[D. Intensive care unit (ICU)]

The size of the ICU is very limited with four beds available for the hospital whose total number of beds is about 900. In this condition, the ICU must function very effectively and efficiently.

In the existing equipment, such items as beds for seriously ill patients, respirators, pulse oximeters, defibrillators, ECG monitors, instrument cabinets, and oxygen flow meters are all in dilapidation, so they must be renewed on the Project.

As for new items which are necessary for intensive care, a blood gas analyzer, X-ray film viewers, ultrasonic nebulizers, instrument carts, syringe pumps, infusion pumps, a capnometer, and an autoclave (desktop type) are requested.

At present, while a seriously ill patient is being transported to a higher level medical facility, it sometimes happens that the condition of the patient become worse and then die inside the car. To prevent such accident, a battery driven type portable respirator will be introduced on the Project. This respirator can be used for a patient who is seriously ill from a disease of the respiratory system during transportation in an ambulance. It is necessary and appropriate to procure such a portable respirator for the improvement of this department.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
D-1	ICU bed	It is a bed which can change the posture of the seriously ill patient lying thereon. The existing four beds will be renewed.	5	4
D-2	Ventilator for ICU	It is used for monitoring the respiration of a seriously ill patient. Two units are necessary for the four beds. Therefore, two respirators are planned for the procurement, one respirator for renewal of the existing one and the other one for supplementation.	5	2
D-3	Potable ventilator	It is used for a patient who is seriously ill from a disease of the respiratory system, during transportation. For an average of two to three patients referred daily, one unit will be introduced on the Project.	1	1
D-4	Pulse oximeter	It is used to measure continuously and percutaneously the oxygen saturation rate in the blood of a patient. Two oximeters are necessary for the four beds, so the one existing unit will be renewed on the Project as one existing unit is working.	2	1
D-5	Defibrillator	It is used for defibrillation of the ventricle. It is appropriate to procure one defibrillator for renewal of the existing defibrillator.	1	1
D-6	ECG monitor	It is used for recording electrocardiogram of a patient to monitor the frequency of tachycardia, bradycardia or arrhythmia. It is appropriate to equip the four beds with two ECG monitors. One existing ECG monitor is in	5	2

		good condition, so one monitor will be procured and the other one as replacement.		
D-7	Blood gas analyzer	It is used to analyze blood gas (CO2 and O2) concentration. One unit is planned for this one room ICU with four beds.	1	1
D-8	X-ray film viewer for 2 films	It is used for viewing an X-ray film for diagnosis. One unit is planned for this one room ICU with four beds.	2	1
D-9	Ultrasonic wave nebulizer	It is a medical device to nebulize medicines for treating respiratory diseases. Two units are planned for this one room ICU with four beds.	2	2
D-10	Instrument cabinet	It is a shelf to store instruments in clean condition. It is appropriate to equip the one room ICU with two cabinets, so the existing two cabinets will be renewed on the Project.	2	2
D-11	Instrument cart	It is a cart to carry instruments, etc. for operations. It is appropriate to equip the one room ICU with two instrument carts, so two units will be introduced on the Project.	2	2
D-12	Syringe pump	It is used for administration of a medicine in minute amounts. Because this item is used frequently, four units are planned for this four bed ICU.	6	4
X	Infusion pump	It is used to control infusions. Because this item is not used at all, this item is eliminated from the procurement.	2	0
D-13	Oxygen flow meter	It is used to control the flow of oxygen gas and to humidify the gas for oxygen treatment. Because four sets are necessary for the four beds, the existing four sets will be renewed.	5	4
D-14	Capnometer	It is used to measure the carbon dioxide content in the exhaled breath of a patient in order to monitor the respiration. One unit will be procured for this four bed ICU as it is essential to monitor the respiration of an ICU patient.	1	1
D-15	Autoclave, table top	It is a small autoclave to sterilize medical instruments in a simple manner. One unit will be procured for the one room ICU with four beds.	1	1

[E. Coronary care unit (CCU)]

Because the coronary care unit (CCU) is not equipped properly, patients with circulatory disease are not treated appropriately at present. This problem should be solved by procuring items essential for this specialized care.

The existing equipment in deterioration includes such items as aspirators, sphygmomanometers, ultrasonic nebulizers, resuscitation bags, bedside monitors, defibrillators, syringe pumps, infusion pumps and beds for seriously ill patients. These items will be renewed to satisfy the

quantities necessary for providing coronary care.

It is appropriate to increase the quantities of aspirators, ultrasonic nebulizers, bedside monitors, syringe pumps, and infusion pumps to make the CCU with four beds to be sufficient and efficient for providing this specialized care.

Also, respirators, electrocardiographs and pulse oximeters are considered for the procurement. These items are basic and essential medical equipment, so it is appropriate to procure them in proper quantities.

The following items are given special descriptions.

1) Defibrillators

A total of two defibrillators will be procured, one for renewal and the other for supplementation. One unit will be placed in the CCU on the first floor, and the other in the ICCU on the second floor.

2) Loading test for electrocardiogram

This item is used for diagnosis of latent ischemic heart disease. In Japan, when a patient is load tested for electrocardiogram, a doctor must be present with a defibrillator and a resuscitator, which can be used for emergency care. Therefore, this item will be procured on the Project on condition that the hospital acquire a cardiologist.

3) Respirators

It is also appropriate that this item should be procured on condition that the hospital acquires a cardiologist.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
X	Respirometer	It is used to measure gas flow in a respirator or an anesthesia apparatus. This is a special maintenance tool and not used directly in medical care, so this item is eliminated because the necessity for such an item is low.	2	0
E-1	Ventilator for adult	It is used for monitoring the respiration of a seriously ill patient. It is appropriate to procure one unit for the four beds, so one unit will be introduced on the Project.	4	1
E-2	ECG machine	It is used for recording electrocardiogram of a patient. It is an item of medical equipment essential to any CCU. One unit will be introduced on the Project.	2	1
E-3	Suction apparatus	It is used to suck and extract body fluids and foreign substances. It is appropriate to procure four such units for the four beds, so the existing two units will be renewed, and two more will be added as	6	4

		supplements.		
E-4	Sphygmomanometer	It is used to measure the blood pressure of a patient. The existing two units in dilapidation will be renewed on the Project.	6	2
E-5	Ultrasonic wave nebulizer	It is a medical device to nebulize medicines for administration to a patient. A total of four units will be procured, one as a replacement of the existing unit and the other three as supplements.	4	4
E-6	Resuscitation bag	It is used to assist the breathing of a patient in emergency. The existing two units in deterioration will be renewed.	2	2
E-7	Bedside monitor	It is used to monitor some biological signals of a patient (electrocardiogram, heart rate, and respiration rate). Four units are planned for the four beds. Therefore, a total of four monitors will be procured, two for renewal and the other two for supplementation.	4	4
E-8	Defibrillator with monitor	It is used for defibrillation of the ventricle. It is appropriate to equip each of the CCU and ICCU with a defibrillator. Therefore, the existing one unit will be renewed, and one unit will be introduced for supplementation.	2	2
E-9	Pulse oximeter	It is used to measure continuously and percutaneously the oxygen saturation rate in the blood of a patient. It is appropriate to procure two such units for the four beds.	4	2
E-10	Syringe pump	It is used for administration of medicines in minute amounts. It is appropriate to procure three such units for the four beds considering use of frequency.	6	3
X	Infusion pump	It is used to control the rate of infusion or blood transfusion to a patient. It is eliminated from the procurement as this unit is not common in use.	4	0
E-11	Exercise ECG	It is used to examine the heart of a patient in a physical activity for diagnosing latent cardiac disorder or myocardium ischemia, accurately. One unit will be planned for the procurement on the Project as the MOH confirmed assignment of a cardiologist to the hospital.	1	1
E-12	Gatch bed	It is a bed which can change the posture of a seriously ill patient lying thereon. It is appropriate to procure four beds for the four bed CCU. The existing four beds will be renewed on the Project.	6	4

[F. Outpatient department (OPD)]

At present, the otolaryngology clinic is equipped with an audiometer, an impedance meter

and an otorhinological examination table. These audiometer, impedance meter and otorhinological examination table were made in Japan and donated by a local Rotary Club, but now, they are deteriorated into an irreparable condition. It is necessary to improve this clinic by renewing these existing items and by introducing basic items such as an electric aspirator, and an otorhinological scope. As for the ophthalmology clinic, basic items essential for medical care in ophthalmology such as ophthalmoscopes and otoscopes and an instrument set for small surgery will be procured on the Project.

Furthermore, for the dental, otolaryngology, surgery, internal medicine, pediatrics, and obstetrics and gynecology clinics, the following basic items of medical equipment are planned for the procurement: sphygmomanometers, medicine refrigerators, instrument cabinets, instrument carts, and examination lights.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
F-1	Pure Tone audiometer	It is used for diagnosis of deafness and for differentiation of conductive deafness and perceptive deafness. The existing one unit will be renewed.	1	1
F-2	Impedance audiometer	It is used for diagnosis and differentiation of conductive deafness and perceptive deafness, and for hearing tests on infants. The existing broken unit will be renewed.	1	1
F-3	Sphygmomanometer	It is used for diagnosis of blood pressure. 8 units in total will be planned: 2 units for MCH /pediatrics, 1 unit for ENT/Ophthalmology, 1 unit for medicine, 3 units for examination room and 1 unit for admission.	30	8
F-4	Set of ophthalmo and Otoscope	It is used for diagnosis of ears and eyes. 3 units in total will be planned: 1 unit for examination room/admission, 1 unit for vaccination/family planning room, and 1 unit for medical clinic.	4	3
F-5	Minor surgical instrument set	It is used for minor surgery. 1 unit will be planned for treatment room.	1	1
F-6	Medical refrigerator	It is used for storing vaccination material and drugs. 3 units in total will be planned: 1 unit for vaccination/family planning room, 1 for injection room, and 1 unit for dispensary.	5	3
X	Diagnostic sets	This item is the same as F-4, so it is eliminated.	6	0
F-7	Instrument cabinet	It is used for storing instruments to keep them clean. 6 units in total will be planned: 1 unit for treatment room, 1 unit for vaccination/family planning room, 1 unit for injection room, 1 unit for MCH/surgery, 1unit for ENT/eye, and 1 unit for dental clinic.	6	6
F-8	Instrument cart	It is used for diagnosis of blood pressure. 8 units in total will be planned: 2 units for MCH /pediatrics, 1 unit for ENT/Ophthalmology, 1 unit for medicine, 3 units for examination room and 1	6	3

		unit for admission.		
F-9	Spot lamp	It is used for diagnosis of blood pressure. 8 units in total will be planned: 2 units for MCH /pediatrics, 1 unit for ENT/Ophthalmology, 1 unit for medicine, 3 units for examination room and 1 unit for admission.	6	5
F-10	Suction apparatus for ENT	It is used to suck and extract body fluids. One unit will be procured for the otorhinology clinic.	1	1
F-11	Fiber optic ENT scope	It is a lighting tool to illuminate a narrow and deep part in a medical examination in otolaryngology. One unit will be introduced for the otorhinology clinic.	1	1
F-12	Head mirror set for ENT	It is a lighting instrument used in a medical examination in otolaryngology. This instrument reflects natural light for illumination. The existing one unit will be renewed for the otorhinology clinic.	3	1
F-13	ENT treatment unit	It is a table used for a medical examination in otorhinology. The existing one unit will be renewed to the unit for treating two patients at the same time.	3	1

[G. Ophthalmology department]

Many items of the equipment in the ophthalmology department are secondhand donations from nongovernmental organizations (NGO). For example, the operating microscope in the operating room is a donation from the Eye Fund, and the anesthesia apparatus is a donation from an ophthalmology hospital in Colombo. The two slit lamps in the outpatient clinic are also secondhand donations. These items are in dilapidation and not able to provide their original functions. It is important to renew these items of medical equipment for this department to be functional for providing medical care. Also, to improve the function of providing surgical operations, the ophthalmological echo machine, which is used for diagnosing lesions in the eye balls and the eye sockets, and the pulse oximeters used in the operating room must be renewed. In addition, sets of surgical instruments which are used frequently for cornea operations must be procured as supplements to satisfy the demand for such operations, which are increasing in number. Furthermore, because there are many patients with glaucoma or retinal optic nerve disorder in the region, it is also necessary to improve the diagnostic accuracy of the department. Therefore, one perimeter will be procured for the outpatient clinic.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
G-1	Operation microscope for Eye	It is used for close observation when a minute operation is performed. The existing one unit in dilapidation will be renewed on the Project.	1	1
G-2	Echo unit for Ophthalmology, A & B scan	It is used to diagnose cancerous disease and to find foreign bodies in the eye balls and sockets, and also to measure blood flow in the eyes.	1	1

		The existing one unit in dilapidation is planned be renewed.		
G-3	Visual field analyzer	It is used to examine the visual sense of a patient from the visual center to all the area of the retina. One unit will be introduced to improve the diagnostic function.	1	1
G-4	Slit lamp with tonometer	It is used to examine transparent bodies, external eye parts, adnexal parts and the iris, in magnification. The existing one unit will renewed, and one unit will be procured additionally.	2	2
G-5	Anesthesia with ventilator	It is used to perform general anesthesia to a patient prior to an ophthalmological operation. The existing one unit in the ophthalmology operating room is planned to be renewed.	1	1
G-6	Pulse oximeter	It is used to measure continuously and percutaneously the oxygen saturation rate in the blood of a patient. The existing one broken unit in the operating room will be renewed.	1	1
G-7	Eye surgical instrument set	It is used for eye surgeries. Two unit are supplemented to solve the shortage of instrument.	2	2

[H. Dentistry and facial orthopedic surgery]

1) Dentistry

In the dental clinic, there are three therapy booths, and a total of three dental chairs are set for providing dental care, at present. All these chairs are more than ten years old and in deterioration, so they cannot provide functions which are essential for dental therapy. Because these chairs did not have a scaling function, scalers have been added to the chairs, individually. For the dental clinic to provide dental care efficiently in improved quality, it is appropriate to renew these three dental chairs. The dental chairs to be procured should be equipped with a scaling function, so that patients will be removed of dental calculi while they are seated comfortably. In addition, as the existing beaming device is deteriorated, it is appropriate that this unit be also renewed, and another unit should be added as a supplement to satisfy the current demand for dental therapy. Also, the existing autoclave (desktop type), which is used for sterilization of dental instruments, is old and breaks down frequently. A total of two autoclaves will be procured, one for the renewal of this existing unit and the other for supplementation, to support the dental care provided with these three dental chairs.

2) Maxillo facial surgery

This department for facial orthopedic surgery has an examination room and a treatment room. Small surgeries which do not require anesthesia are performed in the treatment room. At present, the electric aspirator and the motored drill used in the treatment room are old and not so effective for the surgeries. In addition, mini-plates and microplates, which are used for facial

orthopedic surgeries, are in shortage. This condition is impeding the provision of effective treatment. To solve this problem, the motored drill should be renewed, and such plates necessary for orthopedic care should be procured for supplementation. Furthermore, a pulse oximeter to be used for monitoring the respiration of a patient during an operation is planned for the procurement.

A laser scalpel, requested, is considered effective in treating oral cancer that is prevalent in Sri Lanka. However, there is no local representative of a manufacturer who produces such an apparatus, so it would be difficult to maintain such an item technically as well as economically. Therefore, this item is eliminated from the procurement plan.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
H-1	Dental chairs with compressor	It is a set of a chair and a table used for dental therapy. In consideration of the number of booths and the demand for dental therapy, it is appropriate to renew the three dental chairs.	4	3
X	Scalers	The function of this item is included in the item listed above as H -1. Therefore, this item is eliminated.	2	0
H-2	Light cure machine	It is a light beaming apparatus used for starting the polymerization of a photocoagulant resin applied as a filling. Two units are planned, one for the renewal of the existing unit in dilapidation and the other for supplementation.	2	2
H-3	Suction unit	It is used to extract saliva and fluids of a patient during a therapy. The existing one unit in good condition is not enough. A total of two units are necessary. Therefore, the existing one irrepairable unit is planned to be renewed.	2	1
H-4	Autoclave, table top	It is used to sterilize forceps, etc., simply and easily. A total of two units are planned to be procured, one for the renewal of the existing unit in dilapidation and the other as a supplement.	2	2
H-5	Micromotor drill	It is a drill driven by a motor and used for dental therapy. The existing one unit in deterioration needs renewal.	1	1
H-6	Air motor drill	It is an air-driven high speed drill used for dental therapy. The existing one unit in deterioration will be renewed on the Project.	2	1
H-7	Mini plating kits	It is a set of instruments used for facial orthopedic surgery. One set is supplemented to solve the shortage.	2	1
H-8	Micro plating kits	The same as above. One set is supplemented to solve the shortage.	1	1
H-9	Pulse oximeter	It is used for monitoring the respiration of a patient during an operation, which is performed	1	1

		in the treatment room. One unit will be introduced for the treatment room.		
X	Laser unit for Maxillo facial surgery	It is a laser surgical knife used for operations on oral cancer. Because this item presents a maintenance problem, it is eliminated from the procurement.	1	0

[I. Radiology department]

The existing general X-ray apparatus and linear ultrasonic apparatus made in Japan were procured by the Japanese grant assistance executed in 1986, and they have been used for about 15 years. These items are now old and operable only in a limited function. Also, the existing portable type X-ray apparatus is more than ten years old. It is important to renew these items for the improvement of this department. In addition, it is necessary for the hospital to acquire a cardiologist for diagnosis of the heart by echo examination performed with an ultrasound diagnostic apparatus, which is requested for this department. On condition that the hospital acquires a cardiologist, this item will be planned for procurement.

At present, the hospital does not have an X-ray fluoroscopy apparatus, so it cannot perform barium-contrasted roentgenography. In this condition, it is difficult for doctors to grasp the condition of patients before performing surgical operations. If this diagnosis is executed properly, then surgical operations will be performed more accurately and successfully. Because an X-ray fluoroscopy apparatus is essential for diagnosis of the digestive system, it is appropriate to introduce one unit on the Project. Together with this X-ray apparatus, film markers, protection aprons, film viewers and cassettes, which are accessories to an X-ray apparatus, will be procured to improve the diagnostic function of this department.

Furthermore, for X-ray examinations to be performed by the dental department and the facial orthopedic surgery department, the existing dental X-ray apparatus will be renewed, and, additionally, a new panorama-type dental X-ray apparatus will be introduced. In this way, the diagnostic function of the dental department and the facial orthopedic surgery department will be improved on the Project.

As for the request for computers, it is considered that a computer may not be used in a beneficial manner because no computer is used at any of the other medical departments, currently. Therefore, no computer will be procured for this department. Moreover, the request for cassette-pass boxes is also turned down because the necessity of this item is not recognized from the present condition, where only one of the existing two cassette-pass boxes is being used.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
I-1	Ultrasound scanner unit	It is used for diagnosis of organs in the body cavity. The existing one unit will be renewed to improve the diagnostic accuracy.	1	1
X	Personal computer and a printer	No other medical department uses a computer for data management, so it is considered that the	1	0

		necessity for a computer is low. This item is eliminated from the procurement plan.		
X	Computer table	The same as above.	1	0
I-2	General X-ray unit	It is a general apparatus used for diagnostic imaging by X-ray. The existing one unit which has deteriorated and fallen in accuracy will be renewed on the Project.	1	1
I-3	Fluoroscopy X-ray unit	It is used for barium-contrasted X-ray imaging to acquire information necessary for performing an operation on the digestive system. One new apparatus will be introduced on the Project.	1	1
I-4	Mobile X-ray unit	It is used to X-ray a patient, for example, in a ward where a fixed X-ray apparatus is not available. The existing unit in dilapidation will be renewed.	1	1
I-5	Film mark set	It is used to mark X-ray films with serial numbers. A total of two sets will be procured to solve the current shortage of this item. One set is for the renewal of the existing one, and the other as a supplement.	3	2
I-6	X-ray film storage cabinet	It is used to store X-ray films for safekeeping. It is necessary for storing X-ray films properly, so one unit is planned for the procurement on the Project.	1	1
I-7	X-ray protective apron	It is a protective apron against exposure to X-ray radiation. Three aprons are planned for use with the C-arm X-ray apparatus and the fluoroscopy X-ray apparatus. They are to replace the existing aprons in deterioration, which may cause radiation leaks.	3	3
I-8	Aprons hanger	For the above three aprons, three hangers will be procured.	3	3
X	Cassettes pass box	The existing cassette-pass boxes are still usable, so there is no need to procure new ones. Therefore, this item is eliminated.	1	0
I-9	Panoramic X-ray unit	It is used for panoramic odontography by X-ray to examine the jaw and the face area. It is necessary for examination and treatment in facial orthopedic surgery. One unit will be introduced on the Project.	1	1
I-10	Dental X-ray unit	It is used for odontography by X-ray to examine the teeth and the periodontium in dental care. The existing unit will be renewed to solve the shortage for this item.	1	1
I-11	X-ray film illuminator for 1film	It is used to illuminate X-ray films for viewing. Two units in dilapidation will be renewed to solve the present shortage. The units procured on the Project will be installed in the control room of this department.	3	2
I-12	X-ray film illuminator	The same as above.	2	1

	for 4 films	One unit in dilapidation will be renewed to solve the shortage. The unit procured on the Project will be installed in the room assigned for radiologists.		
I-13	X-ray cassettes with screen set	It is a container for X-ray films. One existing unit in dilapidation will be renewed to solve the shortage of film cassettes.	1	1
I-14	Lead glass and lead doors	Lead glass is of X-ray shielding material for monitoring X-ray room and Lead doors are the doors for X-ray room made from X-ray shielding material. One set of such material will be planned for X-ray shielding necessary for X-ray room renovation.	0	1

[J. Laboratory]

The existing two temperature-controlled baths for bacterium culturing and one autoclave for the bacteriology room were procured by the Japanese grant assistance executed in 1986. Now, these temperature-controlled baths are unstable in keeping constant temperatures, and the autoclave has a problem of water leaks. Therefore, it is appropriate to renew these deteriorated items. Because the volume of culture preparations and of used specimen sterilization by autoclave is increasing, a total of two units will be procured, one unit for supplementation in addition to the above mentioned renewal. Bacteriological examinations are carried out in the steps of staining and culturing media and examining drug resistance, so it is appropriate to introduce a colony counter, which will assist the work, and a freezer to store culture media. In addition, medicine refrigerators for storage of homemade pharmaceutical preparations, a standard platinum wire set for bacterium smear, a glass pipette, a glassware set, water baths and PH meters will be procured as replacements and supplements to improve the function of bacteriological examination.

Although there was a request for an automatic blood analysis apparatus, this item will not be included in the procurement because it is not possible for the hospital to continually receive supplies of chemical reagents necessary for conducting analyses. Instead, it is appropriate to renew the existing microscopes which are used for manual analyses.

As a general analysis, urinalysis is performed frequently. Therefore, the experiment tables will be renewed to improve the placement of specimens for microscopy, and also the microscopes used for urine precipitation tests will be renewed on the Project.

Furthermore, an automatic embedding apparatus, a microtome and a wax bath set are requested for the pathology room. At present, the hospital does not have a pathologist, so it asks for pathological sampling to Teaching Hospital, Karapitiya or to Maharagama Cancer Center. If the hospital cannot acquire a pathologist, then it is appropriate to eliminate these items from the procurement plan.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
J-1	Colony counter for Microbiology	It is used to estimate the number of bacteria in a culture medium.	1	1

		One unit will be procured as a supplement to improve the efficiency and accuracy of examinations.		
J-2	Spectrophotometer	It is used for biological analyses which are conducted daily. One unit will be procured as a replacement for the existing colorimeter.	1	1
J-3	pH meter	It is used to prepare chemical reagents, which are used for analyses by spectrophotometer. Two units will be procured for the bacteriology room and the biochemistry room, one for the renewal of the existing unit in deterioration and the other for supplementation.	2	2
X	Auto hematology Analyzer	This item requires continual supplies of chemical reagents and difficult maintenance work, so this item is eliminated from the procurement plan.	1	0
J-4	Freezer, small	It is a freezer for storing bacterium culture media at a low temperature. One unit will be introduced to control the temperature accurately.	1	1
J-5	Medical refrigerator	It is a refrigerator for storing chemical reagents at a low temperature. Three units are planned for the three laboratory rooms, for keeping the quality of reagents.	5	3
J-6	Water distillation apparatus	It is used to produce distilled water, which is used in laboratory analyses. The existing unit in dilapidation will be renewed on the Project.	2	1
J-7	Micro-plate rotator	It is used for immunological examinations. One unit will be introduced for use in immunity examinations.	1	1
J-8	Water bath	It is used to keep a solution after an reaction at a constant temperature (i.e., a constant temperature water tank). Two unit will be procured to supplement the two existing units in good condition (one as a replacement and the other as a supplement), so that four units can be used for the four laboratory rooms.	2	2
J-9	Pippette washer	It is used for washing pipettes in a water current. One unit will be introduced to improve the efficiency and accuracy of laboratory examinations.	1	1
J-10	Vacuum pump	It is an evacuator driven by a water flow to dispose tested specimens. As it is a basic item of laboratory equipment, one unit will be introduced on the Project.	1	1
J-11	Laboratory incubator	It is used to culture bacteria, cells, tissues, etc. Two units set at 27 degrees C and 37 degrees C, respectively, will be procured as replacements for the two units in deterioration.	2	2
J-12	Laboratory table	It is used as a table on which various examinations can be performed. The existing two deteriorated tables used in the	2	2

		general examination room will be renewed on the Project.		
J-13	Glassware set	It is used for preparing various chemical reagents. This item is short, so one set will be procured to supplement the existing one set.	1	1
J-14	Autoclave for Microbiology	It is used to prepare culture media and to sterilize used media. Two units will be procured, one as a replacement for the existing unit in deterioration and the other as a supplement.	2	2
J-15	Binocular microscope	It is used for general microscopic examinations. Ten units are necessary for this laboratory (two for the bacteriology, five for the hematology, and two for the general examination). Six microscopes are in good condition, so four broken units will be renewed on the Project.	10	4
J-16	Glass pipettes set	It is used for measuring a chemical reagent by volume. One set will be procured to solve the current shortage.	1	1
J-17	Automatic micropipet set	It is used for measuring a minute amount of a chemical reagent or a specimen. One micropipette will be introduced on the Project.	1	1
J-18	Standard wire loop set for Microbiology	It is used for bacterium smear. One unit will be supplemented to the existing one unit to solve the current shortage.	1	1
J-19	Automatic tissue processor	It is used to dry and delipidate a pathological specimen and embed it in a paraffin for pathological sampling. One unit will be introduced on the Project.	1	1
J-20	Microtome and knives	It is used to make a thin slice of a pathological sample in preparation for a microscopic examination. One unit will be introduced on the Project.	1	1
J-21	Wax bath set	It is used to melt a wax in pathological sampling. One unit will be introduced on the Project.	1	1

[K. New obstetrics and gynecology department (delivery room)]

The hospital was planning to install a total of 24 beds for labor and delivery in a so-called "Labor Room", which is used for labor and delivery without any differentiation. However, the hospital has accepted a plan proposed by the Japanese party to separate this room into a labor room with nine beds and a delivery room with six beds. In consideration of the daily delivery rate, i.e., 30 births per day, and of the space available, six delivery beds will be procured as replacements for renewal, and nine labor beds will be introduced on the Project.

The existing oxygen flow meters, infant warmers, aspirators, delivery monitors, fetal doppler heart rate monitors, medicine refrigerators and neonatal aspirators are all obsolete, and this condition is hindering the medical care of this department. Therefore, these items need renewal and supplementation.

In addition, an ultrasonic nebulizer, deep freezers, suction extraction apparatus and an autoclave, which are necessary for medical care in obstetrics and gynecology, are planned to be introduced on the Project.

At present, the obstetrics and gynecology department does not have an ultrasound diagnostic apparatus. In this condition, it is difficult to diagnose abnormal pregnancy and to see the condition of embryos. To solve this problem, it is appropriate to procure an ultrasound diagnostic apparatus for use in obstetrics and gynecology, and this item can be used also in gynecological examinations.

As for the request for emergency resuscitators, this item is eliminated from the procurement plan because the same function is included in neonate treatment tables used in the pediatrics department. Redundancy should be eliminated.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
K-1	Oxygen flow meter	It is used for oxygen treatment. The existing three units in deterioration will be renewed on the Project.	6	3
K-2	Infant warmer	It is used to keep an infant warm while he is receiving a treatment. One broken unit will be renewed for use with the six beds in the delivery room.	2	1
K-3	Ultrasonic wave nebulizer	One unit will be introduced on the Project.	1	1
K-4	Suction apparatus	The existing three units will be renewed for the six delivery beds.	7	3
K-5	Delivery bed	It is a bed which is designed exclusively for child delivery. Determining from the layout of the delivery room, six beds will be placed there. The existing six beds will be renewed (this quantity should be confirmed at the time of DF).	24	6
	Labor bed	It is a bed for labor. From the layout of the labor room, it is appropriate to place nine beds. The existing nine beds will be renewed (this quantity should be confirmed at the time of DF).	0	9
K-6	Cardiotocograph (CTG)	It is used for tocography to monitor the fetal heart rate for asphyxia during a child delivery. The existing two broken units will be renewed for the nine labor beds.	4	2
K-7	Fatal Doppler unit	It is used to detect the heartbeat of an embryo and to monitor the condition of a neonate during a delivery. Two units will be procured, one unit as a replacement for renewal and the other as a supplement. These two units will be used in the labor room, and the existing unit in good condition will be placed in the obstetrics and gynecology clinic in the outpatient department.	4	2
K-8	Medical refrigerator	It is used to store medicines at a low temperature. The existing unit in dilapidation will be renewed.	4	1

K-9	Deep freezer	It is a freezer for storing placentae in a frozen condition. One unit will be introduced to the new obstetrics and gynecology department.	2	1
K-10	Ultrasound scanner unit for Obstetrics	It is used for monitoring the growth of an embryo before a child delivery. It is essential for provision of medical care in obstetrics and gynecology. One unit will be introduced on the Project (specifications should be confirmed at the time of DF).	1	1
K-11	Baby suction unit	It is used for extracting foreign materials from the mouth of a neonate. Three units will be procured as supplements for the six delivery beds.	6	3
K-12	Vacuum extractor	It is used to assist the delivery by aspiration. One unit will be introduced for the six delivery beds.	2	1
X	Autoclave, table top	This item is eliminated from the plan because the same function is included in the item listed as L-15.	2	0
K-13	Oxygen flow meter	It is used to sterilize instruments such as forceps, in a simple manner. One unit will be supplied to the new obstetrics and gynecology department.	2	1

[L. Pediatrics, premature baby unit (existing PBU)]

[M. Pediatrics, new premature baby unit (new PBU)]

For this department, equipment procurement is planned for the existing PBU and for the new PBU, which will be opened in the ward of the new obstetrics and gynecology department. It is a plan of this department that babies now referred to high level medical facilities like Karapitiya Hospitals should be treated in this hospital after the implementation of the Project. In this region, the rate of premature babies is high among the people who are working in plantations, but the hospital is unable to accommodate and care all these babies. Therefore, not only the equipment but also the capacity should be increased for accommodation of more premature babies. On this background, the hospital plans to open a new PBU, and thereby increasing the capacity to accommodate more premature babies, the two PBU are used to separate infected babies for prevention of nosocomial infection. In the plan, the existing PBU is used to accommodate babies referred from other medical facilities and those with infections, and the new PBU is used to accommodate noninfectious babies born prematurely in this hospital.

[L. Existing PBU]

The neonates in the PBU are those who have been brought from the obstetrics ward of the hospital after birth or referred from other medical facilities. Major diseases treated here are premature birth, asphyxia, blood poisoning, jaundice, etc. If the condition of a baby is urgent, requiring artificial respiration and intensive care, or special care by a cardiologist, a neurologist

or a neurosurgeon, then he or she is referred to Karapitiya Teaching Hospital. The following table lists major diseases treated in this department.

Table 2- 5 Figures for SCBU for last 4 months

Number of admissions	573
Number of Deaths	61
Deaths due to prematurity & IRDS	23
Deaths due to septicaemia	23
Asphyxia & mecornium aspiration	08
Other causes	07
Gross prematurity	20
Number of patients transferred out	30

(Source: Data from Statistic dept. of GHM)

Major items of medical equipment are examined as follows.

1) Incubator

Because there are seven incubators in good condition, it is appropriate to procure two incubators as a replacement.

The space of the new PBU allows the installation of four incubators if the space is also used for the installation of other items of medical equipment. Therefore, it is appropriate to procure four incubators for the new PBU.

2) Pediatric respirator

At present, the hospital has no pediatric respirator. In this condition, premature babies who need artificial respiration are transported by ambulance to the teaching hospital in Galle or to pediatric hospitals in Colombo. There are many cases where premature babies die during the transportation because there is no respirator available in the ambulance. By procuring pediatric respirators on the Project, the hospital expects to prevent babies' deaths of infectious respiratory diseases. Because the hospital refers an average of eight babies to Karapitiya Hospital as mentioned above, it is judged appropriate to procure one pediatric respirator.

3) Neonate treatment table, pulse oximeter, and ECG monitor

A total of three neonate treatment tables, which are to be used for treating neonates and premature babies in the delivery room, operation room and PBU, are planned for the procurement, one of them for the PBU and the other two for the new PBU. This quantity is determined in consideration of the quantity required for the condition at the peak of the demand, which information is provided by the pediatrician in charge of the department, and of the space available for the installation.

If the quantity for pulse oximeters is determined from the frequency of use, then two pulse oximeters can be used effectively in each PBU. As for syringe pumps, which are used for

administration of a powerful medicine in a minute amount in this department, four syringe pumps will be procured although six units are requested, because it seems that syringe pumps are used frequently here. Because infusion pumps are not so frequently used as syringe pumps, two infusion pumps will be enough to procure for supplementation. As for ECG monitors, three units will be procured for use with the treatment tables. Also, in consideration of the frequent occurrence of jaundice, which information is provided by the pediatrician, it is appropriate to procure three photo-therapy devices to treat the jaundice of the newborn.

The other items are determined as follows.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
L-1	Infant Incubator	It is used to provide a warm comfortable environment for caring a pronatis or a neonate. Because seven units are working in good condition, two units will be procured, one as a replacement for renewal and the other one for supplementation.	6	2
L-2	Pulse oximeter	It is used to monitor the partial pressure of the saturated oxygen in the blood of a pronatis or a neonate. In consideration of the frequency of use, four units will be procured, one as a replacement for renewal and the other for supplementation.	6	4
L-3	Syringe pump	It is used for controlling administration of a medicine in a minute amount. Because serious cases are expected to rise to an average of five per day and existing 1 unit is working, it is appropriate to renew the existing three units and to procure 1 unit for supplementation on the Project.	6	4
L-4	Infusion pump	It is used to manage an infusion. Two units will be procured as supplements.	4	2
L-5	ECG monitor	It is used to monitor the electrocardiograph, heart rate and respiration rate of a patient. Because an average of one serious case a day is occurring currently, it is appropriate to introduce one unit on the Project.	3	1
L-6	Laryngoscope for neonatal	It is used to examine the larynx of a neonate. It is appropriate to supplement a total of two units, one unit for the PBU (four doctors) and one for the obstetrics and gynecology department (for two doctors.	4	2
L-7	Laryngoscope for pediatrics	It is used to examine the larynx of a child. It is appropriate to introduce two units for examinations in the pediatrics ward.	2	2
L-8	Autoclave, table top	It is used to sterilize forceps, etc. simply and easily. One unit is necessary for providing routine medical care in the PBU.	1	1

L-9	Phototherapy unit	It is used to treat the jaundice of a neonate by ultraviolet-light irradiation. To treat an average of two or a maximum of two cases per day in photo-therapy, the existing two units in dilapidation will be renewed on the Project.	3	2
L-10	Sphygmomanometer for child	It is a portable device used for measuring the blood pressure of an infant. One unit will be sufficient to provide examinations in the pediatric ward.	1	1
L-11	Transport incubator	It is an incubator that can be set in an ambulance for transportation of a dangerously ill infant. An average of one baby is referred to Karapitiya Hospital currently. Therefore, at least one unit is necessary for transportation of a dangerously ill infant.	1	1
X	Glucometer	It is a portable device for measuring the blood glucose level of a patient. This item will be eliminated because two units which are recently donated are sufficient for present work load.	3	0
L-12	Infant ventilator	It is used for assisting the respiration when an infant is in dyspnea. At least one unit is necessary for each room to treat a dangerously ill infant (one case / day).	1	1
X	Portable Infant ventilator	Because there is no such an item available on the market, this item is eliminated from the plan.	1	0
L-13	Resuscitator table	It is used when medical care is provided to a neonate or a premature baby. Considering from the current need for pediatric care, it is appropriate to procure one unit for the PBU as a replacement.	3	1
L-14	Ambue bag for neonatal	It is used for resuscitation of a neonate in asphyxia. A total of three units will be procured, one unit for each of the PBU, the delivery room and the operating room of the obstetrics and gynecology department.	4	3
L-15	Ambue bag for pediatrics	It is used for resuscitation of an infant in asphyxia. It is appropriate to introduce two units for the pediatrics ward.	2	2

[M. New PBU of the pediatrics department]

As mentioned previously, the new PBU is an expansion to accommodate babies who are in need of medical care. Currently, an increase in the number of babies in need of pediatric care is caused mainly by a population increase in the area where rubber and tea plantations are located. An additional increase is expected from the fact that babies who are now referred to Karapitiya Teaching Hospital in Galle will be treated in this hospital after the implementation of the Project. A 20% increase is expected in the number of patients.

The quantities of the items to be procured are determined for use with the above mentioned

four incubators. Thus, two treatment tables, two pulse oximeters, two medicine carts and two electric aspirators will be procured as a set. Additionally, one respirator and one ECG monitor are planned for treating seriously ill babies in emergency. In addition, one glucose meter will be procured to monitor the blood glucose level of such babies. The following item is eliminated as a result of the determination.

1) Apnea monitor

This item warns of the inactivity of a neonate if he does not move for a predetermined period. Here, nurses are available all the time, observing and caring the babies, so this items is not necessary.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
M-1	Infant incubator	It is used to provide a warm comfortable environment for caring a pronatis or a neonate. Although six incubators are requested, it is appropriate to introduce four units because of the limited space available for the new PBU.	4	4
X	Baby cot	It is used for a newborn baby in the ward of the obstetrics and gynecology department. Because the existing units are sufficient for present use, this item will be eliminated.	6	0
M-2	Phototherapy unit	It is used to treat the jaundice of a neonate by ultraviolet-light irradiation. It is appropriate to procure two units for the four incubators used in the one room PBU.	2	2
M-3	Resuscitator table	It is used when medical care is provided to a newborn baby or a premature baby. It is appropriate to procure a total of two units, one for the operating room of the obstetrics and gynecology department and the other for the delivery room. Therefore, two tables are introduced on the Project.	2	2
M-4	Baby suction unit	It is used for extracting foreign materials from the mouth of a neonate. Two units will be introduced to the one room PBU.	2	2
M-5	Infant ventilator	It is used for assisting the respiration when an infant is in dyspnea. At least one unit is necessary for the one room PBU to treat a dangerously ill infant (one case / day).	1	1
M-6	Pulse oximeter	It is used to monitor the partial pressure of the saturated oxygen in the blood of a pronatis or a neonate. In consideration of the frequency of use, two units will be introduced on the Project.	2	2
M-7	Syringe pump	It is used for controlling administration of a strong medicine in a minute amount. For an average of two serious cases per day, it is	4	2

		appropriate to procure two units on the Project.		
X	Infusion pump	It is used to control an infusion at a constant rate. Because this item is not so frequently used here, it will be eliminated from the procurement.	2	0
M-8	Glucometer	It is a portable device for measuring the blood glucose level of a patient. It is appropriate to introduce one glucometer to this PBU.	1	1
X	Apnea monitor	It warns of the asphyxia of a neonate. This item is not necessary because nurses are present and monitoring the babies all the time.	4	0
M-9	ECG monitor	It is used to monitor some biological signals of a patient (electrocardiogram, heart rate and respiration rate). Because an average of one serious case per day is expected, it is appropriate to introduce one unit on the Project.	1	1
M-10	Treatment & Drug carrying trolley	It is a cart used for carrying medicines for treatment. It is appropriate to introduce one unit for the new PBU room.	2	1

[N. Wards]

As the existing equipment of the wards is deteriorated, a lack or a shortage of medical equipment has become a severe impediment for provision of medical care in the wards. To solve this problem, it is necessary to renew and improve the basic items of medical equipment. For this purpose, the quantities of the items to be procured are appropriately limited to the present quantities of the existing items. In this respect, syringe pumps, infusion pumps, X-ray film viewers, etc. requested for the wards are eliminated from the procurement plan because such medical examinations and treatments as requiring these items are not performed in the wards currently.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
N-1	Suction apparatus	It is used to suck and extract body fluids and foreign substances from a patient. Six units will be renewed on the Project.	8	6
N-2	Sphygmomanometer	It is used for measuring the blood pressure of a patient. Four units will be renewed on the Project.	16	4
N-3	Ultrasonic wave Nebulizer	It is a therapy device used for nebulizing a medicine to let a patient inhale it. Three units will be renewed.	12	3
N-4	Ambue bag	It is used to assist the breathing of a patient in emergency. Four units will be renewed.	12	4
X	Syringe pump	It is used to control administration of a medicine in a minute amount. This item is eliminated from the procurement plan because necessity is low.	8	0

X	Infusion pump	It is used to control an infusion. This item is eliminated from the plan because necessity is low.	8	0
N-5	Medical Refrigerator	It is used for storing medicines in refrigeration. Five units will be renewed on the Project.	10	5
N-6	Stretcher trolley	It is a cart used for transporting a patient to an operating room, etc. Ten units will be renewed.	50	10
N-7	X-ray film illuminator for 1 film	It is used to illuminate X-ray films for viewing. Six units (3 units X 2 new Ob & Gy wards) will be planned for the procurement.	10	6

[O. Sterilization department]

The sterilization department does not have sterilizers in a sufficient quantity, so it cannot handle all the sterilization need at present. In this condition, because the equipment is in full operation, it is being worn and torn rapidly. All the three sterilizers installed there are of a large size, and only one unit is operating in good condition currently. Another one is broken, and the other one in dilapidation is being removed. At least these two large sterilizers in deterioration must be replaced anew to satisfy the current sterilization need. In addition, a middle size sterilizer should be introduced as a supplement to meet the new demand of sterilization that is expected in relation to the opening of the operating room of the new obstetrics and gynecology department. If the quantities of sterilizers are estimated for the expected, increased sterilization work, then clearly more are needed. However, the space is limited, so it is not possible to install sterilizers in a larger quantity. To improve the sterilization department further to satisfy the future need which is expected to rise, it would be better that the hospital expand the building for this department and then procure necessary equipment (refer to a material attached to the end of this report, for an estimation in which the number of sterilizers necessary is calculated).

There are four boiling type sterilization devices, which are used for sterilization of instruments. Two of them were procured by the Japanese grant assistance executed in 1986, and the other two are also more than 10 years old. According to the surgeon in charge, two of the boiling sterilization devices in dilapidation must be renewed to meet the great need for sterilization of instruments. Furthermore, it is considered appropriate that additional two such sterilization devices be supplied to the operating room of the new obstetrics and gynecology department.

Surgical instruments are washed in a one-tank sink made of a stone at present. This condition is not sanitary for washing the instruments contaminated with blood, etc. Therefore, it will be replaced appropriately with a two-tank sink made of a stainless steel to improve the working environment.

In connection with the procurement of the above mentioned large size and middle size sterilizers, a set of dressing containers will be procured as supplements to deal with an increased number of instruments, etc. which are sterilized here. In addition, to improve the efficiency of sterilization work, a cart will be introduced to carry these containers.

Furthermore, the existing wooden cabinets used for storing the containers are in

deterioration, and it is difficult to keep them in a clean, sanitary condition. Therefore, existing two cabinets in the sterilization department will be renewed, and one additional cabinet will be supplied also for the operating room of the new obstetrics and gynecology department.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
O-1	Autoclave, large size	It is used to sterilize instruments and materials for surgical operations. Sterilization is effected by steam under a high pressure and at a high temperature. Two units will be renewed.	3	2
O-2	Autoclave, medium size	The application of this item is the same as above. One unit will be procured as a supplement to meet the sterilization need of the new obstetrics and gynecology department.	3	1
O-3	Instrument sterilizer, floor type	It is used for sterilizing instruments and materials by boiling. A total of two units will be procured, one unit as a replacement and the other as a supplement.	2	2
O-4	Instrument sterilizer, table top	The application of this item is the same as above. A total of four units will be procured, there units for renewal of the existing units and the remaining one unit as a supplement. Two units are for operating rooms A and B, and the other two are for the operating room of the obstetrics and gynecology department.	4	4
O-5	Stainless sink unit for CSSD	It is a sink used for washing instruments. One unit will be procured to replace one existing sink (the place for installation should be confirmed at the time of DF).	1	1
O-6	Storage cabinet for dressing container	It is a cabinet with shelves, and containers which contain sterilized materials are stored on the shelves in the cabinet. Three units are planned for the procurement to meet the increased amount of sterilization work. Two units in operating rooms A and B will be renewed, and one unit will be introduced to the operating room of the obstetrics and gynecology department.	4	3
O-7	Cart for dressing Container	It is used for carrying containers of dressings. One unit will be introduced to the operating room of the obstetrics and gynecology department.	1	1
O-8	Dressing container set	It is a set of various sterilization containers for dressings. One unit will be introduced to the operating room of the obstetrics and gynecology department.	2	1

[P. Health education department]

1) Video camera

It will be used to record courses of hygienic education and training for the purpose of producing teaching materials. For this reason, it is judged appropriate to introduce one video camera.

2) Video cassette recorder and monitor set

It is considered appropriate to procure two sets of video cassette recorders and monitors. One set is installed in the lecture hall and used to show video teaching materials for training, and the other set is installed in the waiting room of the outpatient department to show a hygienic education video or other educational videos to local people.

3) Overhead projector, slide projector and white board

These devices are planned to be procured and to be used for training and lecturing in the lecture hall.

4) Mannequins for cardiopulmonary resuscitation training

An adult mannequin and a neonate mannequin are planned to be procured as materials used in the training of cardiopulmonary resuscitation to the staff of the hospital including the nurses.

5) Desktop computer set

It is determined appropriate to procure one desktop computer set for the purpose of preparing teaching materials in text and OHP films.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
P-1	Video camera	It is used to record courses of hygienic education or training sessions for the purpose of making teaching materials. One unit will be introduced on the Project.	1	1
	Video deck and TV monitor	It is used to play videocassettes of teaching materials for educational purpose. Two sets are planned to be introduced to two places in the hospital.	1	2
P-2	Overhead projector	It is used effectively to project tables and diagrams in lectures. One unit is planned for the lecture hall.	1	1
P-3	Slide projector and screen	It is used effectively to show slides in lectures. One unit is planned for the lecture hall.	1	1
P-4	CPR training manikin set, adult	It is used in the training of nurses in cardiopulmonary resuscitation. One adult mannequin is planned for the procurement to improve the effectiveness of the training.	1	1
	CPR training manikin set, infant	It is used in the training of nurses in cardiopulmonary resuscitation. One neonate mannequin will be introduced on the Project.	1	1
P-5	White writing board Set	It is used in trainings or lectures held in the lecture hall. One unit will be procured to supplement the existing one small white board used in lectures.	1	1

		It is expected to improve the way how lectures are presented.		
P-6	Desk top computer set	It is used to prepare teaching materials in text or OHP films for training courses. One set, which number is considered sufficient, is planned to be introduced on the Project.	1	1

[Q. Maintenance department]

At present, two assistant engineers are assigned to the maintenance department. They have received technical training for a period of three months at the BES of the MOH, so they can repair relatively simple items, for example, aspirators. However, they cannot handle difficult repair work, so technically complicated items are referred to the BES in Colombo for repair. There is a plan that two medical engineers be dispatched from the BES to the hospital after the implementation of the Project to strengthen the function of the workshop for equipment maintenance. Therefore, on this Project, it is appropriate to procure testers, wrenches, drivers, etc. necessary for checking and repairing mechanical and electrical equipment.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
Q-1	Electric maintenance equipment	It is necessary for checking and repairing electrical equipment. A set of maintenance instruments will be procured to renew existing items in deterioration, such as an oscilloscope and a tester.	1	1
Q-2	Mechanic maintenance Equipment	It is necessary for checking and repairing mechanical quipment. A set of maintenance tools will be procured to renew existing items in deterioration, such as an electric drill and a grinder.	1	1
Q-3	Tool set	It is a set of tools such as screw drivers. One set will be procured to renew and supplement the existing tools.	1	1

[R. Other items]

1) Laundry

According to the manual of the MOH directed to the teaching hospitals, provincial hospitals (i.e., general hospitals) and base hospitals, it has been common for hospitals to assign linen services to outside private companies. However, Karapitiya Teaching Hospital in Galle and other general hospitals have established or are being building their own laundry rooms to avoid fears of linens being not in an expected level of sanitary condition. For example, there are reported cases of an outside laundryman drying linens on the floor, or of environmental pollution from laundry sewage coming out of linen washing. To avoid such negative effects and from an economical reason, GHM also plans to establish its own laundry room. Because GHM is currently using an outside laundry service, to start its own laundry system, the hospital needs large washers and driers designed for business-use. However, there is no space to install such large size washers and driers in the existing buildings, so the hospital has a plan to build a ward

for this new laundry next to the ambulance garage. In this condition, the procurement plan for washers and driers is stopped. This procurement consideration will be started after a report is received from the Sri Lankan party in November, concerning a schedule and funds for the construction of this new laundry building. As for the economical effect from and the maintenance cost for these laundry machines are estimated as described in materials attached to this report.

2) Disposal of medical wastes

At present, such medical wastes as syringe needles and intravenous injection needles, which may cause secondary infection, are burnt and buried in the ground in the sewage treatment lot. To improve the burning process, a small incinerator for medical wastes is suggested for the procurement on condition that the hospital excludes plastic wastes not to be burnt in the incinerator. This separation and exclusion of plastic materials are important to prevent generation of harmful substances like dioxin and destruction of the incinerator by high temperatures developed from burning plastics.

3) Ambulance

At present, the hospital has five ambulances. One of them is not usable, but the other four vehicles are in good condition. Two of them are made in Japan and given to the hospital secondhand by the local Rotary Club. These secondhand ambulances are very old. However, the request for ambulances is turned down and eliminated from the procurement plan. The reason is that the existing ambulances are used not only for patient transportation but also for transportation of supplies, etc., so new ambulances, if procured on the Project, may be used in the same manner, which is wasteful and not right.

4) Mortuary

There are three corpse refrigerators in the mortuary. They were procured by the Japanese grant assistance executed in 1986. These refrigerators are broken and deteriorated. In this condition, an average of 80 cases of autopsy are performed each month. To improve the condition, it is judged appropriate to renew these three refrigerators.

5) Autopsy equipment

The existing autopsy table is made of a stone and not functional without any faucet to supply water, which is necessary for washing blood and body fluids. Therefore, an autopsy table made of a stainless steel and having water faucets is procured to replace this stone table. Furthermore, a set of autopsy instruments is planned to solve the shortage of dissection instruments.

No	Equipment	Use, necessity and quantity	Q/R	Q/P
R-1	Washing machine	It is used to wash and spin-dry linens, etc.	4	3

		Three units will be introduced in consideration of the amount of linens laundered by an outside laundryman currently.		
R-2	Drying machine	It is used to further dry spin-dried linens. Two units will be introduced in correspondence with the capacity of the above mentioned washers.	2	2
R-3	Incinerator for medical Waste	It is used to burn and sterilize medical wastes at about 800 degrees C. One unit will be introduced to process the current amount of medical wastes.	1	1
X	Ambulance	It is a vehicle used for transporting a patient to a high level hospital. The existing four ambulances are judged enough to handle the present need, so this item is eliminated from the plan.	1	0
R-4	Mortuary cooler for 2 Bodys	It is used to store a corpse in a refrigerated condition. The existing three units will be renewed to satisfy the present need for autopsy because an average of 80 cases of autopsy are performed every month.	3	3
R-5	Autopsy table	It is a table used for performing an autopsy. The existing stone autopsy table is deteriorated and not functional. Therefore, this table will be renewed on the Project.	1	1
R-6	Autopsy instruments Set	It is a set of instruments used in autopsy. In consideration of the number of autopsies performed currently, one set is planned as a supplement to the existing instrument set.	1	1
R-7	Ironing machine	It is used to iron operating gowns after washed and dried. Two units will be planned for procurement considering quantity to iron.	0	2

On the basis of the results of this determination, major items of the equipment requested are outlined as described in Table 2-6, and the results of the determination are summarized as described in "6. Basic Design Equipment List" at the end of this report.

Table 2-6 Major equipment (Equipment of more than Yen one million)

No.	Equipment name	Major specifications and composition	Justification of purpose and level of
A-1	Bedside monitor	Measuring parameter:ECG, Temp. Display : 6 inches or more Number of traces : 2 or more recorder unit and cart included. Sweep speed 25 and 50 mm/sec. Respiration rate counting range:40-235bpm inclusive of temperature probe for adults, and ECG	Monitoring vital signals of patients such as ECG and Temperatures continuously.
B-1	Cystoscope set	telescope: 0° . 25 or 30° . 70° outer diameter: 4 mm Working length: 230~305mm Halogen light source unit	To observe, diagnose and treat urethra and bladder and also use for examination such as pyelography, biopsy of bladder, get rid of foreign material in bladder and a small bladder stone.
B-4	Operationg microscope for ENT	Mobile type Assistance observation tube: 12.5 Total magnification: x 3.4-21. with Halogen lamp Length of arm extended: 920 mm or wider	To make micro-operations for ENT patients which is impossible to conduct under naked eyes.
B-6	Surgical scrub station unit	Pump, UV lamp and filter: Provided Flow rate: 5L/min (one for each faucet) material of main unit: Stainless steel	To be installed at anterior room of operation theater and to supply water UV-sterilized for washing hands of operators before operations.
B-7	Electric surgical unit	Electrodes and safety device provided. Function: Cutting, Coagulation and Bipolar Output: Cutting: 300w Coagulation: 65w Bipolar: 50w	To make cutting and coagulation by electrification of high-frequency current from cautery knife to electrodetip, human body, plate electrode for surgical operations conducted in operation theater.
B-12 B'-5	ECG Monitor	Measuring parameter: ECG, Respiration display: 6 inch or more Number of trace: 2 or more Trandgraph: 1, 2, 8 and 24 hours Heart rate counting range: 12-300bpm Respiration rate counting range: 2-150bpm	To monitor patients under operation by monitoring vital signs such as ECG and respiration.
C-1	Gastrointestinal fiberscope set	Biopsy forceps, brush, coagulation electrode provided. Mouthpiece and brush with a case provided. Field of view: 100° - 120° Range of distal end bending: UP:210° ,DOWN:90° , RIGHT:100° , LEFT:100° Length: Scope section: 1000mm Total length: 1350mm Outer diameter: 9mm	To use for description, biopsy, and treatment of gastro-lesion.
C-2	Colono fiberscope set	Biopsy forceps, brush, coagulation electrode provided. Mouthpiece with a case provided. Field of view: 120° Range of distal end bending: UP:180° .DOWN:180° , RIGHT:160° , LEFT:160° Length: Scope section: 1350mm Total length: 1600mm Outer diameter: 13mm or less	To use for description, biopsy, treatment against lesion existing in lower digestive canal from colon to ileocical part.
C-3	Video monitor set	camera control unit, adaptor for Endoscope provided. 14 inch monitor, Workstation cart, with monitor shelf Color video printer with paper TV system: PAL/NTSC Camera: Resolution: Horizontal, 450 lines, CCD S/N: 40 dB or more Color video printer: thermal type Print: A6 size or less, Printing time: 40sec. Or less	To connect with gastroscope and colonoscope and to use for treatment of patients.
C-7	Broncho fiberscope set	Biopsy forceps, Filed odd view: 100° -120° Range of distal end bending: UP:160° -180° , DOWN:100° -130° Working length: 550-600mm Total length: 770-880mm Outer diameter: 4.9-5.9mm	To use for bronchial diseases, biopsy, treatment, to find out and remove foreign material in bronchial tube, and to suck and clean for treatment.
D-2	Ventilator for ICU	Air compressor, Humidifier, Laryngel mask, Safety device, alarm, airway provided. Flow rate: More than 40 liters/min. Respiratory rate: 6-40 times/min, or wider range Max. ventilation pressure: 70cm H2O or more PEEP/CPAP: 0-20cmH2O Oxygen concentrations: 21-100% Air compressor: Floe rate: More than 35L/min.	To control respiration of patients after operation in ICU.

D-3	Portable Ventilator	Reservoir bag, Humidifier, Mask, Alarm provided. Tidal volume: 200-900ml Frequency: 5-40 breaths/min. or wider Relief valve: 20-60cm H2O or more Trigger level: -1cm H2O or less O2 concentration: 21-100% Power requirements: AC and DC (Car Battery)	To control respiration of patients during transportation of serious case to other medical institutions.
D-6	ECG Monitor	Measuring parameter: ECG, Respiration Display: 6 inch or more Number of trace: 2 or more Recorder, cart provided. Sweep speed : 25mm/sec. Trandgraph: 24 hours Heart rate counting range: 12-300bpm Respiration rate counting range: 4-150bpm Skin electrode for adults, ECG paste provided.	To monitor vital signs of patients in ICU such as ECG, respiration.
D-7	Blood Gas Analyzer	Electrode: pH, pCO2, pO2 Measuring range: pH: 6.300-8.000 or wider pCO2: 8-200mmHg or wider pO2: 0-745mmHg or wider Calculated parameter: pO2, BE, HCO3- and sO2 Measuring time: 45 seconds or less	To measure P CO2, P O2, Ph and so on in artery to monitor status of patients in ICU.
E-1	Ventilator for Adult	Air compressor, Humidifier, Laryngel mask, Safety device, alarm, airway provided. Flow rate: More than 40 liters/min. Respiratory rate: 6-40 times/min. or wider range Max. ventilation pressure: 70cm H2O or more PEEP/CPAP: 0-20cmH2O or wider range Oxygen concentrations: 21-100% Air compressor: Floe rate: More than 40L/min.	To monitor vital signs of patients such as ECG, temperatures
E-7	Bedside Monitor	Measuring parameter: ECG, Temp. or more Display: 6 inch or more Number of traces: 2 or more Recorder, cart provided. Sweep speed: 25 and 50 mm/sec. Trend time: Possible to see trend-graph of numerical data 1 to 24 Heart rate counting range: 12 to 300bpm or wider Temperature range: 0 to 45°C or wider SpO2: Measuring range: 0 to 100% Respiration rate counting range: 4 to 150bpm or wider Skin probe for adults and ECG paste provided.	To monitor vital signs of patients such as ECG, temperatures
E-8	Defibrillator with monitor	Heart rate: 15 to 300bpm or wider Output energy: 2 to 360 ioules, 14 steps or more Charging time by battery: less than 10 sec. External paddle suitable for adult and child Cart an drecording paper Battery capacity: 2.5 hours monitoring or longer Monitor: type and size: 5" or more : Sweep speed: 25mm/sec. more : Alame function: 20-300bpm or wider	To restore original heart rhythm by transcutaneous electrification of direct current for patients having ventricular fibrillation, atrial flutter, arythmia, cardiac arrest.
E-11	Exercise ECG	Cart, Tred mill unit, hunger, electrode provided. with recording pepar ECG leads: Standard 12 leads. Sensitivity selection: 5mm/mV, 6-ch, Or.more CMRR: 90 dB or more Battery operationg time: 40 min. or more Tread mill unit: 0.5-16 km/hour, Slope angle: 0-12% : Display parameter: Time, Distance : Calories, Speed, Slope angle	To use for determination of manifest ischemic heart disease, to identify latent ischemic heart disease and to determine severity of the disease, and to determine effect of cadiovacular medicines.
F-1	Pure tone Audiometer	Earphone, Bone vibrator, Recording, Accessory case Test items: Pure tone eudiometry, SISI test : ALBA test Frequency: 125-8000Hz Conduction: Air: 110dB, Bone: 65dB Masking noise: 0-100dB or more	To use for diagnosis of deafness, for differentiation of conductive deafness and perception deafness, for affect of noise and chemicals against hearing, and to be operated at sound-proof room of ENT.
F-13	Bull's eye lamp set for ENT	ENT treatment unit: Suction pump, Illumination light : Compressor pump Patient chair: Back rest: Adjustable Height adjustment: Adjustable	To make diagnosis/treatment of patients with a combined unit of illumination, suction, syringe, treatment device and so on. And tube used at ENT.

G-1	Operationg Microscope	Mobile floor stand type with Halogen lamp Eyepiece: 12.5x or more Objective lens: F=175mm or more Total magnification: 4-25x ±5% or wider	To make micro-operations for patients which is impossible to conduct under naked eyes. And to be used at eye dept. operation theater.
G-2	Echo Unit for Ophthalmology. A & B scan	Video printer, Probe (A and B-Mode) Printing paper: Provided A-mode: Probe: 10MHz Measurable value of display: Axial length, Anterior chamber depth, Lens thickness and Vitreous length Measurable range: 15-40mm B-mode: Probe: 10NHz Scanning angle: 40-60° Scanning depth: 40-60mm	To use for diagnosis for sickness, foreign material in the eye or eye pit, for cloud and hemmorage of vitreneous body, for detached retina, for chroidal detachment, for extraocular muscles, for thick cornea, for depth of anterior chamber, for thickness of crystal lens, and for measurement of eye axial length and intraocular blood flow, at OPD clinic.
G-3	Visual Field Analyzer	Provided: Stand, Recording paper and Chin rest paper Type: Projection type Stimulus interval: 0.6, 0.9sec. Measuring area: 36° or more Stimulus size: Goldman Ⅲ Stimulus duration: 0.2sec.	To examine optic function from retina to visual center and identify and determine progress of glaucoma, optic nerves, brain tumor, at OPD eye clinic.
G-4	Slit Lamp with tonometer	Provided: Instrument stand, Tonometer and Eyepiece Eyepiece: 10x, 16x Lamp: Halogen lamp Slit angle: 0-180° Slit indication: 5° , 10° , 15° , 20° Tonometer: Measuring range: 0-83mmHg	To use for diagnosis of opacities of optic media(cornea, anterior chamber, crystal lens, anterior vitreous body)and of inflammatory change, and for magnification observation for outside of eye, eye annex, iris ansd so on.
G-5	Anesthesia with ventilator	Provided: Anesthesia apparatus, Anesthesia ventilator Monitoring, Mask and Blood pressure apparatus Flow meter: O2, N2O and Air Safety device: N2O cut-off in O2 supply failure	To conduct general anesthesia at the operation theater of eye dept. with inhalation anesthetic.
G-7	Micro instrument set for Eye	Eye surgical instrument set	To use for eye surgeries
H-1	Dental chairs with compressor	Dental chair with operation light, Air compressor Provided: Scalar unit, Handpiece, Film viewer and Alcohol lamp Air compressor: Air tank capacity: 25 lit. or more Air compressor capacity : 25litters Scalar : Ultrasound wave type Scalar bar : 2 pcs.	To use for diagnosis and treatment of patients of POD dental clinic.
H-5	Micromotor drill	Hand-piece set, Chip set, Foot switch Speed rotation: 1,500~20,000rpm or wider	To use for treatment of patients for maxillar/facial cases such as forming of maxillary bone, jaw bone, cheek bone and so on.
H-7	Mini Plaiting Kits	Implant rack for Maxillo Facial unit Material : Titanium	To treat patients of maxillar/facial cases such as forming of upper/lower jaw bone, cheek bone and so on.
H-8	Micro Plating Kits	Micro implant set for Maxilar/facial surgeries Plate material : Titanium	To treat patients of maxillar/facial cases such as forming of upper/lower jaw bone, cheek bone and so on.
I-1	Ultrasound Scanner Unit	Scanning type: Linear, Convex Scanning depth: Max. 2cm or more Monitor: 12 inch or more Probe connector: 2pcs. or more	To use for diagnosis of abdomen by ultrasound scanning image.
I-2	General X-ray Unit	Bucky stand Provided. X-ray tube stand: Floor loading type, MAX. tube currency : 150kV Max. tube unit: 150 kV Anode heat storange: 300kHU Bucky stand: Vertical movement, 80-1200mm	To use for radiography of respiratory apparatus disease, chest, spine and bones.
I-3	Fluoroscopy X-ray Unit	X-ray TV system: Monitor: 15 inch, X-ray protected high voltage generator: Inverter type Tube voltage : Max. 150kV or more Anode heat storage: 400kHU or more High voltage generator Radiography : Max 150 kV, Max 1,000 mA or more Fluoroscopy : Max. 125kV, max. 4mA or more	To use mainly for fluoroscopy and radiography of digestive organs of patients.

I-4	Mobile X-ray Unit	Tube voltage : 40-100kV mAs setting : 2-32mAs Tube current: 160mA or more	To use for X-ray photography at wards, ETU, operating theaters, ICU and so on.
I-9	Panoramic X-ray Unit	Stool for patients provided. Tube voltage : 60—80KV or more Tube currency : 10mA or more	To use for comprehensive X-ray photography in dental, jaws, facial zone, and to be applied mainly for patients of Maxillo-facial dept.
I-13	X-ray cassettes with screen set	X-ray film cassettes (HS or MS) X-ray film size : 43 X 35cm, 35 X 35cm 40 X 30cm, 30 X 24cm 24 X 18cm	To be used for X-ray photography
K-10	Ultrasound Scanner for Obstetrics	Printer provided. Scanning type : Linear, Convex Image mode : B, B/B, B/M, M Depth : Max. 20cm Monitor : 9 inches or more. Probe connector : 1 or more	To diagnose fetus at Obstetrics and womb malformation, womb/ovarian tumors at Gynecology.
L-1	Infant Incubator	Skin temperature probe, mattress, and IV pole provided. Temperature control : 27-37°C Skin temperature control : 35-37°C Oxygen supply system, Alarm, and castors provided.	To treat and care premature, low-weighted, sick neo-natal.
L-5	ECG Monitor	Electrode for neo-natal and recording paper provided. Measuring parameters : ECG and respiration Counting range : ECG : 30 to 300bpm : respiration : 2 to 150bpm Monitor size : 6 inches or more Number of traces : 2 or more	To monitor vital signs such as ECG and Respirations for neo-natal of PBU.
L-11	Transport incubator	Mattress castors and IV pole provided. Battery equipped Temperature control : 29-37°C Skin temperature control : 35-37°C Oxygen supply system and Alarm provided.	To transport neo-natal between medical institutions.
L-12	Infant Ventilator	Air compressor and fumidifier provided. O2 concentration : 21-100% Flow rate : 3 - 30 litters/min. or more Alarms provided. Compressor flow rate : 35 litters/min. or more	To assist premature, low-weighted neo-natal when air cell expansion or keeping air cell expansion are not enough, and in case that hypoxia would be caused due to neo-natal breathing problem.
M-1	Infant Incubator	Skin temperature probe, mattress, and IV pole provided. Temperature control : 27-37°C Skin temperature control : 35-37°C Oxygen supply system, Alarm, and castors provided.	To treat and care premature, low-weighted, sick neo-natal.
M-5	Infant Ventilator	Air compressor and fumidifier provided. O2 concentration : 21-100% Flow rate : 3 - 30 litters/min. or more Alarms provided. Compressor flow rate : 35 litters/min. or more	To assist premature, low-weighted neo-natal when air cell expansion or keeping air cell expansion are not enough, and in case that hypoxia would be caused due to neo-natal breathing problem.
M-9	ECG Monitor	Electrode for neo-natal and recording paper provided. Measuring parameters : ECG and respiration Counting range : ECG : 12 to 300bpm : respiration : 2 to 150bpm Monitor size : 6 inches or more Number of traces : 2 or more	To monitor vital signs such as ECG and Respirations for neo-natal of PBU.
O-1	High pressure steam sterilizer	Booster pump and air compressor provided. Recording paper provided. Capacity : around 300Liters Material : Stainless steel Inner pressure : around 2.0-2.5kg/cm2 Door opening : Vertical sliding Safety device and Control panel provided. Electric boiler provided.	To sterilize medical instruments and material used in operating theater.

O-2	Autoclave	Booster pump and air compressor provided. Recording paper provided. Capacity : around 230Liters Material : Stainless steel Inner pressure : around 2.2kg/cm2 Door opening : Sliding Safety device and Control panel provided. Electric boiler provided.	To sterilize medical instruments and material used in operating theater.
R-1	Washing Machine	Dealing capacity : 30 kgs or more Material : Stainless steel Rotating capability in washing : 35rpm Rotating capability in squeezing : 760rpm Brake provided.	To wash cloths of patients and linens of the hospital.
R-3	Incinerator for Medical Waste	Type : for incineration of medical waste. oil incinerating furnace Dealing capacity : 20-30kg/hr.	To incinerate medical waste of hospital in safety. to be installed outside of the hospital.
R-4	Mortuary Cooler for 2 Bodies	Type : for 2 bodies Inner temperatures : 0-100°C Material : stainless steel	To keep patients died in hospital
R-5	Autopsy table	Material : stainless steel Composition : sink and hand-shower provided.	To investigate/inspect death cause of patients.

Chapter 3 Implementation Plan

Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation concept

This project will be implemented within the framework of Grant Aid Assistance by the Japanese government. It will be implemented when approved by the governments of both countries and the Exchange of Notes on it has been concluded between them. After then the Government of Sri Lanka will select a Japanese consultant firm and it will start the detailed design work for the project. After the documents of detailed design have been completed, the tendered and selected Japanese firm as the supplier has to be proceeding the procurement and installation of the equipment.

The following are some basic and relevant matters for implementation planning.

1) Implementation System

The MOH is performing the implementation on this project and will conclude the contract with a Japanese consultant. This said hospital will hold responsibility directly as implementing agency to control over all procurement, installation and supervision of the equipment. Furthermore, the MOH after implementation will be fully responsible to secure the necessary budget for operation, maintenance and management on procured equipment.

2) Consultant

As soon as the Exchange of Notes (E/N) on the project has been concluded between the governments of the two countries, the Japanese consultant will conclude a contract with the MOH in accordance with the procedure under Japanese Grant Aid Assistance. On the basis of that contract, which will take effect once it has been verified by the Japanese government, the consultant will carry out the following work.

(1) In detailed design (D/D) stage: preparation of specifications in D/D and other technical documents.
(2) In the tender stage: selection of the supplier and operational cooperation regarding the supply contract.
(3) In the procurement stage: equipment procurement work and supervision of installation and of training for operation and maintenance.

3) Supplier

The supplier that is selected in the tender will conclude a contract with the Sri Lanka side. It also will take effect upon verification by the Japanese Government. On the basis of that contract the supplier will procure and deliver the necessary equipment and materials and will

provide Sri Lanka side with operation and daily maintenance training on operator- level basis for that equipment. Furthermore it will set up a maintenance and management system for supply, for a consideration, of spare parts and consumables and education provision of technical knowledge.

4) Japan International Cooperation Agency (JICA)

JICA's Grant Aid Management Department will instruct the consultant and the supplier as to ensure that the project is appropriately implemented in accordance with the Japanese Grant Aid Assistance system. Moreover, when necessary, it will hold discussions with those carrying out the work for the purpose of promoting implementation of the project.

5) Implementation Planning

During the detailed design (D/D) stage, discussions concerning the implementation planning will be held between the consultant and those concerned with the project on the Sri Lanka side based upon the implementation schedule indicated in this report for the purpose of confirming the starting times and the methods of the work to be undertaken by the Japanese side and by the Sri Lanka side with respect to each work item and ensuring that the work to be carried out by each side is smoothly accomplished. The work to be done by the Sri Lanka side must be implemented by it as scheduled before commencement of installation of the equipment.

6) Need to Send Technical Personnel

It is extremely important to learn how to operate properly and to maintain the procured equipment in order to make it possible to operate normally at all items after installation and thereby contribute to suitable diagnosis and better treatment. It is therefore necessary, for such items of X-Ray Apparatus or High Pressure Steam Sterilizer, that the manufactures send technical personnel for supervision of the installation work and provision of explanations on how to handle the equipment and also study training (instruction on operating techniques, easy repair techniques and inspection routines).

7) Implementation Planning and Supervision

The consultant will accomplish the detailed design work and supervision of the project on the basis of the contract with the Sri Lanka side. What is meant by detailed design work is determination of the detailed specifications of the equipment on the basis of the present basic design study and preparation of the tender drawings and documents, which consist of the tender instructions, draft contracts for procurement of the equipment and specifications of the equipment, and it also includes estimation of the cost of procurement of the equipment.

What is meant by supervision is determination of whether or not the supplier is doing his work as required by the contract and making sure that the contract is properly performed. It also includes provision of guidance and advice and making adjustments from a fair point of view so as to promote implementation of the work and it involves the following specific duties:

(1) The necessary procedures work for selection of the supplier, the holding of the tender and witnessing conclusion of the contract with the supplier,
(2) Study and approval of the working drawings, equipment specifications and other documents submitted by the supplier,
(3) Inspection and approval of the quality and performances of the delivered equipment,
(4) Overseeing of inspection and provisional acceptance of the delivered equipment and completed installation work,
(5) Reporting on the state of progress of the work, and
(6) Witnessing final acceptance.

Besides accomplishment of the above duties, the consultant has to report to the Japanese government officials concerned on the state of progress of project implementation, payment procedures, completion and final acceptance, and so forth.

3-1-2 Implementation Conditions

- It is predicable that equipment installation will be implemented, while GHM is running. Therefore, a supplier should discuss all the detailed schedule of implementation with the Sri Lanka side before the implementation so as not to intercept any pause of work as possibly.
- It will be necessary to break up one partial of wall of the hospital when equipment are moved in.
- It will be necessary to modify fixing material in installing the equipment as it may have some difference of the specifications in between Sri Lanka and Japan on drainage, sewer piping, power line.

3-1-3 Scope of Works

1) The Work Load of Japan side

The Japan side is responsible for accomplishing the following duties concerning consulting services and equipment procurement for the present project:

(1) Consulting Services

- Preparation of detailed design drawings and documents for the equipment for the project and instructions for the tender,
- Operational assistance concerning selection of the supplier and the supply contract,
- Providing of technical assistance on equipment maintenance management, and
- Overseeing of process of procurement of the equipment.

(2) Procurement and Installation of the Equipment

- Procurement of the equipment for the project and its transportation to the subject

medical institution and unloading and handling there,

- Guidance of installation of the equipment for the project and trial operation and adjustment there of, and
- Provision of brief explanations and guidance concerning how to operate and maintain the equipment for the project.

2) The Government of Sri Lanka Work Load

The Government of Sri Lanka is responsible for accomplishment of the work not included in the Japan side's responsibilities, such as installation of the equipment of the project. The scope of that work is shown as the following:

(1) Preparation for equipment installation

Sri Lanka side will prepare places of the equipment installation and accomplish the construction work for the utilities and other facilities necessary for such installation (power supply lines to the places of installation, water supply and sewer piping, outlets, etc) The main work items at the different facilities are as follows:

- Construction work of the laundry block

The work includes construction of laundry block and its utilities to house laundry equipment.

- Renovation of the X-ray block

The work consists of fixing of lead-covered doors, securing of wall thickness, changing of partition, and lead-glass installation.

(2) Securing budget for tax exemption

The equipment for the project will be exempted from customs duties, national securities levies, goods and services tax and other fiscal levies. The total amount of such tax will be borne by the government of Sri Lanka.

(3) Disposition of specialist doctors

The MOH will secure disposition of necessary specialist doctors for the following sections:

- Cardiologist for CCU and ICCU, and
- Pathologist for Laboratory.

3-1-4 Consultant Supervision

The consultant is to organize a standing project implementation team for smooth accomplishment of the detailed design work on the basis of the policies of Japanese Grant Aid Assistance with the basic design.

[Implementation Supervision Policies]

1) Close liaison with the persons in charge at the organization concerned with the project in both countries with a view to completion of provision of the equipment as scheduled,

2) Expeditious provision of those undertaking the work with guidance and advice from a fair point of view,
3) Provision of appropriate guidance and advice concerning maintenance and control of the equipment after it has been installed and accepted, and
4) After confirming completion of installation of the equipment and the fact that the conditions of the contract have been met, the consultant is to witness final acceptance of the equipment and wind up the work after the Sri Lanka side has approved acceptance.

3-1-5 Procurement Plan

1) Selection of Supplier and Type of Contract

The supplier to undertake the equipment procurement work, who must be an enterprise in Japanese nationality, whether a national or a juristic person, will be selected on the basis of evaluation of bids in an open competitive tender held for that purpose.

The contract is to be an lump sum sales contract specifically indicating the types and models of the equipment. The supplier's responsibilities under the contract are included integrally from supply, production and transportation of the contract equipment to provision of guidance for installation, adjustment and trial operation and technical guidance for operation and maintenance and control.

2) Procurement of the Equipment

With regard to the equipment procurement for the project, principally the country origins are limited to Japan and Sri Lanka. However, it should be considered be more appropriate to procure some items of equipment from other countries in the light of proper purpose and importance. For example, for some of Japanese items are not set the representative agents for repair and maintenance. No matter what country's products should be considered and compare its local prevalence, procurement range should be extended to the third country products to secure sustainability of the project.

The products will be selected, subject to the following conditions:

(1) That it be easy to receive services by engineers and to obtain consumables for equipment necessary for periodical check and purchase of consumable items. That for such items the manufacturer has an agent or branch in Sri Lanka
(2) That it be possible to procure, deliver and install of the equipment within the validity of the E/N.

The main equipment for maintenance service and consumables to purchase constantly is shown in Table 3-1.

Table 3-1. Major Equipment that need maintenance service

No.	Department	Name of Equipment
A-1	ETU	Bedside Monitor
A-2	-ditto-	Defibrillator
B-5	Operation Department	Anaesthetic Ventilator
C-1	Endoscope Department	Gastroscope
C-2	-ditto-	Colonoscope
D-2	ICU	Respirator
E-1	CCU	Respirator
E-7	-ditto-	Bedside Monitor
I-2	Radiology Department	X-Ray Apparatus
I-3	-ditto-	Ultrasound Scanner
I-4	-ditto-	Mobile X-Ray Apparatus
J-6	Laboratory	Water Distiller Apparatus
K-6	New Obstetrics and Gynecology	Cardio-tocograph
O-1	Sterilization Department	High Pressure Steam Sterilizer
O-2	-ditto-	Autoclave

3) Means of Transportation

1) From Japan

The equipment procured in Japan will be transported overland by truck to a Japanese port and from there shipped by sea to the Sri Lanka port of Colombo that is the most biggest harbor with well equipped in Sri Lanka as well as no problem when unloading shipment. From Colombo it will be transported again by truck to the Matara Town (200 km).

2) From the Third Country

The equipment procured in the third countries will be transported to the agent's warehouse located in Colombo City and then delivered by the term of CIF on site.

3) Tax Charge

The equipment for the project will be exempted from customs duties, national securities levies, goods and services tax and other fiscal levies. The total amount of such tax will be borne by the MOH.

3-1-6 Management Guidance (Software Component)

GHM is planning to improve quality of medical services through procurement of medical equipment by the Project.

GHM requested the Japanese government that management guidance be provided besides equipment supply because the management guidance makes the Project more fruitful and effective.

Management guidance requested are shown as the following:

1) Management guidance for medical waste control in GHM, and

2) Management guidance for maintenance control of medical equipment of GHM.

The outlines of the software component are as follows.

1) Medical waste control of GHM

GHM is not satisfied with the way of dealing with medical waste at the moment in such a way that syringe needle and patient tissue removed are simply burned outside to sterilize them. GHM is planning to introduce proper medical waste control by procurement of an incinerator and introduction of WHO medical waste control standard. It is important to separate medical waste following the rule and let the operators fully understand how to operate an incinerator properly and efficiently. Now that tertiary level health care institutions such as teaching hospitals have been equipped with incinerators from the point of prevention of cross infections, however secondary level institutions such as GHM have just started introducing incinerators in Sri Lanka. They say that some sort of troubles happened about incinerators in the past, that is, the unit was damaged heavily because separating of waste is not done properly and inflammable plastic items were burnt, which generated more temperatures than designed when the incinerator was installed newly at the teaching hospital, Karapitiya. Therefore, it is strongly recommended that assistance in system building be introduced to GHM, which is planning to conduct proper medical waste control as one component of the Project.

[Direct Effect]

- To strengthen prevention of cross infections in GHM by dealing and control of medical waist.
- To utilize incinerator which will be procured through the Project properly and efficiently.

The Consultant will assist GHM to conceive medical waste control plan including organizing of waste control committee, rule for waste separation, and determination of waste collecting route and waste treating procedures.

[Activities Plan]

Work item	Contents	Output
Assistance in System building	Organization Building Determining of scope of work	Organization chart Regulations/Activities
Assistance in medical waste dealing system building	Separating of medical waste, infectious/hazardous medical waste control, planning of collecting route of medical waste.	Manual for medical waste control 1) Manual for separating/dealing of medical waste 2) Flow chart/procedures for collecting route of medical waste

2) Equipment maintenance control

GHM plans to reorganize existing workshop and to establish BES unit of GHM in collaboration with BES in order to enhance maintenance ability for equipment of GHM.

Therefore the hospital requested the Japanese side provision of electric and mechanical maintenance equipment/tool through the Project. The basic design study team recommends that the existing workshop be recognized as one dept. of the hospital and be managed so properly as to rectify the current problems of the workshop that there happen missing of spare-parts, and taking long time to respond to the equipment which gets out of order.

The Consultant will assist GHM to conceive the plan of BES unit through the management guidance. In the concrete idea of activities of the Consultant, the guidance will cover refer to organization of BES unit, system to control medical equipment by keeping a inventory book, and keeping record of disorder, inventory check of spar-parts in collaboration with financial dept. of GHM

[Direct Effective]

- To enable GHM to utilize limited budget more efficiently by proper inventory control,
- To enable GHM to utilize medical equipment which will be procured through the Project and
- To enable GHM to make out procurement plan for spare-parts and equipment more rationally.

[Activities Plan]

Work item	Contents	Output
Assistance in System building	Organization Building Determining of scope of work	Organization chart, Scope of work of BES unit
Assistance in making out manual	Guidance, to make maintenance work more efficiently Training of work	Control manual 1) Equipment Inventory book 2) Maintenance Record 3) Inspection request form 4) Service manual Inventory 5) Operation manual Inventory 6) Repair request form

3-1-7 Implementation Schedule

Implementation Period

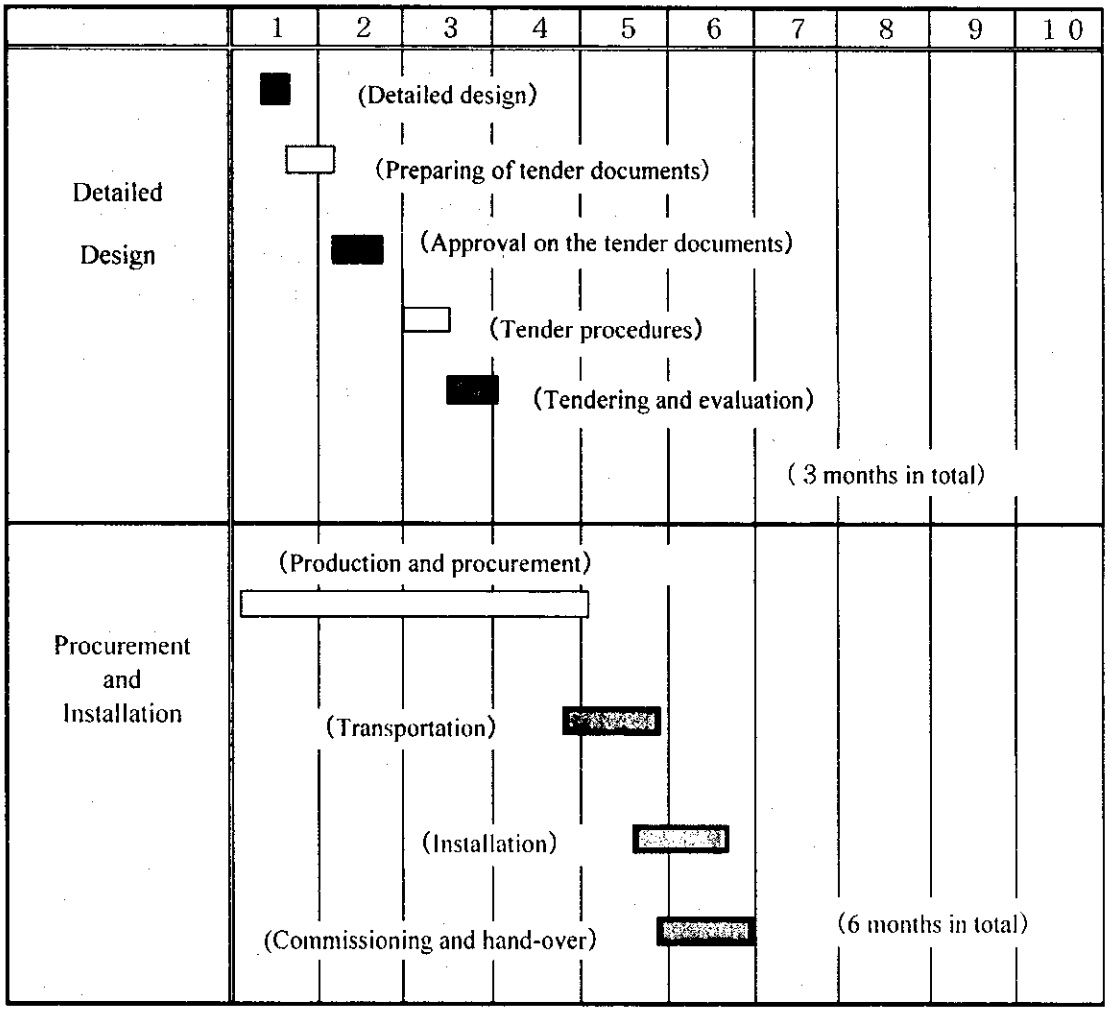
After conclusion of the exchange of Notes it will take approximately 9 months to accomplish all the different work including conclusion of a supply contract that the Japan side is responsible for, the times needed for the different work items being as follows:

1) From conclusion of the E/N up to and including the tender: 2.0 months
2) Approval of the contract with the supplier and placing the orders: 1.0 months
3) Production and procurement of the equipment: 4.0 months
4) Transportation: 1.0 months
5) Installation, adjustment, trial operation and guidance concerning operation and maintenance: 1.0 months

TOTAL 9.0 months

The implementation schedule is shown as Table 3-2.

Table 3-2 Implementation Schedule



3-1-8 Obligations of Recipient Country

1. Furnishing necessary information and documents for the project.
2. Payment of the commissions concerning the "Banking Arrangement" (B/A) and the "Authorization to Pay" (A/P) to a Japanese bank.
3. Ensuring expeditious unloading of the equipment purchased as non-reimbursable cooperation at the port, tax exemption measures, customs clearance, domestic transportation, and so forth.
4. Exemption of all taxes and levies in Sri Lanka concerning the project, including domestic taxes on Japanese staff and staff members of other nationalities involved in the project customs duties and taxes on procurement of equipment and services on the basis of approved contracts.
5. Provision of necessary assistance to project staff of Japanese and other nationalities for entry to Sri Lanka and residing there for the purpose of accomplishment of their work connected with procurement of equipment and services on the basis of approved contracts.
6. Issuing or approving, on the basis of Sri Lanka law, of authorizations, qualifications and permits needed for implementation of the project.
7. Appropriate budgetary appropriations and assignment of personnel for the purpose of proper and effective use and maintenance and control of the equipment purchased for the project.
8. Ensuring that the equipment purchased for the project is properly and effectively used and maintained.
9. Bearing of all necessary expenses for implementation of the project that are not covered by Japanese Grant Aid Assistance.

3-2 Project Cost Estimation

Cost borne by the Sri Lankan party is estimated as Rs. 21.75 million. The breakdown is shown as follows:

1) Building cost for new laundry block: Rs. 2.5 million

The Sri Lankan party bears the above amount for building a laundry ward, to which some items of equipment procured on the Project will be installed.

[Note: This amount includes various expenses related to the construction of the laundry room.]

2) Tax exemption

The Sri Lankan party secures budget necessary for tax exemption on customs duties, goods and services tax, national securities levies, and other fiscal levies which will be imposed in Sri Lanka for procurement of the equipment for this project. The budget is estimated as Rs. 19.25 millions.

3-3 Operation and Maintenance Costs

1) Establishment of maintenance system

The improvement of the medical equipment implemented on this Project is aimed at improving the functions of the hospital whose facilities are being renovated and expanded, so the items of medical equipment procured on the Project are mainly to replace existing counterparts. However, some items planned for the procurement are new to the staff of the hospital. For example, X-ray fluoroscopy apparatus is new to the hospital staff and relatively difficult to operate and maintain. After the procurement, this item may present a technical problem in maintenance. To make the maintenance of such items easier, at the time of procurement, it is necessary for the hospital to reinforce the maintenance system in cooperation with the BES and the local representatives in Colombo who represent the manufacturers of the products procured.

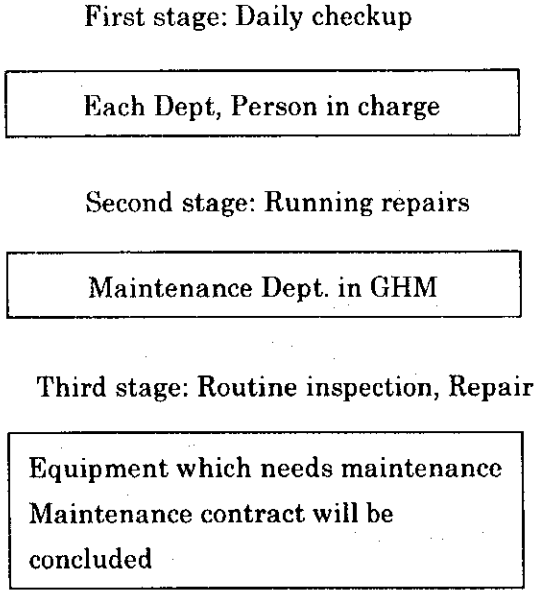
The following is a proposal to improve the maintenance system for the items of medical equipment procured on the Project.

Products to be selected for the items planned for the procurement are all available through the local representatives of manufacturers in Colombo. These representatives have technical experts and repair systems for after-sales service. Therefore, the hospital can receive appropriate maintenance work on the equipment by concluding maintenance agreements with the respective representatives.

At present, the X-ray apparatus of the hospital are maintained by engineers of the respective representatives, who are dispatched after a request by the BES. To receive such service, the hospital plans to conclude maintenance agreements for the equipment procured on the Project. Therefore, in this system, ordinary checkups of the equipment will be performed by the maintenance department of the hospital, and difficult repair work and periodical inspections

will be provided by the local representatives in accordance with the agreements.

Figure 3-1 Maintenance system



The equipment to be procured on the Project can be grouped into 1) medical equipment and 2) audiovisual equipment. How these groups of equipment are maintained is described below.

Table 3-2 Way of Maintenance

EQUIPMENT GROUP	MAJOR EQUIPMENT	WAY OF MAINTENANCE
1) Medical Equipment	· Measurement and Monitoring equipment · X-ray unit · Sterilizer	· Daily Checkup: The man in charge of each section · Mainer repair: BES unit (BES technician) · Routine inspection and Repair: Contract with the agency for Maintenance of equipment
2) Audiovisual Equipment	· Audiovisual equipment · Filming and Recording equipment · Computer	· Daily Checkup: Department chief · Mainer repair: BES unit (BES technician)

2) Maintenance cost

The cost for operating and maintaining the items of equipment procured on the Project is estimate as follows. According to this estimation, the annual cost for maintaining the equipment will increase by Japanese Yen 14.5 million (Rs. 10,620,000). For this increased budgetary allocation, the MOH plans to request the budget which includes the increased cost of this hospital to the Ministry of Finance, starting from administrative year 2002, when the operation of the equipment procured on the Project will start. The amount of the cost increase is about 5.8% of the last year's annual budget. The MOH is confident of acquiring needed funds, and to show its ability, the MOH says that it has secured, for the next year's budget, twice the amount of funds for purchasing medicines, in comparison with the last year's. The MOH is willing to assist the implementation of the Project in all aspects. Therefore, this task of budgetary allocation for the increased cost will be left securely to the discretion of the MOH. The following table 3-3 shows the breakdown of the maintenance cost which will be increased by procurement of the new equipment on the Project.

Table 3-3 Breakdown of the maintenance cost

Expense Item	Breakdown	Amount
Expense for water, electricity and fuel	① Water expense	Japanese Yen 55,000
	② Electricity expense	Japanese Yen 2,849,000
	③ Fuel expense for the incinerator	Japanese Yen 118,000
	④ Medical gas	Japanese Yen 3,670,000
Consumables	Consumables	Japanese Yen 2,310,000
Maintenance cost	① X-ray equipment	Japanese Yen 600,000
	② Other medical equipment	Japanese Yen 4,950,000
Maintenance cost	Japanese Yen 14,552,000	

(1) Expenses for water, electricity and fuel

① Water expense: Japanese Yen 55,000

As the items of equipment that require water supply, high-pressure steam sterilizers, distillers and washers with spin-driers are planned to be introduced on the Project. The amount of water consumed and the charge for the consumption are estimated as follows.

Rs. 25/m^3×5.1 m^3×26 days/month×12 months/year=Rs. 39,780

Condition: Toll: Rs.25/m^3, Consumption: 5.1 m^3/day

② Electricity expense: Japanese Yen 2,849,000

Because of the items of equipment which are supplemented and introduced on the Project,

an increase in the electricity consumption is expected.

The amount of this increase and the charge for the increase are estimated as follows.

Basic charge: 364.9 kW/month×12 months/year×Rs. 115.00/kW·month=Rs. 503,562

Specific charge: 364.9 kW×6 hrs/day×300 days/year×Rs. 2.4/kW·hrs=Rs. 1,576,368

The total of these two amounts is Rs. 2,079,930 (Japanese Yen 2,849,000).

Condition: ① Operating 300 days/year

② Unit price of electricity

Basic charge Rs. 115.00/kW · month

Specific charge: Rs. 2.4/kW · hrs (CEB)

③ Operating duration: 6 hrs/day

The following table describes the details of the electricity consumption by the items that are requested for the procurement on the Project as additions and supplements to the existing equipment.

Table 3-4 Breakdown of Consumable power

Code	Section	Power (kW/day)
A	ETU	2.41
B	Operation dept.	6.06
C	Endoscope dept.	2.50
D	Intensive care unit	2.08
E	CCU	3.11
F	OPD clinic	2.35
G	Ophthalmology dept.	0.06
H	Dental / Maxillo-facial	1.33
I	Radiology	121.2
J	Laboratory	5.00
K	OB&GY	5.50
L	PBU	3.70
M	New PBU	2.60
N	Wards	12.60
O	Sterilization dept.	140.00
P	Health education unit	4.8
Q	BES unit	44.00
R	Service dept.	5.60
TOTAL		364.9

③ Fuel expense for the incinerator: Japanese Yen 118,000

The hospital segregates medical wastes from general wastes in disposal. The incinerator procured on the Project will be used mostly for burning and sterilizing used linens, tested specimens, placentae, etc. which are infectious medical wastes. The hospital estimates the amount of such infectious wastes at 100 kg daily, so the amount of fuel required for the burning is expected to be about 20 liters. Therefore, the fuel expense is estimated at Rs. 851,760 (¥ 1.90 million) annually, as follows.

20 liters×26 days / month×Rs. 13.5 / liters×12 months / year=Rs. 84,240 / year

④ Medical gas: Japanese Yen 3,670,000

Respirators and anesthesia apparatus, which are used in the operating rooms and the intensive care units, are principal items procured on the Project that consume oxygen gas and laughing gas. The consumption of each of these gases and the expenses are estimated annually as follows.

26 days×12 months/year×
(Rs. 200/cylinder×36 cylinders+Rs. 300/cylinder×4 cylinders)=Rs. 2,620,800
Condition: O_2 Rs.200/cylinder, N2O Rs. 300/cylinder
Consumption of Medical gas: Oxygen cylinder 36 cylinders/day
N_2O 4 cylinders/day

(2) Consumables: Japanese Yen 2,310,000

The cost increase for purchasing consumables is estimated at Japanese Yen 2,310,000.

(3) Maintenance cost

① X-ray equipment: Japanese Yen 600,000

If the hospital concludes a maintenance agreement with a local representative, annually, about Japanese Yen 600,000 is necessary.

② Other medical equipment: Japanese Yen 4,950,000

The MOH is responsible for providing funds for the operation and maintenance of the hospitals under its jurisdiction, and the expenses necessary for operating and maintaining the equipment improved on the Project are handled as expenses of the MOH. In this respect, there is no financial burden on the hospital.

The cost for operating and maintaining the items other than the above-mentioned X-ray equipment is required about Japanese Yen 4,950,000 annually. It is a common practice that when new items of medical equipment are introduced, the MOH adds up the increased costs for operating and maintaining these items in the budgetary allocations. Therefore, it is expected that also for this Project, the same budgetary measures will be taken by the MOH.