

INNOVATION IN HUMAN CENTRIC HEALTH CARE

(ROLE OF ARCHITECTURE IN HOSPITAL DESIGN AND HEALING)

By

HEENA HANIF CHOGALE

A REPORT

Submitted in partial fulfillment of the requirements for the degree of
Bachelor of Architecture.



University of Mumbai

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ABSTRACT

Healthcare buildings are to be designed as living spaces for patients rather than warehouses for the sick. It has to be remembered that a hospital is not a factory in which the assembly lines dictates all aspects of design but is a community in which the patient is fundamental to the successful working of the whole. Needs and expectations of the patients have to be visualized, analyzed and fulfilled. The hospital building should provide the patients a sense of safety, comfort, dignity and repose. It should also provide pleasing spaces for patients, families and visitors as well as imbibe the cultural concerns of the community

This thesis is therefore intended to elucidate on how to create a healing environment in light of growing health challenges

The aim is to have a humanizing architecture that can positively contribute to the healing process. It should make the patient enjoy the best of bioclimatic comfort. Healthcare Design must also satisfy professional requirements.

The physical environment of the healthcare facility should firstly do no harm and secondly facilitate healing process

Hospital is an institution providing medical and surgical treatment and nursing care for sick or injured people.

In case of Roha there are no multi-speciality hospitals or proper health care facility in the vicinity. Based on the statistics of roha town it shows that the area lacks health centre to cater the citizens .As a result of this patient have to be rushed to nearby developed areas to obtained that required treatment .this is the major issue since it poses as a threat to the health and lives of patients that have to be taken to the nearby cities.

Immediate treatment is not available. It is essential for basic and advance facilities to be provided with in the area to cater the patient residing in that area

Hence there is a need of health care centre in the area, which will cater to the general public of that area and the people will not have to travel long distance for the kind of treatment needed.

INTRODUCTION:

What are health care facilities-

Health is a state of complete physical, mental and social well being

Health care facilities are places where patients with health conditions go for treatment which provide specialist care

Health care facilities are places such as **hospital**, clinics, primary health care centres, camps etc

Nowadays, healthcare facilities have become quite advanced. But, not everyone has access to these facilities. People living in rural areas are still devoid of advanced healthcare services. Also, there has been an increase in the disease rate in such areas with no or less services to cater to them. Majorly, there are no advanced places for cases such as accidents, life threatening diseases. Even basic healthcare facilities are lacking in a few areas.

In the case of Roha, there are no multi-specialty hospitals or healthcare centres present in the vicinity. As a result of this, for big cases, patients have to be rushed to nearby developed places to obtain the required treatment. This is a major issue since it poses as a threat to the health and lives of the patients that have to be taken to nearby cities.

Immediate treatment is not available. It is essential for basic and advanced facilities to be provided within the area to cater to the patients residing in that area.

Hence, there is a need of a healthcare centre in that area, which will cater to the general public of that area, and people will not have to travel long distances for the kind of treatment needed.

Facilities like these must be present either within immediate reach or atleast within a certain radius. That is when the number of casualties would be reduced and a healthier society would be formed.

2.1.2) BACKGROUND STUDY

HIERARCHY OF HEALTH CARE SYSTEM –

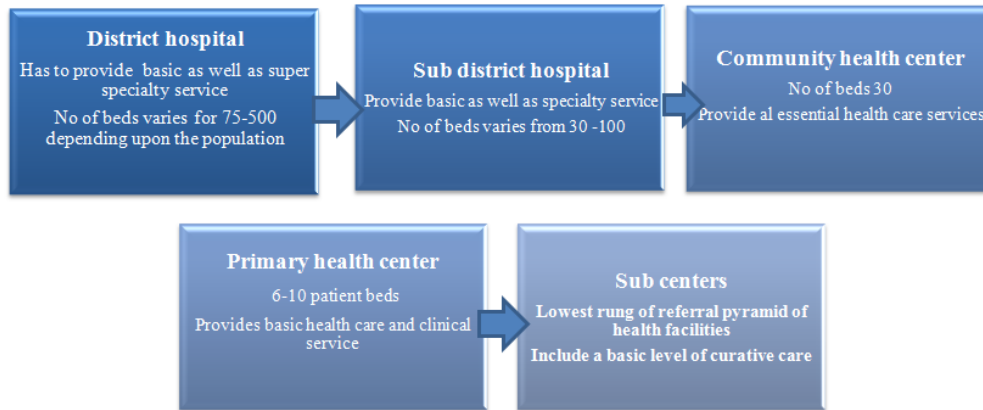


Figure 1 Health care system (ref.Dist.hospital guideline handbook)

2.2.) CURRENT SCENARIO –

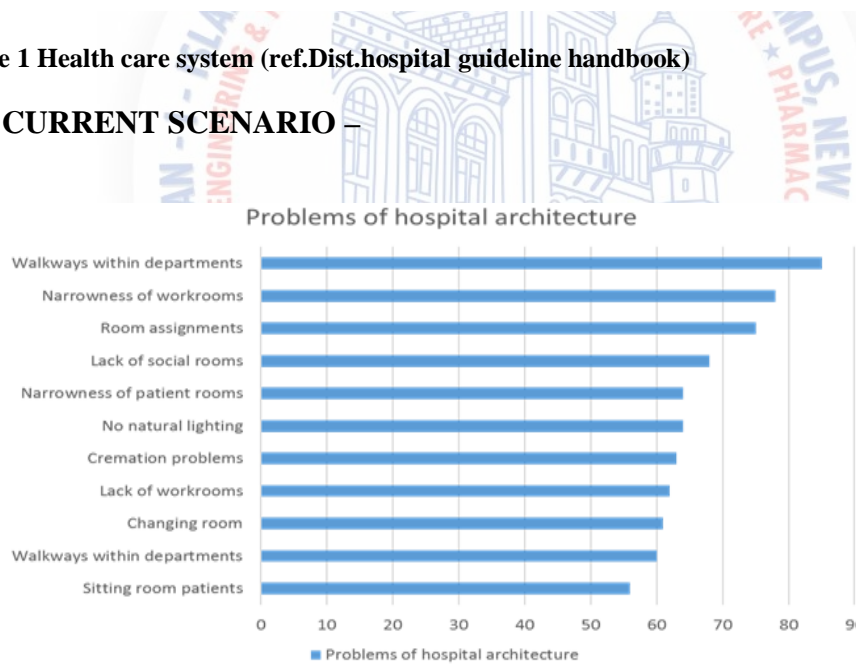


Figure 2 .PROBLEM IN HOSPITAL ARCHITECTURE IN INDIA

The graph above shows the most common problems in the government hospital buildings

Distribution of bed available in hospitals all over India

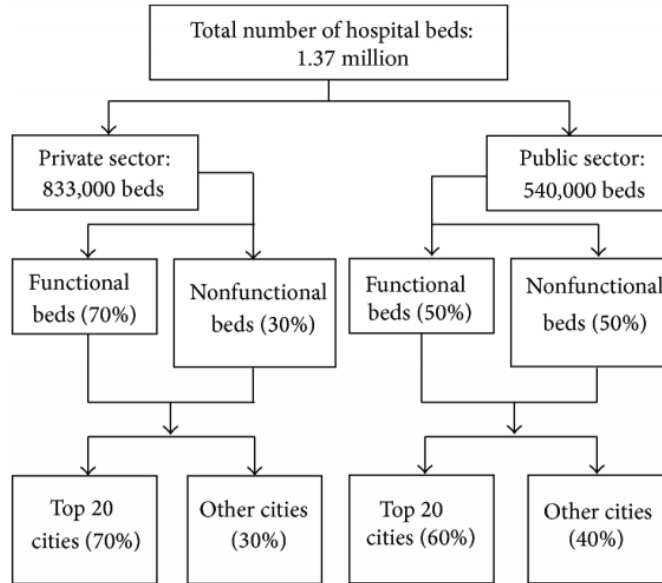


Figure 3(<http://hindawa.com/journal/aph/2014/898502/>)

PROBLEMS IN DISTRICT HOSPITAL IN INDIA

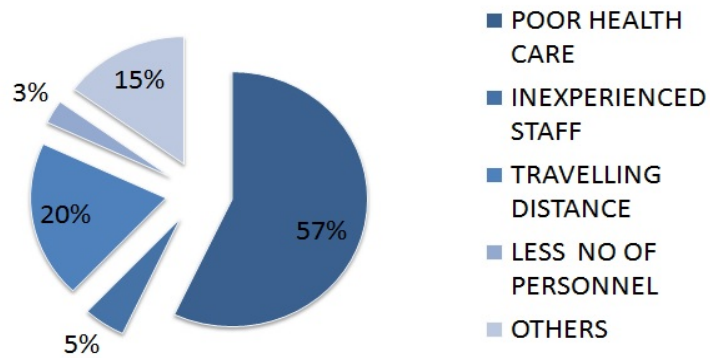


Figure 4Problem in hospital (ref. district hospital guideline handbook)

DESIGN OBJECTIVES:

Circulation in hospital:

It is said that hospital planning start from circulation

In the word of emersion globe ,separate all departments, yet keep them all close together, separate types of traffic, yet save steps for everybody, that's all there is to hospital planning "thus the different type of traffic of trans versing the buildings should show planned so as to avoid inter mixing of functions there by keeping them as short as possible as —time "is an also important aspect.

The main aim while caring for the sick is to prevent cross infection ,maintain asepsis of highest order and ensure ease of movement for patients and supplies. Therefore, all movements need to be well planned in advance to facilitate ease for function and asepsis maintained.

THE TRAFFIC IN HOSPITAL CONSTITUTES OF FIVE MAIN STREAMS

- Out patients
- In patients
- Visitors
- Staff, and
- Supplies

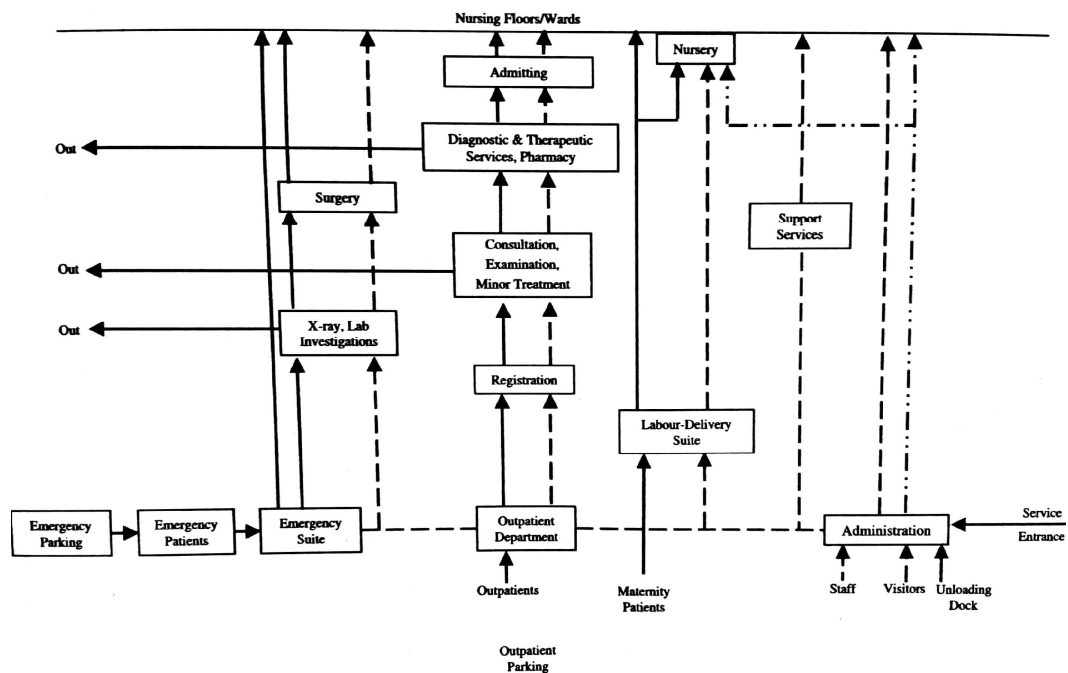


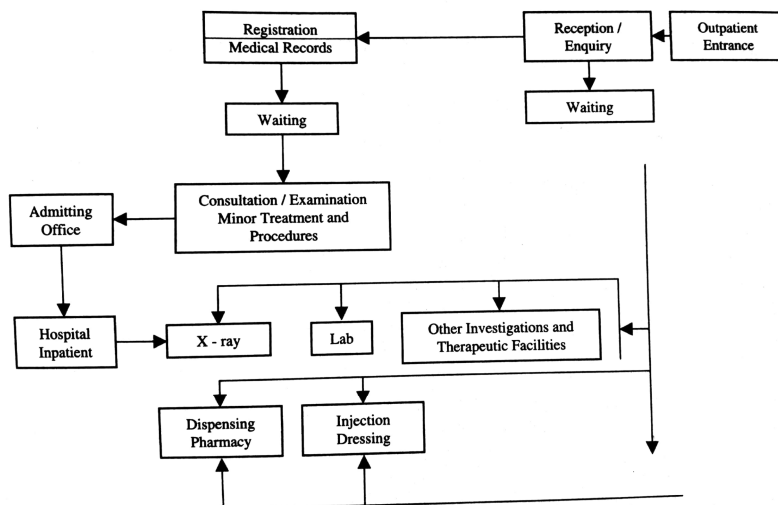
Figure 5. traffic flow with in the hospital(hospital planning and facilities by G D KUNDERS)

And for their functional interrelation, it is necessary to know well as to where they circulate, throughout in planning, traffic requires careful thought ,besides, the various complicated lines of traffic within the hospital, traffic to and from the hospital must be given consideration, to be able to regulate traffic within the building ,we should start by regulating it first on the outside of the building

External traffic

- Patients-arriving or leaving by foot or by vehicle
- Visitors
- Staff members
- Delivery of incoming supply
- Removal of dead
- Delivery of removal and removal of refuse
- Out patient's traffic.

OUTPATIENT DEPARTMENT:



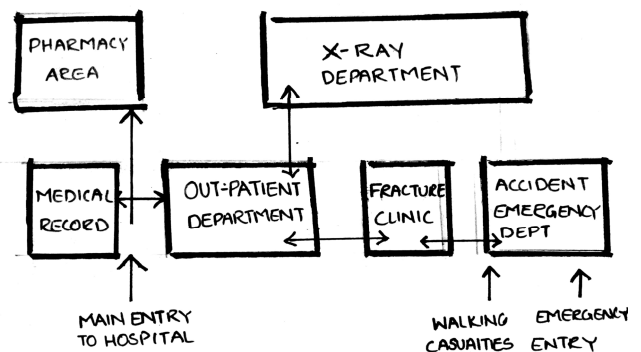
- The hospitals must pay keen attention in proper planning ,designing, organization and function of the out patient department as any other department
- This is because the patient is first studied and given treatment in the outpatient department till he is hospitalizes
- Emergency room is the integral unit of

total outpatient department

Figure 6.Outpatient department flow chart

Location :

- Outpatient department should be located close to services such as registration and medical records admitting, emergency.
- The outpatient department should be on the ground floor preferably



-Special attention should be given to the circulation which should result in smooth flow of various traffic line traversing the department

Figure7.relation diagram of out patient()

INPATIENT DEPARTMENT:

-Private ward: Depending upon the requirement of the hospital and catchment area, appropriate beds may be allowed for private facility. 10%of the total bed strength is recommended as private wards beds.

-Location - Location of the ward should be such to ensure quietness and to control number of visitors.

Planning - The basic aim in planning a ward unit should be to minimize the work of the nursing staff and provide basic amenities to the patients within the unit.

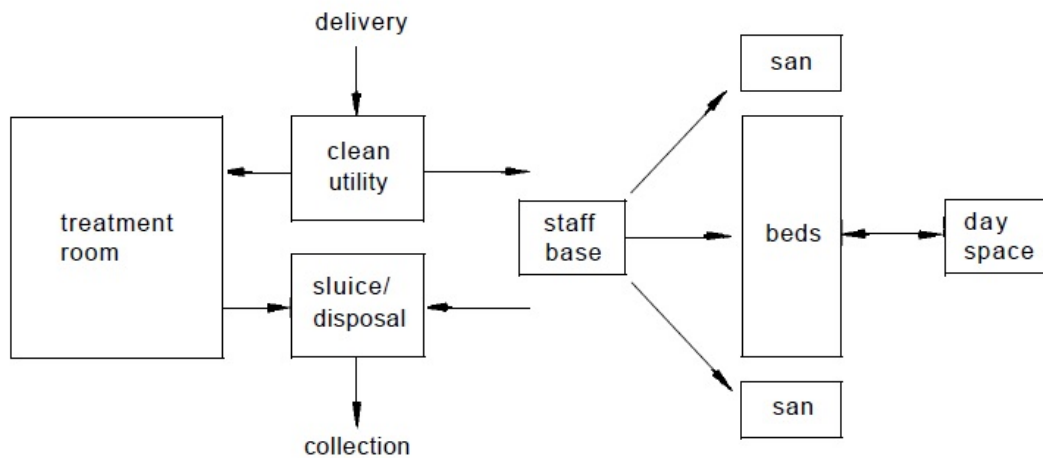


Figure 7. IN PATIENT DEPARTMENT

EMERGENCY DEPARTMENT:

Location:

-The emergency department should be located on the ground floor with easy excess for patients and ambulance.

-There should be a separate entrance to the emergency department

-It should be well marked with signs and should be easily accessible from the street

Design:

-The entrance to the emergency should be sheltered to protect ambulance patients from weather while unloading

-Adequate reserved parking spaces for ambulance

-The design should facilitate good public relation

-The design should also facilitate quick access to the patients by staff and supplies.

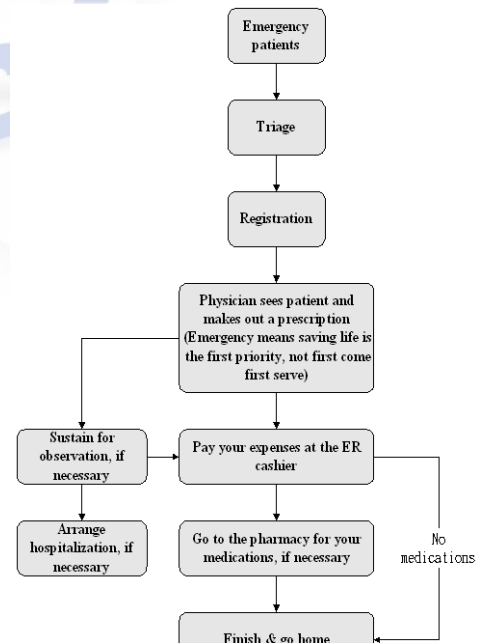


Figure 8. EMERGENCY DEPT.

CLINICAL LABORATORIES:

The primary function of the laboratories is to perform the laboratory test in the fields bacteriology biochemistry etc

The laboratory plays a vital role in hospital infection control and surveillance programme

Location:

The laboratory should be conveniently located on the ground floor to serve the outpatient emergency and admitting department

It should be close to or easily accessible to surgery intensive care radiology and obstetrics

Design:

While designing the laboratory the use of modules is recommended both for workstations and for piping layout for essential utility services.

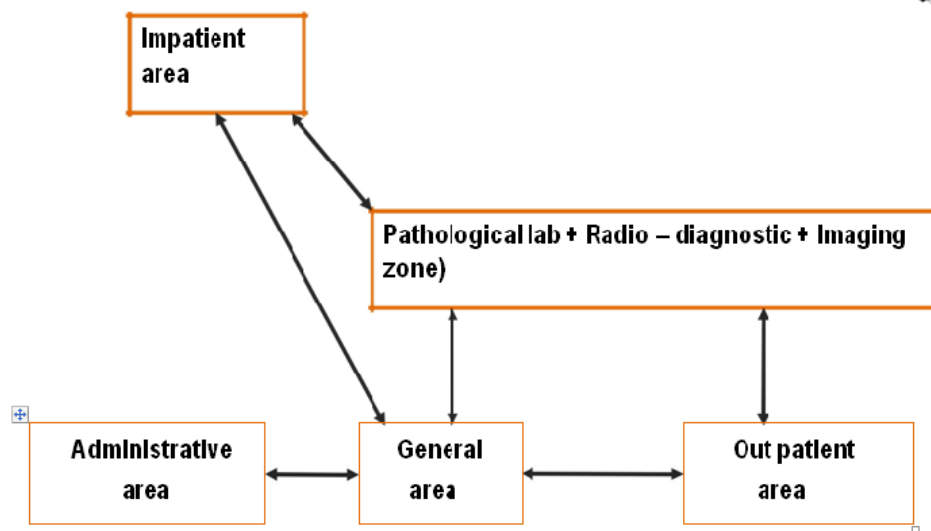


Figure 9. FLOW CHART CLINICAL LABORATORY

OPERATION THEATRE :

The location of Operation theatre should be in a quiet environment, free from noise and other disturbances, free from contamination and possible cross infection, maximum protection from solar radiation and convenient relationship with surgical ward, intensive care unit, radiology, pathology, blood bank and CSSD.

Normally there are three types of traffic flow, namely, patients, staff and supplies. All these should be properly channelized.

Central sterile supply department :

- As the operation theatre department is the major consumer of this service, it is recommended to locate the department at a position of easy access to operation theatre department. It should have a provision of hot water supply

Hospital kitchen:

-The dietary service of a hospital is an important therapeutic tool. It should easily be accessible from outside along with vehicular accessibility and separate room for dietician and special diet.

-It should be located such that the noise and cooking odours emanating from the department do not cause any inconvenience to the other departments.

- At the same time location should involve the shortest possible time in delivering food to the wards

Hospital laundry –

-It should be provided with necessary facilities for drying, pressing and storage of soiled and cleaned linens. It may be outsourced

Waste management:

-Segregation of hospital waste from non- infectious (domestic type) waste,

-Packing of waste to isolate from the people and this environment as to prevent accidental spillage ,

-Labeling of waste to avoid accidental tampering or contact with waste materials, through ignorance of its presence and/or health hazards,

-Controlled management within hospitals and during transit to disposal, such that collection, storage and transport is secure, well supervised and maintained effectively at all times,

-Controlled disposal in a manner which minimizes access to unauthorized people as well as animals (insects, birds, cats, etc.)

-Hospital wastes needs to be collected and treated within a maximum period of 48 hours from the time of generation.

Disposal systems:

Five basic components:

Handling waste at the point of production.

Transportation within the facilities.

Internal storage.

Internal processing treatment.

Transportation to point of final disposal. Solid waste should be sterilized at or near the point of production source, preferably in disposable plastic bags in containers.

Pathologic waste should be sterilized at or near the point of production, prior to removal from the place

Background study of Roha:

Roha is a small city and taluka in Raigad District of Maharashtra located 120 km southeast of MUMBAI. It belongs to Konkan region. It belongs to Konkan Division. It is located 41 KM towards East from District head quarters Alibag, 82 KM from State capital Mumbai towards North.

Population of roha:

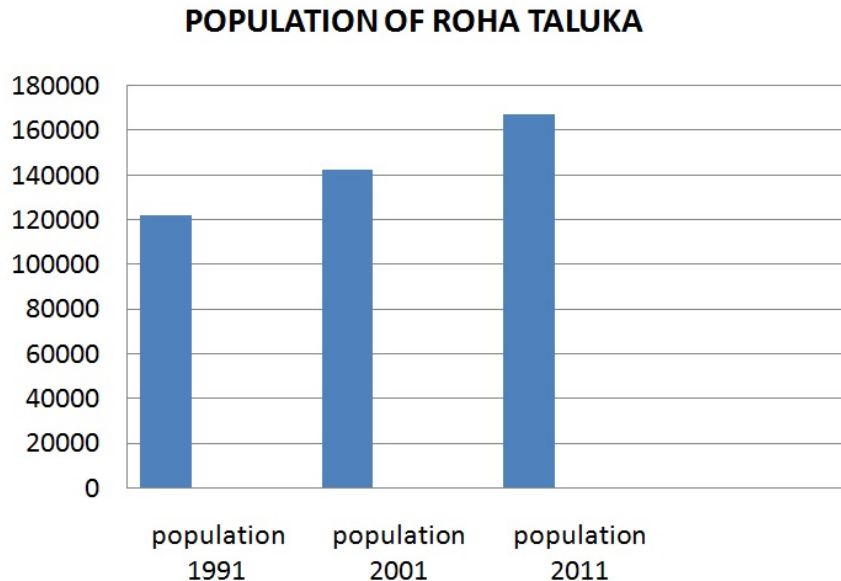


Figure 10. POPULATION(REF.RAIGAD.NIC.IN)

Health care in roha:

There is a Subdistrict hospital situated in the city of roha. It is a 50 bedded hospital

The two-storey hospital has an ICU, diagnostic room, a post-mortem centre, but when it comes to staff, the hospital doesn't have much to boast of.

Waiting area:

The waiting area caters 20 to 30 people

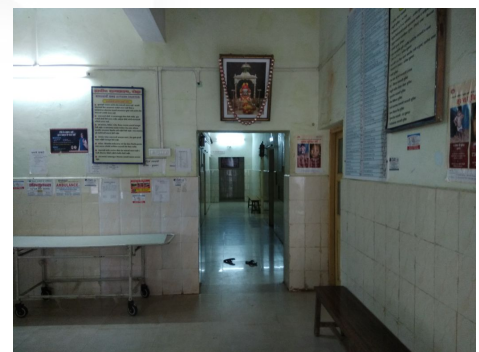


Figure 11.WAITING AREA (ROHA HOSPITAL)

The waiting area is connected to the wards and other department through a long inadequately light corridor

-There is male and female general medicinal ward on the ground floor of the hospital

-The nursing station is located in side with no proper partition

-They eye hospital located on the campus remain close due to no proper space and instruments

-There is ambulance parking outside the main structure

-The hospital lack advance facilities



**Figure 12. MEDICAL WARED
(ROHA HOSPITAL)**



DESIGNING ASPECTS:

Visual connection:

A space with a good Visual Connection with Nature feels whole, it grabs one's attention and can be stimulating or calming

Stress recovery from visual connections with nature have reportedly been realized through lowered blood pressure and heart rate; reduced attentional fatigue, sadness, anger, and aggression; improved mental engagement/attentiveness, attitude and overall happiness

Use of subtle elements in a hospital building design –

Ideal conditions for a patient:

- Subtle or indirect artificial lighting in the room
- View of a landscaped garden preferably accessible from the patient's room
- A reading room located near the patient's room or

a lounge

- Daylight coming in patient's room
- Use of natural materials in room or design
- Sculptures of paintings or murals of natural elements

Dynamic and diffuse light:

-Dynamic & Diffuse Light leverages varying intensities of light and shadow that change over time to create conditions that occur in nature. A space with a good Dynamic & Diffuse Light condition conveys expressions

of time and movement to evoke feelings of drama and intrigue, buffered with a sense of calm.

-Higher content of blue light (similar to skylight) produces serotonin;

whereas, an absence of blue light (which occurs at night) produces melatonin. The balance of serotonin and melatonin can be linked to sleep quality, mood, alertness, depression, breast cancer and other health conditions.



Figure 13. condition that should be accessible to patients (colour and light by hilarey dhalke)



Figure 14. dynamic and diffuse light (biophallic by Stephen Kellert)

Thermal and airflow variability –

-Thermal & Airflow Variability can be characterized as subtle changes in air temperature, relative humidity, airflow across the skin, and surface temperatures that mimic natural environments. The space provides a feeling of both flexibility and a sense of control.

-People like moderate levels of sensory variability in the environment, including variation in light, sound and temperature, and that an environment devoid of sensory stimulation and variability can lead to boredom and passivity

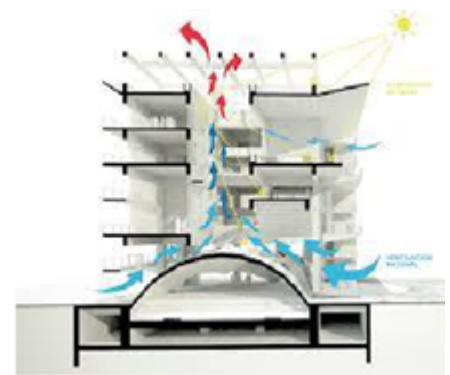


Figure 15.thermal and air flow

Reduction in staff stress-

Reduction in staff stress by placing monitoring stations closer to the patients so that the staff doesn't have to walk long distances and also so that the patient is taken of more efficiently

- Decentralization of nursing stations
- Nursing stations having a view of all the patients so as to reduce the travelling time
- Proper ventilation to reduce infection problems for staff
- Noise control measures to reduce staff stress

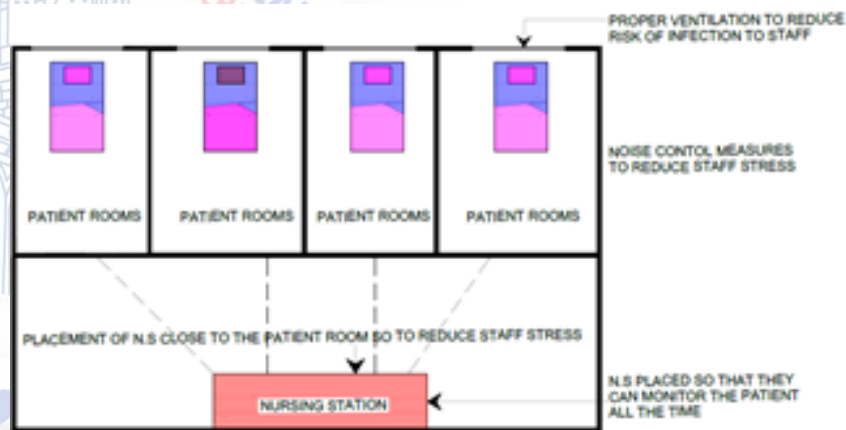


Figure 16.reduction in staff stress(sustainable architecture by SARA BENSALAM)

COLOURS IN A HOSPITAL BUILDING DESIGN

Color schemes –

-Ideally functional color scheme for a hospital building in accordance with the usage of a particular room or space

-For workplaces and sanitary places and even corridors white color is thought to be the best option

-The patient rooms are best suited in yellow color

-The color scheme should be a mix of dull colors with bright intervals in areas where there is less light

-The children sections are always treated with bright sparkly colors but in a recent study of children photography it was revealed that they want more of calm rather than the vibrancy of these gaudy colors

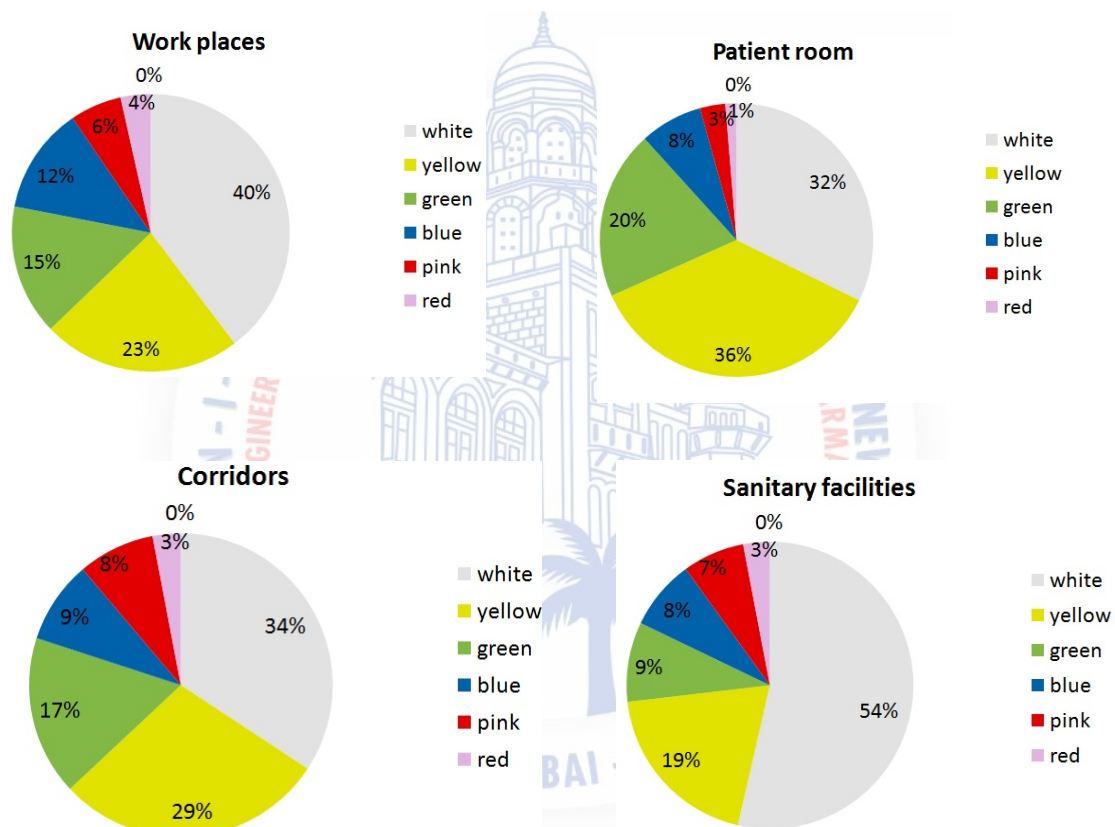


Figure 17. COLOR CHART

Skillful use of colors –

-The skillful use of color can help to overcome the sensory deprivation caused by lack of visual stimuli associated with drab or monotonous environments. Older people, long-stay patients and people with mental health problems have particular needs here

-High reflectance materials are required to give visual lightness, otherwise the surface – and hence the space itself – is likely to appear dark, even when high levels of light are used. Equally, limited areas of

strong color, such as those sometimes used in murals for children's wards, will need to be well-lit for them to have the full sense of vibrancy and to maintain interest after twilight. Lighting of such complex colored designs needs to maintain a consistent appearance from day to night.

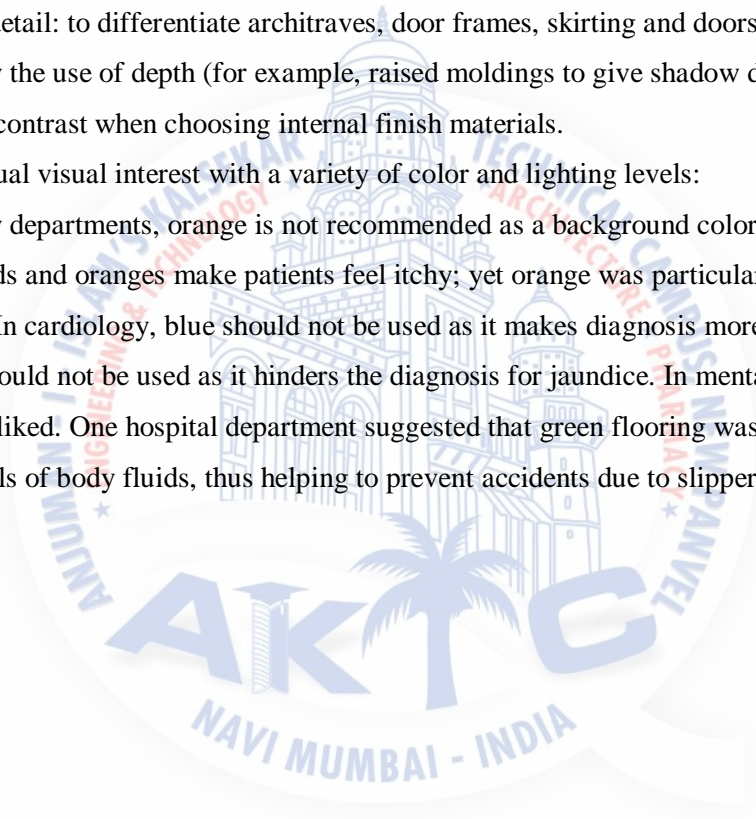
-Use of strong contrast on potential obstacles, such as edges of doors, aids safety and accessibility for all transfer to or from a wheelchair may need extra lighting. The positions of glazed surfaces should be checked for adverse reflections and glare

-Lighting of reception desks should be positioned so that the receptionist's face can be clearly seen by people with hearing impairment who can lip-read.

-Provide tonal detail: to differentiate architraves, door frames, skirting and doors from their immediate surroundings by the use of depth (for example, raised moldings to give shadow detail). Limit the color palette to tonal contrast when choosing internal finish materials.

-Provide continual visual interest with a variety of color and lighting levels:

-In dermatology departments, orange is not recommended as a background color. Staff in these units also reported that reds and oranges make patients feel itchy; yet orange was particularly popular for a maternity unit. In cardiology, blue should not be used as it makes diagnosis more difficult. In maternity units, yellow should not be used as it hinders the diagnosis for jaundice. In mental health wards, oranges and reds are disliked. One hospital department suggested that green flooring was particularly good at showing up spills of body fluids, thus helping to prevent accidents due to slippery floors.



2.1.3OBJECTIVE:

To promote the creation of a healing environment by research and design

To design an environment that aim patients' psychology that will help them feel comfortable while undergoing treatment

To develop a bond between different departments for better functioning and access for the patients and visitors

To look into the safety aspect of the patient and visitors

To provide an institution which responds to present needs while anticipating future changes and including new techniques.

To provide the patient a homely environment and social interaction areas while they are the part of this institute

To connect the spaces to nature, natural day light ventilation, surrounding views to help the patients to heal when they are the part of the institution.

To make an assessment of the physical form of the healthcare building and asses its response to enhanced patients' expectations.

To promote architectural solutions to improve the existing condition of hospitals nowadays

2.1.4SCOPE:

The idea is to create an institute to spread awareness about the diseases which are still unknown in the area.

Taking into consideration, Raigad, a district of Maharashtra, it is observed that it lacks a good and advanced health care unit.

Healthcare services in the area and around the district are small and often provide limited services.

For major and advanced medical help such as accidents, heart attacks, etc., people have to rush the victim either to Mumbai or Pune.

The distance between the rural stretches of Raigad and the developed cities is huge and thus, at times, it brings about major losses of lives or causes some medical complications to the victim and their family.

2.1.5LIMITATION:

As Roha is still not developed and is towards developing the 1st level of trauma and health care facility is difficult to achieve in that area. As the resource supply can be an issue while having and advance health care centre.

Poor knowledge of the health care and their ability of understand the health information is a barrier to accessing the health care centre.

2.1.6METHODODOLOGY:

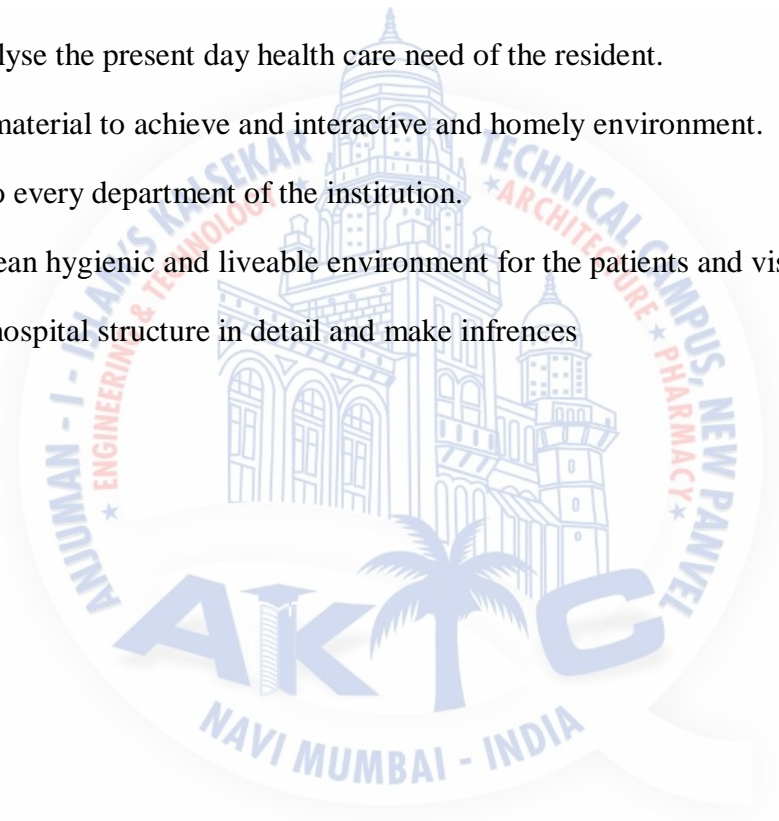
Survey to analyse the present day health care need of the resident.

Wise use of material to achieve and interactive and homely environment.

Easy access to every department of the institution.

To create a clean hygienic and liveable environment for the patients and visitors.

To study the hospital structure in detail and make infrences



2.2 LITERATURE REVIEW

2.2.1 DEFINITIONS

Hospital: A facility that provides emergency, inpatient, and usually outpatient medical care for sick or injured people

Definition of Terms Patients – The main concern and users of the research. Based on observing and gathering data about them, designing a healing environment can help them recover faster by the help of nature.

Inpatient (IPD): A person who has been admitted to a hospital or other health facility for diagnosis or treatment for at least a period of 24 hours.

Outpatient service (OPD): A service in which patients receive ambulatory care treatment without being admitted in hospital.

Healing – the process of making or becoming healthy again.

Healing Environment – An environment that can reduce stress and help to reduce medical error and hospital acquired infections.

Intensive care unit (ICU): A focused unit dedicated to close monitoring and regular medical care of patients with life-threatening conditions.

Dialysis unit: Specialized medical division that provide artificial kidney function.

Blood bank: A place where blood is collected from donors, separated into components, stored, and prepared for transfusion to recipients.

Emergency department (ED): A hospital facility that provides triage, assessment, care or treatment for non-admitted patients suffering from a medical condition or injury.

General surgery: Surgical specialty focusing on the organs of the abdomen (such as the stomach, intestines, gall bladder, liver and pancreas). General surgeons may also treat diseases of the skin and breast.

Medical clinic: Hospital facility for non-admitted patients providing general services such as wound dressing, dermatology, pain management, palliative care and sexual health services.

Pediatrics unit: A specialized facility dedicated to the care of children

Surgery: A physical medical intervention, often called an operation, to treat or investigate a disease or injury.

Nurses' station: An area in a clinic, unit, or ward in a health care facility that serves as the administrative center for nursing care for a particular group of patients.

Isolation ward : A ward in a hospital set aside for patients with contagious or infectious diseases

Pharmacy: A shop or hospital dispensary where medicinal drugs are prepared or sold.

Acute care: Care in which the intent is to perform surgery, diagnostic or therapeutic procedures in the treatment of illness or injury. Management of childbirth is also considered acute care

Cardiology clinic: Hospital facility for non-admitted patients providing services relating to the heart.

MR: Medical record room for all the records related to patients

X-ray: radiology department

MHC: (maternal child health) dept

SNCU: (special newborn care unit)



2.2.2 ARTICLE FROM ARCHITECTURE UPDATE



ameyadesign
Architecture | Interiors | Project Management

Ameya Design works predominantly in the Healthcare Architecture, Interiors and Project Management segments in India. Their business is committed to providing professional management of the complete project cycle and thus supporting clients from inception to post completion aftercare.

Ameya now has team of over 20 people solely dedicated, with range of experience and expertise to offer either on an advisory capacity or as development managers to a consortium.

In conversation with **Nida Chikte**, Architect **Nagesh Musham** from Ameya Design, speaks about the current phase and the future of healthcare architecture as an individual segment

How has healthcare architecture evolved over the years?

It has become more patient centric considering their convenience and comfort. It has become efficient in terms of space planning, flow of process, materials and utilities with an emphasis on efficient management of energy.

How is the approach of designing a healthcare structure different from conventional structures?

Domain knowledge of all aspects of healthcare delivery plays a major role in efficiently planning the flow of patients, staff, doctors, materials, and waste in and out of the hospital facility.

Basic difference is the complexity for design and integration of services, which are usually minimal in any conventional structures.

As healthcare architects, how can you'll unite architecture and technology to create a dynamic and engaging environment for all the users?

Technology on the architecture (building infrastructure) front in healthcare is more emphasised on the energy management and utilities management side, as an energy efficient building can improve the economics of the healthcare cost eventually transferred to patients.

Examples:

- use of solar energy for lighting, hot water generation
- Waste water management – recycling and use for flushing, cooling towers, landscape watering, etc.
- BMS (Building Management System) - to monitor, control and analyse all services (air conditioning, electrical, plumbing, networking, etc.)

What are the different kinds of healthcare structures and how are they catered to differently?

Healthcare structures mainly are categorised based on inpatient/ outpatient and day care facilities.



The design must be such that it proves fruitful for both the patients and the staff. The headwalls in most hospitals are monotonous and unappealing. They can be made aesthetically appealing, while being functional at the same time. The walls can conceal services or storage spaces, which would be used by the hospital staff, instead of leaving the equipment in the open or providing an extra space for it. This gives the hospital flexibility as technology changes and the needs are different.



DESIGN AND FUNCTION

Creating a calming environment is a top priority in hospitals and treatment centres, given that reduced stress has been shown to shorten patient stays.

Firms have worked to bring nature into the patient experience with indoor and outdoor gardens, glazed exteriors that provide views and light, and the use of natural materials such as wood and stone.

This constant research allows design firms to keep testing and refining innovative solutions that can improve the patient experience and add beauty to their communities.

Hence, these medical facilities and hospitals can be beautiful and powerful pieces of architecture beyond just being functional buildings. ▲

nidairfanchikte@gmail.com

Inpatient facilities can be either of short term in the specialties or long term in terms of prolonged disease management and palliative care facilities.

Outpatient clinics and daycare facilities cater more in the space of preliminary consulting and conducting procedures that do not need patients to be hospitalised overnight.

Speaking on a smaller scale, how can well-designed clinics be set up in small pockets in the city?

Smaller clinics in cities in different locations should be designed with basic emergency care, first level of diagnostics, tele medicine and a pharmacy.

What role do colours play in creating healthy and positive environments?

In recent years, there has been a growing acceptance that the healthcare environment can have a significant impact on a patient's perception of their medical care and, in some cases, on their actual recovery. Colour in a healthcare environment should do much more than just make the building look attractive. Well-chosen decor can contribute positively to the creation of an environment in which patients can feel comfortable and at ease.

What are the most apt materials that should be used for the construction of hospitals? Why?

Beyond the conventional brick and concrete as basic materials, materials which have low and zero volatile organic components and are efficient in sound absorption and in reflecting light well are preferred. All contact surfaces need to be seamless with no crevices to ensure they do not harbour some infectious bacteria.

Compare healthcare structures in India and abroad.

Healthcare facilities constructed in the past decade onwards are on par with any facility abroad. One only difference is in the overall per bed space planning with India @ 750 sqft / bed against 900 to 1100 sqft/ bed in the western world.

How do you foresee the future of healthcare architecture in India? Do you see any vast transformations in terms of space planning and management?

India still needs 3 times the existing infrastructure to meet WHO standards and hence a lot of scope for healthcare architecture, space planning and management needs to focus more interns of patient comfort and efficiencies in energy management.

Tell us about one commendable structure that you have designed.

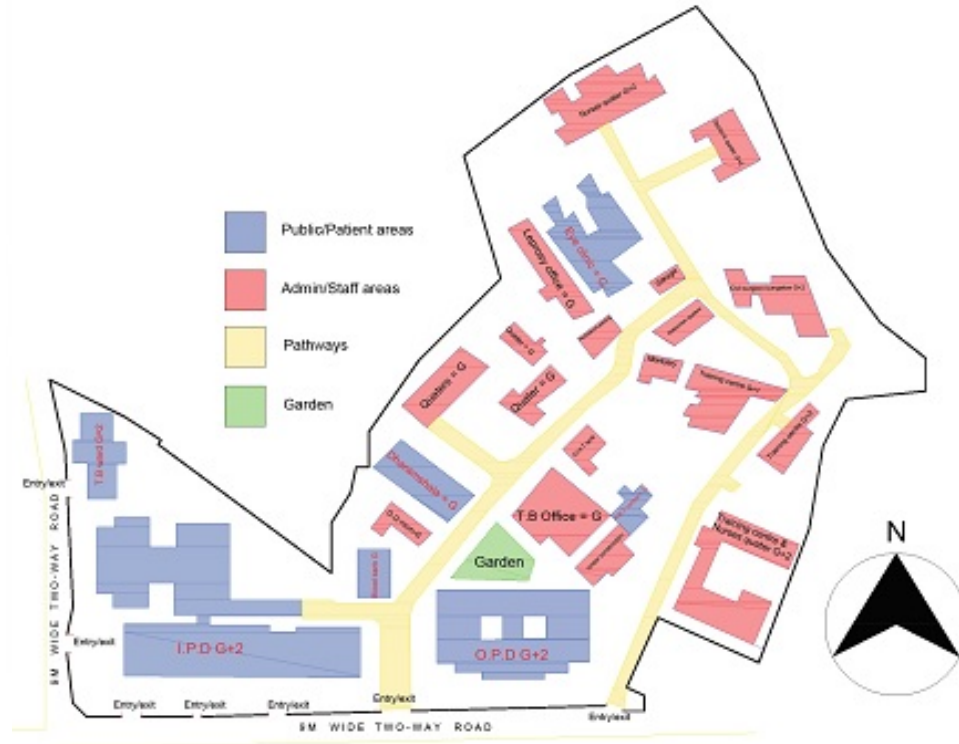
We have designed Global Hospitals, Mumbai in a

25000 sqft plot in central Mumbai with a building foot print of 14000 sqft and 18 floors adding up to 2.5 lac sqft. Our bed efficiency there is at 675 sqft/ bed with all the services planned efficiently not compromising on patient comfort. Clearly defined pathways and efficient space planning have resulted in a facility appreciated both by doctors and patients.



2.2.3.1 CASE STUDIES:**CIVIL HOSPITAL ALIBAG-**

- Address - LimayeWadi, Alibaug, Maharashtra 402201
- The Site of this Civil hospital is of 6.06 acre
- Civil hospital is a 300 bedded hospital and caters to the entire district of Raigad
- The nearest hospital to this is Shrustru Shah hospital which is 1.02 km away

**Figure 18. front elevation of civil hospital alibag****Site plan:****Figure 19. SITE PLAN (Alibag civil hospital)**

The site is accessed by a 9 M road on two sides

There are total 7 entrances, 1 for OPD and site, 4 for IPD and emergencies, 1 for T.B ward and 1 for staff quarters and training centers

There is parking available for bikes at the entrance near the IPD (In-patient department) building and parking for cars and ambulance behind the IPD

There is also an ambulance garage and parking for ambulances, there are total 11 ambulances for this hospital

The T.B ward and some of the training centers and quarters are presently under construction and these weren't there before

The site is covered with trees and open spaces

The highest temperature is 29.5 c and lowest is 23 c in January and 804 mm highest rainfall In July

GROUND FLOOR PLAN:



1. Dispensary
2. Ayush clinic
3. Surgery dept. and plaster room
4. Pediatric dept.
5. Gynecology room
6. Gynecology examination room
7. General medicine room
8. Registration office and case booth
9. RNTCP dept.
10. Breast feeding room
11. Minor OT
12. Enjection room
13. Ophthalmology OPD
14. Physio-therapy
15. Dental dept.
16. Pathology lab

Figure 20. Ground floor plan

17. MHC (maternal child health) dept,`

Ground floor is very busy there are people queuing outside most of the departments, it is noisy but because of the courtyard it is not felt that much, the floor space is well-maintained and clean, there is a female and gents' toilet on this floor and a staff toilet and 1 central staircase but there are no lifts



Figure 22. CASE BOOTH



Figure 21. COURTY WARD IN TH
 OUT PAITIENT DEPARTMENT

FIRST FLOOR PLAN:

1. Account store room
2. Open to sky terrace
3. Medical research room
4. Admin office
5. CS office
6. E-hospital data entry
7. District
8. Female staff toilet
9. Male staff toilet
10. Different OPDS
11. Medicine room
12. Store room
13. Clinical lab



Figure 23. FIRST FLOOR PLAN

The staircase divides the plan in 2 halves, on one side is the admin dept. and on the other side are the OPD depts.

This floor has fewer patients' area and thus is not so busy and can be defined like more of an administrative area

Second floor plan:

1. On the second floor only offices are there. There are no OPD's on this floor and thus there are no patients coming up here.
2. There is a hostel for nurses on the corner of the floor, this is a restricted area and only the nurses can go there, there are 2 guards here and 60 nurses stay in this hostel.
3. This floor is least noisy as there are no patients coming here just the office staff and the nurses

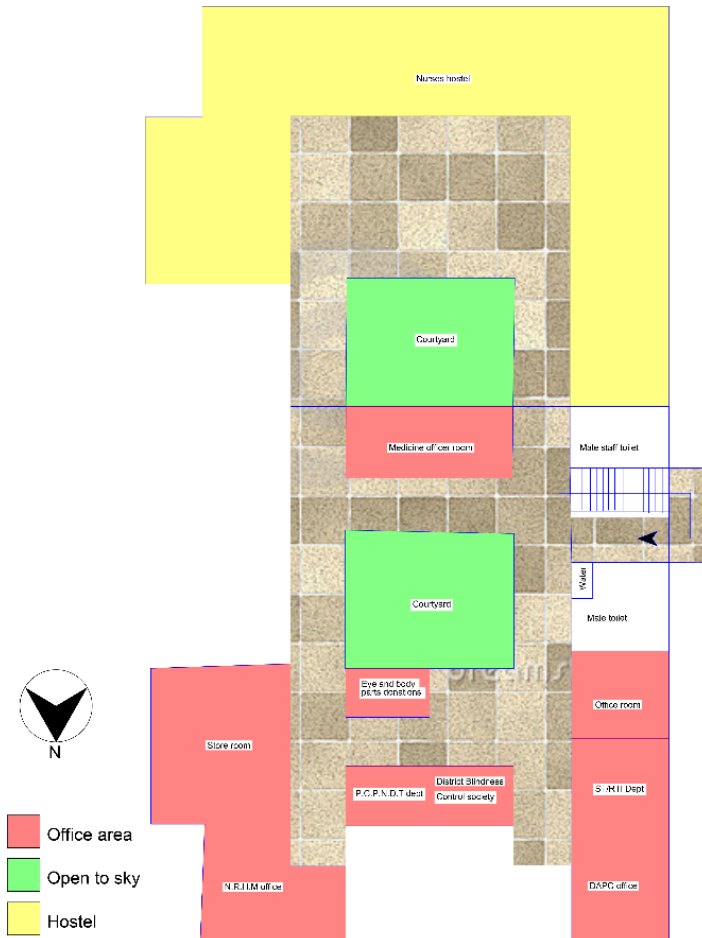


Figure 24. SECOND FLOOR PLAN. CIVIL HOSPITAL ALIBAG



Figure 25. OPEN TERRACE



Figure 26. ADMINISTRATIVE DEPT

IPD building (In-Patient Department) :

This building is situated next to the OPD building and has 5 entrances, 3 from the main road, 2 from the other road and 1 from the inside of the site

There is emergency ward and radiology and all the in-patient wards in this building

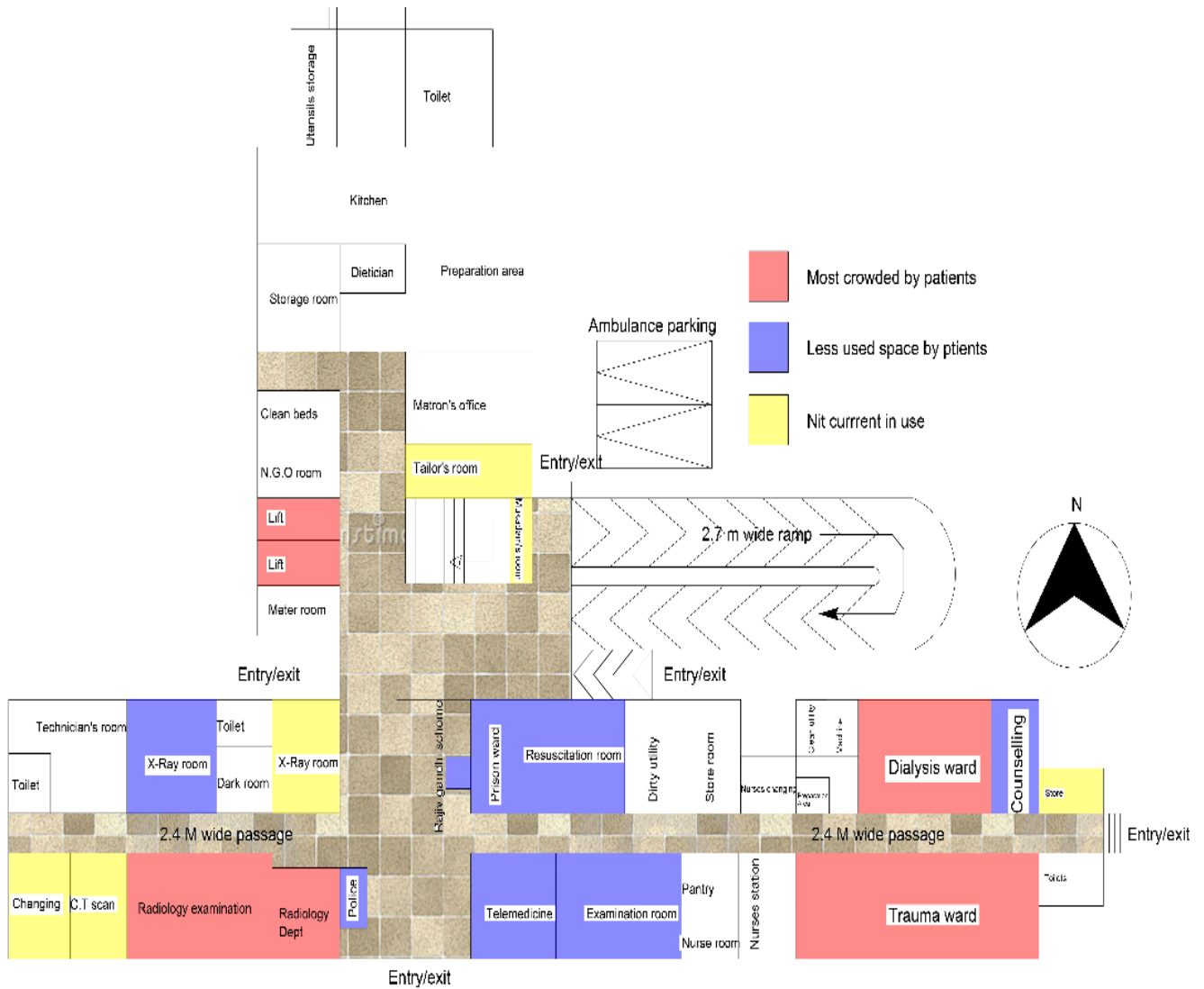


Figure 27.GROUND FLOOR IPD(ALIBAG)

Ground floor plan:

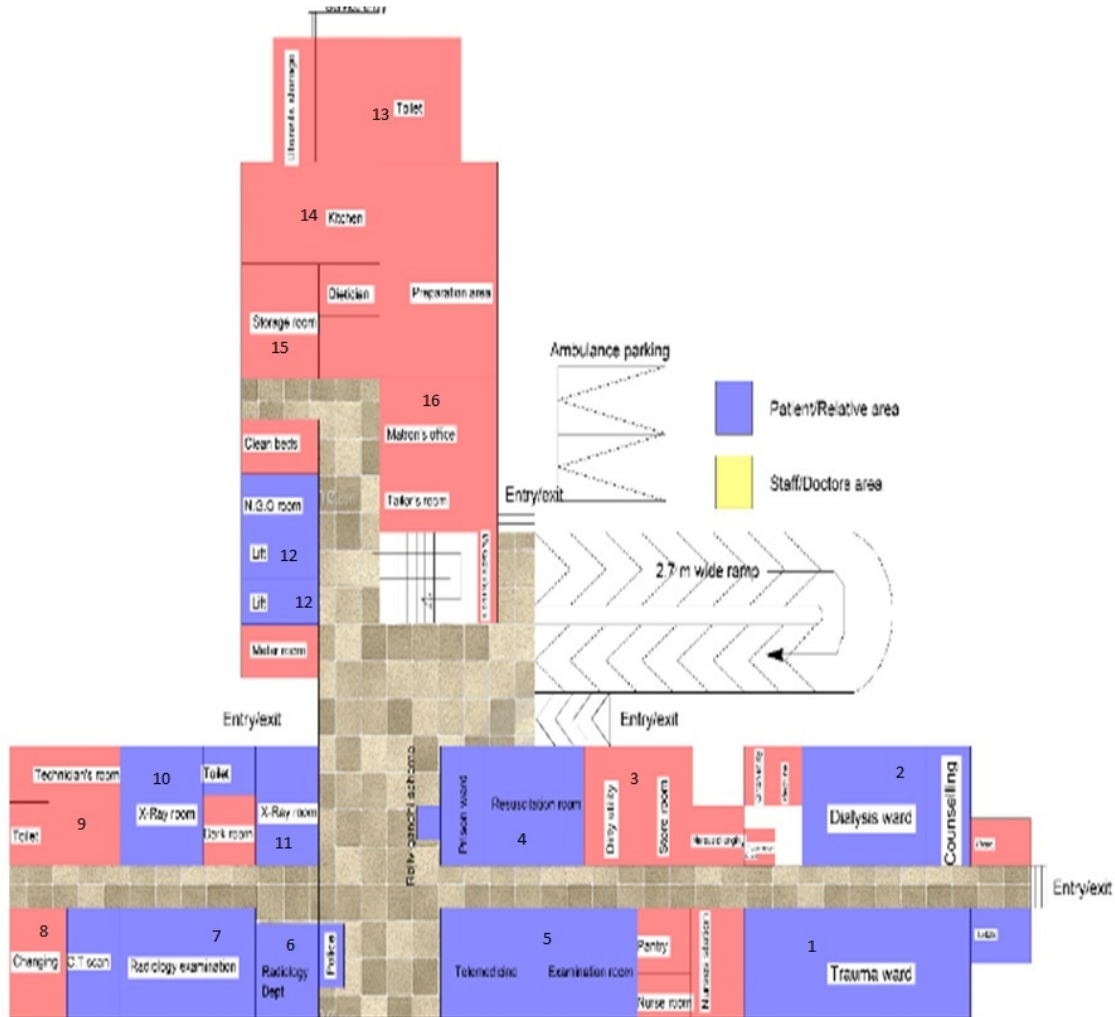


Figure 28.GROUND FLOOR PLAN

- | | | |
|-------------------------------|-------------------|---------------------|
| 1. Trauma ward | 2. Dialysis ward | 3. Dirty utility |
| 4. Prisoner ward | 5. Radiology dept | 6. Examination room |
| 7. Radiology examination room | 8. changing room | 9. Technical room |
| 10. X-ray room | 11. Lift | 12. Lift |
| 13. Toilet | 14. Kitchen | 15. Store room |

First floor plan:



Figure 29 FIRST FLOOR PLAN IPD BUILDING (ALIBAG CIVIL HOSPITAL)

- | | | |
|------------------------|----------------------------|-----------------------|
| 1. Female medical ward | 2. Doctors room/nurse room | 3.S.N.C.U ward |
| 4. S.N.C.U in patient | 5.Feeding room | 6.Sterilization room |
| 7. Meter room | 8.Lift | 9.Minor OT |
| 10. Machine room | 11.Female changing | 12.Toilet |
| 13. Male changing | 14.Operation theatre | 15.Recovery room |
| 16.Store | 17.Dirty utility | 18.sterilization dept |

19.ICU

20.Ramp

Second floor plan:

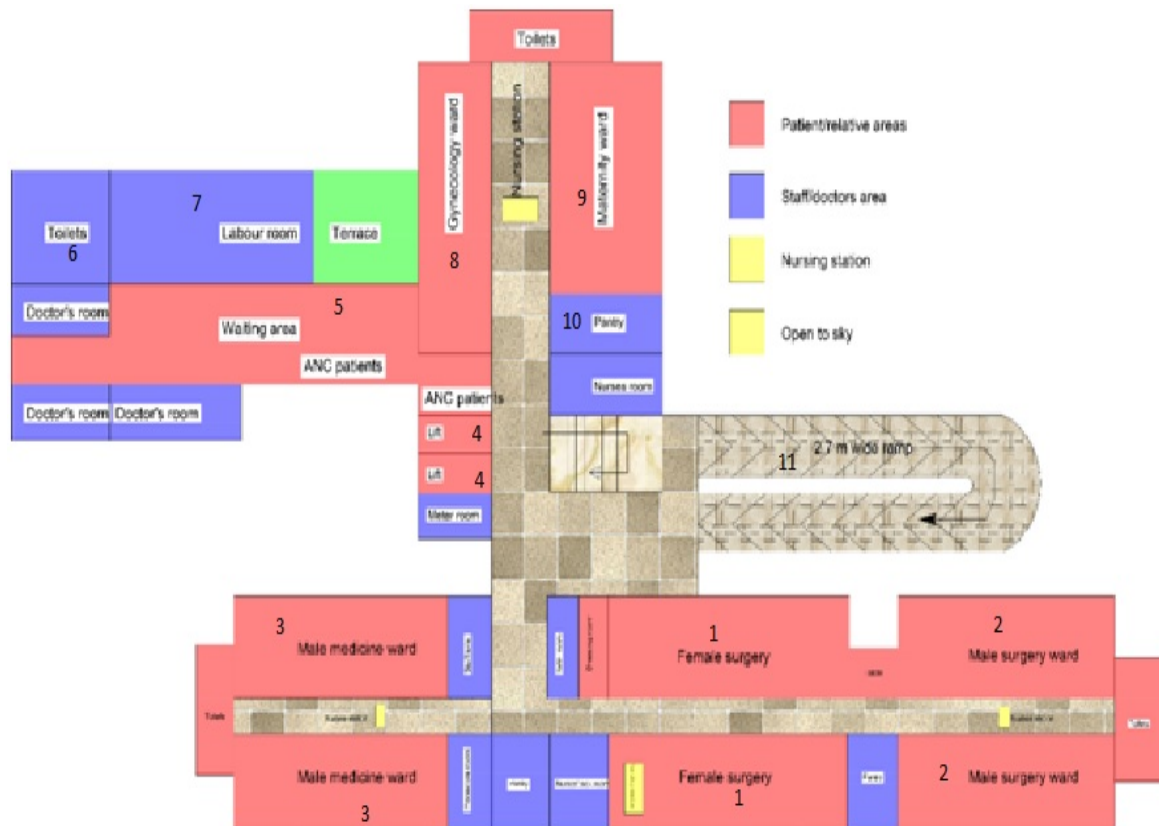


Figure 30. SECOND FLOOR PLAN (CIVIL HOSPITAL ALIBAG)

- 1. Female surgery ward
- 2. Male surgery ward
- 3. Male medicine ward
- 4. Lift
- 5. Waiting area
- 6. Toilets
- 7. Labour room
- 8. Gynecology ward
- 9. Maternity ward



Figure 32. FEMALE WARD

Figure 31. MALE WARD

Strength and weakness:**Strength:**

- There is good circulation space throughout the campus
- The building design is scattered and there is place for good ventilation and sunlight in all the departments
- There are courtyards in the OPD building and thus is a good planning as it reduces the noise and smell
- The emergency ward is readily accessible from a separate entry made for it and thus provides speedy healthcare
- The people and patient coming in are mostly satisfied

Weakness:

- There is no provision for ample waiting areas for the relatives and thus the relatives tend to sleep or sit on the ground thus creating circulation problems
- There is need for ramps in certain areas of the building
- Many areas are abandoned or not supervised correctly
- There are no fire extinguishers inside the building
- There are queues outside all the OPD departments and thus it creates noise and also hinders movement
- The major façade of the OPD and IPD building is facing south side and can give way for heat built-up during summer

2.2.1.2 CIVIL HOSPITAL, THANE (THANE DISTRICT):

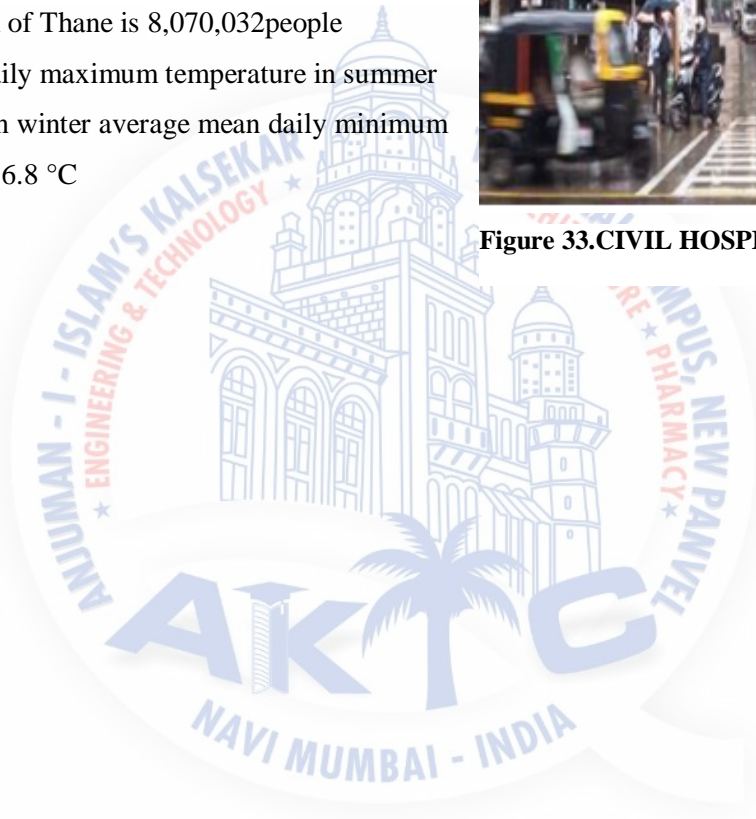
Features:

- Located in Thane west
- A 200 bedded hospital
- 2-acre site
- Caters to the entire district of Thane
- There is no hospital within 750 mts radius
- The population of Thane is 8,070,032 people
- The average daily maximum temperature in summer is 32.9 °C and in winter average mean daily minimum temperature is 16.8 °C

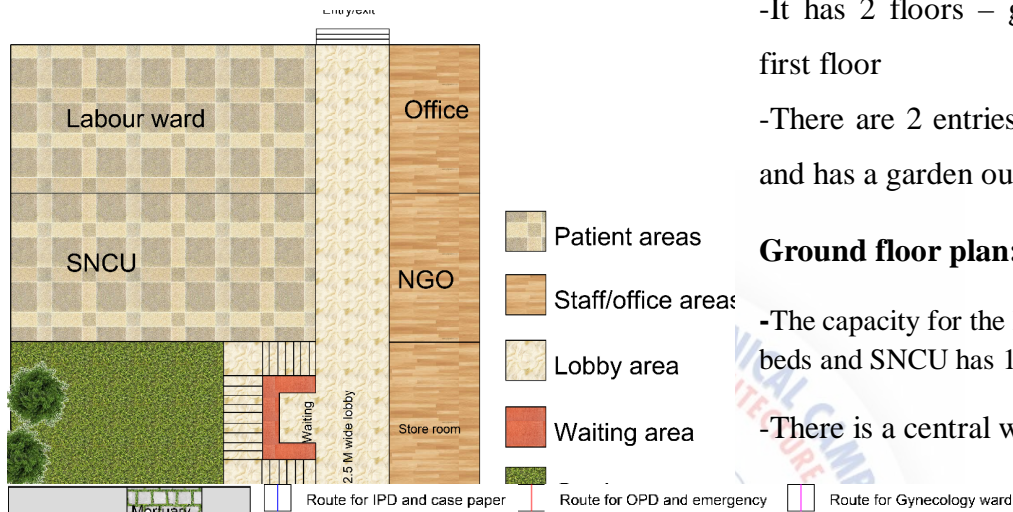


Figure 33. CIVIL HOSPITAL THANE

SITE PLAN:



Admin Building:



-It has 2 floors – ground floor and first floor

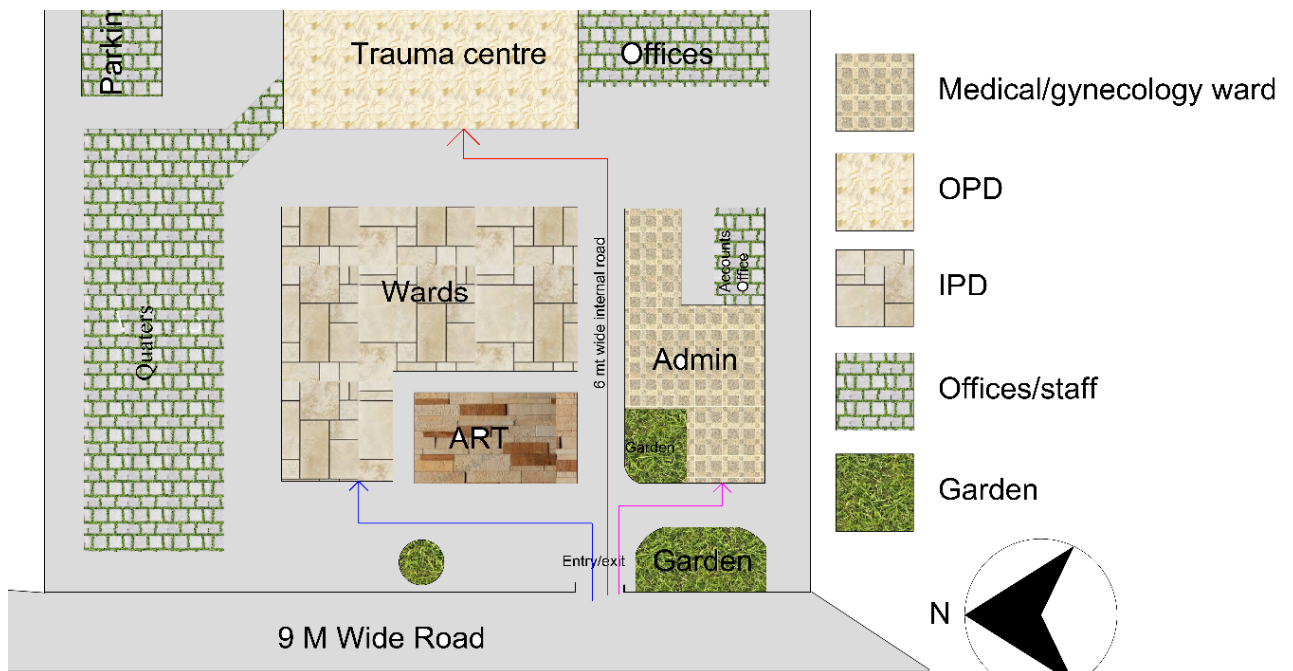
-There are 2 entries for the building and has a garden outside

Ground floor plan:

-The capacity for the labor ward is of 15 beds and SNCU has 10 beds

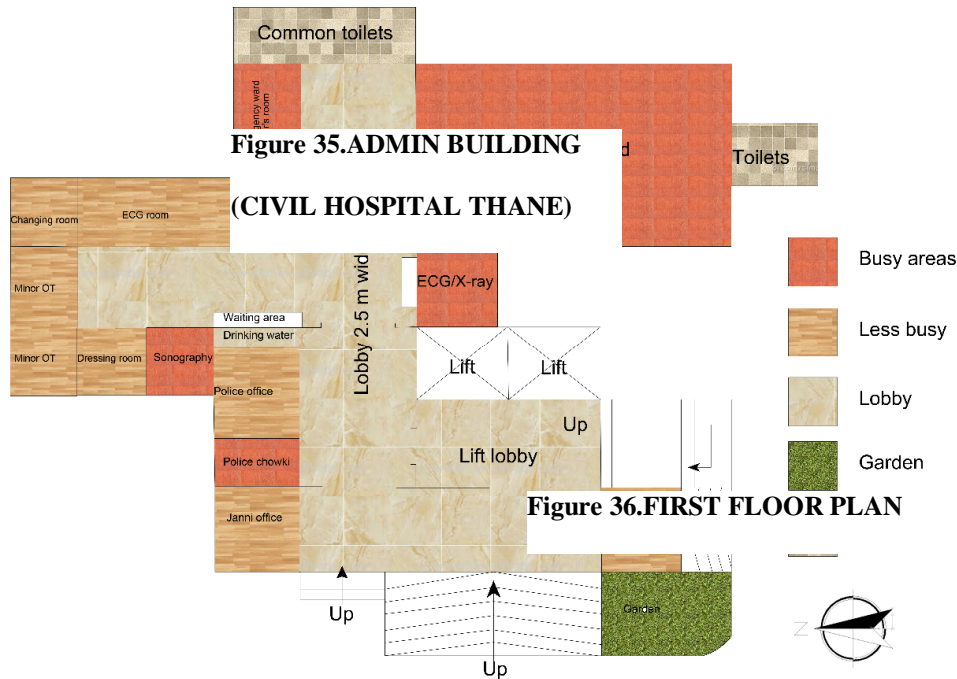
-There is a central waiting area

Figure 34 CIVIL HOSPITAL THANE



which is always full with people

- The lobby area is very dull and has no good amount of natural light and ventilation except from the entries on the side and the floor isn't hygienic enough also.



- The male medical ward consists of 15 bed
- The male medicinal ward is very crowded all the time and there is pressure on the bed occupancy
- The gynecology ward is similar to the male medicinal ward with similar conditions and having similar bed capacity

-There are no common toilets on this floor

TRAUMA CENTRE:

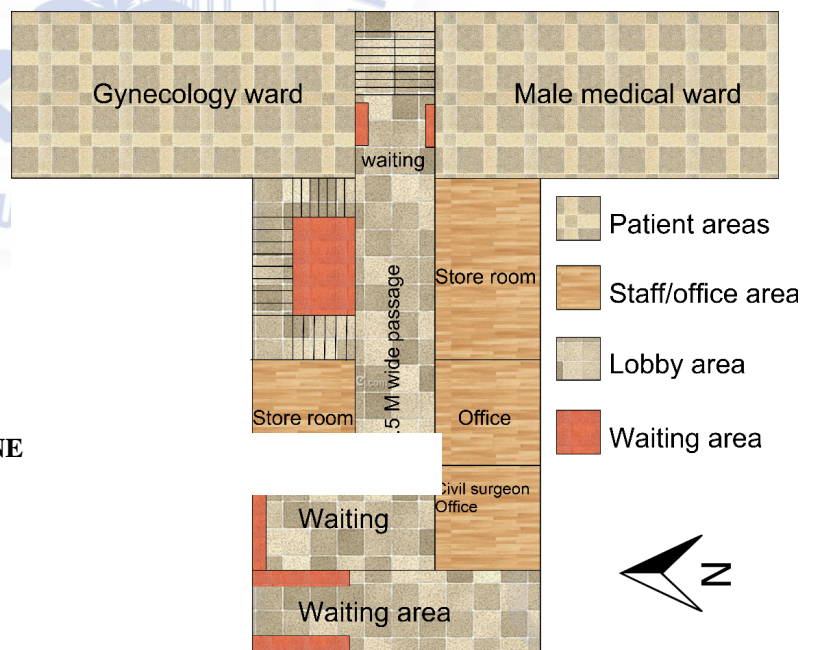
Ground floor plan:

-The trauma centre is located on the eastern corner of the site

-There are 12 beds inside the emergency ward

Figure 37.TRAUMA CENTER.CIVIL THANE

-The minor OT has a dressing room one small OT and changing rooms and



ancillary spaces

-The emergency ward is of size 5.5 mt x 15 mt

First floor plan:

-The first floor is a less crowded area as compared to the ground floor

- The ICU ward has 7 beds and a nursing station with a common toilet and places for storage inside and a pantry and utility room opposite to it and nurses retiring and doctors room next to it along with the waiting area

-All the beds are separated by curtains from each other and there is a good circulation space in the room and it can be used to accommodate more beds in the future

Second floor plan:

-This area is closed when not in use and is crowded only during the visiting hours

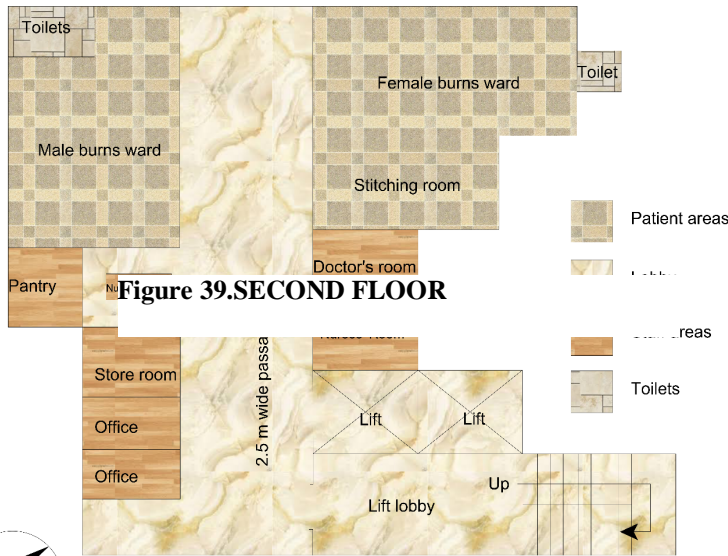
-The second floor has the burns ward

-There are 2 wards in the burns department one is female ward and the other is



male ward

-Both the wards have 10 beds each with a common toilet for the patients and are air conditioned



Third floor plan:

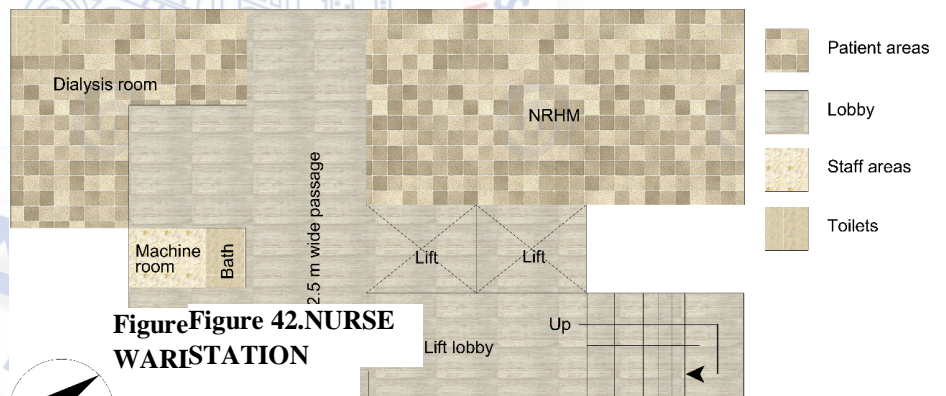
-The third floor is having the dialysis room and the NRHM Centre

-The NRHM is a social service dept. and is open only one a day or two

-The NRHM department is mostly closed

-The dialysis room has 6 beds and 6 machines

Figure 41. DIALYSIS WARD



Fourth floor plan:

-The fourth floor is the hematology department and the psychiatry OPD and consulting rooms



-This floor Saturdays and before

-This floor and only people concerning



is closed and after 9 a.m

is not so accessed the

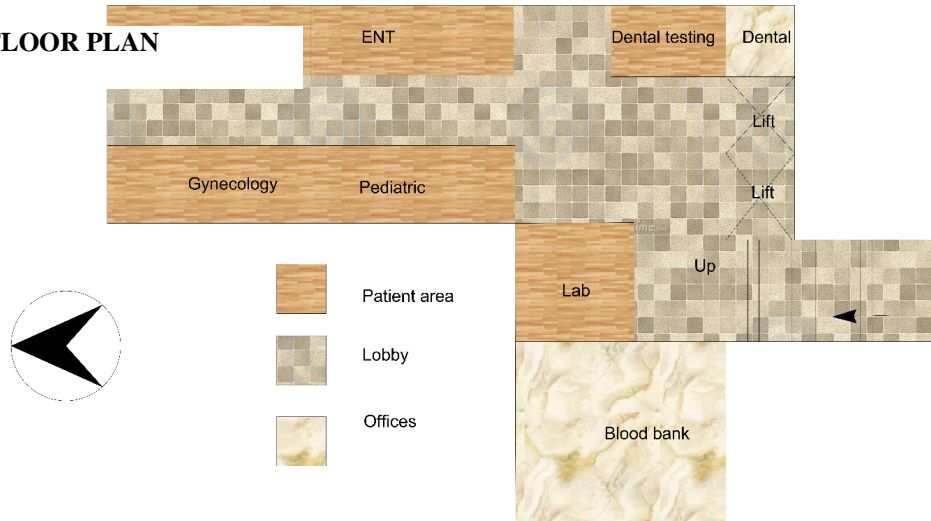


on 5 p.m

crowded by the

departments

Figure 43.FOURTH FLOOR PLAN



Ground floor IPD building:

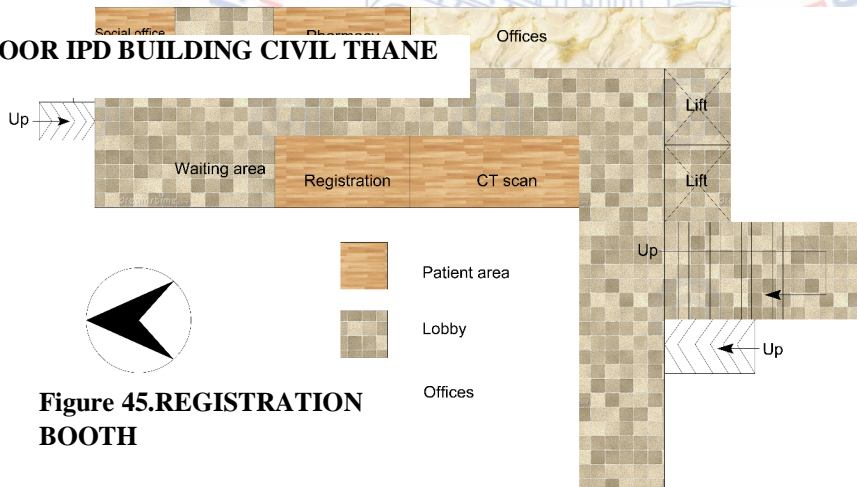
-The ground floor is mostly used for the registration counters and is not such a crowded area

The ground floor has the entrance for the

buildings on 2 sides

There is a CT scan room which is not in use anymore

Figure 44.GROUND FLOOR IPD BUILDING CIVIL THANE



-There is the registration counter and the pharmacy rooms also on the ground floor

-There is also a Rajiv Gandhi yojna room which is a social worker's office

Figure 45.REGISTRATION BOOTH

IPD first floor:

-First floor has the blood bank

-The blood bank is situated in this building as it also has the OT and thus it can be used in cases of emergencies

-This area is closed on Saturdays and after 5p.m everyday

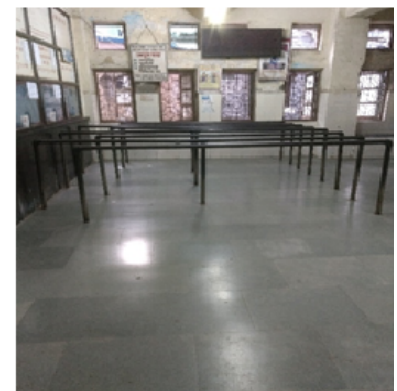
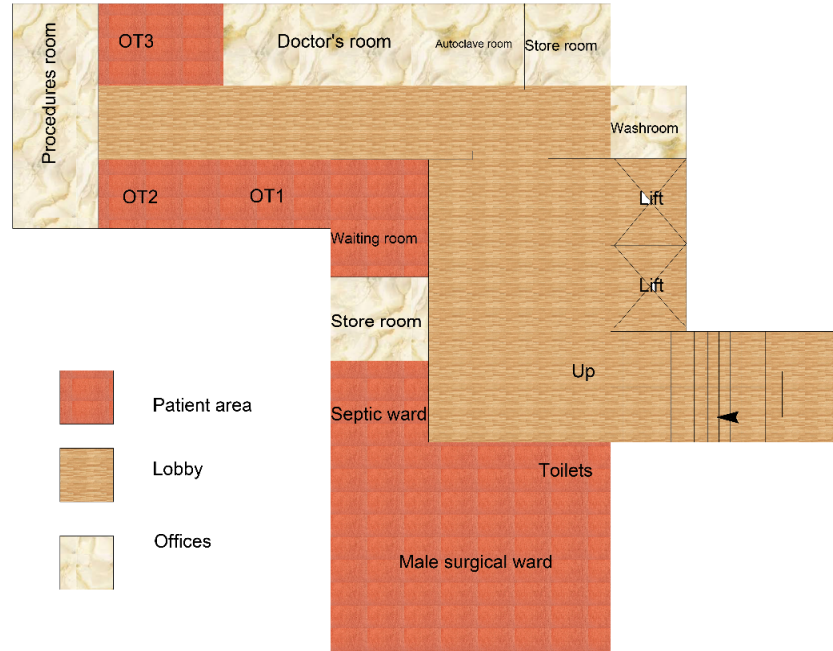


Figure 46.IPD FIRST FLOOR

IPD second floor:



IPD third floor:

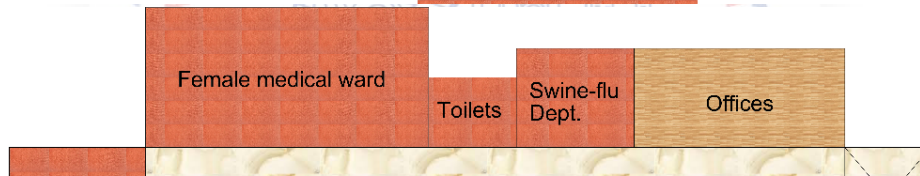
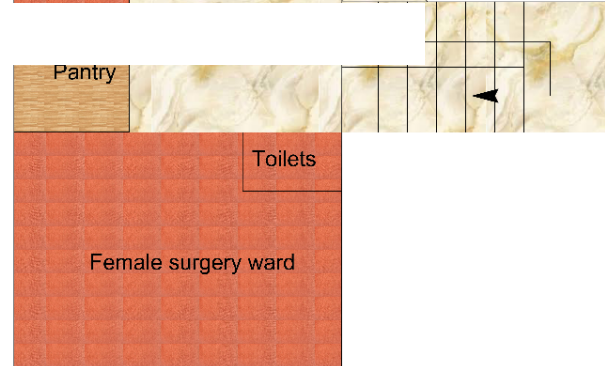
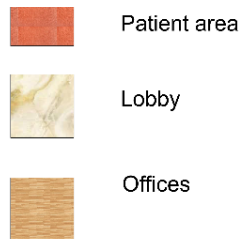
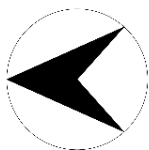


Figure 47. IPD .SECOND FLOOR PLAN



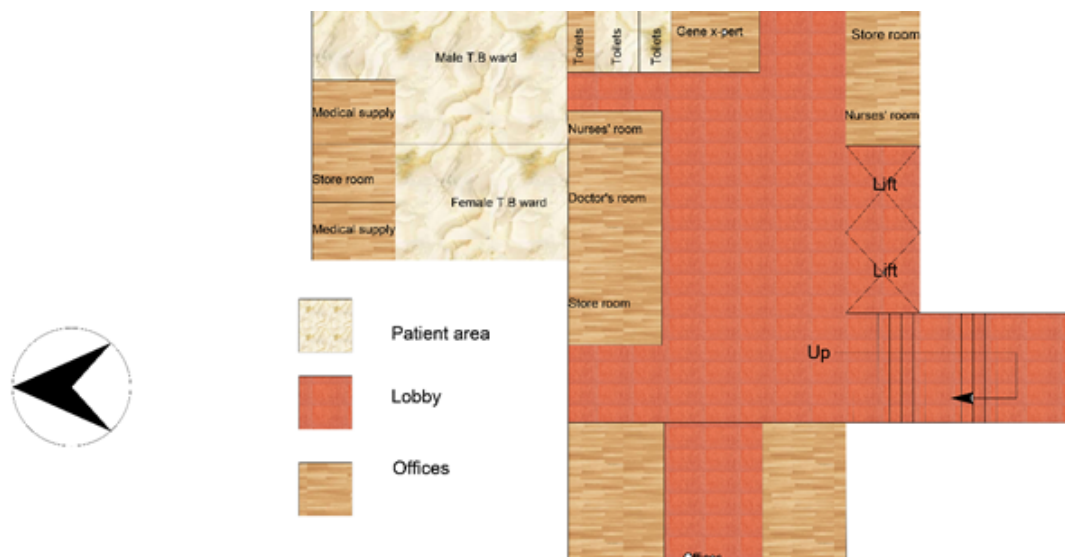
Figure 48. IPD THIRD FLOOR PLAN



IPD fourth floor:



Figure 49. IPD FOURTH FLOOR PLAN



sunlight in all the departments

Strengths and weakness:

Strengths-

-There is good circulation space throughout the campus

-The building design is scattered and there is place for good ventilation and

-The site is near the local railway and bus station and thus is very accessible

Weakness-

- There is acute shortage of beds in some departments and thus it leads to people sleeping on the ground
- There is no canteen or common toilets accessibility for the relatives staying back and thus creates further problems
- There is need for ramps in certain areas of the building
- Many areas are abandoned or not supervised correctly
- There is problem of noise control and smell control in certain ar



PARS HOSPITAL

Architects: New wave Architects

Location: Rasht, Gilan Province, Iran

Lead Architects: Lida Almassian, Shahin Heidari

Built Area: 30000.0 sqm

Site area: 17400 sqm

Project : Year 2016

No of Beds: 160 Beds

Pars hospital Rasht is built in over all 30000sqm with 160 beds, it is located adjacent to one of the most crowded roads of Rasht

In accordance with the context of the city designer tries to considered sloppy volumes so in this way apparently continuity of sightseeing is preserved.

Concept of design:

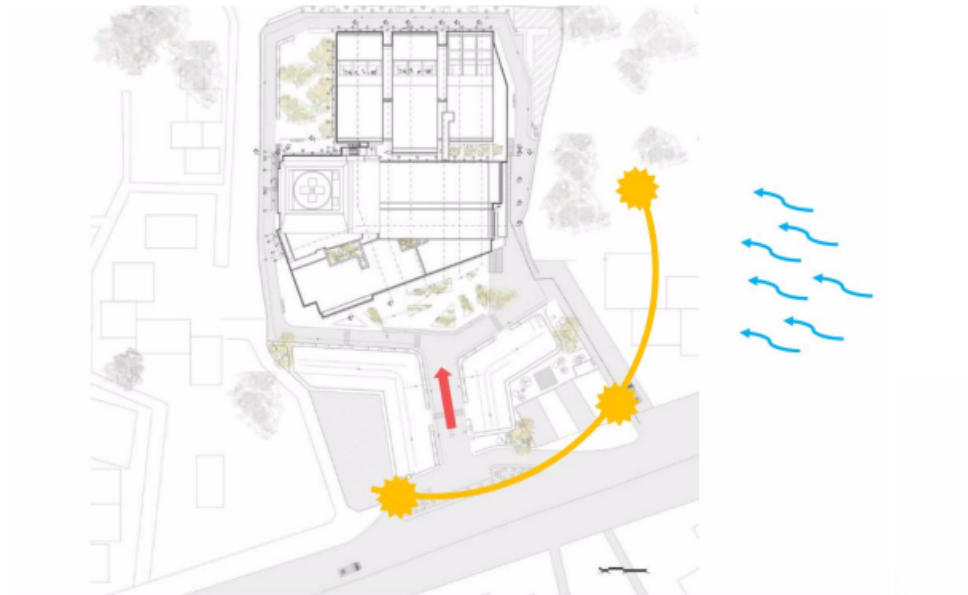


The concept of design in ground floor coming from having wide space with combination of diagnostic spaces, emergency parts and Outpatient clinic which are connected to other sections vertically an horizontally through main transparent Atrium, play vital role of merging buildings sections into one single entity and acting as organizer of interior pedestrian path, provide coherency, forming hierarchy between public and private areas and creating light space with efficient usage of daylight and

less using electrical energy.

Preservation of Continuity of users movement beyond remedial sections in all parts of building is afforded in a way that wouldn't makes any interruption between protected and unprotected areas

Site plan:



Ground floor plan:

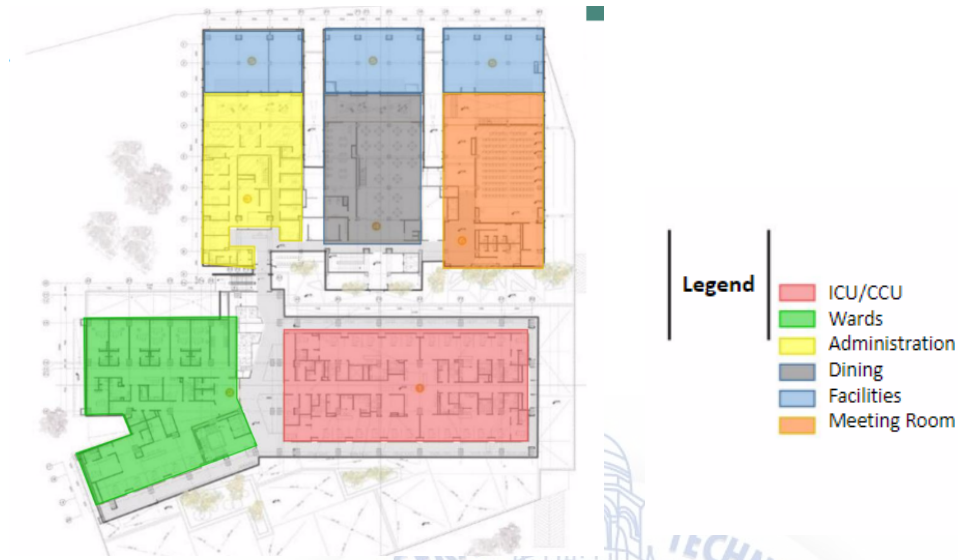


The ground floor plan shows the segregation of different areas in the hospital

The outpatient dept clinics and emergency is on the ground floor for easy access

The building has the sterilization zone on ground floor to look after the bio medical waste

First floor plan

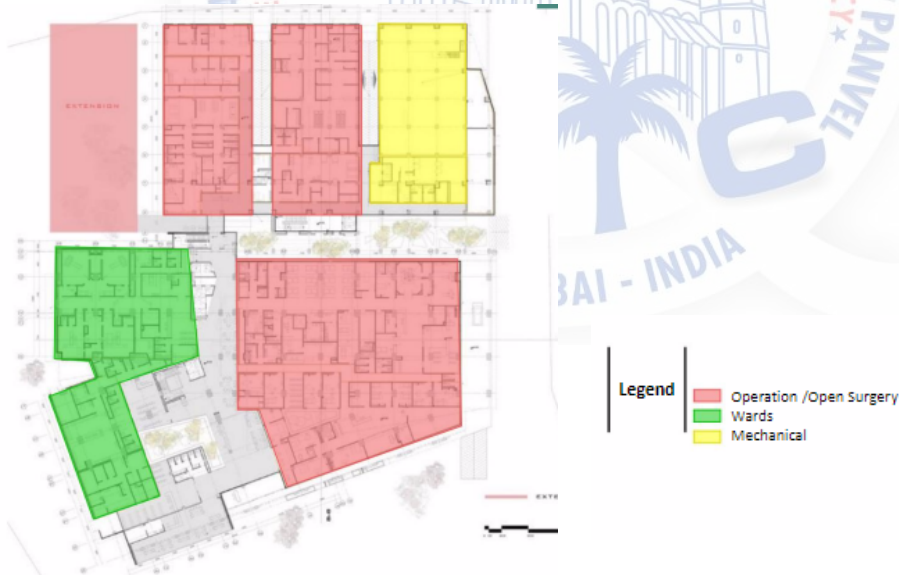


The first floor comprises of administration area on the north side

ICU/CCU on the dept on the south side

Ward next to the ICU dept

Second floor plan:

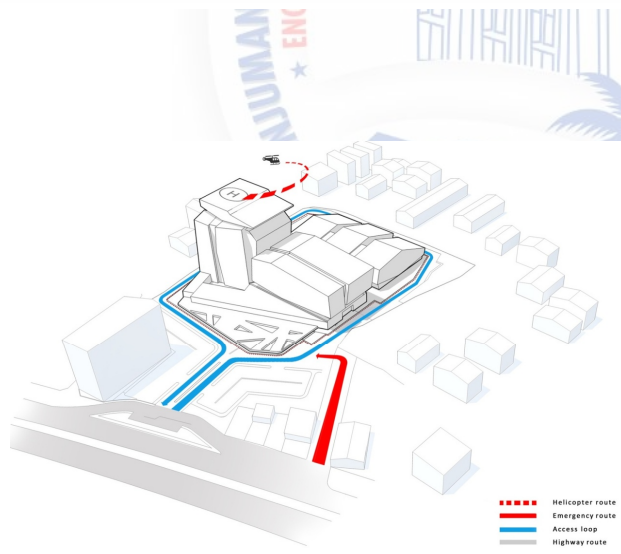
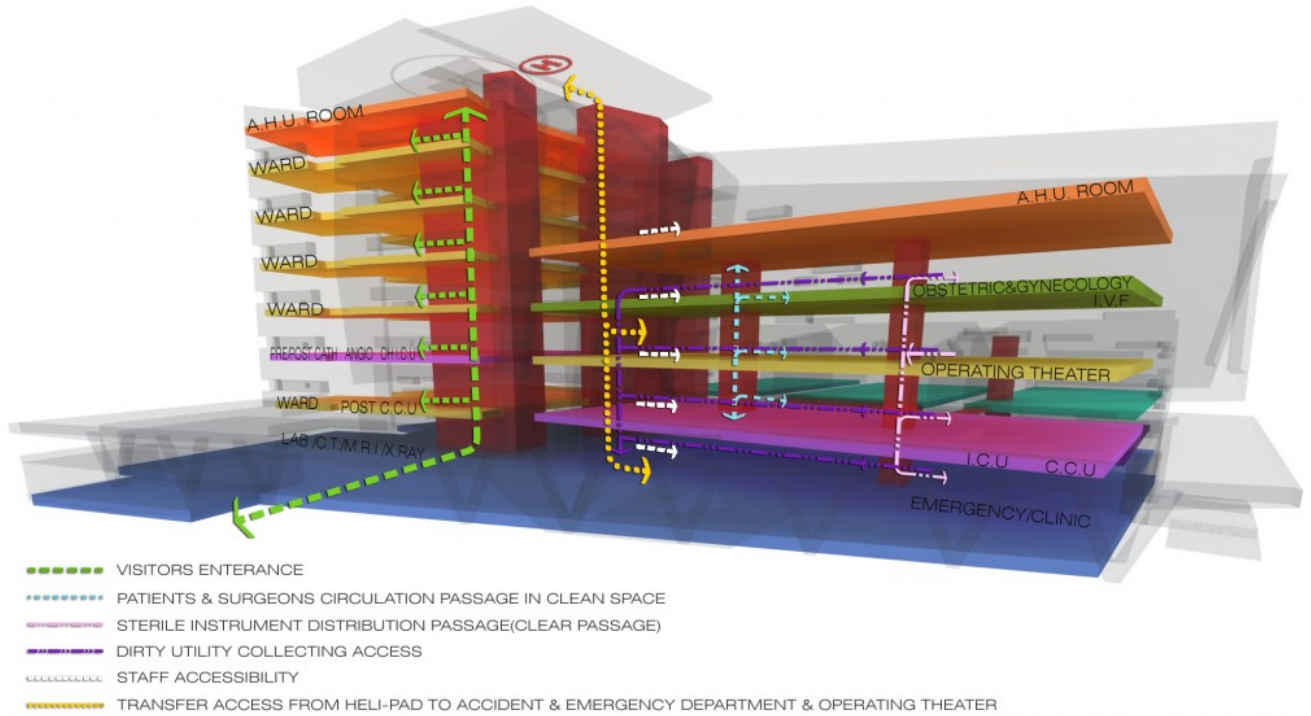


The second is totally dedicated to operation and surgery dept

Post operation wards and mechanical services

SECTIONAL VIEW SHOWING ALL RELATIONS:

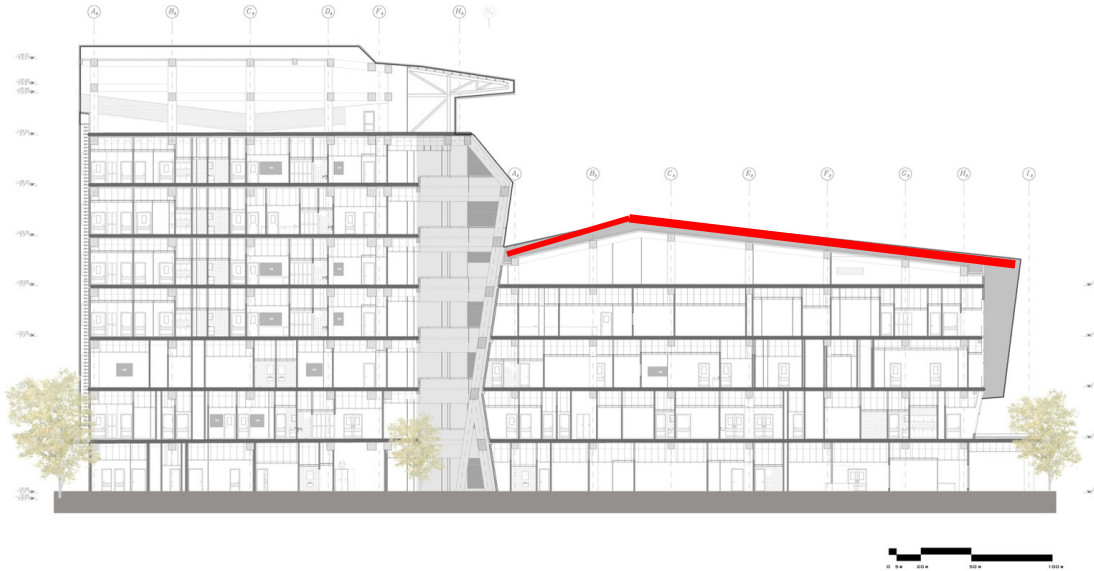
INTER-DEPARTMENTAL RELATIONSHIPS



Entrees to hospital are divided in three types of main entrance in south side and emergency door in east side of building and finally there is helipad in roof that prepares the vertical access of the building. All the accesses are connected in atrium and then generated through the building's sections

SECTION :

Designer tries to consider sloppy volumes so in this way apparently continuity of sightseeing preserved.



COMPARATIVE ANALYSIS:

Comparison	Thane Civil hospital	Alibaugh Civil hospital					
Scale	200 beds	300 beds					
Location	Thane	Alibaugh					
Building type	Spread out structure	Spread out structure					
Ownership type	District hospital	District hospital					
Provision for breathable spaces like landscaping etc.	Yes, landscaped garden outside the OPD building	Yes, Courtyards and gardens used					
Provision for positive distractions	No, There are no courtyards or TV or any other entertainment	Yes through courtyards and garden spaces					
Infection control measure	Not good	Good					
Fire safety measures	Not good, there were less fire extinguishers	Not good					
Lobby space	Inside but still has views of windows so decent	Inside but with courtyards so good					
Comparison	Thane Civil	Alibaugh Civil					

	hospital	hospital					
Waiting areas	Dull and insufficient	Good and sufficient					
Motivations for movement and subtle healing	Not-good	Not-good					
Staff and security	Ok	Good					
Noise control measures	Not good control measures	Use of courtyards					
Control for odor	Not good	Use of courtyards					
Room types	Wards	Wards					
Major strengths	Patient satisfaction and good flow of staff and services	Good building circulation spaces and smooth functioning					
Major weakness	Bad circulation on site and problems of way-finding, problems of entries to the site	Room assignments and lack of beds and future planning and no fire safety					
Patient satisfaction	Yes all were satisfied	Yes all were satisfied					

Table 4.1) Comparative analysis of all case studies

--	--	--	--	--	--	--	--

SITE ANALYSIS AND SELECTION:

Roha is a taluka in raigad district of maharashtra state, india. roha taluka head quarters is roha town . it belongs to konkan region

.It belongs to konkan division . it is located 41 km towards east from district head quarters alibag. 82 km from state capital mumbai towards north



 **USAR ROAD ADJOINING THE SITE**

 **STATE HIGHWAY 1.5KM FROM THE SITE**

CLOSE PROXIMITY SITE:

NEAREST BUS DEPOT: ROHA 2KM

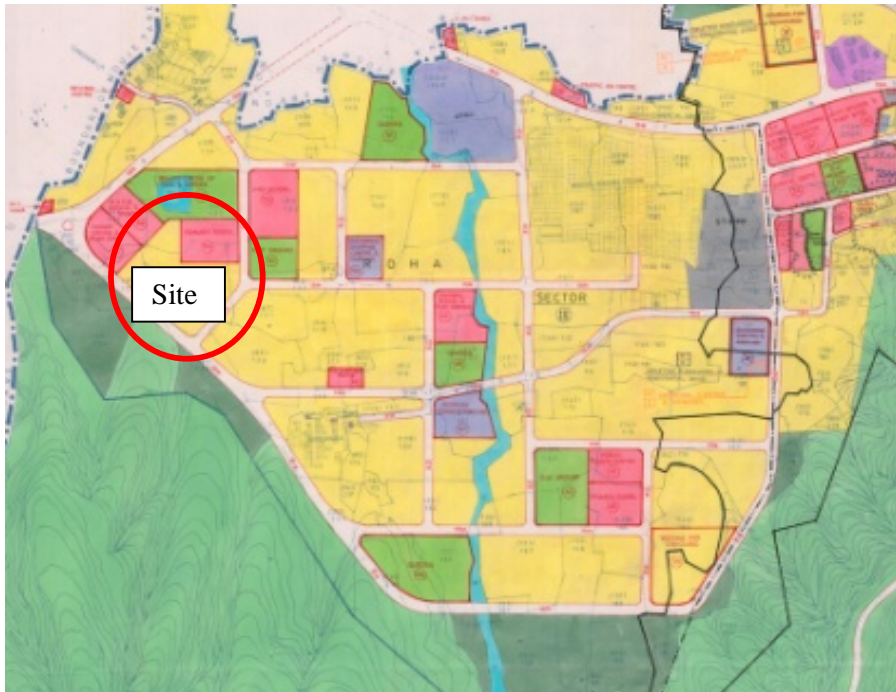
NEAREST RAILWAY STATION : ROHA RAILWAY STATION 3KM

HIGHWAY: STATE HIGHWAY 1.KM

NATIONAL HIGHWAY: 12KM AWAY FROM THE SITE

NEAREST WATER BODY: KUNDALIKA RIVER 1.5KM

THE SITE IS EASILY ACCESSIBLE FROM ALL MEANS OF TRANSPORT

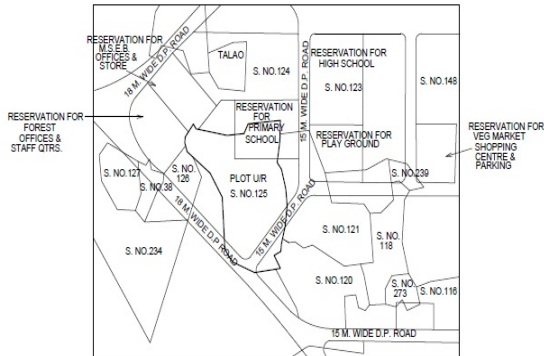
LANDUSE MAP:**CHANGE IN LAND USE**

(Residential plots abutting on road having width 12 m. and above in non-congested area and 9 m. and above in congested area) in this zone the following uses, mix uses may be permitted: uses permissible in r-2 zone .:

- ii) Personal service establishments: professional offices
- .iii) Radio broadcasting stations and studio, telephone exchanges, mobile towers.
- iv) Frozen food lockers, fast food and vending stalls.
- vix) Sale of used or second hand goods or merchandise (not junk, cotton waste, rage or other materials of offensive nature).
- xi) Storage of furniture and household goods.
- xii) Repairs to all household articles (excluding auto vehicle).
- xiii) Veterinary dispensaries and hospitals.

SITE LOCATION MAP SHOWING ADDJOINING

PLOTS:

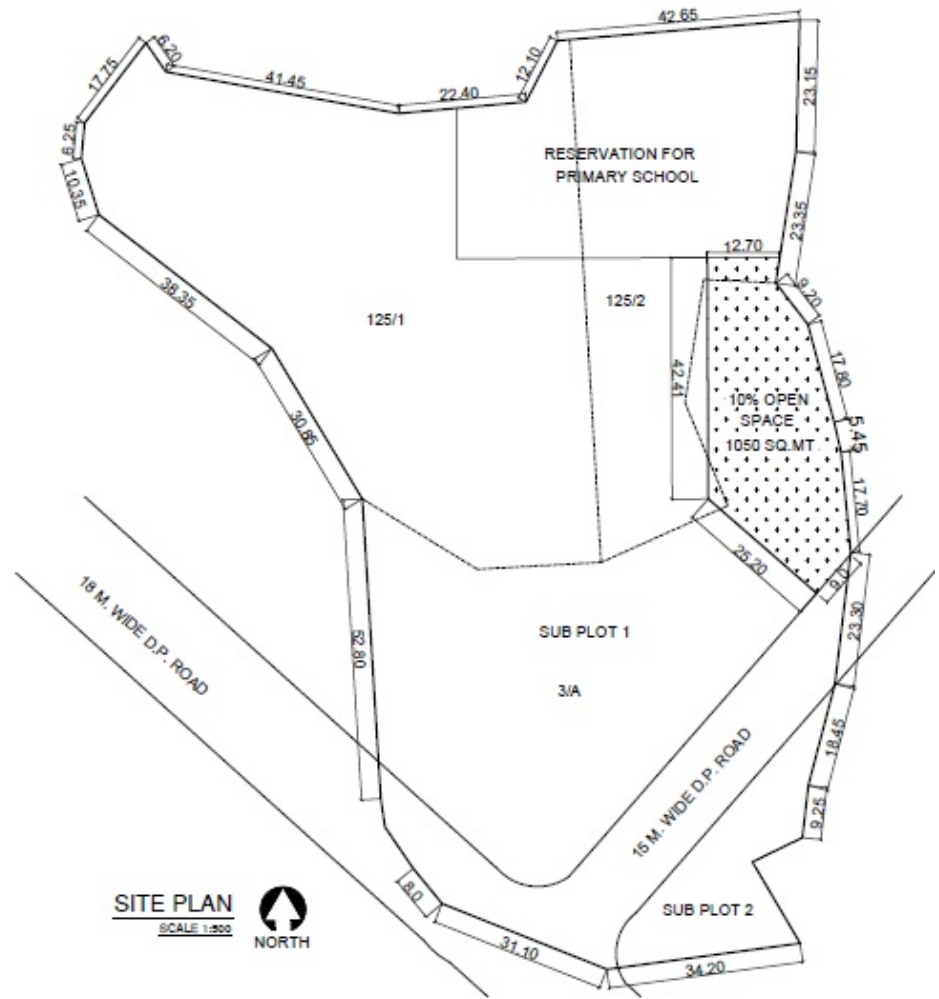


PLOT AREA SUMMARY	
AREA OF S. NO. 125/1A	= 2340.00 SQ.MT.
AREA OF S. NO. 125/1B	= 2870.00 SQ.MT.
AREA OF S. NO. 125/2	= 2500.00 SQ.MT.
AREA OF S. NO. 125/3A/1	= 3380.00 SQ.MT.
AREA OF S. NO. 125/3A/2	= 2760.00 SQ.MT.
TOTAL AREA UNDER PROPOSAL	= 13850.00 SQ.MT.

LOCATION PLAN
 SCALE: NTS

 NORTH

SITE PLAN WITH DIMENSIONS:



SITE PLAN
 SCALE 1:500

 NORTH

WEATHER DATA:

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	23.8	24.3	26.5	28.6	29.8	28.6	27.2	26.8	27	27.7	26.5	24.9
Min. Temperature (°C)	18.6	19.1	21.8	24.7	26.5	25.9	25.1	24.7	24.3	23.8	21.4	19.4
Max. Temperature (°C)	29.1	29.6	31.2	32.5	33.1	31.4	29.4	29	29.7	31.6	31.7	30.4
Avg. Temperature (°F)	74.8	75.7	79.7	83.5	85.6	83.5	81.0	80.2	80.6	81.9	79.7	76.8
Min. Temperature (°F)	65.5	66.4	71.2	76.5	79.7	78.6	77.2	76.5	75.7	74.8	70.5	66.9
Max. Temperature (°F)	84.4	85.3	88.2	90.5	91.6	88.5	84.9	84.2	85.5	88.9	89.1	86.7
Precipitation / Rainfall (mm)	0	0	0	2	24	687	1364	889	398	113	14	1

AVERAGE ANNUAL TEMP.: 26.8C

MEAN AVG. TEMP.: SUMMER- MAX: 33.1degree C

MIN: 29 degree C

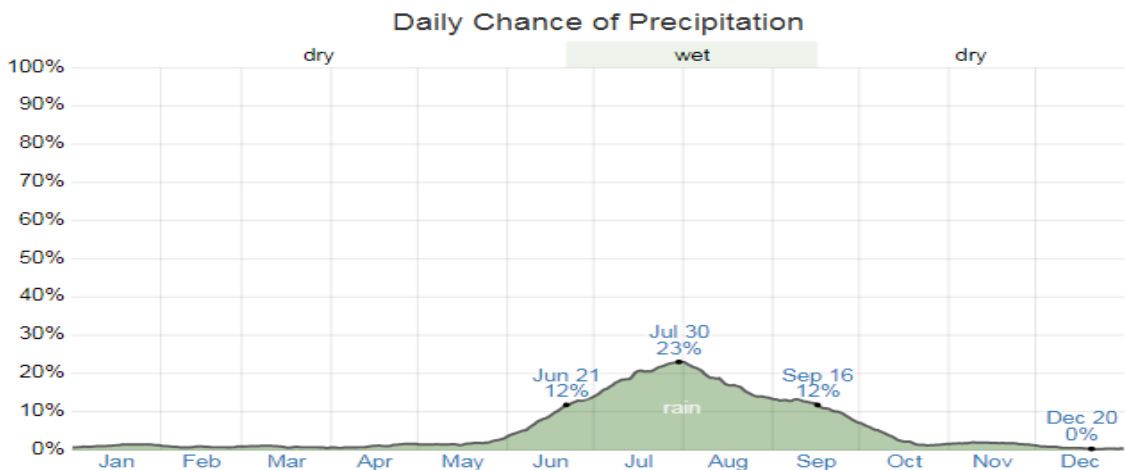
WINTER- MAX: 27.7degree C

MIN: 23.8degree C

PRECIPITATION: AVERAGE- 3492 mm

LOWEST- January (0 mm)

HIGHEST- July (1364 mm)



WIND DIRECTION:

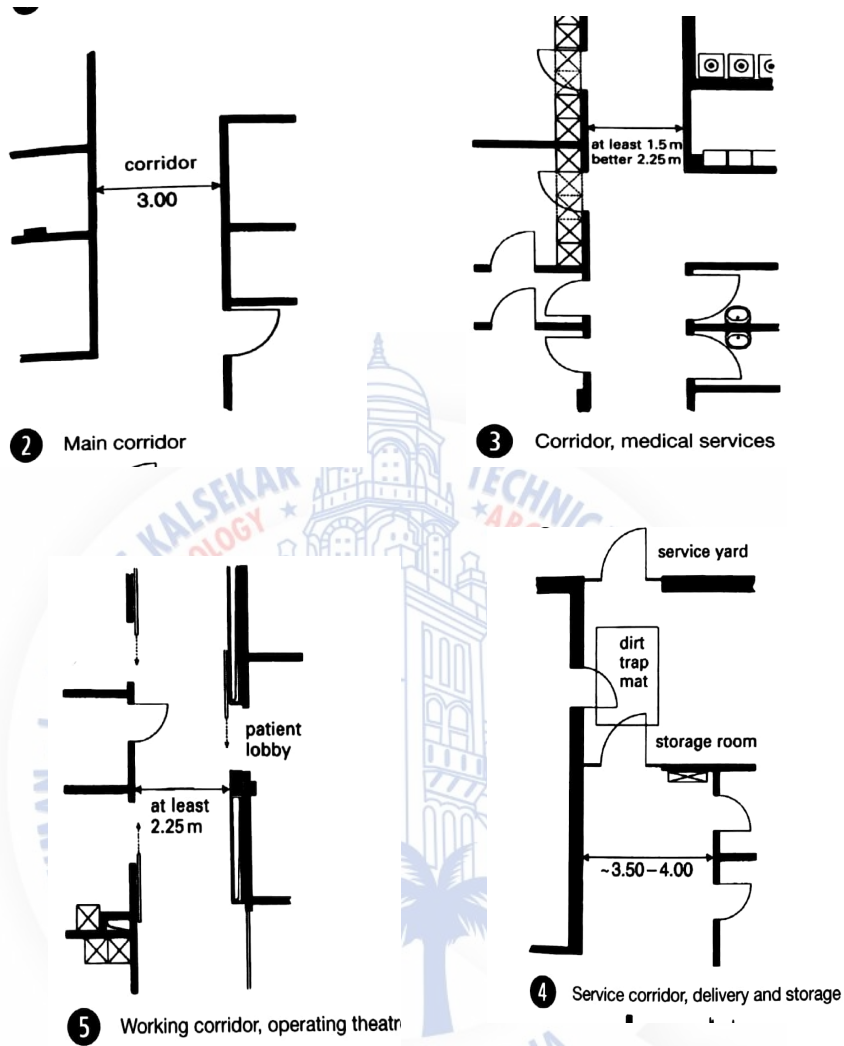
General direction of wind is from the North to the West quarter, with seasonal variations as shown below:

MONTHS	DIRECTIONS
February - May	Mainly from N.W.
June - September	Mainly from W.N.W.
October - January	Mainly from N.N.W.

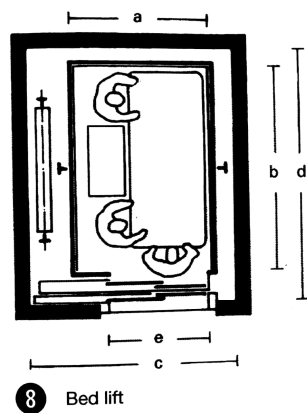


STANDARDS AND DATA COLLECTION:

Corridors:



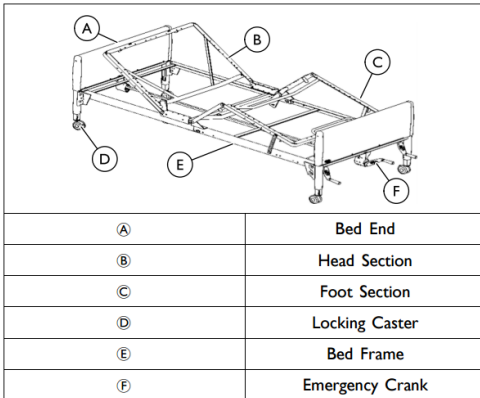
LIFTS:



permissible load kg	1600	2000	2500
shaft width c	2400	2400	2700
shaft depth d	3000	3000	3300
car width a	1400	1500	1800
car depth b	2400	2700	2700
car door width e	1300	1300	1300
car door height	2300	2300	2300
car door height	2100	2100	2100
permissible no. people	21	26	33

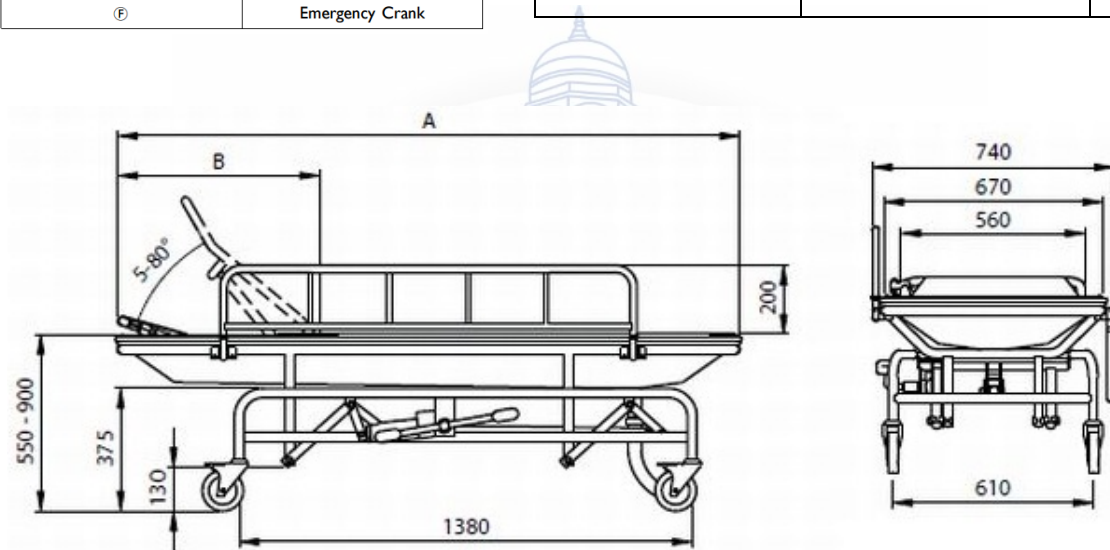
9 Dimensions of bed lifts → 8

BED SIZES:

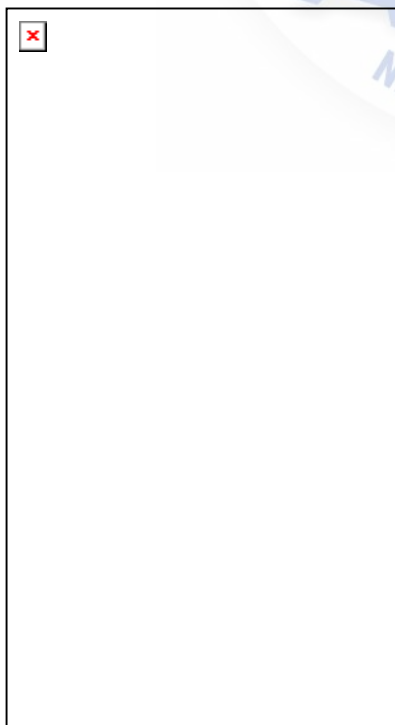


sizes

1380	610	550
2000	900	600
2180	910	750



Distance between tow beds in a ward is 1.9m

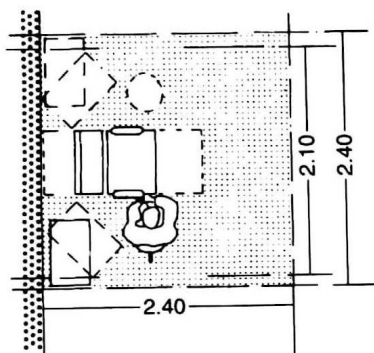


DOORS:

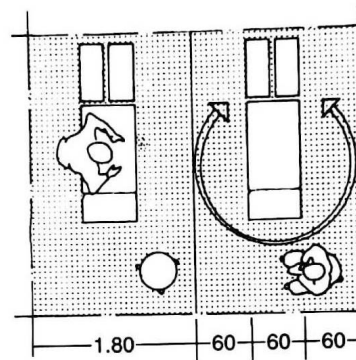


Standard door	885X2135mm
Door through which bed pass	1260-1375X2135
Corridor doors double	2400X2400

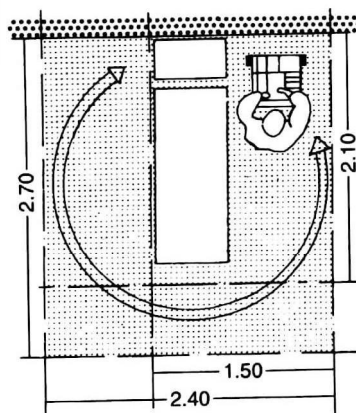
Consultation room:



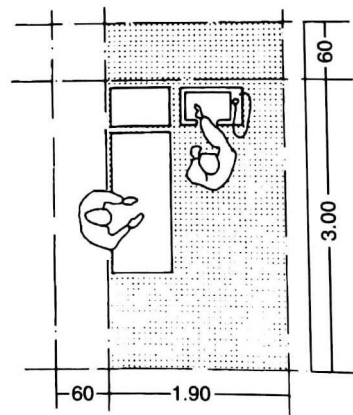
5 Minimum space required: taking a blood sample



6 Physiotherapy couches

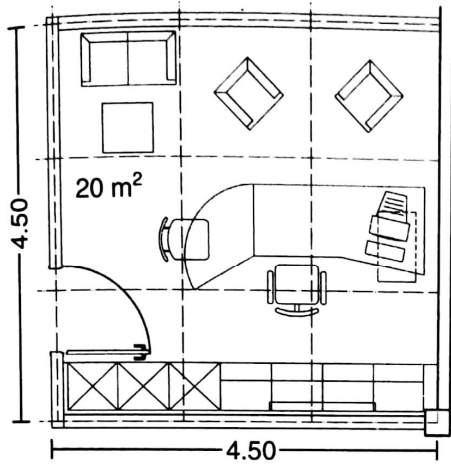


7 Minimum space required: electrocardiogram

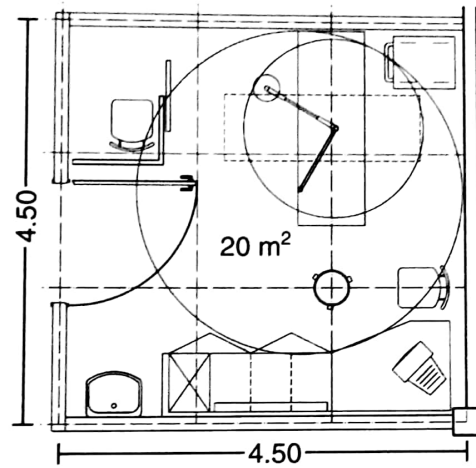


8 Space required: ultrasound

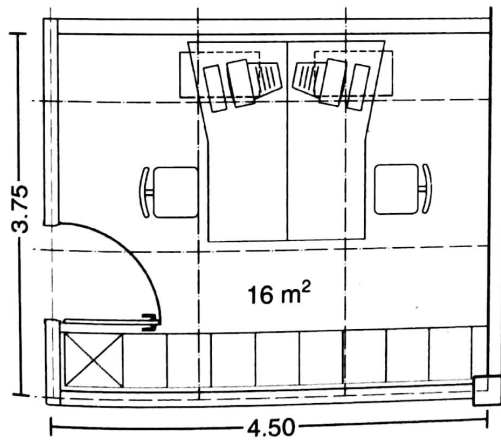
Workroom:



1 Senior doctor's office



2 Examination and treatment room



3 Ward doctor's office

RAMPS:

Minimum slope= 1:10 to 1:12

Minimum width = 2500mm

Turning radius = 3000mm

Landing space = 3000mm (for turning of stretchers)

Railing height = 900mm

The floor should be non slippery

STAIRS:

Railing height = 900mm

Minimum width = 1500mm

Maximum riser = 150mm

Minimum tread = 300mm

Door

When designing doors the hygiene requirements should be considered.

The surface coating must withstand the long-term action of cleaning agents and disinfectant, and they must be designed to prevent the transmission of sound, odors and draughts doors must meet the same standard of noise insulation as the walls surrounding them.

A double – skinned door leaf construction must meet a recommended minimum sound reduction requirement of 25db.

The clear height of doors depends on their type and function.

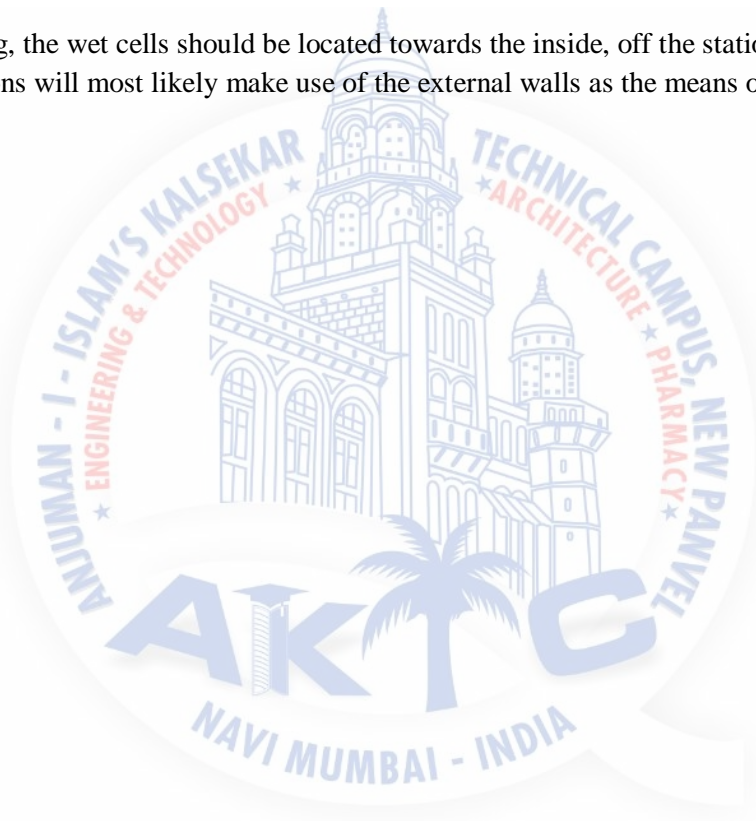
Normal doors 2.10 – 2.20m

Vehicle entrances, oversized doors 2.50 m

Transport entrances 2.70 – 2.80m minimum height on approach roads 3.50 m

Size of the patient rooms:

- The patient's beds must be accessible from three sides and this sets the limits for the overall room sizes.
- The smallest size for a one bed room is 10mq sq.;L for a two and three bed rom, a minimum of 8msq. Per bed should be allowed (in accordance with hospital building regulations)
- The room must be wide enough for a second bed to be wheeled out of the room without disturbing the first bed (minimum width 3.20 m) next to each bed must be a night table and, where appropriate, towards the window there should be a table (900 x 900 mm) with chairs (one chair per patient) the fitted cupboards (usually against tie corridor wall) must be capable of being opened without moving the beds or night tables.
- In new building, the wet cells should be located towards the inside, off the station corridor, because future renovations will most likely make use of the external walls as the means of extending the existing areas



4.ARCHITECTURAL SPACE PROGRAMME:

SPACE PROGRAMME IN PATIENT DEPARTMENT							
SR.NO	SPACES	NOS	SUB SPACES	TYPE OF SPACES	CAPACITY OF PEOPLE	NO OF BEDS	AREA(SQ M)
1	GENERAL MEDICINE		MALE WARD	SEMI PRIVATE	20	15	105
			FEMALE WARD	SEMI PRIVATE	20	15	105
2	NEW BORN WARD			SEMI PRIVATE	20	10	70
3	PEDIA TRAIC WARD			SEMI PRIVATE	20	10	70
4	ISOLATION WARD			SEMI PRIVATE	20	10	70
5	MATERNITY WARD			SEMI PRIVATE	20	10	70
6	EMERGENCY TRAUMA WARD			SEMI PRIVATE	15	10	70
7	POST OPERATIVE WARD			SEMI PRIVATE		20	105
8	PRIVATE WARD						
9	FIRST AID ROOM			SEMI PRIVATE			
10	OPERATION THEATOR		MINOR OT	PRIVATE	6	1	50
			PRE OP	PRIVATE	5	2	40
			POST OP	PRIVATE	5	2	40
			ENT OT	PRIVATE	6	1	50
			MAJOR OT	PRIVATE	10	2	115
			OT CONTROL	PRIVATE	4		24
			DOCTORS LOUNGE	PRIVATE	10		40
			ICU	PRIVATE	10		120
			ANESTHESIA	PRIVATE	5		20
			EQUIPMENT ROOM	PRIVATE	10		20
			DIPOSAL ROOM	PRIVATE			9
			STERILE OFFICE	PRIVATE			
11	DAIGONIST DEPARTMENT		DIAGNOSTICS STORE	SEMI PRIVATE	4		30
			REPORT DISPATCH				
			X-RAY DEPT	SEMI PRIVATE	4		100
			SONOGRAPHY	SEMI PRIVATE	4	1	35
			CT SCAN	SEMI PRIVATE	4	1	35
12	LAB		STORE ROOM	PRIVATE	5		20
			PATHALOGY LAB	PRIVATE	10		
			SAMPLE COLLECTION	SEMI PRIVATE	2		12
			WASHING AREA	PRIVATE			
			CLINICAL PATHOLOGY				12
			REPORTING ROOM				12
13	STERILIZATION UNIT		SOLID MATERIAL ENTRY	PRIVATE			
			CHANGIN ROOM	PRIVATE	2		10
			STERILE STORE	PRIVATE	5		30
			TROLLY WASH	PRIVATE			20
			RECIVING AND STORING	PRIVATE			
			DISPATCH ROOM	PRIVATE			10
14	KITCHEN AREA		PANTRY FOR PATIENTS	SEMI PRIVATE	4		8
			PANTRY FOR DOCTORS	PRIVATE	4		8
			STAFF MESS	PRIVATE	20		30
			CANTEEN	OPEN	30		60
			SPECIAL DIET KITCHEN	PRIVATE	4		30
15	NURSING STATION			PRIVATE	5		12
16	HOSPITAL LAUNDRY		SORTING AREA	PRIVATE			15
			WET WORKING	PRIVATE			50
			DRY WORKING	PRIVATE			50
			LAUNDRY STORE	PRIVATE			15
17	TOILETS		GENERAL WARD				8
			OT				4
			COMMON TOILET				8
18	RESEARCH DEPARTMENT		LAB1	PRIVATE			100
			LAB2	PRIVATE			100

SPACE PROGRAMME							
OUT PATIENT DEPARTMENT							
SR.NO	SPACES	NOS	SUB SPACES	TYPE OF SPACES	CAPACITY OF PEOPLE	NO OF BEDS	AREA(SQ M)
1	CLINICS		GENERAL MEDICINE	SEMI PRIVATE	4	1	15
			ENT	SEMI PRIVATE	4	1	15
			DENTAL	SEMI PRIVATE	4	1	15
			OBSTERTRICS	SEMI PRIVATE	4	1	15
			GYNECOLOGY	SEMI PRIVATE	4	1	15
			DERMETOLOGY	SEMI PRIVATE	4	1	15
			GASTERO ENTOLOGY	SEMI PRIVATE	4	1	15
			ORTHOPEDIC	SEMI PRIVATE	4	1	15
			CARDIOLOGY	SEMI PRIVATE	4	1	15
			UROLOGY	SEMI PRIVATE	4	1	15
			NEUROLOGY	SEMI PRIVATE	4	1	15
2	RECEPTION			OPEN	5		15
3	SOCIAL WORKER			SEMI PRIVATE			15
4	WAITING AREA			OPEN	75		150
5	COMMON TOILETS						8
6	PHARMACY			OPEN	5		30
7	BLOOD BANK			SEMI PRIVATE			20
						TOTAL AREA	403
SPACE PROGRAMME							
ADMINISTRATION AREA							
SR.NO	SPACES	NOS	SUB SPACES	TYPE OF SPACES	CAPACITY OF PEOPLE	AREA(SQ M)	
1	RECEPTION AND WAITING			SEMI PRIVATE		15	
2	ADMINISTRATIVE OFFICE			PRIVATE		20	
3	SEMINAR ROOM			PRIVATE		30	
4	UPS SERVICE ROOM			PRIVATE		15	
5	E-HOSPITAL			SEMI PRIVATE		15	
6	ACCOUNTS DEPARTMENT			PRIVATE		20	
7	FILE STORAGE ROOM			PRIVATE		15	
8	BILLING			PRIVATE		15	
9	REGISTRATION					15	
					TOTAL	160	

SR.NO	SPACES	NOS	SUB SPACES	TYPE OF SPACES	CAPACITY	AREA(SQ M)
1	DOCTORS PARKING		CAR PARKING	PRIVATE	20	300
			BIKE PARKING	PRIVATE	30	135
2	STAFF PRKING		CAR PARKING	PRIVATE	15	225
			BIKE PARKING	PRIVATE	50	225
3	VISITORS PARKING		CAR PARKING	OPEN	30	450
			BIKE PARKING	OPEN	50	225
						1560

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