[APPENDICES]

Appendix-1 Member list of the Study Team

Table.1 Member List of the Study Team

No.	Name	Position	Organization
JICA Member			
1	Hidetaka Sakabe	Team Leader	Infrastructure and Peacebuilding Department, JICA
2	Masahiko Tsunoda	Planning Coordinator	Infrastructure and Peacebuilding Department, JICA
Consultant			
1	Katsufumi Matsuzawa	Consultant Chief	Nippon Koei Co.,Ltd.
2	Yasuhiro Nozue	Deputy Consultant Chief / Construction Planning / Site Survey	Nippon Koei Co.,Ltd.
3	Takeshi Yoshida	Bridge Design	Nippon Koei Co.,Ltd.
4	Tadahiro Fukuda	Hydrological Engineering and River Planning	Nippon Koei Co.,Ltd.
5	Koki Kaneda	Road Planning	Nippon Koei Co.,Ltd.
6	Kan Horikiri	Traffic Survey Engineer	Nippon Koei Co.,Ltd.
7	Kakiko Ide	Environmental and Social Considerations	Nippon Koei Co.,Ltd.
8	Yusuke Kato	Hydrological Engineering and River Planning2	Nippon Koei Co.,Ltd.
9	Masahiro Toriu	Construction Planning2	Nippon Koei Co.,Ltd.
10	Yasuhiro Takaoka	Road Planning and Design	Nippon Koei Co.,Ltd.

Source: JICA Study Team

Appendix-2 Study Schedule

(1) Schedule of First Field Survey

			JICA		Consultant						
			総括 Team Leader 坂部　英孝 Mr. Hidetaka SAKABE	計画管理 Planning Coordinator 角田　真彦 Mr. Masahiko TSUNODA	業務主任 Consultant Chief 松澤　勝文 Mr. Katsufumi MATSUZAWA	副業務主任 施工計画・積算/自然条件調査（地形・地質） Deputy Consultant Chief Construction Planning Site Survey 野末　康博 Mr. Yasuhiro NOZUE	橋梁設計 Bridge Design 吉田　剛 Mr. Takeshi YOSHIDA	水文・水理・河川計画 Hydrological Engineeing and River Planning 福田　忠弘 Mr. Tadahiro FUKUDA	道路設計 Road Design 兼田　公揮 Mr. Koki KANEDA	交通調査 Traffic Survey Engineer 堀切　寛 Mr. Kan HORIKIRI	環境社会配慮 Environmental and Social Considerations 井手　佳季子 Ms. Kakiko IDE
1	5/31	Tue			Tokyo(NRT/12:35)BA006 ⇒London(LHR/17:10)						
2	6/1	Wed			London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/17:10)						
3	6/2	Thu			AM: Courtesy to JICA office　PM:Internal Meeting, Site Survey						
4	6/3	Fri			Courtesy to MIPS&T　Site Survey, Information collection						
5	6/4	Sat			Site Survey	Site Survey	Site Survey	Site Survey			
6	6/5	Sun			1	Document Arrangement	Document Arrangement	Document Arrangement			
7	6/6	Mon			AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey			Tokyo(NRT/12:35)BA006 ⇒ London(LHR/17:10)
8	6/7	Tue			Site Survey	Planning of site survey, Meeting with local company	Site Survey	Planning of site survey, Meeting with local company			London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/17:10)
9	6/8	Wed	Tokyo(11:00)NH10⇒New York(10:45) New York(17:05)BW525⇒Port of Spain(22:05)		AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey			AM:Internal Meeting PM:Site Survey
10	6/9	Thu	Port of Spain(13:50)⇒Saint Lucia(14:55)BW434 Evening: Meeting w/ JICA Office		Site Survey	Site Survey	Site Survey	Site Survey			Site Survey
11	6/10	Fri	AM:Courtesy to MIPS&T PM:Meeting with MIPS&T(Explanation of IC/R)		AM:Courtesy to MIPS&T PM:Meeting with MIPS&T(Explanation of IC/R)						AM:Courtesy to MIPS&T PM:Meeting with MIPS&T(Explanation of IC/R)
12	6/11	Sat	Site Survey		Site Survey	Site Survey	Site Survey	Site Survey		Panama(PTY/12:24) CM0366⇒ Trinidad & Tobago(POS/16:37)	Site Survey
13	6/12	Sun	Internal Meeting, Document Arrangement		Document Arrangement	Document Arrangement	Document Arrangement	Document Arrangement		Trinidad & Tobago(POS/16:37) LI0310⇒ Saint Lucia(SLU/12:24)	Document Arrangement
14	6/13	Mon	M/D Discussion with MIPS&T		M/D Discussion with MIPS&T		AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey		AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey
15	6/14	Tue	M/D Discussion with MIPS&T		M/D Discussion with MIPS&T		Site Survey	Site Survey		Site Survey	Site Survey
16	6/15	Wed	AM:Final Disucussion with MIPS&T & Signing of M/D PM:Report to JICA Office		AM:Final Disucussion with MIPS&T & Signing of M/D, PM:Report to JICA Office Saint Lucia(18:50) ⇒ Port of Spain(20:00)LI309		Site Survey	Site Survey		Internal Meeting, Document Arrangement	Site Survey
17	6/16	Thu	AM:Saint Lucia(07:30)⇒Port of Spain(11:05)LI771 PM:Report to EoJ		PM: Report to EOJ Port of Spain(17:35)⇒Saint Lucia(18:35)BA2158		Site Survey	Site Survey		Site Survey	Site Survey
18	6/17	Fri	Port of Spain(00:15)BW520⇒New York(JFK)(05:35) New York(JFK)(12:30)NH9⇒		Site Survey	Site Survey	Site Survey	Site Survey		Site Survey	Site Survey
19	6/18	Sat	⇒Tokyo(Narita)(15:25)		Site Survey	Site Survey	Site Survey	Site Survey		Site Survey	Site Survey
20	6/19	Sun			Document Arrangement	Document Arrangement	Document Arrangement	Document Arrangement		Document Arrangement	Document Arrangement
21	6/20	Mon			AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey		AM:Internal Meeting PM:Site Survey	AM:Internal Meeting PM:Site Survey
22	6/21	Tue			Site Survey	Site Survey	Site Survey	Site Survey		Site Survey	Site Survey
23	6/22	Wed			Site Survey	Site Survey	Site Survey	Site Survey	Tokyo(NRT/12:35)BA006 ⇒ London(LHR/17:10)	Site Survey	Site Survey
24	6/23	Thu			Site Survey	Site Survey	Site Survey	Site Survey	London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/17:10)	Site Survey	Site Survey
25	6/24	Fri			Discussion with MIPS&T						
26	6/25	Sat			Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	Site Survey
27	6/26	Sun			Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement
28	6/27	Mon			Saint Lucia (UVF/19:35)BA2158⇒	Site Survey	Saint Lucia (UVF/19:35)BA2158⇒		Site Survey	Site Survey	Site Survey
29	6/28	Tue			⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒	Site Survey	⇒London(LHR/8:50) London(LHR/15:30)BA005 ⇒		Site Survey	Site Survey	Site Survey
30	6/29	Wed			⇒Tokyo(NRT/11:05)	Site Survey	⇒Tokyo(NRT/11:05)		Site Survey	Site Survey	Site Survey
31	6/30	Thu				Site Survey			Site Survey	Site Survey	Site Survey
32	7/1	Fri				Discussion with MIPS&T			Discussion with MIPS&T	Discussion with MIPS&T	Discussion with MIPS&T
33	7/2	Sat				Internal Meeting, Site Survey			Internal Meeting, Site Survey	Internal Meeting, Site Survey	Internal Meeting, Site Survey
34	7/3	Sun				Site Survey			Saint Lucia (UVF/19:35)BA2158⇒	Site Survey	Saint Lucia (UVF/19:35)BA2158⇒
35	7/4	Mon				Site Survey			⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒	Site Survey	⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒
36	7/5	Tue				Site Survey			⇒Tokyo(NRT/11:05)	Site Survey	⇒Tokyo(NRT/11:05)
37	7/6	Wed				Site Survey				Site Survey	
38	7/7	Thu				Site Survey				Site Survey	
39	7/8	Fri				Site Survey				Site Survey	
40	7/9	Sat				Saint Lucia (UVF/18:55)BA2158⇒				Site Survey	
41	7/10	Sun				⇒London(LHR/8:10)BA2159 London(LHR/15:30)BA005 ⇒				Saint Lucia(SLU/07:30)⇒Port of Spain(POS/11:05)LI771 Port of Spain(PTY/17:34)CM0365⇒ Panama(PTY/19:53)	
42	7/11	Mon				⇒Tokyo(NRT/11:05)					

Source: JICA Study Team

(2) Schedule of Second Field Survey

			JICA		Consultant							
			総括 Team Leader 坂部　英孝 Mr. Hidetaka SAKABE	計画管理 Planning Coordinator 角田　真彦 Mr. Masahiko TSUNODA	業務主任 Consultant Chief 松澤　勝文 Mr. Katsufumi MATSUZAWA	副業務主任 施工計画・積算/自然条件調査（地形・地質） Deputy Consultant Chief Construction Planning Site Survey 野末　康博 Mr. Yasuhiro NOZUE	橋梁設計 Bridge Design 吉田　剛 Mr. Takeshi YOSHIDA	水文・水理・河川計画 Hydrological Engineeing and River Planning 福田　忠弘 Mr. Tadahiro FUKUDA	道路設計 Road Design 兼田　公揮 Mr. Koki KANEDA	環境社会配慮 Environmental and Social Considerations 井手　佳季子 Ms. Kakiko IDE	施工計画・積算２ Construction Planning & Cost Estimation 2 鳥生　昌宏 Mr. Masahiro TORIU
1	10/23	Sun			Tokyo(NRT/12:35)BA006 ⇒London(LHR/17:10)				Tokyo(NRT/12:35)BA006 ⇒ London(LHR/17:10)		Tokyo(HND/00:05)JL002 ⇒ San Francisco(LHR/21:25, 22OCT) San Francisco(21:25, 22OCT)AA1540 ⇒ MIAMI(05:59) MIAMI(09:59) ⇒ Saint Lucia (UVF/13:39)
2	10/24	Mon			London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/13:45)				London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/13:45)		Site Survey
3	10/25	Tue			Courtesy to JICA Office Courtesy to MIPE&L			Tokyo(NRT/12:35)BA006 ⇒ London(LHR/17:10)	Courtesy to JICA Office Courtesy to MIPE&L		Courtesy to JICA Office Courtesy to MIPE&L
4	10/26	Wed			Site Survey	Site Survey	Site Survey	London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/13:45)	Site Survey		Site Survey
5	10/27	Thu			Site Survey	Site Survey	Site Survey	Site Survey	Site Survey		Site Survey
6	10/28	Fri			Site Survey	Site Survey	Site Survey	Site Survey	Site Survey		Site Survey
7	10/29	Sat			Site Survey	Site Survey	Site Survey	Site Survey	Site Survey		Site Survey
8	10/30	Sun			Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Tokyo(NRT/12:35)BA006 ⇒ London(LHR/17:10)	Internal Meeting, Document Arrangement
9	10/31	Mon			Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/13:45)	Site Survey
10	11/1	Tue			Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	Site Survey
11	11/2	Wed	Tokyo Haneda(10:20)NH110⇒New York(10:00) New York(17:05)BW525⇒Port of Spain(22:05)		Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	Site Survey	Site Survey
12	11/3	Thu	Port of Spain(13:50)Bw434⇒Saint Lucia(14:55) Evening: Meeting w/ JICA Office		Site Survey PM:Meeting with JICA Office		Site Survey	Site Survey	Saint Lucia (UVF/19:35)BA2158⇒	Site Survey	Site Survey
13	11/4	Fri	AM:Courtesy to MIPE&L PM:Meeting with MIPE&L(Explanation of IT/R)		AM:Courtesy to MIPE&L PM:Meeting with MIPE&L(Explanation of IT/R)				⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒	AM:Courtesy to MIPE&L PM:Meeting with MIPE&L(Explanation of IT/R)	
14	11/5	Sat	Site Survey		Site Survey	Site Survey	Site Survey	Site Survey	⇒Tokyo(NRT/11:05)	Site Survey	Site Survey
15	11/6	Sun	Internal Meeting, Document Arrangement		Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement		Internal Meeting, Document Arrangement	Internal Meeting, Document Arrangement
16	11/7	Mon	M/D Discussion with MIPE&L		M/D Discussion with MIPE&L		Site Survey	Site Survey		Site Survey	Site Survey
17	11/8	Tue	M/D Discussion with MIPE&L		M/D Discussion with MIPE&L		Site Survey	Site Survey		Site Survey	Site Survey
18	11/9	Wed	AM:Final Disucussion with MIPE&L & Signing of M/D PM:Report to JICA Office		AM:Final Disucussion with MIPE&L & Signing of M/D PM:Report to JICA Office		Site Survey	Site Survey		Site Survey	Site Survey
19	11/10	Thu	AM:Saint Lucia(7:30)⇒Port of Spain(11:05)LI771 PM:Report to EoJ		AM:Saint Lucia(SLU 7:30)⇒Port of Spain(11:05)LI771 PM:Report to EoJ Port of Spain (18:35)BA2158⇒		Saint Lucia (UVF/20:45)BA2158⇒			Saint Lucia (UVF/19:35)BA2158⇒	Saint Lucia (UVF/15:23)AA2295 ⇒ MIAMI(18:20) MIAMI(20:16)AA1586 ⇒ San Francisco(23:45)
20	11/11	Fri	Port of Spain(9:00)BW524⇒New York(JFK) (13:20) New York(JFK) (16:55)NH109⇒		⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒		⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒			⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒	San Francisco(14:55)JL001 ⇒
21	11/12	Sat	⇒Tokyo(Haneda) (21:10)		⇒Tokyo(NRT/11:05)		⇒Tokyo(NRT/11:05)			⇒Tokyo(NRT/11:05)	⇒ Tokyo(HND/19:20)

Source: JICA Study Team

(3) Schedule of Third Field Survey

			JICA		Consultant			
			総括 Team Leader 坂部 英孝 Mr. Hidetaka SAKABE	計画管理 Planning Coordinator 角田 真彦 Mr. Masahiko TSUNODA	業務主任 Consultant Chief 松澤 勝文 Mr. Katsufumi MATSUZAWA	副業務主任 施工計画・積算/自然条件調査（地形・地質） Deputy Consultant Chief Construction Planning / Site Survey 野末 康博 Mr. Yasuhiro NOZUE	橋梁設計 Bridge Design 吉田 剛 Mr. Takeshi YOSHIDA	環境社会配慮 Environmental and Social Considerations 井手 佳季子 Ms. Kakiko IDE
1	2/26	Sun			Tokyo(NRT/12:35)BA006 ⇒London(LHR/17:10)			
2	2/27	Mon			London(LHR/10:00)BA2159 ⇒Saint Lucia (UVF/13:45) (Accommodation: Palm Haven)			
3	2/28	Tue			(Tentative) Discussion with MIPE&L (Accommodation: Palm Haven)			
4	3/1	Wed			(Tentative) Discussion with MIPE&L / MOF / DCA / Clown Lands (Accommodation: Palm Haven)			
5	3/2	Thu			(Tentative) Discussion with MIPE&L (Accommodation: Palm Haven)			
6	3/3	Fri	AM: Courtesy Call to the Department of Infrastructure Explanation of the Draft Report		AM: Courtesy Call to the Department of Infrastructure Explanation of the Draft Report (Accommodation: CoCo Palm)			
7	3/4	Sat			(Tentative) Site Visit (Accommodation: CoCo Palm)			
8	3/5	Sun			(Tentative) Site Visit (Accommodation: CoCo Palm)			
9	3/6	Mon	9:00 M/D Discussion with MIPE&L		9:00 M/D Discussion with MIPE&L (Accommodation: CoCo Palm)			
10	3/7	Tue	9:00 M/D Discussion with MIPE&L		9:00 M/D Discussion with MIPE&L (Accommodation: CoCo Palm)			
11	3/8	Wed	AM:Final Disucussion with MIPE&L & Signing of M/D PM: Saint Lucia SLU(18:50)⇒Port of Spain(20:00) LI309		AM:Final Disucussion with MIPE&L & Signing of M/D PM:Saint Lucia SLU(18:50)⇒Port of Spain(20:00) LI309 (Accommodation:)		AM:Final Disucussion with MIPE&L & Signing of M/D (Accommodation: CoCo Palm)	
12	3/9	Thu			Report to EoJ Port of Spain (18:35)BA2158⇒		Saint Lucia (UVF/20:45)BA2158⇒	
13	3/10	Fri			⇒London(LHR/8:50)BA2159 London(LHR/15:30)BA005 ⇒			
14	3/11	Sat			⇒Tokyo(NRT/11:05)			

Source: JICA Study Team

Appendix-3 List of Parties Concerned in the Recipient Country

(1) Ministry of Infrastructure, Port Services and Transport

Name	Position
Stephenson King	Miniter
Allison A.Jean	Permanent Secretary
Duor M.Daniel	Deputy Permanent Secretary
Albert Jn Baptiste	Chief Engineer
Amos Hippolyte	Civil Engineer/ Construction and Maintenance Department
Naomi Cherry	Civil Engineer/ Construction and Maintenance Department
Natalie Popovic	Civil Engineer/ Construction and Maintenance Department
Donna Fletcher	Engineering Assistant
Venantius Descartes	Chief/Metrological Department
Peter Cepal	Quantity Surveyor
Flairra hunte	Quantity Surveyor

Source: JICA Study Team

(2) Ministry of Finance

Name	Position
Tamara Joseph Lionel	Economist- Department of Economic Development

Source: JICA Study Team

(3) Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation

Name	Position
Joanna Reynolds Atherton	Permanent Secretary, Department of Physical Planning
Hidreth Lewis	Deputy Permanent Secretary (DCA),
Vernella Charlemagne	Commissioner of Crown Lands, Crown Lands Section, Department of Physical Planning
John Labadie	Chief Surveyor , Division of Lands and Survey
Terrance Gilliard	Director
Rupert Lay	Project Engineer
Junior Mathurin	Water Resource Officer IV
Jason Ernest	Information Technology Manager

Source: JICA Study Team

(4) Embassy of Japan in Trinidad and Tobago

Name	Position
Mitsuhiko Okada	Ambassador Extraordinary
Takafumi Ura	Second Secretary
Miyuki Shinoe	Second Secretary

Source: JICA Study Team

(5) JICA Saint Lucia Office

Name	Position
Tetsuhiro Ike	Resident Representative

Source: JICA Study Team

Minutes of Discussions
on the Preparatory Survey for the Project for
Reconstruction of Bridges in Cul-De-Sac Basin
(The First Field Survey)

In response to the request from the Government of Saint Lucia, the Government of Japan decided to conduct a Preparatory Survey for the Project for Reconstruction of Bridges in Cul-De-Sac Basin (hereinafter referred to as "the Project"), and entrusted the Preparatory Survey to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent the Preparatory Survey Team for the Outline Design (hereinafter referred to as "the Team") to Saint Lucia, headed by Hidetaka Sakabe, Deputy Director, Team 1, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA, and is scheduled to stay in the country from June 1 to July 9, 2016.

The Team held a series of discussions with the officials concerned of the Government of Saint Lucia and conducted a field survey in the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare an Interim Report for the Preparatory Survey.

Castries, June 15, 2016

Hidetaka Sakabe
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Japan

Allison A. Jean
Permanent Secretary

Ministry of Infrastructure, Port Services and Transport
Saint Lucia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to ensure smooth and stable traffic through a year by reconstruction of bridge(s) located within the Cul-De-Sac Basin, thereby contributing to mitigate flood disasters.

2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as "the Project for Reconstruction of Bridges in Cul-De-Sac Basin".

3. Project Site

Both sides confirmed that the sites of the Project are shown in Annex 1.

4. Executing Agency

Both sides confirmed the followings:

4-1. The executing agency is Ministry of Infrastructure, Port Services and Transport (hereinafter referred to as "MIPS&T"). The executing agency shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the Undertakings are taken by relevant agencies properly and on time. The organization charts are shown in Annex 2.

4-2. After the completion of the Project, MIPS&T will be responsible for maintenance and management of the facilities constructed by the Project.

5. Items requested by the Government of Saint Lucia

5-1. As a result of discussions, both sides confirmed that the items requested by the Government of Saint Lucia are as follows:

1) Reconstruction of three (3) bridges (Ravine Poisson Bridge, the Ferrand's Bridge and the Cul-De-Sac Bridge) located within Cul-De-Sac Basin;
2) Approach works from existing roads to the bridges; and
3) Revetment works and bed protection works for abutment and pier.

5-2. Both sides confirmed that the Project do not include the improvement works for the Cul-De-Sac River.

5-3. JICA will assess the appropriateness of the above requested items through the survey and will report findings to the Government of Japan. The final components of the Project would be decided by the Government of Japan.

6. Japanese Grant Scheme

6-1. The Saint Lucia side understands the Japanese Grant Scheme and its procedures as described in Annex 3, Annex 4 and Annex 5, and necessary measures to be taken by the Government of Saint Lucia. A template of the Project Monitoring Report to be submitted by the executing agency is as attached in Annex 6

6-2. The Saint Lucia side understands to take the necessary measures, as described in Annex 7, for smooth implementation of the Project, as a condition for the Japanese Grant to be implemented. The detailed contents of the Annex 7 will be worked out during the survey and shall be agreed no later than by the Explanation of the Draft Preparatory Survey Report.

The contents of Annex 7 will be used to determine the following:

(1) The scope of the Project;
(2) The timing of the Project implementation; and
(3) Timing and possibility of budget allocation.

Contents of Annex 7 will be updated as the Preparatory Survey progresses, and will finally be the Attachment to the Grant Agreement.

7. Schedule of the Survey

7-1. The Team explained the tentative schedule of the Survey as follows:

(1) The Team will visit Saint Lucia three (3) times in total before finalizing the Preparatory Survey Report;
(2) JICA will prepare an Interim Report in English and dispatch a mission to Saint Lucia in order to explain its contents around November 2016 and continue some additional field survey in Saint Lucia;
(3) JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Saint Lucia in order to explain its contents around April 2017;
(4) If the contents of the draft Preparatory Survey Report is accepted in principle and the Undertakings are fully agreed by the Saint Lucia side, JICA will complete the final report in English and send it to Saint Lucia around August 2017; and
(5) The explained schedule is tentative and subject to change.

7-2. Saint Lucia side responded that the residents in the Project Area are put at risk of flood disasters during the long survey period. Then Saint Lucia side requested for the Team to examine shortening of the survey period and earlier commencement of the Project. The Team understood the situation and conveys this request to

JICA HDQ for discussion with related officials of Japanese side.

8. Environmental and Social Considerations

8-1. The Saint Lucia side confirmed to give due environmental and social considerations during implementation of the Project, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).

8-2. The Project is categorized as B because the Project is not considered as a large-scale road and bridge project, which is not located in sensitive areas, and has none of the sensitive characteristics under the Guidelines, it is not likely to have significant adverse impact on the environment. The Saint Lucia side confirmed to conduct procedures as needed concerning the environmental assessment (including stakeholder meetings, Environmental Impact Assessment (EIA) /Initial Environmental Examination (IEE) and information disclosure, etc.) and make EIA/IEE report of the Project.

8-3. The Team requested Saint Lucia side to receive an approval of the EIA/IEE before the commencement of the Project. Saint Lucia side responded that such procedures are not required for bridge construction projects under the law of Saint Lucia. The Team pointed out that there are some possibilities that procedures, e.g. development permit, etc., contain process to check impacts to environment and their mitigation measures. Therefore the Team will collect additional information through this survey. In case the Team identifies necessities of approval(s) related to the environment clearance through the survey, the approval(s) shall be received from the responsible authorities in Saint Lucia and MIPS&T should submit it to JICA by July 2017.

8-4. For projects that will result in involuntary resettlement, the Saint Lucia side confirmed to prepare an Abbreviated Resettlement Action Plan (ARAP) and make it available to the public. In addition, the Saint Lucia side confirmed to provide the affected people with sufficient compensation and/or support in accordance with ARAP, in a timely manner.

9. Other Relevant Issues

9-1. Design of Improvement Works for Cul-De-Sac River

Saint Lucia side indicated that the preparatory survey should include design of improvement works for Cul-De-Sac River to mitigate the flood disasters. The Team responded that the Project is focusing on the bridge construction as a part of

countermeasures to mitigate the flood disasters; therefore the preparatory survey could not include design of improvement works for river considering contents of the project.

On the other hand, the Team proposed to provide some fundamental data and show some conceptual plan for improvement works in the Project area based on the result of hydrological survey. Saint Lucia side understood the situation and agreed about the proposal.

9-2. Assistance to the Preparatory Survey

The Saint Lucia side shall, at its own expense, provide the Team with the following items in cooperation with other organizations concerned

(1) Security-related information as well as measures to ensure the safety of the survey team;
(2) Data and information necessary for the Survey;
(3) Counterpart personnel;
(4) Identification cards if necessary;
(5) Entry permits necessary for the survey team members to conduct field surveys;
(6) Permission for the implementation of traffic survey; and
(7) Supports in obtaining other privileges and benefits, if necessary.

9-3. Major Undertakings to be taken by Saint Lucia Side

The Saint Lucia side agreed that the following undertakings should be taken by the Saint Lucia side at the Saint Lucia expenses under the Project if implementation of the Project is approved by the Government of Japan;

(1) To provide tax exemption for construction materials and equipment for the Project.
(2) The Saint Lucia side agreed that customs duties, internal taxes and other fiscal levies which may be imposed in Saint Lucia are exempted under mutual agreement of Exchange of Notes (E/N).
(3) If any expenses stated above are caused by some reasons such as the delay of execution of tax exemption, the Saint Lucia side shall pay for it.
(4) To secure the lots of land necessary for the implementation of the Project including land for site office, plant yards, material storing yard, motor pool, temporary construction yard and waste disposal site;
(5) To relocate existing utilities within the Project site;
(6) To relocate existing buildings and obstructions if necessary;
(7) To demolish existing bridges if necessary;
(8) To arrange issuance of license, permission and other necessary procedures for

the Project;

(9) To obtain the royalties/permission for taking raw materials such as stone/rock/filling materials from the quarry/river-bed/borrow pit;

(10) To conduct traffic controls of existing road for the Project;

(11) To provide security measures for all concerned working for the Project; and

(12) To provide utility services for all concerned working for the Project such as electricity and water

Annex 1 Project Site

Annex 2 Organization Chart

Annex 3 Japanese Grant

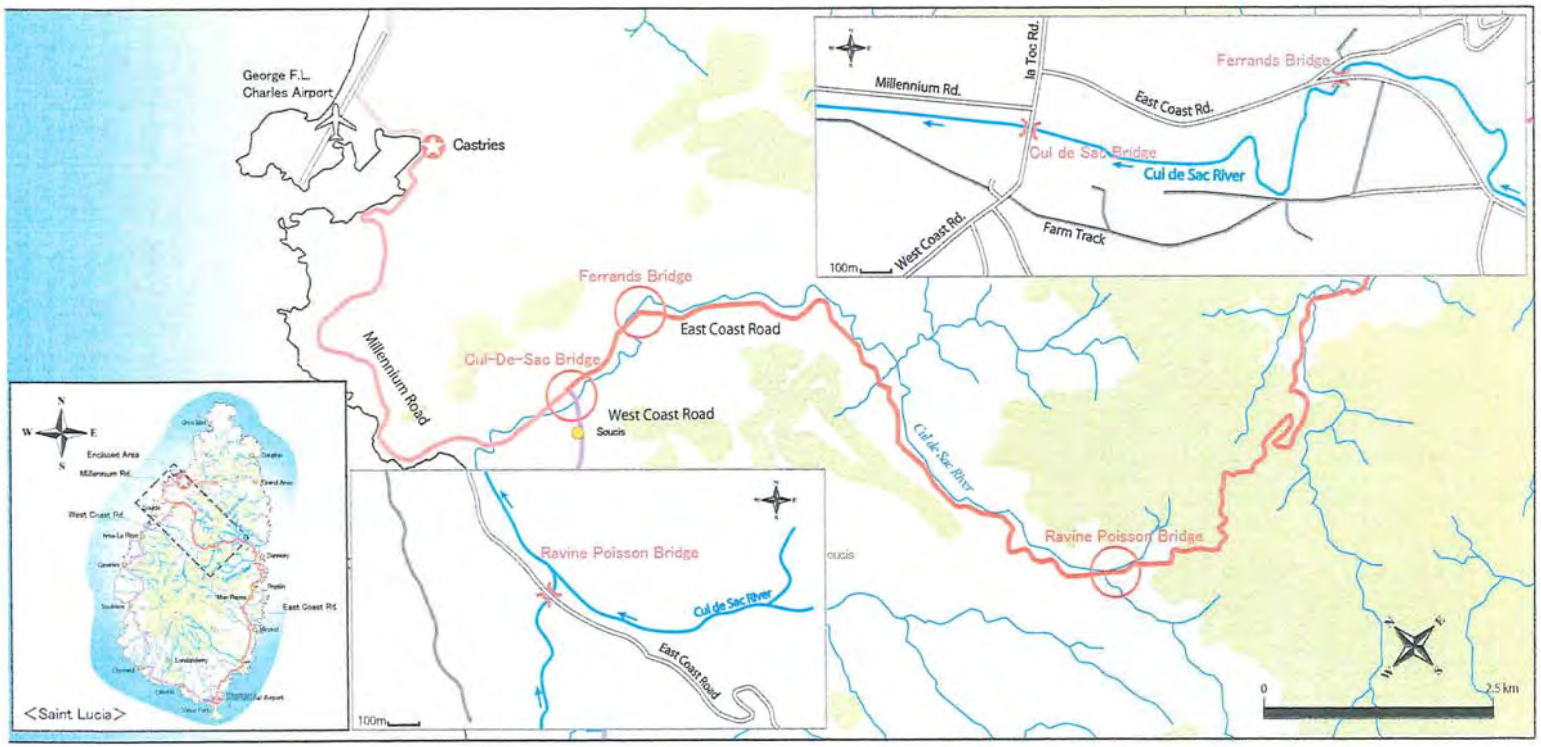
Annex 4 Flow Chart of Japanese Grant Procedures

Annex 5 Financial Flow of Japanese Grant

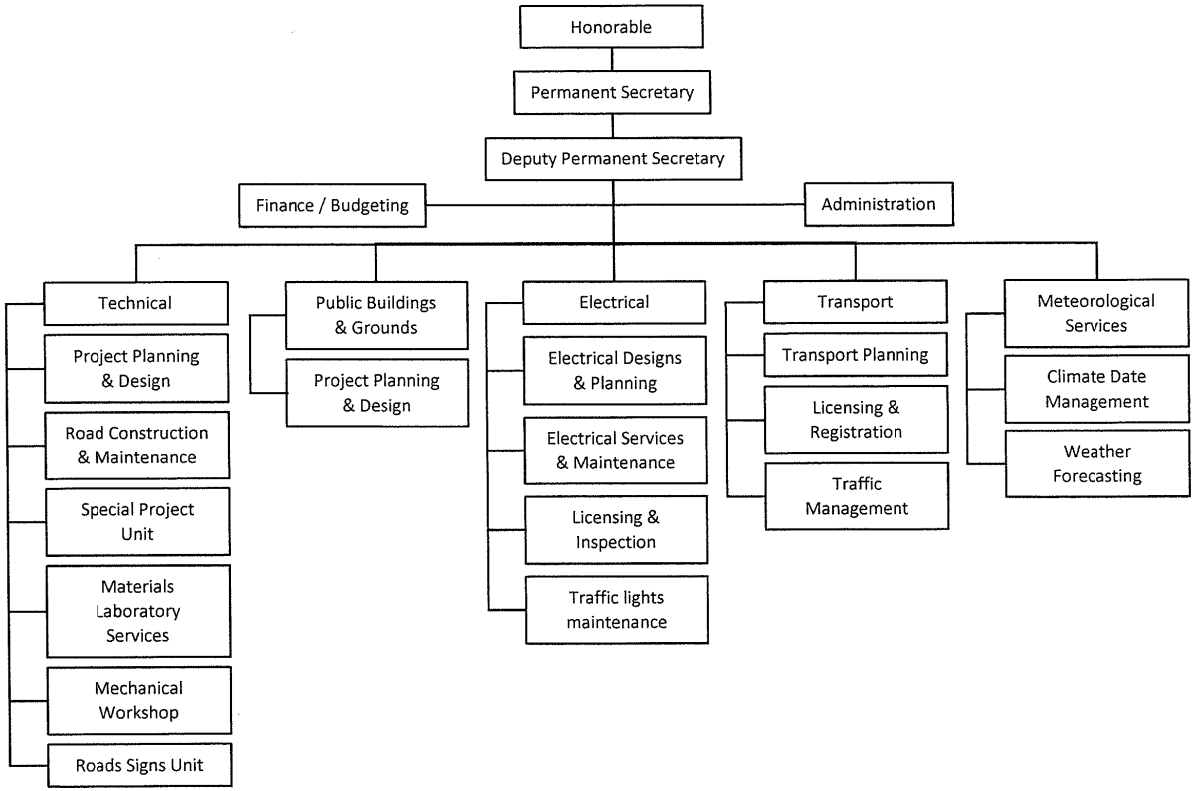
Annex 6 Project Monitoring Report

Annex 7 Major Undertakings to be taken by Each Government

ıex-1: Project Site



2: Organization Chart of MIPS&T



Annex-3: Japan's Grant Aid Scheme

JAPAN'S GRANT AID

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

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

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures:

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

2. Preparatory Survey

(1) Contents of the Survey

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

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

- Estimation of costs of the Project.

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

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

(2) Selection of Consultants

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

(3) Result of the Survey

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

3. Japan's Grant Aid Scheme

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

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

(2) Selection of Consultants

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

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient

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

(4) Necessity of "Verification"

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

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

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex-6. The Japanese Government requests the Government of the recipient country to exempt all customs duties, internal taxes and other fiscal levies such as VAT, commercial tax, income tax, corporate tax, resident tax, fuel tax which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract, since the Grant Aid fund comes from the Japanese taxpayers.

(6) "Proper Use"

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

(7) "Export and Re-export"

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

(8) Banking Arrangements (B/A)

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

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

(9) Authorization to Pay (A/P)

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

commissions paid to the Bank.

(10) Social and Environmental Considerations

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

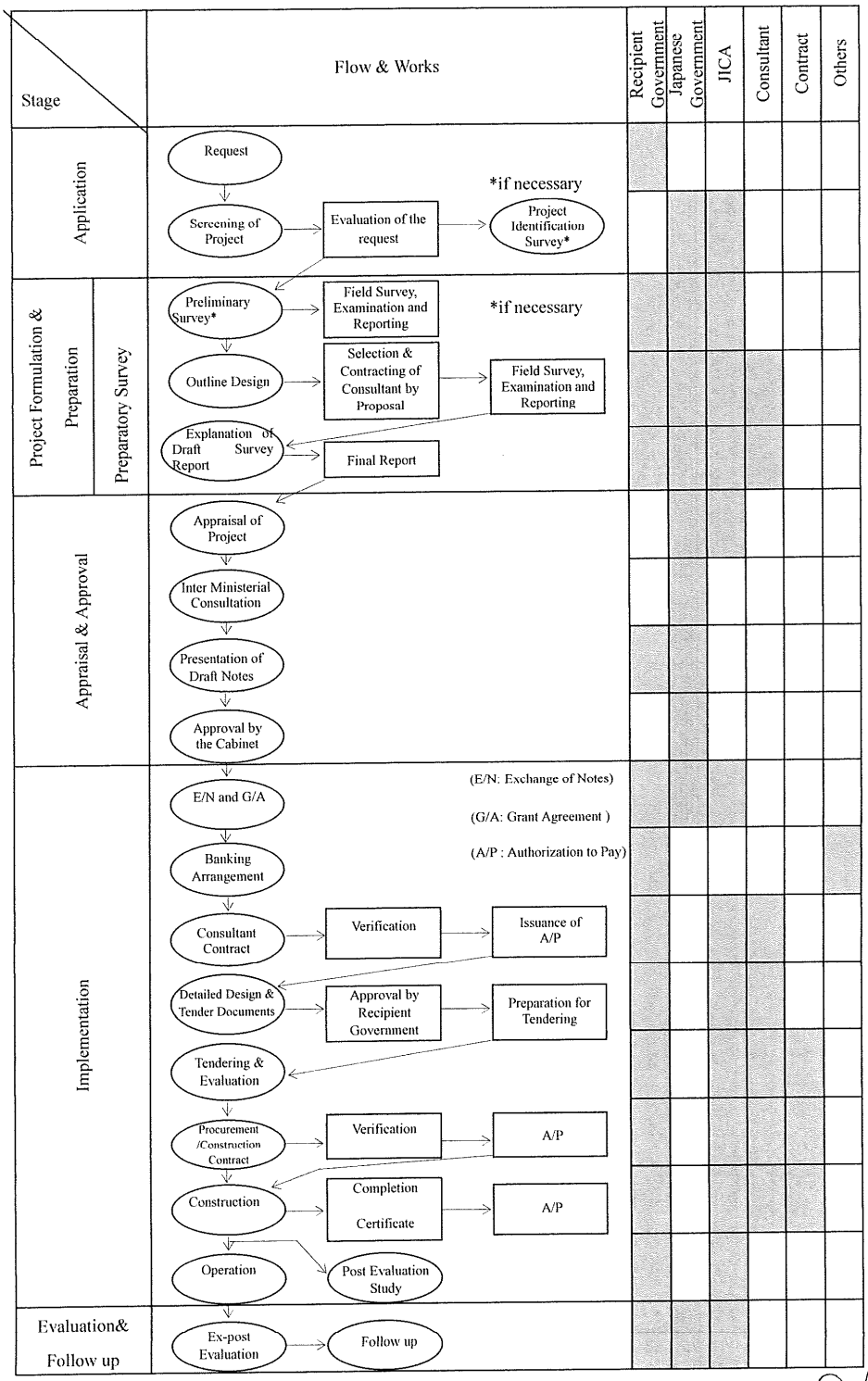
(11) Monitoring

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

(12) Safety Measures

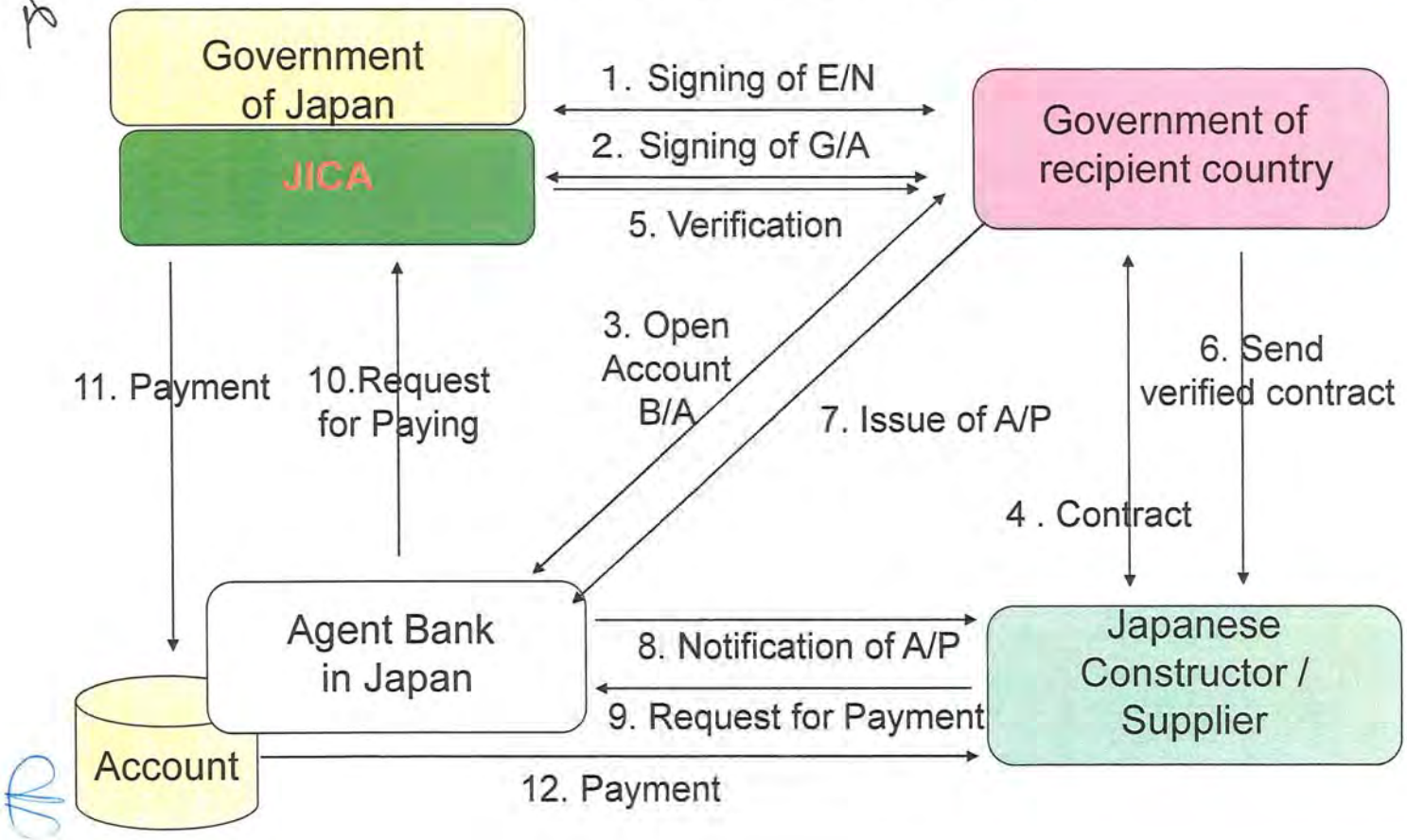
The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Annex-5

Financial Flow of Grant Aid



Project Monitoring Report
on
Project Name
Grant Agreement No. XXXXXXX

Organization Information

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

Outline of Grant Agreement:

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

1: Project Description

1-1 Project Objective

1-2 Necessity and Priority of the Project

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

1-3 Effectiveness and the indicators

- Effectiveness by the project

2: Project Implementation

2-1 Project Scope

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

Location	**Original:** *(M/D)* **Attachment(s):Map**	**Actual:** *(P/Rand PCR)* **Attachment(s):Map**

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

Items	Original	Actual
(M/D)	*(M/D)*	*(P/R and PCR)*

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

(P/R and PCR)

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

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

Items	Original		Actual
	DOD	G/A	
【M/D】 Project Completion Date*	*(M/D)*		*(P/R, PCR)* As of (Date of Revision) Please state not only the most updated schedule but also other past revisions chronologically.

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

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

(P/R and PCR)

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

2-3-2 Activities
See Attachment 3.

2-4 Project Cost
2-4-1 Project Cost
Table 2-3-1 Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities (or Equipment)				
Consulting Services	- Detailed design -Procurement Management -Construction Supervision			
Total				

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

Table 2-3-2 Comparison of Original and Actual Cost by the Government of XX

Items			Cost (Million USD)	
	Original	Actual	Original	Actual
Total				

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

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

(P/R, PCR)

2-5 Organizations for Implementation

2-5-1 Executing Agency:

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

Original: *(M/D)*

Actual, if changed: *(P/R and PCR)*

2-6 Environmental and Social Impacts

Report based on the agreed environmental checklist and monitoring form (See Attachment 4)

3: Operation and Maintenance (O&M)

3-1 O&M and Management

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

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

3-2 **O&M Cost and Budget**
- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

Original: *(M/D)*

4: Precautions (Risk Management)

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

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

(Description of Risk)	Impact: H/M/L
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action during the Implementation:
	Contingency Plan (if applicable):
Actual issues and Countermeasure(s)	
(P/R and PCR)	

5: Evaluation

5-1 Overall evaluation

Please describe your evaluation on the overall outcome of the project.

(PCR)

5-2 Lessons Learnt and Recommendations

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

(PCR)

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

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Monitoring report on environmental and social considerations

Annex-7: Major Undertakings to be taken by Each Government

Major Undertakings to be taken by Recipient Government

1. Before the Tender

NO	Items	Deadline	In charge	Cost	Ref.
1	To approve IEE/EIA	within 1 month after G/A			
2	To implement EIA	before start of the construction			
3	To open Bank Account (Banking Arrangement (B/A))	within 1 month after G/A			
4	To secure lands 1) right of way for Sta. **+***-Sta.**+*** 2) temporary construction yard and stock yard near the Project area 3) borrow pit and disposal site near the Project area	before notice of the tender document			
5	To obtain the planning, zoning, building permit	before notice of the tender document			
6	To clear, level and reclaim the following sites when needed the site to be confiremed in the DRAFT FINAL REPORT	before notice of the tender document			

2. During the Project Implementation

NO	Items	Deadline	In charge	Cost	Ref.
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the singing of the contract			
	2) Payment commission for A/P	every payment			
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country				
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project			
	2) Internal transportation from the port of disembarkation to the project site	during the Project			
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work	during the Project			
4	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted; Such customs duties, internal taxes and other fiscal levies mentioned above include VAT, commercial tax, income tax and corporate tax of Japanese nationals, resident tax, fuel tax, but not limited, which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract	during the Project			
5	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment	during the Project			
6	To submit environmental monitoring report to JICA Bhutan Office	during the Project			

3. After the Project

NO	Items	Deadline	In charge	Cost	Ref.
1	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine/Periodic inspection	After completion of the construction			

Major Undertakings to be covered by the Grant Aid

No	Items	Deadline	Cost Estimated (Million Japanese Yen)*	
1	To construct roads/bridges (or To procure equipment)			
	- Reconstruction of the road			
	- Reconstruction of the bridge			
	1) To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		XX.XX	
	a) Marine(Air) transportation of the products from Japan to the recipient country			
	b) Internal transportation from the port of disembarkation to the project site			
	2) To construct access roads			
	a) Within the site			
2	To implement detailed design, tender support and construction supervision (Consultant)		YY.YY	
3	Contingencies		ww.ww	
	Total		ZZ.ZZ	

MINUTES OF DISCUSSIONS
ON
THE PREPARATORY SURVEY
FOR
THE PROJECT FOR
RECONSTRUCTION OF BRIDGES IN CUL-DE-SAC BASIN, SAINT LUCIA
(The 2nd Field Survey)

On the basis of discussions and field survey in Saint Lucia in June, 2016 and subsequent technical examination in Japan, Japan International Cooperation Agency (hereinafter referred to as "JICA") prepared an Interim Report (hereinafter referred to as "the Report") on the Project for Reconstruction of Bridges in Cul-De-Sac Basin (hereinafter referred to as "the Project").

The Preparatory Survey Team (hereinafter referred to as "the Team"), headed by Mr. Hidetaka SAKABE, Acting Director, Team 1, Transportation and ICT Group, Infrastructure and Peacebuilding Department of JICA, explained the report to and consulted with Ministry of Infrastructure, Ports, Energy and Labor (hereinafter referred to as "MIPE&L"), Government of Saint Lucia (hereinafter referred to as "the GoSL"), and the concerned officials of the GoSL.

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

The Team will stay in the country from October 23 to November 10, 2016 and proceed to further studies and prepare the Preparatory Survey Report.

Castries, November 9, 2016

Hidetaka Sakabe
Leader
Preparatory Survey Team
Japan International Cooperation Agency
Japan

Allison A. Jean
Permanent Secretary
Ministry of Infrastructure, Ports, Energy and Labour
Saint Lucia

ATTACHMENT

1. Contents of the Report

MIPE&L (hereinafter referred to as "the Saint Lucia side") agreed and accepted in principle the contents of the Report explained by the Team, which includes the Minutes of Discussions on the Preparatory Survey for the Project signed on June 15, 2016 by Ministry of Infrastructure, Port Services and Transport (hereinafter referred to as "MIPS&T") the Saint Lucia side and JICA Preparatory Survey Team (hereinafter referred to as "the MD-1").

2. Executing Agency

Both sides confirmed the following:

2-1. After the signing of the M/D-1, the GoSL appointed MIPE&L as the executing agency of the Project due to the reorganization of cabinet-level ministries and agencies based on the result of the election conducted in June, 2016. MIPE&L shall coordinate with all the relevant agencies to ensure smooth implementation of the Project and ensure that the necessary undertakings are taken by relevant agencies properly and on time. The present chart of MIPE&L is shown in Annex-1; and

2-2. After the completion of the Project, MIPE&L will be responsible for maintenance and management of the facilities constructed by the Project.

3. Rescheduling of the Preparatory Survey

Through the discussions in the first field survey in June, 2016, MIPS&T requested to shorten the survey period and earlier commencement of the Project as described on the M/D-1. Based on the request, the Team examined its feasibility and discussed with relevant officials of the Japanese side. As the result of the examinations, the Team responded to the Saint Lucia side that the Survey will be able to progress about two (2) months shorter.

The Team explained the revised schedule of the Survey as follows;

(1) JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Saint Lucia in order to explain its contents around March 2017; and

(2)In case the contents of the draft Preparatory Survey Report is accepted in principle and the undertakings are fully agreed by the Saint Lucia side, JICA will complete the final report in English and send it to Saint Lucia around June 2017.

Both sides confirmed that the explained schedule is tentative and subject to change.

4. Dealing of the Ferrand's Bridge

The Team explained that river improvement plans and their implementation are required for designing of the Ferrand's Bridge due to the flood mechanism described in the Report. However, the Saint Lucia side doesn't have such plan around the Ferrand's Bridge at the moment.

In conclusion, the Ferrand's Bridge reconstruction plan still includes fragile situation for flood disasters. Therefore the Team suggested that the reconstruction of the Ferrand's Bridge must be deferred pending the decision of the comprehensive river improvement plan in Cul-De-Sac basin, and the Project prioritizes other two (2) bridges; the Cul-De-Sac Bridge and the Ravine Poisson Bridge. The Saint Lucia side understood the situation and agreed on it. On the other hand, both sides confirmed that the Team will conduct the outline design for three (3) bridges including the Ferrand's Bridge through the Preparatory survey.

5. Methodology of Reconstruction

5-1. The Team explained the recommended bridge reconstruction plan for the Cul-De-Sac Bridge as shown in Annex-2. Bridge location and length are adjusted to geometric structure of the Millennium Highway and the south embankment. To achieve the objective of the Project, the plan also requires road raising works/improving drainage at the south side of the Cul-De-Sac Bridge on the West Coast Road (hereinafter referred to as "the Southern Road to the Cul-De-Sac Bridge"), which is one of major undertakings by the Saint Lucia side.

5-2. The Team explained the recommended bridge reconstruction plan for the Ravine Poisson Bridge as shown in Annex-3. The plan ensures enough cross-sectional area of flow to prevent flood and collapse of the bridge. The plan also requires rented land, a temporary road diversion and a temporary bridge, which are also major undertakings by the Saint Lucia side.

The Saint Lucia side understood and accepted the proposal, and the Team will proceed to further design based on the methodology mentioned above.

6. Major Undertakings by Each Side

6-1. Major Undertakings by the Saint Lucia Side

The Team explained the major undertakings by each side under the Project as shown in Annex-4. The Saint Lucia side agreed to its explanation and responded that the Saint Lucia side had already started procedures to allocate funds for the implementation of their undertakings in FY2017/2018.

6-2. Land Acquisition and Relocation of Existing Public Utilities

It is understood that GoSL will finance and conduct land acquisition and relocation of existing public utilities necessary for construction work of bridge reconstructions. For the implementation, the Team would provide drawings for reconstruction of bridges to the Saint Lucia side by the end of November, 2016. Based on the provided drawings, the Saint Lucia side will take necessary action for the implementation, e.g. cost estimation for budget arrangement, procedures for land acquisition, negotiation with related companies responsible for public utilities.

6-3. Design for the Southern Road to the Cul-De-Sac Bridge

The Saint Lucia side requested the Japanese side to design for improvement works of the Southern Road to

the Cul-De-Sac Bridge aiming the design continuity between the approach road to the new Cul-De-Sac Bridge and this section. The Saint Lucia side explained that they would implement the works with their own funds based on the design. The Team conveys this request to JICA HDQ and discuss with relevant officials of the Japanese side.

6-4. A Temporary Traffic Road Diversion and a Temporary Bridge at the Ravine Poisson Bridge

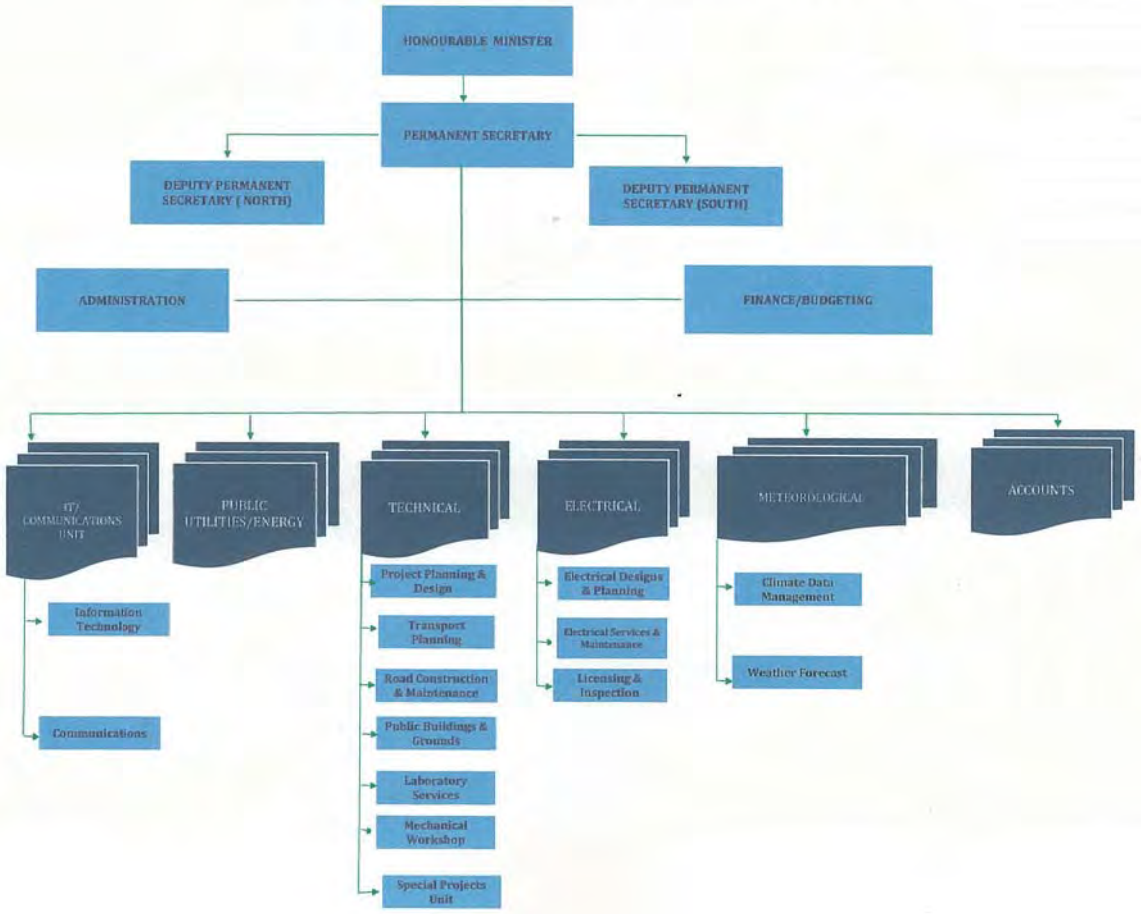
The Saint Lucia side agreed to construct a temporary traffic road diversion and a temporary bridge for detour during the construction period at their own expense. For the construction of these facilities, the Team will provide drawings for temporary traffic diversion and a temporary bridge to the Saint Lucia side by the end of November, 2016. Based on the provided drawings, the Saint Lucia side will take the necessary action for the construction, e.g. cost estimation for budget arrangement and securing land for temporary use.

Annex-1: Modified Organization Charts
Annex-2: Recommended Bridge Reconstruction Plan for the Cul-De-Sac Bridge
Annex-3: Recommended Bridge Reconstruction Plan for the Ravine Poisson Bridge
Annex-4: Major Undertakings to be taken by Each Government

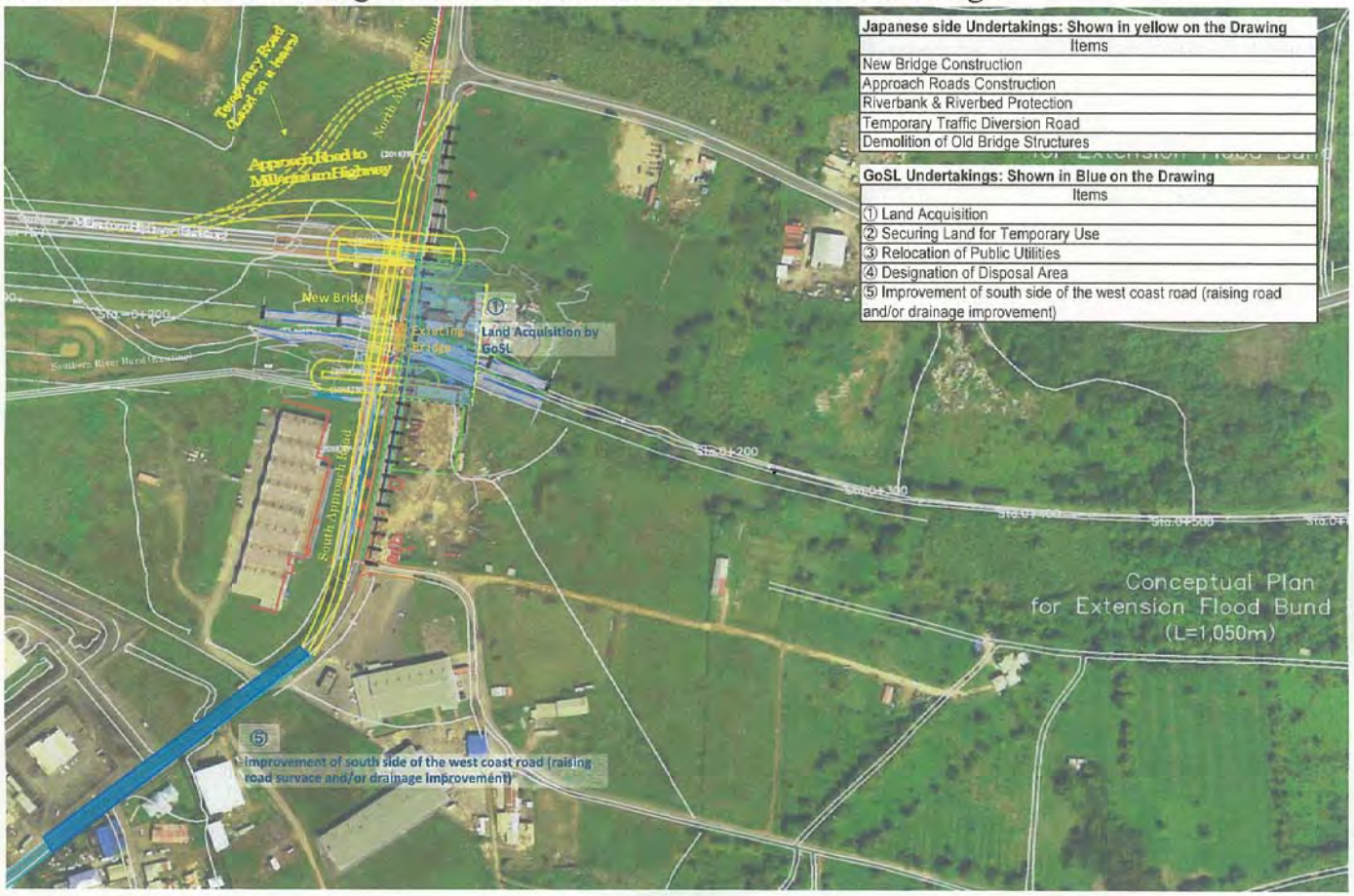
Annex-1 Modified Organization Chart

Ministry of Infrastructure, Ports, Energy and Labour

(Showing only Department of Infrastructure, Ports and Energy)



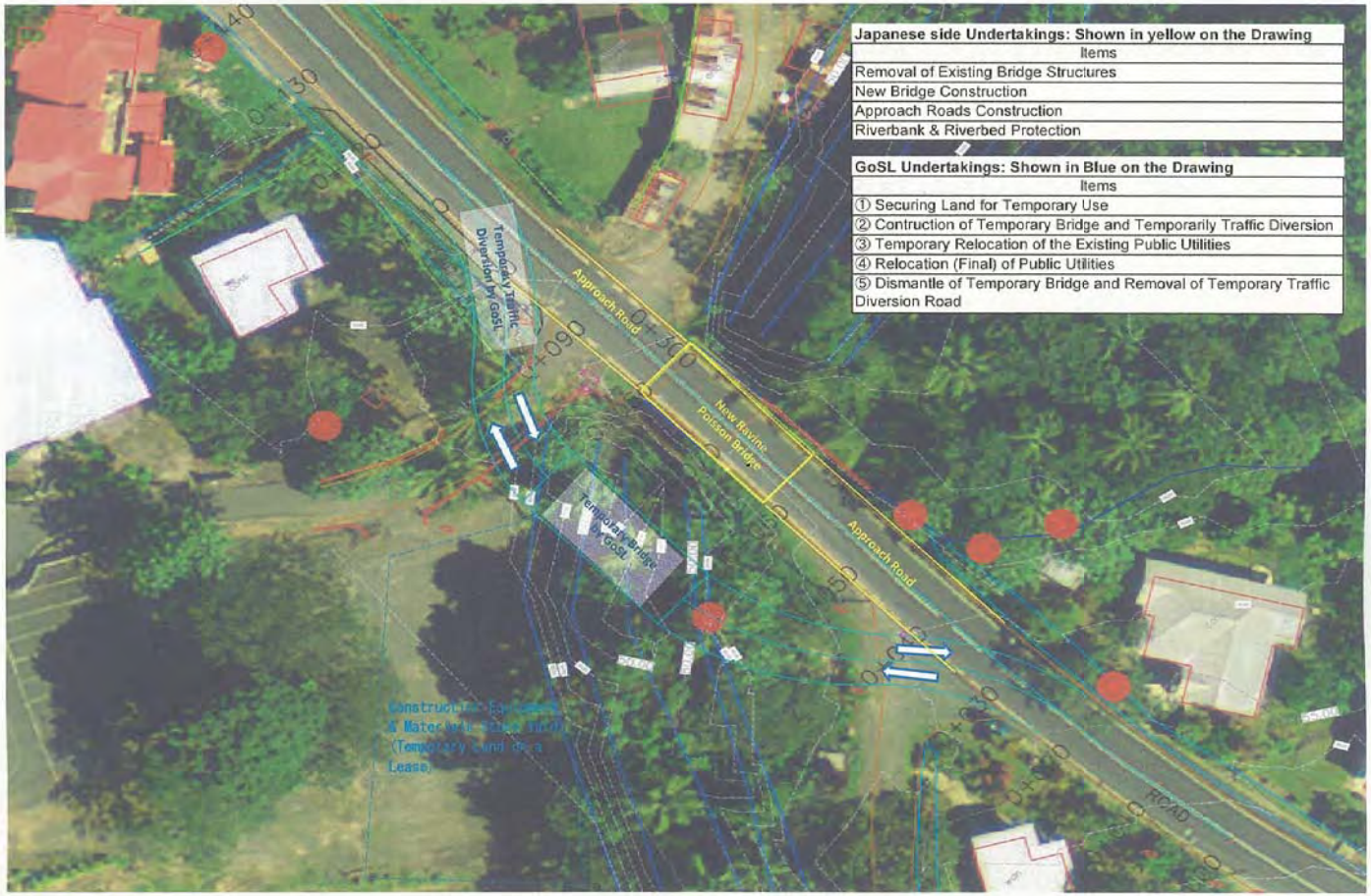
Annex-2 Recommended Bridge Reconstruction Plan for the Cul-De-Sac Bridge



Japanese side Undertakings: Shown in yellow on the Drawing
Items
New Bridge Construction
Approach Roads Construction
Riverbank & Riverbed Protection
Temporary Traffic Diversion Road
Demolition of Old Bridge Structures

GoSL Undertakings: Shown in Blue on the Drawing
Items
① Land Acquisition
② Securing Land for Temporary Use
③ Relocation of Public Utilities
④ Designation of Disposal Area
⑤ Improvement of south side of the west coast road (raising road and/or drainage improvement)

Annex-3 Recommended Bridge Reconstruction Plan for the Ravine Poisson Bridge



Annex-4 Major Undertakings by Each Government

1. Cul De Sac Bridge

(1) The Japanese side

No.	Major Undertakings
1	New Bridge Construction
2	Approach Roads Construction
3	Riverbank & Riverbed Protection
4	Temporary Traffic Diversion Road
5	Demolition of old bridge structures

(2) GoSL

No.	Major Undertakings	Period
1	Development Application	Before PQ Notice
2*1	Land Acquisition	Before Commencement of the work*2
3*1	Securing Land for Temporary Use	Before PQ Notice
4*1	Relocation of Public Utilities (Aerial Electric cable)	Before PQ Notice
5	Relocation of Public Utilities 2 (water supply, telecom and electric on the bridge / under the road side / Aerial Electric cable)	Within 1 month after completion of bridge construction*3
6	Designation of Disposal Area	Before Commencement of the work
7	Improvement of south side of the west coast road (raising road and/or drainage improvement)	Before Completion of the Project

*1 Budget allocation for FY2017/18 should be required.
*2 Agreement with the owners must be concluded by PQ Notice.
*3 Agreement with the management authority must be concluded by PQ Notice.

2. Ravine Poisson Bridge

(1) The Japanese side

No.	Major Undertakings
1	Removal of Existing Bridge Structures
2	New Bridge Construction
3	Approach Roads Construction
4	Riverbank & Riverbed Protection

(2) GoSL

No.	Major Undertakings	Period
1	Development Application	Before PQ Notice
2*1	Securing Land for Temporary Use	Before PQ Notice
3*1	Relocation of Public Utilities (Aerial Electric cable)	Before PQ Notice
4*1	Construction of Temporary Bridge and Temporarily Traffic Diversion Road	Before PQ Notice
5	Temporary Relocation of the Existing Public Utilities	Before Commencement of the work*3
6	Relocation (Final) of Public Utilities	Within 1 month after completion of bridge construction*3
7	Dismantle of Temporary Bridge and Removal of Temporary Traffic Diversion Road	Before Completion of the Project

*1 Budget allocation for FY2017/18 should be required.
*2 Agreement with the owners must be concluded by PQ Notice.
*3 Agreement with the management authority must be concluded by PQ Notice.

Minutes of Discussions
on the Preparatory Survey for the Project for
Reconstruction of Bridges in Cul-De-Sac Basin
(Explanation on Draft Preparatory Survey Report)

With reference to the minutes of discussions signed between Ministry of Infrastructure, Ports, Energy and Labour (hereinafter referred to as "MIPE&L") and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on November 9, 2016 and in response to the request from the Government of Saint Lucia (hereinafter referred to as "the Saint Lucia side") dated September 30, 2015, JICA dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Reconstruction of Bridges in Cul-De-Sac Basin (hereinafter referred to as "the Project"), headed by Mr. Hidetaka SAKABE, Acting Director, Team 1, Transportation and ICT Group, Infrastructure and Peacebuilding Department of JICA, from February 27 to March 9, 2017.

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

Castries, March 8, 2017

Hidetaka Sakabe
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Japan

Allison A. Jean
Permanent Secretary
Department of Infrastructure, Ports and Energy
Ministry of Infrastructure, Ports, Energy and Labour
Saint Lucia

Tracy Polius
Permanent Secretary
Department of Economic Development,Transport and Civil Aviation
Ministry of Economic Development, Housing, Urban Renewal,Transport and Civil Aviation
Saint Lucia

ATTACHMENT

1. Contents of the Draft Report
   After the explanation of the contents of the Draft Report by the Team, the Saint Lucia side agreed to its contents.

2. Cost estimate
   Both sides confirmed that the cost estimate as shown in Annex 1 is provisional and will be examined further by the Government of Japan for its approval.

   Both sides confirmed that the cost estimate including the contingency described in the Draft Report is provisional and will be examined further by the Government of Japan for its approval. The contingency would cover the additional cost against natural disaster, unexpected natural conditions, etc.

3. Confidentiality of the cost estimate and technical specifications
   Both sides confirmed that the cost estimate as shown in Annex 1 of this Minutes of Discussions and technical specifications in the Draft Report should never be duplicated or disclosed to any third parties until all the contracts under the Project are concluded.

4. Timeline for the project implementation
   The Team explained to the Saint Lucia side that the expected timeline for the project implementation is as attached in Annex 2.

   The Saint Lucia side responded that the arrangement for the Project approval, relocation of public utilities and land acquisition will commence immediately based on the provided cost estimation and plan aiming at smooth implementation.

5. Expected outcomes and indicators

Both sides agreed that key indicators for expected outcomes are as follows. The Saint Lucia side will be responsible for the achievement of agreed key indicators targeted in year 2023 and shall monitor the progress based on those indicators.

[Quantitative indicators]

Effect		Base Value (2016)	Target Value (2023)
Impassable car due to road blocked*1 (number/year)	the Cul-De-Sac bridge	64,000	0 *3
	the Ravine Poisson bridge	2,000	0 *3
Number of days of Road closed due to overtopping*2	the Cul-De-Sac bridge	8 days/year	0 *3
	the Ravine Poisson bridge	2 days/five years	0 *3
Average daily passenger (number /year)	the Cul-De-Sac bridge	9.90 mil	10.00 mil (11.70 mil)*4
	the Ravine Poisson bridge	6.50 mil	6.55 mil (7.50 mil) *4
Average cargo weight(ton/year)	the Cul-De-Sac bridge	1.90 mil	2.00 mil (2.30 mil) *4
	the Ravine Poisson bridge	1.40 mil	1.42 mil (1.60 mil) *4

*1 Due to occurrence of flood
*2 Overtopping is defined as the circumstances of which the river water level is higher than 5.3 m at the Cul-De-Sac Bridge and higher than 3.0 m at the Ravine Poisson bridge.
*3 In case rainfall does not exceed the values of 50-year return period in the term
*4 The indicators in parentheses are calculated based on the predicted future average daily traffic volume.

[Qualitative indicators]

- Promotion of the convenience of the transportation route during the heavy rain.
- Development of regional economics along the transportation route due to smooth traffic.

6. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 3. With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in 3-5 of Annex 3, both sides confirmed that such customs duties, internal

taxes and other fiscal levies include VAT, commercial tax, income tax and corporate tax, which shall be clarified in the bid documents by MIPE&L during the implementation stage of the Project.

The Saint Lucia side assured to take the necessary measures and coordination including allocation of the necessary budget which is preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

Both sides also confirmed that the Annex 3 will be used as an attachment of G/A.

7. Monitoring during the implementation

The Project will be monitored by the Executing Agency and reported to JICA by using the form of Project Monitoring Report (PMR) attached as Annex 4. The timing of submission of the PMR is described in Annex 3.

8. Project completion

Both sides confirmed that the project completes when all the facilities constructed and equipment procured by the grant are in operation. The completion of the Project will be reported to JICA promptly, but in any event not later than six (6) months after completion of the Project.

9. Ex-Post Evaluation

JICA will conduct ex-post evaluation after three (3) years from the project completion, in principle, with respect to five (5) evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, and Sustainability). The result of the evaluation will be publicized. The Saint Lucia side is required to provide necessary support for the data collection.

10. Schedule of the Study

JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the Saint Lucia side around June 2017.

11. Environmental and Social Considerations

11-1 General Issues

11-1-1 Environmental Guidelines and Environmental Category

The Team explained that 'JICA Guidelines for Environmental and Social

Such land acquisition shall be implemented based on the Abbreviated Resettlement Action Plan (ARAP) as Annex 7 which was prepared in line with the Guidelines, reviewed and agreed by the Saint Lucia side.
In addition, agreement, compensation and assistance for the land acquisition with the land owner should be obtained by the end of February, 2018.

11-4 Environmental and Social Monitoring

11-4-1 Environmental Monitoring

Both sides agreed that the Saint Lucia side will submit results of environmental monitoring to JICA with PMR by using the monitoring form attached as Annex 8. The timing of submission of the monitoring form is described in Annex 3.

11-4-2 Social Monitoring

Both sides confirmed that the Saint Lucia side will implement social monitoring about land acquisition plan proposed in the ARAP. Both sides agreed that MIPE&L will submit results of social monitoring to JICA with PMR by using the monitoring form attached as Annex 8.

11-4-3 Information Disclosure of Monitoring Results

Both sides confirmed that the Saint Lucia side will disclose results of environmental and social monitoring to local stakeholders through their website / in their field offices.

The Saint Lucia side agreed JICA will disclose results of environmental and social monitoring submitted by the Saint Lucia side as the monitoring forms attached as Annex 8 on its website.

In case there is need to restrict information disclosure in order to secure smooth implementation of the Project, both sides shall negotiate and agree on the arrangement of the contents and the timing of disclosure to the general public.

12. Other Relevant Issues

12-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

In case there is need to restrict information disclosure in order to secure smooth implementation of the Project, both sides shall negotiate and agree on the arrangement of the contents and the timing of disclosure to the general public.

12-2. The South Side of the Cul-De-Sac Bridge on the West Coast Road

12-2-1. The Detailed Design

Through the discussions in the second field survey in November, 2016, the Saint Lucia side requested the Japanese side to design for improvement works at the South Side of the Cul-De-Sac Bridge on the West Coast Road (hereinafter referred to as "the Southern Road") aiming the design continuity between the approach road to the new Cul-De-Sac Bridge and this section. Based on the request, the Team examined its feasibility and discussed with relevant officials of the Japanese side. As the result of the examinations, the Team responded to the Saint Lucia side that the design for the Southern Road will be able to be included into the detailed design to be conducted by the Japanese Side.

However, since the implementation for the design for the Southern Road should be originally undertaking by the Saint Lucia side with its own responsibility. Therefore, as soon after the Saint Lucia side utilizes the design document to the tendering process, the Saint Lucia side shall no longer be entitled to impose defect liability of the design documents on the Japanese side.

12-2-2 Deadline of the Implementation

Both sides confirmed that the temporary slope works in this section to be taken by the Saint Lucia side shall be completed with their own expense before starting the approach road construction to be taken by the Japanese side in order not to let the Project idle.

In addition, the Team requested that the whole improvement works in this section to be undertaken by the Saint Lucia side would be completed by the end of the Project. The Saint Lucia side responded that they will give their best effort to complete the work by the target timing. On the other hand the Saint Lucia side requested that the review of scope, cost and schedule of implementation would be done at detailed design stage.

12-3. Quality Management Meeting

Both sides confirmed that JICA, MIPE&L, consultant and contractor shall have quality management meetings approximately once in a half year during the implementation stage. The meetings should be convened by MIPE&L before the commencement of construction works and during the construction to solve serious problems such as delay of utility relocation, resettlement exercise, construction

works, etc.

12-4. Safety Measures

To avoid accidents on site during the implementation of the Project, the Saint Lucia side agreed to cause the consultant and the contractor to enforce safety measures such as setting safety assurance to the site, providing information for security control to public, and deploying adequate security personnel, based on "The Guidance for Management of Safety for Construction Works in Japanese ODA Projects" which has been published on JICA's URL below.
http://www.jica.go.jp/activities/schemes/oda_safety/ku57pq00001nz4eu-att/guidance_en.pdf

12-5. Operation and Maintenance of the Facilities

The team explained the importance of operation and maintenance of the facilities constructed by the Project considering that proper asset management impacts greatly on life-span of the facilities and its maintenance cost. The Saint Lucia side shall secure enough staff and budgets necessary for appropriate operation and maintenance of the facilities as shown th followings. The annual operation and maintenance costs are estimated and shown in Annex 3.

Item	Activities	Frequency	Cost(XCD)
Periodic Monitoring	Inspection	1 time /1yr	6,500
Drainage facilities	Maintenance	1 time /1yr	6,500
Road safety facilities	Repair/Replace	1 time /10yrs	25,000
Slope	Weeding	Twice /1yr	5,500
Pavement	Repair	1 time /10yrs	550,000
Steel handrail	Repainting	1 time /10yrs	130,000
Expansion joint	Replace	1 time /10yrs	130,000
Annual Cost			100,000

Annex 1 Project Cost
Annex 2 Project Implementation Schedule
Annex 3 Major Undertakings to be taken by the Government of Saint Lucia side
Annex 4 Project Monitoring Report (template)
Annex 5 Environmental Check List

Annex 6 Environmental Management Plan/Environmental Monitoring Plan

Annex 7 Abbreviated Resettlement Action Plan

Annex 8 Environmental and Social Monitoring Form

Annex-1 Project Cost

Project cost to be covered by the Grant Aid

No	Items	Cost Estimated (Million Japanese Yen)*
1	Reconstruction of the bridges	
	Construction of the approach roads and riverbank and riverbed protection	
	Temporarily traffic diversion road (Cul-De-Sac)	
	Demolition of existing bridges	
	Marine(Air) transportation of the products from Japan to the recipient country	
	Internal transportation from the port of disembarkation to the project site	
2	To implement detailed design, tender support and construction supervision (Consulting Service)	
3	Contingencies	
Total		[redacted]

*The Amount is provisional. This is subject to be approval of the Government of Japan

Annex-2 Expected timeline for the project implementation

(1) Cul-De-Sac Bridge

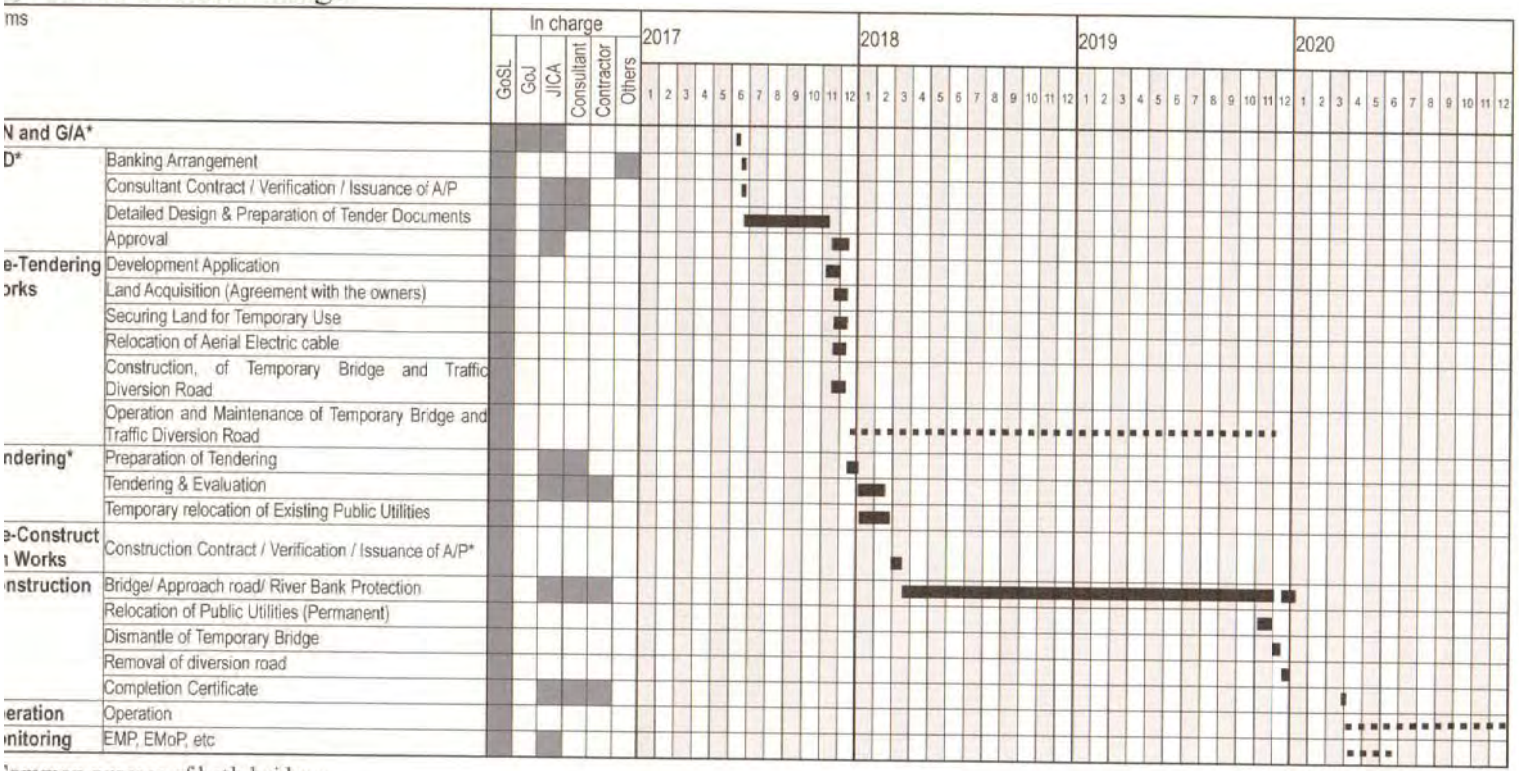
Items		In charge						2017												2018												2019												2020											
		GoSL	GoJ	JICA	Consultant	Contractor	Others	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
E/N and G/A*																																																						
D/D*	Banking Arrangement																																																					
	Consultant Contract / Verification / Issuance of A/P																																																			
	Detailed Design & Preparation of Tender Documents																																																			
	Approval																																																				
Pre-Tendering Works	Development Application																																																				
	Land Acquisition (Agreement with the owners)																																																			
	Securing Land for Temporary Use																																																			
	Relocation of Aerial Electric cable																																																			
Tendering*	Preparation of Tendering																																																			
	Tendering & Evaluation																																																			
Pre-Construction Works	Construction Contract / Verification / Issuance of A/P*																																																			
Construction	Construction of temporary diversion road Bridge /River bank Protection																																																			
	Temporary slope undertaken by GoSL																																																			
	Approach road undertaken by GoJ																																																			
	Relocation of Public Utilities																																																			
	Demolishing of existing bridge and road																																																			
	Improvement of Southern side of West Coast Road																																																			
	Completion Certificate																																																			
Operation	Operation																																																			
Monitoring	EMP, EMoP, etc																																																			

Common process of both bridges

Work schedule

To Implement within this period

2) Ravine Poisson Bridge



ommon process of both bridges

Annex-3 Undertakings by Each Government

1. Before G/A

No	Items	Deadline	In charge	Cost (XCD)	Ref
1-1	To obtain the basic agreement with stakeholders	Before the signing of the G/A	MIPE&L	-	

2. Before the Tender

No	Items	Deadline	In charge	Cost (XCD)	Ref
2-1	To open bank account (B/A)	within 1 month after the signing of the G/A	MOF	10,000	
2-2	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Consultant	within 1 month after the signing of the contract(s)	MIPE&L		
2-3	To issue 'Letter of Acknowledgement on the Project,' as a substitute for the IEE approval and the development approval	within 1 month after G/A	Dept. Physical Planning		
2-4	To secure the necessary budget and implement land acquisition and resettlement (including preparation of resettlement sites, if needed), and compensation with full replacement cost in accordance with ARAP (including clearing and leveling as needed)	Before PQ Notice	MIPE&L	2,000,000	
2-5	To secure and clear the following lands 1) Temporary construction yard and stock yard near the Project area for Cul-De-Sac Bridge site and Ravine Poisson Bridge site 2) Borrow pit and disposal site near the Project area (if needed)	Before PQ Notice	MIPE&L	130,000	
2-6	Relocation of public utilities (aerial electric cable)	Before PQ Notice	MIPE&L	100,000	
2-7	Construction of temporary bridge and traffic diversion road at Ravine Poisson Bridge	Before PQ Notice	MIPE&L	750,000	
2-8	Temporary relocation of public utilities at Ravine Poisson Bridge	Before PQ Notice	MIPE&L	100,000	
2-9	To submit project monitoring report (with the result of detail design)	Before PQ Notice	MIPE&L	-	

3. During the Project Implementation

No	Items	Deadline	In charge	Cost (XCD)	Ref
3-1	To issue A/P to a bank in Japan (the Agent Bank) for the payment to the Contractor(s)	within 1 month after the signing of the contract(s)	MIPE&L	-	
3-2	To bear the following commissions to a bank of Japan for the banking services based upon the B/A			-	
	1) Advising commission of A/P	within 1 month after the singing of the contract(s)	MoF	33,000	
	2) Payment commission for A/P	every payment	MoF	33,000	
3-3	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country and so assist the Contractor(s) with internal transportation therein		MIPE&L	-	
	1) Tax exemption and customs clearance of the products at the port of disembarkation	during the Project	MIPE&L	-	

	2) To assist Contractor (s) with internal transportation from the port of disembarkation to the project site	during the Project	MIPE&L	-	
3-4	To accord Japanese nationals and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	MIPE&L	-	
3-5	To ensure that customs duties, VAT, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by MIPE&L without using Grant	during the Project	MIPE&L	1,250,000	
3-6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	MIPE&L	-	
3-7	To submit Project Monitoring Report	every month	MIPE&L	-	
	To submit Project Monitoring Report (final)	within one month after signing of Certificate of Completion for the works under the contract(s)	MIPE&L	-	
3-8	Relocation of public utilities (Permanent)	within 1 month after completion of the New bridges and roads	MIPE&L	500,000	
3-9	To maintain temporary bridge and traffic diversion road	during the Project	MIPE&L	75,000	
3-10	To dismantle of temporary bridge and removal of diversion road at Ravine Poisson	within 1 month after completion of the new road	MIPE&L	50,000	
3-11	To implement EMP and EMoP	during the construction	MIPE&L	75,000	
3-12	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	Quarterly during the Project	MIPE&L	-	
3-13	To implement ARAP (Abbreviated livelihood restoration program, if needed)	for a period based on ARAP	Dept. of Physical Planning (Survey and Mapping)	-	
3-14	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, as a part of Project Monitoring Report - Period of the monitoring may be extended if affected persons' livelihoods are not sufficiently restored. Extension of the monitoring will be decided based on agreement between MIPE&L and JICA.	Quarterly based on ARAP	MIPE&L	-	
3-15	To submit a report concerning completion of the Project	within six months after completion of the Project	MIPE&L	-	
3-16	To construct temporary slope between new road and West Coast road. (approx.110m)	Before start of the approach road construction by GoJ	MIPE&L	600,000	
3-17	To implement the road improvement of South section of the existing bridge on West Coast road, Cul-De-Sac area (approx. 600m) and drainage improvement including land acquisition and securing, construction and demolition temporary diversion	By the end of the Project	MIPE&L	3,000,000	

	road and relocation of utilities. Note) Review of scope, cost and schedule of implementation would be done at detailed design stage				

4. After the Project

No	Items	Deadline	In charge	Cost (XCD)	Ref
4-1	To implement EMP and EMoP	for a period based on EMP and EMoP	MIPE&L	-	
4-2	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between MIPE&L and JICA.	Semiannually for a period based on EMP and EMoP	MIPE&L	-	
4-3	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form - The period of monitoring may be extended if any significant negative impacts are found. The extension of monitoring will be decided based on the agreement between MIPE&L and JICA.	Semiannually if the livelihood restoration program is on-going after the Project	Dept. of Physical Planning (Survey and Mapping)	-	
4-4	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine/Periodic inspection	After completion of the construction	MIPE&L	100,000/yr	

Annex-4

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

Project Monitoring Report
on
The Project for Reconstruction of Bridges in Cul-De-Sac Basin
Grant Agreement No. XXXXXXX

Organization Information

Authority (Signer of the G/A)	Person in Charge Contacts (Division) Address: Phone/FAX: Email:
Executing Agency	Person in Charge Ministry of Infrastructure, Ports, Energy and Labour Contacts Address: Union Office Complex Castries Phone/FAX: (758)468-4301 Email:

Outline of Grant Agreement:

Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____
Project Title	The Project for reconstruction of bridges in Cul-De-Sac Basin, Saint Lucia
E/N	Signed date: Duration:
G/A	Signed date: Duration:

1: Project Description

1-1 Project Objective

The Project is targeting the smooth and stable traffics on the Cul-de-Sac Bridge on West Coast Road and Ravine Poisson Bridge on East Coast Road. The existing bridges are on the river section which have not enough area for river flow. Thus new bridge shall be reconstructed with the widening the river section in this project. Main project components are follows;

1. Bridge Reconstruction
2. Approach Road Construction
3. River bank protection and riverbed protection around abutments and piers

1-2 Necessity and Priority of the Project

The government of Saint Lucia established 'Saint Lucia, Medium Term Development Plan' on Sep, 2012. The plan describes the rehabilitation and improvement of the road network and bridges suffered from Hurricane Tomas, 2010. The project is consistent with the plan and the Japan's CARICOM policies. Additionally, the project goal contributes the achievement of goal 9 and 13 in SDGs.

1-3 Effectiveness and the indicators

[Quantitative indicators]

Effect		Base Value (2016)	Target Value (2023)
Impassable car due to road blocked*1 (number/year)	the Cul-De-Sac bridge	64,000	0 *3
	the Ravine Poisson bridge	2,000	0 *3
Number of days of Road closed due to overtopping*2	the Cul-De-Sac bridge	8 days/year	0 *3
	the Ravine Poisson bridge	2 days/five years	0 *3
Average daily passenger (number /year)	the Cul-De-Sac bridge	9.90 mil	10.00 mil (11.70 mil)*4
	the Ravine Poisson bridge	6.50 mil	6.55mil (7.50mil) *4
Average cargo weight(ton/year)	the Cul-De-Sac bridge	1.90 mil	2.00 mil (2.30 mil) *4
	the Ravine Poisson bridge	1.40 mil	1.42 mil (1.60mil) *4

*1 Due to occurrence of flood
*2 Overtopping is defined as the circumstances of which the river water level is higher than 5.3 m at the Cul-D-Sac Bridge and higher than 3.0 m at the Ravine Poisson bridge.
*3 In case rainfall have not exceeded the values of 50-year return period in the term
*4 The indicators in parentheses are calculated based on the predicted future average daily traffic volume.

[Qualitative indicators]

- Promotion of the convenience of the transportation route during the heavy rain.
- Development of regional economics along the transportation route due to smooth traffic.

2: Project Implementation

2-1 Project Scope

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

Location	**Original:** *(M/D)* ➢ Cul-De-Sac Bridge on West Coast road ➢ Ferrand's Bridge on East Coast road ➢ Ravine Poisson Bridge on East Coast road Attachment(s):Map	**Actual:** *(P/Rand PCR)* ➢ Cul-De-Sac Bridge in West Coast road ➢ Ravine Poisson Bridge in East Coast road Attachment(s):Map

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

Items	Original	Actual
Cul De Sac Bridge	Hollow Slab Type: Single Span length 25m, Width 10.5m	PC Hollow Slab Type 3 span, Length 81m, Wid th 10.5m
Ravine Poisson Bridge	Hollow Slab Type: Single Span length 25m, Width 10.5m	PC Hollow Slab Type: Single Span length 18m, Width 9.5m

2-1-2 Reason(s) for the modification if there have been any.
River improvement plan have not made around Ferrand's Bridge. A New bridge construction plan shall be consisted with the plan, thus the project of reconstruction of Ferrand's Bridge cannot be commenced on the present situation.

2-2 Implementation Schedule

2-2-1 Implementation Schedule

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

Items	Original		Actual
	DOD	G/A	
Tender / Evaluation	*Nov. 2017*		*(P/R,PCR)* As of (Date of Revision)
Commencement of the construction	Feb 2018		
			Please state not only the most

Project Completion Date*	Feb 2020		updated schedule but also other past revisions chronologically.

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

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

2-3 Undertakings by each Government

2-3-1 Major Undertakings

See Attachment 2.

2-3-2 Activities

See Attachment 3.

2-4 Project Cost

2-4-1 Project Cost

Table 2-3-1 Comparison of Original and Actual Cost by the Government of Japan
(Confidential until the Tender)

Items			Cost (Million Yen)	
	Original	Actual	Original	Actual
Construction Facilities (or Equipment)	Bridge Reconstruction Cul De Sac Bridge, Ravine Poisson Bridge Approach Road Riverbank protection			
Consulting Services	- Detailed design -Procurement Management -Construction Supervision			
Contingencies				
Total				

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = 103.34 Yen

Table 2-3-2 Comparison of Original and Actual Cost by the Government of Saint Lucia

Items			Cost (XCD)	
	Original	Actual	Original	Actual
1	To open bank account (B/A)		10,000	
2	To secure the necessary budget and implement land acquisition and resettlement (including preparation of resettlement sites, if needed), and compensation with full replacement cost in accordance with ARAP (including clearing and leveling as needed)		2,000,000	
3	To secure and clear the following lands 1) Temporary construction yard and stock yard near the Project area for Cul-De-Sac Bridge site and Ravine Poisson Bridge site 2) Borrow pit and disposal site near the Project area (if needed)		130,000	

	cable)			
5	Construction of temporary bridge and traffic diversion road at Ravine Poisson Bridge		750,000	
6	Temporary relocation of public utilities at Ravine Poisson Bridge		100,000	
7	Advising commission of A/P		30,000	
8	Payment commission for A/P		30,000	
9	To ensure that customs duties, VAT, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by MIPE&L without using Grant		1,250,000	
10	Relocation of public utilities (Permanent)		500,000	
11	To maintain temporary bridge and traffic diversion road		75,000	
12	To dismantle of temporary bridge and removal of diversion road at Ravine Poisson		50,000	
13	To implement EMP and EMoP		75,000	
14	To construct temporary slope between new road and West Coast road. (approx.110m)		600,000	
15	To implement the road improvement of South section of the existing bridge on West Coast road, Cul-De-Sac area (approx. 600m) and drainage improvement including land acquisition and securing, construction and demolition temporary diversion road and relocation of utilities.		3,000,000	
16	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure 3) Routine/Periodic inspection		80,000/yr	
Total			8,400,000	

Note: 1) Date of estimation:
2) Exchange rate: 1 US Dollar = 2.6882 XCD

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

(P/R, PCR)

2-5 Organizations for Implementation

2-5-1 Executing Agency:

Implementation of the project shall be responsible for road construction and maintenance branch, MIPE&L. The organization chart is shown below;

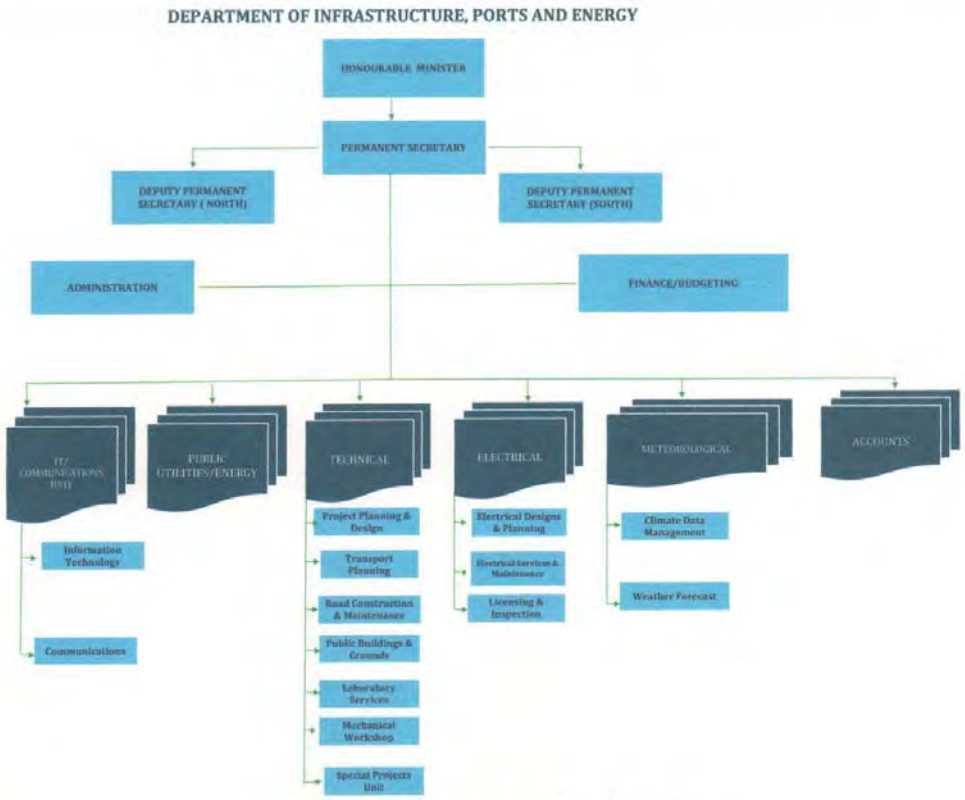


Figure Organization chart of MIPE&L

Original: *(M/D)*
Actual, if changed: *(P/R and PCR)*

2-6 **Environmental and Social Impacts**

Report based on the agreed environmental checklist and monitoring form (See Attachment 4)

3: Operation and Maintenance (O&M)

3-1 **O&M and Management**

Operation and Maintenance of the new facility shall be responsible for road construction and maintenance branch, MIPE&L

3-2 O&M Cost and Budget

The annual cost of O&M is estimated as 30,000USD/year.

4: Precautions (Risk Management)

Original Issues and Countermeasure(s): *(M/D)*	
Potential Project Risks	Assessment
1.	Probability: H/M/L
Delay of relocation of public utilities (Aerial Electric cable)	Impact: H/M/L
	Analysis of Probability and Impact:
	This undertaking shall be completed before PQ notice. Thus the period for implementation is approx. 6 months after E/N & G/A. Additionally related organizations will executed the relocation. Middle probability is determined considering the situation. Occurrence of the risk cause the delay of commencement of the project.
	Mitigation Measures:
	MIPE&L shall coordinate the work implementation with the organization at appropriate timing.
	Action during the Implementation:
	MIPE&L shall facilitate the implementation of the work.
	Contingency Plan (if applicable):
	-
2.	Probability: H/M/L
Delay of construction of temporary bridge and temporarily traffic diversion road for Ravine Poisson Bridge	Impact: H/M/L
	Analysis of Probability and Impact:
	This undertaking shall be completed before PQ notice. Thus the period for implementation is approx. 6 months after E/N & G/A. This work are covered by MIPE&L. Middle probability is determined considering the situation. Occurrence of the risk cause the delay of commencement of the project.
	Mitigation Measures:
	MIPE&L shall arrange the work with the smooth budget allocation and facilitate the work implementation.
	Action during the Implementation:
	MIPE&L continues the appropriate management of the implementation.
	Contingency Plan (if applicable):
	-
3.	Probability: H/M/L
The Delay of Temporary and final Relocation of the Existing Public Utilities	Impact: H/M/L
	Analysis of Probability and Impact:
	This undertaking shall be completed before PQ

	notice. Thus the period for implementation is approx. 6 months after E/N & G/A. Additionally related organizations will executed the relocation. Middle probability is determined considering the situation. Occurrence of the risk cause the delay of commencement of the project.
	Mitigation Measures:
	MIPE&L shall coordinate the work implementation with the organization at appropriate timing.
	Action during the Implementation:
	MIPE&L shall facilitate the implementation of the work.
	Contingency Plan (if applicable):
	-
Actual issues and Countermeasure(s)	
(P/R and PCR)	

5: Evaluation

5-1 Overall evaluation

Please describe your evaluation on the overall outcome of the project.

(PCR)

5-2 Lessons Learnt and Recommendations

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

(PCR)

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

Attachment

1. Project Location Map
2. Undertakings to be taken by each Government
3. Monthly Report
4. Monitoring report on environmental and social considerations

Annex 5 JICA Environmental Checklist

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process?	(a) N	(a) The Project is not required an EIA report in Saint Lucian legal framework.
		(b) Have EIA reports been approved by authorities of the host country's government?	(b) N	(b) The Project is not required an EIA report in Saint Lucian legal framework.
		(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	(c) N	(c) The Project is not required an EIA report in Saint Lucian legal framework.
		(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(d) N	(d) No specific permission is required. In the construction phase, Forestry Department may require notification of cutting trees on the river bank, and request the contractor for proper re-vegetation on the river bank.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders?	(a) Y	(a) MIPST, Department of Physical Planning and Development, Crown Lands Commission, and Member of Parliament elected from the area including the Project sites were informed about the contents of the Project and the potential impacts. During the survey with the local businesses, no negative opinions were heard about the objective of the Project.
		(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(b) Y	(b) During the field survey, individual conversations were held with local residents about the range and speed of water level change, duration of inundation, request for the improvement of bridges. Those information were used in the Project design.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) By comparing alternatives, the priority plan was selected that minimizes social impact from closure of the road, and maximizes the traffic safety by rational alignment of access road and temporal bridge.
2 Pollution Control	(1) Air Quality	(a) Is there a possibility that air pollutants emitted from the project related sources, such as vehicles traffic will affect ambient air quality? Does ambient air quality comply with the country's air quality standards? Are any mitigating measures taken?	(a) N	(a) The sizes of population, industry and traffic are small and no significant source of air pollution is recognized. The Project shall add emission during the Construction Phase but the impact shall be negligible.
		(b) Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?	(b) N	(b) The Project aims to improve flood resiliency of the existing bridges. There is no possibility that the project will make air quality around the bridge worse.
	(2) Water Quality	(a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas?	(a) N	(a) The water quality downstream shall not be changed since the cut and fill slopes shall be protected by planting and stones in Maintenance Phase.
		(b) Is there a possibility that surface runoff from roads will contaminate water sources, such as groundwater?	(b) N	(b) Groundwater is not used as water source in the Project Area. Piped water is supplied to households and businesses. The source of the piped water is located far from the Project Area.
	(4) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic	(a) Y	(a) Given that the population is 180,000 and the registered cars are 60,000,

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		comply with the country's standards?		the traffic volume on the road is relatively small, and susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact of noise and vibrations in the Maintenance Phase shall not be significant.
		(b) Does the low-frequency noise generated by the bridge with effect of passing cars and trains comply with the country's standards?	(b) Y	(b) Given that the population is 180,000 and the registered cars are 60,000, the traffic volume on the road is relatively small, and susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact of low-frequency noise in the Maintenance Phase shall not be significant.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The target area is not located in or near a protected area.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	(a) N	(a) The target area is not located in or near primeval forests, mangroves or coral reefs.
		(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	(b) N	(b) The target area is not located in or near the protected habitats of endangered species designated.
		(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(c) N	(c) The Project does not cause significant negative impact on the local ecosystem.
		(d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock?	(d) N	(d) The Project aims to rehabilitate and improve existing road. There is not a possibility that the Project will negatively affect the migration routes, connectivity of habitat and traffic accident of wildlife and livestock. The river water shall flow pipe culverts set in the river floor for about 2 months when the existing bridges are removed in the Construction Phase. The change of river environment up and down from the construction area shall be minimum and negative impacts on sustainability of aquatic life shall be minimized.
		(e) Is there a possibility that installation of roads will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?	(e) N	(e) The Project aims to rehabilitate and improve existing road. There is not a possibility that the Project will negatively affect on forest destruction, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems.
	(3) Hydrology	(a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?	(a) N	(a) The Project improves existing road bridges at the same location or at nearby location. The structures and earth works shall not change flows of surface and ground water.
	(4) Topography and Geology	(a) Is there any soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to	(a) N	(a) There is no soft ground near the Project Area.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		prevent slope failures or landslides, where needed?		
		(b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?	(b) N	(b) Cut slopes and fill slopes shall be adequately designed and protected so that no slope failures are expected.
		(c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	(c) N	(c) There is no possibility of soil runoff since the cut and fill slopes shall be protected by planting and stones in Maintenance Phase. The Project does not use new disposal site or borrow site.
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	(a) N	(a) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.
		(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?	(b) N	(b) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.
		(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards, developed based on socioeconomic studies on resettlement?	(c) N	(c) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.
		(d) Are the compensations going to be paid prior to the resettlement?	(d) Y	(d) In land acquisition for public works, it is customary that the price for land and livelihood assistance are paid before the resettlement. There have been cases, however, that the payment was delayed when the land owner's demand significantly exceeded rational price.
		(e) Are the compensation policies prepared in document?	(e) Y	(e) The Project shall prepare the preliminary ARAP including an Entitlement Matrix. The preliminary ARAP shall be explained to MIPST and other relevant agencies, updated and adjusted based on their advises, and the agreed ARAP shall be reflected to the final compensation policies when MIPST attends the Board of Assessment as the Project owner.
		(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	(f) Y	(f) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary. The potential PAPs interviewed during the Survey did not include specific vulnerable population or business. If it is found that such vulnerable groups are included in PAPs in later phase of the Project, the Board of Assessment, chaired by a barrister, shall consider individual situation in the process of compensation evaluation.
		(g) Are agreements with the affected people obtained prior to resettlement?	(g) Y	(g) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
				PAPs shall individually contacted and negotiation shall continue until both side reaches agreement according to Land Acquisition Act.
		(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	(h) Y	(h) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary. MIPST has already expressed its intention that MIPST shall take responsibility in acquisition of land, payment for compensation and relocation of utilities necessary for implementation of the Project.
		(i) Are any plans developed to monitor the impacts of resettlement?	(i) Y	(i) The Project does not cause resettlement of residents and businesses. Seven parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. WB-assisted disaster prevention project (DVRP) assigns a Social Coordination Specialist in the Project Coordination Unit of the project owner agency to monitor the implementation of ARAP. The same coordination is expected for the Project.
		(j) Is the grievance redress mechanism established?	(j) Y	(j) The Land Acquisition Act and the Resettlement Policy Framework of the DVRP clearly states the grievance redress mechanism and the mechanism is implemented in the existing projects.
	(2) Living and Livelihood	(a) Where roads are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts?	(a) N	(a) The Project, aiming to improve the existing road bridges, shall not affect the existing means of transportation, land use or livelihoods. The detour route in the Construction Phase shall be provided next to the existing bridges and shall not cause longer travel for road users or loss of road access for neighboring land parcels. The alignment of the detour routes are designed to achieve sufficient road safety. Signboards and traffic guards shall be used to secure the safety of vehicles, pedestrians and road crossings.
		(b) Is there any possibility that the project will adversely affect the living conditions of the inhabitants other than the target population? Are adequate measures considered to reduce the impacts, if necessary?	(b) N	(b) The Project, aiming to improve the existing road bridges, shall not affect the existing means of transportation, land use or livelihoods.
		(c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to the project? Are adequate considerations given to public health, if necessary?	(c) N	(c) The Project, aiming to improve the existing road bridges, shall not cause affect the existing means of transportation, land use or livelihoods.
		(d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., increase of traffic congestion and traffic accidents)?	(d) N	(d) The Project aims to improve flood resiliency of an existing road. The Project will bring positive impact such as reduction of road closures during floods in Maintenance Phase. The target road is an artery road that run through a narrow river valley. The Project shall cause a positive impact during floods by reducing detouring traffic volume on surrounding narrower and steeper roads.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		(e) Is there any possibility that roads will impede the movement of inhabitants?	(e) N	(e) The Project aims to improve flood resiliency of an existing road. There is no possibility that the Project will impede the movement of inhabitants.
		(f) Is there any possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?	(f) N	(f) The Project does not contain facilities that may cause sun shading and radio interference.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The Project aims to improve flood resiliency of an existing road. No archeological, historical, cultural or religious heritage is located on the sites. In case any resources are found in later phase of the Project, due procedure shall be taken according to the laws of Saint Lucia.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) The Project aims to improve flood resiliency of an existing road. No significant landscape resource is located on or around the sites. In case any resources are found in later phase of the Project, due procedure shall be taken according to the laws of Saint Lucia.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	(a) N	(a) Saint Lucia does not have legally recognized minorities and indigenous peoples. There are Kalinago people who were already located before the immigration of European people, but those people are blending in general society, different from Kalinago people in Dominica, where they have a Territory.
		(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources to be respected?	(b) N/A	(b) There is no specific minorities and indigenous peoples in relation to specific rights on land and resources.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	(a) Y	(a) The construction projects contacted by MIPST are monitored by MIPST to obey the Employees (Occupational Health and Safety) Act and Equality of Opportunity and Treatment in Employment and Occupation Act.
		(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	(b) Y	(b) Tangible safety considerations such as installation of safety equipment and management of hazardous materials shall be planned and implemented by MIPST and CSC.
		(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?	(c) Y	(c) Tangible measures such as safety and health program and trainings for workers shall be planned and implemented by MIPST and CSC.
		(d) Are appropriate measures being taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(d) Y	(d) Since Saint Lucia is a small country, security guards shall be hired from communities not far from the Project area. There is little possibility expected that such security guards cause violation of safety of other involved or local residents.
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?	(a) Y	(a) The scale of construction works are not significant. Susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact and number of potentially affected persons from the construction works shall not be significant. Adequate measures shall be implemented and monitored to avoid and

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		(e) Is there any possibility that roads will impede the movement of inhabitants?	(e) N	(e) The Project aims to improve flood resiliency of an existing road. There is no possibility that the Project will impede the movement of inhabitants.
		(f) Is there any possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?	(f) N	(f) The Project does not contain facilities that may cause sun shading and radio interference.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The Project aims to improve flood resiliency of an existing road. No archeological, historical, cultural or religious heritage is located on the sites. In case any resources are found in later phase of the Project, due procedure shall be taken according to the laws of Saint Lucia.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) The Project aims to improve flood resiliency of an existing road. No significant landscape resource is located on or around the sites. In case any resources are found in later phase of the Project, due procedure shall be taken according to the laws of Saint Lucia.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	(a) N	(a) Saint Lucia does not have legally recognized minorities and indigenous peoples. There are Kalinago people who were already located before the immigration of European people, but those people are blending in general society, different from Kalinago people in Dominica, where they have a Territory.
		(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources to be respected?	(b) N/A	(b) There is no specific minorities and indigenous peoples in relation to specific rights on land and resources.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	(a) Y	(a) The construction projects contacted by MIPST are monitored by MIPST to obey the Employees (Occupational Health and Safety) Act and Equality of Opportunity and Treatment in Employment and Occupation Act.
		(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	(b) Y	(b) Tangible safety considerations such as installation of safety equipment and management of hazardous materials shall be planned and implemented by MIPST and CSC.
		(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?	(c) Y	(c) Tangible measures such as safety and health program and trainings for workers shall be planned and implemented by MIPST and CSC.
		(d) Are appropriate measures being taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(d) Y	(d) Since Saint Lucia is a small country, security guards shall be hired from communities not far from the Project area. There is little possibility expected that such security guards cause violation of safety of other involved or local residents.
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?	(a) Y	(a) The scale of construction works are not significant. Susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact and number of potentially affected persons from the construction works shall not be significant. Adequate measures shall be implemented and monitored to avoid and

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
				minimize the pollution impacts caused by operation of the stock yard, transportation vehicles, and construction machineries.
		(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?	(b) N	(b) The scale of construction works are not significant and alteration of river environment and vegetation shall be limited to minimum. No significant ecosystem or protected areas are located in or around the target site. Borrow site or off-site soil disposal site shall not be set up for the Project. The construction activities shall not cause significant adverse impact on the natural environment and ecosystem.
		(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(c) N	(c) The speed of existing traffic at the Project site is quite fast. In the Construction Phase, the traffic shall be guided to drive slower on the detour route by sufficient guiding facilities to avoid and minimize traffic jam and accident. Land acquisition for construction of permanent structure shall follow the due process and socially acceptable fair negotiations based on the Land Acquisition Act, the Resettlement Policy Framework of the DVRP and JICA Guidelines.
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?	(a) Y	(a) Monitoring shall be the responsibility of MIPST in the planning and maintenance phase. The CSC shall be responsible for monitoring in the construction phase.
		(b) What are the items, methods and frequencies of the monitoring program?	(b) Y	(b) The items in the monitoring program coincide with the ones in the mitigation plan. Monitoring methods are mainly observation, patrolling and interview. Frequencies vary between everyday to once a month depending on target item.
		(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?	(c) Y	(c) Monitoring shall be conducted by site managers during the regular work hours by observation, patrolling and interview. Regular MIPST and Contractor personnel cost shall be used for the monitoring. Therefore adequate, continuous budget can be secured.
		(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(d) Y	(d) Monthly report from CSC to MIPST, and quarterly report from MIPST to JICA shall be mandated.
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation).	(a) N/A	(a) Large scale felling of trees is not required for the Project.
		(b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities).	(b) N/A	(b) The Project does not include power transmission and distribution lines.
	Note on Using Environmental Checklist	(a) The impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment,	(a) N	(a) Negative impacts that cross watershed boundary or large, continuous emission of CO2 are not expected since the numbers of tree felling and operation of vehicles and machineries are small. The Project does not

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		acid rain, destruction of the ozone layer, or global warming).		change the watershed. Wastes shall be disposed to existing landfill and shall not be disposed in ocean or abroad.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Annex 6 Environmental Management Plan (According to JICA Guidelines)

1. Purpose of the Environmental Management Plan (EMP)

The purpose of the EMP is to list minimum requirements of social and environmental impact mitigation, management, and monitoring activities to be implemented during the Planning, Construction, and early Maintenance Phase.

The EMP is prepared based on the IEE study done by the JICA Survey Team. When implementing the EMP, the implementing body shall also integrate the Environmental Management Framework for the World Bank Disaster Vulnerability Reduction Project (SFG1909).

2. Implementation Structure of EMP

Mitigation measures and monitoring activities shall be implemented by institutions listed in Table 1.

MIPE&L shall report the monitoring results 4 times a year (every 3 months).

Necessary budget to implement the mitigation measures shall be included in the Project cost and secured by MIPE&L.

Table 1 Implementation Structure of EMP

	Implementation of Mitigation Measures	Monitoring	Report to JICA
Planning Phase	MIPE&L	Consultant	MIPE&L
Construction Phase	Contractor	Construction Supervision Consultant	MIPE&L
Maintenance Phase	Police MIPE&L	MIPE&L	MIPE&L

According to the due process in Saint Lucia, the Contractor shall prepare the EMP (final), by integrating the relevant items required by Environmental Management Framework for the World Bank Disaster Vulnerability Reduction Project (SFG1909). The EMP must be reviewed and approved by MIPE&L. The Contractor shall take overall responsibility of works on the implementation of mitigation measures stipulated in the EMP during the Construction Phase.

The EMP shall be reviewed during the Construction Phase among stakeholders to verify that mitigation measures in the EMP are duly targeted to minimize the negative impact in the Project Areas and then revised as appropriate. This iterative process shall continue throughout the Construction Period.

3. Mitigation and Management Plan

(1) Planning phase

Action	Environmental item	Mitigation and management measures	Responsible institution
1 Approval of development plan	—	1 Design document and other necessary papers shall be prepared and submitted without delay	MIPE&L
2 Land acquisition	Involuntary resettlement	1 According to the laws and regulations of St. Lucia and JICA Guideline, the process of land acquisition, lease contract, compensation shall be started at suitable timing, so that the process shall be finished before the planned timing of the commencement of the construction works.	MIPE&L
3 Temporal removal and recovery of utilities	Involuntary resettlement	1 According to the laws, regulations and normal operation of St. Lucia, the negotiation with the owners and managers of existing utilities shall be started at suitable timing, so that the agreement shall be reached before the planned timing of the commencement of the construction works.	MIPE&L
4 Safety Plan for the school access and the church parking lot at Ravine Poisson Bridge during the construction phase	Children's right	1 Minimize the impact on the school yard function 2 Secure the safety of school access and around the stock yard, that may be set up at the lower parking lot	MIPE&L
5 Impacts on the water intake facility	Water use, water rights	1 Confirm that the design of structure and construction works shall not change water level and run off speed at the water intake upstream from Ravine Poisson Bridge 2 Provide sufficient information on the construction plan to Water & Sewerage Company of Saint Lucia (WASCO) at suitable timing	MIPE&L

(2) Construction phase

Contents of the final EMP to be prepared by the Contractor shall include following actions and measures based on the JICA Guideline, as well as the requirement of Environmental Management Framework for the World Bank Disaster Vulnerability Reduction Project (SFG1909). When necessary and appropriate, following actions and measures may be modified for better results or for avoidance of duplication between the two (2) frameworks.

1) Before commencement of construction works

Action	Environmental item	Mitigation measures	Responsible institution
1 Approval of environmental management plan	—	1 Develop sufficient and implementable environmental management plan, and obtain approval from MIPE&L	Contractor
2 Submission of waste plan	Waste	1 Develop sufficient and implementable waste management plan, and obtain approval from Solid Waste Management Authority	Contractor
3 Agreement of muck disposal at the Deglos Sanitary Landfill	Waste Air quality	1 Negotiate and obtain approval from Solid Waste Management Authority and any other related institutions about the disposal of 14,500 m3 muck from the Project, and reuse of the muck for sanitary purpose 2 To minimize impacts from dust, take	Contractor

2

Action	Environmental item	Mitigation measures	Responsible institution
		measures such as covering the muck, spraying water on the muck, and washing tires of the trucks	
4 Negotiations on existing utilities to be affected	Involuntary resettlement	1 Following up the activities of MIPE&L in the Planning Phase, start negotiation with the owners and managers of existing utilities, and reach agreement on temporal relocation and recovery without causing delay of construction works	Contractor

2) During construction works

Action	Environmental item	Mitigation measures	Responsible institution
1 Operation of transportation vehicles	Air quality Noise and vibration	1 Always use well-maintained transportation vehicles 2 Comply to the design load of each vehicles	Contractor
2 Existence of construction activities Operation of construction machineries Traffic regulation and control Use of alternate routes etc.	1 Air quality	1 Always use well-maintained vehicles and construction machines 2 To minimize impacts from dust, take other measures such as cleaning of tires and spraying water on road surface 3 Cover the muck on the dump truck	Contractor
	2 Noise and vibration	1 Use generators and construction machines that generate lower level of noise 2 Works that generate loud noise and vibration must be limited to day-time, but at the same time, should not obstruct the school-hours 3 Conduct information dissemination meetings with schools, churches and other public facilities and local residents prior to the commencement of works that generate loud noise and significant vibration, and explain the schedule of the works as well as the contact information that receives complaints	Contractor
	3 Water quality	1 Minimize the days of works that dig the river bed 2 Implement mitigation measures to avoid generation and run-off of mud water	Contractor
	4 Waste	1 Handle, store and dispose wastes such as muck, pavement, iron beam and fuel containers properly as planned in the submitted Waste Management Plan	Contractor
	5 Soil contamination	1 Use indoor storage, oil pan, etc. to avoid direct spill of fuel, lubricants, and other chemicals at work areas and yards	Contractor
	6 Existing public facilities, road and transportation facilities, social infrastructure, social services Children's right Accidents, crime	1 Plan temporal detour road and bridges to minimize accidents 2 In case traffic restriction such as alternate passage is necessary, provide sufficient number of traffic guard and communication tools to avoid and minimize congestion and accidents 3 If alternate roads are available, use mass media and other tools to encourage public to detour to alternate roads 4 Instruct the traffic guards to give first priority to pupils and mass attendants during school hours and mass hours	Contractor
	7 Work environment,	1 Comply to the safety standards of St.	Contractor

3

Action	Environmental item	Mitigation measures	Responsible institution
	occupational safety and health	Lucia 2 Mandate use of safety tools 3 Conduct periodical meetings with workers and make sure that full knowledge of work safety and health is well understood by every workers	
	8 Sanitation, public health, transmittable diseases including HIV/AIDS	1 Standing or stagnant water at work areas and yards must be drained everyday or treated by pesticide 2 Provide prevention method/tools to avoid infection of pathogens in the river water to the workers 3 Periodically monitor the occurrence of transmittable diseases among the workers and near the work areas and yards	Contractor

(3) Maintenance phase

Action	Environmental item	Mitigation measures	Responsible institution
1 Existence of upgraded road and bridges (Cul de Sac Bridge) Opening of new route Closure of the existing road	Existing public facilities, road and transportation facilities, social infrastructure, social services Accidents, crime	1 After the opening of the new road section, control and navigate the traffic right after the completion of works to minimize occurrence of traffic accidents for up to 3 months	Police

5. Monitoring Plan

(1) Planning Phase

Item/issue	What to monitor	How to monitor	Frequency	Location	Who does the monitoring
1 Approval of development plan	1 Progress of preparation and submission of design document and project approval papers	Oral interview	Every month	—	Consultant
2 Land acquisition	1 Progress of land acquisition, lease, and compensation negotiation and legal process	Oral interview	Every month	—	Consultant
	2 Progress of negotiations with owners and managers of existing utilities	Oral interview	Every month	—	Consultant
3 Children's rights	1 Extent/significance of impact of construction works for the school yard and church parking lot at Ravine Poisson Bridge 2 Safety measures in the Construction Phase for school access and around the stock yard 3 Progress of information dissemination and negotiations with the school and church	Oral interview	Every month	—	Consultant
4 Water use, water rights	1 Engineering review of the construction plan on existence of impact on water level and run off speed at the water intake upstream from Ravine Poisson Bridge 2 Progress of information dissemination and negotiations with WASCO	Oral interview	Every month	—	Consultant

(2) Construction phase

Contents of the final EMP to be prepared by the Contractor shall include following actions and measures based on the JICA Guideline, as well as the requirement of Environmental Management Framework for the World Bank Disaster Vulnerability Reduction Project (SFG1909). When necessary and appropriate, following actions and measures may be modified for better results or for avoidance of duplication between the two (2) frameworks.

1) Before commencement of construction works

Item/issue	What to monitor	How to monitor	Frequency	Location	Who does the monitoring
1 Approval of environmental management plan	1 Preparation, submission, and approval of Environmental Management Plan	Oral interview	Every month	—	CSC (construction supervision consultant)
2 Wastes	1 Preparation, submission, and approval of Waste Management Plan	Oral interview	Every month	—	CSC
3 Muck disposal	1 Progress of negotiation for muck disposal at Deglos Sanitary Landfill 2 Operation plan of the muck transportation to minimize impacts of dust generation	Oral interview	Every month	—	CSC
4 Utilities	1 Progress of negotiations with owners and managers of existing utilities	Oral interview	Every month	—	CSC

2) During construction works

	Item/issue	What to monitor	How to monitor	Frequency	Location	Who does the monitoring
1. Transportation vehicles						
1	Air Noise, vibration	・Impacts caused by transportation vehicles ・Safe loading behaviors	Observation while patrol Responding to complaints and other reports	Everyday - twice a month (Increased frequency in the phases that require more transportation vehicles)	・Near the public facilities along the transportation routes that are susceptible to negative impacts	CSC
2. Works at the site and yard						
1	Air	・Maintenance condition of vehicles and construction machineries ・Occurrence of dust pollution ・Implementation of preventive measures such as tire wash, spraying road surface, covering muck on dump trucks, etc..	Observation while patrol Responding to complaints and other reports	Everyday - every week (Increase frequency during the works that may cause air pollution)	At the work areas and the yards	CSC
2	Noise, vibration	・Occurrence of noise from generator and construction machineries ・Noise condition during night works ・Information dissemination meetings for the school, church, other public facilities and local residents on work schedule (start and end dates) and potential impacts	Observation while patrol Responding to complaints and other reports	Everyday - every week (Increase frequency during the works that may cause noise and vibration) Record every meetings for information dissemination	At the work areas School, church, and other public facilities near the work areas	CSC
3	Water quality	・Muddy water flow in the downstream ・Implementation and effectiveness of preventive measures	Observation while patrol Responding to complaints and other reports	Everyday - every week, during and after rain fall (Increase frequency during rain season)	At the work areas and down stream	CSC
4	Wastes	・Condition of segregation and storage of wastes, muck, used containers, recyclables, etc.. ・Appropriate waste disposal	Observation while patrol Confirmation of the manifesto or records of waste disposal company	Twice a month	At the work areas and the yards	CSC
5	Soil contamination	・Safe storage of fuels, lubricants, chemicals, etc.. ・Implementation of preventive measures	Observation while patrol	Twice a month	At the work areas and the yards	CSC

	Item/issue	What to monitor	How to monitor	Frequency	Location	Who does the monitoring
		of direct spills on the ground ・Occurrence of direct spills on the ground				
6	Existing traffic facilities, public facilities, social infrastructure, social services Children's rights Accidents, crime	・Occurrence of traffic congestion ・Securing safety for pedestrians and private cars during hours of commuting for school and masses ・Employment of traffic guards and use of media for detour encouragement	Observation while patrol Record every traffic accidents Record of safety measures	Twice a week - twice a month (work day and week end) (Increase frequency after the change of drive course) Record traffic accidents at every occurrence	Areas around the work areas and the yards	CSC
7	Work environment, work safety	・Compliance to safety standards ・Implementation of safety tools ・Holding meetings on safety and sanitation	Observation while patrol	Twice a month	At the work areas and the yards	CSC
8	Transmittable diseases	・Existence of stagnant water ・Occurrence of transmittable diseases among workers ・Occurrence of transmittable diseases in the areas around the construction works and yards	Observation while patrol Interview	Every day - every week, after rainfall (Increase frequency during rain season) Interview once a month	At the work areas and the yards Areas around the work areas and the yards	CSC

(3) Maintenance Phase

	Item/issue	What to monitor	How to monitor	Frequency	Location	Who does the monitoring
1	Existing traffic facilities, public facilities, social infrastructure, social services Accidents, crime	1 Implementation of planned traffic control and other safety measures 2 Occurrence of traffic accidents near the new bridges (up to 3 months after the completion of works)	Field observation Interview with police, business and residents nearby	Every month	Around the new bridges and access roads	MIPE&L

7. Monitoring Forms

(1) Planning Phase

Month	Purpose			Record * Objectives * Attendants * Venue * Main points of discussions, decisions	Recorded by (Name)
	Project Approval	Land	Communication		
Monthly record the activities conducted for : 1) Approval of development plan 2) Acquisition and lease of land 3) Communication with Utilities, SDA Church and school, and the Water Intake Facility					

Add lines when necessary

(2) Construction phase

Contents of the final EMP to be prepared by the Contractor shall include following monitoring forms based on the JICA Guideline, as well as the requirement of Environmental Management Framework for the World Bank Disaster Vulnerability Reduction Project (SFG1909). When necessary and appropriate, following forms may be modified for better results or for avoidance of duplication between the two (2) frameworks.

1) Before commencement of construction works

Month	Purpose				Record * Objectives * Attendants * Venue * Main points of discussions, decisions	Recorded by (Name)
	EMP Approval	Waste Plan	Soil waste	Utilities		
Monthly record the activities conducted for : 1) Approval of EMP 2) Approval of Waste Plan 3) Approval of acceptance of excess soil at the Deglos Sanitary Landfill 4) Communication with utilities						

Add lines when necessary

2) During construction works

Daily patrol, observation, and recording during the Construction Works

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
1	Visible dust, emission gas					
2	Noise condition					
3	Mud water spill down from the site					
4	Stagnant water					
5	Spread of infectious diseases among workers and surrounding areas					

Semi-monthly and monthly monitoring and observation

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
1	Waste storage and segregation					
2	Oil spill, chemical spill, soil and groundwater contamination					
3	Occurrence of traffic jam around the Work Area Any accident or near-accident occurrences on road Safety condition during the commuting hours for school and meetings Received opinions and grievances on traffic problem					
4	Impact on DHR operation Received opinions and grievances from DHR					
5	Work accidents Compliance to the safety plan Periodical educational meetings on sanitation and safety					

(3) Maintenance Phase

Monthly monitoring by interview survey and observation

Year	Month	Date	Record 1) Implementation of traffic control and safety measures 2) Occurrence of traffic accidents at or near the New Bridges	Recorded by (Name)

Add lines when necessary

End.

Annex 7 Preliminary Abbreviated Resettlement Action Plan (ARAP) (According to WB OP 4.12)

1. Introduction of the Project

Table 1 summarize the Project component, and planned activities targeted for evaluation of environmental and social impact evaluation.

Table 1 Project Component Summary

Project area	Target roads and bridges	Project component summary
Watershed of Cul de Sac River	West coast road Cul de Sac Bridge East coast road Ravine Poisson Bridge	1. Replacement of existing 2 road bridges 2. Embankment (flood protection works) of the river on the section near to the bridges 3. Construction of access road to the bridges

2. Rationale of ARAP

The Project was assessed by JICA as a Category B project. This indicates that works proposed under the project primarily involve rehabilitation works and any anticipated potential impacts are considered short term, not significant and readily preventable with standard measures. Although the Project was classified as a Category B Project, it was assessed as having triggered social safeguards, specifically Involuntary Resettlement, as planned works could lead to public acquisition of private property and subsequently impact beneficiary assets or access to assets.

In light of this, this draft Abbreviated Resettlement Action Plan (ARAP) was developed according to the JICA Guideline and the WB OP 4.12 to serve as a guide for the project. The draft ARAP shall be updated when a Special Project Unit (SPU) is appointed for the Project, and by the Social Safeguard Specialist in the SPU, based on the Resettlement Policy Framework for the Disaster Vulnerability Reduction Project (DVRP), which now has a national guideline status.

3. Objective of ARAP

This ARAP provides details on the likely impacts resulting from the construction of the proposed works, and the mitigatory measures that will be implemented to address any potential adverse impacts.

Specifically the objective of this ARAP is to provide following information in each chapters and appendices.

Chapter 4: Results of preliminary census survey of project affected people (PAP) and affected assets
Chapter 5: Preliminary Compensation Packages According to JICA Guideline
Chapter 6: Plan for Consultation
Chapter 7: Institutional Responsibilities for Implementing the ARAP and Timetable for Implementation;
Chapter 8: Arrangements and Timetable for Monitoring Implementation of ARAP
Chapter 9: Procedures for Grievance Redress
Chapter 10: Sources of Funding and Estimated Budget
Appendix 1- Cadastral map and the Project design
Appendix 2- Photos of lands and assets to be affected
Appendix 3- Preliminary monitoring forms

4. Results of preliminary census survey of project affected people (PAP) and affected assets

Table 2 summarizes natural and legal persons who are related to the land planned to be acquired by the Project.

The cut-off date for the listing of persons or assets related to the land shall be determined following the Land Acquisition Act, Chapter 5.04. as the date of issuance of first Notice of Intention, not the date of the starting date of the preliminary census, which was November 11, 2016.

Table 2 Number of Project Affected Units (PAUs) and Affected Persons (APs)

Type of loss		No of PAUs				No of APs		
		Legal	Illegal	Unknown	Total	Legal	Illegal	Total
Required for displacement								
1	HH (Structure owner on Gov. land)	0	0	0	0	0	0	0
2	HH (Structure on Private land)	0	0	0	0	0	0	0
3	HH (Tenants)	0	0	0	0	0	0	0
4	CBEs (Structure owner on Gov. land)	0	0	0	0	0	0	0
5	CBEs (Structure owner on Private land)	0	0	0	0	0	0	0
6	CBEs (Tenants)	0	0	0	0	0	0	0
7	Community owned structures including physical cultural resources	0	0	0	0	0	0	0
Not required for displacement								
8	Land owners (#69, 187, 154, 45, and Crown (#24, 153). All owners lose part of the lot)	5	0	0	5	-	-	-
9	CBEs (Structure owner on Private land) which will lose road access (#154)	1	0	0	1	-	-	-
10	CBEs (Structure owner on Private land) which will relocate an immovable structure to the remaining land (#45)	1	0	0	1	-	-	-
11	CBEs (Structure owner on Private land) which will relocate a movable structure to the remaining land (#69)	0	0	1	1	-	-	-
12	CBEs (Structure owner on Private land) which will lose sign boards, gates, and fences (#187, 154, 45)	3	0	0	3	-	-	-
13	Wage earners of relocating CBEs	0	0	0	0	-	-	-

HH: House Hold, CBEs: Commercial and Business Enterprises

Table 3 summarizes lands and assets planned to be affected by the Project.

The stoppage of lease of Crown Lands and any related matters (#153) and clearance of occupation of Crown Lands without formal contract (#24) shall be handled by the Commissioner of Crown Lands, as regular management operation of Crown Lands. Such activities, therefore, were separated from the action necessary for the Project.

Table 3-1 Lands and assets planned to be affected by the Project (Acquisition)

Acquisition (Cul de sac)		Lot #	Ownership	Necessary area m2	Remaining area m2	Total area m2	% affected	Assets	#
Access roads									
	Millennium Highway	69	Private	300	510	810	37%	Semi-mobile canteen Planting	1 1
		24-4	Crown	3,850				Grazing Semi-mobile canteen	- 1
	West coast road relocation	187	Private	498	13,419	13,917	4%	Signboard	1
		24-3	Crown	3,550				Street trees	5
Embankment Waterway		154	Private	228	8,060	8,288	3%	Net fence and gate Signboard	1 1
		45	Private	277	1,113	1,390	20%	Commercial structure (with concrete founding)(Partially affected) Net fence	1
		153	Crown (1-yr. lease contract)	288	11,633	11,921	2%	Net fence and gate Signboard	1 1
		24-1	Crown	4,150				Grazing Semi-mobile canteens Fruit and ornamental trees	- 3 10
		24-2	Crown	1,900				Semi-mobile canteen	1
Private land m2 Total				1,303					
Crown land m2 Total				13,738					
Grand Total m2				15,041					

Table 3-2 Lands and assets planned to be affected by the Project (Lease during construction phase)

Lease	Use	Lot #	Ownership	Necessary area m2	Remaining area m2	Total area m2	% affected	Assets	#
Cul de Sac	Temporal detour road (Millennium Highway)	69	Private	165	645 (Includes 300 m2 for acquisition)	810	20%	Listed in previous table	
	Temporal detour road (West coast road, eastern access road)	77	Private	480	3,115	3,595	13%	Commercial structure (without concrete founding)	1
		151	Private	2,090	7,660	9,750	21%	Boundary wall Parking pavement Signboards	1 1 2
		101	Private	550	2,400	2,950	19%	Boundary wall Signboard	1 1
		210	Crown (road)	25					
	Temporal office, storage and yard	68	Crown (Application of lease under review)	1,622	3,860	5,482	30%	None	
		24-4	Crown	10,750				Listed in previous table	
Ravine Poisson	Temporal detour road and bridge	14	Private	290	2,150	2,440	12%	Commercial flower nursery	1
		999*	Crown (Road Reserve)	150				Net fence Tree Ornamental planting	1 1 1
		998*	Crown (River)	90				None	
		83	Private	5	1,020	1,025	0.5%	None	
		10-1	Private	65	38,085	39,500	4%	Ornamental planting	1
	Temporal office, storage and yard	10-2	Private	1,350				Chain gate Parking for events	1 1
Private land m2 Total				4,995					
Crown land m2 Total				12,637					

*: Lot # 999, 998 are under survey for factual numbers.

Table 4-1 Owners of lands and businesses to be affected by the Project (Acquisition)

Location	Land Owner (Acquisition)		Tenant/ Business/ Structure Owner
Cul de Sac Map #0845B	69	Francis & Joyce Anatole	H. Farrell (Burger stall)
	154	Martha Jalim	Ernesco Auto Service
	45	Nigel Elibox	Nigel Elibox
	187	DuBoulay Bottling or CPJ Saint Lucia Ltd. (Updated condition unknown)	CPJ Saint Lucia Ltd.
	153	Crown	Green Fresh Ltd. (1 year lease, April to March)
	24	Crown	(Unknown (Semi-mobile canteens))

Table 4-2 Owners of lands and businesses to be affected by the Project (Lease during construction phase)

Location	Land Owner (Lease)		Business/ Structure Owner	School	Church/ Community facility	Resident
Cul de Sac Map #0845B	69	Francis & Joyce Anatole	H. Farrell (Burger stall)	-	-	-
	77	Nigel Elibox	Nigel Elibox			
	151	(Under survey)	Massy Stores Supermarket SL Cul de Sac Gas Station (Rubis Total Auto)			
	101	(Under survey)	West Indies Shipping & Trading Co.,Ltd			
	68	Crown	(Business lease application by owner of #69, Francis & Joyce Anatole)	-	-	-
	24	Crown	Unknown			
	210	Crown	None			
Ravine Poisson Map #1039B	14	Marie Lauri Turnbull	Cuthbert Lucien (Flower cultivation)	-	-	-
	10	Seventh Day Adventist Church	-	L'Abayee SDA Primary School	SDA Church, Zion Community Service Facility	-
	83	Cheryl Blondell King	Cheryl Blondell King (Currently residing at British Virgin Islands)	-	-	None
	999	Crown (Road reserve)	Unknown			
	998	Crown (River)				

5. Preliminary Compensation Packages According to JICA Guideline

Table 5 list the types of impact and compensation and assistances related to the impact rationalized based on WB OP 4.12 and JICA guidelines.

The compensation package shall be finalized after valuation of assets, individual negotiation with the PAP and decision of the Board of Assessment.

Table 5-1 Preliminary Compensation Packages According to JICA Guideline (Acquisition)

All at Cul de Sac Bridge area

No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
1	Land acquisition	Land owner (7) #69, 187, 154, 45 All lose part of the parcel Total 1,303m2	Cash payment for the land price rationally decided based on market value	Agreement shall be reached by following the due process defined in the Land Acquisition Act	Budget: MIPE&L Determination of the acquisition boundary and payment : Dept. of Physical Planning Determination of the volume of

No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
					compensation/ assistance: Chief Surveyor at Department of Physical Planning by negotiation with the PAPs
2	Loss of road access to the remaining land	Land owner (1) #154	Provision of access road as a part of the Project, through #153, Crown Land	The design of the access road shall accommodate the heavy vehicles so that the auto repair business on #154 can continue as before	Budgeting and construction of the access road : MIPE&L Designation of land: Crown Lands Commission
3	Loss of private property	Owner of permanent structure (1) #45	Cash compensation * Demolition cost of whole structure, and * Re-construction of same function on remaining land	In determining the replacement cost, depreciation of the asset and the value of salvage materials are not taken into account.	Budget : MIPE&L Governmental valuation and payment of compensation : Dept. of Physical Planning Determination of the compensation : Chief Surveyor at Department of Physical Planning by negotiation with the PAPs
4		Owner of non-permanent structure (1) #69	Select either option: * Voluntary relocation on remaining land (when land owner agrees so) * Assistance to relocate to other places (provision of tow-vehicle and fuel)	In case of relocation to other place, the owner shall be responsible for selection of the destination (Relocation to a Crown Land may be negotiated)	Negotiation and provision of assistance: MIPE&L
5		Owner of the sign board and other improvements Signboard (2) #187, 154 Fence, wall (2) #154, 45	Cash compensation for reconstruction	In determining the replacement cost, depreciation of the asset and the value of salvage materials are not taken into account.	Budget : MIPE&L Governmental valuation and payment of compensation : Dept. of Physical Planning Determination of the compensation : Chief Surveyor at Department of Physical Planning by negotiation with the PAPs
6	Negative impact on income caused by land acquisition	Above PAPs	Cash compensation decided by Board of Assessment	Board of Assessment shall conduct hearing with PAPs and decide on rational volume of income loss	Budget : MIPE&L Determination of the compensation : Board of Assessment

Following preparations shall be necessary separated from the Project.					
No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
7	Stoppage of renewal of lease contract of public land	Owner of lease contract (1) #153	Select either option: *Provision of new lease contract of other location on public land	Structures and other assets on public land shall be voluntarily removed by the lessee	Crown Lands Commission

No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
			* Provision of lease for annexing land and keep operation		
8	Removal of private assets on public land	Owner of Semi-mobile canteens (5) #24- 4, 24-1, 24-2	Select either option: * Assistance to relocate to other places (provision of tow-vehicle and fuel) * Governmental removal and disposal, coordinating with MIPE&L.	In case of relocation to other place, the owner shall be responsible for selection of the destination	Crown Lands Commission
9		Owner of ornamental trees and planting (1) #24-1	Select either option: * Voluntary removal * Compensatory exchange with saplings, with assistance from Agriculture Department	In case of removal, the owner shall be responsible for selection of the destination and transportation	Crown Lands Commission
Owner of the 5 street trees on #24-3 is MIPE&L and no process or compensation is necessary for felling.					

Table 5-2 Preliminary Compensation Packages According to JICA Guideline (Lease)

No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
1	Temporal termination of land use	Land owner (7) C : #69, 77, 151, 101 R : #14, 83, 10 Total 4,995 m2	Cash payment for the land lease rationally decided based on market value	Contractor shall reach agreement with the owner by following the customary process in Saint Lucia. MIPE&L shall assist the negotiation	Determination of the land boundary : Contractor Assistance in negotiation and payment : MIPE&L
2	Temporal termination of economic activity	Flower cultivator (1) R : #14 (owner shall lose part of the flower nursery)	Income compensation for the months between the stoppage of production to the re-start of the market delivery	Compensation shall be the same value produced from the lost area of the flower nursery. The owner shall provide estimated price and the Contractor shall consult with the Agricultural Division for the rationality of the asking	Determination of the land boundary : Contractor Assistance in negotiation and payment : MIPE&L Assistance in verification of the price : Agricultural Division, Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operatives
3	Loss of private asset	Land owner (ornamental planting, chain gate) (1) R : #10	Recovery of the same condition by the Project budget	The Contractor, together with the owner, shall take photo and descriptive record of existing asset prior to their removal	Record and reconstruction: Contractor Assistance in negotiation : MIPE&L
		Owner of non-permanent structure (1) C: #77	Select either option: * Cash compensation * Voluntary relocation on remaining land (when land owner agrees	In case of relocation to other place, the owner shall be responsible for selection of the destination	Negotiation and provision of assistance: MIPE&L Technical assistance in valuation : Department of Physical Planning

No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
			so) * Assistance to relocate to other places (provision of tow-vehicle and fuel)		
		Owner of the sign board and other improvements Signboard (4) C: #77, 151 (2), 101 Fence, wall (2) C: #151, 101	Select either option * Cash compensation for reconstruction * Reconstruction at the same place as part of the Project * Relocate (the signboard) to places not to be affected by the Project	In determining the replacement cost, depreciation of the asset and the value of salvage materials are not taken into account.	Budgeting and construction of the access road : MIPE&L Governmental valuation and payment of compensation : Dept. of Physical Planning Determination of the compensation : Chief Surveyor at Department of Physical Planning by negotiation with the PAPs

C: Cul de Sac Bridge area. R: Ravine Poisson Bridge area

Further study is necessary about the factual location of the boundary between #83 (private) and #999 (Crown (Road reserve), number under survey), and clarify the ownership of the following assets that are located on #999 on the cadastral map #1039B.					
No.	Type of impact	Eligible PAP	Compensation and assistance	Implementation guideline	Responsible institution
4	Loss of assets on Crown Land	Owner (Fence, tree, ornamental plants) (1) R : #999	Recovery of the same condition by the Project budget (If found that the assets are on private land, or are on Crown Land with permission)	The Contractor, together with the owner, shall take photo and descriptive record of existing asset prior to their removal	Record and reconstruction: Contractor Assistance in negotiation : MIPE&L

6. Plan for Consultation

Separated from community meetings to disseminate the information about the Project, PAPs shall be contacted by the Chief Surveyor of Department of Physical Planning or his/her agent (hereinafter referred as 'CS') individually for their rights, process of the Project, official census and assessment, voluntary claiming of asset value, necessary assistances, and other negotiation and consultation.

7. Institutional Responsibilities for Implementing the ARAP and Timetable for Implementation

The CS shall be responsible for implementation of the ARAP, and the CS shall coordinate with relevant institutions to oversee the implementation of this ARAP.

The CS shall ensure that implementation of the ARAP is done in accordance with the requirements of the JICA Guideline, with guidance from the World Bank OP 4.12 and the Resettlement Policy Framework of

DVRP.

The agencies involved with implementation of this ARAP are listed in Table 6.

Table 6 Relevant Institutions

Responsibility	Relevant Institutions
• Securing necessary budget (land acquisition, compensation and other assistances) • Request for technical coordination to Dept. of Physical Planning and Development and Crown Lands Section • Transfer of budget to Dept. of Physical Planning and Development and Crown Lands Section	MIPE&L
• Demarcation of necessary land • Estimation of budget for acquisition and lease	Land and Survey Section, Dept. of Physical Planning and Development
• Submission of memorandum to Cabinet to acquire the land • Gazette the Notice of Intention • Letter to land owners informing potential acquisition; Letter to land owners to request claim of compensation amount, negotiation for compensation including livelihood assistances, compensation payment	PS, Dept. of Physical Planning and Development
• Clearance of properties on Crown Lands and necessary assistance to the owners of private properties • Registration of the land for road usage	Crown Lands Section, Dept. of Physical Planning and Development
• Study and decision of compensation and assistance to PAPs	Board of Assessment

8. Arrangements and Timetable for Monitoring Implementation of ARAP

The SPU, MIPE&L, is responsible for following up and ensuring that all activities are completed as outlined above and according to agreed upon timelines. In case any difficulty arises, and if the concerned parcel of land may remain as it is for the time being, the monitoring activities may continue after the commencement of the Construction Phase.

The SPU shall ensure that the affected persons are compensated satisfactorily, and in accordance with the ARAP. Minutes of all meetings and consultations will be maintained by the SPU, shared with all parties. The Consultant assigned by MIPE&L shall be informed by email immediately following each meeting, or, if appropriate, observe the activities on site.

Table 7 shows the plan for monitoring of the implementation of the ARAP. Monthly monitoring shall continue until all the compensation and assistances are given, or all the lands are cleared for the Project, or all the comments and grievances are solved. Preliminary monitoring forms to be used in the process are listed in Appendix 3. MIPE&L shall report the monitoring results to JICA quarterly (every 3 months).

Table 7 ARAP Monitoring Plan

Items to be monitored	Measure	Summarization Frequency	Location	Responsible institution
Information dissemination and consultation about the Project	Daily record and interview	Monthly	Social Safeguards Officer, SPU, MIPE&L	SPU, MIPE&L
Comments and grievance redress on land acquisition and loss of private properties	Daily record and interview	Monthly	Social Safeguards Officer, SPU, MIPE&L	SPU, MIPE&L
Progress of valuation of assets, presentation of compensation options, negotiations, and payment	Daily record and interview	Monthly	Social Safeguards Officer, SPU, MIPE&L	SPU, MIPE&L

9. Procedures for Grievance Redress

A grievance redress mechanism is necessary for addressing eligible concerns of affected individuals and groups who may consider themselves deprived of appropriate treatment under the project.

The mechanism includes:

(i) a recording and reporting system, including grievances filed both verbally and in writing,

(ii) designated staff with responsibility for addressing grievances at various levels of Government, and

(iii) a time frame to address the filed grievances.

The functioning of the grievance redress mechanism for this ARAP shall be monitored and evaluated by the CS during its implementation in the Planning Phase of the Project.

The Remedial Abbreviated Resettlement Action Plan for Dennery Infant School (2016) followed the steps of grievance redress as shown in Table 8. Similar staff, institutions and steps are expected to work for the Project as well.

Table 8 Grievance Redress Procedures in the Remedial Abbreviated Resettlement Action Plan for Dennery Infant School

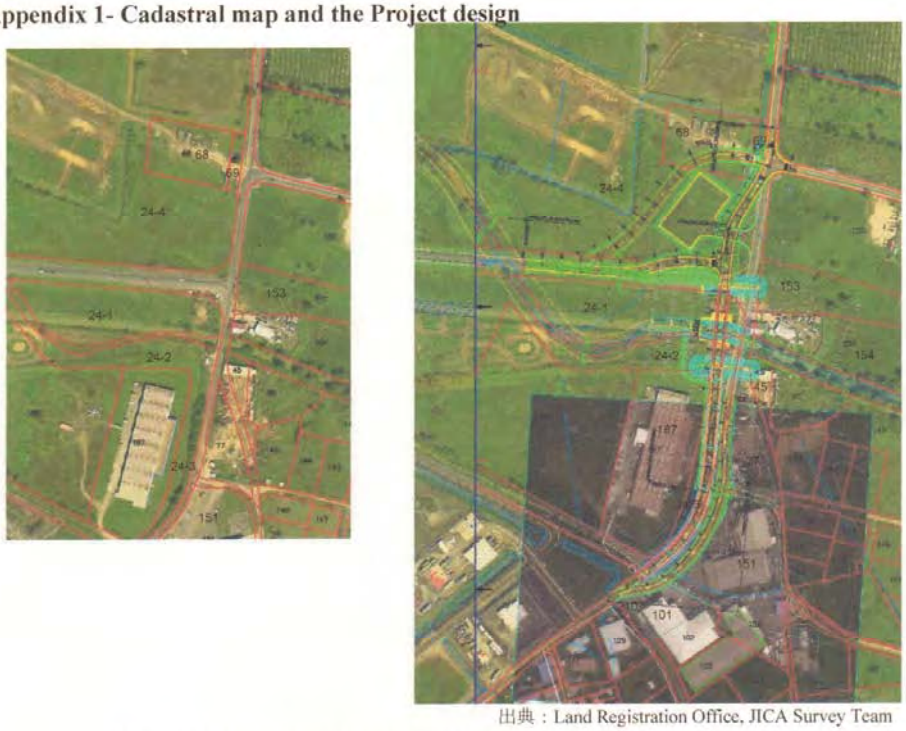
Grievances from affected parties	* Grievances made verbally to the Social Safeguards Officer
Access Point	* The SPU serves as the access point for grievances
Grievance Log	* Grievances received verbally are documented, verified and signed by both parties. * Grievances will be copied to the relevant authority as defined in the Land Acquisition Act.
Assessment	* Grievances categorized by type. Determination of eligibility of grievance. * The first assessment of the grievance conducted by a Grievance Committee comprising persons drawn from the SPU and technical officers from the MOPD, MIPE&L, and MOE. * Letters acknowledging grievance relating to resettlement issued by the SPU to the aggrieved persons. * The Community Development Officer (CDO) (Social Transformation Officer) for Dennery to provide assistance with dealing with conflict resolution and grievance. The CDO will communicate all disputes and grievances to the SPU immediately when received. Should a dispute arise, the applicable Laws of Saint Lucia will prevail.
Resolution and Follow-up	* Development of Implementation Plan for resolution of grievances.

Source: Remedial Abbreviated Resettlement Action Plan for Dennery Infant School (2016) p.9

10. Sources of Funding and Estimated Budget

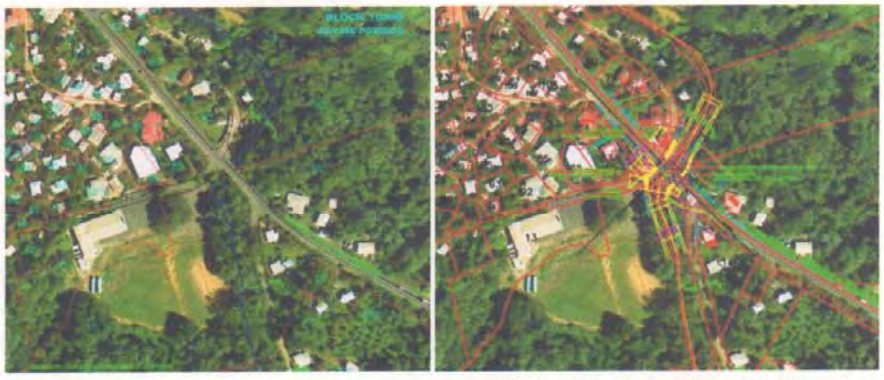
The cost of acquisition and associated administrative and logistical costs shall be provided for by the MIPE&L as part of the Project cost. Necessary budget shall be estimated after the official valuation of assets by Department of Physical Planning and Development.

Appendix 1- Cadastral map and the Project design



出典：Land Registration Office, JICA Survey Team

Figure 1 Cadastral map and the Project design at Cul de Sac Bridge area



出典：Land Registration Office, JICA Survey Team

Figure 1 Cadastral map and the Project design at Ravine Poisson Bridge area

10

Appendix 2- Photos of lands and assets to be affected

1) Land acquisition (All in the Cul de Sac Bridge area)

69

24-4

187

24-3

154

45

11

153

24-2

24-1

24-1

12

2) Lease during the Construction Phase

Cul de Sac Bridge

69

68

24-4

77

151

101

Ravine Poisson Bridge

14

10-1 (Detour road and temporal bridge)

14

10-2 (Temporal office, storage, yard)

999/83

Appendix 3- Preliminary monitoring forms

1) Record of public consultation

No.	Date	Place	Number of attendants (Number of female attendants)	Purpose, Agenda, Main comments and answers
1				
2				

2) Record of grievances and comments

No.	Date	Place	Name of the person concerned	Grievances, comments	Name of officer receiving	Next action
1						
2						

3) Progress record of land acquisition

	#69	#187	#154	#45
1. Memorandum to Cabinet to acquire				
2. Cabinet Conclusion Document to acquire				
3. Notice of Intention gazetted				
4. Letter to land owner(s) - Inform them of potential acquisition				
5. Survey / Valuation of property				
6. Memorandum to Cabinet for declaration				
7. Cabinet Conclusion of declaration				
8. Notice of Declaration gazetted				
9. Registration of the property for government's purchase intention				
10. Letter to land owner(s) - to request claim of amount				
11. Negotiation for compensation, including livelihood compensation				
12. Board of Assessment Review and decision				
13. Memorandum to Cabinet for payment				
14. Cabinet Conclusion for final payment				
15. Compensation payment to land owner				
16. Other assistances, compensations	Assistance for the tenant vendor	Compensation for the sign board	Provision of access road	Demolition and reconstruction of the structure

Record completion date and any other notes in the cell.

End.

Annex 8 Environmental and Social Monitoring Forms

Environmental and social impacts and implementation of mitigation measures shall be monitored using following Monitoring Forms. In the later phase of the Project, the forms and contents may be modified and updated to incorporate the latest site condition and design, the latest legislations, as well as the Environmental Management Framework of the DVRP.

(1) Environmental Monitoring Forms

1) Planning Phase

Month	Purpose			Record	Recorded by (Name)
	Project Approval	Land	Communication	* Objectives * Attendants * Venue * Main points of discussions, decisions	
Monthly record the activities conducted for : 1) Approval of development plan 2) Acquisition and lease of land 3) Communication with Utilities, SDA Church and school, and the Water Intake Facility					

Add lines when necessary

Source : JICA Survey Team

2) Construction Phase

Prior to the commencement of construction works

Month	Purpose				Record	Recorded by (Name)
	EMP Approval	Waste Plan	Soil waste	Utilities	* Objectives * Attendants * Venue * Main points of discussions, decisions	
Monthly record the activities conducted for : 1) Approval of EMP 2) Approval of Waste Plan 3) Approval of acceptance of excess soil at the Deglos Sanitary Landfill 4) Communication with utilities						

Add lines when necessary

Source : JICA Survey Team

After the commencement of construction works

Daily patrol, observation, and recording during the Construction Works

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
1	Visible dust, emission gas					
2	Noise condition					
3	Mud water spill down from the site					
4	Stagnant water					

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
5	Spread of infectious diseases among workers and surrounding areas					

Source : JICA Survey Team

Semi-monthly and monthly monitoring and observation

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
1	Waste storage and segregation					
2	Oil spill, chemical spill, soil and groundwater contamination					
3	Occurrence of traffic jam around the Work Area Any accident or near-accident occurrences on road Safety condition during the commuting hours for school and meetings Received opinions and grievances on traffic problem					
4	Impact on DHR operation Received opinions and grievances from DHR					
5	Work accidents Compliance to the safety plan Periodical educational meetings on sanitation and safety					

Source : JICA Survey Team

3) Maintenance Phase

Monthly monitoring by interview survey and observation

Year	Month	Date	Record 1) Implementation of traffic control and safety measures 2) Occurrence of traffic accidents at or near the New Bridges	Recorded by (Name)

Add lines when necessary

Source : JICA Survey Team

(3) Social Monitoring Forms

1) Record of public consultation

No.	Date	Place	Number of attendants (Number of female attendants)	Purpose, Agenda, Main comments and answers
1				
2				

Add lines when necessary

Source : JICA Survey Team

2) Record of grievances and comments

No.	Date	Place	Name of the person concerned	Grievances, comments	Name of officer receiving	Next action
1						
2						

Add lines when necessary

Source : JICA Survey Team

3) Progress of land acquisition

	#69	#187	#154	#45
1. Memorandum to Cabinet to acquire				
2. Cabinet Conclusion Document to acquire				
3. Notice of Intention gazetted				
4. Letter to land owner(s) - Inform them of potential acquisition				
5. Survey / Valuation of property				
6. Memorandum to Cabinet for declaration				
7. Cabinet Conclusion of declaration				
8. Notice of Declaration gazetted				
9. Registration of the property for government's purchase intention				
10. Letter to land owner(s) - to request claim of amount				
11. Negotiation for compensation, including livelihood compensation				
12. Board of Assessment Review and decision				
13. Memorandum to Cabinet for payment				
14. Cabinet Conclusion for final payment				
15. Compensation payment to land owner				
16. Other assistances, compensations	Assistance for the tenant vendor	Compensation for the sign board	Provision of access road	Demolition and reconstruction of the structure

Record completion date and any other notes in the cell.

Source : JICA Survey Team

Appendix-5 Other Relevant Data

5-1 Traffic Survey Data

5-2 Geological Survey Data

5-3 Environmental and Social Considerations

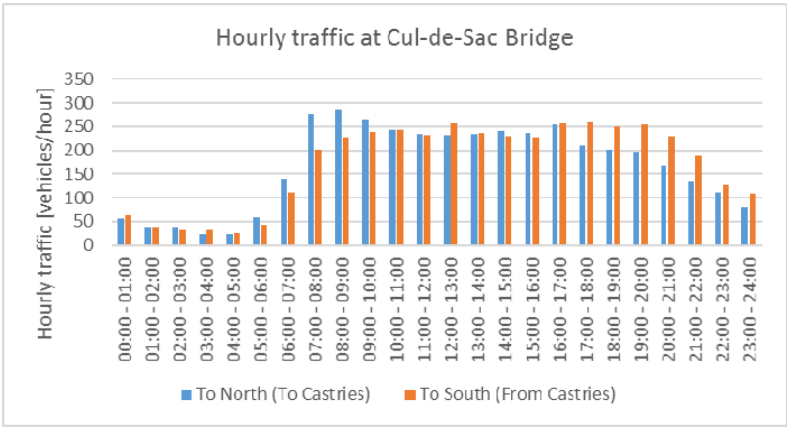
5-4 Estimation of quantative indicators

Appendix 5-1

Traffic Survey Data

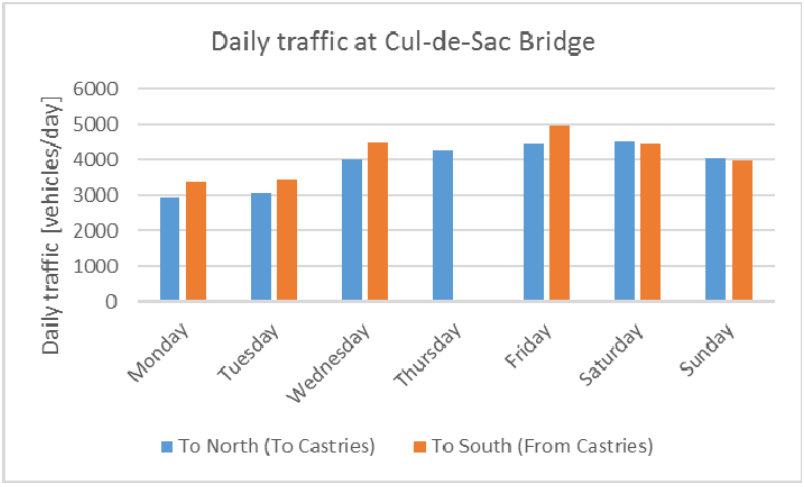
Appendix 5-1 Traffic flow at Cul-De-Sac Bridge

(1) Cul-De-Sac Bridge



Source: JICA Study Team

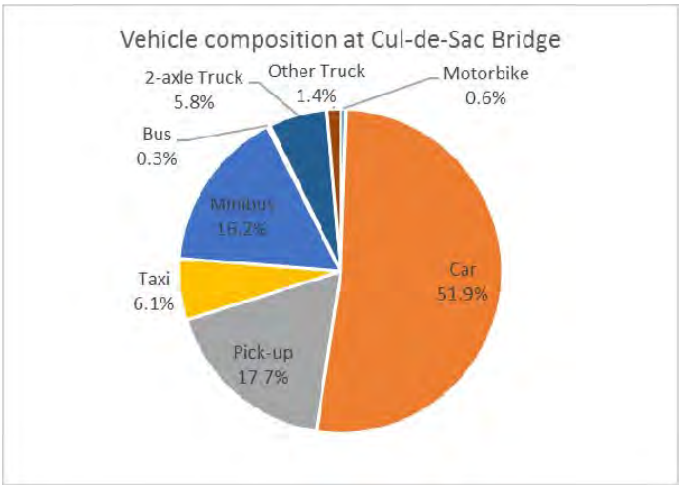
Figure 1 Hourly traffic at Cul-de-Sac Bridge



Note: No data obtained for southward traffic on Thursday because of device failure

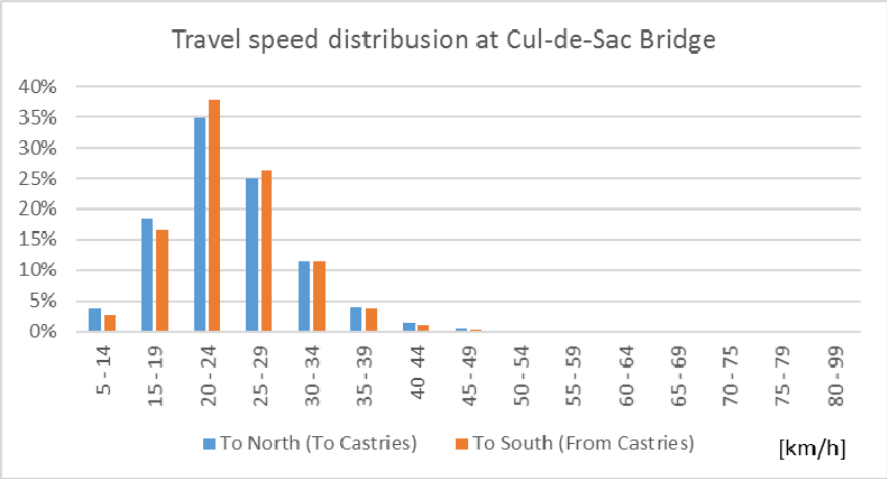
Source: JICA Study Team

Figure 2 Daily traffic at Cul-de-Sac Bridge



Source: JICA Study Team

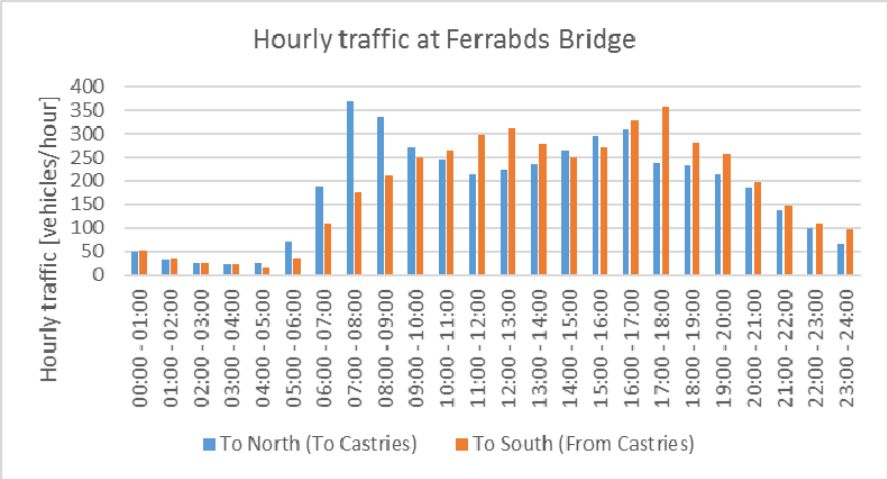
Figure 3 Vehicle composition at Cul-de-Sac Bridge



Source: JICA Study Team

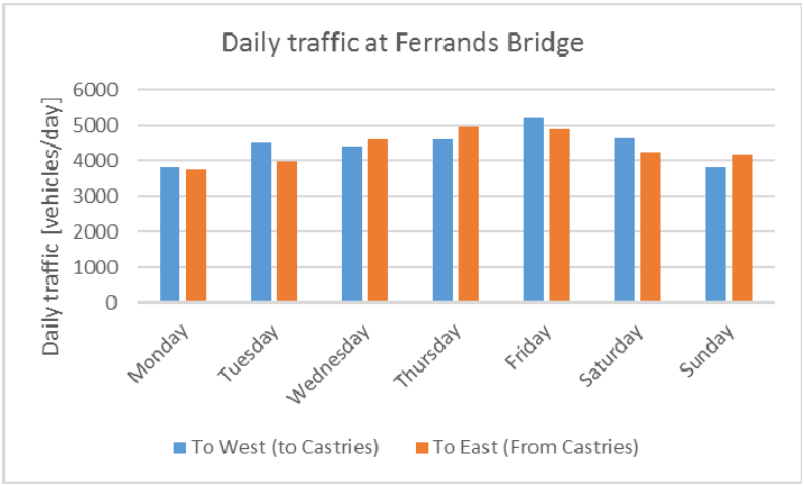
Figure 4 Travel speed distribution at Cul-de-Sac Bridge

(2) Ferrands Bridge



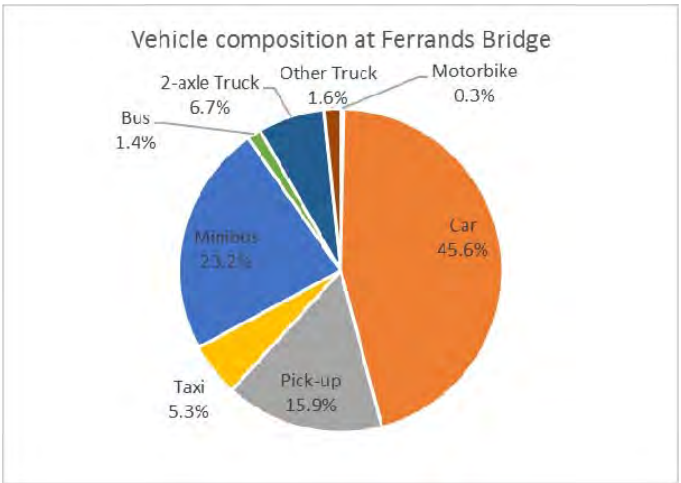
Source: JICA Study Team

Figure 5 Hourly traffic at Ferrands Bridge



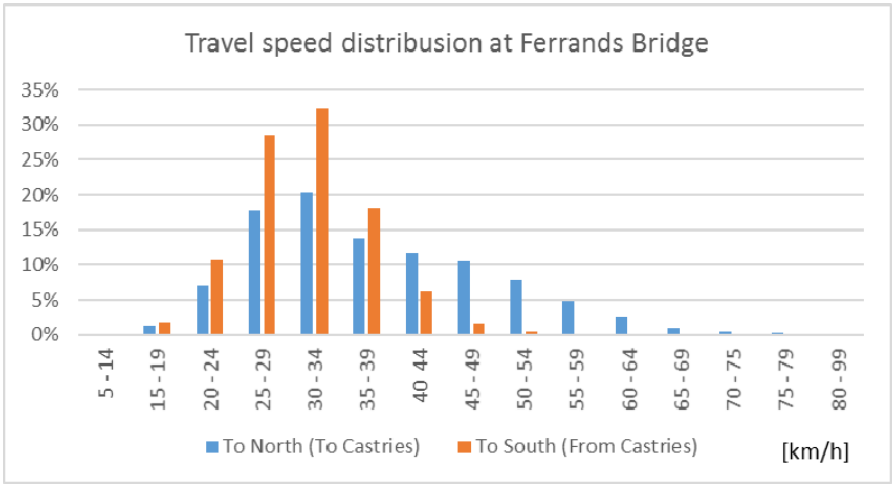
Source: JICA Study Team

Figure 6 Daily traffic at Ferrands Bridge



Source: JICA Study Team

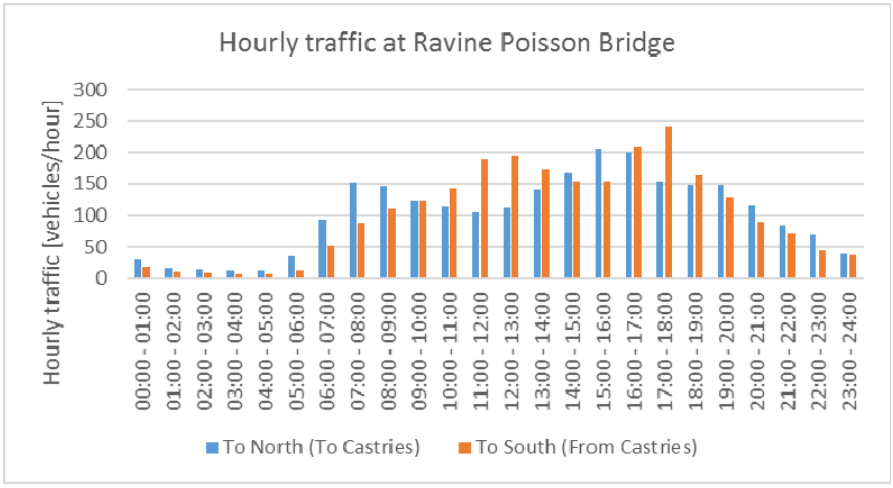
Figure 7 Vehicle composition at Ferrands Bridge



Source: JICA Study Team

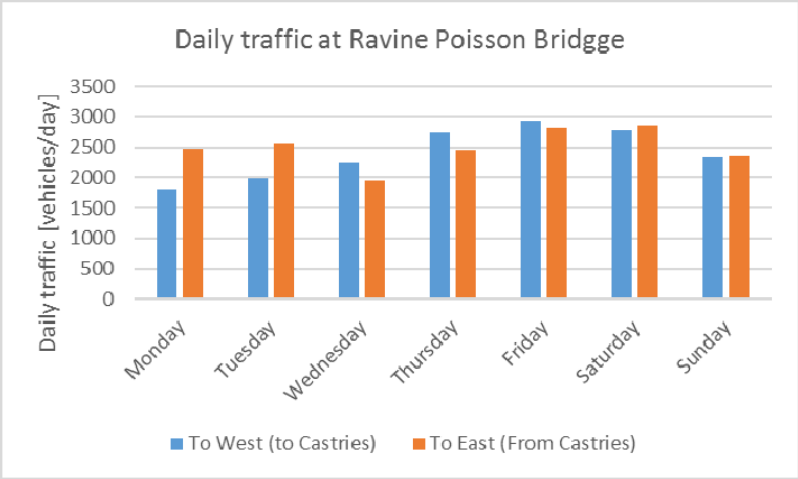
Figure 8 Travel speed distribution at Ferrands Bridge

(3) Ravine Poisson Bridge



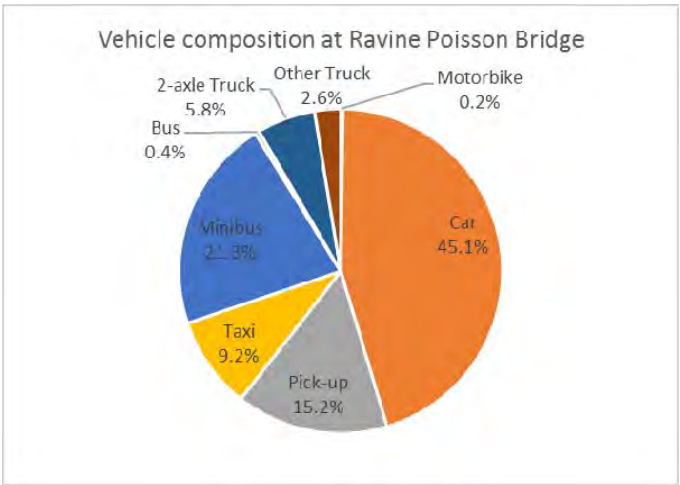
Source: JICA Study Team

Figure 9 Hourly traffic at Ferrands Bridge



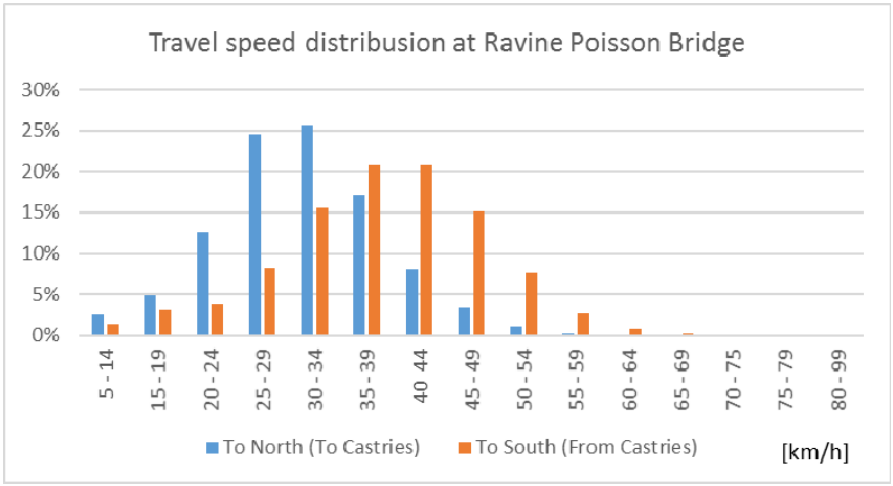
Source: JICA Study Team

Figure 10 Daily traffic at Ferrands Bridge



Source: JICA Study Team

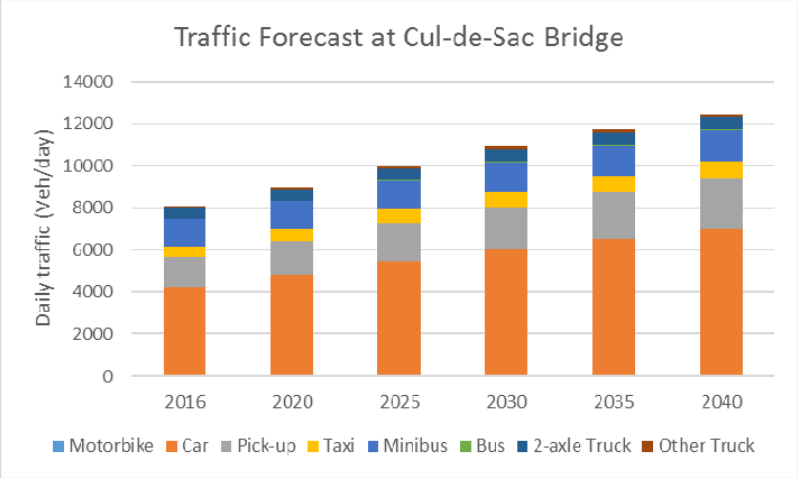
Figure 11 Vehicle composition at Ferrands Bridge



Source: JICA Study Team

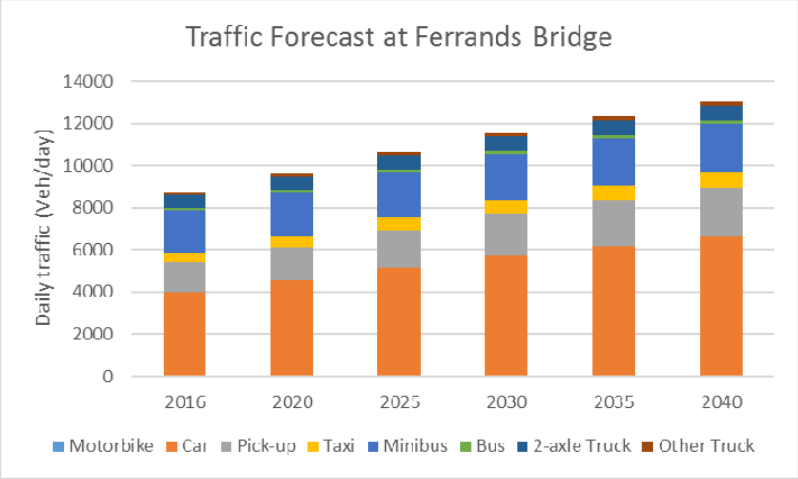
Figure 12 Travel speed distribution at Ferrands Bridge

(4) Future Traffic Forecast



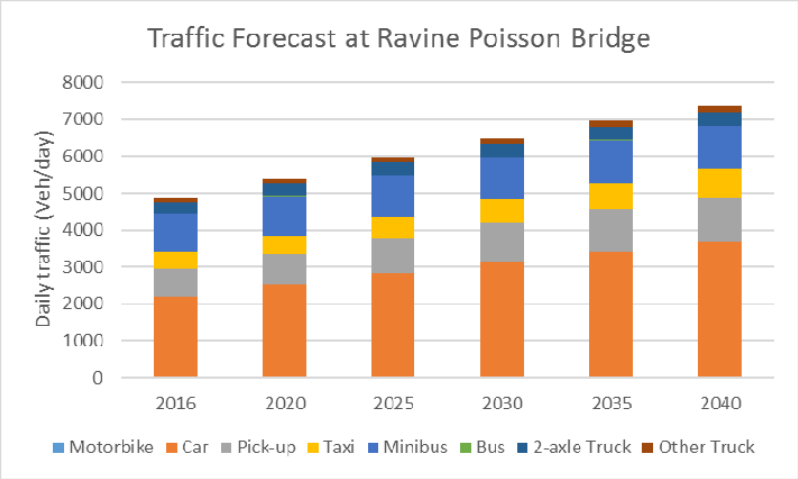
Source: JICA Study Team

Figure 13 Forecasted traffic volume at Cul-de-Sac Bridge



Source: JICA Study Team

Figure 14 Forecasted traffic volume at Ferrands Bridge



Source: JICA Study Team

Figure 15 Forecasted traffic volume at Ravine Poisson Bridge

Appendix 5-2

Geological Survey Data

Appendix5-2 Geological Survey Data

(1)Survey Location

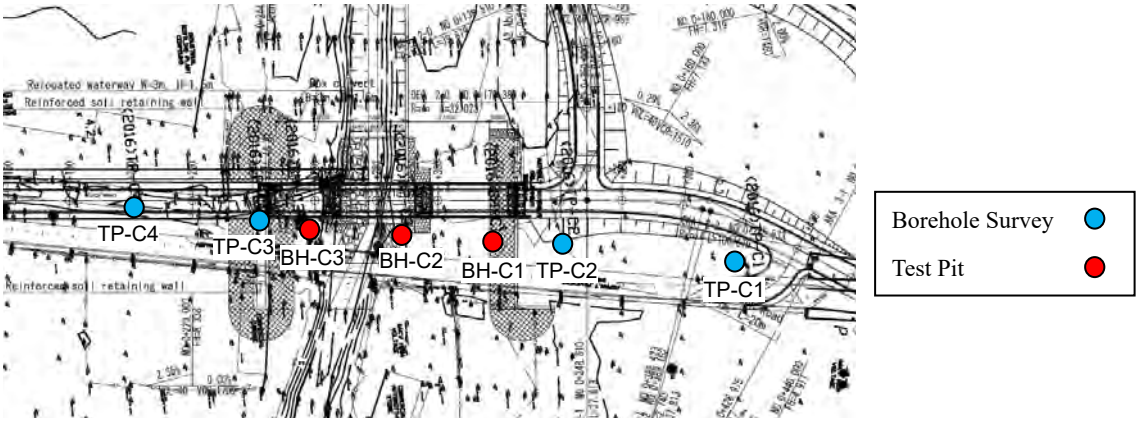


Figure1　Survey Location at Cul-De-Sac bridge

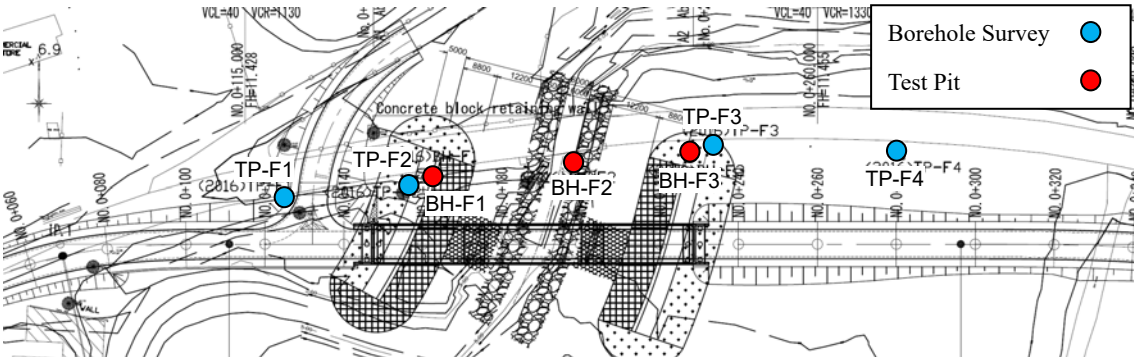


Figure2　Survey Location at Ferrands bridge

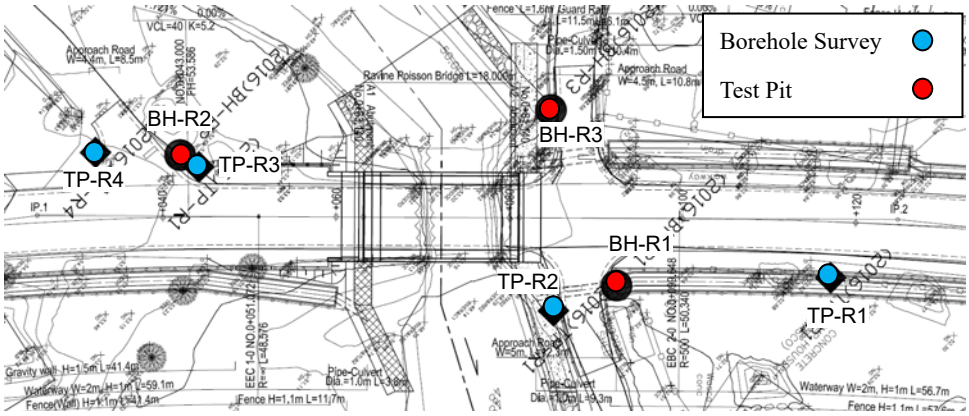


Figure3　Survey Location at Ravine Poisson bridge

GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **1**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C1**
Sheet 1 of 3

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting: **1545560.808, 508267.330**
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **17-8-16** Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface	0					
	Medium dense, brown & grey, SILTY SAND & GRAVEL, with clay.	0 – 2.4			1, 2, 3, 4		
	Medium stiff, grey, SILTY CLAY.	2.4 – 4.6			5, 6, 7, 8		
	Very loose, grey, SILTY CLAY (0.15m) to c.m.f. SILTY SAND.	4.6 – 5.0			9		
	Very loose, grey, SANDY SILTY PEAT.	5.0 – 6.5			10		
	Loose, grey, c.m.f. SILTY SAND & GRAVEL, trace shells.	6.5 – 9.0			11, 12		
	Stiff, brownish black, SANDY SILTY PEAT.	9.0 – 10.0			13		
	Continued Next Page	10.0 – 12.0					

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BECHTEL 16168-2 GPJ 12-9-16

GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **2**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C1**
Sheet 2 of 3

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **17-8-16** Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)						
	Soft, blackish brown, CLAYEY PEAT, with shells & coral.	12			14		
	Medium stiff, blackish brown, SILTY CLAYEY PEAT, with shells & coral.	13			15		
		14			16		
		15			17		
		16			18		
		17			19		
		18			20		
		19			21		
		20			22		
		21			23		
	Medium stiff, brownish black, CLAYEY PEAT.	22			24		
		23			25		
	Stiff, brown & grey, SILTY CLAY.	24	93		26		
	Stiff, brown & grey, SILTY CLAY, trace Continued Next Page						

GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **3**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C1**
Sheet 3 of 3

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **17-8-16** Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)						
	gravel.	24			27		
	Medium dense, greenish grey, CLAYEY decomposed ROCK.	25			28		
	Very stiff, brown, SILTY CLAY.	26			29		
		27			30		
		28			31		
		29			32		
		30			33		
	Very stiff, brown, CLAYEY SILT, trace sand.	31			34		
		32			35		
	Very stiff, brown, SILTY CLAY, trace sand.	33			36		
		34			37		
	End of Borehole at 34.1m.						

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **4**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C2**
Sheet 1 of 2

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting: **1545538.382, 508263.489m**
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **16-8-16** Completed on: **16-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)
	Ground Surface	0
	Loose, brown, SILTY SAND & GRAVEL, trace clay.	1
	Medium dense, grey, CLAYEY SAND & GRAVEL.	2
	Medium stiff, grey, SILTY CLAY.	3
	Medium stiff, brown & grey, SILTY CLAY.	4
	Medium stiff, grey, SILTY CLAY.	5
	Medium stiff, grey, SILTY CLAY & blackish brown, PEAT.	6
	Soft, grey, SILTY CLAY.	7
	Loose, blackish brown & grey, SILTY SAND, with peat.	9
	Loose, grey & dark brown, SILTY SAND & PEAT.	10
	Loose, dark brown, SILTY CLAYEY SAND & PEAT.	11
	Continued Next Page	12

w% 20 40 60 80
Cu 50 100 150 200 (kPa)
N-value 20 40 60 80 (Blows/0.3m)

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Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		

GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **5**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C2**
Sheet 2 of 2

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **16-8-16** Completed on: **16-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)						
	Medium stiff, black, PEAT, trace coral & sea shells.	12			14		
		13			15		
		14			16		
		15			17		
		16			18		
		17			19		
	End of Borehole at 17.1m.						

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **6**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C3**
Sheet 1 of 3

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting: **1545505.808, 508253.55m**
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **5-8-16** Completed on: **1-9-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface	0					
	Medium dense, dark brown, SILTY SAND & GRAVEL.	0			1		
	Loose, brown, SANDY SILT, trace clay.	2			3		
	Soft, grey, CLAYEY SILT.	3			4		
	Very soft, brown, SANDY SILT, with clay.	4			5		
	Loose, grey, SILTY SAND (0.15m) to soft, CLAYEY SILT.	5			6		
	Medium stiff, grey, SILTY CLAY, trace sand.	6			7		
	Soft, grey, SILTY CLAY, trace sand.	7			8		
	Soft, dark brown, SANDY SILT, with peat & clay.	8			9		
	Soft, dark brown, SANDY SILT, trace clay.	9			10		
	Loose, grey, SILTY SAND.	10			11		
	Continued Next Page	11			12		
		12			13		

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TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. 7

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C3**
Sheet 2 of 3

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **5-8-16** Completed on: **1-9-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)						
	Medium stiff, dark brown, organic PEAT.	12			14		
	Medium stiff, dark brown, organic PEAT.	13			15		
	Medium stiff, dark brown, organic PEAT, trace coral.	14			16		
	Medium stiff, dark grey, organic PEAT, trace coral.	15			17		
	Medium stiff, dark grey, SILTY CLAY, trace organic peat & sand.	16			18		
	Medium stiff, dark brown, SILTY CLAY, with organic peat.	17			19		
	Medium stiff, dark brown, SILTY CLAY, with corals & sea shells.	18			20		
		19					
		20			21		
		21					
	Medium stiff, dark brown, SILTY CLAYEY PEAT.	22			22		
		23			23		
	Continued Next Page	24					

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-2**

ENCLOSURE No. **8**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **C3**
Sheet 3 of 3

Client: **AMARNA**
Project: **Soil Inv. for Cul De Sac Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **5-8-16** Completed on: **1-9-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)	24					
	Soft, grey, SILTY CLAY, with sand.	25			24		
		26			25		
	Stiff, brownish grey, SILTY CLAY, with sand & trace peat.	27			26		
		28			27		
	Hard, brownish grey, SILTY CLAY, with sand & trace peat.	29			28		
	End of Borehole at 31.1m.	30					
		31					

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **1**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F1**
Sheet 1 of 3

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting: **1545666.113, 509261.769m**
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)
	Ground Surface	0
	Stiff, brown, moist, CLAYEY SILT, with boulders fragments.	0 – 1
	Medium stiff to stiff, brown, moist, CLAYEY SILT and SAND.	1 – 3
	Soft, grey, wet, SANDY SILT, with clay.	3 – 5
	Soft, brown and grey, wet, SILTY CLAY, trace sand.	5 – 8
	Loose, grey, wet, SILTY, fine SAND, trace clay.	8 – 10
	Stiff, grey, wet, SILTY CLAY.	10 – 12

Continued Next Page

w% 20 40 60 80
Cu 50 100 150 200 (kPa)
N-value 20 40 60 80 (Blows/0.3m)

Sample: Type, Numb
Bulk Density kN/m3
Additional Tests and Remarks

GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **2**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F1**
Sheet 2 of 3

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)	12			14		
	Medium stiff, grey, SILTY CLAY.	13			15		
	Stiff, organic PEAT.	14			16		
		15			17		
	Medium dense, brown, SILTY SAND and GRAVEL.	16			18		
		17			19		
		18					
		19					
	Stiff, dark brown, CLAYEY PEAT, trace shells and corals, with veins of silty sand.	20			20		
		21			21		
	Medium dense, grey, wet, fine, SILTY SAND, trace gravel, peat and clay.	22					
	Stiff, grey, SILTY CLAY.	23			22		
	Continued Next Page	24	101				

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **3**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F1**
Sheet 3 of 3

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)	24					
		25			23		
	Medium dense, grey, SILTY SAND, trace peat.	26					
		27			24		
		28					
		29			25		
		30					
	Medium dense, grey, SILTY SAND, some clay.	31			26		
		32					
	Stiff, grey and brown, SILTY CLAY, trace peat.	33			27		
		34					
	Very stiff, brown and grey, CLAYEY SILT, with sand.				28		
	End of Borehole at 34.1m.						
					29		

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **4**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F2**
Sheet 1 of 2

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting: **1545665.768, 509290.415m**
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **10-8-16** Completed on: **10-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)
	Ground Surface	0
	Medium dense, brown, moist, SILTY SAND, CLAY and GRAVEL.	1
	Stiff, brown, moist, SANDY SILT, with clay and gravel.	2
		3
	Medium stiff, brown, moist, CLAYEY SILT, trace gravel.	4
	Medium stiff, light grey SILTY CLAY.	5
		6
	Very loose, grey, wet, SILTY SAND, some clay.	7
	Soft, grey, wet, SANDY SILT, trace clay.	8
		9
	Medium stiff, light brown CLAY.	10
		11
	Continued Next Page	12

w% 20 40 60 80
Cu 50 100 150 200 (kPa)
N-value 20 40 60 80 (Blows/0.3m)

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Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **5**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F2**
Sheet 2 of 2

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **10-8-16** Completed on: **10-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)						
	Medium stiff, brownish grey, SILTY CLAY.	12			14		
	Medium stiff, dark grey, wet, SILTY CLAY, trace sand.	13			15		
	Stiff, dark grey, wet, CLAYEY PEAT.	14			16		
		15			17		
	Medium dense, grey, wet, SILTY SAND, trace gravel.	16			18		
	End of Borehole at 17.1m.	17			19		

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **6**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F3**
Sheet 1 of 4

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting: **1545664.155, 509335.677m**
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on:

No Recovery
Poor Recovery (<50mm)
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more

Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface	0					
	Medium dense, dark brown, moist, SILTY SAND and GRAVEL, trace clay.				1		
	Stiff, brown, moist, CLAYEY SILT, trace sand.	1			2		
	Medium dense, grey, moist, SILTY SAND and GRAVEL.	2			3		
	Medium stiff to stiff, grey, wet, SILTY CLAY.	3			4		
		4			5		
	Stiff, brown, wet, SILTY CLAY.	5			6		
		6			7		
	Very stiff, brown, wet, SILTY CLAY.	7			8		
		8			9		
		9			10		
	Stiff, brown, wet, SILTY CLAY.	10			11		
		11			12		
	Medium stiff, grey, wet, SILTY CLAY.	12			13		
	Continued Next Page		105				

GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **7**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F3**
Sheet 2 of 4

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)	12			14		
	Very stiff, grey, wet, SILTY CLAY, with peat and sand.	13			15		
	Medium dense, grey, SILTY SAND.	14			16		
	Medium stiff, grey, wet, SILTY CLAY.	15			17		
	Medium stiff to stiff, blackish brown PEAT.	16			18		
		17			19		
		18			20		
		19					
	Stiff, blackish brown SILTY CLAY, with sand.	20			21		
	Loose, grey, wet, SILTY SAND, trace gravel.	21			22		
		22					
	Very stiff, grey CLAY, trace peat and sand.	23			23		
	Continued Next Page	24	106				

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TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **8**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F3**
Sheet 3 of 4

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)	24					
		25			24		
	Very loose, grey, SILTY SAND, trace gravel.	26			25		
	Medium dense, grey, SILTY SAND and GRAVEL, with peat.	27			26		
		28					
		29			27		
	Stiff, grey, SILTY CLAY, some sand.	30			28		
		31					
	Medium dense, grey and brown, SILTY SAND and PEAT.	32			29		
		33					
	Medium dense, grey, SILTY SAND, trace gravel.	34			30		
		35					
		36			31		

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-3**

ENCLOSURE No. **9**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **F3**
Sheet 4 of 4

Client: **AMARNA**
Project: **Soil Inv. for Ferrands Bridge**
Location: **St. Lucia**
Northing, Easting:
Elevation:
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: Completed on:

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	(continued)	36					
	Medium dense, grey, SILTY SAND, trace gravel.				32		
	End of Borehole at 36.9m.						

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. **GA 16 168-1**

ENCLOSURE No. **1**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **R1**
Sheet 1 of 1

Client: **AMARNA**
Project: **Soil Inv. for Ravine Poisson Bridge**
Location: **St. Lucia**
Northing, Easting: **1539773.136, 511082.455**
Elevation: **m**
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **8-8-16** Completed on: **8-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface	0				
	Loose, brown, CLAYEY SILT, with sand & gravel.	1				
	Medium stiff, brown, CLAYEY SILT, trace sand.	2				
	Very dense, greyish white, weathered ROCK.	3				
	End of Borehole at 3.96m.					

w% 20 40 60 80
Cu 50 100 150 200 (kPa)
N-value (Blows/0.3m) 20 40 60 80

33/3"

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REPORT No. **GA 16 168-1**

ENCLOSURE No. **2**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **R2**
Sheet 1 of 1

Client: **AMARNA**
Project: **Soil Inv. for Ravine Poisson Bridge**
Location: **St. Lucia**
Northing, Easting: **1539725.58, 511108.757**
Elevation: **m**
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **7-8-16** Completed on: **7-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface						
	Medium dense, brown, SILTY SAND & GRAVEL.	0			1		
	Medium dense, brown, SANDY SILT, with gravel.	1			2		
	End of Borehole at 2.44m.	2			3		

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RECITEL 16168-1.GPJ 12-9-16

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REPORT No. **GA 16 168-1**

ENCLOSURE No. **3**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **R3**
Sheet 1 of 1

Client: **AMARNA**
Project: **Soil Inv. for Ravine Poisson Bridge**
Location: **St. Lucia**
Northing, Easting: **1539743.873, 511072.472m**
Elevation: **m**
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **9-8-16** Completed on: **9-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface	0					
	Dense, grey, SILTY SAND & GRAVEL.	1			1		
	Medium stiff, brown, CLAYEY SILT, trace sand & gravel.	2			2		
		3			3		
	Dense, brown, SANDY SILT, with clay & gravel.	4			4		
	Medium dense, brown, SANDY SILT, with gravel & boulders.	5	13, 49, 15, 60/2"		5		
	End of Borehole at 5.1m.				6		

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RECITEL 16168-1.GPJ 12-9-16

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REPORT No. **GA 16 168-1**

ENCLOSURE No. **4**

PRELIMINARY BOREHOLE LOG

BOREHOLE No: **R4**
Sheet 1 of 1

Client: **AMARNA**
Project: **Soil Inv. for Ravine Poisson Bridge**
Location: **St. Lucia**
Northing, Easting: **1539720.815, 511073.928m**
Elevation: **m**
Boring Method: **Wash Boring**
Prep by: **W. Chotai**
Boring Started on: **9-8-16** Completed on: **9-8-16**

- No Recovery
- Poor Recovery (<50mm)
- Split Spoon Sample
- Shelby Tube Sample
- Core Sample
- Water Level at End of Drilling
- Water Level 24 hrs. or more

Water Content (W%)
- Plastic and Liquid Limit
- Natural Moisture Content

Shear Strength (Cu)
- Unconsolidated Undrained Triaxial, UU
- Unconfined Compression, UC
- Pilcon Vane Shear, PV
- Field Vane Shear, FV

Penetration Resistance (N)
- Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% 20 40 60 80 / Cu 50 100 150 200 (kPa) / N-value 20 40 60 80 (Blows/0.3m)	Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	Ground Surface						
	Loose, grey & brown, SILTY SAND & GRAVEL.	0			1		
	Stiff, brown, CLAYEY SILT, with sand & trace of gravel.	1			2		
	End of Borehole at 1.52m.						

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室内土質試験結果

4. Summary of Results

4.1. Test Pit Samples

		TPC1	TPC2	TPC3	TPC4	TPR1	TPR2	TPR3	TPR4	TPF1	TPF2	TPF3	TPF4
Sample Depth (m)		1	1	1	1	1	1	1	1	1	1	1	1
Natural Moisture Content (%)		28	25	12	20	14	16	24	23	24	23	29	34
Specific Gravity (Particle Density) (Mg/m3)		2.6	2.44	2.56	2.55	2.59	2.47	2.47	2.61	2.57	N.A.	2.56	2.52
Atterberg Limits	PL	26	28	13	22	25	26	29	30	27	28	27	30
	LL	53	48	27	32	35	38	45	45	47	36	40	43
	P.I.	27	20	14	10	10	12	16	15	20	8	13	13
Particle Size Distribution	% retained on #200 sieve (sand)	51.2	71.5	78.3	71.7	83.5	85.7	82.8	77.3	72.1	65.6	29.1	34.7
	% retained on #4 sieve (gravel)	13.1	18.6	31.7	18.3	37.3	51.9	37.3	32.9	19	31.7	0.4	0.6
	D10 (mm)	0.002	0.02	0.02	0.02	0.03	0.04	0.04	0.03	0.02	0.005	0.002	0.005
	D30 (mm)	0.02	0.08	0.2	0.6	0.3	0.5	0.24	0.14	0.09	0.05	0.01	0.15
	D60 (mm)	0.2	0.7	2.6	0.18	3	18	3.5	2	0.8	1.7	0.04	0.06
	Cu	100	35.00	130	9	100	450	87.5	66.6667	40	340	20	12
	Cc	1.00	0.46	0.77	100.00	1.00	0.35	0.41	0.33	0.51	0.29	1.25	75.00
California Bearing Ratio	Max Dry Density (Mg/m3)	1.92	1.91	2.08	2.02	2.03	2.01	1.93	1.91	1.89	1.91	1.73	1.82
	Optimu	12	12.4	7.2	12.5	11.4	11	14.2	14.4	14.4	11.4	18.6	17.6

	m Moisture Content (%)												
	Ave. CBR (%)	15.8	15	20	29	50	34	22	19	4	15	18	18
Site Classification (USCS)		SC (CLAYEY SAND)	SC (CLAYEY SAND)	SC (CLAYEY SAND)	SC (CLAYEY SAND)	SC (CLAYEY SAND)	GM (SILTY GRAVEL)	SM (SILTY SAND)	SM (SILTY SAND)	SM (SILTY SAND)	SM (SILTY SAND)	ML (INORGANIC SILT)	ML (INORGANIC SILT)

Table5: showing test results and analysis for Test Pit Samples

4.2. River Samples

		RSC1	RSC2	RSC3	RSP1	RSP2	RSP3	RSF1	RSF2	RSF3
Sample Depth (m)		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Particle Size Distribution	% retained on #200 sieve (sand)	75.5	95.1	96.9	97.1	97.9	94.8	74.4	98.4	97.2
	% retained on #4 sieve (gravel)	0.7	19.2	12.1	60.1	51.9	52.2	6.3	2.5	20.3
	D10 (mm)	0.001	0.2	0.4	0.5	0.5	0.3	0.002	0.3	0.3
	D30 (mm)	0.3	0.85	0.75	3	2	2	0.4	0.5	0.7
	D60 (mm)	0.7	2	1.6	10.7	10.8	10	1.4	0.7	2
	Cu	700.0	10.0	4.0	21.4	21.6	33.3	700.0	2.3	6.7
	Cc	128.6	1.8	0.9	1.7	0.7	1.3	57.1	1.2	0.8

Table6: showing test results and analysis for River Samples

4.3. Borrow Pit Samples

		BPM1	BPR1	BPR2	BPR3	BPU1
Natural Moisture Content (%)		23	7	13	21	21
Specific Gravity (Particle Density) (Mg/m3)		2.25	2.62			
Atterberg Limits	PL		18	24		
	LL		28	31		
	P.I.	Non Plastic	10	7	Non Plastic	7
Particle Size Distribution	% retained on #200 sieve (sand)	91	88.9	86.1	80.1	66.9
	% retained on #4 sieve (gravel)	39.4	64.8	35.2	34.4	45.6
	D10 (mm)	0.08	0.07	0.06	0.03	0.001
	D30 (mm)	0.45	2.4	0.3	0.3	0.03
	D60 (mm)	4.5	18	2.4	3	7
	Uniformity Coefficient, Cu	56.25	257.14	40	100	7000
	Coefficient of gradation, Cc	0.56	4.57	0.63	1.00	0.13
California Bearing Ratio	Max Dry Density (Mg/m3)	1.71	2.28	2.01	1.79	1.58
	Optimum Moisture Content (%)	18.4	7.8	12.2	14.2	25.6
	Ave. CBR (%)	50	46	25	55	31.2

Table7: showing test results and analysis for Borrow Pit Samples

4.4. Aggregate Samples

		COARSE AGGREGATE						FINE AGGREGATE					
		CIE1 3/4" -1/2" STONE	CIE2; 3/8"STONE	COW1:3/4" STONE	COW2: 1/2" STONE	WIL1: 5-25mm STONE	WIL2:1/2"-3/8" STONE	CIE3: SAND	COW3: PUMICE	COW4: DUST	WIL3: SAND	WIL4: DUST	WIL5: IMPORTED SAND
Specific Gravity (bulk)		2.53	2.53	2.56	2.56	2.64	2.65	2.3	2.24	2.56			
Water Absorption		2.84	3.08	1.51	2.01	0.96	1.12	4.8	5.7	2.7			
Atterberg Limits	PL												
	LL												
	P.I.							5	0	10			
Particle Size Distribution	% retained on #200 sieve (sand)	99.8	94.8	98.5	98.2	98.9	98.7	61.1	94.9	88.9	87.1	92.5	97.4
	% retained on #4 sieve (gravel)	99.3	81.2	97.1	96.9	97.4	95	4.7	1.8	5.3	0.5	13.2	0.3
	D10 (mm)	11	1	14	8.5	7	0.04	0.002	0.1	0.07	0.06	0.13	0.17
	D30 (mm)	14	5	15	12	12	0.5	0.03	0.28	0.8	0.28	0.7	0.3
	D60 (mm)	16	7	18	14	16	18	0.6	0.65	2.4	1	2.5	0.5
	Cu	1.455	7.00	1.286	1.647	2.286	450	300	6.5	34.29	16.67	19.23	2.9412
	Cc	1.11	3.57	0.89	1.21	1.29	0.35	0.75	1.21	3.81	1.31	1.51	1.06
Sodium Sulphate Soundness	% loss	18.3	18.3	4.7	4.7	1.3	1.3						

Table 8: showing test results and analysis for Aggregate Samples

Borehole Disturbed Samples : Ravine Poisson

		BHR1#3	BHR2#3	BHR3#5	BHR4#2
Sample Depth (m)		1.8 - 2.4	1.8 - 2.4	3.60-4.2	1 - 1.5
Natural Moisture Content (%)		31.5	38.3	22.6	20
Specific Gravity (Particle Density) (Mg/m3)		2.45	2.53	2.63	2.7
Atterberg Limits	PL	27	29	24	30
	LL	44	47	39	51
	P.I.	17	18	15	21
Particle Size Distribution	% retained on #200 sieve (sand)	80.6	61.8	82.6	53.3
	% retained on #4 sieve (gravel)	48.9	3.3	29.8	2.6
	D10 (mm)	0.02	0.01	0.03	0.003
	D30 (mm)	0.4	0.05	0.3	0.01
	D60 (mm)	14	0.4	2.6	0.12
	Uniformity Coefficient, Cu	700	40.00	86.67	40
	Coefficient of gradation, Cc	0.57	0.63	1.15	0.28

Table 9: showing test results for RP Borehole Samples

Borehole Disturbed Samples : Cul De Sac (C3)

		BHC3 #5	BHC3 #5A	BHC3 #10	BHC3 #12	BHC3 #14	BHC3 #18	BHC3 #20	BHC3 #22	BHC3 #24	BHC3 #27
Sample Depth (m)		3.6	4	8.3	10	12	16	18	22	25	29
Natural Moisture Content (%)		39.7	37.4	60.8	54.2	83.4	69	74	83	36	58
Specific Gravity (Particle Density) (Mg/m3)		2.63	2.55	2.66	2.63	2.32	2.46	2.18	2.11	2.43	2.44
Atterberg Limits	PL	26	24	27	28	36	36	35	40	26	29
	LL	38	40	47	42	61	64	64	61	43	45
	P.I.	12	16	20	14	25	24	29	21	17	16
Particle Size Distribution	% retained on #200 sieve (sand)	61.5	71	26.8	65.8	50.5	46.2	15.7	12.8	37.3	47.3
	% retained on #4 sieve (gravel)	0.3	0	0	0	8.9	3.5	0	0.4	0	0.8
	D10 (mm)	0.01	0.02	0.001	0.02	0.001	0.001				0.002
	D30 (mm)	0.05	0.08	0.002	0.06	0.01	0.002				0.015
	D60 (mm)	0.27	0.29	0.03	0.3	0.3	0.3				0.14
	Uniformity Coefficient, Cu	27	14.50	30	15	300	300				70
	Coefficient of gradation, Cc	0.93	1.10	0.13	0.60	0.33	0.01				0.80

Table 10: showing test results for C3 Borehole Samples

Borehole Disturbed Samples : Cul De Sac (C2)

		BHC2#5	BHC2#7	BHC2#11	BHC2#13	BHC2#16	BHC2#19
Sample Depth (m)		3.6	5.5	9	11	14	16.5
Natural Moisture Content (%)		54.8	46.4	49.8	53.9	41.1	103.2
Specific Gravity (Particle Density) (Mg/m3)		2.2	2.63	2.54	2.53	2.33	2.2
Atterberg Limits	PL	32	30	28	36	35	39
	LL	62	58	42	59	58	63
	P.I.	30	28	14	23	23	24
Particle Size Distribution	% retained on #200 sieve (sand)	20.6	44.4	80.8	46.3	54	61.8
	% retained on #4 sieve (gravel)	0.3	1	0.9	2.7	8.6	20.8
	D10 (mm)		0.007	0.03		0.003	0.001
	D30 (mm)		0.02	0.17		0.02	0.02
	D60 (mm)		0.1	0.4	0.16	0.3	1.2
	Uniformity Coefficient, Cu		14.3	13.3		100.0	1200.0
	Coefficient of gradation, Cc		0.6	2.4		0.4	0.3

Table 11: showing test results for C2 Borehole Samples

Borehole Disturbed Samples : Cul De Sac (C1)

		BHC1# 30	BHC1 #25	BHC1 #5	BHC1 #2	BHC1 #36	BHC1 #33	BHC1 #21	BHC1 #16	BHC1 #13	BHC1 #9
Sample Depth (m)		26.5	22	3.65	1.5	32	29	18.3	14	11	
Natural Moisture Content (%)		54.8	46.4	49.8	53.9	69.9	103.2	35.5	38	58.5	
Specific Gravity (Particle Density) (Mg/m3)		2.55	2.48	2.57	2.58	2.66	2.58	2.51	2.23	2.27	2.51
Atterberg Limits	PL	27	34	37	27	23	27	37	32	32	29
	LL	44	66	67	46	48	48	76	51	51	52
	P.I.	17	32	30	19	25	21	39	19	19	23
Particle Size Distribution	% retained on #200 sieve (sand)	56.1	44.5	52.8	67.4	27.5	38.4	46.2	51.6	85.3	43..8
	% retained on #4 sieve (gravel)	3	1.6	0.1	21.2	90.7	8.5	19.1	1.4	9.3	0
	D10 (mm)	0.006	0.002	0.01	0.008	0.001	0.001		0.008	0.04	0.01
	D30 (mm)	0.03	0.009	0.03	0.06	0.004	0.008		0.02	0.25	0.03
	D60 (mm)	0.25	0.1	0.16	1	0.04	0.07	0.3	0.16	0.6	0.09
	Uniformity Coefficient, Cu	41.7	50.0	16.0	125.0	40.0	70.0		20.0	15.0	9.0
	Coefficient of gradation, Cc	0.6	0.4	0.6	0.5	0.4	0.9		0.3	2.6	1.0

Table 12: showing test results for C1 Borehole Samples

Borehole Disturbed Samples : Cul De Sac (F1)

		BHF1 #22	BHF1 #25	BHF1 #28	BHF1 #3	BHF1 #6	BHF1 #9	BHF1 #12	BHF1 #18
Sample Depth (m)		21	26	30.5	2	5	7.5	10	13
Natural Moisture Content (%)		31.2	35.5	28.4	25	39	36	45	59
Specific Gravity (Particle Density) (Mg/m3)		2.56	2.51	2.54	2.35	2.39	2.37	2.4	2.3
Atterberg Limits	PL	27	26	21	32	25	20	27	35
	LL	44	41	37	45	42	44	48	71
	P.I.	17	15	16	13	17	24	21	36
Particle Size Distribution	% retained on #200 sieve (sand)	76.8	87.7	62.7	77.3	96.5	42.8	20.6	1.5
	% retained on #4 sieve (gravel)	2.6	12.8	1.3	2.4	0	0	8	0
	D10 (mm)	0.03	0.07	0.01	0.05	0.007			
	D30 (mm)	0.16	0.18	0.04	0.09	0.06			
	D60 (mm)	0.7	0.6	0.32	0.2	0.21			
	Uniformity Coefficient, Cu	23.33	8.57	32.00	4.00	30.00			
	Coefficient of gradation, Cc	1.22	0.77	0.50	0.81	2.45			

Table 13: showing test results for F1 Borehole Samples

Borehole Disturbed Samples : Cul De Sac (F2)

		BHF2#16	BHF2#12	BHF2#6	BHF2#9	BHF2#3	BHF2#18
Sample Depth (m)		14	10	4.6	7.5	2	16
Natural Moisture Content (%)		83.1	50.9	46.9	55.3	33.7	93.2
Specific Gravity (Particle Density) (Mg/m3)		2.5	2.67	2.56	2.5	2.5	2.4
Atterberg Limits	PL	39	36	26	35	24	44
	LL	83	59	50	69	43	60
	P.I.	44	23	24	34	19	16
Particle Size Distribution	% retained on #200 sieve (sand)	42	21.2	42.6	27.7	62.7	40.5
	% retained on #4 sieve (gravel)	2.6	0	3	0	19.6	0.2
	D10 (mm)					0.006	
	D30 (mm)					0.04	
	D60 (mm)					0.6	
	Uniformity Coefficient, Cu	NA	NA	NA	NA	100.00	
	Coefficient of gradation, Cc	NA	NA	NA	NA	0.44	

Table 14: showing test results for F2 Borehole Samples

Borehole Disturbed Samples : Cul De Sac (F3)

		BHF3 #27	BHF3 #23	BHF3 #21	BHF3 #25	BHF3 #3	BHF3 #6	BHF3 #13	BHF3 #16	BHF3 #19
Sample Depth (m)		29	23	20	26	2	5	11	14	16.5
Natural Moisture Content (%)		20.2	54.7	43.9	27.9	35	33	58	58	82
Specific Gravity (Particle Density) (Mg/m3)		2.58	2.47	2.69	2.62	2.39	2.36	2.31	2.31	2.23
Atterberg Limits	PL	23	30	29	23	28	31	38	32	41
	LL	33	60	52	33	54	56	71	70	64
	P.I.	10	30	23	10	26	25	33	38	23
Particle Size Distribution	% retained on #200 sieve (sand)	82.8	57.4	66.1	90.6	26.8	18.1	3	7.8	16.4
	% retained on #4 sieve (gravel)	2.6	3.9	9.6	2.6	0	1	0	5.3	1.3
	D10 (mm)	0.03	0.007	0.015	0.1					
	D30 (mm)	0.4	0.03	0.06	0.6					
	D60 (mm)	1.2	0.3	0.4	1					
	Uniformity Coefficient, Cu	40	42.86	26.67	10.00					
	Coefficient of gradation, Cc	4.44	0.43	0.60	3.60					

Table 15: showing test results for F3 Borehole Samples

Borehole Undisturbed Samples

		BHC1 #4	BHC1 #6	BHC1 #8	BHC2 #4	BHC2 #6	BHC2 #9	BHC3 #4	BHC3 #6	BHC3 #15	
Sample Depth/m		3	5	6.7	3	4.9	7.6	3	5	25	
Direct Shear	Bulk Density (mg/m3)	1.858	1.657	1.882	1.875	1.843	1.748	1.838	n/a	1.059	
	Cohesion (psi)	6.8	1.9	2	5.3	5.3	2.6	2.2		2.3	
	Friction Angle ,ϕ	6	10	8	7	5	6	5		16	
		BHF1#5	**BHF1#7**	**BHF1#10**	**BHF2#4**	**BHF2#7**	**BHF2#10**	**BHF3#7**	**BHF3#10**	**BHF3#14**	**BHR1 #4**
Sample Depth (m)		4	6	8.5	3	5.8	8.5	18	8.5	12	3
Direct Shear	Bulk Density (mg/m3)	1.869	1.842	1.784	1.922	1.941	1.779	N/A	1.719	1.74	1.853
	Cohesion (psi)	2.8		3	3.8	1.2	3.6	N/A	4	1.8	N/A
	Friction Angle ,ϕ	7		6	32	20	10	N/A	7	8	N/A

Table 15b: showing test results for Undisturbed Samples

Appendix 5-3

Environmental and Social Considerations

Appendix 5-3-1 Schedule 3 and 4 of the Physical Planning and Development Act

Table 1 Projects that do not need development permission (Schedule 3)

(a) Garden huts, other than garages, in approved residential areas and not used for human habitation or for the conduct of any activity of a commercial nature.
(b) Gates, fences and walls not exceeding 4 feet in height.
(c) Agricultural out buildings not used for human habitation and enclosures and works on agricultural holdings that are requisite for or incidental to the use of land for the purposes of agriculture not including sub-division of land for agricultural purposes.
(d) Repairs to roads, bridges and harbour installations.
(e) Repairs to services
(f) Internal alterations to buildings not involving changes to the basic structure or facade of the buildings.
(g) Subject to any requirements of the Regulations prescribing minimum building setback, site coverage, and building height limitations, the enlargement or improvement of an existing single dwelling house provided that the floor of the enlargement or improvement does not exceed 1/3 of the floor area of the existing single dwelling house.
(Amended by Act 3 of 2005)

Source: Physical Planning and Development Act Schedule 3

Table 2 Projects EIA is required (Schedule 4)

1. Hotels of more than the number of rooms specified in the Regulations;
2. Sub-divisions of more than the number of plots specified in the Regulations;
3. Residential development of more than the number of units specified in the Regulations;
4. Any industrial plant which in the opinion of the Head of the Physical Planning and Development Division is likely to cause significant adverse environmental impact;
5. Quarrying and other mining activities;
6. Marinas;
7. Land reclamation, dredging and filling of ponds;
8. Ports;
9. Dams and reservoirs;
10. Hydro-electric projects and power plants;
11. Desalination plants;
12. Water purification plants;
13. Sanitary land fill operations, solid waste disposal sites, toxic waste disposal sites and other similar sites;
14. Gas pipeline installations;
15. Any development projects generating or potentially generating emissions, aqueous effluent, solid waste, noise, vibration or radioactive discharges;
16. Any development involving the storage and use of hazardous materials;
17. Coastal zone developments;

Source: Physical Planning and Development Act Schedule 4

Appendix 5-3-2 Laws and standards

Laws and standards related to the Project and environmental impact assessment in St. Lucia are summarized in the following Table.

Table 1 Laws and standards related to the Project and environmental impact assessment in St. Lucia

Name	Summary	Implications with the Project
CHAPTER 5.12 PHYSICAL PLANNING AND DEVELOPMENT ACT Revised Edition Showing the law as at 31 December 2005	* Government's duty to prepare physical plans (Section 10) * Application for permission to develop land (19) * Environmental impact assessment (22) * Right of appeal (26) * Declaration of zoned area (32) * Protection of natural areas (34) * Compensation and acquisition (Part 5)	・Land acquisition and compensation in the Project shall be conducted based on this law ・Necessity of environmental impact assessment procedure for the Project will be decided based on this law ・This law gives the basis of designation of areas to be protected
SAINT LUCIA NATIONAL STANDARD SLNS 83: 2010 GUIDELINES FOR RECREATIONAL WATER QUALITY (2010)	* Defines Class I waters (areas) that are particularly sensitive to the impacts of domestic wastewater * Waters used for recreational purposes are classified as Class I Waters * Defines Effluent Limits for Discharges into Class I Waters including Recreational Waters	・The effluent quality standards defined by this guideline shall be applied to the effluent from the work areas and facilities of the Project
Litter Act 1983	* Wastes must not be stored or disposed at locations without legal approval * Stored wastes must be removed when it is found to risk health or safety of surrounding environment	・Wastes generated by the Project shall be stored and disposed properly based on this law
SAINT LUCIA SOLID WASTE MANAGEMENT AUTHORITY GUIDELINES FOR THE SUBMISSION OF WASTE MANAGEMENT PLANS FOR DEVELOPMENTS (Revised September 2013)	* To Promote a coherent, integrated approach whereby the management of construction and demolition waste, green waste and other waste generated in the process of the development * Information to be submitted to the office of the Saint Lucia Solid Waste Management Authority (SWMA)	・MoI and the contractor must submit information on the management of construction and demolition waste, green waste and other waste generated in the process of the Project for Planning Phase and Construction Phase to SWMA
Chapter 7.12 Plant Protection Act (2005)	* Defines plant quarantine services, restriction of importation of plant material, safeguard measures, etc.	・Procurement of the Project must also observe plant quarantine procedure
Wildlife Protection Act, 1980 (Act No. 9 of 1980). stl 10053	* Lists 6 plants, 14 birds, 2 reptiles, 21 fishes, and 11 Corals, Jellyfish, and Sea Anemones	・The Project must avoid and minimize negative impacts on the listed species
CHAPTER 5.04 LAND ACQUISITION ACT Revised Edition Showing the law as at 31 December 2005	* Defines detailed procedures of public land acquisition and compensation	・The Project shall comply to this law in its land acquisition and compensation procedure
Development Control Authority (DCA) Guide to Obtaining Permission to Develop Land	* DCA minimum standards for river and ravine buffers (p.9)	・This guide defines minimum standards for river buffer as 15.24 m (50 ft) and ravine buffer as 4.57 m (15 ft) and restricts any construction on the buffer ・Those buffers may be understood as similar area to Japanese River Area ・Compensation value of private properties on the buffers need

Name	Summary	Implications with the Project
		specific negotiation and legal considerations
Labour Code (2006)	* Prohibition against forced labour * General prohibition against discrimination * Protection of freedom of association * Hours of Work * Minimum Wages * Sick Leave and Benefits * Employment of Children and Young Persons * Occupational safety and health	・The Project shall fully comply to the law
SAINT LUCIA EMPLOYEES (OCCUPATIONAL HEALTH AND SAFETY) ACT CHAPTER 16.02 Revised Edition, 31 December 2001		・The Project shall fully comply to the law
SAINT LUCIA EQUALITY OF OPPORTUNITY AND TREATMENT IN EMPLOYMENT AND OCCUPATION ACT CHAPTER 16.14 Revised Edition, 31 December 2001		・The Project shall fully comply to the law

Following documents were also reviewed but found no implications with the Project：
Forest, Soil and Water Conservation (Declaration of Forest Reserves) Order (S.I. No. 53 of 1984). stl49047
Forest, Soil and Water Conservation (Declaration of Protected Forests) Order (S.I. No. 31 of 1986). stl49043
Chapter 25. Forest, soil and water conservation ordinance (1946)
Saint Lucia National Trust Act, 1975 (No. 16 of 1975). stl17869
Second national communication on climate change for Saint Lucia (2011)

Source: JICA Survey Team

Appendix 5-3-3 Site characters and scoping of potential negative impacts

During the first site survey, initial survey on the Project site and surroundings were conducted and environmental items that may be affected by the Project were selected. The results are summarised in Table 1.

Table 1 Results of initial site survey and impact scoping

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
Environmental pollution					
1	Air quality	B-	D	* No continuous monitoring of air quality is conducted in St. Lucia * The number of registered vehicles in St. Lucia is about 60,000, and no significant air pollution is currently caused by vehicle exhaust * The environment surrounding the sites is residential and commercial land surrounded by vegetation. No significant sources of air pollution are located in the areas	＜Construction Phase: Yes＞ Impacts on air quality is possible from earth works, transportation, and operation of construction machineries ＜Maintenance Phase: No＞ No additional impacts on air quality is expected because the Project aims to improve flood resiliency of the existing bridges and the Project does not cause increase of traffic volumes or change of location or distribution of traffic volume
2	Water quality	B-	D	* No continuous monitoring of water quality is conducted in St. Lucia * The environment surrounding the sites is residential and commercial land surrounded by vegetation. No significant sources of water pollution are located in the areas	＜Construction Phase: Yes＞ Construction works in the waterways may cause muddy water flow in the river ＜Maintenance Phase: No＞ No interference to water quality is anticipated in Maintenance Phase
3	Waste	B-	D	* Solid Waste Management Authority commissions private companies to collect wastes * Wastes are disposed to 2 controlled landfill sites located north and south of the island	＜Construction Phase: Yes＞ Wastes such as muck and fuel containers will be generated ＜Maintenance Phase: No＞ No specific waste generation is anticipated
4	Soil contamination	B-	D	* No significant incident of soil contamination has occurred in St. Lucia	＜Construction Phase: Yes＞ Spills of oils and chemicals may cause soil and groundwater contamination ＜Maintenance Phase: No＞ No specific soil contamination is anticipated
5	Noise and vibration	B-	D	* No continuous monitoring of noise and vibration is conducted in St. Lucia * The total number of registered vehicles in St. Lucia is about 60,000. No significant negative impacts of noise and vibration are caused by vehicles	＜Construction Phase: Yes＞ Operation of construction machineries and transportation vehicles may increase noise and vibration around the work area and along the transportation routes ＜Maintenance Phase: No＞

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
				* The environment surrounding the sites is residential and commercial land surrounded by vegetation. No significant sources of noise and vibration are located in the areas	Compared to existing condition, no additional impacts on noise and vibration is expected because the Project aims to improve flood resiliency of the existing bridges and the Project does not cause increase of traffic volumes or change of location or distribution of traffic volume
6	Ground subsidence	D	D	* No significant incident of ground subsidence has occurred in St. Lucia	＜Construction Phase: No＞ No activities that may cause ground subsidence shall be conducted in the Project ＜Maintenance Phase: No＞ No occurrence of ground subsidence is anticipated
7	Odour	D	D	* No significant incident of offensive odour problem has occurred in St. Lucia	＜Construction Phase: No＞ No activities that may cause offensive odour shall be conducted in the Project ＜Maintenance Phase: No＞ No occurrence of offensive odour is anticipated
8	Contamination of bottom Sediment	D	D	* No significant contamination of bottom sediment has been recorded in St. Lucia	＜Construction Phase: No＞ The Project shall operate in the river waterway. Polluting materials, such as heavy metals and dioxin, however, will not be used or generated. ＜Maintenance Phase: No＞ No occurrence of river bottom sediment contamination is anticipated
Natural environment					
9	Protected areas	D	D	* There are 6 types and 29 locations of designated protected areas in St. Lucia * All three work areas are not located in or near those protected areas	＜Construction Phase: No＞ The Project does not affect protected areas ＜Maintenance Phase: No＞ The Project does not affect protected areas
10	Ecosystem	D	D	* The environment surrounding the sites is residential and commercial land surrounded by vegetation. No significant ecosystem is located in the areas	＜Construction Phase: No＞ The Project does not affect important ecosystems ＜Maintenance Phase: No＞ The Project does not affect important ecosystems
11	Hydrology, water regime	C	D	* The target sections of Cul de Sac River has relatively complicated features including a tributary, fast flowing section and bends	＜Construction Phase: Unknown ＞ The Project will conduct construction works within river area and there is possibility that water regime (volume, speed, dynamics) may change from existing condition. Changes at the water intake upstream are not

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
					expected. ＜Maintenance Phase: No＞ The Project shall reduce overflow floods during heavy rains, and shall not cause changes of the water regime during normal weather.
12	Topography and geology	D	D	* The target sections of Cul de Sac River has relatively complicated features including a tributary, fast flowing section and bends * Major surface textures of the Project area are Andesite and andesitic volcano deposits * Topography and geology of the Project area are quite typical in St. Lucia and academically significant features do not exist in the area	＜Construction Phase: No＞ The Project does not affect important topography and geology ＜Maintenance Phase: No＞ The Project does not affect important topography and geology
Social environment					
13	Involuntary resettlement, loss of land and asset, business relocation	B-/C	D	* The Project area and surrounding area is basically owned by private land owners * In typical construction project in St. Lucia, the contractor usually find land owners who wish to raise his/her land level or improve soil texture, and bring the excess soil or muck to the land parcel. * The designated landfill site can also accept such soil or muck, especially as the layer covering material	＜Planning Phase: Yes＞ Permanent or temporal land occupation will be necessary to construct new access road or temporal detour route ＜Construction Phase: Unknown ＞ It is unknown that the Contractor shall need to lease land for construction yards Since the volume of excess soil or muck that will be generated from the Project is not known yet, if the volume is significant, the Contractor may need to purchase or lease the disposal site ＜Maintenance Phase: No＞ No resettlement or land acquisition will be necessary
14	The poor	D	D	* No slum areas were recognized around the Project areas	＜Planning Phase, Construction Phase, Maintenance Phase: No ＞No new impacts on the poor is expected because the Project aims to improve existing road and bridges and the Project does not cause negative impacts to specific area or group of people
15	Ethnic minorities, indigenous peoples	D	D	* No ethnic minorities or indigenous groups are recognized socially in St. Lucia	＜Construction Phase, Maintenance Phase: No＞ The Project does not cause any negative impacts on ethnic minorities or indigenous peoples
16	Local economy, employment and living, livelihood	D	D	* Major employment sector and its share in Castries Quarter (excluding Castries city) in 2016 was as follows: Human	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on local

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
				health and social work activities (29%), Accommodation and food service activities (16%), Wholesale and retail trade; repair of motor vehicles and motorcycles (11%), Public administration and defence; compulsory social security (8%)	economy, employment, living, and livelihood is expected because the Project aims to improve existing road and bridges, and the Project does not cause negative impacts to specific area or group of people
17	Land use, local resource use	D	D	* The land use pattern of the Project area is consisted of forests and coco plantation on slope, agriculture, banana and pasture on flat valley bottom, and residential area with gardens in between of those two. * No significant exploitation of natural resources are operated in the area	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on land use and local resource use is expected because the Project aims to improve existing road and bridges
18	Water use, water rights	C	D	* Main water source in St. Lucia is surface water in rivers * Each river has relatively small watershed and there is only one water storage dam. Therefore, preparation for drought is a mandate and all buildings are required to store water sufficient for 3 days * The water intake in Cul de Sac River watershed is located upstream of Ravine Poisson Bridge and managed by the Water and Sewerage Company Inc. * No significant water use activities were observed in the Project area	＜Construction Phase: Unknown ＞ The Project will conduct construction works within river area and new structures will be placed in the river. There is possibility that water regime (volume, speed, dynamics) changes from existing condition, and affect existing water intake at the existing WASCO facility. ＜Maintenance Phase＞The Project shall reduce overflow floods during heavy rains, and shall not cause changes of the water regime during normal weather.
19	Existing public facilities, road and transportation facilities, social infrastructure, social services	C	C	* Most section of the target road has one lane for each direction without much width for extra ROW * The road passes undulated terrain with many curves. Even in existing condition, it is often observed that heavy and slow vehicles cause temporal queue behind until faster vehicles can pass over at wider road section * Public transportation with mini buses and mini vans, all operated privately, are well developed and used all around the country * There is a church and a school next to Ravine Poisson Bridge * Cul de Sac Bridge is located between the capital and the oil storage facility	＜Construction Phase: Unknown ＞ If traffic is allowed only 1 lane at some part of temporal road and bridge, there is possibility that traffic jam may be observed more frequently and more severely Traffic restriction and traffic jam may make access to the church and the school at Ravine Poisson Bridge more difficult or unsafe compared to existing condition ＜Maintenance Phase: Unknown ＞ If the alignment of the Project road section differs from existing one, and if appropriate safety measures and traffic control measures are not taken, temporal increase of accidents may be observed right after the opening of the new road

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
					section.
20	Social capitals, local decision making systems, social organizations	D	D	* All target bridges are located in Castries South East Constitution * As the governmental unit, all target bridges are located in Castries Quarter	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on social capitals, local decision making systems and social organizations is expected because the Project aims to improve existing road and bridges
21	Uneven distribution of project impact and benefit	D	D	* The target road is the most important route that connects the main airport and the capital. Whole economy and society of St. Lucia depends on the target road directly or indirectly	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on distribution of project impact and benefit is expected because the Project aims to improve existing road and bridges
22	Local conflicts of interest	D	D	* The target road is the most important route that connects the main airport and the capital. Whole economy and society of St. Lucia depends on the target road directly or indirectly	＜Construction Phase, Maintenance Phase: No＞ No local conflicts of interest are expected because the Project aims to improve existing road and bridges
23	Split of community	D	D	* Although the target road is the most important road in St. Lucia, most section of the road has one lane each direction, and current traffic volume is between 5,000 to 9,000 vehicle per 24 hours. Therefore the target road is not causing division of community on both sides of the road	＜Construction Phase, Maintenance Phase: No＞ No further community split is expected because the Project aims to improve existing road and bridges, and the Project itself will not cause significant expansion of the road width or increase of traffic volume
24	Historical heritage, cultural resources	D	D	* No significant historical heritage or cultural resources are located on or around the Project area	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on significant historical heritage or cultural resources are expected because the Project aims to improve existing road and bridges, and the Project itself will not affect any existing resources
25	Landscape	D	D	* No significant landscape or touristic resources are located on or around the Project area	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on significant landscape or touristic resources are expected because the Project aims to improve existing road and bridges
26	Gender	D	D	* Gender Development Index (GDI) of St. Lucia shows high equality between male and female population. The condition in the Project area is expected to be similar to national condition	＜Construction Phase, Maintenance Phase: No＞ No negative impacts on gender equality is expected because the Project aims to improve existing road and bridges
27	Children's rights	B-	D	* There is no obvious problem in the Project area in regard to basic children's rights, such as provision of care,	＜Construction Phase: Yes＞ The existing activities on the playground and commuting on foot may be restricted, and the

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
				play and education, protection from negligence and violence, etc.. * One school with 12 grades students and its play ground are located next to Ravine Poisson Bridge	risk of traffic accidents may increase. ＜Maintenance Phase: No＞ The new bridge shall be constructed at the same location with the existing one, and surrounding environment shall be restored as before. No negative impacts or additional risk of accidents are expected.
28	Sanitation, public health, transmittable diseases including HIV/AIDS	B-	D	* In construction project in St. Lucia, workers usually commute from own residence * Main transmittable diseases in St. Lucia are the ones caused by mosquitoes (Dengue fever, Zika virus, Chikungunya fever, and malaria) and the ones venom exists in water (leptospirosis and schistosomiasis)	＜Construction Phase: Yes＞ Stagnant water at work areas and yards may breed mosquitoes. Workers may be infected water- borne venom during the works in river water The Project does not bring cross-border workers or construct workers camp, negative impacts on sanitary condition is not expected ＜Maintenance Phase: No＞ Since the Project aims to improve existing road and bridges, no negative impacts on sanitation and public health is expected
29	Work environment, occupational safety and health	B-	D	* In typical construction sites in St. Lucia, occupational health and safety standards are well implemented	＜Construction Phase: Yes＞ Even with good intention and effort is paid for occupational health and safety, there is possibility of accidents, and the Project must be well prepared for accidents and other emergency situation ＜Maintenance Phase: No＞ Since the Project aims to improve existing road and bridges, no works besides already existing maintenance works of bridges and roads will be operated on the Project area
Other					
30	Accidents, crime	B-	B-	* The number of deaths by traffic accidents in St. Lucia is between 15 to 30 per year. The largest number in recent years was 39 deaths in 2011. * The total number of deaths by traffic accidents on main roads are totalled between the year 2002 to 2012 as follows: Castries / Gros Islet Highway = 42 persons Bexon Highway (including Ravine Poisson Bridge and Ferrands Bridge) = 18 persons Millennium Highway near Cul de Sac Bridge: 12 persons	＜Construction Phase: Yes＞ There is possibility of increased risk of traffic accidents in case the Project leads passing traffic to detour route without sufficient signs and safety measures. Also, the workers in the river area may be susceptible of accidents during rain since the water level and flow speed may increase rapidly. ＜Maintenance Phase: Yes＞If the alignment of the Project road section differs from

Items		Scoping results		Site characters	Rationale for scoping
		Plan, Construction	Maintenance		
				Micoud/Vieux Fort Highway in south east part of St. Lucia = 18 persons * The road sections around Ravine Poisson Bridge and Ferrands Bridge both curve gently, but cars are passing the sections very fast * The road section around Cul de Sac Bridge is straight but carries many heavy vehicles such as trailers and fuel trucks	existing one, and if appropriate safety measures and traffic control measures are not taken, temporal increase of accidents may be observed right after the opening of the new road section.
31	Climate change, cross-border impacts	D	D	* St. Lucia is one of the small island nations that are susceptible to be affected by exotic species, raised sea level, increased scale of hurricanes and other conditions predicted as impacts of climate change	＜Construction Phase: No＞ The Project aims to improve existing road and bridges. Emission of greenhouse gases from the Project will be small. The materials and machineries shall be procured domestically as much as possible. With those reasons, no negative impacts are expected on climate change or cross-border impacts ＜Maintenance Phase: No＞ No negative impacts on climate change and cross-border impacts are expected because the Project aims to improve existing road and bridges, and the Project itself will not cause significant increase of traffic volume

Source: JICA Survey Team

Appendix 5-3-4 Monitoring forms for Environmental Management Plan

(1) Planning Phase

Month	Purpose			Record * Objectives * Attendants * Venue * Main points of discussions, decisions	Recorded by (Name)
	Project Approval	Land	Communication		
Monthly record the activities conducted for : 1) Approval of development plan 2) Acquisition and lease of land 3) Communication with Utilities, SDA Church and school, and the Water Intake Facility					

Add lines when necessary

(2) Construction phase

Contents of the final EMP to be prepared by the Contractor shall include following monitoring forms based on the JICA Guideline, as well as the requirement of Environmental Management Framework for the World Bank Disaster Vulnerability Reduction Project (SFG1909). When necessary and appropriate, following forms may be modified for better results or for avoidance of duplication between the two (2) frameworks.

1) Before commencement of construction works

Month	Purpose				Record * Objectives * Attendants * Venue * Main points of discussions, decisions	Recorded by (Name)
	EMP Approval	Waste Plan	Soil waste	Utilities		
Monthly record the activities conducted for : 1) Approval of EMP 2) Approval of Waste Plan 3) Approval of acceptance of excess soil at the Deglos Sanitary Landfill 4) Communication with utilities						

Add lines when necessary

2) During construction works

Daily patrol, observation, and recording during the Construction Works

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
1	Visible dust, emission gas					
2	Noise condition					
3	Mud water spill down from the site					
4	Stagnant water					
5	Spread of infectious diseases among workers and surrounding areas					

Semi-monthly and monthly monitoring and observation

Date:		Findings (Enter either 'Approved' or 'Need action')		Record of conditions	Actions taken	Recorded by (Name)
Item ID	Parameters	Construction site	Office/ Storage/ Camp sites			
1	Waste storage and segregation					
2	Oil spill, chemical spill, soil and groundwater contamination					
3	Occurrence of traffic jam around the Work Area Any accident or near-accident occurrences on road Safety condition during the commuting hours for school and meetings Received opinions and grievances on traffic problem					
4	Impact on DHR operation Received opinions and grievances from DHR					
5	Work accidents Compliance to the safety plan Periodical educational meetings on sanitation and safety					

(3) Maintenance Phase

Monthly monitoring by interview survey and observation

Year	Month	Date	Record 1) Implementation of traffic control and safety measures 2) Occurrence of traffic accidents at or near the New Bridges	Recorded by (Name)

Add lines when necessary

Appendix 5-3-5 Monitoring forms for implementation activities of ARAP

1) Record of public consultation

No.	Date	Place	Number of attendants (Number of female attendants)	Purpose, Agenda, Main comments and answers
1				
2				

2) Record of grievances and comments

No.	Date	Place	Name of the person concerned	Grievances, comments	Name of officer receiving	Next action
1						
2						

3) Progress record of land acquisition

	#69	#187	#154	#45
1. Memorandum to Cabinet to acquire				
2. Cabinet Conclusion Document to acquire				
3. Notice of Intention gazetted				
4. Letter to land owner(s) - Inform them of potential acquisition				
5. Survey / Valuation of property				
6. Memorandum to Cabinet for declaration				
7. Cabinet Conclusion of declaration				
8. Notice of Declaration gazetted				
9. Registration of the property for government's purchase intention				
10. Letter to land owner(s) - to request claim of amount				
11. Negotiation for compensation, including livelihood compensation				
12. Board of Assessment Review and decision				
13. Memorandum to Cabinet for payment				
14. Cabinet Conclusion for final payment				
15. Compensation payment to land owner				
16. Other assistances, compensations	Assistance for the tenant vendor	Compensation for the sign board	Provision of access road	Demolition and reconstruction of the structure

Record start and completion dates and any other notes in the cell.

Appendix 5-3-6　JICA Environmental Checklist

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process?	(a) N	(a) The Project is not required an EIA report in Saint Lucian legal framework.
		(b) Have EIA reports been approved by authorities of the host country's government?	(b) N	(b) The Project is not required an EIA report in Saint Lucian legal framework.
		(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	(c) N	(c) The Project is not required an EIA report in Saint Lucian legal framework.
		(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(d) N	(d) No specific permission is required. In the construction phase, Forestry Department may require notification of cutting trees on the river bank, and request the contractor for proper re-vegetation on the river bank.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders?	(a) Y	(a) MIPE&L, Department of Physical Planning, Crown Lands Commission, and Member of Parliament elected from the area including the Project sites were informed about the contents of the Project and the potential impacts. During the survey with the local businesses, no negative opinions were heard about the objective of the Project.
		(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(b) Y	(b) During the field survey, individual conversations were held with local residents about the range and speed of water level change, duration of inundation, request for the improvement of bridges. Those information were used in the Project design.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) By comparing alternatives, the priority plan was selected that minimizes social impact from closure of the road, and maximizes the traffic safety by rational alignment of access road and temporal bridge.
2 Pollution Control	(1) Air Quality	(a) Is there a possibility that air pollutants emitted from the project related sources, such as vehicles traffic will affect ambient air quality? Does ambient air quality comply with the country's air quality standards? Are any mitigating measures taken?	(a) N	(a) The sizes of population, industry and traffic are small and no significant source of air pollution is recognized. The Project shall add emission during the Construction Phase but the impact shall be negligible.
		(b) Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?	(b) N	(b) The Project aims to improve flood resiliency of the existing bridges. There is no possibility that the project will make air quality around the bridge worse.
	(2) Water Quality	(a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas?	(a) N	(a) The water quality downstream shall not be changed since the cut and fill slopes shall be protected by planting and stones in Maintenance Phase.
		(b) Is there a possibility that surface runoff from roads will contaminate water sources, such as groundwater?	(b) N	(b) Groundwater is not used as water source in the Project Area. Piped water is supplied to households and businesses. The source of the piped water is located far from the Project Area.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
	(4) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a) Y	(a) Given that the population is 180,000 and the registered cars are 60,000, the traffic volume on the road is relatively small, and susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact of noise and vibrations in the Maintenance Phase shall not be significant.
		(b) Does the low-frequency noise generated by the bridge with effect of passing cars and trains comply with the country's standards?	(b) Y	(b) Given that the population is 180,000 and the registered cars are 60,000, the traffic volume on the road is relatively small, and susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact of low-frequency noise in the Maintenance Phase shall not be significant.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) The target area is not located in or near a protected area.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	(a) N	(a) The target area is not located in or near primeval forests, mangroves or coral reefs.
		(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	(b) N	(b) The target area is not located in or near the protected habitats of endangered species designated.
		(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(c) N	(c) The Project does not cause significant negative impact on the local ecosystem.
		(d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock?	(d) N	(d) The Project aims to rehabilitate and improve existing road. There is not a possibility that the Project will negatively affect the migration routes, connectivity of habitat and traffic accident of wildlife and livestock. The river water shall flow pipe culverts set in the river floor for about 2 months when the existing bridges are removed in the Construction Phase. The change of river environment up and down from the construction area shall be minimum and negative impacts on sustainability of aquatic life shall be minimized.
		(e) Is there a possibility that installation of roads will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?	(e) N	(e) The Project aims to rehabilitate and improve existing road. There is not a possibility that the Project will negatively affect on forest destruction, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems.
	(3) Hydrology	(a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?	(a) N	(a) The Project improves existing road bridges at the same location or at nearby location. The structures and earth works shall not change flows of surface and ground water.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
	(4) Topography and Geology	(a) Is there any soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?	(a) N	(a) There is no soft ground near the Project Area.
		(b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?	(b) N	(b) Cut slopes and fill slopes shall be adequately designed and protected so that no slope failures are expected.
		(c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	(c) N	(c) There is no possibility of soil runoff since the cut and fill slopes shall be protected by planting and stones in Maintenance Phase. The Project does not use new disposal site or borrow site.
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	(a) N	(a) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.
		(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?	(b) N	(b) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.
		(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards, developed based on socioeconomic studies on resettlement?	(c) N	(c) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary.
		(d) Are the compensations going to be paid prior to the resettlement?	(d) Y	(d) In land acquisition for public works, it is customary that the price for land and livelihood assistance are paid before the resettlement. There have been cases, however, that the payment was delayed when the land owner's demand significantly exceeded rational price.
		(e) Are the compensation policies prepared in document?	(e) Y	(e) The Project shall prepare the preliminary ARAP including an Entitlement Matrix. The preliminary ARAP has been explained to MIPE&L, Department of Physical Planning and Crown Lands Commission, been updated and adjusted based on their advises.The agreed ARAP shall be referred when the Chief Surveyor at Department of Physical Planning contacts and negotiate with individual PAP.
		(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	(f) Y	(f) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary. The potential PAPs interviewed during the Survey did not include specific vulnerable population or business. If it is found that such vulnerable groups are included in PAPs in later phase of the Project, the individual circumstances and requests shall be studied and consulted in the negotiation between the Chief Surveyor and the particular PAP.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		(g) Are agreements with the affected people obtained prior to resettlement?	(g) Y	(g) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary. PAPs shall individually contacted by the Chief Surveyor and negotiation shall continue until both side reaches agreement according to Land Acquisition Act.
		(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	(h) Y	(h) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. All businesses shall continue operation on remaining parcel and no economic dislocation shall be necessary. MIPE&L has already expressed its intention that MIPE&L shall take responsibility in securing necessary budget and relocation of utilities. Acquisition of private land and payment of compensation shall be handled by Department of Physical Planning. Issues on Crown Lands (public land) shall be taken care of by Crown Lands Commission.
		(i) Are any plans developed to monitor the impacts of resettlement?	(i) Y	(i) The Project does not cause resettlement of residents and businesses. Four parcels of private land, all used for businesses, shall be affected by partial purchase for the Project. WB-assisted disaster prevention project (DVRP) assigns a Social Coordination Specialist in the Project Coordination Unit of the project owner agency to monitor the implementation of ARAP. The same coordination is expected for the Project.
		(j) Is the grievance redress mechanism established?	(j) Y	(j) The Land Acquisition Act and the Resettlement Policy Framework of the DVRP clearly states the grievance redress mechanism and the mechanism is implemented in the existing projects.
	(2) Living and Livelihood	(a) Where roads are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts?	(a) N	(a) The Project, aiming to improve the existing road bridges, shall not affect the existing means of transportation, land use or livelihoods. The detour route in the Construction Phase shall be provided next to the existing bridges and shall not cause longer travel for road users or loss of road access for neighboring land parcels. The alignment of the detour routes are designed to achieve sufficient road safety. Signboards and traffic guards shall be used to secure the safety of vehicles, pedestrians and road crossings.
		(b) Is there any possibility that the project will adversely affect the living conditions of the inhabitants other than the target population? Are adequate measures considered to reduce the impacts, if necessary?	(b) N	(b) The Project, aiming to improve the existing road bridges, shall not affect the existing means of transportation, land use or livelihoods.
		(c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to the project?	(c) N	(c) The Project, aiming to improve the existing road bridges, shall not cause affect the existing means of transportation, land use or livelihoods.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		Are adequate considerations given to public health, if necessary?		
		(d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., increase of traffic congestion and traffic accidents)?	(d) N	(d) The Project aims to improve flood resiliency of an existing road. The Project will bring positive impact such as reduction of road closures during floods in Maintenance Phase. The target road is an artery road that run through a narrow river valley. The Project shall cause a positive impact during floods by reducing detouring traffic volume on surrounding narrower and steeper roads.
		(e) Is there any possibility that roads will impede the movement of inhabitants?	(e) N	(e) The Project aims to improve flood resiliency of an existing road. There is no possibility that the Project will impede the movement of inhabitants.
		(f) Is there any possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?	(f) N	(f) The Project does not contain facilities that may cause sun shading and radio interference.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) The Project aims to improve flood resiliency of an existing road. No archeological, historical, cultural or religious heritage is located on the sites. In case any resources are found in later phase of the Project, due procedure shall be taken according to the laws of Saint Lucia.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) The Project aims to improve flood resiliency of an existing road. No significant landscape resource is located on or around the sites. In case any resources are found in later phase of the Project, due procedure shall be taken according to the laws of Saint Lucia.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	(a) N	(a) Saint Lucia does not have legally recognized minorities and indigenous peoples. There are Kalinago people who were already located before the immigration of European people, but those people are blending in general society, different from Kalinago people in Dominica, where they have a Territory.
		(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources to be respected?	(b) N/A	(b) There is no specific minorities and indigenous peoples in relation to specific rights on land and resources.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	(a) Y	(a) The construction projects contacted by MIPE&L are monitored by MIPE&L to obey the Employees (Occupational Health and Safety) Act and Equality of Opportunity and Treatment in Employment and Occupation Act.
		(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	(b) Y	(b) Tangible safety considerations such as installation of safety equipment and management of hazardous materials shall be planned and implemented by MIPE&L and CSC.
		(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?	(c) Y	(c) Tangible measures such as safety and health program and trainings for workers shall be planned and implemented by MIPE&L and CSC.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
		(d) Are appropriate measures being taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(d) Y	(d) Since Saint Lucia is a small country, security guards shall be hired from communities not far from the Project area. There is little possibility expected that such security guards cause violation of safety of other involved or local residents.
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?	(a) Y	(a) The scale of construction works are not significant. Susceptible facilities/population such as houses, school, church are mostly located at some distance from the road. Negative impact and number of potentially affected persons from the construction works shall not be significant. Adequate measures shall be implemented and monitored to avoid and minimize the pollution impacts caused by operation of the stock yard, transportation vehicles, and construction machineries.
		(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?	(b) N	(b) The scale of construction works are not significant and alteration of river environment and vegetation shall be limited to minimum. No significant ecosystem or protected areas are located in or around the target site. Borrow site or off-site soil disposal site shall not be set up for the Project. The construction activities shall not cause significant adverse impact on the natural environment and ecosystem.
		(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(c) N	(c) The speed of existing traffic at the Project site is quite fast. In the Construction Phase, the traffic shall be guided to drive slower on the detour route by sufficient guiding facilities to avoid and minimize traffic jam and accident. Land acquisition for construction of permanent structure shall follow the due process and socially acceptable fair negotiations based on the Land Acquisition Act, the Resettlement Policy Framework of the DVRP and JICA Guidelines.
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?	(a) Y	(a) Monitoring shall be the responsibility of MIPE&L in the planning and maintenance phase. The CSC shall be responsible for monitoring in the construction phase.
		(b) What are the items, methods and frequencies of the monitoring program?	(b) Y	(b) The items in the monitoring program coincide with the ones in the mitigation plan. Monitoring methods are mainly observation, patrolling and interview. Frequencies vary between everyday to once a month depending on target item.
		(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?	(c) Y	(c) Monitoring shall be conducted by site managers during the regular work hours by observation, patrolling and interview. Regular MIPE&L and Contractor personnel cost shall be used for the monitoring. Therefore adequate, continuous budget can be secured.
		(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(d) Y	(d) Monthly report from CSC to MIPE&L, and quarterly report from MIPE&L to JICA shall be mandated.

	Environmental Item	Main Check Items	Yes: Y No: N	Environmental Item
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation).	(a) N/A	(a) Large scale felling of trees is not required for the Project.
		(b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities).	(b) N/A	(b) The Project does not include power transmission and distribution lines.
	Note on Using Environmental Checklist	(a) The impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) Negative impacts that cross watershed boundary or large, continuous emission of CO2 are not expected since the numbers of tree felling and operation of vehicles and machineries are small. The Project does not change the watershed. Wastes shall be disposed to existing landfill and shall not be disposed in ocean or abroad.

1) Regarding the term “Country's Standards” mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Appendix 5-4

Estimation of Quantative Indicators

Cul-De-Sac Bridge

	Standard passenger number and load			Quantative indicator			
	Passenger number	Load	Traffic Count (num/day)	Passenger number		Load	
	person	kg		Current	Target	Current	Target
Motorbike	1	100	45	45		4,500	
Car	3	300	4,195	12,585		1,258,500	
Pick-up	2	1,000	1,434	2,868		1,434,000	
Taxi	3	100	493	1,479		49,300	
Minibus	7	500	1,313	9,191		656,500	
Bus	20	500	22	440		11,000	
2-axle Truck	2	2,000	472	944		944,000	
3-axle Truck	2	5,000	67	134		335,000	
4-axle Truck	2	10,000	25	50		250,000	
5-axle Truck	2	30,000	19	38		570,000	
6-axle Truck	2	30,000	0	0		0	
		Total		27,774		5,512,800	
		Number of days exclusive of days blocked		357	365	357	365
		num/yr		9,915,318	10,137,510	1,968,069,600	2,012,172,000
			Rounding	9,900,000	10,000,000	1,950,000,000	2,000,000,000

Ravine Poisson Bridge

	Standard passenger number and load			Quantative indicator			
	Passenger number	Load	Traffic Count (num/day)	Passenger number		Load	
	person	kg		Current	Target	Current	Target
Motorbike	1	100	11	11		1,100	
Car	3	300	2,199	6,597		659,700	
Pick-up	2	1,000	742	1,484		742,000	
Taxi	3	100	448	1,344		44,800	
Minibus	7	500	1,039	7,273		519,500	
Bus	20	500	20	400		10,000	
2-axle Truck	2	2,000	284	568		568,000	
3-axle Truck	2	5,000	66	132		330,000	
4-axle Truck	2	10,000	39	78		390,000	
5-axle Truck	2	30,000	19	38		570,000	
6-axle Truck	2	30,000	2	4		60,000	
		Total		17,929		3,895,100	
		Number of days exclusive of days blocked		363	365	363	365
		num/yr		6,508,227	6,544,085	1,413,921,300	1,421,711,500
			Rounding	6,500,000	6,550,000	1,410,000,000	1,420,000,000