in together, stored, dispensed and assorted in one lump, these will be separated.

(5) Department which will not be rebuilt this time, but for which a new system should be Induced

Mental ward

The current condition where patients of both long-stay and short-stay share the same common from should be re-examined.

The possibility of implementing a vocational training programme, etc. should also be examined.

3-3 Outline of the Project

3-3-1 Outline of the Project

Upon studying the health and medical services situation in the Republic of Kiribati, the TCH's activities and their relations with the country's National Health Program, and also examining in detail the contents of the request for this project by the Government of the Republic of Kiribati, it was judged appropriate to include the following in the Project for the Construction of the New Tungaru Central Hospital in the Republic of Kiribati.

Medical Sector

(1) General Outpatient Department and Emergency Clinic

(2) Specialty Outpatient Clinics

(3) Central Diagnostic and Therapeutic Department

1) Radiology Section
2) Clinical Examination Section
3) Operating Room
4) Blood Bank
5) Central Supply and Sterilization Department

(4) Autopsy Room

(5) Ward

1) Private Ward
2) Medical Ward, Surgical Ward
3) Pediatric Ward
4) Tuberculosis Ward
5) Obstetric Ward
6) Mental Ward

(6) Nursing School and Student Dormitory

(7) Medical Assistant Training School

(8) Health Education and Family Planning Department

(9) Service Department

(10) Cafeteria

Health Education

(1) Medical Education

The center of facilities throughout the country

(2) Nursing School

Only one in the country

Service Sector

Kitchen, Laundry, Sewing Room, Workshop, others

Administrative Sector

Administration Building

1. Facilities

(1) General Outpatients Department and Emergency Clinic

The work sharing system of the nurse performing preliminary examinations and the doctor performing screening is effective in saving manpower. The Department accepts emergency patients, but the fact that it has no special treatment and recovery room for emergency cases is a hindrance to its activities when an emergency case is brought in during regular consultation hours. Considering that emergency patients are on an increasing trend every years, it is necessary to strengthen the Emergency Department.

(2) Specialty Outpatient Department

The Internal Medicine Section has two consultation rooms now, which are used by two doctors, an internist and internist cum psychiatrist. Surgery, pediatrics, gynecology, and obstetrics share the use of one consultation room. Although every section examines the patients only one day a week, three rooms should be provided, one for each of the three doctors. As the Dental Clinic which was built by the assistance of the Untied Kingdom adopts the modern medical system, it has no problem whatsoever, and is not planned for rebuilding under this project. It will suffice to reserve a space for it on the new site and to lay the necessary ground-work for electricity, water supply and drainage.

(3) Central Diagnostic and Therapeutic Department

1) Radiology Section

Judging from the number of examinations during the previous fiscal year, the only one x-ray unit existing in the country is insufficient to cover the entire population. The provision of radioactive ray shielding device and other means to protect the

x-ray technician from being affected are also necessary.

2) Clinical Laboratory Section

The Examination Section undertakes examination crossing the functional boundaries among sections today. For instance, it performs blood tests for the Blood Bank and water quality analysis for the health inspectors. It is appropriate to merge the Blood Bank with this section and have the water quality analysis performed in the health inspector's room.

3) Operating room

The present operating room is the only one in the country where surgical and obstetric and gynecological operations are performed. As the Surgery Section operates only on Tuesdays and Thursdays, it sometimes performs five operations in a day. When a doctor's troupe is dispatched to the country under the foreign aid and the number of operations increases as a result, they are compelled to forego many operations till another time as only one operating room is not enough. Considering that the Hospital has two doctors who can operate, it is considered reasonable to provide two operating rooms, one for dirty operations and another for clean operations.

4) Blood Bank

It is an independent facility now, but blood tests of those who wish to donate blood are performed in the Central Laboratory. Merging of the Blood Bank with the Central laboratory would make the traffic line more simple.

5) Central Supply and Sterilization Department (CSSD)

It serves the entire hospital, but as its space is cramped and it is short of equipment it is lacking in processing capacity which is hindering medical activities. As there will be two operating rooms, it would be necessary to expand CSSD and reinforce its equipment.

(4) Autopsy Room

Although the scale of existing facility is large enough for performing judicial autopsy two or three times a year, the room would have to be enlarged somewhat if a mortuary refrigerator (for two corpses) for keeping corpses until sending them back to the outer islands is to be installed.

(5) Wards

1) Private ward

There are 7 rooms now (two are with bath and toilet), which are considered sufficient judging from their record of use. The room space, even when allowing for sleeping space for the attendant, is considered large enough.

2) Medical ward, surgical ward

The ward is divided into the men's ward and women's ward now, but as both surgical (7 beds) and internal (15 beds) patients of both ward share the same room it is difficult to prevent hospital infection. The number of beds in the surgical ward (altogether 14 beds) is too small for the present number of patients. As the number of beds of the internal patients (altogether 30 beds) is too many, it would be reasonable to adjust the numbers to 22 beds for surgical patients and 26 beds for internal patients (an increase of altogether 2 beds).

3) Pediatric ward

It was designed for 21 beds, but it now has 8 beds for children, and the private rooms (2 rooms for accommodating 2 persons each, and 1 room for 1 person) are used for patients with infectious diseases, one patient in each room. As tubercular children also share the same ward (since there is no room for children in the tuberculosis ward) the danger of hospital infection is great. It is necessary that a room for tubercular children be

integrated with the tuberculosis ward. Assuming that 4 beds would be integrated with the tuberculosis ward, it is considered appropriate to leave 16 beds in the children's ward.

4) Tuberculosis ward

17 beds are now installed in the ward designed for 16 beds. The present ward is considered appropriate both in space and scale. It would be appropriate to increase the number of beds to 20 by adding 4 beds for children.

5) Obstetric ward

There are altogether 8 beds now, 4 for prepartum (ante natal) and 4 for postpartum (post natal) patients, but as the number of beds for the latter are short, the new mother and the newly born are asked to leave the hospital after one or two days. In Kiribati where the new mother and newly born are not guaranteed sufficient medical care after birth, it is advisable that they be hospitalized for two or three days which necessitates an increase in the number of beds of postpartum patients.

It is considered appropriate to increase 4 beds for postpartum patients and make the total number of beds 12. As the ward has only one delivery table, it is not rare that a baby is delivered on the bed of the labour room. The ward therefore should have two delivery tables. As there is no operating room for obstetrics, its operations are performed in the Central Operating Room which is the only one in the hospital and therefore unable to cope with all of the operating needs. Instead of attaching an operating room to the obstetric ward, it is considered more effective to have two central operating rooms for reasons of maintenance and control.

6) Mental ward

27 patients (including one female) are hospitalized now, some for nearly 10 years. It has one common room and two private rooms for men and women respectively, but the staying together

of midly ill and gravely ill patients poses a problem. Handling of long-stay patients in this ward should be planned on a long range perspective. For this reason, it is considered appropriate for now to reserve the necessary space for the construction of the new ward and make the necessary arrangements for infrastructure facilities (water supply and electricity).

(6) Nursing School and Students' Dormitory

The existing facilities are considered appropriate both in scale and space.

(7) Medical Assistant Training School

As the present classroom is too large, it would suffice to add one classroom to the nursing school and utilize same for training of medical assistance.

(8) Health Education Sub-Division

It has 8 counselling rooms now, but 4 is deemed enough for the number of counsellers (five). The recording room and the room for its manipulation must be enlarged somewhat in view of the contents of equipment. Th recording room must also be improved for better acoustic effect.

(9) Service Department

1) Kitchen

Judging from the meals served, it can be slightly reduced in size. It should have a freezer for storing frozen food.

2) Laundry

It is considered appropriate or it to keep its current space. It would be necessary to provide washing machines as a grant.

(10) Cafeteria

Assuming that the hospital's staff of 180 persons will be served meals in three shifts, a space for accommodating 60 persons is considered appropriate. As the hospital has no cafeteria now, the staff take their meals in the nurses' room or under the trees.

2. Outline of Equipment

In reviewing the contents of equipment to be provided under this project, it is necessary to examine them from many more aspects than is usually necessary for a new installation as they are for existing facilities which are either to be reconstructed or relocated.

Among others the utilization of existing equipment is especially problematic. The possibility of their utilization must be positively considered, but considering that the buildings will not be completed until several years later it would be difficult to treat all of them uniformly. In other words, the utilization of each equipment would have to be based on various criteria, such as its operating condition, durable life, its compatibility with the new equipment requested and harmony with the particular facility for which it is meant. whether to use or not use each equipment, therefore, will be studied and determined individually on the basis of whether it would contribute to upgrading or maintaining the hospital's functions. Here, based on the maintenance condition of each equipment classified in Section 2-3-4-2 "Current Conditions of Existing Equipment", the corresponding facilities were roughly divided into the following three categories, and each category was planned to have the following equipment.

1. Place where mainly new equipment will be installed (newly installed)
2. Place where mainly existing equipment will be installed (transferred)
3. Place where existing and new equipment will be juxtaposed (juxtaposed)

Based on the foregoing classification, the following tables shows for each facility whether its equipment are to be newly installed, transferred, or juxtaposed.

Department	Section	Newly Installed	Transferred	Juxtaposed
Outpatient	General outpatient	*		
	Emergency	*		
	Specialty	*		
	Pharmacy			*
Central Diagnostic and Therapeutic	Radiology	*		
	Clinical examination			*
	Blood Bank	*		
Operating	Operating room			*
	Recovery room			*
	CSSD	*		
	Autopsy room	*		
Ward	Private ward	*		
	Surgical ward	*		
	Medical ward	*		
	Pediatric ward	*		
	Tuberculosis ward			*
	Obstetric ward	*		

Department	Section	Newly Installed	Transferred	Juxtaposed
Service	Laundry	*		
	Kitchen	*		
	Workshop		*	
	Linen room		*	
Other	Administration		*	
	Nursing School			*
	Dormitory for nursing students		*	
	Public Health Sub-Division			*
	Health Education Sub-Division		*	

As shortage of the necessary equipment is particularly prominent in the Outpatient Department, the provision of new equipment for both the general and specialty clinics will be considered. As emergency clinic as an independent section will be newly established this, too, will be provided with new equipment. The pharmacy has many equipment which can transferred to the new building, such as its medicine cabinet. Such existing equipment will be effectively utilized.

As none of the existing equipment in the radiology section, blood bank and autopsy room of the Central Diagnostic and Therapeutic Department (Central Laboratory) are reusable, they will be replaced with new ones. The equipment in the clinical examination department and operating department are in satisfactory condition now. Those equipment which are likely to continue performing well will be juxtaposed with some new equipment.

As most of the equipment in the hospital wards are worn out by age, they will be replaced with new ones as a principle. Only the existing equipment which are still relatively satisfactory will be diverted for use in the tuberculosis ward which has many long-stay patients.

As kitchen and laundry equipment of the Service Department are rather out of place as medical equipment it is more appropriate to treat then as part of the building fixtures, but as the laundry is small in scale it will be included in the category of equipment.

The equipment of both workshop and linen room will be transferred for reuse.

The existing equipment of all other departments, except some of those of the nursing school and the Public Health Sub-Division, will all be reutilized.

The following outlines the plan for each facility based on the foregoing classification. The places which are substantially the objects of planning under this project are where the equipment are to be "newly installed" and "juxtaposed."

Target Place	Outline of Plan
Outpatient Department	
General Outpatient	The equipment will basically the same as now. They will mainly consist of examination and treatment equipment necessary for the consultation room, treatment room, and nurse's preliminary examination room. As the nurse's preliminary examination room and treatment room will also serve the emergency cases, they will be provided with equipment for treating emergency cases and equipment related to plaster cast. Some of the major equipment are examining table, aspirator, autoclave, weighing scale, etc.

Target Place	Outline of Plan
Emergency	The equipment will consist of those related to the emergency examination room and observation room which will be provided independent of the General Outpatient Department. For minor injuries and bone fractures the treatment room will be used. Serious cases requiring operation will be transferred to the Operation Department, so that operation-related equipment will be excluded. The main equipment therefore will consist of emergency cart, illuminating box, medicine cabinet, stretcher, etc.
Specialty clinic	Examination and diagnosis equipment for six rooms, namely for internal medicine (2 rooms), surgery, pediatrics, ob. and gyn., will be provided. Also, basic examining equipment for otorhinology and ophthlmolgy will be added at the objects for planning. Internal examination table for gynecology, examining unit, ultrasonic diagnosis apparatus are among the major ones that will be provided.
Pharmacy	As the same work system as now will be adopted, the equipment related to the drugs and medical supplies storage, formulation, packing and shipping, empty bottle washing, compounding and dispensing will be considered for planning. Also, the provision of a truck for delivery of drugs and medical supplies will be planned. Existing medicine cabinet, pill counter, refrigerator, will be examined for reutilization. Forklift, bottle washer, medicine refrigerator are other major equipment that will be newly installed.

Target Place	Outline of Plan
Central Diagnostic and Therapeutic Department	
Radiology	Revitalization of the functional performance and speeding up of diagnosis will be planned with the new installation of the most popular diagnostic apparatus of the type that mounts TV unit on the existing system and the enlargement of the dark room. Other equipment planned besides x-ray unit are table-top automatic developer, film loading desk, illuminating box, etc.
Clinical examination	Basically the laboratory will be of the same scale and the same level as now but will be revamped overall with the newly installed or transferred equipment. The hematological laboratory will concurrently serve as the laboratory for the blood bank, while water quality analysis will be transferred to the Public Health Sub-Division where they should belong in the first place. Replacement of equipment which no longer fit for use will be the main content of plan. The automatic blood cell counter is the only equipment that will be newly installed.
Blood Bank	The main equipment are blood collection and blood preservation related ones, and principal equipment necessary for examinations will be shared with the clinical examination section. Major equipment are the blood collection bed and blood bank refrigerator.

Target Place	Outline of Plan
Operating Department	
Operating room	The equipment will consist of those necessary for the operating room (2 rooms) and the preparation room, but in scope they shall not exceed the present scale. Operating table, anesthesia apparatus, shadowless lamp, provision of other general operating instruments for obstetric, gynecological and emergency operation are the prime objects.
Recovery room	Recovery sets (for 2 beds) are the main items, besides which resuscitator, emergency cart, etc. will be provided. A system of mainly having nurses keep vigil will be adopted, and monitors, etc. which might impair rather than facilitate mobility will be excluded from the list.
Central Supply and Sterilization Department	
Materials room	Strengthening of the back-up system and alleviation of labour burden on the staff will be aimed by replacement of equipment which are no longer usable and inducement of ultrasonic cleaner, operating glove dryer and powder spreader, etc.
Autopsy room	Installation of a new mortuary refrigerator.

Target Place	Outline of Plan
Wards Private ward Internal medicine ward Surgical ward Pediatric ward Tuberculosis ward	7 private rooms, 26 beds for internal medicine, 22 beds of surgery, 16 beds for pediatrics and 20 beds for tuberculosis will be provided, with each patient's room equipped with patient bed and ober bed table. Nurse stations will be equipped with aspirator, wheel chair, examining light, diagnostic and treatment instruments, etc. to be ready for nursing services to inpatients. Besides the above, equipment related to sterilization, pantry, filth will be installed with due regard to hospital infection control.
Obstetric ward	The ward will have 12 beds, and in addition to the aforementioned, equipment necessary for labor, delivery and neo-natal control will be mainly considered. Delivery table, new-born treatment table, baby balance, etc. are the objects of consideration. As with the recovery room, equipment that might impair rather than facilitate mobility will be excluded.
Service Department Laundry	Provision of home-size washing machine will be considered.
Other Nursing School	Teaching materials necessary for nurse education and dummies useful for empirical training will mainly considered for the project.

Target Place	Outline of Plan
Public Health Sub-Division	For all of examination-related equipment, existing ones will be used. Equipment to be provided will be contained to laboratory table and other necessary ones.

3-3-2 Executing Organization

The executing organization of this project is the Ministry of Health and Family Planning, Government of the Republic of Kiribati. The Ministry of Health and Family Planning has already discussed many times with the Ministry of Foreign Affairs, Ministry of Home Affairs and Decentralization, Ministry of Works and Energy, Ministry of Transportation and Communication in an effort to maintain smooth liaison with each of them in implementing this project. As every one of these Ministries has had experience in implementing grant-in-aid projects of the Government of Japan, no obstacle is foreseeable in executing their duties. As the Chief Medical Officer under the overall supervision of the Secretary will take command of actual duties in association with other responsible staff and work out the best possible manpower assignment, a system of smoothly expediting work for this project will be organized.

No changes will be made in the basic organization of the Ministry of Health and Family Planning even after the new hospital is constructed with all of the existing staff, except those for the facilities left on the existing site, moving over to the new hospital to continue with their activities.

3-3-3 Manpower Plan

At present, the Ministry of Health and Family Planning (MOH) has a staff of 296 persons who are engaged in health care and medical services for the population throughout the country. Only 93 of them, however, are engaged in actual medical work. Both doctors and nurses are in short supply. Because of this, the staff of both MOH and TCH take on each other's work concurrently and the students of the nursing school work in the TCH as practical training by which they somehow manage to run the Ministry of the hospital with a small number of staff.

When one considers the present economic condition of the Republic of Kiribati it is unlikely that any rapid improvement will be made in its budget plan. Considering that MOH now pays some 50% of its budget as personal emoluments, this project will owe to be of a scale that will allow it to be operated and managed with the current force including the three doctors who are now studying abroad.

Although the size of TCH's staff is small and TCH's examination and diagnostic an therapeutic activities are being restricted by the aging and breakdown of its laboratory and medical equipment, the equipment and materials to be provided under this project will enable it to perform more sophisticated examination and diagnostic and therapeutic activities and make effective use of its current staff.

3-3-4 Condition of the Site Proposed for Construction of Facilities

The Government of the Republic of Kiribati had ultimately proposed four sites for construction of the facilities, of each of which an evaluation list was prepared as per Appendix VIII. As a result of discussions, Site 2 was selected (Nawerewere). (Site number represents the sequence in which it was proposed by the Kiribati side.)

The site is 2.7km to the east of the existing buildings. It stretches for about 250m in the east-west direction and about 140m in the north-south direction, covering an area of approximately 3.7 ha. It faces a 6m

wide road (it is being widened into a 10m wide road) on the north and the coast line (open sea) on the south. The site is privately owned by 16 families who live on the site, but the Land Survey Division of the Ministry of Home Affairs was able to obtain their concurrence to evacuate the site by concluding a leasing contract of this site for a period of 99 years with the Government of Kiribati. The evacuation fee and the rental (A$420 per acre per year) will be e paid by the Ministry of Home Affairs. The site on which the existing hospital stands is also under a 99 year lease. The Study Team has requested that a copy of the lease contract between the Government of Kiribati and the inhabitants be submitted as soon as possible. This site is one the five lens water reservoirs on Tarawa Island. It covers an area of 14,904 acres but intake of water being temporarily suspended due to the deterioration of water quality. Electricity, telephone and water pipes are laid along the front road but there is no drainage pipe. The site is on the whole flat, and the work which must be borne by the Kiribati side includes relocation of private homes, uprooting and felling of palm trees and levelling of a part of the ground.

As test boring at two locations on the site has proved fine coral sand and coral rock to exist at a depth of 1.5m to 2m below ground surface, a ground bearing capacity of about 3-7 tons/m^2 can be anticipated for the bearing stratum of buildings. The ground water level is GL-2.6m - 2.8m.

The following matters ought to be fully considered in planning this site for the project.

1) Considerations to the neighboring homes (traffic, etc.)

2) Natural conditions (wind direction is mostly east-northeast, wind velocity around 4 to 10 m/sec., annual mean rainfall around 2,000 mm, daytime maximum temperature ranges between 31°C and 33°C, the difference between daily minimum temperature and maximum temperature is 6°-7°C.)

3) Drainage treatment methods (seepage method is unacceptable in the light of the usage condition of wells by the neighboring homes. Will be discharged into the open sea by laying a

pipeline.)

4) Standby water supply and water conservation (an hour-restricted stoppage of water supply may be enforced if fine days continue). (Utilization of ceilings, utilization of sea water for flushing of toilet and other sanitary purpose, etc.)

Table for Comparing Sites Proposed
for Construction of Tungaru Central Hospital
(Prepared by the Basic Design Study Team)

Description	Site 1	Site 2	Site 3	Site 4
Location	Existing TCH	Nawerewere	Proposed site for construction of a prison	Reclaimed area
Area size	8.67 acres (including 7.24 acres of hospital premises)	10.43 acres (Initial 8.4 acres) (Final)	5.59 acres (including 0.3 arce of pond)	Vast
Ground condition	Good	Good	Good	Not surveyed yet
Shape	Good	Good	Good	Good
Ownership	Private (leased 99 years, of which 30 years already elapsed)	Private	Government	Government
Infrastructure				
Water main	Available	Available up to the boundary of site	Unavailable	Available up to the boundary of site
Electricity	"	"	"	"
Telephone	"	"	"	"
Sewer main	Not provided	Not provided	Not provided	Not provided and difficult to provide
Access road	Constructed already	Constructed already	Not constructed yet	Constructed already
Demolition	Needed on total floor area of 4,000m²	Need relocate 16 households	Unnecessary	Unnecessary
Construction period	Min. 14 months	Approx. 12 months	Approx. 12 months	Min. 12 months
Estimated cost of work borne by Kiribati	Demolition cost:	Demolition cost: Ground leveling cost:	- Water supply and electricity lead-in work: A$220,000 - Access road: A$94,000 - Telephone drop-in: A$100,000	Large ground leveling cost
Unit cost of work borne by Japan	Reasonable	Reasonable	Reasonable	High (due to ground condition)
Commuting of patients	Most convenient	Convenient	Inconvenient	Rather convenient
Problems	Construction to be divided into 2 phases to assure continuous functioning of hospital, No. of sick beds reduced during construction, needs temporary relocation of X-ray and laboratory facilities	Site to be secured (by the end of 1988) and certificate to be obtained	Site slightly too small and infrastructure development to cost large	Needs ground survey, requires long extension of water main.
Degree of difficulty in construction	Difficult	Easy	Rather easy	Rather difficult

CHAPTER 4

BASIC DESIGN

CHAPTER 4 BASIC DESIGN

4-1 Basic Design Policy

The basic design will take into account the various local characteristics of the Republic of Kiribati, such as its weather, climate, current condition of medical services and construction situation in order to ensure that the project will be one that harmonizes with those characteristics.

The following matters must be given particular attention in planning the facilities.

(1) In order to save energy, only certain rooms will be air-conditioned. The arrangement of other rooms must be planned so that natural ventilation is secured. As the wind is mostly east-northeasterly throughout the year at this site, the windows will face the east and west sides. Louvers will be provided to shield the westering sun. For exterior walls, materials with the lowest possible thermal conductivity will be adopted.

(2) Local construction methods will be adopted as much as possible. Also, an economical design that matches the local construction techniques and abilities will be adopted, in an attempt to minimize costs while maintaining the required functions and environment. As all materials must be imported with the exception of sand and aggregate, only the minimum materials necessary for operation and maintenance will be used.

(3) Attempts will be made to conserve energy and reduce operating costs through architectural and equipment considerations, but as strong winds blow up a lot of coral sand during the dry season (June through November), air conditioning will provided in the operating room, laboratory room and other rooms where necessary for the smooth conducting of activities.

(4) The facilities will be planned with due regard to ease of maintenance and operation. Also, ancillary mechanical systems attached to the buildings will be of types for which spare parts and whatever materials are necessary are locally procurable in consideration of maintenance and operation.

Special attention will be given to the following points in selecting the equipment for this project.

(1) TCH's staff assignment plan and technical level must be fully considered.

(2) The current health care and medical service situation in the Republic of Kiribati must be duly considered as a condition for selecting the equipment.

(3) Ease of maintenance and operation and economical operating costs must be taken into full consideration.

(4) Basically, the equipment selected must not be too far removed in technical level from that which is in use now.

(5) The purpose of use of each type of equipment contained in this project must be closely examined so that the equipment selected will be suitable for the present and future medical program.

4-2 Determination of the Scale of Facilities and Equipment

First, a technical study will be made to determine the scale of the necessary facilities and equipment to be covered by this project, following which the structural design and the necessary utilities and plumbing for the construction of those facilities and the installation of equipment will be examined.

4-2-1 General Outpatient Department and Emergency Clinic Building

The General Outpatient Department and Emergency Clinic Building will consist of various rooms having the respective functions described below. This building will perform the screening and treatment of patients transferred from various places. The number of patients will be about 50 per day on average. Various rooms for emergency patients will also be provided in this building. The number of emergency patients is increasing by 20 or more every year, having recorded 177 persons in 1986, due to the growing number of traffic accidents. Necessary rooms are as follows:

1) Reception room
2) Chart filing storage
3) Consulting room
4) Nurse's preliminary examination (screening) room
5) Treatment room
6) Emergency patient examining room
7) Observation room
8) Medical radio room cum night duty staff room
9) Storeroom
10) Entrance and exit for patient and entrance hall
11) Outside corridor

Room	Description	Area, m²
1) Reception room	Space for arranging a reception counter, desks for 4 staff.	13.2
2) Chart filing storage	Space for racks to retain charts for entire population of 66,000 for 10 years.	19.4
3) Consulting room	A room for screening by a doctor. Space for a consulting desk and an examining couch.	15.8
4) Nurse's preliminary examination room	A room for preliminary screening by a nurse.	14.1
5) Treatment room	A room with a plastering corner and sterilizing corner for treatment of patients who do not have to be transferred to Specialty Clinics. A space for a small bed.	11.4
6) Emergency patient examining room	A small desk and a small bed will be arranged. A space for bathing patients will be provided.	12.3
7) Observation room	Two beds, one each for outpatients and emergency patients, and a drip infusion stand will be installed in order to reduce the number of inpatients.	14.1
8) Medical radio room cum night duty staff room	A room for ambulance drivers working in shifts. A space for desks, chairs, radio system, and sofa for resting.	4.0 5.7
9) Storeroom	Same size as the existing one	13.2
10) Patient's entrance hall, outside corridor	A canopy will be provided on the outside as a space for waiting. Width of corridor: 1.6m	67.3
Total		190.5

4-2-2 Specialty Outpatient Clinic Building

The Specialty Outpatient Clinic has six specialists, consisting of one surgeon, two internists (one of which concurrently serves as a psychiatrist), one gynecologist cum obstetrician, one pediatrician, and one dentist.

Consultations held in this building are: surgery and gynecology on Mondays, pediatrics on Tuesdays, prepartum care on Wednesdays, internal medicine on Thursdays, and obstetrics on Fridays.

The Dental Clinic will not be relocated under this project. Various necessary rooms are as follows:

1) Surgery Section
2) Pediatrics Section
3) Internal Medicine 1 and 2
4) Gynecology and Obstetrics Section
5) Internal examination room
6) Nurse station
7) Principal Nursing Officer's room
8) Outside corridor

Room	Description	Area, m^2
1) Surgery	1 examining couch, 1 desk, 1 chair 4.2m x 4.4m	18.5
2) Pediatrics	Desk and chair (one each) 2.4m x 4.4m	10.6
3) Internal Medicine 1 " 2	To be used as a suite of rooms 4.4m x 2.9m 2 examining couches, 2 chairs, 2 desks 12.8m^2 x 2	(12.8 x 2) 25.6
4) Gynecology and Obstetrics	One examining couch, 1 desk, 1 chair 3.0m x 4.4m	13.2

Room	Description	Area, m²
5) Internal examination room	Internal examining table, 1 desk, 1 chair 2.4m x 4.4m	10.6
6) Nurse station (room)	Dressing room for nurses, lockers for 20 nurses on a three-shift basis.	10.6
7) Principal Nursing Officer's room	The same size as the existing one.	10.6
8) Toilet for Doctor		6.2
9) Outside corridor	Width of corridor: 1.6m	57.5
Total		163.4

4-2-3 Pharmacy

Prescription for inpatients and dispensing, packing and shipping of drugs and medical supplies to dispensaries located throughout the country are performed. It concurrently serves as the storage area for drugs purchased once a year on a tender. Various rooms necessary are as follows:

1) Handling and shipping room
2) Packing room
3) Office
4) Storage 1
5) Storage 2
6) Bottle washing room
7) Drying room
8) Dispensing and sorting room
9) Air-conditioned Storage 1 and 2
10) Pharmacist's room
11) Pharmacy
12) Toilet, etc.

Room	Description	Area, m²
1) Handling room Unloading room Shipping room	6m x 6m as an outdoor space. A staff of 4.	36.0
2) Packing room	6m x 3.4m Workroom for packing drugs and medical supplies for shipment to dispensaries throughout the country. A staff of 2.	20.4
3) Office room	A staff of 8.	30.0
4) Storage - 1	For storing drugs.	122.4
5) Storage - 2	For storing drugs.	86.4
6) Bottle washing room	For washing and sterilizing drug bottles. A staff of 1.	10.8
7) Drying room	For drying and storing bottles after washing.	6.5
8) Dispensing and sorting room	For dispensing and sorting drugs and medical supplies for shipment to dispensaries throughout the country.	80.2
9) Air-conditioned Storage 1 & 2	For storing drugs which must be kept cool.	(13.2 x 2) 26.4
10) Pharmacist's room	A staff of 1.	14.4
11) Pharmacy	For dispensing drugs and medicines for inpatients and outpatients of TCH. A staff of 2.	28.8
12) Toilet, etc.		15.8
Total		478.1

4-2-4 X-ray Examination Building

One large stationary x-ray unit and one portable type x-ray unit will be installed. Here, two radiographers will perform examinations for hospital patients and also those receiving medical checkups. Various rooms necessary are as follows:

1) X-ray examination room 1
2) X-ray examination room 2
3) Manipulating and waiting room
4) Darkroom
5) Film storage
6) Undressing and washing room

Room	Description	Area, m^2
1) X-ray examination room 1	A stationary type large x-ray unit of the same size as the existing one will be installed. 5m x 7m	35.0
2) X-ray examination room 2	A portable type x-ray unit will be installed. 5m x 4m	20.0
3) Manipulating and waiting room	Manipulated from behind a x-ray shielding glass window. ($26.5m^2$)($11.0m^2$) A staff of 3.	(26.5) (11.0) 37.5
4) Darkroom	Installed with a cabinet for storing unused x-ray films, a developing tank for x-ray films and work table.	4.0
5) Film storage	For storing used x-ray films.	14.4
6) Undressing and washing room	For dressing and undressing of patients.	6.8
7) Waiting room	As an open space	18.4
Total		136.1

4-2-5 Laboratory and Blood Bank Building

It consists of various rooms for hematological examinations, biochemical examinations and bacteriological examinations as well as various rooms of the Blood Bank. Various rooms necessary are as follows:

1) Washing room
2) Weighing room
3) Blood Bank
4) Hematological examination room
5) Biochemical analysis room
6) Bacteriological examination room
7) Anteroom
8) Storage 1
9) Water analysis room
10) Senior Laboratory Officer's room
11) Waiting room
12) Toilet, etc.

Room	Description	Area, m^2
1) Washing room		20.2
2) Weighing room		2.3
3) Blood Bank (blood collecting corner)	2 beds 1 blood collecting bed	(22.1) (7.4) 29.5
4) Hematological examination room	A 70cm wide examining counter will be arranged in an L shape. 4.6m x 3.6m	16.6
5) Biochemical analysis room	Same as above	16.6
6) Bacterio-logical examination room	Same as above	22.6

Room	Description	Area, m²
7) Anteroom	6 laboratory technicians 2 blood bank staff Total 8 persons	16.6
8) Storage 1	Laboratory reagents and also equipment received for repairs from dispensaries throughout the country will be stored. A cooler will be installed. The size will be the same as the existing one.	17.9
9) Water analysis room		12.4
10) Senior Laboratory Officer's room		16.6
11) Waiting room	As an open space	20.5
12) Toilet, corridor, etc.		62.0
Total		253.8

4-2-6 Operating Theater Building

This is the only operating room in Kiribati where surgical operations, obstetric operations and eye operations (with the assistance of other countries) are performed. The annual number of operations performed in this facility reaches as many as 361 and is increasing by 20 every year. On Tuesdays and Fridays, five to six surgical operations are performed a day, so that dirty and clean operations are performed on the same day. When emergency operations are taken into consideration, it is difficult to cope with only the one existing operating room. The following rooms are covered under this project.

1) Operating rooms 1 and 2
2) Pre-treatment room
3) Recovery room
4) Nursing room

5) Waiting room

6) Dressing rooms 1 and 2

7) Pre-washing room

8) Instrument crib

9) Central Supply and Sterilization Department (CSSD)

10) Ward instrument crib

11) Waiting room

12) Air conditioning machine room

13) Cylinder storage

14) Corridor, etc.

Room	Description	Area, m²
1) Operating rooms 1 and 2	Size of each room same as the existing one. 6.0m x 5.6m	(33.6 x 2) 67.2
2) Pre-treatment room cum hall	Pre-treatment patients	48.3
3) Recovery room	2 beds with (oxygen) cylinder	11.5
4) Nursing room	For recovery observation, 1 desk, 1 chair	8.6
5) Waiting room	Waiting room for 6 persons	11.0
6) Dressing rooms 1 and 2	For four nurses, for 2 doctors, each with toilet and shower of the same size as the existing ones.	25.9
7) Pre-washing room	For pre- and post-operative pre-washing. Same size as the existing one.	9.0
8) Instrument crib		22.4
9) CSSD	Mainly for surgical operations and obstetric operations but caters to the needs of entire TCH. Nurses and laundry staff perform the work. 30% larger than the existing one which is too small to arrange equipment satisfactorily.	44.0
10) Ward instrument crib		5.8

Room	Description	Area, m²
11) Waiting room	Open space	7.2
12) Air-conditioning machine room		5.8
13) Cylinder storage	For storing oxygen and laughter gas cylinders.	5.8
14) Corridor, etc.		19.3
Total		291.8

4-2-7 Autopsy Room

Room	Description	Area, m²
1) Autopsy room	Judicial autopsies are performed two or three times a year. A mortuary for dead patients from outer islands waiting to be shipped home. (for two corpses)	35.0

4-2-8 Wards

Wards are composed of the following:

(1) Private ward
(2) Pediatric ward
(3) Internal medicine ward
(4) Surgical ward
(5) Obstetric ward
(6) Tuberculosis ward
(7) Mental ward (which will not be relocated under this project)

(1) Private ward

Isolation ward for patients with infectious diseases such as children's diarrhoeal infectious diseases, fish poisoning, diarrhoeal infectious diseases, hepatitis and other diseases who should not come into contact with other patients, or patients suspected of having infectious diseases.

1) Sickrooms 1 to 5
2) Sickrooms 6 and 7
3) Treatment room
4) Nurse station
5) Workroom
6) Linen room
7) Pantry
8) Storerooms 1 and 2
9) Toilet
10) Corridor

Room	Description	Area, m^2
1) Sickrooms 1 to 5	10.2m^2/room x 5 rooms	(10.2 x 5) 51.0
2) Sickrooms 6 and 7	With bath and toilet	(20.4 x 2) 40.8
3) Treatment room	Treatment room for inpatients.	8.2
4) Nurse station	6 nurses in all (one on night duty).	13.0
5) Workroom	For general nursing work including sterilization. Equipped with a sink, work table and closet.	13.6
6) Linen room	For storing linens for ward use.	5.1
7) Pantry	Dishing out of meals for patients, washing of dishes and plates after meal.	9.5

Room	Description	Area, m²
8) Storerooms 1 and 2	5.1m² and 11.4m²	(5.1) (11.4) 16.5
9) Toilet		20.4
10) Corridor		64.4
Total		242.5

(2) Pediatric ward

The ward is divided into surgery and internal medicine areas with the nurse station placed between them. A room for infectious diseases will also be provided. This wing contains the following rooms:

1) Sickrooms 1 and 2
2) Sickroom 3
3) Nurse station
4) Workroom
5) Treatment room
6) Playroom
7) Linen room
8) Corridor

Room	Description	Area, m²
1) Sickroom 1	A 12-bed room	76.8
2) Sickroom 2	A 4-bed room with bath and toilet for patients affected with infectious diseases.	(28.2) (12.8) 41.0
3) Nurse station	9 nurses in all (one on night duty).	12.0

Room	Description	Area, m²
4) Workroom	For general nursing work including sterilization. Equipped with a sink, work table and closet.	19.2
5) Treatment room	Treatment room for inpatients.	11.5
6) Playroom	Playroom for hospitalized children.	11.5
7) Linen room	For storing linens for ward use.	4.3
8) Kitchen	Dishing out of meals for patients, washing of dishes and plates after meal.	4.3
9) Corridor		21.6
Total		202.2

(3) Internal Medicine ward (Medical ward)

This ward is divided into a male patients' room and a female patients' room with the nurse station placed between them. An ICU for gravely ill patients will also be provided. This wing contains the following rooms:

1) Men's sickroom
2) Women's sickroom
3) Nurse station
4) Workroom
5) ICU
6) Linen room
7) Kitchen
8) Corridor

Room	Description	Area, m²
1) Men's sickroom	A 12-bed room	80.6
2) Women's sickroom	A 10-bed room	67.6
3) Nurse station	9 nurses in all (one on night duty).	12.6
4) Workroom	For general nursing work including sterilization. Equipped with a sink, work table and closet.	18.0
5) ICU	2 beds	26.8
6) Linen room	For storing linens for ward use.	4.3
7) Kitchen	Dishing out of meals for patients, washing of dishes and plates after meal.	4.3
8) Corridor		21.1
Total		235.3

(4) Surgical ward

The basic composition is the same as that of the internal medicine ward. The difference is in the number of beds only. This wing contains the following rooms:

1) Men's sickroom
2) Women's sickroom
3) Nurse station
4) Workroom
5) ICU
6) Linen room
7) Kitchen
8) Corridor

Room	Description	Area, m²
1) Men's sickroom	A 10-bed room	65.3
2) Women's sickroom	A 12-bed room	78.1
3) Nurse station	9 nurses in all (one on night duty).	12.6
4) Workroom	For general nursing work including sterilization. Equipped with a sink, work table and closet.	18.0
5) ICU	2 beds	26.8
6) Linen room	For storing linens for ward use.	4.3
7) Kitchen	Dishing out of meals of patients, washing of dishes and plates after meal.	4.3
8) Corridor		21.2
Total		230.6

(5) Obstetric ward

As the existing ward has only one delivery bed, babies are occasionally given birth in the labor room. The ward contains the following rooms:

1) Prepartum (prenatal) room
2) Labor room
3) Delivery room
4) Nurse station
5) Workroom
6) Bathing room
7) Premature babies' room (nursery)
8) Milk room
9) Postpartum (postnatal) room
10) Linen room
11) Instrument crib

12) Kitchen

13) Corridor

Room	Description	Area, m²
1) Prepartum (prenatal) room	A 4-bed room	30.7
2) Labor room	1 bed	12.6
3) Delivery room	2 beds The room is partitioned with a curtain.	45.7
4) Nurse station	6 nurses in all.	14.0
5) Workroom	2 beds	20.0
6) Bathing room	For bathing and diagnosing newborns.	9.6
7) Premature babies' room (nursery)	One incubator and treatment table for newborns.	7.2
8) Milk room	For washing and storing milk bottles and conditioning of milk.	7.2
9) Postpartum (postnatal) room	8 beds with baby bed. (mother and baby in the same room)	58.9
10) Linen room	For storing linens for ward use.	4.3
11) Instrument crib	Fot storing equipment and instruments used for delivery and in the ward.	4.3
12) Kitchen	Dishing out of meals for patients, washing of dishes and plates after meal.	4.3
13) Shower		6.3
14) Corridor		33.5
Total		258.6

(6) Tuberculosis ward

The composition will be the same as that of the existing ward, with the addition of a children's sickroom (a 4-bed room). The ward is divided into men's and women's areas on each side of the nurse station. This wing contains the following rooms:

1) Sickrooms 1 to 4
2) Nurse station
3) Dispensing room
4) Pantry
5) Storeroom
6) Terrace

Room	Description	Area, m^2
1) Sickrooms 1 - 5	4-bed room x 3 = 12 beds, of which one room is for children, 8-bed room, with bath and toilet.	134.5
2) Nurse station	6 nurses in all (one on night duty).	11.9
3) Dispensing room	For dispensing medicines for inpatients.	4.5
4) Pantry	Dishing out of meals for patients, washing of dishes and plates after meal.	6.4
5) Storeroom	For storing nursing equipment and supplies.	4.0
6) Terrace	As an outdoor portion	32.0
Total		193.3

4-2-9 Kitchen

Breakfast, lunch and supper (free of charge) for inpatients and their attendants, nursing school students and staff are prepared in this kitchen. Meals for 350 persons to 400 persons per day are cooked. Necessary rooms are as follows:

1) Kitchen
2) Nutritionist's room
3) Anteroom
4) Food storage
5) Deep freezer
6) Refrigerator
7) Corridor

Room	Description	Area, m^2
1) Kitchen	Two stainless steel sinks (3900x600), 6-burner range (1800x600), grill (600x300), oven (600x600), kitchen table (1800x900). A space for accommodating the above and a working space for 6 persons. 8m x 8m	64.0
2) Nutritionist's room	1 desk, 1 chair, 1 bookshelf	12.0
3) Anteroom	A space for a sofa	12.0
4) Food storage	Same space as the existing storage area for storing rice, flour, potatoes, canned foods, etc.	25.0
5) Deep freezer	For storing meat and fish	3.0
6) Refrigerator	For storing vegetables, etc.	9.0
7) Corridor		3.0
Total		128.0

4-2-10 Cafeteria

Assuming that about 200 persons including staff, nursing school students and attendants of patients will eat at the cafeteria in three shifts, eating space for 60 persons and a pantry will be provided.

Room	Description	Area, m²
1) Eating space	Outdoor space, 10 tables for six persons each.	56.5
2) Pantry		7.5
Total		64.0

4-2-11 Laundry

At present, washing is done manually by 5 washwomen using 6 sinks. The two washing machines and two dryers are out of order now. About 20 sheets (1kg), white robes (1kg), etc., totalling 50kg a day are washed. Necessary rooms are:

1) Washing yard
2) Anteroom

Room	Description	Area, m²
1) Washing yard	A space for installing two washing machines and 6 sinks, and for working. The same space as the existing yard.	55.0
2) Anteroom	As a rest room for 5 washwomen. The same size as the existing one.	9.0
Total		64.0

4-2-12 Drying Yard

An open space of 165m² as at present and covered with a roof.

4-2-13 Workshop

Necessary rooms are:

1) Electrical repairshop
2) Carpentry shop
3) Sewing room
4) Storeroom

Room	Description	Area, m²
1) Electrical repairshop	The same as the existing one	40.0
2) Carpentry shop	The workshop will be of the same size as the existing one. A space for carpenter's tools.	(52.0) (12.0) 64.0
3) Sewing room	The same 15m² as now with 2 sewing machines. Space for an iron stand will be provided.	15.0
4) Storeroom		9.0
Total		128.0

4-2-14 Fuel Storage

7.5m² will be provided for the storage of kerosine and gasoline.

4-2-15 Generator Room

It will have a space of 5m x 5m = 25m².

4-2-16 Administration Building

Administrative functions of both the Ministry of Health and the hospital are housed in the same building because the staff concurrently serve both organizations in order to save manpower.

TCH also functions in every area of activity of the Ministry of Health.

The Administration Building is composed of the following rooms:

1) Minister's office
2) Secretary's office
3) Secretariat
4) Assistant Secretary's office
5) Chief Medical Officer's office
6) Accounting office
7) Typist room
8) Office room
9) Telephone operator room
10) Chief Nursing Officer's office
11) Principal Medical Officer's office (Curative)
12) Principal Medical Officer's office (Preventive)
13) Secretariat
14) Conference room
15) Statistical office, computer room
16) Health Inspector's room
17) Overseas consultant's office
18) Toilet, storeroom
19) Corridor, hall

Room	Description	Area, m²
1) Minister's office	As at present	37.2
2) Secretary's office	Office desk, a table for meetings, space for bookshelves	24.0
3) Secretariat (Office for secretaries)	Private secretaries of the Minister and Secretary. Private secretaries of the Assistant Secretary and Chief Medical Officer.	31.2
4) Assistant Secretary's office	The same size as the Secretary's office.	24.0
5) Chief Medical Officer's office	An office desk and a table for meetings, a space for bookshelves.	24.0
6) Accounting office	Same as at present, including a store-room of 9.6m².	48.6
7) Typist room	The same as at present	38.4
8) Office room	For 5 staff members, including a store-room of 7m²	37.0
9) Telephone operator room	4.0m x 4.0m	12.0
10) Chief Nursing Officer's office	The same as at present	24.0
11) Principal Medical Officer's office (Curative)	The same as at present	24.0
12) PMO's office (Preventive)	The same as at present	24.0
13) Secretariat (Office for secretaries)	Office for secretaries to PMO (Curative) and CNO. The same as at present.	12.0

Room	Description	Area, m²
14) Conference room	As a conference room for 30 high-ranking staff. Includes a storeroom of 7m².	52.0
15) Statistical office, including computer room	A room for 6 staff members and also a computer room.	51.6
16) Health Inspector's room	Desks and chairs for 4 staff members and for bookshelves.	21.0
17) Overseas Consultant's Office		52.0
18) Toilet, hot water heater		22.0
19) Corridor, hall, staircase	As an outdoor portion	236.7
Total		795.9

4-2-17 Health Education Building

The building will be composed of the following rooms:

1) Private rooms for counselling
2) Staff room
3) Recording room
4) Manipulation room
5) Design room
6) Printing room
7) Darkroom
8) Printed matter storage
9) Toilet
10) Entrance porch

Room	Description	Area, m²
1) Private rooms for counselling	4 rooms of the same size as at present for 5 counsellors. 3m x 3m	(9.0 x 4) 36.0
2) Staff room 1, 2		42.0
3) Recording room (soundproof room)	Soundproof room for repairing tapes for educational programmes. Includes 1 large table, 2 chairs, and a 6.4m² front room.	30.4
4) Manipulation room	Includes a 6m² storage area	23.6
5) Design room	For preparing original plates for offset lithography. The same size as the existing one.	36.0
6) Printing room	The same size as the existing one as a space for a cutting machine and for working.	36.0
7) Darkroom	Darkroom for offset lithography. The size will be reduced by 40m² compared to the existing one. Includes a front room of 8.0m²	24.0
8) Printed matter storage	The same size as the existing one	43.0
9) Toilet		8.0
10) Entrance porch, corridor	As an outside portion	123.9
Total		402.9

4-2-18 Nursing School Building

There are ten students for each grade, totalling 30 student's plus five students in the medical assistant course. Altogether 30 students are taught in shifts incorporating practical training. The nursing school is composed of the following rooms:

1) Large multi-purpose classroom
2) Classroom for 10 students
3) Practice room
4) Instructor's room
5) Libraries 1 and 2
6) Corridor

Room	Description	Area, m^2
1) Large multi-purpose classroom	35 students in total + 4 instructors + 10 guests, altogether 50 persons can be accommodated. Joint class-work of 1st and 2nd year students, also training of staff from outer islands. 20 desks, 21 chairs, and a blackboard.	61.2
2) 10-student classroom	Used as a classroom for 10 students of each grade and 5 students for medical assistantship. 10 desks, 20 chairs, and a blackboard.	27.0
3) Practice room	A bed for demonstration with dummy, 2 beds for practice, and a counter with sink.	27.0
4) Instructor's room	A room for 1 doctor and 3 staff, altogether 4 persons. 4 desks, 4 chairs, bookshelves.	27.0
5) Medical library	A library for students and another for doctors.	46.8
6) Medical Assistant classroom		27.0
7) Corridor	As an outdoor portion	92.0
Total		308.2

4-2-19 Nursing School Dormitory

The dormitory will contain the following rooms:

1) Large common room for nursing school students
2) Room for male students
3) Room for medical assistants
4) Room for taking short rests
5) Room for matron
6) Washing room
7) Washroom, toilet, shower
8) Laundry drying yard

Room	Description	Area, m^2
1) Common room for female nursing school students	Common room for 20 1st and 2nd grade students partitioned with bookshelves and curtains. Each booth will be 2.0m x 2.4m (with locker) or $4.8m^2$.	128.0
2) Common room for male students	Common room for 4 students. Each booth will be 2.0m x 2.4m (with locker) or $4.8m^2$. Includes $12.8m^2$ for shower and toilet.	38.4
3) Common room for medical assistants, room for taking short rests	5 medical assistants, 9 nurses on night duty for 6 wards. Partitioned with bookshelves and curtains. Each booth: 2.0m x 2.4m.	89.6
4) Room for matron	Room for dormitory superintendent with the same space as the existing one, for 1 bed, desk, chair, and bookshelf.	38.4
5) Washing room	8 sinks for washing, with the same space as the existing one for simultaneous washing by 8 persons.	38.4
6) Washroom and toilet	3 sanitary bowls for female students, 2 sinks, total 2 rooms.	(19.2 x 2) 38.4

Room	Description	Area, m²
7) Shower room	3 shower booths for female students, 2 sinks, total 2 rooms.	(19.2 x 2) 38.4
8) Laundry drying yard	As an outdoor portion	(38.4 x 2) 76.8
9) Corridor, stairway	As an outdoor portion	119.1
Total		605.5

4-2-20 Lodging Accommodations for Caretakers (Maneaba)

The space will be the same 160.0m² as for the existing one. A sink and public latrines will be provided.

4-2-21 Outdoor Latrines

1) For hospital
2) For Maneaba

Room	Description	Area, m²
1) Latrines for hospital	For male patients, female patients, doctors, nurses; a total of 4 places, 35m²x 4	(35 x 4) 140.0
2) Latrines for Maneaba	Latrines for males and females, with shower and community kitchen	24.5
Total		164.5

4-2-22 Connecting Corridors

1.8m in width x 280m in total length, 504,0m².

Table 4-1 Scale of the Facilities

Department	Name of Buildings	Area (m^2)		
		Outdoor Portion	Indoor Portion	Subtotal
1) Outpatient Diagnosis and Treatment Department	General Outpatient Department and Emergency Clinic Building	123.2	67.3	190.5
	Specialty Outpatient Clinic Building	105.9	57.5	163.4
	Pharmacy	442.1	36.0	478.1
		671.2	160.8	832.0
2) Central Diagnostic and Therapeutic Department	X-ray Examination Building	117.7	18.4	136.1
	Laboratory and Blood Bank Building	220.9	32.9	253.8
	Operating Theater Building	276.4	15.4	291.8
	Autopsy Room	35.0	0	35.0
		650.0	66.7	716.7
3) Ward Department	Private Ward	242.5	0	242.5
	Pediatric Ward	202.2	0	202.2
	Internal Medicine Ward	235.3	0	235.3
	Surgical Ward	230.6	0	230.6
	Obstetric Ward	258.6	0	258.6
	Tuberculosis Ward	161.3	32.0	193.3
		1,330.5	32.0	1,362.5
4) Service Department	Kitchen	128.0	0	128.0
	Cafeteria	7.5	56.5	64.0
	Laundry	64.0	0	64.0
	Drying Yard	0	165.0	165.0
	Workshop	128.0	0	128.0
	Fuel Storage	7.5	0	7.5
	Generator Room	25.0	0	25.0
		360.0	221.5	581.5
5) Administration Building	Administration Building	559.2	236.7	959.9
	Health Education Building	276.0	126.9	402.9
	Nursing School Building	216.0	92.2	308.2
	Nursing School Dormitory	409.6	195.9	605.5
		1,460.8	651.7	2,112.5
6) Others	Maneaba	0	160.0	160.0
	Outdoor Latrines	164.5	0	164.5
	Connecting Corridors	0	504.0	504.0
		164.5	664.0	828.5
Grand Total		4,637.0	1,796.7	6,443.7

4-3 Basic Plan

4-3-1 Site Layout Plan

The site comprises a part of the Lens Water Reservoir from which intake of water has been temporarily suspended due to the deterioration of water quality. It is a part of the residential area and is surrounded by coconut groves. In planning the layout of buildings the local meteorological conditions and natural conditions will be taken into account while adequate consideration will also be given to the neighboring residences.

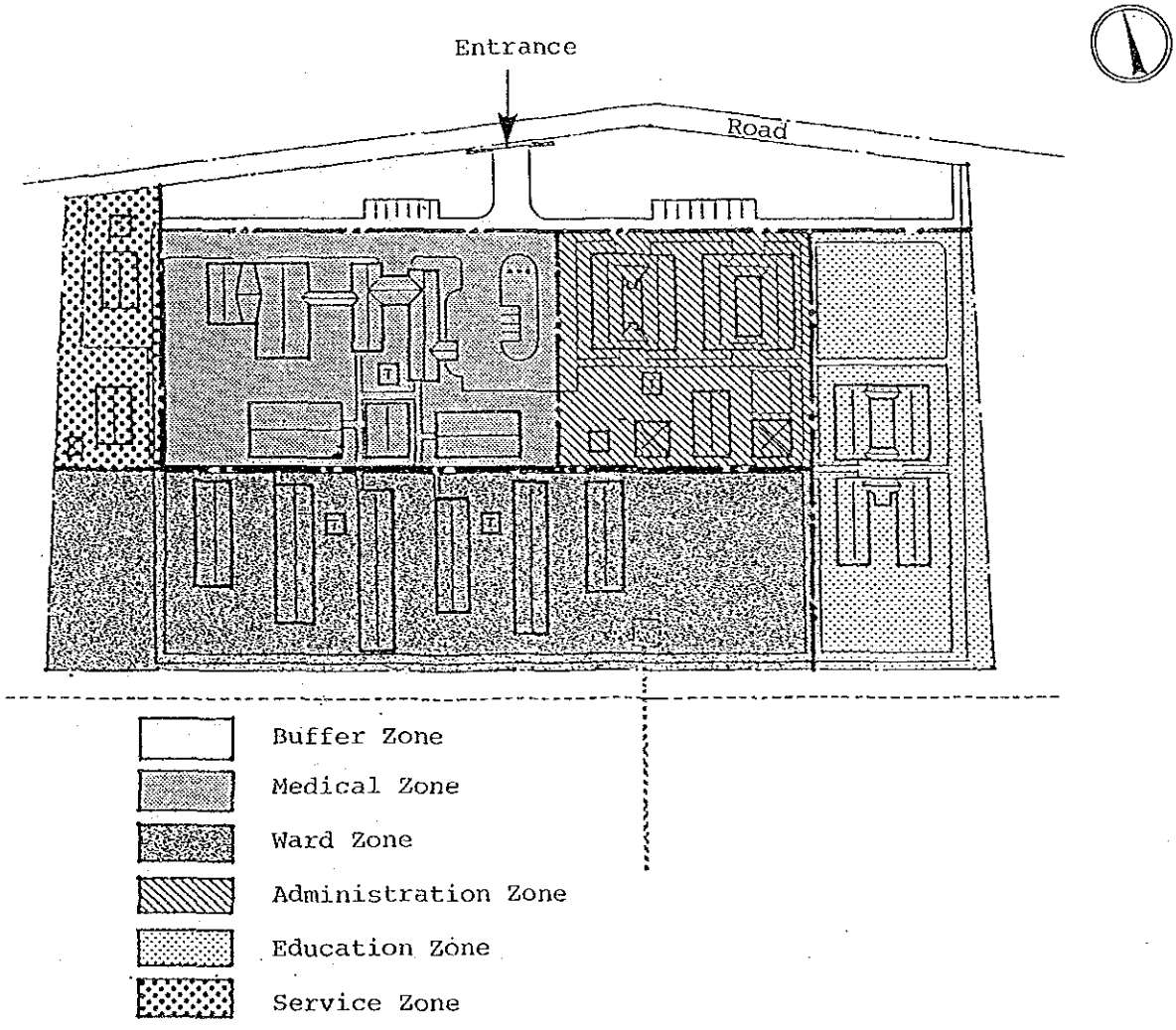


Fig. 4-1 Zoning Plan

The site extends about 250m in the east-west direction and about 140m in the north-south direction (about 3.7ha) and can be largely divided into six zones.

As the wind blows mainly from the east and northeast throughout the year, the clean zone is in the east of the site which gradually becomes dritier toward the west. Also, as traffic noise lessens as one goes further away from the front and the road toward the sea, the nursing school dormitory will be located in the southeast zone to be integrated with the adjacent residential district.

The Administration Building, Education and Training Building and Pharmacy will be located near the dormitory in the northeast zone.

As the Pharmacy will function as the central dispensing center for the nation, incoming and outgoing traffic lines will be secured.

A park will be planned between the south and southeast zones, with a kitchen and cafeteria in the corner. The park zone will be reserved for building additional facilities in the future.

The wards will be placed in the south zone in the order of surgical, internal, pediatric, gynecological and isolation wards from east to west. As the number of surgical operations is increasing yearly with the increase in the number of traffic accidents, additional surgical and internal wards are scheduled to be constructed in the park zone. The general outpatient wing, emergency wing, specialty outpatient wing, operating theater, laboratories and x-ray wing will be arranged in the north zone in front of these wards, and each of the wings and wards will be linked by an open corridor.

The private nurses' lodgings will be located in the southwest zone, and as they will be occupied by many people who will be leaving and entering at every hour of the day or night, they will be planned with an independent access way. The tuberculosis ward will be placed in the northwestern zone to prevent infection within the hospital premises.

A parking area will be provided in front of the Administration, Pharmacy, Outpatient and Emergency buildings. The space for the dental clinic, the relocation of which has been deferred this time, is reserved in the north zone in front of the Pharmacy, and the space for future relocation of the mental ward, in the northwestern zone.

A minimum number of the coconut trees now growing densely on the site will be felled on the basis of the layout plan.

4-3-2 Building Component Parts Plan

In planning the building component parts it is important to consider the local meteorological conditions, such as the strong sunshine, frequent rainfall, high humidity and winds which raise a lot of dust during the dry season. It is also necessary to take adequate measures against salinity damage as the site is located on the seacoast.

The building component parts must be planned to be as maintenance-free as possible. They must also be planned with due consideration to ventilation, heat insulation, dust prevention and energy conservation so that they afford a comfortable and healthy environment.

The structures will be of concrete block which is popular in Kiribati. Steel skeleton construction, which may be considered as an alternative, is disadvantageous in terms of durability against salt damage and maintenance. Based on the foregoing points, the building component parts were planned as follows:

(1) Roofs

As priority is placed on ventilation rather than on heat insulation, the roof will be sloped, with a small-sized roof truss covered with corrugated steel plate and ample space provided above the truss to secure ventilation. Eaves and pentroofs will be planned with a large overhang to protect against sunshine and rainfall. Sub-waterwork facilities will be provided to utilize rainwater.

(2) Exterior Walls

A material that is highly heat insulating, superior in waterproof properties, hard to soil and easy to clean will be used. Specifically, the locally produced concrete block will be adopted.

Hollow concrete block will be adopted for part of the walls to secure ventilation.

(3) Windows

Windows will be made amply large to fully utilize natural lighting. However, louvers and hoods will be provided as necessary to shield the direct rays of the sun. The site being located on the seacoast, the use of steel fittings which are susceptible to corrosion and wooden fittings which are poor in dust-proof properties will be avoided. Instead, aluminum fittings will be used.

(4) Ceilings

The ceilings of rooms which will not be air-conditioned will be made high to secure a large air volume so that comfort may be obtained even under natural conditions. The materials will be selected according to the function required by each room, for example, cleanliness, waterproofing, sound absorbing, beauty, etc.

(5) Partitioning Walls

Basically, locally produced concrete block will be adopted. Wooden partitioning, however, will be adopted for rooms which must be flexible for future changes.

Finishing materials for each room will be selected with due consideration to fireproofing, chemical resistance, heat resistance, fire resistance and other requirements.

(6) Floors

Finishing materials of flooring that requires waterproofing or chemical resistance will be synthetic resin coated. For other portions of flooring terrazzo block, plastic tile, etc., will be used as suited to each place.

4-3-3 Structural Plan

As the proposed construction site is near the seashore, the materials that will be selected for structural members will be those that are as little susceptible to salt damage as possible. The chief considerations of the structural system are reliability, durability, economics of local construction work and ease of maintenance. The main frame structure will therefore be of reinforced concrete block wall, the roof of wood and the slab and foundation of reinforced concrete block.

According to the test boring results, the surface soil between ground level and -0.5m is filled ground consisting of coral sand, and that between -0.5m and -2.0m is consolidated sand containing coral. Although a soil survey has not been conducted on a deeper F horizon, the underlying portion is inferred to be coral rock foundation and the sand layer containing coral sand at around GL-0.5m to have the ground bearing capacity of 3 to 7 ton/m^2. Considering the scale of the planned buildings, therefore, spread footing will be adopted.

As for load, on which the structural design is based, the Australian Standard (i.e., AS) will be adopted as a rule. Other factors dependent on natural conditions such as wind pressure, seismic force, etc., will be determined on the basis of local observation data.

The following loads are considered to mainly act on the structures.

1) Dead load

Actual load of building components such as structural members, finishing materials, etc.

2) Live load

For office rooms, bedrooms and other general rooms, SAA LOADING CODE will be applied.

Live loads of principal rooms are assumed to be as follows:

Bedroom : 2.0 KPa

Office room: 3.0

3) Wind load

Based on past records which recorded a maximum wind velocity of 55km (about 30 m/sec.) and a recurrence interval of 100 years (for hospital buildings), the design velocity pressure was determined to be 90 kg/m^2 (for buildings of 10m or less in height).

4) Seismic force

Although a very slight seismic acceleration had been observed sometime in the past, it will not be particularly considered in designing.

The concrete used as a structural material will be ordinary portland cement. A concrete plant will be installed on the site for measuring and mixing the cement. As sea sand will be used, rust preventives are planned to be used.

4-3-4 Utilities & Plumbing Plan

In planning the utilities and plumbing for this installation, the following must be given particular attention.

(1) Operating Expense Reduction Measures

The primary condition is to select systems and equipment which will keep electric charges, water charges and other operating expenses to a minimum.

Concrete measures are:

1) Energy saving (loss minimizing) type of equipment shall be selected.
2) Utilization of solar energy shall be considered.
3) Utilization of rainwater and seawater shall be considered.
4) Equipment shall be diversified and systems shall be simplified as much as possible.

(2) Maintenance Expense Reduction Measures

Equipment and plumbing materials which will allow any malfunctioning, damage, wear and tear or corrosion of equipment and piping installed to be repaired with the minimum of expense shall be selected.

Concrete measures are:

1) Equipment composed of complicated parts (such as electronic circuits) shall not be selected.
2) Smaller equipment shall be selected as much as possible.
3) The equipment and materials shall be readily procurable locally in terms of method and cost.
4) The equipment and materials shall either be of the same industrial standards or interchangeable.

5) The equipment and materials shall be those which will not require advanced technology for their maintenance and unkeep.

6) The equipment and materials shall be those which are as little susceptible to corrosion and salt damage as possible.

In addition to the foregoing, consideration must also be given to planning the facilities so that they are easy to operate and handle daily.

1. Air Conditioning and Ventilation Facilities

(1) Air Conditioning Facilities

Air conditioning facilities necessary to maintain the function of the hospital will be installed. The rooms to be air-conditioned, the types of air conditioning systems and room conditions are as follows:

Name of Room	Type of Air Conditioning System	Conditions	
		Temperature (°C)	Humidity (%)
Operating Room I	All fresh type	25	60
Operating Room II	"	"	"
Hematological Lab.	Wall-through type	27	50
Biochemical Lab.	"	"	"
Bacteriological Lab.	"	"	"
Weighing Room	"	"	"
Laboratory Wing Storage	"	"	"
Laboratory Wing Examination Rooms	"	"	"
X-ray Room I	"	"	"
X-ray Room II	"	"	"
X-ray Operating Room	"	"	"
X-ray Darkroom	Separate type	"	"
Pharmacy Storage I	Prefabricated refrigerator	5	"
Pharmacy Storage II	"	"	"
Food Storage II	"	"	"
Delivery Room	Wall-through type	27	"
Minister's Office	"	"	"
Secretary's Office	"	"	"
Telephone Exchange Room	"	"	"
Statistics Room	"	"	"
Consultant's Office	"	"	"
Offset Darkroom	Separate type	"	"

(Note) Assumed outdoor conditions are as follows:

Temperature: 33°C (D.B.)
Humidity : 90% (R.H.)

(2) Ventilation Facilities

Rooms which will not be air-conditioned will be mechanically ventilated with the exception of toilets, corridors and storerooms. Types of ventilation systems are as follows:

Room	Type of Ventilating System	Remarks
Laundry	Wall mounted ventilating fan	
Kitchen	"	
Darkroom	"	For darkroom
Generator Room	"	
Office Room Ward Rooms Other Rooms	Ceiling propeller fan	900 - 1,400 ø

2. Water Supply, Drainage and Sanitary Facilities

(1) Clean water for the water supply facilities will be supplied from the water service pipe of the Public Utilities Board (PUB). Water from the water service pipe will be induced into the water reservoir for storage, then lifted to the elevated water tanks by a lifting pump and supplied to the necessary places by gravity feed.

The necessary amount of water for this installation is assumed to be 20 m³/day as the actual water consumption of existing facilities is between 15m³ and 20 m³/day. To provide for the dry season when the water supply runs short (water supply is restricted during the dry season), the capacity of the water reservoir is planned to be about 40m³ and the capacity of the elevated water tank, around 8m³. To utilize rainwater, a water reservoir of 3-4m³ in which to store rainwater from the roofs will be installed at each wing to save water during the rainy season.

The use of seawater will also be considered for flushing of toilets, for which the capacity of the seawater reservoir is planned to be around 20m³, and that of the elevated water tanks, around 5m³ each.

The aforementioned system is as illustrated below.

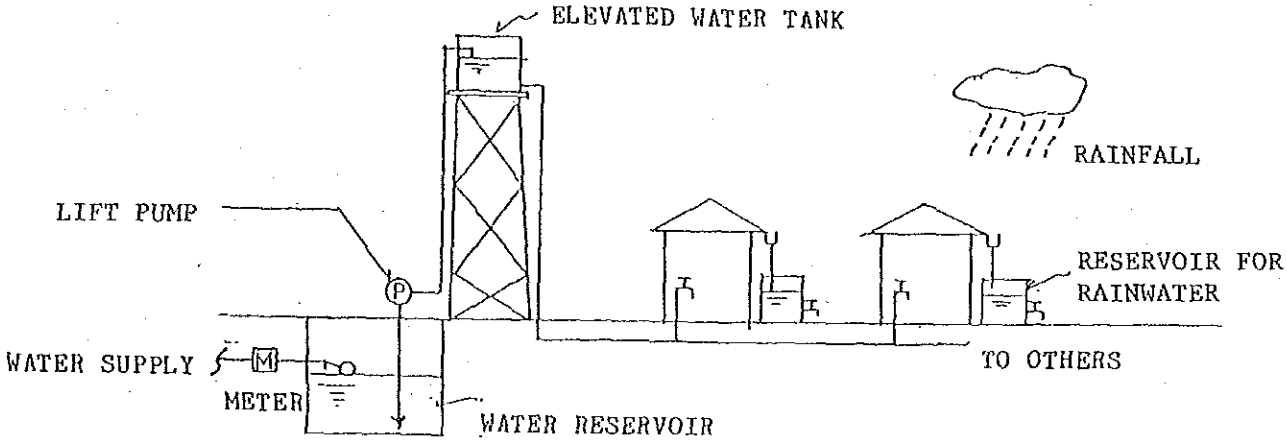


DIAGRAM FOR FRESH WATER INTAKE SYSTEM (1)

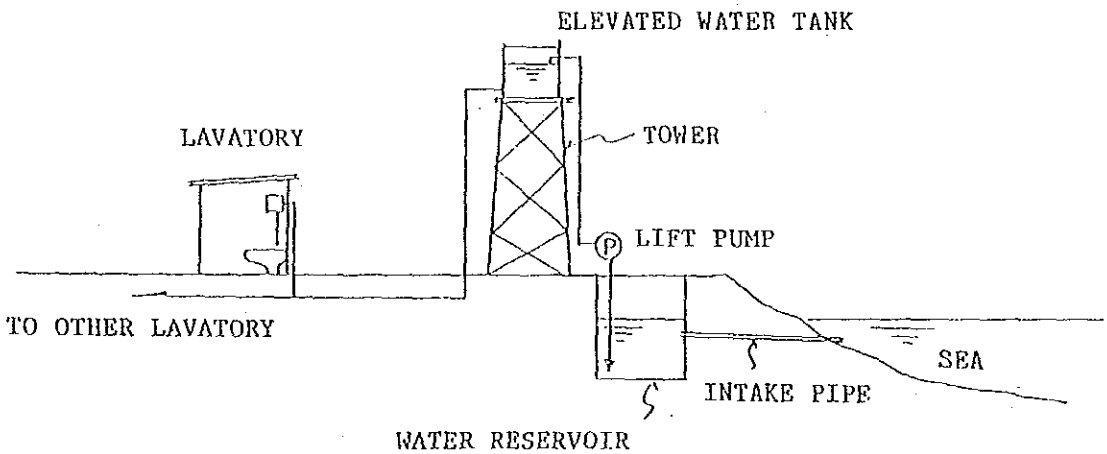


DIAGRAM FOR SEAWATER INTAKE SYSTEM (2)

(2) Drainage Facilities

The types of drainage other than for rainwater are classified as follows and will be treated accordingly. Waste water other than rainwater which is stored will be disposed of by natural percolation.

(i) General waste water

Miscellaneous waste water and sanitary sewage discharged from places other than the wards, laboratories and operating theater which do not need to be specially sterilized will be induced into the septic tank and discharged into the sea by drainage pump.

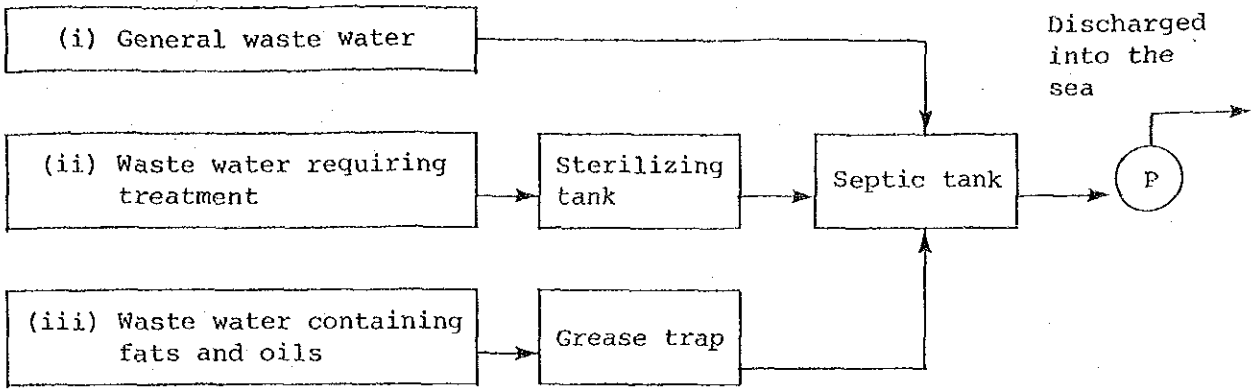
(ii) Waste water requiring treatment

Waste water other than (i) above which needs to be sterilized will be sterilized in the sterilizing tank and then disposed of in the same way as (i) above.

(iii) Waste water containing fats and oils

Waste water containing fats and oils discharged from the kitchen will be led to the grease trap to separate the fats and oils and then discharged in the same manner as (i) above.

The above described drainage system is illustrated in the following flow chart.



(3) Hot Water Supply Facilities

The hot water supply facilities for the kitchen, laundry and the central sterilized medical supply room of the Obstetrics Department will utilize solar energy to supply hot water. The laboratory wing, operating theater and other places that need only a small amount of hot water supply will be installed with an electric hot water heater with storage tank.

(4) Sanitary Fixtures

Sanitary fixtures will be installed in the toilets, wash rooms, laboratories and other necessary places.

(5) Incinerator

A small incinerator will be installed to incinerate raw waste.

3. Electrical Facilities

(1) Line Facilities

Three phase, four wire system 240/415 V 50Hz power will be received from PUB and distributed to the panel board and power board of each wing. The main line will be an underground cable to be buried directly in the ground.

(2) Generator Facilities

As an emergency power source to be resorted to in the event of power failure, a diesel engine generator will be installed. The generator load will be supplied to the operating room, water lifting pump, drainage pump and refrigerator on a priority basis. The type of generator is assumed to be of the indoor radiator cooled type with a capacity of three phase four wire 240/415 V 50Hz 75 KVA, for which an oil tank having a capacity large enough to secure 30 hours or more of operation will be provided. It will be the automatically actuated type.

(3) AVR Facility

To prevent voltage fluctuations (particularly voltage drop) from adversely affecting the medical equipment, an automatic voltage regulator (AVR) will be installed.

(4) Power Facilities

A water lifting pump, drainage pump and other motor driven equipment will be attached to a power source and control panel. As control panels will be installed outdoors, they must be treated to withstand salt damage.

(5) Lighting and Convenience Outlets

Lighting fixtures and convenience outlets in each building will be supplied with power from the distribution board installed in each building. Every branch circuit will be protected with a circuit breaker. Lighting fixtures to be used in principal rooms shall be fluorescent lamps, and energy conservation will be planned by finely dividing the switching blocks. Solar energy will be utilized for the outdoor lamps provided outside the buildings. Power to convenience outlets will be supplied at 240V, but for 100V convenience outlets which are required because some of the medical equipment requires 100V, 240V/100V transformers will be supplied. The outlet circuit of the operating room will be of the nongrounded system installed with an insulating transformer and insulation monitoring device for the sake of safety. Lighting fixtures to be installed outdoors will be heavily resistant against salt damage and those installed indoors will be the ordinary salt damage resisting type.

(6) Telephone Conduit Facility

Only the telephone conduit will be provided. The existing telephone exchange and telephone sets will be used.

(7) P.A. System

A P.A. system will be installed to smoothly conduct communications and paging within the hospital. The amplifier will be installed in the office room.

(8) Antenna for Wireless

An antenna for the wireless will be installed for communicating with ambulances and outer islands.

Table 4-2 Material Planning for Each Building Component Part

Work Item	Factors Considered	Materials, Specifications & Construction Method					Reasons for Adoption
		A	B	C	D	E	
External and internal wall		Exposed concrete, paint finish	Concrete block dressed masonry, paint finish	Hollow concrete block dressed masonry, paint finish	Concrete block mortar backing, paint finish	Wooden built, slate pitched	A will not be adopted to minimize use of aggregate and sand which are both expensive locally. B and D which are most common locally and also economical will be adopted mainly. E will be used in the gable wall section of buildings where laying of concrete block is difficult. D will be adopted for rooms that need ventilation and need not be closed.
	Water resistance	o	Δ	Δ	o	o	
	Salt resistance	o	o	o	o	o	
	Heat resistance	o	o	o	o	o	
	Weather resistance	o	o	o	o	o	
	Heat insulation	Δ	o	x	o	x	
	Workability	Δ	o	o	Δ	o	
	Local material	o	o	o	o	x	
	Price	Expensive	Cheap	Cheap	A little expensive	Rather cheap	
	Adoption	Unadopted		Warehouse, workshop (carpentry)	Unadopted		
Floor		Terrazzo block	Synthetic resin coated (Epoxy type)	Mortar hardener	Long PVC sheet	Tile	B will be used for laboratory rooms that require chemical resistance. D will be used for consultation rooms, ward rooms, classrooms of school, and dormitory rooms. C will be used for pharmacy, warehouse, outside corridor. A will be used for entrance lobby of Administration Building. E will be used for Central Supply, operating room, laundry, kitchen and washroom/toilet.
	Appearance	o	o	Δ	o	o	
	Water resistance	o	o	o	Δ	o	
	Abrasion resistance	o	o	Δ	Δ	o	
	Impact resistance	Δ	o	o	o	Δ	
	Chemical resistance	x	o	Δ	x	o	
	Cleanliness	Δ	o	x	Δ	o	
	Local material	x	x	x	x	x	
	Price	A little expensive	Expensive	Cheap	Rather cheap	A little expensive	
	Adoption	Kitchen, laundry, washroom, toilet, central supply	Laboratory	Stock room, outside corridor, pilotis, pharmacy			

Work Item	Factors Considered	Materials, Specifications & Construction Method				Reasons for Adoption
		A	B	C	D	
Roof		(With wooden backing) Zn.Al. plated	(With wooden backing) Corrugated slate	(With wooden backing) Pandanus leaves	(With wooden backing) Tile	C, which is most common locally but not durable and must be replaced every three years, will be adopted for Maneaba, it being the traditional craft method. A, which is used in all government buildings in Kiribati lately, will be adopted for economic reasons.
	Water resistance	◎	o	x	o	
	Salt resistance	Δ	o	o	o	
	Heat resistance	x	o	o	o	
	Weather resistance	o	o	x	o	
	Heat insulation	x	x	o	o	
	Workability	◎	o	o	x	
	Local material	x	x	o	x	
	Price	A little expensive	Rather cheap	Cheap	Expensive	
	Adoption			Maneaba		
Ceiling		Exposed concrete, paint finish	Rockwool acoustical board	Asbestos board, paint finish	Plaster board, paint finish	B will be used for nursing school classrooms, office rooms, recording room, classrooms, and the typing room that need to absorb sound. C will be used for medical rooms, laboratory rooms and other rooms that require cleanliness. A will be used for the operating room made of concrete as it requires shadowless light and also cleanliness. D will be used for other rooms.
	Appearance	o	o	o	o	
	Moisture resistance	o	x	o	Δ	
	Durability	o	o	o	Δ	
	Sound absorption	x	o	x	Δ	
	Cleanliness	o	x	o	Δ	
	Local material	x	x	x	x	
	Price	Cheap	Expensive	A little expensive	Rather cheap	
	Adoption	Operating room, ground floor portion that does not need ceiling of two-storied building	Classroom, recording room, typing room, office room	Central supply, medical room, laboratory room, kitchen, toilet, laundry	Ward room, dormitory for nurses, warehouse, printing room, pharmacy, workshop, etc.	

Work Item	Factors Considered	Materials, Specifications & Construction Method				Reasons for Adoption
		A	B	C	D	
Windows and doors		Aluminum sash	wooden sash	Steel sash		C will not be adopted as site is on the seashore. B will not be adopted either because of sand dust during dry season. A will be adopted, provided that B will be used for buildings that use hollow block for external wall.
	Water tightness	o	x	x		
	Water resistance	o	Δ	Δ		
	Durability	o	o	o		
	Workability	o	Δ	Δ		
	Local material	x	x	x		
	Price	Expensive	Cheap	Expensive		
	Adoption		Warehouse, workshop (carpentry)			
Partitioning walls		Tile	Concrete block dressed masonry, paint finish	Concrete block mortar coated, paint finish	Wooden, fine stemmed board packing, paint finish	B, which is most common locally and is economical, will be mainly adopted. C will be used for rooms that require cleanliness or use lots of water. A will be used for frequently used rooms (up to skirting, however.)
	Appearance	o	Δ	o	o	
	Water resistance	o	o	o	Δ	
	Durability	o	o	o	Δ	
	Impact resistance	Δ	o	o	x	
	Sound insulation	o	o	o	Δ	
	Cleanliness	o	Δ	o	Δ	
	Local material	x	o	o	x	
	Price	Expensive	Cheap	Rather cheap	A little expensive	
	Adoption	Kitchen, laundry and toilet skirting		Operating room, central supply, laboratory, kitchen, laundry, up to upper skirting of toilet		

4-3-6 Basic Plan for Equipment

The actual selection of equipment and final determination of its scope and scale will be subject to numerous factors such as the composition of rooms, the respective functions of each section and the linkage with those of other sections, not to mention the composition and characteristics of the hospital as a whole. The trend of hospital patients, the number of doctors and other medical staff and their technical competence, which determine the level of the hospital's medical services, and the environment relevant to equipment such as the hospital's repair and maintenance system, are also important factors which must be taken into consideration. What is more, the proposed project also calls for resolving the problem concerning the use of existing equipment as pointed out in Chapter 3-3, "Outline of the Project."

The content of the equipment plan including the handling of existing equipment is outlined for each section as follows:

General Outpatient Department

Basically, the present outpatient diagnosis and treatment system which provides one room each for doctor's consultations, nurse's preliminary examinations and treatment will be adopted. As the latter two rooms will also be used for emergency cases, the content of equipment will be commensurate to their needs. In other words, in addition to an examination table, sphygmomanometer, weighing scale and other basic equipment necessary for medical and surgical examinations and treatment, they will be provided with equipment for resuscitation and plastering. As it is advisable for the Department to sterilize its own tongue depressors, forceps and other examination and treatment instruments in order to alleviate the work burden of the CSSD and speed up sterilization and recovery time, a table-top autoclave and a boiling sterilizer to support it will be provided. As the locally available woodworking products are generally fragile in terms of both material and structure and therefore unsuitable for intensive use at the hospital, consulting desks, chairs and working tables and other such items which are

directly related to examination and treatment will also be added to the planning list. The provision of these articles will be considered not only for this Department but for all other departments of the hospital. As this Department also performs, besides carrying out its normal consultation and treatment, health examinations for applicants wishing to enter schools or apply for jobs, the provision of equipment necessary for this purpose will also be considered.

This Department has no equipment which can be reutilized.

Emergency Clinic

As the Emergency Clinic will use the treatment room of the General Outpatient Department and operate in the Central Operating Room instead of having one of its own, the only equipment that it will need is that for the emergency examination room and observation room. The number of emergency patients is 200 per year, but as the cases range from surgical (traffic accidents) to internal (diarrhea, etc.), the content of equipment must be such that it can respond to various needs. For the examination room, mainly resuscitation-related equipment for treating emergency cases, and for the observation room, mainly equipment for observing the development of symptoms will be provided. In addition, the Emergency Clinic will be provided with a rechargeable mobile examining light and a medicine cabinet in order to be able to cope with off-hour emergency cases. As this section will be substantially newly established, the only equipment that can be reutilized for it are the ambulances and oxygen cylinders.

Specialty Outpatient Department

The composition of the specialty clinics will be the same as now, consisting of internal medicine (including psychiatrics), surgery (including ophthalmology, otology and rhinology, dermatology),

pediatrics, gynecology and obstetrics, and these will examine and treat patients referred from the General Outpatient Department from their specialized viewpoint. Accordingly, their equipment must be more or less special except for that for internal medicine, but as a rule, they will be contained within the limits of the present scope of examination and treatment.

Internal medicine will consist of two units. The two units will occupy one room, and each unit will be equipped with an examining table, examining instruments and illuminating box, etc., while the instrument cabinet and weighing scale will be shared between them. As this section will basically do well enough with the sort of equipment used for examinations by the General Outpatient Department, it will not be equipped with any specialized equipment. For psychiatrics, the provision of new equipment will not be considered because therapy for the patients will primarily consist of interviews.

Surgery will be equipped with general examination and treatment equipment, in addition to which equipment will also be provided for carrying out simple examinations and treatment for ophthalmology, otology and rhinology and dermatology. The existing slit lamp will be moved to this section for reuse.

The equipment for pediatrics will be approximately the same in content as for internal medicine with the addition of a baby balance and electrocardiograph for early detection of children's heart diseases.

Gynecology and obstetrics will share one room and, as in the case of internal medicine, will share the use of the instrument cabinet, weighing scale, etc. As the Gynecology Section also performs, in addition to normal consultations and treatment, examinations and treatment of both males and females requesting assistance in family planning, it will be provided mainly with equipment that has to do with internal examinations including an examination table and examining unit. For obstetrics, the ultrasonic diagnostic equipment

useful for health control of perinatal pregnant women will be provided so that a more extensive diagnosis can be made. The ultrasonic diagnostic equipment, however, will be the most popular linear type without the photographic attachment which involves a high running cost.

This Department has no equipment which is reutilizable.

Pharmacy

Its major job is not only to supply drugs and medical supplies to almost every area of TCH but also to the medical sub-organs such as dispensaries and health centers. Accordingly, the drugs and medical supplies handled in the Pharmacy are quite substantial in terms of both variety and quantity, so that it is most desirable to facilitate the complex work involved in their custody and management. The equipment will be selected with emphasis on improving the efficiency of all work involved in the procurement of drugs and medical supplies and in supplying them.

As the demand for liquid medicine is particularly large at about 600 ℓ per month on average, the pharmacy room will be provided with a bottle washer, distillation unit, distilled water tank, high voltage sterilizer, and other equipment required in the manufacturing process of washing - sterilization - filling - sealing.

Besides the above, small trucks for the Pharmacy's exclusive use will be added to the list so that it will not have to use the ambulances for shipping medical supplies to outer islands (five times a week, about 790 packages a year), procuring fuel, detergents and other supplies (three times a week) or collecting bottles of medicine (once a week).

Some of the equipment which can be reutilized in the Pharmacy are the steel cabinet, medicine refrigerator, electronic balance, pill counter, typewriter, mixer, etc.

Radiography Department

In place of the worn out fluoroscopic apparatus, a more easily operable general purpose X-ray TV radiographic apparatus will be used. It will be far more useful than the existing fluoroscopic apparatus in that it will allow more efficient examinations to be made as they can be done in a bright room and reduce exposure of the doctors and radiographers to X-rays. It also has the advantages of rendering more distinct pictures and of being able to change the position of the patient with greater ease.

Radiography mainly consists of general radiography of the chest, etc., but as the Department's capacity is used almost to the limit already, it is necessary to shorten the time required from reception to radiography examination and from radiography examination to film development.

The equipment for the darkroom was thus planned with the aim of reducing the required processing time and with emphasis on compactness and functional performance.

There is no reutilizable equipment in this Department.

Clinical (Laboratory) Examination Department

The equipment planned for provision is that related to hematology, bacteriology, biochemistry, the blood bank, and to the weighing room and washing room which support these activities.

The hematological test room also serves as the test room for the blood bank now. The tests are mostly for screening, such as hemoglobin concentration, leukocyte count and erythrocyte sedimentation rate.

As every test is performed manually now by only one technologist, the processing capacity is limited. A highly useful automatic blood

cell counter will therefore be specially supplied for this Department to simplify and speed up the work process.

The objects of bacteriological tests are almost exclusively bacteria and eumycetes, and the test methods are smearing tests, culturing tests, and sensitivity tests to investigate the effectiveness of chemotherapy agents against pathogenic bacteria. The role played by such tests is important in diagnosing infectious diseases which occupy the largest share of disease composition. In this field where biochemical qualitative and quantitative analyses are not performed, the important problem is how to secure a safe and well-functioning environment for carrying out the tests as they not only require along periods of time but the specimens must be preserved in good condition even under high climatic temperatures and hospital infection must be prevented. Also, as microscopic examination is primarily resorted to in every test, special considerations are called for in maintaining the microscopes in good working condition.

Biochemical tests are made mostly with the use of a flame photometer and spectrophotometer. Although the number of tests made in FY 1987 was 2,400, which is not large compared to other tests such as those on blood and cells, these tests provide indispensable information for diagnosing diseases of the kidneys and liver and in determining the treatment policy.

As the equipment was all delivered in the early 1980s and was used for only a small number of tests and repaired whenever necessary, it is in relatively good condition. However, as difficulties are naturally foreseen in maintaining it in good condition by the time the new hospital is completed and for subsequent use, replacing it with equipment of the same level will be considered.

As most of the equipment in the washing room is either out of order or worn out it will be newly installed with emphasis on sterilization-related equipment. In other words, an autoclave necessary for sterilizing culture media in bacteriological tests, a dry heat sterilizer for sterilizing glass ware and a normal boiling

sterilizer will be provided so that each of them can be used for its proper purpose. Also, a small distillation apparatus will be placed in this room for use by the entire Clinical Examination Department.

Another important function of the weighing room is keeping custody of reagents including hazardous chemicals so that this room will be provided with facilities and equipment necessary for that purpose.

The oldest pieces of equipment still active in the Clinical Examination Department are the refrigerator and centrifuge (delivered in 1979), followed by the mixer (1980), flame photometer (1983), thermostatic water bath (1984), etc. On the other hand, the newest of the equipment abandoned due to equipment failure are the incubator (1985), dryer (1984) and microscope (1984), etc. As there are differences in the frequency of use, the environment in which the equipment was placed and the characteristics of the equipment itself it is difficult to generalize the tendency of the failures but they will serve as a guideline in selecting the equipment to be newly installed or transferred.

Blood Bank

The number of people who wished to donate blood in FY 1987 was 1,709, of which the actual donors numbered 665. In order to judge the congruity of bloods, three types of tests, namely, blood type judgement tests (1,624 cases), cross matching tests (753 cases) and hemoglobin analysis (719 cases) are generally performed, and approximately 3,100 of such tests are performed a year. Judging from the actual record of these tests, it is considered appropriate to perform all tests other than blood type analysis and cross matching tests at the blood testing room of the Clinical Examination Department. Accordingly, the Blood Bank will be provided only with equipment related to blood collection and blood preservation.

The utilization of a thermostatic water bath will also be considered for the Blood Bank.

Operating Department

Two operating rooms will be provided and used for not only general operations but also for gynecological and obstetric and emergency operations. As one will be used for clean operations and the other for dirty operations, both rooms will basically have the same equipment. In content they will be of the same grade, size and level as the existing ones with emphasis on their functional aspect. In other words, the operating table will be the hydraulic type and strong in construction; the anesthetic apparatus will be mounted with a laughing gas cylinder; and the use of local standard size cylinders will be considered for oxygen supply. The ventilator will be made capable of being incorporated in the anesthetic apparatus, and the shadowless lamp will be made simpler than the existing one by removing the side lamp.

The scrub room will be provided with a new brush sterilizer, but the sterilized water apparatus will not be adopted since difficulties are anticipated in periodically replacing its filter and the like. The required water will be fed directly from the water supply pipe as in the past.

As operating instruments are ultimately the most needed items in the medical field at all times and are basically expendables, their variety and quantity will be decided in the light of the content and number of operations performed by each section to make sure that no shortage will result in the future.

The recovery room will have two beds, and the equipment will be limited to a respirator, emergency cart, aspirator and the like. Monitors and such which are highly likely to remain idle will be excluded.

As the Central Supply and Sterilization Department (CSSD) is administered by the Operating Department, the nurses in this Department are often overworked. Consequently in this Department greater efficiency is sought in carrying out the series of work from

preliminary washing to sterilization and custody in order to reduce the work-time, and the equipment plan will be made with emphasis on this point. In other words, for preliminary washing an ultrasonic cleaner will be supplied, and for sterilization the present overuse of the table-top autoclave will be corrected by switching mainly to the use of the small, 4-cast high-voltage sterilizer to be supplemented by a vertical type autoclave and boiling sterilizer. For keeping custody of instruments and medical supplies the present decentralized system of storing them at several places will be simplified by changing to the centralized system of keeping them in one place.

For the autopsy room the installation of a mortuary refrigerator to accommodate two corpses will be considered as it often takes time for the corpse to be removed from the hospital, particularly when the dead patient is from an outer island.

As the condition of the equipment in this Department is satisfactory on the whole except for that in CSSD and the autopsy room, its reutilization will be systematically incorporated into the new equipment plan.

Wards

The beds will be distributed as follows: 7 beds for the private ward, 26 beds for the medical ward, 22 beds for the surgical ward, 16 beds for the pediatric ward, 12 beds for the obstetric ward and 20 beds for the tuberculosis ward, and each ward will be deemed as one nursing unit. Every ward except for obstetrics will consist of a patients' room, nursing station and space for utilities, and the equipment for every ward will basically be the same in content.

For the patient's rooms, five crank-up beds each will be provided for the gravely ill patients of the medical surgical wards (of the 5 beds for the surgical ward two are existing ones) in addition to the ordinary beds without casters, and 8 pediatric beds for the

pediatric ward.

Of the crank-up beds for surgical patients, two will be for orthopedic patients and will therefore be equipped with a traction device.

The equipment for the nurse station will be provided with emphasis on securing a functional and sanitary working environment. It will also have the necessary equipment for examinations and treatment.

The utilities section of each ward will be installed with equipment related to sterilization, the pantry and filth treatment based on the principle that each ward shall take care of itself. An ice-making machine will be added to the pantry of the private ward for common use by all wards.

As delivery of babies plays a major role in the obstetric ward, the equipment will be provided with emphasis on delivery, but no major changes will be made except in the number of delivery beds which will be increased from one to two. In the handling of newborns, the system of putting mother and baby in the same room will be continued while a new system that enables intensive treatment to be given to premature and gravely ill infants will be adopted. However, a nursing system heavily equipped with various functions is incongruous with the existing conditions. Rather than that, it is considered appropriate to amplify the content of equipment for the bathing room and milk room annexed to the ward.

Equipment deemed transferrable from the present wards consists of one incubator, two crank beds and 13 over-bed tables.

Service Department

As laundry is done by hand at present, the daily quantity of washing is estimated to be less than 50 kgs consisting of sheets, white robes and draperies, but excluding patients' personal belongings. As the quantity of laundry is certain to increase from now on the

installation of two, home-size washing machines for operation four or five times a day will be considered to cope with the situation.

Nursing School

Desks and chairs for one additional classroom and dummies for nursing practice will be added to the list of equipment.

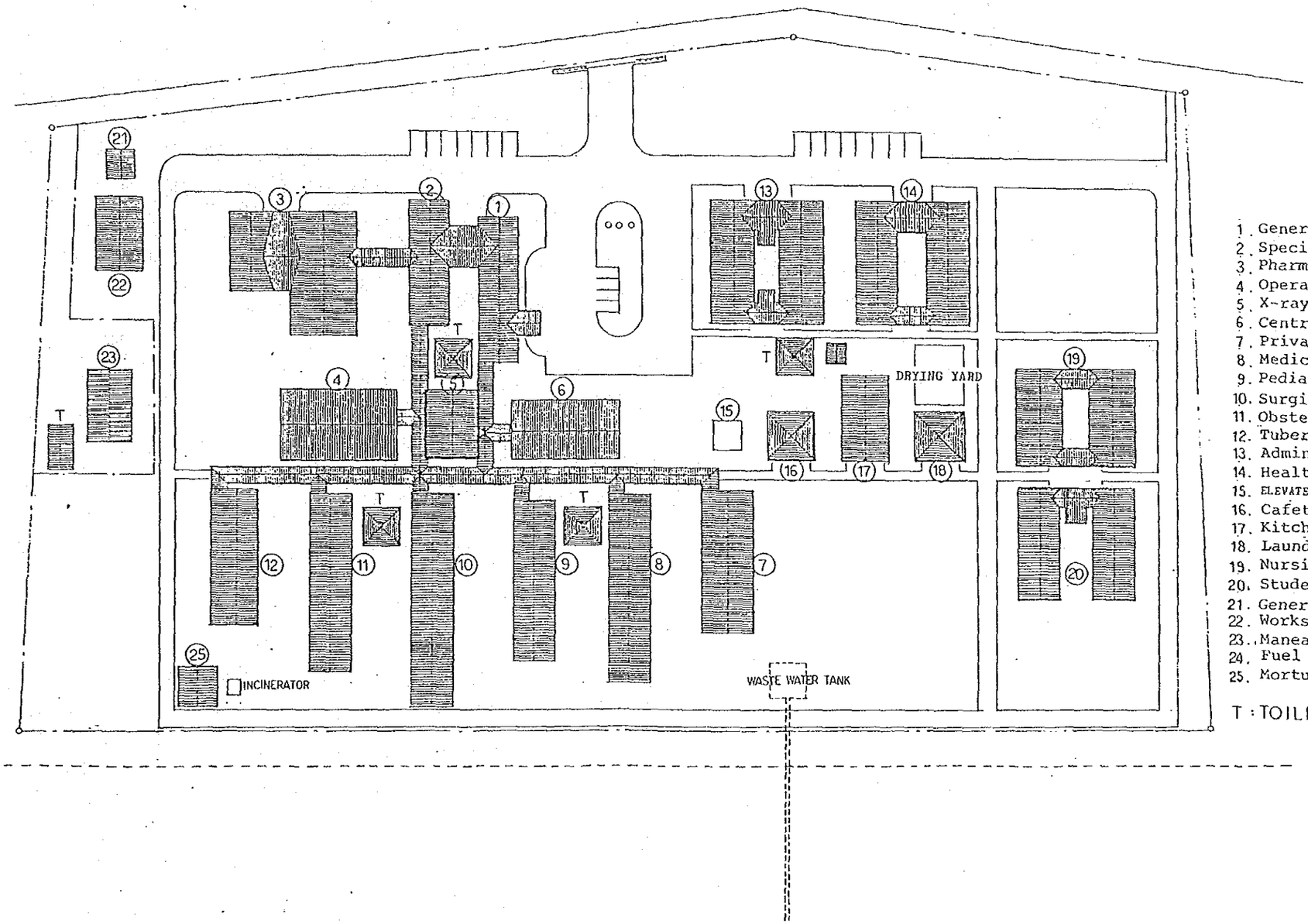
Public Health Department

Amalgamating the water quality tests performed by TCH with those of this Department will allow the existing equipment of both TCH and this Department to be mutually utilized.

4-4 Basic Design Drawings

(Facilities)

1. Site Plan
2. Outpatient Clinic
3. Specialty Clinic
4. Pharmacy
5. X-ray Dept., Mortuary, Generator Hut
6. Laboratory & Blood Bank
7. Operation Theater
8. Private Ward
9. Pediatric Ward
10. Medical Ward
11. Surgical Ward
12. Obstetric Ward
13. Tuberculosis Ward
14. Laundry, Workshop, Main Kitchen, Cafeteria
15. Laundry, Cafeteria, Workshop, Main Kitchen
16. Administration
17. Administration
18. Health Education Dept.
19. Nursing School, Dormitory
20. Nursing School, Dormitory
21. Maneaba, Toilet, Fuel Store
22. Toilet, Fuel Store
23. Power Supply & Telephone System
24. Water Supply System
25. Drainage System

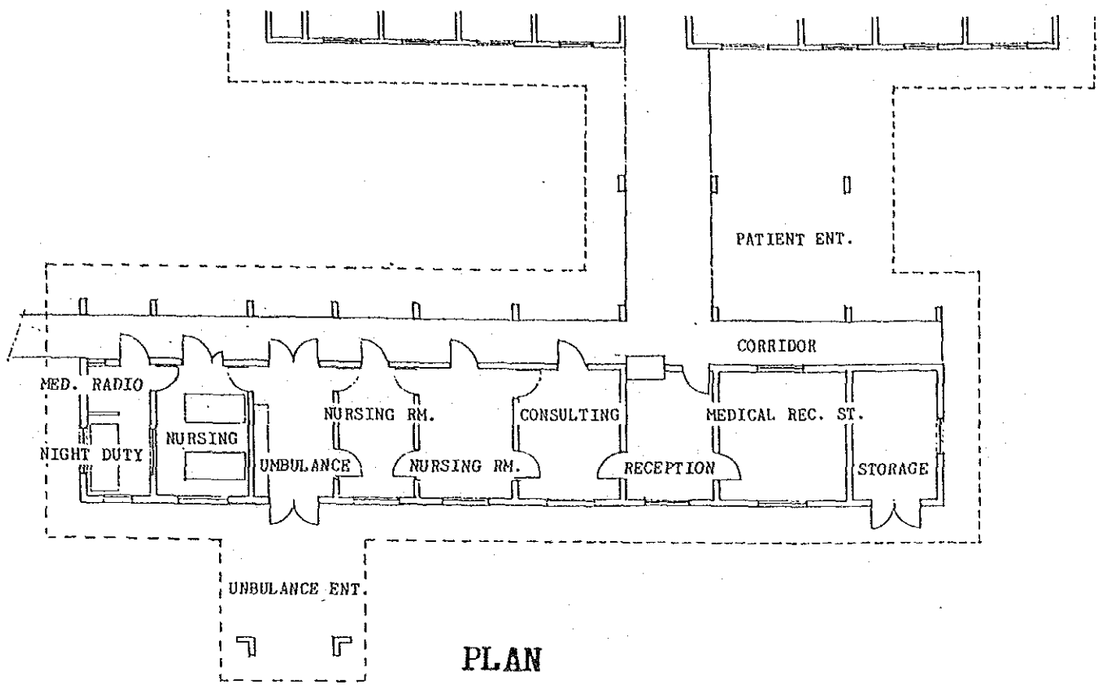


1. General Outpatient Clinic
2. Specialty Outpatient Clinics
3. Pharmacy
4. Operating Theater Building
5. X-ray Examination Department
6. Central Diagnostic Department
7. Private Ward
8. Medical Ward
9. Pediatric ward
10. Surgical Ward
11. Obstetric Ward
12. Tuberculosis Ward
13. Administration Building
14. Health Education
15. ELEVATED WATER TANK
16. Cafeteria
17. Kitchen
18. Laundry
19. Nursing School
20. Student Dormitory
21. Generator room
22. Workshop
23. Maneaba
24. Fuel storage
25. Mortuary house

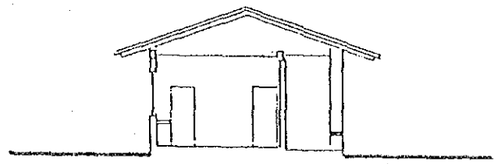
T : TOILET

SITE PLAN

Scale 1:1000 0 10 30 50(M)



PLAN



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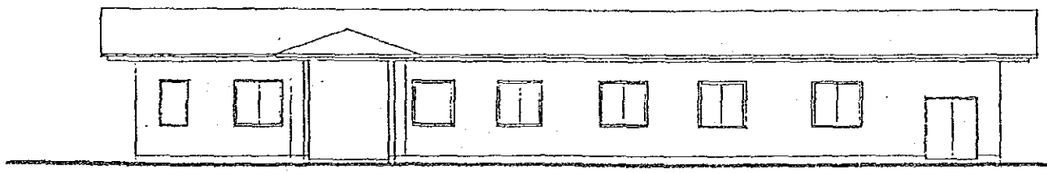

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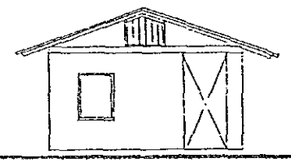
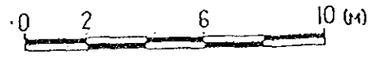
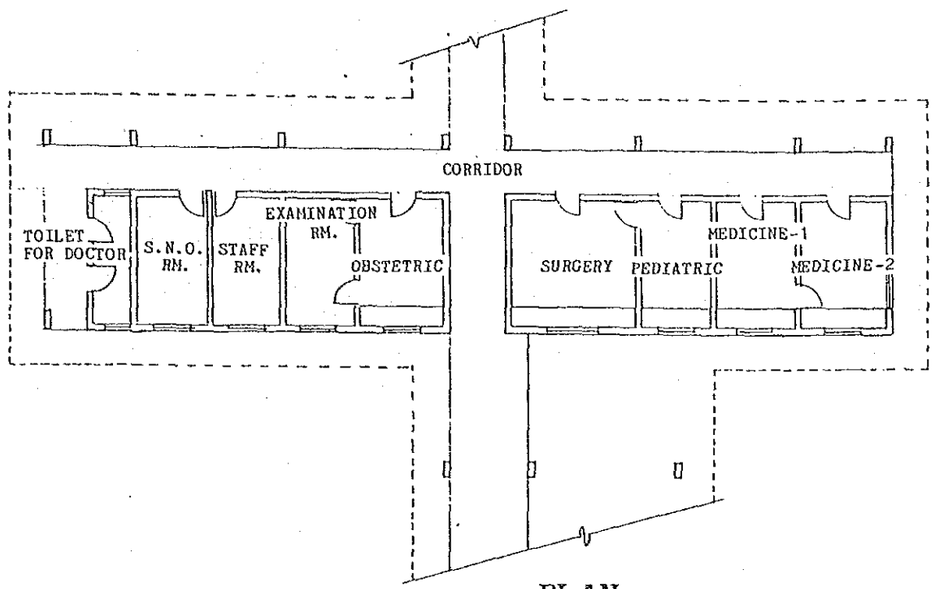


NORTH ELEVATION

OUTPATIENT CLINIC

Scale 1:200





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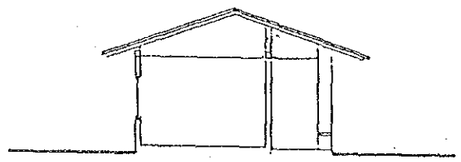

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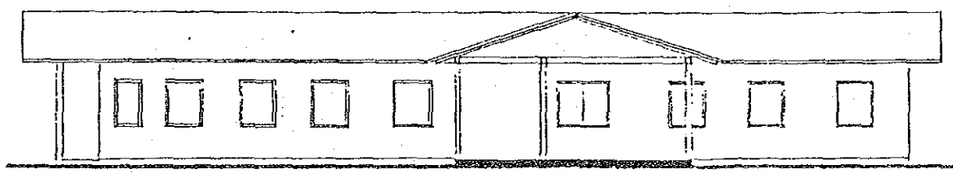

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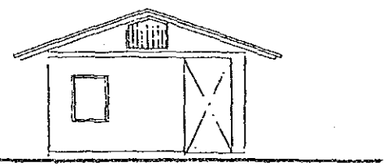
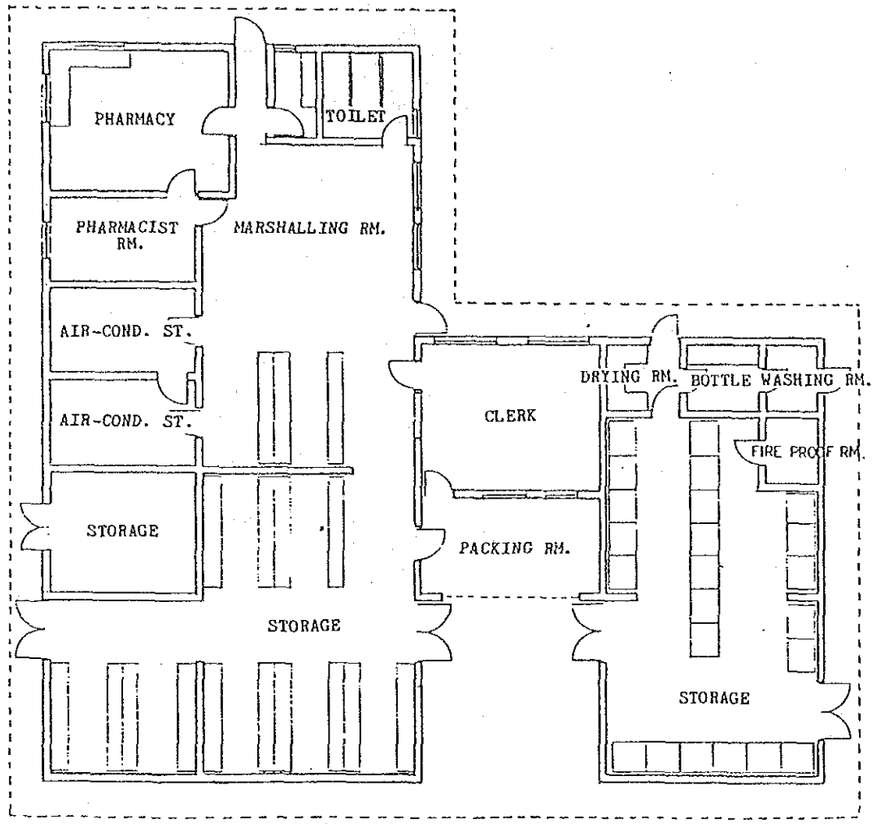


NORTH ELEVATION

SPECIALITY CLINIC

Scale 1:200

0 2 6 10 (M)



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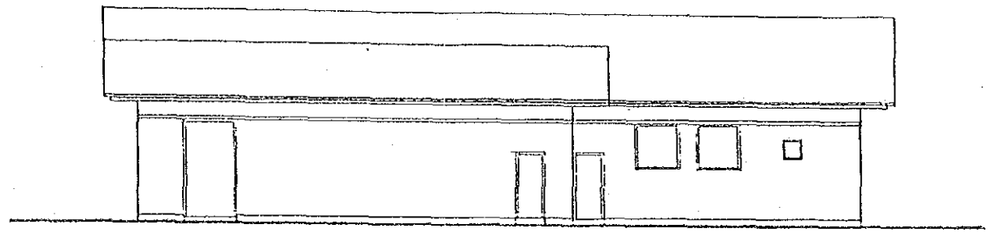

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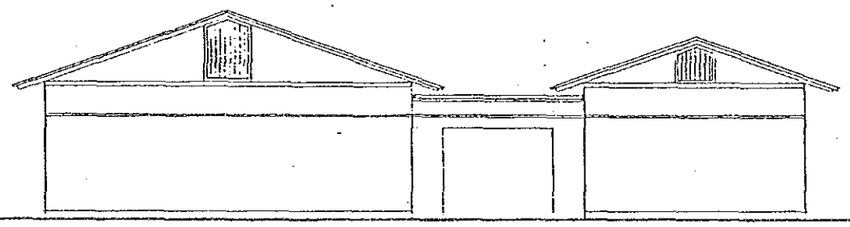

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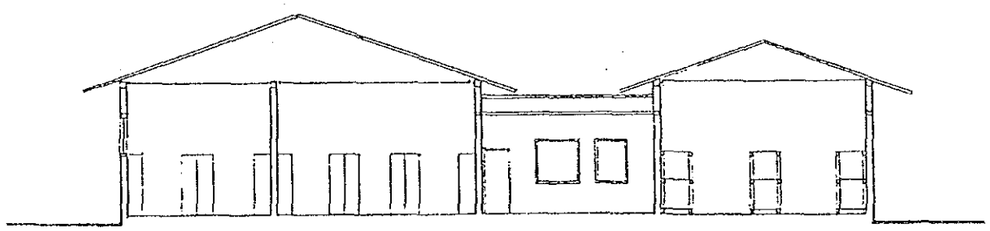


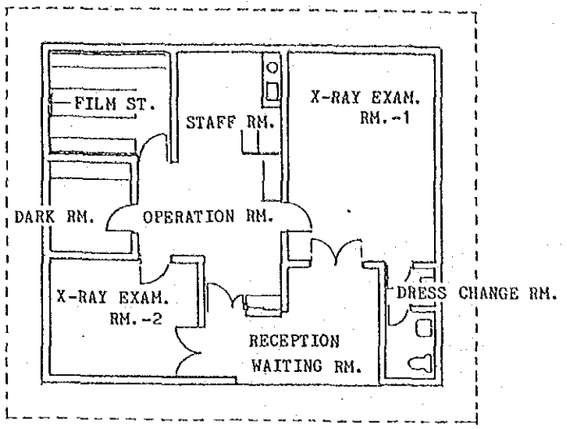
SECTION

PHARMACY

Scale 1:200

0 2 6 10 (M)

X-RAY DPT.



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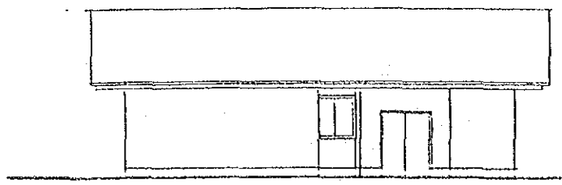

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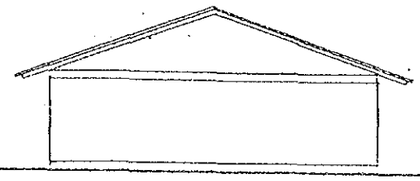
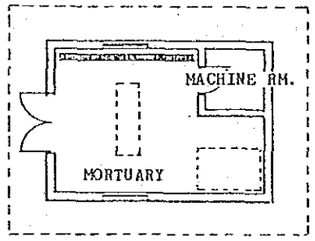


NORTH ELEVATION

MORTUARY

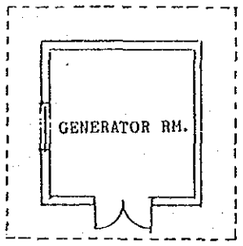


PLAN

EAST ELEVATION

SOUTH ELEVATION

GENERATOR HUT



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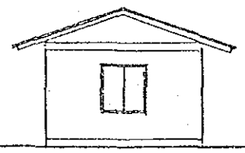

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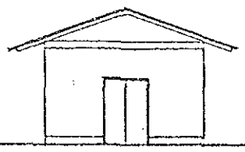
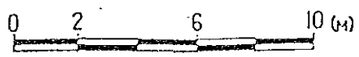
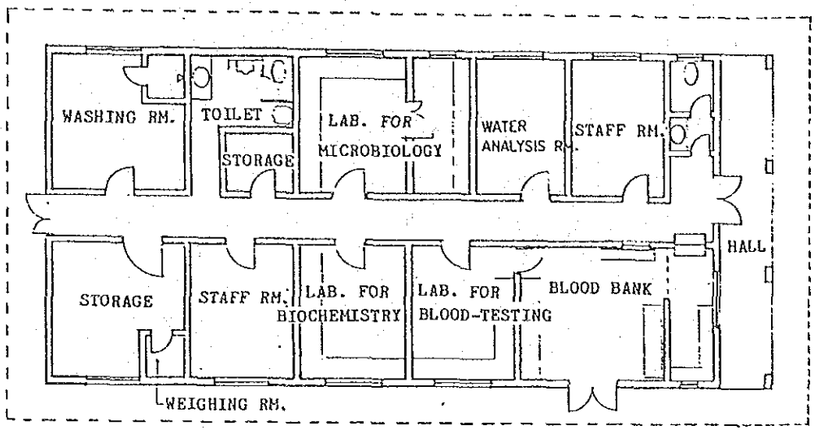


NORTH ELEVATION

X-RAY DPT.
MORTUARY
GENERATOR HUT

Scale 1:200





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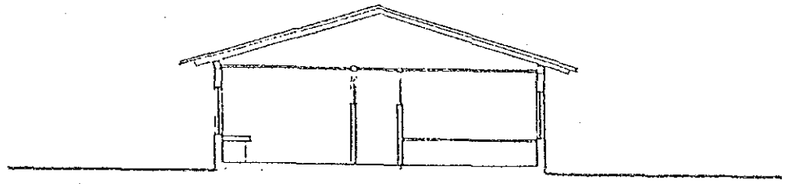

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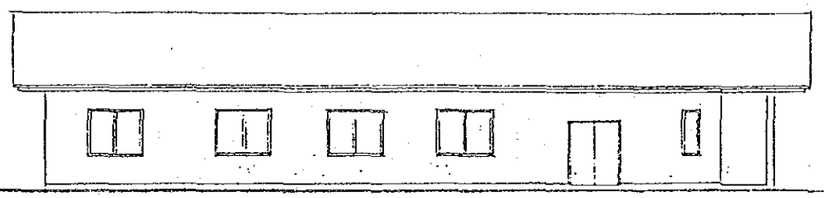

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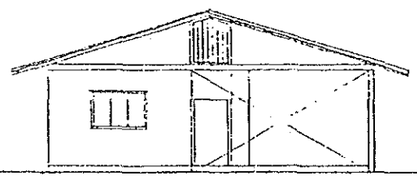
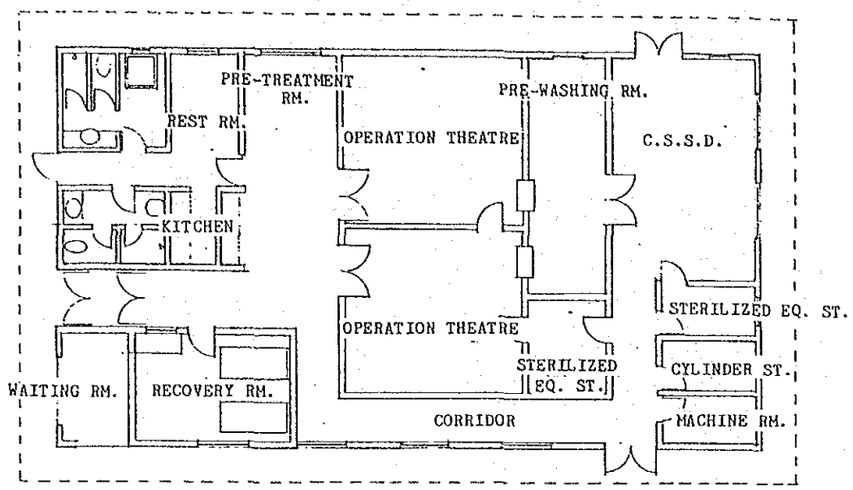


WEST ELEVATION

LABORATORY & BLOOD BANK

Scale 1:200 0 2 6 10 (M)



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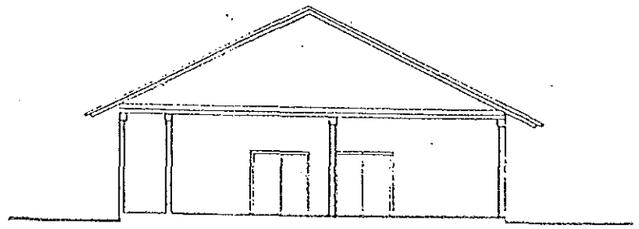

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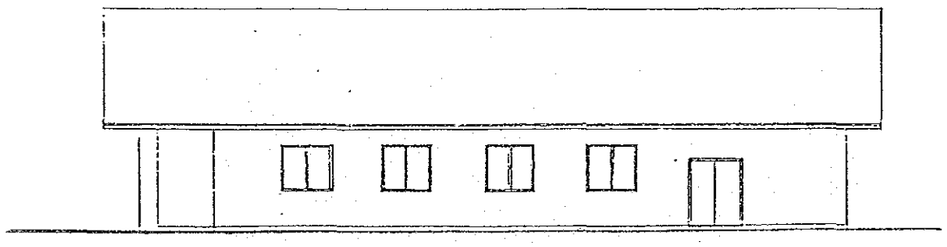

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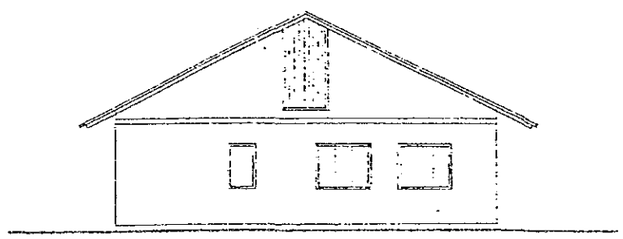
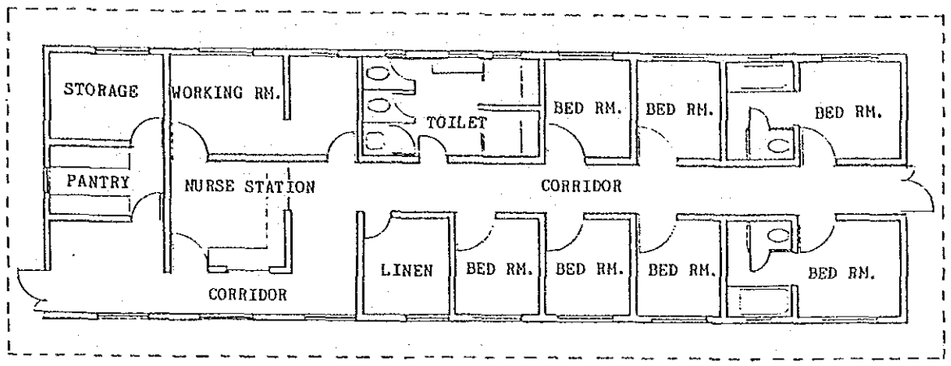


WEST ELEVATION

OPERATION THEATRE

Scale 1:200 0 2 6 10 (M)



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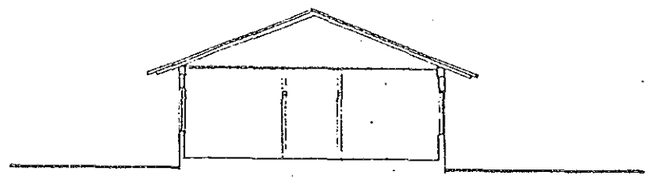

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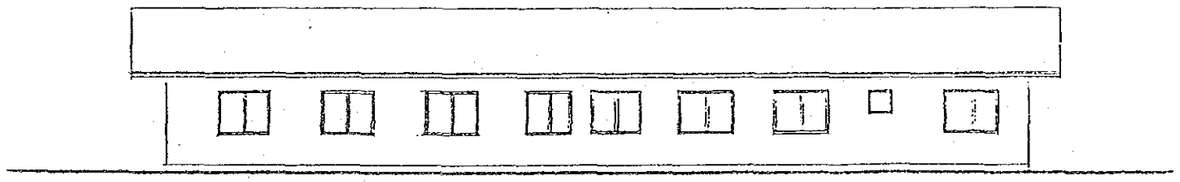

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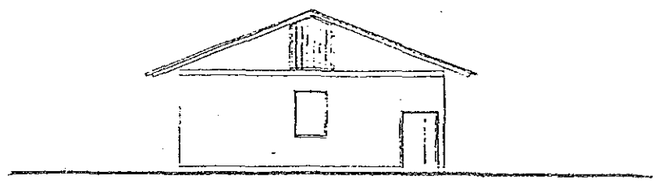
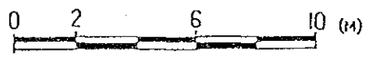
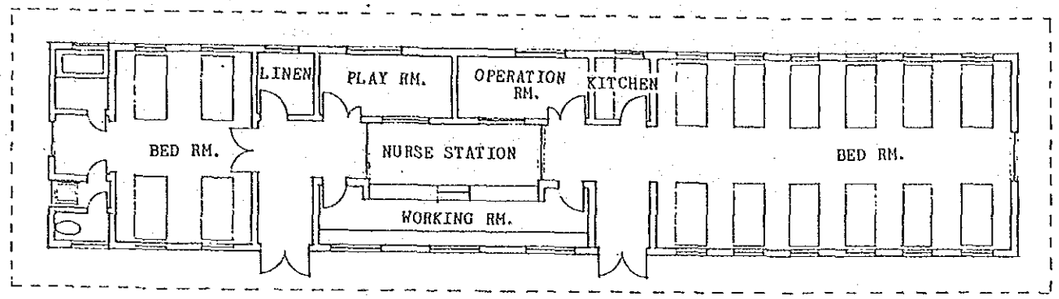


SOUTH ELEVATION

PRIVATE WARD

Scale 1:200





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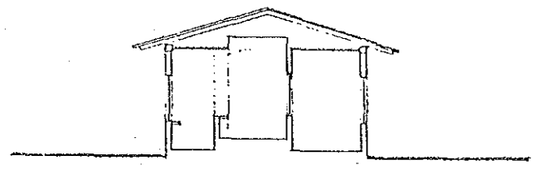

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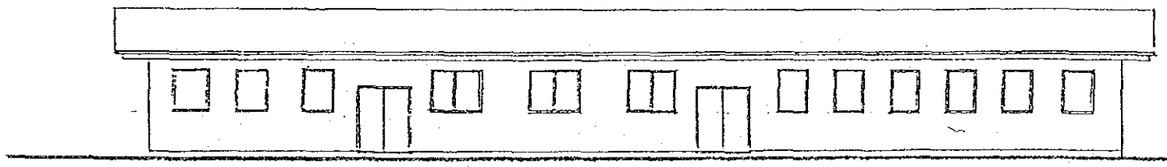

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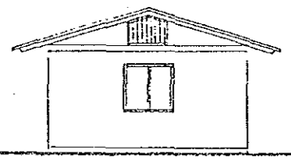
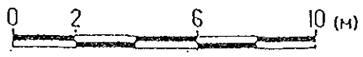
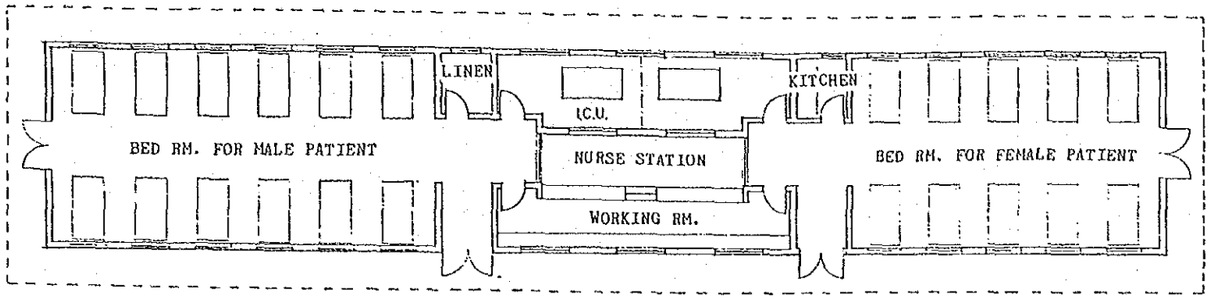


SOUTH ELEVATION

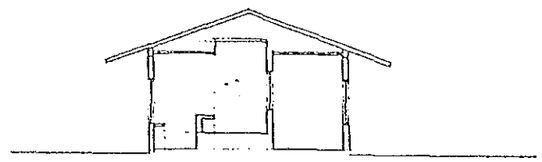
PEDIATRIC WARD

Scale 1:200





PLAN



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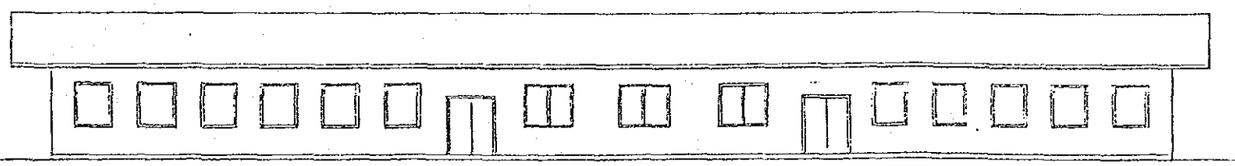

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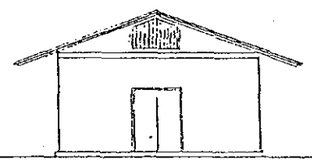
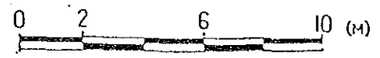
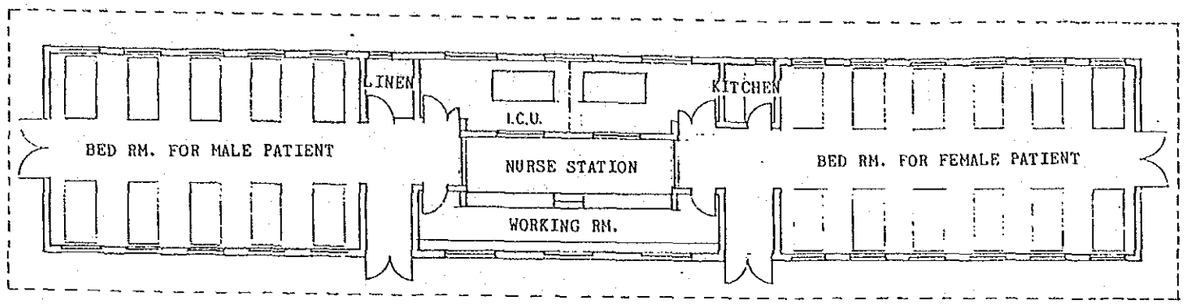


SOUTH ELEVATION

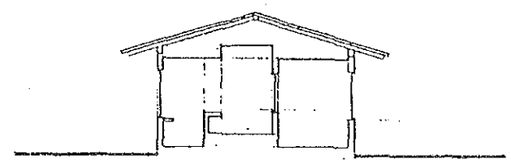
MEDICAL WARD

Scale 1:200





PLAN



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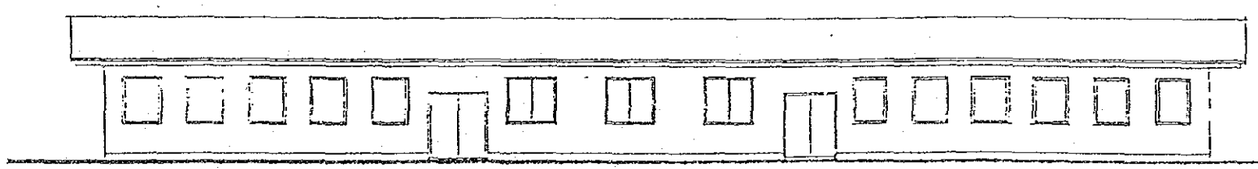
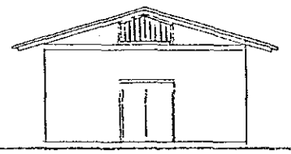


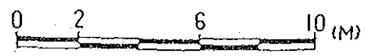
WEST ELEVATION

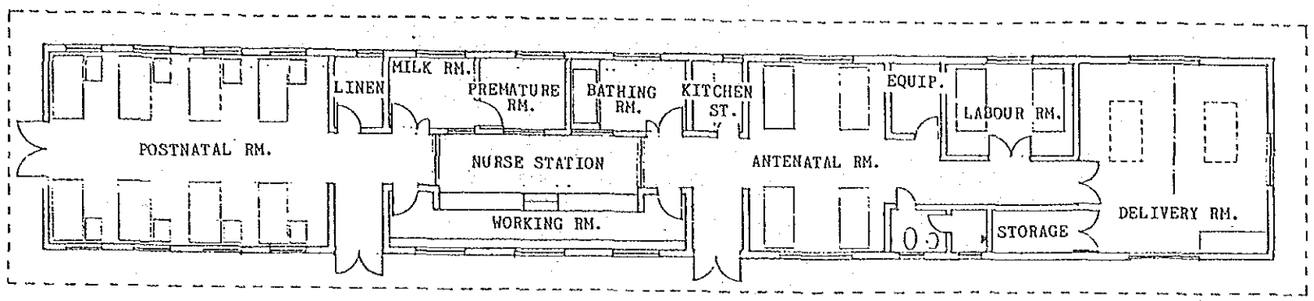


NORTH ELEVATION

SURGICAL WARD

Scale 1:200





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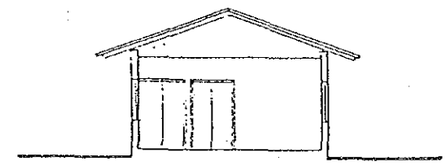
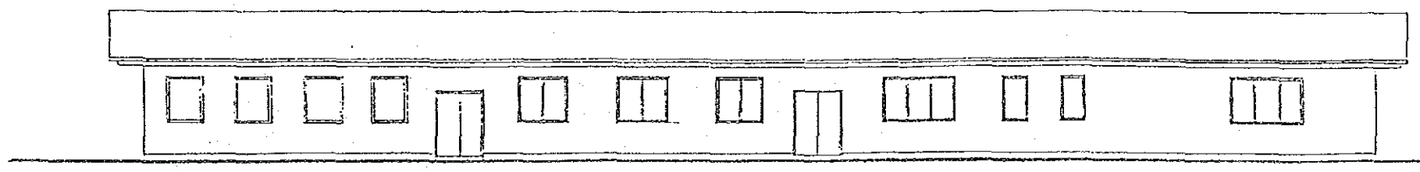
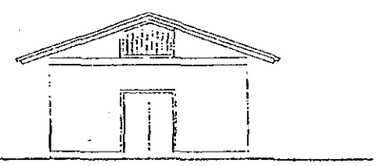


SECTION



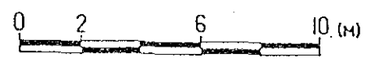
WEST ELEVATION

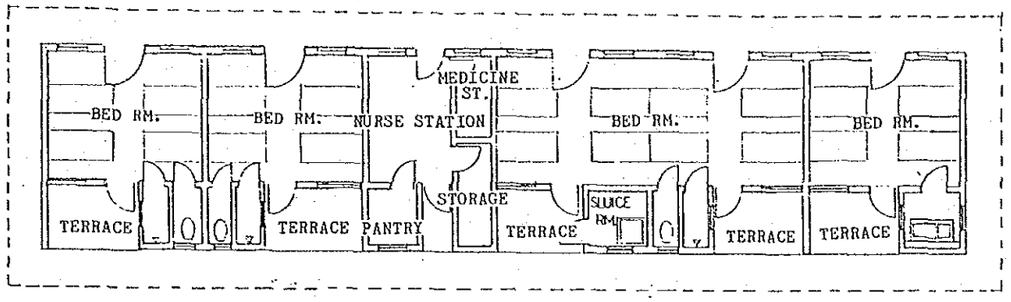


NORTH ELEVATION

OBSTETRIC WARD

Scale 1:200





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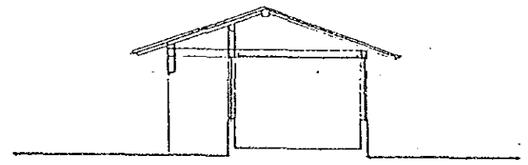

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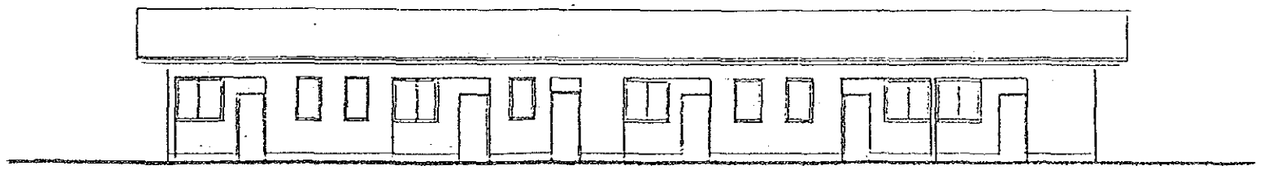
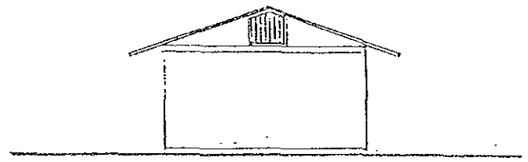


WEST ELEVATION

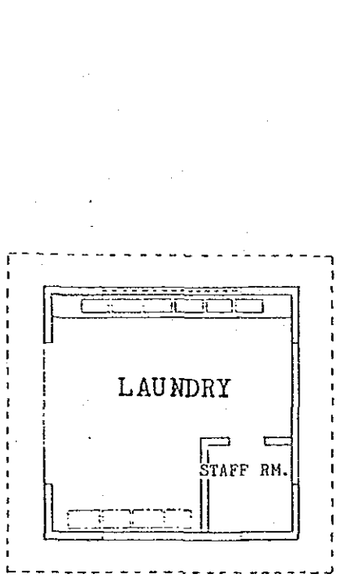


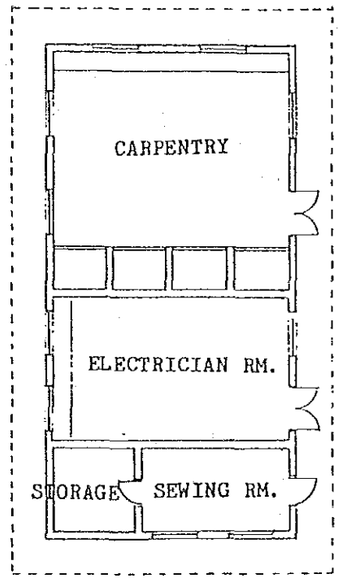
NORTH ELEVATION

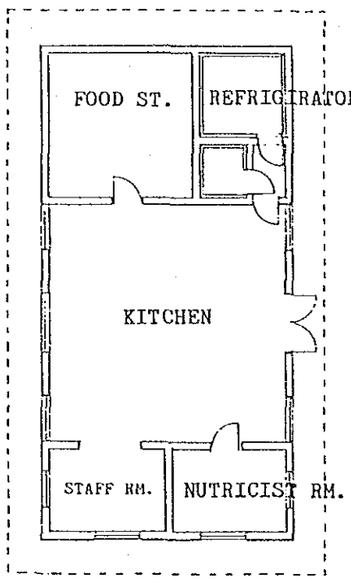
TUBERCULOUS WARD

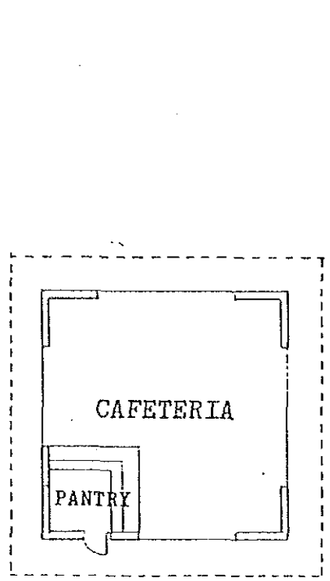
Scale 1:200

0 2 6 10 (M)





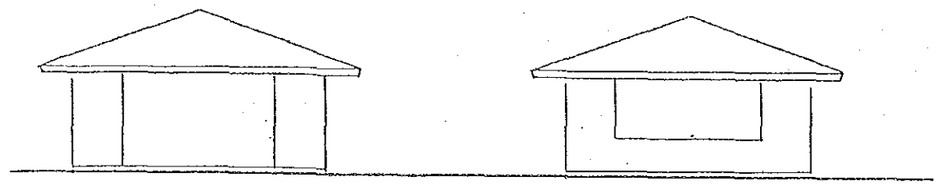




LAUNDRY
WORKSHOP
MAIN KITCHEN
CAFETERIA

Scale 1:200

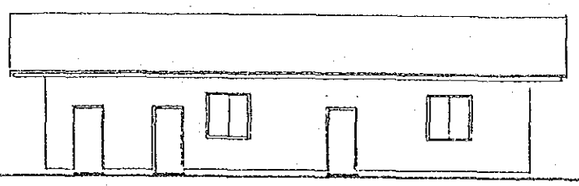
0 2 6 10 (M)



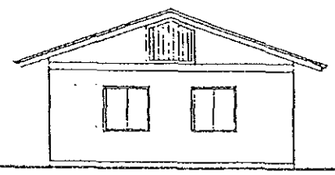
WEST ELEVATION

SOUTH ELEVATION

LAUNDRY

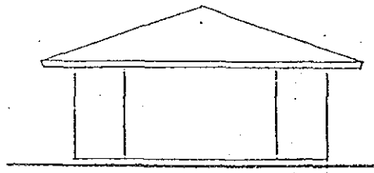


EAST ELEVATION

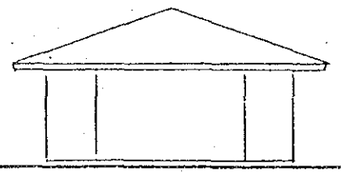


NORTH ELEVATION

WORKSHOP

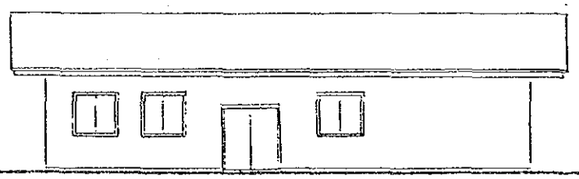


EAST ELEVATION

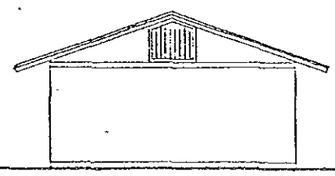


NORTH ELEVATION

CAFETERIA



EAST ELEVATION

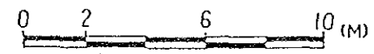


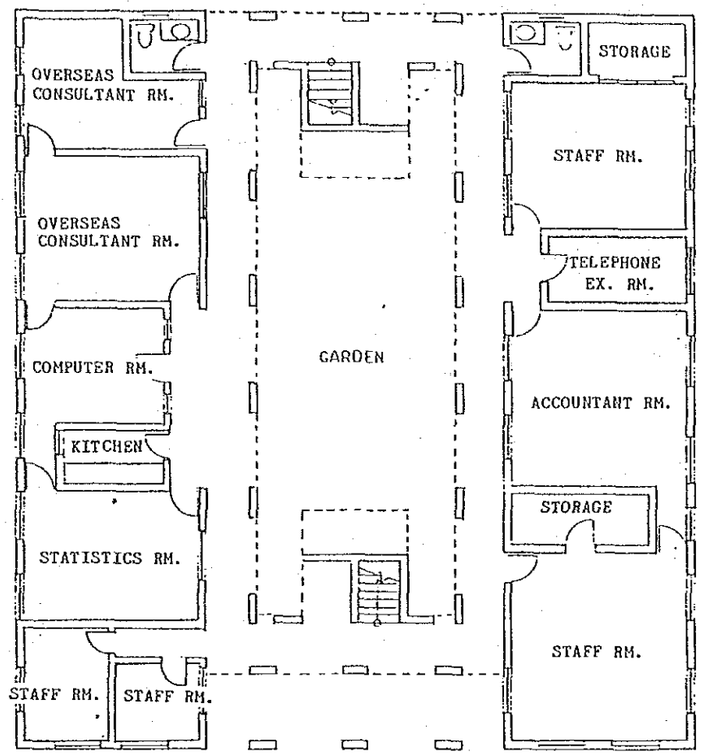
NORTH ELEVATION

MAIN KITCHEN

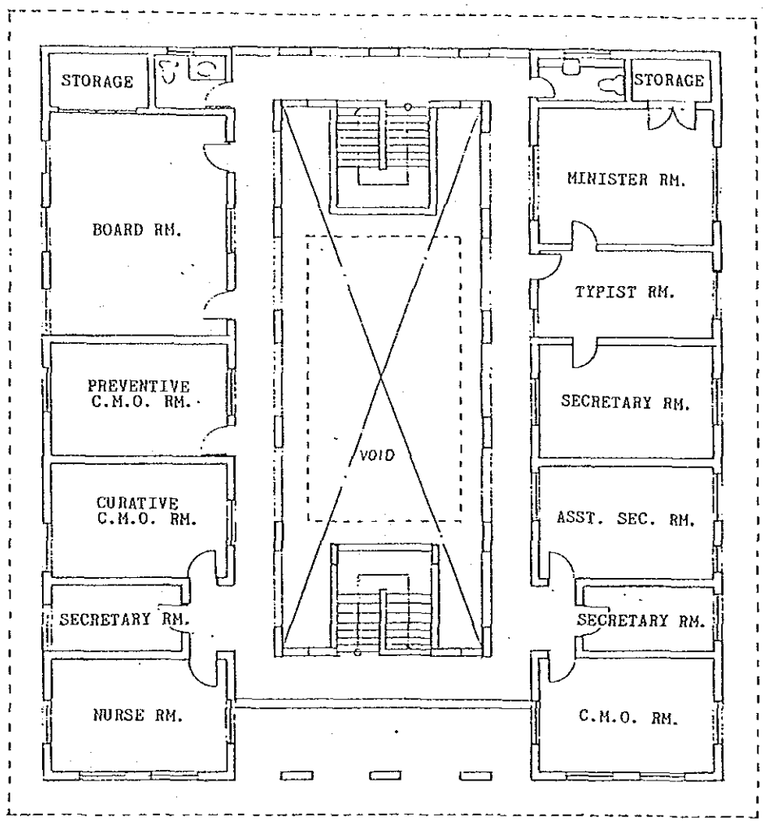
LAUNDRY
CAFETERIA
WORKSHOP
MAIN KITCHEN

Scale 1:200





1ST FLOOR PLAN

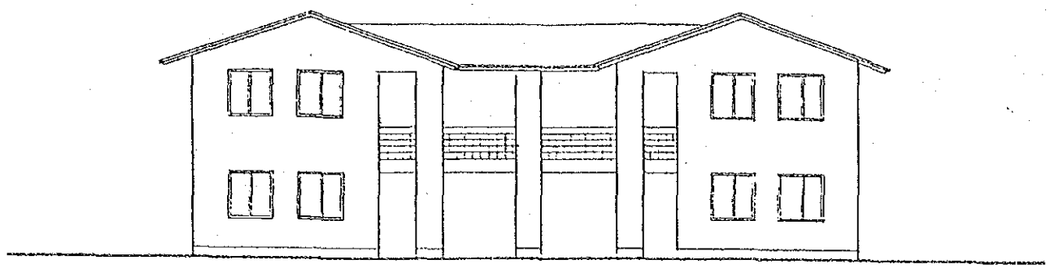


2ND FLOOR PLAN

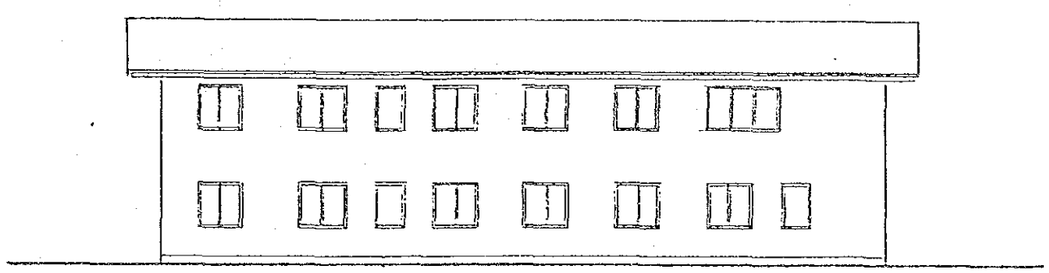
ADMINISTRATION

Scale 1:200

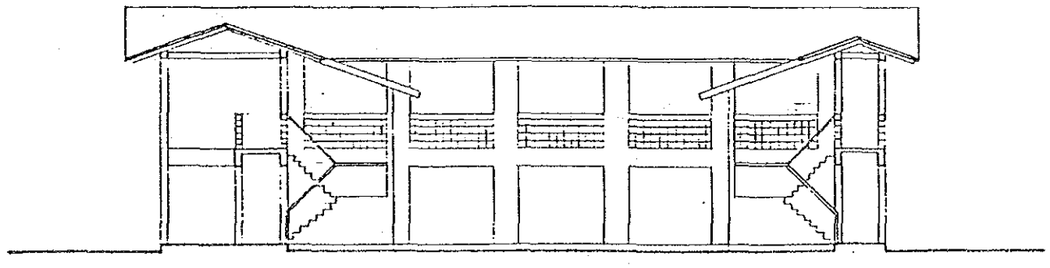
0 2 6 10 (M)



NORTH ELEVATION



WEST ELEVATION

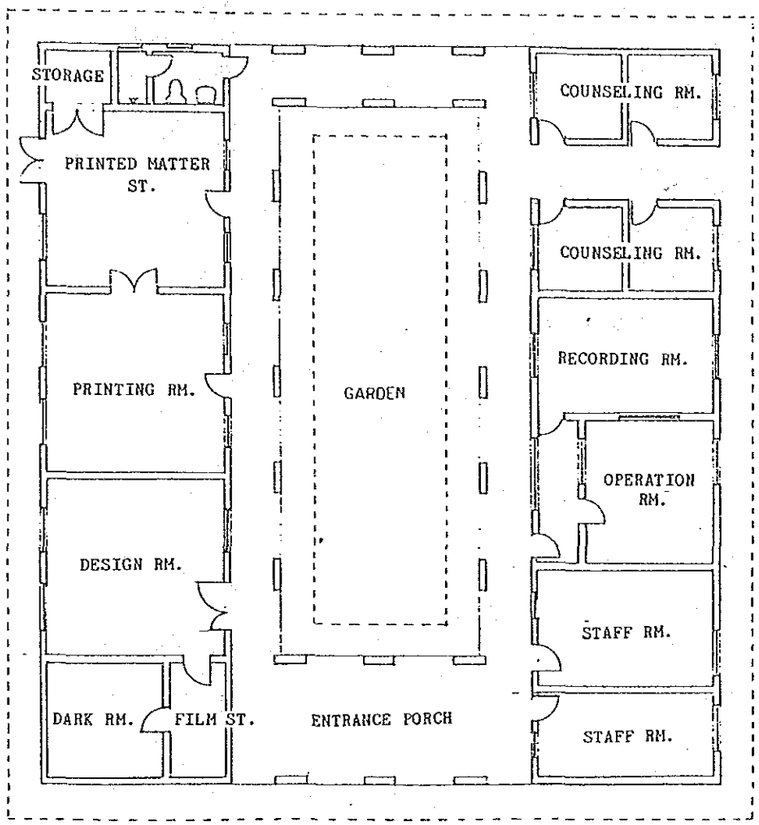


SECTION

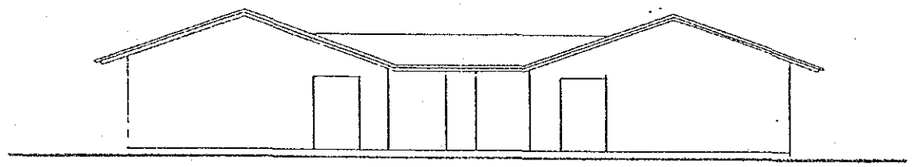
ADMINISTRATION

Scale 1:200

0 2 6 10 (M)



PLAN



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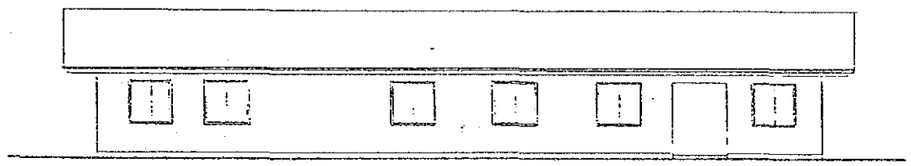
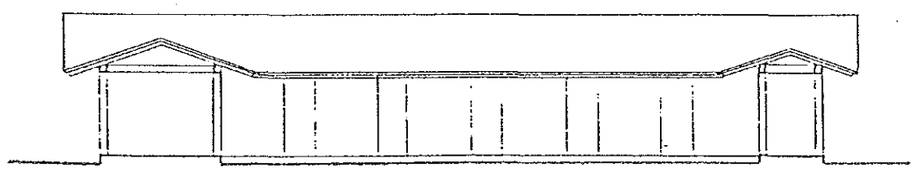


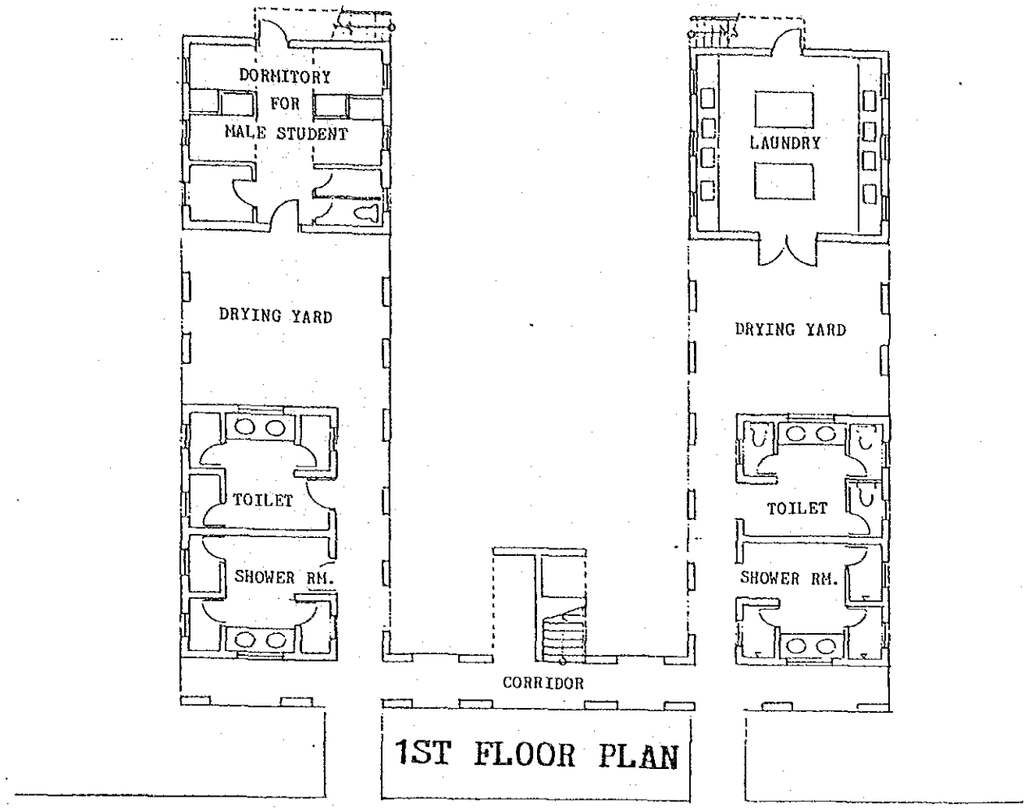
WEST ELEVATION



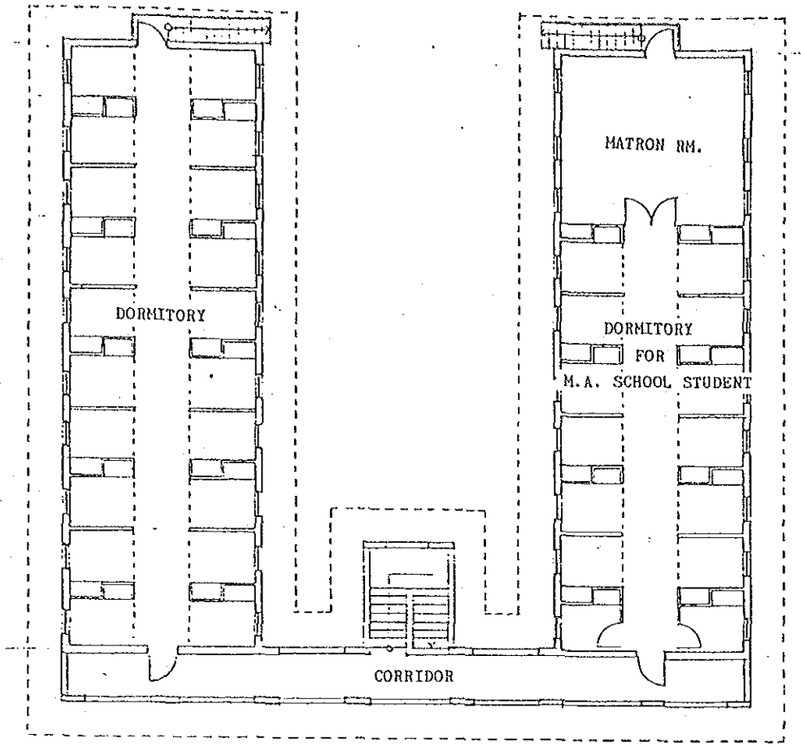
SECTION

HEALTH EDUCATION DPT.

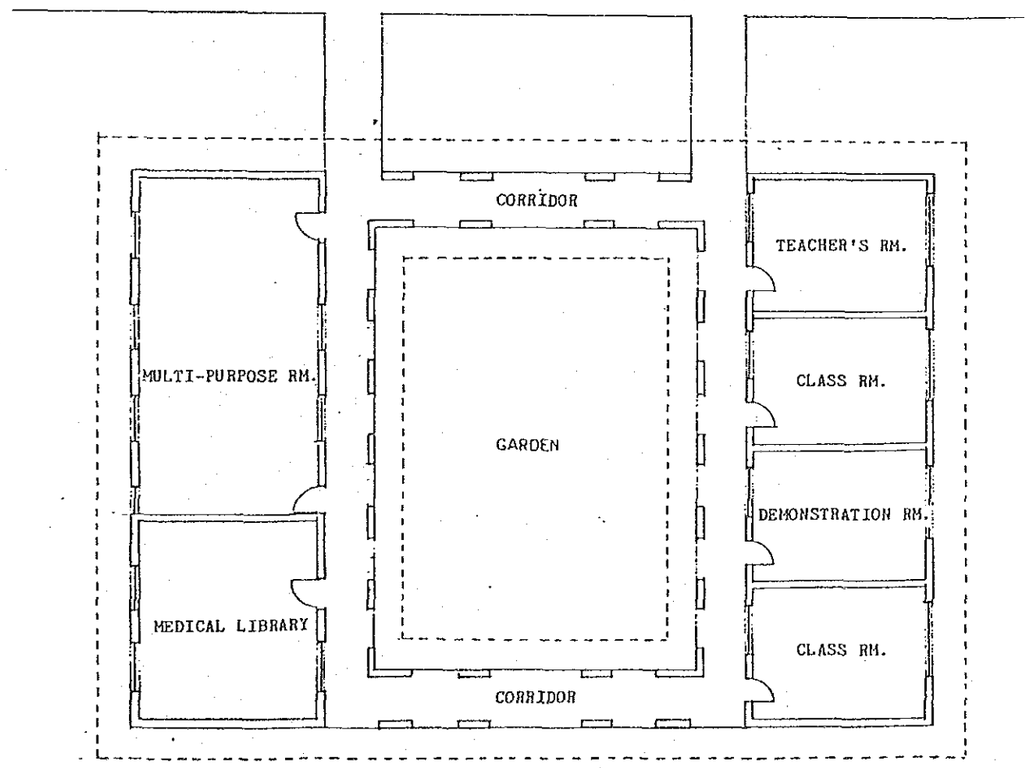
Scale 1:200 0 2 6 10 (M)



1ST FLOOR PLAN



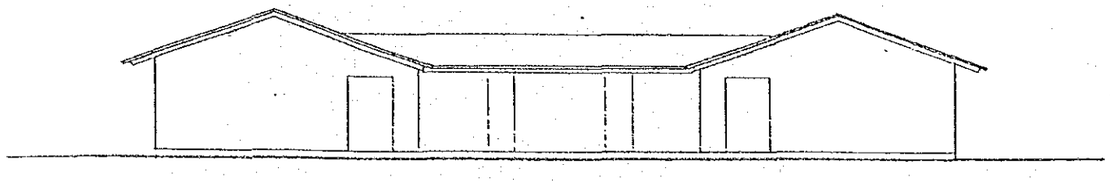
2ND FLOOR PLAN



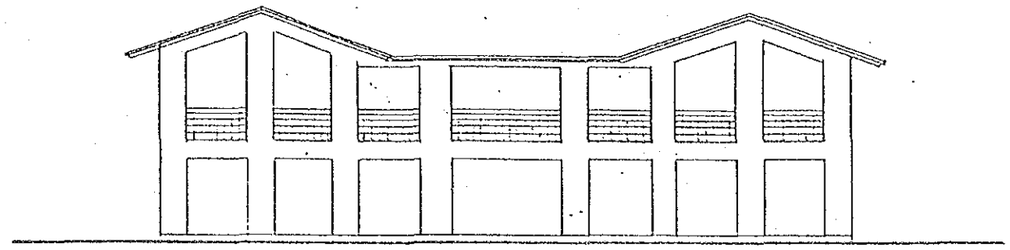
NURSING SCHOOL DORMITORY

Scale 1:200

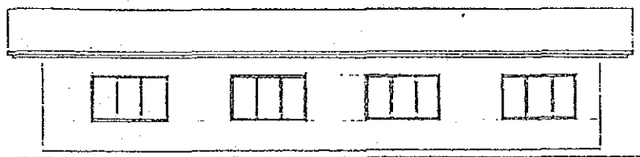
0 2 6 10 (M)



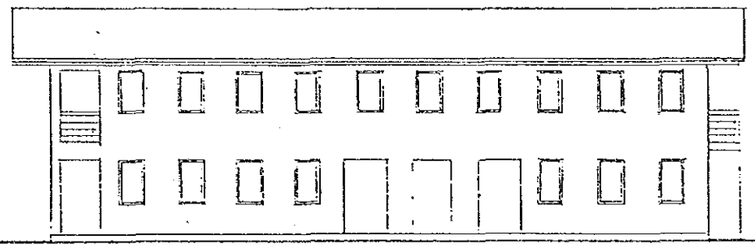
SOUTH ELEVATION



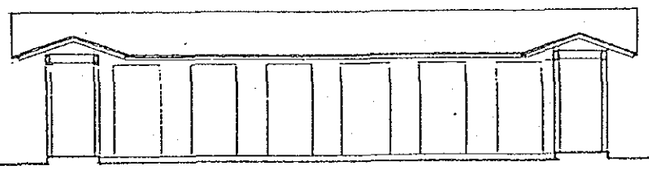
NORTH ELEVATION



WEST ELEVATION



WEST ELEVATION



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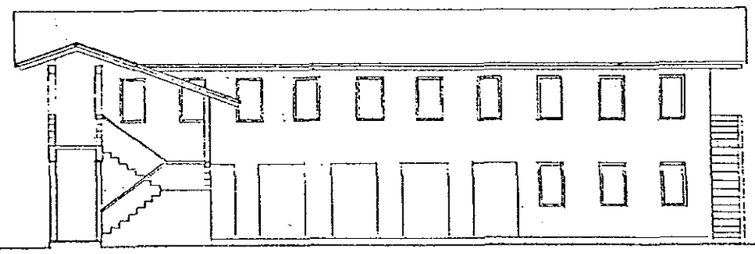
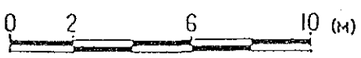


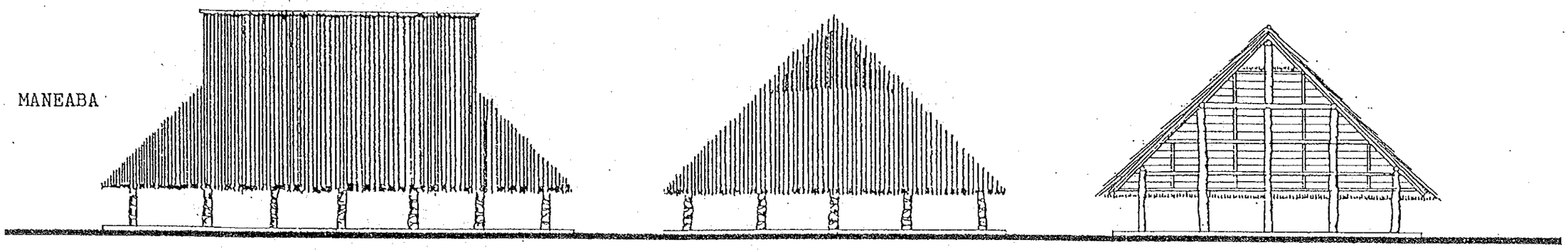
SECTION

NURSING SCHOOL
DORMITORY

Scale 1:200



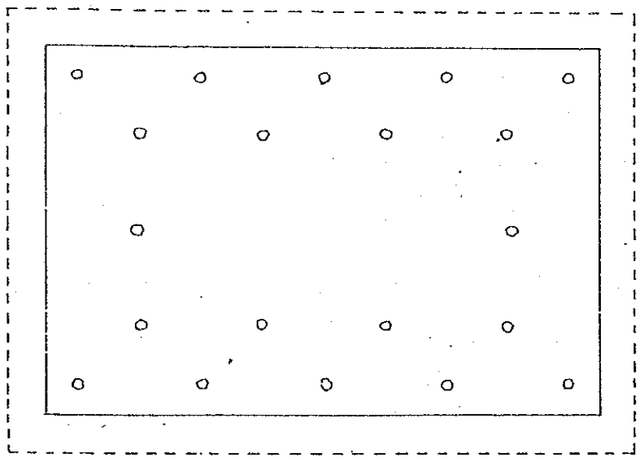
MANEABA



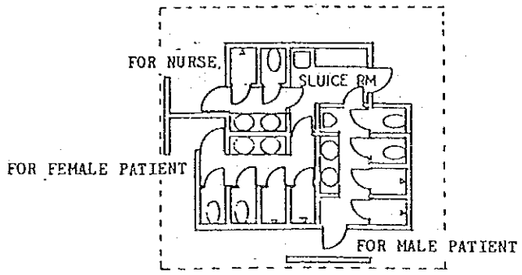
EAST ELEVATION

SOUTH ELEVATION

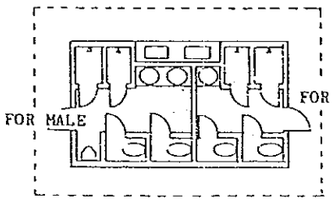
SECTION



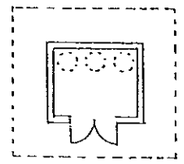
MANEABA



TOILET



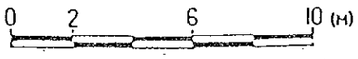
TOILET
FOR MANEABA



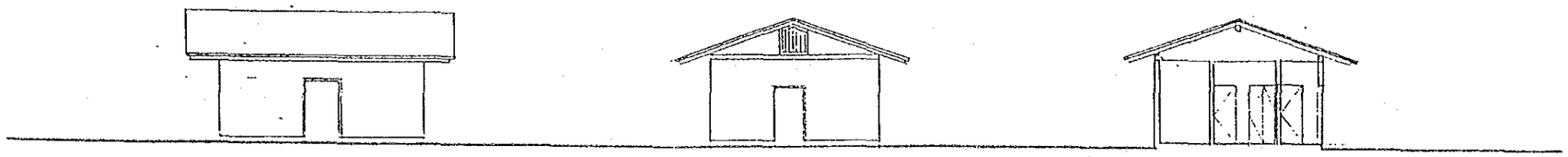
FUEL STORE

MANEABA
TOILET
FUEL STORE

Scale 1:200

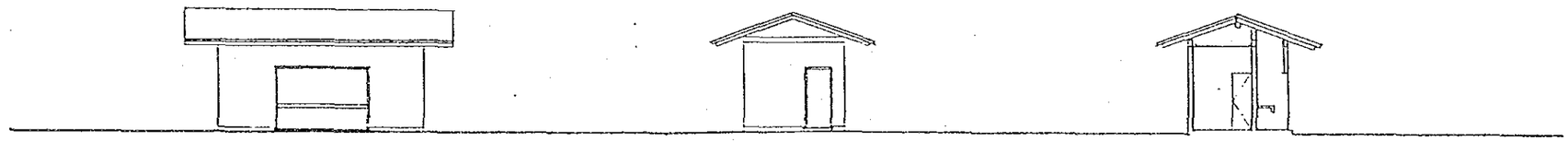


TOILET



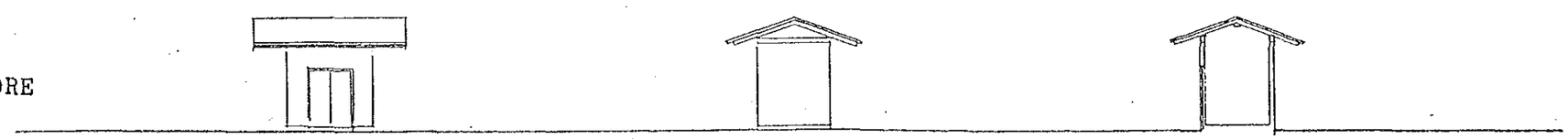
EAST ELEVATION SOUTH ELEVATION SECTION

TOILET



EAST ELEVATION SOUTH ELEVATION SECTION

FUEL STORE

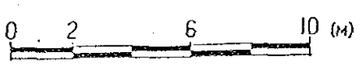


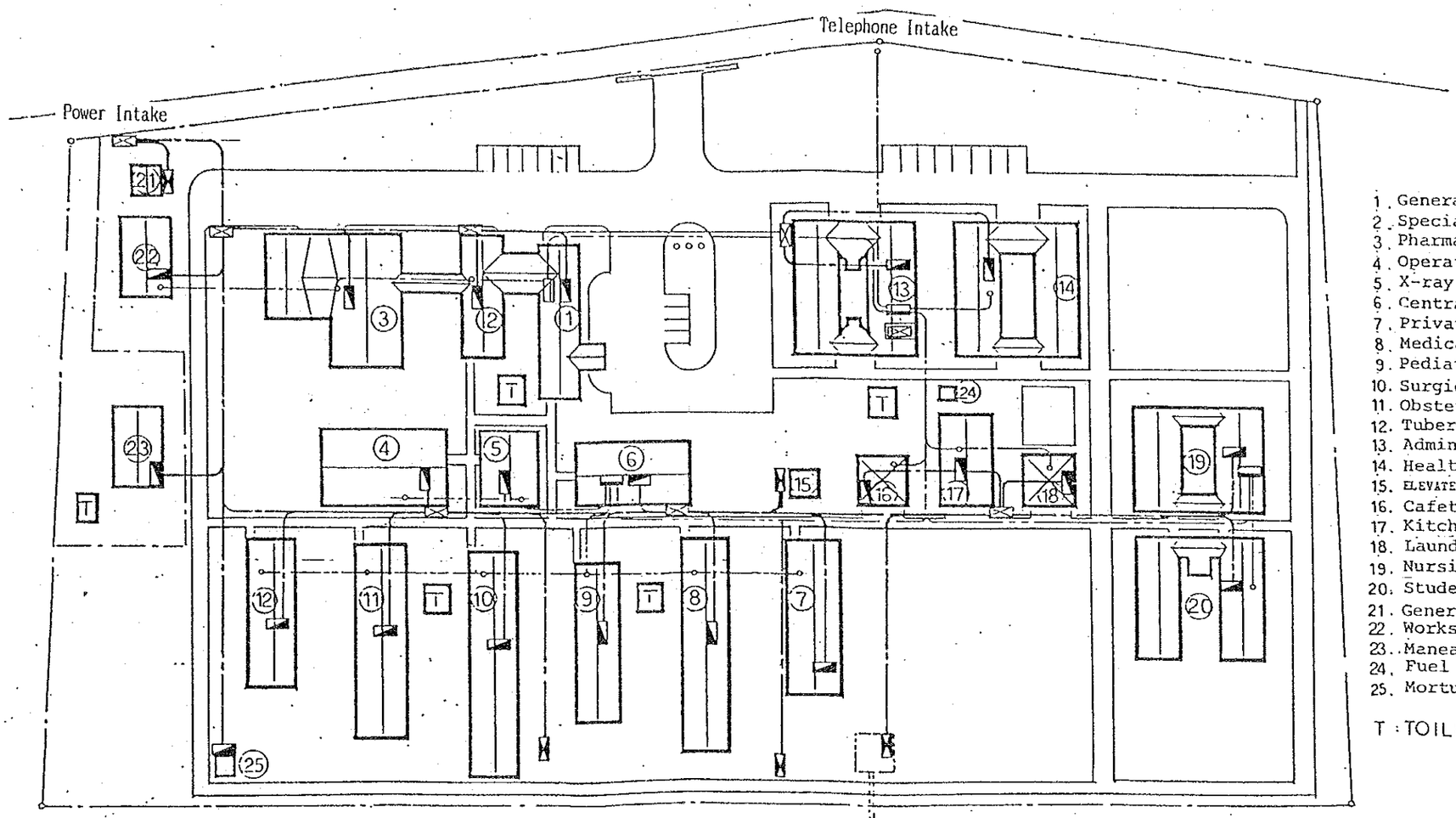
EAST ELEVATION SOUTH ELEVATION SECTION

TOILET

FUEL STORE

Scale 1:200





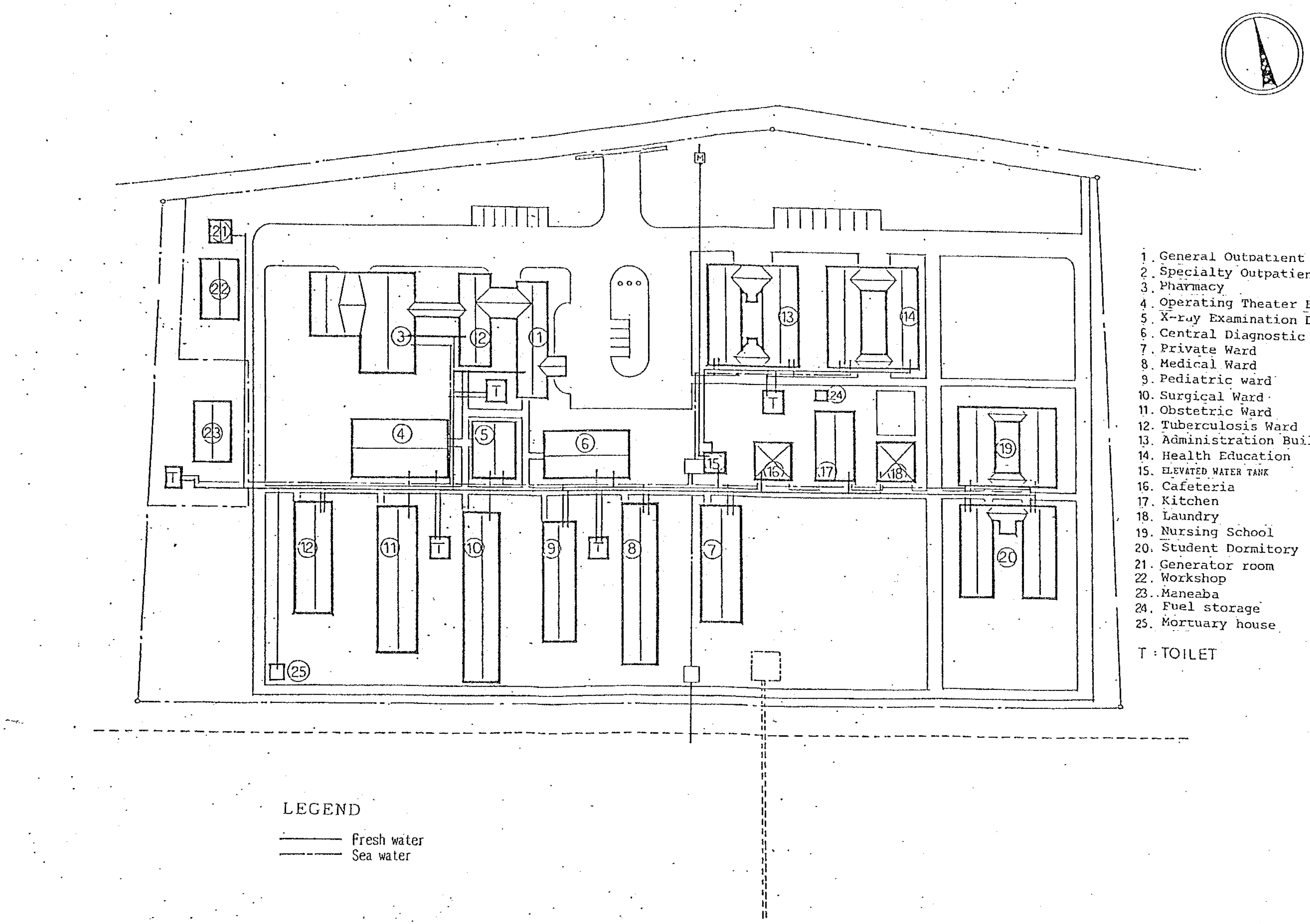
1. General Outpatient Clinic
2. Specialty Outpatient Clinics
3. Pharmacy
4. Operating Theater Building
5. X-ray Examination Department
6. Central Diagnostic Department
7. Private Ward
8. Medical Ward
9. Pediatric ward
10. Surgical Ward
11. Obstetric Ward
12. Tuberculosis Ward
13. Administration Building
14. Health Education
15. ELEVATED WATER TANK
16. Cafeteria
17. Kitchen
18. Laundry
19. Nursing School
20. Student Dormitory
21. Generator room
22. Workshop
23. Maneaba
24. Fuel storage
25. Mortuary house

T : TOILET

LEGEND

- Branch Board
- Motor Control Panel
- Distribution Panel
- Underground Cable
- Telephone Exchanger
- Telephone Terminal Box
- Piping for Telephone

POWER SUPPLY & TELEPHONE SYSTEM



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6. Central Diagnostic Department
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8. Medical Ward
9. Pediatric ward
10. Surgical Ward
11. Obstetric Ward
12. Tuberculosis Ward
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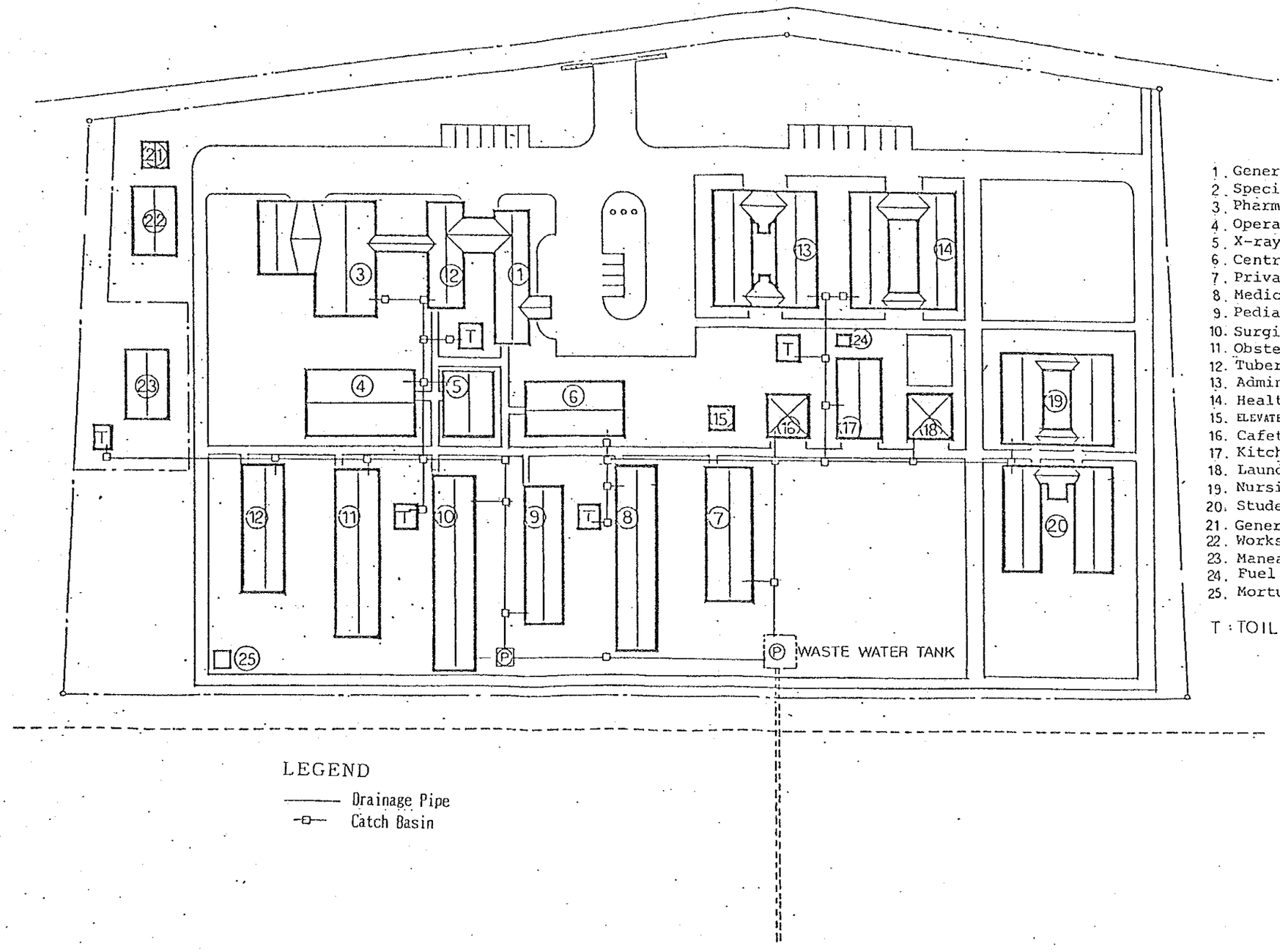
15. ELEVATED WATER TANK
16. Cafeteria
17. Kitchen
18. Laundry
19. Nursing School
20. Student Dormitory
21. Generator room
22. Workshop
23. Maneaba
24. Fuel storage
25. Mortuary house

T : TOILET

WATER SUPPLY SYSTEM



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16. Cafeteria
17. Kitchen
18. Laundry
19. Nursing School
20. Student Dormitory
21. Generator room
22. Workshop
23. Maneaba
24. Fuel storage
25. Mortuary house

T : TOILET

DRAINAGE SYSTEM

4-5 List of Medical Equipment for Tungaru Central Hospital

Lt.No.	Item	Q'ty
	GENERAL OPD	
01	Doctor's Consulting Desk	1
02	Doctor's Chair	1
03	Patient Stool	1
04	Examining Couch	1
05	Examining Light	1
06	Film Illuminator, 14"x17"	1
07	Diagnostic instrument Set	1 set
08	Instrument Cabinet	1
	NURSE STATION	
01	Nursing Desk	1
02	Nursing Chair	1
03	Patient Stool	1
04	Examining Couch	1
05	Medicine Cabinet	1
06	Weighing Scale	1
07	Boiling Sterilizer	1
08	Diagnostic Instrument Set	1 set
	TREATMENT	
01	Examining Couch	1
02	Examining Light	1
03	Suction Unit	1
04	Oxygen Inhaler Apparatus	1
05	Treatment Instrument Set	1 set
06	Plaster Instrument set	1 set
07	Instrument Cabinet	1
08	Autoclave	1
09	Boiling Sterilizer	1

Lt.No.	Item	Q'ty
	SPECIAL CLINIC	
01	Doctor's Consulting Desk	6
02	Doctor's Chair	6
03	Patient Stool	6
04	Examining Couch	4
05	Patient Bed	1
06	Gynecological Examining Table	1
07	Gynecological Examining Unit	1
08	Examining Light	6
09	Diagnostic Instrument Set	6 sets
10	Film Illuminator, 14"x17"	5
11	Weighing Scale, 150kg	4
12	Baby Balance	1
13	Instrument Cabinet	4
14	Eye Examining Instrument	1 lot
15	ENT Examining Instrument	1 lot
16	Gynecological Examining Set	2 sets
17	Fetal Heart Detector	1
18	Electrocardiograph, 1-ch	1
19	Ultrasound Scanner, portable	1
20	Boiling Sterilizer	2
	EMERGENCY	
01	Doctor's Consulting Desk	1
02	Doctor's Chair	1
03	Patient Stool	1
04	Examining Couch	1
05	Emergency Light	1
06	Film Illuminator, 14"x17"	1
07	Diagnostic Instrument Set	1 set
08	Treatment Instrument Set	1 set
09	Local Anesthesia Set	2 sets
10	Medicine Cabinet	1
11	Resuscitation Trolley	2
12	Suction Unit	1

Lt.No.	Item	Q'ty
13	Oxygen Inhaler Apparatus	1
14	Emergency Kit	2 sets
15	Instrument Cabinet	1
16	Stretcher Trolley	1
17	Patient Bed	2
18	Bedside Cabinet	2
19	Nebulizer	1
	PHARMACY	
01	Prescription Table	1 lot
02	Nursing Chair	6
03	Distillation Apparatus	1
04	Working Table	1 set
05	Hot Plate	1
06	Precision Balance	1
07	Weighing Balance	1
08	Medicine Refrigerator, 700ℓ	2
09	Drug Safe	1
10	Drying Oven	1
11	Bottle Washer	1
12	Photocopy Machine	1
13	Typewriter	1
14	Steel Shelving	1 lot
15	Supply Cart	1 lot
16	Forklift	1
17	Pick-up, 1 ton	1
18	Personal Computer	1
	X-RAY	
01	X-Ray TV Unit, 3-Phase 800mA	1 set
02	Clothes Basket	1
03	Automatic X-Ray Film Processor	1
04	Developing Tank	1
05	Film Illuminator, 14"x17"	1
06	Film Loading Desk	1

Lt.No.	Item	Q'ty
07	Cassette Pass Box	1
08	Dark Room Instrument	1 lot
09	Film Keeping Shelves	1 lot
	HEMATOLOGY	
01	Refrigerator, 700ℓ	1
02	Binocular Microscope	1
03	Blood Glucose Meter	1
04	Hematocrit Centrifuge	1 set
05	Blood Cell Counter	1
06	Hemoglobinmeter	1
07	Coagulo Meter	1 set
08	Bilirubin Meter	1
09	Slide Stainer	1
10	Blood Mixer	1
11	Laboratory Table	1 set
12	Laboratory Chair	1
	MICROBIOLOGY	
01	Binocular Microscope	1
02	Dark Ground Microscope	1
03	Hot Plate	1
04	Colony Counter	1
05	Bacti-Cinerator	1
06	Water Bath	1
07	Incubator	1
08	Microscope Cabinet	1
09	Clean Bench, Table Top	1
10	Refrigerator, 260ℓ	1
11	Laboratory Table	1 set
12	Laboratory Chair	1

Lt.No.	Item	Q'ty
	BIOCHEMISTRY	
01	Spectrophotometer	1
02	pH Meter	1
03	Flame Photometer	1
04	Electrophoretic Apparatus	1 set
05	Chloride Meter	1
06	Centrifuge	1
07	Water Bath	1
08	Mixer	1
09	Refrigerator, 260ℓ	1
10	Laboratory Table	1 set
11	Laboratory Chair	1
	WEIGHING ROOM	
01	Precision Balance	1
02	Laboratory Table	1 set
	WASHING ROOM	
01	Vertical Type Autoclave	1
02	Large Boiling Sterilizer	1
03	Drying Oven	1
04	Distillation Apparatus	1
05	Wire Shelf	2
06	Laboratory Instrument Set	1 lot
07	Laboratory Table	1 set
	BLOOD BANK	
01	Donor Couch	2
02	Donor Table	1
03	Blood Collection Instrument Set	1 set
04	Blood Bank Refrigerator, 700ℓ	1
05	Refrigerator, 260ℓ	1
06	Laboratory Table	1 set
07	Laboratory Chair	1

Lt.No.	Item	Q'ty
	OPERATING ROOM	
01	Operating Table	1
02	Operating Light, 12 bulbs	2
03	Anesthesia Apparatus	2
04	Anesthetic Instrument Set	2 sets
05	Electro Surgical Unit	1
06	Irrigating Cystoscope	1
07	Suction Unit, 2 bottles	2
08	Film Illuminator, 14"x17"	2
09	Anesthetist Table	2
10	Dressing Drum Stand	2
11	Mayo Instrument Table	2
12	Instrument Cabinet	2
13	Kick Bucket	2
14	Refrigerator, 260ℓ	1
15	Warming Cabinet, Table Top	1
16	Brush Sterilizer	2
17	Soap Dispenser	2
	RECOVERY ROOM	
01	Recovery Bed	2
02	Respirator	1
03	Resuscitation Trolley	1
04	Suction Unit	1
05	Low Pressure Suction Unit	2
	CSSD	
01	Floor Type Autoclave	1
02	Vertical Type Autoclave	1
03	Large Boiling Sterilizer	1
04	Ultrasonic Cleaner	1
05	Operating Glove Dryer	1
06	Working Table	2
07	Dressing Case Cabinet	2

Lt.No.	Item	Q'ty
08	Dressing Drum Cabinet	2
09	Surgical Instrument Set	1 lot
	MORTUARY	
01	Mortuary Cabinet	1
02	Mortuary Table	1
	OBSTETRIC	
01	Patient Bed	12
02	Irrigator Stand	5
03	Bedside Cabinet	12
04	Baby Bassinet	8
05	Working Table	1
06	Nursing Desk	1
07	Nursing Chair	3
08	Film Illuminator, 14"x17"	1
09	Medicine Cabinet	1
10	Instrument Cabinet	1
11	Weighing Scale, 150kg	1
12	Diagnostic Instrument Set	1 set
13	Treatment Instrument Set	1 set
14	Refrigerator, 260ℓ	1
15	Nebulizer	1
16	Examining Light	1
17	Wheelchair	1
18	Stretcher Trolley	1
19	Oxygen Inhaler Apparatus	1
20	Suction Unit	1
21	Resuscitation Trolley	1
22	Fetal Heart Detector	1
23	Labor Bed	1
24	Bedside Cabinet	1
25	Delivery Table	2
26	Delivery Light, 4 bulbs	2
27	Obstetric Instrument Set	1 set

Lt.No.	Item	Q'ty
28	Pediatric Treatment Table	1
29	Baby Balance	1
30	Infusion Pump	1
31	Nursing Bottle Sterilizer	1
32	Autoclave	1
33	Boiling Sterilizer	1
34	Bed Pan Sterilizer	1
35	Bed Pan Rack	1
	PRIVATE WARD-PATIENT'S ROOM	
01	Patient Bed	7
02	Irrigator Stand	5
03	Over Bed Table	7
04	Bedside Cabinet	7
04	Working Table	1
06	Nursing Desk	1
07	Nursing Chair	3
08	Film Illuminator, 14"x17"	1
09	Medicine Cabinet	1
10	Instrument Cabinet	1
11	Weighing Scale, 150kg	1
12	Diagnostic Instrument Set	1 set
13	Treatment Instrument Set	1 set
14	Refrigerator, 260ℓ	1
15	Nebulizer	1
16	Examining Light	1
17	Wheelchair	1
18	Stretcher Trolley	1
19	Oxygen Inhaler Apparatus	1
20	Suction Unit	1
21	Resuscitation Trolley	1
22	Autoclave	1
23	Boiling Sterilizer	1
24	Drug Safe	1
25	Ice Making Machine	1

Lt.No.	Item	Q'ty
26	Bed Pan Sterilizer	1
27	Bed Pan Rack	1
	MEDICAL WARD-PATIENT'S ROOM	
01	Patient Bed	21
02	1-Crank Bed	5
03	Irrigator Stand	5
04	Bedside Cabinet	26
05	Working Table	1
06	Nursing Desk	1
07	Nursing Chair	3
08	Film Illuminator, 14"x17"	1
09	Medicine Cabinet	1
10	Instrument Cabinet	1
11	Weighing Scale, 150kg	1
12	Diagnostic Instrument Set	1 set
13	Treatment Instrument set	1 set
14	Refrigerator, 260ℓ	1
15	Nebulizer	1
16	Examining Light	1
17	Wheelchair	1
18	Stretcher Trolley	1
19	Oxygen Inhaler Apparatus	1
20	Suction Unit	1
21	Resuscitation Trolley	1
22	Autoclave	1
23	Boiling Sterilizer	1
24	Bed Pan Rack	1
	SURGICAL WARD-PATIENT'S ROOM	
01	Patient Bed	17
02	1-Crank Bed	3
03	Traction Apparatus	2 sets
04	Irrigator Stand	5
05	Bedside Cabinet	22

Lt.No.	Item	Q'ty
06	Working Table	1
07	Nursing Desk	1
08	Nursing Chair	3
09	Film Illuminator, 14"x17"	1
10	Medicine Cabinet	1
11	Instrument Cabinet	1
12	Weighing Scale, 150kg	1
13	Diagnostic Instrument Set	1 set
14	Treatment Instrument Set	1 set
15	Refrigerator, 260ℓ	1
16	Nebulizer	1
17	Examining Light	1
18	Wheelchair	1
19	Stretcher Trolley	1
20	Oxygen Inhaler Apparatus	1
21	Suction Unit	1
22	Resuscitation Trolley	1
23	Autoclave	1
24	Boiling Sterilizer	1
25	Bed Pan Sterilizer	1
26	Bed Pan Rack	1
	PEDIATRIC WARD-PATIENT'S ROOM	
01	Pediatric Bed	8
02	Patient Bed	8
03	Irrigator Stand	5
04	Bedside Cabinet	16
05	Working Table	1
06	Nursing Desk	1
07	Nursing Chair	3
08	Film Illuminator, 14"x17"	1
09	Medicine Cabinet	1
10	Instrument Cabinet	1
11	Weighing Scale, 150kg	1
12	Baby Balance	1

Lt.No.	Item	Q'ty
13	Diagnostic Instrument Set	1 set
14	Treatment Instrument Set	1 set
15	Refrigerator, 260ℓ	1
16	Nebulizer	1
17	Examining Light	1
18	Wheelchair	1
19	Stretcher Trolley	1
20	Oxygen Inhaler Apparatus	1
21	Suction Unit	1
22	Resuscitation Trolley	1
23	Autoclave	1
24	Boiling Sterilizer	1
25	Food Mixer	1
26	Bed Pan Sterilizer	1
27	Bed Pan Rack	1

TUBERCULOSIS WARD-PATIENT'S ROOM

01	Patient Bed	20
02	Irrigator Stand	6
03	Bedside Cabinet	5
04	Working Table	1
05	Nursing Desk	1
06	Nursing Chair	3
07	Film Illuminator, 14"x17"	1
08	Medicine Cabinet	1
09	Instrument Cabinet	1
10	Weighing Scale, 150kg	1
11	Diagnostic Instrument Set	1 set
12	Treatment Instrument Set	1 set
13	Refrigerator, 260ℓ	1
14	Nebulizer	1
15	Examining Light	1
16	Wheelchair	1
17	Stretcher Trolley	1
18	Oxygen Inhaler Apparatus	1

Lt.No.	Item	Q'ty
19	Suction Unit	1
20	Resuscitation Trolley	1
21	Autoclave	1
22	Boiling Sterilizer	1
23	Bed Pan Rack	1
	ALL DEPARTMENTS	
01	Hospital Sundries	1 lot
02	Hospital Equipment	1 lot
03	Stainless Instruments	1 lot
04	Spare Parts & Expendables	1 lot
	NURSING SCHOOL	
01	Desk & Chair	20 sets
02	Slide Projector	1
03	Dummy for Demonstration	1 lot
	PUBLIC HEALTH	
01	Laboratory Table	1 set
02	Laboratory Chair	1

List of Equipment Planned for Transfer

Equipment which was being used in a satisfactory condition at the time of the basic design study and which is anticipated to be capable of maintaining its functions in the future and being effectively utilizable for a long time even after transfer will be considered for transfer and use at the respective sections concerned.

The following is the list of candidate equipment considered for transfer. However, equipment that belongs to the Administration Department and Health Education Department, all of which is planned to be transferred, is omitted from the list.

Name of Equipment	Quantity
Out-patient	
1. Ambulance	3
Pharmacy	
1. Mixer	1
2. Tablet Counter	3
3. Typewriter	1
4. Medicine Refrigerator	1
5. Steel Shelf	50
6. Medicine Trolley	2
7. Desk, Chair and other furniture	1 set
Laboratory	
1. Hot Plate	1
2. Test Tube Stand	5
3. Pipette Stand	1
4. Refrigerator	2
5. Filtering Machine	1
6. Boiling Sterilizer	1

Name of Equipment	Quantity
7. Cooler Box	1
8. Rotating Mixer	1
9. Hand Dispenser	1 set
10. Laboratory Counter	1
11. Medicine Refrigerator	1
12. Bacti-Cinerator	2
13. Water Bath	1
14. Electric Pot	1
15. Desk, Chair and other furniture	
Operating Room	
1. Operating Table	1
2. Stretcher Trolley	3
3. Defibrillator	1
4. Slit Lamp	1
5. Medicine Cabinet	1
6. Instrument Trolley	2
7. Mayo Instrument Trolley	2
8. Instrument Tray Table	2
9. Basin Stand	2
10. Foot Stool	2
11. I.V. Stand	2
12. Operating Stool	1
13. Kick Bucket	2
14. Dressing Drum Stand	2
15. Operating Microscope	1
16. Sigmoid Scope	1
17. Desk, Chair and other furniture	

Name of Equipment	Quantity
Ward	
1. Delivery Instrument	2 sets
2. Infant Incubator	1
3. Suction Unit	2
4. Emergency Kit	1
5. Gatch Bed	2
6. Electric Pot	3
7. Food Mixer	1
8. Nebulizer	1
9. Bedside Cabinet	13
All Hospital	
1. Dressing Drum, Pus Basin, Forceps Stand, Instrument Tray, etc.	1 set
2. Instrument Table, I.V. Stand, Wheelchair, etc.	1 set
3. Sphygmomanometer, Stethoscope, Boiling Sterilizer, Oxygen Cylinder, etc.	1 set

CHAPTER 5

PROJECT IMPLEMENTATION PLAN

CHAPTER 5 PROJECT IMPLEMENTATION PLAN

5-1 Project Implementation System

The organization responsible for procedural matters regarding grant-aid to Kiribati is the Ministry of Foreign Affairs and the organization executing this project is the Ministry of Health and Family Planning. The Ministries of Home Affairs & Development, Finance & Economic Planning, Works and Energy, and Transportation & Communication will also respectively share the responsibilities in implementing this project.

Table 5-1

Ministry	Shared Responsibilities
Foreign Affairs	Procedures for accepting grant-aid, conclusion of Exchange of Notes
Health and Family Planning	Executing organization, conclusion of contracts
Home Affairs & Development	Securing, surveying, and levelling of project site
Finance & Economic Planning	Banking arrangements, issuance of Authorization to Pay, securing of budget for the project
Works & Energy	Development and provision of facilities for distribution of electricity and water supply
Trade, Industry and Labour	Supply and control of building engineers and technical workers, supply of construction materials
Transportation & Communication	Procedures for import and export, development and provision of telephone facilities

5-2 Scope of the Work

The scope of work to be undertaken by the Government of the Republic of Kiribati and the Government of Japan is as itemized below.

Table 5-2 Scope of Work

Item		Government of Japan	Government of Kiribati
Infra-structure	Site development & outdoor structure	Roads, parking lots, outdoor lamps within plots of each planned building	Completion of ground levelling, felling and uprooting of trees based on the site plan prior to start of construction Fence
	Water supply	Installation of water receiving tank, pumping equipment and overhead tanks, and water supply facilities for supplying water to each planned facility	Burying and connecting of water supply main pipe to water reservoir installed by the Japanese side
	Drainage	Drainage facilities for various planned facilities	
	Electric power supply	Power receiving and transforming facilities and subsequent transmission to each facility	Leading-in of service wire to transforming facilities, and cost of formalities associated with it; requesting government authorities for permission with respect to power receiving and transformation and bearing of cost for leading in service wire
Building		Medical Department Building, Administration Building, Service Building, Wards, Laboratory Building, Nursing School, Dormitory for Nursing Students, Education and Training Building	Guard Post

Item	Government of Japan	Government of Kiribati
Various equipment and materials	Provision of planned equipment and materials, necessary installation work, guidance on operation	Relocation of existing equipment and materials
Furniture and furnishings	Desks and chairs for medical and laboratory examination, bookshelves, lockers, etc.	Furniture, drawing room furniture sets
Transportation of equipment and materials	Packing and crating, insurance premiums, loading, marine transport, landing at Port Betio, and inland transport of equipment and materials exported from Japan to construction site.	Customs clearance procedures, tax exemption and acquisition of import permit at time of landing.
Other work accompanying implementation of this project		Banking arrangements and bearing of associated expenses. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies.

5-3 Execution Plan

5-3-1 Execution Policy

The technical level of the construction workers in Kiribati is generally not high, and skilled workers are also in short supply. The Tarawa Technical School in Kiribati, which is placed under the jurisdiction of the Ministry of Trade, Industry and Labour, carries out training and development of technical workers. All technical workers in Kiribati are registered with the Bureau of Labour.

Job classifications include foreman, artisan (carpenter, block mason, electrician; each classified into 3 grades), junior artisan, clerical worker, sales worker, service worker (policeman, fireman), fisherman, etc. The number of newly registered technical workers and the number of those who left their jobs in FY 1987 are shown below.

Job Type	No. Registered	No. Who Left Job
Foreman	9	1
Machine watcher	2	2
Plant operator	65	5
Equipment foreman	2	1

If high quality execution results are to be sought in Kiribati, it would be necessary to hire supervisors from third countries to oversee the technical skill and work of the local workers in order to make up for the current deficiency and thus secure the necessary technical level. Depending on the type of job, it is considered necessary to dispatch skilled technical workers from Japan as supervisors.

Kiribati depends on imports for most construction materials as it hardly produces any of them locally, so it is essential to accurately grasp the time required to procure them, that is, from the time of placing the order to the time of delivery.

The construction execution plan of this project must be established with due regard to the aforementioned working ability of the local laborers, the period required for procurement of imported construction materials and the local meteorological conditions, and the execution schedule must be worked out according to said execution plan.

5-4 Execution Supervision Plan

After conclusion of the construction contract for this project, the chief engineer and the resident supervisor will visit the field and give instructions to the building contractors and also discuss and confirm the execution schedule with them and make the necessary arrangements. Upon commencement of construction work, the resident supervisor will station himself in Tarawa on a full-time basis to supervise the construction and report on the progress of work periodically to the Embassy of Japan and the JICA Office in Fiji and the concerned authorities of the Government of the Republic of Kiribati. He will also assume the initiative in coordinating the views of the parties involved in this project, including the contractors, and in establishing mutual understanding among them. The chief engineer and the staff members in charge of structure, utilities and mechanical systems and equipment will visit Tarawa during each stage of work as necessary for spot inspections and control. The resident supervisor will stay in Tarawa until various procedures for delivery of the completed facilities and equipment have been completed. His actual work will consist of supervising the execution of work by paying due regard to the characteristic climatic conditions, customs and institutions in Kiribati and by acquiring a clear grasp of the technical level of the local laborers. The purpose of execution supervision is to ensure smooth progress of construction and to complete the construction work with the best possible results within the prescribed period of time. The execution plan will be adjusted and approved upon examining the work schedule in detail with due regard to local working skills and competence, and the period required for delivering the construction materials to be procured from Japan and the third countries to the construction site.

Execution supervision consists of the following duties:

(1) Advice and Guidance on Construction Contract

Screening of qualifications of participating tenderers, preparation and execution of tender, evaluation of the details of the statements of tender, selection of construction contractor, witnessing of the

conclusion of the construction contract.

(2) Inspection and Approval of Working Diagrams, etc.

Inspection and approval of contractors' working diagrams, sample materials, mechanical systems and equipment.

(3) Guidance on Work and Inspection

Examination of and guidance on execution plan and working steps, follow-up and guidance on progress of work and inspection of work required during construction.

(4) Approval of Payment

Inspection and confirmation of the completed portion of work for making partial payments during and upon completion of construction work, and issuance of approval for payment.

(5) Construction Progress Report

Submission of periodical reports on the progress of construction to the executing organization and concerned authorities of the Government of Japan and thereby contribute to the smooth implementation of the work of both the Government of Japan and the Government of Kiribati.

(6) Delivery of Facilities and Equipment

Confirmation of the fulfillment of contract provisions upon completion of construction, witnessing of deliveries of facilities and equipment based on the contract, and issuance of the certificate of acceptance by the executing organization. With these, the duties of the execution supervisor will have been completed.

Fig. 5-1 Organization Diagram for Execution