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資料1 調査団員・氏名

資料1 調査団員・氏名

(1) 基本設計調査(期間：平成19年6月17日から7月14日まで)

1.	小林 秀弥	総括	独立行政法人国際協力機構 無償資金協力部業務第二グループ主査
2.	稲葉 淳一	技術参与	国立国際医療センター 国際医療協力局
3.	泉田 隆史	計画管理	独立行政法人国際協力機構 無償資金協力部業務第二グループ
4.	長岡 嶺男	業務主任/建築計画	(株)山下設計
5.	藤沼 傑	建築設計	(株)山下設計
6.	鈴木 正知	設備計画	(株)山下設計
7.	鈴木 修	施工計画/積算	(株)山下設計
8.	竹中 友美	機材計画	アイテック(株)
9.	大林 幸一	調達計画/積算	アイテック(株)
10.	石田 賢司	機材計画-2	アイテック(株)
11.	黒澤 圭	機材計画-3	アイテック(株)

(2) 基本設計概要説明調査(期間：平成19年10月20日から10月31日まで)

1.	小林 秀弥	総括	独立行政法人国際協力機構 無償資金協力部業務第二グループ主査
2.	長岡 嶺男	業務主任/建築計画	(株)山下設計
3.	鈴木 修	施工計画/積算	(株)山下設計
4.	竹中 友美	機材計画	アイテック(株)

資料 2 調査行程

資料2 調査行程

(1) 基本設計調査

日順	日付	総括	技術参与	計画管理	業務主任/ 建築計画	建築設計	機材計画	設備計画	施工計画/積算	調達計画/積算	機材計画-2	機材計画-3
		小林 秀弥 9日間	稲葉淳一 14日間	泉田隆史 9日間	長岡嶺男 28日間	藤沼 傑 27日間	竹中友美 28日間	鈴木正知 21日間	鈴木 修 21日間	大林幸一 21日間	石田賢司 10日間	黒澤 圭 26日間
1.	6月17日(日)				成田発 シンガポール着							成田発 シン カポール着
2.	6月18日(月)		成田発 シンガポール着		シンガポール発 コロンボ着 JICA 事務所表敬、協議 日本大使館表敬							機材計画と 同じ
3.	6月19日(火)		シンガポール発 コロンボ着		保健省表敬、インセプションレポート説明、カウンターパート確認、質問書配布 財務省表敬 建設事情調査	医療機材事 情調査	建設事情調査					同上
4.	6月20日(水)		コロンボからアヌ ラタプラに移動		コロンボからアヌラタプラに移動 アヌラタプラ病院既存施設機材調査							同上
5.	6月21日(木)		アヌラタプラ教 育病院協議		アヌラタプラ教育病院,インセプションレポート説明,質問票配布 コンポーネント、建設予定地、取壊し対象建物、実施工程について協議							同上
6.	6月22日(金)		アヌラタプラ周 辺医療事情 調査		アヌラタプラ周辺医療事情調査/大学医学部調査		気象情報収集 アヌラタプラ市確認申請関連		成田発 シンガポール着			同上
7.	6月23日(土)	成田発 シンガポール着	アヌラタプラ病 院協議	成田発 シンガポール着	病院活動調査 アヌラタプラ教育病院協議		既存病院測量調査		シンガポール発 コロンボ着 調達事情調査			同上
8.	6月24日(日)	シンガポール発 コロンボ着 アヌラタプラへ 移動	病院活動調 査	シンガポール発 コロンボ着 アヌラタプラへ 移動	病院活動調査 団内打合せ	機材調査	既存病院測量調査 既存病院設備調査		コロンボからアヌラタプラに移動 道路事情調査			同上
9.	6月25日(月)	アヌラタプラ教 育病院協議	アヌラタプラ教 育病院協議 既存施設機 材調査	アヌラタプラ教 育病院協議	協力計画案の概略について協議 自然条件調査(地質/測量)担当 会社の出張者に対し作業指示	既存機材調査 質問票回収	既存病院測量調査 既存病院設備調査 質問票回収 インフラ関連調査		機材計画と同じ 既存機材調査 質問票回収 メンテナンス事情調査			
10.	6月26日(火)	アヌラタプラからコロンボへ移動 保健省・財務省協議 JICA 事務所協議					インフラ関連調査		機材計画と同じ			
11.	6月27日(水)	日本大使館表敬、協議 保健省協議				協力計画案 検討	機材調査	インフラ関連調査	機材代理店 調査	機材計画と 同じ	調達計画/積 算と同じ	

日 順	日付	総括	技術参与	計画管理	業務主任/ 建築計画	建築設計	機材計画	設備計画	施工計画/積算	調達計画/積算	機材計画-2	機材計画-3
		小林 秀弥 9日間	稲葉淳一 14日間	泉田隆史 9日間	長岡嶺男 28日間	藤沼 傑 27日間	竹中友美 28日間	鈴木正知 21日間	鈴木 修 21日間	大林幸一 21日間	石田賢司 10日間	黒澤 圭 26日間
12.	6月28日(木)	<ul style="list-style-type: none"> 保健省討議議事録案協議 財務省協議 					<ul style="list-style-type: none"> 機材調査 	<ul style="list-style-type: none"> インフラ関連調査 アヌラダプuraからコロンボへ移動 	<ul style="list-style-type: none"> 機材代理店調査 	<ul style="list-style-type: none"> 同上 	<ul style="list-style-type: none"> 同上 	
13.	6月29日(金)	<ul style="list-style-type: none"> 討議議事録署名 				<ul style="list-style-type: none"> 保健省計画局打合せ 		<ul style="list-style-type: none"> 建設事情調査 	<ul style="list-style-type: none"> 同上 	<ul style="list-style-type: none"> 同上 	<ul style="list-style-type: none"> 同上 	
14.	6月30日(土)	<ul style="list-style-type: none"> コロンボ発 シンガポール着 				<ul style="list-style-type: none"> 協力計画案団内打合せ 				<ul style="list-style-type: none"> コロンボ発 シンガポール着 	<ul style="list-style-type: none"> 同上 	
15.	7月1日(日)	<ul style="list-style-type: none"> シンガポール発 成田着 				<ul style="list-style-type: none"> 収集資料整理 				<ul style="list-style-type: none"> シンガポール発 成田着 	<ul style="list-style-type: none"> 同上 	
16.	7月2日(月)					<ul style="list-style-type: none"> ローカルコンサルタント打合せ 質問票回収 	<ul style="list-style-type: none"> BES 調査 	<ul style="list-style-type: none"> 建設事情調査 	<ul style="list-style-type: none"> 機材代理店調査 		<ul style="list-style-type: none"> 同上 	
17.	7月3日(火)					<ul style="list-style-type: none"> コロンボからアヌラダプuraに移動 アヌラダプura教育病院協力計画案協議 					<ul style="list-style-type: none"> 同上 	
18.	7月4日(水)					<ul style="list-style-type: none"> アヌラダプura教育病院協力計画案協議 質問票回収 		<ul style="list-style-type: none"> 排水処理施設及び変電施設敷地確認 アヌラダプuraからコロンボに移動 	<ul style="list-style-type: none"> 補足調査 		<ul style="list-style-type: none"> 同上 	
19.	7月5日(木)					<ul style="list-style-type: none"> アヌラダプura教育病院協力計画案協議 アヌラダプuraからコロンボに移動 		<ul style="list-style-type: none"> 建設事情調査 	<ul style="list-style-type: none"> アヌラダプuraからコロンボに移動 		<ul style="list-style-type: none"> 同上 	
20.	7月6日(金)					<ul style="list-style-type: none"> ラトナプura総合病院調査 カレピティア教育病院調査 		<ul style="list-style-type: none"> コロンボ発 シンガポール着 	<ul style="list-style-type: none"> 機材代理店調査 		<ul style="list-style-type: none"> 同上 	
21.	7月7日(土)					<ul style="list-style-type: none"> カレピティア教育病院追加調査 		<ul style="list-style-type: none"> シンガポール発 成田着 	<ul style="list-style-type: none"> 機材代理手調査 		<ul style="list-style-type: none"> 同上 	
22.	7月8日(日)					<ul style="list-style-type: none"> 団内打合せ 				<ul style="list-style-type: none"> 団内打合せ 	<ul style="list-style-type: none"> 同上 	
23.	7月9日(月)					<ul style="list-style-type: none"> 建設事情調査 質問票回収 	<ul style="list-style-type: none"> BES 補足調査 		<ul style="list-style-type: none"> 機材代理店調査 		<ul style="list-style-type: none"> 機材計画と同じ 	
24.	7月10日(火)					<ul style="list-style-type: none"> スリランカ国立病院調査 追加調査 	<ul style="list-style-type: none"> スリランカ国立病院調査 機材調査 		<ul style="list-style-type: none"> 追加補足調査 		<ul style="list-style-type: none"> 同上 	
25.	7月11日(水)					<ul style="list-style-type: none"> 保健省報告 JICA 事務所報告、ドラフト説明打合せ 				<ul style="list-style-type: none"> コロンボ発 シンガポール着 	<ul style="list-style-type: none"> 調達計画/積算と同じ 	
26.	7月12日(木)					<ul style="list-style-type: none"> キャスルストリート病院調査 スリジャヤワルダナプura病院調査 	<ul style="list-style-type: none"> コロンボ発 シンガポール着 	<ul style="list-style-type: none"> キャスルストリート病院調査 スリジャヤワルダナプura病院調査 	<ul style="list-style-type: none"> シンガポール発 成田着 		<ul style="list-style-type: none"> 同上 	
27.	7月13日(金)					<ul style="list-style-type: none"> コロンボ発 シンガポール着 	<ul style="list-style-type: none"> シンガポール発 成田着 	<ul style="list-style-type: none"> コロンボ発 シンガポール着 				
28.	7月14日(土)					<ul style="list-style-type: none"> シンガポール発 成田着 		<ul style="list-style-type: none"> シンガポール発 成田着 				

(2) 基本設計概要説明調査

日数	日付		総括	業務主任/建築計画	機材計画	施工計画/積算
			小林秀弥	長岡 嶺男	竹中友美	鈴木修
1	10月20日	(土)	・成田発 シンガポール着			
2	10月21日	(日)	・シンガポール発 コロンボ着 ・コロンボからアヌラダプラへ移動			
3	10月22日	(月)	・アヌラダプラ教育病院基本設計概要説明 ・アヌラダプラからコロンボへ移動			
4	10月23日	(火)	・JICA事務所協議、大使館表敬 ・保健省基本設計概要書説明/ミニッツ案協議 ・財務省基本設計概要書説明/ミニッツ案協議			
5	10月24日	(水)	・保健省/アヌラダプラ教育病院ミニッツ署名 ・財務省ミニッツ署名 ・JICA事務所協議 ・資機材追加調査			
6	10月25日	(木)	・資料整理	・コロンボからアヌラダプラへ移動 ・アヌラダプラ教育病院追加調査		
7	10月26日	(金)	・JICA事務所、大使館報告	・アヌラダプラ教育病院機材仕様説明/追加調査		
8	10月27日	(土)	・コロンボ発 ・シンガポール着	・アヌラダプラ教育病院協議 ・アヌラダプラからコロンボへ移動		
9	10月28日	(日)	・シンガポール発 ・成田着	・資料整理	・コロンボ発 ・シンガポール着	
10	10月29日	(月)		・保健省追加調査 ・JICA事務所報告 ・資機材追加調査	・シンガポール発 ・成田着	
11	10月30日	(火)		・コロンボ発 シンガポール着 ・シンガポール発		
12	10月31日	(水)		・成田着		

資料3 関係者(面会者)リスト

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. ラジャラタ大学医学部 Prof. Malkanthi S. Chandrasekara	Acting Dean, Faculty of Medical & Allied Sciences, Rajarata University of Sri Lanka
4. カラピティヤ教育病院 Dr. P. K. Wijewickrama Dr. W. A. M/ Shelton Perera	Director Deputy Director
5. ラトナプラ総合病院 Dr. R. M. S. I. Ratnayake	Deputy Director
6. キャッスルストリート産婦人科病院 Dr. Wimal Karandagoda	Director
7. CECB/アヌダラプラ教育病院マスタープラン担当 Mr. Nihal Rupasinghe Mr. Priyanga Almitha Kumara Mr. Amitha Dasayanake	Chairman Project Manager Site engineer
8. BES 保健省医療機材維持管理部 Mr. RD LIYANAGE Mr. S.A.J KARUNATHILAKE Mr. Gayan Senarathna MR. KENJI SAITO	Director Biomedical Engineer Technician JICA シニアボランティア
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
13. Fire Service, Municipal Council, Anuradhapura Mr. R.K.S.S.C. Wijesinghe	Commissioner

14. 在スリランカ国日本国大使館
大西 英之
川畑 知広
15. 国際協力機構スリランカ事務所
鈴木 規子
植島 卓巳
井上 琴比
Dr. P. Serasinghe
井田 八郎
- 参事官
一等書記官
- スリランカ事務所所長
スリランカ事務所元所長
所員
所員
財務省派遣専門家

資料 4 討議議事録 (M/D)

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



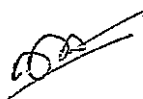
Mr. Hideya Kobayashi
Leader
Basic Design Study Team
Japan International Cooperation Agency



Dr. A. Kahandaliyanage
Secretary
Ministry of Healthcare and Nutrition



Mr. 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. 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

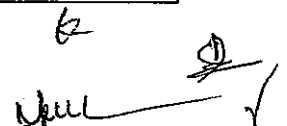
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Lists of the Equipment

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



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	JICA	Consultant	Contractor	Others
Application	<p>Request</p> <p>Screening Of Project</p> <p>Evaluation Of T/R</p> <p>Project Identification Survey</p> <p>(T/R: Terms of Reference)</p>						
Study Formulation & Project Preparation	<p>Preliminary Study</p> <p>Field Survey Home Office Work Report</p> <p>Basic Design Study</p> <p>Selection & Contracting of Consultant by Proposal</p> <p>Field Survey Home Office Work Reporting</p> <p>Explanation of Draft Final Report</p> <p>Final Report</p>						
Appraisal & Approval	<p>Appraisal of Project</p> <p>Inter Ministerial Consultation</p> <p>Presentation of Draft Notes</p> <p>Approval by The Cabinet</p>						
Implementation	<p>E/N</p> <p>Banking Arrangement</p> <p>(A/P: Authorization to Pay)</p> <p>Consultant Contract</p> <p>Verification</p> <p>Issuance of A/P</p> <p>Detailed Design & Tender documents</p> <p>Approved by Recipient Government</p> <p>Preparation for Tendering</p> <p>Tendering & Evaluation</p> <p>Procurement / Construction Contract</p> <p>Verification</p> <p>A/P</p> <p>Construction</p> <p>Completion Certificate by Recipient Government</p> <p>A/P</p> <p>Operation</p> <p>Post Evaluation Study</p>						
Evaluation & Follow up	<p>Ex-post Evaluation</p> <p>Follow up</p>						

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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.

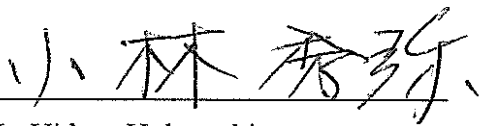
MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR
IMPROVEMENT OF ANURADHAPURA TEACHING HOSPITAL
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
(EXPLANATION ON DRAFT REPORT)

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.

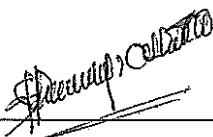
Colombo, 24th Oct 2007



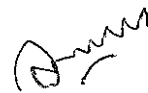
Mr. Hideya Kobayashi
Leader
Basic Design Study Team
Japan International Cooperation Agency



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

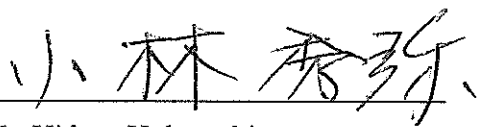
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Department of External Resources
Ministry of Finance and Planning



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Director
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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.

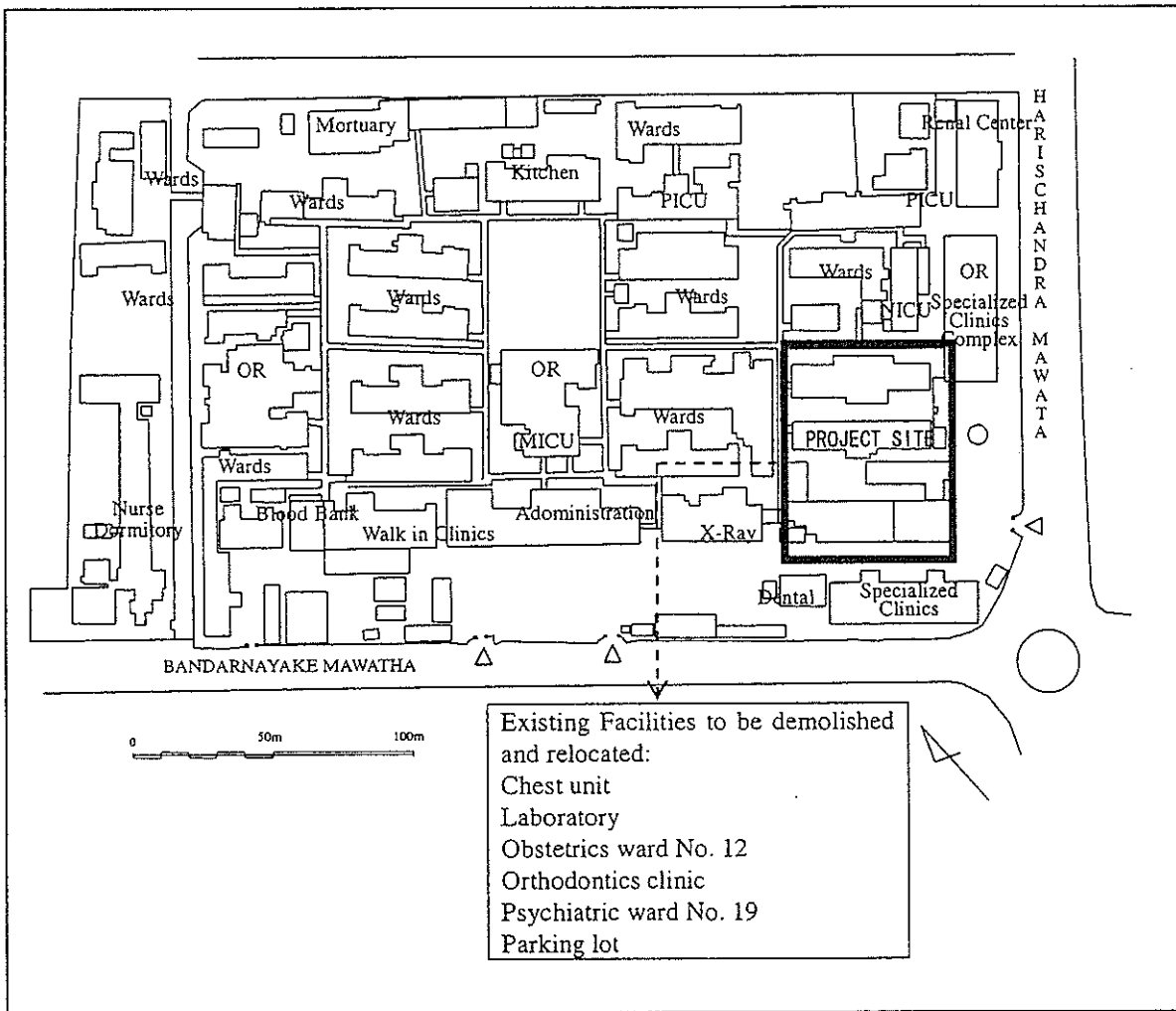
- Annex-1 Project Site Plan
- Annex-2 Outline of Facilities
- Annex-3 Equipment List
- Annex-4 Project Cost Estimation
- Annex-5 Detailed Schedule of Demolition

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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, Dermatoragy, 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

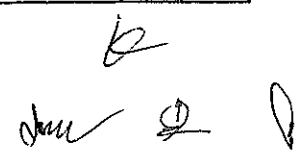
Project Cost Estimation		approx. 1,903 million JPY	
Item	Estimate Cost (million JPY)		
Facility	1,520		
Equipment	206	1,726	
Design, operational supervision			177

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						



資料 5 事業事前計画表(基本設計時)

資料5 事業事前計画表(基本設計時)

事業事前計画表 (基本設計時)

1. 案件名
スリランカ民主社会主義共和国 アヌラダプラ教育病院整備計画
2. 要請の背景
<p>スリランカ国における保健状況は、独立当初から福祉重視政策が採られ、無料の医療サービスが末端まで普及したことから、乳児死亡率は出生 1,000 人対 12 人 (2004 年 : UNICEF)、5 歳未満児死亡率は出生 1,000 人対 14 人 (2004 年 : UNICEF)、妊産婦死亡率は出生 10 万人対 92 人 (2000 年 : UNICEF) と同じ GNI レベルの国々と比べて比較的良好である。しかしながら、保健医療サービスの地域間格差は大きく、特に北東部の紛争地域、北中央部、南部地域では、貧困状況下にあることもあり、他州と比較して、保健医療分野の各種指標が低くなっている。かかる状況の中、2016 年までの 10 年間のヘルス・マスタープラン (HMP) における 5 つの戦略的目的において保健医療サービス・施設網の強化・合理化を重要な政策としている。本件プロジェクトは中央北部地域のトップレファラル病院であるアヌラダプラ教育病院 (以下 AT 病院) の整備計画である。本件対象地域はスリランカ国において貧しい州の 1 つである中央北部州である。中央北部州の乳児死亡率は 2002 年には出生 1,000 人対 18.6 人 (男子)、1,000 人対 15.8 人 (女子)、5 歳未満児死亡率は出生 1,000 人対 20.3 人 (男子)、1,000 人対 17.5 人 (女子) となっており、スリランカ国全州の中で、最も高い数値となっている。同病院は、この州唯一の 3 次医療施設で、2006 年 3 月に政府は、医療施設としての格付けを総合病院から教育病院にあげ、その役割、施設機能、設備、提供するサービスを拡充することを決定した。診療圏には約 130 万人が居住しており、下位医療施設は基本的な外来診療、内科治療と正常分娩には対応できるものの、専門外来はなく、外科手術や帝王切開は対応不可能な状況であることから、AT 病院に患者が集中している。毎日 1,050 名程度の外来患者、300 名の入院患者がおり、ベッド数は 1,350 床で占有率は平均で 115% であるが、主要な診療科である産科は 180%、小児科 180%、婦人科 130%、男性一般病棟 180%、女性一般病棟 200%、未熟児病棟 180% と大変混雑し、適正な医療サービスの提供に支障をきたしている状況にある。1958 年以來増改築を重ねてきた施設の多くは老朽化が著しく、特に外来部門は管理棟を転用して使用しているため、患者待合室がなく、昔の事務室の狭い廊下に患者がすし詰め状態となり、患者及び医療従事者の動線が錯綜している。このように州内唯一の 3 次医療施設として備えておくべき専門医療サービスが施設、機材の未整備のため十分に行えない状況にある。</p>
3. プロジェクト全体計画概要
<p>(1) プロジェクト全体計画の目標</p> <ul style="list-style-type: none"> ・中央北部地域において 3 次医療サービスが改善される。 ・裨益対象の範囲及び規模は中央北部地域 (約 130 万人) <p>(2) プロジェクト全体計画の成果</p> <ul style="list-style-type: none"> ・<u>アヌラダプラ教育病院の外来部門、産婦人科手術、新生児 ICU、小児 ICU 機能に関わる施設・機材を整備・調達される。</u> <p>(3) プロジェクト全体計画の主要活動</p> <ul style="list-style-type: none"> ・<u>アヌラダプラ教育病院の外来部門、産婦人科手術部門、新生児 ICU・小児 ICU に関わる施設・機材を整備・調達する。</u> ・上記施設・機材を活用して保健医療サービス活動を実施する。 <p>(4) 投入(インプット)</p> <ul style="list-style-type: none"> ア. <u>日本側 (=本案件) : 無償資金協力 19.09 億円</u> イ. 相手国側 : <ul style="list-style-type: none"> (ア) 必要な人員 (イ) 施設・機材の運営・維持管理にかかる経費 <p>(5) 実施体制</p> <ul style="list-style-type: none"> ・主管官庁 : 保健省医療サービス局 ・実施機関 : 保健省アヌラダプラ教育病院

4. 無償資金協力案件の内容												
(1) サイト スリランカ国北中央州アヌラダプラ県アヌラダプラ市												
(2) 概要 アヌラダプラ教育病院の外来部門・産婦人科手術部門・新生児 ICU・小児 ICU 等の施設建設及び関連医療機材の調達												
(3) 相手国側負担事項 ・既存建物の解体・撤去及び建設予定地の整地 ・屋外変電所の整備および既存インフラ引き込み工事												
(4) 概算事業費 概算事業費 24.82 億円(無償資金協力 19.09 億円、スリランカ国側負担 5.73 億円)												
(5) 工期 詳細設計・入札期間を含め約 31 ヶ月(予定)												
(6) 貧困、ジェンダー、環境及び社会面の配慮 スリランカ国において公共医療サービスは全国民に対し無料で行われている。												
5. 外部要因リスク ・ LTTE との和平交渉が進展せず、治安が悪化すること。												
6. 過去の類似案件からの教訓の活用 ・ラトナプラ総合病院(一般無償)は大いに活用されている成功例であるが、外来部門待合室については非常に混雑しており患者サービスの低下をきたしているように観察されたため、本件ではできる限り適切な規模の待合室を確保する												
7. プロジェクト全体計画の事業評価に係る提案												
(1) プロジェクト全体計画の目標達成を示す成果指標 2006 年(事業実施前) 2011 年(事業完工後 1 年以降)												
<table border="0"> <tr> <td>専門外来患者数(整備対象科目)</td> <td></td> <td>209,291 件/年</td> </tr> <tr> <td>産婦人科手術件数</td> <td>6,759 件/年</td> <td>増加</td> </tr> <tr> <td>小児 ICU 患者数</td> <td>252 人</td> <td>増加</td> </tr> <tr> <td>新生児 ICU 病床占有率</td> <td>156%</td> <td>減少</td> </tr> </table>	専門外来患者数(整備対象科目)		209,291 件/年	産婦人科手術件数	6,759 件/年	増加	小児 ICU 患者数	252 人	増加	新生児 ICU 病床占有率	156%	減少
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小児 ICU 患者数	252 人	増加										
新生児 ICU 病床占有率	156%	減少										
(2) その他の成果指標 ・特に無し												
(3) 評価タイミング ・2011 年(完工後 1 年)以降												

資料6 計画機材リスト

資料6 計画機材リスト

計画番号	計画機材名	数量
1	吸引器	5
2	喉頭鏡	3
3	除細動装置、モニター付	2
4	救急カート	2
5	処置台車	43
6	医用冷蔵庫	6
7	シャウカステン、2枚掛け用	68
8	患者監視装置	8
9	手術台	3
10	无影灯	3
11	麻酔器	3
12	麻酔台車	3
13	麻酔椅子	3
14	電気メス	3
15	手洗いユニット	3
16	インフアントウォーマー	6
17	ストレッチャー	5
18	腹腔鏡	1
19	子宮鏡	1
20	術後患者回復ベッド	4
21	酸素流量計、マニフォールド用	37
22	高圧蒸気滅菌器	2
23	滅菌缶セット	2
24	滅菌作業テーブル	3
25	滅菌コンテナ保管棚	3
26	滅菌トロリー	1
27	吸引器、壁掛け式	27
28	喉頭鏡、新生児用	3
29	パルスオキシメーター	9
30	与薬車	3
31	検眼鏡	16
32	シリンジポンプ	16
33	患者監視装置、新生児用	6
34	保育器	7
35	光線治療器	4
36	体重計、新生児用	2
37	人工呼吸器、CPAP機能付き	1
38	ビリルビンメーター、ハマトクリット遠心器付き	1
39	診断テーブル	4
40	診断椅子	12
41	器械戸棚	7
42	喉頭鏡、小児用	2
43	ICUベッド	8
44	輸液ポンプ	7
45	患者監視装置、小児用	2
46	血液ガス分析装置	1
47	X線撮影装置、移動式	1
48	診察セット、成人用	25
49	診察セット、小児用	2
50	診察灯	55
51	診察机	94
52	患者椅子	94
53	診察椅子	94
54	診察ベッド	37
55	診療戸棚	48
56	車椅子	4
57	肺機能測定装置	1
58	電気メス、皮膚科用	1
59	冷凍処置装置	1
60	ギブスカッター	1
61	ギブス台	1
62	胎児心拍測定器	1

計画番号	計画機材名	数量
63	診察ベッド、婦人科用	1
64	超音波診断装置	1
65	額帯鏡、耳鼻科用	3
66	耳鼻科用顕微鏡	1
67	鼻用硬性鏡（大人、小児）	1
68	耳鼻科用処置ユニット	3
69	オーディオメーター	1
70	歯科ユニット椅子付き	4
71	マイクロモーター	1
72	スピーチセラピー用教育器具	1
73	パノラマ・セファロX線撮影装置	1
74	気管支内視鏡	1
75	大腸内視鏡	1
76	食道胃十二指腸内視鏡	1
77	鼻咽頭内視鏡	1
78	内視鏡吸引装置	3
79	内視鏡用電気メス	2
80	内視鏡用処置台	3
81	内視鏡洗浄器具	2
82	内視鏡保管庫	2
83	ビデオモニター、光源装置付き	3
84	骨密度測定装置	1
85	心電モニター	1
86	筋電図検査装置	1
87	救急ベッド	6
88	血液分析装置	1
89	分光光度計	1
90	顕微鏡	2
91	遠心器	1
92	ヘマトクリット遠心器	1
93	ウォーターバス、ミキシングタイプ	1
94	高圧蒸気滅菌器、縦型	1
95	蒸留器	1
96	臨床検査台	11
97	臨床検査椅子	22
98	電子天秤、中型	1
99	電子天秤、小型	1
100	薬品戸棚、窓口用	12
101	薬品戸棚、保管用	7
102	調剤テーブル	3
103	調剤椅子	12
104	自動錠剤カウンター	2
105	ペーストミキサー	1
106	マイクロ波治療器	2
107	赤外線灯	1
108	赤外線灯、広範囲タイプ	1
109	超音波治療器	1
110	干渉低周波治療器	1
111	電気神経刺激装置	1
112	起立傾斜台	1
113	肩関節輪転運動器	1
114	バランスボード	1
115	角度計セット	1
116	ホットバックヒーター	1
117	エルゴメーターバイク	1
118	トリートメントテーブル	2
119	パラレルバーセット	1
120	牽引装置	1
121	X線防護セット	1

資料 7 主要機材内容

資料7 主要機材内容

計画番号	計画機材名	原産国	調達国	主な仕様または構成	機材水準	台数	使用目的 機材水準の妥当性
8	患者監視装置	日本	日本	1. 測定項目: ECG、呼吸、SpO ₂ 、NIBP、体温、CO ₂ 2. 心拍数レンジ: 30bpm以下～250bpm以上 3. SpO ₂ レンジ: 50以下～100%	普及機種	8	手術室、術後回復室において、患者の生体情報を、継続的に監視するために使用する。
10	无影灯	日本	日本	1. タイプ: 天吊式 2. アーム数: 2アーム 3. 照度・主灯: 120,000LUX以上 小灯: 90,000LUX以上	普及機種	3	手術をする際に術野を十分な明るさと、正しい色を執刀医が視認するために使用する。
11	麻酔器	米国	ス国	1. 麻酔器 1) O ₂ 流量: 最大10L/分以上 2) N ₂ O流量: 最大10L/分以上 3) 気化器: ハセシ、イソフルン 2. 人工呼吸器 1) 駆動方式: 電気駆動式 2) 換気量: 最大1200ml以上	中級機種	3	手術の際に患者を全身麻酔状態にするために使用する。また、手術の際に全身麻酔状態下で自発呼吸が出来ない患者に人工呼吸器を使用する。
15	手洗いユニット	日本	日本	1. 材質: ステンレス製 2. 人数: 1人用 3. UVランプ: 装備 4. 処理水量: 30 /分以上	普及機種	3	手術前に、医療スタッフが手を清潔に洗浄するために使用する。
18	腹腔鏡	独国	ス国	1. テレスコープ A (1) 角度: 0度 2. テレスコープ B (1) 角度: 30度あるいは25度 3. 起腹装置 (1) 炭酸ガス式 4. 電気メス (1) 切開と凝固 5. 光源 (1) キセノン 6. ビデオモニターシステム: 装備 7. 吸引送水装置: 装備	中級機種	1	婦人科領域手術に使用するセットで、開腹することなく低侵襲手術を行うためのセット。主な症例として子宮内膜症の治療、子宮筋腫の切除や種々の腫瘍切除等の手術を行う。
19	子宮鏡	日本	日本	1. 視野角度120度以上 2. 視野深度2-50mmより広く 3. 有効長205mm以上 4. 先端部外径4.9mm以下 5. 送水装置: 装備	中級機種	1	婦人科領域において、異常子宮出血、異常内膜細胞診、子宮腫大疾患の診断・処置に使用する。
22	高圧蒸気滅菌器	スペイン	ス国	1. 片扉型 2. 滅菌温度: 132度以上(鋼製小物滅菌時) 3. 容量: 160L以上 4. 蒸気発生器内臓型	中級機種	2	手術室や集中治療病棟等で使用される手術セット、鋼製小物やリネン類を高圧蒸気にて、滅菌するために使用する。
34	保育器	米国	ス国	1. 温度設定: サボ、マニュアル式 2. 庫内最高温度: 37.5度以上 3. アクセサリー: 6箇所	中級機種	7	新生児集中治療室において、未熟児やハイリスク新生児の観察、保温加湿、酸素投与に使用する。
37	人工呼吸器、CPAP機能付き	米国	日本	1. 適用用途: 小児、新生児用 2. 呼吸時間: 0.1から3秒より広く 3. 呼吸回数: 2から150回/分より広く	中級機種	1	集中治療室において、自発呼吸が困難な患者に対して使用する。気道の閉塞を防ぐ経鼻的持続陽圧呼吸(CPAP)機能を付属させる。
45	患者監視装置、小児用	米国	ス国	1. 測定項目: ECG、呼吸、SpO ₂ 、NIBP、体温 2. 心拍数レンジ: 30bpm以下～250bpm以上 3. SpO ₂ レンジ: 50以下～100%	普及機種	2	小児集中治療室において、患者の生体情報を、継続的に監視するために使用する。
46	血液ガス分析装置	日本	日本	1. 測定項目: pH、pCO ₂ およびpO ₂ 2. サンプル量: 100μL以下 3. プリンター内臓型	中級機種	1	血中の酸素、二酸化炭素分圧および電解質測定し、呼吸機能と代謝状態を把握するために用いる。
47	X線撮影装置、移動式	日本	日本	1. 管電圧: 最大110kV以上 2. X線管球移動縦回転範囲: 最大90度以上	普及機種	1	集中治療室において、体位移動困難な患者などに対して、緊急かつ簡易的な放射線撮影するために使用する。

計画番号	計画機材名	原産国	調達国	主な仕様または構成	機材水準	台数	使用目的 機材水準の妥当性
64	超音波診断装置	韓国	ス国	1.プローブ構成 (1)コンベックス: 2.0-5.5MHz以内 (2)リニア: 5.0-10.0MHz以内 (3)経膈: 5.0-9.0MHz以内 2.イメージモード: B&M 3.画面サイズ: 12インチ以上 4.プリンター: 白黒プリンター	普及機種	1	婦人科領域において体内の画像診断に使用。主に胎児の経過観察等に使用する。
67	鼻用硬性鏡(大人、小児)	日本	日本	1.鼻腔内視鏡大人用 外径: 4mm 2.鼻腔内視鏡小児用 外径: 2.7mm	中級機種	1	耳鼻科領域において鼻副腔内の診断、経過観察等に使用する。
68	耳鼻科用処置ユニット	日本	日本	1.処置タイプ: 伸縮タイプ 2.曇り止めヒーター 3.吸引器	普及機種	3	耳鼻科領域における患者の診療に専用として使用する。
70	歯科ユニット椅子付き	日本	日本	1.シート昇降方式: 油圧式 2.エアコンプレッサ: 25L以上	普及機種	4	歯科、口腔外科領域において、患者の歯や顎骨の検査・治療に使用する。
73	パノラマ・セファロX線撮影装置	日本	日本	1.最大管電圧80kV以上 2.最大管電流10mA以上 3.露出時間16秒以下(パノラマ)	普及機種	1	歯科口腔外科領域において、歯・顎顔面部の骨体部や歯の骨植総覧的診査に使用する。
74	気管支内視鏡	日本	日本	1.視野角度120度 2.視野深度3-50mmより広く 3.有効長600mm 4.先端部外径6.0mm以下	中級機種	1	肺癌、肺結核などの、肺や気管支疾患の診断に使用する。
75	大腸内視鏡	日本	日本	1.視野角度140度以上 2.視野深度3-100mmより広く 3.有効長1680mm以上 4.先端部外径13.4mm以下	中級機種	1	大腸癌などの、大腸疾患の診断・処置に使用する。
76	食道胃十二指腸内視鏡	日本	日本	1.視野角度100度 2.視野深度5-60mmより広く 3.有効長1240mm以上 4.先端部外径13.5mm以下	中級機種	1	食道ポリープ等など、食道から十二指腸にいたる疾患の診断・処置に使用する。
83	ビデオモニター、光源装置付き	日本	日本	1.光源装置 1)光源: セノン 2)出力: 100W以上 2.モニター 1)19インチ 2)LCDあるはTFT	中級機種	3	各種内視鏡に必要となる光源装置、モニター等を1つのタワー内に配置し、内視鏡検査時の対応をしやすいとするもの。
84	骨密度測定装置	中国	ス国	1.測定方式: 超音波式 2.測定部位: 踵骨 3.測定時間: 10秒以下	中級機種	1	小児期における骨成長の評価、若年成人期の最大骨量の評価、骨量減少・骨粗鬆症の診断、治療効果の判定等に使用する。
86	筋電図検査装置	日本	日本	1.検査項目 (1)筋電: 筋電図検査 (2)神経: 神経伝導検査 (3)電位: 脊髄誘発電位検査 視覚誘発電位検査 聴覚誘発電位検査 2.チャンネル数: 2以上	普及機種	1	末梢神経炎等の疾患、神経・筋接合部疾患、リウマチ等のリハビリテーションの経過観察に使用する。
88	血液分析装置	米国	日本	1.測定項目: 赤血球数、白血球数、ヘモグロビン量、ヘマトクリット値、平均赤血球容積、平均赤血球ヘモグロビン量、平均赤血球ヘモグロビン濃度、血小板数、他 2.処理量: 50サンプル/時以上 3.プリンター: 装備 4.モニター: 装備	中級機種	1	赤血球数・白血球数・ヘモグロビン数等を計測する装置。基本的な血液検査として、診断に広く使用される。
110	干渉低周波治療器	日本	日本	1.治療モード: 3モード以上 2.出力周波数: 1~199Hzの範囲以上 3.安全装置: 装備	普及機種	1	障害を持った筋肉の鎮痛効果、血行改善に使用する。
120	牽引装置	日本	日本	1.牽引力: 最大80kg以上 2.治療時間: 最大30分以上 3.安全装置: 装備	普及機種	1	脊椎や腰椎を間欠的または連続的に牽引し、椎間板や椎間関節周辺に起因する痺れや痛みを改善するために使用する。

資料 8 医療機材 年間消耗品・交換部品費用明細

資料 8 医療機材 年間消耗品・交換部品費用明細

計画 番号	計画機材名	計画 数量	消耗品・部品	単 位	数量の想定根拠	数 量	単価 (Rs.)	金額 (一台あたり)	合計 (Rs.)
1	吸引器	5							
			吸引瓶(2本/式)	式	1式/年	1	13,404	13,404	
			接続ホース	個	1個/年	1	410	410	
			吸引チューブ	個	2個/年	2	342	684	
			小計					14,498	72,490
2	喉頭鏡	3							
			電球(3個/式)	式	1式/年	1	2,390	2,390	
			小計					2,390	7,171
3	除細動装置、モニター付	2							
			ジェル(250mL)	個	365日×0.5人/日= 182人/年×5mL/人 ÷250mL/個=3.64	4	498	1,992	
			小計					1,992	3,984
8	患者監視装置	8							
			体温プローブ、成人用、リユーズブル	個	1個/年	1	23,902	23,902	
			SPO2プローブ、成人用、リユーズブル	個	1個/年	1	27,387	27,387	
			カフ、ホース付き、成人用、リユーズブル	個	1個/年	1	2,191	2,191	
			ディスプレイ電極、成人用(150個/式)	式	300日/年×2人/日 ×3個/人÷150個/ 式=12	12	4,980	59,754	
			小計					113,234	905,874
10	無影灯	3							
			ハロゲンランプ	式	1000時間を寿命とする。8時間/日× 365日÷1000時間/ 式=2.92	3	24,510	73,530	
			小計					73,530	220,589
11	麻酔器	3							
			患者回路、大人用、リユーズブル	式	2式/年	2	29,877	59,754	
			CO ₂ 吸収タブレット(4.5kg/箱)	箱	300日×6時間× 0.05kg/時間÷ 4.5kg/箱=20	20	4,980	99,590	
			小計					159,345	478,034
14	電気メス	3							
			電極セット(10種類/セット)	式	2式/年	2	20,914	41,828	
			小計					41,828	125,484
15	手洗いユニット	3							
			プレフィルターエレメント	個	1個/年	1	2,052	2,052	
			紫外線ランプ	個	1個/年	1	1,026	1,026	
			小計					3,077	9,232
16	インファントウォーマー	6							
			体温プローブ貼付パッド(100枚/箱)	式	300日/年×2人/日 ÷100枚/式=6	6	7,659	45,956	
			小計					45,956	275,736

計画 番号	計画機材名	計画 数量	消耗品・部品	単 位	数量の想定根拠	数 量	単価 (Rs.)	金額 (一台あたり)	合計 (Rs.)
22	高圧蒸気滅菌器	2							
			プレフィルター樹脂	式	3 式/年	3	2,351	7,054	
			小計					7,054	14,109
28	喉頭鏡、新生児用	3							
			電球	式	1 式/年	1	1,600	1,600	
			小計					1,600	4,801
29	パルスオキシメーター	9							
			フィンガープローブ	個	1 個/年	1	25,531	25,531	
			小計					25,531	229,780
32	シリンジポンプ	16							
			シリンジ(50mL)	個	300 日/年×0.5 人/ 日×1 個/人=150	150	50	7,469	
			チューブセット	個	300 日/年×0.5 人/ 日×1 個/人=150	150	39	5,826	
			小計					13,295	212,725
33	患者監視装置、新生児用	6							
			体温プローブ、新生児用、リユーズブル	個	1 個/年	1	23,902	23,902	
			SPO2 プローブ、新生児用、リユーズブル	個	1 個/年	1	27,387	27,387	
			カフ、ホース付き、新生児用、リユーズブル	個	1 個/年	1	2,191	2,191	
			ディスプレイ電極、新生児用	式	300 日/年×2 人/日 ×3 個/人÷150 個/ 式=12	12	4,183	50,194	
			小計					103,674	622,042
35	光線治療器	4							
			蛍光灯	式	3000 時間を寿命とする。12 時間/日× 365 日/年÷3000 時間/ 個=1.46	2	5,129	10,258	
			小計					10,258	41,032
37	人工呼吸器、CPAP 機能付き	1							
			加温加湿フィルター(100 個/式)	式	365 日/年×2 人/日 ÷100 枚/式=7.3	8	68,387	547,096	
			バクテリアフィルターセット	式	2 式/年	2	1,094	2,188	
			小計					549,284	549,284
42	喉頭鏡、小児用	2							
			電球	式	1 式/年	1	2,390	2,390	
			小計					2,390	4,780
44	輸液ポンプ	7							
			輸液チューブセット(10 個/式)	式	300 日/年×0.5 人/ 日×1 個/人÷10 個/ 式=15	15	398	5,975	
			小計					5,975	41,828
45	患者監視装置、小児用	2							
			体温プローブ、小児用、リユーズブル	個	1 個/年	1	23,902	23,902	
			SPO2 プローブ、小児	個	1 個/年	1	27,387	27,387	

計画番号	計画機材名	計画数量	消耗品・部品	単位	数量の想定根拠	数量	単価 (Rs.)	金額 (一台あたり)	合計 (Rs.)
			用、リユーザブル						
			カフ、ホース付き、小児用、リユーザブル	個	1 個/年	1	2,191	2,191	
			ディスプレイ電極、小児用	式	300 日/年 × 2 人/日 × 3 個/人 ÷ 150 個/式 = 12	12	4,980	59,754	
			小計					113,234	226,469
46	血液ガス分析装置	1							
			試薬・記録紙 (1,800 検査/式)	式	20 検体/日 × 365 日 = 7300 検体/年 ÷ 1800 検査/式 = 4.05	4			
			小計					672,000	672,000
47	X 線撮影装置、移動式	1							
			フィルム (100 枚/箱)	箱	300 日 × 2 人/日 × 2 枚/人 ÷ 100 枚/箱 = 12	12	27,355	328,257	
			小計					328,257	328,257
50	診察灯	55							
			白熱灯	個	1000 時間を寿命とする。3 時間/日 × 312 日 ÷ 1000 時間/個 = 0.936	1	498	498	
			小計					498	27,387
57	肺機能測定装置	1							
			紙製マウスピース (200 個/式)	式	260 日/年 × 2 人/日 ÷ 200 個/式 = 2.6	3	3,009	9,027	
			記録紙	個	260 人/年 × 2 人/日 × 0.2m/人 ÷ 30m/個 = 3.46	4	410	1,641	
			小計					10,668	10,668
62	胎児心拍測定器	1							
			ジェル (250g/個)	個	260 日/年 × 8 人/日 × 2g/人 ÷ 250g/個 = 16.64	17	855	14,532	
			小計					14,532	14,532
64	超音波診断装置	1							
			ジェル	リットル	260 日/年 × 5 人/日 × 5mL/人 ÷ 1000mL = 6.5	7	4,980	34,857	
			記録紙	個	260 日/年 × 5 人/日 × 0.2m/人 ÷ 30m/個 = 8.66	9	2,988	26,889	
			小計					61,746	61,746
65	額帯鏡、耳鼻科用	3							
			電球	個	2000 時間を寿命とする。6 時間/日 × 312 日 ÷ 2000 時間/個 = 0.936	1	2,735	2,735	
			小計					2,735	8,206
66	耳鼻科用顕微鏡	1							
			電球	個	2000 時間を寿命とする。6 時間/日 × 312 日 ÷ 2000 時間/個 = 0.936	1	2,735	2,735	
			小計					2,735	2,735

計画 番号	計画機材名	計画 数量	消耗品・部品	単 位	数量の想定根拠	数 量	単価 (Rs.)	金額 (一台あたり)	合計 (Rs.)
73	パノラマ・セファロ X線撮影装置	1							
			フィルム(100枚/箱)	箱	260日×3人/日×2 枚/人=1560÷100 枚/箱=15.6	16	4,103	65,651	
			小計					65,651	65,651
83	ビデオモニター、 光源装置付き	3							
			キセノン電球	個	2000時間を寿命と する。6時間/日× 312日÷2000時間/ 個=0.936	1	95,742	95,742	
			小計					95,742	287,225
84	骨密度測定装置	1							
			記録紙	個	260日/年×2人/日 ÷100人/個=5.2	6	1,992	11,951	
			ジェル(250g)	個	260日/年×2人/日 ×2g÷250g=4.16	5	2,988	14,939	
			小計					26,889	26,889
85	心電モニター	1							
			胸部電極セット、成人 用(6個/式)	式	2式/年	2	1,992	3,984	
			胸部電極セット、小児 用(6個/式)	式	2式/年	2	1,992	3,984	
			四肢電極セット、成人 用(4個/式)	式	2式/年	2	1,992	3,984	
			四肢電極セット、小児 用(4個/式)	式	2式/年	2	1,992	3,984	
			患者ケーブル	個	2式/年	2	11,951	23,902	
			ECGクリーム(100g)	個	260日/年×10人/ 日×5g/人÷100g/ 個=130	130	498	64,734	
			記録紙	個	260日/年×10人/ 日÷40人/個=65	65	598	38,840	
			小計					143,410	143,410
86	筋電図検査装置	1							
			誘発脳波用電極セッ ト	式	1式/年	1	27,355	27,355	
			筋電図用電極キット	式	1式/年	1	74,542	74,542	
			ジェル	個	260日/年×2人/日 ×5g/人÷270g/個 =9.6	10	1,846	18,464	
			筋電図用ペースト	個	260日/年×2人/日 ×5g/人÷1200g/個 =2.16	2	6,155	12,310	
			小計					132,671	132,671
88	血液分析装置	1							
			試薬・記録紙(6,000 検査/式)	式	100検体/日×260 日/年÷6000=4.33	4	244,825	979,302	
			小計					979,302	979,302

89	分光光度計	1							
			記録紙	個	5 個/年	5	5,471	27,355	
			小計					27,355	27,355
90	顕微鏡	2							
			油浸オイル、50cc	個	1 本/年	1	1,846	1,846	
			小計					1,846	3,693
109	超音波治療器	1							
			ジェル(250g)	個	260 日/年×2 人/日 × 2g÷250g=4.16	5	9,027	45,135	
			小計					45,135	45,135
							合計	ルビー	6,882,309

資料 9 医療機材 年間保守契約費用明細

資料 9 医療機材 年間保守契約費用明細

計画 番号	計画機材名	計画 数量	契約 単位	単価 (1台あたり)	合計
22	高圧蒸気滅菌器	2	年間	¥105,000	¥210,000
46	血液ガス分析装置	1	年間	¥125,000	¥125,000
47	X線撮影装置、移動式	1	年間	¥200,000	¥200,000
64	超音波診断装置	1	年間	¥250,000	¥250,000
73	パノラマ・セファロ X線撮影装置	1	年間	¥161,000	¥161,000
88	血液分析装置	1	年間	¥125,000	¥125,000
89	分光光度計	1	年間	¥46,700	¥46,700
概算総合計 日本円					¥1,117,700
概算総合計 ルピー					Rs. 1,019,148

資料 10 地質調査結果

**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.
No 24, Station Road,
Wattala.**

**Tel : 011 - 2941538 / 0712-727764
Fax : 011 - 2941536
E-mail : ground@sltnet.lk**

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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	Classification
				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.

4. 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).

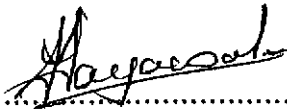
However, the approximate loading on the columns, according to the provided information, is in the range of 3,000 kN/column. Under the above circumstances the most suitable foundation will be a strip foundation placed at a depth of 1.0m below the EGL (approximately at the elevation of 99.0m) considering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



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

17th July 2007
Date

ANNEXURE A

Location Plan of the Bore Holes

ANNEXURE B

Vertical Soil Profiles

BOREHOLE LOG

Project Teaching Hospital Improvement Project
Location Amuradhapura
Client Yarnashita 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					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
1.00					- do -	ML		Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.	1.00	11						
1.25					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
1.50					- do -	ML		Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.								
1.75					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
2.00					- do -	ML		Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.								
2.25					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
2.50	97.75	2.50	0.50		- do -	ML		Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.								
2.75					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
3.00					- do -	ML		Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.								
3.25					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
3.50					- do -	ML		Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.								
3.75					- do -	ML	Loose, fine to coarse sand mixed with approx. 30% silt and 10% plastic fines.									
4.00	96.25	4.00	1.50		- do -	SM		Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.	4.00	25						
4.25					- do -	SM	Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.									
4.50					- do -	SM		Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.								
4.75					- do -	SM	Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.									
5.00	95.20	5.05	1.05		- do -	SM		Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.								
5.25					- do -	SM	Completely decomposed rock in the form of dense, sand mixed with approx. similar amount of silt.									
5.50					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.								
5.75					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.									
6.00					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.								
6.25	94.15	6.10	1.05		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.		6.00	30						
6.50					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								
6.75					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									
7.00					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								
7.25					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									
7.50					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								
7.75					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									
8.00	92.25	8.00	1.90		Brown	Bt.Gn.		HW-MW bedrock. CR = 37%, RQD = 0% Broken into pieces of 5-50mm long, due to high grade of weathering.	7.00	> 50 / 15cm						
8.25					Brown	Bt.Gn.	HW-MW bedrock. CR = 37%, RQD = 0% Broken into pieces of 5-50mm long, due to high grade of weathering.									
8.50					Brown	Bt.Gn.		HW-MW bedrock. CR = 37%, RQD = 0% Broken into pieces of 5-50mm long, due to high grade of weathering.								
8.75					Brown	Bt.Gn.	HW-MW bedrock. CR = 37%, RQD = 0% Broken into pieces of 5-50mm long, due to high grade of weathering.									
9.00	91.25	9.00	1.00		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.	8.00	> 50 / 1cm						
9.25					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.									
9.50					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.								
9.75					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.									
10.00	90.25	10.00	1.00		- do -	- do -		MW bedrock. CR = 66%, RQD = 20% Broken into pieces of 50-125mm long, due to high grade of weathering.								
10.25					- do -	- do -	MW bedrock. CR = 66%, RQD = 20% Broken into pieces of 50-125mm long, due to high grade of weathering.									
10.50					- do -	- do -		MW bedrock. CR = 66%, RQD = 20% Broken into pieces of 50-125mm long, due to high grade of weathering.								
10.75					- do -	- do -	MW bedrock. CR = 66%, RQD = 20% Broken into pieces of 50-125mm long, due to high grade of weathering.									
11.00	89.25	11.00	1.00		- do -	- do -		MW bedrock with uneven dip angle. CR = 92%, RQD = 19% Broken into pieces of 150-150mm long, due to high grade of weathering.								
11.25					- do -	- do -	MW bedrock with uneven dip angle. CR = 92%, RQD = 19% Broken into pieces of 150-150mm long, due to high grade of weathering.									
11.50	88.60	11.65	0.65		- do -	- do -		MW bedrock with uneven dip angle. CR = 92%, RQD = 19% Broken into pieces of 150-150mm long, due to high grade of weathering.								
11.75					- do -	- do -	MW bedrock with uneven dip angle. CR = 92%, RQD = 19% Broken into pieces of 150-150mm long, due to high grade of weathering.									
12.00					Gray	- do -		Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%								
12.25					Gray	- do -	Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%									
12.50	87.95	12.30	0.65		Gray	- do -		Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%								
12.75					Gray	- do -	Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%									
13.00					Gray	- do -		Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%								
13.25					Gray	- do -	Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%									
13.50					Gray	- do -		Fresh bedrock with 10deg. Dip angle. CR = 100%, RQD = 82%								
							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	
0.25					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																
2.75					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.									
3.00																
3.25																
3.50	96.16	3.60	1.20													
3.75																
4.00					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.									
4.25																
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%									
8.50							Broken into pieces of 5-25mm long, due to high grade of weathering.									
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%									
9.50	90.16	9.60	0.50				Broken into pieces of 10-75mm long, due to high grade of weathering.									
9.75																
10.00																
10.25																
10.50																
10.75																
11.00	88.61	11.15	1.55				Broken into pieces of 50-85mm long, due to high grade of weathering.									
11.25					Grayish brown	- do -	MW bedrock with 60-20deg. dipping. CR = 100%, RQD = 38%									
11.50																
11.75	88.06	11.70	0.55				Broken into pieces of 50-85mm long, due to high grade of weathering.									
12.00																
12.25					Gray		SW - Fresh bedrock with 20-60deg. dipping. CR = 100%, RQD = 60%									
12.50							Ponly mechanical fractures are observed.									
12.75	87.36	12.40	0.70													
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																
9.00	91.15	9.00	0.97			- do -	- do -	HW - MW bedrock with irregular dipping. CR = 66%, RQD = 24%								
9.25								Broken into pieces of 5-25mm long, from 9.00 - 9.05m due to high grade of weathering.								
9.50																
9.75																
10.00	90.15	10.00	1.00			Brown to grayish brown	- do -	HW - MW bedrock dipping 40- 60deg. CR = 97%, RQD = 56%								
10.25																
10.50																
10.75																
11.00	89.15	11.00	1.00			Grayish brown	- do -	HW bedrock with irregular dipping. CR = 45%, RQD = 14%								
11.25								Broken into pieces of 1-5mm. from 11.75 - 11.90m due to high grade of weathering.								
11.50	88.25	11.90	0.90													
11.75																
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
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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

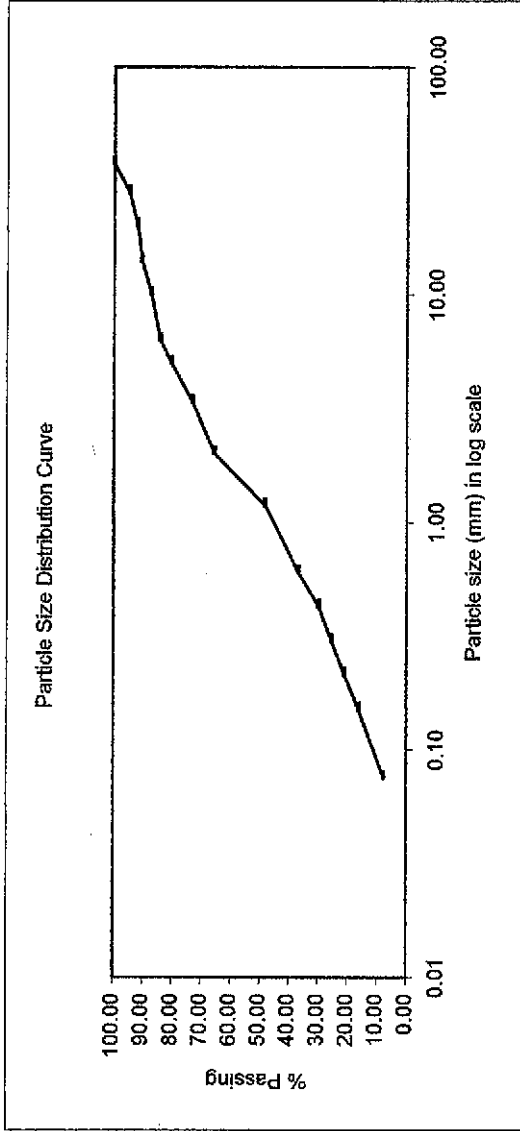
Project : Teaching Hospital Improvement project
 Location : Anuradhapura
 Sample Nos. : 1 & 2
 Test method : BS 1377, 1990, Part 2, Test 9.3

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

BH No. : BH 1

Depth : from 0.00 to 0.55 m

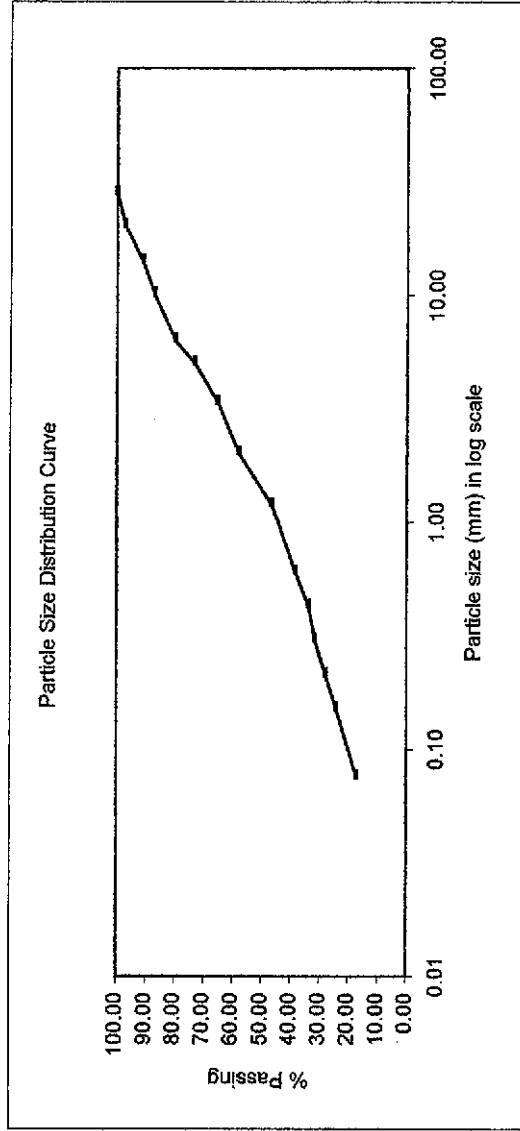
Sample No. :	1		2		Remarks
Pan No.	1		2		
Wt. of pan	8.86 g				
Wt. Of pan + soil	274.56 g				
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %		
50.00		0.00	100.00		
37.50	14.17	5.33	94.67		
20.00	6.96	2.62	92.05		
14.00	4.12	1.55	90.50		
10.00	8.42	3.17	87.33		
6.30	8.62	3.24	84.08		
5.00	10.00	3.76	80.32		
3.35	19.30	7.26	73.06		
2.00	20.05	7.55	65.51		
1.180	46.51	17.50	48.01		
0.600	29.65	11.16	36.85		
0.425	18.50	6.96	29.88		
0.300	11.45	4.31	25.57		
0.212	12.10	4.55	21.02		
0.150	12.58	4.73	16.29		
0.075	23.05	8.68	7.61		



BH No. : BH 3

Depth : from 0.00 to 1.00 m

Sample No. :	2		2		Remarks
Pan No.	2		2		
Wt. of pan	10.23 g				
Wt. Of pan + soil	228.17 g				
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %		
50.00		0.00	100.00		
37.50	6.29	2.89	97.11		
20.00	13.20	6.06	91.06		
14.00	8.91	4.09	86.97		
10.00	15.50	7.11	79.86		
6.30	15.07	6.91	72.94		
5.00	17.06	7.83	65.11		
3.35	15.93	7.31	57.80		
2.00	25.00	11.47	45.33		
1.180	17.37	7.97	38.36		
0.600	9.96	4.57	33.79		
0.425	4.84	2.22	31.57		
0.300	8.00	3.67	27.90		
0.212	8.01	3.68	24.23		
0.150	15.76	7.23	17.00		



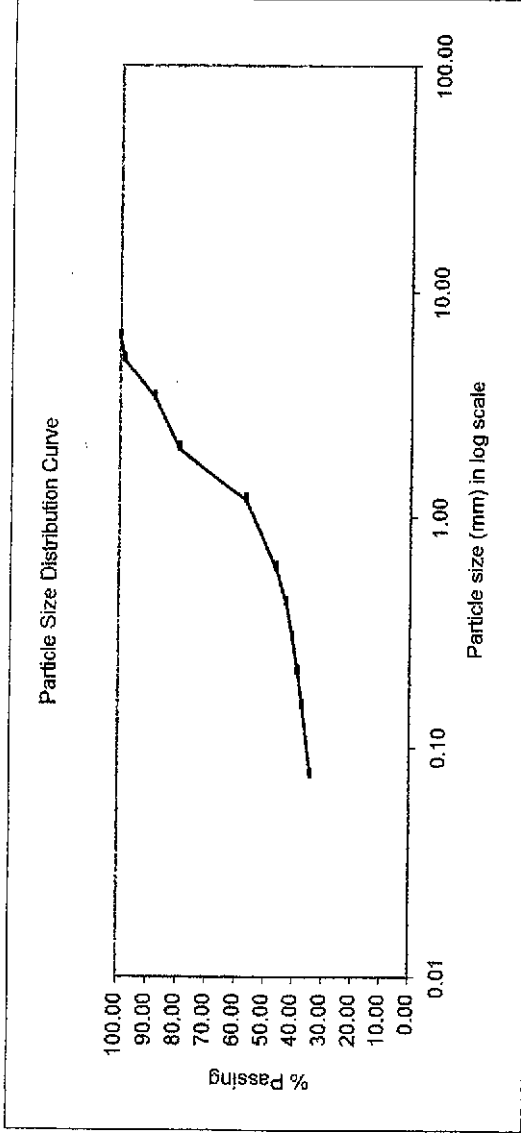
SIEVE ANALYSES OF SOILS

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

Client : Yamashita Sekket Inc.
 Contractor :
 Date : 11.07.2007

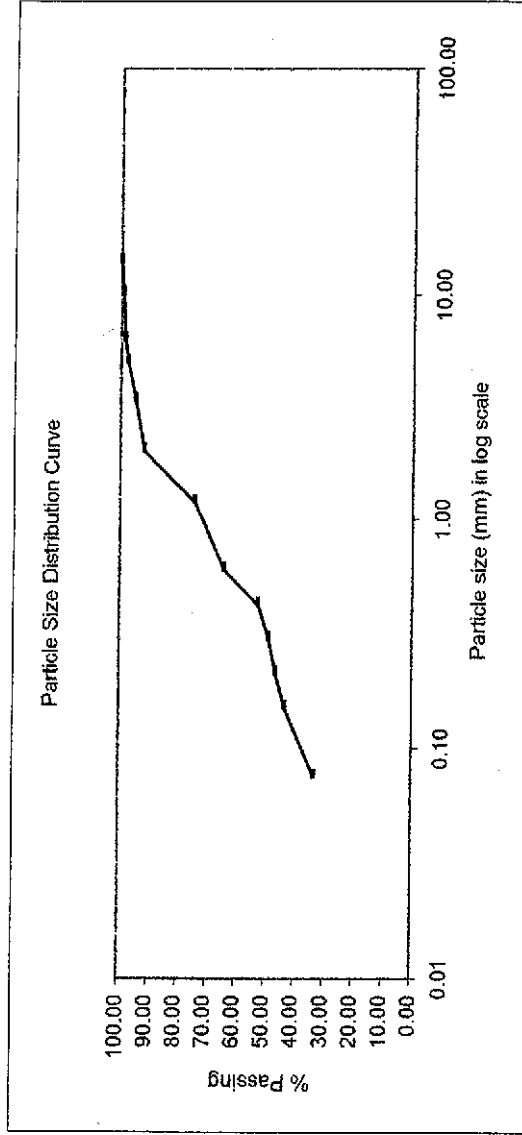
BH No. : BH 2 Depth : from 0.00 to 2.40 m

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		0.00	100.00	
5.00	3.69	1.53	98.47	
3.35	24.98	10.34	88.14	
2.00	20.00	8.28	79.86	
1.180	55.68	23.04	56.82	
0.600	25.27	10.46	46.36	
0.425	8.60	3.56	42.81	
0.300	5.08	2.10	40.70	
0.212	4.40	1.82	38.88	
0.150	4.05	1.68	37.21	
0.075	7.25	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		0.00	100.00	
6.30	2.36	0.82	99.18	
5.00	2.01	0.70	98.48	
3.35	2.89	1.00	97.48	
2.00	7.70	2.67	94.81	
1.180	9.01	3.13	91.68	
0.600	49.90	17.32	74.36	
0.425	29.15	10.12	64.25	
0.300	34.13	11.84	52.40	
0.212	10.13	3.52	48.89	
0.150	7.02	2.44	46.45	
0.075	9.31	3.23	43.22	
	28.78	9.99	33.24	



SIEVE ANALYSES OF SOILS

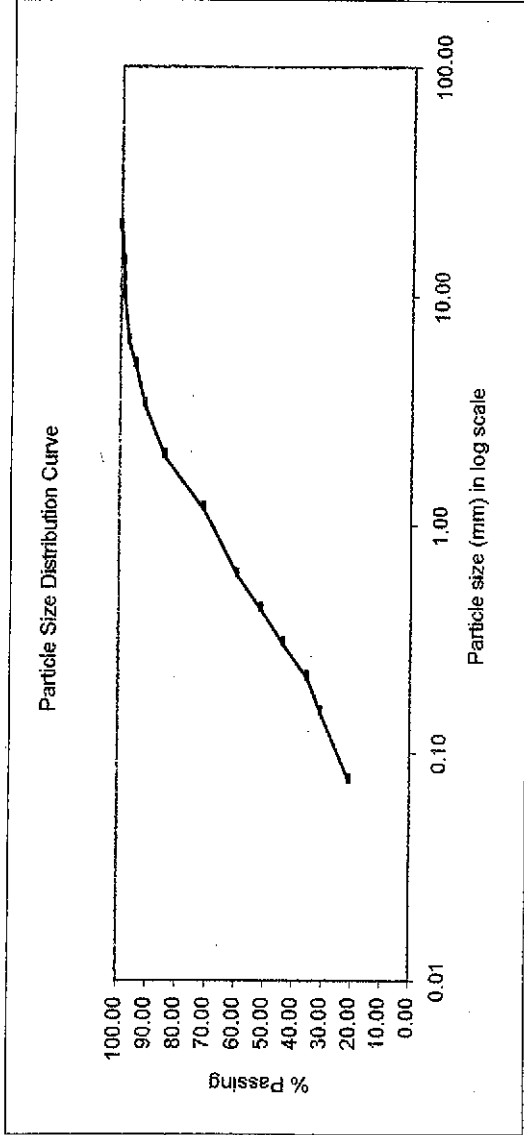
Project : Teaching Hospital Improvement project
 Location : Anuradhapura
 Sample Nos. : 5 & 6
 Test method BS 1377, 1990, Part 2, Test 9.3

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

BH No. : BH 1 Depth : from 4.00 to 5.05 m

Sample No. : 5
 Pan No. 5
 Wt. of pan 12.75 g
 Wt. Of pan + soil 281.54 g

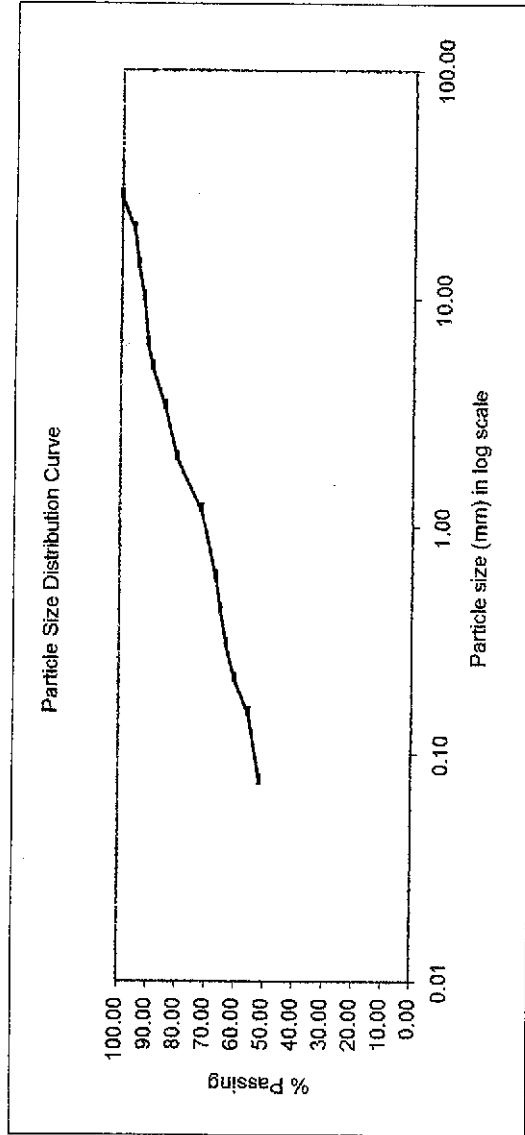
Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Remarks
50.00				
37.50		0.00	100.00	
28.00		0.86	99.14	
20.00		0.49	98.65	
14.00	2.31	0.82	97.83	
10.00	1.32	0.47	97.07	
6.30	4.25	1.51	94.76	
5.00	6.21	2.21	91.59	
3.35	8.51	3.02	84.70	
2.00	18.52	6.58		
1.180	35.61	12.65		
0.600	31.26	11.10		
0.425	22.05	7.83		
0.300	21.00	7.48		
0.212	22.31	7.92		
0.150	12.32	4.38		
0.075	26.59	9.45		



BH No. : BH 2 Depth : from 2.40 to 6.00 m

Sample No. : 6
 Pan No. 6
 Wt. of pan 8.93 g
 Wt. Of pan + soil 198.05 g

Dia. (mm)	Wt. Ret. (g)	Ret. %	Cu. Pas. %	Remarks
50.00				
37.50		0.00	100.00	
28.00		4.47	95.53	
20.00	8.45	4.27	94.19	
14.00	2.53	1.28	92.20	
10.00	3.77	1.90	90.55	
6.30	3.12	1.58	88.93	
5.00	3.06	1.54	84.68	
3.35	8.05	4.07	71.88	
2.00	8.03	4.05	66.96	
1.180	16.18	8.17	65.24	
0.600	9.30	4.70	63.30	
0.425	3.25	1.64	60.34	
0.300	3.66	1.84	55.57	
0.212	5.60	2.83	51.50	
0.150	9.03	4.56		
0.075	7.69	3.88		



SIEVE ANALYSES OF SOILS

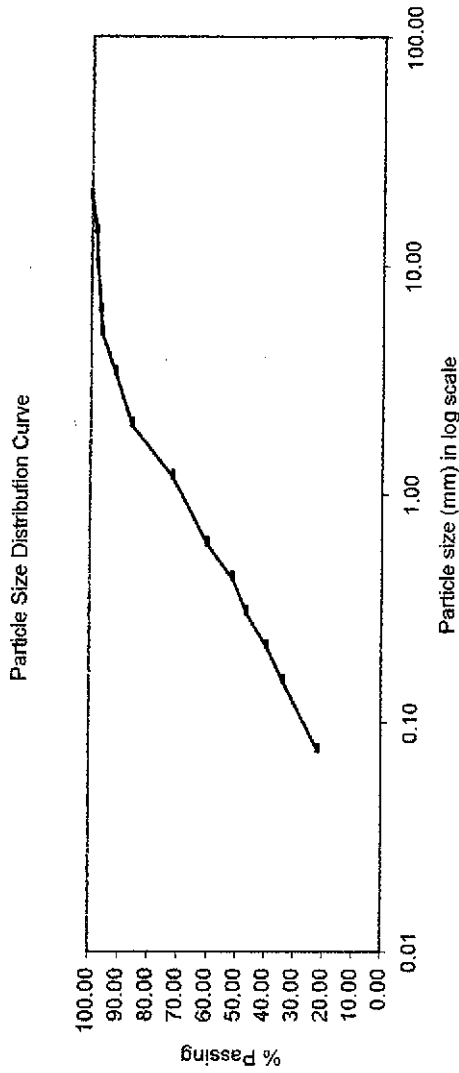
Project : Teaching Hospital Improvement project
 Location : Anuradhapura
 Sample Nos. : 7 &
 Test method : BS 1377, 1990, Part 2, Test 9.3

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		0.00	100.00	
28.00		1.55	98.45	
20.00		0.45	98.00	
14.00	2.81	1.20	96.80	
10.00	0.81	0.65	96.15	
6.30	2.17	4.53	91.62	
5.00	1.18	5.58	86.04	
3.35	8.19	14.15	71.89	
2.00	10.09	11.85	60.05	
1.180	29.60	15.83	51.30	
0.600	21.43	8.75	46.53	
0.425	15.83	4.76	39.46	
0.300	8.62	7.07	33.92	
0.212	12.80	5.54	21.93	
0.150	10.03	11.99		
0.075	21.69			



ATTEBURG 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!

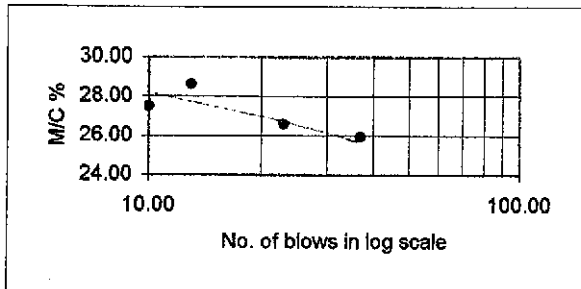
Plastic Limit	
1	2
3E	3F
10.42	10.51
31.02	22.77
27.46	20.66
20.89	20.79

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

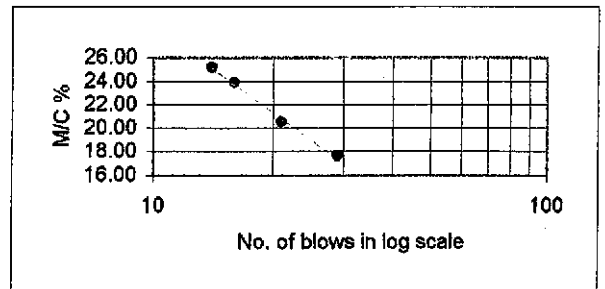
Test No.	Liquid Limit					
	1	2	3	4	5	6
Number of blows	29	21	16	14		
Can No.	4A	4B	4C	4D		
Wt. of the can	g 9.16	g 10.58	g 8.95	g 10.12		
Wt. Of wet soil + can	g 20.22	g 18.74	g 15.78	g 21.20		
Wt. Of dry soil + can	g 18.56	g 17.35	g 14.46	g 18.97		
Moisture content	% 17.66	% 20.53	% 23.96	% 25.20	#DIV/0!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

ATTERBURG 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					
		1	2	3	4	5	6
		38	28	18	11		
Can No.		2A	2B	2C	2D		
Wt. of the can	g	10.44	5.96	8.55	8.73		
Wt. Of wet soil + can	g	21.94	18.58	17.92	22.21		
Wt. Of dry soil + can	g	19.53	15.81	15.84	19.00		
Moisture content	%	26.51	28.12	28.53	31.26	#DIV/0!	#DIV/0!

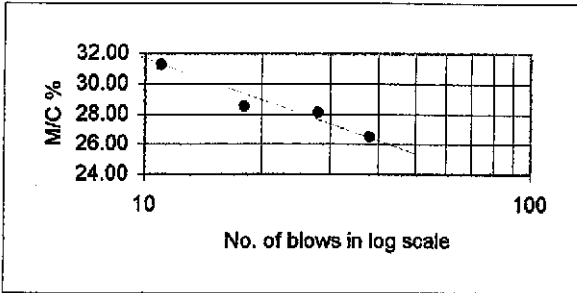
Plastic Limit	
1	2
2F	2G
10.71	10.44
28.41	25.67
24.95	22.71
24.30	24.12

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

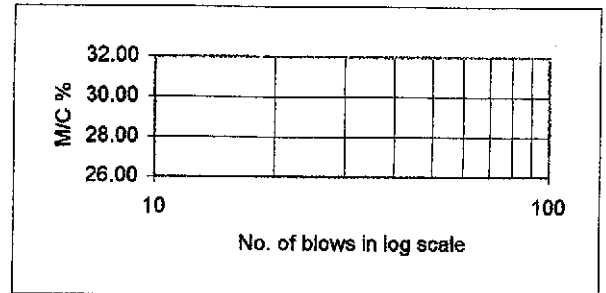
Test No.	Number of blows	Liquid Limit					
		1	2	3	4	5	6
Can No.							
Wt. of the can	g						
Wt. Of wet soil + can	g						
Wt. Of dry soil + can	g						
Moisture content	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Plastic Limit	
1	2
#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	1196.00	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	
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			

WET & DRY DENSITY OF SOILS

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

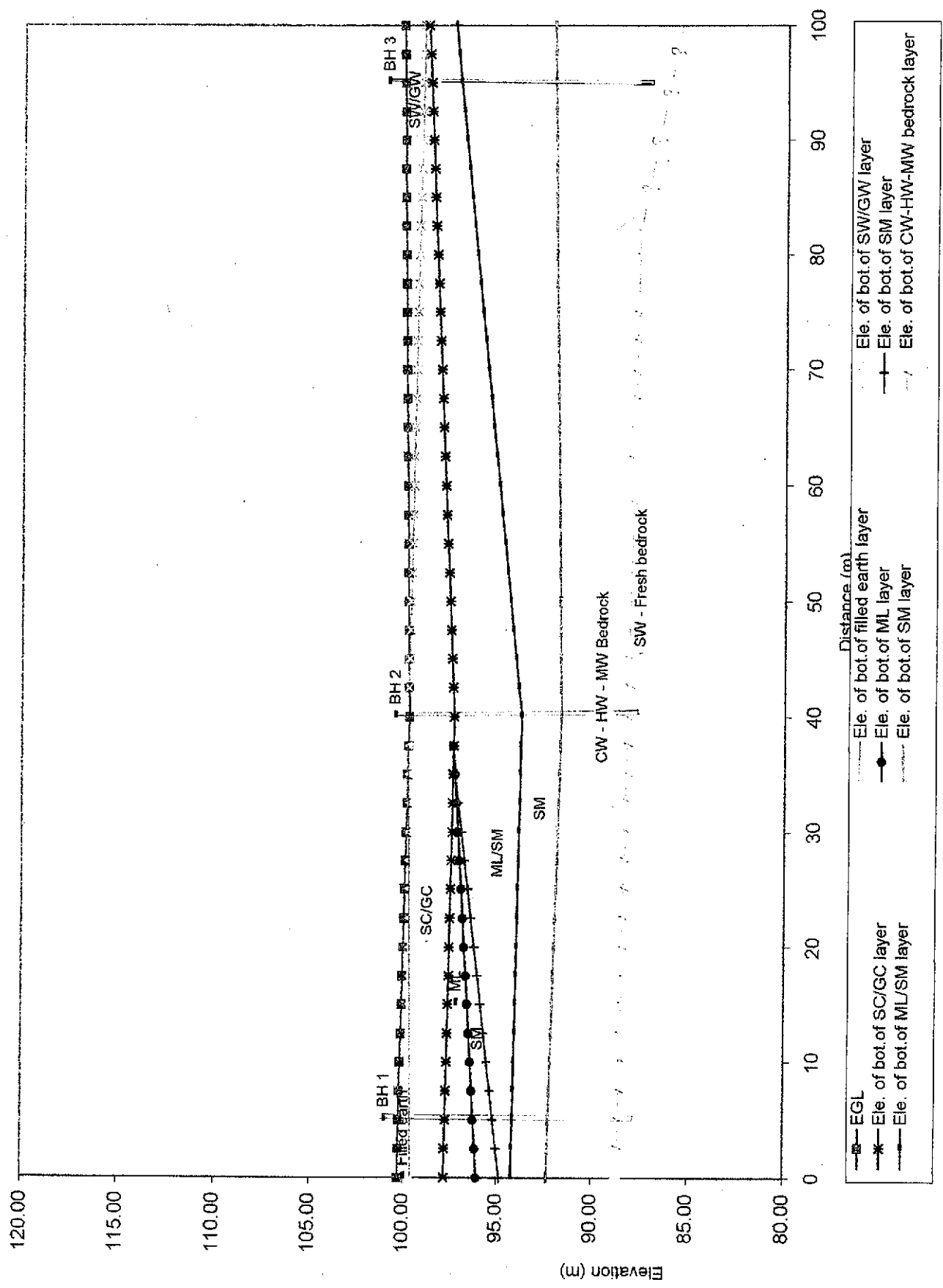
Test Method : BS 1377 : 19754.4.4 Test 15(D)

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)



資料 11 水質調査結果



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	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
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 absorbtion 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

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: 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
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 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