which are located in Apia, that do construction work for both the Government and private concerns. The scope of the work and the areas of specialization of these companies are limited: general contractors such as those in Japan do not exist in the country. For major constructions, the Department of Public Works or a foreign construction company supply materials to local contractors, and local contractors, as subcontractors, supply labour to the main contractor. In previous construction projects funded by Japan's Grant Aid Programme, Japanese contractors subcontracted work to Western Samoan construction companies.

Given this, considerations on the fullest possible use of local contractors will be given in the basic design.

2) Local Consultants

The detailed design for the Project is a comprehensive technical work, which includes not only architectural, structural, electrical, and mechanical design but also detailed determination of specifications and quantities of medical equipment. This requires a high level of communication between all technical disciplines to facilitate appropriate adjustments at all stages in the detailed design. As this is time consuming and the available period for the Project implementation is limited, it is difficult to use local consultants to this effect.

(3) Construction Materials, Equipment, and Labour

Locally produced construction materials include lumber, gravel, sand, and concrete blocks. Most other construction materials must be imported. As there is not much demand for construction materials, inventories are small and unstable. When large volumes of imported materials are needed, importers procure them as required. In Apia, there are several retailers selling general imported construction materials and equipment, and they can usually provide them unless large volumes are needed. Imported construction materials and equipment on the market in Western Samoa are made in New Zealand, Australia, U.S., China, or Taiwan. New Zealand provides almost all types of construction materials and equipment needed. A company leasing construction machinery leases almost all general construction machinery such as bulldozers, rollers, truck cranes, and concrete mixers.

In Western Samoa it is quite easy to obtain sufficient numbers of construction workers, although their technical skills are not always at high levels. Construction workers usually work eight hours a day except on Sundays and holidays.
Given the above, all construction machinery can be locally leased and all labour can be procured in Western Samoa.

4-1-5 CONSIDERATIONS FOR OPERATION AND MAINTENANCE OF FACILITIES AND EQUIPMENT BY THE DEPARTMENT OF HEALTH

Tuasivi Hospital has a full-time staff to maintain its facilities, and when buildings or their installations need to be repaired, repairs are done by the staff. If parts or alternative materials used in the Project are locally available, repairs or daily maintenance of the hospital facilities should not present problems in terms of technology and the maintenance system. However, availability for operation and maintenance funds should be taken into due considerations, because the updating of facilities generally increases maintenance and operation costs. To minimize additional costs, the following measures will be taken in the facility plan: measures to reduce the energy cost, which is a large part of the maintenance and operation cost, and measures to make facilities maintenance free to the extent possible.
The National Hospital has a staff for maintenance and operation of medical equipment; however, as their ability to make repairs is limited, the Department of Health often orders repairs directly to foreign agencies. This makes maintenance and operation of medical equipment expensive in the country. Therefore, to the extent possible, medical equipment for the Project should have durable and simple mechanisms, and should use inexpensive consumables and replacement parts.

4-1-6 POLICY FOR THE CONSTRUCTION PERIOD

The fundamental goal of the Project is to rehabilitate facilities and equipment damaged by the cyclone as soon as possible. The scale of the Project is such that construction can be completed within one fiscal year; so the construction period need not be extended over two fiscal years.

4-2 EXAMINATION OF THE DESIGN CONDITIONS

4-2-1 BUILDING DESIGN CONDITIONS

(1) Architectural Design Standards

The building design basically complies with the draft of Western Samoa's National Building Code. Where the draft does not provide clear standards, standards from Japan or New Zealand are applied.

(2) Size of Facilities

The size of the facilities in the Project are decided based on the contents and scale of operations of Tuasivi Hospital as outlined in Chapter 3, with reference to the size of existing facilities at Tuasivi Hospital and Sataua District Hospital as well as floor area standards for medical facilities in Japan (Architectural Data Files, Architectural Institute of Japan). The sizes of facilities by section and room are outlined below.

1) Outpatient Department

Section	Rooms	Area (m^2)	Criteria for deciding area and notes
General outpatient	Examination room-1 Examination room-2 Treatment room	18 18 36	The sizes of the outpatient examination rooms and the treatment room are about the same as those at Sataua District Hospital.
Antenatal care and family planning	Counseling room Examination room Gynecological examination room	24 18 12	The counseling room requires space for counseling up to 10 people and is the same size as the present room. The examination room is the same size as the general outpatient rooms
Dental clinic	Examination room Dark room Dental mechanics room	24 4 8	The examination room requires space for one dental unit and a work area for the unit. The darkroom requires space for one x-ray unit and a work area. The dental mechanics room requires space for one sink and a work area.
Pharmacy	Dispensary Foundation room Storage room for pharmaceutical drugs Cool and dry storage room	32 10 54 8	For the amount of dispensing at the hospital, the dispensary requires space for a 7.5 m-long unit pharmacy table. The dispensary is the same size as the present pharmacy, but the formulation room requires space only for formulation work and a sink. The pharmaceutical drug storage room requires space for the present volume of drugs.
Total		266	

2) Central Diagnosis and Treatment Department

Section	Rooms	Area (m^2)	Criteria for deciding area and notes
Inspection and testing	Clinical laboratory	36	The unit laboratory table must be large enough to accommodate the testing equipment required. The size of the laboratory is based on the size of the unit laboratory table.
	Sterilizing room	8	
	Sampling room	16	
	X-ray inspection room	28	
	X-ray operation room	22	The sterilizing room requires space for all cleaning and sterilizing equipment.
	Darkroom	6	*The blood and urine sampling room requires* space for a toilet and a work area.
			Rooms for all x-ray operations are the standard sizes required for a general X-ray unit.
Operation	Operation theatre	30	The operation theatre is the standard size required to accommodate a five-member surgical team and an operating table.
	Preparation room	24	
	Recovery room	36	
	Change room/toilet with shower for staff	20	Separate change rooms with toilets for men and women are the minimum size and include one shower booth each.
Delivery	Delivery room	40	The delivery room and labour room are the standard sizes for two beds and one bed, respectively.
	Labour room	12	
	Bathing room	6	
	Immature-baby room	10	Other rooms require space for one nurse and one infant.
	Nurses' station	16	
	Change room/toilet with shower for staff	8	Change rooms require space for one booth for women.
	Internal corridor	28	About 30% of the total area of the maternity section is required for internal corridors.
CSSD	Sluice room-1	12	Each sluice room requires space for one sink and a work area for one person.
	Sluice room-2	12	
	Sterilizing room	28	The sterilizing room requires space for cleaning and a work area for one or two people.
	Sterilized materials room	12	
Total		410	

3) Administration Department

Section	Rooms	Area (m^2)	Criteria for deciding area and notes
Administration	Administration and medical records room	36	The administration and medical records room requires space for present medical records and a work areas for two people.
	Administrative officer's office	18	Offices are the same size as the present offices.
	Regional medical officer's office	18	The size of the health inspectors' office is based on their work routines: the four health inspectors are usually in the field and are rarely in the office at the same time.
	Multipurpose room	18	
Health services and Education/training	Nursing manager's office	18	Based on past experience, the conference and training room requires space for 30 people for lectures and for 18 people for seminars; it also requires 12 m^2 for an adjacent furniture storage room and a pantry.
	Health inspectors' office	18	
	Conference room	60	
Total		186	

4) Common Areas

Section	Rooms	Area (m^2)	Criteria for deciding area and notes
Common area	Entrance hall	60	The area of the entrance hall is about 7% of the total area of the three departments above.
	Corridors	430	The area of the corridors, which includes the Outpatient Department waiting room, is about 50% of the total area of the three departments above. The corridors of the Central Treatment Department are 3 m wide to accommodate stretchers.
	Toilet for staff	30	Men's toilets for both staff and patients have two urinals and one booth. Women's toilets for both staff and patients have two booths.
	Toilet for patients	30	
	Storage	40	
	Subtotal	590	
Garage	Garage	108	The garage requires space for two ambulances, two trucks, and the doctor's car.
Building installations	Generator room	24	The sizes of the rooms for other facilities are based on the size of the equipment installed in them.
	Power receiving room	6	
	Water pump room	6	
	Subtotal	144	The garage and the rooms for other facilities are in different buildings than the three departments above.
Total		734	
Others	Connecting corridors	60	Corridors connecting buildings are 3 m wide.

(3) Structural Design Standards

1) Standards for Calculating Wind Loads

To design buildings to withstand cyclones, New Zealand Standards (NZS), which are used in the National Building Code for Western Samoa, is used to calculate wind loads. The standards provide the following formula:

$$F = Cf \times q \times Ae$$

where, F : wind load

Cf: wind pressure coefficient (varies with the shape of the section of the building)

Ae: area subjected to wind loads (area of the section of the building)

q : velocity pressure = $0.613\ Vs^2$ (unit: pascal)

Vs is the design wind velocity, which is expressed as follows:

$$Vs = S1 \times S2 \times V$$

where, S1: coefficient based on geographical position (NZS p. 65 Table 13).

As Western Samoa is in an area subject to cyclones,

S1 = 1.1

S2: coefficient based on the roughness of the ground surface, the building's length, and the building's height (NZS p. 66 Table 14)

As the site is beside the sea, the roughness of the ground surface is 1; the building is less than 50 m long and 5 m high, therefore, S2 = 0.83

V : standard wind velocity

The standard wind velocity is the maximum average wind velocity that occurs once every fifty years over a period of three seconds at a height of 10 m. The value used for the maximum wind velocity is the value specified in the National Building Code for Western Samoa--V = 57 m/sec. The wind velocity near the ground is disproportional to the biquadratic root of the height of the wind. Therefore, 57 m/sec is equal to Cyclone Val's maximum gust of 65 m/sec, which was measured at a height of 24 m.

Given the above, Vs = 1.1 x 0.83 x 57 = 52m/sec,

therefore $q = 0.613\ Vs^2 = 1.657$ Pa (170 kg/m^2).

According to the Japanese Standard, velocity pressure is calculated as follows: $q = 60\sqrt{h}$ ($h < 16$ m), h = height above the ground

For buildings 5 m high, q = 135 kg/m^2.

Then the value based on the New Zealand standard is much higher than that based on the Japanese standard. Therefore, the safer New Zealand standard isused in the Project.

2) Standards for Calculating Seismic Loads

Like Western Samoa, New Zealand is in an area affected by earthquakes with epicenters along the Tongan Trench. Since New Zealand is well known for its advanced research on earthquakes, in the Project, seismic loads are calculated using New Zealand Standards, taking into consideration the specific physical features of Western Samoa. NZS gives the following formula:

$$V = Cd \times Wt$$

where, V : horizontal forces during an earthquake

Wt: total building weight

Cd: aseismic design coefficient = C x R x S x M

where, C : coefficient based on the region, ground type, and the natural period of the building (NZS p. 45 Figure 3)
Based on the frequency of earthquakes, New Zealand is divided into three earthquake zones (A to C). Areas located off the end of the Tongan Trench, where earthquakes are frequent, are classified as zone A. Areas further from the trench are less subject to earthquakes and are thus classified as zones B or C. Western Samoa is located off the end of the Tongan Trench so it is reasonable to consider it as being in zone A. According to NZS, C = 0.15 for the design of 1-3-story buildings for sites in zone A.

R : coefficient based on the importance of the use of the building (NZS p. 40 Table 4)
For the construction of hospital buildings, R = 1.6.

S : coefficient based on the structural system of the building (NZS p. 42 Table 6)
When both X and Y axis have a rigid frame structure, S = 0.8.

M : coefficient based on the type of building structure (NZS p. 44 Table 5)
When the building has a reinforced concrete structure, M = 0.8.

Given the above, Cd is calculated as follows:

$$Cd = 0.15 \times 1.6 \times 0.8 \times 0.8 = 0.16$$

3) Structural Calculation Method

After wind loads and seismic loads are calculated, stresses on members are calculated and members are designed using the standards of the Architectural Institute of Japan.

4-2-2 BUILDING INSTALLATION DESIGN CONDITIONS

(1) Electrical Installation Design Standards

1) Electrical Installation Loads

In order to design the Project's electrical installation system it is necessary to establish electrical installation load densities in unit areas and the demand factors. When of the facilities in the Project

and the operation plan are evaluated, the electrical installation load densities of the facilities to be rebuilt are considered to be almost equal to those of school buildings in Japan, and those of the facilities to be renovated are estimated about half those of houses in Japan. Considering the climate of Western Samoa, the demand factor of the power required for air conditioning is assumed to be 100%. It is reasonable to assume that the demand factors of other loads are about 50%, considering the patterns of use. Table 4-1 shows the electrical installation load densities in unit areas and the demand factors that have hereby been established.

Table 4-1 Eectrical Installation Load Standards

Load	Load density		Demand factor
	Facilities to be rebuilt	Facilities to be renovated	
Lighting and power outlets	20 VA/m^2	10 VA/m^2	50%
Air conditioning	As per the air-conditioning plan	0	100%
Power	As per water supply/ sanitary installations	—	20%

2) Illumination Levels

As there are no standards in Western Samoa for illumination levels for designing lighting systems, illumination levels referred to are those specified by JIS; given the illumination levels in similar facilities in Western Samoa, the lowest levels are to be adopted.

Room	Design illumination adopted (lx)	JIS illumination level (lx)
Operation theatre	750	1,500-750
Delivery room	300	750-300
Dispensary, inspection and testing rooms, and examination room	300	750-300
Office and conference room	300	750-300
X-ray room	100	200-100
Storage room	100	200-100
Toilet	75	150-75
Corridor	50	100-50

(2) Plumbing Installation Design Standards

1) Water Consumption Standards

There are no standards in Western Samoa on daily water consumption per head per day. Referring to actual water consumption patterns at the existing buildings of Tuasivi Hospital, and based on Japanese standards (Building Installation Design Guidelines, Government Building Department of the Ministry of Construction), the daily water consumption standards in various consumer categories are established as shown in Table 4-2.

Table 4-2 Daily Water Consumpiton for People in Various Consumer Categories

Consumer	Daily average (litres)	Japanese standard referred to
Outpatient	10	Average volume of consumption by outpatients at private clinics
Person accompanying an outpatient	5	One-half the volume of an outpatient
Inpatient	200	Average volume of consumption by single people living in dormitories
Person accompanying an inpatient	200	Same as above
Medical staff member	110	Average volume of consumption by members of private clinic staff
Non-medical staff member	80	Average volume of consumption by office workers
Resident of hospital housing	200	Average volume of consumption by single people living in dormitories

2) Rainwater Storage Standards

Volumes of rainwater storage are calculated based on the assumption that another cyclone will strike the island, and as was the case with Val, that the water supply will be cut off for about a week. It may be adequate to store enough rainwater to sustain operations for three days if the water supply is reduced by 50% during emergencies.

3) Quality of Water Discharged from the Soil Water Treatment Facilities

Since there are no standards in Western Samoa for wastewater quality, Japanese standards are referred to. According to Japan's Building Law, the drainage water quality for facilities similar to the Project facilities (capacity of fewer than 500 people) must be between BOD = 60 ppm and BOD = 90 ppm. Levels vary with location. Pollution of the ocean by inadequately treated wastewater is of great concern in the Project, therefore, the highest value in the Building Standard Law, 60 ppm, is adopted.

4-3 DESIGN DESCRIPTION

4-3-1 SITE AND LAYOUT PLANS

(1) Site Plan

1) Zoning

For the efficient land use and the orderly layout of facilities for the future plan, the site is divided into three zones and the facilities are laid out in the appropriate zones.

a) Medical Facility Zone

This zone includes central functions of the hospital and contains the existing wards and the medical facilities to be rebuilt (the Outpatient Department, the Central Diagnosis and Treatment Department, and the Administration Department).

b) Housing Zones

This zone contains the eight staff houses to be renovated and the existing house for the regional medical officer.

c) Service Facility Zones

These zones, located on both sides of the medical facility zone, contain facilities that support the key functions of the hospital. The zone on the right (looking from the road) is the highest land on the site and contains the existing water pipe. Given this, the water tank and the elevated water tank are to be installed here. This zone is away from the sea and is thus a safe place for the generator building. Being close to the road, it can be easily accessed by car and is the best place for the garage.

The left service facility zone (looking from the road) is the site of the morgue and autopsy building to be built by the Government. As the land in this zone is low, the septic tank is installed here. The existing generator building is converted to the incinerator building.

2) Access to the Hospital from Outside the Site

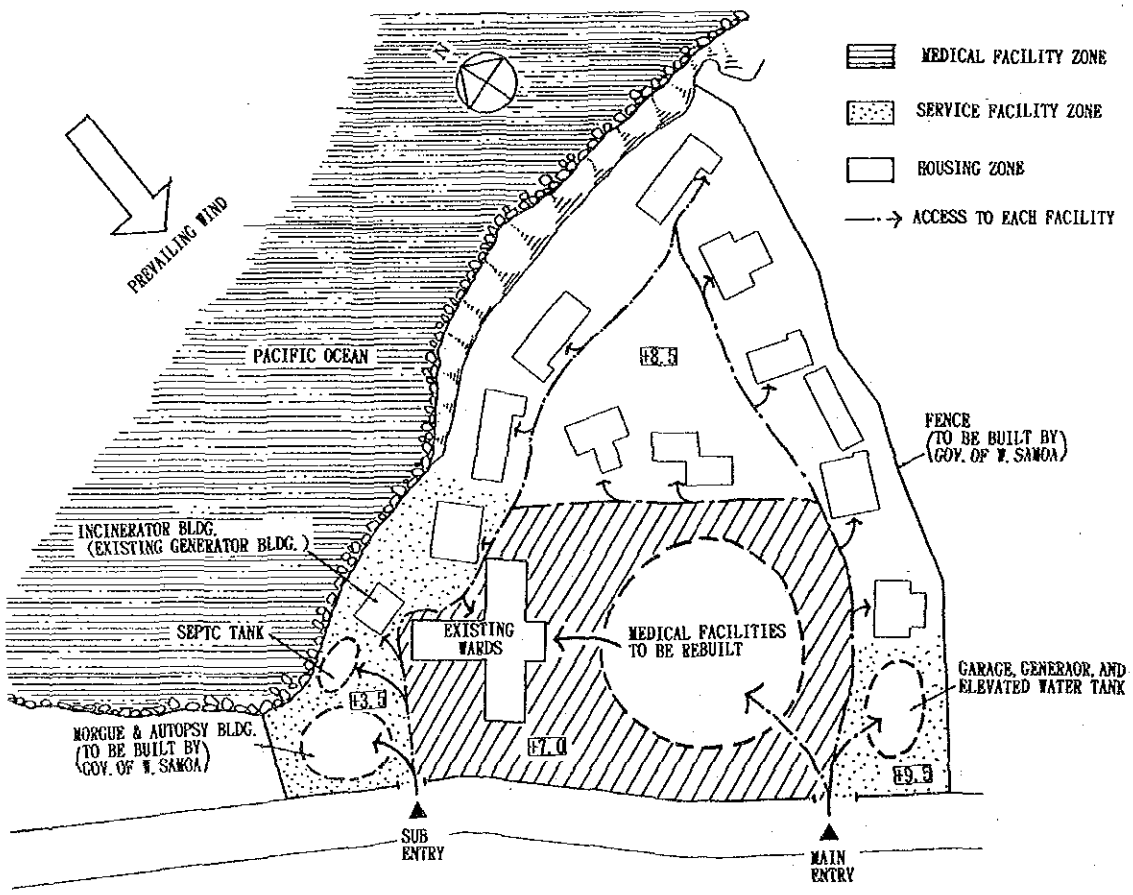
In order to prevent livestock from entering the site and to control the flow of people into the hospital, fences are to be built around the perimeter. The main access point, which faces the medical facilities to be rebuilt, is for outpatients, hospital staff, and people visiting inpatients; the secondary access point, which is near

the planned morgue and autopsy building, is for transporting the deceased, for the families of the deceased, and for service vehicles for the septic tank and the incinerator.

3) On-site Roads

In order to organize the flow of people and materials on the site and to keep traffic away from buried objects such as water and sewer pipes, a half-circle road is built. At the main access point the road is paved with asphalt, but the rest of it is covered with local lava stone.

Figure 4-1 Overall Layout Plan



(2) Layout Plan for the Buildings to be Rebuilt

1) Building Structure and Formation

Considering the functions of the hospital and the use of the existing facilities, the buildings to be rebuilt should be one story. As the total floor area is about 1,650 m^2, it is possible to obtain sufficient space to build them by using the land of the existing buildings to be demolished and the vacant space between them and the wards.

The facilities include the Outpatient Department, the Central Diagnosis and Treatment Department, and the Administration Department. To determine the incorporation of these functions into the hospital buildings, the following factors have been comprehensively evaluated: the topographical features of the site; the size of each department; the relationships between the functions of each facility; the relationship between each facility and the wards; the probability of future expansion. From this evaluation, it has been concluded that the facilities to be rebuilt should consist of the following three main buildings.

a) Outpatient and Administration Building

Outpatient Department + Administration Department

b) Central Diagnosis and Treatment Building

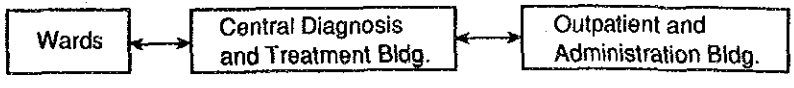
Central Diagnosis and Treatment Department

c) Garage and Generator Building

Garage + generator room + pump room

2) Building Layout

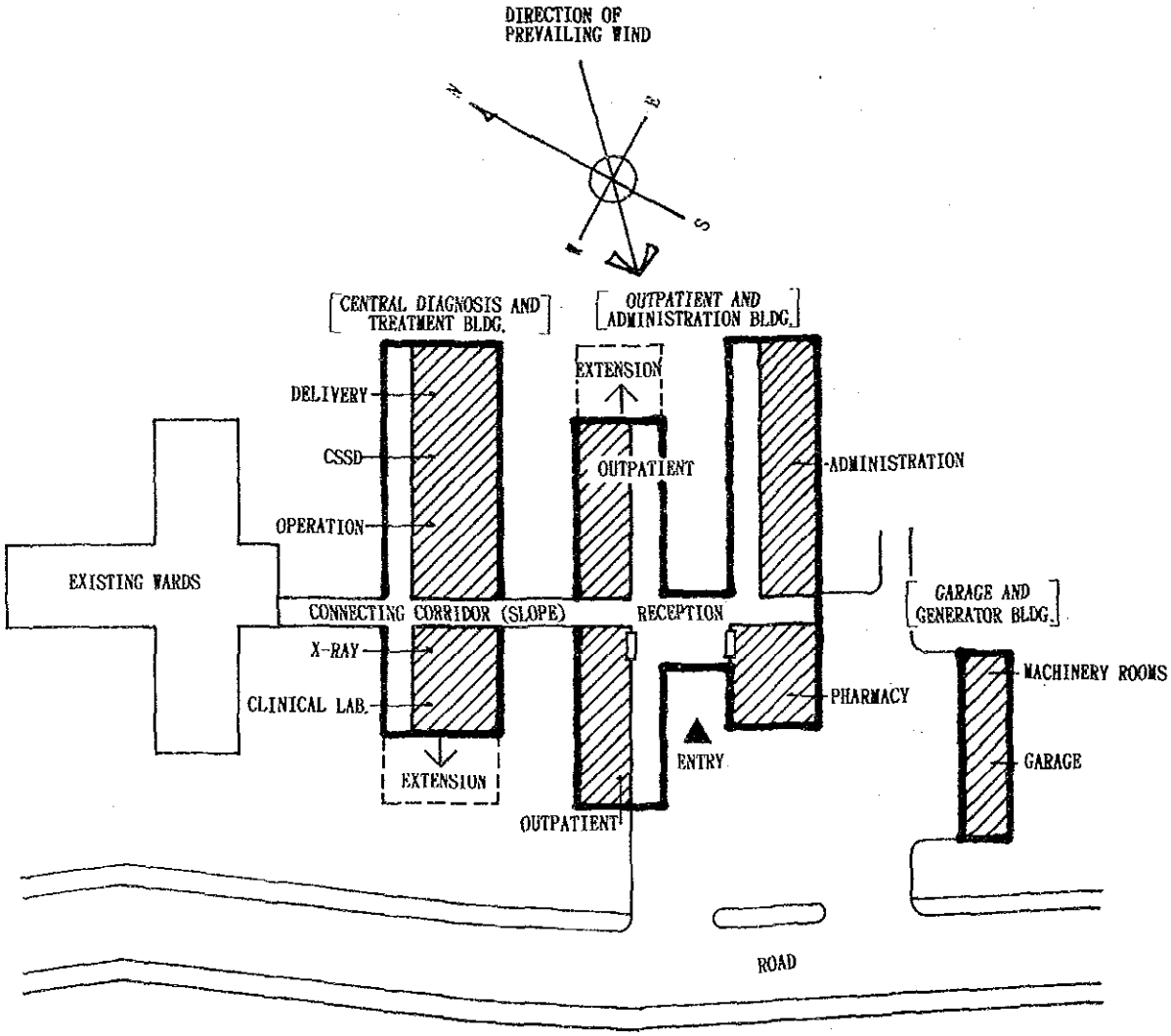
As the site is sloping, the buildings are built into the slope at different elevations to minimize earthwork and reduce costs. To maximize ventilation in all buildings, each building has a long rectangular plan with a single corridor and is aligned parallel to the prevailing winds direction. After evaluating the functional relationships of each building and between each building and the existing wards, the following layout has been established.



These three buildings are connected by corridors along the axis of the wards. As the floor levels of each building are different, the corridors are gently sloping.

The garage and other facilities are contained in an ancillary building laid out separately from the main buildings to prevent exhaust gas and noise from entering them.

Figure 4-2 Layout Plan for the Buildings to be Rebuilt



4-3-2 BUILDING DESIGN FOR THE FACILITIES TO BE REBUILT

(1) Floor Planning

1) Outpatient and Administration Building

a) Outpatient Department

For the convenience of patients, general outpatient examination rooms and the dental examination room are laid out near the entrance hall. As emergency patients are treated in the treatment room in the Outpatient Department, this room is laid out near the area where the ambulance unloads patients. Those who use antenatal care and family planning services are not sick. Considering this and their wishes for privacy, the rooms for these services are well away from the entrance. The toilet for outpatients and the people accompanying them is well ventilated, and for the convenience of its users, it is near the antenatal care and family planning counseling room considering the convenience of its users. As the corridor is open to the outside, it is well ventilated, and is to be used as a waiting area for outpatients and their attendants.

b) Pharmacy

For the convenience of outpatients, the dispensary is laid out to face the entrance hall. As Tuasivi Hospital functions as a drug supply center for all of Savaii Island, this location is also convenient for service vehicles delivering drugs.

c) Administration Department

Most administration rooms are in an area that people not working for the hospital will not usually pass through. However, as the office/medical records room functions as the reception area for outpatients, it is laid out near the outpatient examination and treatment rooms and has a wide window that opens onto the entrance hall. The administrative officer's office is beside the office/medical records room to facilitate management of office workers.

2) Central Diagnosis and Treatment Building

a) Inspection and Testing Sections

As X-ray inspections and laboratory testing are closely related to the functions of both the Outpatient Department and the wards, these sections are in an area convenient to both.

b) Surgical Operation Section

The operation theatre and the preparation room are in a clean-management zone. Staff enter these rooms through the change rooms. Sterilized supplies from the sterilized supply storage room in the CSSD enter the operation theatre in a pass box. After materials and instruments are used, they are taken to the adjacent sluice room. The recovery room is outside the clean-management zone to give nurses easier access to patients.

c) Delivery Section

To simplify delivery preparations and the moving of women to delivery room, the labour room and the delivery room are opposite each other. As with procedures in the operation theatre, sterilized supplies from the sterilized supply storage room in the CSSD enter the delivery room in a pass box. After materials and instruments are used, they are taken into the adjacent sluice room. When delivery staff go into the delivery room, they go through the change rooms. Newborns are bathed and weighed in the bathing room adjacent to the delivery room. To facilitate the monitoring of immature babies, the immature-baby room is adjacent to the nurses' station on the corridor side, from which parents or visitors can look through glass partitions.

d) CSSD

The CSSD is between the surgical operation section and the delivery section: this makes it possible to directly send sterilized supplies to and directly receive used supplies from both sections. Sterilized supplies for other departments pass through the sterilizing room. The sterilized material room is adjacent to the sterilizing room.

3) Garage and Generator Building

a) Garage

The back and side walls of the garage are made of concrete blocks and the front is open but has metal mesh steel doors.

b) Rooms for Miscellaneous Facilities

The present generator is to be moved to the new generator room. This generator is designed to be used outdoors and without an exhaust duct, therefore, the room housing it should be open to ensure good ventilation.

Since the wattmeter and the receiving panel must be protected from moisture, they are installed in an enclosed room. This room has a window so that the wattmeter can be read from outside. The room containing the pump for pumping water up to the elevated water tank has the same structure as the receiving panel room.

(2) Section Planning

The function of the roofs is like that of an umbrella. It is to prevent rain and incursion of direct sunlight. In accordance with this basic concept, the roofs are raised above the walls to allow cooling breezes to enter the buildings. To provide sufficient ventilation in the corridors, which are used as waiting areas, the corridors have no ceilings and the attics, backsides of the roofs can be seen from the corridor. The rooms, however, have reinforced concrete slab ceiling so that they will not be damaged, even if rain is blown into the attics or even if the roofing materials are holed by flying debris during a storm. Inside the rooms, beams supporting the ceiling slabs are exposed: the height below the beams is 3.0 m and below the ceilings it is 3.2 m, which is common in Western Samoa. To maximize ventilation inside rooms, windows are as large as possible, and most are louvered, which is also common in Western Samoa. To prevent windows from being broken during storms, the following two measures are adopted:

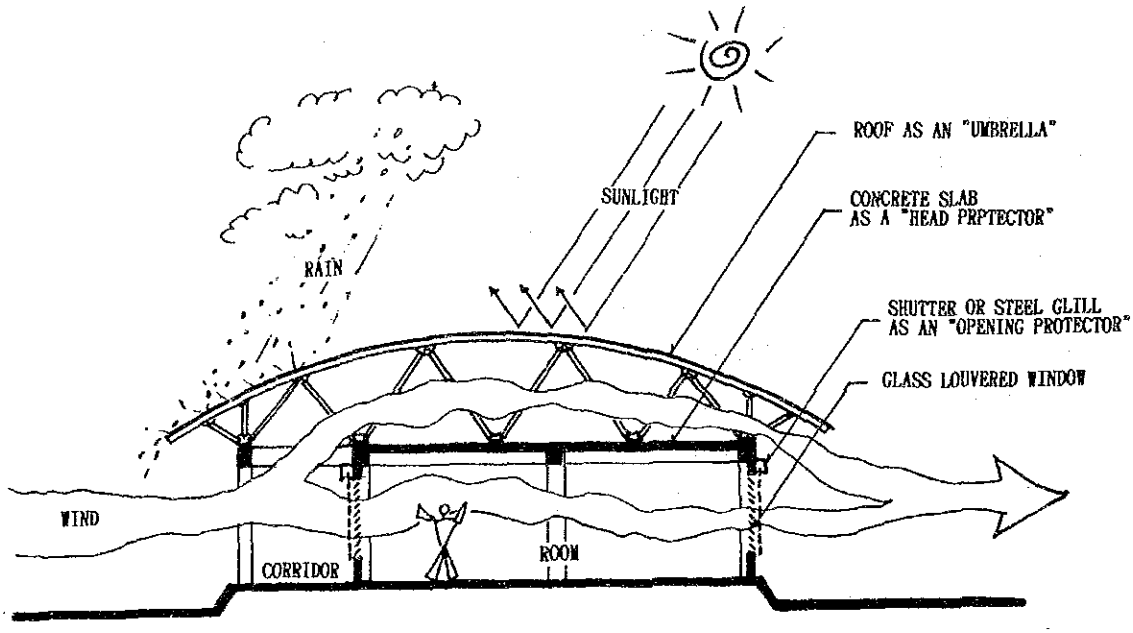
1) Installation of Shutters on Windows

The Central Diagnosis and Treatment Building is designed to function as a shelter which is able to withstand strong winds, heavy rain, and flying debris even during powerful storms. Therefore, all the windows of this building are furnished with shutters. Shutters are also installed on the windows of the pharmacy so that drugs will not be damaged during cyclones and the pharmacy will be able to continue to function as distribution centre for the island.

2) Installation of Steel Grill Panels on Windows

Only steel grill panels are installed on the windows of other rooms in the Outpatient and Administration Building. This is because the daily functions in these rooms may be stopped during a heavy cyclone. Thus it is acceptable for some rain and wind to enter into this building, so far as the windows are protected from flying debris.

Figure 4-3 Concept of the Section Plan



(3) Structural Planning

1) Foundations

Pile foundations are not required because the bearing capacity of the soil is estimated be about 10 t/m^2. Spread foundations made of reinforced concrete are adopted.

2) Structures

The main structures are reinforced concrete rigid-frame structures: their columns and beams form a rigid frame. Most walls are made of concrete blocks, which are common in Western Samoa. However, the walls of the X-ray inspection room are made of reinforced concrete to prevent exposure to radiation. Rooms are covered with reinforced concrete slabs.

3) Roofing Material and Roof Structure

The roofing material is galvanized corrugated steel sheet, and the roof structure consists of curved steel beams supported by steel struts on reinforced concrete rigid frames and steel purlins on the beams. Roofing is directly and tightly fastened to the purlins by hook bolts to counter the dynamic lift of the wind. To prevent corrosion, roof structural members are coated with marine paint and the purlins are galvanized.

(4) Building Installation Planning

1) Electrical Installations

a) Lighting and Receptacles

Lighting is mainly provided by 20 W and 40 W fluorescent lamps. Recessed open fixtures are installed in most rooms except for the operation theatre and delivery room which have covered fixtures. The receptacles are grounded triplex units which are standard in Western Samoa. In the laboratory, an automatic voltage regulating system is introduced to ensure that testing equipment functions properly and to prevent voltage fluctuations that can damage integrated circuits.

b) Communications Equipment

A telephone system with an intercom function for internal communications is provided. Since automatic telephone exchanges (PABX) are difficult to maintain, push-button telephones are provided. The telephone system has a capacity of three outside lines and twenty extensions.

c) Disaster Control Equipment

1/ Emergency Lighting

In the operation theatre and the delivery room, even momentary power outages can create serious problems. Therefore, emergency lighting fixtures with built-in batteries are installed. However, in other sections, as the facilities to be rebuilt are single-story buildings with open corridors and evacuation from these buildings in an emergency is not a problem, emergency lights are not installed.

2/ Taxi Lights

It is not necessary to install taxi lights for the same reason mentioned for emergency lights.

3/ Fire Alarm System

Manually-operated electric alarms are installed on the operating panels of interior fire hydrants. An automatic fire alarm system is not adopted for the Project because it is difficult to maintain in the country.

2) Plumbing Installations

For ease of maintenance, interior water pipes are left exposed wherever possible. There are two sewer lines, one for soil water and the other for wastewater. The lines meet at the outside sump pit. At present, facilities at Tuasivi Hospital have low-tank closets, but most tanks are not functioning properly. In the Project, flush-valve closets are installed.

Three solar water heaters of 300-litre capacity are installed on the roof of the Central Diagnosis and Treatment Building to provide hot water for the following sections:

a) Surgical operation section: the hand wash basins in the preparation room, the sink in the recovery room, and the showers

b) Delivery section: the wash basins in the delivery room, the newborn bathtub, the sink in the nurses' station, and the shower

c) CSSD: the sink and the sterilizer

3) Air-conditioning System

a) Cooling Equipment

In the Project, separate-type room air conditioners are installed. The rooms in which they are installed and the number of units installed are listed below.

Rooms	Number of units	Capacity (kW)	Reason for installation
Operation theatre Delivery room Preparation room	6	14.4	To block the inflow of outside air for clean-management
Cool and dry storage room in the pharmacy	1	2.2	To preserve the quality of drugs
X-ray operation room Clinical laboratory room	3	7.0	To block the inflow of outside air to protect equipment
X-ray room	1	2.2	The room has no windows because of radiation
Administrative officer's office Regional medical officer's office Nursing manager's office Multipurpose room	4	8.8	Already installed or to maintain previous standards of the Department of Health
Total	15	34.6	

b) Ventilation Equipment

Fans are installed in the following rooms: rooms not facing the outside (darkrooms and change rooms); rooms that tend to be smelly (toilets); rooms with windows that cannot be opened because of operations in them (operation theatre); rooms generating a lot of heat (sterilizing room)

4) Fire Extinguishing System

a) Fire hydrants

Interior fire hydrants and hose reels are installed in the Outpatient and Administration Building and the Central Diagnosis and Treatment Building.

b) Fire extinguishers

Powder-type portable fire extinguishers are installed in the testing room and the pantry, both of which have equipment that produce open flames.

(5) Materials Plan

Construction methods for building elements commonly used in Western Samoa are adopted to the extent possible. However, local methods are subject to alteration whenever a problem with them arises. The same rule applies to finishing materials: the Project adopts materials commonly used and readily available in the country when repairs are needed.

1) Exterior Building Elements and Finishes

a) Roofs

The Project buildings are roofed with corrugated galvanized steel sheet, the most common roofing material in Western Samoa. This material is mainly imported from New Zealand and is three to four times thicker than that usually used for temporary buildings in Japan; both its strength and durability are thus superior. In most construction in Western Samoa, corrugated galvanized steel sheet is nailed onto wooden purlins, and for this reason, Cyclone Val blew off the majority of roofs. In the Project, a method enabling buildings to withstand the design wind pressure is adopted: the purlins are steel and the roofing materials are fastened to them with hook bolts which have great tensile strength.

b) Exterior Walls

Exterior walls are built of locally made concrete blocks which are laid fair-faced and coated with acrylic paint. As Western Samoans have experience with fair-faced blockwork, this type of construction is not a problem. As for the finish, sprayed paint is more durable and water resistant than standard-type painting, but spray painting is not common in Western Samoa. As spray painting is not interchangeable with standard paint, standard-type painting is adopted.

c) Floor Finish of Exterior Corridors

Since the corridors will be used frequently, a durable floor surface is needed. The surface must also be smooth because carts and stretchers bearing patients are often wheeled and carried along them. Furthermore, because they are often rained upon, they must be water-resistant and non-slip. Cement plastering is inexpensive, but it is not durable, and generates a fine dust as it weathers. Terrazzo tiles satisfy all the above criteria, but they are not readily available in Western Samoa and thus are not appropriate. Mosaic tiles, however, are common in the country and meet almost all the above requirements except that mosaic tile floors are not as smooth as Terrazzo tile floors. Given this, mosaic tiles are selected for the floor finish of the exterior corridors.

d) Doors and Windows

Doors and windows are likely to need repairs in the near future. Such repairs can be done in the country if the doors and windows have wooden frames. Thus wooden frames and doors are to be used. Imported louvered windows, which are common in Western Samoa, are installed.

2) Interior Building Elements and Finishes

a) Flooring

For flooring, plastic tiles which are common in Western Samoa are laid. The operation theatre and the delivery room must always be kept clean, although they are often soiled. Plastic tiles are difficult to clean and are thus inappropriate. Vinyl sheet flooring or floorings coated with synthetic resin materials are ideal for these rooms, but they are not readily available in Western Samoa. Mosaic tiles have long been used in operation

theatres around the world, despite the demerit that dirt tends to collect in their joints. But as they can be easily washed and cleaned, mosaic tile flooring is adopted in both the operation and the delivery room. In addition, mosaic tiles are laid in other rooms that often get soiled or wet such as the sluice rooms, the sterilizing room, the toilets, and the shower rooms.

b) Partition Walls

Partition walls that need to be fire-resistant or soundproof are made of local concrete blocks that are plastered with cement mortar and painted. Other partition walls have wooden frames and are covered with particleboard imported from New Zealand, which is common in Western Samoa. In rooms that often need to be washed such as the operation theatre, the delivery room, the toilets, and the showers, wall finishes are finished with ceramic tiles.

c) Doors and Windows

In the Project, doors and window frames are to be made of wood. However, the doors of the X-ray inspection room are to be steel to prevent radiation leaks and the window between the X-ray operating room and the X-ray inspection room is glazed with leaded glass.

d) Ceilings

Acoustical gypsum board imported from New Zealand, which may be available on the local market, is installed in the ceilings of the most rooms. For rooms where porous materials are inappropriate because of moisture or the need for cleanliness, ceilings are mounted with fiber cement board coated with vinyl paint.

4-3-3 RENOVATION PLANS

The plan for each building to be renovated is outlined below:

(1) Wards (640 m^2)

Elements	Renovation work	Scale of repair
Structure	Reinforce the buckled concrete columns by installing reinforcing columns	2 places
	Reinforce the defective beam by installing portal frames	1 span of about 4 m
Exterior finish	Repair cracks and holes in exterior walls	All
	Extend rainwater gutters to cover all sections of the eaves	About 140 m, excluding existing gutters
	Repair damaged and missing verge board and eave fascia	About 12 m
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Demolish interior partitions on the ground floor and make the following changes (Before) (After) Morgue 24 m^2 Laundry room 48 m^2 Autopsy room 60 m^2 Kitchen for patients' family 12 m^2 Laundry room 12 m^2 Public toilets for men and women 24 m^2 Storage room 30 m^2 Storage room 36 m^2 Corridors 18 m^2 Open space 24 m^2	Total area of 144 m^2
	Replace existing toilets on the first floor with new toilets, washrooms, and shower rooms for both men and women; build a sluice room	Total area of 50 m^2
	Repair cracks in the mortar floors and apply a dustproof coating	All
	Partially refloor wooden flooring in the children's ward on the first floor	About 20 % of present floor area
	Paint walls, ceilings, and partitions	All
Openings	Replace metal frames of louvered windows with plastic frames	About 80% of windows
	Renew worn-out wooden doors	All
Electrical installations	Install lighting and power outlets	Re-partitioned rooms
	Install emergency lighting and exit sign lighting	5 places in the wards
Plumbing installations	Install fixtures and pipe needed for new plumbing	All renewed water sections
	Install interior fire hydrants	1 each on both the ground floor and the first floor

(2) Doctors' House (202 m^2)

Elements	Renovation works	Scale of repair
Exterior finish	Replace existing balcony	All
	Install rainwater gutters	50% of the length of the eaves
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Replace plaster floor tiles	About 35% of present floor area
	Lay soft vinyl sheet on the wooden floors on the first floor	All
	Replace wallboard	About 30% of present wall area
	Replace ceiling board	About 20% of present ceiling area
	Renew sink cabinet in the kitchen and the work table	2 places
	Paint walls, ceilings, and fittings	All
Openings	Renew louvered and screen windows	All
	Repair or renew wooden and screen doors	About 70% of the present doors
Electrical installations	Renew present fixtures and wiring	Places missed or damaged by board replacement
	Install additional lighting fixtures where needed	4 places
Plumbing installations	Renew existing fixtures and pipe	All
Others	Excavate topsoil around the entrance	About 30 m^3
	Rebuild external toilets and showers	10 m^2 (2 buildings)

(3) Nurses' House (222 m^2)

Elements	Renovation works	Scale of repair
Structure	Repair cracks in the concrete foundation with mortar	All severe cracks
Exterior finish	Repair damaged siding boards	About 10% of present siding
	Remove rust from the pent-roof and repaint	All
	Install rainwater gutters	50% of the length of the eaves
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Replace plastic floor tiles	All
	Install soft vinyl sheet on the wooden floors on the first floor	All
	Lay mosaic tiles on the floors of the toilets and the shower rooms	All
	Replace wallboard and ceiling board	All
	Paint walls, ceilings, and fittings	All
Openings	Renew louvered windows, screen windows, and wooden doors	All
Electrical installations	Renew present fixtures and wiring	All
Plumbing installations	Renew present fixtures and pipe	All

(4) Pharmacist's House (116 m^2)

Elements	Renovation work	Scale of repair
Exterior finish	Replace siding	All
	Ceil undersides of the eaves	All
	Repair damaged and missing verge board and eave fascia	About 4 m
	Install rainwater gutters	50% of the length of the eaves
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Replace plaster floor tiles	All
	Lay mosaic tiles on the floors of the toilet and the shower room	All
	Replace wallboard and ceiling board	All
	Install a sink in the kitchen	1 unit
	Paint walls, ceilings, and fittings	All
Openings	Renew louvered windows, screen windows, and wooden doors	All
Electrical installations	Install lighting fixtures and power outlets	All
Plumbing installations	Install sanitation equipment, hardware, and pipe	All

(5) Clinical Laboratory Technician's House (105 m^2)

Element	Renovation work	Scale of repair
Exterior finish	Replace siding	All
	Install covering for undersides of eaves	All
	Install rainwater gutters	50% of the length of the eaves
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Replace plaster floor tiles	All
	Lay mosaic tiles on the floors of the toilet and the shower room	All
	Replace wallboard and ceiling board	All
	Renew the kitchen sink	1 unit
	Paint walls, ceilings, and fittings	All
Openings	Renew louvered windows, screen windows, and wooden doors	All
	Install windows to the outside in the toilet and the shower room	1 place
Electrical installations	Renew present fixtures and wiring	All
Plumbing installations	Renew present fixtures and pipe	All
Others	Remove soil around the kitchen	About 10 m^3

(6) Health Inspectors' House (95 m^2)

Element	Renovation work	Scale of repair
Exterior finish	Repair damaged areas of sheathing	About 10% of present siding
	Ceil undersides of eaves	All
	Install rainwater gutters	50% of the length of the eaves
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Replace plaster floor tiles	All
	Lay mosaic tiles on the floors of the toilet and the shower room	All
	Replace wallboard	About 10% of present area
	Replace ceiling board	About 5% of present area
	Replace the kitchen sink	1 unit
	Paint walls, ceilings, and fittings	All
Openings	Renew louvered windows	About 40% of present windows
	Replace screens of the screen doors	All
	Install door knobs with locks	2 units
Electrical installations	Renew lighting fixtures in the toilet and the washroom	2 units
Plumbing installations	Renew present fixtures and pipe	All
Others	Remove soil from around the building	About 1/2 the perimeter of the building (about 10 m^3)

(7) Guest House (79 m^2)

Element	Renovation work	Scale of repair
Exterior finish	Repair damaged areas of siding	About 10% of present siding
	Repair damaged or missing sections of undersides of eaves	About 10% of the present area
	Repair damaged or missing sections of verge board and eave fascia	About 10 m
	Install rainwater gutters	50% of the length of the eaves
	Paint exterior walls, undersides of eaves, verges, and eave edges	All
Interior finish	Replace plaster floor tiles	About 15% of existing tiles
	Lay mosaic tiles on the floors of the toilet and the shower room	All
	Replace wallboard	About 15% of present area
	Replace ceiling board	About 10% of present area
	Paint walls, ceilings, and fittings	All
Openings	Renew louvered and screen windows	All
	Replace screen doors	All
Electrical installations	Renew the lighting fixture in the toilet	1 unit
	Replace missing lighting fixtures	2 units
Plumbing installation	Replace present fixtures and pipe	All

(8) X-ray Technician's House and the Dentist's House (116 m^2 + 116 m^2)

Element	Renovation work	Scale of repair
Remaining sections	Remove deteriorated sections of the concrete foundations and reinforce with new concrete	All
	Replace missing concrete blocks in walls with the same type of blocks	All
Sections to be rebuilt	Build a building with the same structure, finish, and installations as the pharmacist's house	116 m^2 floor area

(9) House for Patients' Families (115 m^2)

Element	Renovation work	Scale of repair
Exterior finish	Ceil with board using existing furring	All
	Paint columns, exterior walls, ceilings, verges, and eave edges	All
	Renew the existing kitchen sink and work table	All
Electrical installations	Install lighting fixtures	4 units
Plumbing installations	Renew plumbing hardware and pipe	All

(10) Existing Generator Building (to be converted to the incinerator building 39 m^2)

Element	Renovation work	Scale of repair
Exterior finish	Paint exterior walls and the roof	All
Electrical installations	Install lighting fixtures	1 unit
	Install a power receiving panel to supply power to the incinerator and the soil water treatment facility	1 unit

4-3-4 ON-SITE FACILITIES PLANNING

(1) Power Supply Facilities

1) Power Lead-in Installations

Power is supplied from the outside service line running on the trunk road in front of the site. The power to be led in is three phase 400/230 V, 50 Hz of four-wire system. The maximum power demand of the hospital is estimated as shown in Table 4-3.

Table 4-3 Estimated Demand (kVA)

Load	Load density (Kw/m^2)	Area (m^2)	Total load (Kw)	Demand factor (%)	Demand (Kw)
Lighting, power outlets	20	1,650	33.0	50	16.5
Air conditioners	As per the air-conditioning plan		34.6	100	34.6
Plumbing system	As per the plumbing plan		5.0	20	1.0
X-ray unit	-	-	40.0	0	0.0*
Subtotal			112.6		56.3
Facilities to be renovated	10	1,845	18.5	50	9.3
Total			131.1		65.6

Note: The X-ray unit requires momentary loads so the demand factor can be assumed to be 0.

To meet the demand estimated above, the capacity of the transformer is calculated to be about 77 KVA, assuming an average power factor of 0.85. The capacity of the pole-mounted transformer presently distributing power to Tuasivi Hospital is 50 KVA, which is insufficient for the demand. Therefore, the transformer and the service lines must be replaced. When the probable increase in demand and a stable supply of power are taken into consideration, an exclusive transformer for the hospital with a 100 KVA capacity is required.

2) Power Distribution Installations

The present power distribution lines from the receiving panel to all the buildings are to be replaced. The lines from the receiving panel to the distribution panel of the Outpatient and Administration Building are laid underground. However, after that the lines in the new buildings are laid on cable racks, they are left exposed for easy maintenance. Power is distributed by aerial lines to all the buildings to be renovated.

3) Emergency Power Supply Installations

When power fails, the existing emergency power unit with a 50 KVA capacity supplies power. Facilities to which emergency power is supplied are prioritized due to the system's limited capacity. The Central Diagnosis and Treatment Building and the outpatient treatment room, which functions as the emergency treatment room, have top priority, and lighting for the corridors and wards follow this. As with the present emergency power supply system, power is automatically activated.

(2) Water Supply Facilities

1) Water Receiving Tank and Elevated Water Tank

The water receiving tank is reinforced concrete and buried underground. City water is received through the existing 50 mm water intake pipe. It is decided that the capacity of the tank will be equal to the volume of average daily consumption of the hospital. This is based on the guidelines which Japanese local governments usually apply to areas with poor water supply conditions.

The elevated water tank is a standard FRP tank placed on a steel frame tower. The capacity of the elevated water tank is equal to the volume of average hourly consumption of the hospital. Table 4-4 shows an estimate of the average daily and hourly consumption rates.

Table 4-4 Average Daily and Hourly Water Consumption per Capita

Consumer	Number of people	Daily average per person (litres)	Daily average (litres)	Hours of consumption	Hourly average (litres)
Outpatient	82	10	820	8	103
Outpatient attendant	82	5	410	8	52
Antenatal and dental patient	36	10	360	8	45
Inpatient	18	200	3,600	12	300
Inpatient attendant	18	200	3,600	12	300
Medical personnel	46	110	5,060	8	633
Paramedical personnel	30	80	2,400	8	300
Resident staff	36	200	7,200	12	600
Total			23,450		2,333

According to the table above, the average daily consumption of water is 23,450 litres, thus the capacity of the water receiving tank should be 24 m^3; the average hourly consumption is 2,333 litres, thus the capacity of the elevated water tank should be 3 m^3. As a water pressure of 0.7 kg/cm^2 is required at each water tap, it is estimated that the elevated tank should be elevated 8 m, taking into consideration the loss of pressure head in the pipe. The water level regulating system adopted for the water receiving tank is the ball-tap system; the system adopted for the elevated water tank is the

electrode system. The pump is installed in the garage/generator building.

2) On-site Water Supply Network

The water main pipe is of hard vinyl chloride with a diameter of 100-65 mm. It is laid underground along the on-site road and gate valve is provided for each building.

3) Rainwater Storage Tanks

According to the design criteria set up in Section 4-2-2, the hospital stores rainwater for three days' consumption. As the average daily water consumption at the hospital is 24 m^3, 72 m^3 of water should be reserved. Tanks are installed at each building to reserve rainwater. Ten rainwater tanks of 1.5 m^3 are installed at the staff houses and three new 5 m^3 water tanks are installed at the wards. Together with the existing 8 m^3 tank at the wards, a total of 38 m^3 can be stored. Twelve (12) tanks of 3 m^3 are installed at the new buildings.

The Central Diagnosis and Treatment Building which funcitons as a shelter, should have a normal supply of water as long as possible. During emergencies when city water is cut off, city water already stored in the receiving tank will be exclusively used for the Central Diagnosis and Treatment Building by closing the valves on water supply pipes for other facilities.

(3) Drainage Facilities

1) Soil Water Treatment Facility

There are two types of soil water treatment systems: the septic system and the aeration system. The septic system has a simple structure and requires few components so it is easy to operate and maintain. The treatment capabilities of the system are limited, however, it is difficult to treat soil water to the level of BOD = 60 ppm or less. The aeration system is more sophisticated and can purify soil water at a higher level, but it consumes more energy and is comparatively difficult to properly maintain.

The soil water treatment facility in the Project has the advantages of both systems. It is based on the septic system but supplemented by the contact aeration system. The contact aeration system requires relatively few components and is thus easy to operate and maintain.

In order to reduce pollution of seawater by soil water, resolved soil water is not directly discharged into the sea but it is first disinfected and then percolated into the ground. The soil water treatment facility adopted in the Project is outlined below:

a) System

Combined soil and wastewater treatment by an aerated septic tank

b) Tank Components

1 raw-water tank, 2 sedimentation and separation tanks, 1 sedimentation tank, 1 defoaming-pump tank, and 1 disinfection tank

c) Apparatus

2 raw water pumps, 2 aeration blowers, and 1 defoaming pump

2) On-site Drainage Network

Soil water and wastewater are drained into a sump pit outside each building, from which they are drained together to the soil water treatment facility. Drainage pipe is made of hard vinyl chloride and is laid underground along the on-site road and slope.

(4) Solid Waste Processing Facility

Solid waste is separately collected. Except for organic waste, solid waste from the hospital (paper, cloth, and plastic) is incinerated. The daily volume of solid waste is estimated to be 27 kg based on the assumption that the per bed volume is 1.5 kg and the average number of beds occupied daily is 18. An incinerator with a capacity of 10 kg/h can handle this volume if it is operated for three hours a day. To completely burn plastic, the incinerator is to be equipped with a secondary incineration chamber to reburn smoke and coarse particulate matter.

4-3-5 EQUIPMENT PLAN

(1) Basic Policy for Selecting Equipment

In selecting equipment, not only the medical service level in Western Samoa but also the present demand and supply factor must be comprehensively evaluated. The demand factors include the role of the hospital and its daily activities. The supply factor affects the probability of proper operations and maintenance, and includs the availability of consumables and spare parts, ease of repair, and the technical levels of the staff who use the equipment.

The equipment plan is established based on the following policies:

1) To keep the same grade of equipment upon supplement of items lost by the cyclones and replacement of broken or worn-out equipment
2) To introduce equipment that did not exist before the cyclones but is essential for the hospital to fulfill its role, as long as it is appropriate for the technical capabilities of the staff, and not difficult to operate and maintain
3) To select equipment that is appropriate for the present technical level and activities of the hospital
4) To give priority to items of equipment which meet the following criteria:
   a) Items that medical staff know how to operate well
   b) Items that are neither expensive nor difficult to maintain
   c) Medical furniture that is strong, good quality, wooden, and locally procurable
5) To carefully consider standards of equipment commonly used at facilities such as the National Hospital, and the body sizes and lifestyles of Western Samoans

(2) Conditions for Selecting Equipment

The following conditions are used as the basis for the selection of items of equipment and their specifications:

1) Electricity
   a) Electric power: single-phase 230 V, 50 Hz; three-phase 400 V, 50 Hz
   b) For equipment that cannot meet the standards above, transformers are used.
   c) For equipment easily damaged by voltage fluctuation, voltage regulators are installed.
2) Water
   a) Water quality:
      The present city water is used. It is judged not to be particularly hard because the water source is nearby and surface water is used.
   b) Water pressure: 0.7 kg/cm^2

3) Medical gas and fuel gas
   a) Medical gas: oxygen and dinitrogen monoxide
   b) Fuel gas: liquefied petroleum gas

(3) Project Equipment List

Selection of equipment for the Project is based on the perspectives described above. Table 4-5 outlines the principal items of equipment together with the specifications and numbers. When examining the table, the following notes may be referred to:

1) Items newly introduced to the hospital by the Project are marked with a bullet (•) in the "New" column.
2) A bullet (•) is marked in the "Parts" column for some items which may require the joint purchase of consumables and/or spare parts to ensure smooth operations when the new hospital opens.
3) For some items such as the dental unit, it is necessary to have Japanese engineers train staff on their operation and maintenance at the time of delivery. These items are marked with a bullet (•) in the "Training" column.
4) Minor items for the common use of several sections which are outlined "Common Equipment" include the following:
   a) General diagnosis and treatment instruments: items mainly used by nurses such as blood pressure gauges and stethoscopes
   b) Transportation equipment: wheelchairs, stretchers, instrument trolleys
   c) Hospital equipment: nebulizers, irrigator racks, and shielding screens
   d) Stainless steel products: pus basins, disinfecting basins, and scrubbers
   e) Linen and rubber products: operating gowns and rubber gloves

Table 4-5 Medical Equipment List

No.	Item	Specifications	Quantity	New	Parts	Training
General Outpatient Examination Rooms 1, 2						
1	Consulting desk and chair	Order-made locally	2 sets			
2	Examining table	Order-made locally	2			
3	X-ray film viewer	2 films	2		●	
4	Examining light		2		●	
5	1-channel electrocardiograph	Portable	1	●	●	●
6	Instrument and dressing cabinet	Stainless steel	2			
Outpatient Treatment Room						
1	Consulting desk and chair	Order-made locally	1 set			
2	Examining table	Order-made locally	1			
3	X-ray film viewer	2 films	1		●	
4	Examining light		1		●	
5	Suction unit		1		●	
6	*Refrigerator*	*260 litre*	1			
7	Instrument and dressing cabinet	Stainless steel	1			
Antenatal Care/Family Planning Clinic						
1	Consulting desk and chair	Order-made locally	1			
2	Examining table	Order-made locally	1			
3	Gynecological examining table	Fixed	1			
4	X-ray film viewer	2 films	1		●	
5	Examining light		1			
6	Fetal heart detector	Doppler	1	●	●	●
7	Ultrasound scanner	Portable	1	●	●	●
8	Suction unit		1		●	
9	Instrument and dressing cabinet	Stainless steel	1			
Dental Clinic						
1	Consulting desk and chair	Order-made locally	1			
2	Dental unit		1		●	●
3	Dental X-ray unit	Movable	1	●	●	●
4	Amalgam mixer		1			○
5	Autoclave	Tabletop	1		●	●
6	Instrument and dressing cabinet	Stainless steel	1			
7	Dental chair		1			
Pharmacy						
1	Unit pharmacy table		1			
2	*Work table*		1			
3	Shelves	Stainless steel	1			
4	Medicine refrigerator	500 litre	1			
5	Typewriter	Manual	1		●	

No.	Item	Specifications	Quantity	New	Parts	Training
Clinical Laboratory						
1	Unit laboratory table		1			
2	Hemoglobinometer	Portable	1		•	
3	Precision balance		1			
4	Binocular microscope		1		•	
5	Spectrophotometer	Single-beam	1	•	•	•
6	Incubator	Tabletop	1		•	•
7	Centrifuge	Tabletop	1		•	
8	Refrigerator	260 litre	1			
9	Autoclave	Floor-type	1		•	•
10	Water still	Barnstead	1		•	•
11	Blood bank refrigerator	120 litre	1	•		
X-ray Inspection Room						
1	General X-ray unit	500 mA	1		•	•
2	X-ray film viewer	2 films	1		•	
3	X-ray film viewer	3 films	1		•	
4	Developing tank	Manual	1			
5	Film loading table		1			
6	Film keeping shelf		1			
Operation Theatre						
1	Operating table	Hydraulic	1			
2	Operating light	8 halogen lamps	1		•	
3	Anesthesia apparatus		1		•	•
4	Defibrillator	Portable	1	•	•	•
5	Suction unit		2		•	
6	X-ray film viewer	3 films	1		•	
7	Instrument and dressing cabinet	Stainless steel	1			
Recovery Room						
1	Recovery bed		1			
2	Suction unit		1		•	
3	Refrigerator	260 litre	1			
4	Work table and chair	Order-made locally	1			
Sluice Room						
1	Bedpan sterilizer	Chemical	1	•	•	•
2	Bedpan and urinal rack		1			
CSSD						
1	High-pressure steam sterilizer	3 drums	1	•	•	•
2	Instrument boiling sterilizer	Floor-type	1		•	•
3	Work table and chair	Stainless steel	1			
4	Dressing drum cabinet	Stainless steel	1			
5	Instrument and dressing cabinet	Stainless steel	3			
6	Surgical operation instrument set	Various types	1			

No.	Item	Specifications	Quantity	New	Parts	Training
Labour Room						
1	Labour bed		1			
2	Fetal heart detector	Doppler	1	•	•	•
Delivery Room						
1	Delivery table	Manual	2			
2	Operating light	4 lamps + 4 lamps	1		•	
3	Suction unit		1		•	
4	Fetal heart detector	Doppler	1	•	•	•
5	Instrument and dressing cabinet	Stainless steel	1			
Milk/Bathing Room						
1	Infant treatment table		1			
2	Baby balance		1			
3	Refrigerator	260 litres	1			
Immature baby Room						
1	Infant incubator	Manually-controlled	1		•	•
2	Infant bed		2			
3	Infant Resuscitation table	Order-made locally	1			
Nurses' Station						
1	Nurse's desk and chair	Order-made locally	1			
2	Instrument and dressing cabinet	Stainless steel	1			
3	Medicine cabinet		1			
Wards						
1	Mattress		20			
2	Suction unit	Movable	1		•	
3	Instrument boiling sterilizer	Tabletop	1		•	•
4	Refrigerator	260 litre	1			
5	Bedpan sterilizer	Chemical	1	•	•	•
6	Bedpan and urinal rack		1			
Common Equipment						
1	General diagnosis and treatment equipment		1			
2	Carrying equipment		1			
3	Medical fixtures		1			
4	Stainless steel equipment		1			
5	Linen and rubber items		1			
Administration Department—Reception						
1	*Chart file shelf*	Steel	1			
2	Typewriter	Manual	1		•	
3	Copy Machine		1		•	•

No.	Item	Specifications	Quantity	New	Parts	Training
Administration Department---Education/Training						
1	Overhead projector	Portable	1	•	•	•
2	Slide projector	Portable	1	•	•	•
3	Video set	20 inch TV	1	•		•
4	Conference desk and chair	Order-made locally	1			
Vehicles						
1	Doctor's car for external services	Four-wheel drive	1		•	
2	Truck	2 ton	1		•	

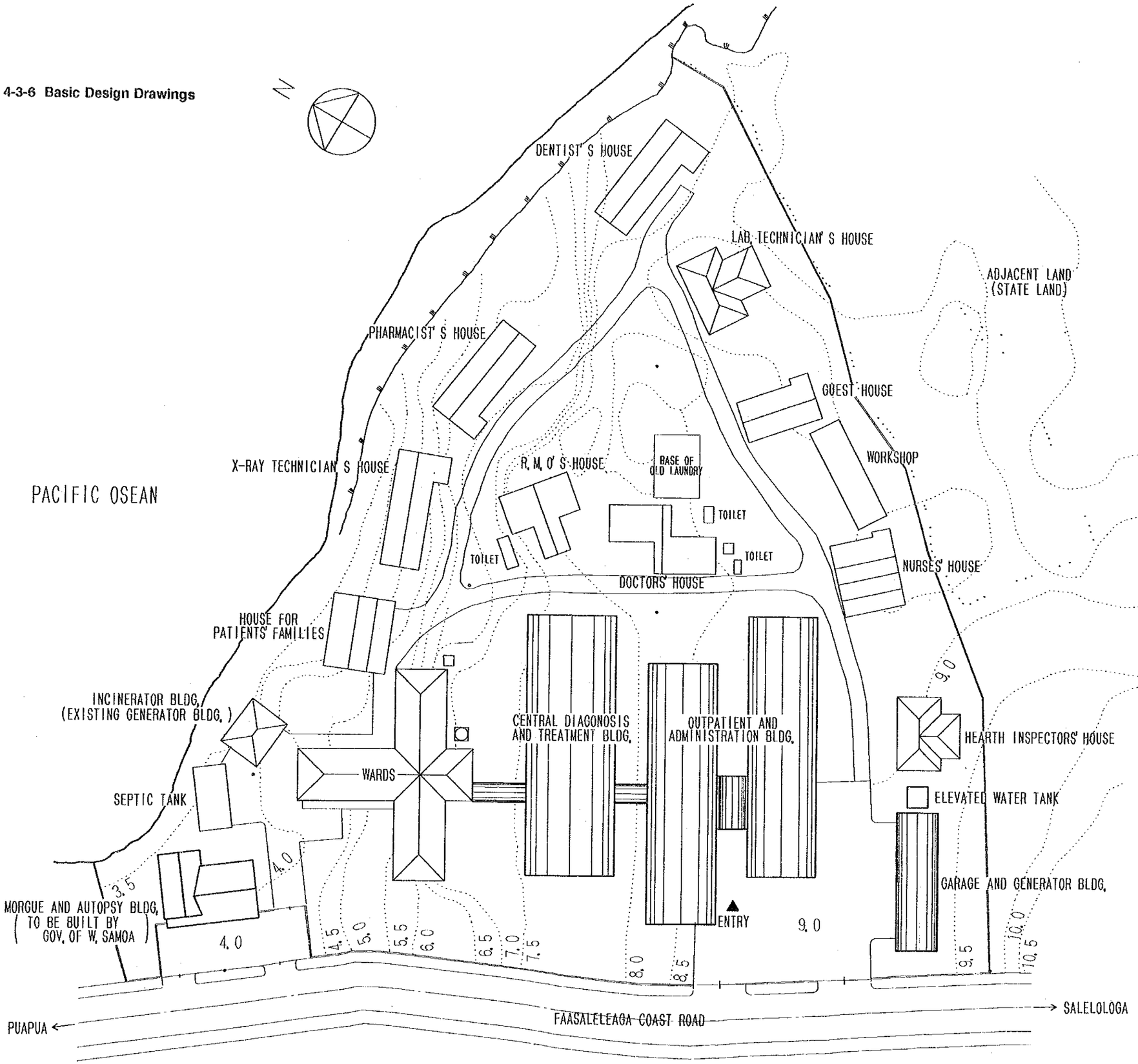
(4) Reasons for Selection of Principal Equipment Items

The need for principal equipment items is examined in Chapter 3. The table below outlines the reasons for their specifications and quantities. The quantities of these items are based on the scale of operations: in most cases only one unit of each item is needed.

	Item	Specifications	Q'ty	Reasons for specifications and quantities
General outpatient	Consulting desk and chair set	Order-made locally with a local material (tava)	2	Size of Japanese standard products is inappropriate; local products are strong; for two examination rooms
	Examining table	Same as above	2	Same as above
	Examining light	Standard	2	
Treatment room	Electrocardio-graph	1-channel portable	1	Used in wards when needed
	Instrument and dressing cabinet	90 cm-wide stainless steel	1	Rust prevention
	Treatment table	Order-made locally with a local material (tava)	1	Size of Japanese standard products is inappropriate; local products are strong
	Instrument boiling sterilizer	Tabletop, electric	1	Easy to operate
	Refrigerator	Medium-size (260 litres)	1	Appropriate size for volume of drugs
Antenatal care	Gynecological examining table	Box-type, fixed height	1	Easy to operate and maintain
	Fetal heart detector	Doppler-type, portable	1	Easy to operate and within capabilities of midwives
	Ultrasound scanner	Portable, without a printer	1	Useful for obstetrics; low maintenance costs
Dental clinic	Dental unit	Shadowless light, X-ray film viewer, handpiece set, dental bar set, compressor	1	Simple unit selected due to operation and maintenance conditions
	Dental X-ray unit	Movable, 60 KV, 10 mA	1	Relatively easy to operate; does not require special room
	Autoclave	Small, electric, tabletop	1	Patients few so size adequate
	Instrument and dressing cabinet	W = 90 cm , stainless steel	1	Rust prevention

	Item	Specifications	Q'ty	Reasons for specifications and quantities
Pharmacy	Pharmacy table	W = 240, D = 120, H = 90	1	Size adequate for amount of daily dispensing
	Medicine refrigerator	500 litre	1	Size required for volume of medicine that needs to be kept cool
	Medicine cabinet	W = 90, D = 60, H = 200, stainless steel	40	Size required for present volume of drugs and sanitary supplies
	Typewriter	Manual, locally available	1	Easy to operate and maintain
	Medicine scale	Manual, 240 g capacity	1	Same as above
Clinical laboratory	Unit laboratory table	1 central testing table, W = 300, D = 150; 2 side testing tables, W = 300, D = 60	1	Based on the amount of equipment to be procured, each category of testing needs 3 m of space
	Binocular microscope	Blood and parasitological tests	1	Parasitological tests are few so 1 is sufficient for both categories of testing
	Small, tabletop centrifuge	2-unit set: 1 unit for 8 centrifuge tubes, 1 unit for 24 capillary tubes	1	Not often used so only small unit for centrifuge tubes and one unit for capillary tubes
	Spectrophoto-meter	Single beam analog display	1	Easy to operate and maintain
	Water still	Barnstead type, 3 litre/hrs	1	Moderate operation and maintenance costs
	Blood bank refrigerator	120 litre	1	Surgical operations are few so a small unit adequate
X-ray inspection	General X-ray unit	500 mA, bucky stand, fixed bucky table	1	Appropriate for size of Western Samoans' bodies; easy to operate and maintain
	Developing tank	Manual	1	Manual unit sufficient for daily volume; easy to maintain
	Film keeping shelf	Stainless steel: space for 3 drums of 17" x 14" film and 3 drums of 14" x 14" film	1	Enough space to store 5 years of film
Operation theatre	Operating table	Hydraulic	1	Easy to operate and maintain; one sufficient for the number of surgical operations
	Operating light	8 halogen lamps	1	Same type of equipment as existing equipment: no new surgical operations will be introduced
	Anesthesia apparatus	BS standards, blood pressure gauge, Fluothane vaporizer	1	Same type of equipment as previous equipment: no new surgical operations will be introduced
	Defibrillator	Simple, portable	1	Easy to operate; can be used in other sections of the hospital
Delivery	Labour bed	Manual position adjustment	1	Easy to maintain and operate
	Delivery bed	Manual hydraulic height adjustment, stirrups	2	Easy to operate and maintain; 1 for emergency
	Fetal heart detector	Doppler, portable	1	Easy to operate; within the capabilities of midwives
	Infant incubator	Manual temperature control, drawer-type	1	Most basic functions; easy to operate and maintain
CSSD	High pressure steam sterilizer	Electric, 3-6 drums	1	Sufficient for the small number of operations and deliveries
	Instrument boiling sterilizer	Electric, floor-type	1	Relatively large floor-type needed
	Dressing drum cabinet	Stainless steel: W = 170, D = 54, H = 170	1	Appropriate size for number of drums stored
	Instrument and dressing cabinet	Stainless steel: W = 90	1	Rust protection

	Item	Specifications	Q'ty	Reasons for specifications and quantities
Administration	Slide projector	Portable	1	
	Video set	Multi-type, 25 inch colour monitor	1	Compatible with various types of video software; size appropriate for size of education/training room
	Conference table and chair	Locally made wooden conference chair	18	Estimated conference participants
		Locally made wooden conference tables	8	
		Folding chair	18	Extra chairs for estimated education/training group participants
	Car for doctor providing external services	4-wheel drive, 2 cabomes	1	Needed for rough local roads
	Truck	4-wheel drive, 2 ton	1	Same as above
	Typewriter	Manual	1	Easy to operate and maintain
	Copy machine	A-4 and B-4, black and white	1	Common in the country so easy to operate and maintain
	Chart file shelf	Steel: W = 90, D = 38, H = 180	6	Appropriate for number of medical records; steel so easy to arrange
Wards	Mattress for patient's bed	Vinyl covers	20	Durable; 10% more than estimated number of patients
	Suction unit	Movable, 3000 + 500 cc	1	Can be used in sections other than wards
	Instrument boiling sterilizer	Electric, movable	1	Easy to operate
	Bedpan sterilizer	Chemical sterilizing	1	Simple; plumbing installations unnecessary



FLOOR AREAS

(1) BUILDINGS TO BE REBUILT

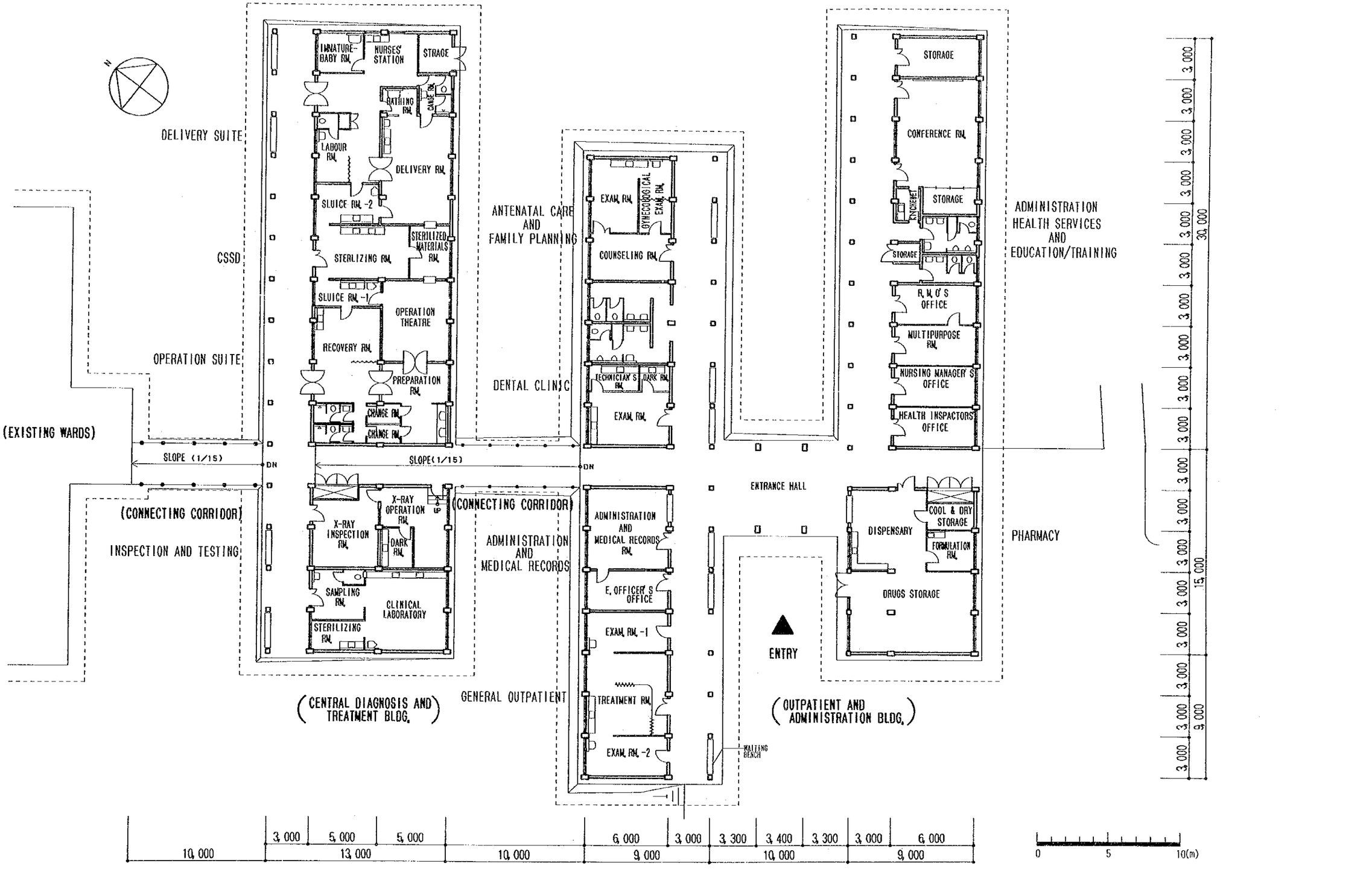
NAME OF BUILDING	FLOOR AREA
OUTPATIENT AND ADMINISTRATION BUILDING	870㎡
CENTRAL DIAGONOSIS AND TREATMENT BUILDING	585㎡
GARAGE AND GENERATOR BUILDING	144㎡
CONNECTING CORRIDORS	60㎡
TOTAL	1,659㎡

(2) BUILDINGS TO BE RENOVATED

NAME OF BUILDING	FLOOR AREA
WARDS	640㎡
DOCTORS' HOUSE	202㎡
NURSES' HOUSE	222㎡
X-RAY TECHNICIAN' S HOUSE	116㎡
PHAMACIST' S HOUSE	116㎡
DENTIST' S HOUSE	116㎡
LAB. TECHNICIAN' S HOUSE	105㎡
HEALTH INSPESTORS' HOUSE	95㎡
GUEST HOUSE	79㎡
HOUSE FOR PATIENTS' FAMILIES	115㎡
* EXISITING GENERATOR BUILDING	39㎡
TOTAL	1,845㎡

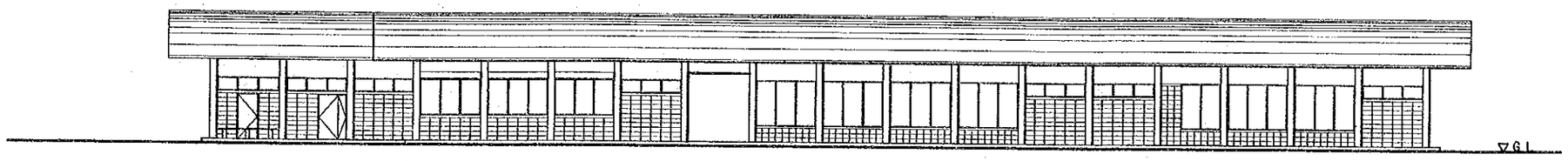
*To be converted to the incinerator building

SITE PLAN S=1:800



OUTPATIENT AND ADMINISTRATION BUILDING
CENTRAL DIAGNOSIS AND TREATMENT BUILDING PLAN

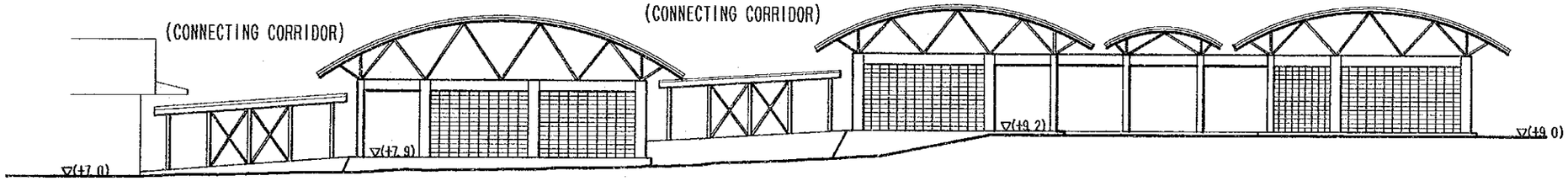
(OUTPATIENT AND ADMINISTRATION BLDG.)



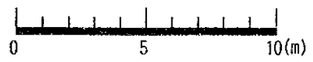
SOUTHEAST ELEVATION

(EXISTING WARDS) (CENTRAL DIAGONOSIS AND TREATMENT BLDG.) (OUTPATIENT AND ADMINISTRATION BLDG.)

(CONNECTING CORRIDOR) (CONNECTING CORRIDOR)

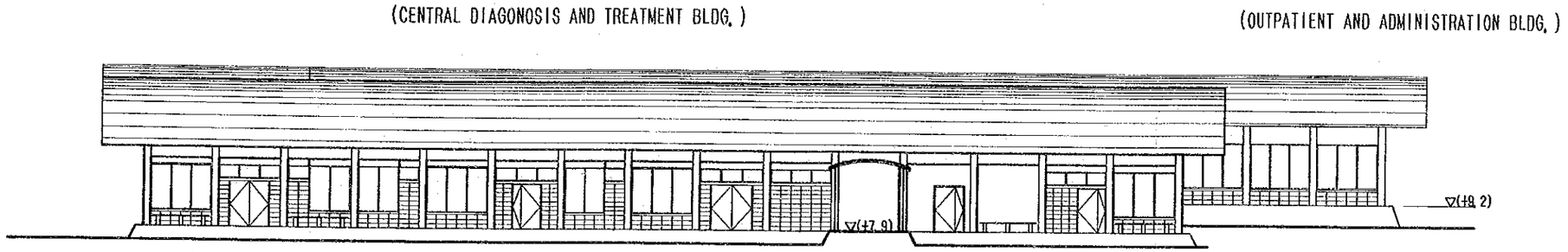


SOUTHWEST ELEVATION

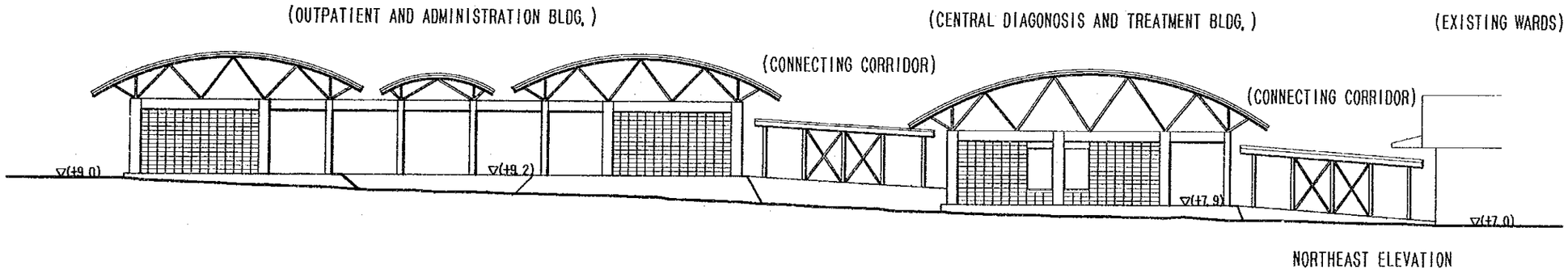


OUTPATIENT AND ADMINISTRATION BUILDING
CENTRAL DIAGONOSIS AND TREATMENT BUILDING

ELEVATIONS



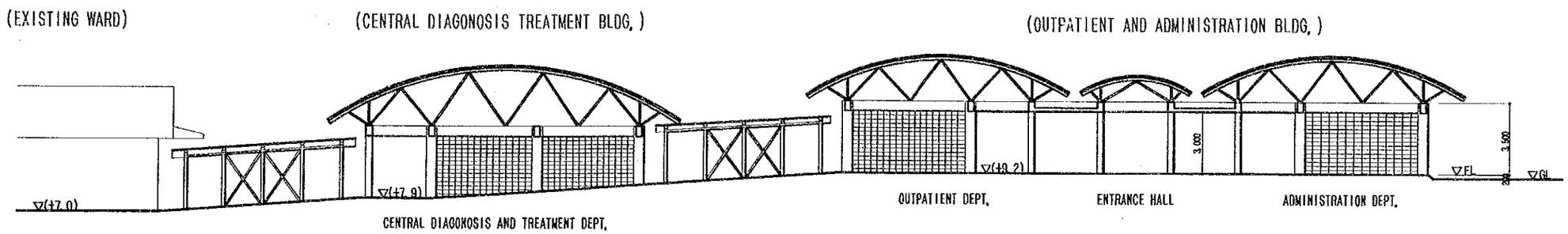
NORTHWEST ELEVATION

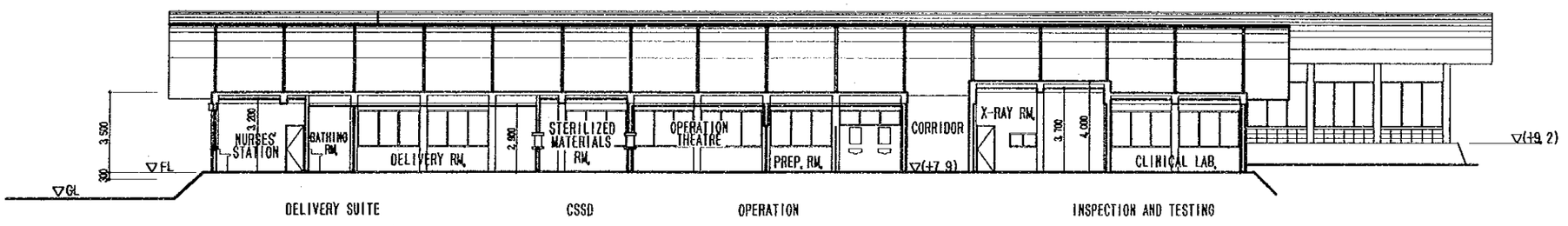


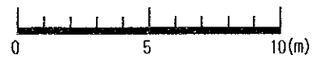
NORTHEAST ELEVATION

0 5 10(m)

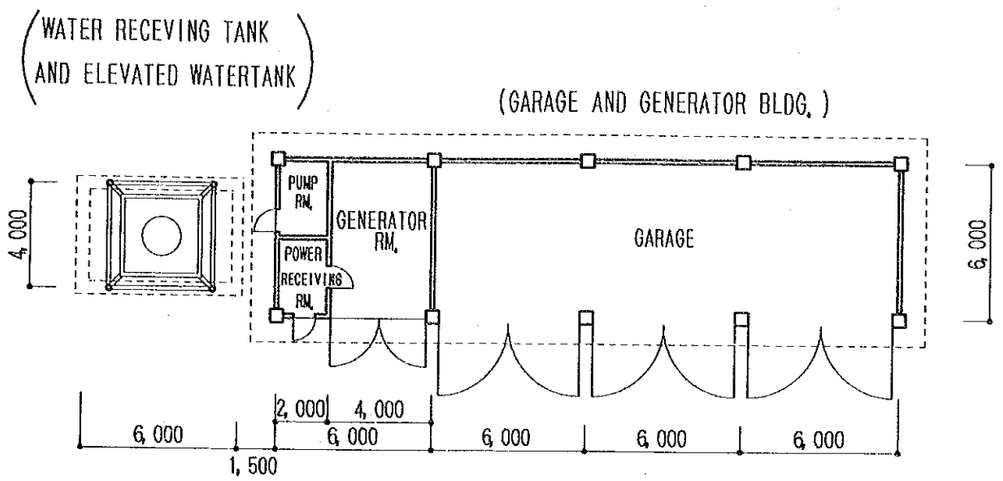
OUTPATIENT AND ADMINISTRATION BUILDING
CENTRAL DIAGONOSIS AND TREATMENT BUILDING
ELEVATIONS



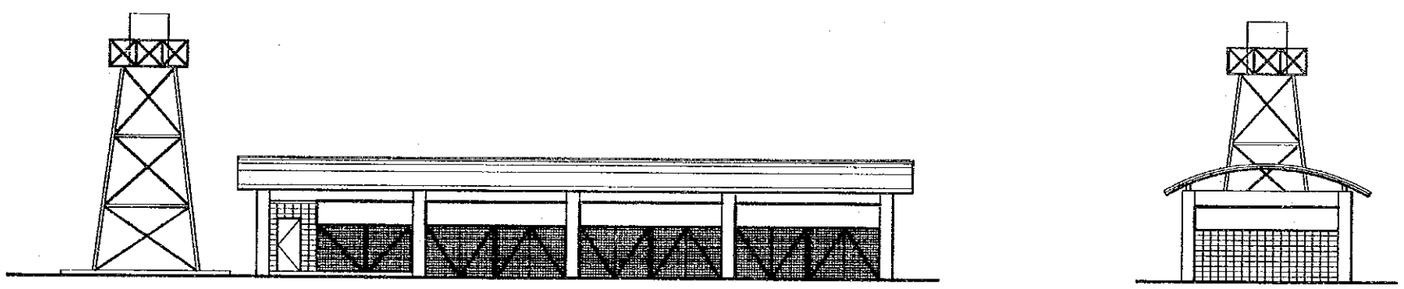




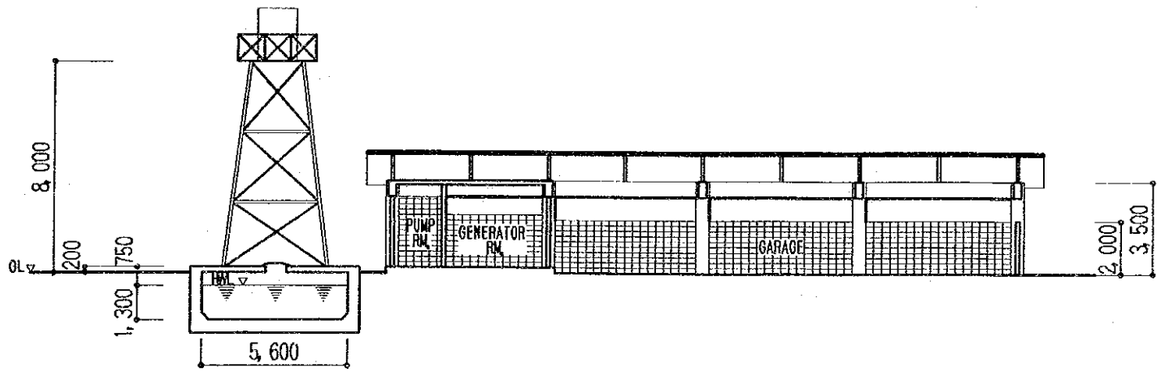
OUTPATIENT AND ADMINISTRATION BUILDING
CENTRAL DIAGONOSIS AND TREATMENT BUILDING
SECTIONS

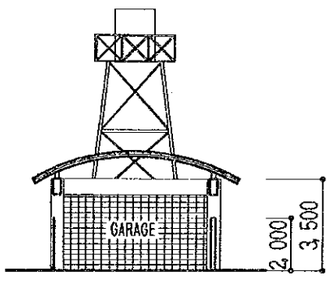


PLAN



ELEVATIONS





SECTIONS

0 5 10(m)

GARAGE AND GENERATOR BUILDING
WATER RECEIVING TANK AND ELEVATED WATER TANK

PLAN, ELEVATIONS & SECTIONS

4-4 IMPLEMENTATION PLAN

4-4-1 IMPLEMENTATION METHOD

(1) Works for the Project

The Project will be implemented after the Japanese cabinet approves it and the Exchange of Notes (hereinafter referred to as the E/N) for the Project is executed by and between both the governments of Japan and Western Samoa. The works to be done under the Project include the detailed designs, the preparation of tender documents, construction and renovation of facilities, and procurement of equipment. The works are funded by either Japan or Western Samoa, the demarcation of which is explained in Section 4-4-4.

(2) Implementing Organizations and their Respective Works

The implementing organization of the Project consists of the implementing agency, the consultant, the contractor(s) for construction work and equipment procurement, and JICA. The works of these bodies are outlined below:

1) Implementing Agency of the Project

The Department of Health of Western Samoa is the implementing agency of the Project. The department becomes one party of the contracts to be concluded for the Project. It advances the works to be done by Western Samoa in cooperation with the Department of Public Works, the Department of Lands and Environment, and other concerned bodies.

2) Consultant

After the E/N, the Department of Health immediately commissions the Japanese consultant involved in the basic design study of the Project for consulting services in accordance with the procedures of the Japanese Grant Aid Programme. The contract between the Department of Health as the Client and the Japanese consulting firm must be verified by the Government of Japan. The consulting services include the following:

a) Detailed Design Stage

1/ Detailed design of the facilities and selection of equipment based on the basic design study report

2/ Preparation of tender documents

3/ Preparation of technical documents required for the building permit application

b) Tendering Stage

1/ Cooperation with the Client in implementing pre-qualification of tenderers (P/Q announcement, evaluation of applications, and recommendation)

2/ Cooperation with the client in implementing Tenders (invitation, evaluation, and report)

3/ Assessment of contract agreement(s), and witnessing the signing of contract(s)

c) Construction and Procurement Stage

Supervision of construction work and equipment procurement (providing technical guidance to contractors, reporting to the Department of Health, handling contract problems if any arise, inspecting of work, witnessing the hand-over, etc.)

3) Contractor

Basically, the Department of Health awards the contract(s) to the lowest responsible tenderer(s) (company or group of companies) and the work is done on a contract agreement basis as one package of construction work and equipment procurement or separately. The contractor(s) execute construction work and/or equipment procurement following the contract documents and instructions given by the Consultant. When the contractor(s) hand-over the works, they are to provide instructions on the operation and maintenance of facilities and/or equipment to staff members designated by the Department of Health.

4) JICA

The Grant Aid Project Management Department of JICA and the JICA office in Western Samoa are to guide the consultant and contractor(s), so that the Project can be smoothly implemented following the procedures of the Japanese grant aid scheme. Whenever required, JICA is to discuss the expediting of the Project execution with the Government.

(3) Plans for the Temporary Transfer of the Present Hospital

The functions of Tuasivi Hospital must be transferred prior to commencement of construction. The Department of Health has a tentative

plan outlined below for the transfer of the functions. In the plan, the principal functions are to be transferred to Palauli Health Centre, which is about 20 kilometers west of Tuasivi Hospital.

1) Facilities
   a) Tuasivi Hospital's main functions as a referral hospital are to be transferred to Palauli Health Centre.
   b) The health inspectorate and the dental clinic are to be transferred to Satupaitea Health Centre, which is about 5 kilometers west of Palauli Health Centre.
   c) Day clinics are to be established at Puapua and Tuasivi for the convenience of residents of these areas.
   d) A warehouse is to be built on the police property to store existing equipment and furniture.
2) Time Schedule
   The present hospital will be transferred from the end of May to the beginning of June 1993 so that existing buildings can be demolished in July 1993.

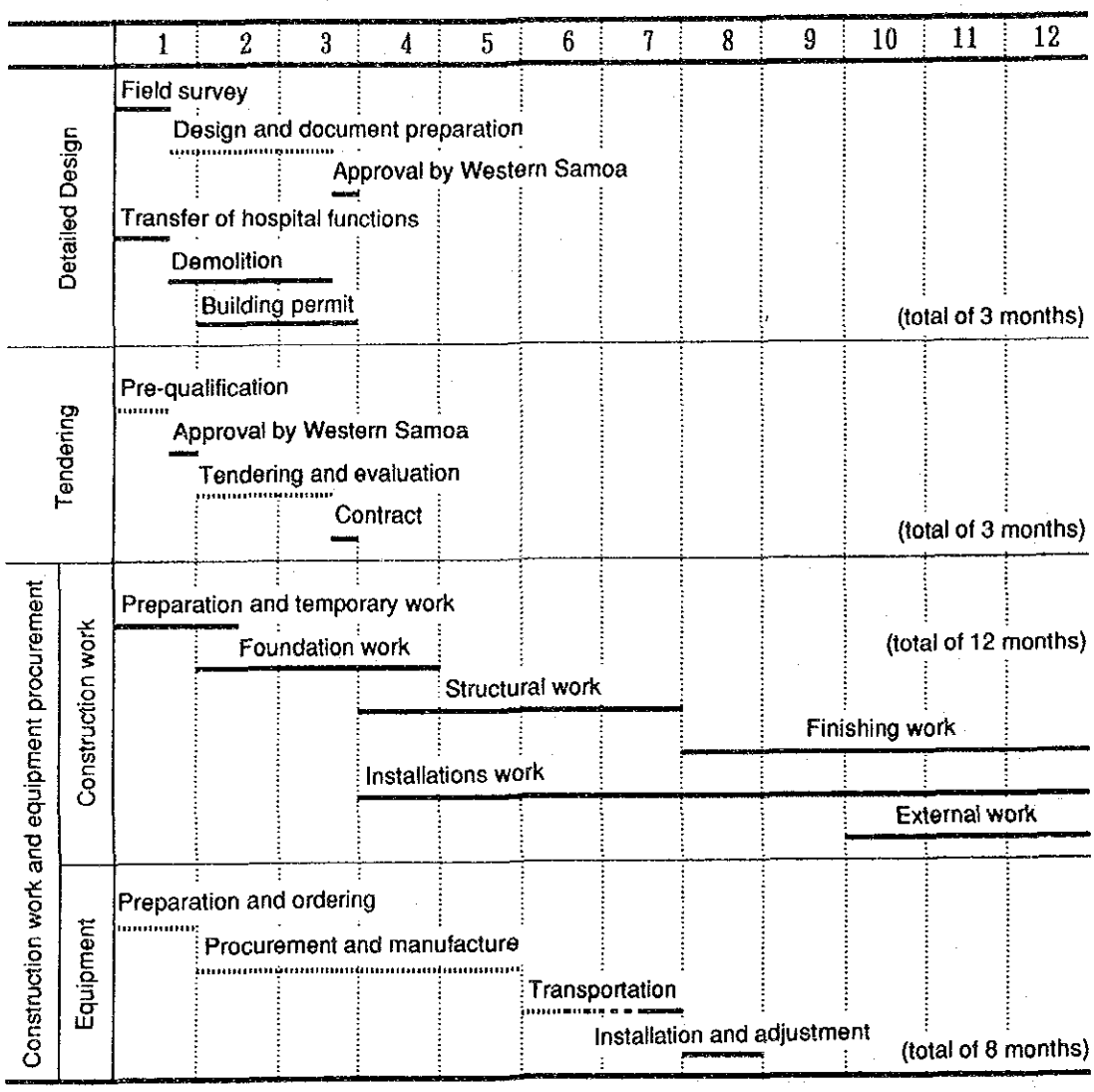
Palauli Health Centre was built in 1990 and consists of four buildings, including a ward with 20 beds, an examination and treatment building, and a nurses' house. Facilities at the health centre are smaller than those of the present Tuasivi Hospital, but they should be large enough to accommodate the principal functions. To accommodate Tuasivi Hospital's staff, however, separate arrangements must be made such as the rental of private houses. Palauli Health Centre is up a slope 300 m from the trunk road, and the road leading to the centre is very poor. As has been pointed out, this could be a problem for outpatients. Satupaitea Health Centre, however, is on the trunk road and the size of its facilities is adequate.

The above plan is tentative and can be improved. It would not be efficient to establish two separate day clinics, though it would be convenient for outpatients. The Department of Health stated that it would decide upon the transfer plan by the end of March 1993 after completing discussions with officials and community members concerned. Given this, it should not be a problem to secure facilities for the temporary transfer of Tuasivi Hospital while the new hospital is being built.

4-4-2 IMPLEMENTATION SCHEDULE

The Project implementation process is divided into three stages as shown in Table 4-6: the detailed design stage, the tendering stage, and the construction and procurement stage.

Table 4-6 Implementation Process



(1) Detailed Design Stage

The consultant carries out detailed designs of the facilities, selects equipment, and prepares tender documents which are subject to the approval of the Department of Health. In this stage, the Department of Health applies to the Department of Public Works for a building permit, transfers the functions of the present hospital, demolishes buildings to be rebuilt, and grades the site. This stage is about three months.

(2) Tendering Stage

On behalf of the Department of Health, the consultant makes a public announcement and executes the prequalifications of the tenderers. After the Department of Health approves the pre-qualification results, it invites nominated tenderers to submit tenders. The consultant then evaluates tender results for assisting the Department of Health to select the successful tenderer(s). Then, as witnessed by the consultant, the Department of Health enters into contract for construction work and equipment procurement with the successful tenderer(s). This stage is about three months, but the one month for the pre-qualification of tenderers can overlap with the Detailed Design Stage.

(3) Construction and Procurement Stage

The Construction work takes 12 months and equipment procurement takes eight months.

4-4-3 MATERIALS AND EQUIPMENT PROCUREMENT PLANS AND NOTES FOR CONSTRUCTION

(1) Policy for Procuring Materials and Equipment

1) Procurement in Western Samoa

a) Construction Materials

Construction materials produced in the country are very limited and most are imported. Among construction materials needed for the Project, gravel, sand, and concrete blocks which are all locally available are to be used. Some of lumber is to be locally procured, but all other materials are to be imported.

b) Construction Machinery

As construction machinery needed for the construction work of the Project is available in Western Samoa, they are to be leased locally.

c) Medical Equipment and Instruments

Medical equipment cannot be procured locally, but medical furniture can be. In Western Samoa, wooden furniture is made with local materials. Although furniture on the local market is not of sophisticated design, it is strong, and considering the size of

Western Samoans' bodies, it is much more appropriate than furniture made to Japanese standards. Since several furniture manufacturers in Apia have supplied the National Hospital with wooden furniture of such quality, medical furniture is to be procured locally.

There are some import agents in Apia which deal with office equipment such as copy machines for government agencies and private companies. For ease of access to after-sales-service and ease of maintenance, office equipment will be locally procured. For the same reason, some kinds of electric appliances such as refrigerators will be locally procured.

2) Procurement Overseas

a) Construction Materials and Equipment

To ensure that future repairs can be easily carried out, materials for which substitutes can be easily obtained will be selected. As most imported materials and products are from New Zealand, materials and building installations equipment which may require repairs or replacement are to be procured from New Zealand. Some basic materials such as concrete reinforcing and hard polyvinyl chloride pipe are maintenance free, so depending on competitive prices with suppliers outside Japan, Japanese products will be used for the convenience of supply and delivery period as well as the quality.

b) Medical Equipment

Clinical laboratory equipment, such as a spectrophotometer, which needs a continuous supply of reagents or other consumables and daily maintenance, should be procured in third countries from which equipment commonly used in Western Samoa is imported. Most laboratory equipment in the National Hospital is purchased from dealers in New Zealand or Australia who have close ties with Western Samoa and can provide after-sales-service. In New Zealand, there are several dealers who provide pharmaceutical drugs and medical equipment to neighbouring island countries such as Vanuatu, Tonga, and Fiji. Basically, these dealers are agents for manufacturers in other countries. Considering their good connections with South Pacific countries and their relative proximity, procurement of equipment from these third countries is to be examined.

As with clinical laboratory equipment, the X-ray unit needs daily maintenance. Three Japanese manufacturers of X-ray units have affiliates or agents in Australia, and of these, two have branches in New Zealand. Western Samoa is covered by these agents and it is possible to obtain services such as the installation of equipment, training in its operation, and after-sales-service. Therefore, Japanese X-ray units basically present no problems in the country and can be selected for the Project.

Equipment other than that mentioned above will be procured from Japan.

(2) Procurement Plans for Construction Materials and Equipment

Based on the policies described above, the following construction materials, machines, and building equipment are to be procured either in Western Samoa or from Japan. Items not listed are to be procured from New Zealand.

1) Materials and Machinery to be Procured in Western Samoa

a) Construction Materials : Concrete aggregate, concrete blocks, lumber

b) Construction machinery : Dump trucks, Excavators, Concrete mixers, Truck cranes, Generators, Compressors, etc.

2) Materials and Building Equipment to be Procured in Japan

a) Buildings Materials : Reinforcing bar, Structural steel, X-ray protection glass, Iron doors, Synthetic-resin, Water-proof materials, etc.

b) Installation Materials : Electric wire, Conduit tubes, Panels, Refrigerant tubes, VP tubes, Faucets, Valves, etc.

c) Building Equipment : Incinerator, Sanitary fixtures, FRP elevated water tank, Soil water treatment etc.

(3) Procurement Plan for Medical Equipment and Instrument

Based on the policies described above, the following items of equipment are to be procured either in Western Samoa or from a third country. Items not listed are to be procured in Japan.

1) Equipment to be Procured in Western Samoa

a) Wooden Products	: Consulting desks and chairs, Examining tables, Work tables, Conference tables and chairs
b) Office Equipment	: Copy machine, Typewriters
c) Electric Appliances	: Refrigerators, Electric heaters, Washing machines

2) Equipment to be Procured from a Third Country

a) Laboratory Equipment	: Hemoglobinometer, Spectrophotometer
b) Other Equipment	: Wheel chairs, Blood pressure gauges, Press bandages

(4) Notes for Construction

Since Japan has a single fiscal year budget system, all projects under the Grant Aid Programme must be, in principle, completed within a fiscal year. Although allocated budgets can be carried over into a second year in exceptional cases, any extension beyond this is absolutely impossible. Therefore, all the works must be executed without delay and special consideration must be given to the following:

1) Rainy Season

The rainy season in Western Samoa is from November to March, and cyclones can be expected during the season. A plan for minimizing cyclone effects to the construction progress must be established prior to the start of work.

2) Demolition of the Existing Facilities

The Department of Health must demolish the buildings to be rebuilt and grade the site before the tender call for the construction work so that tenderers can confirm the site conditions and prepare reasonable bids without consideration of risk.

3) Relocation of the Present Hospital

All hospital facilities must not be used while work is underway including the above demolition, in order to ensure that it progresses

smoothly and safely for both patients and staff. For this purpose, immediately after the E/N, the Department of Health must relocate all hospital functions at another site.

4) Building Permit

The Department of Health must obtain the building permit before concluding the contract for the construction work.

4-4-4 SCOPE OF WORK

(1) Work Responsibilities

As described in Section 4-4-1, the Government is to take the initiative in implementing the Project. However, the Project can only be implemented through the full cooperation of both Japan and Western Samoa. Each country's work responsibilities are demarcated as follows:

1) Responsibilities of Japan

a) Consulting Services

Consulting services mentioned in Section 4-4-1 (2) 2)

b) Building Construction Work

Rebuilding and renovation of buildings described in Chapters 3 and 4 of this report, including ancillary work of: electrical installations, air-conditioning installations, plumbing installations and instructions for proper operation and maintenance

c) Equipment Procurement

Procurement and installation of equipment described in Chapters 3 and 4 of this report and instructions for proper operations and maintenance

d) Infrastructure Work

Construction of on-site power supply installations including the power receiving panel in the generator room, on-site plumbing installations, the solid waste treatment facility, and instructions for proper operation and maintenance

e) Exterior Work

Construction of on-site roads and parking areas

f) Administration

Packing, transporting, and insuring the materials and equipment imported from Japan and other countries

2) Responsibilities of Western Samoa

a) Relocation of the functions of the present hospital and custody management of existing equipment to be reused (emergency generator, radiotelephones, medical equipment and supplies, etc.)

b) Site Preparation

Demolition of buildings to be rebuilt described in Chapters 3 and 4 of this report and grading of the site

c) Cooperation in Construction Work

Provision of access to the site to Japanese contractors and provision of temporary power and water (utility fees to be borne by Japan)

d) Infrastructure Work

Replacement of the transformer and power supply lines; connection of the new transformer and power lines to the power receiving panel; connection of telephone lines to the telephone panel

e) Exterior Work

Building of perimeter fences and gates; gardening

f) Administration

Obtaining of the building permit; banking arrangements; issuing of the authorization to pay; arrangement of exemptions from customs duties, surcharges, internal taxes, and other levies; other items needed for the Project that are not included in the responsibilities of Japan

(2) Burden of Western Samoa

Estimates for implementing the work responsibilities of Western Samoa are as follows:

a) Site preparation	WS$ 37,500
b) Infrastructure	WS$ 14,000
c) External work	WS$ 90,000
d) Administration (authorization to pay)	WS$ 13,000
e) Obtaining of the building permit	WS$ 9,000
Total	WS$ 163,500 (about ¥8,320,000)

It is also necessary to consider office expenses to accrue from arrangement of tax exemptions and other activities to advance the Project, the cost of relocation of hospital functions, and the cost of managing custody of equipment to be reused.

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

5-1 EFFECTS OF THE PROJECT

When Tuasivi Hospital is rebuilt and operated as specified in the basic design study, health and medical services on Savaii Island are expected to improve as follows:

Present circumstances	Measures to be taken in the Project	Effects of the Project
At present, Tuasivi Hospital, which was devastated by the two cyclones, is far from fully operational as a base hospital providing secondary medical care for residents of the island or even as a district hospital providing primary medical care for residents of the area.	To enable Tuasivi Hospital to function as the base hospital on Savaii Island providing proper secondary medical care for residents of the island and primary medical care for residents of the area, the principal diagnosis and treatment facilities of the hospital are to be rebuilt. Equipment damaged by the cyclones is to be replaced. Buildings to be rebuilt are to incorporate anti-cyclone measures to ensure that the hospital can continue to function even during a disaster. The existing wards and staff housing are to be repaired so that these buildings can continue to be used for the time being.	1) The capacity of the hospital to provide outpatient care for all residents of Savaii Island will increase to 21,000 visits per year, an increase of 75%. 2) As the referral hospital on Savaii Island, Tuasivi Hospital's capacity to provide inpatient care will increase to 6,400 admissions per year, an increase of 42%. 3) The capacity of doctors to provide care at external facilities such as district hospitals will increase to 13,000 patients. 4) X-ray inspections, which presently cannot be done, will be able to be done once again. 5) Emergency surgical operations and cesarean sections, which are virtually not done at present, will be able to be done. 6) Given the above, it is expected that residents of Savaii Island will be provided with basic medical care on the island, thus the by-pass rate to the National Hospital will greatly decrease.
To date, Tuasivi Hospital has not had proper drainage and solid waste processing systems. If present practices were to continue, it is likely that the hospital would contaminate groundwater and generate a host of infectious diseases.	To protect environment and upgrade sanitary conditions, soil water treatment facility is to be installed, the on-site drainage system is to be replaced, water supply facilities are to be upgraded, and a solid waste separation collection system is to be established in conjunction with the solid waste incinerator to be installed.	Soil water and wastewater discharged from the hospital are to be combined and treated to the level of BOD = 60 ppm. Although waste seeps directly into the ground, groundwater contamination will be reduced by this. The danger of the spread of infectious diseases will be reduced by the incineration of solid waste.

5-2 APPROPRIATENESS OF THE PROJECT FOR THE GRANT AID PROGRAMME

The objective of the Project is to restore the facilities and equipment damaged by the cyclones in order to improve health and medical services on Savaii Island and thereby satisfy basic human needs (BHN). The provision of improved health care and secondary medical care by Tuasivi Hospital will benefit all of the approximately 42,700 residents of the island. The provision of improved primary medical care will benefit the approximately 12,000 residents in the vicinity of the hospital. Given the Project's goals and the number of people who will benefit from the Project, it is judged that the Project qualifies for the Japanese Grant Aid Programme.

Tuasivi Hospital had been properly operating as the base hospital on Savaii Island for more than 30 years before the cyclones struck. X-ray inspections and surgical operations were done at the hospital. Given this, if the facilities and equipment of the hospital are upgraded to pre-cyclone levels, operation of the hospital should not present any problems. However, if the required staff including three doctors and operating funds are not secured, it will be impossible to operate the hospital appropriately and the benefits outlined above cannot be expected. The Department of Health can, however, secure required staff and the funds for operation cost by taking the following actions:

1) Securing of Staff

   Doctors, a dentist, nurses, and X-ray technicians are the primary additional staff required for the operations planned. The securing of nurses should not be a problem because nurses can be recruited from other medical facilities on Savaii Island when the health and medical system is reorganized as proposed in DP7. The securing of X-ray technicians should be possible because the National Hospital has a sufficient number of them and funds for X-ray technicians have already been allocated.

   The biggest staffing problem is the shortage of doctors. As of October 1992, there were three doctors at Tuasivi Hospital, which is the absolute minimum number of doctors required. Since funds for two doctors have already been allocated to Savaii Island, it would be possible to secure three doctors at Tuasivi Hospital.

In places such as Savaii Island where there are few doctors, doctors should be experienced and able to handle cases outside of their areas of specialization. Therefore, it is inappropriate to secure doctors who have just completed their medical training overseas, although the Department of Health is planning to do so. As doctors in the country are concentrated at the National Hospital and the ratio of patients to doctor is low, it is appropriate to transfer doctors from the National Hospital to Tuasivi Hospital. If the terms of the transfer, such as limiting the period of services to a few years, are established, it should not be too difficult to secure the additional doctors.

The dentist on Savaii Island who was providing services in October 1992 has since retired. As a result, the island is now without a resident dentist. Although the Department of Health is now providing dental services on the island through a visiting dental team a resident staff consisting of a dentist and dental nurses must be permanently stationed at Tuasivi Hospital. It is as vital as doctors to secure the required staff by the completion of the Project. The securing of another dentist should not be a problem, however, if terms similar to those for the doctors are established.

2) Securing of Funds for Operation Cost

By implementing the Project, the operation cost of Tuasivi Hospital is expected to increase by about WS$ 162,000 per year. The funding of this amount may be severe for the country, because its economy is experiencing negative growth as a result of the devastation by the cyclones. However, as the following discussion shows, it should be possible to secure needed operation funds.

a) As noted, the national budget has been well planned and the total balance has a surplus of about WS$ 3.26 million. Funds for the operation cost amount to about 4.9% of this surplus. Therefore, if the same consideration is taken for the national budget arrangement in the future, it will be possible to allocate some of the funds for the operation of Tuasivi Hospital from this surplus.

b) The additional cost of WS$ 162,000 is equivalent to 1.45% of the current expenditure of the Department of Health. Since this percentage is not extremely high, it should be possible to raise some of the funds for the operation by reducing nonurgent expenses and squeezing the current expenditures.

The Department of Health has given the Project the first priority in its district hospital development programme, which is one of the four most important issues of DP7 for the health and medical sector. "Improvement in the health delivery system" is enumerated as one of the major policies arising from a DP7 strategy to efficiently manage all of the nation's resources. To achieve this, the Department of Health is reorganizing the country's health and medical services system. This policy aims to use district medical facilities and their staff more efficiently, and thereby provide health and medical services more effectively. The Project aims to upgrade health and medical services on Savaii island by improving the hospital's facilities and equipment. Therefore, the Project will physically support this policy, and is in keeping with the policies of DP7.

5-3 CONCLUSION AND RECOMMENDATION

Given the above, it is evident that the Project will greatly contribute to improving health and medical services on Savaii Island, and that its contents and scale meet the requirements of the Japanese Grant Aid Programme. The Project is to rehabilitate the hospital's facilities and equipment to pre-cyclone levels, which is urgently required. However, it is difficult for Western Samoa to implement the Project on its own because the country's economy and finances are presently in tight situations. It is thus appropriate to implement the Project under Japan's Grant Aid Programme.

As described in Section 5-2, there are some unknown factors about the problems of securing additional staff and operation funds; if these problems are not resolved, it will be impossible to appropriately operate the hospital, thus the benefits outlined above will not be able to be brought. As the Project facilities should be properly operated, the Government is requested to make further efforts to establish a permanent system for proper operation and maintenance, which include the securing of required staff and operation funds. For this purpose it is recommended that the Government take note of the following:

(1) Securing of Staff

The Department of Health should promote the transfer of medical and dental officers from the National Hospital to Tuasivi Hospital by establishing attractive transfer terms such as limited assignment periods and favorable allowance, which may encourage them to provide services on Savaii Island.

(2) Securing of Operation Funds

The Department of Health should obtain consensus for the Project implementation in the Government including the financial authorities to secure additional funds from the surplus in the national budget. At the same time, the Department of Health should try to eliminate nonurgent expenditures as much as it can raise some of the operation funds.

APPENDIX

APPENDIX-1 ORGANIZATION OF THE BASIC DESIGN STUDY TEAM

(1)Team Members of the Basic Design Study

1)Team Leader	Dr. Ryosuke Shoda Department of International Medical Cooperation, National Medical Center, Ministry of Health and Welfare
2)Grant Aid Planner	Hiroyuki Kanzaki First Basic Design Study Division, Grant Aid Study and Design Department, JICA
3)Architectural Planner	Masao Okui K.Ito Architects and Engineers
4)Architectural Designer	Koichi Suzuki K.Ito Architects and Engineers
5)Facilities Designer	Hideo Matsuda K.Ito Architects and Engineers
6)Medical Equipment Planner	Taiji Nakatani K.Ito Architects and Engineers

(2)Team Members for Explanation of the Draft Report

1)Team Leader/ Hospital Planner	Dr. Atsko Aoyama Department of International Medical Cooperation, National Medical Center, Ministry of Health and Welfare
2)Grant Aid Planner	Koji Noguchi Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
3)Architectural Planner	Masao Okui K.Ito Architects and Engineers
4)Medical Equipment Planner	Taiji Nakatani K.Ito Architects and Engineers

APPENDIX-2 SURVEY SCHEDULE

(1)Basic Design Study (7 October - 4 November, 1992)

Day	Date		Main Activities
01	07 Oct.	Wed.	Pm. Departure of Consultant members from Narita 20:15(NZ24), Arrival at Apia 15:15(PH566) Meeting at JICA Office on survey schedule
02	08 Oct.	Thu.	Am. Courtesy call to the Department of Health(DOH) Explanation of the Inception Report Pm. Visit to the National Hospital in Apia
03	09 Oct.	Fri.	Am. General inspection of Tuasivi Hospital Pm. Question and confirmation on the present management system of Tuasivi hospital
04	10 Oct.	Sat.	Am. Investigation on the existing facilities and equipment of Tuasivi Hosoital Pm. Visit to the district hospitals in Savaii Island
05	11 Oct.	Sun.	Am. Ditto (continued) Pm. Return to Apia
06	12 Oct.	Mon.	Inner-team meeting (National holiday)
07	13 Oct.	Tue.	Meeting at DOH, question and confirmation on; -Function and status of Tuasivi Hospital -Contents and scale of services of Tuasivi Hospital
08	14 Oct.	Wed.	Am. Data collection at the Department of Public Works (DPW) Pm. Meeting at DOH, discussion on the facility plan of Tuasivi Hospital
09	15 Oct.	Thu.	Am. Data collection at DPW and Electric Power Corporation Pm. Meeting at DOH, discussion on the medical equipment plan of Tuasivi Hospital
10	16 Oct.	Fri.	Am. Data collection at the Department of Lands and Environment Investigation on the existing medical equipment of the National Hospital Pm. Meeting at DOH, discussion on; -Operation and maintenance plan of Tuasivi Hospital -Works to be borne by the Gov.of Western Samoa

Day	Date		Main Activities
11	17 Oct.	Sat.	Am. Inner-team meeting
12	18 Oct.	Sun.	Data analysis
13	19 Oct.	Mon.	Am. Investigation on the present cicumstances of building maintenance of the National Hospital
			Data collection at DOH
			Pm. Departure of government members from Narita 20:30(FJ303), Arrival at Apia 12:05(FJ252)
			Meeting at JICA Office on the results of preceding survey by consultant members
14	20 Oct.	Tue.	Government members: Visit to Tuasivi Hospital
			Consultant members: Data collection at the Department of Posts and Telecommunications
15	21 Oct.	Wed.	Am. Inner-team meeting
			Pm. Meeting at DOH, discussion on contents of the Project
16	22 Oct.	Thu.	Am. Data collection at DPW and the Fire Brigade
			Pm. Discussion on the Minutes of Discussions
17	23 Oct.	Fri.	Government members: Visit to Sataua District Hospital
			Consultant members: Market research and collection of meteorological data
18	24 Oct.	Sat.	Inner-team meeting
19	25 Oct.	Sun.	Data analysis
20	26 Oct.	Mon.	Am. Signing of the Minutes of Discussions at DOH
			Pm. Inspection of the sludge disposal site in Apia
21	27 Oct.	Tue.	Government members: Departure from Apia 07:45 for Wellington
			Consultant members: Detailed investigation on the existing buildings of Tuasivi Hospital
22	28 Oct.	Wed.	Consultant members: Ditto (continued)
23	29 Oct.	Thu.	Am. Government members: Progress reporting to the Japanese Embassy in New Zealand
			Consultant members: Ditto (continued)
			Pm. Government members: Departure from Wellington 14:25(NZ361),
			Consultant members: Return to Apia
24	30 Oct.	Fri.	Government members: Arrival at Narita 06:05 (QF021)
			Consultant members: Supplementary data collection in Apia

Day	Date		Main Activities
25	31 OCT.	Sat.	Departure from Apia 02:30
26	1 Nov.	Sun.	Arrival at Auckland 05:30
27	2 Nov.	Mon.	Progress reporting to the Japanese Embassy Market Research in Auckland
28	3 Nov.	Tue.	Market Research in Auckland (continued)
29	4 Nov.	Wed.	Departure from Auckland 11:40(NZ/JL99) Arrival at Narita 19:20(ditto)

(2)Explanation of the Draft Report (21 February - 4 March,1993)

Day	Date			Main Activities
1	21	Feb.	Sun.	Pm. Depature from Narita 19:20(NH913)
2	22	Feb.	Mon.	Pm. Arrival at Wellington 13:00(QF047) Courtesy call and report to Japanese Embassy
3	23	Feb.	Tue.	Flight from Wellington to Auckland (delay due to bad foggy weather)
4	24	Feb.	Wed.	Pm. Depature from Auckland 18:30
3	23	Feb.	Tue.	Pm. Arrival at Apia 23:50
4	24	Feb.	Wed.	Visit to Tuasivi Hospital, explanation of the draft report to acting staff menmbers Inspection of the facilities to which Tuasivi Hospital is to transfer
5	25	Feb.	Thu.	Explanation and discussion on the draft report
6	26	Feb.	Fri.	Am. Discusssion on the Minutes of Discussions Courtesy call to the Treasury Department and the Department of Foreign Affairs Pm. Signing of the Minutes of Discussions
7	27	Feb.	Sat.	Mr.Noguchi: Return to Japan Other members: Data analysis
8	28	Feb.	Sun.	Data analysis
9	1	Mar.	Mon.	Collection of supplementary data
10	2	Mar.	Tue.	Am. Departure from Apia 08:10
11	3	Mar.	Wed.	Pm. Arrival at Auckland 13:45
12	4	Mar.	Tue.	Departure from Auckland 08:00(NZ101), Arrival at Narita 18:00(JL772)

APPENDIX-3 LIST OF OFFICIALS INTERVIEWED

(In no particular order)

(1) Department of Health / National Hospital

Hon. Sala Vaimili-II	Minister of Health
Dr. Sua George Schuster	Director General of Health
Mr. Talaoalii Ielu Lokeni	Chief Executive Officer
Mr. Polataivao Tipasa Me	Chief Health Planner, Health and Information Office
Mr. Mapu Tuilagi Tili	Chief Accountant
Mr. Win Myint	Financial Advisor
Dr. Leilua Faalii Aloaina	Medical Superintendent
Dr. Vaasilifiti Faleniu Asaua	Chief of Laboratory Services
Ms. Letuu Slaven	Chief Technologist
Dr. Veni Sila	Chief Radiologist
Mr. Samuelu Kaleopa	Chief Pharmacist
Ms. Marieta Westerland	Parmacist
Mr. Pene Tomane	Maintenance Manager
Str. Pele Stowers	Director of Nursing
Dr. Tuala Misi Tuala	Chief Dental Officer
Dr. Sale T. Fau	Dental Officer
Dr. Mika Fepuleai	Regional Medical Officer Upolu
Dr. Vaiouga Levi	Chief of T.B. & Leprosy Control Public Health Division
Mr. Sauea Tua Tipi	Senior Health Inspector, Public Health Division
Mr. Kolia Filipo	Assistant, Health Education Sec. Public Health Division

(2) Savaii Island

Dr. Malaki Malaki	Regional Medical Officer Savaii
Dr. Aung Huay	Medical Doctor, UNV
Dr. Tu'u'u Faletoese	Medical Officer
Mr. Sufia Joe Taulapapa	Executive Officer
Str. Naifoua S. T. Asiata	Nurse Supervisor
Str. Mesepi Mulitalo	Nurse Consultant
Str. Malae Faamatala	Nurse in Charge
Dr. Fepuleai Filitoga	Ex-Dental Officer
Dr. Manutai Saipele II	Dental Officer
Mr. Panapa Tolua Mataafa	Pharmacist
Mr. Logo Miti Lagaaia	Laboratory Technicien
Dr. Tibby Mackinnon	Medical Doctor, Sataua Hospital

(3) Other Government Officials

Mr. Mose Sua	Secretary, Department of Foreign Affairs
Ms. Noumea Simi	Assistant Secretary, Department of Foreign Affairs
Ms. Hinari Petana	Assistant Secretary of Finance, Department of Treasury
Mr. John Fitzgerald	Financial Advisor, Department of Treasury
Ms. Lusia Sefo	Chief of Central Planning Unit, Department of Treasury
Mr. Etuale Ioane	Chief Architect, Department of Public Works
Mr. Mila Posini	Engineer, Building Section, Department of Public Works
Mr. Papalii Tupe	Superintendent, Building Sec, Department of Public Works
Mr. David Solomon	Chief Engineer, Water Section, Department of Public Works
Mr. Tim Waters	Engineer, Civil Section, Department of Public Works
Ms. Luatara Taulealo	Chief Accountant, Department of Public Works
Mr. Toluono Feti	General Manager, Electricty Public Corporation
Mr. Fiu Mataese Elisara Laulu	Director (Land Registrar), Depatment of Land and Environment
Mr. Jean Peter	Acting Superintendent of Line & Cable, Depatment of Posts and Telecommunications
Mr. Tapuana Ainiu	Deputy Chief of Fire Officers, Fire Brigade
Mr. Faatoia Malele	Assistant Superintendent, Apia Observatory
Mr. Tupae Esera	Director, Department of Education

(4) WHO

Dr. David Parkinson	Resident Representative, W.S.

(5) Embassy of Japan in New Zealand

Mr. Takeo Iguchi	Ambassodor to New Zealad
Mr. Jiro Kobayashi	Minister
Mr. Hajime Sasaki	Counsellor
Mr. Yoshikazu Takeuchi	First Secretary
Mr. Toshio Okajima	Second Secretary

(6) JICA / Japan Overseas Coopertion Volunteers(JOCV)

Mr. Shin-ichi Suzuki	Ex-Resident Representative
Mr. Kai Yanaka	Resident Representative
Ms. Hatsuko Uhara	JOCV Midwife, National Hospital
Ms. Yoshiko Masuyama	JOCV Nurse, National Hospital
Mr. Masamichi Taguchi	Sr. Volunteer Civil Engineer, Department of Public Works
Mr. Satoru Ishigaki	JOCV Civil Engineer, Department of Public Works
Mr. Susumu Kinjo	JOCV Civil Engineer, Department of Public Works
Mr. Shuji Sakai	JOCV Civil Engineer, Department of Public Works

APPENDIX-4 COPIES OF THE MINUTES OF DISCUSSIONS

(1) Minutes of Discussions at Field Survey Stage

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR
REBUILDING OF TUASIVI HOSPITAL
IN
WESTERN SAMOA

Based on the results of the Preliminary Study, the Japan International Cooperation Agency(JICA) decided to conduct a Basic Design Study on the Project for Rebuilding of Tuasivi Hospital (hereinafter referred to as "the Project").

JICA has sent to Western Samoa a study team, which is headed by Dr. Ryosuke Shoda, Department of International Cooperation, National Medical Center Hospital and is scheduled to stay in the country from October 7 to October 30,1992. The team had a series of discussions with the officials concerned of the Government of Western Samoa and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The team will proceed to further works and prepare the Basic Design Study Report.

Apia, October 26, 1992

Dr. Ryosuke SHODA
Team Leader
Basic Design Study Team
JICA

Hon. Sala Vaimili II
Minister of Health
Department of Health
Government of Western Samoa

ATTACHMENT

1. Objective

The objective of the Project is to improve health services in Savaii Island by restoring the damaged buildings and equipment of Tuasivi Hospital (hereinafter referred to as "the Hospital"), including the construction and provision of necessary facilities and equipment for the Hospital.

2. Project Site

The Project site is located at Tuasivi, Savaii, with the total area of approximately 6 acre (24,300 m²) as shown in Annex I.

3. Executing agency

Department of Health is responsible for the administration and execution of the Project.

4. Items requested by the Western Samoa Government

After discussions with the Basic Design Study team, the following items were finally requested by the Western Samoa Government

(1) Construction of the facilities for
   a) Outpatient Dept including a Dental Clinic
   b) X-ray room, Pharmacy, Operation Theater, Deliverly Suite and Laboratory
   c) Administration Block

(2) Renovation of the facilities for
   a) Inpatient Wards
   b) Staff Residences and Dormitories except the Doctor's Residence which is already rebuilt
   c) Subsidiary Buildings (kitchen and public toilet)

(3) Installation of water supply, drainage and sanitary facilities

(4) Provision of equipment related to the Project
   a) Equipment for Clinical Services
   b) Equipment for Administration
   c) Vehicles

5. Project content

The final content of the Project will be decided after further studies.

R.S

6. Japan's Grant Aid system

(1) The Western Samoa Government has understood the system of Japan's Grant Aid explained by the team.

(2) The Western Samoa Government will take necessary measures, as described in Annex II for the smooth implementation of the Project condition that the Grant Aid by the Government of Japn is extended to the Project.

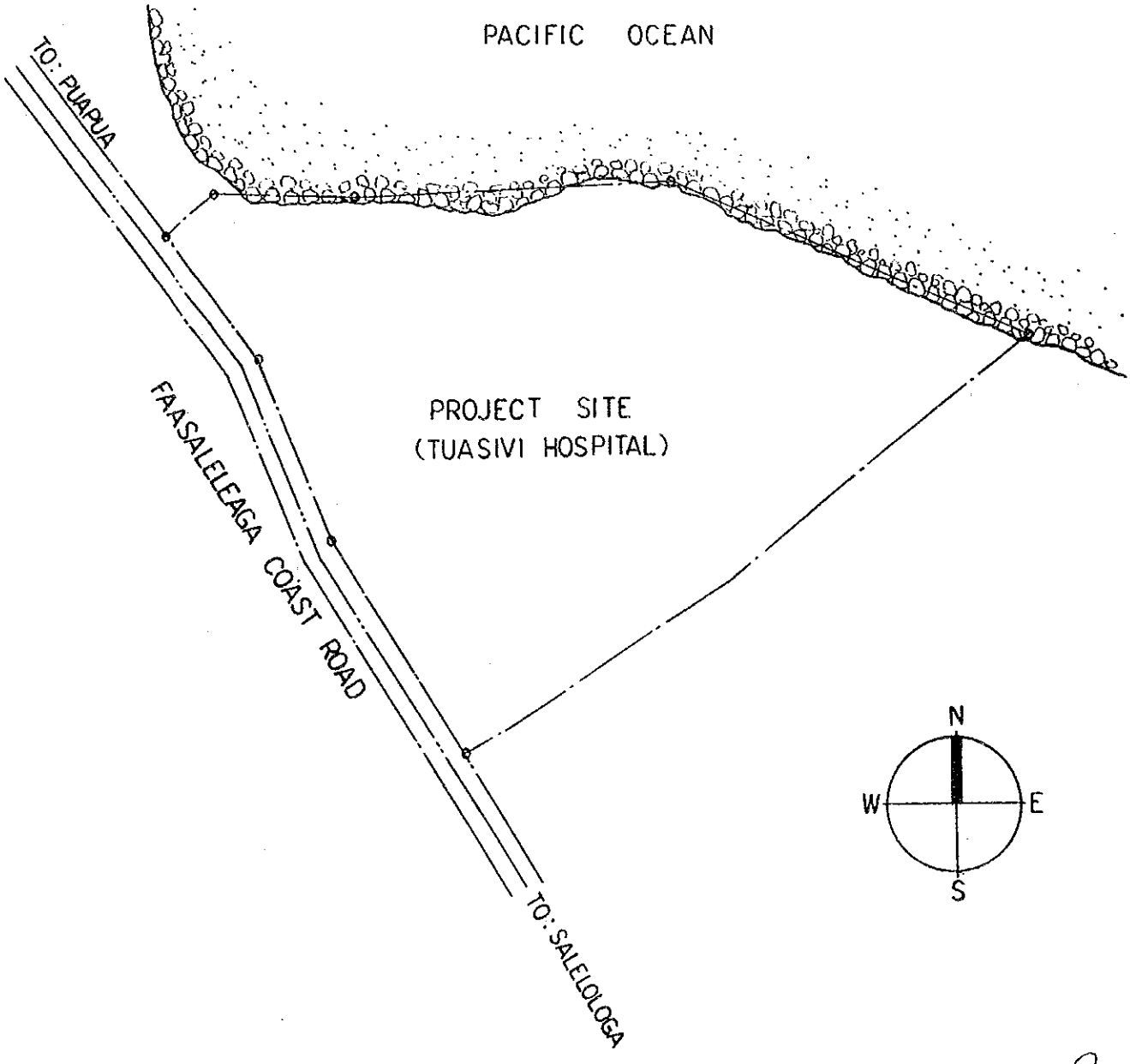
7. *Schedule of the Study*

1) The consultants will proceed to further studies in Western Samoa until October 30, 1992.

2) JICA will prepare a draft report in English and dispatch a mission in order to explain its contents around February, 1993.

R. S.

Annex I


PACIFIC OCEAN
TO: PUAPUA
PROJECT SITE
(TUASIVI HOSPITAL)
FAASALELEAGA COAST ROAD
TO: SALELOLOGA
N
W
E
S
0 10 20 50 100m
PROJECT SITE

Annex II

1. To secure the site for the Project

2. To demolish the following buildings prior to commencement of construction
   a) X-ray room, Pharmacy, Dental Clinic and Laboratory
   b) Obsterics and Gynecology Clinic, Deliverly Suite and Operation Theater
   c) Administration Office
   d) Outpatient Clinics

3. To clear, level and reclaim the site prior to commencement of the construction

4. To undertake incidental outdoor works such as gardening, fencing and gates within and around the site

5. To provide facilities for distribution of electricity, water supply, telephone, sewage and other incidental facilities to the Project site
   1) Electricity distributing line to the site including an adequate transformer
   2) Water distribution main to the site
   3) Telephone trunk line to the main distribution panel of building
   4) General furniture such as carpets, curtains, tables, chairs and others

6. To exempt taxes and to take the necessary measures for customs clearance of the materials and equipment brought for the Project at the port of disembarkation

7. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Western Samoa with respect to the supply of the products and services under the verified contracts

8. To accord Japanese Nationals, whose services may be required in connection with the supply of products and the services under the verified contracts, such facilities as may be necessary for their entry into Western Samoa and stay therein for the duration of their work

9. To use and maintain properly and effectively the facilities constructed and equipment purchased under the Grant, in relation to this;
   1) The Department of Health will maintain adequate performance and utilization data on the facilities included in the Project. And these data will be submitted by the end of each calender year to the JICA Office in Western Samoa.
   2) The Department of Health will make an inventory list on the equipment and spare parts included in the Project. And the list will be renewed in accordance with the conditions of the equipment and the consumption of the spare parts.

10. To ensure necessary budget and personnel for proper and effective operation and maintenance of facilities and equipment purchased under the Grant, in relation to this; The Department of Health will secure sufficient permanent doctors and other staff members as shown in AnnexⅢ.

11. To bear all the expenses other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and the installation of the equipment

RS

Annex III

Planned Number of Personnel by Job and Duty

	STAFF	Number of Persons	
		Full-Time	Part-Time
(1)	MEDICAL STAFF		
	Doctor General Medicine	1	
	Doctor Specialist	2	
	Dentist	1	
	Midwife	6	
	Nurse Duty in Outpatient Dept.	6	
	Duty in Ward	6	
	Practical Nurse		
	Duty in Outpatient Dept.	1	
	Duty in Ward	1	
	Dental Nurse	1	
	Dental Practical Nurse	1	
(2)	PARAMEDICAL STAFF		
	Laboratory Technician	2	
	X-Ray Technician	2	
	Dental Technician	-	1*
	Pharmacist	3	
	C.S.S.D. Staff	3	
	Others (casual)	3	
	Health inspectors	4	
(3)	NON-MEDICAL STAFF		
	Porters	2	
	Medical Records	2	
	Groundsmen	2	
	Administrative Officer	1	
	Office Worker	2	
	Building Maintenance Staff	5	
	Medical Equipment Maintenance Staff	-	1*
	Security Guard	3	
	Driver (Ambulance and Others)	5	
	Domestic workers	2	

* Part time from Apia if need.

R.S

(2) Minutes of Discussions at Draft Report Explanation Stage

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR
REBUILDING OF TUASIVI HOSPITAL
IN
WESTERN SAMOA
(CONSULTATION ON DRAFT REPORT)

In October 1992, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team on the Project for Rebuilding of Tuasivi Hospital (hereinafter referred to as "the Project") to the Western Samoa, and based on the discussions with the Western Samoa side and the results of the field survey, JICA has prepared the draft report of the study.

In order to explain and discuss the contents of the draft report, JICA has sent to Western Samoa a study team. The team is headed by Dr.Atsuko Aoyama, Department of International Cooperation, National Medical Center, and is scheduled to stay in the country from February 22 to March 2, 1993.

As a result of discussions, both sides confirmed the main items described on the attached sheets.

Apia, February 26, 1993

Atsuko Aoyama

Atsuko Aoyama, M.D., Ph.D.
Leader
Draft Report Explanation Team
JICA

Sala Vaimili II

Hon. Sala Vaimili II
Minister of Health
Department of Health
Government of Western Samoa

ATTACHMENT

1. Contents of draft report

The Government of Western Samoa has agreed and accepted in principle the contents of the Draft Report proposed by the team.

2. Japan's Grant Aid System

(1) The Government of Western Samoa has understood the system of Japanese Grant Aid explained by the team.

(2) The Government of Western Samoa will take the necessary measures, described in Annex, for smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

3. Further schedule

(1) The team will proceed to further studies in Western Samoa until March 2.

(2) The Government of Western Samoa will prepare a plan for the relocation of the existing functions of Tuasivi Hospital and submit a report on the plan to JICA Western Samoa Office by the end of March, 1993.

The report will include the following:

1) Name of facility which Tuasivi Hospital will be relocated to
2) Physical conditions of the facility above
3) Necessary procedures for government clearance
4) Budgetary arrangement
5) Tentative schedule of the relocation

(3) The team will make the final report in accordance with the confirmed items, and send it to the Government of Western Samoa by the end of April, 1993.

ANNEX

1. To secure the site for the Project, in relation to this; the Department of Health will relocate the existing hospital functions and staff residents on the site to other places prior to commencement of construction

2. To demolish the following buildings prior to commencement of construction
   1) X-ray Department, Pharmacy, Dental Clinic and Laboratory
   2) Family Planning Clinic, Deliverly Suite and Operation Theater
   3) Administration Office
   4) Outpatient Clinics

3. To clear, level and reclaim the site prior to commencement of the construction

4. To undertake incidental outdoor works such as gardening, fencing and gates within and around the site

5. To provide facilities for distribution of electricity, water supply, and telephone, and other incidental facilities to the Project site
   1) Electricity distributing line to the site including a transformer of an adequate capacity
   2) Water distribution main to the site
   3) Telephone trunk line to the main distribution panel of building

6. To exempt taxes and to take the necessary measures for customs clearance of the materials and equipment brought for the Project at the port of disembarkation

7. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Western Samoa with respect to the supply of the products and services under the verified contracts

8. To accord Japanese nationals, whose services may be required in connection with the supply of products and the services under the verified contracts, such facilities as may be necessary for their entry into Western Samoa and stay therein for the duration of their work

9. To bear all the expenses other than those to be borne by the Grant, necessary for the construction of the facilities as well as for the transportation and the installation of the equipment

10. To ensure necessary budget for proper and effective operation and maintenance of facilities and equipment purchased under the Grant

11. To ensure necessary personnel for proper and effective operation and maintenance of facilities and equipment purchased under the Grant, in relation to this; the Department of Health will secure sufficient resident doctors and other staff members.

12. To use and maintain properly and effectively the facilities constructed and equipment purchased under the Grant, in relation to this;
    1) The Department of Health will maintain data on adequate performance and utilization of the facilities provided by the Project. And these data will be submitted to the JICA Office in Western Samoa by the end of each calender year.
    2) The Department of Health will make an inventory list of the equipment and spare parts provided by the Project. And the list will be renewed in accordance with the conditions of the equipment and the consumption of the spare parts.

APPENDIX-5 EXTRACT OF HEALTH STATISTICS

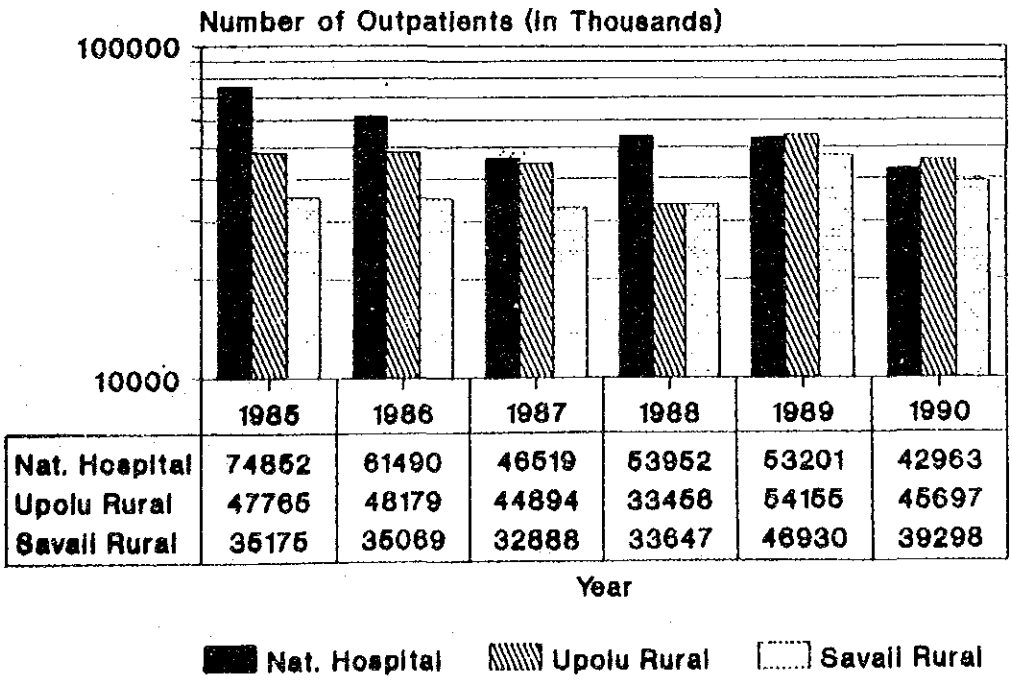
(1)Annual Report 1988-1990, Depatment of Health

1)Change in Number of Outpatient

Number of Outpatient and Percent Distribution
by Region: Western Samoa, 1981 - 1990

Year	Nat. Hospital Number	%	Upolu Rural Number	%	Savaii Number	%	Total Number	%
1981	68,607	41.0	62,900	37.6	35,719	21.4	167,226	100
1982	54,755	36.6	56,686	37.8	38,381	25.6	149,822	100
1983	51,070	36.6	51,280	36.8	37,126	26.6	139,476	100
1984	82,230	50.3	43,653	26.7	37,498	23.0	163,381	100
1985	74,582	47.4	47,765	30.3	35,175	22.3	157,522	100
1986	61,490	42.5	48,179	33.3	35,069	24.2	144,738	100
1987	46,519	37.4	44,894	36.1	32,888	26.5	124,301	100
1988	53,952	44.5	33,458	27.8	33,647	27.7	121,057	100
1989	53,201	34.5	54,155	25.1	46,930	30.4	154,286	100
1990	42,963	33.6	45,697	35.7	39,298	30.7	127,958	100

Outpatient by Region
Health Dept: 1985 - 1990

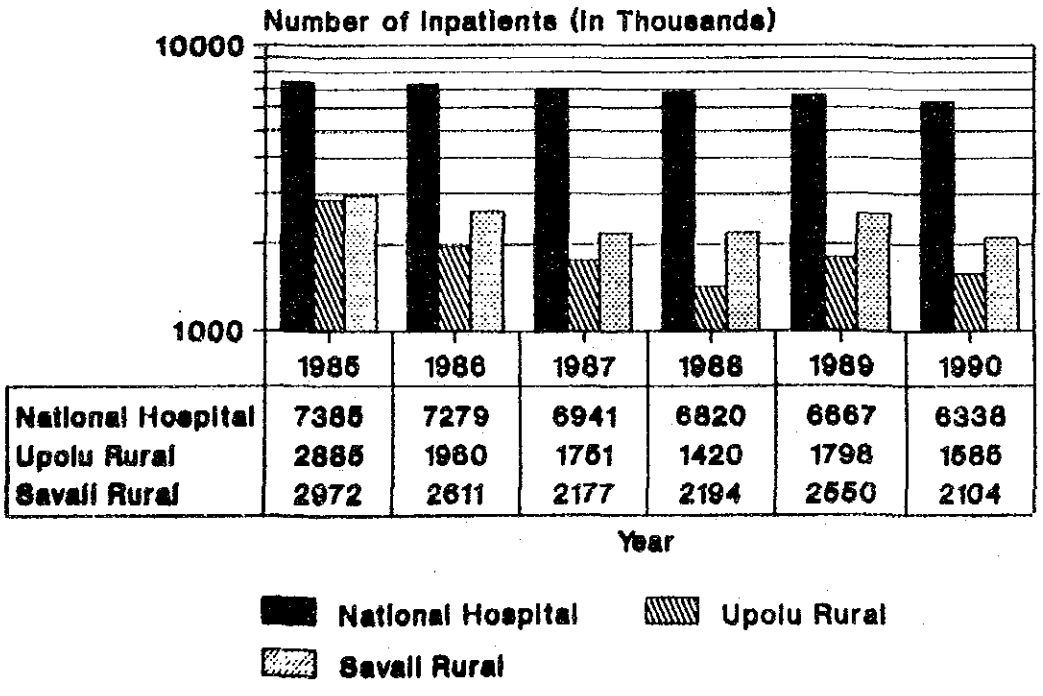


2)Change in Number of Inpatient

Number of Inpatient and Percentage Distribution by Region: Western Samoa: 1981 - 1990

Year	Nat. Hospital Number	%	Upolu Rural Number	%	Savaii Number	%	Total
1981	7352	62.2	2127	18.0	2337	19.8	11,796
1982	7366	62.6	1903	16.2	2500	21.2	11,769
1983	6798	62.8	1817	16.8	2205	20.4	10,820
1984	7062	62.5	2116	18.7	2129	18.8	11,307
1985	7385	55.8	2885	21.8	2972	22.4	13,242
1986	7279	61.4	1960	16.6	2611	22.0	11,858
1987	6941	63.9	1751	16.1	2177	20.0	10,869
1988	6820	65.4	1420	13.6	2194	21.0	10,434
1989	6667	60.5	1798	16.3	2550	23.2	11,015
1990	6338	63.2	1585	15.8	2104	21.0	10,027

Inpatient by Region, Health Dept: 1985 - 1990



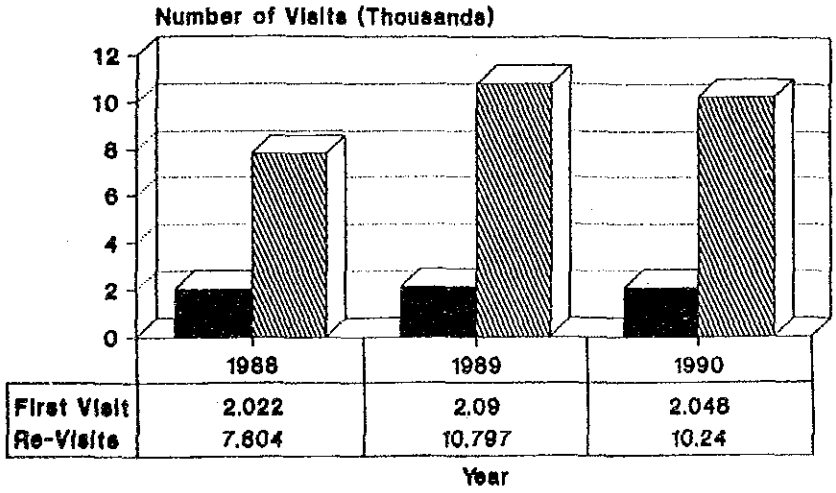
3) Users of Ante-natal Care

Antenatal Attendances by Region,
Western Samoa, 1988 to 1990.

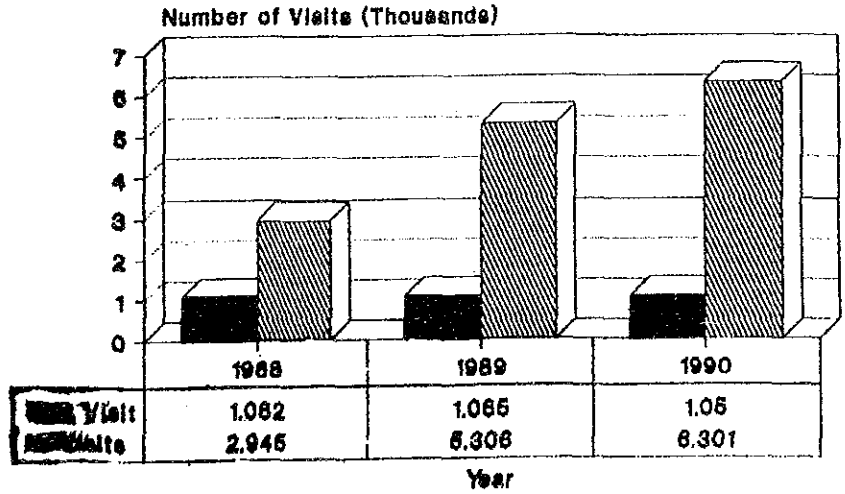
Year	Est. Target Popn.*	Apia urban Areas		Upolu rural		Savaii Island	
		First Visit	Re-Visits	First Visits	Re-Visits	First Visits	Re-Visits
1988	4,431	2,022	7,804	1,388	2,372	1,082	2,945
1989	4,446	2,090	10,797	1,250	5,827	1,065	5,306
1990	4,460	2,048	10,240	1,315	7,890	1,050	6,301

NOTE: Estimated pregnant women in a year.

Antenatal Attendances,
Apia Region: 1988 - 1990



Antenatal Attendance
Savaii Rural Region: 1988 - 1990



(2) Extracted Data form Monthly Report of Tsusivi Hospital

Number of Users, Patients, and Rate of use, in 1991

	Apr	May	Jul	Average	Use Rate	
Ante-natal Care Users Savaii		412	395	403	100 %	
Tuasivi		183	142	163	40 %	
Family Planning Users Savaii		703	745	724	100 %	
Tuasivi		105	117	111	15 %	
Delivery Total of Savaii		72	63	68	100 %	
In-Hospital		23	24	24	35 %	100 %
By TBA		49	39	44	65 %	
In Tuasivi Hospital		9	11	10		41 %
Dental Patient Tuasivi	223	183	131	179