Chapter 2 Contents of the Project

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2-1 Basic Concept of the Project

2-1-1 Overall Goals and Project Purpose

The Democratic Socialist Republic of Sri Lanka (hereinafter called "Sri Lanka") has a land area of 62,700 km^2 and an estimated population of around 19.88 million (as of 2006 estimate). According to 2006 estimates, the country's GNP per capita is 140,302 Rupees (US$1,350) and the GDP growth rate 7.4%.

The 6-Year National Development Plan (1999-2004) formulated by the Government of Sri Lanka aimed to provide high-quality medical services and upgrade medical facilities in each province. The National Health Policy (1997 Presidential Order) called for the provision of free access to medical services for all citizens and the establishment of a tertiary or top referral hospital in each district. The Health Master Plan (HMP) for the subsequent 10 years till 2016 has five strategic objectives. Top strategy out of five is "To ensure the delivery of comprehensive health services, which reduce the disease, burden and promote health". This strategy includes "To rationalize and strengthen health network of facilities and services" and "To ensure adequate provision of drugs, material and equipment for service delivery".

AT Hospital, the target site of the Project, is a top referral hospital situated in Anuradhapura, the capital city of North Central Province. It serves as a tertiary hospital not only for Anuradhapura Province but also for the Central/Northern regions of Sri Lanka. The catchment area (direct beneficiaries) of AT Hospital encompasses northern Provinces of Vavuniya and Mannar, as well as a part of Puttalam Province in western Sri Lanka, with an estimated population of around 1.8 million people.

As lower level medical facilities of AT Hospital, Anuradhapura Province has five District Hospitals and two Base Hospitals. These lower level medical facilities can cover outpatient services, internal medicine, and normal deliveries, however, there are no specialized outpatient clinics to perform operations and Caesarean sections. Therefore, more and more patients come to AT Hospital.

In line with the new comprehensive master plan for the phased upgrading of AT hospital, which is designated as a teaching hospital, to a tertiary medical institution, this Project has set the following objectives:

1. To upgrade outpatient services.
2. To upgrade facilities for handling abnormal deliveries.
3. To upgrade Intensive Care Units; Pediatric and Neonatal

Also, this Project is positioned as a trigger project in the comprehensive master plan for the AT hospital's future development.

2-1-2 Outline of the Project

The Project will upgrade facilities and equipment in order to accomplish the objectives described above. With the Project, tertiary medical services in central/northern Sri Lanka will be enhanced, enabling the residents of the region to receive reliable medical services without needing to be transferred to Colombo.

The basic part of this Project consists of the integration of inefficiently dispersed outpatient clinics into a consolidated outpatient department and the upgrading of facilities and equipment for the obstetric and gynecology operation department, neonatal/pediatric ICUs, and laboratory by constructing facilities and procuring related medical equipment. The departments and units to be upgraded by the Project are listed in the table below.

OB-GYN Div. Operation Dept.	Operating theater Infectious operating theater Preparation room Recovery room Theater sterilizing unit Other related rooms	Outpatient Div.	Walk-in Clinic Medical outpatient clinic (medical, cardiology, dermatology, respiratory, oncomedical) Surgical outpatient clinic (surgery, rectal, orthopedics, oncosurgery, neurosurgery) Pediatric clinic OB-GYN clinic ENT clinic Special Dental clinic (OMF, orthodontics) Endoscopy unit Physiological test unit Emergency treatment unit (ETU) Laboratory Rheumatology & rehabilitation clinic (excluding rehabilitation rooms) Outpatient administration unit (including medical record storage room to be used on a daily basis) Pharmacy Related rooms
Pediatric Div. ICU Dept.	Pediatric ICU Neonatal ICU Other related rooms		

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Policy

1) The scope, scale, and contents of the facilities and equipment to be provided by the Project should be reasonable and appropriate for the Sri Lankan side, as well as for the function of AT Hospital as a teaching hospital, with due regard to the present conditions and healthcare policies of MOH, North Central Province and AT Hospital.

2) The contents and scale should not be excessive, but should be sufficient to improve the efficiency of each medial department and facility in alignment with AT Hospital's master plan.

3) The construction works of the Project should be carefully planned by taking into account the overall implementation schedule, including the demolition work of existing facilities of the Project site. The construction period should allow sufficient time frame for the Sri Lankan government to secure budget and other resources necessary for the demolition work.

4) The scope, scale, and contents of the medical equipment to be procured for the Project should be appropriate and effective in light of the present conditions of the existing equipment, budget of the Sri Lankan government, the skill levels of local engineers/technicians, and the maintenance, management, and other implementing aspects. In selecting items of medical equipment, due consideration should be paid to the local availability of consumables/ parts.

5) Assistance projects of other donors should be taken into account in planning the Project, for consistency among donors.

6) Sufficient measures should be taken to ensure security and safety during implementation of the Project.

(2) Policy on Natural Conditions

Anuradhapura City is located at latitude 8.20˚N, longitude 80.20˚E. In 2006, the city recorded the lowest and highest temperatures at 19.1˚C and 34.1˚C respectively, relative humidity varying between 60 and 95%, annual precipitation of 1,138.8mm, and maximum wind velocity at 18.2m/s. Climatically, the city has dry and rainy seasons with the latter normally lasting from October to

December. The prevailing wind direction is southwest from April to October and northeast from November to March.

In the facility plan, the building will be laid out perpendicular to the prevailing wind direction with ample ceiling heights to utilize natural winds to create a comfortable environment without relying on air conditioning. Since the city is located at low latitude, installing roofs with long eaves will effectively block direct sunlight from heating the external walls. The long eaves will also allow the windows to be left open while raining. The waiting area for outpatients will be open space with no glass windows and high ceilings. To protect the building from frequent thunderstorms, a lightening rod will be installed in a high place, utilizing the elevated water tank tower.

The surface layer soil (1.5m – 4.0m) of the Project site is deposits of gravel and sand, underneath of which lies decomposed granite over rock mass found eight meters underground. Based on these findings, the new facilities will be built on raft foundations sitting on a supporting layer of gravel and sand at 1.5 – 2.0 meters underground.

(3) Policy on Socioeconomic Conditions

Most of the outpatient clinics to be upgraded by the Project, provide specialized medical services that are only available at AT Hospital within North Central Province. For this reason, each of these clinics accepts a large number of patients and employs a number of medical officers. The situation is quite different from Japanese tertiary level hospitals, where there are only one or two doctors for each specialty. The number of examination rooms to be provided by the Project will reflect this relatively large number of medical staff. At the same time, since most hospital in Sri Lanka provides an individual room for each consultant, and changing rooms exclusively for qualified staff such as doctors or nurses, the Project will follow suit.

(4) Policy on Construction and Procurement Situations

1) Construction Plan

Anuradhapura City is located about 210km northeast of, or 6 hours drive from, Colombo. All construction materials, except for fundamental materials such as gravel and sand, are transported from Colombo by land via two main routes connecting the two cities. However, both roads are narrow and curvy that only small container trucks up to 20 feet are used to travel on these routes.

In Colombo, there has been a construction boom of large condominium complexes joined with shopping facilities for the last two or so years, raising demand for construction materials and workers.

This, combined with a construction rush in the Middle East, has caused an efflux of competent building engineers from Sri Lanka, making them increasingly hard and expensive to recruit within the country.

In addition, the worldwide price run up of crude oil and steel is unexceptionally affecting Sri Lanka, where the prices of construction materials and fuels are rising by the month. For example, the fuel price has more than doubled in the last two years.

Wooden forms imported mostly from Southeast Asia (namely, Indonesia, and Malaysia) is showing a particularly drastic price increase due to reduced import volumes as a result of restriction on felling to counter the effects of global warming.

Under these circumstances, the Sri Lankan construction market will most likely experience on-going inflation, making local construction companies wary of signing new contracts. Therefore, if local construction cost is deemed high, procurement from Japan or third countries will be considered as necessary in order to determine the most advantageous procurement method.

2) Equipment Procurement Plan

Most of the medical equipment commonly used in Sri Lanka is made in Japan, Europe, or in the United States. In the Project, items that require spare parts or consumables and those requiring maintenance services by their manufacturers will be procured from manufacturers that have a sales agency in Sri Lanka. Equipment manufactured in countries other than Japan, Europe and in US, will also be considered.

(5) Policy on local consultants and local contractors

AT Hospital is contracting out maintenance work to local consultants, who have technical knowledge on facility design with existing facilities. Therefore the consultants will be utilized for the construction administration of the Project.

Regarding the local contractors, only those who have comprehensive capacity of carrying out the works will be selected for the Project. Most of them are based in the capital city of Colombo, and some contractors, who have experience of Japan's ODA projects could carry out the works

unless they are very complicated.

However, even the top-rated construction companies employ only about 50 engineers maximum, therefore comprehensive instructions on quality control and schedule management by Japanese side will be needed.

(6) Policy on Operation and Maintenance Abilities of the Implementing Agency

1) Facility Plan

The scope and contents of the facility plan will be determined to allow AT Hospital to operate and maintain the new facilities on a sustainable basis within the hospital's current operation/maintenance capacities, which are presently sufficient to constantly perform necessary functions as a teaching hospital in Sri Lanka.

More specifically, the facilities will be built based on commonly-used local construction methods, using reinforced concrete structural frames, mortared external brick walls, and as much locally-available material as possible to make it as least burdensome as possible for the hospital to maintain, repair, and renovate within their current operation/maintenance capacities.

2) Equipment Plan

At AT Hospital, an engineer from MOH's Biomedical Engineering Service (BES) is working fulltime to perform daily check-up and repair work. The BES engineer also acts as a liaison between the hospital and the BES headquarters. In case of equipment trouble that cannot be handled within the hospital capacities, he requests a dispatch of another engineer from BES or sends the broken equipment directly to BES. The BES headquarters manages all equipment items owned at each hospital under its jurisdiction by maintaining an inventory list for each hospital, to which an entry is made each time a new item is purchased. Also, for the X-ray units, auto-analysers, and other items of equipment that contains complicated electronic parts, the hospital has signed a maintenance contract with the sales agent of each equipment manufacturer. The above indicates that the recipient side has established a viable operation and maintenance system and can independently operate and maintain the new equipment. Therefore, the Project will not include Soft Component (Japanese assistance) for maintenance. The equipment provided through the Project will be determined in consideration of the present maintenance capabilities. Items of equipment that require relatively sophisticated maintenance techniques will be selected to

fit the servicing abilities of the manufacturers' sales agencies in Sri Lanka.

(7) Policy on the Grading of Facilities and Equipment

1) Facility Plan

The layout and construction materials of the facilities will be determined by taking into account the maintenance work and cost. Since the new facilities will be constructed under Japan's grant aid, the concrete structure will meet quality standards that are comparable to those applied in Japan. It will be higher standards than those commonly used locally, such as better precision in form work, concrete mixture, etc.

As for flooring, long vinyl sheets or vinyl tiles, which are commonly used in Japanese hospitals, would not be usable because local people are used to cleaning floors with water, and are not familiar with using wax or other finishing agents. Therefore, terrazzo tile will be used as basic flooring materials. Window sashes will be anodized aluminum with brownish pigments to make minor scratches less visible. Wooden or stainless steel door will both have steel frames for longer durability compared to wooden frames. Other surfaces will be generally finished with paint. Local roof tiles will be applied, but the selection will be based on quality for longer durability.

2) Equipment Plan

The equipment will be of the same grade as the existing items handled by the current users. Specifications will be determined by taking into account the quality and conditions of medical services currently provided by AT Hospital.

(8) Policy on Construction/Procurement Methods and the Term of Work

With the exception of cement, gravel, and sand, Sri Lanka imports most of construction materials from Japan, Southeast Asia, India, and China. Abundant volumes of materials and equipment from these regions are constantly flowing into the Sri Lankan market. Among the third-country construction materials and equipment, Southeast Asian products are higher in quality and price than their Chinese and Indian equivalents. Therefore, Japanese or Southeast Asian products will be used for items requiring certain degrees of precision, quality and durability. Indian and Chinese products may be considered if its consumables and other items are commonly used and easily obtainable in Sri Lanka.

Doors and windows requiring relatively high air-tightness, as well as finishing materials requiring relatively high chemical resistance, to maintain hygienic environment for hospital, may need to be procured from Japan or third countries. Electric, air-conditioning, and sanitary equipment requiring relatively high reliability and safety standards are also to be procured from Japan or third countries.

These imported construction materials will be transported by land from Colombo Port as is the case with medical equipment described later.

Engineers/technicians and skilled workers required for the construction work of the Project are to be recruited from Colombo, as most of them work for companies in Colombo, which is the center of the current construction boom.

For earthwork and other relatively simple construction work, workers can be recruited from Anuradhapura and surrounding areas.

Based on the assumption that engineers/technicians and skilled workers will be recruited from Colombo, their lodging and other necessary arrangements will be incorporated in the temporary work plan.

In planning the construction schedule, the top priority will be placed on safety, giving due consideration to the climatic and social conditions of Sri Lanka.

2-2-2 Basic Plan

(1) Facility Plan

1) Design Policy

1. Creation of Healing Environment

   This Project will create a healing environment appropriate for medical care facilities, especially in the waiting lounge and examination/treatment rooms.

2. Respect for Local Heritage, Custom, and Natural Environment

   Paying due respect to the old history of Anuradhapura City, the building design will incorporate local lifestyle and customs rather than forcing the Japanese design standards for medical facilities. Natural ventilation will be utilized to create a comfortable environment in hot local climate.

3. Simplicity

   Facility composition and layout will be simple and straightforward to allow patients to easily get to their destinations and the staff to move around efficiently. A simple building structure will also reduce the maintenance cost.

- Vertical Plan

  The new building will have a total floor space of around 7,000m^2 to house the following departments and units in a three-story structure:

  2F Ob-Gyn Operation Dept.
  Operation rooms, Theatre Sterilization Unit, Pediatric ICU, Neonatal ICU, etc.

  1F Specialized outpatient clinics (Internal medicine, ENT, OMF, etc.)
  Endoscopy unit, Physiological test rooms (ECG, EEG, etc), Laboratory, etc.

  GF Emergency treatment unit, Walk-in clinic
  Specialized outpatient clinics (Surgery, Ob-Gyn, Pediatrics, etc.), Pharmacy, etc.

(2) Site and facilities layout plan

1) Layout Plan

Below are overviews of the AT Hospital Master Plan.

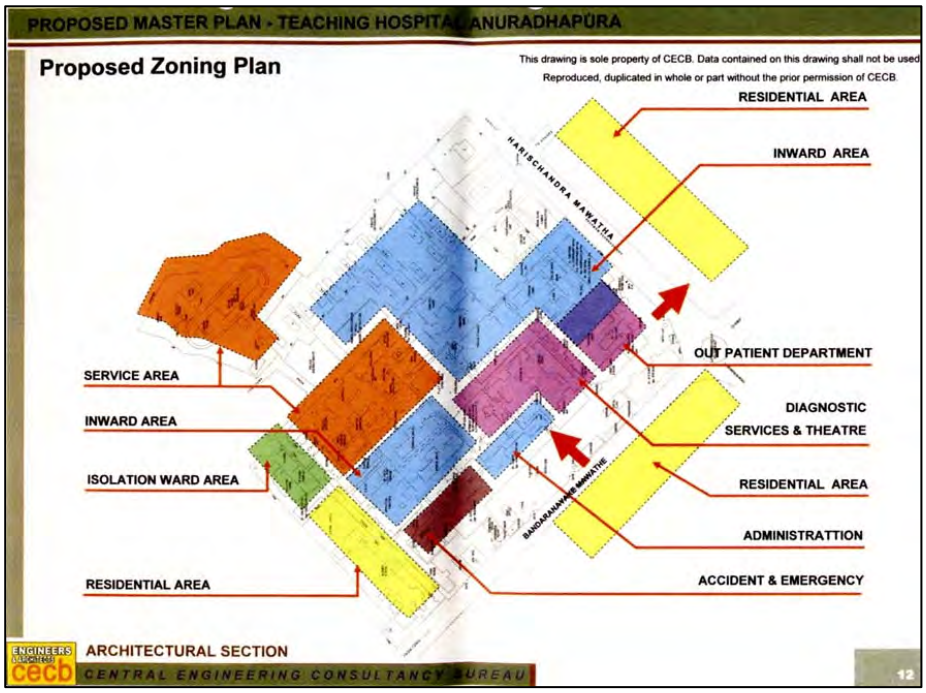


Figure 2-1 Zoning Plot of AT Hospital Master Plan

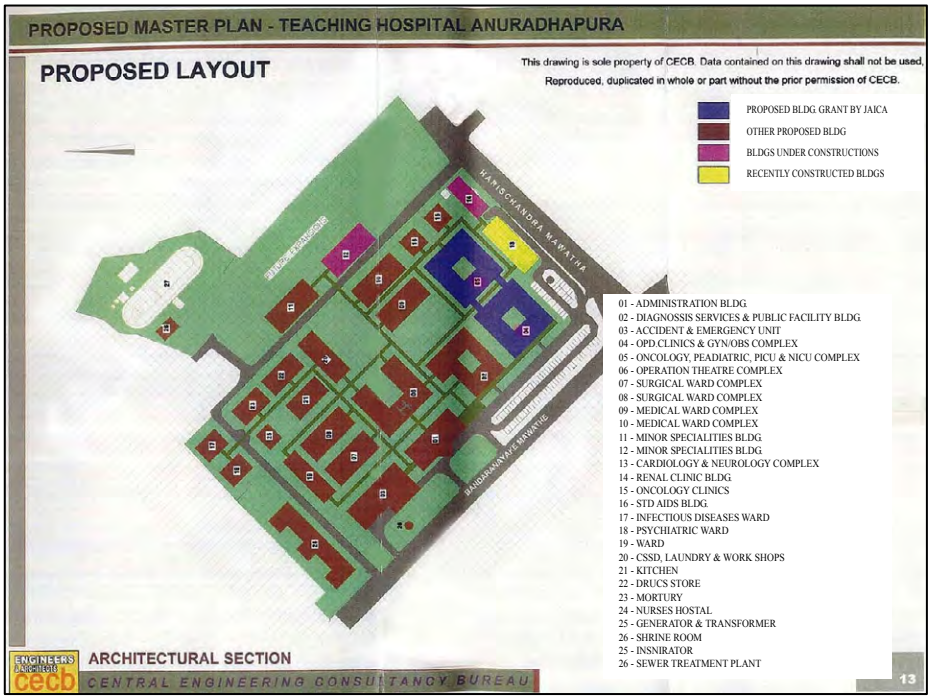


Figure 2-2 Facility Layout of AT Hospital Master Plan

Based on the Master Plan, the site of the Project has been located at the southern corner of the hospital premises. The Project will aim to upgrade the Outpatient Department, as well as the OB/GYN Operation Department and Neonatal/Pediatric ICUs. Considering the location and contents of the Project, and relation of each division of the hospital, the original Master Plan has been revised in consultation with the Sri Lankan side.

After the completion of the Project, necessary steps will be taken in phases toward upgrading the facilities according to the Master Plan. These will be done at an appropriate timing adjusted from time to time to the hospital's service conditions and the scale of upgrading. The figure below shows the basic zoning plan of the revised Master Plan.

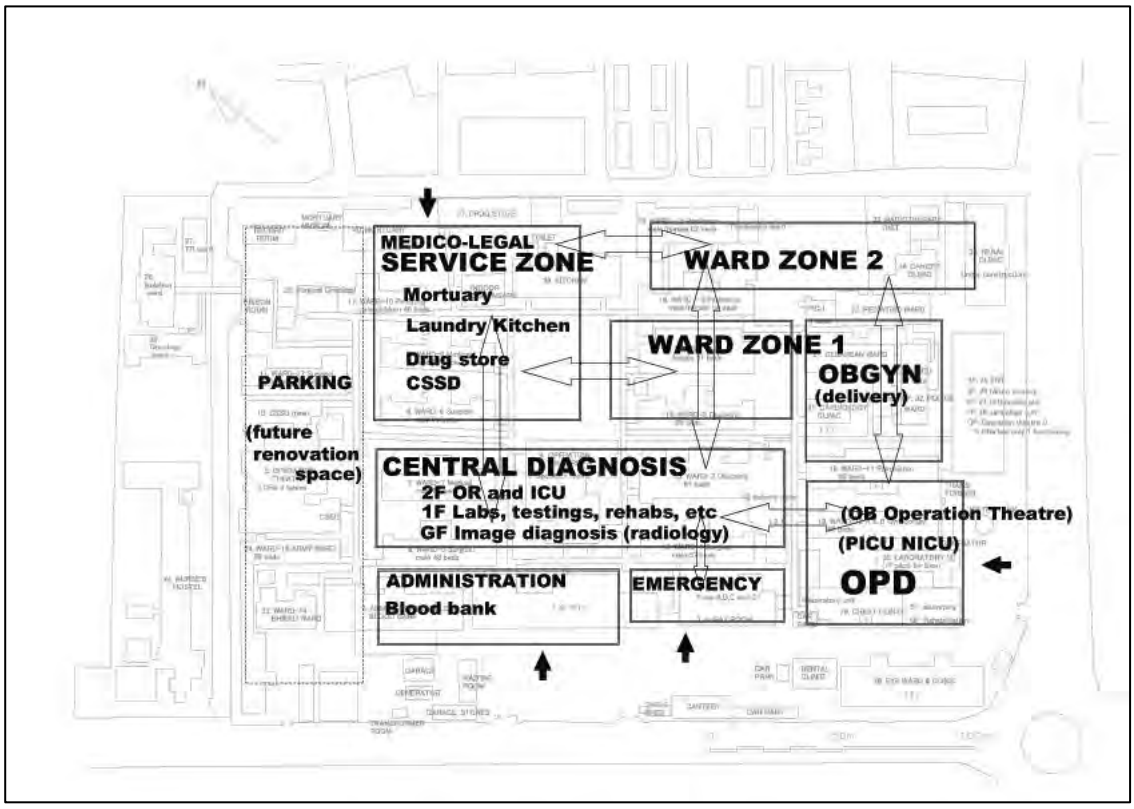


Figure 2-3 Revised Master Plan

The above zoning is the result of following issues and considerations.

① The future OB/GYN Delivery Ward will be established directly connected to the OB/GYN Operation Department of the Project.

② Other Operation Departments and ICUs will also be directly connected and established on the same floor as those in the Project.

③ The Radiology Department will be situated in the middle of the Outpatient Department and

the Inpatient Ward Zone.

④ The Emergency Department will be situated in an area directly connected to the Outpatient Department, Radiology Department, and Operation Departments.

⑤ Parking lot will be made, which will also be space for future expansion and addition.

2) Facilities layout plan

- The construction site is bordered by Bandarnayake Mawatha and Harischandra Mawatha. The west gate provides access to the existing outpatient clinics, and there is another gate on the south along Harischandra Mawatha.

  Since the west gate is more than 100 meters away from the proposed construction site, this Project will use the route from the intersection to the south gate as an approach road.

  The new building will be facing the same direction as the existing facilities parallel to the adjoining street and in harmony with other buildings and structures on the street.

  An efficient parallel layout will be used to obtain the maximum floor space. The north side of the building, however, will be in alignment with another street running adjacent to the hospital premises in order to be consistent with the Master Plan that uses this street as the reference line.

(3) Scale of the Building

1) Room size and layout

The scale of the new building will be determined by referring to the following information:

- Floor areas of the existing facilities of AT Hospital
- Medical services rendered by the existing facilities of AT Hospital
- Floor areas of other teaching hospitals in Sri Lanka
- Actual floor areas of hospitals in Japan and other countries

Outpatient Department

The table below shows the number of outpatients handled by each clinic, which has been on the increase for the past several years. Each patient is directed to go first to the walk-in clinic and then to an appropriate specialized clinic as deemed necessary by his/her physician.

Table 2-1 Trend in the Number of Outpatients

Dept.	2003	2004	2005	2006	4-yr. average	4-yr. high
Walk-in clinic	261,029	169,597	153,127	179,415	190,792	261,029
Specialized outpatient clinic						
Internal medicine	57,067	44,758	51,125	57,213	52,541	57,213
Surgery	17,329	13,875	13,079	15,704	14,997	17,329
Orthopedics	7,195	6,451	9,794	12,234	8,919	12,234
Respiratory	10,123	13017	12,358	13,114	12,153	13,114
Cardiology	3,543	5,854	6,166	9,583	6,287	9,583
Neurosurgery	—	800	984	4,483	2,089	4,483
Neurology	—	—	4,809	5,455	5,132	5,455
ENT	6,856	5,445	6,507	8,843	6,913	8,843
Renal	6,123	4,294	5,068	8,476	5,990	8,476
Rectal	2,225	1,933	2,332	2,019	2,127	2,332
Dermatology	16,663	13,175	12,205	13,252	13,824	16,663
Pediatrics	26,836	26,745	19,009	14,752	21,836	26,836
Neonatology	11,388	6,132	6,346	7,114	7,745	11,388
Psychiatry	10,670	14,907	16,300	14,183	14,015	16,300
Gynecology	8,721	7,266	6,377	5,211	6,894	8,721
Obstetrics	8,944	8,370	8,057	9,240	8,653	9,240
Family planning	2,663	1,036	1,440	1,315	1,614	2,663
Ophthalmology	8,649	10,390	10,609	11,458	10,277	11,458
Tuberculosis	—	—	2,855	3,192	3,024	3,192
Oncosurgery	2,606	6,734	1,662	3,724	3,682	6,734
Oncomedical	—	—	8,585	7,077	7,831	8,585
STD	2,304	2,457	3,178	4,383	3,081	4,383
Dental	11,764	18,665	19,883	19,293	17,401	19,883
OMF	4,744	7,773	8,008	8,928	7,363	8,928
Orthodontics	—	—	3,441	3,396	3,419	3,441
Rheumatology & Rehabilitation	11,356	9,842	9,375	6,634	9,302	11,356
Pharmacy		440,927	438,654	508,594	462,725	508,594

(Source: Questionnaire answers by AT Hospital)

The table below shows the current office hours of each outpatient clinic of AT Hospital.

Table 2-2 Office Hours of Each Outpatient Clinic

Clinic	Mon.		Tues.		Wed.		Thu.		Fri.		Sat.		Sun	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Walk-in clinic	□	□	□	□	□	□	□	□	□	□	□	□	□	
Specialized outpatient clinic														
Internal medicine		○			○	○	○	△		○	○			
Surgery	○								○					
Pediatrics			○	△	○	△								
Neonatology				○		○			○					
Obstetrics			○				○							
Oncosurgery	○								○					
Orthopedics			○	△			○	△						
Neurology		○		○	○									
Neurosurgery								○	○					
Rectal					○				○					
Family planning		○		○										
Respiratory	○	△	○	△	○	△	○	△	○	△	○	△		
Cardiology					○				○					
ENT	△		○		△		△		○		○			
Renal	○		○		○		○		○					
Dermatology		○			○		○		○		○		○	
Psychiatry					○		○							
Gynecology		○		○										
Ophthalmology	○	△			○	△					○			
Tuberculosis	○		○		○		○		○		○			
Oncomedical			○	△					○	△				
STD	○		○		○		○		○		○			
Dental	○	△	○	△	○	△	○	△	○	△	○			
OMF	○	△	△	△	△	△	○	△	△	△	△		△	
Orthodontics	○	△	○	△	○	△	○	△	○	△	○		○	
Rheumatology & Rehabilitation	○	△	○	△	○	△	○	△	○	△				
Emergency Treatment Unit	7～19		7～19		7～19		7～19		7～19		7～19		7～19	
Pharmacy	○	○	○	○	○	○	○	○	○	○	○	○	○	○

(Source: Questionnaire answers by AT Hospital)

AM: 8:00 – 12:00, PM:14:00 – 16:00, ○: first visits seen by consultant
△: secondary visits seen by medical officer, □: first visits seen by medical officer

Due to lack of examination rooms, each of the following rooms is shared by more than one clinic or unit operating on different days and hours (marked by bold lines in the above table).

Room 12: Rectal, Family planning

Room 13: Internal medicine, Surgery, Pediatrics, Neonatology, Oncosurgery

Room 23: Internal medicine, Surgery, Obstetrics, Neonatology, Gynecology, Oncosurgery

Room 22: Orthopedics, Neurology, Neurosurgery

Of the outpatient clinics listed in the above table, the following clinics will not be included in the

Project for reasons described below:

Renal: It will be included in the new building currently under construction.

Psychiatry: It will use the existing facilities, as it would be difficult to care for psychiatric patients together with other patients.

Ophthalmology: It is already operating in the building situated right in front of the Project site, which will be close enough to the integrated outpatient clinics of the Project.

Tuberculosis: It is a separate organization under the jurisdiction of the local government.

STD: It is a separate organization under the jurisdiction of the local government.

Dental: It is operating in the building situated right in front of the Project site, which will be close enough to the integrated outpatient clinics of the Project.

Generally, it would be desirable for a tertiary medial institution to have a dedicated room for each outpatient clinic. However, not all clinics at AT Hospital are seeing patients every day. The clinics in the new building will be grouped into following units.

Surgery 1	Surgery, Neurosurgery, Neurology
Surgery 2	Orthopedics,Oncosurgery, Rheumatology & Rehabilitation
Ob-Gyn, Pediatrics	Gynecology, Obstetric, Neonatology, Pediatric, Family planning
Internal Medicine 1	Internal medicine,Rectal, Oncomedical
Internal Medicine 2	Dermatology
Internal Medicine 3	Respiratory
Internal Medicine 4	Cardiology
ENT	ENT
Specialized Dentistry	OMF, Orthodontics

Each doctor of each clinic will have his/her own examination room/space. As a general rule, each medical officer will be given an approx. 1.8 m x 1.8 m space in a common room, and each consultant a 3 m x 4 m room. To increase efficiency of services, an intermediate waiting area will be set up next to the examination room. The next patient will be waiting in this intermediate waiting area, so that they can be consulted right after the former patient. This way, there will be no time loss for finding the next patient becoming astray in large common waiting area.

The table below shows the floor area of each examination room of each clinical unit.

Table 2-3 Floor Area of Examination Rooms

Clinical Unit	Examination room	Area (m^2)
Surgery 1	Surgery	55.40
	Neurology, Neurosurgery	55.40
Surgery 2	Oncosurgery, Orthopedics	75.43
	Rheumatology & Rehabilitation	75.43
Ob-Gyn, Pediatrics	Ob-Gyn, Family planning	54.59
	Pediatrics, Neonatology	54.59
Internal Medicine 1	Internal medicine,Rectal	54.23
	Oncomedical	54.23
Internal Medicine 2	Dermatology	89.33
Internal Medicine 3	Respiratory	79.21
Internal Medicine 4	Cardiology,	90.82
ENT	ENT	90.77
Specialized Dentistry	OMF	90.68
	Orthodontics	124.74
Total		1,044.85

- Operation (Ob-Gyn) and ICU Division

The existing Operation Theater A (exclusive to Ob-Gyn Dept.) has two operating rooms for caesarian sections and scheduled operations. The number of operations performed each year is increasing as shown in the table below. Average number of operations per day on a 365-days/year basis is 18.

Table 2-4 Number of Ob-Gyn Operations

	Type of operation	**2004**	**2005**	**2006**
Gynecology	Major operation	101	756	878
	Minor operation	612	3,056	3,353
	Laparoscopy	6	190	45
	Sterilization	64	482	135
Obstetrics	Major operation	529	2,277	2,312
	Minor operation	6	28	36

(Source: Questionnaire answers by AT Hospital)

Considering the work needed for preparation, cleaning, and sterilization before and after each operation, the average 9 operations per day per operating room is slightly too many. It would be desirable to have a separate operating room for infectious operations, as they would require a long preparation and after-cleaning time.

In view of the foregoing, the Project will provide a total of three operating rooms, two for general

operations and one for infectious operations.

Listed below are rooms for the Operation Department and Theater Sterilization Unit.

Department	Name of Room	Area (m^2)
Operation Dept.	Operating Room 1	42.72
	Operating Room 2	32.84
	Operating Room 3 (infectious diseases)	25.77
	Preparation Room	45.17
	Hall	51.97
	Anteroom	19.57
	Hall	58.71
	Doctors' room	22.93
	Nurses' room	11.68
	Staff room	11.57
	Pantry	6.96
	Minor staff l changing room (men)	20.52
	Minor staff changing room (women)	19.37
	Doctors' changing room (men)	19.68
	Doctors'/Nurses' changing room (women)	20.21
	HVAC mechanical room	15.66
	Storage	8.49
	HVAC mechanical room	7.41
Total		441.23

Department	Name of Room	Area (m^2)
Theater Sterilization Unit	Washing room	43.15
	Sterilization room	18.19
	Clean storage	11.82
	Administrative office	11.24
	Staff room	8.97
Total		93.37

The number of patients admitted to the ICU Department has been increasing as shown in the table below.

Table 2-5 Trend in Total Number of Inpatients of ICU

Dept.	**2003**	**2004**	**2005**	**2006**
Medical ICU	404	344	355	372
Surgical ICU	325	340	368	442
C.C.U.	593	1,353	1,130	1,214
Pediatric ICU	341	315	271	252
Neonatal ICU	3,879	2,265	2,376	2,570
Dialysis Unit	—	—	1,216	1,603
Thalassemia Unit	1,920	1,920	1,920	1,920

(Source: Questionnaire answers by AT Hospital)

Table 2-6 No. of Beds, BOR, and ALS of ICU

		2005			2006		
Ward No	**Dept.**	No. of beds	BOR	ALS	No. of beds	BOR	ALS
—	Medical ICU	5	100.1	5.15	5	100.4	4.92
—	Surgical ICU	5	93.5	4.6	5	107	4.42
—	C.C.U.	4	—	—	4	—	—
—	Pediatric ICU	4	73.4	3.96	4	75.9	4.43
—	Neonatal ICU	19	424.2	—	19	404.3	10.9
—	Dialysis Unit	3	—	—	6	—	—
—	Thalassemia Unit	13	—	—	13	—	—

(Source: Questionnaire answers by AT Hospital)

BOR: Bed occupancy rate ALS: Average lengths of stay

Of the above ICUs, this Project will upgrade the Pediatric and Neonatal ICUs.

The existing Pediatric ICU is struggling to provide adequate nursing care due to old facilities and equipment, and as a result, the number of patients has been decreasing despite the increasing demand. The Project will restore the functions of the Pediatric ICU to a scale that can meet the demand. The existing Pediatrics Department has four separate wards with a total of 200 beds. Generally, the number of ICU beds is 2 – 4% of the total number of beds of the department. Thus 4 – 8 beds should be needed for the 200 beds. BOR of the existing wards is over 100%, actual need for the number of beds is consequently more than 200. Therefore, the project will supply 8 beds, which is the maximum number within the above range; 6 for general patients and 2 for patients with infectious diseases.

The Neonatal ICU presently has 19 beds with a BOR over 400%, which clearly indicates the number is inadequate compared to its demand. Assuming an ALS of 10 days per each of the

2,570 patients accommodated by the ICU during 2006, 76 beds would be ideally needed. In reality, however, such a number is not realistic, considering the actual number of nurses and other medical staff available. After discussing this issue with the representatives of AT Hospital, we have concluded to increase the number of beds by 1.5 times to 27 beds. The breakdown of 27 beds is as follows:

Premature babies : 15 beds

Intensive Care : 6 beds

Infectious disease : 6 beds

Total : 27 beds

In view of the foregoing, the floor area of each room associated with the new Neonatal /Pediatric ICUs is set as follows:

Table 2-7 Necessary Rooms for NICU/PICU

Department	Name of Room	Area (m^2)
Premature ICU	Premature babies room	82.66
	Neonatal intensive care room	44.31
	Infectious disease room	33.93
	Doctors' room	10.09
	Nurses' room	11.46
	Administrative office	10.66
	Procedure room	36.69
	Feeding room	14.31
	Anteroom	12.30
	Staff room	3.74
	Toilet	4.08
Total		264.23

Department	Name of Room	Area (m^2)
Pediatric ICU	Pediatric intensive care room	89.18
	Infectious disease room 1	12.04
	Infectious disease room 2	14.75
	Feeding room	14.10
	Staff room	9.53
	Storage	8.14
	Nurses' room	12.34
	Doctors' room	13.35
	Pantry	16.56
	Toilet	4.23
	Hall	28.16
Total		222.38

Laboratory Department

The scale of the Laboratory Department will be similar to the existing facilities to be demolished under the Project. There will be three rooms for endoscopy unit, and one each for EEG, ECG, and EMG units.

The floor area of each room is shown in the table below.

Table 2-8 Necessary Rooms for Laboratory Department and Physiological Test Units

Department	Name of Room	Area (m^2)
Laboratory	Reception	20.13
	Blood collecting room	8.65
	Laboratory office	83.97
	Outpatient lab	14.74
	Hematology	31.13
	Pathology	27.95
	FNA room	5.44
	Specimen preparation room	5.04
	Biochemistry	15.04
	Microbiology	14.01
	Preparation room	5.47
	Washing room	6.81
	Staff room	14.66
Total		253.04

Department	Name of Room	Area (m^2)
Endoscopy unit	Endoscopy 1	18.70
	Endoscopy 2	12.48
	Endoscopy 3	12.37
	Preparation room	11.82
Total		55.37

Department	Name of Room	Area (m^2)
Physiological test	Reception	13.69
	EEG room	13.94
	ECG room	12.95
	EMG room	14.93
Total		55.51

2) Section Plan

- The building housing the outpatient department will mainly have natural ventilation with 4.2 m of floor height to ensure sufficient air volume. The top floor will have a sloped roof with tiles which is typical of the region, with adequate air vent on the gable to prevent the solar irradiation on the roof raising the room temperature. The roof will have a simple structure as

much as possible. The sub-floor will have a pit (see section on Foundation Plan) with a structure designed to minimize the maintenance and operation of the sub-floor piping.

3) Structure Plan

- Outline of the Structure

This building is designed as a medical facility with a structure outlined below:

No. of floors :	3 stories above ground
Floor height:	4.2m
Standard column spacing:	6.0m x 7.5m
Type of structure:	Reinforced concrete structure with brick walls
Foundation:	Direct foundation (raft foundation)

- Foundation Plan

The ground of the project site sits on a surface layer of gravel and sand at 0.5 – 4.0 meters depths, beneath which is a layer containing decomposed granite lying over rock mass at depths of 8 meters and below. According to the geological survey report, a long-term allowable bearing capacity of 150kN/m^2 can be obtained at G.L.-1.0m.

However, the foundation bottom of existing buildings is G.L.-1.0m. Considering possible sub-grade disturbances to be caused by the removal of existing foundation, the supporting layer needs to be established at least 50cm below the existing foundation bottom.

In light of the above, this Project will use a direct foundation (raft foundation) supported by a layer of gravel and sand at G.L.-1.5m.

This Project plans to use much of the sub-floor space of the Ground floor as a piping pit. For optimum economy, the foundation girder will be raised from the ground level to create a space for piping (see the following figure).

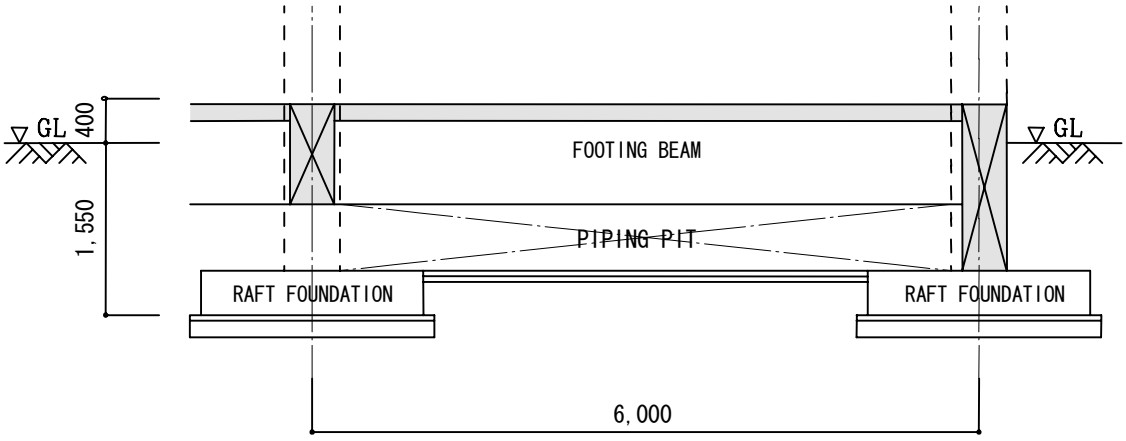


Figure 2-4 Conceptual Drawing of Piping Pit

- Superstructure Plan

  The superstructure of this building will be a post-and-beam reinforced concrete structure, as it is deemed most appropriate from the standpoints of durability, local climatic conditions, familiarity among local builders with the construction method, and other factors. Walls will be brick masonry, as it is economical, relatively easy to install, and commonly adopted locally.

- Load and External Force

  - Live load

    The maximum live load of each room is defined according to the Building Code of Japan. The live load allowances of the main rooms are as follows:

Office room	:	3000N/m^2	Dental X-ray room	:	3000N/m^2
Operating room	:	4000N/m^2	Mechanical room	:	5000N/m^2

  - Seismic Load

    The project area has no past records of earthquake disasters. Thus, seismic load is not considered in the Project.

  - Wind Load

    The wind load is calculated according to Article 87 of the Building Code of Japan. Taking into account the local climatic conditions and the importance of this building, the standard wind velocity V_0 is set at V_0=38m/s (Zone 3).

- Major Construction Materials

  - Concrete: Standard design strength: Fc=21N/mm^2
    Quality standard strength: Fc=24N/mm^2
  - Steel bars: SD345 (D19 or above) or at least its equivalent
    SD295 (D16 or below) or at least its equivalent

4) Facility Plan

- Electrical Work

1. Power Supply Connection

   An incoming main will be branched off from the overhead HT line of the Ceylon Electric Board (CEB) to supply power through outdoor substation(to be provided by CEB) to the new building.

2. Power Supply System

   - Sub-station

     An outdoor sub-station will be newly constructed to supply LV electricity to the Project site. CEB's WHM will be installed inside the generator room of the Project.

   - LV Distribution System

     LV power will be supplied from MSB inside the electrical room (PH floor) to DBS and MCC on each floor via electric riser shafts. The main voltage will be 3-phase 4-wire 415/240V, 50Hz. An alarm panel will be installed in a security room on the ground floor to monitor water level in the water reservoir and elevated water tank ,and to monitor the status of pumps, power substation, transformer, emergency generators, etc.

   - Emergency Generators

     A diesel engine driven generator system will be installed as an emergency power supply to ensure that minimum hospital's functions are maintained during power failures. Low-noise generator set will be installed in the generator room with accoustic/vibration insulation. The service tank (fuel tank) will have enough capacity to sustain continuous operation for about 12 hours. A space for storing fuel

in drums will be provided outside the generator room. The generator system will consist of two generators so that in case one generator fails, power supply to essential loads such as life supporting equipment, will be fed by another generator.

Table 2-9 Power Supply Load of Generator

	Load	Remarks
Operating room	Power source for medical equipment, lighting fixtures, HVAC / water systems	
Recovery room		
Neonatal ICU		
Pediatric ICU		
ETU		
Other	Power source for refrigerators used for medical purposes	

- Automatic Voltage Regulator (AVR)

  While the fluctuation of the supply voltage set by CEB is ±6%, the actual measurement taken in the existing ATHospital with a voltage recording instrument indicated fluctuations exceeding 10% every day: AC 200-240 V on the 1st day, AC 209-243 V on the 2nd day, and AC 213-239 V on the 3rd day (see the measurement results in the figure below).

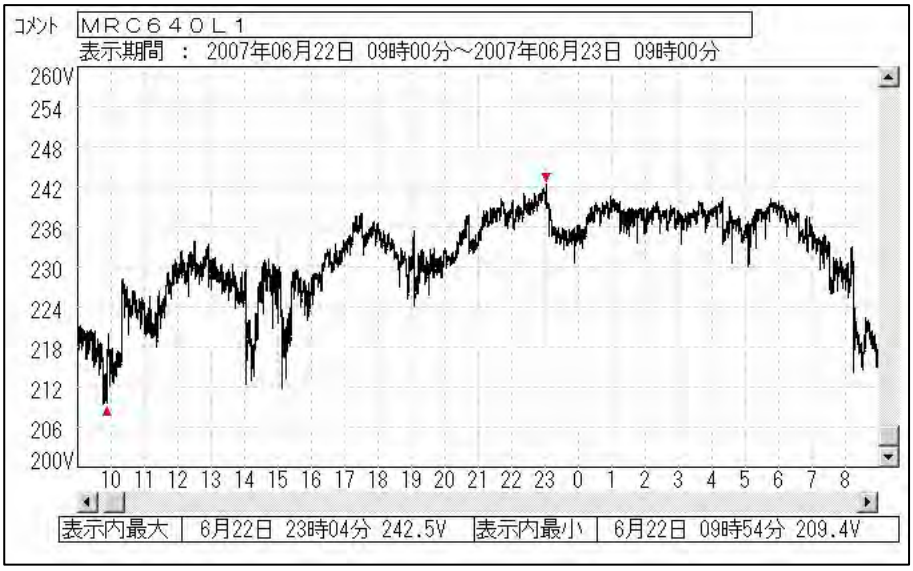


Figure 2-5 Record of Voltage Measurement

Therefore, an automatic voltage regulator (AVR) will be installed in the LV main to prevent damage to medical equipment. In addition, portable uninterruptible power sources (UPSs) will be provided for individual medical equipment susceptible to

malfunction by momentary power failure. An isolation transformer will be installed to decouple the general power supply circuit from the power unit for operating rooms and ICUs with life supporting equipment, as well as to block interference caused by earth loop, which is controlled by the monitor panel that gives an alarm upon detecting an electric current exceeding the rated value. In addition, protective earthing devices will be provided to protect people from macro shock (5mA or higher) that has negative effects on human body, as well as micro shock (10μA or higher) that is harmful to the heart and the surrounding tissues.

Table 2-10 Calculation of Power Demand

	Estimated Equipment Capacity	Estimated Demand Factor	Max. Power Demand
Medical Equipment	170 KVA	40 %	68 KVA
HVAC	330 KVA	80 %	264 KVA
Water Supply & Waste water treatment plant	70 KVA	20 %	14 KVA
Lighting facilities	130 KVA	80 %	104 KVA
Receptacles	40 KVA	20 %	8 KVA
Other Loads	10 KVA	20 %	2 KVA
Firefighting Facilities	30 KVA	0 %	0 KVA
Total	780 KVA		460 KVA

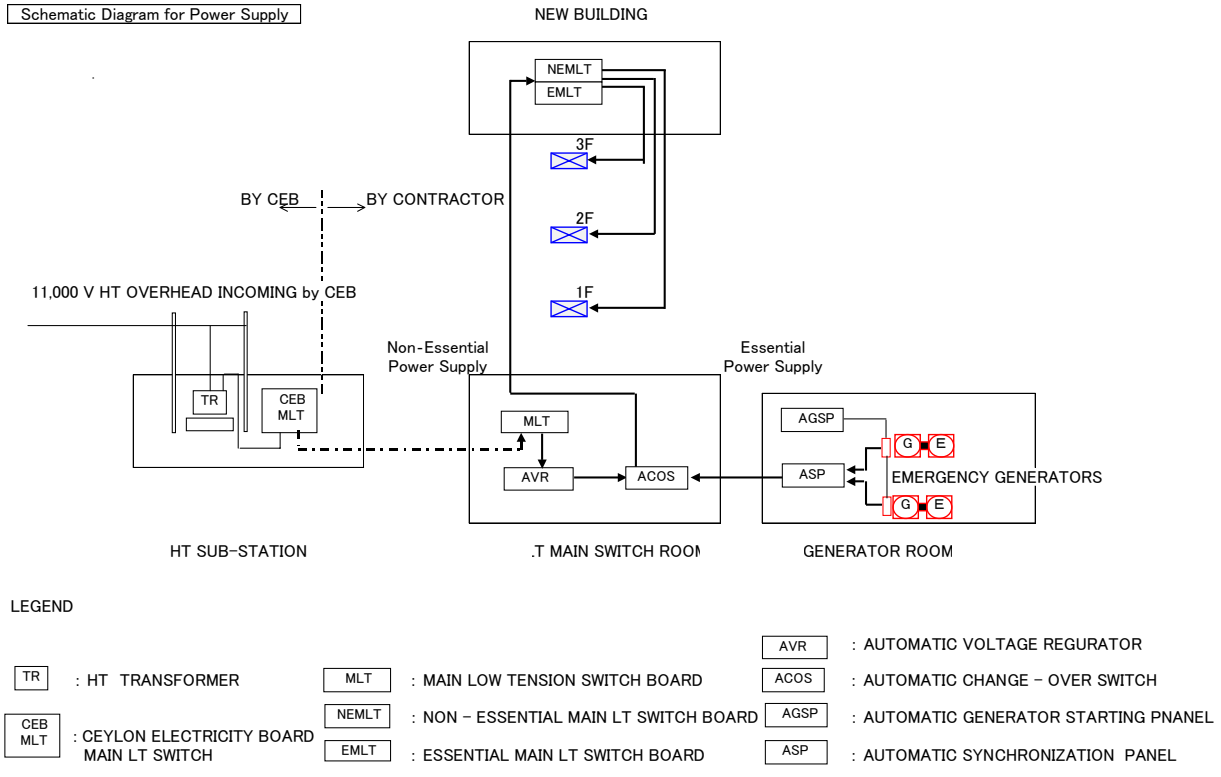


Figure 2-6 Schematic Diagram for Power Supply

3. Lighting and Socket Outlets

DB will be installed on each floor with an appropriate circuit configuration. Conduit piping and wiring for sub circuits will run from DB to the lighting fixtures and socket outlets.

- Lighting Facilities

General lighting: Lighting fixtures mainly using fluorescent lamps will be selected. The lighting circuit will be designed to facilitate energy saving by separating into small groups that enable individual switching.

Special lighting facilities: Shadowless lamps in the operating rooms and other lighting equipment used for medical purposes will be provided under the scope of medical equipment works.

Emergency lighting facilities: Wall mounted emergency lighting equipment with built-in batteries will be provided in rooms that accommodate people.

Exit lights: Plate-type pictograph exit lights with built-in batteries will be provided.

Table 2-11 Intensity of Illumination in Main Rooms

Room	Intensity of Illumination
Operating room	750 lx
Examination/procedure room	500 lx
Office room	300 lx
Toilet, changing room, storage	150 lx
Hall	50 lx

- Socket Outlet

Socket outlets for general use, the number of which will not be excessive in one circuit, will be 13A socket outlets with switches and earthing pole. The power sources for medical equipment will be configured to meet the required power capacity considering the equipment layout. The socket outlets under essential power supply from the emergency generator will be identified by red plates.

4. Public Address System

A main public address system will be installed in the security room on the ground floor of the new building. This will facilitate paging of doctors and emergency evacuations, announcements, etc, as well as communications with the existing facilities.

5. Interphone System

Individual interphone systems will be provided between the operating rooms and related rooms (i.e., doctors' rooms and nurses' rooms). A nurse-call interphone system will be installed in Pediatric ICUs and recovery rooms.

6. Telephone System

Telephone sets will be installed in rooms that require telephones to operate the new building adequately. Existing general telephone lines are considered enough for use in the new building. Since the existing private automatic branch exchange (PABX) system is 15 years old and antiquated, a new PABX system will be installed in the security room of the new building. Telephone cables will be installed from the telephone exchange room in the existing building (Operation Theater A) to the main distribution frame (MDF) in the new building, to enable connection to the existing PABX system.

In addition, an empty conduit for future information network (Local Area Network) will be installed in appropriate places.

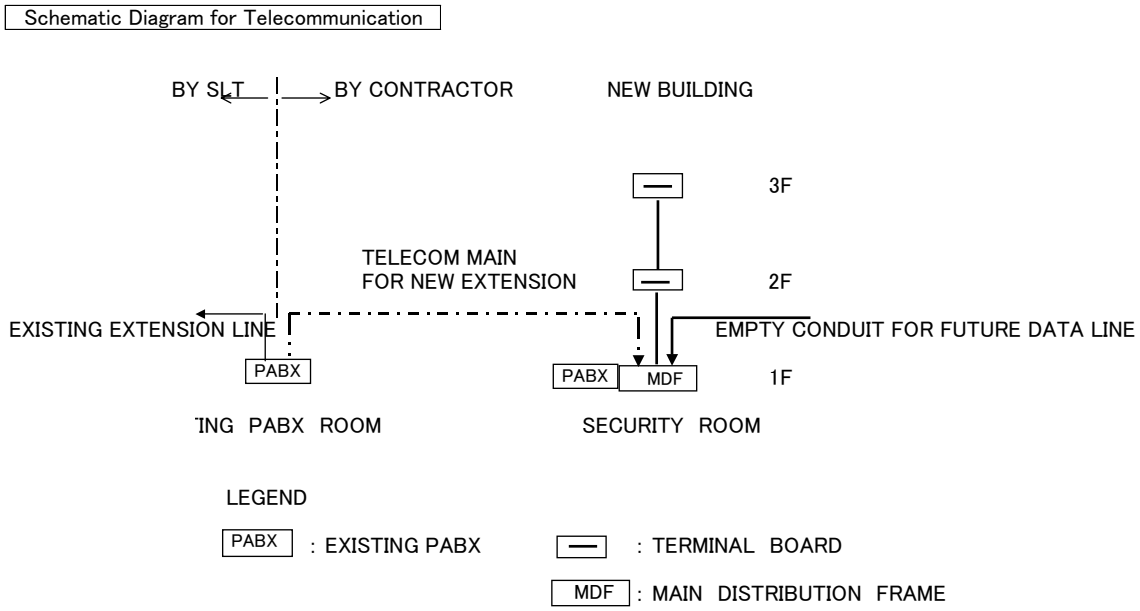


Figure 2-7 Main Telephone Line System

7. Automatic Fire Alarm System

Fire alarm system will be designed by referring to the British Standards.

8. Lightning Protection System

This will be installed for lightning protection of elevated areas 20 meters above ground or higher referring on the French Standard, which is widely applied in Sri Lanka.

9. Earthing of Medical Equipment

Separate earthing facilities will be installed for the operating rooms.

10. Master TV Antenna System

TV outlets will be installed in the halls. An aerial for the Master TV antenna designed for terrestrial broadcasting reception will be installed in the Project.

- Mechanical Work

1. Air Conditioning System

Air conditioning system that is as simple and effective as possible will be used, considering the purpose of use of each room and the medical equipment installed inside.

Air conditioning will be installed in the rooms where air conditioning is required due to functional reasons, such as rooms used in a closed condition, or rooms with large generation of heat load, as well as in the rooms where cleanliness is required.

Stand-alone air-cooled air conditioners will be used in most cases considering the ease of repair. Operating rooms will have a system with floor-standing package-type air conditioning units in the adjacent air conditioning machine room, equipped with HEPA filters to ensure the cleanliness of operation rooms.

Rooms without air conditioning will be equipped with ceiling fans.

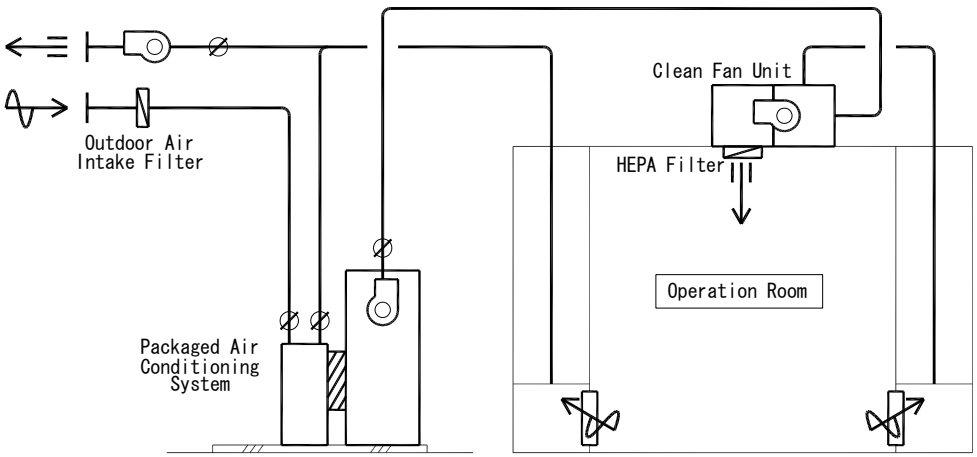


Fig. 2-8 Conceptual Drawing of Air Conditioning System for Operating rooms

Table 2-12 Air Conditioning Systems for Main Rooms

Air Conditioning System	Rooms	Remarks
Floor-standing package-type air conditioning units + Clean fan units	2F : operating rooms 1 - 3	
Ceiling-mounted cassette-type air conditioners	GF : drug storage, pharmacy 1F : audiometry room, pulmonary function test room, dental X-ray room, EEG room, ECG room, EMG room, laboratory, endoscopy room, deputy-director'sroom, matron's room, Special dental room, Special dental examination room 2F : Clean corridors, operation theater hall, recovery room, pediatric ICU, neonatal ICU, operation theater doctors' room, operation theater nurses' room, operation theater staff room, sterilization room, clean store	
Wall-mounted air conditioners	GF : Emergency treatment unit	

2. Ventilation System

Ventilation system will be planned mainly based on natural ventilation, ensuring consistency with the architectural plan.

Toilets, electrical room, generator room, pump room, etc. will be equipped with mechanical ventilation for the purpose of removing smell and heat. Rooms that are used in a closed condition such as operating rooms, laboratory rooms, etc. will

be equipped with mechanical ventilation.

3. Sanitation Equipment and Facilities

Sanitation equipment in accordance with the local customs will be installed.

The toilets for visitors, which will be used by the general public, will be of the squatting closet style. These will have no roll paper holders but have hand showers.

The toilets for staff will be of the western style, equipped with roll paper holders and hand showers.

4. Water Supply System

Tap water will be branched from the hospital's dedicated water mains (225 mm diameter, approximate depth 1 m), buried beneath the road to the southeast of the premises, and sent to the new building via a 75 mm diameter line.

After storage in the reservoir, water is pumped up to the elevated water tank and then delivered to points of use by gravity.

To prevent the contamination of stored water, the reservoir will be a concrete tank above the ground level. The capacity of the reservoir is planned to be 100 m^3, sufficient for the daily use of water.

The capacity of the elevated water tank is planned to be 15 m^3, corresponding to 15% of daily water use.

- Estimated Water Supply

	Number of persons	Unit water use	Daily water use
Outpatients/Visitors	1,450persons	20 ℓ/day	29 m^3/day
Staff	580 persons	100 ℓ/day	58 m^3/day
ICU	35 beds	400 ℓ/day	14m^3/day
Total			101 m^3/day

The installation cost of the new 75 mm diameter line down to the installation of the water meter is to be born by the Sri Lankan side.

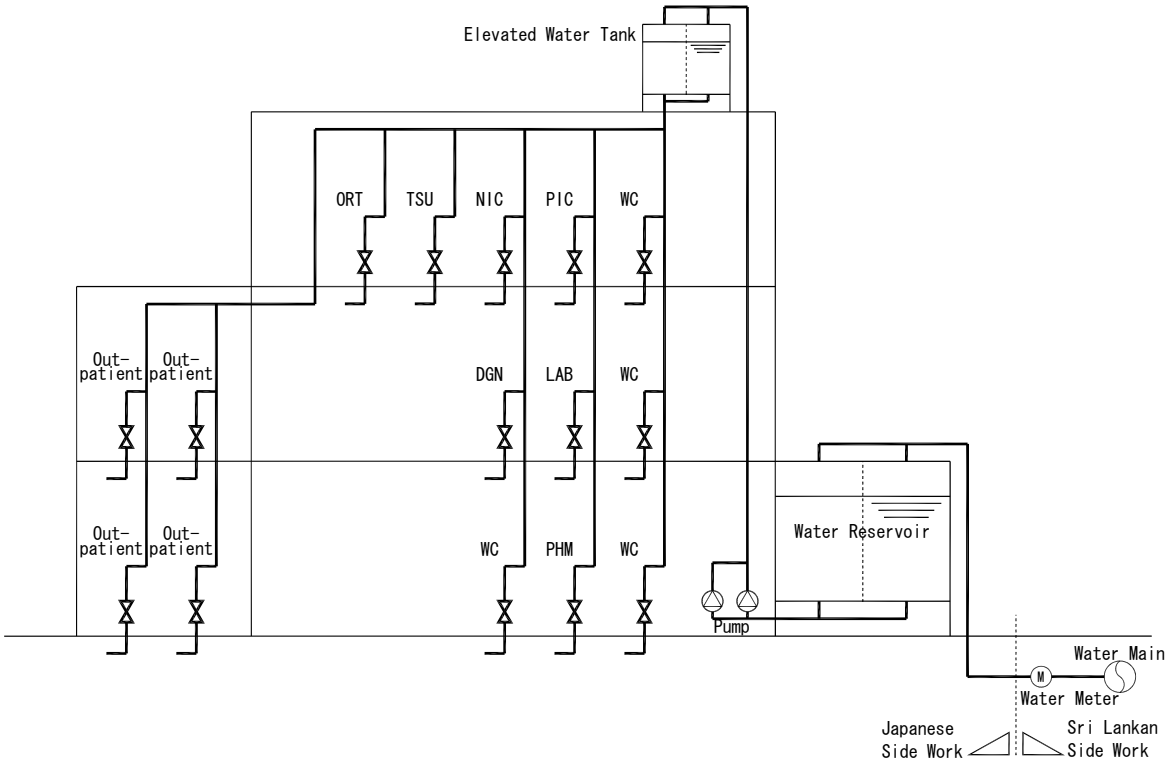


Fig. 2-9 Schematic Diagram for Water Supply

5. Hot Water Supply System

Hot water supply facilities are planned for pantries and feeding rooms. Hot water will be supplied individually from electric storage-tank water heaters considering safety.

6. Drainage System

- Wastewater

  Because the existing drainage treatment plant is already accepting drainage exceeding its treatment capacity, the drainage (sewage from closets, urinals, sinks, etc.) from the new building of the Project will be treated in the waste water treatment plant that will be newly constructed in the Project. The water after treatment will be discharged to the lake via connection to the existing system.

  An independent route from the new building to the waste water treatment plant will be planned beneath the hospital's private internal road to the northeast of the premises. Because the piping distance is long and the gradient

is insufficient for a gravity flow, one pump-up tank will be installed at midpoint.

Toilets and operating rooms will have floor drains for floor cleaning. The floor drains in operating rooms will be fitted with lids.

Plaster traps to intercept plaster will be installed in the orthodontics and orthopedics clinics where the use of plaster is expected. Considering the space for maintenance, plaster traps will be integrated into sinks.

Basically, PVC pipes will be used as piping material.

- Rainwater

  Rainwater drainage will be connected to the existing rainwater drainage ditch in the premises.

7. Fire fighting System

Indoor fire hydrants and fire extinguishers will be installed to ensure the safety of the new building.

The capacity of the fire fighting water tank will be 45m^3.

8. Medical Gas Supply System

Centralized oxygen supply facility using integrated cylinder systems, centralized compressed air supply facility, and centralized vacuum suction facility will be installed. Nitrous oxide gas will be supplied individually as in the existing system.

An alarm display panel will be installed in a security room on the ground floor to monitor the operation of equipment.

Table 2-13 Rooms with Medical Gas Supply

Room		Oxygen (O)	Compressed Air (A)	Vacuum (V)	Remarks
GF	ETU	○	○	○	1 set/bed
2F	Operating room	○	○	○	Installed on wall and ceiling
	Preparation room	○	○	○	1 set/bed
	Recovery room	○	○	○	1 set/bed
	Pediatric ICU	○	○	○	1 set/bed
	Neonatal ICU	○	○	○	1 set/bed

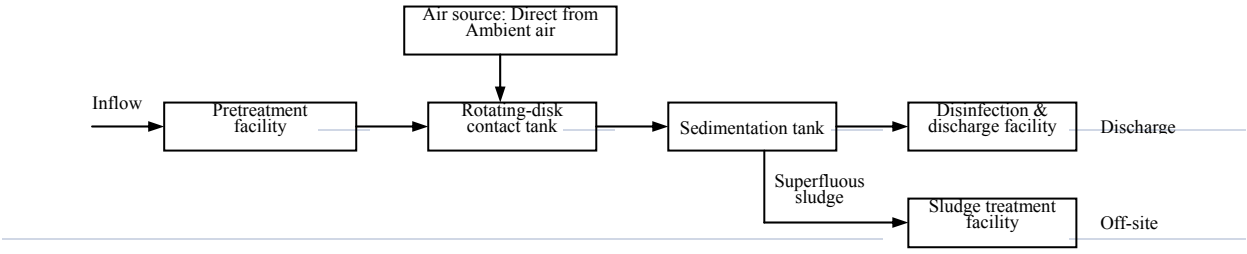
9. Waste Water Treatment System

New waste water treatment plant will be constructed for the treatment of the drainage from closets, urinals, sinks, etc. solely from the new building in the Project.

Considering the ease of maintenance and the reduction of operating cost, the Project will employ a rotating-disk contact system based on a biofilm process. In this system, several disks immersed in the wastewater treatment tank are rotated slowly, allowing the microbes on disk surfaces to take oxygen directly from air and decompose organic matter. Because microbes take oxygen directly from air in a quantity matching to the wastewater load, the system itself is simple. It requires no adjustment of air flow rate and routine maintenance is needed only for a limited number of items. Power consumption is low, because the system uses no blower for air supply and power is used basically only for the rotation of disks. For these reasons, a rotating-disk contact system is considered to be most suitable for the Project.

A summary of this system is shown below.

- Throughput capacity: 100 m^3/day
- BOD: 200 mg/ℓ inflow, 20 mg/ℓ discharge
- Facility dimensions 15 m x 15 m



The location of this plant is planned to be adjacent to the existing drainage treatment facility. Land preparation of the planned site (removal of existing trees and removal of existing abandoned generator) is to be done by the Sri Lankan side.

5) Building Material Plan

In order to rationalize procurement, construction work and maintenance, the project will use

common local materials such as floor tiles for the floor, bricks and paints for the wall, ceramic roof tiles for the roof.

(4) Equipment Plan

1) Policy on Equipment Selection

The equipment related to the Project is selected with the following policy.

1. Equipment for the renewal of existing and replenishment of equipment in short supply.
2. The level of the equipment should be compatible with the current technical level.
3. Equipment with low maintenance cost should be selected.
4. Office equipment, general furniture and general-purpose equipment are not to be included.

2) Examination of the Contents of the Request

In List of the Equipment attached to Minutes of Discussion on Basic Design Study, the components of requested equipment were assigned three graded priorities in descending order: A, B, and C. Considering this priority rating and according to the above policy on equipment selection, the following points are examined based on the medical activities of each department and the status of existing equipment, as well as ensuring consistency with the Facility Plan in terms of the grade and quantity of equipment.

1. Classification

i) Renewal: Items procured for renewal of existing equipment.
ii) New: Newly procured items of a type not previously used in the existing departments.
iii) Addition: Items that are similar to existing equipment and procured for replenishment.

2. Equipment Selection Criteria

i) Examination of Purpose of Use

○: Basic equipment suitable for the activities of the target facility.
△: Equipment that can be replaced by simpler alternatives; equipment that should be considered separately from the request.
×: Equipment unsuitable for the activities of the target facility.

ii) Examination of Need

○: Equipment considered indispensable for the activities of the target facility.

×: Equipment not strongly required for the activities of the target facility and with limited benefit; equipment whose main functions can be provided by existing equipment.

iii) Examination of Technical Level

○: Equipment compatible with the current technical level.

×: Equipment requiring a high degree of technical skill which may be difficult to acquire in the future.

iv) Examination of Operating Organization

○: The facility already has or is expected to have personnel to operate the equipment.

×: The facility is not expected to have the personnel to operate the equipment.

v) Examination of Maintenance System

○: The equipment can be maintained easily and appropriately by current personnel. The manufacturer provides appropriate maintenance services, or consumable supplies and spare parts are easily available locally.

×: The equipment is difficult to maintain and the maintenance burden is expected to cause problems after introduction of the equipment. Equipment requiring consumable supplies and spare parts which are difficult to procure locally.

vi) Examination of Operation and Maintenance Cost

○: The equipment requires only low operation and maintenance cost, or the renewal of existing equipment will not impose a heavy burden in the budget allocation on the Sri Lankan side.

×: New or added equipment requires high operation and maintenance cost and is expected to impose a heavy burden in budget allocation.

vii) Overall Evaluation

○: Equipment considered appropriate and covered by the Project.

×: Equipment not included in the Project.

The results of the above examination regarding individual equipment items are as shown in "Table 3-14 Examination List of Requested Equipment". The final "Planned Equipment List" and "Detail for Main Equipment" are included in the appendices. (See "Appendix 5 – Planned Equipment List" and "Appendix 6 – Detail for Main Equipment".)

3) Equipment Quantities, Spare Parts, and Consumable Supplies

Equipment quantities are determined at the minimal required quantities according to the number of medical staff, the number of patients, the number of tests, and the facility plan. Spare parts and consumables are included in the plan, assuming that 3 months will be needed from the installation of equipment for the process of comprehending stable demands, placing orders, and receiving delivery.

4) Examination of Equipment for Each Department

The necessity and appropriateness of requested main equipment are discussed below for each department.

- Operation Department

1. Operating rooms (Obstetrics-Gynecology)

Three operating rooms are planned, one for Caesarean sections, one for scheduled operations, and one for infectious operations. The existing operating rooms that have been used by Obstetrics-Gynecology Department will be used by other departments, new equipment will be needed for the new operation rooms, such as theater tables, anesthetic machines, theater lamps, cautery units, and patient monitors. Pulse-oximeters and ECG monitors are excluded from the plan, because these functionally overlap with patient monitors. Central monitors are excluded because central information management is not implemented at the Hospital. Laparoscopes, including accessories in short supply, will be procured as renewal items, because the need for laparoscopic operations are increasing year by year. Although hysteroscopes will be a new addition to the Hospital, no problems in operation are expected because there are doctors experienced in the use of this

equipment. Hysteroscopes are useful for visual identification of endometrial polyps and uterine myomas, which are common conditions in Obstetrics-Gynecology Department, and also are capable of minimally invasive removal of lesions requiring treatment. For these reasons, hysteroscopes are included in the plan. BP apparatus, glucometers, and other items that are procurable with the budget of the Hospital are excluded.

The plan for Theater sterilizing unit includes procurement of 2 autoclaves and associated working tables, shelves for storing sterilization containers, and sterilizing trolleys, considering the daily number of operations performed at present.

Daily number of operations (Ob-Gyn): 18, surgical instruments per operation: 50ℓ
Incidental items: 10 % of surgical instruments, loading efficiency: 60 %, 6 runs/day
Volume of sterilized items per day: 18 operations x 50ℓ x 110 % = 990ℓ
Required sterilizer capacity: 990ℓ / 60 % / 6 runs = 275ℓ
Therefore, two 150ℓ sterilizers are needed.

The plan for recovery room includes the procurement of 4 oxygen flowmeters and 2 patient monitors, corresponding to the planned 4 beds.

2. Intensive Care Units (ICUs)

1) Neonatal ICU

Because Neonatal ICU is planned to have 27 beds for infants in total, the Project covers the addition of incubators and infant warmers considering the status of existing equipment. Because 6 of the 27 beds will be used for neonates in serious conditions, patient monitors corresponding to this number will be procured. As for the ventilator with CPAP function, 1 unit will be procured considering existing equipment, because not all patient in Neonatal ICU lack the ability of spontaneous respiration. This unit will be installed in the infections room.

2) Pediatric ICU

Because Pediatric ICU is planned to have 8 beds, 8 ICU beds will be procured for the renewal of deteriorated existing beds. While patient monitors corresponding to this number of beds will be needed, only 2 units will be procured and installed in infectious room, because some of the existing units are suitable for continued use.

Ventilators with CPAP function are excluded from the plan, because existing equipment is suitable for continued use. One defibrillator will be procured, to be shared with Neonatal ICU.

- Outpatient Department

1. Common Equipment and Walk-in Clinic

   BP apparatus, knee hammers, and weighing scales will be procured as examination sets in appropriate quantities considering existing equipment. Examination lamps, X-ray illuminators, examination tables, examination chairs, examination beds, cupboards, trolley dressings, and other basic items will be procured as common equipment of Outpatient Department in quantities corresponding to examination rooms and procedure rooms. Television sets and computers are excluded from the Project, because these are office equipment.

2. Specialized Outpatient Clinics

   The request included the equipment necessary in 9 specialized outpatients clinics.

   Respiratory Clinic: The request included a spirometer that can test pulmonary diffusing capacity. However, such apparatus would be an elaborate system consuming special gas and requiring difficult maintenance. Instead, the Project will procure the standard equipment for the diagnosis of asthma, bronchitis, pulmonary emphysema, etc. Pulse-oximeters are included, because these are useful for the diagnosis of patients with suspected respiratory diseases.

   Dermatology Clinic: Skin tumors are now treated manually using liquid nitrogen. The Project will procure the cryosurgery unit enabling safer and simpler treatment.

   Rheumatology & Rehabilitation Clinic: The request included bone densitometer, because the department currently lacks diagnostic equipment needed for the treatment of osteoporosis and monitoring the progress of rehabilitation. However, because the requested equipment is expensive and requires difficult maintenance, the Project will procure simple equipment for ultrasound bone measurement of the calcaneus.

   Obstetrics-Gynecology Clinic: The Obstetrics-Gynecology outpatient clinic does not have

ultrasonic diagnostic unit, which is regarded as basic diagnostic equipment. Although a unit installed in the wards is temporarily moved to the outpatient clinic and used for diagnosis, the unit is also highly demanded in the wards. The Project will procure 1 unit of ultrasonic diagnostic equipment for the outpatient clinic. Fetal monitor(CTG) is excluded from the Project, because the test using this monitor takes time and the need can be covered by the existing unit in the delivery room.

ENT Clinic: The request included an ENT microscope. Our survey has shown that the existing equipment is broken and a microscope is necessary for treatment such as removal of foreign matters in external auditory meatus, so this equipment is to be renewed. The ENT operating room is equipped with a rigid nasal endoscope for use in operation, but the outpatient clinic does not have one for examination. This Project will procure 1 unit. ENT treatment units will be procured as renewal of old units comprising suction pumps and examination lamps in quantities corresponding to the number of examination rooms. Caloric nystagmus test machine is the equipment to test equilibrium function by applying thermal stimuli to the inner ear to occur nystagmus. This equipment is excluded from the Project, because the need can be covered by other test methods.

OMF Clinic: The request included video swallowing fluoroscopy unit and aerophonoscope. Although these are the equipment used for functional tests of the oral cavity, pharynx, and larynx, these are excluded from the Project because of the difficulty to maintain. Instead, the Project will procure educational instruments for speech therapy. Panoramic & cephalo X-ray unit is capable of wide-area photography and observation of curved jaw bones and is useful for evaluating various diseases, including diseases of the jaw bones, diseases originating from teeth, diseases of the nasal cavity and paranasal sinuses (such as the maxillary sinus), and temporomandibular arthrosis. The Project includes the procurement of this device as the renewal of the dental X-ray apparatus, which has been used for over 20 years. This Project will procure 3 additional dental units for minor operations and treatment, because the existing units in the present facility will be used by Dental Clinic.

Orthodontics Clinic: While dental units for treatment were requested, 2 existing units will be moved to the new clinic and the 1 unit showing deterioration will be renewed.

3. Endoscopy Unit

Because the need for endoscopic examination is increasing year by year, the Project covers the addition and renewal to replace the deteriorated existing equipment. Bronchial endoscope will be renewed because of the deterioration of the existing equipment, which has been used for 10 years. Nasopharyngoscope will be shared by ENT Clinic and OMF Clinic, oesophagogastroduodenoscope(OGD) will be shared by Internal Medicine Clinic, Surgical Oncosurgery Clinic, and ENT Clinic, and colonoscope will be shared by Internal Medicine Clinic and Oncosurgery Clinic. The Project will include the peripheral equipment to be used with endoscopes, such as light sources, suction units, electrosurgical units, and endoscopic tables.

4. Physiological Test Unit

The plan for physiological tests includes ECG room, EEG room, and EMG room. ECG monitor is currently used for more than 200 patients every day, including outpatients and inpatients. This Project covers the renewal of 1 unit for outpatients because of the deterioration of existing equipment. EEG is excluded from the Project, because the existing equipment purchased in 2006 is in good condition. EMG machine is useful for evaluation and diagnosis of neuropathy, sensory disturbance such as numbness of the limbs, and motor disturbance (difficulty in walking and other muscular power loss) resulting from various diseases such as diabetes and rheumatoid arthritis, as well as for followup assessment. Because this equipment is needed in Rheumatology & Rehabilitation Clinic and Neurology Clinic, it will be installed in physiological test room and shared by these departments. The Project will renew this equipment.

Blood gas analyser is essential to the assessment of patients' respiratory function and gas exchange capacity of the lungs. It is one of the most important tests in clinical settings. For this reason, the Project will procure a blood gas analyser, to be shared by Neonatal ICU, Pediatric ICU, and Emergency Treatment Unit. Considering the emergency use at night, this equipment will be installed in Pediatric ICU.

5. Emergency Treatment Unit (ETU)

The Project will cover the addition and renewal of patient monitors, syringe pumps, etc., considering the status of existing equipment. Ventilators are excluded, because patients

requiring respiration management will be treated in existing ICUs. O2 supply wall unit for oxygen inhalation will be procured in quantities corresponding to the number of beds. Mobile X-ray machine would be useful in emergencies in patients with difficulty in movement to X-ray room, however, this is excluded from the Project because the use in emergency medical clinic would be infrequent.

6. Outpatient Laboratory

While hematology tests and biochemistry tests are performed in outpatient laboratory, microscopes, centrifuges, and other basic equipment have been deteriorated and require renewal. The deteriorated hematology analyser will be renewed, because the number of outpatient specimens for hematology tests has been increasing. The biochemistry analyser will be changed to a spectrophotometer, reflecting the revision to minimize measurement items considering the number of specimens tested at present. Although polarizing microscope is used for the biopsy to detect amyloidosis as a cause of rheumatic diseases, this is excluded from the Project because the need can be covered by blood tests.

7. Pharmacy

Automatic tablet counter will improve the hygienic condition of tablets by mechanizing the counting of tablets, which has been performed by hands, and improve the efficiency and accuracy of dispensing while saving time and labor. This equipment will be included in the Project because of these reasons. Similarly, paste mixer will be included in the Project, because the mechanization of the preparation of ointments, which has been performed by hands, will improve the hygienic condition of ointments, the efficiency of preparation work, and the homogeneity of ointments.

8. Rehabilitation Room

Interferential low-frequency therapy unit and electrical nerves stimulator unit are basic equipment for electric stimulation therapy on muscles and nerves. These will be covered by the Project, because the needs are expected to be high. Trans cutaneous nervous stimulator(TENS) unit will be excluded, because the electrical nerves stimulator unit has similar function. Parallel bar sets and traction apparatus will be covered by the Project, because existing equipment has been fixed on the floor and it is impossible to relocate the existing equipment after dismantling of the present facility. Nerve conduction test machine

will be excluded from the Project, because EMG machine has similar function. EMG machine will be covered by the Project, but this will be moved to physiological test room and shared with Neurology Clinic and Rheumatology & Rehabilitation Clinic. While the request included a dynamometer as a muscle power test device with advanced functions, this will be excluded because of difficult maintenance procedures.

Table 3-14 Examination List of Requested Equipment

Department	Room	Minutes No.	Description (Request)	Priority	Classification	①	②	③	④	⑤	⑥	⑦	Remarks	Planned Q'ty	Delivery No.	Item No.	Description (Planned)
Ob-Gyn surgical	Operating theater	OT-01	Suction apparatus	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-01	1	Suction apparatus
Ob-Gyn surgical	Operating theater	OT-02	Laryngoscope	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-02	2	Laryngoscope
Ob-Gyn surgical	Operating theater	OT-03	Defibrillator with monitor	A	A	○	○	○	○	○	○	○	1 unit is shared by 3 operating rooms	1	OT-03	3	Defibrillator with monitor
Ob-Gyn surgical	Operating theater	OT-04	Trolley (emergency)	A	A	○	○	○	○	○	○	○	For mounting defibrillator	1	OT-04	4	Trolley (emergency)
Ob-Gyn surgical	Operating theater	OT-05	Trolley dressing	A	A	○	○	○	○	○	○	○	2 units in each operating room	6	OT-05	5	Trolley dressing
Ob-Gyn surgical	Operating theater	OT-06	Medical refrigerator	A	A	○	○	○	○	○	○	○	1 unit is shared by 3 operating rooms	1	OT-06	6	Medical refrigerator
Ob-Gyn surgical	Operating theater	OT-07	X-ray illuminator, multi film	A	A	○	○	○	○	○	○	○	Same number as operating rooms, renamed	3	OT-07	7	X-ray illuminator, 2 films
Ob-Gyn surgical	Operating theater	OT-08	Patient monitor	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-08	8	Patient monitor
Ob-Gyn surgical	Operating theater	OT-09	Theater table	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-09	9	Theater table
Ob-Gyn surgical	Operating theater	OT-10	Theater lamp	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-10	10	Theater lamp
Ob-Gyn surgical	Operating theater	OT-11	Anesthetic machine	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-11	11	Anesthetic machine
Ob-Gyn surgical	Operating theater		Anesthetic ventilator	Remarks	A	○	×	○	○	○	○	×	Attached to anesthetic machine	0			
Ob-Gyn surgical	Operating theater		Instrument trolley	mar	A	○	×	○	○	○	○	×	Same as Trolley dressing	0			
Ob-Gyn surgical	Operating theater	OT-12	Table top sterilizer	C	A	○	×	○	○	○	○	×	Can be covered by Autoclave	0			
Ob-Gyn surgical	Operating theater		Surgeons stool	Remarks	A	○	×	○	○	○	○	×	Same as Anesthetist stool	0			
Ob-Gyn surgical	Operating theater	OT-13	Anesthetic trolley	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-12	12	Anesthetic trolley
Ob-Gyn surgical	Operating theater	OT-14	Anesthetist stool	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-13	13	Anesthetist stool
Ob-Gyn surgical	Operating theater	OT-15	Cautery unit	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-14	14	Cautery unit
Ob-Gyn surgical	Operating theater	OT-16	Scrub up sink	A	A	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-15	15	Scrub up sink
Ob-Gyn surgical	Operating theater	OT-17	Laparoscope set	B	R	○	○	○	○	○	○	○		1	OT-16	18	Laparoscope set
Ob-Gyn surgical	Operating theater	OT-18	Hysteroscope	B	N	○	○	○	○	○	○	○	Fiberscope for treatment	1	OT-17	19	Hysteroscope
Ob-Gyn surgical	Operating theater	OT-19	Infant resuscitation table	A	R	○	○	○	○	○	○	○	Same number as operating rooms	3	OT-18	16	Infant warmer
Ob-Gyn surgical	Operating theater	OT-20	BP apparatus	C	A	○	×	○	○	○	○	×	Patient monitor can be substituted	0			

Examination List of Requested Equipment

Department	Room	Minutes No.	Description (Request)	Priority	Classification	①	②	③	④	⑤	⑥	⑦	Remarks	Planned Q'ty	Delivery No.	Item No.	Description (Planned)
Ob-Gyn surgical	Operating theater	OT-21	Tracheostomy set	C	A	○	×	○	○	○	○	×	Can be provided by hospital	0			
Ob-Gyn surgical	Operating theater	OT-22	Pulse oxymeter	C	A	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Ob-Gyn surgical	Operating theater	OT-23	ECG monitor	C	A	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Ob-Gyn surgical	Operating theater	OT-24	Drug trolley	C	A	×	×	○	○	○	○	×	Excluded because it is equipment for ward	0			
Ob-Gyn surgical	Operating theater	OT-25	Table	C	A	×	×	○	○	○	○	×	Excluded because it is general furniture	0			
Ob-Gyn surgical	Operating theater	OT-26	Revolving chair	C	A	×	×	○	○	○	○	×	Excluded because it is general furniture	0			
Ob-Gyn surgical	Operating theater	OT-27	Glucometer	C	A	○	×	○	○	○	○	×	Can be provided by hospital	0			
Ob-Gyn surgical	Operating theater	OT-28	Central monitoring unit	C	N	×	×	○	×	○	○	×	Central management is not needed	0			
Ob-Gyn surgical	Operating theater	OT-29	Spot lamp	C	A	×	×	○	○	○	○	×	Theater lamp can be substituted	0			
Ob-Gyn surgical	Operating theater		Surgeons chair	Remarks	A	○	×	○	○	○	○	×	Same as Anesthetist stool	0			
Ob-Gyn surgical	Operating theater				A	○	○	○	○	○	○	○	Moved from recovery room, same number as operation rooms	3	OT-19	17	Stretcher
Ob-Gyn surgical	Operating theater				A	○	○	○	○	○	○	○	Instruments cabinet is added to operating room	3	OT-20	41	Instrument cabinet
Ob-Gyn surgical	Sterilization	OT-30	Autoclave	A	A	○	○	○	○	○	○	○		2	OT-21	22	Autoclave
Ob-Gyn surgical	Sterilization	OT-31	Sterilizing container set	A	A	○	○	○	○	○	○	○		2	OT-22	23	Sterilizing container set
Ob-Gyn surgical	Sterilization	OT-32	Sterilizing working table	A	A	○	○	○	○	○	○	○		3	OT-23	24	Sterilizing working table
Ob-Gyn surgical	Sterilization	OT-33	Sterilizing container storage rack	A	A	○	○	○	○	○	○	○		3	OT-24	25	Sterilizing container storage rack
Ob-Gyn surgical	Sterilization	OT-34	Sterilizing trolley	A	A	○	○	○	○	○	○	○		1	OT-25	26	Sterilizing trolley
Ob-Gyn surgical	Recovery	OT-35	Stretcher	B	A	○	×	○	○	○	○	×	Move to operating room	0			
Ob-Gyn surgical	Recovery	OT-36	Patient bed	A	A	○	○	○	○	○	○	○		4	OT-26	20	Patient bed
Ob-Gyn surgical	Recovery	OT-37	O2 supply wall unit	A	A	○	○	○	○	○	○	○	Same number as beds	4	OT-27	21	O2 supply wall unit
Ob-Gyn surgical	Recovery	OT-38	O2 supply wall/cylinder regulator	C	A	○	×	○	○	○	○	×	O2 supply wall unit can be substituted	0			
Ob-Gyn surgical	Recovery	OT-39	Patient monitor	A	A	○	○	○	○	○	○	○	1 unit for 2 beds	2	OT-28	8	Patient monitor
Ob-Gyn surgical	Recovery	OT-40	IV stand	A	A	○	×	○	○	○	○	×	Attached to patient bed	0			
Pediatric	Neonatal ICU	NI-01	Suction wall unit	A	R	○	○	○	○	○	○	○	6 for infectious, 7 for premature, 6 for ICU	19	NI-01	27	Suction wall unit
Pediatric	Neonatal ICU	NI-02	Laryngoscope, neonate	A	A	○	○	○	○	○	○	○	Miller type	3	NI-02	28	Laryngoscope, neonate
Pediatric	Neonatal ICU	NI-03	Defibrillator with monitor	C	N	○	×	○	○	○	○	×	Shared with Pedicatric ICU	0			

Examination List of Requested Equipment

Department	Room	Minutes No.	Description (Request)	Priority	Classification	①	②	③	④	⑤	⑥	⑦	Remarks	Planned Q'ty	Delivery No.	Item No.	Description (Planned)
Pediatric	Neonatal ICU	NI-04	Trolley (emergency)	A	R	○	×	○	○	○	○	×	Shared with Pediatric ICU	0			
Pediatric	Neonatal ICU	NI-05	Trolley dressing	A	R	○	○	○	○	○	○	○	1 for infectious, 2 for premature, 1 for ICU	4	NI-03	5	Trolley dressing
Pediatric	Neonatal ICU	NI-06	O2 supply wall unit	A	R	○	○	○	○	○	○	○	6 for infectious, 7 for premature, 6 for ICU	19	NI-04	21	O2 supply wall unit
Pediatric	Neonatal ICU	NI-07	IV stand	A	R	○	×	○	○	○	○	×	Existent can be used	0			
Pediatric	Neonatal ICU	NI-08	Pulse oxymeter, neonate	A	A	○	○	○	○	○	○	○	Half number of incubator (7 unites) in infectious room and premature room, 2 units is existent	5	NI-05	29	Pulse oxymeter
Pediatric	Neonatal ICU	NI-09	Drug trolley	A	R	○	○	○	○	○	○	○	1 unit for each room	3	NI-06	30	Drug trolley
Pediatric	Neonatal ICU	NI-10	X-ray illuminator, multi film	A	R	○	○	○	○	○	○	○	Renamed	1	NI-07	7	X-ray illuminator, 2 films
Pediatric	Neonatal ICU	NI-11	Ophthalmoscope	A	R	○	○	○	○	○	○	○		2	NI-08	31	Ophthalmoscope
Pediatric	Neonatal ICU	NI-12	Otoscope	A	R	○	×	○	○	○	○	×	Included in ophthalmoscope	0			
Pediatric	Neonatal ICU	NI-13	Syringe pump	A	A	○	○	○	○	○	○	○	Half number of incubator (3 for infectious, 5 for premature, 3 for ICU), 2 unites is existent	9	NI-09	32	Syringe pump
Pediatric	Neonatal ICU	NI-14	Infusion pump	A	A	○	○	○	○	○	○	○	Existent can be used, Syringe pump can be used at NICU	0			
Pediatric	Neonatal ICU	NI-15	Patient monitor, neonate	A	N	○	○	○	○	○	○	○	6 units for intensive room	6	NI-10	33	Patient monitor, neonate
Pediatric	Neonatal ICU	NI-16	Incubator	A	A	○	○	○	○	○	○	○	Required 22 units, 15 units is existent	7	NI-11	34	Incubator
Pediatric	Neonatal ICU	NI-17	Phototherapy unit	A	A	○	○	○	○	○	○	○	Half number of NICU bed (required 14 units, 10 unites is existent)	4	NI-12	35	Phototherapy unit
Pediatric	Neonatal ICU	NI-18	Apnoea monitor	A	R	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Pediatric	Neonatal ICU	NI-19	Infant warmer	A	A	○	○	○	○	○	○	○	For premature room	3	NI-13	16	Infant warmer
Pediatric	Neonatal ICU	NI-20	Baby scale	A	R	○	○	○	○	○	○	○		1	NI-14	36	Baby scale
Pediatric	Neonatal ICU	NI-21	Ventilator, C-pap	A	A	○	○	○	○	○	○	○	1 unit for infectious room	1	NI-15	37	Ventilator, C-pap
Pediatric	Neonatal ICU	NI-22	Bilirubinmeter with hematocrit centrifuge	A	N	○	○	○	○	○	○	○		1	NI-16	38	Bilirubinmeter with hematocrit centrifuge
Pediatric	Neonatal ICU	NI-24	BP apparatus	C	R	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Pediatric	Neonatal ICU	NI-25	Tracheostomy set	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Neonatal ICU	NI-26	ECG monitor	C	R	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Pediatric	Neonatal ICU	NI-27	Cot	C	R	○	×	○	○	○	○	×	Existent can be used	0			

Examination List of Requested Equipment

Department	Room	Minutes No.	Description (Request)	Priority	Classification	①	②	③	④	⑤	⑥	⑦	Remarks	Planned Q'ty	Delivery No.	Item No.	Description (Planned)
Pediatric	Neonatal ICU	NI-28	Bed side locker	C	R	×	×	○	○	○	○	×	Excluded because it is general furniture	0			
Pediatric	Neonatal ICU	NI-29	Refrigerator	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Neonatal ICU	NI-30	Nurse table	B	R	○	○	○	○	○	○	○	Renamed	2	NI-17	39	Nurse table
Pediatric	Neonatal ICU	NI-31	Nurse chair	B	R	○	○	○	○	○	○	○	Renamed	6	NI-18	40	Nurse chair
Pediatric	Neonatal ICU	NI-32	Glucometer	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Neonatal ICU	NI-33	ICU Cot	C	R	○	×	○	○	○	○	×	Incubator can be substituted, existent can be used	0			
Pediatric	Neonatal ICU	NI-34	Hand dryer	C	R	○	×	○	○	○	○	×	Existent can be used	0			
Pediatric	Neonatal ICU	NI-35	Mattress	C	R	○	×	○	○	○	○	×	Attached to incubator	0			
Pediatric	Neonatal ICU	NI-36	Neonatal resuscitator	C	R	○	×	○	○	○	○	×	Existent can be used	0			
Pediatric	Neonatal ICU	NI-37	Central monitoring unit	C	N	×	×	○	×	○	○	×	Central management is not needed	0			
Pediatric	Neonatal ICU	NI-38	ICU table	B	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Neonatal ICU	NI-39	Cupboard	B	R	○	○	○	○	○	○	○	Renamed	2	NI-19	41	Instrument cabinet
Pediatric	Pediatric ICU	PI-01	Suction wall unit	A	R	○	○	○	○	○	○	○	Same number as bed	8	PI-01	27	Suction wall unit
Pediatric	Pediatric ICU	PI-02	Laryngoscope, pediatric	B	A	○	○	○	○	○	○	○		2	PI-02	42	Laryngoscope, pediatric
Pediatric	Pediatric ICU	PI-03	BP apparatus	C	R	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Pediatric	Pediatric ICU	PI-04	Tracheostomy set	A	A	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-05	Trolley (emergency)	C	R	○	○	○	○	○	○	○	For mounting defibrillator	1	PI-04	4	Trolley (emergency)
Pediatric	Pediatric ICU	PI-06	Trolley dressing	C	R	○	×	○	○	○	○	×	Same as ICU table	0			
Pediatric	Pediatric ICU	PI-07	O2 supply wall unit	A	R	○	○	○	○	○	○	○	Same number as beds	8	PI-05	21	O2 supply wall unit
Pediatric	Pediatric ICU	PI-08	IV stand	C	R	○	×	○	○	○	○	×	Included in ICU bed	0			
Pediatric	Pediatric ICU	PI-09	ICU bed	A	R	○	○	○	○	○	○	○		8	PI-06	43	ICU bed
Pediatric	Pediatric ICU	PI-10	Drug trolley	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-11	Medical refrigerator	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-12	X-ray illuminator, multi film	A	R	○	○	○	○	○	○	○	Renamed	1	PI-07	7	X-ray illuminator, 2 films
Pediatric	Pediatric ICU	PI-13	Ophthalmoscope	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-14	Otoscope	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-15	Glucometer	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-16	Syringe pump	A	A	○	○	○	○	○	○	○	1 unit for 2 beds	4	PI-08	32	Syringe pump
Pediatric	Pediatric ICU	PI-17	Infusion pump	A	A	○	○	○	○	○	○	○	1 unit for 2 beds	4	PI-09	44	Infusion pump
Pediatric	Pediatric ICU	PI-18	Patient monitor, pediatric	A	A	○	○	○	○	○	○	○	2 units in infectious room	2	PI-10	45	Patient monitor, pediatric

Examination List of Requested Equipment

Department	Room	Minutes No.	Description (Request)	Priority	Classification	①	②	③	④	⑤	⑥	⑦	Remarks	Planned Q'ty	Delivery No.	Item No.	Description (Planned)
Pediatric	Pediatric ICU	PI-19	Ventilator, C-pap	A	A	○	×	○	○	○	○	×	Existent can be used	0			
Pediatric	Pediatric ICU	PI-20	Apnoea monitor	C	R	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Pediatric	Pediatric ICU	PI-21	X-ray machine, mobile	B	R	○	○	○	○	○	○	○	Shared at the 2nd floor	1	PI-11	47	X-ray machine, mobile
Pediatric	Pediatric ICU	PI-22	Defibrillator with monitor	B	N	○	○	○	○	○	○	○	Shared with NICU	1	PI-12	3	Defibrillator with monitor
Pediatric	Pediatric ICU	PI-23	Pulse oxymeter, pediatric	B	R	○	×	○	○	○	○	×	Existent can be used	0			
Pediatric	Pediatric ICU	PI-24	Suction apparatus	C	R	○	×	○	○	○	○	×	Wall type suction unit can be substituted	0			
Pediatric	Pediatric ICU	PI-25	Doppler BP	C	R	○	×	○	○	○	○	×	Patient monitor can be substituted	0			
Pediatric	Pediatric ICU	PI-26	Cot	C	R	○	×	○	○	○	○	×	ICU bed can be substituted	0			
Pediatric	Pediatric ICU	PI-27	Bed side locker	C	R	○	×	○	○	○	○	×	Excluded because it is general furniture	0			
Pediatric	Pediatric ICU	PI-28	Refrigerator	C	R	○	×	○	○	○	○	×	Can be provided by hospital	0			
Pediatric	Pediatric ICU	PI-29	Nurse table	B	R	○	○	○	○	○	○	○	Renamed	2	PI-13	39	Nurse table
Pediatric	Pediatric ICU	PI-30	Nurse chair	B	R	○	○	○	○	○	○	○	Renamed	6	PI-14	40	Nurse chair
Pediatric	Pediatric ICU	PI-31	Hand dryer	C	R	○	×	○	○	○	○	×	Existent can be used	0			
Pediatric	Pediatric ICU	PI-32	Water mattress	C	N	○	×	○	○	○	○	×	ICU bed can be substituted	0			
Pediatric	Pediatric ICU	PI-33	Mattress	C	R	○	×	○	○	○	○	×	Attached to ICU bed	0			
Pediatric	Pediatric ICU	PI-34	ICU table	B	R	○	○	○	○	○	○	○	Renamed	2	PI-15	5	Trolley dressing
Pediatric	Pediatric ICU	PI-35	Cupboard	B	R	○	○	○	○	○	○	○	Renamed	2	PI-16	41	Instrument cabinet
Pediatric	Pediatric ICU				R	○	○	○	○	○	○	○	Moved from physiological test room, sheared with NICU and ETU	1	PI-17	46	Blood gas analyser
OPD	Common	OPD-01	Diagnostic set	A	R	○	○	○	○	○	○	○	Set of BP apparatus for adult, knee hammer and weighing scale	25	OPD-01	48	Diagnostic set, adult
OPD	Common				R	○	○	○	○	○	○	○	Set of BP apparatus for child, knee hammer and weighing scale	2	OPD-02	49	Diagnostic set, pediatric
OPD	Common	OPD-02	Examination lamp	A	R	○	○	○	○	○	○	○		55	OPD-03	50	Examination lamp
OPD	Common	OPD-03	Ophthalmoscope	A	R	○	○	○	○	○	○	○		14	OPD-04	31	Ophthalmoscope
OPD	Common	OPD-04	X-ray illuminator, multi film	A	R	○	○	○	○	○	○	○	Renamed	63	OPD-05	7	X-ray illuminator, 2 films
OPD	Common	OPD-05	Consultation table	A	R	○	○	○	○	○	○	○	Same number as examination booths	94	OPD-06	51	Consultation table
OPD	Common	OPD-06	Patient chair	A	R	○	○	○	○	○	○	○	Same number as examination booths	94	OPD-07	52	Patient chair
OPD	Common	OPD-07	Consultation chair	A	R	○	○	○	○	○	○	○	Same number as examination	94	OPD-08	53	Consultation chair

Examination List of Requested Equipment

Department	Room	Minutes No.	Description (Request)	Priority	Classification	①	②	③	④	⑤	⑥	⑦	Remarks	Planned Q'ty	Delivery No.	Item No.	Description (Planned)
													booths				
OPD	Common	OPD-08	Examination bed	A	R	○	○	○	○	○	○	○		34	OPD-09	54	Examination bed
OPD	Common	OPD-09	Cupboard	A	R	○	○	○	○	○	○	○		48	OPD-10	55	Cupboard
OPD	Common	OPD-10	Trolley dressing	A	R	○	○	○	○	○	○	○		31	OPD-11	5	Trolley dressing
OPD	Common		BP apparatus	mar	R	○	×	○	○	○	○	×	Included in diagnostic set	0			
OPD	Common		Knee hammer	mar	R	○	×	○	○	○	○	×	Included in diagnostic set	0			
OPD	Common		Weighing scale	mar	R	○	×	○	○	○	○	×	Included in diagnostic set	0			
OPD	Common		Otoscope	mar	R	○	×	○	○	○	○	×	Included in ophthalmoscope	0			
OPD	Walk-in clinic	OPD-11	Medical refrigerator	A	R	○	○	○	○	○	○	○		2	OPD-12	6	Medical refrigerator
OPD	Respiratory diseases	OPD-12	Pulse oxymeter	A	N	○	○	○	○	○	○	○		1	OPD-13	29	Pulse oxymeter
OPD	Respiratory diseases	OPD-13	Spirometer	A	N	○	○	○	○	○	○	○		1	OPD-14	57	Spirometer
OPD	Dermatology	OPD-14	Diathermy unit	A	R	○	○	○	○	○	○	○		1	OPD-15	58	Cautery unit, dermatology
OPD	Dermatology	OPD-15	Cryo surgery unit	B	N	○	○	○	○	○	○	○		1	OPD-16	59	Cryo surgery unit
OPD	Rheumatology & rehabilitation	OPD-16	Bone densitometer	B	N	○	○	○	○	○	○	○	Ultrasonic method, calcaneal bone measurement	1	OPD-17	84	Bone densitometer
OPD	Orthopedic	OPD-17	Gypsum cutter	A	R	○	○	○	○	○	○	○		1	OPD-18	60	Gypsum cutter
OPD	Orthopedic	OPD-18	Gypsum table	A	R	○	○	○	○	○	○	○		1	OPD-19	61	Gypsum table
OPD	Neonatology	OPD-19	Baby scale	A	R	○	○	○	○	○	○	○		1	OPD-20	36	Baby scale
OPD	Ob-Gyn	OPD-20	Fetal doppler	A	N	○	○	○	○	○	○	○		1	OPD-21	62	Fetal doppler
OPD	Ob-Gyn	OPD-21	Examination table, gynecology	A	R	○	○	○	○	○	○	○		1	OPD-22	63	Examination table, gynecology
OPD	Ob-Gyn	OPD-22	US scan, B/W	A	A	○	○	○	○	○	○	○		1	OPD-23	64	US scan, B/W
OPD	Ob-Gyn	OPD-23	CTG	C	R	○	×	○	○	○	○	×	Existent at delivery room can be used	0			
OPD	Ob-Gyn	OPD-24	Pinnard	C	R	○	×	○	○	○	○	×	Fetal doppler can be substituted	0			
OPD	ENT	OPD-25	Headlight, ENT	B	R	○	○	○	○	○	○	○	Number of examination units at ENT	3	OPD-24	65	Headlight, ENT
OPD	ENT	OPD-26	Microscope, ENT	A	R	○	○	○	○	○	○	○	Used by consultant doctor	1	OPD-25	66	Microscope, ENT
OPD	ENT	OPD-27	Rigid nasal endoscope, adult & child	A	A	○	○	○	○	○	○	○	Planned for diagnosis	1	OPD-26	67	Rigid nasal endoscope, adult & child
OPD	ENT	OPD-28	ENT chair	C	N	○	×	○	○	○	○	×	Examination table can be substituted	0			
OPD	ENT	OPD-29	ENT treatment unit	B	N	○	○	○	○	○	○	○	Number of examination units at ENT	3	OPD-27	68	ENT treatment unit
OPD	ENT	OPD-30	Suction apparatus, ENT	B	R	○	×	○	○	○	○	×	Included in ENT treatment unit	0			
OPD	ENT	OPD-31	Audiometer with sound proof booth	A	R	○	○	○	○	○	○	○	Booth for audiometer will be provided by	1	OPD-28	69	Audiometer

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													construction work				
OPD	ENT	OPD-32	Caloric test machine	B	N	○	×	○	○	○	○	×	Other examination method can be substituted	0			
OPD	ENT	OPD-33	Computer	C	R	○	×	○	○	○	○	×	Existent can be used	0			
OPD	OMF	OPD-34	Dental unit and chair	A	R	○	○	○	○	○	○	○		3	OPD-29	70	Dental unit and chair
OPD	OMF	OPD-35	Panoramic & cephalomatic X-ray unit	A	N	○	○	○	○	○	○	○		1	OPD-30	73	Panoramic & cephalomatic X-ray unit
OPD	OMF				N	○	○	○	○	○	○	○	X-ray protective set for panoramic & cephalomatic X-ray unit is added	1	OPD-31	121	X-ray protective set
OPD	OMF	OPD-36	Video fluroscope	B	N	○	×	○	○	×	×	×	Maintenance is difficult because this is special radiographic examination using contrast agent	0			
OPD	OMF	OPD-37	Aerophonoscope	B	N	○	△	○	○	○	○	○	Changed to educational instruments for speech therapy	1	OPD-32	72	Educational instrument for speech therapy
OPD	OMF	OPD-38	Fiberoptic nasalscope	B	N	○	×	○	○	○	○	×	Shared with ENT at endoscopy room	0			
OPD	Orthodontic	OPD-39	Dental unit and chair	A	R	○	○	○	○	○	○	○	2 existent units are moved	1	OPD-33	70	Dental unit and chair
OPD	Orthodontic	OPD-40	Micromotor	B	R	○	○	○	○	○	○	○		1	OPD-34	71	Micromotor
OPD	Endoscopy	OPD-41	Bronchoscope	A	R	○	○	○	○	○	○	○	Shared with Respiratory, ENT and Oncosurgery	1	OPD-35	74	Bronchoscope
OPD	Endoscopy	OPD-42	Colonoscope	B	A	○	○	○	○	○	○	○	Shared with Medical and Oncosurgery	1	OPD-36	75	Colonoscope
OPD	Endoscopy	OPD-43	OGD	A	A	○	○	○	○	○	○	○	Shared with Medical, Oncosurgery and ENT	1	OPD-37	76	OGD
OPD	Endoscopy	OPD-44	Nasopharyngoscope	A	A	○	○	○	○	○	○	○	Shared with ENT and OMF	1	OPD-38	77	Nasopharyngoscope
OPD	Endoscopy	OPD-45	Suction unit, endoscope	A	A	○	○	○	○	○	○	○	1 unit in each endoscope room	3	OPD-39	78	Suction unit, endoscope
OPD	Endoscopy	OPD-46	Electrosurgical unit, endoscope	A	A	○	○	○	○	○	○	○		2	OPD-40	79	Electrosurgical unit, endoscope
OPD	Endoscopy	OPD-47	Endoscopic table	A	A	○	○	○	○	○	○	○	1 unit in each endoscope room	3	OPD-41	80	Endoscopic table
OPD	Endoscopy	OPD-48	Endoscope washing machine	A	A	○	○	○	○	○	○	○	Manually-operated, renamed	2	OPD-42	81	Endoscope washing apparatus
OPD	Endoscopy	OPD-49	Endoscope cabinet	A	A	○	○	○	○	○	○	○		2	OPD-43	82	Endoscope cabinet
OPD	Endoscopy	OPD-50	Video monitor with light source	A	A	○	○	○	○	○	○	○	1 unit in each endoscope room	3	OPD-44	83	Video monitor with light source
OPD	Endoscopy	OPD-51	Sigmiodoscope	C	N	○	×	○	○	○	○	×	Colonoscope can be substituted	0			
OPD	Endoscopy				A	○	○	○	○	○	○	○	Pulseoxymeter is added to endoscope room	3	OPD-45	29	Pulse oxymeter

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OPD	Physiological test room	OPD-52	ECG monitor	A	A	○	○	○	○	○	○	○		1	OPD-46	85	ECG monitor
OPD	Physiological test room	OPD-53	EEG	C	R	○	×	○	○	○	○	×	Existent can be used	0			
OPD	Physiological test room	OPD-54	EMG machine	B	N	○	○	○	○	○	○	○	Shared with Rheumatology & rehabilitation and Neurology	1	OPD-47	86	EMG machine
OPD	Physiological test room	OPD-55	Blood gas analyser	B	R	○	×	○	○	○	○	×	Moved to PICU for night time emergency	0			
OPD	ETU	OPD-56	Emergency bed	A	R	○	○	○	○	○	○	○		6	OPD-48	87	Emergency bed
OPD	ETU	OPD-57	Infusion pump	A	R	○	○	○	○	○	○	○		3	OPD-49	44	Infusion pump
OPD	ETU	OPD-58	Patient monitor	A	R	○	○	○	○	○	○	○	1 unit for 2 beds	3	OPD-50	8	Patient monitor
OPD	ETU	OPD-59	Suction apparatus	A	R	○	○	○	○	○	○	○		2	OPD-51	1	Suction apparatus
OPD	ETU	OPD-60	Syringe pump	A	R	○	○	○	○	○	○	○		3	OPD-52	32	Syringe pump
OPD	ETU	OPD-61	Ventilator	B	R	○	△	○	○	○	○	○	Patients needed respiratory care will be treated at ICU, Change to O2 supply wall	6	OPD-53	21	O2 supply wall unit
OPD	ETU	OPD-62	Defibrillator with monitor	B	R	○	×	○	○	○	○	×	Existent can be used	0			
OPD	ETU	OPD-63	X-ray machine, mobile	B	N	○	×	○	○	○	○	×	Necessity and use frequency are low as it is internal emergency	0			
OPD	Laboratory	OPD-64	Hematology analyser	A	A	○	○	○	○	○	○	○		1	OPD-54	88	Hematology analyser
OPD	Laboratory	OPD-65	Biochemistry analyzer	B	N	○	△	○	○	○	○	○	Change to spectrophotometer	1	OPD-55	89	Spectrophotometer
OPD	Laboratory	OPD-66	Microscope	A	R	○	○	○	○	○	○	○		2	OPD-56	90	Microscope
OPD	Laboratory	OPD-67	Centrifuge	A	R	○	○	○	○	○	○	○		1	OPD-57	91	Centrifuge
OPD	Laboratory	OPD-68	Hematocrit centrifuge	B	A	○	○	○	○	○	○	○		1	OPD-58	92	Hematocrit centrifuge
OPD	Laboratory	OPD-69	Medical refrigerator	A	R	○	○	○	○	○	○	○		1	OPD-59	6	Medical refrigerator
OPD	Laboratory	OPD-70	Water bath, mixing type	B	A	○	○	○	○	○	○	○		1	OPD-60	93	Water bath, mixing type
OPD	Laboratory	OPD-71	Autoclave, vertical	B	A	○	○	○	○	○	○	○		1	OPD-61	94	Autoclave, vertical
OPD	Laboratory	OPD-72	Distiller	B	R	○	○	○	○	○	○	○		1	OPD-62	95	Distiller
OPD	Laboratory	OPD-73	Polarized microscope	B	N	○	×	○	○	○	○	×	Used for biopsy of amyloidosis causeing rheumatism, less frequently used	0			
OPD	Laboratory				A	○	○	○	○	○	○	○	Laboratory table is added	11	OPD-63	96	Laboratory table
OPD	Laboratory				A	○	○	○	○	○	○	○	Laboratory chair is added	22	OPD-64	97	Laboratory chair
OPD	General	OPD-74	Stretcher	A	R	○	○	○	○	○	○	○	1 unit for each OPD floor	2	OPD-65	17	Stretcher
OPD	General	OPD-75	Wheel chair	A	R	○	○	○	○	○	○	○	2 units at each OPD floor	4	OPD-66	56	Wheel chair
OPD	Waiting area	OPD-76	Television	C	N	○	×	○	○	○	○	×	Excluded because it is general-purpose	0			

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													equipment				
OPD	Waiting area	OPD-77	Public address system	C	N	○	×	○	○	○	○	×	Provided by construction work	0			
OPD	Information center	OPD-78	Computer	C	N	○	×	○	○	○	○	×	Excluded because it is office equipment	0			
OPD	Pharmacy	OPD-79	Balance	A	R	○	○	○	○	○	○	○	Renamed	1	OPD-67	98	Electronic balance, medium
OPD	Pharmacy	OPD-80	Electronic balance	A	R	○	○	○	○	○	○	○	Renamed	1	OPD-68	99	Electronic balance, small
OPD	Pharmacy	OPD-81	Medicine cabinet	A	R	○	○	○	○	○	○	○	Plan 2 different type (for counter and storage)	12	OPD-69	100	Medicine cabinet, counter
OPD	Pharmacy				R	○	○	○	○	○	○	○		10	OPD-70	101	Medicine cabinet, storage
OPD	Pharmacy				R	○	○	○	○	○	○	○	Medicine table is added to pharmacy	3	OPD-71	102	Medicine table
OPD	Pharmacy				R	○	○	○	○	○	○	○	Medicine chair is added to pharmacy	12	OPD-72	103	Medicine chair
OPD	Pharmacy	OPD-82	Tablet counting machine	A	N	○	○	○	○	○	○	○		2	OPD-73	104	Tablet counting machine
OPD	Pharmacy	OPD-83	Paste mixer	A	N	○	○	○	○	○	○	○		1	OPD-74	105	Paste mixer
OPD	Pharmacy	OPD-84	Medical refrigerator	A	R	○	○	○	○	○	○	○		2	OPD-75	6	Medical refrigerator
OPD	Pharmacy	OPD-85	Computer	C	R	○	×	○	○	○	○	×	Existent can be used	0			
Rheumatology & Rehabilitation	Rehabilitation room	OPD-86	Short wave diathermy machine	A	R	○	○	○	○	○	○	○	Change to microwave diathermy machine	2	OPD-76	106	Microwave diathermy machine
Rheumatology & Rehabilitation	Rehabilitation room	OPD-87	Infra red lamp	A	R	○	○	○	○	○	○	○		1	OPD-77	107	Infra red lamp
Rheumatology & Rehabilitation	Rehabilitation room	OPD-88	Infra red lamp non luminous	A	R	○	×	○	○	○	○	×	Infra red lamp can be substituted	0			
Rheumatology & Rehabilitation	Rehabilitation room	OPD-89	Infra red baker system	A	R	○	○	○	○	○	○	○		1	OPD-78	108	Infra red baker system
Rheumatology & Rehabilitation	Rehabilitation room	OPD-90	Ultra sound therapy unit	A	R	○	○	○	○	○	○	○		1	OPD-79	109	Ultra sound therapy unit
Rheumatology & Rehabilitation	Rehabilitation room	OPD-91	Trans cutaneous nervous stimulator (TENS) unit	A	N	○	×	○	○	○	○	×	Electrical nerves stimulator unit can be substituted	0			
Rheumatology & Rehabilitation	Rehabilitation room	OPD-92	Interferential therapy unit	A	N	○	○	○	○	○	○	○		1	OPD-80	110	Interferential therapy unit
Rheumatology & Rehabilitation	Rehabilitation room	OPD-93	Electrical nerves stimulator unit	A	R	○	○	○	○	○	○	○		1	OPD-81	111	Electrical nerves stimulator unit
Rheumatology & Rehabilit	Rehabilitation room	OPD-94	Tilt table with mobile stand	B	N	○	○	○	○	○	○	○		1	OPD-82	112	Tilt table with mobile stand

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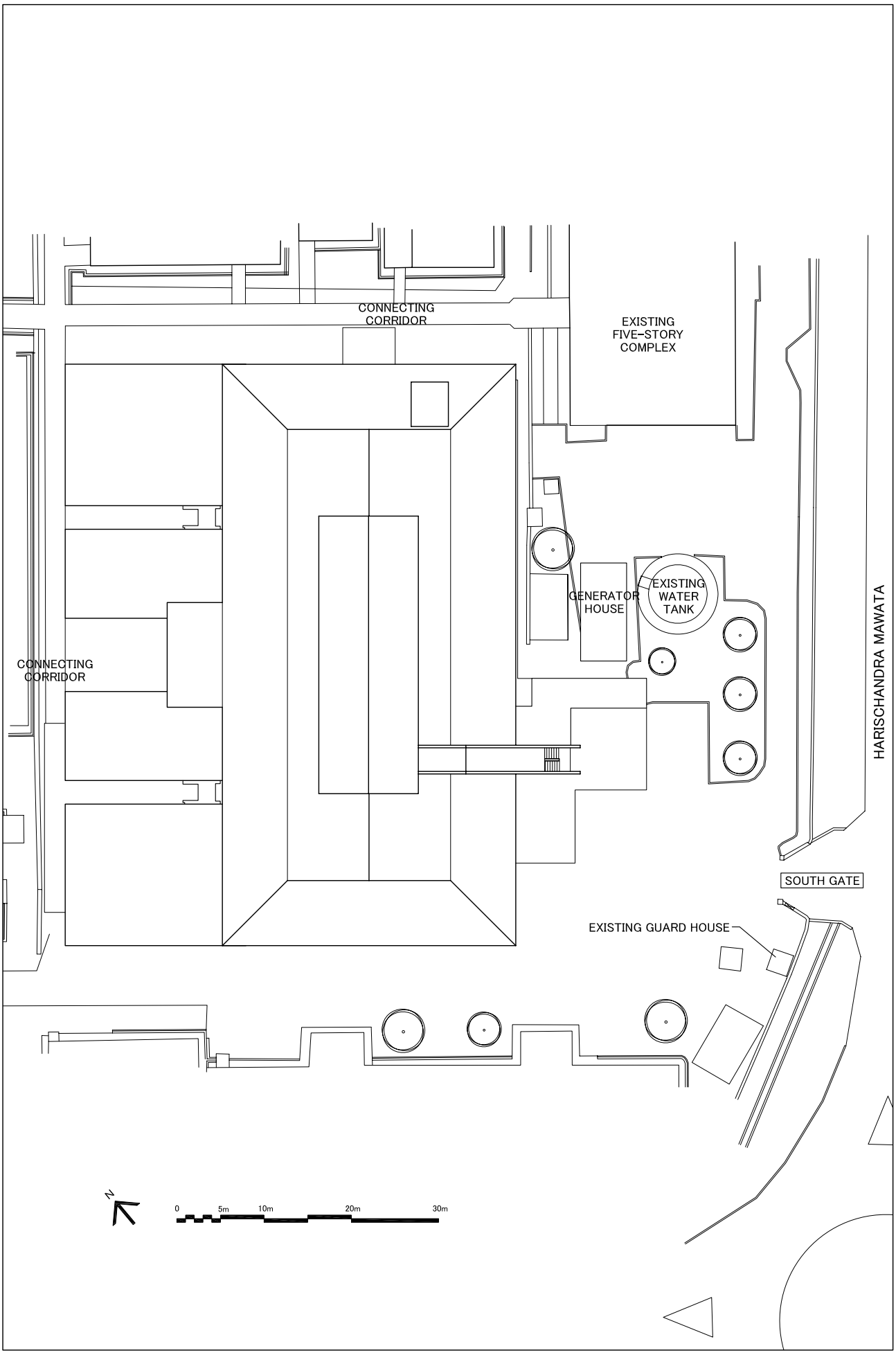
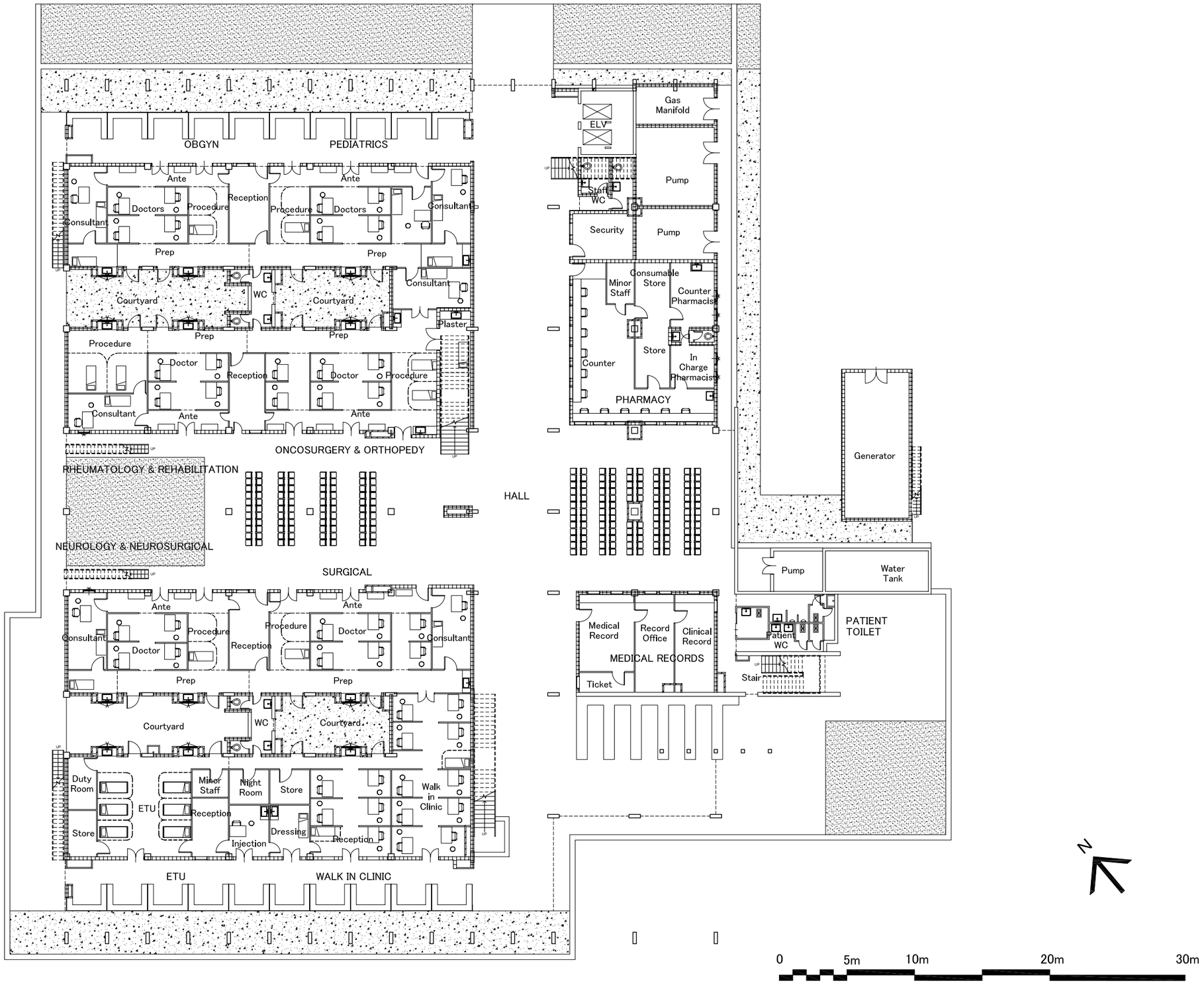
ation																	
Rheumatology & Rehabilitation	Rehabilitation room	OPD-95	Shoulder wheel	B	N	○	○	○	○	○	○	○		1	OPD-83	113	Shoulder wheel
Rheumatology & Rehabilitation	Rehabilitation room	OPD-96	Balancing board	B	N	○	○	○	○	○	○	○		1	OPD-84	114	Balancing board
Rheumatology & Rehabilitation	Rehabilitation room	OPD-97	Gonio meters set	B	R	○	○	○	○	○	○	○		1	OPD-85	115	Gonio meters set
Rheumatology & Rehabilitation	Rehabilitation room	OPD-98	Exercise chair (Rowing machine)	B	N	○	×	○	○	○	○	×	Existent can be used	0			
Rheumatology & Rehabilitation	Rehabilitation room	OPD-99	Packheaters for hot packs	B	N	○	○	○	○	○	○	○		1	OPD-86	116	Packheaters for hot packs
Rheumatology & Rehabilitation	Rehabilitation room		Hot pack & hot cold pack set	Remarks	N	○	×	○	○	○	○	×	Attached to Packheater	0			
Rheumatology & Rehabilitation	Rehabilitation room	OPD-100	Ergometer cycle	B	R	○	○	○	○	○	○	○		1	OPD-87	117	Ergometer cycle
Rheumatology & Rehabilitation	Rehabilitation room	OPD-101	Treatment plinth	B	R	○	○	○	○	○	○	○		2	OPD-88	118	Treatment plinth
Rheumatology & Rehabilitation	Rehabilitation room	OPD-102	Parallel bar set	A	R	○	○	○	○	○	○	○		1	OPD-89	119	Parallel bar set
Rheumatology & Rehabilitation	Rehabilitation room	OPD-103	Traction unit	A	R	○	○	○	○	○	○	○		1	OPD-90	120	Traction unit
Rheumatology & Rehabilitation	Rehabilitation room	OPD-104	Examination bed	A	R	○	○	○	○	○	○	○	Used for electrotherapy and thermotherapy	3	OPD-91	54	Examination bed
Rheumatology & Rehabilitation	Rehabilitation room	OPD-105	Dynamo meter	B	N	○	×	○	○	×	×	×	Use for measurement of muscle strength Technical skills and cost are required for maintenance	0			
Rheumatology & Rehabilitation	Rehabilitation room		EMG machine	Remarks	N	○	×	○	○	○	○	×	Shared with Neurology at physiological test room	0			
Rheumatology & Rehabilitation	Rehabilitation room	OPD-106	Nerve conduction machine	C	N	○	×	○	○	○	○	×	EMG machine can be substituted	0			

2-2-3 Basic Design Drawings

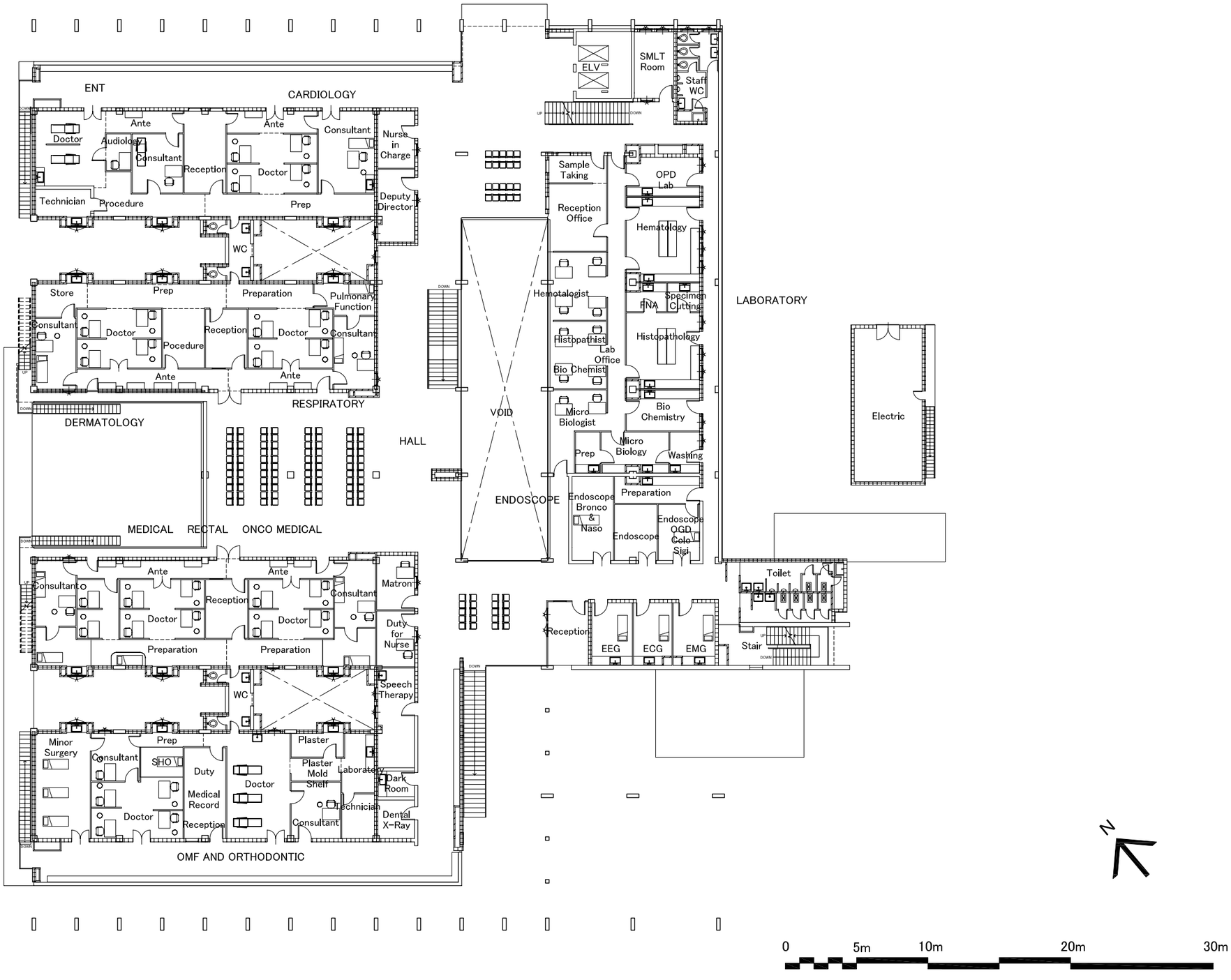
1. Site Plan
2. Ground Floor Plan
3. 1st Floor Plan
4. 2nd Floor Plan
5. Elevations
6. Elevations
7. Sections
8. Sections


CONNECTING CORRIDOR
EXISTING FIVE-STORY COMPLEX
GENERATOR HOUSE
EXISTING WATER TANK
CONNECTING CORRIDOR
HARISCHANDRA MAWATA
SOUTH GATE
EXISTING GUARD HOUSE
N
0
5m
10m
20m
30m

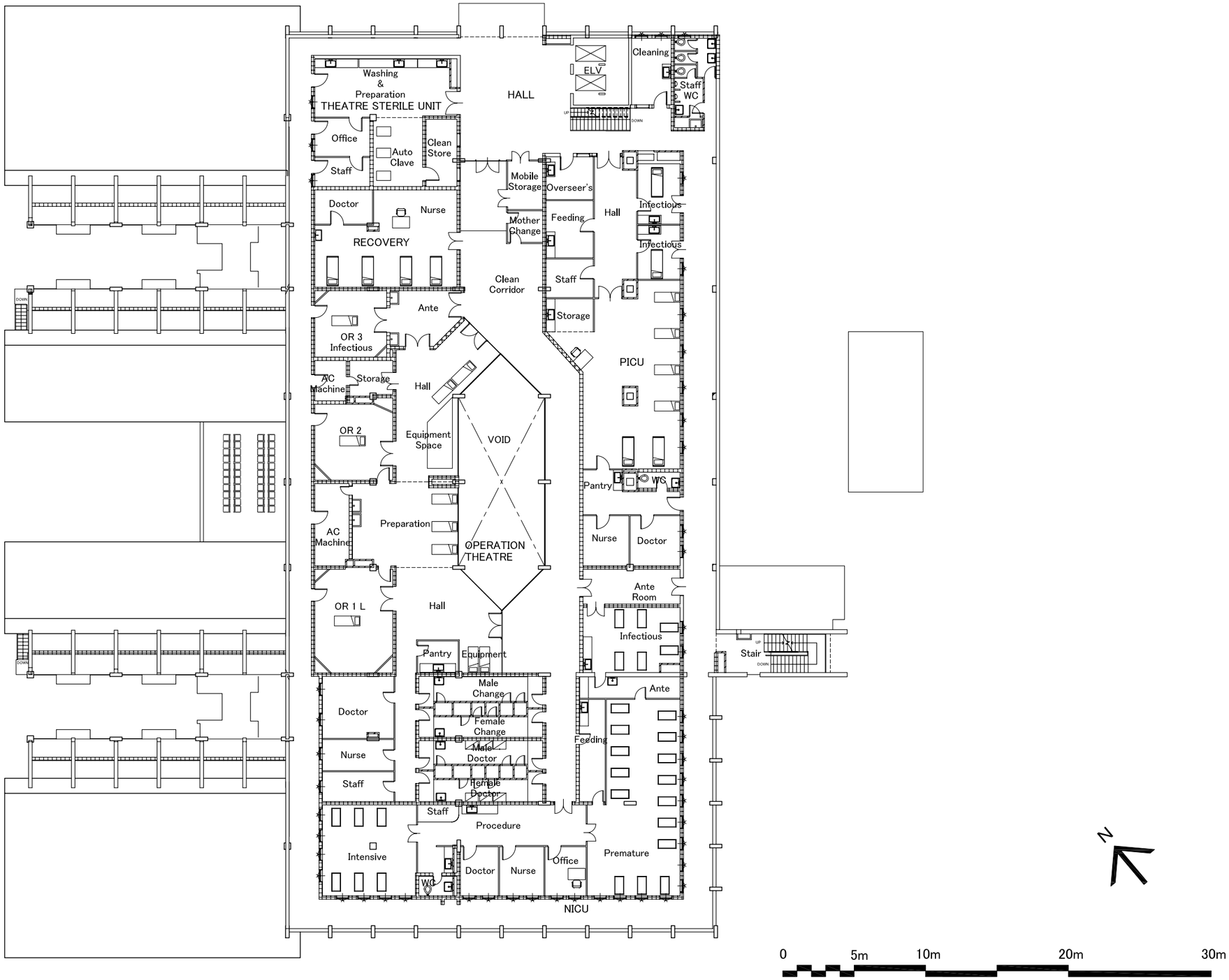
SITE PLAN



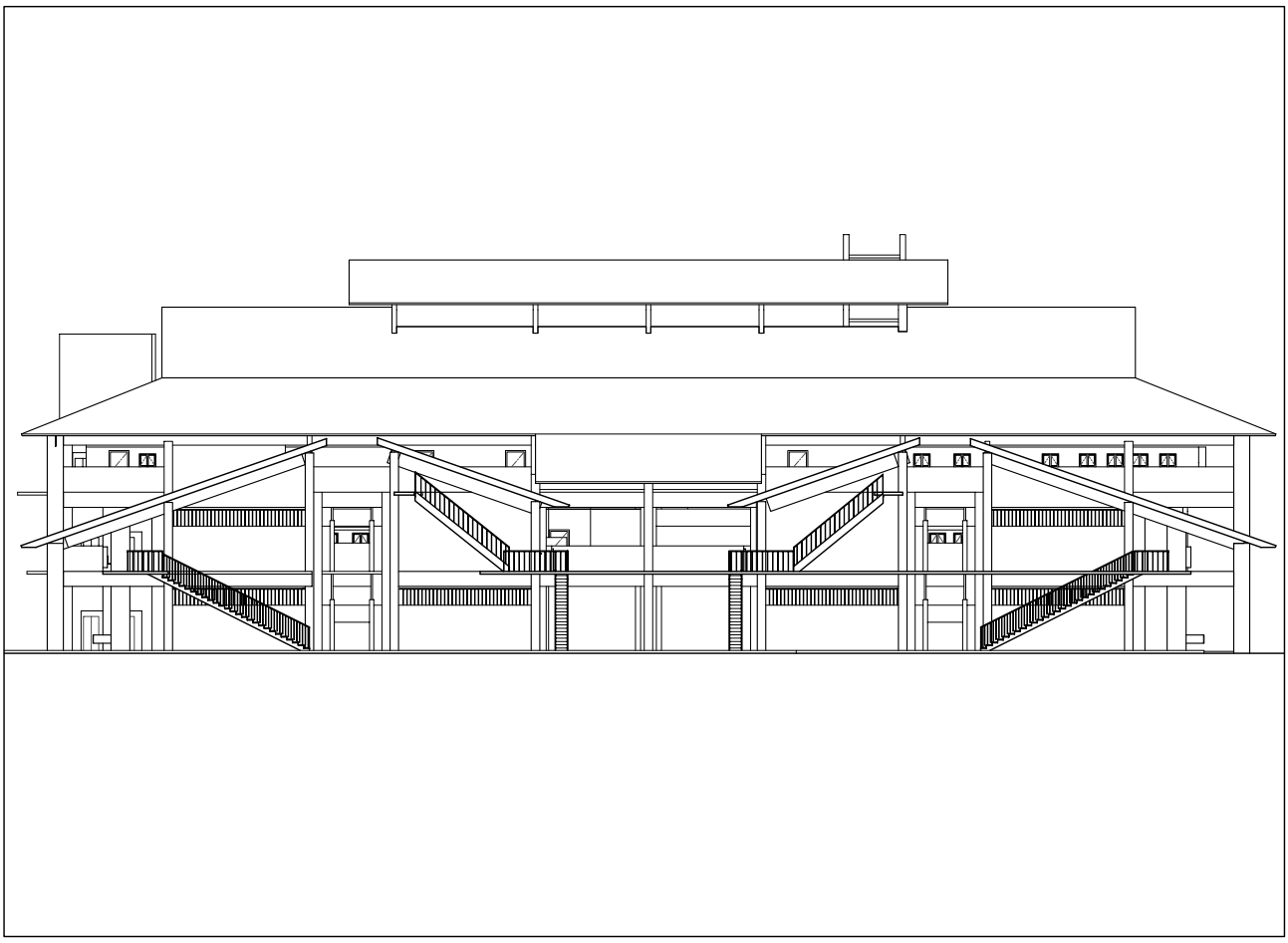
GROUND FLOOR PLAN



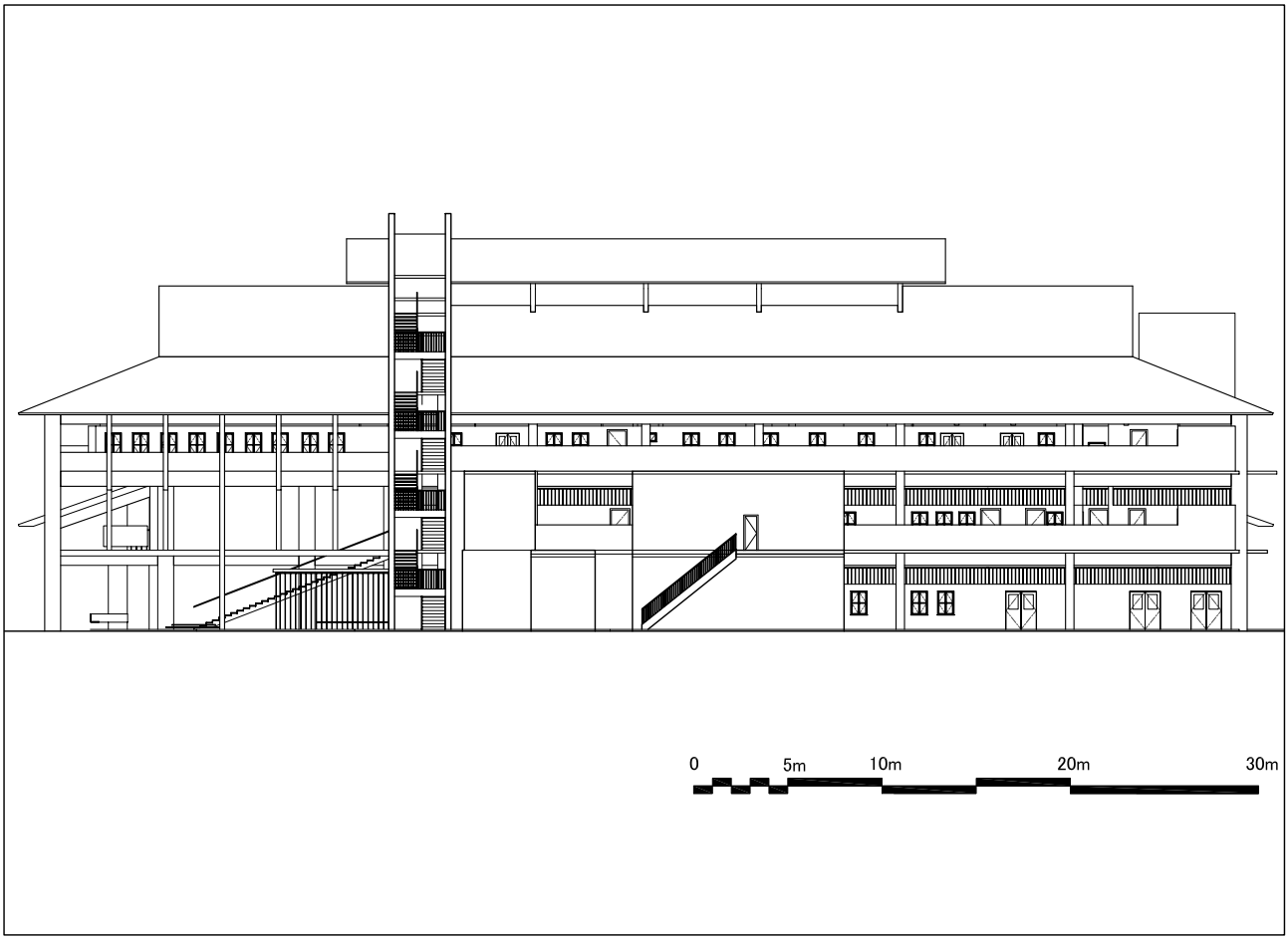
FIRST FLOOR PLAN



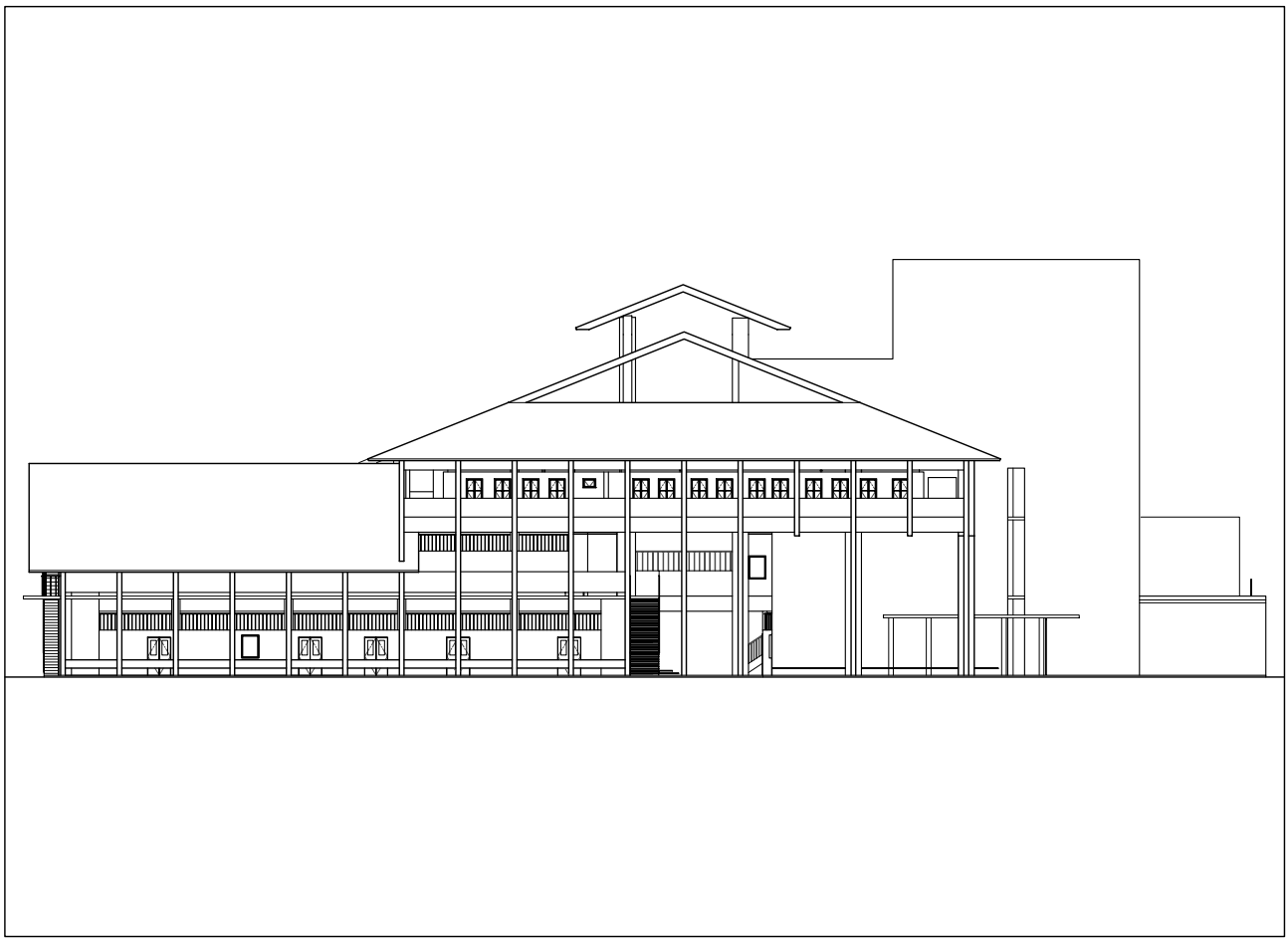
SECOND FLOOR PLAN



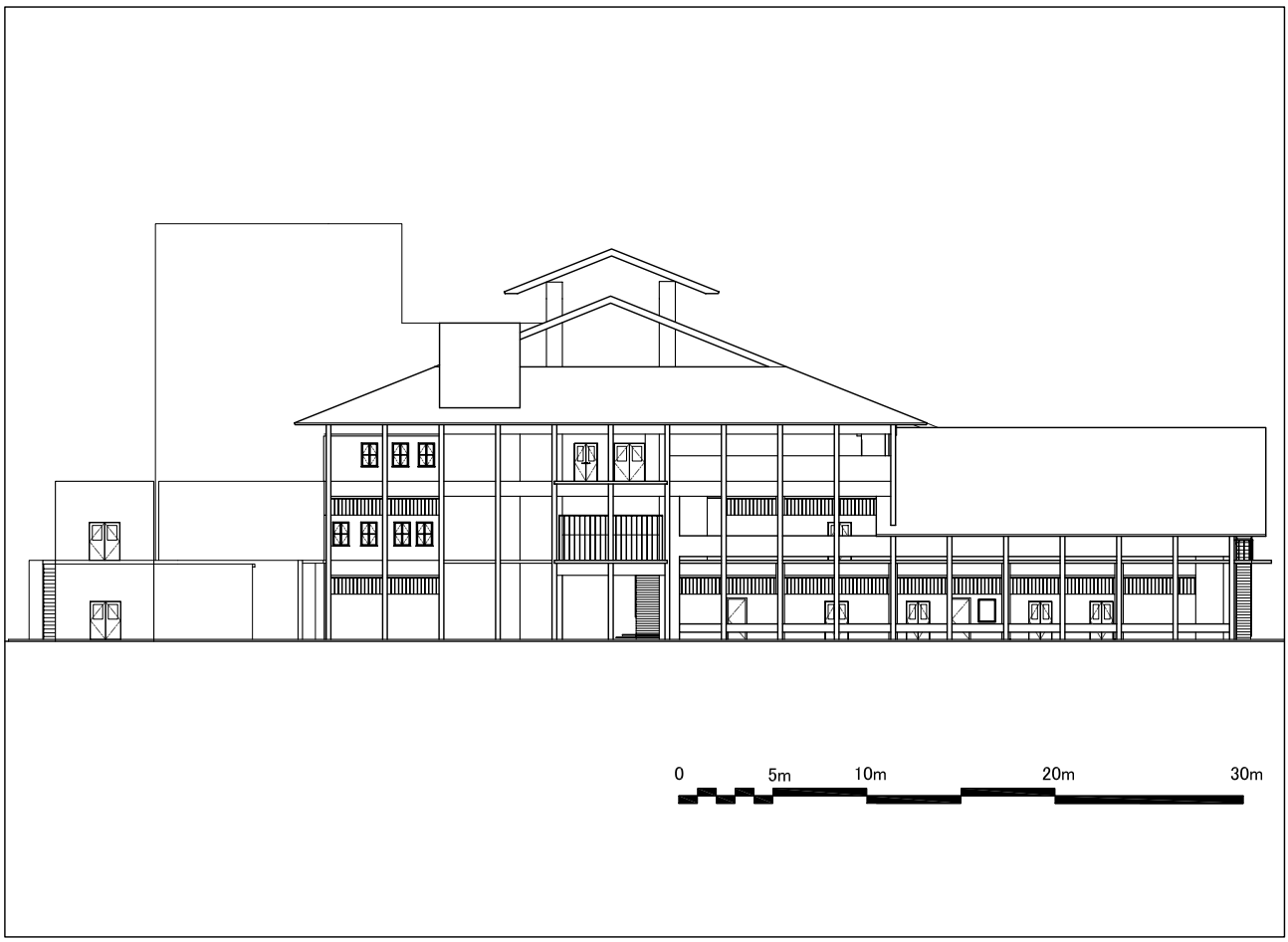
WEST ELEVATION



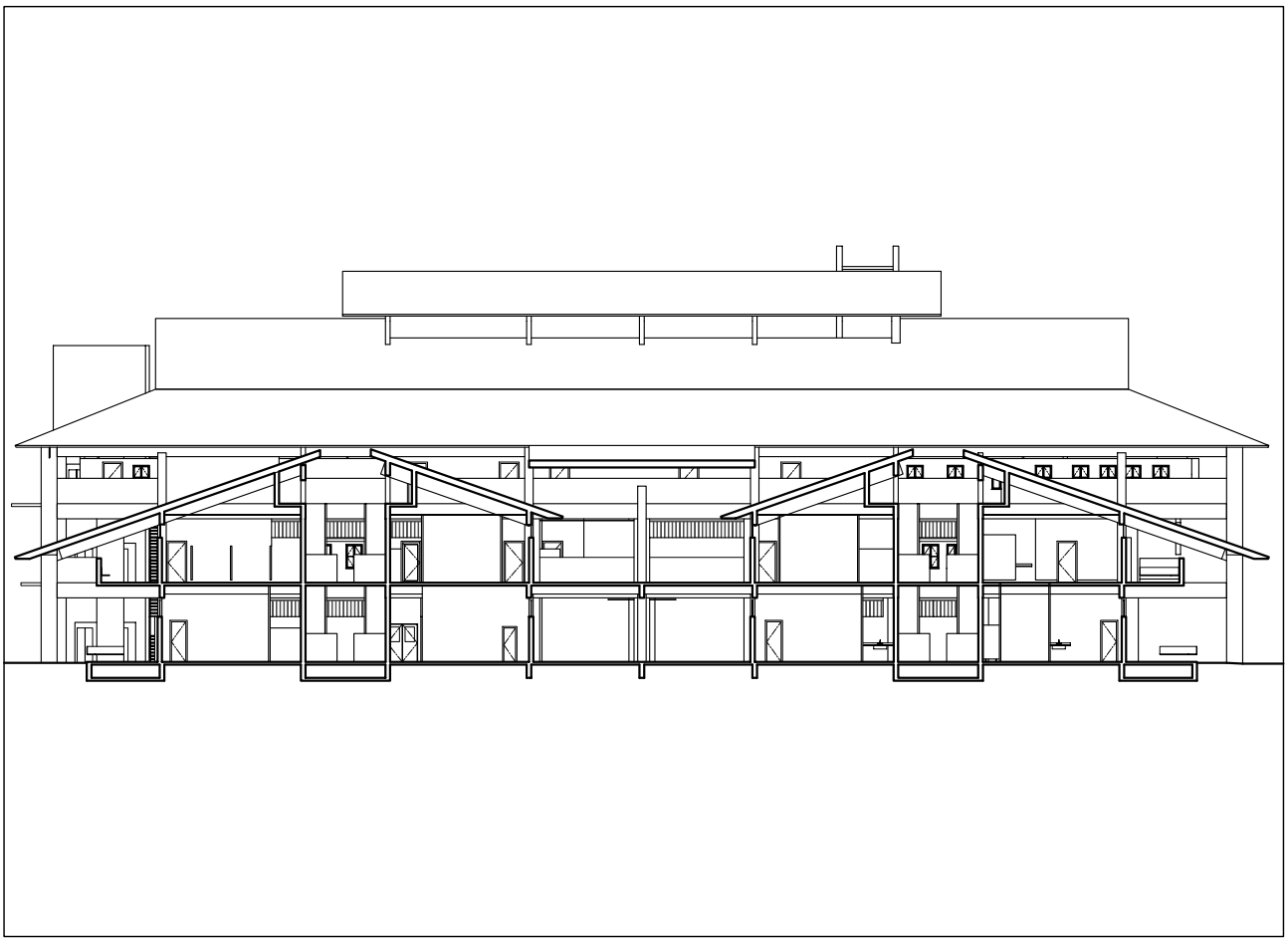
EAST ELEVATION



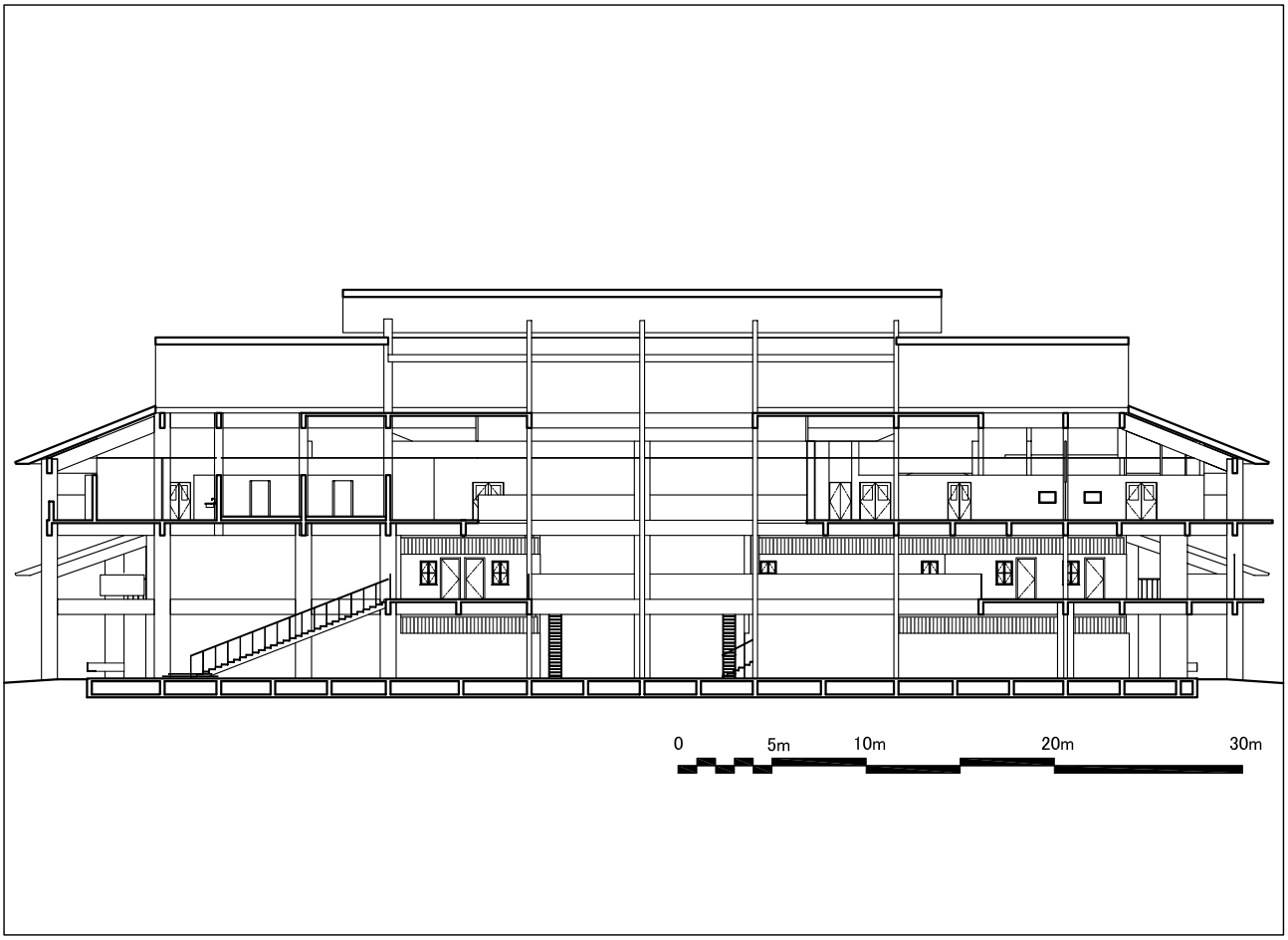
SOUTH ELEVATION



NORTH ELEVATION

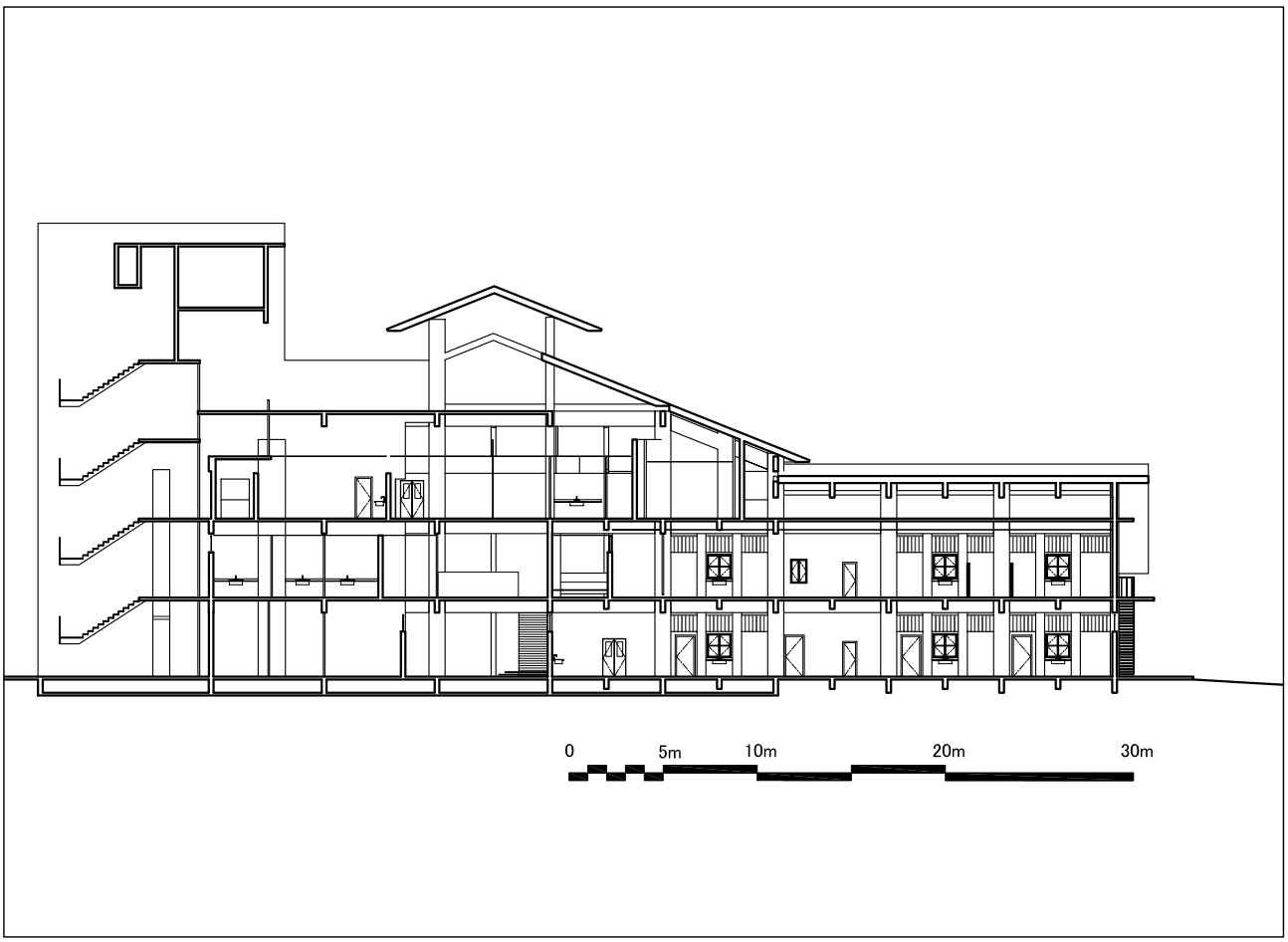


BUILDING SECTION A-A



BUILDING SECTION B-B

BUILDING SECTION C-C



BUILDING SECTION D-D

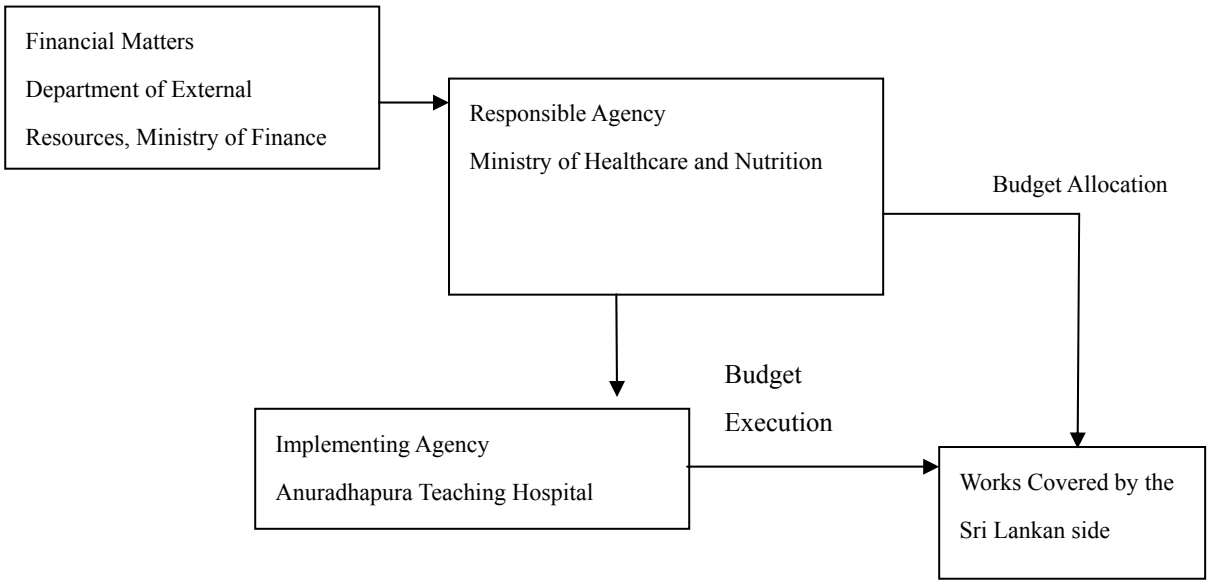
2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

This Project is to be implemented through grant aid from the Government of Japan, following the decision by the Cabinet of the Government of Japan and the signing of Exchange of Notes by both governments. The following section outlines the basic matters concerning the construction of the facilities and the procurement and installation of equipment for the Project.

(1) Organization in Recipient Country

The following organizations in the recipient country are involved in the Project implementation.



(2) Contract Package

The Project consists of construction works and equipment works. It will be appropriate to contract them separately, given that the two categories of work are not closely related to each other, and that the construction companies that will be responsible for the construction works are generally not familiar with the procurement, installation, and testing of medical equipment .

(3) Consultant

After the signing of the Exchange of Notes by both governments, the Ministry of Healthcare and Nutrition (MOH) will conclude consulting services agreement for detailed design and supervision with a consultant in Japan and obtain verification of the Government of Japan. The consultant will prepare tender documents (detailed design drawings, specifications, etc.) based on the contents of Basic

Design Study Report, assist in tendering, and execute construction and procurement/installation supervision.

In order to ensure smooth operation of the Project, it will be necessary for the Government of Sri Lanka to conclude such agreements with a consultant promptly after the signing of the Exchange of Notes by both governments.

(4) Contractors

The contractor undertaking construction works and the contractor undertaking equipment works will be selected from Japanese firms as prescribed under the grant aid scheme. The construction contractor will be selected by prequalification and tender, and the equipment contractor will be selected by tender. MOH will conclude a construction work contract and an equipment work contract with the lowest tenderer as a general rule, then obtain verification of the Government of Japan.

Depending on the contents of works, the Japanese contractors may use subcontractors in Sri Lanka mainly for the purposes of labour, procurement of local materials, custom clearance, etc. However, the subcontractors must have a certain level of general capacity to satisfy the requirements of the Project.

2-2-4-2 Implementation Conditions

(1) Procurement of Materials

Materials and equipment imported from Japan or a third country that are disembarked at Colombo Port are transported to the Project site by land, after customs clearance by the Government of Sri Lanka. The customs duties will be borne by the Government of Sri Lanka.

The Government of Sri Lanka will be requested to secure the budget for customs duties and to clarify the custom clearance procedures.

(2) Construction works on the Hospital Premises

The Project site is more than 100m away from the West Gate on the Bandarnayake Mawatha which is the main entrance to the existing outpatients' department building, however, the South Gate on the Harischandra Mawatha which will be used as the gate for the construction works of the Project , is also constantly crowded by patients/visitors/staff and will be difficult to occupy it exclusively for the construction works. Therefore, adequate safety measures, such as assigning traffic safety guards on

the pathway of construction vehicles, should be necessary.

Although the Project site will be fenced temporarily, it is still adjacent to the existing buildings; therefore, special care will be needed to prevent noise and vibration etc., to adversely influence the hospital's medical functions.

(3) Security Measures

The country continues to suffer from ethnic conflict, making future security situation uncertain. It will be necessary to work on the basis of security first, taking measures such as constant information collection concerning the security in the local area and interruption of work as needed at the time of disorder.

2-2-4-3 Scope of Works

The construction, procurement, and installation works will be implemented through the cooperation between the Governments of Japan and Sri Lanka in the framework of grant aid. The following summarizes the contents of works and tasks to be covered by each country.

(1) Works Covered by Grant Aid from the Government of Japan

1. Works Related to Facilities

- Construction of the building described in the Basic Design Study Report
- Water facilities needed in the building constructed in the Project (including water reservoir and elevated water tank)
- Sewage treatment facility within the hospital premises, exclusively used for the building constructed in the Project.
- Provision of temporary office, workers' lodgings, materials yard, etc.

2. Works Related to Equipment

- Procurement, installation, and test operation of medical equipment and procurement and installation of furniture for medical use described in the Basic Design Study Report.

3. Infrastructure Works

- New electrical, water supply, and drainage facilities in the Project site.

4. Exterior Works

- Pavement of internal road in the Project site, and installation of exterior lamps.

5. Related Procedures

- Transportation of materials and equipment from Japan and/or a third country to Sri Lanka, and procedures related to the transportation of materials and equipment.
- Inland transportation within Sri Lanka.

(2) Works Covered by the Government of Sri Lanka

1. Works Related to Premises and Exterior

- Relocation of existing hospital functions in the Project site; renovation of existing buildings as needed.
- Demolition of existing structures above and underground structures including foundation, existing border fences, trees, and other obstacles in the Project site, and leveling of the ground.
- Removal or rerouting of existing electricity conduits and underground utility lines in the Project site.
- Removal or rerouting of temporary electricity and telephone cables in the Project site.
- Exterior works, including planting and landscaping.

2. Infrastructure Works

- Provision of an electric power line to the site, including 33kV primary substation, and payment of levies.
- Provision of telephone line to the site and payment of levies.
- Provision of water supply and drainage connections and payment of levies.

3. Works Related to Preparation for Construction

- Provision of land for temporary office, workers' lodgings, materials yard, etc., which will be needed for the works to be covered by the Japanese side.

4. Works Related to Equipment, Furniture, and Fittings

- Moving and installation of existing equipment to be relocated to the building constructed in the Project.
- Preparation of equipment installation sites(rehabilitation room), and relocation of existing equipment
- Procurement and installation of the equipment, furniture and fittings, curtains and blinds etc., which are not covered by the Government of Japan.

5. Procedures and Bearing of Costs

- Costs related to Banking Agreement and Authorization to pay.
- Costs related to tax exemption procedures.
- Custom clearance procedures.
- Procedures required in relation to inland transportation.
- Exemption of customs duties, internal taxes, and other fiscal levies imposed in Sri Lanka, for the Japanese nationals engaged in the Project implementation based on verified contract.
- According the said Japanese nationals with such facilities as may be necessary for their entry into Sri Lanka and stay therein.
- Maintenance costs for appropriate and effective operation of the facility and equipment.
- Cost of various procedures related to construction, including but not limited to, building permission, inspection and building usage permission
- All the procedures and expense necessary for the Project, other than those covered by the Government of Japan.

2-2-4-4 Consultant Supervision

In accordance with the Grant Aid scheme of the Government of Japan, the Japanese consultant firm will conclude consultant agreements with the responsible organization of the Government of Sri Lanka and execute the detailed design and supervision of construction/equipment works. The purpose

of the supervision is to confirm whether or not the works are implemented according to the design documents, and to stand in a fair position providing instructions and advices, as well as coordinating various operations during the work period, in order to ensure appropriate execution of the work contract and to monitor the quality of work. The works of the consultant include the following:

(1) Assistance in the Tenders and Construction Contract and Equipment Contract

The consultant will prepare tender documents and other materials needed for the tendering to select the Japanese contractors undertaking construction works and equipment works; assist the Sri Lankan side in carrying out tenders including tender announcement, receiving of tender applications, prequalification document, distribution of tender documents, acceptance of tenders, and evaluation of tenders; and provide assistance for the conclusion of contracts between the responsible organization of Sri Lanka and the contractors.

(2) Instruction, Advice, and Coordination

The consultant will review work schedules, work plans, plans for procurement of construction materials and machinery, plans for equipment procurement and installation, etc., as well as instruct, advise and coordinate the contractors.

(3) Inspection and Approval of Working Drawings, Production Drawings, etc.

The consultant will inspect the working drawings, production drawings, and other documents submitted by the contractors, and provide approval after giving instructions or making corrections where necessary.

(4) Confirmation and Approval of Construction Materials and Machinery and Medical Equipment

The consultant will confirm that the construction materials and machinery and medical equipment to be procured by the contractors are in conformity with the construction contract documents, and approve the use of such items.

(5) Plant Inspection

As needed, the consultant will attend the inspections of the production processes of construction parts and medial equipment in order to verify product quality and performance.

(6) Reporting of the Progress of Work

The consultant will keep track of the work processes and the situation of the construction site and report the progress of work to the pertinent organizations of both countries.

(7) Completion Inspection and Test Operation

The consultant will conduct completion inspection and test operation of facilities and equipment, confirm the conformity with the contract documents, and submit inspection reports to the Sri Lankan side.

In order to implement the above-mentioned responsibilities on the consultant supervision, the consultant will assign one resident engineer for supervising throughout the whole construction period. According to the progress of works, and where appropriate, specialized engineers will also be dispatched to the project site to perform necessary inspection, instruction, and coordination. Engineers in charge of the Project will also be assigned in Japan in order to establish lines of communication between the project site and backup personnel in the head office. They will report on the progress of the Project, payment procedures, completion and transfer, and other issues to the relevant organizations of the Government of Japan.

2-2-4-5 Procurement Plan

(1) Policies Concerning Procurement of Materials and Equipment

The materials and equipment used in the Project will be procured in accordance with the following policy. Products complying with Sri Lankan standards and/or British Standards (BS), the prevailing standards used in the recipient country, will be procured. If above-mentioned standards for a particular item are not available or inappropriate, JIS standards will be applied.

1. Local Procurement

   To facilitate maintenance and repair after the completion of the facilities, materials and equipment will be procured locally whenever possible. Products which are normally imported to the recipient country and available in the market will be regarded as local products.

2. Procurement by Importation

   If imported products cannot be procured locally in sufficient quantities, such products will be imported from Japan and/or a third country.

(2) Procurement Plans for Materials and Equipment

The plans for procurement of main materials and equipment used in construction works and in equipment works are as shown below.

1. Procurement Plans for Materials and Equipment

Table 2-15 Plan for Procurement of Construction Materials and Equipment

Work Type	Item	Source			Remarks
		Local	Japan	Third country	
Construction work	Cement	○			BS-compliant products normally available in the local market.
	Sand	○			River sand from Mannampitiya, situated 120km in south-east.
	Gravel	○			Crushed stone from Mihintale, situated 15km in south-east.
	Reinforced bar	○			BS-compliant products normally available in the local market.
	Form panels	○			South-East Asian products are available locally.
	Terrazzo tiles	○			Local procurement is possible.
	Tiles	○			Imported products can be procured locally.
	Glass	○			Imported products can be procured locally.
	Timber	○			Local and South-East Asian products are available.
	Aluminium sash	○			Local procurement is possible.
	Aluminium partition	○			Local procurement is possible.
	Doors for operation rooms, stainless steel/leaded doors for X-ray rooms		○		Japanese products are advantageous both in quality and price.
	Wood fixtures	○			Produced locally.
	Fittings for fixtures	○			Imported products can be procured locally.
	Paint	○			Locally available imported products.
Plumbing/ Mechanical work	Pumps	○			Local procurement is possible.
	Fans	○			Local procurement is possible.
	Air-conditioners	○			Local procurement is possible.
	HEPA filters	○			South-East Asian products are available locally.
	Sanitary wares	○			Local procurement is possible.
	PVC pipes	○			Produced locally.
	Galvanized steel pipes	○			Local procurement is possible.
	Copper tubes	○			Local procurement is possible.
	Fire hydrants	○			Local procurement is possible.
	Fire extinguishers	○			Local procurement is possible.
	Electric water heaters	○			Local procurement is possible.
	Medical gas system		○		For quality.
	Waste water treatment		○		Local products unavailable.
Electrical work	Main distribution board, switch board	○			Local procurement is possible.
	Emergency generator,AVR	○			Local procurement is possible.
	Lighting fixtures	○			Local procurement is possible.
	Fire detector, alarm bell facility	○			Local procurement is possible.
	Telephones	○			Local procurement is possible.
	Public announcement equipment	○			Local procurement is possible.
	Intercom, nurse-call equipment	○			Local procurement is possible.
	TV antenna	○			Local procurement is possible.
	Cable	○			Local procurement is possible.
	Conduit (PVC pipe)	○			Local procurement is possible.
	Power supply facility for medical equipment	○			Local procurement is possible.

(3) Equipment Procurement Plan

1. Procurement Plan

The equipment to be procured will be the products of Japan or Sri Lanka, as a rule. However, if procurement from a third country is considered desirable due to price advantages, maintenance advantages or other factors such as popularity in Sri Lanka, procurement from a third country will also be considered based on the following conditions and the approval of both countries. Procurement plans for other items will place priority on reliable delivery times and price advantages.

- The manufacturer has a branch office or sales agency in Sri Lanka, providing advantage in maintenance.
- Failure and other troubles are rare and maintenance cost is low.
- A product of Japan or Sri Lanka does not exist or does not meet specifications.
- Servicing is easy and the manufacturer has a well-established maintenance system.
- The product is widely used in Sri Lanka.
- The product can be procured and delivered within the time limit of the E/N.

The possibility of procurement from a third country is considered for the following items.

Table 2-16 Equipment Procurable from a Third Country

Items	Country of Origin
Laryngoscope	US, EU
Defibrillator, with monitor	US, EU, India
X-ray film viewer, double panel	US, EU
Patient monitor	US, EU
Shadowless lamp	US, EU
Anesthetic machine	US, EU
Cautery unit	US, EU
Laparoscope	US, EU
O2 supply wall unit	US, EU
Autoclave	US, EU
Laryngoscope, neonate	US, EU
Pulse oxymeter	US, EU
Ophthalmoscope	US, EU
Syringe pump	US, EU
Patient monitor for neonate	US, EU
Incubator	US, EU
Respirator,C-pap	US, EU
Laryngoscope, pediatric	US, EU
ICU bed	US, EU
Infusion pump	US, EU

Items	Country of Origin
Patient monitor, pediatric	US, EU
Blood gas analyser	US, EU
X-ray machine, mobile	US, EU
Consultation table	US, EU
Spirometer	US, EU
Cautery unit, dermatology	US, EU
Cryo surgery unit	US, EU
Gypsum cutter	US, EU, Switzerland
US scan,B/W	US, EU, Korea
Headlight,ENT	US, EU
Rigid nasal endoscope,adult,&child	US, EU
Audiometer	US, EU
Dental unit and chair	US, EU
Micromoter	US, EU
Panoramic& cephalomatic X-ray unit	US, EU
Suction unit, endoscope	US, EU
Electrosurgical unit, endoscopy	US, EU
Bone densitometer	US, EU, China
ECG monitor	US, EU, India
EMG machine	US, EU
Emergency bed	US, EU
Hematology analyser	US, EU
Spectrophotometer	US, EU
Microscope	US, EU
Tablet counting machine	US, EU, India
Paste mixer	US, EU, India
Treatment plinth	US, EU

2. Transportation Plan

- Equipment Procured from Japan and/or third country

  − Ocean Transport

  For medical equipment, the container will be shipped from a port of Japan and/or in a third country, and will be disembarked at the Port of Colombo, Sri Lanka.

  − Inland Transport

  After custom clearance, the products are transported for 210km by motor lorries, from the Port of Colombo to the Project site, taking the Routes A1-A6-A9 where the road conditions are rather good. The transportation will take about 1 day.

- Equipment Procured Locally

  Almost all medical agencies are located in Colombo, the central city of commerce. Equipment are generally delivered directly to the site by each agency; hence the same delivery method will be employed for the Project.

2-2-4-6 Quality Control Plan

Prior to the commencement of the construction works, the consultant will direct the Japanese contractor to prepare work manual, including inspection parameters, target values, contents of inspection, test methods, curing methods, work methods, applicable standards, etc., as listed below, and verify quality control plan.

Table 2-17 Quality Control Plan

Work Type	Control Parameter	Target Value	Test Method	Quality Standards	Frequency of Measurement	Treatment of Results
Earth work	Bearing capacity of ground	Ra=150kN/m2 or more (long-term)	Plate bearing test	JGS1521-1995	2 locations or more	Test report
	Slope angle	Within planned range	Gauge, visual	JIS	As needed	Photos, documents
	Bedding accuracy	Within +0～-5cm	Level, visual	〃	〃	〃
	Foundation work height	Within +0～-3cm	〃	〃	〃	〃
	Thickness of replaced soil	+5cm～0	〃	〃	〃	〃
Reinforcement bars	Reinforcement cover thickness	Places not in contact with soil:30mm Place in contact with soil Footing 60mm Other 40mm	Visual, measurement	JIS,BS Specifications	As needed	Photos, documents
	Processing accuracy	Stirrup, hoop ±5mm Other ±10mm	〃		〃	〃
	Tensile test	Standard strength or more	On-site sampling or sampling at shipping	JIS,BS	1 test on 3 test pieces per 300t of steel bars with given diameter. The test may be omitted if an inspection sheet (misheet) is available for confirmation.	Test report
Concrete work	Compressive strength	Quality standard strength 24N/mm^2 or more	Attending at test site (any time)	JIS,BS	3 or more test pieces for each placing and per 150m^3	Test report
	Slump value	15cm±2.5cm	Attending at work site		For each placing	Photos, documents
	Chloride content	0.3kg/m^3 or less	Test pieces, attending at work site		〃	〃
	Concrete temperature	35 degrees or less (just before placing)	Attending at work site		For each placing	Photos, documents
Plastering	Materials, storage methods, work methods, mixing, coating thickness, curing, work accuracy	According to separate specifications	Same as left	Same as left	As needed	Photos, documents
Water supply and drainage	Water supply pipes	〃	Pressure test	JIS,BS	Upon completion of pipe laying, for each system	Test report
	Drainage pipes		Water filling test			
Electrical work	Cables	〃	Insulation test	JIS,BS	〃	〃
			Conductivity test			

2-2-4-7 Operational Guidance Plan

In order to ensure proper usage and maintenance of the procured equipment, trainings for the following initial operation and periodical check-up will be conducted by engineers from the equipment works contractor, at the time of delivery. Operation and maintenance manuals, list of contacts of the manufacturers and agencies will be attached, when the equipment are installed and put into service.

- Operational methods (description of equipment, operation procedure, check list, etc.)
- Periodical maintenance method (cleaning, adjustment, minor repairs, etc.)

2-2-4-8 Soft Component (Technical Assistance) Plan

The equipment for the Project is mostly renewal of the existing equipment, or is not highly sophisticated. Moreover, as BES is establishing an operation and maintenance system, there will be no particular need for the Soft Components (Technical Assistance).

2-2-4-9 Implementation Schedule

When the Governments of Japan and Sri Lanka sign the Exchange of Notes concerning the implementation of the Project, the construction of the facility and the procurement/ installation of equipment will be conducted as followings.

(1) Detailed Design

After conclusion of the consulting services agreement, the consultant will prepare detailed design drawings and specifications based on the Basic Design Study Report. Meanwhile, approval concerning design documents will be obtained through consultation with persons concerned of the Sri Lanka side. This stage is expected to require about 5.0 months to complete.

(2) Tender

The consultant will start the tender procedures after the conclusion of supervision services agreement. Construction works and equipment works will be contracted separately, and the contractor undertaking each category of work will be determined by tender. The works related to tender will take about 4.0 months.

(3) Construction Works and Equipment Works

The construction work is expected to be about 16.0 months.

In view of the contents and the scale of the Project, local situations concerning construction and equipment procurement, and other factors, the Project is expected to be implemented over a period of four fiscal years. Detailed design will be commenced in the first year. Tender, construction works and equipment works will be implemented from the second year onward.

Considering the above-mentioned factors, the implementation schedule of the Project from the E/N to completion of work is shown below. Risks of interruption of works due to security reasons are not included in this schedule. In such cases, completion date of the Project will be delayed accordingly.

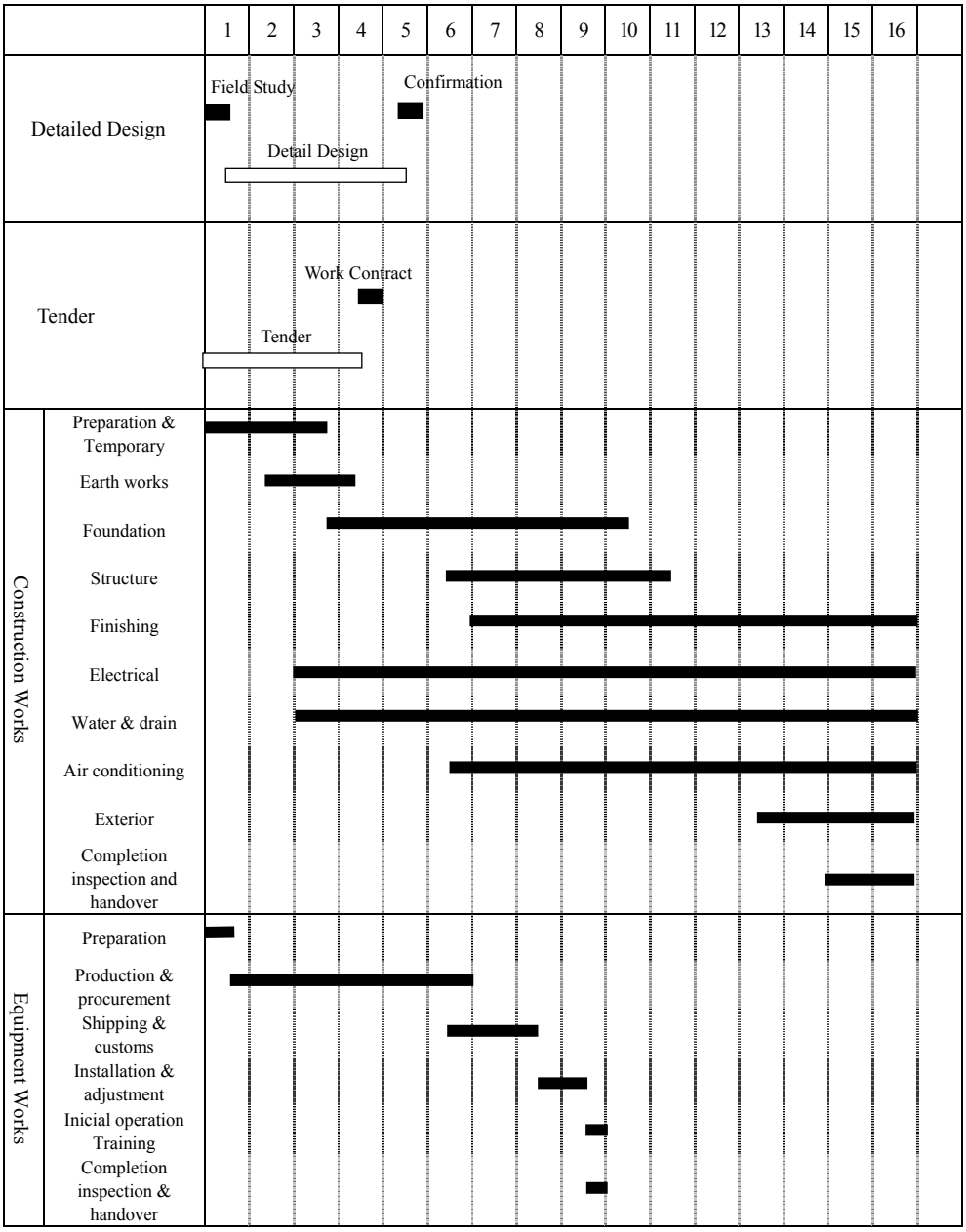


Fig. 2-10 Implementation Schedule

2-3 Obligations of Recipient Country

The Project corresponds to the first stage of a master plan to redevelop the existing hospital on the same premises.

The following table lists the facilities to be demolitioned and their relocation sites.

Table 2-18 Existing Facilities at the Project Site

Facilities for Demolition	Story	Floor Area	Relocation Sites
Chest unit	Two-story	1,190m^2	Transferred to neighboring provincial building run by local government
Laboratory	Two-story	210m^2	Temporary use of 5th floor of the new complex building
Obstetrics ward No. 12	One-story	530m^2	Transferred to No.4 and No.30 buildings
Orthodontics clinic	One-story	160m^2	Temporary use of the new complex building
Psychiatric ward No. 19	One-story	680m^2	Transferred to isolation ward building
Parking lot	One-story	50m^2	Only 3 lots. Demolish and utilize other parking areas.
	Total	2,820m^2	

(Source: Answers of Interview by AT Hospital)

The estimated cost to be borne by the Sri Lankan side only includes direct costs such as the cost for the demolition of existing buildings at the Project site. The relocation of medical services is not estimated in this report, but needs to be budgeted and implemented separately.

In the Minutes of the Discussions on Basic Design Study, the Sri Lankan side agrees to assume the responsibility for performing all activities enlisted below.

1. To take necessary measures with the Ministry of Finance in exempting the Japanese nationals engaged in the Project from customs duties, internal taxes and fiscal levies which may be imposed in Sri Lanka, with respect to the supply of product and services, including construction materials, construction machinery, construction expatriates, local personnel, construction labor, building equipment, and medical equipment under the verified contracts.

2. To clear the land through demolition of the existing building includings the foundation at the Project site, to relocate the electricity, water, drainage and other existing infrastructure to outside the site, and to level the land, within 6 months after the signing of the Exchange of Notes by both governments.

3. To allocate the necessary budget and manpower for the proper maintenance and utilization of the equipment and facilities provided under the Project.

4. To relocate the equipment which are currently being used in the existing buildigs to the new

facility if and when needed.

Furthermore, the following general requirements of the Japanese Grant Aid have been agreed upon.

1. To secure the land necessary for the Project.
2. To clear and level the site for the Project prior to the commencement of the construction.
3. To provide proper access road to the Project site.
4. To provide facilities for distribution of electricity, water supply, telephone trunk line, drainage and other incidental facilities outside the Project site.
5. To undertake gardening, fencing, exterior lighting and other incidental exterior works in and around the Project site.
6. To ensure prompt disembarkation, tax exemption, and customs clearance of the products purchased under the Japanese Grant Aid.
7. To exempt Japanese nationals from customs duties, internal taxes, and fiscal levies which may be imposed in Sri Lanka, with respect to the provision of products and services under the verified contract.
8. To accord Japanese nationals whose services may be required in connection with the provision of products and services under the verified contracts such facilities as may be necessary for their entry into Sri Lanka and stay therein for the performance of their work.
9. To bear commissions of an Authorization to Pay (A/P) and payment commissions, due to the Japanese foreign exchange bank for the banking services based upon the Banking Agreement (B/A).
10. To provide necessary permissions, licenses, and other authorization for implementing the Project, if necessary.
11. To ensure that the facilities constructed and equipment procured under the Japanese Grant Aid are maintained and used properly and efficiently for the Project.
12. To bear all expenses, other than those covered by the Japanese grant Aid, necessary for the Project.

2-4 Project Operation Plan

- Operation Plan

Given that the Project is for the renewal and improvement of the existing facility, current medical staff will be responsible for the operation of the hospital.

- Maintenance Plan

(1) Facility Maintenance Plan

1) Overall Plan

Even reinforced concrete buildings such as those planned in the Project will deteriorate over the years, with the influence of various conditions induced by nature or by man. Progressive erosion of the building (roof water proofing, exterior wall paint, fixtures etc.) and deterioration of incidental facilities (water tanks, pumps, elevators etc.) will result in lower performance.

For example, if the exterior wall paint is left to deteriorate, it will not only give an impression of an unhygienic medical institution but could also become a remote cause of shortened endurance years of the building framework itself, by causing desiccation cracks in concrete, and eventual neutralization of concrete due to infiltration of rain and atmospheric carbon dioxide.

Meanwhile, deterioration of incidental facilities can directly influence the medical services. One accident may compromise the basic functioning of the facility, including water and power supply, requiring emergency response, increased expenses, and in some cases, temporary suspension of medical services.

In order to prevent such situation, it is necessary to carry out continuous maintenance activities. If appropriate repair works are not conducted when necessary, it is possible that repair cost will increase several fold in the near future.

For the Project, detailed maintenance manual will be handed over by the contractor's side at the time of completion of the Project. In order to maintain proper activities, it is advised to conduct regular check-up of the buildings, appropriately review the repair plan and the budget based on the check-up results, and to ensure implementation of the repair plan.

Therefore, maintenance plan should be formulated based on the repair cycle of each part that has been reported in the past, and by reviewing the modification methods and the cost estimation whenever necessary.

2) Endurance Years of Reinforced Concrete Buildings

Assuming that a building's endurance years ends when its structural performance starts to decrease, the determining factors of the number of endurance years can be analyzed based on physical factors, such as the strength of concrete and the life-span of reinforcement bars.

Buildings resist external force and load with compressive strength of concrete, and tensile force of reinforcement bars. However, with regards to reduction in strength due to rust in reinforcement bars, factors such as the neutralization of concrete, contact with acid and salt, and infiltration of moisture can be important causes.

Once reinforced bars start rusting, the expansive force of the rust will cause cracks to form in the concrete, atmospheric carbon dioxide and moisture will aggravate the detachment of concrete, and such vicious cycle will result in rapid deterioration from the initial structural performance.

Since the deterioration of structural performance is thought to start when neutralization stage reaches the reinforced bar, this point is generally taken as the number of endurance years. (Reference: "Techniques to improve endurance capacity of reinforced concrete buildings", Japan Institute of Construction Engineering)

Therefore, calculations for the Project will be based on the assumption that the endurance years of the building starts when the neutralization stage of concrete, the cause of rust, reaches the reinforcement bars.

The following practical equation for concrete neutralization is used.

$$T = \alpha \times \beta \times r \times AO \times X^2$$

T＝ Number of year taken for neutralization to reach Xcm from the surface of concrete.

α＝ Material coefficient of concrete. Largely influenced by water-cement ratio.
For the Project, the ratio of 1.45 will be adopted base on the following conditions for general buildings.

Normal Portland Cement

Water-cement ratio 60%

β= Coefficient indicating the regional differences of the area in which the building is located.

Determined by the carbon dioxide concentration of the site.

In general, 0.81 is adopted for urban areas.

r= Rate of neutralization delay 1.0

AO=Neutralization constant. Experimental value of Dr. Uchida and Dr. Hamada 7.2 years/2cm.

Physical endurance years under the following conditions were calculated based on the above equation.

Cement	Normal Portland Cement
Water-Cement Ratio	60%
Construction site	Urban area
External walls	Concrete + Mortar finish

$T = 1.45 \times 0.81 \times 1.0 \times 7.2 \times X^2$

$= 8.52 \times X^2$

Here, X to be only 3cm of concrete covering, and mortar covering is to be ignored in order to get a safe side conclusion.

$T = 8.5 \times 9 = 76.5$

Although the number of physical endurance years is calculated to be 76 years, this result does not immediately limit the use of the building to 76 years, given that structural materials generally have more capacity than indicated and that the life-span of a building is long in areas where disasters such as earthquakes are rare. However, it should be interpreted that reconstruction plan and cost calculation should start sometime in this period.

3) Maintenance Management

The facility maintenance of this Project is planned in accordance with the current number and the level of staff in the Facility Maintenance Department at AT Hospital. Therefore, interior and exterior materials which may require special maintenance will not be used. The Project is the initial stage of the Master Plan developed by the Hospital, and the construction of wards will continue after the completion of the Project. Therefore, it is assumed that the engineering company will remain stationed after the completion of the Project, to implement the proceeding stages of the Master Plan. Thus, the maintenance of the Project's facilities can be performed properly under

the guidance of this engineering company.

The facilities in the Project that require outsourcing of maintenance services are the elevators and air-conditioning system. With respect to the waste water treatment plant which will be constructed for the Project buildings, daily management will involve the same work as the existing facility, sludge and disinfectant treatment, making it possible for the current staff to manage. However, in view of the operational situation of similar facilities in Sri Lanka, where mechanical failure cannot be easily repaired or spare parts exchanged, it is advisable to outsource regular inspection of the equipment in order to maintain proper functioning. Meanwhile, various pumps on the planned sanitation facilities can be maintained by the existing staff.

(2) Medical Equipment Maintenance

1) Current Situation

There is one resident maintenance personnel assigned by the Biomedical Engineering Services (BES) of MOH in Colombo, under whom 2 assistant staff employed by the Hospital are assigned. Major tasks include exchanging spare parts such as light bulbs and electrical fuses, cleaning motors, trouble-shooting, and repairing simple equipment such as blood-pressure gauge. The tools they use are simple tools such as driver sets and testers, and there are no stocks of spare parts. Small work space limits their work to relatively minor repairs. Items that cannot be managed here are handled by engineers dispatched from BES in Colombo, or sent directly to BES. Those that cannot be repaired in BES are entrusted to the agencies of the manufacturer.

BES prepares an inventory list for each hospital under its responsibility, and all medical equipment are registered. If an item breaks down, a standardized repair form is completed with the equipment reference number, nature of repairs, spare parts used etc., enabling a comprehensive equipment maintenance.

The Hospital also has a general maintenance department, with 18 engineers. The maintenance of the overall hospital facility and the repairs of medical furniture, such as beds and stretchers, are handled by this department.

2) Maintenance Plan of New Medical Equipment

The equipment procured by the Project will be of the same level as the existing equipment,

therefore, current medical staff will be capable of proper maintenance. Operation and maintenance manuals will be provided at the time of equipment delivery, and instructions of operation and daily inspection will be given upon installation. These procedures will enable Hospital staff and the resident BES engineer to perform daily inspection and minor repair works. It is also recommended to register the delivered equipment in the inventory list and undertake control for some consumables and spare parts at BES headquarters which is independently developing a maintenance management system. Meanwhile, some of the equipment with electrical parts will be difficult to repair, even for the engineers of BES headquarters. Therefore, X-ray units, auto-analysers, physiological testing equipment etc., need to be maintained under maintenance contract with the agencies of the manufacturers. The equipment that are expected to require annual maintenance contract, are listed in the Appendix-8.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Project Costs Estimation to be Borne by the Government of Sri Lanka

Table 2-19 Costs to be borne by the Government of Sri Lanka

1) Premises, exterior works	
• Premises preparation works	
－ Demolition of existing buildings and levelling of ground	Rs 2,000,000
• Preparation for construction	
－ Application/ approval for waste water water treatment plant	Rs 15,000
－ Application for building permission	Rs 5,000
－ Local consultant fee for application for building permission	Rs 1,000,000
－ Rerouting and temporary provision of electricity	Rs 500,000
－ Rerouting and temporary provision of telephone	Rs 300,000
－ Rerouting and temporary provision of water supply	Rs 2,000,000
－ Rerouting and temporary provision of drainage facility	Rs 2,000,000
• Infrastructure works	
－ Provision of electricity	Rs 2,000
－ Construction of outdoor sub-station	Rs 2,490,000
－ Provision of telephone trunk line (existing)	Rs 0
－ Provision of water supply	Rs 900,000
• Exterior works	
－ Planting	Rs 2,000,000
• Fixtures and furniture(excluding medical furniture)	Rs 20,000,000
• Relocation of existing equipment	
－ Relocation of dental unit	Rs 100,000
Total	Rs 33,398,500
VAT （15%）	Rs 5,009,775
Grand Total	Rs 38,408,275

2) Tax exemption	
• Customs duties, VAT, and commission charges of banks, for works of the Japanese side	
Total	Rs 535,000,000

Total	Rs 573,408,275 Approximately 573 million JPY

The above cost estimation does not include the cost for relocation of medical services/equipment which will be necessary before the demolition of the existing buildings in the Project site, the cost for moving of existing medical services to the new building and the cost for procuring/renting necessary land for temporary office, worker's lodgings, building materials yard, etc, for Japanese construction

works near to the Project site.

If the project is approved, the department in charge of logistics in MOH will be responsible for tax exemption procedure.

2-5-2 Operation and Maintenance Cost

(1) Estimated Budget

The following Table shows the result of estimation concerning the operation and maintenance costs after the implementation of the Project.

Table 2-20 Operation/ Maintenance Costs after Completion

Item	Cost (Rs)	Remark
1) Electricity Charge	6,832,320	
2) Telephone Charge	164,250	2 lines
3) City Water Charge	1,762,950	20% increase for the specialized outpatient clinics is assumed.
4) Fuel Cost for Emergency Generator	861,120	3-hour outage/week is assumed.
5) Facility Maintenance Cost	3,500,000	500Rs/m^2/year is assumed.
6) Cost for Equipment Maintenance Service Contract	2,300,600	For elevators and HVAC equipment
7) Cost for maintenance of waste water treatment facility	1,166,000	Estimation for only once-a-month periodic servicing. Once a week would be ideal.
8) Cost for Medical equipment maintenance	7,991,457	Annual cost for expendable/spare parts and maintenance service contract.
Total	24,578,697	

(2) Basis for Cost Calculation

Operation and maintenance costs are estimated based on the assumptions described below. Price escalations are not taken into consideration.

1) Electricity Charge Rs 6,832,320/year

Maximum power demand is estimated to be 460 kVA, as indicated in the following table.

Table 2-21 Calculation of Power Demand

	Expected Installed Capacity	Expected Demand Rate	Max. Power Demand	Remark
Medical Equipment	170 KVA	40 %	68 kW	
Air-conditioning/ Ventilation Facilities	330 KVA	80 %	264 kW	
Water Supply, Drainage & Sanitation Facilities	70 KVA	20 %	14 kW	
Lighting Facilities	130 KVA	80 %	104 kW	
Receptacles	40 KVA	20 %	8 kW	
Other Loads	10 KVA	20 %	2 kW	
Firefighting Facilities	30 KVA	0 %	0 kW	
Total	780 KVA		460 kW	

- Assumption on power consumption: From "Max. Power Demand" in the Table of Calculation of Power Demand,

  Weekday 460kW × 0.3(mean demand rate) ×10 hours × 20 days =27,600kWh/month

  Holiday 460kW × 0.1(mean demand rate) × 10 hours × 10 days = 4,600kWh/month

- Annual electricity charge

  Base rate (fixed): Rs 800/month x12 months = Rs 9,600·····i)

  Base rate (Maximum):460kW×Rs 480/kW・month×12 months = Rs 2,649,600/year·····ii)

  Electricity charge:32,200kWh/month×Rs 10.8/kWh×12 months = Rs 4,173,120/year·····iii)

  i)+ ii)+ iii) = Rs 6,832,320/year

2) Telephone Charge Rs 164,250/year

- Number of subscriber lines: Assumed usage 2 lines

- Assumption on call charge: Assumed number of outside calls per subscriber line: 10 calls/line day, Length of call: 5 min/call

  Annual telephone charge

  2 lines x 10 calls/line x 5 min x 365 days = 36,500 min/year

  A half of the above time is assumed to be local calls and the other half is assumed to be long-distance (mostly domestic) calls.

  Local calls: 36,500 min/year x 0.50 x Rs 2.5 = Rs 45,625 ·····i)

  Long-distance calls: 36,500 min/year x 0.45 x Rs 5.0 = Rs 82,125 ·····ii)

  International calls: 36,500 min/year x 0.05 x Rs20.0 = Rs 36,500·····iii)

  i) +ii) +iii) = Rs 164,250/year

3) City Water Charge Rs 1,762,950/year

City Water Consumption in New Facility

The expected water supply in this facility is as follows:

Table 2-22 Calculation of City Water Consumption

	Number	Unit consumption	Volume per day
Outpatient	1,450 users *1	20ℓ/day	29 m^3/day
Staff	580 users *2	100ℓ//day	58 m^3/day
ICU	35 beds	400ℓ//day	14 m^3/day
Total			101 m^3/day

*1. See "(8) Expenditure Forecast after Project Implementation" below for the number of outpatients.
*2. The number of workers of the outpatient clinics is the same as the current figure.

Therefore, annual consumption will be as follows.

100 m^3/day = 36,500 m^3/year

Annual city water charge will be as follows.

36,500 m^3/year × 48.3 Rs/ m^3 ≒ 1,762,950 Rs/year

4) Fuel Cost for Emergency Generator Rs 861,120/year

- Emergency generator: 250kVA Fuel consumption 60ℓ/h

  Power outages are assumed to last about 3 hours per week.

  Annual fuel cost: 60ℓ/h ×3 hours ×2 generators×52 weeks ×Rs46/ℓ = Rs 861,120/year

5) Facility Maintenance Cost Rs 35,000,000/year

The 2007 budget allocates 15,000,000Rs for the 38,000m^2 space of the existing facilities, which translates to about 400Rs/m^2/year. Since the new building will have operating rooms, its maintenance cost is set at about 500Rs/m^2/year.

500 Rs /m^2/year x 7,000 m^2 = 35,000,000 Rs/year

6) Cost for Equipment Maintenance Service Contract Rs 2,300,600/year

The two existing emergency power generators are maintained and controlled by the hospital staff, who are capable of maintaining additional generators for the new building. Therefore, the maintenance service contract cost is not included in the estimation.

Elevators

2 elevators will be installed. As annual maintenance cost by specialized agency is 200,000 Rs/unit, 400,000 Rs/year will be necessary for 2 units.

Air-conditioners

The maintenance cost for air-conditioning system after the implementation of this Project will include maintenance contract cost with mechanical agencies and the cost for periodical exchange of HEPA filters. The replacement frequency of HEPA filters varies depending on the conditions of use. In this calculation, once-a-year replacement is assumed.

Maintenance contract fee	1,843,000 Rs/year
HEPA filter maintenance	57,600 Rs/year
Total	1,900,600 Rs/year

7) Waste Water Treatment Plant Rs 1,166,000/year

For the maintenance of waste water treatment plant after the implementation of the Project, costs for the maintenance contract fee, including water quality tests and equipment overhaul, will be necessary. The cost of a desirable service contract for maintaining the facilities in optimum conditions (4-times-per-month periodic servicing, once-a-month water-quality inspection, etc.) is estimated at around 3 million yen per year. However, in the cost estimation chart, the cost is calculated based on a minimum service contract (once-a-month periodic servicing, once-per-3-months water-quality inspection, etc.). At least this budget is necessary to maintain the waste water treatment plant provided in the Project.

Sludge disposal fee	121,000 Rs/year
Equipment overhaul fee	548,000 Rs/year
Periodical maintenance commission	422,000 Rs/year
Water quality test fee	75,000 Rs/year
Total	1,166,000 Rs/year

8) Medical Equipment Maintenance Cost Rs 7,991,457/year

The maintenance for medical equipment after the implementation of the Project will include the cost for the purchase of consumable supplies and spare parts for equipment, and maintenance

contract fees paid to the agencies of the manufacturers of medical equipment. See Appendix 10 and 11 for details.

Consumables and spare parts	6,882,309 Rs/year
Maintenance contract fee	1,109,148 Rs/year
Total	7,991,457 Rs/year

(3) Expected Budgetary Balance after Implementation of the Project

The table below shows the records of expenditures of AT Hospital, as well as forecasts after the completion of the new facilities.

Table 2-23 Expenditures (records and forecasts) of AT Hospital

	Actual 2005	Actual 2006	Budget 2007	Forecast 2008	Forecast after the completion of the new facilities
Personnel cost	356,602,401	391,373,715	593,307,000	716,630,000	716,630,000
Transportation	1,999,891	3,055,354	6,000,000	7,000,000	7,000,000
Office supplies	5,498,127	7,222,014	9,500,000	11,000,000	11,000,000
Fuels	7,093,007	6,483,690	10,000,000	11,000,000	11,000,000
Uniforms, meals	19,199,761	19,453,066	37,800,000	31,843,300	31,843,300
Drugs	3,329,451	2,472,225	208,400,000	255,000,000	280,500,000
Test reagents, etc.	28,918,467		48,000,000	47,800,000	52,580,000
Oxygen	9,200,000	4,646,715	20,000,000	24,000,000	26,400,000
Linens	4,887,500	2,117,182	6,682,000	7,444,500	7,444,500
Consumables	300,000	2,952,582	5,000,000	6,000,000	6,600,000
Vehicle maintenance	1,389,594	3,600,383	9,000,000	5,000,000	5,000,000
Equipment maintenance	3,098,603	6,818,881	14,000,000	9,000,000	16,991,457
Building maintenance	959,107	4,405,543	15,000,000	12,000,000	14,400,000
Contracted transportation		26,339	200,000	220,000	220,000
Communications	1,899,092	1,840,803	5,430,000	5,830,000	5,830,000
Postage	91,690	50,000	300,000	300,000	300,000
Kerosene	29,056		75,000	300,000	300,000
Gas	640,500	180,682	1,000,000	500,000	500,000
Water	14,091,046	19,811,677	18,000,000	26,000,000	28,600,000
Electricity	37,150,309	39,845,719	43,000,000	45,000,000	48,682,320
Generator maintenance	1,727,531		2,500,000	2,000,000	4,861,120
Office rental fee	625,143	120,000	2,300,000	2,500,000	2,500,000
Laundry	10,124,587	9,884,031	14,000,000	10,000,000	11,000,000
Security	4,906,897	6,095,216	10,000,000	10,600,000	12,720,000
Cleaning	8,899,813	13,364,523	12,000,000	20,000,000	24,000,000
Other contract-related	28,515,592	2,096,320	30,000,000	10,000,000	10,000,000
Other	651,300	1,715,969	22,150,000	27,400,000	27,400,000
Sub-total	551,828,465	549,632,629	1,143,644,000	1,304,367,800	1,364,302,697

(2007 AT Hospital Expenditure Report)

The above forecasts were derived based on the following assumptions.

1) Number of Workers

Because this Project will not create additional medical departments, the number of workers is assumed to remain the same after the Project as in the 2008 forecast.

2) Number of Patients

Generally, the number of patients is in proportion to the number of physicians and the hours of practice. Since the Project will not provide new medical clinics/departments, the number of patients is not expected to increase significantly. However, there are some clinics that have been sharing rooms with other clinics and forced to restrict operating hours due to lack of space. The new facilities will ease these restrictions, and consequently the number of patients visiting the specialized outpatient clinics to be upgraded by the Project is assumed to increase by about 20% from around 700 to around 850 per day on the average. The number of people visiting the new walk-in clinic is assumed to remain the same as the current average of around 600 patients per day, because the number of physicians will not change after the Project. Therefore, the total daily average number of patients coming to the new walk-in clinic and specialized outpatient clinics is assumed to be around 1,450.

The hospital record shows that the specialized outpatient clinics to be upgraded by the Project saw about 209,000 outpatients during 2006. This combined with inpatients, the hospital had a total of about 552,000 patients in 2006. Based on this ratio, the 20% increase in the number of outpatients for the specialized outpatient clinics will lead to around 10% increase in the total number of patients. Therefore, the costs for drugs, test reagents, consumables, laundry, and water supply for these patients are assumed to increase by 10% from their 2008 forecasts.

3) Floor Area of the Facilities

The floor area of the existing facilities is about 38,000m^2, of which 2,800m^2 will be removed to build new facilities with floor space of 7,000m^2. This means that the total floor space will increase by around 20% to 42,200m^2. Therefore, the costs for building maintenance, security, and cleaning related to these facilities are assumed to increase by 20% from their 2008 forecasts.

4) Other

The electricity charge after the Project was calculated by subtracting from the 2008 forecast the portion to be demolished and adding the volume required for the new facilities. Extra cost was added to the equipment maintenance cost for the new equipment to be installed by the Project.

Because two new power generators will be procured in addition to the existing two generators, the total generator expense will double after the Project, which is included as fuel cost being twice as much as the 2008 forecast.

Based on the foregoing, the total expenditures of AT Hospital after the completion of the new facilities are estimated to increase by 5% from the 2008 forecast.

Since AT Hospital has been placed under the direct jurisdiction of MOH, its total budget is now part of the MOH budget.

Table 2-24 MOH Budget

(In Thousands Rupees)

	Actual 2004	Actual 2005	Actual 2006	Estimate 2007	Estimate 2008
Current expenditure	19,099,181	22,602,660	23,481,980	28,246,832	31,217,886
Capital investment expenditure	7,255,237	7,190,390	6,841,200	18,225,600	25,850,000
Total	26,354,418	29,793,050	30,323,180	46,472,432	57,067,886
% in government budget	3.9%	3.7%	2.8%	3.4%	
Rate of increase		13.0%	1.8%	53.3%	22.8%
Total government budget	665,661,399	792,853,059	1,072,780,680	1,353,091,470	-

(2006 Ministry of Finance Expenditure Report)

As shown above, it is planned that the MOH budget will increase at an annual rate of over 20% after year 2006. Therefore, the 5% increase in cost after the completion of the Project is deemed reasonable and sustainable.

2-6 Other relevant issues

Following matters are required for the implementation of this Project.

(1) A joint Project Implementation Unit comprised of members from both MOH and AT hospital is to be set up immediately after the signing of Exchange of Notes. This unit will be responsible for smooth implementation of the Project.

(2) The Project site needs to be cleared of existing facilities. These include chest clinic, laboratory, obstetrics ward no. 12, orthodontics clinic, psychiatric ward No. 19 and parking lot. The total floor area comes up to 2,820m2. Sri Lankan side must clear the site by demolishing these facilities according to the given schedule (within 6 months after exchange of notes). Clearing the site includes also demolishing of existing infrastructure lines such as water, drainage and electricity within the Project site. These infrastructure lines may have to be re-located outside the Project site. All these work, including demolition and relocation of infrastructure necessary for clearance of the Project site is to be implemented and completed according to the Project schedule.

(3) Government of Sri Lanka are to allocate appropriate budget and personnel for above pre-construction works and also for proper operation and maintenance of the facility/equipment after completion of the Project.

Chapter 3 Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

Current State and Issues	Measures Taken by the Project	Direct Effect and Degree of Improvement	Indirect Effect and Degree of Improvement
1) The target hospital, which is the top referral hospital in the North Central Province, cannot provide quantitatively and qualitatively adequate medical services due to aging or insufficient facilities and equipment 2) In the North Central Province, lack of adequate primary and secondary medical institutions and medical personnel is resulting in the overcrowding of patients at AT Hospital. With limited supply of medical personnel, deploying personnel to these lower level institutions is difficult.	・Enhancement of outpatient facilities and equipment ・Enhancement of OB/GYN surgery facilities and equipment ・Enhancement of NICU/PICU facilities and equipment	1) Improved efficiency of hospital functions through the centralization and concentration of outpatient functions By centralizing the various outpatient clinics currently dispersed into various buildings, the hospital functions will become more efficient and enable the hospital to better manage outpatients (209,291 cases/year increase in special outpatients). 2) Improved efficiency of the OB/GYN surgery room By enhancing its aged facilities and equipment, the OB/GYN surgery department will be able to provide better quality services, and increase the number of surgeries (6,759 OB/GYN cases/year increase) 3) Improved efficiency of ICU By enhancing its facilities and equipment, neonatal/pediatric ICU will be safer, and will be able to provide better services (bed occupancy rate of NICU will be less than the current 156%, number of PICU patients will increase by 252 persons/year).	1) Promote the implementation of AT Hospital Master Plan AT Hospital can be accessed in just over an hours' commute from each of its service coverage area owing to Sri Lanka's reasonably developed transportation system. Therefore, concentrating specialized outpatient services required in the North Central Province at AT Hospital will enable the provision of efficient medical services. Meanwhile, this would further intensify the number of patients at AT Hospital. Improving the outpatient care at At Hospital will increase the number of outpatients, which inevitably leads to the increase in inpatients, thereby raising the urgency for the enhancement of inpatient facilities. The Project will also expand the overall floor area of the facility by approximately 20 percent; rooms that are currently in use and planned to be vacated after transfer to the new facility may be utilized as a temporary transfer space. In short, this plan will allow the sequential implementation of the Master Plan. 2) Contribute to decreasing Sri Lanka's maternal mortality and infant mortality rate. 3) Promote the Economic Development of North Central Province The economy of the North Central Province is less developed due to its proximity to the LTTE -controlled area in the North. By improving basic medical services, the Project is expected to promote the economic development of this Province. AT Hospital will also be able to provide high quality medical services to patients from the LTTE-controlled area which the hospital also serves.

3-2 Recommendations

3-2-1 Recommendations to be Taken by the Government of Sri Lanka

(1) The Project only covers a part, and not the whole, of the Master Plan. Improvement of wards and delivery rooms are out of scope of the project. To fully function as an educational and tertiary medical facility, appropriate enhancement of wards and delivery rooms based on the Master Plan is advisable.

(2) Currently, the lack of specialized outpatient services at primary and secondary medical care institutions is conducing the concentration of patients at AT Hospital. Considering the impracticality and inefficiency of allocating medical personnel across these lower level institutions, this trend is expected to continue. With the expected increase in inpatients resulting from improved outpatient facilities brought about by the Project, enhancement of the said facilities such as wards is immediately called for. Meanwhile, AT Hospital also attracts a large number of walk-in outpatients without referrals. Although it is understandable that some patients may find it more efficient to directly visit a tertiary hospital than be referred to one on a need-basis after visiting a local medical clinic, many of their conditions do not need an advanced tertiary service. AT Hospital, controlled under the Ministry, should build a close cooperative relationship with the area's lower level medical institutions and take measures to minimize its patients' burden.

(3) In the Project, enhancement of the delivery rooms is not included, and is to be done in the next phase. Currently, AT Hospital has too many cases of delivery as a tertiary hospital. This is due to the fact that the lower level hospitals in the area do not have adequate facilities or personnel for Caesarean sections. The government of Sri Lanka intends to enhance base hospitals and above as secondary hospitals (68 sites). It is advisable to accommodate the Northern Central Province with these secondary hospitals, especially those specializing in OB/GYN at an early date so as to decrease the number of deliveries at AT Hospital and to allow it to concentrate on the provision of services as a truly tertiary hospital.

(4) Currently, MOH's BES headquarters maintains the medical equipment at AT Hospital by stationing a BES engineer full-time; however, the operation and maintenance are ineffective due to the lack of adequate manuals. In the Project, in addition to the operation/maintenance manuals and trainings, which are included as components, strengthening of the maintenance system and continuous effective maintenance operation, including registering the equipment into the inventory list maintained at the BES headquarters and inventory management of consumables/parts, are desirable.

(5) In the Project, two elevators, two emergency power generators and air-conditioning systems are planned for installation. The existing facilities are maintained by outsourcing contracts. As with the current facilities, these new installations also should be maintained by contracting with an outside service provider such as specialized manufacturers for proper maintenance. For items of medical equipment, which use certain electronic parts such as X-rays, or auto-analysers, maintenance by the BES engineer stationed at AT Hospital would be difficult, and annual service agreements should be made between the hospital and the agencies of the equipment manufacturers. In order for the equipment to be fully utilized, a robust maintenance operation based on service agreements is advisable.

(6) The existing drainage treatment plant is already accepting more than twice its planned capacity. The treatment performance of the plant is no longer adequate according to water quality inspection: in fact, it does not meet the drainage water quality standard (General Standards For Discharge Of Effluents Into Inland Surface Waters-Sri Lanka). The Sri Lankan side should include a drastic renovation of the existing facility corresponding to the scale of the facility enhancement or a new construction in the Master Plan and implement this at an early date.

(7) This Project will construct a new waste water treatment plant solely for the target project building. Unless appropriately maintained, this plant will not function properly; thus, ensuring the maintenance operation mentioned in this basic design study report is requested.

3-2-2 Technical Cooperation and Collaboration with Other Donors

This Project does not add new advanced functions to AT Hospital, but is aimed at concentrating and improving the efficiency of the existing functions. No particular technical cooperation from the Japanese side is necessary since the hospital is currently being run by the hospital staff without major technical issues. In addition, as for this Project, while the coverage of the catchment area is wide, the improvement work itself is contained to the AT Hospital premises, so collaboration with other donors is not essential.