

**[7] Pre-marking, Control Point Survey, Simple Leveling**

Before aerial photography, pre-marking will be done on the checked and selected control points in the target area. The point distribution will be prepared and consulted with counterpart.

- Pre-marking

The Pre-marking and pricking refers to establishing markers or performing pricking at control points and distinct point on simple leveling route required for aerial triangulation and marking the locations on aerial photographs or other material such as satellite images.

The Pre-marking and pricking shall be planned in view of aerial triangulation and digital plotting.

- Pricking

Pricking refers to “pricking the locations of control points”, etc. directly on aerial photographs or other materials such as satellite images. If pricking of control points cannot be performed directly on an aerial photo or other materials such as satellite images, or if it is advantageous to set an eccentric point at a distinct location on an aerial photo, pricking shall be performed at the location of the eccentric point.

- Control Point Survey

Control Point Survey refers to the establishment of control points required for Aerial Triangulation and Digital Plotting processes based on the existing control points.

The establishment of control points shall be performed by using the GPS survey method.


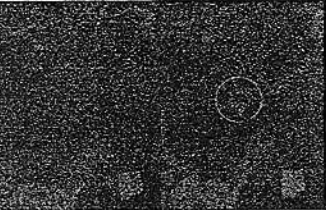



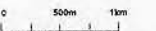

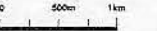
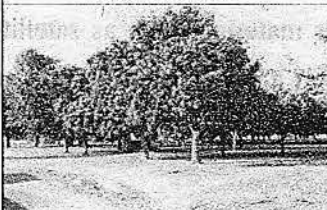
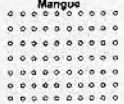


- Simple Leveling

Simple Leveling refers to the establishment of height control points required for aerial triangulation processes based on the existing benchmarks. The pricking of staff points and selection of points will refer to “pricking”.

*[Handwritten signature]*  
*[Handwritten mark]*

**[8] Interpretation Key**

In order to secure the Digital Plotting work quality, Interpretation Key will be produced by using of aerial photographs and/or satellite imagery. Filed objects for Interpretation Key will be selected before work starts. Sample of Interpretation Key is as follows.

Interpretation Key		Interpretation Key	
		Date: March 1999	
Name of Map Symbol : 5.30_Plantation Feature Code:		Name of Map Symbol : 5.21_Rice field Feature Code:	
Existing Map 	Stereoscopic Aerial Photographs (L) (R) 	Existing Map 	Stereoscopic Aerial Photographs (L) (R) 
Scale : 1:250,000 	Photo No. L2-09 Flight date : Dec.1998 Photo No. L2-10 Scale : 1:25,000 	Scale : 1:200,000 	Photo No. L1-18 Flight date : Dec.1998 Photo No. L1-19 Scale : 1:25,000 
Terrestrial Photograph 	Symbol <b>Mangue</b> 	Terrestrial Photograph 	Symbol 
Description On the aerial photograph the object is seen as a gray color with some dots formed in line on rectangular field.		Description On the aerial photograph the object is not clearly seen. However, with the use of a stereoscopic viewing it can be identified as some cross stripes on a gray background.	

Sample of Interpretation Key

*Handwritten signature and date: 21*

**[9] Field Verification**

Field Verification refers to the verification of the boundary, place, and other geographical names in the field using materials created or provided with the approval by counterpart as well as the verification of important items represented in output for compiled data or topographic map data

**[10] Digital Compilation after Field Verification**

Digital Compilation after Field Verification refers to the execution of the completion processing such as adding the results of Field Verification to compiled data and correcting them in order to create compiled and topographic map data that include the results of Field Verification.

**<Work in Japan>**

**[11] Aerial Triangulation, DEM Acquisition, Ortho-photo Production**

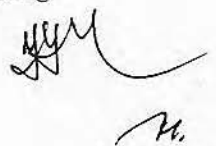
- Aerial Triangulation  
Aerial Triangulation will be performed with scanned photograph data, result of control point and Simple Leveling by using of work-station and bundle adjustment software.
  
- DEM Acquisition  
By using of the result of Aerial Triangulation, DEM (Digital Elevation Model) will be generated with stereo-matching method for ortho-photo.
  
- Ortho-photo Production  
A scale of 1:10,000 ortho-photo will be produced for the study area includes water pump station and water pipeline by means of generated DEM data. After generation of orthotphoto, contour line data will be consolidated.

**[12] Digital Plotting**

Ground objects and topographic features in spatial model digitally structured by stereo pair of aerial photograph data will be plotted and expressed on each layers. Individual feature and object data will be categorized, distributed and saved into each layer. Contour line data will be acquired prior to other field objects in order to consolidate with ortho-photo data.

**[13] Digital Compilation**

Digital Compilation will be carried out on the digital plotting data. The works include data amendment, annotation of geographical names and other items not modified on digital plotting stage.



#### **[14] Symbolization**

Digitally compiled data (point, line and polygon) will be symbolized to acquire the topographic map data to print out.

#### **[15] Creation of Data File**

Finalized topographic data will be checked for matching with work specification. Topographic data will be recorded certain format agreed with counterpart. Study team plans following 3 (three) data types format.

- KML data
- DXF file
- PDF file

### **3.2 Staffing**

The members of study team are listed below.

Name	Assignment	No.	Works
Takashi HARADA	Team Leader	(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16)	Adjustment and analysis of collected data Preparation of Inception Report Consultation of Inception Report Field Reconnaissance Consultation of Work Specification Aerial Photography Pre-marking, Control Point Survey, Simple Leveling Interpretation Key Field Verification Digital Compilation after Field Verification Aerial Triangulation, DEM production, Ortho-photo Production Digital Plotting Digital Compilation Symbolization Creation of Data File Final Report
Kentaro USUDA	Interpretation key Simple leveling Pre-marking Control point survey Field verification Digital compilation of F.V	(4) (5) (7) (8) (9) (10) (16)	Field Reconnaissance Consultation of Work Specification Pre-marking, Control Point Survey, Simple Leveling Interpretation Key Field Verification Digital Compilation after Field Verification Final report
Nobuteru MATSUSHITA	Field verification Digital compilation of F.V.	(9) (10)	Field Verification Digital Compilation after Field Verification
Yuji OUCHI	Coordinator		

### 3.3 Equipment to be used

Main equipment to be used for the Study is as follows.

No.	Equipment	Description	Quantity
1	Large Sized Printer	A0 size	1 set

*Handwritten signature*  
*Handwritten mark*

**4. Study and Staffing Schedule**

The study is planned to be conducted from October 2008 to April 2009. The Work Schedule of the Study is shown in page 18 and Staffing Schedule in page 19.

*[Handwritten signature]*  
*[Handwritten initials]*

## Work Schedule

Work Items	year/month	1	2	3	4	5	6	7
		2008			2009			
		10	11	12	1	2	3	4
<b>1. Work in Japan</b>								
(1)	Data collection	—						
	Adjustment and analysis of collected data	—						
	Preparation of tender document	—						
	Preparation of Work Specification	—						
(2)	Inception report	—						
<b>2. Work in Libeira</b>								
(3)	Consultation of Inception report		△△					
(4)	Field reconnaissance		■					
(5)	Consultation of work specification		■					
(6)	Aerial photography		■					
(7)	Pre-marking, control point survey, simple leveling		■					
(8)	Interpretation key			■				
(9)	Field verification					■		
(10)	Digital compilation after field verification						■	
<b>3. Work in Japan</b>								
(11)	Aerial triangulation, DEM creation, Orthophoto production				□			
(12)	Digital plotting				□			
(13)	Digital compilation after field verification				□			
(14)	Symolization							□
(15)	Creation of data file							□
(16)	Final report							□

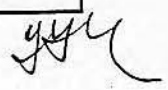

Legend. — Preliminary study    ■ Work in Libeira    □ Work in Japan

*Handwritten signature*



### Staffing Schedule

	Assignment	Name	1	2	3	4	5	6	7	
			2008			2009				
			2008(fiscal year)							2009(fiscal year)
			10	11	12	1	2	3	4	
Works in Liberia	1	Team Leader	Takashi HARADA							
	2	Pre-marking, control point survey, simple leveling	Kentaro USUDA							
	3	Field verification, Digital compilation	Kentaro USUDA							
	4	Field verification, Digital compilation	Nobuzeru MATSUSHITA							
	5	Coordinator	Yuji OUCHI							
Report				IC/R ▲					F/R ▲4/13	
			10	11	12	1	2	3	4	



## 5. Reports and Deliverables

Reports and Deliverables are as follows.

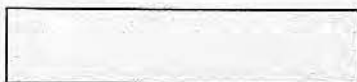
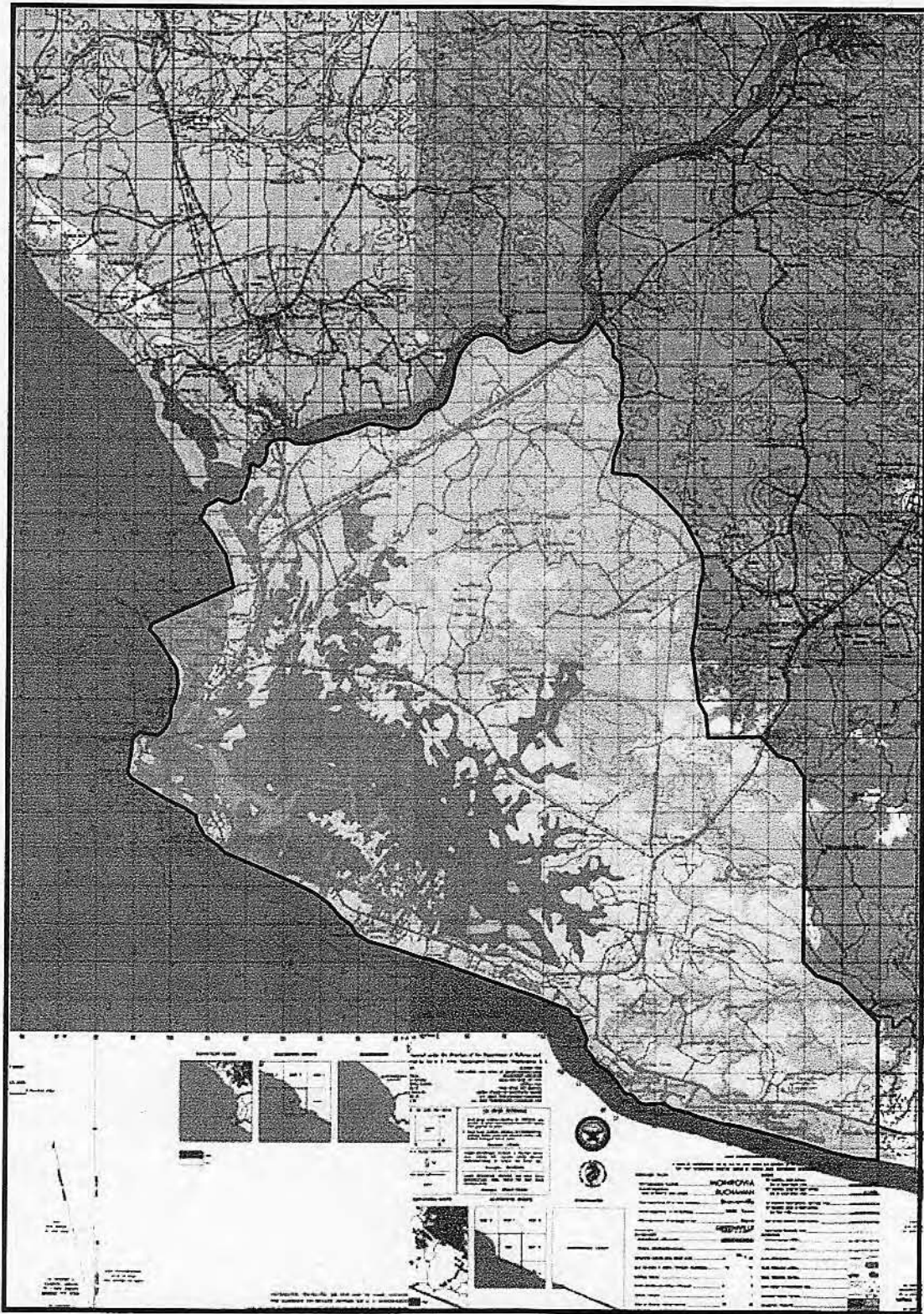
### (1) Reports

- 1) Inception Report : 3 sets
- 2) Final Report
  - Main Report : 3 sets
  - Summary : 3 sets

### (2) Final Result (Topographic Map Data and others)

- 1) Aerial Photography
  - Negative Film : 1 set
  - Digital Data File : 1 set
  - Contact Print : 1 set
  - Flight Index Map : 1 set
- 2) Field Survey
  - Survey Result : 1 set
- 3) 1:10,000 Topographic Map
  - Topographic Map Data : 5 sets
- 4) 1:10,000 Ortho-photo
  - Ortho-photo Data : 5 sets

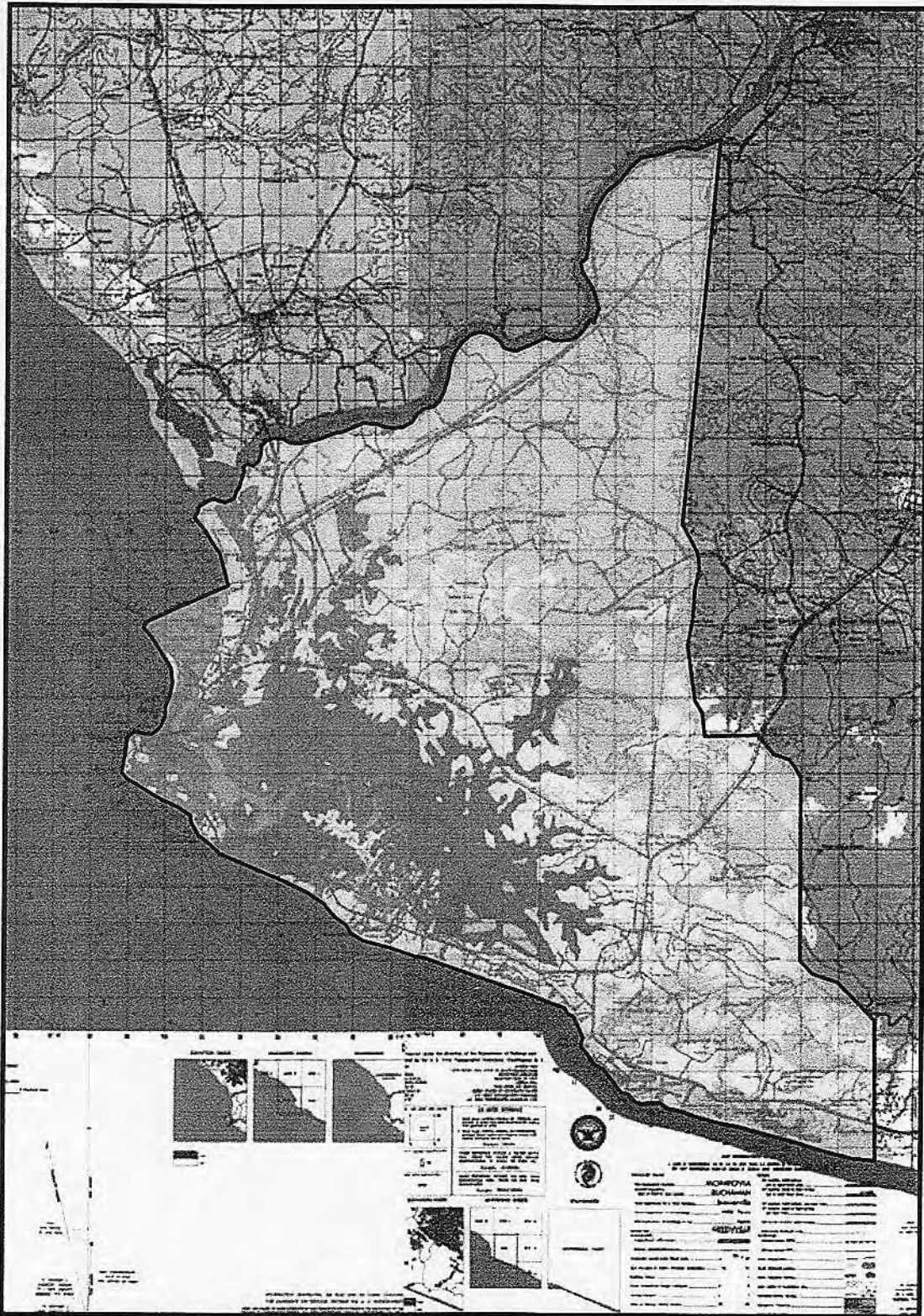
THE MASTER PLAN STUDY ON URBAN FACILITIES RESTORATION AND  
IMPROVEMENT IN MONROVIA  
TOPOGRAPHIC MAPPING AREA



Project Area for Topographic Mapping: 240km<sup>2</sup> approx.

*[Handwritten signature]*  
*[Handwritten initials]*

THE MASTER PLAN STUDY ON URBAN FACILITIES RESTORATION AND  
IMPROVEMENT IN MONROVIA  
**AREA FOR  
AERIAL PHOTOGRAPHY AND ORTHOPHOTO PRODUCTION**





Area for Aerial Photography, Orthophoto: 265km<sup>2</sup> approx.

*Handwritten signature and initials.*

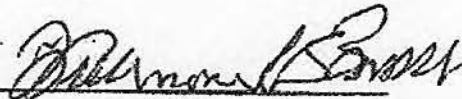
**SCOPE OF WORK  
FOR  
THE MASTER PLAN STUDY ON  
URBAN FACILITIES RESTORATION AND IMPROVEMENT  
IN MONROVIA**

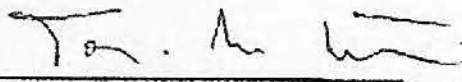
**AGREED UPON  
BETWEEN  
THE GOVERNMENT OF LIBERIA,  
(MINISTRY OF PUBLIC WORKS)  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)  
Monrovia,  
11<sup>th</sup> June, 2008**

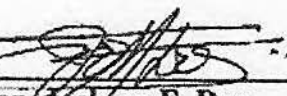
  
**Hon. Loseni Dunzo**  
Minister,  
Minister of Public Works

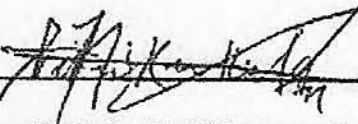
  
**Mr. Masahiko Suzuki**  
Leader,  
Preparatory Study Team,  
Japan International  
Cooperation Agency (JICA)


(Witness by)

  
**Ambassador William V.S. Bull**  
Acting Minister,  
Ministry of Foreign Affairs

  
**Hon. Toga G. McIntosh**  
Minister,  
Ministry of Planning and Economic  
Affairs

  
**Hon. Jackson E. Doe**  
Minister  
Ministry of Transport

  
for  
**Hon. Ophelia Hoff-Saytumah**  
Mayor  
Monrovia City Corporation

  
for  
**Hon. N. Hun-Bu Tulay**  
Managing Director,  
Liberia Water and Sewer Corporation





## I. INTRODUCTION

In response to the request of the Government of the Republic of Liberia (hereinafter referred to as "GOL"), the Government of Japan (hereinafter referred to as "GOJ") has decided to conduct "The master plan study on Urban Facilities Restoration and Improvement in Monrovia" (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the technical cooperation program of GOJ, will undertake the Study in close cooperation with the concerned authorities of GOL.

The present document sets forth the scope of work with regard to the Study.

The sectors covered by the Study are listed on the Scope of the study (Section IV).

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To develop the 10 years master plan including 5year restoration plan on urban facilities.
2. To carry out relevant technology transfer to Liberian counterpart personnel in the course of the Study

## III. STUDY AREA

The Study will cover entire the city of Monrovia and adjoining areas such as Paynesville, and Johnsonville as shown in APPENDIX 1.

## IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study shall cover the following activities:

1. Review and analysis of the present situation
  - 1-1. To review existing laws, regulations, policies and institutional arrangements related to urban facilities restoration and improvement
  - 1-2. To review on-going projects/plans
  - 1-3. To collect and analyze necessary data of the presents situation for the Study
  - 1-4. To evaluate the present conditions of urban facilities for urban restoration and improvement
2. Preparation of digital topographic maps
3. Formulation of the vision for Monrovia Urban Development
4. Formulation of Monrovia Urban Facilities Development Strategies
5. Formulation of Monrovia Urban Facilities Development Plan
  - 5-1 To formulate 5years restoration programs/projects to cope with urgent and priority issues
    - 5-1-1 Road and Road facilities
    - 5-1-2 Water supply system
    - 5-1-3 Sewage system
    - 5-1-4 Drainage system
  - 5-2 To formulate 10years development programs/projects
    - 5-2-1 Road and Road facilities
    - 5-2-2 Water supply system
    - 5-2-3 Sewage system
    - 5-2-4 Drainage system
6. Formulation of the implementation/management plan
7. Formulation of a capacity development plan necessary for implementation/management of the programs/projects
8. Technical/knowledge transfer through the implementation of the Study

9. Overall evaluation and recommendation.

**V. STUDY SCHEDULE**

The Study will be carried for approximately 14 months as shown in APPENDIX 2.

**VI. REPORTS**

JICA shall prepare and submit the following reports in English to GOL.

Inception Report:

Thirty (30) copies in English at the commencement of the Study.

Interim Report:

Thirty (30) copies in English within seven (7) months after the commencement of the Study.

Draft Final Report:

Thirty (30) copies, same number of copies of executive summary in English within twelve (12) months after the commencement of the Study

The authorities concerned with the Study in the Republic of Liberia will provide written comments within one (1) month after receiving the report.

Final Report:

Thirty (30) copies, same number of copies of executive summary in English and a digital file copy. Within one (1) month after the receiving of the written comments from Liberian side on preceding Draft Final Report

**VII. UNDERTAKING OF GOL**

1. To facilitate the smooth implementation of the Study; GOL shall take necessary measures:
  - (1) To permit the members of the Team to enter, leave and sojourn in Republic of Liberia duration of their assignments therein and exempt them from foreign registration requirements and consular fees for the implementation of the Study;
  - (2) To exempt the members of the Team from taxes, duties and any other charges on equipment, machinery and other material brought into and out of the Republic of the Liberia for the implementation of the Study;
  - (3) To exempt the members of the Team from income taxes and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the team for their services in connection with the implementation of the Study; and
2. GOL shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the team.
3. GOL shall, at its own expense, provide the Team with the following, in cooperation with other organizations concerned:
  - (1) Security-related information as well as measures to ensure the safety of the Team;
  - (2) Information on as well as support in obtaining medical service;
  - (3) Available data (Including maps) and information related to the Study;
  - (4) Counterpart personnel; and
  - (5) Credentials or identification cards.

**VIII. UNDERTAKING OF JICA**

鈴木  
E  
JCS  
MED/HR  
P  
A  
S  
YU

For the implementation of the Study, JICA shall dispatch, at its own expense, the Team to the Republic of the Liberia.

**IX. OTHERS**

JICA and GOL shall consult with each other in respect of any matter that may arise from or in connection with the Study.

APPENDIX 1 Study Area

APPENDIX 2 Tentative Study Schedule

鈴木

Te

9/25

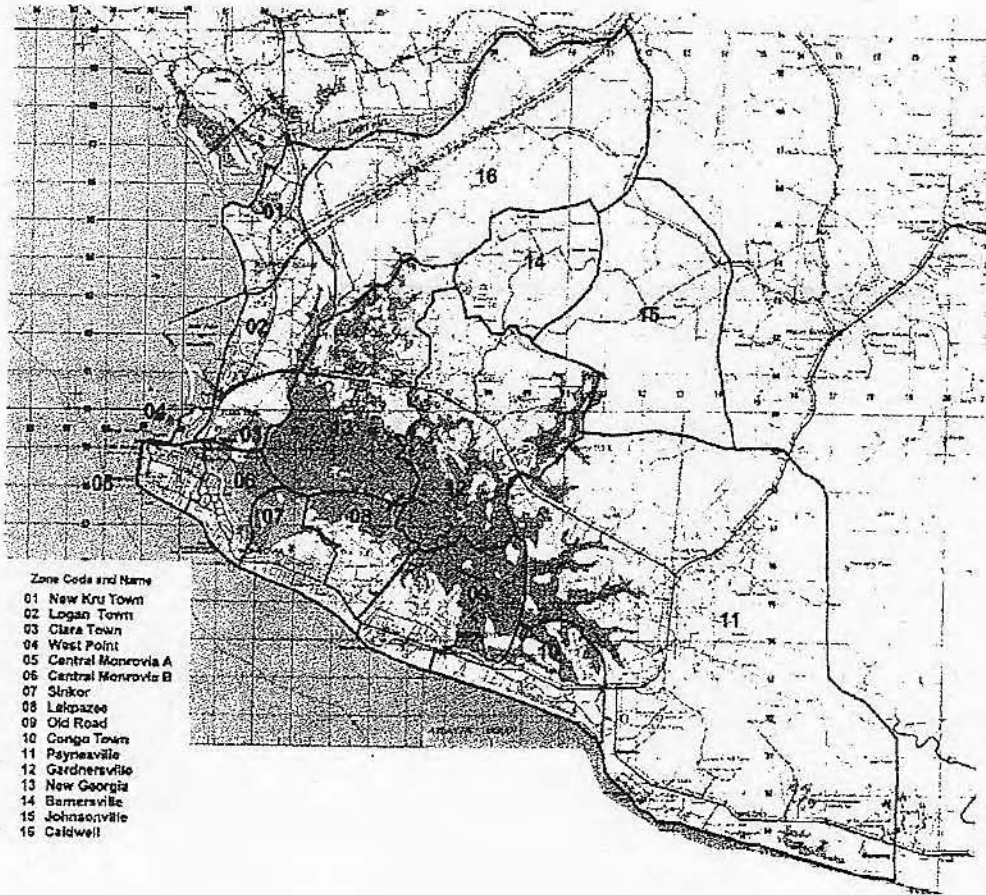
*[Handwritten signatures and initials]*

*[Handwritten signature]*

*[Handwritten mark]*



APPENDIX I



Greater Monrovia Administrative Boundaries Zones



Zone boundary

Printed under license by the Government of Liberia



Map scale 1:50,000  
Map projection: UTM

Data source: Greater Monrovia Administrative Boundaries, Ministry of Planning and Economic Affairs, 1998

Boundaries indicated by the numbers 01-16 are not to be used for any other purpose without the written consent of the Housing Improvement Centre for Liberia.

HIC Logo: Housing Improvement Centre for Liberia  
P.O. Box 217  
Monrovia, Liberia



- Zone Code and Name
- 01 New Kru Town
  - 02 Logan Town
  - 03 Clara Town
  - 04 West Point
  - 05 Central Monrovia A
  - 06 Central Monrovia B
  - 07 Sinkor
  - 08 Lokozae
  - 09 Old Road
  - 10 Congo Town
  - 11 Payneville
  - 12 Gardnersville
  - 13 New Georgia
  - 14 Barmersville
  - 15 Johnsonville
  - 16 Caldwell

鈴木

Te

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*

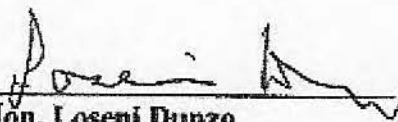
*[Handwritten signature]*



**MINUTES OF MEETINGS ON  
SCOPE OF WORK  
FOR  
THE MASTER PLAN STUDY ON  
URBAN FACILITIES RESTORATION AND IMPROVEMENT  
IN MONROVIA**


**AGREED UPON  
BETWEEN  
THE GOVERNMENT OF LIBERIA,  
(MINISTRY OF PUBLIC WORKS)  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY**


**Monrovia,  
11<sup>th</sup> June, 2008**


  
**Hon. Loseni Dunzo**  
Minister,  
Minister of Public Works

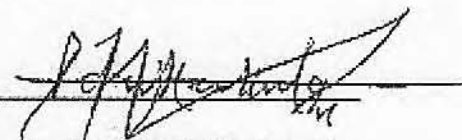
  
**Mr. Masahiko Suzuki**  
Leader,  
Preparatory Study Team,  
Japan International  
Cooperation Agency (JICA)


(Witness by)

  
**Ambassador William V.S. Bull**  
Acting Minister,  
Ministry of Foreign Affairs

  
**Hon. Toga G. McIntosh**  
Minister,  
Ministry of Planning and Economic  
Affairs

  
**Hon. Jackson E. Doe**  
Minister  
Ministry of Transport

  
for  
**Hon. Ophelia Hoff-Saytumah**  
Mayor  
Monrovia City Corporation

  
for  
**Hon. N. Hun-Bu Tulay**  
Managing Director,  
Liberia Water and Sewer Corporation



## INTRODUCTION

In response to the request of the Government of the Republic of Liberia (hereinafter referred to as "GOL"), the Government of Japan (hereinafter referred to as "GOJ") has dispatched the preparatory study team (hereinafter referred to as "the Team") headed by Mr. MASAHIKO SUZUKI to discuss and conclude the scope of work (S/W) for "The Master Plan Study on Urban Facilities Restoration and Improvement in Monrovia" (hereinafter referred to as "the Study").

The Team had a series of discussions with the representatives from Ministry of Public Works (hereinafter referred to as "MPW") and related ministries and agencies. Participants of the discussions are listed in APPENDIX 1.

This document summarizes major items discussed and remarks expressed by both sides, and is meant to supplement the S/W.

### 1. Study Title

Both sides agreed that the Study is titled as "The Master Plan Study on Urban Facilities Restoration and Improvement in Monrovia".

### 2. Steering Committee

Both sides agreed that the Steering Committee should be set up to facilitate the Study and review papers submitted by the Team. The Steering Committee will comprise the following ministries and agencies with possible inclusion of others if necessary. MPW shall provide JICA the names of the members of the Steering Committee before the commencement of the Study.

Chair:	Ministry of Public Works
Vice Chair:	Ministry of Planning and Economic Affairs
Member:	Ministry of Foreign Affairs
	Ministry of Transport
	Monrovia City Corporation
	Liberia Water and Sewer Corporation

Both sides also agreed to set up a working group which will consist of counterparts of each ministry and agency based on the themes/sectors to cooperate with the Study.

### 3. JICA guidelines for Environmental and Social Considerations

The Team explained the outline of the JICA guidelines and the need of compliance in the implementation of the Study. Both sides agreed to work together to adopt the approach specified by the guidelines in addition to the adoption of the Liberian Environmental Law.

### 4. Study Schedule

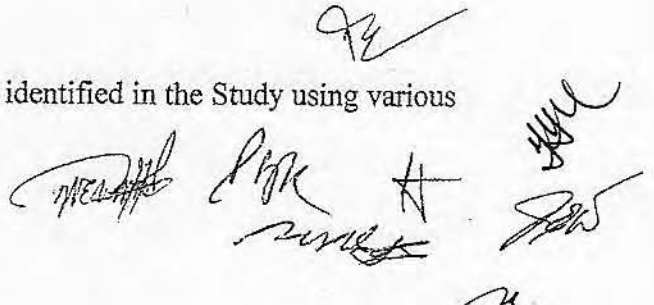
Liberian side requested that the Study period should be short due to urgent needs to coordinate various urban facilities' restoration projects and the Study should cover various sectors due to serious damage on them. Both sides agreed on the Study schedule and the sectors covered by the Study as noted in the S/W in response to the request. Both sides also agreed that the methods and procedure of the Study would be decided in accordance with the schedule of the Study.

### 5. Coordination between the Study and other donor activities

Liberian side mentioned importance of coordination between the Study and other donor activities such as World Bank, GTZ, etc.

### 6. Utilization of the Master Plan

Both sides confirmed that it is important to implement projects identified in the Study using various



resources such as Liberian Reconstruction Trust Fund.

## 7. Map

### (1) Utilization of the existing maps

It is agreed that digital topographic maps would be prepared utilizing existing maps from the Ministry of Land, Mines and Energy.

### (2) Copyright

Both sides agreed that GOL and JICA hold the copyright of the digital topographic map which would be prepared in the Study.

### (3) Preparation

The Team explained that preparation of digital topographic maps could start independently prior to the commencement of the study on the Master Plan.

## 8. Capacity Development Plan

Liberian side mentioned that capacity development plans are necessary for various sectors. The Team emphasised the necessity of capacity development in the road and water sectors. Both sides agreed that the priority areas for the capacity development plan would be determined in the course of the Study.

## 9. Harmonization with policies on settlement

Both sides recognized the importance of harmonization of the Master Plan with Liberian policies on settlement including programs on IDPs and refugees.

## 10. Information Disclosure

Both sides agreed that JICA will disclose the results of the Study after the Study is completed.

## 11. Security arrangements

Both sides confirmed that Liberian side will arrange security protection including police escort, if necessary, for the Study team during conduct of the Study.

## 12. Office Space and Equipment

MPW confirmed provision of office space with basic equipment such as electricity, internet connection for the Study team.

APENDIX 1 List of Participants

鈴木

A collection of handwritten signatures and initials in black ink, located in the bottom right corner of the page. The signatures are somewhat stylized and difficult to read, but appear to be from multiple individuals.



## List of Participants

### ■ Liberian side

#### ● Ministry of Public Works

Hon. Loseni Dunzo	Minister, Ministry of Public Works
Ms. Bindu Brewer	Coordinator-Planning, Ministry of Public Works
Mr. Ambrose C. Wureh	Technical Assistant, Ministry of Public Works
Mr. Christian Herbert	Consultant / Transport, Ministry of Public Works
Mr. Manfred A. Verdier	Consultant / Electromechanical, Ministry of Public Works
Mr. David L. Wiles	Environmentalist, Ministry of Public Works
Mr. Emmanuel S. Nimely	Project Officer, Ministry of Public Works
Mr. Paul M. Deowoco	Traffic Chief, Ministry of Public Works
Mr. O. P. Shepherd	Urban Planner, Ministry of Public Works

#### ● Ministry of Foreign Affairs

Ambassador William V.S. Bull	Acting Minister, Ministry of Foreign Affairs
------------------------------	--

#### ● Ministry of Planning and Economic Affairs

Hon. Toga G. McIntosh	Minister, Ministry of Planning and Economic Affairs
Hon. Simeon M. Moribah	Deputy Minister, Ministry of Planning and Economic Affairs

#### ● Ministry of Transport

Hon. Jackson E. Doe	Minister, Ministry of Transport
Mr. D Erasmus Gongar	Director for Special Project, Ministry of Transport

#### ● Monrovia City Corporation

Mr. Daniel Y. Zawu	Monrovia City Corporation
Mr. Peter Kerkulah	Executive Assistant to the Mayor, Monrovia City Corporation

#### ● Liberia Water and Sewer Corporation

Hon. N. Hun-Bu Tulah	Managing Director, Liberia Water and Sewer Corporation
Mr. William E. D. Warner	Deputy Managing Director / Technical Services

### ■ Japanese side

Mr. Masahiko Suzuki	Leader, Preparatory Study Team
Mr. Hitoshi Ara	Member, Preparatory Study Team
Mr. Kazunori Matsui	Member, Preparatory Study Team
Ms. Miho Nakano	Consultant, Preparatory Study Team
Mr. Hiroataka Sato	Consultant, Preparatory Study Team
Mr. Takeshi Yoshida	Consultant, Preparatory Study Team
Mr. Isamu Kikuchi	Resident Representative, JICA Liberia
Mr. Yukinari Tanaka	Assistant Resident Representative, JICA Ghana Office

鈴木

Handwritten signatures and initials at the bottom right of the page.