

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT
FOR
THE IMPROVEMENT IN EQUIPPING
OF MEDICAL FACILITIES
IN
GEORGIA**

MARCH 1999

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**JAPAN INTERNATIONAL COOPERATION AGENCY
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**Ministry of Health
Georgia**

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PREFACE

In response to a request from the Government of Georgia, the Government of Japan decided to conduct a basic design study on the Project for the Improvement in Equipping of Medical Facilities and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Georgia a study team from October 22 to November 20, 1998.

The team held discussions with the officials concerned of the Government of Georgia, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Georgia in order to discuss a draft basic design, and as this 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 Georgia for their close cooperation extended to the teams.

March, 1999



Kimio Fujita
President

Japan International Cooperation Agency

March, 1999

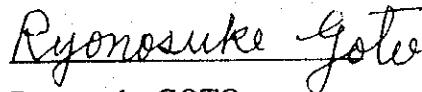
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for the Improvement in Equipping of Medical Facilities in Georgia.

This study was conducted by CRC Overseas Cooperation Inc., under a contract to JICA, during the period from October 19, 1998 to March 31, 1999. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Georgia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

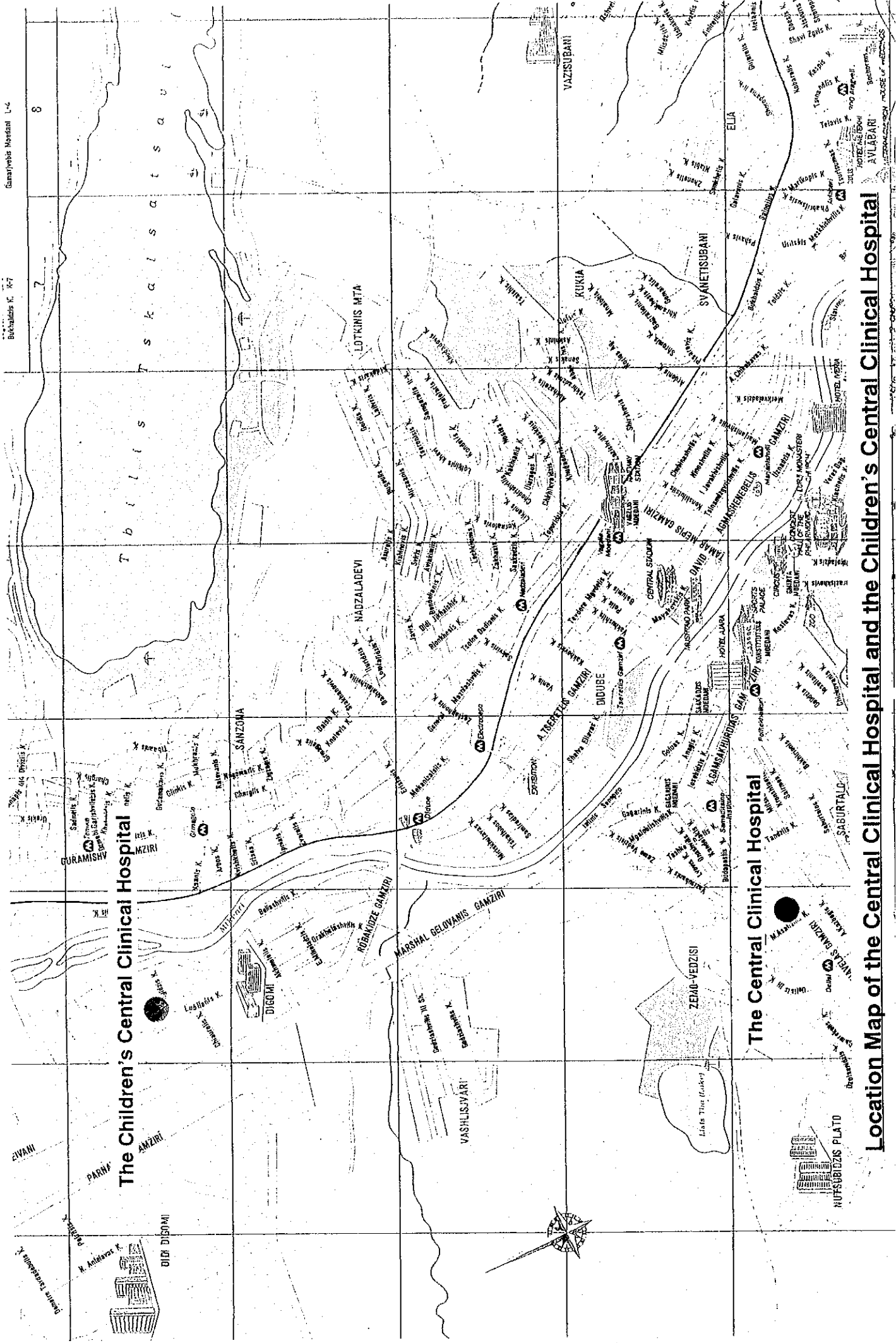
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Ryonosuke GOTO

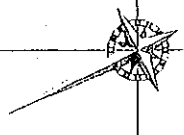
Project manager,
Basic design study team on
the Project for the Improvement in
Equipping of Medical Facilities in Georgia
CRC Overseas Cooperation Inc.



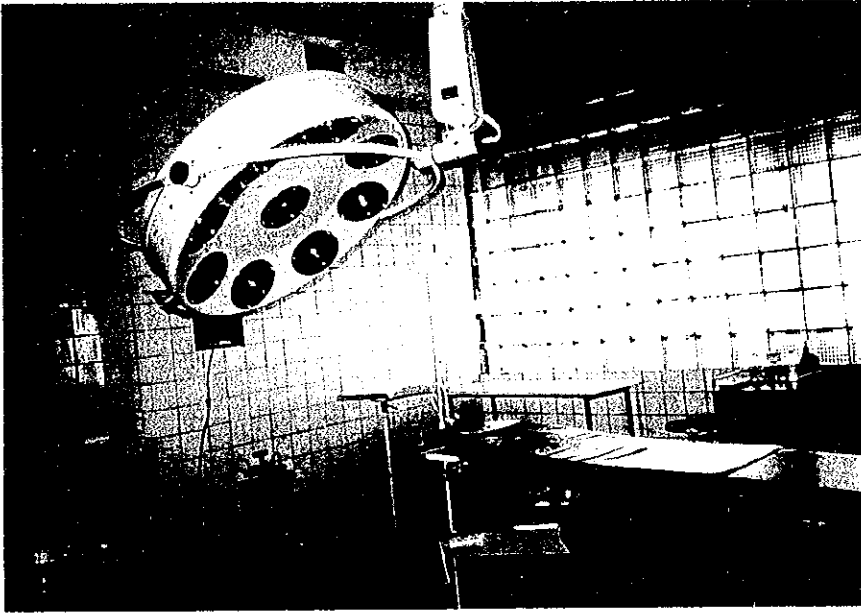
The Children's Central Clinical Hospital

The Central Clinical Hospital

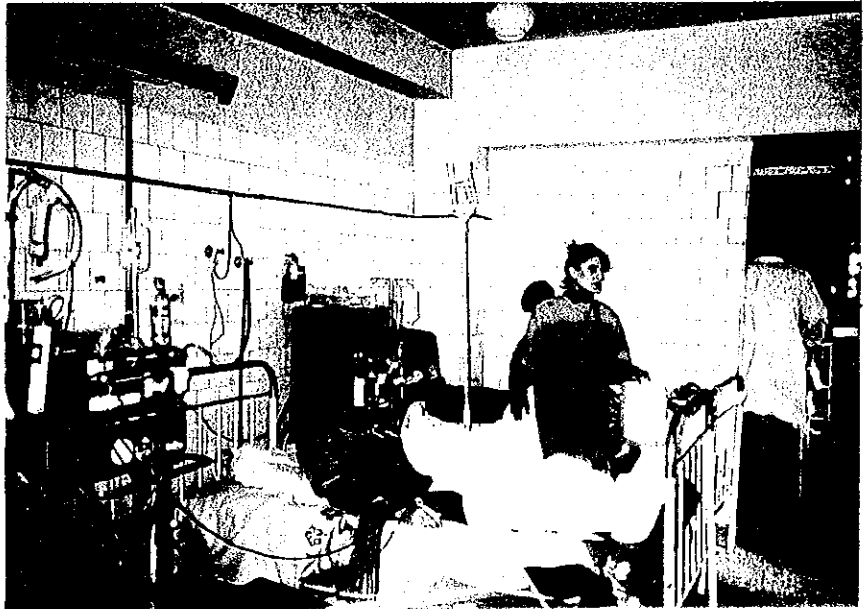
Location Map of the Central Clinical Hospital and the Children's Central Clinical Hospital



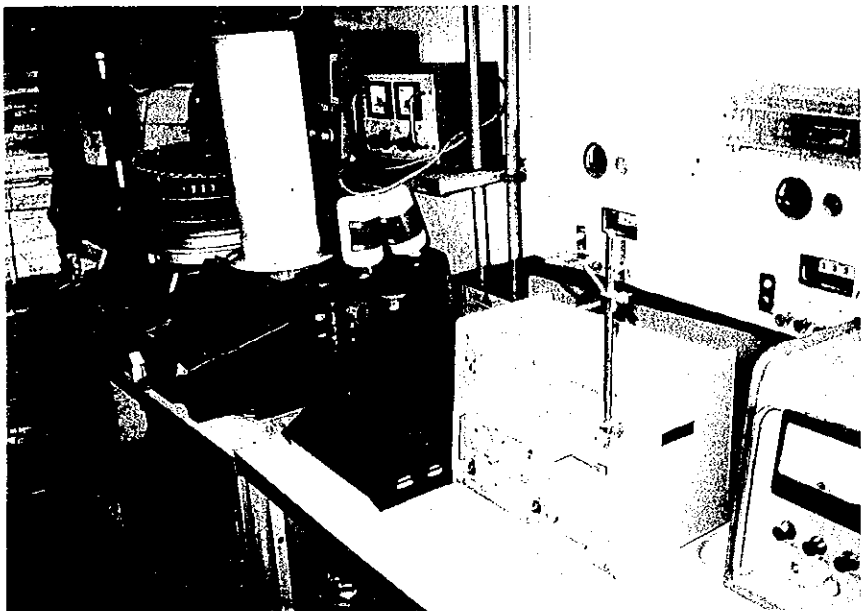
Central Clinical Hospital



Operation Theatre

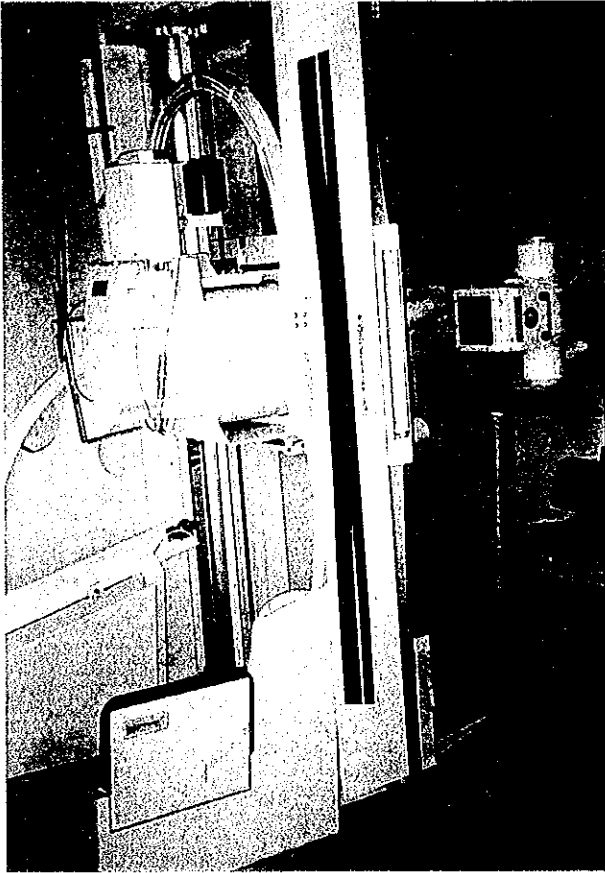


Hemodialysis Room
with Full Patients



Obsolete Laboratory Equipment

Children's Central Clinical Hospital



Obsolete Fluoroscopy X-ray Unit

Obsolete Sterilizer



Present Situation of Intensive Care Unit



Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
CIS	Commonwealth of Independent States
CT	Computed Tomography
DNA	Deoxyribonucleic Acid
E/N	Exchange of Notes
EIA	Enzyme Immuno Assay
GEL	Georgian Lari
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
ICU	Intensive Care Unit
IMF	International Monetary Fund (Un)
JICA	Japan International Cooperation Agency
M/M	Minutes of Meeting
UNICEF	United Nations Children's Fund
US\$	U.S. Dollar
WHO	World Health Organizaiton

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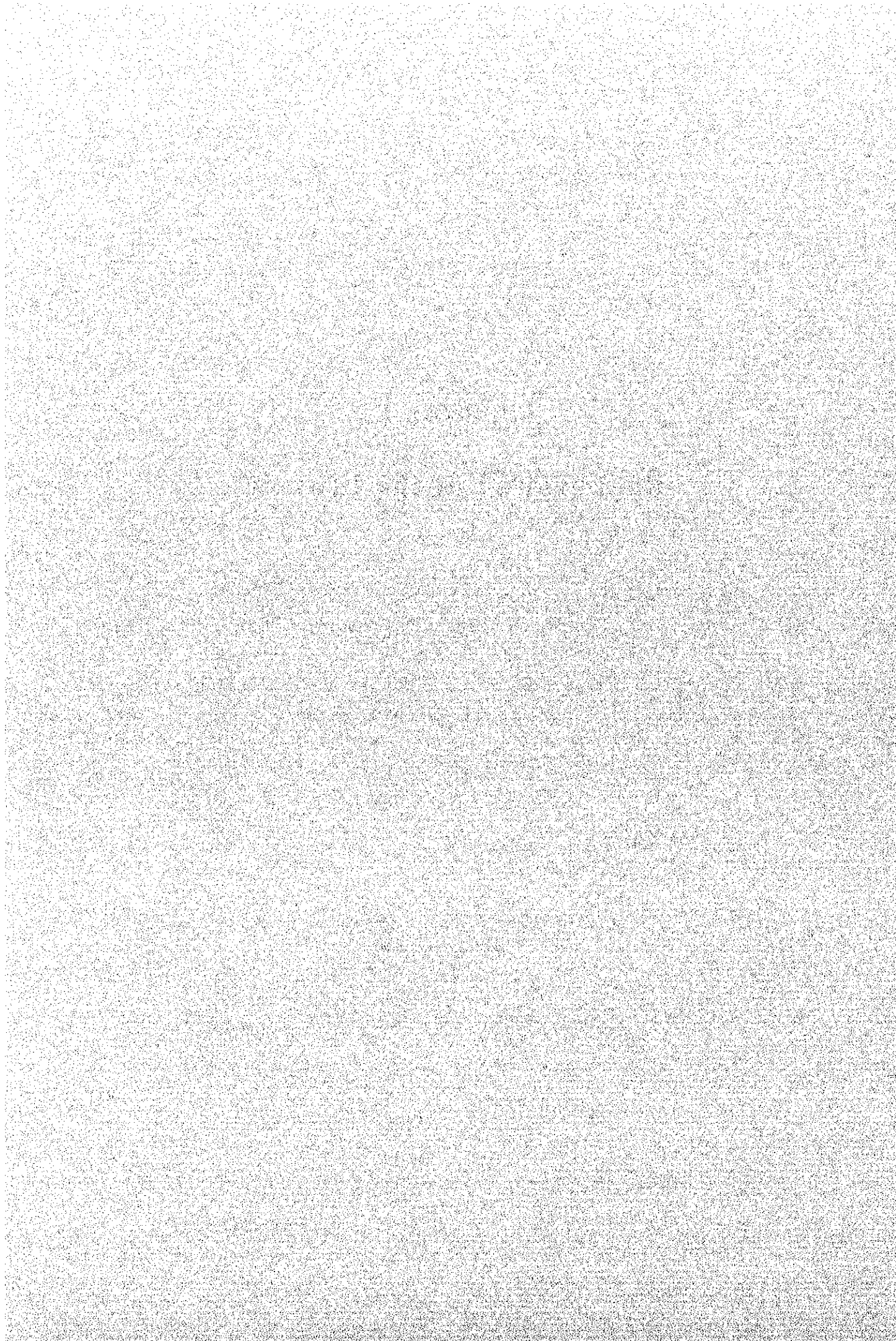
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Chapter 1

Background of the Project



Chapter 1 Background of the Project

1-1 Background

Since the breakup of the former Soviet Union, the country of Georgia has been pushing for economic reforms. However, due to the unstable political system, the collapse of industries within CIS, and regional independence movements, among other factors, the country's economy has suffered greatly. In fact, the economy showed a negative growth rate (-26.1%) between 1990 and 1996. The gross domestic product in 1994 was approximately 30% of the 1990 level, and as a result the budget allocation for the health care sector was reduced. Then, in 1995, the country's infrastructure was reorganized for economic reconstruction and stability: a new constitution was drafted, the election laws were revised, laws regulating foreign investment were reevaluated, and a new currency (the Lari) was introduced. As a result of these efforts, the country's economy has shown a growth rate of approximately 11% per year for two consecutive years. The gross domestic product in 1997 was approximately 43% of the 1991 level. The Georgian Government has long been embroiled in a heated debate with the Russian Government over the issue of oil pipelines in the Caspian Sea. Resolution of this issue, which seems to be close, will greatly contribute to the recovery of the Georgian economy.

The national health care system in Georgia has lost its ability to function, and cannot provide proper health care services due to such problems as the confusion caused by system transitions in the health care sector; economic hardship; the small fee paid by Georgia citizens for public services, as is common in former socialist countries; and the lack of health care strategies.

The Ministry of Health of Georgia has identified five main problems associated with its health care sector:

- (1) Worsening indicators for mother-child health care services caused by the lack of preventive measures and early diagnostic plans;
- (2) The inferior quality of health care services due to improper medical strategies and medical instruments, as well as ill-equipped medical institutions;
- (3) The inability to provide health care services to the poor;
- (4) An excess of medical institutions (twice the demand);
- (5) Insufficient financial resources for health care.

To improve this situation, the Ministry of Health of Georgia has proposed an "Optimization Plan." As part of the optimization of medical institutions, outpatient hospitals and clinics have been privatized and restructured. The target of this plan, the Central Clinical Hospital and the Children's Central Clinical Hospital, are included in the "Optimization Plan." It has been determined that these medical centers are strategically important, and will be operated as government-owned tertiary medical institutions instead of being privatized. However, this "Optimization Plan" does not take into account the procurement of medical instruments, thus hampering the quick recovery of hospital functions. The majority of existing medical equipment were made in the former Soviet Union approximately 15 to 20 years ago, so are antiquated. Furthermore, there is not a sufficient supply of functional instruments, thus greatly hindering medical activities. Facilities are being repaired and the obsolete medical equipment are being replaced, using the budget provided by the Ministry of Health of Georgia. Nonetheless, due to financial problems, these plans are not being implemented satisfactorily. As a result, these medical centers are not in a position to provide proper health care services.

To correct this situation and improve the quality of health care services, facilities should be repaired and obsolete medical instruments replaced promptly. This will help recover the hospital function of the two medical centers operated as tertiary medical institutions, which will ultimately improve the quality of health care services in Georgia.

Under these circumstances, the Georgian Government requested a grant-in-aid to procure medical instruments for the two medical centers. In response to this request, the Japan International Corporation Agency dispatched a preparatory study team to Georgia, from June 26 to July 13, 1998. After the necessity and propriety of this request was confirmed, a basic design study team was dispatched to Georgia, from October 22 to November 20, 1998, to conduct an on-site study. After the basic design study team returned to Japan, a basic design was drawn up based on the results of meetings with the Georgian Government, and a draft report of the basic design was compiled. To explain the components of draft final report, a draft report explanation team was dispatched to Georgia from January 17 to January 28, 1999. The present report was prepared based on this survey.

1-2 Outline of the Project

Request : November, 1997
Recipient country : Georgia
Application Source : Government of Georgia
Responsible Authorities : Ministry of Health of Georgia
Department of Medical Equipment and Technologies
Project Site : Central Clinical Hospital,
Children's Central Clinical Hospital

As a result of Basic design study, a total of 232 items were selected for procurement at the two hospitals. Although, the Central Clinical Hospital and the Children's Central Clinical Hospital requested the procurement of a total of 423 items.

Hospital Name	No.	Items
Central Clinical Hospital	112	Fluoroscopic/radiological unit, General radiological unit, Laparoscope surgery set, Anesthetic unit, Operating table, Patient monitor, Biochemical Analyzer, Blood gas analyzer, Sterilizer, Holter equipment, Ultrasound Scanner, Equipment for haemodialysis, etc.
Children's Central Clinical Hospital	120	Fluoroscopic/radiological unit, General radiological unit, Laparoscope for surgery, Anesthetic unit, Operating table, Patient monitor, Biochemical Analyzer, Blood gas analyzer, Sterilizer, Ultrasound Scanner, Infant incubator, infusion pump, ECG monitor, etc

Chapter 2

Contents of the Project

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The goal of the project is to replace the existing obsolete medical equipment at the Central Clinical Hospital and the Children's Central Clinical Hospital in the country of Georgia. This effort will restore and improve the functioning of the two hospitals, which will in turn enrich the quality of Georgia's national healthcare services.

The project complements the Georgian Government's "Optimization Plan," currently being carried out with help from the World Bank. According to a report prepared by Kaiser Permanente, the total cost for the restructuring of these hospitals is estimated at US\$11,600,000. These costs will be covered by a loan from the World Bank and by the sale of the existing facilities. Since the Optimization Plan does not provide for the procurement of medical equipment, the project bears partial responsibility for installation of the medical equipment acquired.

Together, the project and the Optimization Plan will ideally serve to maximize the limited resources available in the region while also improving the organization, facilities and equipment of the two hospitals, thus significantly enhancing the function of them.

The aim of the project is to procure 232 items for the two hospitals. **Table 2-1** lists medical equipment that are scheduled to be delivered to different departments of the two hospitals.

2-2 Basic Concept of the Project

The targeted Hospitals of the project are the Central Clinical Hospital and the Children's Central Clinical Hospital in Georgia. The goal of the project is to replace the existing obsolete medical equipment in order to improve the hospital function of these two medical centers, which will lead to a recovery and an improvement in the quality of health care services in Georgia. The highest priority is replacement of the existing medical instruments at the two medical centers, to ensure that the bare minimum number of medical instruments needed for tertiary medical institutions are included in the plan. As far as the selection of medical instruments is concerned, a priority list was prepared based on the "Basic criteria for selecting the equipment." After the appropriateness of the priority instruments was confirmed, the extent of the present plan and target instruments were determined based on the "Additional criteria for selecting the equipment" and the following

basic guidelines:

- (1) The scale of the plan takes into account the hospital size, hospital organization, and medical system following the implementation of the optimization plan.
- (2) The highest priority is the replacement of the existing antiquated diagnostic and surgical instruments, to ensure that the bare minimum number of medical instruments will be procured for the recovery of hospital functions.
- (3) The plan should be designed so that it can be implemented and managed by the Georgian Ministry of Health Care and the two targeted medical centers.
- (4) Medical instruments requiring high maintenance, as well as those used by a limited number of patients, are excluded from the present plan.
- (5) Medical instruments with a low level of medical necessity are also excluded.

Due to social issues such as the sluggish Georgian economy, post- independence; confusion caused by the introduction of a market economy; the persistent notion that public services should be available at minimal cost (a problem common to all former socialist countries); and a general lack of national healthcare strategies, the Georgian healthcare sector is beset by problems. Five specific ones can be cited: (1) worsening indicators for maternal and child healthcare, due to problems associated with the availability of preventive care and early diagnoses; (2) declining quality of healthcare services, caused by ill-equipped medical institutions and equipment and a lack of medical strategies; (3) the need to provide healthcare services to the economically disadvantaged; (4) an excess of medical institutions and facilities; and (5) insufficient funds for healthcare services.

Consequently, the Ministry of Health of Georgia is actively reorganizing and decentralizing the country's healthcare sector. The Optimization Plan represents part of the Ministry's attempts to deal with secondary and tertiary medical institutions (271 hospitals), through steps such as reduction of hospital size, integration and rearrangement of hospital organizations, and privatization of healthcare services. In March 2000, when the medical equipment designated for procurement under the project are scheduled for installation at the project sites, the Central Clinical Hospital and the Children's Central Clinical Hospital will be jointly positioned as the third-most important referral hospitals within the new organizational system. Therefore, the project takes account of the projected size and organization of the two hospitals, and of their medical systems, following implementation of the Optimization Plan.

The majority of medical equipment in the Central Clinical Hospital and the Children's Central Clinical Hospital were made fifteen and twenty years ago in the Former Soviet Union (FSU), and hence are highly obsolete by today's standards. To make matters worse, there are not enough of these obsolete equipment to meet current demands, thus crippling the functioning of the two hospitals. Neither hospital can currently function as a tertiary medical institution or provide adequate basic medical diagnoses and treatment. To improve this situation, the number-one priority is to replace the hospitals' obsolete diagnostic equipment and operating room equipment. The project is structured so as to procure the minimal amounts of medical equipment necessary to restore hospital function.

Also, the project's scope has been structured so as to be suited to the size of the two hospitals after they undergo appropriate organizational reform and centralization according to the Optimization Plan.

The Ministry of Health of Georgia and the two hospitals will be responsible for maintenance and management of all equipment provided through the project. In accordance with criteria proposed by the Japan International Cooperation Agency, only medical equipment that are assessed as maintainable and manageable should be procured; equipment failing to meet these criteria will not to be procured under the project.

As a result of Basic design study, a total of 232 items were selected for procurement at the two hospitals. Although, the Central Clinical Hospital and the Children's Central Clinical Hospital requested the procurement of a total of 423 items.

2-3 Basic Design

2-3-1 Design Concept

2-3-1-1 Policy for Medical Equipment

(1) Central Clinical Hospital

The following describes the design policy for each department scheduled to receive medical equipment.

1) Operating Theater Department

On the eleventh floor of this hospital, there are thirteen operating rooms, only six of which are currently functional. Surgeries performed on the floor include general surgeries, abdominal surgery, thoracic surgery, neurosurgery, laparoscopic surgery, and ophthalmologic surgery.

At the time the minutes were signed, the plan was to replace the medical equipment in the six functional operating rooms. However, after considering such issues as current usage of these operating rooms, projected operation rates (about 120 a month), and the results of a survey of existing equipment and peripherals, it was determined that only four operating rooms should be initially targeted. Therefore, the basic equipment necessary to improve four operating rooms will be procured.

The existing surgical instrument sets are very obsolete, and there are not enough of these instruments to perform surgery properly. Instrument sets that are used frequently, such as the general-purpose surgical instrument set, gall bladder surgical instrument set, and abdominal hysterectomy instrument set, should be procured in greater numbers. However, surgical instrument sets that are not expected to see regular use should not be procured at this point of time.

At present, all instruments in operating rooms are washed and steam-cleaned manually and sterilized in large dry autoclaves. Since these autoclaves often break down, the limited number of available surgical instruments cannot be sterilized efficiently, with numerous consequent problems. Under the hospital's current sterilization system, sterilizers are maintained at different locations, though plans call for all sterilizers to be collected into a central sterilization room. In order to ensure effective use of the surgical instruments scheduled for procurement, surgical set cleaners should be procured - not large dry autoclaves.

2) Radiology department

There are eight physicians and four technicians in this department. Though about 50,000 X-rays were performed annually within the department prior to year of independence, only about 4,000 X-rays are now taken annually. There are a total of eleven radiological units made either in the FSU or East Germany, but all are obsolete and should be replaced. There is one fluoroscopic unit, two general examination radiological units and one mobile X-ray unit that still function to some degree, but the other radiological units are unserviceable. There is one used radiological unit, made during the 1960s, that was donated under an American humanitarian aid program after the Gulf War. However, this unit does not function properly either. The manual X-ray film processor is very obsolete and barely functional. Given that many of the department's units are not functional, there is a waiting list for radiological examinations, and the department cannot meet the current

demand of 130 X-rays a day. To improve this situation, one fluoroscopic-radiological unit, one general examination radiological unit and one mobile X-ray unit should be procured.

3) Functional test department

There are eight physicians and seven nurses in this department. The majorities of the existing equipment were procured about ten years ago, and are now obsolete. These include an electrocardiograph (current workload: 400 patients a month), electroencephalograph (current workload: four patients a day), spirometer (current workload: ten patients a day) and US scanner (current workload: 15 patients a day). Latent demand is more than twice the current workload, and cannot be satisfied through use of the department's existing equipment. After the Optimization Plan is implemented, this department will function as the hospital's main diagnostic center (except for radiological examinations). Therefore, basic diagnostic equipment such as an electroencephalograph and electrocardiograph should be procured to the department. Since a Ultrasound scanner is expected to be working at full capacity, a multipurpose Ultrasound scanner equipped with various types of probes should be procured as well.

4) Central laboratory; currently the clinical laboratory

Since clinical laboratory tests at the Central Clinical Hospital are performed independently in each department, overall testing efficiency is very low. Under the Optimization Plan, all work related to clinical laboratory tests will be centralized in a central laboratory.

At present, two physicians, eleven technicians and 29 assistants run the clinical laboratory. Every analyzer is obsolete, but twenty-three different types of tests are still routinely performed in this laboratory (general hematological test: about 700 specimens a month; general urine test: about 350 specimens a month). However, due to the obsolescence of the equipment, basic tests cannot be performed with sufficient accuracy. To improve this situation, analyzers that perform basic clinical laboratory tests should be procured; however, no analyzers that require expensive reagents or that perform research-oriented tests should be procured.

In the past three years, the number of AIDS/HIV patients seen at the hospital has tripled. The Georgian Government initiated an AIDS Prevention and Treatment program last year, but only one institution in the whole country can currently perform AIDS/HIV

tests. Consequently, demand for such tests 43,084 specimens last year exceeds availability. Based on this growing demand for HIV tests and on the hospital's intended role as a tertiary medical institution, an EIA photometer should be procured. However, the per-test cost of reagents for EIA photometer is higher than that for malignant tumor or hormone tests, so a manual analyzer that performs only HIV tests and which uses relatively inexpensive reagents should be selected.

"Express laboratory equipment" refers to a simple analyzer that performs essential tests in emergency medicine, i.e., blood gas and electrolyte tests. This hospital does not have such a unit, but should: any hospital with an emergency department should have one. They are not expensive and do not require maintenance; one should be procured.

5) Endoscopy department

Three physicians trained in Moscow work in this department, and see about 30 patients a day for digestive tract examinations and biopsies. They currently use highly obsolete endoscopes that bend inappropriately. These obsolete and broken machines are able to meet only half of current demand, so new ones should be procured immediately. As part of the project, one fiberbronchoscope, one fiberduodenoscope, one fibergastroscope and one fibercolonoscope should be procured. Also, since the hospital does not currently have an endoscope washer, the department's physicians are seeing infection-related problems; an endoscope washer should also be procured.

6) Transfusion department

In this department, two physicians and thirteen staff manage blood transfusions and test blood donors. About 100 blood donors visit this hospital each week, and each donor gives 200-400g of blood. Many of the department's basic medical equipment are highly obsolete, including its refrigerators for storing blood, plasma and serum; freezers for storing antihemophilic agents, fresh plasma and blood components; and balances. Their poor performance hampers hospital operations. To improve matters, a refrigerator, two types of freezers and a balance should be procured.

7) Dialysis department

There are eight functioning dialysis machines in the Central Clinical Hospital, but four are obsolete and often break down. Demand for dialysis is high, and since it is not possible

to treat all dialysis patients in this hospital, some patients are sent to the Children's Central Clinical Hospital for treatment. At present, every functioning dialysis machine is working at full capacity, which enables a total of 400 patients monthly to be treated, but not enough functioning machines are available. Demand for dialysis far exceeds available supply. To correct this situation, the four obsolete dialysis machines should be replaced as soon as possible. Since the existing water treatment facility is not sufficient to handle four additional dialysis machines, a new water treatment facility should also be procured.

8) Intensive care unit

The intensive care units in this hospital are dispersed: there is a recovery room adjacent to the operating rooms, an intensive care unit in the emergency medicine department, and another intensive care unit in the neurosurgery department. Under the Optimization Plan, the intensive care unit in the emergency medicine department is scheduled to serve as the hospital's designated ICU area. However, this room is equipped with only one volumetric ventilator, and nothing else. The Optimization Plan calls for the room to be remodeled with utmost urgency. Six beds for critically ill patients should be procured under the project.

9) Central Sterilization Department

The central sterilization department currently has two sterilizers made in the FSU – both completely broken - and four used sterilizers donated the year before last under an American humanitarian aid program. However, one of these used sterilizers is unserviceable, and the remaining three often break down, hindering sterilization work in the hospital. To improve this situation and to establish a sound sterilization system, two sterilizers should be procured under the project.

10) Pathology department

Replacement of the existing autopsy tables was requested, but it was judged that the two existing obsolete tables would be sufficient. As a result, a new table was removed from the procurement list.

The existing postmortem instrument sets are very obsolete and many necessary instruments are missing. Since autopsies may not be performed properly, postmortem instrument sets should be procured under the project.

Since the existing corpse refrigerator is broken and unrepairable, corpses cannot be stored properly. To improve this situation, a new corpse refrigerator should be procured immediately. Even though a new refrigerator will replace the old one, some work involving electrical wiring must be done before installing the new refrigerator. The Georgian Government will be responsible for covering the cost of this remodeling work.

11) Laparoscope center

The Central Clinical Hospital has an independent Laparoscope center. Last year, Japanese humanitarian aid program donated a Laparoscope, but the relevant surgical instrument sets were not procured. Five physicians at the Laparoscope Center perform 30-40 operations a month using obsolete surgical instruments. To effectively utilize the existing Laparoscope and to meet high demand, surgical instrument sets for the Laparoscope should be procured.

(2) Children's Central Clinical Hospital

The following describes the design policy for each department where medical equipment are scheduled to be delivered.

1) Operating Theater Department

In this hospital, a variety of surgeries (including general surgery, abdominal surgery, thoracic surgery, neurosurgery and ophthalmologic surgery) are performed in the five active operating rooms. The existing instruments are obsolete and basic medical equipment such as the operating tables, operating lights, anesthetic devices, suction pumps and electrosurgical units should be replaced. At present, about eight operations are performed each day. Once new instruments are procured, the hospital will be able to handle more patients, but it is predicted that the five operating rooms will not be utilized to their full capacity. After evaluating ways to effectively utilize the existing usable ceiling-mounted operating lights and usable operating tables, three operating rooms should be equipped with appropriate medical instruments.

2) Central Sterilization Department

Four sterilizers made in the FSU (250L), all highly obsolete. One Sterilizer is completely broken while the remaining three often break down, creating problems with reliability of sterilization services. To improve this situation as soon as possible, new

sterilizers should be procured immediately. Two sterilizers with a chamber capacity of 600 liters should be enough to handle the hospital's sterilization needs.

3) Radiology department

Six physicians and five technicians work in this department, which takes about 5,000 X-rays annually. There are a total of seven radiological units (GE, FSU/ Czechoslovakia) and one manual X-ray film processor. All these pieces of equipment are obsolete and should be replaced. At present, since the existing equipment do not work sufficiently, only about 5,000 X-rays are performed annually. However, demand is much higher - at about 40 X-rays a day (or about 10,000 X-rays annually) - so one fluoroscopic-radiological unit, one general examination radiological unit, one mobile X-ray unit and one manual X-ray film processor should be procured.

4) Functional test department

Sixteen physicians and fifteen nurses are assigned to this department. The majorities of the existing equipment were procured about ten years ago, and are now obsolete. These include: an electrocardiograph (current workload: 500 patients a month), electroencephalograph (current workload: 200 patients a month) and US scanner (current work load: 60 patients a day). Latent demand is more than twice the current workload, and it will be necessary to procure enough medical equipment to satisfy this demand. After the Optimization Plan is introduced, this functional test department will function as the main diagnostic center (except for radiological examinations), so basic diagnostic equipment such as electroencephalograph and electrocardiograph should be procured to here. Since a US scanner is expected to be working at full capacity, a multipurpose US scanner equipped with various types of probes should be procured.

5) Central laboratory

Since clinical laboratory tests at the Children's Central Clinical Hospital are performed independently in each department, efficiency is very low. According to the Optimization Plan, all work related to clinical laboratory tests will be centralized in a central laboratory. At present, eight physicians and 40 assistants run the clinical laboratory. Even though every analyzer is obsolete, various types of tests (mainly hematological and urine tests) are performed. However, basic tests cannot be performed adequately because of these

obsolete machines. To run the central laboratory efficiently, analyzers that perform basic tests should be procured. Nevertheless, analyzers that require expensive reagents or perform research-oriented tests should not be procured.

“Express laboratory equipment” is a simple analyzer that performs the essential tests in emergency medicine: blood gas and electrolyte tests. This hospital does not have this equipment, but any hospital with an emergency department should have this type of equipment. This equipment is not expensive and does not require maintenance, so it should be procured.

6) Endoscopy department

Two physicians work in this department, and see about 100 patients a month, mostly for digestive tract examinations. They use highly obsolete endoscope that bend inappropriately. At present, the obsolete and broken machines can only meet half the demand, so new machines should be procured immediately. To improve this situation, a fiberbronchoscope, a fibercolonoscope, a fiberduodenoscope, a fibergastroscope, a laparoscope surgery set and a cold light source unit for pediatric use should be procured. Also, since the hospital does not currently have an endoscope cleaner, physicians are having trouble with infections, so an endoscope washer should be procured.

The existing rigid rectoscope is still functional. Also, the benefits of procuring a ureteral fiberscope alone are limited. Therefore, these equipment were removed from the procurement list.

7) Transfusion department

In this department, two physicians and ten staff are in charge of blood transfusions. Since basic equipment such as refrigerators for storing blood, plasma and serum; freezers for storing antihemophilic agents, fresh plasma and blood components; and balances are very obsolete, proper medical services cannot be provided. To improve this situation, a refrigerator, two types of freezers and a balance should be procured.

8) Intensive care unit (ICU)

The intensive care unit currently has 24 beds, but lacks proper medical equipment. As a result, despite its name, beds in the unit are rarely used. Seven physicians and 33 nurses are assigned to this unit on alternating shifts. According to the Optimization Plan,

the Ministry of Health of Georgia is planning to remodel this intensive care unit. Therefore, three beds for critically ill pediatric patients and three ICU infant incubators should be procured.

9) Department of Pathological Anatomy

At present, all relevant equipment is broken, and the storage of corpses is an issue. Since this situation should be improved as soon as possible, a corpse refrigerator and a postmortem instrument set should be procured.

10) Obstetrics and gynecology department (OB/GYN)

This department refers about 20 cases of dystocia a month to the neonatology department. The OB/GYN department does not have enough medical equipment to provide proper care, so an operating table for dystocia, incubators and other equipment should be procured.

11) Laparoscope center

There is a plan to establish a laparoscope center that is independent from the Children's Central Clinical Hospital. About 300 pediatric patients (under 15 years old) require laparoscopic examinations every year. However, this hospital does not currently have a serviceable laparoscope. In the Former Soviet Union, endoscopic surgery was extremely common, and the hospital has physicians from Moscow who are skilled at performing laparoscopic surgery. Therefore, a laparoscope should be procured immediately. Also, surgical instrument sets for the laparoscope should be procured to satisfy high medical demand in this area.

2-3-1-2 Operation and management (O&M) policy

The financial status of the Ministry of Health of Georgia is strained since the ministry is in the process of Georgian healthcare system reorganization. Nonetheless, the necessary consumable goods for medical equipment scheduled to be procured under the project must be obtained using income generated by the hospital or funds budgeted by the Ministry of Health. Funding for medical equipment maintenance must come from one of these two sources as well. Therefore, to avoid placing additional financial burdens on the hospital, open-type equipment capable of accommodating manufacturer's and third-party reagents

should be selected for procurement. Furthermore, reagents must be purchasable in Georgia or in neighboring countries at reasonable price. For those medical equipment that require periodical maintenance, it is important to consider procurement from companies that have distributors or agents in Georgia or in neighboring countries, thus ensuring the availability of periodical servicing at reasonable cost.

By considering the above issues, the project has been structured so as to reduce the financial burden on both the Ministry of Health of Georgia and the two hospitals.

2-3-1-3 Third-country procurement policy

The country of Georgia is located in the Caucasus region, i.e., at some geographic distance from Japan. Economic ties between Georgia and Japan have been weak since the former achieved independence, compared to those between Japan and other European countries, and Japanese companies have largely stayed out of the Georgian market. In terms of medical equipment, hardly any Japanese equipment has been delivered to Georgia, except for a few X-ray and endoscope equipment, so there are no distributors or agents in Georgia. Even in the capital city of Tbilisi, the number of European and American companies having distributors and agents is limited. As a result, when procuring equipment that require periodical maintenance or a continuous supply of consumable goods and reagents, it is important to consider procurement from Japanese, American or European companies having distributors or agents in Georgia or in nearby countries.

There is a long history of trade between Moscow and Georgia, and many Japanese, American and European companies maintain Moscow-based distributors for the Georgian region. However, due to the recent economic turmoil in Russia, many companies there have been unable to operate normally. Surveys of distributors in Moscow and Tbilisi provide clear support for this notion. Therefore, the following equipment should be procured from companies having distributors or agents in neighboring countries. This same concept should also apply to the trading firms selected through open tender.

Radiological unit, Ultrasound scanner, Anesthetic unit, Clinical laboratory equipment, Transfusion pump, Sterilizer, Equipment for Hemodialysis

2-3-1-4 Consumable good and spare part policy

The majority of the existing equipment in the two hospitals are unusable, due to obsolescence. One problem is that most of these equipment were made in the Former

Soviet Union, and spare parts and consumable goods can no longer be obtained. This point should be kept in mind when selecting consumable goods and spare parts for equipment scheduled to be procured under the project. Even when spare parts are available, certain repairs must be done by a trained specialist; any evidence of user tampering can often void the manufacturer's responsibility to provide repairs during the after-sales service period. Consequently, many spare parts may simply become dead stock once procured. Therefore, basic accessories such as electrodes should be procured under the project, but spare parts that require specialists for repair (e.g., electrical boards) should not.

For laboratory equipment that requires a constant supply of reagents, the relevant equipment should accommodate both manufacturer's and third-party reagents, to ensure the necessary reagents can be obtained in Georgia or in the nearby countries at reasonable cost. When acquiring reagents, issues such as expiration dates, transportation and storage must all be considered. In some cases, a procured reagent may become unusable after a certain period of time. Therefore, as a general rule, only those reagents that can be used within three months of a post-installation test run should be procured. This same concept should be applied to transfusion sets, which implies that open-type transfusion pumps should be procured under the project. Since the existing equipment for hemodialysis is scheduled to be replaced, models capable of accommodating the consumable goods available in Georgia should be procured. Also, when procuring equipment requiring printer paper or film, models that can accommodate inexpensive replacements should be selected, and enough printer paper or film to conduct a post-installation test run should be procured.

2-3-1-5 Inland transportation policy

The medical equipment scheduled to be procured under the project will be transported through Poti port.

2-3-1-6 Policy for term of works

As a general rule, the project should be completed within one fiscal year.

2-3-1-7 Policy concerning the Georgian government's responsibilities

The main aim of the project is to replace obsolete equipment. Along these lines, the areas of the two hospitals where the new equipment will be installed have mostly been prepared. There are no problems with basic installation issues such as electrical and

plumbing facilities.

However, for the following medical equipment, some renovating work will be necessary to allow either their installation or transportation to a designated area. The Georgian Government will be responsible for the cost of such renovation work. Both the Central Clinical Hospital and Children's Central Clinical Hospital are included in the Optimization Plan, and the Ministry of Health will bear responsibility for renovating work through a loan from the World Bank.

Areas needing renovating or reinforcement work:

(1) Central Clinical Hospital

1) Radiological unit room (No. 2 #7: 7.44m x 5.49m) Cost: US\$ 1,650

There is enough space to install the new instrument, and X-ray protection measures are already in place. However, one double-hinged door with a transom blocking panel (2.33m x 1.2m : lead equivalent of 2mm) should be installed in the space facing the corridor. Also, the floor should be reinforced.

2) Fluoroscopy room (No. 2 #8: 7.44m x 5.49m) Cost: US\$ 1,650

There is enough space to install the new instrument, and X-ray protection measures are already in place. However, one double-hinged door with a transom blocking panel (2.33m x 1.2m : lead equivalent of 2mm) should be installed in the space facing the corridor. Also, the floor should be reinforced.

3) Corpse refrigerator (No 4 #16: 5.23m x 3.93m) Cost: US\$ 500

The area where the new refrigerator is scheduled to be installed does not have an electrical outlet, so a switch box must be provided by extending the wiring from the power distribution board in the building.

(2) Children's Central Clinical Hospital

1) Radiological unit room (No. 2 #47: 5.94m x 4.71m) Cost: US\$ 9,650

The window facing the outside (height of 2m from the floor), and the entire entrance door (2.06m x 0.7m) require lead lining (lead equivalence of 2mm). Also, some repair work will be necessary after the partition wall is removed.

2) Fluoroscopy room (No. 2 #8: 7.44m x 5.49m)

Cost: US\$ 14,240

The window facing the outside (height of 2m from the floor), and the entire entrance door (2.06m x 0.7m) require lead lining (lead equivalence of 2mm). The existing concrete and brick wall, up to the lower edge of the ceiling, require radiation protection measures (mortar and painting).

3) Sterilizers (No. 5 #64: 5.23m x 3.93m)

Cost: US\$ 2,050

In order to deliver the new sterilizers, part of the existing door must be removed. After the sterilizers are installed, the door must be repaired. Electrical power will be secured by extending the wiring from the substation located in the floor under the sterilization room.

2-3-2 Basic Design

This section deals with the basic plan for selecting major medical equipment judged appropriate for the project based on the results of the basic design study. **Table 2-1** lists medical equipment that are scheduled to be delivered to different departments of the two hospitals.

2-3-2-1 Total concept of the project

The goal of the project is to replace the existing obsolete medical equipment in order to improve the hospital function of these two medical centers, which will lead to a recovery and an improvement in the quality of health care services in Georgia. The highest priority is replacement of the existing medical instruments at the two medical centers, to ensure that the bare minimum number of medical instruments needed for tertiary medical institutions are included in the plan. As far as the selection of medical instruments is concerned, a priority list was prepared based on the "Basic criteria for selecting the equipment." After the appropriateness of the priority instruments was confirmed, the extent of the present plan and target instruments were determined based on the "Additional criteria for selecting the equipment".

The Ministry of Health of Georgia and the two hospitals will be responsible for maintenance and management of all equipment provided through the project. In accordance with criteria proposed by the Japan International Cooperation Agency, only medical equipment that are assessed as maintainable and manageable should be procured;

equipment failing to meet these criteria will not to be procured under the project.

2-3-2-2 Equipment Plan

(1) Radiological units

For the fluoroscopic/radiological unit, a remote-control type unit should be procured so that fluoroscopy and X-ray can be performed from a control room through a TV monitor. Under this arrangement, an operator monitors test subjects through the lead glass and TV monitor and controls every aspect of the test: body-position changes, fluoroscopic and irradiation field selection, compression, snapshots, and test conditions. This configuration minimizes the operator's radiation exposure. Also, when procuring a radiological unit, Bucky table/movable-type radiological units should be selected, in view of operability and maneuverability considerations.

Since new equipment will replace the existing equipment, the rooms where these equipment are scheduled to be installed already have a basic X-ray protection measures in place; no major reconstruction work is necessary. However, in the Central Clinical Hospital, the floor must be reinforced and the door must be modified. In the Children's Central Clinical Hospital, the window must be blocked and the door modified in the room where the fluoroscopic-radiological unit is scheduled to be installed. Also, the partitioning wall must be removed, the window blocked, and the door modified in the room where the general examination radiological unit is scheduled to be installed.

Also, when procuring a mobile X-ray unit, a conventional type unit should be selected. Through the use of an inverter, mobile X-ray units can capture high-frequency output and high dose-rate radiographs. Also, these units should be equipped with a current regulating function to minimize waiting time. Furthermore, these units should be operable with batteries so that they can be shared among various departments.

There are no major problems associated with maintenance costs of these equipment, but it will be necessary to consider availability of post-installation technical servicing.

For those medical equipment that require periodical maintenance, it is important to consider procurement from companies that have distributors or agents in Georgia or in neighboring countries, thus ensuring the availability of periodical servicing at reasonable cost.

(2) Ultrasound scanners (US scanners)

This instrument is widely used today to examine internal organs because it is easy to use and involves no radiation exposure. Centralization is an emphasis of the project, so a multipurpose doppler US scanner (which can also examine the circulatory organs) and a mobile US scanner, capable of B/M mode diagnostic imaging, should be procured. US scanners should accommodate various types of probes so that they can be shared among various departments. Probes should be frequency adjustable, so that physicians can examine ailments over a range of fields (e.g., by using probes that examine digestive organs, circulatory organs or urinary organs, and probes used in neonatology or OBGYN units (vaginal probes).

(3) Endoscopes

Flexible and rigid endoscopes that can be equipped with various accessories should be selected. To avoid duplicating accessories, the number of shared accessories (i.e., light source, monitoring system, electrosurgical unit, etc.) should be adjusted accordingly at each hospital. Also, a standard laparoscope accessory set should be procured. However, since the Central Clinical Hospital already has a German laparoscope (by Stoltz Ltd.) that was donated by a Japanese humanitarian aid program, instruments that fit this equipment should be procured.

(4) Equipment for hemodialysis

There are many patients who require hemodialysis, and the hemodialysis equipment to be procured will be utilized to its full capacity. As such, two key considerations are ability for routine inspection and access to a continuous supply of consumable goods. The equipment procured should thus be able to accommodate locally produced consumable goods and to be supplied technical service locally.

(5) Sterilizers

Centralization-related considerations suggest that two large, high-pressure sterilizers should be procured. Based on current usage patterns, the capacity of the two new sterilizers should be about 500 liters. In the Central Clinical Hospital, once the two existing large (and completely broken) sterilizers in the central sterilization room are removed, there should be no problems installing the new sterilizers. In the Children's Central Clinical

Hospital, some electrical work is necessary before the new sterilizers can be installed in the designated area.

(6) Laboratory equipment

Basic laboratory equipment should be procured by considering the cost of reagents and consumable goods and the ease of acquiring these products. Also, laboratory equipment should be serviced in Georgia. Furthermore, reagents must be purchasable in Georgia or in neighboring countries at reasonable price.

(7) Operating tables

All the operating tables planned for procurement should be equipped with an electrical adjuster, so that patient body position can be altered to accommodate various types of surgeries. A multi-purpose operating table, gynecological table or neurosurgery table should be procured.

(8) Surgical instruments sets

Basic surgical instruments should be procured under the project. After consulting with physicians at each hospital, standard surgical sets used in Japan should be selected. Also, monopolar and bipolar electrosurgical units should be procured so that they can be used for coagulation and incisions by adjusting output.

(9) Operating lights

In order for hospital surgeons to be able operate smoothly under sufficient lighting, shadowless operating lights should be procured. Since new surgical lights will replace the existing lights, there should not be any problem with utility hook-ups or installation of ceiling lamps.

(10) Anesthetic apparatus with Ventilator

Anesthetic unit with Ventilator should be procured, so that intravenous, spinal or epidural anesthesia can be performed. Each apparatus should be equipped with safety devices to ensure:

- a) immediate connection and/or shut-off, using an oxygen gas safety block system;
- b) no simultaneous administration of two anesthetic gases; and

c) minimal oxygen concentration is maintained. The most commonly utilized halothane or isoflurane type vaporizers should be selected.

(11) Patient monitoring units

Bedside monitors that measure regular biological parameters (ECG, SpO₂, body temperature, non-invasive blood pressure and respiration) should be procured for the ICU. Due to the structure of the rooms where these monitors are scheduled to be used, a central monitoring system will not be employed.

Table 2-1 Equipment List

Central Clinical Hospital

Item No.	Dept.	Equipment Name	Qty.
A 1	Blood Bank	Blood refrigerator	1
A 2	Blood Bank	Blood bags' seal machine	1
A 3	Blood Bank	Blood units balance	1
A 4	Blood Bank	Centrifuge for blood bags	1
A 5	Blood Bank	Freezer (-70C)	1
A 6	Blood Bank	Freezer, blood plasma	1
A 7	Central Laboratory	Automatic cell counter	1
A 8	Central Laboratory	Balance, analytical	1
A 9	Central Laboratory	Bilirubinometer	1
A 10	Central Laboratory	Biochemical analyzer	1
A 11	Central Laboratory	Blood gas analyzer	1
A 12	Central Laboratory	Centrifuge, microhematocryt	1
A 13	Central Laboratory	Centrifuge, cyto	1
A 14	Central Laboratory	Centrifuge, general	1
A 15	Central Laboratory	Centrifuge, serologic	1
A 16	Central Laboratory	Centrifuge, universal	1
A 17	Central Laboratory	Coagulator analyzer, semi-automatic	1
A 18	Central Laboratory	Differential counter	1
A 19	Central Laboratory	Digital colony counter	1
A 20	Central Laboratory	EIA Incubator	1
A 21	Central Laboratory	EIA Photometer (reader)	1
A 22	Central Laboratory	EIA Washer	1
A 23	Central Laboratory	Electrolyte analyzer	1
A 24	Central Laboratory	Electrophoresis unit	1
A 25	Central Laboratory	Incubator, laboratory	1
A 26	Central Laboratory	Magnetic stirrer	1
A 27	Central Laboratory	Microscope, Binocular	5
A 28	Central Laboratory	Refrigerator, laboratory	1
A 29	Central Laboratory	Spectrophotometer, UV-VIS	1
A 30	Central Laboratory	Staining equipment	1
A 31	Central Laboratory	Urine analyzer	1
A 32	Central Laboratory	Water bath, universal	1
A 33	Central Laboratory	Water distiller & deionizing	1
A 34	Central Laboratory	pH meter	1
A 35	Central Laboratory	Sterilizer, dry	1
A 36	CSSD	Sterilizer, steam, horizontal	2
A 37	Diagnostic C.	Electrocardiograph, 3 channel	2
A 38	Diagnostic C.	Electrocardiograph, 6 channel	1
A 39	Diagnostic C.	Electroencepalograph, 16 channel	1
A 40	Diagnostic C.	Holter equipment	1
A 41	Diagnostic C.	Scale, adult, antropometric	5
A 42	Diagnostic C.	Spirometer	1
A 43	Diagnostic C.	US probe, abdominal	1
A 44	Diagnostic C.	US probe, cardiology	1
A 45	Diagnostic C.	US probe obst/gynecological	1
A 46	Diagnostic C.	US probe, urology	1
A 47	Diagnostic C.	US scanner, multipurpose	1
A 48	Diagnostic C.	US scanner, portable	1
A 49	Emergency	Trolley, emergency	1
A 50	Emergency	Express laboratory equipment	1
A 51	Endoscopy	Cold light source unit	2
A 52	Endoscopy	Fiberbroncoscope	1
A 53	Endoscopy	Fibercolonoscope	1
A 54	Endoscopy	Fiberduodenoscope	1

Table 2-1 Equipment List

Central Clinical Hospital

Item No.	Dept.	Equipment Name	Qty.
A 55	Endoscopy	Fibergastroscope	1
A 56	Endoscopy	Washer, flexible endoscopes	1
A 57	ENT	Instrument set for Othorinolaringology	1
A 58	General	Sphygmomanometer, adult, table	5
A 59	General	Sphygmomanometer, table	21
A 60	General	Suction pump, low pressure	15
A 61	General	Surgical minor set	11
A 62	Diagnostic C.	Colposcope	1
A 63	Hemodialysis	Equipment for hemodialysis	4
A 64	Hemodialysis	Equipment for preparation dis. water	1
A 65	ICU	Functuional beds	6
A 66	ICU	Infusion pump, volumetric	8
A 67	ICU	Laryngoscope, 3 curved blades	1
A 68	ICU	Monitor ECG/HR/Temp/Respiration	6
A 69	ICU	Oxymeter, pulse	3
A 70	ICU	Resuscitator, manual, adult	10
A 71	ICU	Ventilator volumetric, adult	1
A 72	ICU	Ventilator, adult, mobile	4
A 73	Laparo. C.	Laparoscope surgery set	1
A 74	Ophthamology	Otho-ophthalmoscope	6
A 75	Operation Teatre	Sterilizer (surgical set cleaner)	1
A 76	Operation Teatre	Abdominal hysterectomy instrument set	2
A 77	Operation Teatre	Abrams pleural biopsy set	1
A 78	Operation Teatre	Anesthetic unit with ventilator	4
A 79	Operation Teatre	Defibrillator/monitor	2
A 80	Operation Teatre	Electrosurgical unit	3
A 81	Operation Teatre	Gall bladder surgical instrument set	2
A 82	Operation Teatre	Gynaecology basic set	1
A 83	Operation Teatre	Instrument set for Urology	1
A 84	Operation Teatre	Intestinal surgical instruments set	1
A 85	Operation Teatre	Lamp, examination, mobile	5
A 86	Operation Teatre	Lamp, surgical batteries, mobile	4
A 87	Operation Teatre	Lamp, surgical, ceiling	4
A 88	Operation Teatre	Laryngoscope, adult	6
A 89	Operation Teatre	Negatoscope, 3 parts	3
A 90	Operation Teatre	Operating table (general)	4
A 91	Operation Teatre	Suction pump, high pressure	6
A 92	Operation Teatre	Suction pump, toracic	2
A 93	Operation Teatre	Surgical instruments set, large	4
A 94	Operation Teatre	Surgical microscope	1
A 95	Operation Teatre	Thyroidectomy surgical instrument set	1
A 96	Operation Teatre	Tracheostomy set	1
A 97	Operation Teatre	Tubal ligation set	1
A 98	Operation Teatre	Vaginal repair & hysterectomy inst. set	1
A 99	Operation Teatre	Vasectomy surgical instrument set	1
A 100	Pathology	Corpses refrigerator, 3 drawers	1
A 101	Pathology	Postmortem instrument set	1
A 102	X-Ray	Dark room light, inactinic filter	2
A 103	X-Ray	Exposimeter, automatic	1
A 104	X-Ray	Fluoroscopic/radiologic unit	1
A 105	X-Ray	Image intensifying TV system	1
A 106	X-Ray	Negatoscope, 2 parts	2
A 107	X-Ray	Negatoscope, 4 parts	2
A 108	X-Ray	Radiologic unit, general examination	1

Table 2-1 Equipment List

Central Clinical Hospital

Item No.	Dept.	Equipment Name	Qty.
A 109	X-Ray	X-ray film cassettes (package)	1
A 110	X-Ray	X-ray film processor, manual	1
A 111	X-Ray	X-ray protecting apron	2
A 112	X-Ray	X-ray unit, mobile	1

Table 2-1 Equipment List

Children's Central Clinical Hospital

Item No.	Dept.	Description	Qty.
B 1	Blood Bank	Blood bags' seal machine	1
B 2	Blood Bank	Blood refrigerator	1
B 3	Blood Bank	Blood units balance	1
B 4	Blood Bank	Centrifuge for blood bags	1
B 5	Blood Bank	Freezer (-70C)	1
B 6	Blood Bank	Freezer, blood plasma	1
B 7	Central Laboratory	Automatic cell counter	1
B 8	Central Laboratory	Balance, analysis	1
B 9	Central Laboratory	Bilirubinometer	1
B 10	Central Laboratory	Biochemical analyzer	1
B 11	Central Laboratory	Blood gas analyzer	1
B 12	Central Laboratory	Centrifuge, microhematocryt	1
B 13	Central Laboratory	Centrifuge, cyto	1
B 14	Central Laboratory	Centrifuge, for haematocrite	1
B 15	Central Laboratory	Centrifuge, general	1
B 16	Central Laboratory	Centrifuge, serologic	1
B 17	Central Laboratory	Centrifuge, universal	1
B 18	Central Laboratory	Coagulator analyzer, semi-automatic	1
B 19	Central Laboratory	Differential counter	1
B 20	Central Laboratory	Digital colony counter	1
B 21	Central Laboratory	Electrolyte analyzer	1
B 22	Central Laboratory	Electrophoresis unit	1
B 23	Central Laboratory	Incubator, laboratory	1
B 24	Central Laboratory	Magnetic stirrer	1
B 25	Central Laboratory	Microscope, binocular	7
B 26	Central Laboratory	pH-meter	1
B 27	Central Laboratory	Refrigerator, laboratory	1
B 28	Central Laboratory	Spectrophotometer, UV-VIS	1
B 29	Central Laboratory	Staining equipment	1
B 30	Central Laboratory	Urine analyzer	1
B 31	Central Laboratory	Sterilizer, dry	1
B 32	Central Laboratory	Water distiller & deionizing	1
B 33	CSSD	Sterilizer, steam, horizontal	2
B 34	Diagnostic C.	Electrocardiograph, 3 channel	2
B 35	Diagnostic C.	Electrocardiograph, 6 channel	1
B 36	Diagnostic C.	Electroencephalograph, 16 channel	1
B 37	Diagnostic C.	Scale, adult/ped., antropometric	1
B 38	Diagnostic C.	Scale, infant, antropometric	1
B 39	Diagnostic C.	Spirometer	1
B 40	Diagnostic C.	US probe, abdominal	1
B 41	Diagnostic C.	US probe, cardiology	1
B 42	Diagnostic C.	US scanner, multipurpose	1
B 43	Diagnostic C.	US scanner, portable	1
B 44	Emergency	Trolley, emergency	1
B 45	Emergency	Express laboratory equipment	1
B 46	Endoscopy	Cold light source unit	2
B 47	Endoscopy	Fiberbroncoscope, ped	1
B 48	Endoscopy	Fibercolonoscope, ped	1
B 49	Endoscopy	Fiberduodenscope, ped	1
B 50	Endoscopy	Fibergastroscope, ped	1
B 51	Endoscopy	Washer, flexible endoscopes	1
B 52	ENT	Instrument set for Othorinolaringology	1
B 53	General	Sphygmomanometer, table, adult/ped.	15
B 54	General	Sphygmomanometer, infant, mobile	5
B 55	General	Sphygmomanometer, neonatal, mobile	4
B 56	General	Suction pump, low pressure	12

Table 2-1 Equipment List

Children's Central Clinical Hospital

Item No.	Dept.	Description	Qty.
B 57	General	Surgical minor set	10
B 58	GY.OB	Caesarian set	1
B 59	GY.OB	Colposcope	1
B 60	GY.OB	Delivery table	1
B 61	GY.OB	Gynaecology basic set	1
B 62	GY.OB	Infant incubator, normal	3
B 63	GY.OB	Instrument set for delivery	1
B 64	GY.OB	Instrument set for Obs. & Gyn. Exam/treat.	1
B 65	GY.OB	Operating table (general and cesaria)	1
B 66	GY.OB	Suction pump, gynecological	2
B 67	ICU	Functional beds	3
B 68	ICU	Infant incubator, ICU	3
B 69	ICU	Infant warmer	2
B 70	ICU	Infusion pump, syringe, infant	3
B 71	ICU	Infusion pump, volumetric	4
B 72	ICU	Laryngoscope, 3 curved blades, infant	2
B 73	ICU	Laryngoscope, adult/ped.	1
B 74	ICU	Laryngoscope, ped	1
B 75	ICU	Laryngoscope, straight blade, infant	1
B 76	ICU	Monitor ECG/HR/Temp/Respiration	6
B 77	ICU	Nebulizer ultrasonic	4
B 78	ICU	Oxymeter, pulse	3
B 79	ICU	Resuscitator, manual, adult/pediatric	10
B 80	ICU	Ventilator volumetric, adult	1
B 81	ICU	Ventilator volumetric, infant	2
B 82	ICU	Ventilator volumetric, ped.	2
B 83	ICU	Ventilator, adult/ped.	1
B 84	Laparo. C	Laparoscope for surgery	1
B 85	Ophthalmology	Otho-ophthalmoscope	5
B 86	Operation Theatre	Abdominal hysterectomy instrument set	1
B 87	Operation Theatre	Abrams pleural biopsy set	1
B 88	Operation Theatre	Anesthetic unit with ventilator	3
B 89	Operation Theatre	Defibrillator/monitor	1
B 90	Operation Theatre	Defibrillator, neonatal pads	1
B 91	Operation Theatre	Electrosurgical unit	3
B 92	Operation Theatre	Intestinal surgical instruments set	1
B 93	Operation Theatre	Lamp, surgical batteries, mobile	3
B 94	Operation Theatre	Lamp, surgical, ceiling	2
B 95	Operation Theatre	Negatoscope, 3 parts	2
B 96	Operation Theatre	Operating table (general)	2
B 97	Operation Theatre	Suction pump, high pressure	2
B 98	Operation Theatre	Suction pump, toracic	3
B 99	Operation Theatre	Surgical instruments set, large	3
B 100	Operation Theatre	Surgical microscope	1
B 101	Operation Theatre	Thyroidectomy surgical instrument set	1
B 102	Operation Theatre	Tracheostomy set	1
B 103	Operation Theatre	Tracheostomy set, infant	1
B 104	Operation Theatre	Tubal ligation set	1
B 105	Operation Theatre	Vaginal repair & hysterectomy inst. Set	1
B 106	Operation Theatre	Vasectomy surgical instrument set	1
B 107	Outpatient	Lamp, examination, mobile	3
B 108	Patholgy	Corpses refrigerator, 3 drawers	1
B 109	Patholgy	Postmortem instrument set	1
B 110	X-Ray	Dark room light, inactinic filter	1
B 111	X-Ray	Exposimeter, automatic	1
B 112	X-Ray	Fluoroscopic/radiologic unit	1
B 113	X-Ray	Image intensifying TV system	1

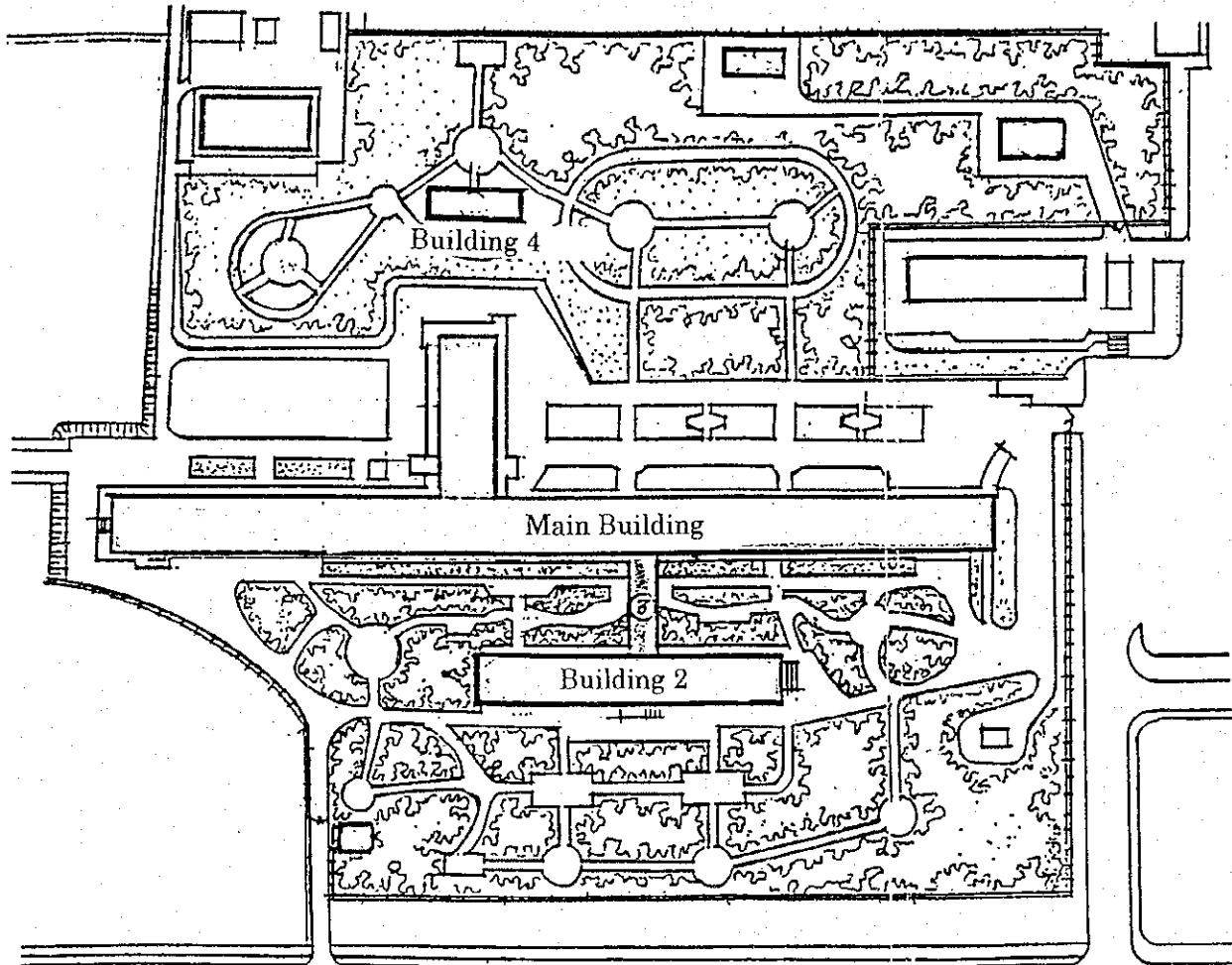
Table 2-1 Equipment List

Children's Central Clinical Hospital

Item No.	Dept.	Description	Qty.
B 114	X-Ray	Negatoscope, 2 parts	1
B 115	X-Ray	Negatoscope, 4 parts	1
B 116	X-Ray	Radiologic unit, general examination	1
B 117	X-Ray	X-ray film cassettes (package)	1
B 118	X-Ray	X-ray film processor, manual	1
B 119	X-Ray	X-ray protecting apron	2
B 120	X-Ray	X-ray unit, mobile	1

2-3-2-3 Plan of Central Clinical Hospital and Children's Central Clinical Hospital

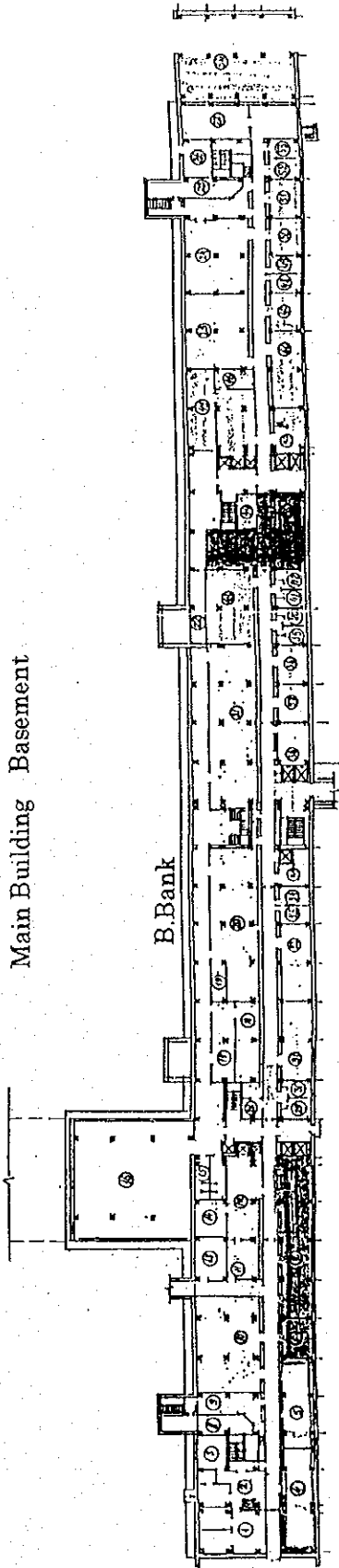
Plan of the two Clinical Hospitals are shown in Fig 2-1 and Fig. 2-2



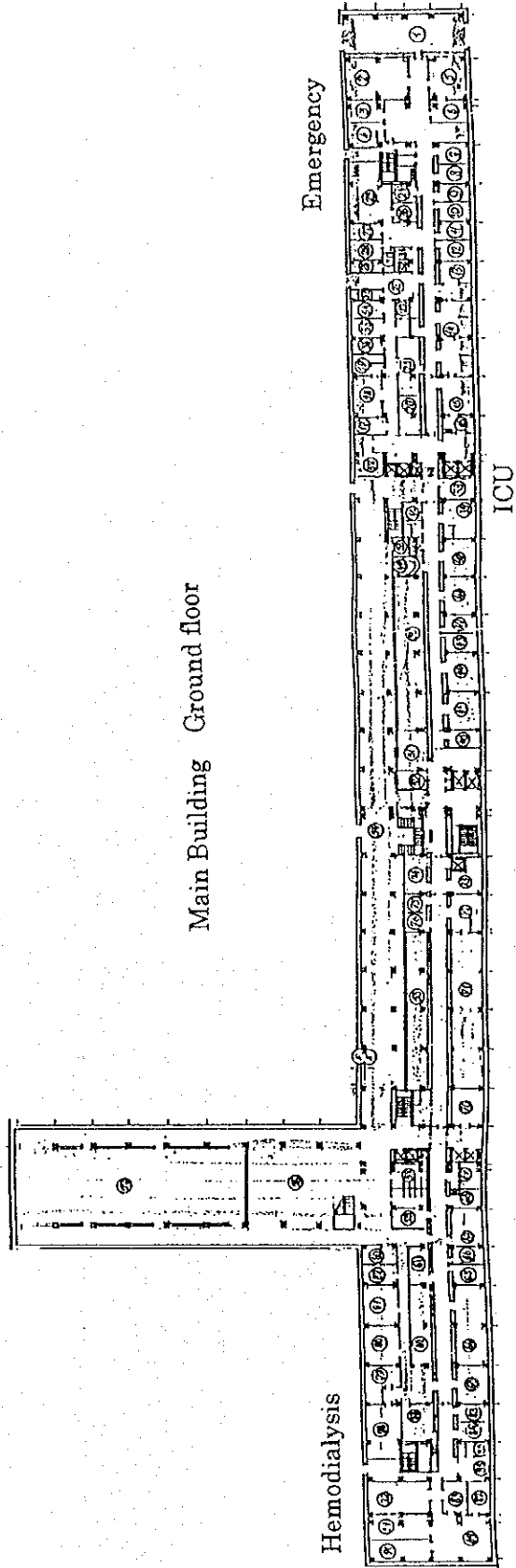
1. Main Building	2. Building 2	3. Building 4
B1F: B. Bank GF : Emergency, Hemodialysis, ICU, 1F : C.Lab. Diagnostic C., Endoscopy 7F : Ophtamology, ENT 11F : OT, Laparo. C.	GF : X-Ray	B1F: Pathology

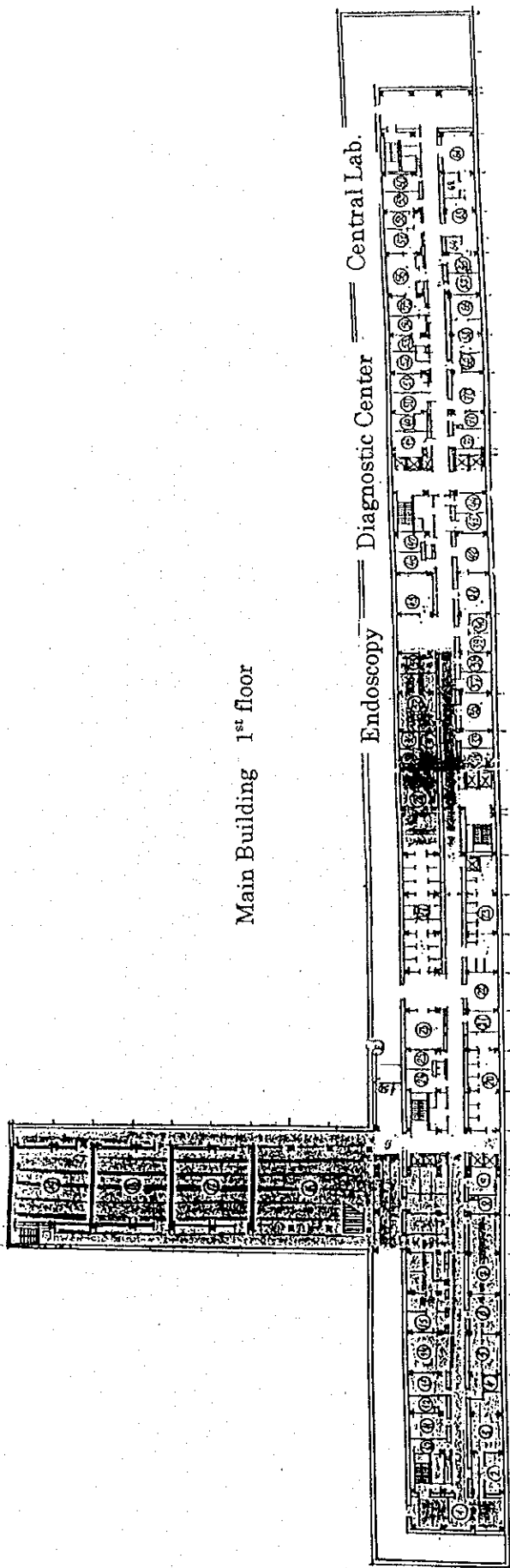
Fig. 2-1 Plan of the Central Clinical Hospital

Main Building Basement



Main Building Ground floor





Main Building 1st floor

Central Lab.

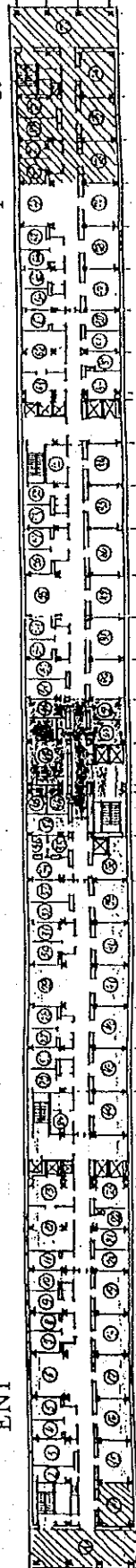
Diagnostic Center

Endoscopy

Main Building 7st floor

Ophtamology

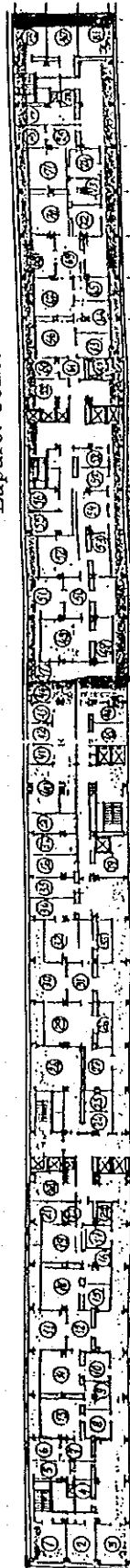
ENT



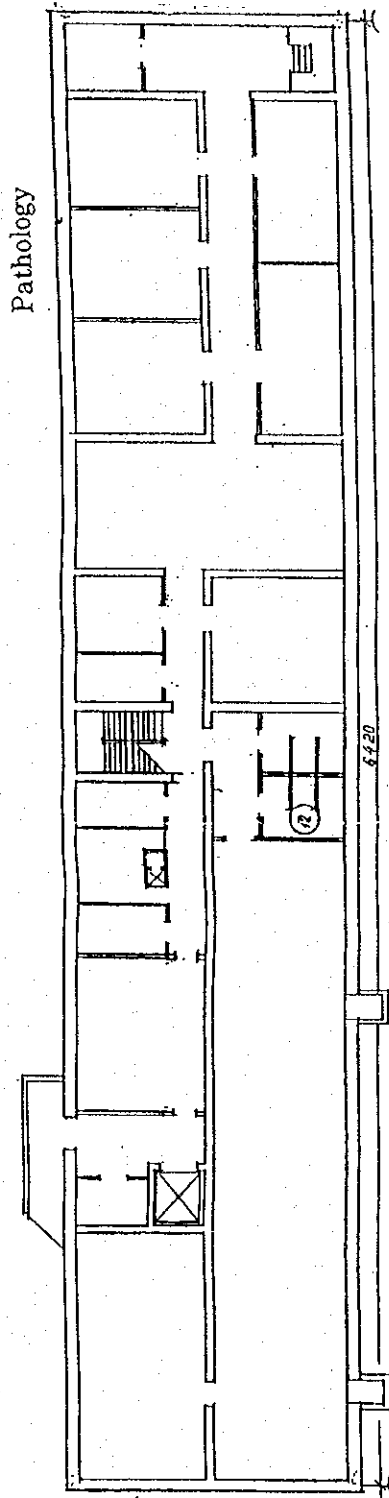
Main Building 11st floor

Operation Theater

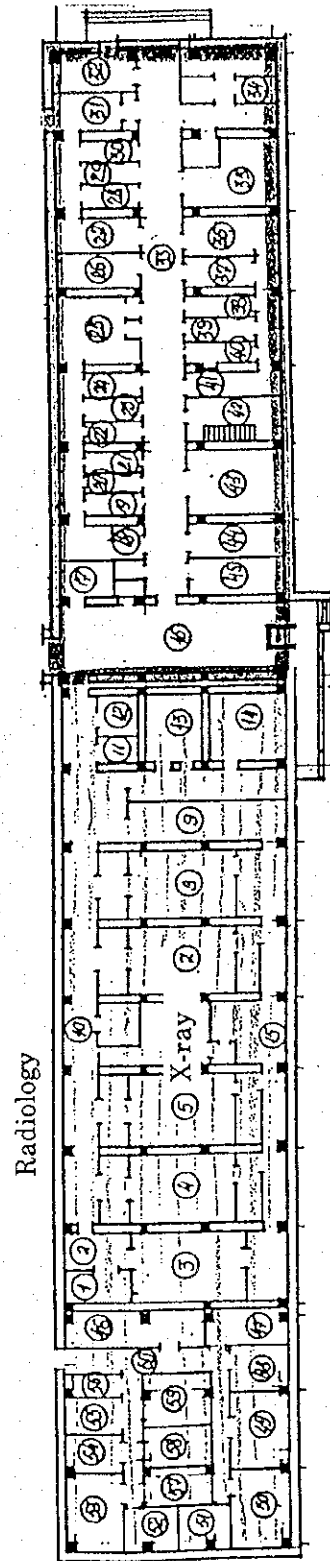
Laparo. Center

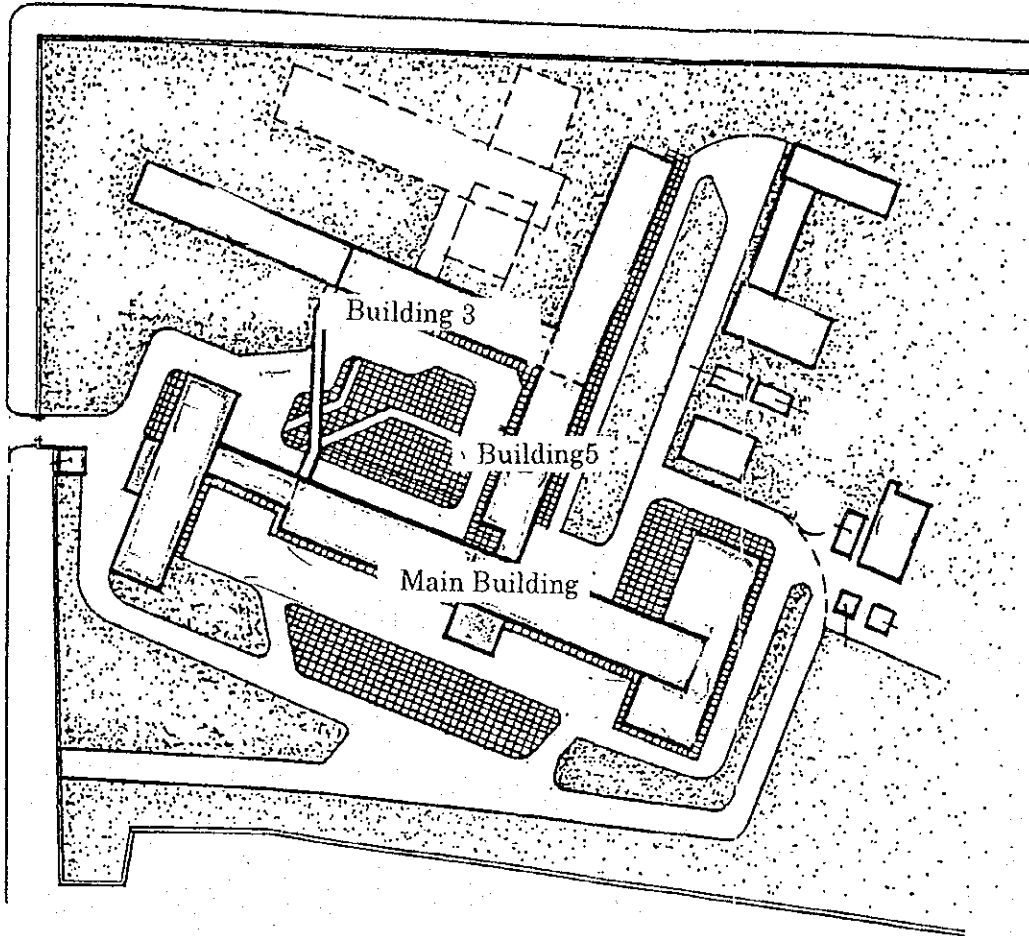


Building #4 Basement



Building #2 Ground floor

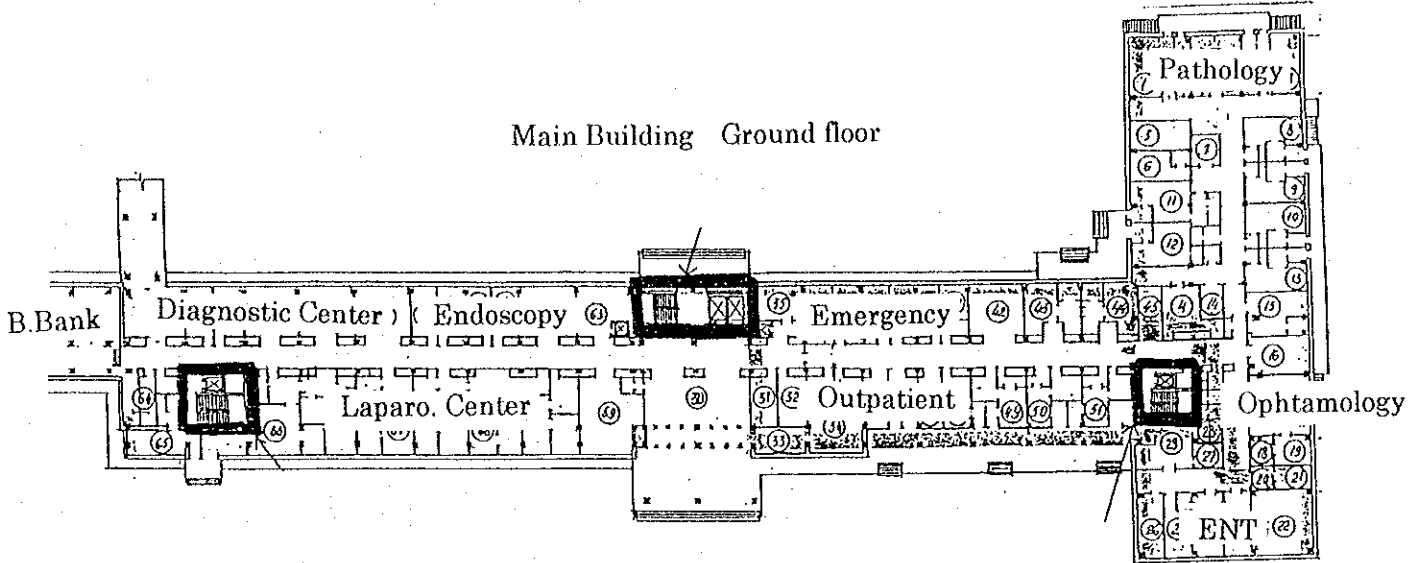




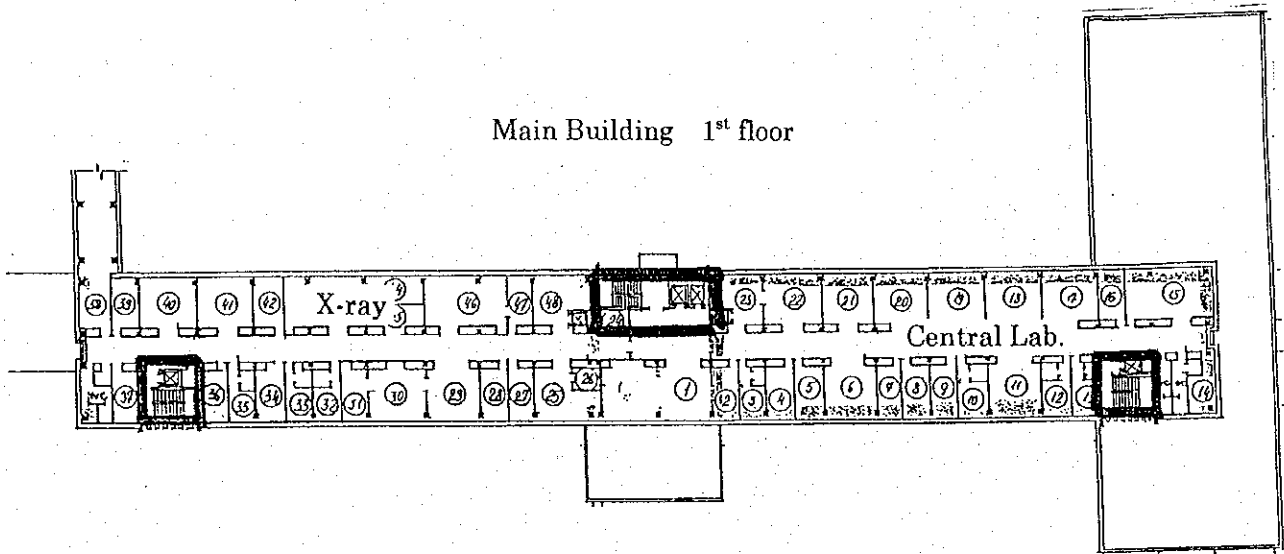
1. Main Building	2. Building 3	3. Building 5
GF : B. Bank Diagnostic C., Emergency, Endoscopy, ENT, Ophtamology, Outpatient, Laparo. C., Pathology 1F : C.Lab., X-Ray 5F : OT	GF : GYOB	B1F: CSSD 5F : ICU

Fig. 2-2 Plan of the Children's Central Clinical Hospital

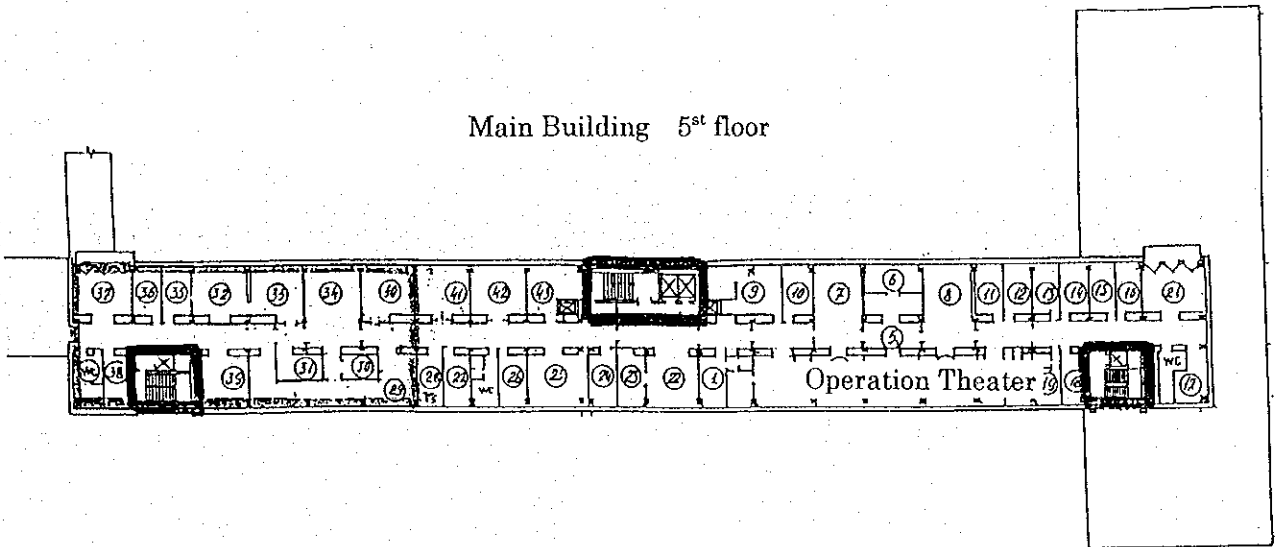
Main Building Ground floor



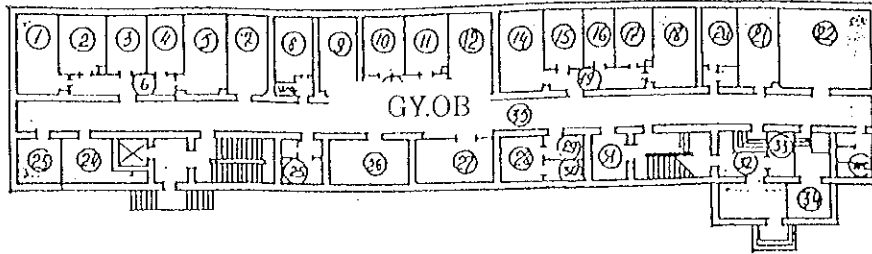
Main Building 1st floor



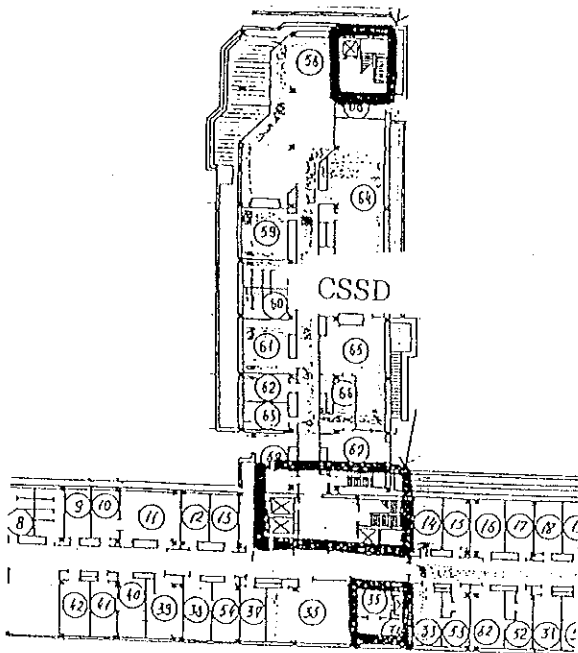
Main Building 5st floor



Building #3 Ground floor



Building #5 Basement



Building #5 5th floor

