MINISTRY OF PUBLIC WORKS AND TRANSPORT
THE KINGDOM OF CAMBODIA

THE PROJECT

FOR

STUDY ON THE IMPROVEMENT OF EXISTING BRIDGES

IN

THE KINGDOM OF CAMBODIA

FINAL REPORT

VOLUME III
APPENDIX

March 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

CHODAI CO., LTD.
ORIENTAL CONSULTANTS CO.,LTD.

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APPENDICES

- Table of contents -

Appendix A. Record of JCC Meeting

1) First JCC meeting

THE PROJECT FOR STUDY ON THE IMPROVEMENT OF EXISTING BRIDGES

Date & Hour	27/July/2012 (Fri) 15:30～17:30	Venue	MTWT Conference Room
Participant	MPWT: HE.Tauch Chankosal (Secretary of State, Chairman of JCC) HE.Kem Borey (Director General of Public Works) and others MEF : Ream Utdom (Deputy Chief of Bilateral Cooperation Division, Department of Investment and Cooperation) and others JICA : Masahiko Egami (Representative) Tadao Kuwano (JICA Expert) Takashi Shimada (JICA Expert) Study Team: Junji Yasui (Team Leader) and others		
Subject	1st of JCC Meeting		

Main Topic of Discussion

Project introduction Session

Mr. Junji Yasui

Contents of the Project are introduced by using Power point and document prepared for the meeting. The Contents are as follows:

A. Package A
1. Objectives of the study
2. Outline of the Study
3. Study Schedule
4. Selection of the Priority Roads
5. Introduction for Inventory and inspection data sheet
6. Bridge replacement plan
7. Environmental and social consideration

B Package B
1. Present situation for Road and bridge maintenance in MPWT.
2. Budget for the Road and bridge maintenance in MPWT
3. Program for maintenance management
4. Establishment of organization for bridge maintenance
5. Technology transfer for Cambodia
6. Development of Bridge data base

Question-and-answer Session

H.E. Tauch Chankosal

1) The road network master plan was prepared 5 years ago, our activity has changed from the master plan. If you set priority of master plan too heavy, it may not be correct.
2) We have a road maintenance manual. Bridge maintenance manual is also very important.

H.E. Kem Borey

1) We have Standard Drawing, we would like JICA study team to utilize/integrate the existing Standard Drawing, as well as other materials, produced under the Strengthening of Construction Quality Control Project (hereinafter referred to as the SCQC) instead of producing new standard for bridge length, bridge type and span length in the report of page 20.

2) Responsibility overlapping organizations in MPWT (page 28) are not only 4 departments, but totally 5 departments. One new department is Sub-national Public Infrastructure & Engineering Department (SPIED). JICA study team may consider what SPIED should be responsible in this study.

3) Prior designation of the C/P responsible for the project implementation and setting up a PIU is a heavy task for the General Director. We would like to set up a permanent institution or office, under one existing department or a separate one. We have to discuss in detail about it.

4) The budget is necessary for sustainable management. It includes staff salary and some additional wages. Budget is a complicated matter because it is related not only to MPWT, but also to MEF. As an example from the SCQC, our C/P team does not fully participate in the project because of the problem with incentive/additional salary. Therefore, alternatives proposals for this project should be:

- Request for budget for C/P will also be submitted to JICA together with TA project proposal.
- Request for budget for C/P will be submitted to MEF.

We are considering the budget support from JICA.

5) Also, after the completion of the project, we plan to form this project office (PIU) into one permanent institution in MPWT. Therefore, it is necessary to request budget from MEF in order to ensure the sustainability of this new institution. We already experienced problem in 1999 when we created Structural Inspection Bureau (SIB) implemented under assistance from New Zealand. Unfortunately, it disappears after the project completed. Actually, the office name still exists, but all staffs shifted to other departments. And we do not want to repeat this problem.

Mr. Kong Sophal

1) Standard lane width for bridge along national road is 3.5-3.75m, so 2lane width is 7m. But 2-lane width is 6 m only in page 19.

2) As for bridge type (page 20), RC bridge is popular in Cambodia because it is easy to construct. However, the beam height is large which makes the approach road high. So we should consider PC bridge from now on to reduce the beam height.

The study team answer:

1) Lane width for bridge can be changed according to the recommendation. This is the first time for discussion, so we appreciate your comments.

2) This stage is just for the Master Plan, so all the existing bridge types are included for the selection by Cambodian contractors. This rough plan applies to over 1200 bridges to enable cost estimation. In actual stage, after road prioritization is completed, we will make a more comprehensive planning which includes precise selection of bridge type.

Mr. Koun Bunthoeun

1) the SCQC has the Standard Drawing of Bridge and Road, you can use them.

2) Bridge maintenance organization and budget for operation are important for sustainable operation. We have to confirm them before the project start.

The study team answer:

We have received information and data from the SCQC. This is shown in Appendix 2.

H.E. Tauch Chankosal

1) Is training included in this JICA Project? We need sustainable maintenance system, so technical transfer is important. It is not only from Japanese to Cambodian but also from Cambodian to Cambodian. It is important how to keep sustainability.

The study team answer:

It is not included at this stage. But if you accept next stage study, next stage of Package B will include it.

H.E. Kem Borey

Promotion of junior officers of DPWH is very fast. They are promoted and move other offices by 6 month -1 year. So we need to keep substitutes. We need the system that staffs of maintenance organization receive technical skill transferred from promoted staff before replacement take place.

Mr. Kem Socheat

1) Data base should be updated continuously.

2) 5 relative organizations should hold the data base in common. One opinion is that the Center(one of the section or department) should be established for the data base management. Each organization has each data base. The data bases are not useful for other organization. It should be improved. It may be good that the Center for the data base is established. We want the study team to propose the system that relevant organization can access to the data base.

H.E. Tauch Chankosal

1) To manage road and bridge, we need to know how many assets we have. So we need database which should be sustainable.

2) In MPWT, we must have only one database system, we should not have many database belonging to different departments. Please help us how to set up database and make it sustainable. Before the SCQC finish, all documentations belong to everywhere. Now we collect them and put in one library (electronic copy). We must do that in the future, after one project finishes, we collect all the documents, all the drawings, and keep in the Center. This is just an idea, but please helps us following your experience in Japan and other countries.

Mr. Takashi Shimada

1) Staffs of MPWT managed many project, so they are very busy. It is not reality that DPWT staffs manage and update database. One option, it is local consultant to do it (out sourcing). I recommend you to discuss it.

2) In Philippine, there are many kinds of database belong to different institutions. To overcome this problem, Philippine government has introduced common data exchange platform system (JICA proposed) for using various organization data base.

Mr. Masahiko Egami

1) We also think that establishment of new unit/office for getting sustainability before implementation of next typical cooperation project is important.

2) Budget also is important for sustainable operation. We request MPWT to discuss with MEF about the Budget matter and establish the new office with some budget before the project start. JICA is interested in supporting the capacity of the new office. JICA can arrange some input, and this becomes a good cooperation. However, without any input from Cambodia side, it is going to be difficult for Japan side to support.

Mr. Takashi Shimada

In terms of budget, Philippine government (Department of Transportation) gets the budget from vehicle registration and inspection fee. I think MPWT can find individual budget from like them.

H.E. Tauch Chankosal

We will discuss about them before start of the project. We request you (JICA) to submit us your proposal about these matter.

Mr. Ream Utdom

We should discuss about it. We request you to submit us your opinion.

Schedule of the Study

Mr. Junji Yasui

1) Package B will be finalized by September,2012.

2) Package A will be finalized at the end of 2012.

List of Attendants for 1st JCC Meeting

No.	Name	Organization	Position
1	HE. Tauch Chankosal	MPWT	Secretary of State
2	HE. Kem Borey	MPWT	Director General of Public Works
3	Chhim Phalla	MPWT	Director of ICD
4	Kong Sophal	MPWT	Deputy Director of ICD
5	Heng Salpiseth	MPWT	Officer of ICD
6	Dun Vandy Reagan	MPWT	Officer of ICD
7	Sok Ly	MPWT	Officer of ICD
8	Kith Chandararith	MPWT	Officer of ICD
9	Kem Socheat	MPWT	Deputy Chief of Bridge and Road Planning and Technical Office, RID
10	Heng Rathpiseth	MPWT	Director of SPIED
11	Phy Lyda	MPWT	Director of HEC
12	Koun Buthoeun	MPWT	Director of PWRC
13	Prach Chantha	MPWT	Chief of Infrastructure Office, PWRC
14	Prok Novida	MPWT	Chief of Public Investment Planning Office, Planning Department
15	Ream Utdom	MEF	Deputy Chief of Bilateral Cooperation Division, Department of Investment and Cooperation
16	Pich Socheata	MEF	Deputy Chief of Bilateral Cooperation Division, Resettlement Department
17	Sim Samnang	MEF	Deputy Director of Resettlement Department
18	Nhean Vannak	MEF	Officer of Resettlement Department
19	Masahiko Egami	JICA Cambodia Office	Representative
20	Tadao Kuwano	JICA Expert, MPWT	Chief Advisor of The Strengthening of Construction Quality Control Project
21	Takashi Shimada	JICA Expert, MPWT	Transport Policy Advisor
22	Junji Yasui	JICA Study Team	Team Leader
23	Kazuto Honda	JICA Study Team	Road Planning 1
24	Kov Monyrath	JICA Study Team	Road Planning 2
25	Kazuyuki Takeshita	JICA Study Team	Bridge Maintenance Management
26	Yasunori Nagase	JICA Study Team	Organization Analysisi
27	Osamu Matsumoto	JICA Study Team	Coordinator

MPWT: Ministry of Publics work and Transport
ICD: International Cooperation Department
RID: Road Infrastructure Department
SPIED: Sub-National Public Infrastructure and Engineering Department
HEC: Heavy Equipment Center
PWRC: Public Works Research Center
MEF: Ministry of Economy and Finace

2) Second JCC meeting

THE PROJECT FOR STUDY ON THE IMPROVEMENT OF EXISTING BRIDGES

Date & Hour	2012/9/25 (Wen) 9:30～11:10	Venue	MTWT Conference Room
Participant	MPWT: HE.Tauch Chankosal (Secretary of State, Chairperson of JCC) HE.Kem Borey (Director General of Public Works) and others MEF : Sim Samnang (Deputy Director of Resettlement Department) and others JICA : Hitoshi Hirata (Senior Representative) Masahiko Egami (Representative) Tadao Kuwano (JICA Expert) Takashi Shimada (JICA Expert) Study Team: Junji Yasui (Team Leader) and others		
Subject	2nd of JCC Meeting		
Main Topic of Discussion			

Agenda 1 – Opening Remark

(1) H.E. Tauch Chankosal, Chairperson of JCC, Secretary of State, MPWT

(2) Mr. Hitoshi Hirata, Senior Representative of JICA Cambodia Office

Agenda 2 – Explanation of the Interim Report,

by Mr. Junji Yasui, Team Leader of JICA Study Team

Contents of Explanation:

1. Introduction
2. Bridge Survey(Target Roads)
3. Environmental and Social Consideration
4. Information System
5. Bridge Maintenance in Cambodia

Agenda 3 – Discussion about the Interim Report

Mr. Nou Vaddhanak

I would like to know what is soundness 1 to 4 in Figure 7-2 of repair scenario, page number 31of Interim Report (Summary).

Answer by Mr. Junji Yasui

The Figure 7-2 shows the image of 2 cases of the scenario and the Figure 7-3 shows the comparison of the life cycle cost between the cost of a bridge with frequent maintenance and one with long interval maintenance. The grade of soundness 1 to 4 are not prescribe in detail due to comparison of two cases of general maintenance managements.

H.E. Tauch Chankosal

Group 1 of the Target Roads is recommended for improvement as short term program by JICA Study Team in accordance with 2.4.3 of Focus on the Group of High Priority Road and I agree the recommendation but I would like to know if the JCC member have other opinion.
JICA Study Team should confirm the Group of the Target Road to avoid the overlap of the project to the Ministry of Rural Development.

H.E. Kem Borey

I agree the recommendation by JICA Study Team. The average weight of bridges in Group 1 and Group 2 are similar. Hence JICA Study Team is requested to consider that Group 1 and Group 2

are recommended for improvement as short-term program.

Mr. Sim Samnang

For Table 4-1 of Preliminary Scoping,

1) In the item "1. Involuntary Resettlement", "without" means "outside"?

2) In the item "3. The indigenous and ethnic people", I regard the Vietnamese people as Cambodian people because they have been lived in Cambodia long time. Therefore, I suppose they cannot be paid special interest.

3) In the item "6. Water Usage or Water Rights and Rights of Common", the fishery can be affected temporally but it would not be daily activities and not be serious issue.

4) This Study includes a Resettlement Plan? If not, it is better but if it is necessary in the end, the resettlement plan will be prepared to be rushed. For the resettlement plan, a social study should be done by a Japanese consultant with certain experience in resettlement to follow the Cambodian procedure, regulation and the JICA guideline. The key point is the resettlement plan requires long time discussion to be clear and to secure resettlement policies.

Mr. Omura

Yes, "without" means "outside".

Mr. Junji Yasui

1) We just observed the fishery activities around the priority bridges near by the Mekong River especially on road No. 73 and 377. They can be affected by construction activities but only in construction period.

2) The Resettlement Plan is not included because the projects are not new road constructions but some peoples can be temporally affected by construction activities during construction period.

Mr. Omura

In the Study, we cannot identify the affected peoples because the Study is for the prioritization of roads and bridges to be replaced, it is not F/S, B/D or D/D. Therefore, we can survey potential resettlement around the priority bridges at this stage. We observed some houses nearby the bridges and they could be affected. We will collect the information of the potential resettlement cases. We cannot identify the affected peoples. Policies of resettlement can be proposed.

Mr. Masahiko Egami

After this study of the prioritization, we can discuss how to prepare the resettlement action plan (RAP) but it is not at this stage.

Agenda 4 - Closing Remark, by H.E. Tauch Chankosal, Chairperson of JCC

Document List

1. Interim Report (Summary)
2. Interim report

KINGDOM OF CAMBODIA
Nation Religion King

Ministry of Public Works and Transport
The Study on the Improvement of Existing Bridges
(Fianced by JICA)
2nd JOINT COORDINATION COMMITTEE MEETING
Date: 25th September, 2012, at 9:30am at MPWT's Meeting Hall

ATTENDENT LIST

No.	Name	Organization	Position
1	H.E Tauch Chankosal	MPWT	Secretary of State
2	H.E Kem Borey	MPWT	Director General of Public Works
3	Chhim Phalla	MPWT	Director of ICD
4	Kong Sophal	MPWT	Deputy Director of ICD
5	Chreang Phollak	MPWT	Deputy Director of Planning Department
6	Heng Salpiseth	MPWT	Officer of ICD
7	Nou Vaddhanak	MPWT	Director of RID
8	Kem Socheat	MPWT	Deputy Chief of Bridge and Road Planning and Technical Office, RID
9	Heng Rathpiseth	MPWT	Director of SPIED
10	Kiv Samal	MPWT	Chief of SPIED
11	Phy Lyda	MPWT	Director of HEC
12	Koun Buthoeun	MPWT	Director of PWRC
13	Prach Chantha	MPWT	Deputy Chief Officer of PWRC
14	Sim Samnang	MEF	Deputy Director of Resettlement Department
15	Nhean Vannak	MEF	Acting Chief of bilateral office of Resettlement Department
16	Vos Sovanne	MEF	Officer of Department of Investment and Cooperation
17	Tomohiro Iizuka	EOJ	Second Secretary
18	Hitoshi Hirata	JICA Cambodia	Senior Representative
19	Masahiko Egami	JICA Cambodia	Representative
20	Say Bora	JICA Cambodia	Officer
21	Tadao Kuwano	JICA Expert, MPWT	Chief Advisor of the Strengthening of Construction Quality Control Project
22	Takashi Shimada	JICA Expert, MPWT	Transport Policy Advisor
23	Junji Yasui	JICA Study Team	Team Leader
24	Jun Morishita	JICA Study Team	Bridge Diagnosis
25	Masaaki Minaishi	JICA Study Team	Brige Maintenance System Planning
26	Masahiko Mori	JICA Study Team	Bridge Design/ Bridge Planning
27	Takeshi Omura	JICA Study Team	Environmental and Social Consideration

3) Third JCC meeting

Minutes of Discussions

on the Project for

the Study on the Improvement of Existing Bridges

in the Kingdom of Cambodia

The JICA Study Team carried out the Project for the Study on the Improvement of Existing Bridge (herein after referred to as The Study) since March 2012. The study is almost completed and the Study Team submits the Draft Final Report for the Project to the Ministry of Public works and Transport.

The Study Team held the meeting of 3rd Joint Coordination Committee (hereinafter referred to as "JCC") in 6th February 2013 for the Study with the concerned officials of the Royal Government of Cambodia as attached in ANNEX 1. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Phnom Penh, 8, February, 2013

安井淨治

Junji YASUI
Team Leader
JICA Study Team

H.E Tauch Chankosal
Secretary of State
Ministry of Public Works and Transport(MPWT)
Kingdom of Cambodia

ATTACHMENT

1. Components of the Draft Final Report

Cambodian side agreed and accepted in principal the components of the Draft Final Report of the Study. The Study Team will correct and add information to the Final Report based on the discussion on the 3rd JCC meeting.

Both sides confirmed that additional information shall be described in a Final Report in the process of finalization, if necessary.

2. The Project for Strengthening of Inspection and Maintenance of Roads and Bridges

Cambodian side agrees to select the main counterpart of department and personnel, and select several DPWT for the pilot project.

3. Other Relevant Issue

Cambodian side agreed that Japanese side disclose the contents of final report of the Study including the collected information through the JICA homepage.

ANNEX 1: Attendance List

ANNEX 2: Record of 3rd of JCC meeting

ANNEX 1

Attendance List

No.	Name	Organization	Position
1	H.E Kem Borey	MPWT	Director General of Public Works
2	Chhim Phalla	MPWT	Director of ICD
3	Kong Sophal	MPWT	Deputy Director of ICD
6	Kith Chandararith	MPWT	Deputy Director of ICD
4	Prok Novida	MPWT	Deputy Director of Planning Department
5	Heng Salpiseth	MPWT	Officer of ICD
7	Heng Rathpiseth	MPWT	Director of SPIED
8	Long Chivira	MPWT	Deputy Chief of SPIED
9	Kiv Samal	MPWT	Chief of SPIED
10	Koun Bunthoeun	MPWT	Director of PWRC
11	Prach Chantha	MPWT	Deputy Chief Officer of PWRC
12	Ngy Laymithuna	MEF	Officer of Department of Investment and Cooperation
13	Hitoshi Hirata	JICA Cambodia	Senior Representative
14	Masahiko Egami	JICA Cambodia	Representative
15	Say Bora	JICA Cambodia	Officer
16	Junji Yasui	JICA Study Team	Team Leader
17	Jun Morishita	JICA Study Team	Bridge Diagnosis
18	Kazuto Honda	JICA Study Team	Road Planning 1
19	Takeshi Omura	JICA Study Team	Environmental and Social Consideration
20	Yasunori Nagase	JICA Study Team	Organization Analysis

MPWT : Ministry of Publics work and Transport

ICD : International Cooperation Department

SPIED : Sub-National Public Infrastructure and Engineering Department

PWRC : Public Works Research Center

MEF : Ministry of Economy and Finance

2

ANNEX 2

Record of 3rd JCC Meeting

Main Topic of Discussion

Agenda 1 – Opening Remark

(1) H.E. Kem Borey, Chairperson of JCC, Director General of Public Works, MPWT
(2) Mr. Hitoshi Hirata, Senior Representative of JICA Cambodia Office

Agenda 2 – Explanation of the Draft Final Report, by Mr. Junji Yasui, Team Leader of Study Team

1) Package A Plan for Bridge Replacement

1. Outline of the Project
2. Prioritization of the Target Roads
3. Bridge Survey
4. Traffic Count Survey
5. Indicator for selection of Priority Road
6. Bridge Plan
7. Economic Evaluation of the Project
8. Study on the Information System
9. Environmental and Social Consideration
10. Implementation Program
11. Conclusions and Recommendations

2) Package B: Capacity Development of Bridge Maintenance

Agenda 3 – Discussion about the Draft Final Report

Mr. Ngy Laymithuna
How to estimate the construction cost for each road.
Answer by the Study Team
Construction cost of every target bridge estimated by following steps.
1. Scale of bridge is determined by the results of the inventory survey.
2. Sizes of structure of bridge are determined from the standard design.
3. Volume of construction materials are calculated from the standard design of bridge.
4. A bridge construction cost is calculated by volume of construction material multiply unit costs.
5. Construction cost for each road is sum total of cost of each bridge on the road.

H.E. Kem Borey
Excellency asks whether the construction cost include the temporary detour or not.
Answer by the Study Team
The cost of temporary work for the detour is included in the construction cost.

Mr. Kong Sophal
Soil investigation has been carried out through the study?
Answer by the Study Team
The study team carried out visual survey of river bed condition. The type of soil condition such as fine sand, course aggregate and rock are investigated to assume the type of foundation. For example, pile wills deep if the river bed material is fine sand.

Mr. Masahiko Egami
Is there any financial plan for the implementation of project following the result of the study?

Answer by H.E. Kem Borey
MPWT will ask donor countries like JICA, ADB, and development partner and also consider finding the national budget by referring this report.

Mr. Prach Chantha
He requests to delete the sentence of "(Vietnamese immigrants)" at No.3 of draft TOR of environmental and social study in Chapter 9 of Environmental and Social Considerations due to not necessary to specify the nationality.
Answer by the Study Team
The study team agrees to revise the sentence.

Mr. Chhim Phalla
Some abbreviation of authorities and name of the department shall be corrected.
Answer by the Study Team
The study team agrees to correct the abbreviation.

Mr. Kong Sophal
He asks contents of the construction cost.
Answer by the Study Team
The cost of administration and supervision is not included in the construction cost. The Study Team will add the note in chapter 6 and 10 to the final report.

Mr. Kong Sophal
He requests to explain that how to calculate unit costs.
Answer by the Study Team
The Study Team obtains the unit cost from five domestic bridge construction projects. The unit costs are correlated by using an international competition bidding (ICB) project and revised to the final unit cost.

Mr. Heng Rathpiseth
He request to explain that what kind of structure are applied to the Project.
Answer by the Study Team
The standard design which provide by the strengthening of Construction Quality Control Project are adopted to the study. The reinforced concrete bridges which are mainly utilized in Cambodia are adopted to the project.

The Study Team
To implements the Project for Strengthening of Inspection and Maintenance of Roads and Bridges, the cooperation of the Cambodian side and Japanese side are essential. The MPWT shall cooperate to select the counterpart organizations and personnel for the project. Technical transfer will give a great benefit to the recipient country.

Mr. Hitoshi Hirata
JICA request to further discussion about the Project for Strengthening of Inspection and Maintenance of Roads and Bridges with MPWT to start the Project this year.

Agenda 4 - Closing Remark, by H.E. Kem Borey, Chairperson of JCC

Appendix B. Result of the Bridge Inspection Survey

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
1	11	1	11	19	18.8	105	17	15.1	Concrete	144.37	Girder	6	2	11.06
2	11	2	11	23	23.3	105	19	58.6	Steel	79.90	Truss	3	1	6.30
3	11	3	11	23	58.1	105	20	25.1	Steel	79.50	Truss	3	1	6.30
4	11	4	11	26	16.4	105	21	6.6	Concrete	41.96	Girder	3	2	10.00
5	11	5	11	26	48.9	105	21	15.3	Steel	41.90	Girder	3	1	5.43
6	11	6	11	28	26	105	20	40.5	Steel	83.90	Girder	6	1	5.40
7	11	7	11	28	51.7	105	20	25.7	Steel	53.70	Girder	5	1	4.95
8	11	8	11	29	54.7	105	20	18.5	Bailey	18.30	Truss	1	1	5.05
9	11	9	11	30	17.5	105	20	36.9	Concrete	15.53	Girder	1	2	9.49
10	11	10	11	32	17.3	105	22	47.4	Bailey	42.30	Truss	2	2	8.62
11	11	11	11	32	56.9	105	23	38.3	Concrete	29.50	Girder	5	2	8.00
12	11	12	11	33	9.4	105	23	55.8	Bailey	42.65	Truss	2	2	8.80
13	11	13	11	33	32.4	105	24	27.8	Steel	48.23	Girder	4	1	4.79
14	11	14	11	43	51.5	105	27	53.1	Bailey	27.74	Truss	1	2	9.90
15	11	15	11	44	11.6	105	28	0.8	Concrete	19.00	Girder	4	2	6.50
16	11	16	11	44	33.5	105	28	9.2	Concrete	46.71	Girder	3	2	9.74
17	11	17	11	44	49.4	105	28	15.6	Steel	24.10	Girder	2	1	4.85
18	11	18	11	45	52	105	28	41.3	Steel	26.73	Girder	2	1	5.42
19	13	1	11	5	34.4	105	49	9	Concrete	4.70	Girder	2	2	7.68
20	13	2	11	6	10.3	105	49	10.1	Concrete	7.00	Slab	1	1	5.00
21	13	3	11	9	10.5	105	49	27.5	Concrete	7.00	Slab	1	1	3.90
22	13	4	11	9	30.7	105	49	22.5	Bailey	27.36	Truss	2	1	5.10
23	13	5	11	11	15.4	105	49	3.2	Bailey	12.00	Truss	1	1	4.60
24	13	6	11	17	46.6	105	49	41.6	Steel	36.10	Girder	3	1	4.80
25	13	7	11	23	12.1	105	48	8.7	Concrete	9.00	Slab	3	2	8.00
26	13	8	11	25	25	105	47	52.6	Bailey	83.75	Truss	4	1	5.24
27	21	1	11	23	42.8	105	0	17.2	Steel	35.90	Girder	3	2	6.00
28	21	2	11	23	25.2	105	0	14.5	Bailey	18.00	Truss	1	1	5.20
29	21	3	11	23	10.6	105	0	9.5	Bailey	18.00	Truss	1	1	5.20
30	21	4	11	22	42.5	105	0	4.1	Bailey	18.00	Truss	1	1	5.30
31	21	5	11	21	50.4	105	0	16	Concrete	7.80	Girder	1	1	6.33
32	21	6	11	21	23	105	0	32.3	Steel	12.00	Girder	1	2	7.10
33	21	7	11	21	12.7	105	0	41.9	Bailey	18.40	Truss	1	2	8.80
34	21	8	11	21	6.3	105	0	48	Bailey	18.50	Truss	1	2	8.90
35	21	9	11	20	53.2	105	1	0	Concrete	15.96	Girder	1	2	7.20
36	21	10	11	20	35	105	1	37.2	Steel	24.20	Girder	2	2	7.00
37	21	11	11	19	26.1	105	1	57.3	Bailey	18.00	Truss	1	1	5.20
38	21	12	11	19	14.8	105	1	57	Steel	17.92	Girder	1	2	7.00
39	21	13	11	18	15.1	105	2	6.6	Steel	23.87	Girder	2	2	6.04
40	21	14	11	17	53.3	105	2	12.8	Steel	47.85	Girder	4	1	5.62
41	21	15	11	17	14.9	105	2	6.6	Bailey	24.00	Truss	2	1	5.27
42	21	16	11	16	48.4	105	1	51.2	Concrete	45.03	Girder	3	2	10.06
43	21	17	11	16	16.4	105	1	40.7	Bailey	21.34	Truss	1	2	8.72
44	21	18	11	16	6	105	1	39.5	Steel	23.90	Girder	2	1	4.64
45	21	19	11	15	54.7	105	1	39.6	Bailey	24.95	Truss	1	2	8.88

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
46	21	20	11	15	41.9	105	1	39.9	Steel	24.11	Girder	2	1	4.55
47	21	21	11	15	25	105	1	40.5	Bailey	18.03	Truss	1	1	5.32
48	21	22	11	14	36.4	105	1	28.9	Bailey	88.42	Truss	5	2	8.86
49	21	23	11	13	58.3	105	1	37.9	Bailey	18.38	Truss	1	2	8.86
50	21	24	11	13	27.5	105	1	51	Steel	17.93	Girder	2	1	4.49
51	21	25	11	12	46.8	105	2	13.8	Bailey	21.34	Truss	1	2	8.90
52	21	26	11	12	32.4	105	2	24.9	Bailey	21.44	Truss	1	2	8.90
53	21	27	11	12	21.6	105	2	34.7	Bailey	20.97	Truss	2	2	8.90
54	21	28	11	12	15.1	105	2	41.3	Bailey	24.60	Truss	1	2	8.90
55	21	29	11	12	10.2	105	2	46.4	Steel	24.20	Girder	2	2	6.00
56	21	30	11	12	4.1	105	2	52.6	Bailey	24.00	Truss	1	1	5.33
57	21	31	11	11	39	105	3	16.5	Bailey	18.50	Truss	1	2	8.40
58	21	32	11	11	34.4	105	3	19.8	Bailey	21.00	Truss	1	1	5.40
59	21	33	11	11	23.7	105	3	25.8	Steel	12.00	Girder	1	1	5.20
60	21	34	11	11	8	105	3	29.1	Steel	12.00	Girder	1	1	5.20
61	21	35	11	10	53.7	105	3	31	Concrete	9.00	Slab	3	1	5.10
62	21	36	11	10	21.6	105	3	35.1	Bailey	24.00	Truss	1	1	5.40
63	21	37	11	9	49.2	105	3	47.2	Concrete	14.00	Girder	2	1	5.10
64	21	38	11	8	50.8	105	3	39.2	Concrete	72.00	Girder	4	2	13.00
65	21	39	11	8	28.6	105	3	31.9	Bailey	24.00	Truss	1	1	5.60
66	21	40	11	7	48.1	105	3	25	Concrete	8.00	Girder	2	1	5.40
67	21	41	11	7	42	105	3	24.2	Concrete	9.00	Slab	1	1	5.40
68	21	42	11	7	16.9	105	3	23.5	Concrete	8.50	Girder	1	1	5.20
69	21	43	11	6	57.7	105	3	23.2	Bailey	31.00	Truss	2	2	8.90
70	21	44	11	6	31.81	105	3	23.4	Concrete	24.00	Girder	2	2	10.00
71	21	45	11	6	11.1	105	3	23.2	Concrete	30.00	Girder	2	2	10.00
72	21	46	11	5	51.2	105	3	23.1	Bailey	27.00	Truss	1	1	5.60
73	21	47	11	5	22.8	105	3	23.8	Concrete	12.00	Slab	1	2	6.40
74	21	48	11	5	11	105	3	32.8	Bailey	48.00	Truss	2	1	5.60
75	21	49	11	4	54.8	105	3	41	Bailey	36.00	Truss	3	1	5.30
76	21	50	11	3	50.4	105	3	57.1	Bailey	18.50	Truss	1	1	5.30
77	21	51	11	3	26.4	105	3	55.5	Steel	24.00	Girder	2	1	5.00
78	21	52	11	3	2.4	105	3	53.4	Steel	24.00	Girder	2	1	4.90
79	21	53	11	2	34.3	105	3	48.3	Steel	24.00	Girder	2	1	4.90
80	21	54	11	2	3.9	105	3	38.3	Steel	24.00	Girder	2	1	5.10
81	21	55	11	1	44.8	105	3	32.3	Bailey	28.70	Truss	1	1	5.20
82	21	56	11	1	23.9	105	3	29.8	Bailey	109.70	Truss	5	2	8.80
83	21	57	11	1	1.8	105	3	27.1	Bailey	17.80	Truss	1	1	5.10
84	21	58	11	0	11.3	105	3	23.7	Bailey	36.00	Truss	2	1	5.16
85	21	59	10	59	41.4	105	3	20.6	Bailey	36.20	Truss	2	1	5.10
86	21	60	10	59	13.3	105	3	22.5	Bailey	27.00	Truss	1	1	5.20
87	21	61	10	58	49.7	105	3	20.9	Bailey	27.00	Truss	1	1	5.20
88	21	62	10	58	36.5	105	3	22.5	Bailey	24.00	Truss	1	1	5.16
89	21	63	10	58	20.9	105	3	27.3	Bailey	48.00	Truss	2	1	5.16
90	21	64	10	58	2.8	105	3	38	Bailey	48.00	Truss	2	1	5.10
91	21	65	10	57	44.2	105	4	4.9	Bailey	36.00	Truss	2	1	5.20
92	21	66	10	57	28.8	105	4	28.5	Steel	12.00	Girder	1	1	5.04
93	31	1	10	42	32.8	104	34	44.4	Bailey	15.00	Truss	1	1	5.00

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
94	31	2	10	39	57.6	104	33	34.8	Concrete	45.00	Others	3	2	5.60
95	31	3	10	35	0.4	104	30	48.7	Concrete	30.00	Girder	3	2	6.20
96	31	4	10	33	19.1	104	29	53.5	Concrete	7.00	Slab	1	2	6.20
97	31	5	10	33	22.2	104	29	23.4	Concrete	10.00	Girder	2	2	5.34
98	31	6	10	33	24.9	104	28	52.7	Concrete	10.00	Girder	2	2	8.70
99	33	1	10	36	28	104	11	33.2	Concrete	8.00	Slab	1	2	6.40
100	33	2	10	36	40.4	104	13	25.6	Concrete	90.00	Girder	5	2	10.00
101	33	3	10	36	21.1	104	13	56.8	Concrete	8.00	Slab	2	2	7.20
102	33	4	10	34	29.5	104	15	47.8	Concrete	7.00	Slab	1	2	6.60
103	33	5	10	33	54.7	104	16	19.8	Concrete	7.00	Slab	1	2	6.60
104	33	6	10	33	47.4	104	16	29.1	Concrete	9.00	Slab	1	2	6.60
105	33	7	10	32	49.6	104	17	40.2	Bailey	12.00	Truss	1	2	8.90
106	33	8	10	31	45.7	104	21	2.2	Concrete	20.00	Girder	2	2	8.60
107	33	9	10	31	51.5	104	22	20.7	Concrete	10.00	Girder	1	2	5.40
108	33	10	10	33	21	104	27	4.9	Concrete	7.00	Slab	1	2	10.04
109	33	11	10	33	27.9	104	28	20.9	Bailey	30.00	Truss	2	1	5.60
110	33	12	10	25	37.4	104	27	12.1	Bailey	9.00	Truss	1	2	5.60
111	41	1	11	27	46.6	104	39	34	Concrete	6.70	Girder	1	1	4.07
112	41	2	11	26	58.9	104	39	27	Concrete	197.46	Girder	10	2	10.01
113	41	3	11	19	56.2	104	38	17.4	Concrete	24.20	Girder	2	2	7.01
114	41	4	11	16	27.9	104	37	14.1	Concrete	12.00	Girder	1	2	6.98
115	41	5	11	11	40.1	104	34	27.1	Concrete	12.00	Girder	1	2	6.99
116	41	6	11	11	28.9	104	34	22.9	Concrete	18.00	Girder	1	2	6.99
117	41	7	11	7	13.5	104	31	22.5	Concrete	12.00	Girder	1	2	6.99
118	41	8	11	7	10.2	104	31	19.8	Concrete	24.00	Girder	2	2	7.00
119	41	9	11	7	4.8	104	31	17.3	Concrete	24.00	Girder	2	2	6.99
120	41	10	11	5	51.4	104	30	32	Concrete	24.00	Girder	2	2	6.99
121	41	11	11	5	38.1	104	30	22.7	Concrete	24.00	Girder	2	2	7.00
122	41	12	11	5	27.3	104	30	15.7	Concrete	12.00	Girder	1	2	6.99
123	41	13	11	4	7.4	104	29	38.7	Concrete	18.00	Girder	1	2	6.98
124	41	14	11	2	53.8	104	28	31.9	Concrete	24.00	Girder	2	2	6.99
125	41	15	11	0	40.2	104	27	20.6	Concrete	21.95	Slab	2	1	5.31
126	41	16	10	57	32	104	26	13.1	Concrete	10.00	Slab	2	1	4.53
127	42	1	11	33	23.5	104	45	13.6	Concrete	8.92	Girder	2	1	3.94
128	42	2	11	34	15.3	104	45	17.4	Concrete	20.10	Girder	8	1	3.57
129	42	3	11	34	29.7	104	45	14.2	Concrete	11.90	Girder	4	1	3.96
130	42	4	11	35	28.7	104	45	18.7	Concrete	7.70	Slab	1	1	4.50
131	42	5	11	37	7.8	104	45	26.5	Concrete	7.75	Slab	1	1	4.51
132	42	6	11	40	10.5	104	43	53.1	Concrete	7.98	Girder	3	1	5.04
133	43	1	11	16	2.3	104	13	57.8	Bailey	36.00	Truss	1	1	5.26
134	43	2	11	14	50.5	104	14	5.6	Concrete	8.88	Slab	2	1	5.03
135	43	3	11	13	52.3	104	14	12.2	Concrete	8.35	Slab	2	1	4.99
136	43	4	11	13	25.8	104	14	16	Concrete	8.39	Slab	2	1	4.98
137	43	5	11	12	51.8	104	14	22.8	Concrete	36.00	Girder	3	2	9.92
138	43	6	11	11	38.3	104	14	22.4	Bailey	18.00	Truss	1	1	4.36
139	43	7	11	11	12.7	104	14	22.1	Bailey	9.00	Truss	1	1	4.32
140	43	8	11	9	38.6	104	14	8.9	Bailey	12.00	Truss	1	1	4.32
141	43	9	11	8	23.9	104	13	29.5	Bailey	21.00	Truss	1	1	5.24

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
142	43	10	11	7	28.4	104	13	27.5	Bailey	12.00	Truss	1	1	4.32
143	43	11	11	6	53	104	13	36.8	Bailey	18.00	Truss	1	1	4.32
144	43	12	11	6	44.9	104	13	38.9	Bailey	9.00	Truss	1	1	4.32
145	43	13	11	6	10.2	104	13	48.1	Bailey	15.00	Truss	1	1	4.32
146	43	14	11	5	0.9	104	14	8.1	Bailey	15.00	Truss	1	1	4.32
147	43	15	11	4	42.2	104	14	22.1	Bailey	18.00	Truss	1	1	4.32
148	43	16	11	4	28.5	104	14	31.6	Bailey	15.00	Truss	1	1	4.32
149	43	17	11	4	5	104	14	33.6	Bailey	21.00	Truss	1	1	5.22
150	43	18	11	3	37.5	104	14	33.4	Bailey	27.00	Truss	1	1	5.22
151	43	19	11	3	22.7	104	14	34	Bailey	18.00	Truss	1	1	4.32
152	43	20	11	3	8.5	104	14	35.6	Bailey	12.00	Truss	1	1	4.34
153	43	21	11	2	11.5	104	14	48.6	Bailey	27.00	Truss	1	1	5.18
154	43	22	11	1	41.5	104	14	43.9	Bailey	15.00	Truss	1	1	4.40
155	43	23	11	0	59.1	104	14	38.8	Bailey	21.00	Truss	1	1	5.16
156	43	24	11	0	43	104	14	22.1	Bailey	21.00	Truss	1	1	5.14
157	43	25	11	0	27.6	104	14	21.5	Bailey	27.00	Truss	1	1	5.18
158	43	26	11	0	22.7	104	14	21.3	Bailey	24.00	Truss	1	1	5.17
159	43	27	11	0	13.5	104	14	21.2	Bailey	18.00	Truss	1	1	4.26
160	43	28	10	57	33.9	104	14	32.3	Bailey	12.00	Truss	1	1	4.46
161	43	29	10	56	30.2	104	15	15.7	Bailey	15.00	Truss	1	1	5.19
162	43	30	10	55	30.5	104	15	2.3	Bailey	63.00	Truss	3	1	5.35
163	43	31	10	51	27.7	104	14	10.9	Bailey	60.00	Truss	3	1	5.35
164	43	32	10	49	54.9	104	15	26.3	Bailey	14.85	Truss	1	1	5.41
165	43	33	10	49	32.4	104	14	57.9	Bailey	9.25	Truss	1	1	4.29
166	43	34	10	49	21	104	14	30.6	Bailey	15.00	Truss	2	1	4.49
167	43	35	10	45	35.7	104	13	59.8	Bailey	27.20	Truss	1	1	5.14
168	44	1	11	32	5.6	104	24	28.2	Bailey	45.00	Truss	3	1	5.22
169	44	2	11	35	58.8	104	18	7.8	Bailey	15.00	Truss	1	1	5.22
170	44	3	11	37	18.7	104	15	20	Bailey	18.00	Truss	1	1	5.22
171	44	4	11	37	35.4	104	14	50.5	Bailey	21.00	Truss	1	1	5.22
172	44	5	11	38	16.1	104	14	17.5	Bailey	18.00	Truss	1	1	5.22
173	44	6	11	38	21.6	104	13	44.9	Bailey	12.00	Truss	1	1	5.22
174	44	7	11	38	32.9	104	12	27.1	Bailey	15.00	Truss	1	1	5.22
175	44	8	11	38	56.4	104	11	47.2	Bailey	33.00	Truss	2	1	5.22
176	44	9	11	40	27.1	104	10	17.5	Concrete	8.33	Girder	2	2	8.23
177	44	10	11	40	34.1	104	9	48	Bailey	12.00	Truss	1	1	5.22
178	44	11	11	41	15.3	104	7	57.5	Bailey	63.00	Truss	3	1	5.22
179	44	12	11	42	27.8	104	5	54.8	Bailey	51.00	Truss	3	1	5.22
180	44	13	12	42	30.9	103	54	52.3	Wood	22.51	Girder	6	1	2.63
181	46	1	11	18	12.5	104	9	7.3	Bailey	34.00	Truss	1	1	5.88
182	46	2	11	18	34	104	7	54.8	Steel	27.30	Girder	2	1	4.22
183	46	3	11	19	18.1	104	6	31.4	Bailey	21.80	Truss	1	1	6.00
184	46	4	11	19	23.8	104	4	59.3	Bailey	21.80	Truss	1	1	6.14
185	48	1	11	8	11.7	103	46	11.1	Concrete	424.20	Girder	14	2	12.96
186	48	2	11	8	50.3	103	44	39.2	Concrete	10.00	Slab	1	2	9.98
187	48	3	11	8	55.2	103	44	15.2	Concrete	10.00	Slab	1	2	9.98
188	48	4	11	9	3.8	103	43	55	Concrete	10.00	Slab	1	2	9.98
189	48	5	11	9	13.2	103	43	3.1	Concrete	30.00	Slab	3	2	9.98

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
190	48	6	11	9	34.4	103	42	10.4	Concrete	50.00	Slab	5	2	9.98
191	48	7	11	10	13.9	103	41	0.9	Concrete	10.00	Slab	1	2	9.98
192	48	8	11	10	26.9	103	40	22.5	Concrete	30.00	Slab	3	2	9.98
193	48	9	11	10	51.1	103	39	46.2	Concrete	20.00	Slab	2	2	9.98
194	48	10	11	10	42.6	103	36	13.2	Concrete	60.00	Slab	6	2	9.98
195	48	11	11	11	38	103	33	50.2	Concrete	10.00	Slab	1	2	9.98
196	48	12	11	11	32.9	103	33	38.4	Concrete	20.00	Slab	2	2	9.98
197	48	13	11	11	44.4	103	32	27.4	Concrete	10.00	Slab	1	2	9.98
198	48	14	11	12	0.9	103	31	32.4	Concrete	20.00	Slab	2	2	9.98
199	48	15	11	12	10.1	103	31	0.8	Concrete	20.00	Slab	2	2	9.98
200	48	16	11	12	22.9	103	30	45.3	Concrete	40.00	Slab	4	2	9.98
201	48	17	11	12	36.6	103	29	33.5	Concrete	20.00	Slab	2	2	9.98
202	48	18	11	12	27	103	29	2.3	Concrete	20.00	Slab	2	2	9.98
203	48	19	11	11	49.2	103	28	32.8	Concrete	20.00	Slab	2	2	9.98
204	48	20	11	11	34.2	103	28	24	Concrete	270.00	Girder	9	2	13.00
205	48	21	11	10	18.9	103	26	58	Concrete	20.00	Slab	2	2	9.98
206	48	22	11	10	51.4	103	26	3.8	Concrete	20.00	Slab	2	2	9.98
207	48	23	11	16	37.5	103	19	47.6	Concrete	30.00	Slab	3	2	9.98
208	48	24	11	16	51	103	19	48.7	Concrete	10.00	Slab	1	2	9.98
209	48	25	11	17	33.7	103	19	28.6	Concrete	10.00	Slab	1	2	9.98
210	48	26	11	17	54.6	103	19	29.6	Concrete	10.00	Slab	1	2	9.98
211	48	27	11	18	38.6	103	19	18.8	Concrete	10.00	Slab	1	2	9.98
212	48	28	11	20	1.4	103	17	57.9	Concrete	20.00	Slab	2	2	9.98
213	48	29	11	20	45.7	103	17	33.2	Concrete	40.00	Slab	4	2	9.98
214	48	30	11	21	20.6	103	16	39.6	Concrete	20.00	Slab	2	2	9.98
215	48	31	11	22	53.4	103	15	13.7	Concrete	480.00	Girder	16	2	13.04
216	48	32	11	24	11.6	103	14	18	Concrete	10.00	Slab	1	2	9.98
217	48	33	11	33	54.6	103	7	36.8	Concrete	390.00	Girder	13	2	12.96
218	48	34	11	34	7.4	103	6	40.9	Concrete	10.00	Slab	1	2	9.98
219	48	35	11	35	40.5	103	4	42.3	Concrete	10.00	Slab	1	2	9.98
220	48	36	11	36	6.6	103	4	16.07	Concrete	20.00	Slab	2	2	9.98
221	48	37	11	36	17	103	2	49.5	Concrete	40.00	Slab	4	2	11.10
222	48	38	11	36	17.8	103	1	21.3	Concrete	20.00	Slab	2	2	11.10
223	48	39	11	36	59.9	102	58	35.7	Concrete	1720.65	Girder	85	2	9.92
224	51	1	11	44	28.5	104	43	49.2	Concrete	12.00	Slab	1	2	12.00
225	51	2	11	38	24.5	104	41	11.2	Concrete	12.00	Slab	1	2	12.00
226	51	3	11	33	37.2	104	40	43.8	Concrete	36.00	Slab	3	2	12.00
227	53	1	12	7	0.3	104	33	29.8	Concrete	15.00	Girder	1	2	8.00
228	53	2	12	4	48.7	104	31	58	Concrete	15.00	Girder	1	2	8.00
229	53	3	12	3	17.7	104	31	19.8	Concrete	18.00	Girder	1	2	8.00
230	53	4	12	1	53.5	104	28	4.6	Concrete	15.00	Girder	2	1	4.50
231	53	5	12	1	35.7	104	27	42.1	Concrete	15.00	Girder	2	1	4.50
232	53	6	12	1	15.4	104	27	5.5	Concrete	63.00	Girder	6	1	4.50
233	53	7	11	59	10.1	104	23	26.3	Concrete	9.00	Girder	1	1	4.50
234	53	8	11	59	9.4	104	23	12.2	Concrete	21.00	Girder	2	1	4.50
235	53	9	11	57	11.4	104	19	55	Concrete	15.00	Girder	2	1	4.50
236	53	10	11	53	50.2	104	16	54.5	Wood	20.00	Girder	4	1	2.50
237	53	11	11	49	59.2	104	19	26.6	Concrete	30.00	Girder	3	1	4.50

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
238	53A	1	12	14	8.4	104	16	57.2	Bailey	72.00	Truss	4	1	5.20
239	53B	1	12	22	4.6	104	7	42	Steel	11.43	Girder	2	1	4.47
240	53B	2	12	21	50.8	104	7	29.1	Concrete	5.00	Girder	2	1	4.50
241	53B	3	12	21	32.9	104	7	12.5	Steel	12.12	Girder	2	1	3.94
242	55	1	12	31	31.8	103	51	50	Wood	29.85	Girder	10	1	4.50
243	55	2	12	30	25.4	103	51	6.6	Concrete	15.05	Slab	2	2	7.84
244	55	3	12	30	21.7	103	51	0.4	Concrete	17.90	Slab	2	2	7.94
245	55	4	12	30	15.9	103	48	58.1	Concrete	21.90	Slab	2	2	7.86
246	55	5	12	30	13.7	103	48	54.5	Steel	6.05	Girder	2	1	4.97
247	55	6	12	22	5.2	103	44	15.1	Bailey	12.00	Truss	1	1	4.43
248	55	7	12	21	17.7	103	44	12.2	Bailey	20.81	Truss	4	1	5.30
249	55	8	12	20	11.6	103	41	45.6	Wood	5.10	Girder	1	1	5.12
250	55	9	12	20	0.5	103	41	33.3	Wood	9.43	Girder	2	2	5.02
251	55	10	12	19	59	103	41	28.1	Bailey	12.25	Truss	1	1	4.37
252	55	11	12	19	51	103	40	38	Bailey	21.10	Truss	1	1	5.28
253	55	12	12	19	37.2	103	39	9.8	Bailey	15.20	Truss	1	1	4.38
254	55	13	12	19	21.7	103	38	48.7	Bailey	18.25	Truss	1	1	5.32
255	55	14	12	19	4.3	103	38	15	Bailey	15.10	Truss	1	1	4.42
256	55	15	12	18	53.9	103	37	57.1	Wood	9.65	Girder	2	1	4.63
257	55	16	12	18	42.4	103	37	40.1	Bailey	12.10	Truss	1	1	5.34
258	55	17	12	18	36.4	103	37	25.1	Bailey	12.00	Truss	1	1	5.29
259	55	18	12	18	38.1	103	36	36.2	Bailey	15.00	Truss	1	1	5.34
260	55	19	12	18	34.4	103	35	21.2	Bailey	12.00	Truss	1	1	5.26
261	55	20	12	18	30.9	103	35	2.4	Bailey	21.05	Truss	1	1	5.29
262	55	21	12	18	35.1	103	34	1.6	Wood	5.05	Girder	1	1	4.92
263	55	22	12	18	48.3	103	33	32.5	Bailey	15.00	Truss	1	1	4.32
264	55	23	12	18	55	103	33	29.3	Wood	6.02	Girder	1	1	4.92
265	55	24	12	19	1.5	103	33	24	Bailey	30.00	Truss	2	1	5.28
266	55	25	12	19	8.7	103	33	6.5	Bailey	12.00	Truss	1	1	4.27
267	55	26	12	19	10.5	103	32	52.5	Bailey	21.00	Truss	2	1	3.27
268	55	27	12	18	56.8	103	32	39.1	Wood	6.06	Girder	1	1	4.96
269	55	28	12	18	46.3	103	32	34.1	Bailey	15.00	Truss	1	1	5.30
270	55	29	12	18	44.2	103	32	33.6	Bailey	15.00	Truss	3	1	5.31
271	55	30	12	18	25.5	103	32	26.1	Bailey	15.00	Truss	1	1	4.36
272	55	31	12	18	33.3	103	31	49.3	Bailey	15.00	Truss	1	1	4.28
273	55	32	12	18	37.4	103	31	41.7	Bailey	18.00	Truss	1	1	4.29
274	55	33	12	18	51.3	103	31	19	Wood	5.92	Girder	1	1	4.96
275	55	34	12	19	20.4	103	30	44.5	Bailey	15.00	Truss	1	1	4.44
276	55	35	12	19	25.6	103	30	38	Bailey	36.00	Truss	3	1	5.26
277	55	36	12	19	40.6	103	29	27.8	Wood	5.80	Girder	1	2	5.90
278	55	37	12	19	59.8	103	29	11.1	Bailey	15.00	Truss	1	1	4.37
279	55	38	12	20	38.5	103	28	46.6	Wood	6.35	Girder	1	1	4.98
280	55	39	12	21	16.2	103	28	12.1	Bailey	12.00	Truss	1	1	4.51
281	55	40	12	21	18.7	103	28	9.4	Wood	6.10	Girder	1	2	4.92
282	55	41	12	21	26	103	27	59.7	Wood	6.00	Girder	1	2	5.96
283	55	42	12	21	27.7	103	27	57.3	Wood	5.08	Girder	1	2	5.02
284	55	43	12	21	46	103	27	31.6	Bailey	18.30	Truss	1	1	4.44
285	55	44	12	21	50.8	103	27	23.1	Bailey	18.25	Truss	2	1	4.47

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
286	55	45	12	22	9.5	103	25	36.4	Bailey	18.20	Truss	1	1	4.42
287	55	46	12	22	28.1	103	24	16	Bailey	15.30	Truss	1	1	4.37
288	55	47	12	22	23.8	103	24	2.8	Bailey	15.25	Truss	1	1	4.41
289	55	48	12	22	14.7	103	23	31.4	Bailey	21.25	Truss	1	1	4.43
290	55	49	12	22	12.1	103	23	22.1	Bailey	15.30	Truss	1	1	4.40
291	55	50	12	22	36	103	20	53.8	Bailey	15.23	Truss	1	1	4.46
292	55	51	12	22	34.3	103	20	44.6	Bailey	12.30	Truss	1	1	4.44
293	55	52	12	22	31.9	103	19	36.6	Wood	6.10	Girder	1	2	6.00
294	55	53	12	22	31.2	103	19	20.3	Bailey	21.20	Truss	1	1	4.40
295	55	54	12	22	47.3	103	18	11.5	Bailey	12.10	Truss	1	1	4.40
296	55	55	12	22	43.2	103	14	49.3	Bailey	15.20	Truss	1	1	4.45
297	55	56	12	22	10	103	13	44.3	Bailey	12.27	Truss	1	1	4.43
298	55	57	12	22	0	103	13	27	Bailey	12.25	Truss	1	1	4.46
299	55	58	12	21	36.4	103	12	28.8	Bailey	15.25	Truss	1	1	4.48
300	55	59	12	21	22.2	103	11	52.2	Bailey	12.25	Truss	1	1	4.49
301	55	60	12	21	2.4	103	11	12.2	Bailey	15.25	Truss	1	1	4.48
302	55	61	12	20	54.1	103	10	55.5	Bailey	24.10	Truss	2	1	4.36
303	55	62	12	20	43.3	103	10	35.5	Bailey	15.15	Truss	1	1	4.44
304	55	63	12	20	42.1	103	10	16	Bailey	12.20	Truss	1	1	4.46
305	55	64	12	20	44.6	103	10	10	Bailey	15.25	Truss	1	1	4.43
306	55	65	12	20	43.9	103	9	40.9	Bailey	29.00	Truss	2	1	4.49
307	55	66	12	20	39.7	103	9	29.2	Bailey	15.27	Truss	1	1	4.47
308	55	67	12	20	18.1	103	9	0.3	Bailey	12.26	Truss	1	1	4.46
309	55	68	12	19	40	103	8	48.1	Bailey	32.75	Truss	2	1	5.33
310	55	69	12	19	46.4	103	7	47.5	Bailey	12.25	Truss	1	1	4.47
311	55	70	12	19	43.3	103	7	15.1	Bailey	12.10	Truss	1	1	4.42
312	55	71	12	19	6.9	103	6	53.4	Bailey	12.10	Truss	1	1	4.51
313	55	72	12	18	30.4	103	6	36.2	Bailey	36.07	Truss	3	1	5.30
314	55	73	12	18	14.8	103	4	53.3	Bailey	12.00	Truss	1	1	4.32
315	55	74	12	17	34.9	103	4	30.8	Bailey	26.50	Truss	2	1	4.34
316	55	75	12	16	57.1	103	3	23.5	Bailey	21.25	Truss	2	1	4.03
317	55	76	12	16	49.5	103	2	57.7	Bailey	12.10	Truss	1	1	4.42
318	55	77	12	16	48	103	2	7.3	Bailey	12.10	Truss	1	1	4.39
319	55	78	12	16	43.7	103	1	40.6	Bailey	15.10	Truss	1	1	4.42
320	55	79	12	16	44.6	103	0	48.4	Bailey	63.45	Truss	3	1	5.31
321	55	80	12	16	31.5	103	0	21.8	Bailey	12.15	Truss	1	1	4.39
322	55	81	12	16	22.6	103	0	9.2	Bailey	15.15	Truss	1	1	4.38
323	55	82	12	16	21.5	103	0	6.2	Bailey	18.13	Truss	1	1	4.41
324	55	83	12	16	44.2	103	57	40.6	Bailey	21.20	Truss	1	1	4.40
325	55	84	12	12	34.1	103	57	27.8	Bailey	21.15	Truss	1	1	4.41
326	55	85	12	12	42.4	102	54	55.3	Bailey	18.25	Truss	1	1	4.30
327	55	86	12	12	36.6	102	54	51.6	Bailey	27.15	Truss	2	1	5.20
328	55	87	12	12	40.4	102	54	38.9	Bailey	9.30	Truss	1	1	4.04
329	55	88	12	12	48.1	102	54	23.2	Bailey	12.25	Truss	1	1	4.26
330	55	89	12	12	47.8	102	54	13.4	Bailey	21.25	Truss	1	1	5.25
331	55	90	12	12	43.4	102	54	4.5	Bailey	27.00	Truss	1	1	5.25
332	55	91	12	12	37.3	102	53	58.5	Wood	6.10	Girder	1	2	5.82
333	55	92	12	12	32	102	52	58	Bailey	15.25	Truss	1	1	4.30

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
334	55	93	12	12	25.9	102	52	26	Bailey	36.35	Truss	2	1	4.28
335	55	94	12	12	17.1	102	51	51.1	Bailey	12.30	Truss	1	1	4.27
336	55	95	12	12	17.1	102	51	35.1	Bailey	12.32	Truss	1	1	4.30
337	55	96	12	12	17.9	102	50	49.9	Bailey	18.30	Truss	1	1	4.27
338	55	97	12	12	23.9	102	50	43.8	Bailey	12.20	Truss	1	1	4.27
339	55	98	12	12	27.1	102	50	40.2	Bailey	12.15	Truss	1	1	4.28
340	55	99	12	12	45.9	102	49	35.9	Bailey	9.20	Truss	1	1	4.26
341	55	100	12	13	1.9	102	49	30.1	Bailey	9.32	Truss	1	1	4.26
342	55	101	12	13	9.6	102	49	14	Bailey	15.15	Truss	1	1	4.26
343	55	102	12	13	11.2	102	48	43.1	Bailey	52.50	Truss	3	1	5.15
344	55	103	12	12	48.4	102	47	47.4	Bailey	52.05	Truss	3	1	5.18
345	55	104	12	12	48.4	102	47	26.1	Bailey	9.10	Truss	1	1	4.31
346	55	105	12	12	6.3	102	46	23.5	Bailey	18.15	Truss	1	1	5.18
347	55	106	12	11	51	102	46	24.9	Bailey	9.15	Truss	1	1	4.29
348	55	107	12	11	38.1	102	45	46.5	Bailey	9.30	Truss	1	1	4.29
349	55	108	12	11	40.3	102	45	45.3	Wood	7.12	Girder	1	1	4.62
350	55	109	12	11	39.7	102	45	40.4	Bailey	15.17	Truss	1	1	4.28
351	55	110	12	11	16.3	102	45	0.7	Bailey	129.00	Truss	13	1	4.26
352	55	111	12	11	8.8	102	44	47.8	Bailey	12.30	Truss	1	1	4.26
353	55	112	12	11	4.1	102	44	34.5	Wood	5.93	Girder	1	2	5.80
354	55	113	12	9	55.7	102	44	21.8	Bailey	18.20	Truss	1	1	4.26
355	55	114	12	9	44.4	102	44	4	Bailey	27.30	Truss	1	1	5.18
356	55	115	12	9	9.6	102	43	57.5	Concrete	24.10	Girder	2	2	7.00
357	55	116	12	8	29.2	102	44	9.2	Concrete	12.00	Girder	1	2	7.01
358	56	1	13	38	58.3	102	57	36.8	Concrete	20.00	Slab	2	2	10.90
359	56	2	13	40	1.8	102	57	33.5	Concrete	33.00	Slab	3	2	8.00
360	56	3	13	50	13	102	59	10	Concrete	16.00	Slab	1	2	10.90
361	56	4	13	52	43.7	103	0	24.1	Concrete	20.00	Slab	2	2	10.90
362	56	5	13	54	7.4	103	1	0.5	Concrete	26.00	Slab	2	2	10.90
363	56	6	13	57	3.9	103	2	56.8	Concrete	22.00	Slab	2	2	8.00
364	56	7	13	57	31.9	103	2	55.9	Concrete	26.00	Slab	2	2	10.90
365	56	8	14	5	58.7	103	8	48.7	Concrete	20.00	Slab	2	2	10.90
366	56	9	14	6	37.5	103	8	59.8	Concrete	26.00	Slab	2	2	10.90
367	56	10	14	7	2.6	103	9	6.2	Concrete	13.00	Slab	1	2	10.90
368	56	11	14	7	39.7	103	10	47.9	Concrete	20.00	Slab	2	2	10.90
369	56	12	14	9	50.2	103	15	59.9	Concrete	30.00	Slab	2	2	10.90
370	56	13	14	9	41.4	103	17	2.8	Concrete	20.00	Slab	2	2	10.90
371	56	14	14	8	24.6	103	18	57.2	Concrete	30.00	Slab	2	2	10.90
372	56	15	14	8	17.5	103	19	10.2	Concrete	30.00	Slab	2	2	10.90
373	56	16	14	9	20.9	103	21	25.6	Concrete	30.00	Slab	2	2	10.90
374	56	17	14	10	11.9	103	22	25.8	Concrete	30.00	Slab	2	2	10.90
375	56	18	14	10	29.7	103	24	1	Concrete	30.00	Slab	2	2	10.90
376	56	19	14	10	23.4	103	29	16.6	Concrete	30.00	Slab	2	2	10.90
377	57	1	13	4	37.7	103	12	9.4	Concrete	89.74	Girder	5	2	11.12
378	57	2	12	51	51.5	102	56	40	Concrete	25.80	Slab	1	2	11.02
379	57	3	12	51	22.8	102	56	18.1	Concrete	33.10	Slab	1	2	10.86
380	57	4	12	50	54.9	102	51	48.4	Concrete	32.80	Slab	1	2	11.92
381	57	5	12	50	58.1	102	49	31.4	Concrete	15.30	Slab	1	2	11.92

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
382	57	6	12	51	5.1	102	47	56	Concrete	19.96	Slab	1	2	11.63
383	57	7	12	50	59.9	102	47	19.7	Concrete	48.80	Slab	3	2	10.98
384	57	8	12	50	45.1	102	45	41.3	Concrete	38.95	Slab	3	2	10.97
385	57	9	12	50	19.9	102	44	35	Concrete	19.90	Slab	1	2	10.96
386	57	10	12	49	34.5	102	43	20.6	Concrete	31.96	Slab	2	2	11.00
387	57	11	12	48	10.5	102	41	34.7	Concrete	20.00	Slab	1	2	11.00
388	57	12	12	48	8.1	102	41	25.5	Concrete	19.98	Slab	1	2	11.00
389	57	13	12	48	6.6	102	41	17.7	Concrete	19.98	Slab	1	2	11.06
390	57	14	12	48	11.9	102	40	41.6	Concrete	16.01	Slab	1	2	11.00
391	57	15	12	48	18.1	102	40	8.4	Concrete	15.99	Slab	1	2	10.93
392	57	16	12	50	32.2	102	37	33.1	Concrete	31.83	Slab	2	2	10.97
393	57	17	12	50	43.3	102	36	58.8	Concrete	15.96	Slab	1	2	10.97
394	57	18	12	51	33.9	102	35	59.5	Concrete	12.93	Slab	1	2	10.91
395	57	19	12	52	38.6	102	34	55.7	Concrete	80.11	Slab	5	2	10.99
396	57B	1	13	16	4.7	103	4	8.7	Concrete	13.00	Slab	1	2	11.00
397	57B	2	13	16	17.4	103	3	22.5	Concrete	13.00	Slab	1	2	11.00
398	57B	3	13	16	7.8	103	2	16.1	Concrete	13.00	Slab	1	2	11.00
399	57B	4	13	15	45.5	102	57	1.4	Concrete	39.00	Slab	1	2	11.00
400	57B	5	13	16	12.6	102	56	9.1	Concrete	8.00	Slab	1	2	11.00
401	57B	6	13	16	15.6	102	56	0.4	Concrete	26.00	Slab	2	2	11.00
402	57B	7	13	16	7.9	102	55	20.1	Concrete	8.00	Slab	1	2	11.00
403	57B	8	13	15	0.7	102	52	6.5	Constructing			0	1	0.00
404	57B	9	13	14	44.9	102	51	28.8	Concrete	13.00	Slab	1	2	11.00
405	57B	10	13	14	33.5	102	50	32.7	Concrete	39.00	Slab	3	2	11.00
406	57B	11	13	14	58.2	102	48	44.2	Concrete	13.00	Slab	1	2	11.04
407	57B	12	13	15	2.8	102	48	3.2	Concrete	13.00	Slab	1	2	11.00
408	57B	13	13	15	14.3	102	46	55.9	Constructing		Slab	0	1	5.03
409	57B	14	13	15	29.9	102	46	24.8	Concrete	13.00	Slab	1	2	11.02
410	57B	15	13	15	51.3	102	44	56.3	Concrete	13.00	Slab	1	2	12.06
411	57B	16	13	15	50.5	102	44	49.3	Concrete	11.32	Slab	1	2	12.02
412	57B	17	13	16	18	102	43	18.2	Concrete	7.92	Slab	1	2	10.62
413	57B	18	13	16	20.4	102	41	17.1	Concrete	8.10	Slab	1	2	11.00
414	57B	19	13	16	35.2	102	40	1.3	Constructing			0	1	0.00
415	57B	20	13	19	44.5	102	34	53.2	Constructing			0	1	0.00
416	57B	21	13	20	9.8	102	34	11.4	Concrete	8.04	Slab	1	2	10.00
417	57B	22	13	21	12.2	102	32	44	Concrete	13.00	Slab	1	2	10.00
418	57B	23	13	21	45.7	102	31	23.6	Concrete	13.08	Slab	1	2	10.00
419	57B	24	13	25	11.2	102	25	13.8	Concrete		Slab	1	2	10.00
420	58	1	14	1	1.9	102	54	47	Concrete	24.00	Girder	2	2	7.00
421	58	2	14	13	36	103	4	37.1	Wood	15.00	Girder	6	1	3.00
422	58	3	14	13	49.3	103	5	53	Wood	15.00	Girder	5	1	3.00
423	59	1	13	1	16.1	102	35	5.1	Concrete	80.00	Slab	4	2	12.00
424	59	2	13	3	5.2	102	29	55.2	Concrete	100.00	Slab	5	2	12.00
425	59	3	13	4	57.4	102	29	2.3	Concrete	39.53	Slab	3	2	12.00
426	59	4	13	8	3.5	102	25	8	Concrete	39.00	Slab	3	2	12.00
427	59	5	13	8	44.4	102	24	49.6	Concrete	39.00	Slab	3	2	12.00
428	59	6	13	33	16.1	102	26	42.9	Concrete	52.00	Slab	4	2	12.00
429	59	7	13	35	26.2	102	40	25.5	Concrete	13.00	Slab	1	2	12.00

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
430	59	8	13	35	32.4	102	40	25.8	Concrete	52.00	Slab	4	2	12.00
431	59	9	13	36	16.9	102	40	35.6	Concrete	26.00	Slab	2	2	12.00
432	59	10	13	36	46.5	102	40	36.5	Concrete	13.00	Slab	1	2	12.00
433	59	11	13	37	9.3	102	40	37.4	Concrete	39.00	Slab	3	2	12.00
434	59	12	13	37	29.8	102	40	37.9	Concrete	13.00	Slab	1	2	12.00
435	62	1	13	0	5.2	104	56	57.6	Concrete	20.00	Slab	1	2	10.00
436	62	2	13	8	34.3	105	0	29.2	Concrete	65.00	Slab	5	2	10.00
437	62	3	13	17	15.5	105	0	7	Concrete	26.00	Slab	2	2	10.00
438	62	4	13	24	49.1	105	1	36.6	Concrete	52.00	Slab	4	2	10.00
439	62	5	13	25	2	105	1	42.1	Concrete	26.00	Slab	2	2	10.00
440	62	6	13	31	35.8	105	1	46.2	Concrete	65.00	Slab	5	2	10.00
441	62	7	13	34	27.4	105	1	59.2	Concrete	20.00	Slab	1	2	10.00
442	62	8	13	34	40.9	105	1	56	Concrete	26.00	Slab	2	2	10.00
443	62	9	13	36	9.1	105	1	55.4	Concrete	20.00	Slab	1	2	10.00
444	62	10	13	36	46.7	105	1	58.1	Concrete	78.00	Slab	6	2	10.00
445	62	11	13	48	16.4	104	57	59.6	Concrete	26.00	Slab	2	2	10.00
446	62	12	13	48	22	104	57	54.6	Concrete	26.00	Slab	2	2	10.00
447	62	13	13	47	30.1	104	50	48.5	Concrete	13.00	Slab	1	2	10.00
448	62	14	13	47	45.6	104	49	33.5	Concrete	20.00	Slab	1	2	10.00
449	62	15	13	47	51.7	104	49	12.9	Concrete	20.00	Slab	1	2	10.00
450	62	16	13	51	42.5	104	49	21.9	Concrete	24.00	Girder	2	2	10.00
451	62	17	13	51	48.3	104	49	24.8	Concrete	15.00	Girder	1	2	10.00
452	62	18	13	51	56.1	104	49	28.4	Concrete	140.00	Slab	7	2	10.00
453	62	19	14	14	14	104	43	59.2	Concrete	80.00	Slab	4	2	10.00
454	62	20	14	20	41.7	104	42	58.5	Concrete	39.00	Slab	3	2	10.00
455	62	21	14	22	24	104	42	32.3	Concrete	39.00	Slab	3	2	10.00
456	62	22	14	22	25.9	104	42	20.2	Concrete	39.00	Slab	3	2	10.00
457	62	23	14	22	26.7	104	42	14.2	Concrete	39.00	Slab	3	2	10.00
458	62	24	14	22	41.1	104	40	40.2	Concrete	26.00	Slab	2	2	10.00
459	62	25	14	22	45.8	104	40	24.1	Concrete	39.00	Slab	3	2	10.00
460	62	26	14	22	45.4	104	39	58	Concrete	26.00	Slab	2	2	10.00
461	62	27	14	23	2.6	104	39	52.9	Concrete	26.00	Slab	2	2	10.00
462	62	28	14	23	14.6	104	39	59.1	Concrete	40.50	Slab	3	2	10.00
463	64	1	13	26	39.5	104	10	10.8	Concrete	18.00	Girder	2	2	5.62
464	64	2	13	26	58.5	104	11	28.1	Concrete	8.00	Girder	1	2	7.50
465	64	3	13	28	11.5	104	12	38.5	Concrete	7.00	Girder	1	2	7.50
466	64	4	13	28	52.5	104	13	33.2	Concrete	10.00	Girder	1	2	8.20
467	64	5	13	33	51	104	18	52.4	Bailey	15.00	Truss	1	1	4.35
468	64	6	13	33	51.4	104	19	7.8	Bailey	35.00	Truss	1	1	5.10
469	64	7	13	41	7.1	104	31	51.4	Bailey	12.00	Truss	1	1	4.30
470	64	8	13	43	30.7	104	34	19.9	Concrete	13.00	Slab	1	2	10.00
471	64	9	13	45	37.6	104	37	46.5	Concrete	39.00	Slab	3	2	10.00
472	64	10	13	46	43	104	39	16.7	Concrete	26.00	Slab	2	2	10.00
473	64	11	13	47	7.3	104	39	49.7	Concrete	13.00	Slab	1	2	10.00
474	64	12	13	47	35.3	104	40	28	Concrete	13.00	Slab	1	2	10.00
475	64	13	13	49	11.9	104	42	48.8	Concrete	60.00	Slab	3	2	10.00
476	64	14	13	49	12.8	104	42	58.7	Concrete	39.00	Slab	3	2	10.00
477	64	15	13	49	10.1	104	43	22.8	Concrete	60.00	Slab	3	2	10.00

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
478	64	16	13	49	9.4	104	43	27.6	Concrete	26.00	Slab	2	2	10.00
479	64	17	13	49	9	104	43	38.5	Concrete	26.00	Slab	2	2	10.00
480	64	18	13	49	10.7	104	44	12.6	Concrete	13.00	Slab	1	2	10.00
481	64	19	13	49	11	104	44	37.3	Concrete	13.00	Slab	1	2	10.00
482	64	20	13	49	6.2	104	45	15.4	Concrete	13.00	Slab	1	2	10.00
483	64	21	13	49	9	104	45	20.8	Concrete	26.00	Slab	2	2	10.00
484	64	22	13	49	22.3	104	46	11.7	Concrete	13.00	Slab	1	2	10.00
485	64	23	13	49	24	104	46	28.5	Concrete	26.00	Slab	2	2	10.00
486	64	24	13	49	22.7	104	46	49.2	Concrete	13.00	Slab	1	2	10.00
487	64	25	13	49	21.3	104	47	2.5	Concrete	26.00	Slab	2	2	10.00
488	64	26	13	49	20.9	104	47	6.5	Concrete	26.00	Slab	2	2	10.00
489	64	27	13	49	22.6	104	47	29.7	Concrete	13.00	Slab	1	2	10.00
490	64	28	13	49	20.6	104	47	37.9	Concrete	13.00	Slab	1	2	10.00
491	64	29	13	49	19.4	104	47	42.4	Concrete	26.00	Slab	2	2	10.00
492	64	30	13	49	12.9	104	48	7.9	Concrete	26.00	Slab	2	2	10.00
493	64	31	13	49	9.3	104	58	7.3	Concrete	45.00	Slab	3	2	10.00
494	64	32	13	49	29.2	104	58	6.3	Concrete	12.00	Slab	1	2	10.00
495	64	33	13	49	38.2	104	58	7.5	Concrete	90.00	Girder	5	2	10.00
496	64	34	13	50	32.5	104	59	53.8	Bailey	60.00	Truss	4	1	4.40
497	64	35	13	51	39.6	105	1	5.7	Bailey	16.00	Truss	1	1	5.60
498	64	36	13	51	19	105	2	11	Bailey	22.00	Truss	1	1	5.80
499	64	37	13	51	14.6	105	2	22.2	Bailey	12.00	Truss	1	1	5.80
500	64	38	13	49	31.5	105	5	16	Bailey	45.00	Truss	3	1	4.60
501	64	39	13	48	44.5	105	12	23.5	Bailey	22.00	Truss	1	1	5.80
502	64	40	13	49	28.8	105	14	36.2	Bailey	25.00	Truss	1	1	5.40
503	64	41	13	49	11.3	105	15	37.1	Bailey	36.00	Truss	2	1	5.40
504	64	42	13	48	39.5	105	16	38.9	Bailey	48.00	Truss	3	1	5.40
505	64	43	13	48	6.9	105	17	10.3	Bailey	19.00	Truss	1	1	5.60
506	64	44	13	47	28	105	19	17.8	Bailey	13.00	Truss	1	1	5.60
507	64	45	13	47	0.5	105	20	8	Bailey	13.00	Truss	1	1	5.60
508	64	46	13	46	48.6	105	21	55.3	Bailey	19.00	Truss	1	1	5.60
509	64	47	13	46	56.7	105	22	9.7	Bailey	22.00	Truss	1	1	5.60
510	64	48	13	46	27.9	105	25	8.8	Constructing			0	1	0.00
511	64	49	13	48	37.5	105	31	36.2	Constructing			0	1	0.00
512	64	50	13	47	15	105	34	25.3	Constructing			0	1	0.00
513	64	51	13	46	59.2	105	35	17.8	Constructing			0	1	0.00
514	64	52	13	45	42.4	105	38	43.7	Constructing			0	1	0.00
515	64	53	13	37	32.7	105	54	51.9	Bailey	20.00	Truss	1	1	5.00
516	64	54	13	35	40.7	105	55	46.5	Constructing			0	1	0.00
517	66	1	13	20	35	104	0	2.4	Concrete	8.00	Slab	1	2	19.10
518	66	2	13	25	7.3	104	0	30.5	Concrete	8.00	Slab	1	2	11.00
519	66	3	13	25	54.9	104	0	13.3	Concrete	30.00	Slab	3	2	11.00
520	66	4	13	30	36	103	58	48	Concrete	18.00	Slab	3	2	11.10
521	66	5	13	36	13.4	103	58	51.9	Concrete	30.00	Slab	3	2	11.10
522	66	6	13	38	48.6	103	59	39.8	Concrete	15.00	Slab	3	2	11.00
523	66	7	13	39	33.4	104	0	34	Concrete	15.00	Slab	3	2	11.10
524	66	8	13	40	26	104	1	37.9	Concrete	15.00	Slab	3	2	11.10
525	66	9	13	40	40.5	104	1	49.9	Concrete	23.00	Slab	3	2	11.10

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
526	66	10	13	41	1.4	104	2	3.5	Concrete	17.00	Slab	3	2	11.00
527	66	11	13	41	33.2	104	2	7.9	Concrete	15.00	Slab	3	2	11.00
528	66	12	13	46	43.9	104	1	57.8	Concrete	15.00	Slab	3	2	11.00
529	66	13	13	47	59.6	104	1	35.7	Concrete	16.00	Slab	3	2	11.00
530	66	14	13	48	2.6	104	1	40.1	Concrete	24.00	Slab	3	2	11.00
531	66	15	13	48	11.9	104	1	47.3	Concrete	35.00	Slab	5	2	11.00
532	66	16	13	49	5.9	104	2	41.9	Concrete	30.00	Slab	3	2	11.00
533	66	17	13	49	14.1	104	2	32.3	Concrete	35.00	Slab	5	2	11.00
534	66	18	13	52	42.3	104	4	1.1	Concrete	15.00	Slab	3	2	11.00
535	66	19	13	53	9.8	104	4	29.7	Concrete	21.00	Slab	3	2	11.00
536	66	20	13	54	5.2	104	5	27	Concrete	20.00	Slab	3	2	11.00
537	66	21	13	54	12.6	104	6	10	Concrete	15.00	Slab	3	2	11.00
538	66	22	13	54	28.2	104	6	25	Concrete	26.00	Slab	3	2	11.00
539	66	23	13	58	17	104	7	14.5	Concrete	15.00	Slab	3	2	11.00
540	66	24	13	59	55.7	104	8	24.4	Concrete	18.00	Slab	3	2	11.00
541	66	25	14	0	28.1	104	8	20.7	Concrete	21.00	Slab	3	2	11.00
542	66	26	14	0	48.3	104	8	6.6	Concrete	21.00	Slab	3	2	11.00
543	66	27	14	0	52.6	104	8	4.4	Concrete	21.00	Slab	3	2	11.00
544	66	28	14	1	6	104	7	56.6	Concrete	15.00	Slab	3	2	11.00
545	66	29	14	1	41.7	104	7	39.1	Concrete	23.00	Slab	3	2	11.00
546	66	30	14	3	38.3	104	6	23.7	Concrete	30.00	Slab	3	2	11.00
547	66	31	14	5	15.1	104	5	42.6	Concrete	24.00	Slab	3	2	11.00
548	66	32	14	7	8.3	104	6	43.8	Concrete	21.00	Slab	3	2	11.00
549	66	33	14	9	59.2	104	5	48.7	Concrete	15.00	Slab	3	2	11.00
550	66	34	14	10	15.6	104	4	11.4	Concrete	21.00	Slab	3	2	11.00
551	66	35	14	11	11.1	104	3	8.5	Concrete	15.00	Slab	3	2	11.00
552	66	36	14	11	37.6	104	3	40.6	Concrete	26.00	Slab	3	2	11.00
553	66	37	14	13	23.6	104	3	58.3	Concrete	46.00	Slab	5	2	11.00
554	66	38	14	13	52.7	104	3	57	Concrete	58.00	Slab	7	2	11.00
555	66	39	14	13	58.9	104	3	56.7	Concrete	56.00	Slab	7	2	10.10
556	68	1	13	36	36	103	25	35.6	Concrete	39.00	Slab	3	2	10.90
557	68	2	13	36	37.2	103	25	56.6	Concrete	26.00	Slab	2	2	10.90
558	68	3	13	36	40.4	103	26	12.1	Concrete	26.00	Slab	2	2	10.90
559	68	4	13	38	51.7	103	28	53.7	Concrete	26.00	Slab	2	2	10.90
560	68	5	13	43	55	103	32	12.9	Concrete	26.00	Slab	2	2	10.90
561	68	6	13	44	44.5	103	32	33.1	Concrete	30.00	Slab	2	2	10.90
562	68	7	13	47	11.4	103	31	52.5	Concrete	26.00	Slab	2	2	10.90
563	68	8	13	47	59.2	103	31	35.4	Concrete	26.00	Slab	2	2	10.90
564	68	9	13	50	14.9	103	30	51.6	Concrete	39.00	Slab	3	2	10.90
565	68	10	13	51	3.2	103	31	11.2	Concrete	15.00	Slab	1	2	10.90
566	68	11	13	53	30.8	103	32	1.2	Concrete	39.00	Slab	3	2	10.90
567	68	12	13	53	56.2	103	32	8	Concrete	76.50	Girder	3	2	10.90
568	68	13	13	54	17.8	103	32	10.8	Concrete	39.00	Slab	3	2	10.90
569	68	14	13	54	55.6	103	32	33.9	Concrete	15.00	Slab	1	2	10.90
570	68	15	13	55	48.1	103	33	29.6	Concrete	20.00	Slab	2	2	10.90
571	68	16	14	1	1.9	103	33	33.2	Concrete	20.00	Slab	2	2	10.90
572	68	17	14	2	33.5	103	33	24.8	Concrete	30.00	Slab	2	2	10.90
573	68	18	14	2	52.7	103	33	19.44	Concrete	13.00	Slab	1	2	10.90

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
574	68	19	14	8	47.9	103	31	29.2	Concrete	26.00	Slab	2	2	10.90
575	68	20	14	9	5.6	103	31	22.5	Concrete	26.00	Slab	2	2	10.90
576	68	21	14	9	18.9	103	31	17.8	Concrete	45.00	Slab	3	2	10.90
577	68	22	14	12	35.6	103	32	7.2	Concrete	24.00	Girder	2	2	11.00
578	68	23	14	13	44.1	103	33	19	Concrete	24.00	Girder	2	2	11.00
579	68	24	14	15	4.4	103	34	48	Concrete	36.00	Girder	3	2	11.00
580	68	25	14	17	51	103	37	17.3	Concrete	45.00	Girder	3	2	11.00
581	68	26	14	19	54	103	38	6.5	Concrete	15.00	Girder	1	2	11.00
582	68	27	14	20	50.2	103	38	21.1	Concrete	12.00	Girder	1	2	11.00
583	68	28	14	23	27.4	103	39	51	Concrete	12.00	Girder	1	2	11.00
584	68	29	14	23	40.3	103	39	55.9	Concrete	18.00	Girder	1	2	11.00
585	68	30	14	23	52.3	103	40	2.4	Concrete	30.00	Girder	2	2	11.00
586	68	31	14	24	46.4	103	40	21.6	Concrete	18.00	Girder	1	2	11.00
587	70	1	11	59	57.7	105	16	0.7	Bailey	84.00	Truss	4	1	5.40
588	70	2	11	59	34.6	105	15	50.9	Bailey	75.00	Truss	7	1	4.36
589	70	3	11	59	0.6	105	16	1.8	Concrete	84.00	Girder	5	2	9.04
590	71	1	12	18	25.1	105	16	56.8	Concrete	18.00	Girder	1	2	10.80
591	71	2	12	23	40.2	105	12	20.8	Concrete	14.96	Girder	1	2	10.00
592	72	1	11	40	26.4	105	58	26.8	Concrete	22.20	Girder	2	2	10.10
593	73	1	11	58	54.8	105	49	50.4	Concrete	24.00	Girder	2	2	10.02
594	73	2	12	5	48.8	105	53	59.3	Concrete	24.00	Girder	2	2	9.96
595	73	3	12	7	54.2	105	53	50.8	Concrete	30.00	Girder	2	2	9.96
596	73	4	12	12	11	105	56	36.3	Bailey	150.00	Truss	7	1	5.36
597	73	5	12	12	38.9	105	56	57.4	Bailey	30.00	Truss	2	1	5.15
598	73	6	12	13	31.8	105	57	21.2	Bailey	54.03	Truss	2	1	5.30
599	73	7	12	15	1.8	105	57	35.9	Bailey	42.00	Truss	2	1	5.34
600	73	8	12	15	5.8	105	59	9.1	Bailey	119.98	Truss	5	1	4.98
601	73	9	12	16	30.6	106	1	11.4	Concrete	30.08	Girder	2	2	10.00
602	73	10	12	18	51.7	106	2	39.3	Concrete	56.47	Girder	5	2	10.00
603	73	11	12	20	15.1	106	3	15.7	Concrete	68.92	Girder	5	2	9.90
604	73	12	12	21	15.7	106	3	36.6	Concrete	45.00	Girder	3	2	9.90
605	73	13	12	22	42.2	106	3	30.4	Concrete	15.20	Girder	1	2	10.00
606	73	14	12	23	34.1	106	3	1.1	Concrete	59.98	Girder	5	2	10.10
607	73	15	12	26	50	106	1	51.7	Steel	30.07	Girder	2	2	8.12
608	73	16	12	26	56.3	106	1	51.3	Bailey	150.94	Truss	6	1	5.09
609	76	1	12	3	3.8	106	28	37.4	Concrete	20.10	Slab	1	2	11.09
610	76	2	12	5	0.4	106	30	15.8	Concrete	48.08	Slab	3	2	11.09
611	76	3	12	5	47.4	106	32	33.9	Concrete	32.03	Slab	2	2	11.09
612	76	4	12	7	2.4	106	53	43	Concrete	20.00	Slab	1	2	11.09
613	76	5	12	7	40.6	106	54	13.6	Concrete	8.01	Slab	1	2	11.12
614	76	6	12	7	53.9	106	54	34.7	Concrete	32.00	Slab	2	2	11.09
615	76	7	12	8	2.7	106	54	46	Concrete	12.98	Slab	1	2	11.04
616	76	8	12	12	15.1	107	1	2.1	Concrete	13.00	Slab	1	2	11.14
617	76	9	12	17	17.4	107	4	17.4	Concrete	79.46	Slab	5	2	11.10
618	76	10	12	20	51.4	107	10	11.3	Concrete	80.07	Slab	5	2	11.11
619	76	11	12	21	30.9	107	10	57.1	Concrete	48.12	Slab	3	2	11.06
620	76	12	12	23	8	107	10	41.5	Concrete	81.20	Slab	5	2	11.15
621	76	13	12	24	48.8	107	11	9.9	Concrete	77.43	Slab	5	2	11.80

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
622	76	14	12	27	14.1	107	11	18.6	Concrete	13.03	Slab	1	2	11.18
623	76	15	12	28	14.5	107	12	18.4	Bailey	12.00	Truss	1	1	4.24
624	76	16	12	28	56.1	107	12	50.9	Bailey	12.00	Truss	1	1	4.30
625	76	17	12	35	4.5	107	15	11	Bailey	18.00	Truss	1	1	4.30
626	76	18	12	35	25.6	107	14	42.9	Bailey	30.00	Truss	2	1	4.30
627	76	19	12	35	38.1	107	14	11.5	Bailey	15.00	Truss	1	1	4.30
628	76	20	12	38	3	107	12	53	Bailey	18.00	Truss	1	1	4.30
629	76	21	12	41	58.6	107	12	20.7	Bailey	15.00	Truss	1	1	4.30
630	76	22	12	42	14.2	107	11	49.4	Bailey	12.00	Truss	1	1	4.30
631	76	23	12	42	53.9	107	11	8.3	Bailey	12.00	Truss	1	1	4.30
632	76	24	12	43	27.2	107	10	29.4	Bailey	9.00	Truss	1	1	4.30
633	76	25	12	43	34.1	107	10	28.5	Bailey	9.00	Truss	1	1	4.30
634	76	26	12	44	9.9	107	9	58.9	Bailey	12.00	Truss	1	1	4.30
635	76	27	12	44	58.4	107	9	26.5	Bailey	9.00	Truss	1	1	4.30
636	76	28	12	59	59.4	107	8	1.4	Bailey	27.00	Truss	1	1	5.16
637	76	29	13	1	8.4	107	6	7.9	Bailey	9.00	Truss	1	1	4.30
638	76	30	13	3	39.5	107	2	36.4	Bailey	66.00	Truss	3	1	5.28
639	76	31	13	3	58.6	107	2	13	Bailey	24.00	Truss	1	1	5.18
640	76	32	13	28	51.1	107	0	13.7	Wood	23.59	Girder	8	1	3.22
641	76	33	13	29	2.3	106	58	56.3	Wood	15.73	Girder	3	1	3.22
642	76	34	13	29	57.2	106	58	42	Wood	40.72	Girder	8	1	4.68
643	76	35	13	30	10.8	106	58	38.6	Wood	11.15	Girder	2	1	4.63
644	76	36	13	31	49.8	106	58	40.7	Bailey	33.00	Truss	1	1	5.27
645	76	37	13	32	0.1	106	58	36.6	Wood	13.98	Girder	3	1	3.96
646	76	38	13	34	5.9	106	57	41.5	Wood	12.30	Girder	3	1	4.63
647	76	39	13	35	19.1	106	57	5.2	Wood	20.95	Girder	4	1	4.33
648	76	40	13	35	48.2	106	57	3.4	Wood	10.96	Girder	2	1	4.23
649	76	41	13	36	3.1	106	56	55.6	Wood	10.90	Girder	2	1	4.63
650	76	42	13	36	9.5	106	56	54.2	Bailey	24.00	Truss	1	1	5.66
651	76	43	13	36	44.6	106	56	41.9	Wood	10.40	Girder	2	1	4.82
652	76	44	13	36	50.2	106	56	42.2	Wood	17.59	Girder	3	1	4.36
653	76	45	13	39	1.4	106	56	25.8	Wood	7.97	Girder	2	1	4.55
654	76	46	13	39	58.1	106	56	30.9	Wood	17.10	Girder	3	1	4.72
655	76	47	13	40	17.2	106	56	17.5	Wood	18.00	Girder	3	1	4.22
656	78	1	13	24	6.3	106	13	48.8	Concrete	39.00	Slab	3	2	11.02
657	78	2	13	24	51.9	106	15	3	Concrete	38.96	Slab	3	2	9.90
658	78	3	13	24	32.4	106	20	7.1	Concrete	39.00	Slab	3	2	11.02
659	78	4	13	23	0.6	106	25	25.4	Concrete	39.00	Slab	3	2	11.08
660	78	5	13	22	59.2	106	25	46	Concrete	60.00	Slab	3	2	11.06
661	78	6	13	21	49.4	106	29	6	Concrete	60.00	Slab	3	2	11.02
662	78	7	13	21	59.6	106	29	35.1	Concrete	60.00	Slab	3	2	11.02
663	78	8	13	26	28.7	106	36	3.6	Concrete	80.00	Slab	4	2	11.02
664	78	9	13	26	39.8	106	36	14.7	Concrete	329.99	Girder	11	2	11.04
665	78	10	13	35	28.3	106	48	30.3	Concrete	13.50	Slab	1	2	11.02
666	78	11	13	35	47	106	49	11.9	Concrete	12.08	Slab	1	2	11.06
667	78	12	13	45	38.3	107	27	30.2	Concrete	45.15	Girder	3	2	9.02
668	78	13	13	45	38.1	107	27	46.9	Concrete	45.17	Girder	3	2	9.02
669	110	1	11	31	37.9	104	56	10.6	Concrete	12.08	Girder	1	2	7.58

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
670	110	2	11	29	33.9	104	56	57.8	Concrete	15.50	Girder	1	2	9.96
671	110	3	11	28	5.6	105	1	57.9	Concrete	6.91	Girder	3	2	6.93
672	110	4	11	27	18.8	105	3	3	Concrete	19.26	Slab	4	1	5.01
673	110	5	11	26	50	105	3	20.9	Concrete	6.72	Girder	3	2	8.11
674	110	6	11	25	59	105	3	37.2	Concrete	14.90	Girder	1	2	8.00
675	110	7	11	25	27.9	105	3	16.5	Concrete	24.06	Girder	2	2	7.00
676	110	8	11	24	44.1	105	2	26	Concrete	28.69	Girder	3	1	5.22
677	110	9	11	24	15.6	105	1	40.6	Concrete	45.00	Girder	3	2	8.89
678	110	10	11	23	48.9	105	1	5.1	Concrete	45.00	Girder	3	2	7.95
679	110	11	11	21	42.5	105	0	45	Concrete	24.00	Girder	2	2	8.92
680	110	12	11	21	9.2	105	1	17	Concrete	24.00	Girder	2	2	7.96
681	110	13	11	20	48.6	105	1	53.4	Concrete	20.00	Slab	4	1	5.03
682	110	14	11	20	35	105	2	19.4	Concrete	20.00	Girder	1	2	7.20
683	110	15	11	20	28.9	105	2	29.9	Concrete	24.00	Girder	2	2	8.92
684	110	16	11	20	19.2	105	2	44.7	Concrete	24.00	Girder	2	2	8.90
685	110	17	11	20	11.5	105	2	54.3	Concrete	24.00	Girder	2	2	8.89
686	110	18	11	20	3.1	105	3	3.8	Concrete	24.00	Girder	2	2	8.92
687	110	19	11	19	40.8	105	3	24.9	Concrete	26.00	Girder	2	2	8.91
688	110	20	11	19	20.2	105	3	39.2	Concrete	21.32	Girder	3	1	4.20
689	110	21	11	18	0.9	105	3	17.3	Concrete	24.00	Girder	2	2	8.90
690	110	22	11	17	47	105	3	3.4	Concrete	24.00	Girder	2	2	8.91
691	110	23	11	17	37.7	105	2	55.6	Concrete	18.00	Girder	1	2	8.90
692	110	24	11	17	23.5	105	2	44.8	Concrete	15.00	Girder	1	2	8.90
693	110	25	11	17	12.9	105	2	33.1	Concrete	15.00	Girder	1	2	8.89
694	110	26	11	16	57.6	105	2	18.9	Concrete	12.00	Girder	1	2	8.92
695	110	27	11	16	39.3	105	2	5.4	Concrete	15.00	Girder	1	2	8.92
696	110	28	11	16	0.9	105	2	1	Concrete	15.00	Girder	1	2	8.92
697	110	29	11	15	23.2	105	2	6.5	Concrete	18.00	Girder	1	2	8.90
698	110	30	11	14	56.9	105	2	14	Concrete	18.00	Girder	1	2	9.02
699	110	31	11	14	28.8	105	2	22.2	Concrete	9.22	Girder	2	1	4.56
700	110	32	11	14	18.3	105	2	24.3	Concrete	6.65	Girder	2	1	4.56
701	110	33	11	13	57.2	105	2	29.6	Concrete	15.00	Girder	1	2	8.00
702	110	34	11	13	42	105	2	32.2	Concrete	11.84	Girder	3	1	4.29
703	110	35	11	12	52.3	105	2	37.8	Concrete	7.20	Girder	2	1	4.27
704	110	36	11	12	30.1	105	2	52	Concrete	9.50	Girder	2	1	4.12
705	110	37	11	12	18.1	105	3	3.2	Concrete	8.50	Girder	2	1	4.46
706	110	38	11	12	6.1	105	3	16.7	Concrete	30.08	Girder	2	2	8.00
707	110	39	11	12	2.1	105	3	21.8	Concrete	10.62	Girder	3	1	4.32
708	110	40	11	11	43	105	3	43.9	Concrete	15.00	Girder	1	2	9.02
709	110	41	11	11	21.7	105	4	3.4	Concrete	15.13	Slab	3	1	4.97
710	110	42	11	11	9.2	105	4	17.4	Concrete	24.00	Girder	2	2	9.00
711	110	43	11	10	23.2	105	4	51.1	Concrete	9.10	Slab	2	1	3.95
712	110	44	11	9	49.9	105	5	4.4	Concrete	9.19	Slab	2	1	4.04
713	110	45	11	9	41.8	105	5	5.4	Concrete	9.18	Slab	2	1	4.01
714	110	46	11	9	30.5	105	5	4.7	Concrete	11.06	Girder	3	1	3.83
715	110	47	11	9	21.3	105	5	3.4	Concrete	7.90	Girder	2	1	4.02
716	110	48	11	8	41.8	105	4	45	Concrete	23.97	Girder	5	1	3.57
717	110	49	11	8	28.2	105	4	42	Concrete	15.97	Slab	3	1	5.02

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
718	110	50	11	7	37.1	105	4	12.6	Concrete	6.52	Girder	2	1	4.85
719	110	51	11	6	58.3	105	3	51.7	Concrete	14.51	Slab	3	1	4.98
720	110	52	11	6	45.2	105	3	49.4	Concrete	14.88	Slab	3	1	5.04
721	110	53	11	6	17.7	105	3	52.4	Concrete	14.63	Slab	3	1	4.90
722	110	54	11	5	38	105	4	0	Concrete	5.90	Slab	1	1	4.83
723	110	55	11	5	1.6	105	4	15.9	Concrete	13.90	Slab	3	1	4.87
724	110	56	11	4	43	105	4	22.1	Concrete	10.18	Slab	3	1	4.86
725	110	57	11	4	30.8	105	4	25	Concrete	6.06	Slab	1	1	4.73
726	110	58	11	3	56.3	105	4	33.2	Concrete	8.95	Slab	2	1	3.95
727	110	59	11	3	37.3	105	4	34.7	Concrete	8.90	Slab	2	1	3.95
728	110	60	11	1	35.5	105	4	11.9	Concrete	10.22	Girder	2	1	4.05
729	110	61	11	0	53.5	105	4	10.9	Concrete	15.00	Slab	3	1	4.97
730	110	62	11	0	1.3	105	3	59	Concrete	8.10	Slab	2	1	4.23
731	110	63	10	59	43.5	105	4	1.2	Wood	9.30	Girder	3	1	2.90
732	110	64	10	59	17.7	105	4	0.7	Wood	9.50	Girder	3	1	3.00
733	110	65	10	58	59	105	3	58.8	Concrete	4.27	Girder	1	1	3.88
734	110	66	10	58	5	105	5	49.8	Concrete	20.00	Slab	4	1	4.01
735	110	67	10	58	1	105	6	11.3	Concrete	10.00	Slab	2	1	3.98
736	110	68	10	57	46.9	105	6	54.1	Concrete	20.00	Slab	4	1	4.00
737	110	69	10	57	45.7	105	7	0.1	Concrete	10.00	Slab	2	1	4.00
738	114	1	11	31	10.7	104	59	38.5	Steel	45.00	Girder	3	2	8.30
739	118A	1	11	14	56.3	105	16	15.3	Concrete	24.30	Girder	3	1	5.03
740	118A	2	11	14	10.2	105	16	4.7	Concrete	19.70	Girder	3	1	5.06
741	118A	3	11	12	47.7	105	15	35.9	Concrete	11.98	Girder	2	1	6.00
742	118A	4	11	12	17.2	105	15	12.8	Concrete	24.00	Girder	2	2	7.95
743	118A	5	11	11	44.5	105	14	37.7	Concrete	24.00	Girder	2	2	8.00
744	118A	6	11	11	0.9	105	13	51.7	Concrete	45.00	Girder	3	2	8.00
745	118A	7	11	10	22.5	105	13	48.6	Concrete	15.00	Girder	1	2	8.02
746	118A	8	11	10	14	105	13	50.3	Bailey	36.00	Truss	2	1	5.30
747	118A	9	11	9	36.2	105	14	1.5	Concrete	29.60	Girder	6	1	5.09
748	118A	10	11	8	21.8	105	13	31.9	Concrete	30.14	Girder	2	2	8.00
749	118A	11	11	8	1.2	105	13	17.8	Concrete	20.00	Girder	4	1	5.10
750	118A	12	11	6	56	105	12	25.7	Concrete	15.25	Girder	1	2	7.96
751	118A	13	11	6	8	105	11	53.6	Concrete	30.00	Girder	2	2	7.98
752	118A	14	11	5	27.5	105	11	23.7	Concrete	30.00	Girder	2	2	7.94
753	118A	15	11	5	2.1	105	11	21.5	Concrete	18.00	Girder	1	2	8.00
754	118A	16	11	4	48.2	105	11	21.8	Concrete	17.94	Girder	1	2	7.96
755	118A	17	11	4	12.2	105	11	23.4	Concrete	18.05	Girder	1	2	7.94
756	118A	18	11	3	57.5	105	11	24.1	Concrete	17.90	Girder	1	2	7.94
757	118A	19	11	3	44.3	105	11	25.4	Concrete	18.00	Girder	1	2	8.00
758	118A	20	11	3	17.4	105	11	25.6	Concrete	18.06	Girder	1	2	8.00
759	118A	21	11	3	4.1	105	11	23.7	Concrete	15.10	Girder	1	2	8.02
760	118A	22	11	2	53.5	105	11	23.7	Concrete	18.10	Girder	1	2	8.00
761	118A	23	11	2	37.5	105	11	22.9	Concrete	30.14	Girder	2	2	8.00
762	118A	24	11	2	23.3	105	11	21.1	Concrete	24.03	Girder	2	2	8.04
763	118A	25	11	1	30.7	105	11	10.4	Concrete	29.94	Girder	2	2	8.04
764	118A	26	11	1	16.9	105	11	7.3	Concrete	24.00	Girder	2	2	8.00
765	118A	27	11	1	1.5	105	11	5.2	Concrete	18.00	Girder	1	2	8.00

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
766	118A	28	11	0	29.1	105	11	2.1	Concrete	18.07	Girder	1	2	8.02
767	118A	29	10	59	58.8	105	10	57.5	Concrete	24.00	Girder	2	2	8.04
768	118A	30	10	59	26.1	105	10	49.5	Concrete	18.00	Girder	1	2	8.00
769	118A	31	10	59	8.9	105	10	44.4	Concrete	18.00	Girder	1	2	8.00
770	118A	32	10	58	52.5	105	10	40.2	Concrete	18.00	Girder	1	2	8.00
771	118A	33	10	58	40.3	105	10	37.2	Concrete	15.00	Girder	1	2	8.00
772	118A	34	10	58	31.9	105	10	35.8	Concrete	18.00	Girder	1	2	8.06
773	118A	35	10	58	7.8	105	10	35.4	Concrete	18.00	Girder	1	2	8.00
774	118A	36	10	57	43.3	105	10	36.2	Concrete	12.05	Girder	1	2	8.00
775	118A	37	10	57	30.3	105	10	38.1	Concrete	15.00	Girder	1	2	8.00
776	118A	38	10	56	58.5	105	10	44.4	Concrete	15.00	Girder	1	2	8.00
777	118A	39	10	56	27.1	105	10	42.2	Concrete	15.00	Girder	1	2	8.00
778	118A	40	10	56	4.8	105	10	42.4	Concrete	15.00	Girder	1	2	8.00
779	118A	41	10	55	49.1	105	10	43.3	Concrete	15.00	Girder	1	2	8.00
780	118A	42	10	55	14.8	105	10	41.8	Concrete	15.00	Girder	1	2	8.00
781	121	1	11	16	31.4	104	52	54.2	Concrete	12.00	Girder	2	1	4.10
782	124	1	11	8	50	104	45	16.8	Concrete	7.00	Slab	1	2	6.00
783	126	1	10	47	34.8	104	44	13.2	Concrete	40.00	Girder	8	2	5.00
784	129	1	11	10	23.3	104	50	43.9	Concrete	40.00	Girder	8	1	6.94
785	129C	1	10	51	43	104	47	57.2	Concrete	11.00	Girder	2	1	4.80
786	130	1	11	24	58.2	104	40	22.7	Concrete	22.00	Girder	2	1	5.50
787	130	2	11	26	45	104	36	17.8	Concrete	10.00	Girder	1	1	4.30
788	130	3	11	26	42.5	104	34	37	Concrete	25.00	Girder	2	1	4.30
789	130	4	11	26	27.1	104	33	55.7	Concrete	7.00	Slab	1	1	4.50
790	130	5	11	26	30.4	104	33	29.1	Concrete	5.00	Slab	1	1	4.50
791	130	6	11	26	55.4	104	32	27.1	Concrete	25.00	Girder	2	1	4.12
792	130	7	11	27	12.7	104	32	14.8	Concrete	30.00	Girder	3	1	4.62
793	130	8	11	27	35.8	104	31	17	Steel	105.00	Girder	7	2	10.00
794	130	9	11	27	44.2	104	31	20.3	Concrete	36.00	Truss	3	1	4.90
795	132	1	11	4	14.2	104	30	38.8	Concrete	58.80	Girder	6	2	5.10
796	133A	1	10	48	18.8	104	29	34	Concrete	20.00	Slab	4	1	5.50
797	133A	2	10	48	12.9	104	30	1.9	Concrete	10.00	Slab	2	1	5.50
798	133A	3	10	47	19.1	104	31	51.3	Concrete	10.00	Slab	2	2	6.00
799	133A	4	10	46	9	104	33	54.1	Concrete	7.00	Slab	1	1	4.50
800	134	1	10	57	42.3	104	34	55.9	Concrete	5.70	Slab	1	2	4.50
801	134A	1	10	57	39.9	104	28	21.9	Concrete	15.00	Slab	3	2	6.00
802	134B	1	10	50	30.3	104	27	11	Concrete	7.50	Slab	1	2	8.50
803	134B	2	10	51	20.8	104	27	3.9	Concrete	15.00	Slab	3	1	5.50
804	134B	3	10	53	12.3	104	26	43.4	Concrete	15.00	Slab	3	1	5.50
805	135	1	10	48	1.6	104	26	41.6	Concrete	10.00	Girder	3	1	5.00
806	135	2	10	45	19.6	104	26	58.6	Concrete	20.00	Slab	4	2	6.00
807	136	1	10	42	21.6	104	10	58.1	Concrete	45.00	Slab	3	1	4.60
808	136	2	10	40	9	104	10	0.8	Wood	20.00	Girder	8	1	3.50
809	136A	1	10	38	33.7	104	10	26.4	Concrete	33.00	Slab	3	1	5.30
810	136A	2	10	38	51.3	104	10	24	Concrete	11.00	Slab	1	1	5.30
811	136A	3	10	38	53.8	104	10	21.8	Concrete	45.00	Slab	3	1	4.50
812	137	1	10	42	36	104	28	8.8	Concrete	6.48	Girder	3	1	4.50
813	137	2	10	42	41.9	104	28	17.5	Concrete	20.00	Slab	4	1	4.50

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
814	137	3	10	42	46.8	104	28	33.6	Concrete	15.00	Slab	3	1	4.50
815	137	4	10	42	53.3	104	28	42.2	Concrete	10.00	Slab	2	1	4.54
816	137	5	10	43	3.2	104	29	7.9	Concrete	10.50	Girder	2	1	5.04
817	137	6	10	42	59.8	104	30	0	Bailey	12.50	Truss	1	1	4.90
818	138	1	10	37	28.9	104	9	52.9	Concrete	7.00	Slab	1	2	9.40
819	138	2	10	39	14.5	104	9	2.5	Concrete	13.00	Slab	1	2	8.80
820	138	3	10	41	2.2	104	7	17.4	Concrete	20.00	Girder	1	2	8.00
821	140	1	11	27	1.1	104	20	15.7	Steel	15.00	Girder	1	1	4.16
822	140	2	11	27	13.6	104	19	43.8	Concrete	48.00	Girder	4	2	7.02
823	140	3	11	30	41.2	104	15	11	Concrete	24.00	Girder	2	2	7.00
824	140	4	11	31	13.7	104	14	32.5	Concrete	15.02	Girder	1	2	7.00
825	140	5	11	38	0.8	104	8	29.6	Concrete	35.90	Girder	3	2	7.04
826	140	6	11	40	13.6	104	6	47	Wood	5.28	Girder	2	1	3.34
827	147	1	11	21	47.7	104	31	29.5	Concrete	15.00	Slab	3	1	5.10
828	147	2	11	21	15.6	104	32	15.6	Concrete	15.00	Slab	3	1	5.00
829	147	3	11	19	47.9	104	34	6.9	Concrete	10.00	Slab	2	1	5.00
830	147	4	11	19	27.7	104	34	40	Concrete	25.00	Girder	2	1	4.70
831	151B	1	11	44	13.6	104	28	56.4	Bailey	33.00	Truss	2	1	5.60
832	151B	2	11	45	55.4	104	22	23.7	Bailey	23.00	Truss	1	1	5.60
833	151B	3	11	46	10.3	104	22	14.6	Bailey	27.00	Truss	1	1	5.60
834	151B	4	11	47	57.2	104	20	39.3	Bailey	36.00	Truss	2	1	5.50
835	152	1	12	4	9.1	104	46	3.9	Concrete	8.00	Girder	2	1	5.00
836	152D	1	12	31	51	104	6	29.5	Concrete	8.53	Slab	2	1	4.00
837	152D	2	12	34	12.1	104	7	17.8	Wood	9.09	Girder	3	1	4.60
838	152D	3	12	34	53.6	104	6	36.5	Wood	33.34	Girder	11	1	3.21
839	152E	1	12	34	3.5	104	5	13.7	Concrete	5.08	Slab	1	1	4.40
840	152E	2	12	34	18.2	104	5	18.1	Wood	7.50	Girder	3	1	3.00
841	152F	1	12	36	11.8	104	3	59.9	Wood	8.12	Girder	4	1	3.00
842	152G	1	12	31	43.7	103	59	21.9	Concrete	10.00	Girder	3	1	5.11
843	152H	1	12	32	3	103	55	17.7	Concrete	6.81	Slab	3	1	4.24
844	152H	2	12	34	50.3	103	57	51.5	Wood	13.03	Girder	4	1	3.63
845	153	1	11	57	2.1	104	39	46	Concrete	22.00	Slab	2	1	5.40
846	153A	1	12	6	43.9	104	35	40.5	Concrete	30.00	Slab	6	2	6.00
847	153A	2	12	4	44.6	104	35	25.2	Concrete	25.00	Slab	5	2	6.00
848	153A	3	12	7	28.5	104	34	41.5	Concrete	10.00	Slab	2	2	6.00
849	153B	1	12	14	7.1	104	33	32.1	Concrete	30.00	Girder	6	1	5.00
850	153B	2	12	13	4.3	104	32	44.9	Concrete	25.00	Slab	4	2	9.00
851	153B	3	12	13	11.7	104	27	26.6	Concrete	30.00	Girder	5	1	4.60
852	153B	4	12	12	18.3	104	26	26	Concrete	12.00	Girder	1	2	7.00
853	153C	1	12	19	43	104	32	18	Concrete	30.00	Girder	6	1	5.40
854	154	1	12	32	51.4	103	55	16.5	Concrete	4.66	Girder	2	2	9.08
855	154	2	12	35	4.5	103	57	22.2	Steel	14.80	Girder	2	2	5.62
856	154	3	12	35	4.7	103	57	41.7	Steel	5.80	Girder	1	2	5.00
857	154	4	12	36	48	103	59	29	Wood	7.97	Girder	2	1	4.00
858	154	5	12	37	26.4	104	0	26.2	Steel	45.07	Girder	3	1	4.48
859	154	6	12	37	6.8	104	0	59.1	Wood	23.65	Girder	7	1	4.03
860	154A	1	12	33	44.6	103	53	17.8	Wood	4.60	Girder	2	1	3.72
861	154A	2	12	33	52.1	103	53	18.7	Concrete	14.89	Slab	3	1	4.06

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
862	154A	3	12	35	17.9	103	53	15.2	Concrete	7.09	Slab	1	1	4.41
863	154A	4	12	35	29.7	103	53	19.6	Concrete	12.00	Slab	2	1	4.08
864	154A	5	12	38	26.5	103	53	49.9	Concrete	9.95	Girder	1	1	4.22
865	154A	6	12	38	30.1	103	53	51.5	Concrete	9.92	Girder	1	1	4.30
866	154A	7	12	39	4.6	103	53	53.8	Concrete	6.50	Slab	1	1	4.01
867	154B	1	12	39	59.7	103	52	17.5	Wood	12.10	Girder	4	1	4.20
868	154C	1	12	37	4.8	103	47	24	Wood	5.96	Girder	2	1	4.03
869	154C	2	12	41	2.8	103	49	28.7	Wood	13.45	Girder	4	1	3.26
870	154C	3	12	42	8.2	103	49	45.9	Concrete	9.92	Girder	1	1	4.27
871	154E	1	12	45	37.8	103	38	46.8	Wood	9.38	Girder	3	1	3.18
872	154E	2	12	45	57.3	103	38	46.8	Wood	9.52	Girder	3	1	3.22
873	154F	1	12	40	41.1	103	38	34	Wood	9.10	Girder	3	1	4.23
874	154F	2	12	42	30.4	103	38	9.1	Wood	12.25	Girder	4	1	4.22
875	154F	3	12	42	44.6	103	38	4.7	Concrete	11.49	Girder	5	1	4.60
876	154F	4	12	44	15.3	103	37	32.6	Wood	11.87	Girder	4	1	3.18
877	155	1	12	30	54.6	103	55	16.8	Concrete	12.00	Girder	1	2	7.04
878	155	2	12	30	43.3	103	55	15.3	Concrete	15.00	Girder	1	2	8.02
879	155	3	12	30	21.4	103	55	12.4	Concrete	30.00	Girder	2	2	8.05
880	155	4	12	29	58.1	103	55	9.2	Concrete	15.00	Girder	1	2	7.96
881	155	5	12	29	34.5	103	55	6.1	Concrete	15.00	Girder	1	2	7.98
882	155	6	12	28	0.1	103	54	3.8	Steel	11.90	Girder	2	1	4.54
883	155	7	12	27	49.5	103	53	47.2	Steel	18.50	Girder	2	1	5.05
884	155	8	12	22	17.7	103	47	27	Bailey	24.00	Truss	1	1	4.96
885	155	9	12	20	56.3	103	46	24.2	Concrete	7.30	Slab	2	1	4.18
886	155	10	12	17	16.1	103	48	23	Wood	7.90	Girder	3	1	3.05
887	155	11	12	17	5.9	103	48	23.8	Wood	5.30	Girder	2	1	3.00
888	155	12	12	17	5.2	103	48	23.9	Wood	5.30	Girder	2	1	3.00
889	155	13	12	16	27.2	103	48	55.4	Wood	15.30	Girder	6	1	3.08
890	155	14	12	16	26.1	103	48	56.1	Wood	10.20	Girder	4	1	2.80
891	155A	1	12	30	19.7	103	53	46.1	Bailey	33.40	Truss	2	1	4.42
892	155B	1	12	32	29.1	103	49	21.5	Wood	6.10	Girder	2	1	4.15
893	155B	2	12	32	25.6	103	48	56.8	Wood	12.26	Girder	4	1	4.21
894	155B	3	12	32	25.3	103	48	55.7	Wood	6.14	Girder	2	1	4.20
895	155B	4	12	31	23.3	103	48	27.6	Wood	18.43	Girder	6	1	4.25
896	155B	5	12	31	0.7	103	48	19	Wood	18.01	Girder	6	1	4.23
897	155B	6	12	30	42.5	103	48	38.7	Wood	5.87	Girder	2	1	4.21
898	155C	1	12	33	7.4	103	45	16.2	Wood	20.33	Girder	6	1	4.23
899	155C	2	12	30	52.9	103	44	43.8	Concrete	5.20	Slab	2	1	4.90
900	155D	1	12	35	46.5	103	41	5.4	Concrete	12.04	Girder	1	2	7.01
901	155D	2	12	32	53	103	40	20.6	Steel	12.01	Girder	4	1	3.94
902	155E	1	12	39	19.1	103	34	28.1	Wood	29.85	Girder	10	1	4.18
903	155E	2	12	38	4.1	103	34	41.4	Concrete	4.63	Girder	1	1	4.27
904	155E	3	12	37	36.8	103	34	50.3	Concrete	4.62	Girder	1	1	4.18
905	155E	4	12	36	17.2	103	35	16.1	Concrete	15.00	Girder	1	2	6.06
906	155E	5	12	35	23.8	103	34	53.2	Concrete	24.04	Girder	2	2	6.08
907	155F	1	12	46	14.8	103	26	30.3	Concrete	5.06	Girder	1	1	5.03
908	155F	2	12	45	37	103	26	0.1	Concrete	5.30	Girder	1	1	5.21
909	155F	3	12	45	34.9	103	25	51.5	Concrete	6.45	Girder	1	1	5.21

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
910	155F	4	12	44	56	103	22	53.6	Constructing			0	1	0.00
911	156	1	13	8	16.7	103	13	16	Concrete	7.00	Girder	1	1	5.60
912	156	2	13	8	19.9	103	13	18.8	Concrete	11.60	Girder	1	1	5.10
913	156	3	13	8	31.6	103	13	20.8	Concrete	5.00	Girder	1	1	4.90
914	156	4	13	8	54.6	103	13	28.6	Bailey	81.00	Truss	4	1	5.60
915	156	5	13	9	25.1	103	14	11.8	Concrete	16.30	Girder	1	1	4.70
916	156	6	13	10	10.3	103	14	37.9	Concrete	4.00	Girder	1	1	5.00
917	156	7	13	10	57.8	103	15	39.8	Concrete	5.00	Girder	2	1	4.74
918	156	8	13	11	40.8	103	16	10.3	Concrete	4.30	Girder	1	1	4.20
919	156	9	13	12	33.4	103	17	38.9	Bailey	15.50	Truss	1	1	6.10
920	156A	1	13	8	22.7	103	12	52.8	Concrete	26.02	Girder	5	1	5.60
921	156A	2	13	9	46	103	11	21.4	Concrete	16.00	Girder	2	1	5.54
922	156A	3	13	10	16.7	103	9	59.2	Concrete	7.00	Girder	2	1	4.60
923	156A	4	13	10	39.2	103	9	4	Concrete	25.00	Girder	5	1	4.00
924	156A	5	13	10	41	103	7	53.9	Concrete	15.00	Girder	3	1	4.00
925	156C	1	13	28	11.4	103	3	7.1	Concrete	3.43	Slab	1	1	4.50
926	156C	2	13	28	15.1	103	4	25.2	Concrete	3.90	Slab	1	1	5.13
927	156C	3	13	28	11.9	103	4	51.3	Concrete	5.00	Slab	1	1	4.09
928	156C	4	13	28	18.3	103	6	15.1	Concrete	5.40	Slab	1	1	5.20
929	156C	5	13	28	23.7	103	7	0	Concrete	7.03	Slab	1	1	5.04
930	156C	6	13	28	31.3	103	7	47.3	Concrete	4.10	Slab	1	1	5.24
931	156C	7	13	28	44.2	103	8	38.8	Concrete		Girder	1	2	8.00
932	156C	8	13	28	55.5	103	9	29.4	Concrete	4.02	Slab	1	1	4.98
933	156C	9	13	28	52.6	103	9	42.5	Concrete	4.10	Slab	1	1	5.00
934	156C	10	13	28	41.6	103	10	28.1	Concrete	4.01	Slab	1	1	5.02
935	156C	11	13	28	26.8	103	10	41.3	Concrete	18.00	Slab	3	1	4.04
936	156C	12	13	28	11.9	103	11	20.9	Concrete	4.19	Slab	1	1	4.03
937	156C	13	13	27	47.3	103	11	49.8	Constructing			0	1	0.00
938	156D	1	13	32	15.9	103	1	56	Concrete	6.00	Slab	1	2	5.93
939	156D	2	13	32	26.1	103	2	51.9	Concrete	4.00	Slab	1	2	5.97
940	156D	3	13	32	39.1	103	3	51	Concrete	6.15	Slab	1	2	5.96
941	156D	4	13	32	56.3	103	4	44.6	Concrete	6.80	Slab	1	2	5.91
942	156D	5	13	33	19.3	103	6	1.9	Wood	12.20	Girder	6	1	4.11
943	156D	6	13	33	22.2	103	6	30.9	Wood	10.20	Girder	5	1	4.01
944	156D	7	13	33	32.6	103	6	54.5	Wood	5.40	Girder	2	1	4.20
945	156D	8	13	33	38.9	103	7	4.8	Concrete	8.60	Slab	3	1	4.12
946	156D	9	13	33	48.2	103	7	11.8	Bailey	36.00	Truss	3	1	5.29
947	157A	1	12	57	52.6	103	14	55.7	Concrete	5.70	Girder	4	1	4.12
948	157B	1	13	2	3.9	103	15	56.1	Concrete	10.10	Girder	1	1	4.43
949	157B	2	13	1	15.7	103	15	6.4	Concrete	8.40	Slab	2	1	4.46
950	157C	1	13	3	48.2	103	12	57.3	Concrete	6.30	Girder	2	1	4.23
951	157C	2	13	3	44.4	103	12	15.6	Concrete	12.83	Girder	4	1	4.50
952	157C	3	13	1	50	103	13	36.2	Concrete	6.80	Slab	1	1	4.66
953	159B	1	13	19	58.6	103	0	5.2	Concrete	3.94	Slab	1	1	4.07
954	159B	2	13	20	52.9	102	54	20.2	Concrete	5.50	Slab	1	1	4.99
955	159B	3	13	19	58.2	102	53	57.8	Concrete	5.60	Slab	1	1	4.98
956	159B	4	13	19	19.1	102	53	29	Concrete	5.71	Slab	1	1	5.07
957	159B	5	13	19	4.1	102	53	15	Concrete	5.65	Slab	1	1	5.03

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
958	159B	6	13	18	4.8	102	52	40.7	Concrete	5.60	Slab	1	1	5.01
959	159B	7	13	16	8.5	102	52	11.7	Concrete	5.80	Slab	1	1	5.03
960	159B	8	13	15	28.9	102	52	28.6	Bailey	37.20	Truss	1	1	9.75
961	159B	9	13	13	52.7	102	52	29.3	Concrete	8.03	Slab	1	2	11.74
962	159B	10	13	13	28.6	102	51	24.7	Concrete	8.03	Slab	1	2	10.94
963	159B	11	13	12	48.5	102	51	9.1	Concrete	13.00	Slab	1	2	10.94
964	159B	12	13	11	57.1	102	50	32.6	Concrete	13.05	Slab	1	2	11.04
965	159B	13	13	11	17.8	102	50	11.1	Concrete	8.00	Slab	1	2	10.98
966	159D	1	13	37	29.8	102	40	37.9	Concrete	13.05	Slab	1	2	12.00
967	159D	2	13	37	9.3	102	40	37.4	Concrete	39.00	Slab	3	2	12.00
968	159D	3	13	35	32.4	102	40	25.8	Concrete	52.00	Slab	4	2	12.03
969	159D	4	13	36	16.9	102	40	35.6	Concrete	26.00	Slab	2	2	12.00
970	159D	5	13	35	26.2	102	40	23.5	Concrete	13.00	Slab	1	2	12.00
971	159D	6	13	33	16.1	102	26	42.9	Concrete	52.00	Slab	4	2	12.00
972	258D	1	13	45	49.1	102	44	15.5	Constructing			0	1	0.00
973	260	1	11	50	56.2	104	59	39.8	Concrete	52.76	Girder	4	2	7.06
974	261	1	11	50	3.8	104	57	17.8	Concrete	9.80	Slab	2	2	6.00
975	261	2	11	46	17.2	104	54	37.2	Concrete	10.00	Slab	2	2	6.00
976	261	3	11	45	21.1	104	54	36.5	Concrete	19.87	Slab	4	2	6.00
977	261	4	11	44	39.3	104	54	43.3	Concrete	19.92	Slab	4	2	6.00
978	261	5	11	44	11.6	104	54	45.3	Concrete	10.00	Slab	2	2	6.00
979	261	6	11	43	3.6	104	54	6.8	Concrete	9.80	Girder	2	2	6.00
980	261	7	11	43	2.2	104	52	2.3	Concrete	45.00	Girder	3	2	7.00
981	264C	1	12	36	50.4	105	4	27.8	Concrete	11.00	Slab	2	2	6.12
982	264C	2	12	42	30.4	105	7	38.3	Wood	17.00	Girder	5	1	4.00
983	264C	3	12	49	52.9	105	9	38.8	Wood	25.00	Girder	2	1	4.00
984	264D	1	12	57	6.3	104	54	4.8	Concrete	30.00	Girder	3	2	6.10
985	264D	2	12	57	4.6	104	55	34.8	Concrete	24.00	Girder	2	2	5.60
986	264E	1	12	57	0.6	104	34	14.5	Concrete	14.00	Slab	2	2	5.50
987	264E	2	13	13	12.7	104	45	38.6	Concrete	11.00	Slab	1	1	5.30
988	264E	3	13	13	30.2	104	45	45.7	Concrete	11.00	Slab	1	1	5.30
989	264E	4	13	16	42.7	104	44	59.7	Concrete	12.00	Girder	1	2	7.00
990	264E	5	13	17	16.1	104	45	20.6	Concrete	15.00	Girder	1	2	7.00
991	264E	6	13	17	56.1	104	45	44.2	Constructing			0	1	0.00
992	264E	7	13	18	30	104	46	6.1	Concrete	36.00	Girder	3	2	8.00
993	264E	8	13	21	24	104	46	28.9	Concrete	15.00	Girder	1	2	7.00
994	264E	9	13	21	32.3	104	46	29.8	Concrete	45.00	Girder	3	2	7.00
995	265	1	12	56	7.3	104	30	50	Wood	26.00	Girder	1	1	3.50
996	265B	1	13	3	40.3	104	16	59.4	Concrete	13.10	Slab	3	1	4.00
997	265B	2	13	3	18.1	104	16	26.4	Concrete	13.10	Slab	3	1	4.00
998	265C	1	13	8	50.2	104	7	44.7	Concrete	20.00	Slab	1	2	7.70
999	265C	2	13	8	5.6	104	7	24.8	Concrete	16.50	Girder	3	1	5.20
1000	265C	3	13	7	5.7	104	7	30	Concrete	10.90	Girder	3	2	5.90
1001	265C	4	13	5	55.1	104	7	5.7	Wood	40.00	Girder	6	1	3.80
1002	265E	1	13	13	57.3	103	58	30	Concrete	8.50	Girder	2	1	4.45
1003	266	1	13	10	38.1	104	22	31.2	Concrete	20.00	Girder	3	1	5.30
1004	266	2	13	13	50.1	104	23	2.1	Concrete	18.00	Girder	2	1	5.50
1005	266	3	13	17	53.5	104	25	22.2	Bailey	21.00	Truss	1	1	5.80

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
1006	266	4	13	22	26.8	104	28	9	Concrete	32.00	Girder	5	2	5.90
1007	266C	1	13	27	30.8	103	56	16.4	Concrete	15.30	Girder	5	2	6.40
1008	266C	2	13	35	42.9	103	57	42.7	Bailey	30.60	Truss	3	2	8.02
1009	266C	3	13	36	28	103	58	39.9	Concrete	10.00	Slab	1	2	9.00
1010	266D	1	13	31	39.6	103	52	47.1	Concrete	18.00	Slab	4	2	5.30
1011	266E	1	13	39	49.5	103	40	21.6	Concrete	20.00	Slab	4	1	5.20
1012	266E	2	13	44	56.6	103	41	14.3	Concrete	25.00	Slab	5	1	5.00
1013	266E	3	13	45	2.1	103	41	19.5	Concrete	8.30	Slab	2	1	4.00
1014	266E	4	13	47	56	104	0	19.2	Concrete	30.00	Girder	2	2	7.10
1015	266E	5	13	47	53.9	104	0	29.9	Concrete	22.00	Slab	2	2	7.20
1016	266F	1	13	44	27.4	103	38	57.9	Concrete	10.00	Girder	1	2	6.20
1017	267	1	13	26	15	103	43	46.7	Steel	20.00	Girder	4	1	5.00
1018	267	2	13	21	58	103	47	13.3	Concrete	10.00	Slab	2	2	6.00
1019	268A	1	13	37	43.1	103	16	57	Concrete	10.00	Slab	2	1	5.00
1020	268A	2	13	40	28.8	103	18	22.9	Concrete	10.00	Slab	2	1	5.00
1021	268A	3	13	40	57	103	18	36.6	Concrete	10.00	Slab	2	1	5.00
1022	268A	4	13	43	9.4	103	19	37.6	Concrete	10.00	Slab	2	1	5.00
1023	268A	5	13	44	4.8	103	20	6.5	Concrete	10.00	Slab	2	1	5.00
1024	268B	1	13	49	12.9	103	7	29.9	Concrete	16.50	Slab	3	1	5.00
1025	268B	2	13	50	41.5	103	7	40	Concrete	16.50	Slab	3	1	5.00
1026	269	1	13	34	35.5	103	25	1.6	Concrete	8.00	Girder	1	2	6.20
1027	270	1	11	58	16.9	105	26	35.4	Concrete	16.40	Girder	2	2	8.00
1028	270	2	11	57	54.3	105	26	3.4	Concrete	35.49	Girder	6	1	4.38
1029	270	3	11	57	27.4	105	25	18	Concrete	8.15	Girder	1	1	5.80
1030	270	4	11	56	55	105	24	2.9	Concrete	34.03	Girder	3	1	5.63
1031	270	5	11	56	48.6	105	23	37.6	Concrete	20.27	Girder	2	1	6.18
1032	270	6	11	56	25.9	105	22	21.3	Concrete	19.87	Girder	4	1	6.14
1033	270	7	11	56	15.3	105	20	3.9	Concrete	14.60	Girder	4	1	3.98
1034	270	8	11	56	23.5	105	18	44.2	Steel	72.95	Girder	5	1	4.60
1035	270	9	11	56	44	105	16	13.2	Bailey	45.70	Truss	3	1	5.50
1036	270	10	11	57	19.4	105	12	49.6	Bailey	150.00	Truss	6	1	5.20
1037	270	11	11	57	24.7	105	11	25.7	Concrete	8.40	Girder	2	1	4.62
1038	270	12	11	57	5.9	105	10	58.8	Concrete	14.60	Girder	3	1	5.00
1039	270	13	11	56	52.9	105	10	52.9	Concrete	9.80	Girder	2	1	5.30
1040	270	14	11	55	23	105	8	51.8	Bailey	36.00	Truss	3	1	5.20
1041	270	15	11	54	2.2	105	7	47.6	Steel	8.10	Girder	1	1	4.70
1042	270	16	11	53	26.3	105	7	37.6	Steel	7.10	Girder	1	1	4.50
1043	270	17	11	52	39	105	7	32.8	Concrete	9.60	Slab	2	1	4.98
1044	270	18	11	52	27.3	105	7	29.6	Bailey	20.00	Girder	2	1	5.26
1045	270	19	11	51	31.3	105	0	15.5	Concrete	107.87	Girder	6	2	9.00
1046	277	1	12	9	32.6	105	26	2.6	Concrete	10.00	Slab	2	1	4.96
1047	277	2	12	12	36.4	105	27	15.6	Concrete	9.24	Slab	2	1	4.01
1048	277	3	12	14	17.4	105	27	10.6	Bailey	27.00	Truss	1	1	5.10
1049	277	4	12	15	14.5	105	26	14.5	Bailey	18.00	Truss	1	1	5.10
1050	279	1	12	1	5.4	105	28	7.9	Concrete	71.89	Girder	6	1	5.06
1051	279	2	12	1	41.9	105	28	24	Concrete	35.93	Girder	3	1	5.04
1052	279	3	12	1	59.1	105	28	35.1	Concrete	87.92	Girder	5	1	5.06
1053	279	4	12	2	47.5	105	29	0.1	Concrete	40.86	Girder	4	1	5.07

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
1054	279	5	12	3	17.1	105	29	15.9	Concrete	29.89	Girder	3	1	4.96
1055	279	6	12	4	12.2	105	29	42.9	Concrete	90.00	Girder	5	1	4.50
1056	279	7	12	9	19.7	105	31	42.9	Steel	129.07	Girder	9	1	7.03
1057	279	8	12	11	13.4	105	31	15.6	Concrete	83.74	Girder	7	1	5.00
1058	279	9	12	13	40.4	105	31	45.3	Concrete	71.81	Girder	6	1	5.00
1059	311	1	11	13	24.7	105	21	4.9	Concrete	96.00	Girder	5	2	10.60
1060	312	1	10	57	58.6	105	25	21.8	Constructing			0	1	0.00
1061	312B	1	10	58	11.2	105	33	14.9	Concrete	24.00	Girder	2	2	7.00
1062	313	1	11	10	4.2	105	31	35.6	Concrete	14.70	Girder	2	1	4.96
1063	313	2	11	10	39	105	31	8.1	Concrete	15.12	Girder	1	2	7.00
1064	313	3	11	11	31.6	105	30	5.2	Concrete	12.10	Girder	1	2	7.00
1065	313	4	11	13	44.7	105	28	16	Concrete	15.10	Girder	1	2	7.00
1066	313	5	11	15	0.8	105	24	40.6	Concrete	11.50	Girder	2	1	5.65
1067	313A	1	11	15	20.6	105	28	12.6	Concrete	9.00	Slab	2	1	4.00
1068	314	1	11	5	35.5	105	43	55.2	Concrete	30.25	Slab	6	1	4.98
1069	314B	1	11	4	38.5	105	46	50.9	Constructing			0	1	0.00
1070	314C	1	11	4	41.9	105	48	10.6	Bailey	69.00	Truss	3	1	5.40
1071	314C	2	10	59	21.8	105	50	2.8	Concrete	75.00	Girder	5	2	7.00
1072	314D	1	10	51	36	105	55	42.9	Bailey	21.32	Truss	3	1	5.44
1073	315	1	11	9	13.9	105	45	38	Concrete	7.00	Slab	1	2	4.50
1074	315	2	11	13	13.9	105	43	26.5	Concrete	48.00	Girder	4	2	7.00
1075	315	3	11	14	57.4	105	43	41.6	Concrete	7.00	Slab	1	2	4.50
1076	315	4	11	17	53.4	105	43	19.3	Concrete	36.00	Girder	3	2	7.00
1077	315	5	11	29	12.3	105	42	36.8	Concrete	36.00	Girder	3	2	7.00
1078	315	6	11	32	10.7	105	42	53.5	Constructing			0	1	0.00
1079	316A	1	10	59	5.5	106	6	47.8	Bailey	21.00	Truss	1	1	5.30
1080	317A	1	11	3	36.5	105	56	11.2	Concrete	5.00	Girder	2	2	7.94
1081	317B	1	11	4	7.9	105	58	54.1	Concrete	10.00	Girder	2	1	4.99
1082	317C	1	11	5	10.8	106	2	23.8	Concrete	10.00	Slab	2	1	5.00
1083	317C	2	11	6	21.6	106	3	0.4	Concrete	10.00	Slab	2	1	5.00
1084	371	1	12	2	20.2	105	32	40.5	Concrete	75.00	Girder	5	2	7.00
1085	371	2	12	6	10.1	105	32	51.9	Concrete	108.00	Girder	6	2	7.00
1086	371	3	12	7	48.2	105	33	42	Concrete	36.00	Girder	3	2	7.00
1087	371	4	12	12	33.2	105	32	43.6	Concrete	9.65	Girder	1	1	6.34
1088	371	5	12	17	31	105	35	25	Concrete	27.30	Slab	4	1	3.60
1089	371	6	12	17	32.7	105	37	27.6	Concrete	35.20	Girder	5	1	4.70
1090	371	7	12	16	39.9	105	38	49.5	Bailey	96.20	Truss	4	1	5.10
1091	371	8	12	14	57	105	47	30.2	Bailey	155.15	Truss	6	1	5.20
1092	371	9	12	15	9.6	105	52	25.7	Bailey	21.00	Truss	1	1	5.10
1093	371	10	12	15	19.8	105	55	12.6	Bailey	120.00	Truss	5	1	4.96
1094	371D	1	12	0	32.1	105	44	27.1	Bailey	48.20	Truss	2	1	5.10
1095	372A	1	11	49	37.3	106	18	59.3	Bailey	27.00	Truss	1	1	5.10
1096	372A	2	11	48	59.8	106	19	28.5	Bailey	27.00	Truss	1	1	5.10
1097	372A	3	11	46	9.3	106	20	15.4	Bailey	24.00	Truss	1	1	5.10
1098	372A	4	11	45	52.6	106	19	41.1	Bailey	12.00	Truss	1	1	5.10
1099	372A	5	11	44	24	106	20	37.9	Bailey	30.00	Truss	1	1	5.10
1100	373B	1	11	54	12.8	106	5	22.6	Concrete	9.00	Girder	1	1	3.70
1101	373C	1	11	53	14.2	106	10	32.8	Concrete	12.00	Girder	1	2	7.06

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
1102	373C	2	11	56	2.1	106	10	41.1	Concrete	24.00	Girder	2	2	7.00
1103	373C	3	11	56	51.4	106	8	30.4	Concrete	15.00	Girder	1	2	7.00
1104	373C	4	12	1	14.2	106	5	52.3	Concrete	14.80	Girder	1	2	7.00
1105	373C	5	12	2	53	106	2	24.7	Concrete	24.00	Girder	2	2	7.00
1106	373D	1	11	57	17.5	106	15	38.3	Constructing			0	1	0.00
1107	373D	2	11	56	56.9	106	15	22.7	Wood	12.50	Girder	1	1	3.50
1108	373D	3	11	56	35.2	106	15	2.9	Wood	10.00	Girder	1	1	3.50
1109	373D	4	11	56	18.7	106	14	48	Wood	8.00	Girder	1	1	2.50
1110	373D	5	11	56	1.1	106	13	41	Wood	10.50	Girder	1	1	4.50
1111	373D	6	11	55	59.8	106	13	29.6	Wood	24.00	Girder	1	1	4.50
1112	373D	7	11	55	51.7	106	12	14.1	Wood	8.00	Girder	1	1	3.50
1113	373D	8	11	55	50.9	106	12	3.8	Wood	5.60	Girder	1	1	3.80
1114	373D	9	11	55	48	106	11	39.2	Wood	8.30	Girder	1	1	4.50
1115	373D	10	11	55	47.2	106	11	33	Wood	9.20	Girder	1	1	3.50
1116	373D	11	11	55	45.7	106	11	19.3	Wood	6.00	Girder	1	1	3.70
1117	373D	12	11	55	43.7	106	10	59.2	Wood	9.00	Girder	1	1	4.50
1118	374	1	12	10	13.3	106	27	39.5	Bailey	9.14	Truss	1	1	5.50
1119	374	2	12	10	22.9	106	27	46.5	Bailey	48.85	Truss	3	1	5.56
1120	375	1	12	15	14.5	106	17	38.8	Concrete	12.00	Slab	2	1	5.40
1121	375	2	12	14	23.7	106	7	5.8	Wood	16.50	Girder	1	1	3.00
1122	375	3	12	14	20	106	7	1.2	Wood	7.50	Girder	1	1	3.50
1123	375	4	12	14	26.3	106	6	10.1	Wood	10.00	Girder	1	1	2.80
1124	375	5	12	14	13.5	105	59	4.1	Concrete	84.37	Girder	6	2	8.00
1125	377	1	12	29	52.1	106	1	1.9	Steel	37.50	Girder	3	2	5.30
1126	377	2	12	30	39.3	106	0	56.9	Steel	51.00	Girder	3	2	5.30
1127	377	3	12	34	11.4	106	1	19.9	Bailey	45.00	Truss	3	2	5.30
1128	377	4	12	37	0.9	106	1	19.3	Bailey	91.00	Girder	11	2	5.30
1129	377	5	12	39	38.1	106	0	56.7	Bailey	60.00	Truss	3	2	5.30
1130	377	6	12	40	48.5	106	1	2.3	Bailey	18.00	Truss	1	2	5.30
1131	377	7	12	41	32.7	106	1	3.3	Steel	35.00	Girder	3	2	5.35
1132	377	8	12	42	24.1	106	0	47	Bailey	18.00	Truss	3	2	4.60
1133	377	9	12	42	55.9	106	0	34.2	Steel	32.80	Girder	4	2	5.40
1134	377	10	12	43	41.9	106	0	3	Steel	64.20	Girder	5	2	5.90
1135	377	11	12	44	56.4	105	59	10.9	Steel	36.00	Girder	3	2	5.40
1136	377	12	12	45	19.2	105	58	50.5	Bailey	36.00	Truss	5	2	4.65
1137	378	1	13	58	11.8	106	10	24.1	Concrete	13.00	Girder	1	2	7.00
1138	378	2	13	59	47.9	106	11	36.3	Concrete	36.00	Girder	3	2	7.00
1139	378	3	14	2	10.9	106	14	42.1	Concrete	12.00	Girder	1	2	7.00
1140	378	4	14	3	3.5	106	16	7.8	Concrete	12.00	Girder	1	2	11.00
1141	378	5	14	6	44.5	106	19	17.6	Concrete	24.00	Girder	2	2	7.00
1142	378	6	14	6	50.1	106	20	19.1	Concrete	12.00	Girder	1	2	7.00
1143	378	7	14	6	45.5	106	21	19.9	Concrete	12.00	Girder	1	2	7.00
1144	380	1	11	43	40	104	59	24.1	Concrete	109.00	Girder	5	2	8.25
1145	380	2	11	43	6.3	104	58	55.7	Constructing			0	1	0.00
1146	380	3	11	41	14.5	104	58	6.7	Concrete	11.00	Slab	3	2	7.16
1147	380	4	11	39	53.9	104	57	53.5	Concrete	12.33	Girder	3	2	7.00
1148	380	5	11	39	29.3	104	57	49.1	Concrete	18.00	Girder	1	2	7.84
1149	380	6	11	38	48.1	104	57	24.6	Constructing			0	1	0.00

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
1150	380	7	11	37	29.9	104	57	7.2	Constructing			0	1	0.00
1151	380	8	11	35	40.6	104	57	9.7	Concrete	27.10	Slab	3	2	8.02
1152	380	9	11	35	6	104	57	15.7	Concrete	11.90	Girder	3	2	8.10
1153	380	10	11	33	59.1	104	57	44.8	Concrete	9.40	Girder	3	1	5.46
1154	380A	1	11	40	12.4	105	6	14.3	Bailey	27.00	Truss	2	1	5.20
1155	380A	2	11	38	39.7	105	6	15.5	Concrete	105.13	Girder	7	2	8.00
1156	381	1	11	45	39.2	105	1	20.1	Concrete	12.60	Girder	3	1	5.96
1157	381	2	11	46	39.5	105	1	31.7	Concrete	14.10	Girder	3	1	6.10
1158	381	3	11	47	21	105	1	11.6	Concrete	11.93	Girder	1	2	6.94
1159	381	4	11	49	47.7	105	1	22	Constructing			0	1	0.00
1160	382	1	11	33	43.6	105	7	2.9	Concrete	66.00	Girder	5	2	7.00
1161	383	1	11	43	32.5	105	2	54.5	Bailey	51.00	Truss	3	1	5.20
1162	383	2	11	43	32.6	105	3	7	Bailey	51.00	Truss	3	1	5.20
1163	383	3	11	43	30.3	105	3	23.1	Bailey	51.00	Truss	3	1	5.20
1164	383	4	11	43	50.6	105	5	50.9	Concrete	14.60	Girder	1	2	7.06
1165	383	5	11	43	15.6	105	8	6.2	Constructing			0	1	0.00
1166	383	6	11	43	11.8	105	8	19.6	Constructing			0	1	0.00
1167	383	7	11	43	6.7	105	9	12.8	Bailey	54.00	Truss	3	1	5.20
1168	383	8	11	43	8.2	105	8	35.2	Bailey	45.00	Truss	3	1	5.20
1169	383	9	11	43	8.7	105	9	25.3	Constructing			0	1	0.00
1170	387	1	11	35	49.8	105	35	10.1	Concrete	10.80	Girder	3	1	4.90
1171	387	2	11	36	0.3	105	35	10.4	Concrete	21.47	Slab	2	1	5.24
1172	387A	1	11	38	32	105	39	39.7	Concrete	5.00	Slab	1	1	3.60
1173	387A	2	11	39	54.3	105	36	40.7	Concrete	10.00	Slab	2	2	6.00
1174	1488	1	11	37	9.3	102	58	48	Concrete	10.15	Slab	1	2	8.81
1175	1488	2	11	43	58.5	103	5	31.3	Concrete	100.25	Girder	5	2	7.84
1176	1488	3	11	45	20.9	103	4	56.4	Concrete	100.25	Girder	5	2	7.82
1177	1488	4	11	46	4.3	103	3	49.3	Constructing			0	1	0.00
1178	1488	5	11	57	25.6	103	6	33.6	Bailey	48.00	Truss	2	1	6.22
1179	1551	1	12	17	52.2	103	6	4.7	Bailey	90.00	Truss	4	1	5.18
1180	1551	2	12	17	30.8	103	6	7.5	Wood	6.70	Girder	1	1	4.60
1181	1551	3	12	14	19.6	103	6	34	Wood	9.25	Girder	1	1	3.80
1182	1551	4	12	14	5.6	103	6	41.8	Wood	4.50	Girder	1	1	3.90
1183	1551	5	12	13	1.5	103	6	52.8	Wood	9.80	Girder	1	1	3.70
1184	1551	6	12	12	24.2	103	7	1.6	Wood	13.10	Girder	1	1	3.90
1185	1551	7	12	11	32.1	103	6	54.6	Wood	11.10	Girder	2	1	3.30
1186	1551	8	12	9	56.4	103	7	0.9	Wood	13.60	Girder	1	1	3.80
1187	1551	9	12	8	51.2	103	8	21	Wood	8.40	Girder	1	1	4.12
1188	1551	10	12	7	3.5	103	10	11.1	Wood	6.08	Girder	1	1	4.30
1189	1551	11	12	5	53.8	103	10	51	Wood	9.60	Girder	1	1	4.16
1190	1551	12	12	5	39.3	103	11	3.3	Wood	11.00	Girder	1	1	3.54
1191	1551	13	12	5	16	103	11	28.6	Wood	18.20	Girder	2	1	4.57
1192	2620	1	12	50	28.9	104	58	48.4	Concrete	24.00	Girder	2	1	5.90
1193	2620	2	12	52	20	105	2	7.2	Concrete	50.00	Girder	5	1	5.30
1194	2620	3	12	53	29.6	105	5	1.7	Concrete	12.00	Girder	1	2	7.00
1195	2620	4	12	54	57.4	105	7	21	Concrete	12.00	Girder	1	2	7.00
1196	2620	5	12	55	27.6	105	8	9.1	Concrete	44.00	Girder	4	2	7.00
1197	2620	6	12	55	47.9	105	10	5.8	Bailey	122.00	Truss	5	2	8.82

No.	Road No.	Bridge No.	North latitude			East longitude			Bridge type	Bridge Length (m)	Girder Type	Span	Lane	Width of Cross Sections (m)
			°	'	''	°	'	''						
1198	2624	1	13	18	29.9	105	1	3.4	Concrete	15.00	Girder	1	2	7.60
1199	2624	2	13	24	10.9	105	8	42.2	Concrete	50.00	Girder	3	2	8.40
1200	2624	3	13	30	44.4	105	11	34.2	Bailey	125.00	Truss	4	1	5.60
1201	2624	4	13	31	17.5	105	13	7.7	Concrete	45.00	Girder	3	2	7.00
1202	2646	1	13	45	49.4	105	24	11.8	Bailey	51.90	Truss	3	1	5.40
1203	2646	2	13	45	19.8	105	23	53.8	Bailey	19.00	Truss	1	1	5.40
1204	2646	3	13	41	11.6	105	17	27.6	Constructing			0	1	0.00
1205	2646	4	13	39	26.2	105	15	45.5	Constructing			0	1	0.00

Appendix C. List of the Reference Materials

No.	Title of the document	Document Form	Publication organization	Publication year
1	FLOOD DAMAGE ASSESSMENT 2011 (FINAL PROGRESS REPORT)	PDF	MPWT	2012
2	BRIDGE STANDARD DRAWING (DRAFT)	PDF/Auto CAD	MPWT	2011
3	National Strategic Development Plan 2009-2013	PDF	RGC	2009
4	Bridge Inspection Manual by AZ	PDF	AZ	2012
5	Monthly Bulletin of Statistics	PDF	MEF	2010
6	Road Numbering System 2009	PDF	MPWT	2009
7	Map data for whole province in Cambodia	JPEC	MPWT	2005
8	District topographic Map in Cambodia	Hard copy	MPWT	1996
9	As Built Drawing of Bridges	PDF/CAD	MPWT	
10	JICA Expert Road and Bridge Planning, Management of Road and Road Public Land Titles(1stDraft)	PDF	MPWT	2002
11	JICA Expert Road and Bridge Planning, Overloaded Vehicle Controlling in MPWT (Draft)	PDF	MPWT	2003
12	JICA Expert Road and Bridge Planning, Cambodia Bridge Improvement Plan Volume II, Proposal for the Next Bridge Improvement Project	PDF	MPWT	2003
13	JICA Expert Road and Bridge Planning, Cambodia National Budget and Road Budget	PDF	MPWT	2003
14	JICA Expert Road and Bridge Planning, GIS Road DATA	GIS data	MPWT	2003
15	Legal system about the site acquisition in Cambodia and the resettlement	Hard copy	JICA	2012
16	Basic Resettlement Procedures	Hard copy	MEF	2012
17	General Population Census of Cambodia 2008 Community Profile System	PDF	NIS	2010
18	Law on Forestry	Hard copy	MAFF	2002
19	Law on Fisheries	Hard copy	MAFF	2006
20	Law on Water Resource Management	Hard copy	MOE	2007
21	Sub-decree on Solid Waste Management	Hard copy	MOE	1999
22	Project List (Dec 2011)	PDF	MPWT	2011
23	IRITWG (May 2012)	PDF	MPWT	2012
24	Map of road improvement system 2012	PDF	MPWT	2012
25	Unit price of slope protection	PDF	MPWT	2010
26	Organization and functioning of the MPWT	Hard copy	MPWT	1998
27	Organization and functioning of the HEC	Hard copy	MPWT	2007
28	Organization and functioning of the RID	Hard copy	MPWT	2007
29	Seminar on bridge maintenance and road quality control bridge maintenance stats in Cambodia	PDF	MPWT,RID	2012
30	Technical Standard of Roads & Bridge Builds and Maintenance- art structure	Hard copy	MPWT	2012
31	Component B2 asset management technical capacity development cakh512 first annual report	Hard copy	Roughton intrrnational	2012
32	CAMBODIA Road Asset Management Project	PDF	WB	2008
33	Document Management Database USER Manual	Hard copy	MPWT	2012
34	Structure Inventory of Kandal province	Hard copy	DPWT	2012
35	Structure Inventory of Kampong Cham province	Hard copy	DPWT	2012

No.	Title of the document	Document Form	Publication organization	Publication year
36	Organizational chart of Kampong Cham province	Hard copy	DPWT	2012
37	List of officials of Kampong Cham province	Hard copy	DPWT	2012
38	ROYAL DECREE ON THE ESTABLISHMENT OF THE BOARD OF ENGINEERS CAMBODIA	Hard copy	MPWT	2012
39	Economy , trade and an investment environment in Cambodia	Hard copy	JETRO	2012
40	SEZ information	PDF	JETRO	2012
41	SEZ Map	PDF	JETRO	2012
42	Road Asset Management Project(RAMP) Component B2 Asset Management Technical Capacity Development CAKH512 Final Inception Report	PDF	MPWT	MPWT
43	Achieving Cambodia's Millennium Development Goal 2010	PDF	RGC	2010
44	National Poverty Reduction Strategy 2003-2005	PDF	council for social Development	2003

Appendix D. Traffic Count Survey Sheet

Count Station: ……Date: …… Time : ……

PK: ……Weather: ☐ Sunny ; ☐ Cloudy; ☐ Rainy; ☐ Heavy Rainy

GPS(WGS84): E= …… N= ……

Direction: from …… To ……

Supervisor: …… Surveyor: ……

Category	1	2	3	4	5	6	7	8	9	10	11
Type	Motorcycle	Motorcycle+ Trailer	Car+Taxi	4WD/Pick Up	Passenger Van&Minibus	Bus	Light Comercial&2 axles Truck	3 axles Truck	4&5 axles Truck	4,5,6&7 axles Truck Trailer	Ox Cart&Etan
Sample											
1st Quarter:15mn											
2nd Quarter:30mn											
3rd Quarter:45mn											
4th Quarter:00mn											
TOTAL 1 HOUR											

Appendix E. Environmental and Social Considerations

Table of Contents

1. PROJECT COMPONENTS

Table 1-1 List of Prioritized Bridges

Ser. No.	Road No.	Bridge No.	Bridge			Coordinate	
			Type	Length (m)	Width (cm)	North	East
1	11	2	Steel	79.90	630	N 11 23 23.3	E 105 19 58.6
2	11	3	Steel	79.50	630	N 11 23 58.1	E 105 20 25.1
3	70	1	Bailey	84.00	540	N 11 59 57.7	E 105 16 00.7
4	70	2	Bailey	75.00	436	N 11 59 34.6	E 105 15 50.9
5	73	4	Bailey	150.00	536	N 12 12 11.0	E 105 56 36.3
6	73	5	Bailey	30.00	515	N 12 12 38.9	E 105 56 57.4
7	73	6	Bailey	54.03	530	N 12 13 31.8	E 105 57 21.2
8	73	7	Bailey	42.00	534	N 12 15 01.8	E 105 57 35.9
9	73	8	Bailey	119.98	498	N 12 15 05.8	E 105 59 09.1
10	73	16	Bailey	150.94	509	N 12 26 56.3	E 106 01 51.3
11	277	3	Bailey	27.00	510	N 12 14 17.4	E 105 27 10.6
12	277	4	Bailey	18.00	510	N 12 15 14.5	E 105 26 14.5
13	279	7	Bailey	129.07	703	N 12 09 19.7	E 105 31 42.9
14	314C	1	Bailey	69.00	540	N 11 04 41.9	E 105 48 10.6
15	314D	1	Bailey	21.32	544	N 10 51 36.0	E 105 55 42.9
16	316A	1	Bailey	21.00	530	N 10 59 05.5	E 106 06 47.8
17	372A	1	Bailey	27.00	510	N 11 49 37.3	E 106 18 59.3
18	372A	2	Bailey	27.00	510	N 11 48 59.8	E 106 19 28.5
19	372A	3	Bailey	24.00	510	N 11 46 09.3	E 106 20 15.4
20	372A	4	Bailey	12.00	510	N 11 45 52.6	E 106 19 41.1
21	372A	5	Bailey	30.00	510	N 11 44 24.0	E 106 20 37.9
22	373B	1	Concrete	9.00	370	N 11 54 12.8	E 106 05 22.6
23	373D	1	None	None	None	N 11 57 17.5	E 106 15 38.3
24	373D	2	Wood	12.50	350	N 11 56 56.9	E 106 15 22.7
25	373D	3	Wood	10.00	350	N 11 56 35.2	E 106 15 02.9
26	373D	4	Wood	8.00	500	N 11 56 18.7	E 106 14 48.0
27	373D	5	Wood	10.50	450	N 11 56 01.1	E 106 13 41.0
28	373D	6	Wood	24.00	450	N 11 55 59.8	E 106 13 29.6
29	373D	7	Wood	8.00	350	N 11 55 51.7	E 106 12 14.1
30	373D	9	Wood	8.30	450	N 11 55 48.0	E 106 11 39.2
31	373D	10	Wood	9.20	350	N 11 55 47.2	E 106 11 33.0
32	373D	12	Wood	9.00	450	N 11 55 43.7	E 106 10 59.2
33	375	2	Wood	16.50	300	N 12 14 23.7	E 106 07 05.8
34	375	3	Wood	7.50	350	N 12 14 20.0	E 106 07 01.2
35	375	4	Wood	10.00	280	N 12 14 26.3	E 106 06 10.1
36	377	1	Steel	37.50	530	N 12 29 52.1	E 106 01 01.9
37	377	2	Steel	51.00	530	N 12 30 39.3	E 106 00 56.9
38	377	3	Bailey	45.00	530	N 12 34 11.4	E 106 01 19.9
39	377	4	Wood	91.00	530	N 12 37 00.9	E 106 01 19.3
40	377	5	Bailey	60.00	530	N 12 39 38.1	E 106 00 56.7
41	377	6	Bailey	18.00	530	N 12 40 48.5	E 106 01 02.3
42	377	7	Steel	35.00	535	N 12 41 32.7	E 106 01 03.3
43	377	8	Bailey	18.00	460	N 12 42 24.1	E 106 00 47.0
44	377	9	Steel	32.80	540	N 12 42 55.9	E 106 00 34.2
45	377	10	Steel	64.20	590	N 12 43 41.9	E 106 00 03.0
46	377	11	Steel	36.00	540	N 12 44 56.4	E 105 59 10.9
47	377	12	Bailey	36.00	465	N 12 45 19.2	E 105 58 50.5

Note: Bridge 373D-1 was collapsed.
Source: Study Team

2. ROUTE-SIDE SOCIO-ECONOMIC CONDITIONS

2.1 NR11 (Bridge No. 11-2/3)

1) Local Administration

Table 2-1 Local Administrations along the Route NR11

Bridge No.	Village	Commune	District	Province
Bridge 11-2	Ba Boang	Ba Boang	Peam Ro	Prey Veng
Bridge 11-3				

Source: Environmental and Social Study 2012

2) Population

Table 2-2 Population along the Route NR73

Bridge No.	Village	Total Families	Population	Family Size
Bridge 11-2	Ba Boang	579	2,656	4.6
Bridge 11-3				

Source: Village Profile December 2011

3) Living Conditions and Social Services

Table 2-3 Living Conditions and Social Services

Living Indicator	Description
Source of Light	Since no electricity supply, all families in Ba Boang village use battery as sources of light.
Source of Cooking	Firewood is main source of cooking.
Toilet Facility	19.3% (112 families) of the total families in Ba Boang village have access to latrine.
Water Use	No pipe water supply is available in Ba Boang village. Borehole and open well are major water sources for daily life water, drinking, cooking, washing and bathing. in the village.
Industry and Employment	Core economy is still based on agriculture. About 98% families in Ba Boang village are farmers. Main income sources are (i) selling surplus rice, (ii) selling pigs and poultry, and (iii) selling surplus vegetables. Common subsidiary occupations are (i) motorbike repairer, (ii) family-scale business, and (iii) construction worker.
Health Facility	No health facility was found around the bridges. There is a commune health center, Baboang Health Center, for serving local people's needs at commune level.
Education	Enrolment rate of primary school in the Ba Boang village is 100%. Illiteracy rate[1] for both sexes is 1.6%. There are 4 primary schools and 1 secondary school in Ba Baong commune. On the average basis, the distances from the middle of villages to primary school and secondary school are 0.1 and 1.5 km respectively.

Bridge No.	Village	Total Families	Surface water	Pipe water	Borehole	Open well
Bridge 11-2/3	Ba Boang	579	0	0	340	239

Source: Village Profile and Commune Profile December 2011

4) Transportation

[1] The illiteracy rate is calculated from the male and female population aged 15 and above.

2.2 NR70 (Bridge No. 70-1/2)

1) Local Administration

Table 2-4 Local Administrations along the Route NR70

Bridge No.	Village	Commune	District	Province
Bridge 70-1	Peam Khnong	Prek Krabao	Kang Meas	Kampong Cham
Bridge 70-2	Peam Khnong			
	Por Sala II			

Source: Environmental and Social Study 2012

2) Population

Table 2-5 Local Administrations along the Route NR70

Bridge No.	Village	Population	Families	Family Size
Bridge 70-1	Peam Khnong	989	247	4.0
Bridge 70-2	Peam Khnong			
	Por Sala II	939	207	4.5

Source: Village Profile December 2011

3) Living Conditions and Social Services

Table 2-6 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>About 52% families use electricity in Por Sala II village while Peam Khnong village is about 11% of families.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 70-1</td><td>Peam Khnong</td><td>247</td><td>26</td><td>138</td></tr>
<tr><td>Bridge 70-2</td><td>Por Sala II</td><td>207</td><td>107</td><td>100</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Less than 40% families use toilet in both villages.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 70-1</td><td>Peam Khnong</td><td>247</td><td>80</td><td>32.4%</td></tr>
<tr><td>Bridge 70-2</td><td>Por Sala II</td><td>207</td><td>65</td><td>38.6%</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>About 90% families use pipe water for daily life water, drinking, cooking, washing and bathing in both villages, and they also use boreholes as another water source.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 70-1</td><td>Peam Khnong</td><td>247</td><td>0</td><td>207</td><td>140</td><td>10</td></tr>
<tr><td>Bridge 70-2</td><td>Por Sala II</td><td>207</td><td>0</td><td>200</td><td>157</td><td>45</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 90% of the families in the Peam Khnong and Por Sala II villages are farmers. Therefore, main income sources are (i) selling surplus rice, (ii) selling pigs and poultry, and (iii) selling surplus vegetables.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridges. There is one commune health center, Prek Krabao Health Center, for serving local people’s needs at commune level.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school in the project area is 75.2%. Illiteracy rate for both sexes is 1.6%. There are 6 primary schools and 1 secondary school in Prek Krabao commune. On the average basis, the distances from the middle of villages to primary school and secondary school are the same at 0.5 km.</td></tr>
</table>

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.3 NR73 (Bridge No. 73-4/5/6/7/8/16)

1) Local Administration

Table 2-7 Local Administrations along the Route NR73

Bridge No.	Village	Commune	District	Province
The bridge 73-4	Kampong Raing	Seda	Dam Bae	Kampong Cham
	Hann Chey I	Hann Chey	Chhlong	Kratie
The bridge 73-5	San Dan			
The bridge 73-6	Chhlong	Chhlong		
The bridge 73-7	Hann Chey 4	Hann Chey		
The bridge 73-8	Kandal	Chhlong		
The bridge 73-16	Rokar Kandal II	Rokar Kandal	Kratie	

Source: Environmental and Social Study 2012

2) Population

Table 2-8 Population along the Route NR73

Bridge No.	Village	Total Families	Population	Family Size
Bridge 73-4	Kampong Raing	230	1,397	6.1
	Hann Chey I	359	1,936	5.4
Bridge 73-5	San Dan	408	2,039	5.0
Bridge 73-6	Chhlong	261	1,244	4.8
Bridge 73-7	Hann Chey 4	270	1,478	5.5
Bridge 73-8	Kandal	260	1,255	4.8
Bridge 73-16	Rokar Kandal II	589	2,794	4.7
Total		2,377	12,143	5.1

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile December 2011

3) Living Conditions

Table 2-9 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>There are electricity supplies for all villages where the bridges are located except for Kampong Raing village.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 73-4</td><td>Kampong Raing</td><td>230</td><td>0</td><td>230</td></tr>
<tr><td></td><td>Hann Chey I</td><td>359</td><td>195</td><td>164</td></tr>
<tr><td>Bridge 73-5</td><td>San Dan</td><td>408</td><td>347</td><td>61</td></tr>
<tr><td>Bridge 73-6</td><td>Chhlong</td><td>261</td><td>240</td><td>21</td></tr>
<tr><td>Bridge 73-7</td><td>Hann Chey 4</td><td>270</td><td>198</td><td>72</td></tr>
<tr><td>Bridge 73-8</td><td>Kandal</td><td>260</td><td>260</td><td>0</td></tr>
<tr><td>Bridge 73-16</td><td>Rokar Kandal II</td><td>589</td><td>493</td><td>96</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>All villages except for Kampong Raing village show high percentages to use toilet facility. High percentages of using latrine in the villages indicate better living standard and knowledge about basic health care in the villages.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 73-4</td><td>Kampong Raing</td><td>230</td><td>20</td><td>8.7</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>Living Indicator</td><td>Description</td></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>Hann Chey I</td><td>359</td><td>210</td><td>58.5</td></tr>
<tr><td>Bridge 73-5</td><td>San Dan</td><td>408</td><td>180</td><td>44.1</td></tr>
<tr><td>Bridge 73-6</td><td>Chhlong</td><td>261</td><td>180</td><td>69.0</td></tr>
<tr><td>Bridge 73-7</td><td>Hann Chey 4</td><td>270</td><td>220</td><td>81.5</td></tr>
<tr><td>Bridge 73-8</td><td>Kandal</td><td>260</td><td>208</td><td>80.0</td></tr>
<tr><td>Bridge 73-16</td><td>Rokar Kandal II</td><td>589</td><td>370</td><td>62.8</td></tr>
</table>
</td></tr>
<tr><td>Water Use</td><td>Pipe water is highly used in Kandal and Rokar Kandal II villages for daily life water, drinking, cooking, washing and bathing. For the other villages, surface water is mainly used.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 73-4</td><td>Kampong Raing</td><td>230</td><td>19</td><td>0</td><td>97</td><td>114</td></tr>
<tr><td></td><td>Hann Chey I</td><td>359</td><td>327</td><td>0</td><td>28</td><td>4</td></tr>
<tr><td>Bridge 73-5</td><td>San Dan</td><td>408</td><td>348</td><td>0</td><td>19</td><td>65</td></tr>
<tr><td>Bridge 73-6</td><td>Chhlong</td><td>261</td><td>160</td><td>0</td><td>40</td><td>61</td></tr>
<tr><td>Bridge 73-7</td><td>Hann Chey 4</td><td>270</td><td>137</td><td>0</td><td>93</td><td>40</td></tr>
<tr><td>Bridge 73-8</td><td>Kandal</td><td>260</td><td>0</td><td>101</td><td>160</td><td>100</td></tr>
<tr><td>Bridge 73-16</td><td>Rokar Kandal II</td><td>589</td><td>0</td><td>512</td><td>0</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. More than 90% families of the villages are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facilities were found around the bridges. There is a health center for each commune, Seda, Hann Chey, Chhlong and Rokar Kandal.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school and Illiteracy rates for both sexes are shown below.
<table>
<tr><th>District</th><th>Commune</th><th>Village</th><th>Enrolment rate</th><th>Illiteracy rate</th></tr>
<tr><td>Dam Bae</td><td>Seda</td><td>Kampong Raing</td><td>83%</td><td>0%</td></tr>
<tr><td>Chhlong</td><td>Hann Chey</td><td>Hann Chey I</td><td>100%</td><td>2.6%</td></tr>
<tr><td>Chhlong</td><td>Chhlong</td><td>Kandal</td><td>100%</td><td>0%</td></tr>
<tr><td>Kratie</td><td>Rokar Kandal</td><td>Rokar Kandal II</td><td>100%</td><td>0.3%</td></tr>
</table>
There are 17 primary schools, 5 secondary schools and a high school at commune level. On the average basis, the distance from the middle of villages to primary school and secondary school is less than 2 km.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Seda</td><td>11</td><td>2</td><td>0</td></tr>
<tr><td>Hann Chey</td><td>2</td><td>1</td><td>1</td></tr>
<tr><td>Chhlong</td><td>3</td><td>1</td><td>0</td></tr>
<tr><td>Rokar Kandal</td><td>1</td><td>1</td><td>0</td></tr>
</table>
</td></tr>
</table>

Source: Village Profile and Commune Profile December 2011

2.4 PR277 (Bridge No. 277-3/4)

1) Local Administration

Table 2-10 Local Administrations along the Route PR277

Bridge No.	Village	Commune	District	Province
Bridge 277-3	Tameung	Tuol Preah Khlaing	Stung Trang	Kampong Cham
Bridge 277-4	So Pheas	So Pheas		

Source: Environmental and Social Study 2012

2) Population

Table 2-11 Population along the RoutePR277

Bridge No.	Village	Total Families	Population	Family Size
Bridge 277-3	Tameung	202	921	4.6
Bridge 277-4	So Pheas	391	1601	4.1
Total		593	2,522	4.3

Source: Village Profile December 2011

3) Living Conditions

Table 2-12 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>Since no electricity supply, all families use battery as sources of lighting.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 277-3</td><td>Tameung</td><td>202</td><td>0</td><td>202</td></tr>
<tr><td>Bridge 277-4</td><td>So Pheas</td><td>391</td><td>0</td><td>391</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Few families use toilets in Tameung village and about 30% families use it in So Pheas village.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 277-3</td><td>Tameung</td><td>202</td><td>12</td><td>5.9</td></tr>
<tr><td>Bridge 277-4</td><td>So Pheas</td><td>391</td><td>115</td><td>29.4</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>No pipe water supply is available in the villages for daily life water, drinking, cooking, washing and bathing. Boreholes are major water sources in both villages.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 277-3</td><td>Tameung</td><td>202</td><td>0</td><td>0</td><td>172</td><td>30</td></tr>
<tr><td>Bridge 277-4</td><td>So Pheas</td><td>391</td><td>0</td><td>0</td><td>391</td><td>0</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 95% families in the villages are farmers. Main income sources are (i) selling surplus rice, and (ii) selling pigs and poultry. The other main income source includes seasonal labours.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridges. There is a commune health center in each Tuol Preah Khlaing and So Pheas commune.</td></tr>
<tr><td>Education</td><td>Enrolment rates of primary school in So Pheas and Tameung villages are 100% and 80% respectively. Illiteracy rates of both sexes are 0% and 7.2% for So Pheas and Tameung villages.
There are 5 primary schools and 2 secondary schools in Tuol Preah Khlaing and So Pheas communes. On the average basis, the distance from the middle of villages to primary school and secondary one is less than 1 km.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Tuol Preah Khlaing</td><td>4</td><td>1</td><td>0</td></tr>
<tr><td>So Pheas</td><td>1</td><td>1</td><td>0</td></tr>
</table></td></tr>
</table>

Source: Village Profile and Commune Profile December 2011

2.5 PR279 (Bridge No. 279-7)

1) Local Administration

Table 2-13 Local Administrations along the Route PR279

Bridge No.	Village	Commune	District	Province
Bridge 279-7	Hann Chey	Hann Chey	Kampong Siem	Kampong Cham

Source: Environmental and Social Study 2012

2) Population

Table 2-14 Population along the Route PR279

Bridge No.	Village	Total Families	Population	Family Size
Bridge 279-7	Hann Chey	325	1,616	4.9

Source: Village Profile December 2011

3) Living Conditions

Table 2-15 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>16% of the total families use electricity and the other families still use battery as sources of lighting in Hann Chey village.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 279-7</td><td>Hann Chey</td><td>325</td><td>53</td><td>272</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>35.4% (115 families) of the total families in the Hann Chey village have access to latrine.</td></tr>
<tr><td>Water Use</td><td>About 90% families use pipe water in the village for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 279-7</td><td>Hann Chey</td><td>325</td><td>0</td><td>290</td><td>0</td><td>0</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 90% of the families in Hann Chey villagers are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridge. There is one commune health center, Hann Chey Health Center, for serving local people’s needs at commune level.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school in Hann Chey village is 94%. Illiteracy level for both sexes is 0%. There is 1 primary school, 1 secondary school and 1 high school in Hann Chey commune. On the average basis, the distances from the middle of villages to primary, secondary, and high schools are 2, 0.1 and 0.1 km respectively.</td></tr>
</table>

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.6 PR372A (Bridge No. 372A-1/2/3/4/5)

1) Local Administration

Table 2-16 Local Administrations along the Route PR372A

Bridge No.	Village	Commune	District	Province
Bridge 372A-1	Chrey Leung	Choam Kravien	Memot	Kampong Cham
Bridge 372A-2	Mkhos			
Bridge 372A-2	Kravien Cheung			
Bridge 372A-4	Choam Kravien			
Bridge 372A-5	Daung			

Source: Environmental and Social Study 2012

2) Population

Table 2-17 Population along the Route PR372A

Bridge No.	Village	Total Families	Population	Family Size
Bridge 372A-1	Chrey Leung	105	382	3.6
Bridge 372A-2	Mkhos	108	459	4.3
Bridge 372A-2	Kravien Cheung	230	1,040	4.5
Bridge 372A-4	Choam Kravien	285	1,415	5.0
Bridge 372A-5	Daung	207	1,059	5.1
Total		935	4,355	4.7

Source: Village Profile December 2011

3) Living Conditions

Table 2-18 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>There are electricity supplies for most villages where the bridges are located except for Mkhos village.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 372A-1</td><td>Chrey Leung</td><td>105</td><td>30</td><td>75</td></tr>
<tr><td>Bridge 372A-2</td><td>Mkhos</td><td>108</td><td>0</td><td>108</td></tr>
<tr><td>Bridge 372A-2</td><td>Kravien Cheung</td><td>230</td><td>191</td><td>39</td></tr>
<tr><td>Bridge 372A-4</td><td>Choam Kravien</td><td>285</td><td>246</td><td>39</td></tr>
<tr><td>Bridge 372A-5</td><td>Daung</td><td>207</td><td>97</td><td>110</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Kravien Cheung village shows high percentage to use toilet facility. High percentages of using latrine in the villages indicate better living standard and knowledge about basic health care in the villages.
<table>
<tr><th>Bridge Name</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 372A-1</td><td>Chrey Leung</td><td>105</td><td>25</td><td>23.8</td></tr>
<tr><td>Bridge 372A-2</td><td>Mkhos</td><td>108</td><td>5</td><td>4.6</td></tr>
<tr><td>Bridge 372A-2</td><td>Kravien Cheung</td><td>230</td><td>130</td><td>56.5</td></tr>
<tr><td>Bridge 372A-4</td><td>Choam Kravien</td><td>285</td><td>65</td><td>22.8</td></tr>
<tr><td>Bridge 372A-5</td><td>Daung</td><td>207</td><td>37</td><td>17.9</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>No pipe water supply is available in the village. Borehole and open well are used for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 372A-1</td><td>Chrey Leung</td><td>105</td><td>0</td><td>0</td><td>105</td><td>0</td></tr>
<tr><td>Bridge 372A-2</td><td>Mkhos</td><td>108</td><td>0</td><td>0</td><td>38</td><td>70</td></tr>
</table></td></tr>
</table>

Living Indicator	Description
	Bridge 372A-3 | Kravien Cheung | 230 | 0 | 0 | 32 | 198 Bridge 372A-4 | Choam Kravien | 285 | 0 | 0 | 35 | 250 Bridge 372A-5 | Daung | 207 | 0 | 0 | 16 | 191
Industry and Employment	Core economy is still based on agriculture. More than 95% families in the villages are farmers.
Health Facility	No health facilities were found around the bridges. There is one commune health center, Choam Kravien Health Center, for serving local people's needs at commune level.
Education	Enrolment rates of primary school and Illiteracy level for both sexes are shown as follows.

District	Commune	Village	Enrolment rate	Illiteracy rate
Memot	Choam Kravien	Chrey Leung	100%	44.3%
		Mkhos	100%	47.0%
		Kravien Cheung	100%	22.4%
		Choam Kravien	58.9%	13.1%

There are 8 primary schools, 1 secondary school in the Choam Kravien commune. On the average basis, the distances from the middle of villages to primary school and secondary one are 1 and 5 km respectively.

Commune	Primary School	Secondary School	High School
Choam Kravien	8	1	0

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.7 PR373B (Bridge No. 373B-1)

1) Local Administration

Table 2-19 Local Administrations along the Route PR373B-1

Bridge No.	Village	Commune	District	Province
Bridges 373B-1	Chamkar Thmey	Koki	Memot	Kampong Cham

Source: Environmental and Social Study 2012

2) Population

Table 2-20 Population along the Route PR373B

Bridge No.	Village	Total Families	Population	Family Size
Bridge 373B-1	Chamkar Thmey	239	1,152	4.8

Source: Village Profile December 2011

3) Living Conditions

Table 2-21 Living Conditions and Social Services

Living Indicator	Description
Source of Light	36% of the total families use electricity and the other families still use battery as sources of lighting in Chamkar Thmey village.

Bridge No.	Village	Total Families	Electricity	Battery
Bridge 373B-1	Chamkar Thmey	239	87	152

Source of Cooking	Firewood is main source of cooking.
Toilet Facility	41% (98 families) of the total families in Chamkar Thmey village have access to latrine.

Bridge No.	Village	Total Families	Families using toilet	Percentage
Bridge 373B-1	Chamkar Thmey	239	98	41

<table>
<tr><td>Water Use</td><td>No pipe water supply is available in the village. Borehole and open well are used for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 373B-1</td><td>Chamkar Thmey</td><td>239</td><td>0</td><td>0</td><td>125</td><td>114</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 95% families in the Chamkar Thmey village are farmers who produce corn, mung bean, soy bean, or potato. Main income sources are selling these agricultural products. The other main income source includes seasonal labours.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridge. There is one commune health center, Kampoin Health Center, for serving local people’s needs at commune level.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school in the village is 85%. Illiteracy rate for both sexes is 9.3%.
There are 3 primary schools, 1 secondary school in the Koki commune. On the average basis, the distances from the middle of villages to primary and secondary schools are 1 and 4 km respectively.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Koki</td><td>3</td><td>1</td><td>0</td></tr>
</table></td></tr>
</table>

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.8 PR373D (Bridge No. 373D-1/2/3/4/5/6/7/9/10/12)

1) Local Administration

Table 2-22 Local Administrations along the Route PR373D

Bridge No.	Village	Commune	District	Province
Bridge 373D-1	Sa Art	Sre Char	Snuol	Kratie
	Sampov Loun	Cham Tamao	Memot	Kampong Cham
Bridge 373D-2				
Bridge 373D-3				
Bridge 373D-4				
Bridge 373D-5				
Bridge 373D-6	Kabas	Memorng		
Bridge 373D-7				
Bridge 373D-9				
Bridge 373D-10				
Bridge 373D-12				

Source: Environmental and Social Study 2012

2) Population

Table 2-23 Population along the Route PR372A

Bridge No.	Village	Total Families	Population	Family Size
Bridge 373D-1	Sa Art	601	2,576	4.3
Bridge 373D-1/2/3/4/5	Sampov Loun	309	1,426	4.6
Bridge 373D-6/7/9/10/12	Kabas	292	1,297	4.4
Total		1,202	5,299	4.4

Source: Village Profile December 2011

3) Living Conditions

Table 2-24 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>Since no electricity supply, the people use battery as the source of lighting.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 373D-1</td><td>Sa Art</td><td>601</td><td>0</td><td>601</td></tr>
<tr><td>Bridge 373D-1/2/3/4/5</td><td>Sampov Loun</td><td>309</td><td>0</td><td>309</td></tr>
<tr><td>Bridge 373D-6/7/9/10/12</td><td>Kabas</td><td>292</td><td>0</td><td>292</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Very few families use toilet facility in the villages.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 373D-1</td><td>Sa Art</td><td>601</td><td>48</td><td>0.08</td></tr>
<tr><td>Bridge 373D-1/2/3/4/5</td><td>Sampov Loun</td><td>309</td><td>52</td><td>0.17</td></tr>
<tr><td>Bridge 373D-6/7/9/10/12</td><td>Kabas</td><td>292</td><td>8</td><td>0.03</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>No pipe water supply is available in the village. Borehole and open well are used for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 373D-1</td><td>Sa Art</td><td>601</td><td>82</td><td>0</td><td>170</td><td>349</td></tr>
<tr><td>Bridge 373D-1/2/3/4/5</td><td>Sampov Loun</td><td>309</td><td>0</td><td>0</td><td>79</td><td>230</td></tr>
<tr><td>Bridge 373D-6/7/9/10/12</td><td>Kabas</td><td>292</td><td>0</td><td>0</td><td>241</td><td>51</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. More than 95% of families in the villages are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facilities were found around the bridges. There is a health center, Thmar Toteung Health Center, in Memorng commune for serving local people’s needs at commune level.</td></tr>
<tr><td>Education</td><td>Enrolment rates of primary school and Illiteracy level for both sexes are shown as follows.
<table>
<tr><th>District</th><th>Commune</th><th>Village</th><th>Enrolment rate</th><th>Illiteracy rate</th></tr>
<tr><td>Memot</td><td>Sre Char</td><td>Sa Art</td><td>87.6%</td><td>0.3%</td></tr>
<tr><td></td><td>Cham Tamao</td><td>Sampov Loun</td><td>100%</td><td>12.1%</td></tr>
<tr><td></td><td>Memorng</td><td>Kabas</td><td>70%</td><td>18.7%</td></tr>
</table>
There are 33 primary schools and 3 secondary schools in three communes. On the average basis, the distances from the middle of villages to primary and secondary schools are 1 and 5 km respectively.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Sre Char</td><td>15</td><td>1</td><td>0</td></tr>
<tr><td>Cham Tamao</td><td>13</td><td>1</td><td>0</td></tr>
<tr><td>Memorng</td><td>5</td><td>1</td><td>0</td></tr>
</table></td></tr>
</table>

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.9 PR375 (Bridge No. 375-2/3/4)

1) Local Administration

Table 2-25 Local Administrations along the Route PR375

Bridge No.	Village	Commune	District	Province
Bridge 375-2	Kroch	Damrei Phong	Chhlong	Kratie
Bridge 375-3				
Bridge 375-4				

Source: Environmental and Social Study 2012

2) Population

Table 2-26 Population along the Route PR372A

Bridge No.	Village	Total Families	Population	Family Size
Bridge 375-2/3/4	Kroch	141	625	4.4

Source: Village Profile December 2011

3) Living Conditions

Table 2-27 Living Conditions and Social Services

Living Indicator	Description
Source of Light	Since no electricity supply, the people use battery as the source of lighting.

Bridge No.	Village	Total Families	Electricity	Battery
Bridge 375-2/3/4	Kroch	141	0	141

Source of Cooking	Firewood is main source of cooking.
Toilet Facility	Very few families use toilet facility in the village.

Bridge No.	Village	Total Families	Toilet use	Percentage
Bridge 375-2/3/4	Kroch	141	4	2.8

Water Use	No pipe water supply is available in the village. Borehole and open well are used for daily life water, drinking, cooking, washing and bathing.

Bridge No.	Village	Total Families	Surface water	Pipe water	Borehole	Open well
Bridge 375-2/3/4	Kroch	141	4	0	70	67

Industry and Employment	Core economy is still based on agriculture. More than 95% of families in the villages are farmers.
Health Facility	No health facilities were found around the bridges. There is a health center, Kanh Chor Health Center, in Damrei Phong commune for serving local people's needs at commune level.
Education	Enrolment rate of primary school in the village is 59.4%. Illiteracy level for both sexes is 8.9%. There are 8 primary schools and 1 secondary school in Damrei Phong commune. On the average basis, the distances from the middle of village to primary and secondary schools are 0.1 and 10 km respectively.

Commune	Primary School	Secondary School	High School
Damrei Phong	8	1	0

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.10 PR377 (Bridge No. 377-1/2/3/4/5/6/7/8/9/10/11/12)

1) Local Administration

Table 2-28 Local Administrations along the Route PR377

Bridge No.	Village	Commune	District	Province
Bridge 377-1	Phsar Veng	Krokor	Kratie	Kratie
	Krokor			
Bridge 377-2				
Bridge 377-3	Thmar Kre Leu	Thmar Kre	Chet Borey	
	Sambok	Sambok		
Bridge 377-4	Kbal Chuor			
Bridge 377-5	Thom	Sandan	Sambo	
Bridge 377-6				
Bridge 377-7	Sandan			
Bridge 377-8				
Bridge 377-9	Samroang	Sambo		
Bridge 377-10	Cha Thnoal			
Bridge 377-11				
Bridge 377-12	Kaeng Prasat			

Source: Environmental and Social Study 2012

2) Population

Table 2-29 Population along the Route PR377

Bridge No.	Village	Total Families	Population	Family Size
Bridge 377-1	Phsar Veng	143	571	4.0
	Krokor	623	2,962	4.8
Bridge 377-2				
Bridge 377-3	Thmar Kre Leu	493	2,642	5.4
	Sambok	778	3,473	4.5
Bridge 377-4	Kbal Chuor	430	1,910	4.4
Bridge 377-5	Thom	331	1,599	4.8
Bridge 377-6				
Bridge 377-7	Sandan	456	1,804	4.0
Bridge 377-8				
Bridge 377-9	Samroang	87	411	4.7
Bridge 377-10	Cha Thnoal	191	913	4.8
Bridge 377-11				
Bridge 377-12	Kaeng Prasat	575	2,856	5.0
Total		4,107	19,141	4.7

Source: Village Profile December 2011

3) Living Conditions

Table 2-30 Living Conditions and Social Services

Living Indicator	Description
Source of Light	Only in two villages, Phsar Veng and Krokor, which are neighbouring to Kratie town, 90% and 83% families for each village use electricity. Another electrified village is Kaeng Prasat village where 59% families use electricity. The other villages are hardly electrified.

Bridge No.	Village	Total Families	Electricity	Battery

Living Indicator	Description

Bridge 377-1	Phsar Veng	143	126	17
Bridge 377-2	Krokor	623	518	105
Bridge 377-3	Thmar Kre Leu	493	5	488
	Sambok	778	0	778
Bridge 377-4	Kbal Chuor	430	0	430
Bridge 377-5	Thom	331	47	284
Bridge 377-6				
Bridge 377-7	Sandan	456	78	378
Bridge 377-8				
Bridge 377-9	Samroang	87	0	87
Bridge 377-10	Cha Thnoal	191	0	191
Bridge 377-11				
Bridge 377-12	Kaeng Prasat	575	338	237

Source of Cooking: Firewood is main source of cooking.

Toilet Facility: As same as use of electricity, Phsar Veng and Krokor villages show high percentages to use toilet facility. High percentages of using latrine in the villages indicate better living standard and knowledge about basic health care in the villages.

Bridge No.	Village	Total Families	Toilet use	Percentage
Bridge 377-1	Phsar Veng	143	102	71.3
Bridge 377-2	Krokor	623	397	63.7
Bridge 377-3	Thmar Kre Leu	493	92	18.7
	Sambok	778	239	30.7
Bridge 377-4	Kbal Chuor	430	38	8.8
Bridge 377-5	Thom	331	76	23.0
Bridge 377-6				
Bridge 377-7	Sandan	456	52	11.4
Bridge 377-8				
Bridge 377-9	Samroang	87	11	12.6
Bridge 377-10	Cha Thnoal	191	16	8.4
Bridge 377-11				
Bridge 377-12	Kaeng Prasat	575	153	26.6

Water Use: As same as use of electricity, Phsar Veng and Krokor villages show high percentages to use pipe water. Surface water, borehole and open well are used in the other villages for daily life water, drinking, cooking, washing and bathing.

Bridge No.	Village	Total Families	Surface water	Pipe water	Borehole	Open well
Bridge 377-1	Phsar Veng	143	0	102	0	0
Bridge 377-2	Krokor	623	0	397	65	130
Bridge 377-3	Thmar Kre Leu	493	0	0	0	97
	Sambok	778	0	0	0	182
Bridge 377-4	Kbal Chuor	430	0	0	93	30
Bridge 377-5	Thom	331	0	0	100	50
Bridge 377-6						
Bridge 377-7	Sandan	456	0	0	93	38
Bridge 377-8						
Bridge 377-9	Samroang	87	75	0	12	0
Bridge 377-10	Cha Thnoal	191	189	0	1	1
Bridge 377-11						

<table>
<tr><td>Living Indicator</td><td>Description</td></tr>
<tr><td></td><td>
<table>
<tr><td>Bridge 377-12</td><td>Kaeng Prasat</td><td>575</td><td>473</td><td>0</td><td>100</td><td>2</td></tr>
</table>
</td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 90% of the families are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the surveyed bridges. There are commune health centes for each commune, Krokor, Thmar Kre, Sambok, Sandan and Sambo, except for Sambok commune, for serving local people’s needs.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school and Illiteracy rates for both sexes are shown below.
<table>
<tr><th>District</th><th>Commune</th><th>Village</th><th>Enrolment rate</th><th>Illiteracy rate</th></tr>
<tr><td rowspan="2">Kratie</td><td rowspan="2">Krokor</td><td>Phsar Veng</td><td>66%</td><td>0%</td></tr>
<tr><td>Krokor</td><td>70%</td><td>0%</td></tr>
<tr><td rowspan="2">Chet Borey</td><td>Thmar Kre</td><td>Thmar Kre Leu</td><td>100%</td><td>0.9%</td></tr>
<tr><td rowspan="2">Sambok</td><td>Sambok</td><td>100%</td><td>0.3%</td></tr>
<tr><td>Kbal Chuor</td><td>77%</td><td>5.9%</td></tr>
<tr><td rowspan="3">Sambo</td><td rowspan="2">Sandan</td><td>Thom</td><td>74%</td><td>4.2%</td></tr>
<tr><td>Sandan</td><td>100%</td><td>0%</td></tr>
<tr><td rowspan="3">Sambo</td><td>Samroang</td><td>60%</td><td>0%</td></tr>
<tr><td>Cha Thnoal</td><td>80%</td><td>22.9%</td></tr>
<tr><td>Kaeng Prasat</td><td>100%</td><td>4.4%</td></tr>
</table>
There are 24 primary schools, 9 secondary schools, and 3 high schools at commune level. On the average basis, the distances from the middle of villages to primary, secondary and high schools are 1, 1, and 5 km respectively.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Krokor</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td>Thmar Kre</td><td>3</td><td>1</td><td>1</td></tr>
<tr><td>Sambok</td><td>7</td><td>1</td><td>0</td></tr>
<tr><td>Sandan</td><td>7</td><td>5</td><td>1</td></tr>
<tr><td>Sambo</td><td>5</td><td>1</td><td>1</td></tr>
</table>
</td></tr>
</table>

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

2.11 PR314C (Bridge No. 314C-1)

1) Local Administration

Table 2-31 Local Administrations along the Route PR314C

Bridge No.	Village	Commune	District	Province
Bridge 314C-1	Tarang Bal	Koy Trabaek	Svay Rieng	Svay Rieng

Source: Environmental and Social Study 2012

2) Population

Table 2-32 Population along the Route PR314C

Bridge No.	Village	Total Families	Population	Family Size
Bridge 314C-1	Tarang Bal	360	1,415	3.9

Source: Village Profile December 2011

3) Living Conditions

Table 2-33 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>About 73% families use electricity in Tarang Bal village.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 314C-1</td><td>Tarang Bal</td><td>360</td><td>262</td><td>98</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Tarang Bal village shows high percentage (79%) to use toilet facility. High percentages of using latrine in the villages indicate better living standard and knowledge about basic health care in the villages.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 314C-1</td><td>Tarang Bal</td><td>360</td><td>285</td><td>79</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>No pipe water supply is available in the village. Open well is used for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 314C-1</td><td>Tarang Bal</td><td>360</td><td>0</td><td>0</td><td>0</td><td>360</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 80% of families in the village are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridge. There is a commune health center in Koy Trabaek commune and a provincial hospital is also located nearby the village.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school in thevillage is 68.2%. Illiteracy level for both sexes is 1.9%.
There is only 1 primary school in Koy Trabaek commune. On the average basis, the distances from the middle of villages to primary school is 0.2 km.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Koy Trabaek</td><td>1</td><td>0</td><td>0</td></tr>
</table></td></tr>
</table>

Source: Village Profile and Commune Profile December 2011

2.12 PR314D (Bridge No. 314D-1)

1) Local Administration

Table 2-34 Local Administrations along the Route PR314D

Bridge No.	Village	Commune	District	Province
Bridge 314D-1	O	Thmey	Kampong Roa	Svay Rieng

Source: Environmental and Social Study 2012

2) Population

Table 2-35 Population along the Route PR314C

Bridge No.	Village	Total Families	Population	Family Size
Bridge 314D-1	O	263	987	3.8

Source: Village Profile December 2011

3) Living Conditions

Table 2-36 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>O village is electrified and 100% families use electricity in the village.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 314D-1</td><td>O</td><td>263</td><td>263</td><td>0</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Only 16% (42 families) of the total families in O village have access to latrine.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 314D-1</td><td>O</td><td>263</td><td>42</td><td>16</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>No pipe water supply is available in the village. Borehole is used for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 314D-1</td><td>O</td><td>263</td><td>0</td><td>0</td><td>263</td><td>0</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. More than 90% families in the village are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridge. There is a commune health center, Gnor Health Center in Thmey commune for serving local people’s needs at commune level.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school in the village is 100%. Illiteracy level for both sexes is 9.7%.
There are 3 primary schools and 1 secondary school in Thmey commune. On the average basis, the distances from the middle of village to primary and secondary schools are the same at 0.5 km.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Thmey</td><td>3</td><td>1</td><td>0</td></tr>
</table></td></tr>
</table>

Source: Village Profile and Commune Profile December 2011

2.13 PR316A (Bridge No. 316A-1)

1) Local Administration

Table 2-37 Local Administrations along the Route PR316A

Bridge No.	Village	Commune	District	Province
Bridge 316A-1	Bos	Me Sor Thngork	Chantrea	Svay Rieng

Source: Environmental and Social Study 2012

2) Population

Table 2-38 Population along the Route PR316A

Bridge No.	Village	Total Families	Population	Family Size
Bridge 316A-1	Bos	252	1,003	3.9

Source: Village Profile December 2011

3) Living Conditions

Table 2-39 Living Conditions and Social Services

<table>
<tr><th>Living Indicator</th><th>Description</th></tr>
<tr><td>Source of Light</td><td>Since no electricity supply, the families use battery as the source of lighting.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Electricity</th><th>Battery</th></tr>
<tr><td>Bridge 316A-1</td><td>Bos</td><td>252</td><td>0</td><td>252</td></tr>
</table></td></tr>
<tr><td>Source of Cooking</td><td>Firewood is main source of cooking.</td></tr>
<tr><td>Toilet Facility</td><td>Only 24.6% (62 families) of the total families in Bos village have access to latrine.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Toilet use</th><th>Percentage</th></tr>
<tr><td>Bridge 316A-1</td><td>Bos</td><td>252</td><td>62</td><td>24.6</td></tr>
</table></td></tr>
<tr><td>Water Use</td><td>No pipe water supply is available in the village. Borehole is used for daily life water, drinking, cooking, washing and bathing.
<table>
<tr><th>Bridge No.</th><th>Village</th><th>Total Families</th><th>Surface water</th><th>Pipe water</th><th>Borehole</th><th>Open well</th></tr>
<tr><td>Bridge 316A-1</td><td>Bos</td><td>252</td><td>0</td><td>0</td><td>239</td><td>0</td></tr>
</table></td></tr>
<tr><td>Industry and Employment</td><td>Core economy is still based on agriculture. About 95% of families in the village are farmers.</td></tr>
<tr><td>Health Facility</td><td>No health facility was found around the bridge. There is a commune health center, Me Sor Thngork Health Center in Me Sor Thngork commune for serving local people’s needs at commune level.</td></tr>
<tr><td>Education</td><td>Enrolment rate of primary school in the village is 100%. Illiteracy level for both sexes is 2.9%.
There are 3 primary schools, 1 secondary school and 1 high school in Me Sor Thngork commune. On the average basis, the distances from the middle of village to primary, secondary, and high schools are 2, 0.1, and 0.1 km respectively.
<table>
<tr><th>Commune</th><th>Primary School</th><th>Secondary School</th><th>High School</th></tr>
<tr><td>Me Sor Thngork</td><td>3</td><td>1</td><td>1</td></tr>
</table></td></tr>
</table>

Note: A reason why the sums in the tables are not equal to the total families is that families use multiple utilities or share them.

Source: Village Profile and Commune Profile December 2011

3. PRELIMINARY SCOPING

Table 3-1 Preliminary Scoping

	No.	Likely Impacts	Rating		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	[Pre-Construction Phase] Depending on the bridges, there could be temporary relocation or involuntary resettlement within and outside ROW caused by location of temporary bridges, diversions or material yards for construction works.
	2	The poor people	C-	D	[Pre-Construction Phase] As some houses in poor condition can be seen nearby area of the bridges depending on the bridges, there could be temporary relocation or involuntary resettlement within and outside ROW caused by location of temporary bridges, diversions or material yards for construction works.
	3	The indigenous and ethnic people	C-	D	There could be immigrants from Vietnam nearby the bridges depending on the locations.
	4	Local economy such as employment and livelihood, etc.	B+/-	B+	[Construction Phase] Depending on the bridges, some buildings, crops, trees could be cleared within and without ROW caused by location of temporary bridges, diversions or material yards for construction works. Fishery also can be affected at least temporality. The construction will demand for workers (especially unskilled), and it can provide a temporary boost for local employment. Local service sector can provide the construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
	5	Land use and utilization of local resources	B-	D	[Construction Phase] As the Study will recommend the bridges to be replaced and the construction activities do not seriously change land use, however, temporary change of land use is necessary for diversions or material yards for construction works.
	6	Water Usage or Water Rights and Rights of Common	B-	D	[Construction Phase] Depending on locations of the bridges, the construction works can temporally affect fishery or domestic use of river water around the bridges.

	No.	Likely Impacts	Rating		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	
	7	Existing social infrastructures and services	B-	C+	[Construction Phase] Depending on the bridges, some water supply pipes and communication cables are attached on the bridges, and the same kind of infrastructure, electric wires, street lamps are installed along the roads. These can be temporally relocated caused by setup of temporary bridges, diversions or material yards for construction works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility for hospitals and schools can be improved in neighborhood and region.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	As the Study will recommend the bridges to be replaced, no negative impacts on social institutions are expected.
	9	Misdistribution of benefit and damage	D	D	As the Study will recommend the bridges to be replaced, no misdistribution of benefit and damage are expected.
	10	Local conflict of interests	D	D	As the Study will recommend the bridges to be replaced, no local conflict of interests is expected.
	11	Cultural heritage	B-	D	[Construction Phase] There are no cultural heritages nearby the bridges. However, some monuments or temples can be seen nearby the bridges. They can be affected by the location of temporary bridges, diversions or material yards for construction works.
	12	Landscape	D	D	As the Study will recommend the bridges to be replaced, it does not seriously change or detract surrounding landscape.
	13	Gender	D	D	As the Study will recommend the bridges to be replaced, no negative impacts on gender are expected.
	14	Children's rights	D	D	As the Study will recommend the bridges to be replaced, no negative impacts to infringe on children's rights are expected.
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	[Construction Phase] As the bridges do not have large scale construction works and the local employment can be expected, no considerable influx of workers is expected. The risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas. However, the external workers could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	[Construction Phase] There is a possibility of accidents involving workers and the local people caused by operation of construction vehicles and equipment. It can temporally disturb their health and security.
Environme	17	Protected Areas	C-	D	[Construction Phase] If the bridges located in protected areas are selected, natural environment around the bridges can be affected by the construction activities.
	18	Flora, Fauna and Biodiversity	C-	D	[Construction Phase] If the bridges located in protected areas are selected, flora, fauna and biodiversity around the bridges can be affected by the construction activities.

	No.	Likely Impacts	Rating		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	
	19	Hydrological Situation	C-	D	Construction of diversions for the replacement of the bridges can affect water flow in rivers or flood plain.
	20	Topography and Geographical features	D	D	As the Study will recommend the bridges to be replaced, it does not seriously change the local topography and geological features.
	21	Soil Erosion	B-	D	[Construction Phase] Soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	As the Study will recommend the bridges to be replaced and the construction activities do not seriously change geological feature, no considerable negative impacts on groundwater are expected.
	23	Coastal Zone	D	D	As the bridges are not located on coastal zone, no negative impacts are expected.
Pollution	24	Air Pollution	B-	D	[Construction Phase] Exhaust gas and dust caused by operation of construction vehicles and equipment can temporally deteriorate air quality around the bridges.
	25	Water Pollution	B-	D	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate river water.
	26	Waste	B-	D	[Construction Phase] Disposal of the construction residue including demolished bridges (bailey bridges) is required for the replacement of the bridges. In case to build a construction site office, it temporally generates domestic wastes and night soil.
	27	Soil Contamination	C-	D	[Construction Phase] Unintentional considerable spilled fuel and oil from construction vehicles or equipment can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	[Construction Phase] The operation of construction vehicles and equipment can temporally increase levels of noise and vibration nearby the construction sites. [Operation Phase] The bailey bridges generate noise while vehicles pass, however, the noise can be decreased after the replacement of bailey bridges.
	29	Ground Subsidence	D	D	As the Study will recommend the bridges to be replaced, no activities to raise ground subsidence are expected.
	30	Offensive Odor	C-	D	[Construction Phase] Operation of construction vehicles, equipment and site offices can temporally generate offensive odor from exhaust gas, discharging water, or domestic waste.
	31	Bottom sediment	D	D	As the Study will recommend the bridges to be replaced and the construction activities do not seriously change bottom sediment.
Others	32	Accidents	B-	B-	[Construction Phase] There is a possibility of accidents involving workers and the local people caused by operation of construction vehicles and equipment. [Operation Phase] Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.

	No.	Likely Impacts	Rating		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	
	33	Trans boundary issues, Global Warming	D	D	As the Study will recommend the bridges to be replaced and construction areas/periods are limited, no negative impacts are expected on this item.

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

4. INVOLUNTARY RESETTLEMENT

Table 4-1 Buildings and Population in PAA

Ser. No.	Road No.	Sub No.	Residence	Commerce mixed	Workshop	Stall	Businesses	Public building	Other building	Total	Household	Population
1	11	2	0	0	0	0	0	0	0	0	0	0
2	11	3	0	0	0	0	0	0	0	0	0	0
3	70	1	1	0	0	0	0	0	0	1	1	3
4	70	2	12	21	0	0	0	0	0	33	33	119
5	73	4	9	15	0	0	0	1	0	25	38	144
6	73	5	0	0	0	0	0	0	0	0	0	0
7	73	6	0	0	0	0	0	0	0	0	0	0
8	73	7	0	0	0	0	0	0	0	0	0	0
9	73	8	4	11	0	0	0	0	0	15	15	78
10	73	16	2	0	0	0	1	1	0	4	2	10
11	277	3	0	0	0	0	0	0	0	0	0	0
12	277	4	0	0	0	0	0	0	0	0	0	0
13	279	7	17	5	1	0	0	1	1	25	22	114
14	372A	1	10	1	0	0	0	0	0	11	13	62
15	372A	2	7	0	0	0	0	0	0	7	9	35
16	372A	3	8	6	1	0	1	1	1	18	17	42
17	372A	4	3	0	0	1	1	0	0	5	5	21
18	372A	5	3	0	0	0	0	0	0	3	3	21
19	373B	1	0	0	0	0	0	0	0	0	0	0
20	373D	1	3	1	0	0	0	0	0	4	4	32
21	373D	2	0	0	0	0	0	0	0	0	0	0
22	373D	3	3	0	0	0	0	0	0	3	5	15
23	373D	4	0	0	0	0	0	0	0	0	0	0
24	373D	5	4	2	0	0	0	1	0	7	8	35
25	373D	6	0	0	0	0	0	0	0	0	0	0
26	373D	7	10	2	0	0	0	0	0	12	12	41
27	373D	9	0	0	0	0	0	0	0	0	0	0
28	373D	10	0	0	0	0	0	0	0	0	0	0
29	373D	12	4	0	0	0	0	0	0	4	4	18
30	375	2	0	0	0	0	0	0	0	0	0	0
31	375	3	7	0	0	0	0	0	0	7	7	28
32	375	4	0	0	0	0	0	0	0	0	0	0
33	377	1	16	22	0	0	2	0	0	40	46	114
34	377	2	18	15	0	0	0	0	1	34	40	112
35	377	3	3	1	0	0	0	0	0	4	5	23
36	377	4	5	3	0	0	0	1	0	9	12	44
37	377	5	23	2	0	0	0	0	0	25	25	130
38	377	6	9	1	1	0	0	0	0	11	10	44
39	377	7	24	1	0	0	0	0	0	25	30	100
40	377	8	5	0	0	0	0	0	0	5	10	40
41	377	9	8	2	0	0	0	0	0	10	16	62
42	377	10	8	0	0	0	0	0	0	8	10	54

Ser. No.	Road No.	Sub No.	Residence	Commerce mixed	Workshop	Stall	Businesses	Public building	Other building	Total	Household	Population
43	377	11	0	0	0	0	0	0	0	0	0	0
44	377	12	7	1	0	0	0	0	0	8	8	46
45	314C	1	1	4	0	29	0	1	1	36	5	26
46	314D	1	4	1	0	0	0	1	0	6	5	15
47	316A	1	12	3	0	0	0	1	0	16	15	75

Source: Environmental and Social Study 2012

5. IMPOVERISHED PEOPLE

Table 5-1 Living Conditions

Ser. No.	Road No.	Sub No.	Type of structure	Structure ownership	Land ownership	Source of light	Cooking fuel	Toilet in premises	Drinking water
1	11	2	-	-	-	-	-	-	-
2	11	3	-	-	-	-	-	-	-
3	70	1	Concrete house	Owner	Owner	City power	Firewood	Septic tank	Well
4	70	2	Wooden wall with zinc roof/tiled roof, Concrete house	Owner	Owner	City power Battery	Firewood	Septic tank	Pipe, Well
5	73	4	Wooden wall with zinc roof/thatch roof	Owner, Rent	Owner, Rent	Battery	Firewood	None	Surface water, Well
6	73	5	-	-	-	-	-	-	-
7	73	6	-	-	-	-	-	-	-
8	73	7	-	-	-	-	-	-	-
9	73	8	Wooden wall with zinc roof	Owner	Owner	City power	Firewood	Septic tank	Pipe
10	73	16	Wooden wall with zinc roof	Owner	Owner	City power Kerosene	Firewood	Septic tank	Pipe
11	277	3	-	-	-	-	-	-	-
12	277	4	-	-	-	-	-	-	-
13	279	7	Wooden wall with zinc roof/tiled roof	Owner, Rent	Owner, Rent	Generator Battery	Firewood LPG	Septic tank None	Pipe
14	372A	1	Wooden wall with zinc roof	Owner	Owner	Battery City power	Firewood	None	Well
15	372A	2	Wooden wall with zinc roof	Owner, Rent	Owner, Rent	Generator Candle Battery	Firewood	None	Well Bought
16	372A	3	Wooden wall with zinc roof	Rent	Rent	City power	Firewood	None	Well Bought
17	372A	4	Wooden wall with zinc roof	Rent	Rent	Battery	Firewood	None	Well
18	372A	5	Wooden wall with thatch roof	Owner	Owner	Battery	Firewood	None	Well
19	373B	1	-	-	-	-	-	-	-
20	373D	1	Wooden wall with zinc roof/tiled roof	Owner	Owner	Battery	Firewood	None	Well, Rain
21	373D	2	-	-	-	-	-	-	-
22	373D	3	Wooden wall with zinc roof/thatch roof	Owner	Owner	Battery	Firewood	None	Well
23	373D	4	-	-	-	-	-	-	-
24	373D	5	Wooden wall with zinc roof/tiled roof, Thatch/wooden leave with thatch roof	Owner, Rent	Owner, Rent	Battery Kerosene	Firewood	None, Septic tank	Well
25	373D	6	-	-	-	-	-	-	-
26	373D	7	Wooden wall with zinc roof/tiled roof	Owner, Rent	Owner, Rent	Battery	Firewood	None	Surface water, rain

Ser. No.	Road No.	Sub No.	Type of structure	Structure ownership	Land ownership	Source of light	Cooking fuel	Toilet in premises	Drinking water
27	373D	9	-	-	-	-	-	-	-
28	373D	10	-	-	-	-	-	-	-
29	373D	12	Wooden wall with zinc roof	Rent	Rent	Battery	Firewood	None	Surface water
30	375	2	-	-	-	-	-	-	-
31	375	3	Wooden wall with zinc roof/thatch roof	Owner, Rent	Owner, Rent	Battery City power	Firewood	None	Surface water
32	375	4	-	-	-	-	-	-	-
33	377	1	Wooden wall with zinc roof	Owner, Rent	Owner, Rent	City power	Firewood, Charcoal, LPG	None, Septic tank	Pipe
34	377	2	Wooden wall with zinc roof/tiled roof	Owner, Rent	Owner, Rent	City power	Firewood, Charcoal, LPG	None, Septic tank	Pipe
35	377	3	Wooden wall with zinc roof/tiled roof	Owner, Rent	Owner, Rent	Battery, Generator	Firewood, Charcoal	None	Bought
36	377	4	Wooden wall with zinc roof	Owner	Owner	Battery, Candle	Firewood	None	Bought
37	377	5	Wooden wall with zinc roof/thatch roof, Concrete house	Owner	Owner	Battery	Firewood, Charcoal	Septic tank, None	Bought
38	377	6	Wooden wall with zinc roof/tiled roof	Owner, Rent	Owner, Rent	City power, Battery	Firewood	Septic tank, None	Bought, Surface water
39	377	7	Wooden wall with zinc roof/tiled roof	Owner	Owner	City power, Battery	Firewood	None	Bought, Surface water
40	377	8	Wooden wall with zinc roof, Thatch/wooden leave with thatch roof	Owner	Owner	Battery	Firewood	None	Surface water, Well
41	377	9	Wooden wall with zinc roof/tiled roof	Owner	Owner	Battery	Firewood	Septic tank, None	Surface water
42	377	10	Wooden wall with zinc roof/thatch roof	Owner	Owner	City power	Firewood	None	Surface water
43	377	11	-	-	-	-	-	-	-
44	377	12	Wooden wall with zinc roof/tiled roof, Thatch/wooden leave with thatch roof	Owner	Owner	Generator Battery	Firewood	Septic tank, None	Surface water
45	314C	1	Wooden wall with zinc roof/tiled roof	Owner	Owner	City power	Firewood	Septic tank	Well
46	314D	1	Thatch/wooden leave with thatch roof	Owner	Owner	City power	Firewood	None	Well
47	316A	1	Wooden wall with zinc roof, Concrete house	Owner	Owner	Battery	Firewood	None, Septic tank	Well

Source: Environmental and Social Study 2012

6. MAJOR INCOME SOURCES OF LOCAL PEOPLE

Table 6-1 Major Income Sources

Ser. No.	Road No.	Sub No.	Income Source
1	11	2	-
2	11	3	-
3	70	1	Self-employed: shop
4	70	2	Self-employed: shop
5	73	4	Self-employed: shop, Fishing
6	73	5	-
7	73	6	-
8	73	7	-
9	73	8	Self-employed: Shop
10	73	16	Farming: Rice
11	277	3	-
12	277	4	-
13	279	7	Self-employed: Shop
14	372A	1	Farming: Cassava, Rubber
15	372A	2	Farming: Cassava
16	372A	3	Self-employed: Shop, Farming: Cassava
17	372A	4	Employed: Temporary, Farming: Rubber
18	372A	5	Farming: Cassava
19	373B	1	-
20	373D	1	Self-employed: Shop, Farming: Rice
21	373D	2	-
22	373D	3	Farming: Rice, Cassava
23	373D	4	-
24	373D	5	Farming: Cassava, Self-employed: Shop
25	373D	6	-
26	373D	7	Farming: Cassava, Employed: Temporary
27	373D	9	-
28	373D	10	-
29	373D	12	Farming: Cassava
30	375	2	-
31	375	3	Farming: Cassava
32	375	4	-
33	377	1	Self-employed: Shop
34	377	2	Self-employed: Shop, Motorcycle taxi driver
35	377	3	Farming: Cassava/Corn, Self-employed: Shop
36	377	4	Government Employee, Farming: Cassava
37	377	5	Self-employed: Shop, Farming: Cassava/ Rice
38	377	6	Self-employed: Shop, Farming: Cassava/Rice
39	377	7	Farming: Rice, Self-employed: Shop, Fishing
40	377	8	Farming: Rice, Fishing
41	377	9	Farming: Rice/Cassava, Self-employed: Shop
42	377	10	Farming: Rice , Employed: Temporary
43	377	11	-
44	377	12	Farming: Rice
45	314C	1	Self-employed: Shop, Government Employee
46	314D	1	Self-employed: Shop
47	316A	1	Farming: Rice, Self-employed: Shop, Worker, Government Employee

Source: Environmental and Social Study 2012

7. LAND USE AND UTILIZATION OF LOCAL RESOURCES

Table 7-1 Land Use in the PAAs

Ser. No.	Road No.	Sub No.	Residential area	Commercial area	Farm land	Shrub land	Wetland	Grass land	Public land	Other land	Total
1	11	2	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2	11	3	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3	70	1	30.8%	0.0%	0.0%	0.0%	0.0%	69.2%	0.0%	0.0%	100.0%
4	70	2	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
5	73	4	50.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	100.0%
6	73	5	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	0.0%	25.0%	100.0%
7	73	6	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
8	73	7	0.0%	0.0%	0.0%	75.0%	0.0%	0.0%	0.0%	25.0%	100.0%
9	73	8	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	100.0%
10	73	16	25.0%	12.5%	62.5%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
11	277	3	0.0%	0.0%	93.8%	0.0%	0.0%	6.3%	0.0%	0.0%	100.0%
12	277	4	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
13	279	7	75.0%	0.0%	12.5%	0.0%	0.0%	0.0%	12.5%	0.0%	100.0%
14	372A	1	25.0%	0.0%	67.5%	0.0%	0.0%	7.5%	0.0%	0.0%	100.0%
15	372A	2	32.5%	0.0%	50.0%	0.0%	0.0%	17.5%	0.0%	0.0%	100.0%
16	372A	3	68.8%	0.0%	0.0%	0.0%	0.0%	18.8%	0.0%	12.5%	100.0%
17	372A	4	47.5%	0.0%	52.5%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
18	372A	5	12.5%	0.0%	25.0%	51.3%	0.0%	11.3%	0.0%	0.0%	100.0%
19	373B	1	0.0%	0.0%	12.5%	0.0%	0.0%	87.5%	0.0%	0.0%	100.0%
20	373D	1	15.0%	0.0%	0.0%	0.0%	56.3%	28.8%	0.0%	100.0%	100.0%
21	373D	2	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
22	373D	3	70.0%	0.0%	17.5%	0.0%	0.0%	12.5%	0.0%	0.0%	100.0%
23	373D	4	3.8%	0.0%	60.0%	0.0%	0.0%	36.3%	0.0%	0.0%	100.0%
24	373D	5	70.0%	0.0%	0.0%	5.0%	0.0%	12.5%	12.5%	0.0%	100.0%
25	373D	6	5.0%	0.0%	32.5%	25.0%	0.0%	37.5%	0.0%	0.0%	100.0%
26	373D	7	62.5%	0.0%	30.0%	0.0%	0.0%	0.0%	7.5%	0.0%	100.0%
27	373D	9	0.0%	0.0%	90.0%	0.0%	0.0%	3.8%	6.3%	0.0%	100.0%
28	373D	10	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
29	373D	12	35.0%	0.0%	12.5%	25.0%	0.0%	27.5%	0.0%	0.0%	100.0%
30	375	2	0.0%	0.0%	85.0%	0.0%	0.0%	15.0%	0.0%	0.0%	100.0%
31	375	3	47.5%	0.0%	15.0%	37.5%	0.0%	0.0%	0.0%	0.0%	100.0%
32	375	4	0.0%	0.0%	37.5%	62.5%	0.0%	0.0%	0.0%	0.0%	100.0%
33	377	1	87.5%	12.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
34	377	2	81.3%	12.5%	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	100.0%
35	377	3	25.0%	0.0%	0.0%	62.5%	0.0%	0.0%	0.0%	12.5%	100.0%
36	377	4	62.5%	37.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
37	377	5	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
38	377	6	87.5%	0.0%	0.0%	0.0%	0.0%	12.5%	0.0%	0.0%	100.0%
39	377	7	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
40	377	8	75.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	100.0%
41	377	9	87.5%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%	100.0%
42	377	10	62.5%	0.0%	25.0%	0.0%	0.0%	12.5%	0.0%	0.0%	100.0%
43	377	11	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
44	377	12	75.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	100.0%
45	314C	1	17.5%	0.0%	0.0%	0.0%	37.5%	0.0%	45.0%	0.0%	100.0%
46	314D	1	52.5%	0.0%	0.0%	0.0%	47.5%	0.0%	0.0%	0.0%	100.0%
47	316A	1	84.5%	0.0%	0.0%	0.0%	0.0%	0.0%	15.5%	0.0%	100.0%

Source: Environmental and Social Study 2012

8. WATER USAGE OR WATER RIGHTS AND RIGHTS OF COMMON

Table 8-1 Water Usage of River Water

Ser. No.	Road No.	Sub No.	Water Usage of River Water
1	11	2	-
2	11	3	-
3	70	1	Washing, Bathing
4	70	2	Washing, Bathing
5	73	4	Washing, Bathing
6	73	5	-
7	73	6	-
8	73	7	-
9	73	8	Washing
10	73	16	Washing
11	277	3	-
12	277	4	-
13	279	7	Fishing
14	372A	1	Washing, Fishing
15	372A	2	Washing, Fishing
16	372A	3	Washing, Fishing
17	372A	4	Washing
18	372A	5	Washing, Bathing
19	373B	1	-
20	373D	1	Washing, Bathing, Fishing
21	373D	2	-
22	373D	3	Washing, Bathing
23	373D	4	-
24	373D	5	Washing, Bathing
25	373D	6	-
26	373D	7	Washing
27	373D	9	-
28	373D	10	-
29	373D	12	Washing
30	375	2	-
31	375	3	Washing
32	375	4	-
33	377	1	Washing
34	377	2	Washing
35	377	3	Washing
36	377	4	Washing
37	377	5	Washing
38	377	6	Washing, Bathing
39	377	7	Washing, Bathing
40	377	8	Washing, Bathing
41	377	9	Washing, Bathing
42	377	10	Washing
43	377	11	-
44	377	12	Washing
45	314C	1	Washing, Fishing
46	314D	1	Fishing
47	316A	1	Washing

Source: Environmental and Social Study 2012

9. EXISTING SOCIAL INFRASTRUCTURES AND SERVICES

Table 9-1 Infrastructure on the Bridges and in the PAAs

Ser. No.	Road No.	Sub No.	Infrastructure	Public facility
1	11	2	Telephone cable with pole	None
2	11	3	Telephone cable with pole	None
3	70	1	Telephone cable with pole, electric cable with pole, water supply pipe	None
4	70	2	Telephone cable with pole, electric cable with pole, water supply pipe	None
5	73	4	Telephone cable with pole, optical cable	None
6	73	5	None	None
7	73	6	None	None
8	73	7	Telephone cable with pole	None
9	73	8	Telephone cable with pole, optical cable, electric cable with pole, water supply pipe	None
10	73	16	Telephone cable with pole, optical cable, electric cable with pole, water supply pipe	None
11	277	3	None	None
12	277	4	None	None
13	279	7	Telephone cable with pole, electric cable with pole, water supply pipe	Rest hall, Police Post
14	372A	1	Electric cable with pole	None
15	372A	2	Electric cable with pole	None
16	372A	3	Electric cable with pole	Private English School
17	372A	4	Telephone cable with pole	None
18	372A	5	None	None
19	373B	1	Telephone cable with pole	None
20	373D	1	None	None
21	373D	2	None	None
22	373D	3	None	None
23	373D	4	None	None
24	373D	5	Telephone cable with pole	None
25	373D	6	Telephone cable with pole	None
26	373D	7	Telephone cable with pole	None
27	373D	9	Telephone cable with pole	None
28	373D	10	Telephone cable with pole	None
29	373D	12	Telephone cable with pole	None
30	375	2	None	None
31	375	3	None	None
32	375	4	None	None
33	377	1	Water supply pipe, electric cable with pole	None
34	377	2	Electric cable with pole	None
35	377	3	Telephone cable with pole	None
36	377	4	Telephone cable with pole	None
37	377	5	Telephone cable with pole	None
38	377	6	Telephone cable with pole	None

Ser. No.	Road No.	Sub No.	Infrastructure	Public facility
39	377	7	Telephone cable with pole, electric cable with pole	None
40	377	8	Telephone cable with pole	None
41	377	9	Telephone cable with pole	None
42	377	10	Telephone cable with pole	None
43	377	11	Telephone cable with pole	None
44	377	12	Telephone cable with pole, electric cable with pole	None
45	314C	1	Telephone cable with pole	Kindergarten
46	314D	1	Electric cable with pole	Guard post
47	316A	1	Telephone cable with pole	High school

Source: Environmental and Social Study 2012

10. FLORA

Bridge No.	Type	Local name	English name	Scientific name
373D-3	Flora	Neang Nuon	Rosewood	Dalbergia Bariensis

11. HYDROLOGICAL SITUATION

Table 11-1 Seasonality of River Water Flows

Ser. No.	Road No.	Sub No.	Seasonality	Velocity
1	11	2	Seasonal water flow in rainy season	Gentle flow
2	11	3	Seasonal water flow in rainy season	Gentle flow
3	70	1	Annual river water flow	Gentle flow
4	70	2	Annual river water flow	Gentle flow
5	73	4	Annual river water flow	Gentle flow
6	73	5	Annual river water flow	Gentle flow
7	73	6	Annual river water flow	Gentle flow
8	73	7	Annual river water flow	Gentle flow
9	73	8	Annual river water flow	Gentle flow
10	73	16	Annual river water flow	Gentle flow
11	277	3	Seasonal water flow in rainy season	Gentle flow
12	277	4	Seasonal water flow in rainy season	Gentle flow
13	279	7	Annual river water flow	Gentle flow
14	372A	1	Annual river water flow	Gentle flow
15	372A	2	Annual river water flow	Gentle flow
16	372A	3	Annual river water flow	Gentle flow
17	372A	4	Annual river water flow	Gentle flow
18	372A	5	Annual river water flow	Gentle flow
19	373B	1	Annual river water flow	Gentle flow
20	373D	1	Annual river water flow	Gentle flow
21	373D	2	Seasonal water flow in rainy season	Gentle flow
22	373D	3	Seasonal water flow in rainy season	Gentle flow
23	373D	4	Seasonal water flow in rainy season	Gentle flow
24	373D	5	Annual river water flow	Gentle flow
25	373D	6	Seasonal water flow in rainy season	Gentle flow
26	373D	7	Annual river water flow	Gentle flow (Seasonally rapid)
27	373D	9	Seasonal water flow in rainy season	Gentle flow
28	373D	10	Seasonal water flow in rainy season	Gentle flow
29	373D	12	Annual river water flow	Gentle flow (Seasonally rapid)
30	375	2	Seasonal water flow in rainy season	Gentle flow
31	375	3	Seasonal water flow in rainy season	Rapid flow
32	375	4	Seasonal water flow in rainy season	Gentle flow

Ser. No.	Road No.	Sub No.	Seasonality	Velocity
33	377	1	Annual river water flow	Gentle flow
34	377	2	Annual river water flow	Gentle flow (Seasonally rapid)
35	377	3	Annual river water flow	Gentle flow (Seasonally rapid)
36	377	4	Annual river water flow	Gentle flow (Seasonally rapid)
37	377	5	Annual river water flow	Gentle flow (Seasonally rapid)
38	377	6	Annual river water flow	Gentle flow
39	377	7	Annual river water flow	Gentle flow
40	377	8	Annual river water flow	Gentle flow (Seasonally rapid)
41	377	9	Annual river water flow	Gentle flow (Seasonally rapid)
42	377	10	Annual river water flow	Gentle flow
43	377	11	Annual river water flow	Gentle flow
44	377	12	Annual river water flow	Gentle flow (Seasonally rapid)
45	314C	1	Annual river water flow	Gentle flow (Seasonally rapid)
46	314D	1	Annual river water flow	Gentle flow
47	316A	1	Annual river water flow	Gentle flow

Source: Environmental and Social Study 2012

12. ASSUMED VEHICLES AND MACHINERY FOR CONSTRUCTION WORKS FOR AIR POLLUTION

Table 12-1 Assumed Vehicles and Machinery for Construction Works

Name of Machinery	Specification	Generating power (kW)	Machinery weight (t)	Purpose
Bulldozer	15t (13-16)	100	14.6	Preparation work/Road work
Backhoe	Pileup 0.8m^3 (Flat pile 6m^3)	104	19.8	Preparation work/Road work
Dump truck	10t freight	246	9.7	Preparation work/Road work
Motor grader	Blade width 3.1m	85	10.1	Road work
Road roller	10-12t, Compaction width 2.1m	56	9.3	Road work
Tire roller	8-20t	71	14.8	Road work
Concrete mixer	0.5m^3	7.5	7.4	Concrete plant work
Truck-mixer	4.4m^3	213	9.2	Concrete plant work
Large-sized breaker	Hydraulic 600-800kg class	60	12.5	Removal work (1 month)
Vibro hammer	60t Hang	154	67.4	Installation and removal periods for temporary bridge
Truck crane	25t Hang	162	28.5	Base structure work/Superstructure work
Diesel pile hammer	Ram mass 3.5t	125	54.0	Foundation work
Asphalt finisher'	Paving width 2.4-6.0m	70	13.9	Road work

Source: Study Team

13. NOISE AND VIBRATION

Table 13-1 Noise and Vibration from the Existing Bridges

Ser. No.	Road No.	Sub No.	Bridge Type	Conditions
1	11	2	Steel	-
2	11	3	Steel	-
3	70	1	Bailey	Some noise and vibration from the bridge while vehicles passing by
4	70	2	Bailey	Some noise and vibration from the bridge while vehicles passing by
5	73	4	Bailey	Some or Much noise and vibration from the bridge while vehicles passing by
6	73	5	Bailey	-
7	73	6	Bailey	-
8	73	7	Bailey	-
9	73	8	Bailey	Much noise and vibration from the bridge while vehicles passing by
10	73	16	Bailey	Some noise and vibration from the bridge while vehicles passing by
11	277	3	Bailey	-
12	277	4	Bailey	-
13	279	7	Bailey	Much noise and vibration from the bridge while vehicles passing by
14	372A	1	Bailey	Much noise and vibration from the bridge while vehicles passing by
15	372A	2	Bailey	Much noise and vibration from the bridge while vehicles passing by
16	372A	3	Bailey	Much noise and vibration from the bridge while vehicles passing by
17	372A	4	Bailey	Much noise and vibration from the bridge while vehicles passing by
18	372A	5	Bailey	Much noise and vibration from the bridge while vehicles passing by
19	373B	1	Concrete	-
20	373D	1	None	None
21	373D	2	Wood	-
22	373D	3	Wood	None
23	373D	4	Wood	-
24	373D	5	Wood	None
25	373D	6	Wood	-
26	373D	7	Wood	None
27	373D	9	Wood	-
28	373D	10	Wood	-
29	373D	12	Wood	None
30	375	2	Wood	-
31	375	3	Wood	None
32	375	4	Wood	-
33	377	1	Steel	None
34	377	2	Steel	Some noise and vibration from the bridge while vehicles passing by
35	377	3	Bailey	None
36	377	4	Wood	None
37	377	5	Bailey	Much or Some noise and vibration from the bridge while vehicles passing by
38	377	6	Bailey	None or Little noise and vibration from the bridge while vehicles passing by
39	377	7	Steel	None or Little noise and vibration from the bridge while vehicles passing by
40	377	8	Bailey	None
41	377	9	Steel	None
42	377	10	Steel	None or Little noise and vibration from the bridge while vehicles passing by
43	377	11	Steel	-
44	377	12	Bailey	None

Ser. No.	Road No.	Sub No.	Bridge Type	Conditions
45	314C	1	Bailey	None
46	314D	1	Bailey	Much noise and vibration from the bridge while vehicles passing by
47	316A	1	Bailey	Little noise and vibration from the bridge while vehicles passing by

Source: Environmental and Social Study 2012

14. EVALUATION OF ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS

14.1 Bridge No. 11-2/3 on NR11

Table 14-1 Environmental and Social Impact Evaluation: Bridge No. 11-2/3

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	D	N/A	No buildings and resident were identified around the both bridges.
	2	The poor people	C-	D	D	N/A	No specific poor people were identified around the both bridges.
	3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the both bridges.
	4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+	B+	[Construction Phase] The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture is the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
	5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the bridges were farm land (rice fields) in the PAAs of two bridges. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] No residents were identified around the both of Bridge No. 11-2/3 and the seasonal surface water was used for the paddy field. The bridge replacement works in rainy season can affect surface water flow for the rice fields.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone cables with poles were identified nearby two bridges. These will be temporally relocated by setup of temporary bridges, diversions or material yards for the bridge replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the bridges.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are about 80 and 80m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	Two bridges are not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] Seasonal surface water flows were observed in rainy season and the construction of diversions for the replacement of the bridges in rainy season can affect the surface water flows.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	D	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period. However, no resident were identified around the both bridges. Nobody is affected by the exhaust gas and dust.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate surface waters in rainy season.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished steel bridges. However, the demolished steel bridges are collected by recycle manufacturers. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	D	D	No resident were identified around the both of Bridge No. 11-2/3. Nobody is affected by noise and vibration caused by the operations of construction vehicles and machinery.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	D	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. However, no resident were identified around the both of Bridge No. 11-2/3. Nobody is affected by the offensive odor.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. Pedestrians and traffic through the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers, the pedestrians and traffic. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.2 Bridge No. 70-1/2 on NR70

Table 14-2 Environmental and Social Impact Evaluation: Bridge No. 70-1/2

<table>
<tr><th></th><th rowspan="2">No.</th><th rowspan="2">Likely Impacts</th><th colspan="2">Evaluation at Scoping</th><th colspan="2">Evaluation with Study Results</th><th rowspan="2">Reasons of Rating</th></tr>
<tr><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th>Pre-/ Construction Phase</th><th>Operation Phase</th></tr>
<tr><td rowspan="6">Social Environment:</td><td>1</td><td>Involuntary Resettlement</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Pre-Construction Phase]
There were buildings and residents in the PAAs as follows.
<table><tr><th>Bridge No.</th><th>Houses*</th><th>Other building</th><th>Household</th><th>Population</th></tr><tr><td>No. 70-1</td><td>1</td><td>0</td><td>1</td><td>3</td></tr><tr><td>No. 70-2</td><td>33</td><td>4</td><td>33</td><td>119</td></tr></table>(*: including commercial-mixed-use buildings)
Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridges, diversions or material yards for construction works.</td></tr>
<tr><td>2</td><td>The poor people</td><td>C-</td><td>D</td><td>B-</td><td>N/A</td><td>There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.</td></tr>
<tr><td>3</td><td>The indigenous and ethnic people</td><td>C-</td><td>D</td><td>D</td><td>N/A</td><td>No indigenous and ethnic people were identified around the bridge.</td></tr>
<tr><td>4</td><td>Local economy such as employment and livelihood, etc.</td><td>B+/-</td><td>B+</td><td>B+/-</td><td>B+</td><td>[Construction Phase]
Shops were identified in the PAAs of two bridges. Some of them can be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations.
The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector.
[Operation Phase]
Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.</td></tr>
<tr><td>5</td><td>Land use and utilization of local resources</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Construction Phase]
Major land uses around the two bridges were residential area and glass land in the PAAs of two bridges. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.</td></tr>
</table>

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for washing and bathing around two bridges. The bridge replacement works can temporally affect these domestic uses of river water around the bridges about for two years.
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone and electric cables with poles, water supply pipe were identified nearby two bridges. These will be temporally relocated by setup of temporary bridges, diversions or material yards for the bridge replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the bridges.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 85m and 75m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridges were not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridges cross the rivers which have annual water flows and the construction of diversions for the replacement of the bridges can affect the river water flows.
	20	Topography and Geographical features	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate river water.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridges. However, the demolished bailey bridges are reused by DPWT. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	B-	B+	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. [Operation Phase] According to the interviews for the residents nearby replaced bridges from bailey bridges, they recognize decreases of noise and vibration while vehicles pass after the replacement. New concrete bridges can reduce the noise and vibration from the bridges.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes.
	31	Bottom sediment	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.3 Bridge No. 73-4/5/6/7/8/16 on NR73

Table 14-3 Environmental and Social Impact Evaluation: Bridge No. 73-4/5/6/7/8/16

<table>
<tr><th></th><th rowspan="2">No.</th><th rowspan="2">Likely Impacts</th><th colspan="2">Evaluation at Scoping</th><th colspan="2">Evaluation with Study Results</th><th rowspan="2">Reasons of Rating</th></tr>
<tr><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th>Pre-/ Construction Phase</th><th>Operation Phase</th></tr>
<tr><td rowspan="3">Social Environment:</td><td>1</td><td>Involuntary Resettlement</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Pre-Construction Phase]
There were buildings and residents in the PAAs as follows.
<table>
<tr><th>Bridge No.</th><th>Houses*</th><th>Other building</th><th>Household</th><th>Population</th></tr>
<tr><td>No. 73-4</td><td>24</td><td>1</td><td>38</td><td>144</td></tr>
<tr><td>No. 73-5</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 73-6</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 73-7</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 73-8</td><td>15</td><td>0</td><td>15</td><td>78</td></tr>
<tr><td>No. 73-16</td><td>2</td><td>2</td><td>2</td><td>10</td></tr>
</table>
(*: including commercial-mixed-use buildings)
Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridges, diversions or material yards for construction works.</td></tr>
<tr><td>2</td><td>The poor people</td><td>C-</td><td>D</td><td>B-</td><td>N/A</td><td>There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.</td></tr>
<tr><td>3</td><td>The indigenous and ethnic people</td><td>C-</td><td>D</td><td>D</td><td>N/A</td><td>No indigenous and ethnic people were identified around the bridge.</td></tr>
</table>

No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
		Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+/-	B+	[Construction Phase] Restaurants and shops were identified in the PAAs of three bridges of 73-4/8/16. Some of them can be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the three bridges were residential area, commercial area, farm land, and shrub land in the PAAs. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for washing around 73-8/16 and seasonally use the surface water for washing and bathing around 73-4. The bridge replacement works can temporally affect these domestic uses of river water and surface water about for 2 years.
7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone and electric cables with poles, water supply pipes and optical cables were identified nearby the bridges except 73-5/6. These will be temporally relocated by setup of temporary bridges, diversions or material yards for the bridge replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
9	Misdistribution of benefit and damage	D	D	N/A	N/A	
10	Local conflict of interests	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	11	Cultural heritage	B-	D	B-	N/A	A Pagoda was identified in the PAA of 73-8 and its walls and garden can be affected by the bridge replacement works depending on the locations of diversion, temporary bridge or material yard.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 150, 30, 54, 42, 120, 151m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridges are not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridges crosses the rivers which have annual water flows and the construction of diversions for the replacement of the bridges can affect the river water flows about for two years.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate the river water.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridges. However, the demolished bailey bridges are reused by DPWT. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	B-	B+	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. They can affect the residents nearby 73-4/8/16. [Operation Phase] According to the interviews for the residents nearby replaced bridges from bailey bridges, they recognize decreases of noise and vibration while vehicles pass after the replacement. The residents nearby the bridges recognized much or some noise and vibration from the bailey bridges. New concrete bridges of 73-4/8/16 replaced from the bailey bridges can reduce the noise and vibration from the bridges.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. They can affect the residents nearby 73-4/8/16.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.4 Bridge No. 277-3/4 on PR277

Table 14-4 Environmental and Social Impact Evaluation: Bridge No. 277-3/4

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	D	N/A	No buildings and resident were identified around the both of Bridge No. 277-3/4.
	2	The poor people	C-	D	D	N/A	No specific poor people were identified around the both of Bridge No. 277-3/4.
	3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the both of Bridge No. 277-3/4.
	4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+	B+	[Construction Phase] The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
	5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the two bridges were farm land (rice fields) in the PAAs of two bridges. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] No residents were identified around the both of Bridge No. 277-3/4 and the seasonal surface water was used for the paddy field. The bridge replacement works in rainy season can affect surface water flow for the rice fields.
	7	Existing social infrastructures and services	B-	C+	D	B+	[Construction Phase] No social infrastructure was identified nearby two bridges. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the both of Bridge No. 277-3/4.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 27m and 18m. They do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	Two bridges are not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] Seasonal surface water flows were observed in rainy season and the construction of diversions for the replacement of the bridges in rainy season can affect the surface water flows.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around 2 bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	D	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period. However, no resident were identified around the both of Bridge No. 277-3/4. Nobody is affected by the exhaust gas and dust.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate surface waters in rainy season.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridges. However, the demolished bailey bridges are reused by DPWT. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	D	D	No resident were identified around the both of Bridge No. 277-3/4. Nobody is affected by noise and vibration caused by the operations of construction vehicles and machinery.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	D	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. However, no resident were identified around the both of Bridge No. 277-3/4. Nobody is affected by the offensive odor.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.5 Bridge No. 279-7on PR279

Table 14-5 Environmental and Social Impact Evaluation: Bridge No. 279-7

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	B-	N/A	[Pre-Construction Phase] There were buildings and residents in the PAAs as follows. Bridge No. / Houses* / Other building / Household / Population No. 279-7 / 22 / 3 / 22 / 114 (*: including commercial-mixed-use buildings) Some of them can be affected by the bridge replacement works. The bridge replacement works can replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridge, diversion or material yard for the replacement works.
	2	The poor people	C-	D	B-	N/A	There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.
	3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the bridge.
	4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+/-	B+	[Construction Phase] A workshop and shops were identified in the PAA of the bridge. Some of them can be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. The bridge replacement works can demand about 10-20 general workers (unskilled workers) for the site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
	5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the bridge were dominated by residential area and followed by farm land and public land in the PAAs. Some areas will be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for fishing around 279-7. The bridge replacement works can temporally affect the fishing about for 2 years.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone and electric cables with poles, water supply pipe and were identified nearby the bridge. These will be temporally relocated by setup of temporary bridge, diversion or material yard for the bridge replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the bridge.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The length of bridge is 129m and this does not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridges are not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridge crosses the river which has annual water flows and the construction of diversion for the replacement of the bridge can affect the river water flow about for two years.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversion or material yard.
	22	Groundwater	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridge at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversion or material yard can temporally contaminate the river water.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridge. However, the demolished bailey bridge is reused by DPWT. The solid wastes from site office are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction site.
	28	Noise and Vibration	B-	C+	B-	B+	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. They can affect the residents nearby 73-4/8/16. [Operation Phase] According to the interviews for the residents nearby replaced bridges from bailey bridges, they recognize decreases of noise and vibration while vehicles pass after the replacement. The residents nearby the bridge recognized much noise and vibration from the bailey bridge. New concrete bridge of 279-7 replaced from the bailey bridge can reduce the noise and vibration from the existing bridge.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site office can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. They can affect the residents nearby the bridge.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction site can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridge. It can increase traffic and speed of cars and consequently traffic accidents can increase.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.6 Bridge No. 372A-1/2/3/4/5 on PR372A

Table 14-6 Environmental and Social Impact Evaluation: Bridge No. 372A-1/2/3/4/5

<table>
<tr><th></th><th>No.</th><th>Likely Impacts</th><th>Evaluation at Scoping</th><th></th><th>Evaluation with Study Results</th><th></th><th>Reasons of Rating</th></tr>
<tr><th></th><th></th><th></th><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th></th></tr>
<tr><td rowspan="3">Social Environment:</td><td>1</td><td>Involuntary Resettlement</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Pre-Construction Phase]
There were buildings and residents in the PAAs as follows.
<table>
<tr><th>Bridge No.</th><th>Houses*</th><th>Other building</th><th>Household</th><th>Population</th></tr>
<tr><td>No. 372A-1</td><td>11</td><td>0</td><td>13</td><td>62</td></tr>
<tr><td>No. 372A-2</td><td>7</td><td>0</td><td>9</td><td>35</td></tr>
<tr><td>No. 372A-3</td><td>14</td><td>4</td><td>17</td><td>42</td></tr>
<tr><td>No. 372A-4</td><td>3</td><td>2</td><td>5</td><td>21</td></tr>
<tr><td>No. 372A-5</td><td>3</td><td>0</td><td>3</td><td>21</td></tr>
</table>
(*: including commercial-mixed-use buildings)
Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridges, diversions or material yards for construction works.</td></tr>
<tr><td>2</td><td>The poor people</td><td>C-</td><td>D</td><td>B-</td><td>N/A</td><td>There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.</td></tr>
<tr><td>3</td><td>The indigenous and ethnic people</td><td>C-</td><td>D</td><td>D</td><td>N/A</td><td>No indigenous and ethnic people were identified around the bridge.</td></tr>
</table>

No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
		Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+/-	B+	[Construction Phase] Shops were identified in the PAAs. Some of them can be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses were residential area and vegetable fields (cassava/rubber) around the bridges. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for washing, bathing or fishing around 372A-3/4/5 and seasonally use the surface water for washing and fishing around 372A-1/2. The bridge replacement works can temporally affect these domestic uses of river water and surface water about for 2 years.
7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Electric cables with poles or telephone with poles were identified nearby the bridges except 372A-5. These will be temporally relocated by setup of temporary bridges, diversions or material yards for the bridge replacement works. A private English school and a guard post were identified in the PAA of 372A-3. They also can be affected by the replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
9	Misdistribution of benefit and damage	D	D	N/A	N/A	
10	Local conflict of interests	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	11	Cultural heritage	B-	D	B-	N/A	A Pagoda was identified in the PAA of 372A-3 and its walls and garden can be affected by the bridge replacement works depending on the locations of diversion, temporary bridge or material yard.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 27, 27, 24, 12, 30m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridges are not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridges cross the rivers which have annual water flows and the construction of diversions for the replacement of the bridges can affect the river water flows about for two years.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate the river waters and surface waters.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridges. However, the demolished bailey bridges are reused by DPWT. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	B-	B+	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. They can affect the residents nearby 73-4/8/16. [Operation Phase] According to the interviews for the residents nearby replaced bridges from bailey bridges, they recognize decreases of noise and vibration while vehicles pass after the replacement. The residents nearby the bridges recognized much noise and vibration from the bailey bridges. All new concrete bridges replaced from the bailey bridges can reduce the noise and vibration from the existing bridges.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. They can affect the residents nearby the bridges.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.7 Bridge No. 373B-1 on PR373B

Table 14-7 Environmental and Social Impact Evaluation: Bridge No. 373B-1

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	D	N/A	No buildings and resident were identified around the Bridge No. 373B-1.
	2	The poor people	C-	D	D	N/A	No specific poor people were identified around the Bridge No. 373B-1.
	3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the Bridge No. 373B-1.
	4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+	B+	[Construction Phase] The bridge replacement activities can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
	5	Land use and utilization of local resources	B-	D	D	N/A	[Construction Phase] Major land uses around the bridge were glass land and farm land (rice fields) was little in the PAA of bridge. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] No residents were identified around the bridge and no river water use was heard and observed. River water may be used for the paddy field. The bridge replacement works can affect river water flow for the rice fields.
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone cable with poles was identified nearby the bridge. This will be temporally relocated by setup of temporary bridge, diversion or material yard for the bridge replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the b ridge.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The length of bridge is 9m. This does not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridge is not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	B-	N/A	[Construction Phase] One endangered fish name (Yellow Tail Barb) was found in the answers from local peoples by hearing although indefinitely. Further study is necessary at F/S or design stages.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridge crosses small river which has annual water flow and the construction of diversions for the replacement of the bridges can affect the river water flow about for two years.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridge was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	D	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridge at least during construction period. However, no resident were identified around the bridge. Nobody is affected by the exhaust gas and dust.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate the river water.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate the waste of demolished concrete bridge but it is small amount. The solid wastes from site office are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction site.
	28	Noise and Vibration	B-	C+	D	D	No resident were identified around the bridge. Nobody is affected by noise and vibration caused by the operations of construction vehicles and machinery.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	D	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. However, no resident were identified around the bridge. Nobody is affected by the offensive odor.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. Pedestrians and traffic through the construction site can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the pedestrians and the traffic. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridge. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.8 Bridge No. 373D-1/2/3/4/5/6/7/9/10/12 on PR373D

Table 14-8 Environmental and Social Impact Evaluation: Bridge No. 373D-1/2/3/4/5/6/7/9/10/12

<table>
<tr><th></th><th rowspan="2">No.</th><th rowspan="2">Likely Impacts</th><th colspan="2">Evaluation at Scoping</th><th colspan="2">Evaluation with Study Results</th><th rowspan="2">Reasons of Rating</th></tr>
<tr><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th>Pre-/ Construction Phase</th><th>Operation Phase</th></tr>
<tr><td rowspan="5">Social Environment:</td><td>1</td><td>Involuntary Resettlement</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Pre-Construction Phase]
There were buildings and residents in the PAAs as follows.
<table>
<tr><th>Bridge No.</th><th>Houses*</th><th>Other building</th><th>Household</th><th>Population</th></tr>
<tr><td>No. 373D-1</td><td>4</td><td>0</td><td>4</td><td>32</td></tr>
<tr><td>No. 373D-2</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 373D-3</td><td>3</td><td>0</td><td>5</td><td>15</td></tr>
<tr><td>No. 373D-4</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 373D-5</td><td>6</td><td>1</td><td>8</td><td>35</td></tr>
<tr><td>No. 373D-6</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 373D-7</td><td>12</td><td>1</td><td>12</td><td>41</td></tr>
<tr><td>No. 373D-9</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 373D-10</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 373D-12</td><td>4</td><td>0</td><td>4</td><td>18</td></tr>
</table>
(*: including commercial-mixed-use buildings)
Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridges, diversions or material yards for construction works.</td></tr>
<tr><td>2</td><td>The poor people</td><td>C-</td><td>D</td><td>B-</td><td>N/A</td><td>There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.</td></tr>
<tr><td>3</td><td>The indigenous and ethnic people</td><td>C-</td><td>D</td><td>D</td><td>N/A</td><td>No indigenous and ethnic people were identified around the bridge.</td></tr>
<tr><td>4</td><td>Local economy such as employment and livelihood, etc.</td><td>B+/-</td><td>B+</td><td>B+/-</td><td>B+</td><td>[Construction Phase]
Shops were identified in the PAAs. Some of them can be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations.
The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector.
[Operation Phase]
Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.</td></tr>
</table>

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses were residential area, farm land (rice field), glass land and shrub land around the bridges. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people around 373D-1 annually use river water for washing, bathing and fishing. The other seasonal surface waters were used for washing or bathing around 373D-3/5/7/12. The bridge replacement works can temporally affect these domestic uses of the river water and surface waters about for 2 years.
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone cables with poles were identified nearby 373D-5/6/7/9/10/12. These will be temporally relocated by setup of temporary bridges, diversions or material yards for the bridge replacement works. A temporary rest place was identified in the PAA of 373D-5. This also can be affected by the replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	B-	N/A	No cultural heritages were identified around the bridges.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 12, 10, 8, 10, 24, 8, 8, 9, 9m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
	17	Protected Areas	C-	D	D	N/A	The bridges are not located in/nearby any types of protected areas.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	18	Flora, Fauna and Biodiversity	C-	D	B-	N/A	[Construction Phase] Rosewood trees which are categorized as an endangered species were identified in the residential area at 373D-3. However, they were planted by the owners of residents. The trees can be cleared by the bridge replacement works depending on location of temporary bridges, diversions or material yards for construction works.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] There were seasonal surface water flows at the bridges except 373D-1 which has annual river water flow. The construction of diversions for the replacement of the bridges can affect the water flows about for two years.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate the river waters and surface waters.
	26	Waste	B-	D	D	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished wooden bridges. The demolished wooden are natural and no adverse impacts are expected. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	B-	D	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. They can affect the residents nearby 373D-1/3/5/7/12. [Operation Phase] The residents nearby the bridges recognized no noise and vibration from the existing wooden bridges.
	29	Ground Subsidence	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. They can affect the residents nearby the bridges.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.9 Bridge No. 375-2/3/4 on PR375

Table 14-9 Environmental and Social Impact Evaluation: Bridge No. 375-2/3/4

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	B-	N/A	[Pre-Construction Phase] There were buildings and residents in the PAAs as follows. Bridge No. / Houses* / Other building / Household / Population No. 375-2: 0 / 0 / 0 / 0 No. 375-3: 7 / 0 / 7 / 28 No. 375-4: 0 / 0 / 0 / 0 (*: including commercial-mixed-use buildings) Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridges, diversions or material yards for construction works.
	2	The poor people	C-	D	B-	N/A	There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.

No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
		Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the bridge.
4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+	B+	[Construction Phase] The bridge replacement works can demand about 10-20 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses were residential area, farm land (rice field), glass land and shrub land around the bridges. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people around 375-3 seasonally use surface water for washing. The surface waters can be used for rice fields around the bridges. The bridge replacement works can temporally affect these domestic uses of the surface waters about for 2 years.
7	Existing social infrastructures and services	B-	C+	D	B+	[Construction Phase] Neither social infrastructure nor services were identified nearby the bridges. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
9	Misdistribution of benefit and damage	D	D	N/A	N/A	
10	Local conflict of interests	D	D	N/A	N/A	
11	Cultural heritage	B-	D	B-	N/A	No cultural heritages were identified around the bridges.
12	Landscape	D	D	N/A	N/A	
13	Gender	D	D	N/A	N/A	
14	Children's rights	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 16, 7, 10m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridges are not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	B-	N/A	[Construction Phase] A few endangered species names were found in the answers from local peoples by hearing although indefinitely. A reptile name (Elongated Tortoise) was at 375-2/3/4, and a mammal name (Black-shanked Douc Langur) was at 375-3. However, according to the Wildlife Conservation Society, the habitat is in Seima Protected Forest. The nearest Forest boundary is located about 35km away from 375-3. Thus, no serious impact is expected. Further studies are necessary at F/S or design stages.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] Seasonal surface water flows were observed in rainy season and the construction of diversions for the replacement of the bridges in rainy season can affect the surface water flows.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate the surface waters in rainy season.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	26	Waste	B-	D	D	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished wooden bridges. The demolished wooden are natural and no adverse impacts are expected. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	B-	D	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. They can affect the residents nearby 375-3. [Operation Phase] The residents nearby the bridge of 375-3 recognized no noise and vibration from the existing wooden bridge.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. They can affect the residents nearby the bridge of 375-3.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.10 Bridge No. 377-1/2/3/4/5/6/7/8/9/10/11/12 on PR377

Table 14-10 Environmental and Social Impact Evaluation: Bridge No. 377-1/2/3/4/5/6/7/8/9/10/11/12

<table>
<tr><th></th><th>No.</th><th>Likely Impacts</th><th colspan="2">Evaluation at Scoping</th><th colspan="2">Evaluation with Study Results</th><th>Reasons of Rating</th></tr>
<tr><th></th><th></th><th></th><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th></th></tr>
<tr><td rowspan="5">Social Environment:</td><td>1</td><td>Involuntary Resettlement</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Pre-Construction Phase]
There were buildings and residents in the PAAs as follows.
<table>
<tr><th>Bridge No.</th><th>Houses*</th><th>Other building</th><th>Household</th><th>Population</th></tr>
<tr><td>No. 377-1</td><td>38</td><td>2</td><td>46</td><td>114</td></tr>
<tr><td>No. 377-2</td><td>33</td><td>1</td><td>40</td><td>112</td></tr>
<tr><td>No. 377-3</td><td>4</td><td>0</td><td>5</td><td>23</td></tr>
<tr><td>No. 377-4</td><td>8</td><td>1</td><td>12</td><td>44</td></tr>
<tr><td>No. 377-5</td><td>25</td><td>0</td><td>25</td><td>130</td></tr>
<tr><td>No. 377-6</td><td>10</td><td>1</td><td>10</td><td>44</td></tr>
<tr><td>No. 377-7</td><td>25</td><td>0</td><td>30</td><td>100</td></tr>
<tr><td>No. 377-8</td><td>5</td><td>0</td><td>10</td><td>40</td></tr>
<tr><td>No. 377-9</td><td>10</td><td>0</td><td>16</td><td>62</td></tr>
<tr><td>No. 377-10</td><td>8</td><td>0</td><td>10</td><td>54</td></tr>
<tr><td>No. 377-11</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>No. 377-12</td><td>8</td><td>0</td><td>8</td><td>46</td></tr>
</table>
(*: including commercial-mixed-use buildings)
Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridges, diversions or material yards for construction works.</td></tr>
<tr><td>2</td><td>The poor people</td><td>C-</td><td>D</td><td>B-</td><td>N/A</td><td>There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.</td></tr>
<tr><td>3</td><td>The indigenous and ethnic people</td><td>C-</td><td>D</td><td>D</td><td>N/A</td><td>No indigenous and ethnic people were identified around the bridge.</td></tr>
<tr><td>4</td><td>Local economy such as employment and livelihood, etc.</td><td>B+/-</td><td>B+</td><td>B+/-</td><td>B+</td><td>[Construction Phase]
Restaurants, shops and workshops were identified in the PAAs except 377-11. Some of them can be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations.
The bridge replacement works can demand about 10-20 or 20-40 general workers (unskilled workers) for each construction site depending on the bridge lengths, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector.
[Operation Phase]
Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.</td></tr>
</table>

No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
		Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the the bridges were residential area, commercial area, farm land, shrub land and grass land in the PAAs. Some areas will be cleared by the temporary bridges, diversions or material yards for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for washing, bathing or fishing around the bridges. The bridge replacement works can temporally affect these domestic uses of river waters about for 2 years.
7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone and electric cables with poles were identified nearby the bridges. A police post was identified on the south side of the Bridge 377-4. The cables will be temporally relocated and the police post can be affected by setup of temporary bridges, diversions or material yards for the bridge replacement works. [Operation Phase] As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
9	Misdistribution of benefit and damage	D	D	N/A	N/A	
10	Local conflict of interests	D	D	N/A	N/A	
11	Cultural heritage	B-	D	B-	N/A	No cultural heritages were identified around the bridges.
12	Landscape	D	D	N/A	N/A	
13	Gender	D	D	N/A	N/A	
14	Children's rights	D	D	N/A	N/A	
15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The lengths of bridges are 37, 51, 45, 91, 60, 18, 35, 18, 33, 64, 36, 36m and they do not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
17	Protected Areas	C-	D	D	N/A	The bridges are not located in/nearby any types of protected areas.
18	Flora, Fauna and Biodiversity	C-	D	D	N/A	There were no endangered species of flora and fauna identified around the bridges.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridges crosses the rivers which have annual water flows and the construction of diversions for the replacement of the bridges can affect the river water flows about for two years.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridges was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversions or material yards.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridges at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversions or material yards can temporally contaminate the river water.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridges. However, the demolished bailey bridges are reused by DPWT. The solid wastes from site offices are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction sites.
	28	Noise and Vibration	B-	C+	B-	D	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction sites. They can affect the residents nearby 73-4/8/16. [Operation Phase] Few residents nearby the bridges recognized noise and vibration from the existing bailey or steel bridges.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site offices can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes. They can affect the residents nearby 73-4/8/16.
	31	Bottom sediment	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridges. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.10.1 Bridge No. 314C-1on PR314C

Table 14-11 Environmental and Social Impact Evaluation: Bridge No. 314C-1

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	B-	N/A	[Pre-Construction Phase] There were buildings and residents in the PAA as follows. Bridge No. / Houses* / Other building / Household / Population No. 314C-1 / 5 / 2 / 5 / 26 (*: including commercial-mixed-use buildings) Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridge, diversion or material yard for construction works.
	2	The poor people	C-	D	B-	N/A	There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.
	3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the bridge.

No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
		Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+/-	B+	[Construction Phase] Shops and stalls (29) were identified in the PAA. Some of them can be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. The bridge replacement works can demand about 20-40 general workers (unskilled workers) for each construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.
5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the bridge were public land, residential area and wetland in the PAA. Some areas will be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for washing and fishing around the bridge. The bridge replacement works can temporally affect these domestic uses of river water around the bridge about for 2 years.
7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone cable with poles was identified nearby the bridge. These will be temporally relocated by setup of temporary bridge, diversion or material yard for the bridge replacement works. The kindergarten and conference hall were identified in the PAA and its walls and gardens can be affected by the bridge replacement works depending on the locations of diversion, temporary bridge or material yard. [Operation Phase] As the bridge which is bottleneck on traffic is replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
9	Misdistribution of benefit and damage	D	D	N/A	N/A	
10	Local conflict of interests	D	D	N/A	N/A	
11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the bridges.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The length of bridge is 69m and it does not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridge is not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	B-	N/A	[Construction Phase] Endangered species names of a reptile (Elongated Tortoise) and a fish (Yellow Tail Brook Barb) were found in the answers from local peoples by hearing although indefinitely. Further study is necessary at F/S or design stages.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridge crosses the river which has annual water flow and the construction of diversion for the replacement of bridge can affect the river water flow.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridge was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversion or material yard.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridge at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversion or material yard can temporally contaminate the river water.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridge. However, the demolished bailey bridge is reused by DPWT. The solid wastes from site office are buried in coordination with surrounding communities. Waste water is treated with septic tank.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction site.
	28	Noise and Vibration	B-	C+	B-	D	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction site. [Operation Phase] The residents nearby the bridge recognized no noise and vibration from the existing bailey bridge as their houses were located about 50m away from the bridge.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site office can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridge. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.11 Bridge No. 314D-1 on PR314D

Table 14-12 Environmental and Social Impact Evaluation: Bridge No. 314D-1

<table>
<tr><th></th><th rowspan="2">No.</th><th rowspan="2">Likely Impacts</th><th colspan="2">Evaluation at Scoping</th><th colspan="2">Evaluation with Study Results</th><th rowspan="2">Reasons of Rating</th></tr>
<tr><th>Pre-/ Construction Phase</th><th>Operation Phase</th><th>Pre-/ Construction Phase</th><th>Operation Phase</th></tr>
<tr><td rowspan="6">Social Environment:</td><td>1</td><td>Involuntary Resettlement</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Pre-Construction Phase]
There were buildings and residents in the PAA as follows.
<table><tr><th>Bridge No.</th><th>Houses*</th><th>Other building</th><th>Household</th><th>Population</th></tr><tr><td>No. 314D-1</td><td>5</td><td>1</td><td>5</td><td>15</td></tr></table>(*: including commercial-mixed-use buildings)
Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridge, diversion or material yard for construction works.</td></tr>
<tr><td>2</td><td>The poor people</td><td>C-</td><td>D</td><td>B-</td><td>N/A</td><td>There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.</td></tr>
<tr><td>3</td><td>The indigenous and ethnic people</td><td>C-</td><td>D</td><td>D</td><td>N/A</td><td>No indigenous and ethnic people were identified around the bridge.</td></tr>
<tr><td>4</td><td>Local economy such as employment and livelihood, etc.</td><td>B+/-</td><td>B+</td><td>B+/-</td><td>B+</td><td>[Construction Phase]
A shop was identified in the PAA. It can be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations.
The bridge replacement works can demand about 10-20 general workers (unskilled workers) for the construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector.
[Operation Phase]
Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.</td></tr>
<tr><td>5</td><td>Land use and utilization of local resources</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Construction Phase]
Major land uses around the bridge were residential area and wetland in the PAA. Some areas will be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.</td></tr>
<tr><td>6</td><td>Water Usage or Water Rights and Rights of Common</td><td>B-</td><td>D</td><td>B-</td><td>N/A</td><td>[Construction Phase]
Local people annually use river water for fishing around the bridge. The bridge replacement works can temporally affect the domestic use of river water around the bridge about for 2 years.</td></tr>
</table>

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Electric cable with poles and the guard post were identified nearby the bridge. These will be temporally relocated by setup of temporary bridge, diversion or material yard for the bridge replacement works. [Operation Phase] As the bridge which is bottleneck on traffic is replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the bridges.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The length of bridge is 21m and it does not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Natural Environment	17	Protected Areas	C-	D	D	N/A	The bridge is not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	B-	N/A	[Construction Phase] An endangered species name of a reptile (Elongated Tortoise) was found in the answers from local peoples by hearing although indefinitely. Further study is necessary at F/S or design stages.
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridge crosses the narrow river which has annual water flow and the construction of diversion for the replacement of bridge can affect the river water flow.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridge was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversion or material yard.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridge at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversion or material yard can temporally contaminate the river water.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridge. However, the demolished bailey bridge is reused by DPWT. The solid wastes from site office are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction site.
	28	Noise and Vibration	B-	C+	B-	D	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction site. [Operation Phase] According to the interviews for the residents nearby replaced bridges from bailey bridges, they recognize decreases of noise and vibration while vehicles pass after the replacement. The residents nearby the bridge recognized much noise and vibration from the bailey bridge. New concrete bridge replaced from the bailey bridge can reduce the noise and vibration from the existing bridge.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site office can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes.
	31	Bottom sediment	D	D	N/A	N/A	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridge. It can increase traffic and speed of cars and consequently traffic accidents can increase.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

14.12 Bridge No. 316A-1 on PR316A

Table 14-13 Environmental and Social Impact Evaluation: Bridge No. 316A-1

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Social Environment:	1	Involuntary Resettlement	B-	D	B-	N/A	[Pre-Construction Phase] There were buildings and residents in the PAA as follows. Bridge No. / Houses / Other building / Household / Population No. 316A-1 / 15 / 1 / 15 / 75 Some of them can be affected by the bridge replacement works. The bridge replacement works can demand temporary relocation or involuntary resettlement within and outside ROW depending on location of temporary bridge, diversion or material yard for construction works.
	2	The poor people	C-	D	B-	N/A	There were some households that average monthly household incomes were assumed under WB poverty line (US$ 1.25 per headcount) in the PAAs. Some of them can be affected by the bridge replacement works.
	3	The indigenous and ethnic people	C-	D	D	N/A	No indigenous and ethnic people were identified around the bridge.
	4	Local economy such as employment and livelihood, etc.	B+/-	B+	B+/-	B+	[Construction Phase] A workshop was identified in the PAA. It can be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. The bridge replacement works can demand about 10-20 general workers (unskilled workers) for the construction site, and it can provide a temporary boost for local employment. The others expected skilled workers are: bridge chief, general chief, special worker, reinforcement workers, steeplejacks, formwork workers, and construction machinery drivers. Local service sector can provide these construction workers accommodation, foods and beverages. It can facilitate business opportunities for the local service sector. [Operation Phase] Agriculture was the major economic activities on the route. As the bridges which are bottleneck on traffic are replaced and it can facilitate efficient logistics and transportation, local economy development is expected.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	5	Land use and utilization of local resources	B-	D	B-	N/A	[Construction Phase] Major land uses around the bridge were residential area, public land and wetland in the PAA. Some areas will be cleared by the temporary bridge, diversion or material yard for the replacement works depending on their locations. However, the replacement activities do not seriously change the land uses.
	6	Water Usage or Water Rights and Rights of Common	B-	D	B-	N/A	[Construction Phase] Local people annually use river water for washing around the bridge. The bridge replacement works can temporally affect the domestic use of river water around the bridge about for 2 years.
	7	Existing social infrastructures and services	B-	C+	B-	B+	[Construction Phase] Telephone cable with poles and the high school were identified nearby the bridge. The cable will be temporally relocated and the walls and the schoolyard can be affected by setup of temporary bridge, diversion or material yard for the bridge replacement works. [Operation Phase] As the bridge which is bottleneck on traffic is replaced and it can facilitate efficient transportation, accessibility and security for health centers and schools can be improved in neighborhood and communities.
	8	Social institutions such as social infrastructure and local decision making institutions	D	D	N/A	N/A	
	9	Misdistribution of benefit and damage	D	D	N/A	N/A	
	10	Local conflict of interests	D	D	N/A	N/A	
	11	Cultural heritage	B-	D	D	N/A	No cultural heritage was identified nearby the bridges.
	12	Landscape	D	D	N/A	N/A	
	13	Gender	D	D	N/A	N/A	
	14	Children's rights	D	D	N/A	N/A	
	15	Hazards (Risk), Infectious diseases such as HIV/AIDS	B-	D	B-	N/A	[Construction Phase] The length of bridge is 21m and it does not have large scale construction works. Local employment and no considerable influx of workers are expected. Therefore, the risk of a disaster or the occurrence of infectious diseases due to the mass inflow of laborers from other areas is low. However, the external workers, special workers for steeplejack, rebar, or mold make, could induce/illicit for sexual relationships with the local peoples and it would enlarge risks on both of them without sensitizations.
	16	Working conditions	B-	D	D	N/A	The Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers.
Envir	17	Protected Areas	C-	D	D	N/A	The bridge is not located in/nearby any types of protected areas.
	18	Flora, Fauna and Biodiversity	C-	D	B-	N/A	[Construction Phase] An endangered species name of a reptile (Elongated Tortoise) was found in the answers from local peoples by hearing although indefinitely. Further study is necessary at F/S or design stages.

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
	19	Hydrological Situation	C-	D	B-	N/A	[Construction Phase] The bridge crosses the narrow river which has annual water flow and the construction of diversion for the replacement of bridge can affect the river water flow.
	20	Topography and Geographical features	D	D	N/A	N/A	
	21	Soil Erosion	B-	D	B-	N/A	[Construction Phase] The type of soil around the bridge was laterite and it tends to be eroded by heavy rain. The soil can be temporally eroded from cut and fill for the construction of diversion or material yard.
	22	Groundwater	D	D	N/A	N/A	
	23	Coastal Zone	D	D	N/A	N/A	
Pollution	24	Air Pollution	B-	D	B-	N/A	[Construction Phase] Types of construction vehicles and machinery are bulldozer, backhoe, dump truck, motor grader, road roller, concrete mixer, truck-mixer, heavyweight breaker, vibratory hammer, track crane, diesel pile hammer, asphalt finisher. The exhaust gas and dust caused by operation of them can temporally deteriorate air quality around the bridge at least during construction period.
	25	Water Pollution	B-	D	B-	N/A	[Construction Phase] Soil erosion from cut and fill for the construction of diversion or material yard can temporally contaminate the river water.
	26	Waste	B-	D	B-	N/A	[Construction Phase] The bridge replacement works generate wastes and the most waste is demolished bailey bridge. However, the demolished bailey bridge is reused by DPWT. The solid wastes from site office are buried in coordination with surrounding communities. Waste water is treated with septic tank.
	27	Soil Contamination	C-	D	B-	N/A	[Construction Phase] Unintentional considerable spilled fuel and oil from the assumed construction vehicles or machinery can contaminate soil nearby the construction site.
	28	Noise and Vibration	B-	C+	B-	D	[Construction Phase] The operation of construction vehicles and machinery can temporally increase levels of noise and vibration nearby the construction site. [Operation Phase] The residents nearby the bridge recognized little noise and vibration from the existing bailey bridge.
	29	Ground Subsidence	D	D	N/A	N/A	
	30	Offensive Odor	C-	D	B-	N/A	[Construction Phase] The operation of construction vehicles, machinery and site office can temporally generate offensive odor caused by exhaust gas, discharging water, or domestic wastes.
	31	Bottom sediment	D	D	N/A	N/A	

	No.	Likely Impacts	Evaluation at Scoping		Evaluation with Study Results		Reasons of Rating
			Pre-/ Construction Phase	Operation Phase	Pre-/ Construction Phase	Operation Phase	
Others	32	Accidents	B-	B-	B-	B-	[Construction Phase] Typical accidents involving workers are falls, accidents by the construction vehicles and machinery. The residents around the construction sites can be involved in traffic accidents. However, the Labour Law, the safety plan and environmental management plan prepared by contractors will safeguard the workers and the residents. [Operation Phase] The residents nearby replaced bridges expressed traffic accidents have been increased. Vehicles can run smoothly after the replacement of bridge. It can increase traffic and speed of cars and consequently traffic accidents can increase.
	33	Trans boundary issues, Global Warming	D	D	N/A	N/A	

Rating:
A+/-: Significant positive/negative impact is expected.
B+/-: Positive/negative impact is expected to some extent.
C+/-: Extent of positive/negative impact is unknown (Examination is needed. Impacts may become clear as study progresses.)
D: No impact is expected

15. MITIGATION MEASURES

Table 15-1 Proposed Environmental Mitigation Measures

No.	Possible Negative Impacts	Proposed Environmental Mitigation Measures	Implementing Organization	Responsible Organization
Pre-construction and Construction Phases				
1	Involuntary Resettlement			
	Loss of lands and structures	- Consultant will plan detail designs, the locations of diversions, temporary bridges and material yards, to avoid or minimize resettlement.	Consultant	MPWT
		- Cash compensations for loss of lands and structures due to the Project alignment at full replacement cost.	RD (MEF)/ IRC	MPWT
2	The poor people			
	Same as Item1 and 4	- Same as Item1 and 4	Same as Item1 and 4	
4	Local economy such as employment and livelihood, etc.			
	Loss of perennial trees and standing crops	- Consultant will plan detail designs, the locations of diversions, temporary bridges and material yards, to avoid or minimize damages on the productive plants.	Consultant	MPWT
		- Cash compensation at full replacement cost for loss of perennial trees and standing crops due to the Project alignment at full replacement cost.	RD (MEF)/ IRC	MPWT
	Losses of incomes	- Consultant will plan detail designs, the locations of diversions, temporary bridges and material yards, to avoid or minimize the damages on livelihoods	Consultant	MPWT

No.	Possible Negative Impacts	Proposed Environmental Mitigation Measures	Implementing Organization	Responsible Organization
		- Disruption allowances for households on income losses while reconstruction or repair of houses, and for employees on income losses during reestablishment period - Disruption allowance for business owners on losses of business revenues during reestablishment period	RD (MEF)/ IRC	MPWT
5	Land use and utilization of local resources			
	Temporary change of land use around the bridges	- Cash compensations for loss of lands due to the Project alignment at full replacement cost	RD (MEF)/ IRC	MPWT
		- The diversions, temporary bridges, material yards and site offices will be cleared and restore the lands.	Supervising Consultant/ Contractor	MPWT
6	Water Usage or Water Rights and Rights of Common			
	Obstruction of domestic water uses	- Contractor will prepare temporary places for domestic water uses such as washing, bathing for the local peoples	Supervising Consultant/ Contractor	MPWT
	Losses of incomes from river fishing	- If households on river fishing as the primary income source are identified nearby the bridges, they will be compensated as the "Losses of incomes".	RD (MEF)/ IRC	MPWT
7	Existing social infrastructures and services			
	Displacement of the installed social infrastructure	- Contractor will temporarily relocate telephone and electric cables with poles, water supply pipes, or optical cables located nearby the bridges, and rehabilitate them after the bridge replacement works are completed.	Supervising Consultant/ Contractor	MPWT
	Partial losses of community or public facilities (school, police post)	- Consultant will plan detail designs, the locations of diversions, temporary bridges and material yards, to avoid or minimize damages on the structures of public facilities such as schools and police posts.	Consultant	MPWT
		- If some structures are inevitably partially lost, contractor will rebuild them.	Supervising Consultant/ Contractor	MPWT
11	Cultural heritage			
	Partial losses of pagoda structures	- Consultant will plan detail designs, the locations of diversions, temporary bridges and material yards, to avoid or minimize damages on the structures of pagodas.	Consultant	MPWT
		- If structures are inevitably partially lost, contractor will rebuild them.	Supervising Consultant/ Contractor	MPWT
15	Hazards (Risk), Infectious diseases such as HIV/AIDS: Expansion of HIV/AIDS			
	Expansion of HIV/AIDS	- Contractor will sensitize workers and communities through cooperation with respective local health centers.	Contractor/ Health Centers	MPWT/ MOH
18	Flora, Fauna and Biodiversity			
	Loss of endangered trees	- Consultant will plan detail designs, the locations of diversions, temporary bridges and material yards, to avoid clearance of Rosewood trees.	Consultant	MPWT
		- Cash compensation at full replacement cost for loss of Rosewood trees at full replacement cost for the owners. - Transplantation can be considered by negotiation with the owners.	RD (MEF)/ IRC	MPWT

No.	Possible Negative Impacts	Proposed Environmental Mitigation Measures	Implementing Organization	Responsible Organization
	Obstruction on habitats of endangered fishes, reptiles and mammals, which may inhabit	- Further studies will be conducted to prepare IEIA report at F/S or design stages before project implementation.	Consultant	MPWT
19	Hydrological Situation			
	Obstruction of the river water flows	- Contractor will build two temporary bridges over the rivers which have annual water flows for the demolishing works and the general traffic, and these will not obstruct the river flows.	Supervising Consultant, Contractor	MPWT
21	Soil Erosion			
	Soil erosion from cut and fill works	- Contractor will construct stable slope with temporary protection - Drainage will be also installed to drain heavy rain water	Supervising Consultant, Contractor	MPWT
24	Air Pollution			
	Deterioration of air quality due to dust	- Contractor will spray water on working area to minimize dust generation. - Hauling equipment will be covered by sheet during their operations. - The construction vehicles and machineries will be regularly washed and cleaned by high pressure water spray.	Supervising Consultant, Contractor	MPWT
	Deterioration of air quality due to emission gases	- Contractor will regularly maintain the construction vehicles and machineries.		
25	Water Pollution			
	Deterioration of river water due to eroded soil from cut and fill works	- Contractor will construct stable slope with temporary protection - Drainage will be also installed to drain heavy rain water	Supervising Consultant, Contractor	MPWT
	Deterioration of river water due to waste water from site office	- Septic tanks will be installed in site offices to treat waste water primarily.	Supervising Consultant, Contractor	MPWT
26	Waste			
	Generation of debris from demolished bridges	- Demolished bailey bridges will be reused by DPWT - Demolished steel bridges will be collected by recycling companies	Supervising Consultant, Contractor	DPWT
	Domestic Wastes from construction site	- The solid wastes from site office will be disposed to assigned place by community or bury in where feasible under coordination with community. - Waste water is treated with septic tank.	Supervising Consultant, Contractor	MPWT
27	Soil Contamination			
	Deterioration of soil due to spilled fuel and oil from equipment	- Contractor will regularly maintain the construction vehicles and machineries to avoid spillage.	Supervising Consultant, Contractor	MPWT
28	Noise and Vibration			
	Disturbance on residents or structures due to noise and vibration generated by equipment	- Contractor will use proper construction vehicles and machineries to generate low noise and vibration, and regularly maintain them. - Contractor will effectively schedule operation hours considering disturbance nearby communities.	Supervising Consultant, Contractor	MPWT
30	Offensive Odor			

No.	Possible Negative Impacts	Proposed Environmental Mitigation Measures	Implementing Organization	Responsible Organization
	Disturbance on residents due to offensive odor generated by exhaust gas from equipment	- Contractor will use proper construction vehicles and machineries to generate less emission, and regularly maintain them. - Contractor will effectively schedule operation hours considering disturbance nearby communities.	Supervising Consultant, Contractor	MPWT
	Generation of offensive odor due to domestic wastes and discharging water	- All garbage will be put in trash can and regularly disposed to assigned place by community or bury in where feasible under coordination with community. - Septic tanks will be installed in site offices to treat waste water primarily.	Contractor/ Community	MPWT
32	Accidents			
	Accidents of construction workers and local residents	- Supervising consultant and contractor take responsible to ensure safe working conditions in accordance with the Labour Law. - Contractor prepares the safety plan and environmental management plan in a contract to secure overall safety for persons involved, workers and local residents, and environmental conservation around construction site. - The safety plan may include safety training, safety meeting, personal protective equipment, access control on site, protection and restoration of property and landscape, and safety report.	Supervising Consultant/ Contractor	MPWT
Operation Phase				
32	Accidents			
	Increase of traffic accidents	- Local governments with schools will conduct traffic safety campaign to promote awareness to prevent traffic accidents in the communities and schools along the routes.	Local Government/ School	MPWT/ NGOs

Source: Study Team