

GENERAL HOSPITAL

A THESIS

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

By

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DEPARTMENT OF ARCHITECTURE
SCHOOL OF BUILDING AND ENVIRONMENT

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY) Accredited

With Grade "A" by NAAC

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CHENNAI - 600 119

NOVEMBER 2021



DEPARTMENT OF ARCHITECTURE

BONAFIDE CERTIFICATE

This is to certify that this Thesis Report is the bonafide work of Reagan Raju (37210027) who carried out the Thesis entitled "General Hospital" under our supervision from July 2021 to November 2021.

A handwritten signature in black ink, appearing to read 'Catherine', is placed above the name of the Internal Guide.

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Internal Review Member
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Submitted for Viva voce Examination held on _____

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DECLARATION

I, **Reagan Raju** declare that the Thesis Report entitled “**General Hospital**” done by me under the guidance of **Ar.Catherine**(Internal Guide),**Ar.R.Vijendranath**(Internal Review Member) and **Ar.V.Sp.Sakthivel Raja**(External Guide) Sathyabama Institute of Science and Technology is submitted in partial fulfilment of the requirements for the award of Bachelor of Architecture Degree.

DATE: 06-12-2021

PLACE: Chennai



SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **Sathyabama Institute of Science and Technology** for their kind encouragement in doing this Thesis and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr.DevyaniGangopadhay**, Dean and Head of the Department, School of Building and Environment, Our Design Chair**Dr.Suresh Kuppuswamy**, Thesis Coordinator**Ar.SuryaRajkumar** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Thesis Internal guide **Ar.Catherine**, Internal Review member **Ar.R.Vijendranath** and External Guide **Ar.V.Sp.Sakthivel Raj** at their guidance, suggestions and constant encouragement which paved the way for the successful completion of my Thesis work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Architecture** who were helpful in many ways for the completion of the Thesis.

Reagan Raju

THESIS SYNOPSIS

The main aim of the project is to propose a general hospital in outskirts of Chennai in Thirumazhisai, as the proposal of THHB housing is on process. The site is chosen near to EVP filmcity, school, collage, Queensland. The site is chosen on NH48 and for easier transportation bus stand is in front of the site and metro is also proposed near by the site. Proposing a general hospital is more needed in this location as the population is settling on the outskirts and this hospital can also be the identity of the place.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Hospital is a healthcare institute providing treatment for the patients with specific medical and nursing staff and medical equipment. This is a building that is built, staffed and equipped for diagnosis of disease for treatment both medical and surgical for the sick and injured.

1.2 NEED OF THE PROJECT

A general hospital with 200 beds and the emergency care is mainly required in this location. The site is chosen on NH 48. This design proposal will benefit the area and help to rescue people who went into accidents as there is no emergency care hospital in this locality and also in case of emergency from industry as this is an industrial zone and schools and colleges. As the Chennai city expands the next main area that is focused is Thirumazhisai.

1.3 AIM

To propose a general hospital in outskirts of Chennai city where the population is settling down.

1.4 OBJECTIVE

To build a barrier free design, appropriate and eco-friendly design.

1.5 DEVELOPMENTS

- TNHB housing is under construction in a huge scale.
- Metro extension is planned.
- Express high-way is also planned.
- Government has also planned a bus-terminus and a market is also planned to be proposed by the government.

CHAPTER 2

LITERATURE CASE STUDIES

2.1 CASE STUDY 1

Fortis Memorial Research Institute, Gurgaon

Name of the Project: Fortis memorial research institute

Architect: Ar.Rajinder Kumar

Location: Gurgaon

Capacity: 380Beds

General Care Beds: 250 Beds

Intensive Care Beds: 100 Beds

OPD: 80 Beds

Site Area: 43,303 sq.m

FAR: 1.52

Ground Coverage: 65,961sq.m

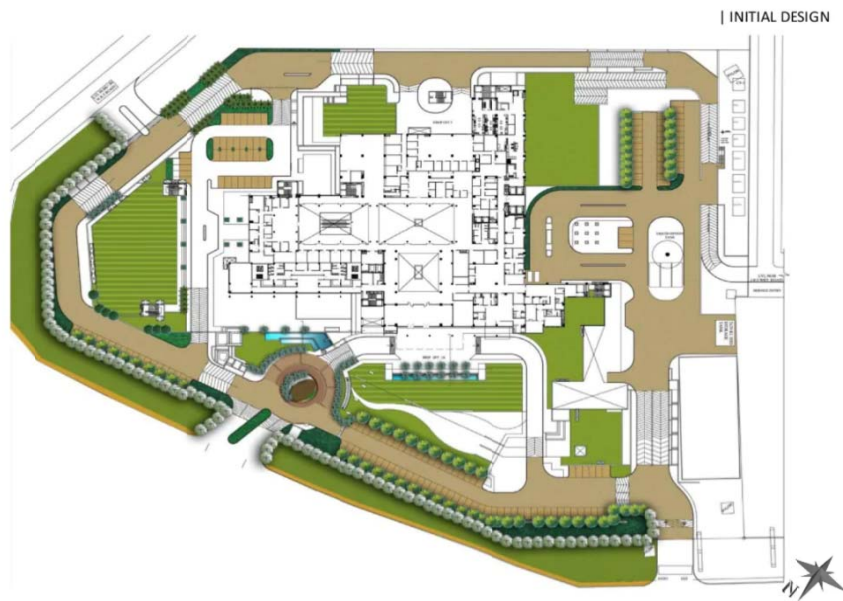


Fig2.1.1 Fortis Memorial Research Institute Site Plan

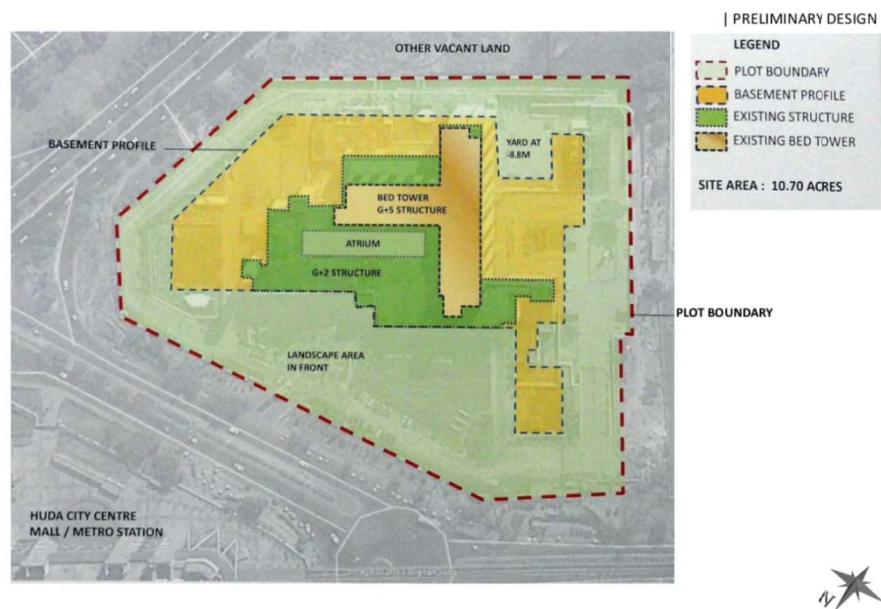


Fig2.1.2 Fortis Memorial Research Institute Building Profile

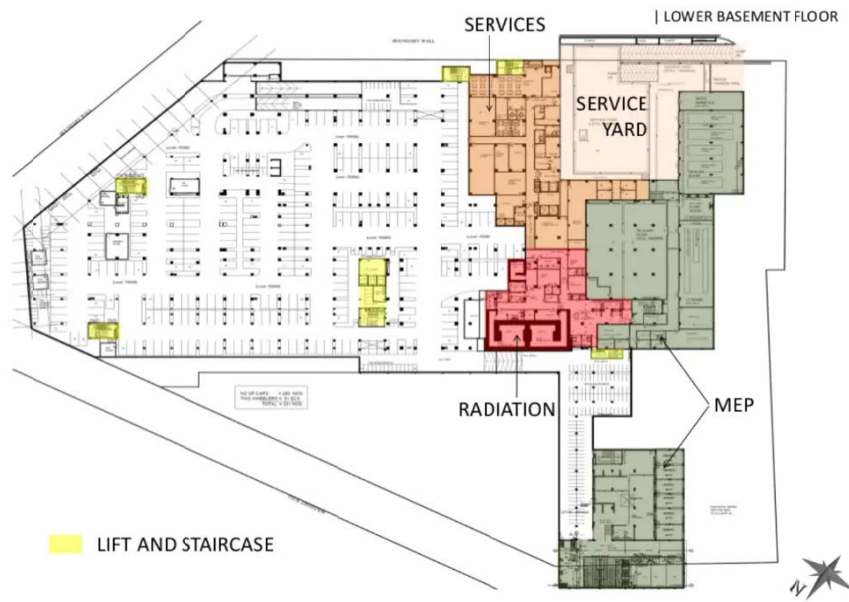


Fig2.1.3 Fortis Memorial Research Institute Lower Basement Plan

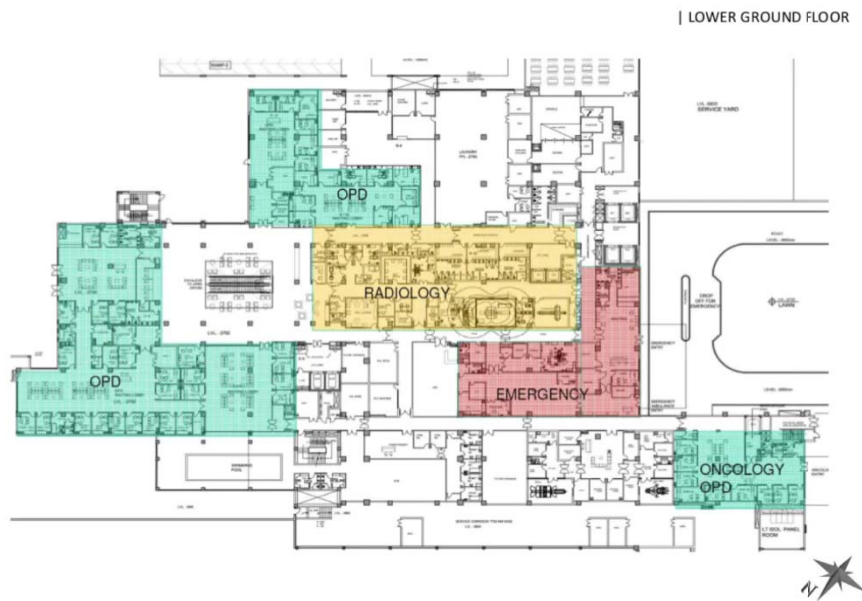


Fig2.1.4 Fortis Memorial Research Institute Lower Ground Floor



Fig2.1.5 Fortis Memorial Research Institute Upper Ground Floor

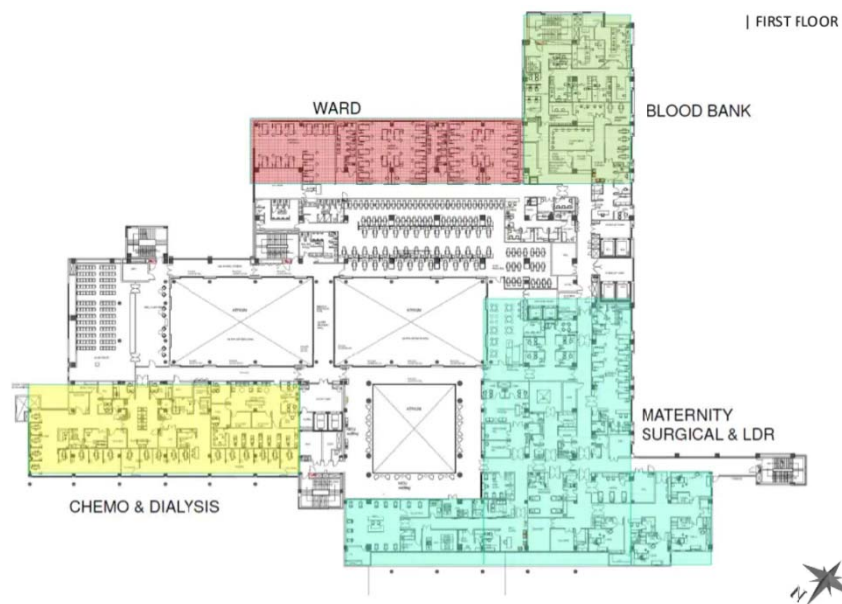


Fig2.1.6 Fortis Memorial Research Institute First Floor

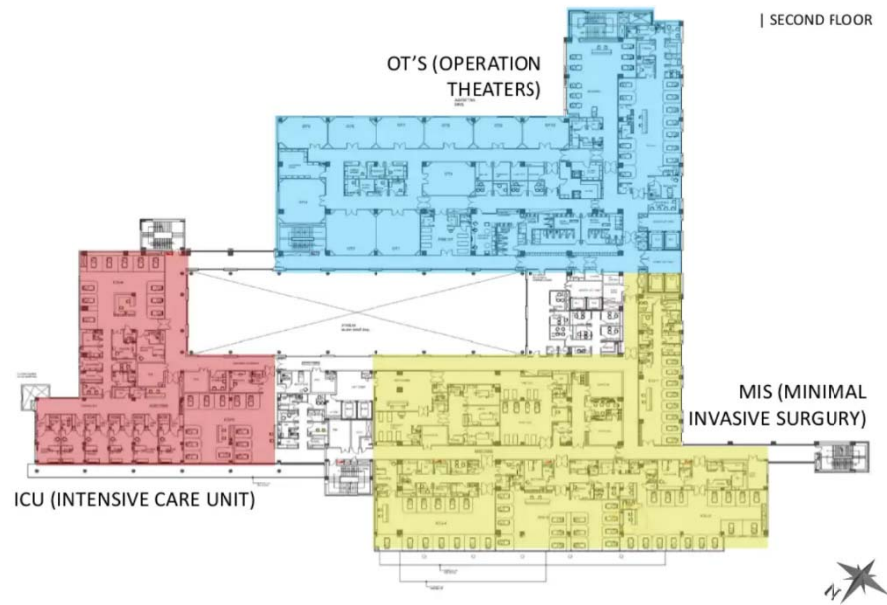


Fig2.1.7 Fortis Memorial Research Institute Second Floor

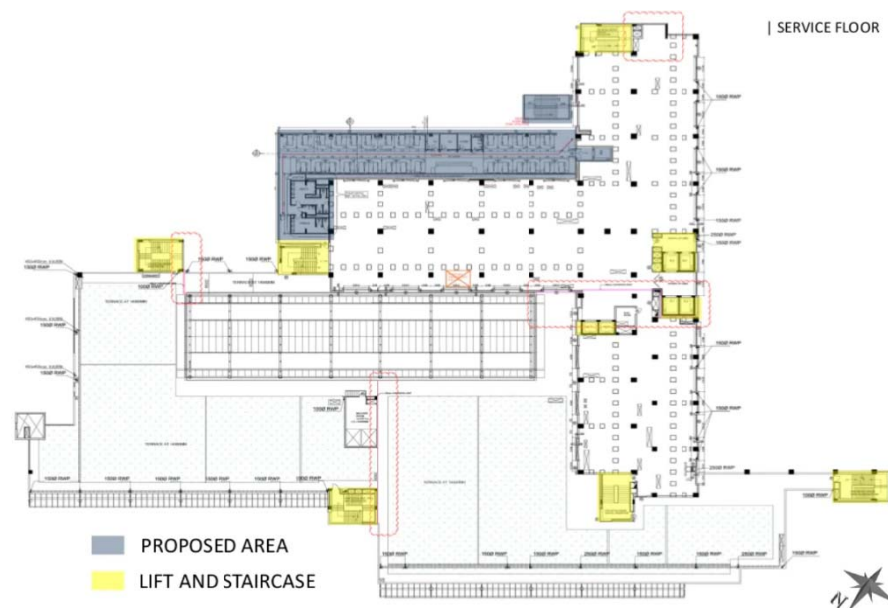


Fig2.1.8 Fortis Memorial Research Institute Service Floor

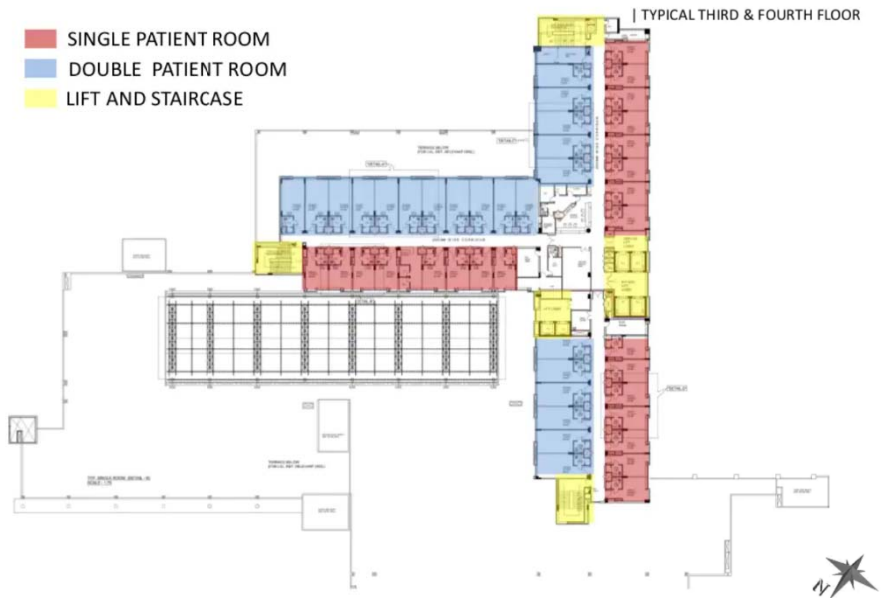


Fig2.1.9 Fortis Memorial Research Institute Typical Third &Forth Floor

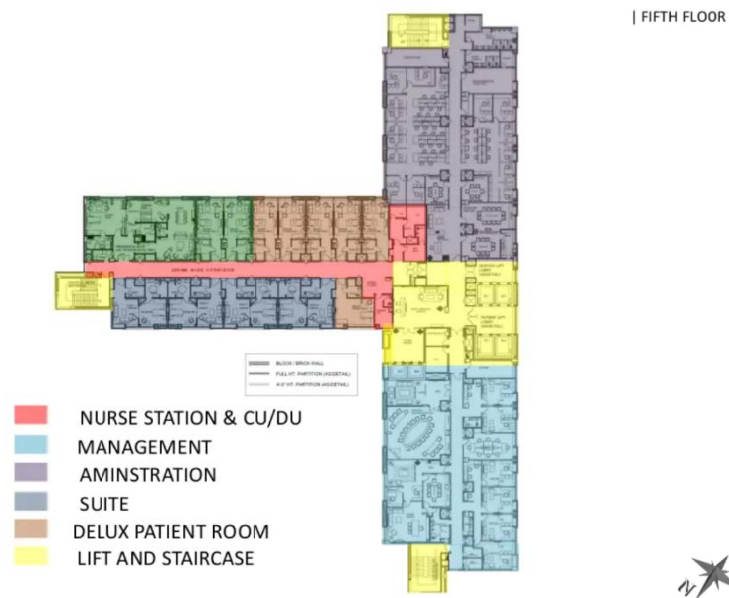


Fig2.1.10 Fortis Memorial Research Institute Fifth Floor

2 DY 2

Rock land Hospital, New Delhi.

Name of the Project: Rock land Hospital

Architect: Ar.Anil Yadav

Location: New Delhi

Capacity: 150 Beds

Site Area: 3,360 sq.m

FAR: 1.8

Ground Coverage: 45%

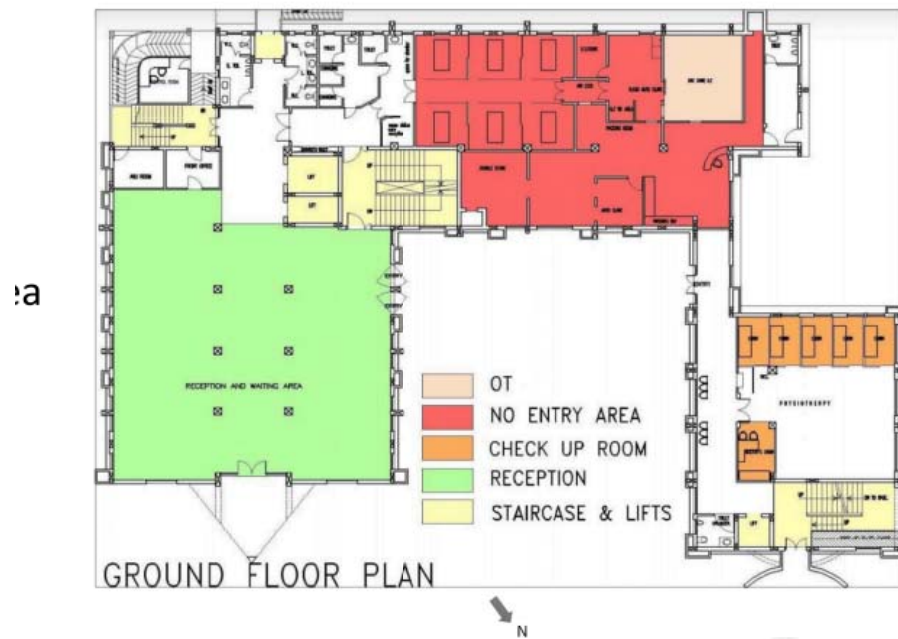


Fig2.2.1 Rock land Hospital Ground Floor

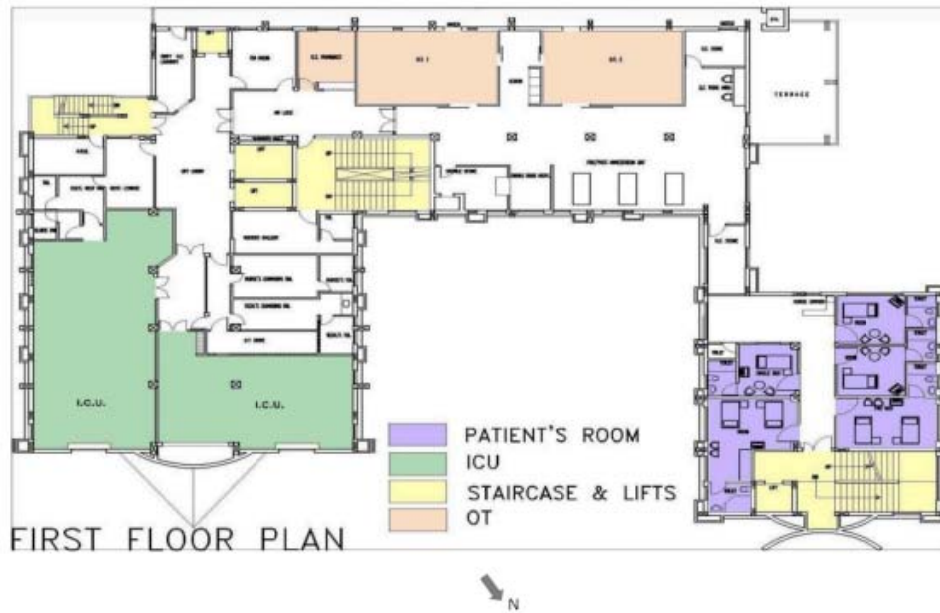


Fig2.2.2 Rock land Hospital First Floor



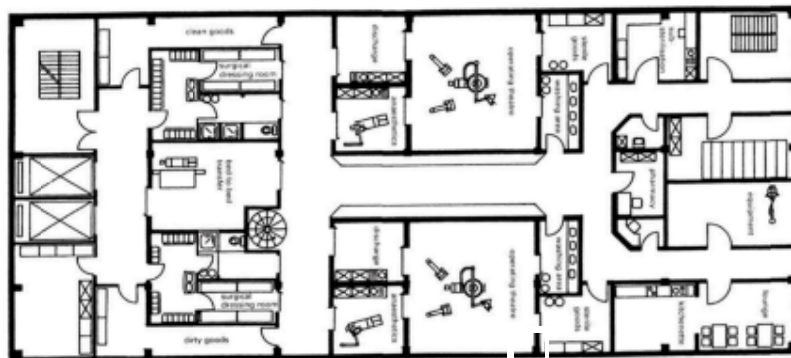
Fig2.2.3 Rock land Hospital Second & Third Floor



CHAPTER 3

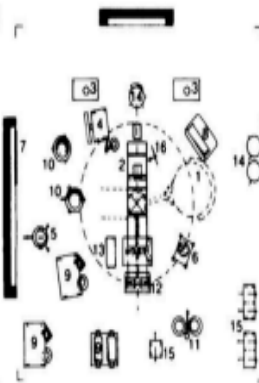
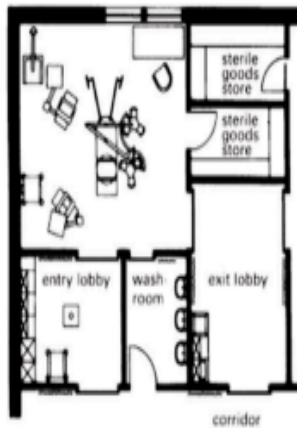
DATA COLLECTION AND STANDARDS

MAIN SURGICAL ROOM



OT

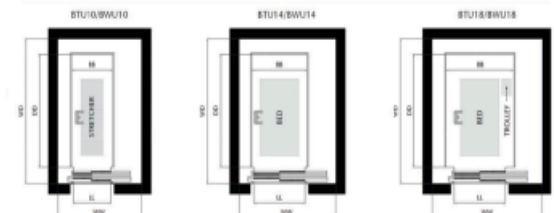
SURGICAL OT



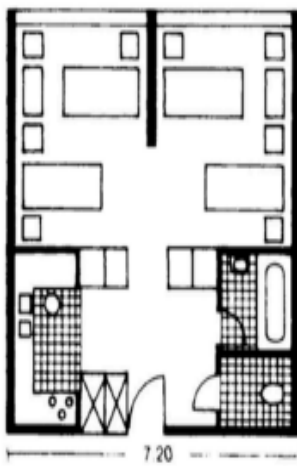
- 1 overhead operating lamp
- 2 operating table with fixed base
- 3 wall or ceiling pendulum
- 4 anaesthesia equipment
- 5 dish stand with heater
- 6 electric suction pump
- 7 X-ray display box
- 8 anaesthesia table
- 9 instrument table
- 10 waste bin, used instrument container
- 11 dish stand without heater
- 12 suturing materials table
- 13 operating steps
- 14 swivel stool for surgeon
- 15 drum stand
- 16 infusion stand

LIFT

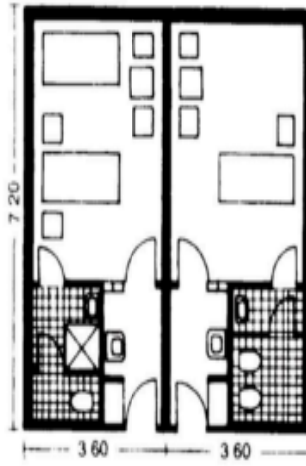
KONE Bed Elevator - MRL							
Capacity	Number of Persons	Rated Load (kg)	Car Internal dimensions (mm)		Clear Opening (mm)	Handway Internal dimensions for Side Opening Door (mm)	
			BB	DD	LL	WW	WD
BWU10	15	1020	1000	2400	800	1625	2850
					900	1700	2850
BWU14	20	1360	1300	2400	1000	2000	2850
					1100	2025	2850
					1200	2175	2850
BWU18	26	1768	1600	2400	1000	2300	2850
					1100	2300	2850
					1200	2300	2850



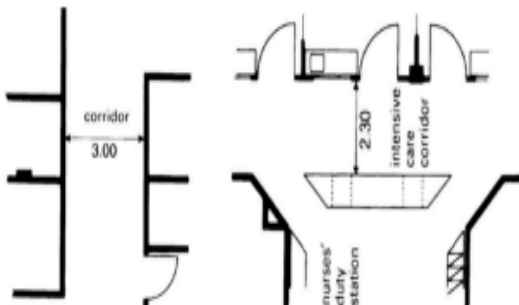
4 BEDS ROOMS



SINGLE & DOUBLE ROOMS

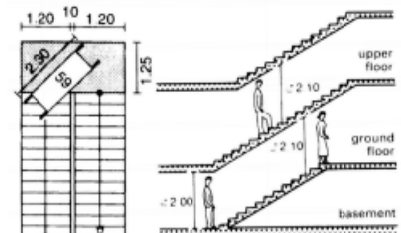


CORRIDOR WIDTH

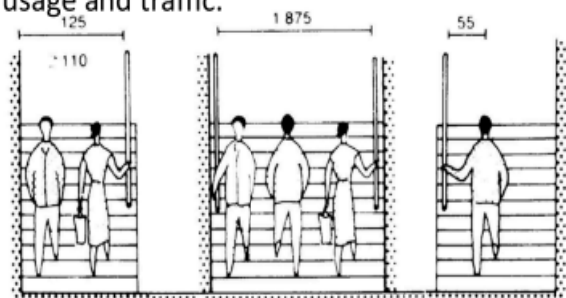


STAIRCASE

Doors to the staircase must be in the way to escape.
Width 1.5m - 2m



Dimensions of staircase according to the usage and traffic.



PARKING

Hospitals and Nursing Homes

	(A) Corporation or Municipal Areas	(B) Panchayat Areas
Floor Area	Number of Spaces	Number of Spaces
Upto 3000sqm	1 car space and 1 Two wheeler space for every 50sq.m or part thereof	1 car space and 1 Two wheeler space for every 100sq.m or part thereof
Above 3000sqm	1 car space and 1 Two wheeler space for every 75sq.m or part thereof	1 car space and 1 Two wheeler space for every 150sq.m or part thereof

Driveway:

The driveway width shall be 3.0m for one-way movement and 6.0m for two-way movement.

Aisle Widths:

Aisle is a access lane leading to/abutting the individual parking lot within a parking facility. The aisle widths for different types of parking shall be:

Vehicle Type	Parallel Parking	All angles up to 60°	Angles above 60° & Perpendicular parking
Two Wheeler	1.5m	1.5m	1.5m
Car	3.0m	3.0m	4.5m.
LCV/Truck/Bus	7.0m	7.0m	10.0m

The width of the driveway and the aisle shall be free from kerb and other encumbrances.

(D) Width Entry and Exit Gates

The width of entry or exit gates shall be a minimum of 3.0m

(E) Gradient

Slope of parking spaces shall be not more than 4% in any direction.

(F) Turning Radius

Sufficient turning radius shall be provided for adequate manoeuvring of vehicle

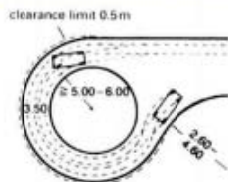
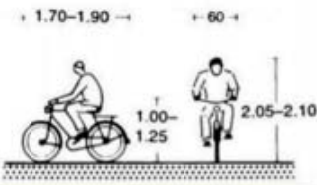
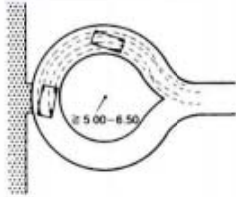
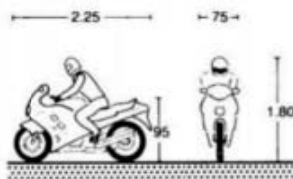
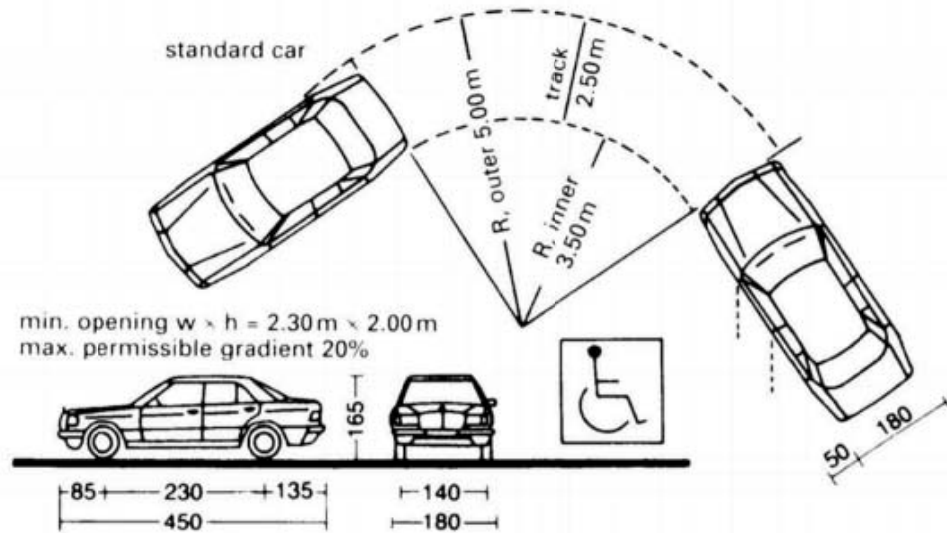
(G) Ramps

The minimum clear width of the ramps shall be 3.0 m for one-way movement and 6.0m for two-way movement. Gradient shall not be steeper than 1 in 8.

Parking for differently-abled

For parking of vehicles of differently-abled people, the following provisions shall apply:

- Surface parking for two car spaces shall be provided near entrance for the physically differently-abled persons with maximum travel distance of 30m. from building entrance.
- The width of parking bay shall be minimum 3.6 meter.
- The information stating that the space is reserved for wheel chair users shall be conspicuously displayed.
- Guiding floor materials shall be provided or a device, which guides visually impaired persons with audible signals, or other devices, which serves the same purpose, shall be provided.



Double row	∠	Single row
	30°	
	45°	
	60°	
	90°	



CHAPTER 4

SITE STUDY AND ANALYSIS

4.1 SITE DETAILS

- Site is located in PalanjurThirumazhisai.
- Total plot area is 9.6 acre and it is on the national high-way 48.
- FSI in the location is 2.
- OSR=10%

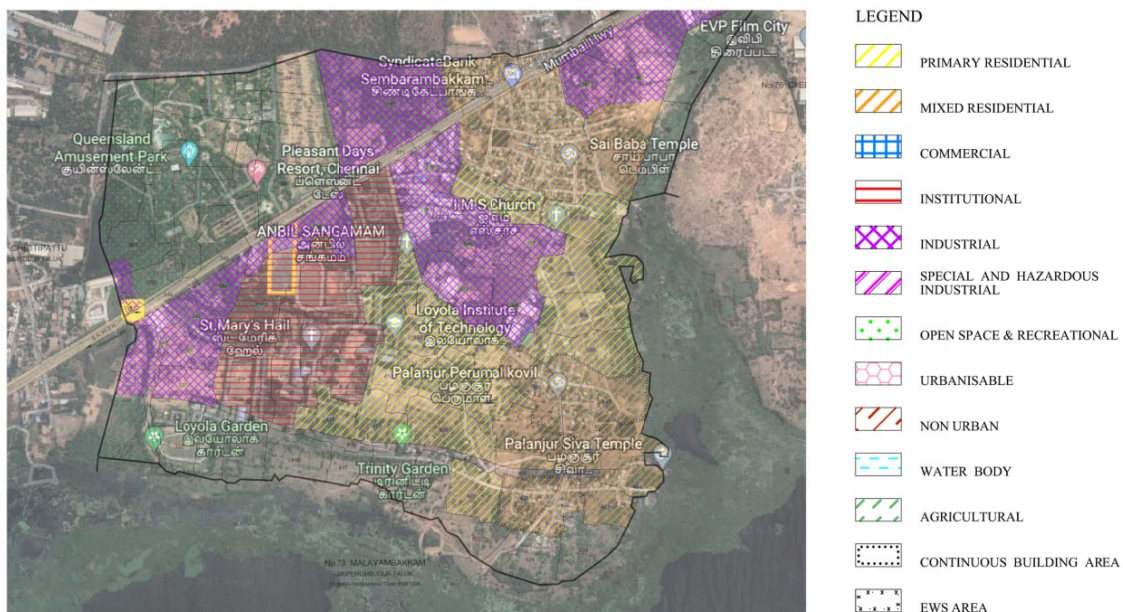


Fig4.1.1Land Use Map

4.2 Site Analysis

SWOT Analysis

STRENGTH

- Located on national highway.
- Developing sub-urban area.
- Traffic free area.
- Easily accesble to the upcomming developments.
- Bus stand in front of the site to more easier transportation.

Weakness

- There is always movement of heavy vehicles.
- Has a chance to be flooded during heavy rain.

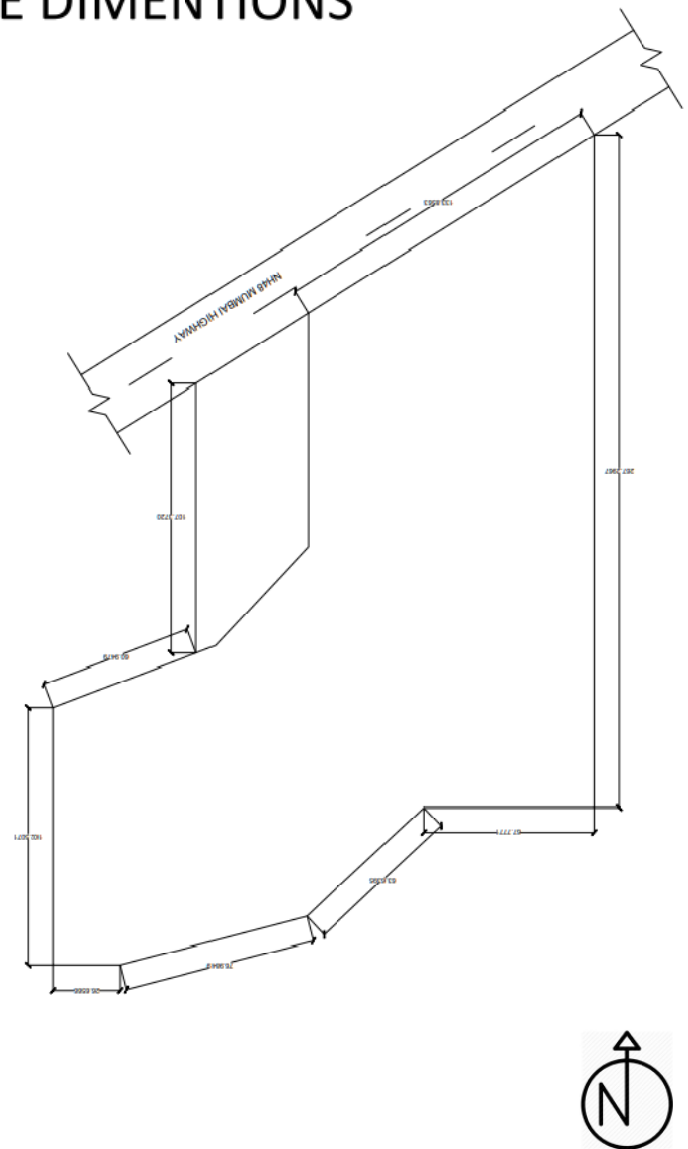
OPPORTUNITES

- As there is no hospitals this may help to provide medication to the population in that location and victims in accidents.
- This can also help in employment to the EWS groups in upcomming TNHB.

THREATS

- Heavy vehicles might cause vibrations.
- Floods during heavy rain.

SITE DIMENTIONS



4.3 SITE ANALYSIS

A general hospital with 200 beds and the emergency care is mainly required in this location. The site is chosen on NH48. As the Chennai city expands the next main area that is focused is thirumazhisai.



Fig 4.3.1 Site Front View

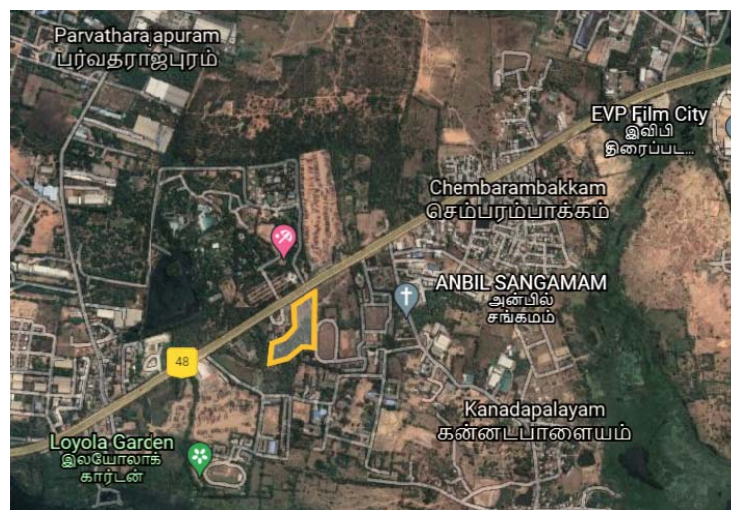


Fig 4.3.2 Site Location Map

CHAPTER 5

ARCHITECTURAL DESIGN

5.1 SPATIAL REQUIREMENTS

GROUND FLOOR				
SL NO		DIMENTION	NUMBER OF ROOMS	TOTAL AREA IN Sqm
1	NURSE STATION 1	5 X 2.2	1	11
2	TRIAGE	8.7 X 9.7	2	168.78
3	PANTRY	2.8 X 5	1	14
4	W/C	1.2 X 2	1	2.4
5	CHANGING ROOM	1.2 X 2	1	2.4
6	HELP DESK	6 X 2	1	12
7	WAITING AREA 1	10.7 X 7.3	1	78.11
8	POLICE BOOTH	3.3 X 3	1	9.9
9	TOILET 1	5 X 4	1	20
10	TOILET 2	5 X 2.8	1	14
11	STORAGE 1	4.4 X 5.5	1	24.2
12	TRIAGE 2	8.1 X 9.1	1	73.71
13	DOCTOR'S ROOM	3.8 X 3.8	1	14.44
14	TOILET 3	2 X 2.2	1	4.4
15	CHANGING ROOM	3.6 X 3	2	10.8
16	PATIENT ENTRY	4.5 X 7.3	1	32.85
17	MINOR OT	7 X 7.7	1	53.9
18	DIRTY CORRIDOR	3.2 X 3.4	1	10.88
19	STORAGE 2	9.3 X 3.4	2	31.62
20	TOILET 4	5.6 X 3.8	2	42.56
21	WAITING AREA 2	7.2 X 8.6	1	61.9
22	MRI	7 X 10	1	70
23	CONTROL ROOM	4.5 X 3.1	1	13.95

24	MECHANICLE ROOM	4.5 X 3.2	1	13.95
25	WAITING AREA 3	4.5 X 4.5	2	40.5
26	LAB	15.8 X 7.2	1	113.76
27	CT	6.8 X 6.2	1	42.16
28	CONTROL ROOM	4.5 X 3.1	1	13.95
29	X RAY	6.6 X 7	1	46.2
30	BIILING /INSURANCE COUNTERS	17.8 X 3	1	53.4
34	PANTRY 2	13.2 X 4	1	52.8
35	CLOG ROOM	7.8 X 6.8	1	53
36	TOILET 5	4.5 X 2.2	1	9.9
37	UTILITY	2.2 X 1.5	1	3.3
38	TOILET 6	5.6 X 3.8	2	21.28
39	OPD	5.8 X 3.6	24	501.1
40	WAITING AREA	11.7 X 21.2	2	248
41	STORAGE	36.7 X 28	1	1027.6
42	AHU & ELECTRICAL	8 X 6.7	1	53.6
43	ATRIUM	15.7 X 22.7	1	356.39
TOTAL				3428.69
				4457.18

FIRST FLOOR

1	ICU	7.8 X 12.1	3	283.14
2	STERILE ZONE	16.9 X 5.9	1	99.71
3	STORAGE	5.8 X 3.2	1	18.5
4	STAFF LAUNGE	5.6 X 5.9	1	33
5	V I P ICU	7.8 X 4.1	1	32
6	PREPARATION ROOM	10 X 8.2	1	82
7	RECOVERY ROOM	10.7 X 10.2	1	109
8	O T	7.6 X 6.7	3	153
9	CLEAN ROOM	4.5 X 2.5	3	33.75
10	ANAESTATIA / STORE	4.5 X 4.3	3	58
11	STERILE STORAGE	12.7 X 7	1	88.9
12	AHU	3.10 X 5	1	15.5
13	SUB STERILE ZONE	5.8 X 6.7	1	38.86
14	SCRUB	3.7 X 7.3	1	27
15	NURSE CHANGING RROM	7.7 X 5.8	1	44.66
16	BROTHERS CHANGING ROOM	5.2 X 7.1	1	36.92
17	HELP DESK / WAITING	23.8 X 13.7	1	326.06
18	PHYSIOTHERAPY	10.6 X 23.3	1	247
19	DOCTORS LAUNGE	16 X 7.2	1	115.2
20	ADMIN	24 X 14.2	1	1760
21	INFIERTILITY CLINIC	17.6 X 13.7	1	241.12
22	NURSE/BROTHERS CHANGING ROOM	23.7 X 11.7	1	277.2

23	AHU & ELECTRICAL	8 X 6.7	1	53.6
TOTAL				4174.12
40 % CIRCULATION				5844

SECOND FLOOR

1	MEETING HALL	24 X 20	1	480
2	LDR	8 X 8.5	1	68
3	SRUB	2.8 X 4	1	11.2
4	PREPARATION ROOM	10 X 8.2	1	82
5	CHANGE ROOM	4 X 5	2	40
6	STERILE ZONE	7.8 X 4.8	1	37.44
7	RECOVERY ROOM	7.8 X 7.3	1	56.94
8	NICU	5.7 X 3.2	1	18.24
9	STORAGE	3.4 X 3.5	1	11.9
10	TOILET	2.1 X 2.4	1	5
11	DOCTORS ROOM	2.6 X 3.5	1	9
12	WAITING AREA	9.1 X 7.7	1	70
13	NURSE STATION	2 X 11.2	1	22.4
14	SINGLE SHARING WARD 1	7.7 X 7.2	4	221.7
15	TWIN SHARING 1	7.7 X 7	12	646.8
16	TWIN SHARING 2	17.8 X 5.6	1	99.6
17	DOCTORS CABIN	16 X 7.2	1	115.2
18	TOILET	3.8 X 5.6	2	42.5
19	NURSE STATION	7.7 X 5.6	2	86.24
20	SINGLE SHARING WARDS 2	5.8 X 7.6	10	440.8
21	TWIN SHARING 3	7.8 X 7.2	1	56.16
22	TWIN SHARING 2	5.8 X 7.2	1	41.76
23	AHU & ELECTRICAL	8 X 6.7	1	53.6
24	NURSE STATION	6.4 X 4.8	1	30.72
25	GENERAL WARD	10.4 X 30.4	1	316.16
26	WAITING AREA	6.4 X 5.2	1	33.28
27	HELP DESK	11.5 X 3	1	34.5
28	RECEPTION	7.8 X 9.2	1	71.76
29	WAITING AREA	3 X 8.2	1	24.6
30	WAITING AREA 2	7.8 X 6.3	1	49
TOTAL				3276.5
40 % CIRCULATION				4587

THIRD FLOOR

1	CANTEEN	31.8 X 28	1	890.4
2	SINGLE SHARING ROOM 1	5.6 X 7.2	7	282.2
3	TWIN SHARING ROOM	7.7 X 7	12	646.8
4	SINGLE SHARING ROOM 2	5.8 X 7.2	10	417.6

5	TWIN SHARING ROOM 2	5.8 X 7.2	1	41.76
6	TWIN SHARING ROOM 3	7.8 X 7.2	1	56.16
7	TWIN SHARING ROOM 4	8 X 7	1	56
8	DOCTORS CABIN	16 X 7.2	1	115.2
9	TOILET	3.8 X 5.6	2	425.6
10	NURSE STATION 1	6.5 X 8.4	1	54.6
11	NURSE STATION 2	7.7 X 4.5	2	69.3
12	NURSE STATION 3	4.8 X 6.4	1	30.72
13	AHU & ELECTRICAL	8 X 6.7	1	53.6
14	WAITING AREA	5 X 4.5	1	22.5
15	HELP DESK / WAITING AREA	14.3 X 10	1	143
TOTAL				3305.44
40 % CIRCULATION				4297
GRAND TOTAL				19185

5.2 DETAIL DRAWINGS



Fig 5.2.1 Site Plan



Fig 5.2.2 Master Plan

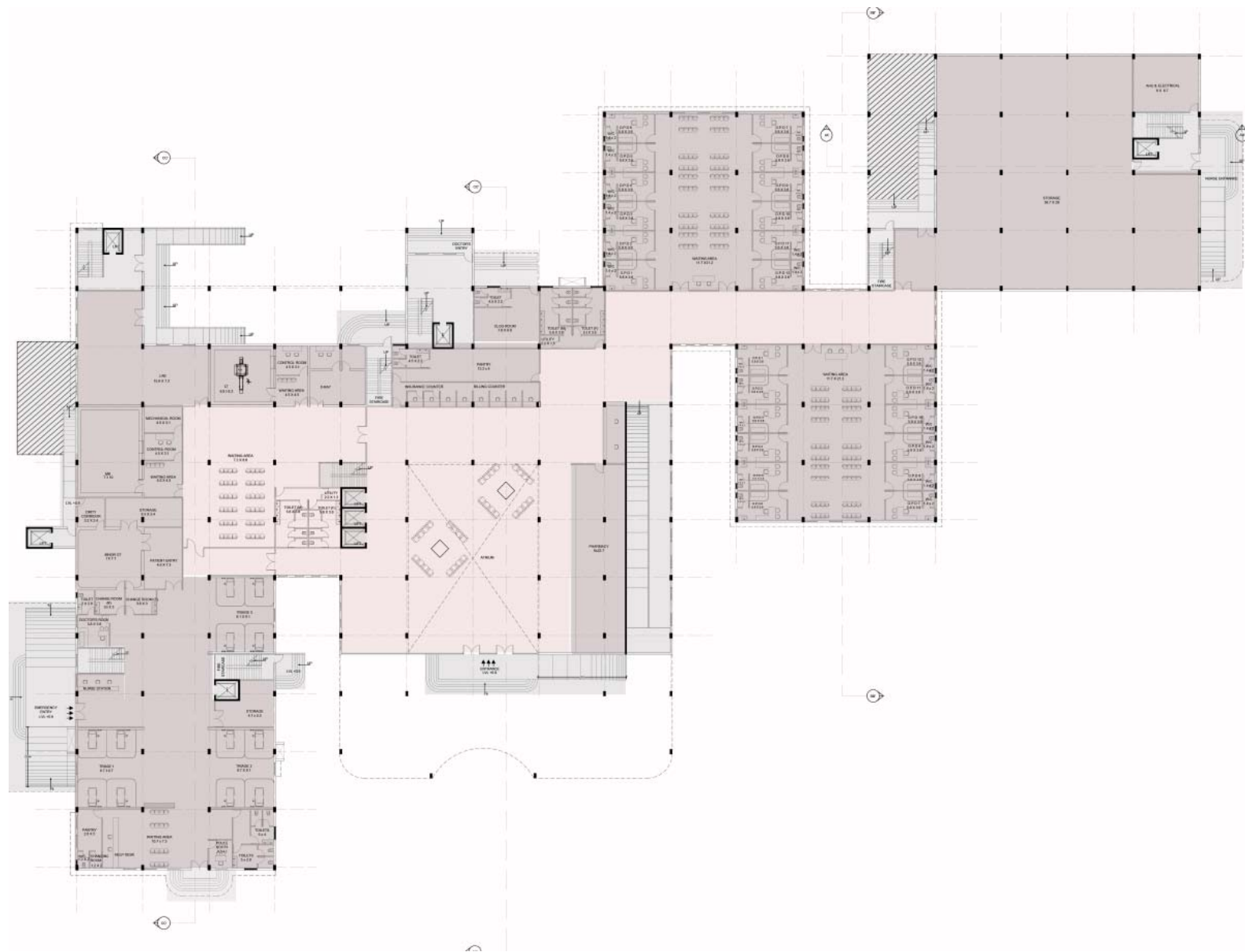


Fig 5.2.3 Ground Floor Plan

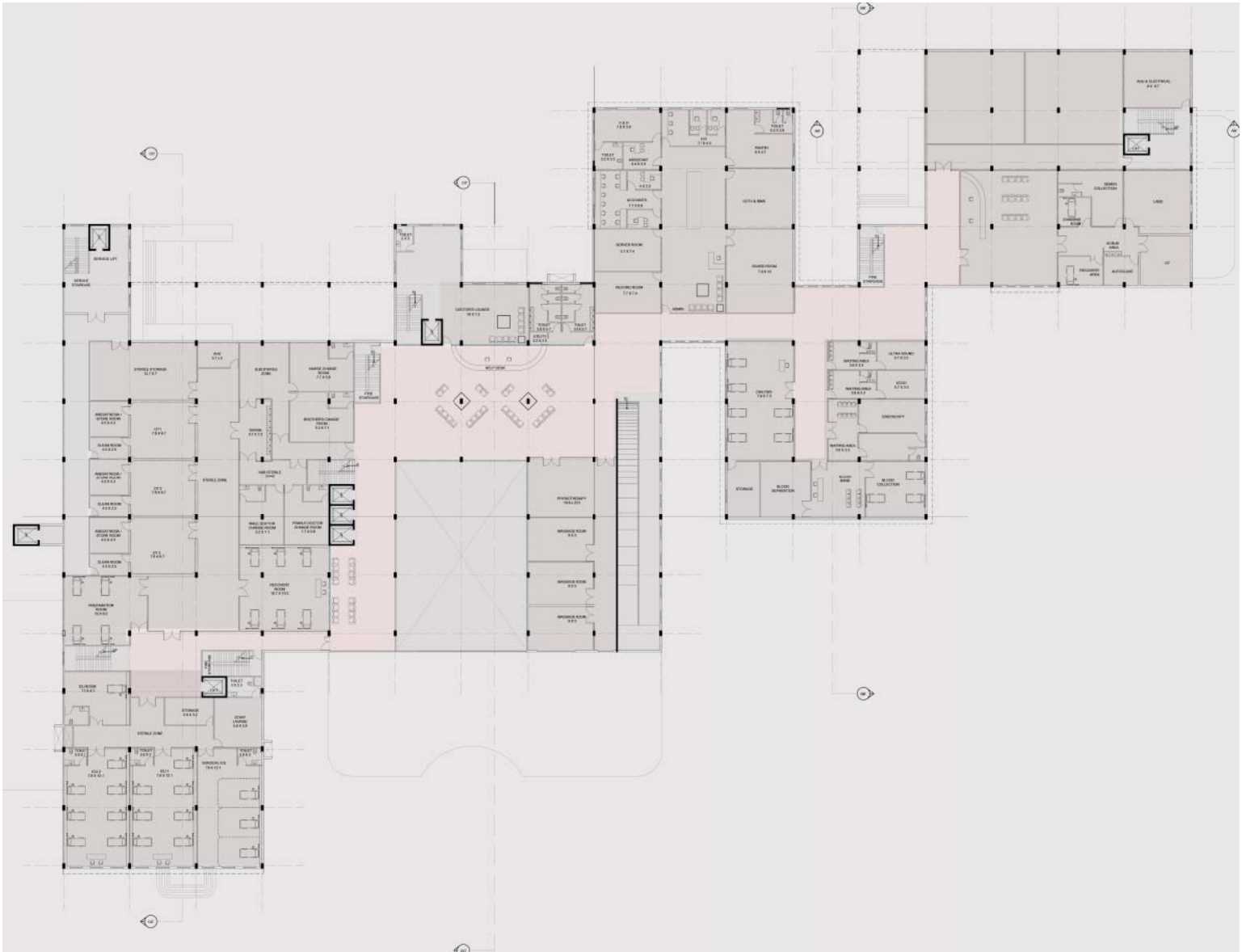


Fig 5.2.4First Floor Plan



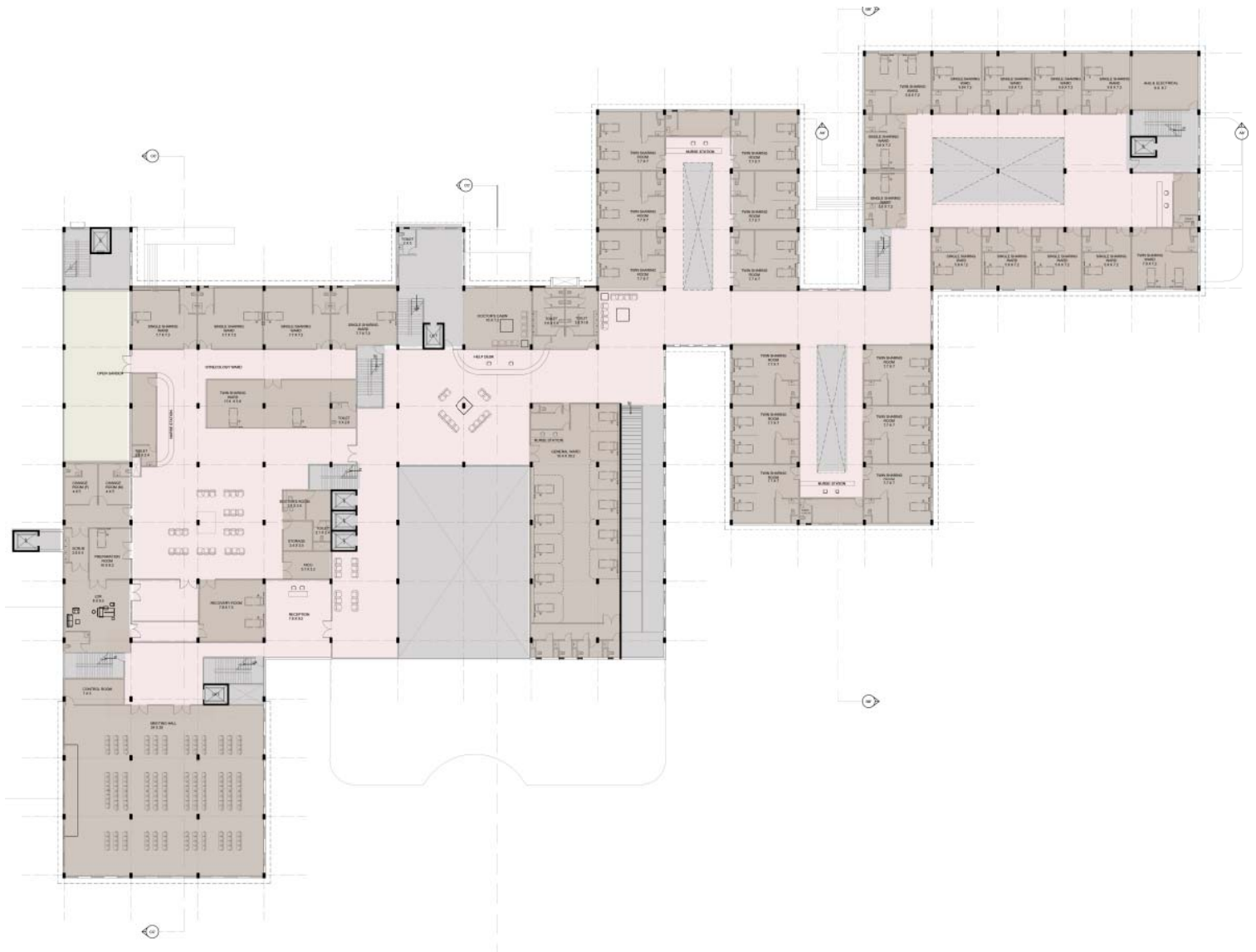


Fig 5.2.5 Second Floor Plan

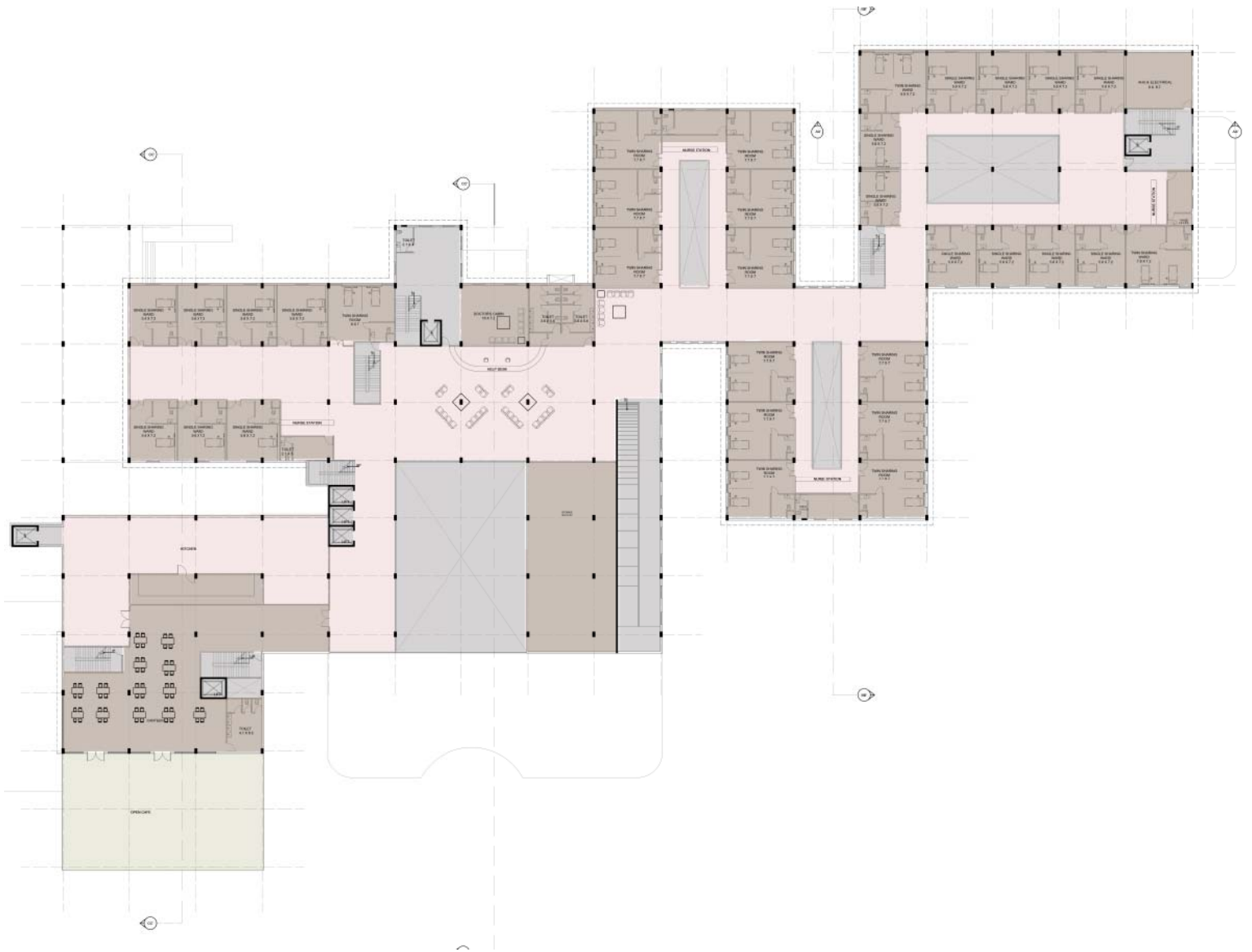


Fig 5.2.6 Third Floor Plan



SECTION AA'

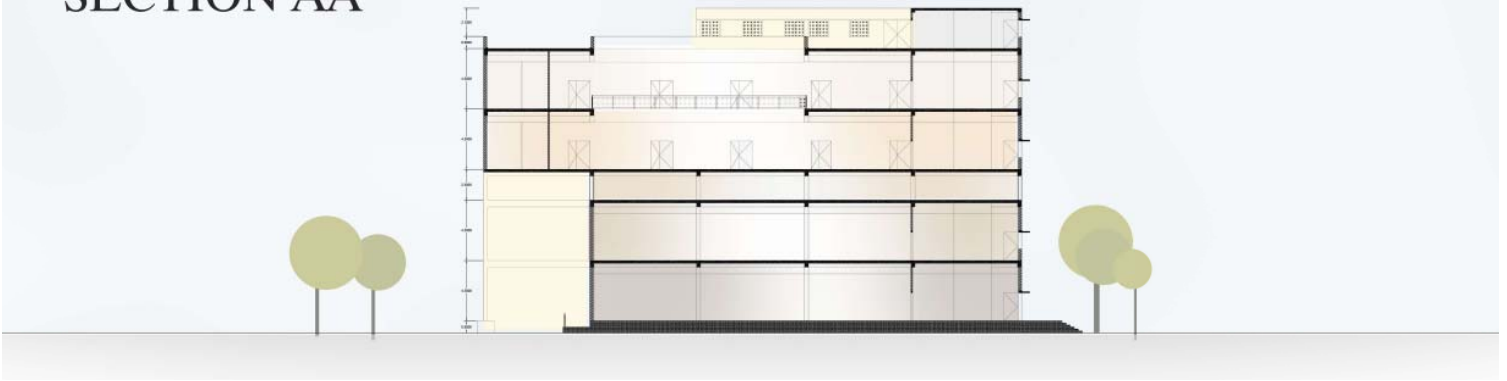


Fig 5.2.7Section AA'

SECTION BB'



Fig 5.2.8Section BB'

SITE SECTION

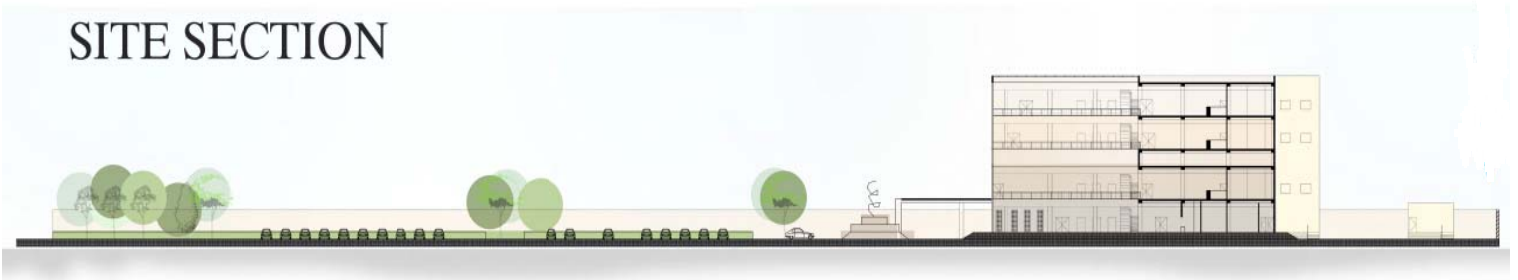


Fig 5.2.9Site Section CC'



Fig 5.2.10Front Elevation



Fig 5.2.11Side Elevation

5.3Model



Fig 5.3.1Site Entrance View



Fig 5.3.2Birds Eye View



Fig 5.3.3Front View

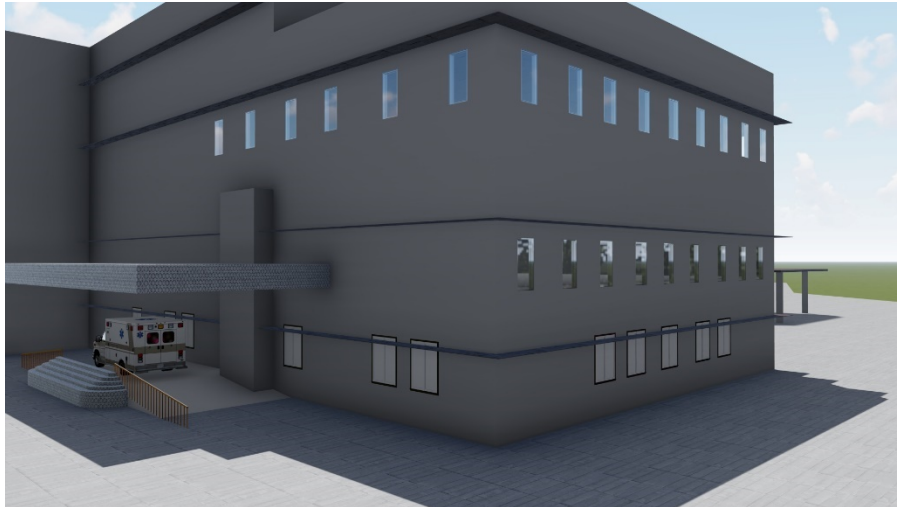


Fig 5.3.4Emergency Entry View