

Summer Training at



**Sakra World Hospital, Bangalore
(April - June, 2013)**

**REPORT ON INFRASTRUCTURE COMPLIANCE AS PER
NABH STANDARDS**

**By
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**Under the guidance of
Dr. Rahul Ghai**

**Post Graduate Diploma in Hospital and Health Management
2012-2014**



**Institute of Health Management Research,
Jaipur
2013**

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CERTIFICATE

This is to certify that Dr.Arjun Kubsad, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management and Research, Jaipur has undergone Summer training in Sakra World Hospital, Bangalore, from April 8th to June 8th, 2013.

The candidate has successfully carried out the study assigned to him during summer training and his approach to study has been sincere, scientific and analytical.

I wish him success in all his future endeavor.



Dr. Rahul Ghai

Faculty and Mentor

IIHMR, Jaipur



Dr. Ashok Kaushik

Dean, Academics and Student affairs

IIHMR, Jaipur



Date: 08/06/2013

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Arjun Kubsad, student of PGDHM-17, Indian Institute of Health Management & Research, Jaipur has successfully underwent his summer internship from our hospital from 8th April to 8th June, 2013. During the internship, He was found to be sincere, dedicated and hardworking. He has shown a great passion towards learning.

I wish him a successful career ahead.

Yours Sincerely,

For Takshasila Hospitals Operating Private Limited.

S.V.Kiran

Vice President - Human Resources & Operations

A Kirloskar + Toyota Tsusho + Secom Hospitals Japan venture

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Dr Arjun Kubsad

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ABBREVIATIONS

1F – 1st floor

2F – 2nd floor

3F – 3rd floor

4F – 4th floor

5F – 5th floor

AAC – Access, assessment and continuity of care

ABG – Arterial blood gas

ACLS – Advanced cardiac life support

AERB – Atomic energy regulatory board

AF – Auditorium floor

AHU – Air handling unit

Arch. – Architecture

BLS – Basic life support

BMD – Bone marrow density

CCTV – Closed circuit television

CMO – Chief medical officer

COP – care of patients

CQI – continuous quality improvement

CSSD – Central sterile supply department

CT – Computed tomography

CTVS – Cardiothoracic and vascular surgery

CTVS RR – Cardiothoracic and vascular surgery recovery

CU – Clean utility

D1 - doctors and staff lift

DG – Diesel generator

DU – Dirty utility

EEG – Electroencephalography

EHC – Executive health check-up

EMG – Electromyography

ER – Emergency

ERCP – Endoscopic retrograde cholangiopancreatography

ESWL – Extracorporeal shock wave lithotripsy

EX CO2 – Carbon dioxide fire extinguisher

EX DCP – Dry chemical powder fire extinguisher

FMS – Facility management and safety

GF – Ground floor

HIC – Hospital infection control

HIS – Hospital information system

Hosp – Hospital

HRM – Human resource management

HVAC – Heating, ventilation and air conditioning

ICU – Intensive care unit

IMS – information management system

IP – In patient

IPD – Inpatient department

ISQua – International society for quality in healthcare

Kms – Kilo metres

LB – Lower basement

LDRP – Labour, delivery, recovery, postpartum

LPG – Liquid petroleum gas

MCP –

MF – Mezzanine floor

MGPS – Medical gas pipe system

MICU – Medical Intensive care unit

MOM – Management of medication

MRD – Medical records

MRI – Magnetic resonance imaging

NABH – National accreditation board for hospital and healthcare

NICU – Neonatal intensive care unit

NS – Nurse Station

OE – Objective evidence

OPD – Out patient department

OPG – Ortho pantamo gram

OT – operation theatre

P1 & P2 – patient lift

PA system – Public address system

PACS – Picture archiving and communication system

PRE – Patient rights and education

Pt – Patient

QI – Quality improvement

RBS – Random blood sugar

RO – Reverse osmosis

ROM – Responsibility of management

S1 & S3 – dirty utility lift

S2 & S4 – clean utility lift

SICU – Surgical intensive care unit

Sq.ft – Square feet

Sq.mtrs – Square metres

STP – Sewage treatment plan

TMT – Treadmill test

TV – Television

UB – Upper basement

UPS – Uninterruptible power supply

USG – Ultra sonography

V1, V2, V3 & V4 – Visitor lift

W – Week

WIP – Work in progress

Wk – Week

SUMMARY

NABH standards provides frame work for quality assurance and improvement of quality of care offered by hospitals, many times constructed hospitals undergo modifications, partial demolitions, reconstructions during the phase of NABH accreditation leading to reduction in strength of building and extra cost, hence to avoid all such things, proper planning during the design phase and construction phase is to be made to achieve best quality of hospital.

The main objective of study is to ensure that hospital is complete in all respect with its infrastructure as per the requirements of NABH standards to get NABH accreditation as per the target time line and to deliver best patient care to the patients. The study under taken was cross sectional analytical study where in the infrastructure requirements, construction activity of hospital project, for completion of hospital were captured and analysed on daily basis in a tool which is in compliance with NABH 3rd Edition.

INTRODUCTION TO ORGANIZATION

SAKRA WORLD HOSPITAL is a joint venture between Kirloskar, Secom & Toyota Tsusho of Japan. Promoter Groups carry a reputation from 127 years; the group carries experience from Secom Hospitals, Japan. Sakra world hospital is an upcoming 300 bedded multi super speciality hospital in Bangalore. Land Area for the hospital is 11008Sq.mtrs or 118446Sq.Ft. Built up Area for the hospital is 40208Sq.mtrs or 432638Sq.Ft. Building Height is 24.3mtrs, proposed height of helipad is 6.0mtrs. Hospital has a helipad on the top. Major expertise of the hospital is in the field of orthopedics, neurosciences, trauma care and cardiology.

Hospital has state of art infrastructure with specialized Operation Theatres (OT) which are equipped for very advance surgical procedures. The hybrid OT and the Minimal Invasive Surgery OT will revolutionize patient care by reducing surgical time and body cuts to a minimum. Faster and sophisticated Imaging equipment with advanced PACS system and fully automated diagnostic machines will radically reduce time of diagnosis and starting the treatment. A completely equipped Trauma unit & Mobile ICU are focused to provide high end and prompt service to the accident cases.

Keeping affordability in mind, the inpatient rooms are designed as per Japanese architecture. These rooms are equipped with comfortable automated beds, infection control measures. The IP TVs will provide all the entertainment with information exclusive to the patient.

MISSION:

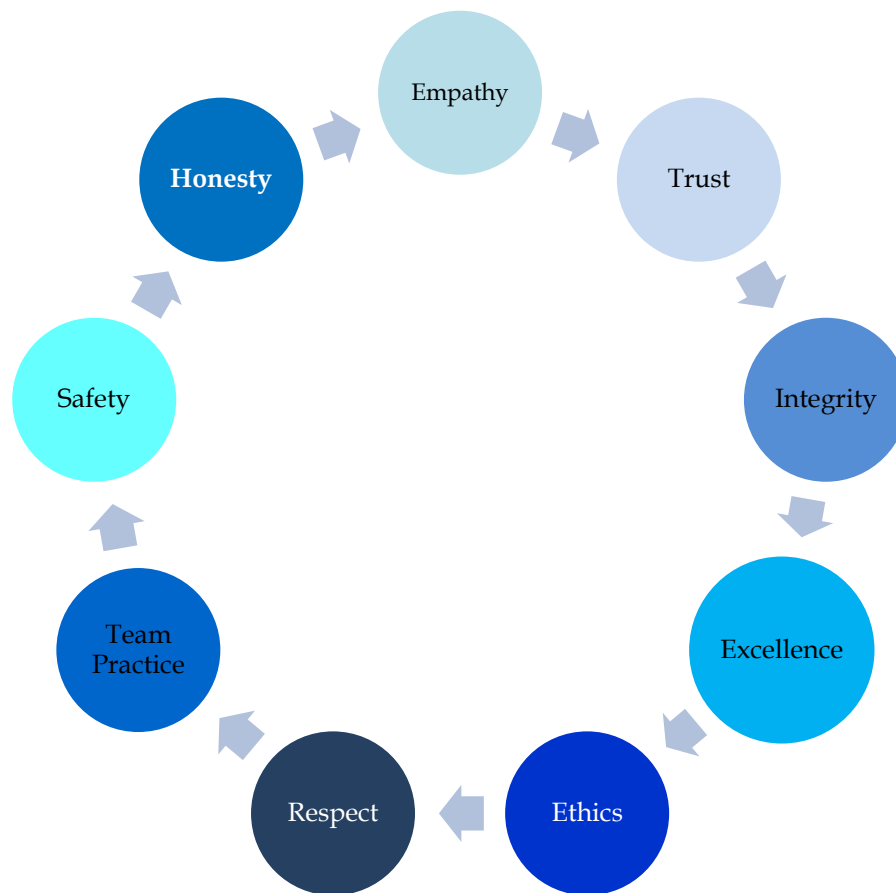
To provide high quality medical care to India's large and growing middle and upper middle class, with Neuro & Ortho ailments at affordable prices.

Caring beyond the treatment to include complete after-care.

VISION:

- We commit to Medical care that enhances the Value of Human Life.

CORE VALUES:



- **Integrity:** To do what is right.
- **Honesty:** To be true to the task for the best outcome.
- **Empathy:** To be sensitive to the patient's need for care and prompt attention and to our employees motivation and respect.
- **Safety:** To protect and safeguard our patients from any harm and infection. Maintain the highest safety standards for a safe workplace for all.
- **Team Practice:** Integrate medical & non-clinical functions. To enable both to work as a team. To deliver the best solution and care to all patients.
- **Trust:** To create institution patients can trust. (Patients must believe that the medical solution and treatment offered is genuinely required and best suited to their case), in an ethical and reliable manner.
- **Respect:** To institutionalise Respect, to families and colleagues.
 - Respect for the patient & families.
 - Respect within the team members, across hierarchy.
 - Respect vendors and partners equally.

- **Excellence:** Genuine Commitment to deliver the highest standard of surgery, post care, diagnosis & treatment with the most convenient and caring experience; using experienced and skilled personnel, processes that drive excellence, appropriate technology, best practices, collaborative effort and training & development.
- **Ethics:** Ethical conduct of all Business & Clinical Practices. Not just meeting compliances, but exceeding them.

Hospital Plan

This hospital has a unique 'H' Shaped design, inspired by Japanese hospitals. It allows:

- Free movement for patients
- Avoids un-easy turns and intersections
- Easy access to the central lifts
- Windows for all patient rooms.

Keeping privacy, infection control and affordability in mind, the in-patient rooms are customized without compromising on services. Room designs are flexible, to allow single rooms to be converted into twin rooms. This accommodates high demand for the twin category.

The Hospital has Isolation rooms in each ICU to provide extra care to patients with infection. Bedside facilities, such as oxygen supply, are kept after mapping even the future requirements, flexibility and minimum movement possible for the treating doctors and nurses.

Hospital has 10 floors divided in 4 wings (A, B, C, and D)

- Lower Basement
- Upper Basement
- Ground Floor
- 1st Floor
- 2nd Floor
- 3rd Floor
- 4th Floor
- 5th Floor
- Auditorium Floor

- Mezzanine Floor

LOGO:

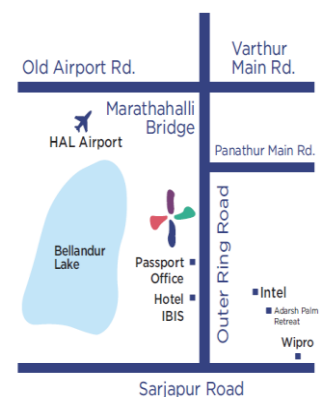
The brand and logo of Sakra World Hospital has derived from the word *Sacrum* which is the tail bone of the vertebral column & *Sakura*, flowering Cherry, National flower of Japan. The logo is in the shape of cross which is a symbol of many facets. It is a positive, sign of hope and recovery. It indicates that disparate paths and avenues can converge for the purpose of harmonious function. The Logo has 4 petals conjoined at the stem; the flower metaphor lends certain softness to the brand. A hospital brand also has essential qualities of care, nurturing and empathy. Hence the logo represents a coming together of strength and energies. The colours of the logo are coral, mauve, orchid blue & teal which symbolizes the amalgamation of Healing, calming and relaxing process. Each of the colours has a meaning to it.



- **Coral** – Heals grief and sadness, restores youthfulness, brings you in contact, and connects you with your feelings.
- **Mauve** – Slows down an over active heart, stimulates the immunity, soothe mental and emotional stress, Soothes mental and emotional stress, decreases sensitivity to pain, helps in detoxification
- **Orchid Blue** –Represents elemental water and elemental air.
- **Teal**- Increases intuition and sensitivity while dissipating any sensation of stress.

LOCATION:

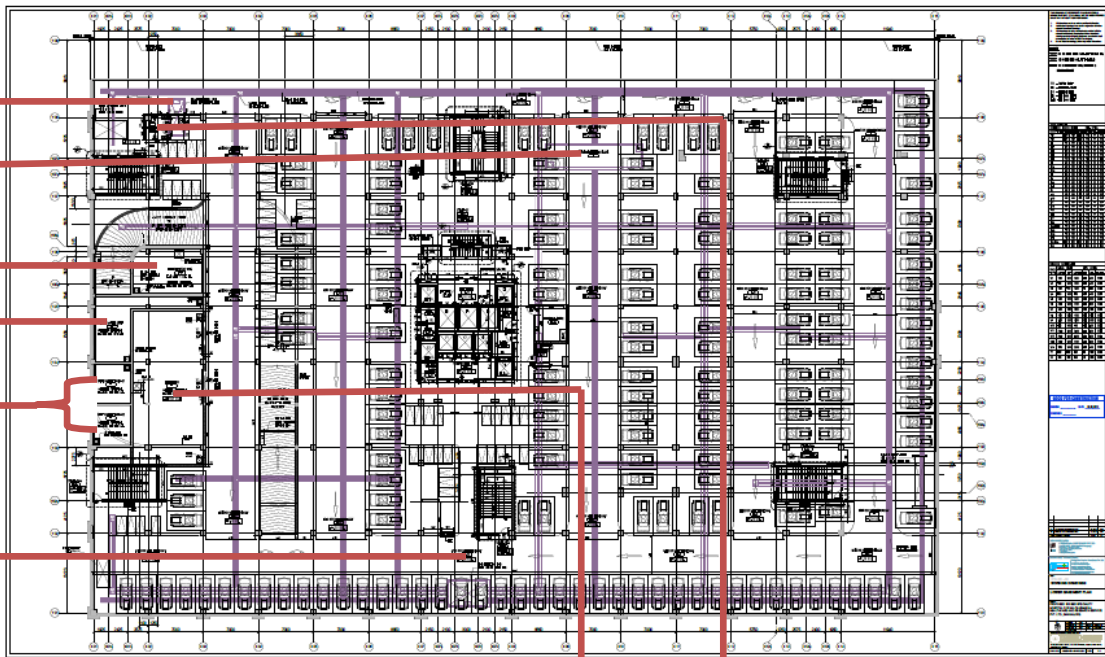
- Located in Devarabeesanahalli surrounded by SEZ & IT Companies
- Around 45 Kms from Airport, around 12 Kms from Railway station
- No prominent Established Healthcare units in the location



- **SAKRA WORLD HOSPITAL,**
52/2 & 52/3, Devarabeesanahalli, Varthur Hobli, Opposite Intel,
Outer ring road, Marathahalli,
Bangalore – 560 103.

Following are the floor wise drawing shows clearly the plan of hospital & concerned areas of infrastructure compliance as per NABH standards

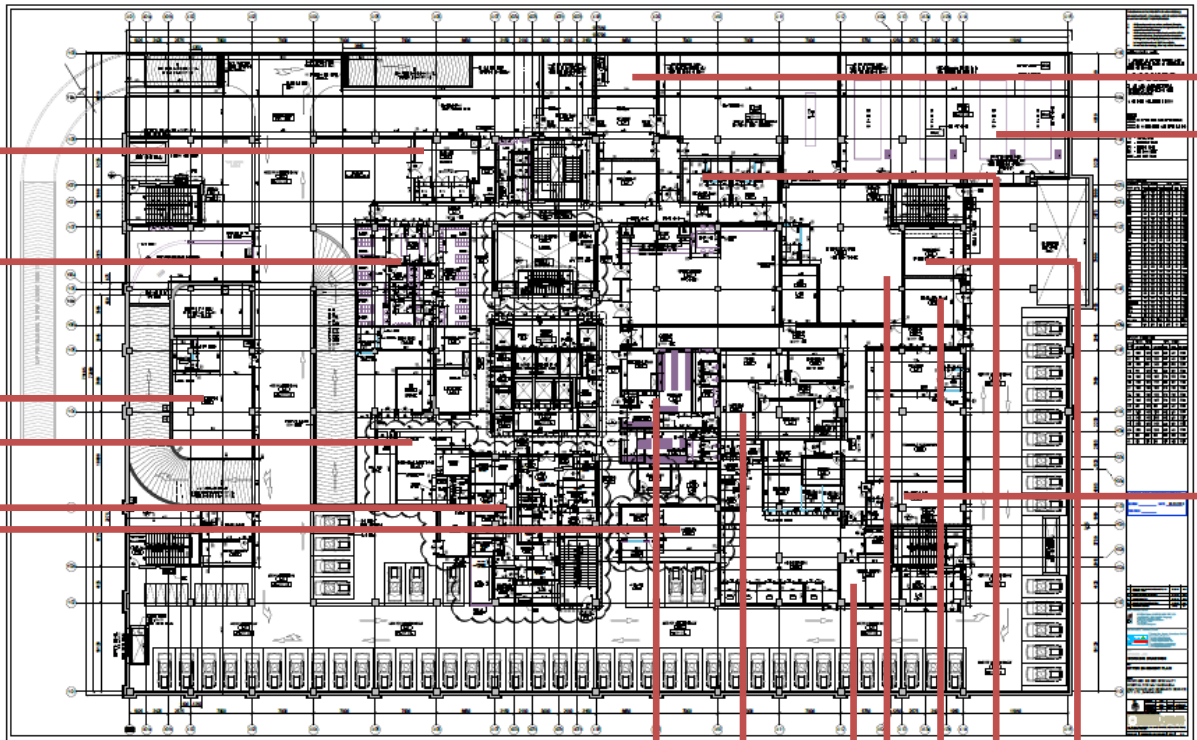
Lower Basement



Concerned areas –

1. Drain Collection Tank
2. Drain Collection Tank
3. Sewage Collection Tank
4. Fire Water Tank
5. Raw Water Tank
6. Soft Water Tank-1
7. Soft Water Tank-2
8. Drainage System
9. Pump Room
10. Toilet

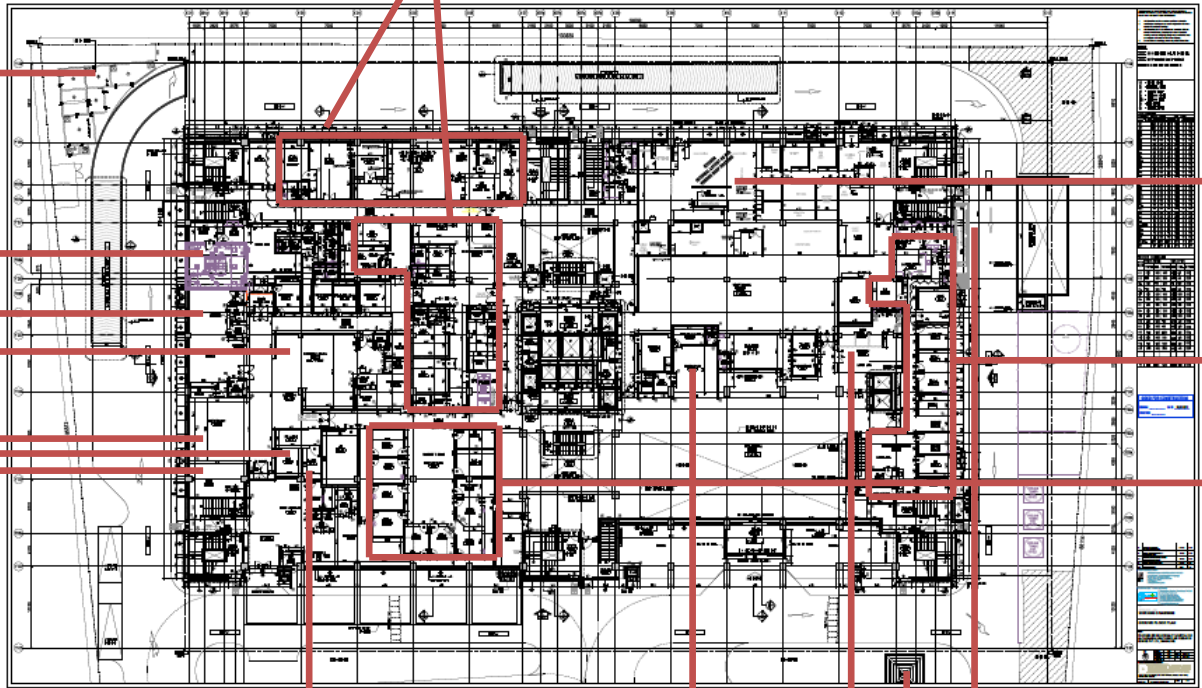
Upper Basement



Concerned areas -

1. Blood bank
2. Biomedical Engineering Room
3. MRD
4. Mortuary
5. Engineering workshop
6. Staff change room
7. Doctors change room
8. Laundry, linen chute
9. DG
10. UPS
11. House keeping
12. IP pharmacy
13. Biomedical waste collection, Garbage chute
14. Security control room
15. RO Plant
16. Medical gas room
17. All toilets

Ground Floor



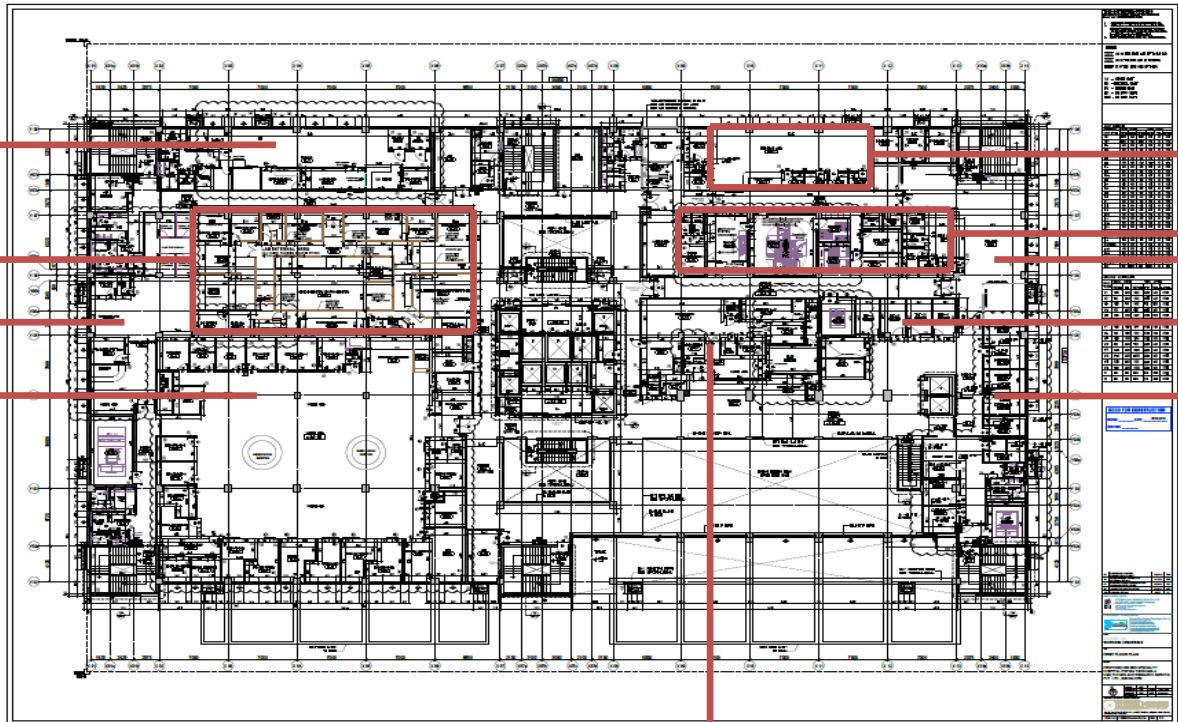
Concerned Areas -

1. Gas Manifold room
2. Triage
3. Resuscitation, Nurse station
4. Emergency Trauma beds, Nurse station, CU, DU
5. Trauma ICU, Nurse station, DU
6. CMO room
7. Major OT
8. Plaster room
9. Radiology- CT, MRI, X ray 1,2, USG 1,2, Mamography, OPG, EEG, EMG
10. OPD- ortho, neuro
11. EHC- consultation (3), dietics, breakfast, Sample collection, X ray, USG
12. Phlebotomy
13. OP Pharmacy
14. Prayer room
15. Ambulance parking
16. All toilets
17. STP Plant
18. Rain water collection tank
19. Kitchen

20. Garbage chute

21. Linen chute

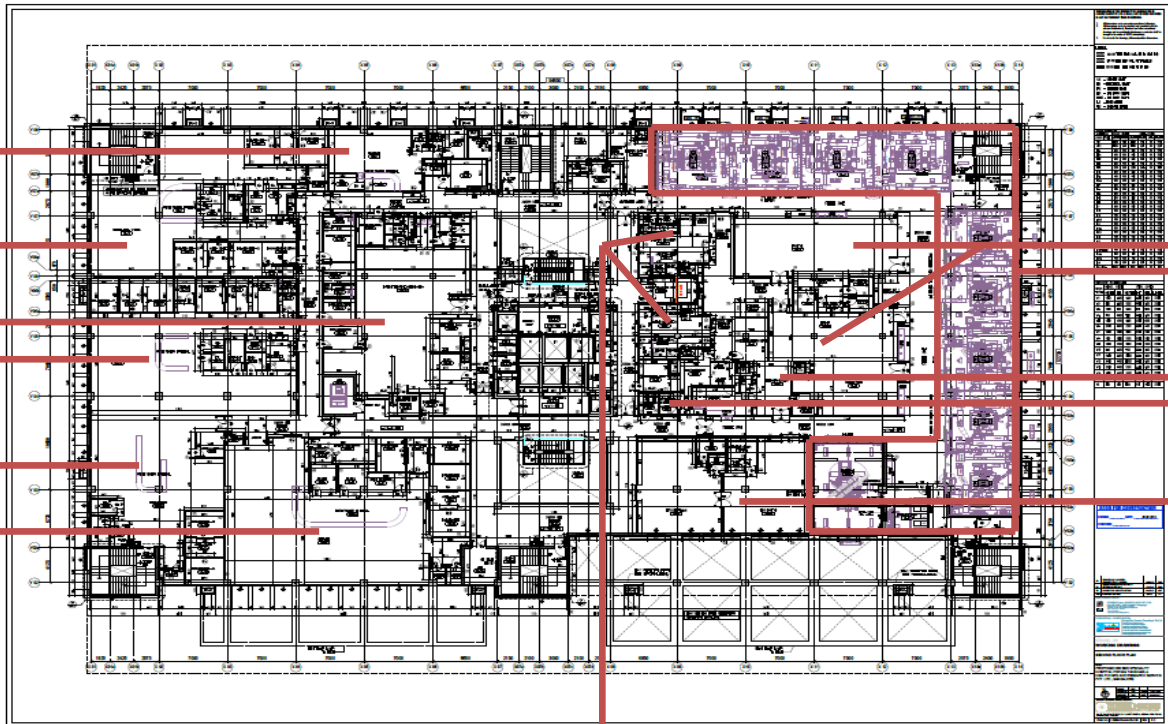
1st Floor



Concerned Areas –

- 1.0 Cathlab
- 2.0 Pre-post angio – nurse station, CU, DU, Medication room
- 3.0 CCU – Nurse station, CU, DU
- 4.0 Cardiology OPD (8)
- 5.0 ECHO, TMT
- 6.0 Lab
- 7.0 Dialysis – Nurse station, CU, DU, Nephrology consultation
- 8.0 Endoscopy, ERCP, ESWL
- 9.0 Multispecialty OPD
- 10.0 Physiotherapy
- 11.0 All toilets
- 12.0 Garbage chute
- 13.0 Linen chute

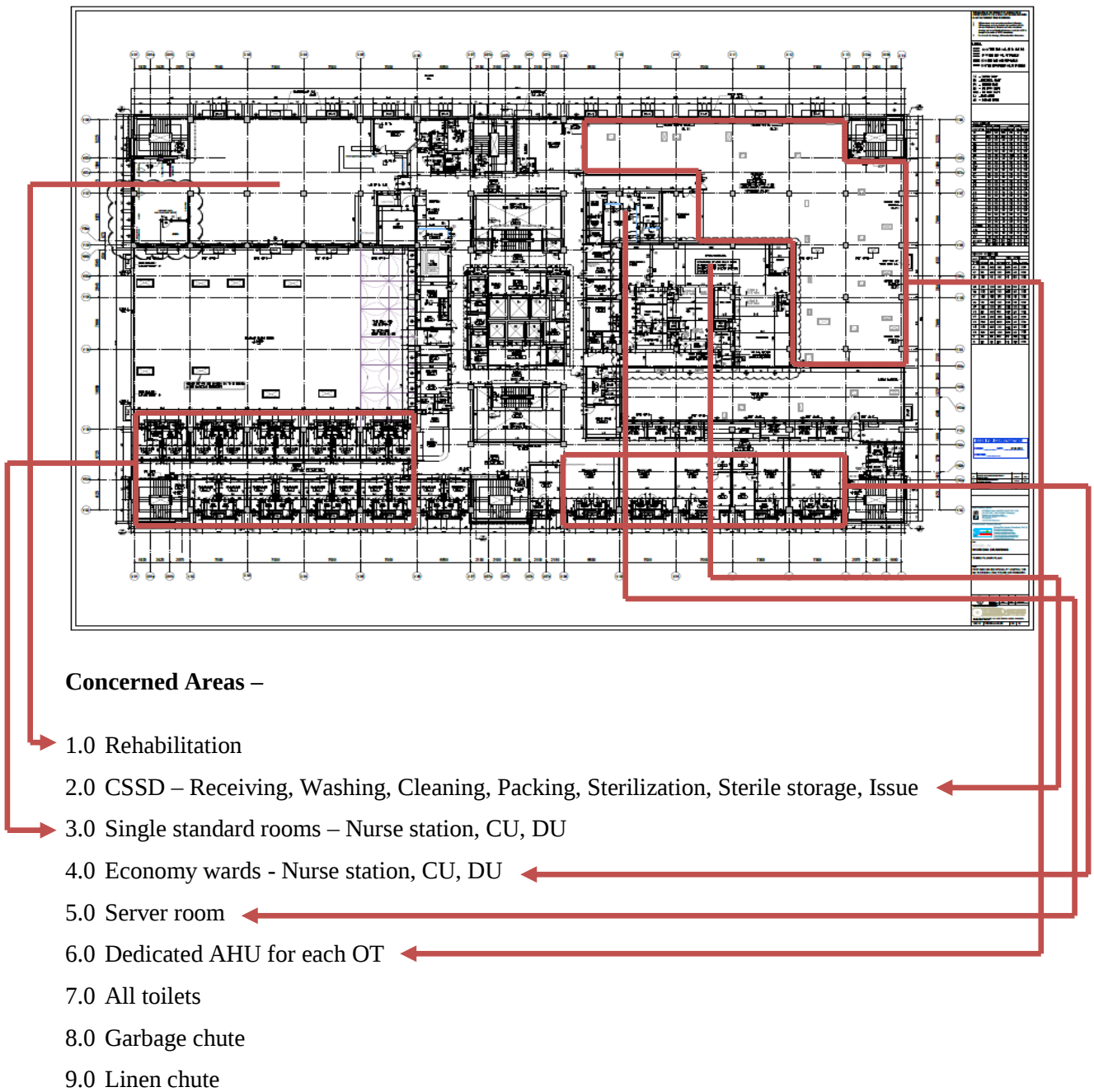
2nd Floor



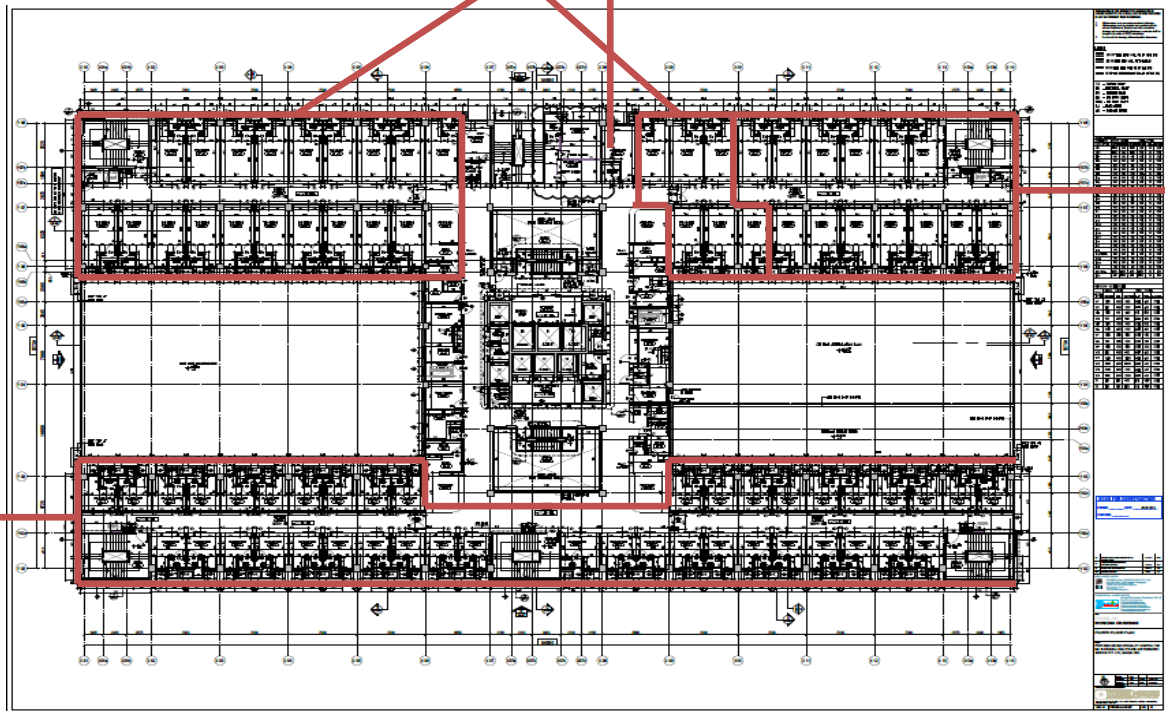
Concerned Areas –

- ➔ 1.0 Neuro ICU – Nurse station, CU, DU, Isolation beds, Ante space 1,2
- ➔ 2.0 Paediatric cardiac ICU – Nurse station, CU, DU, Isolation beds, Ante space1,2
- ➔ 3.0 SICU - Nurse station, CU, DU, Medication room, Isolation beds, Ante space1,2, Stat lab
- ➔ 4.0 MICU - Nurse station, CU, DU, Isolation beds, Ante space1,2, Medication room
- ➔ 5.0 Daycare – Nurse station, CU, DU
- ➔ 6.0 Hazmat store
- ➔ 7.0 OT – General(4), Ortho(2), Neuro(2), CTVS(2), Hybrid OT
- ➔ 8.0 CTVS RR - Nurse station, CU, DU
- ➔ 9.0 Pre-post op – Nurse station, CU, DU
- ➔ 10.0 Decontamination OT
- ➔ 11.0 Doctors change, Nurse change
- ➔ 12.0 Pt Relative waiting area
- 13.0 All toilets
- 14.0 Garbage chute
- 15.0 Linen chute

3rd Floor



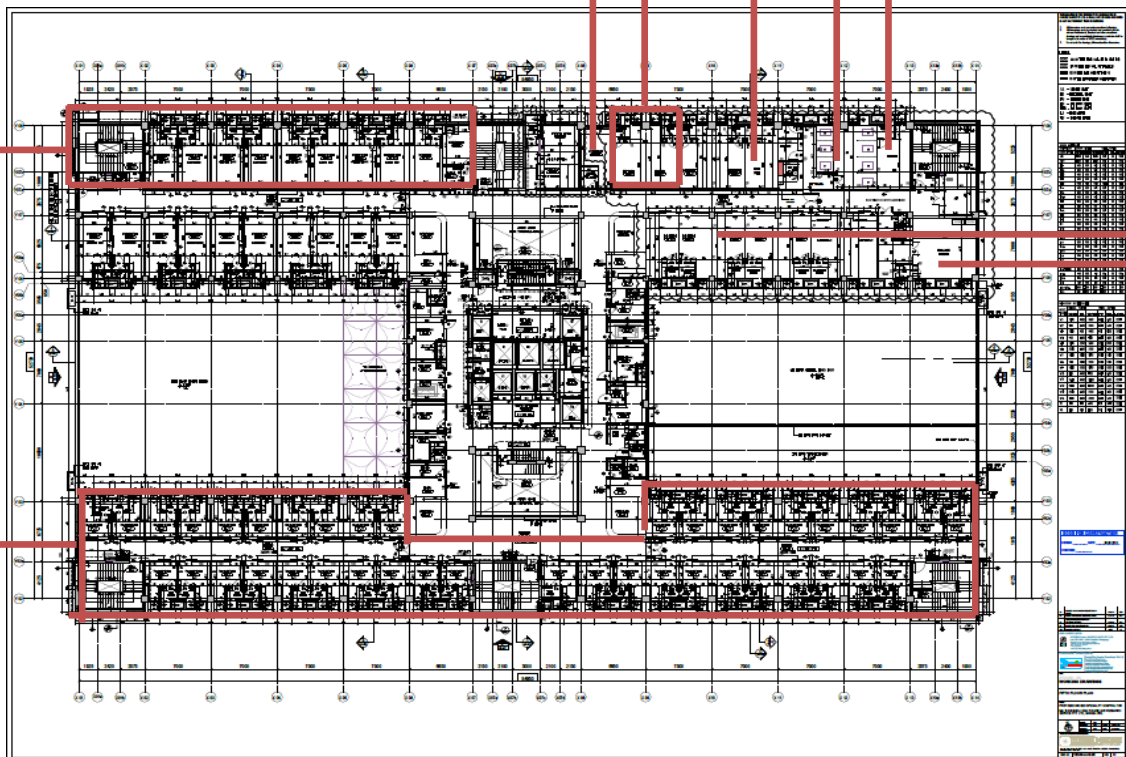
4th Floor



Concerned Areas –

- 1.0 Assisted bath
- 2.0 Twin sharing rooms – Nurse station, CU, DU
- 3.0 Single Deluxe rooms - Nurse station, CU, DU
- 4.0 Single standard rooms – Nurse station(2), CU(2), DU(2)
- 5.0 All toilets
- 6.0 Garbage chute
- 7.0 Linen chute

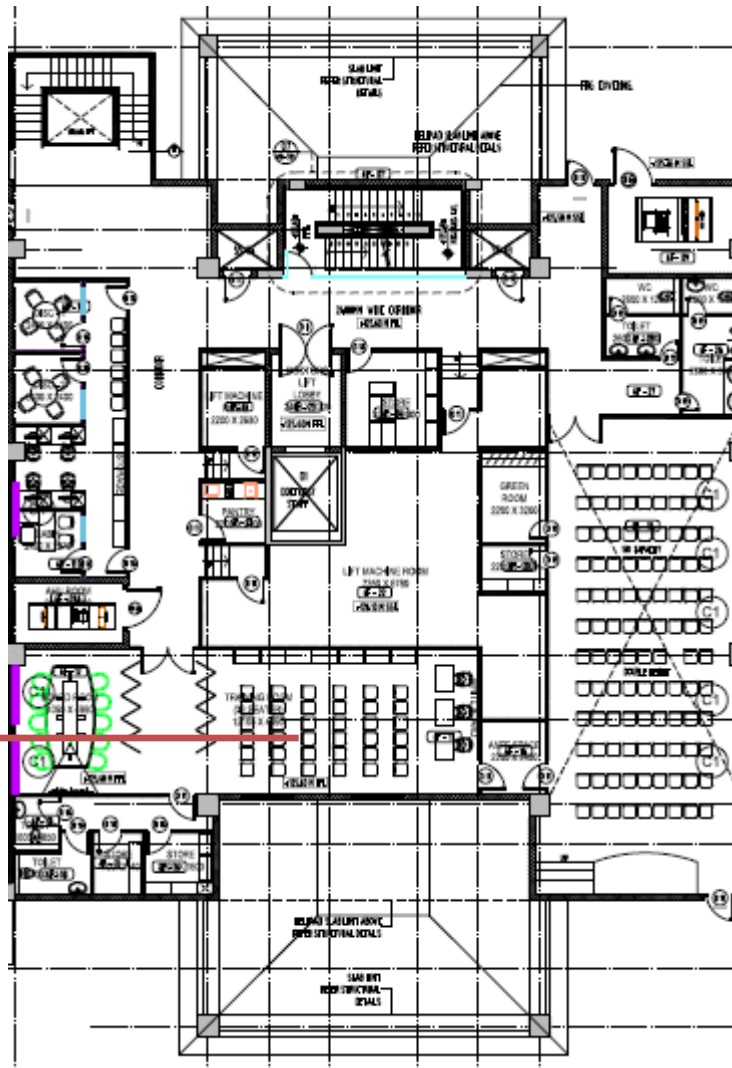
5th Floor



Concerned Areas –

- 1.0 Assisted bath
- 2.0 Executive suite rooms – Nurse station, CU, DU
- 3.0 Single Deluxe rooms - Nurse station, CU, DU
- 4.0 Single standard rooms – Nurse station(2), CU(2), DU(2)
- 5.0 OPD IPD Triage
- 6.0 Gynae OT
- 7.0 Pre-post op
- 8.0 LDRP suite
- 9.0 NICU
- 10.0 All toilets
- 11.0 Garbage chute
- 12.0 Linen chute

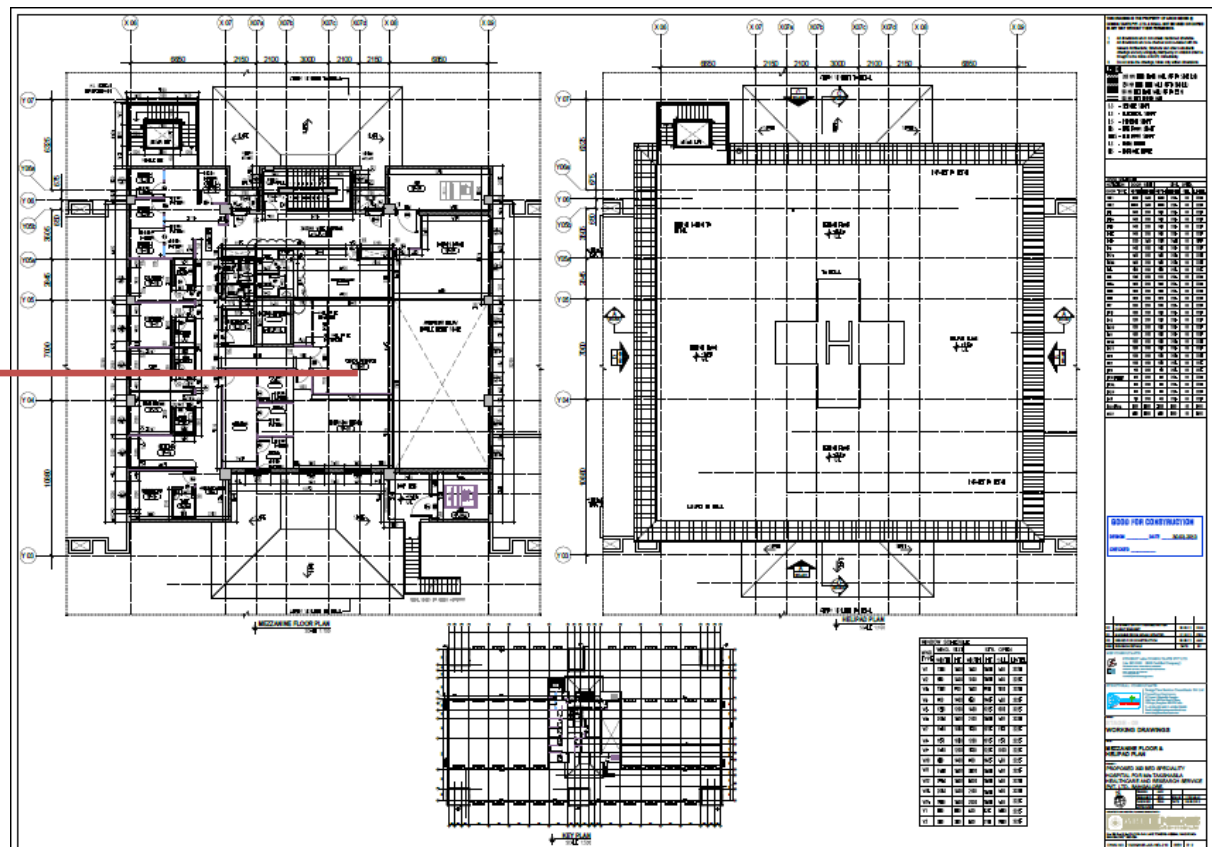
Auditorium Floor



Concerned Areas –

- 1.0 Training room
- 2.0 All toilets

Mezzanine Floor



Concerned Areas –

- 1.0 Clinical research
- 2.0 Over head tanks(6)
- 3.0 All toilets

RATIONALE

National Accreditation Board for Hospitals & Healthcare Providers (NABH) is a constituent board of Quality Council of India, set up to establish and operate accreditation programme for healthcare organizations. The board is structured to cater to much desired needs of the consumers and to set benchmarks for progress of health industry. The board while being supported by all stakeholders including industry, consumers, government, have full functional autonomy in its operation.

Quality in Hospitals is all about meeting expectations of Quality - Patients, Statutory/Legal bodies, Internal Customers, Owners / Trust, Third parties (NABH).

NABH Standards for hospitals, 3rd Edition, November 2011 has been released. This standard has been accredited by International Society for Quality in Healthcare (ISQua). The approval of ISQua authenticates that NABH standards are in consonance with the global benchmarks set by ISQua. The hospitals accredited by NABH will have international recognition. The standards provide framework for quality assurance and quality improvement for hospitals. The standards focus on patient safety and quality of care. The standards call for continuous monitoring of sentinel events and comprehensive corrective action plan leading to building of quality culture at all levels and across all the functions. The 10 chapters in the standard reflect two major aspects of healthcare delivery i.e. patient centred functions (chapter 1-5) and healthcare organization centred functions (chapter 6-10). Under which there are 102 standards and 636 objectives.

The 10 chapters are being as follows

Patient Centred Standards

- **Access, Assessment and Continuity of Care (AAC)**
- **Care of Patients (COP)**
- **Management of Medication (MOM)**
- **Patient Rights and Education (PRE)**
- **Hospital Infection Control (HIC)**

Organization Centred Standards

- **Continuous Quality Improvement (CQI)**

- **Responsibilities of Management (ROM)**
- **Facility Management and Safety (FMS)**
- **Human Resource Management (HRM)**
- **Information Management System (IMS)**

Based on the standards mentioned in the above chapters of NABH, there are 96 infrastructure checklists being developed which will be discussed in the upcoming headings.

The design compliance is reviewed with architect and Objective evidences have been compiled for the design compliance, subsequently the checklist is being crosschecked and verified at site on daily basis for work execution as per design.

STUDY DESIGN

PROBLEM STATEMENT

NABH standards provides frame work for quality assurance and improvement of quality of care offered by hospitals, many times constructed hospitals undergo modifications, partial demolitions, reconstructions during the phase of NABH accreditation leading to reduction in strength of building and extra cost, hence to avoid all such things, proper planning during the design phase and construction phase is to be made to achieve best quality of hospital.

LITERATURE REVIEW

1.0 Quality improvement program- Gujarat, Hospital engineering services as per NABH-Commissionerate of health MS & ME Dr Jivraj Maheta Bhavan Block No: 5 2nd floor, Gandhinagar, Gujarat

Engineering services are perhaps the most vital of the utility services in the hospital. The efficiency of entire care delivery system of the hospital depends on their efficiency. Even the slightest breakdown of power supply system, information system communication system or malfunctioning of vital equipment can have catastrophic effects.

The scope of Engineering services in a hospital comprises of civil assets, electricity supply, water supply including plumbing and fittings, steam supply,

central medical gases, air and clinical vacuum delivery system, air conditioning and refrigeration, lifts and dumb waiters, public health services, lighting protection, structured cabling, communication system(public address system, telephones, paging system), TV and piped music system, non conventional energy devices, horticulture, arboriculture and landscaping and last but not the least workshop facilities for repairs and maintenance.

The scope of services generally includes repair and maintenance of existing facilities to ensure optimum operational reliability, risk reduction and their safety for the patient, staff and public. Initial planning and building the civil assets is to include the scope of services.

2.0 The Role of Organizational Infrastructure in implementation of hospitals

‘Quality Improvement - Jefrey A Alexander, Bryan J Weuner, Stephen M Shortell, Laurence C Baker, Mark P Becker

Quality improvement (QI) is an organised approach to planning and implementing continuous improvement in performance. Although QI holds promise for improving quality of care and patient safety, hospitals that adopt QI often struggle with its implementation. This article examines the role of organizational infrastructure in implementation of quality improvement practices and structures in hospitals. The authors focus specially on 4 elements of hospital support and infrastructure for QI – Integrated data system, Financial support for QI, Clinical integration and information system capability. These macro level factors provide consistent, ongoing support for the QI efforts of clinical teams engaging in direct patient care, thus promoting institutionalization of QI. Results from the multivariate analysis of 1997 survey data on 2,350 hospitals provide strong support for the hypotheses. Results signal that organization intent upon improving quality must attend to the context in which QI efforts are practiced, and that such efforts are unlikely to be effective unless appropriate support systems are in place to ensure full implementation.

3.0 Reaching pinnacles of quality – TNHSP access, equity, quality – Accreditation

Thiru. V. K. Subraj, I.A.S., Dr S. Vijaykumar. I.A.S

Quality: A continuous journey, in order to demonstrate unswerving commitment to improving quality of health care constantly, Tamil nadu, decided to take up the challenge of obtaining an international recognized accreditation accorded by National accreditation board for hospitals and healthcare providers for govt

hospitals – a tough goal for even private hospitals with enormous resources at their disposal. As a pilot, twelve hospitals were chosen throughout the state to obtain accreditation provided by NABH. The selection was done on the basis of willingness of hospital management, infrastructure management, and the enthusiasm exhibited by the staff.

RESEARCH QUESTIONS

What are the standards and objectives of NABH that specify about the infrastructure quality of hospital?

How the design can be planned for infrastructure in order to achieve the quality?

What are the departments involved in planning and implementation of the design?

How the site readiness can be monitored based on the design being planned?

How the observations can be quantified in to a tool in order to record and cross verify the daily data?

What steps need to be taken in order to co-ordinate with the different departments involved in quality achievement of hospital?

GENERAL OBJECTIVE

To ensure that hospital is complete in all respect with its infrastructure as per the requirements of NABH standards to get NABH accreditation as per the target time line and to deliver best patient care to the patients.

SPECIFIC OBJECTIVES

To device a master schedule to compile all the NABH standards which explain about infrastructure

To device a checklist based upon NABH 3rd edition

To ensure the hospital design is completely equipped infrastructural as per the standards

To monitor the execution of infrastructure on the site as per the design developed

To raise the concerns to project team

HYPOTHESIS: The hospital will be ready to go live by 15 Aug 2013 with respect to its compliance with NABH standards 3rd Edition

STUDY DESIGN: Cross sectional Analytical study

Study period: Apr 14 – Jun 6

DATA COLLECTION METHOD

Technique: Qualitative research technique

Primary data:	Secondary data:
Data was collected through the tools mentioned below at site on daily basis, for technical clarifications and accurate information tools were cross verified with project team and concerned departments.	Secondary data was collected by doing literature review through internet, books.

Data collection tools:

- NABH infrastructure design compliance tracker
- Infrastructure check list as per NABH standard
- Site visit checklist tool

METHODOLOGY

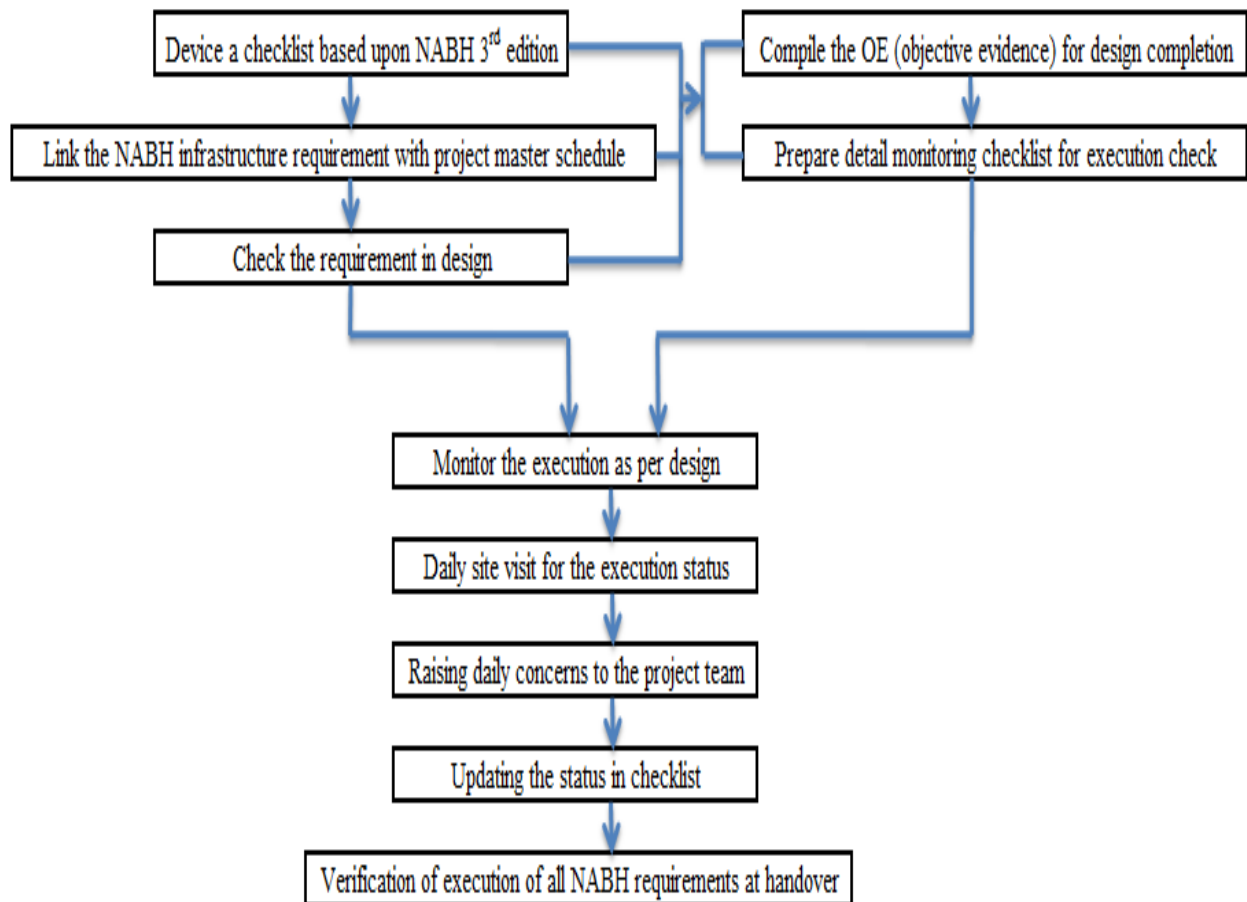
The study was taken up as per the basic requirement of hospital to outstand with its infrastructure quality, hospital to prove itself should get NABH accreditation for the same, The study under taken was cross sectional analytical study where in the infrastructure requirements, construction activity of hospital project, for completion of hospital were captured and analysed on daily basis in a tool which is in compliance with NABH 3rd Edition.

Study plan:

- Of the foremost NABH 3rd edition was studied thoroughly and all the standards and objectives which addressed the infrastructure quality were noted down on one side.
- On the other hand complete design of the hospital was studied and NABH infrastructure requirement was linked with project master schedule to note down and mark all the areas concerned with infrastructure quality
- As a control group OE (objective evidence) were compiled and NABH infrastructure execution completion tool was designed
- A tool of detail monitoring checklist for execution check at site was prepared in which the infrastructure quality check list were divided under the headings of civil, furniture, curtain, electrical (crash cart), PA system, MGPS, HVAC, plumbing and hand hygiene, nurse call and rodent system, pneumatic chute, CCTV, access control, fire alarm system and extinguisher, drainage, lift service, signnages, garbage chute and linen chute to check at all the concerned area of each floor.
- Site was visited on the daily basis and rounds were made in order to make execution check and concerned team was met daily for cross verifications.
- Meeting was attended daily and concerns were raised to the project team.
- Observations made, remarks obtained and other such status were updated in the checklist daily.
- Execution of all NABH requirements were verified thoroughly and handed over for further follow up.

Following flow chart explains study plan in brief:

Project process flow chart



NABH STANDARDS AND OBJECTIVES DEFINING INFRASTRUCTURE QUALITY AND SITE EXECUTION STATUS

The standards of NABH and design of hospital are studied thoroughly and 96 objective evidences are identified out of 636 objective evidences which are divided into following headings:

Access control/CCTV works, Computer hardware system, Design and development, DG works, Electrical installation works, Fire protection system, HVAC, Interior works, Kitchen equipment and dining, Laundry works, Medical equipment, Medical gas piped system, Networking system, Nurse call system works, Plumbing works, Pneumatic pipe line works, Signages works, Solar heating system works, Trial run, Water treatment works.

S.N.	Activity Name	NABH OE	Arch. Requirement	Floor	Hosp design	Execution at site
1	Design & Development	AAC8c	Written procedures guide the handling and disposal of infectious and hazardous materials - Central waste collection area	GF	✓	
2	Design & Development	AAC9a	Imaging services comply with legal and other requirements. All the statutory requirements are met with such as BARC clearance, dosimeters, lead sheets, lead aprons, signage, display as per PNDT act, reports to competent authority, etc. The organization shall have an RSO (of appropriate level). Area for imaging services as per legal requirement (AERB)	GF	✓	
2	Design & Development	AAC9a	CT	GF	✓	
2	Design & Development	AAC9a	Mammography	GF	✓	
2	Design & Development	AAC9a	BMD	GF	✓	
2	Design & Development	AAC9a	OPG	GF	✓	
2	Design & Development	AAC9a	Cathlab	GF	✓	
2	Design & Development	AAC9a	X-ray 1	GF	✓	
2	Design & Development	AAC9a	X-ray 2	GF	✓	
2	Design & Development	AAC9a	X-ray 3	GF	✓	

3	Design & Development	AAC8b	Lab-safety programme is aligned with the safety programme of the organization. The broad principles shall be the same as that of the organization's safety programme. LABORATORY DESIGN - Lab Safety- Space for Autoclave, Space for LPG Cylinder	1F	√	
4	Design & Development	AAC9b	Scope of the imaging services is commensurate to the services provided by the organization. For example, a neuro-science centre shall have CT and MRI.	GF	√	
5	Design & Development	AAC2e	The documented policies and procedures also address managing patients during non-availability of beds. * Temporary holding area in ER	GF	√	
6	Design & Development	COP2d	Documented policies and procedures guide the triage of patients for initiation of appropriate care. * Self-explanatory. Triage shall be done only by qualified/trained individuals. Triage area in ER	GF	√	
7	Design & Development	COP7c	The transfusion services are governed by the applicable laws and regulations. Blood Bank infrastructure as per NABH blood bank standard	UB	√	
8	Design & Development	COP9c	The organization provides for a safe and secure environment for this vulnerable group. Safe and secure environment for vulnerable group- Play room for children, anti skid tiles for elderly, ramps with railing for disabled etc.	1F	√	Antiskid tiles  Corridor rails 
9	Design & Development	COP11e	Provisions are made for special care of children. Special care of children- Play room and breast feeding room.	1F	√	Play room, breast feeding room 
9	Design & Development	COP11e	Provisions are made for special care of children. Special care of children- Play room and breast feeding room.	1F	√	

10	Design & Development	COP14h	Patient, personnel and material flow conforms to infection control practices - The layout of the theatre should be such that the mix of sterile and unsterile patients does not happen or if it is not possible the mix is reduced to the bare minimum.	2F	√	
11	Design & Development	COP14i	Appropriate facilities and equipment/appliances/instrumentation are available in the operating theatre. The organization shall ensure that the operating theatre has facilities for pre-op holding, separate changing rooms for male and female staff, hand-washing area, operating rooms, waiting area for relatives, storage area, collection area for waste and linen and recovery room. In addition to the equipment required for anesthesia and surgery, there shall be equipment for resuscitation, radiation protection (where applicable) etc.	2F	√	Pre-post op 
				2F	√	Change rooms 
				2F	√	Scrub 
				2F	√	OT 
				2F	√	Relative waiting area 
12	Design & Development	COP17f	There is adequate space and equipment to perform these activities. The equipment shall be as per the scope of rehabilitation services provided. However, equipment for resuscitation shall be available in these areas. Space for rehabilitation services	3F	√	Rehabilitation 

13	Design & Development	COP18a	Documented policies and procedures guide all research activities in compliance with national and international guidelines. * Area for clinical research	AF	√	
14	Design & Development	PRE2a	Patients and family rights include respecting any special preferences, spiritual and cultural needs. Patients spiritual and cultural needs Worship requirement	GF	√	Prayer room – WIP
15	Design & Development	HIC7a	The organization provides adequate space and appropriate zoning for sterilization activities. 1. Adequate space for cssd 2. Separate areas for receiving, washing, cleaning, packing, sterilization, sterile storage and issue.	3F	√	CSSD 
16	Design & Development	HIC8b	Proper segregation and collection of biomedical waste from all patient-care areas of the hospital is implemented and monitored. DU room at all floors to collect waste	All IPD floors	√	
17	Design & Development	HIC8c	The organization ensures that biomedical. Waste is stored and transported to the site of treatment and disposal in proper covered vehicles within stipulated time limits in a secure manner. - Central waste collection area	UB	√	
18	Design & Development	FMS2b	Up-to-date drawings which detail the site layout, floor plans and fire escape routes . In addition to fire-evacuation plans, it is preferable that separate civil, electrical, and plumbing, HVAC and piped medical gas drawings are maintained.	Entire Hospital	√	
19	Design & Development	FMS2d	The provision of space shall be in accordance with the available literature on good practices (Indian or international standards) and directives from government agencies. - Provision of space as per IS 12433 and IS	Entire Hospital	√	Same will be verified by the architect

			10905			
20	Design & Development	HRM2c	Every staff member entering the organization is provided induction training. Space for training room	AF	√	Training room 
21	Design & Development	IMS2d	Documented procedures exist for storing and retrieving data. * Resources for effective data management- Space for MRD	UB	√	MRD 
22	Design & Development	COP3a	There is adequate access and space for the ambulance(s). This shall be demarcated keeping in mind easy accessibility for receiving patients and to enable the ambulance to turn around/exit quickly.	GF	√	
23	Interior Works	AAC8b	Lab-safety programme is aligned with the safety programme of the organization. The broad principles shall be the same as that of the organization's safety programme. Lab Safety - floors and stairs uniform and slip-resistant	1F	√	
24	Interior Works	AAC8b	Lab-safety programme is aligned with the safety programme of the organization. The broad principles shall be the same as that of the organization's safety programme. Lab Safety -Are bench surfaces resistant to solvents and corrosive chemicals.	1F	√	
25	Interior Works	AAC12f	The patient's record is available to the authorized care-providers to facilitate the exchange of information - Nursing station with file storage racks and handover takeover in HIS	All IPD floors	√	Space for Nurse station 
26	Interior Works	COP4a	Documented policies and procedures guide the uniform use of resuscitation throughout the organization - Crash cart	Applicable area	√	Socket for Crash cart 
27	Interior Works	FMS1b	Patient-safety devices are installed across the organization and inspected periodically. -	Entire Hospital	√	

			<i>For example, grab bars, bed rails, sign posting, safety belts on stretchers and wheel chairs, alarms both visual and auditory where applicable, warning signs like radiation or biohazard, call bells, fire-safety devices, etc.</i>			
28	Interior Works	MOM3 a	Documented policies and procedures exist for storage of medication. * These should address issues pertaining to temperature (refrigeration), light, ventilation, preventing entry of pests/rodents and vermin.	Entire Hospital	√	
29	Interior Works	MOM3 a	Documented policies and procedures exist for storage of medication. * These should address issues pertaining to temperature (refrigeration), light , ventilation, preventing entry of pests/rodents and vermin.	GF	√	Op pharmacy 
				UB	√	IP pharmacy 
30	Interior Works	MOM3 b	Medications are stored in a clean, safe and secure environment; and incorporating manufacturer's recommendation(s). Vaccines could preferably be kept in vaccine refrigerators (Ice Lined Refrigerator). Where appropriate, temperature monitoring of the storage area/refrigerator shall be done at least once a day.	Applicable area	√	
31	Interior Works	MOM9 b	These drugs are stored in a secure manner. Storage of narcotic drugs	Applicable area	√	Narcotic storage 
32	Interior Works	MOM1 3b	Medical supplies and consumables are used in a safe manner, where appropriate - Storage of hazardous material at all location	Applicable area	√	Hazmat store 
33	Interior Works	MOM1 3c	Medical supplies and consumables are stored in a clean, safe and secure environment; and	Applicable area	√	

			incorporating manufacturer's recommendation(s).			
34	Interior Works	PRE2b	Patient and family rights include respect for personal dignity and privacy during examination, procedures and treatment. <i>Curtains in all examination room in OPD, treatment room and economy ward</i>	Applicable area	√	
35	Electrical Installation Works	FMS6a	The organization has plans and provisions for early detection, abatement and containment of fire and non-fire emergencies. - <i>Provision for emergency illumination system which comes in to effect in case of a fire</i>	Entire Hospital	√	
36	DG Works	FMS2f	<i>Alternate sources for electricity and water are provided as backup for any failure/shortage</i> - Alternate electric supply could be from DG Sets, solar energy, UPS and any other suitable source.	UB	√	DG 
				UB	√	UPS 
				Roof	√	Solar panel 
37	Plumbing Works	AAC8b	Lab-safety programme is aligned with the safety programme of the organization. The broad principles shall be the same as that of the organization's safety programme. <i>Lab Safety - Is there a hand-washing sink in each laboratory room?</i>	1F	√	
38	Plumbing Works	HIC5b	Adequate and appropriate facilities for hand hygiene in all patient-care areas are accessible to healthcare providers. - <i>Hand washing facilities in all patient care areas - Large washbasins, Hands free control, soap and facility for drying hands</i>	Entire Hospital	√	

						
39	Plumbing Works	FMS6a	The organization has plans and provisions for early detection, abatement and containment of fire and non-fire emergencies - Provision of drainage system in case of sudden flooding specifically in basements	LB	√	Drainage system 
40	Pneumatic Pipe Line Works	AAC6d	Documented procedures guide ordering of tests, collection, identification, handling, safe transportation, processing and disposal of specimens. * 1. Mode of Sample Transportation (Manual or Pneumatic Chute)	Entire Hospital	√	Pneumatic chute 
41	Solar Heating System Works	FMS2f	Alternate sources for electricity and water are provided as backup for any failure/shortage Alternate sources are provided for in case of failure – Water	Entire Hospital	√	
42	Water Treatment Works	FMS2e	Potable water and electricity are available round the clock.- Arrangements for supply	LB	√	Water pump 
				UB	√	RO plant 
43	HVAC	AAC8b	Lab-safety programme is aligned with the safety programme of the organization. The broad principles shall be the same as that of the organization's safety programme. Lab Safety -Does mechanical ventilation compromise airflows in and around biological safety cabinets and fume cupboards?	1F	√	

44	HVAC	COP14 k	The quality assurance programme includes surveillance of the operation theatre environment. - Surveillance activities include the daily monitoring of humidity and temperature; at least monthly monitoring of pressure differential, and at least six monthly monitoring of integrity of filter. In addition, efficacy of OT cleaning and disinfection processes shall be monitored. Refer to the guidelines issued by NABH.	Applicable area	√	
45	HVAC	MOM3 a	Documented policies and procedures exist for storage of medication. * - These should address issues pertaining to temperature (refrigeration), light, ventilation, preventing entry of pests/rodents and vermin.	Medication storage area in the hospital	√	
46	HVAC	MOM3 b	Medications are stored in a clean, safe and secure environment; and incorporating manufacturer's recommendation(s). Medication is stored in a clean and ventilated environment.	Medication storage area in the hospital	√	
47	HVAC	HIC 2j	Annexure1 - NABH OT guidelines	2F	√	
48	HVAC	HIC 2j	a. The AHU of each OT should be dedicated one and should not be linked to air conditioning of any other areas. B. The flooring, walls and ceiling should be non porous, smooth, seamless without corners and should be easily cleanable repeatedly. The material should be chosen accordingly	2F	√	
49	HVAC	HIC 2j	The organization has appropriate engineering controls to prevent infections. - This shall include design of patient care areas (optimum spacing between beds is one-two meters), operating rooms, air quality and water supply. Issues such as air-conditioning plant and equipment maintenance, cleaning of AC	2F	√	

			ducts, AHUs, replacement of filters, seepage leading to fungal colonization, replacement/repair of plumbing, sewer lines (in shafts) should be included. Water-supply sources and system of supply, testing for water quality must be included. Any renovation work in hospital patient-care areas should be planned with infection control team with regard to architectural segregation, traffic flow, use of materials, etc.			
50	HVAC	HIC5c	Isolation/barrier nursing facilities are available. Refer to glossary for "isolation/barrier nursing". Ideally patients requiring isolation (contact, droplet and airborne) should be placed in isolation rooms and droplet cases be kept in negative pressure rooms. An air-conditioned single room with an exhaust or a well-ventilated room is an adequate option for healthcare facilities without "negative pressure" rooms. If an air-conditioned single room is not available, a fan can be placed in the room to direct airflow towards an outside window. The door/s to the aisle or other rooms should be kept closed at all times. Appropriate signage shall be used/displayed.	2F	√	Isolation room 
51	Fire Protection System	AAC8e	Laboratory personnel are provided with appropriate safety equipment/devices. Adequate safety devices are available in the lab, e.g. fire extinguishers , dressing materials, disinfectants etc. This should be sufficient to address the safety issue. At a minimum, standard precautions are adhered to.	1F	√	
52	Fire Protection System	FMS6a	The organization has plans and provisions for early detection, abatement and containment of fire and non-fire emergencies fire detection system	Entire Hospital	√	Heat detector, sprinkler

						
53	Fire Protection System	FMS6a	The organization has plans and provisions for early detection, abatement and containment of fire and non-fire emergencies Plans and provisions for fire emergencies as per national building code	Entire Hospital	√	
54	Fire Protection System	FMS6a	The organization has plans and provisions for early detection, abatement and containment of fire and non-fire emergencies Fire exit plan	Entire Hospital	√	
55	Fire Protection System	FMS1b	Patient-safety devices are installed across the organization and inspected periodically. - For example, grab bars, bed rails, sign posting, safety belts on stretchers and wheel chairs, alarms both visual and auditory where applicable, warning signs like radiation or biohazard, call bells, fire-safety devices, etc.	Entire Hospital	√	
56	Access Control/CCTV works	COP11g	Documented policies and procedures prevent child/neonate abduction and abuse. The organization shall ensure that there is an adequate security/surveillance to prevent such happenings. - CCTV for surveillance	Entire Hospital	√	
57	Kitchen Equipments & Dining Area Works	COP 19f	Food is prepared, handled, stored and distributed in a safe manner. The dietary services to be designed in a manner that there is no criss-cross of traffic. All the activities fall in a sequence. The organization shall ensure that hygienic conditions are followed all throughout. Other indicative points are: i. dedicated food storage/refrigeration areas exist to ensure food preservation; ii. food storage areas/refrigerators	GF	√	Kitchen 

			are maintained appropriately; iii. all food products are stored at the floor; iv. cleaning supplies stored in a separate location way from food; v. separate dedicated food preparation areas exist; vi. measures are in place to ensure that flies do not come in contact with prepared/stored food; vii. food distribution to patients occurs where possible in temperature appropriate food service trolleys (hot food kept hot and cold food kept cold).			
58	Kitchen Equipments & Dining Area Works	COP 19f	Dietary services to be designed in a manner that there is no criss cross of traffic	GF	√	
59	Laundry Works	HIC 2h	The organization adheres to laundry and linen management processes. * The laundry can be in-house or outsourced. The organization shall have a policy for change of linen. There shall be separate washing protocols for different categories of linen including blankets (where applicable).	Upper Basement	√	Laundry, linen store 
60	Medical Equipment	COP 3c	1. Ambulance(s) is appropriately equipped. 2. This shall be in consonance with ACLS or BLS guidelines.	GF	√	
61	Medical Equipment	AAC3a	Documented policies and procedures guide the transfer-in of patients to the organization. * ACLS/BLS Ambulance	GF	√	
62	Medical Equipment	AAC3b	Documented policies and procedures guide the transfer-out/referral of unstable patients to another facility in an appropriate manner. * ACLS/BLS Ambulance	GF	√	
63	Medical Equipment	AAC3c	Documented policies and procedures guide the transfer-out/referral of stable patients to another facility in an appropriate manner. * ACLS/BLS Ambulance	GF	√	

64	Medical Equipment	AAC6a	Scope of the laboratory services are commensurate to the services provided by the organization 1. Test results required for emergency management (RBS, ABG etc.) must be available within its premises. 2. Cardiac care organization must necessarily have facilities for cardiac enzyme.	Applicable area	v	
65	Medical Equipment	AAC6b	The infrastructure (physical and manpower) is adequate to provide for its defined scope of services The available equipment and manpower should be able to effectively deliver its laboratory services.	1F	v	
66	Medical Equipment	AAC7d	The programme includes periodic calibration and maintenance of all equipment. * Calibration of equipment	1F	v	
67	Medical Equipment	AAC9c	The infrastructure (physical and manpower) is adequate to provide for its defined scope of services. Imaging equipment	1F	v	
68	Medical Equipment	AAC9e	Documented policies and procedures guide identification and safe transportation of patients to imaging services. * Transportation of patient to imaging services- Patient bed, stretcher, wheel chair	Entire Hospital	v	
69	Medical Equipment	AAC10d	The programme includes periodic calibration and maintenance of all equipment. * Calibration of Imaging Services equipment	GF	v	
70	Medical Equipment	COP5f	Nurses are provided with adequate equipment for providing safe and effective nursing services. There shall be adequate number of sphygmomanometers, thermometers, weighing scale(s), etc.	Applicable area	v	
71	Medical Equipment	COP8d	Adequate staff and equipment are available. Adequate equipment in ICU	2F	v	ICU

						
72	Medical Equipment	COP14i	Appropriate facilities and equipment/appliances/instrumentation are available in the operating theatre. In addition to the equipment required for anesthesia and surgery, there shall be equipment for resuscitation, radiation protection (where applicable) etc.	Applicable area	√	
73	Medical Equipment	COP17f	There is adequate space and equipment to perform these activities. Equipment for rehabilitation services	3F	√	Rehabilitation 
74	Medical Equipment	MOM3e	The list of emergency medications is defined and is stored in a uniform manner A crash cart would help the organization to store these medications in a standardized manner, i.e. the rows and drawers have defined medicines. No other drugs shall be kept stored with emergency medications.	Applicable area	√	
75	Medical Equipment	FMS4a	The organization plans for equipment in accordance with its services and strategic plan. Equipment as per IPHS guidelines	Entire Hospital		
76	Medical Equipment	FMS4e	Equipment are periodically inspected and calibrated for their proper functioning. Inspected and calibrated for their proper functioning. Equipment calibration tool	UB	√	
77	Medical Equipment	FMS1b	Patient safety devices are installed across the organization - For example, grab bars, bed rails, sign posting, safety belts on stretchers and wheel chairs , alarms both visual and auditory where applicable, warning signs like	Entire Hospital	√	

			radiation or biohazard, call bells, fire-safety devices, etc.			
78	Medical Gas Piped System	FMS5c	Medical gases are handled, stored, distributed and used in a safe manner. Uniform color coding systems for medical gases	Entire Hospital	√	
79	Medical Gas Piped System	FMS5c	Medical gases are handled, stored, distributed and used in a safe manner. This shall include alarm units and valve boxes installation at various locations and 24X7 monitoring of plant alarm unit for gas pressure going beyond the set limit, pin-indexed medical gas outlets, etc.	Applicable area	√	
80	Medical Gas Piped System	FMS5d	Alternate sources for medical gases, vacuum and compressed air are provided for, in case of failure. Alternate sources for medical gases	UB	√	
81	Medical Gas Piped System	FMS5a	Documented procedures govern procurement, handling, storage, distribution, usage and replenishment of medical gases. * A good reference is HTM 2022 or NFPA's Medical Gas and Vacuum Systems Installation Handbook (NFPA's new NFPA 99C solution). Proper signage is kept for used, full, empty cylinders. The organization shall adhere to statutory requirements under the provisions of Indian Explosives Act, Gas Cylinder rules and Static and Mobile Pressure Vessel (unfired) rules. The documentation shall cover objective element "b" also.	UB	√	
82	Nurse Call System Works	FMS1b	Patient safety devices are installed across the organization - For example, grab bars, bed rails, sign posting, safety belts on stretchers and wheel chairs, alarms both visual and auditory where applicable, warning signs like radiation or biohazard, call bells, fire-safety devices, etc.	Entire Hospital	√	

83	Computer hardware system works	CQI5a	The management makes available adequate resources required for quality improvement programme. Software for data analysis	UB	√	
84	Networking System	COP3h	The ambulance(s) have a proper communication system. The ambulance shall be connected with the hospital/control room by wireless/mobile phones.	GF	√	
85	Networking System	IMS5c	The policies and procedure(s) incorporate safeguarding of data/record against loss, destruction and tampering. Safeguarding of data For electronic data there should be protection against virus/Trojans and also a proper back up procedure. To prevent tampering for physical records access shall be limited only to the concerned health care provider. In electronic format this could be done by adequate passwords.	Entire Hospital	√	
86	Signages Works	AAC9a	Imaging services comply with legal and other requirements. Radiation Signages	Applicable area	√	
87	Signages Works	PRE1a	Patient and family rights and responsibilities are documented and displayed. * Display of patient and family rights - displayed in the form of a Citizen Charter	Entire Hospital	√	
88	Signages Works	AAC1b	The defined services are prominently displayed. The services so defined should be displayed prominently in an area visible to all patients entering the organization. The display could be in the form of boards, citizen's charter, etc. They should be of permanent nature. Care should be taken to ensure that these are displayed in the language(s) the patient understands.	Entire Hospital	√	
89	Signages Works	AAC11g	Imaging signages are prominently displayed in all appropriate locations	Applicable area	√	
90	Signages Works	HIC2c	The organization adheres to hand-hygiene guidelines. * Hand washing signages	All patient care areas	√	

91	Signages Works	CQI7b	The organization has a process to collect feedback and receive complaints. This shall be communicated to the patients using displays or brochures.	All patient care areas	√	
92	Signages Works	FMS1c	The organization is a non-smoking area. Smoking signages	Entire Hospital	√	
93	Signages Works	FMS2c	There is internal and external sign postings in the organization in a language understood by the patient, families and community. Bilingual signages	Entire Hospital	√	
94	Signages Works	FMS5a	Documented procedures govern procurement, handling, storage, distribution, usage and replenishment of medical gases. * Proper signages for used, full, empty cylinders	UB	√	
95	Signages Works	FMS6b	Fire-exit plan shall be displayed on each floor particularly close to the lifts. Exit doors should remain open all the time. Signages as per national building code.	Entire Hospital	√	
96	Trial Run	MOM3a	Documented policies and procedures exist for storage of medication. * Preventing entry of pests/rodents and vermins.	Entire Hospital	√	

DATA

Based upon the above standards and the design of hospital a checklist is designed to compile the status of site on daily basis which consist of the monitoring of execution of each floor, the headings under which the execution is monitored are:

civil, furniture, curtain, electrical (crash cart), PA system, MGPS, HVAC, plumbing and hand hygiene, nurse call and rodent system, pneumatic chute, CCTV, access control, fire alarm system and extinguisher, drainage, lift service, signanges, garbage chute and linen chute

All the above headings are considered below and the data is shown in table and graph, graphs explain the weekly progress of each floor of hospital

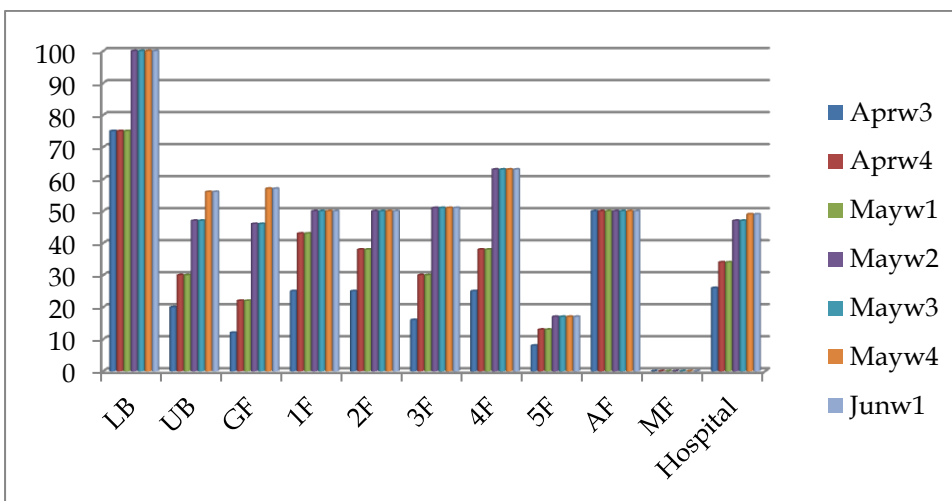
ASSUMPTIONS

Assumption	
1	If any particular service not applicable to particular activity it will score 100 marks
2	The decimals are rounded off by making a whole number - lower whole number if the decimal is less than 0.5, upper whole number if the decimal is 0.5 and above
3	Out of 100% hospital Design completion is considered as 50% and site execution is considered as 50%

CIVIL

Civil is concerned with wall construction, plastering, floor levelling, flooring/water proofing, and type of flooring, wall premier, first coat and second coat paint, ambulance marking, furniture

CIVIL - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	75	75	75	100	100	100	100
UB	20	30	30	47	47	56	56
GF	12	22	22	46	46	57	57
1F	25	43	43	50	50	50	50
2F	25	38	38	50	50	50	50
3F	16	30	30	51	51	51	51
4F	25	38	38	63	63	63	63
5F	8	13	13	17	17	17	17
AF	50	50	50	50	50	50	50
MF	0	0	0	0	0	0	0
Hospital	26	34	34	47	47	49	49



Pending work: type of flooring, wall premier, first coat paint, second coat paint, ambulance marking are under process.

Areas yet to be constructed: partition for separation in biomedical waste collection(UB),prayer room (GF), ambulance parking(GF), Gynae OT (5F), Pre-post OP gynaecology (5F), LDRP suit (5F), NICU (5F), Labour room (5F)

FURNITURE:

As hospital is under construction phase the furniture will be installed once the construction is finished and there is a dust free area. The design specifying furniture layout is ready.

Furniture is concerned with narcotic storage unit installation, corridor rails installation (WIP), furniture of storage of hazardous material, refrigeration, rodent control, food trolleys.

CURTAINS:

As hospital is under construction phase the curtains will be installed once the construction is finished and there is a dust free area. The design specifying the areas curtains to be installed is ready.

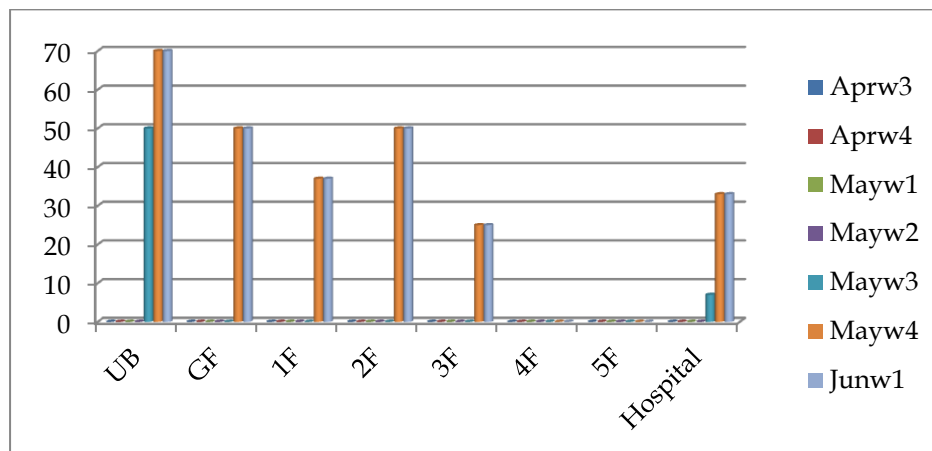
Curtain is concerned with grill fixing and curtain fixing.

ELECTRICAL (CRASHCART, DG, UPS):

Electrical works are concentrated on crash cart DG and UPS works and is concerned with wall chasing, wall conduting, electrical wiring, switch box, termination, power testing, DG and UPS completion

ELECTRICAL(CRASHCARD,DG,UPS)- FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
UB	0	0	0	0	50	70	70
GF	0	0	0	0	0	50	50
1F	0	0	0	0	0	37	37
2F	0	0	0	0	0	50	50
3F	0	0	0	0	0	25	25
4F	0	0	0	0	0	0	0
5F	0	0	0	0	0	0	0

Hospital	0	0	0	0	7	33	33
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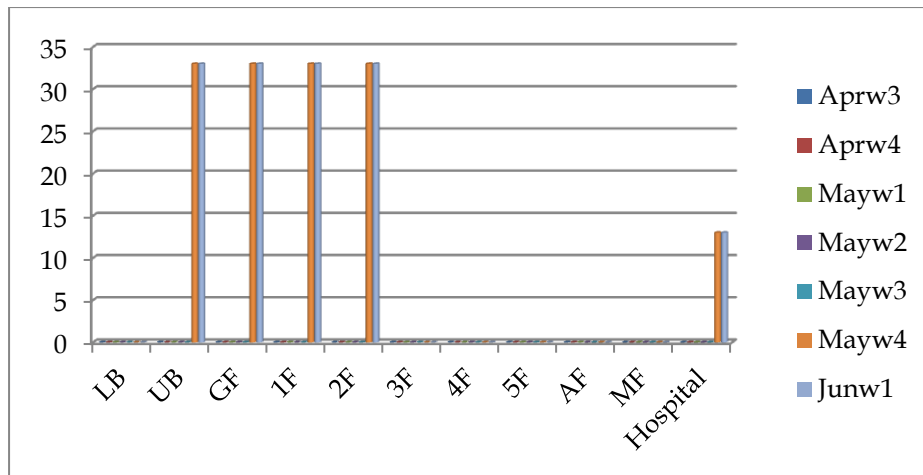
Pending work: wall chasing and wiring, DG completion & UPS completion work is under progress, wall conduiting, switch box, termination, power testing is pending

Pending area: 3F, 4F, 5F

PA SYSTEM:

Public address system is concerned with installation and testing

PA SYSTEM - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	0	0	0	0	0	0	0
UB	0	0	0	0	0	33	33
GF	0	0	0	0	0	33	33
1F	0	0	0	0	0	33	33
2F	0	0	0	0	0	33	33
3F	0	0	0	0	0	0	0
4F	0	0	0	0	0	0	0
5F	0	0	0	0	0	0	0
AF	0	0	0	0	0	0	0
MF	0	0	0	0	0	0	0
Hospital	0	0	0	0	0	13	13



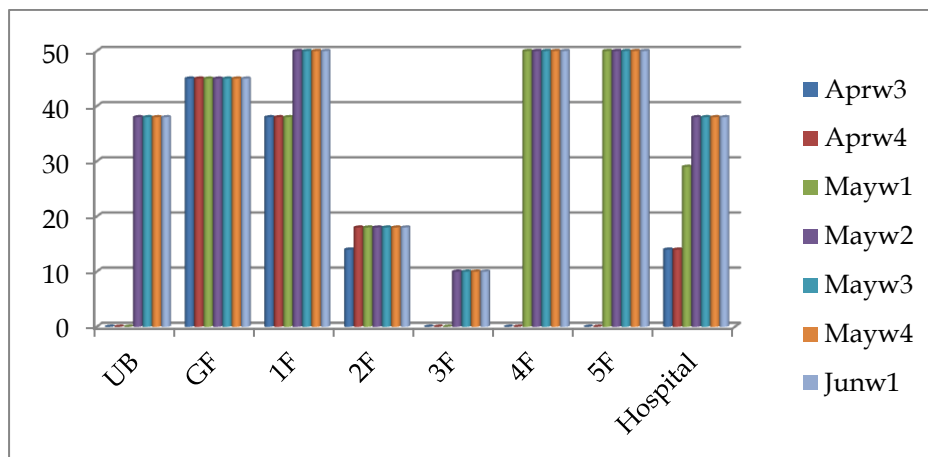
Pending work: Installation, testing

Pending area: LB, 3F, 4F, 5F, AF, MF

MGPS:

Medical gas pipe system consists of area alarm – 2,3,4,5 gases

MGPS - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
UB	0	0	0	38	38	38	38
GF	45	45	45	45	45	45	45
1F	38	38	38	50	50	50	50
2F	14	18	18	18	18	18	18
3F	0	0	0	10	10	10	10
4F	0	0	50	50	50	50	50
5F	0	0	50	50	50	50	50
Hospital	14	14	29	38	38	38	38



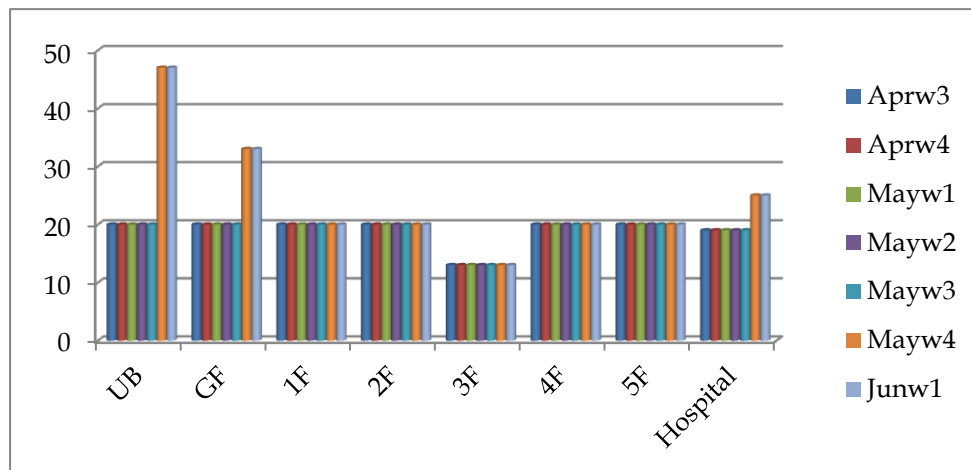
Pending work: testing will be done once all the MGPS are installed and medical gas room is ready, piping work is under progress.

Pending areas: Plant room (UB), Gas manifold room (GF), OT (2F).

HVAC:

Heating, ventilation and air conditioning is concerned with duct work erection, AC blow, AC exhaust, grill installation, diffuser

HVAC- FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
UB	20	20	20	20	20	47	47
GF	20	20	20	20	20	33	33
1F	20	20	20	20	20	20	20
2F	20	20	20	20	20	20	20
3F	13	13	13	13	13	13	13
4F	20	20	20	20	20	20	20
5F	20	20	20	20	20	20	20
Hospital	19	19	19	19	19	25	25

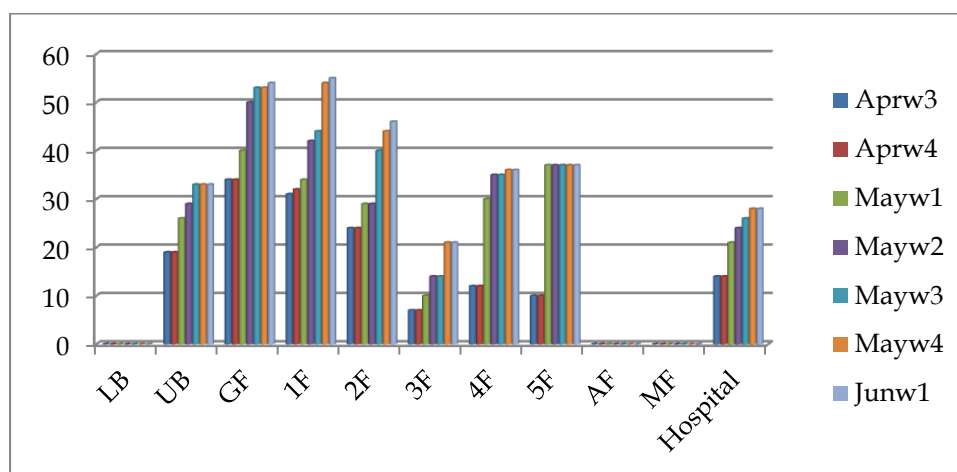


Pending work: AC blow, AC exhaust, grill installation, diffuser installation are under process

PLUMBING:

Plumbing work is concerned with anti skid tiles, grab bars, marking and chasing, lying of water supply, core cutting, lying of drainage, fixing of sanitary fixtures, eye washer, special commode for bed pan, water cheking(RO/hot/cold)

PLUMBING - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	0	0	0	0	0	0	0
UB	19	19	26	29	33	33	33
GF	34	34	40	50	53	53	54
1F	31	32	34	42	44	54	55
2F	24	24	29	29	40	44	46
3F	7	7	10	14	14	21	21
4F	12	12	30	35	35	36	36
5F	10	10	37	37	37	37	37
AF	0	0	0	0	0	0	0
MF	0	0	0	0	0	0	0
Hospital	14	14	21	24	26	28	28



Pending work: anti skid tiles, marking and chasing, lying of water supply are under progress, fixing of sanitary fixtures, eye washer, special commode will be done after the construction of building is complete.

Pending area:

Pipe line work: mortuary, engineering work shop, neuro consultation 2, NS pre-post op OT, Decontamination OT, NS CTVS RR, NS1, CU 2, DU 2, NS 2

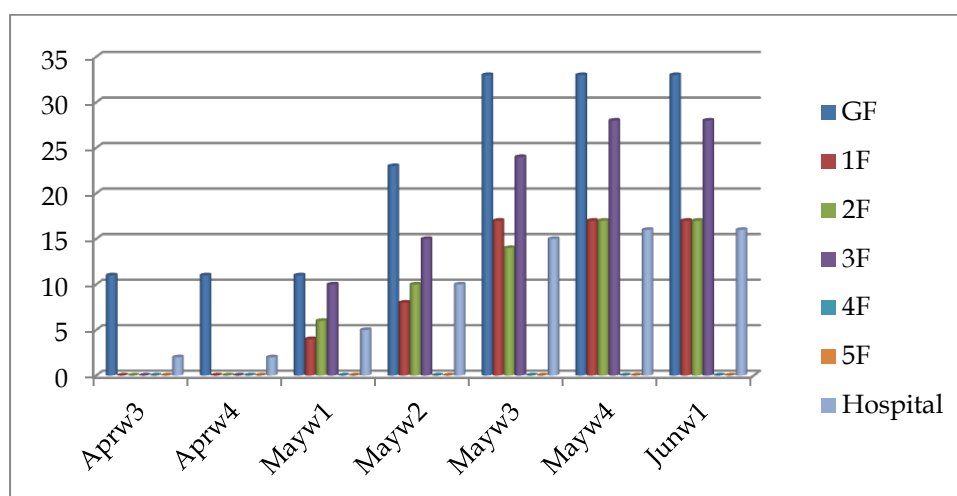
Anti skid tiles: toilet, public toilet, doctor change room toilet (female), International pt lounge, OPD toilet, toilet near kitchen, back office toilet, physiotherapy toilet, toilet near dialysis, Complete 2F except MICU toilet, paediatric cardiac ICU toilet, Doctors room

toilet, doctors lounge toilet (male), complete 3F except economy ward toilet, nurse rest room toilet, public toilet near visitors lounge, 4F, 5F, AF, MF.

NURSE CALL AND RODENT REPELLENT SYSTEM:

Nurse call and rodent repellent system is concerned with wall chasing, wall conduiting, CAT cable works, female junction box, termination, nurse call installation and testing, rodent repellent system

NURSE CALL AND RODENT REPELLENT SYSTEM - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
GF	11	11	11	23	33	33	33
1F	0	0	4	8	17	17	17
2F	0	0	6	10	14	17	17
3F	0	0	10	15	24	28	28
4F	0	0	0	0	0	0	0
5F	0	0	0	0	0	0	0
Hospital	2	2	5	10	15	16	16



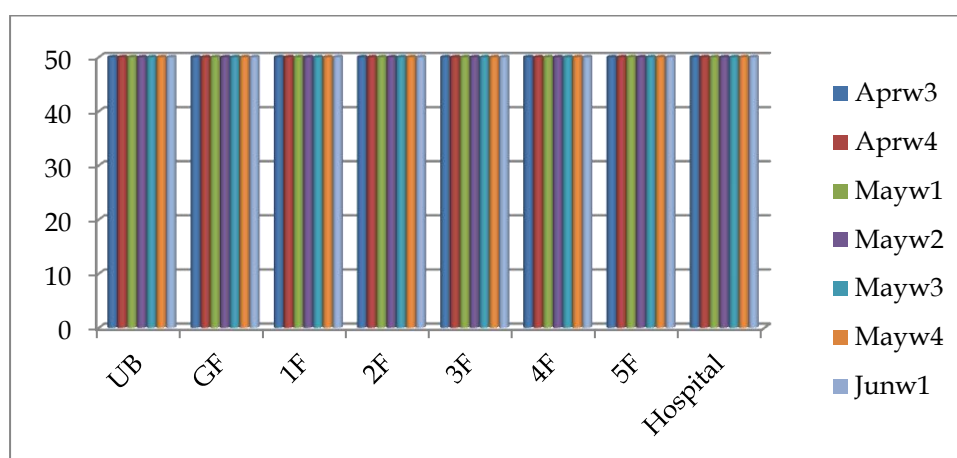
Pending work: wall chasing, wall conduiting CAT cable work is under process, female junction box, termination, nurse call installation and testing, rodent repellent system will be done at the end of building construction.

Pending area: 4F, 5F

PNEUMATIC CHUTE:

Pneumatic chute is concerned with lying of pipe, pneumatic station

PNEUMATIC CHUTE - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
UB	50	50	50	50	50	50	50
GF	50	50	50	50	50	50	50
1F	50	50	50	50	50	50	50
2F	50	50	50	50	50	50	50
3F	50	50	50	50	50	50	50
4F	50	50	50	50	50	50	50
5F	50	50	50	50	50	50	50
Hospital	50	50	50	50	50	50	50

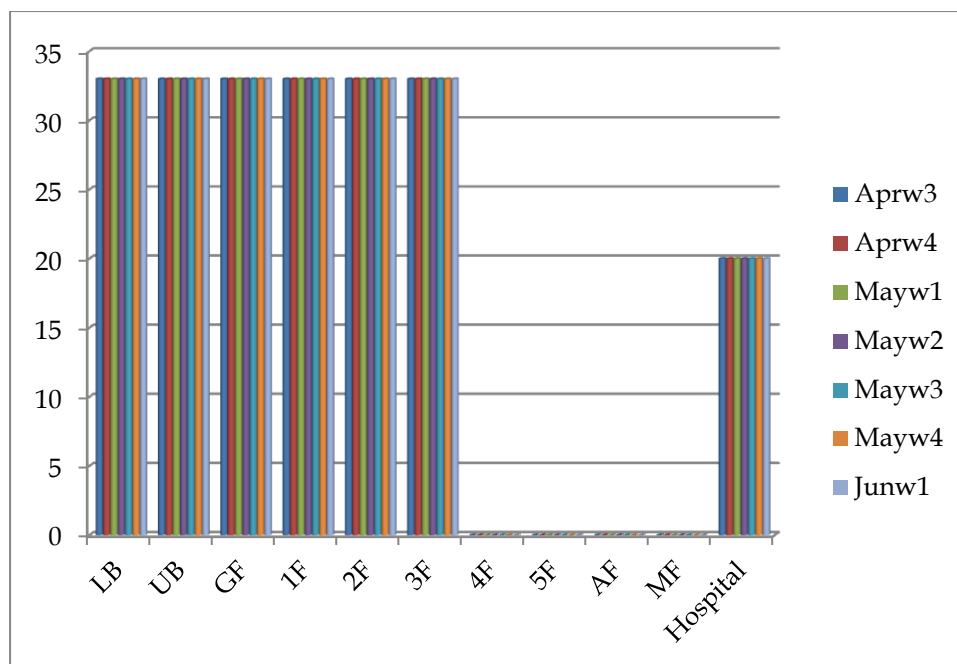


Pending work: Pneumatic station will be installed once the construction is complete

CCTV:

CCTV is concerned with wiring, installation, testing

CCTV- FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	33	33	33	33	33	33	33
UB	33	33	33	33	33	33	33
GF	33	33	33	33	33	33	33
1F	33	33	33	33	33	33	33
2F	33	33	33	33	33	33	33
3F	33	33	33	33	33	33	33
4F	0	0	0	0	0	0	0
5F	0	0	0	0	0	0	0
AF	0	0	0	0	0	0	0
MF	0	0	0	0	0	0	0
Hospital	20	20	20	20	20	20	20



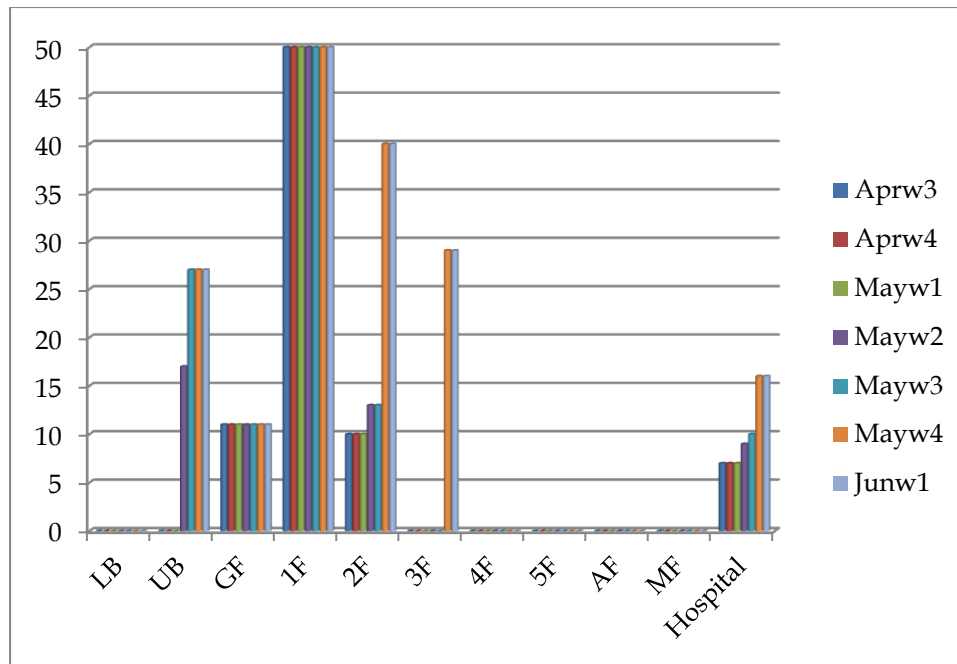
Pending work: CCTV installation and testing will be done at the end of construction of building.

Pending area: 3F, 4F, 5F, AF, MF.

ACCESS CONTROL:

Access control is concerned with wiring, card reader, biometric reader, electromagnetic lock, glass break switch, metal detector, baggage scanner, testing

ACCESS CONTROL - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	0	0	0	0	0	0	0
UB	0	0	0	17	27	27	27
GF	11	11	11	11	11	11	11
1F	50	50	50	50	50	50	50
2F	10	10	10	13	13	40	40
3F	0	0	0	0	0	29	29
4F	0	0	0	0	0	0	0
5F	0	0	0	0	0	0	0
AF	0	0	0	0	0	0	0
MF	0	0	0	0	0	0	0
Hospital	7	7	7	9	10	16	16



Pending work: Card reader installation, biometric reader installation, glass break switch installation, metal detector installation, baggage scanner installation, testing will be done at the end of construction

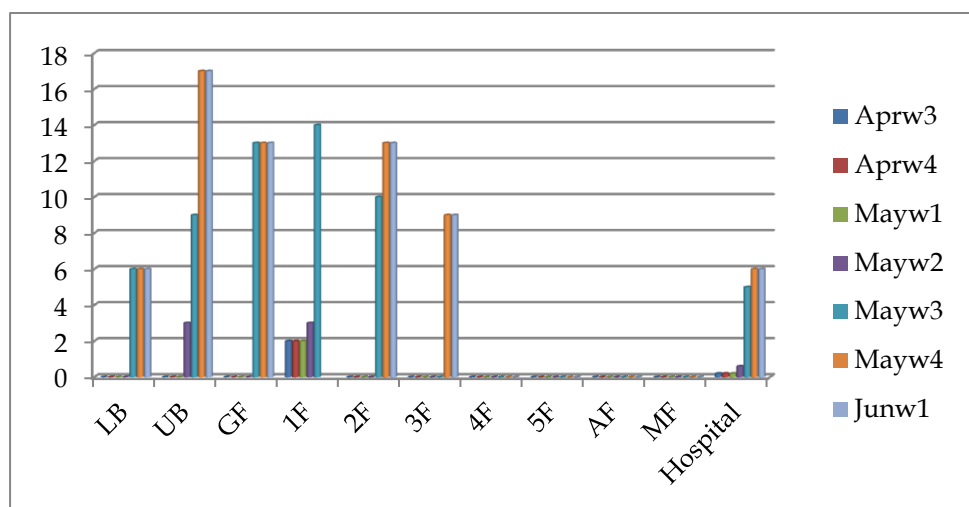
Pending area: 3F, 4F, 5F, AF, MF.

FIRE ALARM SYSTEM AND EXTINGUISHER:

Fire alarm system and extinguisher is concerned with wiring, multi detector, detector above false ceiling, response indicator, heat detector, duct detector, control module, monitor module, beam detector, fire EX DCP 5kg, fire EX CO2+water, MCP, hooter, strobes, fire rated doors, emergency illumination system, testing

FIRE ALARM AND EXTINGUISHER - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	0	0	0	0	6	6	6
UB	0	0	0	3	9	17	17
GF	0	0	0	0	13	13	13
1F	2	2	2	3	14		
2F	0	0	0	0	10	13	13
3F	0	0	0	0	0	9	9
4F	0	0	0	0	0	0	0
5F	0	0	0	0	0	0	0
AF	0	0	0	0	0	0	0

MF	0	0	0	0	0	0	0
Hospital	0.2	0.2	0.2	0.6	5	6	6



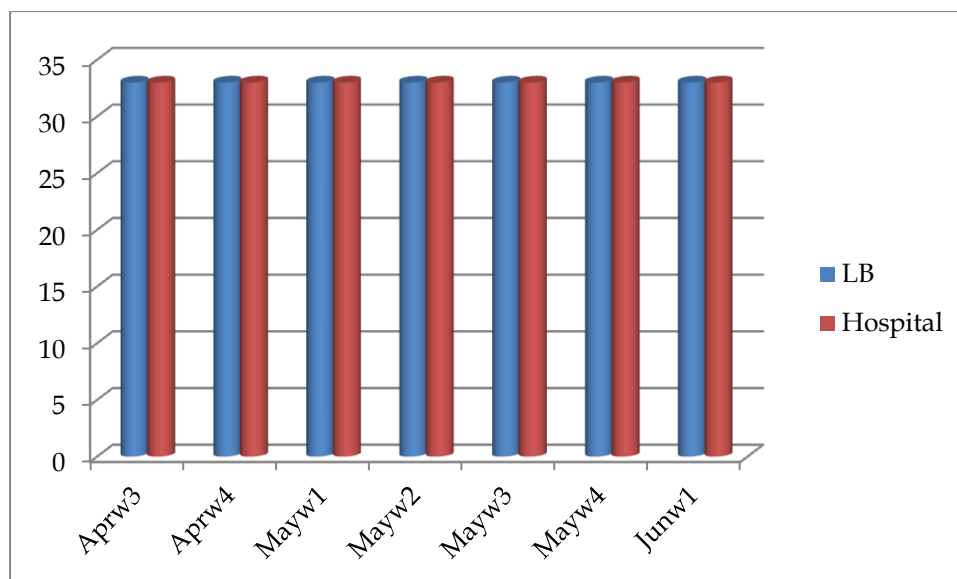
Pending work: multi detector, detector above false ceiling, response indicator, heat detector, duct detector, control module, monitor module, beam detector, fire EX DCP 5kg, fir EX CO2+water, MCP, hooter, strobes, exit signs, fire rated door, emergency illumination system installation, testing are under process.

Pending area: 3F, 4F, 5F, AF, MF.

DRAINAGE:

Drainage is concerned with delivery of material, installation, testing

DRAINAGE- FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	33	33	33	33	33	33	33
Hospital	33	33	33	33	33	33	33

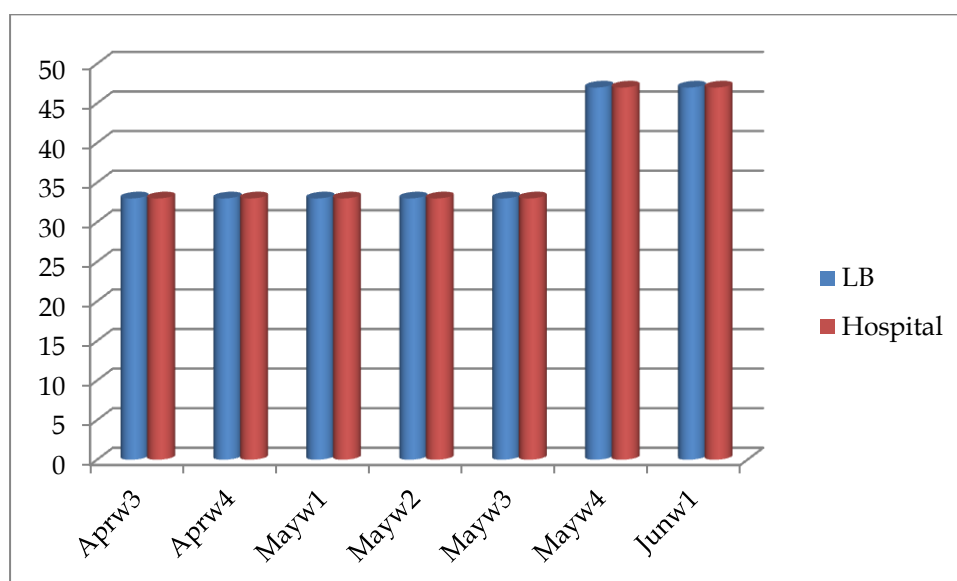


Pending work: Installation and testing

LIFT SERVICE:

Lift service is concerned with delivery of material installation and testing

LIFT SERVICE - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	33	33	33	33	33	47	47
Hospital	33	33	33	33	33	47	47



There are 10 lifts, D1 (doctors and staff), P1 & P2 (patients), V1, V2, V3 & V4 (Visitors), S1 & S3 (dirty), S2 & S4 (clean).

Out of these lifts, V1 is working, P2 & S2 are installed, and testing is under process

Remaining lifts are under process

SIGNAGES:

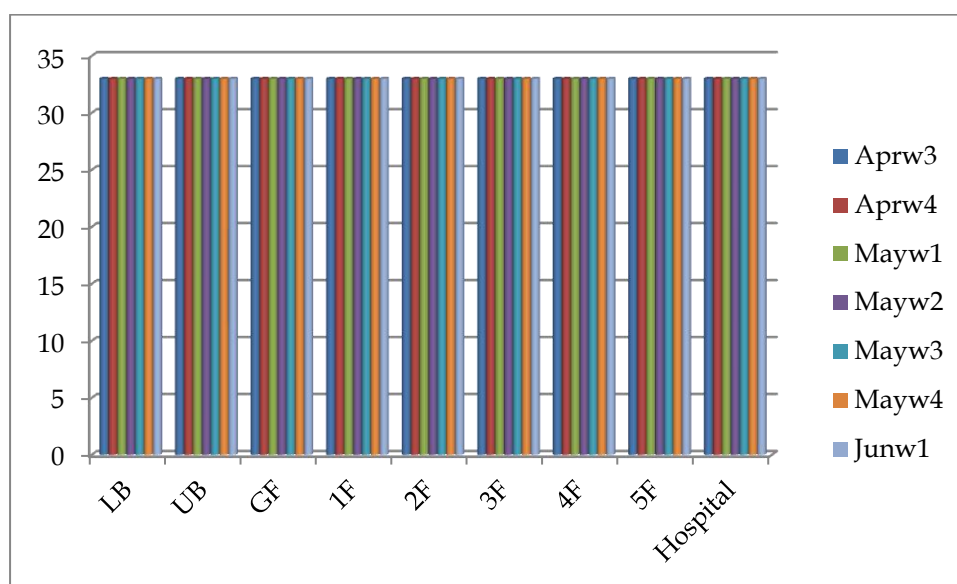
All the signages and displays, boards etc will be installed once the building construction is completed.

Signages are concerned with design completion and placement at respective places

GARBAGE CHUTE:

Garbage chute is concerned with construction, installation and testing

GARBAGE CHUTE - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	33	33	33	33	33	33	33
UB	33	33	33	33	33	33	33
GF	33	33	33	33	33	33	33
1F	33	33	33	33	33	33	33
2F	33	33	33	33	33	33	33
3F	33	33	33	33	33	33	33
4F	33	33	33	33	33	33	33
5F	33	33	33	33	33	33	33
Hospital	33	33	33	33	33	33	33

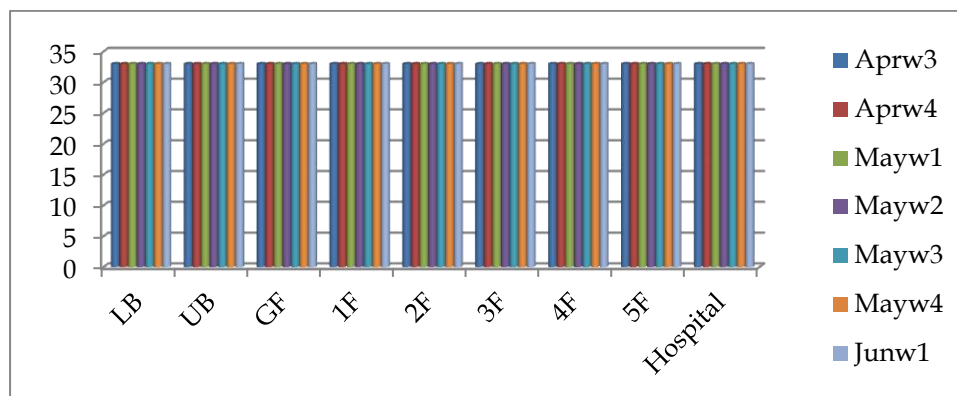


Pending work: installation and testing will be done at the end of building construction.

LINEN CHUTE:

Linen chute is concerned with construction, installation testing

LINEN CHUTE - FLOOR WISE COMPLETION IN PERCENTAGE							
Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	33	33	33	33	33	33	33
UB	33	33	33	33	33	33	33
GF	33	33	33	33	33	33	33
1F	33	33	33	33	33	33	33
2F	33	33	33	33	33	33	33
3F	33	33	33	33	33	33	33
4F	33	33	33	33	33	33	33
5F	33	33	33	33	33	33	33
Hospital	33	33	33	33	33	33	33



Pending work: installation and testing will be done at the end of building construction.

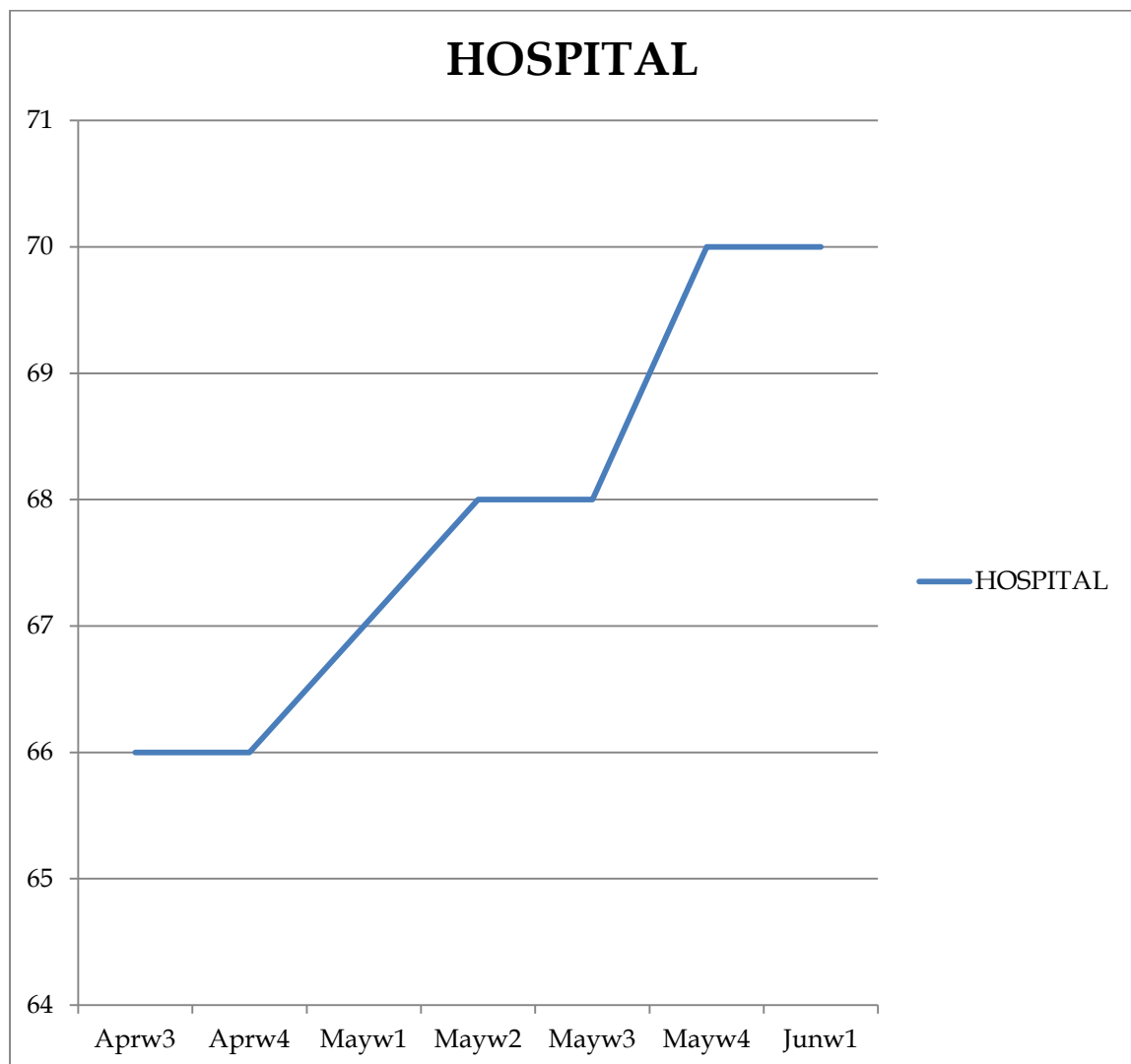
WEEKLY FLOOR WISE HOSPITAL EXECUTION PROGRESS:

Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
LB	52	52	52	54	54	54	54
UB	30	31	31	35	39	45	45
GF	23	24	24	27	28	34	34
1F	25	26	26	28	29	35	35
2F	21	22	22	23	25	32	32
3F	18	18	19	21	22	26	26

4F	19	20	23	26	26	\23	23
5F	18	18	22	23	23	21	21
AF	51	52	52	52	52	60	60
MF	57	57	57	57	57	57	57
Average	31	32	33	35	36	39	39

Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
Design	100	100	100	100	100	100	100
Hospital Execution	31	32	33	35	36	39	39

Floor	Aprw3	Aprw4	Mayw1	Mayw2	Mayw3	Mayw4	Junw1
HOSPITAL	66	66	67	68	68	70	70



CHALLENGES FACED:

CHALLENGES	STATUS	COUNTER MEASURE
• Construction of the hospital as per schedule	There is a slight delay in construction schedule	Catch up plan has prepared by project team and all the delayed activities taken on priority to complete the construction on time
• Legal compliance completion before hospital go live	Application to the government authorities has been submitted as per the time line provided by the project team for the concerned area, some of the areas are not handed over as per the time line	Hospital Liasioning team is in regular follow up with government authorities to have the inspection/approval on time as per project handover schedule
• Getting government approval for various services like STP, Water Connection, Electrical Connection, Drainage System, etc.	Same as legal compliance	Same as legal compliance
• Coordination between project teams	NA	Project management consultant is coordinating all the activities with structural consultant architect, MEP consultant, MEP contractor, etc to deliver the project on

		target timeline
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LIMITATIONS:

Time available for the study was one of the major limitations

Availability of micro schedule for the each construction activity was frequently changed.

RECOMMENDATIONS:

Strict adherence to the time schedule to be followed to complete the legal compliances on time as per project completion schedule.

Application to be filed as per the timeline given by the prescribed authority on time as per project completion schedule so that inspection can be completed on time to get the particular license/approval on time.

Hospital compliance team and project team should work in close coordination to so that there is proper synchronisation between the site completion and filing of application.

CONCLUSION:

It can be concluded that it is a good step to undertake actions to complete all the required infrastructure compliance as per NABH 3rd Edition during hospital project time itself so that the hospital will be ready from all aspects to comply with NABH before the hospital go live.

The study gives a frame of NABH standards defining hospital infrastructure, division of infrastructure in to different working departments like electrical, plumbing, HVAC, MGPS, Civil etc, monitoring the execution accordingly, Collection and analysis of data, present status of hospital completion, challenges faced, steps taken for the challenges being faced

As per the data available above, present status of hospital is 70% complete infrastructurally, majority of things like furniture, curtains etc can be installed only when the hospital construction is complete and there is a dust free condition, hence it can be considered that hospital construction is as per schedule and is expected to achieve target time being set.

The actual status is more than we have presented in this report as the assumption taken by the Q & S is not as per the construction activity sequence it is more like a monitoring only the major activity for the particular activity.

REFERENCES:

- NABH 3edition, November 2011
- Publication of OIG compliance program guidance for hospitals.
- **Quality improvement program- Gujarat, Hospital engineering services as per NABH-Commissionerate of health MS & ME Dr Jivraj Maheta Bhavan Block**
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- **The Role of Organizational Infrastructure in implementation of hospitals**
‘Quality Improvement - Jeffrey A Alexander, Bryan J Weuner, Stephen M Shortell, Laurence C Baker, Mark P Becker
- **Reaching pinnacles of quality – TNHSP access, equity, quality – Accreditation** - Thiru. V. K. Subraj, I.A.S., Dr S. Vijaykumar. I.A.S
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- en.wikipedia.org/wiki/NABH
- acronyms.thefreedictionary.com
- oxford reference – a dictionary of abbreviations
- Nabh.co

ANNEXURE:

1.0 NABH infrastructure design compliance tracker

2.0 Infrastructure check list as per NABH standard

3.0 Site visit checklist tool

4.0 Working drawings

5.0 MEP drawings

6.0 MGPS drawings

7.0 Furniture lay out drawings