India
Health and Family Welfafe Department
Government of Tamil Nadu

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR IMPROVEMENT
OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI
IN
INDIA

NOVEMBER 2013

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

THE CONSORTIUM OF
YOKOGAWA ARCHITECTS & ENGINEERS, INC.
YAMASHITA SEKKEI, INC. AND
BINKO INTERNATIONAL LTD.

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SUMMARY

SUMMARY

1. Overview of the Country

India is located on the Indian peninsula in the South Asia protruding in the Indian Ocean. It covers 3,287,590 km^2 (about 8.7 times as large as Japan).

Tamil Nadu lies in the southernmost part of India and covers 130,058 km^2. It is the eleventh largest state in India. As Tamil Nadu is near the equator, it is under tropical hot and humid climate throughout the year from the effects of monsoon. The state has three distinct seasons dependent on rainfalls; southwest monsoon (from June to September), northeast monsoon (from October to December) and dry season (from January to May). The annual rainfall is about 1,000 mm of which about 50% is through the northeast monsoon.

The country's per capita GDP (Gross Domestic Products) is US$1,509 (World Bank, 2011). The GDP composition by sector in 2010 is: services 57.7%; industry 27.9%; and agriculture 14.4%. With the steady economic growth since 1990s, high and middle-income earners have increased in urban areas, while income gaps and regional disparities have been expanding.

GDP of Tamil Nadu is about 42.8 billion Rs in 2011, which account for about 8.2% of the country's GDP of 522.2 billion Rs. The state economic growth rate is 9.4%, which surpasses the 6.9% average of the country. Also, Tamil Nadu is a state with the highest urban population ratio (48.5% urban population ratio according to the 2011 census).

2. Background, History and Outline of the Project

Despite the achievement of high economic growth, the Human Development Index (HDI) report ranked India 136th among 186 countries (UNDP, 2012), which shows that India still faces challenges. Health indices have shown significant improvement: the "Infant Mortality Rate" (IMR) decreased from 64/1,000 live births in the year 2000 to 47 in 2011, and the "Under Five Mortality Rate" (U5MR) decreased from 87/1,000 live births to 61 (UNICEF). However, considerable effort is required to reduce IMR and U5MR respectively for the achievement of Millennium Development Goals (MDGs) by 2015. From the above background, the 12th Five Year Plan (2012-2017), which is the national development plan of India, focuses on the health sector. The plan states that one of the most important issues is to provide medical services for low-income groups in the urban areas to ensure broader coverage of health services by National Urban Health Mission, and to provide quality medical services aiming at reducing IMR and the maternal mortality rate.

The Institute of Child Health and Hospital for Children, Chennai (ICH), which is an affiliated hospital of Madras Medical College (MMC), is regarded as the top referral public hospital for pediatric care in the State of Tamil Nadu. ICH provides specialized pediatric care for children that no other top referral hospitals in Tamil Nadu and neighboring states offer, and the number of inpatients counts about 600 children (537 beds) at any given time, while outpatients are up to 2,000-2,500 children per day. Additionally, most of patients are poor populations since ICH provides specialized and high quality healthcare services for free mainly to them.

ICH, as a pediatric hospital under MMC, also serves as the top level medical educational institute as it provides specialized training for medical personnel, including its medical students, and health workers in primary and secondary health care facilities. Currently, however, the clinic functions are dispersed in various buildings in the hospital campus due to the repetitive reconstructions and extensions since its foundation in 1968 in response to demands from time to time. The hospital buildings do not have a suitable structure to serve as a place to provide quality care and to offer learning opportunity of comprehensive clinical skills for medical personnel in its outpatient department.

Under this circumstance, the State Government of Tamil Nadu and the Government of India (GOI) sent a request for Grant Aid to the Government of Japan (GOJ) in 2009 for the construction of a comprehensive outpatient building, aiming to improve the quality of medical services of the outpatient department of ICH in view of recent congestion of OPD department.

Thereafter, following the decision of constructing the New Ward Building, ICH reviewed the original request and proposed a request for Grant Aid to GOJ in August 2011 for the construction of a comprehensive outpatient building consisting of the following components.

Facilities	Building: 4 stories Total floor areas: Approx. 4,459 m^2
Departments	General outpatient departments of paediatric medicine and paediatric surgery with OP admission counter, Emergency room, Medical new born OP, X-ray, USG room, Manifold room, Electrician room, A/C Mechanic room, Outpatient departments of all specialty (Cardiology, Cardiothoracic surgery, Nephrology, Urology, Neurology, Hematology, Diarrhea/GE clinic, Nutrition, Endocrinology, Immunization clinic, Diabetes, Pulmonology, Rheumatology, ENT, Dental clinic), Emergency care centre, Observation room, Biochemistry, Pathology, Microbiology with labs, Blood bank, ORT/Health education, Palliative care, Child guidance clinic, Metabolism, TB clinic, School health cell, Audiometry, Speech therapy, Regional ART centre, Child development clinic, Dermatology, Medical genetics, Ayurveda, Yoga, Ophthalmology, Medical education cell, Orthopedic surgery
Medical Equipment:	Medical equipment necessary for neonatal and pediatric care (Ultrasound scanner, Infant warmer, Neonatal/infant ventilator, Operation equipment, Laboratory equipment, etc.) (74 items in total)

3. Outline of the Survey Results and Description of the Project

In response to the request, GOJ decided to conduct the Preparatory Survey for the Project, and the Japan International Cooperation Agency (JICA) sent survey teams from February to May 2013 for the field surveys 1, 2 and 3. Following further analysis in Japan, the draft report explanation mission was dispatched from September 1 to 7 in 2013, and the Indian side agreed with the basic concepts of the Project stated in the draft Preparatory Survey Report.

The Project is to construct a New OPD Building with attached facilities and to provide equipment necessary for outpatient care.

The Project plans a "user-friendly" New OPD Building that will minimize the movement of patients and medical personnel by accommodating related clinical departments in consideration of the current internal referral situation. In the current facility layout, the emergency department is not aptly accessible by the ambulance cars, thus it takes considerable time for the life-saving measures to be initiated no sooner than patient arrives at the hospital. In order to improve this situation, the emergency department is planned to be located on the ground floor of the New OPD Building, ensuring direct access by the ambulance cars and securing large receiving area.

In the equipment plan, the important equipment for basic management of emergency cases such as X-ray unit and portable ultrasound shall be installed within the building. Since these examinations are not available either in the current emergency room or in the Main Building, they will be expected to be used not only for emergency cases, but also for all OPD cases. In addition to the equipment required for the New OPD Building, equipment which will benefit the outpatients, though they will not be installed in the New OPD building, will be also in the Project: for example, various clinical testing equipment (biochemistry, pathology, microbiology) that are inseparable from the outpatient department, equipment such as Electroencephalograph (EEG) and Electromyography (EMG) used in the Ward Building, and equipment like hemodialysis machine.

The following table summarizes the planned facilities and equipment.

Summary of Planned Facilities and Equipment

Facilities			
Building Components (m^2)			Rooms and Departments
New OPD Building	RF	50.6	Staircase
	3F	1,247.0	Pulmonology/TB, Diabetics, Endocrinology, Dermatology, School education cell, Integrated Counselling and Testing Centre (ICTC), Rheumatology, Adolescence, Class room, etc.
	2F	1,247.0	Medical newborn, Child development clinic, Child guidance clinic, Diarrhea/gastroenterology (GE), Paediatric surgery /Urology, Procedure room, Nutrition, etc.
	1F	1,247.0	Neurology, Nephrology, Hematology, Immunization/VPD, X-ray room, USG, Class room, etc.
	GF	1,247.0	Pediatric medicine, Pediatric emergency, Newborn emergency, Pharmacy, Class room, Triage, Electrical Room, Server Room, Parking Space, etc.
	BF	1,288.9	Parking space, Machine / Pump room, etc.
	Subtotal	6,327.5	
Generator Room	GF	19.2	Generator rooms
HT Panel Room	GF	35.0	HT panel room, Transformer space
Total		6,381.7	

Equipment	
Department	Major Planned Equipment
Emergency	Patient monitor, Ventilator (for infant), Ultrasound scanner, Defibrillator, Mobile X-ray unit
Paediatric Surgery	Operation table (for paediatric), Mobile operating light (LED), Instrument sets for pediatric surgery, Suction unit, Paediatric laparoscope set
ORT/Diarrhea/GE	Gastroscope with video, Colonoscope
Neonatology	Transport incubator, Infant Warmer, Infusion Pump, Syringe pump, Phototherapy unit (LED), Pulse Oxymeter
Pulmonology	Bronchoscope with video
Nephrology	Hemodialysis machine
Neurology	EMG, EEG
Microbiology	Automated blood culture system
Blood Bank	Refrigerated Centrifuge
Biochemistry	Fully automated chemistry analyzer, Illuminate hormone analyzer, Electrolyte analyzer, Tandem mass spectrometer for metabolic syndrome, UV spectrophotometer Electrophoresis apparatus, Medicine Refrigerator, Centrifuge, Urine Analyzer, Semi-automated chemistry analyzer, Blood coagulation apparatus fully automated
Pathology	Microtome, Automatic blood cell counter
Physiotherapy	Electrical stimulator, Ultrasonic therapy, Balance board, Peg board
Each department	Automatic voltage stabilizer 80kVA

4. Project Schedule and Cost Estimate

When the Project is implemented, the detailed design will take about 3.0 months, about 3.0 months for the tender procedures, and 17.0 months for the construction work, including procurement and installation of the equipment. The total cost to be borne by the Indian side is estimated at approximately 36 million yen (approximately 19 million Rs).

5. Project Evaluation

(1) Relevance

The Project is expected 1) to have a large number of beneficiaries who are children up to the age 12 in Tamil Nadu which comprises of 72 million people in the state and in the neighboring southern states 178 million people in total; 2) to contribute to the stability of people's livelihood by narrowing the disparity between the poor and the rich; 3) to contribute achieving of the goals of the 12th Five Year Plan (2012 - 2017) of India as well as the strategy of the Government of Tamil Nadu, and 4) to contribute to human security through the improvement of health services. In this regard, the Project is consistent with cooperation policies and principles of Japan and the validity of the implementation of the Project will be high.

Moreover, in order to improve health status of children in India, there is a need to strengthen the pediatric care in India which is still fragile as the quality of pediatric care services provided in each state within the public health system varies significantly. Also, for the national government to consider the effective input to each state to reduce the disparities of health

indicators among the states, a state with an established pediatric referral system by public institutions is expected to serve as a model state or improvement of pediatric care in India.

Tamil Nadu has the potential to be a model state of public pediatric care system because of its strong commitment. The state has the second best pediatric health indicators in India. This success owes to a distinguished initiatives and support system such as health policies and programs concerning the improvement of primary and secondary health facilities. Currently, the primary and secondary health facilities as well as the referral system have been improved with the assistance of these policies and support from international donors. However, the medical institutions of tertiary level are still in need of improvement, where the Project aims to contribute. Therefore, the relevance of the Project is high to enhance the medical service of ICH as the top referral hospital in order to contribute to reduction the disparity among the states in India and improve the health status of children in India.

(2) Effectiveness

The following (1) Quantitative Effects and (2) Qualitative Effects are expected by the implementation of the grant aid project.

1) Quantitative Effects

For post-evaluation of the Project after three years of its completion, ultrasonographic examination and X-ray examination are set as index, and base values which are calculated from the data in the past three years and the expected figures in 2019 are in the following table. As the number of X-ray examinations taken in 2010 was not available, the average of the years 2011 and 2012 is set as the base value. The actual value of ultrasonographic examination indicates significant increase in the year 2012, although the reasons are not clear. Therefore, the average of 2011 and 2012 that seems to be more reasonable to measure the effects is used as the base value. Meanwhile, reference target values of both indices that are estimated based on the value in 2012 are also shown below.

Index	Actual Value (2010)	Actual Value (2011)	Actual Value (2012)	Base Value (Average of 2011 and 2012)	Target Value (2019) (3 years after project completion)	Reference Target Value (2019) (3 years after project completion)
Ultrasonographic examination	14,164 cases	16,495 cases	20,961 cases	18,728 cases	20,600 cases	23,057 cases
OPD X-ray examination (No. of pictures taken)	--	37,825 cases	36,351 cases	37,088 cases	40,800 cases	40,316 cases

2) Qualitative Effects

1. Patient satisfaction will improve through shortening of patient movement and reduction of waiting time related with outpatient diagnosis.

2. Motivation of medical personnel working at ICH will improve through the improvement of facilities and equipment.

3. Educational environment for medical activities OJT and conference within ICH, and level of satisfaction with it will improve through having educational rooms and shortening of movement of medical personnel including medical students.

In conclusion, the validity of the Project to be implemented by grant aid from Japan as well as the anticipated effectiveness of the Project is high.

CONTENTS

LOCATION MAP

Chennai City

Project for Improvement of the Institute of Child Health and Hospital for Children, Chennai **NEW OPD BUILDING PERSPECTIVE**

LIST OF FIGURES AND TABLES

ABBREVIATIONS

Abbreviation	English
A/P	Authorization to Pay
ART	Antiretroviral Therapy
AVR	Automatic Voltage Regulator
B/A	Banking Arrangement
CDC	Child Development Clinic
CGC	Child Guidance Clinic
CMDA	Chennai Metropolitan Development Authority
CT	Computed Tomography
DME	Department of Medical Education
E/N	Exchange of Notes
ECG	Electrocardiography
EEG	Electroencephalography
EMG	Electromyograph
ENT	Ear, Nose, and Throat
G/A	Grant Agreement
GDP	Gross Domestic Product
GE	Gastro-Enterology
GOI	Government of India
GOJ	Government of Japan
HDI	Human Development Index
ICH	Institute of Child Health and Hospital for Children, Chennai
ICTC	Integrated Counselling and Testing Center
IMNCI	Integrated Management of Neonatal and Childhood Illness
IMR	Infant Mortality Rate
IOG	Institute of Obstetrics / Gynaecology and Government Hospital for Women and Children
MBBS	Bachelor of Medicine, Bachelor of Surgery
M/D	Minutes of Discussions
MDF	Main Distribution Frame (main terminal box frame)
MDGs	Millennium Development Goals
MMC	Madras Medical College

Abbreviation	English
NBCI	National Building Code of India
NICU	Neonatal Intensive Care Unit
NRHM	National Rural Health Mission
NUHM	National Urban Health Mission
OJT	On-the-job Training
OPD	Outpatient Department
PABX	Private Automatic Branch Exchange (telephone exchange machine)
PG	Post Graduate
PICU	Paediatric Intensive Care Unit
PWD	Public Works Department
RCC	Regional Collaboration Center
TB	Tuberculosis
TNHSP	Tamil Nadu Health System Project
TNMSC	Tamil Nadu Medical Services Corporation
U5MR	Under-five Mortality Rate
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USG	Ultrasonography
VPD	Vaccine Preventable Diseases
WHO	World Health Organization

CHAPTER 1 BACKGROUND OF THE PROJECT

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1-1 Background, History and Outline of the Requested Japanese Assistance

Despite the achievement of high economic growth, the Human Development Index (HDI) report ranked India 136th among 186 countries (2012, UNDP), which shows that India still faces challenges. Health indices have shown significant improvement: the "Infant Mortality Rate" (IMR) decreased from 64/1,000 live births in year 2000 to 47 in 2011, and the "Under Five Mortality Rate" (U5MR) decreased from 87/1,000 live births to 61 (UNICEF). However, considerable effort is required to reduce IMR and U5MR respectively for the achievement of Millennium Development Goals (MDGs) by 2015. While India is required to reduce the U5MR to 42/1,000 live births and the IMR to 27/1,000 live births by 2015; the current prediction indicates that it would be around 52 (U5MR) and 42 (IMR) respectively by the end of the MDG deadline. From the above background, the 12th Five Year Plan (2012-2017), which is the national development plan of India, focuses on the health sector. The plan states that one of the most important issues are to provide medical services for low-income groups in the urban areas to ensure broader coverage of health services by National Urban Health Mission, and to provide quality medical services aiming at reducing IMR and the maternal mortality rate.

The Institute of Child Health and Hospital for Children, Chennai (ICH), which is an affiliated hospital of Madras Medical College (MMC), is regarded as the top referral public health hospital for pediatric care in the State of Tamil Nadu. ICH provides specialized pediatric care for children that no other top referral hospitals in Tamil Nadu and neighboring states offer, and the number of inpatients counts about 600 children (537 beds) at any given time, while outpatients are up to 2,000-2,500 children per day. Additionally, most of patients are poor since ICH provides specialized and high quality healthcare services for free to the economically weaker sections.

ICH, as a pediatric hospital under MMC, also serves as the top level medical educational institute as it provides specialized training for medical personnel, including its medical students, and health workers in primary and secondary health care facilities.

Currently, however, the clinic functions are dispersed in various buildings in the hospital campus due to the repetitive reconstructions and extensions since its foundation in 1968 in response to demands from time to time. The hospital buildings do not have a suitable structure to serve as a place to provide quality care and to offer learning opportunity of comprehensive clinical skills for medical personnel in its outpatient department. The necessity to achieve overall enhancements of outpatient department is high in order to provide quality care and training based on the congestion of outpatient department and expanding demand.

Under this circumstance, the State Government of Tamil Nadu and the Government of India (GOI) sent a request for Grant Aid to the Government of Japan (GOJ) in 2009 for the construction of a comprehensive outpatient building, aiming to improve the quality of

medical services of the outpatient department of ICH in view of the recent increase of outpatients.

Facilities:	Building: 9 storeys Total floor areas: approx. 19,600 m^2
Ground Floor:	Emergency room, Manifold room, Observation room (Day care), and other maintenance offices of PWD, Electrician room, AC mechanic room, Plumber room, OP admission counter
1 to 6 Floors:	Paediatric medicine, Paediatric surgery, Medical newborn follow up, Cardiology, Cardiothoracic surgery, Nephrology, Urology, Neurology, Hematology, Diarrhea /GE clinic, Orthopedic surgery, Physiotherapy, ENT/Audiometry/Speech therapy, ICTC and Regional ART centre for paediatrics, Dental clinic, Nutrition, Pulmonology / Asthma, TB clinic, Child development clinic, Medical genetics, Child guidance clinic, Immunization cell-VPD, School health cell, Endocrinology and metabolic clinic, Paediatric diabetic clinic, Paediatric ophthalmology clinic, Dermatology, Ayurvedic clinic, Rheumatology, Naturopathy & Yoga clinic, State IMNCI nodal centre
7th Floor	Paediatric Intensive Care Unit
8th Floor:	Common room (6 rooms) - Auditorium / Examination hall (biochemistry, pathology, microbiology)/ Teaching hall
Medical Equipment:	Equipment required for Emergency room, Equipment required for Intensive Medical Care Unit, Lab equipment, Digital computerized X-ray with PACS for OPD, Computerization, Furniture including air conditioning with audiovisual aids for the auditorium

Thereafter, following the decision of constructing the New Ward Building, ICH reviewed the original request and proposed a revised request for Grant Aid to GOJ in August 2011 for the construction of a comprehensive outpatient building with the following components.

Facilities	Building: 4 stories Total floor areas: Approx. 4,459 m^2
Departments	General outpatient departments of paediatric medicine and paediatric surgery with OP admission counter, Emergency room, Medical new born OP, X-ray, USG room, Manifold room, Electrician room, A/C Mechanic room, Outpatient departments of all specialty (Cardiology, Cardiothoracic surgery, Nephrology, Urology, Neurology, Hematology, Diarrhea/GE clinic, Nutrition, Endocrinology, Immunization clinic, Diabetes, Pulmonology, Rheumatology, ENT, Dental clinic), Emergency care centre, Observation room, Biochemistry, Pathology, Microbiology with labs, Blood bank, ORT/Health education, Palliative care, Child guidance clinic, Metabolism, TB clinic, School health cell, Audiometry, Speech therapy, Regional ART centre, Child development clinic, Dermatology, Medical genetics, Ayurveda, Yoga, Ophthalmology, Medical education cell, Orthopedic surgery
Medical Equipment:	Medical equipment necessary for neonatal and pediatric care (Ultrasound scanner, Infant warmer, Neonatal/infant ventilator, Operation equipment, Laboratory equipment, etc.) (74 items in total)

In response to the revised request proposal in August 2011, the Japan International Cooperation Agency (JICA) conducted a field survey in February 2012 to examine the necessity and validity of the request, and the following points were confirmed as the main challenges of ICH.

1) Despite being a top referral hospital, the buildings of ICH are old and have inefficient layout due to the repetitive reconstructions and extensions since its foundation in 1968. As a result of this, there is long waiting time for patients, poor cooperation between the departments, and insufficient operation of triage.

2) The structural problems could cause inappropriate hospital infection control and there is a risk of developing a nosocomial infection.

3) GOJ provided ICH with medical equipment by Grant Aid in 1997, but some equipment has become old because they have not been replaced in spite of proper maintenance.

4) In addition to the fact that the training space is not sufficient, the outpatient functions are dispersed, thus it is difficult for the trainees to obtain comprehensive diagnostic capabilities.

1-2 Natural Conditions

(1) Survey of Natural Conditions

Since the project site is situated in the premises of the adjacent Institute of Obstetrics / Gynaecology and Government Hospital for Women and Children (IOG), the survey of natural conditions was conducted after the approval of the Superintendent in Charge of IOG. Consequently, it took a certain period of time for the Japanese Survey Team to implement the surveys.

1) Topographic Survey

The Japanese survey team commissioned topographic survey to a local company in order to confirm precise shape and size of the project site designated by the Indian side. The topographic survey started on March 7, 2013 according to the following specifications.

a) Objective : To seize topographic conditions necessary for planning, designing and construction of the planned building
b) Survey Areas : Site ground and vicinity areas in the premises of ICH (approx. 30,000 m^2) as designated by the Consultant
c) Survey Items : Plane-table survey
d) Survey Methods : Topographic survey using a transit

The survey result was presented on March 18, 2013. It was found that the outline design of the project building would not fit in the site shown in the presented topographic map. During the field survey 2, the Japanese survey team and the Indian side agreed that the shape and size of the proposed site should be secured not hindering the construction of the project building. Then the survey team commissioned the topographic survey again and received the result on April 12, 2013. (See Appendix 6-1 Topographic Map)

2) Geotechnical Investigations

The Japanese survey team commissioned geotechnical investigations to a local company in order to confirm geological conditions of the project site ground. The investigation started on March 19, 2013 according to the following specifications.

a) Objective : To seize geological conditions necessary for planning and design of the foundations and structures to be constructed in the site
b) Survey Areas : Site ground in the premises of ICH as designated by the Consultant
c) Survey Items : Geotechnical investigations by boring
d) Survey Methods : Boring: 25 m depth, three locations
Standard penetration test: per one meter depth
Laboratory soil test

The geotechnical investigation report was presented in the middle of April 2013. The report shows rigid strata appear down between 15m and 16.5m depth. For the subsoil conditions the weight of the planned building can be safely rested on concrete pile foundations down to the refusal strata. (See Appendix 6-2 Geotechnical Investigation Report excerpt)

(2) Climatologic Conditions in Chennai

Table 1-1 Monthly Weather Data in Chennai

Month	1	2	3	4	5	6	7	8	9	10	11	12
Avg. temperature (°C)	24.6	25.8	27.8	30.3	32.5	32.4	30.7	30.0	29.6	28.0	26.0	24.8
Max. temperature (°C)	32.0	38.0	38.0	40.0	42.0	42.0	40.0	37.0	40.0	38.0	36.0	33.0
Min. temperature (°C)	17.0	16.0	17.0	20.0	20.0	21.0	20.0	21.0	21.0	20.0	18.0	16.0
Avg. humidity (%)	90	90	90	88	77	68	77	79	86	90	91	90
Avg. precipitation (mm)	30	10	10	10	40	50	90	120	120	280	330	130
Max. precipitation (mm)	240	280	260	190	530	210	290	390	370	950	850	710
Avg. thunderbolt (days)	0	0	0	1	3	4	5	5	6	7	3	1
Avg. velocity (km/h)	64	57	93	219	177	35	18	24	28	55	154	10

Source: Weather base

Chennai belongs to the hot and humid tropical area where there is little change in temperature throughout the year. The hottest season in a year is from the late May to early June, when the maximum temperature reaches 38 to 42˚C, while the temperature goes down to 16-17˚C in January and February.

The rainy season in Chennai is from mid-September to mid-December influenced by the northeast monsoon. Most of the annual precipitation falls down in this season, with cyclones to attack from the Bay of Bengal. Wind from the southwest blows from May to September, but it does not cause heavy rain in Chennai, because it is dry wind after bringing rains in the west coast areas.

(3) Seismic Control

As it is shown in the India Earthquake Zone Map, Chennai is located near the borderline of Zone 2 and Zone 3 areas, and the project site belongs to Zone 3 area where minor anti-seismic design considerations are required. For the sake of safety, detailed standards and requirements are investigated at the Buildings Department of the Corporation of Chennai, to enable appropriate design with taking advantage of local structural design consultant.

1-3 Environmental and Social Considerations

The environmental impact is limited, because the Project is a new construction plan among medical institutes currently in operation. Also there is limited impact on the surrounding areas during the construction works and equipment installation works. In this term, this Project is considered to belong to Category C (a project likely to have minimal or no adverse environmental impacts) according to "JICA Guidelines for environmental and social considerations".

(1) Environmental Impact Assessment

Submission of the Environmental Impact Assessment is required to the production facilities such as factories only, and it is not applied to healthcare facilities like this Project. Moreover, this Project does not need the Initial Environmental Examination.

(2) Disposal of Wastes out of the Hospital

Currently, wastes from the hospital are classified into the following five categories and disposed in the containers.

Red: garbage sterilized in a dual-tank garbage container, and classified into two types of garbage containers
- Plastic garbage after disinfection, 25L (large)
- Waste other than plastic (used cotton, gauze and bandages) 15L (small)

Blue: biomedical waste (needle, ampoules (chemical in small glass bottle), vial, suture thread)

Yellow: biomedical waste (anatomical waste, placenta, part of human body, etc.)

Black: expired medicine, cytotoxic drugs

Green: general trash (garbage, plastic containers, needle cover, etc.)

Disposal of these wastes is outsourced to a biomedical waste management service and is carried out every day. In the New OPD Building to be constructed under this Project, waste storage space is planned in consideration of the separate collection of wastes.

(3) Impacts during the Construction Period

In consultation with ICH, the east gate on the north front road will be used as a dedicated path of construction and equipment workers and vehicles. The entrance and exit of laborers and vehicles will be managed at this gate, so that they will not affect hospital visitors and passing vehicles.

The project site will be clearly separated in the hospital premises by the temporary enclosures, and flow lines of the construction workers and engineers will be planned not to overlap those of the hospital visitors. Also, it will be necessary to adjust the construction hours of these works with the ICH peak operational hours in order to minimize the noise.

CHAPTER 2 CONTENTS OF THE PROJECT

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Objectives

(1) General Description of India Health Sector Overview, as well as the State of Tamil Nadu

Health Indicators in India though MDGs accounted steady improvement in life of the general population since 1990. However, with comparison to neighboring South Asian countries, these Indicators are still marked high in India. According to GOI, some of the MDG targets are unlikely to be achieved by 2015. While India is required to reduce the U5MR to 42/1,000 live births and the IMR to 27/1,000 live births by 2015; the current prediction indicates that it would be around 52 (U5MR) and 42 (IMR) respectively by the end of the MDG deadline.

Tamil Nadu State has performed as one of the best in pediatric health indicators in India as the State achieved U5MR of 31/1,000 live births and IMR of 24/1,000 live births in 2008 according to "The Situation of Children in India" (UNICEF, 2008). Tamil Nadu State has been committed to establishing well-worked out referral especially primary and secondary level health care in terms of the number of health facilities and medical personnel. In this light, many projects have been implemented at primary and secondary levels. Chennai city itself has well-organized referral system at primary and secondary level. However, tertiary care has received little effort to upgrade its medical services. In addition, many projects from the national government have focused health issues in rural areas rather than urban areas. Health projects from other international donors have also focused at primary and secondary levels and in rural areas.

During the 12th Five Year Plan, the Government of India is launching the National Urban Health Mission (NUHM) alongside with NRHM. Under this initiative, urban local bodies, such as Municipal Corporations and Municipalities, have primal responsibility for provision of health care services. In the case of Chennai, Chennai Municipal Corporation administratively oversees primary health care centers, dispensaries and outreach programs within the city. Since 2008, Tamil Nadu state initiated Urban Health Programme by allowing medical colleges to take strong technical roles to strengthen urban health service delivery and effective referral mechanism, which could serve as a model Urban Health mechanism for other states in India.

Under MMC, ICH is regarded as the top referral public health hospital for pediatric care in the southern areas of India including the State of Tamil Nadu, which has a population of approximately 72 million people with increasingly growing number of urban population. ICH provides specialized and high quality healthcare services for free mainly to poor populations. As the patients visit ICH from throughout Tamil Nadu State as well as the neighboring states, the number of inpatients counts about 600 children (537 beds) at any given time, while outpatients are up to 2,000 - 2,500 children per day. Having the hospital located in the centre of Chennai city, ICH takes the crucial role to serve for state's Urban Health initiative, both service provision for children and human resource development.

ICH serves as the top level medical educational institute as it provides largest numbers of

educational opportunities for pediatricians than any other government medical institutions in Tamil Nadu. ICH also has functionalities of training for primary and secondary level health workers such as doctors and nurses. It houses two regional centers which are State Integrated Management of Neonatal and Childhood Illness (IMNCI) Nodal Center and Regional Collaboration Center (RCC) by UNICEF. State IMNCI Nodal Center and RCC at ICH have contributed to train numbers of doctors, nurses and health workers in secondary level health facilities.

Currently, however, the clinic functions are dispersed in various buildings in the hospital campus due to the repetitive reconstructions and extensions since its foundation in 1968 in response to demands from time to time. The necessity to achieve overall enhancements of outpatient department is high in order to provide quality care and training based on increasing number of outpatients and expanding demand.

(2) Overall Goal

The Project aims to improve the health status of children in Tamil Nadu and in the other southern states through the implementation of the Project. Through the construction of a New OPD Building and provision of medical equipment, the quality of medical services of ICH as the top referral hospital will be improved. The Project will also enhance the function of ICH as the educational hospital to foster medical students in college as well as health workers in primary and secondary level hospitals and health centers, which will enable qualitative upgrading of human resources at hospitals and health centers all over the State of Tamil Nadu and southern areas in India. Since most of the tertiary and secondary level hospitals observed over-crowding of patients in the consultation rooms, as well as inadequate waiting areas and seating arrangement for patients, the New OPD Building would be a model facility for tertiary level hospital in Tamil Nadu, as well as in other southern states.

(3) Project Objectives

The Project aims to contribute to improvement of ICH to provide quality medical services for children and to provide a place for medical education through the construction of a new outpatient building and provision of medical equipment.

2-1-2 Basic Concepts of the Project

In order to achieve these objectives, this Project is to construct the New OPD Building with affiliated structures and to provide equipment necessary for outpatient medical services. In the facility plan, the Project plans a "user-friendly" New OPD Building that will require minimal movement of patients and medical personnel by accommodating related clinical departments in consideration of the current internal referral situation. In the current facility layout, the emergency department is not aptly accessible by the ambulance cars, thus it takes considerable time for the life-saving measures to be initiated no sooner than patients arrive at the hospital. In order to improve this situation, the emergency department is planned to be located on the ground floor of the New OPD Building, ensuring direct accessibility by the ambulance cars and securing large receiving area.

In the equipment plan, the important equipment for basic management of emergency cases such as X-ray unit and portable ultrasound shall be installed within the building. Since these examinations are not available either in the current emergency room or in the Main Building, smooth management will be expected not only for emergency cases, but also for all OPD cases. In addition to the equipment required for the New OPD Building, equipment which will not be used in the New OPD Building but will benefit the outpatients will be also procured under the Project: for example, various clinical testing equipment (biochemistry, pathology, microbiology) that are inseparable from the outpatient department, equipment such as Electroencephalograph (EEG), Electromyography (EMG) and hemodialysis machine used in the Ward Building.

Table 2-1 Summary of Planned Facilities and Equipment

Facilities			
Building Components (m^2)			Rooms and Departments
New OPD Building	RF	50.6	Staircase
	3F	1,247.0	Pulmonology/TB, Diabetics, Endocrinology, Dermatology, School education cell, ICTC, Rheumatology, Adolescence, Class room, etc.
	2F	1,247.0	Medical newborn, Child development clinic, Child guidance clinic, Diarrhea/gastroenterology (GE), Paediatric surgery/urology, Procedure room, Nutrition, etc.
	1F	1,247.0	Neurology, Nephrology, Hematology, Immunization/VPD, X-ray room, USG, Class room, etc.
	GF	1,247.0	Paediatric medicine, Paediatric emergency, Newborn emergency, Pharmacy, Class room, Triage, Electrical Room, Server Room, Parking Space, etc.
	BF	1,288.9	Parking space, Machine / Pump room, etc.
	Subtotal	6,327.5	
Generator Room	GF	19.2	Generator rooms
HT Panel Room	GF	35.0	HT panel room, RMU room
Total		6,381.7	

Equipment	
Department	Major Planned Equipment
Emergency	Patient monitor, Ventilator (for infant), Ultrasound scanner, Defibrillator, Mobile X-ray unit
Pediatric Surgery	Operation table (for paediatric), Mobile operating light (LED), Instrument sets for paediatric surgery, Suction unit, Pediatric laparoscope set
ORT/Diarrhea/GE	Gastroscope with video, Colonoscope
Neonatology	Transport incubator, Infant Warmer, Infusion Pump, Syringe pump, Phototherapy unit (LED), Pulse Oxymeter
Pulmonology	Bronchoscope with video
Nephrology	Hemodialysis machine
Neurology	EMG, EEG
Microbiology	Automated blood culture system
Blood Bank	Refrigerated Centrifuge
Biochemistry	Fully automated chemistry analyzer,, Illuminate hormone analyzer, Electrolyte analyzer, Tandem mass spectrometer for metabolic syndrome, UV spectrophotometer Electrophoresis apparatus, Medicine Refrigerator, Centrifuge, Urine Analyzer, Semi-automated chemistry analyzer, Blood coagulation apparatus fully automated
Pathology	Microtome, Automatic blood cell counter
Physiotherapy	Electrical stimulator, Ultrasonic therapy, Balance board, Peg board
Each department	Automatic voltage stabilizer 80 kVA

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

(1) Basic Policies

1) Restructuring of outpatient care function

ICH serves examination and treatment at 37 clinical departments within the four main buildings (Main Building, 10 Storey Building, OPD Building, and Cardiology Building). Because these buildings were constructed in the open space within the narrow premises, the buildings seem to stand on an inefficient layout. The narrow pathway in the buildings and the complicated layout of clinics, treatment rooms of the outpatient department and laboratory cause long and confusing patient flow lines and inefficient medical services. In addition, the existing buildings are fully occupied and have no more capacity to accept new outpatients. In order to improve this situation, this Project is to build a New OPD Building which will accommodate main clinics in a more planned layout to shorten the patient flow lines, thus to realize efficient medical services.

2) Effective utilization of existing facilities

In the existing ICH buildings, various clinics, laboratories and administrative offices are packed in a limited space. After 24 clinics in the existing buildings are moved to the New OPD Building, the vacated space is to be used for clinics, treatment rooms, class rooms and laboratories of the departments that would remain in the existing buildings.

3) Floor plan of outpatient clinics

Being positioned as the public pediatric hospital to perform the highest level treatment in Tamil Nadu, ICH provides, in principle, free consultation, medication and treatment for many patients not only in the state but also from the adjacent states. Because ICH has to examine many patients, and at the same time as a teaching hospital its professors have to train post graduate students (PGs), ICH has adopted an examination system of its own.

In each department, a large examination desk is installed in the center of the examination room, and a professor, assistant professor and PGs sit around it, while family members (usually mothers) holding the child patient undergo examinations by the PGs. Waiting patients and families are also in the examination room, standing or sitting in chairs that are placed around the examination desk. The professor observes the examination of PGs, giving advices to them if necessary. Duties of nurses include filing medical record, coordinating the examination order of patients, and sometimes doing simple treatment at the table near the wall.

Their method is quite different from the one generally adopted in Japan and other countries that a doctor is in the examination room and one patient with family attendants enters the room to undergo examination, while other patients and their families wait in the waiting space. Examination room in each department of ICH needs to be one large room that

will be capable of accommodating a lot of patients and families including those waiting for examination.

4) Architectural codes and regulations

"The National Building Code of India, 1983" (NBCI) is defined as the law on building design and construction in India. Also, Chennai Metropolitan Development Authority (CMDA) has prescribed "The Second Master Plan for Chennai Metropolitan Area, 2026", which outlines detailed requirements in each district of the city. Building design should be pursued in compliance with these laws and regulations.

5) Building floors

The land proposed for the project site is 3,197.5 m^2. In compliance with the legal regulations of Chennai Corporation on the permissible building coverage ratio (60%), the maximum permissible area of each floor is 1,918 m^2. The planned total floor areas of the project building is 6,381.7 m^2, and by arranging rooms on each floor and by satisfying the minimum wall distance from the property line (6.0 m), the building is planned to consist of one basement floor and four floors above ground; five floors in total.

6) Technical and fiscal sustainability

a) Facility

In facility planning, construction materials that are readily available in the local market and that need inexpensive repair costs for maintenance will be used considering the local construction situation. Also, construction methods will be adopted which the construction technology of local level is capable of.

b) Medical equipment

i) Technical sustainability

It is mandatory that the manufacturer has its local agent in Chennai especially for medical equipment that requires regulatory technical support in order to ensure continuous support after expiration of the warranty/guarantee period.

ii) Financial sustainability

The procurement target of clinical laboratory equipment is the one which uses open type reagents. The Government of Tamil Nadu has its own procurement rule which can be called “Bulk Procurement” of medicine and reactive reagents in order to minimize procurement cost but secure quality. The selection of equipment is to put priority on the clinical laboratory equipment which can use the medicine procured under this system.

7) Construction Plan for Sustainable Medical Service

a) Safety management

Because the project site is located at the center of the ICH campus, the flow lines of construction vehicles and workers should be surrounded by temporary fences in order to separate the construction area from the flow lines of hospital staff and visitors. Some guards will be stationed at the gates of the site who guide hospital visitors to prevent accidents of construction vehicles and people when construction machines and materials are carried in and/or out. Fences with appropriate height should be installed without gaps in between so that the users especially children may not enter the project site.

b) Countermeasures for noise

It can be assumed that the existing facilities will be exposed to noise, vibrations and other influences of construction works, such as concrete casting work into the frameworks at night. It will be necessary to adjust the construction hours of these works with the ICH peak operational hours in order to minimize the impact.

c) Influence to the neighboring buildings

Because the neighboring buildings are located adjacent to the project site, the sheet pile method will be adopted for the excavation work with providing shoring to avoid erosion of soils.

8) Equipment plan

Under the current outpatient diagnostic system, it is necessary for patients to do the admission procedure for a day to get tested and treated such as cancer treatment and dialysis treatment. Equipment for these treatments is kept at each clinical department.

Based on this current recognition, the policy is to either replace or procure some equipment which is necessary for the improvement of outpatient diagnostic and treatment services even though some of the treatment equipment would be kept in existing facilities. Through the installation of necessary equipment for the improvement of outpatient diagnostic service to be used in the existing facilities, a comprehensive approach can be adopted for the improvement of clinical diagnostic services in addition to the equipment procurement plan for the New OPD Building.

(2) Policies to Natural Conditions

1) Temperature

Temperature in Chennai is quite high throughout the year with the monthly mean maximum temperatures ranging from 24.6˚C in January to 32.5˚C in May. The recorded maximum temperature during April and July exceeds 40˚C. In such a climate, modern buildings with airconditioning system are designed to have thick brick walls for heat insulation and high ceilings to prevent warm air from staying in the room. Also, canopies and pilasters are designed on the external walls to block direct sunlight into the room. Wide

windows are designed to intake cool wind blowing from the sea.

Such climatic conditions are fully taken into consideration for the floor and elevational planning; devising building elements around the windows to block direct sunlight as well as enabling the maximum natural air flow.

2) Humidity

Humidity in Chennai is high throughout the year with the monthly average humidity exceeding 90% in six months from October to March. Due to the hot and humid weather conditions, many of the building walls in the city suffer from molds. Molds can be seen prominently on the connections and fixtures of downpipes that are wet at all times during the rainy season. In the facility design, it is necessary to consider measures against molds, such as to adopt a finishing material on the exterior walls on which molds hardly grow.

3) Subsoils

The subsoil strata of the project site consist of brown sandy silty clay down to 4.5 m depth and grey clayey silty sand down to 6m depth with N values ranging from 5 to 8. The strata with brown or brownish grey silty sand with N values 7 - 15 appear down between 15 m and 16.5 m depth, followed by the refusal strata consisting of weathered rock (Granite Gneiss Based) with N values over 75. With these subsoil conditions the 5-storied superstructure of reinforced concrete construction can be safely rested on concrete pile foundations down to the refusal strata at 17 m depth.

(3) Policies for Social-Economic Conditions

1) Patients and family attendants

As mentioned in the basic concept of the Project, ICH offers advanced pediatric care service for free to the poor, and many patients visit the hospital every day from far. At the public hospitals in India, nursing service is in principle a role of family attendants of the patients. It is commonly seen that all the family members accompany the patients, thus the area around ICH has become a place for temporary living.

In many cases, the patient and the attending mother enter the examination room, while other family members wait in the nearby waiting space till the examination is finished. In consideration of these circumstances, sufficient waiting spaces are planned on each floor for the waiting family members.

2) Location and maintenance of toilet

Many of the outpatients and their family members use the open areas around the hospital premises for urination and defecation as they are not familiar with toilet facilities. Thus, majority of the patients are not using the existing toilet facilities thereby creating unhygienic conditions which further lead to unpleasant odor across the entire hospital premises.

This social feature will be taken into consideration for designing the toilets, such as toilet floors will be of waterproof type that can be washed to facilitate cleaning and maintenance, and that toilets are situated apart from the examination rooms for hygiene control.

(4) Policies to Construction and Procurement Situations

1) Facility plan

In India, prior permits are required when trees in public premises need to be cut down. This procedure is to be undertaken by the Public Works Department (PWD), and it usually takes about three months. In the facility plan, information should be shared with the Indian side with respect to needs and time for cutting down the trees for smooth implementation of the Project.

2) Equipment plan

Equipment regardless of its country of origin should have its local agent in Chennai. Through the procurement of equipment under this rule, continuous maintenance service will be ensured.

(5) Policies for Utilizing Local Constructors

Local construction method will be adopted preferentially to utilize local constructors.

a) Local construction workers

In India, construction workers generally live in a labor camp set up at the project site. In this Project, however, the labor camp will not be set up because the work space should be secured with precedence in the limited space of the project site. Sufficient number of workers is expected to be employed from the city of Chennai who can commute from home to the site.

b) Procurement of ready-mixed concrete

Most of the contractors in Chennai possess their own batcher plant, and the plant is set up in the project sites at the time of concrete casting work. In this Project, however, due to the limited areas of the site, ready-mixed concrete will be procured directly from the local concrete plant in Chennai.

(6) Policies concerning Capability of the Implementing Agency for Operation and Maintenance

1) Facility plan

It is hard to say maintenance of the Main Building and the 10 Storey Building of ICH has been performed properly. In particular, large cracks are observed in the columns, beams and exterior eaves in the 10 Storey Building, and concrete are dislodged, fractured or dropped with corroded reinforcing bar underneath. Such symptoms will seriously impair the strength of the building, shorten the life of the building, and will be very dangerous to the patients,

attendant families and hospital staff. Being fully aware of the importance of the proper maintenance of the buildings, a structural system of high strength and not to easily cause cracks will be adopted, with the use of stain-resistant and minimal-maintenance-requiring materials as much as possible. Meanwhile, PWD will be asked to form a sufficient maintenance system of the facilities.

2) Equipment plan

Basically, medical equipment is to be selected based on its operability by the present doctors, paramedical staff and nurses. Especially for the image diagnostics equipment and clinical laboratory equipment which requires proficiency of operation technique, equipment is selected to be utilized by medical personnel who could work at the New OPD Building based on the confirmation of individual operational technique of the current radiology technicians and laboratory technicians.

At the time of the equipment handover, medical equipment engineers of the local manufacturer employed by the equipment supplier will be requested to instruct doctors, technicians, and nurses on the proper and safe operational and maintenance methods of the equipment thoroughly. The operational and maintenance methods such as daily check-up points will be instructed to the medical staff at every shift in consideration of emergency clinical activities.

(7) Policies for Setting Grade of Facilities and Equipment

1) Facility plan

a) Size

In principle, floor areas of the facilities in the project building are set according to the work loads and diversities of the current practice of medical services. At the same time, the floor areas are set with reference to the similar facilities nearby and the facilities of past grant aid projects in India.

b) Grade

With the use of materials that are predominantly used in Chennai, reinforced concrete construction will be adopted for the structure. In general, the New OPD Building is designed to be well-ventilated with natural winds. Local control type air conditioning system will be considered in such rooms as emergency room, X-ray room, laboratory and class rooms.

2) Equipment plan

The grade of equipment is for ICH to implement tertiary pediatric services and can be operated by the medical staff including doctors working in the existing hospital. In addition, sophisticated medical equipment is to be maintained by the local agencies in Chennai.

(8) Policies on Terms of Work

1) Construction period

The New OPD Building is planned to have four floors above ground and one floor below the ground, and the total construction period is expected to be 17 months. In the foundation work, as the refusal strata lies 15 - 16 m underground, concrete piles will be driven in to the depth of 17 m to support the weight of the building. In the entire construction schedule, the foundation work will occupy a considerable period of time. As the site area is small, the steel bending yard of the local contractor is planned to be used for storing construction materials and bending of reinforcement steel. During the period between the signing of Exchange of Notes (E/N) and the commencement of construction work, the Indian side should finish the works under their responsibility including the demolition and removal of the existing building and foundations, relocation of the existing underground piping, and leveling of the site, which is a prerequisite for completing the construction work of the Project as per schedule.

2) Equipment

Equipment is to be procured from Japan, India and/or third countries. After the engagement of supplier's contract, the production period of medical equipment is assumed approximately 3.5 to 4 months. The overall procurement period is expected approximately 7 months.

2-2-2 Basic Plan

2-2-2-1 Process of the Discussions on the Project Components

The discussion process on the project components for the outline design during the field surveys 1, 2 and 3 are as follows:

(1) Request Components in August 2011

In August 2011, the Indian side presented the request for the New OPD Building which was composed of the following components.

Table 2-2 Request Components of the New OPD Building

Facilities	Building: 4 stories Total floor areas: Approx. 4,459 m^2
Departments	General outpatient departments of paediatric medicine and paediatric surgery with OP admission counter, Emergency room, Medical new born OP, X-ray, USG room, Manifold room, Electrician room, A/C Mechanic room, Outpatient departments of all specialty (Cardiology, Cardiothoracic surgery, Nephrology, Urology, Neurology, Hematology, Diarrhea/GE clinic, Nutrition, Endocrinology, Immunization clinic, Diabetes, Pulmonology, Rheumatology, ENT, Dental clinic), Emergency care centre, Observation room, Biochemistry, Pathology, Microbiology with labs, Blood bank, ORT/Health education, Palliative care, Child guidance clinic, Metabolism, TB clinic, School health cell, Audiometry, Speech therapy, Regional ART centre, Child development clinic, Dermatology, Medical genetics, Ayurveda, Yoga, Ophthalmology, Medical education cell, Orthopedic surgery
Medical Equipment:	Medical equipment necessary for neonatal and pediatric care (Ultrasound scanner, Infant warmer, Neonatal/infant ventilator, Operation equipment, Laboratory equipment, etc.) (74 items in total)

(2) Project Components Agreed upon during the Field Survey 1

1) Facility component

Table-3 shows the project components discussed and agreed during the field survey 1 from February 10 to March 12, 2012, and the Minutes of Discussions stated in the Annex dated March 1st, 2012.

Table 2-3 Project Components Agreed during the Field Survey 1

Basement: (Semi-underground)	Car-parking, Machine room
Ground Floor:	Emergency room: Emergency reception, Pediatric emergency, Newborn emergency and Related rooms, Pediatric medicine (female, male), Entrance hall, Slope, Power receiving room, Machine room, Patient toilet, Staff toilet, Toilet for disabilities
1st Floor:	Medical newborn, Child development clinic, Diabetics, Genetics, Endocrinology, Satellite clinical laboratory, Sub Pharmacy, X-ray room with control room, Waiting space, Slope, Patient toilet, Staff toilet, Toilet for disabilities, Connection corridor, etc.
2nd Floor	Paediatric surgery/Urology, Neurology, Nephrology, Child guidance clinic, Waiting space, Slope, Patient toilet, Staff toilet, Toilet for disabilities, etc.
3rd Floor:	Hematology, Pulmonology/TB/Asthma, Dermatology, ORT/Diarrhea/GE, Class rooms, Waiting space, Slope, Patient toilet, Staff toilet, Toilet for disabilities, etc.

Regarding the facility components, the both parties discussed especially on the following subjects:

a) Outpatient Department

The main component of the planned building is the Outpatient Department, which is composed of general OPD and a part of specialty OPD. The pediatric medicine and the emergency department should be located on the ground floor keeping in view the quantum of patients and their relatives that would be accessing facilities. The present system at ICH pediatric medicine is to examine children accompanied by mothers and those accompanied by fathers in separate rooms. This system will also be applied in the Project, and since the children accompanied by mothers are much more than those with fathers, examination rooms for those with mothers should be planned larger than those for children with fathers.

The request was to create a building in which all the outpatient clinical departments will be integrated, however, certain specialty OPD like ENT that requires large consultation room, and OPD that need to be located closely with related departments and rooms, for example cardiothoracic surgery rooms, are excluded from this Project.

b) Emergency Department

The emergency department on the ground floor of the Main Building is located at the rear of the main entrance near the front gate. Patient transported through ambulance is dropped off at the front door held by the family attendant, and enters the emergency room through the main entrance and hallway, but there are stairs and other barriers that are obstacle to patient admission.

In 45 years since its construction, the facilities of the existing emergency department have become dilapidated and small compared to the increasing demand. In this Project the emergency department will be provided with improved facilities. In order to shorten the time from patients arrival to the treatment, the emergency department will be designed so that ambulance cars can go alongside the emergency entrance directly from the driveway, and the patients can be transported to the emergency anteroom by opening one door.

c) Underground Parking Space

The development regulations of Chennai Corporation define the required parking capacity by the size and purpose of the building. According to the regulations, parking space for one car and one motor-bike is required per $75m^2$ of the planned New OPD Building. However, since the project site that has been proposed by the Indian side is narrow in comparison to the scale of the planned building, the parking space on the ground will not satisfy the parking requirement, so semi-basement parking space are planned to cover the parking space shortage. (The required parking capacity: Approx. 60 cars and motor-bikes.)

It was decided to include the corridor connecting the New OPD Building and the 10 Storey Building in the scope of the Japanese side, because of the necessity to convey critically ill patient accepted in the emergency department to NICU on the 2nd floor of the Main Building, operating room on the 3rd floor of the Main Building and PICU on the 1st floor of the New Ward Building. Currently the Main Building is connected to the 10 Storey Building on the ground floor and connected to the New Ward Building on the 2nd and 3rd floors. When the New OPD Building is connected to the 10 Storey Building in the Project,

the main buildings in the ICH campus are all connected with corridors by which patients can be transferred to each building indoors.

2) Equipment component

Following equipment was requested from each clinical department at the time of the field survey 1. As a result of selection of medical equipment in terms of strengthening outpatient diagnostic function, 70 types of equipment is to be considered under this Project.

Clinical department	Requested Items	Items after discussion
Emergency（Newborn、Infant）	18 items	11 items
Paediatric surgery	17 items	7 items
Anesthesiology	6 items	**1** items
Orthopedics	8 items	NIL
Paediatric Medicine	4 items	NIL
Neonatology	20 items	9 items
Child Development Clinic（CDC）	6 items	3 items
Cardiology	3 items	NIL
Cardiothoracic surgery	10 items	NIL
Pulmonology/TB	2 items	**1** items
ORT/Diarrhea/GE	**4** items	3 items
Nephology	6 items	**1** items
Neurology	2 items	2 items
Hematology	2 items	**1** items
Endocrinology	**4** items	NIL
Genetics	10 items	NIL
Palliative Care	3 items	NIL
Nutrition	4 items	NIL
Immunization	**1** item	NIL
ENT	2 items	NIL
Dental	**1** item	NIL
Child Guidance Clinic（CGC）	1 item	1 item
School Health	3 items	NIL
ART	2 items	NIL
Ayurveda /Yoga	11 items	NIL
Physiotherapy	7 items	7 items
Outpatient Pharmacy	2 items	2 items
Microbiology	2 items	**1** item
Biochemistry	18 items	12 items
Blood Bank	5 items	**1** item
Radiology	3 items	1 item
ECG/Echo	1 item	**1** item
Each OPD dept.	1 item	**1** item
Total	194 items	70 items

(3) Project Components Discussed during the Field Survey 2

As it was not possible to start the topographic survey of the project site in time for the discussion of the Minutes of Discussions (M/D) on the field survey 1, the outline design draft of the project building was created based on the plot plan provided by PWD. Thereafter, when the topographic survey was conducted, it was found that the outline design of the project building

which was agreed as per M/D would not fit in the site.

As it was not possible to construct the outline design building agreed upon in M/D on the actual proposed site, thus, it had become necessary to discuss and confirm with the Indian side about the shape and size of the planned building and project site. Thus, JICA dispatched a survey mission from April 8 to 14, 2013 for the field survey 2.

During the field survey 2, the survey team and the Indian side agreed that the shape and size of the proposed site should be secured thereby not hindering the construction of the project building.

Meanwhile, during the field survey 2, ICH presented a request for alteration of the facility component of the Project which had been agreed upon during the field survey 1, as listed below:

a) Surgery / urology and procedure room to be excluded from the New OPD Building.
b) Diabetics, genetics, and endocrinology departments to have an individual examination room.
c) Nutrition to be included in the New OPD Building
d) Vaccination room to be included in the New OPD Building.
e) School health cell to be included in the New OPD Building.
f) Integrated Counselling and Testing Center (ICTC) to be included in the New OPD Building.
g) Rheumatology to be included in the New OPD Building.

Table 2-4 Modified Request Components from ICH during the Field Survey 2

Requested Size of Rooms	No	Department	Field Survey 1		Field Survey 2	
			New Building	Existing Building	New Building	Location
(6m × 12m)	1	Paediatric Medicine	●		●	GF
	2	Medical Newborn (Neonatology)	●		●	2F
	3	Child Development Clinic (CDC)	●		●	2F
	4	Neurology	●		●	1F
	5	Child Guidance Clinic (CGC)	●		●	2F
	6	Paediatric Surgery	●			2F
(6m × 9m)	7	Nephrology	●		●	2F
	8	ORT/Diarrhea/GE	●		●	2F
	9	Hematology	●		●	1F
	10	Pulmonology/TB	●		●	3F
(6m × 6m)	11	Diabetics Genetics Endocrinology	●		● ● ●	3F
	12	Dermatology	●		●	3F
	13	Clinical Laboratory	●		●	3F
	14	Emergency (<30days) Emergency (>30days)	●		●	GF
	15	Prof/A. Prof/PG’	●		●	Each Floor
	16	Classroom	●		●	Each Floor
	17	Sub Pharmacy	●		●	GF

	18	Meeting room	△			
	19	Auditorium	△			
	20	Operation Theater		●		
	21	PICU/NICU		●		
No particular request	22	Cardiology, ECOH, ECG		●		
	23	Dental Clinic		●		
	24	Nutrition		●	●	2F
	25	Physiotherapy		●		
	26	ENT		●		
	27	Immunization/VPD		●	●	
	28	School Education Cell		●	●	1F
	29	ART Center		●		
		ICTC			●	3F
	30	Ayurveda/Yoga		●		
	31	Blood Bank		●		
	32	Cardio Thoracic		●		
	33	Rheumatology		●	●	3F
	34	Palliative Care		●		
	35	Orthopedic Surgery		●		
	36	Radiology		●		
	37	CT		●		
	38	USG	●		●	3F

(4) Project Components Agreed upon during the Field Survey 3

As a result of discussions in Japan after the field survey 2, it was concluded ICH's request for alteration of facility components should be discussed again for confirmation, and JICA dispatched a survey mission from May 15 to 17, 2013 for the field survey 3.

During the field survey 3, the Japanese survey team and the Indian side agreed upon the project component as shown below.

a) Surgery / urology and procedure room to be included in the New OPD Building.
b) Diabetics, genetics, endocrinology departments to share one consultation room.
c) Nutrition to be included in the New OPD Building
d) Vaccination room to be included in the New OPD Building.
e) School health cell and adolescent clinic to be included in the New OPD Building.
f) ICTC to be included in the New OPD Building.
g) Rheumatology to be included in the New OPD Building.

Table 2-5 Project Components Agreed upon through the Field Survey 3

No	Department	Field Survey 1		Field Survey 3	
		New Building	Existing Building	New Building	Existing Building
1	Paediatric Medicine	●		●	
2	Medical Newborn (Neonatology)	●		●	
3	Child Development Clinic (CDC)	●		●	
4	Neurology	●		●	
5	Child Guidance Clinic (CGC)	●		●	
6	Paediatric Surgery/Urology	●		●	
7	Nephrology	●		●	
8	ORT/Diarrhea/GE	●		●	
9	Hematology	●		●	
10	Pulmonology/TB	●		●	
11	Diabetics Genetics Endocrinology	●		●	
12	Dermatology	●		●	
13	Clinical Laboratory	●		●	
14	Emergency (<30days) Emergency (>30days)	●		●	
15	Prof/A. Prof/PG’	●		●	
16	Classroom	●		●	
17	Sub Pharmacy	●		●	
18	Meeting Room		●		●
19	PICU/NICU		●		●
20	Cardiology, ECOH, ECG		●		●
21	Dental Clinic		●		●
22	Nutrition		●	●	
23	Physiotherapy		●		●
24	ENT		●		●
25	Immunization/VPD		●	●	
26	School Education Cell		●	●	
27	ART Center		●		●
28	ICTC			●	
29	Ayurveda/Yoga		●		●
30	Blood Bank		●		●
31	Cardio Thoracic		●		●
32	Rheumatology		●	●	
33	Palliative Care		●		●
34	Orthopedic Surgery		●		●
35	Radiology		●		●
36	CT		●		●
37	USG	●		●	
38	Adolescent			●	

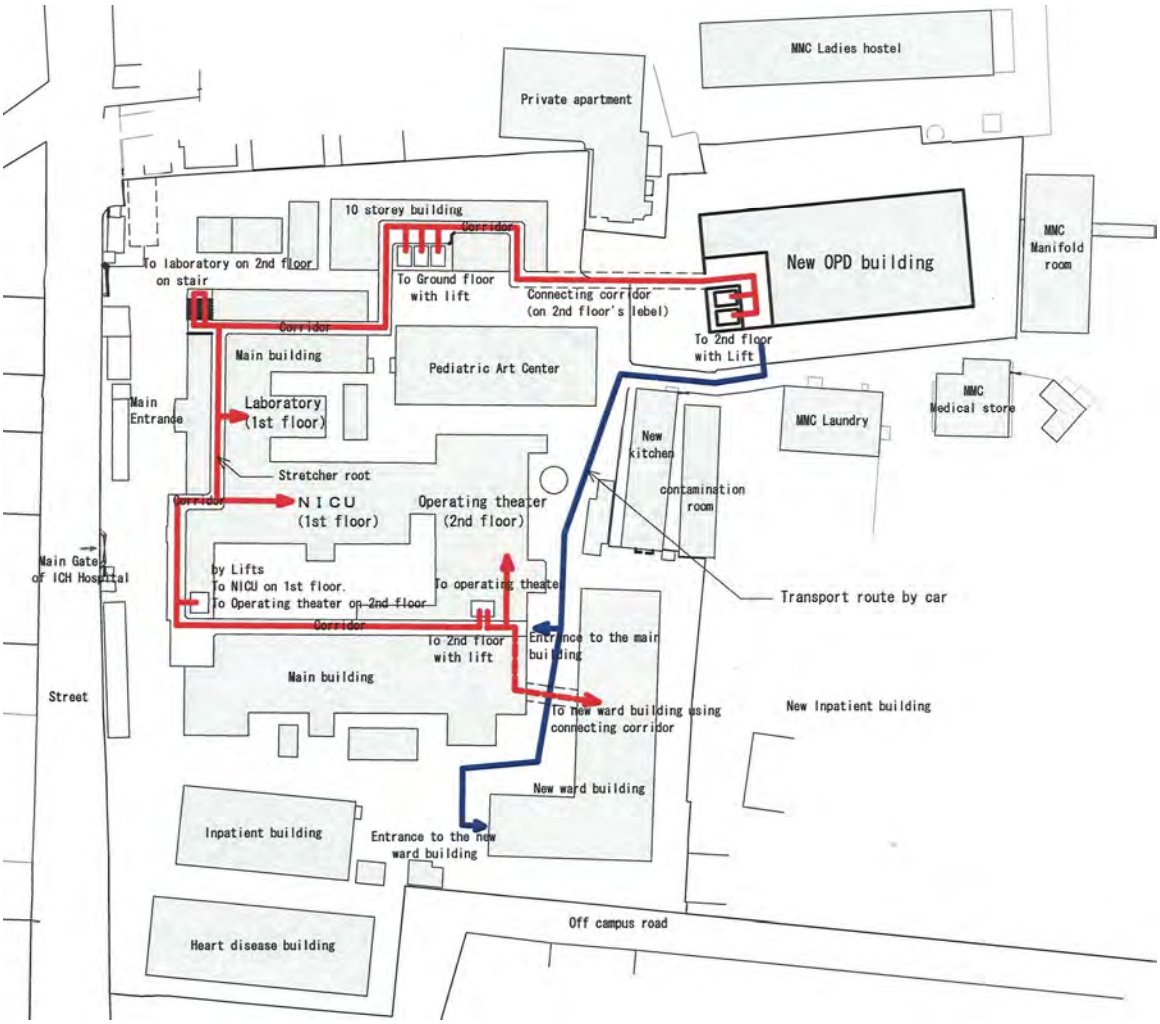
As per the results of discussions during the field surveys 1 and 2, it was planned to construct a corridor connecting the New OPD Building and the adjacent 10 Storey Building for the purpose of patient transportation from the New OPD Building to the New Ward Building as well as NICU and laboratories in the Main Building. However, there were difficulties that the connection corridor would have complex structures when it was reconsidered in compliance

with the CMDA requirements, and that patients would have to bypass a considerable distance from the New OPD Building to the New Ward Building though the transfer would be indoors. In particular, the possibility of risks associated with transportation of critically ill patients requiring oxygen control, etc. was a main concern. During the field survey 3, this issue was discussed again from the viewpoint of the inconvenience for the patients, and ICH proposed a corridor directly connecting the New OPD Building and the New Ward Building. However, this corridor would need pillars to connect a long distance, which was expected to obstruct the use of road beneath, and was judged impractical.

Since the plan of installing a connection corridor between the adjacent buildings would be of little convenience to the patients, ICH opined that patients move on ground through a short straight line distance. Still, the transportation of critically ill patients through open areas remained a risk and was of huge concern especially in the rainy weather. Thus, both parties came to a conclusion that patient transportation by the vehicle between the New OPD Building and the New Ward Building as well as NICU and laboratories in the Main Building would be the best choice.

From the fact that there was a demand for transporting about 140 - 150 persons a day, and that the Health and Family Welfare Department, Tamil Nadu, has promised budget allocation for the driver and fuel costs for its 24-hour operation once the vehicle was provided through this Project, effective use of the vehicle is expected to be possible.

Based on the above discussions, it was decided to cancel construction of the connection corridor between the New OPD Building and the 10 Storey Building through the Japanese Grant, and one vehicle for patient transportation would be included in the equipment list for procurement. The clinical departments added in the field survey 3 would not require special medical equipment. Thus, there was no change in the equipment plan other than a vehicle for patient transportation.



Note: Blue line: patient transportation route by vehicle
Red line: patient transportation route by stretcher

Figure 2-1 Patient Transportation Route

(5) Future Issues

The construction the New Ward Building of 9 storeys and about 9,000m^2 floor areas is to be completed in December 2013 and be functional. If this Project is implemented as per schedule, the New OPD Building will be completed by the end of 2015 to contribute to the improvement of outpatient care services.

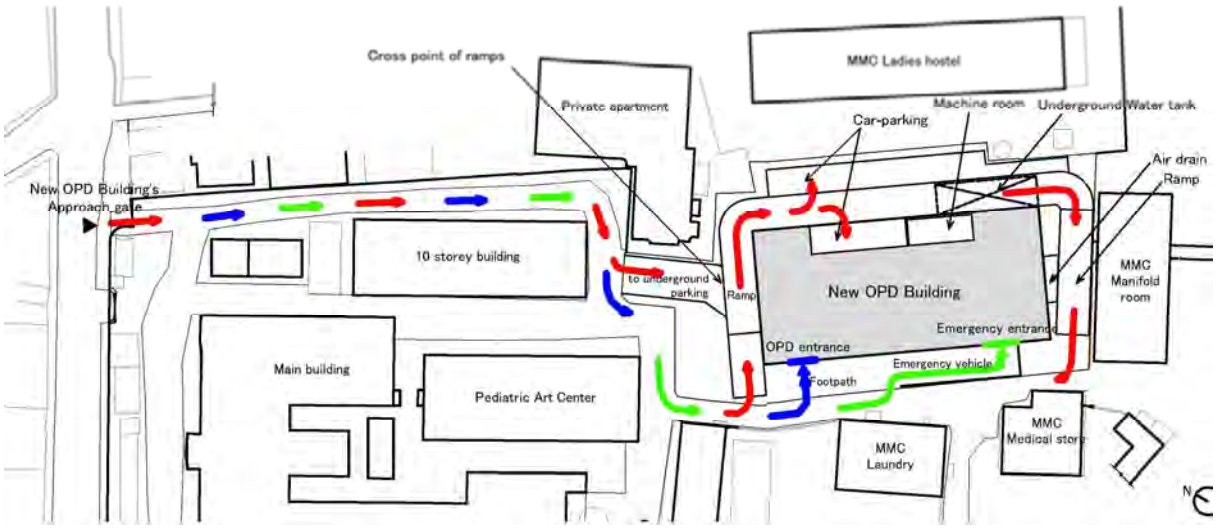
The Health and Family Welfare Department, Tamil Nadu has announced the improvement plan of operation theaters and other medical facilities of the cardiothoracic surgery department of ICH. On the other hand, improvement of the operation theaters and laboratory sections that are the main functions of the Main Building remains necessary. The Main Building is a 4-storey building with 13,400 m^2 floor areas, constructed in 1968. Since 45 years have passed, the building has become old and the necessity for its renewal is high.

Due to repetitive extensions and reconstructions since 1968, the medical service functions of ICH have necessitated its improvement. Along with the completion of the New Ward Building, the construction plan of the New OPD Building through this Project and the improvement plan of the cardiothoracic department, it is considered necessary to formulate a medium and/or long-term master plan of ICH.

2-2-2-2 Layout Plan

In the layout planning, people and vehicles will enter through the sub-entrance in the north of ICH campus and access the main entrance at the northwest corner of the New OPD Building by way of the campus road. Emergency vehicles will approach the emergency room of the west side of the project building through the campus road.

The project building is placed length-wise to the north-south direction to fit the shape of the site for the purpose of efficient use of the premises. In order to satisfy legal requirements with respect to four and two wheeler parking space, the open parking space on the ground level and underground parking space is planned. The campus road and a ramp to the underground parking intersect on the north side of the site. An air drain and a driveway ramp are on the south side, and on the east side a machine room and underground water tanks are situated along with the covered car parking and open car parking space on the ground floor.



Note: Green line: patient access route by ambulance car
Blue line: patient access rout on foot
Red line: patient access route by passenger car

Figure 2-2 Access to the New OPD Building

2-2-2-3 Architectural Plan

(1) Floor Plan

1) Study on the required rooms

The following table shows the required rooms in each department to accommodate the planned components of the New OPD Building.

Table 2-6 Main Rooms in the New OPD Building

Department	Planned Components	Main Rooms
Out-Patient	Specialty departments (Paediatric medicine, Newborn, CDC, Neurology, CGC, Paediatric surgery / Urology / Procedure room, Nephrology, GE, Diarrhea, Hematology, Pulmonology/TB, Diabetics, Genetics, Endocrinology, Dermatology, Nutrition, Vaccination, School education cell, ICTC, Rheumatism, Adolescence)	Examination room (22 rooms), Doctors room, Nurse changing room, Procedure room, Patients waiting space, etc.
Laboratory / Diagnosis	Clinical laboratory Biochemical and blood testing General testing	Biochemical / blood testing laboratory, Doctors room, Waiting area, etc.
	Diagnostic imaging X-ray Ultrasonography	X-ray room, Control room, Ultrasonography room
Education	Lecture and seminars	Class room
Common	Entrance, car and motorbike parking space, Reception (triage), Pharmacy Rooms for electric / mechanical / alarm systems	Lobby, Reception (triage), Office, Pharmacy, Parking, Driveway, Electric room, Generator room, Water tank room, Machine room (pump room), Store, Lift, Staircase, etc.

2) Layout of clinical departments on each floor

The layout of the OPD clinical departments is planned not only for the required practice areas but to increase the practice efficiency by adjoining examination rooms where doctors and medical staff are closely related.

For the purpose of prevention of nosocomial infections, rooms for pulmonology and TB are to be placed on the 3rd floor, the top floor of the building. Interrelations of the clinical departments and laboratories to be incorporated in the planned New OPD Building are summarized in the following diagram.

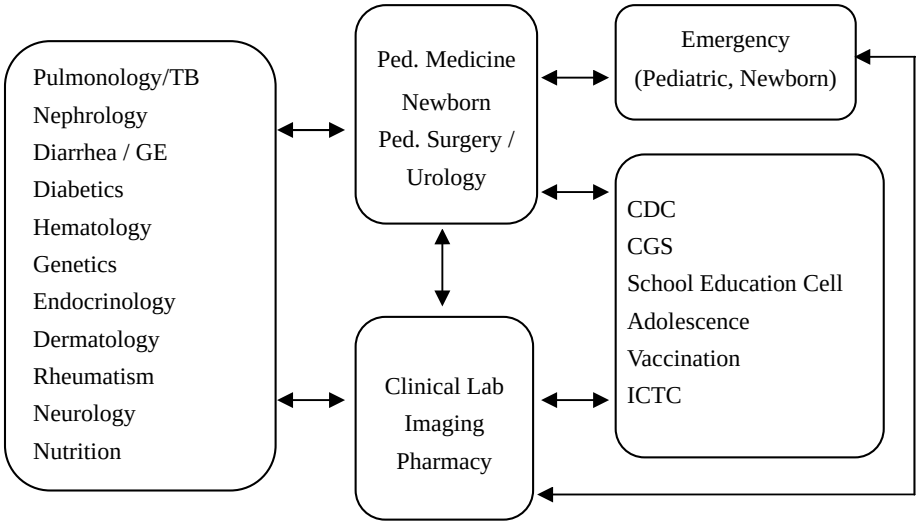


Figure 2-3 Interrelations of OPD Clinical Departments and Laboratories

a) Vertical flow lines

In addition to the lifts and staircases, a slope is planned at the center for the convenience of patient movement on foot or transport in a stretcher and/or wheelchair from the entrance to the clinics on each floor.

b) Paediatric emergency and medicine

The emergency department is located on the ground floor for the accessibility of ambulance cars. Emergency patient flow line is planned to distinguish from the general outpatient flow line and patients can be directly transported to the emergency room from the ambulance car without going through the corridor.

From the fact that pediatric medicine accepts about 500 patients per day because it also performs triage of patients to various specialty departments, it is also located on the ground floor.

c) Procedure room / X-ray / Clinical laboratory

The procedure room is planned to serve as a minor operation room associated with pediatric surgery on the 2nd floor. The X-ray room is planned on the 1st floor for the convenience of patient accessibility because it serves for various departments in common. The clinical laboratory is situated on the 3rd floor, next to the clinics which need to diagnose diseases such as bacterial infection.

From the above-mentioned analysis, the clinical departments in the New OPD Building are to be located as shown in table 2-7.

Table 2-7 OPD Clinical Departments in each Floor

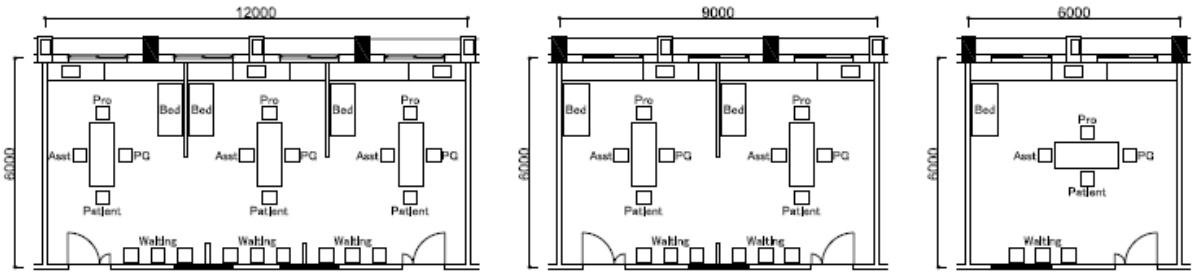
Floor	OPD Clinical Departments	
3F	Pulmonology/TB	Diabetics
	Genetics	Endocrinology
	Dermatology	School education cell
	ICTC	Rheumatology
	Adolescence	
2F	Newborn	Child development clinic (CDC)
	Child guidance clinic (CGC)	Gastroenterology
	Diarrhea	Nutrition
	Paediatric surgery / Urology / Procedure room	
1F	Neurology	Nephrology
	Hematology	VPD
GF	Paediatric medicine	Emergency
	Newborn emergency	

3) Required floor areas

The floor area of each room of the New OPD Building is planned in consideration of the current status of existing facilities, and with reference to the standard for medical facilities in India and the standard for medical facilities in Japan (AIJ Architectural Design Data Corpus and others). A semi-underground car-parking and motorbike-parking space is planned on the basement floor in order to satisfy the requirement for parking capacity of the building.

Since several PGs examine one patient under the supervision of a professor and an assistant professor around the examination desk, the space of 6m × 6m = 36m^2 necessary for a patient and family attendants and doctors is set as one unit space. The examination rooms of each specialty department consist of roughly three different sizes according to the service situations and the number of patients. Departments that have many patients, professors, assistant professors and PGs like pediatric medicine and surgery (including OT), and CGC are planned to have two unit spaces (Approx. 72m^2). Nephrology, GE and nutrition, etc. are to have 1.5 unit spaces (Approx. 54m^2) because less number of patients is expected. Rooms and the departments like CDC, pulmonology and dermatology, and where part-time doctors serve are planned to have one unit space (Approx. 36 m^2).

In addition, the expected layout of medical equipment in each room as well as the number of patients and medical staff are comprehensively considered to calculate the required floor area of each room.



Ped. Medicine, Newborn, Neurology, CGC, Surgery, etc.

Nephrology, GE, Nutrition, Vaccination, etc.

CDC, Pulmonology/TB, Dermatology, Rheumatism, Diabetics, School Education Cell, Adolescence, ICTC, etc.

Figure 2-4 Size of Examination Rooms

Table 2-8 Rooms in the New OPD Building

	Room	Q'ty	Area (m^2)	Purpose and/or Necessity
BF	Car parking	1	928.8	Parking capacity requirement (28 cars including 2 for handicapped persons)
	Motor-bike parking	1	23.5	Parking capacity requirement (54 motor-bikes)
	Machine room (pump room)	1	57.8	Fire pump, Lift pump
	Lift / Lift lobby	1	42.4	
	Staircase	1	42.0	Staircase for emergency evacuation
	Space for plumbing and electric pipes, etc.	-	14.4	Pipe space, etc.
	Basement floor total areas		1,288.9	
GF	Paediatric medicine	2	142.2	Examination of male and female patients (including patients waiting)
	Emergency entrance	1	48.0	Exclusive use for the emergency patients
	Emergency room	1	112.5	Paediatric emergency care
	Newborn emergency	1	27.0	Newborn emergency care
	Doctors room (Asst. Prof., PG) (Emergency and Medical doctors)	2	18.0	Desk work, gowning, rest, etc.
	Staff corridor	1	28.9	Corridor for the emergency staff
	Class room	1	36.0	Lectures and seminars
	Lobby	1	65.6	Main entrance lobby to OPD clinics
	Lifts / Lift lobby	1	73.5	Lifts and waiting lobby
	Triage	1	23.8	Triage of patients
	OPD pharmacy	1	36.0	Sub pharmacy and medicine store
	Infant feeding	1	18.0	Infant feeding
	Waiting space	1	26.4	Waiting space for patients and families
	Administration area and staff entrance	1	38.4	Staff office and entrance
	Server room	1	7.5	Data server
	PABX	1	5.6	Automatic telephone exchange
	PA/alarm, security camera room	1	15.0	Security system and equipment
	Manifold room	1	18.0	Oxygen cylinder and manifold
	Electrical room	1	60.0	Transformer and panel
	Store	2	25.4	Office supplies
	Emergency store	1	18.0	Equipment storage for emergency

	Toilet	7	53.8	Toilets for patients, handicapped and staff
	Slope	1	48.5	For patients use
	Staircase	2	84.0	Staircase for emergency evacuation
	Corridor	1	102.8	
	Space for plumbing and electric pipes, etc.	-	25.2	Pipe space, etc.
	Car parking	1	88.9	Parking capacity requirement (6 cars)
	Ground floor total areas		1,247.0	
1F	Neurology	1	126.0	OPD examination, including patients waiting
	Nephrology	1	60.8	OPD examination
	Hematology	1	38.4	OPD examination
	VPD, ILR	1	58.9	OPD examination, vaccine refrigerator
	Doctors room (Asst. Prof., PG) (Neurology)	2	18.0	Desk work, gowning, rest, etc.
	Doctors room (Asst. Prof., PG) (Nephrology)	2	19.2	Desk work, gowning, rest, etc.
	Doctors room (Asst. Prof., PG) (Hematology)	2	19.2	Desk work, gowning, rest, etc.
	Waiting space	1	35.8	Waiting space for patients and families
	X-ray room	1	30.0	X-ray photography
	Control room	1	11.0	X-ray machine operation
	Ultrasonography	1	21.0	Ultrasonographic examination
	Dispensing room	1	18.0	Dispensing medicine for Neurology
	Class room	3	93.0	Lectures and seminars
	Lifts / Lift lobby	1	73.5	Lifts and waiting lobby
	Staircase	2	84.0	Staircase for emergency evacuation
	Toilet	6	75.0	Toilets for patients, handicapped and staff
	Slope	1	150.0	For patients use
	Corridor	1	290.0	
	Space for plumbing and electric pipes, etc.	-	25.2	Pipe space, etc.
	1st floor total areas		1,247.0	
2F	Newborn	1	80.0	OPD examination
	Child development clinic (CDC)	1	36.0	OPD examination
	Child guidance clinic (CGC)	1	78.1	OPD examination
	Nutrition	1	54.0	OPD examination
	Diarrhea /GE	1	57.0	OPD examination
	Ped. surgery / Urology	1	70.7	OPD examination
	Procedure room	1	35.8	Minor operation
	Doctors room (Asst. Prof., PG) (Newborn)	2	19.2	Desk work, gowning, rest, etc.
	Doctors room (Asst. Prof., PG) (CDC)	2	19.2	Desk work, gowning, rest, etc.
	Doctors room (Asst. Prof., PG) (Nutrition)	2	18.0	Desk work, gowning, rest, etc.
	Doctors room (Asst. Prof., PG) (Diarrhea/GE)	2	18.0	Desk work, gowning, rest, etc.
	Doctors room (Asst. Prof., PG) (Ped. surgery / Urology)	2	22.3	Desk work, gowning, rest, etc.
	Waiting space / Waiting area	1	41.0	Waiting space for patients and families
	Lifts / Lift lobby	1	73.5	Lifts and waiting lobby
	Staircase	2	84.0	Staircase and pipe space
	Toilet	6	75.0	Toilets for patients, handicapped and staff
	Slope	1	150.0	For patients use
	Corridor	1	290.0	
	Space for plumbing and electric pipes, etc.	-	25.2	Pipe space, etc.
	2nd floor total areas		1,247.0	

3F	Pulmonology/TB	1	57.6	OPD examination
	Diabetics / Endocrinology / Genetics	1	36.0	OPD examination
	Dermatology	1	36.0	OPD examination
	School education cell	1	38.4	OPD examination
	ICTC	1	36.0	OPD examination
	Rheumatology	1	39.0	OPD examination
	Adolescence	1	39.7	OPD examination
	Doctors room (Asst. Prof., PG) (Pulmonology /TB)	2	19.2	Desk work, gowning, rest, etc.
	Nurse changing room	1	36.0	Nurses' changing, rest, etc.
	Waiting space	1	35.8	Waiting space for patients and families
	Clinical laboratory	1	41.6	Biochemical test, blood test
	Class room	3	93.0	Lectures and seminars
	Library	1	41.0	Reference room
	Lifts / Lift lobby	1	73.5	Lifts and waiting lobby
	Staircase	2	84.0	Staircase for emergency evacuation
	Toilet	6	75.0	Toilets for patients, handicapped and staff
	Slope	1	150.0	For patients use
	Corridor	1	290.0	
	Space for plumbing and electric pipes, etc.	-	25.2	Pipe space, etc.
	3rd floor total areas		1,247.0	
RF	Staircase	1	50.6	Staircase and pipe space
	RF total areas		50.6	
Exterior	HT panel room (HT panel room, RMU room)	1	35.0	Electric power incoming
	Generator room	1	19.2	Emergency generator 250 kVA
	Exterior structures total areas		54.2	
Grand Total Floor Areas			6,381.7	

4) Floor planning (zoning plan)

One passenger lift and one hospital stretcher lift are planned for the vertical migration. In addition to the staircases at the corners in the building, slopes are planned at the center for the convenience of patients and families and handicapped persons.

a) Zoning plan of the 1st through 3rd floors

Examination rooms, which are main components of the New OPD Building, are lined along the east and west peripheral walls on the long side of the building, in order to introduce sufficient natural light and breeze in the rooms. As shown in figure 2-5, the slopes are designed at the center in the building with airy space above, which will also serve for ventilation and lighting.

Along the north-south side of the building, features for common use are gathered, such as lifts and staircases for vertical migration, laboratories, diagnostic imaging rooms, and rooms for common use.

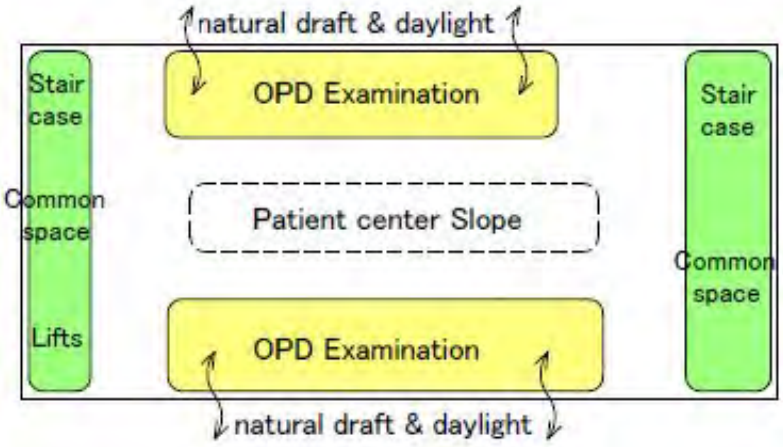


Figure 2-5 Zoning of the New OPD Building: 1F through 3F

b) Zoning plan of the basement and ground floors

On the basement floor a two-way driveway is planned at the center, and parking spaces for cars and motorbikes are placed around the driveway on both sides. On the ground floor, an electrical room, machine rooms and car-parking space are situated on the east side of the slope, while the OPD examination rooms and the emergency department are on the west side.

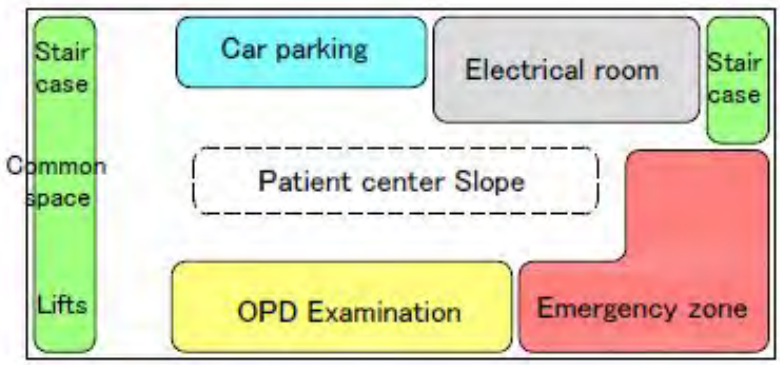


Figure 2-6-1 Zoning of the New OPD Building: Ground Floor

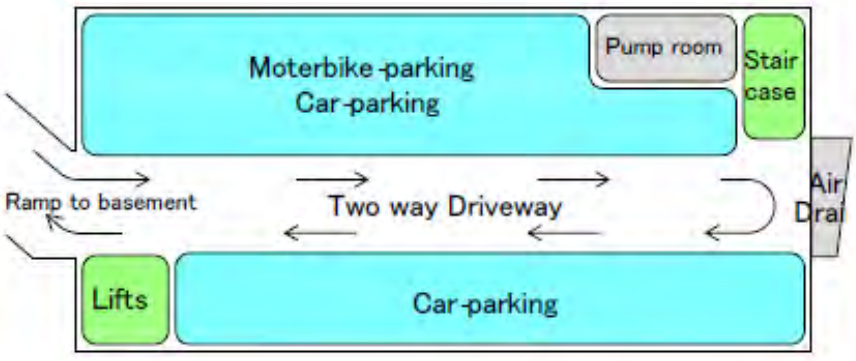


Figure 2-6-2 Zoning of the New OPD Building: Basement Floor

(2) Elevation Planning (shape, exterior finishing material)

The building will be of a rigid-frame concrete structure, which is commonly used locally, with masonry exterior walls of concrete blocks. In principle, columns and beams will be finished with painting on the cement mortar substrate. The exterior masonry walls will be finished with tiles on the cement mortar substrate. Slightly sloped roof (1/50 slope) with asphalt waterproofing is adopted for economy and efficient rainwater drainage.

Pilasters to serve as pipe space are designed in the center of 6-meter pitch columns. Floor decks are extended on each floor, which will serve as eaves to shade the east-west side walls by shielding direct sunlight. They will be also effective to block radiation heat around the windows and will reduce airconditioning load. On the north side, aluminum framed glass curtain walls are planned to give an open feeling by incorporating natural light to the lobbies on each floor.

(3) Sectional Planning

The height of the floors (GF - 3F) is set at 3.90 meters in consideration of the required ceiling height of the rooms (2.80 m) and spaces for pipes for water supply and sewage above the ceiling. The basement floor is designed to have a lower height of 3.30 m, based on the required height for passenger car parking.

In the New OPD Building, vent grills will be provided above the slopes so that air flowing into the building through the openings in each room will flow out through the highside grilles under the roof. Fanlights and windows of each OPD clinic should be opened for securing natural air flow. Windows facing the corridors will also serve to intake natural light and air flow.

Air conditioning system is provided in some rooms like procedure room, emergency department, X-ray department, laboratories and classrooms where windows need to be closed due to the purpose of the room and natural air flow is not expected. Polycarbonate roofings will be used part of the atrium ceilings, which will serve as rooftop lights.

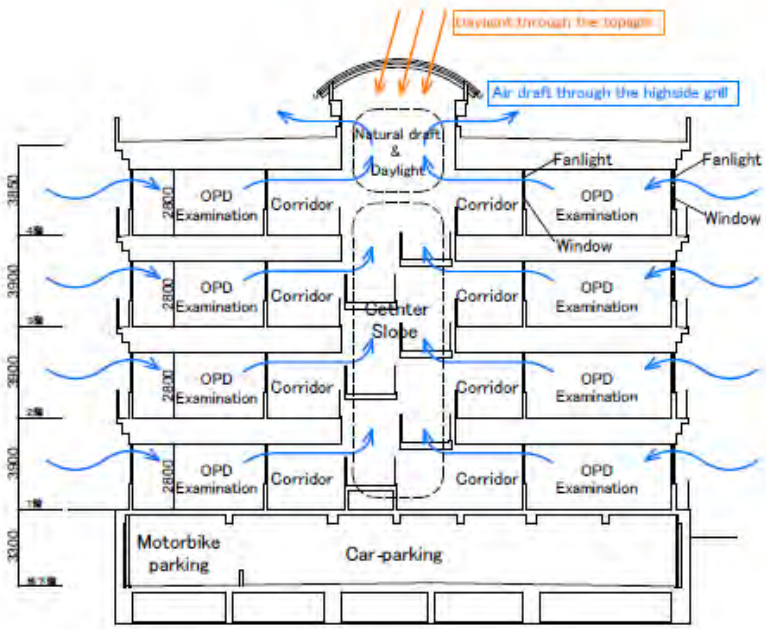


Figure 2-7 New OPD Building: Section

(4) Structural Design

1) Type of Construction and Frames

Reinforced concrete buildings predominate in Chennai, since effective anti-seismic design is mandatory in India, where all parts of the country are prone to earthquake. Therefore, the New OPD Building of 4 floors and 1 basement floor will be constructed of reinforced concrete with rigid frames to ensure sufficient seismic resistance, durability and maintenance. Masonry walls composed of concrete blocks, which is a common local feature, will be adopted in consideration of local construction conditions and their cost performance.

2) Foundations

The report of geotechnical investigations conducted during the field survey 1 shows that the subsoil strata of the project site consists of brown sandy silty clay down to 4.5 m depth, and grey clayey silty sand down to 6 m depth with N values ranging from 5 to 8. The strata with brown or brownish grey silty sand with N values 7 - 15 appears down between 15m and 16.5 m depth, followed by the refusal strata consisting of weathered rock (Granite Gneiss Based) with N values over 75. For these subsoil conditions the 5-floor structure of reinforced concrete construction can be safely rested on concrete pile foundations down to the refusal strata at 17 m depth.

The permissible soil bearing capacity is set at 200t/m^2 taking account of the initial and consolidation settlements.

The underground water level measured in the dry season (March) was reported as GL-6.8 - 7.1 m. The structural calculation should assume 2 to 3 meter increase during the rainy season.

3) Structural Design Standards

The National Building Code of India (NBCI) 1983, Part VI: Structural Design will be adopted.

a) Live load: The required live load in each room will comply with Table-1 in Section 1, Part IV of NBCI.

Table 2-9 Live Load in Principal Rooms (in kN/m^2)

Rooms	For Frame	For Seismic Force
Examination room, Office	2.50	0.65
OT, X-ray room, Laboratory	3.00	1.50
Corridor, Hall, Staircase, Balcony	4.00	2.00
Machine room	5.00	2.50
Toilet	2.00	0.50
Roof	0.75	-

b) Seismic Force: The Alpide Belt brushes the north edge of India, and the country is divided in 5 categories according to past earthquake records. Consequently, effective anti-seismic

design must be considered during architectural planning. Chennai, where the project site is located, belongs to Zone 3. The seismic force is calculated in accordance with Article 5, Section 1, Part VI of NBCI.

Calculation of base shear (V):

$V = K \times C \times \alpha_h \times W$

$\alpha_h = \beta \times I \times \alpha_0$

where
- K: performance factor depending upon the structural framing system and brittleness or ductility of construction (1.0)
- C: a coefficient defining the structural flexibility depending upon the fundamental time period (1.0)
- α_h: design seismic coefficient (0.072)
- W: total dead load + appropriate amount of live load
- β: a coefficient depending upon the soil-foundation systems (1.2)
- I: a coefficient depending upon the importance of the structure (1.5)
- α_0: basic horizontal seismic coefficient (0.04)

The base shear (V) of the New OPD Building is calculated as follows:

$\alpha_h = 1.2 \times 1.5 \times 0.04 = 0.072$

Therefore,

$V = 1.0 \times 1.0 \times 0.072 \times W = 0.072 \cdot W$

(5) Utility Planning

1) Electrical Planning

a) Power Receiving and Transformer System

Electric power of 550 kVA is provided from the local electric company to the existing buildings, which is connected to two transformers in the 10 Storey Building via the ring main unit. Capacity of the transformers is 800 kVA in total (400 kVA x 2).

The existing system does not have sufficient capacity to supply the New OPD Building which will require approximately 400 kVA electric power supply. A new transformer should be installed for this Project. After the examination of the existing electric system by the electric company (examination period: two months after the detailed design drawings are presented), either of the following connection works will be instructed.

i) To install a new transformer within 15 m from the boundary line of the front road of ICH from which electric power line will be connected to the electric room in the New OPD Building (all works to be under the scope of the Indian side including installation of the transformer).

ii) An 11kV cable will be extended from the existing electric room in the 10 Storey Building from which electric power lie will be connected to the transformer in the

electric room in the New OPD Building (transformer installation by the Japanese side, and cable extension and connection by the Indian side).

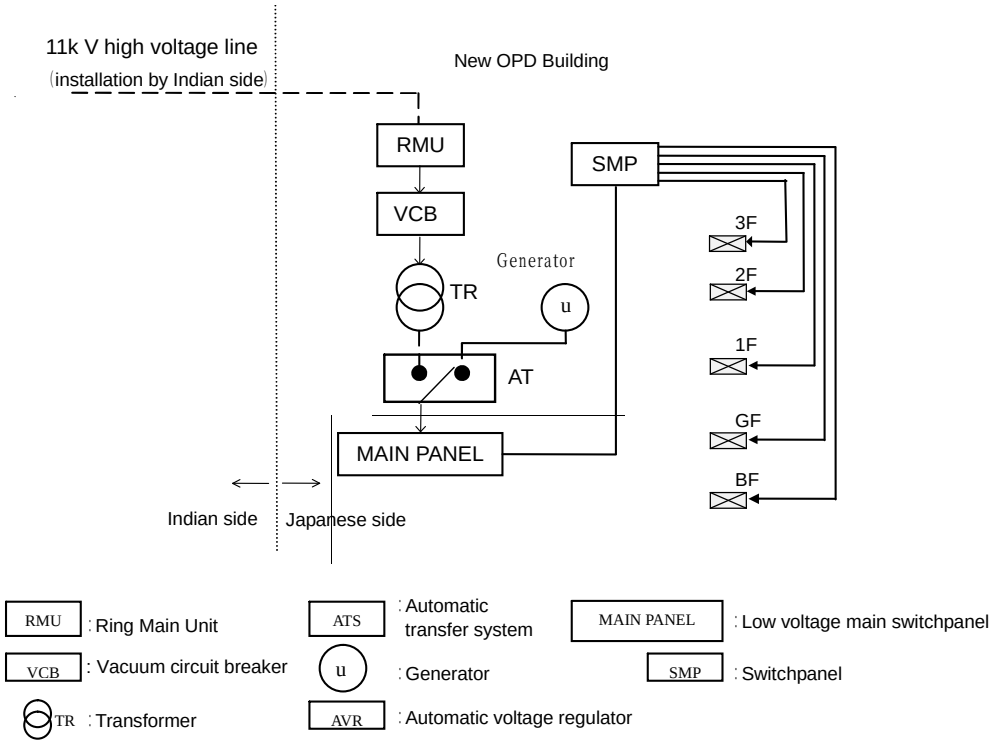


Figure 2-8 Main Power System Diagram

b) Lighting System

- General lighting system

  Lighting fixtures mainly using fluorescent lamps will be selected. Measures to segmentalize the lighting control zones into small ones is to be considered to enable lighting cost saving.

- Specialized lighting system

  A mobile operating light (LED) will be planned in the medical equipment work.

- Emergency lighting system

  Built-in battery wall-mounted type emergency lights will be installed in necessary rooms.

- Emergency exit signs

  Built-in battery type emergency escape luminaries will be installed.

Table 2-10 Design Illuminance in Main Rooms

Room	Design Illuminance
Examination room, Procedure room	500 LX
Office, Doctors room	300 LX
Toilet, Changing room, Store	150 LX
Lobby, Hall	50 LX

c) Receptacles

Receptacles for general use are to be with 13A switches and grounding terminals. The power sources for medical equipment are to be configured to meet the required power capacity in consideration of the equipment layout. The receptacles connected to the emergency generator system for backup power will be installed with red plates for distinctiveness.

d) Generator

To ensure at least the minimum hospital operations in case of the power failures, an emergency generator (250 kVA) is to be planned as the backup power source for the emergency room, newborn emergency room, procedure room, examination rooms, hospital stretcher lift and necessary medical equipment. Fuel for 24 hours will be stored in an oil tank.

Table 2-11 Required Emergency Power Load

Room / Equipment	Power Load
Emergency room	Medical equipment, Lights
Newborn emergency	
Administrative rooms	Lights, Receptacles, etc.
Medical equipment	X-ray, Medical refrigerator, etc.
Common installations	Pumps, Stretcher lift, Medical gas

e) Master TV Antenna System

TV outlets are planned in the lobby and waiting space. A master antenna for regular TV broadcasting will be installed in the project site.

2) Plumbing systems

a) Water supply

The existing water supply piping runs along the west boundary line of the project site. A water supply pipe for the New OPD Building is planned to connect to this existing piping. Local piping method will be adopted to facilitate maintenance and repairs in the future.

b) Hot water supply

Solar panel system is required by the construction act of Chennai Corporation. A solar panel water heater system is planned to supply hot water to wash basins in necessary rooms on each floor.

c) Sewerage

For the convenience of future maintenance, sanitary apparatus are planned along the exterior walls as near as possible, and sewage pipe are planned to be exposed on the exterior walls and connected to the existing sewer manholes.

d) Sanitary apparatus

Sanitary apparatus suitable to local customs will be installed. Toilets for the hospital visitors will be equipped with an Indian type (Asian type) toilet bowl and a hand shower tool instead of a paper holder. Staff toilet will be equipped with a Western-style toilet bowl, and both a hand shower and paper holder will be installed.

3) Ventilation system

Rooms will be basically ventilated by natural air flows, and toilets will be installed with exhaust fans. An exhaust fan will be installed in the room that does not have exterior openings, for the purpose of keeping the air current.

4) Air conditioning system

Package-type air conditioners are planned for the following rooms.

- GF: Newborn emergency room, Emergency room, Server room, PABX room, PA/alarm security camera room
- 1F: X-ray room, Control room
- 3F: Clinical laboratory
- Common areas: Class room, Doctors room (PG, Asst.)

5) Medical gas

A medical gas system is to be planned for the Emergency room, Newborn Emergency, and outpatient examination rooms in each floor. An oxygen supply and vacuum system is to be installed in the outpatient examination room, while an oxygen supply, vacuum and compressed air supply system is to be installed in the Newborn Emergency room and Emergency room. The manifold room is designed on the ground floor for the convenience of exchanging empty cylinders.

6) Public address system

The public address system is planned for communication in the facilities. Speakers are to be installed in the necessary rooms and common areas, and the broadcast amplifiers will be in the PA /alarm security camera room.

7) Interphone system

An interphone line is to be installed in the doctor’s rooms, examination rooms and corridors.

8) Security camera

Security cameras are to be installed in the lobbies, corridors and lift lobbies on each floor for facility management and security purpose.

9) Alarm system

a) Fire alarm

An automatic fire alarm system composed of heat sensor and smoke detector will be installed in compliance with the local Fire Code.

b) Machine alarm

Alarms will be installed to transmit alarms when malfunctions of generator system and pumps, etc. are detected.

10) Firefighting system

Fire hydrants and sprinklers will be installed in each floor in compliance with the local Fire Code. The water pipes will be laid according to the local methods to facilitate future repairs and maintenance. An underground fire water tank (100,000 liters) is designed to supply water for fire fighting.

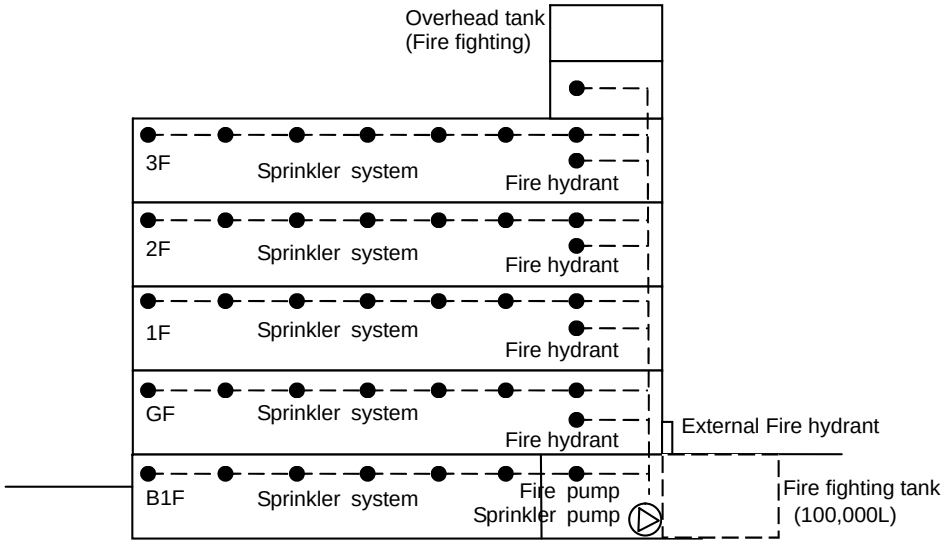


Figure 2-9 Fire Fighting System Diagram

11) Lightening rod

A lightening rod will be installed on the roof for lightning protection.

12) Telephone system

Phones will be installed in the rooms necessary for hospital operation. A new telephone exchange machine (PABX) is to be installed for the New OPD Building. A telephone cable will be laid from the existing telephone exchange room to the main terminal box frame (MDF), to allow contact with the PABX in the existing telephone exchange room (connection of the telephone cable between the existing PABX and the new PABX will be the Indian side work).

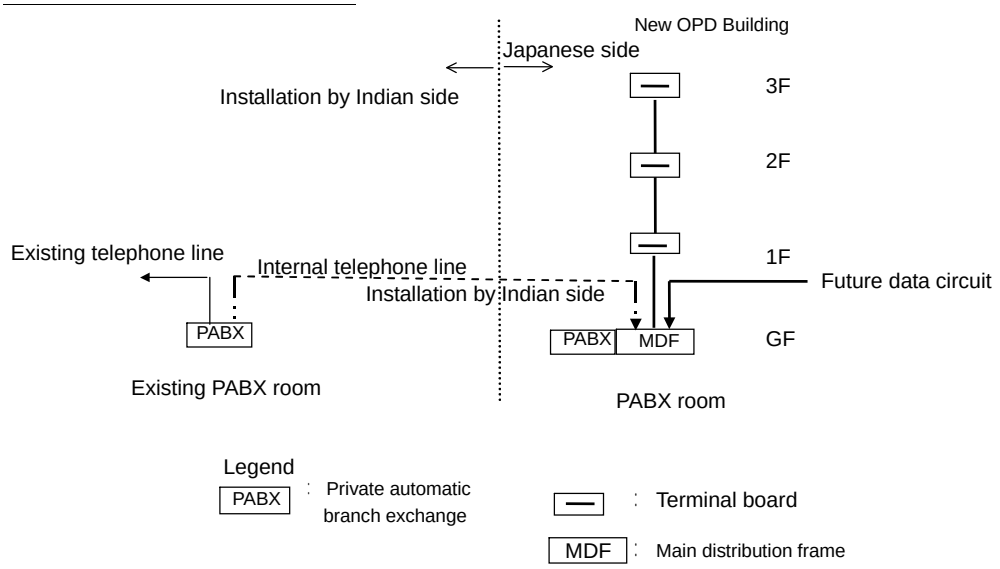


Figure 2-10 Telephone Line System Diagram

13) Internet LAN

An empty piping will be installed where necessary, for the convenience of future installation of LAN cables by the Indian side.

14) Lift

One hospital stretcher lift and one passenger lift of appropriate capacity are planned for vertical transport of handicapped patients and equipment.

(6) Construction Materials Plan

In principle, materials and products predominantly used in India and easy for future maintenance will be selected. The following table shows the finishing schedule under consideration at present.

Table 2-12 Finishing Schedule

Exterior Finish	
Roof	Insulation, Lightweight concrete substrate, Asphalt waterproofing, Brick tiles finishing
Top light	Insulation subbase, Colored steel sheet roof, Top light (partly)
Exterior wall	Cement mortar base with elastic spray coating finish, Porcelain tile (partly)
Doors & windows	Aluminum sash, Colored aluminum curtain wall, Steel door (partly)
Campus road, Parking	Concrete with trowel finish

Interior Finish				
	Room	Floor	Wall	Ceiling
BF	Parking	Concrete	Vinyl paint H=2100, Emulsion paint above	Emulsion paint
	Machine room	ditto	Glasswool acoustic material	Glasswool acoustic material
GF	Lobby	Porcelain tile	Ceramic tile H=2100, Emulsion paint above	Aluminum insulated acoustic panel
	Emergency room	ditto	ditto	ditto
	Examination room	ditto	ditto	ditto
	Electric room	Mortar	Mortar	Mortar
	Generator room	Mortar	Glasswool acoustic material	Glasswool acoustic material
1F	Ultrasonography	Porcelain tile	Ceramic tile H=2100, Emulsion paint above	Aluminum insulated acoustic panel
	X-ray room	ditto	ditto	ditto
	Examination room	ditto	ditto	ditto
	Class room	ditto	Plywood with natural decorative face board	ditto
2F	Examination room	Porcelain tile	Ceramic tile H=2100, Emulsion paint above	Aluminum insulated acoustic panel
	Procedure room	ditto	Ceramic tile	Calcium silicate board, Emulsion paint
3F	Examination room	Porcelain tile	Ceramic tile H=2100, Emulsion paint above	Aluminum insulated acoustic panel
	Library	ditto	Plywood with natural decorative face board	ditto
	Nurse changing	ditto	Vinyl paint H=2100, Emulsion paint above	ditto
Common	Lift lobby	Porcelain tile	Ceramic tile H=2100, Emulsion paint above	Aluminum insulated acoustic panel
	Waiting space	ditto	ditto	ditto
	Corridor	ditto	ditto	ditto
	Slope	ditto	—	Steel panel, Oil paint
	Staircase	ditto	Elastic spray coating finish	Aluminum insulated acoustic panel
	Toilet	ditto	Ceramic tile H=2100, Emulsion paint above	Calcium silicate board, Emulsion paint

2-2-2-4 Equipment Plan

The Project is to strengthen the health services of ICH as a tertiary hospital and for this purpose medical equipment is planned to be procured for the outpatient diagnostic department, the emergency department, the image diagnostic department and the clinical laboratory department.

(1) Policy on Selection of Equipment

In the Project, necessary equipment is to be selected in accordance with the following policies:

- Grade of equipment to be equivalent to that of public medical facilities such as MMC
- Equipment which contributes to reduction of hazardous waste such as mercury
- Grade of equipment which can follow technical advance of medical equipment such as digitalization at the time of commencement of facilities
- Equipment which is allowed to procure for public hospitals in Tamil Nadu (Mobile X-ray unit equipped with Flat Panel Detector) is excluded to procure since it is not allowed to procure by the State Government.
- Grade of equipment which can be operated and maintained at the technical levels of the present staff

- Equipment equivalent to the existing equipment has the priority in replacement and supplement for easy operation and maintenance
- Equipment which can be repaired and maintained easily by local agents
- Equipment which specifies manufacturers and disturbs competitive tendering is to be excluded in selection.

(2) Selection Criteria

Based on the policy on selection of equipment, the equipment requested by GOI and additionally necessary equipment were confirmed. The variety and the quantity of equipment were decided in accordance with the following six criteria:

- Purpose of Use
  - O (appropriate): Equipment suitable for the basic medical services at the tertiary medical facilities
  - X (inappropriate): Equipment not suitable for the basic medical services at the tertiary medical facilities
- Necessity
  - O (appropriate): Equipment for pediatric medical services at the tertiary level
  - X (inappropriate): Equipment not necessary for pediatric medical services at the tertiary level, or its benefit is limited
- Technical Level
  - O (appropriate): Equipment compatible with the current technical level
  - X (inappropriate): Equipment which requires higher technical skills
- Operational System
  - O (appropriate): Equipment for which medical staff are properly allocated or expected
  - X (inappropriate): Equipment for which medical staff are not expected to be allocated
- Maintenance and Management System
  - O (appropriate): Equipment which can be regularly inspected and repaired by the local agents, and whose spare parts and consumables can be easily procured
  - X (inappropriate): Equipment which has difficulties on maintenance by the local agents and on procurement of spare parts and consumables
- Operation and maintenance Cost
  - O (appropriate): Equipment for which operation and maintenance cost is low or affordable
  - X (inappropriate): Equipment for which operation and maintenance cost is high or not affordable
- Overall Evaluation
  - O (appropriate): Equipment which is procured appropriately and borne by the Project
  - X (inappropriate): Equipment which is inappropriate and not borne by the Project

Table 2-13 Examination List of Requested Equipment

Department	Item No.	Description	Qty Requested	Objective	Necessity	Technical Capability	Organization	Maintenance	Running Cost	Overall Evaluation	Quantity to be procured
Emergency	ER-1	Infant warmer	2	○	○	○	○	○	○	○	2
Emergency	ER-2	Patient monitor	5	○	○	○	○	○	○	○	4
Emergency	ER-3	Syringe pump	15	○	○	○	○	○	○	○	4
Emergency	ER-4	Infusion pump	5	○	○	○	○	○	○	○	4
Emergency	ER-5	Resuscitation Trolley(Emergency Cart)	5	○	○	○	○	○	○	○	1
Emergency	ER-6	Pulse oxymeter	6	○	○	○	○	○	○	○	2
Emergency	ER-7	Ventilator (for infant)	1	○	○	○	○	○	○	○	1
Emergency/ECG ECO	ER-8	Ultrasound scanner, echo portable	1	○	○	○	○	○	○	○	1
Emergency	ER-9	ECG, portable	1	○	○	○	○	○	○	○	1
Emergency/Pediatric Medicine/Newborn/Cardiology	ER-10	Defibrillator	4	○	○	○	○	○	○	○	1
Emergency/Newborn(NICU)	ER-11	Mobile X-ray unit	0	○	○	○	○	○	○	○	1
Pediatric surgery	PS-1	Operation table (for pediatric)	4	○	○	○	○	○	○	○	1
Pediatric surgery	PS-2	Mobile operating light (LED)	3	○	○	○	○	○	○	○	1
Pediatric surgery		High pressure steam sterilizer (Approx.30L)	0	○	X	○	○	○	○	X	0
Pediatric surgery	PS-3	Treatment Instrument sets	0	○	○	○	○	○	○	○	1
Pediatric surgery	PS-4	Suction machine	2	○	○	○	○	○	○	○	1
Pediatric surgery	PS-5	Pediatric laparoscope set	1	○	○	○	○	○	○	○	1
Pediatric surgery		Blanket warmer	1	○	X	○	○	○	○	X	0
Anesthesiology		Anesthesia machine with ventilator	10	○	X	○	○	○	○	X	0
Newborn	N-1	Transport incubator	3	○	○	○	○	○	○	○	1
Newborn/Biochemistry	N-2	Bilirubin analyzer with centrifuge	1	○	○	○	○	○	○	○	1
Newborn	NICU-1	Infant warmer	10	○	○	○	○	○	○	○	5
Newborn	NICU-3	Infusion pump	10	○	○	○	○	○	○	○	5
Newborn	NICU-2	Syringe pump	10	○	○	○	○	○	○	○	5
Newborn		Nerve stimulator	1	○	X	○	○	○	○	X	0
Newborn	N-3	Phototherapy unit (LED)	5	○	○	○	○	○	○	○	2
Newborn	NICU-4	Pulse oxymeter	10	○	○	○	○	○	○	○	2
Newborn/Biochemistry/Nephrology		Blood gas analyzer	1	○	X	○	○	○	X	X	0
Child Development Clinic	CDC-1	Bayley infant scale of development kit	2	○	○	○	○	○	○	○	1
Child Development Clinic	CDC-2	Infant meter (height & weight) cot type	2	○	○	○	○	○	○	○	1
Child Development Clinic		Resuscitation bag for neonate	2	○	X	○	○	○	○	X	0
Pulmonology/Anesthesiology	PU-1	Bronchoscope with video	3	○	○	○	○	○	○	○	1
ORT/Diarrhea/GE	GE-1	Gastro scope with video	1	○	○	○	○	○	○	○	1
ORT/Diarrhea/GE	GE-2	Colon scope with video	1	○	○	○	○	○	○	○	1
ORT/Diarrhea/GE		Esophagogastroduodenoscope (with side camera)	1	○	X	○	○	○	○	X	0
Nephrology	NP-1	Hemodialysis machine	3	○	○	○	○	○	○	○	1
Neurology	NU-1	EMG	1	○	○	○	○	○	○	○	1
Neurology/Newborn/Child Development Clinic /Child Guidance Clinic/ENT	NU-2	EEG	5	○	○	○	○	○	○	○	1
Child Guidance Clinic	CGC-1	Psychological test(10set)	10	○	○	○	○	○	○	○	1
Physiotherapy	PHY-1	Electrical simulator	2	○	○	○	○	○	○	○	1
Physiotherapy		Wax therapy	1	○	○	○	○	X	X	X	0
Physiotherapy	PHY-2	Ultrasonic therapy	2	○	○	○	○	○	○	○	1
Physiotherapy		Cycle for children	1	○	X	○	○	○	○	X	0
Physiotherapy	PHY-3	Balance board	1	○	○	○	○	○	○	○	1
Physiotherapy		CPM (continuous passive motion unit)	1	○	X	○	○	○	○	X	0
Physiotherapy	PHY-4	Peg board	1	○	○	○	○	○	○	○	1
Pharmacy OPD	PHA-1	Medicine refrigerator	1	○	○	○	○	○	○	○	1
Pharmacy OPD	PHA-2	Medicine cabinet	0	○	○	○	○	○	○	○	2
Biochemistry/Hematology	BIOL-1	Blood coagulation apparatus fully automated	0	○	○	○	○	○	○	○	1
Blood bank/Genetics	BL-1	Refrigerated centrifuge	3	○	○	○	○	○	○	○	1
Biochemistry	BIOL-2	Fully automated chemistry analyzer	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-3	Illuminate Hormone analyzer	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-4	Electrolyte analyzer	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-5	Tandem mass spectrometer for metabolic syndrome	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-6	PH meter	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-7	UV spectrophotometer	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-8	Electro phoresis apparatus	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-9	Distillation plant (Fully automated chemistry analyzer)	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-10	Distillation plant (Semi automated chemistry analyzer)	1	○	○	○	○	○	○	○	1
Biochemistry	PHA-1	Laboratory refrigerator	3	○	○	○	○	○	○	○	1
Biochemistry	BIOL-12	Centrifuge	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-13	Urine analyzer	1	○	○	○	○	○	○	○	1
Biochemistry	BIOL-14	Semi automated chemistry analyzer	1	○	○	○	○	○	○	○	1
Pathology Lab	PL-1	Microtome	1	○	○	○	○	○	○	○	1
Pathology Lab	PL-2	Automatic Blood cell counter	2	○	○	○	○	○	○	○	1
Pathology Lab		Tissue processor	1	○	X	○	○	○	○	X	0
Pathology Lab/Newborn/Nephrology	PL-3	Microscope Binocular	6	○	○	○	○	○	○	○	1
Microbiology Lab	ML-1	Automated blood culture system	1	○	○	○	○	○	○	○	1
Radiology	R-1	Digital X-ray unit	1	○	○	○	○	○	○	○	1
Radiology	R-2	CR System	1	○	○	○	○	○	○	○	1
Radiology	R-3	Automatic Voltage Stabilizer 80kVA	0	○	○	○	○	○	○	○	1
Cardiology	CAR-1	ECG (12channel)	3	○	○	○	○	○	○	○	1
Emergency	ER-12	Transport Van	0	○	○	○	○	○	○	○	1
Emergency	ER-13	Stretcher	0	○	○	○	○	○	○	○	1
Each department	DEP-1	Oxygen flow meter and humidifier	0	○	○	○	○	○	○	○	42
Each department	DEP-2	Automatic Voltage Stabilizer 0.5kVA	0	○	○	○	○	○	○	○	35
Each department	DEP-3	Automatic Voltage Stabilizer 1kVA	0	○	○	○	○	○	○	○	11
Each department	DEP-4	Automatic Voltage Stabilizer 2kVA	0	○	○	○	○	○	○	○	5
Each department	DEP-5	UPS 0.5kVA	0	○	○	○	○	○	○	○	1
Each department	DEP-6	UPS 2kVA	0	○	○	○	○	○	○	○	4

Table 2-14 Planned Equipment List

Equipment No.	Department	Item No.	Description	Quantity to be Procured
1	Emergency	ER-1	Infant warmer	2
1	Neonatology	NICU-1	Infant warmer	5
2	Emergency	ER-2	Patient monitor	4
3	Emergency	ER-3	Syringe pump	4
3	Neonatology	NICU-2	Syringe pump	5
4	Emergency	ER-4	Infusion pump	4
4	Neonatology	NICU-3	Infusion pump	5
5	Emergency	ER-5	Resuscitation trolley (Emergency Cart)	1
6	Emergency	ER-6	Pulse oxymeter	2
6	Neonatology	NICU-4	Pulse oxymeter	2
7	Emergency	ER-7	Ventilator (for infant)	1
8	Emergency	ER-8	Ultrasound scanner, echo portable	1
9	Emergency	ER-9	ECG, portable	1
10	Emergency	ER-10	Defibrillator	1
11	Emergency	ER-11	Mobile X-ray unit	1
12	Emergency	ER-12	Transport Van	1
13	Emergency	ER-13	Stretcher	1
14	Pediatric surgery	PS-1	Operation table (for pediatric)	1
15	Pediatric surgery	PS-2	Mobile operating light (LED)	1
16	Pediatric surgery	PS-3	Instrument sets for pediatric surgery	1
17	Pediatric surgery	PS-4	Suction machine	1
18	Pediatric surgery	PS-5	Pediatric laparoscope set	1
19	Neonatology	N-1	Transport incubator	1
20	Neonatology	N-2	Bilirubin analyzer with centrifuge	1
21	Neonatology	N-3	Phototherapy unit (LED)	2
22	Child Development Clinic	CDC-1	Bayley infant scale of development kit	1
23	Child Development Clinic	CDC-2	Infantmeter (height & weight)	1
24	Pulmonology/Anesthesiology	PU-1	Bronchoscope with video	1
25	ORT/Diarrhea/GE	GE-1	Gastroscope with video	1
26	ORT/Diarrhea/GE	GE-2	Colonoscope	1
27	Nephrology	NP-1	Hemodialysis machine	1
28	Neurology	NU-1	EMG	1
29	Neurology	NU-2	EEG	1
30	Child guidance clinic	CGC-1	Psychological test	1
31	Physiotherapy	PHY-1	Electrical stimulator	1
32	Physiotherapy	PHY-2	Ultrasonic therapy	1
33	Physiotherapy	PHY-3	Balance board	1
34	Physiotherapy	PHY-4	Peg board	1
35	Pharmacy OPD	PHA-1	Medicine refrigerator	2
36	Pharmacy OPD	PHA-2	Medicine cabinet	2
37	Blood bank	BL-1	Refrigerated centrifuge	1
38	Biochemistry	BIOL-1	Blood coagulation apparatus fully automated	1
39	Biochemistry	BIOL-2	Fully automated chemistry analyzer	1
40	Biochemistry	BIOL-3	Illuminate hormone analyzer	1
41	Biochemistry	BIOL-4	Electrolyte analyzer	1
42	Biochemistry	BIOL-5	Tandem mass spectrometer for metabolic syndrome	1
43	Biochemistry	BIOL-6	PH meter	1
44	Biochemistry	BIOL-7	UV spectrophotometer	1
45	Biochemistry	BIOL-8	Electro phoresis apparatus	1
46-1	Biochemistry	BIOL-9	Distillation plant (for Fully automated chemistry analyzer)	1
46-2	Biochemistry	BIOL-10	Distillation plant (for Semi automated chemistry analyzer)	1
47	Biochemistry	BIOL-12	Centrifuge	1
48	Biochemistry	BIOL-13	Urine analyzer	1
49	Biochemistry	BIOL-14	Semi automated chemistry analyzer	1
50	Pathology lab	PL-1	Microtome	1
51	Pathology lab	PL-2	Automatic blood cell counter	1
52	Pathology lab	PL-3	Microscope binocular	1
53	Microbiology lab	ML-1	Automated blood culture system	1
54	Radiology	R-1	Digital X-ray unit	1
55	Radiology	R-2	CR System	1
56	Radiology	R-3	Automatic Voltage Stabilizer 80kVA	1
57	Cardiology	CAR-1	ECG (12channel)	1
58	Each department	DEP-1	Oxygen flow meter and humidifier	42
59	Each department	DEP-2	Automatic Voltage Stabilizer 0.5kVA	35
60	Each department	DEP-3	Automatic Voltage Stabilizer 1kVA	11
61	Each department	DEP-4	Automatic Voltage Stabilizer 2kVA	5
62	Each department	DEP-5	UPS 0.5kVA	1
63	Each department	DEP-6	UPS 2kVA	4

Table 2-15 Specification of Planned Major Equipment

No.	Description	Q'ty	Purpose of Use, Justification of Equipment Grade
2	Patient monitor	4	To monitor patient's condition by showing oxygen saturation, ECG and respiratory rate and ETCO2 by digit or wavelength on the display. Grade is general to monitor serious patient during and after operation.
7	Ventilator (for infant)	1	For adjustment of ventilation such as supplementary ventilation for spontaneous patient and forced ventilation. Grade is general as a ventilation management for neonatal and pediatric patients.
8	Ultrasound scanner, echo portable	1	To diagnose abdominal disease, neonatal brain diagnosis and congenital cardiac problem and soft tissue disease in invasive way. Grade of equipment is general as cardiac echo machine to be used for cardiac disease patients.
10	Defibrillator	1	For delivering the electric shock to recover the patient from the lethal cardiac arrhythmia such as, Ventricular fibrillation, Ventricular tachycardia. Grade of equipment is general for using emergency situation such as sudden condition change etc.
11	Mobile X-ray unit	1	For X-ray examination of the patient such as pneumonia and burns who might be difficult to be moved to the X-ray room. Grade of equipment is general.
12	Transport Van	1	To transfer patient from new OPD building to inpatient ward equipped with stretcher. The grade of equipment is general.
14	Operation table (for pediatric)	1	For fixing a suitable position of patient depending on kinds of operation by adjustment of height & degree. Grade of equipment is general.
16	Instrument sets for pediatric surgery	1	For casual pediatric surgical treatment and operation. Grade of equipment is general.
18	Pediatric laparoscope set	1	For operation for abdominal internal organs such as stomach & gallbladder by using camera through small hole of abdomen. Benefit is to minimize invasion and complication such as intestinal blockage. Grade of equipment is general.
19	Transport incubator	1	For transporting premature neonate to internal and outside of hospital under appropriate humidity and temperature. Grade of equipment is general.
24	Bronchoscope with video	1	For observing bronchial tubes to detect respiratory disease at lung & bronchus and taking tissues and cell via biopsy. It is used for treatment of bronchostenosis. Grade of equipment is general.
25	Gastroscope with video	1	For observing upper digestive system to detect digestive disease at esophagus and stomach and taking tissues and cell via biopsy. Grade of equipment is general.
26	Colonoscope	1	Endoscope to diagnose and treat rectum and colon inserting anus. Grade of equipment is general.
27	Hemodialysis machine	1	For electrolyte correction, removal of waste products and water in order to make kidney function. Grade of equipment is general.
28	EMG	1	To record and monitor active electrode as wavelength reflecting shrieked muscle. To diagnose amyotrophic lateral sclerosis (ALS) and myasthenia gravis. To plan how to rehabilitate for patients who has myopathy, cerebral palsy and infantile paralysis. Grade of equipment is general.
29	EEG	1	To record movement of brain by electrodes attached to the head in order to use analysis of brain activity and diagnosis of brain disease such as epilepsy. Grade of equipment is general.
37	Refrigerated centrifuge	1	For examination by refrigerated centrifuges to measure unstable enzyme and chemical compound against heat. This equipment is mainly used in the blood bank. Grade of equipment is general.

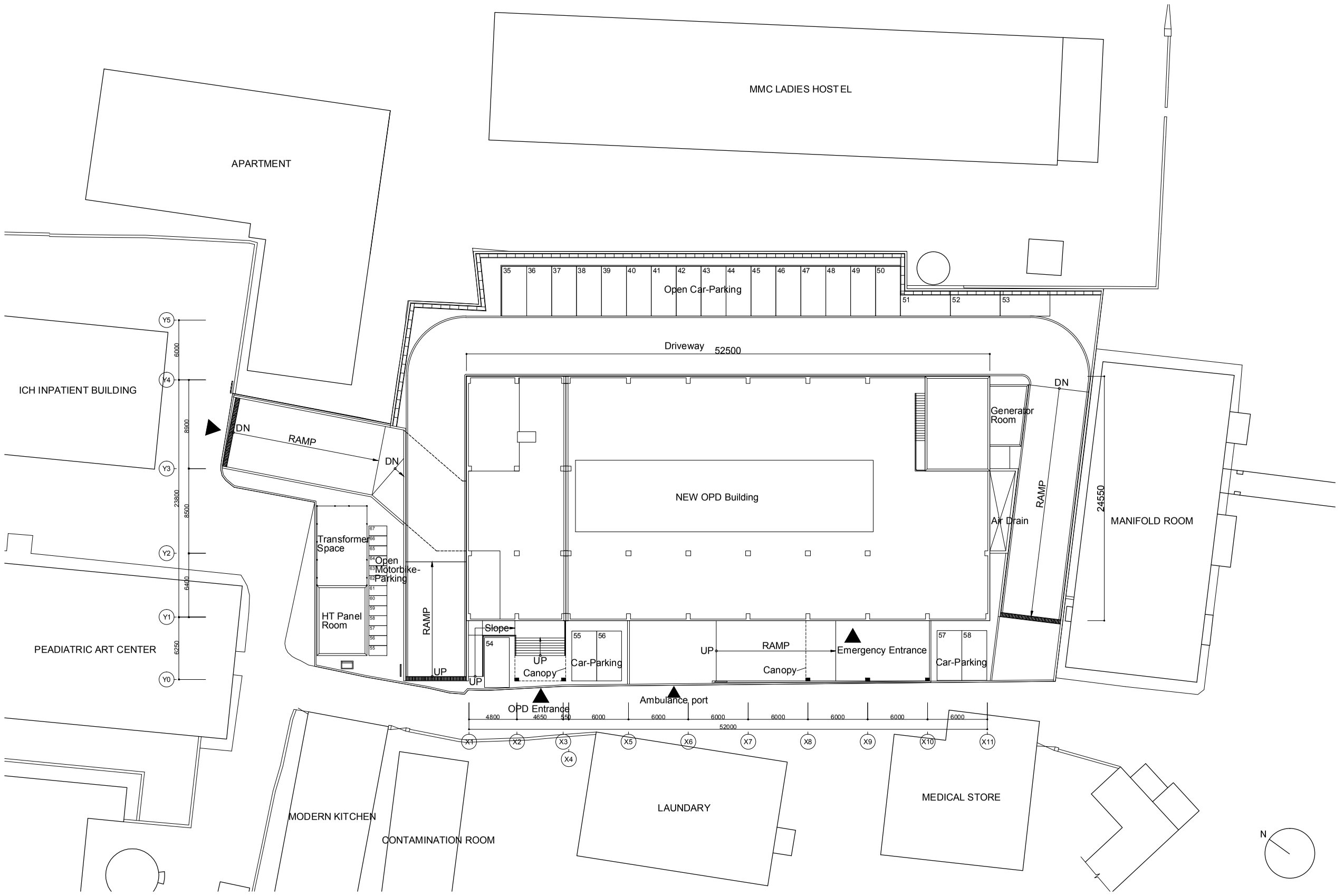
39	Fully automated chemistry analyzer	1	For overall clinical laboratory tests such as liver function test and kidney function test in order to judge patient condition especially for medicine. Grade of equipment is general as tertiary medical facility
40	Illuminate hormone analyzer	1	For detecting hormone such as thyroid hormone, gonadal hormone and tumor markers in the serum. Grade of equipment is general as tertiary medical facility.
42	Tandem mass spectrometer for metabolic syndrome	1	To diagnose congenital metabolic disorder patient. Grade of equipment is general for children special hospital.
45	Electro phoresis apparatus	1	For analyzing proteins in serum with electrophoresis. To diagnose nephrosis, infectious disease and malignant tumor. Grade of equipment is general.
51	Automatic blood cell counter	1	To diagnose blood components such as red blood cell, white blood cell and platelet. Grade of equipment is general.
53	Automated blood culture system	1	For rapid diagnosis for detecting whether bacteria is existing or not through measuring continuous changes of the growth of bacteria in the blood collected in culture bottle. Grade of equipment is general.
54	Digital X-ray unit	1	For taking an X-ray photo/image for diagnosis patients such as fracture, respiratory disease, gallstone and abdominal disease such as an intestinal blockage. For fluoroscopic function, to diagnose gastrointestinal disease and kidney disease by using contract medium for oral administration or intravenous.
55	CR system	1	To produce x-ray picture from analog image into digital image by computed radiography system. Grade of equipment is general.
56	Automatic voltage stabilizer 80 kVA	1	To protect sophisticated medical equipment from sudden voltage changes by recovering voltage fluctuation immediately in order to control voltage escalation at loading interception. Grade of equipment is general as AVR attached with medical equipment.
57	ECG (12channel)	1	To record wavelength of electric activity of heart and diagnose arrhythmia. Grade of equipment is general as medical facility to receive circulatory system patients

2-2-3 Outline Design Drawings

01	Site Plan	1/400
02	BF Plan	1/200
03	GF Plan	1/200
04	1F Plan	1/200
05	2F Plan	1/200
06	3F Plan	1/200
07	RF1 Plan	1/200
08	RF2 Plan	1/200
09	Elevation 1	1/200
10	Elevation 2	1/200
11	Elevation 3	1/200
12	Section 1	1/200
13	Section 2	1/200

Table 2-16 Building Components

Floors		Rooms	Floor Areas (m^2)
New OPD Bldg.			
	RF	Staircase	50.6
	3F	OPD clinic (Rheumatology, Dermatology, Pulmonology, etc.) Class room, Nurse changing room	1,247.0
	2F	OPD clinic (Diarrhea / GE, Newborn, Nutrition, Surgery, etc.)	1,247.0
	1F	OPD clinic (Neurology, Nephrology, Hematology, X-ray, etc.), Class room	1,247.0
	GF	OPD clinic (Ped. medicine), Emergency, Pharmacy, Triage, Generator room	1,247.0
	BF	Car parking, Machine room	1,288.9
	Subtotal		6,327.5
Generator Room			19.2
HT Panel Room			35.0
Total Floor Areas			6,381.7



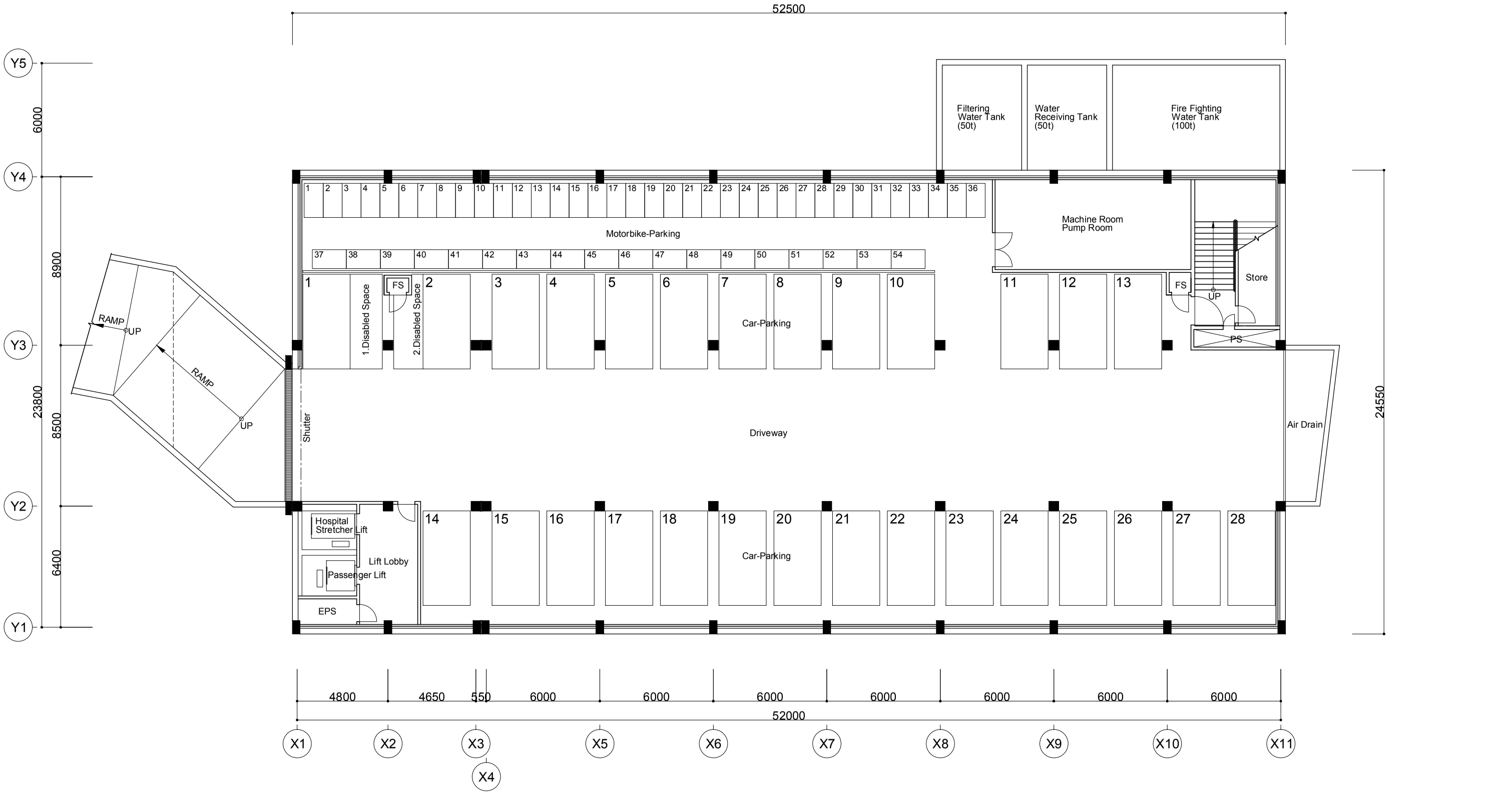
PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

TITLE

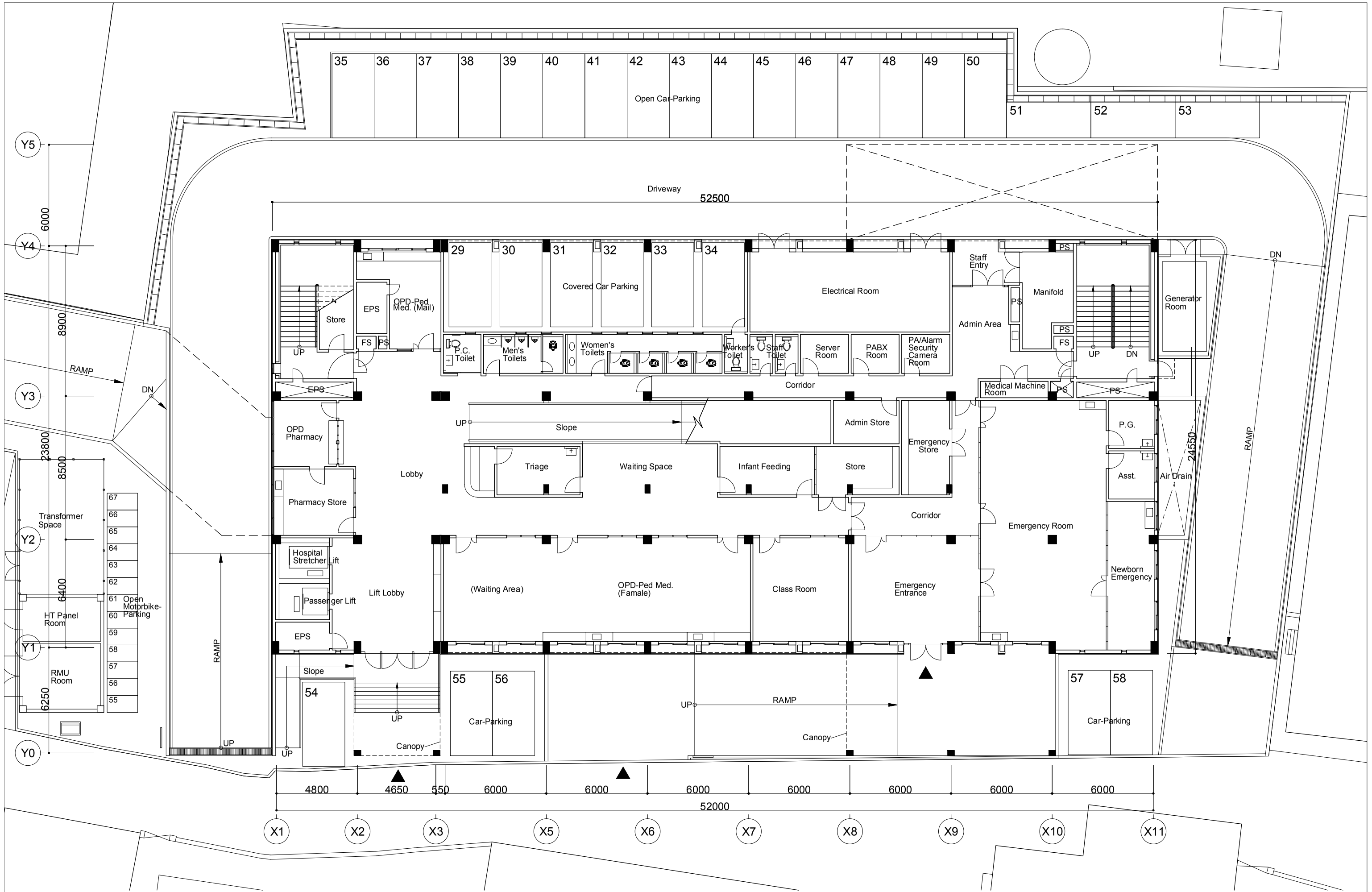
NEW OPD Building SITE PLAN

Number of Drawing: 01

Scale: A3:1/400



	PROJECT FOR IMPROVEMENT OF THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI, INDIA	TITLE NEW OPD Building BF PLAN	Number of Drawing 02 Scale A3:1/200



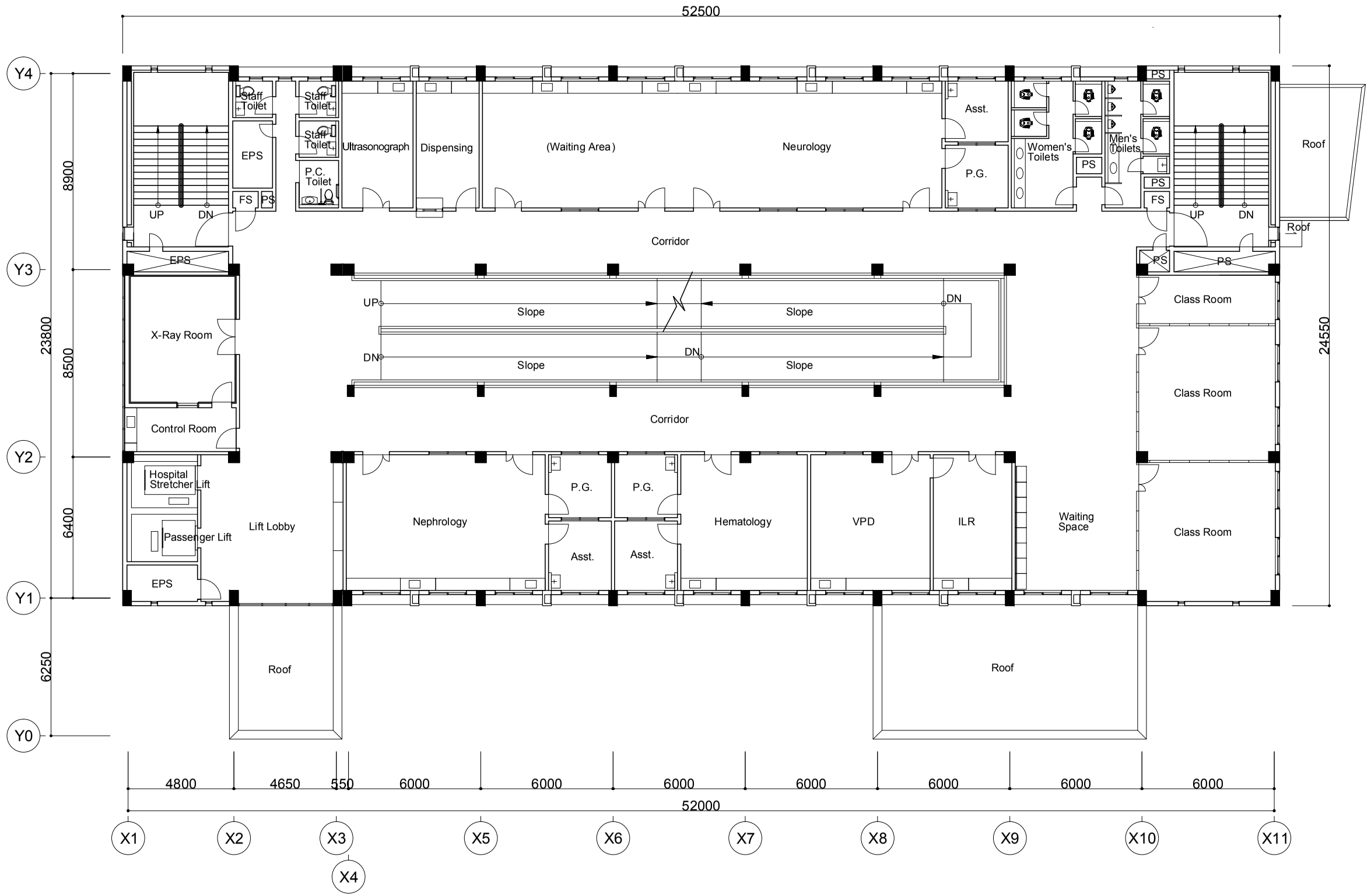
PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

TITLE

NEW OPD Building GF PLAN

Number of Drawing: 03

Scale: A3:1/200



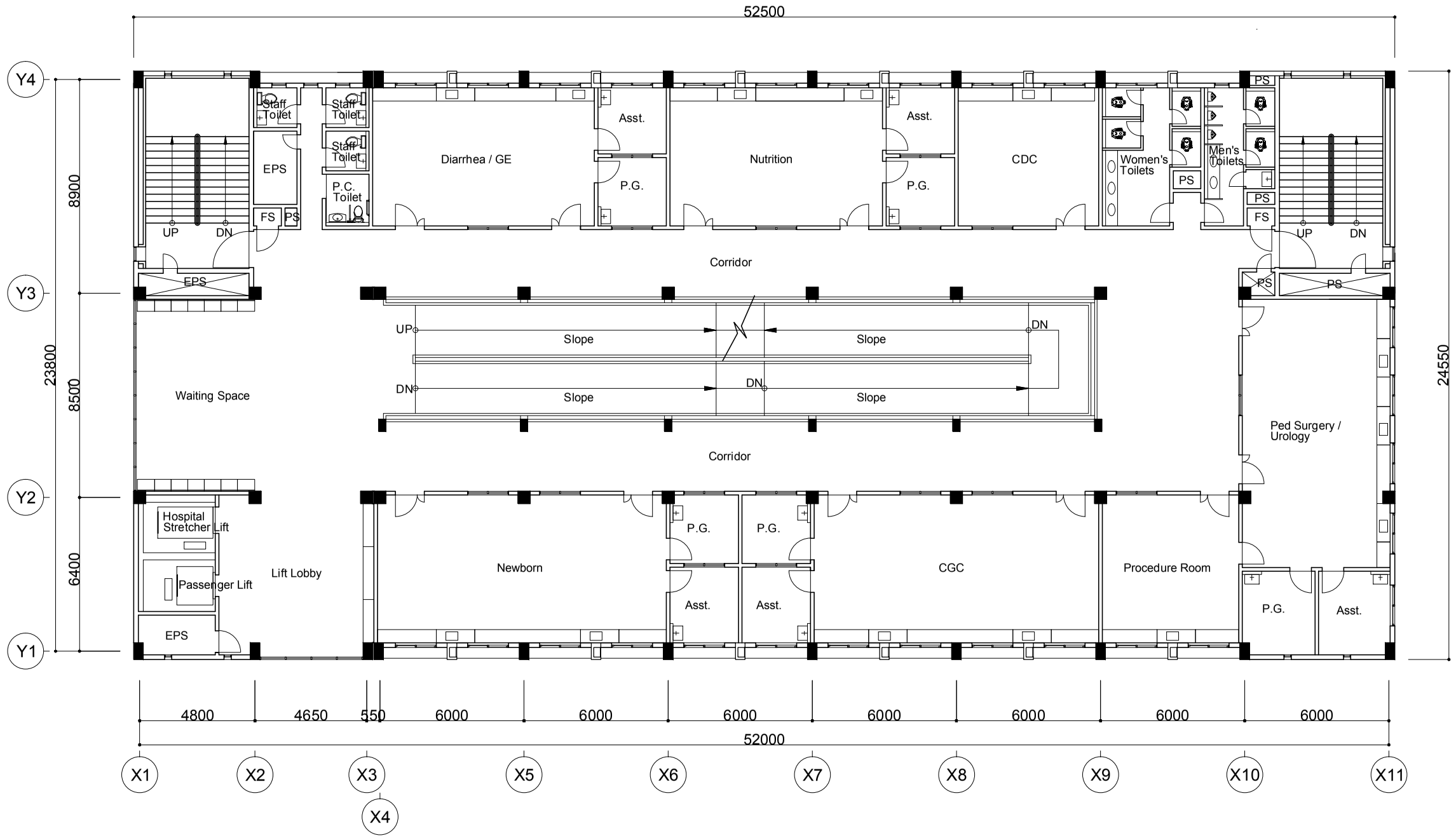
PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

TITLE

NEW OPD Building 1F PLAN

Number of Drawing: 04

Scale: A3:1/200



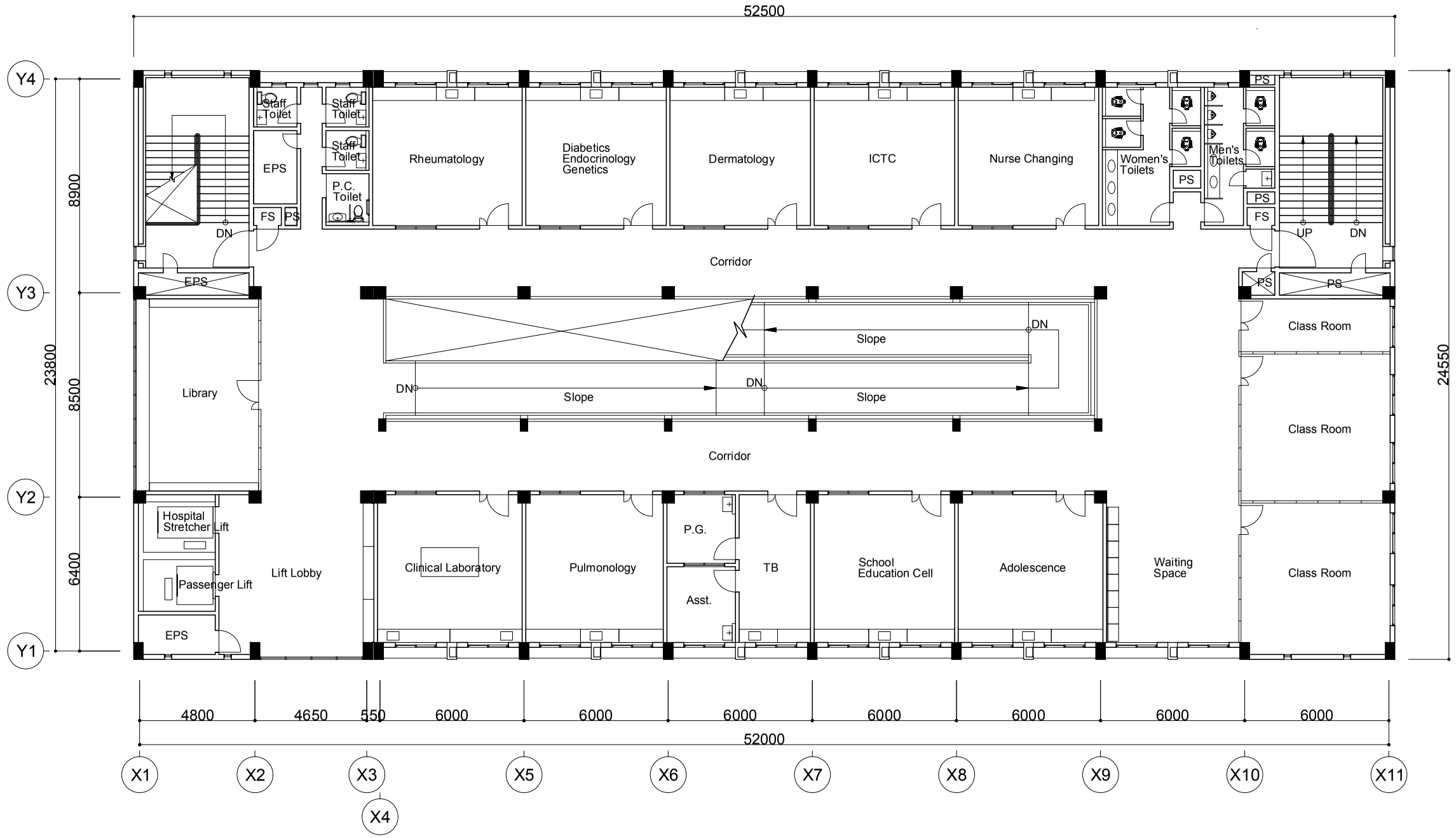
PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

TITLE

NEW OPD Building 2F PLAN

Number of Drawing: 05

Scale: A3:1/200



	PROJECT FOR IMPROVEMENT OF THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI, INDIA	TITLE: NEW OPD Building 3F PLAN	Number of Drawing: 06 Scale: A3:1/200

PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

TITLE

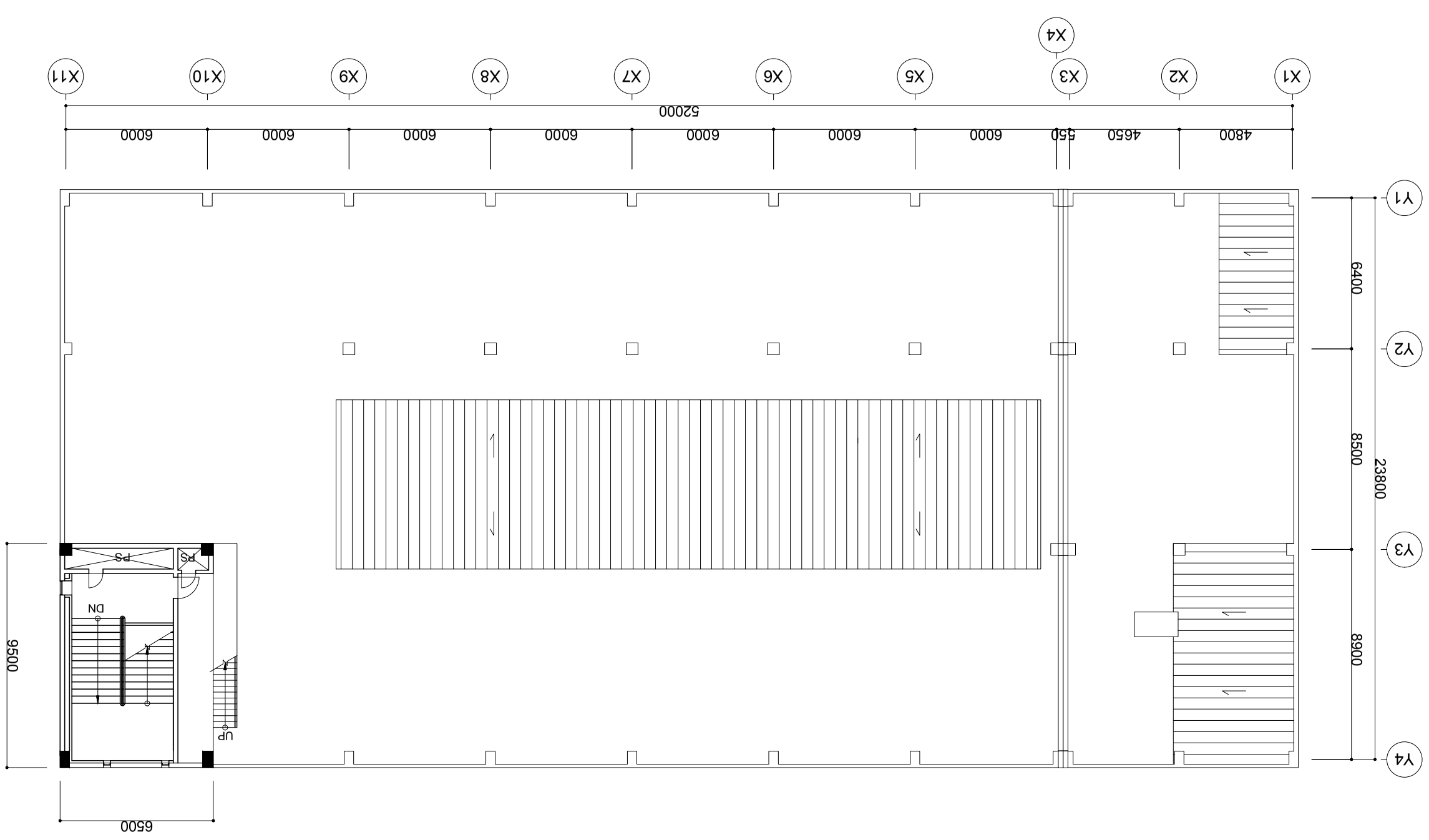
NEW OPD Building RF1 PLAN

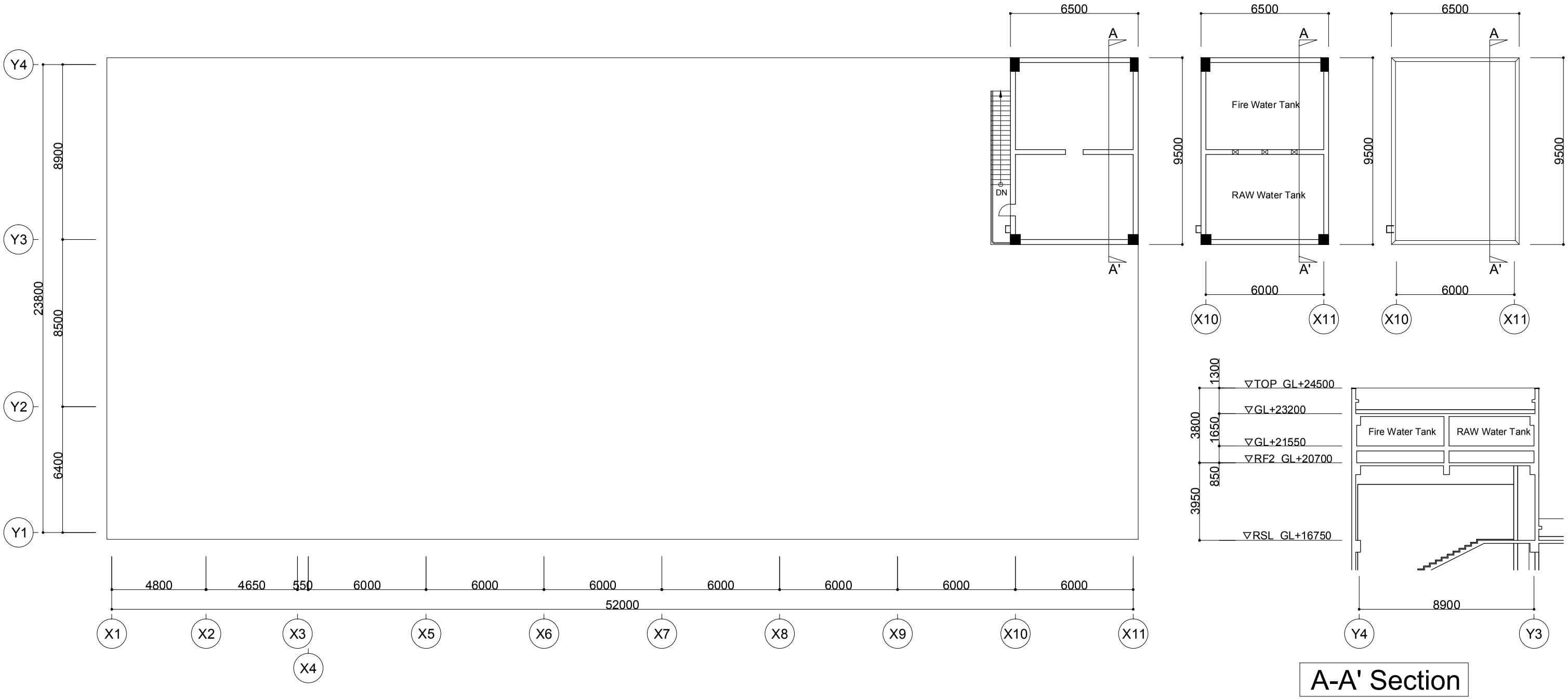
Number of Drawing

07

Scale

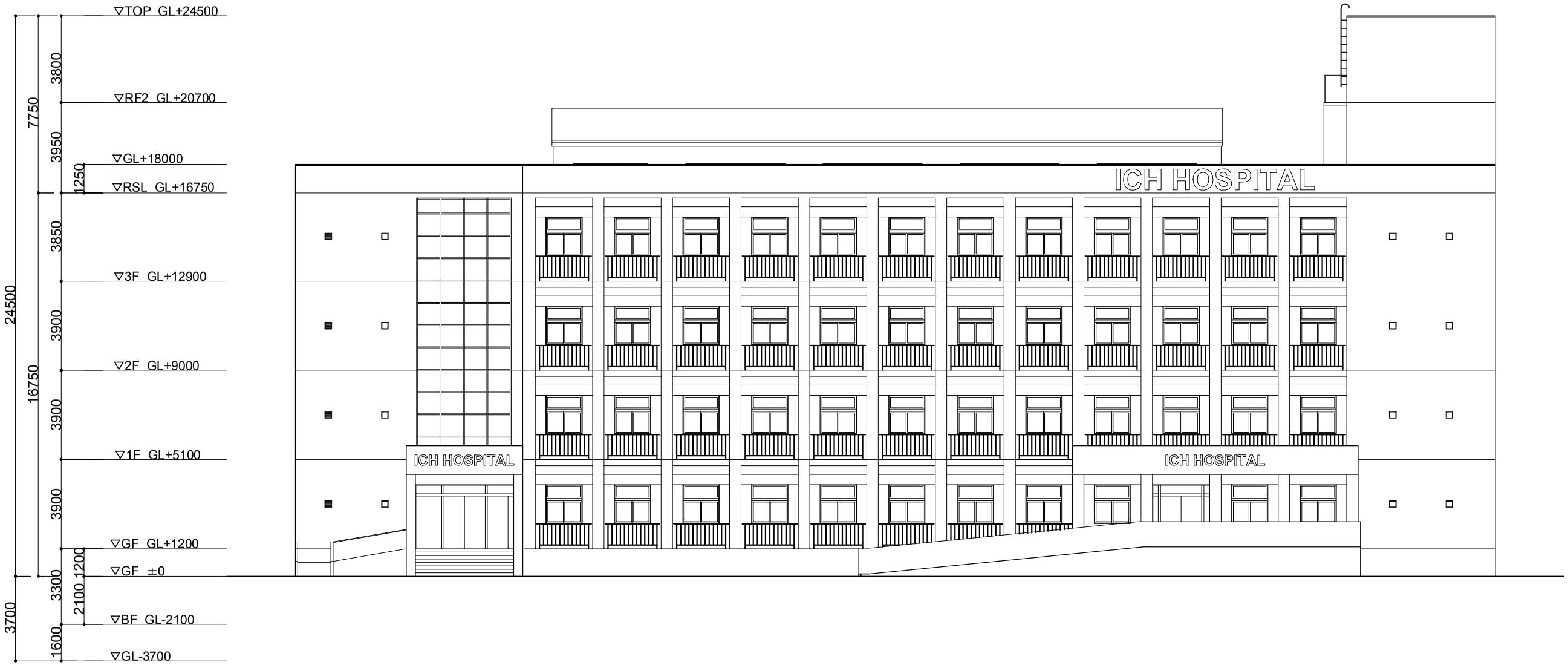
A3:1/200

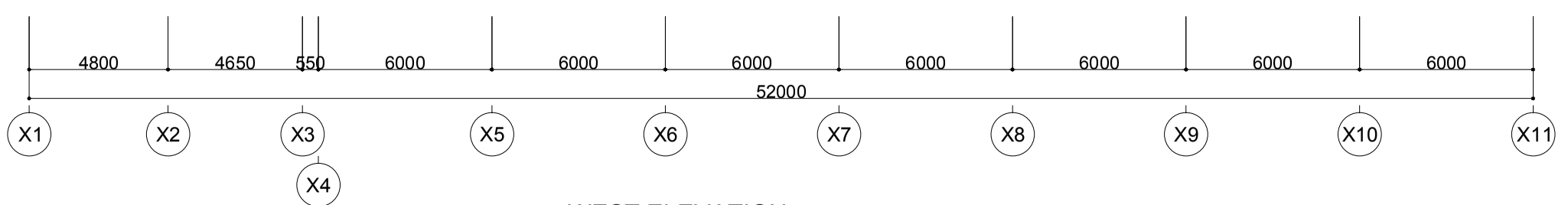




A-A' Section

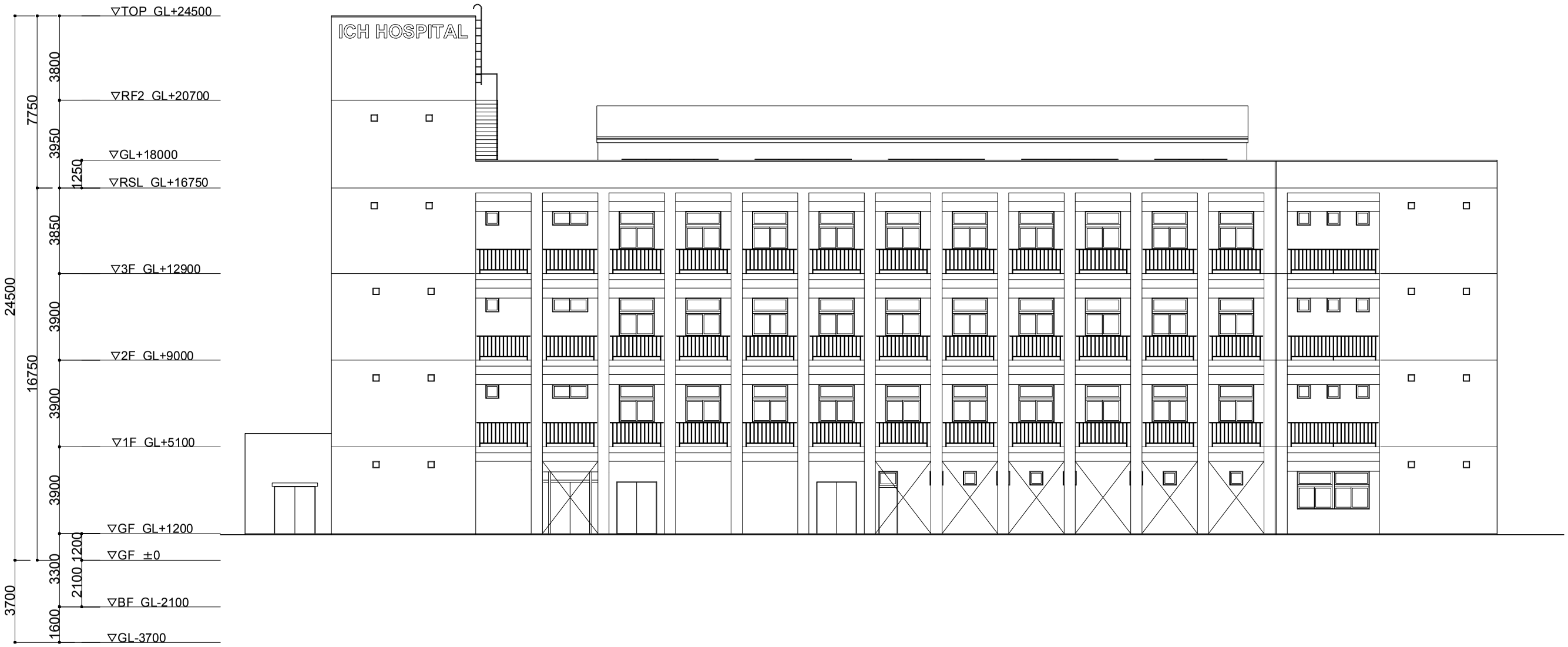
	PROJECT FOR IMPROVEMENT OF THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI, INDIA	TITLE NEW OPD Building RF2 PLAN	Number of Drawing 08
			Scale A3:1/200





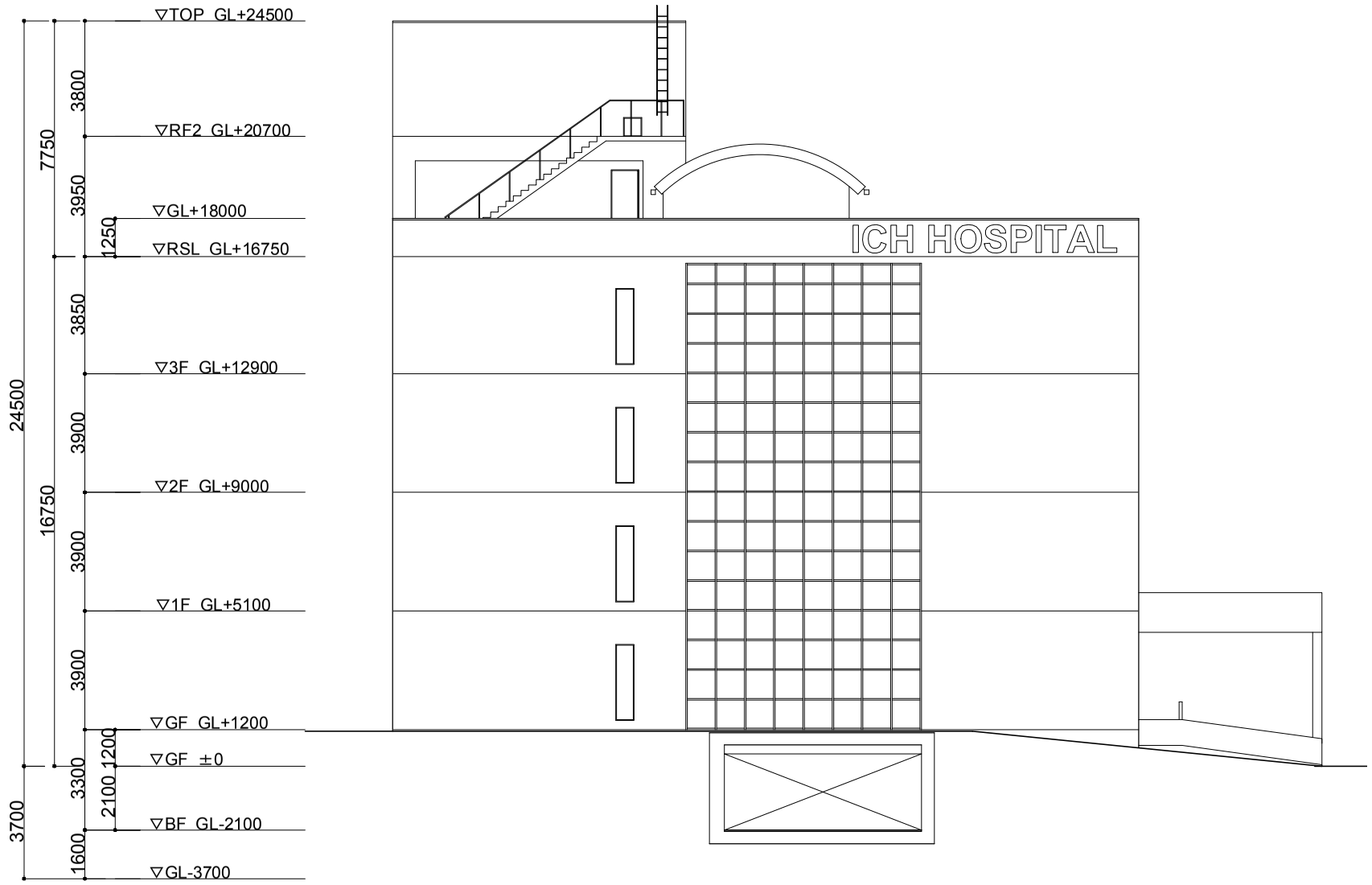
WEST ELEVATION

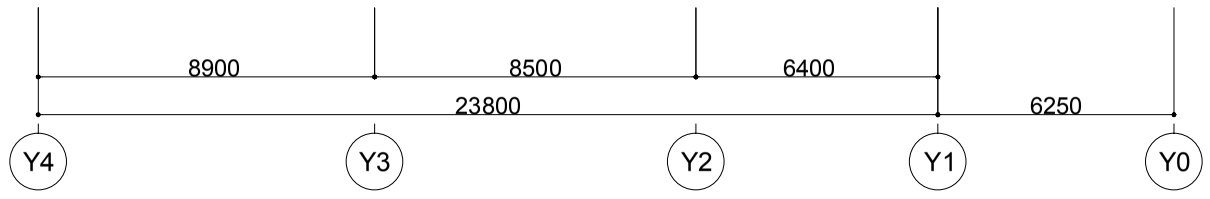
	PROJECT FOR IMPROVEMENT OF THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI, INDIA	TITLE NEW OPD Building ELEVATION 1	Number of Drawing 09
			Scale A3:1/200



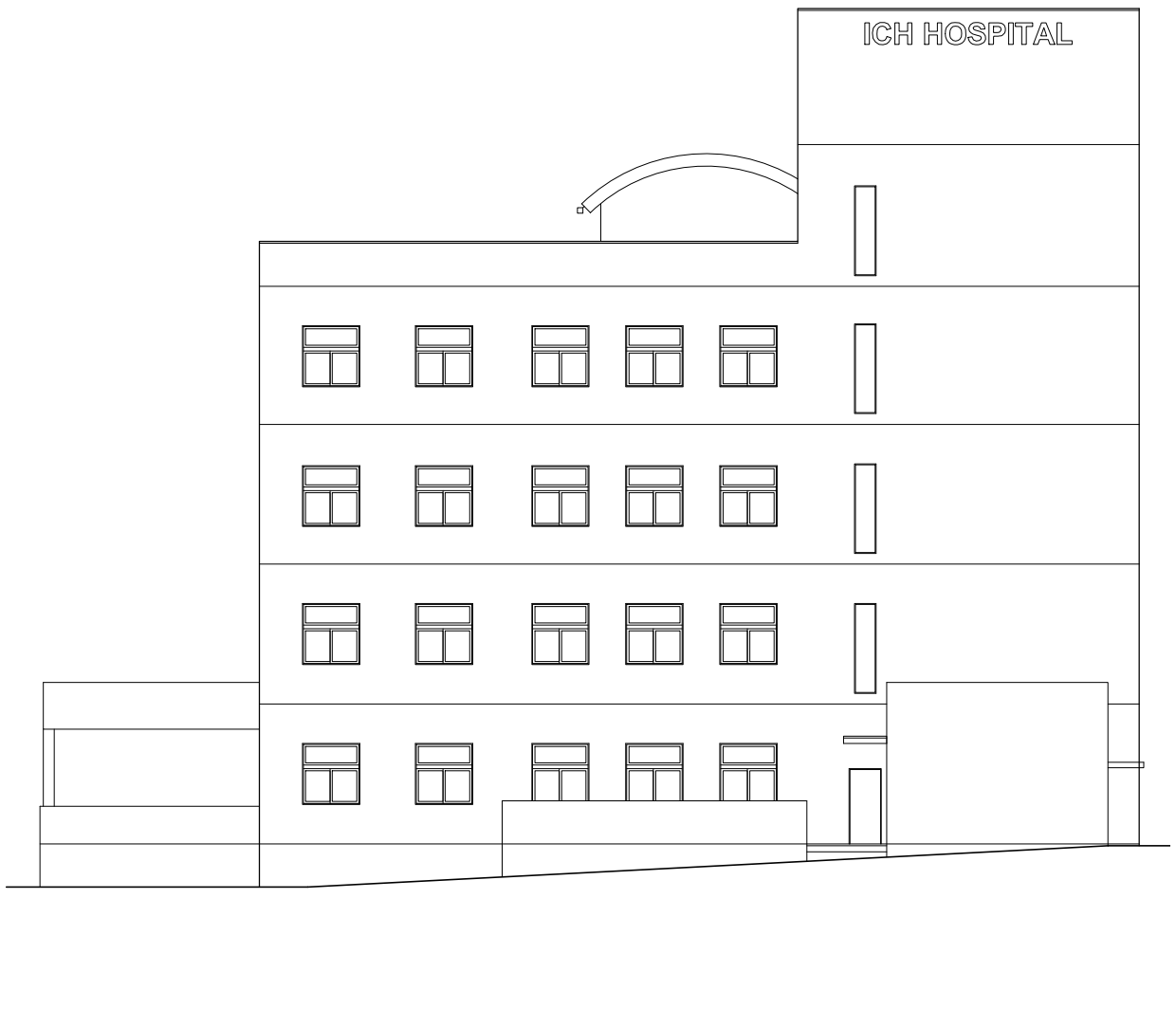
EAST ELEVATION

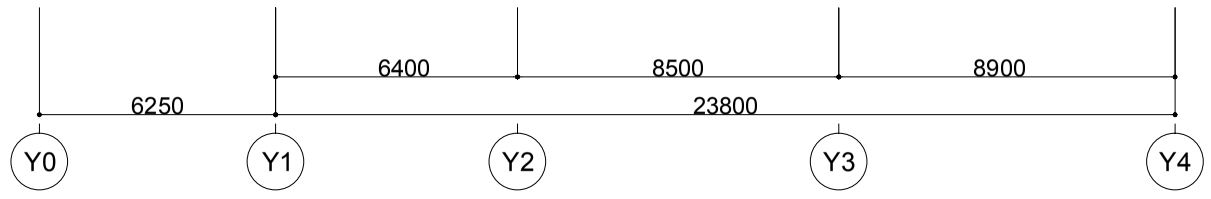
	PROJECT FOR IMPROVEMENT OF THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI, INDIA	TITLE NEW OPD Building ELEVATION 2	Number of Drawing 10 Scale A3:1/200





NORTH ELEVATION





SOUTH ELEVATION

PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

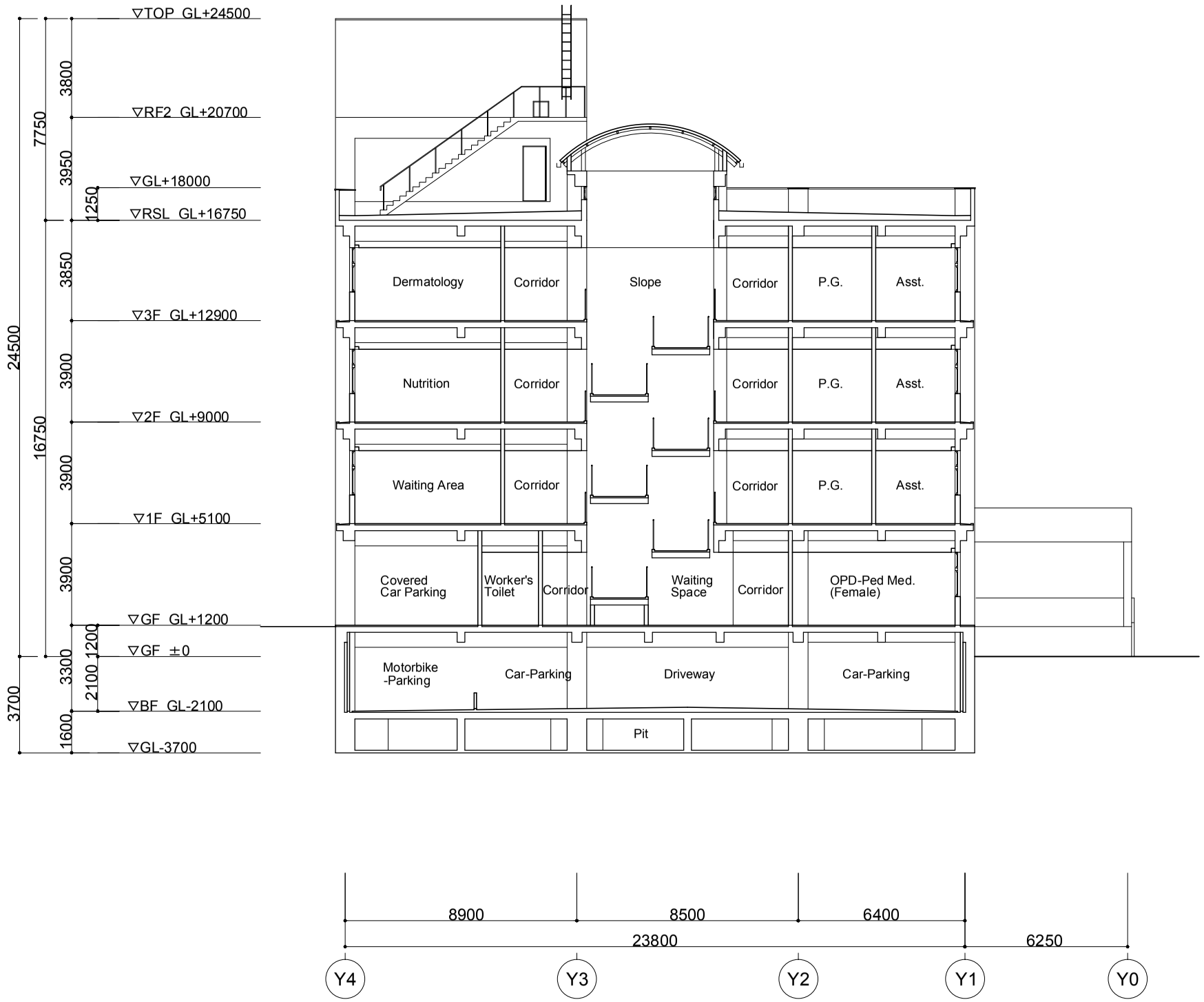
TITLE

NEW OPD Building ELEVATION 3

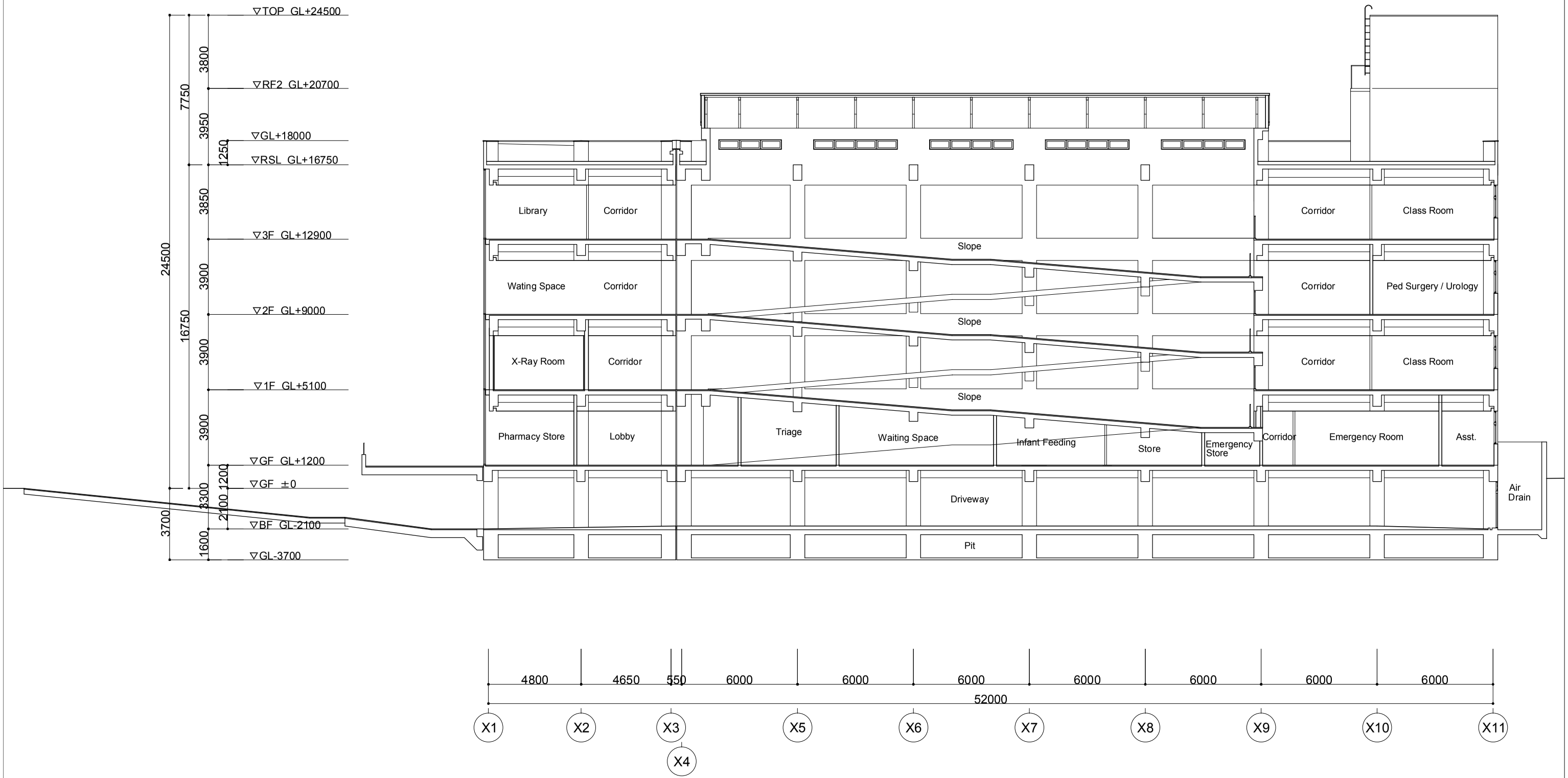
Number of Drawing

11

Scale A3:1/200



	PROJECT FOR IMPROVEMENT OF THE INSTITUTE OF CHILD HEALTH AND HOSPITAL FOR CHILDREN, CHENNAI, INDIA	TITLE NEW OPD Building SECTION 1	Number of Drawing 12 Scale A3:1/200



PROJECT FOR IMPROVEMENT OF
THE INSTITUTE OF CHILD HEALTH AND HOSPITAL
FOR CHILDREN, CHENNAI, INDIA

TITLE

NEW OPD Building SECTION 2

Number of Drawing: 13

Scale: A3:1/200

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

This Project consists of construction works of hospital facilities and procurement and installation works of equipment. The scope of Japan's cooperation is to be carried out within the framework of the Grant Aid scheme of GOJ. After the Project is approved by the Cabinet of Japan, E/N will be signed between GOJ and GOI, which is followed by the conclusion of Grant Agreement (G/A) between JICA and GOI.

After the signing of G/A, the executing agency will conclude a consulting services agreement for the Project with a Japanese consultant, and the consultant will start the detailed design and preparation of tender documents for the Project. Upon completion of tender documents, tender procedure will take place for selection of a construction contractor and an equipment supplier of the Japanese companies (Japanese juridical persons). The respective contractors will execute construction of facilities and procurement and installation of equipment.

Agreement with the consultant as well as the contracts with the construction contractor and the equipment supplier shall be verified by JICA to be eligible for the Grant Aid. After the construction contract and supplier's contract, the implementation organization shall be established among the implementation body of the Indian side, consultant, construction contractor and equipment supplier.

(1) Implementation Organization of the Indian Side

The responsible organization of India for the Project is the Health and Family Welfare Department, Government of Tamil Nadu, and will be a signatory of agreements and contracts. ICH, which is going to make use of the facilities/equipment, will be in charge of overall coordination of works during implementation of the Project.

(2) Consultant

After the signing of E/N and G/A, the Health and Family Welfare Department of the Government of Tamil Nadu will conclude a consulting service agreement for detailed design and supervision of the Project with the Japanese consultant, and obtain verification of JICA in accordance with Japan's Grant Aid scheme. The consultant will prepare detailed design documents and tender documents based on the Preparatory Survey Report, and obtain approval of the Health and Family Welfare Department.

In implementing tenders and construction works, the consultant is to assist tendering procedures of facilities and to supervise the construction works based on the detailed design documents and the tender documents. Also in the equipment works, the consultant is to assist tendering procedure and supervise procurement, installation and operation training works.

a) Detailed design

The services are to design facilities in detail and to review equipment plan based on the Preparatory Survey Report, and prepare tender documents including drawings,

specifications, instructions to tenderers and draft contracts for construction works and equipment works. They also include cost estimation for construction works and equipment works.

b) Assistance of Tendering

The services are to assist tendering by the implementing agency to select a construction contractor and an equipment supplier and conclude the contracts, and to assist reporting the result to JICA.

c) Supervision

The services are to supervise the construction contractor and the equipment supplier that they carry out their respective works in accordance with the provision of the relevant contracts, and to ensure that the contracted obligations are properly fulfilled. In addition, the consultant is to give the contractor and the equipment supplier instructions and advices and to coordinate their works for smooth implementation of the Project on the stance of fairness. Details of supervision services are as follows:

- Examining and confirming the implementation plan, shop drawings, equipment specifications and other relevant documents submitted by the contractor and the supplier.
- Examining and confirming the construction materials and quality and performance of equipment delivered.
- Examining utility appliances and medical equipment for delivery, installation and operation manuals
- Managing the progress of construction works and equipment works
- Inspecting completed facilities and installed equipment

In addition to the services mentioned above, the consultant is to report the progress of the Project, procedure of payment, handover after completion and others to the relevant agencies of GOI and JICA.

(3) The Construction Contractor and the Equipment Supplier

The construction contractor and the equipment supplier are to be selected by the qualified competitive tender intended for Japanese firms. As a general rule of the Japan's Grant Aid scheme, the Health and Welfare Department of the Government of Tamil Nadu will conclude a construction work contract and the equipment work contract with the firm who offers the lowest tender price. The construction contractor and the equipment supplier are to construct facilities, procure and install equipment and provide operation training of equipment to the Indian side in accordance with the contracts.

(4) JICA

JICA provides necessary services for execution of the Project as the implementing agency of GOJ for Grant Aid in accordance with the Japan's Grant Aid scheme.

(5) Local Consultants and Local Construction Companies

There are many large-scale consultant offices in Chennai city, which provide design and supervision services in public and private building projects in Chennai city. For the design and supervision work of the construction of the New OPD Building, national and local laws and regulations of India like NBCI and the development regulations of Chennai Corporation have to be complied with. In this regard, cooperation of the local consultant office which has detailed knowledge of these laws and regulations is to be secured.

Local major construction companies have enough capability and manpower, and are expected to work on the Project as the subcontractors of the Japanese construction contractor.

2-2-4-2 Implementation Conditions

(1) Construction Conditions

The construction conditions in Chennai are basically as follows:

- Many contractors in India have proper technical capabilities in the local markets.
- Most of construction materials are manufactured in India, and imported materials are also widely available in the local markets. Therefore, these materials can be procured without difficulties in India.
- The project site is narrow and there is not sufficient space for temporary facilities like a site management office. Therefore, the conditions for selection of the local contractor should include that the contractor takes care of the land to establish the temporary facilities.

1) Schedule control

- In order to minimize the influences of rain, it is necessary to plan the constructions work for ensuring the effective rainwater drainage system.
- Because of the limited space of the site, it is expected to be difficult to secure temporary stock space such as excavated soil and construction materials including reinforcing steel, concrete casting molds, which may influence the work efficiency to keep the construction schedule. At the time of selecting a local contractor, it should be taken into consideration to select the company who owns bending yard and storehouse, and the construction materials will be transported to the project site.

2) Security control

- The project site is located at the center place of hospital campus consisting of ICH and IOG. It is necessary to surround the flow lines of construction vehicles and workers with temporary fences in order not to be mingled with the flow lines of hospital staff and visitors.

- It is necessary to station guards at hospital main gate who guide pedestrians and construction vehicles in order to avoid accidents.

- In Chennai, passage of big construction vehicles and big heavy machine is restricted in the nighttime, and ICH operates for 24 hours a day. It is necessary to instruct the local contractor to pay attention at the time of transporting construction materials.

- It is necessary to give attention such as installing high fences without gaps in between, and preventing the third person, especially children, from entering into the project site.

(2) Points to be considered on Procurement of Equipment

The planned equipment includes Digital X-ray unit which requires coordination with construction works at the time of installation. Therefore, it is necessary to control the schedule of procurement and installation in close coordination between the consultant and the construction contractor.

2-2-4-3 Scope of Works

(1) Construction Works

The Project will be implemented through mutual cooperation between GOJ and GOI. In the case that the Project will be implemented under the Japan's Grant Aid, the works borne by each government are as follows:

1) Works borne by the Grant Aid of GOJ

Consulting services, construction of facilities and procurement and installation of equipment as listed below are borne by GOJ.

- Preparation of detail design documents and tender documents of the facilities and equipment
- Assistance for selection and contract with a contractor and equipment supplier
- Construction of facilities and procurement, installation and operation and maintenance training of equipment

2) Works borne by GOI

a) Related to construction and furniture

- Demolition of existing facilities and fences in the project site (including foundations)
- Rerouting of existing piping and cables associated with the demolition of existing

facilities
- Preparation of the site ground (including cutting and removal of trees, removal of pavement, etc.)
- Obtaining the building permission (including permission for demolition of the existing facilities)
- Infrastructure connecting works
- Procurement and installation of general furniture, equipment and fittings, etc. that will not be borne by the Japan's Grant Aid

b) Related to hospital operation and maintenance
- Procurement of spare parts and consumables necessary for proper maintenance
- Appropriate and effective operation and maintenance of the facilities and equipment
- Employment and securing medical personnel, drivers necessary for proper operation of the planned equipment

c) Related to procedures
- Allotment of the Project budget in the appropriate section of the annual budget of the State of Tamil Nadu.
- Opening an account with a bank in Japan.
- Issuing Banking Arrangement (B/A) and Authorization to Pay (A/P).
- Payment of costs related to B/A and A/P
- Applying for and obtaining building permit, relevant permissions, licenses and other authorizations as may be necessary for the Project
- Prompt execution of unloading, customs clearance, responsibility for the payment of customs duties, and assistance for inland transportation of equipment and materials to be imported.
- Exemption of Japanese nationals from custom duties, internal taxes and fiscal levies
- According Japanese nationals with such facilities for their entry into India and stay therein
- Bearing all expenses, other than those borne by Japan's Grant Aid, necessary for the implementation of the Project

(2) Scope of Procurement and Installation

The equipment supplier shall procure, deliver and install medical equipment, and provide technical guidance on how to use and maintain the equipment to the Indian side.

2-2-4-4 Supervision by the Consultant

(1) Construction Supervision Plan

In accordance with the grant aid scheme of GOJ, the consultant is to form a project team to ensure smooth implementation of the Project based on the Preparatory Survey Report. The policies for supervision of construction works and equipment works are as stated below.

- To keep close contacts with the officials in charge of the Project of both governments to ensure completion of construction of the facilities and procurement of the equipment without delay
- To give prompt and proper instructions and advices with justice to the construction contractor, the equipment supplier and other concerned parties.
- To give proper instructions and advices on operation and maintenance of the facilities and the equipment after handover, to confirm the completion of construction works and equipment works in compliance with contents of the contracts, to witness handover of the facilities and the equipment, and to conclude the consulting services by obtaining the consent of ICH.

(2) Supervision Organization

In view of the diversity of construction work elements of this Project, the consultant is to dispatch a qualified architect as a stationed representative to the project site throughout the construction period and to send the following architects and engineers to the project site as may be necessary.

- Chief Consultant : Overall supervision, instruction of schedule and quality management
- Architectural Design : Presentation of the coordination drawing, check of design intent, shop drawings and material specifications
- Structural Design : Check of bearing capacity of ground and materials
- Mechanical Design : Presentation of the coordination drawing, midterm and final inspection of pluming works and air conditioning works
- Electrical Design : Presentation of the coordination drawing, midterm and final inspection of electrical works
- Equipment Planning : Instruction of equipment installation, coordination with construction works, witness of numerical examination, check of operation training, operation and maintenance manuals, etc.

(3) Supervision Plan of Equipment Installation

- Installation, trial run and quantity inspection of the equipment and instruction of equipment operation
- Preparation of the parts of main equipment which are subject to trouble and handover the list to Health and Family Welfare Department of Tamil Nadu

2-2-4-5 Quality Control Plan

The quality control plan of the main construction works is as follows:

Table 2-17 Quality Control Plan

Work Type	Control Parameter	Test Method	Quality Standards	Frequency of Measurement	Analysis of Results
Earth work	Slope angle	Gauge, visual observation	Specifications	As needed	Photos, documents
	Bedding accuracy	Level, visual observation	〃	〃	〃
	Foundation work height	Level, visual observation	〃	〃	〃
	Thickness of replaced soil	Level, visual observation	〃	〃	〃
Reinforcement steel	Reinforcement cover thickness	Visual observation, measurement	Specifications	As needed	Photos, documents
	Processing accuracy	Visual observation, measurement	〃	〃	〃
	Tensile strength test	Check with Mill Sheet	〃	〃	Mill test certificate
Concrete work (mixing plant)	Compressive strength	Attending at test site	Specifications	3 or more test pieces for each placing and per 50m^3	Test result report
	Slump value	Attending at work site	〃	For each placing	Photos, documents
	Chloride content	Test pieces, attending at work site	〃	〃	〃
	Air content	Attending at work site	〃	〃	〃
	Concrete temperature	Attending at work site	〃	〃	〃
	Performance accuracy	Measurement	〃	After form removal	〃
Masonry	Compressive strength of concrete blocks	Attending at test site after selection of manufacturer	Specifications	Once before shipment from factory	Test result report
Plastering	Materials, storage methods, work	Same as left	Specifications	As needed	Photos, documents
Painting	methods, mixing,	〃	〃	〃	〃
Waterproofing	coating thickness,	〃	〃	〃	〃
Doors & windows	curing, work accuracy	〃	〃	〃	〃
Water supply & drainage	Water supply pipes	Water pressure test	Specifications	On completion of pipe laying, for each system	Test result report
	Drainage pipes	Water filling test	〃	〃	〃
	Fittings	Performance test	〃	〃	〃
Electrical work	Cables	Insulation test	Specifications	On completion of pipe laying, for each system	Test result report
	Electric appliances	Performance test	〃	〃	〃

2-2-4-6 Procurement Plan

(1) Building Materials Procurement Plan

- Building Frame Works

Local materials can be procured for reinforcement steel, concrete materials and formworks, etc. Bricks and concrete blocks for partition walls can be procured locally.

- Interior and Exterior Works

Interior and exterior materials can be procured in the local markets easily, including imported products, such as aluminum sashes, wood, tiles, paint and glasses, etc.

- Air-conditioning and Sanitary Works

Air conditioning equipment, exhaust fans, pumps and sanitary wares, etc. can be procured in the local markets, including imported products.

- Electrical Works

Lighting fixtures, panels, cables/wires, conduit/pipes, telephone equipment, fire alarms and generators, etc. can be procured locally, though their types are limited. Import from Japan or third countries will be studied if necessary.

- Elevator Works

Local procurement is available including imported materials.

- Medical Gas

Local procurement is available including imported materials.

Table 2-18 Procurement Plan of Major Construction Materials

Architectural Work

Item	Procurement Plan			Remarks
	Local	Japan	Third Country	
Temporary Work				
Scaffold	○			Can be prepared by local construction contractor
Temporary Fence	○			Steel plate painted zinc is popular
Temporary Office	○			To rent a house in the neighborhood
Concrete Work				
Portland Cement	○			Can be procured locally
Sand	○			Can be procured locally
Gravel	○			Can be procured locally
Reinforcing bar	○			Can be procured locally
Veneer Form	○			Can be procured locally
Concrete Block Work				
Concrete Block	○			Can be procured locally
Brick	○			Can be procured locally
Tile Work				
Ceramic Tile	○			Many types, including imports, can be procured locally
Wood Work				
Timber	○			Can be procured locally
Stone Work				
Marble	○			Many types can be procured locally at cheap price.
Granite	○			Can be procured locally
Doors & Windows Work				
Aluminum Door/Window	○			Can be procured locally
Steel Door	○			Can be procured locally
Stainless Steel Door	○	△	△	May be procured in Japan or third countries depending on quality
Wooden Door	○		△	May be procured in Japan depending on quality
Hardware (Lock / Pull Tab)	○			Can be procured locally
Glazing				
Glass	○			Can be procured locally
Lead Glass	○			Can be procured locally
Sealant				
Polysulfide Sealant	○			Can be procured locally
Silicon Sealant	○			Can be procured locally

Waterproofing				
Asphalt waterproofing	○			Can be procured locally
Finishes				
T Bar / Mineral Acoustic Ceiling Board	○			Can be procured locally
Calcium Silicate Baseboard	○			Can be procured locally
Rock wool	○			Can be procured locally
Glasswool	○			Can be procured locally
Painting				
Paint	○			Can be procured locally
Furniture				
Counter	○			Can be procured locally
Signs				
Interior signs	○			Can be procured locally
Exterior stainless steel sings	○		△	May be procured in Japan depending on quality
Outdoor Facility				
Grating	○		△	May be procured in Japan or third countries depending on quality

Mechanical/Electrical Works

Item	Procurement Plan			Remarks
	Local	Japan	Third Country	
Air Conditioning Works				
Air Conditioning				
Packaged	○			Can be procured locally
Wall Mounted	○			
Exhaust Fan	○			Can be procured locally
Ceiling Fan	○			Can be procured locally
Plumbing Works				
FRP Water Tank	○			Can be procured locally
Pump	○			Can be procured locally
Pipe	○			Can be procured locally
Sanitary Ware	○			Can be procured locally
Solar Water Boiler	○			Can be procured locally
Water Purifier	○			Import can be procured locally
Electrical Works				
Distribution Panel	○			Can be procured locally
Switch / Outlet	○			Can be procured locally
Wire / Cable	○			Can be procured locally
Conduit Pipe	○			Local product (PVC, etc.) can be used
Lighting Fixtures	○			Can be procured locally
Fire Detector	○			Can be procured locally
Telephone System	○			Can be procured locally
Television Antenna	○			Can be procured locally
Condenser Lightning Arrester	○			Can be procured locally
Special Works				
Elevator	○			Can be procured locally
Medical Gas	○			Can be procured locally
Emergency Generator	○			Can use local product.

(2) Equipment Procurement Plan

Equipment is to be procured from Japan, India and third countries (USA and EU countries) in consideration of the sales records to public medical facilities, stock amount of parts and consumables, and availability of trained technical service engineers of the local agents in Chennai. In principal, clinical laboratory equipment to be procured under this Project should be used for open type reagents procured from the State Government of Tamil Nadu through the bulk procurement method.

The Government of Tamil Nadu in principal requires three years warranty for sophisticated medical equipment. In addition, the state government also requires the equipment to be used for 10 years, by engagement of annual maintenance contract with local agent for seven years after the expiration of three years warranty period.

Though the warranty period under Japan's Grant Aid is in principal one year, the state government rule should be appreciated by prolonging the warranty period for three years. Maintenance contract fee between ICH and the local agent should be secured by the Health and Family Welfare Department of Tamil Nadu, including costs of spare parts and consumables.

2-2-4-7 Operation Guidance Plan

Equipment operation training is divided into three groups, for image diagnostic equipment, for laboratory equipment and for other equipment.

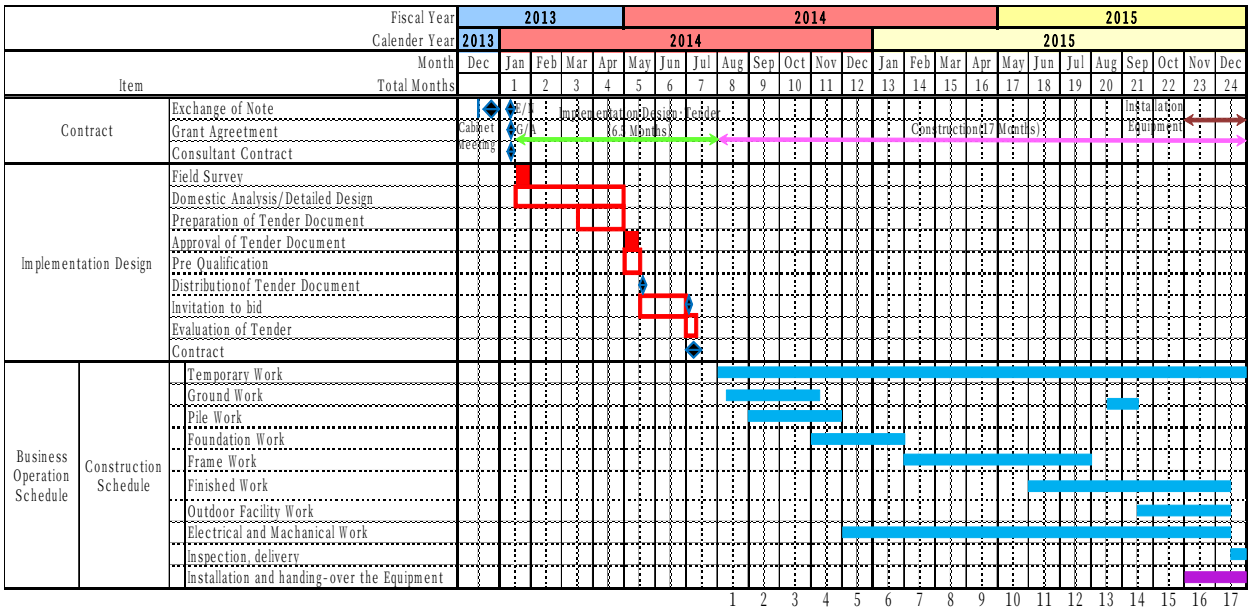
Table 2-19 Initiated Operational and Management Instruction

Trainer	Description	Contents of Instruction	Necessary Days
Engineer/technician of local agents	Digital X-ray unit, Mobile X-ray unit, Ultrasound scanner, echo portable, EEG, EMG, Hemodialysis machine, Paediatric laparoscope set, Bronchoscope with video, Gastro scope with video, Colonoscopy	Operational method Usage of application Daily check method	7 days
Local agent equipment engineer/technician of laboratory	Fully automated chemistry analyzer, Automated blood culture system, Automated blood cell counter, Automated blood coagulation machine, Refrigerated centrifuge, Illuminate hormone analyzer, Tandem mass spectrometer for metabolic syndrome, Electro phoresis apparatus	Operational method Daily check method	10 days
Local agent equipment engineer/technician	Other medical equipment (Patient monitor, Defibrillator, Suction machine, Infant warmer, etc.)	Operational method Daily check method	16 days

2-2-4-8 Implementation Schedule

The implementation schedule is as shown in table 2-20. After signing of the contract and its verification by JICA, the construction contractor and the equipment supplier will commence their works. It is expected that 17 months will be necessary for construction works and equipment procurement & installation works in consideration of the construction work volume and local construction conditions. This assumption of implementation period is based on the premise that the Indian side will promptly take necessary measures and carry out the works under their responsibility.

Table 2-20 Project Implementation Schedule



2-3 Obligations of the Recipient Country

2-3-1 Formalities

- To provide the Project site
- To coordinate and adjust with IOG; e.g. hospital operations
- To coordinate and adjust with PWD; e.g. acquisition of building permit, preparation of the site like excavation and leveling, etc.
- To bear commissions, namely advising commissions of A/P and payment commissions to the Bank of India for the banking services based on B/A,
- To perform procedures for various application and registration required for building permit,
- To obtain relevant permissions, licenses and other authorization on infrastructure systems as may be necessary for this implementation of the Project,
- To bear all costs related to internal taxes relevant to the procurement and/or contract in India, as necessary,
- To ensure prompt unloading and customs clearance, to take responsibility for the payment of customs duties, and to assist inland transportation of equipment and materials imported from Japan and/or other countries based on the verified contracts,
- To exempt Japanese nationals engaged in the implementation of the Project from customs duties, internal taxes and other fiscal levies which may be imposed in India,
- To accord Japanese nationals engaged in the implementation of the Project with such facilities for their entry into India and stay therein,
- To secure the budget required for effective use and maintenance of the facilities constructed and equipment procured in the Project, and
- To bear all the expenses, other than those borne by Japan's Grant Aid, necessary for the implementation of the Project.

2-3-2 Obligations Borne by the Indian Side

(1) Related to Construction

1) Demolishing of existing buildings and relocation of boiler

There are various structures existing in the project site such as the old cancer ward, doctor's mess, boiler room, surgical store, tank room, storage, sheds and toilets. Pipes and pits of plumbing and electrical systems also remain there. ICH should take necessary measures to apply for demolishing, disposing and removal of the buildings and foundations, which should be completed before the commencement of construction works of the Project. The boiler will be used continuously for the existing buildings, so it is necessary to take measures such as to construct a new boiler room in the ICH campus and move the boiler there before the commencement of construction works of the Project.

In the case that any other remaining structures are found after the commencement of construction work of the Project, the Indian side should take necessary procedures for

demolishing, disposal and removal so that they may not obstruct the project construction schedule.

2) Cutting trees at the project site

There are many trees at the project site. ICH needs to complete all the necessary measures such as applying for getting permission to cut, dispose and remove the trees and roots before the commencement of construction works of the Project.

3) Demolition and removal of concrete pavement at the project site and existing fences, etc.

ICH should demolish and remove concrete pavement, fences and their foundations, and should clear and level the site ground.

4) Infrastructure to the boundary line of the project site

ICH should supply infrastructure systems like wiring and piping for electricity, telephone, city water, and sewerage up to the boundary line of the project site.

5) Construction of fences and gate, and plantation

The Health and Family Welfare Department of Tamil Nadu should construct fences around the project site promptly after the completion of construction works by the Japanese side, and should do planting in the site ground after completion of the Project.

6) Procurement of necessary furniture and fixtures

ICH needs to procure general furniture and fixtures that will not be borne by the Project.

(2) Related to Equipment

Measures taken by the Indian side related with the installation of planned equipment in the existing buildings are as follows:

1) Equipment should be installed in the air conditioned environment in the existing buildings. There is no equipment that will require considerable air conditioning load.

2) Medical equipment and furniture such as examination table, examination desk and chair which are necessary for operation of the New OPD Building should be newly procured by the Indian side or relocated from the existing buildings.

2-4 Project Operation Plan

2-4-1 Operation Plan

Total 614 persons currently work at ICH, consisting of one director and superintendent, one deputy superintendent, 32 professors, 40 assistant professors, 205 nurses, 176 paramedical staffs, 151 administrative staff, and eight other staffs.

Currently, in order to serve the outpatients and inpatients, outpatient diagnosis hours and inpatient monitoring hours are scheduled in different hours, and there have been no major problems in terms of personnel organization. Currently 12 radiologists work at ICH while the allocated posts are 16. In order to use provisional portable and stationary X-ray units under this Project, the number of radiologists needs to increase by the year 2016 for taking X-ray pictures at the New OPD Building in three shifts. It will be also necessary to arrange sufficient number of drivers to enable a three-shift system to provide round the clock service of the vehicle for patient transportation to be procured in the Project.

2-4-2 Maintenance System

(1) Facilities

PWD is in charge of operations and maintenance of all the buildings of the Government of Tamil Nadu. Regular maintenance of ICH is done by a maintenance engineer stationed at the branch office of PWD. Similar to the other buildings of ICH, PWD will be in charge of maintenance of the New OPD Building after completion of the Project.

(2) Medical Equipment

1) Equipment maintenance system

The Government of Tamil Nadu has established the regulations on the procurement of medical equipment that the equipment requires advanced technical maintenance should be provided with at least three years of warranty/guarantee period at the time of procurement for effective maintenance. After this warranty/guarantee period is expired, it is necessary to engage (i) a comprehensive maintenance contract with the local agent of manufacturer for sophisticated equipment by the responsibility of DME for seven years, and (ii) an annual maintenance contract with the local agent of manufacturer for equipment to be maintained by the responsibility of the hospital for seven years.

Therefore, the equipment to be procured under this Project should be such that can be maintained by the local agent of manufacturer through the engagement of maintenance contract, and that its specifications and procurement source should be applicable level to the agent.

In respect of the State Government Procurement Rule, the warranty/guarantee period should be prolonged from one year to three years for the equipment to be newly procured including image diagnostic equipment. Thus, continuous maintenance will be possible in compliance with the government policy.

Table 2-21 Medical Equipment subject to three-year Warranty

Type	Description	Reason
Image Diagnostic Equipment	Mobile X-ray unit Digital X-ray unit	Sophisticated maintenance is required.
Clinical Laboratory Equipment - category 1	Refrigerated centrifuge Full automated chemistry analyzer	Sophisticated maintenance is required.
Clinical Laboratory Equipment - category 2	Automated blood culture system , Blood coagulation apparatus fully automated, Illuminate hormone analyzer, Tandem mass spectrometer for metabolic syndrome, Electro phoresis apparatus	Newly procured medical equipment
Others	Paediatric laparoscope set, Bronchoscope with video, Gastroscope with video, Colonoscope, Hemodialysis machine, EEG, EMG	Sophisticated maintenance is required.

Among the equipment to be procured under this Project, it is necessary to consider annual running cost such as reactive reagents used for clinical laboratory equipment. Currently, some reagents for a certain type of equipment take time for procurement, because the State Government procures open reagents only. Newly procured equipment in principal could use open type reagents so that operation should not have major problems. However, some types of the equipment for clinical tests require closed type reagents. In that case, reagents and consumables such as medical disposables need to be procured by donation, family members or newly requesting to the State Government in order to use the equipment continuously. Most of the equipment to be procured under this Project is for replacement, and newly procured equipment does not require huge running cost. Costs for reagents and consumables for the supplementation and newly procured equipment planned in the Project are estimated approximately 4.07 million JPY (approx. 2.120 million Rs) as shown in table 2-22, which is about 8.9% of the 2012/2013 budget for medicine and consumables of ICH (23.720 million Rs).

Table 2-22 Reagents and Consumables for Supplementation and Newly Procured Equipment

No.	Type	Description	Reagents and consumables	Cost estimation evidence	Number of cases
2	Supplementation	Patient monitor	Approx.180 thousand JPY	ECG electrode, saturation probe, ECG cable, SpO2 electrode, Invasive blood pressure transducer, recording paper etc.	70-80 patients including emergency patients
7	Supplementation	Ventilator (for infant)	Approx.280 thousand JPY	Patient circuit, humidifier, filter, O2 battery, temp. sensor	10-15 patients/day who need ventilation management among the above 70-80 emergency patients
8	Supplementation	Ultrasound scanner, echo	Approx.280 thousand JPY	Gel and recording paper	Approx. 2 million/year
9	Supplementation	Portable ECG	Approx.180 thousand JPY	Gel recording paper disposable electrode	Approx.5,000 to 6,000 cases/year
26	Supplementation	EMG	Approx.230 thousand JPY	Electrode, Paste, Skin electrode gel, plate electrode set	Approx. 2-3 cases/day

27	Supplementation	EEG	Approx.100 thousand JY	Electrode, paste, skin electrode gel etc.	Approx. 3 cases /day
35	Newly procured	Automated blood culture system	Approx.380 thousand JPY	Culture reagents one set	200-300 cases/day (among 50 emergency cases/day)
42	Newly procured	Tandem mass spectrometer for metabolic syndrome	Approx.100 thousand JPY	Reagents one set	5-10 patients/week
44	Newly procured	UV spectrophotometer	Approx.130 thousand JPY	Reagents one set	Newborn patients (fetus hemoglobin information)
48	Newly procured	Urine Analyzer	Approx.810 thousand JY	Urine strap one set	30-50 tests/day
53	Newly procured	Digital X-ray unit	Approx.1,400 thousand JPY	Film and cleaning roller, air filter, pump, filter, lamp unit	Approx. 40 thousand cases/year
Total		Approx. 4,070 thousand JPY			

2) Equipment maintenance management plan

In order to use the equipment effectively, it is important to keep daily washing and cleaning after use, and to conduct periodical check by the manufacturers or its agents. In addition, appropriate operation according to the operation manual is most important to avoid unexpected usage. Thus, the operational guidance training together with the instructions on how to conduct daily check should be held before handing over of the equipment.

Table 2-23 Summary of Periodical Check of the Equipment

Type of equipment	Description	Frequency of periodical check
Image diagnostics equipment	Digital X-ray unit	Every six months and annual
	Ultrasound scanner, echo portable	Annual
	Mobile X-ray unit	Annual
Clinical laboratory equipment	Fully automated chemistry analyzer	Annual
	Automated blood culture system	Annual
	Blood coagulation apparatus fully automated	Annual
	Illuminate hormone analyzer	Annual
	Tandem mass spectrometer for metabolic syndrome	Annual
	Electro phoresis apparatus	Annual
Others	Hemodialysis machine	Annual

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The detailed initial costs to be borne by the Indian side according to the division of works are estimated based on the calculation conditions as specified in (2), when the Project is implemented through the Japan's Grant Aid. This cost estimation is provisional.

(1) Costs to be borne by the Indian side

18,783,221 Rs (Approximately 36.1 million JPY)

Estimated Project Cost to be borne by the Indian Side

Item	Cost Estimate (Rs)	Yen conversion
(1) Building construction costs		
Demolition of existing structures (including foundations) and clearing of the project site	3,957,000	7,597,000
Application fee for Demolition	150,000	288,000
Demolition of existing paving and clearing of the project site	1,150,000	2,208,000
Demolition and removal of existing sewerage pipes and pits	535,000	1,027,000
Application fee to CMDA for approval of plan for the New OPD	4,850,000	9,312,000
Construction of fences around the project site	267,000	513,000
Planting in the project site	374,000	718,000
Connection of infrastructure systems		
Connection of electric power line	132,000	253,000
Connection of telephone piping	5,000	9,600
Connection of city water piping	1,200,000	2,304,000
Connection of sewerage piping	300,000	576,000
(2) Maintenance costs		
Procurement of general furniture and fixtures	1,872,000	3,594,000
(3) Costs for formalities		
A/P advising commission, bank commission	1,925,000	3,696,000
Subtotal	16,717,000	32,095,600
Tax (12.36%)	2,066,221	3,967,016
Total	18,783,221	36,062,616

(2) Calculation Conditions

1) Time of Estimation : as of May 2013
2) Conversion Rate : 1.00 US$ = 96.32 JPY
: 1.00 Rs = 1.92 JPY
: 1.00 = 126.63 JPY

3) Construction and Equipment Work Period: period for detailed design, construction works and equipment works as shown in the Project Implementation Schedule.

4) Other Conditions : project cost estimation intended to be in compliance with the Grant Aid scheme of the Government of Japan.

: price increase not to be considered in the project cost estimation.

2-5-2 Operation and Maintenance Costs

(1) Estimated Operation and Maintenance Costs

The following table shows the operation and maintenance costs estimated for the entire hospital after completion of the Project. Price increase is not considered in the estimation of the operation and maintenance costs.

Table 2-24 Record in the Past Three Years and Expected ICH Budget (in thousand Rs)

Item	2010/2011	2011/2012	2012/2013	After completion of the Project (2016/2017)
(1) Operation Cost				
1. Personnel Expenses	155,181	160,180	160,180	162,006
2. Medical Care Activities				
- Transportation, Library	884	840	998	1,072
- Medicine/Consumables/Meals	10,284	17,422	23,720	27,596
3. Utility/Communication	10,264	8,635	10,916	15,485
(2) Maintenance Cost				
1. Maintenance (Facilities)	7,000	5,900	5,500	6,937
2. Maintenance (Equipment)	14,000	14,000	14,000	14,000
3. Equipment Purchase	4,500	4,500	5,300	4,767
(3) Others				
1. Office Supplies	315	293	270	293
2. Miscellaneous (including linens)	402	376	386	388
Total	202,830	212,146	221,270	232,544

ICH budget in the fiscal year 2016/2017 when the New OPD Building starts operation after the completion of the Project is expected 232,544 thousand Rs which is about 5.1% increase from the budget 221,270 thousand Rs in the year 2012/2013. This amount, being divided into an annual rate between 2013 and 2016, is within the affordable range if the budget increases by about 1.5% annually. In fact, the annual ICH budget has been increased by over 1.5% in the past years. In the M/D at the Explanation Mission of the Outline Design, the Indian side agreed to allocate all necessary budgets for the Project which includes maintenance cost.

(2) Basis for Calculation

1) Personnel cost

With the strengthening of outpatient and emergency services through the Project, the number of hospital staff is assumed to increase from 614 persons in the year 2012/2013 (74 doctors + 205 nurses + 176 paramedical staff + 151 administrative staff + 8 other staff) to 621 persons (at least 4 radiologists and 3 drivers will be needed for the operation of the New OPD Building.)

Expected personnel cost is calculated based on the personnel costs in the fiscal year 2012/2013 taking into account of the staff increase.

160,180,000 × 621 / 614 = 162,006,156 Rs

2) Medical care activities cost

As the outpatient clinical activities are improved, costs are expected to increase for medicine, consumables and meals, and for transportation of staffs and goods relevant to the activities, etc. The medical care activities cost is calculated in consideration of the increase rate of the number of outpatients based on the budget in the fiscal year 2012/2013 (increase rate between 675,590 outpatients as of 2008 and 727,597 outpatients as of 2009).

- Transportation and library

  998,000 × 725,597 / 675,590 = 1,071,871 Rs

- Medicine, consumables and meals

  23,720,000 × 725,597 / 675,590 = 25,475,748 Rs

In addition, 2,119,792 Rs as shown in the following table will be necessary as the costs for medicine and consumables for operation of the equipment planned in the Project.

Table 2-25 Medicine and Consumables Cost for Supplementation and Newly Procured Equipment

Description	Cost（JPY）
Patient Monitor	180,000
Ventilator (for infant)	280,000
Ultrasound Scanner, echo portable	280,000
Portable ECG machine	180,000
EMG	230,000
EEG	100,000
Automated Blood Culture System	380,000
Tandem Mass Spectrophotometer for metabolic syndrome	100,000
UV Spectrophotometer	130,000
Urine Analyzer	810,000
Digital X-ray Unit	1,400,000
Total	4,070,000

(2,119,792 Rs)

Therefore, total cost for medicine, consumables and meals after completion of the Project is calculated as follows:

25,475,748 + 2,119,792 = 27,595,540 Rs

(3) Utility and Communication Cost

Utility and communication cost after the completion of the Project is estimated as sum of the utility and communication cost for the New OPD Building and that for the existing facilities. The utility and communication cost for the existing facilities after completion of the Project is estimated as much as the present utility and communication cost (2012/2013).

Table 2-26 Utility and Communication Cost

Item	Cost (Rs)
1) Electricity	1,084,049
2) Fuel for Emergency Generator	2,486,680
3) Communication	113,259
4) City Water	851,127
5) Medical Gas	1,011,240
Subtotal (New OPD Building)	5,546,355
6) Existing facilities (Average of past 3 years)	9,938,333
Total (New + Existing)	15,484,688

1) Electricity charge

- Assumed consumption of electricity

  Week day: 300kVA×0.4 (avg. demand rate)×0.8 (p/f[1])×5 hours × 25 days = 12,000kWh/month

  Weekend: 300kVA×0.1 (avg. demand rate)×0.8 (p/f) × 5hours × 5 days = 600kWh/month

- Assumed electricity charge

  Base rate: 300kVA ×100 Rs/kVA/month × 12months = 360,000 Rs/year (a)

  Metered rate: 12,600kWh/month × 4.0 Rs/kWh × 12 months = 604,800 Rs/year (b)

  (a)+ (b) (964,800) +Tax12.36% = 1,084,049 Rs/year

2) Fuel cost for emergency generator

- Emergency generator: 250kVA (fuel consumption 30L/h) × 1 machine

  Power failure is expected 2 hours in the daytime and 2 hours in the night.

- Assumed fuel cost for emergency generator

  Daytime: 30 L/h × 2hours × 30days × 12months × 51.23 Rs/L = 1,106,568 Rs/year (a)

  Night: 30 L/h × 2hours × 30days × 12months × 51.23 Rs/L = 1,106,568 Rs/year (b)

  (a) + (b) (2,213,136) +Tax12.36% = 2,486,680 Rs/year

3) Communication cost

(3a) Telephone charge (2 new lines)

- Assumed interconnection charge and call charge

  Interconnection charge: 500 Rs/month・line

  500 Rs/month・line × 2 lines × 12 months = 12,000 Rs/year

  Assumed number of outside calls per subscriber: 20 times/day

  Length of call: 5 minutes/time

  20 times/day × 5 minutes/time × 30 days = 3,000 minutes/month・line

  Basic call charge: 0.4 Rs/minute

  0.4 Rs/minute × 3,000 minutes/month・line × 2 lines × 12 months = 28,800 Rs/year

[1] p/f: power factor (i.e. conversion rate from kVA to kWh)

Interconnection charge + call charge

12,000 Rs/year+28,800 Rs/year = 40,800 Rs/year (a)

(3b) Internet charge (1 new line)

- Assumed internet charge (medium speed)

5,000 Rs/month (6MB)

5,000Rs/month・line × 1 line × 12 months = 60,000 Rs/year (b)

(a) + (b) (100,800) + Tax12.36% = 113,259 Rs/year

4) City water charge

- Assumed consumption of city water

0.03 m^3/day・total floor areas (excluding parking space), use rate as 0.7

0.03 × 4,800 × 0.7 = 101 m^3/day

- Assumed city water charge

101 m^3/day × 25 days × 12 months × 25 Rs/m^3 = 757,500 Rs/year

757,500 Rs/year + Tax12.36% = 851,127 Rs/year

5) Medical gas charge

- Assumed consumption of oxygen 5 cylinders/day × 30 days = 150 cylinders/month
- Assumed medical gas charge

150 cylinders/month × 500 Rs/cylinder × 12 months = 900,000 Rs/year

900,000 Rs/year + Tax12.36% = 1,011,240 Rs/year

6) Expenses for the existing facilities

Average expenses in the past three years:

(10,264,000 Rs + 8,635,000 Rs + 10,916,000 Rs) / 3 = 9,938,333 Rs

(4) Maintenance Cost (Facilities / Equipment)

1) Facilities maintenance cost: 6,936,979 Rs

- Building repair cost

Though the building repair cost varies year by year, the average cost for 10 years after completion of the Project is assumed to be 0.1% of the direct construction cost.

900,000 JPY (Approx. 468,750 Rs)

- Cost for utility repairs

The utility repair cost will be small for the first five years after completion of the Project. Then, exchange of parts or renewal of the system will increase. The average cost of utility repairs for 10 years is assumed approximately 0.2% of the direct cost for utility systems works.

355,000 JPY (184,896 Rs)

- Maintenance cost of elevator system

  The annual maintenance cost on the contract with the distributer of the manufacturer is expected as follows:

  150,000 Rs/year

- Maintenance cost of the existing facilities

  Average expenses in the past three years:

  (7,000,000 Rs + 5,900,000 Rs + 5,500,000 Rs) / 3 = 6,133,333 Rs

2) Equipment maintenance cost:

Since the equipment to be provided in the Project is covered with one-year or three-year warranty period, equipment maintenance costs including the maintenance contract costs will not increase in the first fiscal year after the completion of the Project (2016-2017), except the consumables necessary for the operation of the equipment. Table 2-27 shows maintenance costs from the second year after the handing over of facilities and equipment. The equipment maintenance costs after the expiration of the warranty period will be under the responsibility of the Indian side, and the assumed increase of equipment maintenance cost is shown in the following table.

Table 2-27 Increase of the Equipment Maintenance Cost from the 2nd Year after the Project

(in thousand Rs)

Fiscal Year	Equipment Maintenance Cost Increase	Percentage in the 2012/2013 Budget for Equipment Maintenance
2016/2017	0	—
2017/2018	73	0.52%
2018/2019	73	0.52%
2019/2010	2,476	17.69%

Although the increase may seem a large percentage of the equipment maintenance cost, it shares only about 1% of the total ICH budget as shown below. Thus, it can be said within the affordable range.

Year	Equipment Maintenance Cost Increase	Percentage in the 2012/2013 ICH Budget
2017	73	Less than 1%
2019	2,476	Approx. 1%

- Equipment in the existing facilities

  Equipment maintenance cost in the fiscal year 2012/2013 is 14,000,000 Rs.

- Maintenance cost in the fiscal year 2016/2017

  All the medical equipment to be newly procured in the Project is covered with the maintenance contract warranty, and no additional maintenance costs are needed. Thus, the annual maintenance cost is expected to be 14,000,000 Rs, the same as the previous

year.

- Maintenance cost in the fiscal years 2017/2018 and 2018/2019

  Additional annual maintenance cost 140,000 JPY (72,916 Rs) is expected for the following equipment after the one-year warranty period expires.

Table 2-28 Annual Maintenance Cost of Small Medical Equipment

Item	Annual Maintenance Cost (JPY)
Ventilator (for infant)	50,000
Transport incubator	20,000
Electrolyte analyzer	30,000
UV spectrophotometer	10,000
Semi-automated chemistry analyzer	10,000
Automated blood cell counter	10,000
Transport vehicle	10,000
Total	140,000
	(72,916 Rs)

Consequently, the medical equipment maintenance cost in the fiscal year 2017/2018 is estimated as follows:

14,000,000 + 72,916 = 14,072,916 Rs

- Maintenance cost in the year 2019/2020 and thereafter

  The above-mentioned annual maintenance cost will be continuously necessary in and after 2019/2020. In addition, the annual maintenance contract cost for the following major medical equipment is expected to be 4.614 million JPY (2,403,152 Rs) after the three-year warranty period expires.

Table 2-29 Annual Maintenance Cost of Major Equipment

Item	Annual Maintenance Cost (JPY)
Digital X-ray unit	1,500,000
Mobile X-ray unit	1,150,000
Ultrasound scanner, echo portable	300,000
Paediatric laparoscope set	220,000
Bronchoscope with video	75,000
Gastroscope with video	95,000
Colonoscope	74,000
EMG, EEG	100,000
Automated blood culture system	80,000
Fully automated chemistry analyzer	130,000
Blood coagulation apparatus fully automated	130,000
Refrigerated centrifuge	30,000
Hemodialysis machine	40,000
Illuminate hormone analyzer	250,000
Tandem mass spectrometer for metabolic syndrome	410,000
Electro phoresis apparatus	30,000
Total	4,614,000
	(2,403,125 Rs)

Consequently, the medical equipment maintenance cost in and after the fiscal year 2019/2020 is estimated as follows:

14,000,000 + 72,916 + 2,403,125 = 16,476,041 Rs

3) Equipment procurement cost

The equipment procurement costs for the past three years have been 4,500,000 Rs in the year 2010/2011, 4,500,000 Rs in 2011/2012, and 5,300,000 Rs in 2012/2013. The average equipment procurement cost for the past three years is 4,766,667 Rs (9,152,000 JPY). This average cost is assumed as the expected annual equipment procurement cost after the completion of the Project.

(4,500,000 + 4,500,000 + 5,300,000) / 3 = 4,766,667 Rs

(5) Others

1) Office Supplies

The procurement costs of office supplies for the past three years have been 315,000 Rs in the year 2010/2011, 293,000 Rs in 2011/2012, and 270,000 Rs in 2012/2013. The average procurement cost for the past three years is 292,667 Rs. This average cost is assumed as the expected annual procurement cost of office supplies after the completion of the Project.

(315,000 + 293,000 + 270,000) / 3 = 292,667 Rs

2) Miscellaneous expenses (including linens)

Similarly, the miscellaneous expenses for the past three years have been 402,000 Rs in the year 2010/2011, 376,000 Rs in 2011/2012, and 386,000 Rs in 2012/2013. The average procurement cost for the past three years is 388,000 Rs. This average cost is assumed as the expected annual miscellaneous expenses after the completion of the Project.

(402,000 + 376,000 + 386,000) / 3 = 388,000 Rs

CHAPTER 3 PROJECT EVALUATION

Chapter 3 Project Evaluation

3-1 Preconditions

GOI and the State Government of Tamil Nadu need to conduct the issues mentioned below to achieve satisfactory implementation of the Project.

- To demolish and remove the existing building including foundations, embedded tanks, embedded pipes, remaining fences and gates, pavement, etc. and level/clear the project site prior to tender of construction works of the Project
- To apply and obtain the building permit from CMDA prior to the commencement of construction works of the Project
- To cut, dispose and remove the trees and roots in the project site prior to the commencement of construction works of the Project
- To relocate the existing sewerage lines in the project site prior to the commencement of construction works of the Project
- To apply connection of infrastructure systems and bear the costs by the completion of the Project
- To promptly carry out the related formalities necessary for the implementation of the Project

3-2 Necessary Inputs by the Recipient Country

(1) Issues the Government of India needs to implement

1) Allocation of budget necessary for the operation and maintenance of the New OPD Building

The increase of annual operation and maintenance costs for the equipment to be procured in the Project is estimated to be 4.596 million Rs, which is the sum of 2.476 million Rs for the increased equipment annual maintenance contract cost and 2.120 million Rs for the increased amount of the medicine and consumables cost. Though the increase of equipment maintenance cost accounts for only about 2% of the total ICH budget (221.270 million Rs) in 2012/2013, the Department of Health and Family Welfare of Tamil Nadu should allocate necessary budget for operation and maintenance cost, especially maintenance cost for medical equipment, because most of the patients do not need to pay user fee being from economically weaker section and ICH is the top referral public hospital for pediatric care.

2) Maintenance contract for the medical equipment

It is required to engage maintenance contract for image diagnostics equipment and laboratory equipment to be procured in the Project. Either the comprehensive maintenance contract or the annual maintenance contract should be engaged with local agents depending on the frequency of defects and replacement of parts in order to minimize downtime of the equipment.

3) Appropriate operation and maintenance of facilities and equipment after the completion of the Project

a) Facility maintenance

PWD is in charge of operations and maintenance of all the buildings of the Government of Tamil Nadu, and will be in charge of maintenance of the New OPD Building after completion of the Project. Proper maintenance is significant to keep good conditions and to extend the lifespan of building. ICH should ensure sufficient maintenance budget for PWD to conduct regular maintenance of the facilities.

b) Equipment maintenance

It is required to conduct daily and periodic check by the hospital maintenance engineers or outside engineers (local agents) based on the requirements of the equipment operational manual.

4) Allocation of necessary medical staff to provide medical service at the New OPD Building

The Project plans to provide X-ray units in the New OPD Building so that the outpatients need not move to the Main Building for X-ray examination. Currently ICH has 12 radiologists. Four additional radiologists are scheduled to be posted by DME before the expected completion of the Project in 2016. Therefore, the operation of X-ray units and diagnosis will be conducted well in the New OPD Building. Budget for these additional personnel costs are assured by the Department of Health and Family Welfare of Tamil Nadu. Additionally, during the field surveys, the Indian side agreed to allocate all necessary budget and staff for the Project which includes cost and personnel for car usage for transportation of patients.

(2) Coordination with Projects by the Federal Government of India and International Donors

There are other programs for improving health standards in Tamil Nadu, which are led by the World Bank and the Federal Government of India. These projects mainly emphasize on the improvement of facilities, capacity development of medical workers and provision of basic medical equipment of primary and secondary levels. Through the coordination with these cooperation programs, this Project will be able to contribute to further improvement of the pediatric healthcare and referral system in Tamil Nadu.

3-3 Important Assumptions

Important assumptions to maximize impact of the Project and ensure its sustainability are as follows:

(1) Health policies of GOI as well as the Government of Tamil Nadu are continued.

Currently, GOI implements health policies to strengthen the health systems through the improvement of referral systems, public healthcare facilities of the primary and secondary levels, and capacity development of medical workers. In order to achieve the Project goal and sustainability, the direction of such healthcare policies should not be largely changed.

(2) Appropriate budget is secured by GOI and the Government of Tamil Nadu for health sector.

Currently, the Government of Tamil Nadu provides medical services free of charge at public health facilities for the people whose annual income are less than 12,000 Rs, excluding some fees such as for X-ray examination. Therefore, in order for the public hospitals to continue appropriate operation, it is critical to secure proper budget allocation from the both, central and state Governments. For the achievement of the Project's sustainability, budget necessary for hospital operation should be secured continuously.

3-4 Project Evaluation

3-4-1 Relevance

Despite the achievement of high economic growth, the Human Development Index (HDI) of India is marked at 136th among 186 countries (2012, UNDP), which shows that India still faces challenges. Health indices have shown significant improvement: the IMR decreased from 64/1,000 live births in the year 2000 to 47 in 2011, and the U5MR decreased from 87/1,000 live births to 61 (UNICEF). However, considerable effort is required to reduce IMR and U5MR respectively for the achievement of MDGs by 2015. In order to improve health status of children in India, there is a need to strengthen pediatric care in India which is still fragile as the quality of pediatric care services provided in each state within the public health system varies significantly. Also, for the national government to consider the effective input to each state to reduce the disparities of health indicators among the states, a state with an established pediatric referral system is expected to serve as a model state for improvement of pediatric care.

Tamil Nadu has the second best pediatric health indicators in India. This success owes to a distinguished initiatives and support system such as health policies and programs concerning the improvement of primary and secondary health facilities. Currently, the primary and secondary health facilities as well as the referral system have been improved with the assistance of these policies and programs. Meanwhile, many other states have not established a comprehensive pediatric health system. These situations indicate that Tamil Nadu has the potential to be a model state of public pediatric care system because of its strong commitment and the current health status if there is quality tertiary medical care. The Project can contribute to enhancement of the medical service and educational function of ICH as the top referral hospital, and the pediatric referral system so that Tamil Nadu would be a model state for pediatric services Therefore, the validity of the Project is high.

Also, the validity of the implementation of the Project will be high in terms of the followings:

(1) Beneficiaries of the Project

ICH has been providing free specialized medical services of tertiary level especially to the poor people in Tamil Nadu and neighboring states which other public health facilities are not able to provide. Therefore, the beneficiaries of the Project are expected to be children up to the age 12 in Tamil Nadu which comprises of 72 million people in the state and in the neighboring

southern states (Andhra Pradesh, Karnataka, and Kerala) 178 million people in total[1].

(2) Human Security

India still has low HDI, being ranked 136th among 186 countries (UNDP, 2011). Many 37.2% of the total population in India still live below the poverty line (US$ 1.25 per day)(2004)[2]. There is a considerable disparity between the rich and poor in terms of the accessibility to basic social services, especially in large cities like Chennai. It is necessary to narrow this disparity to achieve social and economic development, and the 12th Five Year Plan (2012-2017) features NUHM for the improvement of accessibility to medical services in urban areas. Being the public hospital, ICH provides medical services for free to poor population. In this regard, the Project will contribute to the human security by improving the medical services of ICH through the provision of facilities and medical equipment.

(3) Accomplishment of the Objectives of the Medium to Long-term Development Plan

In the 12th Five Year Plan, health and medical care is one of the major thrusts to work on. The "Vision 2023" issued by the Government of Tamil Nadu also aims to improve the health indicators by reinforcement of tertiary level health facilities. For example, India works to reduce IMR to 28 in the country and 18 in Tamil Nadu. ICH, as a top referral pediatric hospital in Tamil Nadu and in southern India, also serves as the top level medical educational institute. The Project will enable strengthening of pediatric referral system as well as improvement of healthcare facilities and medical educational environment, which will contribute to achieve the goals of the development plans and health programs of India and the state.

(4) Appropriateness of the Project to Japan's assistant policy

Currently 99% of the inpatients in ICH are poor, and ICH provides medical services to them for free. In this regard, the Project can contribute to "human security" and MDGs such as reducing IMR and U5MR. For these reasons, the Project is appropriate with Japan's cooperation policy.

3-4-2 Effectiveness

(1) Quantitative Effects

For post-evaluation of the Project after three years of its completion, ultrasonographic examination and X-ray examination are set as index, and base values which are calculated from the data in the past three years and the expected figures in 2019 are in table 3-1. As the number of X-ray examinations taken in 2010 was not available, the average of the years 2011 and 2012 is set as the base value. The actual value of ultrasonographic examination indicates significant increase in the year 2012, although the reasons are not clear. Therefore, the average of 2011 and 2012 that seems to be more reasonable to measure the effects is used as the base value. Meanwhile, reference target values of both indices that are estimated based on the value in 2012

[1] source: Calculated from the data in 'Planning of Commission, Government of India, 2011'
[2] source: Planning of Commission, Government of India, 2011

are also shown in table 3-1.

Table 3-1 Quantitative Index

Index	Actual Value (2010)	Actual Value (2011)	Actual Value (2012)	Base Value (Average of 2011 and 2012)	Target Value (2019) (3 years after project completion)	Reference Target Value (2019) (3 years after project completion)
Ultrasonographic examination	14,164 cases	16,495 cases	20,961 cases	18,728 cases	20,600 cases	23,057 cases
OPD X-ray examination (No. of pictures taken)	--	37,825 cases	36,351 cases	37,088 cases	40,800 cases	39,986 cases

The target figures of quantitative indicators are settled according to the following assumptions:

Ultrasonographic examination
Currently ICH owns one USG in the Main Building and average 65 patients take ultrasonographic examinations per day. In general, the ultrasonographic examination needs 4 minutes per person, so it is estimated to be able to examine 60 patients within the OPD examination hours (4 hours from 8 a.m. to noon). This shows that the existent USG in the Main Building operates almost fully. Compared with the number of patients at pediatric medicine a day (550 on average), though the actual number of patients who really need to be examined is difficult to estimate, it can be assumed that the number of patients who need to take ultrasonographic examination excludes the current capacity of ultrasonographic examination. With the improvement of examination capacity and the convenience for the patients with an additional USG at the New OPD Building to be provided by the Project, the number of ultrasonographic examinations is expected to increase by 10%, and the target value in 2019 will be 20,600 and the reference target value will be 23,057.
OPD X-ray examination
Judging from the past average number of patients, 120 X-ray examinations (5% of the total 2,500 outpatients) are carried out for outpatients a day. On the other hand, in consideration of the number of annual treatments in ICH, the number of outpatients who need X-ray examination, like those of tuberculosis, pneumonia and fracture, is assumed to be more than the present number of the testing. With the improvement of the convenience for the outpatients through the provision of mobile X-ray unit and an X-ray examination room in the New OPD Building, more number of outpatients will take X-ray examinations, who currently return home without X-ray examination. Therefore, the target value in 2019 will be 40,800 and the reference target value will be 39,986.

In the Project, the emergency room is to be placed on the ground floor of the New OPD Building and equipped with medical equipment to improve emergency medical services. In particular, the improvement of the “in-hospital mortality within 48 hours” and the “mortality of sepsis” is expected. On the other hand, these mortality rates may be also greatly influenced by the factors such as the skills of the medical workers and the severity of transported patients.

Therefore, it is not possible to set the target value as the index, but by measuring the both

mortality continuously as the monitoring index, they will be helpful for the evaluation of the emergency medical services. The following table shows statistic data in the past years relating to these two indices.

Table 3-2 Monitoring Index

Index	2010*	2011*	2012**	Average
In-hospital mortality within 48 hours	52.6%	69.5%	--	61.1%
Mortality from sepsis	27.7%	40.8%	10.0%	26.2%

Source: * ICH statistic book
** Result of hearing during the draft report explanation mission in September 2013

The monitoring indices are settled according to the following assumptions

In-hospital mortality within 48 hours
When an emergency patient is transported to ICH, the patient is given first aid in the emergency room and is moved to NICU or PICU in 6 to 12 hours when his/her condition becomes stable. The existing emergency room is situated 10 meters far from the drop-off by the ambulance across the steps and long corridor where many people walk on the way. The new emergency room at the New OPD Building is located to ensure direct accessibility by the ambulance cars to the emergency room that is designed to have large space and new medical equipment like ventilators. With this provision, emergency patients can be treated with quality measures in a short time, which is expected to improve the life-saving rate.
Mortality from sepsis
According to the statistics of 2008 2011, the mortality of sepsis of newborn babies has always been in a high rank of causes of death. Sepsis is often caused by infectious disease of various infectious bacteria at the early stage of medical treatment. It is essential to ensure clean and sanitary environment for consultation and treatment of patients in order to prevent sepsis. With the opening of the New OPD Building, the medical environment will be improved and the mortality of sepsis is expected to decrease. One reason for high mortality from sepsis is the delay of life-saving measures to be initiated for emergency patients under serious conditions. Through the implementation of the Project, time to start treatment can be shortened, which is expected to improve the mortality rate from sepsis.

(2) Qualitative Effects

The output of the implementation of the Project through the improvement of functions of the News OPD Building is as follows:

1. Patient satisfaction will improve through shortening of patient movement and reduction of waiting time related with outpatient diagnosis.
2. Motivation of medical personnel working at ICH will improve through the improvement of facilities and equipment.
3. Educational environment for medical activities OJT and conference within ICH, and level of satisfaction with it will improve through having educational rooms and shortening of movement of medical personnel including medical students.

APPENDICES

Appendix 1　Member List of the Survey Team

1-1　Field Survey 1 (February 10 – March 12, 2013)

	Name	Position	Organization
1	Dr. Mitsuo Isono, MD, PhD	Leader	JICA Senior Advisor (health sector)
2	Ms. Aya Kagota	Project Coordinator	Health Division 4, Health Group 2, Human Development Department, JICA
3	Mr. Keiichi Ide	Chief Consultant / Architectural Planner	Yokogawa Architects & Engineers, Inc.
4	Mr. Shoichi Tashiro	Deputy Chief Consultant / Architectural Designer	Yokogawa Architects & Engineers, Inc.
5	Mr. Koki Masumi	Utility Designer	Yamashita Sekkei Inc.
6	Ms. Yasuko Asanuma	Equipment Planner	Binko International Ltd.
7	Mr. Hiroaki Mochizuki	Construction / Cost Planner	Yamashita Sekkei Inc.
8	Ms. Kazue Nishiki	Equipment Procurement Planner / Cost Planner	Binko International Ltd.
9	Ms. Mari Shimizu	Medical & Health Planner	Binko International Ltd.
10	Mr. Koichi Nakamura	Architectural Designer (voluntary)	Yokogawa Architects & Engineers, Inc.

1-2 Field Survey 2 (April 8 – April 14, 2013)

	Name	Position	Organization
1	Mr. Shoichi Tashiro	Deputy Chief Consultant / Architectural Designer	Yokogawa Architects & Engineers, Inc.

1-3 Field Survey 3 (May 15 – May 17, 2013)

	Name	Position	Organization
1	Dr. Mitsuo Isono, MD, PhD	Leader	JICA Senior Advisor (health sector)

1-4 Draft Report Explanation Mission (September 1 – September 7, 2013)

	Name	Position	Organization
1	Dr. Mitsuo Isono, MD, PhD	Leader	JICA Senior Advisor (health sector)
2	Ms. Aya Kagota	Project Coordinator	Health Division 4, Health Group 2, Human Development Department, JICA
3	Mr. Keiichi Ide	Chief Consultant / Architectural Planner	Yokogawa Architects & Engineers, Inc.
6	Mr. Waichi Aoki	Equipment Planner	Binko International Ltd.

Appendix 2　Survey Schedule

2-1　Field Survey 1 (February 10 – March 12, 2013)

No.	Date	Day	Official Members (a) Leader	Official Members (b) Project Coordinator	1) Chief Consultant / Architectural Planner	2) Deputy Chief Consultant / Architectural Designer	3) Utility Designer	4) Equipment Planner	5) Construction Planner / Cost Planner	6) Equipment Procurement Planner / Equipment Cost Planner	7) Medical and Health Planner	8) Architectural Designer (voluntary member)
			Dr. Mitsuo Isono	Ms. Aya Kagota	Mr. Keiichi Ide	Mr. Shoichi Tashiro	Mr. Koki Masumi	Ms. Yasuko Asanuma	Mr. Hiroaki Mochizuki	Ms. Kazue Nishiki	Ms. Mari Shimizu	Mr. Koichi Nakamura
Survey days			6	8	22	31	22	31	31	22	28	31
1	2/10	Sun				Narita 11:10 --> Singapore --> Chennai 22:00		Narita 11:10 --> Singapore --> Chennai 22:00			Narita 11:10 --> Singapore --> Chennai 22:00	Narita 11:10 --> Singapore --> Chennai 22:00
2	2/11	Mon				Joining Officer of JICA India Office, Courtesy call to ICH, Presentation of Inception Report, Survey of ICH campus, Courtesy call to MMC		Accompanying 2)			Accompanying 2)	Accompanying 2)
3	2/12	Tue				Meeting with ICH, Survey of existing buildings and candidate site, Meeting with PWD		Survey of equipment in the New Ward Bldg., & Cardiothoracic Surgery Bldg. of ICH	Accompanying 2)		Accompanying 4)	Accompanying 2)
4	2/13	Wed				Survey of the candidate project site, meeting with PWD		Survey of clinical services of ICH (existing OPD)	Accompanying 2) Meeting with PWD		Accompanying 4)	Accompanying 2)
5	2/14	Thr				Meeting with ICH, Meeting with MMC and survey of affiliated hospitals		Accompanying 2)	Survey of local A & E consultant, Survey of construction company		Accompanying 4)	Accompanying 5) Survey at Building Dept.
6	2/15	Fri				Meeting with ICH, Courtesy call to Special Secretary of Health and Family Welfare Department, Tamil Nadu		Accompanying 2)	Survey of local A & E consultant, Survey of construction company		Accompanying 2)	Accompanying 2)
7	2/16	Sat			Narita 11:10 --> Singapore --> Chennai 22:00	Data filing, Making Progress Report	Narita 11:10 --> Singapore --> Chennai 22:00	Data filing, Making Progress Report		Narita 11:10 --> Singapore --> Chennai 22:00	Data filing, Making Progress Report	Accompanying 2)
8	2/17	Sun	Team meeting / Data filing									Team meeting / Data filing
9	2/18	Mon			Courtesy call to ICH and PWD	Meeting with ICH, PWD, CMDA	Accompanying 1)	Survey of existing ICH equipment	Accompanying 1) Meeting with PWD, Meeting with CMDA	Accompanying 4)	Survey at Health and Family Welfare Dept. (Finance, statistics)	Accompanying 5)
10	2/19	Tue			Visit to CMDA, Survey of the candidate site	Meeting with ICH, Survey of existing ICH buildings	Accompanying 1, Survey of existing ICH buildings	Survey of existing ICH equipment	Meeting with CMDA Survey of construction company for cost estimation	Survey of ICH Accompanying 4)	Survey of projects by other donors (TNHSP by WB, NRHM)	Accompanying 5) Survey of existing ICH buildings, Making draft DWG
11	2/20	Wed			Meeting with ICH	Meeting with PWD, Survey of existing ICH buildings	Survey of infrastructures in existing facilities Survey of utility work company	Survey of existing ICH equipment	Survey of construction situations Survey of construction company for cost estimation	Accompanying 4)	Survey of ICH medical services	Peripheral survey of ICH Visiting PWD
12	2/21	Thr	--> Chennai	--> Chennai	Survey of ICH existing buildings	Meeting with PWD, Meeting with ICH	Survey of infrastructures in surrounding areas Survey of utility work company	Meeting with ICH clinical department on equipment planning	Survey of construction situations Survey of construction company for cost estimation	Survey of existing equipment of ICH, requested equipment, and medical services	Visiting UNICEF	Peripheral survey of ICH Visiting PWD
			Courtesy call to ICH and meeting									
13	2/22	Fri	Observation of ICH campus and meeting (Team meeting)			Meeting with ICH, PWD, CMDA	Survey of infrastructures in surrounding areas Survey of utility work company	Meeting with ICH clinical department on equipment planning	Survey of construction situations Survey of construction company for cost estimation	Survey of existing equipment of ICH, requested equipment, and medical services		Accompanying 2)
14	2/23	Sat	Data filing		Survey at private hospital construction site		Accompanying 1)		Accompanying 1)			Survey of existing ICH buildings
								Data filing, Making Progress Report				
15	2/24	Sun	Team Meeting / Data filing									Team meeting
16	2/25	Mon	General meeting with ICH HODs (facility and equipment components) Team meeting				Meeting with CMDA Survey of mechanical gas company Survey of utility work company	Accompanying 1)	Meeting with CMDA Survey of construction company for cost estimation	Accompanying 4)	Survey of ICH medical services	Accompanying 1)
17	2/26	Tue	Courtesy call to Special Secretary of Health and Family Welfare Department of the Government of Tamil Nadu and meeting, Meeting with CMDA, Team meeting			Meeting with ICH	Accompanying 2) , Meeting with CMDA Survey of utility system consultant and utility work company	Accompanying 1)	Accompanying 2) Survey of construction company for cost estimation	Survey of existing equipment of ICH, requested equipment, and medical services	Referral system survey	Accompanying 5) Survey at Building Dept.
18	2/27	Wed	Signing of Minutes of Discussions (Health Dept., ICH)			Meeting with ICH, Meeting with PWD	Meeting with Fire Department, Survey of utility system consultant and utility work company	Discussion of equipment spec based on the equipment list attached to M/D (grade)	Accompanying 3) Survey of construction company for cost estimation	Survey of ICH (procurement, operation and maintenance of medical equipment)	Survey of ICH medical services	Accompanying 3) Making DWG for cost estimation
19	2/28	Thr	Chennai 7:05--> Delhi 9:35 Discussion on Minutes of Discussions (Min. of Health and Family Welfare, Ministry of Finance)			Meeting with ICH	Survey of Chennai Metropolitan Water Supply and Sewerage Board, Survey of utility work company	Discussion of equipment spec based on the equipment list attached to M/D (grade)	Accompanying 3) Survey of construction company for cost estimation	Accompanying 4)	Survey of other hospitals (tertiary) and IOG	Accompanying 2) , Meeting with ICH
20	3/1	Fri	Signing on M/D, meeting with Health Secretary Chennai -->			Meeting with the local consultants (survey of natural conditions)	Survey of utility system consultant and utility work company	Discussion of equipment spec based on the equipment list attached to M/D (grade)	Accompanying 3) Survey of construction company for cost estimation	Survey of other hospitals (tertiary)	Survey of other hospitals (tertiary) Survey at Dept. of Medical Services, Chennai Corporation	Accompanying 1) , Meeting Health Secretary
21	3/2	Sat		--> Narita 7:10	Team meeting / Data filing	Meeting with ICH (survey of natural conditions), Survey of existing OPD Building	Survey of construction company for cost estimation	Discussion of equipment spec	Survey of construction company for cost estimation	Accompanying 4)	Survey of public primary / secondary level hospitals	Survey of existing ICH buildings
22	3/3	Sun			Chennai --> Delhi	Data filing						Data filing
23	3/4	Mon			Report to JICA and Ministry of Health, Meeting with local health consultant, Report to Japanese Embassy	Meeting with ICH, Survey of existing OPD Building, Meeting with PWD, Meeting with ICH Director and Superintendent in charge	Survey of utility system consultant and utility work company	Discussion of equipment spec based on the equipment list attached to M/D (grade)	Survey of construction company for cost estimation	Survey of secondary public hospital Receiving quotation data, Discussion with equipment supplier (at ICH)	Survey of public primary / secondary level hospitals	Meeting with Director and Superintendent of ICH
24	3/5	Tue			Delhi --> Chennai	Meeting with ICH Director and Superintendent in charge, Meeting with ICH	Survey of utility system consultant and utility work company	Discussion of equipment spec based on the equipment list attached to M/D (grade)	Survey of construction company for cost estimation	Receiving quotation data, Discussion with equipment supplier (at ICH) Survey of transport company	Survey of Health and Family Welfare Dept.	Survey of existing ICH buildings
25	3/6	Wed			Meeting with PWD, Meeting with ICH	Meeting with ICH Director and Superintendent in charge, Meeting with ICH	Making draft utility plan	Making draft equipment plan	Making draft construction plan	Accompanying 4)	Visiting MED, Survey of private hospitals	Survey of existing ICH buildings
26	3/7	Thr			Meeting with ICH executives, Meeting with PWD, Meeting with local consultant	Meeting with ICH, Meeting with local consultants	Making draft utility plan	Making draft equipment plan	Making draft construction plan	Accompanying 4)	Supplementary survey of ICH medical services, Survey of EMR on emergency service system	Survey of existing ICH buildings
27	3/8	Fri			Meeting with ICH (Technical Note), Meeting with PWD, Chennai 23:15 -->	Meeting with PWD, Meeting with ICH	Market research for utility cost estimation Chennai 23:15 -->	Joint meeting with Health Dept. and ICH (equipment)	Receiving quotation data	Accompanying 4) Chennai 23:15 -->	Supplementary survey of ICH medical services, Survey of Mental Hospital in MMC, Chennai 23:15 →	Survey of existing ICH buildings
28	3/9	Sat			Singapore --> Narita 17:05	Meeting with PWD, Survey of existing buildings	Singapore --> Narita17:05	Meeting with ICH Receiving quotation data, Discussion with equipment supplier (at ICH)	Market research relevant to construction materials/products	Singapore --> Narita17:05	Singapore --> Narita17:05	Accompanying 2)
29	3/10	Sun				Data filing		Data filing				Data filing
30	3/11	Mon				Survey of ICH buildings and meeting Signing Technical Note Chennai 23:15 -->		Supplementary survey Chennai 23:15 -->	Receiving quotation data Chennai 23:15 →			Accompanying 2) Chennai 23:15 -->
31	3/12	Tue				Singapore --> Narita 17:05		Singapore --> Narita17:05				Singapore --> Narita 17:05

2-2 Field Survey 2 (April 8 – April 14,2013)

No.	Date	Day	Mr. Shoichi Tashiro, Deputy Chief Consultant/Architectural Designer
Survey days			6
1	4/8	Mon	Narita → Singapore → Chennai
2	4/9	Tue	Prior observation of site boundary line Meeting with ICH, JICA India Office and local consultant on the purpose and subjects of Field Survey 2 Explanation of the site boundary line, and discussions
3	4/10	Wed	Meeting with ICH, PWD and local consultant on the site boundary line Discussions with ICH and local consultant on room layout and floor planning
4	4/11	Thr	Observation of the topographic survey, Meeting with the local consultant on facility design Making floor plans
5	4/12	Fri	Discussions with ICH and local consultant on room layout and floor planning, Discussions with ICH on Technical Note and making draft Technical Note
6	4/13	Sat	Discussions with ICH on Technical Note and Signing Technical Note Meetiing with local consultant on room layout floor planning and legal matters Chennai →
7	4/14	Sun	→ Singapore → Narita

2-3 Field Survey 3 (May 15 – May 17, 2013)

No.	Date	Day	Dr. Mitsuo Isono, MD, PhD, Leader
Survey days			3
1	5/15	Wed	Arrival in Chennai Meeting with Director and Superintendent and staff of ICH
2	5/16	Thr	Data filing and report making Meeting with Director and Superintendent and staff of ICH
3	5/17	Fri	Signing on Technical Note Meeting with Acting Secretary of Health and Family Welfare Department Chennai → Dubai → Kabul

2-4 Draft Report Explanation Mission (September 1 – September 7, 2013)

<table>
<tr><td rowspan="3">No.</td><td rowspan="3">Date</td><td rowspan="3">Day</td><td colspan="2">Official Members</td><td colspan="2">Consultants</td></tr>
<tr><td>1) Leader</td><td>2) Project Coordinator</td><td>3) Chief Consultant / Architectural Planner</td><td>4) Equipment Planner</td></tr>
<tr><td>Dr. Mitsuo Isono</td><td>Ms. Aya Kagota</td><td>Mr. Keiichi Ide</td><td>Mr. Waichi Aoki</td></tr>
<tr><td colspan="3">Survey days</td><td>7</td><td>7</td><td>8</td><td>8</td></tr>
<tr><td>1</td><td>9/1</td><td>Sun</td><td>→ Chennai</td><td colspan="3">Narita → Chennai</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">9/2</td><td rowspan="2">Mon</td><td colspan="4">Team meeting
Courtesy call to ICH and Meeting (Explanation of draft report)</td></tr>
<tr><td colspan="2">Discussion with the local consultant</td><td>Meeting with HODs on details of equipments</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">9/3</td><td rowspan="2">Tue</td><td colspan="4">Courtesy call to Health and Family Welfare Department, Government of Tamil Nadu (Explanation of draft report, discussion on MD)</td></tr>
<tr><td colspan="3">Meeting with ICH onMinutes of Discussions (M/D)</td><td>Meeting with HODs on details of equipments</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">9/4</td><td rowspan="2">Wed</td><td colspan="3">Signing of M/D</td><td>Meeting with HODs on details of equipments</td></tr>
<tr><td colspan="4">Reporting to Consulate General
Chennai → Delhi</td></tr>
<tr><td>5</td><td>9/5</td><td>Thu</td><td colspan="4">Courtesy call to MOHFW and MOF (Explanation of Report, M/D)</td></tr>
<tr><td>6</td><td>9/6</td><td>Fri</td><td>Delhi →</td><td colspan="3">Report to JICA India and EOJ
Delhi →</td></tr>
<tr><td>7</td><td>9/7</td><td>Sat</td><td></td><td colspan="3">→ Singapore → Narita</td></tr>
</table>

Appendix 3 List of Parties Concerned in the Recipient Country

Name	Title, Position
Ministry of Finance, Federal Government of India	
Ms. Petal Dhillon	Deputy Secretary
Health &Family Welfare Department, Government of Tamil Nadu	
Dr. J Radhakrishnani, I.A.S	Health Secretary
Health &Family Welfare Department, Government of Tamil Nadu	
Dr. J. Radhakrishnani, I. A. S	Health Secretary
Dr. P. Senthilkumar	Special secretary
Institute of Child Health and Hospital for Children, Chennai (ICH)	
Dr. M. Kannaki	Director and Superintendent
Dr. P. S. Murali Dharan	Deputy Superintendent
Dr. Subbulaksumi	RMO in charge
Dr. Kumudha	Professor, HOD of Neonatology
Dr. Annamalai Vijayaragm	Professor of Paediatric Medicine
Dr. Shridharan	Professor of Paediatric Medicine
Dr. D. huwasinea	Professor of Paediatric Medicine
Dr. S. Sundani	Professor of Paediatric Medicine
Dr. Sundari	General Paediatrician, Professor of Paed. Medicine unit 2
Dr. Karmath	Paediatrician, Associate Professor of Paed. Medicine unit 2
Dr. Ragunathan	Assistant RMO
Dr. Ramesh Kumar	Administrator in charge
Dr. Leematauline	Professor, HOD of Neurology
Dr. Padmaraj	Professor, HOD of Nephrology
Dr. Padmaraj	Professor of Paediatric Nephrology
Dr. S.Gnanasamhandam	HOD of Cardiology
Dr. A. Vijaya Lasemi	Professor of Cardiology
Dr. D. Gunasingh	HOD of Nutrition
Dr. Sarath Balaja	HOD of Pulmonology
Dr. T. Chtra	HOD of Pathology
Dr. N. Devasena	HOD of Microbiology
Dr. Kasinathan	HOD of Cardiothoracic surgery
Dr.Nirmala	HOD of Gastroenterology
Dr. Mohammad Sajjid	MOD of Newborn Emergency Centre
Dr. Thilagavathi	HOD of Haematology
Dr. S.V. Senthilnathan	HOD of Paediatric Surgery
Dr. Mohan	Professor of Paediatric Surgery
Dr. Mathavan	Professor of Paediatric Surgery
Dr. Hawris	Assistant Professor of Paediatric Surgery
Dr. Sirnivasan	Register of ICH
Dr. Anhalagam	Assistant Professor of ENT
Ms. Suma	Speech therapist, ENT
Dr. K. Porselii	Health Visitor of ORT/Gastroenterology
Dr. U. G. Thirumaran	Professor of Paed. Anaesthesiology, Dept. of Cardiothoracic Thoracic
Dr. Amnthanalh	Professor of Biochemistry
Dr. Poonguzhali Gopotath	Assistant Professor of Biochemistry

Dr. Parimala	Assistant Professor of Biochemistry
Dr. Pasupathy	MD, Orthopaedics
Dr. Kasi Vsalakshi	Radiologist Associate Professor
Ms. A. M. Jayamth	Senior physiotherapist
Mr. V. Ganesan	Dental Technician
Dr. S. Rajasekaran	Professor of ENT
Dr. R. Subalaksmi	HOD of Blood Bank
Dr. Subalakshma	MD Transfusion Medicine (Blood Bank)
Dr. Rema	Child Development Clinic
Dr. A. Roselen	Child Guidance Clinic
Dr. E. Suresh	ART Centre
Dr. Narayansamy	Pharmacist
Dr. Tmurali	Emergency
Dr. Indhumathi	Emergency
Dr. R. Lalta	Yoga
Dr. C. Clitra	Ayurveda
Dr. N. Raja	Palliative Care
Dr. D. Anwadla	Genetics
Dr. Pamshh	UNICEF Regional Collaboration Centre
Ms.M. Padma	Senior Nurse grade II
Ms.G. Mamjuria	Senior Nurse grade II
Dr. Karthink Raj	Postgraduate Student: ORT/Gastroenterology

Public Works Department (at ICH)

Arch. N. Usha	Senior Architect
Eng. R. Ravi	Assistant Executive Engineer
Eng. M. L. Loganathan	Assistant Executive Engineer
Eng. K. S. Chendhil Kamalakaran	Assistant Engineer
Eng. Chendhil Kamalakaran	Assistant Engineer
Eng. K. Ethiraj	Engineer
Eng. C. Azhagarsamy	Assistant Engineer

Medical Education Department

Dr. C. Vamsadara	Director
Dr. Rukmangathan	Deputy Director
Dr. Geetha	Deputy Director

Madras Medical College

Dr. V. Kannagasabai	Dean
Dr. R. Nandini	Deputy Principal
Dr. Venita Kurshamanti	Director, HOD of Radiology
Dr. Thasnwem	Professor of Microbiology
Dr. Sudha Venkatesh	Professor of Pathology
Dr. K.Manoharan	Professor, HOD of Dermatology
Dr. Manjura	Assistant Professor
Dr. A. Muraleedjaraah	Professor, HOD of ENT
Dr. Mageshma	Professor of Neurosurgery
Dr. M. Marayatham	Biochemist

Public Works Department (PWD Head Office)

Arch. Rambabu	Architect
Arch. Lakshmi Narayanan	Architect
Eng. S. Inmozhi	Assistant Executive Engineer

Chennai Metropolitan Development Authority (CMDA)

Mr. R. Venketesan, I. A. S.	Member Secretary
Mr. Sivashanmugam	Chief Planner
Ms. S. Chitra	Chief Planner
Dr. Rajasekara Pandian	Chief Planner/Multi - Storied Building
Ms. N. Usha	Senior Planner

Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB)

Mr. A. Abdul Rasheed	Technical Officer
Eng. R. D. Icrishnan	Area Engineer
Eng. Ramasamy	Area Engineer
Eng. Maheswari	Assistant Engineer

Tamil Nadu Fire and Rescue Service Department

Mr. S. Vijayasekar	Deputy Director

EKAM Foundation

Dr. Sailaksmi	Director

Department of Medical Service

Dr. Satyabrata Sahoo	Director of NRHM
Dr. M. Kamatchi	Expert Advisor

UNICEF

Dr. Vandana Bhatia	Health and HIV Specialist

Tamil Nadu Medical Services Corporation Limited

Mr. Balamurugan	Manager (purchase) Drugs & Medicines
Mr. Ramaswamy	Assistant Executive Engineer

Kilpauk Medical College and Hospital (KMC Hospital)

Dr. R. Narayama Babu	Professor of Paediatric Medicine
Dr. B. Sathyamurthi	Professor of Paediatric Medicine

Corporation of Chennai

Dr. C. N. Mahesvaran, I, A. S.	Deputy Commissioner (Health)
Dr. Hemalatha	Deputy Project Coordinator
Dr. Nachiar	District Family Welfare Medical Officer

Institute of Obstetrics/Gynaecology and Government Hospital for Women and Children (IOG)

Dr. Sasireka	HOD of Newborn Department
Dr. Revathy	Superintendent

Emergency Obstetric Care Centre

Dr. Poonkolteu	Paediatrician

Stanley Hospital

Dr. Elilarasi	Professor of Paediatric Medicine

Vadapalani Health Post

Dr. Dhanalakshmi	Medical Doctor

Urban Primary Health Centre

Dr. Subulaksmi	Medical Doctor

Gandhi Kasturba Hospital

Dr. Dilshath	Superintendent
Dr. Jagadeeswari	HOD of Paediatric Department

Kanchi Kamakoti Child Trust Hospital

Dr. Sandia N.	Public Relations
Dr. Andal	Director

Apollo Children's Hospital

Dr. Roshankurikose	Managing Trainee

Emergency Management and Research Institute (EMRI)

Dr. Sridhar B. N.	Regional Chief Operating Officer

Embassy of Japan

Mr. Toshihiro Yamakoshi	Counsellor, Economic Section
Mr. Yasuhiro Sensho	First Secretary

Consulate-General of Japan

Ms. Kayoko Furukawa	Consul

JICA India Office

Mr. Shinya Ejima	Chief Representative
Mr. Taisuke Watanabe	Senior Representative
Ms. Ayuko Takahashi	Programme Specialist
Mr. Aditi Puri	Senior Development Specialist

Appendix 4 Minutes of Discussions (M/D)

Minutes of Discussions

Preparatory Survey on the Project for

Improvement of the Institute of Child Health and Hospital for Children,

Chennai, India

In response to a request from the Government of India, the Government of Japan decided to conduct a Preparatory Survey on the Project for Improvement of the Institute of Child Health and Hospital for Children, Chennai, India (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to India the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Dr. Mitsuo Isono, Senior Advisor, JICA, and is scheduled to stay in the country from February 10 to March 11, 2013.

The Team held discussions with the officials concerned of the Governments of India and Tamil Nadu, collected basic information and conducted a field survey at the study area.

In the course of discussions and field survey, each of the parties confirmed the main items described in the attached sheets.

March 1, 2013

Dr. Mitsuo Isono
Leader

Preparatory Survey Team
Japan International Cooperation Agency

Dr. M. Kannaki,
Director and Superintendent I/C,
Institute of Child Health and Hospital for Children, Chennai
Tamil Nadu
India

Dr. J. Radhakrishnan
Secretary to Government,
Health and Family Welfare Department,
Government of Tamil Nadu, Chennai,
India

Mr. Amal Pusp
Director, International Health

Ministry of Health and Family Welfare
Government of India

Mr. Abhay Kumar Saran (Confirmed by)
Under Secretary, Japan Desk
Department of Economic Affairs
Ministry of Finance
Government of India

ATTACHMENT

1. Objective of the Project

The objective of the Project is to strengthen the pediatric care services in the Institute of Child Health and Hospital for Children, Chennai by constructing a new OPD building and procuring equipment as a top referral hospital of Tamil Nadu State.

2. Project site

2-1. The site of the Project is Egmore, Chennai, Tamil Nadu.

2-2. The Japanese side and the Indian side agreed on the construction site given in Annex1.

2-3 Upon discussion on the Project site, the Team raised the issue of necessary approval from Chennai Metropolitan Development Authority for construction. The Government of Tamil Nadu confirmed its responsibility to acquire the approval.

2-4. The Government of Tamil Nadu side - Since this grant for the particular facility by JICA fits within the expansion plan of Institute of Child Health and Hospital for Children, Chennai, the Secretary to Government, Health and Family Welfare Department, Government of ~~India,~~ Tamil Nadu gave in principle an agreement to earmark the land for the proposed facility, in anticipation of the JICA grant and also agreed to issue a letter to the Institute of Child Health and Hospital for Children, for the same, by March 10, 2013.

3. Responsible and Implementing Agency

3-1. The Responsible Agency is Health and Family Welfare Department, Government of Tamil Nadu.

3-2. Implementing Agency is Institute of Child Health and Hospital for Children, Chennai.

4. Items requested by the Government of India.

After discussions on components of the new OPD building with the Team, the items described in Annex 2 and 3 were requested by the Indian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for its approval.

5. Japan's Grant Aid Scheme

5-1. The Indian side understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex 5 and 6.

5-2. The Indian side will take necessary measures, as described in Annex 7, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Survey

6-1. The consultants of the Team will proceed to conduct further survey in India until March 11, 2013.

6-2. JICA will prepare the summary of draft report in English which describes the basic design of the Project, and will dispatch a mission, in order to explain its contents in July, 2013.

6-3. In case the basic design is accepted in principle, by the Government of India, JICA will prepare the draft report.

6-4. The draft report will be submitted to the Government of Japan for the Project appraisal. Through the appraisal, the Japanese Cabinet will make a final decision for the implementation of the Project. If the Project is approved by the Japanese Cabinet, the final report (the Preparatory Survey Report) will be sent to the Government of India.

6-5. The above schedule is tentative and subject to change.

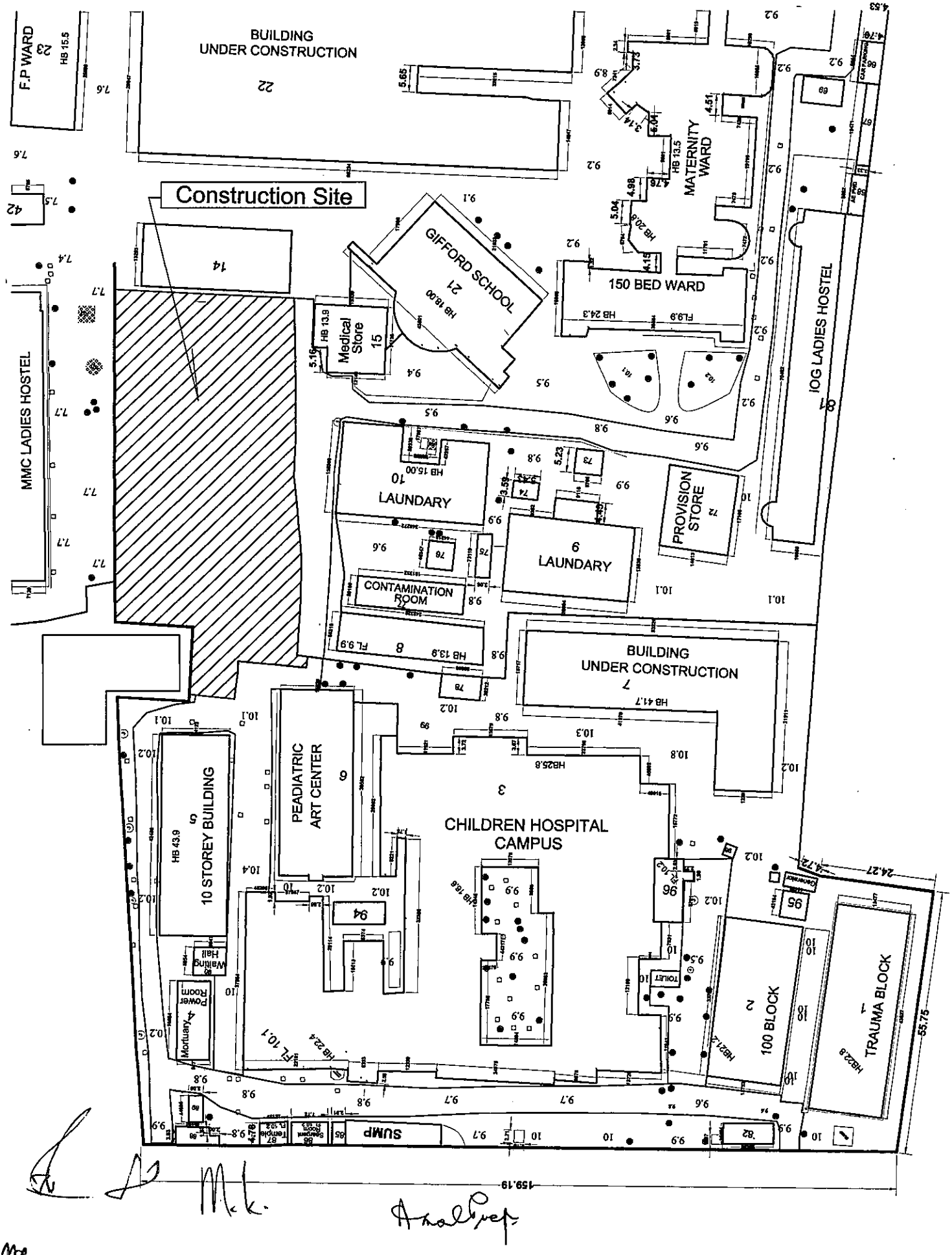
7. Other relevant issues

7-1. As a results of discussions, the Indian side agreed to the outline design of the facility provided in Annex4.

7-2. The Indian side agreed to take necessary measures for construction permit, to clear and take any debris off the construction site.

Annex 1 Construction Site
Annex 2 Equipment List
Annex 3 Components of the facility
Annex 4 Outline Design of the facility
Annex 5 Japan's Grant Aid
Annex 6 Flow Chart of Japan's Grant Aid Procedures
Annex 7 Major Undertakings by each Government

Annex1


F.P WARD
BUILDING UNDER CONSTRUCTION
Construction Site
GIFFORD SCHOOL
MATERNITY WARD
150 BED WARD
IOG LADIES HOSTEL
MMC LADIES HOSTEL
Medical Store
LAUNDARY
PROVISION STORE
CONTAMINATION ROOM
BUILDING UNDER CONSTRUCTION
PEADIATRIC ART CENTER
10 STOREY BUILDING
CHILDREN HOSPITAL CAMPUS
100 BLOCK
TRAUMA BLOCK
SUMP
159.19

Annex 2

Equipment List

Cord No.	Department	Room	Description	Q'ty Requested	Q'ty Procured	Priority
1	Emergency	Pediatrics	Infant warmer	2	2	A
2	Emergency	Pediatrics	Multi channel monitor	5	4	A
3	Emergency	Pediatrics	Syringe pump	15	4	A
4	Emergency	Pediatrics	Infusion pump	5	4	A
5	Emergency	Pediatrics	Resuscitation Trolley(Emergency Cart)	5	1	A
6	Emergency	Pediatrics	Pulse oxymeter	6	2	A
7	Emergency	Pediatrics	Ventilator(for infant)	1	1	A
8	Emergency/ECG ECO	Pediatrics	Ultrasound scanner, echo portable	1	1	A
9	Emergency	Pediatrics	ECG, portable	1	1	A
10	Emergency/Pediatric Medicine/Neonatology/Cardiol	Pediatrics	Defibrillator	4	1	A
11	Emergency/Neonatology(NICU)	Pediatrics	Mobile x-ray unit(digital)	0	1	A
12	Pediatric surgery	Emargency OT	Operation table(for pediatric)	4	2	B
13	Pediatric surgery	Emargency OT	Mobile operating light(LED)	3	2	B
14	Pediatric surgery	Emargency OT	High pressure steam sterilizer (Approx.30L)	0	1	B
15	Pediatric surgery	Emargency OT	Treatment Instrument sets	0	2	B
16	Pediatric surgery	Emargency OT	Suction machine	2	2	B
17	Pediatric surgery	Emargency OT	Pediatric laparoscope set	1	1	B
18	Pediatric surgery	Emargency OT	Blanket warmer	1	1	B
19	Anesthesiology	Emargency OT	Anesthesia machine with ventirator	10	2	B
20	Neonatology	ER	Transport incubator with ventilator	3	1	A
21	Neonatology/Biochemistry	Satelite Lab OP	Bilirubin analyzer with centrifuge	1	1	A
22	Neonatology	NICU	Infant warmer	10	5	B
23	Neonatology	NICU	Infusion pump	10	5	B
24	Neonatology	NICU	Syringe pump	10	5	B
25	Neonatology	NICU	Nerve stimulator	1	1	A
26	Neonatology	NICU	Phototherapy unit LED	5	5	A
27	Neonatology	NICU	Pulse oxymeter	10	2	B
28	Neonatology/Biochemistry/Nephrology	NICU	Blood gas analyzer	1	1	B
29	Child Development Clinic	OP	Bayley infant scale of development kit	2	1	A
30	Child Development Clinic	OP	Infantmeter (height & weight) cot type	2	1	A
31	Child Development Clinic	IP	Resuscitation bag for neonate	2	2	B
32	Pulmonology/Anesthesiology	IP	Bronchoscope with video	3	1	B+
33	ORT/Diarrhea/GE	Endoscopy room	Gastroscope with video	1	1	B+
34	ORT/Diarrhea/GE	Endoscopy room	Colonoscope with video	1	1	B+
35	ORT/Diarrhea/GE	Endoscopy room	Esophagogastroduodenoscope(with side camera)	1	1	B
36	Nephrology	IP	Hemodyalisis machine	3	1	A
37	Neurology	OP,IP	EMG machine	1	1	A
38	Neurology/Neonatology/Child Development Clinic /Child Guidance Clinic/ENT	OP,IP	EEG machine(O.A.E,BERA)	5	1	A
39	Child Guidance Clinic	OP	Psychological test(10set)	10	1	A
40	Physiotherapy	Physiotherapy	Electrical stimrator	2	1	A
41	Physiotherapy	Physiotherapy	Wax therapy	1	1	B
42	Physiotherapy	Physiotherapy	Ultrasonic therapy	2	1	A
43	Physiotherapy	Physiotherapy	Cycle for children	1	1	B
44	Physiotherapy	Physiotherapy	Balance board	1	1	A
45	Physiotherapy	Physiotherapy	CPM(continuous passive motion unit)	1	1	B
46	Physiotherapy	Physiotherapy	Peg board	1	1	A
47	Pharmacy OPD	OP	Medicine refrigerator	1	1	A
48	Pharmacy OPD	OP	Medicine cabinet	0	2	A
49	Microbiology Lab	Laboratory	Automated blood culture system	1	1	B+
50	Pathology Lab	Laboratory	Microtome	1	1	A
51	Pathology Lab	Laboratory	Tissue processor	1	1	B
52	Biochemistry/Hematology	Laboratory	Blood coagulation apparatus fully automated	0	1	A
53	Blood bank/Genetics	Laboratory	Refrigerator centrifuge	3	1	A
54	Biochemistry	Laboratory	Fully automated chemistry analyzer	1	1	A
55	Biochemistry	Laboratory	Illuminate Hormonn analyzer	1	1	A
56	Biochemistry	Laboratory	Electrolyte analyzer	1	1	A
57	Biochemistry	Laboratory	Tandem mass spectrometer for metabolic syndrome	1	1	B
58	Biochemistry	Laboratory	PH merter	1	1	A
59	Biochemistry	Laboratory	UV spectrophotmeter	1	1	A
60	Biochemistry	Laboratory	Electro phoresis Apparatous	1	1	A
61	Biochemistry	Satelite Lab OP	Distillation plant	1	1	A
62	Biochemistry	Satelite Lab OP	Laboratory refrigerator	3	1	A
63	Biochemistry	Satelite Lab OP	Centrifuge	1	1	A
64	Biochemistry	Satelite Lab OP	Urine analyzer	1	1	A
65	Biochemistry	Satelite Lab OP	Semi automated chemistry analyzer	1	1	A
66	Pathology Lab	Satelite Lab OP	Automatic Blood cell counter	2	1	A
67	Pathology Lab/Neonatology/Nephrology	Satelite Lab OP	Microscope Binocular	6	1	A
68	Radiology	X-ray room	Digital X-ray unit	1	1	B
69	ECG ECO/Neonatology	IP	ECG(12channel)	3	1	B
70	Each dep	IP	Oxygen flow meter and humidifier	0	26	A

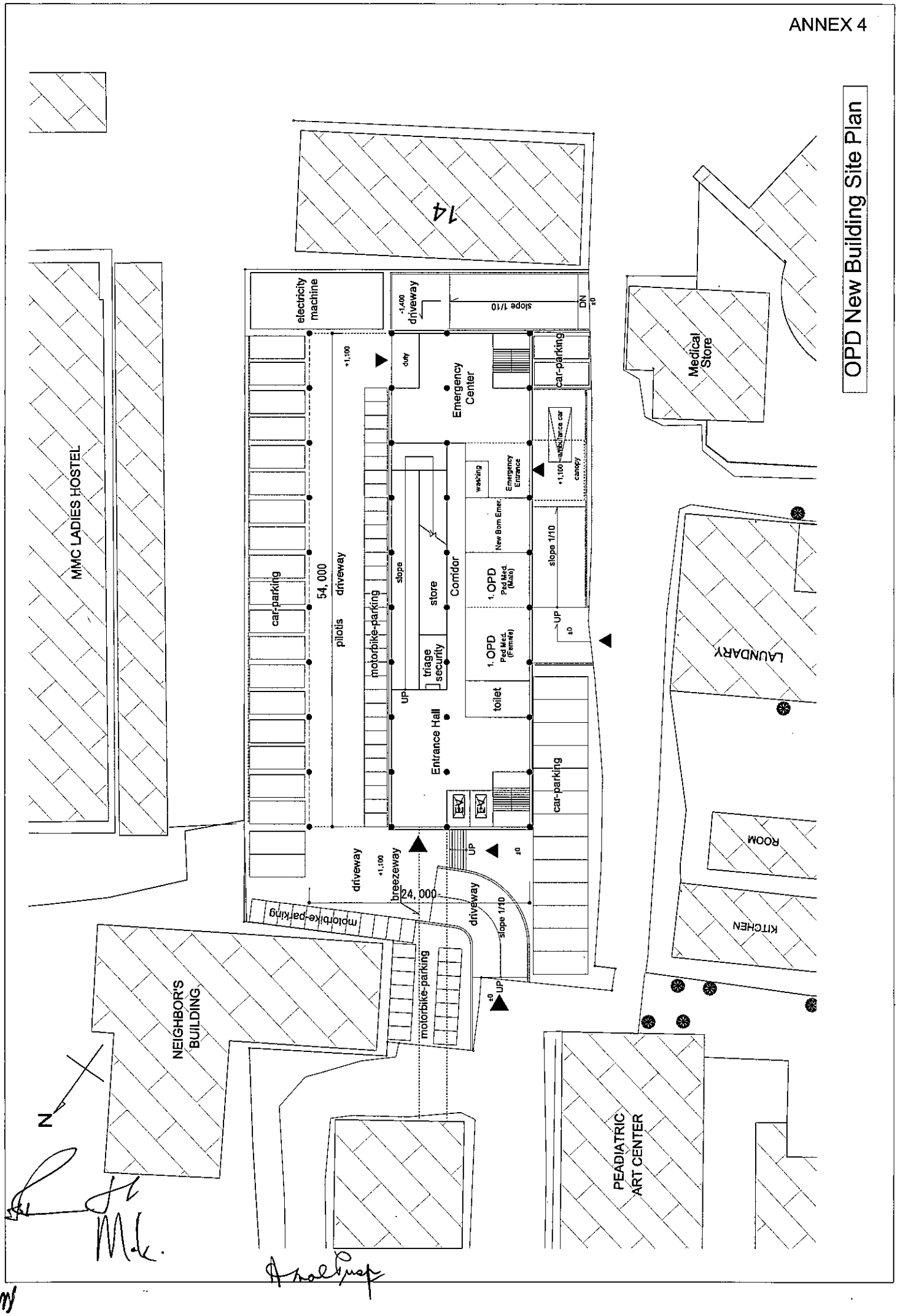
A : Giving High Priority, and multiple benefit for improvement of medical services at ICH.
B+: Confirmed high necessity, but further survey & analisys is needed.
B : Confirmed the necessity, but further survey and analysis is needed.
* Quantity listed above might be changed at further domestic analysis in Japan.

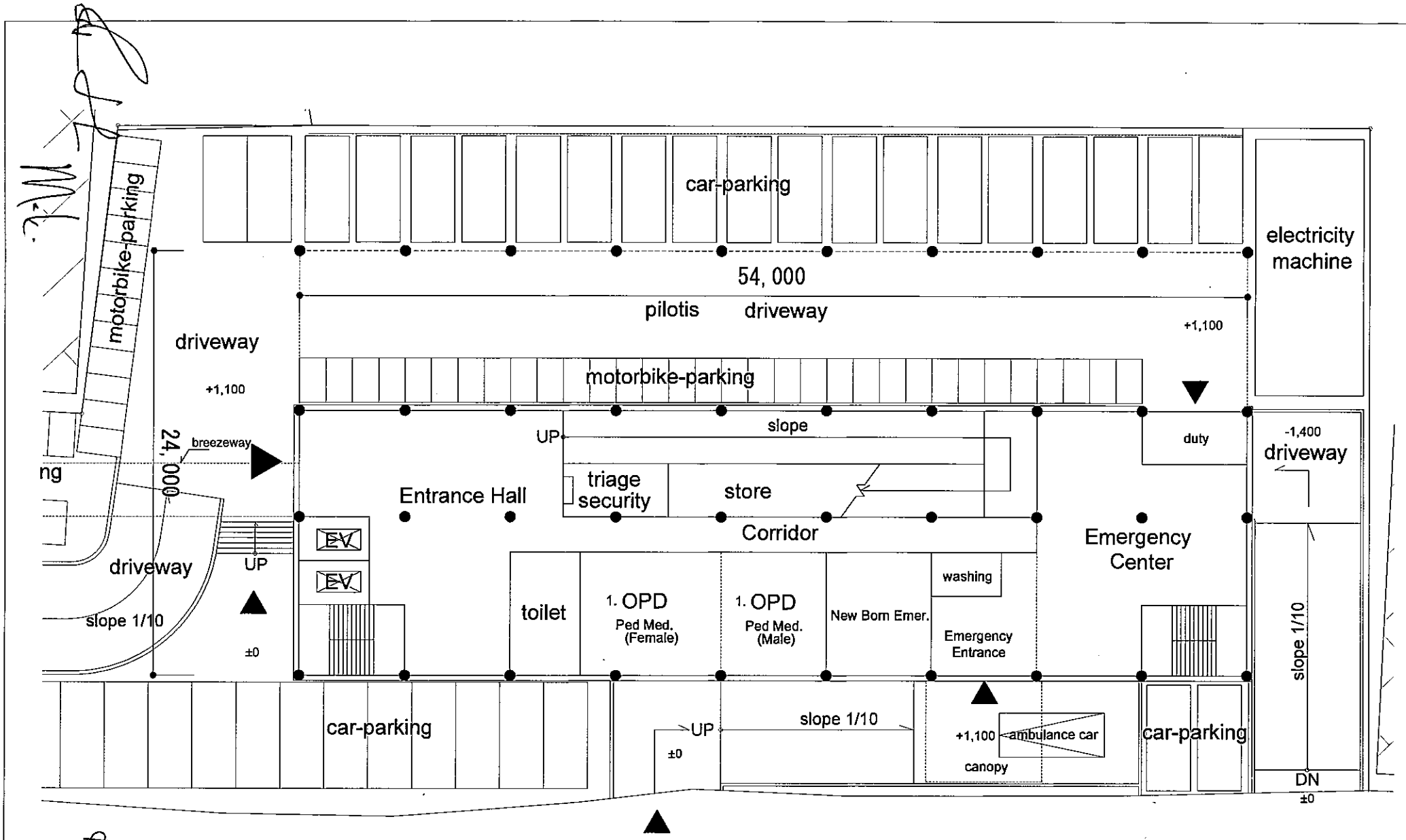
Annex 3

Components of the facility

Floor	Main Components
Basement	Car-Parking, Machine Room
Ground Floor	Emergency Room: Emergency reception, Paediatric Emergency, New Born Emergency and Related rooms, Paediatric Medicine (Female, Male), Entrance Hall, Slope, Power Receiving Room, Machine Room, Patient Toilet, Toilet for Disabilities, Staff Toilet, etc.
1st Floor	Medical New Born, Child Development Clinic, Diabetics, Genetics, Endocrinology, Satellite Clinical Laboratory, Sub Pharmacy, X-ray Room with Control Room, Waiting Space, Slope, Patient Toilet, Staff Toilet, Toilet for Disabilities, Connection Corridor, etc.
2nd Floor	Paediatric Surgery/Urology, Neurology, Nephrology, Child Guidance Clinic, Waiting Space, Slope, Patient Toilet, Staff Toilet, Toilet for Disabilities, etc.
3rd Floor	Hematology, Pulmonology/TB/Asthema, Dermatology, ORT/Diarrhea/GE, Class Rooms, Waiting Space, Slope, Patient Toilet, Toilet for Disabilities, Staff Toilet, etc.

ANNEX 4


OPD New Building Site Plan
MMC LADIES HOSTEL
14
electricity machine
-1.400
driveway
slope 1/10
DN
±0
duty
Emergency Center
car-parking
Medical Store
+1.100
ambulance car
canopy
Emergency Entrance
washing
New Born Emer.
1.OPD Ped Med. (Male)
1.OPD Ped Med. (Female)
toilet
slope 1/10
UP
±0
54, 000
pilotis
driveway
motorbike-parking
slope
store
Corridor
triage security
Entrance Hall
EV
LAUNDARY
ROOM
KITCHEN
breezeway
24, 000
NEIGHBOR'S BUILDING
PEADIATRIC ART CENTER
N

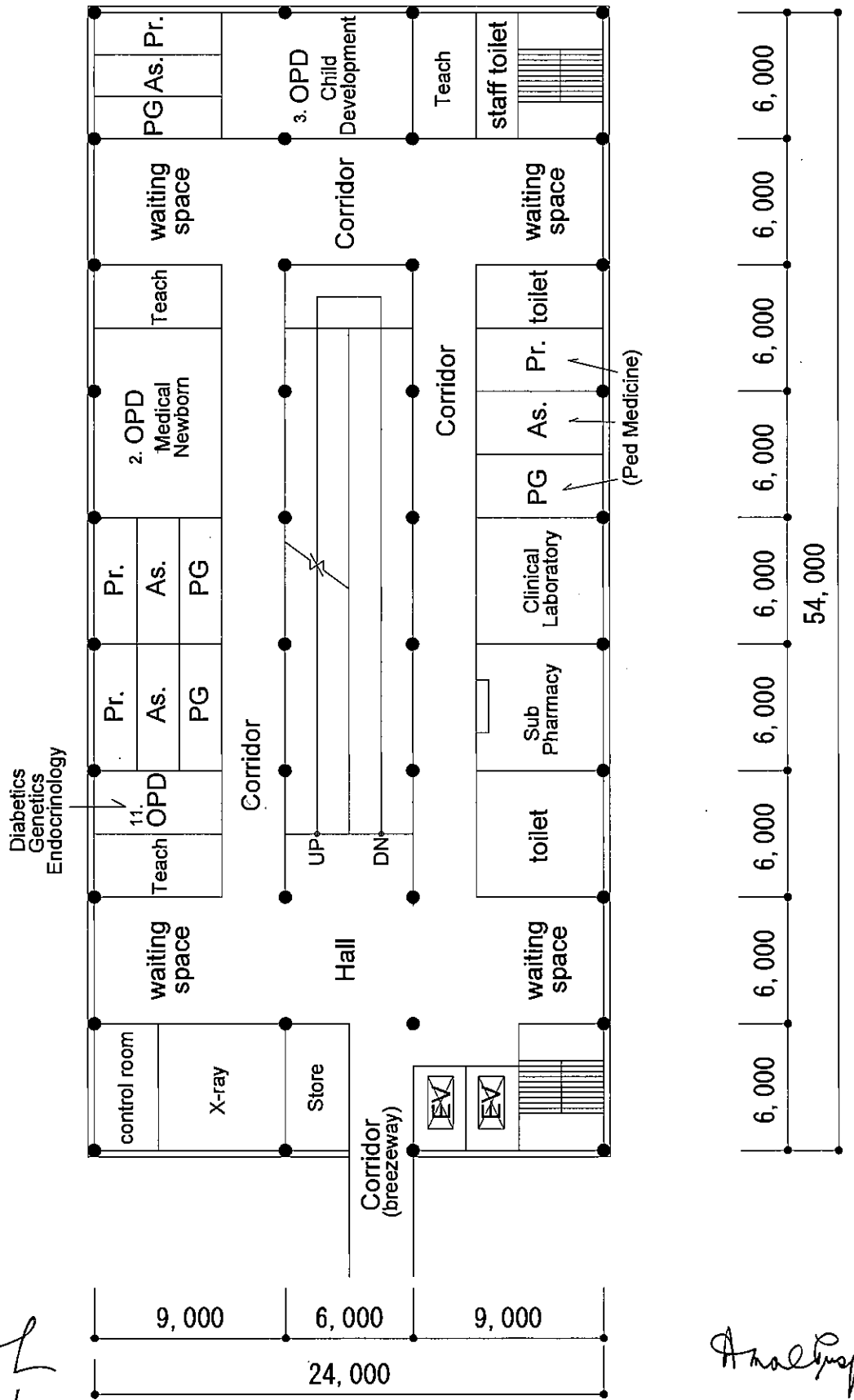


OPD New Building GF Plan

ANNEX 4

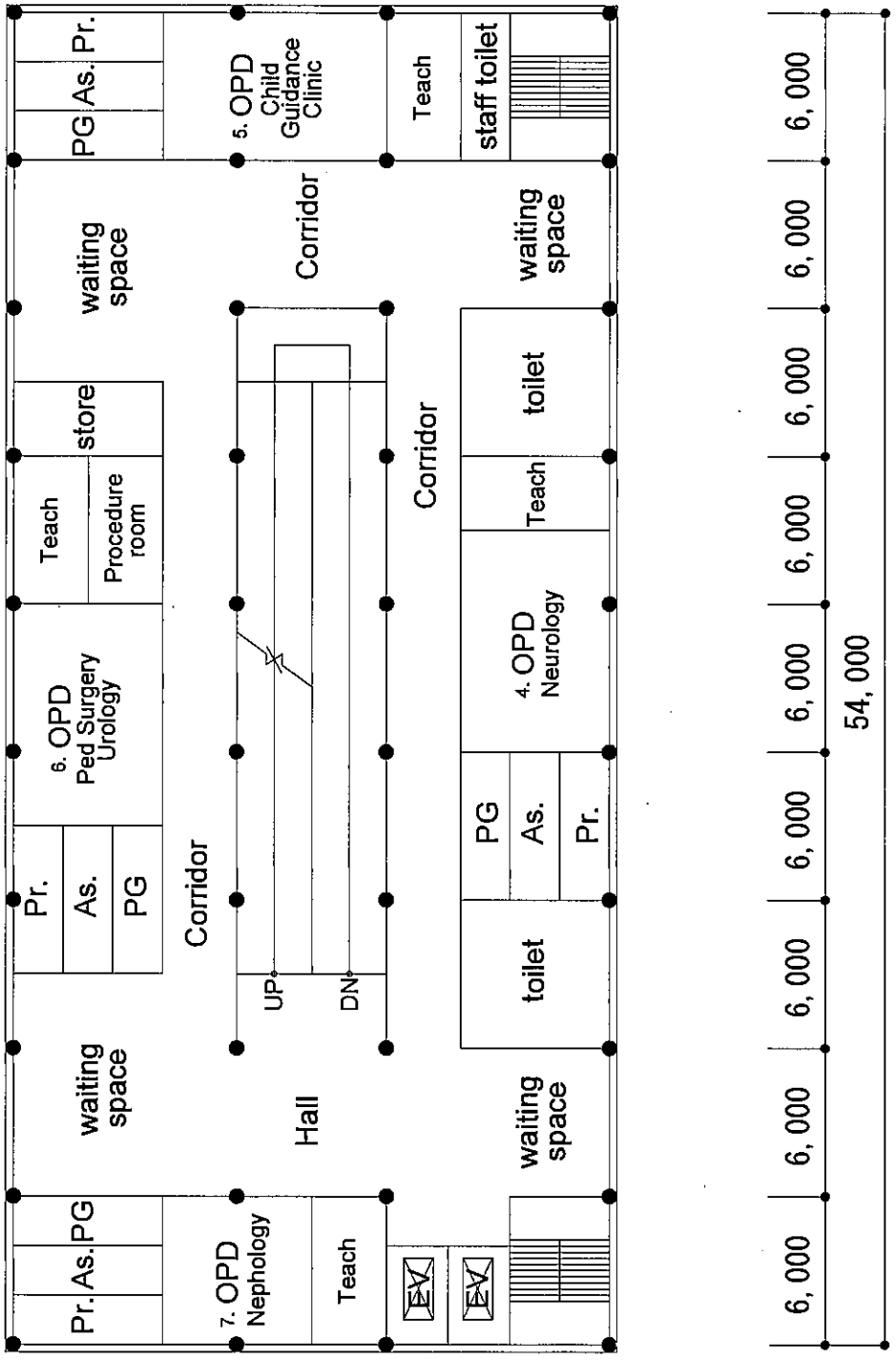
ANNEX 4

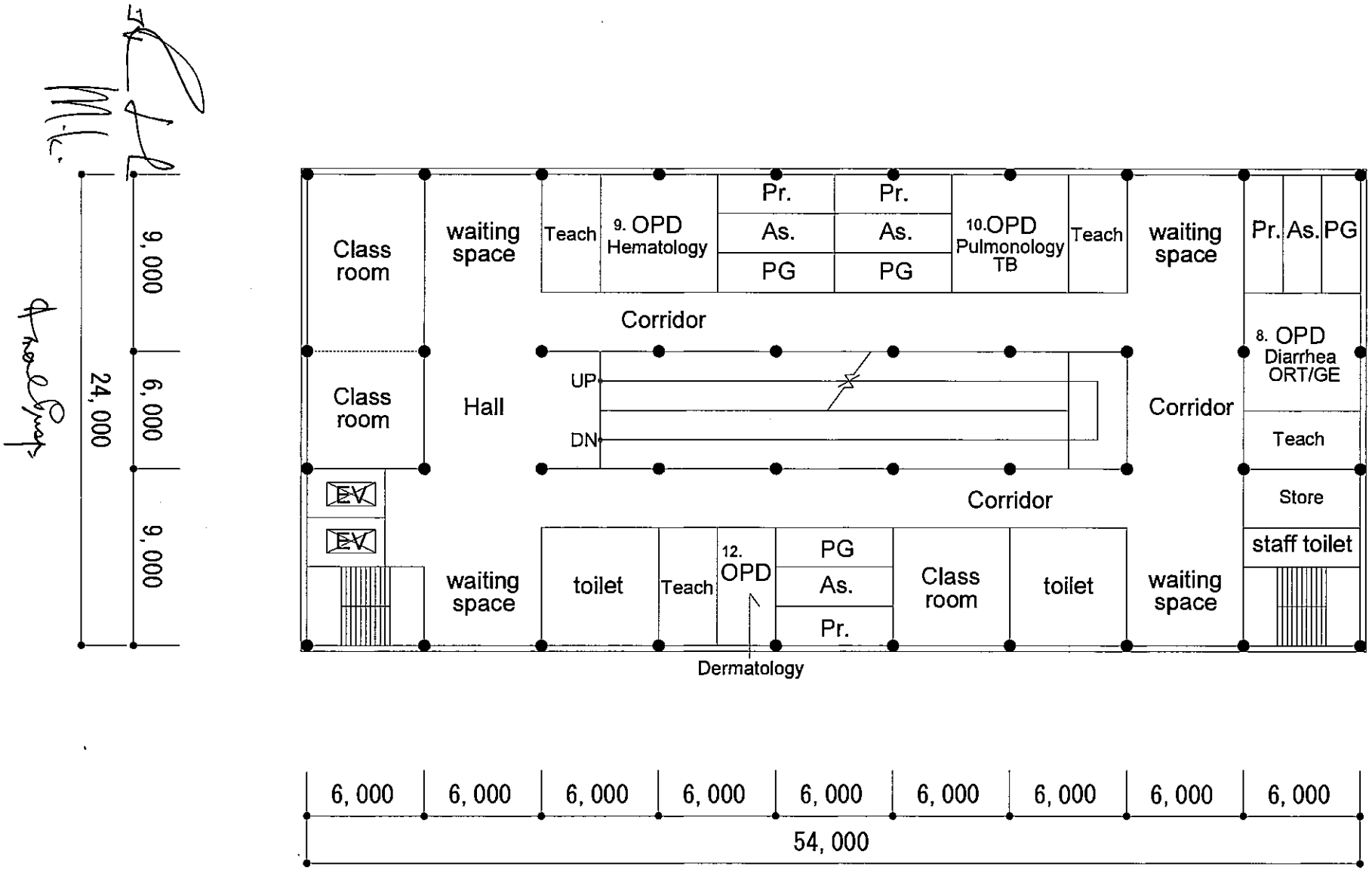
OPD New Building 1F Plan



ANNEX 4

OPD New Building 2F Plan



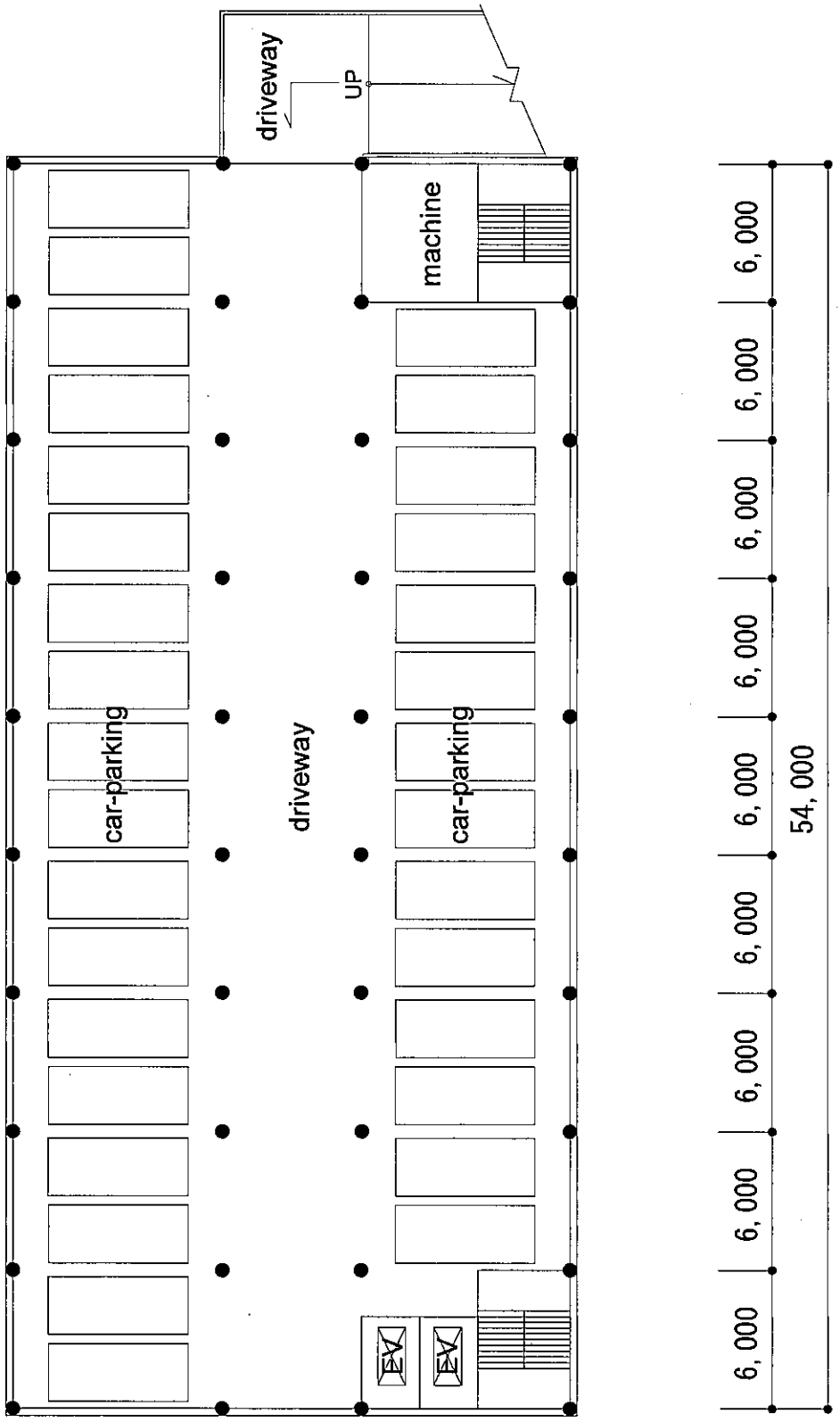


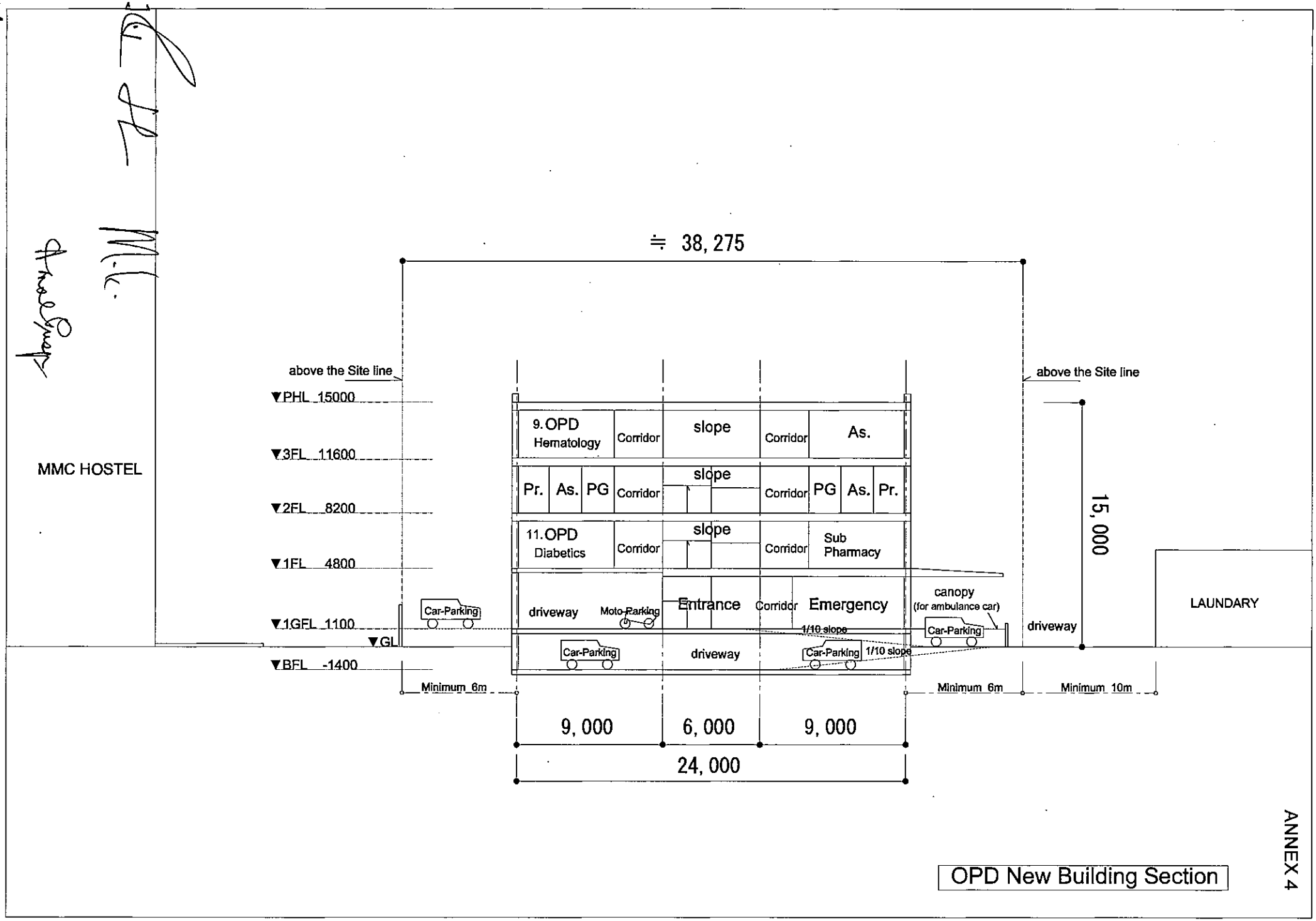
OPD New Building 3F Plan

ANNEX 4

ANNEX 4

OPD New Building BF Plan




≒ 38, 275
above the Site line
above the Site line
▼PHL 15000
▼3FL 11600
▼2FL 8200
▼1FL 4800
▼1GFL 1100
▼GL
▼BFL -1400
MMC HOSTEL
9. OPD Hematology
Corridor
slope
Corridor
As.
Pr.
As.
PG
Corridor
slope
Corridor
PG
As.
Pr.
11. OPD Diabetics
Corridor
slope
Corridor
Sub Pharmacy
driveway
Moto-Parking
Entrance
Corridor
Emergency
canopy
(for ambulance car)
Car-Parking
Car-Parking
1/10 slope
driveway
Car-Parking
driveway
Car-Parking
1/10 slope
15, 000
LAUNDARY
Minimum 6m
Minimum 6m
Minimum 10m
9, 000
6, 000
9, 000
24, 000
OPD New Building Section
ANNEX 4

JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- ·Preparatory Survey
  - The Survey conducted by JICA
- ·Appraisal &Approval
  - -Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- ·Authority for Determining Implementation
  - -The Notes exchanged between the GOJ and a recipient country
- ·Grant Agreement (hereinafter referred to as "the G/A")
  - -Agreement concluded between JICA and a recipient country
- ·Implementation
  - -Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment

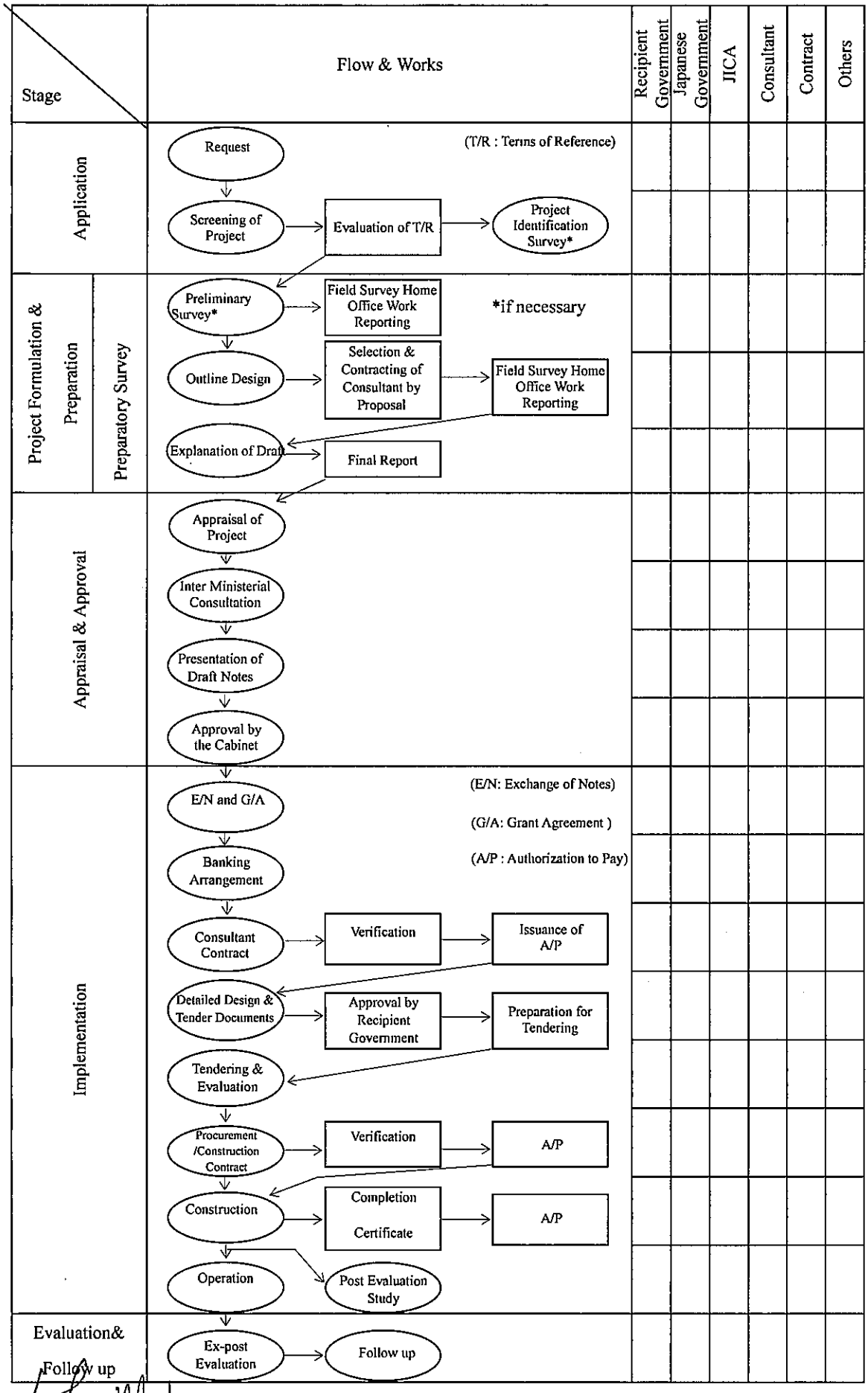
commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

Annex 6

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure a lot of land necessary for the implementation of the Project and to clear the site;		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site		●
	3) The parking lot	●	
	4) The road outside the consruction site		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites		
	1) Electricity		
	a. The distributing power line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Internal transportation from the port of disembarkation to the project site	(●)	(●)
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be borne by the Authority without using the Grant		●
6	To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

Minutes of Discussions

Preparatory Survey on the Project for

Improvement of the Institute of Child Health and Hospital for Children,

Chennai, India

In response to a request from the Government of India, the Government of Japan decided to conduct a Preparatory Survey on the Project for Improvement of the Institute of Child Health and Hospital for Children, Chennai, India (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") to India, which is headed by Dr. Mitsuo Isono, Senior Advisor, JICA, and is scheduled to stay in the country from September 1 to September 6, 2013.

The Team held discussions with the officials concerned of the Governments of India and Tamil Nadu, to explain and consult about the components of the draft report.

In the course of discussions, each party confirmed the main items described in the attached sheets.

September 4, 2013

Dr. Mitsuo Isono
Leader,
Preparatory Survey Team

Japan International Cooperation Agency
Japan

Dr. M. Kannaki
Director and Superintendent,
Institute of Child Health and Hospital for Children,
Chennai,
Tamil Nadu,
India

Dr. J. Radhakrishnan
Secretary to Government,
Health and Family Welfare Department,
Government of Tamil Nadu, Chennai,
India

Mr. Amal Pusp
Director, International Health

Ministry of Health and Family Welfare
Government of India

29 Nov 2013

Ms. Petal Dhillon
Deputy Secretary,
Department of Economic Affairs
Ministry of Finance
Government of India

ATTACHMENT

1. Components of the Draft Report

The Indian side agreed and accepted in principle the components of the Draft Report explained by the Team. The items targeted by the Project described in Annex-1 and Annex-2.

2. Japan's Grant Aid Scheme

2-1 The Indian side had shown full understanding of the Japan's Grant Aid Scheme and the necessary measures to be taken by the Indian side as described in Annex-5, Annex-6 and Annex-7 of the Minutes of Discussions signed by both sides on March 1, 2013.

2-2 Each party, the Institute of Child Health and Hospital for Children, The Government of Tamil Nadu, Ministry of Health and Family Welfare, Ministry of Finance, committed themselves to taking every necessary measure to conduct the undertakings in a timely manner, including allocation of the Project budget within the appropriate ministry/department at state and central level.

3. Schedule of the Study

JICA will complete the final report (the Preparatory Survey Report) in accordance with the confirmed items and send it to the Government of India by February, 2014.

4. Confidentiality of the Project

4-1. Both sides confirmed that all information related to the Project including detailed specifications of the facility and equipment and other technical information shall not be disclosed to any outside parties before the conclusion of all the contracts for the Project.

4-2. The Team explained the Project Cost Estimation as described in Annex-3. Both sides agreed that the Project Cost Estimation should never be disclosed to any outside parties before the conclusion of all the contracts for the Project. The Indian side understood that the Project Cost Estimation is not final and is subject to change.

5. Other Relevant Issues

5-1 The Project site was established as per the Technical Note which was signed on April 13, 2013, as shown in Annex-4.

5-2 The Indian side agreed to allocate all necessary budget and staff for the Project which includes

maintenance cost, staffs of newly created position as well as cost and personnel for car usage for patients transportation listed in Annex-2. Moreover, it is agreed by the Indian side to prepare a plan for patients transportation based on the overall plan of the use of facilities.

Annex-1: Components of the Facility
Annex-2: Equipment List
Annex-3: Project Cost Estimation
Annex-4: Technical Note (signed on April 13, 2013)
Annex-5: Tentative Schedule of the Project

Annex-1 Components of the facility

No.	Department	New OPD Building	Existing Building
1	Pediatric Medicine	●	
2	Medical Newborn (Neonatology)	●	
3	Child Development Clinic (CDC)	●	
4	Neurology	●	
5	Child Guidance Clinic (CGC)	●	
6	Pediatric Surgery/Urology	●	
7	Nephrology	●	
8	ORT/Diarrhea/GE	●	
9	Hematology	●	
10	Pulmonology/TB	●	
11	Diabetics Genetics Endocrinology	●	
12	Dermatology	●	
13	Clinical Laboratory	●	
14	Emergency (<30days) Emergency (>30days)	●	
15	Prof/A. Prof/PG'	●	
16	Classroom	●	
17	Sub Pharmacy	●	
18	Meeting Room		●
19	PICU/NICU		●
20	Cardiology, ECO, ECG		●
21	Dental Clinic		●
22	Nutrition	●	
23	Physiotherapy		●
24	ENT		●
25	Immunization/VPD	●	
26	School Education Cell	●	
27	ART Center		●
28	ICTC	●	
29	Ayurveda/Yoga		●
30	Blood Bank		●
31	Cardio Thoracic		●
32	Rheumatology	●	
33	Palliative Care		●
34	Orthopedic Surgery		●
35	Radiology		●
36	CT		●
37	USG	●	
38	Adolescent	●	

Department	Item No.	Description	Q'ty to be Procured
Emergency and Newborn	ER-1	Infant warmer	2
Emergency	ER-2	Patient monitor	4
Emergency and Newborn	ER-3	Syringe pump	4
Emergency and Newborn	ER-4	Infusion pump	4
Emergency	ER-5	Resuscitation trolley (Emergency Care)	1
Emergency and Newborn	ER-6	Pulse oxymeter	2
Emergency	ER-7	Ventilator (for infant)	1
Emergency	ER-8	Ultrasound scanner, echo portable	1
Emergency	ER-9	ECG, portable	1
Emergency	ER-10	Defibrillator	1
Emergency	ER-11	Mobile X-ray unit	1
Emergency	ER-12	Transport vehicle	1
Emergency	ER-13	Stretcher	1
Pediatric surgery	PS-1	Operation table (for pediatric)	1
Pediatric surgery	PS-2	Mobile operating light (LED)	1
Pediatric surgery	PS-3	Treatment instrument sets	1
Pediatric surgery	PS-4	Suction machine	1
Pediatric surgery	PS-5	Pediatric laparoscope set	1
Newborn	N-1	Transport incubator	1
Newborn	N-2	Bilirubin analyzer with centrifuge	1
Newborn	N-3	Phototherapy unit (LED)	2
Emergency and Newborn	NICU-1	Infant warmer	5
Emergency and Newborn	NICU-2	Syringe pump	5
Emergency and Newborn	NICU-3	Infusion pump	5
Emergency and Newborn	NICU-4	Pulse oxymeter	2
Child Development Clinic	CDC-1	Bayley infant scale of development kit	1
Child Development Clinic	CDC-2	Infant meter (height & weight) cot type	1
Pulmonology	PU-1	Bronchoscope with video	1
ORT/Diarrhea/GE	GE-1	Gastro scope with video	1
ORT/Diarrhea/GE	GE-2	Colon scope with video	1
Nephrology	NP-1	Hemodialysis machine	1
Neurology	NU-1	EMG	1
Neurology	NU-2	EEG	1
Child Guidance Clinic	CGC-1	Psychological test (10 sets)	1
Physiotherapy	PHY-1	Electrical simulator	1
Physiotherapy	PHY-2	Ultrasonic therapy	1
Physiotherapy	PHY-3	Balance board	1
Physiotherapy	PHY-4	Peg board	1
Pharmacy OPD	PHA-1	Medicine refrigerator	2
Pharmacy OPD	PHA-2	Medicine cabinet	2
Microbiology Lab	ML-1	Automated blood culture system	1
Biochemistry	BIOL-1	Blood coagulation apparatus fully automated	1
Biochemistry	BIOL-2	Fully automated chemistry analyzer	1
Biochemistry	BIOL-3	Illuminate hormone analyzer	1
Biochemistry	BIOL-4	Electrolyte analyzer	1
Biochemistry	BIOL-5	Tandem mass spectrometer for metabolic syndrome	1
Biochemistry	BIOL-6	PH meter	1
Biochemistry	BIOL-7	UV spectrophotometer	1
Biochemistry	BIOL-8	Electro phoresis apparatus	1
Biochemistry	BIOL-9	Distillation plant	1
Biochemistry	BIOL-10	Distillation plant	1
Biochemistry	BIOL-11	Centrifuge	1
Biochemistry	BIOL-12	Urine analyzer	1
Biochemistry	BIOL-13	Semi automated chemistry analyzer	1
Blood bank	BL-1	Refrigerated centrifuge	1
Pathology Lab	PL-1	Microtome	1
Pathology Lab	PL-2	Automatic blood cell counter	1
Pathology Lab	PL-3	Microscope binocular	1
Radiology	R-1	Digital X-ray unit	1
Radiology	R-2	CR system	1
Radiology	R-3	Automatic voltage stabilizer 80KVA	1
Cardiology	CAR-1	ECG (12-channel)	1
Each department	DEP-1	Oxygen flow meter and humidifier	42
Each department	DEP-2	Automatic voltage stabilizer 0.5KVA	35
Each department	DEP-3	Automatic voltage stabilizer 1KVA	11
Each department	DEP-4	Automatic voltage stabilizer 2KVA	5
Each department	DEP-5	UPS 0.5KVA	1
Each department	DEP-6	UPS 2KVA	4

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TECHNICAL NOTE

Preparatory Survey Phase 2 on the Project for Improvement of the Institute of Child Health and Hospital for Children, Chennai, India

The Institute of Child Health and Hospital for Children, Chennai and the JICA Preparatory Survey Team held discussions on the land to be earmarked for the proposed new OPD and both parties confirmed the items described in the following:

1 Background

1.1 In response to a request from the Government of India, No.F.1/2/2009-Jap-II, Japan International Cooperation Agency (JICA) conducted a Preparatory Survey on the Project for Improvement of the Institute of Child Health and Hospital for Children in the course from February 10 to March 11, 2013.

1.2 Minutes of Discussions on the above mentioned Survey was mutually agreed on March 1, 2013, with Ministry of Health and Family Welfare, The Government of India; Department of Health and Family Welfare, the Government of Tamil Nadu; the Institute of Child Health and Hospital for Children, and the JICA Preparatory Survey Team.

1.3 The Chennai Metropolitan Development Authority were contacted by the Japanese Team for the construction of the Proposed New Out patient Department under grant in aid as per the latest norms;-

1.4 The area initially assigned will not be adequate to construct the proposed out patient department with functions agreed at Minutes of Discussions dated March 1, 2013. Hence it is necessary to alter the existing area by extending the area for construction and set backs as per the narrative description of the confirmed site referred under 3. to 3.5. The land required is 3,197 m2.

2 Result of Land-Survey

2.1 The JICA Preparatory Survey Team conducted land-survey to measure necessary land to build new OPD as per norms.

2.2 With the basis of the results of the land-survey report dated March 20, 2013, construction site is confirmed, as clarified in **Paragraph** 3 and **Annexe** 1.

3 The narrative descriptions of the confirmed site, which are necessary to build the new OPD under the Project for Improvement of the Institute of Child Health and Hospital for Children, are as follows:

3.1 Northeast: the northeast boundary limit of the car parking (16 cars) lies at the distance of 11.05 m - 9.29 m from MMC Ladies Hostel of IOG.

3.2 Southeast: the southeast boundary lies at the distance of 0.82 m from the Manifold Room of Institute of Obstetrics and Gynaecology & Govt. Hospital for Women and Children (IOG).

3.3 Southwest: the southwest boundary facing visitors' entrance and ambulance car parking lies at the distance of 5.13 m – 4.00 m from the Medical Store of IOG and 4.61 m – 7.82 m from the Laundry of IOG.

3.4 Northwest: the boundary limit at the entrance of the slope to the basement car parking lies at the distance of 6.59 m from the G+9 Building of ICH.

3.5 North: the north boundary lies at the distance of 2.26 m – 4.48 m from the adjacent Private apartment building.

4. Facilities existing in the construction site, which should be dismantled and removed from the site, are shown in **Annexe 3**.

5. The Institute of Child Health and Hospital for Children, Chennai and the JICA Preparatory Survey Team agreed on the construction site given in **Paragraph 3**, **Annexe 1.** and **Annexe 2.**

April 13, 2013

M Kannaki

Dr. M. Kannaki
Director and Superintendent I/C,
Institute of Child Health and Hospital for Children, Chennai
Tamil Nadu
India

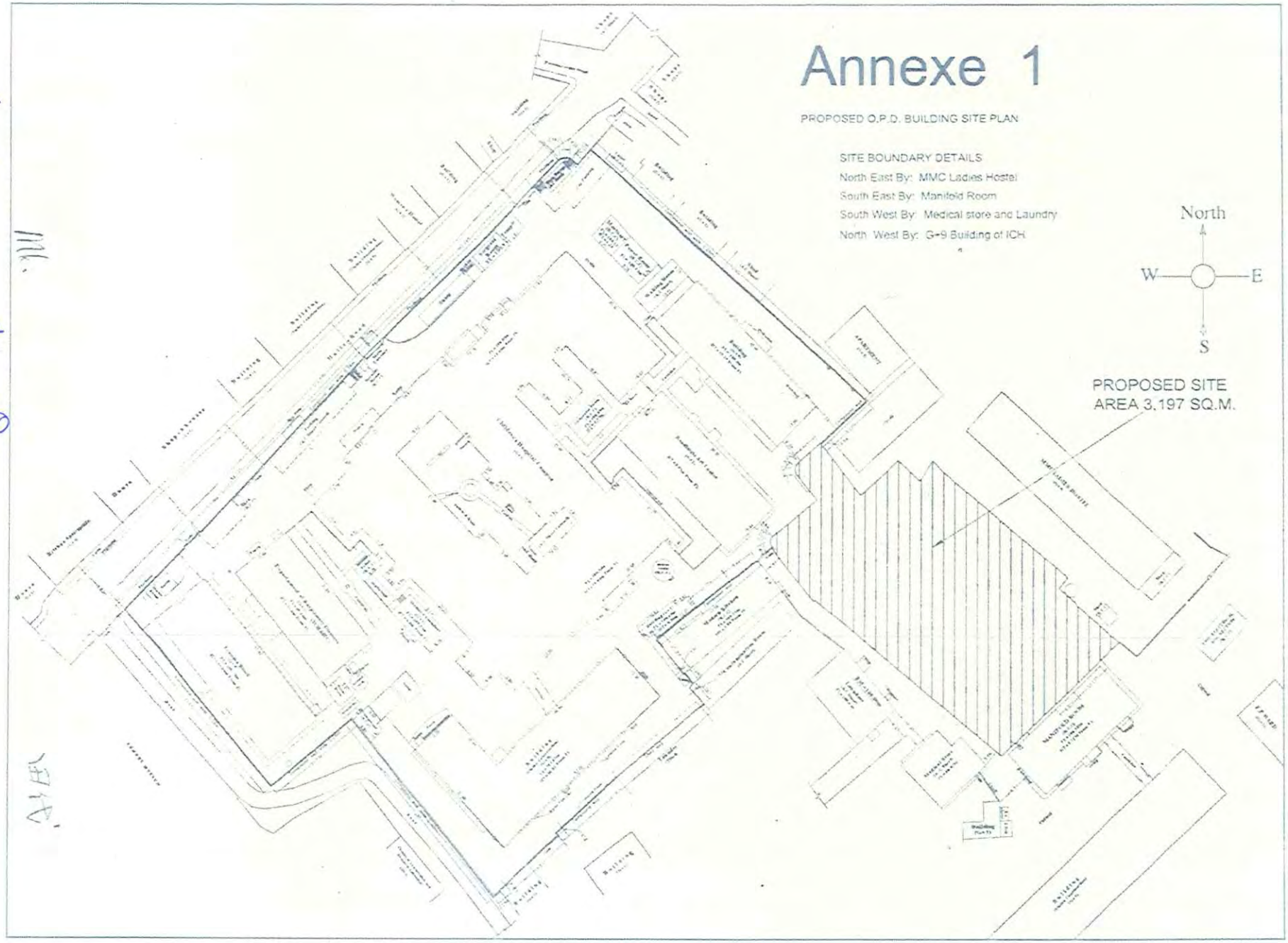
田村正一

Shoichi Tashiro
Deputy Project Manager of the Consultant Team
JICA Preparatory Survey Team

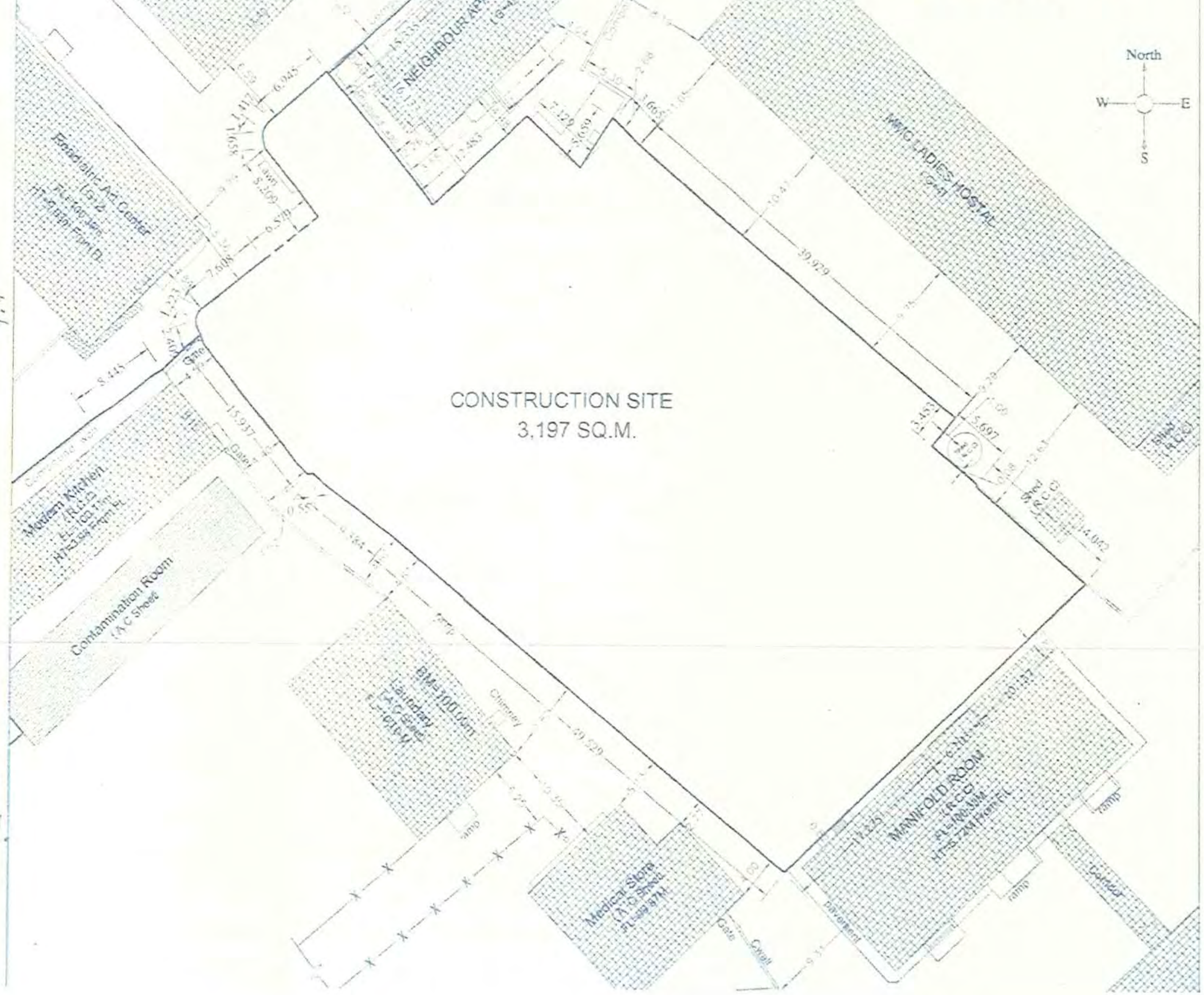
Annexe 1

PROPOSED O.P.D. BUILDING SITE PLAN

SITE BOUNDARY DETAILS
North East By: MMC Ladies Hostel
South East By: Manifold Room
South West By: Medical store and Laundry
North West By: G+9 Building of ICH



Annexe 2


North
W
E
S
CONSTRUCTION SITE
3,197 SQ.M.
NEIGHBOUR APARTMENT
MMC LADIES HOSTAL
Contamination Room
Modern Kitchen
Medical Store
MANIFOLD ROOM
Laundary
Chimney
Gate
Lawn
Corridor
ramp

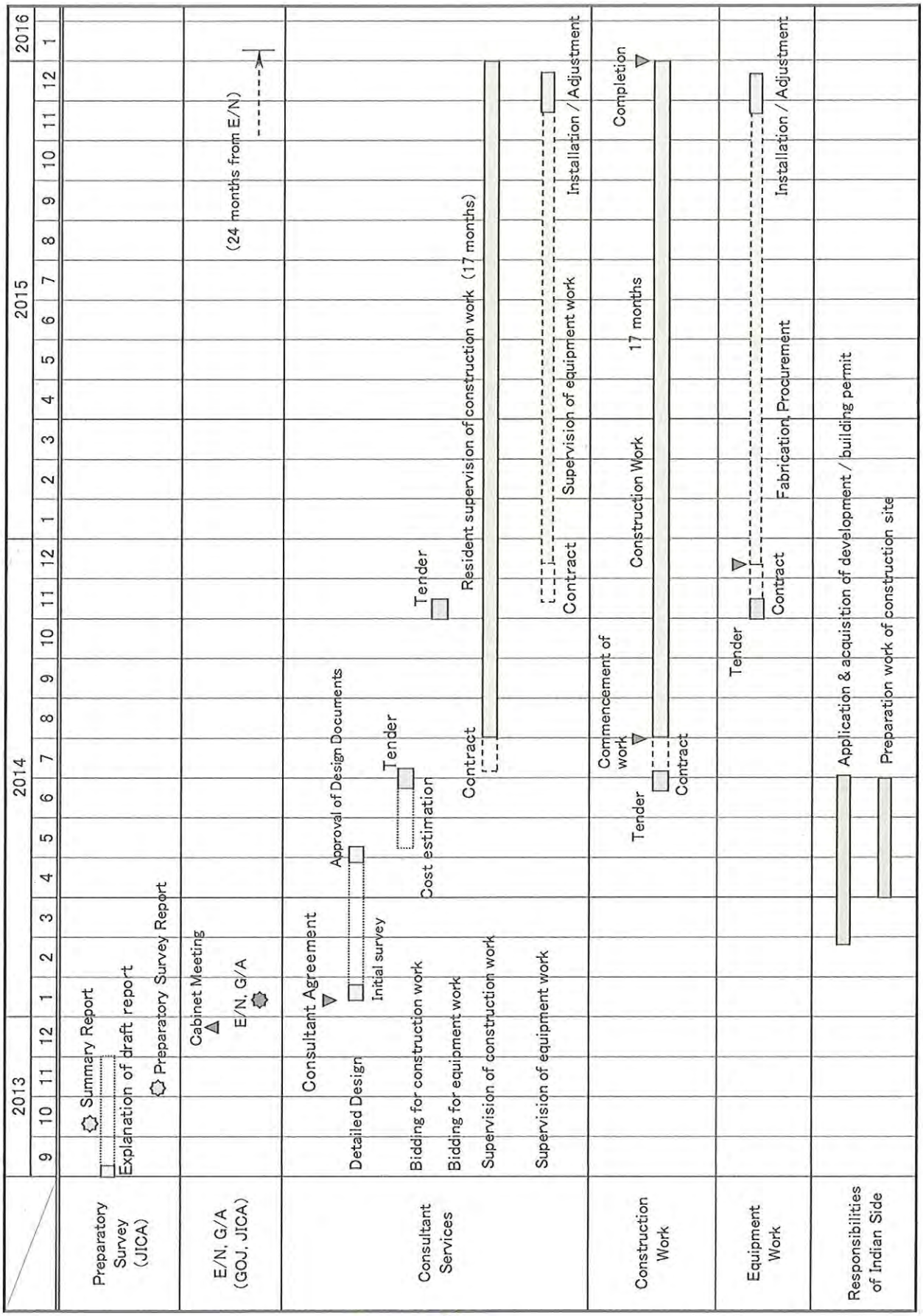
Annexe 3

SITE PLAN SHOWING THE BUILDINGS TO BE DEMOLISHED FOR CONSTRUCTING NEW OPD BLOCK

OLD SURGICAL STORE

OLD CANCER WARD

DOCTOR'S MESS


2013
2014
2015
2016
9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1
Preparatory Survey (JICA)
Summary Report
Explanation of draft report
Preparatory Survey Report
E/N, G/A (GOJ, JICA)
Cabinet Meeting
E/N, G/A
(24 months from E/N)
Consultant Services
Consultant Agreement
Detailed Design
Approval of Design Documents
Initial survey
Bidding for construction work
Tender
Cost estimation
Bidding for equipment work
Tender
Supervision of construction work
Contract
Resident supervision of construction work (17 months)
Supervision of equipment work
Contract
Supervision of equipment work
Installation / Adjustment
Construction Work
Commencement of work
Tender
Contract
Construction Work
17 months
Completion
Equipment Work
Tender
Contract
Fabrication, Procurement
Installation / Adjustment
Responsibilities of Indian Side
Application & acquisition of development / building permit
Preparation work of construction site

Appendix 5 Technical Note

TECHNICAL NOTE

Preparatory Survey on the Project for Improvement of the Institute of Child Health and Hospital for Children, Chennai, India

The Institute of Child Health and Hospital for Children, Chennai and the Consultant Team held discussions after signing of the Minutes of Discussions on March 1st, 2013. In the course of discussions and field surveys, both parties confirmed the items described below.

1. Facilities

1) Power incoming line

- Power distribution line is to be connected to electrical room at the New OPD Building by the Indian side.

2) Medical gas distribution area and type

- OPD Consultation Rooms, Procedure Rooms: O2＋vacuum by the Japanese side.
- New Born Emergency、Pediatric Emergency: O2＋vacuum＋compressed Air by the Japanese side.

3) Communication System

- Telephone extension lines are to be connected to PABX at the New OPD Building by the Indian side.
- Public telephone sets are to be provided by the Indian side.
- Interphone system among the Professor Rooms, OPD Consultation Rooms and Class Rooms is to be provided by the Japanese side.
- Conduit piping for the Local Area Network is to be installed by the Japanese side, and data cable connection and network server system are to be installed by the Indian side.
- Public address system is to be installed in the New OPD Building by the Japanese side.
- Closed circuit TV system is to be installed in the Hall, Waiting Areas and Elevator Car by the Japanese side.

4) Backup generator

- Emergency power supply is to be provided for the major clinical rooms such as the New Born Emergency, Pediatric Emergency, Clinical Laboratory and OPD Consultation Rooms by the Japanese side.
- Only hospital bed elevator is supported by the emergency power system by the Japanese side.

5) Air conditioning system

- Air conditioning system is to be installed at the New Born Emergency, Pediatric Emergency, X-Ray and Clinical Laboratory by the Japanese side.
- Power outlets for the air conditioning units are to be installed at the Professor Rooms and Class Rooms by the Japanese side.
- Ceiling fans are to be installed at the rooms with no air conditioning and Waiting Space by the

田村 M. Kannaki

Japanese side.

6) TV system

- TV antenna is to be installed. TV outlets are to be installed at the Waiting Space by the Japanese side.
- TV sets are to be provided by the Indian side

7) Toilet

- Indian type water closets are to be installed for patient toilets. Western type water closets are to be installed for the persons with disability and hospital staff by the Japanese side.(separate toilets for medical and paramedical personnel)
- Toilet for drivers (male and female) is to be provided by the Japanese side.

8) Medical waste

- Medical waste storage to be provided at the New OPD Building by the Japanese side.

9) Potable water supply, sewer and storm water

- Potable water supply pipe, sewer pipe and storm water pipe from the New OPD Building are to be connected to these lines of the adjoining areas within ICH, not to the lines under the public roads outside ICH by the Japanese side.

10) Temporary access road for construction

- The campus road by the entrance of the 10-storey Building (east of the construction site) is to be used for temporary access road for the exclusive use of construction vehicles during the construction period of the New OPD Building. A manhole projecting on this campus road is to be adjusted by the Japanese side so that it may not interfere with the passage of construction vehicles.
- The east-end the gate on the front road (HALLS ROAD) is to be used for the exclusive use of construction work by the Japanese side.
- The parking lot (for ambulance) in front the above-mentioned gate is to be removed by the Indian side. This gate is to be used as the emergency vehicle gate after the completion of the New OPD Building.
- Patient and public movement should be curtailed by appropriate measures by the Indian side.

2. Equipment

1) Mobile X-ray Unit supplied to the New OPD Building

- The Japanese side is to supply Computed Radiography Reader, and create one PAC terminal at ER. Data cable installation and connection work between CR reader and PAC termination box located at CT Room is to be done also by the Japanese side.

2) Appropriate environment for proper operation of ME

- Sophisticated equipment to be installed at the existing buildings should be kept under the required environment such as humidity and temperature. Thus, it is responsible for ICH to

田代 M. Tanaki

arrange air conditioners to keep the required indoor environment.

3) Arrangement of AVR and UPS

- Equipment to be supplied under this project should be attached with AVR and UPS according to the requirement of each of the equipment in order to avoid breakdown stemming from voltage fluctuation. This measure will be taken by the Japanese side.

4) Warranty period and AMC/CMC contract fee

- As per the strong suggestion from TNMSC, warranty period of equipment should be three years based on the state government procurement rule in Chennai, India. However, universal warranty period is maximum 1 year after handing-over of the equipment. According to the past cases of Japanese grant aid projects, how to set up warranty period and how to fix the cost of AMC/CMC after warranty need to be further studied in Japan, and need to comply with the Japan's grant aid scheme.

5) Medical equipment and ordinary furniture which are necessary for the New OPD Building function should be arranged and shifted by the Indian side.

3. Others

Both parties reconfirmed the demarcation of the following works, furniture and fixtures to be undertaken by the Indian side.

1) Demolition / removal of the existing facilities, (Old Cancer Ward, Doctors Mess, Surgical Store, Boiler Room, Tank Shed, Store and Toilet) in the construction site including foundations. (See attached drawing)

2)

2) Demolition / removal of unnecessary wall, Gate and tanks in the construction site including foundations. (See attached drawing)

3) Cutting / removal of trees (including roots) in the construction site

4) Demolition / removal of the existing utility systems (including sewerage pits and pipes) in the construction site

5) Repairs of the existing fences around the construction site and repairs of the ICH entrance gate

6) Repairs of the existing building (10 Storey Building) facing the Over bridge

7) Furniture such as desks, chairs, tables, shelves, and curtains etc.

March 11, 2013

M. Kannaki

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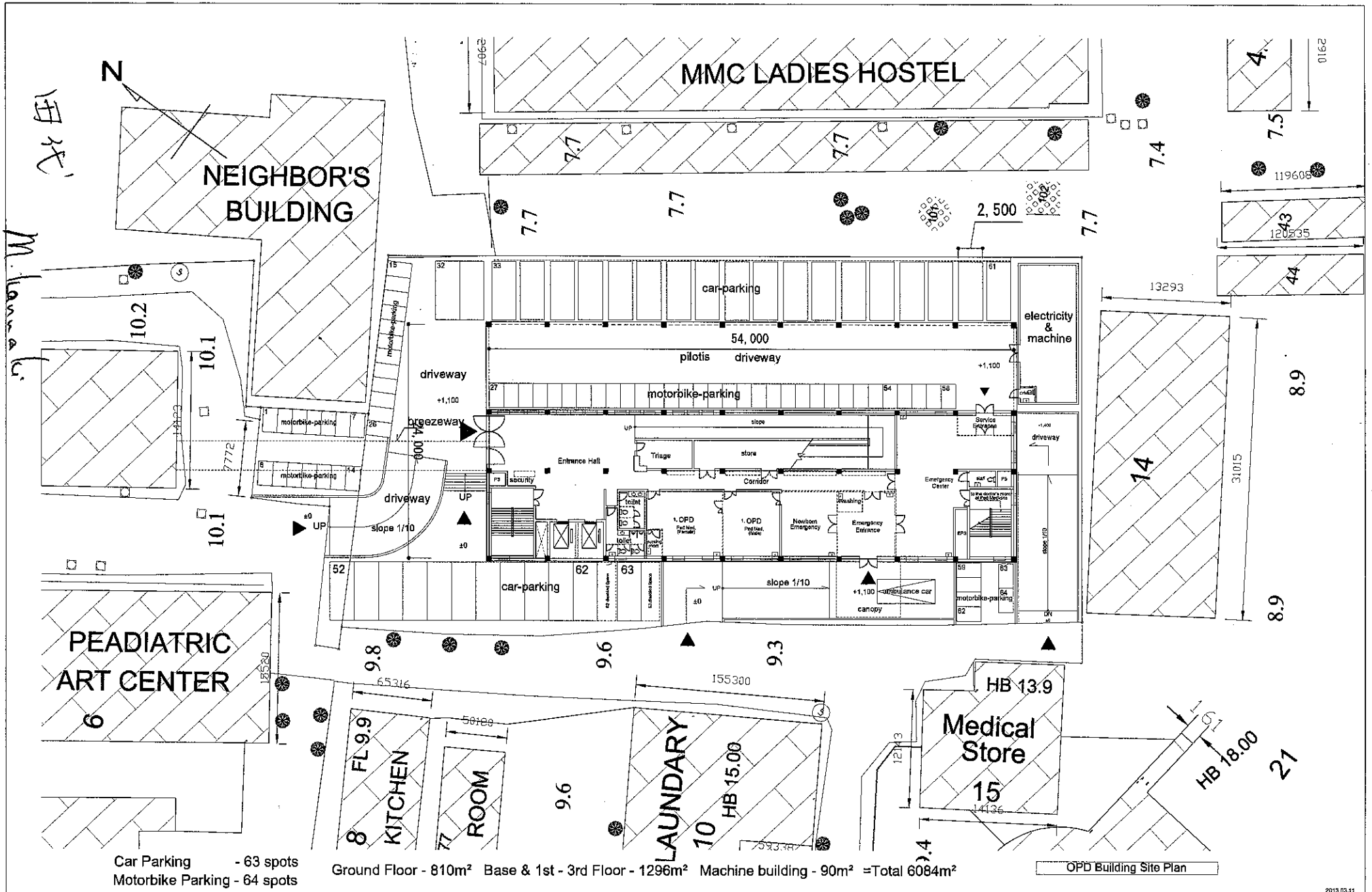
Institute of Child Health and Hospital for Children, Chennai
Tamil Nadu
India

田代正一

Shoichi Tashiro
Deputy Project Manager of the Consultant Team
Japanese Preparatory Survey Team



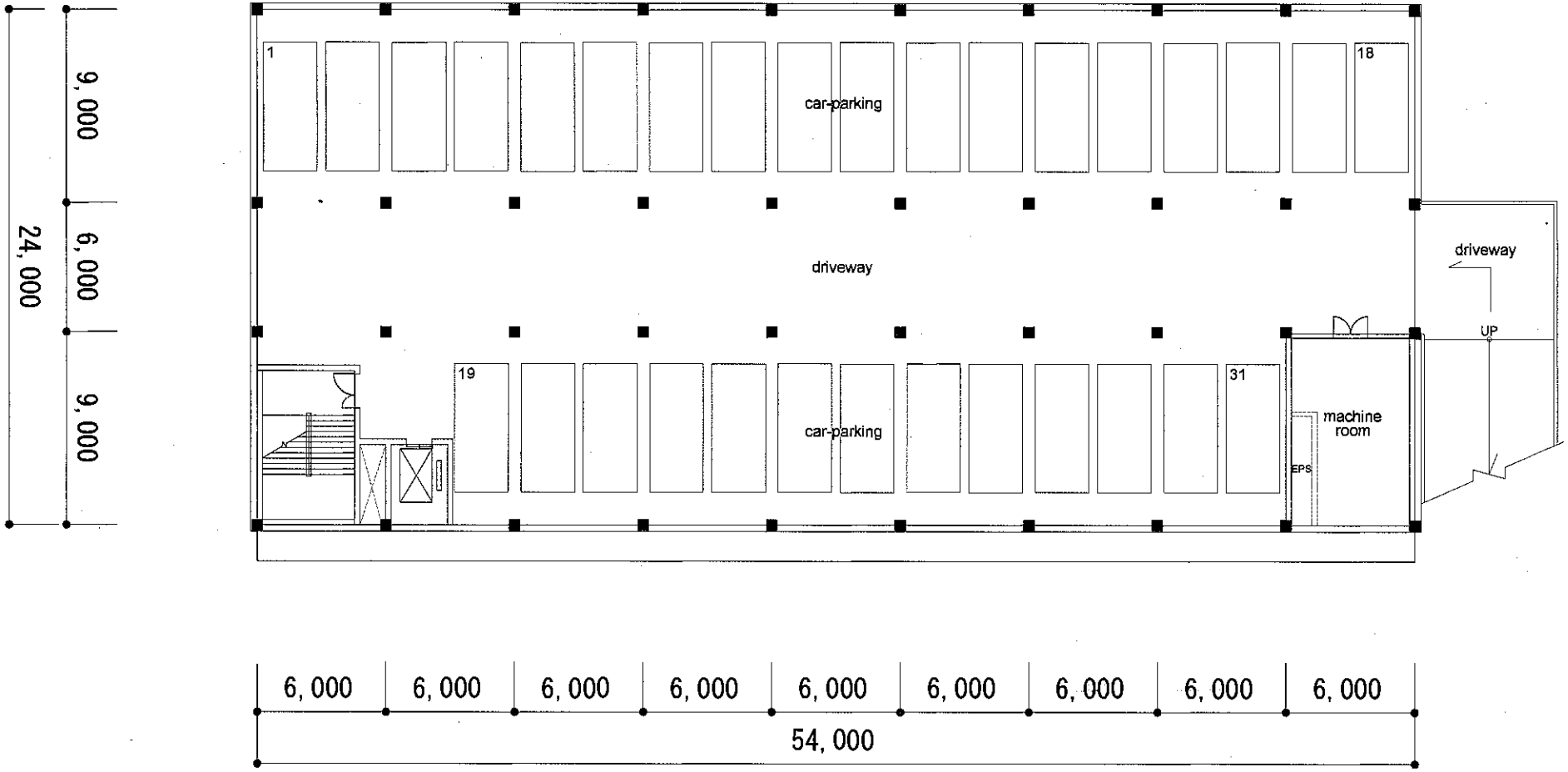
Car Parking - 63 spots
Motorbike Parking - 64 spots

Ground Floor - 810m² Base & 1st - 3rd Floor - 1296m² Machine building - 90m² =Total 6084m²

OPD Building Site Plan

2013.03.11

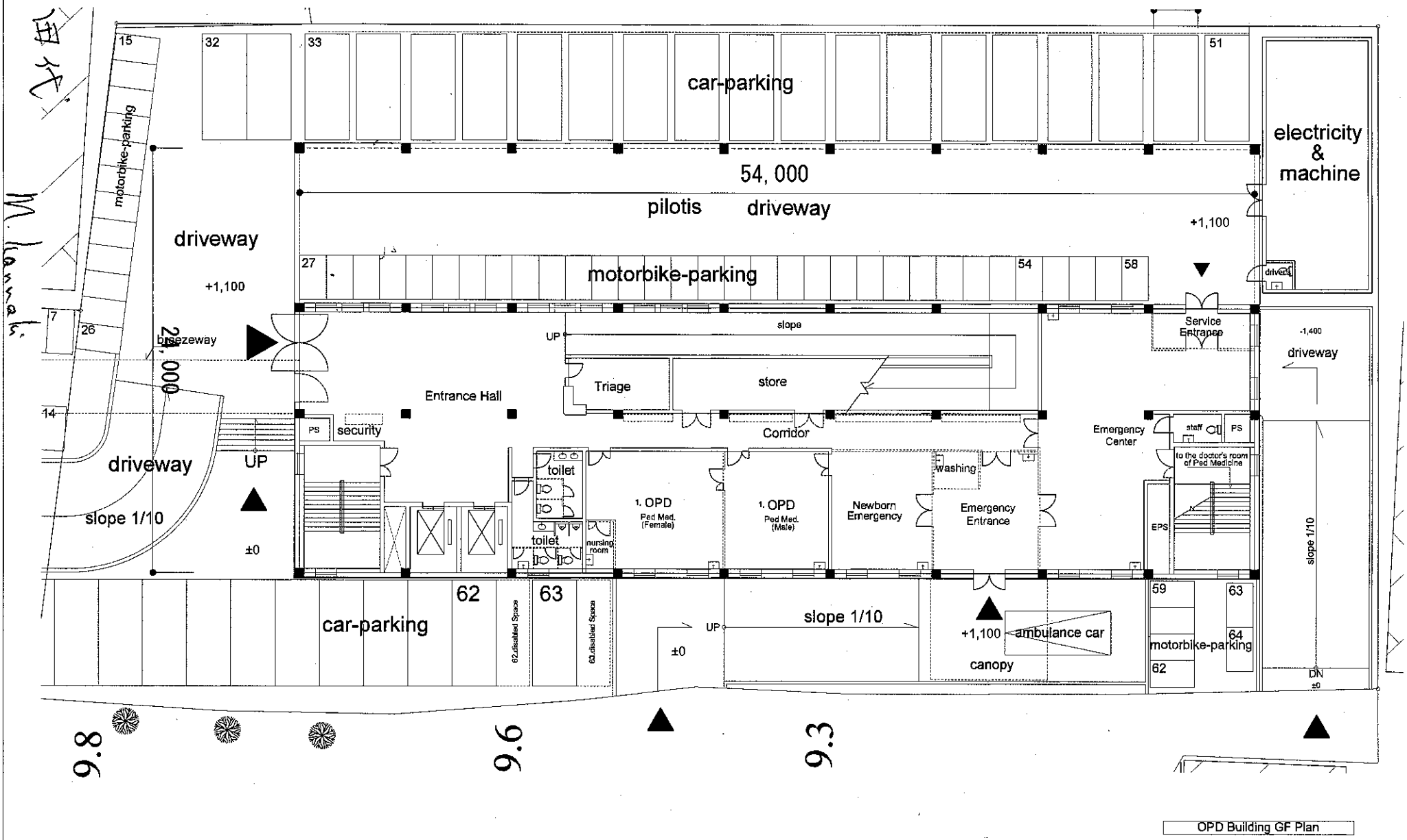
YOKOGAWA ARCHITECTS & ENGINEERS,INC.	YAMASHITA SEKKEI INC. ARCHITECTS, ENGINEERS &CONSULTANTS.	THE PROJECT FOR THE IMPROVEMENT OF OP & DIAGNOSIS SERVICE FOR THE INSTITUTE OF CHILD HEALTHE AND HOSPITAL FOR CHILDREN EGMORE, CHENNAI TAMIL NADU	TITLE OPD Center Building Block PLAN (F)	Number of Drawing F-01
				Scale Non-Scal



OPD Building Basement Floor Plan

2013.03.11

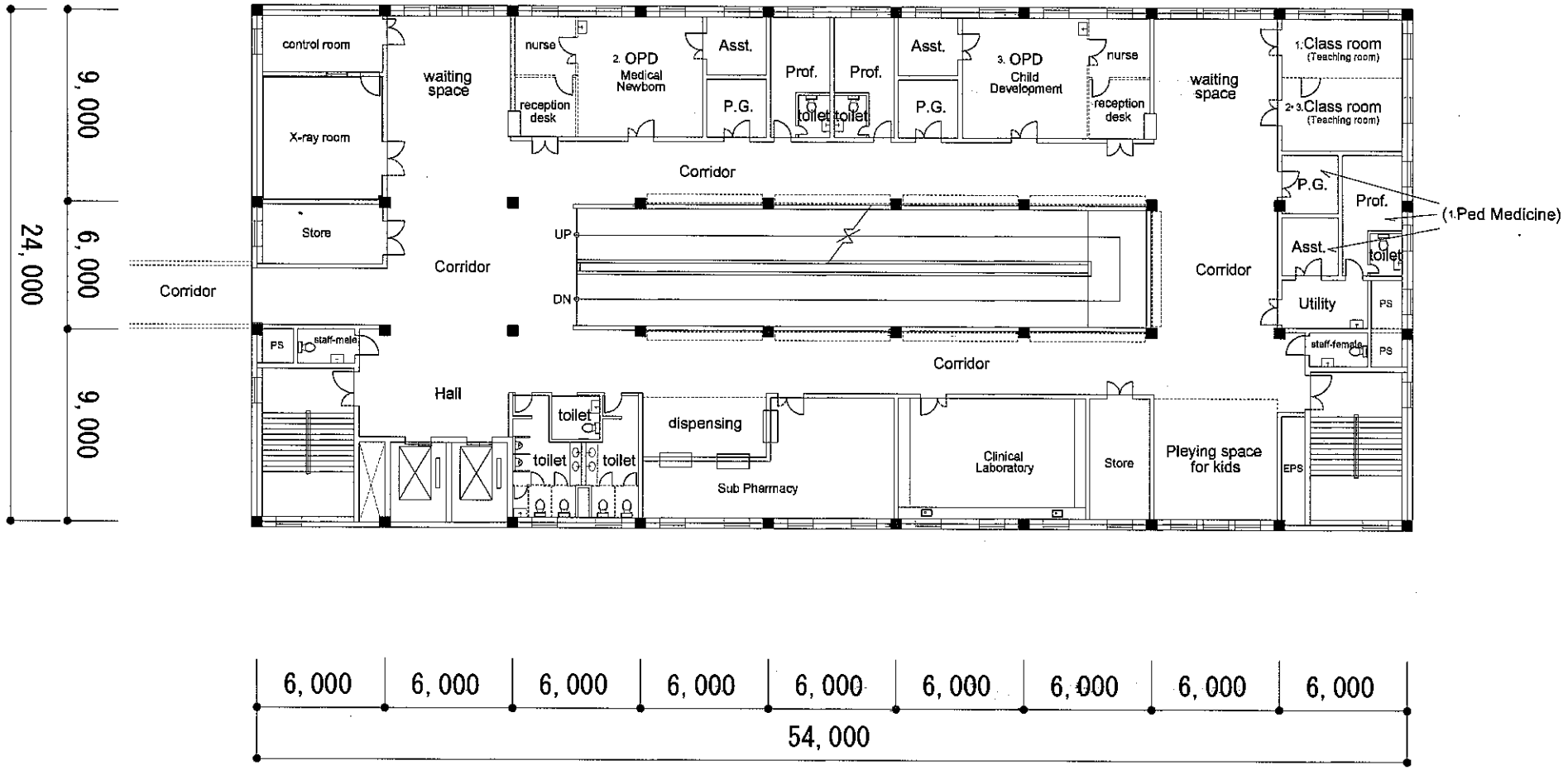
YOKOGAWA ARCHITECTS & ENGINEERS,INC.	YAMASHITA SEKKEI INC. ARCHITECTS, ENGINEERS &CONSULTANTS.	THE PROJECT FOR THE IMPROVEMENT OF OP & DIAGNOSIS SERVICE FOR THE INSTITUTE OF CHILD HEALTHE AND HOSPITAL FOR CHILDREN EGMORE, CHENNAI TAMIL NADU	TITLE: OPD Center Building Block PLAN (F)	Number of Drawing: F-02 / Scale: Non-Scal



OPD Building GF Plan

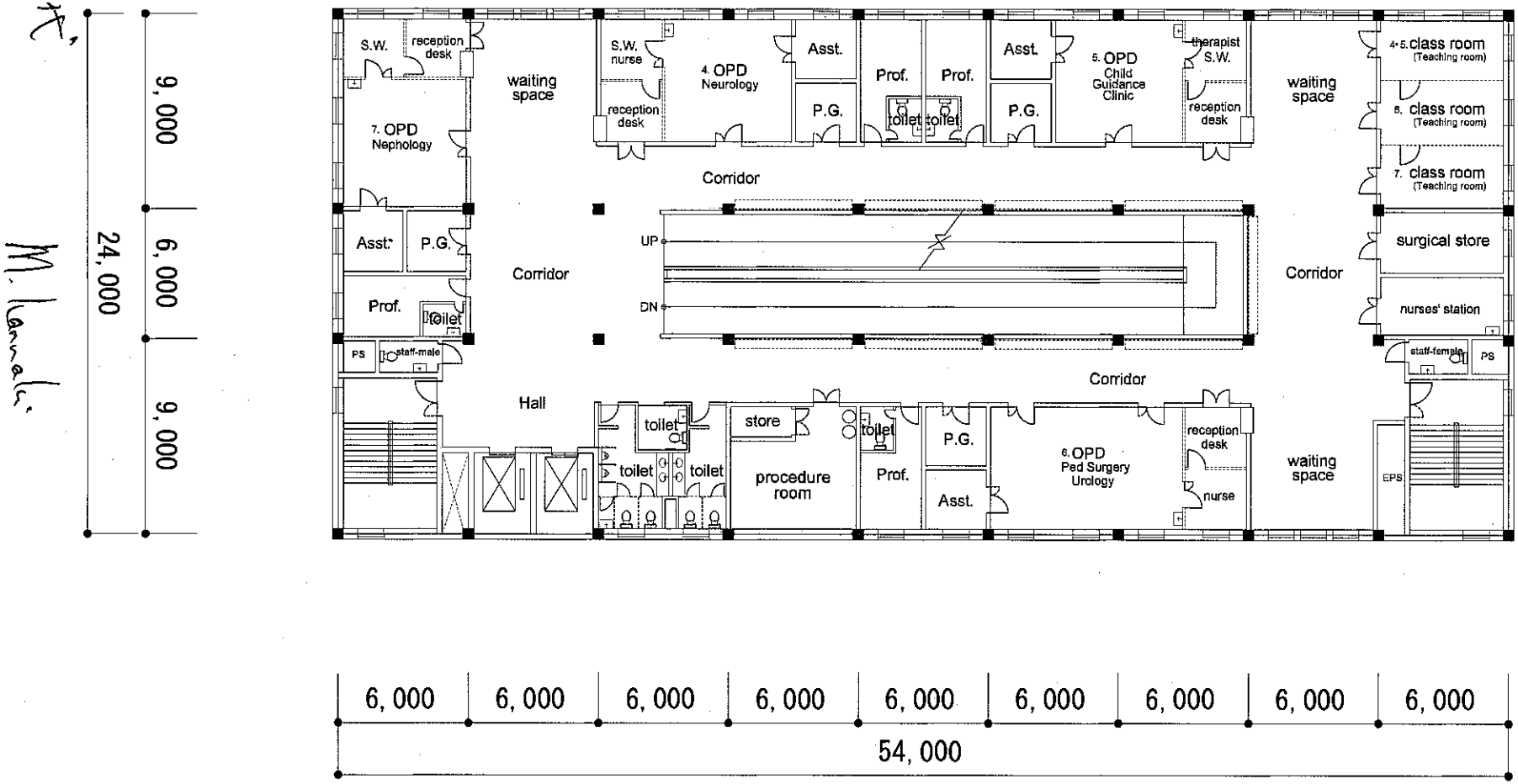
2013.03.11

YOKOGAWA ARCHITECTS & ENGINEERS,INC.	YAMASHITA SEKKEI INC. ARCHITECTS, ENGINEERS &CONSULTANTS.	THE PROJECT FOR THE IMPROVEMENT OF OP & DIAGNOSIS SERVICE FOR THE INSTITUTE OF CHILD HEALTHE AND HOSPITAL FOR CHILDREN EGMORE, CHENNAI TAMIL NADU	TITLE OPD Center Building Block PLAN (F)	Number of Drawing F-03 Scale Non-Scal



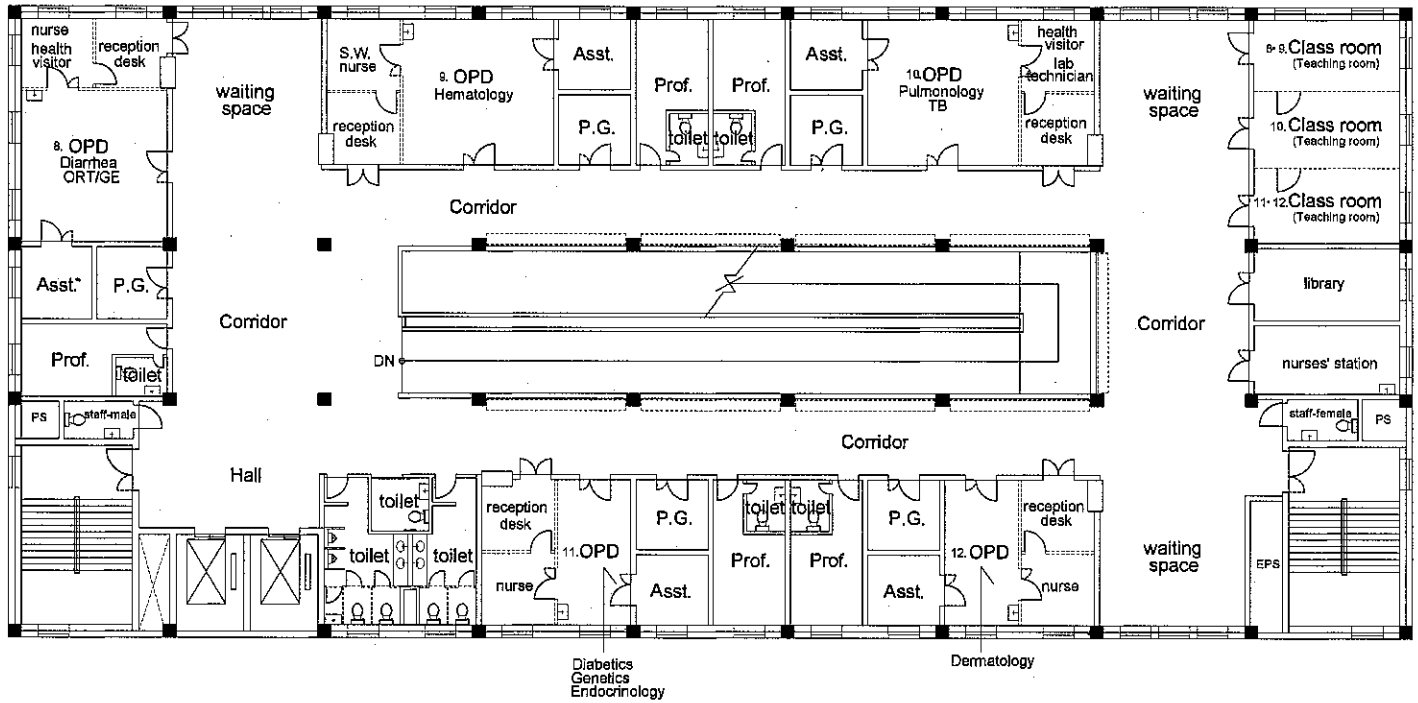
OPD Building 1F Plan

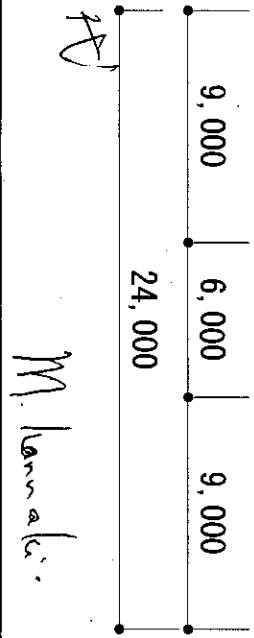
YOKOGAWA ARCHITECTS & ENGINEERS,INC.	YAMASHITA SEKKEI INC. ARCHITECTS, ENGINEERS &CONSULTANTS.	THE PROJECT FOR THE IMPROVEMENT OF OP & DIAGNOSIS SERVICE FOR THE INSTITUTE OF CHILD HEALTHE AND HOSPITAL FOR CHILDREN EGMORE, CHENNAI TAMIL NADU	TITLE: OPD Center Building Block PLAN (F)	2013.03.11 / Number of Drawing: F-04 / Scale: Non-Scal

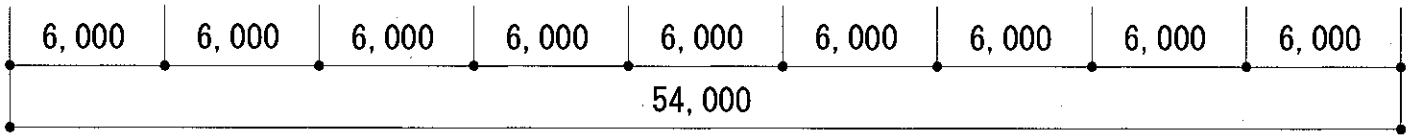


OPD Building 2F Plan

YOKOGAWA ARCHITECTS & ENGINEERS,INC.	YAMASHITA SEKKEI INC. ARCHITECTS, ENGINEERS &CONSULTANTS.	THE PROJECT FOR THE IMPROVEMENT OF OP & DIAGNOSIS SERVICE FOR THE INSTITUTE OF CHILD HEALTHE AND HOSPITAL FOR CHILDREN EGMORE, CHENNAI TAMIL NADU	TITLE: OPD Center Building Block PLAN (F)	2013.03.11 / Number of Drawing: F-05 / Scale: Non-Scal







OPD Building 3F Plan

YOKOGAWA ARCHITECTS & ENGINEERS,INC.	YAMASHITA SEKKEI INC. ARCHITECTS, ENGINEERS &CONSULTANTS.	THE PROJECT FOR THE IMPROVEMENT OF OP & DIAGNOSIS SERVICE FOR THE INSTITUTE OF CHILD HEALTHE AND HOSPITAL FOR CHILDREN EGMORE, CHENNAI TAMIL NADU	TITLE: OPD Center Building Block PLAN (F)	2013.03.11 / Number of Drawing: F-06 / Scale: Non-Scal

TECHNICAL NOTE

Preparatory Survey Phase 2 on the Project for Improvement of the Institute of Child Health and Hospital for Children, Chennai, India

The Institute of Child Health and Hospital for Children, Chennai and the JICA Preparatory Survey Team held discussions on the land to be earmarked for the proposed new OPD and both parties confirmed the items described in the following:

1 Background

1.1 In response to a request from the Government of India, No.F.1/2/2009-Jap-II, Japan International Cooperation Agency (JICA) conducted a Preparatory Survey on the Project for Improvement of the Institute of Child Health and Hospital for Children in the course from February 10 to March 11, 2013.

1.2 Minutes of Discussions on the above mentioned Survey was mutually agreed on March 1, 2013, with Ministry of Health and Family Welfare, The Government of India; Department of Health and Family Welfare, the Government of Tamil Nadu; the Institute of Child Health and Hospital for Children, and the JICA Preparatory Survey Team.

1.3 The Chennai Metropolitan Development Authority were contacted by the Japanese Team for the construction of the Proposed New Out patient Department under grant in aid as per the latest norms;-

1.4 The area initially assigned will not be adequate to construct the proposed out patient department with functions agreed at Minutes of Discussions dated March 1, 2013. Hence it is necessary to alter the existing area by extending the area for construction and set backs as per the narrative description of the confirmed site referred under 3. to 3.5. The land required is 3,197 m2.

2 Result of Land-Survey

2.1 The JICA Preparatory Survey Team conducted land-survey to measure necessary land to build new OPD as per norms.

2.2 With the basis of the results of the land-survey report dated March 20, 2013, construction site is confirmed, as clarified in **Paragraph 3** and **Annexe 1**.

3 The narrative descriptions of the confirmed site, which are necessary to build the new OPD under the Project for Improvement of the Institute of Child Health and Hospital for Children, are as follows:

3.1 Northeast: the northeast boundary limit of the car parking (16 cars) lies at the distance of 11.05 m - 9.29 m from MMC Ladies Hostel of IOG.

Mk

3.2 Southeast: the southeast boundary lies at the distance of 0.82 m from the Manifold Room of Institute of Obstetrics and Gynaecology & Govt. Hospital for Women and Children (IOG).

3.3 Southwest: the southwest boundary facing visitors' entrance and ambulance car parking lies at the distance of 5.13 m – 4.00 m from the Medical Store of IOG and 4.61 m – 7.82 m from the Laundry of IOG.

3.4 Northwest: the boundary limit at the entrance of the slope to the basement car parking lies at the distance of 6.59 m from the G+9 Building of ICH.

3.5 North: the north boundary lies at the distance of 2.26 m – 4.48 m from the adjacent Private apartment building.

4. Facilities existing in the construction site, which should be dismantled and removed from the site, are shown in **Annexe 3**.

5. The Institute of Child Health and Hospital for Children, Chennai and the JICA Preparatory Survey Team agreed on the construction site given in **Paragraph 3**, **Annexe 1.** and **Annexe 2.**

April 13, 2013

M Kannaki

Dr. M. Kannaki
Director and Superintendent I/C,
Institute of Child Health and Hospital for Children, Chennai
Tamil Nadu
India

田村正一

Shoichi Tashiro
Deputy Project Manager of the Consultant Team
JICA Preparatory Survey Team

Annexe 1

PROPOSED O.P.D. BUILDING SITE PLAN

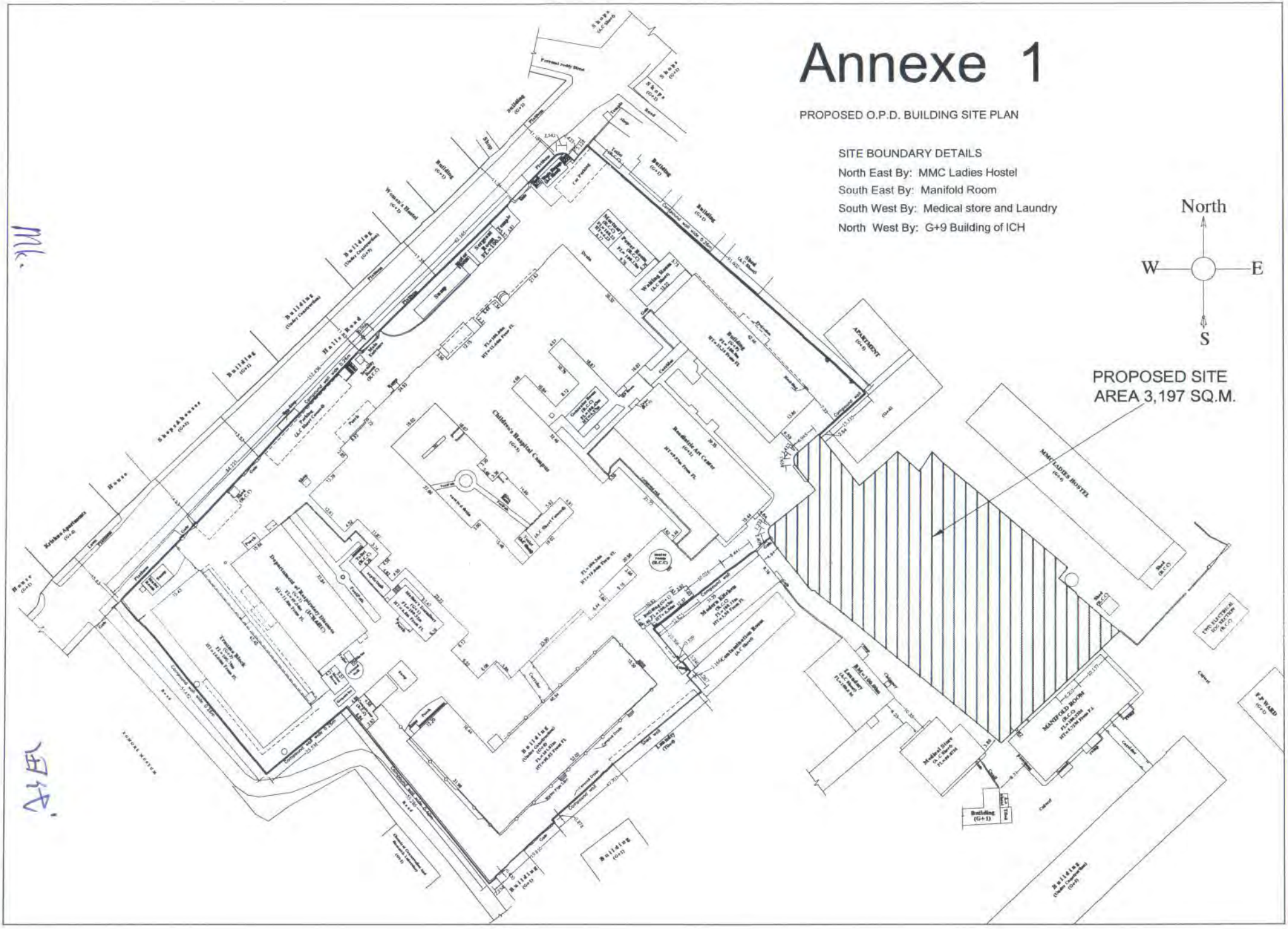
SITE BOUNDARY DETAILS

North East By: MMC Ladies Hostel

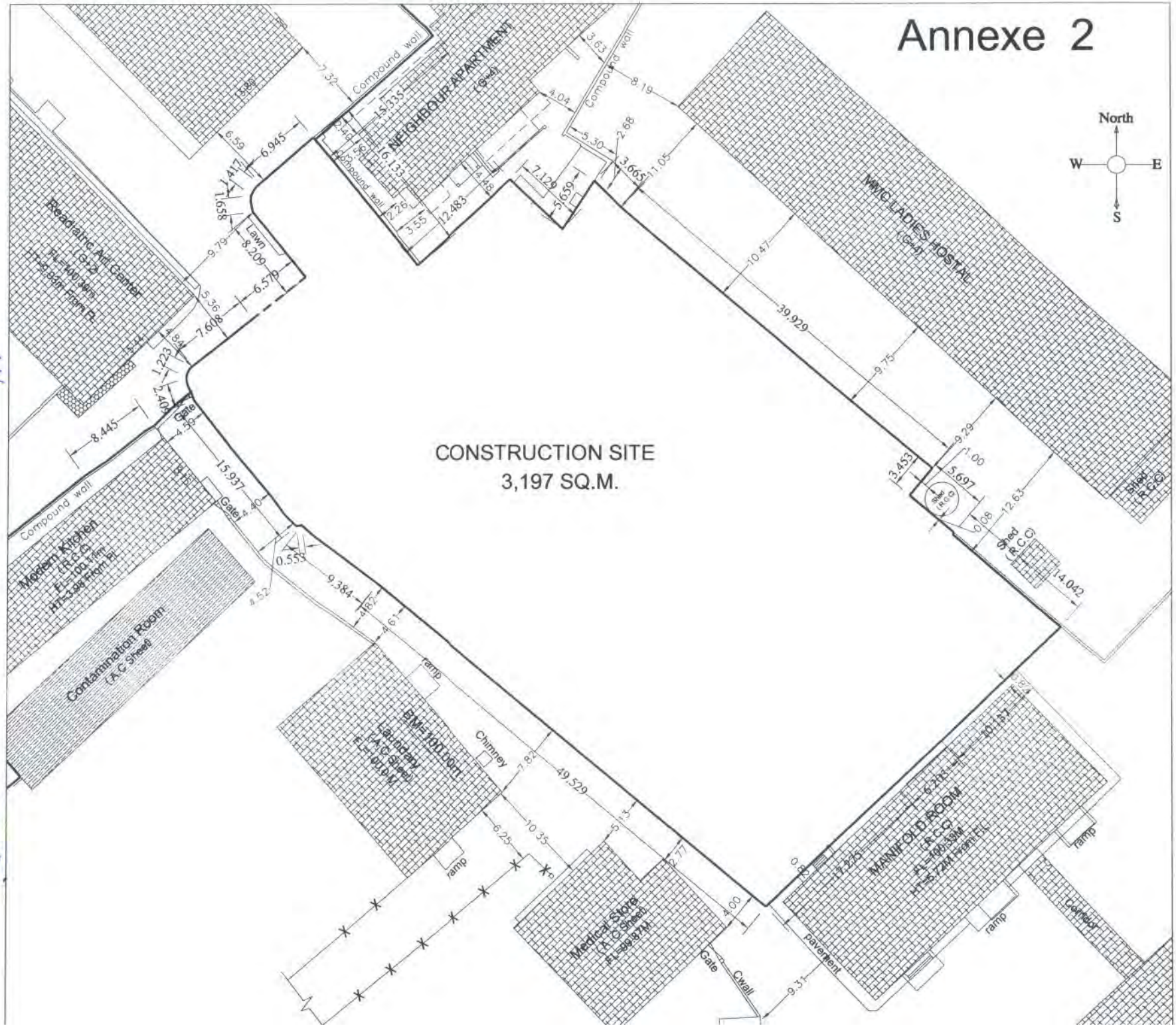
South East By: Manifold Room

South West By: Medical store and Laundry

North West By: G+9 Building of ICH

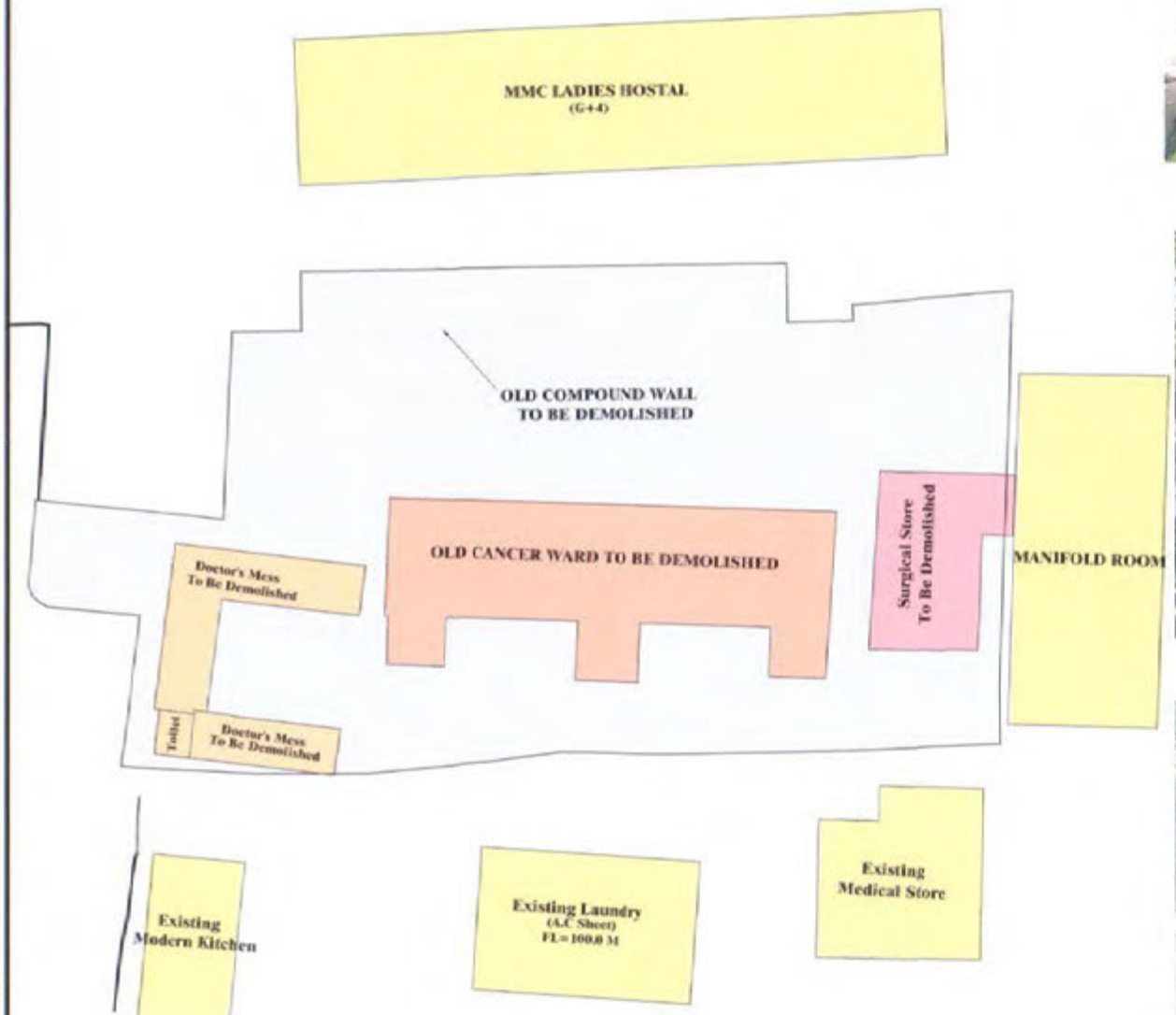


Annexe 2


CONSTRUCTION SITE
3,197 SQ.M.
6 NEIGHBOUR APARTMENT (G+4)
MWC LADIES HOSTAL (G+4)
Readiatric Art Center (G+2)
Modern Kitchen (R.C.C)
Contamination Room (A.C Sheet)
Laundary (A.C Sheet)
Medical Store (A.C Sheet)
MANIFOLD ROOM (R.C.C)
Shed (R.C.C)
Compound wall
Gate
Gate1
Lawn
Chimney
ramp
pavement
Cwall
Corridor
North
W
E
S

Annexe 3

SITE PLAN SHOWING THE BUILDINGS TO BE DEMOLISHED FOR CONSTRUCTING NEW OPD BLOCK



OLD SURGICAL STORE

OLD CANCER WARD

DOCTOR'S MESS

TECHNICAL NOTE

Preparatory Survey Phase 3on the Project for Improvement of the Institute of Child Health and
Hospital for Children, Chennai, India

The Institute of Child Health and Hospital for Children (ICH), Chennai and the JICA Preparatory Survey Team held discussions on the clinical departments for the proposed new OPD and both parties confirmed the items described in the following:

1. The clinical departments of the planned new OPD building are modified as shown in Annex1 as against those, which are attached to the Minutes of Discussions signed on 1st March 2013.
2. Two large classrooms for 70~80 students shall be built in the new OPD building and a classroom for 15-20 students shall be built on the ground floor.
3. Three departments (Diabetics, Genetics and Endocrinology) shall share one room.
4. Considering rare incidence of contagious cases, space for Tuberculosis control shall be included as a separate room in the Pulmonology department.
5. Considering convenience of patients, nutrition department should be located next to the Gastroenterology department
6. Integrated Counseling and Testing Centre for HIV/AIDS, the immunization cell, adolescent clinic, school health program and rheumatology departments shall also be located in the new proposed OPD.
7. The equipment list defined by the JICA Preparatory Survey Team was shared as the current proposed list including a vehicle for patients transfer between ICH buildings. The vehicle was proposed instead of connection corridor planned for the same purpose (Annex.2). Further modification may be made keeping in view the results of the analysis by the Team.
8. The current changes proposed to the location of the clinical departments within the OPD are the final modifications and any further modification of clinical departments shall not be taken in to consideration although there will be minor modifications in the location and space of each department due to the effective design of the new OPD.

May 17, 2013

Dr. Mitsuo Isono
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Dr. M. Kannaki
Director and Superintendent
Institute of Child Health and Hospital for Children, Chennai
Tamil Nadu, India

ANNEXE-1 List of clinical departments for new OPD building

May 16, 2013

No	Departments	Agreed departments in March, 2013		Modified in May, 2013	
		New building	Old building	New Building	Old building
1	Ped Medicine	●		●	
2	Medical Newborn(Neonatology)	●		●	
3	Child Development Clinic (CDC)	●		●	
4	Neurology	●		●	
5	Child Guidance Clinic (CGC)	●		●	
6	Ped Surgery /Urology Procedure room	●		●	
7	Nephology	●		●	
8	ORT//Diarrhea/GE	●		●	
9	Hematology	●		●	
10	Pulmonology/TB	●		●	
11	Diabetics Genetics Endocrinology	●		●	
12	Dermatology	●		●	
13	Clinical Laboratory	●		●	
14	Emergency(<30days) Emergency(>30days)	●		●	
15	Prof/A. Prof./ PG's room	●		●	
16	Class rooms (Mandatory)	●		●	
17	Sub Pharmacy	●		●	
18	Operation Theater		●		●
19	PICU/NICU		●		●
20	Cardiology/ECO/ECG		●		●
21	Dental Clinic		●		●
22	Nutrition		●	●	
23	Physiotherapy		●		●
24	ENT		●		●
25	Immunization/VPD		●	●	
26	School Education Cell		●	●	
27	ART		●		●
28	ICTC			●	
29	Ayurveda/Yoga		●		●
30	Blood Bank		●		●
31	Cardio thoracic		●		●
32	Rheumatology		●	●	
33	Palliative Care		●		●
34	Orthopedic Surgery		●		●
35	Radiology		●		●
36	CT		●		●
37	USG	●		●	
38	Adolescence			●	

Annex 2

Equipment List

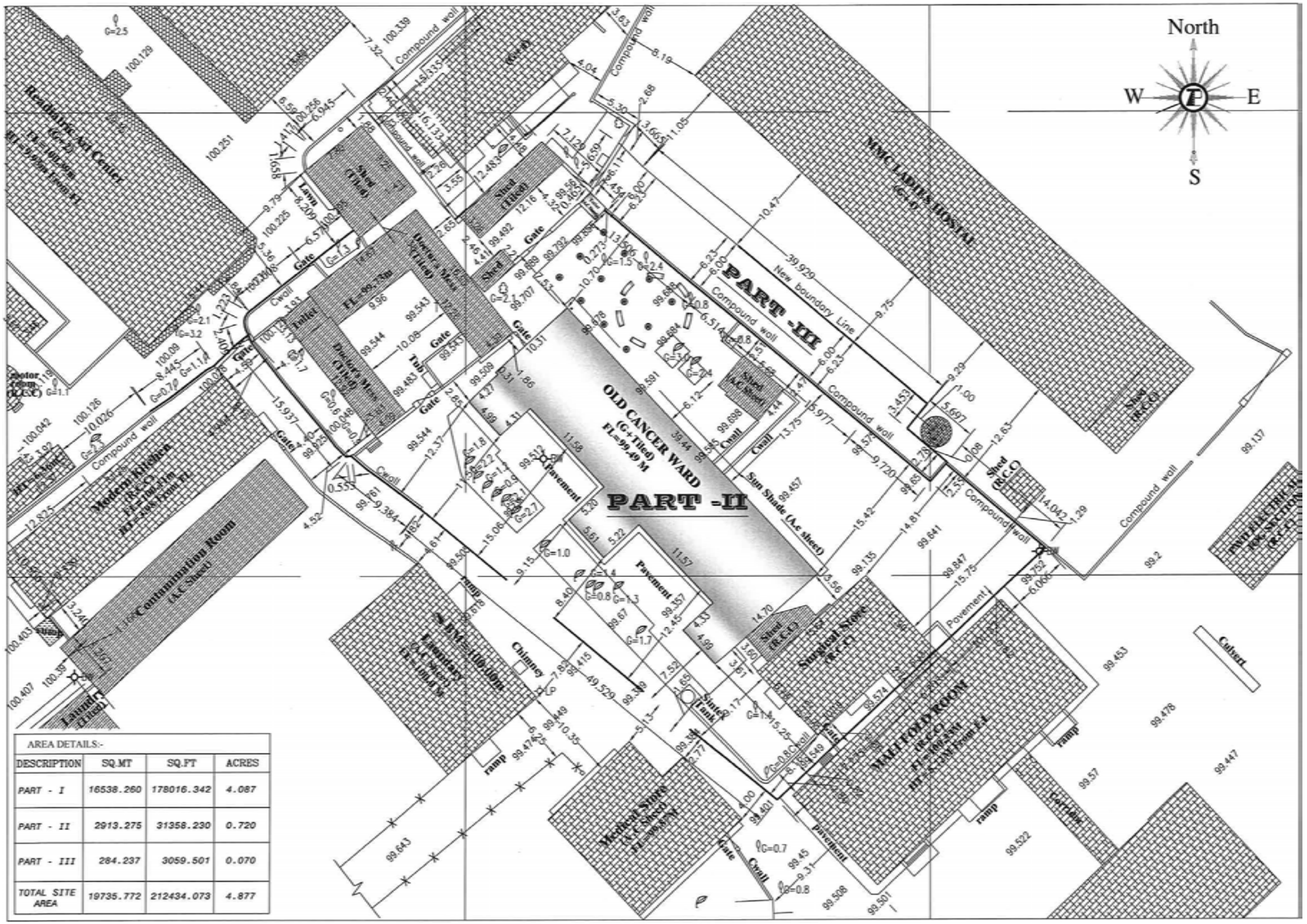
Cord No.	Department	Room	Description	Q'ty Requested	Q'ty Procured	Priority	Q'ty Supplie
1	Emergency	Pediatrics	Infant warmer	2	2	A	2
2	Emergency	Pediatrics	Multi channel monitor	5	4	A	4
3	Emergency	Pediatrics	Syringe pump	15	4	A	4
4	Emergency	Pediatrics	Infusion pump	5	4	A	4
5	Emergency	Pediatrics	Resuscitation Trolley(Emergency Cart)	5	1	A	1
6	Emergency	Pediatrics	Pulse oxymeter	6	2	A	2
7	Emergency	Pediatrics	Ventilator(for infant)	1	1	A	1
8	Emergency/ECG ECO	Pediatrics	Ultrasound scanner, echo portable	1	1	A	1
9	Emergency	Pediatrics	ECG, portable	1	1	A	1
10	Emergency/Pediatric Medicine/Neonatology/Cardiology	Pediatrics	Defibrillator	4	1	A	1
11	Emergency/Neonatology(NICU)	Pediatrics	Mobile x-ray unit(digital)	0	1	A	1
12	Pediatric surgery	Emargency OT	Operation table(for pediatric)	4	2	B	1
13	Pediatric surgery	Emargency OT	Mobile operating light(LED)	3	2	B	1
14	Pediatric surgery	Emargency OT	High pressure steam sterilizer (Approx.30L)	0	1	B	0
15	Pediatric surgery	Emargency OT	Treatment Instrument sets	0	2	B	1
16	Pediatric surgery	Emargency OT	Suction machine	2	2	B	1
17	Pediatric surgery	Emargency OT	Pediatric laparoscope set	1	1	B	1
18	Pediatric surgery	Emargency OT	Blanket warmer	1	1	B	0
19	Anesthesiology	Emargency OT	Anesthesia machine with ventirator	10	2	B	0
20	Neonatology	ER	Transport incubator with ventilator	3	1	A	1
21	Neonatology/Biochemistry	Satelite Lab OP	Bilirubin analyzer with centrifuge	1	1	A	1
22	Neonatology	NICU	Infant warmer	10	5	B	5
23	Neonatology	NICU	Infusion pump	10	5	B	5
24	Neonatology	NICU	Syringe pump	10	5	B	5
25	Neonatology	NICU	Nerve stimulator	1	1	A	0
26	Neonatology	NICU	Phototherapy unit LED	5	5	A	2
27	Neonatology	NICU	Pulse oxymeter	10	2	B	2
28	Neonatology/Biochemistry/Nephrology	NICU	Blood gas analyzer	1	1	B	0
29	Child Development Clinic	OP	Bayley infant scale of development kit	2	1	A	1
30	Child Development Clinic	OP	Infantmeter (height & weight) cot type	2	1	A	1
31	Child Development Clinic	IP	Resuscitation bag for neonate	2	2	B	0
32	Pulmonology/Anesthesiology	IP	Bronchoscope with video	3	1	B+	1
33	ORT/Diarrhea/GE	Endoscopy room	Gastroscope with video	1	1	B+	1
34	ORT/Diarrhea/GE	Endoscopy room	Colonoscope with video	1	1	B+	1
35	ORT/Diarrhea/GE	Endoscopy room	Esophagogastroduodenoscope(with side camera)	1	1	B	0
36	Nephrology	IP	Hemodyalisis machine	3	1	A	1
37	Neurology	OP,IP	EMG machine	1	1	A	1
38	Neurology/Neonatology/Child Development Clinic /Child Guidance Clinic/ENT	OP,IP	EEG machine(O.A.E,BERA)	5	1	A	1
39	Child Guidance Clinic	OP	Psychological test(10set)	10	1	A	1
40	Physiotherapy	Physiotherapy	Electrical stimrator	2	1	A	1
41	Physiotherapy	Physiotherapy	Wax therapy	1	1	B	0
42	Physiotherapy	Physiotherapy	Ultrasonic therapy	2	1	A	1
43	Physiotherapy	Physiotherapy	Cycle for children	1	1	B	0
44	Physiotherapy	Physiotherapy	Balance board	1	1	A	1
45	Physiotherapy	Physiotherapy	CPM(continuous passive motion unit)	1	1	B	0
46	Physiotherapy	Physiotherapy	Peg board	1	1	A	1
47	Pharmacy OPD	OP	Medicine refrigerator	1	1	A	1
48	Pharmacy OPD	OP	Medicine cabinet	0	2	A	2
49	Microbiology Lab	Laboratory	Automated blood culture system	1	1	B+	1
50	Pathology Lab	Laboratory	Microtome	1	1	A	1
51	Pathology Lab	Laboratory	Tissue processor	1	1	B	0
52	Biochemistry/Hematology	Laboratory	Blood coagulation apparatus fully automated	0	1	A	1
53	Blood bank/Genetics	Laboratory	Refrigerator centrifuge	3	1	A	1
54	Biochemistry	Laboratory	Fully automated chemistry analyzer	1	1	A	1
55	Biochemistry	Laboratory	Illuminate Hormonn analyzer	1	1	A	1
56	Biochemistry	Laboratory	Electrolyte analyzer	1	1	A	1
57	Biochemistry	Laboratory	Tandem mass spectrometer for metabolic syndrome	1	1	B	1
58	Biochemistry	Laboratory	PH merter	1	1	A	1
59	Biochemistry	Laboratory	UV spectrophotmeter	1	1	A	1
60	Biochemistry	Laboratory	Electro phoresis Apparatous	1	1	A	1
61	Biochemistry	Satelite Lab OP	Distillation plant	1	1	A	1
62	Biochemistry	Satelite Lab OP	Laboratory refrigerator	3	1	A	1
63	Biochemistry	Satelite Lab OP	Centrifuge	1	1	A	1
64	Biochemistry	Satelite Lab OP	Urine analyzer	1	1	A	1
65	Biochemistry	Satelite Lab OP	Semi automated chemistry analyzer	1	1	A	1
66	Pathology Lab	Satelite Lab OP	Automatic Blood cell counter	2	1	A	1
67	Pathology Lab/Neonatology/Nephrology	Satelite Lab OP	Microscope Binocular	6	1	A	1
68	Radiology	X-ray room	Digital X-ray unit	1	1	B	1
69	ECG ECO/Neonatology	IP	ECG(12channel)	3	1	B	1
70	-	-	Vehicle for patients transportation	1	1	A	1
71	Each dep	IP	Oxygen flow meter and humidifier	0	26	A	42
72	Each dep.	OP/IP	Automatic Voltage Stabilizer 0.5KVA				35
73	Each dep.	OP/IP	Automatic Voltage Stabilizer 1KVA				11
74	Each dep.	OP/IP	Automatic Voltage Stabilizer 2KVA				5
75	Each dep.	OP/IP	Automatic Voltage Stabilizer 5KVA				0
76	Each dep.	OP/IP	Automatic Voltage Stabilizer 80KVA				1
77	Each dep.	OP/IP	UPS 0.5KVA				1

Annex 2

Equipment List							
Cord No.	Department	Room	Description	Q'ty Requested	Q'ty Procured	Priority	Q'ty Supplied
78	Each dep.	OP/IP	UPS 1KVA				0
79	Each dep.	OP/IP	UPS 2KVA				4
80	Each dep.	OP/IP	UPS 5KVA				0

Appendix 6 Other Relevant Data

6-1 Topographic Map



AREA DETAILS:-			
DESCRIPTION	SQ.MT	SQ.FT	ACRES
PART - I	16538.260	178016.342	4.087
PART - II	2913.275	31358.230	0.720
PART - III	284.237	3059.501	0.070
TOTAL SITE AREA	19735.772	212434.073	4.877

GEOTECHNICAL INVESTIGATION REPORT

for New Hospital building in and around the premises of the Institute of Child Health and Hospital for Children, Egmore, Chennai.

EXECUTIVE SUMMARY

M/s.Yokogawa Architecs & Engineers, Inc., Tokyo, Japan are associated in the construction of a New Hospital building within the existing premises of the Institute of Child Health and Hospital for Children, Egmore, Chennai.

The site for the proposed hospital building is within the existing premises of Institute of child Health and Hospital for Children, Egmore, Chennai. The site is fairly level. Vegetation in the form of bushes and shrubs were observed at the site during the period of field investigations.

The proposed structure is New Hospital building comprising of ground floor and five upper floors.

Geotechnical investigations have been undertaken at the site as per the scope of investigations, stipulated by the client, which consisted of three boreholes down to 25m depth including refusal/rock strata (where N value is >75).

The subsoil strata consists of filled up soil (soil with brickbats) down to 1.2m in borehole no.1, 1.3m depth in borehole no.2 and 3.2m depth in borehole no.3 from the existing ground level followed by virgin soil. The virgin soil comprises of sand, silt and clay in varying proportions. The refusal strata in the form of weathered rock (Granite Gneiss Based) is available between 15.0 and 16.5m depth. The virgin soil down to 12m depth is in a soft state with N values varying between 2 and 8 at the location of borehole no 3. The N values varies between 2 and 32 in the top 12m depth and increase to >75 between 15 and 16.5m depth.

Ground water table had been encountered between 6.8 and 7.1m depth in the boreholes during the period of field investigations.

G(C)8304

For these subsoil conditions the superstructure can be safely rested on pile foundations. The piles can be terminated after embedding the pile atleast 2 times the diameter of piles in refusal strata (weathered rock). The cutoff level of the piles has been considered as 2m below the existing ground level. The refusal strata was encountered between 15 and 16.5m depth. Hence, the effective length of the piles will be about 17m. The load carrying capacity of different diameter piles are given below:

Dia of Pile (mm)	Load Carrying Capacity (t)	Uplift Capacity (t)	Lateral Capacity for (t)	
			Free Head	Fixed Head
450	105	45	0.4	1.05
500	130	55	0.45	1.25
600	190	80	0.6	1.65
750	290	130	0.9	2.4
900	425	190	1.2	3.2

SOIL PROFILE

Project: New Hospital building in and around the premises of the Institute of child Health and Hospital for Children, Egmore, Chennai.

B.H. Location: | Water Table: 6.8m | Term. Depth : 25m | B.H. No. : 1

N - Value#	Depth (m)	Soil Description	Grain Size Analysis				Atterberg Limits		In-situ properties		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density* (g/cm^3)	Water Cont (%)	Type	c (kg/cm^2)	Φ (°)
	0.0	Ground level Filled up soil (0.0 to 1.2m - Soil with brickbats)											
	1.5	Brown Sandy silty clay											
7	2.0	Brown Sandy silty clay	0	15	32	53	50	26					
	2.5	Brown Sandy silty clay							1.81	12.63	CD	0.31	14
8	3.0	Brown Sandy silty clay	0	17	33	50	47	25					
5	4.0	Brownish grey Sandy silty clay											
	4.5	Brownish grey Sandy silty clay							Sample slipped				
	4.6	Change of strata											
7	5.0	Grey clayey silty sand	0	37	34	29	35	18					
	5.5	Grey clayey silty sand							1.86	12.13	CD	0.19	22
8	6.0	Grey clayey silty sand											
	6.7	Change of strata											
12	7.0	Brown silty sand	0	82	18	0	-	NP					
	7.5	Brown silty sand											
16	8.0	Brown silty sand											
20	9.0	Grey silty sand	0	85	15	0	-	NP					
27	10.0	Grey silty sand											
32	12.0	Grey silty sand											
39	13.5	Grey silty sand	0	88	12	0	-	NP					
51	15.0	Grey silty sand											
>75 (110/ 20cm)	16.5	Weathered rock (Granite Gneiss Based)									D	-	39

*-Natural Bulk Density # -N Values (Observed)

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ROCK PROFILE

Project : New Hospital building in and around the premises of the Institute of child Health and Hospital for Children, Egmore, Chennai.

Location :

B.H. Size :

Water Table (m): 6.8

Term. Depth (m): 25

B.H. No. : 1

Depth (m)	Strata Description	No. of Core Pieces of Size (cm)	Core Recovery (%)	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
16.5	Weathered rock										
18.0	Weathered rock		NIL	NIL							
19.5	Weathered rock		NIL	NIL							
21.0	Weathered rock		NIL	NIL							
22.5	Weathered rock		12	NIL		2.66	0.08	0.09		605	
24.0	Weathered rock		21	NIL		2.69	0.10	0.11		685	
25.0	Weathered rock		33	12		2.68	0.08	0.08	653	766	

Core Recovery (%): 100, 80, 60, 40, 20

No. of Core Pieces of Size (cm): >75, 25-75, 10-25, <10

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1A

SOIL PROFILE

Project: New Hospital building in and around the premises of the Institute of child Health and Hospital for Children, Egmore, Chennai.

B.H. Location: | Water Table: 7.1m | Term. Depth : 25m | B.H. No. : 2

N - Value#	Depth (m)	Soil Description	Grain Size Analysis				Atterberg Limits		In-situ properties		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density* (g/cm^3)	Water Cont (%)	Type	c (kg/cm^2)	Φ (°)
	0.0	Ground level Filled up soil (0.0 to 1.3m - Soil with brickbats)											
	1.5	Brown Sandy silty clay											
6	2.0	Brown Sandy silty clay	0	17	33	50	45	25					
	2.5	Brown Sandy silty clay							1.78	14.16	CD	0.30	13
6	3.0	Brown Sandy silty clay											
10	4.0	Brown Sandy silty clay											
	4.5	Brown Sandy silty clay							1.84	12.84	CD	0.29	15
9	5.0	Brown Sandy silty clay	0	16	36	48	43	24					
	5.6	Change of strata											
12	6.0	Grey silty sand											
16	7.0	Grey silty sand	0	83	17	0	-	NP					
20	8.0	Grey silty sand											
26	9.0	Brown silty sand	0	81	19	0	-	NP					
29	10.0	Brown silty sand											
31	12.0	Grey silty sand											
33	13.5	Grey silty sand	0	84	16	0	-	NP					
37	15.0	Grey silty sand											
>75 (50/ 8cm)	16.5	Weathered rock (Granite Gneiss Based)									D	-	38
>75 (60/ 7cm)	18.0	Weathered rock (Granite Gneiss Based)											

*-Natural Bulk Density # -N Values (Observed)

ROCK PROFILE

Project : New Hospital building in and around the premises of the Institute of child Health and Hospital for Children, Egmore, Chennai.

Location :

B.H. Size :

Water Table (m): 7.1

Term. Depth (m): 25

B.H. No. : 2

Depth (m)	Strata Description	No. of Core Pieces of Size (cm) >75	No. of Core Pieces of Size (cm) 25-75	No. of Core Pieces of Size (cm) 10-25	No. of Core Pieces of Size (cm) <10	Core Recovery (%)	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
16.5	Weathered rock													
18.0	Weathered rock					NIL	NIL							
19.5	Weathered rock					NIL	NIL							
21.0	Weathered rock					NIL	NIL							
22.5	Weathered rock					9	NIL		2.65	0.10	0.11		645	
24.0	Weathered rock					18	9		2.68	0.08	0.10	589	847	
25.0	Weathered rock					24	14		2.71	0.05	0.08	703	968	

SOIL PROFILE

Project: New Hospital building in and around the premises of the Institute of child Health and Hospital for Children, Egmore, Chennai.

B.H. Location: | Water Table: 7.1m | Term. Depth : 25m | B.H. No. : 3

N - Value#	Depth (m)	Soil Description	Grain Size Analysis				Atterberg Limits		In-situ properties		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density* (g/cm^3)	Water Cont (%)	Type	c (kg/cm^2)	Φ (°)
	0.0	Ground level Filled up soil (0.0 to 3.2m - Soil with brickbats)											
5	4.0	Brown Sandy silty clay	0	20	30	50	46	25					
	4.5	Brown Sandy silty clay							1.78	13.16	CD	0.29	13
5	5.0	Brown Sandy silty clay											
	5.7	Change of strata											
6	6.0	Grey clayey silty sand	0	41	32	27	34	18					
	6.5	Grey clayey silty sand							Sample slipped				
	6.8	Change of strata											
8	7.0	Grey silty sand	0	84	16	0	-	NP			D	-	29
8	8.0	Grey silty sand											
	8.6	Change of strata											
2	9.0	Grey clayey silty sand	0	51	28	21	27	16					
2	10.0	Grey clayey silty sand	0	57	25	18	24	14					
4	12.0	Grey clayey silty sand											
	13.0	Change of strata											
38	13.5	Grey silty sand	0	79	21	0	-	NP					
>75 (118/ 25cm)	15.0	Weathered rock (Granite Gneiss Based)									D	-	38
>75 (65/ 8cm)	16.5	Weathered rock (Granite Gneiss Based)									D	-	40

*-Natural Bulk Density # -N Values (Observed)

ROCK PROFILE

Project : New Hospital building in and around the premises of the Institute of child Health and Hospital for Children, Egmore, Chennai.

Location :

B.H. Size :

B.H. No. : 3

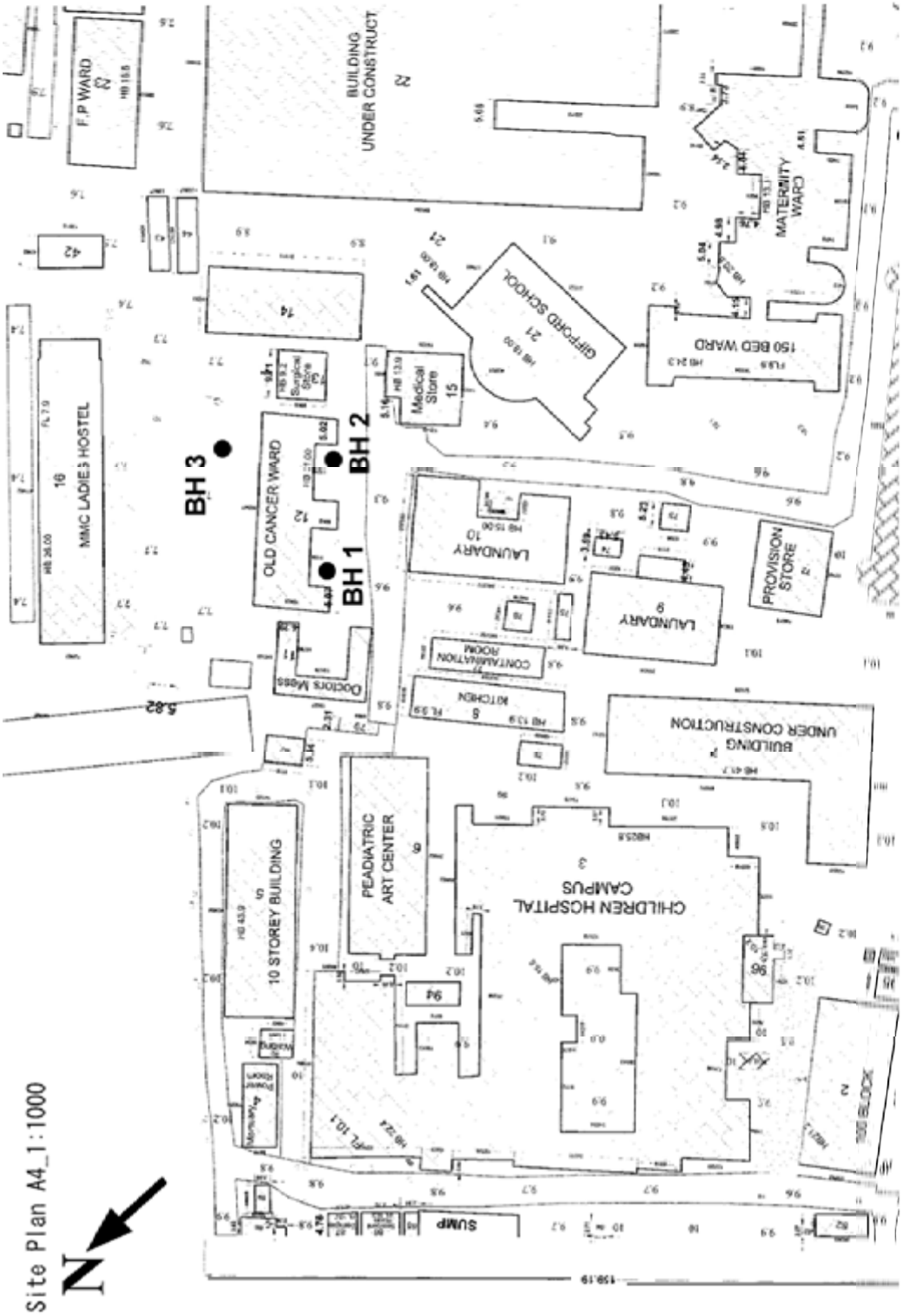
Water Table (m): 7.1

Term. Depth (m): 25

Depth (m)	Strata Description	No. of Core Pieces of Size (cm)	Core Recovery (%)	RQD (%)	Run Time (min)	Unit Weight (g/cm^3)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm^2)	Point Load Strength (kg/cm^2)	Remarks
15.0	Weathered rock										
16.5	Weathered rock		NIL	NIL							
18.0	Weathered rock		NIL	NIL							
19.5	Weathered rock		NIL	NIL							
21.0	Weathered rock		NIL	NIL							
22.5	Weathered rock		12	NIL		2.65	0.09	0.11		685	
24.0	Weathered rock		21	9		2.69	0.06	0.08	648	806	
25.0	Weathered rock		34	22		2.71	0.04	0.05	902	1129	

Core Recovery (%): 100, 80, 60, 40, 20

No. of Core Pieces of Size (cm): >75, 25-75, 10-25, <10



Site Plan A4_1:1000

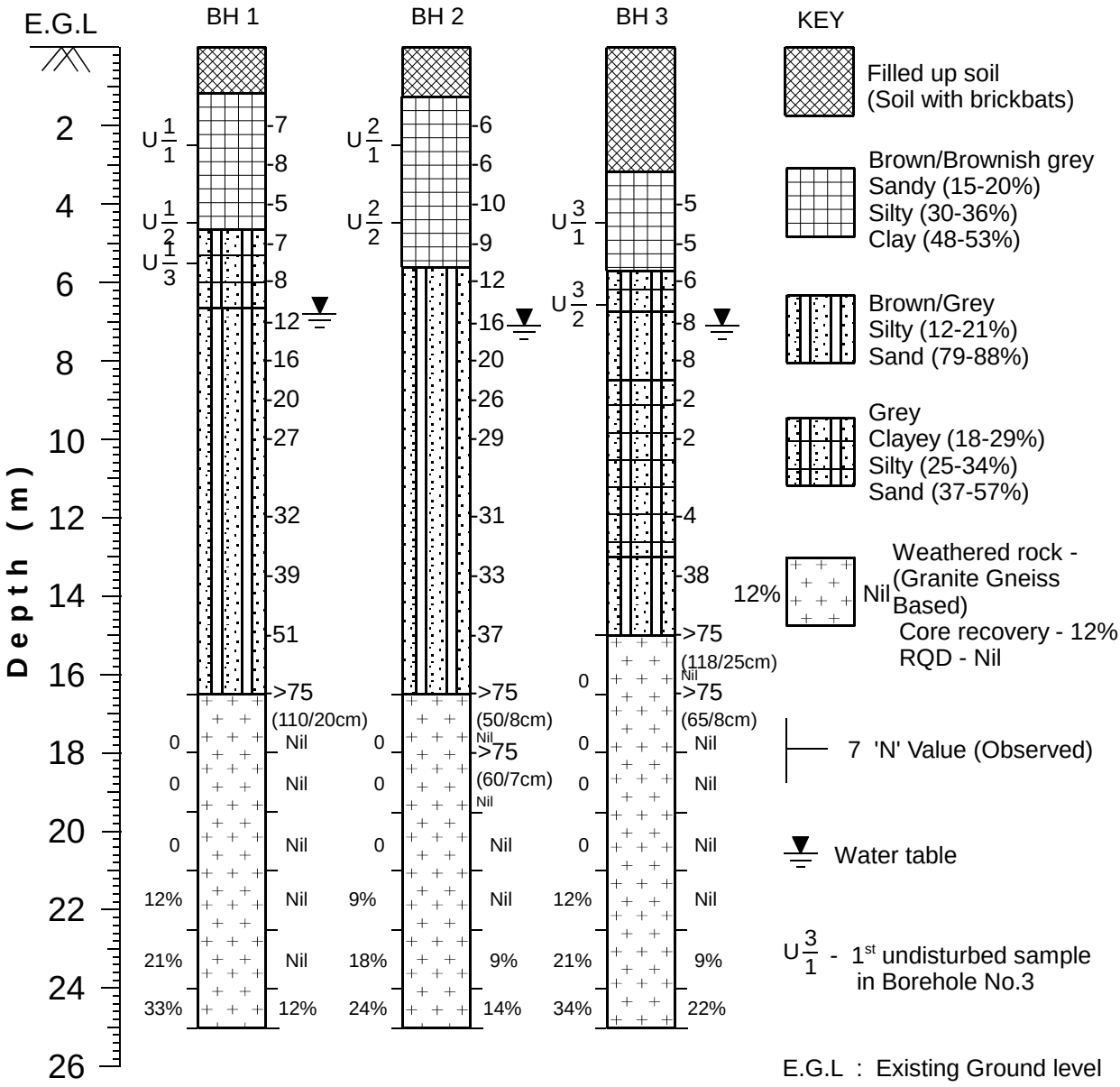
LOCATION PLAN (NOT TO SCALE)

G(C)8304

LOCATION PLAN (NOT TO SCALE)

G(C)8304

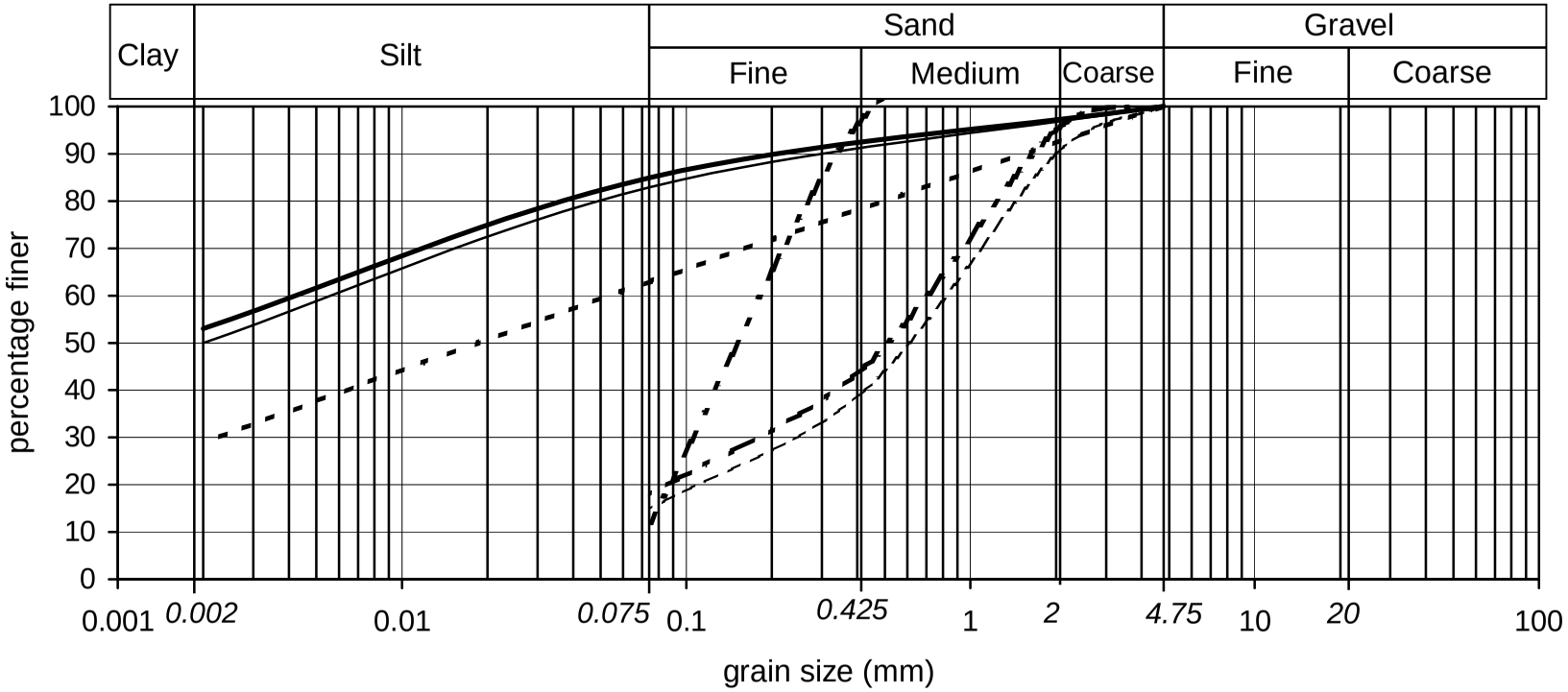
1A



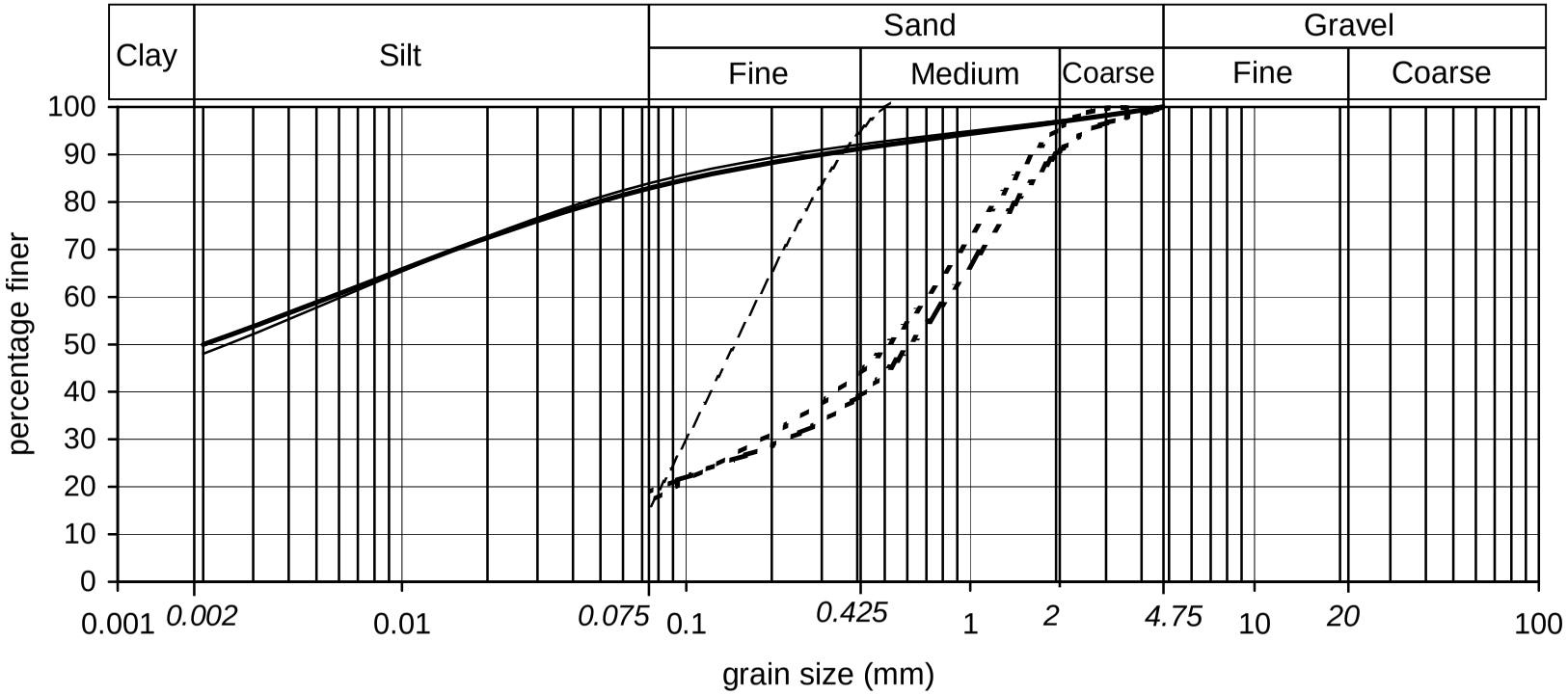
COMPILED SOIL-ROCK PROFILE

PROJECT: NEW HOSPITAL BUILDING IN AND AROUND THE PREMISES OF THE INSTITUTE OF CHILE HEALTH FOR CHILDREN, EGMORE, CHENNAI.

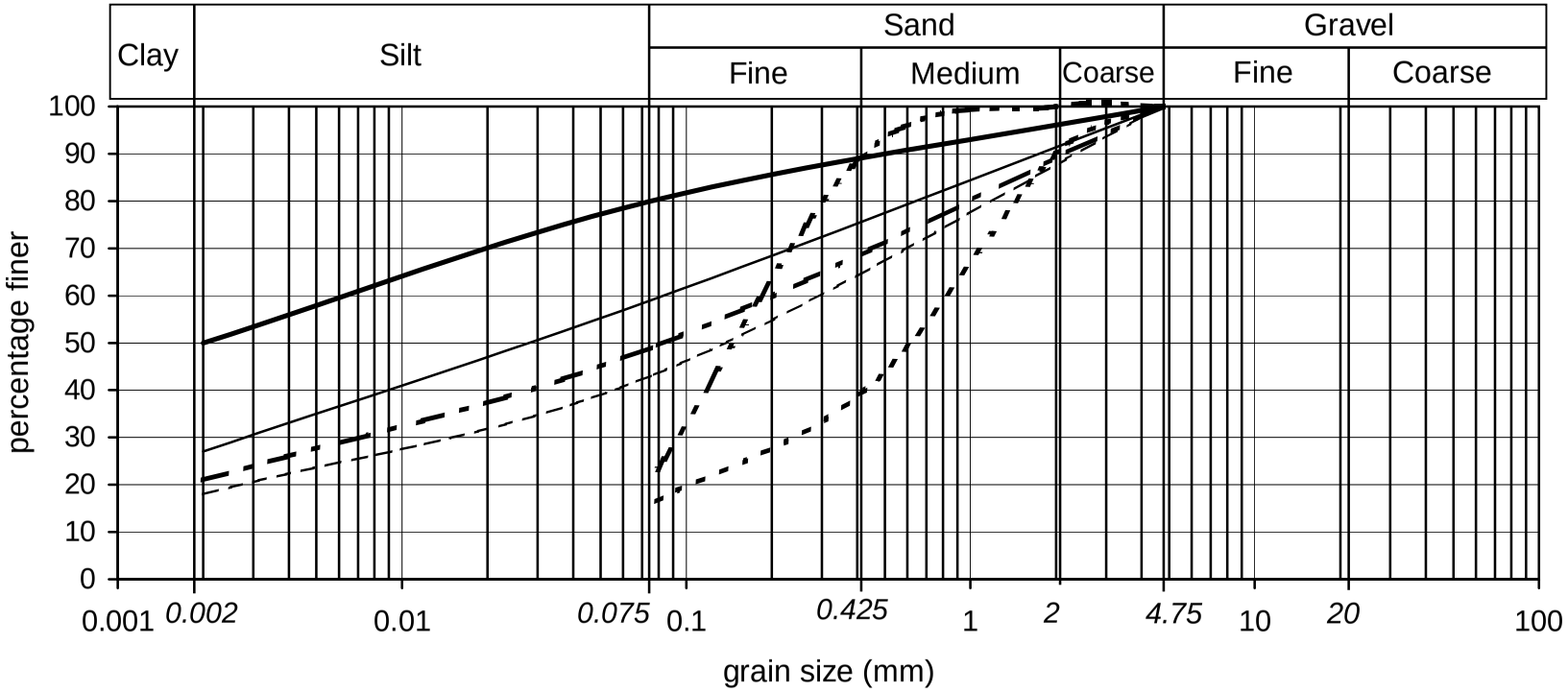
G(C)8304



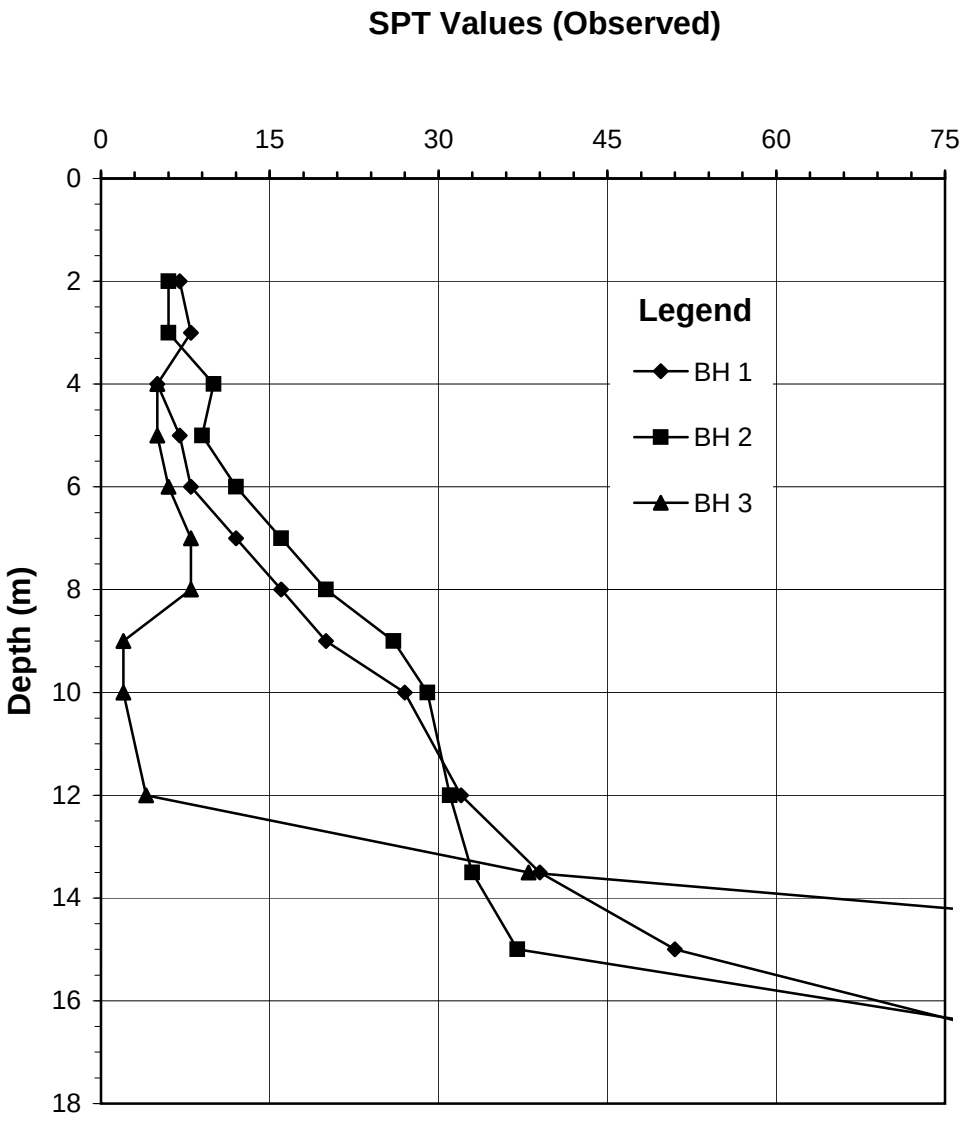
Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
———	1	2.0	Sandy silty clay	0	15	32	53	0.004		
———	1	4.0	Sandy silty clay	0	17	33	50	0.006		
- - - - - - - -	1	5.0	Clayey silty sand	0	37	34	29	0.050		
—·—·—·—	1	7.0	Silty sand	0	82	18	0	0.725		
– – – – – –	1	9.0	Silty sand	0	85	15	0	0.825		
—··—·	1	13.5	Silty sand	0	88	12	0	0.180		



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
———	2	2.0	Sandy silty clay	0	17	33	50	0.005		
———	2	5.0	Sandy silty clay	0	16	36	48	0.006		
- - - - - - - -	2	7.0	Silty sand	0	83	17	0	0.725		
—·—·—·—	2	9.0	Silty sand	0	81	19	0	0.825		
– – – – – –	2	13.5	Silty sand	0	84	16	0	0.180		



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d_{60}	d_{10}	U
———	3	4.0	Sandy silty clay	0	20	30	50	0.006		
———	3	6.0	Clayey silty sand	0	41	32	27	0.085		
- - - - - - - -	3	7.0	Silty sand	0	84	16	0	0.825		
—·—·—·—	3	9.0	Clayey silty sand	0	51	28	21	0.200		
– – – – – –	3	10.0	Clayey silty sand	0	57	25	18	0.300		
—··—·	3	13.5	Silty sand	0	79	21	0	0.180		



SPT Values (Observed) Vs Depth Curves

G(C)8304

Appendix 7 References (Land Transfer Order)

ABSTRACT

Planning and Development - Institute of Child Health and Hospital for Children-Chennai the Institute of Child Health and Hospital for Children, Chennai – Construction of building for Outpatient Department – Transfer of land from Institute of Obstetrics and Gynecology to Institute of Child Health, Chennai and demolition of Old Buildings in Institute of Obstetric and Gynecology Campus - Orders Issued.

HEALTH AND FAMILY WELFARE (EAPI/1) DEPARTMENT

G.O. (Ms) No.216

Dated:26.09.2013
Thiruvalluvar Aandu – 2044
Vijaya Purattasi – 10

Read:

1. From the Government of India, Ministry of Finance, Department of Economic Affairs, Japan II Section, New Delhi Letter No. 1/4/007-Jap II, dated 31.7.2007.

2. From the Director of Medical Education Letter No. 47130 /P&D2/1/2009, dated 26.6.2009, 2.7.2013, 26.7.2013 and 12.8.2013.

3. Govt. Letter No. 39098 / EAP1/1/2008-2, Health and Family Welfare Department, dated 16.7.2009.

4. From the Project Director and Superintendent, Institute of Child Health and Hospital for Children, Chennai, Letter No. Roc No. 322 / E1 / 2012, dated 18.1.2012.

5. From the Director and Superintendent, Institute of Child Health and Hospital for Children, Roc No.0322/P&D/2012 Dated: 20.05.2013.

Read also

6. From the Under Secretary to Government of India, Ministry of Finance, Department to Economic Affairs, BC Division (Japan), New Delhi, Letter No.1/2/2009-Jap II, dated: 30.08.2013.
7. From the Director of Medical Education, Letter Ref. No.47130/ P&D II (1) / 2009 dated: 12.08.2013.

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ORDER

In the reference first read above, the Government of India, Ministry of Finance, Department of Economic Affairs, has stated that the Government of Japan

has invited proposals for Grant Aid Programmes for the year 2009-2010 for providing Grant Aid for construction of facilities and procurement of products and services necessary for development projects. The main target fields of the General Grant Aid include basic human needs, such as, Medical Care / Health, water supply, Rural / Agricultural development, as well as human resources development, such as education and research, which otherwise cannot be covered by Yen loans. The entire cost of the activities was to be funded by the Government of Japan and implementation is facilitated by the Japan International Cooperation Agency (JICA). Proposals in the range of Rs.20 crore to Rs.150 crore and with a project implementation period of one to two years were be considered for posing for Japanese Grant Aid. The Government of India had requested the State Government to send suitable proposals in the prescribed proforma along with the screening format.

2. In the reference second read above, the Director of Medical Education has recommended and forwarded a proposal for Japanese Grant Aid for the year 2009-2010 for construction of a new building, procurement of equipments and furniture for developing the Institute of Child Health and Hospital for Children, Chennai, at a total cost of Rs.50.00 crore to the Government for forwarding the same to the Government of India. In the reference third read above, the above proposal was forwarded to the Government of India.

3. In the reference fourth read above, the Director and Superintendent, Institute of Child Health and Hospital for Children, has stated that he has subsequently submitted a modified proposal for getting Japanese Grant Aid for construction of a building, restricted to ground plus three floors and the equipment required to the value of Rs.50.00 crore to strengthen the Institute of Child Health and Hospital for Children, Chennai. Subsequently, a number of visits and consultations were made with the Japan International Cooperation Agency.

4. In this regard, among other things, the issue of the land earmarked in Institute of Obstetrics and Gynecology and Maternity Hospital campus for construction of a proposed outpatient department was discussed in detail. The proposed land facility fits in with the expansion plan of the Institute of Child Health and Hospital for Children (ICH), in creation of the proposed outpatient block.

5. Subsequently, based on Chennai Metropolitan Development Authority norms, on 17.05.2013 Japan International Cooperation Agency requested transfer of 3197 sq.mt of land to the Institute of Child Health, Chennai. Director of Medical Education suggested that land which was under usage of Institute of Obstetrics and Gynecology (IOG) may be reallotted to Institute of Child Health, Chennai. Japan International Cooperation Agency suggested demolition of the existing old structures to enable the new construction.

6. The Director of Medical Education has sent a report dated 02.07.2013 in which the Director and Superintendent, Institute of Child Health and Hospital for Children, Chennai, has furnished the details of land currently with the Institute of

Obstetrics and Gynecology and requested for issuance of suitable orders of the Government to transfer the site to the Institute of Child Health and Hospital for children, Chennai so as to commence the steps to get the clearance from the competent authorities. The land required for construction is 3197 sq.mt (34,400 sq.ft.) in the Institute of Obstetrics and Gynecology Campus in Field no.482 located in Egmore, Nungambakkam Taluk, Chennai and requested necessary orders for demolition of the following old building viz., Doctors Mess, Old Surgical Store and Compound Wall to north east of Old Cancer Ward at Institute of Obstetrics and Gynecology which can be demolished by the Public Works Department as per Rules existing in force.

7. In her of the report dated: 02.07.2013, the Director of Medical Education has also furnished the following details:-

i. Based on Chennai Metropolitan Development Authority norms, a building consisting G + 3 floors {New Outpatient Department Block} is proposed to be constructed for the improvement of the Institute of Child Health and Hospital for Children, Chennai under Japanese Grant Aid.

ii. The land now proposed for construction of Outpatient Department building under Japan International Cooperation Agency Grant in Aid scheme is under the control of the Director and Superintendent, Institute of Obstetrics and Gynecology and Government Hospital for Woman and Children Chennai and maintained by the Public Works Department authorities.

iii. The occupier of the proposed land is Public Works Department, as per the extract of the Permanent Land Register of Government lands.

iv. The buildings at present existing in the site proposed for demolition are in dilapidated stage. None of them are in the heritage list.

v. The Cancer ward which has 80 Beds for Cancer patients and about 60 years old, (constructed during the year of 1951) is one among the above and it needs demolition and alternative space will be provided in the campus of Obstetrics and Gynecology itself, in the existing OBSTERICS ward, (which will be shifted to Reproductive Child Health Project building which is nearing completion).

8. The Government, after careful examination of the request of the Director of Medical Education have decided to accept them. Accordingly, the following orders are issued:-

i. An extent of 3197 sq.m of land, which is currently with the Institute of Obstetrics and Gynecology, Chennai shall be transferred to the Superintendent, Institute of Child Health and Hospital for Children, Chennai for construction of a new building i.e., Outpatient Department Block.

ii. The Old no heritage buildings viz Cancer Ward, Doctors Mess, Surgical Stores etc., in the campus of Institute of Obstetrics and Gynecology be demolished by following due procedure so as to enable construction of new facilities for the Institute of Child Health, Chennai.

10. This Order issues with the concurrence of Public Works Department vide its U.O.NO. 21790 / H1 / 2013, dated 02.09.2013

(BY ORDER OF THE GOVERNOR)

J.RADHAKRISHNAN
SECRETARY TO GOVERNMENT

To
The Director of Medical Education, Chennai-10.
The Director and Superintendent, Institute of Child Health and Hospital for Children, Chennai-8.
The Secretary to Government of India, Ministry of Finance, Department of Economic Affairs, New Delhi.
The Japan International Cooperation Agency, JICA India Office,
2nd Floor, Dr. Gopal Das Bhawan,
28, Barakhamba Road, New Delhi-110 001.
The Director and Superintendent,
Institute of Obstetrics and Gynecology and Hospital for Children, Chennai-8.
The Principal Accountant General (A&E),Chennai-18.
The Principal Accountant General (Audit -I), Chennai-18
The Resident Audit Officer (GSSA), Office of the Principal Accountant General, Chennai-9.
Copy to:
The Public Works Department, Chennai-9.
SF/SC

// FORWARDED BY ORDER //

SECTION OFFICER
27/9/13

Cir.: JPN, DS, PO, ALL			D.I.C. : JICA ID		
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C.R.					
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