THESIS REPORT ON

SANT KABIR MULTI-SPECIALITY HOSPITAL (300 BED), SHIVPUR, VARANASI

BBD UNIVERSITY

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF:

BACHELOR OF ARCHITECTURE

BY:

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THESIS GUIDE

AR. MOHIT SACHAN

SESSION

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TO THE

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SCHOOL OF ARCHITECTURE AND PLANNING

BABU BANARASI DAS UNIVERSITY, LUCKNOW (U.P.).

CERTIFICATE

I hereby recommend that the thesis entitled **"SANT KABIR MULTI-SPECIALITY HOSPITAL (300 BED), SHIVPUR, VARANASI"** under the supervision, is the bonafide work of the students and can be accepted as partial fulfillment of the requirement for the degree of Bachelor's degree in architecture, school of Architecture and Planning, BBDU, Lucknow.

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Recommendation

Accepted

Not Accepted

External Examiner	External Examiner

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INTRODUCTION

A Hospital is a health care institution providing patient treatment by specialized staff and equipment . Hospital are usually founded by the public sector, health organization(for profits and non profits),health insurance companies , charitable donations. Historically , hospitals were often founded are funded by religious orders or charitable individuals and leaders. Today , hospital are largely staffed by professional physicians, surgeons and nurses, whereas in the past , this work was usually performed by the founding religious orders or by volunteers.

RATIONALE FOR THE STUDY

The future will see a continued demand for the construction of healthcare facilities including completely new or replacement facilities and projects involving major additions and modernization . The annual value of healthcare construction projects will see an uptrend in the immediate years ahead owning to various factors like opening up of the insurance sector and privatization initiatives. Therefore planning and design will continue to merit prime emphasis amongst other responsibilities of healthcare officials Technological requirements and operational and operational procedure to the extent a product of beauty , reasonable cost and optimal utility will result . A functional design can promote skill, economy ,conveniences and comforts whereas a non functional design can impede activities of all types ,detract from the quality of care and raise costs.

FIG.1 : Introduction to the hospital

SPECIFIC OBJECTIVES

To study/understand the issues involved in functional planning of a hospital .To determine the recent trends and changes in the healthcare facilities needs and to evolve a document that can incorporate these changes so as to enable the architects to build hospitals in tune with modern architecture.

To draw up a space plan for the proposed hospital.

To study certain departments in greater detail and to provide a brief that may be used as a basis for detailed programming later on.

ABOUT THE HOSPITAL

The hospital is an integral part of a social & medical organisation, 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 a centre for the training of health workers and biosocial research.

-WHO definition of hospital

Hospital is a premise providing medical facilities of general or specialized nature for treatment of indoor and outdoor patients. A hospital is a place which delivers health services to the people and where the patients are cared for nurse and treated. It is an integral part of social and medical organization, the function of which is to provide for the population complete health care, both curative and preventive. The modern concept goes beyond the conventional idea of a hospital as place for treatment of the sick. It visualize as hospital is one part of comprehensive system of preventive and curative medicine and as an institution devoted not only to patients treatment but also to a ambulatory and domiciliary care.

FIG.2 : Introduction to the hospital

A hospital building is something difficult that is difficult to change when it has been constructed. The methods of looking after the patients, nursing and treatment however continually and rapidly due to the development of medical science hence its challenge job for an architect to design such a building.

LEVELS OF MEDICAL CARE

LEVEL OF CARE	MEDICAL FACILITY	LEVEL OF DECISION MAKER
1. **Primary**	Dispensary, Primary health centre or sub centre	General practitioner medical assistant, multipurpose worker
1. **2- Secondary**	District hospital (intermediate) or equivalent	Mostly general practitioner, partly specialist
1. **Tertiary**	Provincial or si ilar hospital (regional)	Specialists
1. **Quaternary**	Institute of research and higher training	Super specialists, researchers

TABLE.1 : Levels of medical care

HOSPITAL CLASSIFICATION:

Hospital building can be classified in a variety of way. In accordance with the nature of the health care provide, these building can be classified as-

1-Primary care facilities
2- Secondary care facilities
3-Tertiary care facilities

FIG.4 : Hospital services

This classification is in tune with the national health care policy :

•A network of primary health care facilities support upto 6 sub centers or field units, creating to a population of about 1000000.

•Secondary health care facilities provide service to the patient referred from primary health care facilities; these are generally district level hospital.

•Tertiary medical care provide superior level, super specialties to the patient referred from secondary level facilities. Super specialize include cardiac care, neuro -sciences facilities etc., with necessary high diagnostic and laboratory support facilities. Depending upon the type of ownership, the hospital may be categorized as a private or public. Private hospitals include consultant clinic, poly clinic and nursing home. Private hospital could be owned by individuals, trust, corporate sector in certain cases, joint venture with government institution/ body is also resorted to.

Indian standard provide function planning norms for five categories of hospital A to E which range form -

1. Category A - 25- 50 beds
2. Category B - 51- 100 beds
3. **Category C - 101-300 beds**
4. Category D - 301- 500 beds
5. Category E - 501- 700 beds

FIG. 5 : Hospital services

INTRAMURAL AND EXTRAMURAL FUNCTIONS OF HOSPITAL:

The activities of the present day hospital can be divided into two distinct types-

• Intramural and Extramural

• Intramural activities are confined within the wall of hospital, where as extramural activities are the services which radiate outside of the hospital and to the home environment and community.

EXTRAMURAL FUNCTIONS OF A HOSPITAL-

1-Outpatient service

2-Home care service

3-Outreach service

4-Mobilo clinics

5-Day care centre

6-Night hospital

7-Medical care camps

FIG.8 : Functions of a hospital

OBJECTIVE: WHAT?

The thesis will try to achieve the following objectives:

• To understand in details, the following of hospitals in term of requirements, circulations, services and all the necessary infrastructure that goes such into designs, thus to achieve a functional standard point, whore the overall co-ordination of spaces and services to attain of functional system.

• To take into account the aspects of phasing, extension and future growth of the project.

• To be able to device solution of certain ever-prevailing issues/problems associates with such spaces via methods of justified building planning. These are minute but very practical issues like poor comprehensibility/legibility in hospitals, attendants accompanying patients, feeling of discomfort/hatred unhygienic with respect to such places.

• To develop on the whole a practical possible solutions which seriously takes into consideration the site constraints of features, surrounding, climate and legal buildings?

MEDICAL MANPOWER	
POPULATION	1000 MILLION (2001)
HOSPITALS	10,204 URBAN : 4,903 RURAL :10.301
DISPENSARIES	28,279 URBAN : 16,319 RURAL :11,904
HOSPITALS BEDS	8,70,180
BED : POPULATION RATIO	0.84 PER THOUSAND
DOCTORS	6,03,947
NURSES	7,37,000
ARMS	3,01,691
DENTAL SURGEONS	28,705
DOCTOR: POPULATION RATIO	1:1985 URBAN: 1:600 RURAL : 1 : 14,000 TO 18,000
NURSE: POPULATION RATIO	1.188805556
NURSE: DOCTOR RATIO	1,0,83
MEDICAL COLLEGES	140

TABLE 2 : Medical Manpower

SCOPE AND MAGNITUDE:

A super speciality hospital will be an ideal combination of appropriate medical technology and contemporary architecture to suit the tertiary health care needs of the regional populations. Its addition to the regional health care infrastructure will be a major step forward in bringing modern diagnostic and therapeutic modalities and services of skilled medical and allied personal within easy reach of the regional population.

They will also participate in the national programs for promotion and prevention of health, and epidermiological and community research to investigate establishes the nature and extent of these burdens in the region. The scope of the project as envisaged under the terms of reference following activities:

- Acquisition of land
- Construction activities
- Procurement of equipment and machine
- Installation of machines
- Commission of hospital

ARCHITECTURAL ISSUES

STUDYING SERVICES AND PRIVATE AND PUBLIC SPACES IN HOSPITAL DESIGN

Services in any hospital are quite important. These play important role in prop,Jr functioning of various activities to be performed during the whole life of hospital. If once these are planned wrong then they will create problems throughout the life. Hospital services include the following services:

1. Hospital Supportive Services

a) Pharmacy

b) Central Sterile And Supply Department

c) Dietary Services (Kitchen And Canteen)

d) Hospital Laundry

e) Library

f) Mortuary

FIG.10-a : Hospital engineering services

2. Engineering Services

a) Electrical

b) Acoustics

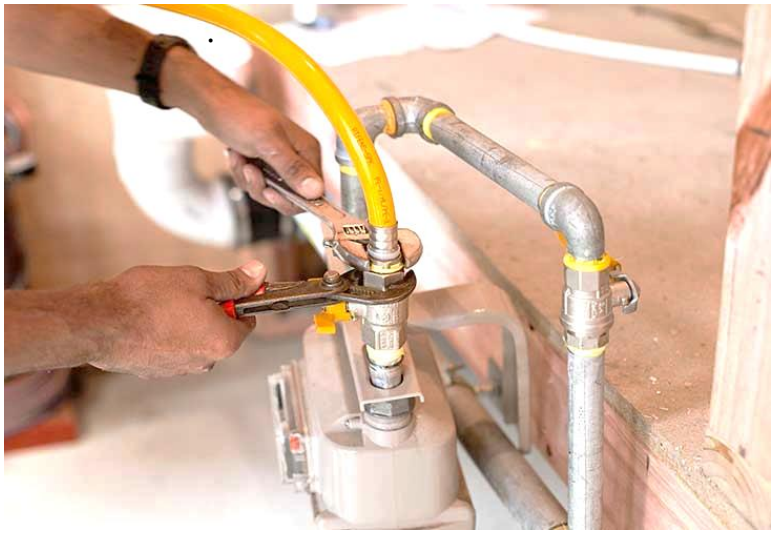
c) Lighting

3. Mechanical Engineering

a) Air Conditioning

b) Lifts

c) Fire Fighting



4. Public Health Engineering

a) Water Supply

b) Drainage And Sanitation

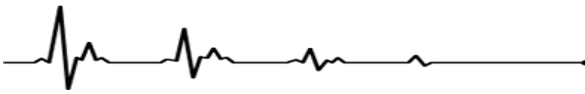
c) Waste Disposal System

5. Gas supply service

a) Manifold system

b) Cooking gas

c) Laboratory gas



1. HOSPITAL SUPPORTIVE SERVICES:

A) Pharmacy

The pharmacy is the main distribution method of distribution for all in-patient and out patient users of the hospital.

In any hospital there should be a properly organised pharmacy department under the direction of a professionally competent and qualified pharmacist.

Availability of the right drug at the required place at the time of need is the key to the hospital's existence.

In medium-size and large hospitals the pharmacy stocks prescriptions and carries out examinations under the management of an accredited pharmacist. In the design the following rooms are necessary: dispensary, materials room, drug store, laboratory and, possibly, an issue desk. If necessary, also include herb and dressing materials rooms, and acid cellar, and a room in which night duty personnel can sleep. The dispensary and laboratory should contain a prescription table, a work table, a packing table and a sink. The storage of inflammable liquids and acids, as well as various anesthetics , means appropriate safely measures are stipulated for the walls, ceilings and doors. The pharmacy must be close to lifts and the pneumatic tube dispatch system.

ESTIMATED REQUIRMENT OF PHARMACISTS	
SIZE OF HOSPITAL (BEDS)	NO. OF PHARMACISTS
100	2
200	3
300	4
400	5
500	7
600	9

Table 3 : Estimated requirement of pharmacists

.

B) Central Sterile and Supply Department (CSSD)

Sterilization, being one of the most essential services in a hospital, requires the utmost consideration in planning. Centralization increases efficiency, results in economy in the use of equipment and ensures better supervision and control. ensuring a high standard of sterilisation and disinfection to minimize the incidence of hospital infection has been uppermost in the mind of clinicians as well as hospital administrators.

Stertile Services

The purpose of this department is to supply sterilized instruments and packs for use in procedures in theatres and all clinical departments, The workload of the department will be affected not just by the needs of the hospital but also by the extent to which the hospital its supplying other users and using other suppliers.

The functions cover cleaning and disinfecting instruments, trays and other items, Preparing, Packaging and sterilizing trays and packs; storing non-sterile materials and components; storing processed goods and purchasing sterilized goods; distributing processed goods to consumers. However, it is likely that packs for use in basic procedures and some supplementary packs, will Workflow is a progression from dirty to clean. Used items are sorted, washed, dried and passed to a packing room where trays and procedure packs are assembled under clean conditions (personnel pass through a growing room). The packaged goods are moved through to the sterilizer loading area and, after sterilization, to the cooling room and stores.

Location

The location of CSSD should be convenient to its principal consumers. These are the nursing units, labour suites and operation theatre. It should be so located that supplies and equipment are brought to and taken away by the shortest route.

The materials and equipment dealt in CSSD should fall under three categories:

a) those related to the operation theatre department,

b) common to operating and other departments, and

c) pertaining to other departments alone.

Planning option; closeness of relationship to other materials handling function: CGS, lay against traditional ties to certain users: surgery, obstetrics, means of conveyance for stertile goods (dedicated or general use system).

Key spaces: decontamination, stertile processing preparation, store and issue.

Main design issues: strict separation of dirt and clean areas, use of sterilizer bank to form separation; location of sterilisation function for surgical instrument.

SPACE REQUIRED FOR PLANNING CSSD	
Up to -100 beds	10 sq. Ft per bed
Up to 200 beds	9-10 sq. Ft per bed
Up to 300 beds	8.9 sq. Ft per bed
300 and above	7 sq. Ft per bed

TABLE 4 : Space required for planning CSSD

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C) Dietary Services (Hospital Kitchen)

Providing the patients with proper nutrition places High demands on food preparation since the required amounts of protein, fat, carbohydrates, vitamins, minerals, fibre and flavourings often vary. The dominant food provision systems are those which rationalise the individual phases of conventional food preparation (preparatory work, making up, transporting, distribution). Preparation of normal food and special diets takes place separately. After preparation and cooking the meals are put together on the portioning line. The portioned trays are transported with the supply trolleys to the various stations for distribution. The same trolleys are used to transport the used crockery back to the central washing up and trolley cleaning unit.

Staff catering consists of about 40% of the total catering demand. The staff dining room should be close to the central kitchen. A division into separate rooms for domestic staff, nurses, clerical staff and doctors could be considered in a large hospital but, again, for economic reasons, these rooms must be near to the main kitchen. For small and medium size hospitals this type of division is not recommended.

Central kitchen

The kitchen serves all the food requirements of the in-patient and out-patient department. It mostly consists of stores ,large –scale kitchen, toilet.

Historically, kitchens were on the top floor to reduce the smell and noise. Today they are positioned on the same level as supplies to give an efficient working process: delivery, storage, preparation, making up and dispatch. When deep-frozen food is used, the set-up of the kitchen changes. Here the architect and users must co-operate closely to optimize the meal preparation process and find an advantageous, space-saving solution. The clear height of the kitchen hail should be 4.00m. The size of the kitchen depends on the requirements and number of patients in the hospital. In the main kitchen an area of 1.00m^2 is needed per person. A special-diet kitchen (60m^2 minimum) should also be planned, with a desk for the head chef, a 30m^2 vegetable cleaning area and a 5m^2 provision for waste disposal, In addition, the plan must include a daily supplies room (8m2), a cold store with compartments for meat, fish and dairy products (8m^2 each) and a pre-cooling store (10m^2) with a chest freezer and cooling unit. The goods delivery area should be connected to administration and have sufficient storage space (15-20m^2). The main store should hold fruit and vegetables (20m^2), dry goods (20m^2) and tinned goods/preserves, and must be adjoining.

Central washing up unit:

The central washing-up unit, adjacent to the central kitchen, stores and cleans the staff and patients' dishes. The high level of automation makes it essential for the designer, at an early stage, to clarify and conform to the specific requirements of the individual pieces of equipment.

Central general store

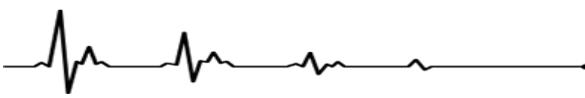
The central store should be located at the base level and away from the hustle of the hospital. It should be close to a loading and unloading dock. This department also houses the purchases department.

Nearly all goods, except sometimes pharmaceuticals and often food, received and disposed centrally. UK daily av weight goods handled in 600 B hospital 3000 kg, waste produced 1 200 kg. Considerations relating to central general stores (CGS).

• **Function:** receiving store, distribution of goods, supplies and movable eqp; inventory control.

• **Main planning options**: Use of disposables or reusable? Systems for materials handling, conveying and transport; remote store possibilities.

• **Key space**: service court for vehicles, sized for separate access to building entry points for various types' service traffic. Receiving dock with levellers. Warehouse: special/secure store areas.



• **Main design Issues**: separation of incoming goods from outgoing material (supplies, eqp, perishables, trash, refuse, soiled goods); separate receipt and handling of foodstuffs; internally segregated store and control of goods (central supply store (CSS), pharmacy, engineering); special store requirements: med gases, volatile liquids. Items classified as fragile or needing light, moisture or dust control, need special arrangements. Items with high security risk (eg radioactive material, dangerous drugs, inflammable gases, volatile material) must be stored I accordance with legislation. Store areas at point-of-use must allow for extra space required during public holiday period when portering staff not available.

D) HOSPITAL LAUNDARY:

Laundering of hospital linen shall satisfy two basic considerations, namely, cleanliness and disinfection. Dirty zone ; storage of all dirty soiled items. Sterilization zone; treatment instruments and clothes are cleared and sterilized. Sterile zone; all cleaned and sterile items are stored here to be dispatched to the various departments that require it.

Mechanical laundary should be provided with necessary facilities for dying, pressing and storage of soiled and cleaned linens. Air change in laundry area may be times per hour.

Figures for the amount of dirty dry washing generated per bed per day vary between 0.8 and 0.3 kg. the following sequence of work is preferred in the laundary; receipt, sorting, weighing, washing, spinning, beating out, mangling or drying (tumble dryer), pressing (if possible high pressure steam connection), ironing, sewing, storage issue. The laundary hail consists of a sorting-

- Weighing area
- Laundary collectin room under
- laundary chutes from the wards,
- Wet working area
- Dry working area
- Sewing room

FIG.11: Laundary

E) LIBRARY:

Medical libraries should be designed as open-shelf libraries, with no closed stores and no requirement for issuing books. A large part of the literature will be made up of periodicals. It is important to have an adequate amount of reading tables with reading lamps, workstations with microfiche readers, slide viewers and typewriters. It is advantageous if the library is connected to the small or medium size transportation systems of the hospital.

FIG.12 : Hospital library

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F) MORTUARY:

Mortuary shall provide facilities for keeping of dead bodies and conducting autopay. It should be so located that the dead bodies can be transported unnoticed by the general public and patients. Relatives and mourners should have direct access to the mortuary. The mortuary shall have facilities for walk in cooler, post mortem area, etc..

2) ENGINEERING SERVICES:

a) Electrical Engineering

The power supply should be from the national grid: 220-240V standard voltage and 380V high voltage. The low voltage system is controlled from the distributor room which requires at least two free-standing transformer cell units. Sufficiently wide doors (at least 130m clear width) and good ventilation must be provided and all relevant VDE and professional association regulations must be compiled with.

The size and number of emergency power units depends on the size of the hospital and local plants for individual functional units (surgical/outpatients department, care areas, radiology) are preferable to a central emergency power system. Anti-vibration foundations should be used underneath these units to reduce noise. Additional batteries must be provided for lighting and emergency power in the surgical department.

b) Acoustics:

Importance of acoustics in hospital:

- Noise in a hospital affects both doctors and patients and raises the risk of medical error.
- Hospitals are extremely noisy, and noise levels in most hospitals far exceed recommended guidelines. The high ambient and peak noise levels in hospitals have serious.
- The introduction of loudspeaker, radio, television and call systems also increases the noise.
- In most hospitals, windows to the open air and fanlights to the corridors are usually open for the purpose of ventilation.
- Noise control in the hospital is made much more difficult by the extensive use of hard washable surfaces which reflect and intensify the noise.
- The world health organization (WHO) guidelines values for continuous background noise in hospital patient rooms are 35 db(a) during the day and 30 db(a) with night time peaks in wards not to be exceed 40 db(a).
- Peak hospital noise levels often exceed 85 db(a) to 90(a).
- HVAC ducts can be excellent movers of noise from one room to the next, they can be conduct sound for over a mile. Therefore, it is best line ducts as much as possible and to run the main line through corridors rather than between rooms.

- Doors should be solid with close fitting in the frames.
- There is little insulation value in double swing doors and where these are fitted to a noisy room the opening should be planned so that it is screened from areas requiring quiet by a baffle lobby lined with absorbent material.

According to a study the impact of modifying room sound-absorbing ceiling bites of an intensive care unit (ICU) on patient and staff outcomes. During the good acoustical conditions (when sound- absorbing ceiling tiles were installed), pulse amplitudes were lower among patients. They were also more satisfied with the care provided by the staff during the good acoustic conditions.

C) Illumination:

For requirements for day lighting in hospital building reference may be made to IS: 2440.

- The level of illumination for various visual tasks shall be provided in accordance with IS: 4347.
- General lighting of all hospital areas except stores and lavatory block shall be fluorescent.
- In other areas, it is recommended to be of incandescent lamps.
- Electrical installations except for artificial illumination shall be in accordance with IS: 732, IS: 8030 and SP: 30.

D) Lighting:

DESIRABLE ILLUMINATION INTENSITIES	
Corridors	100 lux
General lighting in wards	100-200 lux
Doctors/ Nurses work place	300-500 lux
For patient examination	500-1000 lux

Shadow loss Light:

Shadow loss light (mountable type) shall be provided in operation theatres and operating delivery rooms whereas in other areas, where operation of minor nature are carried out, shadow less light (portable type) shall be provided.

Emergency Lighting:

Emergency portable light units should also be provided in the wards and departments to serve as alter-native source of light in case of power failure.

Lighting Protection:

The lighting protective system of hospital buildings shall be in accordance with IS 2309.

Call Bells:

Call bells (see IS 2268) with switches for all beds should be provided in all types of wards with indicator lights and location indicator situated in the nurses duty room of the wards.

E) Ventilation:

Ventilation of hospital buildings may be achieved by either natural supply or natural exhaust of air, or natural supply and mechanical supply and mechanical exhaust of air. The following standards of general ventilation are recommended for various areas of the hospital building based on maintenance of required oxygen, carbon-dioxide and other air quality levels and for the control of body odours when no products of combustion or other contaminants are present in the air or anaesthesia gases, which are highly explosive, are present.

Space to be Ventilated Air Changes Per Hour

- Bathrooms/toilets 6.12
- Wards 8 - 12
- Kitchens 6 - 9
- Operation theatres 15 20
- Other air-conditioned spaces 8 - 10

The general principles of natural ventilation shall be in accordance with IS: 3362. Where adequate air changes cannot be obtained by natural ventilation, mechanical ventilation either by exhaust of air or by positive ventilation (like fans and other equipment) or combination of the two shall be provided. Fans and other equipment for mechanical ventilation may be located in convenient positions having regard to the intake of fresh air, accessibility for maintenance and noise control Exhaust fans shall be provided in walls on one side or in the attic or roof. The exhausted air shall not find entry back into hospital.

3) MECHANICAL ENGINEERING:

a) Air Conditioning:

The air-conditioning department looks after the ventilation of all parts of the hospitals including those places that require specialized sterile ventilation.

The following department, wards are consider essential and recommended for air-conditioning:

- Blood laboratory in blood bank of out-patient department
- Operation theatre complex in emergency and casualty department
- Certain laboratories in pathology department
- Radiography and radio therapy rooms in radiology department
- Fracture-cum-casualty theatre, recovery, frozen section of clear zone and all room in sterile zone of operation theatre department
- Certain number of beds in wards unit of particular specialties
- All room in sterile zone of delivery suite
- Intensive care unit
- Autopsy room in mortuary

Refrigeration:

Hospital shall be provided with water cooler and refrigeration in wards and department, freezers in pathology, and cold storage plants for pathology, mortuary, medical stores and dietary department.

b) Lifts:

Hospital Bed Lift: Hospital bed lifts should be situated conveniently near the ward and operating theatre entrances. There shall be sufficient space near the landing door for easy movement of stretcher.

FOUR TYPES OF LIFT USE IN HOSPITAL

a. Freight

b. Dumb waiter

c. Passenger lift

d. Hospital services-1 for upto50, 2 for 60-200

FIG.14: Lifts

• A suitable size 2 ton, with inside dimensions 1.6 M x 2.6 M x 2.1 M.

• Lifts are provided with facilities for either manual or automatic operation.

• Service lifts are the most flexible device for moving wheeled carriers.

• Bed lifts are essential for the movement of beds.

• Door should close with maximum speed = 0.5 m/s.

• Lobby area = 5 – 6 m^2 per elevator on upper floors and 15 – 20 m^2 per elevator at ground floor.

c) Fire fighting

This department the security of the hospital by the installation of security cameras and placement of guards. They are usually in-charge of training hospital personnel on fire-evacuation drills etc.

First-aid Fire-fighting Equipment

Adequate first-aid, fire-fighting equipment shall be provided and installed in accordance with IS 2190.

Fire Alarm:

Manually-operated fire alarm facilities shall be provided in hospital buildings which sound an audible alarm in administrative department, engineering service offices, fire office and such other locations where gongs, sirens, whistles or bells do not disturb the patients. Distinctive visual or audible alarm shall be installed at each nurse's duty room, duty station and used for fire alarm purpose only. Hospitals may also be equipped with automatic fire alarm system conforming to IS 2189.

Telephone and Intercom:

Wiring in conduits shall be provided to give telephone outlet points in rooms, wards and departments as desired by the authority. An intercom system may also be provided in addition to the telephones. The communication system should be adequately designed in hospitals for alerting all persons charged with duties for patient care and all employees of the hospital who are within the building in the event of emergency. The alerting system shall be capable of being operated from intercoms, telephones and the administrative office.

4) Public Health Engineering

a) Water Supply:

Arrangements shall be made to supply 10000 litres of potable water every day to meet all the requirements including laundry) except fire fighting. Storage capacity of 2 days requirements should be on the basis of the above consumption Round the clock water supply shall be made available to all wards and departments of the hospital. Separate tank shall be provided for operation theatre, Necessary water storage, overhead tanks with pumping/boosting arrangements shall be made, The laying and distribution of the water supply s): Item shall be according to the provisions of IS 2065. Cold and hot water supply piping should be run in concealed form embedded into wall with full precautions to avoid any seepage.

Drainage and sanitation:

It consists of managing all the drainage of the waste in the hospital. The design, construction and maintenance of drains for waste water, surface water, sub-soil water and sewage shall be in accordance with IS: 1742. The selection, installation and maintenance of sanitary appliances shall be in accordance with IS 2064. The design and installation of soil waste and ventilating pipes shall be as given in IS 5329.

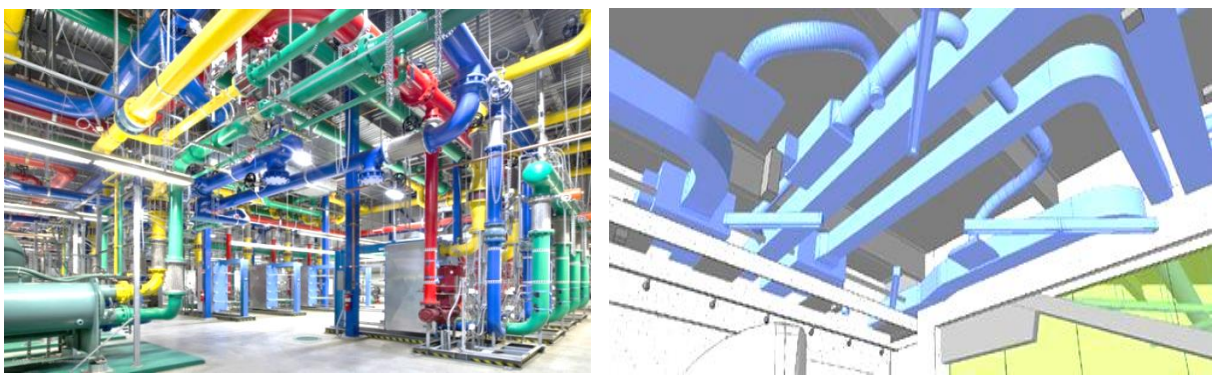

FIG.15: Drainage and sanitation

b) Waste Disposal System:

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The waste water is recycled to use for landscaping. The bio-medical wastes are usually sorted and given to an out-sourced company to incinerate the non-recyclable.

A hospital produces many types of waste material. Housekeeping activity generates considerable amount of trash, and the visitors and others bring with them food and other materials which must in some way be disposed off. In addition to the waste that is produced in all residential buildings, hospitals generate pathological waste -blood soaked dressings, carcasses and similar waste. These waste materials must be suitably disposed of immediately lest they emit foul smells, act as a source of infection and disease, and become a public health hazard.

SOLID WASTES OF A HOSPITAL		
1	Day garbage	Ordinary floor refuse, papers flowers,
2	Partially wet garbage	Waste from kitchen (fruit peels, left over food, etc)
3	Wet tissues and bones	From operation theatres, labour rooms, mortuary, laboratory
4	Plaster casts	From plaster room, OT
5	Packing materials	Cardboard cartons, paper packets etc
6	Surgical waste	Dressings, cotton pads
7	Metal waste	Tin cans, bottle caps, needles
8	Glass	Broken bottles, syringes
9	Disposable plastic items	Disposable plastic items

TABLE 5: Solid wastes of a hospital

.

GROUPING OF WASTE FOR FINAL DISPOSAL		
	FINAL DISPOSABLE	
Group-1	Incinerate Or Autoclave Or Microwave	
Group-2	Deep burial Or fill in secured landfill (After disinfection by chemical treatment)	
Group-3	Deep burial Or fill in secured landfill (After physical destruction/ mutilation)	

TABLE 6: Grouping of waste for final disposal

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COLOUR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BIOMEDICAL WASTES			
COLOUR CODING	TYPE OF CONTAINER	WASTE CATEGORY	TREATMENT OPTIONS AS PER SCHEDULE I
Yellow	Plastic bag	Cat.1, Cat.2, and Cat.3, Cat.6	Incineration/deep burial
Red	Disinfected container/ plastic bag	Cat.3, Cat.6, Cat.7	Autoclaving/Microwaving/Chemical treatment
Blue/White	Plastic bag/puncture proof	Cat.4, Cat.7	Autoclaving/Microwaving/Chemical treatment and destruction/shredding
Black	Plastic bag	Cat.5, Cat.9, and Cat.10 (Solid)	Disposal in secured landfill

TABLE 7: Colour coding and type of container for disposal of biomedical wastes

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6) Gas supply system

Centralized gas bank supplies the oxygen and nitrogen gas to the various departments as per requirements . This area must have adequate storage for cylinders and fire fighting system.

a) Medical Gas:

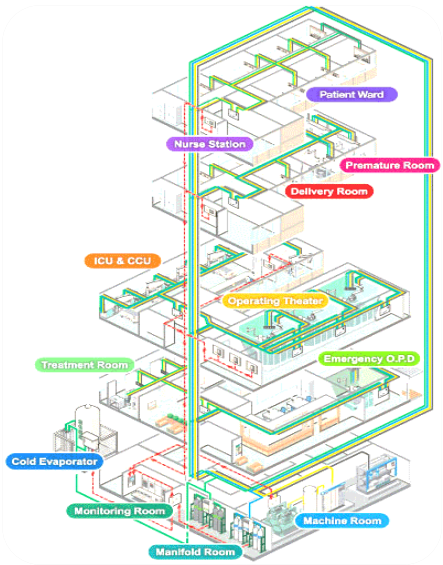
Medical gases comprise mainly of oxygen and nitrous oxide. The cylinder supply should be made available. Medical gas supply through centralized gas supply system may also be considered.

b) Cooking Gas:

For better hygienic conditions use of LPG (liquefied petroleum gas) cylinders is recommended.

c) Laboratory Gas:

LPG (liquefied petroleum gas) cylinders should be made available for pathological lab. Alternatively, kerosene stove may be made available where gas supply is not available.

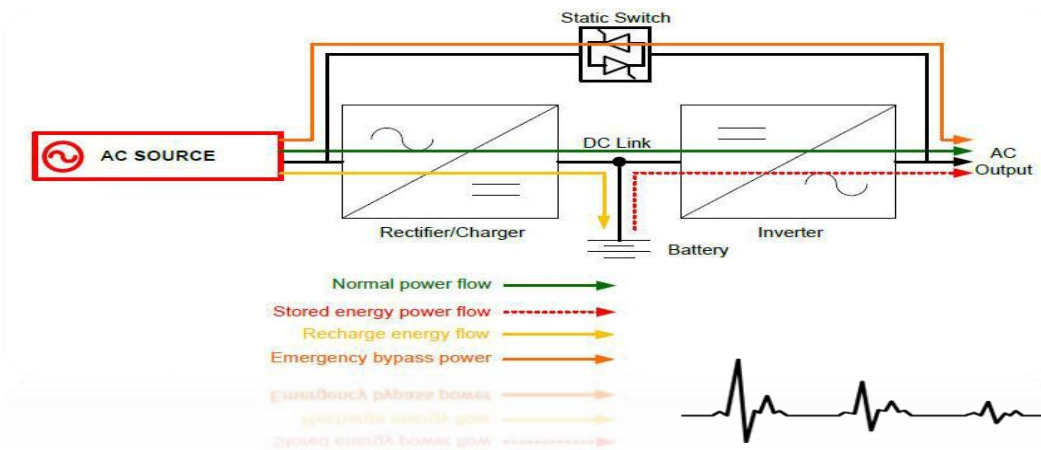


COLOUR CODING OF GAS PIPELINES DISTRIBUTION SYSTEM	
ITEM	COLOUR OF PIPELINE
Oxygen	Yellow
Nitrous oxide	Dark blue
Compressed air	Sky blue
Vacuum	Sky blue

FIG.8: Colour coding of gas pipelines distribution system

7) ELECTRICAL SUPPLY·

The electrical supply department must ensure that the electricity to vital installations is never lost. Adequate backup generators are also maintained by this department. UPS systems are installed on those services that require uninterrupted supply.



Hospital Outdoor Landscape Design

. Introduction

Among public institutions, the large buildings and complicated intervening and surrounding areas of hospitals usually tend to be seen by the public as removed from the urban context, as spaces to be feared, which one only accesses in emergencies or out of necessity. However, this psychological perception of their distance and separation can be decreased by today's more hospitable approaches to their content and design . With a growing understanding of the importance of the physical environment for the quality of hospital care and the health and safety of patients and staff, the outdoor spaces of hospitals are beginning to be considered, particularly in scenic and more green areas, as a productive complement to the interior areas which are reserved for patient treatment and have traditionally been prioritized. As a result of this new, holistic approach to medicine which entails alleviating the fears and disorientation of patients that may hinder medical treatment, the hospital has come to be seen today as a necessarily comforting and stress-free environment, created with a broader, patient-oriented sense that encompasses both master planning and landscaping. This means that the outdoor as well as the indoor spaces of hospitals are understood as crucial to patients' physical, psychological and social recuperation and wellness Appropriately designed active and passive hospital landscapes enhance patients' interaction with nature and so reduce stress, facilitating interaction with others in ways compatible with and complementary to those found in the urban environment .

Benefits of natural environments within hospitals

Physical benefits

Research shows that rehabilitative structures and procedures enhance both the physical endurance and the physical well-being of patients. Interaction with a natural environment has a positive effect on patients' feeling of well-being, which in turn has a salutary effect on their physical health. In addition to anecdotal evidence, there are theoretical and practical studies illustrating the positive effects of interaction with nature on blood pressure, cholesterol levels and stress-reduction . a study by Robert Ulrich concluded that patients recovering from operations were discharged earlier, took fewer analgesics and were evaluated less negatively by nurses when they had windows in their rooms overlooking nature, compared to patients in similar rooms facing brick walls; and a study of the home environment similarly found that a living context with windows overlooking a natural scene produced "micro-restorative experiences" that enhanced a sense of well-being, as against a context with views of built elements .

Accessibility

This is an essential requirement, both within the hospital and in its environment. Gardens may be designed and set up attractively, but people need to be aware that they exist, that they are easily accessible through entrances and paths and useable regardless of people's age or disability, and that they facilitate certain activities. Within the garden, visitors follow internal circulation routes, typically between walls, but occasionally crossing open spaces. Paths help people to find their way in hospitals, and differentiating them can help patients and visitors find their way .

Visibility

The more a garden is visible and people are aware of it, the more its activity areas and paths will be preferred. At least one outdoor space should be visible or its location clearly indicated from the main entrance. Patients' rooms should have views of the garden so they can enjoy it even if they are unable to visit it.

Feeling of Control

Research shows that a feeling of lack of control can lead to or aggravate depression, passivity, elevated blood pressure, and decreased immune system operation. A sense of control in the garden can be enhanced by getting users involved in its design; and different types of spaces and layouts can enable them to make their own choices – for example, a variety of pathways, of types of nooks where they can sit, of furniture (if some is moveable), or of views, ranging from close to distant .

Feeling of Security

Patients often feel both physically and psychologically vulnerable in hospitals, and a feeling of security should be provided. This includes sufficient lighting and public telephones in isolated areas so people can call for help, and other facilities and design elements in the garden that make them feel safe. Broadly speaking, there should be a feeling of enclosure but without the feeling that one is being watched. Features should include handrails and seating at frequent intervals, particularly near the entrance, to assist the elderly, the disabled or mobility-impaired, and an avoidance of paving materials like asphalt that reflect a strong glare .

Physiological comfort

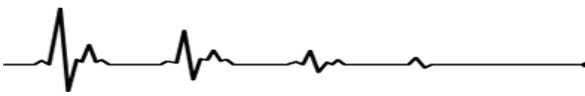
As hospital patients are often sensitive to temperature (burn patients, for example, generally have to keep out of direct sunlight), options such as sunny and shady areas should be provided , as well as seating shielded from breeze by plants or structures. Various medications require patients taking them to avoid sunlight; some patients might be afraid of catching a chill if they go outdoors. Others patients have trouble getting up on their feet, so the garden should have garden seats with arms and backs, and also benches one can sprawl or lie on.

Quiet

Research on four hospital gardens showed that users were disturbed by sounds of machines like air conditioners and traffic noise; areas to be used as garden spaces should be planned in advance, away from traffic, parking areas, delivery driveways, and helicopter landing pads . A garden designed for therapeutic purposes should be quiet and removed fromsounds inside the hospital, which range from public announcements, to television sets to catering trolleys and gurneys; visitors to the garden should feel calm, and be able to hear reassuring sounds such as birdsong, wind chimes, or flowing water.

Familiarity

Hospitals may cause stress for patients and their families, as they are unfamiliar environments, and they can be made more comforting and familiar if they include aspects of nature .People working in hospitals similarly experience stress, and need to have access to familiar and



relaxing garden settings. The aesthetic of the health-care environment should therefore be based on this fundamental need and provide spaces on a human or domestic scale as well as familiar-looking plants and furniture; this is particularly important in facilities for Alzheimer's patients and the terminally ill.

Flexibility

Exterior spaces should attract people, invite them in and engage them; they should be designed based on when (i.e. at what times and in what weather conditions) by whom (i.e. what groups), and how they are currently used (for example, for a lunch break, exercise, or socializing), and also on how their usage may be shaped in the future. To maintain interest and year-round interaction, for instance, they should be studied to see how they are used in different seasons, and then designed with different seasonal blooms and colors and different weather conditions taken into account.

Sustainability

Resources should be allocated intelligently when designing outdoor spaces: every material used does not have to be green, and some hard surfaces like concrete can help prevent storm water run-off. Wild grasses and Sedum spp. create ground cover which reduces domestic grass, decreasing the cost of maintaining lawns. Xeriscaping (designing with low water-use plants) together with native vegetation also helps reduce water use and maintenance. Nature trails enable users to have exercise, education and a natural aesthetic at a minimal cost; and solar-powered lights and water features that recycle rainwater can also be costeffective and sustainable.

Hard landscape design

Gateways and entrances

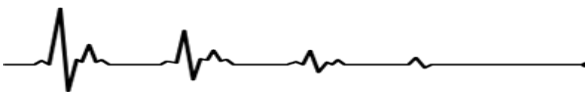
Gateways and entrances welcome people on arrival and provide cues for them to find their way around the site; they can perform this function if a comprehensive network of connecting paths is planned, specified, and followed up to ensure they are properly constructed .The main entrance should be accessed logically by the most direct path, and the entry way to the outdoor space should have no ramps or steps . Landscaping, artwork and detailing can prioritize the main access points and create a sense of place, and benches should be available for people arriving or waiting for rides to sit on. Entrances must be sufficiently wide to accommodate people with special mobility requirements; for the visually impaired, different kinds of surfacing materials can be helpful, and tactile elements should indicate thresholds .

.Parking areas

Parking areas should be sufficient to accommodate staff and employees, and parking should ideally be reserved for staff at the back of the hospital so they do not have to deal with heavy traffic when they come to work. Parking for patients, especially those with
disabilities should be as close as possible to the entrance. Patients and visitors unfamiliar with the hospital may easily be confused if parking space is difficult to find; this can be solved by using directional signs that can be altered or moved as conditions change .

Paths

Large hospital or medical complexes should be organized within a clear circulation hierarchy: main roads, shopping streets, neighbourhood streets and service alleys. Each of these, as well as intersections and destinations, should be indicated by a consistent system of spatial cues. This circulation in the health-care facility should be independent of public roadways, and public (nonsecured) and private (secured) zones should be distinct, preferably with patient intake and outdoor recreational areas in the



private zone. Traffic circulation should be organized so that individuals and ambulances can directly access emergency facilities .

The main circulation routes should be clearly indicated, for example by giving easily understood names to the main corridors like "Hospital Street" or "Blue Corridor" (here the walls and floor should be predominantly blue in color); or having colored lines along the walls or floor to designate main routes; or using lighting along a route . Primary routes should be accessible to everyone; however, some people will prefer to experience the natural environment unmodified and will not expect easy access everywhere . Minor walkways should be at least 1.5m wide, with drainage that will get rid of rainwater quickly. One-way traffic routes should be at least 1.5m wide to allow for the turning circle of a wheelchair; while two-way traffic routes should be at least 2.1m wide. There is a risk of tripping if the edges of a path are raised; and handrails or balustrades and wheelchair barriers will preclude people's falling where surface levels change, or from entering uneven ground beside paths and paved areas.

In the garden, clear links with different facilities and direct routes are essential. Right-angled corners in paths should be avoided, and slopes designed as follows: a walkway's slope should not exceed 5% (i.e. 30.48cm of rise for a length of 6.1m); cross slopes should not exceed 2% (30.48cm of rise for a length of 15.24m). Where the slope does exceed 1/20, there should be a support railing to preclude slipping. The surfaces of paths should be firm, smooth and level, and provide traction; they should reflect the context, with "softer" materials used for informal settings. Paving surfaces should be smooth enough to be used by wheelchairs and gurneys; but grooved paving may be unsuitable for them. Different materials have different pros and cons: concrete is suitable, but costly; asphalt absorbs and radiates heat, and may be too hot in the summer; decomposed granite may be suitable for wheelchairs, but is not for users of crutches. More recently developed rubberized paving materials are firm enough to support wheelchairs, and also absorb the force of a fall.

Outdoor areas should be designed so they can be used throughout the year; snow- or ice melting devices should be in place for walkways during the winter.

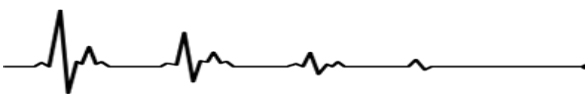
Children's gardens

Children are usually discouraged from moving around in hospital environments lest they disturb the health-care workers or patients; there should be spaces set apart for them where they can move as freely as they need or wish to , as they need to engage in imaginative play regardless of the condition of their health. Children need to feel they can create and make changes by interacting with their environment and moving objects and parts; as a result, flexible play areas should be designed to stimulate their imaginations and give them the pleasure and therapeutic benefit of creative activity.

A children's area might, in addition to using primary colours and providing climbing structures, include a path maze, a chalkboard masonry wall, child-sized sculptures, or a miniature bridge traversing a faux rock stream, which can also be crossed on stepping stones. Routes should be stable and made of surfaces like decomposed granite, asphalt, wooden boardwalk, resilient mats, and concrete, to resist slipping. There might be platforms so children in wheelchairs can safely move onto and off play structures; and sand play areas may be made available at different heights, so they can be used on the ground or from a wheelchair.

Dining areas

Because the dining area is used by more people than any other hospital area, there are more potential outdoor space users in it; having an outdoor space near the dining area is essential



There should be tables in the space for eating, reading, and writing activities, and to serve as territorial markers, as people rarely intrude on a table that is being used. Shade and semiprivate group spaces can also be provided by umbrella tables with chairs.

Art

Artworks form part of the healing environment, and works of art in health-care facilities featuring images of nature have been linked with stress relief in diverse groups of people. In hospital spaces which can easily be accessed, artworks which create inviting, habitable spaces should be incorporated into the design. The type of artwork used is also important; it should have what Niedenthal et al. (1994) describe as "emotional congruence", which means that when confronted with a collection of environmental stimuli, the viewer will tend to focus on the parts that correspond to his or her emotional state. For example, abstract art might be seen as interesting by a relaxed person, but as frightening or threatening by a person in a state of anxiety. As the hospital environment tends to increase stress, artworks, sculptures and other design elements should provide an unambiguously positive message; complex or abstract art is therefore not suitable for this kind of setting. Appropriate artworks can create an engaging focal point for a hospital space. In terms of genre, Ulrich has shown that postoperative patients preferred representational pictures, which tend to incorporate the subdued colors of nature, as opposed to abstract art, which often features unexpected color combinations; another study found that people in a state of anxiety prefer less saturated colors. The artworks should therefore be selected with these effects in mind.

Water

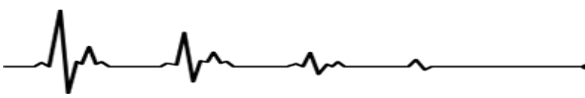
Hearing water running in a fountain, or seeing fish in a pond or sunlight reflecting on water, can be meaningful for a patient ; the sound of running water in particular can mask other noises which negatively affect the therapeutic value of a space. Such sights and sounds create sensory focal points for garden spaces which attract all ages and abilities.Water should be available, close to the garden site, and in a paved area to prevent muddying. The spigot should be 61-91.5cm above ground, and hand levers (not round spigot handles) and snap connectors should be used. Soaker hoses and mulch can decrease the water requirements of the garden. "Bubble" fountains may be appropriate, as they are tactile and make use of shallow water, raising fewer health and safety issues.

Site furniture

This term refers to free-standing elements such as seating, litter bins, lighting and signs, which should be selected to meet the needs of users. Furniture should be anchored to concrete pads or too heavy to be moved, and in cases where there is a risk of users running away, it should not be placed near fences or walls.

Seating

Seating should be available where people would actually want to use it, typically enclosed and towards the back, facing an attractive view or focal point, and not obstructing people on the path. Comfortable, movable, and varied seating can increase usage of the garden, especially by hospital staff; there should be benches and chairs for individuals, and more social seating arrangements for groups. Social seating arrangements (right-angled or centripetal benches, or movable chairs) should be conveniently located near the garden entrance, where they are most likely to be used by staff for short breaks. In addition to semiprivate areas there should be some benches arranged in a line rather than in a group, facing a view or circulation area.



Benches are usually situated at rest places or corridors with an exterior view . Space should be left beside a seat to accommodate a wheelchair or electric scooter. Raised features can help wheelchair users and people who cannot easily bend down, and should attract others as well, for example if the edge can serve as an informal seat. The thinnest construction materials should be used as long as they are stable, to increase the area of the garden: seating ledges should be 20-45cm wide, and the sides may range from 45cm high for a child, to 60cm for a visitor sitting by a bed, to 75cm or more for those who cannot bend easily.

Seats can be artworks in themselves. The material used should not retain heat or cold, so concrete, aluminium and steel should not be used: wood or hard plastic are preferable.

Moveable chairs can be rearranged depending on the sun or shade, and to adjust the size of the seated group. In general, seats should have arm and back support, but their height and depth, as well as their supporting structure, will affect their usefulness to people with special needs, and this should be taken into consideration.

Signage

Being able to choose whether or not to follow or avoid a route that might have rough paths is essential; appropriate, approachable and welcoming signs are a must. Site signage should indicate, among other things, directional or one-way traffic, restrictions, parking, deliveries, patient entry points, entrances to facilities, and so on . Tactile signs should be fixed at a height of 150cm (120cm for children). Other sensory indictors, such as audible water features and wind chimes may also be used to assist way finding for the visually impaired in the garden.

Lighting

The primary purpose of lighting is to enhance safety and security. Exterior lighting deters thieves or vandals; while lights on stairs, walkways or approach roads both increase safety from attackers and help prevent accidental falls. Parking areas, entrance and service roads, and also isolated or dark areas need to be clearly defined and lit; bollards or bulkheads are usually used for this purpose. Lighting along pedestrian routes should be mounted at a height where faces can be seen and recognized, and any entrances, intersections or hazards such as changes in path level, should be indicated by beacons. An added therapeutical benefit of night-time lighting is that it enables safe use of the space at night, and viewing of the garden from indoors .

. Receptacles

The locations of trash containers should be considered as an essential element of health-care facility planning, as they allow for easy disposal of food and paper products outdoors. The number of receptacles required depends on the population density and the activity level in an area, as well as how often they are emptied; overflowing litter bins indicate a need either for more of them or for more frequent service. There should be litter containers at all transition areas such as doors, building entries, parking access points and social and pedestrian spaces. To provide a less disturbing environment, receptacles should be placed at least 3.6m away from where people tend to socialize.

Planting design

As noted earlier, plants which require little water beyond the establishment period and can tolerate the urban environment and climate changes should take precedence in hospital garden planning. Other types of vegetation with varied densities should be used to connect greenways and wildlife corridors; and native vegetation should be mixed with compatible new plants in such a way as to sustain both. Native trees are particularly useful as they attract local wildlife: plant species that attract butterflies bring an atmosphere of gentleness; while additional features (fountains or birdbaths, a bird feeder, trees appropriate for roosting or nesting) may be used to attract birds, which stimulate the senses with their colours and sounds and raise people's morale.

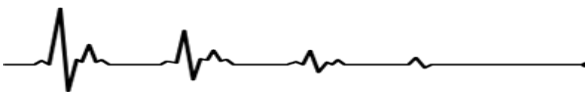
A dark woodland environment might feel oppressive, so open, sunny glades and generous paths are preferable for the health-care environment: they help wild flowers to grow, and enhance the sensory aspects of nature. Seasonally changing flowering trees, shrubs and perennials bring a comforting awareness of life's rhythms and cycles; and using vegetation that provides contrast and harmony through textures, forms, colours and arrangements draws people's attention and focus away from themselves.

Large canopy trees create shade in summer and provide shelter in winter; they can help modify the local climate and reduce the air temperature. Trees with foliage that moves in the breeze attract the gaze to patterns of colours, shadows, light, and movement, providing a soothing and meditative experience . In mental health facilities with high security, trees can soften and screen off the sight of security fences, and can also be planted in areas that patients can access under supervision. Shrubs should be trimmed to emphasize their natural form, so the space looks well cared for and sends the implied message that patients are also well cared for.

For all users of the garden, including the partially sighted, scented and brightly coloured flowers and leaves provide an attractive sensory experience. The olfactory sense is closely associated with memories and feelings, so scents can suddenly stimulate memories and responses, aiding those with memory loss. Sensory stimulation is particularly important for the visually impaired and for patients with reduced cognitive function, and this can be assisted by plants that are colourful throughout the year, are scented (e.g. Lavandula spp. And Echinacea spp.), and have tactile qualities (e.g. Festuca caesia). Fruit trees can be good for smaller spaces, and offer seasonal attractions.

The edible garden is a useful concept, particularly if the produce can be used in the facility's kitchens. Long-term residents will be able to experience the seasonal development of the garden, and patients in day centers will be able to participate in tending the garden at any time of the year; an activities program might focus on food-growing – for example, eating fruit crumble, or painting berries . Planting an orchard also puts a site which is only available for a short time to good use.

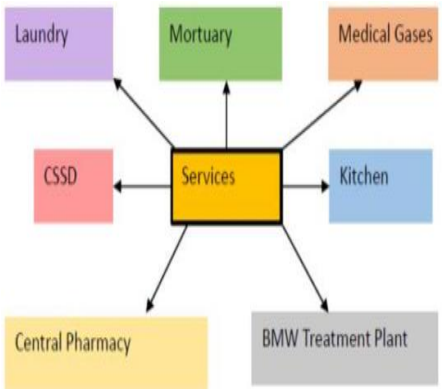
Precautions should be taken in planting to ensure that there are no hazardous or thorny plants, especially in gardens for children or psychiatric patients, and also no plants that drop slippery fruit or leaves that might constitute a hazard Low shrubs and dense, dark vegetated "walls" that obscure the view should not be planted near sidewalks; instead, these areas should be planted with year-round screens whose appearance is softened by varied deciduous plants and open spaces.

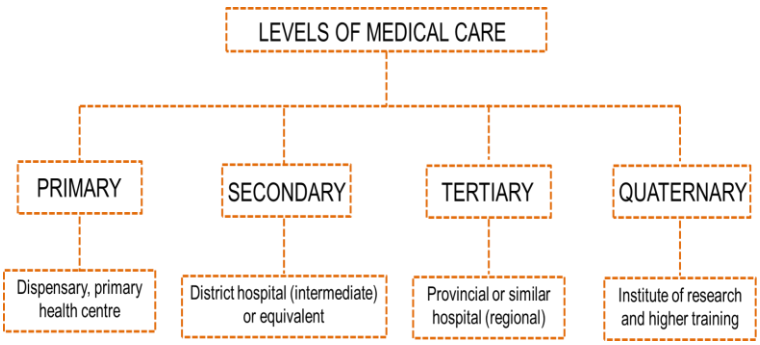


A HOSPITAL IS A HEALTH CARE INSTITUTION PROVIDING PATIENT TREATMENT BY SPECIALIZED STAFF AND EQUIPMENT. HOSPITALS ARE USUALLY FUNDED BY THE PUBLIC SECTOR, HEALTH ORGANISATIONS (FOR PROFIT OR NON-PROFIT), HEALTH INSURANCE COMPANIES, CHARITIES, INCLUDING DIRECT CHARITABLE DONATIONS. HISTORICALLY , HOSPITALS WERE OFTEN FOUNDED AND FUNDED BY RELIGIOUS ORDERS OR CHARITABLE INDIVIDUALS AND LEADERS. TODAY , HOSPITALS ARE LARGELY STAFFED BY PROFESSIONAL PHYSICIANS, SURGEONS AND NURSES, WHERE IN PAST , THIS WORK WAS USUALLY PERFORMED BY THE FOUNDING RELIGIOUS ORDERS OR BY VOLUNTEERS.

OUT PATIENT SERVICES

THIS AREA SHALL BE DESIGNED KEEPING IN VIEW FUNCTIONAL REQUIREMENT AND ADJUSTING THE SAME IN PHYSICAL FACILITY AND SPACE PROVIDE GENERAL FACILITIES CLINIC OF DIFFERENT MEDICAL FACILITIES INCLUDING ROOM LAYOUT AND REGISTRATION

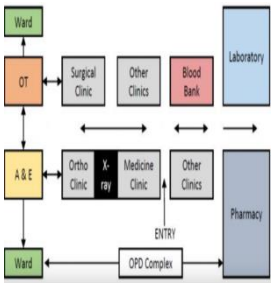


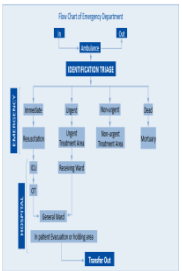


FLOW CHART OF SERVICES

MULTI-SPECIALITY HOSPITAL

A MULTI-SPECIALITY HOSPITAL MUST HAVE MORE THAN ONE SPECIALITY BUT THEY CAN BE THE BOARD SPECIALITIES LIKE MEDICINE, SURGERY, PEDIATRICS, ETC. THEY OFFER SPECIALIZED SERVICES TO THEIR PATIENTS





SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

LOCATION

KABIR BAGH, SHIVPUR ROAD NEAR KASHI, GOMTI BANK,
SHIVPUR, VARANASI.

APPROACH

THERE IS A SINGLE ENTRY TO THE SITE WHICH IS 16M WIDE FROM THE SHIVPUR ROAD ON THE NORTH SIDE WHICH MEETS THE NH-56 TOWARDS THE EAST.

SITE DETAILS

THE SITE OF THE PROJECT IS 5.2 ACRES (226512 SQ.FT/ 21043.7 SQ.MT) IN SIZE, WITH THE GROUND COVERAGE OF 35% AND FAR TO BE 1.50 FOR UNDEVELOPED AREAS.

CAPACITY

ACCORDING TO THE PROJECT, A TOTAL OF 300 BED MULTI SPECIALTY HOSPITAL IS PROPOSED TO SERVE THE AREA.

THE SIDE IS 3KM AWAY FROM RAILWAY STATION AND 3.5 KM AWAY FROM BUS STOP.

VARANASI IS MAINLY FAMOUS FOR ITS CULTURAL FESTIVE EVENTS LIKE GANGA MOHOTSAV, SUR GANGA DHRUPAD MELA , BUDDHA POORNIMA, RAMLEELA RAMNAGAR, GANGA DUSHEHRA.

VARANASI HOLDS SECOND PLACE IN UP GROWTH TRENDS OF TOURISTS

SETBACK

FRONT - 10 M

REAR – 10 M

G.C. – 40%

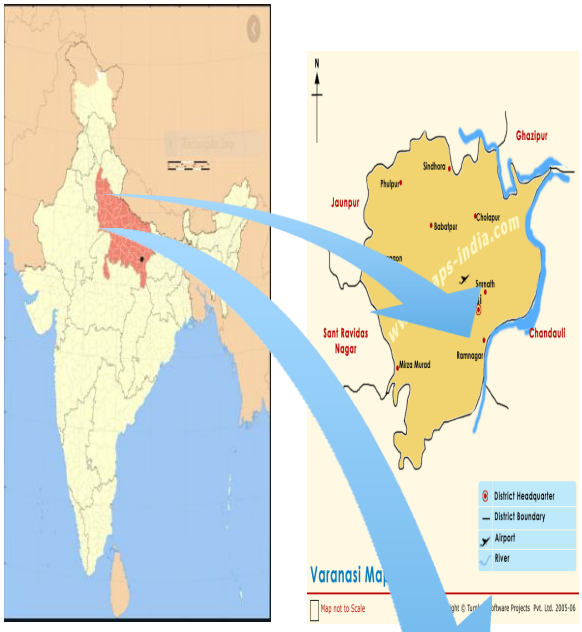
FAR- 2.0

HEIGHT -23.7 M

ECS-1.5

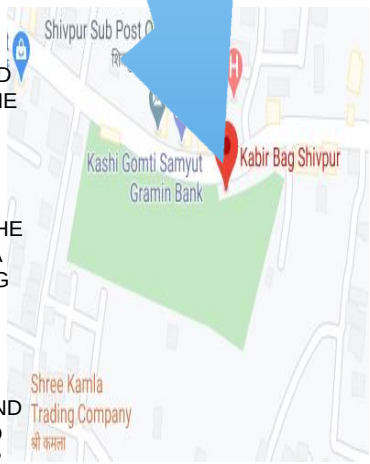
SITE TOPOGRAPHY

THE TOPOGRAPHY OF THE ZONE DEPICTS GENTLE SLOPE FROM THE NORTH TO SOUTH PLAIN BARREN SITE WITH UNEVEN SURFACES. MAINLY COMPRISES OF PEBBLES AND SMALL STONES. AT THE SAME LEVEL OF THE ROAD LEVEL .



SOIL BEARING CAPICITY

SOIL BEARING CAPACITY SURVEYS WERE CONDUCTED IN ORDER TO DETERMINE THE GEOLOGY AND THE SOIL BEARING CAPACITY, WATER QUALITY AND CHARACTERISTICS OF THE GROUND WATER FOR THE PURPOSE OF DEVELOPING A BUILDING DESIGN INCLUDING A STRUCTURAL DESIGN AND CONTRUCTION PLAN INVESTIGATION WERE CONDUCTED AT 6 POINT, EACH BEING 30.00M DEEP AND SAMPLES WERE COLLECTED FROM THEREIN AT REGULAR INTERVALS OF 1.00M.THIS INVESTIGATION INCLUDED THE STANDARD PENETRATION TEST (SPT)



THE CURRENT CONDITION OF THE SITE AND ITS SURROUNDINGS

THE CURRENT LAND IS AGGRICULTURE LANDS , LOT OF TREES IN SITE , THERE IS NO SEWAGE OI DRAINAGE PROPERLY , THERE IS TRANSFERMER, AND WATER TANK NEAR BY , NO CONTOURS

ACCESS TO SITE

BUS STAND IS 6.8 KM 18 MINS FROM SITE

VARANASI AIRPORT IS 16 KM 24 MIN FROM THE SITE

VARANASI CANT RAILWAY STATION IS 7 KM SITE 22 MINS FROM SITE

SITE ANALYSIS

ARCHITECTURAL THESIS 2019-20

Roll no. 1150101004

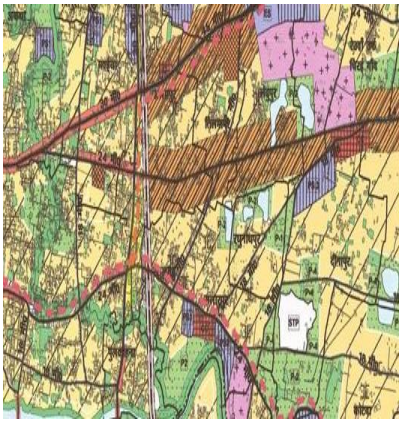
THESIS GUIDE AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTURE

Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

HOSPITAL

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

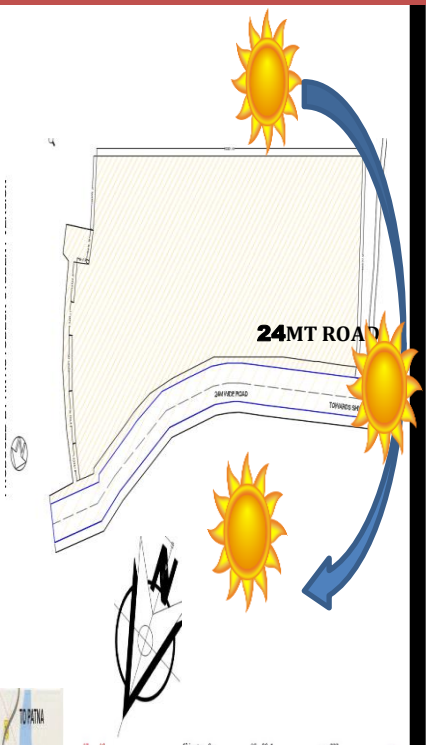


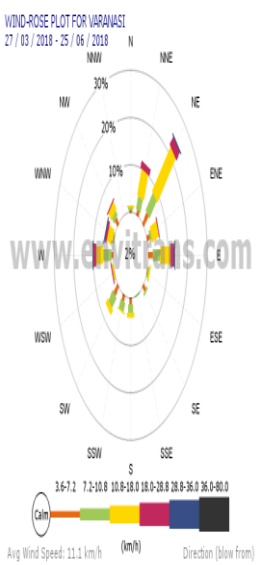
MASTER PLAN

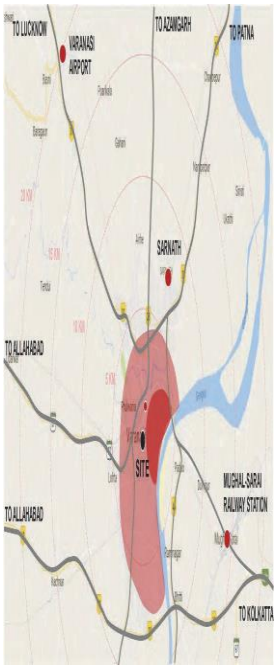
LAND USE – AGGRICULTURE LAND

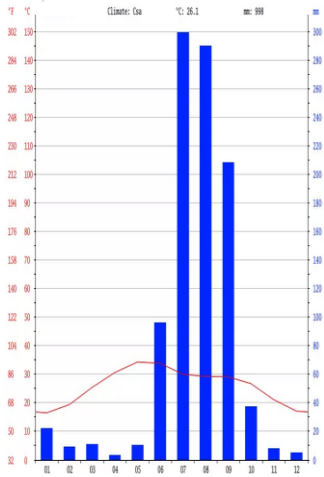
CLIMATOLOGY

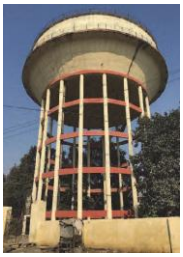
VARANASI CITY, WHERE THE PROJECT SITE IS LOCATED, OUT SIDE THE MAIN VARANASI DISTRICT IN UTTAR PRADESH STATE AND IS LOCATED ON THE BANK OF THE GANGA RIVER . SINCE INDIA IS A HUGE COUNTRY, THE CLIMATE IS VERY DIFFERENT IN EACH AREA . THE NORTH INDIA DISTRICT, INCLUDING VARANASI CITY , BELONGS IN THE TEMPERATE CLIMATE ZONE AND HAS THREE SEASONS WHICH ARE CLASSIFIED AS THE HOT SEASON: APRIL TO JUNE ,WET SEASON: JULY TO SEPTEMBER AND DRY SEASON: OCTOBER TO MARCH.











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CLIMATE

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HOSPITAL

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

World Health Organization

IIS standards for illumination are

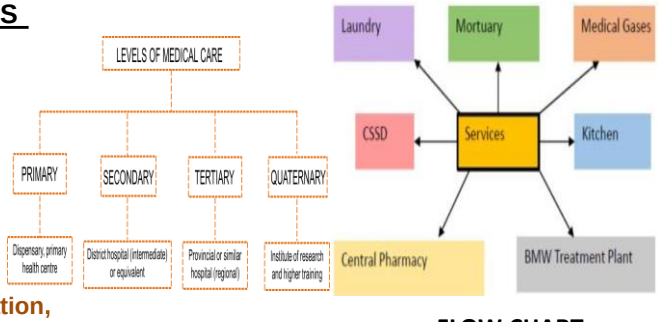
Sl. No.	Department	Illumination (lux)
1	Reception and waiting room	150
2	Wards	
2a	General	100
2b	Beds	150
3	Operation Theatre	
3a	General	300
3b	Tables	Special Lighting
4	Laboratories	300
5	Radiology	100
6	Casualty and Outpatient Departments	150
7	Stairs and corridor	100
8	Dispensaries	300

A HOSPITAL IS A HEALTH CARE INSTITUTION PROVIDING PATIENT TREATMENT BY SPECIALIZED STAFF AND EQUIPMENT. HOSPITALS ARE USUALLY FUNDED BY THE PUBLIC SECTOR, HEALTH ORGANISATIONS (FOR PROFIT OR NON-PROFIT), HEALTH INSURANCE COMPANIES, CHARITIES, INCLUDING DIRECT CHARITABLE DONATIONS. HISTORICALLY , HOSPITALS WERE OFTEN FOUNDED AND FUNDED BY RELIGIOUS ORDERS OR CHARITABLE INDIVIDUALS AND LEADERS. TODAY , HOSPITALS ARE LARGELY STAFFED BY PROFESSIONAL PHYSICIANS, SURGEONS AND NURSES, WHERE IN PAST , THIS WORK WAS USUALLY PERFORMED BY THE FOUNDING RELIGIOUS ORDERS OR BY VOLUNTEERS.

CLASSIFICATIONS ON DIFFERENT BASIS

Basing on Objective

a. General hospitals
b. Special hospitals
c. Teaching cum Research Hospital



FLOW CHART OF SERVICES

Basing on Administration, ownership, control or financial income

a. Governmental or public
b. Non-governmental or private
c. Semi Govt Hospital
d. Voluntary Agency Hospitals

OUT PATIENT SERVICES

THIS AREA SHALL BE DESIGNED KEEPING IN VIEW FUNCTIONAL REQUIREMENT AND ADJUSTING THE SAME IN PHYSICAL FACILITY AND SPACE PROVIDE GENERAL FACILITIES CLINIC OF DIFFERENT MEDICAL FACILITIES INCLUDING ROOM LAYOUT AND REGISTRATION FACILITIES

MULTI-SPECIALITY HOSPITAL

A MULTI-SPECIALITY HOSPITAL MUST HAVE MORE THAN ONE SPECIALITY BUT THEY CAN BE THE BOARD SPECIALITIES LIKE MEDICINE, SURGERY, PEDIATRICS, ETC. THEY OFFER SPECIALIZED SERVICES TO THEIR PATIENTS

Requirements of Operation Theatre

Sl. No.	Item	District Headquarters Hospital		
		101-200 Bedded	201-300 Bedded	301-500 Bedded
1	Elective OT-Major	1	2	3
2	Emergency OT/PW OT	1	1	1
3	Ophthalmology/ENT OT	1	1	1

Basing on bed capacity (Size)

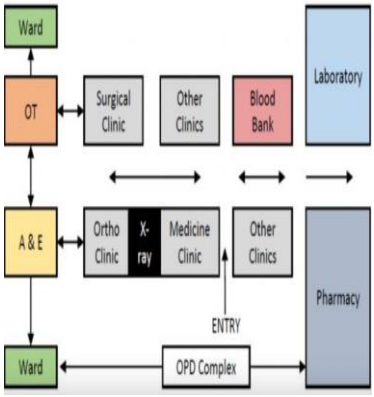
a. Small hospital (Up to 100 beds)
b. Medium hospital (More than 100 to less than 300 beds)
c. Large hospital (More than 300 beds)

Basing on type of care:

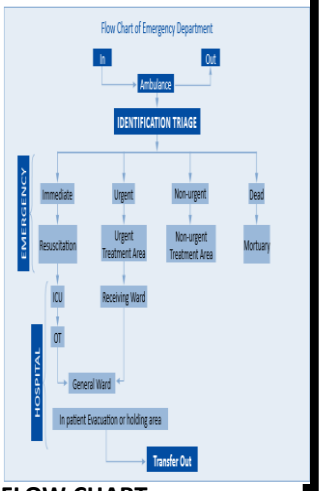
a. Primary Care
b. Secondary Care
c. Tertiary Care

As per WHO Classification:

a. Regional Hospital
b. Intermediate/ District Hospital
c. Rural Hospital



FLOW CHART OF HOSPITAL



FLOW CHART OF EMERGENCY

HOSPITAL

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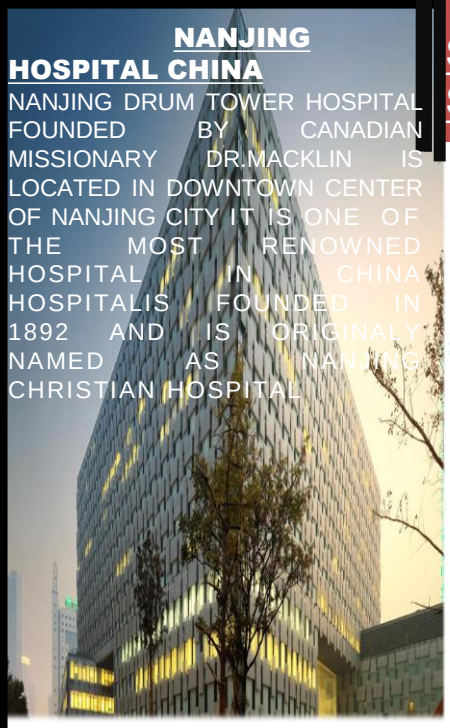
SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

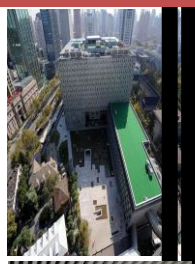


NANJING HOSPITAL CHINA

NANJING DRUM TOWER HOSPITAL FOUNDED BY CANADIAN MISSIONARY DR.MACKLIN IS LOCATED IN DOWNTOWN CENTER OF NANJING CITY IT IS ONE OF THE MOST RENOWNED HOSPITAL IN CHINA HOSPITALIS FOUNDED IN 1892 AND IS ORIGINALY NAMED AS NANJING CHRISTIAN HOSPITAL

ABOUT HOSPITAL

LOCATED AT THE CENTRE OF NANJING CITY, NANJING DRUM TOWER HOSPITAL SOUTH EXTENSION IS A GENERAL HOSPITAL EXTENSION PROJECT COMBINING INPATIENT AND OUTPATIENT DEPARTMENTS ,EMERGENCY,MEDICAL DESIGN ACADEMIC EXCHANGE DEPARTMENTS.THE CONCEPT OF THE PROJECT WAS INSPIRED BY INTERPRETATION OF TERM “HOSPITAL”IN TRADITIONAL CHINESSE CULTURE



BACKGROUND

CHINA IS A UNITARY ONE-PARTY SOVEREIGN STATE IN EAST ASIA AND THE WORLD MOST POPULOUS COUNTRY WITH THE POPULATION OF 1.404 BILLION.

CHINA’S CLIMATE IS MAINLY DOMINATED BY DRY SEASONS AND WET MONSOONS WHICH CAUSES GREAT TEMPERATURE DIFFERENCE IN THE WINTERS AND SUMMERS. THE NORTHERN WINDS IN THE WINTERS COMING FROM HIGH-LATITUDES ARE COLD AND DRY, WHERE AS SOUTHERN WINDS FROM COASTAL AREAS AT LOWER LATITUDES ARE WARM AND MOIST.

APPROACH

THE MAIN ENTRANCE TO THE HOSPITAL SITE IS ZHONGSHAN ROAD

SITE DETAILS

THE SITE OF THE PROJECT IS 37900 SQM IN SIZE, WITH AN OVERALL FLOOR AREA OF 260000 SQ M. THE PROJECT WAS DESIGNED IN 2005 AND COMPLETED IN 2012.

CAPACITY

ACCORDING TO THE PROJECT, A TOTAL OF 2800 BEDS WILL BE SERVED, OF WHICH 1600 IS PROVIDED BY THE NEW EXPANSION. DAILY OUTPATIENT IS PLANNED TO REACH 10,000 PERSON

LOCATION

ZHONGSHAN NORTH ROAD & DRUM TOWER SQUARE, GULOU, NANJING, JIANGSU, CHINA

THE ENGLISH WORD 'HOSPITAL' IS ORIGINATED FROM LATIN, MEANING GATHERING GUESTS, BUT IN CHINESE, THE TERM 'HOSPITAL' (YI YUAN) IS READ WORD BY WORD AS THE 'HEALING GARDENS'. THE CORE OF THE DESIGN FOR THE PROJECT IS TO 'GARDENISE‘ THE HOSPITAL, TO CREATE GARDENS EVERYWHERE. IN TRADITIONAL CHINESE CULTURE, A GARDEN IS THE BORDERLAND BETWEEN HOME AND THE OUTSIDE WORLD. WALKING INTO IT NOT ONLY PROVIDE SENSORY BEAUTY TO THE PIECE BUT ALSO GIVE INTERNAL RELAXATION.

SITE PLAN

LITERATURE STUDY

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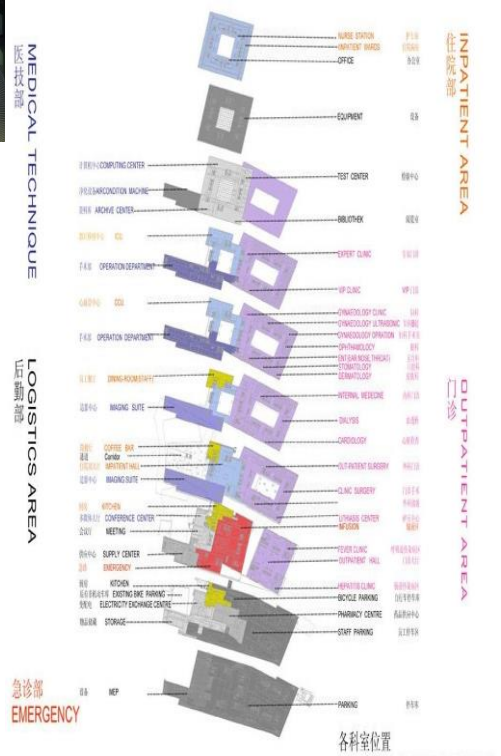
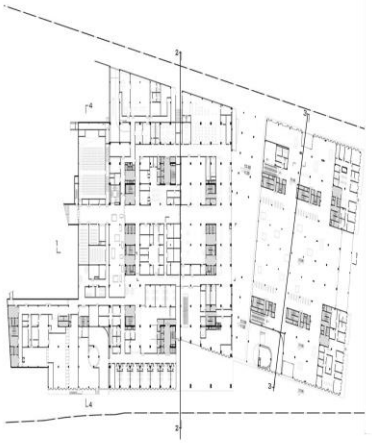
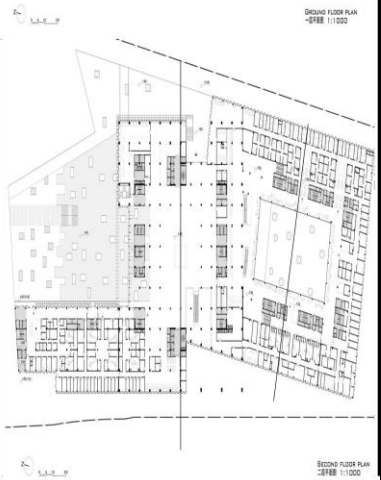
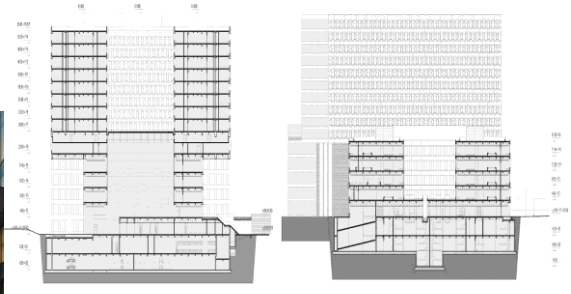
THE EARLIER EXPANSIONS OF THE HOSPITAL WAS DRIVEN BY THE OF DEVELOPMENT OF MODERN MEDICAL TECHNOLOGY AS WELL AS THE INCREASING MUNICIPAL POPULATION. DESPITE THE REMARKABLE SCALES, MOST OF THESE EARLY EXPANSIONS ARE HARDLY MORE THAN SIMPLE AND URGENT ADDITION AND EXTENSION OF EXISTING FUNCTION TO MEET THE RAPIDLY INCREASING NEED FOR MEDICAL SERVICE. AS A RESULT, THE FUNCTIONAL LAYOUT OF MANY NOT IZE NE TH TH FO TH

DEPARTMENT IS ON THE EAST SIDE OF ZHONGSHAN RD, CONNECTED WITH THE MAIN BUILDINGS OF THE HOSPITAL, WHICH IS ON THE WEST SIDE, ONLY THROUGH A NARROW UNDERGROUND PASSAGEWAY, WHICH MAKES EXTRA INCONVENIENCE TO BOTH PATIENTS AND STAFFS.

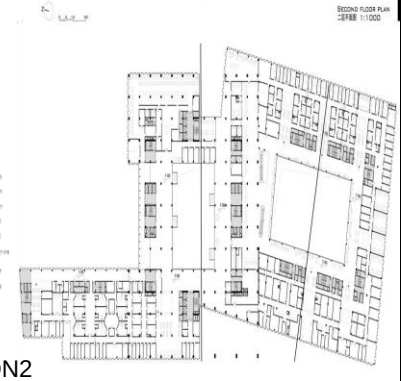




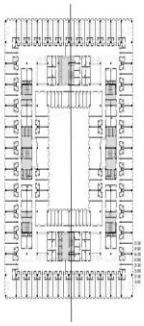




SECTION 1



SECTION2



WITH REGARD TO ENERGY CONSERVATION, THE EXTERNAL FAÇADE EMPLOYS WHITE FROSTED GLASS, WHICH RESOLVED THE ISSUE OF INDOOR LIGHTING WHILE FILTERING THE DIRECT SUNLIGHT, CREATING SOFT AMBIENCE.

FURTHERMORE, IN ALLUSION TO THE SWELTERING SUMMER WEATHER IN NANJING, A LATERAL VENTILATION SYSTEM IS INSTALLED ON THE FAÇADE TO RELEASE ACCUMULATIVE HEAT ON THE SURFACE, SIGNIFICANTLY REDUCING ENERGY CONSUMPTION AND ALLOWING THE BUILDING TO BETTER SERVE THE USERS.

LITERATURE STUDY

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SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

PARS HOSPITAL, RASHT, IRAN

Location

LOCATED IN GOSLAR DISTRICT, RASHT, GILAN PROVINCE, IRAN. SITUATED ON HIGHWAY 24M WIDE

APPROACH

2 MAIN ENTRANCES ONE OF WHICH IS USED AS AN EMERGENCY ENTRANCE

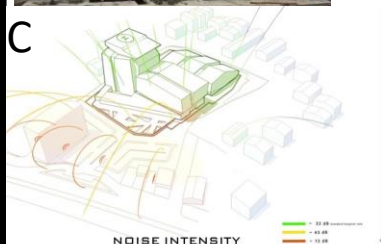
SITE DETAILS

SITE IS` SURROUNDED BY OTHER PROPERTIES EXCEPT OF ENTRANCE
TOTAL SITE AREA = 4.3 ACRES OR 17,400SQM

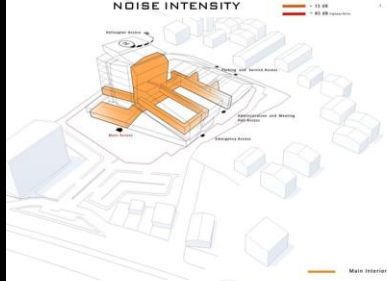
CAPACITY

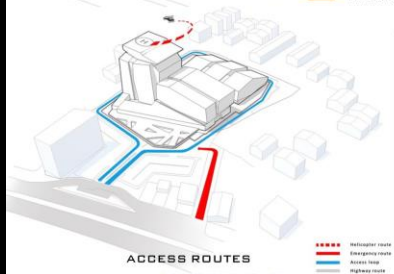
HOSPITAL COMPRISING OF 160 BEDS AND 9 OPERATION THEATRE

C

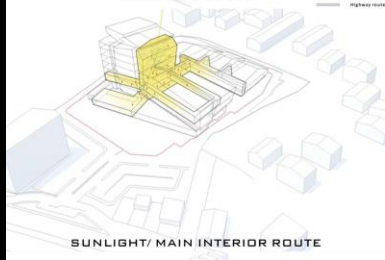


NOISE INTENSITY

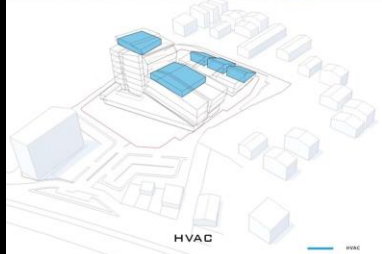




ACCESS ROUTES

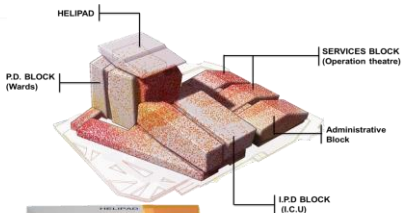


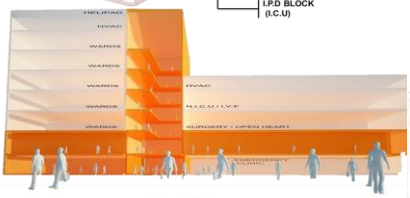
SUNLIGHT/ MAIN INTERIOR ROUTE

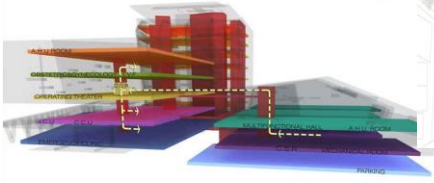


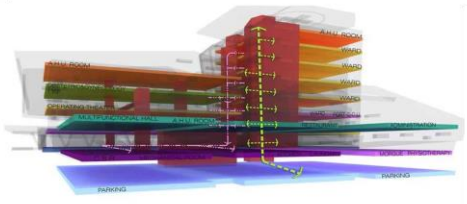
HVAC

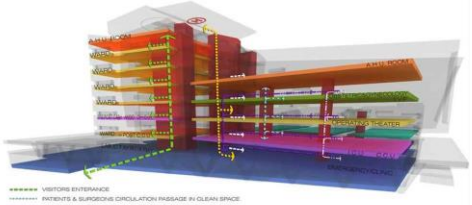
.Composing several blocks in three different height built on the basis of concrete structure features a comprehensive medical infrastructure. Moreover, being integrated via a transitive atrium that pervades and provides natural light accessibility in different departments, while porches create a subtle and interactive visual communication between inside and surrounding environment.











GROUND FLOOR PLAN

FIRST FLOOR PLAN

SECOND FLOOR PLAN

SECTION AA'

LITERATURE STUDY

LITERATURE STUDY

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SAHARA HOSPITAL LUCKNOW

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

HOW TO REACH

- LOCATION :**GOMTI NAGAR, LUCKNOW**
- SURROUNDING :COMMERCIAL,RESIDENTIAL
- ROAD: **24MTS. WIDE ROAD** FROM **TWO SIDES**

1. BUS STOP : HEINEMANN CHAURAHA 850 MTS.
2. CHARBAGH BUS STATION: **12.6 KM** TAKES**40 MINUTES**,BUSES AVAILABLE EVERY 15 MINUTES
3. AIRPORT :**23.7KM** TAKES **1HOUR 39MINUTES** FROM HEINEMANN
4. RAILWAY STATION **: 12.5 KM** AWAY FROM HEINEMANN TAKES **55 MINUTES** FROM **BUS VIA ROUTE NO. 45** AND IT TAKES **25 MINUTES FROM CAR**

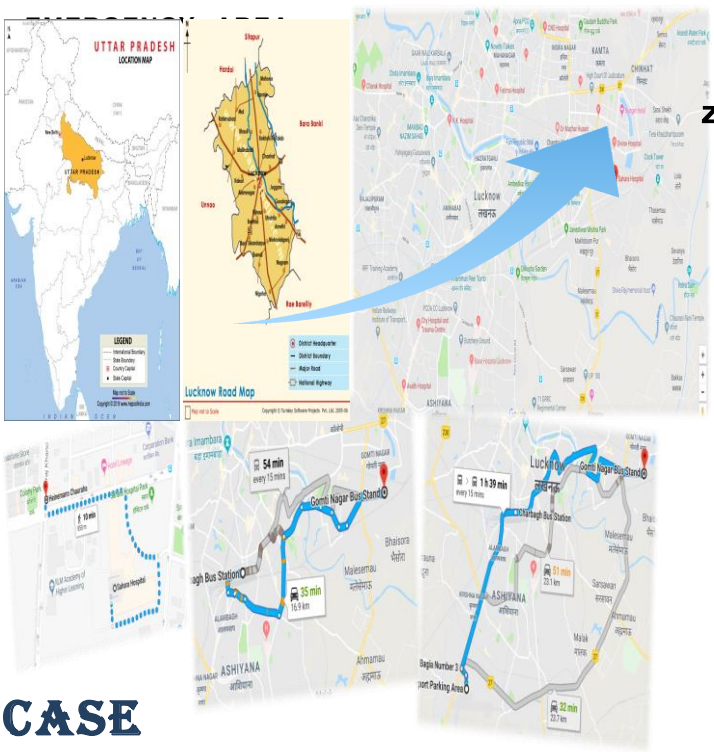
•MAIN ACCESS IS FROM

24 MTS WIDE ROADS FROM TWO SIDES

•ACROSS THE ROAD IS THE GOMTI NAGAR COMMERCIAL AREA. EMBARKED WITH NUMBER OF SMALL MALLS IN THE AREA. OTHER VICINITY IS FLOODED BY RESIDENTIAL SECTOR.

•**TWO ENTRY FROM MAIN ROAD** WHICH SERVES THE **SERVICE BLOCK AND OPD**, WILL SERVE GENERAL PUBLIC AND DOCTORS.

• OTHER **SEPARATE ENTRY FOR**

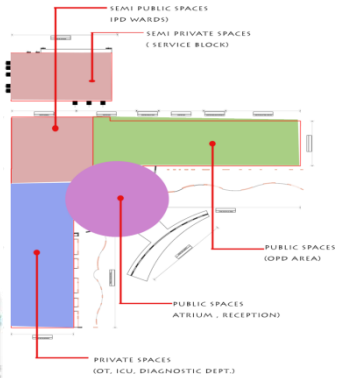


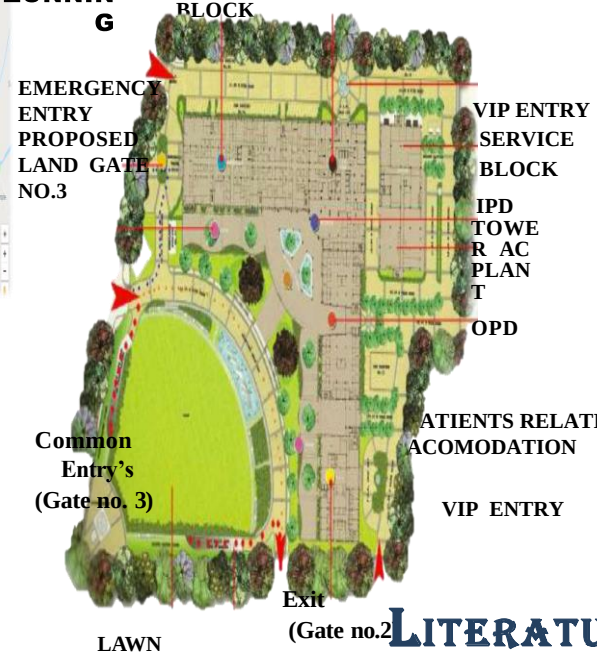
SAHARA HOSPITAL

A Centre for Tertiary Care

IN TECHNICAL COLLABORATION WITH APOLLO HOSPITALS.
GOMTI NAGAR , LUCKNOW

LOCATION : GOMTI NAGAR, LUCKNOW
CLIENT : SAHARA INDIA PARIVAR, IN TECHNICAL COLLABORATION WITH APOLLO HOSPITALS
DESIGN TEAM :M/S ARCHITECT HAFEEZ CONTRACTOR (DESIGN AND CONCEPT),
M/S ARCHIMEDES
CONSULTANTS (PRESENT)
TOTAL SITE : 27 ACRES
BUILT UP AREA : 74,000 SQ M (APPROX)
COST : RS 400 CRORES (APPROX.)
YEAR OF COMPLETION : 2008





CASE STUDY

LITERATURE STUDY

ARCHITECTURAL THESIS 2019-20

Roll no. 1150101004

THESIS GUIDE AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTURE

Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

SAHARA HOSPITAL LUCKNOW

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI`

UNIQUE FEATURES OF THE HOSPITAL:

- A HYPERBARIC OXYGEN THERAPY CENTRE WHICH IS A SPECIALISED
- CENTRE TO TREAT DISEASES CAUSED BY ISCHEMIA (OXYGEN DEPLETION IN TISSUES).
- SAHARA HOSPITAL WILL HAVE THE MOST MODERN DELIVERY SYSTEM –
- "PNEUMATIC TUBE" TO ACHIEVE EFFICIENT & SAFE TRANSPORTATION OF
- DRUGS, PATHOLOGICAL SAMPLES.

O.P.D. BLOCK:-

- FRONT BLOCK OF FOUR STOREY'S HOUSES OPD
- SIMPLE IN BOTH PLANNING AND SERVICES THAN I.P.D. OR DIAGNOSTIC BLOCK.
- MAIN ENTRY FROM PARKING AREA.
- ENTRY IS TAKEN FROM THE MIDDLE, CREATING A RECEPTION THERE AND THEN FORMING TWO WINGS.
- CONSIST OFDIFFERENT DEPARTMENTS WHICH ARE DISTRIBUTED ON FOUR FLOORS.
- IN EACH O.P.D., ROOMS ARE ARRANGED ALONG THE PERIPHERY WITH TOILETS AT THE CORNER AND WAITING AND RECEPTION IN THE MIDDLE.
- SUFFICIENT LIGHT IN THE CONSULTING CHAMBER

GENERAL FEATURES OF BUILDING:

A HOSPITAL WITH 350 BEDS EXPANDABLE TO 500 BEDS.

STATE-OF-THE-ART, MULTI-SPECIALTY, TERTIARY CARE. HOSPITAL PROVIDING 7-STAR FACILITIES HOSPITAL IS BROKEN INTO TWO BLOCKS OF DIFFERENT HEIGHTS CONNECTED BY AN ATRIUM.

ESTIMATED TO CARE FOR THE NEEDS OF ALMOST 3 LAKH PEOPLE WITH ITS OUTPATIENT DEPARTMENT

- THE "L' SHAPED 4-FLOOR HIGH BLOCK HOUSES THE DIAGNOSTICS ZONE IN ONE ARM AND AN OUTPATIENT SECTION IN ANOTHER.
- THE 13-STOREY HIGH IN PATIENT TOWER RISES FROM THE CENTRE AND IS FRONTED BY A DOUBLE VOLUME ENTRANCE LOBBY, WHICH FUNCTIONS AS A COMMON FOYER TO ALL THE ZONES.
- TWO ORGANICALLY SHAPED DOUBLE HEIGHT ATRIUMS WAITING AREAS EMERGE FROM THIS CENTRAL FOYER.

ACCORDIND TO IPHS

- RAMP IS ACCESS TO ONLY 1ST FLOOR
- THERE IS NO ADEQUATE SPACE FOR LOBBY,ATLEAST 3M
- LIFT ARE NOT PROPERLY STARTED
- FROM 2ND FLOOR IT IS EASILY ACCESS TO **MEZZANINE FLOOR**
- **ABOVE 7 FLOOR ALL FLOORS ARE NOT WORKING PROPERLY**
- **THERE IS NOT SEPARATE GATE FOR PEDISTRIAL AND AMBULANCE**
- **NOT ADEQUATE PARKING SPACE FOR VISITORS AND STAFF**
- **AND SINAGES ARE ALSO NOT PROPERLY USED**
- **NOT PROPER STREET LIGHT IN NIGHT**

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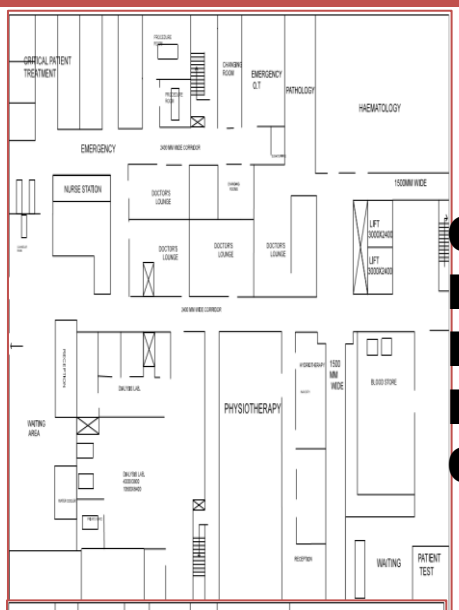
DIAGNOSTICS BLOCK:-

TWO ENTRIES, ONE FROM WING PERPENDICULAR TO OPD WING.
MULTIPLE ENTRANCES OF ALL DIAGNOSTICS AREAS.
LINEAR BLOCK CONSISTS OF THREE MAJOR ZONES ON GROUND FLOOR-
EMERGENCY- O.T., TRIAGE ROOM, PLASTER AND CONSULTANT'S ROOM.
DIAGNOSIS- RADIOLOGY, C.T. SCAN, PATHOLOGY LABS, ETC. AND ADMINISTRATION AREA
C) IPD TOWER .
D) SERVICES BLOCK
MINOR OT IS PROVIDED IN THIS AREA.
ALL THREE ARE APPROACHABLE BY DIFFERENT ENTRIES.
INTER CONNECTED TO EACH OTHER BY 2.4 M WIDE DOUBLY LOADED CENTRAL CORRIDOR.
ALL FUNCTIONS ARRANGED AROUND ONE SINGLE SPINE WHICH REDUCED THE CIRCULATION AREA.
PROPER WAITING IN ALL FACILITIES.
LIFTS ARE PROVIDED AT THE MIDDLE AND END OF THE CORRIDOR.
10 O.T.'S AND I.C.U.'S ARE PLACED ON FIRST FLOOR.



G.F PLAN DIAGONOSTIC

F.F PLAN DIAGONOSTIC

EMERGENCY

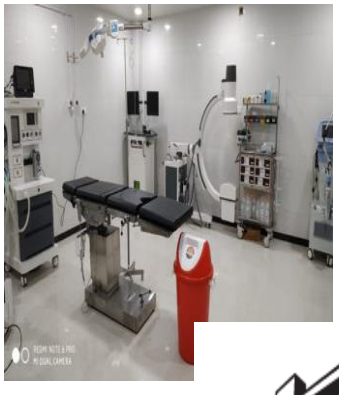
- SEPARATE ENTRY FROM MAIN ROAD AND FROM OUTSIDE FROM ROAD WE CANNOT SEE EMERGENCY
- EMERGENCY 12 BEDS , 3 TRIAG BEDS , EMERGENCY OT , NURSING SUPRETENDENT , BED PEN WASH ,PLASTER ROOM ,LINEN ROOM , UTILITY ROOM , DIRTY UTILITY ROOM , PATIENT WASH ROOM , BED PEN WASHROOM , NEUMATIC TOOL SYSTEM ,DUCT AS
- EMERGENCY IS AS PER IPHS STANDARDS

• BLOOD BANK

- ACCESSIBLE FROM MAIN ATRIUM AND EMERGENCY.
- CONSIST OF COUNSILING ROOM,DONOR REGISTRATION,DON SCREENING,REFRESHMENT ROOM,MEDICAL EXAMNINATION,PLATELETE COLLECTION,RECEPTION,UTILITY
- BLOOD BANK AS PER IPHS NORMS

DIAGNOSTIC FACILITIES AS PER IPHS

Blood bank , Radiology, C.T. scan, M.R.I. ,Ultrasound ,Pathology labs
Administration area.
Approachable from inside atrium for I.P.D. And O.P.D. patients and for staff from Outside.
Adequate waiting space in diagnosis.



HOSPITAL

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SAHARA HOSPITAL LUCKNOW

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

GENERAL RADIOLOGY

ACCESSIBLE FROM MAIN ATRIUM AND DIAGNOSTICS SPINE.
CONSIST OF TWO X-RAY ROOMS, CONSOLE PANEL, DARK ROOM AND CHANGING ROOM.
FOR SAVING FROM RADIATIONS THE LEAD SHEETS EMBEDDED IN CONCRETE WALLS.
SEPARATE WAITING AND A RECEPTION WITH TOILET FACILITIES.

C.T. SCAN & M.R.I.

SITUATED IN FRONT OF RADIOLOGY.
CONSIST OF BASIN, GANTRY ROOM, TECHNICIAN ROOM, CONSOLE PANEL, PROCESSING AREA AND REPORT AREA.
SAFETY LEAD SHEETS ARE FITTED INTO THE DOOR.
SHARES COMMON WAITING AND RECEPTION.

INTENSIVE CARE UNIT

120 BEDDED CRITICAL CARE INFRASTRUCTURE PLACED ON FIRST FLOOR WITH O.T. BLOCKS.
ALL THE I.C.U.'S ARE PLACED ALONG THE DOUBLY LOADE CENTRAL SPINE CORRIDOR.
CONSISTS OF
11 BEDDED MEDICAL I.C.U.
12 BEDDED SURGICAL I.C.U.
12 BEDDED NEURO I.C.U.
4 BEDDED TRANSPLANT I.C.U.
CORONARY I.C.U.
ATTACHED TO CATH LABS.
.TOILETS ARE ATTACHED WITH T

MATERNITY AND NEO-NATAL I.C.U.

LOCATED ON THE FIRST FLOOR OF THE TOWER BLOCK .
CONSIST OF 2 LABOUR ROOM, O.T. AND ANCILLARY FACILITIES WHICH ARE CENTERALLY LOCATED.
NEONATAL I.C.U IS 20 BEDDED EQUIPPED WITH ALL THE LATEST FACILITIES AND MOTHER FEEDING ROOM IN THE RIGHT AND INCUBATORS.

PATIENT LIFT IN OPD

O.T. COMPLEX

PLACED AT THE ENDS OF FIRST FLOOR.
CAREFULLY PLACED WITH THE DIAGNOSTIC FACILITY JUST BELOW.
I.C.U.'S ARE ADJACENT TO THE COMPLEX.
SEPARATE ENTRIES FOR PATIENT, I.C.U. AND DOCTORS ARE PROVIDED.
A BIT FAR FROM ELEVATORS.ISOLATED FROM THE REST OF THE HOSPITAL.
CONNECTED WITH EMERGENCY AND CASUALTY DEPARTMENT BY ELEVATORS, PLACED JUST UPON IT.
10 O.T.'S ARE DIVIDED IN DIFFERENT DEPARTMENTS.
SHARES COMMON FACILITIES LIKE WASH AREA, SCRUB AREA, STORE ETC.

Recommended Allocation of Bed Strength

Sl. No.	Item	Type	District Headquarters Hospital		
			101-200 Bedded	201-300 Bedded	500 Bedded
1	General Medicine	Beds (M + F)	15 + 15	25 + 25	40 + 40
2	Newborn ward	Beds	5	5	10
3	Mothers room with dining and toilets	Beds	5	5	10
4	Paediatrics ward	Beds	10	20	40
5	Critical care ward – IMCU	Beds	5	10	10
6	Isolation Ward	Beds	4	5	5
7	Dialysis unit (as per specifications)	Beds		3	3
8	Thoracic medicine ward with room for pulmonary function test	Beds (M + F)		5 + 5	10 + 10
9	Blood bank		Yes	Yes	Yes
10	General surgery ward (incl. Urology, ENT)	Beds (M + F)	15 + 15	25 + 20	35 + 35
11	Post – Operative Ward	Beds (M + F)	10 + 16*	10 + 10	15 + 15
12	Accident and Trauma ward	Beds	10	10	15
13	Labour room	Boards	3	8	8
14	Labour room (Eclampsia)	Beds		3	3
15	Septic Labour room	Boards		2	2
16	Ante-natal ward	Beds	15	15	30
17	Post-natal ward	Beds	15	15	30
18	Postpartum ward	Beds	20	30	50
19	Post operative ward	Beds		20	40
20	Ophthalmology ward	Beds	5	10	20
21	Burns Ward	Beds	-	5	10

LOBBY NEAR LIFT

CASE STUDY

SAHARA HOSPITAL LUCKNOW

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

HIGH DEPENDENCY
8 BEDDED HIGH DEPENDENCY WARD WITH ATTACHED TOILETS, SINK,

SEMI-PRIVATE WARD
ROOM WITH TWO BEDS, ATTACHED TOILETS, BALCONY AND CURTAIN
FOR PRIVACY.
EQUIPPED WITH ALL FACILITIES ON FIFTH AND SIXTH FLOOR.

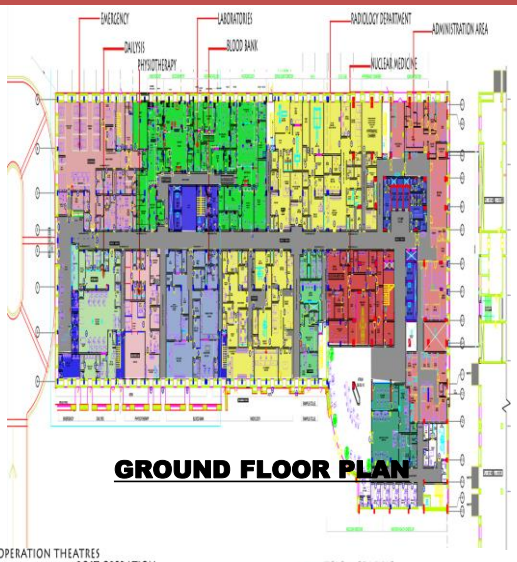
DOCTORS & NURSES ACCOMMODATION
Doctors and nurses accommodation is provided on the top floor

SIX BEDDED WARD
PLACED IN TOWER BLOCK ON TWO FLOORS
UNITS ARE EACH CONNECTED WITH TOILETS AT THEIR END.
FOR PRIVACY CURTAINS ARE USED.

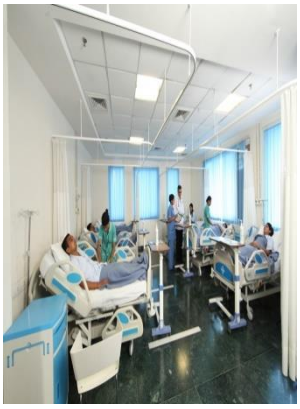
DELUXE ROOM
SINGLE DELUXE, DELUXE AND DELUXE SUITS ARE LOCATED ON THE
PERIPHERY
WITH ANCILLARY SERVICES IN THE CENTRAL CORE.
ROOM WITH ATTACHED TOILET, BALCONY AND FOLDABLE SOFA CUM BED

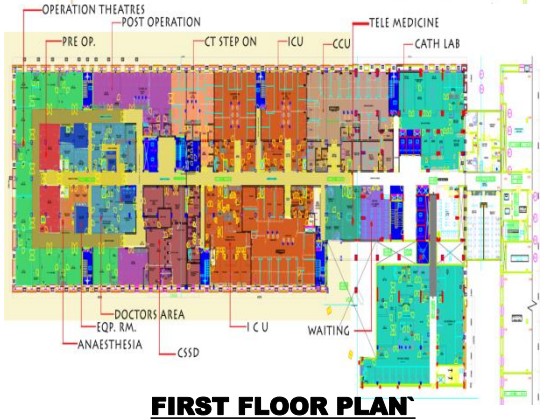
PATIENTS RELATIVES ACCOMMODATION (PRA):-
PRA IS GIVEN IN HOSPITAL TO FACILITATE THE RELATIVES OF THE PATIENTS.

PRIVATE ROOM
CONSIST OF A PATIENT ROOM WITH ATTACHED TOILET AND PANTRY.

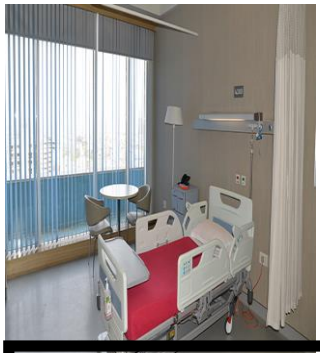


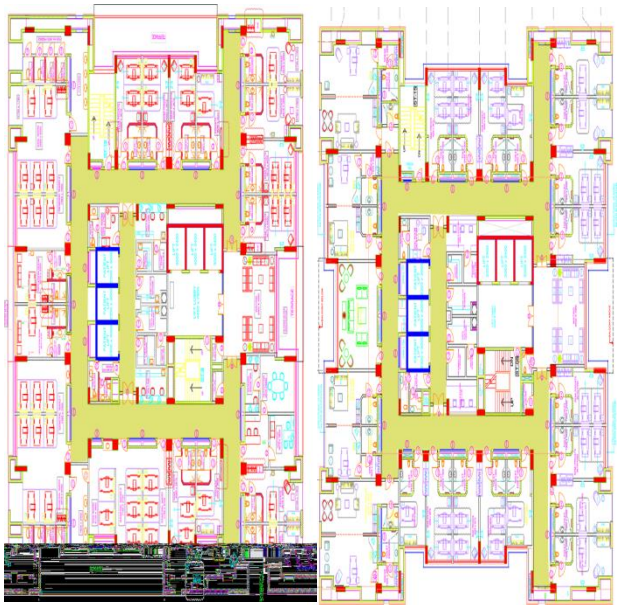
GROUND FLOOR PLAN





FIRST FLOOR PLAN`





FLOOR PLAN –GENERAL & PRIVATE WARDS

FLOOR PLAN – DELUXE & SEMI PRIVATE WARDS

CASE STUDY

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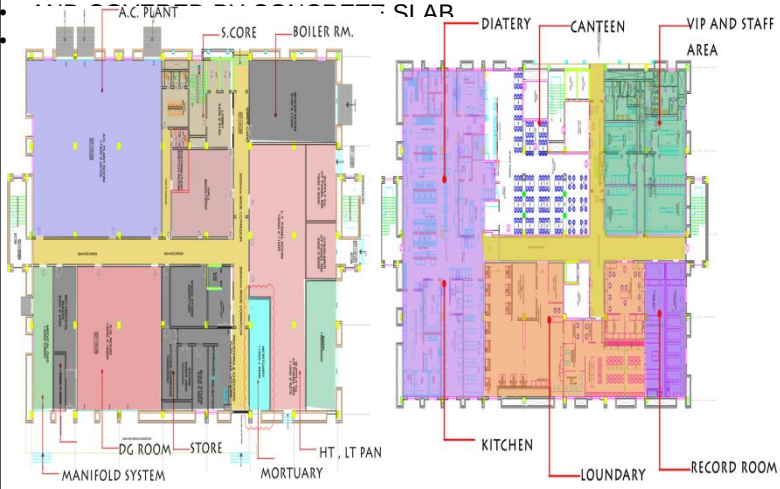
SERVICES:-

- SERVICE BLOCK IN THE REAR OF THE MAIN HOSPIT BUILDING.
- SEPARATE SERVICE ENTRY THROUGH ONE SEPARA GATE
- ALMOST WHOLE OF THE BLOCK IS DOUBLE HEIGHT (6M
- LIFTS ARE PROVIDED FOR SERVICE IN THE AREA.
- L.T. AND H.T , FOOD RECEIVING AREAS, WATE TREATMENT PLANT, STP ,ETP
- OXYGEN,NITROGENTELEPHONE EXCHANGE, STOR GAS MANIFOLD ROOM,
- L.P.G. STORES, D.G. SET, WORKSHOP, CHANGE ROOMS, A.C. PLANT ROOM,
- LINEN STORE, LAUNDRY, BOILER,MORTUARY.
- THESE SERVICES TRAVEL THE VERTICAL DISTANCE BY DUCTS AND THEN
- SPAN THE HORIZONTAL DISTANCE RUNNING THROUGH DUCTS UNDERGROUND
- AND [illegible] BY CONCRETE SLAB



GROUND FLOOR FIRST FLOOR

GROUND FLOOR

EMERGENCY,PHYSIOTHERAPY,LAB MEDICINE,BLOOD BANK,SAMPLE COLLECTION,RADIOLOGY,CT SCAN,ENDOSCOPY,BMD,MRI, ACCOUNT,PA SYSTEM CONTOL,ADMIN BLOCK,BILLING CASH,HEALTH CHECKUP,RECPTION,WAITING ,OPD

SECOND FLOOR

OPD,AUDIO AND VOICE DISORDER ROOM,MAIN PHARMACY STORE (DEMERIT)

FOURTH FLOOR

ISOLATION WARD,GERNAL WARD,PRIVATE WARD

FIRST FLOOR

IVF,HDU,DIALYSIS(12-13 BEDS),OPD,RECEPTION,ICU,OT BLOCK,MICU,CATH LAB,COMMON ROOM, CANTEEN,ICU WAITNIG(REST ROOMS)

THIRD FLOOR

OPD OF DIFF DEPARTMENT , SAHARA NURSING COLLEGE

FOURTH FLOOR

GYNECOLOGIST,2 CONSULTANT ROOMS,DELEVERY ROOM, WARDS ,WASHROOM,OT,RECEPTION,WAITING

INFERENCES:-

ADEQUATE WAITING AREAS IN ALL DEPARTMENTS.
ATRIUM HOUSES A LARGE NUMBER OF VISITORS AND HAS DIFFERENT ACCESSES TO DIFFERENT DEPARTMENTS THEREBY RESTRICTED THE FLOW OF VISITORS TO THIS AREAS ONLY.
THE SERVICE BLOCK FORMS THE MAJOR HUB FOR HOSPITAL FUNCTIONS, WITHOUT THE INTERFERENCE OF THE MAIN STREAM OF THE HOSPITAL.
SEGREGATION OF VISITOR, STAFF AND SERVICE ENTRY.
SEPARATE EMERGENCY ENTRY, WHICH HAS A DIRECT AND UNHINDERED ACCESS.
SEPARATE SERVICE LIFT FOR FOOD, LINEN, STAFF, VISITORS AND PATIENT HELP TO AVOID CONGESTION.
FLEXIBILITY FOR THE FUTURE SO THAT ANY FLOOR COULD BE CONVERTED FROM WARDS TO ROOMS AND VISE-VERSA.
TOILETS ARE DESIGNED ACCORDING TO THE NEEDS OF PATIENT.
EMERGENCY EVACUATION IS NOT CATERED FOR SINCE THERE IS NO PROVISION OF A RAMP.
LACK OF SEPARATE FIRE ESCAPES IN FIRE BLOCKS.
LACK OF NATURAL LIGHT AND VENTILATION IN LOWER FLOORS.
NO DIRT DISPOSAL CORRIDOR IN THE O.T. COMPLEX.
INCREASE IN THE COST BECAUSE OF INTRODUCTION OF SERVICE FLOORS IN THE BUILDING.
SERVICE FLOORS CREATE BETTER FLOORS USABILITY AS AREA IN SERVICES IS SEGREGATED ON FLOORS.
SERVICE FLOORS GIVES DESIGN FLEXIBILITY AS SERVICES CONSIDERATIONS IN DESIGN ARE REDUCED.

PARKING:-

TOTAL PARKING IS IN BASEMENT.
PARKING IS BASICALLY OF THREE TYPES:
AMBULANCE-NEAR THE EMERGENCY
VISITOR-PARKING AREA
STAFF-IN BASEMENT 300 CAR PARKING 200 BIKE

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FORTIS MEMORIAL GURGAON

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

GURGAON BUS STAND
6.6 KM VIA MEHRAULI –

INDIRA GANDHI INTERNATIONAL AIRPORT
20 KM 30 MIN

GURGAON RAILWAY STATION
9.7 KM

FORTIS HOSPITAL
30 M WIDE SECTOR MAIN ROAD NETAJI SUBHASH MARG
SECTOR 44 ROAD
ROAD WITHIN SECTOR

INTRODUCTION OF FORTIS HOSPITAL , GURGAON

FORTIS MEMORIAL RESEARCH INSTITUTE

LOCATION : SECTOR 44, GURGAON

SITE AREA : 43,303 SQ. M.

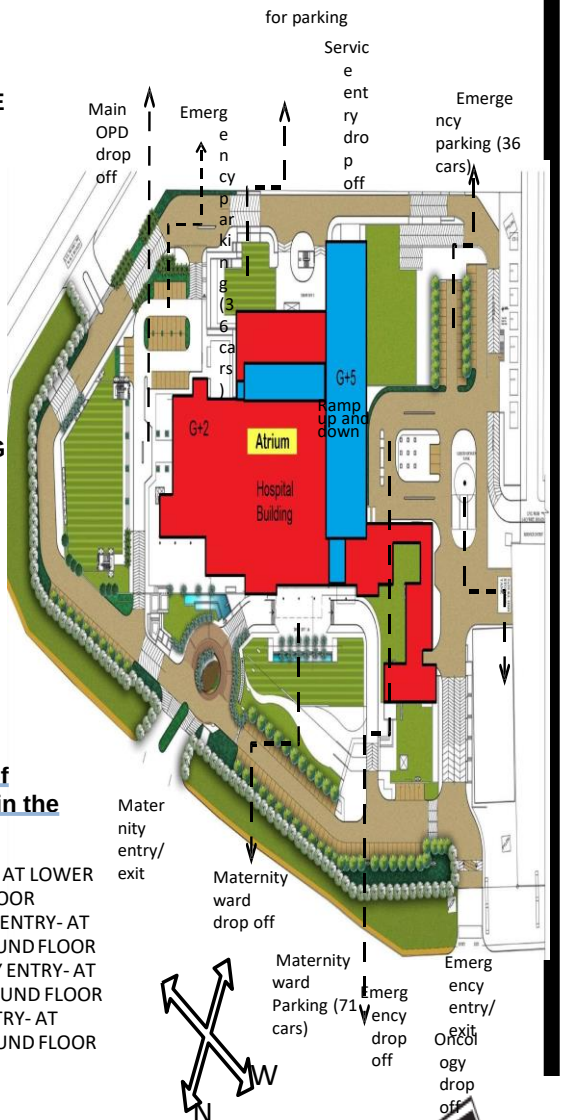
BUILT – UP AREA : 65,961 SQ.M.

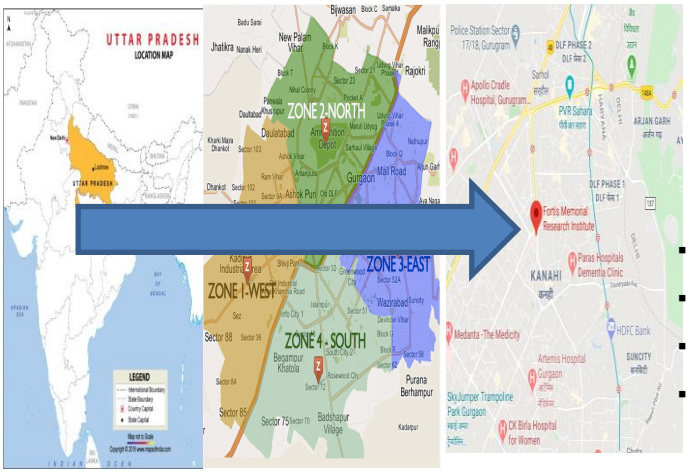
SURFACE PARKING : 143 CARS 100 BIKES

FAR : 1.52

PRINCIPAL ARCHITECT : AR. RAJINDER KUMAR, RAJINDER KUMAR ASSOCIATES, NEW DELHI

- FORTIS MEMORIAL RESEARCH INSTITUTE, GURGAON (FMRI) IS A FLAGSHIP HOSPITAL OF THE FORTIS HEALTHCARE LIMITED.
- FMRI IS A MULTI SUPER-SPECIALITY, HOSPITAL.
- FMRI IS A SET ON AN 11 – ACRE CAMPUS.
- IT HAS 430 FUNCTIONAL BEDS, WITH A FURTHER PLANNED INCREASE IN BEDS TO 1000.
- FMRI IS ACCESSIBLE EASILY BY ROAD, IT CAN ALSO BE REACHED USING DELHI METRO, AS THE HOSPITAL IS LOCATED OPPOSITE TO THE HUDA CITY METRO STATION





Total no. of entry/exit in the site-

- OPD ENTRY- AT LOWER GROUND FLOOR
- MATERNITY ENTRY- AT UPPER GROUND FLOOR
- EMERGENCY ENTRY- AT LOWER GROUND FLOOR
- SERVICE ENTRY- AT UPPER GROUND FLOOR

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VARIOUS DEPARTMENT

- MINIMAL ACCESS, BARIATRIC & GI SURGERY
- PLASTIC SURGERY
- OPHTHALMOLOGY
- PULMONOLOGY
- PLASTIC SURGERY
- DENTAL SCIENCES
- INTERNAL MEDICINE
- COSMETIC & PLASTIC SURGERY
- INVASIVE CARDIOLOGY
- PAEDIATRICS
- MINIMAL ASSESS SURGERY (GYNAE)
- C-DOC
- NEONATOLOGY
- IVF
- LIVER TRANSPLANT, GI & HEPATO PANCREATO BILIARY SURGERY
- MENTAL HEALTH & BEHAVIOURAL SCIENCE
- RADIATION ONCOLOGY
- RADIOLOGY
- RHEUMATOLOGY
- ENT
- Gastroenterology & Hepatobiliary Sciences

AUDITORIUM

MEDITORIUM

TUMMY LUCK

A MULTI-CUISINE FOOD COURT

NO. OF BEDS- 430

GENERAL CARE BEDS: 250 ICU BEDS : 100

OPD CHAMBER- 80

A DAY CARE AND AN ACTIVITY CENTRE FOR CHILDREN.

HEALTH4U PREVENTIVE PROGRAMME WITH LIFESTYLE INTERVENTIONS INCLUDING TAILOR-MADE HEALTH SCREENINGS.

R & R LOUGE

REST OPTIONS WITH RECLINERS, PRIVATE CUBICLES, SHOWER, AND LOCKER FACILITIES FOR ATTENDANTS.

FORTIPLEX

MOVIE LOUNGE

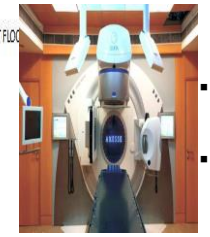
TOTAL NO. OF ENTRY/EXIT IN THE BUILDING-

- OPD ENTRY- AT LOWER GROUND FLOOR TO THE OPD
- MAIN ENTRY- AT UPPER GROUND FLOOR
- EMERGENCY ENTRY- AT LOWER GROUND FLOOR
- SERVICE ENTRY- AT UPPER GROUND FLOOR
- ONCOLOGY OPD ENTRY- AT UPPER GROUND FLOOR

BASEMENT IS USED FOR-

- THE BASEMENT IS USED FOR ENGINEERING SERVICES PLANT ROOM LIKE HVAC, LT PANEL ROOM, DG ROOM, PUMP ROOMS ETC.
- AND IT IS ALSO USED FOR RADIATION THERAPY USED IN ONCOLOGY TREATMENT.
- AND FOR PARKING AND HR DEPARTMENT AND STAFF AREAS
- SERVICE YARD
- MECHANICAL THERAPY RADIATION THERAPY LIFTS AND SERVICES
- LINAC (RADIATION THERAPY) USED FOR TREATMENT OF ONCOLOGY HAS 1 TO 1.5 METERS THICK WALL

BASEMENT PLAN



- THE MAIN AIM OF HOSPITAL IS CREATING A ENVIRONMENT NOT TO GIVE FEELING OF A BORING HOSPITAL.

TOTAL PARKING IN THE BASEMENT-

- 280 CARS PARKING
- 51 TWO WHEELER PARKING

CASE STUDY

HOSPITAL

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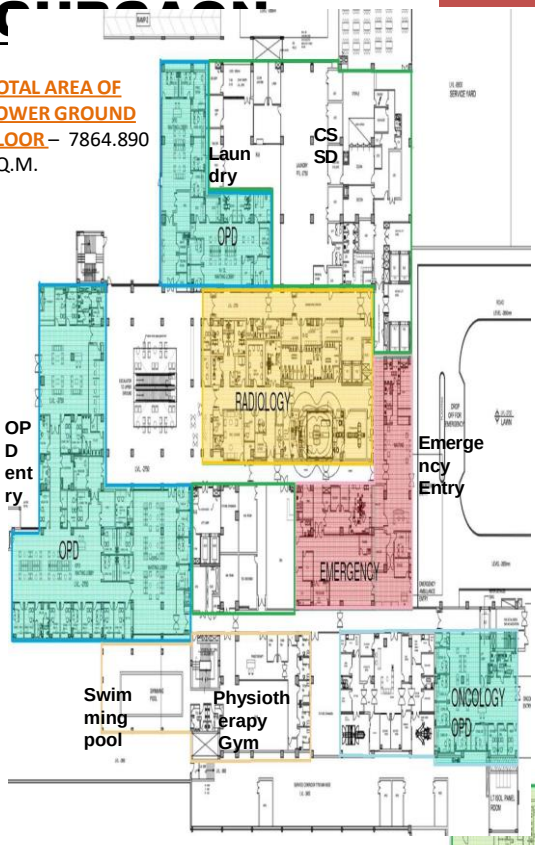
FORTIS MEMORIAL GURGAON

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

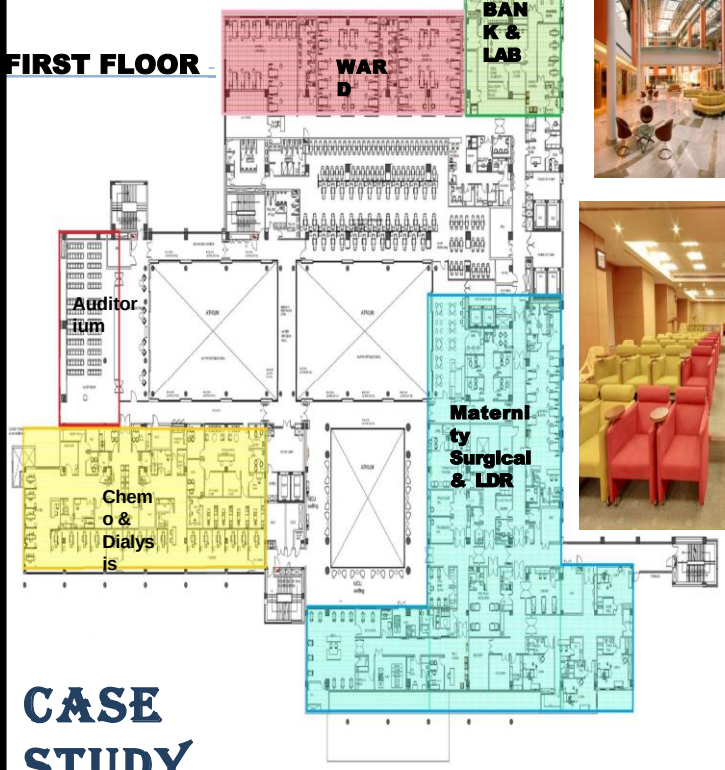
LOWER GROUND FLOOR

TOTAL AREA OF LOWER GROUND FLOOR – 7864.890 SQ.M.



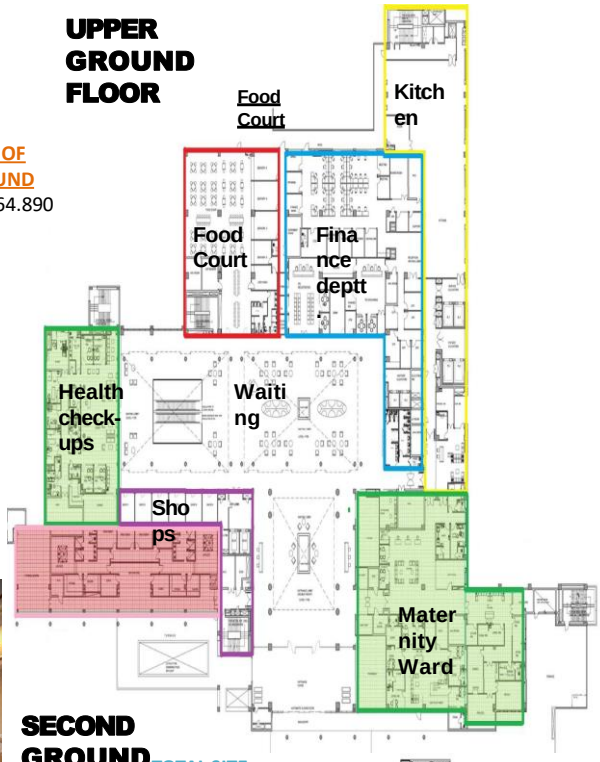
TOTAL AREA OF FIRST FLOOR – 6828.190 SQ.M.

FIRST FLOOR



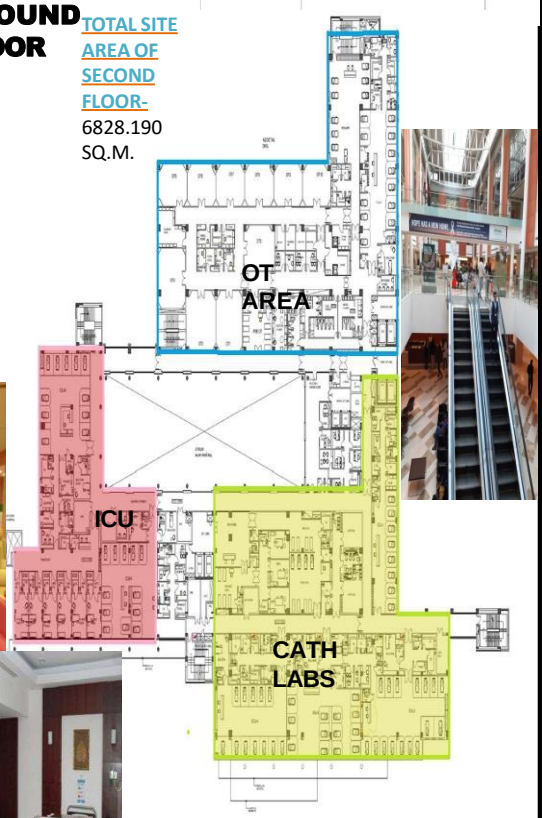
UPPER GROUND FLOOR

TOTAL AREA OF UPPER GROUND FLOOR – 7864.890 SQ.M.



SECOND GROUND FLOOR

TOTAL SITE AREA OF SECOND FLOOR- 6828.190 SQ.M.



CASE STUDY

HOSPITAL

ARCHITECTURAL THESIS 2019-20

Roll no. 1150101 004

THESIS GUIDE AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTU RE

Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

FORTIS MEMORIAL GURGAON

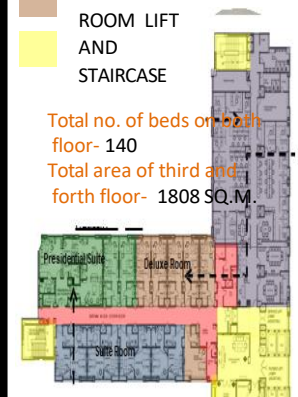
SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

Total area of third and fourth floor- 1944 SQ.M.

Total no. of beds on both floor – 140

THIRD AND FOURTH FLOOR PLAN

PRAYER ROOM



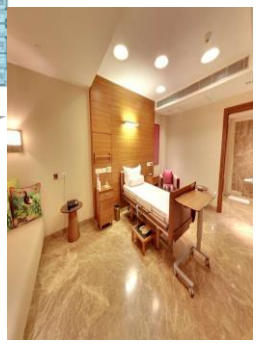
Total no. of beds on forth floor- 140

Total area of third and forth floor- 1808 SQ.M.

FIFTH FLOOR PLAN

GERNAL WARD

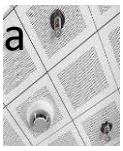
INTERNATIONAL LOUNGE



PRIVATE WARD

SECTION

SMOKE DETECTOR DETECT THE FIRE AND RAISE THE ALARM



THEN THE SPRINKLERS GET ACTIVATED HAVING ACCESS FROM OVERHEAD TANK (IF IT FAILS)

THEN THE SPRINKLERS JOCKEY PUMP GET ACTIVATED

IF IT IS NOT SUFFICIENT THEN SECOND SPRINKLERS JOCKEY PUMP STARTS

HYDRANT PUMPS GET ACTIVATED

IF IT IS NOT SUFFICIENT SECOND HYDRANT PUMP GETS ACTIVATED

IF ELECTRICITY IS SWITCHED DOWN THEN DIESEL PUMP STARTS THE HYDRANT PUMP

IF ELECTRICITY IS SWITCHED DOWN THEN DIESEL TANK STARTS THE PUMP

FCS TELLS IN WHICH ZONE FIRE IS SPREAD AND RAISE THE ALARM INSTALLED IN EVERY FLOOR

PIPELINES TO CARRY WATER DURING FIRE

EXHAUST DUCTS TO

CONTROL PANEL PUMP

VERTICAL DISTRIBUTION OF SPACES :-

- Typical Floor
- Third Floor (patient beds 67)
- Service floor
- Second floor (surgical floor 10 OT. ICU BEDS 92)
- First floor (maternity ICU 62 beds, wards, ICU relatives
- Upper ground (maternity, atrium lobby)
- Lower ground (diagnostics, OPD, ER)
- Basement (parking, plant rooms)

CASE STUDY

HOSPITAL

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BBDU SCHOOL OF ARCHITECTURE

Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

AREA/STANDARDS/INFRENCES

S.NO	SPACE Required FOR 300 BEDED	NORMS (sq.m)	Sahara Hospital (sq.m)	FORTIS MEMORIAL(sqm)
1.	Entrance Hall,Cash Counter, Record	180	230	150
2.	Officer-in-charge	18	12	30
3.	Nurse-in-charge	20	12	--
4.	Sanitory Inspector Room	16	24	14
5.	OPD Record Room	35	48	24
6.	Examination Room and Consulation	18	22	24
7.	Sub-Waiting	6	6	--
8.	Recovery Room	14	26	54
9.	Toilet cum Changing	14	10	--
10.	Clinical Laboratory	18	24	
11.	Dark Room	18	18	17.5
12.	Treatment	17.5	24	24
13.	Blood Bank	440	280	240
14.	Circulation Area	40%	40%	30%
15.	Pharmacy	190	400	240

AREA/STANDARDS/INFRENCES

S.NO.	Space Required FOR 300 BEDED	NORMS(Sqm)	Sahara Hospital (Sqm)	FORTIS MEMORIAL(sqm)
17.	ECG Room	18	30	14
18.	Fracture Prepration	17.5	17.5	17.5
19.	Dirty Wash	10.5	--	12
20.	X-Ray Room	35	30	24
21.	Injection Room	14	14	12
22.	Doctor's Lounge	30	24	20
23.	Resuscition Room	25	42	60
24.	Nurse Station+Toilet	35	42	30
25.	Instrument Sterlisation	10.5	12	12
26.	Reception,waiting, police bay ETC.	250	180	--
27.	Circulation Area	35%	30%	20%
28.	O.T	35	42	45

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

S.N0.	FACILITY	AREA
1	TOTAL SITE AREA	24050SQM
2	TOTAL BUILT UP	38045SQM
3	PERMESIBLE GROUND COVERGAGE	35%
4	G.C.A	33%
5	F.A.R	1.5
6	MAX HEIGHT	20 M
7	ROAD AREA	3094SQM
8	GREEN AREA	3854SQM
9	HOSPITAL BLOCK COVERED	5466SQM
10	HOSPITAL BLOCK BUILTUP	21524SQM
11	ADMIN BLOCK BUILT UP	728SQM
12	CANTEEN BUILT UP	2008SQM
13	BLOOD BANK BUILT UP	280 SQM
14	MORTUARY BUILTUP	230 SQM
15	SERVICE BLOCK BUILTUP	2259 SQM

AREA STATEMENT

AREA ANALYSIS

ROVISION ADMINISTRATIVE UNIT

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Medical Supdt (M.S.)room with toilet	1	35
2	Dy/ Asstt. Medical Supdt. room with toilet	1	21
3	Admin Officer	1	21
4	Waiting room	1	21
5	Library cum Conference room	1	56
6	Nursing Officer's room with toilet	1	31.5
7	Accounts Officer	1	14
8	Cashier	1	14
9	Purchase Officer	1	14
10	Clerical Staff	1	5.25/ staff
11	Reception cum Enquiries	1	28
12	Welfare/ Labour Officer	1	14
13	Stationery/Record	1	42
14	Security Officer	1	14
15	Lavatory for staff(Separate for maIe and female)	3	21

•PROVISION OF HOSPITAL STORE

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Receipt of stores (weighing, inspection)	1	28
2	Medical store	1	70
3	General store	1	56
4	Linen store	1	42
5	Furniture store	1	70
6	Surgical store	1	21
7	Equipment store	2	42
8	Areas for storage of mechanical transport spares	1	28
9	Area for storage of articles awaiting condemnation	1	17.5
10	Store office room with toilet	2	21
11	Office	1	10.5
12	Stationery store	1	10.5

•PROVISION OF TRANSPORT SERVICES

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Ambulance	6	42
2	Mortuary van	2	21
3	Tempo	4	42
4	Staff car	10	120

•PROVISION OF DIETARY UNIT

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Reception area	1	28
2	Cooking area	1	84
3	Therapeutic diet preparation and cooking area	1	21
4	Dietetion with toilet	1	14
5	Trolley loading	1	10.5
6	Walk in coId storage	1	10.5
7	Dry ration storage	1	14
8	Washing areas	1	55
9	Garbage collection area	1	14

•PROVISION OF BLOOD BANK

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Reception and waiting	1	30
2	Bleeding area	2	42
3	Donor's rest room with kitchenette	2	42
4	Laboratory & blood storage area	1	21
5	Office	1	10.5
6	Stores	1	21
7	Bottle washing area	1	10.5
8	Lavatory	1	10.5
9	Doctor's room with toilet	1	17.5

•PROVISION OF LAUNDARY UNIT

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Dirty clothes receiving and sorting area (with weighing facility)	2	42
2	Sluice and autoclaving machine area	2	56
3	Washing area	2	56
4	Hydro extractor area	2	56
5	Drying tumbler area	2	56
6	Calendaring machine Area	1	17.5
7	Tailor desk	2	21
8	Steam pressing	2	28
9	Manual press area	2	28
10	Clean clothes storage area	2	42
11	Issue area	1	17.5
12	Trolley bay	1	10.5
13	Store	2	21
14	Laundry supervisor office with toilet	1	14
15	Laundry staff room with toilet	1	21

•PROVISION OF MORTUARY

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Walk in cooler(to store)	1	21 (8 Bodies)
2	Post mortem area	1	17.5
3	Autopsy stores	1	14
4	Body wash and prayer room	1	14
5	Relative waiting area with toilet and drinking water facilities	1	35
6	Doctor's office wit toilet	1	17.5
7	Staff room with toilet	1	17.5
8	Office	1	10.5
9	Stores	1	10.5
10	Janitors closet	1	3.5
11	Trolley bay	1	10.5

•PROVISION OF PATHOLOGY DEPT.

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
1	Reception and specimen collection/ distribution	1	42
2	Patients waiting area with toilet	1	42
3	Pathologist laboratory with toilet	5	51
4	Office and record	1	14
5	Technician's room with toilet	1	14
6	Stores	3	42
7	Biochemistry	1	35
8	Microbiology with incubator	1	35
9	Media room	1	14
10	Clinical pathology and heamoto1ogy	1	28
11	Histology and cytology	1	14
12	Washing and sterilizing area	1	14
13	Janitors closet	1	3.5
14	Specimen disposal and sluice room	1	7.0

S.NO.	DEPARTMENT	TOTAL AREA (SQM.)
1	ADMIN BLOCK	394
2	HOSPITAL STORAGE	495.5
3	TRANSPORT SERVICES	225
4	DIETICIAN UNIT	287.3
5	LAUNDRY UNIT	595

•PROVISION OF O.T. DEPARTMENT

S. N0.	FACILITY	ROOM (NO)	AREA (SQ M.)
	ZONE A		
1	OT reception bay	1	14
2	Relatives waiting room (including 2 toilets of 6sqm. each)	1	24
3	Officer-in-charge of OT with toilet	1	15
4	Doctor's room change	1	17.5
5	Nurses room change	2	42
6	Technician change room	1	17.5
7	Class IV staff change room	1	14
8	Sterile storage area	2	14
9	Instrument and linen room	1	10.5
10	Trolley bay	1	10.5
11	Gas cylinder storage	1	10.5
12	Switch room	1	10.5
	ZONE B		
1	Fracture-cum Casualty theatre	1	28
2	Instrument sterilization	1	10.5
3	Scrub up	2	24
4	Dirty wash up	2	21
5	Plaster Preparation	1	10.5
6	Splint store	1	35
7	Pre-operative room with toilet	6	84
8	Recovery room	6	63
9	Nurses duty room	1	10.5
10	Theatre pack preparation room	1	17.5
11	Frozen section	1	21
12	X-ray with dark room	1	17.5
13	Pantry	1	14
	ZONE C		
1	Operation theatres (Major)	6	126
2	Operation theatres (Minor)	4	70
3	Instrument sterilization	3	10.5
4	Scrub up	3	10.5
5	Anaesthetist room	1	14
6	Anaesthetic storage	1	10.5
7	Anesthesia room	2	21
8	Doctor's work room	1	21
9	Nurses work room	1	10.5
	ZONE D		
1	Dirty utility	3	10.5
2	Janitor's closet	2	14

• PROVISION OF EMERGENCY BLOCK

S. NO.	FACILITY	ROOM (NO.)	AREA (SQ M.)
1	Drive-in Ambulance unit(Reception,waiting,Trolley bay, PA System,police control, Special Woker room	1	150
2	Doctor's Duity with Toilet	5	72
3	Doctor's Lounge with Toilet	1	21
4	Medico legal Specimen And Record room	1	10.5
5	Brought in Dead Room	1	14
6	Retiring Room for Ambulance -drivers and support staff	1	17.5
7	ECG Room	1	14
8	Treatment Room	5	35
9	Operation Theatre Unit:-		
A	Operation Theatre	2	48
B	Instrument Sterilization	1	7
C	Scrub Up	1	21
D	Dirty Utility	1	7
E	Anesthesia Room	1	10.5
10	Resusciation Room	4	120
11	X-Ray Room with Dark Room	1	28
12	Clinical Laboratory	1	17.5
14	Blood Storage Area	1	10.5
15	Drug Dispensing Facility	1	10.5
16	Stores	1	14
17	Sluice Room & Janitor Closet	1	14
18	Nurses Station with Toilet	1	17.5
19	Observation room	3	42
20	Emergency Ward (A) 6 Bedded@1 (B) 4 Bedded@2 (C) 2 Bedded@2	3	335

S.NO.	DEPARTMENT	TOTAL AREA (SQM.)
1	MORTUARY	222
2	PATHOLOGY LAB	480
3	O.T	1055
4	EMERGENCY	1330

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

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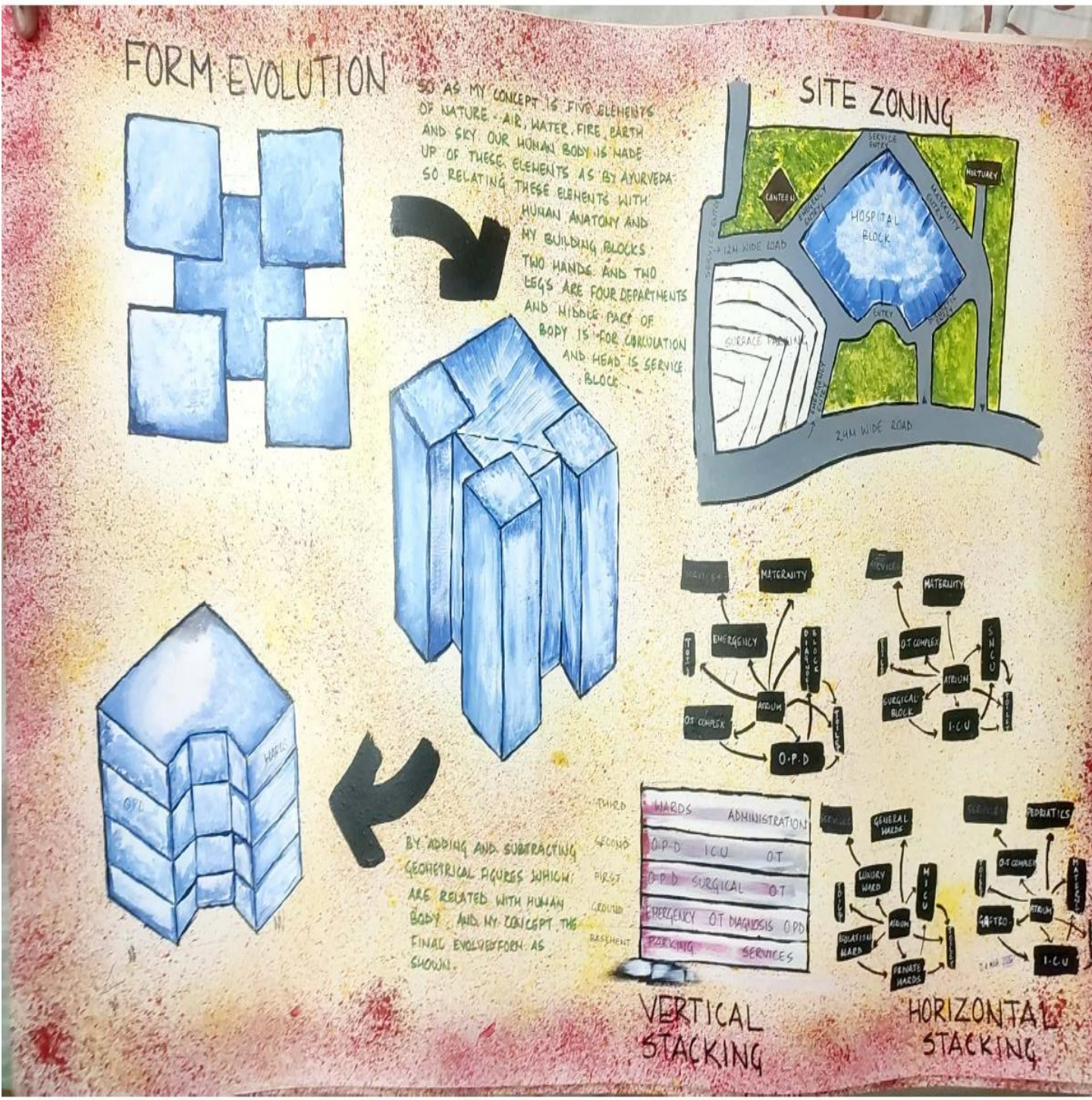
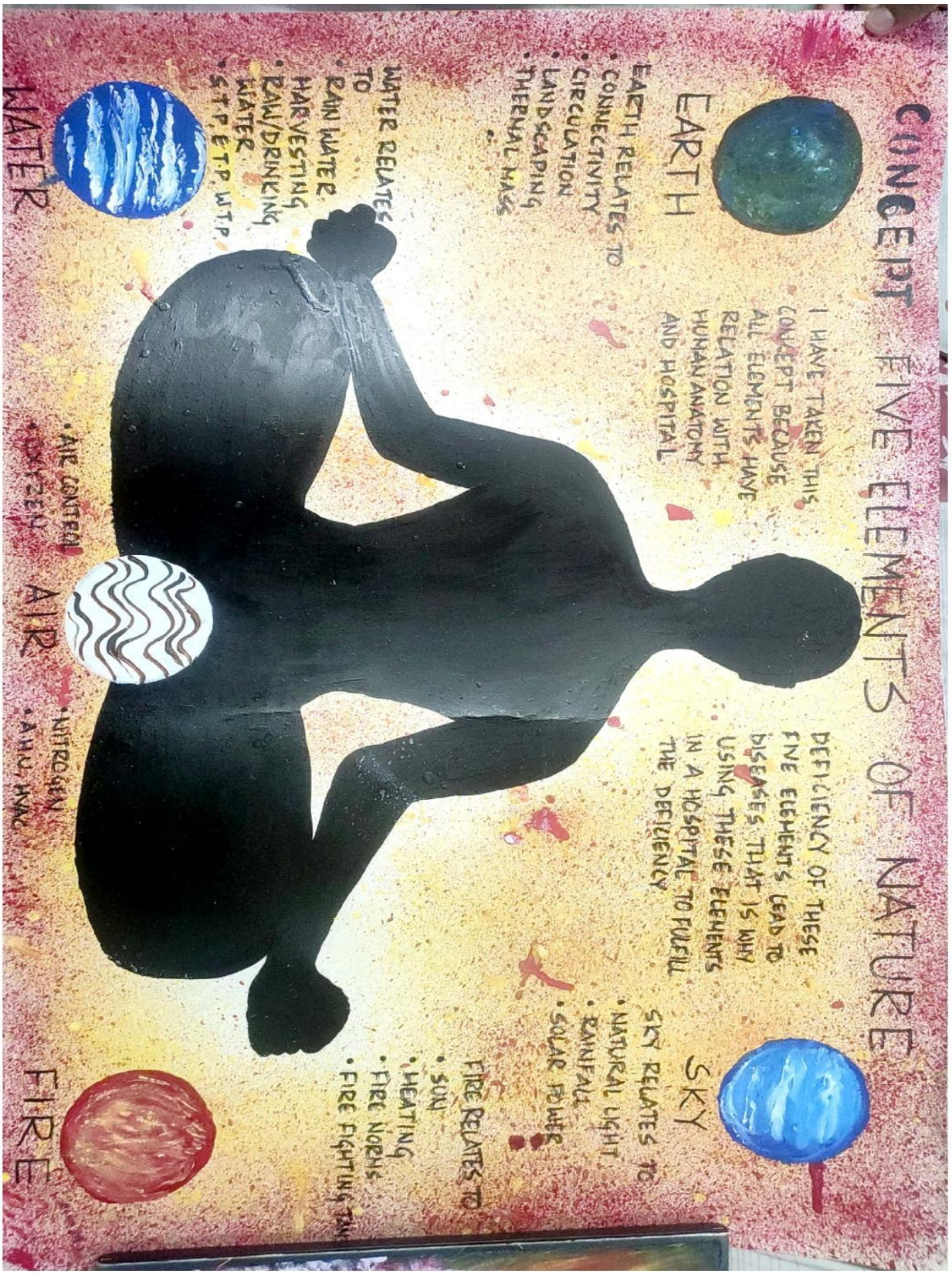
FORM EVALOUTION CONCEPT



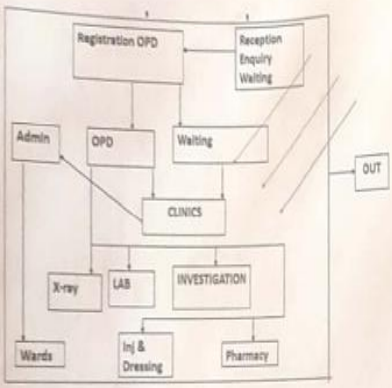
FORM EVOLUTION CONCEPT

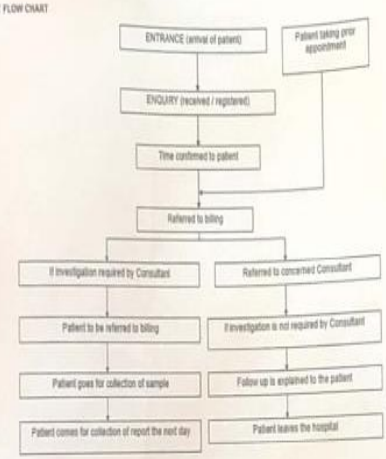


FORM EVOLUTION CONCEPT

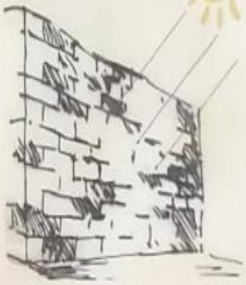
SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR

HOSPITAL FLOW CHART





THICK WALLS IN SOUTH, TO PROTECT GAIN OF HEAT.



DESIGN IMPLEMENTATION

THE IPD (INDOOR PATIENT DEPARTMENT) BLOCK IS PLACES IN THE NORTH AND EASTERN SIDE,
THIS IS DONE SO THAT PATIENT CAN BE BENEFITED FROM THE NORTH AND EASTERN RAYS OF THE SUN. THESE RAYS ARE THE CONSIDERED EFFECTIVE FOR HEALING

EMERGENCY BLOCK

IPD BLOCK

DIAGNOSTIC

EMERGENCY BLOCK WILL ALWAYS NEED ARTIFICIAL SOURCE OF ENERGY, THE PLACEMENT OF IT IS THUS DONE IN SOUTH, WHERE IT IS HARD TO CONTROL THE HEAT OF SUN.

IN DIAGNOSTIC CENTRE, PATHOLOGY WILL BE PLACED ON THE EASTERN SIDE FOR BLOOD TO BE STORED IN COOL AND DRY SPACE

THE DECIDIOUD TREES WILL PROVIDE SHADING IN SOUTH AND WEST ZONE IS SUMMER AND WILL LET HEAT COME IN WINTER

THE TERRACE GARDEN AND GREEN WALL IS PROVIDED IN THE WESTERN SIDE, SO THAT THEY CAN ACT AS AN ENVELOPE AND PROTECT THE GAIN OF HEAT FROM THE DIRECT RAYS OF WESTERN SUN. THE TERRACE GARDEN WILL ALSO ACT AS AN AESTHETIC FEATURE .

THE COURTYARDS WILL BE PROVIDED FOR PROPER VENTILATION AND LIGHTNING OF THE BUILDING

ARCHITECTURAL THESIS
2019-20

Roll no.
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THESIS GUIDE
AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTURE

Submitted by
ABHISHEK BANERJEE
B.ARCH X SEMESTER

CONCLUSION

- This study demonstrates that community hospitals form an integral component of local health-care delivery systems, providing care closer to people's homes and addressing challenges arising from service fragmentation. They have the potential to assume a more strategic role as hubs for care integration locally, although this will depend on the specific context within which they are implemented. This multimethod study comprised, first, a synthesis of the literature on models of community hospitals in the COUNTRIES and other high-income countries and an assessment of the evidence of their effectiveness, and, second, a detailed assessment of experiences in five high-income countries and case studies of individual community hospitals in three countries to understand better the roles, functions and contributions of community hospitals in different health system governance and service delivery contexts. We summarise the findings below and suggest options for their future role in the context of the changing policy environment of the NHS .
-

THANK YOU

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

A HOSPITAL IS A HEALTH CARE INSTITUTION PROVIDING PATIENT TREATMENT BY SPECIALIZED STAFF AND EQUIPMENT. HOSPITALS ARE USUALLY FUNDED BY THE PUBLIC SECTOR, HEALTH ORGANISATIONS (FOR PROFIT OR NON-PROFIT), HEALTH INSURANCE COMPANIES, CHARITIES, INCLUDING DIRECT CHARITABLE DONATIONS. HISTORICALLY , HOSPITALS WERE OFTEN FOUNDED AND FUNDED BY RELIGIOUS ORDERS OR CHARITABLE INDIVIDUALS AND LEADERS. TODAY , HOSPITALS ARE LARGELY STAFFED BY PROFESSIONAL PHYSICIANS, SURGEONS AND NURSES, WHERE IN PAST , THIS WORK WAS USUALLY PERFORMED BY THE FOUNDING RELIGIOUS ORDERS OR BY VOLUNTEERS.

CLASSIFICATIONS ON DIFFERENT BASIS

Basing on Objective

a. General hospitals
b. Special hospitals
c. Teaching cum Research Hospital

Basing on Administration, ownership, control or financial income

a. Governmental or public
b. Non-governmental or private
c. Semi Govt Hospital
d. Voluntary Agency Hospitals

Basing on bed capacity (Size)

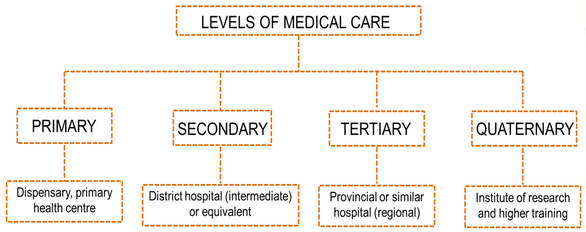
a. Small hospital (Up to 100 beds)
b. Medium hospital (More than 100 to less than 300 beds)
c. Large hospital (More than 300 beds)

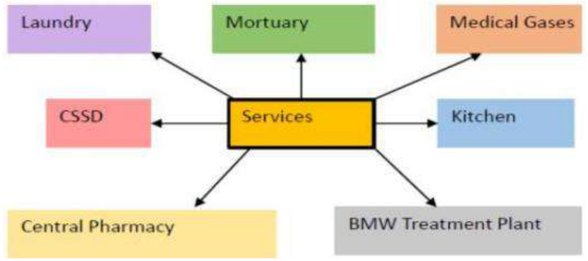
Basing on type of care:

a. Primary Care
b. Secondary Care
c. Tertiary Care

As per WHO Classification:

a. Regional Hospital
b. Intermediate/ District Hospital
c. Rural Hospital





FLOW CHART OF SERVICES

OUT PATIENT SERVICES

THIS AREA SHALL BE DESIGNED KEEPING IN VIEW FUNCTIONAL REQUIREMENT AND ADJUSTING THE SAME IN PHYSICAL FACILITY AND SPACE PROVIDE GENERAL FACILITIES CLINIC OF DIFFERENT MEDICAL FACILITIES INCLUDING ROOM LAYOUT AND REGISTRATION FACILITIES

MULTI-SPECIALITY HOSPITAL

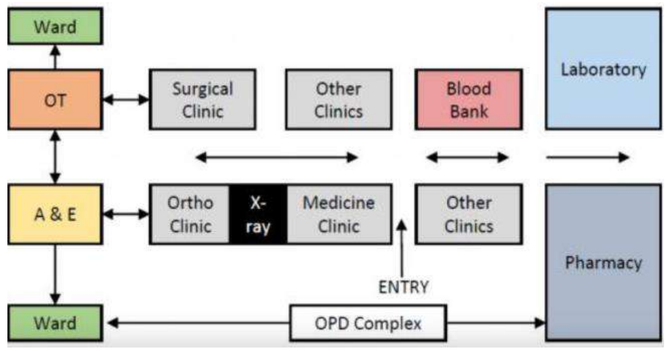
A MULTI-SPECIALITY HOSPITAL MUST HAVE MORE THAN ONE SPECIALITY BUT THEY CAN BE THE BOARD SPECIALITIES LIKE MEDICINE, SURGERY, PEDIATRICS, ETC. THEY OFFER SPECIALIZED SERVICES TO THEIR PATIENTS

BIS standards for illumination are

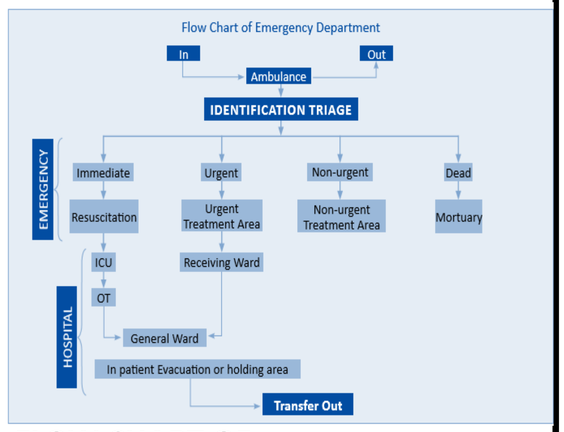
Sl. No.	Department	Illumination (lux)
1	Reception and waiting room	150
2	Wards	
2a	General	100
2b	Beds	150
3	Operation Theatre	
3a	General	300
3b	Tables	Special Lighting
4	Laboratories	300
5	Radiology	100
6	Casualty and Outpatient Departments	150
7	Stairs and corridor	100
8	Dispensaries	300

Requirements of Operation Theatre

Sl. No.	Item	District Headquarters Hospital		
		101-200 Bedded	201-300 Bedded	301-500 Bedded
1	Elective OT-Major	1	2	3
2	Emergency OT/FW OT	1	1	1
3	Ophthalmology/ENT OT	1	1	1



FLOW CHART OF HOSPITAL



FLOW CHART OF EMERGENCY

HOSPITAL

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Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

- **LOCATION**
- KABIR BAGH, SHIVPUR ROAD NEAR KASHI, GOMTI BANK,
- SHIVPUR, VARANASI.

BYE LAWS

- APPROACH
- THERE IS A SINGLE ENTRY TO THE SITE WHICH IS 16M WIDE FROM THE SHIVPUR ROAD ON THE NORTH SIDE WHICH MEETS THE NH-56 TOWARDS THE EAST.
- SITE DETAILS
- THE SITE OF THE PROJECT IS 5.2 ACRES (226512 SQ.FT/ 21043.7 SQ.MT) IN SIZE, WITH THE GROUND COVERAGE OF 35% AND FAR TO BE 1.50 FOR UNDEVELOPED AREAS.
- CAPACITY
- ACCORDING TO THE PROJECT, A TOTAL OF 300 BED MULTI SPECIALTY HOSPITAL IS PROPOSED TO SERVE THE AREA.
- THE SIDE IS 3KM AWAY FROM RAILWAY STATION AND 3.5 KM AWAY FROM BUS STOP.
- VARANASI IS MAINLY FAMOUS FOR ITS CULTURAL FESTIVE EVENTS LIKE GANGA MOHOTSAV, SUR GANGA
- DHRUPAD MELA , BUDDHA POORNIMA, RAMLEELA RAMNAGAR, GANGA DUSHEHRA.
- VARANASI HOLDS SECOND PLACE IN UP GROWTH TRENDS OF TOURISTS

SITE TOPOGRAPHY

THE TOPOGRAPHY OF THE ZONE DEPICTS GENTLE SLOPE FROM THE NORTH TO SOUTH PLAIN BARREN SITE WITH UNEVEN SURFACES. MAINLY COMPRISES OF PEBBLES AND SMALL STONES. AT THE SAME LEVEL AS THE ROAD LEVEL .

SOIL BEARING CAPICITY

SOIL BEARING CAPACITY SURVEYS WERE CONDUCTED IN ORDER TO DETERMINE THE GEOLOGY AND THE SOIL BEARING CAPACITY, WATER QUALITY
AND CHARACTERISTICS OF THE GROUND WATER FOR THE PURPOSE OF DEVELOPING A BUILDING DESIGN INCLUDING A STRUCTURAL DESIGN AND CONTRUCTION PLAN INVESTIGATION WERE CONDUCTED AT 6 POINT, EACH BEING 30.00M DEEP AND SAMPLES WERE COLLECTED FROM THEREIN AT REGULAR INTERVALS OF 1.00M.THIS INVESTIGATION INCLUDED THE STANDARD PENETRATION TEST (SPT)

SOIL CONDITION

- **SETBACK**
- **FRONT - 10 M**
- **REAR – 10 M**
- **G.C. – 40%**
- **FAR- 2.0**
- **HEIGHT -23.7 M**
- **ECS-1.5**

THE CURRENT CONDITION OF THE SITE AND ITS SURROUNDINGS

THE CURRENT LAND IS AGGRICULTURE LANDS , LOTS OF TREES IN SITE THERE IS NO SEWAGE OR DRAINAGE PROPERLY , THERE IS TRANSFERMER, AND WATER TANK NEAR BY , NO CONTOURS

ACCESS TO SITE

BUS STAND IS 6.8 KM 18 MINS FROM SITE

VARANASI AIRPORT IS 16 KM 24 MIN FROM THE SITE

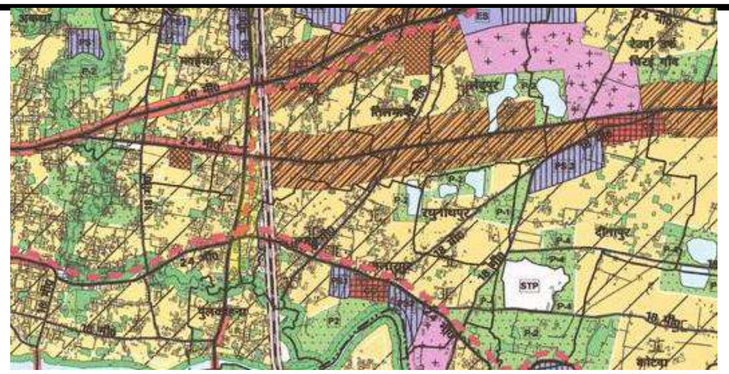
VARANASI CANT RAILWAY STATION IS 7 KM SITE 22 MINS FROM SITE

SITE ANALYSIS

HOSPITAL

ARCHITECTURAL THESIS 2019-20	Roll no. 1150101004	THESIS GUIDE AR.MOHIT SACHAN	BBDU SCHOOL OF ARCHITECTURE	Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI



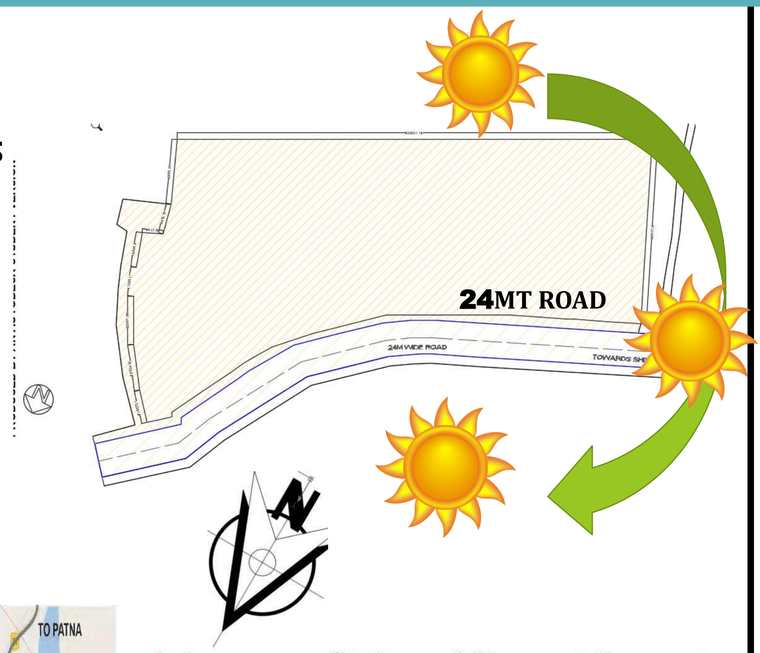
MASTER PLAN

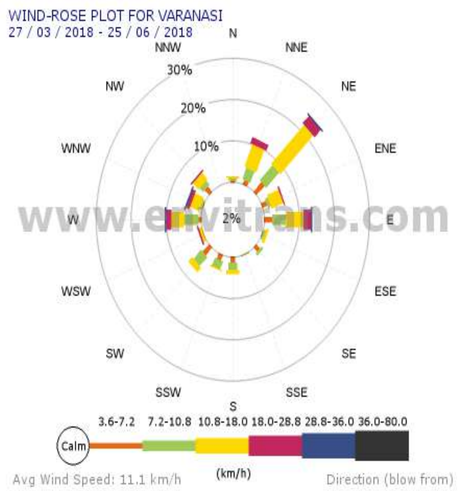
LAND USE – AGGRICULTURE LAND

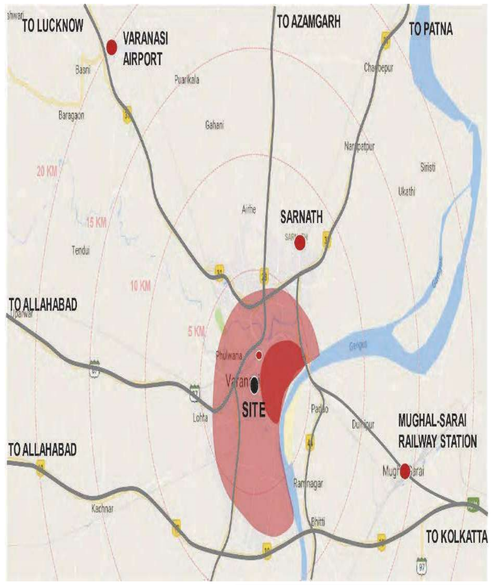
	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	16.5	19.4	25.4	30.6	34.3	33.8	30	29.2	29.1	26.7	21.1	17.1
Min. Temperature (°C)	9.6	12.1	17.3	22.5	27.1	28.4	26.6	26.1	25.5	20.8	13.5	9.8
Max. Temperature (°C)	23.5	26.7	33.5	38.7	41.6	39.2	33.5	32.3	32.7	32.6	28.7	24.5
Avg. Temperature (°F)	61.7	66.9	77.7	87.1	93.7	92.8	86.0	84.6	84.4	80.1	70.0	62.8
Min. Temperature (°F)	49.3	53.8	63.1	72.5	80.8	83.1	79.9	79.0	77.9	69.4	56.3	49.6
Max. Temperature (°F)	74.3	80.1	92.3	101.7	106.9	102.6	92.3	90.1	90.9	90.7	83.7	76.1
Precipitation / Rainfall (mm)	22	9	11	3	10	96	299	290	208	37	8	5

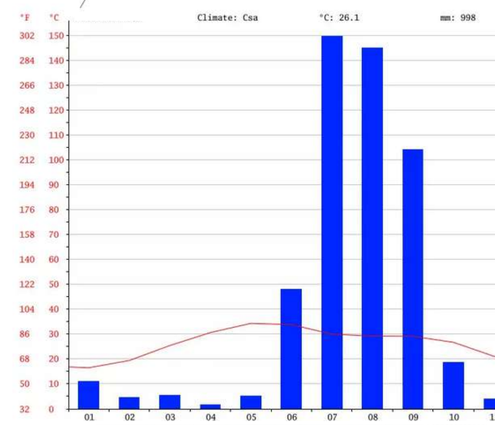
CLIMATOLOGY

VARANASI CITY, WHERE THE PROJECT SITE IS LOCATED, OUT SIDE THE MAIN VARANASI DISTRICT IN UTTAR PRADESH STATE AND IS LOCATED ON THE BANK OF THE GANGA RIVER . SINCE INDIA IS A HUGE COUNTRY, THE CLIMATE IS VERY DIFFERENT IN EACH AREA . THE NORTH INDIA DISTRICT, INCLUDING VARANASI CITY , BELONGS IN THE TEMPERATE CLIMATE ZONE AND HAS THREE SEASONS WHICH ARE CLASSIFIED AS THE HOT SEASON: APRIL TO JUNE ,WET SEASON: JULY TO SEPTEMBER AND DRY SEASON: OCTOBER TO MARCH.









CLIMATE

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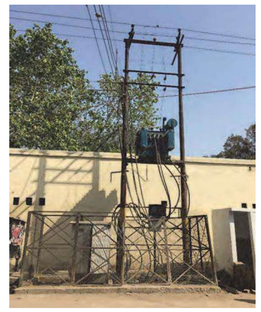
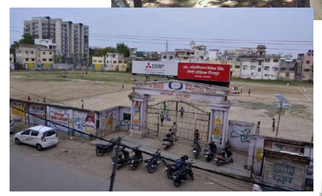




HOSPITAL

ARCHITECTURAL THESIS
2019-20

Roll no.
1150101004

THESIS GUIDE
AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTURE

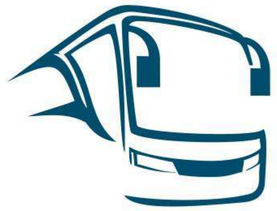
Submitted by
ABHISHEK BANERJEE
B.ARCH X SEMESTER

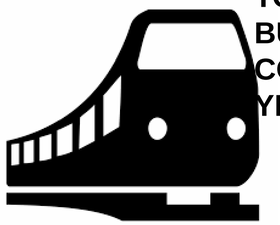
SAHARA HOSPITAL LUCKNOW

HOW TO REACH

- LOCATION :**GOMTI NAGAR, LUCKNOW**
- SURROUNDING :COMMERCIAL,RESIDENTIAL
- ROAD: **24MTS. WIDE ROAD** FROM **TWOSIDES**

1. BUS STOP : HEINEMANN CHAURAHA 850 MTS.
2. CHARBAGH BUS STATION: **12.6 KM** TAKES**40 MINUTES**,BUSES AVAILABLE EVERY 15 MINUTES
3. AIRPORT :**23.7KM** TAKES **1HOUR 39MINUTES** FROM HEINEMANN
4. RAILWAY STATION **: 12.5 KM** AWAY FROM HEINEMANN TAKES **55 MINUTES** FROM **BUS VIA ROUTE NO. 45** AND IT TAKES **25 MINUTES FROMCAR**





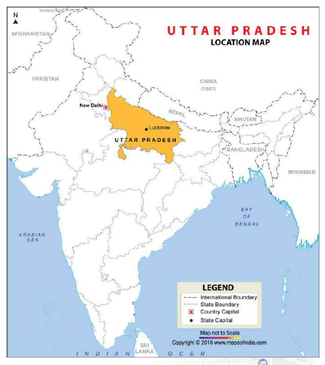
• MAIN ACCESS IS FROM

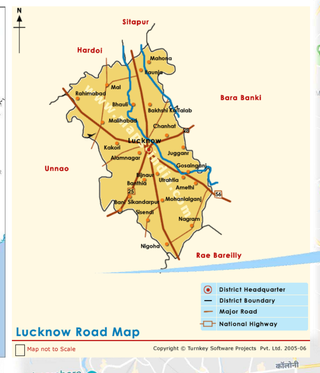
24 MTS WIDE ROADS FROM TWO SIDES.

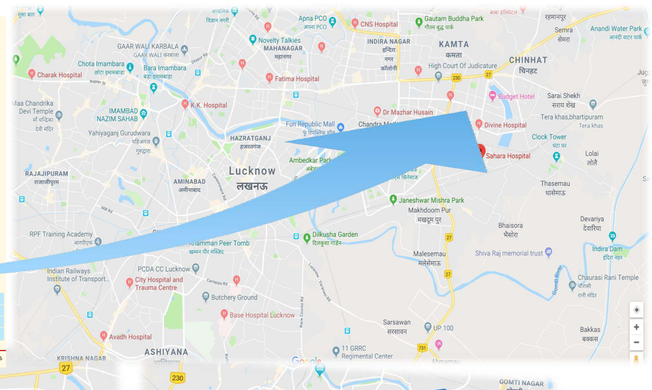
•ACROSS THE ROAD ISTHE GOMTI NAGAR COMMERCIAL AREA EMBARKED WITH NUMBER OFSMALL MALLS IN THE AREA. OTHER VICINITY IS FLOODED BY RESIDENTIAL SECTOR.

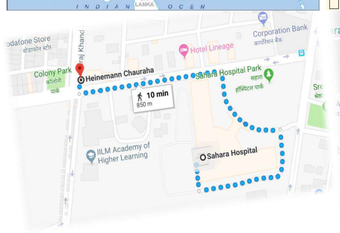
•**TWO ENTRY FROM MAIN ROAD** WHICH SERVES THE **SERVI BLOCK AND OPD**, WILL SERVE GENERAL PUBLIC AND DOCTORS.

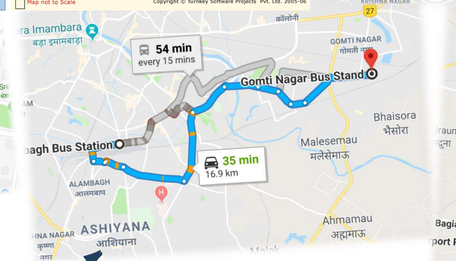
• OTHER **SEPARATE ENTRY FOREMERGENCY AREA.**

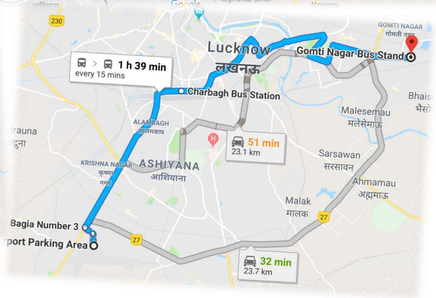












CASE STUDY

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

SAHARA HOSPITAL

A Centre for Tertiary Care

IN TECHNICAL COLLABORATION WITH APOLLO HOSPITALS.

GOMTI NAGAR , LUCKNOW

LOCATION : GOMTI NAGAR, LUCKNOW

CLIENT : SAHARA INDIA PARIVAR, IN TECHNICAL COLLABORATION WITH APOLLO HOSPITALS

DESIGN TEAM :M/S ARCHITECT HAFEEZ CONTRACTOR (DESIGN AND CONCEPT),

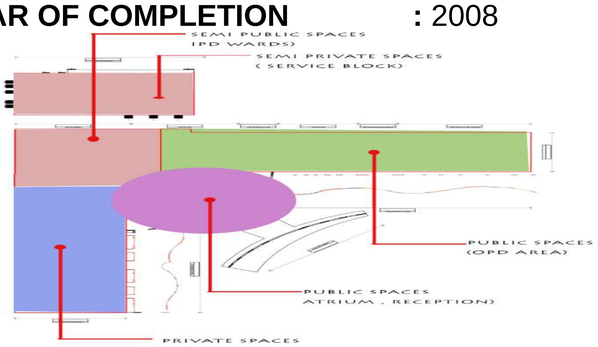
M/S ARCHIMEDES CONSULTANTS (PRESENT)

TOTAL SITE : 27 ACRES

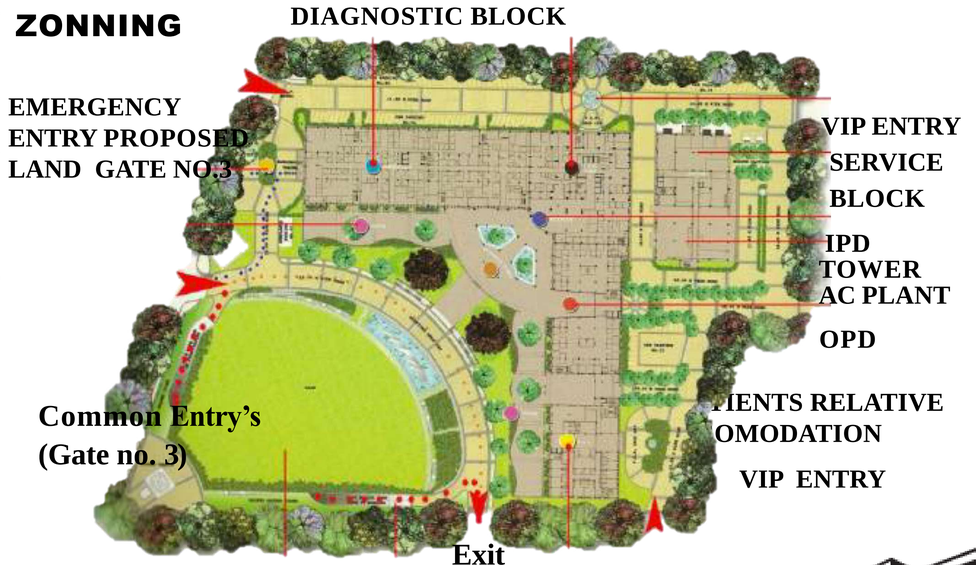
BUILT UP AREA : 74,000 SQ M (APPROX)

COST : RS 400 CRORES (APPROX.)

YEAR OF COMPLETION : 2008



ZONNING



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HOSPITAL

SAHARA HOSPITAL LUCKNOW

GENERAL FEATURES OF BUILDING:

A HOSPITAL WITH 350 BEDS EXPANDABLE TO 500 BEDS. STATE-OF-THE-ART, MULTI-SPECIALTY, TERTIARY CARE. HOSPITAL PROVIDING 7-STAR FACILITIES HOSPITAL IS BROKEN INTO TWO BLOCKS OF DIFFERENT HEIGHTS CONNECTED BY AN ATRIUM. ESTIMATED TO CARE FOR THE NEEDS OF ALMOST 3 LAKH PEOPLE WITH ITS OUTPATIENT DEPARTMENT

DESIGN CONSIDERATIONS

•THE "L' SHAPED 4-FLOOR HIGH BLOCK HOUSES THE DIAGNOSTICS ZONE IN ONE ARM AND AN OUTPATIENT SECTION IN ANOTHER.

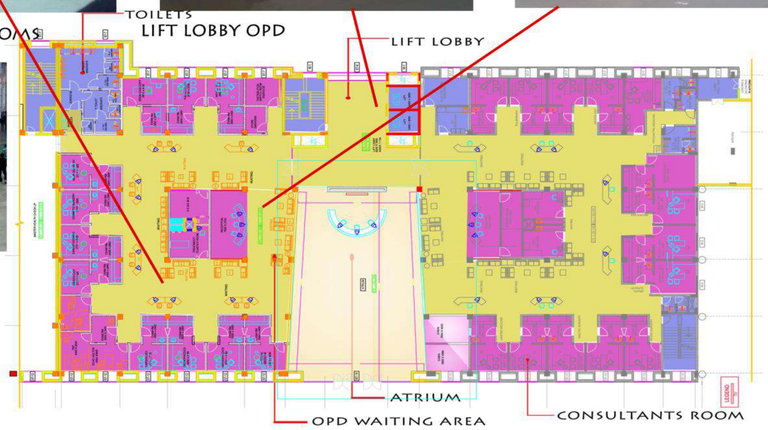
•THE 13-STOREY HIGH IN PATIENT TOWER RISES FROM THE CENTRE AND IS FRONTED BY A DOUBLE VOLUME ENTRANCE LOBBY, WHICH FUNCTIONS AS A COMMON FOYER TO ALL THE ZONES.

•TWO ORGANICALLY SHAPED DOUBLE HEIGHT ATRIUMS WAITING AREAS EMERGE FROM THIS CENTRAL FOYER.

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI`

UNIQUE FEATURES OF THE HOSPITAL:

- A HYPERBARIC OXYGEN THERAPY CENTRE WHICH IS A SPECIALISED
- CENTRE TO TREAT DISEASES CAUSED BY ISCHEMIA (OXYGEN DEPLETION IN TISSUES).
- SAHARA HOSPITAL WILL HAVE THE MOST MODERN DELIVERY SYSTEM –
- "PNEUMATIC TUBE" TO ACHIEVE EFFICIENT & SAFE TRANSPORTATION OF
- DRUGS, PATHOLOGICAL SAMPLES.



DE-MERITS ACCORDIND TO IPHS

- RAMP IS ACCESS TO ONLY 1ST FLOOR
- THERE IS NO ADEQUATE SPACE FOR LOBBY,ATLEAST 3M
- LIFT ARE NOT PROPERLY STARTED
- FROM 2ND FLOOR IT IS EASILY ACCESS TO **MEZZANINE FLOOR**
- **ABOVE 7 FLOOR ALL FLOORS ARE NOT WORKING PROPERLY**
- **THERE IS NOT SEPARATE GATE FOR PEDISTRIAL AND AMBULANCE**
- **NOT ADEQUATE PARKING SPACE FOR VISITORS AND STAFF**
- **AND SINAGES ARE ALSO NOT PROPERLY USED**
- **NOT PROPER STREET LIGHT IN NIGHT**

O.P.D. BLOCK:-

- FRONT BLOCK OF FOUR STOREY'S HOUSES OPD
- SIMPLE IN BOTH PLANNING AND SERVICES THAN I.P.D. OR DIAGNOSTIC BLOCK.
- MAIN ENTRY FROM PARKING AREA.
- ENTRY IS TAKEN FROM THE MIDDLE, CREATING A RECEPTION THERE AND THEN FORMING TWO WINGS.
- CONSIST OFDIFFERENT DEPARTMENTS WHICH ARE DISTRIBUTED ON FOUR FLOORS.
- IN EACH O.P.D., ROOMS ARE ARRANGED ALONG THE PERIPHERY WITH TOILETS AT THE CORNER AND WAITING AND RECEPTION IN THE MIDDLE.
- SUFFICIENT LIGHT IN THE CONSULTING CHAMBER

CASE STUDY

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HOSPITAL

SAHARA HOSPITAL LUCKNOW

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

DIAGNOSTICS BLOCK:-

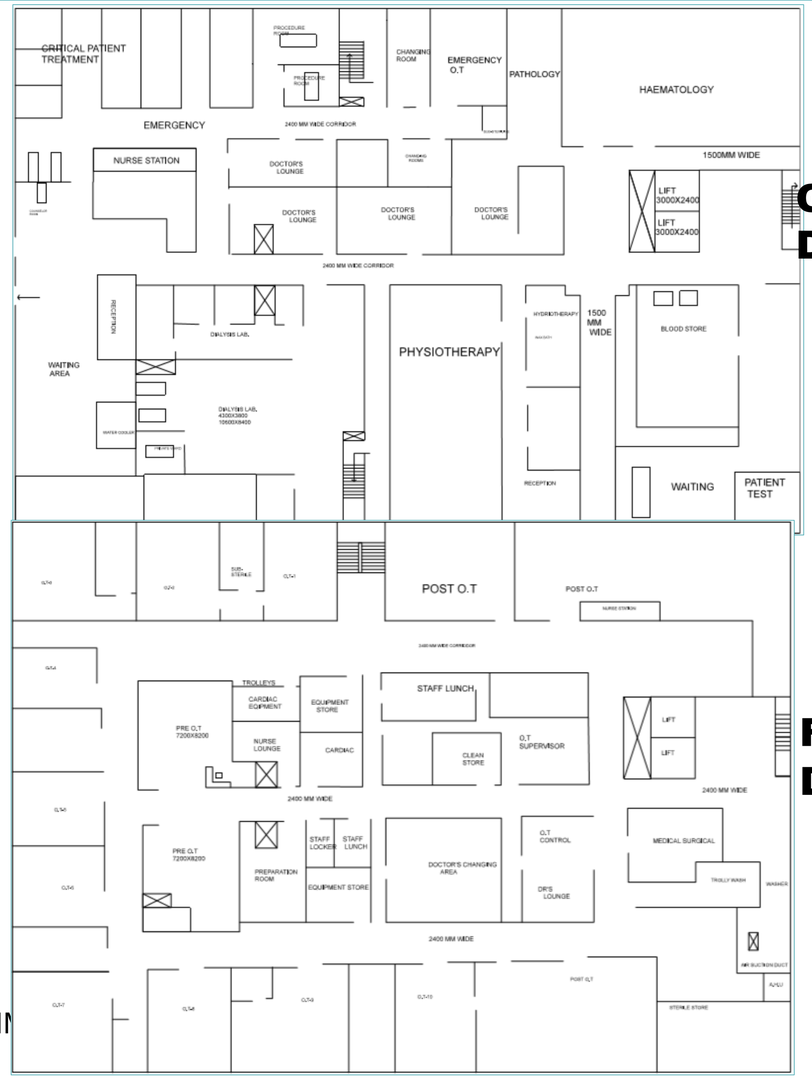
TWO ENTRIES, ONE FROM WING PERPENDICULAR TO OPD WING.
MULTIPLE ENTRANCES OF ALL DIAGNOSTICS AREAS.
LINEAR BLOCK CONSISTS OF THREE MAJOR ZONES ON GROUND FLOOR-
EMERGENCY- O.T., TRIAGE ROOM, PLASTER AND CONSULTANT'S ROOM.
DIAGNOSIS- RADIOLOGY, C.T. SCAN, PATHOLOGY LABS, ETC. AND ADMINISTRATION AREA
C) IPD TOWER .
D) SERVICES BLOCK
MINOR OT IS PROVIDED IN THIS AREA.
ALL THREE ARE APPROACHABLE BY DIFFERENT ENTRIES.
INTER CONNECTED TO EACH OTHER BY 2.4 M WIDE DOUBLY LOADED CENTRAL CORRIDOR.
ALL FUNCTIONS ARRANGED AROUND ONE SINGLE SPINE WHICH REDUCED THE CIRCULATION AREA.
PROPER WAITING IN ALL FACILITIES.
LIFTS ARE PROVIDED AT THE MIDDLE AND END OF THE CORRIDOR.
10 O.T.'S AND I.C.U.'S ARE PLACED ON FIRST FLOOR.

EMERGENCY

- SEPARATE ENTRY FROM MAIN ROAD AND FROM OUTSIDE FROM ROAD WE CANNOT SEE EMERGENCY
- EMERGENCY 12 BEDS , 3 TRIAG BEDS , EMERGENCY OT , NURSING SUPRETENDENT , BED PEN WASH ,PLASTER ROOM ,LINEN ROOM , UTILITY ROOM , DIRTY UTILITY ROOM , PATIENT WASH ROOM , BED PEN WASHROOM , NEUMATIC TOOL SYSTEM ,DUCT AS
- EMERGENCY IS AS PER IPHS STANDARDS

BLOOD BANK

- ACCESSIBLE FROM MAIN ATRIUM AND EMERGENCY.
- CONSIST OF COUNSILING ROOM,DONOR REGISTRATION,DONOR SCREENING,REFRESHM ROOM,MEDICAL EXAMNINATION,PLATELETE COLLECTION,RECEPTION,UTILITY ROOM
- BLOOD BANK AS PER IPHS NORMS



G.F PLAN DIAGONOSTIC

F.F PLAN DIAGONOSTIC

DIAGNOSTIC FACILITIES AS PER IPHS

Blood bank , Radiology, C.T. scan, M.R.I. ,Ultrasound ,Pathology labs
Administration area.
Approachable from inside atrium for I.P.D.
And O.P.D. patients and for staff from Outside.
Adequate waiting space in diagnosis.

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HOSPITAL

SAHARA HOSPITAL LUCKNOW

GENERAL RADIOLOGY

ACCESSIBLE FROM MAIN ATRIUM AND DIAGNOSTICS SPINE.
CONSIST OF TWO X-RAY ROOMS, CONSOLE PANEL, DARK ROOM AND CHANGING ROOM.
FOR SAVING FROM RADIATIONS THE LEAD SHEETS EMBEDDED IN CONCRETE WALLS.
SEPARATE WAITING AND A RECEPTION WITH TOILET FACILITIES.

C.T. SCAN & M.R.I.

SITUATED IN FRONT OF RADIOLOGY.
CONSIST OF BASIN, GANTRY ROOM, TECHNICIAN ROOM, CONSOLE PANEL, PROCESSING AREA AND REPORT AREA.
SAFETY LEAD SHEETS ARE FITTED INTO THE DOOR.
SHARES COMMON WAITING AND RECEPTION.

MATERNITY AND NEO-NATAL I.C.U.

LOCATED ON THE FIRST FLOOR OF THE TOWER BLOCK .
CONSIST OF 2 LABOUR ROOM, O.T. AND ANCILLARY FACILITIES WHICH ARE CENTERALLY LOCATED.
NEONATAL I.C.U IS 20 BEDDED EQUIPPED WITH ALL THE LATEST FACILITIES AND MOTHER FEEDING ROOM IN THE RIGHT AND INCUBATORS.

O.T. COMPLEX

PLACED AT THE ENDS OF FIRST FLOOR.
CAREFULLY PLACED WITH THE DIAGNOSTIC FACILITY JUST BELOW.
I.C.U.'S ARE ADJACENT TO THE COMPLEX.
SEPARATE ENTRIES FOR PATIENT, I.C.U. AND DOCTORS ARE PROVIDED.
A BIT FAR FROM ELEVATORS.ISOLATED FROM THE REST OF THE HOSPITAL.
CONNECTED WITH EMERGENCY AND CASUALTY DEPARTMENT BY
ELEVATORS, PLACED JUST UPON IT.
10 O.T.'S ARE DIVIDED IN DIFFERENT DEPARTMENTS.
SHARES COMMON FACILITIES LIKE WASH AREA, SCRUB AREA, STORE ETC.

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

INTENSIVE CARE UNIT

120 BEDDED CRITICAL CARE INFRASTRUCTURE
PLACED ON FIRST FLOOR WITH O.T. BLOCKS.
ALL THE I.C.U.'S ARE PLACED ALONG THE DOUBLY LOADED CENTRAL SPINE CORRIDOR.
CONSISTS OF
11 BEDDED MEDICAL I.C.U.
12 BEDDED SURGICAL I.C.U.
12 BEDDED NEURO I.C.U.
4 BEDDED TRANSPLANT I.C.U.
CORONARY I.C.U.
ATTACHED TO CATH LABS.
.TOILETS ARE ATTACHED WITH THE I.C.U.'S.

PATIENT LIFT IN OPD

LOBBY NEAR LIFT

Recommended Allocation of Bed Strength

Sl. No.	Item	Type	District Headquarters Hospital		
			101-200 Bedded	201-300 Bedded	500 Bedded
1	General Medicine	Beds (M + F)	15 + 15	25 + 25	40 + 40
2	Newborn ward	Beds	5	5	10
3	Mothers room with dining and toilets	Beds	5	5	10
4	Paediatrics ward	Beds	10	20	40
5	Critical care ward – IMCU	Beds	5	10	10
6	Isolation Ward	Beds	4	5	5
7	Dialysis unit (as per specifications)	Beds		3	3
8	Thoracic medicine ward with room for pulmonary function test	Beds (M + F)		5 + 5	10 + 10
9	Blood bank		Yes	Yes	Yes
10	General surgery ward (incl. Urology, ENT)	Beds (M + F)	15 + 15	25 + 20	35 + 35
11	Post – Operative Ward	Beds (M + F)	10 + 16*	10 + 10	15 + 15
12	Accident and Trauma ward	Beds	10	10	15
13	Labour room	Boards	3	8	8
14	Labour room (Eclampsia)	Beds		3	3
15	Septic Labour room	Boards		2	2
16	Ante-natal ward	Beds	15	15	30
17	Post-natal ward	Beds	15	15	30
18	Postpartum ward	Beds	20	30	50
19	Post operative ward	Beds		20	40
20	Ophthalmology ward	Beds	5	10	20
21	Burns Ward	Beds	-	5	10

CASE STUDY

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HIGH DEPENDENCY

8 BEDDED HIGH DEPENDENCY WARD WITH ATTACHED TOILETS, SINK,

SEMI-PRIVATE WARD

ROOM WITH TWO BEDS, ATTACHED TOILETS, BALCONY AND CURTAIN FOR PRIVACY.
EQUIPPED WITH ALL FACILITIES ON FIFTH AND SIXTH FLOOR.

DOCTORS & NURSES ACCOMMODATION

Doctors and nurses accommodation is provided on the top floor

SIX BEDDED WARD

PLACED IN TOWER BLOCK ON TWO FLOORS
UNITS ARE INTERCONNECTED WITH TOILETS AT THEIR END.
FOR PRIVACY, CURTAINS ARE USED.

DELUXE ROOM

SINGLE DELUXE, DELUXE AND DELUXE SUITS ARE LOCATED ON THE
PERIPHERY
WITH ANCILLARY SERVICES IN THE CENTRAL CORE.
ROOM WITH ATTACHED TOILET, BALCONY AND FOLDABLE SOFA CUM BED

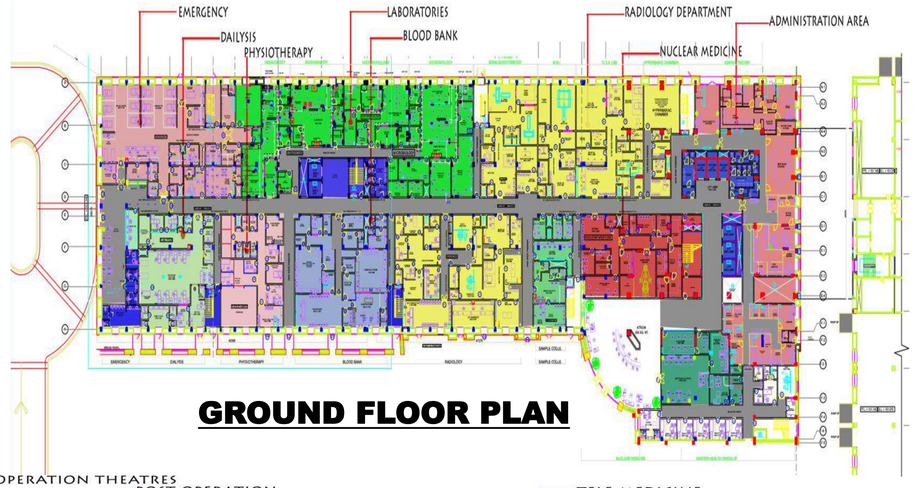
PATIENTS RELATIVES ACCOMMODATION (PRA):-

PRA IS GIVEN IN HOSPITAL TO FACILITATE THE RELATIVES OF THE PATIENTS.

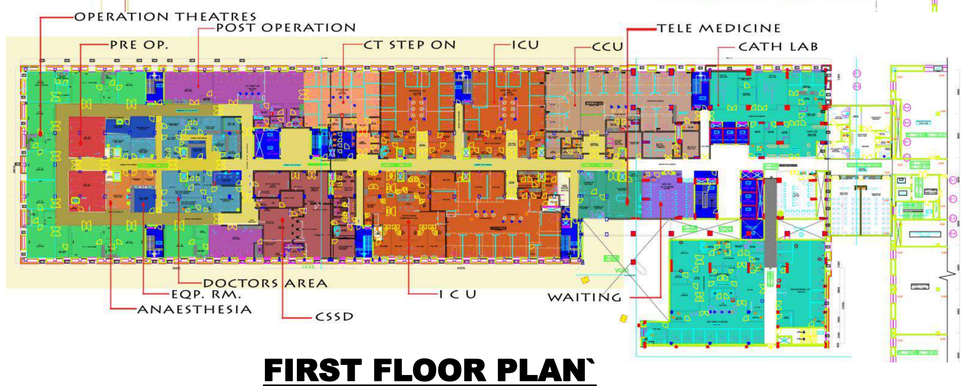
PRIVATE ROOM

CONSIST OF A PATIENT ROOM WITH ATTACHED TOILET AND PANTRY.

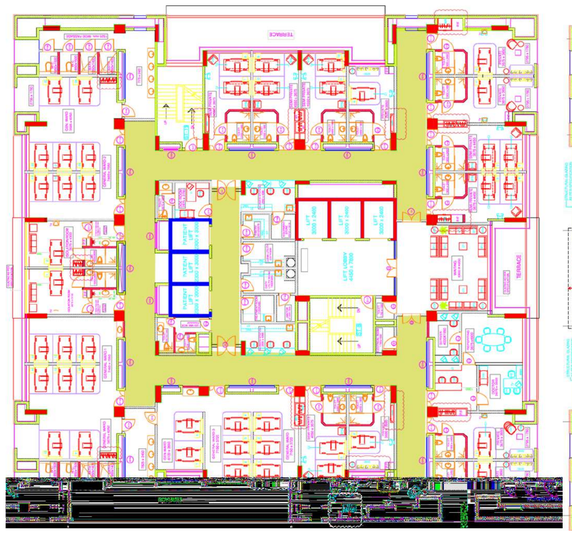
SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI



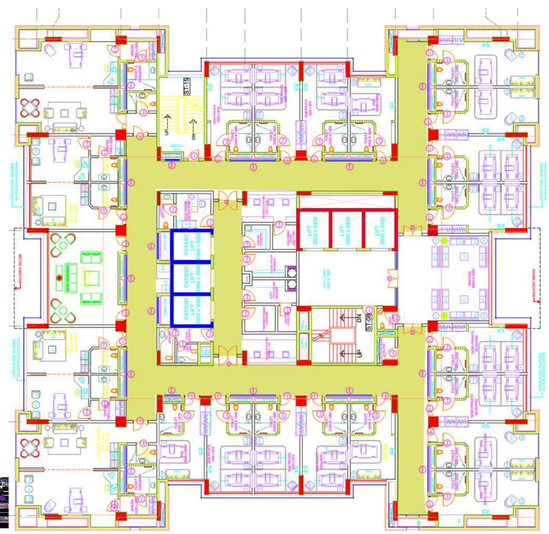
GROUND FLOOR PLAN



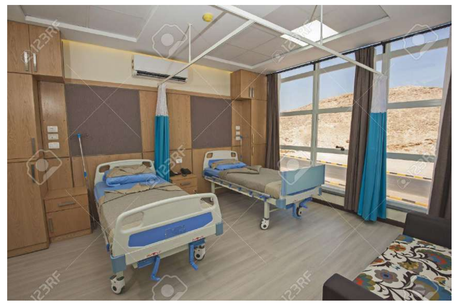
FIRST FLOOR PLAN`

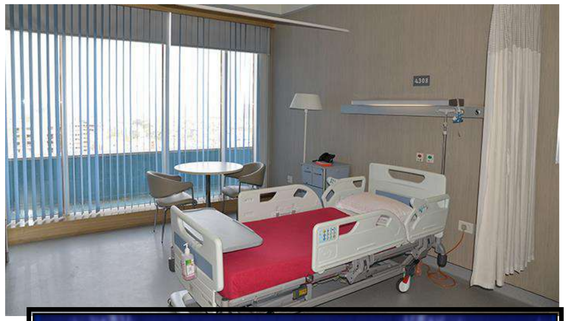


FLOOR PLAN –GENERAL & PRIVATE WARDS



FLOOR PLAN – DELUXE & SEMI PRIVATE WARDS





CASE STUDY

HOSPITAL

ARCHITECTURAL THESIS
2019-20

Roll no.
1150101004

THESIS GUIDE
AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTURE

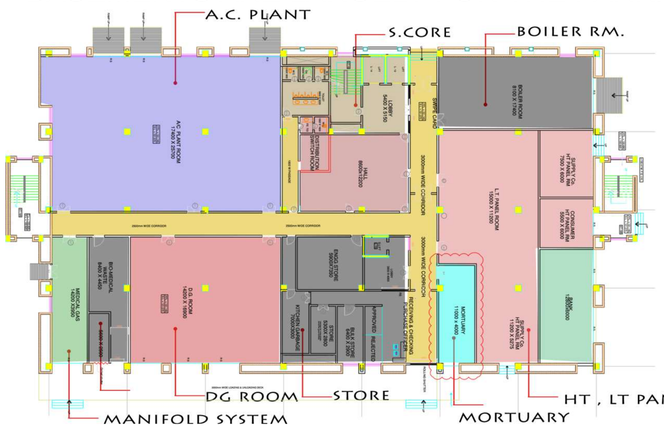
Submitted by
ABHISHEK BANERJEE
B.ARCH X SEMESTER

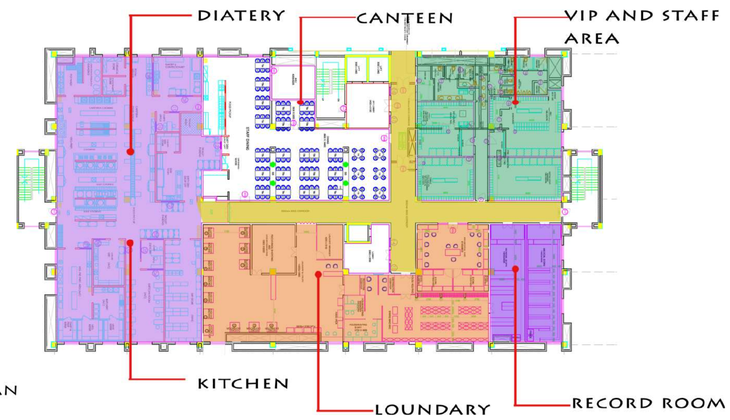
SAHARA HOSPITAL LUCKNOW

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

SERVICES:-

- SERVICE BLOCK IN THE REAR OF THE MAIN HOSPITAL BUILDING.
- SEPARATE SERVICE ENTRY THROUGH ONE SEPARATE GATE
- ALMOST WHOLE OF THE BLOCK IS DOUBLE HEIGHT (6M).
- LIFTS ARE PROVIDED FOR SERVICE IN THE AREA.
- L.T. AND H.T , FOOD RECEIVING AREAS, WATER TREATMENT PLANT, STP ,ETP
- OXYGEN,NITROGENTELEPHONE EXCHANGE, STORE, GAS MANIFOLD ROOM,
- L.P.G. STORES, D.G. SET, WORKSHOP, CHANGE ROOMS, A.C. PLANT ROOM,
- LINEN STORE, LAUNDRY, BOILER,MORTUARY.
- THESE SERVICES TRAVEL THE VERTICAL DISTANCE BY DUCTS AND THEN
- SPAN THE HORIZONTAL DISTANCE RUNNING THROUGH DUCTS UNDERGROUND
- AND COVERED BY CONCRETE SLAB.
- BASEMENTS ARE LARGELY FOR THE PARKING AND SECURITY CONTROL ROOM.





GROUND FLOOR

GROUND FLOOR

EMERGENCY,PHYSIOTHERAPY,LAB MEDICINE,BLOOD BANK,SAMPLE COLLECTION,RADIOLOGY,CT SCAN,ENDOSCOPY,BMD,MRI,ACCOUNT,PA SYSTEM CONTOL,ADMIN BLOCK,BILLING CASH,HEALTH CHECKUP,RECPTION,WAITING,OPD

SECOND FLOOR

OPD,AUDIO AND VOICE DISORDER ROOM,MAIN PHARMACY STORE (DEMERIT)

FOURTH FLOOR

ISOLATION WARD,GERNAL WARD,PRIVATE WARD

FIRST FLOOR

FIRST FLOOR

IVF,HDU,DIALYSIS(12-13 BEDS),OPD,RECEPTION,ICU,OT BLOCK,MICU,CATH LAB,COMMON ROOM, CANTEEN,ICU WAITNIG(REST ROOMS)

THIRD FLOOR

OPD OF DIFF DEPARTMENT , SAHARA NURSING COLLEGE

FOURTH FLOOR

GYNECOLOGIST,2 CONSULTANT ROOMS,DELEVERY ROOM, WARDS ,WASHROOM,OT,RECEPTION,WAITING

INFERENCES:-

ADEQUATE WAITING AREAS IN ALL DEPARTMENTS.
ATRIUM HOUSES A LARGE NUMBER OF VISITORS AND HAS DIFFERENT ACCESSES TO DIFFERENT DEPARTMENTS THEREBY RESTRICTED THE FLOW OF VISITORS TO THIS AREAS ONLY.
THE SERVICE BLOCK FORMS THE MAJOR HUB FOR HOSPITAL FUNCTIONS, WITHOUT THE INTERFERENCE OF THE MAIN STREAM OF THE HOSPITAL.
SEGREGATION OF VISITOR, STAFF AND SERVICE ENTRY.
SEPARATE EMERGENCY ENTRY, WHICH HAS A DIRECT AND UNHINDERED ACCESS.
SEPARATE SERVICE LIFT FOR FOOD, LINEN, STAFF, VISITORS AND PATIENT HELP TO AVOID CONGESTION.
FLEXIBILITY FOR THE FUTURE SO THAT ANY FLOOR COULD BE CONVERTED FROM WARDS TO ROOMS AND VISE-VERSA.
TOILETS ARE DESIGNED ACCORDING TO THE NEEDS OF PATIENT.
EMERGENCY EVACUATION IS NOT CATERED FOR SINCE THERE IS NO PROVISION OF A RAMP.
LACK OF SEPARATE FIRE ESCAPES IN FIRE BLOCKS.
LACK OF NATURAL LIGHT AND VENTILATION IN LOWER FLOORS.
NO DIRT DISPOSAL CORRIDOR IN THE O.T. COMPLEX.
INCREASE IN THE COST BECAUSE OF INTRODUCTION OF SERVICE FLOORS IN THE BUILDING.
SERVICE FLOORS CREATE BETTER FLOORS USABILITY AS AREA IN SERVICES IS SEGREGATED ON FLOORS.
SERVICE FLOORS GIVES DESIGN FLEXIBILITY AS SERVICES CONSIDERATIONS IN DESIGN ARE REDUCED.

PARKING:-

TOTAL PARKING IS IN BASEMENT.
PARKING IS BASICALLY OF THREE TYPES:
AMBULANCE-NEAR THE EMERGENCY
VISITOR-PARKING AREA
STAFF-IN BASEMENT 300 CAR PARKING 200 BIKE

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Submitted by
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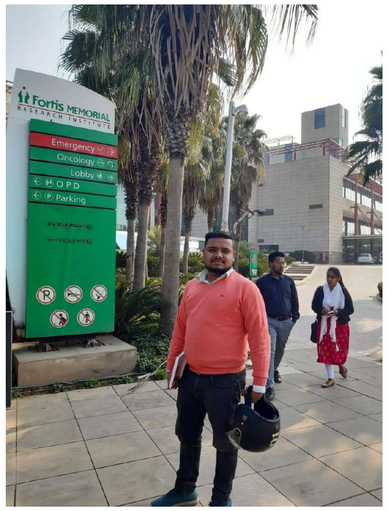
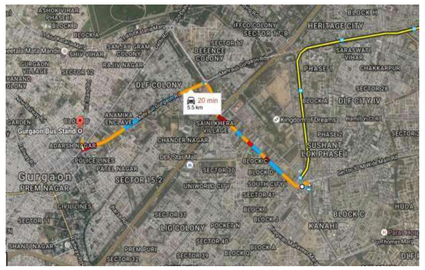
HOSPITAL

FORTIS MEMORIAL GURGAON

HOW TO REACH





GURGAON BUS STAND
6.6 KM VIA MEHRAULI –GURGAON ROAD

INDIRA GANDHI INTERNATIONAL AIRPORT 20 KM 30 MIN

GURGAON RAILWAY STATION 9.7 KM

- FORTIS HOSPITAL
- 30 M WIDE SECTOR MAIN ROAD
- NETAJI SUBHASH MARG
- SECTOR 44 ROAD
- ROAD WITHIN SECTOR

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

INTRODUCTION OF FORTIS HOSPITAL , GURGAON

FORTIS MEMORIAL RESEARCH INSTITUTE

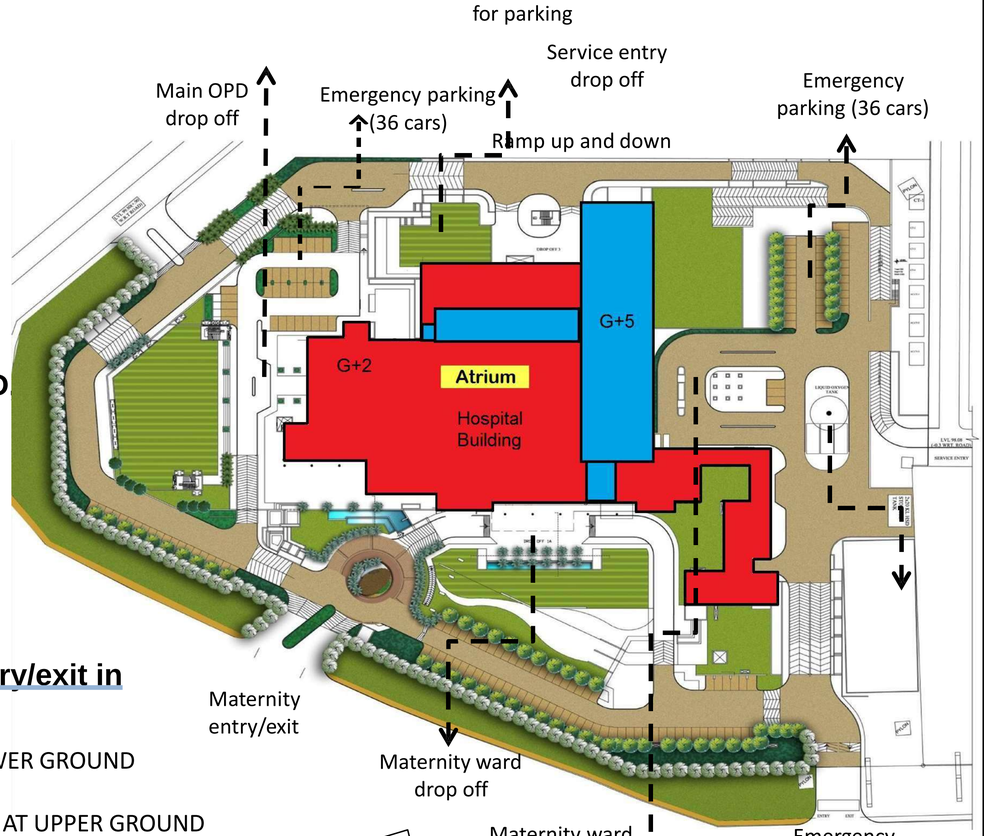
LOCATION : SECTOR 44, GURGAON

SITE AREA : 43,303 SQ. M.
BUILT – UP AREA : 65,961 SQ.M.
SURFACE PARKING : 143 CARS 100 BIKES

FAR : 1.52

PRINCIPAL ARCHITECT : AR. RAJINDER KUMAR, RAJINDER KUMAR ASSOCIATES, NEW DELHI

- FORTIS MEMORIAL RESEARCH INSTITUTE, GURGAON (FMRI) IS A FLAGSHIP HOSPITAL OF THE FORTIS HEALTHCARE LIMITED.
- FMRI IS A MULTI SUPER-SPECIALITY, HOSPITAL.
- FMRI IS A SET ON AN 11 –ACRE CAMPUS.
- IT HAS 430 FUNCTIONAL BEDS, WITH A FURTHER PLANNED INCREASE IN BEDS TO 1000.
- FMRI IS ACCESSIBLE EASILY BY ROAD, IT CAN ALSO BE REACHED USING DELHI METRO, AS THE HOSPITAL IS LOCATED OPPOSITE TO THE HUDA CITY METRO STATION



Total no. of entry/exit in the site-

- OPD ENTRY- AT LOWER GROUND FLOOR
- MATERNITY ENTRY- AT UPPER GROUND FLOOR
- EMERGENCY ENTRY- AT LOWER GROUND FLOOR
- SERVICE ENTRY- AT UPPER GROUND FLOOR

CASE STUDY

HOSPITAL

ARCHITECTURAL THESIS 2019-20	Roll no. 1150101004	THESIS GUIDE AR.MOHIT SACHAN	BBDU SCHOOL OF ARCHITECTURE	Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

FORTIS MEM`ORIAL GURGAON

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

VARIOUS DEPARTMENT

- MINIMAL ACCESS, BARIATRIC & GI SURGERY
- PLASTIC SURGERY
- OPHTHALMOLOGY
- PULMONOLOGY
- PLASTIC SURGERY
- DENTAL SCIENCES
- INTERNAL MEDICINE
- COSMETIC & PLASTIC SURGERY
- INVASIVE CARDIOLOGY
- PAEDIATRICS
- MINIMAL ASSESS SURGERY (GYNAE)
- C-DOC
- NEONATOLOGY
- IVF
- LIVER TRANSPLANT, GI & HEPATO PANCREATO BILIARY SURGERY
- MENTAL HEALTH & BEHAVIOURAL SCIENCE
- RADIATION ONCOLOGY
- RADIOLOGY
- RHEUMATOLOGY
- ENT
- Gastroenterology & Hepatobiliary Sciences
- THE MAIN AIM OF HOSPITAL IS CREATING A ENVIRONMENT NOT TO GIVE FEELING OF A BORING HOSPITAL.

AUDITORIUM

MEDITORIUM

TUMMY LUCK

A MULTI-CUISINE FOOD COURT

NO. OF BEDS- 430

GENERAL CARE BEDS: 250 ICU BEDS : 100

OPD CHAMBER- 80

A DAY CARE AND AN ACTIVITY CENTRE FOR CHILDREN.

HEALTH4U

PREVENTIVE PROGRAMME WITH LIFESTYLE INTERVENTIONS INCLUDING TAILOR-MADE HEALTH SCREENINGS.

R & R LOUGE

REST OPTIONS WITH RECLINERS, PRIVATE CUBICLES, SHOWER, AND LOCKER FACILITIES FOR ATTENDANTS.

FORTIPLEX

MOVIE LOUGE

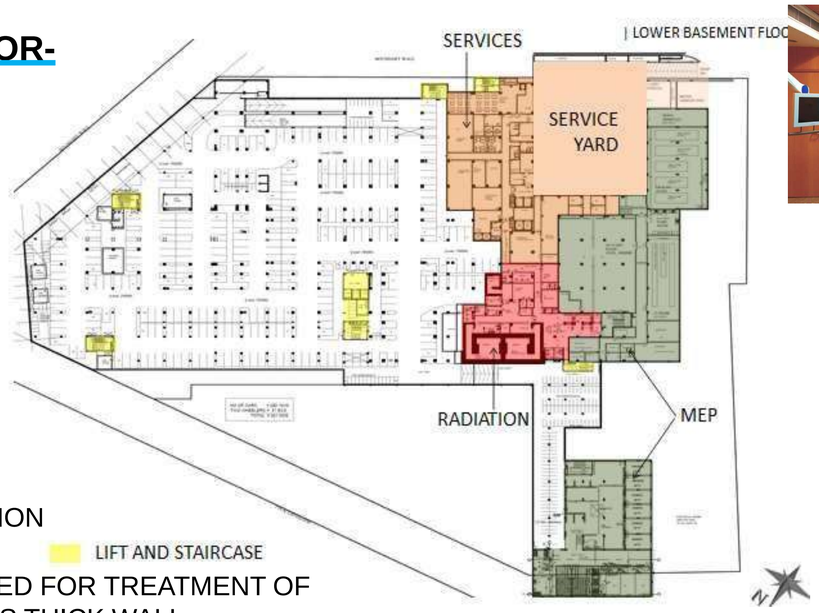
TOTAL NO. OF ENTRY/EXIT IN THE BUILDING-

- OPD ENTRY- AT LOWER GROUND FLOOR TO THE OPD
- MAIN ENTRY- AT UPPER GROUND FLOOR
- EMERGENCY ENTRY- AT LOWER GROUND FLOOR
- SERVICE ENTRY- AT UPPER GROUND FLOOR
- ONCOLOGY OPD ENTRY- AT UPPER GROUND FLOOR

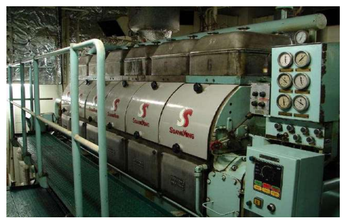
BASEMENT IS USED FOR-

- THE BASEMENT IS USED FOR ENGINEERING SERVICES PLANT ROOM LIKE HVAC, LT PANEL ROOM, DG ROOM, PUMP ROOMS ETC.
- AND IT IS ALSO USED FOR RADIATION THERAPY USED IN ONCOLOGY TREATMENT.
- AND FOR PARKING AND HR DEPARTMENT AND STAFF AREAS.

- ADMIN AREA SERVICE YARD
- MECHANICAL THERAPY RADIATION THERAPY LIFTS AND SERVICES
- LINAC (RADIATION THERAPY) USED FOR TREATMENT OF ONCOLOGY HAS 1 TO 1.5 METERS THICK WALL



BASEMENT PLAN



TOTAL PARKING IN THE BASEMENT-

- 280 CARS PARKING
- 51 TWO WHEELER PARKING

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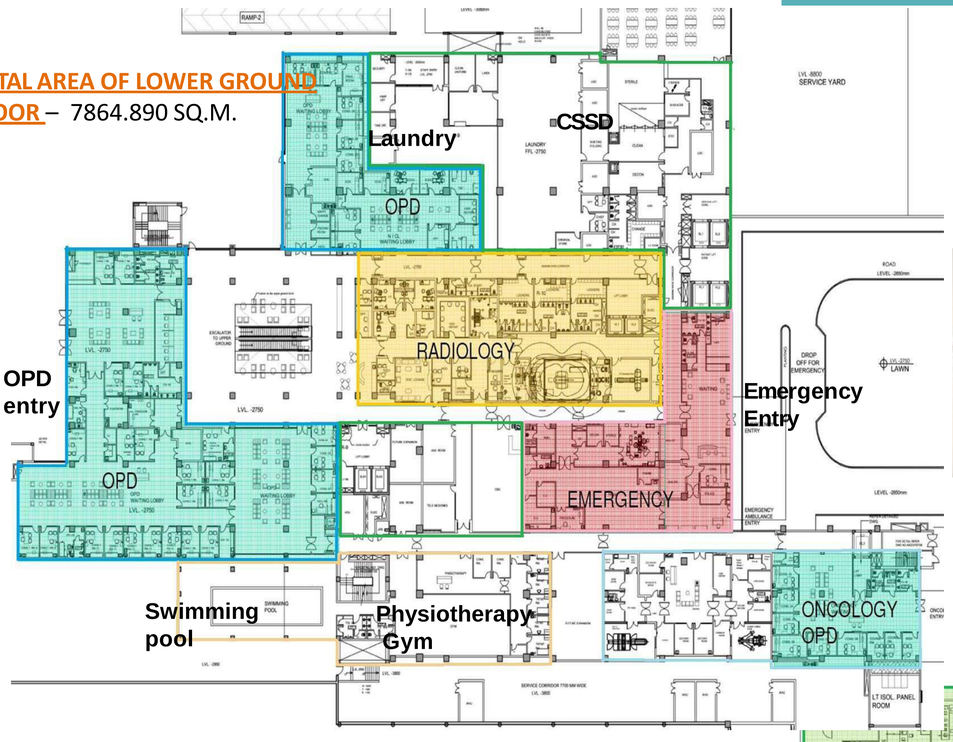
HOSPITAL

FORTIS MEMORIAL GURGAON

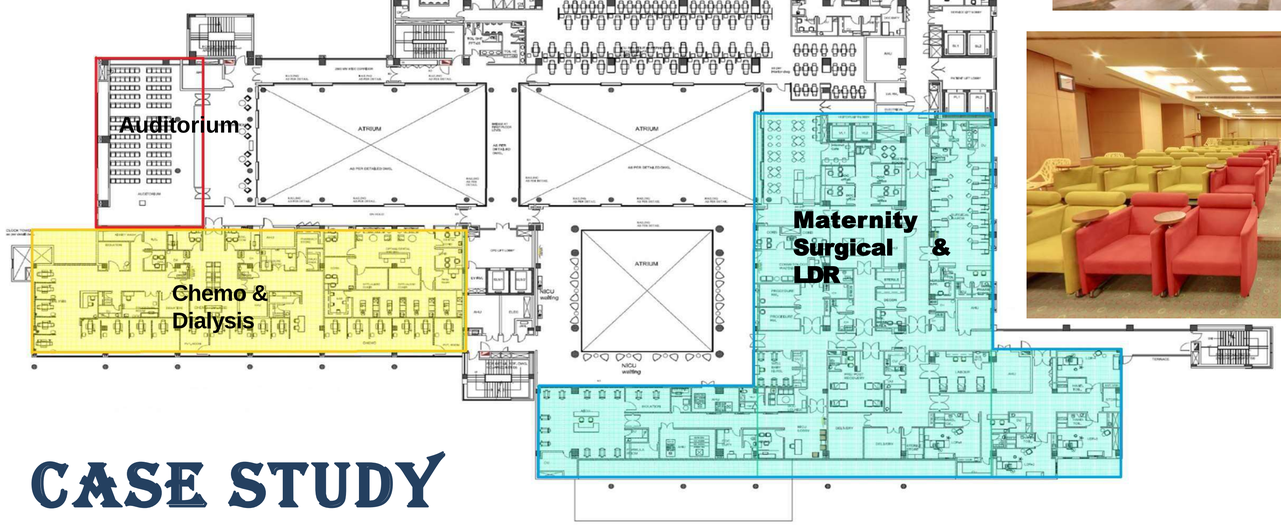
LOWER GROND FLOOR

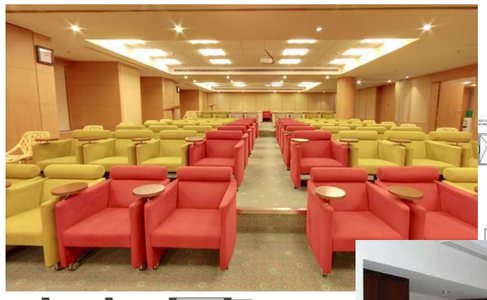
TOTAL AREA OF LOWER GROUND FLOOR – 7864.890 SQ.M.



TOTAL AREA OF FIRST FLOOR – 6828.190 SQ.M.

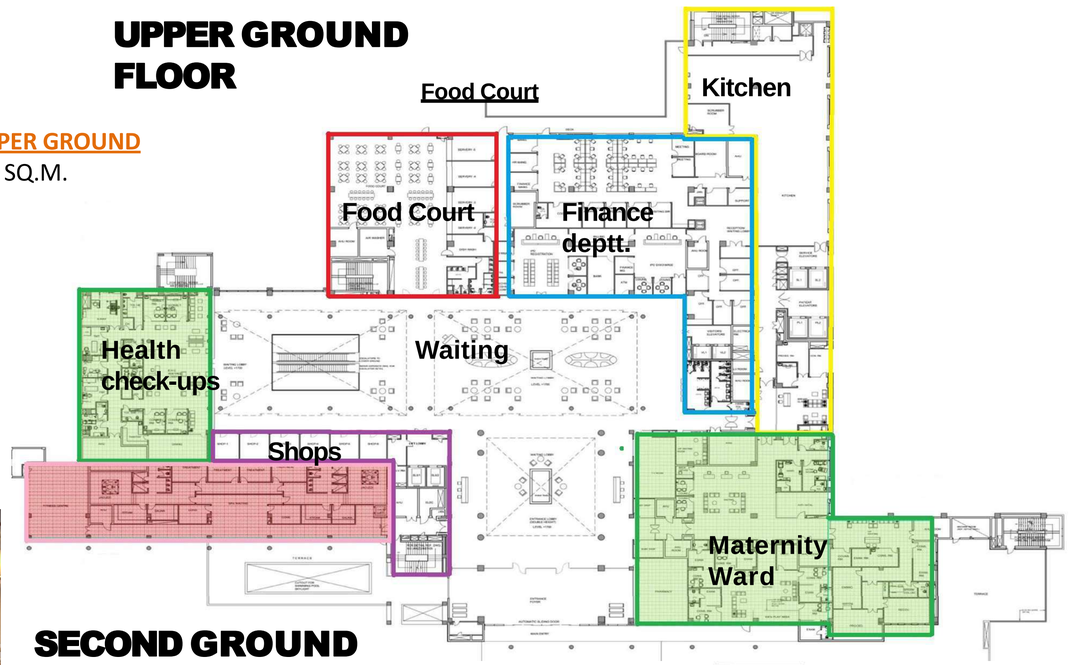
FIRST FLOOR





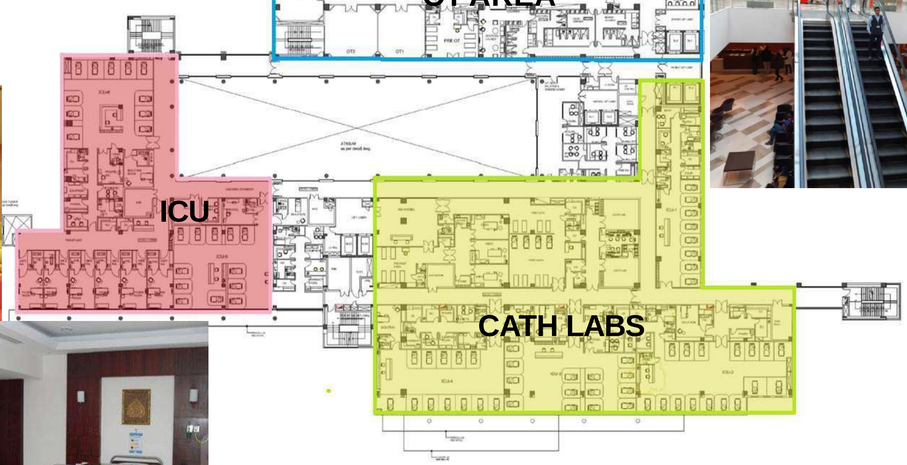
UPPER GROUND FLOOR

TOTAL AREA OF UPPER GROUND FLOOR – 7864.890 SQ.M.



SECOND GROUND FLOOR

TOTAL SITE AREA OF SECOND FLOOR- 6828.190 SQ.M.



SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

CASE STUDY

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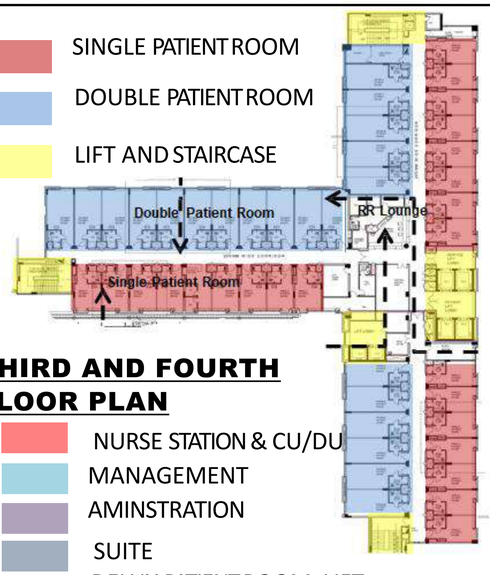
HOSPITAL

FORTIS MEMORIAL GURGAON

SINGLE PATIENT ROOM

DOUBLE PATIENT ROOM

LIFT AND STAIRCASE



Total area of third and fourth floor- 1944 SQ.M.

Total no. of beds on both floor – 140

THIRD AND FOURTH FLOOR PLAN

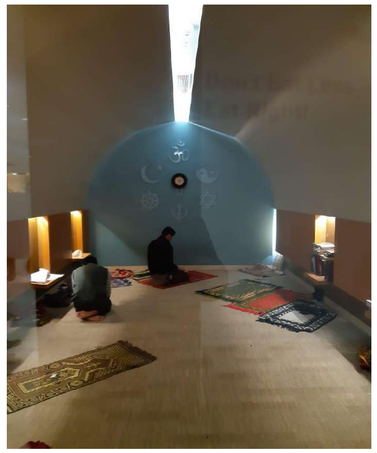
NURSE STATION & CU/DU

MANAGEMENT

AMINSTRATION

SUITE

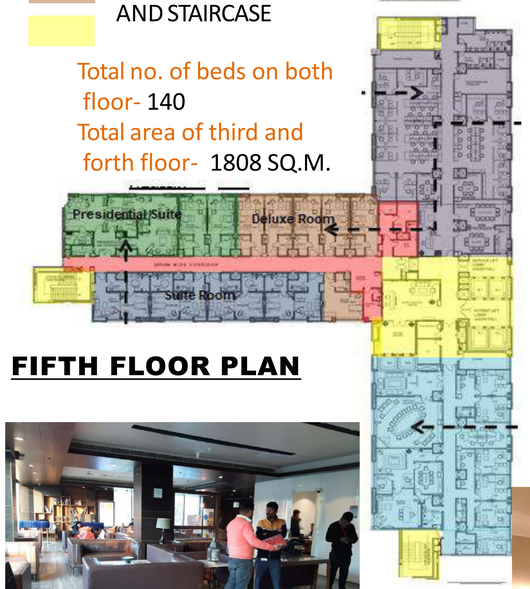
DELUX PATIENT ROOM LIFT AND STAIRCASE



PRAYER ROOM

Total no. of beds on both floor- 140

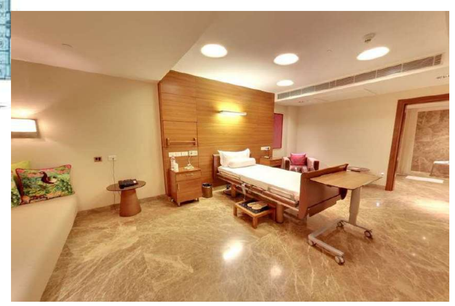
Total area of third and forth floor- 1808 SQ.M.



FIFTH FLOOR PLAN

INTERNATIONAL LOUNGE

GERNAL WARD



PRIVATE WARD

SECTION

CASE STUDY

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

SMOKE DETECTOR DETECT THE FIRE AND RAISE THE ALARM

THEN THE SPRINKLERS GET ACTIVATED HAVING ACCESS FROM OVERHEAD TANK (IF IT FAILS)

THEN THE SPRINKLERS JOCKEY PUMP GET ACTIVATED

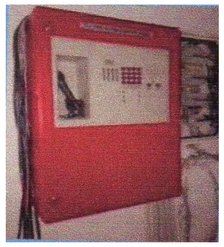
IF IT IS NOT SUFFICIENT THEN SECOND SPRINKLERS JOCKEY PUMP STARTS

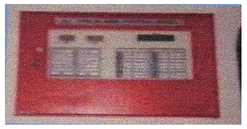
HYDRANT PUMPS GET ACTIVATED

IF IT IS NOT SUFFICIENT SECOND HYDRANT PUMP GETS ACTIVATED

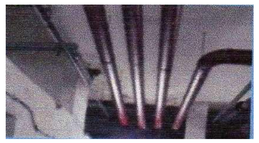
IF ELECTRICITY IS SWITCHED DOWN THEN DIESEL PUMP STARTS THE HYDRANT PUMP

IF ELECTRICITY IS SWITCHED DOWN THEN DIESEL TANK STARTS THE PUMP



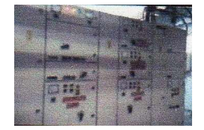


FCS TELLS IN WHICH ZONE FIRE IS SPREAD AND RAISE THE ALARM INSTALLED IN EVERY FLOOR



PIPELINES TO CARRY WATER DURING FIRE

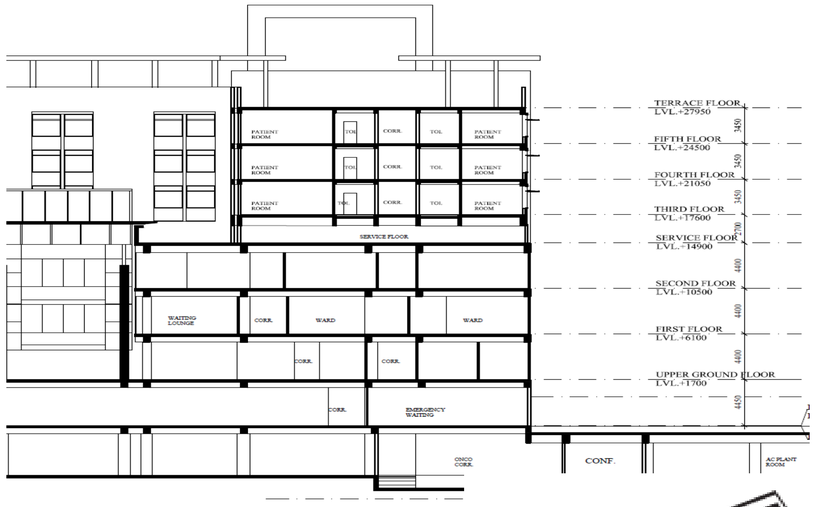
EXHAUST DUCTS TO CARRY SMOKE



CONTROL PANEL PUMP

VERTICAL DISTRIBUTION OF SPACES :-

- Typical Floor
- Third Floor (patient beds 67)
- Service floor
- Second floor (surgical floor 10 OT. ICU BEDS 92)
- First floor (maternity ICU 62 beds, wards, ICU relatives
- Upper ground (maternity, atrium lobby)
- Lower ground (diagnostics, OPD, ER)
- Basement (parking, plant rooms)



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AREA/STANDARDS/INFRENCES

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

S.NO	SPACE Required FOR 300 BEDED	NORMS (sq.m)	Sahara Hospital (sq.m)	FORTIS MEMORIAL(sqm)
1.	Entrance Hall,Cash Counter, Record	180	230	150
2.	Officer-in-charge	18	12	30
3.	Nurse-in-charge	20	12	--
4.	Sanitory Inspector Room	16	24	14
5.	OPD Record Room	35	48	24
6.	Examination Room and Consulation	18	22	24
7.	Sub-Waiting	6	6	--
8.	Recovery Room	14	26	54
9.	Toilet cum Changing	14	10	--
10.	Clinical Laboratory	18	24	
11.	Dark Room	18	18	17.5
12	Treatment	17.5	24	24
29.	Ward Rooms-Private Rooms	14	17.8	12
	Semi-Private(1) 2beds	20	14	18
	General (1)-8bedded	80	70.4	60
	General(2)-4bedded	40	25.2	30.8
30.	Circulation Area	40%	35%	40%
31.	Nurse Station with Toilet	40	24	18
32.	Doctor's Duity	24	20	12

S.NO.	Space Required FOR 300 BEDED	NORMS(Sqm)	Sahara Hospital (Sqm)	FORTIS MEMORIAL(sqm)
17.	ECG Room	18	30	14
18.	Fracture Prepration	17.5	17.5	17.5
19.	Dirty Wash	10.5	--	12
20.	X-Ray Room	35	30	24
21.	Injection Room	14	14	12
22.	Doctor's Lounge	30	24	20
23.	Resuscition Room	25	42	60
24.	Nurse Station+Toilet	35	42	30
25.	Instrument Sterlisation	10.5	12	12
26				
27				
28				
33.	CSSD	300	360	120
34.	Laundry	380	400	150
35.	Mortuary	100	44	---
36.	Central Kitchen Area	600	480	290
37.	D.G Room	250	238	200
38.	AC PLANT	400	425	---
39.	L.T Pannel	150	180	60
40.	Medical Gas	60	56	30
41.	Support Facilities	350	500	240

MERITS OF FORTIS MEMORIAL

- VINTERNATIONAL LOUNGE GIVEN FOR INTERNATIONAL PATIENT
- SEPRATE WARD FOR PATIENTS WHO HAVE COMUNICABLE DISEASE'
- WARDS ARE AS PER IPHS
- PROPER LIFT AND STAIRCASE
- PRAYER ROOM
- ALL TYPES OF SERVICES AS PER MCI AND IPHS
- SEPRATE ENTRY FOR AMBULANCE AND NORMAL PATIENT
- THE NEW MATERNITY AND SNCU ARE MADE ACCORDING TO 2012 NRHM NORMS

DEMERITS

- RAMP ARE NOT PROVIDED IN ALL FLOORS
- NOT ADDEQUATE SPACE FOR STP AND ETP
- CONNECTIVITY ARE NOT GOOD AS COMPARE TO SAHARA
- VARIOUS DEPARTMENTS ARE CLOSED

MERITS OF SAHARA

1. SERVICES PROVIDED WERE OF THE BEST POSSIBLE WAY
2.WAITING AREA WAS QUITE LARGE WITH PROPER SITTING SPACE
3.ALL THE DEPARTMENTS WITH GREAT FACILITIES ARE PRESENT IN THE HOSPITAL.

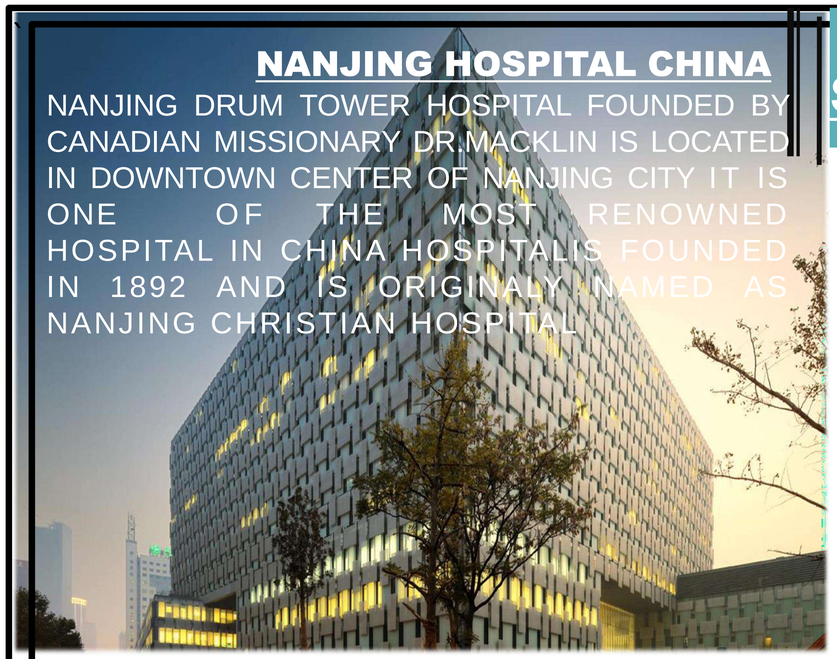
DEMERITS

1.NO RAMP FOR TRANSFER TO ONE FLOOR TO ANOTHER
2.HALF OF THE THINGS ARE CHAOSED AS THE HOSPITAL WAS TO BE OF 500 BEDDED AND IS PRESENTLY OF 350 BEDS
3.MANY DEPARTMENTS ARE NOT FUNCTIONAL AS THE HOSPITAL IS NOT COMPLETE
4.NO PROPER DISPOSAL OF STP WASTE
5.VERY COMPLICATED PLANNING A LOT OF TIME IS TAKEN TO FIND A WARD.
6.NO OPEN PARKING PROVIDED

CASE STUDY

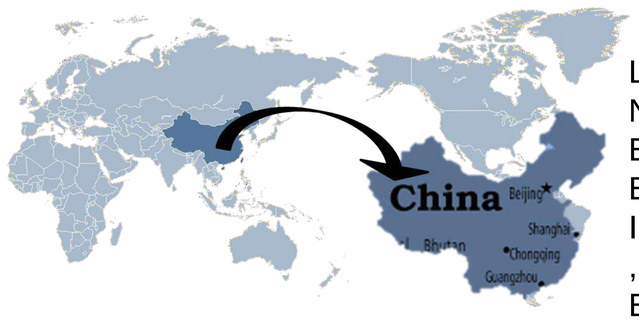
HOSPITAL

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI



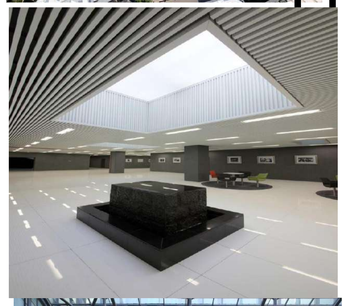
NANJING HOSPITAL CHINA

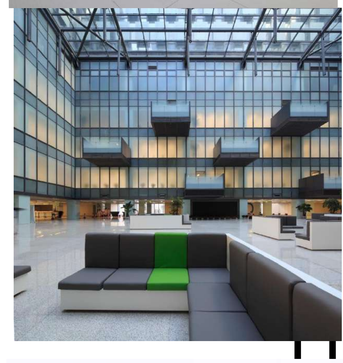
NANJING DRUM TOWER HOSPITAL FOUNDED BY CANADIAN MISSIONARY DR.MACKLIN IS LOCATED IN DOWNTOWN CENTER OF NANJING CITY IT IS ONE OF THE MOST RENOWNED HOSPITAL IN CHINA HOSPITALIS FOUNDED IN 1892 AND IS ORIGINALY NAMED AS NANJING CHRISTIAN HOSPITAL



ABOUT HOSPITAL

LOCATED AT THE CENTRE OF NANJING CITY, NANJING DRUM TOWER HOSPITAL SOUTH EXTENSION IS A GENERAL HOSPITAL EXTENSION PROJECT COMBINING INPATIENT AND OUTPATIENT DEPARTMENTS ,EMERGENCY,MEDICAL DESIGN ACADEMIC EXCHANGE DEPARTMENTS.THE CONCEPT OF THE PROJECT WAS INSPIRED BY INTERPRETATION OF TERM “HOSPITAL”IN TRADITIONAL CHINESSE CULTURE





BACKGROUND

CHINA IS A UNITARY ONE-PARTY SOVEREIGN STATE IN EAST ASIA AND THE WORLD MOST POPULOUS COUNTRY WITH THE POPULATION OF 1.404 BILLION.

CHINA’S CLIMATE IS MAINLY DOMINATED BY DRY SEASONS AND WET MONSOONS WHICH CAUSES GREAT TEMPERATURE DIFFERENCE IN THE WINTERS AND SUMMERS. THE NORTHERN WINDS IN THE WINTERS COMING FROM HIGH- LATITUDES ARE COLD AND DRY, WHERE AS SOUTHERN WINDS FROM COASTAL AREAS AT LOWER LATITUDES ARE WARM AND MOIST.

APPROACH

THE MAIN ENTRANCE TO THE HOSPITAL SITE IS ZHONGSHAN ROAD

SITE DETAILS

THE SITE OF THE PROJECT IS 37900 SQM IN SIZE, WITH AN OVERALL FLOOR AREA OF 260000 SQ M. THE PROJECT WAS DESIGNED IN 2005 AND COMPLETED IN 2012.

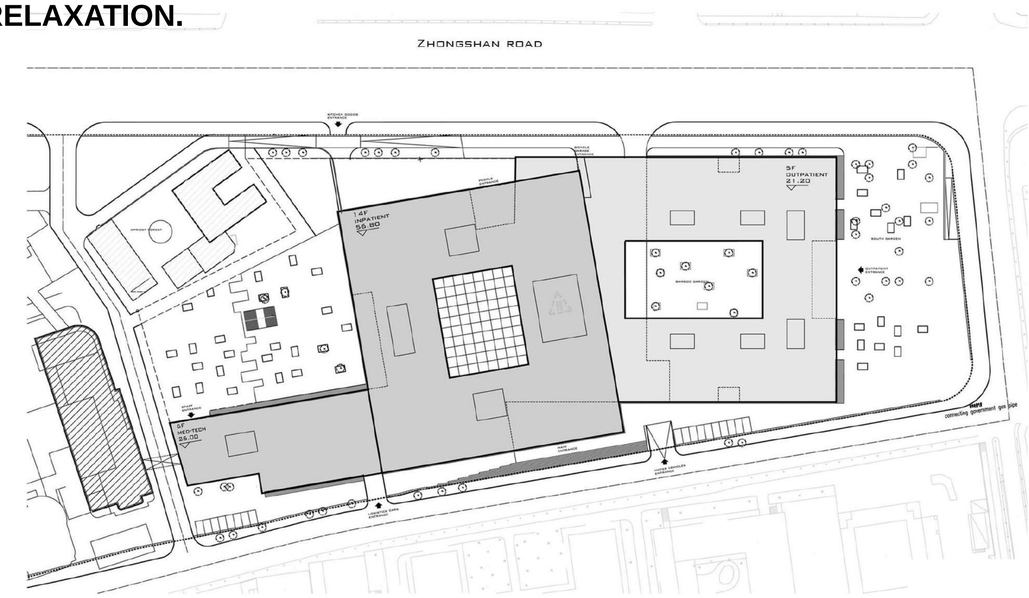
CAPACITY

ACCORDING TO THE PROJECT, A TOTAL OF 2800 BEDS WILL BE SERVED, OF WHICH 1600 IS PROVIDED BY THE NEW EXPANSION. DAILY OUTPATIENT IS PLANNED TO REACH 10,000 PERSON

LOCATION

ZHONGSHAN NORTH ROAD & DRUM TOWER SQUARE, GULOU, NANJING, JIANGSU, CHINA

THE ENGLISH WORD 'HOSPITAL' IS ORIGINATED FROM LATIN, MEANING GATHERING GUESTS, BUT IN CHINESE, THE TERM 'HOSPITAL' (YI YUAN) IS READ WORD BY WORD AS THE 'HEALING GARDENS'. THE CORE OF THE DESIGN FOR THE PROJECT IS TO 'GARDENISE‘ THE HOSPITAL, TO CREATE GARDENS EVERYWHERE. IN TRADITIONAL CHINESE CULTURE, A GARDEN IS THE BORDERLAND BETWEEN HOME AND THE OUTSIDE WORLD. WALKING INTO IT NOT ONLY PROVIDE SENSORY BEAUTY TO THE PIECE BUT ALSO GIVE INTERNAL RELAXATION.



LITERATURE STUDY

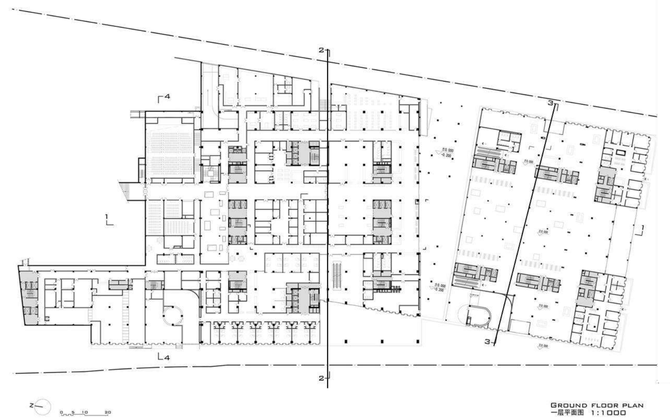
ARCHITECTURAL THESIS 2019-20	Roll no. 1150101004	THESIS GUIDE AR.MOHIT SACHAN	BBDU SCHOOL OF ARCHITECTURE	Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

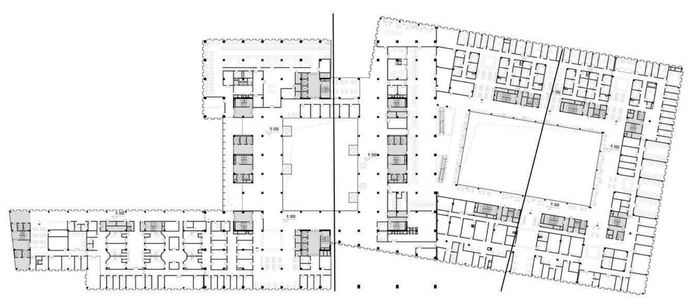
HOSPITAL

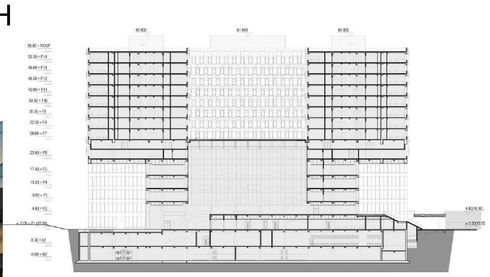
SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

THE EARLIER EXPANSIONS OF THE HOSPITAL WAS DRIVEN BY THE OF DEVELOPMENT OF MODERN MEDICAL TECHNOLOGY AS WELL AS THE INCREASING MUNICIPAL POPULATION. DESPITE THE REMARKABLE SCALES, MOST OF THESE EARLY EXPANSIONS ARE HARDLY MORE THAN SIMPLE AND URGENT ADDITION AND EXTENSION OF EXISTING FUNCTION TO MEET THE RAPIDLY INCREASING NEED FOR MEDICAL SERVICE. AS A RESULT, THE FUNCTIONAL LAYOUT OF MANY FLOORS ARE NOT WELL ORGANIZED AND STREAMLINED FOR THE OPERATION OF THE HOSPITAL AS A WHOLE. FOR INSTANCE, THE EXISTING OUTPATIENT DEPARTMENT IS ON THE EAST SIDE OF ZHONGSHAN RD, CONNECTED WITH THE MAIN BUILDINGS OF THE HOSPITAL, WHICH IS ON THE WEST SIDE, ONLY THROUGH A NARROW UNDERGROUND PASSAGEWAY, WHICH MAKES EXTRA INCONVENIENCE TO B PATIENTS AND STAFFS.

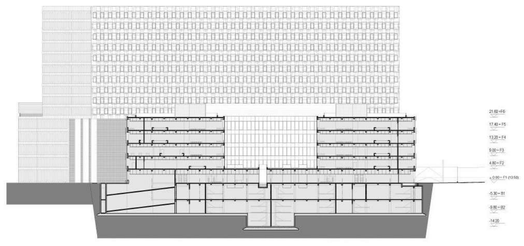
各科室位置
LOCATIDN OF DEPARTMENTS



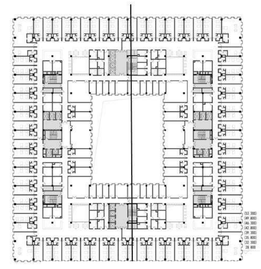




SECTION 1



SECTION2



WITH REGARD TO ENERGY CONSERVATION, THE EXTERNAL FAÇADE EMPLOYS WHITE FROSTED GLASS, WHICH RESOLVED THE ISSUE OF INDOOR LIGHTING WHILE FILTERING THE DIRECT SUNLIGHT, CREATING SOFT AMBIENCE.

FURTHERMORE, IN ALLUSION TO THE SWELTERING SUMMER WEATHER IN NANJING, A LATERAL VENTILATION SYSTEM IS INSTALLED ON THE FAÇADE TO RELEASE ACCUMULATIVE HEAT ON THE SURFACE, SIGNIFICANTLY REDUCING ENERGY CONSUMPTION AND ALLOWING THE BUILDING TO BETTER SERVE THE USERS.

LITERATURE STUDY

ARCHITECTURAL THESIS
2019-20

Roll no.
1150101004

THESIS GUIDE
AR.MOHIT SACHAN

BBDU SCHOOL OF ARCHITECTURE

Submitted by
ABHISHEK BANERJEE
B.ARCH X SEMESTER

HOSPITAL

PARS HOSPITAL, RASHT, IRAN

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

Location

LOCATED IN GOSLAR DISTRICT, RASHT, GILAN PROVINCE, IRAN.
SITUATED ON HIGHWAY 24M WIDE

APPROACH

2 MAIN ENTRANCES ONE OF WHICH IS USED AS AN EMERGENCY ENTRANCE

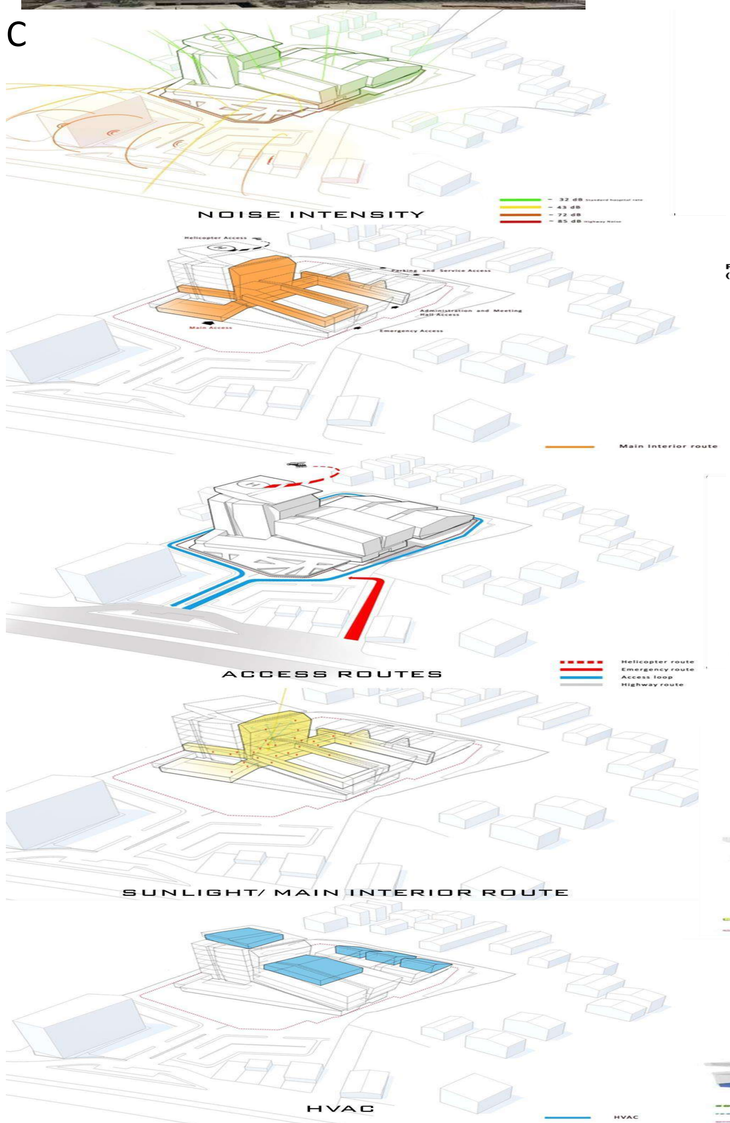
SITE DETAILS

SITEIS`SURROUNDED BY OTHER PROPERTIES EXCEPT OF ENTRANCE
TOTAL SITE AREA = 4.3 ACRES OR 17,400SQM

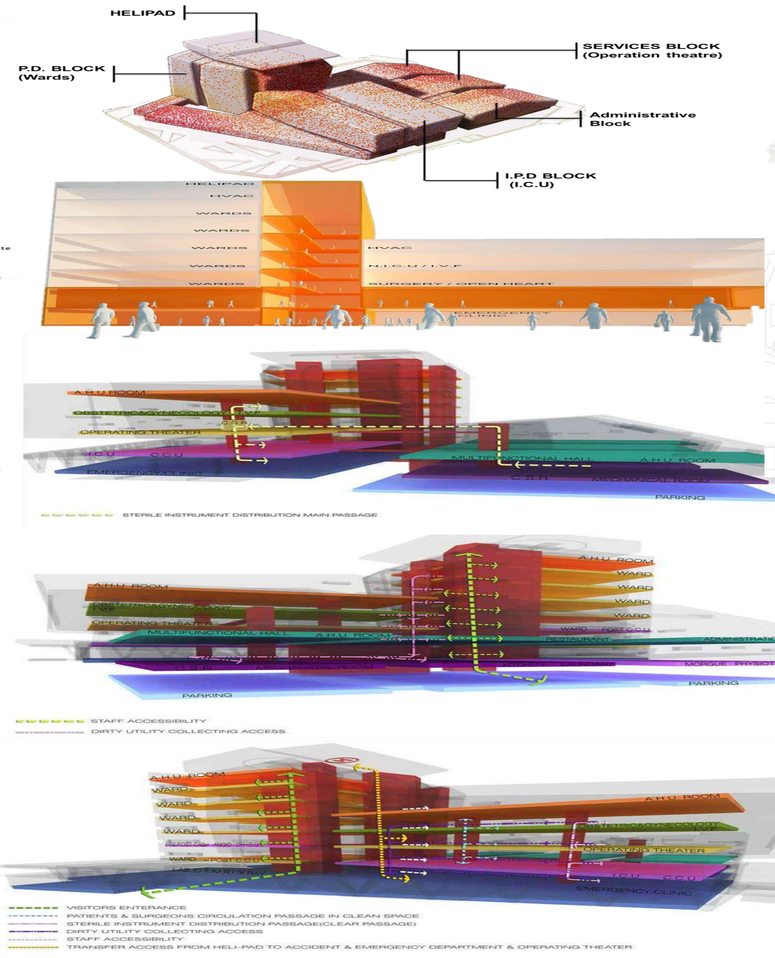
CAPACITY

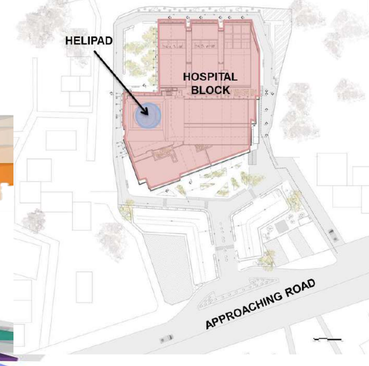
HOSPITAL COMPRISING OF 160 BEDS AND 9 OPERATION THEATRES

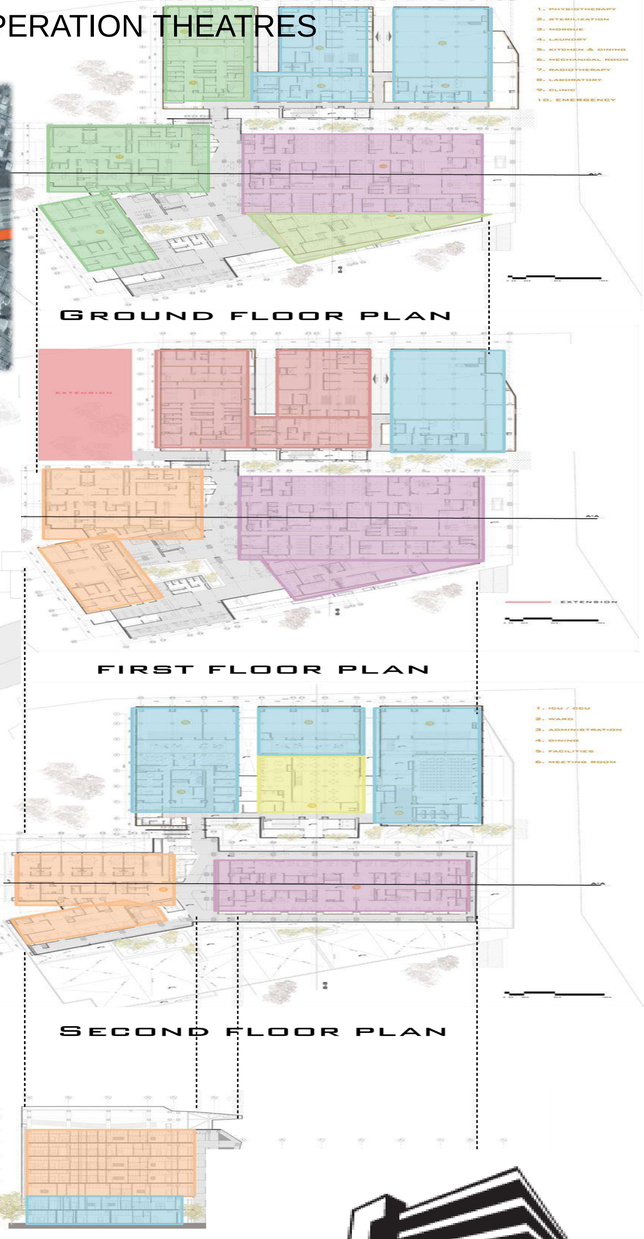
C



.Composing several blocks in three different height built on the basis of concrete structure features a comprehensive medical infrastructure. Moreover, being integrated via a transitive atrium that pervades and provides natural light accessibility in different departments, while porches create a subtle and interactive visual communication between inside and surrounding environment.







LITERATURE STUDY

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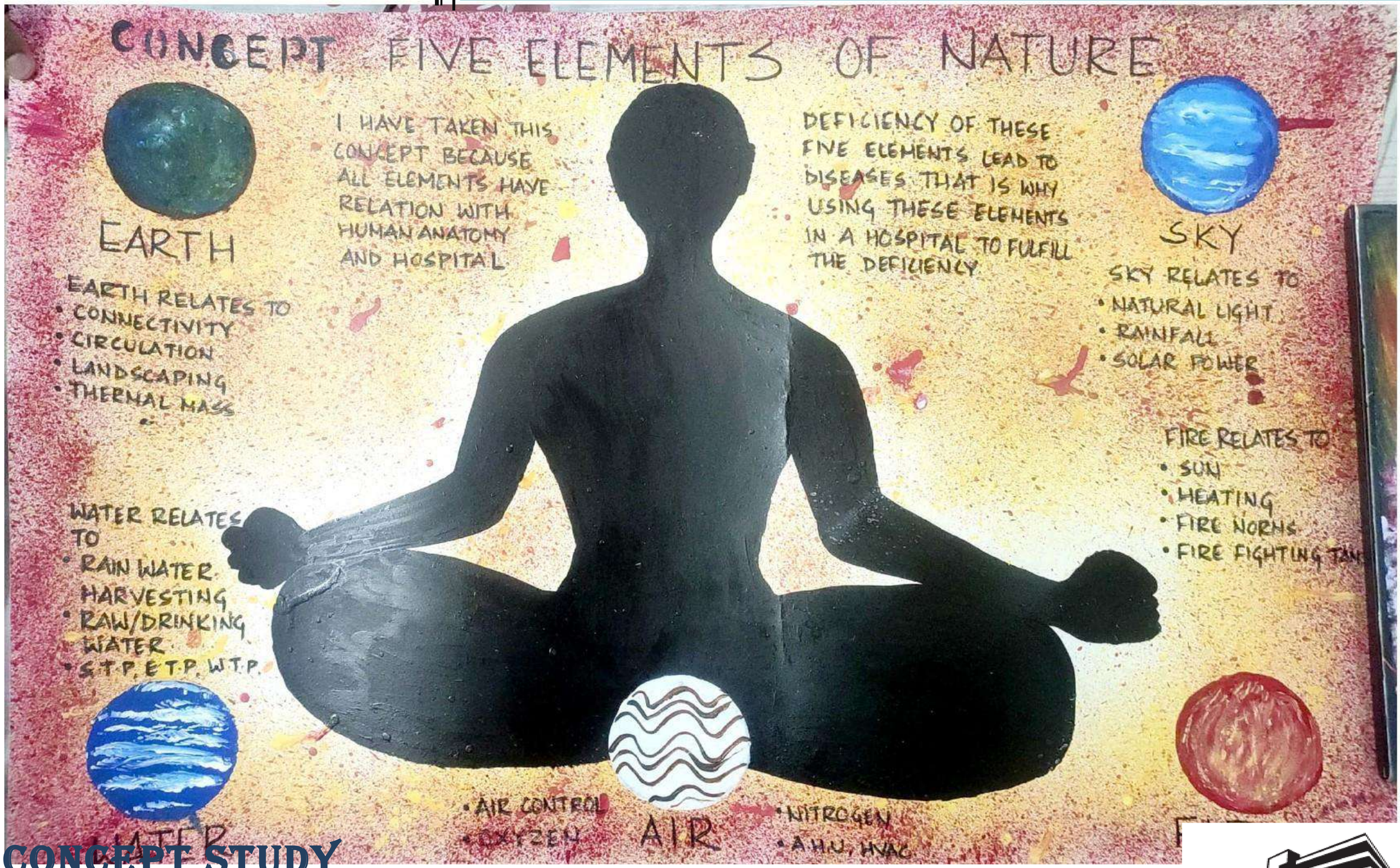
HOSPITAL

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI



CONCEPT STUDY

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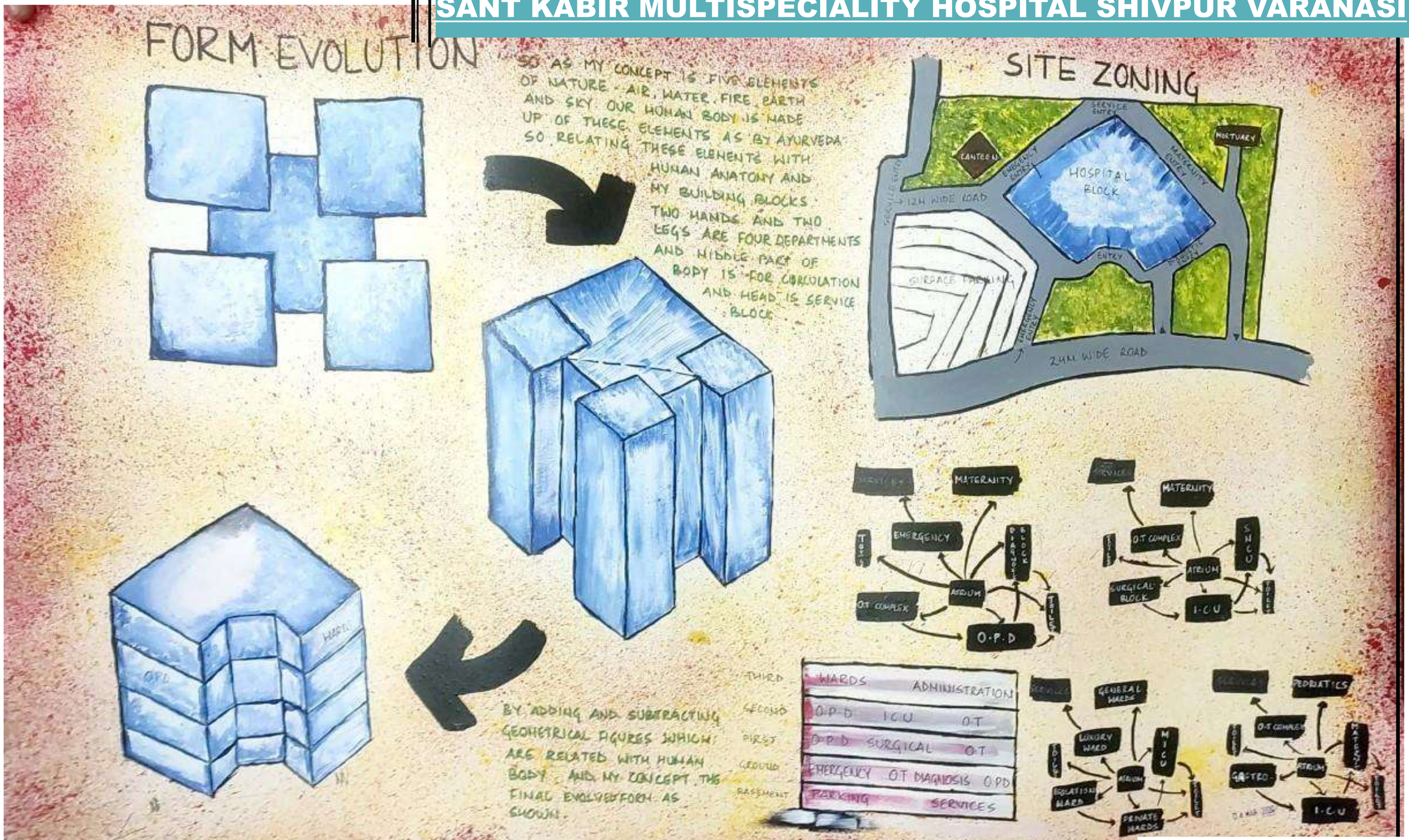
HOSPITAL

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

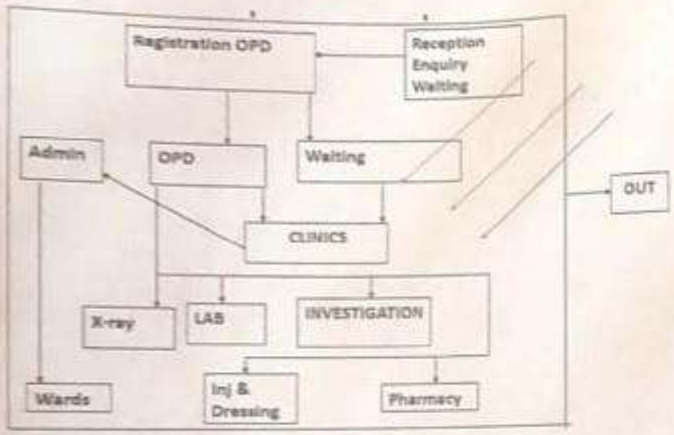


CONCEPT STUDY

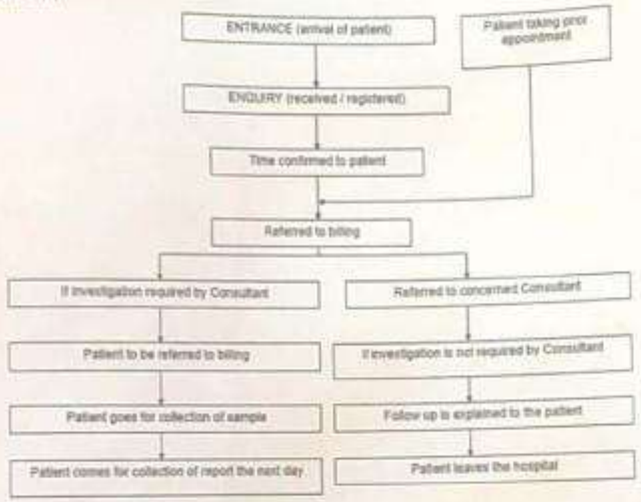
SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR

HOSPITAL FLOW CHART



PATIENT FLOW CHART



THICK WALLS IN SOUTH, TO PROTECT GAIN OF HEAT.

THE TERRACE GARDEN AND GREEN WALL IS PROVIDED IN THE WESTERN SIDE, SO THAT THEY CAN ACT AS AN ENVELOPE AND PROTECT THE GAIN OF HEAT FROM THE DIRECT RAYS OF WESTERN SUN. THE TERRACE GARDEN WILL ALSO ACT AS AN AESTHETIC FEATURE .

DESIGN IMPLEMENTATION

THE IPD (INDOOR PATIENT DEPARTMENT) BLOCK IS PLACES IN THE NORTH AND EASTERN SIDE,
THIS IS DONE SO THAT PATIENT CAN BE BENEFITED FROM THE NORTH AND EASTERN RAYS OF THE SUN. THESE RAYS ARE THE CONSIDERED EFFECTIVE FOR HEALING

EMERGENCY BLOCK

IPD BLOCK

DIAGNOSTIC

EMERGENCY BLOCK WILL ALWAYS NEED ARTIFICIAL SOURCE OF ENERGY, THE PLACEMENT OF IT IS THUS DONE IN SOUTH, WHERE IT IS HARD TO CONTROL THE HEAT OF SUN.

IN DIAGNOSTIC CENTRE, PATHOLOGY WILL BE PLACED ON THE EASTERN SIDE FOR BLOOD TO BE STORED IN COOL AND DRY SPACE

THE DECIDIOUD TREES WILL PROVIDE SHADING IN SOUTH AND WEST ZONE IS SUMMER AND WILL LET HEAT COME IN WINTER

THE COURTYARDS WILL BE PROVIDED FOR PROPER VENTILATION AND LIGHTNING OF THE BUILDING

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HOSPITAL

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR

INTRODUCTION

A HOSPITAL IS A HEALTH CARE INSTITUTION PROVIDING PATIENT TREATMENT BY SPECIALIZED STAFF AND EQUIPMENT. HOSPITALS ARE USUALLY FUNDED BY THE PUBLIC SECTOR, HEALTH ORGANISATIONS (FOR PROFIT OR NON-PROFIT), HEALTH INSURANCE COMPANIES, CHARITIES, INCLUDING DIRECT CHARITABLE DONATIONS. HISTORICALLY , HOSPITALS WERE OFTEN FOUNDED AND FUNDED BY RELIGIOUS ORDERS OR CHARITABLE INDIVIDUALS AND LEADERS. TODAY , HOSPITALS ARE LARGELY STAFFED BY PROFESSIONAL PHYSICIANS, SURGEONS AND NURSES, WHERE IN PAST , THIS WORK WAS USUALLY PERFORMED BY THE FOUNDING RELIGIOUS ORDERS OR BY VOLUNTEERS.

CLASSIFICATIONS ON DIFFERENT BASIS

Basing on Objective
a. General hospitals
b. Special hospitals
c. Teaching cum Research Hospital

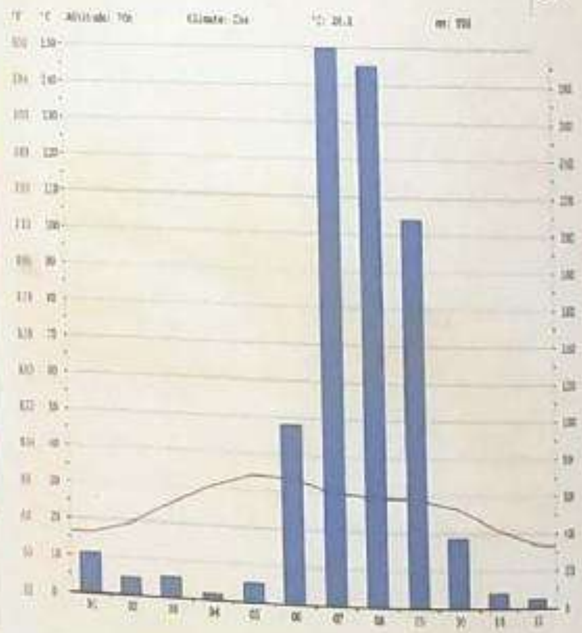
Basing on Administration, ownership, control or financial income
a. Governmental or public
b. Non-governmental or private
c. Semi Govt Hospital
d. Voluntary Agency Hospitals

Basing on bed capacity (Size)
a. Small hospital (Up to 100 beds)
b. Medium hospital (More than 100 to less than 300 beds)
c. Large hospital (More than 300 beds)

Basing on type of care:
a. Primary Care
b. Secondary Care
c. Tertiary Care

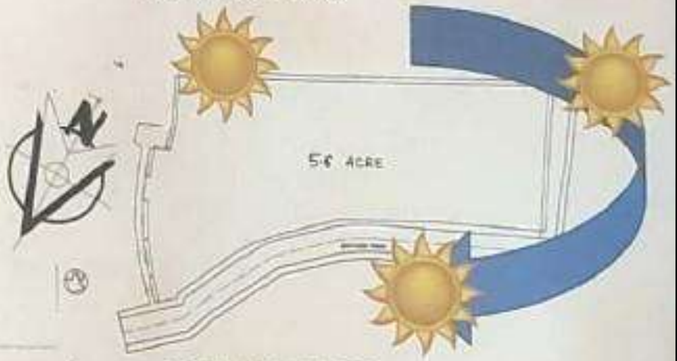
As per WHO Classification:
a. Regional Hospital
b. Intermediate/ District Hospital
c. Rural Hospital

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	16.5	19.4	25.4	30.6	34.3	33.8	30	29.2	29.1	26.7	21.1	17.1
Min. Temperature (°C)	9.6	12.1	17.3	22.5	27.1	28.4	26.6	26.1	25.5	20.8	13.5	9.8
Max. Temperature (°C)	23.5	26.7	33.5	38.7	41.6	39.2	33.5	32.3	32.7	32.6	28.7	24.5
Avg. Temperature (°F)	61.7	66.9	77.7	87.1	93.7	92.8	86.0	84.6	84.4	80.1	70.0	62.8
Min. Temperature (°F)	49.3	53.8	63.1	72.5	80.8	83.1	79.9	79.0	77.9	69.4	56.3	49.6
Max. Temperature (°F)	74.3	80.1	92.3	101.7	106.9	102.6	92.3	90.1	90.9	90.7	83.7	76.1
Precipitation / Rainfall (mm)	22	9	11	3	10	96	299	290	208	37	8	5



MULTI-SPECIALITY HOSPITAL

A MULTI-SPECIALITY HOSPITAL MUST HAVE MORE THAN ONE SPECIALITY BUT THEY CAN BE THE BOARD SPECIALITIES LIKE MEDICINE, SURGERY, PEDIATRICS, ETC. THEY OFFER SPECIALIZED SERVICES TO THEIR PATIENTS



CLIMATOLOGY

VARANASI CITY, WHERE THE PROJECT SITE IS LOCATED, OUT SIDE THE MAIN VARANASI DISTRICT IN UTTAR PRADESH STATE AND IS LOCATED ON THE BANK OF THE GANGA RIVER . SINCE INDIA IS A HUGE COUNTRY, THE CLIMATE IS VERY DIFFERENT IN EACH AREA . THE NORTH INDIA DISTRICT, INCLUDING VARANASI CITY , BELONGS IN THE TEMPERATE CLIMATE ZONE AND HAS THREE SEASONS WHICH ARE CLASSIFIED AS THE HOT SEASON: APRIL TO JUNE, WET SEASON: JULY

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HOSPITAL

• AREA ANALYSIS

PROVISION ADMINISTRATIVE UNIT

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Medical Supdt (M.S.)room with toilet	1	35
2	Dy/ Asstt. Medical Supdt. room with toilet	1	21
3	Admin Officer	1	21
4	Waiting room	1	21
5	Library cum Conference room	1	56
6	Nursing Officer’s room with toilet	1	31.5
7	Accounts Officer	1	14
8	Cashier	1	14
9	Purchase Officer	1	14
10	Clerical Staff	1	5.25/ staff
11	Reception cum Enquiries	1	28
12	Welfare/ Labour Officer	1	14
13	Stationery/Record	1	42
14	Security Officer	1	14
15	Lavatory for staff(Separate for male and female)	3	21

•PROVISION OF HOSPITAL STORE

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Receipt of stores (weighing, inspection)	1	28
2	Medical store	1	70
3	General store	1	56
4	Linen store	1	42
5	Furniture store	1	70
6	Surgical store	1	21
7	Equipment store	2	42
8	Areas for storage of mechanical transport spares	1	28
9	Area for storage of articles awaiting condemnation	1	17.5
10	Store office room with toilet	2	21
11	Office	1	10.5
12	Stationery store	1	10.5

•PROVISION OF TRANSPORT SERVICES

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Ambulance	6	42
2	Mortuary van	2	21
3	Tempo	4	42
4	Staff car	10	120

•PROVISION OF DIETARY UNIT

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Reception area	1	28
2	Cooking area	1	84
3	Therapeutic diet preparation and cooking area	1	21
4	Dietetion with toilet	1	14
5	Trolley loading	1	10.5
6	Walk in cold storage	1	10.5
7	Dry ration storage	1	14
8	Washing areas	1	55
9	Garbage collection area	1	14

•PROVISION OF BLOOD BANK

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Reception and waiting	1	30
2	Bleeding area	2	42
3	Donor’s rest room with kitchenette	2	42
4	Laboratory & blood storage area	1	21
5	Office	1	10.5
6	Stores	1	21
7	Bottle washing area	1	10.5
8	Lavatory	1	10.5
9	Doctor’s room with toilet	1	17.5

•PROVISION OF LAUNDARY UNIT

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Dirty clothes receiving and sorting area (with weighing facility)	2	42
2	Sluice and autoclaving machine area	2	56
3	Washing area	2	56
4	Hydro extractor area	2	56
5	Drying tumbler area	2	56
6	Calendaring machine Area	1	17.5
7	Tailor desk	2	21
8	Steam pressing	2	28
9	Manual press area	2	28
10	Clean clothes storage area	2	42
11	Issue area	1	17.5
12	Trolley bay	1	10.5
13	Store	2	21
14	Laundry supervisor office with toilet	1	14
15	Laundry staff room with toilet	1	21

•PROVISION OF MORTUARY

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Walk in cooler(to store)	1	21 (8 Bodies)
2	Post mortem area	1	17.5
3	Autopsy stores	1	14
4	Body wash and prayer room	1	14
5	Relative waiting area with toilet and drinking water facilities	1	35
6	Doctor’s office wit toilet	1	17.5
7	Staff room with toilet	1	17.5
8	Office	1	10.5
9	Stores	1	10.5
10	Janitors closet	1	3.5
11	Trolley bay	1	10.5

•PROVISION OF PATHOLOGY DEPT.

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
1	Reception and specimen collection/ distribution	1	42
2	Patients waiting area with toilet	1	42
3	Pathologist laboratory with toilet	5	51
4	Office and record	1	14
5	Technician’s room with toilet	1	14
6	Stores	3	42
7	Biochemistry	1	35
8	Microbiology with incubator	1	35
9	Media room	1	14
10	Clinical pathology and heamoto1ogy	1	28
11	Histology and cytology	1	14
12	Washing and sterilizing area	1	14
13	Janitors closet	1	3.5
14	Specimen disposal and sluice room	1	7.0

S.NO.	DEPARTMENT	TOTAL AREA (SQM.)
1	ADMIN BLOCK	394
2	HOSPITAL STORAGE	495.5
3	TRANSPORT SERVICES	225
4	DIETICIAN UNIT	287.3
5	LAUNDRY UNIT	595

•PROVISION OF O.T. DEPARTMENT

S.N0.	FACILITY	ROOM (NO)	AREA (SQM.)
	ZONE A		
1	OT reception bay	1	14
2	Relatives waiting room (including 2 toilets of 6sqm. each)	1	24
3	Officer-in-charge of OT with toilet	1	15
4	Doctor’s room change	1	17.5
5	Nurses room change	2	42
6	Technician change room	1	17.5
7	Class IV staff change room	1	14
8	Sterile storage area	2	14
9	Instrument and linen room	1	10.5
10	Trolley bay	1	10.5
11	Gas cylinder storage	1	10.5
12	Switch room	1	10.5
	ZONE B		
1	Fracture-cum Casualty theatre	1	28
2	Instrument sterilization	1	10.5
3	Scrub up	2	24
4	Dirty wash up	2	21
5	Plaster Preparation	1	10.5
6	Splint store	1	35
7	Pre-operative room with toilet	6	84
8	Recovery room	6	63
9	Nurses duty room	1	10.5
10	Theatre pack preparation room	1	17.5
11	Frozen section	1	21
12	X-ray with dark room	1	17.5
13	Pantry	1	14
	ZONE C		
1	Operation theatres (Major)	6	126
2	Operation theatres (Minor)	4	70
3	Instrument sterilization	3	10.5
4	Scrub up	3	10.5
5	Anaesthetist room	1	14
6	Anaesthetic storage	1	10.5
7	Anesthesia room	2	21
8	Doctor’s work room	1	21
9	Nurses work room	1	10.5
	ZONE D		
1	Dirty utility	3	10.5
2	Janitor’s closet	2	14

• PROVISION OF EMERGENCY BLOCK

S.NO.	FACILITY	ROOM (NO.)	AREA (SQM.)
1	Drive-in Ambulance unit(Reception,waiting,Trolley bay, PA System,police control, Special Woker room	1	150
2	Doctor’s Duity with Toilet	5	72
3	Doctor’s Lounge with Toilet	1	21
4	Medico legal Specimen And Record room	1	10.5
5	Brought in Dead Room	1	14
6	Retiring Room for Ambulance -drivers and support staff	1	17.5
7	ECG Room	1	14
8	Treatment Room	5	35
9	Operation Theatre Unit:-		
A	Operation Theatre	2	48
B	Instrument Sterilization	1	7
C	Scrub Up	1	21
D	Dirty Utility	1	7
E	Anesthesia Room	1	10.5
10	Resusciation Room	4	120
11	X-Ray Room with Dark Room	1	28
12	Clinical Laboratory	1	17.5
14	Blood Storage Area	1	10.5
15	Drug Dispensing Facility	1	10.5
16	Stores	1	14
17	Sluice Room & Janitor Closet	1	14
18	Nurses Station with Toilet	1	17.5
19	Observation room	3	42
20	Emergency Ward (A) 6 Bedded@1 (B) 4 Bedded@2 (C) 2 Bedded@2	3	335

S.NO.	DEPARTMENT	TOTAL AREA (SQM.)
1	MORTUARY	222
2	PATHOLOGY LAB	480
3	O.T	1055
4	EMERGENCY	1330

SANT KABIR MULTISPECIALITY HOSPITAL SHIVPUR VARANASI

S.N0.	FACILITY	AREA
1	TOTAL SITE AREA	24050SQM
2	TOTAL BUILT UP	38045SQM
3	PERMESIBLE GROUND COVERGAGE	35%
4	G.C.A	33%
5	F.A.R	1.5
6	MAX HEIGHT	20 M
7	ROAD AREA	3094SQM
8	GREEN AREA	3854SQM
9	HOSPITAL BLOCK COVERED	5466SQM
10	HOSPITAL BLOCK BUILTUP	21524SQM
11	ADMIN BLOCK BUILT UP	728SQM
12	CANTEEN BUILT UP	2008SQM
13	BLOOD BANK BUILT UP	280 SQM
14	MORTUARY BUILTUP	230 SQM
15	SERVICE BLOCK BUILTUP	2259 SQM

TOTAL AREA

SITE PLAN

SANT KABIR MULTI SPECIALITY HOSPITAL

SUBMITTED BY - ABHISHEK BANERJEE
GUIDED BY - AR. MOHIT SACHAN
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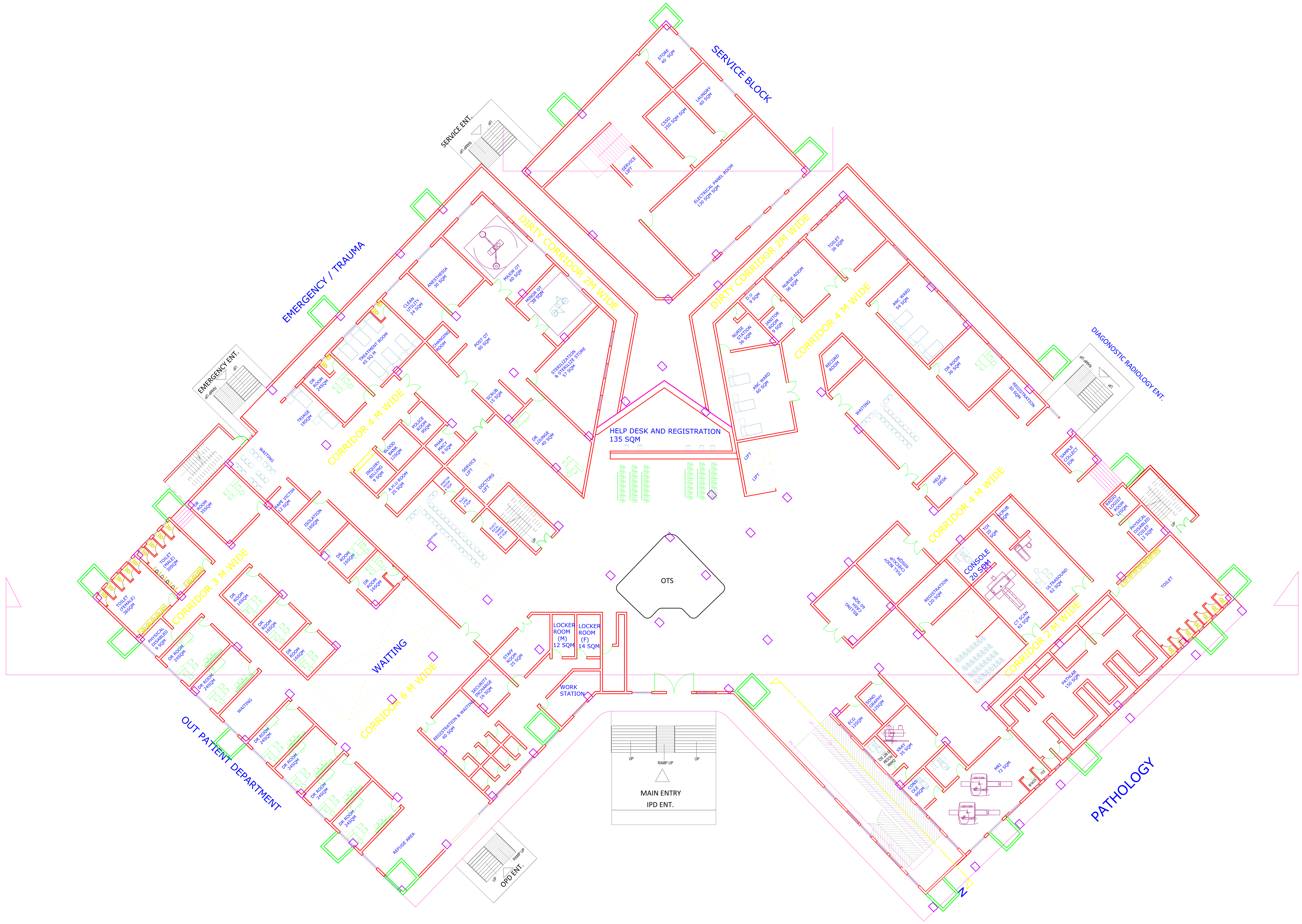
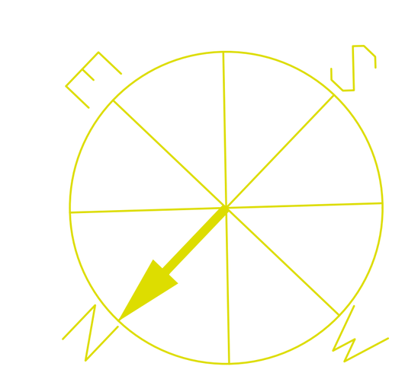


GROUND FLOOR PLAN

NORTH



S A N T

K A B I R

M U L T I

S P E C I A L I T Y

H O S P I T A L

GUIDED BY - AR. MOHIT SACHAN	
SUBMITTED BY - ABHISHEK BANERJEE	
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B B D UNIVERSITY	

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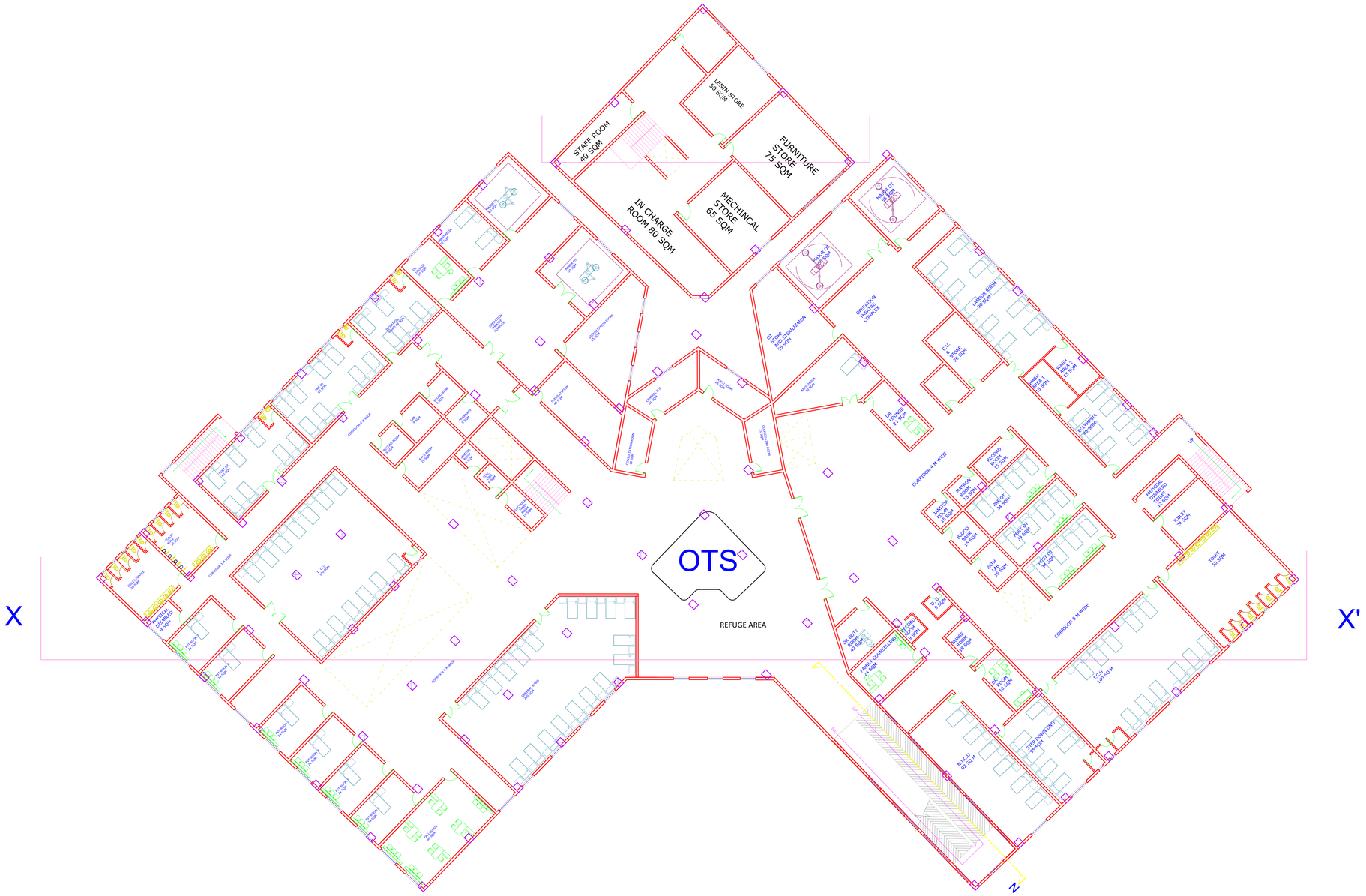

FIRST FLOOR

NORTH

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SUBMITTED BY - ABHISHEK BANERJEE
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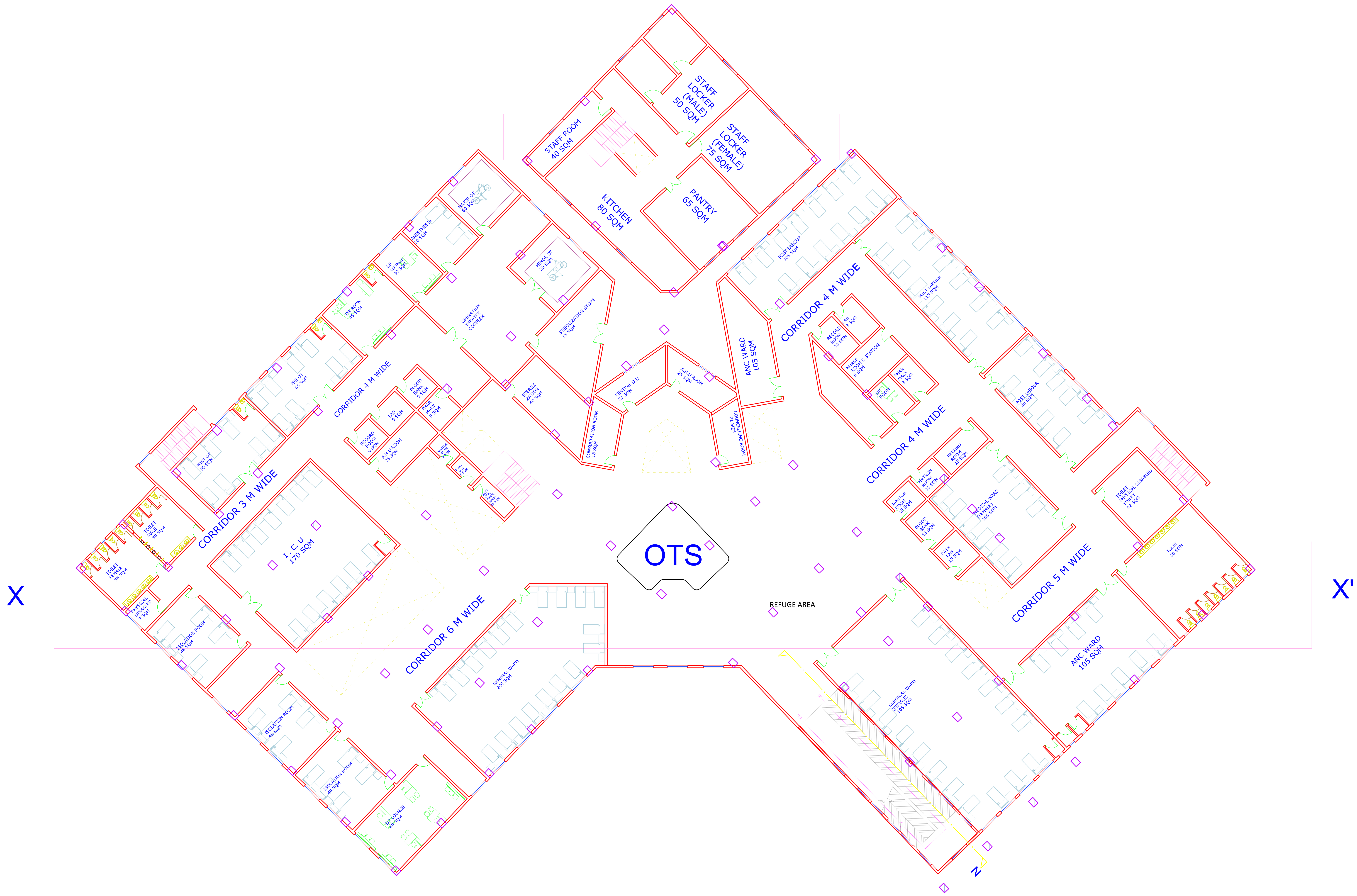
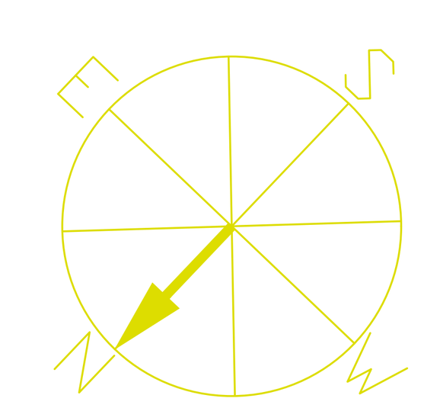


SECOND FLOOR

NORTH



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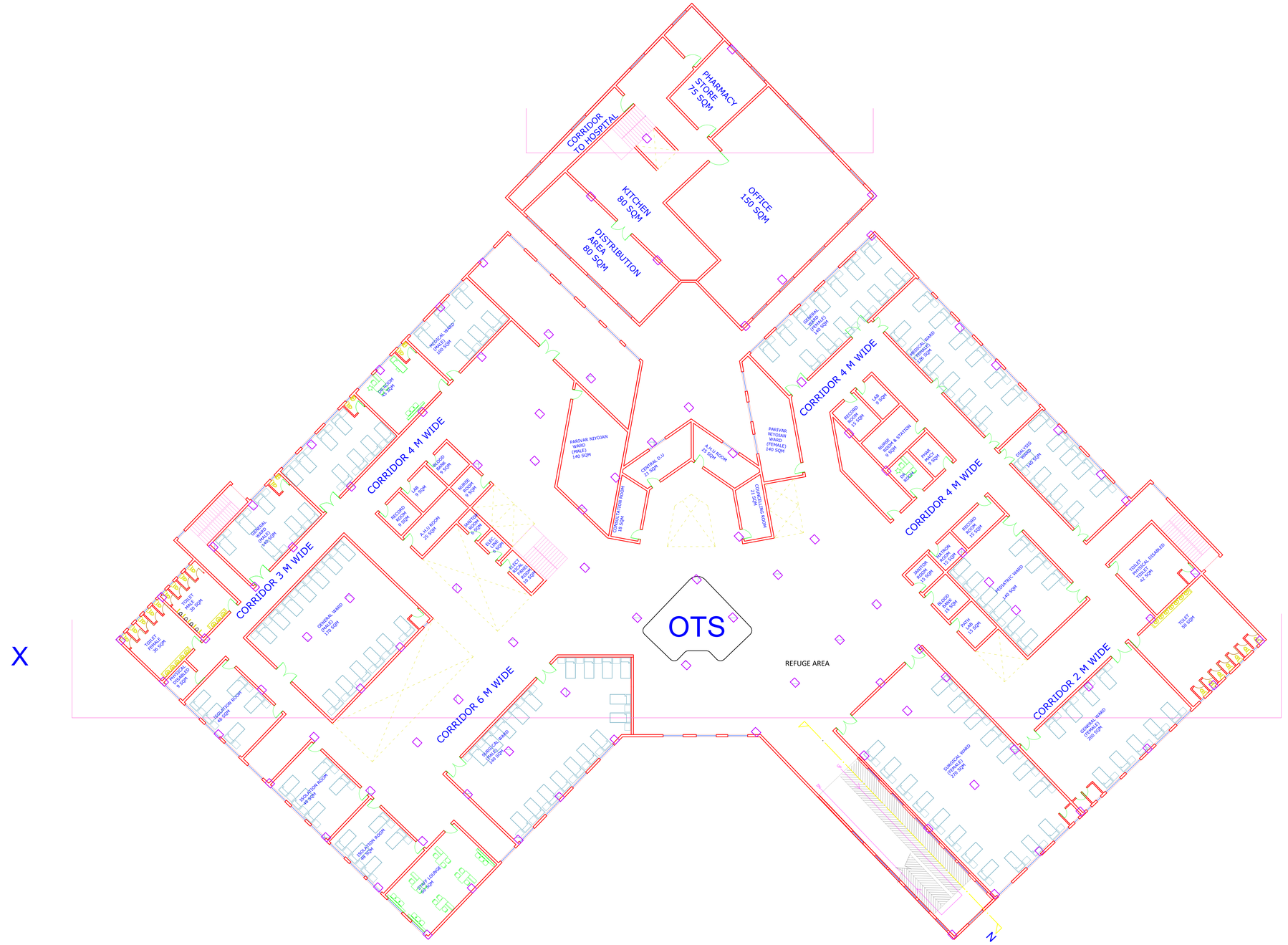

THIRD FLOOR

NORTH

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SUBMITTED BY - ABHISHEK BANERJEE
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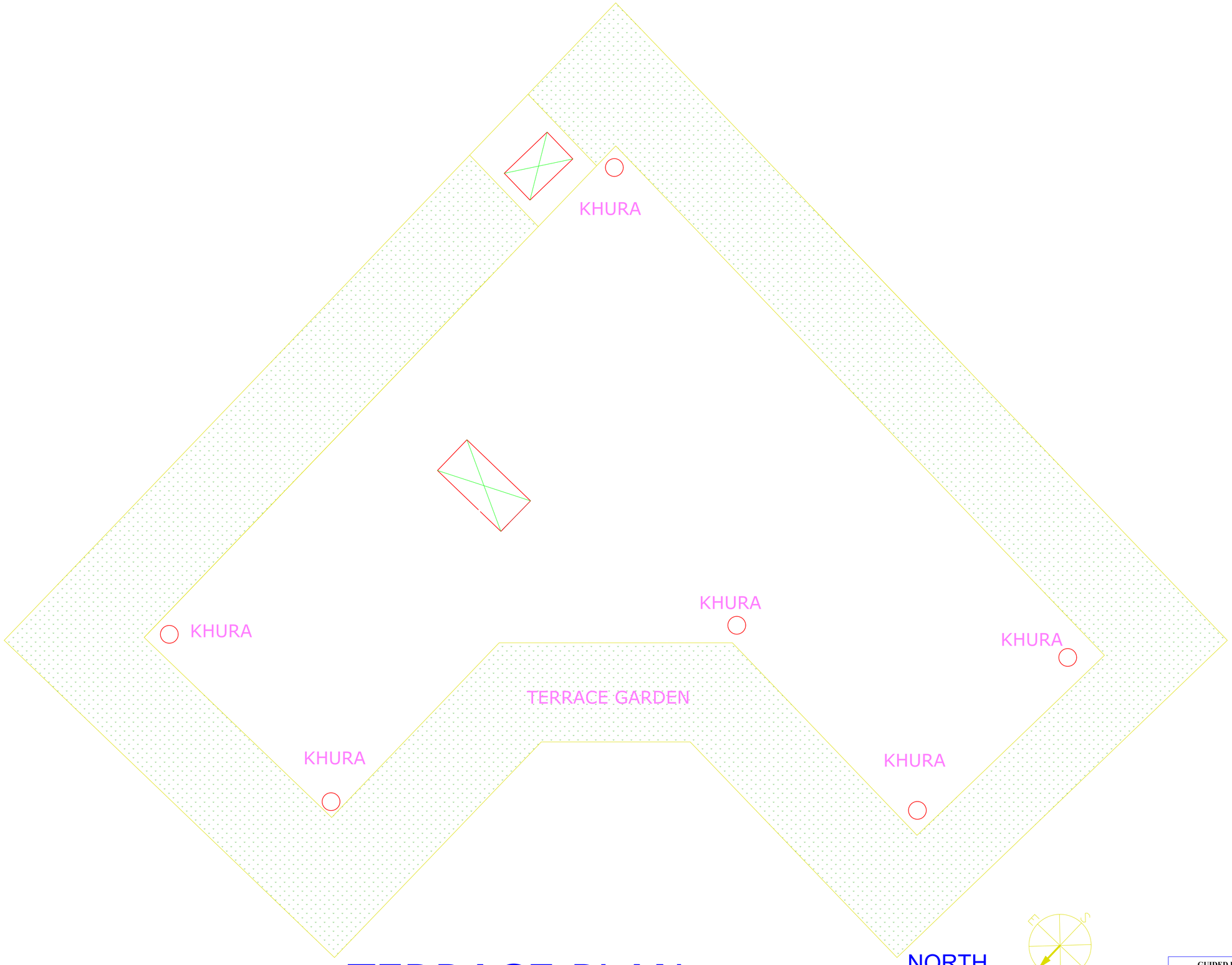

TERRACE PLAN

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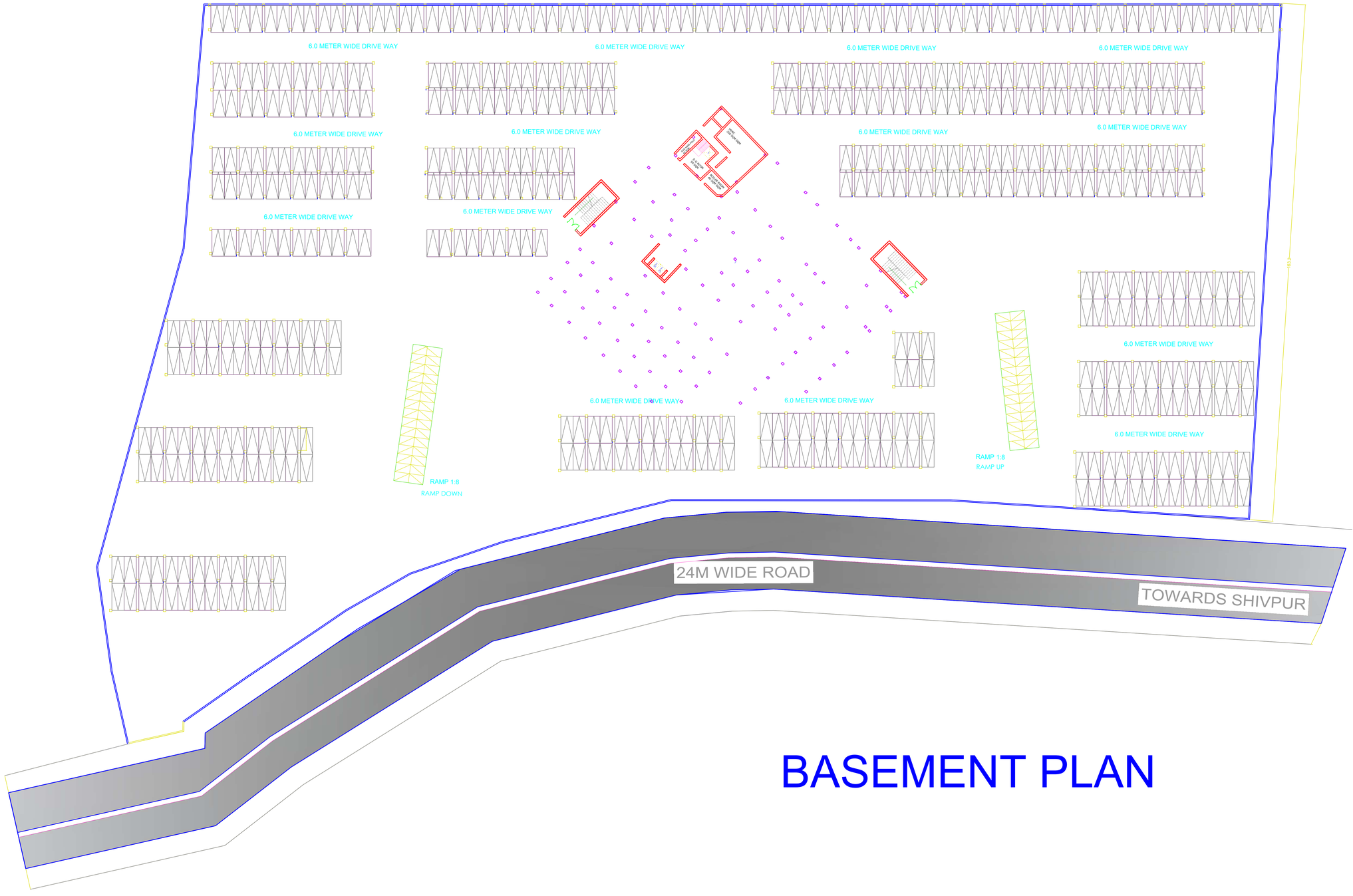

BASEMENT PLAN

SANT KABIR MULTI SPECIALITY HOSPITAL

SUBMITTED BY - ABHISHEK BANERJEE
GUIDED BY - AR. MOHIT SACHAN
B. ARCH. (5th YEAR)
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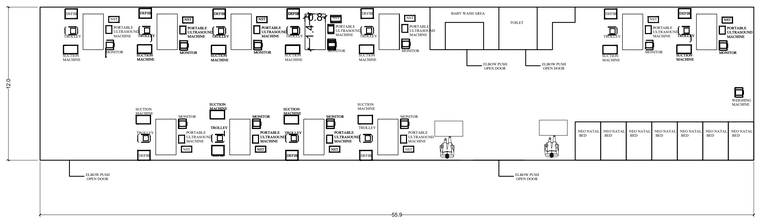
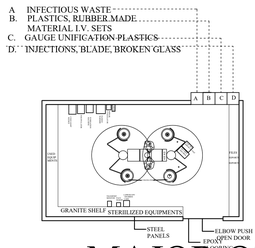
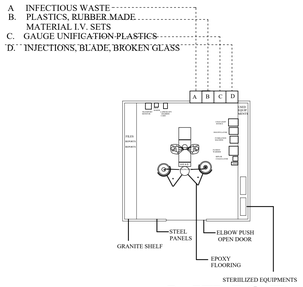


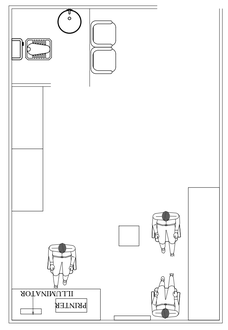
LABOUR ROOM



MAJOR OT



MINOR OT



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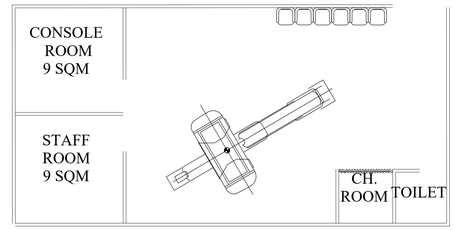
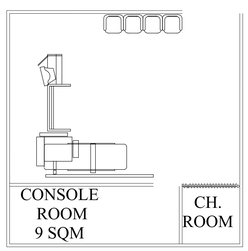
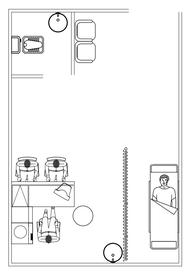


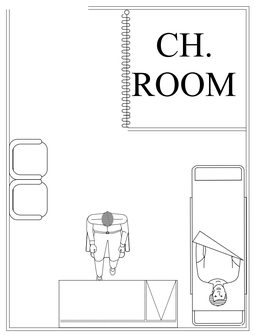
C T SCAN ROOM



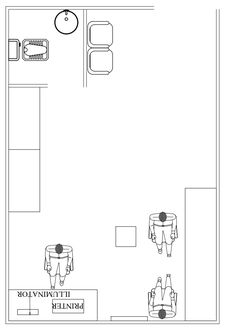
X-RAY ROOM



DOCTOR ROOM



SONOGRAPHY ROOM



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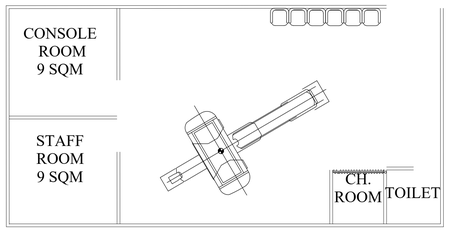

C T SCAN ROOM

NORTH

GROUND FLOOR PLAN

GUIDED BY - AR. MOHIT SACHAN
SUBMITTED BY - ABHISHEK BANERJEE
B. ARCH. (5th YEAR)
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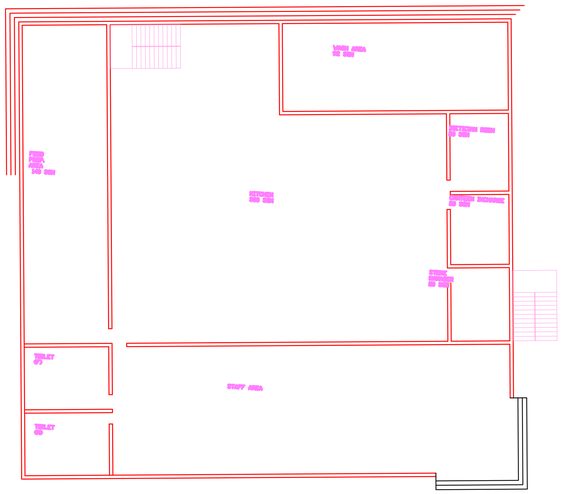
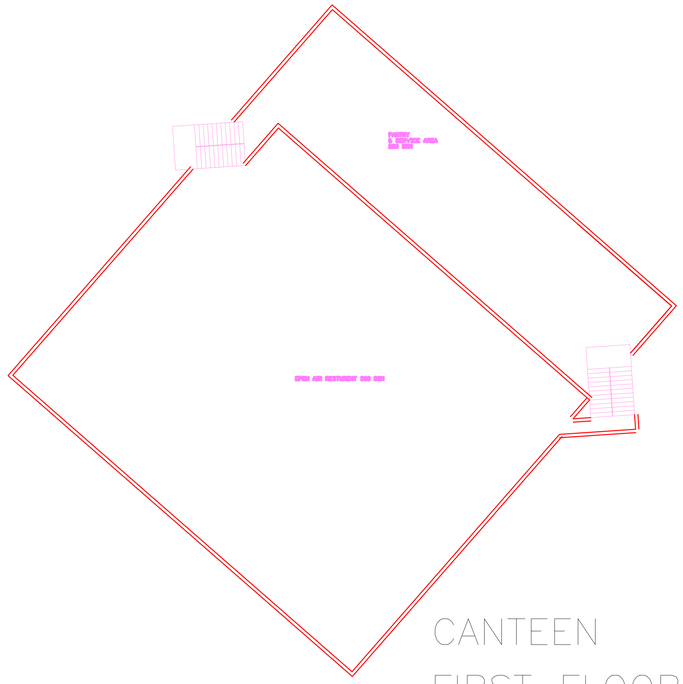
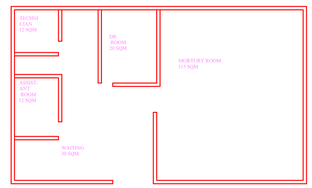


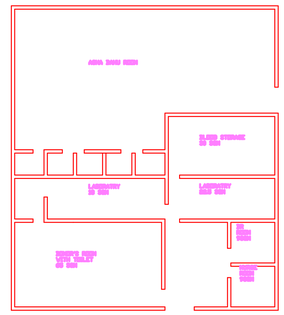
CANTEEN
GROUND FLOOR PLAN



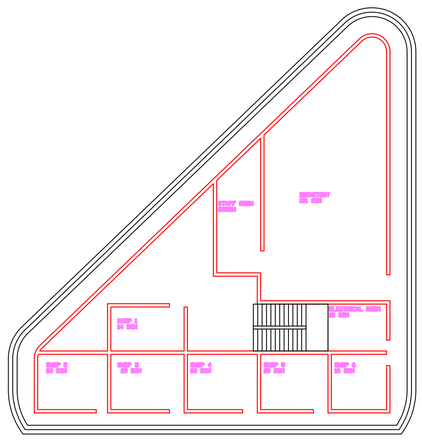
CANTEEN
FIRST FLOOR PLAN



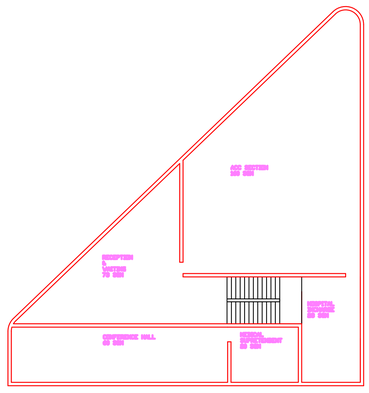
MORTUARY
FLOOR PLAN



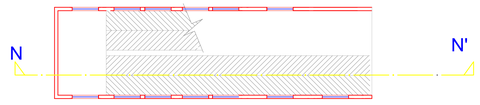
BLOOD BANK



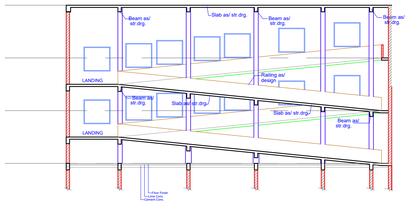
ADMIN BLOCK
GROUND FLOOR PLAN



ADMIN BLOCK
FIRST FLOOR PLAN



PLAN



SECTION

NORTH

GROUND FLOOR PLAN

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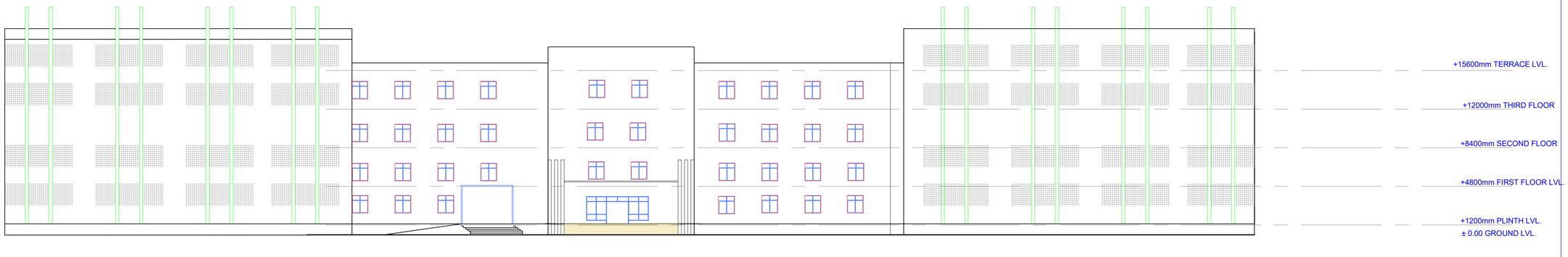
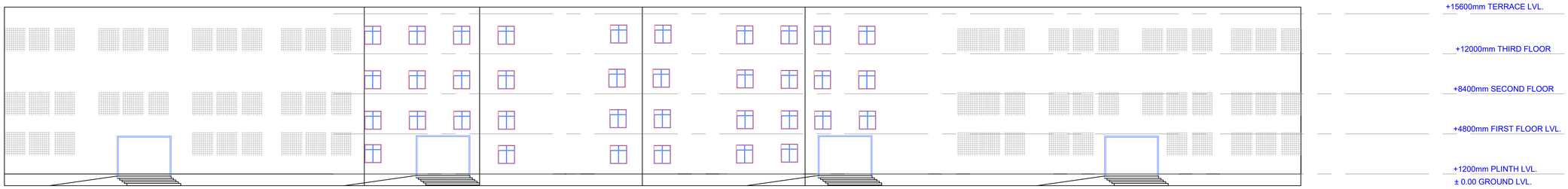


ELEVATION FRONT



REAR ELEVATION

NORTH

GROUND FLOOR PLAN

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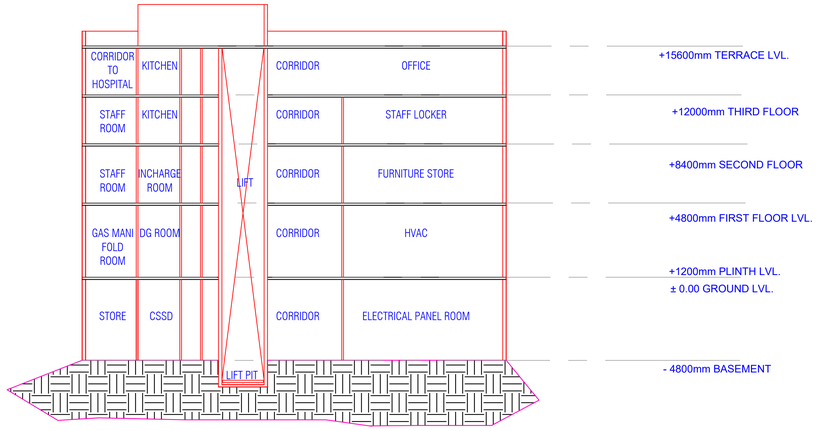

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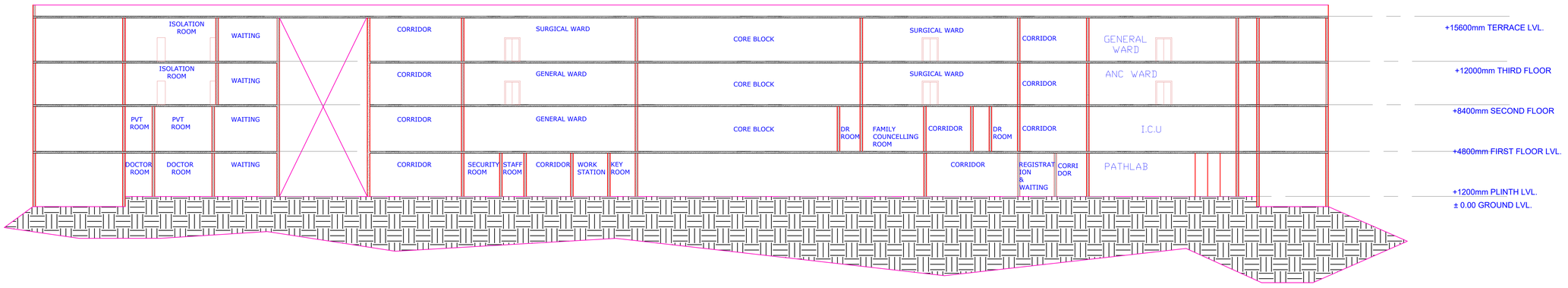

SECTION XX'

NORTH

GROUND FLOOR PLAN

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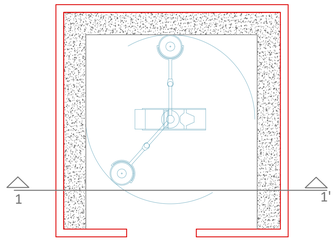
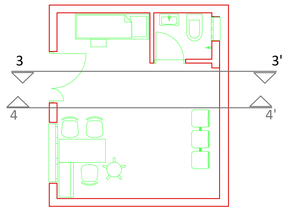
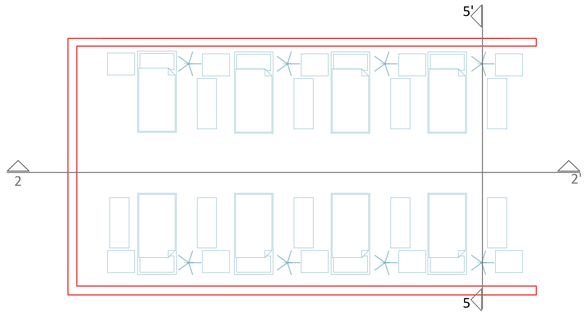


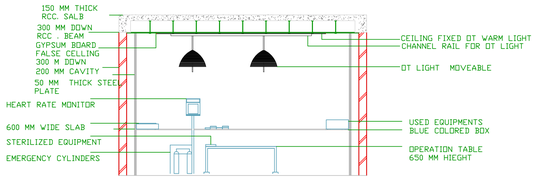
OPERATION THEATER



GENERAL
OPD



WARD



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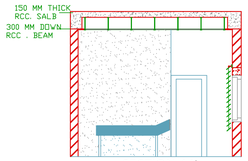
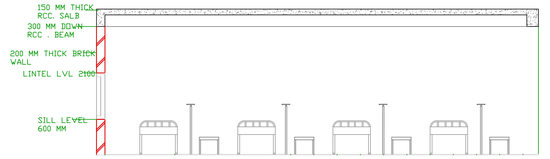
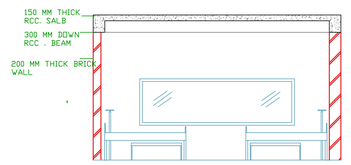


SECTION 44'



SECTION 22'



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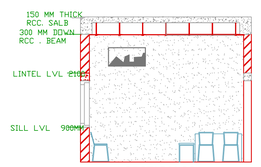

SECTION 33'

INTERIOR DETAIL

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GUIDED BY - AR. MOHIT SACHAN
B. ARCH. (5th YEAR)
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LEGEND	LEGEND	LEGEND
	AZATIRATITA INDICA	NEEM TREE
	AZATIRATITA INDICA	NEEM
	DELONIX REGIA	GULMOHAR
	DELONIX REGIA	BANYAN TREE
	BUTEAMONOSPERMA FRINDOSA	PALAS
	SETCREASEA PURPUREA	PURPLE HEART
	CASSIA FISTULA	AMALTAS

LANDSCAPE PLAN

SANT KABIR MULTI SPECIALITY HOSPITAL

SUBMITTED BY - ABHISHEK BANERJEE
GUIDED BY - AR. MOHIT SACHAN
B. ARCH. (5th YEAR)
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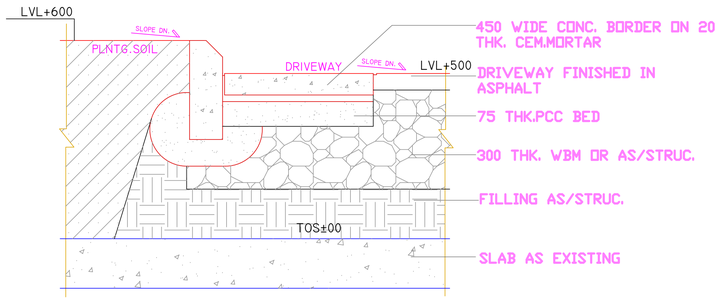
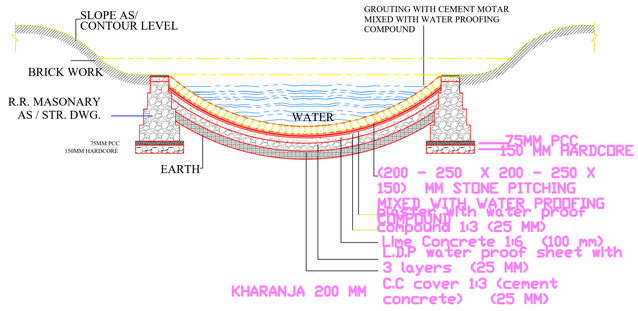
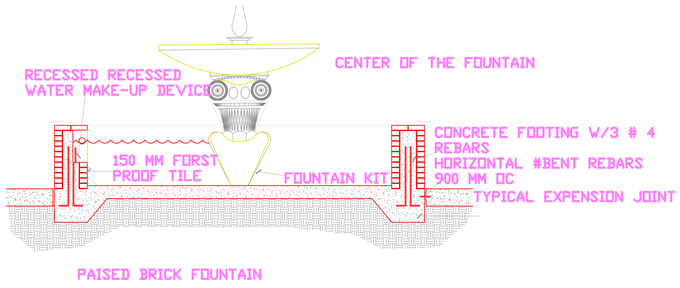
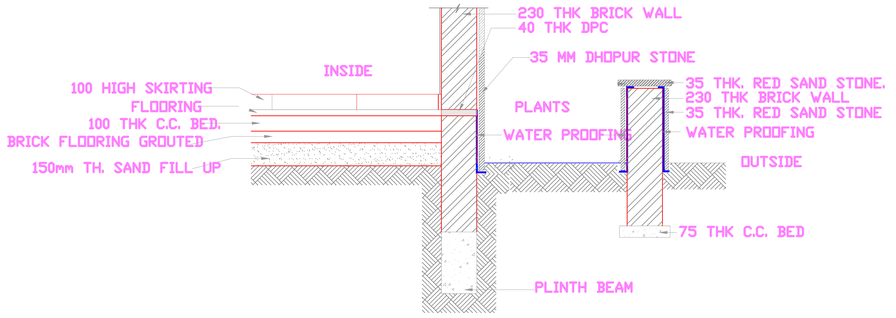


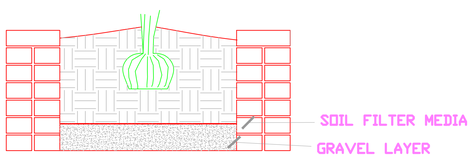




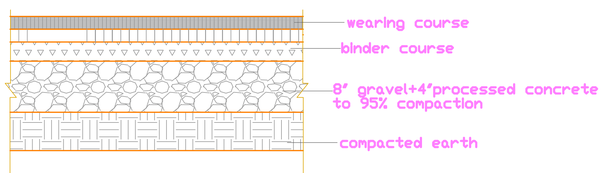
PAISED BRICK FOUNTAIN



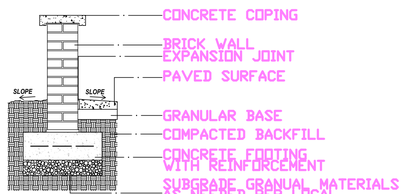
PLANTING DEATIL 1



PLANTING DETAIL 2



ROAD DETAIL



FREE STANDING WALL AT PERIPHERY

LANDSCAPE DETAIL

SANT KABIR MULTI SPECIALITY HOSPITAL

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TOTAL AREA

ARCHITECTURAL THESIS 2019-20	Roll no. 1150101004	THESIS GUIDE AR.MOHIT SACHAN	BBDU SCHOOL OF ARCHITECTURE	Submitted by ABHISHEK BANERJEE B.ARCH X SEMESTER

HOSPITAL

THANKYOU