

2) Explanation of Draft Report

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR RECONSTRUCTION OF BRIDGES IN CHUI OBLAST
OF THE KYRGYZ REPUBLIC
(EXPLANATION ON DRAFT REPORT)

In January 2007, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Reconstruction of Bridges in Chui Oblast (hereinafter referred to as "the Project") to the Kyrgyz Republic, and through discussions, field survey, and technical examination of the results in Japan, JICA prepared the draft report of the study.

In order to explain and to consult with the officials concerned of the Government of the Kyrgyz Republic on the components of the draft report, JICA sent to the Kyrgyz Republic the Basic Design Explanation Team (hereinafter referred to as "the Team"), which was headed by Satoshi Nakano, Resident Representative of the JICA Kyrgyz Republic Office, from May 24 to 28, 2007.

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

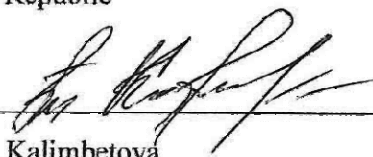


Satoshi Nakano
Leader
Basic Design Explanation Team
Japan International Cooperation Agency



Bishkek, May 28, 2007

Kubanychbek Mamaev
Permanent Secretary
Ministry of Transport and Communications
Kyrgyz Republic



Tajikan Kalimbetova
Deputy Minister
Ministry of Finance
Kyrgyz Republic

ATTACHMENT

1. Components of the Draft Report

The Government of the Kyrgyz Republic agreed and accepted in principle the contents of the draft report of the Basic Design Study explained by the Team.

2. Japan's Grant Aid Scheme

The Kyrgyz side understands the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of the Kyrgyz Republic as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both sides on September 6, 2006.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of the Kyrgyz Republic by the end of July, 2007.

4. Other Relevant Issues

4-1. The Project Cost Estimation, as attached in Annex-1, is confidential and should never be duplicated or disclosed to any outside parties before the signing of all the contracts for the Project.

4-2. The Kyrgyz side ensured that tax exemption for the Project shall be fulfilled in a timely manner in accordance with the Exchange of Notes between the two Governments (hereinafter referred to as "E/N") concerning the Project.

4-3. The Kyrgyz side shall bear the banking commissions for smooth implementation of the Project as a condition for the Japan's Grant Aid to be implemented. The Ministry of Transport and Communications (hereinafter referred to as "MOTC") should secure the sufficient budget to cover the cost.

4-4. MOTC already obtained the Environmental Impact Assessment approval for implementation of the Project, as attached in Annex-2, and completed necessary procedures under the environmental and social considerations of the laws and regulations of the Kyrgyz Republic.

4-5. The following undertakings based on the contents of the draft report should be taken by the Kyrgyz side at the Kyrgyz side's expenses.

(1) Securing land for the temporary yards and detour during the construction within six months after signing of the Exchange of Notes between the two Government.

(2) Securing sites for disposal of waste and land-waste, and borrow pit for construction of the Keng-Bulung bridge within six months after signing of the E/N.

(3) Providing facilities for the distribution of electricity to the temporary yards within one month



after contract with a contractor.

(4) Arrangement for traffic control to make detour on the sites during the construction.

(5) Maintaining the security at the sites and yards for the Project during the construction.

(6) Lending a road roller, tire roller, and asphalt finisher to (a) contractor(s) for asphalt pavement works for the Project.

4-6. MOTC shall obtain following permissions in a timely manner. Items (1), (2) and (3) should be taken before the commencement of the construction work, and (4) within one month after approval of the detail design by MOTC.

(1) Permission for construction works on the river by the Ministry of Agriculture, Water Resources and Processing Industry.

(2) Permission for earthworks by the State Agency on Environmental Protection and Forestry, Local Authorities, and State Inspection on Supervision on Industrial Safety and Mining Supervision in the Ministry of Emergency Situations.

(3) Permission for construction works beside high-voltage power lines by Chui Oblast Enterprise of the High-Voltage Electric Network.

(4) Permission for implementation of the Project by the State Agency of Architecture and Construction.

4-7. The Kyrgyz side shall secure enough budget and personnel necessary for maintenance of the bridges constructed by the Project.

Annex-1: Project Cost Estimation

Annex-2: Approval of Environmental Impact Assessment

КЫРГЫЗ РЕСПУБЛИКАСЫНЫН
ОКМОТУНО КАРАШТУУ КУРЧАМ ТУРАН ЧОЙРОНУ
КОРГОО ЖАНА ТОКОЙ ЧАРБАСЫ БОЮНЧА
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ОКРУЖАЮЩЕЙ СРЕДЫ И ЛЕСНОМУ
ХОЗЯЙСТВУ ПРИ ПРАВИТЕЛЬСТВЕ ЧУИ
КЫРГЫЗСКОЙ РЕСПУБЛИКИ

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№ 03-738 от 03.05. 2007г.

**Министерство транспорта и
коммуникаций КР**

*Об экологической экспертизе проекта
«Реконструкция мостов в северных
областях Кыргызской Республики»*

В Чуй-Бишкекское территориальное управление охраны окружающей среды на экологическую экспертизу представлен проект «Реконструкция мостов в северных областях Кыргызской Республики».

Японское агентство международного сотрудничества (JICA) ознакомившись с заявкой Правительства КР, приняло решение, согласованное с Министерством транспорта и коммуникаций КР о реконструкции трех мостов расположенных в Чуйской области:

- мост №1 через р. Аламедиш на 232,1 км автодороги Алматы-Бишкек-Ташкент;
- мост №2 через р.Ала-Арча на 235,2 км автодороги Алматы-Бишкек-Ташкент;
- мост №14 через р. Кен-Булуң на 46,1 км автодороги Бишкек-Горуларг.

Реконструируемые мосты назначены из расчета минимальной площади на местах расположения существующих мостов. Под еносе не попадаюот древесная и кустарниковая растительность. Режим водного потока не нарушается, так как под реконструируемыми мостами сохраняются естественные поверхности, и русла рек не сужаются.

Оценка возможного воздействия на окружающую среду предопределяется выбросами загрязняющих веществ в атмосферу и размещения отходов. Источниками загрязнения являются:

- погрузочно-разгрузочные работы;
- автотранспортные работы;
- монтаж железобетонных конструкций;
- буровые работы для устройства свай;
- хозяйственно-бытовая деятельность на временных строительных площадках.

Все источники выделения загрязняющих веществ в атмосферу не организованы.

Основным загрязняющим веществом, выделяющимся в атмосферу при реконструкции мостов №1, №2, является пыль, возникающая при движении автотранспорта по временным объездным дорогам, устраиваемых на период реконструкции мостов. На мосту №14 объездная дорога отсутствует – движение автотранспорта предусматривается по рядом стоящему существующему мосту.

В проекте предусмотрены мероприятия по вытеснению и исключению возможных аварийных ситуаций:

- поливание временных объездных путей водой, поливающими машинами 3 раза в сутки;
- предварительное увлажнение грунта при погрузочных и автотранспортных работах;

Сав

Сав *ЗВ*

- для предотвращения размыва берегов на подходах к мосту предусмотрено укрепление русел подпорными стенками.

Для хозяйственно-бытовых нужд персонала питьевую воду предусматривается привозить в специальной цистерной из г. Бишкек.

Отвод хозяйственно-бытовых сточных вод предусматривается в выгребные ямы. Выгребные ямы устраиваются в грунтах со слабо-фильтрующей способностью. По окончании строительства дороги выгребные ямы предусмотрено хлорировать и засыпать.

Временные площадки для строителей предусмотрены в непосредственной близости с реконструируемыми мостами. На местах обустройства временных площадок растительный слой предусмотрено снимать, складировать и использовать при рекультивации. Общая площадь временных площадок составляет 6200м². Территория временных площадок планируется и ограждается.

Хозяйственно-бытовые отходы и мусор предусмотрено складировать и хранить только в специальных контейнерах с дальнейшим вывозом на свалку близлежащего населенного пункта. Строительные конструкции от разборки существующих мостов предусмотрено вывезти и складировать в подведомственных организациях Министерства транспорта и коммуникаций.

Заправка строительной техники будет производиться автозаправщиком. В связи с этим склада ГСМ не требуется. Для предотвращения загрязнения почвы нефтепродуктами в местах заправки строительной техники предусматривается установить поддоны.

Рассмотрев представленные материалы, госэкоэкспертиза ЧБГУООС согласовывает проект «Реконструкция мостов в северных областях Кыргызской Республики».

Начальник

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Appendix 5

List of References

5. List of References

List of References

Survey Name: Basic design Study on the Project for Reconstruction of Bridges in Chui Oblast in the Kyrgyz Republic

No.	Name	Form Book • Video Map • Photo etc.	Original Copy	Publication Agency	Year
1	Road map of the Kyrgyz Republic (Схема автомобильных дорог Кыргызской Республики)	Data		МОТС	2005
2	Map of Chui Oblast (Scale 1:50,000)	Map	Original	GOSKARTOGRAFIA	2002
3	Development Strategy of Road Sector (2006-2010) (Draft) (Стратегия развития дорожного сектора (2006-2010) (проект))	Data		МОТС	2007
4	National Standards Kyrgyz Republic Bridge and culvert Design standards for roads	Data		МОТС	2004
5	Roads in Our Country: Today and Tomorrow	Report	Copy	МОТС	2005
6	Temperature, Rainfall Data of Bishkek and Tokmok (2004-2006)	Data		KYRGYZGIDROMET	2004-6

Appendix 6

Traffic Volume Survey Result

6. Traffic Volume Survey Result

The results of Traffic Volume Survey conducted by the survey team, MOTC and the World Bank (WB) are shown in the Table 6.1 to 10. According to the results, dairy traffic volumes of the bridges are in the range below.

Alamedin bridge (Bridge No.1)	: 14,800~16,600 cars/day
Ala-Archa bridge (Bridge No.2)	: 8,200~10,100 cars/day
Keng-Burun bridge (Bridge No.14 Outbound)	: 6,200~12,200 cars/day

Those Volume ranges are wide because of seasonal variation. Therefore, Annual Average Dairy Traffic (AADT) surveyed by MOTC and WB should be considered to evaluate traffic volume while a part of traffic volume survey result of the survey team and MOTC are referred.

Method of conversion from 12 hours traffic volume to 24 hours traffic volume is set as follows based on the result of 24 hours and 12 hours survey on a weekday at Ala-Archa bridge (Bridge No.2) (Table 6.3 and Table 6.4).

$$\text{Conversion Coefficient } a = \frac{(24 \text{ hours traffic volume})}{(12 \text{ hours traffic volume})} = \frac{8,510}{7,319} = 1.16$$
$$(24 \text{ hours traffic volume}) = a \times (12 \text{ hours traffic volume}) = 1.16 \times (12 \text{ hours traffic volume})$$

AADT of Alamedin bridge (Bridge No.14 Outbound) was calculated from the results of traffic volume survey at Ala-Archa bridge (Bridge No.2) by WB and the study team because there is no datum of traffic volume at Alamedin bridge (Bridge No.1).

Traffic volume of each bridge based on AADT is shown below.

Alamedin bridge (Bridge No.1) : 13,981 cars/day (In 2005 calculated*)
Ala-Archa bridge (Bridge No.2) : 8,224 cars/day (In 2005 actual)
Keng-Burun bridge (Bridge No.14 Outbound) : 8,850 cars/day (In 2005 actual)

*)Rates of traffic volume between Alamedin and Ala-Archa bridge are calculated as follows and they are averaged.

Rate calculated from Table 6.1 and 6.4 : 1.74

Rate calculated from Table 6.2 and 6.5 : 1.65

Average rate : 1.7

Traffic volume increasing rate

Average traffic volume increasing rate from 2002 to 2006 calculated from Table 6.10 is 9.4%.

Large Vehicle mixed rate

It is considered that seasonal variation is wide but the rate is about 10% for each bridge.

Alamedin bridge (Bridge No.1)	: 10.1~11.7%
Ala-Archa bridge (Bridge No.2)	: 8.0~25.4%
Keng-Burun bridge (Bridge No.14 Outbound)	: 6.0~11.0%

The reason that there is a difference of traffic volume between Alamedin bridge (Bridge No.1) and Ala-Archa bridge (Bridge No.2)

There is a big international market between Alamedin bridge (Bridge No.1) and Ala-Archa bridge (BridgeNo.2), goods transported from mainly China and Uzbekistan by large trailers. Shoppers come from in Kyrgyz, Kazakhstan and Uzbekistan by car and large bus, specially, there are many shoppers from Kazakhstan. For the reasons cited above, the traffic volume from the market through Alamedin bridge (Bridge No.1) to Kazakhstan or China is higher.

Traffic Volume Survey Results

Alamedin bridge (Bridge No.1)

Table 6.1 Traffic Volume Survey

「The study team survey : Feb. 10 (Sat.), 2007 (12hrs 7:00~19:00)」

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
8,998	2,289	70	174	914	301	9	12,755
Converted in 24hrs							14,796

Large Vehicle mixed rate : $(70+914+301)/12,755=10.1\%$

Cargo and Bus mixed rate : $(2,289+70+174+914+301)/12,755=29.4\%$

Table 6.2 Traffic Volume Survey

「The study team survey : Feb. 15 (Thu.), 2007 (12hrs 7:00~19:00)」

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
9,671	2,607	22	323	1,127	532	28	14,310
Converted in 24hrs							16,600

Large Vehicle mixed rate : $(22+1,127+532)/14,310=11.7\%$

Cargo and Bus mixed rate : $(2,607+22+323+1,127+532)/14,310=32.2\%$

Ala-Archa bridge (Bridge No.2)

Table 6.3 Traffic Volume Survey

「MOTC survey : Nov. 15 (Wed.), 2006 (24hrs)」

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
5,534		531	336	1,623	486	0	8,510

Large Vehicle mixed rate : $(53+1,623+486)/8,510=25.4\%$

(Large bus number is calculated as it is 10 % of total bus number.)

Cargo and Bus mixed rate : $(531+336+1,623+486)/8,510=35.0\%$

Table 6.4 Traffic Volume Survey**「The study team survey : Feb. 9 (Fri.), 2007 (12hrs 7:00~19:00)」**

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
4,690	956	66	210	857	449	91	7,319
Converted in 24hrs							8,510 ^{*)}

Large Vehicle mixed rate : $(66+857+449)/7,319=18.7\%$

*)This survey is the base of setting the conversion coefficient , therefore, the value of converted in 24hrs is equal to the value in the Table 6.3.

Cargo and Bus mixed rate : $(956+66+210+857+449)/7,319=34.7\%$

Table 6.5 Traffic Volume Survey**「The study team survey : Feb. 15 (Thu.), 2007 (12hrs 7:00~19:00)」**

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
4,730	1,267	146	616	1,268	620	31	8,678
Converted in 24hrs							10,066

Large Vehicle mixed rate : $(146+1,268+620)/8,678=23.4\%$

Cargo and Bus mixed rate : $(1,267+146+616+1,268+620)/8,678=45.1\%$

Table 6.6 Traffic Volume Survey**「WB survey : Feb. 10 (Sat.), 1998 and 2005 (AADT)」**

Year	Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
1998	6,430	486	85	178	389	93	0	7,661
2005	6,864	507	97	197	443	116	0	8,224

Large Vehicle mixed rate : 1998--- $(85+389+93)/7,661=7.4\%$

2005--- $(97+443+116)/8,224=8.0\%$

Cargo and Bus mixed rate : 1998; $(486+85+178+389+98)/7,661=16.1\%$

2005; $(507+97+197+443+116)/8,224=16.5\%$

Keng-Burun bridge (Bridge No.14 Outbound)**Table 6.7 Traffic Volume Survey****「The study team survey : Feb. 7 (Wed.), 2007 (12hrs 7:00~19:00)」**

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
3,894	1,089	34	42	213	74	16	5,362
Converted in 24hrs							6,220

Large Vehicle mixed rate : $(34+213+74)/5,362=6.0\%$

Cargo and Bus mixed rate : $(1,089+34+42+213+74)/5,362=27.1\%$

Table 6.8 Traffic Volume Survey

「MOTC survey : The fourth quarter, 2007 (24hrs)」

Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
6,290	3,790	640	770	368	337	0	12,195

Large Vehicle mixed rate : $(640+368+337)/12,195=11.0\%$

Cargo and Bus mixed rate : $(3,790+640+770+368+337)/12,195=48.4\%$

Table 6.9 Traffic Volume Survey

「WB survey : 1997 and 2005 (AADT)」

Year	Passenger Car	Mini Bus	Large Bus	Small Truck	Truck	Trailer	Other	Total
1997	6,028	281	121	299	488	209	0	7,426
2005	7,254	576	138	206	478	198	0	8,850

Large Vehicle mixed rate : 1997--- $(121+488+209)/7,426=11.0\%$

2005--- $(138+478+198)/8,850=9.2\%$

Cargo and Bus mixed rate : 1997; $(281+121+299+488+209)/7,426=18.8\%$

2005; $(576+138+206+478+198)/8,850=18.0\%$

Table 6.10 Traffic Volume Survey

「MOTC survey : Average of quarter 1997 ~ 2006 (24hrs)」

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
交通量 (台/日)	2,198	2,558	2,615	3,223	3,256	6,545	7,119	7,527	7,339	9,205
増加率 (%)	—	16.4	2.2	23.3	1.0	101.0	8.8	5.7	-2.5	25.4

Average increasing rate (2002~2006) : 9.4%

(The data from 1997 to 2001 are not calculated for the increasing rate because those data are not reliable enough.)

Appendix 7

Environmental and Social Considerations, and Procedures of Acquiring Licenses for the Project

7. Environmental and Social Considerations, and Procedures of Acquiring Licenses for the Project

1. Environmental and Social Considerations

In accordance with the result of IEE level survey conducted in the preliminary study in Oct. 2006, impact on environment and society are supposed to be in limited range of vibration, noise and water pollution during construction, but discussions were held with controlling agencies due to the necessity of EIA process in Kyrgyz law system.

The study team held a discussion with a director and a head of Environmental preservation, Forestry Agency who are in charge of judgment and approval of EIA, as a result of the discussion, because the agency recognized that there was few environmental and social impact caused by the project of reconstruction of three bridges, it took only about one week to judge and approve the EIA providing that a consultant approved by the agency made and applied EIA documents. For example, it may take one year to take approval of EIA for construction of cigarette factory, holding explanation meetings and preparing and judgment of EIA report, because environmental impact of discharging smoke and water from the factory is anticipated.

The team held discussions with entrusted environmental consultant and confirmed necessary information (location map, bridge general drawings, temporary facilities drawings, displacement plan, diversion plan, environmental impact and its countermeasure), time limit of providing the information (middle of April 2007) and work schedule (application time: middle of May, judgment and approval: beginning of June) for preparing EIA report.

EIA Procedure

- Confirmation of actual site condition, acquiring information of natural condition and project information
- Preparation and submission of EIA report
- Impact items, impact details, draft countermeasure, calculation of the amount of impact
- Judgment of EIA report by Environmental Preservation, Forestry Agency
- EIA Completion Approval by Environmental Preservation, Forestry Agency
- Commencement of construction work

Operation System of EIA Procedure for this project

- Bishkek ~ Narin ~ Torgart Road Maintenance Department and No.1 Maintenance Department entrust an environmental consultant in Kyrgyz with EIA procedure work for Alamedin bridge (Bridge No.1) and Ala-Archa bridge (Bridge No.2), and Keng-Burun bridge (Bridge No.14 Outbound) respectively. The trust cost shall be paid by each road maintenance departments. EIA Completion Approval will be obtained in the middle of June. Trust cost of EIA procedure for the asphalt plant in the project for improvement of equipment in Naryn Oblast was US\$ 100. The cost for this project seems to be same as that project cost.

- The consultant mentioned above is a subsidiary of the consultant company with Dutch and German capital and has an environmental license from Environmental preservation, Forestry Agency. (Enco Central Asia Ltd, 0312-549279)
- The team will provide the project information to the environmental consultant through MOTC. Providing time is scheduled for the middle of April.
- Preparing EIA report including the project information, MOTC applies to Environmental Preservation, Forestry Agency for environmental judgment. Application time is the beginning of May.
- Required time for the judgment is one week to 10 days.
- The project will be approved. Completion certificate will be issued to MOTC from the Agency by the middle of June at the latest.

Other relevant environmental issue

- Cutting trees MOTC shall obtain approval of cutting trees at construction site from Environmental Preservation, Forestry Agency with plan drawings through the local public office after a tender of the project. The local public office and Environmental Preservation, Forestry Agency will have discussion each other on the necessity of planting at the place of cutting trees.
- Change of topography MOTC shall obtain approval of change of topography from the local public office with plan drawings after the tender of the project.
- Preservation of Environment of Water Treatment of mad water from construction work (foundation work) shall be done. The treatment shall be carried out at the place the local public office appoints.
- Borrow Pit Private pay borrow pit will be planned.
- Disposal place Wastes should be thrown away at the place MOTC appointed. MOTC shall report disposal to the local public office.

Local public offices to which applications will be reported are following.

Alamedin bridge (Bridge No.1)	: Bishkek city Sberdorov district, Lenin village, Alamedin village, There are three areas divided by boundaries of upstream side, downstream side and the river.
Ala-Archa bridge (Bridge No.2)	: Nidjinealantinski village
Keng-Burun (Bridge No.14 Outbound)	: Keng-Burun village

MOTC and the team held a discussion with a representative from concerned local public office at the bridge sites, explaining temporary yard, diversion, excavation, cutting trees and so on, confirming the public office's cooperation of fast approval when MOTC reports those application.

2. Licenses

- 1) Water Resources Department in the Ministry of Agriculture manages main rivers. It was confirmed that three rivers which three project bridges are crossing was under the jurisdiction of above department.

Alamedin bridge (Bridge No.1) : Alamedin river
Ala-Archa bridge (Bridge No.2) : Ala-Archa river
Keng-Burun bridge (Bridge No.14 Outbound) : Keng-Burun river

Water Resources Department in the Ministry of Agriculture approves construction plans with preliminary judgment of the plan especially considering minimum impact to irrigations. It was confirmed that the Ministry of Agriculture realized that this project was reconstruction of old bridges and anticipated that there were not big problems with the project. And, the Ministry also realizes that excavation for abutment construction, partly excavation of river bank for construction of diversion and change of the river flow are necessary for the bridges reconstruction work.

Documents of draft design drawings (A3 size shrank) necessary for approvals will be submitted during explanation of draft basic design through MOTC to Water Resources Department and approved. It was confirmed that necessary time for it was about 10 days resulting from a discussion with the department.

- 2) Changing topography shall be reported to a local public office.

MOTC shall submit drawings of changing topography (A3 size) and acquire the approval for it. Necessary time for it is about 10 days.

- 3) It was confirmed that following procedures were necessary concerning to approval of design drawings by Architecture Construction Agency which has jurisdiction over all constructions in Kyrgyz.

① A consultant company which design, plan or supervise this project shall register itself as a consultant in Kyrgyz. A consultant shall submit his registration in Japan with its translation and public stamp of Kyrgyz through MOTC to the Agency. Then, a consultant will be given a consultant registration valid for 5 years.

② Documents for approval of the Project

Drawing approval will be made submitting detailed design drawings (English version) with completion certificate of EIA and Basic Design Study Report (Russian version) to MOTC and Architecture Construction Agency before tender. Necessary time for the approval is one month for schedule but actually it takes 10 to 15 days. Drawings will be approved ones by stamps on the cover of drawings.

Appendix 8

Evaluation of Actual Conditions of the Bridges

8. Evaluation of Actual Conditions of the Bridges

Table 8.1 Evaluation of Actual Condition (Alamedin bridge (Bridge No.1))

Bridge Name		Alamedin bridge (Bridge No.1)					
Road Name		AH5					
Superstructure		RC T Type Girder Bridge		Location Chui Oblast			
Substructure		Abutment: Small Reversed T Type Pier: Rahmen structure		Length 42.0 m			
Substructure		Foundation Type Abutment: Pile Pier. Pile					
	Damaged Member	Damaged Position	Damage Degree	Judgment Classification	Explanation	Notes	
	Structural Soundness	Superstructure	Girder	1 Around bearing of main girder, especially upstream side 1, 3 span	I	A	Shear crack (0.45mm) at the side of main girder
2 Main girder underside, especially upstream side 1, 3 span				I	A	Destruction of concrete, exposure of reinforcement (dia. 30mm), rusting reinforcement	
3 Destruction at the center of cross beam				I	A	Not continuous all cross beam caused by bad construction, no load distribution	
4 Span center				I	A	Driving abnormal vibration on bridge surface	
5							
6							
7							
Slab		1 Underside	I	A	Many cracks		
		2					
		3					
Abutment		1 Exposure of pile top, Land subsidence, Unstable abutment	I	A	Without earth covering, Exposure of 1.0 m at head of piles of abutment, Possibility of collapse causing from back soil pouring.		
		2 Bridge seat of abutment A	I	A	Seat length of 50cm not enough		
		1 P1,P2 Pier head	I	A	Width of the coping of the piers of 75 cm not enough on aseismicity		
Pier		2 P1Pier pile	I	A	Exposure and rusting of main reinforcement (Dia. 30 mm, 4 pieces at one side), splitting concrete, Exposure of pile head of 1.1 m, Possibility of scouring and falling		
		3 Upstream side P2 Pier pile underpart	I	A	Exposure and rusting of main reinforcement (Dia. 30 mm, 4 pieces at one side), splitting concrete, Exposure of pile head of 1.5 m, Possibility of scouring and falling		
	Foundation	Lack of bearing capacity, Unstable (Foundation of abutment and Pier)	I	A	Exposure of pile head of abutment and pier, Lack of bearing capacity, horizontal dislocation increasing caused from lack of horizontal residence		
Adjunct		I	A	Corrosion of steel support, Breakage of handrail			
History	40 years old (built in 1967)	Construction of RC T type bridge					
Live load Judgment	Inventory Level						
	Operating Level						
Soundness Evaluation of Structures			<ul style="list-style-type: none"> -Deteriorated concrete, many crack, breakage and exposure of main reinforcement and rusting at main girder. Cross beams not functional. -Abnormal big vibration when driving, lack of rigidity of superstructure -Vertical and horizontal bearing capacity of abutment and pier are lacking. -Possibility of falling on aseismicity 				
Vulnerability against natural disaster	Earthquake-resistance	<ul style="list-style-type: none"> -Short seat length on pier, Possibility of unseating -Deterioration of concrete, big crack, exposure of reinforcement, lack of horizontal resistance of pier -Lack of pile foundation bearing capacity and stability caused from decreasing of ground level 					
	Wind-resistance	-No problem					
	Flood-resistance	-Danger of scouring on pier					
	Durability Evaluation against natural disaster	-Necessity of reconstruction of abutment and pier					
Traffic Function	Traffic limitation	Nothing					
	Traffic Jam Degree	Low level					
	Evaluation of Traffic Function	Diversion is necessary during construction.					
Environmental and Social Impact	Attached Utilities	Nothing					
	Illegal residents	Nothing					
	Other	Shoting training center for policeman at downstream left side of the bridge					
	Environmental and Social Impact Evaluation	-Shoting training center for policeman at downstream left side of the bridge, High voltage line at upstream side of the bridge, no utilities with the bridge					
Overall Evaluation			<ul style="list-style-type: none"> -Lack of load resistance, aseismicity, water proof and durability for this bridge -Necessity of relocation of the bridge to increase the ability of river flow -Necessity of reconstruction for this bridge 				

Notes:

- Damage Degree
 - I : Heavy damage, probable obstacle to securing traffic safety
 - II : Big damage, Examination of necessity of repair with detailed survey
 - III : Confirmed damage, Follow up
 - IV : Confirmed damage, Record the degree of the damage
 - ok: No damage at all
- Judgment Classification
 - A: Reconstruction
 - B: Repair
 - C: Do nothing
 - Review: Middle between B and C

Table 8.2 Evaluation of Actual Condition (Ala-Archa bridge (Bridge No.2))

Bridge Name		Ala-Archa bridge (Bridge No.2)					
Road Name		AH5	Location		Chui Oblast		
Superstructure		RC T Type Girder Bridge	Length		28.0 m		
Substructure		Abutment: Small Reversed T Type Pier: Rahmen structure	Foundation Type		Abutment: Pile Pier: Pile		
	Damaged Member	Damaged Position	Damage Degree	Judgment Classification	Explanation	Notes	
	Structural Soundness	Superstructure	Girder	1 Around bearing of main girder, especially upstream side 1, 2 span	I	A	Shear crack (0.5mm) at the side of main girder
2 Main girder underside, especially upstream side 1, 2 span				I	A	Destruction of concrete, exposure of reinforcement (dia. 30mm), rusting reinforcement	
3 Destruction at the center of cross beam				I	A	Not continuous all cross beam caused by bad construction, no load distribution	
4 Span center				I	A	Driving abnormal vibration on bridge surface	
5 Subsidence and slant of bridge surface				I	A	Bridge Surface Subsidence of 25 cm at left side and 35 cm at right side of down stream side	
6							
7							
Substructure		Slab	1 Underside	I	A	Cracks	
			2				
			3				
Substructure		Abutment	1 Exposure of pile top, Land subsidence, Unstable abutment	I	A	Without earth covering, Exposure of 1.0 m at head of piles of abutment, Possibility of collapse causing from back soil pouring.	
			2 River Bank	I	A	Land Slide proceeding(Crack width 40 cm), Deformation of Revetment of Gabion	
			3 Abutment A, B at down stream side	I	A	Horizontal dislocation of 8 cm toward pier and subsidence of 13 cm at down stream side of Abutment B	
Substructure		Pier	1 P1 Pier head	I	A	Seat length of 75 cm not enough on aseismicity	
			2 P1Pier pile	I	A	Exposure and rusting of main reinforcement (Dia. 30 mm, 4 pieces at one side), splitting	
	3 P1Pier		I	A	Exposure of Pile head of 2.5 m by scouring, Pssibility of scouring and falling		
Foundation	Lack of bearing capacity, Unstable (Foundation of abutment and Pier)	I	A	Exposure of pile head of abutment and pier, Lack of bearing capacity, horizontal dislocation increasing caused from lack of horizontal residence			
Adjunct		I	A	Corrosion of steel support, Breakage of handrail			
History	40 years old (built in 1967)			Construction of RC T type bridge			
Live load Judgment	Inventory Level						
	Operating Level						
Soundness Evaluation of Structures			<ul style="list-style-type: none"> •Deteriorated concrete, many crack, breakage and exposure of main reinforcement and rusting at main girder. Cross beams not functional. •Abnormal big vibration when driving, lack of rigidity of superstructure •Concrete of Abutment and Pier are deteriorated and reinforcement is rusting, Vertical and horizontal bearing capacity of abutment and pier foundation piles are lacking. •Because of high embankment of over 8 m from riverbed, there is possibility of abutment settlement and horizontal movement and collapse. 				
Vulnerability against natural disaster	Earthquake-resistance	<ul style="list-style-type: none"> •Short seat length on pier, Possibility of unseating •Deterioration of concrete, big crack, exposure of reinforcement, lack of horizontal resistance of pier •Lack of pile foundation bearing capacity and stability caused from decreasing of ground level 					
	Wind-resistance	•No problem					
	Flood-resistance	•Danger of scouring on pier					
	Durability Evaluation against natural disaster	•Little durability of Abutment and Pier					
Traffic Function	Traffic limitation	Nothing					
	Traffic Jam Degree	Traffic Jam caused by breakage of approach road in spite of not so many traffic					
	Evaluation of Traffic Function	Diversion is necessary during construction.					
Environmental and Social Impact	Attached Utilities	Nothing					
	Illegal residents	Nothing					
	Environmental and Social Impact Evaluation	•Brickyard at left side of down stream side					
Overall Evaluation			<ul style="list-style-type: none"> •Extremely unstable structure •Necessity of consideration to avoid impact to the brickyard •Bridge should be replace to outbound direction considering the serpentine river and the brickyard. •Necessity of reconstruction for this bridge 				

Note:

- Damage Degree
 - I : Heavy damage, probable obstacle to securing traffic safety
 - II : Big damage, Examination of necessity of repair with detailed survey
 - III : Confirmed damage, Follow up
 - IV : Confirmed damage, Record the degree of the damage
 - ok: No damage at all
- Judgment Classification
 - A: Reconstruction
 - B: Repair
 - C: Do nothing
 - Review: Middle between B and C

Table 8.3 Evaluation of Actual Condition (Keng-Burun bridge (Bridge No.14 Outbound))

Bridge Name		Keng-Burun Bridge (Bridge No. 14 Outbound)				
Road Name		AH61	Location		Chui Oblast	
Superstructure		RC T Type Girder Bridge	Length		25.5 m	
Substructure		Abutment: Reversed T Type Pier: Wall Type	Foundation Type		Abutment: Pile or direct Pier: Pile or direct	
Damaged Member	Damaged Position	Damage Degree	Judgment Classification	Explanation	Notes	
Structural Soundness	Superstructure	Girder	1	I	A	Shear crack (0.55mm) at the side of main girder
			2	I	A	Destruction of concrete in the length of over 1.5 m, exposure of reinforcement (dia. 30mm), rusting reinforcement
			3	I	A	Bridge surface subsidence of 10 to 15 cm at left side and about 35 cm at right side of the bridge comparing with inbound bridge.
			4	I	A	Traffic accidents is seems to be attributed to being not parallel to inbound bridge.
			5	I	A	Narrower freeboard than inbound bridge one caused by bridge subsidence
			6			
			7			
	Slab	1				
		2				
		3				
	Substructure	Abutment	1	I	A	Subsidence of bridge seat that outbound bridge seat is lower than inbound bridge one.
			2	I	A	Seat length of 60cm not enough on aseismicity.
			3			
		Pier	1	I	A	Bridge seat width of 80 cm is not enough on aseismicity.
	2					
	3					
	Foundation	Lack of bearing capacity, Unstable (Foundation of abutment and Pier)	I	A	Possibility of not secured bearing capacity, which pile foundation of inbound bridge is associated with.	
	Adjunct				Corrosion of steel support, Breakage of handrail	
	History	37 years old (built in 1955)			Construction of RC T type bridge	
	Live load Judgment	Inventory Level				
Operating Level						
Soundness Evaluation of Structures				<ul style="list-style-type: none"> •Deteriorated concrete, many crack, breakage and exposure of main reinforcement and rusting at main girder. •Big subsidence of bridge surface at right side •Necessity of raising bridge •Necessity of horizontal alignment of the bridge •Enhancement of aseismicity satisfied with seat length to prevent the bridge from unseating 		
Vulnerability against natural disaster	Earthquake-resistance			•Short seat length on pier, Possibility of unseating		
	Wind-resistance			•No problem		
	Flood-resistance			•Danger of scouring on pier assumed pier to be direct foundation		
	Durability Evaluation against natural disaster			•Problem on aseismicity		
Traffic Function	Traffic limitation			Nothing		
	Traffic Jam Degree			There is little traffic jam in spite of the traffic but traffic accidents are reported.		
	Evaluation of Traffic Function			Inbound bridge will be used for diversion.		
Environmental and Social Impact	Attached Utilities			Nothing		
	Illegal residents			Nothing		
	Environmental and Social Impact Evaluation			•Low pollution construction method is necessary because there are private houses near the bridge.		
Overall Evaluation				<ul style="list-style-type: none"> •Necessity of raising bridge and reducing the number of piers to improve the ability of the river flow. •Necessity of relocate the outbound bridge prallely to the inbound bridge to reduce traffic accidents •Improvement of bridge seat length for unseating prevention on aseismicity •Progressive deterioration : Big crack of superstructure, splitting of main reinforcement of main girder and collosion •Necessity of reconstruction for this bridge 		

Note:

- Damage Degree
 - I : Heavy damage, probable obstacle to securing traffic safety
 - II : Big damage, Examination of necessity of repair with detailed survey
 - III : Confirmed damage, Follow up
 - IV : Confirmed damage, Record the degree of the damage
 - ok : No damage at all
- Judgment Classification
 - A : Reconstruction
 - B : Repair
 - C : Do nothing
 - Review : Middle between B and C