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## **1. Member List of the Survey Team**

1. Leader (for First and Second Works in Cambodia):  
Mr. Masahiro UEKI,  
Advisor, Water Resources Management Division 1, Water Resources and Disaster Management Group, Global and Environment Department, JICA
2. Leader (for Third Work in Cambodia):  
Mr. Takahiro IKENOUE,  
Advisor, Grant Aid Project Management Division 3,  
Financing Facilitation and Procurement Supervision Department, JICA
3. Cooperation Planning:  
Mr. Genya NAKAMURA,  
Water Resources Management Division 1, Water Resources and Disaster Management Group, Global and Environment Department, JICA
4. Chief Consultant/ Water Supply Planning Specialist:  
Mr. Takehiko OGA,  
Director, Overseas Services Department, Nihon Suido Consultants
5. Water Sources Specialist:  
Mr. Takashi FURUKAWA,  
Senior Chief Engineer, Water Resources Management Division,  
CTI Engineering International
6. Water Supply Facilities Designer (Intake/Raw Water Conveyance):  
Mr. Hideki KONNO,  
Water Resources Management Division, CTI Engineering International
7. Water Supply Facilities Designer (Water Treatment Plant):  
Mr. Hideharu KIKUCHI,  
Overseas Services Department, Nihon Suido Consultants
8. Water Supply Facilities Designer (Transmission/Distribution ):  
Mr. Hideo ISHII,  
Manager, International Project Division, International Project Department,  
Water and Sewer Bureau, City of Kitakyushu
9. Construction Plan / Cost Estimation Specialist:  
Mr. Naoto TAKATOI,  
Overseas Services Department, Nihon Suido Consultants
10. Environmental & Social Considerations Specialist:  
Mr. Daisaku KIYOTA,  
Water Resources Management Division, CTI Engineering International
11. O&M Organization Specialist:  
Mr. Masashi YAYAMA,  
International Project Division, International Project Department  
Water and Sewer Bureau, City of Kitakyushu,

12. Water Sources Specialist:  
Mr. Toshihiro GOTO,  
Water Resources Management Division, CTI Engineering International
13. Coordinator:  
Mr. Yoshinobu NAKAJIMA,  
Overseas Services Department, Nihon Suido Consultants,

## 2. Survey Schedule

### (1) Survey Schedule for the First Works in Cambodia

Day & Date	Wednesday	Mr. Ueki	Mr. Nakamura	Mr. Oga	Mr. Furukawa	Mr. Kono	Mr. Khuchi	Mr. Ishii	Mr. Takano	Mr. Kiyota	Mr. Yajima	Mr. Goto	Mr. Nakajima
1	2012/6/3	Sun	NRT -> BKK 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	11:35 FUK -> 14:55 BKK (TG649) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)
2	2012/6/4	Mon	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM	AM: Inception Meeting with MIME PM: Meeting with MOWRAM
3	2012/6/5	Tue	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME	AM: Meeting with KMC WWs PM: Meeting with DIME
4	2012/6/6	Wed	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME	AM: Meeting with PWSA PM: Meeting with MIME
5	2012/6/7	Thu	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)	AM: Meeting with MIME (ICR)
6	2012/6/8	Fri	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB	Meeting with BTB WWs, Site Visit to BTB
7	2012/6/9	Sat	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB	Site Visit to BTB
8	2012/6/10	Sun	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis	Data Collection & Analysis
9	2012/6/11	Mon	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME	Signing of M/D at MIME
10	2012/6/12	Tue	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office	AM: Visit to Embassy of Japan PM: Visit to JICA Office
11	2012/6/13	Wed	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)	20:25 PNH - 21:30 BKK (TG585)
12	2012/6/14	Thu	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo	Tokyo
13	2012/6/15	Fri											
14	2012/6/16	Sat											
15	2012/6/17	Sun											
16	2012/6/18	Mon											
17	2012/6/19	Tue											
18	2012/6/20	Wed											
19	2012/6/21	Thu											
20	2012/6/22	Fri											
21	2012/6/23	Sat											
22	2012/6/24	Sun											
23	2012/6/25	Mon											



## (2) Survey Schedule for the Second Works in Cambodia

Days/Date/Weekday			Mr. Ueki	Mr. Nakamura	Mr. Oga	Mr. Konno	Mr. Ishii	Mr. Takatani	Mr. Kikuchi	Mr. Nakajima	
1	2012/8/21	Tue						12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)			
2	2012/8/22	Wed						Data Collection Meeting with Sub-contractor			
3	2012/8/23	Thu						Data Collection & Analysis			
4	2012/8/24	Fri						Data Collection Meeting with Sub-contractor			
5	2012/8/25	Sat						Data Collection & Analysis			
6	2012/8/26	Sun	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	11:35 FUK -> 14:55 BKK (TG649) 18:15 BKK -> 19:25 PNH (TG584)	Data Collection & Analysis		12:00 NRT -> 16:30 BKK (TG643) 18:15 BKK -> 19:25 PNH (TG584)	
7	2012/8/27	Mon	Meeting with MIME, Visit to JICA Office								Meeting with MIME
8	2012/8/28	Tue	Official Works		Meeting with MIME & MEF		Meeting with MIME	Data Collection & Analysis		Meeting with Sub-contractor	
			Visit to Embassy of Japan & JICA Office								
9	2012/8/29	Wed	20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->	20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->	Meeting with KMC WVs & Field Survey			Data Collection & Analysis			
10	2012/8/30	Thu	--> 08:10 NRT (TG642)	--> 08:10 NRT (TG642)	Meeting with KMC WVs & Field Survey						
11	2012/8/31	Fri			Data Collection & Analysis	KMC Field Survey	Data Collection & Analysis	Data Collection & Analysis			
12	2012/9/1	Sat			Data Collection & Analysis						
13	2012/9/2	Sun			Data Collection & Analysis						
14	2012/9/3	Mon			Data Collection & Analysis	BTB Field Survey			20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->	KMC Field Survey	
15	2012/9/4	Tue			BTB Field Survey				--> 08:10 NRT (TG642)		
16	2012/9/5	Wed			Meeting with BTB DIME & WVs	BTB Field Survey			BTB Field Survey		
17	2012/9/6	Thu			Meeting with MIME						
18	2012/9/7	Fri			Meeting with MOWRAM Data Analysis Meeting with Sub-contractor						
19	2012/9/8	Sat			Data Collection & Analysis	BTB Field Survey		Data Collection & Analysis	20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->		20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->
20	2012/9/9	Sun			Data Collection & Analysis			Data Collection & Analysis	--> 08:10 NRT (TG642)		--> 08:10 NRT (TG642)
21	2012/9/10	Mon			Meeting with MIME and TN Signing	KMC Field Survey					
22	2012/9/11	Tue			Data Collection & Analysis						
23	2012/9/12	Wed			Visit to JICA Office 20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->	BTB Field Survey		Visit to JICA Office Data Collection & Analysis			
24	2012/9/13	Thu			--> 08:10 NRT (TG642)	20:25 PNH -> 21:30 BKK (TG585) 23:50 BKK -->		Data Collection & Analysis			
25	2012/9/14	Fri				--> 08:10 NRT (TG642)		Meeting with MIME			
26	2012/9/15	Sat						Data Collection & Analysis			
27	2012/9/16	Sun						20:25 PNH -> 21:30 BKK (TG585)			
28	2012/9/17	Mon						00:50 BKK -> 08:00 FUK (TG648)			

(3) Survey Schedule for the Third Works in Cambodia

Days	Date/Weekday		Mr. Ikenoue Mr. Nakamura Mr.Oga	Mr. Konno	Mr.Takatoi	Mr. Ishi Mr. Yayama
1	2013/2/10	Sun	NRT→BKK→PNH			FUK→BKK→PNH
2	2013/2/11	Mon	Meeting with MIME			
			Meeting with MOWRAM		Data Collection & Analysis	
3	2013/2/12	Tue	Meeting with Battambang and Kampong Cham			
4	2013/2/13	Wed	Meeting with MIME, Battambang and Kampong Cham			
			Meeting with MOWRAM		Data Collection & Analysis	
5	2013/2/14	Thu	Discussion and Signing of M/D, Visit to JICA Office			
			Visit to Embassy of Japan		Data Collection & Analysis	
			PNH→BKK			
6	2013/2/15	Fri	BKK→NRT			BKK→FUK

### 3. List of Parties Concerned in the Recipient Country

#### Ministry of Industry, Mines and Energy(MIME)

- H.E. Mr. Phork SOVANRITH Secretary of State
- H.E. Mr. Meng Saktheara Director General, General Department of Industry
- Mr. Som SETHY Vice Chief of Regulation Office
- Mr. Tan SOKCHEA Director, Department of Portable Water Supply
- Mr. Heng Kunleang Director, Energy Development Department  
General Department of Energy

#### Ministry of Water Resources and Meteorology (MOWRAM)

- H.E. Mr. Veng SAKHON Secretary of State
- Mr. Mao HAK DDG of Technical Affair and Director, Department of Hydrology and River Works
- Mr. Uch HING Deputy Director Technical Service Center for Irrigation System and Meteorology
- Mr. Theng Tara Director Department Water Resource Management

#### Ministry of Water Resources and Meteorology Tonle Sap Authority

- H.E. Mr. Pich VEASNA Deputy Secretary General of Tonle Sap Authority  
Deputy Director General of Administration Affairs  
Director of Technical Service Center for Irrigation and Meteorology

#### Ministry of Public Works and Transport

- Mr. Chim PHALLA Director, International Cooperation Department
- Mr. Kong SOPHAL Deputy Director, International Cooperation Department

#### Ministry of Economy and Finance

- Mr. Sim SAMNANG Deputy Director of Resettlement Department
- Mr. Im SETHYRA Director of Resettlement Department

#### Ministry of Environment Environmental Impact Assessment Department

- Mr. Duong SAMKEAT Deputy Director

#### Kampong Cham Department of Industry, Mines & Energy

- Mr. Sudndy Director

#### Department of Land management, urban planning and construction of Kampong Cham Province

- Mr. Thoun CHETHA Dupty Director

#### Kampong Cham Waterworks

- Mr. Preap Somala Director
- Mr. Va Sam Aok Deputy Director
- Mr. Teng Savoeun Acting deputy director

#### Department of Industry, Mines & Energy of Battambang Province

- Mr.Chui CHHEANG Director

#### Department of Public Works and Transport of Battambang Province

- Mr. Chan Sambo Deputy Director of Public Works and Transport

#### BATTAMBANG Waterworks

- Mr. Touch CHHOUN SAORITH Director
- Ms. Tith LINDA Deputy Director
- Ms. Ith Kloeng Deputy Director
- Mr. Kai SO DA Deputy Director



4. Minutes of Discussions MINUTES OF DISCUSSIONS

OF THE PREPARATORY SURVEY

ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG  
CHAM AND BATTAMBANG WATERWORKS

In response to the request from the Government of the Kingdom of Cambodia (hereinafter referred to as "Cambodia", the Government of Japan decided to conduct a Project on Additional New Water Treatment Plants for Kampong Cham and Battambang Water Works (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Cambodia the Preparatory Survey Team ( hereinafter referred to as "the Team" ), which is headed by Mr. Masahiro Ueki, Advisor, Water Resources Management 1, Water Resources and Disaster Management Group, Global Environment Department, JICA, and is scheduled to stay in the country from June 3 to 13, 2012.

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

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

Phnom Penh, June 11th, 2012

榎本 雅浩

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Mr. Ueki Masahiro  
Team Leader  
Japan International Cooperation Agency



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H.E. Phork Sovanrith  
Secretary of State  
Ministry of Industry, Mines and Energy



## ATTACHMENT

### 1. Title of the Project

The title of the Project is "The Project on additional new water treatment plants for Kampong Cham and Battambang Waterworks."

### 2. Objective of the Project

The objective of the Project is to improve the water supply services in the cities of Kampong Cham and Battambang through the construction of new water treatment plants and water distribution system.

### 3. Project site

The sites of the Project are the cities of Kampong Cham and Battambang as shown in Annex-1.

### 4. Responsible and Implementing Agency

4-1. The Responsible Agency is Ministry of Industry, Mines and Energy (hereinafter referred to as "MIME").

4-2. The Implementing Agencies are Provincial Departments of Industry, Mines and Energy (hereinafter referred to as "DIME") in respective Provinces of Kampong Cham and Battambang.

### 5. Items requested by the Government of Cambodia

After discussions between the Cambodian side and the Team (hereinafter referred to as "the both sides"), the items described in Annex-2 were finally requested by the Cambodian side.

The both sides confirmed that the appropriateness of the request would be examined in accordance with the further studies and analysis, and the final components of the Project would be decided by both sides.

### 6. Japan's Grant Aid Scheme

6-1 The Cambodian side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-3.

6-2 The Cambodian side will take the necessary measures, as described in Annex-4, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

### 7. Schedule of the Survey

7-1 The consultant members of the Team will proceed with further studies in Cambodia until September, 2012.

7-2 JICA will prepare the draft outline design report in English and dispatch a mission in order to explain its contents to the Cambodian side around February 2013.

7-3 In case that the contents of the report are accepted in principle by the Cambodian side, JICA will finalize the report and send it to the Cambodian side around April 2013.



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7-4 The Cambodian side understands that execution of the Preparatory Survey (hereinafter referred to as "the Survey") does not necessarily imply the Japanese Government's commitment to the project implementation.

## **8. Other relevant issues**

The following issues were discussed and confirmed by both sides.

### **8-1. Phasing of Field Survey**

The Team explained that the field survey in Cambodia will be divided into the following two phases, especially to decide the scope of the Project in Battambang based on the availability of new water sources.

#### **1) Field Survey I (from Early June to Mid-July, 2012)**

- Confirmation of the necessity and appropriateness of the project requested by the Cambodian side
- Collection and analysis of the necessary information and data, especially the availability of new water sources in Battambang.
- Examination of the existing/planned water supply facilities and appropriate scale of the Project as a grant aid
- Explanation of the proposed scope of the Project

#### **2) Homework in Japan (from Mid-July to Mid-August 2012)**

- Examination of the scope of the Project

#### **3) Field Survey II (from Mid-August to Early September, 2012)**

- Explanation of the scope of the Project
- Implementation of the additional survey necessary for the design of facilities and cost estimation

### **8-2. Planning of the facilities**

- 1) The Team explained that the maximum utilization of existing facilities such as water treatment plant and production wells should be reasonably considered. Therefore, both sides confirmed that the capacity of new water treatment plants will be planned considering the capacity of existing water supply facilities.
- 2) Both sides agreed that the target year should be set at a few years after the expected timing of completion the Project, because the Japanese Grant Aid is deemed to be provided to meet urgent and short-term needs of the recipient country.
- 3) As for individual house connections, both sides agreed that necessity of provision of the materials such as water meters, pipes and necessary accessories will be considered in the Survey in order to assist the expansion of water supply to poor communities. Both sides also confirmed that Cambodian side will bear the cost for installation works thereof.

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### 8-3 Ensuring the land for construction of new water supply facilities

-Both sides agreed that the Cambodian side will clear the site completely including removing any remaining underground structures for ensuring the land to construct new water supply facilities, by the beginning of 2013.

-The Team explained that abbreviated resettlement plan will be prepared through the survey based on "Guideline for Environmental and Social Consideration". Then Cambodia side agreed to implement resettlement of residents in accordance with the abbreviated resettlement plan.

### 8-4. Social and Environmental Considerations

- 1) Both sides confirmed that the Team will assist the GOC to carry out the IEE according to the law and regulation related to the Environmental impact assessment in Cambodia.
- 2) The team explained that the environmental and social considerations studies would be conducted according to the JICA's Guidelines for Environmental and Social Considerations in order to examine the mitigation measures of impacts and monitoring plan during/after the implementation.

### 8-5. Tax exemption

The tax exemption including Value Added Tax (VAT), custom duty, and any other taxes in Cambodia which is to be arisen from the Project activities will be ensured by MIME. MIME will take any procedures necessary for tax exemption with the Ministry of Economy and Finance of Cambodia at its responsibility.

### 8-6. Overlapping with other projects

Both side confirmed that the on-going / proposed projects in 2 cities supported by other donor agencies, NGO, Cambodian official organization(s) and private sector should be carefully investigated to avoid overlapping with the Project. The Cambodian side agreed to provide necessary information on related projects.

### 8-7. Hydrological and meteorological data necessary for the Survey

Both sides confirmed that MIME will assist the Team to obtain hydrological and meteorological data which have been recorded by Ministry of Water Resources and Meteorology upon request from the Team.

Annex-1 Project Sites Map

Annex-2 Items Requested by the Cambodian Side

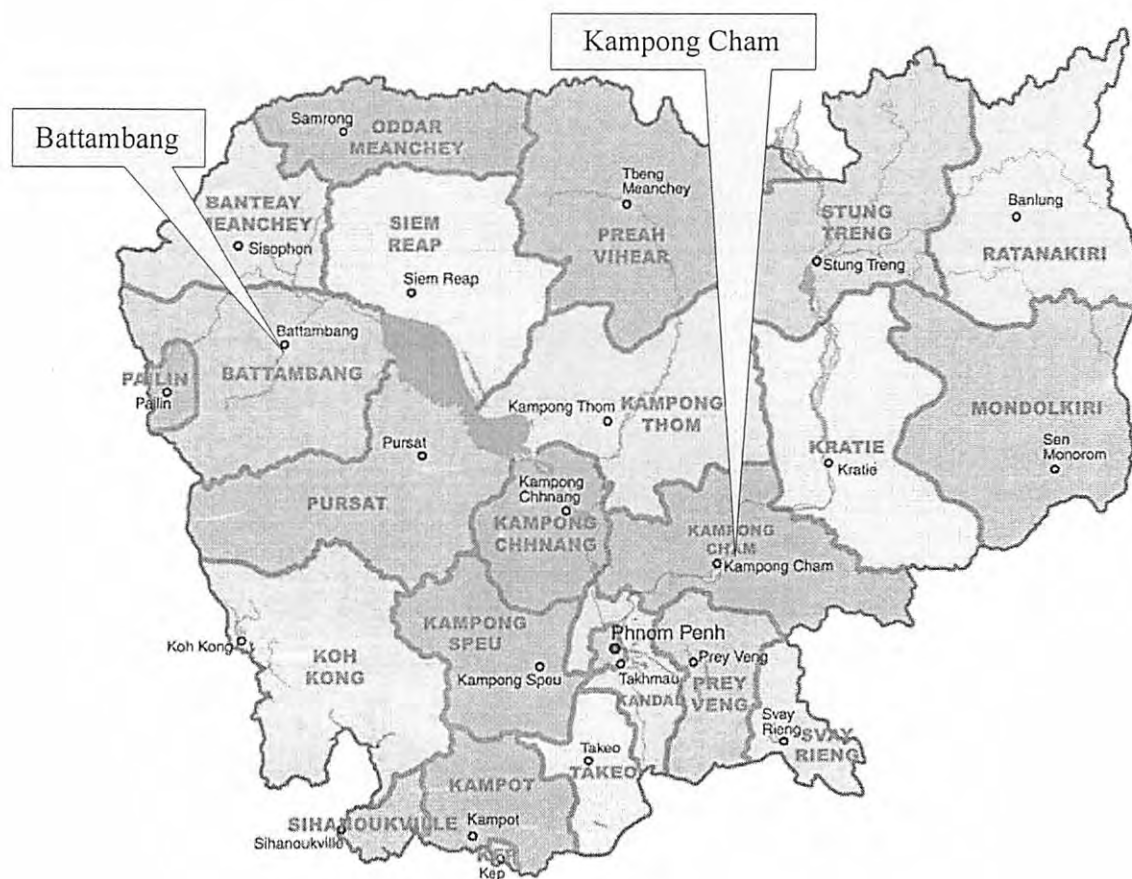
Annex-3 Japan's Grant Aid Scheme

Annex-4 Major Undertakings to be taken by Each Government

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Annex-1: Project Sites Map



Handwritten marks: a signature and the number 3.

Annex-2: Items Requested by the Cambodian Side

Item		Contents of Request	
		Kampong Cham City	Battambang City
Facility	Intake Pump Station and Pipe Line	No. of intake pumps: 3	No. of intake pumps: 3
		Area: 4,200 m2	Area: 20,000 m2
		Capacity: 20,000 m3/d	Capacity: 30,000 m3/d
	Water treatment plant	Treatment Process: flocculation, coagulation, sedimentation, rapid sand filtration	Treatment Process: flocculation, coagulation, sedimentation, rapid sand filtration
	Clear water transmission	WTP to elevated tank	WTP to elevated tank
	Expansion of Distribution Network	Length: approx. 60 km	Length: approx. 80 km
	Elevated tank	1 unit	1 unit
Equipment	Water quality analysis	Optical analyzer Distillation apparatus Reagents Glassware pH meter Turbidity meter UPS Others	Atomic absorption spectrophotometer Distillation apparatus Cultivator Microscope Reagents Glassware pH meter Turbidity meter UPS Others
	Maintenance Tools of Electrical and Mechanical	Electroscope Vibration checker Torque wrench Earth checker Insulation checker Database system for maintenance Other tools	Electroscope Power tester Digital recorder Vibration checker Torque wrench Handy flow meter Earth checker Insulation checker Filtration sand tester Database system for maintenance Other tools
	Accountant system	Hardware	Hardware, software
	Distribution Management tools	Leakage locating equipment Pipe locator Pipe laying Pipe network information system	Leakage locating equipment Pipe locator Pipe laying Pipe network information system
Others		Detailed design Construction supervision Soft component	Detailed design Construction supervision Soft component

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### Annex-3: 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

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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 aoutline 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 signed 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

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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

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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.

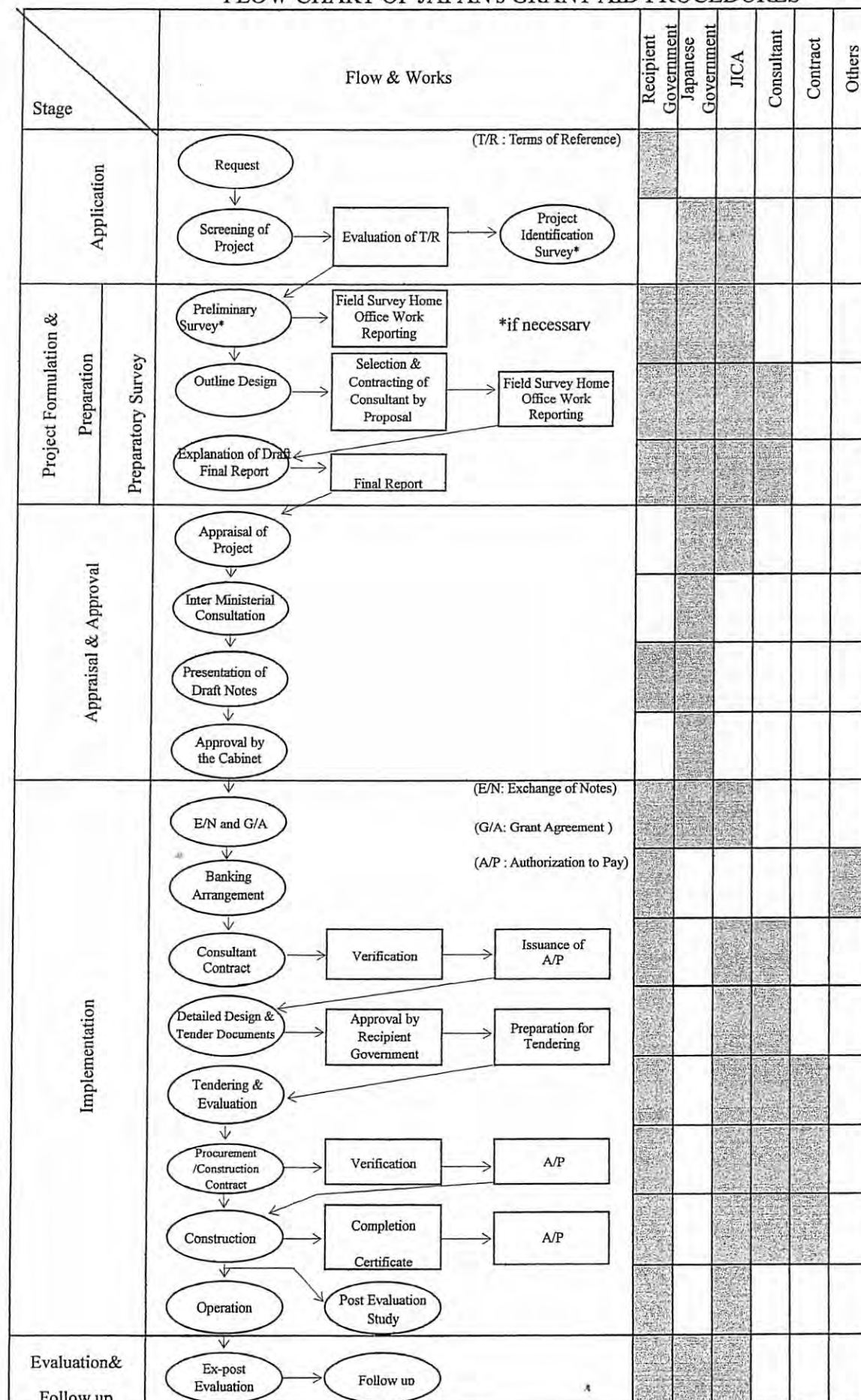
(10) Social and Environmental Considerations

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.

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## FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



#### Annex-4: 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 land necessary for the implementation of the Project and to clear the sites;		●
2	To ensure prompt customs clearance of the products and to assist internal transportation of the products in the recipient country		
	Marine (Air) transportation of the Products from Japan to the	●	
	1) 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	(●)	(●)
3	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		●
4	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		●
5	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
7	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		●
8	To give due environmental and social consideration in the implementation of the Project.		●

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

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MINUTES OF DISCUSSIONS  
OF THE PREPARATORY SURVEY (2ND FIELD SURVEY)  
ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS  
FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS  
IN THE KINGDOM OF CAMBODIA  
AGREED UPON BETWEEN  
MINISTRY OF INDUSTRY, MINES AND ENERGY  
AND  
JICA PREPARATORY SURVEY TEAM

Phnom Penh, August 29, 2012

榎本 雅浩

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Mr. Ueki Masahiro  
Team Leader, Preparatory Survey Team  
Japan International Cooperation Agency  
(JICA)  
Japan



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H.E. Meng Saktheara  
Director General  
General Department of Industry  
Ministry of Industry, Mines and Energy  
The Kingdom of Cambodia



JICA Preparatory Survey Team (hereinafter referred to as “the Team”) for the Project on Additional New Water Treatment Plants for Kampong Cham And Battambang Waterworks (hereinafter referred to as “the Project”) was dispatched to Cambodia from 26th August to 15th September, 2012. The Team held a series of discussions with the Ministry of Industry, Mines and Energy (hereinafter referred to as “MIME”) with the reports and presentation materials. MIME basically agreed on the contents of the report. The following items were also confirmed between both parties as the result of discussions.

The Team will proceed to further works and prepare the Outline Design Study Report.

## **1. Target Site of the Study**

- 1-1. The Team reported that the Japanese Government decided to continue the Study in both Kampong Cham and Battambang as the availability of new water sources in both cities are confirmed in the 1st field survey.
- 1-2. The Team explained the design capacity of new water treatment plant (hereinafter referred to as “WTP”) in both cities as shown in the report based on the preliminary estimation of future demand projection, design capacity of existing facilities and availability of new water sources. The Team emphasized and MIME understood that these estimations are subject to change based on the results for further works.

## **2. Demand Projection**

### **2.1. Target Year**

Both sides reconfirmed that the target year of the Project will be 2019, which is 3 years after the expected timing of completion of the Project.

### **2.2. Service Coverage Ratio**

MIME explained during the 1st field survey that the target service coverage ratio of the Project should be 84.8% in 2019, considering 1.2% annual increase (80% in 2015 based on the “National Strategic Development Plan” plus 4.8% for 4 years). In addition, MIME explained that, although the target service coverage ratio in 2019 is not decided by the Royal Government of Cambodia (RGC) yet, the discussion has been started in MIME to set it on 84.8% and it will be reflected in the Technical Assistance on update of current urban water supply policy funded by ADB. The Team understood the situation and agreed to set it on 84.8%

### **2.3. Leakage Ratio**

During the 1st field survey, MIME requested the Team to accept 2% allowance from the current leakage ratio (13%) in Kampong Cham in the target year. The Team explained that the leakage ratio in the additional service area covered by the Project is expected to be lower than current ratio. In addition, Kampong Cham waterworks is expected to repair the leakage

in order to maintain the current leakage ratio utilizing the know-how and experiences gained through the Capacity Building Project Phase 2. As a conclusion, both sides agreed to estimate the leakage ratio at 13% in the target year.

### **3. Availability of Water Sources in Battambang**

The Team explained to MIME the necessary raw water volume for water supply in Battambang (both existing and new WTP), estimated available water volume from Sangkae River in dry season, and actual available water volume from the river during most serious drought for past 11 years (occurred in 2005) as shown in the report prepared by the Team. Based on the actual water volume of the river in 2005, it is assumed that, during 10-year-or-more drought, raw water shortage would be occurred for 7 days in dry season when extracting raw water for both existing and new WTP. In addition, The Team explained that if another water extraction project is implemented in upper stream of Sangkae river, enough volume of raw water cannot be provided to WTPs. The Team also mentioned that some countermeasures such as a limitation of water supply and/or a negotiation with other river water users would be necessary when the raw water shortage occurs.

MIME understood the availability of water sources for water supply, and agreed on above explanation made by the Team.

### **4. Facilities Design**

#### **4.1. Water Conveyance in Battambang**

During 1st field survey, MIME requested the further study on new conveyance pipeline from the new water intake facility to the existing WTP. The Team replied that the diameter of conveyance pipeline must be larger to convey the raw water to both existing and new WTP, and it will raise the construction cost higher. So the Team explained and MIME agreed that the further study is not included in the Survey.

#### **4.2. Site for New WTP**

Both sides confirmed MIME's plan and progress to clear the site as follows:

- Battambang

Site clearance works will be carried out by Battambang DIME by June 2013.

- Kampong Cham

The small office for business section in existing elevated tank site will be demolished by Kampong Cham DIME by June 2013, and will be secured in the new administration building.

#### **4.3. Emergency Generator and Transformer**

MIME requested during 1st field survey to include emergency generator and transformer in the Project. MIME explained that according to the information from Electric Authority of

Cambodia, the substation of power supply in Kampong Cham is under construction and will start its services in the first quarter of year 2013 so that Kampong Cham will receive stable power supply. The Team replied that it would be included in the Project after the confirmation of future situation of power supply in both cities.

#### **4.4. Distribution System**

MIME requested to consider constructing elevated tank at the fringe of future service area instead of direct pump supply system. The Team pointed out that the acquisition of candidate site by the Cambodian side is not completed yet, and social and environmental consideration as well as topographic survey must be conducted after the land acquisition. The Team expressed that it is impossible to consider this request due to time constraint. MIME understood it and agreed to adopt direct pump supply system.

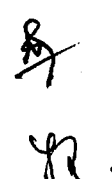
MIME requested the Team to conduct further study on the pro and con of integrated system and isolated system of new and existing distribution system. The Team will report the result of further study. For the purpose of leakage management, both sides agreed to adopt block system.

#### **5. Individual House Connections for Poor Family**

The Team requested MIME to provide the criteria used for the identification of poor family. MIME suggested that the criteria prepared under UN-Habitat project is applied in Kampong Cham while the criteria prepared in the on-going Grant Aid project is applied in Battambang. MIME promised to provide these criteria.

#### **6. Social and Environmental Consideration**

Both sides agreed to conduct further study on the proposed WTP site in Battambang to minimize the impact on social and environmental aspects. Both sides confirmed that if resettlement is required, JICA Guideline for Environmental and Social Considerations will be applied.

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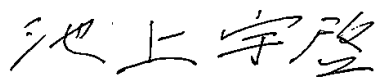
MINUTES OF DISCUSSIONS  
OF THE PREPARATORY SURVEY (OUTLINE DESIGN)  
ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR  
KAMPONG CHAM AND BATTAMBANG WATERWORKS  
(EXPLANATION OF DRAFT REPORT)

In June and August 2012, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey for the Outline Design on the Project on Additional New Water Treatment Plants for Kampong Cham and Battambang Waterworks (hereinafter referred to as "the Project") to the Kingdom of Cambodia (hereinafter referred to as "Cambodia") and through discussion, field survey and technical examination of the results in Japan, JICA prepared a draft outline design report (hereinafter referred to as "the Draft Report").

In order to explain and to consult with the officials concerned of the Government of Cambodia on the components of the Draft Report, JICA sent the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Ikenoue Takahiro, Advisor, Grant Aid Project Management Division 3, Financing Facilitation and Procurement Supervision Dept., JICA, from February 11 to 14, 2013.

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

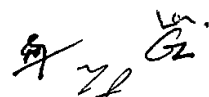
Phnom Penh, February 14, 2013



Mr. Ikenoue Takahiro  
Team Leader,  
Draft Report Explanation Team  
Japan International Cooperation Agency



Mr. Meng Saktheara  
Director General  
General Department of Industry  
Ministry of Industry, Mines and Energy  
The Kingdom of Cambodia



## ATTACHMENT

### 1. Components of the Draft Report

The Cambodian side agreed and accepted in principle the components of the Draft Report explained by the Team. The components of the Project are shown in Annex-1.

### 2. Japan's Grant Aid Scheme

The Cambodian side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Cambodia as explained by the Team and described in Annex-2.

### 3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Cambodia by March 2013.

### 4. Responsible and Implementing Agency

4-1) The Responsible Agency is Ministry of Industry, Mines and Energy (hereinafter referred to as "MIME").

4-2) The Implementing Agencies are Provincial Departments of Industry, Mines and Energy (hereinafter referred to as "DIME"), and the Waterworks in respective Provinces of Kampong Cham and Battambang.

### 5. Precondition of the Project (Permission for water extraction from Rivers)

The Cambodian side explained that currently Ministry of Water Resources and Meteorology (hereinafter referred to as "MOWRAM") is still working on draft of sub-decree on water resources licensing, therefore MIME will just inform and obtain endorsement from MOWRAM for water extraction to secure agreement with MOWRAM on water utilization along the river. When MOWRAM adopted sub-decree on water resources licensing, MIME will coordinate to obtain required water extraction license accordingly.

The Team requested the Cambodian side to speed up process to obtain the endorsement letter and submit to JICA by the end of February since this procedure is precondition for authorizing the Project and the document to prove official permission of water intake is urgently needed to progress required procedure leading to approval of the Project by the cabinet meeting of Japanese Government which will be held in April, at the earliest.

The Cambodian side understood and agreed to submit the official letter from MOWRAM which assures MIME can extract necessary volume of raw water for the Project without restriction by the end of February 2013.

### 6. Other Relevant Issues

#### 6-1) Major Undertakings of the Project

The Team explained to the Cambodian side its major undertakings as listed in Annex 3 and the Cambodian side understood and promised to execute them.

#### **6-2) Project Cost Estimation**

The Team explained to the Cambodian side the tentative Project Cost Estimation as described in Annex-4. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties until signing of all the contract(s) for the Project. The Cambodian side understood that the Project Cost Estimation is still tentative and subject to be modified.

#### **6-3) Necessary budget to be covered by the Cambodian Side**

The Team explained necessary project cost and operation and maintenance cost to be covered by the Cambodian side as attached in Annex-4. The Cambodian side agreed to secure them.

#### **6-4) Allocations of the staffs**

The Cambodian side agreed to assign the staffs necessary for waterworks to operate with facilities enhanced with the Project as proposed on the table 4.2-1 and 4.2-2 of the Draft Report as shown in Annex-5.

#### **6-5) Soft Components (Technical Assistance) of the Project**

Both sides confirmed that soft components on the following three topics will be implemented in the Project for proper operation and maintenance of the new facilities which are provided in the Project.

- Operation and maintenance of water treatment facilities
- Operation and maintenance of water transmission and distribution facilities
- Production Management

Furthermore, the Team explained and the Cambodian side understood that since these soft components is scheduled to start one year before the completion of construction of the facilities as shown in the Table 2.4.8 -1 of the Draft Report, the staffs to operate the new facilities should be allocated one year before the completion of the construction of the facilities so that they can participate in soft component.

#### **6-6) Water Tariff**

The operation and maintenance cost in Kampong Cham will increase after construction of the new water treatment plant which abstracts the water from Mekong River and adopts sedimentation method with rapid filtration. Therefore the Team explained two cases of new water tariff estimation in Kampong Cham which will contribute to maintain good balance as stated on page 5-4 of the Draft Report.

The Cambodian side agreed to consider the revision of water tariff in order to cover the necessary cost.

#### **6-7) Environmental and Social Considerations**



Both sides confirmed Environmental and Social considerations issues as follows:

**6-7-1) IEE/IEIA**

The Cambodian side will prepare and submit IEE/IEIA report and a pre-feasibility study report to Ministry of Environment (MOE) immediately and obtain their approval by the end of June 2013.

**6-7-2) Environmental Checklist**

Environmental and Social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist attached as Annex-6.

**6-7-3) Monitoring for Environmental and Social Considerations**

Results of environmental monitoring will be provided to JICA as a part of Project Progress Report by filing in the Monitoring Form attached as Annex-7 on a quarterly basis during construction in accordance with the Monitoring Plan for the Project described in the Draft Report. After the completion the Project, the Cambodian side will continuously implement monitoring for Environmental and Social considerations until target year and submit Monitoring Form to JICA on semi-annual basis by filling in the Monitoring Form.

In case JICA finds that there is a need for improvement in a situation with respect to environmental considerations after the agreed monitoring period, JICA may request to extend the period of monitoring and reporting.

**6-7-4) Disclosure of Monitoring Result**

JICA may disclose the part of the monitoring results as shown in Annex-6 conducted by MIME on its web site. The Team explained that JICA will disclose further information, when third parties request, with permission of MIME.

The Cambodian side confirmed that it will take stipulated procedures for information disclosure in accordance with Cambodian relevant laws. In addition, the JICA Mission requested and the Cambodian side agreed to disclose the monitoring results to local project stakeholders.

**6-8) Demolition of Existing Buildings**

Both sides confirmed MIME's plan and progress to clear the sites as follows:

- Kampong Cham  
Kampong Cham DIME already allocated the budget for demolition of the small office for business section in existing elevated tank site and will demolish them by June 2013.
- Battambang  
Battambang DIME already allocated the budget for site clearance works and it will be carried out by Battambang DIME by June 2013.

**6-9) Power Supply in Kampong Cham**

The Cambodian side reconfirmed that the substation of power supply in Kampong Cham had been

already constructed and distribution line will be constructed in June 2013, so that Kampong Cham waterworks would receive sufficient power supply from July 2013.

#### **6-10) Land Use Permission for Intake Facilities and Pipeline**

The Cambodian side agreed to submit application for land acquisition of Intake location and obtain approval by the end of March 2013 and application and approval for pipeline route will be submitted and obtained immediately after detailed route is decided.

#### **6-11) Individual Service Connections**

The Cambodian side agreed to promote to increase service connections through announcement to local people and implementation of installation work.

#### **6-12) Intake Water from River**

The Team explained that regarding Sangkae River, the total volume of environmental flow (0.60m<sup>3</sup>/s) and proposed intake water quantity (0.42m<sup>3</sup>/s) for the existing and the new water treatment plants is 1.02m<sup>3</sup>/s and the duration for which the river discharge is smaller than 1.02m<sup>3</sup>/s is estimated for around 9 days in the year of 10-year return period of drought, which means raw water shortage may occur once in a long while. In addition, the Team also explained that if another water extraction project is implemented in upper stream of Sangkae river, enough volume of raw water cannot be provided for water treatment plants. The Team also mentioned that some countermeasures such as a limitation of water supply or a negotiation with other river water users to use water preferentially for water supply would be necessary when the raw water shortage occurs. The Cambodian side understood that there could be potential problem of water shortage during dry season and agreed that there will be necessity to take countermeasures on the issue.

#### **6-13) Resettlement in Battambang**

Both sides reconfirmed that new water supply facilities in Battambang will be constructed in the area where the resettlement would not occur.

#### **6-14) Considering about Autonomy**

Both sides shared common understandings which are;

- As stated in the Royal Government National Policy on Urban Water Supply, autonomy is important to enhance provincial waterworks to ensure sustainability, quality of safe water supply service, financial credibility and effective management.
- Japan has been providing assistance to the Cambodian provincial waterworks both in soft and hard aspects through Grant aid, Yen Loan and technical cooperation projects, which have contributed to the enhancement of their potential to be autonomous. And the Project will also contribute to strengthening their potential.
- Through on going technical cooperation project "the Project on Capacity Building for Urban Water Supply System (Phase 3), future institutional arrangement of provincial waterworks including an option to be autonomy will be discussed.

#### **6-15) Participation to the Technical Cooperation Project**

Both sides agreed that since “the Project on Capacity Building for Urban Water Supply System (Phase 3)” is important for Kampong Cham and Battambang waterworks to develop their capacity to operate the facilities constructed by the Project with proper management and administration, both waterworks will assign a sufficient number of counterpart staffs who can proactively and fully participate in the technical cooperation project.

Annex 1 Components of the Project

Annex 2 JAPAN'S GRANT AID SCHEME

Annex 3 Major Undertakings

Annex 4 Project Cost Estimation (Confidential)

Annex 5 Number of Staff

Annex 6 Check List (Environmental and Social Considerations)

Annex 7 Monitoring Form for Environmental and Social Considerations

# Annex 1 Components of the Project

Project Summary		
	By Japan Grant Aid	By Cambodia Side
<b>1. Constructions</b>		
<b>Kampong Cham</b>		
(1) Water Intake Facilities	- Intake Facility: 12,650 m3/day - 4 intake pumps (vertical shaft type mixed flow pump)	- Electricity Supply Line (100 kVA)
(2) Raw Water Transmission Pipeline	- Intake to WTP (DIP $\Phi$ 400 mm, L=920m)	
(3) Water Treatment Plant	- Treatment Facility: 11,500 m3/day - Mixing Basin - Flocculation Basin - Sedimentation Basin - Rapid Filtration Basin - Ground Reservoir - Transmission Pump - Distribution Pump - Electrical Equipment - Chemical Equipment - Administration Building	- Electricity Supply Line (600 kVA)
(4) Treated Water Transmission Pipeline	- Shallow Well No.2 to Reservoir at WTP (HDPE $\Phi$ 200 L=900m) - WTP to Existing Elevated Tank (within WTP site)	
(5) Distribution Main Pipeline	- WTP to Service Areas (L=57.8km) (DIP $\Phi$ 400 L= 1,060m) (DIP $\Phi$ 350 L= 1,617m) (DIP $\Phi$ 300 L= 2,263m) (DIP $\Phi$ 250 L= 4,237m) (HDPE $\Phi$ 200 L= 5,173m) (HDPE $\Phi$ 150 L= 5,125m) (HDPE $\Phi$ 100 L=27,098m) (HDPE $\Phi$ 50 L=11,223m)	
(6) Service Connections		- Service Connection (7,448 households from 2013 to 2019)
<b>Battambang</b>		
(1) Water Intake Facilities	- Intake Facility: 24,200 m3/day - 3 intake pumps (vertical shaft type mixed flow pump)	- Electricity Supply Line (200 kVA)
(2) Raw Water Transmission Pipeline	- Intake to WTP (DIP $\Phi$ 600 mm, L=4,400m)	
(3) Water Treatment Plant	- Treatment Facility: 22,000 m3/day - Mixing Basin - Flocculation Basin - Sedimentation Basin - Rapid Filtration Basin - Ground Reservoir - Transmission Pump - Distribution Pump - Electrical Equipment - Chemical Equipment - Administration Building	- Electricity Supply Line (700 kVA)
(4) Distribution Main Pipeline	- WTP to Service Areas (L=65.5km) (DIP $\Phi$ 400 L= 1,323m) (DIP $\Phi$ 350 L= 811m) (DIP $\Phi$ 300 L= 254m)	- Contracting of GMS Network connection for the distribution flow monitoring system

	(DIP Ø 250 L= 5,794m) (HDPE Ø 200 L= 6,593m) (HDPE Ø 150 L=16,883m) (HDPE Ø 100 L=20,122m) (HDPE Ø 50 L=13,719m) - Distribution Flow Monitoring System	
(5) Service Connections		- Service Connection (15,645 households from 2013 to 2019)
<b>2. Procurements</b>		
<b><u>Kampong Cham</u></b>		
(1) Procurement of the Equipment	- Water quality analysis equipment (Jar Tester, Turbidity Continuous Measurement Equipment, Residual Chlorine Analyzer, Reagents, Glassware) - Tools for Mechanical Equipment (Vibration Checker) - Equipment and Materials for Service Connections (Socket Fusion Equipment, Materials for Service Connections, 2,529 sets)	
(2) Removal of Existing Facility		- Existing office building at the site where there are the existing elevated tanks.
<b><u>Battambang</u></b>		
(1) Procurement of the Equipment	- Water quality analysis equipment (Jar Tester, Distillation Apparatus, Turbidity Meter, Turbidity Continuous Measurement Equipment, Laboratory Table, Residual Chlorine Analyzer, Chlorine continuous measurement equipment, Uninterruptible Power System (UPS), pH Meter (glass electrode), pH Meter (BTB), Reagents, Glassware) - Tools for Mechanical Equipment (Vibration Checker) - Equipment and Materials for Service Connections (Socket Fusion Equipment, Materials for Service Connections, 5,446 sets)	
(2) Removal of Existing Facility		- Abandoned factory at the proposed WTP site
<b>3. Soft Components</b>		
(1) Technical Assistance	- Operation and maintenance of water treatment facilities - Operation and maintenance of water transmission and distribution facilities - Production Management	



## Annex 2 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 part of this realignment, JICA was reborn on October 1, 2008. Based on the law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Project, for Fisheries and for Cultural Cooperation, etc.

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

### 1. Grant Aid Procedures (Attachment 1)

Japanese Grant Aid is conducted as follows-

- Preparatory Survey (hereinafter referred to as "the Survey")
  - The Survey conducted by JICA
- Appraisal & Approval
  - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Determination of Implementation by Exchange of Notes (hereinafter referred to as "the E/N")
  - The Notes exchanged between the GOJ and a Government of 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 Survey is to provide a basic document necessary for the appraisal of the Project by JICA and the GOJ. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned 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 on by both parties concerning the basic concept of the Project.
- Preparation of a 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 considering the guidelines of the Japan's Grant Aid scheme.

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

#### (2) Selection of Consultants

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

(3) Result of the Survey

The Report on the Survey is reviewed by JICA, and after the appropriateness of the Project is confirmed, JICA recommends the GOJ to appraise the implementation 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 E/N will be signed 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

The consultant firm(s) used for the Survey will be recommended by JICA to the recipient country to also work on the Project's implementation after the E/N and the G/A, in order to maintain technical consistency.

(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". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to secure 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 Attachment 1.

(6) Proper Use

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

(7) 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 in 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)

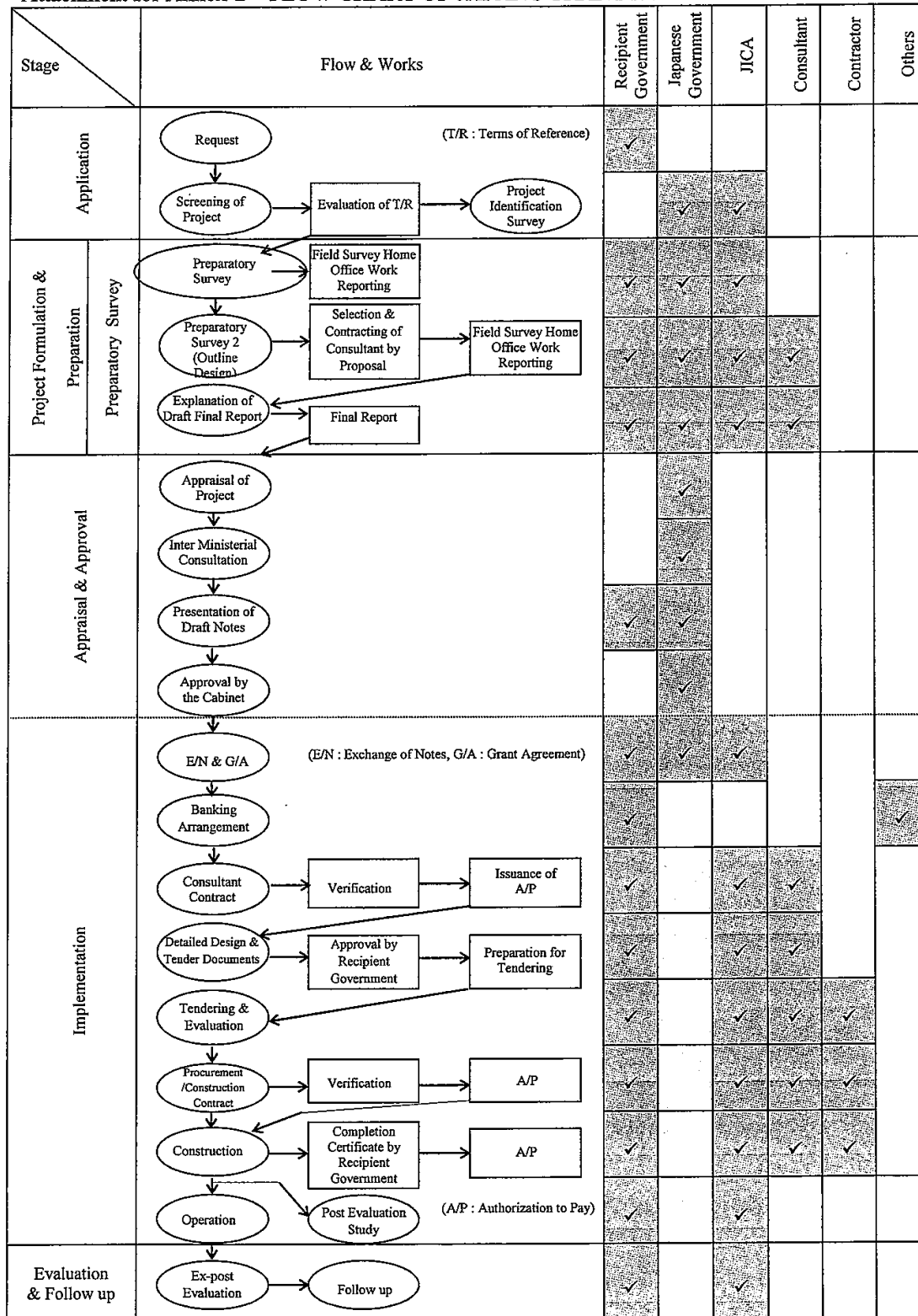
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

(10) Social and Environmental Considerations

A recipient country must ensure the social and environmental considerations for the Project and must follow the environmental regulation of the recipient country and JICA environmental and social considerations guideline.

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By L.A.

Attachment for Annex-2 FLOW CHART OF JAPAN's GRANT AID PROCEDURES



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Annex 3 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 land necessary for the implementation of the Project and to clear the sites;		●
2	To ensure prompt customs clearance of the products and to assist internal transportation of the products in the recipient country		
	Marine (Air) transportation of the Products from Japan to the	●	
	1) 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	(●)	(●)
3	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		●
4	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		●
5	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		●
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
7	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		●
8	To give due environmental and social consideration in the implementation of the Project.		●

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

## Annex 4 Project Cost Estimation

**Confidential**

### Cost Estimations

#### 1. Project Components by Japan Grant Aid

This part is closed due to the confidentiality.

#### 2. Project Components by Cambodia Government

Total Project Cost borne by Cambodia Government: approximately 1,760 Million Riel.

Items	Contents	Estimated Cost					
		For KMC System		For BTB System		Total	
		KHR (million)	Yen (1,000)	KHR (million)	Yen (1,000)	KHR (million)	Yen (1,000)
Land Preparation for WTP	Demolishment of existing structures and land leveling	42.7	811.8	1,328.6	25,242.8	1,371.3	26,054.6
Environmental Consideration	Environmental Monitoring for Air, Water, Noise and Vibration (2016-2019)	59.2	1,124.2	85.2	1,619.6	144.4	2,743.7
Information System	Contracting process of broadband LAN connection for the distribution information system.	6.9	131.0	6.9	131.0	13.8	262.0
Electricity Supply	Transmission of electricity to the new intake facilities and WTPs	64.4	1,224.3	79.3	1,506.8	143.7	2,731.1
Bank Charge	Bank arrangement for the project	-	-	-	-	86.4	1,641.5
Total						1,759.6	33,432.9

KHR (Cambodia Riel) 1 = 0.019 yen

#### 3. Operation and Maintenance

Annual O&M Cost Estimation of Water Supply Facilities in Battambang and Kampong Cham Waterworks in the target year of 2019

(Unit: million KHR)

Item	O&M cost	
	Battambang	Kampong Cham
Personal Expense	919	465
Chemical Cost	2,976	339
Power Cost	4,558	2,538
Fuel Cost	564	261
Repair Cost	2,333	932
Sludge Conveyance Cost	113	17
Flow Monitoring Cost	18	18
Office Supplies	184	93
Total	11,665	4,663

# Annex 5 Number of Staffs

## Proposed Staff Number: Battambang WWs

	2012	2013	2014	2015	2016	2017	2018	2019
	Actual							Target
Director	1	1	1	1	1	1	1	1
Deputy Director	2	2	2	2	2	2	2	2
Administration	4	4	4	4	4	4	4	4
Planning & Accounting	6	6	7	7	8	9	10	11
Business & Small network	10	13	14	15	17	20	21	23
Distribution & Main network	8	8	8	11	11	11	11	11
Water Production	9	9	9	23	23	23	23	23
T o t a l	40	43	45	63	66	70	72	75
Service Connections	9,665	10,265	11,365	12,910	15,110	18,510	21,910	25,310
Annual Connections	600	600	1,100	1,545	2,200	3,400	3,400	3,400

## Proposed Staff Number: Kampong Cham WWs

	2012	2013	2014	2015	2016	2017	2018	2019
	Actual							Target
Director	1	1	1	1	1	1	1	1
Deputy Director	2	2	2	2	2	2	2	2
Administration	2	2	2	4	4	4	4	4
Planning & Accounting	4	4	4	5	6	7	8	8
Business & Small network	8	9	9	9	10	10	11	12
Distribution & Main network	5	5	5	8	8	8	8	8
Water Production	6	6	6	17	17	17	17	17
T o t a l	28	29	29	46	48	49	51	52
Service Connections	4,799	5,099	5,399	6,047	7,447	9,047	10,647	12,247
Annual Connections	300	300	300	648	1,400	1,600	1,600	1,600

Annex6 Checklist (Environmental and Social Consideration (1)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) N (c) N (d) N	(a) IEE instead of EIA is required for the Project. IEE has been prepared. (b) IEE has been prepared and expected to be approved by April 2013. (c) No condition is imposed for the approval of IEE. (d) Permission of intake from Mekong and Sangkhae river will be requested to MOWRAM by MIME and expected to be approved by May 2013.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Public hearings for local residents were held on Aug. 14th, 2012 in Kampong Cham and on Aug. 7th 2012 in Battambang. (b) The comments of the residents are reflected as taking counter measures for noise & vibration, minimization of the expected traffic disturbances by securing access during construction and setting poverty considered water prices on the Project.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Alternative plans for intake positions/ facilities and distribution networks were examined. As the results, the plans in which least adverse effects are expected are selected.
2 Pollution Control	(1) Air Quality	(a) Is there a possibility that chlorine from chlorine storage facilities and chlorine injection facilities will cause air pollution? Are any mitigating measures taken? (b) Do chlorine concentrations within the working environments comply with the country's occupational health and safety standards?	(a) N (b) Y	(a) By taking preventive measure such as conduction of treatment trainings, occurrence of pollution or leakage can be prevented. (b) Trainings have been conducted as designated and this complies the condition.
	(2) Water Quality	(a) Do pollutants, such as SS, BOD, COD contained in effluents discharged by the facility operations comply with the country's effluent standards?	(a) Y	(a) With proper conduction of mitigation measures, water quality standard can be attained.
	(3) Wastes	(a) Are wastes, such as sludge generated by the facility operations properly treated and disposed in accordance with the country's regulations?	(a) Y	(a) With proper conduction of mitigation measures, proper procedures of planned waste management can be secured.
3 Natural Environment	(4) Noise and Vibration	(a) Do noise and vibrations generated from the facilities, such as pumping stations comply with the country's standards?	(a) Y	(a) With proper conduction of mitigation measures, the standard of noise and vibration can be attained
	(5) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a) No intake of ground water is required for the Project.
	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) No protected area exists within the Project area.



Annex6 Checklist (Environmental and Social Consideration (2)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
3 Natural Environment		(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Is there a possibility that the amount of water used (e.g., surface water, groundwater) by project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?	(a) N (b) Y (c) Y (d) Y	(a) The Project area consists of urban & residential area and thus, no precious fauna and flora exit. (b) Although, Mekong giant catfish and the Irrawaddy dolphin inhabit in Mekong River near the Cambodia-Laos border but there is no report that they exist near the project area. (c) Mitigation methods such as minimizing the dredging areas and setting pollution prevention fence are planned to be applied for minimizing the scale of stirring bottom sediments. (d) No serious adverse effect is expected while mitigation measures are planned to be conducted.
	(2) Ecosystem	(a) Is there a possibility that the amount of water used (e.g., surface water, groundwater) by the project will adversely affect surface water and groundwater flows?	(a) Y	(a) No serious adverse effect is expected. In Mekong river; the intake amount is very low comparing to the flow rate of the river, therefore, the effects of the intake is very small. In Sangkhae river; although the flow rate during dry season is very small, the effects of the intake can be minimized by controlling the intake amount during the term.
	(3) Hydrology	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Is the compensations going to be paid prior to the resettlement? (e) Is the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) Y (b) Y (c) - (d) - (e) - (f) - (g) - (h) - (i) - (j) -	(a) Alternative plan is selected in which no resettlement nor land acquisition is required. (b) Public consultation meeting was held for explaining the plan of the Project selected and thus, resettlement plan is not required. (c) Alternative plan in which no resettlement nor land acquisition is required is selected and thus, resettlement plan is not required. (d) No compensation is required. (e) No compensation is required. (f) No adverse impact on vulnerable is expected. (g) No resettlement is required. (h) No resettlement is required. (i) No resettlement is required. (j) No resettlement is required.
4 Social Environment	(1) Resettlement			

Annex6 Checklist (Environmental and Social Consideration (3)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? (b) Is there a possibility that the amount of water used (e.g., surface water, groundwater) by the project will adversely affect the existing water uses and water area uses?	(a) Y (b) Y	(a) Construction works may affect on commercial activity by disturbing the access to commercial facilities and therefore, mitigation measures such as securing traffics are planned to be applied for minimizing the impacts. (b) Limitation of intake amount will be applied as the river follow goes lower than certain level.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) No precious heritage or historical site exists within the Project area.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) No precious landscape exists within the Project area.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) N (b) N	(a) No Project component gives adverse effects on minority and native inhabitants. (b) No Project component gives adverse effects on poor.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved or local residents?	(a) - (b) - (c) - (d) -	(a) The project owner plans to request the contractor to take necessary measures such as holding morning assembly and training sessions for securing proper working conditions defined in laws and regulations in Cambodia. (b) The project owner plans to request the contractor to take necessary measures such as holding morning assembly and training sessions which help promote taking necessary safety procedures such as wearing gears. (c) The project owner plans to request the contractor to take necessary measures. (d) The project owner plans to request the contractor to take necessary measures for preventing any violations of safety measures.
	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts? (d) If the construction activities might cause traffic congestion, are adequate measures considered to reduce such impacts?	(a) Y (b) Y (c) Y (d) Y	(a) Mitigation measures such as selection of proper construction method and equipment are planned to be applied for reduce the impacts. (b) Mitigation measures such as selection of proper construction method and equipment can reduce the adverse impacts. (c) Mitigation measures such as selection of proper construction method and equipment can reduce the adverse impacts. (d) Mitigation measures such as selection of proper construction method and equipment can reduce the adverse impacts, such as traffic congestion.

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Annex6 Checklist (Environmental and Social Consideration (4)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring report system)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities? (a) Where necessary, pertinent items described in the Dam and River Projects checklist should also be checked.	(a) Y (b) Y (c) Y (d) Y	(a) Conduction of monitoring activities will be requested according to proposed monitoring plan. (b) By Cambodian standards for air and water quality. (c) GOC will secure the budget for the monitoring activities and request the contractor to conduct properly. (d) Those should be stipulated in Monitoring plan.
6 Note	Reference to Checklist of Other Sectors Note on Using Environmental Checklist	(a) If necessary, the impacts to Transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as Transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) - (a) N	- No serious adverse impact is expected.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).  
2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which the project is located.

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## Annex 7 Monitoring Form for Environmental and Social Considerations

### a. Air Quality : Ambient Air (For both Construction & In-service period)

Item	Measured Value (Mean)	Measured Value (Max.)	Cambodian STD 1-hour mean	Japanese STD 1-hour Value	WHO Guideline	Remarks (Measurement Point, Frequency, Method, etc.)
CO			<40mg/m <sup>3</sup>	<10ppm	-	1 site including sensitive receptors near the project site or others Frequency: Monthly Method: Authorized methods in Cambodia, WHO.
NO <sub>2</sub>			<0.3mg/m <sup>3</sup>	< 0.04ppm	<0.2mg/m <sup>3</sup> 1-hour mean	
SO <sub>2</sub>			<0.5mg/m <sup>3</sup>	< 0.04ppm	<0.5mg/m <sup>3</sup> 1-hour mean	
O <sub>3</sub>			<0.2 mg/m <sup>3</sup>	<0.06ppm As Ox	<0.1mg/m <sup>3</sup> 8-hour mean	
Pb			<0.005 mg/m <sup>3</sup> 8-hour mean	-	-	
TSP			<0.33 mg/m <sup>3</sup>	<0.2mg/m <sup>3</sup> as SPM	<0.05mg/m <sup>3</sup> as PM <sub>10</sub> 24-hour mean	

### b. Water Quality

#### b-1) Construction Period: Ambient Water Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Cambodian STD	Japanese STD Class AA	WHO Drinking Water Guideline	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-			6.5 – 8.5	6.5 – 8.5	-	Each up & downstream of the center of construction (2 points in total) Frequency: Monthly during construction. Biannual in use. In use, Drinking items shall be monitored. Method: Authorized methods in Cambodia, WHO.
TSS	mg/l			25 - 100	< 25	-	
BOD	mg/l			1.0 – 10	< 1.0	-	
DO	mg/l			2.0-7.5	> 7.5	-	
Coliform	MPN /100 ml			< 100ml	< 50 MPN/100ml	< 0	

#### b-1) In-service period: Ambient Water Quality (pH to DO) and Drinking Water Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Cambodian STD	Japanese STD	WHO Guideline	Remarks (Measurement Point, Frequency, Method, etc.)
pH	-			6.5 – 8.5	6.5 – 8.5	-	Each up & downstream of the center of construction (2 points in total) Frequency: Monthly during construction. Biannual in use. In use, Drinking items shall be monitored. Method: Authorized methods in Cambodia, WHO.
TSS	mg/l			25 - 100		-	
BOD	mg/l			1.0 – 10	< 1.0	-	
DO	mg/l			2.0-7.5	> 7.5	-	
Coliform	MPN /100ml			< 0	< 0	< 0	
TDS	mg/l			< 800	< 500	<1000	
Turbidity	NTU			< 5	0.1(degree)	< 5	
T. Hardness	mg/l			< 300	< 300	-	
NO <sub>2</sub>	mg/l			< 3.0	-	< 0.2	
NO <sub>3</sub>	mg/l			< 50.0	< 10 as nitrate -nitrogen & nitrite -nitrogen	< 50	
SO <sub>4</sub>	mg/l			< 250	-	< 250	
F	mg/l			< 1.5	< 0.8	< 1.5	
Cl	mg/l			< 250.0	< 200	< 250	
NH <sub>4</sub>	mg/l			< 1.5	-	< 1.5	
Color	TCU			< 5.0	5(degree)	15	
CN	mg/l			< 0.07	< 0.01	< 0.07	
Al	mg/l			< 0.2	-	< 0.2	
As	mg/l			< 0.05	< 0.01	< 0.01 provisional	

Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Cambodian STD	Japanese STD	WHO Guideline value	Remarks (Measurement Point, Frequency, Method, etc.)
Cd	mg/l			< 0.003	< 0.01	< 0.003	
Cr	mg/l			< 0.05	< 0.05 as Hexavalent chromium	< 0.05 provisional value	
Cu	mg/l			< 1	< 1	< 2 provisional value	
Fe	mg/l			< 0.3	< 0.3	< 0.3	
Pb	mg/l			< 0.01	< 0.01	< 0.01	
Mn	mg/l			< 0.1	< 0.05	< 0.5 provisional value	
Hg	mg/l			< 0.001	< 0.0005	< 0.001	
Se	mg/l			< 0.01	< 0.01	< 0.01	
Zn	mg/l			< 3.0	< 1	< 3	

### c. Wastes

#### c-1) Construction Period

Basic Information	Monitoring Item	Remarks
Date/Time	Check whether the procedures for dumping the sludge/waste soils and general wastes generated by construction works are conducted properly or not.	Note: If the procedures are not conducted as designated, additional training session or morning session shall be hold to remind proper procedures.
Surveyor's Name		
Description of the general condition		
Map		

#### c-1) In-service period

Basic Information	Monitoring Item	Remarks
Date/Time	Check whether the procedures for dumping the sludge generated by drying bed are conducted right or not.	Note: If the procedures are not conducted as designated, additional training session or morning session shall be hold to remind proper procedures.
Surveyor's Name		
Description of the general condition		
Map		

d. Noise & Vibration (For both Construction and In-service period)

Basic Information	Item	Unit	Measured Value (Mean)	Measured Value (Max.)	Country's Standards	Remarks (Measurement Point, Frequency, Method, etc.)
Date/Time Surveyor's Name	Noise level (Lmax)	dB(A)			60dB(A) (depend on the time)	1 sites including sensitive receptors near the project site or others Frequency: See #1
Description of the general condition	Vibration level (Lmax)	dB			-	

e. Offensive Odor(Construction Period)

Basic Information	Monitoring Item	Remarks
Date/Time	Floating substances such as dead body of living organism.	Note: Visual observation for checking of existing floating materials like dead body or any organisms, suspended substances with confirmation of any occurrence of offensive odor shall be conducted.
Surveyor's Name		
Description of the general condition		
Map	Occurrence of offensive odor.	

f. Bottom Sediment (Construction Period)

Basic Information	Monitoring Item	Remarks
Date/Time	Floating substances such as dead body of living organism.	Note: Visual observation for checking of existing floating materials like dead body or any organisms, suspended substances shall be conducted.
Surveyor's Name		
Description of the general condition	Rapid increase of Turbidity	
Map	Rapid increase/decrease of current speed, flow rate.	

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i-2) In-service period

Basic Information	Monitoring Item	Remarks
Date/Time	Occurrence of any disturbances on the business of existing private water supply companies and checking their responses to the condition.	Note: checking whether any complains has been arisen and conduct hearing if necessary.
Surveyor's Name		
Description of the general condition		

j. Water Usage or Water Rights and Rights of Common

(For both Construction and In-service period)

Basic Information	Monitoring Item	Remarks
Date/Time	Rapid decrease of current speed, flow rate.	Note: Visual observation for checking of existing river conditions, such as flow rate, flow amount and floating materials, turbidity and existence of any complains regarding water utilization.
Surveyor's Name	Rapid increase of Turbidity	
Description of the general condition	Floating substances such as dead body of living organism.	
Map	Occurrence of any complaints from the residents/officer of other supply area.	

k. Existing Social Infrastructures and Services (Construction Period)

Basic Information	Monitoring Item	Remarks
Date/Time	Occurrence of any disturbances to access roads close to the construction site.	Note: Visual observation for checking of occurrence of any disturbance while checking whether any complains has been arisen.
Surveyor's Name		
Description of the general condition	Occurrence of any complaints from the driver/ residents	
Map		

l. Infectious Diseases such as HIV/AIDS(Construction Period)

Basic Information	Monitoring Item	Remarks
Date/Time	Checking whether holding morning session or any training sessions for reminding the risk of infectious diseases and preventive measures.	Note: number of holding sessions, and participants shall be monitored.
Surveyor's Name		
Description of the general condition		

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m. Working Environment (Construction Period)

Basic Information	Monitoring Item	Remarks
Date/Time	Checking whether morning session or any training sessions for reminding the risk of occurrence of accidents and preventive measures are properly conducted. Checking whether proper rest is provide.	Note: number of holding sessions, and participants shall be monitored.
Surveyor's Name		
Description of the general condition		
Map		

m. Accident

m-1) Construction Period

Basic Information	Monitoring Item	Remarks
Date/Time	Checking whether holding morning session and any training sessions for reminding the risk of occurrence of accidents and preventive measures.	Note: number of holding sessions, and participants as well as proper treatment such as allocation of traffic signage shall be monitored.
Surveyor's Name		
Description of the general condition	Checking whether necessary traffic signs and traffic control personnel are properly allocated.	
Map		

m-2) In-service period

Basic Information	Monitoring Item	Remarks
Date/Time	Checking whether proper treatment of chlorine is conducted as defined in the treatment manual.	Note: number of holding sessions, and participants shall be monitored.
Surveyor's Name		
Description of the general condition		
Map		

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## **5. Soft Component (Technical Assistance) Plan**

### **5.1 Background of Soft Component**

#### **5.1.1 Background of the Project**

This project is to improve the water supply services in Kampong Cham City and Battambang City which occupy important places in Cambodia in future, by developing a new water resource while utilizing the existing water treatment plant.

The National Strategic Development Plan, which was issued by the Royal Government of Cambodia (RGC) in 2006 and reviewed in 2008, aims to boost the rate for access to safe water in urban areas to 80% by 2015. However Kampong Cham City and Battambang City, two key centers of political and economic activities in the province, at present have only 30% and 26% safe water access rates respectively, because of insufficient production capacity of existing facility and low intake volume in the dry season.

Under these circumstances, the RGC made an official request in August 2010 to the Government of Japan (GOJ) under the Japanese grant aid scheme, for a project with the title of “the Project on Additional New Treatment Plants for Kampong Cham and Battambang Waterworks in the Kingdom of Cambodia”, to improve water supply service in Kampong Cham City and Battambang City.

#### **5.1.2 Technological Level**

The project on the capacity building for water supply system in Cambodia (phase 2) was conducted in eight targeted provincial waterworks including Battambang and Kampong Cham by the Japan International Cooperation Agency (JICA). As a result, the skill level of the staff at the water bureaus increased dramatically, and at the end of the project it was concluded that "Due to the considerable increase in the capability of the water service personnel, which had been exceedingly limiting, it has become possible to provide a safe and stable water supply in the Targeted Provincial Waterworks (TPWs)". Therefore the TPWs have the basic skills required to operate the existing water treatment plant.

### **5.1.3 Problems to be solved**

The capacity to operate the new facilities in addition to the current facilities will be required. Taking their skills into consideration, the proposed administrative problems are as follows.

- i. The TPWs in Kampong Cham, which up to now has utilized quality groundwater and doesn't have the capacity to operate and maintain a Water Treatment Plant (WTP) with river water. Hence, operation and maintenance training for water treatment plant is required.
- ii. To be able to install the water flow monitoring system, it will be necessary to exchange skills needed for the application of the system.
- iii. A distribution system that uses a direct pressure pumping method will be required.
- iv. In addition to a drastic increase of water consumption, the two water supply systems must be operated continuously by themselves.

### **5.1.4 Necessity of soft component**

As mentioned above, due to the implementation of the project on the capacity building for water supply system in Cambodia (phase 2), the skill level of the staff at the waterworks increased dramatically, the TPWs have the adequate skills required to operate the existing water treatment plant. However, upon the implementation of this project, the capacity to operate the new facilities will be required in addition to the current facilities. Especially, the TPWs in Kampong Cham which up to now has utilized high quality groundwater don't have the capacity to operate and maintain a WTP with river water. And TPWs in Battambang have to operate two WTPs which take from the same river of each. Furthermore the TPWs in Kampong Cham have to operate the two water supply systems which take from the different resources of each. Therefore, the following three soft components should be implemented in this project.

#### **(1) Operation and maintenance of water treatment facilities**

In order to produce clean water at new water treatment plant constructed by this project properly and effectively, the training for operation and maintenance of water treatment facilities will be carried out during the project. New O&M staff must be properly trained to ensure that the facility would be operated consistently in an efficient manner.

The contractor responsible for procurement and construction will only explain the operation of

individual equipment such as valves or pumps, at the commissioning of the facility. The training on the integrated operation of the treatment process would be carried out by the consultant who designed the WTP.

Data necessary for controlling the operation, such as chemical dosing rate, backwash, and flow rate inside the WTP, should be recorded completely and stored systematically. Staff will also be, therefore, trained on routine data acquisition, recording and archiving of records, retrieval and use of data for control and maintenance. Finally, the O&M manual for the WTP will be prepared. Water quality analysis and control, and the related training will be also conducted by the project.

## **(2) Operation and maintenance of water transmission and distribution facilities**

Treated water from the new WTP should be distributed to the existing service area and new service area and also pumped to the existing elevated tank for Kampong Cham. In order to distribute treated water to the service areas corresponding to water demand, the training for operation and maintenance of water transmission and distribution facilities will be conducted.

The contractor will explain the operation of individual machinery equipment including transmission and distribution pumps and flow control valves at the commissioning of the facility. Staff will be trained under the technical assistance component of the project on integrated pump operations, data collection, record keeping and other related skills. Finally, the pump operation plans for transmission and distribution systems will be prepared.

## **(3) Production management**

Necessary training for inventory control of consumable chemicals, sludge disposal plan, and so on will be carried out in order to produce clear water sustainably. In addition, for Kampong Cham, the training of plant operation planning to use groundwater as much as possible will be conducted for minimizing operation and maintenance costs. Through the training,

## **5.2 Objective of Soft Component**

The purpose of this component is that both waterworks continuously operate and maintain the new facilities together with the existing facilities and provide safe water to the people on the water quality standard.

### 5.3 Outputs of Soft Component

Outputs of the soft component are as follows.

#### (1) Operation and maintenance of water treatment facilities

- 1) Capacity to analyze the water quality is improved in the TPWs.
- 2) Capacity to treat water is improved in the TPWs.
- 3) Capacity for operation and routine maintenance of mechanic and electric facilities is improved in the TPWs.

#### (2) Operation and maintenance of water transmission and distribution facilities

- 1) Capacity to operate distribution pump is improved in the TPWs.
- 2) Capacity to operate the flow monitoring system is improved in the TPWs.

#### (3) Production management

- 1) Capacity to operate and maintain water treatment facilities is improved in the TPWs.
- 2) The two WTPs are operated continuously in the TPWs.

### 5.4 Method of confirming Achievement of Outputs

The confirmation method of achievement in each field is shown in **Table 5.4-1**.

**Table 5.4-1 The Confirmation method of achievement in each field**

Field	Achievement	Objectively Verifiable Indicator	Confirmation method
Operation and Maintenance of water treatment facilities	Capacity to analyze the water quality is improved in the TPWs.	<ol style="list-style-type: none"><li>1 . All the relevant staff is able to analyze water quality based on the SOPs.</li><li>2 . Items for analysis necessary are analyzed at their prescribed frequency, using the SOP.</li><li>3 . The results of water quality analysis are integrated into an annual report to MIME</li></ol>	<ol style="list-style-type: none"><li>1 . Daily record of water quality analysis</li><li>2 . Annual report of water quality analysis</li><li>3 . Mini-exam related to understanding level</li></ol>
	Capacity to treat water is improved in the TPWs.	<ol style="list-style-type: none"><li>1 . A report of water treatment is prepared daily in a prescribed format.</li><li>2 . The optimal dosing volume of chemicals is accurately determined according to the quality of raw water.</li><li>3 . Target value for turbidity of the settled</li></ol>	<ol style="list-style-type: none"><li>1 . Operation daily record</li><li>2 . Chemical dosing record</li><li>3 . Record of residual chlorine for treated water</li><li>4 . Washing record of filter sand</li><li>5 . Record of pump operation</li></ol>

		<p>water is always satisfied.</p> <p>4 . Target value for residual chlorine of the treated water is always satisfied.</p> <p>5 . Washing process of filter sand is appropriately controlled.</p>	6 . Mini-exam related to understanding level
	Capacity for operation and routine maintenance of mechanic and electric facilities is improved in the TPWs.	<p>1 . Regular check of mechanic and electric facilities is conducted based on the SOP.</p> <p>2 . Mechanic and electric facilities are operated based on SOP.</p> <p>3 . Network for communication and cooperation with relevant manufactures is established.</p>	<p>1 . Record of daily Routine maintenance</p> <p>2 . Manual for each facility</p> <p>3 . Record of breakdown history</p> <p>4 . Manufacture's contact table</p> <p>5 . Response to the accident</p> <p>6 . Mini-exam related to understanding level</p>
②Operation and maintenance of water transmission and distribution facilities	Capacity to operate distribution pump is improved in the TPWs.	<p>1 . A record of distributed flow amount and pressure data is prepared daily in a prescribed format.</p> <p>2 . Distributed flow amount is controlled according to operation schedule.</p> <p>3 . The treated water is provided people with proper pressure.</p>	<p>1 . Record of Distributed flow amount and pressure</p> <p>2 . Operation schedule</p> <p>3 . Review format according to the actual conditions</p>
	Capacity to operate the flow monitoring system is improved in the TPWs.	<p>1 . A record of hourly flow is prepared daily in a prescribed format.</p> <p>2 . Analyzing the above data, the water leakage point is determined with minimum night flow.</p>	<p>1 . Record of Distributed flow data</p> <p>2 . Record of analysis in distributed flow data</p> <p>3 . Mini-exam related to understanding level</p>
Production management	Capacity to operate and maintain water treatment facilities is improved in the TPWs.	<p>1 . The inventory of chemicals and consumable items is controlled efficiently.</p> <p>2 . Sludge treatment is implemented properly.</p> <p>3 . The corrective action in response to accident is carried out.</p>	<p>1 . Stock management list</p> <p>2 . Sludge treatment plan</p> <p>3 . Mini-exam related to understanding level</p>
	The two WTPs are operated continuously in the TPWs.	<p>1 . Each operation record is summarized and organized them as an annual record.</p> <p>2 . The total operation management plan is prepared based on the above records; as a result two own WTP is operated efficiently.</p>	<p>1 . Operation record</p> <p>2 . Total operation management plan</p> <p>3 . Utilization of 1 and 2</p> <p>4 . Review plan according to the actual condition</p> <p>5 . Operation experience with both the well and the river in Kampong Cham</p>

## 5.5 Activities of Soft Component (Input Plan)

**Table 5.5-1** shows activities of soft component (input plan). The training for operation and maintenance of water treatment facilities will be mainly conducted for the staff that is in charge of water treatment. The training for operation and maintenance of water transmission and distribution facilities will be mainly conducted for the staff that is in charge of distribution management. The training for production management will be conducted for the chief and the deputy chief who have been given the authority to administer the operation of treatment plant.

Moreover, in parallel with this project, the project on the capacity building for water supply system in Cambodia (phase 3) is being implemented by JICA from November 2012 to November 2017.

**Table 5.5-1 Activities of Soft Component (Input Plan)**

Field	Achievement	Training Contents	Input Plan
Operation and Maintenance of water treatment facilities	Capacity to analyze the water quality is improved in the TPWs.	1 . Measurement training of essential analytical items -i.e. pH, conductivity, turbidity, color, and alkalinity 2 . Renewal of SOP 3 . Preparation of the record format 4 . Implementation of mini-exam 5 . Review of the training	Japanese consultant 1 person, 4.00M/M (dry season, rainy season, before operation)  Interpretation / Support (Local staff)
	Capacity to treat water is improved in the TPWs.	1 . Training of chemical (Alum and Lime) dosing 2 . Training of chlorine dosing 3 . O&M training of filtration 4 . O&M training of sedimentation basin and reservoir 5 . Renewal of the SOP 6 . Preparation of the record format 7 . Implementation of mini-exam 8 . Review of the training	1 person, 7.00M/M
	Capacity for operation and routine maintenance of mechanic and electric facilities is improved in the TPWs.	1 . Maintenance training of mechanic and electrical facilities 2 . Renewal of the SOP 3 . Preparation of the record format 4 . Implementation of mini-exam 5 . Review of the training	
Operation and maintenance	Capacity to operate	1 . Operation training of distribution pump 2 . Preparation of the SOP	Japanese consultant 1 person, 3.00M/M

nance of water transmission and dis- tribution facilities	distribution pump is im- proved in the TPWs.	3 . Preparation of the record format 4 . Implementation of mini-exam 5 . Review of the training	(rainy season, before operation)  Interpretation / Support (Local staff)  1 person, 5.00M/M
	Capacity to op- erate the flow monitoring system is im- proved in the TPWs.	1 . Flow monitoring system training 2 . Preparation of the SOP 3 . Preparation of the format 4 . Analytical method of the leakage and the accident based on 1-3 5 . Implementation of mini-exam 6 . Review of the training	
Production manage- ment	Capacity to op- erate and maintain water treatment facilities is im- proved in the TPWs.	1 . Preparation of the total operation management plan 2 . Preparation of stock management list 3 . Preparation of the sludge treatment plan 4 . Updating method of 1-3	Japanese consultant 1 person, 3.00M/M (rainy season, before operation)  Interpretation / Support (Local staff) 1 person, 5.00M/M



Implementation schedule of this soft component is shown in **Figure 5.5-1**.

		22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	Total	
																	Cambodia	Japan
E X P E R T	Expert for O&M of Water Treatment Facility			1.0					1.0							2.0	4.00	0.00
	Expert for O&M of Transmission and Distribution Facility								1.0							2.0	3.00	0.00
	Expert for Production Management								1.0							2.0	3.00	0.00
																	10.00	0.00
P P W S A	Water Treat Operation and Maintenance Expert														0.5		0.50	0.00
	Distribution Operation and Maintenance Expert														0.5		0.50	0.00
																	1.00	0.00
L O C A L	Interpreter/Supporting Staff (Treatment Facility)			2.0					2.0							3.0	7.00	0.00
	Interpreter/Supporting Staff (Transmission and Distribution Facility)								2.0							3.0	5.00	0.00
	Interpreter/Supporting Staff (Production Management)								2.0							3.0	5.00	0.00
																	17.00	0.00
Report		△ Progress Report						△ Progress Report						△ Final Report				

**Figure 5.5-1 Project Implementation Schedule**

## 5.6 Method of Procuring the Implement Resources

The three Japanese experts will be dispatched to the scene for this soft component. The purpose of this component is that both waterworks continuously operate and maintain the new facilities with existing and provide safe water to the people on the water quality standard, and the TPWs have the basic skills required to operate the existing water treatment plant by implementation of the project on the capacity building for water supply system in Cambodia (phase 2).

On the other hand, the capacity to operate the new facilities will be required in addition to the current facilities. And to do that, the implementation of components centering on Japanese experts is preferable. The implement resources scheduled is shown as follows.

#### **(1) Japanese consultants**

A regional government in Japan is learned in water utility management and plant operation, so a total of three people consisting of one person in each field will be dispatched as expert of three components.

Furthermore, the training for operation and maintenance of water treatment facilities will be conducted on the rainy season, the dry season and before operation. The others will be conducted on the dry season and before operation. Since it is expected that new treatment plant is under construction at the beginning of training, OJT will be implemented with current plant in Battambang.

#### **(2) PPWSA staff**

Phnom Penh Water Supply Authority (PPWSA) supplies water with direct pump supply and the flow monitoring system has been introduced at Phum Prek water treatment plant, so the staff of PPWSA has the enough skill required to operate new facilities.

Therefore, human resources in PPWSA will be utilized at the training of operation and maintenance of water transmission and distribution facilities.

### **5.7 Implementation Schedule of Soft Component**

Implementation schedule of soft component is shown in **Figure 5.7-1**.

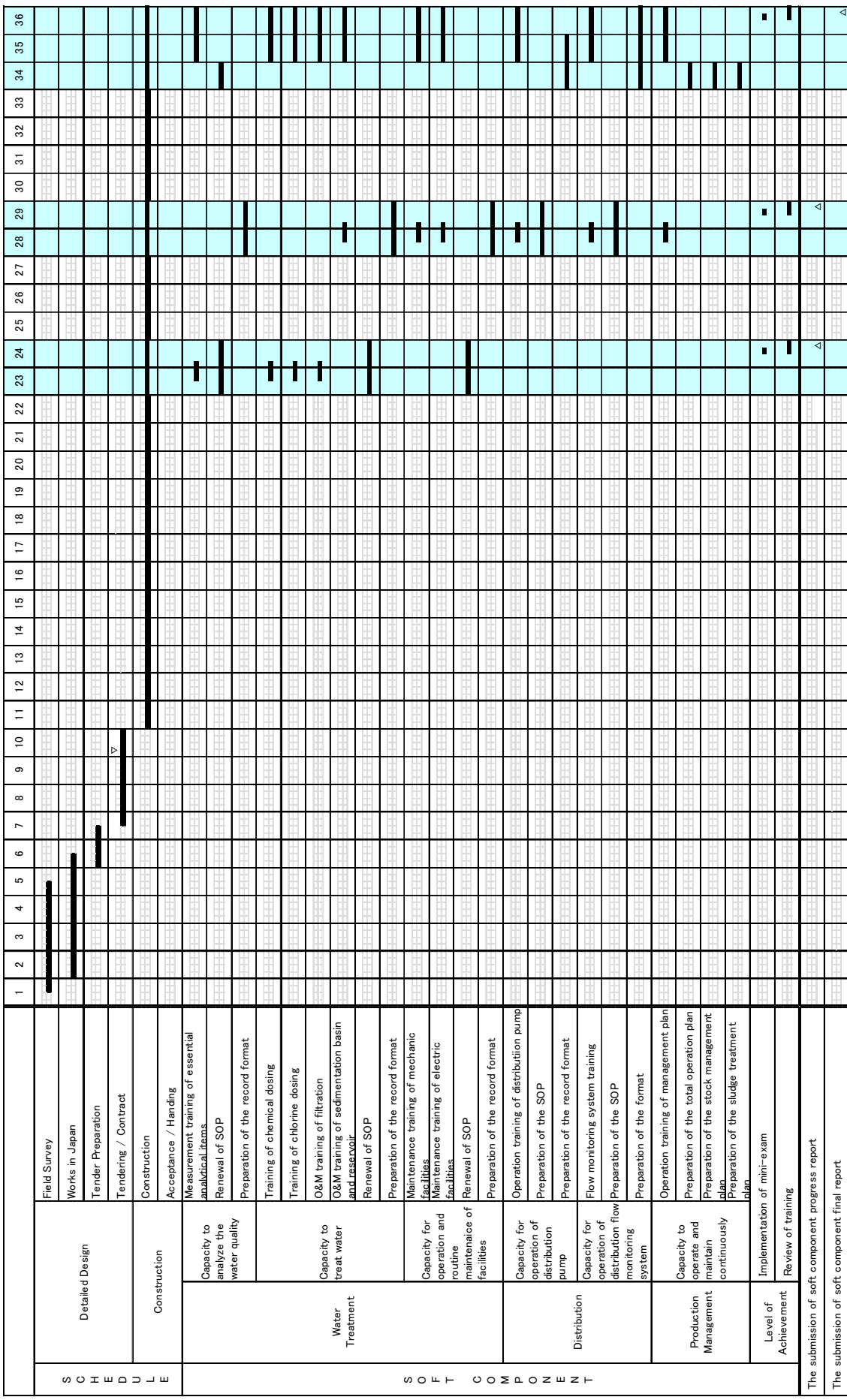


Figure 5.7-1 Implementation Schedule

## 5.8 Deliverables of Soft Component

The deliverables of soft component is as follows.

**Table8-1 Deliverables of Soft Component**

Period of Submission	Products
at the mid-period	Progress Report Training documents Others
at the end	Final report of soft component Training documents SOP in each Record format in each (Operation record) Achievement and Evaluation (mini-exam)

The report of soft component will be prepared based on Soft Component Guide Line (the third edition) issued by JICA.

## 5.9 Responsibility of Recipient Country

In order to achieve the purposes of this soft component, it is necessary to allocate the required number of staff to operate and maintain the new facilities which will be constructed by the project. The Cambodian side needs to secure and distribute enough personnel by one year before the completion of construction of the facilities. If securing and distribution of enough personnel should not be prepared, the training will be implemented for existing staff, which operate and maintain the new plant.

Since the OJT with the new facilities will be carried out before start of operation, construction of the facilities has to complete by 2 months before. The delay in construction schedule makes progress of the soft component interrupt, thus it is preferable to build a support system to construct smoothly.

Suppose the new facilities are underdeveloped due to an avoidable matter, it is considered to utilize the water treatment plant in PPWSA as a countermeasure.

## 6. Other Relevant Data (List of Collected Data)

No.	Name/Title	Figure (Book, Video, Map, Photo, etc)	Original / Copy	Issuing Institution	Date of Issue
1	Feasibility Study for The Development of Battambang Multipurpose Dam (abstract of the report)	Report	Original	Ministry of Water Resources and Meteorology (MoWRAM)	-
2	Feasibility Study Report of Kanghot Irrigation Development Project Battambang Province	Report	Original	MoWRAM	2009
3	Feasibility Study Report of Kanghot Irrigation Development Project-Phase II in Battambang Province	Report	Original	MoWRAM	2010
4	Scheme Design for Kanghot Irrigation Development Project-Phase II in Battambang Province	Report	Original	MoWRAM	2010
5	Daily Water Level and Discharge Rate of the Mekong River at Kampong Cham (1990-2011)	Data	Original	MoWRAM	-
6	Daily Water Level and Discharge Rate of the Sangke River at Battambang (1997-2010)	Data	Original	MoWRAM	-
7	Water Quality Data of the Mekong River at Kampong Cham (2000-2011)	Data	Original	MoWRAM	-
8	Daily Water Level and Discharge Rate of the Sangke River at Battambang (2001-2003)	Data	Original	MoWRAM	-
9	Water Quality Data of Raw Water and Treated Water of the Existing Battambang Water Treatment Plant (2010/1-2012/5)	Data	Original	Battambang Waterworks	-
10	Water Quality Data of Raw Water and Treated Water of Kampong Cham Waterworks (2010/6-2011/12)	Data	Original	Kampong Cham Waterworks	-
11	Flow Data of Intake and Treated Water of the Existing Battambang Water Treatment Plant (2008/1-2011/12)	Data	Original	Battambang Waterworks	-
12	Intake Flow Data of Kampong Cham Waterworks (2007/8-2011/12)	Data	Original	Kampong Cham Waterworks	-
13	Data on Groundwater Level of Kampong Cham (2007/1-2012/6)	Data	Original	Kampong Cham Waterworks	-
14	Cambodia Labor Law (Japanese version)	Word File	Copy	CDC	-

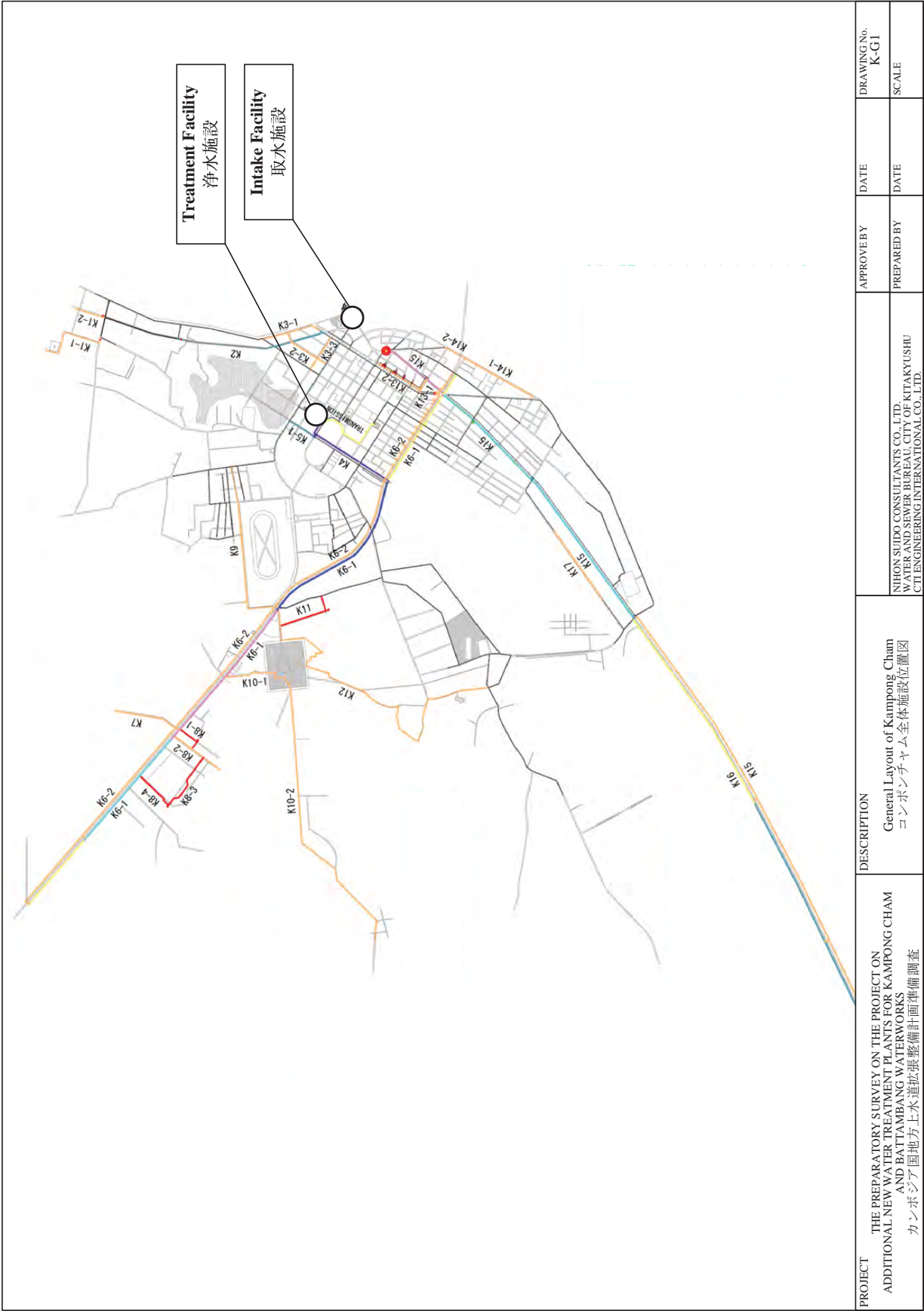
No.	Name/Title	Figure (Book, Video, Map, Photo, etc)	Original / Copy	Issuing Institution	Date of Issue
15	Constitution (1993)	Text File	-	Royal Government of Cambodia	1993
16	Law on environmental Protection and Natural Resource Management (1996)	PDF File	-	Ministry of Environment	1996
17	Sub-Decree on Environmental Impact Assessment Process (1999)	PDF File	-	Ministry of Environment	1999
18	Sub-Decree on Water Pollution Control (1999)	PDF File	-	Ministry of Environment	1999
19	Sub-Decree on Solid Waste Management (1999)	PDF File	-	Ministry of Environment	1999
20	Sub-Decree on Air Pollution Control and Noise Disturbance (2000)	PDF File	-	Ministry of Environment	2000
21	Law on Water Resource Management(2004)	PDF File	-	Ministry of Environment	2004
22	General Guideline for Conducting Initial and Full Environmental Impact Assessment Report (2009)	Paper Copy	-	Ministry of Environment	2009
23	PROTECTED AREA LAW (2008)	PDF File	-	Ministry of Environment	2008
24	Land Law	PDF File	-		2001
25	Land Expropriation Law	PDF File	-		2009
26	The Project for Replacement and Expansion of Water Distribution Systems in Provincial Capitals Tender Documents volume I - III	Paper	Copy	NJS CONSULTANTS CO., LTD.	2011
27	Provincial Towns Improvement Project, Part B Contract No. ICB/PTIP/AB/002 For Construction of Water Supply Systems in BATTANBANG, PURSAT, KOMPON CHAM, KOMPONG THOM, KAMPOT and SVAY RIENG AS-BUILT DRAWING for BATTAMBANG and KOMPONG CHAM	Paper	Copy	NIPPON JOGESUIDO SEKKEI CO. LTD. IN ASSOCIATION WITH SAWAC, CHINA GEO-ENGINEERING CORPORATION AND CAMBODIA CONSTRUCTION & ENGINEERING CO., LTD JOINT VENTURE	2007

## 7. Reference

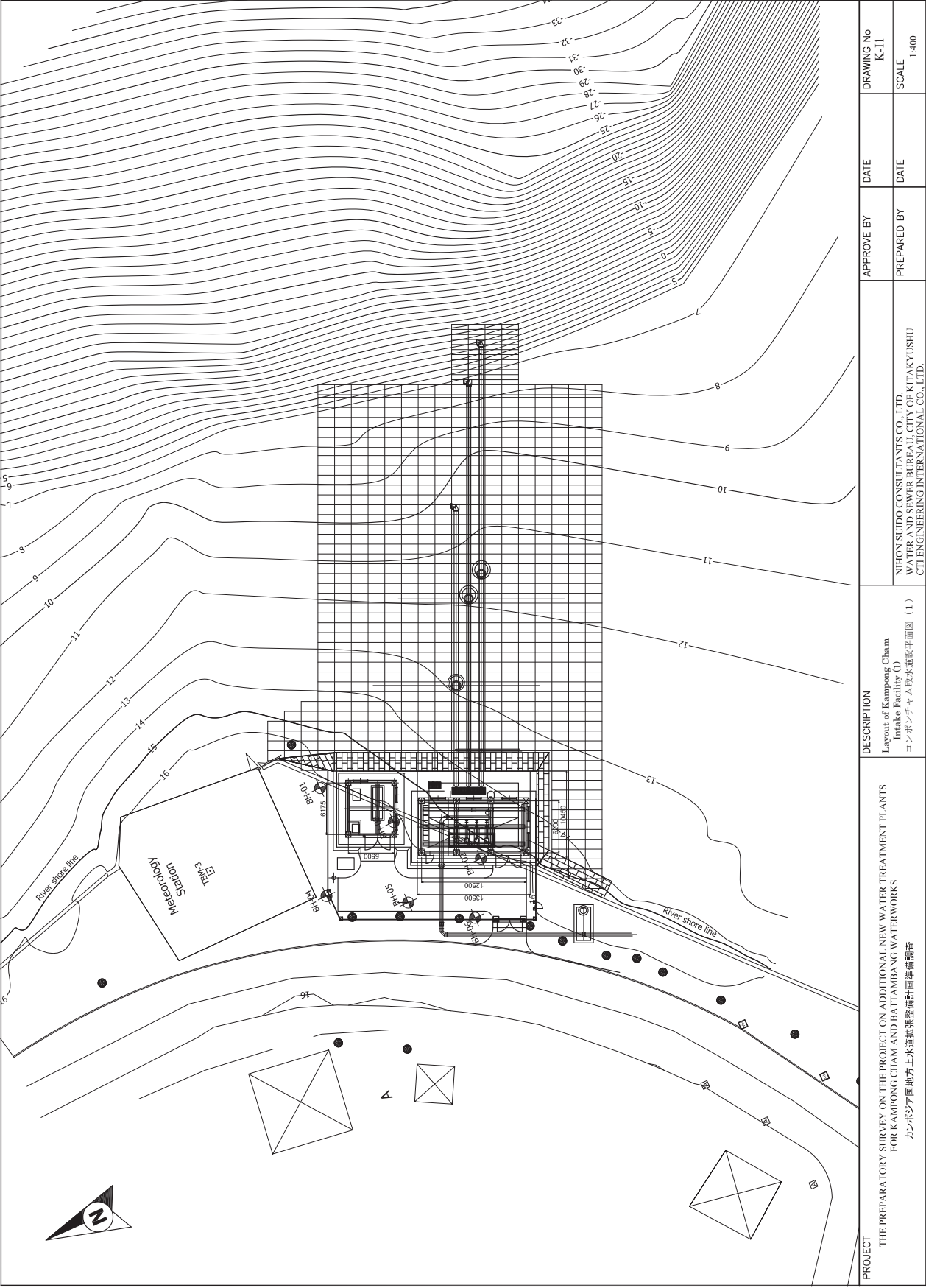
### 7.1 Outline Design Drawings

#### List of Outline Design Drawings

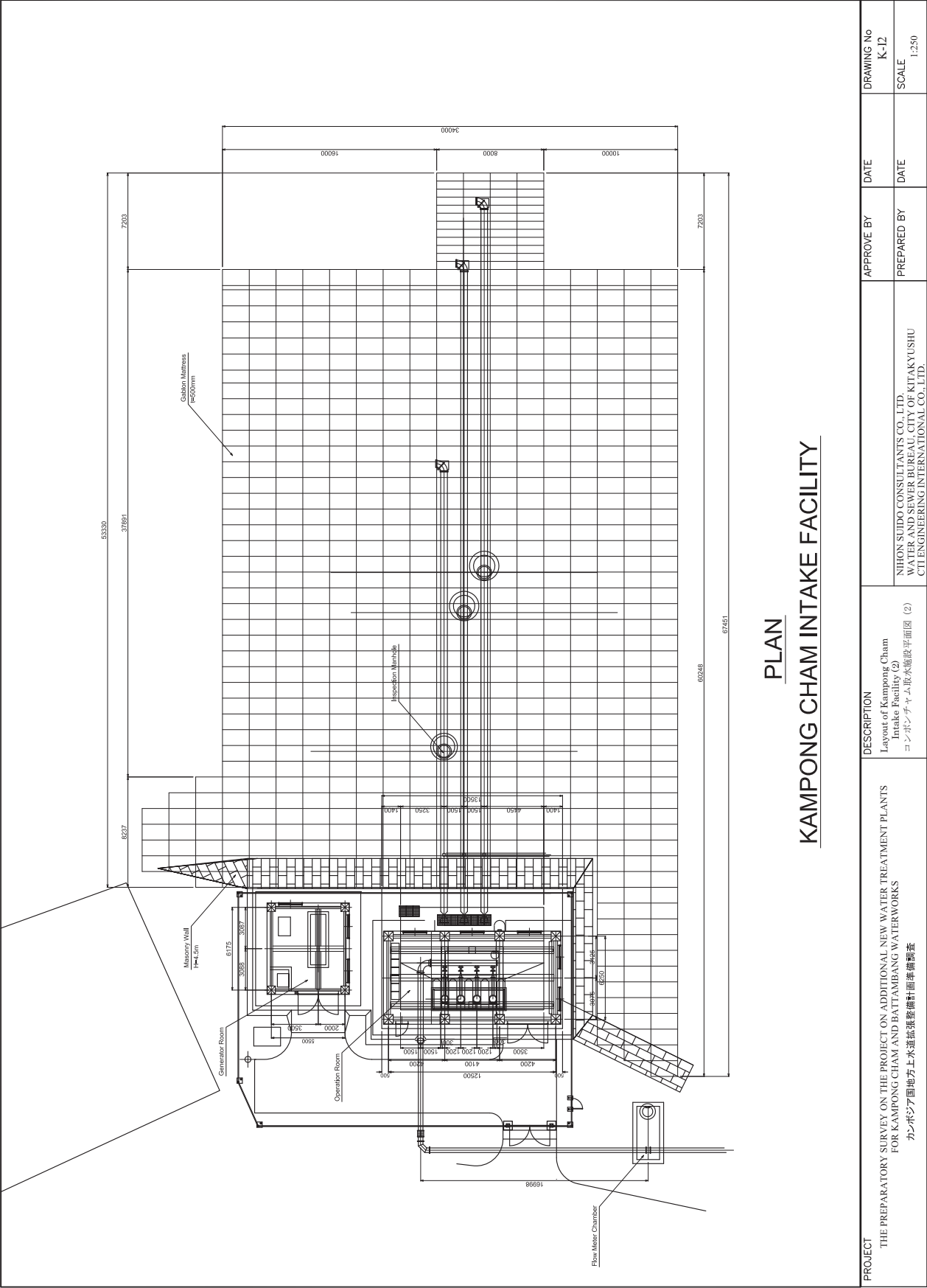
No.	Facility	Drawing Title	Dwg No.	
			KMC	BTB
1.	General (G)	General Layout	K-G1	B-G1
2.	Intake (I)	Layout of Intake Facility (1)	K-I1	B-I1
		Layout of Intake Facility (2)	K-I2	B-I2
		Section View of Intake Facility	K-I3	B-I3
		Front View of Intake Facility	K-I4	B-I4
3.	Conveyance Pipe (R)	Route of Conveyance Pipe	K-R1	B-R1
		Typical Cross Section for Conveyance Pipe	K-R2	B-R2
		Valve Chamber for Conveyance Pipe	K-R3	B-R3
4.	Treatment Facility (T)	General Layout Plan of WTP	K-T1	B-T1
		Water Level Profile of Water Treatment Plant	K-T2	B-T2
		Plan of Receiving well, Flocculation Basin, Sedimentation Basin, Flocculation Basin	K-T3	B-T3
		Section of WTP (1)	K-T3	B-T4
		Section of WTP (2)	K-T5	B-T5
		Section of WTP (3)	K-T6	B-T6
		Section of WTP (4)	K-T7	B-T7
		Service Reservoir and Pumping Station Structure (1)	K-T8	B-T8
		Service Reservoir and Pumping Station Structure (2)	K-T9	B-T9
		Drainage Basin Structure	K-T10	B-T10
		Lagoon (1)	K-T11	B-T11
		Lagoon (2)	K-T12	-
5.	Transmission and Distribution Facility (D)	Location Map	K-D1	B-D1
		Plan (1)	K-D2	B-D2
		Plan (2)	K-D3	B-D3
		Plan (3)	K-D4	B-D4
		Plan (4)	K-D5	B-D5
		Plan (5)	K-D6	B-D6
		Plan (6)	K-D8	B-D7
		Plan (7)	K-D9	B-D8
		Plan (8)	K-D10	B-D9
		Plan (9)	-	B-D10
		Plan (10)	-	B-D11
		Plan (11)	-	B-D12
		Plan (12)	-	B-D13
		Plan (13)	-	B-D14
		General Earth Work for Pipe Laying	K-D11	-
		Typical Drawing for Installation of Sluice Valve	K-D12	-
		Typical Drawing for Installation of Air Valve and Washout	K-D13	-
		Typical Drawing for Branch of Service Pipe	K-D14	-
		Typical Drawing for Structure Crossing	K-D15	-
		Typical Drawing for New Pipe and Existing Pipe (1)	K-D16	-
		Typical Drawing for New Pipe and Existing Pipe (2)	K-D17	-
		Single Mouth Type Fire Hydrant	K-D18	-
		Double Mouth Type Fire Hydrant	K-D19	-
		Standard Drawing for Bridge Attached Pipe	K-D20	-
		Standard Drawing for Pipe Beam	K-D21	-
		Standard Drawing for Flow Meter Chamber	K-D22	-

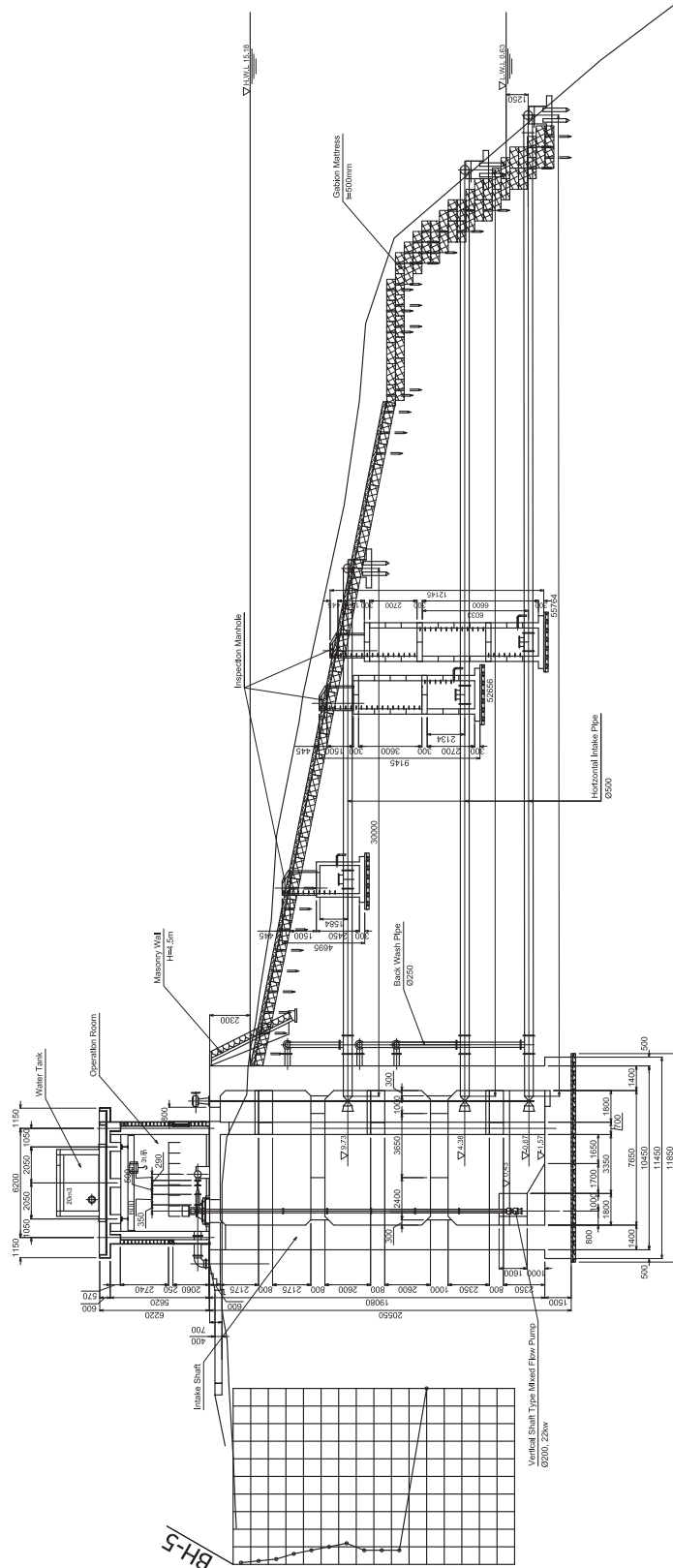






PROJECT	DESCRIPTION	APPROVE BY		DATE		DRAWING No	
		PREPARED BY		DATE		SCALE	
THE PREPARATORY SURVEY ON THE PROJECT ON ADDITIONAL NEW WATER TREATMENT PLANTS FOR KAMPONG CHAM AND BATTAMBANG WATERWORKS カンボジア国地方上水道拡張整備計画準備調査	Layout of Kampong Cham Intake Facility (I) コンボーンチャム取水施設平面図 (1)	NIHON SUDO CONSULTANTS CO., LTD. WATER AND SEWER BUREAU, CITY OF KITAKYUSHU CIT ENGINEERING INTERNATIONAL CO., LTD.				K-11 1:400	





## SECTION

### KAMPONG CHAM INTAKE FACILITY

