

2-2-3 Basic Design Plan

(1) Breakdown list of the planned equipment

As a result of the study, procurement is planned for the equipment listed in the following Table 2-5.

Dept.	Item No.	No.	Description	Q'ty
Sir J.J. Hospital				
Pediatric	167	P-1	Pulse Oxymeter	8
Pediatric	168	P-3	Suction Unit	6
Pediatric	98-2	P-4	High Pressure Steam Sterilizer (250L Ward)	2
Pediatric	193-1	P-5	Room Air Conditions	3
Pediatric	121	P-6	Infusion Pump	7
Pediatric	18	P-7	Baby & Pediatric stethoscope	20
Pediatric	180	P-8	Phototherapy Unit	2
Pediatric	113	P-9	Infant Automatic Weighing Scale	3
Pediatric	24-2	P-10	Bilirubin Meter, Percutaneous Type	3
Pediatric	151	P-11	Syringe Pump	11
Pediatric	117	P-12	Infant Ventilator	2
Pediatric	135	P-13	Laryngoscope	6
Pediatric	147	P-16	Mobile X-ray Unit	1
Pediatric	149	P-17	Neonatal Monitor	5
Pediatric	161	P-18	Oxygen Head Box for Infant	6
Pediatric	3	P-19	Air Mattress	6
Pediatric	10	P-21	Apnea Alarm	6
Pediatric	118	P-22	Infant Warmer	6
Pediatric	82-2	P-23	Examination Table for Pediatrics	2
Pediatric	123	P-24	Instrument Cabinet	4
Pediatric	122	P-25	Blood / Infusion Warmer	2
Pediatric	174	P-26	Pediatric ICU Bed with Cabinet	15
Pediatric	213	P-27	Treatment Carriage	6
Pediatric	190	P-31	Refrigerator	1
Pediatric	184	P-34	Portable Incubator	1
Pediatric	139	P-40	Manual Resuscitation Bag (Portable set for resuscitation)	3
Pediatric	114	P-42	Infant Bassinet Stand	8
Pediatric	142-2	P-45	Medicine Cabinet	5
Pediatric	229	P-51	Wheel Chair	1
Pediatric	51	P-52	Defibrillator with Ped. paddle	1
Pediatric	215	APE-2	Ultrasonic Nebulizer	4
Pediatric	12	APE-5	Arm Rest for Infusion	8
Pediatric	131	APE-7	IV stand	4
Pediatric	46	APE-9	CPAP Unit	2
Pediatric	95-2	APE-10	Height & Weight Scale for Infant	2
Pediatric	72	NPE-12	Emergency Cart	1
Pediatric	21-2	CHD-1	Bedside Monitor for Ward	3
Pediatric	73	CHD-23	Emergency Neonatal Stretcher	2
Pediatric	206	CHD-32	Sphygmomanometer (with pediatric cuff)	5
Pediatric	59	CHD-42	ECG Unit	2
Pediatric	88	CHD-44	Fiberscopic Laryngoscope Set	1
P/Surgery	21-1	PS-1-1	Bedside Monitor for Operating Theatre	3
P/Surgery	21-2	PS-1-2	Bedside Monitor for Ward	4
P/Surgery	156	PS-2-1	Operating Table Electric	1
P/Surgery	155-1	PS-2-2	Operating Table	1
P/Surgery	7	PS-5	Anesthetic Apparatus with ventilator (for Infant)	2
P/Surgery	162	PS-11	Paed. Laryngoscope Set	1
P/Surgery	167	PS-16	Pulse Oxymeter	3
P/Surgery	165	PS-18	Paed.Fiberscopic Laryngoscope	1
P/Surgery	206	PS-19	Sphygmomanometer (with pediatric cuff)	5
P/Surgery	166	PS-20	Paed. General Operating Instrument Set	3
P/Surgery	169	PS-21	Paed. Tracheostomy Instrument Set	2
P/Surgery	168	PS-23	Suction Unit	2
P/Surgery	61-1	PS-24	Electrosurgical Unit (General)	2
P/Surgery	98-1	PS-25	High Pressure Steam Sterilizer (400L OT)	1

Dept.	Item No.	No.	Description	Q'ty
P/Surgery	171	PS-26	Paed. Vertical Steam Sterilizer	1
P/Surgery	170	PS-31	Paed. True Cut Biopsy Needle Set	10
P/Surgery	184	PS-38	Portable Incubator	1
P/Surgery	180	PS-39	Phototherapy Unit	1
P/Surgery	113	PS-40	Infant Automatic Weighing Scale	1
P/Surgery	151	PS-44	Syringe Pump	3
P/Surgery	121	PS-45	Infusion Pump	3
P/Surgery	117	PS-46	Infant Ventilator	1
P/Surgery	215	PS-47	Ultrasonic Nebulizer	2
P/Surgery	82-2	PS-49	Examination Table for Pediatrics	1
P/Surgery	18	PS-50	Baby & Pediatric stethoscope	10
P/Surgery	116	PS-52	Infant Nail Scissors	10
P/Surgery	139	PS-55	Manual Resuscitation Bag (Portable set for resuscitation)	2
P/Surgery	45	PS-60	Continuous Low Pressure Suction Unit	1
P/Surgery	41	PS-61	Clinical Thermometer Electric	10
P/Surgery	160	PS-67	Oxygen Face Mask	20
P/Surgery	148	PS-68	Nasal Oxygen Cannula	20
P/Surgery	172	PS-74	Paediatric Cystoscope Set	1
P/Surgery	178	PS-75	Percutaneous Nephroscope Set	1
P/Surgery	97	PS-78	Hemoglobinmeter	1
P/Surgery	118	PS-79	Infant Warmer	5
P/Surgery	161	PS-89	Oxygen Head Box for Infant	4
P/Surgery	213	APS-3	Treatment Carriage	1
P/Surgery	72	NPS-2	Emergency Cart	2
P/Surgery	76	PII-17	Endotracheal Set	3
P/Surgery	192	PII-19	Revolving Chair	4
P/Surgery	123	PII-20	Instrument Cabinet	1
AIDS Unit	21-1	A-1	Bedside Monitor for Operating Theatre	4
AIDS Unit	35	A-2	Central Monitor	1
AIDS Unit	70	A-3	Emergency Bed with Bedside Cabinet	4
AIDS Unit	121	A-4	Infusion Pump	4
AIDS Unit	98-2	A-9	High Pressure Steam Sterilizer (250L Ward)	1
AIDS Unit	31	A-21	Bronchoscope with Biopsy Forceps Set & Light Source	1
AIDS Unit	136	A-23	Lecture scope for Bronchoscope	1
AIDS Unit	75	A-24	Endoscopy Table	1
AIDS Unit	72	A-49	Emergency Cart	1
Medica Dept. Wards	21-1	M-1	Bedside Monitor for Operating Theatre	9
Medica Dept. Wards	108	M-3	ICU Bed	12
Medica Dept. Wards	11	M-4	Apnea Monitor	1
Medica Dept. Wards	226	M-5	Ventilator	3
Medica Dept. Wards	121	M-6	Infusion Pump	12
Medica Dept. Wards	215	M-7	Ultrasonic Nebulizer	12
Medica Dept. Wards	59	M-9	ECG Unit	2
Medica Dept. Wards	151	M-12	Syringe Pump	12
Medica Dept. Wards	95-1	M-15	Height & Weight Scale for Adult	2
Medica Dept. Wards	229	M-16	Wheel Chair	12
Medica Dept. Wards	3	M-19	Air Mattress	16
Medica Dept. Wards	12	M-24	Arm Rest for Infusion	20
Medica Dept. Wards	72	M-27	Emergency Cart	6
Medica Dept. Wards	168	M-29	Suction Unit	6
Medica Dept. Wards	47	M-31	CPR Training Doll Adult	1
Biochemistry	27	B-1	Blood Gas Analyzer with Electrolyte	2
Biochemistry	228	B-3	Water Distiller	2
Biochemistry	68	B-4	Electrophoresis Apparatus with Densitometer	1
Biochemistry	216	B-6	Ultrasonic Cleaner	2
Biochemistry	38	B-8	Chemistry Auto Analyzer	1

Dept.	Item No.	No.	Description	Q'ty
Biochemistry	5	B-9	Analytical Balance	2
Biochemistry	16	B-10	Autopipette Variable Volume	4
Biochemistry	190	B-11	Refrigerator	2
Biochemistry	204	B-12	Spectrophotometer	1
Biochemistry	43	B-13	Colorimeter (Photoelectric)	4
Biochemistry	179	B-14	pH Meter	1
Biochemistry	102	B-18	Homoginizer	3
Biochemistry	48	B-20	Cyclomixer	1
Biochemistry	227	B-21	Water Bath	1
Biochemistry	146	B-23	Mixer	1
Biochemistry	138	B-24	Magnetic Stirrer	1
Biochemistry	198	B-25	Semi Auto Analyzer	1
Biochemistry	36	B-26	Centrifuge Machine for 40 tubes	2
Biochemistry	42	NB-1	Coagulometer Semi-automated	1
Biochemistry	223	NB-2	Urine Analyzer	1
Biochemistry	26	NB-3	Blood Cell Counter	1
Neuro Surgery	88	N-1	Fiberscopic Laryngoscope Set	1
Neuro Surgery	51	N-2	Defibrillator with Ped. paddle	2
Neuro Surgery	122	N-3	Blood / Insfusion Warmer	7
Neuro Surgery	122	N-4	Blood / Insfusion Warmer	0
Neuro Surgery	108	N-5	ICU Bed	10
Neuro Surgery	3	N-7	Air Mattress	5
Neuro Surgery	202	N-9	Sliding Stretcher	2
Neuro Surgery	72	N-10	Emergency Cart	4
Neuro Surgery	226	N-12	Ventilator	1
Neuro Surgery	121	N-13	Infusion Pump	4
Neuro Surgery	215	N-14	Ultrasonic Nebulizer	2
Neuro Surgery	117	N-15	Infant Ventilator	1
Neuro Surgery	149	N-16	Neonatal Monitor	1
Neuro Surgery	11	N-18	Apnea Monitor	1
Neuro Surgery	168	N-20	Suction Unit	4
Neuro Surgery	61-2	N-22	Electrosurgical Unit (Neuro-Surgery)	2
Neuro Surgery	154	N-23	Operating Light	2
Neuro Surgery	98-1	N-24	High Pressure Steam Sterilizer (400L OT)	1
Neuro Surgery	143	N-29	Micro-neuro Surgery Operating Table	2
Neuro Surgery	144	ANS-2	Microneurosurgery Instrument Set	3
Neuro Surgery	182-1	ANS-3	Pneumatic Bone Drill for Neurosurgery	1
Neuro Surgery	211-2	ANS-4	Surgical X-ray C-arm TV system with DSA	1
Physiotherapy	105	PH-1	Hyrdo Bubbler Bath	1
Physiotherapy	173	PH-3	Parraffin Wax Bath	1
Physiotherapy	200	PH-4	Shoulder Wheel Machine	1
Physiotherapy	195	PH-5	Rotary Wrist Machine	1
Physiotherapy	199	PH-6	Shoulder Ladder	1
Physiotherapy	89	PH-7	Finger Exerciser	1
Physiotherapy	22	PH-8	Bicycle Exerciser	1
Physiotherapy	196	PH-11	Rowing Machine	1
Physiotherapy	39	PH-12	Chest Pulley	1
Physiotherapy	84	PH-14	Exercise Stairs	1
Physiotherapy	90	PH-15	Galvanization & Faradization Unit	1
Physiotherapy	129	PH-16	Interferential Therapy Unit	1
Physiotherapy	145	PH-17	Microwave Therapy Unit	1
Physiotherapy	219	PH-18	Ultrasound Therapy Unit	1
Physiotherapy	220	PH-20	Ultraviolet Lamp	1
Physiotherapy	119	PH-21	Infrared Ray Lamp	1
Physiotherapy	66	PH-22	Electric Traction Pelvic Type A & B	1
Physiotherapy	65	PH-23	Electric Traction Cervical	1

Dept.	Item No.	No.	Description	Q'ty
Physiotherapy	79	PH-26	Treadmill	1
Physiotherapy	93	PH-27	Hand Finger Dynamometer	1
Physiotherapy	91	PH-28	Goniometer Set	1
Physiotherapy	181	PH-30	Pinch Meter	1
Physiotherapy	19	PH-31	Barrel Crawl Roll	1
Physiotherapy	197	AP-1	Short Wave Diathermy	1
OB/GY	177	OG-1	Pelvis Model	1
OB/GY	69	OG-2	Embryo's Head Rotation Stimulator	1
OB/GY	30	OG-3	Breast Cancer Teaching Stimulator	1
OB/GY	67	OG-4	Childbirth Phantom	1
OB/GY	153	OG-5	Obstetric Model with Fetus Development	1
OB/GY	98-1	OG-6	High Pressure Steam Sterilizer (400L OT)	2
OB/GY	57	OG-7	Drying Oven	1
OB/GY	55	OG-10	Dressing Drum	4
OB/GY	141	OG-16	Medical Refrigerator	2
OB/GY	97	OG-17	Hemoglobinmeter	3
OB/GY	96	OG-18	Hemacytometer	2
OB/GY	225	OG-19	Vaginal Prosthesis	1
OB/GY	106	OG-20	Hysterectomy Forceps Set	3
OB/GY	152	OG-21	Obstetric Forceps Set	3
OB/GY	81	OG-29	Examination Light	8
OB/GY	61-1	OG-30	Electrosurgical Unit (General)	2
OB/GY	229	OG-32	Wheel Chair	5
OB/GY	192	OG-35	Revolving Chair	3
OB/GY	123	OG-36	Instrument Cabinet	3
OB/GY	127	OG-39	Instrument Tray	6
OB/GY	140	OG-40	Mayo's Instrument Tray	4
OB/GY	41	OG-42	Clinical Thermometer Electric	12
OB/GY	134	OG-43	Laparoscope Set (Diagnostics / Operative)	1
OB/GY	121	OG-48	Infusion Pump	6
OB/GY	28	OG-49	Blood Sedimentation Unit	2
OB/GY	208	OG-52	Stetcher Trolley	2
OB/GY	213	OG-53	Treatment Carriage	3
OB/GY	54	OG-54	Dressing Carriage	3
OB/GY	131	OG-55	IV stand	20
OB/GY	83	OG-58	Examination Table (Gynecology) with Examination Unit	6
OB/GY	205	OG-59	Sphygmomanometer	15
OB/GY	72	OG-62	Emergency Cart	4
OB/GY	56	OG-64	Dressing Jar	6
OB/GY	21-2	OG-67	Bedside Monitor for Ward	5
OB/GY	51	OG-68	Defibrillator with Ped. paddle	2
OB/GY	167	OG-69	Pulse Oxymeter	5
OB/GY	168	OG-71	Suction Unit	3
OB/GY	6	OG-72	Anesthetic Apparatus	3
OB/GY	226	OG-73	Ventilator	1
OB/GY	187	OG-74	Recovery Stretcher	3
OB/GY	108	OG-75	ICU Bed	2
OB/GY	155-1	OG-77	Operating Table	3
OB/GY	154	OG-78	Operating Light	3
OB/GY	45	OG-79	Continuous Low Pressure Suction Unit	2
OB/GY	77	OG-80	Endotracheal Set for Baby	2
OB/GY	126	OG-82	Instrument Table	2
OB/GY	52	OG-88	Delivery Table	6
OB/GY	224	OG-89	Vacuum Extractor	2
OB/GY	53	OG-91	Doppler Fetus Detector	4
OB/GY	86	OG-92	Fetal Actocardiograph	1

Dept.	Item No.	No.	Description	Q'ty
OB/GY	107	AOG-2	Hysteroscope with Resectroscope (Light Source)	1
OB/GY	59	AOG-3	ECG Unit	2
OB/GY	147	AOG-4	Mobile X-ray Unit	1
OB/GY	185	AOG-5	Portable USG Machine	1
OB/GY	122	AOG-6	Blood / Infusion Warmer	4
OB/GY	228	AOG-11	Water Distiller	1
Pathology	221	APA-2	Universal Reserch Microscope	4
Pathology	101	APA-3	Histoprocessor (Automatic Tissue Processor)	1
Pathology	194	APA-4	Rotary Microtome	2
Pathology	15	APA-5	Automatic Slide Stainer	2
Ophthalmology	128	OP-2	Instrumentation of Viterectomy	1
Ophthalmology	112	AO-3	Indirect Ophthalmoscope	1
Ophthalmology	203	AO-4	Slit Lamp	1
Ophthalmology	189	NO-1	Refractometer	1
Orthopedic	211-1	OR-1	Surgical X-ray C-arm TV system	1
Orthopedic	158	OR-2	Orthopedic Operating Table	1
Orthopedic	155-2	OR-3	Operating Table with Attachment	2
Orthopedic	154	OR-4	Operating Light	2
Orthopedic	108	OR-8	ICU Bed	5
Orthopedic	157	OR-9	Orthopedic Gatch Bed with Traction Accessories	6
Orthopedic	20	OR-11	Basic Orthopedic Instrument Set	3
Orthopedic	62	OR-13	Electric Plaster Saw Set	1
Orthopedic	9	OR-15	Anterior Spinal Instrument Set	1
Orthopedic	182-2	OR-16	Pneumatic Bone Drill	1
Orthopedic	1	OR-17	A.O. Instrument Set	1
Orthopedic	21-2	OR-19	Bedside Monitor for Ward	2
Orthopedic	207	OR-21	Spinal Injury -motorized Beds	2
Orthopedic	167	OR-24	Pulse Oxymeter	2
Orthopedic	190	OR-26	Refrigerator	1
Orthopedic	51	OR-26	Defibrillator with Ped. paddle	2
Orthopedic	61-1	OR-27	Electrosurgical Unit (General)	3
Orthopedic	98-1	OR-28	High Pressure Steam Sterilizer (400L OT)	1
Orthopedic	6	OR-29	Anesthetic Apparatus	2
Orthopedic	229	OR-35	Wheel Chair	4
Orthopedic	82-1	OR-36	Examination Table for Adult	2
Orthopedic	208	OR-38	Stetcher Trolley	4
Orthopedic	183	OR-39	Pneumatic tourniques	2
Orthopedic	100	AOR-5	High Speed Drill	1
Microbio	221	MC-2	Universal Reserch Microscope	2
Microbio	40	MC-3	Biosafety Cabinet Class II	2
Microbio	111	MC-4	Incubator	2
Microbio	190	MC-6	Refrigerator	2
Microbio	228	MC-7	Water Distiller	1
Radiology	218-2	R-1	Ultrasound Machine Color Doppler	1
Maintenance	78	N-1	Equipment for Maitenance Works	1

Dept.	Item No.	No.	Description	Q'ty
Cama and Albless Hospital				
OB/GY	83	C-1	Examination Table (Gynecology) with Examination Unit	4
OB/GY	44	C-5	Colposcope	1
OB/GY	52	C-12	Delivery Table	2
OB/GY	53	C-13	Doppler Fetus Detector	5
OB/GY	86	C-43	Fetal Actocardiograph	3
OB/GY	82-1	C-47	Examination Table for Adult	1
OB/GY	61-1	C-59	Electrosurgical Unit (General)	2
OB/GY	167	C-66	Pulse Oxymeter	3
OB/GY	98-1	C-72	High Pressure Steam Sterilizer (400L OT)	2
OB/GY	125	C-73	Instrument Sterilizer (boiling)	5
OB/GY	59	C-74	ECG Unit	4
OB/GY	187	C-101	Recovery Stretcher	4
OB/GY	51	C-163	Defibrillator with Ped. paddle	4
OB/GY	218-1	CN-7	Ultrasound Machine stational type with probes	1
OB/GY	185	CN-8	Portable USG Machine	2
OT	155-1	C-35	Operating Table	2
OT	154	C-39	Operating Light	2
OT	122	C-49	Blood / Infusion Warmer	1
OT	74	C-52	Emergency Tracheostomy Instruments in Metal	3
OT	71	C-53	Emergency Breast Operating Instruments in Metal	3
OT	6	C-62	Anesthetic Apparatus	2
OT	21-2	CN-11	Bedside Monitor for Ward	3
OPD	81	C-41	Examination Light	4
OPD	206	C-76	Sphygmomanometer (with pediatric cuff)	10
OPD	142-2	C-78	Medicine Cabinet	10
OPD	124	C-79	Instrument Carriage	10
OPD	209	C-80	Stethoscope	10
OPD	12	C-125	Arm Rest for Infusion	6
OPD	135	C-142	Laryngoscope	4
OPD	184	C-149	Portable Incubator	1
OPD	113	C-151	Infant Automatic Weighing Scale	4
Endoscope	134	C-45	Laparoscope Set (Diagnostics / Operative)	1
Endoscope	49	C-57	Cystofiberscope with Biopsy Forceps	1
Radiology	230-1	C-68	X-ray Film Cabinet	1
Radiology	232	C-117	X-ray Unit with Image Intensifiers	1
Radiology	230-2	C-124	X-ray Film Illuminator	1
Radiology	147	C-160	Mobile X-ray Unit	1
Radiology	17	CN-6	Automatic Film Processor	1
Radiology	231	CN-10	X-ray Protection Shields Set	1
Laboratory	27	C-103	Blood Gas Analyzer with Electrolyte	1
Laboratory	97	C-104	Hemoglobinmeter	2
Laboratory	25	C-105	Blood Bank Refrigerator	1
Laboratory	141	C-106	Medical Refrigerator	5
Laboratory	23	C-107	Binocular Microscope	3
Laboratory	216	CA-3	Ultrasonic Cleaner	1
Laboratory	223	CN-5	Urine Analyzer	1
Laboratory	204	CN-9	Spectrophotometer	1
Ward	131	C-135	IV stand	25
Ward	229	C-136	Wheel Chair	6
Ward	142-1	C-137	Medication Cart	1

(2) Specifications of the main equipment

The specifications and applications of the main equipment to be procured in this project are listed in Table 2-6 "List of Main Equipment."

Table 2-6 List of Main Equipment

Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
1	A.O. Instrument Set (Orthopedic surgery instrument set)	Complete set of plates and screws for Orthopedic Surgery	1	To be used for bone surgery (Orthopedic Surgical Operation).
6	Anesthetic Apparatus	Vaporizer: halothane and isoflurane CO ₂ canister: provided Flow meter: for O ₂ and N ₂ O Safety devices: built-in With Anaesthesia ventilator	7	To be used for the painless operation mainly for adult.
7	Anesthetic Apparatus with ventilator (Infant circle absorber, Jackson rees pediatric and bite block)	Vaporizer: halothane and isoflurane Application: Pediatrics Flow meter: for O ₂ , N ₂ O and Air Safety devices: built-in Tidal Volume: 20~1200ml or wider With Anaesthesia ventilator	2	To be used for major operation mainly for infant.
9	Anterior Spinal Instrument Set	Retractor, Drill, Forceps, Bone Gauge and Curette	1	To be used for spinal operation.
15	Automatic Slide Stainer	Throughput: 30 or more No. of Staining Stations: 18 or more No. of Washing Stations: 3 or more No. of Program Memory: 15 or more No. of Staining steps: 25/program	2	It is used for deparaffinization and staining of the slide.
17	Automatic film processor	System: Roller transport Film size: up to 14"×17" Capacity: 220 films/h. (10"×12" size), or more Processing time: 90 sec./film	1	To be used for development of X-ray film automatically.
21-1	Bedside Monitor for Operating Theatre	Parameter: electrocardiogram, respiration rate, temperature, HR, SpO ₂ , NIBP, CO ₂ Display: LCD 8-inch or more Recorder: built-in	16	To be used for observation on vital signal of patient during surgical operation.
21-2	Bedside Monitor for Ward	Parameter: electrocardiogram, respiration rate, temperature, HR, SpO ₂ , NIBP Display: LCD 8-inch or more Recorder: built-in	17	To be used for observation on vital signal of patient keeping at patient bedside.
26	Blood Cell Counter	• Measuring parameters: 18 or more • Throughput: 50tests/h. or more • Sample volume: Less than 50uL (Whole Blood) • with Printer	1	It is used for diagnosis of anemia, evaluation of the treatment efficacy in anemic patients, judgment of the degree of bone marrow suppression during cancer chemotherapy, etc.
27	Blood Gas Analyzer	Parameter (Blood gas): Na, K, Cl, pH, pCO ₂ , pO ₂	3	It is used to analyze the blood concentration, such as the saturation of oxygen, moisture and electrolyte.
31	Bronchoscope with biopsy forceps set & light source	Field of view: 100° or more Outer diameter: 5.6mm or less Working length: 550mm or more Diameter of instrument channel: 2mm or more	1	It is used for endoscopic diagnosis of bronchial diseases.

Table 2-6 List of Main Equipment

Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
35	Central Monitor	Central Monitor Display: 15-inch or more, Colour Paper speed: 25mm/sec. or more Recorder: should be provided	1	This is a centralized system for observation of the vital status of multiple patients.
38	Chemistry Auto Analyzer	Throughput: 180 tests/h. or more Sample volume: 3~30uL/test Printer: should be provided	1	Used for measurement of biochemical status of patient. Measurements are conducted concerning functions of the liver, kidney, pancreas, as well as hormonal and metabolic functions, status of electrolytes, etc.
40	Biosafety Cabinet Class II	·Classification: Class II ·Dimension: 1350mm(W)×2350mm(H)×780mm(D) ·Exhaust Amount: 7.8m ³ /min. or more	2	This equipment is to protect laboratory workers from bacteria during examination of tuberculosis, etc.
46	CPAP Unit	Application: Premature/Infant Mode: CPAP Flow volume: 0~15lit./min. O ₂ /Air mixer: 21~100% Alarm function: provided Compressor: provided	2	To be used for respiratory support (recovery of pulmonary function) of premature baby by applying positive pressure to the lung.
51	Defibrillator (with pediatric paddle)	Output: 2~360J (10 steps or more) or wider Monitor: 5-inch or more Buttery charger: built-in Power: DC, AC With Paddle for adults and pediatrics	11	It is used for the resuscitation in the cardiac arrest. This equipment gives percutaneous countershock with direct current for the ventricular fibrillation.
61-1	Electrosurgical Unit (General)	Function: Bipolar, Monopolar Output: Coagulation: 120W or more Cutting: 250W or more Mix: 200W or more Bipolar: 18W or more Foot switch	9	It is used in the operation, in which incision, hemostatic incision and coagulation are performed on the tissue of patient.
61-2	Electrosurgical Unit (Neuro-Surgery)	Function: Bipolar Output: Bipolar: 80W or more Cutting: 250W or more Coagulation: 120W or more Various kinds of Bipolar Irrigating Forceps: equipped Foot switch	2	It is used for Neurosurgery operation, in which incision, hemostatic incision and coagulation are performed on the tissue of patient.
66	Electric Traction Pelvic Type A & B	Traction force: 5~99kg or wider Traction Mode: 3 or more Safety Function: equipped with Emergency stop button Provided: 1 bed and 1 chair	1	It is used for treatment of Hernia and for pelvic traction. This is essential equipment in Physiotherapy.
68	Electrophoresis Apparatus with Densitometer	Composition: Electrophoresis chamber, Cellulose membrane/gel or Agarose gel, Densitometer Throughput: 18 tests/h. or more	1	This equipment is used for analyzing various kinds of protein/ingredient in blood and body fluid.

Table 2-6 List of Main Equipment

Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
78	Equipment for Maintenance Works	Composition: Oscilloscope, Multimeter, Frequency counter, Function generator, Electric drill, Tool set, etc.	1	This is a set of tools used for maintenance and repair of Medical Equipment.
79	Treadmill	Speed: 1.0~13.0km/h Inclination: 0~12%, adjustable Driving method: Caterpillar mechanism Safety device: Emergency stop pulling switch	1	It is used for gait training of patients who have walking difficulty due to i.e. apoplexy and injury in an accident.
98-1	High Pressure Steam Sterilizer (400L, OT)	•Capacity: 400L or more •Sterilizing temperature: 135 ° or more •Provided with steam generator •Attachments: recorder, cart	7	It is used for sterilizing operating gowns and surgical appliances with high-pressure steam (for Operating Theatre).
98-2	High Pressure Steam Sterilizer (250L, Ward)	•Capacity: 250L or more •Sterilizing temperature: 135° or more •Provided with steam generator •Attachments: recorder, cart	3	It is used for sterilizing operating gowns and surgical appliances with high-pressure steam (for Ward).
100	High Speed Drill	Main Unit (Drill, Cutting, Reaming) Attachment Method: by Air Compressor	1	It is used for bone reaming, bone drilling and osteotomy for Orthopedic Surgical Operation.
105	Hydro Bubbler Bath	Capacity: 125L or more Bubble generator: Incorporated Temperature control: 35~45°C or wider	1	The equipment provides stimuli to the patient body by forming bubbles in the bathtub.
117	Infant Ventilator	Application: Infant Mode: IMV, SIMV, PSV and CPAP Tidal volume: 10~2,000ml or wider Inspiratory time: 0.2~3.0sec. or wider Oxygen concentration: 21~100% or wider With compressor and humidifier	4	To be used to assist or control respiration of the infant patients.
118	Infant Warmer	Skin temperature control: servo-control or manual control Temperature range: 35~37.5°C Alarm: high/low temperature	11	It is used for keeping body temperature of a new-born baby at present condition.
128	Instrumentation of Vitrectomy	Forceps Ophthalmic Illuminator: Halogen, 150W Operational Lens: 6 kinds	1	To be used for eye operation, especially for Vitrectomy surgery.
129	Interferential Therapy Unit	Cycle: 2500, 4000, 5000Hz Interferential frequency: output: 1~199Hz Timer: 30min(Max)	1	It is used for treatment of disordered part with low frequency wave.
134	Laparoscope Set (Diagnostic / Operative)	•Telescope: Light guide type Field of view: 0°, 30° Outer diameter: 10mm, 5.5mm •Illuminator •Instruments for Operation •Video Endoscopy system •Monitor: 20-inch or more, Colour •Electro Surgical Unit	2	To be used for extracting tissue for diagnosis of malignant tumor in Gynecology.

Table 2-6 List of Main Equipment

Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
143	Micro-neuro Surgery Operating Table	Type: Electro-Hydraulic operation, Head frame for Neurosurgery Table top: 1,950(L)×500(W)mm or more Adjustable height: 680~1,000mm or wider Trendelenburg: ±25° Lateral tilting: ±20°	2	To be used for Neurosurgery. Table can be tilted and rolled to adjust patient position.
144	Microneurosurgery Instrument Set	Composition: Clip, Retractor, Cutting forceps, Suction tube, etc.	3	This is a set of basic instruments used for brain surgery.
147	Mobile X-ray Unit	Inverter type: high voltage unit Tube voltage range: 40~125kv mAs range: up to 125mAs or more X-ray tube focus size: Less than 1.2mm	3	It can be used at patient side, in ward, who are too infirm to move X-ray room.
149	Neonatal Monitor	Parameter: electrocardiogram, respiration rate, temperature, HR, SpO ₂ , NIBP Display: LCD Recorder: built-in	8	It is used for monitoring vital-information of a new-born baby, such as ECG, respiration, temperature, etc.
152	Obstetric Forceps Set	Composition: Sponge forceps, Towel clips, Retractors, Hemostatic forceps, etc.	3	To be used for Obstetric operation.
154	Operating Light	Number of bulbs: Main: 5 ~10 bulbs or more Sub: 3~5 bulbs or more Intensity: Main: 120,000lux or more Sub: 80,000lux or more (It is depended by distance.)	9	This equipment irradiates the site of operation with heat-less and shadowless light. Proper colour, temperature and illumination are provided to the operating spot.
155-1	Operating Table	Type: hydraulic and manual operation Table top: 1,900(L)×450(W)mm or more Adjustable height: 780~1,000mm or wider Trendelenburg: ±15° or more Lateral tilting: ±20° or more	6	To be used for surgical operation by adjusting the table height and angle according to the operation method and the operation region, the patient can be placed at the most suitable position for ease and safety of the operation.
155-2	Operating Table with attachment	Type: universal, hydraulic and manual operation, with Lower Limb Traction Unit Table top: 1,900(L)×450(W)mm or more Adjustable height: 780~1,000mm or wider Trendelenburg: ±15° or more Lateral tilting: ±20° or more	2	To be used for surgical operation by adjusting the table height and angle according to the operation method and the operation region, the patient can be placed at the most suitable position for ease and safety of the operation.

Table 2-6 List of Main Equipment

Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
156	Operating Table Electric	Application: Pediatrics Type: Hydraulic and electric operation Position: 3 positions X-ray photograph: should be available Table top: 1,950(L)×500(W)mm or more Adjustable height: 650~1,000mm or wider Trendelenburg: ±25° or more Lateral tilt: ±20° or more	1	To be used for surgical operation by adjusting the table height and angle according to the operation method and the operation region, the patient can be placed at the most suitable position for ease and safety of the operation.
158	Orthopedic Operating Table	Type: Orthopedic hydraulic and electric operation table Table top: 1,940(L)×500(W)mm or more Adjustable height: 740~1,000mm or wider Trendelenburg: ±25° or more Lateral tilt: ±20° or more Equipped with Lower Limb Traction Unit	1	To be used for orthopedic operation by adjusting the table height and angle according to the operation method and the operation region, the patient can be placed at the most suitable position for ease and safety of the operation.
166	Paed. General Operating Instrument Set	Composition: Metzenbaum's scissors, Hager needle holder, Mosquito hemostatic forceps and other instrument set	2	This is a set of scalpels, scissors and forceps, used for general and emergency operation.
169	Paed. Tracheostomy Instrument Set	Composition: Metzenbaum's scissors, Hager needle holder, Mosquito hemostatic forceps, Wire cutter and other instrument set	3	This is a set of forceps and other instruments, used for Pediatric endotracheal operation.
171	Paed. Vertical Steam Sterilizer	•Capacity: 79L or more •Sterilizing Temperature: 135° or more •Steam generator: Incorporated •Water Softener : should be equipped	1	It is used for sterilizing and drying the surgical instruments.
172	Pediatric Cystoscope Set	•Telescope: 1.9mm, 0°, 25°, 30°, autoclavable •Small instrument for treatment •Illuminator	1	It is used for observation, diagnosis, and treatment of the urethra and bladder.
178	Percutaneous Nephroscope Set	•Nephroscope, Resectoscope and Electrosurgical unit •Other forceps	1	It is used for percutaneous observation and treatment of ureter, renal pelvis, etc.
182-1	Pneumatic Bone Drill for Neurosurgery	Composition: Main unit, Neurosurgical Craniotome and other attachment, Air Compressor Micro-motor speed: 80,000rpm or more	1	It is used for craniectomy and drilling for Neurosurgical operation.
182-2	Pneumatic Bone Drill for Orthopedic	Composition: Main unit, Orthopedic attachment, Air Compressor Micro-motor speed: 80,000rpm or more	1	It is used for Orthopedic surgery (for drilling and cutting).

Table 2-6 List of Main Equipment

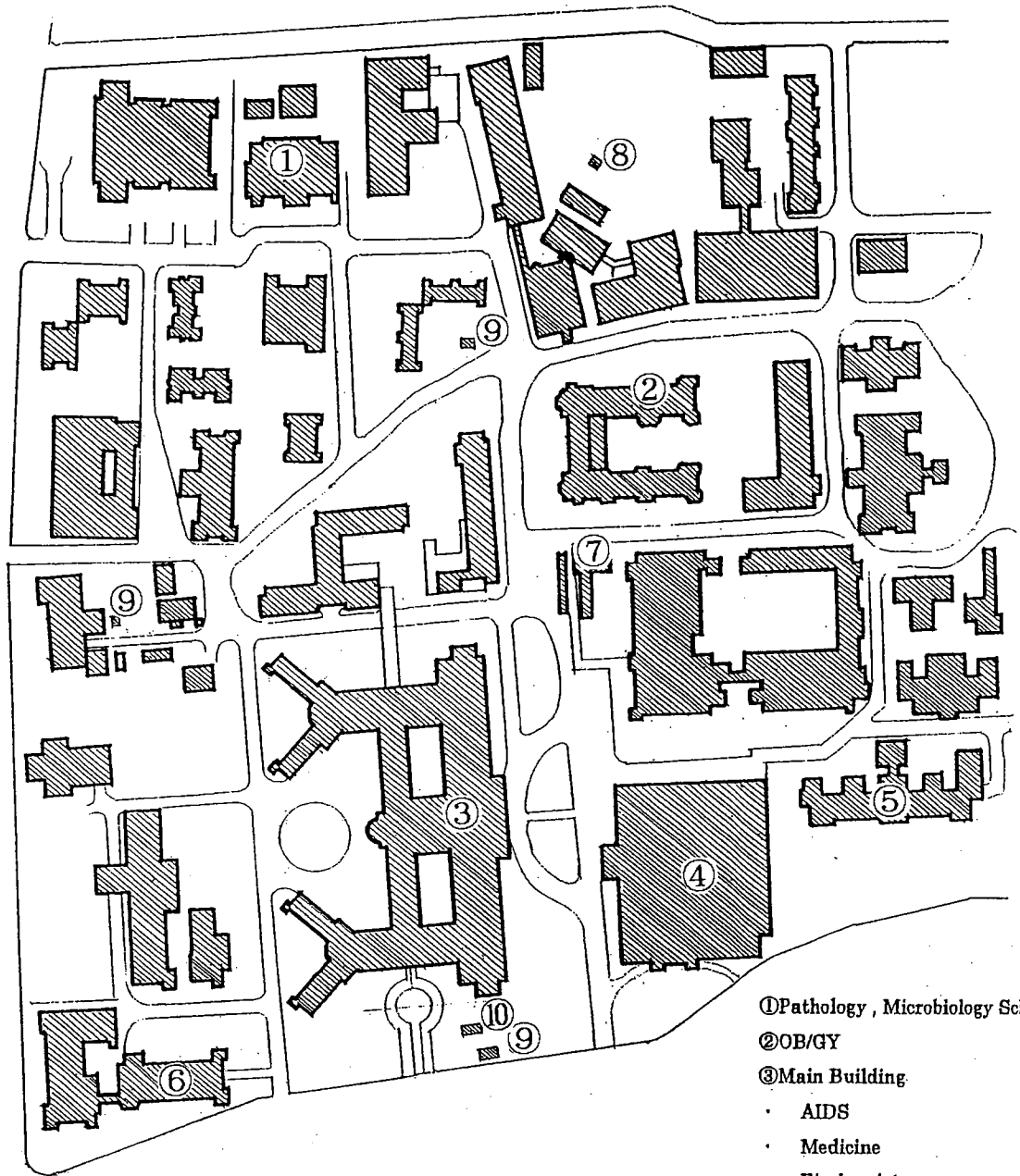
Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
185	Portable USG Machine	Method: Electronic scanning Display mode: B, M, B/M Monitor: 9-inch or more Black & white Concurrent Connection of Probes: 2 Probe: Convex, Linear and Transvaginal With B/W printer and cart	3	It is used for the diagnosis of pregnancy and progress in the obstetrics.
189	Refractometer	Automatically, Sphere: -18D~+22 D or wider Measuring range: max. 85mm or more Vertex Distance: should be selectable.	1	It is used to analyze eye condition (reflected ray from retinal).
204	Spectrophotometer	Measured wavelength range: 190~1000nm Spectral band weight: 5nm Accuracy: within 1nm Optical system: Single or Double beam system Equipped with Autosampler and sipper system	2	It is used for routine biochemical inspections (clinical examination).
211-1	Surgical X-ray C-arm TV System	Generator: High frequency inverter Current: 80mA or more Voltage: 40~110kV Image Intensifier: 6-inch Equipped with 2 TV-monitors	1	It is used for the orthopedic surgery, or emergency care (patient under surgical operation).
211-2	Surgical X-ray C-arm TV System with DSA	Generator: High frequency inverter Current: 80mA or more Voltage: 40~110kV or more Image Intensifier: 9-inch Equipped with 2 TV-monitors and DSA function	1	It is used for the orthopedic surgery, or emergency care (patient under surgical operation).
218-1	Ultrasound Machine Stational Type with Probes	Method: electronic scanning Display mode: B, M, B/M Monitor: 12-inch/black & white/200m function Concurrent Connection of probes: 2 Image Memory: should be provided Probe: Convex, Linear, Transvaginal Equipped with cart	1	It is used for diagnosis of pregnancy and the progress in Obstetrics.
218-2	Ultrasound Machine Colour Doppler	Method: electronic scanning Display mode: B, B/B, M, B/M, B/D, CFM(B)/PWD, THI, Power Monitor: 15-inch/Colour Concurrent Connection of probes: 3 Image Memory: should be provided Probe: Convex, Linear, Transvaginal With foot switch, cart and B/W printer	1	It is used for diagnosis of the patient, such as placental blood flow from mother to baby, intraventricular bleeding, acute venous thrombosis, venous embolism, arterial embolism, etc., by using colour doppler function.
226	Ventilator	Application: Adults Method: Volume limited or Pressure limited with compressor Ventilation mode: PSV, IPPV, SIMV, CPAP Tidal volume: 50~2,000ml or wider	5	It is used for respiratory control of a patient after an operation.

Table 2-6 List of Main Equipment

Equip. No.	Name of Equipment	Specifications	Q'ty	Applications
231	X-ray Protection Shields Set	<ul style="list-style-type: none"> • X-ray protective wall panel • X-ray Protective Steel Door • X-ray Protective Apron and Gloves 	1	This is an X-ray shielding set consisting of X-ray protective wall panel and door for preventing X-ray leakage to the outside.
232	X-ray Unit with Image Intensifiers	Max rating: 600mA or more X-ray tube: 2 tubes R/F table: (Table tilt: 90° / -15° or wider) With local TV monitor Image Intensifier: 9-inch	1	It is used to diagnose the affected part of the patient such as disease related to OB/GY, respiratory and digestive disorder.

(3) Allocation plan of the equipment

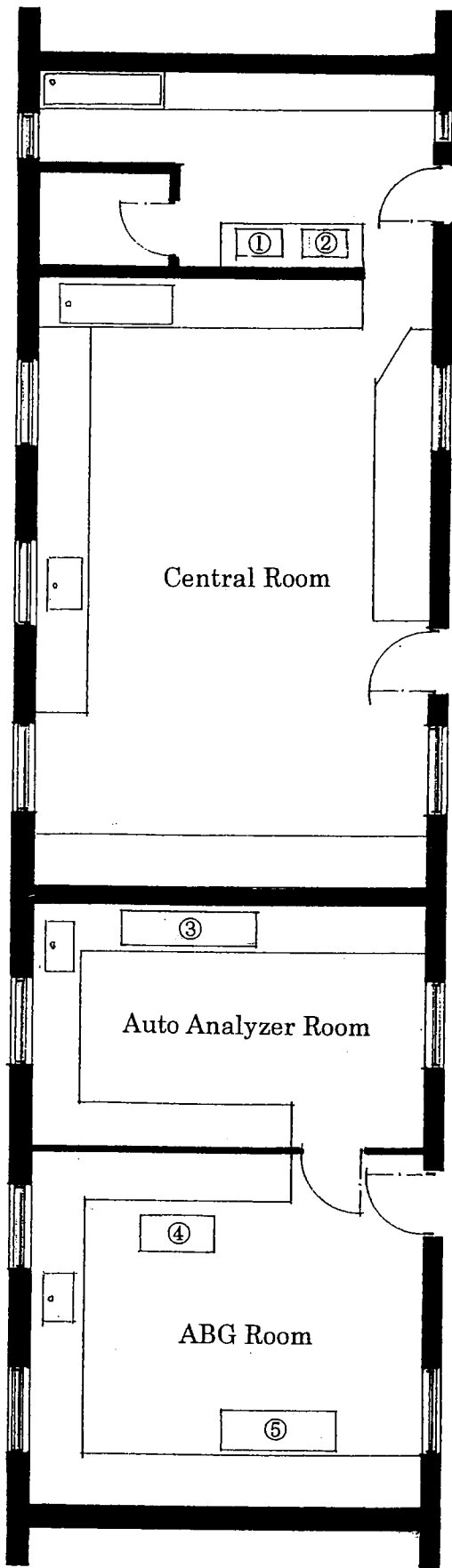
The building layout and the arrangement plan of the equipment that requires installation work are shown for each project facility as follows. The X-ray protective steel door and the X-ray protective materials for radiation shielding of the X-ray room of Cama and Albles Hospital shall be procured. The cost of workers for the installation work should be borne by the Indian side.



- ① Pathology , Microbiology Schools
- ② OB/GY
- ③ Main Building
 - AIDS
 - Medicine
 - Biochemistry
 - Neurosurgery
 - Physiotherapy
 - Orthopedic
- ④ OPD
- ⑤ Pediatric
- ⑥ Ophthalmology
- ⑦ Garage
- ⑧ Incinerator
- ⑨ Transformer
- ⑩ Generator

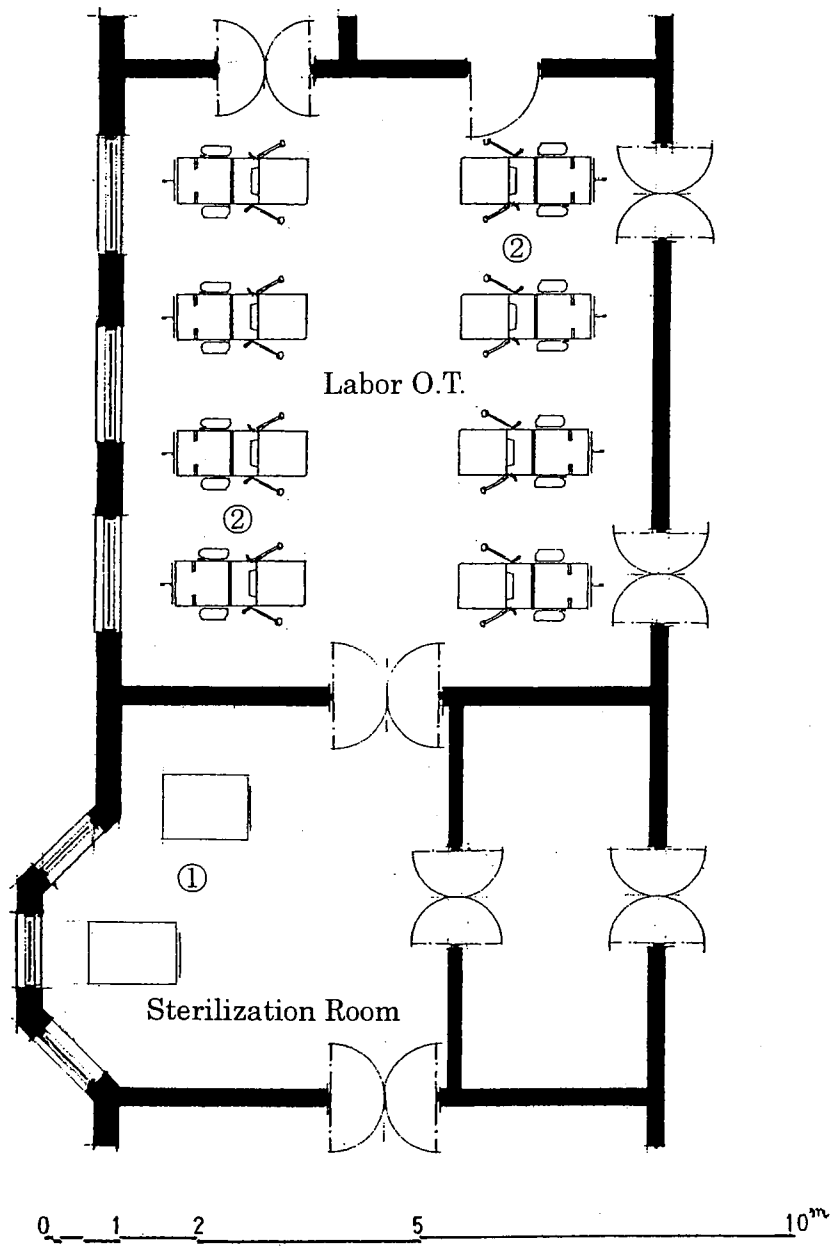
Sir J.J. Hospital

Site Plan



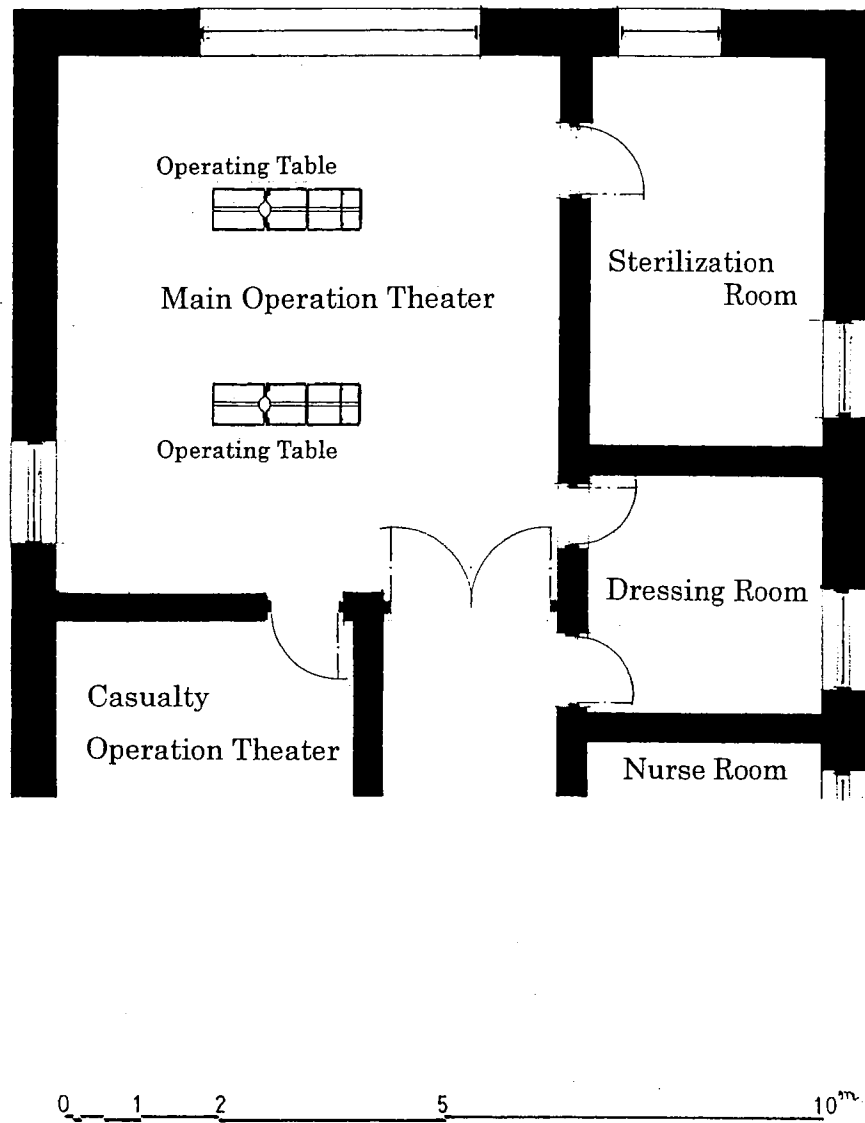
- ① Centrifuge
- ② Ultrasonic Cleaner
- ③ Chemistry Auto Analyzer
- ④ Refrigerator
- ⑤ Blood Gas Analyzer
(2 units)

0 1 2 5 10^m

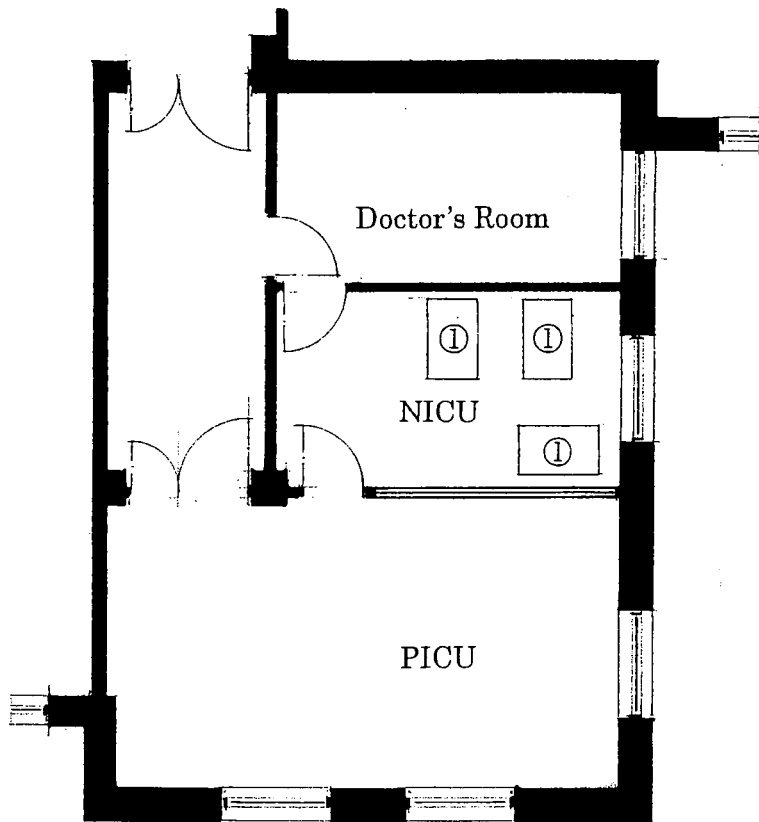


- ① Sterilizer
- ② Operating Table

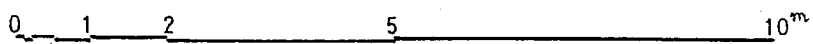
Sir J.J. Hospital
OB/GY Building

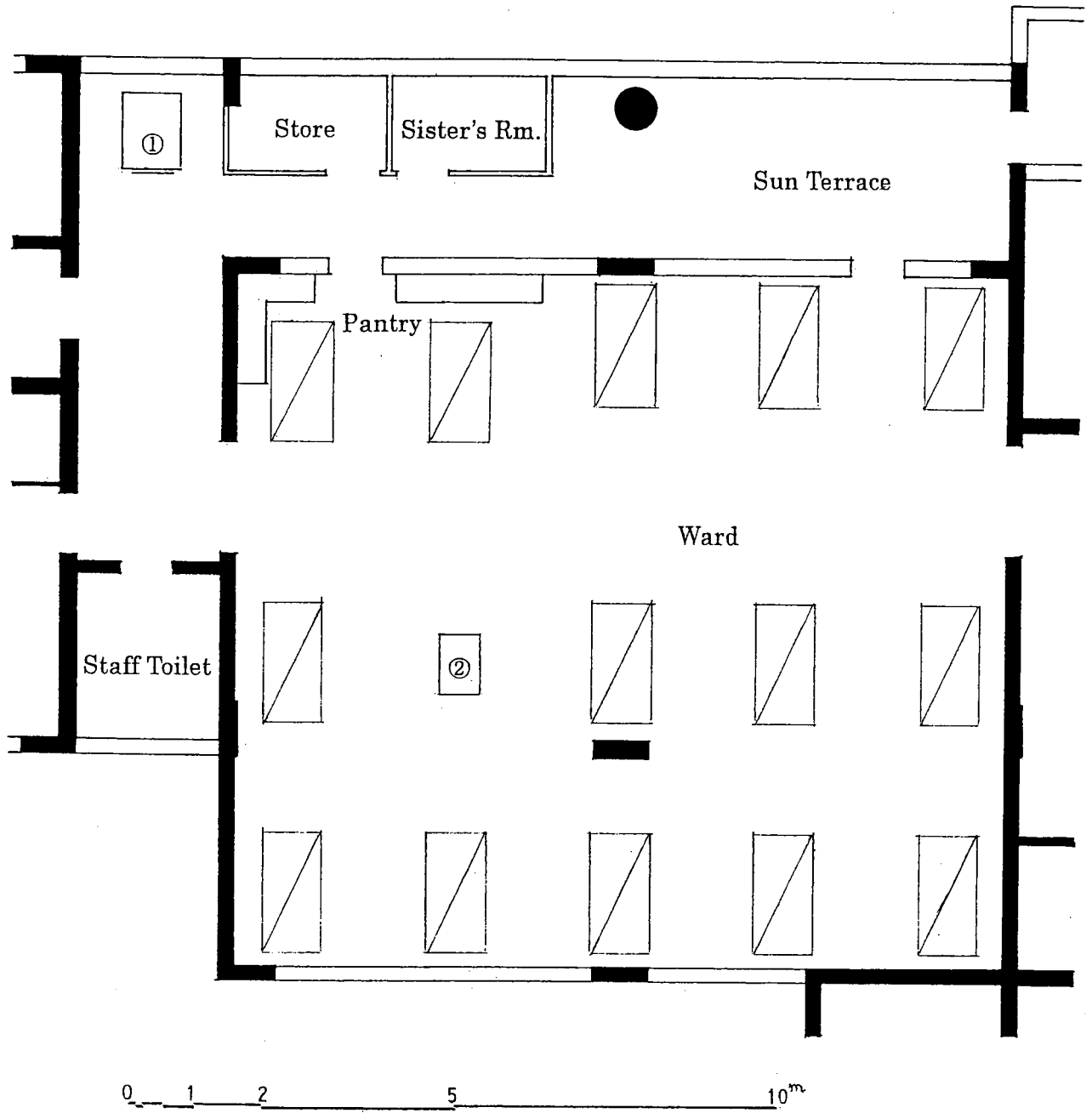


Sir J.J. Hospital
Pediatric Building (Pediatric Surgery)



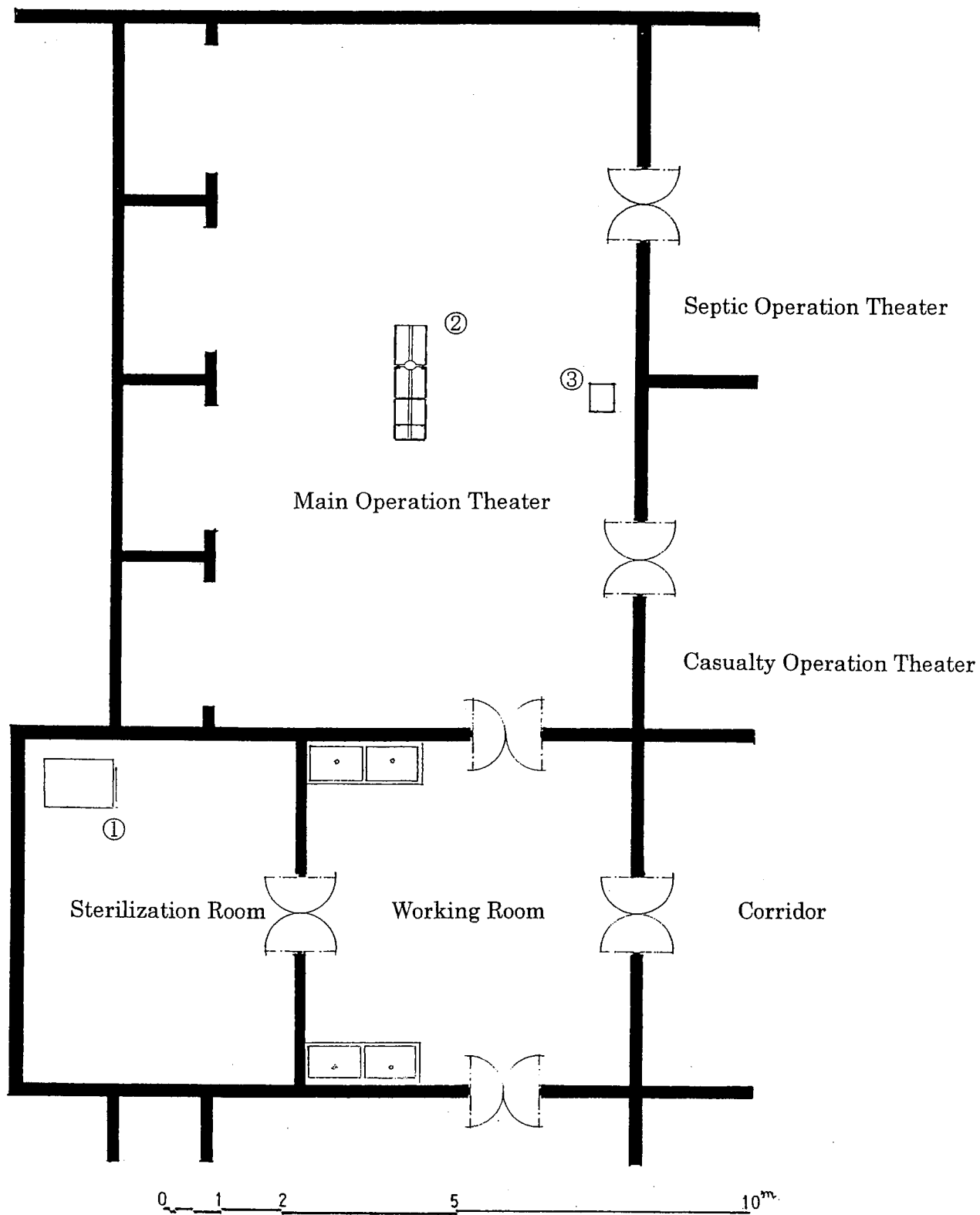
① Infant Warmer





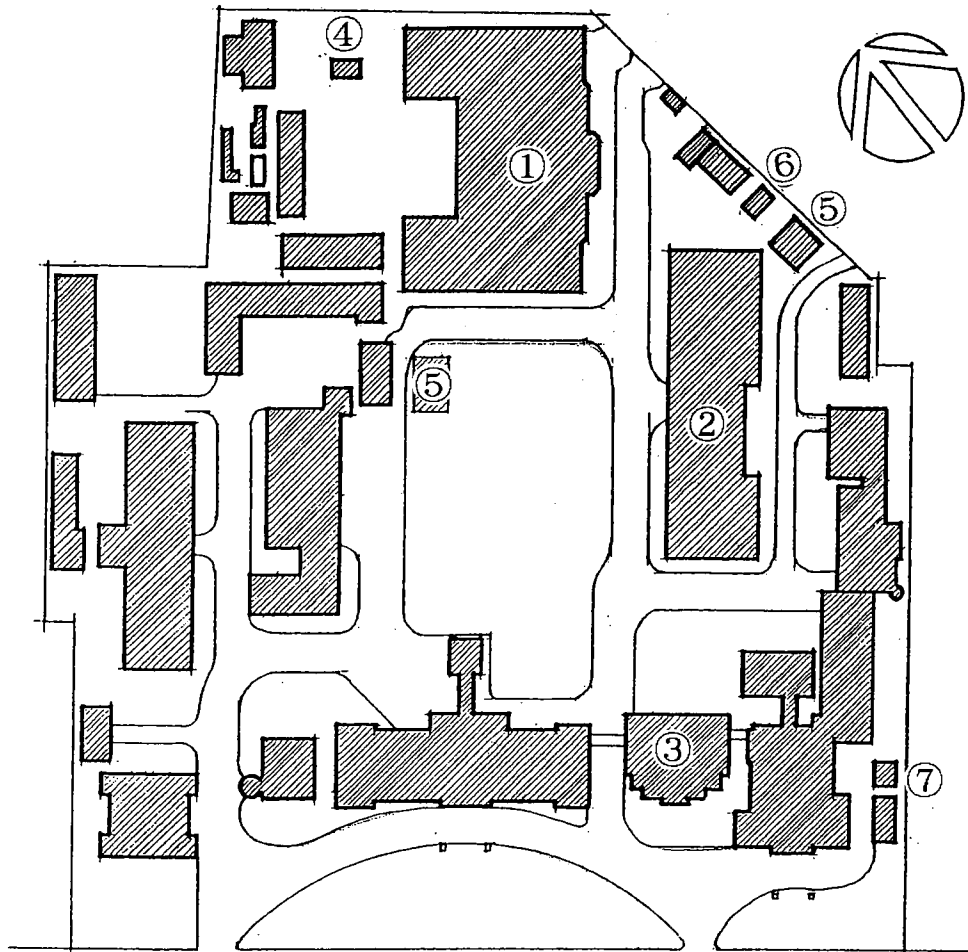
① Sterilizer
 ② Central Monitor

Sir J.J. Hospital 1F.
 AIDS unit



- ① Sterilizer
- ② Operating Table
- ③ Electrosurgical Unit

Sir J.J. Hospital 6F
Orthopedic O.T



①OPD

OB/GY

- Examination table for gynecology
- Colposcope
- Doppler Fetus Detector

Radiology Dept.

- X-ray unit with image intensifier
- Automatic film processor

②New Building

Sonography Room

- Ultrasound machine stationery type with probes

OB/GY

- High pressure steam sterilizer

Operation Theater

- Laparoscope set
- ICU Bed
- Cystofiber scope
- Anesthesia apparatus

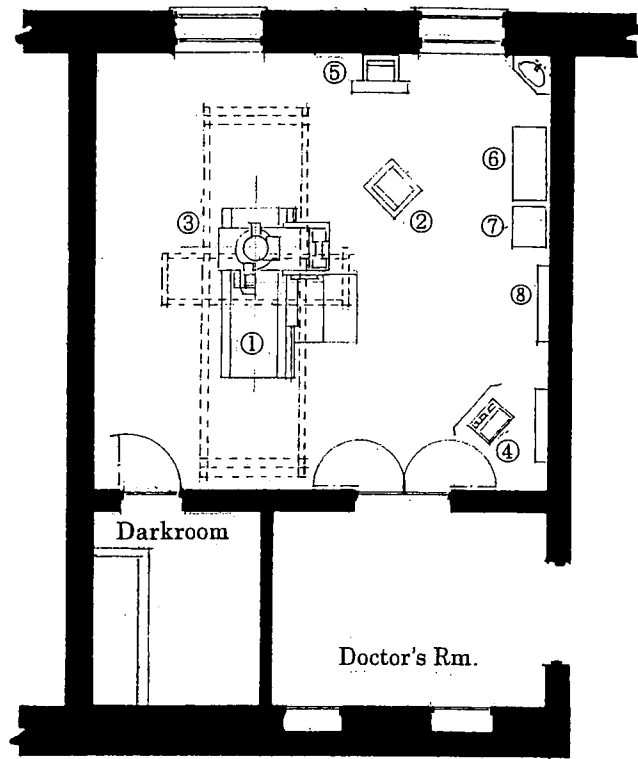
③Administration Bldg.

④Incinerator

⑤Reservoir

⑥Transformer

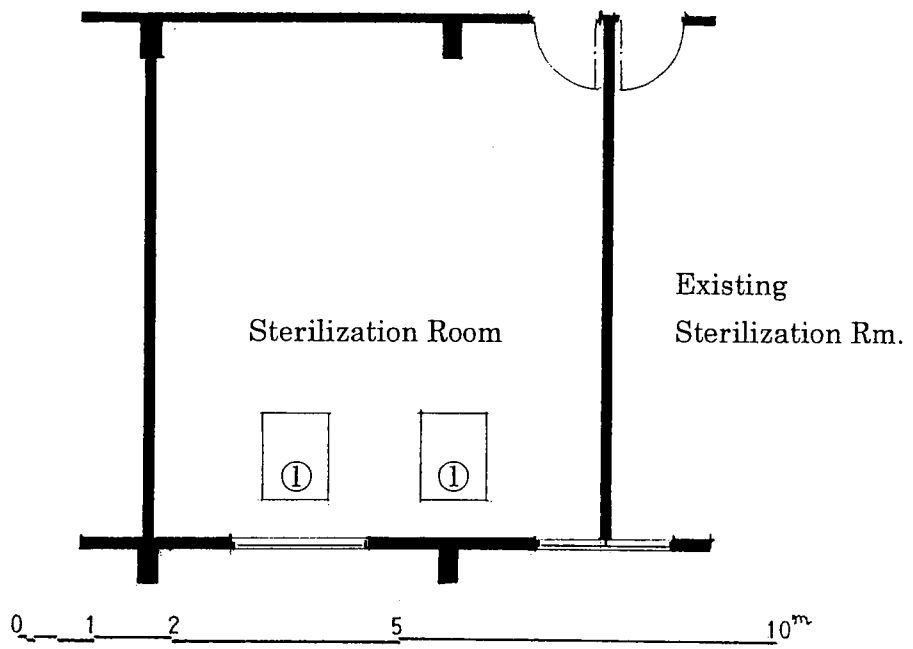
⑦Generator



0 1 2 5 10^m

- ① Diagnostic table
- ② TV monitor and cart
- ③ X-ray tubs support
- ④ X-ray control console
- ⑤ Vertical Bucky stand
- ⑥ X-ray control cabinet
- ⑦ System cabinet
- ⑧ Power distributor

Cama & Albles Hospital
X-ray Room



① Sterilizer

Cama & Albles Hospital
New Building Ground Floor
Sterilization Rm.

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

This project shall be implemented officially in accordance with the Grant Aid framework of the Government of Japan after approval by both the Japanese and Indian governments and conclusion of the Exchange of Notes (E/N). Before implementation, a consultant who is a Japanese corporation representative is selected by the Indian side, and the consultant shall commence work for approval of tender documents for the equipment procurement. After completion of the tender documents, tenders are invited. A Japanese trading company, selected as a result of the tender, shall implement the actual work of procurement, distribution and installation of the equipment. The consultant agreement and the supply contract shall come into effect after verification by the Government of Japan.

This project should be carried out in accordance with Japan's Grant Aid scheme. The implementation plan of this project is elaborated considering the following points.

- (1) The work schedule should be confirmed by both the Japanese and Indian staff in charge. Both sides should clarify the scope of the works and the starting and completion dates of each task in order to avoid confusion over mutual tasks.
- (2) In order to shorten the work period as much as possible, the consultant and the supplier should investigate the project facilities by 2 months before installation of the equipment. They should also check the delivery routes, power supply, water supply, and drainage, and they should prepare a bring-in schedule.
- (3) It is expected to take about 2.4 months for installation and hand-over.
- (4) For equipment requiring technical support (X-ray units, automatic biochemical analyzers, ultrasound machines, high-pressure steam sterilizers, etc.), instruction for operation shall be given by the sales engineer of each equipment manufacturer or the authorized agent.
- (5) For equipment to be procured from Japan, instruction for operation shall be given by a Japanese engineer or the sales engineer (of the authorized agent) specializing in electronic medical equipment or general medical equipment.

2-2-4-2 Implementation Conditions

The project facilities are the medical facilities currently under operation. Considering this situation, the implementation schedule should not disturb their daily activities. Meetings should be held with the project facilities about the distribution plan of the equipment to confirm the schedule of carrying in, the delivery routes, and the distribution of the equipment.

2-2-4-3 Scope of Works

The scope of responsibility of the Japanese side in accordance with the Grant Aid Scheme of this project covers procurement and subsequent distribution of the medical equipment to the 2 project facilities. The scope is limited to those described below.

- ① The equipment shown in the aforementioned equipment list
- ② The expenses for ocean transport, land transport and inland transport to the project facilities
- ③ The expenses for installation of the equipment (expenses for dispatching engineers, local workers, tools and measuring instruments)
- ④ The expenses for setting-up, the test-run, and the expenses for guidance on operation, inspection and maintenance management, for all the equipment to be procured
- ⑤ Technical assistance for re-organizing the maintenance management system by the Soft Component

2-2-4-4 Consultant Supervision

(1) Implementation system

This project shall be implemented by the following 4 parties.

① Project-implementing bodies

The observatory agency is the Ministry of Health and Family Welfare of the Government of India. The responsible agency is the Medical Education & Drugs Department, the Government of Maharashtra. The implementing bodies are the 2 medical facilities. The Secretary of the Medical Education & Drugs Department, the Government of Maharashtra, enters into actual business for this project.

② Consultant

Since this project is implemented under Japan's Grant Aid Program, it is stipulated by rule that a Japanese consultant gives instructions, advises and coordinates from a fair standpoint throughout the tender and the implementation, according to the agreement with the responsible agency of India. In addition, the consultant performs necessary work for smooth implementation of the project. The specific tasks are as follows.

● Approval of tender document

Preparation of tender documents for procurement of equipment (documents of tender conditions, equipment specifications, and budget report)

● Promotion of tender and supply contract

Decision on supply contract system, preparation of a draft of the supply

contract, content analysis of the report on equipment installation work, and selection of a supplier (public announcement of tender, tender evaluation, contract negotiation, and contract witnessing)

● Inspection and approval of the working plan

Inspection and approval of the equipment specifications and the working procedure submitted by the supplier

● Report on work progress

Supervision of progress of work execution, and report on the progress to the project-implementing bodies and related organizations

● Cooperation in approval procedures for payment

Content analysis of the bills relating to the remuneration to be paid after shipment, and cooperation in these procedures

● Consulting work

Witnessing of various works from the beginning through to completion of the project

● Technical assistance for the maintenance management (Soft Component)

Guidance on re-organization of the maintenance management system of the equipment, and re-organization of the on-call maintenance system in case of defect, according to the results of examination of the problems of the current maintenance system

③ Supplier

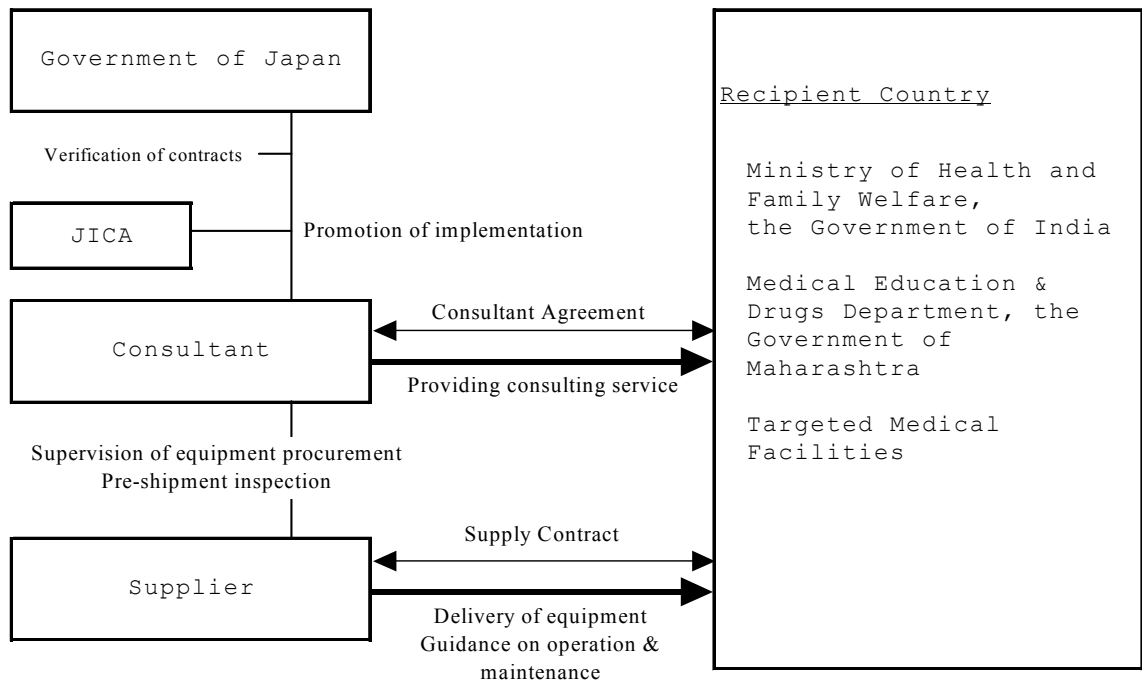
The procurement of equipment shall be implemented by the Japanese supplier (trading company) who makes a successful bid. The supplier, based upon the contract with the Indian side, is responsible for the manufacture, supply, delivery, and set-up of the equipment, and gives instructions for equipment operation and maintenance to the Indian side before hand-over.

④ Japan International Cooperation Agency (JICA)

JICA instructs the consultant so that this project may be implemented properly in accordance with Japan's Grant Aid scheme. Moreover, JICA consults with the project implementing bodies to further the project if necessary.

The following is a flow chart of the implementation system.

Implementation Flow Chart



(2) Implementation design and supervision

The consultant, based on the agreement with the Indian side, performs implementation design and supervision of the project. In the implementation design, detailed specifications of the equipment are determined based on the basic design study, and the tender documents are prepared comprising these specifications, tender conditions and a draft of the supply contract, etc.

"Supervision" indicates assuring that the work of the supplier is implemented in accordance with the contract, fairly giving instructions and advice, and coordinating to promote the project.

① Stage of implementation design

Preparation of tender documents, preparation for tender, and execution of contract documents

② Stage of tender

Prior screening of the qualifications of the prospective tenderer, opening of tender, evaluation of tender, and conclusion of contract

③ Technical assistance

Re-organization of the maintenance management system by the Soft Component

④ Stage of work execution

Supervision of work execution (inspection and approval of equipment specifications; supervision of shipment, ocean transport, and inland transport; instruction and supervision of installation; and supervision of work to be borne by the recipient country), report on work progress, and issuance of certificates (upon confirming that the equipment installation is completed and the contract conditions are complied with, the consultant witnesses the hand-over of the equipment and completes his/her duty by obtaining acknowledgement of receipt of the equipment from the Indian side)

In addition to the above-mentioned work, the consultant reports on the work progress, payment procedures, completion of delivery, etc., to those concerned of the Government of Japan.

(3) Personnel plan

Those engaged in the consulting work for the implementation design and supervision of the work execution are as follows.

- Project Manager (Japanese consultant): 1 person
- Medical Equipment Planner I (Japanese consultant): 1 person
- Medical Equipment Planner II (Japanese consultant): 1 person
- Maintenance Management Planner (Japanese consultant): 1 person
(Engineer in Soft Component)
- Maintenance System Planner (Japanese consultant): 1 person
(Engineer in Soft Component)

2-2-4-5 Procurement Plan

(1) Procurement of equipment

The equipment to be procured in this project shall be restricted to that procured from Japan or India defined in the E/N. The equipment is selected considering the reliability of the delivery schedule and the appropriateness of procurement costs.

The equipment to which the following conditions apply shall be procured from a third country.

- ① The equipment to be procured is not manufactured in Japan.
- ② While the equipment is manufactured in Japan, competitiveness is not expected in tender, and the fairness of tender may not be secured by restricting the procurement source to Japan.
- ③ If the equipment is restricted to a Japanese product, the transportation costs are very expensive, lessening the effect of aid. Alternatively, the equipment

manufacturer and the local agent do not have their own maintenance network, and the equipment cannot be maintained properly. This may lessen the effect of the project.

- ④ There are unavoidable circumstances, such as urgency of procurement.

(2) Transportation of the equipment

The equipment to be procured from foreign countries shall be transported by sea to the port of Mumbai in India. After all shipments pass customs at this port, they are then transported to each project facility by land. In order to avoid miscarriage, the equipment shall be packed in wooden cases or a container at the site.

2-2-4-6 Implementation Schedule

(1) Implementing process

When this project is approved in the Cabinet meeting of the Government of Japan, and the Exchange of Notes (E/N) is concluded between both countries, the project shall be conducted according to the following procedures.

1. Conclusion of the Exchange of Notes between both relevant governments
2. Conclusion of agreement between the responsible agency and a bank in Japan on payment of Japan's Grant Aid for implementation of this project (Banking Arrangement; B/A)
3. Conclusion of the consultant agreement between the responsible agency and the consultant of Japanese nationality
4. Issuance of the Authorization to Pay (A/P) by the responsible agency according to the consultant contract
5. Verification of the above contract by the Government of Japan
6. Preparation of tender documents by the consultant
7. Approval of tender documents by the responsible agency, and preparation for tendering by the consultant
8. Implementation of tender, and assessment of tender
9. Conclusion of supply contract between the responsible agency and the Japanese supplier
10. Verification of the above contract by the Government of Japan
11. Issuance of the Authorization to Pay (A/P) by the responsible agency according to the supply contract
12. Implementation of the primary stage of the Soft Component by the consultant for the maintenance management of existing equipment as a rehearsal
13. Approval to manufacture of equipment, and approval of the working plan (The consultant examines and approves the equipment specifications submitted by the supplier, provides necessary instruction, and coordinates for smooth implementation of the project by maintaining close contact with

- the Medical Education & Drugs Department, the Government of Maharashtra.)
14. Witnessing for equipment inspection
(The consultant witnesses factory inspection before shipment, if necessary, and approves the inspection on behalf of the Medical Education & Drugs Department, the Government of Maharashtra.)
 15. Pre-installation conditions, distribution plan of the equipment, and adjustment of the work schedule
 16. Supervision of work execution
(In accordance with the contract, the consultant, as the proxy of the Medical Education & Drugs Department, the Government of Maharashtra, conducts examination and approval of equipment specifications, examination and approval of equipment, supervision and instruction of inland-transport, and supervision of works covered by the recipient country.)
 17. Progress control
(The consultant supervises work progress, and gives necessary instruction to the supplier so that the supply contract may be completed within the period stated in the Exchange of Notes.)
 18. Implementation of the secondary stage of the Soft Component by the consultant for the maintenance management of purchased equipment in this project
 19. Complete survey and test run
(The consultant performs a final inspection and test-run of the equipment to be procured, confirms that the performance is as described in the specifications, and submits a certificate of completion of inspection to the Medical Education & Drugs Department, the Government of Maharashtra.)
 20. Hand-over of the equipment
 21. Implementation of the tertiary stage of the Soft Component (monitoring) by the consultant for the maintenance management
 22. Completion of the project

(2) Period of implementation

After conclusion of the Exchange of Notes, the period required for each task on the Japanese side is as follows.

Table 2-7 Period of Implementation and Content of Work

Content of Work	Work Period
1. Confirmation of draft of tender documents	1.0
2. Approval of tender documents	0.7
3. Tendering, conclusion of contract, and verification	2.8
4. Manufacture of equipment	4.5
5. Delivery	1.5
6. Installation (including test-run, adjustment, operator training, guidance on maintenance management,	0.9
7. Soft Component	2.5

The work progress chart is as follows.

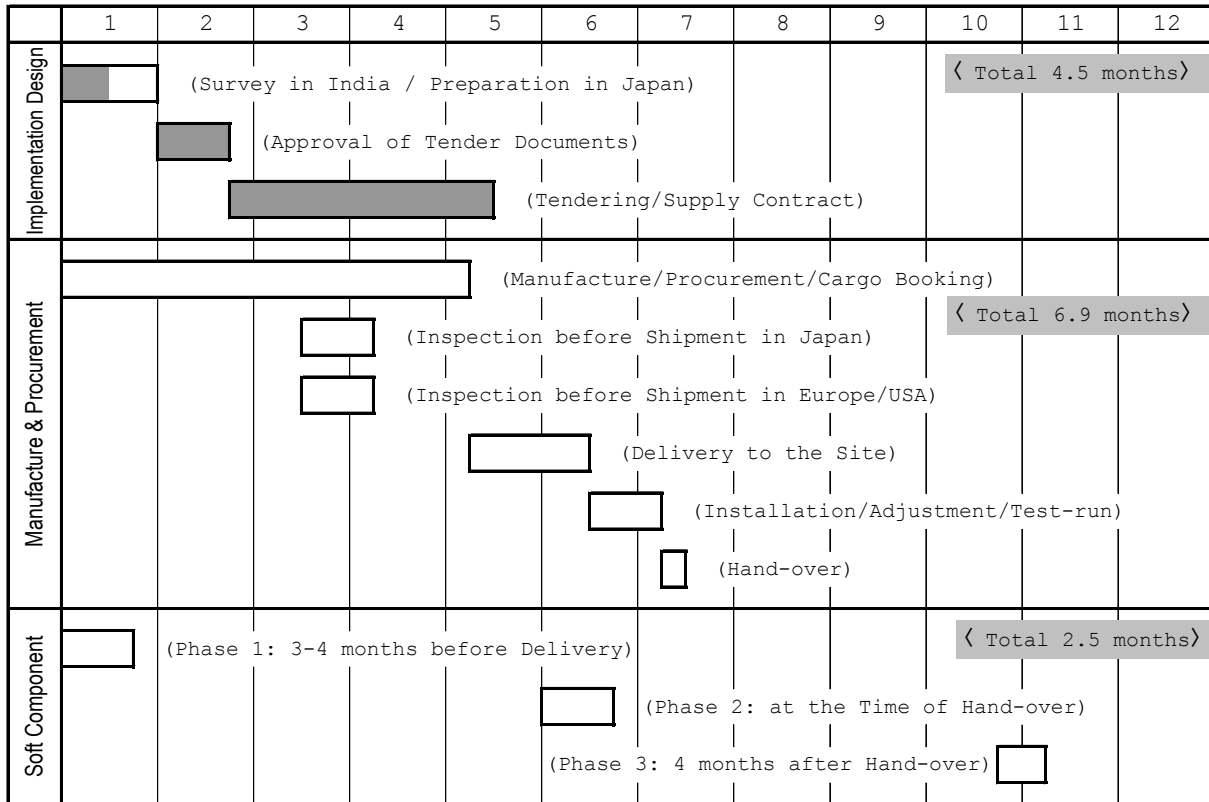


Figure 2-1 Work Execution

2-3 Obligations of the Recipient Country

For the implementation of this project, the Indian side is required to undertake the following measures:

Items to be covered by the Indian side are as follows.

- (1) During the implementation period of the project, the Maharashtra side should find a place to be used as a temporary office in each designated facility for this project.
- (2) The peripheral conditions (supply of electricity, water supply, drainage, and other facilities) necessary for this project should be prepared and supplied before distribution of the equipment. In addition, the existing equipment should be removed from the places where the new equipment will be installed before the distribution.
- (3) The equipment imported for this project should be unloaded without delay, and necessary measures for customs clearance and inland transportation of the equipment should be taken.
- (4) Payment of customs duties and other taxes should be exempted for the Japanese nationals who stay in India to fulfill their mission in this project. Tax exemption certificates should be arranged before arrival of containers at Mumbai seaport.
- (5) For the Japanese nationals who participate in the supply of the necessary equipment and who participate in implementation of this project, necessary conveniences for their stay in India should be provided and sufficient consideration made for their security.
- (6) In accordance with the Banking Arrangement, the Indian side should pay the banking commission and commission for the issuance of the Authorization to Pay into the authorized bank in Japan.
- (7) The equipment to be procured under the Grant Aid should be maintained properly and used effectively. For this purpose, the necessary budget and personnel should be secured.
- (8) The Maharashtra side should bear the cost of installation of air conditioners and dehumidifiers for Sir J.J. Hospital, the cost of workers for shielding work in the X-ray room, and the cost of installation of air conditioners for Cama and Albless Hospital. The shielding materials are included in the procurement list of this project.
- (9) The equipment to be procured under the Grant Aid should be maintained properly and used effectively. For this purpose, the condition of the equipment should be regularly reported to the Government of Japan.
- (10) For implementation of this project, all expenses other than those covered by Japan's Grant Aid should be borne by the Indian side.

- Expenses borne by the Maharashtra side

Table 2-8 Cost of shielding work for X-ray Room

Hospital	Amount	
	J. Yen	Indian Rupee
Cama & Albless Hospital	85,050	31,500

Table 2-9 Cost for distribution of Air Conditioner and Dehumidifier

Hospital	Amount	
	J. Yen	Indian Rupee
Sir J.J. Hospital		
Ultrasound Rm.	50,000	18,500
Laboratory Rm.	50,000	18,500
Cama & Albless Hospital		
X-ray Rm.	50,000	18,500
Total	150,000	55,500

2-4 Project Operation Plan

In this project, procurement of all equipment is made as renewal or supplementation of the equipment that is now in service at the project facilities. Therefore, it is judged that there will be no problems in the maintenance management. It is necessary to allocate sufficient budget for the maintenance of the following equipment. To maintain the long-term good condition of this equipment, it is essential to conclude a maintenance contract with a local agent annually with each equipment manufacturer. It is recommended that each project facility secures the budget for these contracts.

Table 2-10 Cost of Maintenance Service Contract

Sir J.J. Hospital

Description	Q'ty	Maintenance Service Contract	Contract Condition	Contract Amount/Year
Biochemistry Auto-Analyzer	1	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥150,000
Portable Ultrasound Machine	1	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥120,000
Ultrasound Machine	1	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥250,000
Mobile X-Ray Unit	2	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥200,000
X-Ray TV C-arm Machine	2	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥400,000
TOTAL				¥1,120,000

(About 414,800 Rupee)

Cama & Albless Hospital

Description	Q'ty	Maintenance Service Contract	Contract Condition	Contract Amount/Year
Portable Ultrasound Machine	2	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥240,000
Ultrasound Scanner	1	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥250,000
Mobile X-Ray Unit	1	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥100,000
X-ray Unit with Image Intensifiers	1	Periodrical maintenance every 6 months including on-call services	Engineering fee only	¥450,000
TOTAL				¥1,040,000

(About 385,000 Rupees)

● Operating and Maintenance Cost

In order to make up for a deficiency in the medical equipment in the project facilities, certain equivalent equipment is newly procured in this project. The purchase of spare parts and consumables is necessary to run this equipment. Each

project facility is required to secure these costs. Additional operating and maintenance costs are listed below.

Table 2-11 Cost Estimation Additionally Required for Operation and Maintenance

Hospital	Additionally required Operation and Maintenance Cost for Replaced Equipment under the Project	
	J. Yen	Indian Rup. (Million)
Sir J.J. Hospital	3,140,000	1.16
Cama & Albles Hospital	1,305,000	0.48
Total	4,445,000	1.64

Source: Data from the Ministry of Family Welfare

The budget of the Ministry of Health and Family Welfare, the Government of Maharashtra (hereinafter "the Ministry") was 48,820 million yen (18,100 million rupees) in 2002. Newly required maintenance costs after implementation of the project will be about 4.45 million yen (1.64 million rupees), which is only 0.091% of the total budget.

The maintenance cost of both project facilities is about 24.57 million yen (9.1 million rupees) in the current year. The Ministry of Health and Family Welfare, the Government of Maharashtra, has found new meaning in the maintenance management of the equipment. The Ministry has decided to appropriate 121.5 million yen (45 million rupees) for the entire Grant Medical College from Fiscal Year 2004. Over 45% (55 million yen/20.3 million rupees) of the budget goes to both project facilities. Considering the annual inflation rate of 4% (2000~2001), the budgetary appropriation to the project facilities has been increased by 90% or more.

Accordingly, it seems possible for the Maharashtra side to defray the allocation for increase of the maintenance cost with the equipment procurement.

All income from the user charges should go towards the business expenses of the project facilities. (Business expenses include the maintenance cost of equipment, the purchase cost of consumables, etc.) The performance results from the user charges for Fiscal Year 2002 are about 80 million yen (about 29.5 million rupees) at Sir J.J. Hospital and about 8.77 million yen (about 3.25 million rupees) at Cama and Albles Hospital. If the project facilities are well equipped through this project, and medical examinees increase as a result, it will enable these hospitals to secure funds for facility management, including maintenance costs for procured equipment.

2-5 Soft Component

The scope of service is as follows.

(1) Necessity of Introduction of a Soft Component and its Problems

This Soft Component is designed to reveal the necessity for maintenance management of the equipment, and to support the re-organization of the maintenance management system. In the project facilities, equipment control is now conducted separately at the central administrative department and at each site. In the Administrative Department, the placement, amount, and type of model are recorded for each item of equipment in the master equipment register. On the site, the type of model, date of acceptance and repair records are written down in the sub equipment register. The following problems are indicated in the current maintenance management system.

A. Difficulty in communication

The Administrative Department cannot grasp the operating conditions of the equipment, and the equipment operators on the site do not know about the operation and repair of the inquiry system.

B. Complicated procedures for maintenance

While there is a maintenance network in case of machine problems, maintenance requests from equipment operators on the site must pass through several stages to reach the maintenance department. Therefore, it is difficult for the HERM (Hospital Equipment Repair & Management) Department to react swiftly to requests.

C. Lack of maintenance techniques

There are some intermediate electricians in the Maintenance Department. Due to insufficiency of tools as well as knowledge, equipment is often defective and requires considerable downtime.

Therefore, it takes long from breakdown to rerun the equipment, and medical activity is remarkably stagnant. In order to resolve these problems, it is important to support re-organization into a smooth equipment control system in the hospitals by ① centralization of an equipment control system through a computer, and ② education and technical assistance for the maintenance management system to the equipment operators on the site and the HERM engineers through workshops.

(2) Expected outcome from the introduction of a Soft Component

Equipment control is now conducted at the level of section/department/equipment operator (on the site). This Soft Component shall be introduced aiming at improvement of this system on the service side and the

equipment side, so that the medical equipment, including that to be procured in this project, can be used and kept in long-term good condition. The results of the introduction of a Soft Component will be as follows.

1. The data in the equipment registers will be processed using a computer, enabling the centralized control of the equipment. It will also facilitate information management (operating conditions and repair records), and the priority scheduling of maintenance requests.
2. The equipment operators on the site will widen their knowledge of the operation of the medical equipment, and a routine maintenance system will be established to keep the equipment in good condition for a long time. Moreover, this will clarify where the responsibility lies for each item of equipment.
3. Technology transfer concerning maintenance will contribute to improvement of the maintenance techniques of the engineers in HERM of the hospitals. For equipment that has received maintenance service from outside agents, part of the maintenance will be conducted by hospital personnel.
4. An on-call maintenance system will be established. This will contribute to shortening the downtime of equipment, and lead to effective hospital administration.

The concept of a comprehensive approach to re-organizing the equipment maintenance system with the Soft Component is shown below.

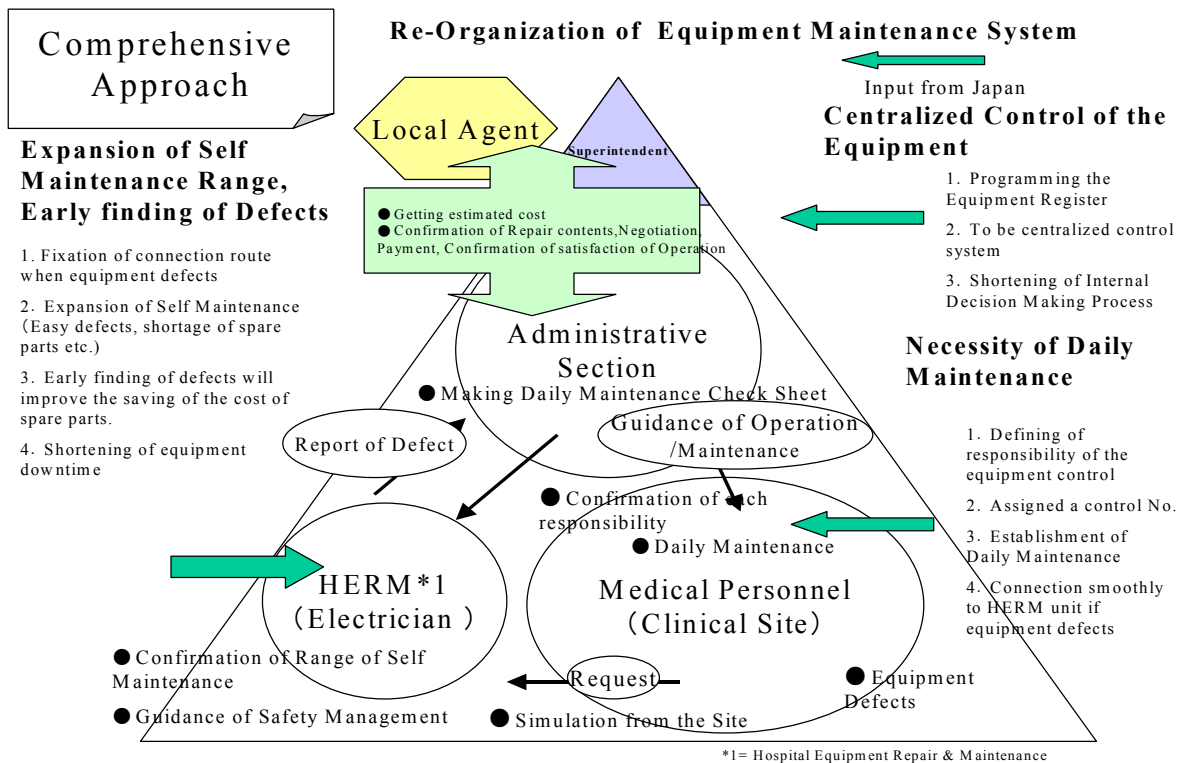


Figure 2-2 Concept of Equipment Maintenance System

(3) Contents and scale of activity

1) Contents of activity

This Soft Component is designed to support ① the establishment of a system that enables the centralized control of the equipment by computer, and ② technical sustaining and development on the Indian side for the maintenance management of the equipment by infiltration of such system that the equipment is controlled and maintained in cooperation between the HERM engineers and the equipment operators on the site. The details of the system are as follows.

A. The equipment control system:

The equipment register is computerized. Sufficient problem analysis is conducted by holding workshops for the equipment operators on the site and the HERM engineers before guidance on programming a suitable equipment register.

- Change of the equipment control system from the existing system in which the equipment registers are controlled by the administrative department and by each section to a centralized control system
- Guidance on programming methods for the equipment register using a computer
- Guidance on registering methods in case of renewal of equipment (how to contact the manufacturer or the local agent)

B. The maintenance management system:

Lectures are given on the equipment control system (on the importance of maintenance management, etc.) through workshops on each site (operating theatre, ICU and delivery room). The workshop participants are to be doctors in charge, nurses, paramedical staff (those in charge of maintenance), and HERM engineers. In the secondary stage of the Soft Component on arrival of the equipment, lectures are given on the equipment control system along with operating instructions and training by the sales engineer(s).

- Responsibility for equipment control lies with the paramedical staff in charge of the maintenance of each device.
- Each device is assigned a control number.
- A person in charge of its operation is assigned to each item of equipment and in each department.
- Suggestions are made for adopting a system in which the user records the condition of the equipment (whether there is a problem with the machine) on a checklist before operation (the pre-service checklist).
- A network system is established, so that machine failure is reported to the person in charge of maintenance through the established route.

- A channel for maintenance requests is fixed from the equipment operator to the person in charge of maintenance.
- The person in charge of maintenance hastens to the site with notification of the machine problem, and judges if it can be repaired by himself/herself. An on-call maintenance system is established for when the case cannot be dealt with by personnel in the hospital.
- The person in charge of maintenance grasps the operating condition by checking the equipment register.

2) Implementation policy (Input from the Japanese side)

This Soft Component is phased in by dividing it into three stages.

The primary stage of the Soft Component is implemented 3~4 months before the arrival of equipment, so that the equipment control system can smoothly take effect. It is placed as a startup (rehearsal) to deepen penetration and understanding of the system in the hospitals.

The secondary stage of the Soft Component concerns technical assistance. The contents of the lectures given in the primary stage come under review to re-organize the equipment control system.

The tertiary stage of the Soft Component concerns monitoring to confirm the primary and secondary stages and final technical assistance.

3) Period of and personnel for the research

[Period]

- Primary Research (January 2004, planned)
Engineer A: approx. 4 weeks, Engineer B: approx. 3 weeks
- Secondary Research (June 2004, planned)
Engineer A: approx. 4 weeks, Engineer B: approx. 3 weeks
- Tertiary Research (November 2004, planned)
Engineer A: approx. 2 weeks

[Personnel]

- Engineer A in charge of the maintenance management plan
- Engineer B in charge of the maintenance system plan

(4) Implementation method

1. The primary stage (before equipment delivery):

The control system is established, and a channel for maintenance requests is clarified in the maintenance network system. The object is narrowed down to the existing equipment.

- To discuss the problems of the current maintenance management system and

their solutions, to ensure that they are commonly recognized, and to make a baseline assessment of the current maintenance system

- To hold workshops in order to broaden the coverage of the system for the entire equipment of each hospital.
- To give a control number to each item of existing equipment, to register it, and to stick a control number label on the equipment
- To make a maintenance checklist and distribute it to each department
- To clarify the person in charge of each item of equipment, and to stick a label of the name of this person on the equipment

⊙ Expected Outcome;

- Recognition of each responsibility
- Re-organization the maintenance network system
- A trial run of the maintenance management system

2. The secondary stage (on arrival of the equipment):

Confirmation is sought of the penetration of the activities practiced in the primary stage of the Soft Component, and these activities are reviewed. A maintenance management system is established for the equipment to be procured in this project.

- To make a list of all the equipment to be procured in this project, and to confirm how and where the consumables and parts can be procured
- To directly computerize the equipment registering system
- To make a simulation experiment and conduct practical training using the equipment registering system (such as access to the repair records)
- To check the stability of the duty allotment to each item of equipment and to modify it if necessary
- To review and give a final lecture on the approach to the equipment control system and the maintenance management system
- To establish a safety management system for the medical equipment

⊙ Expected Outcome:

- Adaptation of the equipment to be procured to the maintenance management system
- Full-scale operation of the system

3. The tertiary stage (4 months after equipment delivery):

Confirmation and monitoring are conducted of the effect of the primary and secondary stages of the Soft Component.

- To confirm the repair records with the equipment control system and to conduct a follow-up survey

- To confirm the contents of the pre-service checklist and the routine checklist (examination of the checklists at every section, and guidance on problems)
 - To make a simulation experiment of the maintenance request system, and to make an assessment of the achievements
 - Generalization:
 - To discuss the effects and the problems after the system is introduced with the heads of every department, and to submit a report on the implementation of the Soft Component
- ◎ Expected Outcome:
- Discovery of and solution to problems
 - Completion of the maintenance management system

(5) Flow chart of Equipment Maintenance System:

The flow chart is shown in Attached Figure 2-3.

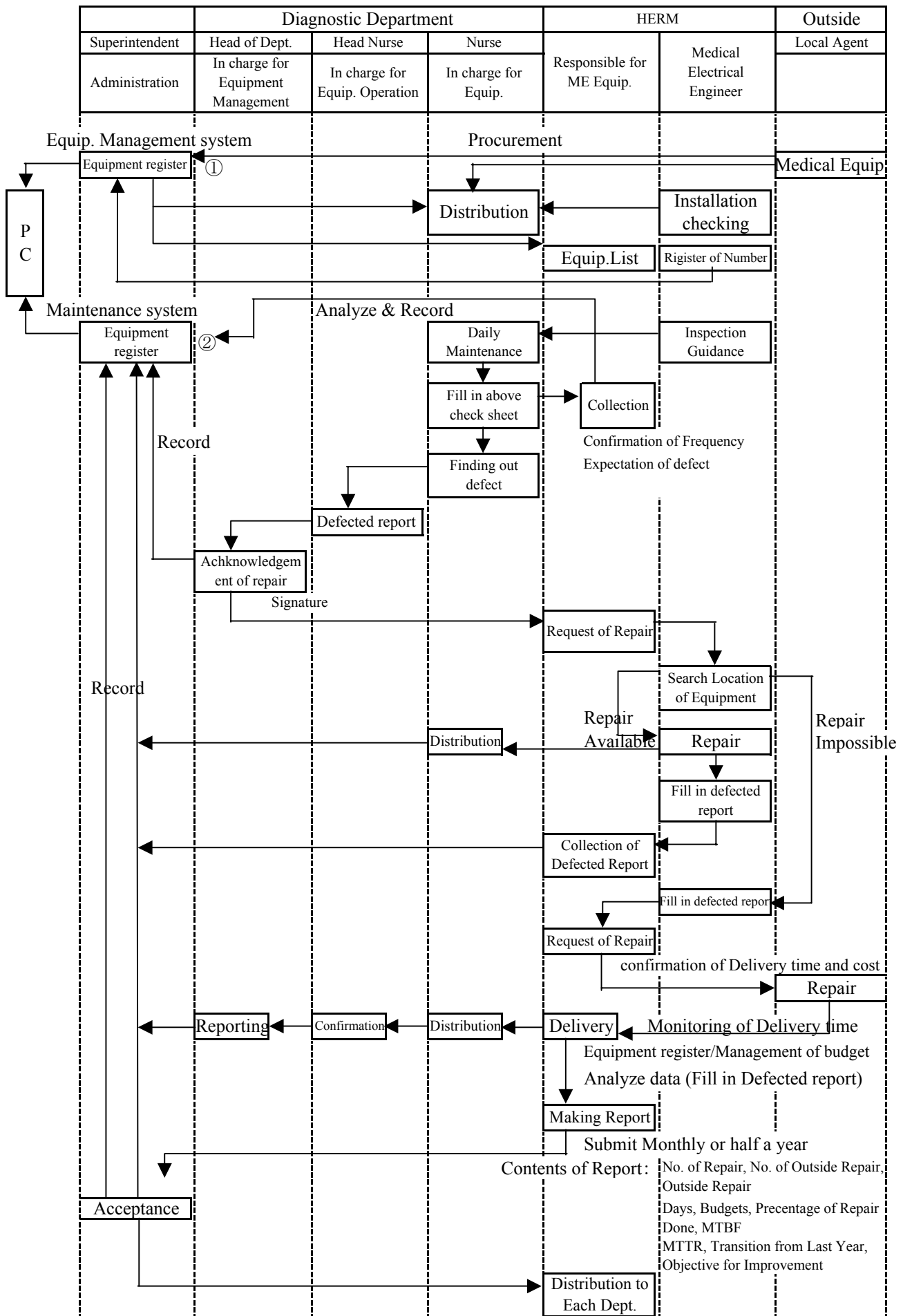


Figure 2-3 Equipment Maintenance System Flow

Chapter 3 Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effects

(1) Direct Effects

- 1) Implementation of this project will contribute to enhancement of the medical service system, such as early diagnosis and early treatment, for the residents (about 13 million people) of Mumbai and its environs, where the residents have access to the project facilities.
- 2) In Cama and Albless Hospital, improvement will be made for the medical equipment in maternal and child health that is in bad condition or too old for use. Accordingly, good quality medical services will be provided annually to about 100,000 patients in OB/GY (the number of patients in the year of 2002), and to about 800 premature babies.
- 3) In Sir J.J. Hospital that is a top referral hospital in Maharashtra, improvement shall be made for medical equipment in maternal and child health and for equipment indispensable for basic medical services, which are too old and insufficient in quantity. Accordingly, the medical service system will be improved. Good quality medical services will be provided annually to about 30,000 patients in a serious condition, including patients with obstetric and gynecologic diseases, and to about 1,000 premature babies.

(2) Indirect Effects

- 1) The functional improvement of maternal and child health services will contribute to a reduction in the infant mortality rate and the maternal mortality rate in Mumbai and its environs.
- 2) Sir J.J. Hospital also functions as teaching hospital for students of Grant Medical College. Improvement of medical equipment will contribute to provision of effective clinical training to the medical students (about 550 students annually).

3-2 Recommendations

This project is expected to have a considerable effect, and its implementation is deemed to be of great importance. In order to make this project more effective, it is important to improve and secure following points.

- (1) This project is to supply medical equipment that is now deficient, and to support improvement of the health and medical situation in Maharashtra from the equipment (hardware) side. It is also essential that the Indian side presses forward with improvement of the service (software) side, such as ① qualitative

improvement of medical services by establishing a periodic retraining system for medical personnel, ② promotion of a better understanding of health and medical care among the residents, and establishment of a medical system that enables lower charges for medical care through early diagnosis and early treatment.

- (2) While the biomedical engineer is sanctioned to the project facilities, maintenance and repair have been conducted under departmental control, regardless of priority level, urgency, or budgetary planning. It is essential to elaborate the maintenance management plan for all the equipment of the project facilities, and that biomedical engineers operate and maintain the medical equipment in order to execute the maintenance management plan that reflects the budget for maintenance costs.