

# SPACE NORMS OF NURSING UNITS FOR HOSPITALS

( District and Tehsil Levels )

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# SPACE NORMS OF NURSING UNITS FOR HOSPITALS (District and Tehsil Levels)

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Design of nursing units is an important and integral part of hospital planning. These units are also known as wards. The chief function of a ward is to give a high degree of nursing care to the patients. It caters to both the medical and the residential needs of the patients. The various activities involved in a nursing unit are investigation, treatment and recuperation of the patients. These involve the doctor-in-charge of the ward, nursing staff in the ward and the patient. For the design of efficient nursing units, it is therefore essential to study and establish its functions as precisely as possible. A study by the Central Building Research Institute, has been undertaken to work out space norms and planning guidelines of hospitals at both district and tehsil levels.

Five district level hospitals, and four tehsil level hospitals in the States of Uttar Pradesh and Haryana were surveyed by a CBRI team. Suggestions were obtained from specialist doctors, matrons, nursing sister, nursing staff, patients and their relatives. The salient points have been discussed in the paper.

## EXISTING PATTERN

The common ward pattern which still adopted in design of hospitals is the nightingale or pavillion pattern in which two rows of beds are arranged perpendicular to the longitudinal walls. Ancillary facilities and services spaces are placed at either end of the unit. The other pattern which is a later development is called Rigs pattern in which beds are arranged parallel to the longitudinal walls and a partition between bed heads is provided. The nightingale pattern is generally understood to offer better care of patients and easy movement of supervisory staff but lacks privacy and quietness. The Rigs pattern affords more privacy, reduces glare and allows group-

ing of patients according to gravity of sickness and minimising the chance of cross-infection.

## NIGHTINGALE VERSUS RIGS PATTERN— ECONOMY AND EFFICIENCY

A study of nightingale and rigs patterns of bed arrangements was made to adjudge their comparative economy and efficiency. Separate nursing unit (Fig. 1) on conventional nightingale and rigs pattern each with 36 beds, a central nurses' station and similar other facilities were compared. In the rigs plan, saving of 41.5% in circulation area, 16% in overall area and 2.5% in area under beds has been obtained, as given in the following table.

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## COMPARISON OF 36 BEDDED NURSING UNITS WITH NIGHTINGALE AND RIGS PATTERN WARDS.

		NIGHTINGALE	RIGS	SAVING
1.	Area under circulation	163.6M <sup>2</sup>	97.2M <sup>2</sup>	41.5%
2.	Total Area (Excluding Multi-functional space)	527.2M <sup>2</sup>	439.2M <sup>2</sup>	16.6%
3.	Area in ward	223.2M <sup>2</sup>	219.6M <sup>2</sup>	2.5%
4.	Nurses' walking distance in a trip	203.0M	192.2M	5.3%
5.	Distance of farthest bed	25.0M	18.0M	28.0%
6.	Wall length	181.2M	153.6M	15.3%

Higher efficiency can be seen from the reduction in per trip walking distance and distance of farthest bed from nurses' station by 5.3% and 28% respectively. In addition to this, savings in cost of walls, column and beams are also available.

### SIZE OF NURSING UNIT

Size of nursing unit may vary depending upon the availability of nursing staff, quality of patient care required, effective use of its ancillary facilities, inpatient bed strength and factors such as grouping by sex, age and condition of patient and speciality. As revealed by surveys, a nursing unit of 30-40 beds is considered workable in view of the provision of nursing staff.

### PHYSICAL ACCOMMODATION

The accommodation needed for each ward may be divided into the following categories—

- (a) **Primary accommodation**
  - (i) Multi-bed wards
  - (ii) Single bed wards
- (b) **Ancillary accommodation**
  - (i) Nurses' duty station with toilet
  - (ii) Treatment room
  - (iii) Clean linen store
  - (iv) Dirty linen store
  - (v) Kitchen/pantry
  - (vi) Accommodation for patient relatives
  - (vii) Multi-functional space (Day space)
  - (viii) Toilets

Although large wards without partitions are preferred by nursing staff, it is desirable for better medical and nursing care to segregate patients into smaller groups in multi-bedded modules of four and six beds. The other reasons for grouping are, to reduce the risk of cross-infection, serious illness, disturbance to others, privacy, quietness and special attention. The survey and study indicated that 8-10% beds should be provided in one/two bedded wards in each nursing unit. Rigs type of arrangement was found advantageous due to its great adaptability to the specific requirements.

### MULTI-BED WARDS

Based on anthropometric studies, measurements taken on survey of actual activity requirements, the following recommendations are made (Fig.-2).

Standard bed size	200 cm X 90 cm
Distance between two longer sides of beds	90 cm
Distance between bed and wall	60 cm
Distance between bed head and wall	10 cm
Distance between foot of beds	150 cm
Distance between foot of bed and wall	
(i) when turning of stretcher is not required within wards enclosure	120 cm
(ii) when 90° turning of stretcher is required within ward enclosure	150 cm

### SINGLE BED WARDS

Distance between wall and one longer side of bed	60 cm
Distance between bed head and wall	10 cm
Distance between wall and longer side of bed	
(i) when turning of stretcher is not required within the ward	120 cm
(ii) when 90° degree turning of stretcher is required within the ward	150 cm

### ANCILLARY ACCOMMODATION

#### (i) Nurses' Duty Station

Diverse functions of nurses station include space for nurses where they can receive instructions, maintain records of in-patients under treatment, store medicine, store equipment like wheeled chair, stretcher, oxygen cylinder, medicine trolley, sterilise syringes, prepare injection and dressing trays for the use in wards. Lockable storage space in the form of built-in-cupboards/steel almirahs should be provided for which a floor space of 1.8 to 2.0M<sup>2</sup> is required. Work counter of not less than 2M in length and 0.4M in width dividing access corridor and duty room is desirable. Attached provision of w.c. and wash hand, basin to be made (Fig. 3)

The use of treatment facility if infrequent and of short duration. Multiple use of space will achieve convenience in working and economy in space when treatment facility is provided within the nurses' station. Whenever required, privacy can be achieved by suitable provision of curtains. The area should be about 30M<sup>2</sup> (Fig. 4).

## (ii) Treatment Room

A treatment room should be provided close to the nurses' duty station. As explained above, in smaller size of hospitals (upto 100 beds) there could be multiple use of space and the treatment room can be planned within the nurses' duty station. Activities to be performed in the treatment room require a clear width of 2.8M and a minimum area of 11M<sup>2</sup>.

## (iii) Clean linen store

A clean linen store should be provided on one side of nurses' duty station. As the name suggests, it is where clean sterilised linen such as bed sheets, pillow covers etc. are stored. This store is to be located on the clean side of the nursing unit and away from toilets. It should have almirah and shelves and a minimum area of 8-10m<sup>2</sup>.

## (iv) Dirty Linen Store

This store should be located on the toilet side of the nursing unit. Dirty and soiled linen is stored here, till they are taken away for washing and sterilisation. It should have shelves and a minimum area of 7M<sup>2</sup> (Fig. 5).

## (v) Kitchen/Pantry

The food is prepared in the central kitchen and is brought in trolleys to the ward pantry. The pantry should be located on the approach side of the nursing unit and should have a minimum area of 12 to 15M<sup>2</sup>.

## (vi) Accommodation for patients' relatives

Relatives' accommodations for 20-25% of the number of beds in the nursing unit should be provided at the rate of 2.5M<sup>2</sup>/relative, near each nursing unit. Provision for a lockable storage cabinet for each relative should be made within the relatives' room. Toilet facility should consist of a w.c., a bathroom and a wash hand basin. Cooking space with preferably a small verandah is also essential. These facilities should be so planned that their access to nursing unit could be easily controlled and the cleanliness and hygiene conditions are not affected. The space provisions should be as follows—

Relatives room at the rate of 2.5M<sup>2</sup>/person  
Cooking space and verandah 10-12M<sup>2</sup> (Fig. 6)  
Toilet 4M<sup>2</sup>

## (vii) Multi-function space or Day Space

Multi-functional space to enable patients who are capable of moving to sit, chit-chat, meet visitors should be provided with each nursing unit. Noise is likely to be generated in this space so it should be duly segregated from bed area. It should be so placed that nurses can easily supervise, while going about their normal duty. They should also be able to enjoy it as an outdoor open space for view, fresh air and sun bathing. Each nursing unit should be provided with a multi-functional space of not less than 18M<sup>2</sup> (Fig. 7).

## NURSING UNITS FOR TEHSIL HOSPITALS

Our studies have revealed that the bed strength of Tehsil level Hospitals vary from 50 to 100 beds. These levels of hospitals are found to have two or more nursing units of varying capacities. During day time, there are two or three staff nurses on duty but during the night only one staff nurse is on duty in the whole hospital. In view of scattered location of different nursing units, the work of a single nurse becomes more difficult with regard to better care of patients. To circumvent this problem a 'T' shaped 50 bedded nursing unit layout was studied and a design evolved (Fig. 8).

The salient features of the design are :—

1. central location of nurses' station.
2. night supervision made easy for staff nurse.
3. separate areas for 25 male beds, 15 female beds and 10 maternity beds.
4. flexibility in addition of future beds in stages of 25, 35 or 50 (Fig. 9).

## NURSING UNITS FOR DISTRICT HOSPITALS

A typical nursing unit of 36 beds (Fig. 10) has been evolved for district levels hospitals. The primary and ancillary accommodation required in a nursing unit has been provided;

- (1) 4 Nos. 6 bedded wards.
- (2) 2 Nos. 4 -do-
- (3) 1 Nos. 2 -do-
- (4) 2 Nos. 1 -do-
- (5) Treatment Room
- (6) Clean Linen Store
- (7) Central nurses' duty station
- (8) Dirty Linen store
- (9) Multi-functional space
- (10) Relatives' room
- (11) Toilets

From the dimensional analysis of nursing unit accommodation facilities, a minimum clear depth of 5.7M and 3.9M for various spaces and a clear width of 2.1M for passage was found suitable. Commonly occurring transverse clear dimensions of spaces are 2.4M, 2.7M, 3.0M, 3.6M and 5.7M. Horizontal planning grids at 6.0M, 2.4M and 4.2M with a cross-grid of 3.0M is considered to be suitable for low rise constructions.

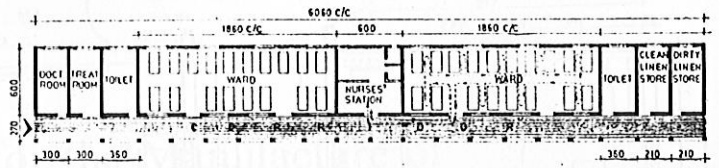
### CONCLUDING REMARKS

This study is based on analysis and synthesis of data obtained through surveys. The views of expert doctors, nurses and other paramedical staff have been taken, especially regarding nursing unit activities and functions. The design parameters and guidelines will benefit architects, designers and other related medical personnel and will help them to design functional nursing units.

### ACKNOWLEDGEMENT

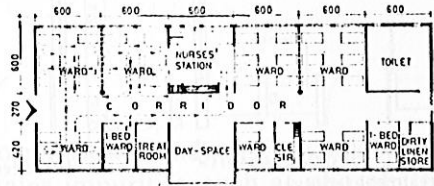
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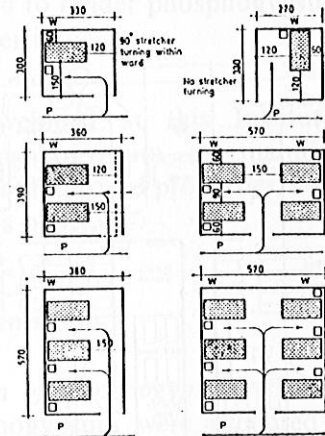


Dia. 1

### Nursing Unit with Nightingale Pattern

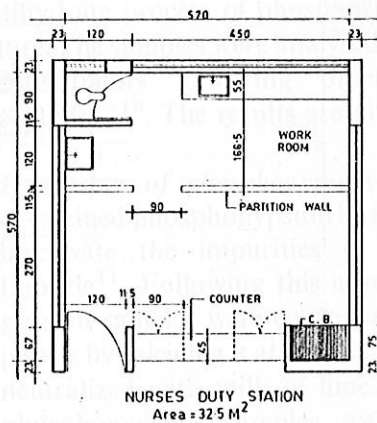


### Nursing Unit with Rig Pattern



Dia. 2

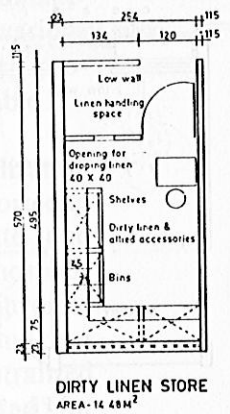
FIG. 2-BED ARRANGEMENTS IN WARDS  
Showing minimum clearances & stretcher movement  
--- alternative  
W window position  
P passage



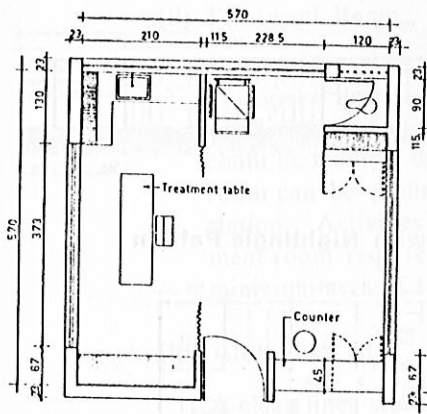
NURSES DUTY STATION  
Area = 32.5 M<sup>2</sup>

Dia. 5

Dia. 3

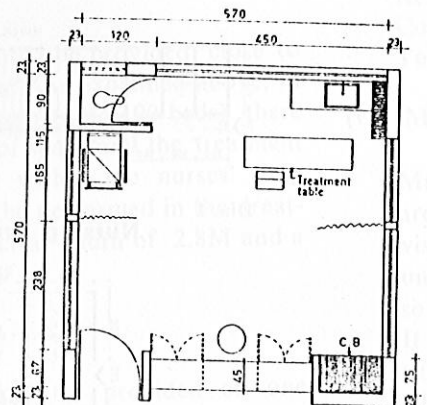


DIRTY LINEN STORE  
AREA = 14.48 M<sup>2</sup>

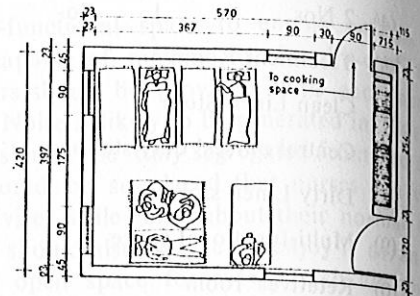


(a) NURSES DUTY STATION AREA-325M<sup>2</sup>  
(With treatment facility)

Fig. 4



(b) (alternative) AREA-325M<sup>2</sup>



RELATIVES ROOM AREA-252M<sup>2</sup>

Fig. 6

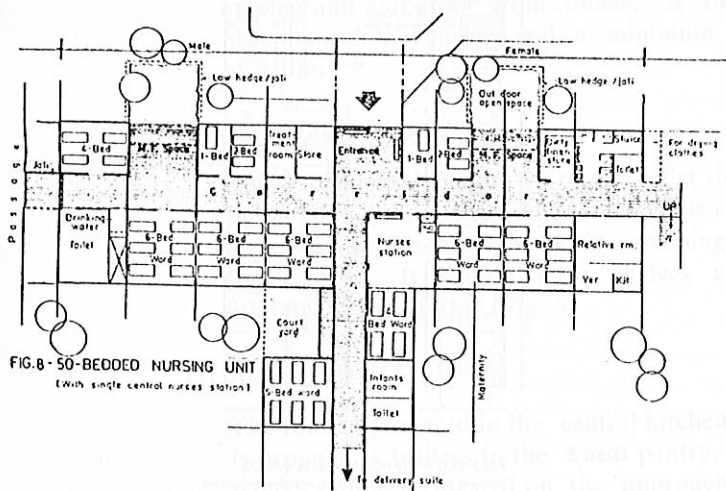


FIG.8-50-BEDDED NURSING UNIT  
(With single central nurses station)

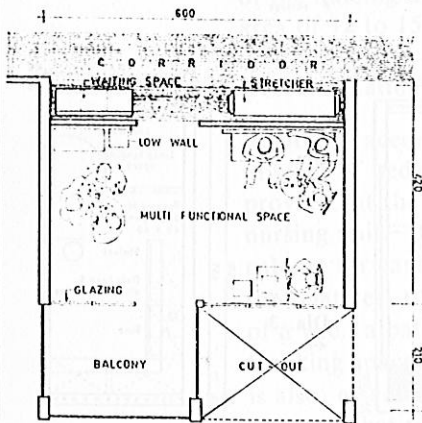
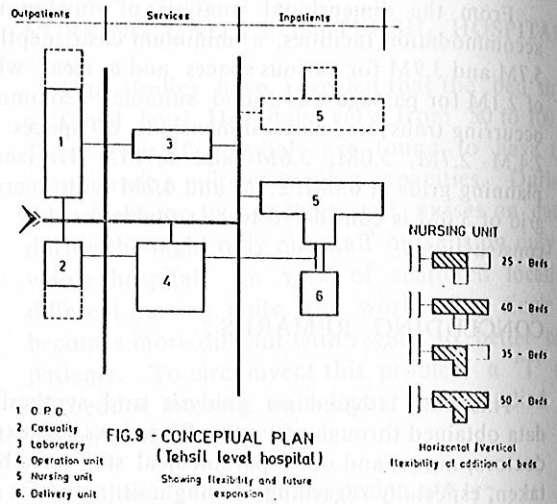


Fig. 7

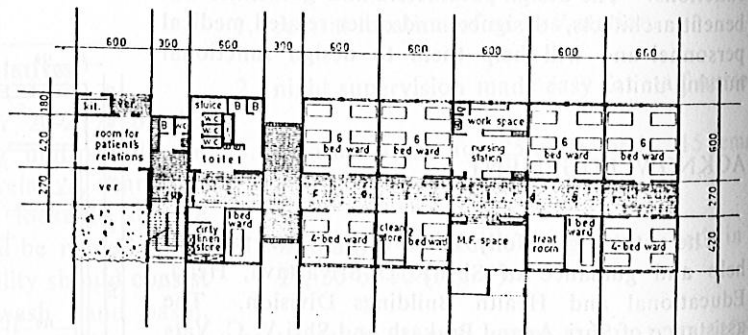


Fig. 10