資　料

［資料］

資料 1. 調査団員氏名、所属

(1) 第一次現地調査団団員リスト

氏　名	担　当	所属先・職位
田中顕士郎	総　　括	JICA 資金協力業務部　実施監理第一課
中川　輝雄	総括／橋梁計画	セントラルコンサルタント（株）
櫻井　郁男	橋梁点検計画	（株）エイティアイ
北村　隆理	橋梁点検	（株）建設技研インターナショナル
関　康一郎	橋梁改修計画	（株）エイティアイ
渡邉　恭史	橋梁設計	（株）建設技研インターナショナル
千葉　靖之	交通調査／舗装設計	セントラルコンサルタント（株）
平岡　一幸	施工計画	セントラルコンサルタント（株）
高山　博文	積算	セントラルコンサルタント（株）
植田　信一	自然条件調査 (地形・地質)	セントラルコンサルタント（株）
仁平　正人	環境社会配慮	セントラルコンサルタント（株）
梅野　　順	自然条件調査 (水理・水文)	セントラルコンサルタント（株）
豊崎　真也	道路計画／設計	セントラルコンサルタント（株）

(2) 第二次現地調査団団員リスト

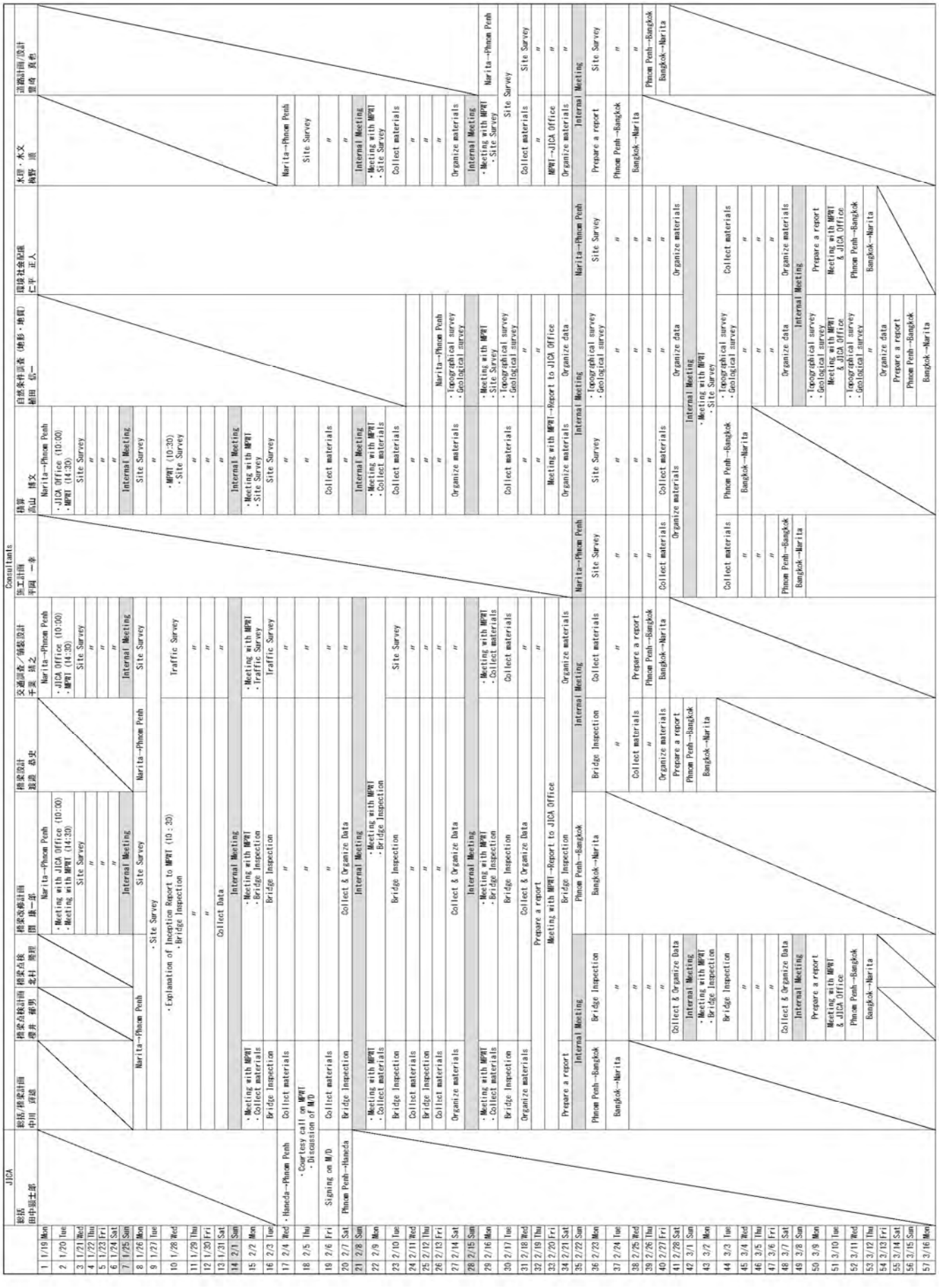
氏　名	担　当	所属先・職位
田中顕士郎	総　　括	JICA 資金協力業務部　実施監理第一課
中川　輝雄	総括／橋梁計画	セントラルコンサルタント（株）
櫻井　郁男	橋梁点検計画	（株）エイティアイ
北村　隆理	橋梁点検	（株）建設技研インターナショナル
関　康一郎	橋梁改修計画	（株）エイティアイ
渡邉　恭史	橋梁設計	（株）建設技研インターナショナル
仁平　正人	環境社会配慮	セントラルコンサルタント（株）

(3) 概略設計概要資料説明調査団団員リスト

氏　名	担　当	所属先・職位
小泉　幸弘	総　　括	JICA 資金協力業務部　実施監理第一課　課長
平林 由梨恵	計画管理	JICA 資金協力業務部　実施監理第一課
中川　輝雄	総括／橋梁計画	セントラルコンサルタント（株）
櫻井　郁男	橋梁点検計画	（株）エイティアイ
藤田　知巳	環境社会配慮	セントラルコンサルタント（株）

資料 2. 調査工程

(1) 第一次現地調査工程表



(2) 第二次現地調査工程表

			JICA	Consultants					
			総括 田中顯士郎	総括/橋梁計画 中川 輝雄	橋梁点検計画 櫻井 郁男	橋梁点検 北村 隆理	橋梁改修計画 関 康一郎	橋梁設計 渡邉 恭史	環境社会配慮 仁平 正人
1	5/24	Sun			Narita→Phnom Penh				
2	5/25	Mon			Bridge Inspection				Site Survey
3	5/26	Tue			〃				〃
4	5/27	Wed			〃				〃
5	5/28	Thu			〃				〃
6	5/29	Fri			〃				〃
7	5/30	Sat			Organize Data				
8	5/31	Sun	Haneda→Phnom Penh	Narita→Phnom Penh	Internal Meeting				
9	6/1	Mon	・Meeting with JICA Office ・Explanation of Interim Report to MPWT		Bridge Inspection	・Meeting with JICA Office ・Explanation of Interim Report to MPWT		Bridge Inspection	Site Survey
10	6/2	Tue	Discussion of M/D with MPWT		Bridge Inspection				〃
11	6/3	Wed	・Signing on M/D with MPWT ・Report to JICA&EOJ		〃				〃
12	6/4	Thu	Phnom Penh→Haneda		Bridge Inspection				〃
13	6/5	Fri		Phnom Penh→Bangkok	Bridge Inspection				〃
14	6/6	Sat		Bangkok→Haneda	Bridge Inspection				〃
15	6/7	Sun			Internal Meeting				
16	6/8	Mon			Phnom Penh→Bangkok				Collect materials
17	6/9	Tue			Bangkok→Haneda				Phnom Penh→Bangkok
18	6/10	Wed							Bangkok→Haneda

(3) 概略設計概要資料説明調査

日次	月日	曜日	JICA		コンサルタント	
			総括	計画管理	総括/橋梁計画	橋梁点検計画
			小泉 幸弘	平林 由梨恵	中川 輝雄	櫻井 郁男
1	1月7日	木	01:30 HND - 05:50 SGN JL79 08:00 ホーチミン市内 - 10:30 バベット 14:00 バベット→18:00 プノンペン			
2	1月8日	金	午前 JICAカンボジア事務所訪問、打ち合わせ 午後 経済財務省、カンボジア開発評議会(CDC) プノンペン市			
3	1月9日	土				
4	1月10日	日			11:45 NRT - 17:05 BKK TG643 18:20 BKK - 19:35 PNH TG584	
5	1月11日	月	公共事業運輸省MM協議			
6	1月12日	火	公共事業運輸省MM協議			
7	1月13日	水	AM 交通管制C/P表敬、先方負担事項等協議 PM MM署名 JICA、大使館報告			
8	1月14日	木	06:15 PNH - 07:25 BKK JL5956 09:55 BKK - 17:30 HND JL032		現地調査	
9	1月15日	金			現地調査	
10	1月16日	土			20:35 PNH - 21:40 BKK TG585 23:55 BKK - 07:35 NRT TG642	
11	1月17日	日			07:35 NRT TG642	

資料 3. 関係者（面会者）リスト

〈カンボジア国側〉

1) 公共事業運輸省（Ministry of Public Works and Transport：MPWT）

Tram Iv Tek	Minister
Tauch Chankosal	Secretary of State
Chhim Phalla	Director of International Cooperation Department
Nay Chamnang	Director of Road Infrastructure Department
Chao Sopheak Phibal	Deputy Director of Road Infrastructure Department
Sam Piseth	Director of Department of Public Works and Transport
Koun Bunthoeun	Director of Public Works Research Center
Nin Menakak	Architect, Road Infrastructure Department
Davuth long	Engineer, Road Infrastructure Department
Yit Bunna	Under Secretary of State

2) 経済財務省（Ministry of Economy and Finance：MEF）

Im Sethyra	Director of Resettlement Department
Yen Sophan	Deputy Director of Resettlement Department (IRC)
Hiv Panhavuth	Deputy Director of Resettlement Department

3) メコン委員会（Mekong River Commission Secretariat)

Preap Sameng	Assistant Hydroligist

4) プノンペン市水道公社（Phnom Penh Water Supply Authority：PPWSA）

Samreth Sovithiea	Deputy General Director of Plan and Investment
Chea Satephoat	Director of Planning and Project Department

<日本側>

1) 日本大使館

飯塚　知浩	二等書記官
千葉　泰三	二等書記官

2) JICA カンボジアオフィス

安達　一	所長
伊藤　隆司	次長
福沢　大輔	所員

資料 4. 討議議事録（M/D）

(1) 第一次現地調査時

Minutes of Discussions
on the Preparatory Survey
on the Project for Rehabilitation of the Chroy Changwar Bridge
(Cambodia - Japan Friendship Bridge)
in the Kingdom of Cambodia

The Government of Japan (hereinafter referred to as "GOJ") decided to conduct a Preparatory Survey on the Project for Rehabilitation of the Chroy Changwar Bridge (Cambodia - Japan Friendship Bridge) (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Royal Government of Cambodia (hereinafter referred to as "RGC") the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Kenshiro Tanaka, Advisor, Grant Aid Project Management Division 1, Financial Cooperation Implementation Department, JICA, and is scheduled to stay in Cambodia from February 4th to 7th, 2015.

The Team held discussions with the officials concerned of RGC and conducted field survey. As a result, both parties confirmed the main items described in the Attachment. The Team will proceed to further works and prepare the Preparatory Survey Report.

Phnom Penh, February 6th, 2015

Kenshiro Tanaka	H.E. Tram Iv Tek
Leader	Minister
Preparatory Survey Team	Ministry of Public Works and Transport (MPWT)
Japan International Cooperation Agency	Kingdom of Cambodia

ATTACHMENT

1. Purpose of the Project

The purpose of the project is to rehabilitate the Chroy Changwar Bridge which has been damaged in 50 year use.

2 Objectives and Schedule of the Survey

(1) Cambodian side understood that the purpose of the Survey is to draft the most appropriate outline design and cost estimation of the Project as Japan's Grant Aid upon explanation by the Team.
(2) Cambodian side agreed with the schedule of the Study explained by the Team as attached Annex 1.

3. Japan's Grant Aid Scheme

(1) Cambodian side understood the Japan's Grant Aid scheme explained by the Team, as described in Annex 2.
(2) Cambodian side confirmed to take necessary measures, as described in Annex 3, for smooth implementation of the Project. The Team supplemented that the detail will be further investigated thorough the Study.
(3) It should be noted that implementation of the Preparatory Survey does not imply any decision or commitment by JICA to extend its grant for the project at this stage.

4. Responsible and Implementing Organizations

Cambodian side explained that the responsible and implementing organization for the Project is Ministry of Public Works and Transport (hereinafter referred to as "MPWT"). MPWT confirmed its responsibility for necessary arrangements and undertakings during the Project. The organization chart of MPWT is as shown in Annex 4.

6. Environmental and Social Considerations

(1) The Team explained the Project is to be categorized as "Category B" according to the JICA Environmental and Social Considerations Guideline (hereinafter referred to as "the JICA Guideline"), since the purpose of the Project should be limited within rehabilitation, retrieval, and replace of the existing road and bridge in principle, its negative impacts on the social and environmental consideration can be minimized and mitigated through designing of the Project.
(2) Cambodian side understands the Project needs to follow the JICA guideline.

7. Inception Report

The Team explained the contents of Inception Report and Cambodian side received it.

8. Other relevant issues

(1) Traffic Control

MPWT will take necessary measures for traffic control of Chroy Changwar Bridge including traffic ban for smooth and efficient implementation of the bridge inspection by the Team. Further technical discussions will be held between MPWT and the Team.

(2) Arrangement with Relevant Authorities

MPWT will conduct necessary arrangement with relevant authorities, if necessary, for smooth and efficient implementation of the bridge inspection by the Team. JICA will join the discussions among MPWT, relevant authorities and the Team, if necessary.

(3) Custom Duty Exemption for Survey Equipment

MPWT will arrange smooth custom clearance and custom duty exemption for survey equipment. All the survey equipment that will be taken into Cambodia by the Team will be brought back to Japan by the Team.

(END)

Annex 1 Schedule of the Survey
Annex 2 Japan's Grant Aid Scheme
Annex 3 Major Undertakings to be taken by Each Government
Annex 4 Organization Chart of MPWT

Annex 1

Schedule of the Survey

Survey Schedule

	Contents	Dec. 2014	Jan. 2015	Feb.	Mar.	Apr.	May	June	July	Aug.
1	Survey Preparation in Japan		■	■						
2	Bridge Inspetion in Cambodia			■	■	■				
3	Analysis of the Result of the Bridge Inspection in Japan					■	■			
4	Discussion of Bridge Rehabilitation Policy in Cambodia						■			
5	Design Works in Japan						■	■	■	■
6	Explanation of the Survey Result in Cambodia									■

* The schedule of the survey might be modified with the result of the bridge inspection

(1) JICA will dispatch the Team for "Discussion Bridge Rehabilitation Policy in Cambodia" in middle of April, 2015.

(2) JICA will prepare the draft report in English and dispatch the Team in order to explain its contents around by the middle of August, 2015.

(3) JICA will prepare and submit the final report around the end of November, 2015.

Annex 2

JAPAN'S GRANT AID

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

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

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

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

2. Preparatory Survey

(1) Contents of the Survey

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

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the

implementation of the Project.

- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

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

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

(2) Selection of Consultants

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

(3) Result of the Survey

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

3. Japan's Grant Aid Scheme

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

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

necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

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

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

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

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

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

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

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

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

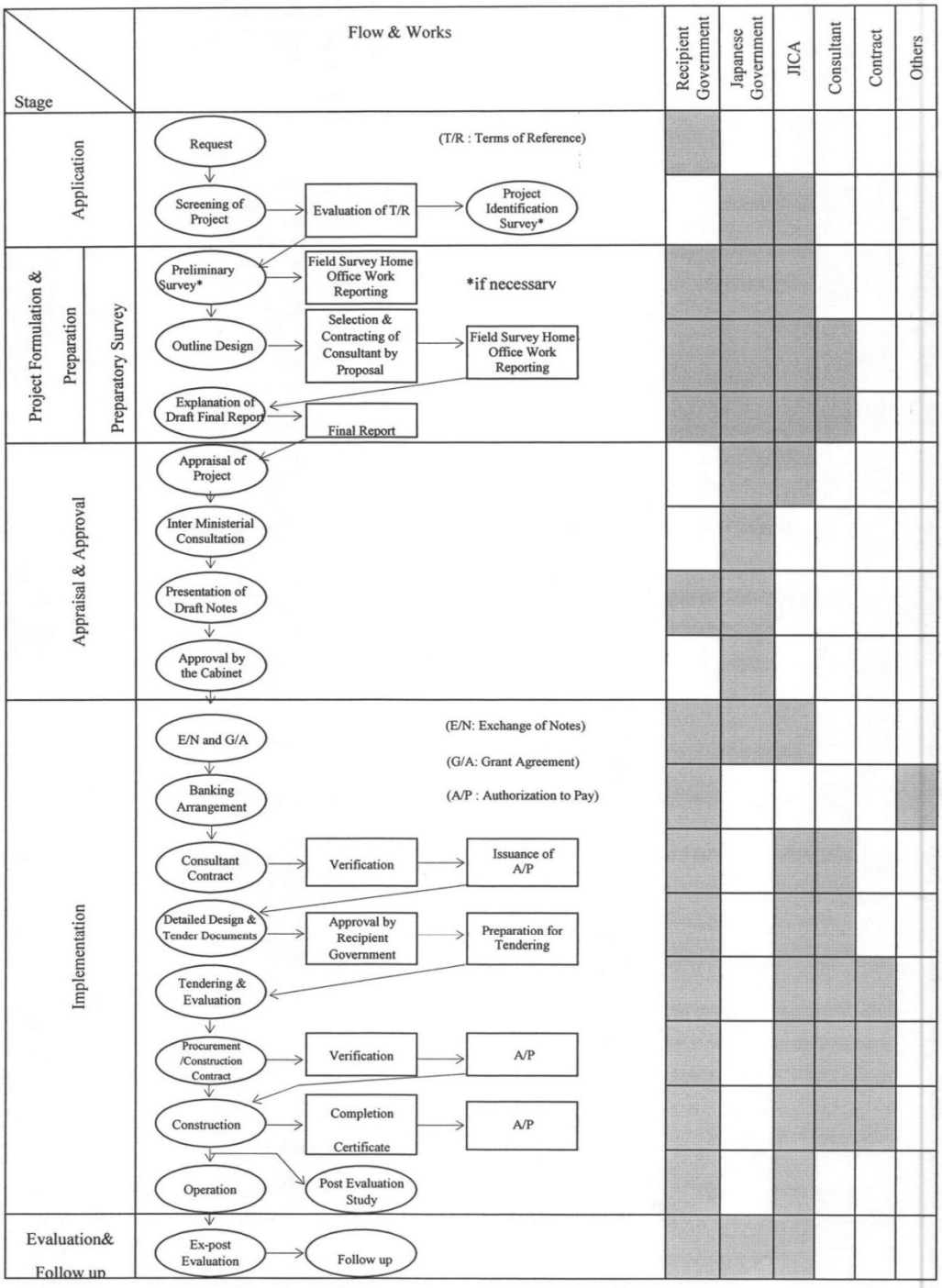
(9) Authorization to Pay (A/P)

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

(10) Social and Environmental Considerations

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

FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



Annex 3

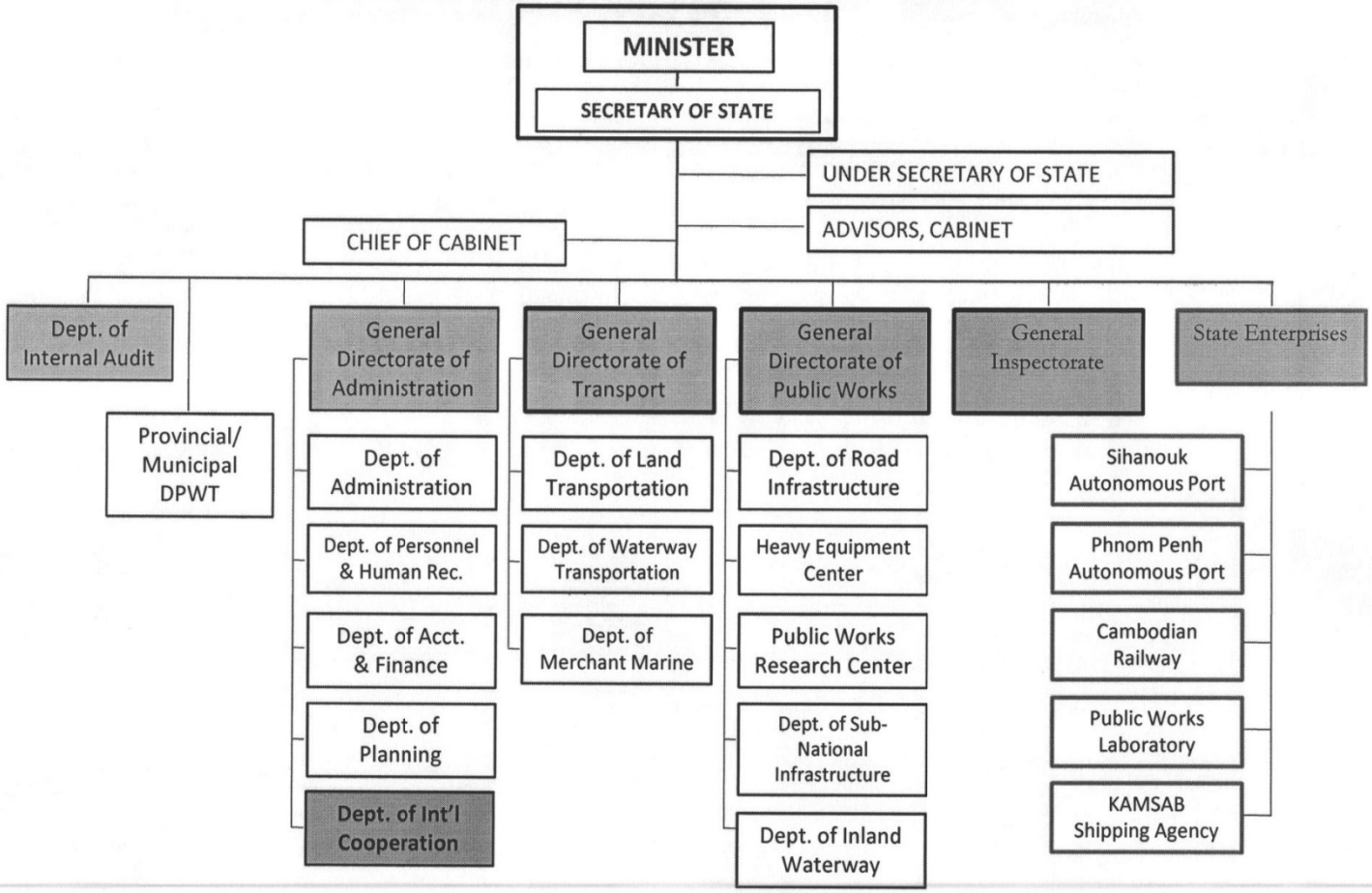
Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure a lot of land necessary for the implementation of the Project and to clear the site;		●
2	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) 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 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

ORGANIZATION CHART OF MPWT



(2) 第二次現地調査時

Minutes of Discussions
on the Preparatory Survey
on the Project for Rehabilitation of the Chroy Changwar Bridge
(Cambodia - Japan Friendship Bridge)
in the Kingdom of Cambodia

The Government of Japan (hereinafter referred to as "GOJ") decided to conduct a Preparatory Survey on the Project for Rehabilitation of the Chroy Changwar Bridge (Cambodia - Japan Friendship Bridge) (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Royal Government of Cambodia (hereinafter referred to as "GOC") the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Kenshiro Tanaka, Advisor, Grant Aid Project Management Division 1, Financial Cooperation Implementation Department, JICA, and is scheduled to stay in Cambodia from May 31st to June 3rd, 2015.

The Team held discussions with the officials concerned of GOC and conducted field survey. As a result, both parties confirmed the main items described in the Attachment. The Team will proceed to further works and prepare the Preparatory Survey Report.

Phnom Penh, June 3rd, 2015

Kenshiro Tanaka
Leader
Preparatory Survey Team
Japan International Cooperation Agency

H.E. Tram Iv Tek
Minister of Public Works and Transport (MPWT)
Kingdom of Cambodia

ATTACHMENT

1. Result of the First Field Survey

The Team explained the result of the first field survey from January to March, 2015, for the bridge inspection for the Chroy Changwar Bridge with the interim report as attached. The Cambodian side understood and agreed it in principle.

2. Additional Field Survey

The Team will conduct additional field survey to confirm and deepen the result of the bridge inspection, including concrete strength tests for piers and supersonic flaw detection tests for steel girders. The Cambodian side shall take necessary measures for the Team, if necessary.

3. Bridge Rehabilitation Policy

The Team explained the bridge rehabilitation policy, which was result of analysis of the result of the field survey, with the interim report. The Cambodian side understood and agreed it in principle. The outline of the policy is as following;

- to rehabilitate the bridge bearable against B live load as a two lane automobile bridge,
- to remove existing approach PC bridges in Phnom Penh side and Chroy Changwar side and to rebuild new approach bridges (including abutments of embankment sections).
- to repair cracks and repaint the existing steel girders (new and old),
- to repave the embankment sections, new approach bridges and existing steel girders,
- to rehabilitate drainage facilities, expansion joints, railings, etc., and
- to make the traffic of the bridge close for necessary period for rehabilitation works.

The Team will conduct outline design, implementation plan and estimation of the rehabilitation project in Japan. The Team will also study to minimize the traffic closure period for the rehabilitation works in the analysis.

3. Other relevant issues

(1) The Cambodian side requested the Team to adopt PC girders instead of steel girders for the approach bridges. The Team will study the possibility of adoption of PC girders and report the result to the Cambodian side in the next mission.

(2) The Cambodian side requested the Team to study traffic management of the entrance of Chroy Changwar Brige at Phnom Penh side to ease the traffic situation. The Team agreed to add it to the scope of the Preparatory Survey and will report the result in to the Cambodian side in the next mission. The Team may dispatch an additional mission to discuss the result before DOD mission, if necessary.

(3) The Team will study outline design in Japan and dispatch a mission for discussion of draft outline design report (DOD mission) in November or December, 2015.

(END)

Annex Interim Report

(3) 概略設計概要資料説明調査時

Minutes of Discussions
on the Preparatory Survey for the Project for
Rehabilitation of the Chroy Changwar Bridge
(Explanation on Draft Preparatory Survey Report)

On the basis of the discussions and field surveys in Kingdom of Cambodia (hereinafter referred to as "Cambodia ") from January 19th to March 16th, 2015 and from May 24th to June 10th, 2015, and the subsequent technical examination of the results in Japan, the Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared a draft Preparatory Survey Report on the Project for Rehabilitation of the Chroy Changwar Bridge (hereinafter referred to as "the Draft Report").

In order to explain the Draft Report and to consult with the concerned officials of the Government of Cambodia on its contents, JICA sent to Cambodia the Preparatory Survey Team for the explanation of the Draft Report (hereinafter referred to as "the Team"), headed by KOIZUMI Yukihiro, Director, Grant Aid Project Management Division 1, Financial Cooperation Implementation Department, JICA, and is scheduled to stay in the country from January 7th to 16th, 2016.

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

Phnom Penh, January 13th, 2016

KOIZUMI Yukihiro
Leader, Preparatory Survey Team
Japan International Cooperation Agency (JICA)
Japan

H.E. Mr. Tram Iv Tek
Minister
Ministry of Public Works and Transport (MPWT)
Kingdom of Cambodia

ATTACHEMENT

1. Objective of the Project

   The objective of the project for rehabilitation of the Chroy Changwar Bridge (Cambodia – Japan Friendship Bridge) (hereinafter referred to as "the Project") to improve load-bearing capacity and long life of the Chroy Changwar Bridge (hereinafter referred to as "the Bridge") through rehabilitation and reconstruction works of the Bridge, thereby contributing to improve traffic capacity of the Bridge and National Road No. 6A.

2. Title of the Preparatory Survey

   Both sides confirmed the title of the Preparatory Survey as "the Preparatory Survey for the Project for Rehabilitation of the Chroy Changwar Bridge".

3. Project Site

   Both sides confirmed that the site of the Project is in Phnom Penh, which is shown in Annex 1.

4. Executing Agency

   Both sides confirmed the executing agency is Ministry of Public Works and Transport (hereinafter referred to as "MPWT") , MPWT shall coordinate with all the relevant ministries and agencies to ensure smooth implementation of the Project and ensure that the Undertakings are taken by relevant agencies properly and on time. The organization charts are shown in Annex 2.

5. Contents of the Draft Report

   After the explanation of the contents of the Draft Report by the Team, the Cambodian side agreed in principle to its contents.

6. Cost Estimation

   Both sides confirmed that the Project cost estimation described in the Draft Report was provisional and would be examined further by the Government of Japan for its final approval.

7. Confidentiality of the Cost Estimation and Specifications

   Both sides confirmed that the Project cost estimation and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until

all the contracts of the Project are concluded.

8. Japanese Grant Scheme

The Cambodian side understands the Japanese Grant Scheme and its procedures as described in Annex 3, 4 and 5, and necessary measures to be taken by the Government of Cambodia.

9. Project Implementation Schedule

The Team explained to the Cambodian side that the expected implementation schedule is as attached in Annex 6.

10. Expected outcomes and Indicators

Both sides agreed that key indicators for expected outcomes are as follows. The Cambodian side has responsibility to monitor the progress of the indicators and achieve the target in year 2021.

[Quantitative Effect]

Indicators	Reference Value in 2015	Target Value (3 years after completion)
Acceralation of Average Driving Speed (km/h)	26.8	40
Increase of Large Vehicle Traffic Volume (units/day)	0 (*)	1,278

(*) Traffic Ban of Large Vehicle Traffic

[Qualitative Effect]

Improvement of Basic Human Needs (BHN) for residents in the north area of Phnom Penh with improvement of access to their schools, hospitals, workplaces, etc.

Vitalization of regional economy of north eastern nine provinces with stable logistics of their agricultural and forest products.

11. Undertakings Taken by Both Sides

Both sides confirmed the undertakings described in Annex 7. The Cambodian side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage. Contents of Annex 8 will be updated as the Detailed Design progresses, and will finally be used in the

contract document.

12. Monitoring during the Implementation

The Project will be monitored every month by the executing agency and using the Project Monitoring Report (PMR). The sample form of the PMR is attached in Annex 8.

13. Ex-Post Evaluation

JICA will conduct ex-post evaluation three (3) years after the project completion with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, Sustainability) of the Project. Result of the evaluation will be publicized. The Cambodian side is required to provide necessary support for them.

14. Issues to be Considered for the Smooth Implementation of the Project

Both sides confirmed the issues to be considered and taken necessary measures for the smooth implementation of the Project described in Annex 7. Especially bellow 3 items are keen for smooth implementation.

(1) Traffic Suspention and Diversion

Due to demollish and reconstruction of approach bridges, it is required to suspend traffic on present Chroy Changwar Bridge around 21 months. MPWT is responsible for securing suspension and divertion of traffic for the period. MPWT will establish a coordinating committee consisting of related agencies such as Municipality of Phnom Penh, traffic police etc. Public announcement and notice is one of the roles of the committee. The detail will be discussed at the detailed design stage.

(2) Relocation of utilities

The Cambodian side shall relocate all the utilities attached to the Bridge with Cambodian budget before notice of tender document for contractor selection. MPWT is responsible for coordination among related agencies and companies and takes necessary measures for relocation.

(3) Resettelement issues

Twenty one (21) households are to be affected by the project. Detail is mentioned on 16-3.

(4)UXO

The Cambodian side shall conduct UXO suevey on the project site before notice of the tender document in order to secure safety of the site and to aviod delay of the project.

yk

15. Schedule of the Study

JICA will complete the Final Report of the Preparatory Survey in accordance with the confirmed items and send it to the Cambodian side around March, 2016.

16. Environmental and Social Considerations

16-1 General Issues

16-1-1 Environmental Guidelines and Environmental Category

The JICA mission explained that 'JICA Guidelines for Environmental and Social Considerations (April 2010)' (hereinafter referred to as 'the Guidelines') is applicable for the Project. The Project is categorized as B because the Project is not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the Guidelines, and its potential adverse impacts on the environment are not likely to be significant.

16-1-2 Environmental Checklist

The environmental and social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist attached as Annex 9. Both sides confirmed that in case of major modification of the content of the Environmental Checklist, The Cambodian side shall submit the modified version to JICA in a timely manner.

16-2 Environmental Issues

16-2-1 Environmental Impact Assessment (EIA)

Both sides confirmed the EIA report shall be approved by Ministry of Environment in March, 2016.

16-2-2 Environmental Management Plan and Environmental Monitoring Plan

Both sides confirmed Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) of the Project is as Annex 10 and 11, respectively. Both side agreed that environmental mitigation measures and monitoring shall be conducted based on the EMP and EMoP, which may be updated during the detailed design stage.

16-3 Social Environment

16-3-1 Resettlement

Both sides confirmed 21 Households /84 people would be relocated/affected due to the implemenation of the Project.

yk

Such resettlement shall be implemented based on the abbrebiated Resettlement Action Plan (ARAP) prepared in line with the Guidelines and Cambodian laws and regulations.

16-4 Environmental and Social Monitoring

16-4-1 Environmental Monitoring

Both sides agreed that the Cambodian side shall submit results of environmental monitoring to JICA by using the monitoring form attached as Annex 12.

16-4-2 Social Monitoring

Both sides confirmed that the Cambodian side shall implement social monitoring about land acquisition and resettlement proposed in the ARAP. The Cambodian side and the JICA mission agreed that MPWT shall submit results of social monitoring to JICA by using the monitoring form attached as Annex 12.

16-4-3 Information Disclosure of Monitoring Results

Both sides confirmed that the Cambodian side shall disclose results of environmental and social monitoring to local stakeholders through their website.

The Cambodian side agreed JICA will disclose results of environmental and social monitoring submitted by the Cambodian side as the monitoring forms attached as Annex 13 on its website.

17. Other Relevant Issues

17-1. Operation and Maintenance of the Facilities

The team explained the importance of operation and maintenance of the facilities constructed by the Project considering that proper asset management impacts greatly on life-span of the facilities and its maintenance cost. The Cambodian side shall secure enough staff and budgets necessary for appropriate operation and maintenance of the facilities. The annual operation and maintenance costs are estimated and shown in Annex 7.

17-2. Construction and Traffic Safety

Both sides confirmed that the Cambodian side shall organize a structure of discussion among stakeholders of the Project, composed of MPWT, Phnom Penh Province, Traffic Police, local residents, schools, JICA, the Consultant, etc., from the Detailed Design phase for construction and traffic safety.

17-3. Construction Methods

yk

The construction site at the Phnom Penh side locates close to a school as well as, high density residential and commercial area. Both sides confirmed the necessity to discuss the selection of construction methods with the school and residents to mitigate adverse impacts for them from the Detailed Design phase.

17-4. Defect Liability

Defect liability of the rehabilitation works of steel girders and concret piers is limited only to the results of the works and not applicable to others.

17-5. Disclosure of Information

Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after completion of the Preparatory Survey. All the study results including the project cost will be disclosed to the public after all the contracts for the Project are concluded.

17-6. Environmental awareness

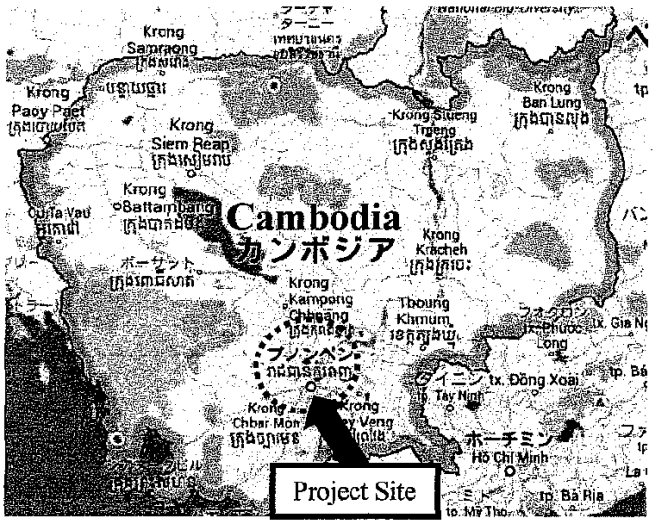
Both sides confirmed that basic implentation policy for the construction works associated with public environemnt awareness such as noise, air pollution, dust, water quality would be taken into consideration.

Annex 1 Project Site
Annex 2 Organization Chart
Annex 3 Japanese Grant
Annex 4 Flow Chart of Japanese Grant Procedures
Annex 5 Financial Flow of Japanese Grant
Annex 6 Project Implementation Schedule
Annex 7 Major Undertakings to be taken by Each Government
Annex 8 Project Monitoring Report (PMR, sample form)
Annex 9 Environmental Check List
Annex 10 Environmental Management Plan
Annex 11 Environmental Monitoring Plan
Annex 12 Environmental and Social Monitoring Form

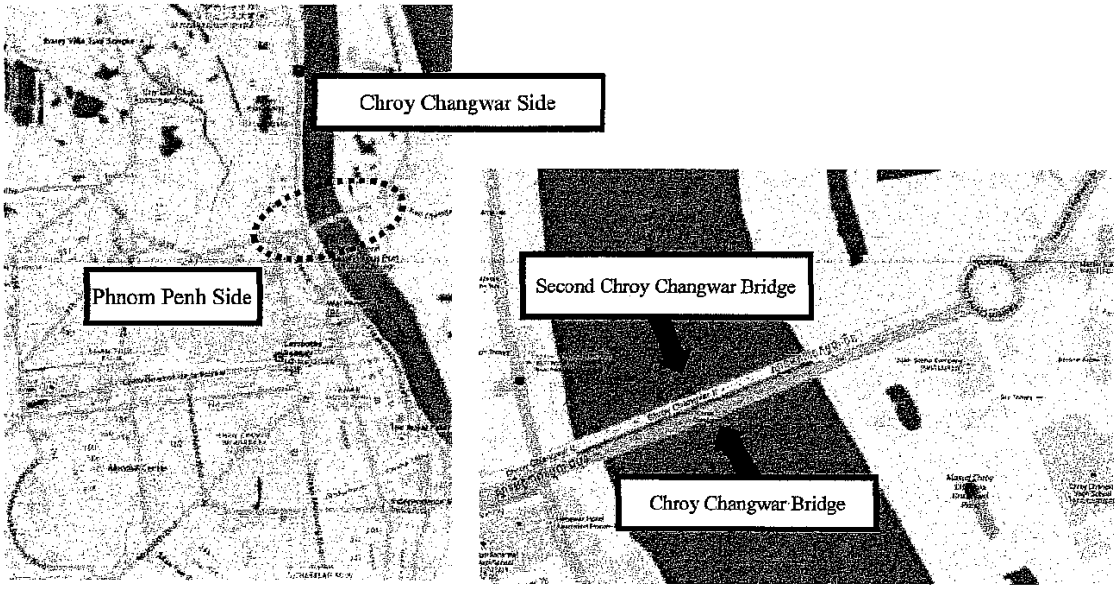
Annex 1

Project Site

< Regional Map >

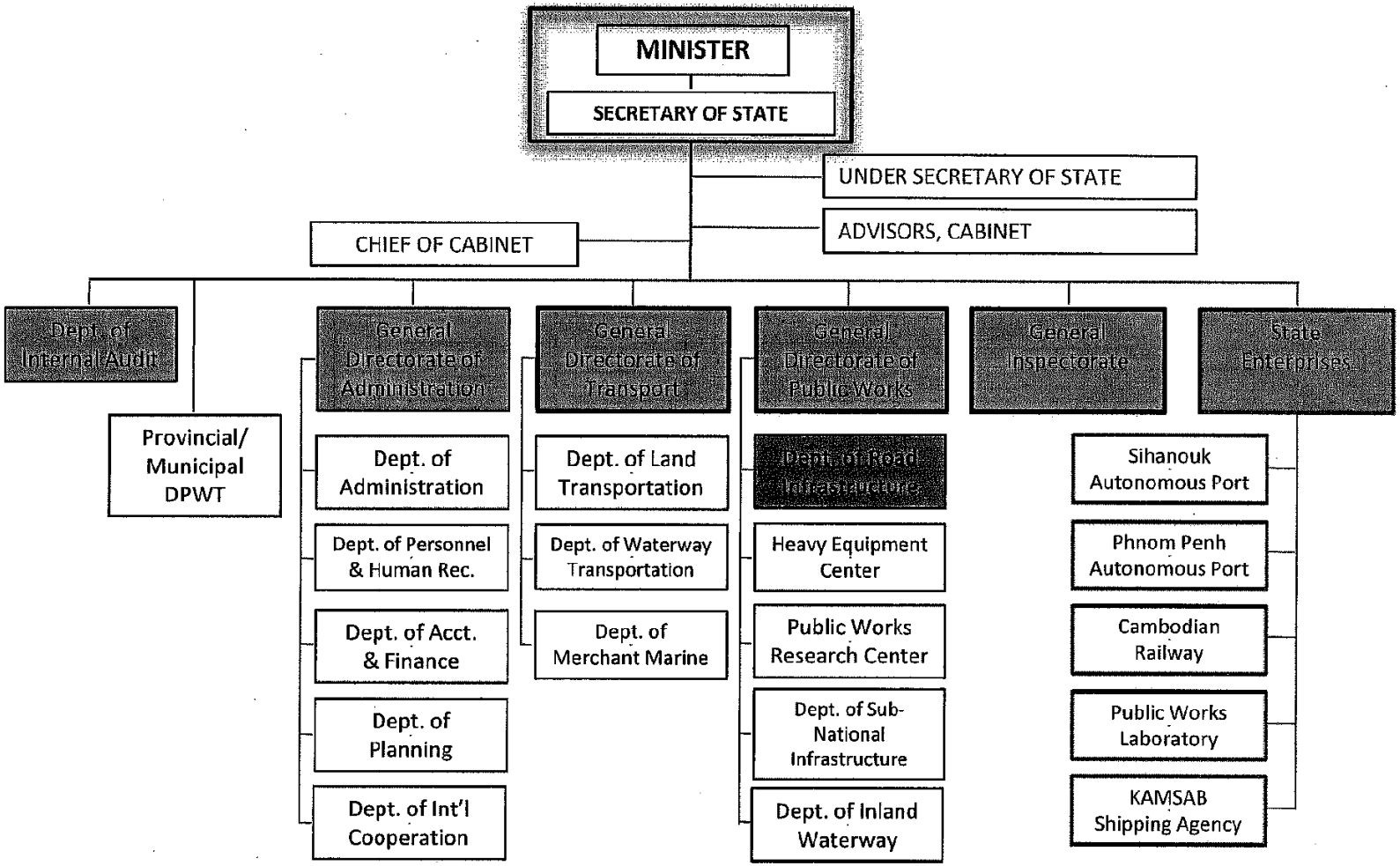


< Phonm Penh >



Annex 2

ORGANIZATION CHART OF MPWT



Annex 3

JAPANESE GRANT

The Japanese Grant (hereinafter referred to as the "Grant") 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 is not supplied through the donation of materials as such.

Based on a JICA law which was entered into effect on October 1, 2008 and the decision of the GOJ, JICA has become the executing agency of the Japanese Grant for Projects for construction of facilities, purchase of equipment, etc.

1. Grant Procedures

The Grant is supplied through following procedures :

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

2. Preparatory Survey

(1) Contents of the Survey

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

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

- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant project. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant 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) 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. Japanese Grant Scheme

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

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

(2) Selection of Consultants

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

(3) Eligible source country

Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. The Grant may be used for the purchase of the products or services of a third country, if necessary, taking into account the quality, competitiveness and economic rationality of products and services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals", in principle.

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals, in principle. 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 Project, the recipient country is required to undertake such necessary measures as Annex. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant fund comes from the Japanese taxpayers.

(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, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant.

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"), in principle. JICA will execute the Grant 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) Environmental and Social Considerations

The Government of the recipient country must carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the recipient country and JICA Guidelines for Environmental and Social Consideration (April, 2010) .

(11) Monitoring

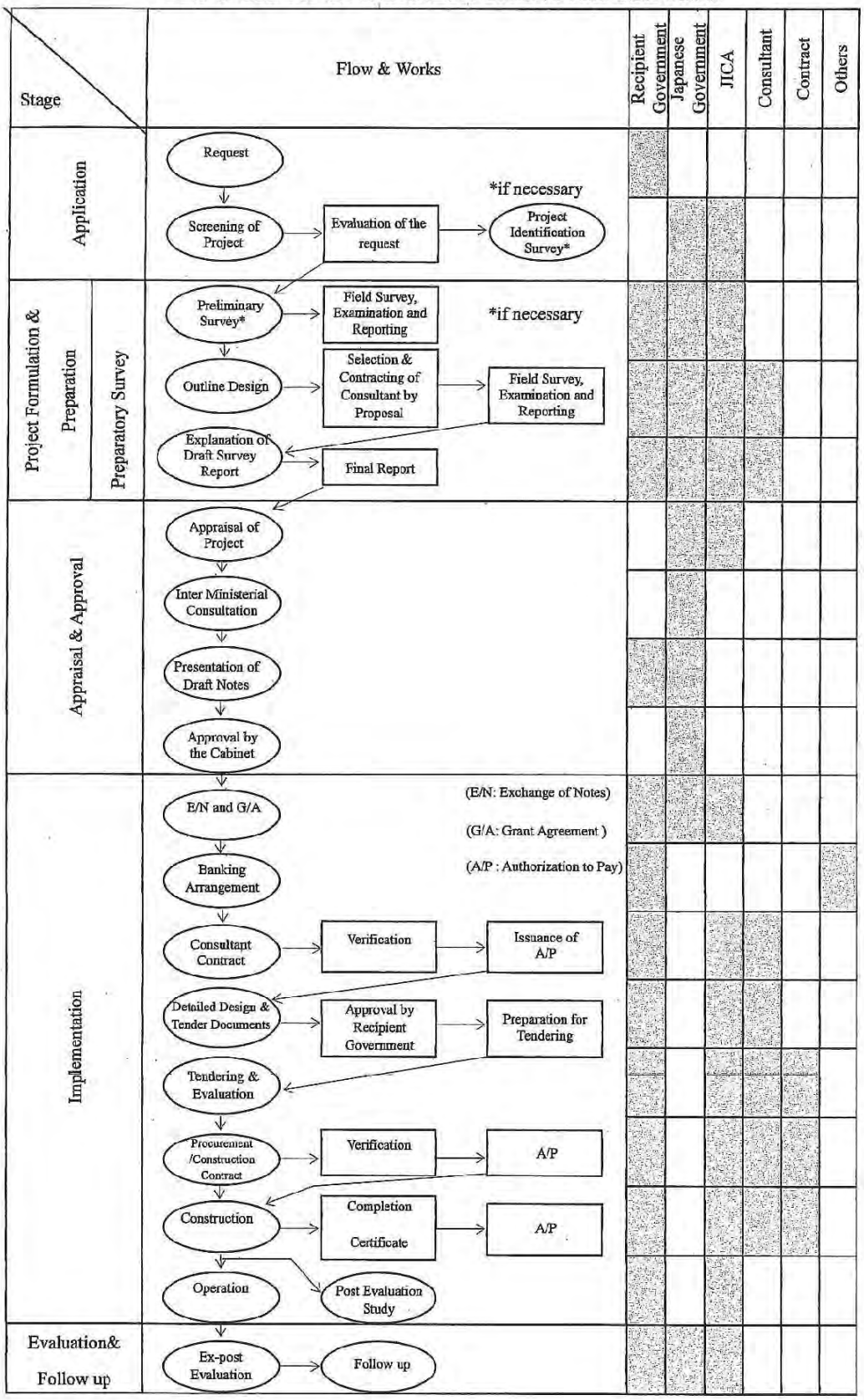
The Government of the recipient country must take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and must regularly report to JICA about its status by using the Project Monitoring Report (PMR).

(12) Safety Measures

The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

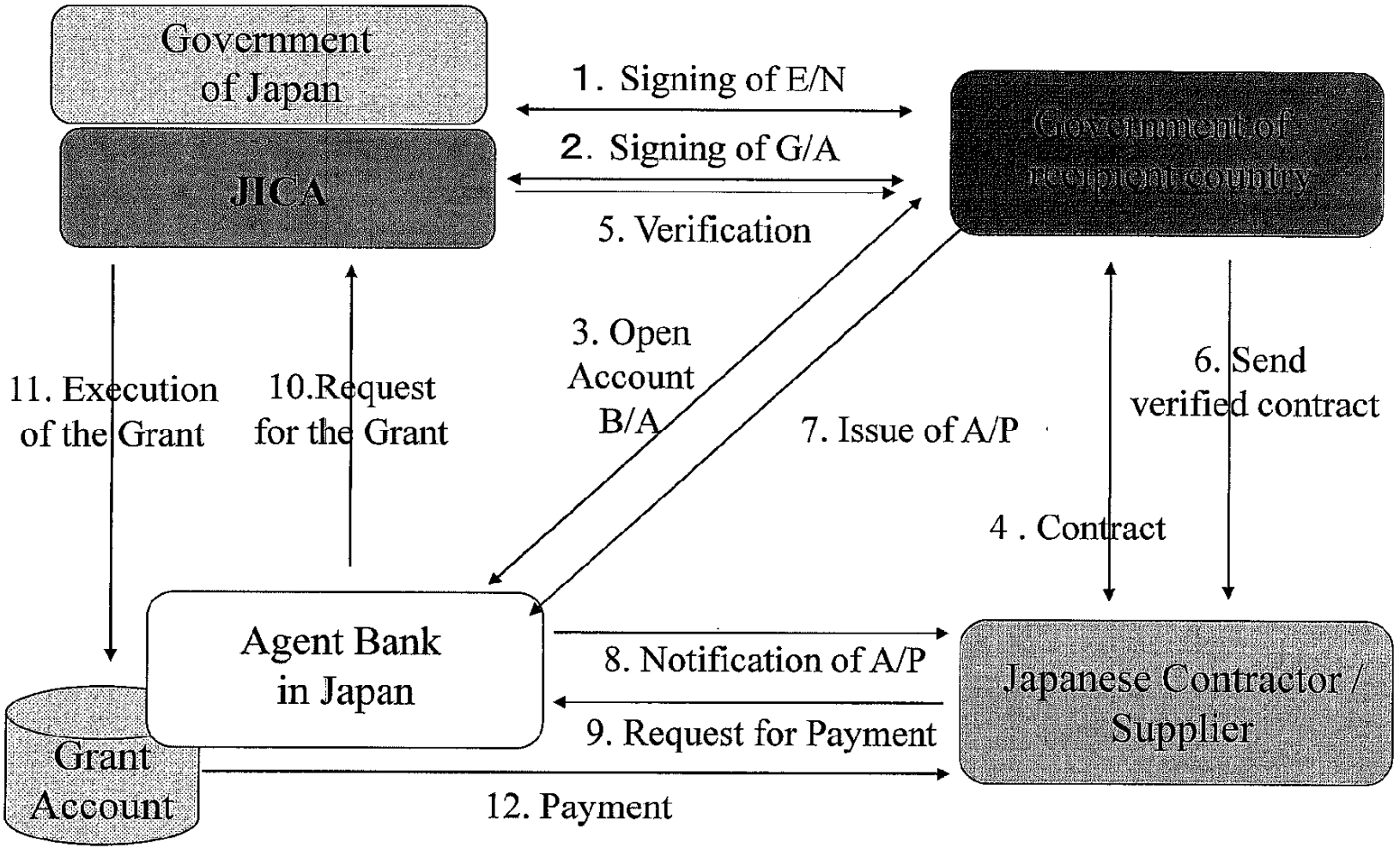
Annex 4

FLOW CHART OF JAPANESE GRANT PROCEDURES



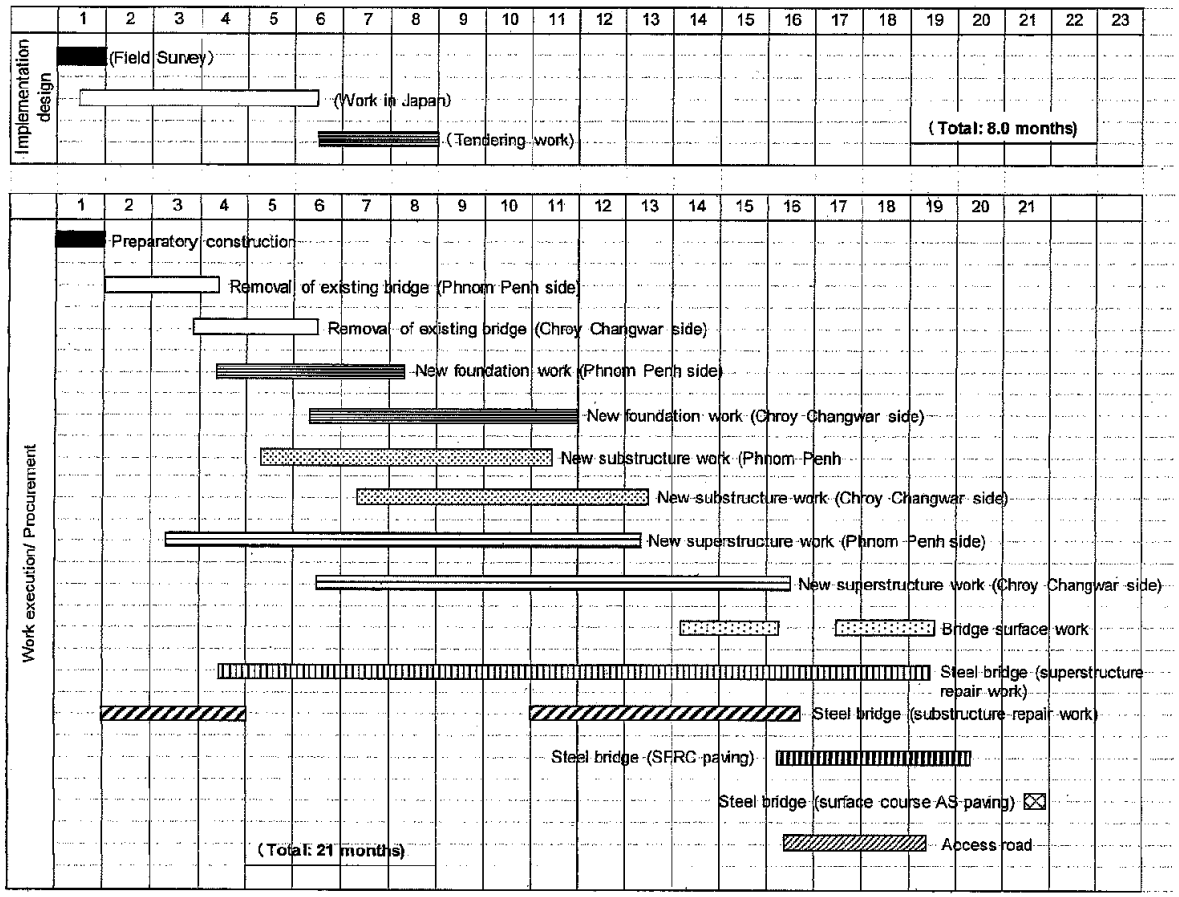
Annex 5

Financial Flow of Grant Aid (A/P Type)



Annex 6

Project Implementation Schedule



1

Annex 7

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A	MEF	***	
2	To approve EIA	March, 2016	MOE	---	Draft EIA report will be submitted to MPWT by JICA in January.
3	To implement Abbreviated RAP (relocation of PAPs)	before notice of the tender document	MPWT	---	Progress report can be considered.
4	To secure the following lands 1) Temporary construction yard and stock yard near the Project area 2) Borrow pits and disposal sites near the Project area	before notice of the tender document	MPWT	***	
5	To clear, level and reclaim the following sites 1) Relocation of utilities (a water pipe, 3 power lines, communication optical fiber and copper cables 2) Existing houses	before notice of the tender document	MPWT	***	Progress report can be considered.
6	To prepare traffic suspension plan of present Chroy Changwar Bridge 1) Preparation of traffic suspension and divert implementation plan 2) Establishment of a coordinating committee for traffic suspension 3) Advanced notice to people	before notice of the tender document	MPWT	---	
7	To conduct UXO survey on the project site	before notice of the tender document	MPWT	***	Drawings required for clearance will be provided at the detailed designs stage. Phnom Penh side: around 1,400m^2, Chroy Changwar side: around 1,400m^2.

*

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the singing of the contract	MPWT	***	Around 5,000(JPY) /time
	2) Payment commission for A/P	every payment	MEF	***	0.1% of payment amount
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project period	MPWT	---	
3	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project period	MPWT	---	
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project period	MPWT	---	
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project period	MPWT	---	
6	To provide facilities for the distribution of electricity and water supply to the construction yard	before start of the construction	MPWT	***	
7	To implement EMP and EMoP	during the Project period	MPWT	---	
	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	during the Project period	MPWT	---	
	To implement Abbreviated RAP (livelihood restoration program)	for a period based on livelihood restoration program	MPWT	---	
	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report - Period of the monitoring may be extended if affected persons' livelihoods are not sufficiently restored. Extension of the monitoring will be decided based on agreement between MPWT and JICA.	- until the end of livelihood restoration program	MPWT	---	
8	To implement traffic suspension of present Chroy Changwar Bridge 1) To assign traffic police for securing suspension and diversion 2) To introduce public for traffic suspension and diversion	during the Project period	MPWT		

3. After the Completion of the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine check/Periodic inspection	After completion of the construction	MPWT	***	
2	To implement EMP and EMoP	for a period based on EMP and EMoP	MPWT	---	
3	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between MPWT and JICA.	for three years after the Project	MPWT	---	Rough estimation will be introduced in the detailed design phase.

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

*Preliminary Estimation Borne by the Cambodian Side

Item	Amount (1,000 USD)	Converted amount (million yen)
(1) Land acquisition and resettlement cost	412.9	49.51
(2) Other mitigation cost	8.0	0.96
(3) Land leasing cost	387.2	46.40
(4) Cost of relocating utilities, etc.	850.0	101.80
(5) Bank handling fees	26.7	3.20
Total	1,684.8	201.87

* The item and amount will be elaborated during the detailed design stage.

CONFIDENTIAL

Annex 8
G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX
20XX, Month

Organization Information

Authority (Signer of the G/A)	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Line Agency	Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

1-3 Effectiveness and the indicators

- Effectiveness by the project

Quantitative Effect (Operation and Effect indicators)		
Indicators	Original (Yr)	Target (Yr)
Qualitative Effect		

2: Project Implementation

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(M/D)* **Attachment(s):Map**	**Actual:** *(PMR)* **Attachment(s):Map**

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(M/D) 'Soft component' shall be included in 'Items'.	*(M/D)*	*(PMR)* Please state not only the most updated schedule but also other past revisions chronologically. All change of design shall be recorded regardless of it s degree.

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

(Sample)Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
1. 2.		

2-1-2 Reason(s) for the modification if there have been any.

(PMR)

2-2 Implementation Schedule
2-2-1 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
【M/D】 'Soft component' shall be stated in the column of 'Items'. Project Completion Date*	*(M/D)*		*(PMR)* As of (Date of Revision) Please state not only the most updated schedule but also other past revisions chronologically.

*Project Completion was defined as _____ at the time of G/A.

(Sample)Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original		Actual
	DOD	G/A	
Cabinet Approval E/N G/A Detailed Design Tender Notice Tender (Lot1) Construction Period Project Completion Date Defect Liability Period			

*Project Completion was defined as Check-out of Construction work at the time of G/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

2-3 Undertakings by each Government
2-3-1 Major Undertakings
See Attachment 2.

2-3-2 Activities
See Attachment 3.

2-3-3 Report on RD
See Attachment 4.

2-4 Project Cost
2-4-1 Project Cost

Table 2-4-1a Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities	'Soft component' shall be included in 'Items'.			Please state not only the most updated schedule but also other past revisions chronologically.
Consulting Services	- Detailed design -Procurement Management -Construction Supervision			
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = Yen

Table 2-4-1b Comparison of Original and Actual Cost by the Government of XX

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
				Please state not only the most updated schedule but also other past revisions chronologically.
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = (local currency)

2-4-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(PMR)

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

2-5 Organizations for Implementation

2-5-1 Executing Agency:

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original: *(M/D)*
Actual, if changed: *(PMR)*

2-6 Environmental and Social Impacts

- The results of environmental monitoring as attached in Attachment 3 in accordance with Schedule 4 of the Grant Agreement.
- The results of social monitoring as attached in Attachment 4 in accordance with Schedule 4 of the Grant Agreement.
- Information on the disclosed results of environmental and social monitoring to local stakeholders, whenever applicable.

3: Operation and Maintenance (O&M)

3-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: *(M/D)*
Actual: *(PMR)*

3-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: *(M/D)*

4: Precautions (Risk Management)

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

- Risks and issues, if any, which may affect the project implementation, outcome, sustainability and planned countermeasures to be adapted are below.

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
2.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
3.	Probability: H/M/L
(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(PMR)	

5: Evaluation at Project Completion and Monitoring Plan

5-1 Overall evaluation

Please describe your overall evaluation on the project.

G/A NO. XXXXXXX
PMR prepared on DD/MM/YY

5-2 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

5-3 Monitoring Plan for the Indicators for Post-Evaluation

Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

Attachment 6

Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

	Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment: Price (Decreased) E=C−D	Condition of payment: Price (Increased) F=C−D
1	Item 1	●●t	●	●	●	●	●
2	Item 2	●●t	●	●	●		
3	Item 3						
4	Item 4						
5	Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

	Items of Specified Materials	1st ●month, 2015	2nd ●month, 2015	3rd ●month, 2015	4th	5th	6th
1	Item 1						
2	Item 2						
3	Item 3						
4	Item 4						
5	Item 5						

(3) Summary of Discussion with Contractor (if necessary)

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Attachment 7

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)
(Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

Environmental Checklist

Category	Environmental item	Main checkpoints	Yes: Y No: N	Specific environmental and social considerations (Reason for Yes or No, rationale, mitigation measures, etc.)
1 Approvals, explanations	(1) EIA and environmental approvals	(a) Have environmental assessment reports (EIA Report, etc.) been created?	(a) N	(a) The MPWT is currently in the process of creating environmental assessment reports.
		(b) Has the EIA Report, etc. been approved by the government of the relevant country?	(b) N	(b) The report is expected to be approved without problems once submitted.
		(c) Does approval for the EIA Report, etc. have attached conditions? If there are attached conditions, have those conditions been met?	(c) N	(c) There are no attached conditions.
		(d) Apart from the above, have environmental approvals been obtained from local governing agencies if required?	(d) N	(d) The MPWT must create an Abbreviated Resettlement Action Plan, apply for approval, and obtain said approval from the MEF. The MPWT is currently in the process of creating the Abbreviated Resettlement Action plan.
	(2) Explanation for local stakeholders	(a) Has an appropriate explanation of the Project content and impacts been given to local stakeholders with full disclosure, and has their agreement been obtained?	(a) N	(a) Under the Cambodian system, the results of discussions with local stakeholders must be attached when obtaining environmental permits. Discussions are planned to be held with stakeholders in the future.
		(b) Have comments from residents, etc. been reflected in the Project?	(b) N	(b) It is planned for discussion results to be reflected in the Project.
	(3) Alternative plan analysis	(a) Have multiple alternative plans for the Project been analyzed? (Including analysis of items related to the environment/society.)	(a) Y	(a) Multiple alternative plans are being analyzed. The plan adopted will also be analyzed in terms of technical, economic, and environmental aspects.
2 Anti-pollution measures	(1) Air pollution	(a) Is there an impact from air pollutants emitted by travelling vehicles, etc.? Is there compliance with the environmental standards of the relevant country?	(a) Y	(a) Traffic congestion is expected during road closures, which may cause a slight worsening in air quality. Air pollution may also be temporarily exacerbated due to the operation of heavy machinery.
		(b) If air pollution in the area near the route already exceeds environmental standards, will the Project further exacerbate air pollution? Will anti-pollution measures be taken?	(b) Y	(b) Measures will be taken to mitigate the exacerbation of air pollution including installing road signs to alleviate traffic congestion, and regularly conducting inspections and maintenance on heavy machinery and construction vehicles. Implementation of the Project will improve road drivability; a decrease in exhaust emissions is also expected.
	(2) Water quality	(a) Will the water quality in the areas downstream decline due to soil runoff from exposed surface soil in land-filled areas and areas where earth was cut?	(a) N	(a) There is very little runoff from land-filled or cut areas to the river.
		(b) Will the Project impact water sources such as wells in the surrounding area?	(b) Y	(b) Precautions must be taken to prevent the flow of wastewater from construction sites/lodgings or oil, etc. from heavy machinery/vehicles into the river.
	(3) Noise and vibration	(a) Is the level of noise and vibration from railways and traveling vehicles in compliance with the standards of the relevant country?	(a) Y	(a) There is no set standard for noise. Mitigation measures will be taken, including the use of low-noise/vibration heavy machinery and the prohibition of work at night.
		(b) Is the level of low-frequency sound from railways and traveling vehicles in compliance with the standards of the relevant country?	(b) N	(b) There is no set standard. In order to reduce low-frequency sound, improved bridge joints will be examined.

Environmental Checklist

Category	Environmental item	Main checkpoints	Yes: Y No: N	Specific environmental and social considerations (Reason for Yes or No, rationale, mitigation measures, etc.)
3 Natural environment	(1) Protected areas	(a) Is the site located within a protected area as stipulated by the laws of the relevant country and international treaties? Does the Project impact protected areas?	(a) N	(a) There are no protected areas in the vicinity of the Project site.
	(2) Ecosystems	(a) Does the site include virgin forests, tropical old-growth forests, or important ecological habitats (coral reef, mangrove swamps, mudflats, etc.)?	(a) N	(a) None included
		(b) Does the site include habitats for rare species that must be protected according to the laws of the relevant country or international treaties?	(b) N	(b) None included
		(c) If a significant impact on the ecosystem is a concern, have measures been taken to mitigate the impact?	(c) N	(c) There is no significant impact on the ecosystem.
		(d) Have measures been taken in regard to blockage of movement paths for wild animals and livestock, division of habitats, and prevention of traffic accidents involving animals?	(d) N	(d) Since the Project involves the rehabilitation of an existing bridge, there is no division of habitats, etc.
		(e) Will the construction of the bridge/road cause deforestation and poaching that accompanies development, desertification, and/or dried swamps, etc? Is there a risk of disturbing the ecosystem due to an introduction of pests or non-native species (those not naturally inhabiting the region)? Have countermeasures for this been prepared?	(e) N	(e) Since the Project involves the rehabilitation of an existing bridge, there are no impacts accompanying development.
	(3) Hydrology	(a) Will the flow of surface water or ground water be adversely impacted by changes in the river system caused by the placement of structures?	(a) N	(a) Since the Project involves the rehabilitation of an existing bridge, there is no construction of new bridge piers or in-river work that may impact river flow conditions.
	(4) Topography and geology	(a) Are there places with poor soil quality on the route where slope failure or landslides may occur? If so, has proper action been taken through construction methods, etc.?	(a) N	(a) There are no locations where slope failure or landslides may occur.
		(b) Will slope failure or landslides occur due to civil engineering work such as landfilling or earth cutting? Have appropriate measures been taken to prevent slope failure and landslides?	(b) N	(b) Since there is no large-scale land filling or earth cutting work, the occurrence of slope failure or landslides is not expected.
		(c) Will soil runoff occur in areas of landfilling, earth cutting, soil disposal, and/or soil extraction? Have appropriate measures been taken to prevent soil runoff?	(c) N	(c) Since there is no large-scale land filling or earth cutting work, the occurrence of soil runoff is not expected.

Environmental Checklist

Category	Environmental item	Main checkpoints	Yes: Y No: N	Specific environmental and social considerations (Reason for Yes or No, rationale, mitigation measures, etc.)
				implemented.
		(d) Will road traffic in the surrounding areas be negatively impacted by the Project? (congestion, increase in accidents, etc)	(d) Y	(d) Since traffic congestion is expected during road closures, road signs will be installed and traffic control personnel will be placed. Conversely, after the bridge is opened for service, the rehabilitation work done will allow for smooth travel.
		(e) Will this hinder the movement of residents?	(e) N	(e) Since the Project involves the rehabilitation of an existing bridge, movement of residents will be improved.
		(f) Will overpasses, etc. block sunlight or cause electromagnetic wave interference?	(f) N	(f) Since the Project involves the rehabilitation of an existing bridge, sunlight will not be blocked.
	(3) Cultural heritage	(a) Does the Project present a risk of damaging anthropological, historical, cultural, or religiously important heritages or historical remains? Have measures stipulated by the domestic laws of the relevant country been considered?	(a) N	(a) There are no such cultural heritages, etc. in the area.
	(4) Landscape	(a) If there are any landscapes that should be especially considered, will they be adversely impacted? If so, will necessary measures be taken?	(a) N	(a) There are no landscapes that require special consideration.
	(5) Ethnic minorities and indigenous peoples	(a) Have considerations been made to lessen the impact on the culture and lifestyles of ethnic minority groups and indigenous people of the relevant country?	(a) N	(a) There are ethnic minority groups in the area, but there is no planned impact on their culture or lifestyles. Bridge rehabilitation is expected to bring positive impacts including the improvement of access to social infrastructure for ethnic minority groups.
		(b) Will the rights regarding land and resources of ethnic minorities and indigenous peoples be respected?	(b) Y	(b) There is no impact on the land and resources of ethnic minorities.
	(6) Working conditions	(a) Are laws pertaining to working conditions in the relevant country being observed for the Project?	(a) Y	(a) Work will be performed following laws pertaining to working conditions during the construction period.
		(b) Are the physical aspects of safety for people working on the Project being considered? (These may include installing safety equipment to prevent work-related accidents and management of toxic substances.)	(b) Y	(b) Thorough considerations will be made to prevent work-related accidents during the construction period.
		(c) Are the non-physical aspects of safety for people working on the project being planned and implemented? (These may include formulating a plan for safety/health and conducting safety education including traffic safety and public health.)	(c) Y	(c) A safety/sanitation plan will be formulated and safety education will be implemented during the construction period.
		(d) Will appropriate measures be taken to ensure that Project security personnel do not compromise the safety of people working on the Project or residents of the area?	(d) Y	(d) Safety education will be implemented for security personnel.

Environmental Checklist

Category	Environmental item	Main checkpoints	Yes: Y No: N	Specific environmental and social considerations (Reason for Yes or No, rationale, mitigation measures, etc.)
5 Other	(1) Impacts during construction	(a) Will mitigation measures be prepared for pollution during construction? (noise, vibration, turbid water, dust, gas emissions, waste, etc.)	(a) Y	(a) The submission of an environmental management monitoring plan and mitigation measures for pollution during the construction period is required when applying for environmental permits.
		(b) Will the natural environment (ecosystem) be adversely impacted by construction work? Will mitigation measures be prepared for these impacts?	(b) N	(b) There will be no large impacts on the natural environment (ecosystem) during construction.
		(c) Will the social environment be adversely impacted by construction work? Will mitigation measures be prepared for these impacts?	(c) N	(c) There will be no large impacts on the social environment during construction.
	(2) Monitoring	(a) Will monitoring for the employer be planned and conducted for environmental items that may have an impact from among those listed above?	(a) Y	(a) The submission of an environmental management and monitoring plan for pollution during the construction period is required when applying for environmental permits; monitoring activities following this plan will be implemented.
		(b) In what way will the items of the relevant plan, along with methods and frequencies, etc. be stipulated?	(b) Y	(b) Environmental management and monitoring will be implemented in accordance with the plan at a frequency of once per month, mainly by a construction subcontractor. The construction supervisor will give a monthly report to the employer.
		(c) Will a monitoring system for the employer be established? (including organization, personnel, equipment, budget, etc., and the continuity of these items)	(c) Y	(c) A monitoring system conducted by the construction supervisor will be secured. For three years after the bridge is opened for service, MPWT must establish a monitoring system.
		(d) Has the method and frequency, etc. for reporting from the employer to the governing agencies been defined?	(d) Y	(d) This is defined in the environmental management and monitoring plan.
6 Focal points	Referencing other environmental checklists	(a) If necessary, relevant items from other checklists pertaining to roads, railways, and forestry may be added to this list and assessed. (For large-scale deforestation, etc.)	(a) –	(a) N/A
		(b) If necessary, relevant items from other checklists pertaining to the transmission, transformation, and distribution of electricity may be added to this list and assessed. (For constructing facilities for the transmission, transformation, and distribution of electricity, etc.)	(b) –	(b) N/A
	Precautions when using the environmental checklist	(a) If necessary, trans-boundary problems or impacts on global climate change may be checked. (For example, trans-boundary waste disposal, acid rain, depletion of the ozone layer, factors contributing to global warming, etc.)	(a) N	(a) Since there is no large-scale construction, there are no trans-boundary or global climate problems.

Annex 10

Environmental Management Plan

No	Environmental Item	Mitigation Measure	Implementing Body	Responsibility	Costs
Before and During Construction					
1	Air pollution	▪ Install traffic signage to mitigate traffic jams ▪ Regular maintenance and inspection of heavy machinery and construction vehicles	Construction contractor	MPWT	Construction costs
2	Water pollution	▪ Using oil booms/preventive nets during pier construction ▪ Regular maintenance and inspection of heavy machinery and construction vehicles	Construction contractor	MPWT	Construction costs
3	Solid waste	▪ Reuse construction soil and waste when possible ▪ Dispose of waste appropriately at disposal sites and facilities	Construction contractor	MPWT	Construction costs
4	Soil pollution	▪ Regular maintenance and inspection of heavy machinery and construction vehicles (check for oil leaks)	Construction contractor	MPWT	Construction costs
5	Noise and vibration	▪ Use low-noise, low-vibration heavy machinery ▪ Prohibit night work	Construction contractor	MPWT	Construction costs
13	Resettlement	▪ Design to minimize resettlement ▪ Prepare an appropriate resettlement plan	MPWT	MPWT	Cambodian Government Budget
15	Ethnic Minorities and Indigenous People	▪ Prepare an appropriate resettlement plan.	MPWT	MPWT	Cambodian Government Budget
17	Land and local resource usage	▪ Prepare fair resettlement plan to prevent disputes over relocation destinations	MPWT	MPWT	Cambodian Government Budget
19	Existing social infrastructure and services	▪ Mitigate impacts of noise and vibration to schools (see 5. "Noise and vibration") ▪ Secure access to clinic and mosque during construction (design phase)	Consultant Construction contractor	MPWT	Construction costs
22	Local conflicts of interest	▪ Prepare fair resettlement plan without disparities between the relocated residents and those that stay	MPWT	MPWT	Cambodian Government Budget
27	Infectious disease (HIV/AIDS, etc.)	▪ Enact sanitation measures and HIV/AIDS and infectious disease awareness and education for construction workers	Construction contractor	MPWT	Construction costs
29	Accidents	▪ Thorough safety education for all construction workers ▪ Asisgn flaggers during heavy machinery operation	Construction contractor	MPWT	Construction costs
After Handoff					
5	Noise and vibration	▪ Install proper traffic signage ▪ Repair potholes and uneven pavement	MPWT	MPWT	Cambodian Government Budget

Annex 11

Environmental Monitoring Plan

Environmental Item		Monitored Item	Location	Frequency	Implementing Body
Before and During Construction					
1	Air pollution	▪ CO, NO_2, SO_2, TSP	Around work site	Twice/yr.	Construction contractor
2	Water pollution	▪ pH, SS	Around work site	Twice/yr.	Construction contractor
3	Solid waste	▪ Records for transport of construction waste to disposal sites	Work site	Monthly	Construction contractor
4	Soil pollution	▪ Regular maintenance and inspection records for heavy machinery and construction vehicles (incl. oil leak inspections)	Around work site	Monthly	Construction contractor
5	Noise and vibration	▪ Noise and vibration levels ▪ Usage of low-noise, low-vibration heavy machinery	Around work site Work site	Twice/yr. Monthly	Construction contractor Construction contractor
13	Resettlement	▪ Resettlement plan	Chrouy Changvar side near bridge	Twice	Consultant MPWT
27	Infectious disease (HIV/AIDS, etc.)	▪ Infection records	Work site	Monthly	Construction contractor
29	Accidents	▪ Accident records	Work site	Monthly	Construction contractor
After Handoff					
5	Noise and vibration	▪ Noise and vibration levels	Around work site	Twice	MPWT

Annex 12

1. Before Constraction (Land Acquisition/Resettlement)

Preparation of Resettlement Sites (where necessary)

No.	Explanation of the site (e.g. Area, no. of resettlement HH, etc.)	Status (Completed (date) / not complete)	Details (e.g. Site selection, identification of candidate sites, discussion with PAPs, development of site, etc.)	Expected Date of Completion
1				
2				

Public Consultation

No.	Date	Place	Contents of the consultation / main comments and answers

Resettlement Activities	Planned Total	Unit	Progress in Quantity			Progress in %		Expected Date of Completion	Responsible Organisation
			During the Quarter	Till the Last Quarter	Up to the Quarter	Till the Last Quarter	Up to the Quarter		
Preparation of ARAP									
Employment of Consultants		Man-month							
Implementation of Census Survey (including Socioeconomic Survey)		-							
Approval of ARAP		-							
Finalisation of PAPs List		No. of PAPs							
Progress of Compensation Payment		No. of HHs							
Lot 1		No. of HHs							
Lot 2		No. of HHs							
Lot 3		No. of HHs							
Lot 4		No. of HHs							
Progress of Land Acquisition (All Lots)		ha							
Lot 1		ha							
Lot 2		ha							
Lot 3		ha							
Lot 4		ha							
Progress of Asset Replacement (All Lots)		No. of HHs							
Lot 1		No. of HHs							
Lot 2		No. of HHs							
Lot 3		No. of HHs							
Lot 4		No. of HHs							
Progress of Relocation of People (All Lots)		No. of HHs							
Lot 1		No. of HHs							
Lot 2		No. of HHs							
Lot 3		No. of HHs							
Lot 4		No. of HHs							

During Construction (Environmental Management)

The latest results of the below monitoring items shall be submitted to the lenders as part of Monthly Progress Report throughout the construction phase.

Construction Phase

1. Response/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
Number and contents of formal comments made by the public	
Number and contents of responses from Government agencies	

2. Pollution

- Air Quality (Ambient Air Quality)

Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standards	Standards for Contract	Referred International Standards	Measurement Point	Frequency
SO_2	μg/m3 (24h)					20		Biannual
NO_2	μg/m3 (1h)					200		Biannual
PM_{10}	μg/m3 (24h)					50		Biannual

- Water Quality

Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standards	Standards for Contract	Referred International Standards	Measurement Point	Frequency
pH	-					6-9		Biannual
SS	mg/l					50		Biannual
Coliform bacteria	MPN /100ml					400		Biannual
Oil	mg/l					10		Biannual

- Noise

Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standards	Standards for Contract	Referred International Standards	Measurement Point	Frequency
Noise Level Leq.	dB A					55 (Day)		Biannual

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Inventry record of using anti-vibration device	Details of survey results, such as findings		Monthly

- Waste

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Invenry record of waste disposal (volume, methodology)	Details of survey results, such as findings		Monthly

3. Social Environment

- HIV/AIDS and other STDs

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
HIV/AIDS and other STDs	Incidences per 1000 inhabitants		Biannual

4. Other

- Traffic Accidents

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Inventry record of traffic accident	Details of survey results, such as findings		Monthly

After Handoff (Land Acquisition/Resettlement and Environmental Management)

The latest results of the below monitoring items shall be submitted to the lenders on biannual basis for the first two years of operation.

Operation Phase

1. Response/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period	Frequency
Number and contents of formal comments made by the public		Upon receipt of comments/complaints
Number and contents of responses from Government agencies		

2. Pollution

- Air Quality (Ambient Air Quality)

Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standards	Standards for Contract	Referred International Standards	Measurement Point	Frequency
SO_2	mg/m3							Annual
NO_2	mg/m3							Annual
PM_{10}	mg/m3							Annual

- Noise

Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standards	Standards for Contract	Referred International Standards	Measurement Point	Frequency
Noise Level Leq.	dB (A)							Biannual

3. Other

- Traffic Accidents

Monitoring Item	Monitoring Results during Report Period	Measures to be Taken	Frequency
Inventry record of traffic accident	Details of survey results, such as findings		Monthly

資料 5. テクニカルノート

Technical Notes

MPWT and JICA Study Team agreed with the following technical matters on Chroy Changwar Bridge Rehabilitation Project.

1. Applicable design specifications

(1) Bridge

Japanese Specifications for Highway Bridges (2012) should be applied by the following reasons.

- Since the project is Japan's Grant Aid project, it is appropriate to apply the Japanese standards.
- Japanese Specifications for Highway Bridges (1990) was applied to Chroy Changwar Bridge (3 span steel box girder) which was designed in 1992.

(2) Road

Japanese Road Structure Ordinance (2014) and Canbodian Road Design Standard should be applied by the following reasons.

- Since the project is Japan's Grant Aid project, it is appropriate to apply the Japanese standards.
- Cambodian Road Design Standard is sufficient to the international road standards, such as Asian Highway Standards.

2. Design live load

B live load which is defined in Japanese specifications for highway bridges (2012) should be applied by the following reasons.

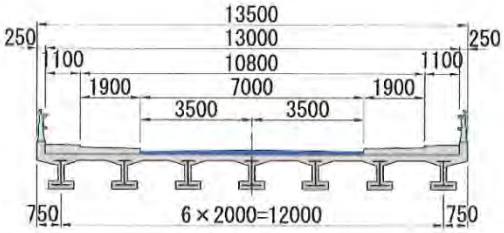
- Since the project is Japan's Grant Aid project, it is appropriate to apply the Japanese standards.
- Although TL-20 and TT-43 prescribed in Japanese specifications for highway bridges (1990) were applied to Chroy Changwar Bridge (3 span steel box girder) which was designed in 1992, B live load encompasses TL-20 and TT-43.

3. Width configuration

In case of replacing some parts of superstructures of Chroy Changwar Bridge, the width configuration shall be applied as shown in the figure below to match the existing bridge.

In addition, the width configuration should be discussed separately in case of replacing the entire superstructure.

- Carriageway=3.5m×2=7.0m
- Motorcycle lane=1.9m×2=3.8m
- Footway=1.1m×2=2.2m



4. Design speed

Design speed should be the 60km/h by the following reasons.

- Design speed of 60km/h was applied to Chroy Changwar Bridge (3 span steel box girder) designed in 1992.
- Bridges on National Road 6A have been designed by the design speed of 60km/h.

5. Design seismic coefficient

Design seismic coefficient (Kh) should be 0.05 by the following reasons.

- Since there is no earthquake in Cambodia, the lowest seismic coefficient (0.05) should be applied for the seismic design of bridge.
- The design seismic coefficient (kH) of Chroy Changwar Bridge (3 span steel box girder) designed in 1992 was 0.05.

Phnom Penh, February 13, 2015

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番号	名　　称	形態 図書、ビデオ、 地図、写真等	オリジナル・ コピー	発　行　機　関	発行年
1	NATIONAL STRATEGIC DEVELOPMENT PLAN(2014-2018)	PDF	コピー	Government of Cambodia	2014
2	Organization Chart of MPWT	PDF	コピー	MPWT	2015
3	Overview-on-Transport-Infrastructure-Sectors-in-Cambodia-2012	PDF	コピー	IRITWG	2012
4	Project Profile & Progress	PDF	コピー	LTI	2014
5	General Population Census of Cambodia 2008	PDF	コピー	NIS, MoP	2008
6	Total Annual Budget 2010-2014	PDF	コピー	MPWT	2014
7	BRIDGE DESIGN STANDARD	PDF	コピー	MPWT	2003
8	ROAD D ES I G N STANDARD PART1. GEOMETRY	PDF	コピー	MPWT	2003
9	ROAD D ES I G N STANDARD PART2. PAVEMENT	PDF	コピー	MPWT	2003
10	ROAD D ES I G N STANDARD PART3. DRAINAGE	PDF	コピー	MPWT	2003
11	Key Indicators of Developing Asian and Pacific Countries	PDF	コピー	ADB	2015
12	日平均水位（プノンペンポート）1960～2014、55年間	エクセル	－	Mekong River Commission Secretariat	2015
13	日平均水位・流量（プノンペンポート）1990、1年間	〃	－	〃	2015
14	日雨量（ポチェントン）2008～2014、7年間	〃	－	〃	2015
15	日最高温度（ポチェントン）2008～2014、7年間	〃	－	〃	2015
16	日最低温度（ポチェントン）2008～2014、7年間	〃	－	〃	2015
17	日平均湿度（ポチェントン）2008～2014、7年間	〃	－	〃	2015
18	日風力、方向（ポチェントン）2008～2014、7年間	〃	－	〃	2015