THE STATE COMMISSION
ON FOREIGN INVESTMENTS AND
ECONOMIC ASSISTANCE,
THE KYRGYZ REPUBLIC

MINISTRY OF HEALTH,
THE KYRGYZ REPUBLIC

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF MEDICAL EQUIPMENT FOR REPUBLIC CHILDREN HOSPITAL
IN
THE KYRGYZ REPUBLIC

AUGUST 1995

JAPAN INTERNATIONAL COOPERATION AGENCY
UNICO INTERNATIONAL CORPORATION

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PREFACE

In response to a request from the Government of the Kyrgyz Republic, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Medical Equipment for Republic Children Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Kyrgyz a study team from April 16, 1995 to May 14, 1995.

The team held discussions with the officials concerned of the Government of the Kyrgyz Republic, and conducted a field study at the study area. After the team returned to Japan, further studies were made, and as the result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Kyrgyz Republic for their close cooperation extended to the teams.

August 1995

Kimio Fujita
President
Japan International Cooperation Agency

August, 1995

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of the Medical Equipment for Republic Children Hospital in the Kyrgyz Republic.

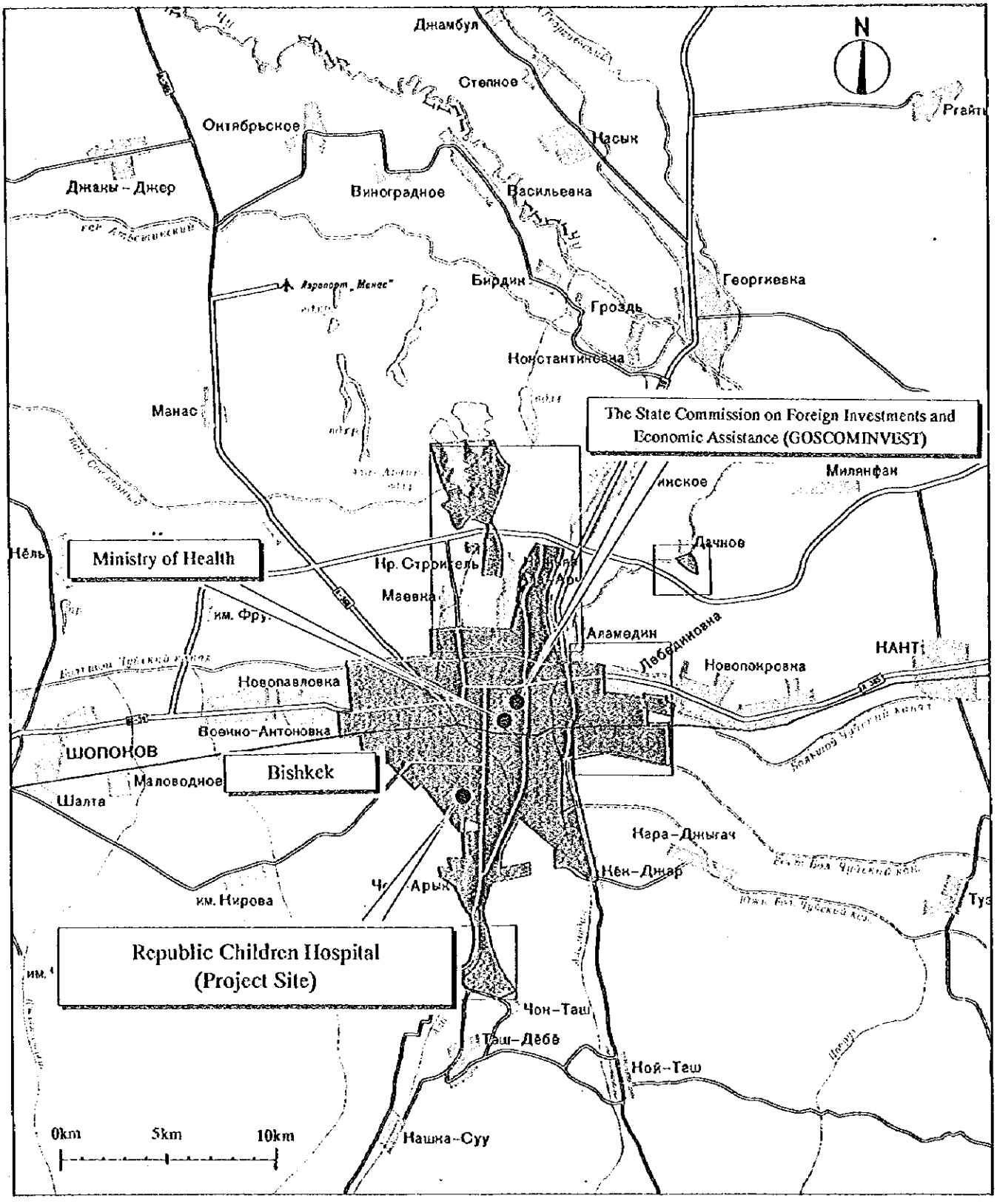
This study was conducted by UNICO International Corporation, under a contract to JICA, during the period from March 31, 1995 to August 24, 1995. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Kyrgyz and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Akira Nakamura
Project manager,
Basic design study team on
the Project for Improvement of
Medical Equipment for Republic Children Hospital
UNICO International Corporation

Location Map



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CHAPTER 1 BACKGROUND OF THE PROJECT

Chapter 1 Background of the Project

1-1 General Background

The Kyrgyz Republic declared independence on August 31, 1991, immediately after the collapse of the Soviet Union. Its land area is small among those in other Republics in Central Aisa, about 199,000km², which is nearly one half that of Japan. As an inland country located in the northeastern part of Central Asia, Kyrgyz is bordered on the southeast by Autonomous Region of Uygur, China, on the north by Kazakhstan, on the west by Uzbekistan, and on the southwest by Tajikistan. Its total population is 4.44 million (as of the end of 1994), of which about 600,000 people live in its capital, Bishkek. Population consists of a variety of races, Kyrgyz 59%, Russian 17%, Uzbek 14%, Ukrainian 1.8%, and Tartar 1.3%. The dominant religion is Muslim (Sunnis) mainly believed by Kyrgyz. GNP per capita is $830 (as of 1993).

The country makes a sharp contrast to other Central Asian countries in its drastic economic reforms, and under cooperation of the World Bank and IMF, it has been vigorously transforming itself into a market economy system through a variety of measures such as price liberalization and privatization. The country has been seriously affected by the dissolution of the Soviet Union, since it is not endowed with natural resources and its economy has been systemized and specialized under the Soviet centrally-planned economic system. It is besieged by lost subsidy from the Soviet Union, deteriorated terms of trade due to price liberalization, the shortage of import products, sluggish demand for Kyrgyz products in the CIS countries, and other adverse effects. In particular, chronic shortages of energy (petroleum in particular) and food (cereals and sugar) as well as sluggish foreign trade are accelerating its economic slump.

The difficult economic conditions affect the country's medical service. While its medical standard measured by population per doctor (297) and population per hospital bed (90) is a fairly high level, public health service was hit hard by a significant cutback in government budget after the collapse of the Soviet Union. In 1993, the public health budget as a percentage of the total plummeted (see Table 1-1 and Note 1), and in particular, the budget for medical drugs and equipment suffered a sharp decline. As a result, revealed are problems, such as deteriorated medical facilities, serious shortages of medical drugs and equipment, and the lack of ability to renew aging medical equipment. Also, the infant mortality rate slightly increased to 31.9 per

thousand births in 1993 according to the Ministry of Health (40 according to the World Bank's estimates). (see Table 1-2 and Note 2) In addition, the absence of the referral system with Moscow after the end of the Soviet era makes the establishment of a central children's hospital utmost urgent.

Table 1-1 Recent Changes in Government Expenditures Related to Public Health

	1991	1992	1993
Total Amount (million Rubles)	564.7	3,511.4	8,565.0
Percentage of total expenditures	11.9%	11.2%	8.1%
Percentage of national income	3.3%	3.2%	3.4%
Amount per capita (rubles)	127.7	784.1	1,891.7
Major Breakdown by cost item			
Wages	48.4%	35.0%	33.3%
Food	12.1%	15.4%	20.2%
Pharmaceuticals	9.3%	10.7%	8.0%
Medical Equipment	3.9%	5.1%	3.0%
Repairs	3.0%	4.4%	1.6%
Others	23.3%	27.9%	33.8%

Source: Central Asian Repulics of Kazakhstan, Kyrgyz, Tadzhikistan, Turkmenistan, Uzbekistan : Economic Development and International Cooperation – International Development Center of Japan

Note 1) The 1993 figures were allocated under budget. The subsequent percentage of the public health expenditures somewhat increased due to efforts of the Kyrgyz government.

Table 1-2 Recent Changes in Infant Mortality Rate in the Kyrgyz Republic (per 1,000 Live Births)

1987	39.0	
1990	29.9	
1991	29.6	
1992	31.5	
1993	31.9	(Japan 4.3)
1994	29.4	

(Source: WHO)

Note 2) The 1994 figure was not available at the time of the request of the Kyrgyz government. It has been pointed out that the IMR figure in the country understates the actual levels partly because the former Soviet statistics are based on registration of under-1-year-old deaths as child mortality and partly because their classification of early infant deaths deviates from the standard recommendations of WHO. According to a survey by Centre for International Research, US Bureau of the Census, the 1990 IMR in the country is estimated at 54.2 per 1,000 births. It should be noted, however, that the government's program "Healthy Nation" for the period of 1994 – 2000" contemplates the reforms of statistical methods including IMR.
According to UNICEF, the rise in IMR in 1992 and 1993 seems to be strongly associated with deteriorated standards of living caused by adverse economic conditions. In particular, shortages of medicines have had an impact on access and availability of health services. Staff motivation has declined and standards of care may have been affected. As to the 1994 figure, UNICEF states that more time will be needed to confirm that this downward trend is firmly resumed (excerpt from 1995 Republic of Kyrgyz Situation Analysis of the Health Sector, I. Child Birth).

1-2 Outline of the Request

As part of efforts to improve the situation, the Kyrgyz government plans to establish a national children's hospital and a national gynecological hospital attached to Research Institute of Obstetrics and Pediatrics located in Bishkek. In consideration to financial difficulties facing the country, the government requested the Japanese government to provide medical equipment for these hospitals on a grant-aid basis. After series of discussions between the Kyrgyz government and the Japanese government as well as the Project Formation Study Team (Grant Aid) who visited the country in March 1994, the kyrgyz government withdrew the request for the gynecological hospital, and only the request for the children's hospital was taken up as a subject of study as a Grant-Aid project.

Medical equipment requested includes those related to ICU reanimation, examination, and operation. The original equipment list was attached to the Application Form for Japan's Grant Aid, as submitted after the completion of the project formation study. However, the Kyrgyz counterpart submitted a modified list on April 20, 1995 to the meeting held at the Ministry of Health in the country. Major changes included the deletion of otolaryngology(ENT)-related equipment from the original list and the addition of those for neonatal surgery, involving relatively a small number of equipment although the new list was recompiled to require relatively long hours for

confirmation. Although such major modification in the final stage of project preparation was not desirable, the Japanese government accepted explanation of the Kyrgyz counterpart that the change was necessitated by the lapse of time after the original request and agreed to enter into discussion on the request based on the new list.

Major equipment requested is summarized in Table 1-3.

Table 1-3 Major Equipment Requested

Department	Equipment Requested	No. of Items
1.ICU Reamination	Including ICU monitoring systems for 4 patients, a portable defibrillator with cart, ventilators, a blood gas analyzer, a regional hypotermia unit, infant incubators, an ECG, and a rapid chemistry analyzer.	41 items, 19,877 units If small-value items with 10 or more units requested are removed from the list, 30 items and 257 units
2.Physiological Examiniation	Including endoscopes, ultrasound scanners, an autospirometer set, an ECG with a cart, an ECG holter recorder, and a linear electronic ultrasonic tomogram.	28 items and 63 units
3.Operation Theater	Including operation tables, operation lights, anesthesia apparatuses with ventilators, operation monitors with carts, a portable defibrillator with cart, a hyper/hypothermia unit, a mobile x-ray unit, surgical instrument sets, and UV hand washing apparatuses.	26 items and 93 sets
4.X-Ray Department	Including a diagnostic x-ray for chest, a diagnostic general x-ray, a R/F diagnostic x-ray TV remote control, a general radiograph, and a MRI.	7 items and 11 units
5.Recovery Room	Including ventilators, bedside monitor telemetries with carts, a portable defibrillator with cart.	8 items and 14 units

6.Pharmacy	Including drug refrigerators, a prescription counter, a distilling apparatus, a redistrillation apparatus, a dissolution tester, a auto-melt pointer, a spectrophotometer--UV, vertical autoclaves, and a suction filter unit.	27 items and 36 units
7.Central Sterilizing	Including steam sterlizers and ultrasonic cleaner sets	9 items and 16 units
8.Blood Transfusion/ Collection	Including blood banks and immunohematology push-button centrifuges.	8 items and 16 units
9.Urology Nephrology	Including heamodialysis for 10 beds, a lithotrypter, a resectoscope set, a ultrasonic lithotrypter, a universal module signostic with colour Doppler unit, and cystometers.	31 items and 438 units; If small-value items with 10 or more units requested are removed from the list, 20 items and 28 units
10.Laboratory	Including a centrifuge, a fume hood, a clean bench, a blood cell counter, a blood gas analyzer, a chemistry analyzer, an electronic phoresis, a flame photometer, an immuno-lab system, an auto-EIA analyzer EIA kit, a gamma counter, a water distiller, and a redistillation apparatus.	42 items and 46 units
11.Rehabilitation Phisiotherapy	Including hydro bubbler baths, low frequency therapy units, microwave therapy apparatuses, and paraffin baths.	16 items and 40 units; 14 items and 20 units if small-value products are excluded.
12.Opthalmic Cabinet	Including an ophthalmology work place, a slit lamp, and a test chart	5 items and 5 units
13.Dental Cabinet	Including dental units and laboratory equipment.	6 items and 8 units
14. ENT	Including an audiometer.	1 item and 1 unit

15.Infant Care Unit	Including infant incubators, an infant warmer, neonatal monitors, ventilators, ultrasonic scan equipment, and a UV hand washing apparatus.	18 items and 45 units
16. Infant Surgery	Including infant warmers, incubators, pediatric monitors, and ultrasonic scan equipment.	7 items and 14 units
17.General	Including ambulances and sphygmomanometers	5 items and 185 units
18.Administration	Including projectors, computers, a copier, a facsimile, and a laser printer	9 items and 12 units
		297 items and 20,920 units; 279 items and 710 units if small-value items with 10 or more units requested are removed from the list.

CHAPTER 2 CONTENTS OF THE PROJECT

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The government's program "'Healthy Nation' for the period of 1994 - 2000" (formulated in August 1994) aims to decrease infant mortality rate and morbidity rates, particularly respiratory and diarrhea-related diseases, and calls for the improvement of medical equipment and drugs in terms of quality and quantity. The project is designed to supply advanced medical equipment to the Republic Children Hospital, thereby contributing to the improvement of children's health in the Kyrgyz Republic and medical standards of the country as a whole.

2-2 Basic Concept of the Project

(1) Role of Republic Children Hospital

In Kyrgyz, children of 14 years or younger account for approximately 40% of total population. Health indices of children in the country (1993) are summarized below.

Table 2-1
Child Mortality Rate

	1993
Number of Births	116,795
Birth Rate	26.1%
Child Mortality Rate (per 1,000 population	7.7%
Infant	31.9%
Less than 5 yrs old	9.1%
5 - 9 years old	0.5%
10 - 14 years old	0.5%

Table 2-2
Chilren s Major Causes of Death by Age Group in the Recent 3 years

	0 - 4 years old	5 - 14 years old
1st	Respiratory Diseases	Traumas and Intoxication
2nd	Infactious and parasitic diseases	Respiratory Diseases
3rd	Traumas and Intoxication	Diseases of Nerve Systems and Sense

Figure 2–1 Morbidity Rate per 100,000 Children under 14 in the Republic of Kyrgyz in 1992, 1993 and 1994

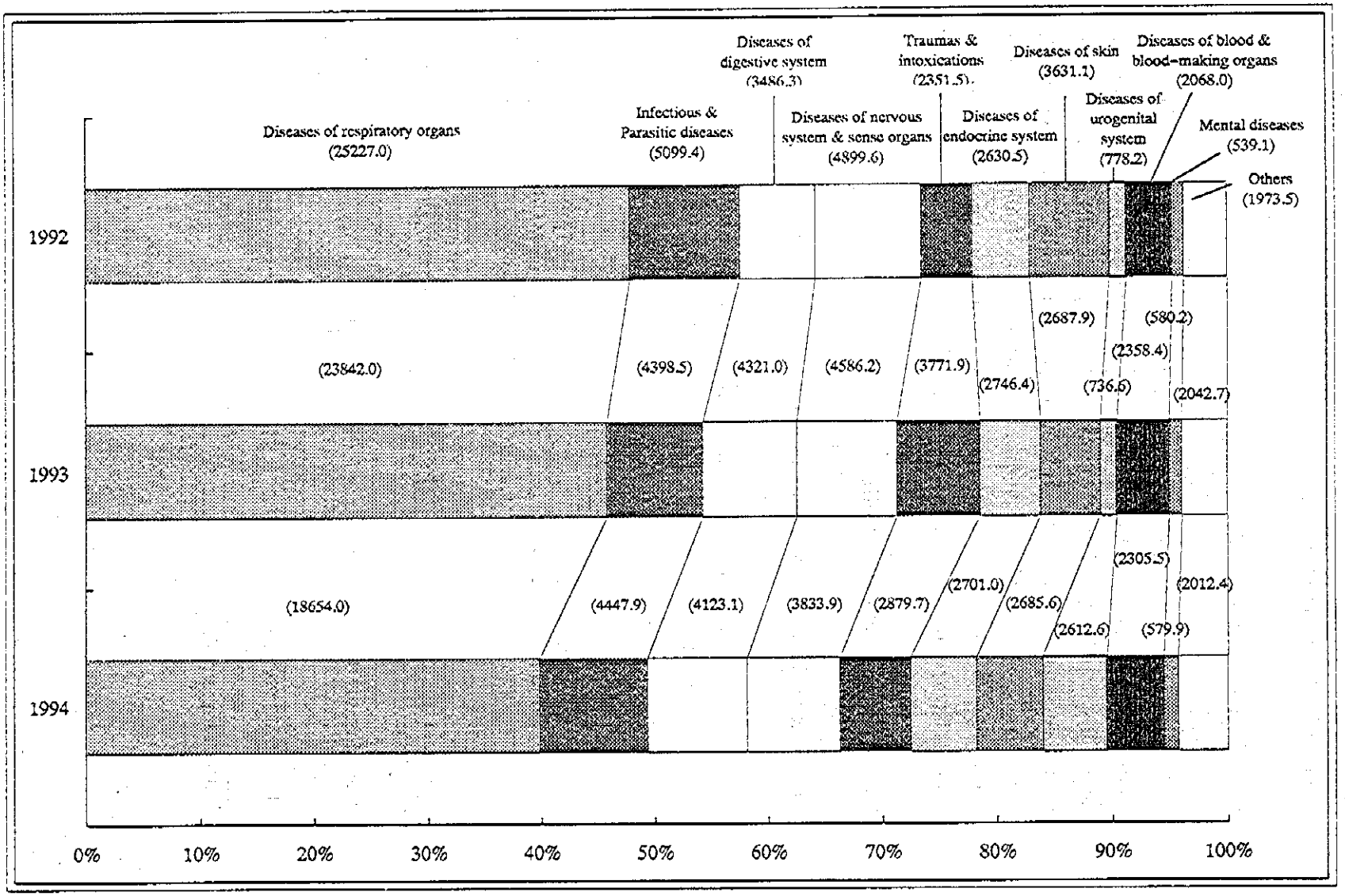

Fig. 2-1 shows disease distribution of children of 14 years or younger in the recent three years. As for major cause of death of infants, diseases of respiratory systems account for approximately one half, perinatal deaths one quarter, and infectious and parasitic diseases 14%. The reduction of the infant mortality rate requires preventive and primary health care policy to reduce the disease rate, as set forth in the objective of better maternal and child health under 'Healthy Nation' for the period of 1994 - 2000." At the same time, the number of deaths must be reduced by improving the cure rate in secondary and tertiary health services. To cure patients who die due to poor medical service, the improvement of diagnostic and treatment capabilities in the child health care process is essential.

Children Municipal Clinical Hospital No.3 in Bishkek, considered to be the best Children Hospital at present in the country, has old medical equipment subject to frequent failure; radiological equipment made in former Czechoslovakia, and ultrasonic diagnostic equipment, endoscopes (not optic fiber) and electrocardiographs made in the former Soviet Union. Republic Diagnosis Center (no accommodation for inpatients)(Note 1) has the most advanced diagnostic equipment in the country and conducts clinical examination for children, but it cannot meet large demand. There are cases that cannot be treated at the Municipal Hospital, which must be transferred to hospitals in Almaty, Kazakhstan or in Moscow. These impose heavy financial burdens on the country of importing oil, which naturally leads to increasing demand for the Republic referral hospital for child care within the country.

The Republic Children Hospital has a major mission to play a leading role in the tertiary health care approach to the reduction of the very high IMR and the mortality rate of children of less than 5 years old. Also, it is expected to serve as a place of pre-graduation and post-graduation training for students of medical schools and nursery schools. Finally, it will function as a major research organization in the field of pediatrics. To this end, the hospital aims to develop into a children hospital fully equipped with latest medical equipment, emulating those at Republic Diagnosis Center, while providing an emergency service facility in Bishkek that operates on an around-the-clock basis.

Note 1: The Republic Diagnostic Center was constructed under the Soviet fund and opened in February 1990. It only provides diagnostic service, mainly clinical examination, and does not have facilities to accommodate inpatients. It employs 275 staff in total, including 82 doctors, 110 radiologists and laboratory technicians, and 10 engineers. The center handles 1,000 – 1,500 outpatients daily. It consists of 9 departments (ultrasonic diagnosis, CT, endoscope, physiological examination, clinical laboratory, cytological diagnosis, health examination, patient information system, and equipment maintenance) and owns ultrasonic diagnostic equipment made by a Japanese manufacturer, 2 CT scanners made by Philips, endoscopes (Olympus Optical), and 48 testing and diagnostic equipment. Clinical Laboratory is capable of conducting 150 items of laboratory tests and has treated 1,020,000 specimens of 185,000 persons over the past five years. Health Examination has examined 175,000 persons during the same period (67% came from rural areas). Children accounted for 10% of total. Patient Information System has 32 computers for registration of patients and maintenance of diagnosis and examination records. Equipment Maintenance is responsible for repairing laboratory equipment except for CT.

(2) Planning framework

The project is designed to supply medical equipment that allows the Republic Children Hospital having 300 beds to provide sufficient child care service that is not currently available due to the lack of the final referral hospital for children.

The institution will provide advanced medical service and handle patients of 14 years or younger referred by other medical institutions throughout the country. It is expected to handle approximately 7,000 inpatients annually.

Medical equipment supplied under the project is selected by giving priority to basic equipment, equipment for emergency care, and frequently used equipment. In addition, relatively advanced equipment is selected for those shared by diagnostic and therapeutic facilities to ensure a high level of service by the hospital as a whole, while basic equipment and tools will be supplied to individual departments.

(3) Selection of equipment

The selection process started from evaluation of equipment in the list, as shown in Chapter 1 (297 items and 20,927 units, or 279 items and 710 units if small-value items with 10 or more units requested are excluded), with representatives of the

Republic Children Hospital. Equipment was classified to three grades (A, B, C) according to priority, and the number of units was partially modified to obtain the final equipment list that was attached to the Minutes of Discussions as the final request of the Kyrgyz Government. After signing the minutes, it was agreed that equipment classified as A and B would be subject to further study and analysis before being incorporated into the final equipment supply plan.

Classification of equipment was made principally in accordance with the following criteria that was established by the study team in the preparation process before leaving Japan:

(Equipment to be given of priority)

① Basic medical equipment
② Medical equipment for emergency service
③ Frequently used equipment

(Equipment to be excluded)

① Equipment not directly related to medical services including diagnosis, treatment, and prevention
② Equipment available within the country such as furniture
③ Equipment requiring advanced technology for operation and maintenance that exceeds the current level in the country
④ Equipment used for research purposes
⑤ Equipment that cannot be installed due to the lack of related infrastructure
⑥ High-cost equipment that is less frequently used, as measured by the number of specimens or beneficiaries
⑦ Equipment that may have environmental problems
⑧ Medical equipment that require to use reagent kits of a particular manufacturer
⑨ Equipment which consumables and/or spare parts are difficult to obtain financially or geographically

During the discussion, the study team proposed that equipment requested by more than two departments would be shared to minimize maintenance requirements, which was agreed by the Kyrgyz counterpart. Also, the study team explained that, although the hospital was expected to serve as the "pediatrics" center in the

country as pointed out in "Role of Republic Children Hospital", priority should be given to equipment serving more urgent purpose, rather than those mainly used for research purposes. The Kyrgyz counterpart agreed with this policy.

At the same time, the study team proposed to add some equipment that should be owned by the general children hospital. For instance, the EEG for Physiological Examination was dropped from the original equipment list attached to the Application Form of Japan's Grant Aid. Since it is indispensable for diagnosis of cerebral neuropathy and for checking auditory perception of neonates, the study team proposed to include in the modified list with priority B. On the other hand, the study team proposed to supply one mobile x-ray unit to Radiology Department for use by individual departments and wards (priority A), while two mobile x-ray units requested by Operation Theater was reduced to one and a general radiograph for X-Ray Department was dropped from the list. As for equipment for ENT Department which was dropped from the original list, except for the audiometer, the study team proposed the comeback of a treatment unit, a laryngoscope set, and a manipulation and surgical intervation instrument set, with priority B. Finally, the use of film illuminators at Operation Theater, Infant Care Unit, Infant Surgery, and Ophthalmic Department was recommended with priority B to allow each department to view x-ray films. As a result, the modified list consisting of 165 items and 3,013 units (156 items and 263 units if small-value items with 10 or more units requested are excluded) has been agreed.

Table 2-3 summarizes the result of evaluation of requested equipment.

Table 2-3
Evaluation Table of Equipment Requests

No.	NAME	Requested No.	Adjusted	Priority	Reasons for Exclusion: Equipment not directly related to medical care. Equipment for research	Available in CIS countries and obtainable by self-help of Kyrgyz side	High-cost and advanced equipment difficult to be maintained	Cannot be used due to the lack of related infrastructure	Infrequently used with a small number of specimens or beneficiaries	Duplicated with other equipmet request or functionally availble with other equipment	●Fairly agree. ▲Partially agree. USE, EVALUATION, ETC.
1. ICU REANIMATION											
1	I.C.U. BED WITH MATTRESS	12		C		●					
2	I.C.U. MONITORING SYSTEM FOR 4 PATIENT	6	1	A							To be used for emergency medical care.
3	PORTABLE DEFIBRILLATOR WITH CART	1	1	A							To be used for reviving patients in cardiac arrest. Equipment for emergency care.
4	VENTILATOR FOR ADULT/CHILDREN, INFANT	6	2	A							To be used for reviving patients in respiratory pause and for respiratory control.
5	ANESTHETC VENTILATOR	1		C						●	Ventillator will suffice.
6	SUCTION UNITS	6	3	A							To suction vomit
7	EXAMINATION LAMP	4	2	A							
8	OXIGEN TENT FOR INFANT	6	1	A							To assist respiration of patients in intensive care.
8-1	OXIGEN TENT FOR CHILDREN	includ-ed in 8	1	A							To assist respiration of patients in intensive care.
9	PULSE OXIMETER	6	2	B							To measure and record oxygen and CO2 concentration in aspirated air during operation or intensive care.
10	RESUSCITATOR(AMBU BAG), LARGE & SMALL	7	2	A							To be used for reviving patients in respiratory pause.
11	HEMATOCRIT CENTRIFUGE	1	1	B							To be used for separation of blood serum at this department
12	ELECTROLITE ANALYZER	1		C						●	To be handled by the Chemistry Analyzer at Laboratory.
13	BLOOD GAS ANALYZER	1		C						●	Available at Laboratory.
14	BLOOD BANK	1		C						●	Available at Blood Transfusion/Collection
15	FILM ILLUMINATOR	2	2	A							To be used for reading X-ray films. Basic equipment.
16	LARYNGOSCOPE SET	3	2	A							To be used for examining larynx. Basic Equipment
17	ULTRASONIC NEBULIZER	1	1	B							To be used for humidifying lung during artificial respiration or providing inhalation treatment for respiratory disseases
18	NEBULIZERS WITH AEROSOL MASKS	100		C		●				●	
19	INFUSION PUMP	15	5	A							To supply infusion to patients. Basic equipment
20	AIRWAY KITS	2		C		●				●	Accessory of ventilator or other equipment
21	SPHYGMOMANOMETER ELECTRONIC	4	1	B							
22	INTUBATION TUBE SET	500		C		●					
23	BILATERAL INTUBATION TUBE SET	50		C		●					
24	TRACHESTOMY TUBE	20	10	A							Frequently used.
25	REGIONAL HYPOTERMIA UNIT (CRANIOTHERM)	1	1	B							To be used to maintain adequate temperature for patients with high fever.
26	INFANT NASAL CPAP CANNULA	50	10	A							To be used to suction secrete from nose and throat.
27	NASAL CANNULA	200	40	A							To be used to suction secrete from nose and throat.
28	INFANT INCUBATOR	4	1	A							To be used to nurture neonates in serious condition and control temperature, humidity and oxygen concentration at specific levels.
29	ELECTRONIC BABY SCALE	1		C		●					Not necessarily of electronic type.
30	PERIDURAL ANESTHESIA SET	100	20	B							Frequently used.

Table 2-3
Evaluation Table of Equipment Requests

No.	NAME	Requested No.	Adjusted	Priority	Reasons for Exclusion: Equipment not directly related to medical care. Equipment for research	Available in CIS countries and obtainable by self-help of Kyrgyz side	High-cost and advanced equipment difficult to be maintained	Cannot be used due to the lack of related infrastructure	Infrequently used with a small number of specimens or beneficiaries	Duplicated with other equipmet request or functionally availble with other equipment	USE, EVALUATION, ETC.
											●Fairly agree. ▲Partially agree.
31	RESUSCITATION MASK, SET	50		C						●	Accessory of other equipment
32	PHOTO THERAPY UNIT	1		C						●	Available at Infant Care Unit.
33	OXYGEN CATHETERS	50		C		●					
34	ECG (WITHOUT ANALYZER, 3 CHANNELS)	1	1	A							To be used for electrocardiographic examination.
35	PERIPHERAL VENOUS CATHETERS, SET(22G*500, 24G*1000)	3200	1500	B							Basic tools essential in operating infusion pumps.
36	CENTRAL VENOUS CATHETERS	3000	100	B							Basic tools essential in operating infusion pumps.
37	INFUSION THERAPY ACCESSORIES	12300	1000	B							Basic tools essential in operating infusion pumps.
38	OXYGEN MASK	160		C						●	Oxygen tent will suffice.
39	BLOOD GAS ANALYZER	1		C						●	Available at Laboratory.
40	RAPID CHEMISTRY ANALYZER	1		C						●	Available at Laboratory.
41	TABLE	1		C		●					

2. PHYSIOLOGICAL EXAMINATION

1	ENDSCOPE CABINET	2	1	A							To be used for storing endoscopes.
2	ENDSCOPE TABLE	4		C		●					
3	SUCTION UNIT	4	1	A							To be used for suctioning during endoscope examination.
4	ENDSCOPE TROLLEY	2	1	A							To be used for transporting endoscopes.
5	ELECTRO SURGICAL UNIT	2		C						●	Available at Operation Theater.
6	LECTURE SCOPE	2	1	A							To allow endoscope examination or operation to be observed by two or more doctors for more accurate diagnosis.
7	LARGE IMAGE PHOTOGRAPHY	1		C	●						
8	LARGE SIZE IMAGE	1		C	●						
9	OES TV SYSTEM	1		C	●						
10	35 MM PHOTOGRAPHIC SYSTEM	3	1	A							To be used for recording endoscope images for re-examination.
11	GASTROINTESTIONAL FIBERSCOPE FOR DIAG	1	2	A							
12	GASTROINTESTIONAL FIBERSCOPE FOR TREATMENT	1		C						●	The fiber scope for diagnosis will suffice by attaching endoscope clamp.
13	GASTROINTESTINAL FIBER SCOPE FOR DIAG	1		C						●	
14	COLONO FIBERSCOPE	1	1	A							
15	BRONCHO FIBERSCOPE	1	1	A							
16	BRONCHO FIBERSCOPE	1		C						●	
17	ENDSCOPE ILLUMINATOR	4	1	A							To be used as a light source for endoscope.
18	BIOPSY FORCEPTS	20	5	A							
19	ELECTROSURGICAL ACCESSORIES	1		C						●	Should be kept at Operation Theater.
20	ULTRASOUND SCANNER	2	1	A							To check histological characteristics of organs and lesions by detecting refraction of ultrasonic wave.

Table 2-3
Evaluation Table of
Equipment Requests

● Fairly agree. ▲ Partially agree.

No.	NAME	Requested No.	Adjusted	Priority	Reasons for Exclusion: Equipment not directly related to medical care. Equipment for research	Available in CIS countries and obtainable by self-help of Kyrgyz side	High-cost and advanced equipment difficult to be maintained	Cannot be used due to the lack of related infrastructure	Infrequently used with a small number of specimens or beneficiaries	Duplicated with other equipmet request or functionally availble with other equipment	USE, EVALUATION, ETC.
21	ECHO CAMERA	1	1	A							
22	AUTOSPIROMETER SET	1		C					●		
23	ECG W/CART	1	1	A							To analyze ECG complex. Basic Medical Equipment. One Unit will be lent out to other deparments whenever necessary.
24	ECG	1	1	A							
25	ECG HOLTER RECORDER	1		C					●		To be used for detection of arrhythmia or diagnosis of angina pectoris. The equipment is not highly needed for children, and electrocardiogram automatically recorded on magnetic tape can be read only by manufacturer.
26	ELECTROCARDIOGRAPH	1		C						●	
27	CRIODISTRUCTION	1		C							Equipment to prepare frozen slices, not suitable for use at Physiological Examination.
28	LINEAR ELECTRONIC ULTRASONIC TOMOGRAM	1		C						●	
29	EEG	0	1	B							Indispensable for diagnosis of cerebral neuropathy. Required to check audiotry perception of neonates.

3. OPERATION THEATER

1	OPERATION TABLE	5	2	A							
2	OPERATION TABLE FULL ACCS.	1	1	A							
3	OPERATON LIGHT	5	3	A							To be used for lighting the range of operation.
4	OPERATION LIGHT	3		C						●	
5	OPERATION LIGHT	2		C						●	
6	ANESTHESIA APPARATUS W/VENTILATOR	5	1	A							For anesthesia during operation.
6-1	ANESTHESIA APPARATUS	3	2	A							For anesthesia during operation.
7	SUCTION UNIT	6	6	A							To suction vomit
8	OPERATION MONITOR W/CART	6	3	A							To monitor patient's heart rate and blood pressure
9	ELECTRIC SURGICAL UNITS	6	2	A							To observe ncisions, hemostatis and coagulation during operation.
10	PORTABLE DEFIBRILLATOR W/CART	1	1	A							To be used for reviving patients in cardiac arrest
11	HYPER/HYPOTHERMIA UNIT	1	1	A							To control hypothermia after operation or anesthesia.
12	MOBILE OPERATION MICROSCOPE ENT	1		C						●	
13	MOBILE OPERATION MICROSCOPE GENERAL	1	1	A							
14	REVOLVING CHAIR	12		C		●					
15	MOBLE X-RAY UNIT	1	1	B							For intraoperative radiography.
16	MOBILE X-RAY UNIT W/T.V.	1		C						●	
18	RESUSCITATOR	2		C						●	The anesthesia machine can be used or the same purpose.
19	REFRIGERATOR DRUGS	2		C						●	Available at Pharmacy.
20	OPERATING INSTRUMENT SET (SURGICAL) FOR CHILDREN	2	2	A							

Table 2-3
Evaluation Table of Equipment Requests

No.	NAME	Requested No.	Adjusted	Priority	Reasons for Exclusion: Equipment not directly related to medical care. Equipment for research	Available in CIS countries and obtainable by self-help of Kyrgyz side	High-cost and advanced equipment difficult to be maintained	Cannot be used due to the lack of related infrastructure	Infrequently used with a small number of specimens or beneficiaries	Duplicated with other equipmet request or functionally availble with other equipment	●Fairly agree. ▲Partially agree. USE, EVALUATION, ETC.
21	BLOOD BANK	1		C						●	Available at Blood Transfusion/Collection.
22	OPERATION MICROSCOPE	1		C						●	
23	SURGICAL INSTRUMENT SET	8	8	A							
24	MICROSURGICAL INSTRUMENT SET	2	2	A							Surgery tools set used for microsurgery (mainly neurosurgery).
25	UV HAND WASHING APPARATUS	5	3	A							To be used for washing and disinfecting hands before and after operation.
26	PUMPS	10	5	A							To inject an adequate amount of infusion to patients.
27	FILM ILLUMINATOR	0	3	A							To be used for reading of x-ray films.

4. X-RAY DEPT.

1	DIAGNOSTIC X-RAY FOR CHEST	1	1	B							For chest examination. In view of the high incidence of respiratory diseases, a chest X-ray unit devoted to this purpose will be in great demand.
2	DIAGNOSTIC GENERAL X-RAY	1	1	A							Used for diagnosis related to abdomen and limb disorder.
3	R/F DIAGNOSTIC X-RAY T.V. REMOTE CONTROL	1	1	A							To be used for radiographing mainly alimentary tract by remote control.
4	AUTOMATIC FILM PROCESSER	1	1	A							To be used for automatically developing x-ray films.
5	FILM ILLUMINATOR	5	1	A							To be used for reading x-ray films.
6	GENERAL RADIOGRAPH	1		C						●	
7	MRI	1		C			●		●		Not applicable to children since patient is required to take the same position for long hours.
8	MOBILE X-RAY	0	1	A							At least one unit will be required for lending out to other departments/wards

5. RECOVERY ROOM

1	RECOVERY BED W/MATTERESS	2		C		●					
2	RESUSCITATOR (AMBU)	1	1	A							To be used for manual reviving.
3	VENTILATOR	2	1	B							To be used for controlling patient's breathing.
4	SUCTION UNIT	2	2	A							To suction vomit
5	EXAMINATION LUMP	2	1	B							
6	BEDSIDE MONITOR TELEMETRY W/CART	2	1	A							To be used for continuous monitoring of heart rate and blood pressure.
7	PORTABLE DEFIBRILLATOR W/CART	1	1	B							To be used for reviving patients in cardiac arrest.
8	GERMINA	2		C						●	System product incorporating monitor into gas piping and electrical wiring around the bed.

6. PHARMACY

1	REFRIGERATER DRUG	2	1	B							To be used for storing medicines at low temperature.
2	REFRIGERATOR GENERAL	2		C		●					
3	TABLE FOR STERILIZER	2	1	B							To be used for sterilization of pharmaceutical tools.
4	DEEP FREEZER - 30	1		C					●		
5	PHARMACY INSTRUMENT SET	1	1	B							
6	PRESCRIPTION COUNTER	1	1	A							Mainly used for preparation of injection.

Table 2-3
Evaluation Table of Equipment Requests

● Fairly agree. ▲ Partially agree.

No.	NAME	Requested No.	Adjusted	Priority	Reasons for Exclusion: Equipment not directly related to medical care. Equipment for research	Available in CIS countries and obtainable by self-help of Kyrgyz side	High-cost and advanced equipment difficult to be maintained	Cannot be used due to the lack of related infrastructure	Infrequently used with a small number of specimens or beneficiaries	Duplicated with other equipmet request or functionally availble with other equipment	USE, EVALUATION, ETC.
7	COUNTER BALANCE	1	1	B							
8	PRECISION BALANCE	1		C						●	
9	ANALYTICAL BALANCE	1	1	A							
10	MOBILE PHARMACY	1		C		●					
11	ASSEMBLY	1		C		●					
12	DISTILLING APPARATUS	1		C						●	The redistillation apparatus is available for the purpose.
13	REDISTILLATION APPARATUS	1	1	A							To be used for producing sterile water containing no pyrogen used for pharmaceutical manufacturing.
14	DISSOLUTION TESTER	1	1	B							Machine to produce uniform mixture.
15	AUTO-MELT POINTER	1	1	B							To be used to comminute drugs for pharmaceutical manufacturing.
16	SPECTROPHOTOMETER-UV	1		C						●	Available at Laboratory.
17	PH-METER	1	1	A							To be frequently used for pharmaceutical manufacturing.
18	FUME HOODS	1	1	B							For forced ventilation.
19	DRY HEAT STERILIZER	2	1	A							To be used for sterilization of pharmaceutical tools.
20	AUTOCLAVES VERTICAL	4	1	A							To be used for sterilization of pharmaceutical tools.
21	ULTRASONIC PIPET WASHER	1	1	A							To jet wash pipettes in the rack.
22	REFRACTOMETER	1	1	A							To be used for measuring injection.
23	MAGNETIC STIRRER	1	1	A							To be used for stirring injections in the beaker.
24	MAGNETIC STIRRER	1		C						●	
25	SUCTION UNIT	1		C		●					To be used for cleaning of agents and powders.
26	MULTI-HYGROMETER	3		C		●					
27	SUCTION FILTER UNIT	1	1	B							To be used for sterilization of injection.

7. CENTRAL STERILIZING

1	STEAM STERLIZER TWO DOOR FLOOR TYPE	2		C						●	
2	MEDIAM STEAM STERLIZER SINGLE DOOR	3	1	A							To be used for sterilization of equipment and materials (including medical tools and materials of metal, porcelain, glass, paper, cloththat that can withstand wet heat of 120°C)
2-1	MEDIAM STEAM STERLIZER SINGLE DOOR		1	B							
3	DRY HEAT STERLIZER	2	1	A							To be used for sterilization of metal, porcelain or glass products that should be disinfected in dry condition.
4	ULTRASONIC CLEANER SET	2	1	A							To be used to ablate and wash away contaminants on steel medical tools and equipment, and glass apparatus by action of ultrasonic wave.
5	BAG SEALER	1		C			▲				While it is not expensive nor advanced, it is difficult to obtain plastic bugs on a continuous basis. Since it can be manually sealed, need is not very strong.
6	AUTOCLAVE STEAM STERLIZER	2		C						●	
7	INSTRUMENT STERLIZER	2	2	A							To be used for sterilization of medical apparatus.

Table 2-3
Evaluation Table of
Equipment Requests

No.	NAME	Requested No.	Adjusted	Priority	Reasons for Exclusion: Equipment not directly related to medical care. Equipment for research	Reasons for Exclusion: Available in CIS countries and obtainable by self-help of Kyrgyz side	Reasons for Exclusion: High-cost and advanced equipment difficult to be maintained	Reasons for Exclusion: Cannot be used due to the lack of related infrastructure	Reasons for Exclusion: Infrequently used with a small number of specimens or beneficiaries	Reasons for Exclusion: Duplicated with other equipmet request or functionally availble with other equipment	●Fairly agree. ▲Partially agree. USE, EVALUATION, ETC.
8	TRANSFER CART	1		C		●					
9	STORING CABINET	1		C		●					

8. BLOOD TRANSFUSION, COLLECTION BLDG.

1	BLOOD BANK	2	1	A							To be used for storing blood for transfusion.
2	REFRIGERATER DRUGS	2	1	A							To be used for storing injection.
3	DEEP FREEZER -30	2		C		▲			▲		Produced in CIS.
4	CENTRIFUGE IMMUNOHEMATOLOGY PUSH BUTTON	2	1	A							To be used for separation of immune serum.
5	PIPETTE SHAKER	2	1	A							To be used to shake pipettes to prevent blood coagulation.
6	CLINICAL REFRACTOMETER	2		C						●	
7	HAND PROTEIN REFRACTOMETER	2	1	A							To be used to measure total serum protein by using refraction of light.
8	BINOCULAR MICROSCOPE	2	1	A							

9. UROLOGY NEPHROLOGY

1	HEAMODIALYSIS FOR 2 BED	1	1	A							For removal of waste matter from blood of patiens with chronic nephropathy. Although the request was the central system of hemodialysis for 10 beds, 2 personal hemodialysises were adopted from maintenance considerations.
2	URINE PASSING EXAMINATION	2	1	B							To examine dysuria and measure urinary flow. Although it can be measured by cystometer, the need for the special equipment is identified.
3	CYSTOSCOPE FOR ADULTS	4		C						●	
4	CYSTOSCOPE FOR CHILD	4	1	A							To be used for examination of urinary bladder.
5	RESECTOSCOPE SET	1	1	B							To be used for transurethral resection of prostate and bladder lesions.
6	LITHOTRYPTER	1	1	A							To be used for removal of foreign bodies in bladder, excision and biopsy of bladder tumor.
7	OPERATING TABLE FOR UROLOGICAL PATIENT	1	1	B							
8	SET OF PERCUTANEUS NEPHROSTOMY	1	1	A							To be used for percutaneous insertion of a pyeloscope from pelvis renalis to upper ureter, in order to crush and remove calculus.
9	ECHO CAMERA	1		C						●	Available at Physiological Examination.
10	CATHETER FOLI WITH 3 CHANNERS	100		C		●					
11	CATHETERS FOLI WITH 2 CHANNERS	100		C		●					
12	ULTRASONIC LITHOTRYPTER	1		C						●	Can be substituted for by the lithotrypter and the operating instrument set.
13	OPERATING INSTRUMENT SET (UROLOGICAL) FOR ADULTS	2	1	A							
13-1	OPERATING INSTURMENT SET (UROLOGICAL) FOR CHILDREN	2	1	A							
14	PUNCTURE CANNULA WITH STYLET FOR PERCULANEOUS NEPHROSTOMY	2		C		●					
15	DRAINAGE CATHETER FOR PERCUTANEOUS NEPHROSTOMY. THREE-STEP AND TWO-STEP TECHNIC, WITH ADAPTOR	20		C		●					
16	RENAL-ACCESS-DILATION SET, STERLILE FOR PERCULANEOUS - DILATOER 10 SIZES	2		C		●					

Table 2-3
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						● Fairly agree. ▲ Partially agree.					
17	FASCIAL DILATORS 12 SIZES OPLH 6-28 FOR PERCUTANEOUS NEPHROSTOMY	2		C		●					
18	BALOON CATHETER (100% SILICONE) WITH HOLLOW STYLET FOR PERCUTANOUS NEPHROSTOMY	20		C		●					
19	OCCLUSION CATHETER STERILE	20		C		●					
20	URETER DILATOR (MODEL VIENNA) STERILE	2		C		●					
21	HYDAULIC URETER DILATOR FOR USE THROUGH THE URETERORENOSCOPE, LUER-LOCK CONNECTION	20		C		●					
22	INTEGRAL URETER STEND, STERILE	30	30	A							Essential for urine induction and indwelling. Also used for cystography.
23	URETERORENOSCOPE SHAFT, STERILE	20		C		●					
24	NEPHRASTOMY CATHETER, 2 EUES STERILE	20		C		●					
25	CATHETER FOR URETEROCCUTANEOSTOMY RENIAL FISTULA CATHETER	30		C		●					
26	CYSTOSTOMY - BALOON CATHETERS	20		C		●					
27	UNIVERSAL MODULE SIGNOSTIC WITH COLOUR DOPPLER UNIT	1		C						●	
28	DANTEC	1		C						●	
29	DANTEC	1	1	B							Useful for identification of urinary disturbance through measurement of intravesical pressure and urinary flow.
30	WATER TREATMENT APPARATUS	2		C						●	Included in the heamodialysis.
31	FILM ILLUMINATOR	4	2	A							

10. LABORATORY

(1) GENERAL URINE											
1	CENTRIFUGE TABLE TOP	1	1	B							To be used for deposition and separation of urine.
2	URINE ANALYZER	1		C						●	
3	CLINICAL REFRACTOMETER	1	1	A							Basic equipment
4	URINE SPECIFIC GRAVITY REFRACTOMETER	1	1	A							Ditto
5	BINOCULAR MICROSCOPE PHASE CONTRAST	1	1	A							Equipment essential in observing microorganisms in specimen.
6	BALANCE	1	1	A							
7	FUME HOOD	1		C		●					Considered to be fixture.
(2) HEMA, BLD											
1	CLEAN BENCH	1		C		●					Considered to be fixture.
2	BLOOD CELL COUNTER	1	1	A							Essential in diagnosis and treatment of hematopathy for sustained observations. To be used to measure blood cell count such as blood erythrocyte and leukocyte.
3	COAGULOMETER	1	1	B							To check coagulation ability of blood by measuring coagulation time.
4	BLOOD GAS ANALYZER	1	1	A							To measure pH, PCO2, PO2 in blood.
5	PIPETTE SHAKER	1	1	A							Equipment to shake blood in the pipette to prevent coagulation.
6	CENTRIFUGE HEMATOCRIT	2		C						●	

Table 2-3
Evaluation Table of
Equipment Requests

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7	CENRIFUGE IMMUNOHEMATOLOGY PUSHBUTTON	2	1	B							To be used for separation of immune serum.
8	CHEMISTRY ANALYZER	1	1	A							To be used for multi-item examination including electrolyte and immunological parameters.
9	SPECTRO PHOTO METER	1	1	B							To analyze specimens based on spectrophotometry.
10	LUMIPHOTOMETER	1		C						●	
11	ELECTRO PHORESIS	1	1	A							To analyze enzymes and substance composition on thebasis of difference in electrophoretic mobility.
12	DENSITOMETER	1	1	A							To measure concentration of agent for examination of specimen.
13	FLAME PHOTOMETER	1	1	A							To measure concentrations of sodium and potassium in serum.
14	PH METER	2		C						●	
15	OSMOMETER	1	1	B							Measurement of osmotic pressure of body fluid is essential in controlling metabolism and the understanding of pathological picture.
16	INCUBATOR	1		C		●					Available in CIS
17	DEEP FREEZER - 30	1		C					●		Ditto
18	BALANCE	1		C						●	
19	BINOCULAR MICROSCOPE PHASE CONTRAST	1		C						●	
20	BINOCULAR MICROSCOPE PHASE CONTRAST	1		C						●	
21	MAGNETING STIRRER	2		C						●	
22	HEMOGLOBINE ANALYZER	1	1	A							To be used to measure haemoglobin.
23	GLUCOS ANALYZER	1		C						●	
24	COAGULATION ANALYZER	1		C						●	
25	IMMUNO-LAB SYSTEM	1		C			●		●		To be used to measure minor component in organism. Used for examination of immune serum, drug, virus, and endocrine function.
26	AUTO-EIA11 ANALYZER EIA KITS (PORTABLE)	1		C			●		●		To determine the amount of antigen or antibody in specimen by measuring products dissolved by enzyme reaction.
27	GAMMA COUNTER	1		C							The gamma counter for isotope cannot be supplied.
28	SPECTRORAL COUNTER	1		C						●	
29	ELECTROLYTE ANALYZER	1		C						●	The chemistry analyzer can be used for the same purpose.
30	ELECTROLYTE ANALYZER	1		C						●	Ditto
31	FLUORESCENCE MICROSCOPE	1		C							To be used to identify an object in tissue by using the fluorescein antibody technique. Not considered as basic equipment.
(3) WASHING											
1	WATER DISTILLER	1	1	A							To produce distilled water used at laboratory.
2	REDISTILLATION APPARATUS	1		C						●	Available at Pharmacy.
3	LAB. EQUIPMENT (GLASS WARE)	1		C		●					
4	REAGENTS FOR LAB	1		C		●					

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Evaluation Table of
Equipment Requests

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11. REHABILITATION PHISIOTHERAPY											
1	WHIRL POOL	2		C		●					Water therapy is not widely used for children in Japan. The equipment is not very complex compared to size and can be procured in CIS. Thus, the both sides agreed on lower priority. The same decision was made for the rest of items except for 2.
2	HYDRO BUBBLER BATH	2	1	B							To be used for balnea medicata. Considered to be basic equipment and classified to priority B.
3	BUBBLE GENERATOR	2		C		●					
4	LOW FREQUENCY THERAPY UNIT	2		C		●					
5	MICROWAVE THERAPY	1		C		●					
6	MICROWAVE THERAPY	1		C		●					
7	MICRO THERAPY HELICAL APPLICATION TABLE	1		C		●					
8	PARAFIN BATH 'PARA PACK'	1		C		●					
9	PARAFIN BATH 'PARA PACK'	1		C		●					
10	ACCESSORIES FOR PARA PACK SOLID PARAFIN	2		C		●					
11	ZIQUID PARAFFIN	2		C		●					
12	INFRA RED AND ULTRAVIOLET LAMP	1		C		●					
13	INFRARED RAY LAMP	1		C		●					
14	ULTRAVIOLET RAY LAMP	1		C		●					
15	TREATMENT TABLE	10		C		●					
16	MOBILE STAND	10		C		●					
12. OPTHALMIC CABINET											
1	OPTHALMOLOGY WORK PLACE	1	1	A							Basic equipment
2	DIAGNOSTIC AND TREATMENT SET	1	1	A							Ditto
3	SLIT LAMP	1	1	A							Ditto
4	TEST CHART	1	1	A							Ditto, with lens set.
5	INSTRUMENT STERLIZER	1	1	B							
6	FILM ILLUMINATOR	0	1	B							
13. DENTAL CABINET											
1	DENTAL UNIT (CHAIR W/STANDARD ACCESSORIES)	2	1	A							Basic equipment
2	DENTAL COMPRESSOR	2	1	A							
3	OPERATING TABLE	1		C						●	The dental unit will be used for the same purpose, or available at Operation Theater.
4	LABORATORY EQUIPMENT	1	1	A							Basic equipment
5	AUTOCLAVE	1	1	A							To be used for sterilization of dental apparatuses.
6	DENTAL INSTRUMENT SET	1	1	A							Basic equipment

Table 2-3
Evaluation Table of
Equipment Requests

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14. ENT											
1	TREATMENT UNIT W/CHAIR	0	1	B							Basic and essential equipment for general hospital for children
2	AUDIOMETER	1	1	A							To be used for audiometry of children between 0 – 14 years old.
3	LARYNGOSCOPE SET	0	1	B							
4	SETS OF INSTRUMENTS FOR MANIPULATION AND SURGICAL INTERVATION ON THE LARYNGITIS ORGANS	0	1	B							
15. INFANT CARE UNIT											
1	INFANT INCUBATOR	8	4	A							To be used to care for low birth weight infants until thy overtake normal neonates by controlling temperature, humidity, and oxygen concentration.
2	INFANT WARMER	1	1	A							To prevent temperature drop of neonates during medical treatment.
3	TRANSPORT INCUBATOR	1	1	A							
4	PHOTOTHERAPY UNIT	1	1	A							To be used for treatment of neonates choloplania.
5	NEONATAL MONITOR	2	2	A							To be used for monitoring of neonates during intensive care or before and after operation.
6	INFUSION PUMP	4	2	B							To inject an adequate amount of infusion into neonates.
7	VENTILATOR	2	2	A							To be used to revive infants in respiratory pause or for respiratory control.
8	REFRIGERATOR	2		C		●					
9	PORTABLE SUCTION UNIT	2	2	A							To suction vomit
10	STAND	8	8	A							To hook infusion. Considered to be utilized not only in this department but in other depts.
11	ULTRASONIC SCAN	1	1	B							Required for diagnosing patients who have to stay in clean area.
12	ULTRAVIOLET RAF LAMP	4	4	B							To be used to maintain cleanliness in the room.
13	UV HAND WASHING APPRATUS	1	1	A							To be used for washing hands previneing infection.
14	LARYNGOSCOPE SET	1	1	A							To be used for mirror examination of newnates' throat, or needed for respiratory control
15	AMBU BAG	2	2	A							To be used to revive infants in cardiac arrest.
16	MICROWAVE THERAPY	2		C					●		
17	ULTRASONIC APPARATUS	1		C						●	
18	ELECTRIC HEAT PACK	2		C						●	
19	FILM ILLUMINATOR	0	1	B							
16. INFANT SURGERY											
1	INFANT WARMER	5	1	A							To prevent temperature drop of neonates during treatment.
2	INCUBATOR	2		C						●	
3	PEDIATRIC MONITOR	2	2	A							To monitor neonates during intensive care or before and after operation.
4	PORTABLE SUCTION UNIT	2	2	A							To suction vomit
5	ELECTROSURGICAL UNIT	1		C						●	Available at Operating Theater.

Table 2-3
Evaluation Table of
Equipment Requests

● Fairly agree. ▲ Partially agree.

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6	TREATMENT TABLE	1		C		●					
7	ULTRASONIC SCAN	1		C						●	
8	FILM ILLUMINATOR	0	1	B							

17. GENERAL

1	INFUZION PUMP	20	10	A							Basic equipment
2	DIAGNOSTIC SET FOR GENERAL	40	20	B							Diagnostic sets for opthalmic and ENT
3	SPHYGMOMANO METER	100	40	A							
4	AMBULANCE	5	1	B							
5	SPHYGMOMANOMETER ELECTRONIC	20		C						●	The electronic type is subject to frequent failure.

18. ADMINISTRATION

1	OVERHEAD PROJECTOR	1		C	●						
2	SLIDE PROJECTOR	1		C	●						
3	FAX	1		C	●						
4	COPY APPARATUS MODEL	1		C	●						
5	PROJECTOR SCREEN	1		C	●						
6	POINTER	1		C	●						
7	COMPUTER WITH LAZER PRINTER	1	1	B							To be used for modernization and centralization of hospital management, preparation of management indices, and statistics of patients and diseases.
8	WORK SHOP KIT	1		C	●						
9	COMPUTERS PERSONAL	4		C	●						

2-3 Basic Design

2-3-1 Design Concept

Based on the modified equipment list attached to the Minutes of Discussions, the following design policy was established to develop the optimum project design:

<1> Based on study on the progress of construction work for the facility to accommodate requested equipment as well as construction plan (including electricity, water supply, interior finish, and furniture and fixture), the range of the project is clearly delineated. By using the modified equipment list attached to the Minutes of Discussions, proposed location of each equipment marked by priority "A" or "B" is confirmed.

<2> Equipment should be supplied to the extent that the Kyrgyz counterpart affords maintenance.

<3> The equipment plan should match disease structure in the country as well as the referral system.

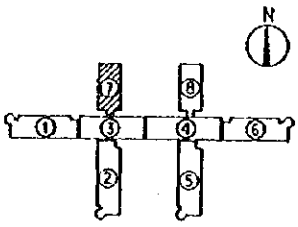
2-3-2 Basic Design

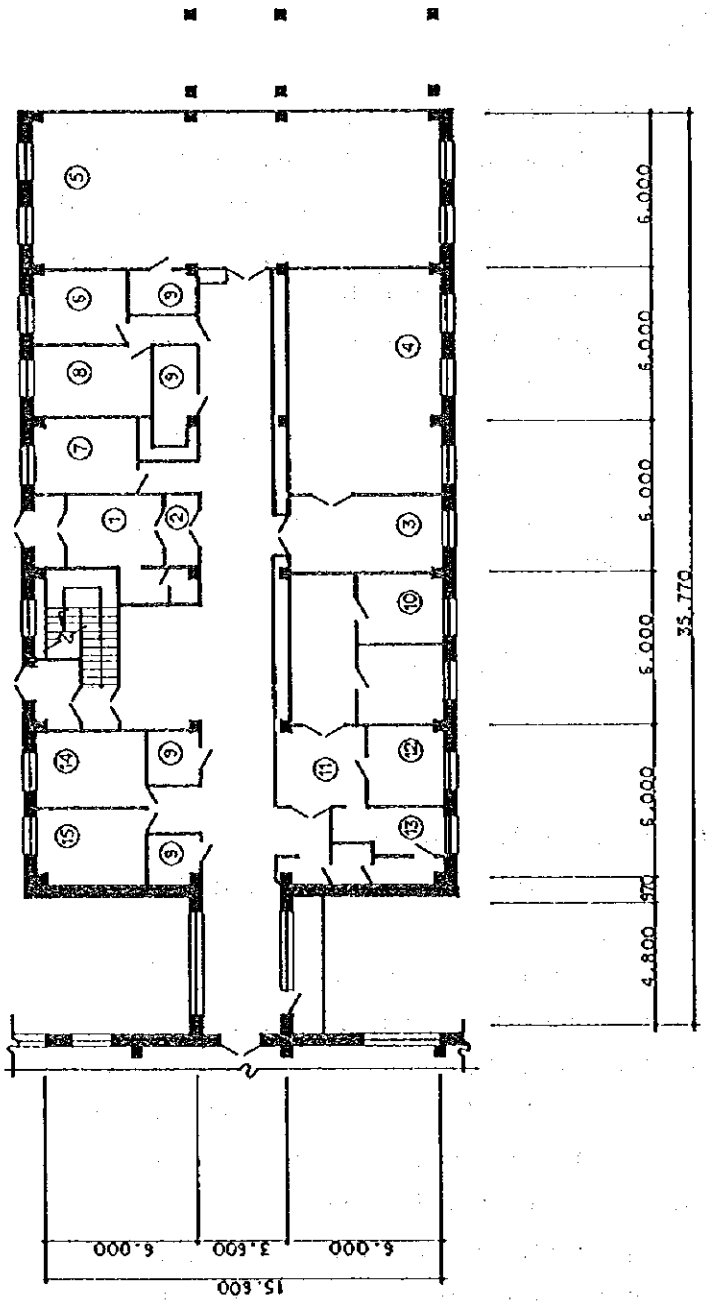
(1) General

1) ICU Reanimation (1st floor, Block 7), Postoperative Recovery Room (1st floor, Block 7)

Reanimation Department accommodates patients suffering acute dysfunction, including respiratory, circulation or metabolic system, both internal and surgical, and provides intensive treatment and care. It is located on the first floor of Block 7 and is 15.6m x 30m (468m²). ⑤ is ICU room, ⑥ postoperative recovery room, and ④ reanimation room. These three rooms are provided with wall piping for oxygen, nitrous oxide, and suction. There is no compressed air piping, because oxygen available at low cost in Kyrgyz is used instead. For safety purpose, however, a compressor is attached to each ventilator.

REPUBLIC CHILDREN HOSPITAL
BLOCK 7 1ST FLOOR
I.C.U. REANIMATION



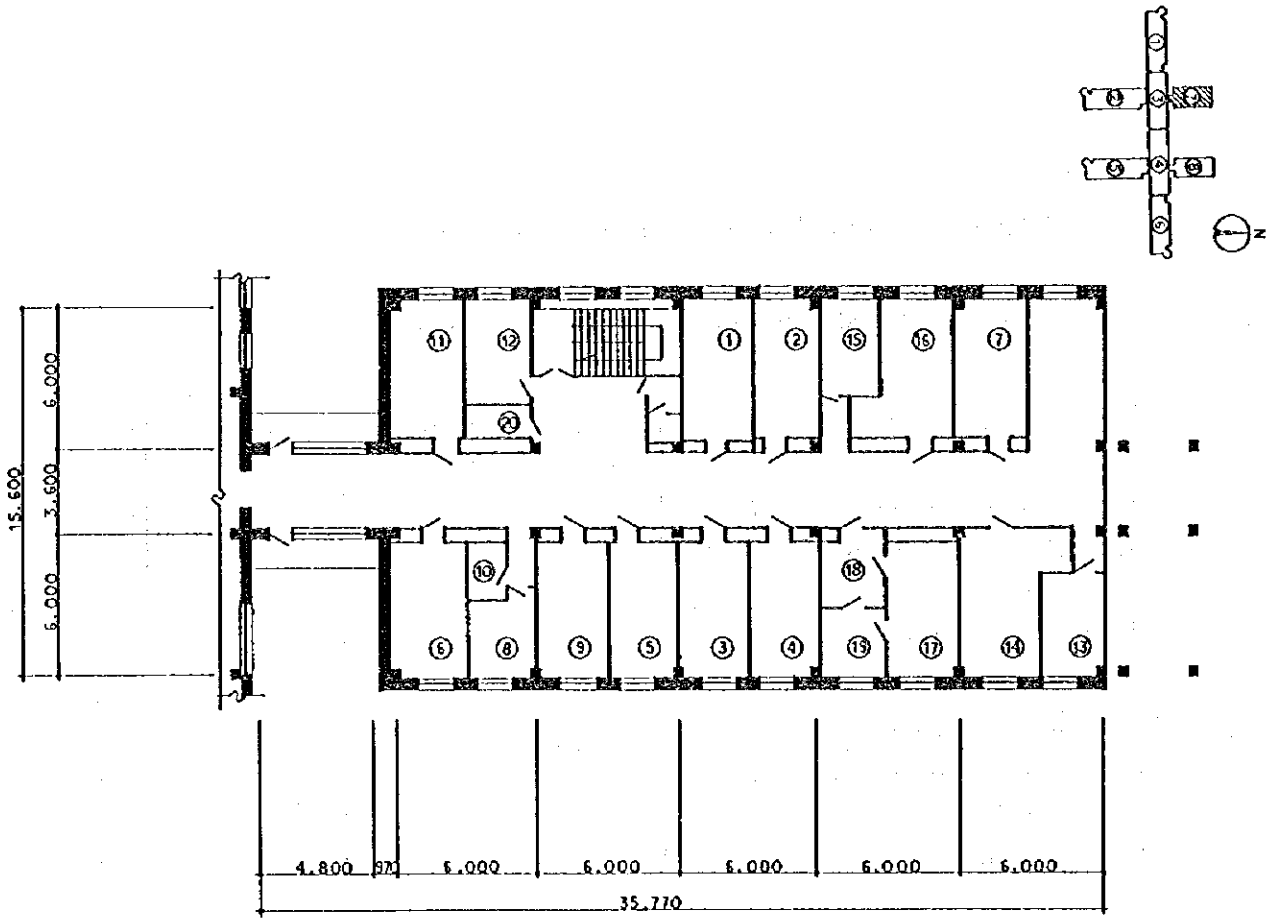


2) Physiological Examination (2nd floor, Block 7)

The department will contain the followi ng examination rooms:

Room No.	Name	Equipment layout plan	Remarks	Floor area
①	Ergometer room			18.9
②	Blood circulation examination room			16.5
⑮	Treatment room			8.5
⑯	Romanoscopy room			19.7
⑦	Electromyogram room			18.1
⑬	Data analysis and processing room			11.6
⑭	Electrocardiography room	Electrocardiograph (2 units)		23.1
⑰	Gastriccamera room	Suction unit, cart for endoscope		17.2
⑱	Endoscope preparation room	Storage for endoscopes		8.9
⑲	Sterilization room			7.6
④	Cardiac sound room / electroencephalogram room	Electroencephalogram (priority B)	Room is shielded	17.6
③	Basal metabolic testing room			17.6
⑤	Lung function testing room			17.8
⑨	Record library			16.1
⑧	Warehouse			
⑩	Lavatory			
⑥	Ultrasonic diagnosis room	Ultrasonic diagnosis equipment (2 units, large and small)		16.4

All endoscopes are kept in the storage all the time, to be located in endoscope preparation room ⑱. The electroencephalogram with priority level "B" will be placed in the shielded room ④.



REPUBLIC CHILDREN HOSPITAL
BLOCK 7 2ND FLOOR
PHYSIOLOGICAL EXAMINATION

3) Hemodialysis Room (4th floor, Block 3)

It is located in room ㊶ and has floor area of 72.2㎡. Floor and wall are covered with white tiles, with drainage bays at four corners. The room can serve 8 patients. 8 oxygen pipelines and 17 electric outlets (8 on one side and 9 on the other) are provided on wall. Two personal dialysers with water treatment apparatus will be installed. ㊴ is a tool room to store dialysis membrane.

Although the original request was a central system of hemodialysis for 10 beds, hemodialysis for infants required for life time, so that in Japan peritoneal lavage is widely used. Also in consideration to high running cost including dialysis membranes, supply of two dialysers was agreed.

In Kyrgyz, chronic renal failure is treated only at Hemodialysis Department of Cardiology Institute. Previously acute renal failure has been treated at Municipal Emergency Hospital No.2. In future, it will be treated at the former. On the other hand, Children requiring hemodialysis are currently transferred to Almaty, Kazakhstan, and Hemodialysis Department prefers them to be treated within the country, regardless of cost. 4 dialysers made in the Soviet Union were purchased in 1989, and 2 became

unserviceable. 10 machines (made in Europe) were purchased in 1994 under government budget. In addition, the department has one central system for 8 beds made in Ukraine. Hemodialysis is done by 2 doctors, 4 nurses, and 2 other staff. Dialysers are maintained by a trained engineer, and minor repair is carried out by Kyrgyz Medical Engineering Corporation (MEDICO TECHNICA) on a contract basis. Dialysis membranes have previously purchased from Minsk. Now direct purchase from Europe on a volume basis is known to be cheaper. In consideration to maintenance requirements and procurement of consumables, dialyzers for the new hospital should preferably be the same make as those used at Hemodialysis Department of Cardiology Institute.

4) Operation Theater (4 rooms on 4th floor of Blocks 3 and 4)

Room ① in Block 3 has floor area of 39.2㎡ and wall is tiled. The operation room will be used for minor operation, and two operation tables are requested. A waiting room will be used for preparation of anesthesia and washing, with floor area of 21.4㎡. There is no air-conditioning, except for heating by hot water radiators. While suction-only ventilators are provided, no forced exhaust duct for waste anesthesia gas is available. Rooms ⑦ and ⑩ adjacent to the operation room will be used for sterilization and preparation of surgical instruments. Each room seems to have sufficient floor space.

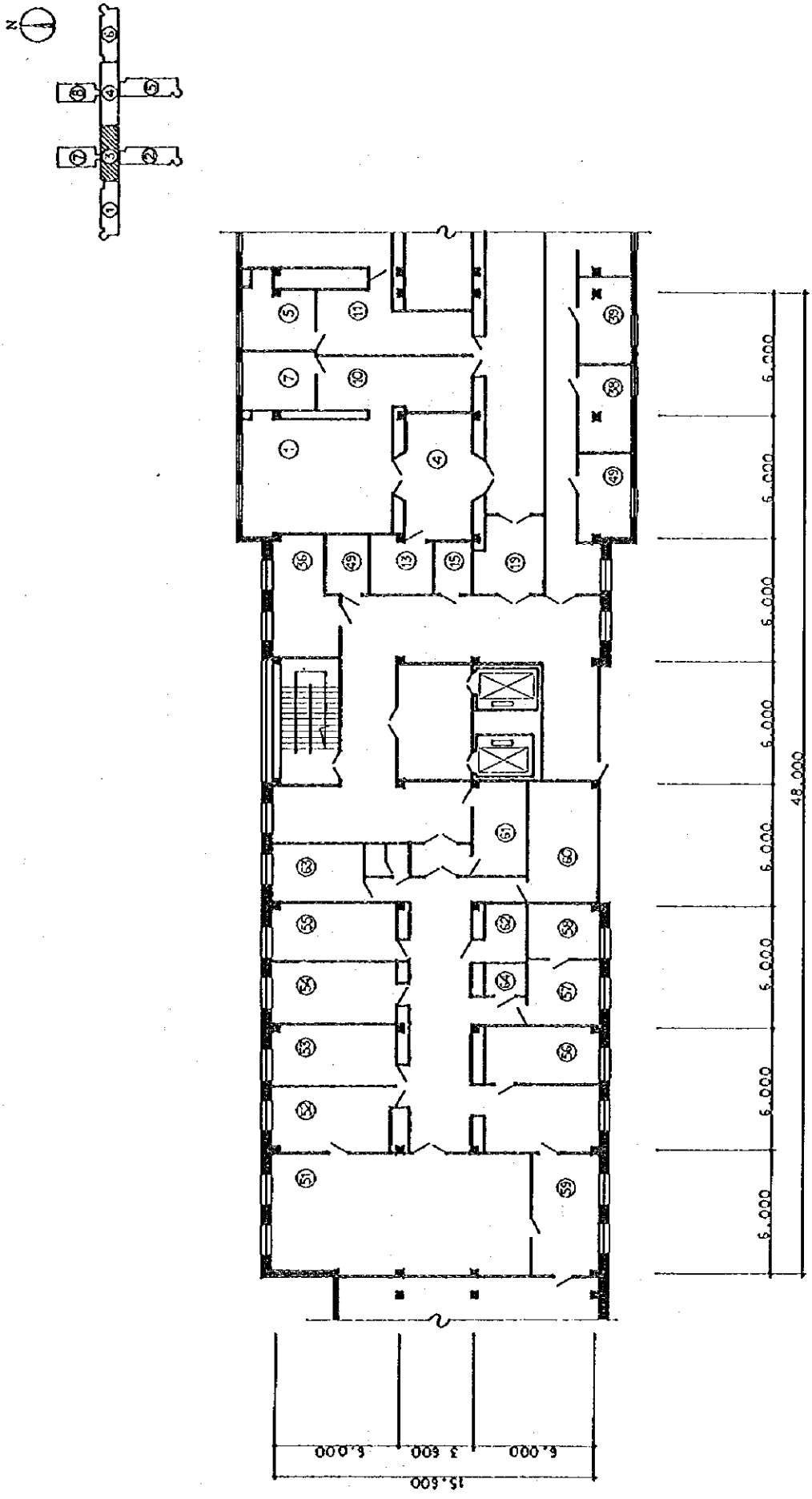
Rooms ② and ③ in Block 4 have the same layout as Room ①, and each will accommodate one operation table.

Each room has piping for oxygen, nitrogen oxide, and suction. All pipes are exposed and provide easy access to repair. Ceiling is high and strong enough to support operation lights. According to a hospital staff, anchor bolts are laid for suspending operation lights, although no bolt was observed.

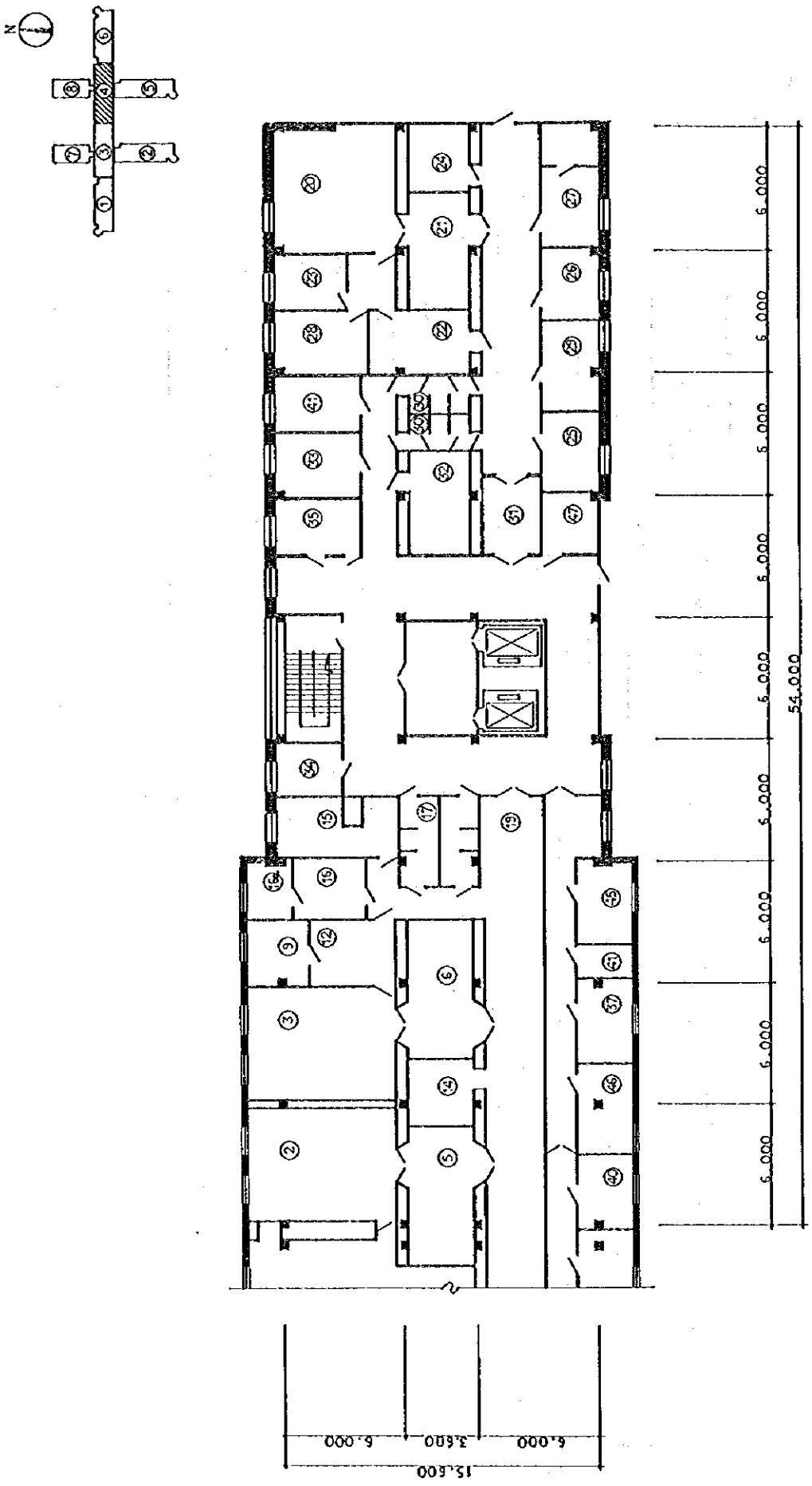
Room ⑮ is provided with a small lift to carry sterilized instruments from the central sterilizing dept.. Away from the central operation room, operation room ⑳ for infectious diseases is located on the east side of Block 4. It has floor area of 35.8㎡ and will accommodate one operation table. Room ㉘ is equipped with a small lift to receive sterilized instruments from the materials center, while room ㉒ is a preparation room. Room ㉑ is an anesthesia room and ㉔ stores surgical instruments. Each room has sufficient space to accommodate equipment to be installed. Equipment with priority level "A" will be assigned to the operation room. The mobile x-ray unit with priority level "B" will be used to observe body regions fixed on the operation table, and

the C arm type to clamp the operation table will be appropriate. In addition, TV monitor is highly recommended since films radiographed at Operation Theater on 4th floor of Block 4 would have to be carried to X-Ray Department on 2nd floor of Block 8 for development, while films are not readily available in the country. The x-ray unit should be maintained by X-Ray Department.

REPUBLIC CHILDREN HOSPITAL
BLOCK 3 4TH FLOOR
OPERATION THEATER,
HEMODIALYSIS ROOM



REPUBLIC CHILDREN HOSPITAL
BLOCK 4 4TH FLOOR
OPERATION THEATER



5) X-Ray Department and Rehabilitation Physiotherapy (2nd floor, Block 8)

X-Ray Department has floor space of 15.6m x 18m. Room ⑭ will accommodate a diagnostic x-ray unit for chest and a diagnostic general x-ray unit, and its floor is already provided with cable slot. This is spacious with ceiling height of 3.7m at maximum and 2.92m under beams, thus capable of accommodating all types of x-ray equipment. On the other hand, its entrance is relatively small (1,07m wide and 1.95m high) and not accessible for most equipment. Room ⑤ is an operation room, an adjacent room ④ is a dark room, and Room ② a film processing room that is wide enough to place an automatic film processor.

Room ⑫ is large enough (51.0m²) to house a R/F diagnostic x-ray TV remote control unit. ⑨ is an operation room and ⑪ a lavatory for patients. ⑩ is a staff room and ⑧ is a 22m² room for interpretation of radiograms and will also house a film illuminator.

X-ray rooms in ⑭ and ⑫ have small entrance width and are not accessible for most equipment. As a result, equipment will have to be hoisted to 2nd floor and brought into these rooms by partially removing windows or external wall. Note that the elevator has maximum load capacity of 540kg.

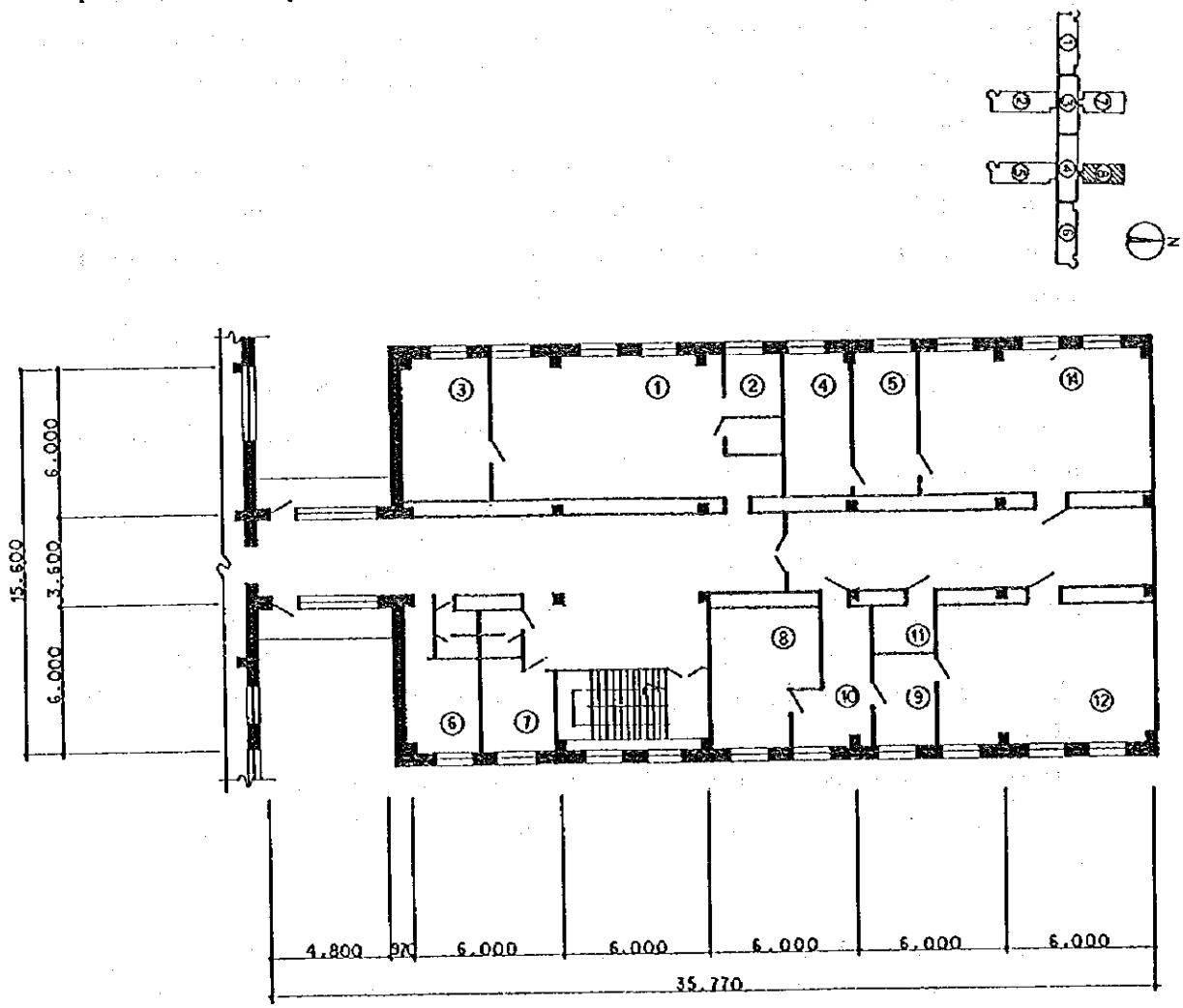
The x-ray rooms are made of concrete or brick, and floor is 510mm thick and ceiling 220mm thick, being coated with lead paint. Design floor strength is 1,800kg per m², robust enough to install a computer-assisted nuclear magnetic resonance tomographic equipment (MRI). Also doors are covered with 1.5mm lead plate. Lead glass is used to separate the equipment room and the operation room. Exterior windows use soda nitre glass. However, they are more than 50m away from an adjacent building and are located on the second floor, thus meeting public health standards related to x-ray rooms and departments (1986, Soviet Ministry of Health (Note 3)).

Note 3: Public Health Standards Related to X-ray Rooms and Departments, 3. "Design of X-ray Rooms and Departments," 3-9. "A x-ray room located above the first floor of a building or more than 50m away from an adjacent building does not necessarily require a protection shield or shutter for its windows."

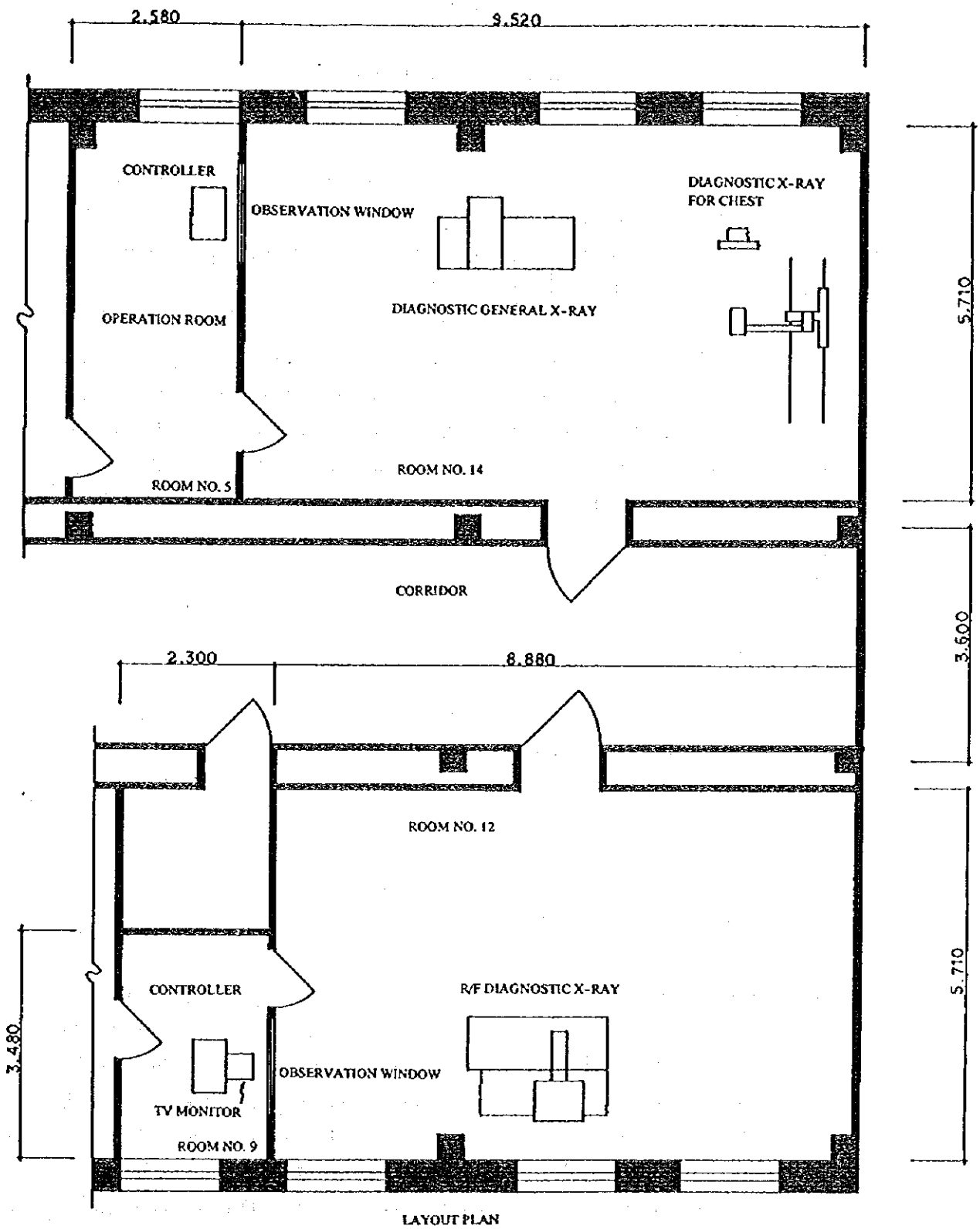
The x-ray equipment should be the same make as far as possible to ensure some compatibility of spare parts upon failure and accessibility to one-time maintenance and inspection by service man. Films should be selected under the assumption that low-cost CIS products (Russia or Ukraine) will be used. These films are reportedly heat-

sensitive and wind themselves around the roller of the casetteless equipment widely adopted in industrialized countries. Also care should be taken to deal with different film sizes (international, Japanese, and CIS standards). The automatic film processer is expected to handle all these types of films.

Rehabilitation and Phisiotherapy Department is located adjacent to X-Ray Department. The hydro bubber bath will be installed in Room ① (52.7㎡).



REPUBLIC CHILDREN HOSPITAL
BLOCK 8 2ND FLOOR
X-RAY DEPARTMENT,
PHYSIOTHERAPY



LAYOUT PLAN
BLOCK 8 2ND FLOOR, ROOM NO. 12 & 14

DIAGNOSTIC X-RAY FOR CHEST
DIAGNOSTIC GENERAL X-RAY
R/F DIAGNOSTIC X-RAY

6) Administration, Opthalmic Cabinet, Dental Cabinet (2nd floor, Blocks 3 and 4)

Room ② in Block 3 is director's room, ⑤ chief nurse room, ⑥ and ⑩ meeting rooms, ⑪ work coordination room, ③, ⑮ and ㉙ of Block 4 vice director's rooms, and ⑧ secretariat and accounting office. The computer with laser printer (priority level "B") will be accommodated in ⑧.

Opthalmic Cabinet will be located in ⑦ of Block 4 and occupy 33.9m². Room ⑫ on the south side is Dental Cabinet and has floor area of 33.2m². There is no reception desk for neither department. Opthalmic Cabinet does not have a dark room. These rooms are large enough to accommodate equipment to be supplied and are accessible to water supply and drainage pipes.

7) Pharmacy and Blood Transfusion/Collection (2nd floor, Block 4)

Pharmacy Department will produce the following agents:

- 5% glucose solution (for fluid replacement)
- Normal saline solution (for fluid replacement)
- 0.5% - 2% novocaine solution (for local anesthesia)
- Magnesium sulfate (fecal softener)
- Neophylline parenteral solution (for treatment of asthma)
- Nicotinic acid amide
- Caustic soda solution
- Other antiseptic solutions

The department produces a wide variety of medical drugs upon request of other departments and pastes account for large portions. Internal medicines are estimated to be liquid 30%, powder 10%, and tablet 60%. 50% of injection are manufactured in the country. Injection accounts for half of medical drugs used in any children's hospital. 95% of internal medicines are imported from Russia and Czechoslovakia. Medicines will be supplied to inpatients with free of charge, except for special drugs including expensive antibiotics, anticancer agents, and cardioactive agents. Drug charges are cut in half for patients with chronic diseases such as diabetics, wounded veterans, and persons of distinguished service.

Pharmacy will employ 9– 10 staff, 6 pharamacists, and 3 persons in charge of washing. An evaluation board on side effects will be established by pharamacists, chemical analysts, and doctors.

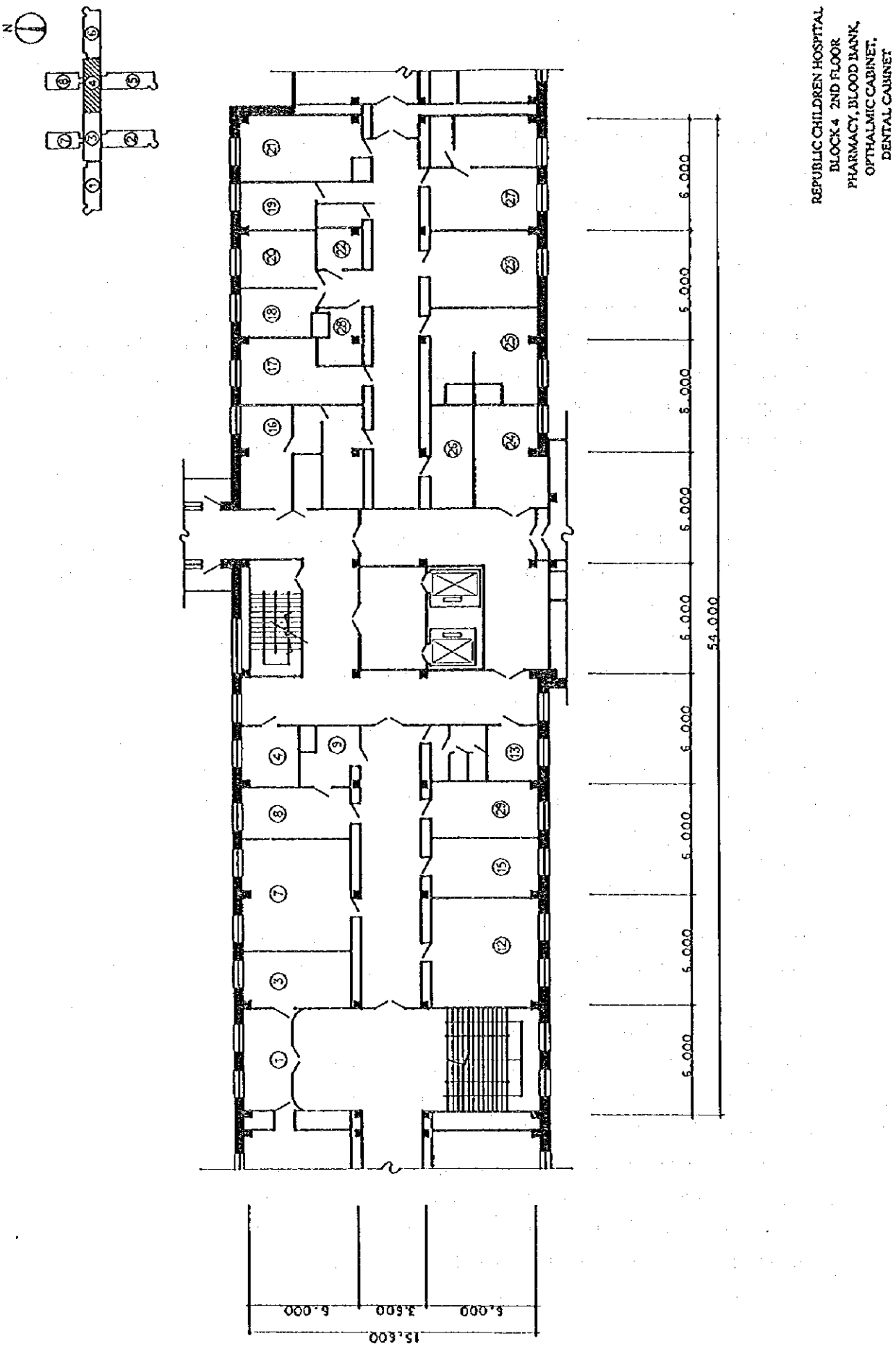
In Kyrgyz, blood is supplied entirely through donation, while donators receive 80 soms for 200ml (200ml – 500ml collected at one time) with a meal and 2-day leaves. Blood collected is checked for blood type, syphilis, AIDS, and hepatitis and is stored at the municipal blood center which supplies blood upon request. At present, blood supply meets demand with few problems. In addition, fresh blood from family members or close relatives is used for transfusion, while component transfusion is rarely done.

Pharmacy and Blood Transfusion/Collection departments are located on the second floor of Block 4, having floor space of 15m x 21m. A side room (11.7㎡) in ⑯ will be used as the blood storage room. This room will house equipment related to blood transfusion. However, it is proposed to use Room ⑦ on the first floor of Block 7 (currently occupied by Hematology Section of Laboratory) by moving the flame photometer from the room to Room ㉛).

Room ⑯ stores medicines, medical supplies (gloves, hot-water bottles, etc.) and medical consumables. Room ⑰ is used for inspection and labeling of prepared drugs. ⑱ is a dry heat room and ⑳ is a chemical analysis room housing pH meter and refractometer. In ⑲, drop solution for liquid replacement will be produced and the analytical balance will be installed.

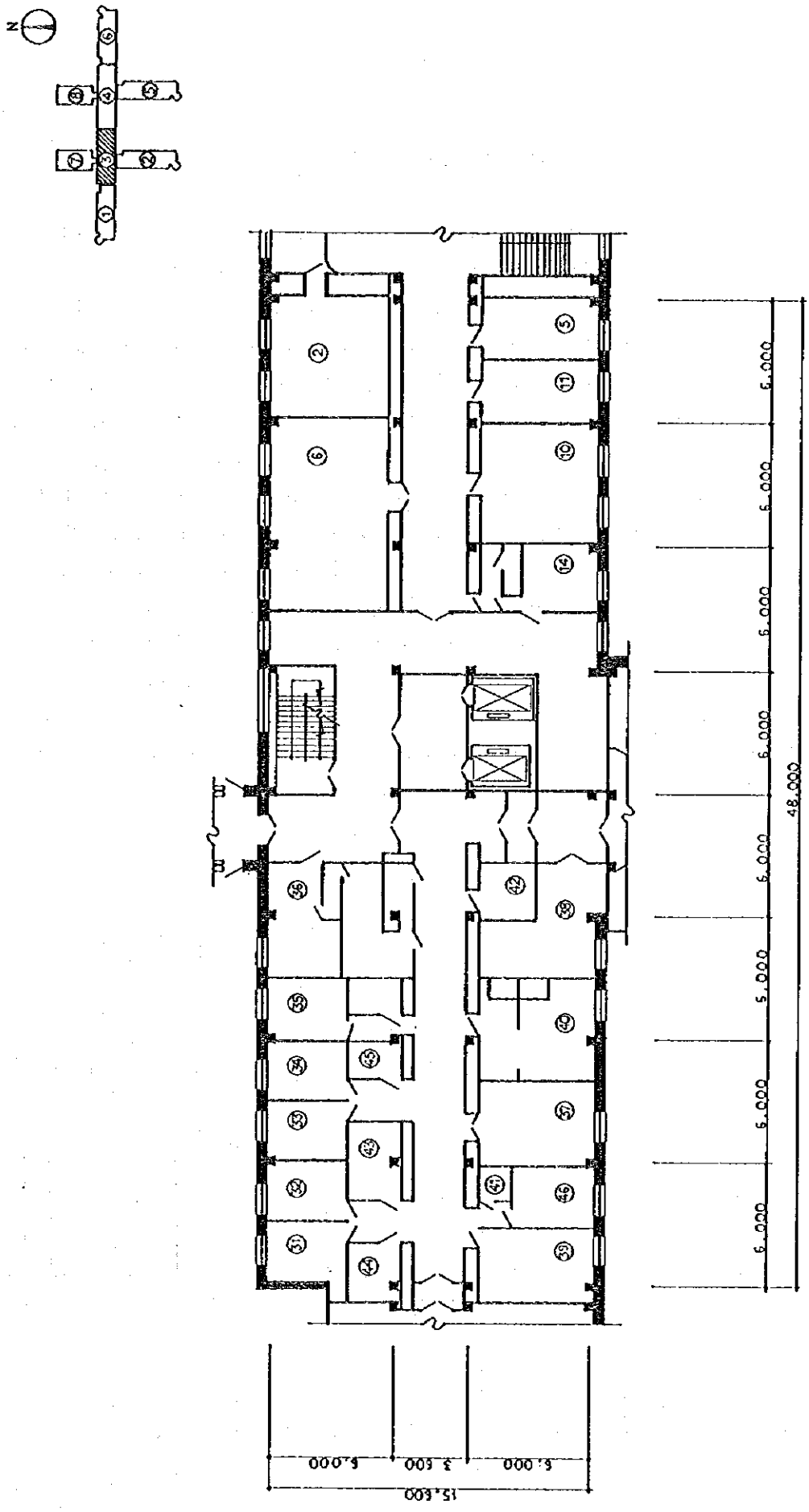
Room ㉑ has floor area of 22.3㎡ and will house the redistillation apparatus, the dry heat sterilizer, the vertical autoclave, and the suction filter unit. Entrance door is 198cm high, while its width is only 78cm through which large equipment will not be able to pass. Wood-framed windows are 95cm high from floor, with 147cm in width and 169cm in height, and need to be removed for transportation of equipment. Electrical outlets, and water supply and drainage facilities are available.

Room ㉗ will be used as a medicine storage. ㉓ will be used to prepare internal medicines and has floor area of 23.1㎡, where the prescription counter will be placed. In addition, equipment with priority level "B" can be installed here, together with the magnetic stirrer. ㉕ is a washing room and already has three sinks. The ultrasonic pipette washer will be installed in this room. ㉖ is a dark room where medicines required to be kept in dark place, mainly powder drugs, will be stored. ㉔ is a staff room.



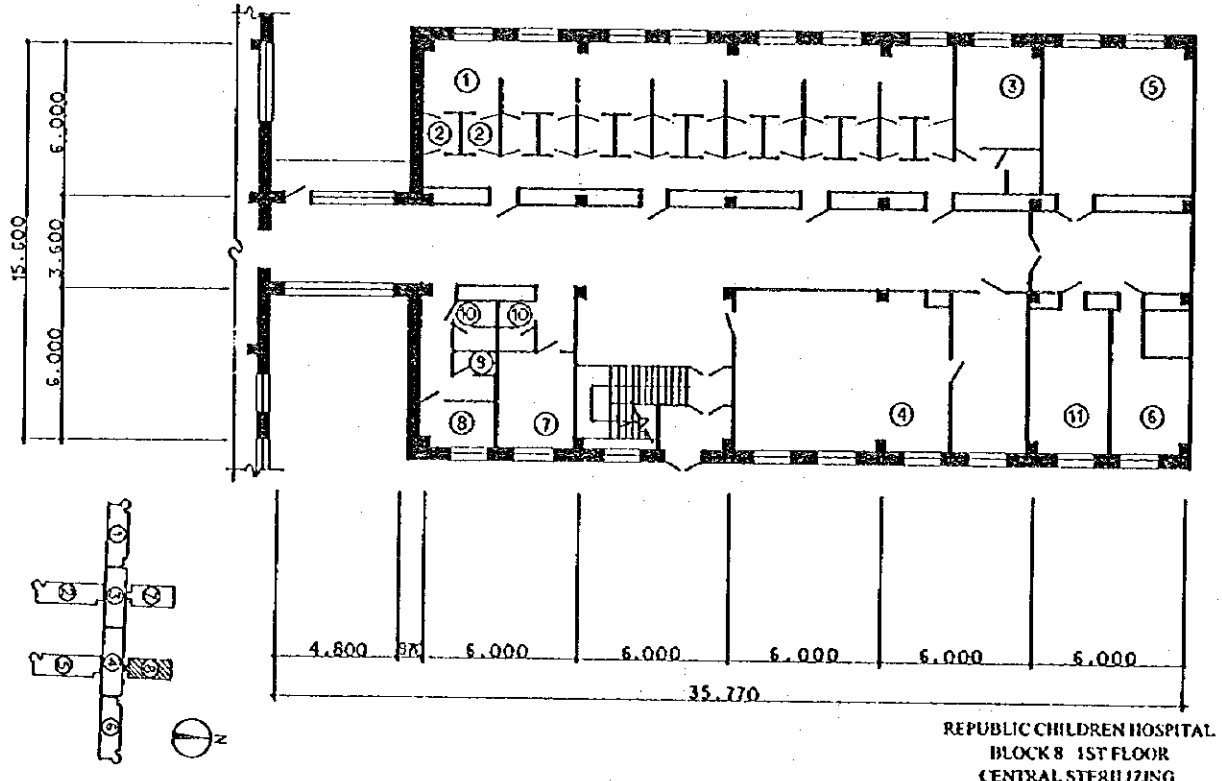
REPUBLIC CHILDREN HOSPITAL
BLOCK-4 2ND FLOOR
PHARMACY, BLOOD BANK,
OPTHALMIC CABINET,
DENTAL CABINET

REPUBLIC CHILDREN HOSPITAL
BLOCK 3 2ND FLOOR
BURNS, ADMINISTRATION

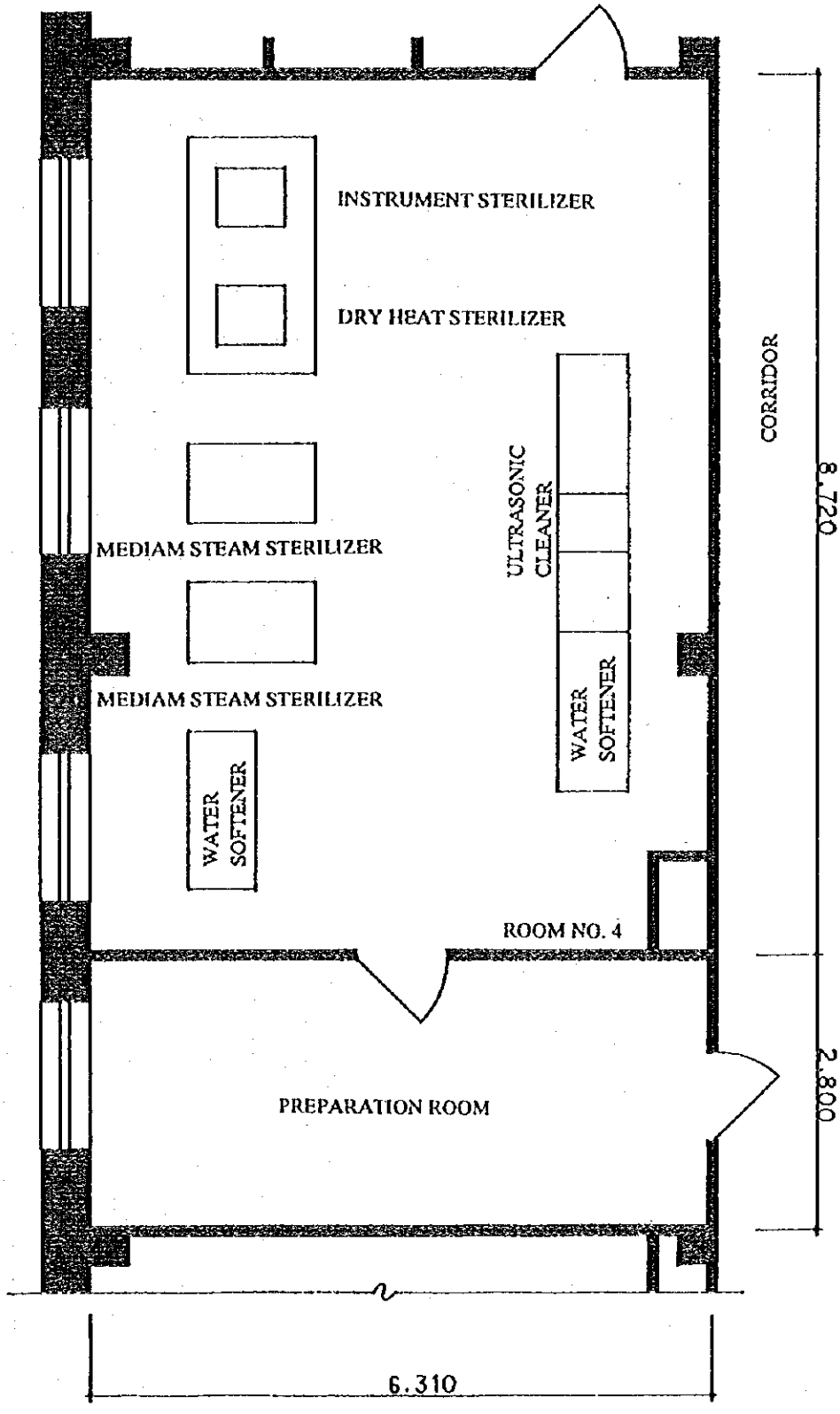


8) Central Sterilizing Department (1st floor, Block 8)

This is located on the first floor of Block 8 and has floor space of 15.6m x 18m. Rooms are arranged in row on the west side of the corridor, in the order of reception, washing, drying, and a room to pack instruments and prepare surgical kits (Room ③ - 11.1㎡). On the east side of the corridor are a preparation room (17.7㎡) and Room ④ to sterilize instruments (floor area of 34.7㎡). Room④ will accommodate equipment with priority level "A" as well as "B." The wall of Central Sterilizing Department is covered with white tiles. The preparation room and the sterilizing room do not have exit for sterilized instruments, which will be provided through the wall of the sterilizing room on the staircase side. Again, doors to the rooms are narrower than 90cm and large equipment such as medium steam sterlizers will be brought into the rooms by removing windows or walls in part. There is no steam source, and a boiler should be installed for the steam sterlizers. Also, a water softener will be installed. Finally, the rooms are not air-conditioned, and ventilation fans seem to be needed to lower room temperature during the summer. Layout is generally acceptable, except for a long distance between Central Sterilizing Department and the lift accessible to Operation Theater, with no consideration to traffic line.



REPUBLIC CHILDREN HOSPITAL
BLOCK 8 1ST FLOOR
CENTRAL STERILIZING,
REHABILITATION



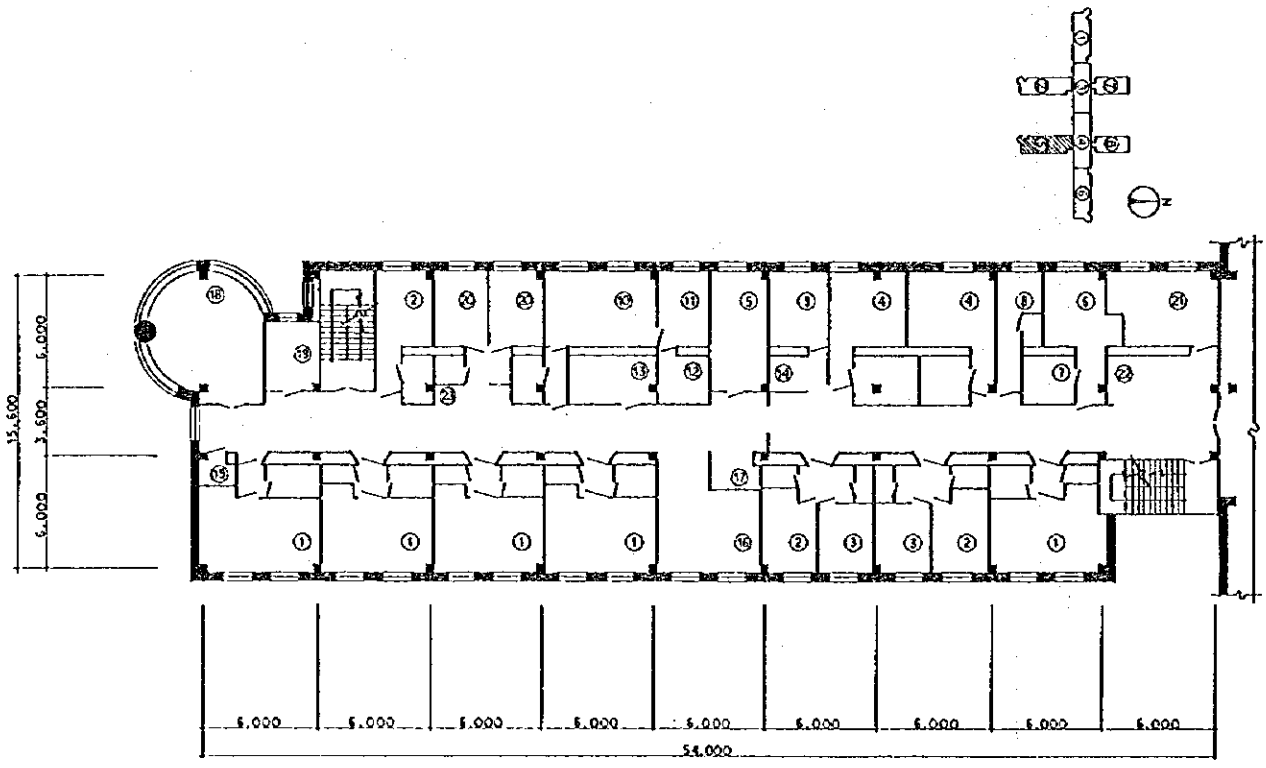
LAYOUT PLAN
BLOCK 8 IST FLOOR, ROOM NO. 4

MEDIAM STEAM STERILIZER
DRY HEAT STERILIZER
ULTRASONIC CLEANER
INSTRUMENT STERILIZER

9) Urology (2nd floor, Block 5)

The department will occupy the whole space on the second floor of Block 5, covering 15.6m x 54m. To reflect a hig h rate of urolithiasis in Kyrgyz (Note 2), Urology Department of Children's Municipal Clinical Hospital No.3 – only one urology department in the country – will move to the new hospital. Note that operating instruments with priority level "A" should be managed by Operating Theater.

Note 2) Comparing the morbidity rate of urologic and reproductive system diseases among children of 14 years or younger between Japan and Kyrgyz, there is a marked difference, 152 patients per 100,000 persons in the former and 2,612 in the latter (1994). (see Fig.2-1 "Morbidity Rate per 100,000 Children of 14 or youngerin the Kyrgyz Republic). The 1994 figure shows a sharp increase from 778.2 in 1992 and 736.6 in 1993. A specific cause for such sharp increase is not known. Compared to the 1992 figure, the disease rate in Kyrgyz is still five times larger than that in Japan, and in particular, urolithiasis is rampant.



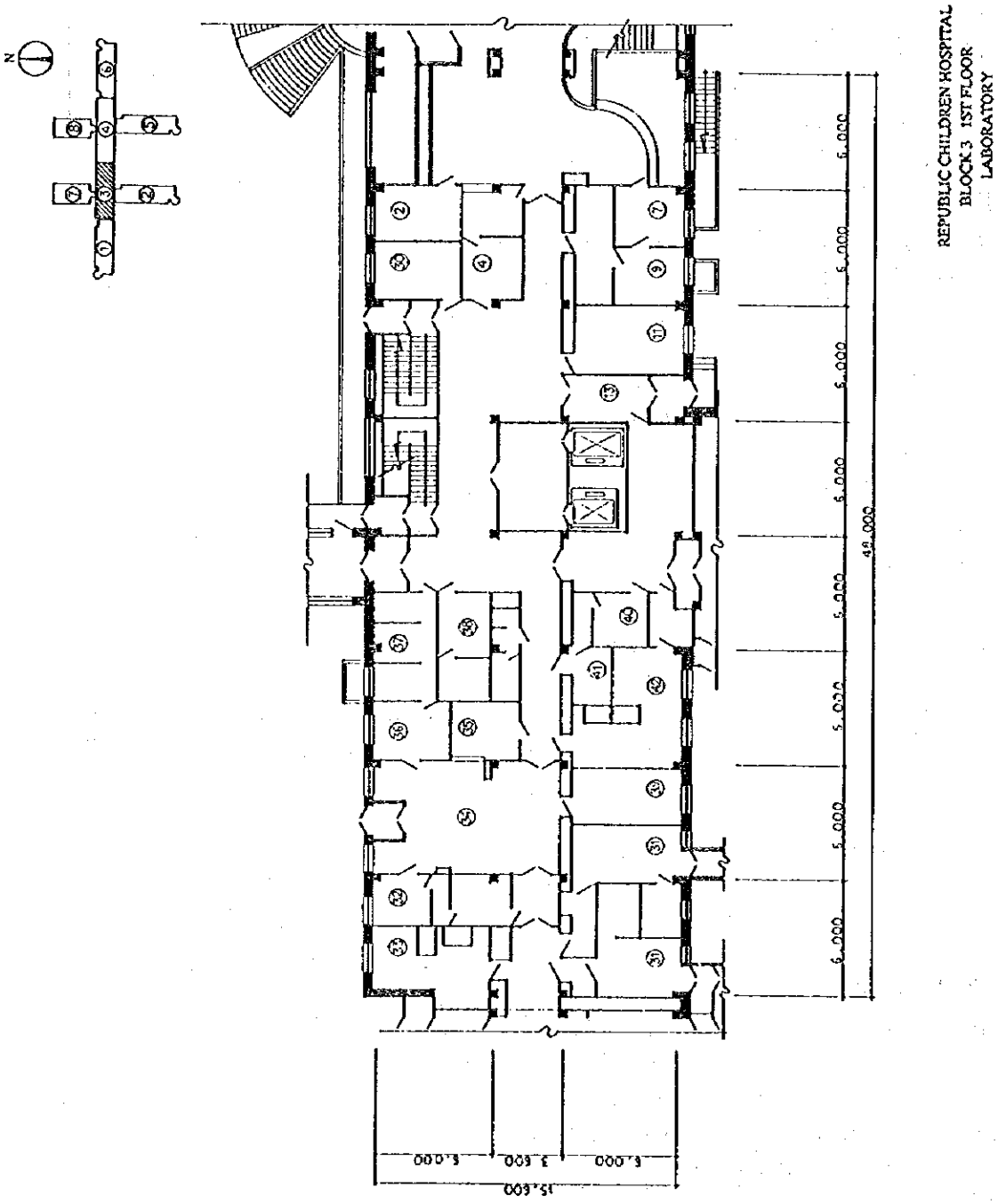
REPUBLIC CHILDREN HOSPITAL
BLOCK 5 2ND FLOOR
UROLOGY

10) Laboratory (1st floor, Block 3)

The laboratory is located on the first floor of Block 3. Floor area is 15 x 42m, located on the right-hand side immediately after the main entrance.

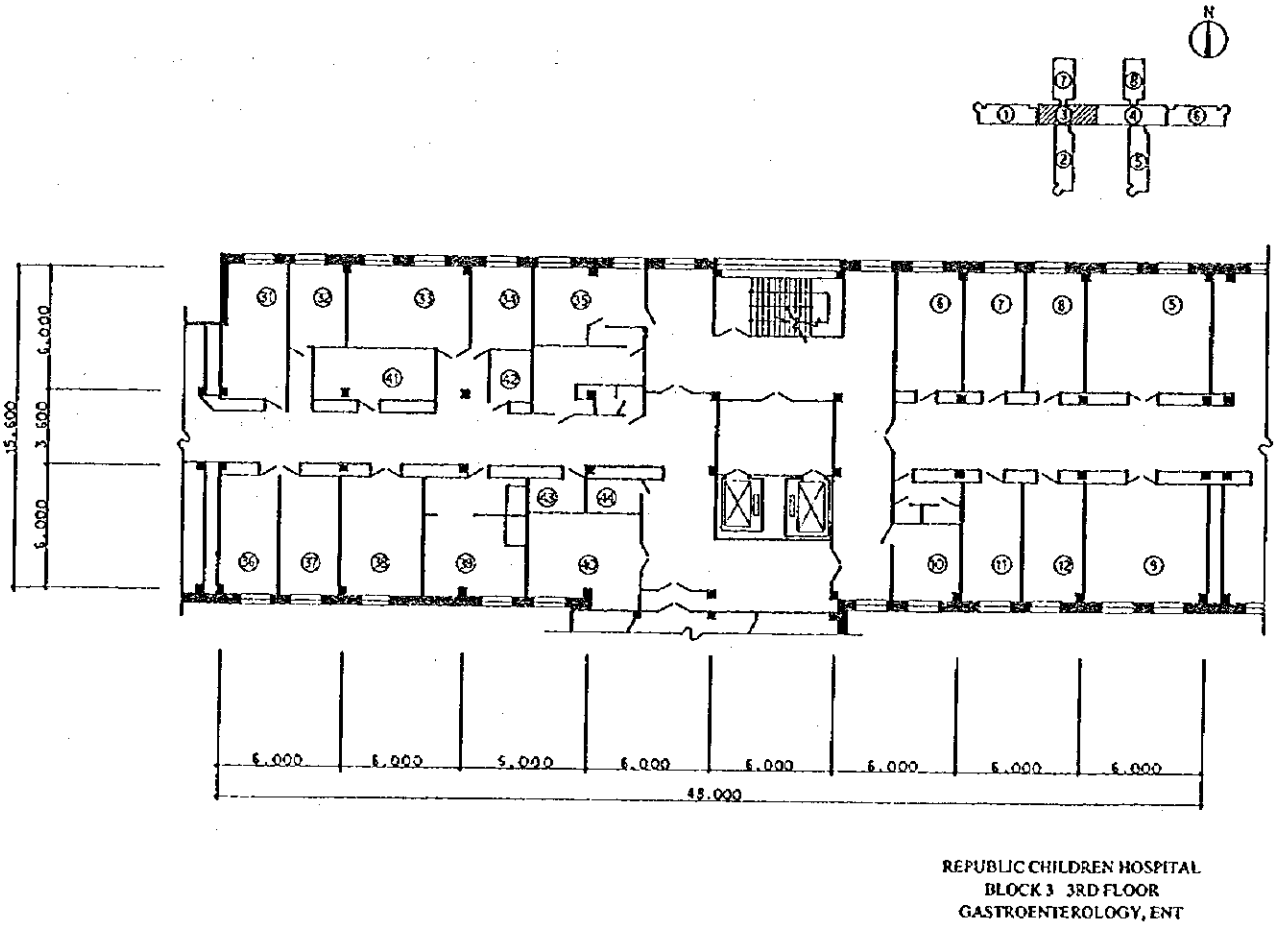
No.	Name of Room	Equipment to be supplied	Remarks
②	Reception for clinical examination		
④	Changing room for patients		
㉓	Lavatory		
㉚	Urine lab		
⑦	Flame photometer lab	Flame photometer	
⑨	Heamatologic lab	Blood cell counter Hemoglobine analyzer Coagulometer (B)	
⑪	Blood/gas/electrolyte lab	Blood gas analyzer Balance	
㊵	Staff shower room		
㊶	Centrifuge room	Table top centrifuge (B)	
㊷	Instrument washing room		4 sinks are provided
㊴	Disaster control center		
㉛ E	Concentration measurement room	Densitometer, clinical refractometer, osomometer (B)	
㉛ W	Chemical analysis room	Chemistry analyzer, pipette shaker, and spectro photo meter (B)	Electrical outlets and earth are not provided. Immediate open wiring is scheduled.
㉝	Washing room	Water distiller	Water supply and drainage are available. A 5kW distribution board is installed.
㉟	Staff rest room		
㊳	Immune lab	Immunohematology push-button centrifuge (B) and electro phoresis	
㊱	Microscope room	Phase contrast microscope	
㊲	Bacteria lab / sterilizing room		

From the maintenance viewpoint, it is not desirable to use laboratory equipment of different manufacturers. In particular, the blood gas analyzer, the chemistry analyzer, the spectro photo meter, the electro phoresis, the densitometer, and the flame photometer should be purchased from the same or few manufacturers.



11) ENT (3rd floor, Block 3)

Room ⑨ facing the south side has floor area of 33.4㎡ and will accommodate the audiometer (priority level "A"). However, the room does not have space for reception and should preferably house the treatment unit with chair (priority level "B"). If so, it is not practical to conduct audiometer testing in this room, and from the interest of promoting centralization of the hospital system, the audiometer should be installed in Room ① or ⑦ of Physiological Examination Department (2nd floor, Block 7). Also, Operation Theater should be responsible for control of the laryngoscope set and the treatment unit.



REPUBLIC CHILDREN HOSPITAL
BLOCK 3 3RD FLOOR
GASTROENTEROLOGY, ENT

12) Infant Care Unit, Infant Surgery, and General (1st floor, Block 4)

This is located on the first floor of Block 4, on the left-hand side of the main entrance and has floor area of 15m x 42m. Room ⑮ is a reception area, and the infant care unit with 45 beds is on the left side and the infant surgery unit (35 beds) on the right side. Room ㉔ will store infusion pumps, sphygmomanometers, and diagnostic sets.

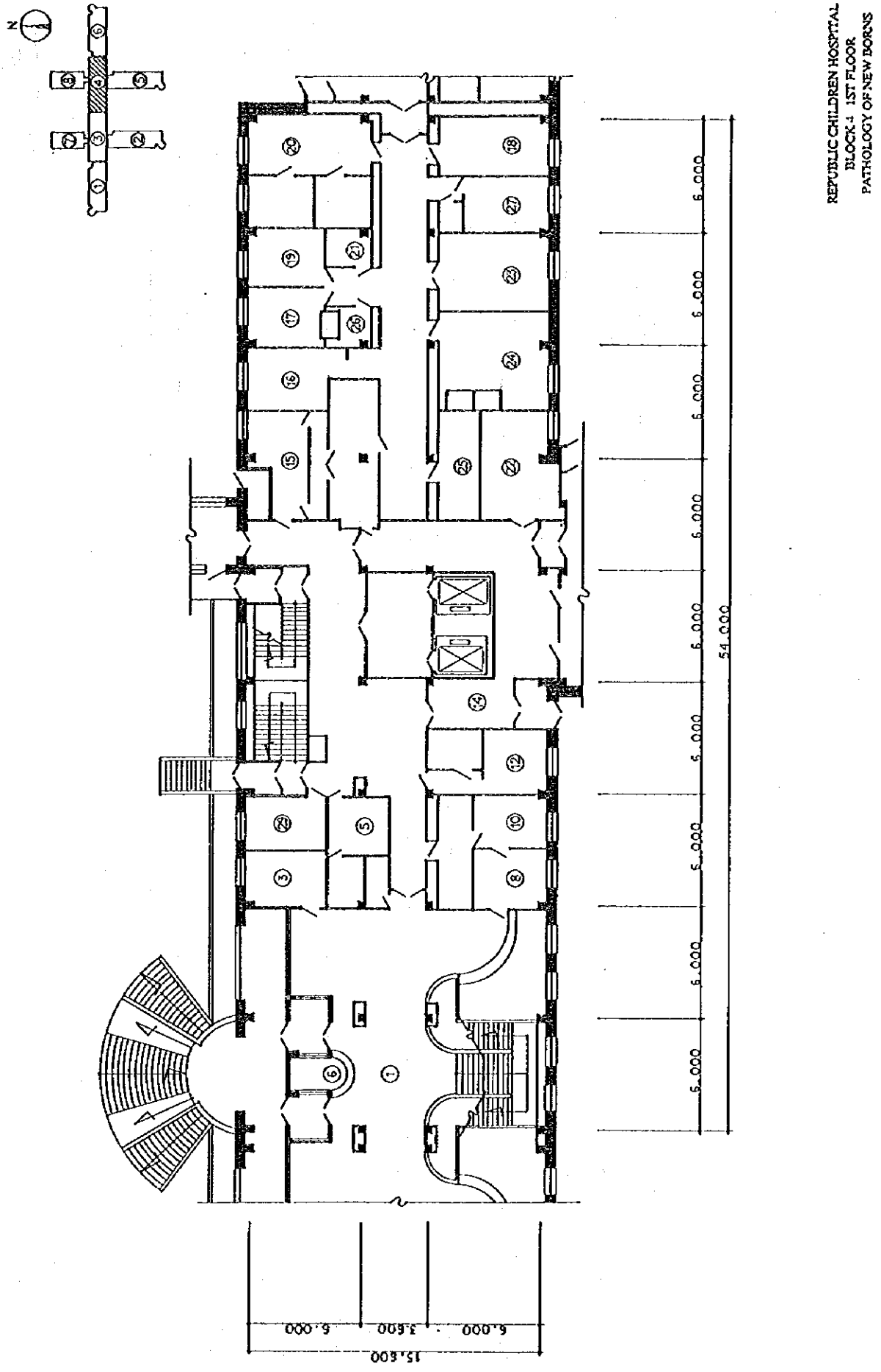
Note that the department head will be the director of Children's Municipal Clinical Hospital No.5 which will be closed.

13) Infant ICU (1st floor, Block 6)

A 15.6m x 54m room on the first floor of Block 6 will be allocated for the infant ICU. Equipment will be housed in half-boxed 2 rooms in ④ which has sufficient space. It is accessible to oxygen and suction sources, with water supply and drainage facilities.

14) Infant Surgery Unit (3rd floor, Block 5)

The infant warmer, the pediatric monitors, and portable suction units with priority level "A" will be installed in Room ④, together with the film illuminator (priority level "B").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REPUBLIC CHILDREN HOSPITAL
BLOCK 4 1ST FLOOR
PATHOLOGY OF NEW BORNS
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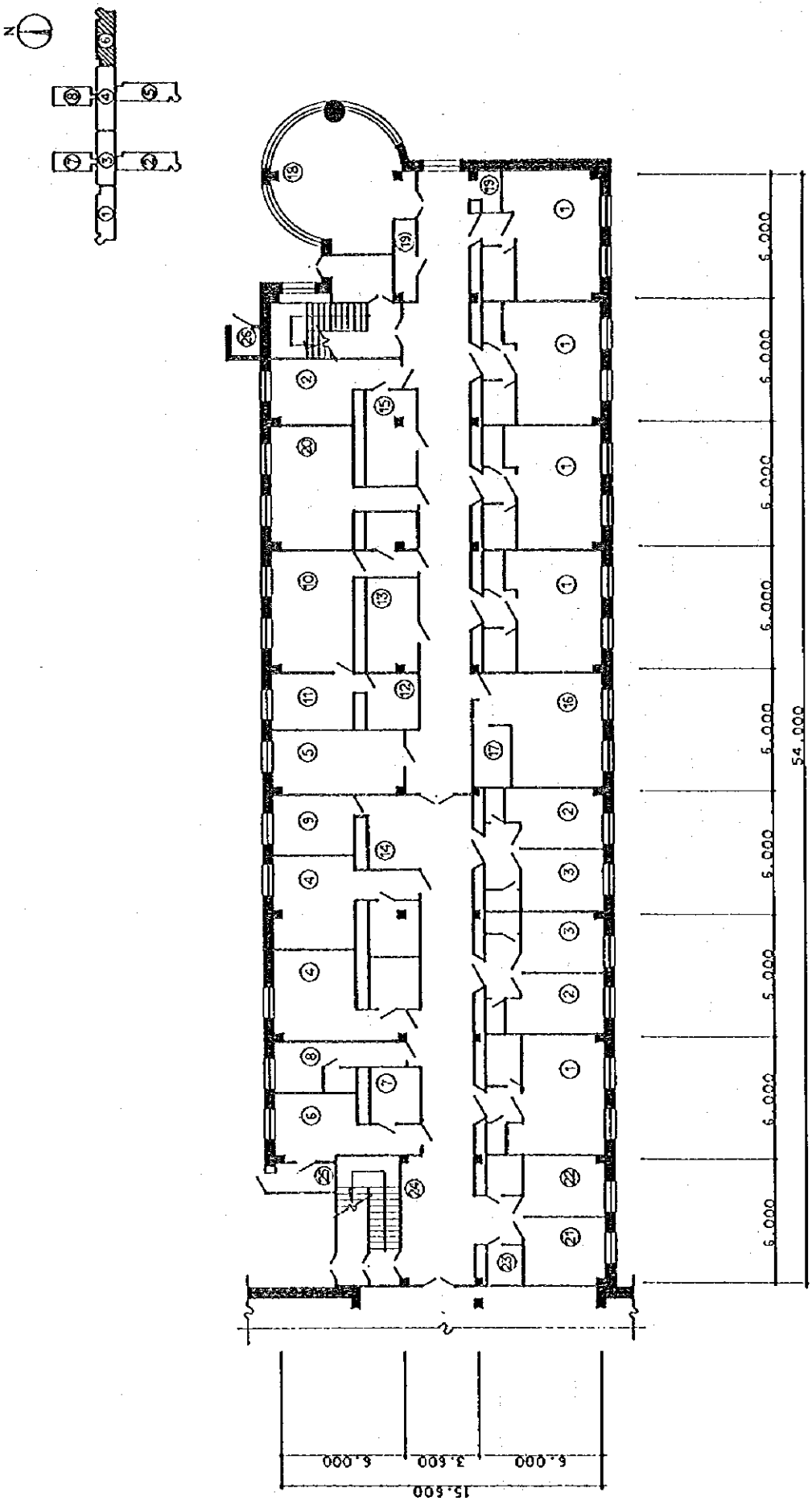
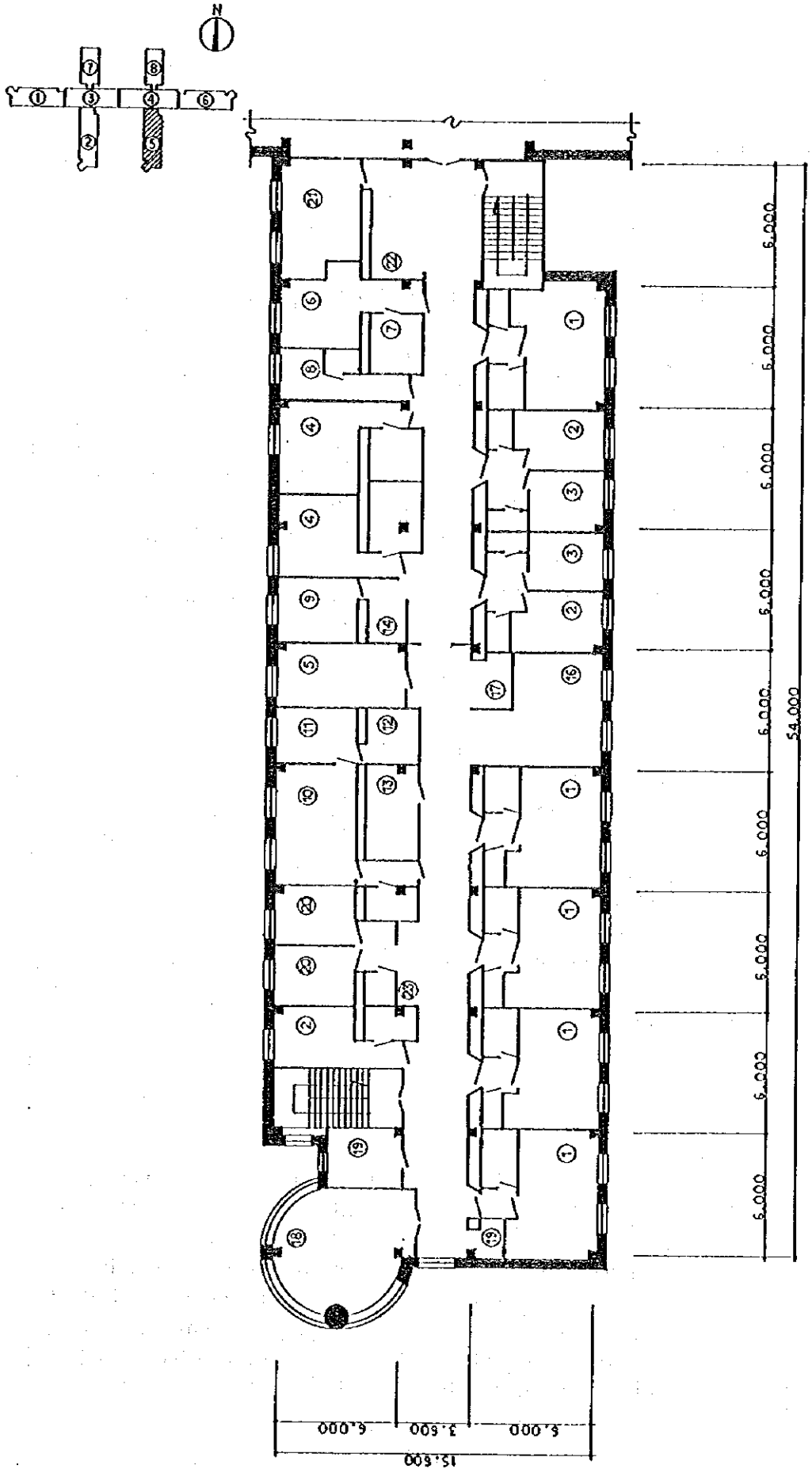
REPUBLIC CHILDREN HOSPITAL
BLOCK 6 1ST FLOOR
INFANT CARE UNIT




N
REPUBLIC CHILDREN HOSPITAL
BLOCK 5 3RD FLOOR
INFANT SURGERY
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6,000
3,600
6,000
15,600

(2) Equipment plan

Specifications for major equipment are summarized in Table 2-4 below.

Table 2-4 Specifications for Major Equipment

Equipment name		Specifications/description	Q tty	Use
1.	ICU Reanimation			
1-1	ICU monitoring system for 4 patients	Radio type Central monitor 1 Bedside monitor 4 ECG, RESP, NIBP, SaO2, TEMP, IBP	1	Continuous monitoring of vital signs of patients requiring intensive care, capable of monitoring 4 patients.
1-2	Portable defibrillator	With 5.5-inch ECG monitor Printer with built-in battery Output energy: 1 – 400J (18 steps), charging time – 10 seconds or less	1	To revive patients in cardiac arrest.
1-3	Ventilator for children	Computer controlled Suitable for children weighing 15kg and above upto adults With compressor With ventilatory volume adjuster	1	To revive patients in respiratory pause as well as to control respiration.
1-4	Ventilator for infant	Suitable for infants weighing under 15kg Pressure-cycled type with ventilatory volume adjuster	1	
1-19	Regional hypotermia unit	Capable of detecting abnormal body temperature Applicabe to low temperature surgery Capable of body temperature control With temperature probe	1	To increase blood flow and improve blood circulation and metabolism by cooling the affected part. Useful in maintaining febrite patients at appropriate body temperature, as infants often have a high fever.

1-22	Infant incubator	Servo control as well as manual control, body temperature adjustable Touch-panel control system	1	To nurture infants in serious condition by controlling temperature, humidity and oxygen concentration.
2.	Physiological Examination			
2-6	Gastrointestional fiberscope	For general examination of upper digestive tract, used for diagnosis Field angle 120° Observation depth 3~100 ㎜, outer diameter 9.8㎜	2	Mainly used for diagnosis of gastric diseases. Also used for biopsy by attaching biopsy forceps (see items below)
2-7	Colono fiberscope	Maximum visual angle 120° Observation depth 3~100 ㎜, outer diameter 11.2㎜	1	To examine lower alimentary tract, from signoid to ileocecum. Applicable to biopsy.
2-8	Broncho fiberscope	Field angle 120° Observation depth 3~50 ㎜, outer diameter 5.8㎜	1	To examine bronchi, for the sake of diagnozing pulmonary and bronchial diseases. Also aplicable to biopsy.
2-9	Endoscope illuminator	Xenon short arc lamp 300W	1	A light source for various types of endoscopes
2-11	Ultrasound scanner	12-inch monitor Probe: with linear and convex sectors Thermal printer, Doppler unit	1	To check histological characteristics of organs and lesions by detecting refraction of ultrasonic waves. Doppler unit is used to differentiate cardiac diseases.
2-12	Ultrasound scanner	Linear and convex scanning 9-inch TV monitor Thermal printer Probe: convex	1	
2-13/14	ECG with cart	with Analyzer 3, 6-element type Input circuit: for defibrillator, an isolated insulation circuit is provied	2	To analyze ECG complex. One unit will be lent to other departments

2-15	EEG	14 channels (10 for brain wave, 4 for multi-purposes) Automatic type, with cart	1	Used for diagnosis of cerebral neuropathy. Required to check audiotry perception of neonates.
3	Operation Theater			
3-1	Operating table	Hydraulic type Body position adjustable of ascending/descending Range: 75 – 100cm	2	
3-2	Operating table	For children, electric-powered Table size: Approx. 45×60cm at minimum, approx. 45×200cm at maximum, separatable into 6 sizes	1	
3-3	Operation lights	14 lamps (100cm in diameter) + 5 lamps (50cm in diameter). approx. 12,000lx + 75000lx	3	Used to light up operation area
3-4	Anesthesia apparatus	Vaporizer (halothane, enflurene) With ventilator safety device With flowmeter, oxygen monitor	1	Used for general anesthesia during operation. Equipped with a ventilator to supplement or control patients respiration under anesthesia; with a safety device to prevent accidents due to oxygen deficiency.
3-5	Anesthesia apparatus	Vaporizer (halothane, enflurene) With flowmeter, oxygen monitor	2	Used for general anesthesia during operation
3-7	Operating monitor	Wired ECG, RESP, NIBP, IBP, TEMP, SaO2	3	To monitor heart rate and blood pressure of patients.
3-8	Electrical surgical unit	Incision (0~350W) Coagulation (0~130W) Combined (0~250W) Bipolar cautery (50W) possible	2	Used to observe incisions, hemostasis and coagulation during operation

3-9	Portable defibrillator	With 5.5-inch ECG monitor Battery built-in printer Output energy:1 - 400J (18 steps) Charging time: 10 seconds or less	1	Used to revive patients in cardiac arrest.
3-10	Hyper / hypothermia unit	Capable of detecting abnormal body temperature Applicable to low temperature surgery Capable of body temperature control With body temperature probe	1	To control hypothermia after operation or anesthesia. Also for therapeutic puropses.
3-11	General operation microscope	Angle of inclination: Adjustable between 30° - 110° Coaxial, binocular side-view mirrors	1	
3-12	Mobile x-ray unit	C arm rotating range: 115° TV monitor (17-inch) X-ray tube focus - Image Intensifier Distance: 90cm Approx. 60MA, 110KV, 3KW X-ray generator with lens opening adjustable	1	For intraoperative radiography
3-13	Surgical instrument set for children	32 types	2	
3-14	Surgical instrument set	35 types	8	
3-16	UV hand washing apparatus	With pressurizing pump, for 2 persons	3	Used for washing and disinfecting hands before and after operation.

4.	X-ray Deparrtment			
4-1	Diagnostic x-ray unit for chest	Consisting of: 1) Approx. 300MA, 125KV, 37.5 KW Inverter x-ray high voltage generator 2) X-ray tube support 3) Bucky table 4) Bucky stand 5) Variable lens opening 6) Rotating anode x-ray tube	1	For chest examination. In view of the high incidence of respiratory diseases, a chest X-ray unit devoted to this purpose will be in great demand.
4-2	Diagnostic general x-ray unit	1) 600MA/150KV high voltage generator 2) 90° ／15° table capable of fluorography 3) 200KHU x-ray tube 4) 9-inch image intensifier 5) CCD type x-ray TV camera 6) Floor ceiling mouned X-ray tube support	1	Used for diagnosis of abdomen and limb disorders
4-3	R/F diagnostic X-ray unit	1) 600MA/150KV high voltage generator 2) 90° ／15° Remote control type fluorography table 3) 200KHU x-ray tube 4) High voltage cable 5) 9-inch image intensifier 5) X-ray TV system	1	Mainly used for radiography of alimentary tract by remote control
4-4	Automatic film processor	2KVA Capable of developing and processing CIS films Computer-controlled	1	Used for automatic development of films

4-6	Mobile x-ray unit	Approx.100KVA Condenser type 1) High voltage part: Controller, and high voltage generator 2) X-ray tube support and cart 3) X-ray tube device, variable lens-opening 4) High voltage and low voltage cables	1	At least one unit will be required to be used in other departments/wards.
5.	Recovery Room			
5-2	Ventilator	Computer controlled Suitable for children weighing 15 kg and above upto adults. With compressor With ventilatory volume adjuster	1	Used for respiratory control of patients.
5-5	Bedside monitor telemetry	Radio type, BCG, RESP, NIBP	1	Continuous monitoring of heart rate and blood pressure
5-6	Portable defibrillator	With ECG monitor Printer with built-in battery Output energy: 1 - 400J (18 steps), charging time - 10 seconds or less	1	To revive patients in cardiac arrest.
6.	Pharmacy			
6-3	Pharmacy instrument set	20 items including mortars, sieves, thermometers, measuring cylinders	1	
6-4	Prescription counter	For powder and liquid drugs 1800 (W)	1	
6-7	Redistillation apparatus	With boiler 20 liters/hour Water tank of 40 liters Major parts are made of SUS304	1	To be used for producing sterile water containing no pyrogen, used for pharmaceutical manufacturing

6-17	Suction filter unit	Sterlizer for injections For 100 500cc bottles Chamber size: Approx. 600W×1000H×650L (mm) With water softener and pressurizing pump	1	Sterilization of injections
7.	Central Sterilizing			
7-1/2	Medium Steam sterlizer single door	Single door, floor type 9 27cm diameter casts Chamber size: 500W× 900L×500H(mm)	2	To be used for sterilization of equipment and materials (including medical tools and materials of metal, porcelain, glass, paper and cloth that can withstand wet heat of 120℃)
7-4	Ultrasonic cleaner set	Set of appratuses for cleansing, drying, water softening and work table.	1	To be used to ablate and wash away contaminants on medical tools and equipment of steel and glass by action of ultrasonic wave.
9.	Urology/Nephrology			
9-1	Hemodialysis	For 1 bed With water pretreating equipment	2	For removal of waste matter from blood of patients with chronic nephropathy
9-2	Urine passing examination	Waveform data can be checked on CRT screen	1	To examine dysuria and measure urinary flow.
9-3	Cystoscope for children	Optical viewing tube 0° ,30° Sheath 10Fr, 13Fr	1	Used for bladder examination
9-4	Resectoscope set	Optical viewing tube 12° Sheath 24Fr Handle 12° /30° with electric knife	1	Used for transurethral resection of prostate and bladder lesions.
9-5	Lithotrypter	Optical viewing tube 12° Sheath 24Fr, Light source for ultrasonic lithotresis	1	Used for removal of foreign bodies in bladder and excision and biopsy of bladder tumor.
9-6	Operating table for urological patients	Manually operated. Stand-type operation lamps (4 lamps), 63000lux	1	

9-7	Set of percutaneous nephrostomy	Basic urological set + pelvilithotomy set (60 items)	1	To be used for percutaneous insertion of a pycloscope from pelvis renalis to upper ureter, in order to crush and remove calculus.
9-8	Operating instrument set (urological) for adults	Basic urological set + partial cystectomy set 55 items	1	
9-9	Operating instrument set (urological) for children	Basic urological set + partial cystectomy set 58 sets	1	
9-11	Cystometer	Water method Measurement of urethral pressure Measurement of urinary flow		Useful for identification of urinary disturbance through measurement of intravesical pressure and urinary flow
10	Laboratory			
10-6	Blood cell counter	WBC, RBC, HGB, HCT, MCV, MCH, MCHC, RLT Diluter With printer	1	Essential in diagnosis and treatment of hematopathy for sustained observation. Blood cell count is readily available.
10-8	Blood gas analyzer	Measuring items: pH, PCO2, PO2, electrode method Calculation items: HCO3, B.E., CTCO2, O2SAT, O2CT, PO2(A-a), PO2(a/A)	1	To measure blood gas on emergency patient.
10-11	Chemistry analyzer	Discrete type, randam access Processing speed: 180 test/hour Simultaneous measurement: 1~40 specimen 1~26 reagent positions Parameter input capacity: 1~48 items	1	Used for multi-item biochemical examination, including measurement of electrolytic and immunological paramters

10-12	Spectro photo meter	Display 3 1/2 LED Range of measurement: 330~900 NM	1	To analyze specimens based on spectrophotometry.
10-13	Electro phoresis	composition: cells, dryer, incubator, etc.	1	To analyze enzymes and substance composition on the basis of difference in electrophoretic mobility.
10-14	Densitometer	Serum protein, isoenzyme, lipoprotein. Interference filter: 340, 415, 520, 600 NM	1	To measure reagent concentration to examine specimens.
10-15	Flame photometer	Measurement items: Na, K (serum, urine), Li (serum), automatic dilution: 30 - 40 seconds Manual: 12 seconds	1	To measure concentrations of sodium and potassium in serum.
10-16	Osmometer	Measurement: digital display, capable of measuring whole blood	1	Measurement of osmotic pressure of body fluid is essential in controlling metabolism and the understanding pathological picture. Frequently used on dialysis patients.
10-18	Water distiller	Amount of intake: 0.5 liter/minute Ion exchanger: cartridge type	1	To distill water to be used at laboratory.
11.	Rehabilitation phisiotherapy			
11-1	Hydro bubbler bath	1800W×700W×700H With handrails Bathtub capacity: 300 liters, 500mm deep	1	Used for therapuetic bathing
12.	Opthalmic cabinet			
12-2	Diagnostic and treatment set	40 items	1	
13.	Dental cabinet			
13-1	Dental unit	Main unit, chair, compressor	1	
13-3	Laboratory equipment	15 items	1	
13-5	Dental instrument set	49 items	1	

14.	ENT			
14-1	Treatment unit	Treatment unit, single type With chair	1	
14-2	Audiometer	1ch, right/left to be switched. Frequencies: 1,2,4,8,0.5, 0.25, 0.125 KHZ	1	To be used for audiometry of children between 0 – 14 years old.
15.	Infant Care Unit			
15-1	Incubator	Servo control as well as manual control. Body temperature adustable Touch-panel control system	4	To be used to care for low birth weight infants until they overtake normal neonates by controlling temperature, humidity, and oxygen concentration.
15-2	Infant warmer	With resuscitator Servo control Functions: body temperature measurement, heat control, Body temperature, heater output , warming time displayed.	1	To prevent temperature drop in neonates during treatment.
15-3	Transport incubator	Power source: Special battery and car battery Temperature control: Manual control system Alarm: Excess temperature, low voltage With power pack and Height adjustable stand	1	Used for transportation of infants within the hospital.
15-7	Ventilator	Suitable for infants weighing under 15 kg Pressure-cycled type With ventilatory volume adjuster	2	To revive infants in respiratory pause as well as to provide respiratory control.
15-10	Ultrasonic scan	Linear and convex scanning 9-inch TV Monitor Thermal Printer Probe: convex	1	Required for diagnosing patients who have to stay in clean area.
15-12	UV hand washing apparatus	Flow rate: 5 liters/minute Wall type: single use	1	Used for washing hands preventing infection.

16.	Infant Surgery			
16-1	Infant warmer	With resuscitator Servo control Functions: body temperature measurement, heat control Body temperature, heater output, and warming time displayed.	1	To prevent temperature drop in neonates during treatment.
17.	General			
17-5	Ambulance	4-wheel drive vehicle With stretcher and medical instrument set Total discharge: around 4,000cc	1	4WD is essential since ambulances are expected to drive on mountain roads that freeze during the winter.

CHAPTER 3 IMPLEMENTATION PLAN

3 Implementation Plan

3-1. Implementation Plan

3-1-1 Procurement Plan

Equipment to be supplied under the project will be procured by a equipment supplier (trading company) under a lump sum contract through tender procedures. Equipment will be delivered on a full-turn-key basis. Equipment should be made in Japan or the Kyrgyz Republic, except for the following equipment that can be purchased from member countries of the Organization for Economic Cooperation and Development (OECD) such as Germany provided that its quality and performance meet requirements in specifications and that its consumables and spare parts are readily available within the country or in neighboring countries such as Russia, Kazakhstan, and Uzbekistan with sufficient after-sales service:

Ventilator
Anesthesia apparatus
X-ray unit
Automatic film processor
Hemodialyzer
Osmometer
Cystometer
Urinary passing examination
Blood gas analyzer
Chemistry analyzer
Spectrophotometer
Electrophoresis apparatus
Densitometer
Flame photometer

3-1-2 Implementation Schedule

If the project is implemented under grant aid of the Japanese government, it will be proceeded in accordance with preliminary schedule as follows.

(1) Detailed design/tender

Based on the basic design study report, detailed specifications for equipment will be determined, and tender documents will be prepared to obtain approval of related organizations. Tender will be carried out, and after evaluation, the contract will be awarded to a successful supplier. This process will take around 5 months.

(2) Manufacturing and installation

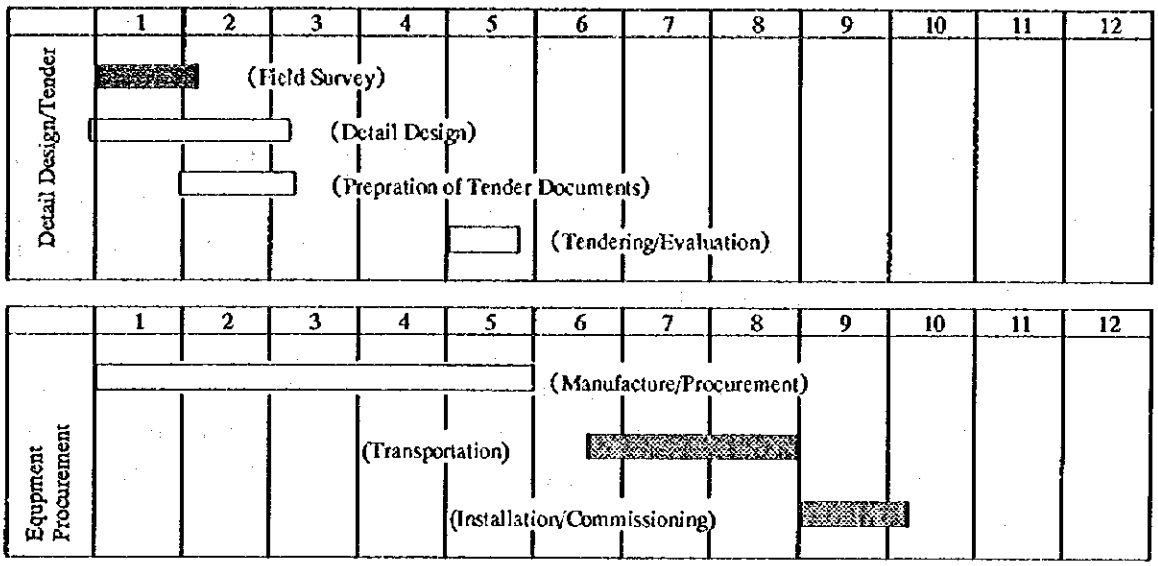
The supplier will prepare shop drawings and specifications for approval, manufacture and ship equipment to Kyrgyz.. The contractor will be responsible for delivery work to Kyrgyz from unloading, inland transportation, and installation to completion test run at Site.

(3) Completion and acceptance

Equipment, upon installation, will be test run under attendance of representatives of State Commission of the Kyrgyz Repulic on Foreign Investment and Ecoomic Assistance, the consultant, and related organizations to check that it complies with required specifications, and will be delivered to the Kyrgyz counterpart. The Kyrgyz counterpart will issue a final completion certificate to the supplier. If all the works proceed smoothly, the project will complete within 9.3 months after the signing of the contract with the supplier.

The preliminary schedule is illustrated in Fig.3-1.

Fig. 3-1 Preliminary Project Schedule



3-1-3 Obligations of the Recipient Country

(1) To finish the following works related to the realization of the Project before arriving the equipment

1) Civil work for the building contemplated to install the requested equipment, interior work of the building, foundation work of the requested equipment.
2) Electric work for receiving, transforming and distribution of electric power.
3) Plumbing work for water and drainage
4) Distribution of Medical Gas
5) Electric lighting work
6) Air conditioning work
7) Draft and ventilation work
8) Telephone and communication facility work

(2) To bear the commission to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement

(3) To ensure prompt customs clearance and internal transportation therein of the products purchased under the Grant Aid

(4) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kyrgyz with respect to the supply of the products and services underthe verified contracts.

(5) To accord Japanese nationals whose services may be required in connection with supply of the equipments and supplementary work under the verified contracts, such facilities as may be necessary for their entry into Kyrgyz and stay therein for the performance of their work.

(6) To assign properly the necessary staff for operation and maintenance of the Republic Children Hospital, and to secure the sufficient budget for maintenance, reagents/consumables, medicines, and other materials necessary for the smooth implementation of the project.

(7) To maintain and use properly and effectively the equipment supplied under the Grant Aid.

(8) To prepare and procure furniture, utensiles, appliances, fixtures necessary for the operation of Republic Children Hospital not included in the equipment supplied under Japan's Grant Aid.

3-2 Operation and Maintenance Plan

To ensure efficient and efficient use of equipment, the following two factors are essential: (1) availability of well-trained engineers and technologists responsible for operation and maintenance, and (2) adequate budgeting for procurement of spare parts and consumables, and maintenance work. As for the former, there exists a corporation named Kyrgyz Medical Engineering Corporation (MEDICO TECHNICA), which is specialized in procurement and servicing of medical equipment. MEDICO TECHNICA is a corporation, 60% of which is owned by the government and operates under the Ministry of Health. The engineers have been trained by major manufacturers and are providing repair services for X-ray units and ventilators, etc. The corporation recently started to charge for repair and maintenance fees. To save such fees to MEDICO TECHNICA, however, the hospital plans to establsh its own maintenance center by training 3 to 5 own engineers. In fact, it follows practice of National Diagnosis Center

that has latest medical equipment in the country and maintains all of them except for CT by 10 engineers of its own. The Hospital's trained enginners would play a major role in control planning and setting up a control system for daily and periodical checks for advanced and large scale equipment, so that they are always ready for use. Also as for other equipment, it is important to appoint personnel in charge of each of them, responsible for daily maintenance, and establish an organization that enforces operation and maintenance standards to all the users.

For effective operation of consumables and spare parts related to each equipment, the monthly consumption volume shall be estimated in a couple of months after opening the hospital for appropriate stock control and supply system. Because a large part of medicine and injection used in the hospital will be provided in in-hospital Pharmacy Dept., effective stock control from procurement of raw material, manufacturing and supply system will have a great influence on the hospital's management. Management System Section of Administration Dept. will handle these stock control.

(1) Maintenance cost

① X-ray unit (3 installation type units)

While manufacturers recommend replacement of x-ray tubes every other year, private hospitals in Japan replace them every 4 - 5 years. Also, these units have different service life and it is not likely that the need arises to replace all the tubes at one time. While x-ray tubes deteriorate steadily regardless of use, their frequency of replacement depends upon frequency of use. To estimate the frequency of use, Municipal Children's Clinical Hospital No.3 in Bishkek, that serves as the final referral hospital for pediatrics, is taken as an example. The hospital took 13,546 x-ray photos annually, or 40 persons per day (7,357 patients hospitalized annually and 350 outpatients visiting daily). A pediatrics hospital will generally have almost same number of annual outpatients as its number of annual inpatients, so that the number of X-ray photos taken annualy are almost no difference between outpatients and inpatiens. The hospital has 370 beds, of which 300 are actually used. Since the new hospital will handle inpatients only, the annual number of x-ray photos taken may be assumed to be one half that of the municipal hospital. If 8,000 shots (a 20% increase from half of 13,546 shots) are assumed as an upper case, 4 years seem to be an appropriate interval

for replacement of X-ray tubes. This means, the total replacement cost ranging between 4.5 million yen and 6 million yen (1.5 million ~ 2 million yen/tube x 3) incurs over 4 years, requiring the annual budget allocation of 1.5 million yen.

② Blood gas analyzer

A set of 4 electrodes will last around 2 years, costing about 500,000 yen. However, manufacturers state that replacement of all four electrodes seldom occurs. Thus, the annual replacement cost of 250,000 yen (2 electrodes) is allowed for.

③ In addition, the maintenance cost for ME equipment such as hemodialyzers and ventilators is assumed to be 1.2 million per year.

In total, 3 million yen should be allowed for maintenance cost. In addition, it is desirable that radiograph and other advanced equipment should be covered by maintenance contract with each manufacturer.

(2) Consumable cost

① X-ray units

As mentioned before, it is assumed that 8,000 X-ray photos will be taken annually, and consumable costs are estimated as follows:

Assuming that 1.5 films is used per each shot, and each film costs 150 yen on average, the film cost is calculated as follows	150 Yen × 1.5 films × 8,000 shots = 1,800,000 Yen
38 liters of developing and fixing solutions will be used for 500 films, costing 13,000 yen:	13,000 Yen ÷ 500 films × 8,000 shots × 1.5 films = 312,000 Yen
Contrast media costs 26,000 yen for 400 grams x 35 packs (14kg), and assuming that gastro-fluoroscopy consumes 200g of contrast media, 20 cases are conducted annually, intestinal fluoroscopy consumes 400g per person and 20 cases are conducted annually, then;	(200g + 400g) × 20 cases = 12,000g 26,000 Yen × 12,000g ÷ 14,000g = 22,286 Yen

Total annual consumable cost is thus 2,134,286 yen (= 251,388 soms; 1 som = 8.49 Yen).

② Blood chemistry analyzer:

It is assumed that a quarter of 40 patiets of serious condition in ICU, 10 specimen are analyzed daily. The necessary agent consist of calibrants, flush solution, KCL solution and precision control solution, and the cost for 1 specimen is about 70 yen, so, the annual cost of agent is;

70 Yen × 10 specimens × 265 days = 185,500 Yen

③ Chemistry analyzer:

To perform basic test consisting of 9 items for 1,000 specimens, the agent cost is 355,000 yen and the calibration liquid cost is 67,000 yen.

Assuming 20% of patients are tested twice weekly, the number of tests is calculated as follows:

300 beds × 0.2 × 2 × 52 weeks = 6,240 specimens

In this case, the cost for agents and calibration liquids is:

(355,000 Yen + 67,000 Yen) × 6,240 specimens ÷ 1,000 specimens
= 2.64 million

④ Hemodialyzer

Assuming that 2 patients per bed receive hemodialysis per day, and 2 beds are used for 5 days per week, the number of cases is 1,040 per year (4 persons × 5 days × 52 weeks). Consumables are dialysis membranes, syringes, stock solution, and tubes. Among them, the stock solution is produced in Hemodialysis Department of Cardiology Institute that handles adult patients and is supplied at low cost. The consumable cost per hemodialysis including the membrane cost (1,410 yen) is 2,540 yen. Thus, the annual cost is calculated as follows:

2,540 Yen × 1,040 cases = 2,641,600 Yen

For reference, Hemodialysis Department of Cardiology Institute performs

hemodialysis for 10 outpatients on average per day. Based on 3 times per week per person, the total number of hemodialysis last year exceeded 3,300 and the annual consumable cost was 1 million Soms (approximately 8,490,000 yen).

⑤ Recording paper tapes for the ICU monitoring system, defibrillators, ultrasonic scanners, electroencephalograph, and patient monitoring systems, and thermal paper for densitometers will cost around 450,000 yen per year.

⑥ Calibration liquid, agents and cleaning liquid for flame photometers will cost about 100,000 yen.

⑦ Other items including filters for distillers and cleaning liquid for ultrasonic washing equipment will amount to about 500,000 yen.

Thus, the total consumable cost is estimated at 9 million yen (=1,060,070 soms; 1 som = 8.49 Yen) per year.

(3) Financial plan

For comparison, the hospital budget for FY1995 (approved) and FY 1996 (requested) and revenues and expenditures of Municipal Children Clinical Hospital No.3 – the final referral hospital in the country – (as response to the study team's questionnaire) are summarized below:

Table 3-1
Republic Children Hospital
FY1995 Budget & FY1996 Budget plan

(unit: soms)

	1995	1996
Wages	621,000	2,300,000
Indirect Personnd Cost	194,000	940,500
Pharmaceuticals	870,000	708,300
Food	327,100	525,100
Operation (incl. Equipment)	193,700	1,140,100
Others	67,720	134,000
Building(repair)	26,480	40,000
Total	2,300,000	5,788,000

Table 3-2
Revenues and Expenditures of Municipal Children Clinical Hospital No. 3 in 1994 (Reference)

	1994 Budget	1994 Expenditure
Wages		1,604,100
Pharmaceuticals		171,100
Food		349,700
Equipment and Consumales		1,800 500
Others		80,000
Building Repair		50,000
Total	18,930,000	2,257,200

Judging from the fact that Municipal Children Clinical Hospital No.3 actually uses 300 beds, the republic hospital receives favorable treatment on budget in the areas of pharmaceuticals and operation (including equipment). The municipal hospital states in its response to our questionnaire that it requires 1.2 million Soms for maintenance that falls far short of budget allocation, and points out the shortages of spare parts and equipment as well as repair resources as serious problems.

The 1996 budget request to be submitted by the republic children hospital is based on assumption that its 300 beds will be fully utilized. The hospital will partially open in September 1995 as part of the restructuring plan consisting of relocation of the closed hospital and partial relocation of the existing hospital. For this reason, this financial plan assumes that the operating rate will be 30% in 1995 and 50% in 1996. Since equipment supplied under the project will be delivered in the fall of 1996 or later, the operating rate of the supplied equipment is assumed to be 20% in 1996. Finally, the maintenance cost is assumed not to occur in the first year after delivery (during warranty period).

The 1995 budget of 2.3 million Soms seems to be fairly reasonable in consideration to the fact that the hospital has already purchased 1 million Soms worth of furniture, fixture and medical equipment for preparation, and is expected to receive various equipment from the closed hospital as well as the existing hospital.

In 1996, the consumable cost equivalent to 25% of the estimated 9 million yen (265,000 Soms) will be allowed for. The amount accounts for 37% of the total budget related to medicines (708,300 Soms) and is affordable for the hospital.

In 1997, few maintenance cost will be required until the fall. Assuming that equipment will be used at operating rate of 80%, the consumable cost of 7.2 million yen (9 million yen × 0.8) or 848,000 Soms, and the maintenance cost of 600,000 yen (3 million yen × 0.8 ×0.25) or 70,670 Soms (incurring after the fall) will incur. Since the materials cost at Municipal Children Clinical Hospital No.3 of 171,100 Soms seems to be mostly related to medicines, say 150,000 Soms, the total pharmacueticlas cost is estimated to be 968,000 Soms, or a sum of 848,000 Soms and 120,000 Soms (150,000 Soms × 0.8). The maintenance cost accounts for 6% of the total operation cost, and if utilities and administration costs are added, the percentage remains very small.

In 1998, the maintenance cost of 3 million yen (350,000 Soms) and the consumable

cost of 9 million yen (1,060,000 Soms) will incur. The pharmaceuticlas cost will amount to 1,210,000 Soms, or a sum of 150,000 Soms and 1,060,000 Soms. The maintenance cost accounts for only 30% of the operation cost and seems to be within an affordable range. A sum of the pharmaceuticals cost and operation cost will increase by 16% between 1996 and 1997, from 1,850,000 Soms to 2,140,000 Soms. Then the amount will grow to 2,480,000 Soms in 1998, a 34% increase over 1996. Adjusted by the annual inflation rate of 3% (assuming that the labor and medicine costs will not rise at general rates of inflation), 1997 and 1998 expenditures are forecasted as follows:

Table 3-3 1994 & 1998 Estimated Expenditures of Republi Children Hospital

	1997		1998	
Wages	2,300,000×1.03=	2,369,000	2,369,000×1.03=	2,440,070
Indirect Personnel Cost	940,500×1.03=	968,715	968,715×1.03=	997,776
Pharmeceuticals	848,000+150,000×0.8=	968,000	1,060,000+150,000=	1,210,000
Food	525,100×1.03×0.8=	432,682	525,100×1.03×1.03=	557,079
Operation(incl. Equipment)	1,140,100×1.03=	1,174,303	1,174,303×1.03=	1,209,532
Others	134,000×0.8×1.03=	110,416	134,000×1.03×1.03=	142,161
Building(Repair)	40,000×1.03=	41,200	41,200×1.03=	42,436
Total		6,064,316		6,599,054

Based on the above data, a 10-year revenue and expenditure schedule has been prepared under the following assumptions:

① Number of beds: 300

② Average number of days stayed in hospital: 15 days

③ The hospital will open in September 1995, and equipment will be delivered in October 1996.

④ In 1997 and onward, the hospitalization cost will rise at 3% annually (assuming that the labor and medicine costs will not rise at general rates of inflation).

⑤ Assuming that the 1996 budget of 5,788,000 Soms (as requested by the hospital) has been compiled under the assumption of operating rate at full capacity, the hospitalization cost per patient is calculated from the annual number of inpatients at the 95% operating rate as follows:

Annual number of patients :	300 × 0.95 × 365÷15=6,935
Hospitalization cost for per patients:	5,788,000 ÷6,935 =835
Daily cost of hospitalization per patiens:	835 ÷ 15 =56

⑥ The 1997 introduction of medical insurance system is likely to be replanned and rescheduled. According to Chief of National Expert Team of "MANAS Project, Mr. T.S. Maymnaliev (Note 1), "Generally, national medical institutions will be maintained as national assets over the next few years. Thus, they will be managed from top down for the time being, with financial assistance."

⑦ However, medical facilities other than national medical institutions charge service fees. For instance, Osh City Hospital charges fees to all patients other than emergency patients and low-income people, while meals, anti cancer drugs and antituberculous drugs are provided with free of charge. Maternity Municipal Hospital No. 4 in Bishkek does not charge childbirth and hospitalization fees, but plans to charge them for all patients except for low-income people. "Thus, the charging of medical fees is introduced in a variety of forms among hospitals and clinics." (excerpt from "Central Asian Republics of Kazakhstan, Kyrgyz, Tadzhikistan, Turkmenistan, Uzbekistan: Economic Developmen and International Cooperation - Interational Development Center in Japan, March 1994")

⑧ For the purpose of cost estimation, the republic children hospital is assumed to collect 10 Soms for hospitalization fee, that covers less than 20% of the total cost (56 Soms), starting in 1977. According to the Osh City Hospital, the total food cost for inpatients is calculated as 4.5 Soms per patient and the medicine cost of 2.15 Soms. Considering the price differentials, 10 Soms seem to be an upper limit for personal payment.

⑨ Nevertheless, 50% of all inpatients are assumed to afford the hospitalization fee in the first year, followed by addition of five percentage point in the second year and onward. The difference will be paid out from the government budget.

⑩ Costs for expensive antibiotics, drugs and consumables will be recovered from the first year. 50 Soms will be collected per person, 10 patients per day.

Table 3-4 Expenditure Plan of Republic Children Hospital (1995 -- 2004)

Fiscal Year	1995	1996	1997	1998	1999
Operating Rate	30%	50%	80%	95%	95%
No. of operating beds	100	150	240	285	285
No. of New Inpatients per year	2, 433	3, 650	5, 840	6, 935	6, 935
Revenue					
Hospitalization Cost bome by patiets	0	0	438, 000	589, 302	662, 161
Special medical service fee	182, 500	187, 975	193, 614	199, 423	205, 405
Insurance Fund or Governemnt Fund	2, 300, 000	5, 788, 000	5, 432, 702	5, 810, 329	5, 929, 459
Expenditures					
Total	2, 482, 500	5, 975, 975	6, 064, 316	6, 599, 054	6, 797, 025

No. of New inpatients per year	6, 935	6, 935	6, 935	6, 935	6, 935
Revenues					
Hospitalization cost bome by patients	738, 861	819, 567	904, 451	993, 690	1, 087, 470
Special medical service fee	211, 568	217, 915	224, 452	231, 186	238, 121
Insurance Fund or Government fund	6, 050, 508	6, 173, 482	6, 298, 390	6, 425, 236	6, 554, 024
Expenditures					
Total	7, 000, 936	7, 210, 964	7, 427, 293	7, 650, 112	7, 879, 615

CHAPTER 4
PROJECT EVALUATION AND RECOMMENDATION

Chapter 4 Project Evaluation and Recommendations

4-1 Major Benefits

The project is expected to bring the following benefits if it is implemented as planned and is operated and maintained properly by the Kyrgyz side, as shown in Table 4-1.

Table 4-1 Major Benefits of the Project and Measurable Improvements

	Current state and major issues	Measures taken under the project	Major benefits/measurable improvements
1.	There is no national children's hospital that can handle cases beyond the ability of existing hospitals. These cases are sent to hospitals in Moscow or Almaty, Kazakhstan, requiring time and cost.	To supply medical equipment needed by the Republic Children Hospital, thereby to solve a problem of deteriorated child care service due to the absence of the top referral hospital.	The referral system will be developed to result in improved accessibility to advanced medical service for children, thereby to provide a sense of confidence for medical facilities and people, while contributing to the furtherance of public health and welfare.
2.	Existing children's hospitals suffer the shortage of medical equipment, including minimum required equipment for emergency use (e.g., ventilators and resuscitators), due to the lack of financial resources. In particular, cure and life saving rates of respiratory diseases -- the largest cause of death for children – are very low.	To supply equipment suitable for emergency care (including ambulances)	Cure and life saving rates are expected to improve. Combined with the decline in disease rate through preventive and primary health care strategies vigorously promoted by foreign aid organizations, the project will contribute to the decline in the number of deaths due to respiratory diseases

	Current state and major issues	Measures taken under the project	Major benefits/measurable improvements
3.	Medical equipment owned by existing children's hospitals is old and fails to perform high levels of diagnostic and testing functions. While examination is carried out by National Diagnosis Center, which cannot meet large demand. At the same time, old medical equipment causes lowering morale among doctors	To upgrade the hospital function by supplying relatively advanced equipment to be used by diagnostic and therpeutic facilities of the hospital including laboratory, physiological examination, operation theater, and X-ray department	Improved diagnostic and inspection functions will help establish an adequate hospital policy, leading to a higher cure rate. Also, the project is expected to help halt the outmigration of competent doctors.
4.	Diagnostic and treatment capabilities related to urological and genital diseases among children – significantly higher in disease rate than that in Japan – remain at low levels. In particular, child chronic nephritis patients requiring hemodialysis need to be sent to Almaty.	To reinforce medical equipment at urology/nephrology department and also to introduce hemodialyzers.	Improvement of surgical treatment in the field of pediatric urology and nephrology is expected.
5.	The lack of core facilities for pediatricians and other specialists to conduct research and study prevents the development of pediatrics in the country.	To provide a place of education and training for pre-graduate doctors, doctors, nurses and other specialists after graduation.	Development of pediatrics and the improvement of levels of child care technology are expected.

4.2 Recommendations

(1) The plan to reinforce the health care sector in Kyrgyz was formulated in 1988 under the Soviet system. Based on the plan, construction of the republic children hospital was started in 1990. Thus, the hospital was designed almost a decade ago. Under the communist regime, efficient operation was conflicting with the principle of full employment, and the design completely lacks idea of centralization of the hospital function. As a result, patients and staff are expected to walk over long distance, and rooms are partitioned into many sections to make them inconvenient for use. Also, each room is provided with a narrow, single door, partly because of heat insulation purpose. Clearly, the floor plan is not based on a well-defined purpose of use, and facility layout does not seem to comply with generally accepted planning theory or technique. In fact, the current design is likely to impede the hospital's efforts for centralization of functions.

(2) Medical equipment is selected for the project with a key objective to promote centralization of hospital functions. Though some limitations from the building design exist, the expected organization chart at full-opening planned by the hospital seems to seek some of centralization. To realize the centralization, however, it is needed that the hospital shall be organized through making clear each person's authority and responsibility, and coordinating among each work effectively and systematically so that the hospital may be united to carry out its given mission. There may be several chances to reform organizations during the period from partial opening to full opening, it is recommended that the centralization would be always bore in mind in such chances.

It is also recommended that the traffic line and job allocation in related to the following thing and each department concerned shall be considered including their transport methods.

- Meal :Meal Service Department <----> each ward
- Linens :Washing Room <----> each ward and Central Sterilizing Department

- Appliances/Utensils
  Department in charge of General <----> each department and ward
- Specimen :Ward, Operation Theater <----> Laboratory
- Sterilized materials
  Central Sterilizing Department <----> each ward and Operation theater, Laboratory
- Medicine :Pharmacy <----> each ward and Operation theater, Laboratory

The equipment planned to be supplied as "General" are infusion pumps, diagnostic sets for general, sphygmomanometers and an ambulance. Besides these, Eight stands to hook infusion listed on "Infant Care Unit" need to be conrolled by the section in charge of "General" equipment, and be lent out to other wards or departments whenver available and necessary. Also for making the effective use of a limited number of equipment, a central control system should be established. As equipment has been selected to avoid duplication, with a view to aim centralization, advanced equipment are allocated to diagnostic and therapeutic facilities such as X-ray dept, Operation Theater, Laboratory, Pharmacy and Phisiological Examination. Among them are equipment to be lent out to other department whenver necessary such as ECG in physiological examinations, and a mobile X-ray in Operation theater, which shall be controlled and maintained at X-ray dept technicians. It is important to establish a maintenance and operation system for each equipment in organizational build-up process.

(3) As pointed out in 3-2 "Operation and Maintenance Plan," equipment maintenance will require 12 million yen annually. The amount must be secured in the hospital budget. In addition, advanced medical equipment should preferably be kept in good condition through formal maintenance contracts (with additional charges). For the longer time financial planning, it is necessary to reserve fund for replacement of equipment according to their service life.

To operate the top referral children's hospital having 300 beds, the hospital needs to identify and procure basic equipment and materials including small medical equipment not included in the project, which has to be securely budgeted.

While the annual maintenance cost of 12 million yen will incur in 1998 and

onward, the maintenance cost will increase by approximately 34% over the 1996 budget. The budget of the Ministry of Health has been on the rise and the project receives much attention from President and other officials, so that special budgetary consideration will be given to the project (see Appendix 6-6). To establish some financial autonomy in future, the hospital must have revenue sources other than the government budget, including collection of fees on specific services.

Introduction of the medical insurance system in FY1997 seems to be under review as part of "the MANAS Health Sector Reform Project" which envisages a broader vision toward the securing financial resources for medical service. While the Republic Children Hospital as the national medical institution can receive financial assistance from the government, hospitals at a lower hierarchy level have moved to charge fees in a variety of ways due to financial difficulties. The republic children hospital will treat only inpatients referred by lower hospitals. As a result, certain medical services that are charged by smaller hospitals are provided with free of charge by the national hospital. Such imbalance should be corrected as early as possible, and an appropriate model for fee charging and collection should be established by the government.

In this connection, the Republic Children Hospital should attempt to establish prices for examination, diagnosis and treatment services in close consultation with the Ministry of Health. The new fee system should cover portions of hospitalization and food costs. It may take some time to realize, but the planning process will help make medical professioals conscious of the medical service cost, which is one of large benefits..

(4) For effective operation of consumables and spare parts related to each equipment, the monthly consumption volume should be estimated in a couple of months after opening the hospital to maintain an appropriate stock control and supply system. Because a large part of medicine and injection used in the hospital will be provided in in-hospital Pharmacy Dept., effective stock control from the procurement of raw material to the manufacturing and supply will have a great influence on the hospital's management.

Check record and repair record shall be kept in a book for each equipment for their effective maintenance. The hospital aims to establish its own maintenance center, for which purpose, it shall continuously train engineers who can handle equipments according to operation and maintennce manuals.

APPENDICES

Appendix 1. Member List of the Survey Team

Mr. Shin INOUE	Leader	Grant Aid Division Economic Cooperation Bureau Ministry of Foreign Affairs
Dr. Koichi MORIWAKI	Technical Advisor	Department of Pedeatrics The University of Tokyo
Mr. Masahiko KOJIMA	Project Coordinator	Second Project Management Division Grant Aid Project Management Department Japan International Cooperation Agenc
Mr. Akira NAKAMURA	Project Manager	Unico International Corporation
Dr. Torao FUJII	Equipment Planner	Unico International Corporation
Mr. Mutumi TABE	Facility Planner	Unico International Corporation
Miss Kazuko YAMAGATA	Cost Calculator	Unico International Corporation
Mr. Yoshiyuki MURAI	Interpreter	Unico International Corporation

Appendix 2. Survey Schedule

Date	Activity
April 18 (Tue.)	Arrived at Bishkek: after check-in with hotel, held a meeting with UNICO's representative to collect background information.
April 19 (Wed.)	Visited State Commission on Foreign Investments and Economic Assistance (GOSCOMINVEST) with Dr.Uzakbaev, Director of Republic Children Hospital, and explained the study team's schedule. Attended at a luncheon under invitation of Mr.Sarygulov of GOSCOMINVEST. (Afternoon) Visited the Ministry of Health, met the minister, and explained the schedule. Visited the new hospital site. Attended at a dinner party under invitation of the Minister of Health.
April 20 (Thr.)	Visited UNICEF to collect information on its activities and obtain reference materials. Visited a poli-clinic. Visited the Ministry of Health and held a kickoff meeting to explain the contents of the inception report. Attended at a luncheon under invitation of Director of Republic Children Hospital. Submitted questionnaires to the Ministry of Health. Visited Municipal Children Clinical Hospital No.3. Received a new equipment list and conducted evaluation.
April 21 (Fri.)	Visited Maternity Municipal Hospital No.4. (Dr.Moriwaki and consultants) Visited Republic Diagnostic Center (Dr.Moriwaki and consultants). Visited GOSCOMINVEST (Mr.Inoue and Mr.Kojima) Discussed the new equipment list at the Ministry of Health. Interviewed by a local newspaper.

April 22 (Sat.)	Discussed equipment selection with department chiefs of Republic Children Hospital at the Ministry of Health. Attended at a dinner party at Dr.Hassan of Urology Department.
April 23 (Sun.)	Went hiking under invitation of Vice Minister of Health. Evaluated the equipment list.
April 24 (Mon.)	Submitted the result of evaluation on the equipment list to the Ministry of Health, and explained the Japanese grant aid process as well as the preliminary project schedule. Visited Medico Technica and Municipal Emergency Hospital No.2. Submitted the draft Minutes of Discussions on Basic Design Study on the Proejct for Improvement of Medical Equipment for Republic Children Hospital in the Kyrgyz Republic.
April 25 (Tue.)	Signed the Minutes of of Discussions on Basic Design Study on the Proejct for Improvement of Medical Equipment for Republic Children Hospital in the Kyrgyz Republic (Afternoon) Attended at a concert of a reputable singer. Hosted a dinner party for the Kyrgyz counterparts.
April 26 (Wed.)	Government members of the study team returned to Japan. Visited the hospital site and checked drawings against building sites with department chiefs.
April 27 (Thr.)	Visited the hospital site and checked drawings against building sites with department chiefs.
April 28 (Fri.)	Visited the hospital site, checked drawings against building sites with department chiefs, and collected information related to building equipment from a construction manager.
April 29 (Sat.)	Analysis of source materials and internal meeting.
April 30 (Sun.)	Analysis of source materials and internal meeting.

May 1 (Mon.) (May Day)	Analysis of source materials and internal meeting.
May 2 (Tue.)	Held a meeting with hospital representatives at new hospital. (Afternoon) Visited Medico Technica to collect information on specifications for piping outlets as well as products available from third countries. Visited WHO to collect information on its activities and obtain reference materials.
May 3 (Wed.)	Visited Hemodialysis Department in Cardiology Institute to collect information on its activities and procurement of consumables. Discussed at the hospital site. Attended at a luncheon at Vice Director's house. (Afternoon) Obtained information on construction schedule and budget from Chief Accountant of Bishkek Kuruluah (Construction Organization). Attended at a dinner party at residence of Dr.Hamida, Chief of Reanimation & Intensive Therapy Dept.
May 4 (Thr.)	Discussed with Director and other staff at the hospital site to collect information. Attended at a luncheon under invitation of Director and his wife. Interviewed by Kyrgyz Republic Television (5 minutes).
May 5 (Fri.) (Constitution Day)	Moved to Osh. Attended at a luncheon under invitation of Director of Health Department of Osh Oblast.
May 6 (Sat.)	Visited Osh City No. 2 Maternity Hospital, Osh City Hospital, and Osh Oblast Children Hospital to collect information. Returned to Bishkek in the afternoon.
May 7 (Sun.)	Analysis of source materials and internal meeting.

May 8 (Mon.)	Final meeting at the hospital site and collected additional information. Visited Ministry of Health and GOSCOMINVEST for greeting. Hosted a luncheon for GOSCOMINVEST officials and Director of Republic Children Hospital. Visited the private clinic (gynecologist) to collect information.
May 9 (Tue.) (Victory Day)	Internal meeting
May 10 (Wed.)	From Bishkek to Almaty (land transport). Checked sales agents of manufacturers. (Stayed in Almaty)
May 11 (Thr.)	From Almaty to Frankfurt.
May 12 (Fri.)	Checked sales agents of manufacturers.
May 13 (Sat.)	Checked sales agents of manufacturers. Left Frankfurt in the afternoon.
May 14 (Sun.)	Arrived at Narita Airport.

Appendix 3. List of Party concerned in the Kyrgyz Republic

3.1 State Commission on Foreign Investment and Economic Assistance (GOSCOMINVEST)

Sarygulov A.I.	Vice Chairman
Duishenkul-Kyzy D.	Senior Specialist, Project Implementation Unit
Moldokulov K.A.	Project Implementation Unit Chief Specialist, Procurement
Abdyldaeva A.A.	Chief Specialist of Coordination Assistance Dept. GOSCOMINVEST General Directorate

3.2 Ministry of Health

Kasiev N.K.	Minister of Health
Dr. kalieva B.A.	Vice Minister of Health
Glinenko V.M	Vice Minister of Health
Dimitrov B.J.	Chief of Dept. of External Relations
Dr. Kushbakeeva A.K.	Chief Pediatrician of Minister of Health
Manbaetov K.B.	Chief of Dept. of Protection, Maternity & Child
Katsuba S.M.	Chief of Dept. of Economic and Finance
Aspidova G.A.	Vice Chief of Dept. of Economic and Finance

3.3 Republic Children Hospital

Dr. Uzakbaev K.A	Director
Dr. Alymkulov A.	Vice Director
Dzumakeev Z. Dz	Vice Director

Isakova	Chief Nurse
Prof. Abdurakhmanov H	Chief of Uroronephrology Dept.
Dr. Dzamankulov	Chief of Dept. of Urology
Isakoza I.	Chief of Urology Dept.
Dr. Kushubekova N.N.	Chief of Cardiology & Endocrinology Dept.
Dr. Kushubekova N.K.	Chief of Cardiorheumatology
Prof. Kodzonazarov	Chief of Gastroenterology Dept.
Dr. Alymbaev E.	Chief of Gastroenterology Dept.
Dr. Svetina	Chief of Pathology of Prematurely Borns Dept.
Dr. Glazhova I.S.	Pathology of Prematurely Borns Dept.
Dr. Mykyev K.	Chief of Prematurely Surgery Dept.
Dr. Akhmedeva H.R.	Chief of Reanimation & Intensive Therapy Dept.
Dr. Stupnina O.J.	Chief of Hemodialysis Dept.
Dzankorozova M.K.	Chemists, Chief of Pharmacy
Dr. Kozhomkulov E.J.	Chief of Laboratory
Uskenbaeva D.G.	Chief of functional diagnostics
Maksutova M.K.	Chief of Technician of X-Ray Dept.

3.4 Construction organization, etc.

Moldobaev A.M.	Director of "Bishkek Kurulush" (Construction Organization)
Sorianikov	Director of Construction, "Bishkek Kurulush"
Karikh S.M.	Chief of Construction Section, "Kyrgyzelectramontazh" (Electric Installaion Organization)

Beishevich Z.M.	Technician of Construction Installation Dept. 1 of "Bishkek Kurulush"
Bilich E.M.	Chief Accountant of Production Technology Section of Construction Installion Dept 1 of "Bishekek Kurulush"

3.5 Medical Institutions & Hospitals, etc.

K. Kojonazarov	Doctor of medicine, professor, Head of Children's Diseases Department No. 1 of the Kyrghyz State Medical Institute
Dr. I.A. Asanbekov	Main Doctor, Doctor of Medical Science, Chidren's Municipal Clinical Hospital No. 3
Dr. Tokhtogylova I.Y.	Maternity Municipal Hospital No. 4
Dr. Yasovich I.K.	Director of Kyrgyz Republic's Diagnostic Center
Tokochev B.I.	General Director, Medico Technica
Ryaskov Y.E.	Main Engineer, Medico Technica
Sergeev E.T.	Chief of Technical Dept., Medeco Technica
Bakeeva I.K.	Chief Doctor of Hospital in Cardiology Institute
Kurmankulova D.I.	Chief of Hemodialysis Dept. in Cardiology Institute
Romanenko, L.V.	Director of the Clinic Certified Doctor Gynaecologist, Expert in USI
Risaliev D.S.	Director of Health Dept. of Osh Oblast
Aitonazarov T.A.	Vice of Honoured doctor of the Osh regional department of health
Abdulyaev A.A.	Chief Pediatrician of Health Dept. of Osh Oblast
Osnonova T.O.	Chief Pediatrician of Health Dept. of Osh City
Abdimomunov T.S.	Director of Osh City Hospital

	Nuraliev A.N.	Vice Director of Osh City Hospital
	Shainazarov T.S.	Director of Osh Oblast Children Hospital
	Alichikenova S.A.	Director of Osh City No.2 Maternity Hospital

3.6 International Oganization

	R.A. Rodrigues	Assistant Representative Kyrghystan, UNICEF
	Bozgunchiev M.	Researcher, WHO Infomation Cener for Health for the Central Asian Republics