APPENDICES

APPENDICES

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1. Member List of the Study Team

1. Member List of the Study Team

(1) The Field Survey in Sudan（23rd August 2014 – 16th September 2014）

	Name	Position	Organization
1.	Ikuo TAKIZAWA	Team Leader	Director, Health Team 1, Health Group 1, Human Development Department, JICA
2.	Masami MIYAKAWA	Technical Advisor	National Centre for Global Health and Medicine
3.	Yoko KOTOURA	Coordinator	Health Team 1, Health Group 1, Human Development Department, JICA
4.	Kentaro NISHIYAMA	Project Manager / Architectural Facilities Planning-1	System Science Consultants Inc.
5.	Masahiko WATANABE	Sub-Manager / Architectural Facilities Planning-2	System Science Consultants Inc.
6.	Yasuko ASANUMA	Equipment Planning	Binko International Ltd.
7.	Keiko KOBAYASHI	Health and Human Development	KRI International Corp.
8.	Yoshio KAWAI	Building Design／Natural Conditions Survey	System Science Consultants Inc.
9.	Shigeru OGURA	Facilities Design	Fukunaga Architects-Engineers
10.	Akihiro HAYAHARA	Construction Planning / Cost Estimation	System Science Consultants Inc.
11.	Toshiharu HATA	Equipment Procurement/ Cost Estimation	System Science Consultants Inc.

(2) DFR Explanation Survey（13th February 2015 – 20th February 2015）

	Name	Position	Organization
1.	Ikuo TAKIZAWA	Team Leader	Director, Health Team 1, Health Group 1, Human Development Department, JICA
2.	Tatsuhito TOKUBOSHI	Coordinator	Health Team 1, Health Group 1, Human Development Department, JICA
3.	Yasuhiro UENO	Coordinator	Budget Division 2, Budget and Accounting Department, JICA
4.	Kentaro NISHIYAMA	Project Manager / Architectural Facilities Planning-1	System Science Consultants Inc.
5.	Yasuko ASANUMA	Equipment Planning	Binko International Ltd.

2. Study Schedule

2. Study Schedule

(1) The Field Survey in Sudan (23rd August 2014 – 16th September 2014)

Day	Week	Official Members	Project Manager / Architectural Plannning-1	Health and Human Development	Sub Manager / Architectural Plannning-2	Equipment Planning	Building Design / Natural Conditions Survey	Construction Planning / Cost Estimation	Facilities Design	Equipment Procurement / Cost Estimation
		Team Leader (JICA) : Ikuo TAKIZAWA Technical Adviser : Masami MIYAKAWA Coordinator (JICA) : Yoko KOTOURA	Kentaro NISHIYAMA	Keiko KOBAYASHI	Masahiko WATANABE	Yasuko ASANUMA	Yoshio KAWAI	Akihiro HAYAHARA	Shigeru OGURA	Toshiharu HATA
23-Aug	Sat		Dep. Narita→	←	←	←	←	←		
24-Aug	Sun	Dep. Narita→	Arv. Khartoum	←	←	←	← Appointments with local survey company	← Arrangement Construction & Procurement survey		
25-Aug	Mon	Arv. Khartoum Meeting with JICA Sudan Office	Meeting with Khartoum State Ministry of Health and related organizations (Explanation of Inception Report, Receive the Questionnaires) Meeting with JICA Sudan Office				Arrangement of the Survey (Soil investigation and Topographic Survey) Meeting with Local Survey Companies	Arrangement Construction & Procurement survey Interview appointment to Local consultants, contractors.		
26-Aug	Tue	Meeting with Khartoum State Ministry of Health(KSMOH) Observation of Sites- -Omdurman Maternity Hospital -Umbaddah General Hospital -Bahry Midwifery School			← Arrangement of Site Survey	←	Infrastructure condition and building layout ←	Construction permit procedure ←		
27-Aug	Wed	Observation of Sites -Truky Hospital -Triaat Albija Health Center -Alban Jadid General Hospital			← Arrangement of Site Survey	←	← Study of building location, service flow,etc.	←		
28-Aug	Thr	Meeting with FMOH / KSMOH - Discussion of Minute's Content			← Confirmation of Sudanese side works	← Equipment planning study	Survey of construction material, similar hospital	Survey of construction material, worker situation and labor law		
29-Aug	Fri	Team Meeting	←	←	← Consideration of Draft plan (Building)	← Consideration of Draft plan (Equipment)	← Consideration of Draft plan (Building)	← Consideration of Draft plan		Dep. Narita →
30-Aug	Sat	Team Meeting Adjustment of Minutes	←	←	Ditto Team Meeting	Ditto Team Meeting	Supervising Natural Condition Survey, Team Meeting	Ditto		Arv. Khartoum Team Meeting
31-Aug	Sun		Meeting with FMOH and KSMOH - Discussion of Minute's Content		←	←	Site Survey & Site Meeting Supervising Natural Condition Survey	Construction method, Procurement and Cost Survey, Site Survey		Equipment Procurement and Cost Survey
1-Sep	Mon	Signing of Minutes (FMOH, Federal MFNE, KSMOH) Visit to JICA and Embassy of Japan	Signing of Minutes (FMOH, Federal MFNE, KSMOH)	←	As same as Project Manager	Consideration of Draft plan (Equipment Survey)	Architectural Design Survey (Concerning Act & Standard) Supervising Natural Condition Survey	Construction method, Procurement and Cost Survey	Dep. Narita →	Equipment Procurement and Cost Survey
2-Sep	Tue	Arv. Narita	Visit to JICA and Embassy of Japan	Meeting with State MOH, Departments; Target Hospitals Survey, Health System, Insurance etc.	Environmental laws and regulations and standards Survey	Ditto	Ditto	Ditto	Arv. Khartoum Facilities Design Survey	Ditto
3-Sep	Wed		Ditto	Ditto	Ditto	Consideration of Draft plan (Training Priority)	Architectural Design Survey (Site Survey)	Ditto	Facilities Design Survey (Site Survey)	Ditto
4-Sep	Thr		Study of the Project Components / Operation & Maintenance System Team Meeting		← Survey	Ditto	Architectural Design Survey	Ditto	Facilities Design Survey	Ditto
5-Sep	Fri		Team Meeting	←	← Dep. Khartoum	Progress of Each Survey Team Meeting	←	←	←	←
6-Sep	Sat		Documentation Team Meeting	←	Arv. Narita	Documentation Team Meeting	←	← Additional Survey	← Additional Survey	← Additional Survey
7-Sep	Sun		Meeting with Related Departments of KSMOH; -Discussion of Draft Plan	Data Collection, Confirmation of: -Assignment of Medical Staff -Budget Allocations		Meeting with State MOH, Departments; -Discussion of Equipment Plan	Meeting with State MOH, Departments; -Discussion of Draft Building Plan	Construction method, Procurement and Cost Survey	Facilities Design Survey (Concerning Act & Standard)	Equipment Procurement and Cost Survey
8-Sep	Mon		Ditto	Visit of Academy of Heath Science -Curriculum of midwifery school		Confirmation of Draft plan	Architectural Design Survey (Planning Department& Hospital)	Ditto	Ditto	Ditto
9-Sep	Tue		Ditto	Data Collection, Confirmation of Operating system & Human Resources of targeted facilities		As same as Project Manager	Ditto	Ditto	Ditto	Ditto
10-Sep	Wed		Ditto	Ditto		Ditto	Receive Outline Survey Report of Natural Condition Survey and Discuss with Local Consultants	Ditto	Facilities Design Survey (Outline of Operational Cost)	Ditto
11-Sep	Thr		Meeting with KSMOH; - Explanation of Survey Outline - Discussion about Technical Note			Meeting with KSMOH; - Explanation of Survey Outline - Discussion about Technical Note			Ditto ←	Ditto ←
12-Sep	Fri		Documentation Team Meeting	←		Dep. Khartoum→	←	Documentation Team Meeting	Documentation Team Meeting	Documentation Team Meeting
13-Sep	Sat		Ditto	←		Arv. Narita	←	Ditto	Ditto	Ditto
14-Sep	Sun		Meeting with FMOH, KSMOH - Confirmation of Draft Outline Plan - Sign of the Technical Note					Request materials collection (Additional Survey)	Facilities Design Survey	Request materials collection (Additional Survey)
15-Sep	Mon		Visit to JICA and EOJ Dep. Khartoum→					Dep. Khartoum→	Dep. Khartoum→	Dep. Narita →
16-Sep	Tue		Arv. Narita					Arv. Narita	Arv. Narita	Arv. Narita

Legend EOJ: Embassy of Japan, FMOH: Federal Ministry of Health, SMOH: State Ministry of Health

(2) DFR Explanation Survey（13th February 2015 – 20th February 2015）

No	Day	Week	Official Members	Project Manager/ Architectural Plannning-1	Equipment Planning
			Team Leader （JICA） : Ikuo TAKIZAWA Coordinator（JICA) : Tatsuhiko TOKUBOSHI Coordinator（JICA) : Yasuhiro UENO	Kentaro NISHIYAMA	Yasuko ASANUMA
1	13-Feb	Fri		Dep. Narita	
2	14-Feb	Sat	Dep. Narita	Arv. Khartoum Site Visit	
3	15-Feb	Sun	Arv. Khartoum Visit JICA Office	Meeting with KSMOH（DFR Explanation） Visit JICA Office	
4	16-Feb	Mon	Meeting with FMOF, with DG of KSMOH, with FMOH for explanation DFR & discussion of MD		
5	17-Feb	Tue	Site Visit Umbaddah General HP Omduruman MCH HP	Meeting with KSMOH Site Visit & Survey Umbaddah General HP	Meeting with KSMOH Site Visit & Survey Khartoum Drug Devolving Fund
6	18-Feb	Wed	Sign th Minutes of Discussion (MD)		
7	19-Feb	Thu	Reporting to JICA office & EOJ Dept. Khartoum	Site Survey Reporting to JICA office & EOJ Dept. Khartoum	Equipment Survey Reporting to JICA office & EOJ Dept. Khartoum
8	20-Feb	Fri	Arriv. Narita	Arriv. Narita	Arriv. Narita

3. List of Parties Concerned in the Recipient Country

3. List of Parties Concerned in the Recipient Country

(1) Federal Ministry of Finance and national Economy

Mr. Omer Mohamed Ahmed Elhag	Director General, International Cooperation Directorate
Mr. Mkin Musa	Director, Bilateral Financing Department
Ms. Faiza Mirghani Mohammed Ali	Deputy Director, Bilateral Financing Department
Ms. Eglal Abdalla Alameed	Japan Desk officer, Bilateral Financing Department

(2) Federal Ministry of Health

Dr. Mohamed Ali Yahia Elabassi	Director General, Planning & International Health Directorate
Dr. Imad El Din. A.M. Ismail	Director, International Health and External Relations Department, Global Health Initiatives Coordinator
Dr. Siham Elamin	PHC Expansion Director

(3) Khartoum State Ministry of Health

Prof. Mamoun Homeida	Minister
Dr. Salah Eldin Abd Elrazig	Director General
Dr. Babiker Mohamed Ali	Director of Curative Medicine Directorate
Dr. Husaam Aldein Elhassein	Director of PHC Directorate
Eng. Elsheikh Fadul Almola Mohamed	Director of Development Directorate
Dr. Mahmoud Elgayem Abdulla	General Manager of Strategy and Planning Directorate
Dr. Nuha A.A. Salheen	MCH Director, PHC Directorate
Dr. Osama Elnour Abdallah	Health System Director, PHC Directorate
Dr. Sareen Mahgoub Alzayat	Health Centers Director
Eng. Aida Sidahmed Mohammed	Biomedical Engineering Director, Curative Medicine Directorate
Eng. Habib Youis	Technical Director of Biomedical Engineering Unit
Eng. Osama Mohamed Hassan	Biomedical Supervisor, Biomedical Engineering Unit
Eng. Asim Osman Mohamed	PHC Planning Unit, PHC Directorate
Dr. Mona Ali	Director, Department of Voluntary Agency
Dr. Yousif Tibin Mohd Nura	Director of Hospital Department
Mr. Osman Elbushra	Health Advisor
Dr. Mahamnad Al Mahdi Abd Alwahab	M&E Department, Curative Medicine Directorate
Mr. Jolyana Elhadi Babiker	Information Department
Mr. Nagwa Mohammed	Information Department
Dr. Zakia Faisal Abubakr Mahmoud	Director of Quality Control at Hospital Management Department
Mr. Elnazir Mohamed Elsayed	Director General of Lab. Administration
Dr. Montser Elameen Gasm Elsecd	Director of Standards & Assurance Department
Dr. Hasin Osama Oner	Director of QTY development

(4) Locality Health office

Dr. Sayed Mohahmed	Director of PHC, Jabal Awlia Locality
Dr. Boshra Atta Taha	Director of MCH, Jabal Awlia Locality
Dr. Taha Omer Alsheekh	Director of PHC, Jabal Awlia Locality
Dr. Mohamed Saeed Mohamed Hassanien	Director of PHC, Jabal Awlia Locality
Dr. Bushra Atif	Director of MCH, Jabal Awlia Locality

(5) Alban Jadid General Hospital

Dr. Atif Ehhom	General Director
Dr. Nadir Elsir	Medical Director
Dr. Al Amin	Obstetrician
Dr. Nagura Abdalla	Obstetrician
Dr. Ossman	Pediatrician
Eng. Hind Mohammed	Biomedical Engineer in Civil Service
Eng. Safa	Biomedical Engineer, employed by KSMOH
Eng. Akkram	Biomedical Engineer , employed by the Hospital

(6) Triaat Albija Health Centre

Mr. Abo Kasawy	Director General
Dr. Ismail	Director of PHC, Locality Health Department

(7) Omdurman Maternal & Child Hospital

Dr. Murawan Ibrahim Omer	Director General
Dr. Lubna Abd Elwahab	Assistant Director General
Dr. Mahasin Ali Elhaj	Pharmacist
Eng. Tarteel Khalid Tagaldin	Biomedical Engineer
Dr. Rifaat M. Abd Elwahab	Deputy General Manager
Mr. Amir	Public Relation officer
Dr. Awad	Medical Dr. for ANC
Dr. Abu Khalid	Gynecologist for ANC care (CTG)
Dr. Sarah	Ob/Gynecologist
Dr. Fath Atia	Master in Women Health (Family planning)
Dr. Hara Eldimyatti	Quality Control Dr.

(8) Turkey GeneralHospital

Dr.Nawal Mustafa Osman	General Director

(9) Ibn Sina Hospital

Dr. Ibrahim Bedri	General Director

(10) Swedi Charity Hospital

Dr. Hazima Abbas	General Director

(11) Omdruman Midwifery School

Dr. Tarig Nasreldin Badawi	President
Dr. Shza	Community Physician (MB Public Health)

(12) Bahry Midwifery School

Ms. Zaura Jebreel Omar	President

(13) Algossy Health Center

Dr.Hassan Abdallah Man	Medical Assistant

(14) Central Ambulance Centre（in Bahry Ahamed Gasin Hospital）

Dr. Hussam Eld Mobel Ellfassan

(15) Ambulance Centre (in Omdurman)

Dr. Husam Abdalrth Man

(16) Ministry of Physical Planning & Public Utilities, Khartoum State

Eng. Mortada Mahjoub	Director, State of Khartoum Development

(17) Khartoum State water cooperation (Umbaddah Office)

Eng. Osman Awad Elkanm	Engineer
Eng. Esam Mohammed Ahmed	Engineer, Umbaddah Water Emergency office

(18) National Electricity Corporation of Sudan

Mr. Nng. Wail	Dar Elsalam Blanch

(19) Khartoum Police, Fire Fighting Department

Mr. Bashir Ali Daw El Bait	General Manager for Fire Fighting Department

(20) WHO Sudan Office

Mr. Amna Osman Mohamed Osman	Pharmacist, Procurement Assistant

(21) Turkish International Cooperation and Coordination Agency: TIKA (Sudan Office)

Mr. Durakan Isci	Deputy Program Coordinator

(22) Medical Equipment Supplier

Mr. Shakir Abdalla elmalih	Azza medical service	General Manager
Mr. Murtada Mohamed Abdalla	Golden Eagle	Product Support Manager
Mr. Lihame Abubakr Osman	Hippocrates medical equipment	Deputy General Manager
Mr. Yassin Hassan Bashir	NASIF MEDICAL	Director General

(23) Local Construction Companies

Mr. Lee Ja Hyeong	Lee Contractor	General Manager
Dr. Mohamed A. Osman	Engineering Services & Design	Chairman
Eng. Tag Eldin Yamani Sadig	Montag Trading & Engineering Co. Ltd	General Manager
Mr. Tring Khalil Badi	Bamho Contracting & Trading Company Ltd.	General Manager
Mr. Ashraf M. Zaki	Ashraf & Salah Consulting Engineers	General Manager
Mr. Urjwan Ibrahim Alkamil	SOLID Building System Development Co. Ltd	General Manager
Mr. Ahmed Mustafa Mohamed	Engineering, Planning and Architectural Consultants	Partner

(24) Others

Mr. Alsadig Ibrahim A. Alrizaigi	Alintbaha Newspaper	Journalist
Mr. Seham Mansour Abrahem	Akhr Lahza Newspaper	Journalist
Mr. Malik Adbulla Hussien	National Parliament	Resident Secretary
Dr. Omer Haj Hassan Osman	Khartoum Health Insurance Corp.	General Manager
Mr. Gamaleldin Khalafalla Mohamed Ali	Drug Revolving Fund	Khartoum State RDF Manager
Mr. Tcuwiba EL Shersh Mohamed	Central Medical Supplies Public Corporation	Pharmacist
Mr. Osama Abkashower	Shipping Company	Director

(25) Embassy of Japan

Mr. Hideki ITO	Ambassador
Mr. Hitoshi NAKAMURA	Deputy Chief of Mission/
Ms. Midori NAKATA	Second Secretary

(26) JICA Sudan Office

Mr. Seiichi KOIKE	Representative
Mr. Shigeru OTAKE	Senior Representative
Mr. Kunikazu AKAO	Project Coodinator
Mr. Eiichi SHIMIZU	Advisor for FMOH
Ms. Halima Abdeen Abdalla	National Staff of Health & Education sector

4. Minutes of Discussions（M/D）

4-1 Minutes of Discussions（Field Survey）

4-2 Minutes of Discussions（Explanation of Draft Report）

4-1 Minutes of Discussions（Field Survey）

MINUTES OF DISCUSSIONS
ON
PREPARATORY SURVEY
ON THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN

In response to a request from the Government of the Republic of the Sudan (hereinafter referred to as "Sudan"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Improvement of Health Care Service in Suburban Area of Khartoum State (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Sudan the Preparatory Survey Team (hereinafter referred to as "the Team") , which is headed by Mr. Ikuo Takizawa, Director, Health Team 1, Human Development Department., and is scheduled to stay in the country from August 24th to September 15th, 2014.

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

In the course of discussions and field survey, both parties confirmed the items described in the ATTACHMENT.

Khartoum, September 1st 2014

Mr. Ikuo Takizawa Leader Preparatory Survey Team Japan International Cooperation Agency	Dr. Mohamed Ali Yahia Elabassi Director General Planning and Inter National Health Directorate Federal Ministry of Health Sudan	Dr. Salah Eldin Abd Elrazig Mohamed General Director Khartoum State Ministry of Health Sudan

Witnessed by:

Mr. Omer Mohamed Ahmed Elhag
Director General
International Cooperation
Directorate
Ministry of Finance and National
Economy

ATTACHMENT

1. Objective of the Project

The objective of the Project is to expand maternal and child health services to the underserved population in the State of Khartoum.

2. Project Site

The requested sites of the Project are located at Umbaddha locality and Sharag Elnil locality as shown in Annex 1. The priority for the Project was agreed by both parties as described in 7. below and Annex 3.

3. Responsible and Implementing Agency

3-1. The responsible agency is the Federal Ministry of Health (hereinafter referred to as "FMOH"). and its focal point is the Department of International Health and External Relations.
3-2. The implementing agency is the Khartoum State Ministry of Health (hereinafter referred to as "SMOH") and its focal point is the Curative Medicine Directorate.

4. Items Requested by the Government of Sudan

The list of requested items for each site and the priorities agreed upon among FMOH, SMOH and the Team is shown in Annex 3. JICA will assess the appropriateness of the request further with the following criteria and will recommend to the Government of Japan for its approval. A list of rooms for each facility with required numbers and priories, as well as a list of equipment with priorities will be confirmed by the technical note among FMOH, SMOH and the consultants of the Team by September 15th 2014.

- Magnitude and urgency of the needs
- Technical feasibility
- Economic and financial viability and sustainability
- Managerial and administrative competency of the organizations concerned
- Possible amount of financial allocation by Japanese side
- No duplication of support by other Development Partners

5. Japan's Grant Aid Scheme

5-1. FMOH and SMOH understood the Japan's Grant Aid Scheme, as described in Annex 4.
5-2. Both sides will take the necessary measures described in Annex 5 faithfully for smooth implementation of the Project.

6. Schedule of the Survey

6-1. The consultants of the Team will proceed with further survey in Sudan until September 15th, 2014.
6-2. JICA will prepare the draft report in English which describes the basic design of the Project and will dispatch a mission in order to explain its contents in February, 2015.
6-3. In case the basic design is accepted in principle by the Government of Sudan, JICA will submit the draft report to the Government of Japan for the Project appraisal. Through the appraisal, the Japanese Cabinet will make a final decision for the implementation of the Project. Once the

Project is approved by the Japanese Cabinet, the final report (the Preparatory Survey Report) will be sent to the Government of Sudan

6-4. The above schedule is tentative and subject to change.

7. Other Relevant Issues

7-1. Maternal and Child Health Section in Umbaddah General Hospital

Both sides confirmed Maternal and Child Health Section in Umbaddah General Hospital to be top priority for the Project. Both sides agreed to modify the terminology of facility from "Maternal and Child Health Clinic" to "Maternal and Child Health Section" to better reflect planned functions. Maternal and Child Health Section will provide following services: antenatal/delivery/postnatal care, comprehensive emergency obstetric care, intensive care for mothers and newborns, family planning, immunization for infants, and related laboratory and other services, as is shown in Annex 3. The number of bed requested from the Sudanese side was 8 high dependency unit beds, 2 ICU beds and 70 normal beds. Appropriate bed capacity will be examined by consultants of the Team. The Maternal and Child Health Section will be designed as an extension of existing facility to support growing needs in the locality. Due to ongoing nature of the rehabilitation work of the existing facility, however, it will be designed with its own administrative and service function in order to secure smooth operation in the section. Both sides confirmed that the sections originally allocated for the similar services in the existing facility will be utilized for other function when on-going rehabilitation work completes.

7-2. Medical equipment for Alban Jadid General Hospital

SMOH requested that the provision of equipment to the maternity and child health section of Alban Jadid General Hospital to be the second priority. Target capacity of 7,000 deliveries per year was requested by SMOH. The Team understood the priority and agreed to further investigate the possibility of inclusion in the Project and appropriate bed capacity, based on the survey by the consultants. Both parties confirmed that the other requested components for Alban Jadid General Hospital are low priority for the Project.

7-3. Construction of Midwifery School

SMOH requested that the construction of Midwifery School attached to Umbaddah General Hospital to be the another second priority, based on the SMOH's plan to deploy one community midwife per 2,000 population in underserved areas. Target capacity of 100 midwives per year was requested by SMOH. The Team understood the priority and agreed to further investigate the possibility of inclusion in the Project and appropriate training capacity, based on the survey by the consultants which will re-examine (1) the needs based on required number and existing number of community midwife and (2) the suitable place to be constructed. Both parties confirmed other request for midwifery school to be of low priority for the Project.

7-4. Budget Allocation

Both sides agreed that SMOH secures and allocates sufficient budget in order to operate and maintain the constructed facility.

7-5. Staff Assignment for the Constructed Facility

Both sides agreed that SMOH assigns the appropriate number of technical staff as well as administrative staff for operation and maintenance of the constructed facility by the end of 2016.

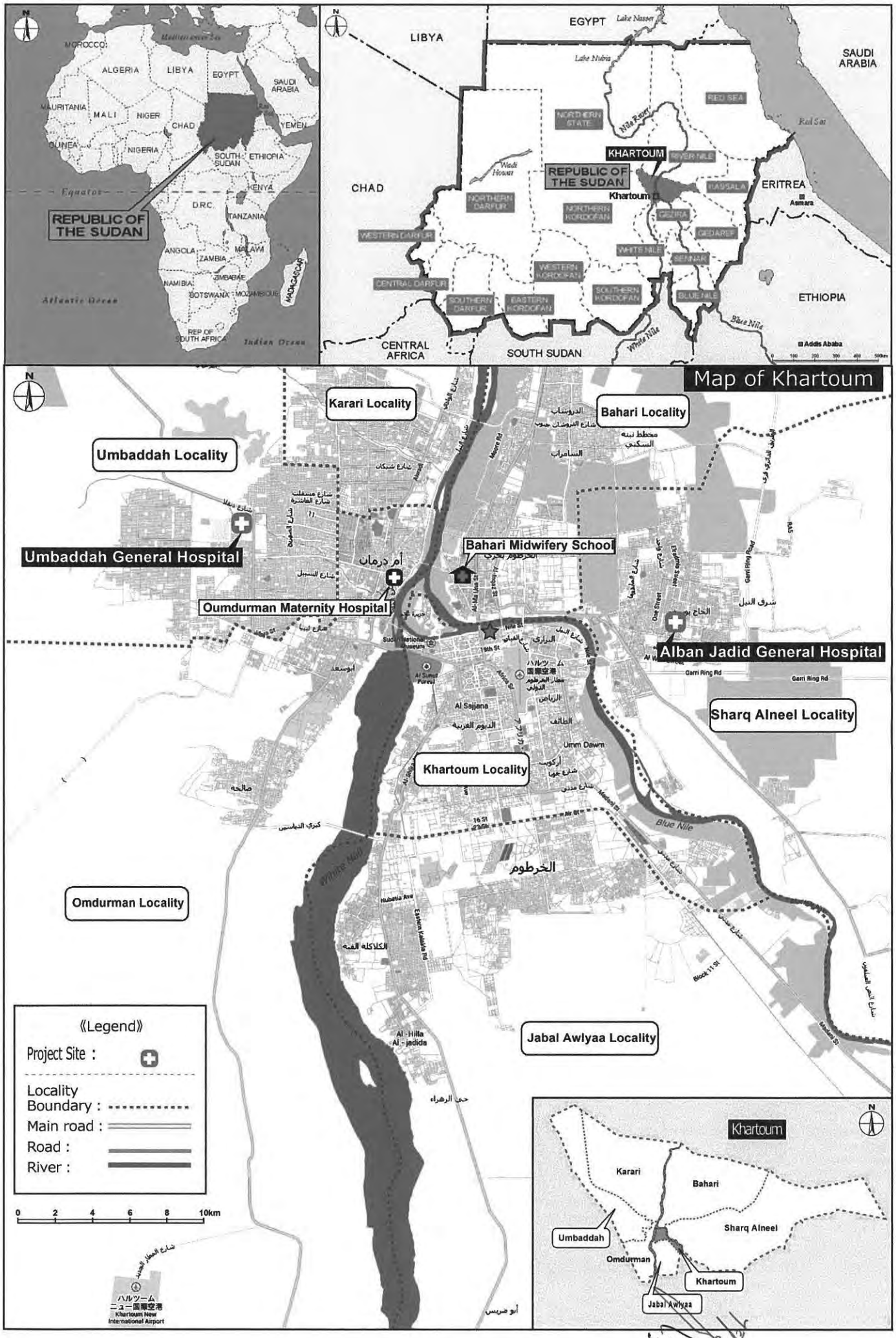
7-6. Undertakings to be taken by the Sudanese Side

1) FMOH and SMOH will confirm necessity of Environmental Impact Assessment for the Project. The result will be written in a technical note which will be signed among FMOH, SMOH and the consultants of the Team, by September 15th 2014.
2) SMOH will submit a copy of land permission to consultants of the Team, by September 15th 2014.
3) FMOH will confirm the procedures for exemption of custom duty and internal tax. FMOH and SMOH agreed to allocate sufficient budget for every Sudanese fiscal year from 2015 to 2017 by completing the necessary procedure by October of the previous year.
4) FMOH and SMOH agreed to take necessary measures for the infrastructure works as follows:
   (i) authorization of construction permit for the Project prior to the commencement of the works, which would be by the end of 2015;
   (ii) completion of site clearance prior to the commencement of the works, which would be by the end of 2015; and,
   (iii) completion of installing water supply, as well as electric supply to the Project site by the end of 2016.

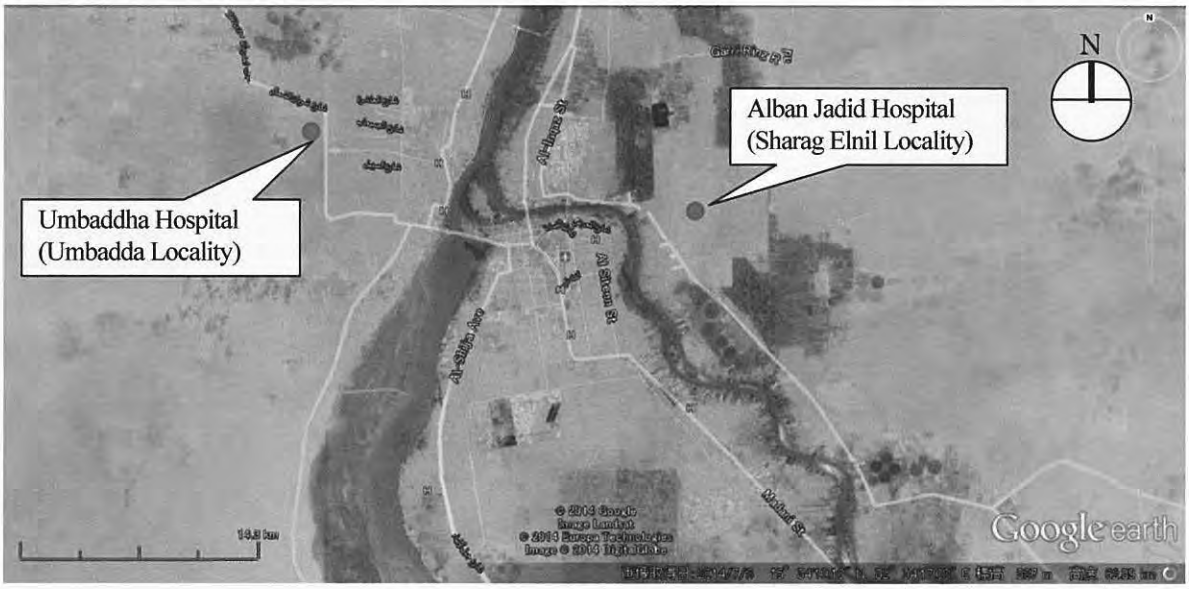
END

Annex 1: Site Map
Annex 2: Organization Chart
Annex 3: Requested Facilities
Annex 4: Japan's Grant Aid Scheme
Annex 5: Major Undertakings to be taken by Each Government

Annex 1. SITE MAP

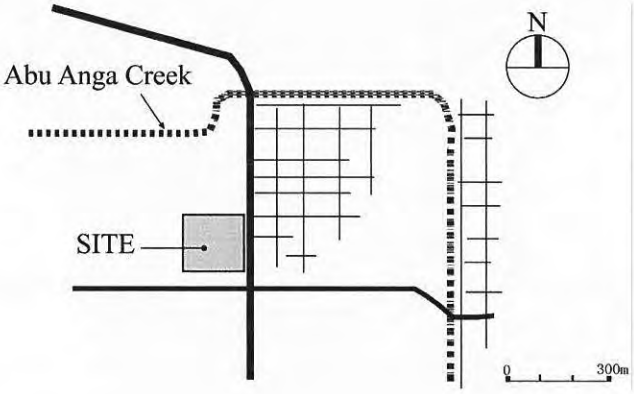


Annex 1. SITE MAP

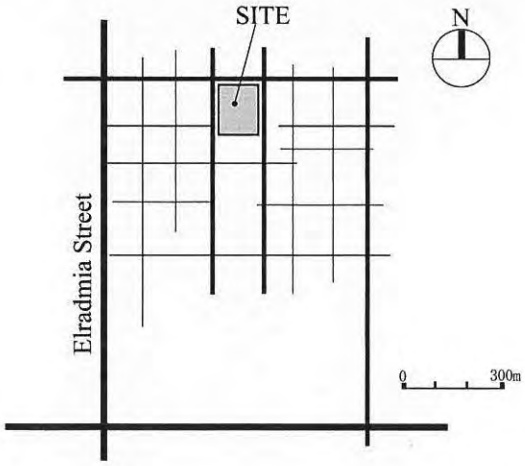


Location of Survey Site

Umbaddha Hospital
(Umbadda Locality)

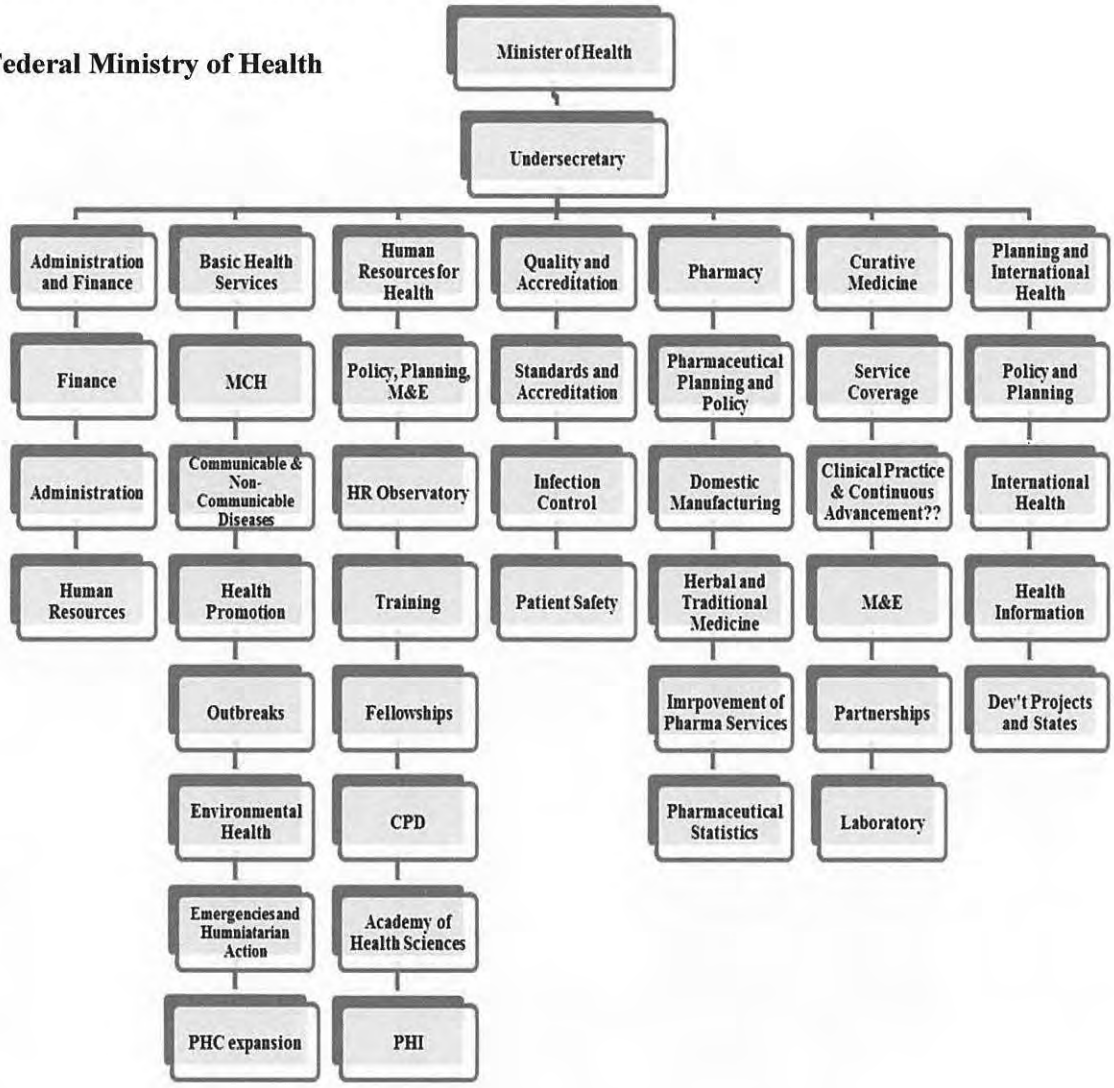


Alban Jadid Hospital
(Sharag Elnil Locality)

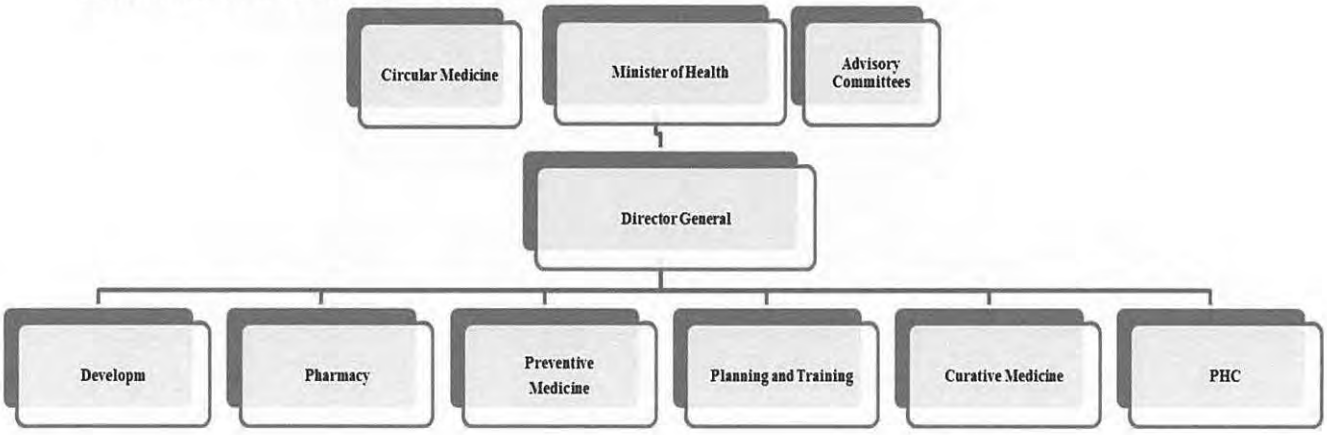


Annex 2. ORGANIZATION CHART

Federal Ministry of Health



Khartoum State Ministry of Health



Annex 3. REQUESTED FACILITIES

- Necessary number of each room and priorities will be examined and discussed between Sudanese side and consultants of the Team by September 15th, 2014.
- Construction site for midwifery school will be reexamined and will be chosen between Sudanese side and consultants of the Team by September 15th, 2014.

Priority	Component	Description
A	Maternal and Child Health Section at Umbaddah General Hospital	Outpatient: Reception, Waiting space, Health Education, Consultation(ANC, PNC, Family Planning, Immunization for Infants), Examination(Obstetrics), (Ultrasound/ECG), Pharmacy Laboratory: Laboratory, Blood and urine collection, Blood bank Delivery: Labor, Delivery, Post-delivery monitoring, NICU, Nurse station, Staff rest, Night duty room, Medical waste, Sterilization Operation Theatre: Pre-operation, Operation theatre, (Recovery), Changing room, Sterilization, Medical waste, Staff rest Hospitalization: Public ward (70 beds were requested from the Sudanese side), Private ward, High Dependency Unit (8 beds were requested from the Sudanese side), ICU (2 beds were requested from the Sudanese side), Nurse station Administration: DG's room, Medical Director's room, Doctor's room, Paramedical staff room, Other clerk's room, Meeting room, Locker, Chart room Service: Laundry, Kitchen and Canteen, Workshop, Service staff's room, Garbage collection
B	Maternal and Child Health Section at Alban Jadid General Hospital	Provision of medical equipment in delivery and labor rooms and operation theatres (target capacity of 7,000 deliveries per year was requested from the Sudanese side)
B	Midwifery School at Umbaddah General Hospital	Class room(capacity for 100 midwives per year were requested from the Sudanese side), Practice room, Locker, Storage, Manager room, Meeting room, Teacher's room, Dormitory, Canteen, Kitchen, Laundry

Annex 4. EXPLANATION OF JAPAN'S GRANT AID SCHME

The Government of Japan is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the Government of Japan, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

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

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures:

・Preparatory Survey

- The Survey conducted by JICA

・Appraisal &Approval

-Appraisal by the Government of Japan and JICA, and Approval by the Japanese Cabinet

・Authority for Determining Implementation

-The Notes exchanged between the Government of Japan and a recipient country

・Grant Agreement (hereinafter referred to as "the G/A")

-Agreement concluded between JICA and a recipient country

・Implementation

-Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the Government of Japan and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid

will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority 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, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

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

(5) Major undertakings to be taken by 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 Annex.

(6) "Proper Use"

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

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or 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 under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA 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 JICA

Scheme from a technical, financial, social and economic point of view.

- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve 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 of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the Government of Japan to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the Government of Japan and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey

under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

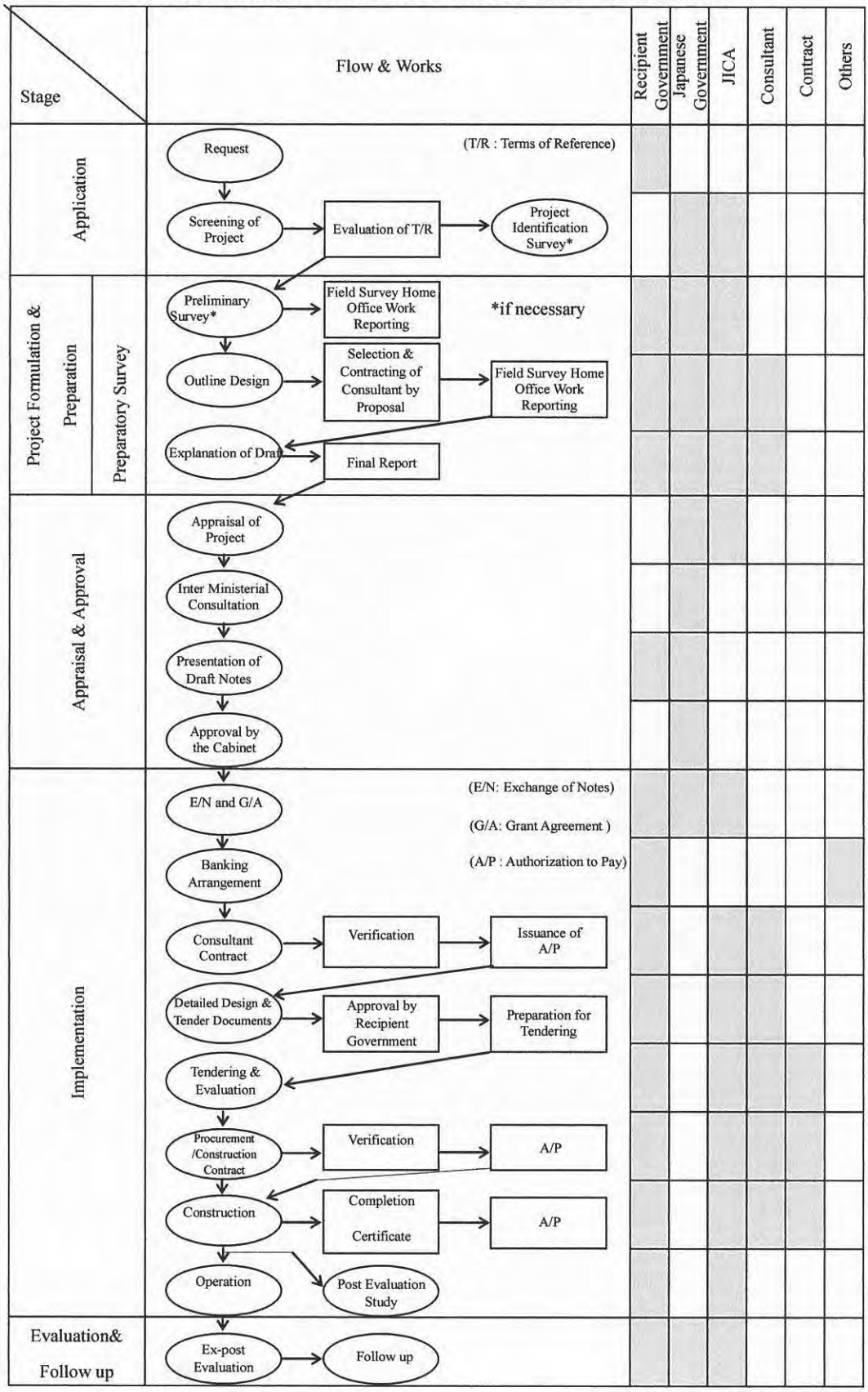
(9) Authorization to Pay (A/P)

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

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



5

Annex. 5 MAJOR UNDERTAKINGS TO BE TAKEN BY EACH GOVERNMENT

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure lots of land necessary for the implementation of the Project and to clear the sites;		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site		●
	3) The parking lot	●	
	4) The road within the site	●	
	5) The road outside the site		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites		
	1) Electricity		
	a. The distributing power 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, common 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	●	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products.		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Internal transportation from the port of disembarkation to the project site	(●)	(●)
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted.		●
6	To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
10	To give due environmental and social consideration in the implementation of the Project.		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

4-2 Minutes of Discussions (Explanation of the Draft Report)

MINUTES OF DISCUSSIONS ON THE PREPARATORY SURVEY ON THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM STATE IN THE REPUBLIC OF THE SUDAN (EXPLANATION OF THE DRAFT REPORT)

In February 2015, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Draft Report Explanation Team on the Project for Improvement of Health Care Service in Suburban Area of Khartoum State (hereinafter referred to as "the Project") to the Republic of the Sudan (hereinafter referred to as "Sudan"), and through discussions, surveys and analysis of the results in Japan, JICA prepared the draft report of the preparatory survey (hereinafter referred to as "the draft report").

In order to explain and to consult on the contents of the draft report with the officials concerned of the Government of Sudan, JICA sent to Sudan the Draft Report Explanation Team (hereinafter referred to as "the Team"), headed by Mr. Ikuo Takizawa, Director, Health Team 1, Human Development Department, from February 15th to 19th 2015.

As a result of discussions, the Sudanese side and the Team (hereinafter referred to as "both sides") confirmed the main items described in the attached sheets.

Khartoum, February 18th, 2015

Mr. Ikuo Takizawa Leader Draft Report Explanation Team Japan International Cooperation Agency Japan	Dr. Imad El Din A M Ismail Director General Planning and International Health Directorate Federal Ministry of Health Sudan	Prof. Mamoun Homeida Minister Khartoum State Ministry of Health Sudan

Witnessed by:

Mr. Omer Mohamed Ahmed Elhag
Director General
International Cooperation Directorate
Ministry of Finance and National Economy
Sudan

Witnessed by:

Mr. Adam Awadallah Adam
Director General
Khartoum State Ministry of Finance
Sudan

ATTACHMENT

1. Components of the draft report

The Sudanese side agreed and accepted the contents of the draft report as explained by the Team. The outline of the Project is as described in Annex 1, 2 and 3.

2. Japan's Grant Aid Scheme

The Sudanese side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Sudan as explained by the Team and described in Annex 4 and 5, as confirmed by both parties in the Minutes of Discussions signed on September 1st, 2014.

3. Schedule of the Survey

After this survey, JICA will submit the draft report to the Government of Japan for the project appraisal. Through the appraisal, the Japanese Cabinet will make a final decision for the implementation of the Project. If the Project is approved by the Japanese Cabinet, the final report (the Preparatory Survey Report) will be sent to the Government of Sudan by the end of May 2015.

4. Confidentiality of the Project Design

Both sides confirmed that all information related to the Project including cost estimation of the Project described in Annex 6, detailed specifications of the facilities, the equipment and other technical information shall not be released to any outside party before the signing of all the Contract(s) for the Project. The Sudanese side understood that the Project Cost Estimation is not final and is subject to change.

5. Measures to be taken by the Sudanese side

5-1. Aside from the items described in Annex 5, the Sudanese side agreed to take necessary measures described in Annex 7 in a timely manner for smooth implementation of the Project.

5-2. Khartoum State Ministry of Health (hereinafter referred to as "SMOH") agreed to allocate necessary budget and manpower by the time of handover as shown in Annex 8 for proper operation and maintenance of the project outcome.

5-3. The Sudanese side agreed to take all necessary measures so that signing of Exchange of Notes (hereinafter referred to as "E/N") and Grant Agreement (hereinafter referred to as "G/A") of the Project will take place without delay, once the approval of the Project is given by the cabinet of Japan.

6. Tentative Project Schedule

The Team explained the tentative schedule of the Project as described in Annex 9.

END

Annex 1: Outline of the Project
Annex 2: Facility Plan
Annex 3: Equipment List
Annex 4: Japan's Grant Aid Scheme
Annex 5: Major Undertakings to be taken by Each Government
Annex 6: Cost Estimation of the Project
Annex 7: Necessary Measures to be taken by the Sudanese Side
Annex 8: Necessary Budget and Manpower for Operation and Maintenance of the Project
Annex 9: Tentative Schedule of the Project

Outline of the Project

1) Outline of the Facility

Outline of New Maternal and Child Health Section at Umbaddah General Hospital

Component	Floor	Function / Rooms
Common Zone	GF/1F	Entrance, Waiting Area, Reception, Casher, Medical Record, Toilet (Male/Female), Slope, Cafeteria, Kitchen, Electrical Panel Room
Outpatient/ Laboratory/Pharmacy Zone	GF	General Outpatient Triage, Consultation Room (ANC/PNC, Immunization/ Growth Monitoring, Family Planning), Ultra Sound / ECG Room, Laboratory, Urinal Collection, Blood Collection, Blood Bank, Pharmacy, Medicine store
Delivery Zone	GF	Nurse Station, Labour Room, Delivery Room, Post-Delivery Room, Nursery (un-septic), Nursery (septic), Medical Waste Stock, Storage, Linen Room, Inpatient Toilet, Night Reception, Waiting Space
Operation Theater Zone	GF	Operation Theatre, Preparation Area, Changing Room (Male/ Female), Shower Room (Male/ Female), Equipment Storage, Recovery Room, Scrub/ Washing Room, Sterilization Room, Service Corridor, Changing Room for Staff
Ward Zone	1F	Nurse Station, Bed Room (5 beds), Private Room (with Shower & Toilet), HDU, Storage, Linen Room, Medical Waste Stock, Pantry, Nursing Room, Inpatient Shower, Inpatient Toilet
Health Education Zone	1F	Health Education/ Seminar Room, Health Educator/ Staff Office, Storage
Administration Zone	1F	Director General's Room, Secretary Room, MCH Director's Room, Accountant Room, Storage, Meeting Room, Statistics Room, Resting Room, Office, Doctor & Paramedical Room(Male/ Female)
Service zone	GF	Laundry, Machine Room, Staff Office, Staff Room (Male/Female), Night Duty Room (Male/ Female), Workshop, Toilet (Male/ Female)
External Zone		Parking, Car Entrance Area, Slope
Annex Building		Electrical Room (with Emergency Generator), Water Reservoir, Pump Room, Septic Tank, Treatment Tank, Elevated Water Tank
Ground Floor Area		2,720 m^2
First Floor Area		1,867 m^2
Roof Floor Area		66 m^2
Total Floor Area		4,653 m^2

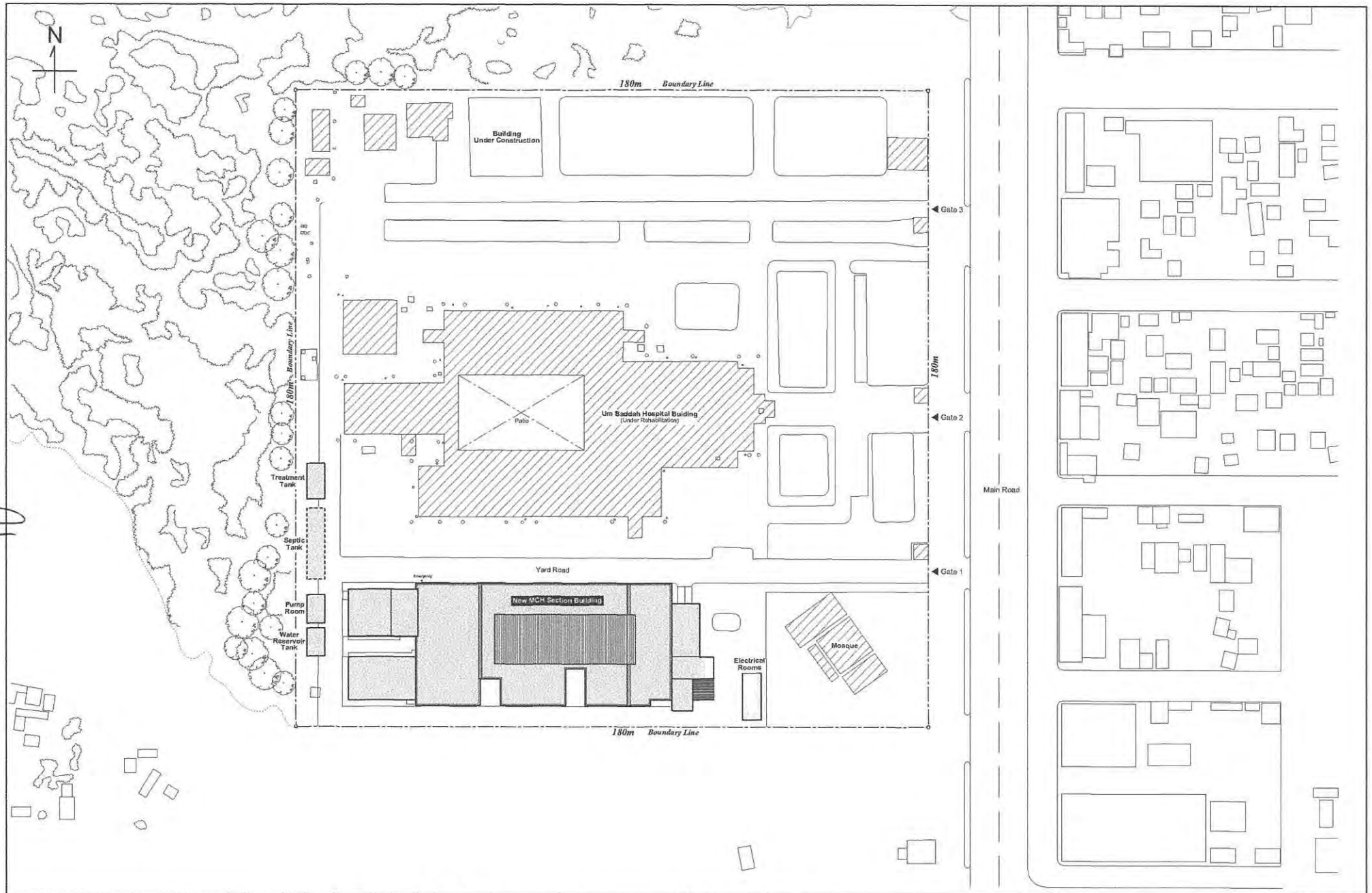
2) Outline of the Equipment for New Maternal and Child Health Section at Umbaddah General Hospital

Department/Zone		Equipment
Common Area		Consultation chair, Consultation desk, Reception chair, Waiting chair(for 3 persons)
Outpatient / Laboratory/	Outpatient	Cardiotocogram(CTG), Ultrasound scanner type A, Gynecology examination table, ECG machine

Pharmacy Zone	Pharmacy	Chair (for laboratory), Desk(for laboratory), Medicine cabinet, Refrigerator
	Laboratory	Coagulometer, Electrolyte analyzer, Hematology analyzer(automated) , Hot air oven, Platelets incubator with agitator, Spectrophotometer
Delivery Zone		CTG, Continuous Positive Airway Pressure (CPAP), Infant incubator, Neonatal monitor, Ultrasound scanner type B, Mobile Operation Theater (OT) lamp with battery
Operation Theater Zone		Anesthesia machine with ventilator, Defibrillator, Electrosurgical unit, Hand scrub station for 3 persons, High pressure steam sterilizer(approx.150L), Infant incubator, Infant warmer, OT Lamp (ceiling type), OT table (hydraulic), Patient monitor
Ward Zone		High Dependency Unit (HDU) bed, Hospital bed with mattress, Infusion pump, Patient monitor, Suction unit, Syringe pump
Health Education Zone		TV monitor, Projector, Projector screen, Stacking chair
Administration Zone		Locker(for 4 persons), Locker(for 9 persons), Meeting table(M), Meeting table(L), Rack for storage
Service Zone		Drying machine, Press machine, Washing machine

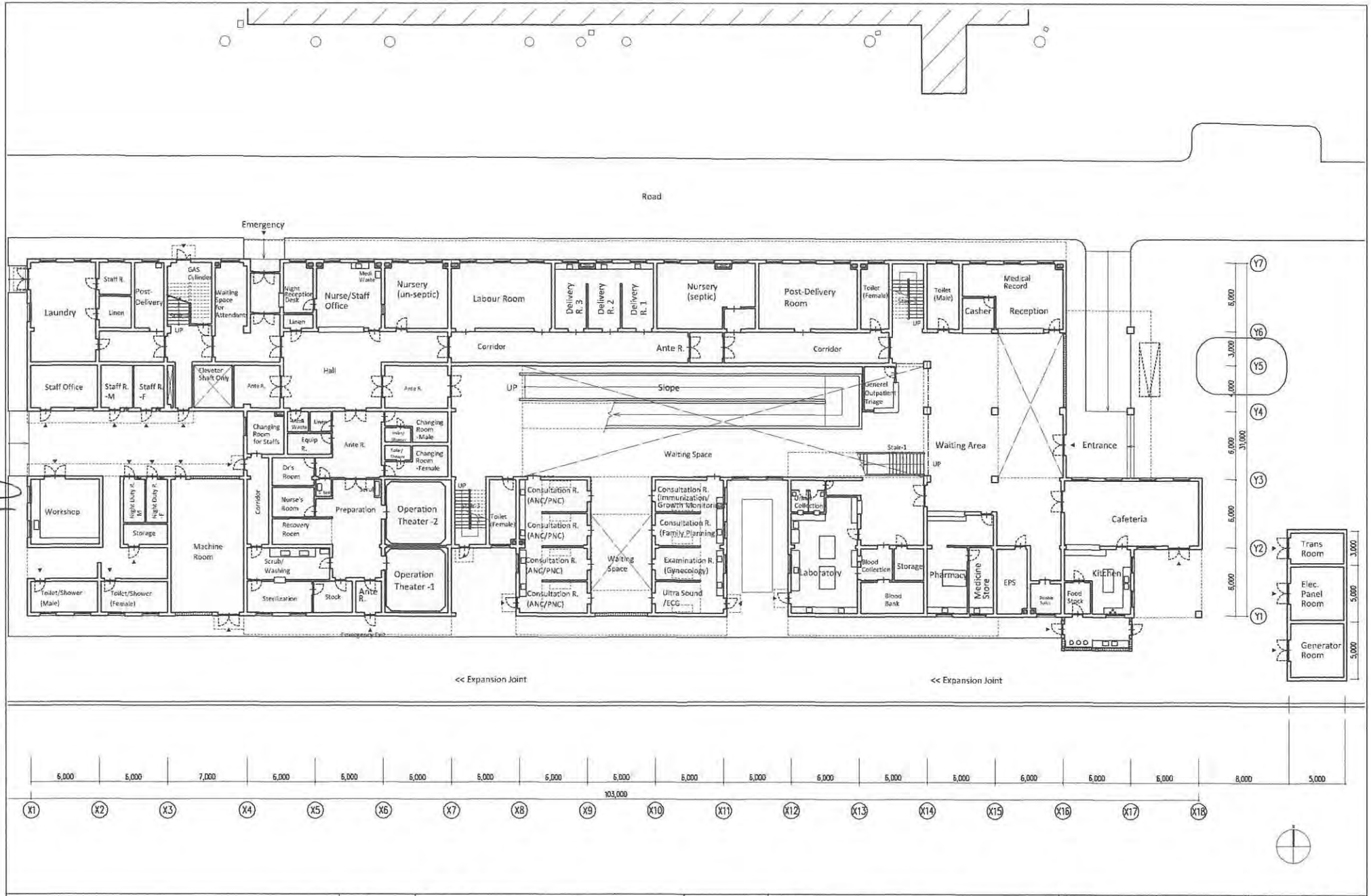
ANNEX 2

Facility Plan



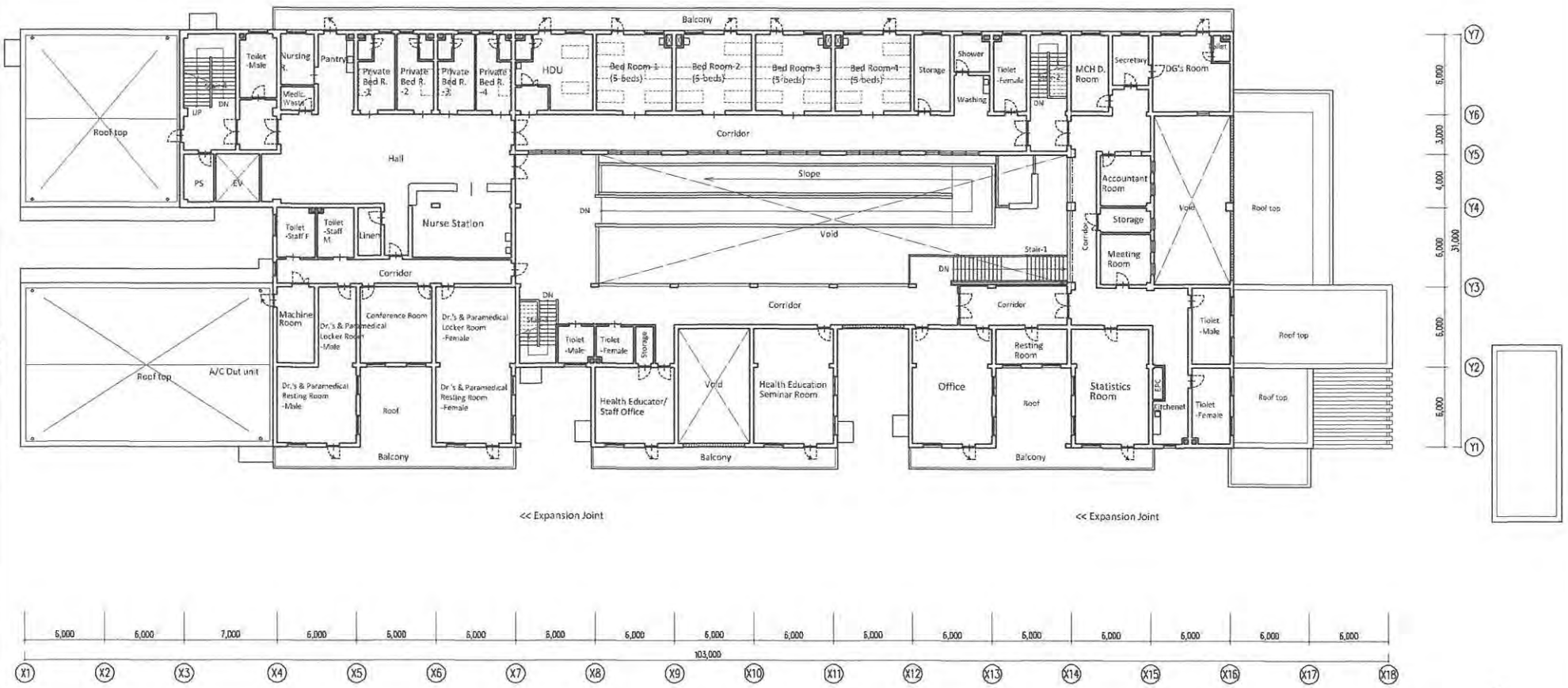
	APR.	SSC SYSTEM SCIENCE CONSULTANTS INC.	Drawn by: / Date: Oct/2014 / Checked by:	PROJECT NAME:	SHEET TITLE: Maternity and Child Health Section - Main Building Layout Plan	SCALE: 1/1,000	DRAWING No: 00

A-29



A-30

	APR.	SSC SYSTEM SCIENCE CONSULTANTS INC. 3-18-13 TAKADANOBABA SHINJUKU-KU TOKYO 169-0075 JAPAN TEL +81-3-5337-6601 FAX +81-3-5337-6609 URL http://www.ssc.co.jp	PROJECT NAME. THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN	SHEET TITLE : Maternity and Child Health Section - Main Building Ground Floor Plan	SCALE :	DRAWING No:



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APR.

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3-18-13 TAKADANOBABA
SHINJUKU-KU TOKYO 169-0075 JAPAN
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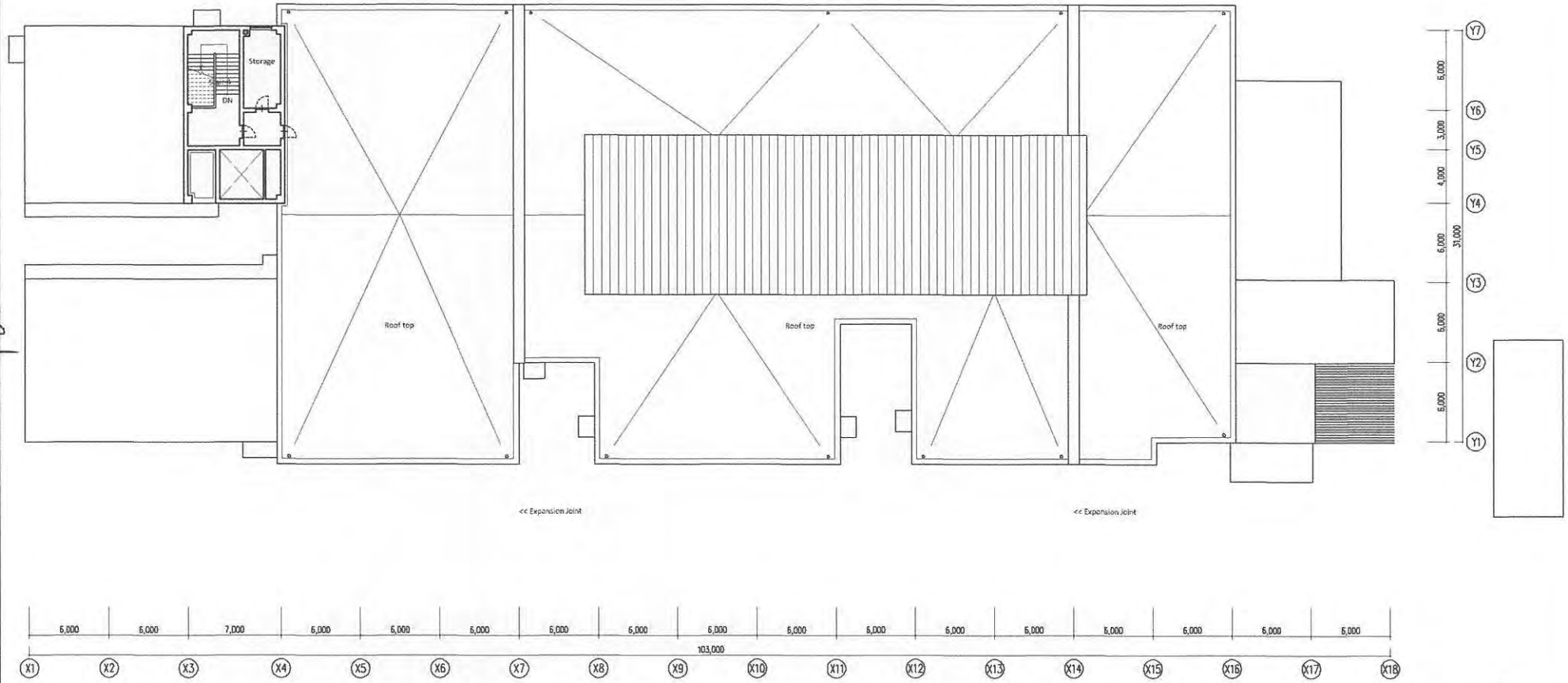
PROJECT NAME:
THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN

SHEET TITLE:
Maternity and Child Health Section - Main Building
First Floor Plan

SCALE:

DRAWING No:



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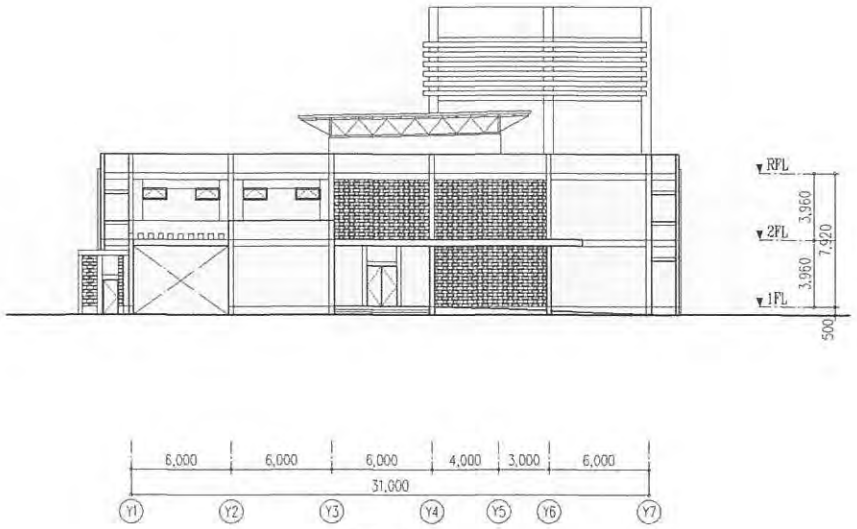
		3-18-13 TAKADANOBABA SHINJUKU KU. TOKYO 169 0075 JAPAN TEL +81 3 5337 6601 FAX +81-3-5337-6609 URL http. www.ssc.co.jp		THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN	Maternity and Child Health Section - Main Building Roof Floor Plan		

A-32

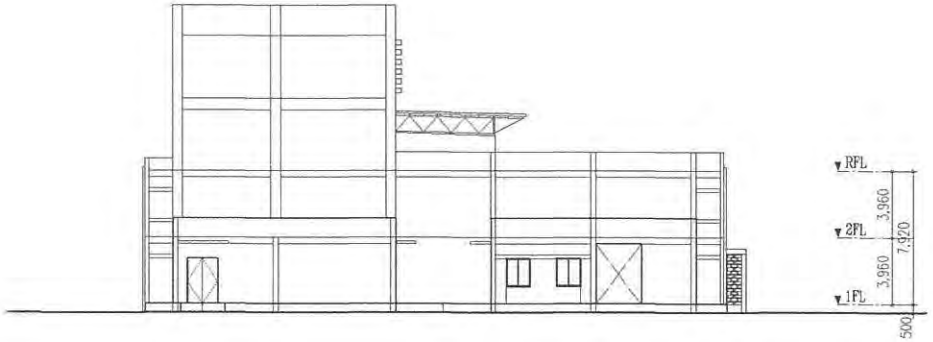


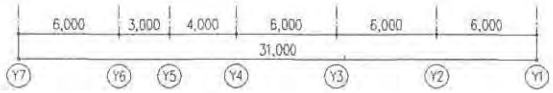
East Elevation

South Elevation

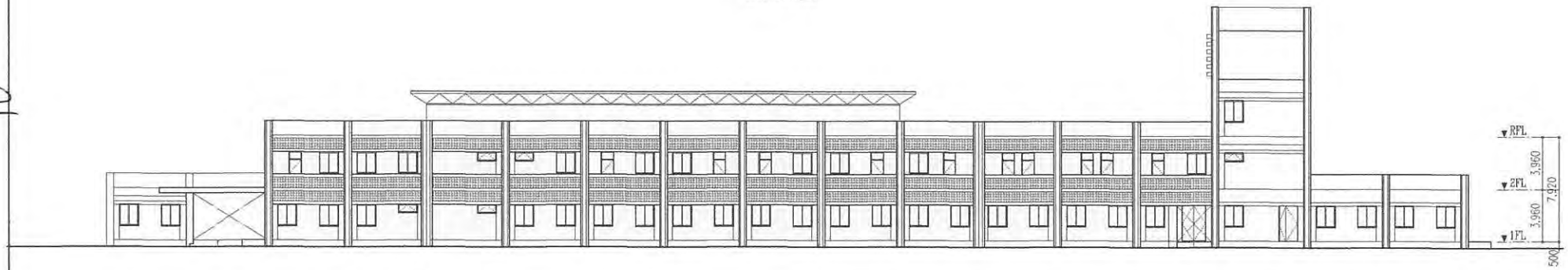
A-33

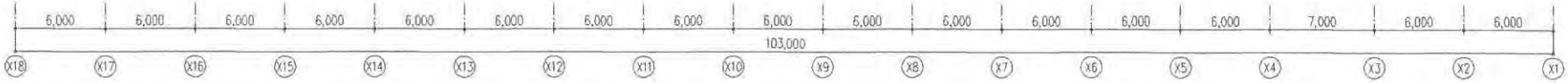
	APR.	**SSC** SYSTEM SCIENCE CONSULTANTS INC. 3-18-13 TAKADANOBABA SHINJUKU-KU TOKYO 169-0075 JAPAN TEL +81-3-5337-6601 FAX +81-3-5337-6603 URL http://www.ssc-dk.co.jp		PROJECT NAME **THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN**	SHEET TITLE : Maternity and Child Health Section - Main Building Elevation-1	SCALE :	DRAWING No.





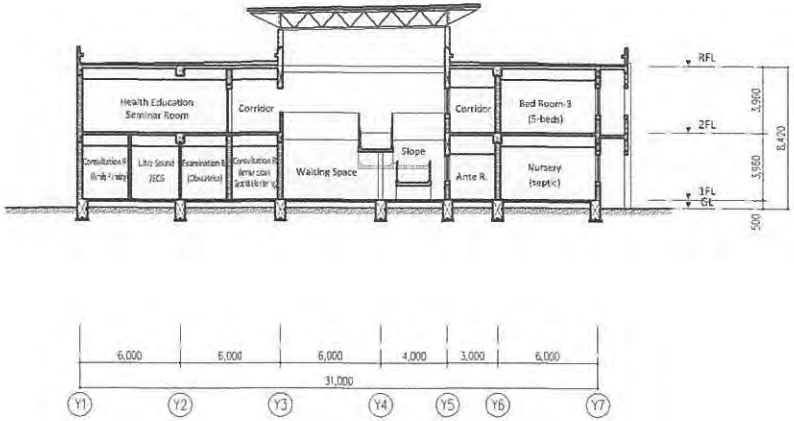
West Elevation





North Elevation

	APPL.	SSC SYSTEM SCIENCE CONSULTANTS INC. 3-18-13 TAKADANOBABA SHINJUKU-KU, TOKYO 169-0075 JAPAN TEL +81-3-5337-6601 FAX +81-3-5337-6603 URL http://www.ssc-jp.co.jp	PROJECT NAME:	THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN	SHEET TITLE: Maternity and Child Health Section - Main Building Elevation-2	SCALE: / DRAWING No.



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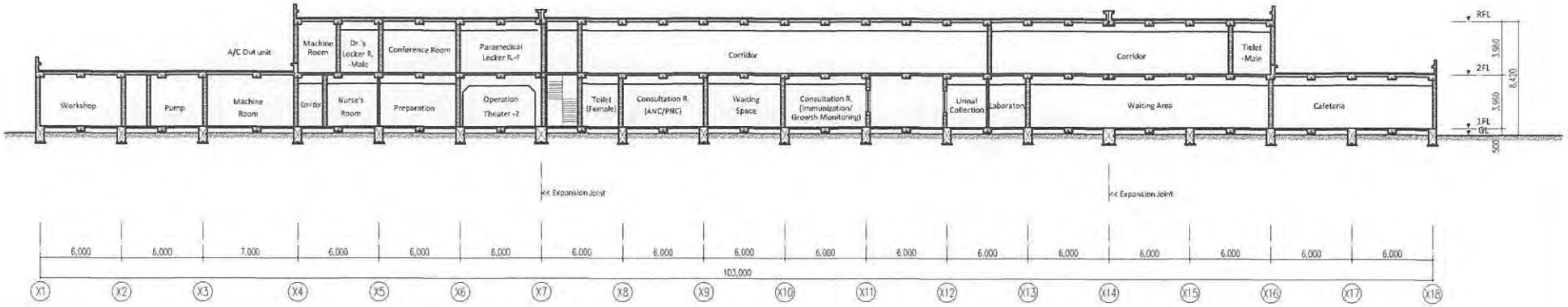

A-A (Y2-Y3)

A-35

APR.

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URL http://www.ssc-dream.co.jp

PROJECT NAME:
THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE IN THE REPUBLIC OF THE SUDAN

SHEET TITLE:
Maternity and Child Health Section - Main Building Section

SCALE:

DRAWING No.

ANNEX 3

Equipment List

Code No.	Description	Qty
1	Reception chair	6
2	Waiting chair(for 3 persons)	34
3	TV monitor	1
4	Consultation desk	26
5	Consultation chair	40
6	Projector	1
7	Projector screen	1
8	Diagnostic set	10
9	Fetal doppler	7
10	Adult weighing scale	2
11	Adult height scale	2
12	Neonatal height & weight scale	4
13	Vaccine refrigerator	2
14	Examination table	4
15	Gynecology examination table	5
16	Examination instrument set	5
17	Examination light	5
18	CTG	3
19	Partition	4
20	Ultrasound scanner type A	1
21	ECG machine	1
22	Examination table with foot step	1
23	Ultrasound scanner type B	1
24	Labor bed	8
25	IV stand	48
26	Refrigerator	3
27	Delivery table	3
28	Delivery instrument set	6
29	Mobile OT lamp with battery	3
30	Instrument trolley	8
31	Instrument cabinet	6
32	Stretcher	4
33	Wheel chair	2

Code No.	Description	Q'ty
34	Infant warmer	7
35	Baby cot	18
36	Resuscitation set for neonate	7
37	Forceps delivery set	3
38	Vacuum extractor	1
39	Suction unit	15
40	Recovery bed	10
41	Hot air oven	4
42	Chair (for laboratory)	10
43	Desk (for laboratory)	2
44	Duty bed (double decker)	2
45	Bedside cabinet	26
46	Infant incubator	12
47	O2 regulator, humidifier and flowmeter	16
48	Phototherapy unit	7
49	Neonatal monitor	10
50	Portable suction unit	10
51	Bilirubin meter with centrifuge	2
52	Syringe pump	9
53	Infusion pump	5
54	Pulse oximeter	3
55	CPAP	2
56	Oxygen concentrator	2
57	Diagnostic set for neonate	2
58	Medicine cabinet	6
59	Rack for storage	25
60	Hematology analyzer (automated)	1
61	Coagulometer	1
62	Spectrophotometer	1
63	Centrifuge	1
64	Table top autoclave	1
65	Electrolyte analyzer	1
66	Microscope	3
67	Micro pipette set	2

Code No.	Description	Q'ty
68	Sample shaker	1
69	Water bath	1
70	Water distiller	1
71	Blood donor beds	1
72	Bag shaker	1
73	Sphygmomanometer	2
74	Platelets incubator with agitator	1
75	Blood bank refrigerator	2
76	Freezer	1
77	Thawing water bath	1
78	Washing machine	2
79	Drying machine	2
80	Press machine	1
81	Laundry cart	6
82	Cooking equipment as a set	1
83	Dining table	5
84	Dining chair	25
85	Garbage box	6
86	Locker (for 9 persons)	12
87	Hand scrub station for 3 persons	1
88	OT table (hydraulic)	2
89	Anesthesia machine with ventilator	2
90	Electrosurgical unit	2
91	D&C set (abortion)	4
92	Caesarian instrument set	8
93	Defibrillator	1
94	N2O regulator, humidifier and flowmeter	2
95	High pressure steam sterilizer (approx.150L)	1
96	Dressing drum set (L,M,S)	8
97	Hospital bed with mattress	25
98	Overbed table	24
99	White board	3
100	HDU bed	2
101	File rack for medical records	3

Code No.	Description	Q'ty
102	Meeting table(L)	10
103	Meeting chairs	90
104	Patient monitor	5
105	Refrigerator & freezer	1
106	Locker (for 4 persons)	10
107	Sofa	4
108	Stacking chair	40
109	Hand truck	1
110	Book shelf	17
111	Cylinder cart	4
112	Couch	3
113	OT Lamp(ceiling type)	2
114	Meeting table(S)	2
115	Meeting table(M)	6

ANNEX 4

Japan's Grant Aid Scheme

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

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

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
  - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as "the G/A")
  - Agreement concluded between JICA and a recipient country
- Implementation
  - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve 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 of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority 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, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

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

(5) Major undertakings to be taken by 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 Annex.

(6) "Proper Use"

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

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or 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 under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA 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 JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

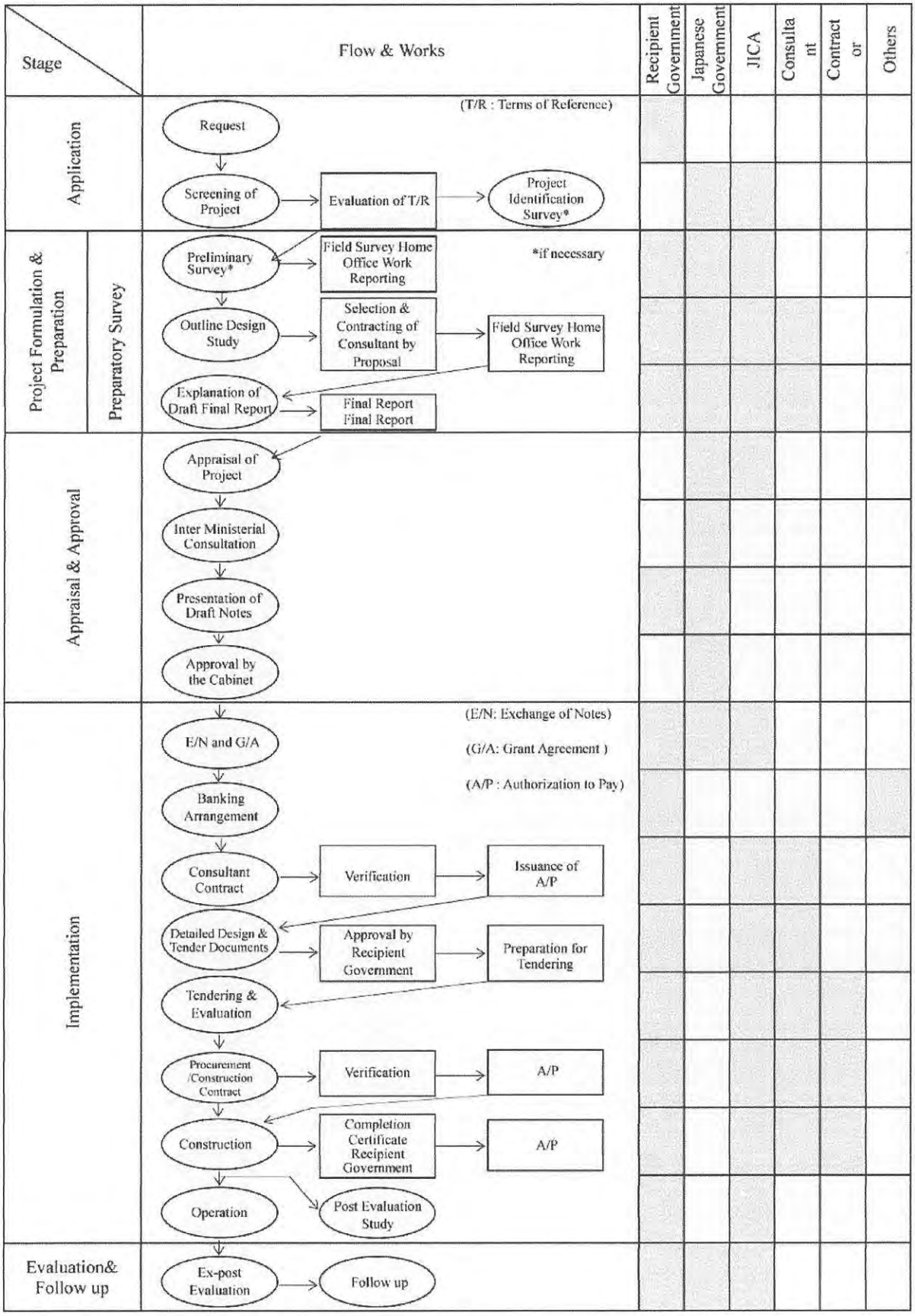
(9) Authorization to Pay (A/P)

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

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

4. Flow Chart of Japan's Grant Aid Procedures



ANNEX 5

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure a lot of land necessary for the implementation of the Project and to clear the sites		●
2	To construct the following facilities		
	1) The building	●	
	2) The gates and fences in and around the site		●
	3) The parking lot (for Project building only)	●	
	4) The road within the site	●	
	5) The road outside the site		●
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites		
	1) Electricity		
	a. The distributing power 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, common 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	●	
4	To ensure prompt customs clearance of the products and to assist internal transportation of the products in the 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	(●)	(●)
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted.(According to the approval of the concerned authorities)		●
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To ensure that the facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●

	2) Payment commission		●
10	To give due social and environmental consideration in the implementation of the Project		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

Cost Estimation of the Project

The total amount of the project expenses required to implement this project is 2,011.6 million yen. The breakdown of the expenses between the Japanese side and the Sudanese side is as estimated below according to the estimation conditions described in (3). Note that this amount does not necessary indicate the grant limit amount in the Exchange of Note.

Expenses to be Paid by Japan

Approximately 1,998 million yen

Construction of Maternal & Child Health Section (total floor area: 4,653 m²)

Item	Outline of the project expenses (million yen)	
Facilities	1,547	1,754
Equipment	207	
Detail Design and Supervision		163
Contingency		81
Total		1,998

Expenses to be Paid by Sudan

Item	Expenses (Thousand SDG)	Responsible Organization
A: Demolition the existing facilities located in the proposed construction area Existing cafeteria, an office building, an old toilet are to be demolished and removed from the site.	152.5	SMOH
B: Removing existing obstacles Existing pavement, trees and obstacles are to be demolished and removed from the site.	90.0	SMOH
C: Site clearance Proposed lands for the project are to be cleared.	86.4	SMOH
D: Distribution and installing the power line and transformer to the site Japanese side is responsible for procurement of the additional new transformer and inland connecting cable and wiring, and Sudanese side is responsible for the installation work of the transformer and its connecting cables from the main line at outside of the site.	226.0	SMOH
E: Distribution of telephone line to the site Three telephone trunk lines (1 for emergency, 1 for general, 1 for internet) to the main distribution frame/panel (MDF) are to be distributed to the building.	30.0	SMOH

F: Distribution the city water to the site City water pipe from main line is to be connected to the site.	60.0	SMOH
G: Planting around the new building	50.0	SMOH
H: Banking Arrangement (B/A) establishment expenses and Authorization to Pay (A/P) issuance charges	50.0	MOFNE
Total	744.9	

Cost Estimation Conditions

i) Time of estimation: September, 2014

ii) Exchange rate: 1 USD = 103.25 yen
1 SDG = 18.08 yen

iii) Construction period: The period of detailed design, tenders and building construction work and equipment procurement are as shown in the project implementation schedule.

iv) Other: The Project will be implemented in accordance with the Japanese Government's Grant Aid Scheme.

ANNEX 7

Necessary Measures to be taken by the Sudanese Side

Necessary measures to be taken by the Sudanese side aside from the items described in Annex 5 are described below:

Necessary Measures to be taken by the Sudanese Side	
01	Issuance of Banking Arrangement (B/A) and Authorization to Pay (A/P) and payment of accompanying charges
02	To accord Japanese physical persons and / or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work
03	Securing of the temporary land/space for the construction works near the site Enough space besides of the project site for the temporary storage of materials and machines, and setting temporary office and accommodations are provided by the Sudanese side.
04	Distribution the power line and installation of the transformer to the site Japanese side is responsible for procurement of the additional new transformer and inland connecting cable and wiring, and Sudanese side is responsible for the installation work of the transformer and its connecting cables from the main line at outside of the site.
05	Distribution the city water to the site City water pipe from main line is to be connected to the site.
06	Distribution of telephone line to the site Three telephone trunk lines (1 for emergency, 1 for general, 1 for internet) to the main distribution frame/panel (MDF) are to be distributed to the building.
07	Planting around the new building
08	Acquisition of permission and authorization required for the construction work
09	Demolition the existing facilities located in the proposed construction area Existing cafeteria, an office building, an old toilet, pavement, trees and obstacles are to be demolished and removed from the site.
10	Procedures, contract, payment related to the electricity, telephones, and water for this project
11	To secure necessary manpower and budget for proper operation and maintenance of the MCH Section as described Annex 8
12	To secure proper operation and maintenance of medical equipment

ANNEX 8

Necessary Budget and Manpower for Operation and Maintenance of the Project

(3) Necessary staffs placement

	Doctor	No.	Paramedical /Med. Engineer /Technician	No.	Management	No.
1	Obstetric & Gynecological doctor	6	Nurse technicians	38	Medical director of MCH	1
2	Pediatrician	3	Certified nurses	6	Secretary	1
3	Medical doctors	10	Midwife	10	Data input	3
4	Family medicine consultant	2	Lab technicians	6	Human resource	1
5	Pharmacists	4	Lab assistant	8	Internal auditor	1
6	Anesthetist	2	Public Health officer	1	Accountant	2
7			Health educator	4	Cashier	4
8			Medical assistant pharmacist	3	Biomedical engineer	1
9			Anesthesia technician	8	Store keeper	1
10			Theater attendant	8	Electrical technician	1
11			Immunization technicians	2	AC and Mechanical engineer	1
12			Statistic technician	3	Plumber	1
13			Data clerk	6	Worker	2
14					Driver	3
15					Cleaner	15
16					Security	6
	Total	27	Total	103	Total	44
Grand Total 174						

(4) Necessary additional budget for operation and maintenance of the Project (Unit: SDG)

Additional expense necessary for the Project (operation, maintenance and management expenses)	Amount (SDG)
①Human Resources	1,908,900
②Office Supplies	147,813
③Medical consumables / Parts	109,144
④Electricity	
Electricity Supply	490,899
Fuel for generator	95,352
⑤Water	13,516

Additional expense necessary for the Project (operation, maintenance and management expenses)	Amount (SDG)
⑥Gas	30,718
⑦Telephone	12,000
⑧Facility maintenance	304,719
⑨Medical equipment maintenance (Table-A below)	8,958
⑩Medical gas (only O^2)	157,680
⑪Medical waste treatment	152,851
Total	3,423,550

1) Maintenance Management Fee for Major Equipment

Table-A: Maintenance Management Fee for Major Equipment

Dept.	Description	Contents	Contract	Contract price In SDG
Image diagnostics	Ultrasound scanner	Annual maintenance	Annual maintenance contract	4,868.55
Clinical laboratory	Coagulometer	Annual maintenance and calibration		2,629.02
	Hematology analyzer(automated)	Annual maintenance and calibration		1,460.56
Total				8,958.13

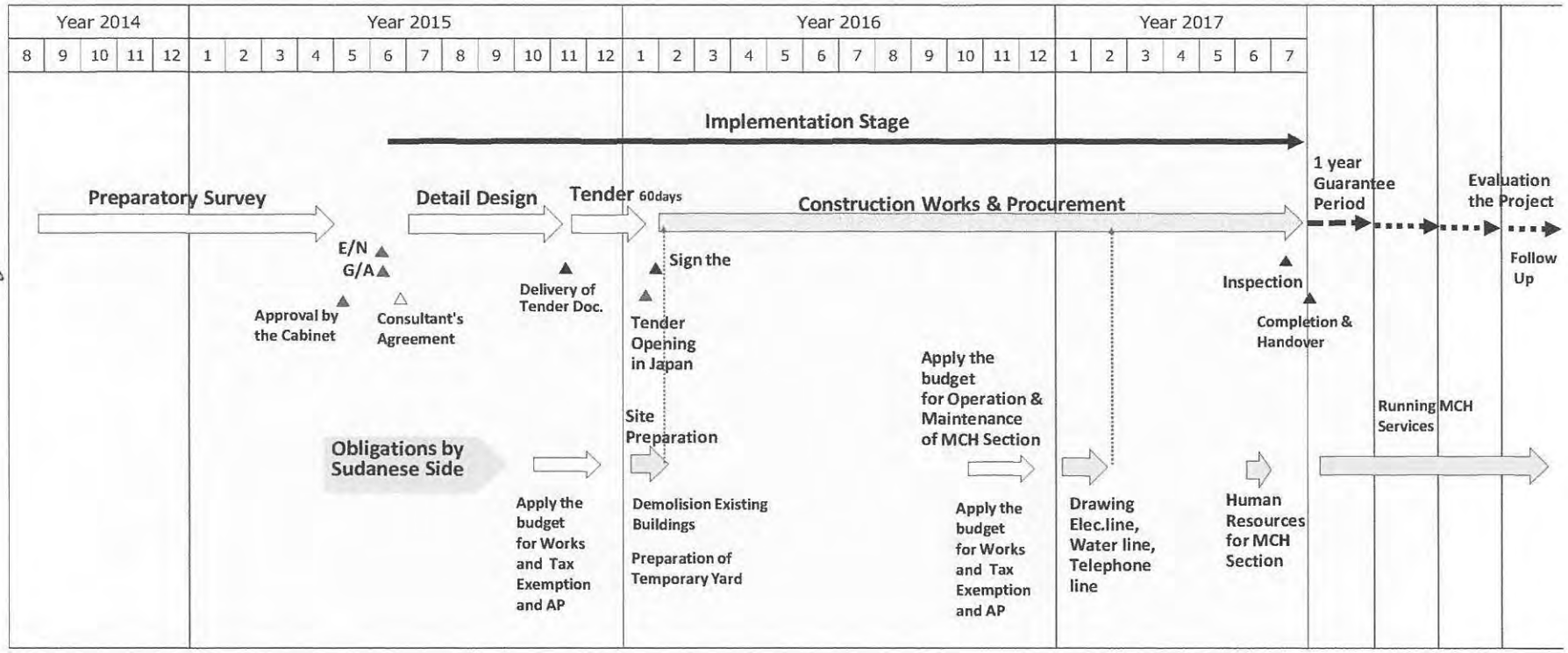
*Annual maintenance contract consists of periodical check-up and calibration.

2) On-call Maintenance Management Fee

Table-B: On-call Maintenance Management Fee

Description	Contents	Category	Service cost in SDG
Infant incubator	Periodical Check	On-call	485～970
Infusion pump	Periodical Check		242～485
Syringe pump	Periodical Check		242～485
ECG machine	Repair		242～388
Anesthesia machine with ventilator	Repair		485～970
High pressure steam sterilizer(approx.150L)	Repair		485～970
Washing machine	Repair		1,457～2,428
Total			3,638～6,696

Tentative Schedule of the Project



ANNEX 9

5. Technical Note

5. Technical Note

TECHNICAL NOTE
ON
PREPARATORY SURVEY
ON THE PROJECT FOR IMPROVEMENT OF HEALTH CARE SERVICE IN SUBURBAN AREA OF KHARTOUM SATE
IN THE REPUBLIC OF THE SUDAN

The Federal Ministry of Health (hereinafter referred to as "FMOH") and Khartoum State Ministry of Health (hereinafter referred to as "SMOH") of the Government of Sudan and The Consultant Team held discussions with conducted a field survey after signing of the Minutes of Discussions on September 1st, 2014. In the course of discussions and field survey, both parties confirmed the items described in the ATTACHMENT.

Khartoum, September 14th 2014

Dr. Mohamed Ali Yahia Elabassi
Director General
Planning and Inter National Health
Directorate
Federal Ministry of Health
Sudan

Dr. Babiker Mohamed Ali
General Director
Curative Medicine Directorate
Khartoum State Ministry of Health
Sudan

Mr. Kentaro Nishiyama
Project Manager of Consultant Team
JICA Preparatory Survey Team

ATTACHMENT

1. Components of Facilities

Both sides confirmed major rooms and priorities to be located at Maternal and Child Health Section (priority A) and Midwifery School (priority B) in Umbaddah General Hospital are shown in Annex-2.

2. Equipment List

Both sides confirmed equipment and priorities for Maternal and Child Health Section (priority A) in Umbaddah General Hospital, Alaban Jadid General Hospital (priority B) and Midwifery School (priority B) in Umbaddah General Hospital and are shown in Annex-3.

3. Obligations at the site by Sudan side

Both parties confirmed the works on the site to be taken by Sudan side has mentioned in the Minutes of Discussions signed on 1st September 2014.

- Land acquisition
  Proposed land area (See Annex-4) are secure to be utilized for the new facilities of the project.
- Site clearance
  Proposed lands for the project are to be cleared.
- Demolition the existing facilities located in the proposed construction area
  Existing cafeteria, an office building, an old toilet, pavement, trees and obstacles are to be demolished and removed from the site.
- Distribution the power line and transformer to the site
  Japanese side is responsible for procurement of the additional new transformer and inland connecting cable and wiring, and Sudanese side is responsible for the installation work of the transformer and its connecting cables from the main line at outside of the site.
- Distribution the city water to the site
  City water pipe from main line is to be connected to the site.
- Distribution of telephone line to the site
  Tree telephone trunk lines (1 for emergency, 1 for general, 1 for internet) to the main distribution frame/panel (MDF) are to be distributed to the building.
- Arrangement of the temporary land/space for the construction works near the site
  Enough space besides of the project site for the temporary storage of materials and machines, and setting temporary office and accommodations is provided by Sudanese side.

4. Organization structure and staffing for the Maternal and Child Health Section

SMOH confirmed the organization structure shown below figure and the staffs shown in Annex-5 to be assigned in the New Maternal and Child Health Section at Umbaddah General Hospital. And former staffs who worked for Umbaddah General Hospital until 2011 are re-assigned for the same hospital after its rehabilitation.

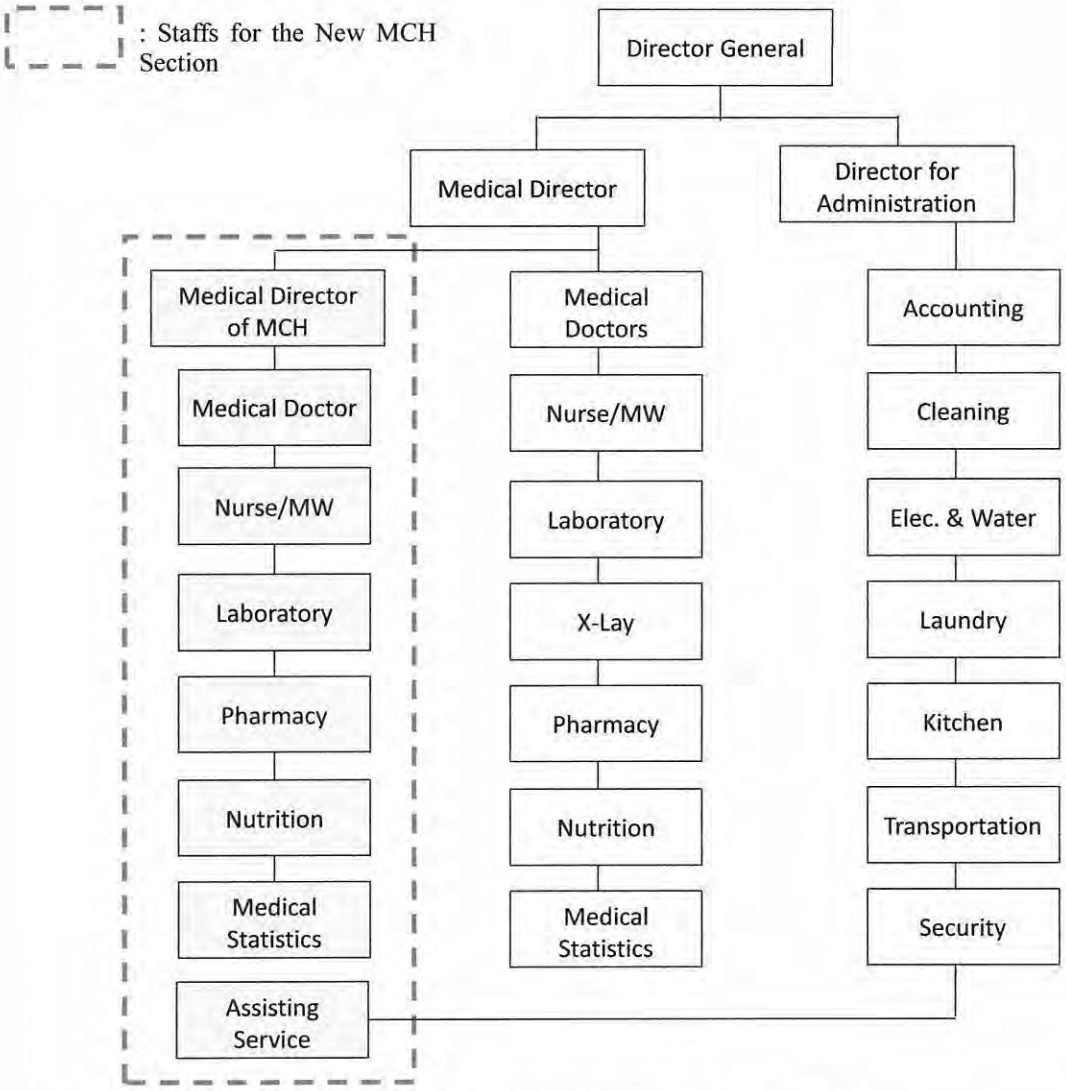


Fig. Organization Structure of Umbaddah General Hospital

5. EIA

FMOH and SMOH confirmed that EIA is not required on the project, because the new Maternal and Child Health Section will be established as an extension of existing Umbaddah General Hospital in the same land which is surrounded permanent fence and gates.

6. Soft component for Improvement of Maintenance of Medical Equipment

Both parties confirmed that a requested training by SMOH for improvement of maintenance capability of biomedical engineers working at hospital level is not considered as the soft component in this project, because the manufacturer allows only their certified engineers to perform corrective maintenance. The training in this project could do is only for the improvement of the medical equipment management such as daily maintenance check, trouble shooting, and periodical check based on user manual which is covered by the Supplier as initial operational training.

7. Utilization of similar services in the existing hospital facility

Both parties confirmed SMOH proposed the maternal and child health section originally allocated in the existing facility is to be utilized for expansion the service of general surgery and gynecologic surgery.

END

Annex-1: Site Map

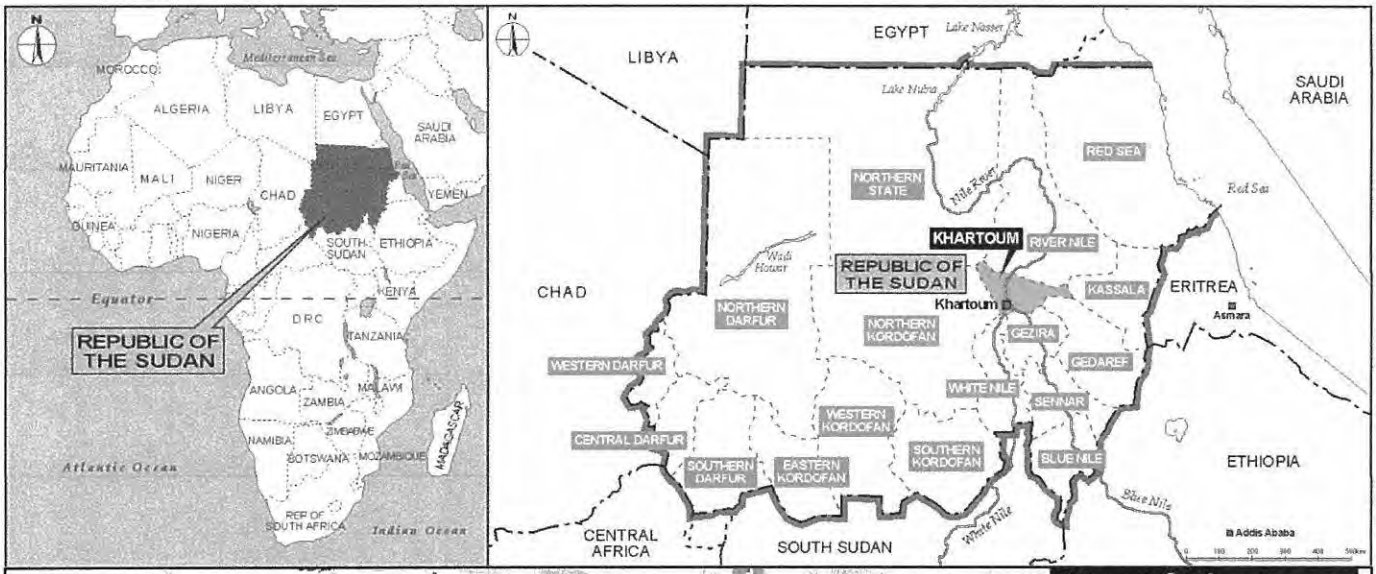
Annex-2: Major rooms and priorities to be located at Maternal and Child Health Section and Midwifery School in Umbaddah General Hospital

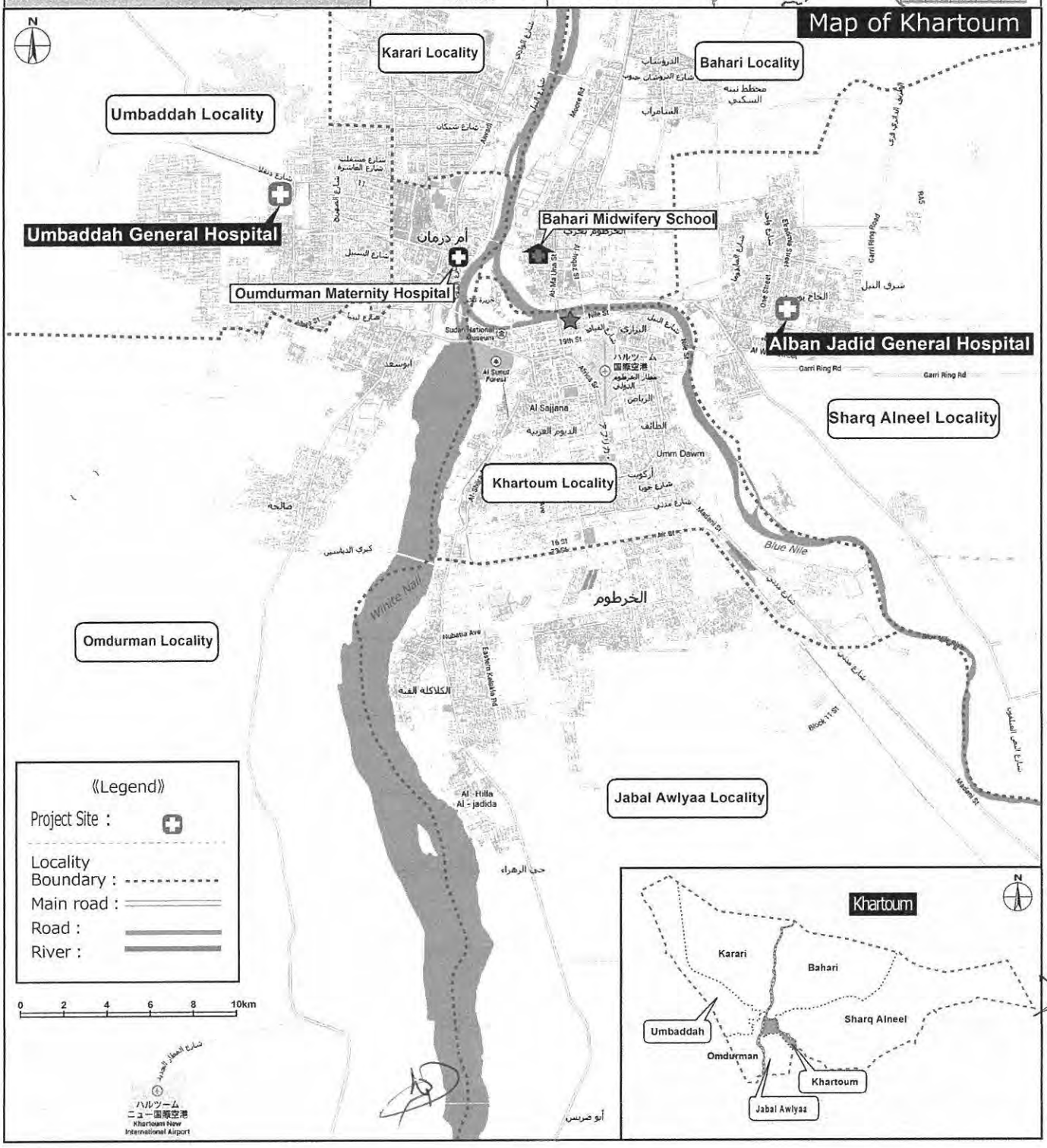
Annex-3: Equipment and priorities for Maternal and Child Health Section in Umbaddah General Hospital, Alaban Jadid General Hospital and Midwifery School in Umbaddah General Hospital

Annex-4: Proposed Area for Construction at Umbaddah General Hospital

Annex-5: Proposed Staff List of the Maternal and Child Health Section in Umbaddah General Hospital by SMOH

Annex 1: Site Map





Annex-2: Major rooms and priorities to be located at Maternal and Child Health Section and Midwifery School in Umbaddah General Hospital

Maternity and Child Health Section at Umbaddah General Hospital (Priority A)

No.	Blocks	Major Functions	Qty	Priority
Ⅰ.	Outpatient (OPD)			
		Reception	1	A
		Waiting space	1	A
		Consultation room (for Antenatal care / Postnatal care)	4	A
		Consultation room (family planning)	1	A
		Consultation room (Immunization / growth monitoring)	1	A
		Health education room	1	A
		Examination room (Obstetrics)	1	A
		Ultrasound / ECG	1	A
Ⅱ.	Delivery			
		Labour (Waiting) room	1	A
		Delivery room	2	A
		Post-delivery monitoring (Recovery) room	1	A
		Nursery(NICU) -Septic	1	A
		Nursery(NICU) - for nside delivery		
		Nurse station	1	A
		Staff rest	2	A
		Night duty room	1	A
		Medical waste	1	A
		Sterilization	1	A
Ⅲ.	Pharmacy			
		Pharmacy	1	A
		Store	1	A
Ⅵ.	Laboratory			
		Laboratory	1	A
		Blood and urine collection	1	A
		Blood bank (only deposit)	1	A
Ⅶ.	Operation Theater (OT)			
		Pre-operation	1	A
		Changing room (Male & Female)	2	A
		Scrub	1	A
		Operation Theater	2	A
		Sterilization	1	A
		Medical waste	1	A
		Staff rest	2	A
		Storage	1	A
Ⅷ.	Hospitalization (ward)			
		Public ward (Ob & Gy)	1	A
		Private ward (Ob & Gy)	1	A
		HDU	1	A
		ICU	1	C
		Nurse station	1	A
		Linen	1	A
Ⅸ.	Administration			
		Director general's room	1	C
		Medical director of MCH room	1	A
		Doctor's room	1	A
		Paramedical's room	1	A
		Other clark's room	1	A

1

		Meeting room	1	A
		Locker room	1	A
X.	Service			
		Laundry	1	B
		Kitchen and Canteen	1	B
		Workshop for maintenance	1	A
		Service staff's room	1	A
		Garbage collection	1	B
		Machine room	1	A
XI.	Others			
		Parking lot , pedestrian passage, etc.		B

A : High priority

B : Put moderate priority and final decision will be made at the analysis in Japan

C : Not to be considered under this project

- Quantity of rooms to be changed at the analysis in Japan
- Result of analysis will report to Sudan side at explanation of draft report planning on Feb., 2015.

Midwifery School at Umbaddah General Hospital (Priority B)

	Department.	Major Rooms	Qty	Priority
Ⅰ.	Theoretical Training			
		Classroom	2	B
		Storage	1	B
		Toilet	1	B
Ⅱ.	Practical Training			
		Practice room (Skill lab)	2	B
		Locker	1	B
		Storage	1	B
Ⅲ.	Administration			
		Manager Room	1	B
		Meeting Room	1	B
		Teacher's Room	1	B
		Locker Room	1	B
		Storage	1	B
		Staff Toilet (male & female)	1	B
Ⅳ.	Dormitory &			
	Other Service Facilities	Dormitory of Trainees	1	B
		Canteen	1	B
		Kitchen	1	B
		Laundry	1	B
		Toilet/ Shower	1	B
		Storage	1	B
		Residence for Staffs	2	B

A : High priority
B : Put moderate priority and final decision will be made at the analysis in Japan
C : Not to be considered under this project

- Quantity of rooms to be changed at the analysis in Japan
- Result of analysis will report to Sudan side at explanation of draft report planning on Feb., 2015.

Annex-3 : Equipment and priorities for Maternal and Child Health Section in Umbaddah General Hospital, Alaban Jadid General Hospital and Midwifery School in Umbaddah General Hospital

Equiment List for Umbaddah G.H

Dept.	Item No.	Room	Description	Priority	Q'ty
OPD	OPD-1	Reception	Reception chair	A	2
OPD	OPD-2	Waiting space	Waiting Chair (3x10)	A	10
OPD	OPD-3	Waiting space	LCD Monitor	B	1
OPD	OPD-4	Health Education room	Consultation Desk	A	1
OPD	OPD-5	Health Education room	Consultation Chair	A	1
OPD	OPD-6	Health Education room	Waiting Chair (3x10)	A	10
OPD	OPD-7	Health Education room	Projector	B	1
OPD	OPD-8	Health Education room	Projector screen	B	1
OPD	OPD-8	Consultation room (for ANC&PNC)	Consultation Desk	A	2
OPD	OPD-9	Consultation room (for ANC&PNC)	Consultation Chair	A	4
OPD	OPD-10	Consultation room (for ANC&PNC)	Diagnostic set	A	2
OPD	OPD-11	Consultation room (for ANC&PNC)	Ambu bag set for adult	C	2
OPD	OPD-12	Consultation room (for ANC&PNC)	Portable suction unit	C	2
OPD	OPD-13	Consultation room (for ANC&PNC)	Fetal Doppler	A	2
OPD	OPD-14	Consultation room (for ANC&PNC)	Adult weighing scale	A	2
OPD	OPD-15	Consultation room (for ANC&PNC)	Adult height scale	A	2
OPD	OPD-16	Consultation room (for ANC&PNC)	IV stand	C	2
OPD	OPD-17	Consultation room (Family Planning)	Consultation Desk	A	1
OPD	OPD-18	Consultation room (Family Planning)	Consultation Chair	A	1
OPD	OPD-19	Consultation room (Family Planning)	Diagnostic set	A	1
OPD	OPD-20	Consultation room (Family Planning)	Ambu bag set for adult	C	1
OPD	OPD-21	Consultation room (Family Planning)	Portable suction unit	C	1
OPD	OPD-22	Consultation room (Family Planning)	IV stand	C	1
OPD	OPD-23	Consultation room (Common)	Hospital Sluice Sink	B	1
OPD	OPD-24	Consultation room (Immunization/Growth Monitoring	Consultation Desk	A	1
OPD	OPD-25	Consultation room (Immunization/Growth Monitoring	Consultation Chair	A	1
OPD	OPD-26	Consultation room (Immunization/Growth Monitoring	Diagnostic set	A	1
OPD	OPD-27	Consultation room (Immunization/Growth Monitoring	Ambu bag set for infant	B	1
OPD	OPD-28	Consultation room (Immunization/Growth Monitoring	Portable suction unit	B	1
OPD	OPD-29	Consultation room (Immunization/Growth Monitoring	Infant height & weight scale	A	1
OPD	OPD-30	Consultation room (Immunization/Growth Monitoring	Vaccine refrigerator	A	1
OPD	OPD-31	Ob.Examinatiom room	Examination table	A	2
OPD	OPD-32	Ob.Examinatiom room	Gynecology examination table with foot step	A	2
OPD	OPD-33	Ob.Examinatiom room	Examination instrument set	A	4
OPD	OPD-34	Ob.Examinatiom room	Examination light (LED)	A	2
OPD	OPD-35	Ob.Examinatiom room	CTG	A	1
OPD	OPD-36	Ultrasound/ECG room	Consultation Desk	A	1
OPD	OPD-37	Ultrasound/ECG room	Consulatation Chair	A	2
OPD	OPD-38	Ultrasound/ECG room	Partition	A	1
OPD	OPD-39	Ultrasound/ECG room	Ultrasound scanner	A	1
OPD	OPD-40	Ultrasound/ECG room	ECG machine	A	1
OPD	OPD-41	Ultrasound/ECG room	Examination table with foot step	A	1
Delivery	D-1	Labour room (Waiting)	CTG	A	1
Delivery	D-2	Labour room (Waiting)	Fetal Doppler	A	1
Delivery	D-3	Labour room (Waiting)	Ultrasound scanner	A	1
Delivery	D-4	Labour room (Waiting)	Labour bed with foot step	A	8
Delivery	D-5	Labour room (Waiting)	IV stand	A	8
Delivery	D-6	Labour room (Waiting)	Refrigerator 10 feet	A	1
Delivery	D-7	Delivery room	Delivery table	A	3
Delivery	D-8	Delivery room	IV stand	A	3
Delivery	D-9	Delivery room	Delivery instrument set	A	6
Delivery	D-10	Delivery room	Mobile OT Lamp (LED) with battery	A	4
Delivery	D-11	Delivery room	Instrument trolley	A	4
Delivery	D-12	Delivery room	Instrument Cabinet	A	4
Delivery	D-13	Delivery room	Stretcher	A	2
Delivery	D-14	Delivery room	Wheel Chair	A	2
Delivery	D-15	Delivery room	Infant Warmer	A	4
Delivery	D-16	Delivery room	Baby Cot	A	4
Delivery	D-17	Delivery room	Resuscitation set for neonate	A	4

Equiment List for Umbaddah G.H

Dept.	Item No.	Room	Description	Priority	Q'ty
Delivery	D-18	Delivery room	Forcept delivery set	A	2
Delivery	D-19	Delivery room	Vacuum extractor	A	2
Delivery	D-20	Delivery room	Suction unit	A	2
Delivery	D-21	Post-delivery monitoring room	Recovery bed	A	4
Delivery	D-22	Post-delivery monitoring room	IV stand	A	4
Delivery	D-23	Post-delivery monitoring room	Instrument trolley	A	1
Delivery	D-24	Medical Waste	Hospital Sluice Sink	C	1
Delivery	D-25	Sterilizatiom room	Hot air oven	A	1
Delivery	D-26	Sterilizatiom room	Table top autoclave	B	1
Delivery	D-27	Staff rest room	Chair	A	5
Delivery	D-28	Staff rest room	Desk	A	1
Delivery	D-29	Night Duty room	Duty bed	A	1
Delivery	D-30	Night Duty room	Bedside Cabinet	A	1
Delivery	D-31	Nurse station	Consultation Desk	A	1
Delivery	D-32	Nurse station	Consultation Chair	A	1
Delivery	D-33	Nurse station	Diagnostic set	A	3
Delivery	D-34	Nursery (delivered inside & outside)	Infan Incubator	A	5
Delivery	D-34	Nursery (delivered inside & outside)	Infan Warmer	A	1
Delivery	D-32	Nursery (delivered inside & outside)	Baby Cot	A	8
Delivery	D-33	Nursery (delivered inside & outside)	Ambu Bag set for neonate	A	3
Delivery	D-34	Nursery (delivered inside & outside)	Oxygen regulator, humidifier and flowmeter	A	4
Delivery	D-34	Nursery (delivered inside & outside)	Phototherapy unit (LED)	A	5
Delivery	D-32	Nursery (delivered inside & outside)	Neonatal Monitor	A	5
Delivery	D-33	Nursery (delivered inside & outside)	Portable suction unit	A	5
Delivery	D-34	Nursery (delivered inside & outside)	Bilirubin meter with centrifuge	A	1
Delivery	D-34	Nursery (delivered inside & outside)	Syringe pump	A	5
Delivery	D-32	Nursery (delivered inside & outside)	Infusion pump	A	2
Delivery	D-33	Nursery (delivered inside & outside)	Pulse Oxymeter	A	2
Delivery	D-34	Nursery (delivered inside & outside)	Infant height & weight scale	A	2
Delivery	D-34	Nursery (delivered inside & outside)	CPAP	B	2
Delivery	D-32	Nursery (delivered inside & outside)	Oxygen concentrator	B	2
Delivery	D-33	Nursery (delivered inside & outside)	IV stand	A	4
Delivery	D-34	Nursery (delivered inside & outside)	Diagnostic set for neonate	A	2
Pharmacy	P-1	Pharmacy	Medicine cabinet	A	3
Pharmacy	P-2	Pharmacy	Refrigerator 10 feet	A	1
Pharmacy	P-3	Pharmacy	Desk	A	1
Pharmacy	P-4	Pharmacy	Chair	A	1
Pharmacy	P-5	Pharmacy store	Rack for storage	A	2
Laboratory	L-1	Blood & Urine collection	Consultation Desk	A	1
Laboratory	L-2	Blood & Urine collection	Consultation Chair	A	1
Laboratory	L-3	Laboratory	Hematology Analyer	A	1
Laboratory	L-4	Laboratory	Coagulometer	B	1
Laboratory	L-5	Laboratory	Hot Air Oven	A	1
Laboratory	L-6	Laboratory	Counter WBC	C	1
Laboratory	L-7	Laboratory	Spectrophotometer	A	1
Laboratory	L-8	Laboratory	Centrifuge	A	1
Laboratory	L-9	Laboratory	Table top autoclave	A	1
Laboratory	L-10	Laboratory	Sensitive balance for callibration	B	1
Laboratory	L-11	Laboratory	Electrolyte (ISE) analyzer	B	1
Laboratory	L-12	Laboratory	Refrigerator 10 feet	A	1
Laboratory	L-13	Laboratory	Microscope	A	2
Laboratory	L-14	Laboratory	Micro Pipette Set	A	1
Laboratory	L-15	Laboratory	Staining set	A	1
Laboratory	L-16	Laboratory	Sample Shaker	A	1
Laboratory	L-17	Laboratory	Water bath	A	1
Laboratory	L-18	Laboratory	Water distiller	B	1
Laboratory	L-19	Blood Bank (only deposit)	Blood Donor Beds	B	2
Laboratory	L-20	Blood Bank (only deposit)	Bag Shaker	B	2
Laboratory	L-21	Blood Bank (only deposit)	Sphygmonanometer	B	1
Laboratory	L-22	Blood Bank (only deposit)	Hemobrobin meter	C	1
Laboratory	L-23	Blood Bank (only deposit)	Micro Pipette Set	A	1

Equiment List for Umbaddah G.H

Dept.	Item No.	Room	Description	Priority	Q'ty
Laboratory	L-24	Blood Bank (only deposit)	Microscope	A	1
Laboratory	L-25	Blood Bank (only deposit)	Refrigerated Centrifuge for Blood Bags(Cryofuge	C	1
Laboratory	L-26	Blood Bank (only deposit)	Platelets Incubator with Agitator	A	1
Laboratory	L-27	Blood Bank (only deposit)	Manual Plasma Extractor	C	1
Laboratory	L-28	Blood Bank (only deposit)	Tube Sealer for Blood Bag	C	1
Laboratory	L-29	Blood Bank (only deposit)	Blood Bank Refrigerator (L)	A	2
Laboratory	L-30	Blood Bank (only deposit)	Blood Bank Refrigerator (S)	B	1
Laboratory	L-31	Blood Bank (only deposit)	Freezer	A	1
Laboratory	L-32	Blood Bank (only deposit)	Thawing Water Bath	A	1
Laboratory	L-33	Blood Bank (only deposit)	Hematocrit Centrifuge	C	1
Service	S-1	Laundry	Washing Machine	A	1
Service	S-2	Laundry	Drying Machine	A	1
Service	S-3	Laundry	Press Machine	A	1
Service	S-4	Laundry	Laundry Cart	A	1
Service	S-5	Canteen & Kitchen	Cooking equipment as a set	B	1
Service	S-6	Canteen & Kitchen	Freezer	A	1
Service	S-7	Canteen & Kitchen	Refrigerator 10 feet	A	1
Service	S-8	Canteen & Kitchen	Dining table	A	3
Service	S-9	Canteen & Kitchen	Dining chair	A	15
Service	S-10	Garbage collectiom	Garbage box	B	2
OT	OT-1	Pre-operation room	Stretcher	A	2
OT	OT-2	Changing room (Male & Female)	Locker (for 3 persons)	A	1
OT	OT-3	Scrub station	Hand Scrub station for 3 persons	A	1
OT	OT-4	Operation Theater	OT table (Hydraulic)	A	2
OT	OT-5	Operation Theater	OT Ceiling Light (LED)	A	2
OT	OT-6	Operation Theater	Mobile OT Light (LED) with bateery	A	2
OT	OT-7	Operation Theater	IV stand	A	2
OT	OT-8	Operation Theater	Anesthesia machine with ventilator	A	2
OT	OT-9	Operation Theater	Electrosurgical unit	A	2
OT	OT-10	Operation Theater	Suction unit	A	4
OT	OT-11	Operation Theater	D&C set (abortion)	A	4
OT	OT-12	Operation Theater	Caesarian Instument set	A	8
OT	OT-13	Operation Theater	Defibrillator	A	1
OT	OT-14	Operation Theater	Instrument trolley	A	4
OT	OT-15	Operation Theater	Instrument Cabinet	A	2
OT	OT-16	Operation Theater	Oxygen regulator, humidifier and flowmeter	A	4
OT	OT-17	Operation Theater	N2O regulator, humidifier and flowmeter	B	4
OT	OT-18	Operation Theater	Infant Warmer	A	2
OT	OT-19	Operation Theater	Baby Cot	A	1
OT	OT-20	Operation Theater	Infant Incubator	A	1
OT	OT-21	Operation Theater	Resuscitation set for neonate	A	2
OT	OT-22	Operation Theater	Portable suction unit	B	2
OT	OT-18	Sterilizatiom room	Hot air oven(50-60L)	A	1
OT	OT-19	Sterilizatiom room	High pressure steam sterilizer (Approx.250L)	A	1
OT	OT-20	Sterilizatiom room	Dressing drum set (L,M,S)	A	8
OT	OT-21	Sterilizatiom room	Linen cart	A	1
OT	OT-22	Sterilizatiom room	Rack for storage	A	1
OT	OT-23	Medical Waste	Hospital Sluice Sink	C	1
OT	OT-24	Staff rest room	Desk	A	1
OT	OT-25	Staff rest room	Chair	A	5
Ward	W-1	Ob/Gy	Hospital bed with mattress	A	20
Ward	W-2	Ob/Gy	IV stand	A	20
Ward	W-3	Ob/Gy	Overbed table	A	20
Ward	W-4	Ob/Gy	Bedside Cabinet	A	20
Ward	W-5	Ob/Gy	Suction unit	A	5
Ward	W-6	Ob/Gy	Hospital Sluice Sink	B	1
Ward	W-7	Nurse station	Consultation Desk	A	1
Ward	W-8	Nurse station	Consultation Chair	A	1
Ward	W-9	Nurse station	Instrument Cabinet	A	1
Ward	W-10	Nurse station	Instrment trolley	A	1
Ward	W-11	Nurse station	Medicine cabinet	A	1

Equiment List for Umbaddah G.H

Dept.	Item No.	Room	Description	Priority	Q'ty
Ward	W-12	Nurse station	Diagnostic set	A	1
Ward	W-13	Nurse station	White board	B	1
Ward	W-14	HDU	HDU bed (3 crank gatch by manual)	A	2
Ward	W-15	HDU	Oxygen regulator, humidifier and flowmeter	A	2
Ward	W-16	HDU	Infusion pump	A	2
Ward	W-17	HDU	Syringe pump	A	2
Ward	W-18	HDU	Ventilator	C	2
Ward	W-19	HDU	Instrument cabinet	A	1
Ward	W-20	HDU	Bedside Monitor	A	2
Ward	W-21	HDU	Defibrillator	B	1
Ward	W-22	Linen	Rack for storage	A	2
Ward	W-23	Linen	Laundry Cart	A	1
Administratiom	A-1	Dr's room	Desk	A	5
Administratiom	A-2	Dr's room	Chair	A	5
Administratiom	A-3	Dr's room	Book shelf	B	1
Administratiom	A-4	Paramedical staff room	Desk	A	1
Administratiom	A-5	Paramedical staff room	Chair	A	1
Administratiom	A-6	Changing room for Male	Locker (for 3 persons)	A	1
Administratiom	A-7	Changing room for Female	Locker (for 3 persons)	A	2
Administratiom	A-8	DG	Desk	A	1
Administratiom	A-9	DG	Chair	A	1
Administratiom	A-10	DG	Book shelf	B	1
Administratiom	A-11	MD/Management room	Desk	A	1
Administratiom	A-12	MD/Management room	Chair	A	1
Administratiom	A-13	MD/Management room	Book shelf	B	1
Administratiom	A-16	Carte room	File rack for medical records	A	3
Administratiom	A-17	Worker's room	Desk	A	1
Administratiom	A-18	Worker's room	Chair	A	5
Administratiom	A-19	Worker's room	Storage rack	A	1
Administratiom	A-20	Meeting room	Meeting table	A	1
Administratiom	A-21	Meeting room	Meeting chairs	A	10
Administratiom	A-22	Meeting room	White board	A	1
Administratiom	A-23	Meeting room	Projector	B	1
Administratiom	A-24	Meeting room	Projector screen	B	1
Outside	O-1	Parking lot	Ambulance	C	1

A : High priority
B : Put moderate priority and final decision will be made at the analysis in Japan
C : Not to be considered under this project

- Quantity of equipment subject to be changed at the analysis in Japan
- Result of analysis will report to Sudan side at explanation of draft report planning on Feb., 2015.

Annex-3 : Equipment and priorities for Maternal and Child Health Section in Umbaddah General Hospital
Alaban Jadid General Hospital and Midwifery School in Umbaddah General Hospital

Equiment List for Midwifery School at Umbaddah

Dept.	Item No.	Curriculum/Room	Description	Priority	Q'ty
Theoretical Training	C-1	Class Room and Storae	Desk	B	50
	C-2		White Board	B	2
	C-3		Platform	B	2
	C-4		Chair	B	50
	C-5		Projector	B	2
	C-6		Screen for Projector	B	2
	C-7		Cabinet	B	2
Practice Training (Skill Labo.)	L-1	Nursery /Midwifery Technique	I.V. Injection Arm	B	2
	L-2		Delux Dual-Sex Torso, 20 parts	B	2
	L-3	Neonatal Care	Resuscitation Baby	B	2
	L-4		Neonatal resuscitation set	B	2
	L-5	Antenatal Care	Pregnancy series	B	2
	L-6		Diagnostic set	B	2
	L-7		Examination table	B	2
	L-8	Delivery	Birth Process, 5 stages	B	2
	L-9		Delivery Model	B	2
	L-10		Pelvis model	B	2
	L-11		Delivery table	B	2
	L-12		Delibery instrument set	B	2
			Examination set	B	2
	L-13		Forceps delivery set	B	2
	L-14		Vacuum extractor	B	2
	L-15		Hot air oven	B	2
	L-16	Post-natal care	Gynecological simulator	B	2
	L-17	Storage	Cabinet	B	6
Changing room	C-1	n/a	Locker	B	5
Administration	A-1	Manager room	Desk	B	1
	A-2		Chair	B	1
	A-3		Book shelf	B	1
	A-4	Meeting room	Meeting Table	B	1
	A-5		Meeting Chair	B	10
	A-6		Projector	B	1
	A-7		Projector screen	B	1
	A-8	Teacher's room	Desk	B	1
	A-9		Chair	B	3
	A-10		Book shelf	B	1
	A-11	Locker room	Locker	B	1
	A-12	Storage	Cabinet	B	1
Domitory	D-1	Canteen	Dining Table Set	B	10
	D-2		Dining Chair set	B	50
	D-3	Kitchen	Kitchen instrument set	B	1
	D-4	Laundry	Washing and Drying machine	B	1
	D-5	Storage	Cabinet	B	1

A : High priority
B : Put moderate priority and final decision will be made at the analysis in Japan
C : Not to be considered under this project

- Quantity of equipment subject to be changed at the analysis in Japan
- Result of analysis will report to Sudan side at explanation of draft report planning on F

Annex-3 : Equipment and priorities for Maternal and Child Health Section in Umbaddah General Hospital, Alaban Jadid General Hospital and Midwifery School in Umbaddah General Hospital

Equiment List for Alban Jadid G.H

Dept.	Item No.	Room	Description	Priority	Q'ty
OPD	OPD-1	Emergency, Obstetric	Diagnostic set	B	2
OPD	OPD-2	Emergency, Obstetric	CTG	B	1
OPD	OPD-3	Emergency, Obstetric	Adult weighing scale	B	2
OPD	OPD-4	Emergency, Obstetric	Adult height scale	B	2
OPD	OPD-5	Pediatric	Diagnostic set for infant	B	1
OPD	OPD-6	Pediatric	Infant height & weight scale	B	1
OPD	OPD-7	Emergency, Obstetric	Gynecology examination table with foot step	B	2
OPD	OPD-8	Emergency, Obstetric	Examination light (LED)	B	2
OPD	OPD-9	Emergency, Obstetric	Partition	B	2
OPD	OPD-10	Ultrasound scanning room	Ultrasound scanner	B	1
Delivery	D-1	Labour room	CTG	B	1
Delivery	D-2	Labour room	Fetal Doppler	B	1
Delivery	D-3	Labour room	Ultrasound scanner	B	1
Delivery	D-4	Labour room	Labour bed with foot step	B	6
Delivery	D-5	Labour room	IV stand	B	6
Delivery	D-6	Delivery room	Delivery table	B	2
Delivery	D-7	Delivery room	Delivery instrument set	B	4
Delivery	D-8	Delivery room	Forcept delivery set	B	2
Delivery	D-9	Delivery room	Vacuum extractor	B	1
Delivery	D-10	Delivery room	Infant warmer	B	1
Delivery	D-11	Delivery room	Baby cot	B	1
Delivery	D-12	Delivery room	Resuscitation set for neonate	B	1
Delivery	D-13	Sterilizatiom room	Hot air oven	B	1
Delivery	D-14	Nursery	Infan Incubator	B	4
Delivery	D-15	Nursery	Infant Warmer	B	1
Delivery	D-16	Nursery	IV stand	B	4
Delivery	D-17	Nursery	Phototherapy unit (LED)	B	4
Delivery	D-18	Nursery	Portable suction unit	B	4
Delivery	D-19	Nursery	Syringe pump	B	4
Delivery	D-20	Nursery	Infusion pump	B	2
Delivery	D-21	Nursery	Pulse Oxymeter	B	4
Delivery	D-22	Nursery	CPAP	B	1
Delivery	D-23	Nursery	Oxygen concentrator	B	2
Delivery	D-24	Nursery	Diagnostic set for neonate	B	2
Laboratory	L-1	Laboratory	Spectrophotometer	B	1
Laboratory	L-2	Laboratory	Microscope	B	3
Laboratory	L-3	Laboratory	Micro Pipette Set	B	1
Laboratory	L-4	Blood transfusion unit	Blood Bank Refrigerator (L)	B	1
Laboratory	L-5	Blood transfusion unit	Freezer	B	1
OT	OT-1	OT 1/OT2	OT Ceiling Light (LED)	B	2
OT	OT-2	OT 1/OT2	Mobile OT Light (LED) with bateery	B	3
OT	OT-3	OT 1/OT2	Anesthesia machine with ventilator	B	2
OT	OT-4	OT 1/OT2	Suction unit	B	6
OT	OT-5	OT 1/OT2	Infant warmer	B	2
OT	OT-6	OT 1/OT2	Infant Incubator	B	1
OT	OT-7	OT 1/OT2	Baby cot	B	1
OT	OT-8	OT 1/OT2	Resuscitation set for neonate	B	2
OT	OT-9	OT 1/OT2	Portable suction unit	B	2
OT	OT-10	OT 1/OT2	High pressure steam sterilizer (Approx.250L)	B	1

A : High priority
B : Put moderate priority and final decision will be made at the analysis in Japan
C : Not to be considered under this project

- Quantity of equipment subject to be changed at the analysis in Japan
- Result of analysis will report to Sudan side at explanation of draft report planning on Feb., 2015.

Annex-4: Proposed Area for Construction at Umbaddah General Hospital

: Existing building to be demolished by Sudanese side

① : **Existing Office to be demolished by Sudan side**

② : **Existing Cafeteria to be demolished be Sudan**

③ : **Existing Toilet to be demolished by Sudan side**

Annex-5

Proposed Staff List of the Maternal and Child Health Section in Umbaddah General Hospital by SMOH

Staff Title	Number
Doctors :	
Obstetric & Gynecological doctor	6
Pediatrician	3
Medical doctors	10
Family medicine consultant	2
Pharmacists	4
Anesthetist	2
Technicians and Assistants:	
Nurse technicians	38
Lab technicians	6
Public Health officer	1
Health educator	4
Medical assistant pharmacist	3
Theater attendant	8
Anesthesia technician	8
Lab assistant	4
Certified nurses	6
Immunization technicians	2
Data clerk	6
Statistic technician	3
Management	
Medical director of MCH	1
Secretary	1
Data input	3
Human resource	1
Internal auditor	1
Accountant	2
Cashier	4
Store keeper	1
Electrical technician	1
AC and Mechanical engineer	1
Plumber	1
Biomedical engineer	1
Drivers	3
Cleaner	15
Worker	2
Security	6

6. Examination List of Requested Equipment Based on the Equipment Selection Criteria

6. Examination List of Requested Equipment Based on the Equipment Selection Criteia

Department	Item No	Equipement	Requested Qty	①purpose of use	②Necessity	③Technical Level	④Operation System	⑤Maintenance system	⑥Operation and Maintenance Cost	⑦Overall evaluation	Planned Qty
Outpatient Zone	OPD-1	Waiting chair (for 3persons)	10	○	○	○	○	○	○	○	32
Outpatient Zone	OPD-2	Diagnostic set	1	○	○	○	○	○	○	○	7
Outpatient Zone	OPD-3	Fetal doppler	1	○	○	○	○	○	○	○	4
Outpatient Zone	OPD-4	Examination table	1	○	○	○	○	○	○	○	4
Outpatient Zone	OPD-5	Gynecology examination table	1	○	○	○	○	○	○	○	5
Outpatient Zone	OPD-6	Examination instrument set	1	○	○	○	○	○	○	○	5
Outpatient Zone	OPD-7	Examination light	1	○	○	○	○	○	○	○	5
Outpatient Zone	OPD-8	Reception chair	1	○	○	○	○	○	○	○	3
Outpatient Zone	OPD-9	CTG	1	○	○	○	○	○	○	○	2
Outpatient Zone	OPD-10	Hospital sluice sink	1	○	X	○	○	○	○	X	0
Outpatient Zone	OPD-11	Adult weighing scale	1	○	○	○	○	○	○	○	2
Outpatient Zone	OPD-12	Adult height scale	1	○	○	○	○	○	○	○	2
Outpatient Zone	OPD-13	Consultation desk	1	○	○	○	○	○	○	○	10
Outpatient Zone	OPD-14	Consultation chair	2	○	○	○	○	○	○	○	19
Outpatient Zone	OPD-15	Ambu bag set for adult	2	○	X	○	○	○	○	X	0
Outpatient Zone	OPD-16	Portable suction unit	2	○	X	○	○	○	○	X	0
Outpatient Zone	OPD-17	Infant height & weight scale	1	○	○	○	○	○	○	○	1
Outpatient Zone	OPD-18	Vaccine refrigerator	1	○	○	○	○	○	○	○	1
Outpatient Zone	OPD-19	Rack for storage	2	○	○	○	○	○	○	○	2
Outpatient Zone	OPD-20	Ambu bag set for infant	1	○	X	○	○	○	○	X	0
Outpatient Zone	OPD-21	Hot air oven	1	○	○	○	○	○	○	○	1
Outpatient Zone	OPD-22	Partition	1	○	○	○	○	○	○	○	2
Outpatient Zone	OPD-23	Ultrasound scanner	1	○	○	○	○	○	○	○	1
Outpatient Zone	OPD-24	ECG machine	1	○	○	○	○	○	○	○	1
Outpatient Zone	OPD-25	Examination table with foot step	1	○	○	○	○	○	○	○	1
Delivery Zone	D-1	Diagnostic set	3	○	○	○	○	○	○	○	3
Delivery Zone	D-2	IV stand	1	○	○	○	○	○	○	○	16
Delivery Zone	D-3	Delivery table	1	○	○	○	○	○	○	○	3
Delivery Zone	D-4	Delivery instrument set	2	○	○	○	○	○	○	○	6
Delivery Zone	D-5	Mobile OT Lamp (LED) with battery	1	○	○	○	○	○	○	○	3
Delivery Zone	D-6	Infant warmer	1	○	○	○	○	○	○	○	3
Delivery Zone	D-7	Baby cot	1	○	○	○	○	○	○	○	3
Delivery Zone	D-8	Resuscitation set for neonate	1	○	○	○	○	○	○	○	3
Delivery Zone	D-9	Forcept delivery set	1	○	○	○	○	○	○	○	3
Delivery Zone	D-10	Suction unit	1	○	○	○	○	○	○	○	3
Delivery Zone	D-11	Vaccine refrigerator	1	○	○	○	○	○	○	○	1
Delivery Zone	D-12	Vacuum extractor	1	○	○	○	○	○	○	○	1
Delivery Zone	D-13	Hot air oven	1	○	○	○	○	○	○	○	1
Delivery Zone	D-14	Infant height & weight scale	1	○	○	○	○	○	○	○	1
Delivery Zone	D-15	Instrument trolley	1	○	○	○	○	○	○	○	3
Delivery Zone	D-16	Hospital sluice sink	1	○	X	○	○	○	○	X	0
Delivery Zone	D-17	Instrument cabinet	1	○	○	○	○	○	○	○	2
Delivery Zone	D-18	Fetal doppler	3	○	○	○	○	○	○	○	3
Delivery Zone	D-19	CTG	1	○	○	○	○	○	○	○	1
Delivery Zone	D-20	Ultrasound scanner	1	○	○	○	○	○	○	○	1
Delivery Zone	D-21	Labour bed	8	○	○	○	○	○	○	○	8
Delivery Zone	D-22	Refrigerator	1	○	○	○	○	○	○	○	1
Delivery Zone	D-23	Recovery bed	8	○	○	○	○	○	○	○	10
Delivery Zone	D-24	Baby cot	4	○	○	○	○	○	○	○	8
Delivery Zone	D-25	Medicine cabinet	1	○	○	○	○	○	○	○	2
Delivery Zone	D-26	Stretcher	1	○	○	○	○	○	○	○	1

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Delivery Zone	D-27	Wheel chair	1	○	○	○	○	○	○	○	1
Delivery Zone	D-28	Garbage box	2	○	○	○	○	○	○	○	2
Delivery Zone	D-29	Reception chair	1	○	○	○	○	○	○	○	1
Delivery Zone	D-30	Consultation desk	1	○	○	○	○	○	○	○	1
Delivery Zone	D-31	Waiting chair (for 3persons)	2	○	○	○	○	○	○	○	2
Delivery Zone	D-32	Cylinder cart	3	○	○	○	○	○	○	○	3
Delivery Zone	D-33	White board	1	○	○	○	○	○	○	○	1
Delivery Zone	D-34	Meeting table	1	○	○	○	○	○	○	○	1
Delivery Zone	D-35	Meeting chairs	6	○	○	○	○	○	○	○	6
Delivery Zone	D-36	Book self	1	○	○	○	○	○	○	○	1
Neonate Zone	N-1	Infant height & weight scale	1	○	○	○	○	○	○	○	2
Neonate Zone	N-2	Portable suction unit	4	○	○	○	○	○	○	○	10
Neonate Zone	N-3	Bilirubin meter with centrifuge	1	○	○	○	○	○	○	○	2
Neonate Zone	N-4	Syringe pump	3	○	○	○	○	○	○	○	7
Neonate Zone	N-5	Infusion pump	1	○	○	○	○	○	○	○	3
Neonate Zone	N-6	Pulse oxymeter	1	○	○	○	○	○	○	○	3
Neonate Zone	N-7	CPAP	1	○	○	○	○	○	○	○	2
Neonate Zone	N-8	Oxygen concentrator	1	○	○	○	○	○	○	○	2
Neonate Zone	N-9	Diagnostic set for neonate	1	○	○	○	○	○	○	○	2
Neonate Zone	N-10	Rack for storage	1	○	○	○	○	○	○	○	1
Neonate Zone	N-11	Laundry cart	1	○	○	○	○	○	○	○	1
Neonate Zone	N-12	IV stand	2	○	○	○	○	○	○	○	5
Neonate Zone	N-13	Infant warmer	1	○	○	○	○	○	○	○	2
Neonate Zone	N-14	Baby cot	1	○	○	○	○	○	○	○	5
Neonate Zone	N-15	Resuscitation set for neonate	1	○	○	○	○	○	○	○	2
Neonate Zone	N-16	Infant incubator	4	○	○	○	○	○	○	○	10
Neonate Zone	N-17	O2 regulator, humidifier and flowmeter	4	○	○	○	○	○	○	○	10
Neonate Zone	N-18	Phototherapy unit (LED)	3	○	○	○	○	○	○	○	7
Neonate Zone	N-19	Neonatal monitor	4	○	○	○	○	○	○	○	10
Pharmacy Zone	P-1	Reception chair	1	○	○	○	○	○	○	○	1
Pharmacy Zone	P-2	Refrigerator	1	○	○	○	○	○	○	○	1
Pharmacy Zone	P-3	Medicine cabinet	3	○	○	○	○	○	○	○	3
Pharmacy Zone	P-4	Laboratory desk	1	○	○	○	○	○	○	○	1
Pharmacy Zone	P-5	Chiar(for laboratory)	4	○	○	○	○	○	○	○	4
Pharmacy Zone	P-6	Rack for storage	2	○	○	○	○	○	○	○	2
Laboratory Zone	L-1	Reception chair	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-2	Table top autoclave	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-3	Electrolyte (ISE) analyzer	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-4	Microscope	2	○	○	○	○	○	○	○	3
Laboratory Zone	L-5	Micro pipette set	1	○	○	○	○	○	○	○	2
Laboratory Zone	L-6	Sample shaker	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-7	Water bath	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-8	Water distiller	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-9	Counter WBC	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-10	Sensitive balance for callibration	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-11	Staining set	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-12	Refrigerator	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-13	Consultation desk	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-14	Consultation chair	1	○	○	○	○	○	○	○	2
Laboratory Zone	L-15	Sphygmomanometer	1	○	○	○	○	○	○	○	2
Laboratory Zone	L-16	Partition	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-17	Blood donor beds	1	○	○	○	○	○	○	○	1

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Laboratory Zone	L-18	Bag shaker	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-19	Platelets incubator with Agitator	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-20	Hot air oven	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-21	Blood bank refrigerator (L)	1	○	○	○	○	○	○	○	2
Laboratory Zone	L-22	Freezer	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-23	Thawing water bath	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-24	Hemobrobin meter	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-25	Refrigerated centrifuge for blood bags(cryofuge)	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-26	Manual plasma extractor	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-27	Tube sealer for blood bag	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-28	Blood bank refrigerator (S)	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-29	Hematocrit centrifuge	1	○	X	○	○	○	○	X	0
Laboratory Zone	L-30	Chiar(for laboratory)	4	○	○	○	○	○	○	○	6
Laboratory Zone	L-31	Desk(for laboratory)	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-32	Hematology analyzer	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-33	Coagulometer	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-34	Spectrophotometer	1	○	○	○	○	○	○	○	1
Laboratory Zone	L-35	Centrifuge	1	○	○	○	○	○	○	○	1
Service Zone	S-1	Dining table	5	○	○	○	○	○	○	○	5
Service Zone	S-2	Meeting chairs	6	○	○	○	○	○	○	○	14
Service Zone	S-3	Meeting table	1	○	○	○	○	○	○	○	2
Service Zone	S-4	Rack for storage	1	○	○	○	○	○	○	○	4
Service Zone	S-5	Consultation desk	1	○	○	○	○	○	○	○	3
Service Zone	S-6	Consultation chair	2	○	○	○	○	○	○	○	4
Service Zone	S-7	Dining chair	20	○	○	○	○	○	○	○	25
Service Zone	S-8	Duty bed	1	○	○	○	○	○	○	○	2
Service Zone	S-9	Cooking equipment as a set	1	○	○	○	○	○	○	○	1
Service Zone	S-10	Refrigerator & freezer	1	○	○	○	○	○	○	○	1
Service Zone	S-11	Washing machine	1	○	○	○	○	○	○	○	2
Service Zone	S-12	Drying machine	1	○	○	○	○	○	○	○	2
Service Zone	S-13	Press machine	1	○	○	○	○	○	○	○	1
Service Zone	S-14	Laundry cart	2	○	○	○	○	○	○	○	2
OT Zone	OT-1	Baby cot	1	○	○	○	○	○	○	○	2
OT Zone	OT-2	Resuscitation set for neonate	1	○	○	○	○	○	○	○	2
OT Zone	OT-3	Suction unit	2	○	○	○	○	○	○	○	4
OT Zone	OT-4	Infant incubator	1	○	○	○	○	○	○	○	2
OT Zone	OT-5	O2 regulator, humidifier and flowmeter	2	○	○	○	○	○	○	○	4
OT Zone	OT-6	OT table (hydraulic)	1	○	○	○	○	○	○	○	2
OT Zone	OT-7	Anesthesia machine with ventilator	1	○	○	○	○	○	○	○	2
OT Zone	OT-8	Electrosurgical unit	1	○	○	○	○	○	○	○	2
OT Zone	OT-9	D&C set (abortion)	2	○	○	○	○	○	○	○	4
OT Zone	OT-10	Caesarian instument set	4	○	○	○	○	○	○	○	8
OT Zone	OT-11	Locker (for 9 persons)	1	○	○	○	○	○	○	○	3
OT Zone	OT-12	Defibrillator	1	○	○	○	○	○	○	○	1
OT Zone	OT-13	N2O regulator, humidifier and flowmeter	1	○	○	○	○	○	○	○	2
OT Zone	OT-14	OTLamp	1	○	○	○	○	○	○	○	2
OT Zone	OT-15	Laundry cart	1	○	○	○	○	○	○	○	2
OT Zone	OT-16	Rack for storage	3	○	○	○	○	○	○	○	5
OT Zone	OT-17	IV stand	1	○	○	○	○	○	○	○	3
OT Zone	OT-18	Hospital bed with mattress	1	○	○	○	○	○	○	○	1
OT Zone	OT-19	Patient monitor	1	○	○	○	○	○	○	○	3
OT Zone	OT-20	Partition	1	○	○	○	○	○	○	○	1

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OT Zone	OT-21	Meeting Table(S)	1	○	○	○	○	○	○	○	2
OT Zone	OT-22	Meeting chairs	6	○	○	○	○	○	○	○	8
OT Zone	OT-23	Hospital sluice sink	1	○	X	○	○	○	○	X	0
OT Zone	OT-24	Hand scrub station for 3 persons	1	○	○	○	○	○	○	○	1
OT Zone	OT-25	Stretcher	1	○	○	○	○	○	○	○	2
OT Zone	OT-26	High pressure steam sterilizer	1	○	○	○	○	○	○	○	1
OT Zone	OT-27	Dressing drum set (L,M,S)	8	○	○	○	○	○	○	○	8
OT Zone	OT-28	Hot air oven	1	○	X	○	○	○	○	X	1
OT Zone	OT-29	Garbage box	2	○	○	○	○	○	○	○	2
OT Zone	OT-30	Instrument trolley	2	○	○	○	○	○	○	○	4
OT Zone	OT-31	Instrument cabinet	1	○	○	○	○	○	○	○	2
OT Zone	OT-32	Infant warmer	1	○	○	○	○	○	○	○	2
Word Zone	W-1	Stretcher	1	○	○	○	○	○	○	○	1
Word Zone	W-2	Meeting table	1	○	○	○	○	○	○	○	1
Word Zone	W-3	Meeting chairs	8	○	○	○	○	○	○	○	8
Word Zone	W-4	Book self	1	○	○	○	○	○	○	○	1
Word Zone	W-5	Rack for storage	1	○	○	○	○	○	○	○	6
Word Zone	W-6	Laundry cart	1	○	○	○	○	○	○	○	1
Word Zone	W-7	Consultation chair	2	○	○	○	○	○	○	○	2
Word Zone	W-8	IV stand	20	○	○	○	○	○	○	○	24
Word Zone	W-9	Suction unit	4	○	○	○	○	○	○	○	8
Word Zone	W-10	Bedside cabinet	20	○	○	○	○	○	○	○	26
Word Zone	W-11	Hospital bed with mattress	20	○	○	○	○	○	○	○	24
Word Zone	W-12	Wheel chair	1	○	○	○	○	○	○	○	1
Word Zone	W-13	Overbed table	20	○	○	○	○	○	○	○	24
Word Zone	W-14	Sofa	4	○	○	○	○	○	○	○	4
Word Zone	W-15	Instrument cabinet	1	○	○	○	○	○	○	○	2
Word Zone	W-16	O2 regulator, humidifier and flowmeter	2	○	○	○	○	○	○	○	2
Word Zone	W-17	Syringe pump	2	○	○	○	○	○	○	○	2
Word Zone	W-18	Infusion pump	2	○	○	○	○	○	○	○	2
Word Zone	W-19	HDU bed (3 crank gatch by manual)	2	○	○	○	○	○	○	○	2
Word Zone	W-20	Patient monitor	2	○	○	○	○	○	○	○	2
Word Zone	W-21	Garbage box	2	○	○	○	○	○	○	○	2
Word Zone	W-22	Cylinder cart	1	○	○	○	○	○	○	○	1
Word Zone	W-23	Instrument trolley	1	○	○	○	○	○	○	○	1
Word Zone	W-24	Medicine cabinet	1	○	○	○	○	○	○	○	1
Word Zone	W-25	White board	1	○	○	○	○	○	○	○	1
Word Zone	W-26	Ventilator	2	○	X	X	○	○	○	X	0
Word Zone	W-27	Hospital sluice sink	1	○	X	○	○	○	○	X	0
Health education Zone	H-1	Consultation desk	4	○	○	○	○	○	○	○	4
Health education Zone	H-2	Consultation chair	6	○	○	○	○	○	○	○	6
Health education Zone	H-3	TV monitor	1	○	○	○	○	○	○	○	1
Health education Zone	H-4	Projector	1	○	○	○	○	○	○	○	1
Health education Zone	H-5	Projector screen	1	○	○	○	○	○	○	○	1
Health education Zone	H-6	White board	1	○	○	○	○	○	○	○	1
Health education Zone	H-7	Straking chair	30	○	○	○	○	○	○	○	40
Administration Zone	A-1	File rack for medical records	3	○	○	○	○	○	○	○	3
Administration Zone	A-2	Book self	1	○	○	○	○	○	○	○	15
Administration Zone	A-3	Consultation desk	2	○	○	○	○	○	○	○	7
Administration Zone	A-4	Consultation chair	2	○	○	○	○	○	○	○	7
Administration Zone	A-5	Rack for storage	3	○	○	○	○	○	○	○	5
Administration Zone	A-6	Projector	1	○	○	○	○	○	○	○	0

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Administration Zone	A-7	White board	1	○	○	○	○	○	○	○	0
Administration Zone	A-8	Meeting table(L)	1	○	○	○	○	○	○	○	6
Administration Zone	A-9	Meeting chairs	10	○	○	○	○	○	○	○	54
Administration Zone	A-10	Projector screen	1	○	○	○	○	○	○	○	0
Administration Zone	A-11	Straking chair	30	○	○	○	○	○	○	○	0
Administration Zone	A-12	Hand truck	1	○	○	○	○	○	○	○	1
Administration Zone	A-13	Ambulance	1	○	X	○	X	○	○	X	0
Administration Zone	A-14	Locker(for 4 persons)	5	○	○	○	○	○	○	○	10
Administration Zone	A-15	Locker (for 9 persons)	4	○	○	○	○	○	○	○	9
Administration Zone	A-16	Couch	1	○	○	○	○	○	○	○	3
Administration Zone	A-17	Meeting table(M)	1	○	○	○	○	○	○	○	6

7. Other Relevant Data

7-1 Result of Soil Investigation

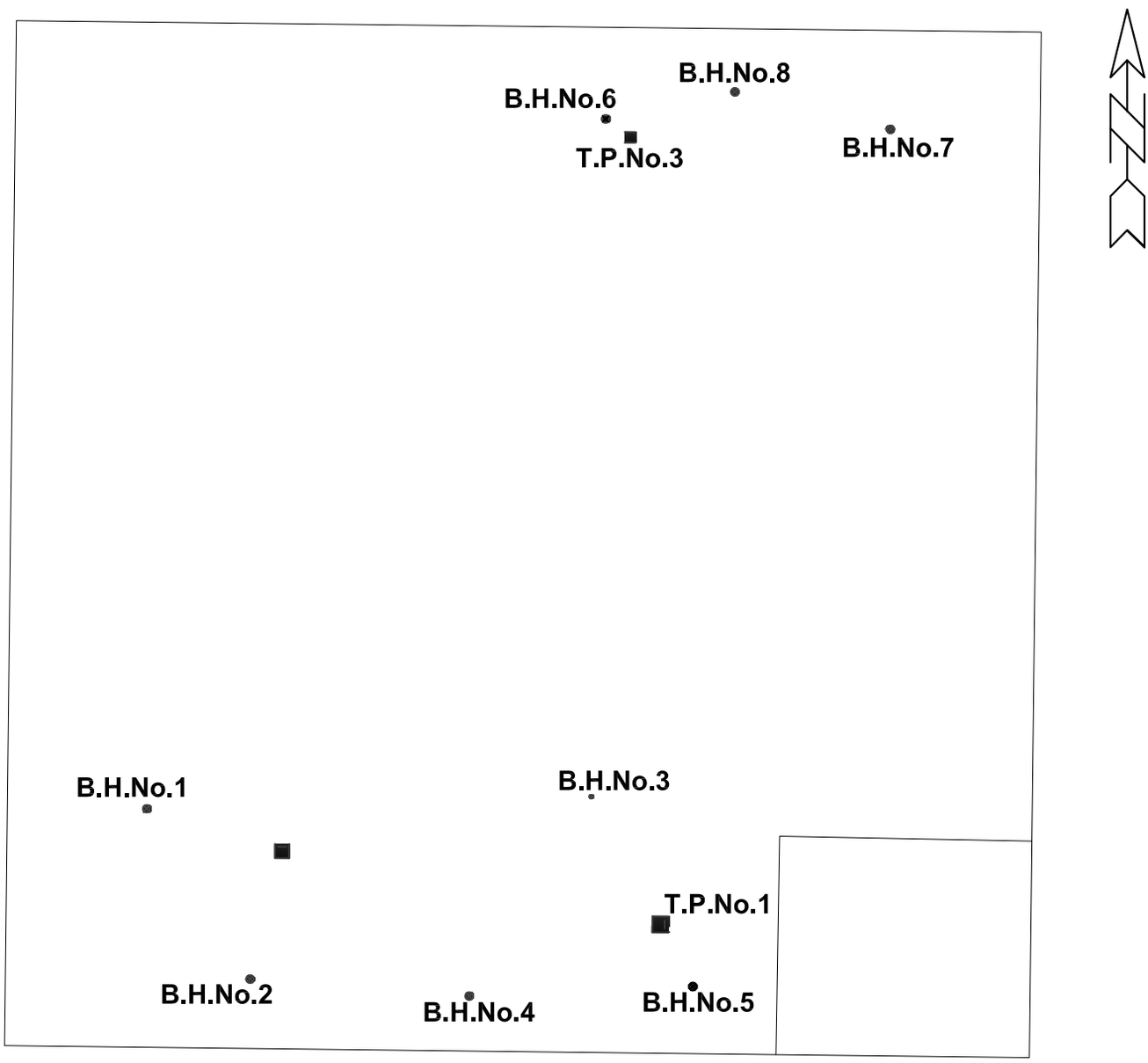
7-1 Result of Soil Investigation

FIGURES (1)

LOCATION OF BOREHOLES

Fig.(1) Locations of Boreholes

Umbaddah General Hospital



ALL UNITS ARE IN METER

FIGURES (2)

SECTIONS OF BOREHOLES

Fig.(2): SPT Vs Depth and Soil Properties

Umbaddah General Hospital

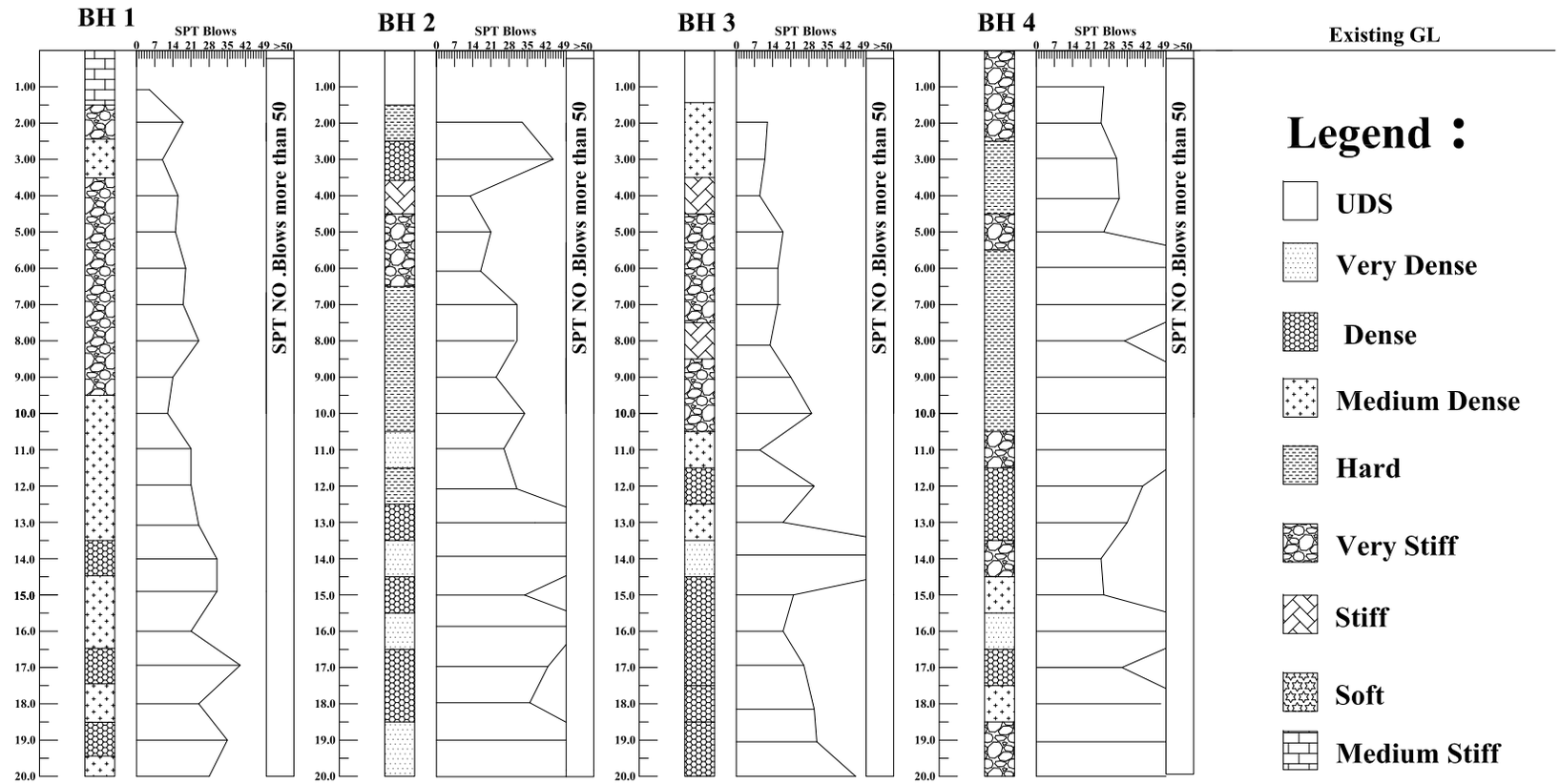
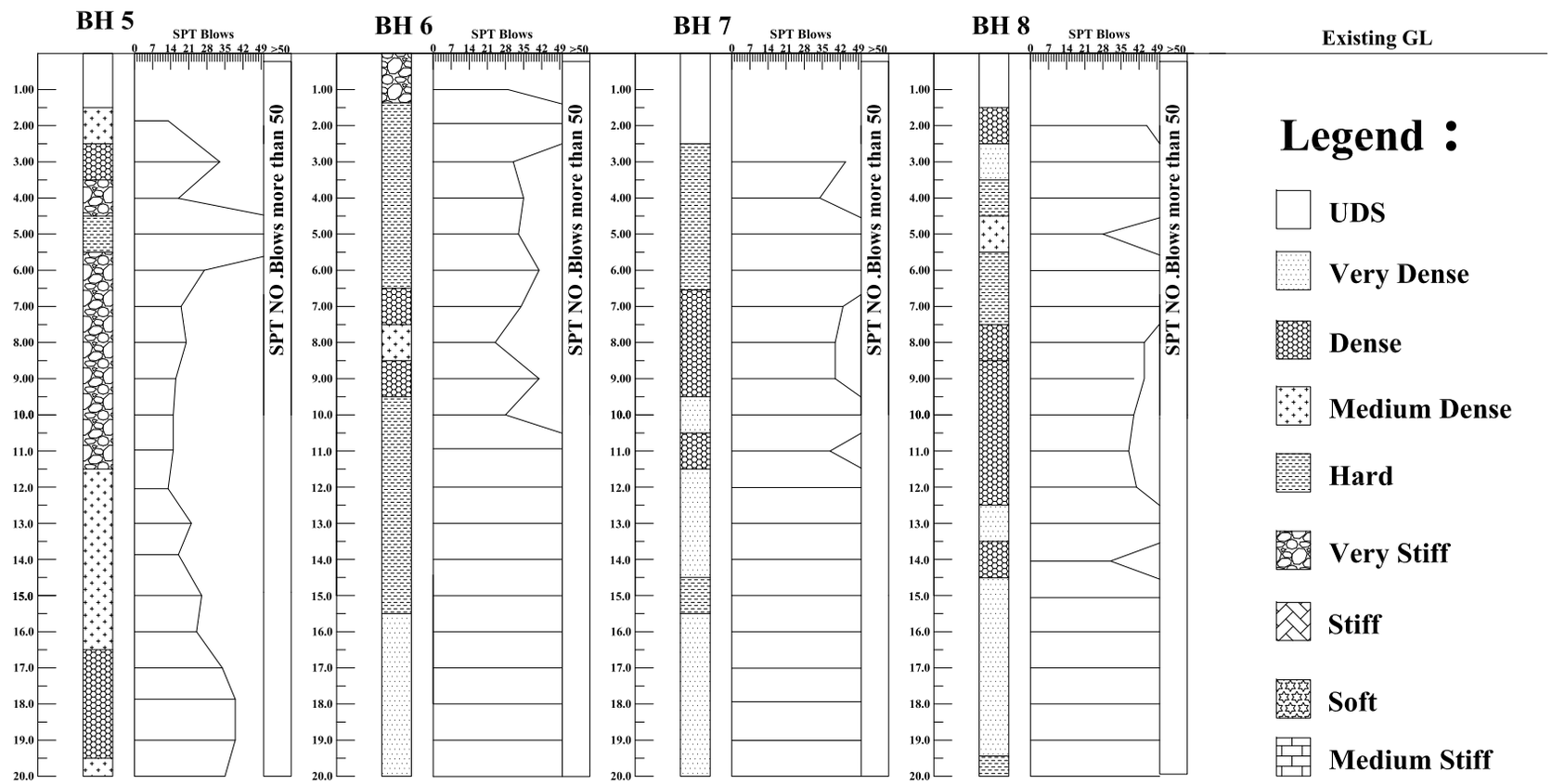


Fig.(2) Continued: SPT Vs Depth and Soil Properties

Umbaddah General Hospital



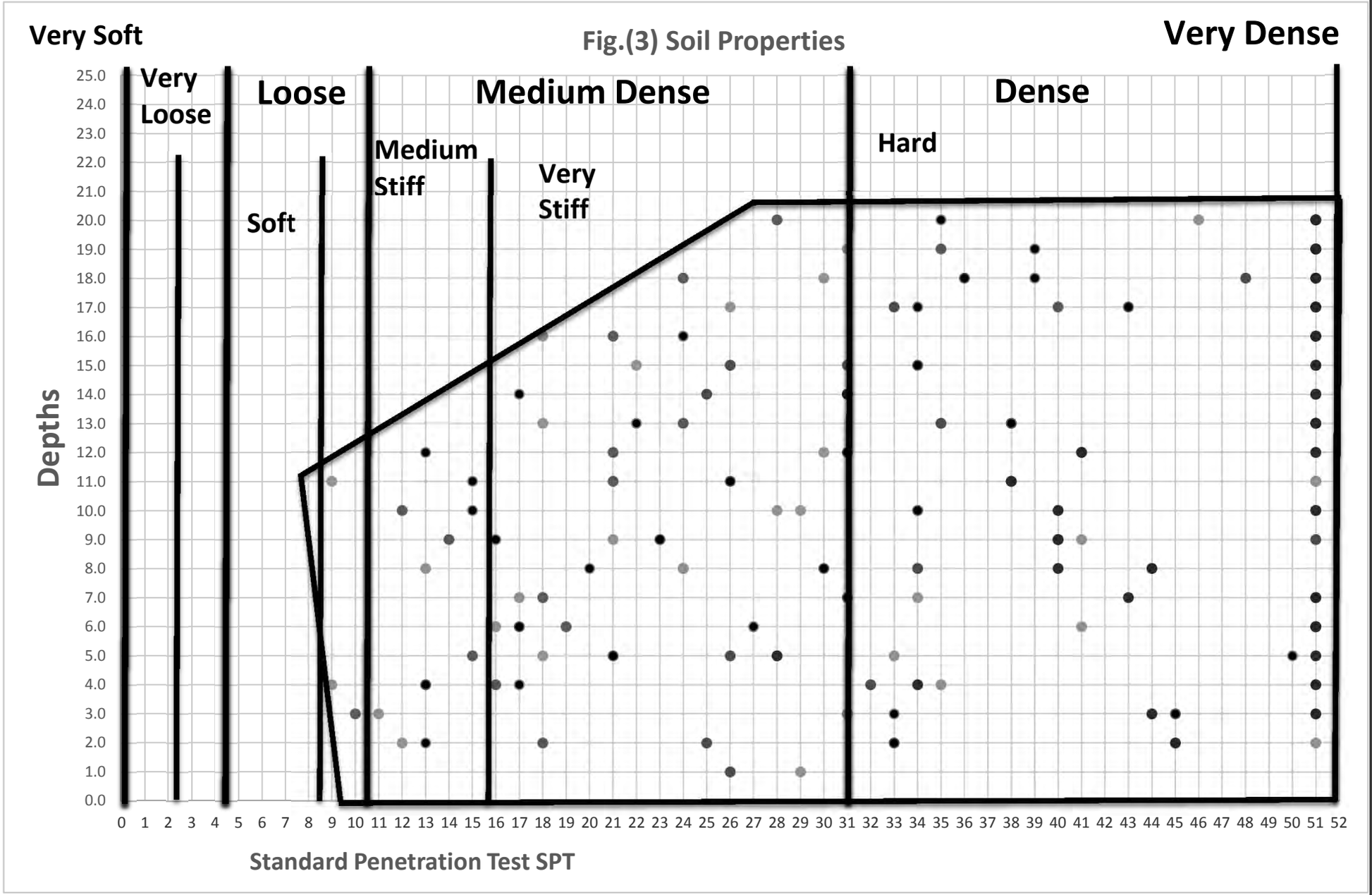


Fig.(3) Soil Properties

APPENDIX (A)

BOREHOLE LOGS AND SUMMARY OF LABORATORY TEST RESULTS

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.1 Coordinates: E: 0437590 N:1731892 Starting date: 04/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 07/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C kn/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0			Medium stiff reddish brown clayey silt of low plasticity	ML	40	27	13	94.03	11.40	27	58								
2.0			Very stiff yellowish grey silty clay of low plasticity	CL	19	12	7	52.82				4	5	5	4	4	**18**		
3.0			Medium dense yellowish grey clayey sand	SC	33	17	16	38.54				2	2	2	3	3	**10**		
4.0			Very stiff yellowish brown silty clay of low plasticity	CL	39	19	20	73.80				5	4	3	4	5	**16**		
5.0			same but possibly completely weathered claystone		33	22	11	82.25				6	5	2	3	5	**15**		
6.0					33	18	15	91.76				5	3	5	5	5	**19**		
7.0					29	18	11	74.65				3	3	4	5	6	**18**		
8.0			Very stiff whitish to yellowish brown clayey silt of low plasticity possibly completely weathered siltstone	ML	43	29	14	94.81				7	6	6	6	6	**24**		
9.0			same but stiff	CL-ML	25	19	6	53.48				4	2	3	4	5	**14**		
10.0			Medium dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	22	17	5	28.91				4	3	2	4	3	**12**		

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.1 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	21.01				5	5	5	5	6	**21**		
12.0			Medium dense whitish yellowish clayey sand possibly completely weathered sandstone	SM-SC	19	14	5	31.35				6	4	5	6	6	**21**		
13.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	26.19				8	6	5	7	6	**24**		
14.0			Dense whitish yellowish clayey sand possibly completely weathered sandstone	SM-SC	19	25	4	27.60				7	6	8	7	10	**31**		
15.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	31.28				14	7	7	9	8	**31**		
16.0			Medium dense whitish yellowish clayey sand possibly completely weathered sandstone	SM-SC	19	16	6	34.53				8	7	4	5	5	**21**		
17.0			Dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	20.36				22	11	8	10	11	**40**		
18.0			same but medium dense			NP	NP	32.80				12	5	7	7	6	**24**		
19.0			same but dense					20.13				12	9	9	8	9	**35**		
20.0			same but medium dense			NP	NP	19.04				6	6	6	8	8	**28**		

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clay sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.2 Coordinates: E: 0437610 N:1731859 Starting date: 04/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 07/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0	☒		Brownish grey silty clay of low plasticity	CL	27	16	11	56.46	8.64	30	99.74								
2.0			same but hard		33	17	16	53.70				6	5	8	11	9	**33**		
3.0	⧅		Dense yellowish brown clayey sand	SC	25	16	9	28.80				15	10	9	14	12	**45**		
4.0			Stiff yellowish brown silty clay of low plasticity	CL	32	17	15	63.52				5	3	3	4	3	**13**		
5.0	⧅		same but possibly completely weathered claystone		36	23	13	75.84				5	4	6	5	6	**21**		
6.0	⧅				35	24	11	89.17				6	3	3	6	5	**17**		
7.0			same but hard dark brown		31	20	11	95.73				8	5	7	9	10	**31**		
8.0	⧅		same but reddish brown		36	21	15	96.04				8	7	7	7	9	**30**		
9.0	⧅		same but very stiff		34	20	14	89.60				4	5	5	6	7	**23**		
10.0			same but dark brown		41	30	11	93.70				7	5	6	10	13	**34**		

☒ Undisturbed Sample

⧅ Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.2 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Very stiff reddish to whitish brown silty clay of low plasticity possibly completely weathered claystone	CL	28	20	8	63.91				6	6	6	6	8	**26**		
12.0			same but hard weathered siltstone	CL-ML	26	20	6	53.36				8	7	8	8	8	**31**		
13.0			Dense whitish brownish to yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	24.41				9	9	7	11	11	**38**		
14.0			same but very dense whitish yellowish			NP	NP	26.07				16	10	14	17	10	**>51**	**2**	
15.0			same but dense					21.99				14	7	10	8	9	**34**		
16.0			same but very dense			NP	NP	22.05				11	9	16	15	11	**>51**	**1**	
17.0			same but dense					23.52				9	8	8	14	13	**43**		
18.0								25.26				7	3	7	13	13	**36**		
19.0			same but very dense					27.99				13	12	16	16	7	**>51**	**2**	
20.0						NP	NP	22.48				21	15	28	8		**>51**	**2**	

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clay sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.3 Coordinates: E: 0437673 N:1731891 Starting date: 21/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 23/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0			Light brown silty clay of low plasticity	CL	28	15	13	52.15	11.98	10	70.28								
2.0			Light brown clayey sand	SC	25	15	10	32.26	6.54			6	4	3	3	2	**12**		
3.0			same but medium dense	SM-SC	21	15	6	31.49	2.65			4	3	3	3	2	**11**		
4.0			Stiff yellowish pinkish silty clay of low plasticity	CL	30	21	9	73.10	9.34			5	3	2	2	2	**9**		
5.0			same but very stiff		41	24	17	76.60	14.98			8	4	5	5	4	**18**		
6.0			same but of high plasticity possibly completely weathered claystone	CH	54	25	29	92.82	16.65			6	5	5	3	3	**16**		
7.0			same but whitish pinkish & low plasticity	CL	35	24	11	90.41	20.18			6	6	4	4	3	**17**		
8.0			same but stiff		39	23	16	86.46	15.97			6	4	3	3	3	**13**		
9.0			same but very stiff		33	20	13	89.28	20.74			7	7	5	5	4	**21**		
10.0			same but yellowish brownish		31	23	8	80.73	18.52			9	8	8	6	7	**29**		

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.3 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Medium dense whitish brownish clayey silty sand possibly completely weathered sandstone	SM-SC	27	20	7	45.26				4	2	2	2	3	**9**		
12.0			Dense whitish pinkish silty sand possibly completely weathered sandstone	SM		NP	NP	22.93				9	5	6	8	11	**30**		
13.0			same but medium dense whitish pinkish			NP	NP	27.16				5	4	4	4	6	**18**		
14.0			Very dense whitish pinkish clayey silty sand possibly completely weathered sandstone	SM-SC	23	19	4	46.18				10	10	14	16	11	**>51**	**1**	
15.0			Dense whitish pinkish silty sand possibly completely weathered sandstone	SM		NP	NP	37.12				8	6	6	5	5	**22**		
16.0						NP	NP	32.90				9	6	4	4	4	**18**		
17.0						NP	NP	18.10				9	5	8	7	6	**26**		
18.0			same but dense			NP	NP	29.93				10	7	6	9	8	**30**		
19.0						NP	NP	38.20				11	6	7	8	10	**31**		
20.0						NP	NP	34.92				15	11	10	13	12	**46**		

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.4 Coordinates: E:0437649 N:1731858 Starting date: 10/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 12/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0			Very stiff light brown silty clay of low plasticity	CL	33	15	18	56.18				6	4	5	9	8	**26**		
2.0			same whitish yellowish with few calcareous materials		35	16	19	56.00				8	5	6	7	7	**25**		
3.0			same hard yellowish brown clayey		33	16	19	64.56				9	8	9	7	8	**31**		
4.0					30	16	14	63.18				17	7	9	8	9	**32**		
5.0			same but very stiff & possibly completely weathered claystone		34	22	13	89.19				3	2	7	7	10	**26**		
6.0			same but hard		44	23	21	96.50				21	22	21	8		**>51**	2	
7.0			same but reddish brown		33	20	13	98.03				15	20	22	9		**>51**	2	
8.0			Hard yellowish brown clayey silt of low plasticity possibly completely weathered siltstone	ML		NP	NP	96.08				6	9	8	8	9	**34**		
9.0			Hard yellowish brown silty clay of low plasticity possibly completely weathered claystone	CL	32	15	17	93.42				25	22	25	6		**>51**		
10.0			Hard whitish brown clayey silt of low plasticity possibly completely weathered siltstone	ML	39	28	11	95.91				15	18	20	13		**>51**	1	

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.4 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	P.L %	P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Very stiff whitish yellowish silty clay of low plasticity possibly completely weathered siltstone	CL	30	21	9	62.31				19	15	17	17	2	**>51**	**3**	
12.0			Dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	22	17	5	29.28				13	10	10	11	10	**41**		
13.0			Dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	21.96				13	9	8	9	9	**35**		
14.0			Very stiff whitish yellowish clayey silt of low plasticity possibly completely weathered siltstone	CL-ML	27	21	6	51.79				9	7	6	6	6	**25**		
15.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	25.59				10	5	7	6	7	**26**		
16.0			same but very dense			NP	NP	24.82				21	13	12	13	13	**51**		
17.0			Dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	21	17	4	25.90				20	9	8	9	7	**33**		
18.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	33.01				19	11	12	12	13	**48**		
19.0			same but very dense			NP	NP	18.63				21	13	12	14	12	**51**		
20.0			Very dense whitish yellowish clayey sand possibly completely weathered sandstone	SM-SC	21	16	5	32.67				18	14	11	12	14	**51**		

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.5 Coordinates: E:0437689 N:1731855 Starting date: 16/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 19/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0	⊠		Light brown silty clay of low plasticity	CL	32	16	16	57.50	12.08	9	118.63								
2.0			Medium dense yellowish brownish clayey sand	SC	29	17	12	27.73	6.50			6	3	3	4	3	**13**		
3.0	⊠		same but dense dark brown		28	16	12	42.14	6.90			13	12	9	7	5	**33**		
4.0			Very stiff yellowish brown silty clay of low plasticity	CL	29	16	13	65.19	16.32			5	5	4	4	4	**17**		
5.0	⊠		same but hard		34	21	13	96.70	15.26			15	13	13	12	12	**50**		
6.0			same but pinkish brown possibly completely weathered claystone		38	21	17	99.34	14.93			10	8	8	6	5	**27**		
7.0	⊠		Very stiff whitish yellowish clayey silt of low plasticity possibly completely weathered siltstone	ML	48	29	19	96.63	7.61			10	3	4	4	7	**18**		
8.0			Very stiff yellowish brown silty clay of low plasticity possibly completely weathered claystone	CL	44	19	25	96.87	4.78			8	5	5	4	6	**20**		
9.0	⊠				38	25	13	94.55	7.64			7	5	5	3	3	**16**		
10.0					26	18	8	61.37	3.50			6	3	3	4	5	**15**		

⊠ Undisturbed Sample

⊠ Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.5 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	P.L %	P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Very stiff yellowish brown silty clay of low plasticity possibly completely weathered claystone	CL	30	17	13	71.37				5	5	4	3	3	**15**		
12.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	37.82				5	4	3	3	3	**13**		
13.0						NP	NP	24.15				8	8	6	4	4	**22**		
14.0						NP	NP	38.79				6	6	4	4	3	**17**		
15.0			Medium dense whitish yellowish clayey silt of low plasticity possibly completely weathered sandstone	CL-ML	22	16	6	50.37				5	5	8	8	5	**26**		
16.0			Medium dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	23.87				8	7	6	6	5	**24**		
17.0			same but dense			NP	NP	29.30				11	7	10	8	9	**34**		
18.0						NP	NP	36.84				12	10	10	9	10	**39**		
19.0						NP	NP	27.84				19	12	8	10	9	**39**		
20.0			Medium dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	20	15	5	30.27				20	8	9	10	8	**35**		

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.6 Coordinates: E: 0437674 N:1732007 Starting date: 17/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 21/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0			Very stiff light brown silty clay of low plasticity	CL	31	14	17	60.49	7.01			12	8	7	7	7	**29**		
2.0			same but hard		33	15	18	56.95	6.68			15	12	25	14		**>51**	1	
3.0			same but yellowish brownish		28	14	14	61.30	8.54			10	9	8	7	7	**31**		
4.0					22	13	9	51.75	5.16			10	10	9	8	8	**35**		
5.0				ML-CL	22	16	6	51.93	4.09			7	8	10	7	8	**33**		
6.0					25	18	5	54.62	5.70			9	9	13	10	9	**41**		
7.0			Dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	31.96	3.22			11	8	9	10	7	**34**		
8.0			same but medium dense			NP	NP	23.27	2.50			7	6	7	6	5	**24**		
9.0			Dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	22	15	7	37.03	4.78			9	9	13	10	9	**41**		
10.0				SC	30	13	17	49.73				10	6	7	7	8	**28**		

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.6 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Hard yellowish whitish silty clay of low plasticity possibly completely weathered claystone	CL	35	23	12	78.08				28	20	20	12		>51	1	
12.0			same but pinkish brownish		37	23	14	79.66				38	26	25			>51		
13.0				ML-CL	24	21	3	54.77				35	28	23			>51		
14.0				CL	25	16	9	61.39				24	25	24	2		>51	3	
15.0			Hard whitish yellowish clayey silt non plastic possibly completely weathered siltstone	ML		NP	NP	59.90				31	25	26			>51		
16.0			Very dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	31.70				18	13	30	8		>51	2	
17.0			Very dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	17	14	3	40.97				17	15	9	10	17	>51		
18.0			Very dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	29.05				31	26	25			>51		
19.0						NP	NP	23.59				32	25	27			>51		
20.0						NP	NP	27.77				28	23	28			>51		

Bottom of borehole @ 20.0m

Legend

- Undisturbed Sample
- Disturbed Soil Sample of SPT
- silty sand
- clayey sand
- silty clay
- clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.7 Coordinates: E: 0437722 N:1732008 Starting date: 13/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 15/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0			Light brown silty clay of low plasticity	CL	32	14	18	55.82											
2.0			Light brown clayey sand	SC	36	19	17	47.82	10.15										
3.0			Hard yellowish whitish clayey silt of low plasticity	ML	41	33	8	84.05				18	16	9	9	10	**44**		
4.0			Hard whitish brownish silty clay of low plasticity	CL	33	14	19	82.95				18	14	8	6	6	**34**		
5.0			Hard whitish brownish clayey silt of low plasticity	ML	41	31	10	83.28				16	16	13	13	10	**>51**		
6.0			same but whitish yellowish possibly completely weathered siltstone		40	26	14	74.80									**>51**	5	
7.0			Dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	33.28				25	15	9	10	9	**43**		
8.0			Dense yellowish brown clayey silty sand of low plasticity possibly completely weathered sandstone	SM-SC	21	17	4	41.22				5	9	10	11	10	**40**		
9.0			Dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	27.67				15	9	11	9	10	**40**		
10.0			same but very dense			NP	NP	16.27				8	12	19	19	4	**>51**	2	

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.7 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Dense whitish yellowish silty sand possibly completely weathered sandstone	SM		NP	NP	28.98				13	10	10	9	9	**38**		
12.0			same but very dense			NP	NP	20.87				51					**>51**	6	
13.0						NP	NP	35.54				18	16	16	15	5	**>51**	2	
14.0			Very dense whitish yellowish clayey silty sand possibly completely weathered sandstone	SM-SC	20	15	5	42.85				8	13	15	16	7	**>51**	**2**	
15.0			Hard yellowish brownish silty clay of low plasticity possibly completely weathered sandstone	ML-CL	21	16	5	50.42				51					**>51**	6	
16.0			Very dense whitish brown clayey silty sand possibly completely weathered sandstone	SM-SC	18	14	4	48.71				7	5	5	25	16	**51**	**2**	
17.0			Very dense whitish brown clayey silty sand possibly completely weathered sandstone	SM	18	15	3	43.96				21	13	19	19		**>51**		
18.0					18	14	4	39.41				11	16	19	16		**>51**	1	
19.0						NP	NP	26.02				13	15	16	15	5	**>51**		
20.0						NP	NP	30.94				18	14	12	15	10	**>51**	**1**	

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

B.H.8 Coordinates: E: 0437696 N:1732013 Starting date: 14/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 16/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
1.0			Light brown silty clay of low plasticity	CL	34	13	21	57.65	16.44	8	22.75								
2.0			Dense yellowish brownish clayey gravelly sand	SC	29	21	8	35.54				10	7	10	15	13	**45**		
3.0			same but very dense	SM-SC	32	26	6	45.50				25	18	17	16		**>51**		
4.0			Hard yellowish brownish clayey silt of low plasticity	ML	32	26	6	95.40				11	16	15	16	4	**>51**		
5.0			Medium dense whitish yellowish silty	SM		NP	NP	34.72				8	6	8	7	7	**28**		
6.0			Hard brownish whitish clayey silt of low plasticity	ML	33	27	6	59.94				45	30	22			**>51**	1	
			siltstone																
7.0			same but non plastic whitish yellowish possibly completely weathered siltstone			NP	NP	51.45				13	21	30			**>51**		
8.0			Dense yellowish brown whitish sand possibly completely weathered sandstone	SM		NP	NP	27.49				10	13	11	10	10	**44**		
9.0						NP	NP	32.01				14	10	9	10	9	**40**		
10.0						NP	NP	24.27				12	9	10	11	10	**40**		

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand

clayey sand

silty clay

clayey silt

E.S.D
Soil Profile
THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT
UMBADDAH GENERAL HOSPITAL

B.H.8 (Continued)

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	Shear Strength Ø (deg)	Shear Strength C KN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Pen. inch	Remarks
11.0			Dense yellowishwhitish silty sand possibly completely weathered sandstone	SM		NP	NP	20.95				11	9	11	8	9	**38**		
12.0						NP	NP	19.28				17	11	11	9	10	**41**		
13.0			same but very dense			NP	NP	27.85				19	15	14	16	6	**>51**	2	
14.0			same but medium dense			NP	NP	23.77				14	7	7	9	8	**31**		
15.0						NP	NP	30.32				20	22	25	4		**>51**	3	
16.0			Very dense whitish brown clayey silt of low plasticity possibly completely weathered siltstone	CL-ML	22	16	6	57.05				51					**>51**	**2**	
17.0			Very dense yellowish whitish silty sand possibly completely weathered sandstone	SM		NP	NP	48.32				31	20	23	8		**>51**	3	
18.0			Very dense yellowish whitish silty sandy gravel possibly completely weathered conglomerate	GM		NP	NP	34.56				18	14	14	13	10	**>51**	1	
19.0			Very dense yellowish whitish silty sand possibly completely weathered sandstone	SM		NP	NP	38.67				35	25	26			**>51**		
20.0			Hard brownish reddish silty clay of low plasticity possibly completely weathered mudstone	CL-ML	22	18	4	51.84				30	24	26	1		**>51**	**1**	

Bottom of borehole @ 20.0m

Undisturbed Sample

Disturbed Soil Sample of SPT

Legend

silty sand
clayey sand
silty clay
clayey silt
silty gravel

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

T.P. 1 Coordinates: E: 0437621 N:1731885 Starting date: 16/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 17/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits			%pass sieve #200	N.M.C %	γ_b KN/m³	γ_d KN/m³	Shear Strength		SPT Result						Remarks
					L.L %	P.L %	P.I %					Ø (deg)	C kN/m²	Blows for inch					N Value	
														6	3	3	3	3		
1.0			Light brown silty clay of low plasticity	CL	29	15	14	54.81	12.15											
2.0					35	16	19	56.65	12.25											
3.0					27	13	14	15.76												

Bottom of borehole @ 3.0m

Undisturbed Soil Sample UDS

Disturbed Soil Sample of SPT

Legend

Clay - high plasticity

Sand

Clay - low plasticity

Silt - low plasticity

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

T.P. 2 Coordinates: E: 0437680 N:1731867 Starting date: 17/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 18/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits			%pass sieve #200	N.M.C %	γ_b KN/m³	γ_d KN/m³	Shear Strength		SPT Result						Remarks
					L.L %	P.L %	P.I %					Ø (deg)	C kN/m²	Blows for inch					N Value	
														6	3	3	3	3		
1.0			Light brown clayey sandy silt non plastic	ML		NP	NP	70.21												
2.0			Light brown silty clay of low plasticity	CL	29	15	14	57.40	9.79											
3.0			Light brown clayey sand	SC	31	16	15	23.24	16.30											

Bottom of borehole @ 3.0m

Undisturbed Soil Sample UDS

Disturbed Soil Sample of SPT

Legend

Clay - high plasticity

Sand

Clay - low plasticity

Silt - low plasticity

E.S.D

Soil Profile

THE IMPROVEMENT OF HEALTH FACILITIES AND EQUIPMENTS PROJECT

UMBADDAH GENERAL HOSPITAL

T.P. 3 Coordinates: E: 0437679 N:1732006 Starting date: 20/09/2014

Elevation : From the existing ground level Ground Water Level : Not Observed Finishing date: 21/09/2014

Depth (m)	Sample Type	Layer Symbol	Description	Group Symbol	Atterberg Limits L.L %	Atterberg Limits P.L %	Atterberg Limits P.I %	%pass sieve #200	N.M.C %	γ_b KN/m³	γ_d KN/m³	Shear Strength Ø (deg)	Shear Strength C kN/m²	SPT Result Blows for inch 6	3	3	3	3	N Value	Remarks
1.0			Light brown silty clay of low plasticity	CL	30	17	13	50.72	7.30											
2.0					35	17	18	39.29	4.97											
3.0					30	16	14	24.23	4.59											

Bottom of borehole @ 3.0m

Undisturbed Soil Sample UDS

Disturbed Soil Sample of SPT

Legend

Clay - high plasticity

Sand

Clay - low plasticity

Silt - low plasticity