codes A, E, I, O, U, and X to describe the adjacency requirement for each space pair. It shows the list of closeness rating relationship codes and its recommended proportion to the whole relations [8 ,9]

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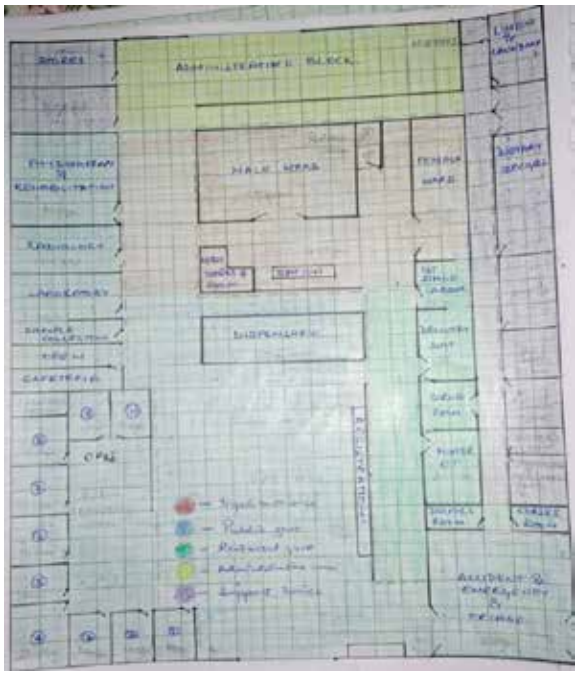
ZONING & LAYOUT OF HEALTH CARE CENTRE



The hospital is divided into various zones depending upon patient and staff access to the various areas of the health care facility. The first zone that patients and their visitors come across is the public zone. This includes the reception, waiting areas, sub-waiting areas, out patient department and accident & emergency. An intermediate zone lies between the public and the in-patient area, which houses the laboratory & radiology services and dispensary (departments that are shared by both the public and in-patient facilities). This is followed by the restricted zone which includes the operation theatre, delivery suite and the first stage labour room. The last zone is the support services, example medical stores, CSSD, dietary services, linen & laundry, and administrative facilities.

Limitations of the study. The closeness relationship between 2 spaces is not necessarily the same for all health care centres. The relationship is based on requirements for the above mentioned hospital only. For example, accident and emergency, minor OT and delivery suit are utilizing common support services.

CONCLUSION

The architect's brief is formulated for a health care centre in the suburbs of a tier two city and has been made with the aim of establishing guidelines that will help the architects and engineers in designing and constructing a state of the art health care facility for provision of quality patient care.

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