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1. Member List of Study Team

1. Member List of Study Team

(1) Basic Design Study (June 17, 2007 to July 14, 2007)

1.	Mr. Hideya KOBAYASHI	Team Leader	Chief, Project Management Group II Grant Aid Management Department Japan International Cooperation Agency
2.	Dr. Junichi INABA	Technical Adviser	Assistant Director (Ob & Gyn.) Bureau of International Cooperation International Medical Center of Japan Ministry of Health, Labor and Welfare
3.	Mr. Takashi SENDA	Project Coordinator	Associate Expert, MA, MPH Health Team, Project Management Group II Grant Aid Management Department Japan International Cooperation Agency
4.	Mr. Mineo NAGAOKA	Project Manager	Yamashita Sekkei Inc.
5.	Mr. Masaru FUJINUMA	Architect	Yamashita Sekkei Inc.
6.	Ms. Tomomi TAKENAKA	Equipment Planner-1	International Total Engineering Corporation
7.	Mr. Masatsugu SUZUKI	Mechanical Engineer	Yamashita Sekkei Inc.
8.	Mr. Osamu SUZUKI	Construction Specialist	Yamashita Sekkei Inc.
9.	Mr. Koichi OBAYASHI	Equipment Engineer-1	International Total Engineering Corporation
10.	Mr. Kenji ISHIDA	Equipment Planner-2	International Total Engineering Corporation
11.	Mr. Kei KUROSAWA	Equipment Engineer-2	International Total Engineering Corporation

(2) Explanation on Draft Report (October 20, 2007 to October 31, 2007)

1.	Mr. Hideya KOBAYASHI	Team Leader	Chief, Project Management Group II Grant Aid Management Department Japan International Cooperation Agency
2.	Mr. Mineo NAGAOKA	Project Manager	Yamashita Sekkei Inc.
3.	Ms. Tomomi TAKENAKA	Equipment Planner	International Total Engineering Corporation
4.	Mr. Osamu SUZUKI	Construction Specialist	Yamashita Sekkei Inc.

2. Study Schedule

2. Study Schedule

(1) Basic Design Study (June 17, 2007 to July 14, 2007)

Date	Place	JICA				Consultants				Equipment Engineer 2 KUROSAWA Kei			
		Team Leader KOBAYASHI Hideya Project Coordinator SENDA Takashi	Technical Adviser Dr. INABA Junichiro	Project Manager NAGAOKA Mineo	Architect FUJINUMA Masaru	Equipment Planner 1 TAKENAKA Tomomi	Mechanical Engineer SUZUKI Masatsugu	Construction Specialist SUZUKI Osamu	Equipment Engineer 1 OBAYASHI Koichi		Equipment Planner 2 ISHIDA Kenji		
June 17 (Sun)	Tokyo			Lv.Tokyo Ar.Singapore	Lv.Tokyo Ar.Singapore	Lv.Tokyo Ar.Singapore							Lv.Tokyo Ar.Singapore
June 18 (Mon)	Colombo		Lv.Tokyo Ar.Singapore	Lv.Singapore Ar.Colombo Meeting at JICA Office Courtesy call on Embassy of Japan (EOJ)									Lv.Singapore Ar.Colombo
June 19 (Tue)			Lv.Singapore Ar.Colombo	Discussion with MOH/inception report and questionnaires									←
June 20 (Wed)	Anuradhapura		Lv.Colombo Ar.Anuradhapura	Courtesy call on Ministry of Finance Anuradhapura Teaching Hospital (ATH) site survey									Equipment agent survey
June 21 (Thu)				Discussion with ATH/inception report, questionnaires, contents, construction site, schedule									←
June 22 (Fri)				Discussion with ATH Visit to Rajarata University									ATH equipment survey
June 23 (Sat)		Lv.Tokyo Ar.Singapore		Discussion with ATH									↑
June 24 (Sun)		Lv.Singapore Ar.Colombo Lv.Colombo Ar.Anuradhapura		Discussion among the team Analysis of collected data									
June 25 (Mon)				Discussion with ATH/component, scale, project site									
June 26 (Tue)			Lv. Anuradhapura Ar.Colombo Meeting at JICA Office Discussion at MOH Courtesy call on Ministry of Finance										
June 27 (Wed)	Colombo			Courtesy call on Embassy of Japan (EOJ) Discussion at MOH									Equipment survey
June 28 (Thu)				Discussion at MOH on the draft of minutes of discussion Discussion at MOF on the schedule / budgetary allocations									←

Date	Place	JICA		Consultants					Equipment Engineer Planner 2 ISHIDA Kenji	Equipment Engineer 2 KUROSAWA Kei	
		Team Leader KOBAYASHI Hideya Project Coordinator SENDA Takashi	JICA Technical Adviser Dr. INABA Junichiro	Project Manager NAGAOKA Mineo	Architect FUJINUMA Masaru	Equipment Planner 1 TAKENAKA Tomomi	Mechanical Engineer SUZUKI Masatsugu	Construction Specialist SUZUKI Osamu			Equipment Engineer 1 OBAYASHI Koichi
June 29 (Fri)		Signing of minutes of discussions at MOH Report to EOJ, JICA Office							Equipment transportation cost survey		
June 30 (Sat)		Lv.Colombo Ar.Singapore		Discussion among the team					Lv.Colombo Ar.Singapore		
July 1 (Sun)		Lv.Singapore Ar.Tokyo		Analysis of collected data					Lv.Singapore Ar.Tokyo		
July 2 (Mon)				Meeting with local consultants in Colombo	BES survey	Construction conditions survey			Equipment agent survey	BES survey	
July 3 (Tue)	Anuradhapura			Lv. Colomb Ar. Anuradhapura Data collection							
July 4 (Wed)				Discussion with ATH Data collection		Additional survey at authorities concerned			Data collection Additional survey		
July 5 (Thu)				Lv. Anuradhapura Ar. Colombo							
July 6 (Fri)	Colombo			Visit to National Hospital, Castle Street Hospital					Same as PM		
July 7 (Sat)				Visit to Ratmapura General Hospital					Equipment survey		
July 8 (Sun)				Analysis of collected data					↑		
July 9 (Mon)				Meeting at MOH Data collection	Equipment agency survey				↑		
July 10 (Tue)				Meeting with local consultant	Equipment additional survey				↑		
July 11 (Wed)				Report to MOH Discussion at Min of Finance					Lv.Colombo Ar.Singapore	Lv.Colombo	
July 12 (Thu)				Report to JICA office	Report to JICA office				Lv.Singapore Ar.Tokyo	Lv.Singapore Ar.Tokyo	
July 13 (Fri)				Lv.Colombo Ar.Singapore	Lv.Colombo Ar.Singapore				Lv.Singapore Ar.Tokyo	Lv.Singapore Ar.Tokyo	
July 14 (Sat)	Tokyo			Lv.Singapore Ar.Tokyo	Lv.Singapore Ar.Tokyo						

(2) Explanation on Draft Basic Design Study Report (October 20, 2007 to October 31, 2007)

Date		KOBAYASHI Hideya Team Leader	NAGAOKA Mineo Project Manager	SUZUKI Osamu Construction Specialist	TAKENAKA Tomomi Equipment Planner
1	October 20 (Sat)	Lv. Tokyo Ar. Singapore			
2	October 21 (Sun)	Lv. Singapore Ar. Colombo Lv. Colombo Ar. Anuradhapura			
3	October 22 (Mon)	Discussion with ATH Lv. Anuradhapura Ar. Colombo			
4	October 23 (Tue)	Explanation on the draft basic design study report and discussion on the minutes of discussions at Ministry of Healthcare and Nutrition (MOH) and Ministry of Finance Courtesy call on EOJ			
5	October 24 (Wed)	Discussion on the minutes of discussions Signing of minutes of discussions at MOH/MOF			
6	October 25 (Thu)	Analysis of collected data	Lv. Colombo Ar. Anuradhapura Additional survey at ATH		
7	October 26 (Fri)	Report to JICA Colombo office and Embassy of Japan	Explanation of equipment		
8	October 27 (Sat)	Lv. Colombo Ar. Singapore	Additional survey at ATH Lv. Anuradhapura Ar. Colombo		
9	October 28 (Sun)	Lv. Singapore Ar. Tokyo	Analysis of collected data	Lv. Colombo Ar. Singapore	Same as PM
10	October 29 (Mon)		Report to MOH and JICA Colombo office	Lv. Singapore Ar. Tokyo	↑
11	October 30 (Tue)		Lv. Colombo Ar. Singapore Lv. Singapore		Lv. Colombo Ar. Singapore Lv. Singapore
12	October 31 (Wed)		Ar. Tokyo		Ar. Tokyo

3. List of Parties Concerned

3. List of Parties Concerned

1. Ministry of Healthcare and Nutrition
Hon Minister Nimal Siripala de Silva
Dr. Athula Kahandaliyanage
Dr. U. A. Mendis
Dr. S. Samarage
Mr. H. A. Ariyadasa
Mr. P.A. P. Pathirathna

Dr. W. M. T. B. Wijekoon
Mr. Tkwil Gurnge

Hon. Minister
Secretary
Deputy Director General
Medical Deputy Director General
Deputy Director General (Logistics)
Deputy Director General of Health Services (Finance)
Director Planning
Director Engineering
2. Ministry of Finance, Department of External Resources
Mr. MPDUK Mapa Pathirana

Director, Japan Division
3. Anuradhapura Teaching Hospital
Dr. Sarath Weerabandara
Dr. Karnatilaga Hettiarachchi
Dr. Monika De Silva
Dr. Wimalasiri Abeykoon
Dr. Dasanthi Akmoemana
Dr. Gakmali Samaraweem
Dr. Vishwa Uduasela
Dr. Sandamali Jayasinghe
Dr. Prasanna Gunasen
Dr. Kosgoda Seneuiratne
Dr. Mahanada Udukala
Dr. Ekanayake Upul
Dr. Dilshan Muaidaru Ishan
Dr. Ravi Sajeewa Walisinghe
Dr. Subasinghe Jayawardana
Priyanka Abeygunasekara
Dr. Himal Wyenyiye
Dr. Suresh Mendis
Dr. Jeuawathan Kandasamy
Dr. Kandasamy Jeganathan
Dr. Eshanth Perera
Dr. Ranthilaka Rasika Ranawaka
Dr. Ravi Walisinghe
Dr. Subasinghe Jayawardana
Mr. Priyankara Perera
Mr. T.M.N. Mettananda
Dr. Hemo Weere Kon
Dr. M.D.A.S. Gunatilleke
Dr. Seuaka Gunatilleke
Dr. Bandamal Hemantha
Dr. Chandrasiri Herath
Dr. S.B. Etulgama
Dr. V.T. Rajendima
Dr. D. Mumdoror Mumidasa
Dr. Dilshen Minidasa
Dr. Ehenayala
Dr. Kandasawy Jenawathan
Dr. Sheela Ratnayaka
Mrs. Sirmen Wipaekn
Mrs. Y. Kamila
Mrs. S.D. Ekanaejaka
Mr. G.G. Prmana

Director
Deputy Director
C. Rhumatologist
Consultant, Gynaecologist
Consultant Psychiatrist
Consultant Anesthesist
Consultant Anesthesist
Consultant Neonatologist
Consultant Neurosurgeon
Consultant OMF Surgeon
Consultant Oncological Surgeon
Consultant, Oncologist
Consultant Orthopedic Surgeon
Consultant, Obstetrician
Consultant, Orthodontist
Consultant Pathologist
Consultant Pediatrician
Consultant Physician
Consultant Physician
Consultant, Physician
Consultant Respiratory Physician
Consultant Dermatologist
Obstetrician & Gynecologist
Orthodontist Consultant
Incharge OPD Pharmacist
Superintendent Physiotherapist
Mo/ Dermatology
Pediatrician
Pediatrician
Pediatrician
Medical Officer
VS /ENT
VN
VOS
VOS
VOS
VP
VP (OPD)
Chief Medical Lab. Technician
Nersing Officer Ent Clinic
Nersing Officer Eye Clinic
Nersing Officer Gri Opd

Mrs. A.A.S. Tumudini	Nersing Officer Omf Clinic
Mrs. C.M. Gamage	N/O Paediatric Wd
Mrs. W.M.D.G. Kamalawathi	N/O Rh Clinic
Cyabl Jcyule	SGNO
Ms. P. Gunasena	Nursing Sister
Ms. Premalatha	Assistant Officer
Ms. Flora Jayawardana	Special Grade Nursing Officer
Ms. Ajantha Amarasinghe	Special Grade Nursing Officer
Ms. Irangani Ekanayake	Nursing Officer Grade I
Ms. D. M. U. N. Dhampath	Nursing Officer Grade I
Ms. R. K. Ariyananda	Nursing Officer Grade I
Ms. J. M. A. S. Gunasekara	Nursing Officer Grade I
Ms. R. M. Kusumalatha	Health Management Assistant
Ms. Premalatha	Assistant Officer
Mr. Asivi Rathnayake	Chief Bio Medical Engineer
Mr. P.L.Dayarathna	In Charge of Telephone Operation
Mr. Sam Mallagala	Technical Assistant
Mr. Samantha Udaya Kumara	Radiographer
3. Rajarata University of Sri Lanka Prof. Malkanthi S. Chandrasekara	Acting Dean, Faculty of Medical & Allied Sciences
4. Karapitiya Teaching Hospital Dr. P. K. Wijewickrama Dr. W. A. M/ Shelton Perera	Director Deputy Director
5. Ratnapra General Hospital Dr. R. M. S. I. Ratnayake	Deputy Director
6. Castle Street Hospital for Women Dr. Wimal Karandagoda	Director
7. CECB/In charge of master plan of Anuradhapura Teaching Hospital Mr. Nihal Rupasinghe Mr. Priyanga Almitha Kumara Mr. Amitha Dasayanake	Chairman Project Manager Site engineer
8. BES : Biomedical Engineering Service Mr. RD LIYANAGE Mr. S.A.J KARUNATHILAKE Mr. Gayan Senarathna MR. KENJI SAITO	Director Biomedical Engineer Technician JICA Senior Volunteer
9. CEB : Ceylon Electricity Board, Anuradhapura Mr. K.S.I. Kumara Mr. H.W.Kumarajinghe	Chief engineer-construction Electricity Superintendent
10. SLT : Sri Lanka Telecom Mr. H.L.G. Liyanage	Distinct Inspector of Telecom
11. Sri Lanka water board, Anuradhapura Mr. Gihan de Silva Mr. K. Dharmapala	Regional Manager District Engineer
12. Central Environmental Office, Pandulagama Mr. Geethajalie Seneriratne	Deputy Director

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|-----|---|--|
| 13 | Fire Service, Municipal Council, Anuradhapura
Mr. R.K.S.S.C. Wijesinghe | Commissioner |
| 14. | Embassy of Japan at Colombo, Sri Lanka
Mr. OHNISHI, Hideyuki
Mr. KAWABATA, Tomohiro | Counsellor
First Secretary |
| 15. | JICA Colombo Office
Ms. SUZUKI, Noriko
Mr. UESHIMA, Takumi
Ms. INOUE Kotohi
Dr. P. Serasinghe
Mr. IDA, Hachiro | Resident Representative
Former Resident Representative
Assistant Resident Representative
Senior Programme Officer
Expert for Ministry of Finance |

4. Minutes of Discussions

Basic Design Study

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR
IMPROVEMENT OF ANURADHAPURA TEACHING HOSPITAL
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

In response to a request from the Government of the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka"), The Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of Anuradhapura Teaching Hospital (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Sri Lanka the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Hideya Kobayashi, Chief, Project Management Group II, Grant Aid Management Department, JICA and is scheduled to stay in the country from 18th June 2007 to 13th July 2007.

The Team held discussions with the officials concerned of the Government of Sri Lanka and conducted a field survey at the study area.

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

Colombo, 29th June 2007



Mr. Hideya Kobayashi
Leader
Basic Design Study Team
Japan International Cooperation Agency



Dr. A. Kahandaliyanage
Secretary
Ministry of Healthcare and Nutrition



Mr. MFD UK Mapa Pathirana
Director, Japan Division
Department of External Resources
Ministry of Finance and Planning



Dr. Sarath Weerabandara
Director
Anuradhapura Teaching Hospital

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve Anuradhapura Teaching Hospital through construction of facilities, procurement/installation of equipment.

2. Project site

The site of the Project is the premises of Anuradhapura Teaching Hospital, Anuradhapura District.

3. Responsible and Implementing Agency

3-1 The Responsible Agency is Ministry of Healthcare and Nutrition.

3-2 The Implementing Agency is Anuradhapura Teaching Hospital.

4. Items requested by the Government of Sri Lanka

After discussions with the Team, the items described in Annex-1 and Annex-2 were finally requested by the Sri Lankan side. JICA will assess the appropriateness of the request. The final components of the Project, both quantity and specification will be decided after further analysis in Japan.

(1) Construction of the Buildings and Facilities

1-1 Out Patient Department

1-2 Obstetric Gynecology Operation Theatre

1-3 Pediatric Unit

Details of items are listed in Annex-1.

(2) Procurement and Installation of the Equipment for the above Buildings and Facilities.

Details of items are listed in Annex-2.

5. Japan's Grant Aid Scheme

5-1. The Sri Lankan side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-3.

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Sri Lankan side will take the necessary measures, as described in Annex-4-1, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

- 6-1. The consultants will proceed to further studies in Sri Lanka until 13th July 2007.
- 6-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around October 2007.
- 6-3. In case that the contents of the report is accepted in principle by the Government of Sri Lanka, JICA will complete the final report and send it to the Government of Sri Lanka by February 2008.

7. Other relevant issues

- 7-1. The Sri Lankan side promised to allocate necessary budget for demolition of existing buildings and relocation of the infrastructure at the construction site on Sri Lankan fiscal year 2008, based on a cost estimation which will be done by the Japanese side as described in Annex-4-2.
- 7-2 The Sri Lankan side promised to allocate appropriate land for sewage treatment plant and electricity power sub station as described in Annex-4-2.
- 7-3. The Sri Lankan side promised to clear the land through demolition of the existing buildings and relocation of the infrastructure at the construction site no later than six months after the signing of the Exchange of Notes on construction of facilities, procurement/installation of equipment by both governments.
- 7-4. Both sides confirmed the construction site of the new facilities will be the land as described in Annex-5
- 7-5. The Sri Lankan side promised to take necessary measures with the Ministry of Finance and Planning to exempt Japanese nationals who will be engaged in the Project, from customs duties, internal taxes and fiscal levies which may be imposed in Sri Lanka with respect to supply of products and services under the verified contracts.

7-6. The Sri Lankan side promised to allocate necessary budget and manpower for the proper maintenance and utilization of the equipments and facilities to be provided under the Project.

7-7. The Sri Lankan side promised to relocate the equipments under usage at the existing buildings to new facility upon necessity.

7-8. The Sri Lankan side strongly requested the assistance of further development for delivery rooms and wards which will not be included in the Project but were part of the original proposal submitted by the Government of Sri Lanka. The team has recognized the necessity of these facilities and would convey the request to the Government of Japan.

Annex-1 Requested Buildings and Facilities

Annex-2 Requested Equipment

Annex-3 Japan's Grant Aid Scheme

Annex-4-1 Major Undertakings to be taken by Each Government

Annex-4-2 Undertaking required to the Government of the Recipient Country

Annex-5 Construction site

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Content of the Facility

Obstetric gynecology Operation theatre	Operation rooms Infectious operation room Preparation room Recovery room TSU (Theatre Sterile Unit) other related rooms
Paediatric Unit Intensive care unit	PICU NICU other related rooms
OPD Out Patient Department	Walk in clinic Medical Clinics Medical Chest Cardiology Dermatology Oncology Surgical Clinics Surgical Rectum Orthopedic Neurology Pediatric Clinics Pediatric / baby ObGyn Clinics Ante Natal / gynecology ENT clinic Dental Specialist Clinic OMF Orthodontic Endoscope rooms Examination rooms Emergency treatment unit Laboratory Physical medicine clinic with Rheumatology clinic (excluding rehabilitation rooms) OPD Registration rooms (Medical records for daily use only) OPD Pharmacy other related rooms

Lists of the Equipment

Annex-2

After discussion, Sri Lankan side requested the following Lists of the Equipment (Annex 2) for new facilities and the rehabilitation service in Anuradhapura Teaching Hospital. The final components of the equipment, however, will be examined according to the three graded priorities A, B and C in Lists of the Equipment, and will be modified by the Team after further survey and analysis in Japan.

The three graded priorities in Lists of the Equipment shall mean as follows.

A : Essential

B : Its appropriateness is examined through further analysis.

C : Lowest priority

Department	Room	Item No.	Descriptions	Priority
Theater Gyn/obs	Theater	OT-01	Suction apparatus	A
Theater Gyn/obs	Theater	OT-02	Laryngoscope	A
Theater Gyn/obs	Theater	OT-03	Defibrillator with monitor	A
Theater Gyn/obs	Theater	OT-04	Trolley (emergency)	A
Theater Gyn/obs	Theater	OT-05	Trolley dressing	A
Theater Gyn/obs	Theater	OT-06	Medical refrigerator	A
Theater Gyn/obs	Theater	OT-07	X-ray illuminator, multi film	A
Theater Gyn/obs	Theater	OT-08	Patient monitor	A
Theater Gyn/obs	Theater	OT-09	Theater table	A
Theater Gyn/obs	Theater	OT-10	Theater lamp	A
Theater Gyn/obs	Theater	OT-11	Anesthetic machine	A
Theater Gyn/obs	Theater		Anesthetic ventilator	(Attached to OT-11)
Theater Gyn/obs	Theater		Instrument trolley	(Same as OT-05)
Theater Gyn/obs	Theater	OT-12	Table top sterilizer	C
Theater Gyn/obs	Theater		Surgeons stool	(Same as OT-14)
Theater Gyn/obs	Theater	OT-13	Anesthetic trolley	A
Theater Gyn/obs	Theater	OT-14	Anesthetist stool	A
Theater Gyn/obs	Theater	OT-15	Cautery unit	A
Theater Gyn/obs	Theater	OT-16	Scrub up sink	A
Theater Gyn/obs	Theater	OT-17	Laparoscope set	B
Theater Gyn/obs	Theater	OT-18	Hysteroscope	B
Theater Gyn/obs	Theater	OT-19	Infant resuscitation table	A
Theater Gyn/obs	Theater	OT-20	BP apparatus	C
Theater Gyn/obs	Theater	OT-21	Tracheostomy set	C
Theater Gyn/obs	Theater	OT-22	Pulse oxymeter	C
Theater Gyn/obs	Theater	OT-23	ECG monitor	C
Theater Gyn/obs	Theater	OT-24	Drug trolley	C
Theater Gyn/obs	Theater	OT-25	Table	C
Theater Gyn/obs	Theater	OT-26	Revolving chair	C
Theater Gyn/obs	Theater	OT-27	Glucometer	C
Theater Gyn/obs	Theater	OT-28	Central monitoring unit	C
Theater Gyn/obs	Theater	OT-29	Spot lamp	C
Theater Gyn/obs	Theater		Surgeons chair	(Same as OT-14)
Theater Gyn/obs	Sterilization	OT-30	Autoclave	A
Theater Gyn/obs	Sterilization	OT-31	Sterilizing container set	A
Theater Gyn/obs	Sterilization	OT-32	Sterilizing working table	A
Theater Gyn/obs	Sterilization	OT-33	Sterilizing container storage rack	A
Theater Gyn/obs	Sterilization	OT-34	Sterilizing trolley	A
Theater Gyn/obs	Recovery	OT-35	Stretcher	B
Theater Gyn/obs	Recovery	OT-36	Patient bed	A
Theater Gyn/obs	Recovery	OT-37	O2 supply wall unit	A
Theater Gyn/obs	Recovery	OT-38	O2 supply wall/cylinder regulator	C
Theater Gyn/obs	Recovery	OT-39	Patient monitor	A

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Lists of the Equipment

Annex-2

Department	Room	Item No.	Descriptions	Priority
Theater Gyn/obs	Recovery	OT-40	IV stand	A
Paediatric	NICU	NI-01	Suction wall unit	A
Paediatric	NICU	NI-02	Laryngoscope, neonate	A
Paediatric	NICU	NI-03	Defibrillator with monitor	C
Paediatric	NICU	NI-04	Trolley (emergency)	A
Paediatric	NICU	NI-05	Trolley dressing	A
Paediatric	NICU	NI-06	O2 supply wall unit	A
Paediatric	NICU	NI-07	IV stand	A
Paediatric	NICU	NI-08	Pulse oxymeter, neonate	A
Paediatric	NICU	NI-09	Drug trolley	A
Paediatric	NICU	NI-10	X-ray illuminator, multi film	A
Paediatric	NICU	NI-11	Ophthalmoscope	A
Paediatric	NICU	NI-12	Otoscope	A
Paediatric	NICU	NI-13	Syringe pump	A
Paediatric	NICU	NI-14	Infusion pump	A
Paediatric	NICU	NI-15	Patient monitor, neonate	A
Paediatric	NICU	NI-16	Incubator	A
Paediatric	NICU	NI-17	Phototherapy unit	A
Paediatric	NICU	NI-18	Apnoea monitor	A
Paediatric	NICU	NI-19	Infant warmer	A
Paediatric	NICU	NI-20	Baby scale	A
Paediatric	NICU	NI-21	Ventilator, C-pap	A
Paediatric	NICU	NI-22	Bilirubinmeter with hematocrit centrifuge	A
Paediatric	NICU	NI-24	BP apparatus	C
Paediatric	NICU	NI-25	Tracheostomy set	C
Paediatric	NICU	NI-26	ECG monitor	C
Paediatric	NICU	NI-27	Cot	C
Paediatric	NICU	NI-28	Bed side locker	C
Paediatric	NICU	NI-29	Refrigerator	C
Paediatric	NICU	NI-30	Nurse table	B
Paediatric	NICU	NI-31	Nurse chair	B
Paediatric	NICU	NI-32	Glucometer	C
Paediatric	NICU	NI-33	ICU Cot	C
Paediatric	NICU	NI-34	Hand dryer	C
Paediatric	NICU	NI-35	Mattress	C
Paediatric	NICU	NI-36	Neonatal resuscitator	C
Paediatric	NICU	NI-37	Central monitoring unit	C
Paediatric	NICU	NI-38	ICU table	B
Paediatric	NICU	NI-39	Cupboard	B
Paediatric	PICU	PI-01	Suction wall unit	A
Paediatric	PICU	PI-02	Laryngoscope, pediatric	B
Paediatric	PICU	PI-03	BP apparatus	C
Paediatric	PICU	PI-04	Tracheostomy set	A
Paediatric	PICU	PI-05	Trolley (emergency)	C
Paediatric	PICU	PI-06	Trolley dressing	C
Paediatric	PICU	PI-07	O2 supply wall unit	A
Paediatric	PICU	PI-08	IV stand	C
Paediatric	PICU	PI-09	ICU bed	A
Paediatric	PICU	PI-10	Drug trolley	C
Paediatric	PICU	PI-11	Medical refrigerator	C
Paediatric	PICU	PI-12	X-ray illuminator, multi film	A
Paediatric	PICU	PI-13	Ophthalmoscope	C
Paediatric	PICU	PI-14	Otoscope	C
Paediatric	PICU	PI-15	Glucometer	C

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Lists of the Equipment

Annex-2

Department	Room	Item No.	Descriptions	Priority
Paediatric	PICU	PI-16	Syringe pump	A
Paediatric	PICU	PI-17	Infusion pump	A
Paediatric	PICU	PI-18	Patient monitor, pediatric	A
Paediatric	PICU	PI-19	Ventilator, C-pap	A
Paediatric	PICU	PI-20	Apnoea monitor	C
Paediatric	PICU	PI-21	X-ray machine, mobile	B
Paediatric	PICU	PI-22	Defibrillator with monitor	B
Paediatric	PICU	PI-23	Pulse oxymeter, pediatric	B
Paediatric	PICU	PI-24	Suction apparatus	C
Paediatric	PICU	PI-25	Doppler BP	C
Paediatric	PICU	PI-26	Cot	C
Paediatric	PICU	PI-27	Bed side locker	C
Paediatric	PICU	PI-28	Refrigerator	C
Paediatric	PICU	PI-29	Nurse table	B
Paediatric	PICU	PI-30	Nurse chair	B
Paediatric	PICU	PI-31	Hand dryer	C
Paediatric	PICU	PI-32	Water mattress	C
Paediatric	PICU	PI-33	Mattress	C
Paediatric	PICU	PI-34	ICU table	B
Paediatric	PICU	PI-35	Cupboard	B

Department	Room	Item No.	Descriptions	Priority
Common items for each clinic such as Medicine, Surgery, Gyn/obs, Rectal, ENT, Neurology, Paediatric, Orthodontic, OMF, Rheumatology, Orthopedic, Cardiology, Skin, Chest, Psychiatry, Oncology, Dispensary, Staff room, Nurses station, Record room, Staff office, Store and Information center				
OPD	Common	OPD-01	Diagnostic set	A
OPD	Common	OPD-02	Examination lamp	A
OPD	Common	OPD-03	Ophthalmoscope	A
OPD	Common	OPD-04	X-ray illuminator, multi film	A
OPD	Common	OPD-05	Consultation table	A
OPD	Common	OPD-06	Patient chair	A
OPD	Common	OPD-07	Consultation chair	A
OPD	Common	OPD-08	Examination bed	A
OPD	Common	OPD-09	Cupboard	A
OPD	Common	OPD-10	Trolley dressing	A
OPD	Common		BP apparatus	(Included in OPD-01)
OPD	Common		Knee hammer	(Included in OPD-01)
OPD	Common		Weighing scale	(Included in OPD-01)
OPD	Common		Otoscope	(Included in OPD-01)
Equipment for each clinic				
OPD	Walk in clinic	OPD-11	Medical refrigerator	A
OPD	Respiratory disease	OPD-12	Pulse oxymeter	A
OPD	Respiratory disease	OPD-13	Spirometer	A
OPD	Skin	OPD-14	Diathermy unit	A
OPD	Skin	OPD-15	Cryo surgery unit	B
OPD	Rheumatology	OPD-16	Bone densitometer	B
OPD	Orthopedic	OPD-17	Gypsum cutter	A
OPD	Orthopedic	OPD-18	Gypsum table	A
OPD	Baby	OPD-19	Baby scale	A
OPD	Gyn/obs	OPD-20	Fetal doppler	A
OPD	Gyn/obs	OPD-21	Examination table, gynecology	A
OPD	Gyn/obs	OPD-22	US scan, B/W	A

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Lists of the Equipment

Annex-2

Department	Room	Item No.	Descriptions	Priority
OPD	Gyn/obs	OPD-23	CTG	C
OPD	Gyn/obs	OPD-24	Pinnard	C
OPD	ENT	OPD-25	Headlight, ENT	B
OPD	ENT	OPD-26	Microscope, ENT	A
OPD	ENT	OPD-27	Rigid nasal endoscope, adult & child	A
OPD	ENT	OPD-28	ENT chair	C
OPD	ENT	OPD-29	ENT treatment unit	B
OPD	ENT	OPD-30	Suction apparatus, ENT	B
OPD	ENT	OPD-31	Audiometer with sound proof booth	A
OPD	ENT	OPD-32	Caloric test machine	B
OPD	ENT	OPD-33	Computer	C
OPD	OMF	OPD-34	Dental unit and chair	A
OPD	OMF	OPD-35	Panoramic & cephalomatic X-ray unit	A
OPD	OMF	OPD-36	Video fluoroscope	B
OPD	OMF	OPD-37	Aerophotoscope	B
OPD	OMF	OPD-38	Fiberoptic nasalscope	B
OPD	Orthodontic	OPD-39	Dental unit and chair	A
OPD	Orthodontic	OPD-40	Micromotor	B
OPD	Endoscope	OPD-41	Bronchoscope	A
OPD	Endoscope	OPD-42	Colonoscope	B
OPD	Endoscope	OPD-43	OGD	A
OPD	Endoscope	OPD-44	Nasopharyngoscope	A
OPD	Endoscope	OPD-45	Suction unit, endoscope	A
OPD	Endoscope	OPD-46	Electrosurgical unit, endoscope	A
OPD	Endoscope	OPD-47	Endoscopic table	A
OPD	Endoscope	OPD-48	Endoscope washing machine	A
OPD	Endoscope	OPD-49	Endoscope cabinet	A
OPD	Endoscope	OPD-50	Video monitor with light source	A
OPD	Endoscope	OPD-51	Sigmoidoscope	C
OPD	Examination room	OPD-52	ECG monitor	A
OPD	Examination room	OPD-53	EEG	C
OPD	Examination room	OPD-54	EMG machine	B
OPD	Examination room	OPD-55	Blood gas analyser	B
OPD	ETU	OPD-56	Emergency bed	A
OPD	ETU	OPD-57	Infusion pump	A
OPD	ETU	OPD-58	Patient monitor	A
OPD	ETU	OPD-59	Suction apparatus	A
OPD	ETU	OPD-60	Syringe pump	A
OPD	ETU	OPD-61	Ventilator	B
OPD	ETU	OPD-62	Defibrillator with monitor	B
OPD	ETU	OPD-63	X-ray machine, mobile	B
OPD	OPD Laboratory	OPD-64	Hematology analyser	A
OPD	OPD Laboratory	OPD-65	Biochemistry analyser	B
OPD	OPD Laboratory	OPD-66	Microscope	A
OPD	OPD Laboratory	OPD-67	Centrifuge	A
OPD	OPD Laboratory	OPD-68	Hematocrit centrifuge	B
OPD	OPD Laboratory	OPD-69	Medical refrigerator	A
OPD	OPD Laboratory	OPD-70	Water bath, mixing type	B
OPD	OPD Laboratory	OPD-71	Autoclave, vertical	B
OPD	OPD Laboratory	OPD-72	Distiller	B
OPD	OPD Laboratory	OPD-73	Polarized microscope	B
OPD	General	OPD-74	Stretcher	A
OPD	General	OPD-75	Wheel chair	A
OPD	Waiting area	OPD-76	Television	C

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Lists of the Equipment

Annex-2

Department	Room	Item No.	Descriptions	Priority
OPD	Waiting area	OPD-77	Public address system	C
OPD	Information center	OPD-78	Computer	C
OPD	Dispensary	OPD-79	Balance	A
OPD	Dispensary	OPD-80	Electronic balance	A
OPD	Dispensary	OPD-81	Medicine cabinet	A
OPD	Dispensary	OPD-82	Tablet counting machine	A
OPD	Dispensary	OPD-83	Paste mixer	A
OPD	Dispensary	OPD-84	Medical refrigerator	A
OPD	Dispensary	OPD-85	Computer	C
Rehabilitation	Rehabilitation	OPD-86	Short wave diathermy machine	A
Rehabilitation	Rehabilitation	OPD-87	Infra red lamp	A
Rehabilitation	Rehabilitation	OPD-88	Infra red lamp non luminous	A
Rehabilitation	Rehabilitation	OPD-89	Infra red baker system	A
Rehabilitation	Rehabilitation	OPD-90	Ultra sound therapy unit	A
Rehabilitation	Rehabilitation	OPD-91	Trans cutaneous nervous stimulator (TENS) unit	A
Rehabilitation	Rehabilitation	OPD-92	Interferential therapy unit	A
Rehabilitation	Rehabilitation	OPD-93	Electrical nerves stimulator unit	A
Rehabilitation	Rehabilitation	OPD-94	Tilt table with mobile stand	B
Rehabilitation	Rehabilitation	OPD-95	Shoulder wheel	B
Rehabilitation	Rehabilitation	OPD-96	Balancing board	B
Rehabilitation	Rehabilitation	OPD-97	Gonio meters set	B
Rehabilitation	Rehabilitation	OPD-98	Exercise chair (Rowing machine)	B
Rehabilitation	Rehabilitation	OPD-99	Packheaters for hot packs	B
Rehabilitation	Rehabilitation		Hot pack & hot cold pack set	(Attached to OPD-99)
Rehabilitation	Rehabilitation	OPD-100	Ergometer cycle	B
Rehabilitation	Rehabilitation	OPD-101	Treatment plinth	B
Rehabilitation	Rehabilitation	OPD-102	Parallel bar set	A
Rehabilitation	Rehabilitation	OPD-103	Traction unit	A
Rehabilitation	Rehabilitation	OPD-104	Examination bed	A
Rehabilitation	Rehabilitation	OPD-105	Dynamo meter	B
Rehabilitation	Rehabilitation		EMG machine	(Move to OPD-54)
Rehabilitation	Rehabilitation	OPD-106	Nerve conduction machine	C

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1. Japan's Grant Aid

The Grant Aid scheme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1-1 Japan's Grant Aid Procedures

Japan's Grant Aid Scheme is executed by the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(Exchange of Notes between the Governments of Japan and the recipient country)

Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for the Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the smooth implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

Basic Design Study

(1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

- Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- Confirmation of items agreed upon by both parties concerning the basic concept of the Project.
- Preparation of a Basic Design of the Project
- Estimation of cost of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

1-2 Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

(2) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consulting firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as natural disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(5) Undertakings required to the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- ① To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction,
- ② To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- ③ To secure buildings prior to the procurement in case the installation of the equipment,
- ④ To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
- ⑤ To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
- ⑥ To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

The recipient country is required to operate and maintain the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(7) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or

its designated authority under the Verified Contracts.

- b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay(A/P) issued by the Government of the recipient country or its designated authority.

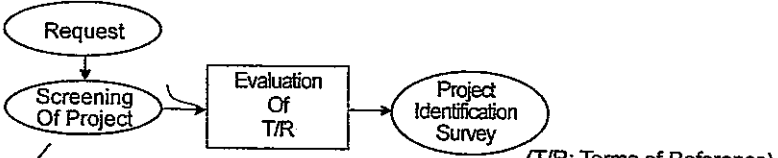
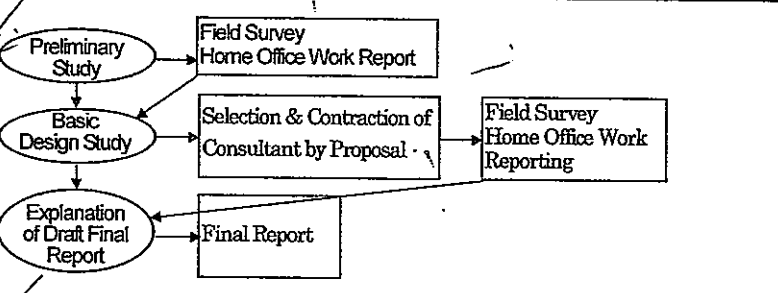

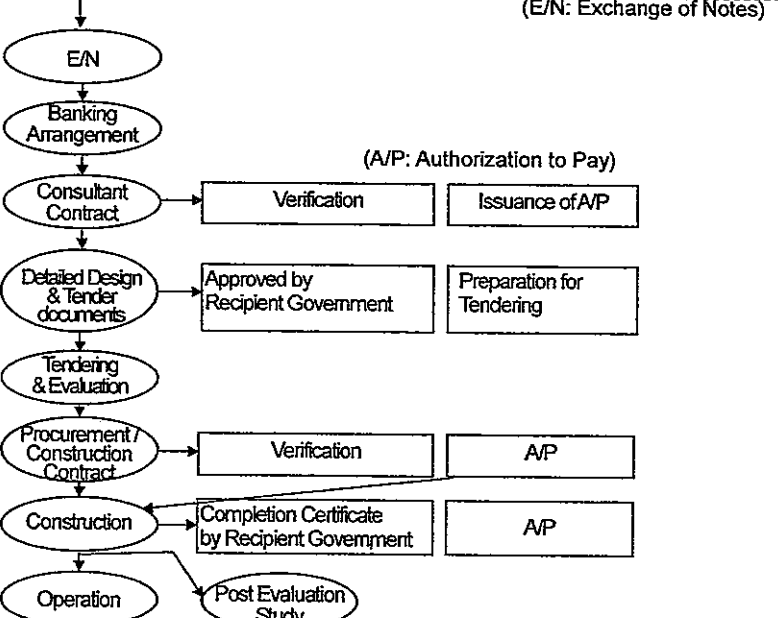

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

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Table Flow Chart of Japan's Grant Aid Procedures

Stage	Flow & Works	Recipient Government	Japanese Government	JTCA	Consultant	Contractor	Others
Application							
Study Formulation & (Project Preparation)							
Appraisal & Approval							
Implementation	<p>(E/N: Exchange of Notes)</p> 						
Evaluation & Follow up							

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Major Undertaking to be taken by Each Government

Annex-4-1

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the buildings	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The Main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

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Undertakings required to the Government of the Recipient Country

- (1) To relocate hospital functions in the construction site; to demolish the existing buildings; and to reroute existing electricity conduits, water pipes, and other utility lines in the construction site of the Project and to clear and level the land prior to commencement of the construction,

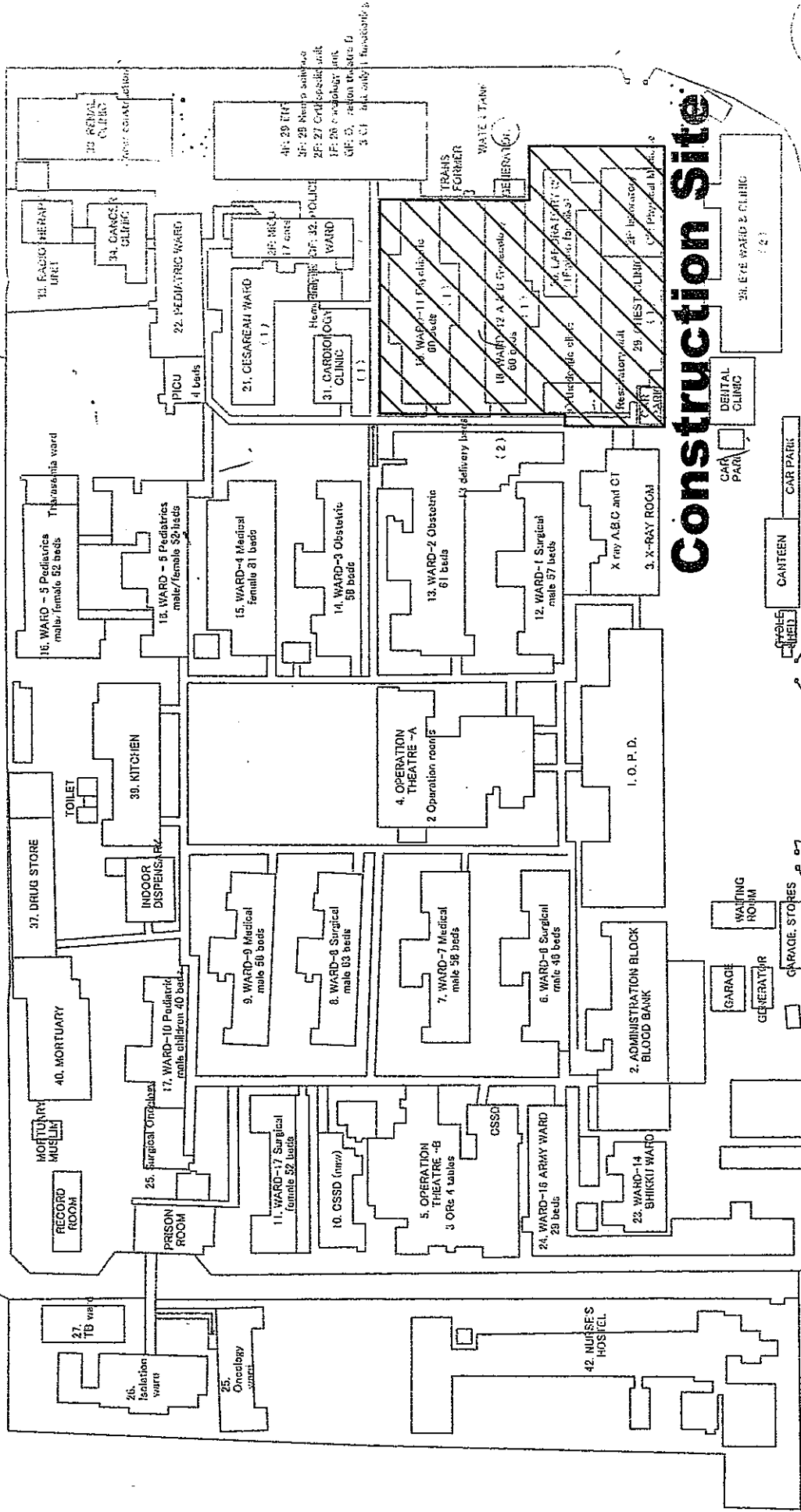
The buildings that is to be demolished for the site are;

1. Chest clinic building
2. Laboratory building
3. Ward 12 Gynecology building
4. Orthodontic clinic building
5. Ward 19 Psychiatric building
6. Car park

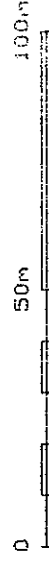
- (2) To provide appropriate land for sewage treatment plant for the Project building, this sewage treatment plan will not be for the entire hospital but only for the Project building

- (3) To provide appropriate land for electricity power sub station for the Project building within the hospital premises.

Annex 5



Construction Site



Project construction site

for Anuradhapura Teaching Hospital

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Explanation on Draft Basic Design Study Report

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR
IMPROVEMENT OF ANURADHAPURA TEACHING HOSPITAL
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
(EXPLANATION ON DRAFT REPORT)

In June 2007, the Japan International Cooperation Agency (Hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Improvement of Anuradhapura Teaching Hospital (hereinafter referred to as "the Project") to the Government of the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

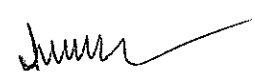
In order to explain and to consult with the Government of Sri Lanka on the components of the draft report, JICA sent to Sri Lanka the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Hideya Kobayashi, Chief, Project Management Group II, Grant Aid Management Department, JICA and is scheduled to stay in the country from 21st Oct 2007 to 27th Oct 2007.

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


Colombo, 24th Oct 2007



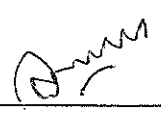
Mr. Hideya Kobayashi
Leader
Basic Design Study Team
Japan International Cooperation Agency



Dr. A. Kahandaliyanage
Secretary
Ministry of Healthcare and Nutrition



Mr. M P D U K Mapa Pathirana
Director, Japan Division
Department of External Resources
Ministry of Finance and Planning



Dr. Sarath Weerabandara
Director
Anuradhapura Teaching Hospital

ATTACHMENT

1. Components of the Draft Report

The Government of Sri Lanka agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid Scheme

The Sri Lankan side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Sri Lanka as explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed by both parties on 29th June 2007

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed item and send it to the Government of Sri Lanka by February 2008.

4. Other relevant issues

4-1. Land Clearance

The Sri Lankan side promised to reallocate the existing hospital services, clear the land through demolition of the existing buildings at the project site and relocate the infrastructure no later than six months after the signing of the Exchange of Notes on construction of facilities, procurement/installation of equipment by both Governments. The Sri Lankan side has submitted the detail schedule of demolition to the Japanese side. (Annex-5)

4-2. Proper Maintenance

The Sri Lankan side promised to allocate necessary budget and manpower for the proper maintenance and utilization of the equipments and facilities to be provided under the Project.

4-3. Relocation of Equipments

The Sri Lankan side promised to relocate the equipments under usage at the existing buildings to the new facility upon necessary.

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4-4. Confidentiality of the Report

Both sides confirmed that the contents of the draft final report should be confidential until the time of tender.

4-5. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in Annex-4 Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the Contract(s) for the Project. The Sri Lankan side understood that the Project Cost Estimation attached as Annex-4 is not final and is subject to change.

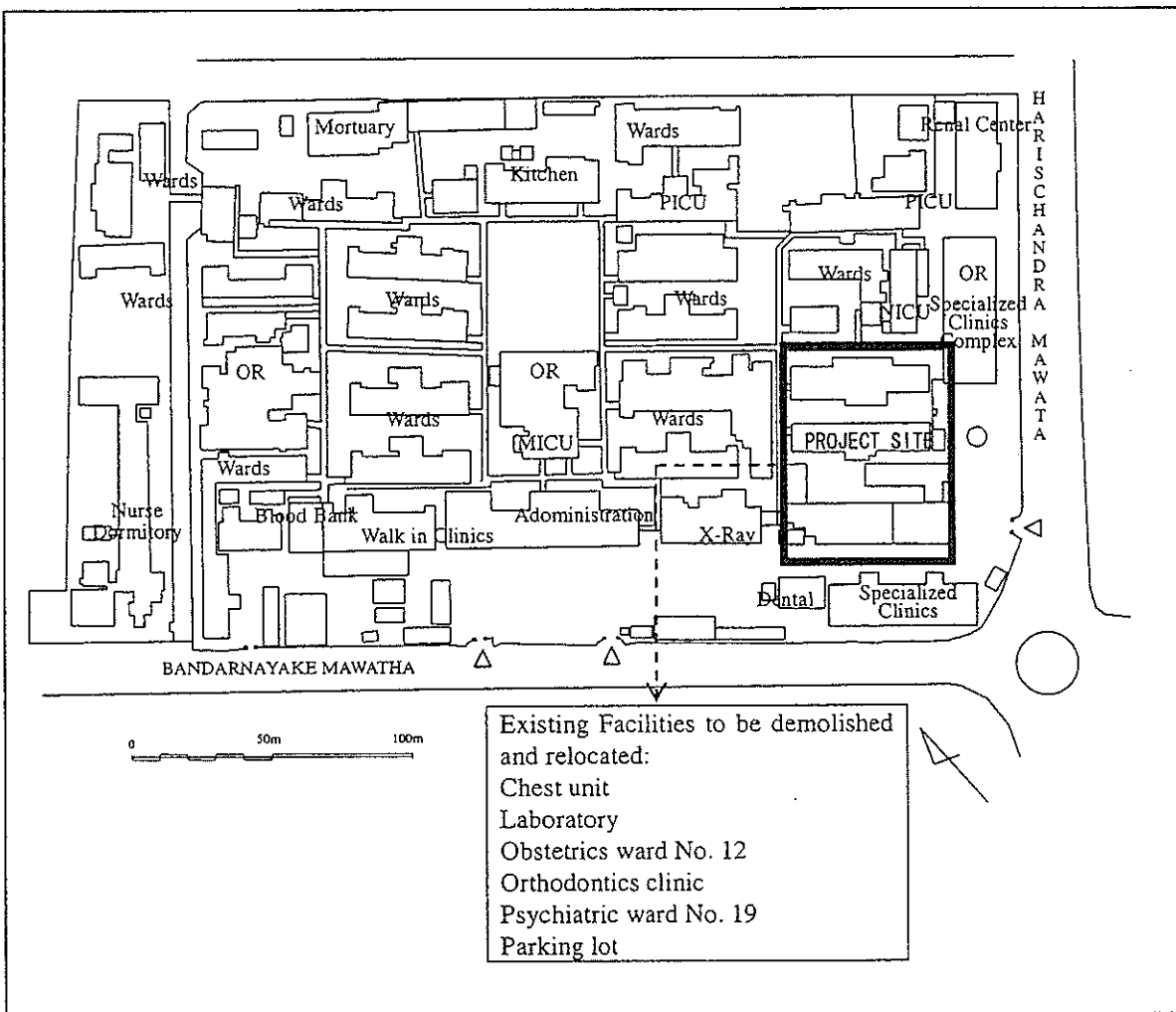
- Annex-1 Project Site Plan
- Annex-2 Outline of Facilities
- Annex-3 Equipment List
- Annex-4 Project Cost Estimation
- Annex-5 Detailed Schedule of Demolition

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Annex-1 Project Site Plan

ANURADHAPURA TEACHING HOSPITAL



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Annex-2 Outline of Facilities

2F	Ob-Gyn Operation Dept, Operating rooms, Supply and Sterilization unit, Pediatric ICU, Neonatal ICU, etc		
1F	Specialized outpatient clinics (Cardiology, Dermatology, ENT, Respiratory)	Specialized outpatient clinics (Internal medicine, OMF & Orthodontic, Onco Medical)	Laboratory Endoscopy unit, Physiological test rooms (ECG, EEG etc),
GF	Specialized outpatient clinics (Ob-Gyn, Oncosurgery, Orthopedics, Pediatrics, Rheumatology & Rehabilitation),	Waiting Area Pharmacy etc.	Emergency treatment unit, Walk-in clinic Specialized outpatient clinics (Surgical, Neurology & Neurosurgical)

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Annex-3 Equipment List

Item No.	Description	Q'ty
1	Suction apparatus	5
2	Laryngoscope	3
3	Defibrillator with monitor	2
4	Trolley (emergency)	2
5	Trolley dressing	43
6	Medical refrigerator	6
7	X-ray illuminator, 2 films	68
8	Patient monitor	8
9	Theater table	3
10	Theater lamp	3
11	Anesthetic machine	3
12	Anesthetic trolley	3
13	Anesthetist stool	3
14	Cautery unit	3
15	Scrub up sink	3
16	Infant warmer	6
17	Stretcher	5
18	Laparoscope set	1
19	Hysteroscope	1
20	Patient bed	4
21	O2 supply wall unit	37
22	Autoclave	2
23	Sterilizing container set	2
24	Sterilizing working table	3
25	Sterilizing container storage rack	3
26	Sterilizing trolley	1
27	Suction wall unit	27

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Item No.	Description	Q'ty
28	Laryngoscope, neonate	3
29	Pulse oxymeter	9
30	Drug trolley	3
31	Ophthalmoscope	16
32	Syringe pump	16
33	Patient monitor, neonate	6
34	Incubator	7
35	Phototherapy unit	4
36	Baby scale	2
37	Ventilator, C-pap	1
38	Bilirubinmeter with hematocrit centrifuge	1
39	Nurse table	4
40	Nurse chair	12
41	Instrument cabinet	7
42	Laryngoscope, pediatric	2
43	ICU bed	8
44	Infusion pump	7
45	Patient monitor, pediatric	2
46	Blood gas analyser	1
47	X-ray machine, mobile	1
48	Diagnostic set, adult	25
49	Diagnostic set, pediatric	2
50	Examination lamp	55
51	Consultation table	94
52	Patient chair	94
53	Consultation chair	94
54	Examination bed	37
55	Cupboard	48

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Item No.	Description	Q'ty
56	Wheel chair	4
57	Spirometer	1
58	Cautery unit, dermatology	1
59	Cryo surgery unit	1
60	Gypsum cutter	1
61	Gypsum table	1
62	Fetal doppler	1
63	Examination table, gynecology	1
64	US scan, B/W	1
65	Headlight, ENT	3
66	Microscope, ENT	1
67	Rigid nasal endoscope, adult & child	1
68	ENT treatment unit	3
69	Audiometer	1
70	Dental unit and chair	4
71	Micromotor	1
72	Educational instrument for speech therapy	1
73	Panoramic & cephalomatic X-ray unit	1
74	Bronchoscope	1
75	Colonoscope	1
76	OGD	1
77	Nasopharyngoscope	1
78	Suction unit, endoscope	3
79	Electrosurgical unit, endoscope	2
80	Endoscopic table	3
81	Endoscope washing apparatus	2
82	Endoscope cabinet	2
83	Video monitor with light source	3

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Item No.	Description	Q'ty
84	Bone densitometer	1
85	ECG monitor	1
86	EMG machine	1
87	Emergency bed	6
88	Hematology analyser	1
89	Spectrophotometer	1
90	Microscope	2
91	Centrifuge	1
92	Hematocrit centrifuge	1
93	Water bath, mixing type	1
94	Autoclave, vertical	1
95	Distiller	1
96	Laboratory table	11
97	Laboratory chair	22
98	Electronic balance, medium	1
99	Electronic balance, small	1
100	Medicine cabinet, counter	12
101	Medicine cabinet, storage	7
102	Medicine table	3
103	Medicine chair	12
104	Tablet counting machine	2
105	Paste mixer	1
106	Microwave diathermy machine	2
107	Infra red lamp	1
108	Infra red baker system	1
109	Ultra sound therapy unit	1
110	Interferential therapy unit	1
111	Electrical nerves stimulator unit	1

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Item No.	Description	Q'ty
112	Tilt table with mobile stand	1
113	Shoulder wheel	1
114	Balancing board	1
115	Gonio meters set	1
116	Packheaters for hot packs	1
117	Ergometer cycle	1
118	Treatment plinth	2
119	Parallel bar set	1
120	Traction unit	1
121	X-ray protective set	1

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Project Cost Estimation

Initial Cost Estimation

(1) Estimation Conditions

The conditions are as follows:

- 1) Estimation date: July 2007
- 2) Exchange rate: 1US\$= 121.36JPY,
1SR(Sri Lankan Rupee)= 1.0967JPY
- 3) Work period: 16 months
- 4) Contract Package: Separate contracts for construction works and equipment works, to Japanese contractors
- 5) Tax exemption: Under the framework of the Japanese Grant Aid, customs duties for the materials and equipment imported to Sri Lanka will be exempted, as well as various taxes including corporate and income taxes.

(2) Estimated Project Cost to be Borne by the Government of Japan

Project Cost Estimation		approx. 1,903 million JPY	
Item	Estimate Cost (million JPY)		
Facility	1,520	1,726	
Equipment	206		
Design, operational supervision			177

Notes; 1. The cost estimation is provisional and would be further examined by the Government of Japan for approval of the grant.

2. The above cost estimation will not be equal to the budget limit indicated in the E/N(Exchange of Notes)

(Annex 5) - Land Clearance Plan

					2007	2008
Reallocation of the existing services						
Exchange of Notes					▲	▲
Chest Clinic	To handover to PDHS				▬	
Laboratory & DPM	To new complex ground floor					▬
Obstetric ward (12)	To old ward 4 & 30					▬
Orthodontic clinic	To new complex ground floor					▬
Psychiatric ward (19)	To old isolation ward					▬
Parking area	Omit					
Demolition of existing buildings						▬
Re-location of infrastructure						▬

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5. Planned Equipment List

Appendix 5 Planned Equipment List

Item No.	Description	Q'ty
1	Suction apparatus	5
2	Laryngoscope	3
3	Defibrillator with monitor	2
4	Trolley (emergency)	2
5	Trolley dressing	43
6	Medical refrigerator	6
7	X-ray illuminator, 2 films	68
8	Patient monitor	8
9	Theater table	3
10	Theater lamp	3
11	Anesthetic machine	3
12	Anesthetic trolley	3
13	Anesthetist stool	3
14	Cautery unit	3
15	Scrub up sink	3
16	Infant warmer	6
17	Stretcher	5
18	Laparoscope set	1
19	Hysteroscope	1
20	Patient bed	4
21	O2 supply wall unit	37
22	Autoclave	2
23	Sterilizing container set	2
24	Sterilizing working table	3
25	Sterilizing container storage rack	3
26	Sterilizing trolley	1
27	Suction wall unit	27
28	Laryngoscope, neonate	3

Item No.	Description	Q'ty
29	Pulse oxymeter	9
30	Drug trolley	3
31	Ophthalmoscope	16
32	Syringe pump	16
33	Patient monitor, neonate	6
34	Incubator	7
35	Phototherapy unit	4
36	Baby scale	2
37	Ventilator, C-pap	1
38	Bilirubinmeter with hematocrit centrifuge	1
39	Nurse table	4
40	Nurse chair	12
41	Instrument cabinet	7
42	Laryngoscope, pediatric	2
43	ICU bed	8
44	Infusion pump	7
45	Patient monitor, pediatric	2
46	Blood gas analyser	1
47	X-ray machine, mobile	1
48	Diagnostic set, adult	25
49	Diagnostic set, pediatric	2
50	Examination lamp	55
51	Consultation table	94
52	Patient chair	94
53	Consultation chair	94
54	Examination bed	37
55	Cupboard	48
56	Wheel chair	4
57	Spirometer	1
58	Cautery unit, dermatology	1
59	Cryo surgery unit	1

Item No.	Description	Q'ty
60	Gypsum cutter	1
61	Gypsum table	1
62	Fetal doppler	1
63	Examination table, gynecology	1
64	US scan, B/W	1
65	Headlight, ENT	3
66	Microscope, ENT	1
67	Rigid nasal endoscope, adult & child	1
68	ENT treatment unit	3
69	Audiometer	1
70	Dental unit and chair	4
71	Micromotor	1
72	Educational instrument for speech therapy	1
73	Panoramic & cephalomatic X-ray unit	1
74	Bronchoscope	1
75	Colonoscope	1
76	OGD	1
77	Nasopharyngoscope	1
78	Suction unit, endoscope	3
79	Electrosurgical unit, endoscope	2
80	Endoscopic table	3
81	Endoscope washing apparatus	2
82	Endoscope cabinet	2
83	Video monitor with light source	3
84	Bone densitometer	1
85	ECG monitor	1
86	EMG machine	1
87	Emergency bed	6
88	Hematology analyser	1
89	Spectrophotometer	1
90	Microscope	2

Item No.	Description	Q'ty
91	Centrifuge	1
92	Hematocrit centrifuge	1
93	Water bath, mixing type	1
94	Autoclave, vertical	1
95	Distiller	1
96	Laboratory table	11
97	Laboratory chair	22
98	Electronic balance, medium	1
99	Electronic balance, small	1
100	Medicine cabinet, counter	12
101	Medicine cabinet, storage	7
102	Medicine table	3
103	Medicine chair	12
104	Tablet counting machine	2
105	Paste mixer	1
106	Microwave diathermy machine	2
107	Infra red lamp	1
108	Infra red baker system	1
109	Ultra sound therapy unit	1
110	Interferential therapy unit	1
111	Electrical nerves stimulator unit	1
112	Tilt table with mobile stand	1
113	Shoulder wheel	1
114	Balancing board	1
115	Gonio meters set	1
116	Packheaters for hot packs	1
117	Ergometer cycle	1
118	Treatment plinth	2
119	Parallel bar set	1
120	Traction unit	1
121	X-ray protective set	1

6. Detail of Main Equipment

Appendix 6 Detail of Main Equipment

Item No.	Description (Planned)	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of medical equipment grade
8	Patient monitor	<ol style="list-style-type: none"> 1. Measurement parameter : ECG, respiration, SpO₂, NIBP, temperature, CO₂ 2. Heart rate range: Min. 30bpm or less, Max. 250bpm or more 3. SpO₂ range: Min 50% or less, Max. 100% 	Basic	8	For continuous monitoring patient's vital sign in operation room, recovering room.
10	Theater lamp	<ol style="list-style-type: none"> 1. Type: Ceiling type 2. Number of arms: 2 3. Lamp intensity Main light head: Max. 120,000 lux or more Satellite light head: Max. 90,000 lux or more 	Basic	3	To keep brightness enough to operate and enable surgeons to see colors correctly.
11	Anesthetic machine	<ol style="list-style-type: none"> 1. Anesthetic machine <ol style="list-style-type: none"> 1) O₂ flow meter range: Max. 10 liter/min. or more 2) N₂O flow meter range: Max. 10L liter/min. or more 3) Vaporizer : Halothane, isoflurane and sevoflurane 2. Ventilator unit <ol style="list-style-type: none"> 1) Ventilation method: Electrically driven 2) Tidal volume range: Max. 1200mL or more 	Middle	3	To do general anesthesia during operations. To ventilate to the patients with difficulty in breathing under general anesthesia during operation.
15	Scrub up sink	<ol style="list-style-type: none"> 1. Material (body and sink): Stainless steel 2. Shower head: For 1 person 3. UV lamp: Equipped 4. Flow rate: 3L/min. or more 	Basic	3	To wash hands before operation.
18	Laparoscope set	<ol style="list-style-type: none"> 1. Telescope A (1) Field of view: 0 degrees 2. Telescope B (1) Field of view: 25 or 30 degrees 3. Insufflation unit (1) Type of Gas: CO₂ 4. Electrosurgical unit (1) Output mode: Cutting and coagulation 5. Light source unit (1) Lamp: Xenon 6. Video monitor system: Equipped 7. Suction irrigation unit: Equipped 	Middle	1	Used in minimally invasive surgery in the field of Gynecology. Case is endometriosis care, fibroid and some kinds of tumor resection.

Item No.	Description (Planned)	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of medical equipment grade
19	Hysteroscope	1. Field of view: 120 degrees or wider 2. Depth of field: 2 to 50mm or more 3. Working length: 205mm or more 4. Outer diameter of distal end: 4.9mm or less 5. Irrigation unit: Equipped	Middle	1	To examine abnormal hemorrhage, uterine mucosa cell, and enlarged tumor in the field of Gynecology.
22	Autoclave	1. Door type: Single door type 2. Sterilizing temperature : 132°C or more (at surgical instruments) 3. Chamber capacity: 160 liter or more 4. Electric boiler unit: Built-in	Middle	2	To sterilize instruments and lines used in operation room and ICU ward with use of high pressure steam.
34	Incubator	1. Temperature setting: Survo and manual control 2. Skin temperature control: Max. 37.5 °C or more 3. Access port: 6 ports	Middle	7	To observe premature and neonatal infant at high risk. To provide oxygen and used for thermal insulation and humidification.
37	Ventilator, C-pap	1. For neonatal and pediatric 2. Inspiratory time: 0.1 to 3.0 sec. or more 3. Respiratory rate: 2 to 150 breath/min. or wider	Middle	1	To ventilate patients who have difficulty in spontaneous breathing in ICU. CPAP function is equipped for preventing airway from closure.
45	Patient monitor, pediatric	1. Measurement parameter : ECG, respiration, SpO ₂ , NIBP, temperature 2. Heart rate range: Min. 30bpm or less, Max. 250bpm or more 3. SpO ₂ range: Min 50% or less, Max. 100%	Basic	2	For continuous monitoring patient's vital sign in PICU.
46	Blood gas analyzer	1. Measurement parameter : pH, pCO ₂ and pO ₂ 2. Sample volume : 100µL or less 3. Printer: Built-in	Middle	1	To analyze respiratory and metabolic functions from measurement of pCO ₂ , pO ₂ , and electrolyte in blood samples
47	X-ray machine, mobile	1. Tube voltage : Max. 110kV or more 2. X-ray tube longitudinal pivoting range (forward): Max. 90 degree or wider	Basic	1	To implement radiographic examinations urgently and simple for unwalkable patients in ICU.
64	US scan, B/W	1. Probe components (1) Convex: within 2.0 to 5.5MHz (2) Linear: within 5.0 to 10.0 MHz (3) Transvaginal: 5.0 to 9.0 MHz 2. Image mode : B and M mode 3. Display size: 12 inch or more 4. Printer: Black and white	Basic	1	For image diagnosis in the field of Gynecology. Used mainly for fetus follow-up.

Item No.	Description (Planned)	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of medical equipment grade
67	Rigid nasal endoscope, adult & child	1. Rigid nasal endoscope, adult Outer diameter of distal end: 4.0mm 2. Rigid nasal endoscope, children Outer diameter of distal end: 2.7mm	Middle	1	For nasal sinus diagnosis and follow-up in the field of Otolaryngology.
68	ENT treatment unit	1. Type of treatment light: Expandable type 2. Anti fogging heater: Equipped 3. Suction unit: Built-in type	Basic	3	Exclusively for patient examination in the field of Otolaryngology.
70	Dental unit and chair	1. Chair up-down control type: Hydraulic control type 2. Air compressor Air capacity 2.5L or more	Basic	4	For examination and cure of patient's teeth and jawbone in the field of Oral surgery and dentistry.
73	Panoramic & cephalometric X-ray unit	1. Tube voltage : Max. 70kV or more 2. Tube current : Max. 10mA or more 3. Exposure time (panorama): 16 sec. or less	Basic	1	For total examination of patient's teeth and maxillofacial in the field of Oral surgery and dentistry.
74	Bronchoscope	1. Field of view : 120° or more 2. Depth of field: 3 to 50mm or wider 3. Working length : 600mm 4. Outer diameter of distal end: 6.0 mm or less	Middle	1	To visually diagnose bronchitis disease like lung cancer, pulmonary TB, etc.
75	Colonoscope	1. Field of view : 140° or more 2. Depth of field: 3 to 100mm or wider 3. Working length : 1680mm or more 4. Outer diameter of distal end : 13.4mm or less	Middle	1	To visually diagnose colon disease like colon cancer.
76	OGD	1. Field of view : 100° or more 2. Depth of field: 5 to 60mm or wider 3. Working length : 1240mm or more 4. Outer diameter of distal end: 13.5mm or less	Middle	1	To visually diagnose disease from esophagus to duodenum like polyp.
83	Video monitor with light source	1. Light source unit 1) Light source: Xenon 2) Light power: 100W or more 2. Monitor 1) Size: 19 inch 2) Type: LCD or TFT	Middle	3	Arrange light source and monitor in one tower, which is needed in endoscopy.
84	Bone densitometer	1. Measuring method: Ultrasound pulse transmission 2. Measurement site: Calcaneus 3. Measuring time: 10 sec. or less	Middle	1	Used for evaluation of bone growth in childhood, evaluation of maximum bone mass in young adulthood, diagnosis for bone loss and osteoporosis and judge the effectiveness of treatment.

Item No.	Description (Planned)	Main specifications or components	Grade	Q'ty	Purpose Appropriateness of medical equipment grade
86	EMG machine	1. Measuring items (1) Electro Myo Gram: (EMG) Electro Myo Gram (2) Nerve Conduction Study: (NCS) Nerve Conduction Study (3) Evoked Potentials: (SEP) Somatosensory Evoked Potentials, (VEP) Visual Evoked Potentials, (ABR) Auditory Brainstem Response 2. Number of channels: 2 channels or more	Basic	1	Used for rehabilitation follow-up of myoneural junction disease, peripheral neuritis and rheumatism etc.
88	Hematology analyzer	1. Measured parameter: RBC, WBC, HGB, HCT, MCV, MCH, MCHC, PLT, etc. 2. Throughput: 50 samples/hour or more 3. Printer: Provided 4. Monitor: Provided	Middle	1	To calculate number of red blood cell, white blood cell and hemoglobin etc. Used for examination in a wide range as basic blood testing.
110	Interferential therapy unit	1. Stimulation mode: 3 mode or more 2. Interferential frequency: 1 to 199Hz or wider 3. Safety device: Equipped	Basic	1	To improve circulation and provide sedation to muscle damaged.
120	Traction unit	1. Traction force: Max. 80kg or more 2. Treatment time: Max. 30 min. or more 3. Safety device: Equipped	Basic	1	To ease numb and pain at around interspinal desk and intervertebral joint by pulling vertebrae and lumbar vertebrae.

**7. Medical Equipment: Annual Cost for Purchase of
Consumables and Spare Parts**

Appendix 7

Medical Equipment:

Annual Cost for Purchase of Consumables and Spare Parts

Item No.	Description (Planned)	Q'ty	Spare parts and Consumables	Unit	Evidence for calculation	Q'ty	Unit price	Price per one set	Total
			Suction bottle (2bottles/set)	set	1set/Y(year)	1	13,404	13,404	
			Connecting hose for cannula	pc	1pc/Y	1	410	410	
			Suction tube	pc	2pcs/Y	2	342	684	
			Sub total					14,498	72,490
2	Laryngoscope	3							
			Bulb (3pcs/set)	set	1set/Y	1	2,390	2,390	
			Sub total					2,390	7,171
3	Defibrillator with monitor	2							
			Gel (250mL)	pc	$365\text{days} \times 0.5\text{P}(\text{patients})/\text{day} = 182\text{P}/\text{Y} \times 5\text{mL}/\text{P} + 250\text{mL}/\text{pc} = 3.64$	4	498	1,992	
			Sub total					1,992	3,984
8	Patient monitor	8							
			Temperature probe for adult (reusable)	pc	1pc/Y	1	23,902	23,902	
			SpO2 finger probe for adult (reusable)	pc	1pc/Y	1	27,387	27,387	
			Blood pressure cuff with hose for adult (reusable)	pc	1pc/Y	1	2,191	2,191	
			ECG electrode for adult (150pcs/set)	set	$300\text{days}/\text{Y} \times 2\text{P}/\text{day} \times 3\text{pcs}/\text{P} + 150\text{pcs}/\text{set} = 12$	12	4,980	59,754	
			Sub total					113,234	905,874
10	Theater lamp	3							
			Halogen lamp	set	$8\text{h}(\text{hours})/\text{day} \times 365\text{D} + 1000\text{h}/\text{set} = 2.92$	3	24,510	73,530	
			Sub total					73,530	220,589

11	Anesthetic machine	3							
			Patient circuit set for adult, reusable	set	2set/Y	2	29,877	59,754	
			CO2 absorbent tablet (4.5kg/box)	box	300days×6h×0.05kg/h÷4.5kg/box=20	20	4,980	99,590	
			Sub total					159,345	478,034
14	Cautery unit	3							
			Electrode set (10kinds/set)	set	2sets/Y	2	20,914	41,828	
			Sub total					41,828	125,484
15	Scrub up sink	3							
			Prefilter element	pc	1pc/Y	1	2,052	2,052	
			Ultraviolet germicidal lamp	pc	1pc/Y	1	1,026	1,026	
			Sub total					3,077	9,232
16	Infant warmer	6							
			Adhesive collar (100sheets/set)	set	300days/Y×2P/day÷100sheets/set=6	6	7,659	45,956	
			Sub total					45,956	275,736
22	Autoclave	2							
			Prefilter element	set	3sets/Y	3	2,351	7,054	
			Sub total					7,054	14,109
28	Laryngoscope, neonate	3							
			Bulb (3pcs/set)	set	1set/Y	1	1,600	1,600	
			Sub total					1,600	4,801
29	Pulse oxymeter	9							
			Finger probe	pc	1pc/Y	1	25,531	25,531	
			Sub total					25,531	229,780
32	Syringe pump	16							
			Syringe (50mL)	pc	300days/Y×0.5P/day×1pc/P=150	150	50	7,469	
			Tube set	pc	300days/Y×0.5P/day×1pc/P=150	150	39	5,826	
			Sub total					13,295	212,725

33	Patient monitor, neonate	6							
			Temperature probe for neonate (reusable)	pc	1pc/Y	1	23,902	23,902	
			SpO2 probe for neonate	pc	1pc/Y	1	27,387	27,387	
			Blood pressure cuff with hose for neonate (reusable)	pc	1pc/Y	1	2,191	2,191	
			ECG electrode for neonate (150pc/set)	set	300days/Y×2P/day×3pc/P+150pcs/set=12	12	4,183	50,194	
			Sub total					103,674	622,042
35	Phototherapy unit	4							
			Irradiation lamp for phototherapy	set	12h/day×365days/Y+3000h/pc=1.46	2	5,129	10,258	
			Sub total					10,258	41,032
37	Ventilator, C-pap	1							
			Heated humidifier filter (100pcs/set)	set	365days/Y×2P/day+100pcs/set=7.3	8	68,387	547,096	
			Bacteria filter set	set	2set/Y	2	1,094	2,188	
			Sub total					549,284	549,284
42	Laryngoscope, pediatric	2							
			Bulb (3pcs/set)	set	1set/Y	1	2,390	2,390	
			Sub total					2,390	4,780
44	Infusion pump	7							
			Infusion tube set (10pcs/set)	set	300days/Y×0.5P/day×1pc/P+10pcs/set=15	15	398	5,975	
			Sub total					5,975	41,828
45	Patient monitor, neonate	2							
			Temperature probe for pediatric (reusable)	pc	1pc/Y	1	23,902	23,902	
			SpO2 probe for pediatric (reusable)	pc	1pc/Y	1	27,387	27,387	
			Blood pressure cuff with hose for pediatric (reusable)	pc	1pc/Y	1	2,191	2,191	
			ECG electrode for pediatric (150pcs/set)	set	300days/Y×2P/day×3pcs/P+150pcs/set=12	12	4,980	59,754	
			Sub total					113,234	226,469

46	Blood gas analyser	1							
			Reagent and printing paper for 1800 tests	set	20tests/day×365days+1800tests/set=4.05	4			
			Sub total					672,000	672,000
47	X-ray machine, mobile	1							
			X-ray film (100sheets/box)	box	300days×2P/day×2sheets/P+100sheets/box=12	12	27,355	328,257	
			Sub total					328,257	328,257
50	Examination lamp	55							
			Incandescent lamp	pc	3h/day×312days+1000h/pc=0.936	1	498	498	
			Sub total					498	27,387
57	Spirometer	1							
			Paper mouthpiece (200pcs/set)	set	260days/Y×2P/day+200pcs/set=2.6	3	3,009	9,027	
			Printer paper (30m/pc)	pc	260P/Y×2P/day×0.2m/P+30m/pc=3.46	4	410	1,641	
			Sub total					10,668	10,668
62	Fetal doppler	1							
			Gel (250g)	pc	260days/Y×8P/day×2g/P+250g/pc=16.64	17	855	14,532	
			Sub total					14,532	14,532
64	US scan, B/W	1							
			Gel	liter	260days/Y×5P/day×5mL/P+1000mL=6.5	7	4,980	34,857	
			Printer paper	pc	260days/Y×5P/day×0.2m/P+30m/pc=8.66	9	2,988	26,889	
			Sub total					61,746	61,746
65	Headlight, ENT	3							
			Lamp	pc	6h/day×312days+2000h/pc=0.936	1	2,735	2,735	
			Sub total					2,735	8,206
66	Microscope, ENT	1							
			Lamp	pc	6h/day×312days+2000h/pc=0.936	1	2,735	2,735	
			Sub total					2,735	2,735

73	Panoramic & cephalomatic X-ray unit	1							
			X-ray film (100sheets/box)	box	260days×3P/day×2sheets/P+100sheets/box=15.6	16	4,103	65,651	
			Sub total					65,651	65,651
83	Video monitor with light source	3							
			Xenon bulb	pc	6h/day×312days+2000h/pc=0.936	1	95,742	95,742	
			Sub total					95,742	287,225
84	Bone densitometer	1							
			Printer paper	pc	260days/Y×2P/day+100P/pc=5.2	6	1,992	11,951	
			Gel (250g)	pc	260days/Y×2P/day×2g+250g=4.16	5	2,988	14,939	
			Sub total					26,889	26,889
85	ECG monitor	1							
			Chest electrode set for adult (6pcs/set)	set	2set/Y	2	1,992	3,984	
			Chest electrode set for child (6pcs/set)	set	2set/Y	2	1,992	3,984	
			Limb electrode set for adult (4pcs/set)	set	2set/Y	2	1,992	3,984	
			Limb electrode set for child (4pcs/set)	set	2set/Y	2	1,992	3,984	
			Patient cable	pc	2set/Y	2	11,951	23,902	
			ECG cream (100g)	pc	260days/Y×10P/day×5g/P+100g/pc=130	130	498	64,734	
			Recording paper	pc	260days/Y×10P/day+40P/pc=65	65	598	38,840	
			Sub total					143,410	143,410
86	EMG machine	1							
			Evoked potential electrode set	set	1set/Y	1	27,355	27,355	
			EMG electrode set	set	1set/Y	1	74,542	74,542	
			Gel (270g)	pc	260days/Y×2P/day×5g/P+270g/pc=9.6	10	1,846	18,464	
			EEG paste (1200g)	pc	260days/Y×2P/day×5g/P+1200g/pc=2.16	2	6,155	12,310	
			Sub total					132,671	132,671

88	Hematology analyser	1							
			Reagent and printing paper for 6000 tests	set	100tests/day×260 days/Y+6000tests/set=4.33	4	244,825	979,302	
			Sub total					979,302	979,302
89	Spectrophotometer	1							
			Printing paper	pc	5pcs/Y	5	5,471	27,355	
			Sub total					27,355	27,355
90	Microscope	2							
			Immersion oil, 50cc	pc	1pc/Y	1	1,846	1,846	
			Sub total					1,846	3,693
109	Ultra sound therapy unit	1							
			Ultrasound gel (250g)	pc	260days/Y×2P/day×2g+250g/pc=4.16	5	9,027	45,135	
			Sub total					45,135	45,135
								TOTAL	
								Rs. 6,882,309	

**8. Medical Equipment: Annual Contract Cost for
Equipment Maintenance**

Appendix 8

Medical Equipment: Annual Contract Cost for Equipment Maintenance

Item No.	Description (Planned)	Q'ty	Unit	Price per one unit	Total (JPY)
22	Autoclave	2	Annual	¥105,000	¥210,000
46	Blood gas analyser	1	Annual	¥125,000	¥125,000
47	X-ray machine, mobile	1	Annual	¥200,000	¥200,000
64	US scan, B/W	1	Annual	¥250,000	¥250,000
73	Panoramic & cephalomatic X-ray unit	1	Annual	¥161,000	¥161,000
88	Hematology analyser	1	Annual	¥125,000	¥125,000
89	Spectrophotometer	1	Annual	¥46,700	¥46,700
				TOTAL (JPY)	¥1,117,700
				TOTAL (Rs.)	Rs. 1,019,148

9. Soil Investigation Report

**YAMASHITA SEKKEI INC.
ARCHITECTS, ENGINEERS & CONSULTANTS.
6 – 1, NIHONBASHI-KOAMICHO, CHUO-KU,
TOKYO 103-8542,
JAPAN.**

**REPORT
ON
SOIL INVESTIGATION FOR PROPOSED
ANURADHAPURA TEACHING HOSPITAL IMPROVEMENT PROJECT
BY
JICA.**

July 2007

**GROUND ENGINEERING CONSULTANTS (PVT) LTD.
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REPORT

REPORT ON SOIL INVESTIGATIONS FOR PROPOSED ANURADHAPURA TEACHING HOSPITAL IMPROVEMENT PROJECT BY JICA.

1.0 Origin.

It is proposed to construct a new building for the Teaching Hospital in Anuradhapura by JICA. The Consultants of the Project M/s Yamashita Sekkei Inc (YSI) of 6 - 1, Nihonbashi-Koamicho, Chuo-Ku, Tokyo 103-8542, Japan require evaluation of sub soil conditions of the proposed Site in order to determine the parameters involved with designing a suitable foundation for the proposed structures. Under the above circumstances, M/s Ground Engineering Consultants (Pvt.) Ltd. (GEC) of No. 24, Station Road, Wattala, were entrusted by Mr. Osamu Suzuki of YSI with required sub soil investigations, under the Agreement signed between YSI and GEC on 18th June 2007.

2.0 Information Provided.

The YSI provided following information to the GEC.

1. Location of the proposed Sites.
2. Present building arrangement of the Site.
3. Location of the test points.
4. The proposed building is a 3 or 4 storey RCC structure.
5. Span of the columns is approximately 6 * 8m.
6. Floor area of the structure is approximately 7,000m².

The actual stress conditions of the foundation / columns are not known to the GEC at the time of preparation of this Report.

3.0 Scope.

The scope of work was to drill 03 boreholes at the given locations, while conducting Standard Penetration Tests (SPT) at 1.0m intervals. The depth of boreholes shall be maximum of 30m, or 5m deeper from the supporting layer (including bedrock layer) if the supporting layer appears within 20m.

Representative undisturbed soil samples were to be taken, if soft, highly compressible fine-grained cohesive soils are encountered.

Disturbed soil samples were to be taken from every SPT location and whenever the soil type changes.

Following laboratory tests were to be conducted on the soil samples, in accordance with relevant ASTM Standards.

1. Atterberg limit test.
2. Specific gravity test
3. Moisture content test
4. Wet & dry density test.
5. Unconfined compression test.
6. Consolidation test.

The depth to the ground water table inside the borehole was to be recorded.

The Technical Report should include the following.

1. Introduction.
2. Scope of work.
3. Geological setup.
4. Engineering properties of the soil samples & foundation type.
5. General notes on soil investigation review.
6. Conclusion and recommendations.
7. Site plan.
8. Borehole logs.
9. Photographs of undisturbed samples of soils.
10. Geological section diagram.

4.0 Location.

Proposed Project Site is located within the present premises of Anuradhapura Teaching Hospital in Anuradhapura in the District of Anuradhapura of the North Central Province of Sri Lanka.

A site plan indicating the locations of boreholes is given as figure 1 under Annexure A to the Report.

The coordinates of the borehole locations and collar elevation, with respect to the survey plan prepared at the time of the investigation, of the boreholes are given in Table No. 1.

Table No. 1 – Location of the Boreholes

Borehole No.	N (m)	E (m)	Collar Elevation (m)
BH 1	4953.646	6969.458	100.251
BH 2	4976.978	6943.462	99.758
BH 3	4997.092	6994.208	100.151

5.0 Work Carried Out.

5.1 General.

A YBM 05 medium weight rotary type drill rig along with an investigation team headed by a Geotechnical Engineering Assistant under the supervision of a qualified Geotechnical Engineer was mobilized for this work on the 04th July 2007, and fieldwork was commenced on the same day. The fieldwork was successfully completed on 10th July 2007.

The boreholes were drilled down vertically while carrying out SPT at 1.0 interval. The borehole was terminated at the following depths, measured from the existing ground level (EGL), on encountering Moderately Weathered to Fresh bedrock.

- BH 1 - 12.30m
- BH 2 - 12.40m
- BH 3 - 14.00m

Representative disturbed soil samples were taken from every SPT location and whenever the type of the soil stratum changes.

Undisturbed soil samples were not obtained from the borehole since soft fine-grained cohesive soils were not encountered.

5.2 Standard Penetration Test (SPT).

Standard Penetration Test (SPT) was conducted inside the boreholes in accordance with relevant BS throughout the total depth up to the highly weathered basement rock.

5.3 Sampling And Classification.

The sub soil strata were recovered using a split spoon sampler, by other dry blocking methods. Disturbed samples, which ever that could be recovered, were collected continuously at 1.0m intervals and when ever the soil type changes.

The bedrock was cored using triple tube core barrel.

The soil samples were examined in the field visually using a 10 x 1 magnifying glass and classified according to the Unified Soil Classification System. The classification has been clarified in the laboratory under the microscope, as well as using the results of the laboratory tests.

The bedrock was classified in accordance with the Standard Rock Classification.

5.4 Ground Water Table.

The depth to the ground water table was measured from the existing ground level in every borehole, 24hours after the completion of the borehole. The depth to the ground water table, in the three boreholes, is as follows.

BH 1 : 3.75m
BH 2 : 2.75m
BH 3 : 2.42m

5.5 Soil Profile.

The vertical profiles of the sub surface are reported under Annexure B in the form of borehole logs.

5.6 Laboratory Testing.

07 numbers of soil strata are identified in the soil overburden. Seven samples of soils representing every stratum were subjected for the following laboratory tests, in accordance with the relevant British Standards.

1.	Moisture content test.	- MC
2.	Sieve Analysis	- SA
3.	Atterberg limit test.	- AL
4.	Specific gravity test.	- SG
5.	Wet and dry density test.	- WD & DD

The unconfined compression test and consolidation test were not conducted, since there were no undisturbed soil samples available.

The samples, which represent the seven soil strata, subjected for the testing are given in the Table No. 2.

Table No. 2 – Details of the Soil Samples Tested

Sample No.	Represented Stratum	BH No.	Depth (m)
1	Filled earth	BH 1	0.00 – 0.55
2	Depositional soil – SW/GW layer	BH 3	0.00 – 1.00
3	Depositional soil – SC/GC layer	BH 2	0.00 – 2.40
4	Residual soil – ML	BH 1	2.50 – 4.00
5	Residual soil – SM (Upper layer)	BH 1	4.00 – 5.05
6	Residual soil – ML/SM	BH 2	2.40 – 6.00
7	Residual soil – SM (Lower layer)	BH 3	3.00 – 8.03

Atterberg Limit tests on Sample Nos. 1,2,5 and 7 could not be conducted due to the absence of sufficient plastic fines in the collected soils samples.

The wet and dry density of the Sample No. 1 could not be conducted as the 0.5m depth from the EGL was manually excavated due to the possible presence of service lines.

The detail results of the laboratory tests are enclosed under the Annexure C to the Report. A summary of the results is given in the Table No. 3.

Table No. 3 – Results of the Laboratory Tests

Sample No.	BH No.	Depth m	MC %	Sieve Analyses			Atterberg Limits %			SG	WD T/m ³	DD T/m ³	Classifi - cation
				Gravel	Sand	Fines	LL	PL	PI				
1	BH 1	0.00-0.55	5.41	19.7	72.7	7.6	NC	NC	NC	2.66	NC	NC	SW/GW
2	BH 3	0.00-1.00	4.93	27.1	55.9	17.0	NC	NC	NC	2.67	1.72	1.64	SW/GW
3	BH 2	0.00-2.40	6.01	1.5	64.3	34.2	26.5	20.8	5.7	2.71	1.75	1.65	SC/GC
4	BH 1	2.50-4.00	16.70	2.5	64.3	33.2	19.8	16.8	3.0	2.62	1.90	1.63	ML
5	BH 1	4.00-5.05	16.62	5.2	73.8	21.0	NC	NC	NC	2.67	1.88	1.62	SM
6	BH 2	2.40-6.00	16.84	11.1	37.4	51.5	25.6	24.2	1.4	2.63	1.87	1.60	ML/SM
7	BH 3	3.00-8.0	12.32	3.9	74.2	21.9	NC	NC	NC	2.76	1.92	1.79	SM

NC – Not conducted

6.0 Discussion.

6.1 Geology of The Site.

The Site is located on a slightly high ground located in the Northern Intermediate Erosional Platform of Sri Lanka.

The overburden of the Site is consisted of a thin layer of filled earth, a comparatively thick prism of depositional soils, which is followed by a similarly thick prism of residual soils. The topsoil stratum is not well defined in this area. The highly weathered bedrock underlies the above soil overburden. An approximate geological cross section through the boreholes was prepared using the data obtained from the investigation and presented in the Figure II under Annexure D to the Report.

The sequence of strata in the soil overburden is as follows.

A. Prism of filled Earth.

Only one layer of filled earth was observed in the Site at the location of BH 1. It was not observed in other areas.

The filled earth layer is comprised of 0.55m thick stratum of reddish brown colored dense, lateritic, fine to coarse sand and gravel mixed with approximately 10% non plastic fines.

B. Prism of Depositional Soils.

1. 0m to 1.0m thick layer of reddish brown mottled with white colored, dense, fine to coarse sand and gravel mixed with approximately 10 – 20% plastic fines. This layer is observed only in BH 3.
2. 0.40m to 2.40m thick layer of reddish / yellowish brown to reddish brown mottled with white colored, medium dense to dense, fine to coarse sand and gravel mixed with approximately 10 – 40% plastic fines.

The above concludes the prism of depositional soils.

C. Prism of Residual Soils.

1. 1.50m thick layer of yellowish brown colored, loose, fine to coarse sand mixed with approximately 30% silt and 10% plastic fines. This layer was observed only in BH 1.
2. 1.05m thick layer of completely decomposed rock in the form of dense, sand mixed with approximately 20% silt. This layer is observed only in BH 1.
3. 1.05m to 1.60m thick layer of 3.60m thick layer of completely decomposed rock in the form of very stiff / medium dense to dense, Yellowish brown mottled with whitish and grayish brown colored, slightly plastic clayey silt mixed with approximately similar amount of fine to coarse sand.

- 1.90m to 4.52m thick layer of completely decomposed rock in the form of yellowish brown mottled with grayish brown colored, medium dense to extremely dense fine to coarse sand mixed with approximately 20% silt.

The above concludes the prism of residual soils.

All the above three layers contain remnants of the microstructures inherited from the parent bedrock.

Soft, compressible, fine-grained cohesive soils, which can be considered as problematic as far as foundation conditions are concerned, were not observed in any of the boreholes. All the soils found in boreholes can be categorized as fine to coarse-grained non-cohesive granular soils.

D. Bedrock.

The highly weathered bedrock surface was observed in the boreholes at the following depths measured from the EGL.

- BH 1 - 8.00m
- BH 2 - 8.12m
- BH 3 - 8.03m.

The bedrock within the investigated depth consists of highly weathered (HW) through moderately weathered (MW) and slightly weathered (SW) to fresh (F) Biotite Gneiss.

The thickness of the weathering profile of the bedrock is given in Table No. 4.

Table No. 4

Grade of Weathering	Depth (m)		
	BH 1	BH 2	BH 3
HW - MW	8.00 - 10.00	8.12 - 11.15	8.03 - 11.90
MW	10.00 - 11.65	11.15 - 11.70	11.90 - ?
SW - F	> 11.62	> 11.7	?

The BH 3 was not driven down to SW - F bedrock as it was beyond the contractual obligations.

6.2 Strength Properties of the Sub Soil and Foundation Conditions.

The soil overburden of the Site is moderately strong and uncompressible and predominantly consisted of coarse grained soils. Problematic soils as far as foundations are concerned, such as very soft, compressible fine-grained cohesive soils, are not found within depth of overburden.

The allowable bearing capacity values that can be recommended for the soils at shallow levels are given in the Table No. 5. It should be noted that the depth are measured from the existing ground level (EGL).

Table No. 5 -- Allowable Bearing Capacity of Subsoils

Depth (m) from EGL	Allowable Bearing Capacity kN/m ²		
	BH 1	BH 2	BH 3
1.0	150	200	225
2.0	200	250	325
3.0	275	300	550
4.0	425	400	550
5.0	500	525	550

The investigation was conducted during a considerably dry spell and therefore the ground water table that has been observed cannot be the shallowest ground water table. Therefore, the ground water table has been assumed to be at a depth of 1.0m below the existing ground level simulating possible worst condition for the evaluation of above allowable bearing capacity values.

The anticipated settlement of the foundation under the above recommended bearing pressures at respective depths is well within tolerable limits, provided that the stress levels imposed on the sub soils will not exceed the recommended allowable bearing capacity values at respective depths. This settlement also, will take place in the form of immediate settlement during the phase of construction.

Under the above circumstances shallow type of foundations such as strip or raft, can be adopted for the proposed structure. The depth of placement and the width of the foundation should be decided considering the stresses that will be transferred to the soil sub grade by the foundation and the allowable bearing capacity of the sub soils at the respective depth. (Such details could be made available if the accurate loads on the columns are provided to GEC).

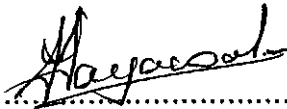
However, the approximate loading on the columns, according to the provided information, is in the range of 3,000 kN/column. Under the above circumstances the most suitable foundation will be a strip foundation placed at a depth of 1.0m below the EGL (approximately at the elevation of 99.0m) considering the average allowable bearing capacity at that depth as 200kN/m².

Dewatering from the excavation for foundations is not necessary to be considered if the depth of placement of the foundation does not exceed 2m from the EGL.

A 4,500 – 5,500kN/m² allowable bearing capacity can be recommended for the highly to moderately weathered bedrock encountered in the area of the Site.

7.0 Conclusion and Recommendations.

1. The allowable bearing capacity of the sub soils in the Site for shallow depths is given in the Table No. 1.
2. The anticipated settlement under the recommended bearing pressures is well within tolerable limits.
3. Shallow type of foundations can be considered for the proposed structure. The most suitable foundation would be strip type of foundation placed at the elevation of 99.0m assuming allowable bearing capacity at that depth as 200kN/m^2 .
4. However, the type, width and the depth of placement of the foundation should be decided, taking the accurate stress levels of the columns and the allowable bearing capacity of the respective depth.
5. The allowable bearing capacity of the moderately weathered bedrock found within the Site area is $4,500 - 5,500\text{kN/m}^2$.
6. It is not necessary to anticipate the need of dewatering, from excavations for the foundations, if the depth is less than 2m.



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S. K. Jayawardana
BSc.(Hons), MSc., CEng.(Lond), MIMM(Lond).

17th July 2007
Date

ANNEXURE A

Location Plan of the Bore Holes

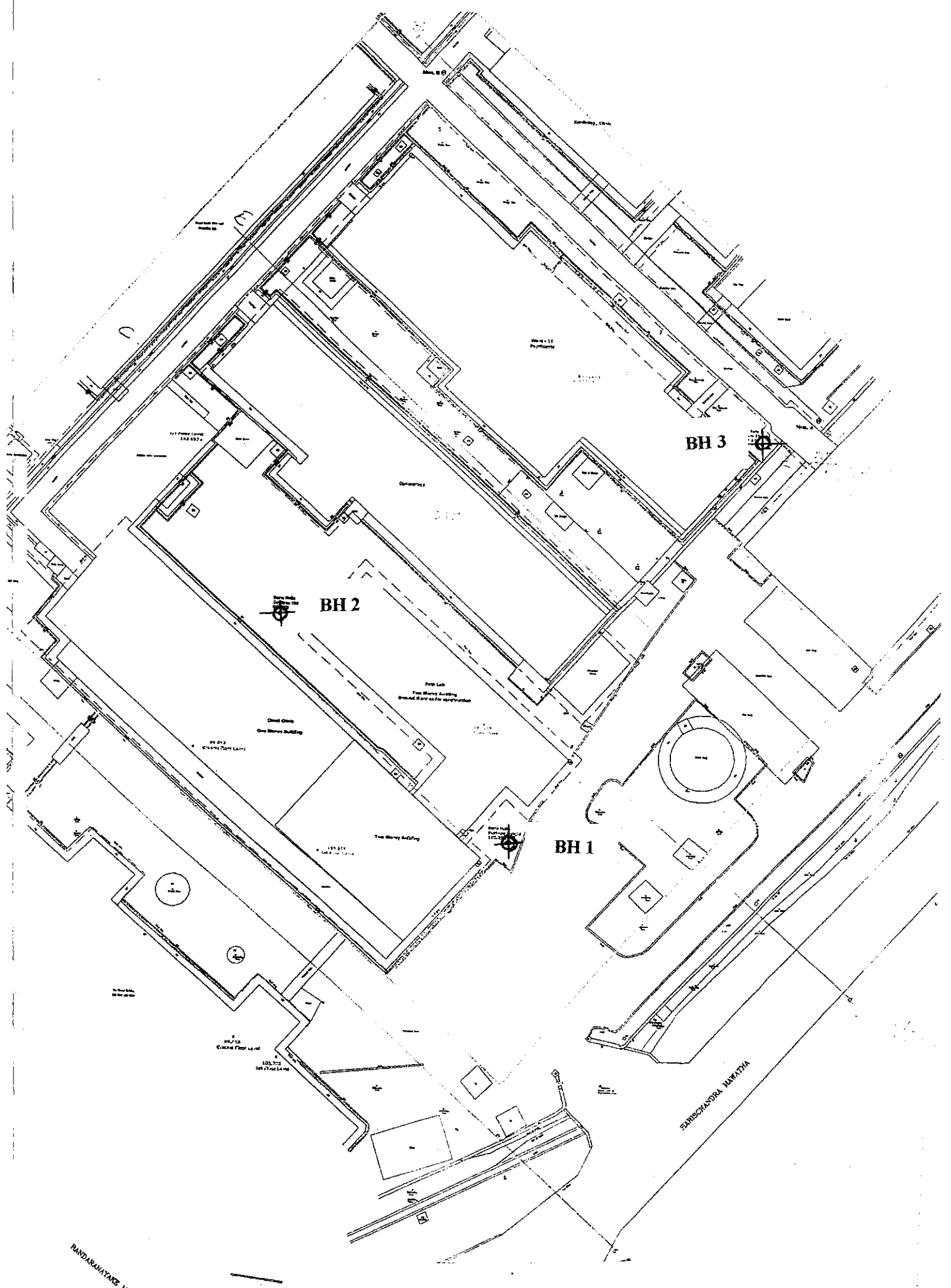


Figure 1
Location Plan of the Boreholes

ANNEXURE B

Vertical Soil Profiles

BOREHOLE LOG

Project Teaching Hospital Improvement Project
Location Anuradhapura
Client Yamashita Sekkei Inc
Consultant
Contractor

BH number BH 1
Collar ele. (m) 100.25
Diameter (mm) 100.00
Angle from vertical 0
Depth (m) 12.30
Depth to GWL (m) 3.75

Commencement: 04.07.2007 **Completion :** 05.07.2007

Elevation (m)	Depth (m) from EGL	Layer thickness (m)	Graphical log	U/D Samples	Colour	Classification	Description	SPT								
								Depth (m)	N	0	10	20	30	40	50	
0.25					Reddish brown	SW/GW	Fill - Dense, lateritic fine to coarse sand and gravel mixed with approx. 10% non plastic fines.									
0.50	99.70	0.55			- do -	SC/GC	Medium dense, fine to coarse sand and gravel mixed with approx. 15 - 30% plastic fines.									
0.75																
1.00								1.00	11							
1.25																
1.50																
1.75																
2.00																
2.25																
2.50	97.75	2.50			- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
2.75																
3.00																
3.25																
3.50																
3.75																
4.00	96.25	4.00			- do -	SM	Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.									
4.25																
4.50																
4.75																
5.00	95.20	5.05			Yellowish brown mixed with whitish brown	ML/SM	Completely decomposed rock in the form of very stiff / dense, slightly plastic, clayey silt mixed with approx. similar amount of sand.									
5.25																
5.50																
5.75																
6.00	94.15	6.10			Yellowish brown to grayish brown	SM	Completely decomposed rock in the form of extremely dense, sand mixed with approx. 20% silt and considerable amount of partially decomposed mica. Remnants of micro structures of the parent rock could be observed									
6.25																
6.50																
6.75																
7.00																
7.25																
7.50																
7.75																
8.00	92.25	8.00			Brown	Bt.Gn.	HW-MW bedrock. CR = 37%, RQD = 0% Broken into pieces of 5-50mm long, due to high grade of weathering.									
8.25																
8.50																
8.75																
9.00	91.25	9.00			Brown to grayish brown	- do -	HW-MW bedrock. CR = 57%, RQD = 0% Broken into pieces of 5-50mm long, due to high grade of weathering.									
9.25																
9.50																
9.75																
10.00	90.25	10.00				- do -	MW bedrock. CR = 66%, RQD = 20% Broken into pieces of 50-125mm long, due to high grade of weathering.									
10.25																
10.50																
10.75																
11.00	89.25	11.00				- do -	MW bedrock with uneven dip angle. CR = 92%, RQD = 19% Broken into pieces of 50-150mm long, due to high grade of weathering.									
11.25																
11.50	88.60	11.65				- do -	Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%									
11.75																
12.00																
12.25																
12.50	87.95	12.30			Gray	- do -										
12.75																
13.00																
13.25																
13.50							Bore hole terminated at 12.30m below the EGL in fresh bedrock.									

Logged by BSY
 Checked by SKJ

BOREHOLE LOG

Project Teaching Hospital Improvement Project
Location Anuradhapura
Client Yamashita Sekkei Inc
Consultant
Contractor

BH number BH 2
Collar ele. (m) 99.76
Diameter (mm) 100.00
Angle from vertical 0
Depth (m) 12.40
Depth to GWL (m) 2.75

Commencement: 06.07.2007 **Completion :** 08.07.2007

Elevation (m)	Depth (m) from EGL	Layer thickness (m)	Graphical log	U/D Samples	Colour	Classification	Description	SPT											
								Depth (m)	N	0	10	20	30	40	50				
0.00																			
0.25					reddish brown	SC/GC	Dense, fine to coarse sand and gravel mixed with approx. 10 - 35% plastic fines.												
0.50																			
0.75																			
1.00																			
1.25																			
1.50					Reddish brown mixed with white														
1.75																			
2.00																			
2.25	97.36	2.40	2.40																
2.50					Yellowish brown mixed with reddish brown	ML/SM	Completely decomposed rock in the form of very stiff / dense, slightly plastic, clayey silt mixed with approx. similar amount of fine to coarse sand.												
2.75																			
3.00																			
3.25																			
3.50	96.16	3.60	1.20																
3.75					Yellowish brown mixed with grayish brown	ML/SM	Completely decomposed rock in the form of stiff to very stiff / medium dense to dense, slightly plastic, clayey silt mixed with approx. similar amount of fine to coarse sand and partially decayed mica.												
4.00																			
4.25																			
4.50																			
4.75																			
5.00																			
5.25																			
5.50																			
5.75																			
6.00	93.76	6.00	2.40																
6.25					- do -	SM	Completely decomposed rock in the form of extremely dense, sand mixed with approx. 20% silt and some partly decayed mica and dark heavy minerals.												
6.50																			
6.75																			
7.00																			
7.25																			
7.50							Remnants of micro structures of the parent rock could be observed												
7.75																			
8.00	91.64	8.12	2.12																
8.25					Dark brown	Bt.Gn.	HW bedrock. CR = 22%, RQD = 0% Broken into pieces of 5-25mm long, due to high grade of weathering.												
8.50																			
8.75																			
9.00	90.76	9.00	0.88																
9.25					Brown	- do -	MW - HW bedrock with 10 - 60deg dipping. CR = 85%, RQD = 0% Broken into pieces of 10-75mm long, due to high grade of weathering.												
9.50	90.16	9.60	0.60																
9.75																			
10.00																			
10.25																			
10.50																			
10.75																			
11.00	88.61	11.15	1.55																
11.25					Grayish brown	- do -	MW bedrock with 60-20deg. dipping. CR = 100%, RQD = 38% Broken into pieces of 50-85mm long, due to high grade of weathering.												
11.50																			
11.75	88.06	11.70	0.55																
12.00																			
12.25					Gray														
12.50																			
12.75	87.36	12.40	0.70				SW - Fresh bedrock with 20-60deg. dipping. CR = 100%, RQD = 60% Ponly mechanical fractures are observed.												
13.00																			
13.25																			
13.50							Bore hole terminated at 12.40m below the EGL, slightly weathered to fresh bedrock.												

Logged by BSY
 Checked by SKJ

BOREHOLE LOG

Project Teaching Hospital Improvement Project
Location Anuradhapura
Client Yamashita Sekkei Inc
Consultant
Contractor

BH number BH 3
Collar ele. (m) 100.15
Diameter (mm) 100.00
Angle from vertical 0
Depth (m) 14.00
Depth to GWL (m) 2.42

Commencement: 08.07.2007 **Completion :** 09.07.2007

Elevation (m)	Depth (m) from EGL	Layer thickness (m)	Graphical log	U/D	Samples	Colour	Classification	Description	SPT								
									Depth (m)	N	0	10	20	30	40	50	
0.25						Reddish brown mixed with white	SW/GW	Dense, fine to coarse sand and gravel mixed with approx. 10 - 20% plastic fines.									
0.50																	
0.75																	
1.00	99.15	1.00	1.00														
1.25						Reddish brown	SC/GC	Dense, fine to coarse sand and gravel mixed approx. 15% plastic fines.									
1.50	98.75	1.40	0.40														
1.75						Yellowish brown mixed with grayish & whitish brown	ML/SM	Completely decomposed rock in the form of very stiff / dense, slightly plastic, clayey silt mixed with approx. similar amount of fine to coarse sand and some partly decayed mica.									
2.00																	
2.25																	
2.50																	
2.75																	
3.00	97.15	3.00	1.60			Yellowish brown mixed with grayish brown	SM	Completely decomposed rock in the form of extremely dense through very dense to extremely dense, sand with approx. 20% silt and some dark heavy minerals.									
3.25																	
3.50																	
3.75																	
4.00																	
4.25																	
4.50																	
4.75																	
5.00																	
5.25																	
5.50																	
5.75																	
6.00																	
6.25																	
6.50																	
6.75																	
7.00																	
7.25																	
7.50																	
7.75																	
8.00	92.12	8.03	5.03														
8.25						Brown	Bt. Gn.	HW - MW bedrock dipping 60deg. CR = 77%, RQD = 40%									
8.50								Broken into pieces of 5-25mm long, from 8.10 - 8.20m due to high grade of weathering.									
8.75						- do -	- do -	HW - MW bedrock with irregular dipping. CR = 66%, RQD = 24%									
9.00	91.15	9.00	0.97					Broken into pieces of 5-25mm long, from 9.00 - 9.05m due to high grade of weathering.									
9.25																	
9.50																	
9.75																	
10.00	90.15	10.00	1.00														
10.25						Brown to grayish brown	- do -	HW - MW bedrock dipping 40- 60deg. CR = 97%, RQD = 56%									
10.50																	
10.75																	
11.00	89.15	11.00	1.00														
11.25						Grayish brown	- do -	HW bedrock with irregular dipping. CR = 45%, RQD = 14%									
11.50								Broken into pieces of 1-5mm, from 11.75 - 11.90m due to high grade of weathering.									
11.75	88.25	11.90	0.90														
12.00																	
12.25																	
12.50																	
12.75																	
13.00																	
13.50																	
14.00	86.15	14.00	2.10					Bore hole terminated at 14.0m below the EGL in moderately weathered bedrock.									
Disturbed soil		Residual Rock															
Depositional																	

Logged by BSY
 Checked by SKJ

ANNEXURE C
Results of the Laboratory Tests

NATURAL MOISTURE CONTENT DETERMINATION

Project :	Teaching Hospital Improvement project	Client :	Yamashita Sekkei Inc.
Location :	Anuradhapura	Consultant :	
		Contractor :	
Test method	BS 1377, 1990, Part 2, Test 3.	Date :	12.07.2006 - 13.07.2007

BH No.	BH 1		BH 3		BH 2		BH 1		BH 1	
Sample No.	1		2		3		4		5	
Depth (m)	0.00 - 0.55		0.00 - 1.00		1.00 - 2.00		2.50 - 4.00		4.00 - 5.05	
Can no.	1a	1b	2a	2b	3a	3b	4a	4b	5a	5b
Weight of can (g)	7.98	7.78	8.43	8.07	8.51	7.97	7.85	10.17	8.01	9.74
Weight of can + wet soil (g)	56.81	55.58	60.94	60.05	55.81	67.36	69.75	72.72	61.32	72.14
Weight of can + dry soil (g)	54.32	53.11	58.40	57.68	53.17	63.94	61.10	63.56	53.74	63.23
Moisture content (%)	5.37	5.45	5.08	4.78	5.91	6.11	16.24	17.16	16.58	16.66
Average m.c. (%)	5.41		4.93		6.01		16.70		16.62	

BH No.	BH 2		BH 3				
Sample No.	6		7				
Depth (m)	2.40 - 6.00		3.00 - 8.03				
Can no.	6a	6b	7a	7b			
Weight of can (g)	8.86	6.05	9.12	5.97			
Weight of can + wet soil (g)	98.82	122.69	97.26	120.40			
Weight of can + dry soil (g)	85.77	105.99	87.47	108.01			
Moisture content (%)	16.97	16.71	12.50	12.14			
Average m.c. (%)	16.84		12.32				

SIEVE ANALYSES OF SOILS

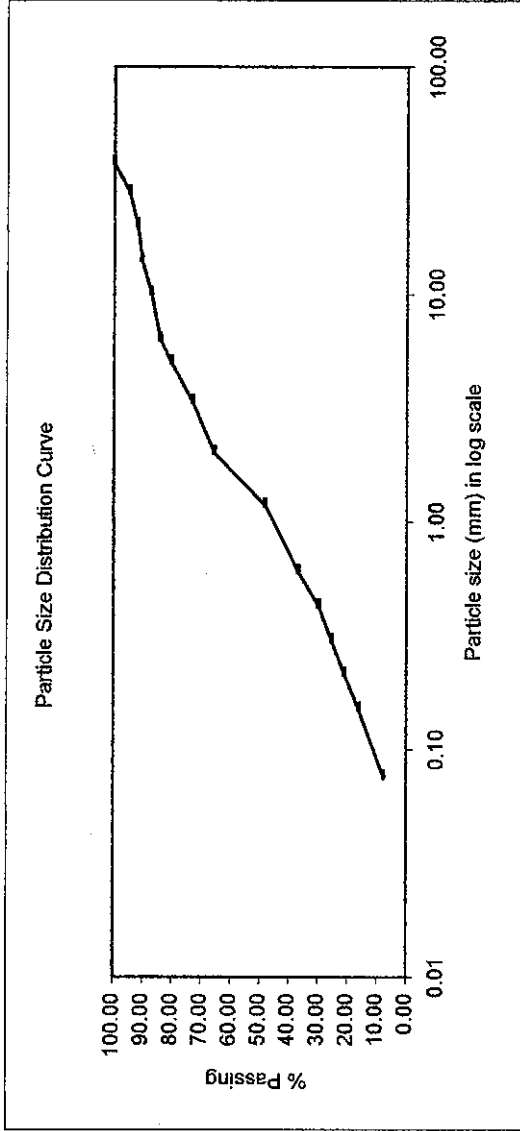
Project : Teaching Hospital Improvement project
 Location : Anuradhapura
 Sample Nos. : 1 & 2
 Test method : BS 1377, 1990, Part 2, Test 9.3

Client : Yamashita Sekkel Inc.
 Consultant :
 Contractor :
 Date : 11.07.2007

BH No. : BH 1

Depth : from 0.00 to 0.55 m

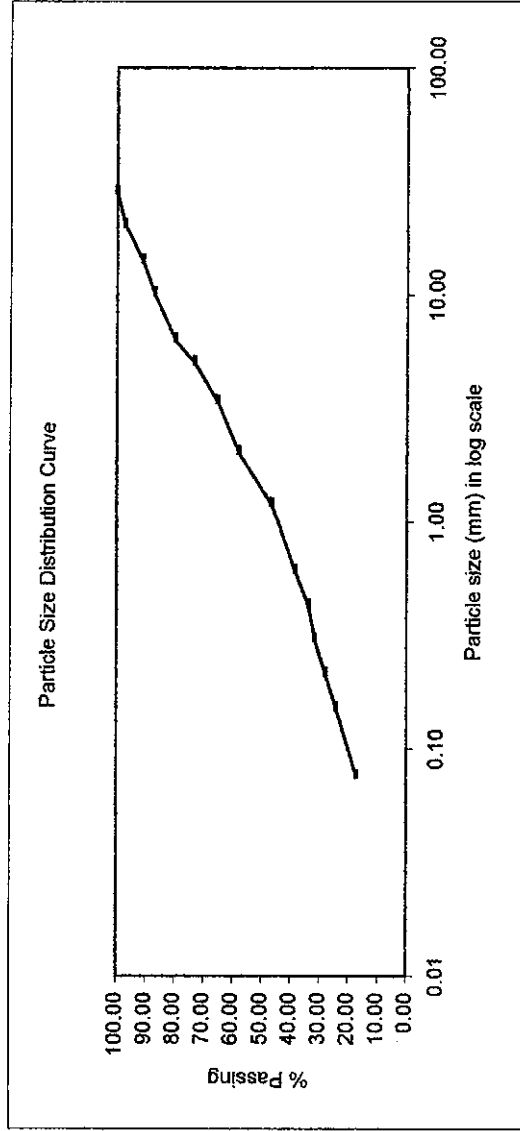
Sample No. :	1		1		2		2		Remarks
Pan No.	1		1		2		2		
Wt. of pan	8.86 g		8.86 g		10.23 g		10.23 g		
Wt. Of pan + soil	274.56 g		274.56 g		228.17 g		228.17 g		
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Ret. %	Cu. Pas. %	Ret. %	Cu. Pas. %	Remarks	
50.00		0.00	100.00		100.00		100.00		
37.50	14.17	5.33	94.67	0.00	94.67	0.00	94.67		
20.00	6.96	2.62	92.05	2.89	91.06	2.89	97.11		
14.00	4.12	1.55	90.50	6.06	86.97	4.09	91.06		
10.00	8.42	3.17	87.33	4.09	79.86	7.11	86.97		
6.30	8.62	3.24	84.08	6.91	72.94	6.91	79.86		
5.00	10.00	3.76	80.32	7.83	65.11	7.83	72.94		
3.35	19.30	7.26	73.06	7.31	57.80	7.31	65.11		
2.00	20.05	7.55	65.51	11.47	46.33	11.47	46.33		
1.180	46.51	17.50	48.01	7.97	38.36	7.97	38.36		
0.600	29.65	11.16	36.85	4.57	33.79	4.57	33.79		
0.425	18.50	6.96	29.88	2.22	31.57	2.22	31.57		
0.300	11.45	4.31	25.57	3.67	27.90	3.67	27.90		
0.212	12.10	4.55	21.02	3.68	24.23	3.68	24.23		
0.150	12.58	4.73	16.29	7.23	17.00	7.23	17.00		
0.075	23.05	8.68	7.61						



BH No. : BH 3

Depth : from 0.00 to 1.00 m

Sample No. :	2		2		2		2		Remarks
Pan No.	2		2		2		2		
Wt. of pan	10.23 g		10.23 g		10.23 g		10.23 g		
Wt. Of pan + soil	228.17 g		228.17 g		228.17 g		228.17 g		
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Ret. %	Cu. Pas. %	Ret. %	Cu. Pas. %	Remarks	
50.00		0.00	100.00		100.00		100.00		
37.50	6.29	2.89	97.11	0.00	97.11	0.00	97.11		
20.00	13.20	6.06	91.06	2.89	91.06	2.89	97.11		
14.00	8.91	4.09	86.97	4.09	86.97	4.09	91.06		
10.00	15.50	7.11	79.86	6.91	72.94	6.91	79.86		
6.30	15.07	7.11	72.94	7.83	65.11	7.83	72.94		
5.00	17.06	7.83	65.11	7.31	57.80	7.31	65.11		
3.35	15.93	7.31	57.80	11.47	46.33	11.47	46.33		
2.00	25.00	11.47	46.33	7.97	38.36	7.97	38.36		
1.180	17.37	7.97	38.36	4.57	33.79	4.57	33.79		
0.600	9.96	4.57	33.79	2.22	31.57	2.22	31.57		
0.425	4.84	2.22	31.57	3.67	27.90	3.67	27.90		
0.300	8.00	3.67	27.90	3.68	24.23	3.68	24.23		
0.212	8.01	3.68	24.23	7.23	17.00	7.23	17.00		
0.150	8.01	3.68	24.23						
0.075	15.76	7.23	17.00						

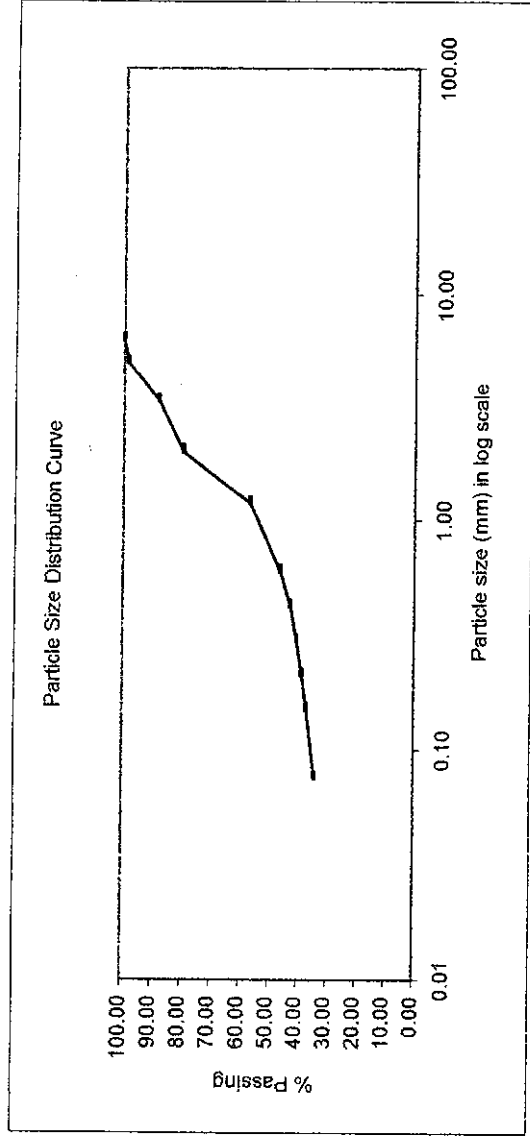


SIEVE ANALYSES OF SOILS

Project : Teaching Hospital Improvement project
 Location : Anuradhapura
 Sample Nos. : 3 & 4
 Test method : BS 1377, 1990, Part 2, Test 9.3

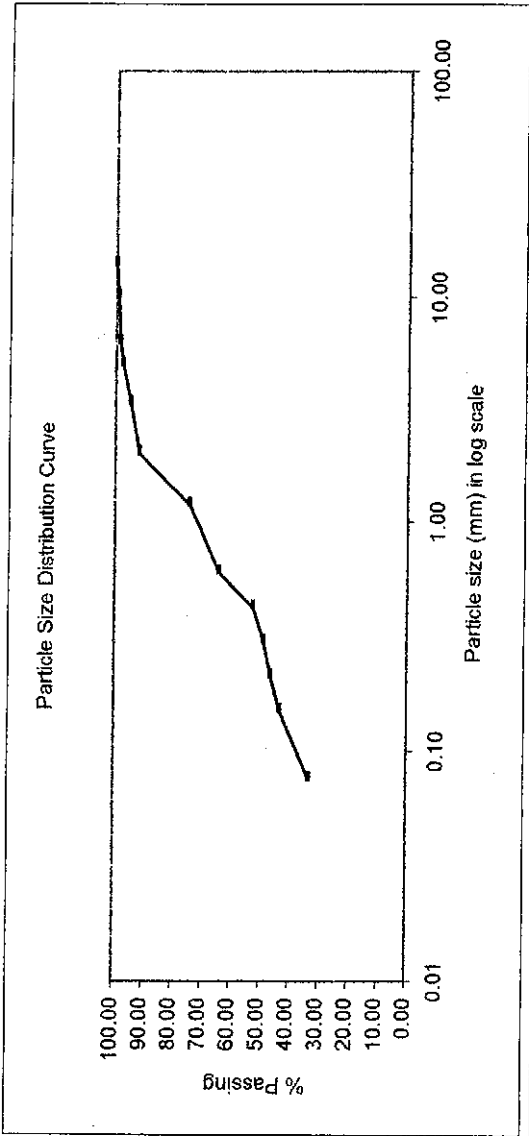
Client : Yamashita Sekkei Inc.
 Consultant :
 Contractor :
 Date : 11.07.2007

BH No. : BH 2 Depth : from 0.00 to 2.40 m



Sample No. :	3			
Pan No.	3			
Wt. of pan	10.45 g			
Wt. Of pan + soil	252.12 g			
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Remarks
50.00				
37.50				
28.00				
20.00				
14.00				
10.00				
6.30				
5.00	3.69	0.00	100.00	
3.35	24.98	1.53	98.47	
2.00	20.00	10.34	88.14	
1.180	55.68	8.28	79.86	
0.600	25.27	23.04	56.82	
0.425	8.60	10.46	46.36	
0.300	5.08	3.56	42.81	
0.212	4.40	2.10	40.70	
0.150	4.05	1.82	38.88	
0.075	7.25	1.68	37.21	
		3.00	34.21	

BH No. : BH 1 Depth : from 2.50 to 4.00 m



Sample No. :	4			
Pan No.	4			
Wt. of pan	5.96 g			
Wt. Of pan + soil	294.12 g			
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Remarks
50.00				
37.50				
28.00				
20.00				
14.00				
10.00				
6.30				
5.00	2.36	0.00	100.00	
3.35	2.01	0.70	98.48	
2.00	2.89	1.00	97.48	
1.180	7.70	2.67	94.81	
0.600	9.01	3.13	91.68	
0.425	49.90	17.32	74.36	
0.300	29.15	10.12	64.25	
0.212	34.13	11.84	52.40	
0.150	10.13	3.52	48.89	
0.075	7.02	2.44	46.45	
	9.31	3.23	43.22	
	28.78	9.99	33.24	

SIEVE ANALYSES OF SOILS

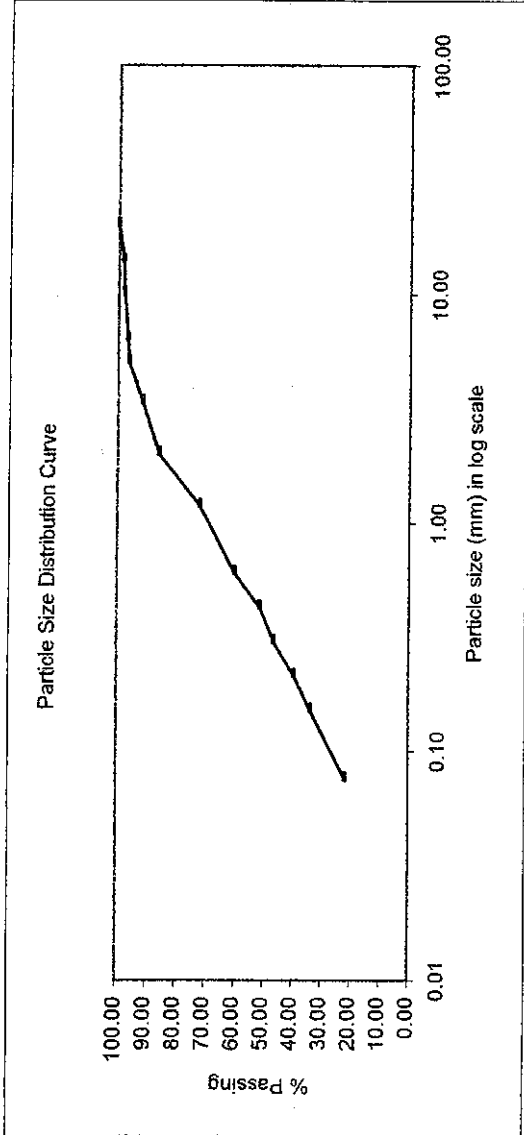
Project : Teaching Hospital Improvement project
 Location : Anuradhapura
 Sample Nos. : 7 &
 Test method : BS 1377, 1990, Part 2, Test 9.3

Client : Yamashita Sekkel Inc.
 Consultant :
 Contractor :
 Date : 11.07.2007

BH No. : BH 3 Depth : from 3.00 to 8.03 m

Sample No. : 7
 Pan No. : 7
 Wt. of pan : 6.05 g
 Wt. of pan + soil : 186.97 g

Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Remarks
80.00				
37.50				
28.00				
20.00			100.00	
14.00	2.81	0.00	98.45	
10.00	0.81	0.45	98.00	
6.30	2.17	1.20	96.80	
5.00	1.18	0.65	96.15	
3.35	8.19	4.53	91.62	
2.00	10.09	5.58	86.04	
1.180	29.60	14.15	71.89	
0.600	21.43	11.85	60.05	
0.425	15.83	8.75	51.30	
0.300	8.62	4.76	46.53	
0.212	12.80	7.07	39.46	
0.150	10.03	5.54	33.92	
0.075	21.69	11.99	21.93	



ATTERBURG LIMIT TEST

Project : Teaching Hospital Improvement project **Client :** Yamashita Sekkei Inc.
Location : Anuradhapura **Consultant :**
Sample Nos. : 3 & 4 **Contractor :**
Test method BS 1377, 1990, Part 2, Tests 4/5 **Date :** 13.07.2007 - 14.07.2007

Sample No. : 3 **BH No. :** BH 2 **Depth :** from 0.00 to 2.40 m

Test No.	Liquid Limit					
	1	2	3	4	5	6
Number of blows	37.00	23.00	13.00	10.00		
Can No.	3A	3B	3C	3D		
Wt. of the can	g 8.50	g 7.97	g 8.42	g 8.08		
Wt. Of wet soil + can	g 20.10	g 15.11	g 20.28	g 19.95		
Wt. Of dry soil + can	g 17.71	g 13.61	g 17.64	g 17.39		
Moisture content	% 25.95	% 26.60	% 28.63	% 27.50	#DIV/0!	#DIV/0!

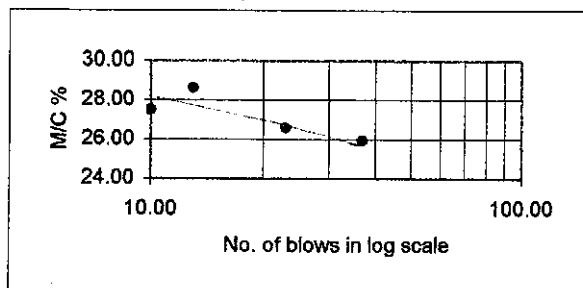
Plastic Limit	
1	2
3E	3F
10.42	10.51
31.02	22.77
27.46	20.66
20.89	20.79

Sample No. : 4 **BH No. :** BH 1 **Depth :** from 2.50 to 4.00 m

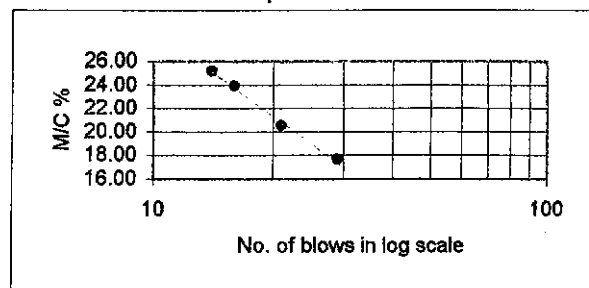
Test No.	Liquid Limit					
	1	2	3	4	5	6
Number of blows	29	21	16	14		
Can No.	4A	4B	4C	4D		
Wt. of the can	g 9.16	g 10.58	g 8.95	g 10.12		
Wt. Of wet soil + can	g 20.22	g 18.74	g 15.78	g 21.20		
Wt. Of dry soil + can	g 18.56	g 17.35	g 14.46	g 18.97		
Moisture content	% 17.66	% 20.53	% 23.96	% 25.20	#DIV/0!	#DIV/0!

Plastic Limit	
1	2
4E	4F
12.10	10.90
21.35	19.26
20.03	18.05
16.65	16.92

Sample No. : 3



Sample No. : 4



Summary of the results

Sample No.	Plastic limit (%)	Liquid limit (%)	Plasticity Index
3	20.8	26.5	5.7
4	16.8	19.8	3.0

ATTEBURG LIMITS TEST

Project : Teaching Hospital Improvement project **Client :** Yamashita Sekkei Inc.
Location : Anuradhapura **Consultant :**
Sample Nos. : 6 & **Contractor :**
Test method BS 1377, 1990, Part 2, Tests 4/5 **Date :** 13.07.2007 - 14.07.2007

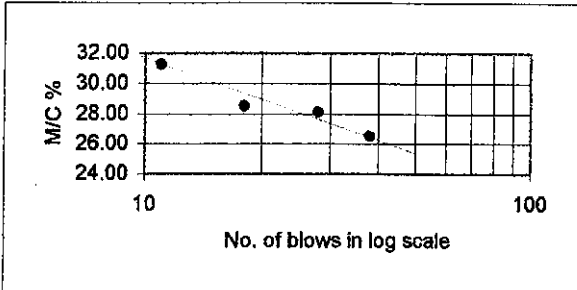
Sample No. : 6 **BH No. :** BH 1 **Depth :** from 2.40 to 6.00 m

Test No.	Number of blows	Liquid Limit						Plastic Limit	
		1	2	3	4	5	6	1	2
		38	28	18	11				
Can No.		2A	2B	2C	2D			2F	2G
Wt. of the can	g	10.44	5.96	8.55	8.73			10.71	10.44
Wt. Of wet soil + can	g	21.94	18.58	17.92	22.21			28.41	25.67
Wt. Of dry soil + can	g	19.53	15.81	15.84	19.00			24.95	22.71
Moisture content	%	26.51	28.12	28.53	31.26	#DIV/0!	#DIV/0!	24.30	24.12

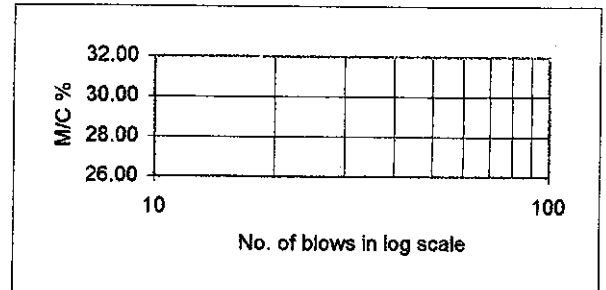
Sample No. : **BH No. :** **Depth :** from to m

Test No.	Number of blows	Liquid Limit						Plastic Limit	
		1	2	3	4	5	6	1	2
Can No.									
Wt. of the can	g								
Wt. Of wet soil + can	g								
Wt. Of dry soil + can	g								
Moisture content	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Sample No. : 6



Sample No. :



Summary of the results

Sample No.	Plastic limit (%)	Liquid limit (%)	Plasticity Index
6	24.2	25.6	1.4
	#DIV/0!		#DIV/0!

SPECIFIC GRAVITY OF SOILS

Project : Teaching Hospital Improvement project

Client : Yamashita Sekkei Inc.

Location : Anuradhapura

Consultant :

Test Method : BS1377 : 1975 2.6 Test 6

Date : 12.07.2006 - 16.07.2006

Sample No.	1		2		3		4	
BH No.	BH 1		BH 3		BH 1		BH 1	
Depth	0.00 - 0.55		0.00 - 1.00		0.55 - 2.45		4.00 - 5.05	
Sub specimen No.	A	B	A	B	A	B	A	B
Mass of glass jar + plate	1193.00	1189.50	1195.00	1205.00	1191.00	1188.00	1206.00	1211.50
Mass of glass jar + plate + soil	1601.00	1599.00	1602.00	1607.00	1591.00	1589.00	1455.00	1451.00
Mass of glass jar + plate + soil + water	3854.00	3859.00	3851.00	3861.00	3840.10	3845.00	3769.00	3771.00
Mass of glass jar + palte + water	3597.50	3605.00	3598.00	3609.00	3587.50	3592.00	3613.00	3625.00
Individual SG	2.69	2.63	2.65	2.68	2.71	2.71	2.68	2.56
Average SG	2.66		2.67		2.71		2.62	
	m		g		g		g	
	(m2-m1)		(m3-m2)-(m4-m1)					
Sample No.	5		6		7			
BH No.	BH 1		BH 2		BH 3			
Depth	4.00 - 5.05		3.60 - 6.00		3.00 - 8.03			
Sub specimen No.	A	B	A	B	A	B		
Mass of glass jar + plate	1191.00	1145.50	1206.50	1198.00	1186.00	1191.00		
Mass of glass jar + plate + soil	1517.00	1478.50	1606.50	1601.90	1586.00	1589.00		
Mass of glass jar + plate + soil + water	3811.50	3625.00	3852.02	3849.40	3861.00	3863.00		
Mass of glass jar + palte + water	3606.00	3418.50	3603.50	3600.00	3606.50	3609.10		
Individual SG	2.71	2.63	2.64	2.61	2.75	2.76		
Average SG	2.67		2.63		2.76			
	m		g		g		g	
	(m2-m1)		(m3-m2)-(m4-m1)					

WET & DRY DENSITY OF SOILS

Project : Teaching Hospital Improvement project
Client : Yamashita Sekkei Inc.
Location : Anuradhapura

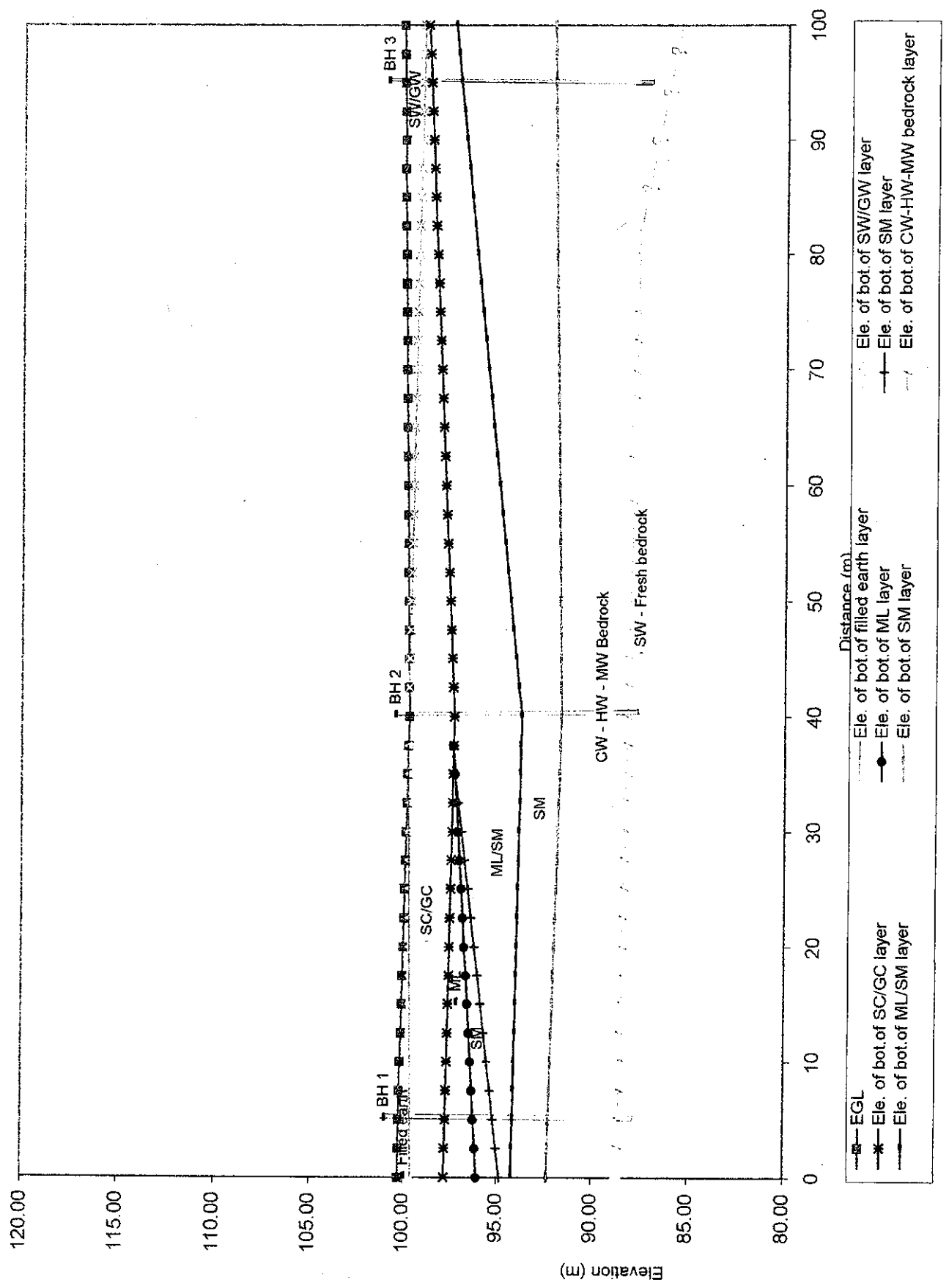
Test Method : BS 1377 : 19754.4.4 Test 15(D)

Date : **From :** 14.06.2007 **To :** 18.06.2007

Sample No.	Borehole No.	Depth m	Diameter mm	Length mm	Weight g	Wet Density T/cum	Moisture Content %	Dry Density T/cum
1	BH 1	0.00 - 0.55	35.0			Not conducted	5.41	Not conducted
2	BH 3	0.00 - 1.00	35.0	106.0	175.60	1.72	4.93	1.64
3	BH 2	0.00 - 2.40	35.0	112.5	189.90	1.75	6.01	1.65
4	BH 1	2.50 - 4.00	35.0	98.7	180.20	1.90	16.7	1.63
5	BH 1	4.00 - 5.05	35.0	101.2	183.60	1.88	16.62	1.62
6	BH 2	2.40 - 6.00	35.0	75.6	136.30	1.87	16.84	1.60
7	BH 3	3.00 - 8.03	35.0	97.5	188.20	2.01	12.32	1.79

ANNEXURE D
Vertical Cross Section

FIGURE II - Vertical Cross Section Through BH 1, BH 2, & BH 3
(Vertically two times exaggerated)



10. Water Quality Test Report



TECH WATER LABORATORIES (PRIVATE) LIMITED
303,HIGH LEVEL ROAD, COLOMBO 05, SRI LANKA.
PHONE- 011 4408399 TEL/FAX: 0112821102
E-MAIL: techlab@slt.net.lk WEBSITE: www.tech-waters.com

TEST REPORT
Ref No: 61-62/C/JUN/2007
2007.07.06

Yamashita Sekkei Inc.,
6-1, Nihonbashi-Koamicho,
Chuo-Ku, Tokyo 103-8542,
Japan.

.....Continuation sheet

CHEMICAL ANALYSIS OF WATER
Ref No: 61-62/C/JUN/2007

CLIENT'S REFERENCE : Yamashita Sekkei Inc.,
6-1, Nihonbashi-Koamicho,
Chuo-Ku, Tokyo 103-8542, Japan.

SPECIMEN : Water

NATURE OF SAMPLE : Sample A from waste water tank of
Anuradhapura Teaching Hospital.
Sample B from after treatment at treatment plant
in Anuradhapura Teaching Hospital.

LAB REF. No. : Sample A- Ref No: 61/C/JUN/2007
Sample B- Ref No: 62/C/JUN/2007

COLLECTED BY : Tech Water Laboratories (Pvt) Ltd.

DATE OF COLLECTION : 2007.06.22

DATE OF RECEIPT : 2007.06.22

TEST METHOD & PRINCIPLES : Standard methods for examination of
water and waste water
APHA, AWWA, WEF 1995, 19th edition.
GC-ECD- Gas Chromatography- Electron
Capture Detector
GE-NPD- Gas Chromatography- Nitrogen
Phosphorous Detector

No	Test	Test Results Sample A (Waste Water)	Test Results Sample B (Treated Water)	Units
01	pH	7.4 at 27.5 °C	7.3 at 27.5 °C	
02	Total Dissolved Solids	548	565	mg/L
03	BOD	120	100	mg/L
04	Sulphate	51	41	mg/L as SO ₄
05	Chloride	101	119	mg/L as Cl
06	Sodium absorbtion ratio	2.1	1.8	
07	Arsenic	< 0.01	< 0.01	mg/L as As
08	Boron	<10	<10	mg/L as B
09	Cadmium	< 0.1	< 0.1	mg/L as Cd
10	Chromium	< 0.1	< 0.1	mg/L as Cr
11	Lead	< 0.1	< 0.1	mg/L as Pb
12	Mercury	< 0.001	< 0.001	mg/L as Hg
13	Residual Sodium Carbonate	1.7	1.5	mg/L
14	Grease & Oil	9.3	06	mg/L
15	Radioactive materials**			
16	Odour	Present	Present	
17	Floatables	Present	Present	
18	Total Suspended Solids	120	65	mg/L
19	Temperature at point of discharge	29 °C	29 °C	
20	COD	280	220	mg/L
21	Phenolic Compounds	0.2	<0.15	mg/L as C ₆ H ₅ OH
22	Cyanide	<0.2	<0.2	mg/L as CN
23	Sulfide	3.3	3.0	mg/L as S
24	Fluoride	0.4	0.2	mg/L as F
25	Total Residual Chlorine	< 0.2	< 0.2	mg/L
26	Ammonical Nitrogen	29	28	mg/L
27	Copper	< 0.1	< 0.1	mg/L as Cu
28	Nikel	0.2	0.1	mg/L as Ni
29	Selenium	<0.5	<0.5	mg/L as Se
30	Zinc	< 0.05	< 0.05	mg/L as Zn
31	Particle Size of Solids**			
32	Residual Chlorine	<0.2	<0.2	mg/L
33	Colour	55	50	HAZEN
34	Free Residual Chlorine	<0.2	<0.2	mg/L

** -Not performed

No	Test	Test Results Sample A (Waste Water)	Test Results Sample B (Treated Water)	Limit of determination , µg/L
35	Pesticide residue			
i	A-HCH	Less than 0.2	Less than 0.2	0.2
ii	β-HCH	Less than 0.2	Less than 0.2	0.2
iii	γ-HCH (Lindane)	Less than 0.2	Less than 0.2	0.2
iv	δ-HCH	Less than 0.2	Less than 0.2	0.2
v	Aldrin	Less than 0.2	Less than 0.2	0.2
vi	Dieldrin	Less than 0.2	Less than 0.2	0.2
vii	Heptachlor	Less than 0.2	Less than 0.2	0.2
viii	Heptachlorepoxyde	Less than 0.2	Less than 0.2	0.2
ix	Endrin	Less than 0.2	Less than 0.2	0.2
x	Endrin aldehyde	Less than 0.2	Less than 0.2	0.2
xi	Endosulfan I	Less than 0.2	Less than 0.2	0.2
xii	Endosulfan II	Less than 0.2	Less than 0.2	0.2
xiii	Endosulfan Sulphate	Less than 0.2	Less than 0.2	0.2
xiv	p.p' DDE	Less than 0.2	Less than 0.2	0.2
xv	o.p' DDT	Less than 0.2	Less than 0.2	0.2
xvi	p.p' DDT	Less than 0.2	Less than 0.2	0.2
xvii	o.p' DDD	Less than 0.2	Less than 0.2	0.2
xviii	p.p' DDD	Less than 0.2	Less than 0.2	0.2
xix	Chlorpyrifos	Less than 1	Less than 1	1
xx	Dimethoate	Less than 5	Less than 5	5
xxi	Diazinon	Less than 2	Less than 2	2
xxii	Fenthion	Less than 2	Less than 2	2
xxiii	Fenitrothion	Less than 2	Less than 2	2
xxiv	Malathion	Less than 2	Less than 2	2
xxv	Parathion	Less than 2	Less than 2	2
xxvi	Parathion Methyl	Less than 2	Less than 2	2
xxvii	Pirimiphos Methyl	Less than 2	Less than 2	2
xxviii	Profenofos	Less than 2	Less than 2	2
xxix	Quinalphos	Less than 2	Less than 2	2
xxx	Carbofuran	Less than 10	Less than 10	10
xxxi	Chlorothalonil	Less than 5	Less than 5	5
xxxii	Captan	Less than 1	Less than 1	1
xxxiii	Metalaxyl	Less than 5	Less than 5	5
xxxiv	Alachlor	Less than 2	Less than 2	2
xxxv	Propanil	Less than 2	Less than 2	2

DATES OF PERFORMANCE : 2007.06.22 to 2007.07.06

.....
P.M.S.Kumari
(Laboratory Analyst)

.....
T.W.L.S. Wasalasooriya
(Laboratory Manager)

Annex 01

CENTRAL ENVIRONMENTAL AUTHORITY GENERAL STANDARDS FOR DISCHARGE OF EFFLUENTS INTO INLAND SURFACE WATERS

Test	Tolerance Limit
pH	6.0 to 8.5
Total Dissolved Solids	2100 mg/L
BOD	30 mg/L
Sulphate	1000 mg/L as SO ₄
Chloride	600 mg/L as Cl
Sodium absorption ratio	10 to 15
Arsenic	0.2 mg/L as As
Boron	2.0 mg/L as B
Cadmium	0.1 mg/L as Cd
Chromium	0.1 mg/L as Cr
Lead	0.1 mg/L as Pb
Mercury	0.0005 mg/L as Hg
Residual Sodium Carbonate	2.5 mg/L
Grease & Oil	10.0 mg/L
Total Suspended Solids	50 mg/L
Temperature at point of discharge	Shall not exceed 40 °C
COD	250 mg/L
Phenolic Compounds	1.0 mg/L as C ₆ H ₅ OH
Cyanide	0.2 mg/L as CN
Sulfide	2.0 mg/L as S
Fluoride	2.0 mg/L as F
Total Residual Chlorine	1.0 mg/L
Ammonical Nitrogen	50 mg/L
Copper	3.0 mg/L as Cu
Nikel	3.0 mg/L as Ni
Selenium	0.05 mg/L as Se
Zinc	5.0 mg/L as Zn
Residual Chlorine	1.0 mg/L



TECH WATER LABORATORIES (PRIVATE) LIMITED

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E-MAIL: techlab@slt.net.lk WEBSITE: www.tech-waters.com

TEST REPORT

Ref No: 59-60/C/JUN/2007

2007.07.06

**Yamashita Sekkei Inc.,
6-1, Nihonbashi-Koamicho,
Chuo-Ku, Tokyo 103-8542,
Japan.**

CHEMICAL ANALYSIS OF WATER

Ref No: 59-60/C/JUN/2007

CLIENT'S REFERENCE : Yamashita Sekkei Inc.,
6-1, Nihonbashi-Koamicho,
Chuo-Ku, Tokyo 103-8542, Japan.

SPECIMEN : Water

NATURE OF SAMPLE : Sample A from city water supply in Anuradhapura
Teaching Hospital
Sample B from well water in Anuradhapura
Teaching Hospital

LAB REF. No. : Sample A- Ref No: 59/C/JUN/2007
Sample B- Ref No: 60/C/JUN/2007

COLLECTED BY : Tech Water Laboratories (Pvt) Ltd.

DATE OF COLLECTION : 2007.06.22

DATE OF RECEIPT : 2007.06.22

TEST METHOD & PRINCIPLES : Sri Lanka Standard Specification for
potable water SLS 614: Part 1: 1983
and Standard methods for examination of
water and waste water APHA, AWWA, WEF 1995,
19th edition.
GC-ECD- Gas Chromatography- Electron
Capture Detector
GE-NPD- Gas Chromatography- Nitrogen
Phosphorous Detector
Coliform count and *E. coli* count as per Sri Lanka
Standard specification for potable water
(SLS 614 : part 2 : 1983).

No	Test	Test Results		Units
		Sample A (City Water)	Sample B (Well Water)	
01	Colour	Less than 05	Less than 05	HAZEN
02	Odour	Unobjectionable		
03	Taste	Unobjectionable		
04	Turbidity	0.7	8.4	NTU
05	pH	6.9 at 27.5 °C	7.1 at 27.5 °C	
06	Ele. Conductivity	444	1245	µs/cm
07	Chloride	69	243	mg/L as Cl
08	Free Residual Chlorine	< 0.2	< 0.2	mg/L as Cl ₂
09	Total Alkalinity	112	410	mg/L as CaCO ₃
10	Free Ammonia	<0.06	0.15	mg/L NH ₄
11	Albuminoid Ammonia	<0.15	0.2	mg/L N
12	Nitrate	< 1	< 1	mg/L as N
13	Nitrite	< 0.01	< 0.01	mg/L as N
14	Fluoride	0.3	0.5	mg/L as F
15	Total Phosphates	< 2.0	19	mg/L as PO ₄
16	Total Residue	315	880	mg/L
17	Total Hardness	140	440	mg/L as CaCO ₃
18	Total Iron	< 0.1	< 0.1	mg/L as Fe
19	Sulphate	32	14	mg/L as SO ₄
20	Anionic Detergents	<0.2	<0.2	mg/L
21	Phenolic Compounds	<0.002	<0.002	mg/L as phenolic OH
22	Grease & Oil	<0.5	<0.5	mg/L
23	Calcium	26	118	mg/L as Ca
24	Magnesium	18	35	mg/L as Mg
25	Copper	< 0.1	< 0.1	mg/L as Cu
26	Manganese	0.04	0.25	mg/L as Mn
27	Zinc	< 0.05	< 0.05	mg/L as Zn
28	Aluminium	0.15	0.5	mg/L as Al
29	COD	< 5	< 5	mg/L
30	Arsenic	< 0.01	< 0.01	mg/L as As
31	Cadmium	< 0.1	< 0.1	mg/L as Cd
32	Cyanide	<0.05	<0.05	mg/L as CN
33	Lead	< 0.1	< 0.1	mg/L as Pb
34	Mercury	< 0.001	< 0.001	mg/L as Hg
35	Selenium	<0.5	<0.5	mg/L as Se
36	Chromium	< 0.1	< 0.1	mg/L as Cr
37	Total Coliform Count per 100 ml (MPN)	Not detected	80	-
38	<i>E. coli</i> Count per 100 ml(MPN)	Not detected	09	-

.....Continuation sheet

No	Test	Test Results Sample A (City Water)	Test Results Sample B (Well Water)	Limit of determination , µg/L
39	Pesticide residue			
i	A-HCH	Less than 0.2	Less than 0.2	0.2
ii	β-HCH	Less than 0.2	Less than 0.2	0.2
iii	γ-HCH (Lindane)	Less than 0.2	Less than 0.2	0.2
iv	δ-HCH	Less than 0.2	Less than 0.2	0.2
v	Aldrin	Less than 0.2	Less than 0.2	0.2
vi	Dieldrin	Less than 0.2	Less than 0.2	0.2
vii	Heptachlor	Less than 0.2	Less than 0.2	0.2
viii	Heptachlorepoxide	Less than 0.2	Less than 0.2	0.2
ix	Endrin	Less than 0.2	Less than 0.2	0.2
x	Endrin aldehyde	Less than 0.2	Less than 0.2	0.2
xi	Endosulfan I	Less than 0.2	Less than 0.2	0.2
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xvii	o.p' DDD	Less than 0.2	Less than 0.2	0.2
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xix	Chlorpyrifos	Less than 1	Less than 1	1
xx	Dimethoate	Less than 5	Less than 5	5
xxi	Diazinon	Less than 2	Less than 2	2
xxii	Fenthion	Less than 2	Less than 2	2
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xxv	Parathion	Less than 2	Less than 2	2
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xxvii	Pirimiphos Methyl	Less than 2	Less than 2	2
xxviii	Profenofos	Less than 2	Less than 2	2
xxix	Quinalphos	Less than 2	Less than 2	2
xxx	Carbofuran	Less than 10	Less than 10	10
xxxi	Chlorothalonil	Less than 5	Less than 5	5
xxxii	Captan	Less than 1	Less than 1	1
xxxiii	Metalaxyl	Less than 5	Less than 5	5
xxxiv	Alachlor	Less than 2	Less than 2	2
xxxv	Propanil	Less than 2	Less than 2	2

DATES OF PERFORMENCE : 2007.06.22 to 2007.07.06

.....
P.M.S.Kumari
(Laboratory Analyst)

.....
T.W.L.S. Wasalasooriya
(Laboratory Manager)

Annex 01

Sri Lanka Specification for Potable Water SLS 614: 1983 Part I

Table 1 – Physical Requirements

Characteristic	Maximum permissible level
Colour	30 Hazen units
Odour	Unobjectionable
Taste	Unobjectionable
Turbidity	8 NTU

Table 2 – Chemical Requirements (Basic)

Characteristic	Maximum permissible level
pH	6.5 - 9.0
Ele. Conductivity	3500 μ s/cm
Chloride (as Cl)	1200 mg/L
Free Residual Chlorine (as Cl ₂)	0.2 mg/L
Total Alkalinity (as Total as CaCO ₃)	400 mg/L
Free Ammonia	0.06 mg/L
Albuminoid Ammonia	0.15 mg/L
Nitrate (as N)	10 mg/L
Nitrite (as N)	0.01 mg/L
Fluoride (as F)	1.5 mg/L
Total Phosphates (as PO ₄)	2.0 mg/L
Total Residue	2000 mg/L
Total Hardness (as CaCO ₃)	600 mg/L
Total Iron (as Fe)	1.0 mg/L
Sulphate (as SO ₄)	400 mg/L

Table 3 – Chemical Requirements (Optional)

Characteristic	Maximum permissible level
Anionic Detergents	1 mg/L
Phenolic Compounds (as phenolic OH)	0.002 mg/L
Grease & Oil	1.0 mg/L
Calcium (as Ca)	240 mg/L
Magnesium (as Mg)	140 mg/L
Copper (as Cu)	1.5 mg/L
Manganese (as Mn)	0.5 mg/L
Zinc (as Zn)	15 mg/L
Aluminium (as Al)	0.2 mg/L
COD	10 mg/L

Table 4 – Toxic substances

Characteristic	Maximum permissible level
Arsenic (as As)	0.05 mg/L
Cadmium (as Cd)	0.005 mg/L
Cyanide (as CN)	0.05 mg/L
Lead (as Pb)	0.05 mg/L
Mercury (as Total Hg)	0.001 mg/L
Selenium (as Se)	0.01 mg/L
Chromium (as Cr)	0.05 mg/L

**Sri Lanka Specification for Potable Water
SLS 614: 1983 Part II**

Table 1- Bacteriological Limits

Parameter	Acceptance Limit
Total Coliform Count per 100 ml (MPN)	< 10 per 100 ml
<i>E. coli</i> Count per 100 ml (MPN)	None in 100 ml