

[資 料]

[資 料]

1. 調査団員・氏名
2. 調査行程
3. 関係者(面会者)リスト
4. 討議議事録(M/D)
5. 参考資料/入手資料リスト
6. その他資料/情報

1. 調査団員氏名、所属

(1) 第1次現地調査時

表A-1 調査団員名簿（第1次現地調査時）

担当	氏名	所属
総括	仁田 知樹	国際協力機構 ブータン事務所 所長
計画管理	坂部 英孝	国際協力機構 経済基盤開発部 都市・地域開発グループ 都市・地域開発第一課 主任調査役
業務主任／道路交通計画	最上 猛夫	(株)アンジェロセック
橋梁設計 I	石川 敦之	(株)アンジェロセック
自然条件調査 I (地形・地質)／環境社会配慮	吉沢 方宏	(株)アンジェロセック
自然条件調査 II (気象・水文)／道路設計	坂中 秀太郎	(株)アンジェロセック
施工実績調査／施工計画／維持計画／調達計画／積算	斉藤 慎英	(株)アンジェロセック
自然条件調査補助／入札図書作成参考資料	前多 浩子	(株)アンジェロセック

(2) 第2次現地調査時（協力内容確認調査）

表A-2 調査団員名簿（第2次現地調査）

担当	氏名	所属
総括	中田 亮輔	国際協力機構 経済基盤開発部 次長 (都市・地域開発担当)
計画管理	坂部 英孝	国際協力機構 経済基盤開発部 都市・地域開発グループ 都市・地域開発第一課 主任調査役
業務主任／道路交通計画	最上 猛夫	(株)アンジェロセック
橋梁設計 I	石川 敦之	(株)アンジェロセック

(3) 第3次現地調査時（追加情報収集調査）

表A-3 調査団員名簿（第3次現地調査）

担当	氏名	所属
業務主任／道路交通計画	最上 猛夫	(株)アンジェロセック
橋梁設計 I	石川 敦之	(株)アンジェロセック
自然条件調査Ⅱ(気象・水文)/ 道路設計	坂中 秀太郎	(株)アンジェロセック
施工実績調査／施工計画／維持 計画／調達計画／積算	斉藤 慎英	(株)アンジェロセック

(4) 第4次現地調査時（概略設計概要書説明調査）

表A-4 調査団員名簿（第4次現地調査）

担当	氏名	所属
総括	坂部 英孝	国際協力機構 ブータン事務所
計画管理	宮田 真弓	国際協力機構 資金協力支援部実施監理第 1 課職員
無償資金協力	河野 秀美	外務省国際協力局国別二課事務官
業務主任／道路交通計画	最上 猛夫	(株)アンジェロセック
橋梁設計 I	石川 敦之	(株)アンジェロセック

2. 調査工程

(1) 第1次現地調査時：平成22年11月9日～平成22年12月25日

表A-5 調査工程（現地調査時）

日程	月	日	曜日	総括	計画管理	業務主任/道路交通計画	橋梁設計	自然条件調査Ⅰ(地形・地質)/環境社会配慮	自然条件調査Ⅱ(気象・水文)/道路設計	施工実務調査/施工計画/維持管理/調達計画/積算	自然条件調査補助/入札図書作成参考資料
				仁田 知樹	坂部 英孝	最上 猛夫	石川 敦之	吉沢 方宏	坂中 秀太郎	齊藤 慎英	前多 浩子
11	8		月								
1	11	9	火			東京～バンコク	東京～バンコク			東京～バンコク	
2	11	10	水		バンコク～ティンブー	JICA事務所	バンコク～ティンブー			バンコク～ティンブー	JICA事務所
3	11	11	木								
4	11	12	金			現地調査 トンサ県、サルバン県、チラン県				現地調査 トンサ県、サルバン県、チラン県	
5	11	13	土								
6	11	14	日		東京～バンコク						
7	11	15	月		バンコク～ティンブー	DoR	DoR			DoR	
8	11	16	火	インセプションレポート説明 (GNHC, DDM, DoR, DoA)						インセプションレポート説明 (GNHC, DDM, DoR, DoA)	
9	11	17	水	現地調査 トンサ県、サルバン県、チラン県			現地調査 バロ県			現地調査 バロ県	
10	11	18	木				収集資料分析調査 DoR, DoA 報告書作成			収集資料分析調査 DoR, DoA 報告書作成	
11	11	19	金								
12	11	20	土								
13	11	21	日	団内会議、報告書作成				東京～バンコク	東京～バンコク	団内会議、報告書作成	東京～バンコク
14	11	22	月	団内会議 ミニッツ協議 (DDM, DoR, DoA)				バンコク～ティンブー	バンコク～ティンブー	団内会議 ミニッツ協議 (DDM, DoR, DoA)	バンコク～ティンブー
15	11	23	火	ミニッツ署名 (GNHC, DDM, DoR, DoA)				現地再委託交渉		収集資料分析調査 DoR, DoA ミニッツ署名 (GNHC, DDM, DoR, DoA)	現地再委託交渉
16	11	24	水	ティンブー～バンコク	バンコク～東京	収集資料分析調査 DoR, DoA 報告書作成	現地調査 トンサ県、サルバン県、チラン県			収集資料分析調査 DoR, DoA	収集資料分析調査 DoR, DoA
17	11	25	木								
18	11	26	金								
19	11	27	土								
20	11	28	日								
21	11	29	月			テクニカルノート説明、署名		収集資料分析調査 DoR, DoA		テクニカルノート説明、署名	
22	11	30	火	ティンブー～バンコク	バンコク～東京			収集資料分析調査 DoR, DoA 報告書作成		市場価格/資材調達 事情/見積依頼	ティンブー～バンコク バンコク～東京
23	12	1	水								
24	12	2	木								
25	12	3	金				現地調査 バロ県	収集資料分析調査 報告書作成		現地調査 バロ県	
26	12	4	土				収集資料分析調査 報告書作成			収集資料分析調査 報告書作成	
27	12	5	日								
28	12	6	月				現地調査 トンサ県、サルバン県、チラン県	収集資料分析調査 報告書作成			
29	12	7	火	ティンブー～バンコク	バンコク～東京						
30	12	8	水							市場価格/資材調達 事情/見積依頼	
31	12	9	木								
32	12	10	金				現地調査 バロ県				
33	12	11	土								
34	12	12	日								
35	12	13	月				現地調査 トンサ県、サルバン県、チラン県	収集資料分析調査 報告書作成		現地調査 トンサ県、サルバン県、チラン県	収集資料分析調査 報告書作成
36	12	14	火								
37	12	15	水								
38	12	16	木								
39	12	17	金								
40	12	18	土								
41	12	19	日								
42	12	20	月					収集資料分析調査 報告書作成	ティンブー～バンコク	バンコク～東京	
43	12	21	火								
44	12	22	水								
45	12	23	木					協議報告 (JICA, DoR, DoA)			
46	12	24	金					ティンブー～バンコク			
47	12	25	土					バンコク～東京			
12	26		金								

(2) 第2次現地調査時：平成23年1月17日～1月29日

表A-6 調査工程（協力内容確認調査時）

日程	月	日	曜日	総括	計画管理	業務主任/道路交通計画	橋梁設計	
				中田 亮輔	坂部 英孝	最上 猛夫	石川 敦之	
1	1	17	月	東京～バンコク				
2	1	18	火	バンコク～ティンブー				
3	1	19	水	相手国機関打合せ				
4	1	20	木					
5	1	21	金		東京～バンコク			
6	1	22	土		バンコク～ティンブー	東京～バンコク	東京～バンコク	
7	1	23	日	団内会議				バンコク～ティンブー
8	1	24	月	相手国機関打合せ				
9	1	25	火					
10	1	26	水					
11	1	27	木	ティンブー～バンコク	ティンブー～バンコク			
12	1	28	金	バンコク～東京	バンコク～東京	ティンブー～バンコク	ティンブー～バンコク	
13	1	29	土			バンコク～東京	バンコク～東京	
	1	30	日					
	1	31	月					

(3) 第3次現地調査時：平成23年4月13日～4月22日

表A-7 調査工程（追加情報収集調査時）

日程	月	日	曜日	業務主任/道路交通計画	橋梁設計	自然条件調査Ⅱ(気象・水文)/道路設計	施工実績調査/施工計画/維持管理/調達計画/積算
				最上 猛夫	石川 敦之	坂中 秀太郎	齊藤 博英
	4	11	月				
	4	12	火				
1	4	13	水	東京～バンコク			
2	4	14	木	バンコク～ティンブー			
3	4	15	金	相手国機関打合せ			
4	4	16	土	現地調査 ドンサ県、 サルバン県、 チラン県			
5	4	17	日				
6	4	18	月				
7	4	19	火	相手国機関打合せ			
8	4	20	水				
9	4	21	木	ティンブー～バンコク	ティンブー～バンコク	ティンブー～バンコク	ティンブー～バンコク
10	4	22	金	バンコク～東京	バンコク～東京	バンコク～東京	バンコク～東京
	4	23	土				
	4	24	日				
	4	25	月				

(4) 第4次現地調査時：平成23年6月1日～6月10日

表A-8 調査工程（概略設計概要書説明時）

日程	月	日	曜日	総括	計画管理	無償資金協力	業務主任/道路交通計画	橋梁設計
				坂部 英孝	富田 真弓	河野 秀美	巖上 猛夫	石川 敦之
1	6	1			東京～バンコク	東京～バンコク		
2	6	2	木		バンコク～ティンブー	バンコク～ティンブー	東京～バンコク	東京～バンコク
3	6	3	金		団内会議		バンコク～ティンブー	バンコク～ティンブー
					相手国機関打合せ			
4	6	4	土		現地調査			
5	6	5	日		現地調査			
6	6	6	月		相手国機関打合せ			
7	6	7	火		相手国機関打合せ			
8	6	8	水	ティンブー～デリー	ティンブー～バンコク	ティンブー～デリー	ティンブー～デリー	ティンブー～デリー
9	6	9	木	デリー	バンコク～東京	デリー～東京	デリー～東京	デリー～東京
10	6	10	金	デリー～ティンブー				
	6	11	土					
	6	12	日					
	6	13	月					

3. 関係者(面会者)リスト

表A-9 面会者リスト

国家計画委員会(Gross National Happiness Commission、GNHC)」	
Rinchen Wangdi	Chief Program Coordinator
Sangay Chedar	Assistant Planning Officer
Kuenzanh Lham Sanhty	Program Coordinator
内務文化省災害管理局(Department of Disaster Management, Ministry of Home and Cultural Affairs、DDM)	
Jigmi Choggal	Program officer
Namgay Wangchuk	Director
農業省農業局(Department of Agriculture, Ministry of Agriculture、DoA)	
Chencho Norbu	Director
Tenzin	Executive Engineer
G. B. Chettri	Agriculture Specialist
Minjur Dorji	Chief Engineer
Laxman Ghalley	DoA Trongsa
公共事業定住省道路局(Department of Roads, Ministry of Works and Human Settlement、DoR)	
Sangey Tenzing	Director General
M. N. Lamichaney	Bridge Division/Chief Engineer
Jangchuk Yeshe	Executive Engineer(Design)
Nidup Dorji	DoR Trongsa
Dorji Wangdi	DoR Sarpang/Executive Engineer
Namgay Wangchuk	DoR Sarpang/Labor Officer
Choden	Environmental Unit
トンサ県庁(Trongsa Dungkhag (Prefectural) Government)	
Tashi Rabgay	Officer
Tenzin Tobgyel	Civil Engineer
Laxman Ghalay	Agricultural Officer
JICA ブータン事務所 (JICA Bhutan Office)	
Tomoki Nitta	Resident Representative
Emi Doyle	Project Formulation Advisor

4. 討議議事録 (M/D)

4.1 討議議事録 (第一次調査時)

**Minutes of Discussions
on the Preparatory Survey
on the Project for Restoration of Vital Infrastructure
Damaged by Cyclone Aila
in the Kingdom of Bhutan**

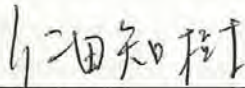
In response to a request from the Royal Government of Bhutan, the Government of Japan decided to conduct a Preparatory Survey on the Project for Restoration of Vital Infrastructure Damaged by Cyclone Aila (hereinafter referred to as "the Project") and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Kingdom of Bhutan (hereinafter referred to as "Bhutan") the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Tomoki Nitta, Resident Representative of JICA Bhutan Office, and is scheduled to stay in the country November 10 to December 21, 2010.

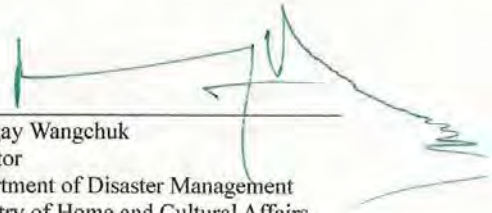
The Team held discussions with the officials concerned of the Royal Government of Bhutan and conducted a field survey at the study area.

In the course of discussions and field survey, both parties confirmed the main items described in the Attachment

Thimphu, November 23, 2010



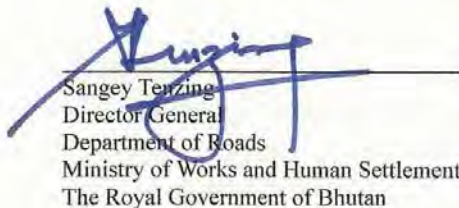
Tomoki Nitta
Leader
Preparatory Survey Team
Japan International Cooperation Agency



Nangay Wangchuk
Director
Department of Disaster Management
Ministry of Home and Cultural Affairs
The Royal Government of Bhutan



Rinchen Wangdi
Chief Program Coordinator
Development Coordination Division
GNHC Commission
The Royal Government of Bhutan



Sangey Tenzing
Director General
Department of Roads
Ministry of Works and Human Settlement
The Royal Government of Bhutan



Chencho Norbu
Director
Department of Agriculture
Ministry of Agriculture and Forest
The Royal Government of Bhutan

ATTACHMENT

I. OBJECTIVES AND ARRANGEMENTS OF THE SURVEY

1. Objectives of the Survey

The Survey has the following objectives;

- (1) To confirm the contents of the requested Project, discuss with the Bhutanese side, conduct the site survey and collect the necessary data and information for formulating the Project to meet the conditions of Japan's Cooperation.
- (2) To explain the Japan's Grant Aid scheme to the Bhutanese side.
- (3) To report the result of Study to Government of Japan.

2. Outline of the Survey

(1) Area

The area of the survey is shown in Annex-1.

(2) Contents and Flow

The Team explained the contents and the flow of the survey to the Bhutanese side, and reached a mutual understanding.

3. Roles of the Implementing Agencies

- 3-1. Department of Disaster Management, Ministry of Home and Cultural Affairs has responsibilities for the monitoring of the Project.
- 3-2. Department of Roads, Ministry of Works and Human Settlement has responsibilities for implementing the bridges and access roads on the national highways and feeder roads.
- 3-3. Department of Agriculture, Ministry of Agriculture and Forests has responsibilities for implementing the bridges on the farm roads and access roads to the bridge sites.

4. The Candidate Bridges for the Project

4-1. The Candidate Bridges

(1) Exclusion from the candidates

The Bhutanese side explained to the Team that “③Naja/Geling Haa Chhu Suspension Bridge” in Paro was improved by Gewog Administration and “(21)Chanchey Bridge” in Tsirang had already completed design works and would commence the procurement procedures for reconstruction. Therefore both sides confirmed that these bridges should be excluded from the Project.

(2) Final Confirmation of the Candidate Bridges

As the result of the discussions, both sides confirmed that the seven (7) bridges as mentioned below are confirmed as the candidate bridges for the Project, which are also shown in Annex-1.

- 1) Paro: ⑤Tshendona Bridge towards Kichu Lakhang.
- 2) Trongsa: ⑨Mangdechhu Bridge, ⑩Dzongkhachulum Bridge, ⑪Kela Bridge, ⑫Jangbi Bridge.
- 3) Sarpang: ⑬Dokhola Bridge, ⑭Jigmiling Bridge.

4-2. The Direction of the Project Formulation

Both sides confirmed that the direction of the Project formulation should be discussed and examined through the further survey not only on the site survey in Bhutan and but also on the internal discussions in Japan after the Team would leave Bhutan.

5. Construction of the Farm Roads

Regarding to the farm roads, which are connected to Mangdechhu Bridge, Kela Bridge or Jangbi Bridge, both sides confirmed the followings;

5-1. Plans of the Construction

The Bhutanese side should confirm the latest plan for the construction of the farm roads, including the budgetary allocation, and report them to JICA Bhutan Office by the end of November, 2010.

5-2. Implementation by the Bhutanese sides

Both sides confirmed that the Bhutanese side would construct/improve the farm roads to be connected to the above-mentioned bridges at the Bhutanese expenses in a timely manner, in case the bridges are selected as components of the Project.

6. Schedule of the Survey

6-1. Consultant members of the Team will proceed to further studies in Bhutan until December 21, 2010.

6-2. JICA will prepare a explanation summary of the Project in English, and dispatch a Team to the Bhutan around February, 2011, for explanation of its contents.

7. Necessary Arrangements for the Survey by the Bhutanese side

7-1. Regarding to the Environmental and Social Considerations, the Bhutanese side will conduct an Initial Environmental Examination (IEE) level survey together with the Team.

7-2. Bhutanese side shall provide necessary numbers of counterpart personnel to the Team during the period of their studies in Bhutan.

7-3 Bhutanese side shall submit answers to the Questionnaire, which the Team handed to the Bhutanese side, by December 6, 2010.

II. JAPAN's GRANT AID SCHEME

1. Japan's Grant Aid Scheme

- 1-1. The Bhutanese side understands the Japan's Grant Aid Scheme explained by the Team.
- 1-2. Bhutanese side will take the necessary measures, as described in Annex-2, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

2. The JICA Guidelines for Environmental and Social Considerations

- 2-1. The Team explained the outline of the JICA Guidelines for Environmental and Social Considerations dated April 2004 (hereinafter referred to as "the JICA Guidelines"), and the Bhutanese side agreed to take the JICA Guidelines into consideration.
- 2-2. The Bhutanese side agreed to obtain basic agreement from the Project Affected Persons (PAPs) including land owners regarding the Project, and to arrange the budget allocation for land acquisition, resettlement and compensation for PAPs before the approval of the Project by the Government of Japan, in case any PAPs would be identified at the Project sites.



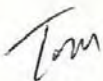
3. Operation & Maintenance

Bhutanese side shall secure enough budget and personnel necessary for the operation and maintenance of the bridges improved by the Project, including the periodical maintenance work after the completion of the Project.

END

ANNEX-1: The Area of the Survey

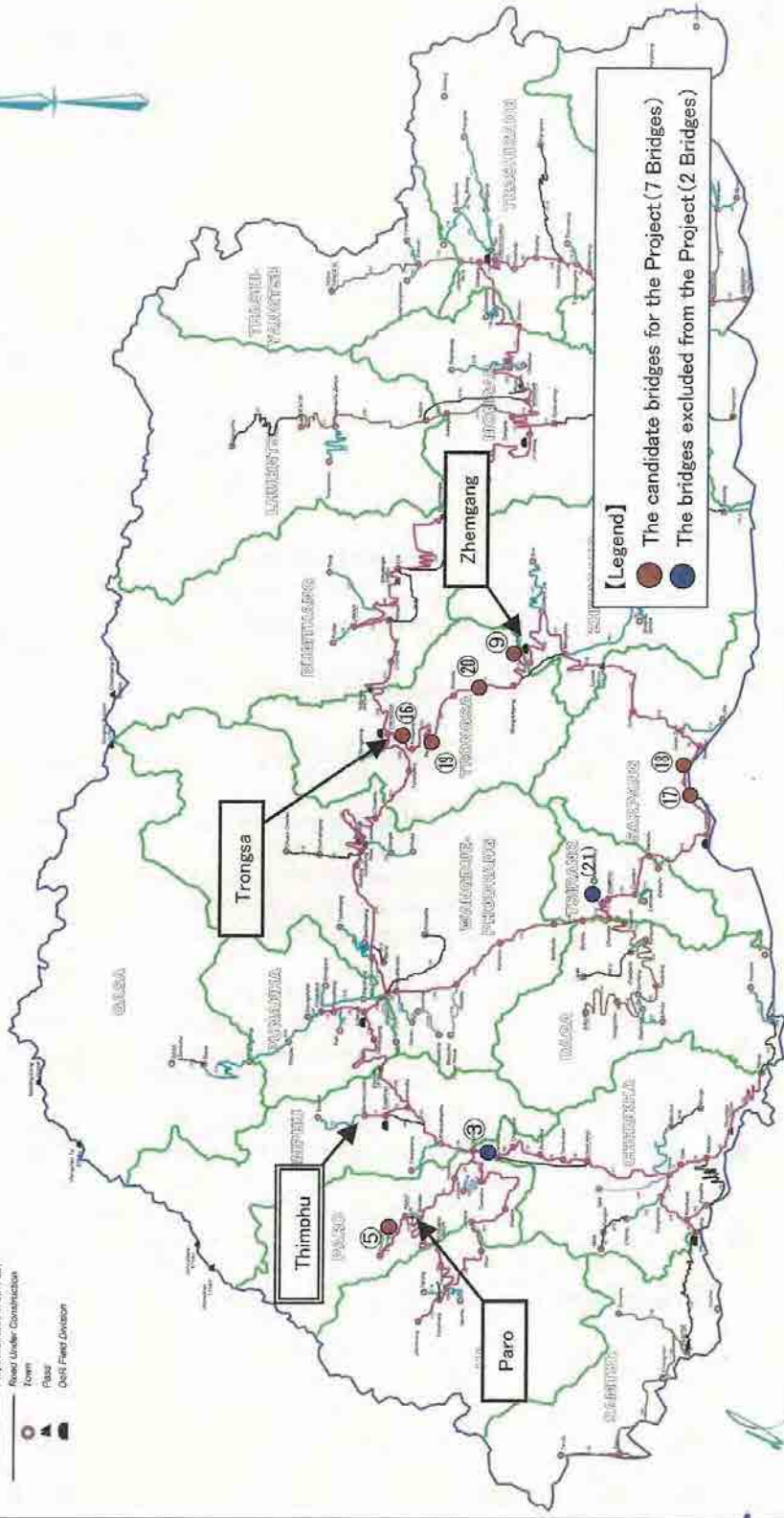
ANNEX-2: Major Undertakings to be taken by Each Government



BHUTAN ROAD NETWORK

Drawn by: Kamruddin
 Engineer: Kamruddin
 Survey & Design Co.
 Department of Roads, MoWHS, Thimphu

International Boundary
 District Boundary
 Highway
 District Road
 Frontier Road
 Other Roads
 Proposed Road in 5th Plan
 Road Under Construction
 Town
 River
 Dam
 Field Contour



[Legend]
 ● The candidate bridges for the Project (7 Bridges)
 ● The bridges excluded from the Project (2 Bridges)

Source - Department of Roads

Last Update: 2/11/2007

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Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Country
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	Relocation, improvement and/or repair of existing utilities (power lines, telecommunication lines, water lines, etc.), if necessary.		●
4	To bear the following commission to the Japanese bank for the banking services based upon the B/A		
	1) Advising commission of A/P or BDA		●
	2) Payment commission		●
5	To ensure prompt unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
6	To accord those, 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 Bhutan and stay therein for the performance of their works, within the authority of Bhutan.		●
7	To exempt from customs duties, internal taxes and other fiscal levies which may be imposed in Bhutanese with respect to the supply of the products and services under the verified contracts, within the authority of Bhutan.		●
8	To maintain and use properly and effectively the facilities constructed and equipment provided under the Japan's Grant		●
9	To bear all the expenses, other than those to be borne by the Japan's Grant, necessary for construction of the facilities		●

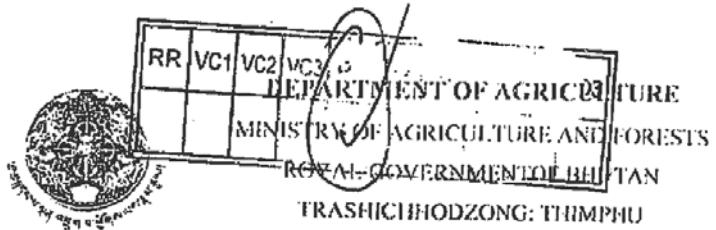
(B/A: Banking Arrangement, A/P: Authorization to Pay, BDA: Blanket Disbursement Authorization)

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ཨོ་ཁྲི་ལུ་ལོ་ལྷན་ཁྲིུང་ལྷན།
 ཨོ་ཁྲི་ལུ་དང་ཁྲི་གཞུང་འཛིན་ལྷན་ཁྲིུང་།
 རྒྱལ་ལཱ་ལེན་ལུ་ལྷན་ཁྲིུང་། རྩིས་ལྷན་ཁྲིུང་།



DoA/Engg-29/ 71

02 February 2011

Dasho Dzongdags
 Dzongkhag Administration
 Trongsa

Subject: Farm Road Bridges under Cyclone Aila Project

Dear Dashos

We are pleased to inform you that following bridges under your Dzongkhag have been selected under the Project for Restoration of Vital Infrastructure Damaged by Cyclone Aila, supported by JICA: Mangdechhu (Reotala), Kela, and Jangbi. Please note the following points:

1. The access to these bridge sites should be ready by October 2011. Since there should be adequate space for trucks, etc to maneuver while construction, the Dzongkhag should ensure that the access is improved and well maintained. If required budget for this activity should be included for the next financial year.
2. Design, supervision, and construction of substructures and appurtenant works are covered by the project. However, the super-structures are not included in the project but shall be budgeted and procured by the DOR, in consultation with the Dzongkhag.
3. In addition, land securing and clearance for temporary yard and securing sites for disposal of wastes, shall also be coordinated by the DOR together with the Dzongkhag.
4. The process for environmental clearance for the bridges construction has already started and is with the Dzongkhag. It should ensure that Environmental Clearance approval for all three sites is ready by March 2011.

Lastly, the consulting team for JICA will continue to carry out design, cost estimation and construction plans. We request Dzongkhag to provide them with all necessary support during this process.

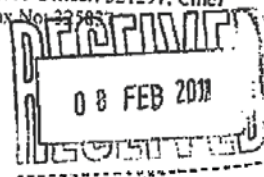
Yours sincerely,


 Chencho Norbu
 Director

Copy:

1. Director General, DOR, MoWHS, for kind information
2. Director, Department of Disaster Management, MoH&CA, for kind information
3. Chief Program Coordinator, Development and Coordination Division, GNHC, for kind information
- ✓ Resident representative, JICA Bhutan, for kind information

Department of Agriculture PABX: 322228, 331316; Fax No. 323562; Director: 322805; Chief Agriculture Officer: 321291; Chief Engineer: 329122; Chief Horticulture Officer: 336946; Horticulture Division PABX: 323183, 323184 Fax No. 323562



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4.2 討議議事録（第二次調査時）

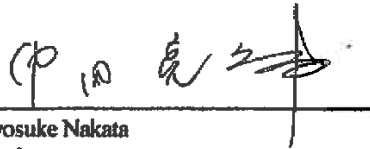
**Minutes of Discussions
on the Preparatory Survey
on the Project for Restoration of Vital Infrastructure
Damaged by Cyclone Aila
in the Kingdom of Bhutan
(Second Field Survey)**

In November 2010, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team on the Project for Restoration of Vital Infrastructure Damaged by Cyclone Aila (hereinafter referred to as "the Project") to the Kingdom of Bhutan (hereinafter referred to as "Bhutan") and had discussions, conducted field survey and technical examination of the results in Japan.

In order to explain and to consult with the concerned officials of the Royal Government of Bhutan (hereinafter referred to as "the RGoB") on the progress of the Preparatory Survey, JICA sent to Bhutan the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Ryosuke Nakata, Deputy Director General, Economic Infrastructure Department, JICA, from January 22 to 28, 2011.

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

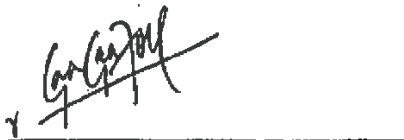
Thimphu, January 26, 2011



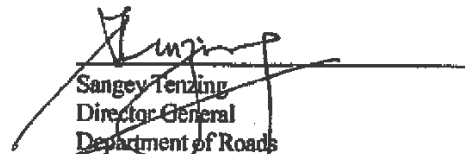
Ryosuke Nakata
Leader
Preparatory Survey Team
Japan International Cooperation Agency



Namgay Wangchuk
Director
Department of Disaster Management
Ministry of Home and Cultural Affairs
The Royal Government of Bhutan



Rinchen Wangdi
Chief Program Coordinator
Development Coordination Division
GNHC Commission
The Royal Government of Bhutan



Sangey Tenzing
Director General
Department of Roads
Ministry of Works and Human Settlement
The Royal Government of Bhutan



Chencho Norbu
Director
Department of Agriculture
Ministry of Agriculture and Forest
The Royal Government of Bhutan

ATTACHMENT

1. Progress and future plan

The Team explained the progress of the Preparatory Survey to the Bhutanese side as follows, and the Bhutanese side understood its contents as below;

1-1. Interim Results

(1) Candidate bridges

The bridges shown as follows are selected as the candidate bridges and proceed to the outline design.

⑨Mangdechu Bridge, ⑩Dokhola Bridge, ⑪Jigmiling Bridge, ⑫Kela Bridge, ⑬Jangbi Bridge.

(2) Components

a) for ⑩Dokhola Bridge and ⑪Jigmiling Bridge,

Design, supervision and construction of whole bridges are covered by the Project.

b) for ⑨Mangdechu Bridge, ⑫Kela Bridge and ⑬Jangbi Bridge,

Design, supervision and construction of sub-structures and appurtenant works are covered by the Project (super-structures are not included and should be covered by the Bhutanese side).

JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

(3) Undertakings to be taken by the Bhutanese side

Both sides confirmed that the Bhutanese side should implement the following items as the undertakings of the Project.

a) To construct farm roads as mentioned in the Minutes of Discussions signed by both parties on November 23, 2010.

b) To procure and install the super-structure for ⑨Mangdechu Bridge, ⑫Kela Bridge and ⑬Jangbi Bridge in a timely manner.

c) Removal of the existing structures and/or its exterior within the Project sites.

d) Relocation and/or removal of existing utilities (power lines, water pipes, etc.) from the Project site.

e) Securing and clearance of the land for temporary yard of the Project.

f) Necessary arrangement for the tax exemption of imported materials, equipment and vehicles for the Project.

g) Securing of site(s) for disposal of waste.

1-2. Future Plan of the Survey

(1) The Team continues to carry out design, cost estimation, and make construction plan of the Project based on the above-mentioned preconditions.

(2) JICA will prepare a draft report in English, and dispatch a mission in order to explain its contents around the end of March 2011.

(3) JICA will prepare and submit a final report in English to the RGOB around May 2011.

2. Project Organization

Both sides confirmed that the DoR will be a focal agency for the implementation of the Project as shown in Annex-1. The Bhutanese side will conclude internal understandings among DoR, DoA, DDM and GNHC with the signing of MOU by the middle of February 2011, and submit a copy of MOU to JICA Bhutan Office by the end of February, 2011.

3. Environmental and Social Considerations

Both sides confirmed that the Bhutanese side should complete the necessary procedures for the Environment Clearance Certificate (ECC) for the Project by the end of March, 2011.

[Handwritten signature]

4. Budget Allocation

Regarding the budget allocation for the Project, the Bhutanese side explained as follows;

(1) For improvement of the farm roads

DoA will make budget provision in FY2011/12 and implement works before October 2011.

(2) For procurement and installation of super-structure for the 3 bridges on the farm roads

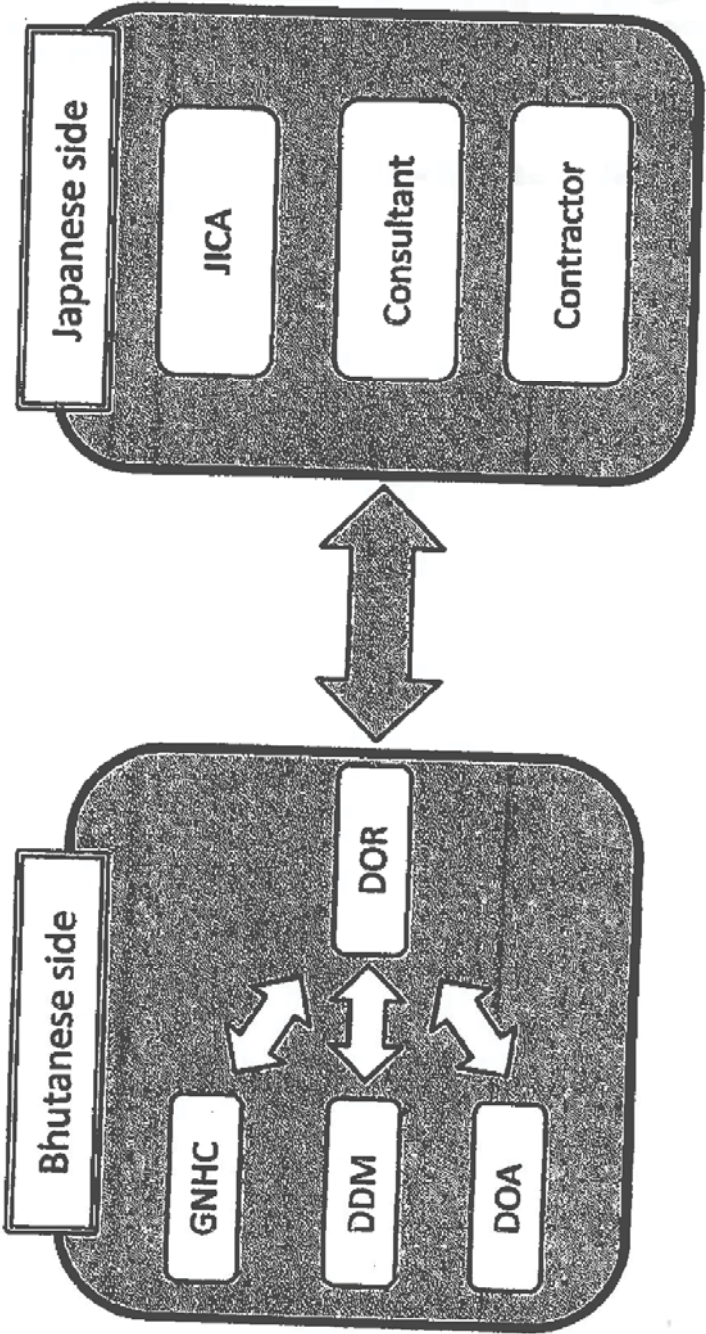
DoR will submit budget proposal in FY2011/12 and procure the bridge parts within FY2011/12.

END

Annex: Project Implementing Organization

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Project Implementing Organization



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4.3 討議議事録（第四次調査時）

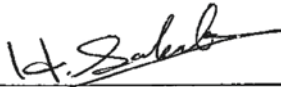
**Minutes of Discussions
on Outline Design Survey
on the Project for Restoration and Improvement of Vital Infrastructure for cyclone disaster
in the Kingdom of Bhutan
(Explanation of Draft Report)**

From November to December 2010, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Outline Design Survey Team on the Project for Restoration and Improvement of Vital Infrastructure for cyclone disaster (hereinafter referred to as "the Project") to the Kingdom of Bhutan (hereinafter referred to as "Bhutan"), and through discussions, field survey and technical examination of the results in Japan, JICA prepared a draft report of the Survey.

In order to explain and to consult with the concerned officials of the Royal Government of Bhutan (hereinafter referred to as "the RGOB") on the contents of the draft report, JICA sent to Bhutan the survey team for explanation of draft report (hereinafter referred to as "the Team"), which is headed by Mr. Hidetaka Sakabe, Assistant Resident Representative, JICA Bhutan Office, from June 2 to June 8, 2011.

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

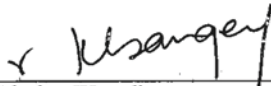
Thimphu, June 7, 2011



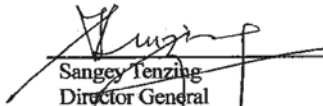
Hidetaka Sakabe
Leader
Draft Report Explanation Team
Japan International Cooperation Agency



Namgay Wangchuk
Director
Department of Disaster Management
Ministry of Home and Cultural Affairs



Rinchen Wangdi
Chief Program Coordinator
Development Coordination Division
GNH Commission



Sangey Tenzing
Director General
Department of Roads
Ministry of Works and Human Settlement



Chencho Norbu
Director
Department of Agriculture
Ministry of Agriculture and Forest

ATTACHMENT

1. Components of the Draft Report

The Bhutanese side agreed and accepted in principle the contents of the draft report of the Survey explained by the Team. Main components of the project are described in clause 7 below.

2. Project Title

The Team proposed title of the project be changed as “the Project for Restoration and Improvement of Vital Infrastructure for cyclone disaster”, and the Bhutanese side agreed.

3. Cost Estimation

The Team explained to the Bhutanese side the estimated project cost as attached in **Annex 1**. Both sides confirmed that this estimation was provisional and would be examined further by the Government of Japan for its cabinet approval. Furthermore, both sides confirmed that this project cost estimate is **confidential**, and should never be duplicated or disclosed to any third parties before the signing of all the agreement(s), contract(s) and effectuation for the Project.

4. Japan's Grant Aid Scheme

The Bhutanese side has shown a full re-confirmation of the Japan's Grant Aid scheme and the necessary measures to be taken by the Bhutanese side which has already been explained by the Japanese side, and agreed by both sides on November 23, 2010.

5. Schedule of the Survey

JICA will complete the Final Report in English, in accordance with the confirmed items and send it to the Bhutanese side around the beginning of August, 2011.

6. Project Organization

DoR, as a focal agency in coordinating related organizations in this Project, explained the result of meeting held 1st February 2011, which clearly showed the agreement among the RGoB stakeholders. DoR further confirmed that all the arrangements to any related matter will be done through DoR for both technical and administrative matters.

7. Project Components.

The Team explained to the Bhutanese side the main components as **Annex 2**, and the Bhutanese side agreed the contents, including the undertakings by the Bhutanese side.

8. Undertakings of the Bhutanese side

The team explained the detailed undertakings to be borne by the Bhutanese side as **Annex 3**, including the matter already agreed by both sides. In response to this, the Bhutanese side confirmed to secure and allocate necessary budget and staff for smooth execution of those undertakings.

As for the installation of superstructure for Kela, Jangbi and Reotala bridges, the Bhutanese side further explained that the installation will be completed within three months after the completion of sub-structures with due quality.

9. Environmental and Social Consideration

Both sides agreed the necessity of monitoring environmental affect so that possible negative impact would be mitigated. The basic idea for monitoring is given as **Annex 4**. However, this will be further refined by DoR and contractor upon discussion.



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Annex;

- 1 Project cost to be borne by Japan's Grant Aid
- 2 Project Components
- 3 Undertakings of the Bhutanese side
- 4 Environmental monitoring format
- 5 Schedule for Improvement of Bridge Access Roads and Construction of Farm Roads



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Project Cost to be borne by Japan's Grant Aid

(Unit: Million Yen)

Components	Cost
Civil Works	
Construction of Bridges and access road	
Construction of substructure and revetment works	952.46
Detailed Design and Construction Supervision	68.82
Total	1,021.28

- (1) The cost estimates in the above table is provisional and will be further examined by the Government of Japan for Cabinet approval.
- (2) The Total Cost of the Project JPY 1,021.28 Million is equivalent to USD 12.23 Million at the current exchange rate 1 USD = 83.48JPY



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Main Project Components

Two bridges on National Highway No. 5

Bridge name	Dolkhola Bridge	Jigmiling Bridge
Bridge structure	2-span PC joining simple post-tensioned T-girder bridge	
Bridge length	70.0m	
Span length	35.0m	
Girder height	2.1m×4 main girders	
Width	7.0m (2 lanes)	
Foundation structure	Spread foundation (Abutments A1 and A2 and Pier P1)	
Main material	PC main girder concrete ($\sigma_{ck}=30\text{N/mm}^2$) RC concrete ($\sigma_{ck}=21\text{N/mm}^2$)	
Method to erect superstructure	Erection girder method	
Notes	Responsibilities of the Bhutanese side: Removal • Bridge superstructure • Bridge abutment on both riverbanks • Existing revetment on the right bank • Embankment at the access road on the right bank	Responsibilities of the Bhutanese side: Removal • Bridge superstructure • Bridge abutment on the right bank • Removal of bridge pier

Three bridges on farm roads along National Highway No. 4

Bridge name	Mandechhu (Reotala) Bridge	Kela Bridge	Jangbi Bridge
Bridge structure	Bailey suspension bridge		Bailey bridge
Bridge length	103.7m(340FT)		49.5328m(163FT)
Span length	97.5m(320FT)		48.768m (160FT)
Width	3.277m (one lane)		3.277m (one lane)
Foundation structure	Spread foundation (Abutments A1 and A2)		Spread foundation (Abutments A1 and A2)
Main material	Steel for beams of Bailey bridge Concrete ($\sigma_{ck}=21\text{N/mm}^2$ (Abutment))		Steel for beams of Bailey bridge Concrete ($\sigma_{ck}=18\text{N/mm}^2$ (Abutment))
Method to erect superstructure	Cable erection/vertical suspension method	Launching method with a support in the middle	
Notes	The construction is to be handed over to the Bhutanese side after the substructure and revetment works in the scope of the works of the Japanese side have been completed. Material procurement and construction of the superstructure should be carried out by the Bhutanese side.	The construction is to be handed over to the Bhutanese side after the substructure works in the scope of the works of the Japanese side have been completed. Material procurement and construction of the superstructure should be carried out by the Bhutanese side.	

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Major Undertakings taken by the RGOB

As in E/N and G/A	Specifically in this project	In charge	Timing	Agreed
to secure of land necessary for the implementation of the Project and to clear the sites	Since the project sites are national land, no need for securing site	N/A	-	-
	Removal of existing structures and/or its exterior within the Project sites	DoR Trongsa Dzongkhag	Upon Completion	M/M, 1st Feb.2011
	Relocation and /or removal of existing utilities (power lines, water pipes etc)from the Project site	DoR/MoWHS	Before t commencement of the work	M/M, 1st Feb.2011
	Securing and Clearance of land for temporary yard of the Project	DoR Trongsa Dzongkhag	Before commencement of the work	M/M, 1st Feb.2011
to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project	Securing Site for Waste Disposal	DoR Trongsa Dzongkhag	During Project	M/M, 1st Feb.2011
to ensure prompt customs clearance and to assist internal transportation of the Products	-	DoR/MoWHS	During Project	M/M, 1st Feb.2011
to ensure that customs duties, internal taxes and other fiscal levies which may be imposed with respect to the purchase of the Products and the Services be exempted	-	DoR/MoWHS	During Project	M/M, 1st Feb.2011
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	-	DoR/MoWHS	During Project	M/M, 23rd Nov,2010
to ensure that [the facilities [constructed / rehabilitated] under the Grant be maintained and used properly and effectively for the implementation of the Project;	-Yearly Maintenance -Periodical (5-year interval) Maintenance *Detailed in Draft Report, p.45	DoR/MoWHS Trongsa Dzongkhag	After Completion	M/M, 23rd Nov,2010
to bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project; and	Improvement of access roads to three bridge sites (Kela, Jangbi, Reotala)	DoA/MoAF Trongsa Dzongkhag	Before P/Q notice (Annex 5)	M/M, 1st Feb.2011
	Construction of Farm Road	DoA/MoAF Trongsa Dzongkhag	As provided in Annex 5	-
	To Procure & Install Superstructure for Reotala, Kela & Jangbi bridge in a timely manner	DoR/MoWHS	Three months after the completion of Sub-Structure	M/M, 1st Feb.2011
to give due environmental and social consideration in the implementation of the Project.	Environmental Clearance has been already issued	DoR/MoWHS	Already Done	M/D Jan. 26, 2011
	Monitoring of the Environmental effect caused by the Project	DoR/MoWHS	During Project	-

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Environmental Monitoring (Provisional)

Environmental parameter	Target bridge	Key point	Countermeasures	Monitoring measures		
				Before construction	During construction	After opening to traffic
Soil erosion	All bridges	Determine an appropriate construction period, consider construction methods and countermeasures to avoid soil erosion caused by rainfall during the substructure work at the construction stage.	Adopt appropriate construction methods to prevent soil erosion	Confirmation of the construction method and plan	Visual inspection	—
Water pollution	All bridges	Determine an appropriate construction period, study construction methods and water quality conservation measures to prevent pollution of the river water at the construction stage.	Adopt appropriate construction methods to prevent the outflow of wastewater from the construction site.	Confirmation of the construction method and plan	Visual inspection	—
Solid waste	All bridges	Study the method of reuse, recycling and final disposal of the solid wastes resulting from the demolishing of the existing bridge at the stage of construction.	Request that the Bhutanese side makes sure that no waste material is left at the site when the existing bridge is removed. Ensure that solid waste from the construction work is disposed of at the designated disposal site.	Confirmation of the construction plan	Visual inspection	Confirmed during the after-opening inspection.
Accident	All bridges	Conduct studies to set an appropriate construction period to prevent accidents caused by natural and man-made disasters during construction.	Develop and implement an appropriate construction plan to avoid accidents.	Confirmation of the construction plan	Confirmation of Monthly Progress Reports	—
Dust emission	All bridges	Study an appropriate construction method and countermeasures to control the dust emission at the stage of construction.	Adopt an appropriate construction method and sprinkling water on the construction access road during construction.	Confirmation of the construction plan	Visual inspection	—




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Schedule for Improvement of Bridge Access Roads and Construction of Farm Roads

Farm Road	Activity	2011												2012											
		May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec				
Nabji-Korphu Farm Road	Improvement of access to mangdechhu bridge**																								
Nabji-Korphu Farm Road	Construction of Nabji-Korphu farm road from the bridge to Nabji																								
Kela Farm Road	Improvement of access to Kela bridge																								
Kela Farm Road	Construction of Farm Road from the bridge to Kela																								
Jangbi Farm Road	Improvement of access to Jangbi bridge																								
Jangbi Farm Road	Construction of farm road from bridge to Jangbi																								

** Construction of gabion walls and filling for the approach road of left bank should be done during the sub-structure construction

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5. 参考資料/入手資料リスト

No.	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	Annual Information Bulletin 2009	図書	オリジナル	ブータン政府公共事業・定住省	2009年
2	Annual Information Bulletin 2008	図書	オリジナル	ブータン政府公共事業・定住省	2008年
3	Statistical Yearbook of Bhutan 2009	図書	オリジナル	ブータン政府統計局	2009年
4	Statistical Yearbook of Bhutan 2007	図書	オリジナル	ブータン政府統計局	2007年
5	BHUTAN SCHEDULE OF RATES 2009	図書	コピー	ブータン政府公共事業・定住省	2009年
6	Environmental Assessment Act, 2000	図書	コピー	ブータン政府環境委員会	2000年
7	FOREST AND NATURE CONSERVATION ACT OF BHUTAN, 1995	図書	コピー	ブータン政府 森林局	1995年
8	National Accounts Statistics 2000-2008	図書	コピー	ブータン政府統計局	2008年
9	GUIDELINE ON Proper Construction Practices for Non Engineered Buildings	図書	コピー	ブータン政府公共事業・定住省	2009年
10	NATIONAL DISASTER RISK MANAGEMENT FRAMEWORK	図書	コピー	ブータン政府内務文化省	—
11	National Recovery and Re-construction Plan	図書	コピー	ブータン政府内務文化省	2009年
12	GUIDANCE NOTE & FORMATS for the reparation of BoQ and estimates for FARM ROADS	図書	コピー	ブータン政府農業省	2009年
13	TECHNICAL GUIDELINES for the constructions of FARM ROADS May 2009	図書	コピー	ブータン政府農業省	2009年
14	TECHNICAL SPECIFICATION & STANDARD DRAWINGS for the construction of FARM ROADS May 2009	図書	コピー	ブータン政府農業省	2009年
15	THE BIODIVERSITY ACT OF BHUTAN, WATER SHEEP YEAR 2003	図書	コピー	ブータン政府農業省	2003年
16	Garden Reach Portable STEEL BRIDGE	図書	オリジナル	Garden Reach Shipbuilders & Engineers Ltd	—
17	Guidelines on use of Standard Work Items for Common Road Works	図書	オリジナル	ブータン政府公共事業・定住省	2010年
18	Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities 2009	図書	オリジナル	ブータン政府公共事業・定住省	2009年
19	Bridge Inventory as of November 2010	図書	オリジナル	ブータン政府公共事業・定住省	2010年
20	SPECIFICATIONS FOR BUILDING & ROAD WORKS 2007	図書	コピー	ブータン政府公共事業・定住省	2007年
21	SPECIFICATIONS FOR BUILDING & ROAD WORKS 2009	図書	コピー	ブータン政府公共事業・定住省	2009年
22	Regulation for the Environmental Clearance of Projects	図書	コピー	ブータン政府環境委員会	2001年
23	Bidding Document for Procurement of Works	図書	コピー	ブータン政府公共事業・定住省	2009年
24	Rules and Regulations for Lease of Government Reserved Forest Land & Government Land	図書	コピー	ブータン政府公共事業・定住省	2009年
25	LAND COMPENSATION RATE 2009	図書	オリジナル	ブータン政府財務省	2009年
26	LABOUR & MATERIAL COEFFICIENTS 2009	図書	コピー	ブータン政府公共事業・定住省	2009年


6. その他資料/情報

6-1 テクニカルノート

6-2 環境申請許可書

6-1 テクニカルノート

「ブ」国内務文化省災害管理局 DDM、公共事業・定住省道路局 DOR、農業省農業局 DOA と取り交わした技術覚書（テクニカルノート）を以下に示す。



INGÉROSEC

Engineering Consultant

To
The Director
Department of Disaster Management (DDM)
Ministry of Home and Cultural Affairs (MoHCA)

The Director General
Department of Roads (DoR)
Ministry of Works and Human Settlement (MoWHS)

The Director
Department of Agriculture (DoA)
Ministry of Agriculture (MoA)

**Subject: Submission of Technical Note on the Preparatory Survey on
the Project for Restoration of Vital Infrastructure Damaged by Cyclone
Aila in the Kingdom of Bhutan**

29th November, 2010

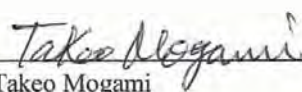
Dear Sirs,

We are pleased to submit the Technical Note which indicates the key design value to be used for the Preparatory Survey for the captioned project by the Japan International Cooperation Agency (JICA) as Japanese Grant Aid Project.

The values on the Technical Note follow the result of discussion by the Survey Team, MoHCA, MoWHS and MoA technical representatives. Thus the principal design specification and basic design concept have been confirmed and agreed at DoR head quarter on 29th November, 2010.

Please kindly confirm the attached Technical Note and references.

Very truly yours,



Takeo Mogami
Project Manager
The Preparatory Survey for Restoration
of Vital Infrastructure Damaged by
Cyclone Aila in the Kingdom of Bhutan

INGÉROSEC Corporation

Shinjuku i-Land Tower 43F 6-5-1 Nishi-Shinjuku Shinjuku-ku TOKYO
163-13443 JAPAN
Tel: +81-3-5324-0211 Fax: +81-3-5324-0215
<http://www.ingerosec.com> e-mail: Ingerosec@ingerosec.com

Technical Note

29th November, 2010

Subject : Technical Note of key items to be designated by The Preparatory Survey on the Project for Restoration of Vital Infrastructure Damaged by Cyclone Aila in the Kingdom of Bhutan

The JICA Survey Team proposes the following principal specification for the design and basic design concept of captioned project.

1. Design Specification : National Highway

1-1 Road Design Specification

Principle Items			Notes
Design speed	Approach Road	20km/hr	
	Main Road	60km/hr	
Minimum Curve Radius	Approach Road	15m	
	Main Road	120m	
Carriage Width (The distance between each wheel guard)		7m	In accordance with the carriage width of Primary National Highway (PNH)
Pavement lateral grade		2%	
Maximum Longitudinal Grade	20km/hr	8%	
	60km/hr	7%	

1-2 Bridge Design Specification

Principle Items			Notes
Design Standard	Standard Specification and Code of Practice for Road Bridges, The Indian Road Congress (IRC), Japanese Standard		
Road Class	National Highway		
Design Load	Single lane IRC 70R (wheeled) or Double lane IRC Class A (whichever is critical)		
Seismic Coefficient	Kh=0.22 Kv=0.0		Zone V (Same to Assam)
Concrete Strength	Substructure	21N/mm ²	
	Superstructure	30N/mm ²	Post tensioning Pre-stress Concrete
	Slab	24N/mm ²	
Pavement	Asphalt	t=60mm	

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2. Design Specification : Farm Road

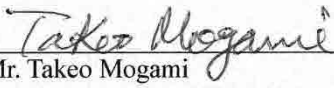
2-1 Bridge Design Specification

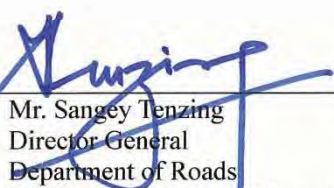
Principle Items			Notes
Design Standard	Substructure	Standard Specification of Bhutan or Japan Standard	
	Superstructure	Standard Specification of Bailey Bridge	
Road Class		Farm Road	
Carriage Width		3.277m	
Design Load		IRC 24R	24t (18t ; actual loading capacity, in the case of reusing materials of existing bailey bridges.)
Seismic Coefficient		Kh=0.22 Kv=0.0	Zone V (Same to Assam)
Concrete Strength	Substructure	21N/mm ²	

Note: Construction of farm roads shall be done by Bhutanese side.

*Attachment: Basic Design Concept


Mr. Namgay Wangchuk
Director
Department of Disaster Management
Ministry of Home and Culture Affairs
The Royal Government of Bhutan


Mr. Takeo Mogami
Chief Consultant of JICA Survey Team


Mr. Sangey Tenzing
Director General
Department of Roads
Ministry of Works and Human Settlement
The Royal Government of Bhutan


Mr. Chencho Norbu
Director
Department of Agriculture
Ministry of Agriculture and Forest
The Royal Government of Bhutan

Basic Design Concept
for
the Project for Restoration of Vital Infrastructure
Damaged by Cyclone Aila
In the Kingdom of Bhutan

Note:

1. This Basic Design Concept is based on the precondition that the motorable farm roads to the bridge sites shall be constructed and completed by Bhutanese side in a timely manner.
(Reference is made to 5. Construction of the Farm Roads of Minutes of Discussions signed on November 23, 2010)
2. The concept drawings contained in this Basic Design Concept are given only to present the image of Basic Design Concept, and do not necessarily present the scope to be borne by Japanese side.
3. This Basic Design Concept is subject to be amended, but limited to fine adjustment, according to the results of the geotechnical survey and the topographic survey that are to be implemented after the direction of the Project formulation will be discussed and examined.
(Reference is made to 4-2. The Direction of the Project Formulation of Minutes of Discussions signed on November 23, 2010)



Basic Design Concept (1/4)

No.5 Tshendona bridge			
Road classification	Farm Road	Jurisdiction	DoA
Existing Size	L = 30m	Existing Bridge Type	Suspension Bridge
Beneficiary	-		

4@30m(100FT)=120m(400FT)

Future Planned Bridge Specifications	
Bridge Length	L=120m(400Ft)
Bridge Type	Bailey Bridge
Carriage Width	W=3.277m
Truck Load	IRC 24R(24ton) / 18R(18ton)
Foundation Type	Spread foundation (T-type)

No.9 Mangdechhu bridge			
Road classification	Farm Road	Jurisdiction	DoA
Existing Size	L = 70m	Existing Bridge Type	Bailey Bridge
Beneficiary	210HH (3,000habitants)		

97.5m(320FT)

Future Planned Bridge Specifications	
Bridge Length	L=97.5m(320Ft)
Bridge Type	Bailey Suspension Bridge
Carriage Width	W=3.277m
Truck Load	IRC 24R(24ton) / 18R(18ton)
Foundation Type	Spread foundation (T-type) Caisson type pile

Basic Design Concept (2/4)

No.16 Dzongkhachulum bridge			
Road classification	National Rd No.4	Jurisdiction	DoR
Existing Size	L=23m	Existing Bridge Type	Truss Bridge
Beneficiary	3 dzongkhags		

Future Planned Bridge Specifications	
Bridge Length	L=70m
Bridge Type	Langer arch Bridge
Carriage Width	W=7.0m
Truck Load	IRC 70R(70ton) or ClassA(40ton)
Foundation Type	Spread foundation (T-type)

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Basic Design Concept (3/4)

No.17 Dolkhola bridge		
Road classification	National Rd No.5	Jurisdiction
Existing Size	L=40m	Existing Bridge Type
Beneficiary	5 dzongkhags	DoR
Bailey Bridge		

Future Planned Bridge Specifications	
Bridge Length	L=70m
Bridge Type	Prestressed Concrete Bridge
Carriage Width	W=7.0m
Truck Load	IRC 70R(70ton) or ClassA(40ton)
Foundation Type	Spread foundation (T-type)

No.18 Jigmiling bridge		
Road classification	National Rd No.5	Jurisdiction
Existing Size	L=64m	Existing Bridge Type
Beneficiary	5 dzongkhags	DoR
Bailey Bridge		

Future Planned Bridge Specifications	
Bridge Length	L=70m
Bridge Type	Prestressed Concrete Bridge
Carriage Width	W=7.0m
Truck Load	IRC 70R(70ton) or ClassA(40ton)
Foundation Type	Spread foundation (T-type)

Basic Design Concept (4/4)

No.19 Kela bridge			
Road classification	Farm Road	Jurisdiction	DoA
Existing Size	L=45m	Existing Bridge Type	Suspension Bridge
Beneficiary	2villages.57HH		

48m(160ft)

Future Planned Bridge Specifications	
Bridge Length	L=48m(160ft)
Bridge Type	Bailey Bridge
Carriage Width	W=3.277m
Truck Load	IRC 24R(24ton) / 18R(18ton)
Foundation Type	Spread foundation (T-type)

No.20 Jangbi bridge			
Road classification	Farm Road	Jurisdiction	DoA
Existing Size	L=53m	Existing Bridge Type	Suspension Bridge
Beneficiary	5villages.64HH		

48m(160ft)

Future Planned Bridge Specifications	
Bridge Length	L=48m(160ft)
Bridge Type	Bailey Bridge
Carriage Width	W=3.277m
Truck Load	IRC 24R(24ton) / 18R(18ton)
Foundation Type	Spread foundation (T-type)

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THIMPHU : BHUTAN

13. Copy of this EC must be maintained at site at all times during construction of the bridge for environment management and monitoring references.

14. In case of non-completion of the activity within the given period, the EC must be renewed one month prior to the date of its expiry.

Any violation of the terms and conditions is a violation of Article 7 of EA Act 2000 which will result in revocation of the EC without any liability on the part of this office and compliance under the provision of Article 40-43, EA Act 2000 will commence.

This Clearance is valid till 30th December 2013.

A handwritten signature in black ink, appearing to be 'Lhaden Pema'.

(Lhaden Pema)

Chief Planning Officer

C:C:

1. The Hon'ble Secretary, MoWHS for kind information.
2. Head, EA Section, NEC, Thimphu for kind information
3. The Chief Engineer, I&DD, DoR, Thimphu for information.
4. The Chief Engineer, Bridge Division, DoR, Thimphu for information.
5. The Dy. Chief Env. Officer, PPD, MoWHS for information.



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31

MoWHS/PPD/Env/01/2010-11/290

Feb 10, 2011

To
The Director General
Department of Roads, MoWHS
Thimphu

Subject: Environmental Clearance for Re-construction of Jigmeling and Dholkhola Bridges on the Gaylephu-Sarpang National Highway

This is with reference to the letter No. DoR/BD/CE(B)/31/2010-2011/399 dated 1st February 2011 for the issuance of the environmental clearance for the Re-construction of Jigmeling and Dholkhola Bridges at Gaylephu-Sarpang National Highway. In this regard, the Environmental Unit under the Policy and Planning Division, MoWHS would like to issue the Environmental Clearance (EC) for the above mentioned works with the following terms and conditions:

1. The EC is valid for the construction of the above mentioned bridges only;
2. Indiscriminate dumping of excavated/waste materials into the river is an offense and is liable to penalty. It should be properly disposed in an appropriate disposal site;
3. The proponent shall ensure that proper care be taken to monitor the dust emissions from the project area;
4. Downstream affects should be monitored at all times to ensure that no damage is caused due to the project activity;
5. The waterways must be protected from any obstruction during and after the construction;
6. The implementation of the activity shall not affect the public and any religious/historic site;
7. Aesthetic value must be preserved/enhanced by reclaiming the disturbed area with re-vegetation of grasses or trees in consultation with the Department of Forest;
8. The applicant shall ensure that safety signs are posted at the strategic locations within project site;
9. Blasting must be carried out as per the rules and regulations of the Ministry of Home and Cultural Affairs. Ensure that proper warning signals are given prior to blasting.
10. The holder shall ensure that Occupational Health and Safety measures are strictly observed at all times. Safety gears should be provided to the workers and visitors coming in contact with the machines or having to execute manual work;
11. The applicant should ensure that first aid-kit is available at the site and proper health records file are maintained and health check up facilities provided to all the employees;
12. Any disputes arising due to the project are the responsibility of the Project Proponent;

Po Box 791, Opposite to UNDP Building, Thimphu : Bhutan


13/2/2011



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MoWHS/PPD/Eny/01/2010-11/335

Apr 08, 2011

To
The Director General
Department of Roads
Thimphu

Subject: **Environmental Clearance for Replacement of Bailey Suspension Bridge over Mangdechhu River (Korphu)**

Dear Sir,

This is with reference to the letter No. DoR/BD/CE(B)/31/2010-2011/520 dated 6th April 2011 for the issuance of the environmental clearance for the Replacement of Bailey Suspension Bridge over Mangdechhu River (Korphu) at Trongsa. In this regard, the Environmental Unit under the Policy and Planning Division, MoWHS would like to issue the Environmental Clearance (EC) for the above mentioned works with the following terms and conditions:

1. The EC is valid for the construction of the above mentioned bridge only;
2. Indiscriminate dumping of excavated/waste materials into the river is an offense and is liable to penalty. It should be properly disposed in an appropriate disposal site;
3. The proponent shall ensure that proper care be taken to monitor the dust emissions from the project area;
4. Downstream affects should be monitored at all times to ensure that no damage is caused due to the project activity;
5. The waterways must be protected and maintained at all times without any disturbance to the ecosystem of the river during and after the construction;
6. The implementation of the activity shall not affect the public and any religious/historic site;
7. Aesthetic value must be preserved/enhanced by reclaiming the disturbed area with re-vegetation of grasses or trees in consultation with the Department of Forest;
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maintained and health check up facilities provided to all the employees;

12. Any disputes arising due to the project are the responsibility of the Project Proponent;

13. Copy of this EC must be maintained at site at all times during construction of the bridge for environment management and monitoring references.

14. In case of non-completion of the activity within the given period, the EC must be renewed one month prior to the date of its expiry.

Any violation of the terms and conditions is a violation of Article 7 of EA Act 2000 which will result in revocation of the EC without any liability on the part of this office and compliance under the provision of Article 40-43, EA Act 2000 will commence.

This Clearance is valid till 30th December 2012.

Yours Sincerely,

(Lhadern Pema)

Chief Planning Officer

1. The Head, EA Section, NEC, Thimphu for kind information
2. The Chief Engineer, I&DD, DoR, Thimphu for information.
3. The Chief Engineer, Bridge Division, DoR, Thimphu for information.
4. The Env. Officer, Dzongkhag Administration, Trongsa for follow-up and information.



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MoWHS/PPD/Env/01/2010-11/334

Apr 08, 2011

To
The Director General
Department of Roads
Thimphu

Subject: Environmental Clearance for Replacement of Bailey Suspension Bridge over Mangdechhu River (Jangbi)

Dear Sir,

This is with reference to the letter No. DoR/BD/CE(B)/31/2010-2011/520 dated 6th April 2011 for the issuance of the environmental clearance for the Replacement of Bailey Suspension Bridge over Mangdechhu River (Jangbi) at Trongsa. In this regard, the Environmental Unit under the Policy and Planning Division, MoWHS would like to issue the Environmental Clearance (EC) for the above mentioned works with the following terms and conditions:

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maintained and health check up facilities provided to all the employees;

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This Clearance is valid till 30th December 2012.

Yours Sincerely

(Chalden Pema)

Chief Planning Officer

1. The Head, EA Section, NEC, Thimphu for kind information
2. The Chief Engineer, I&DD, DoR, Thimphu for information.
3. The Chief Engineer, Bridge Division, DoR, Thimphu for information.
4. The Env. Officer, Dzongkhag Administration, Trongsa for follow-up and information.



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MoWHS/PPD/Env/01/2010-11/336

Apr 08, 2011

To
The Director General
Department of Roads
Thimphu

Subject: Environmental Clearance for Replacement of Bailey Suspension Bridge over Mangdechhu River (Kela)

Dear Sir,

This is with reference to the letter No. DoR/BD/CE(B)/31/2010-2011/520 dated 6th April 2011 for the issuance of the environmental clearance for the Replacement of Bailey Suspension Bridge over Mangdechhu River (Kela) at Trongsa. In this regard, the Environmental Unit under the Policy and Planning Division, MoWHS would like to issue the Environmental Clearance (EC) for the above mentioned works with the following terms and conditions:

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This Clearance is valid till 30th December 2012.

Yours Sincerely,

(Lhaden Pema)

Chief Planning Officer

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2. The Chief Engineer, I&DD, DoR, Thimphu for information.
3. The Chief Engineer, Bridge Division, DoR, Thimphu for information.
4. The Env. Officer, Dzongkhag Administration, Trongsa for follow-up and information