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

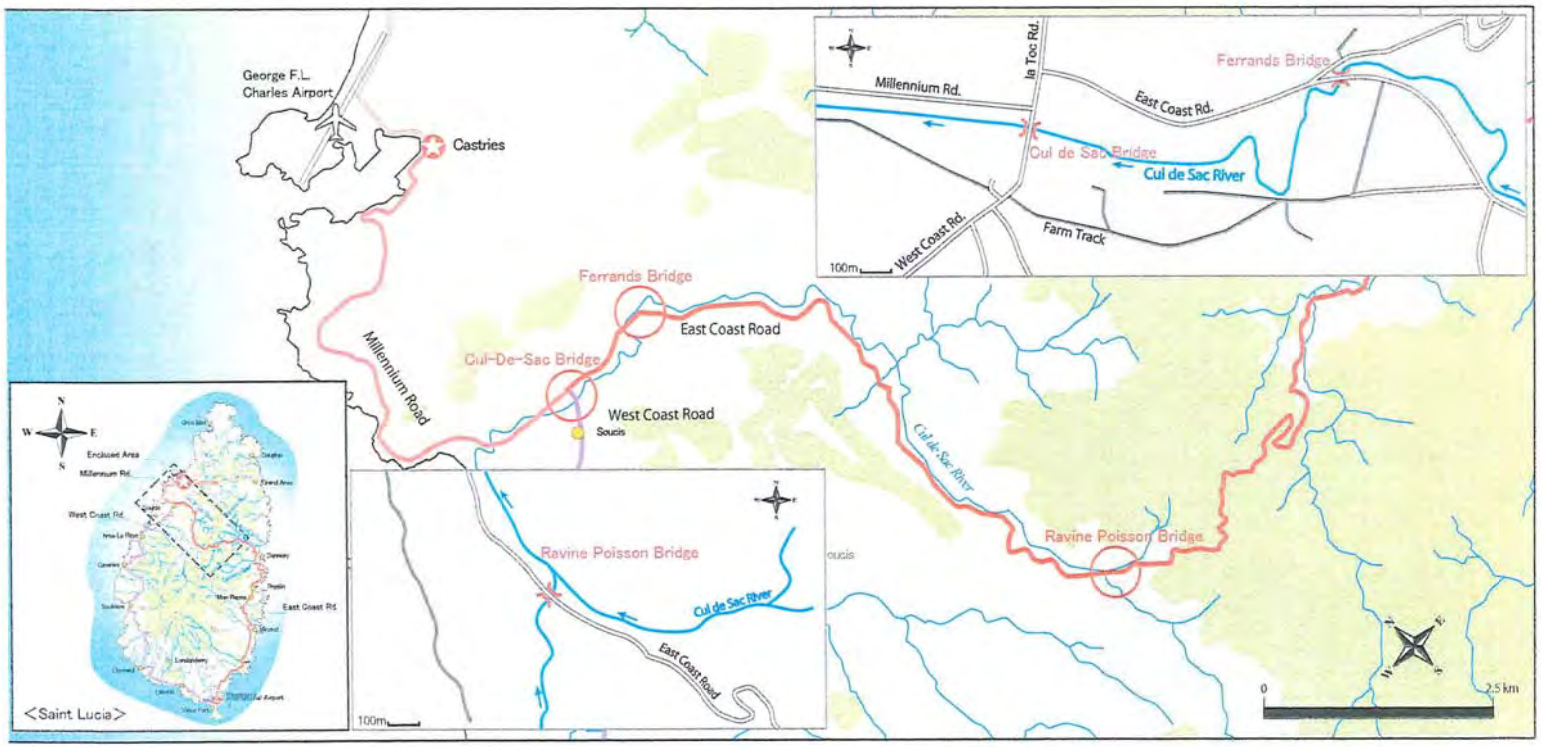
Annex 4 Flow Chart of Japanese Grant Procedures

Annex 5 Financial Flow of Japanese Grant

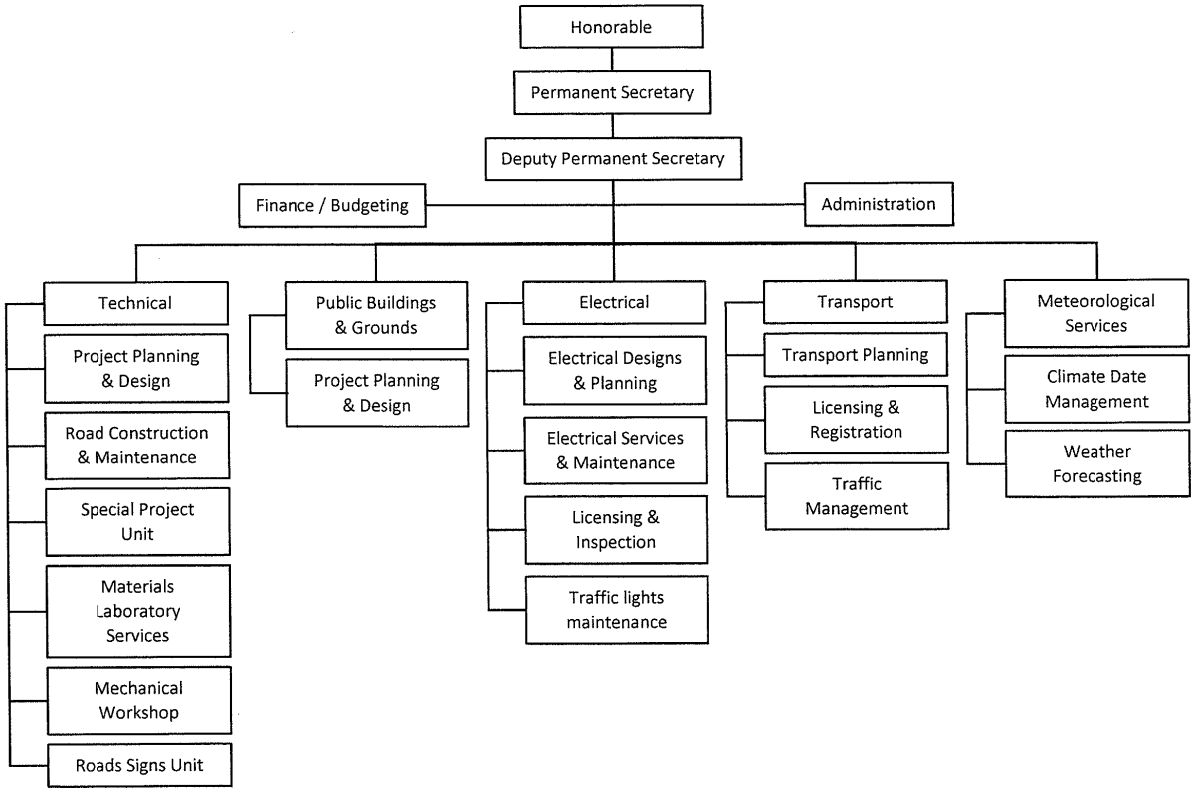
Annex 6 Project Monitoring Report

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.

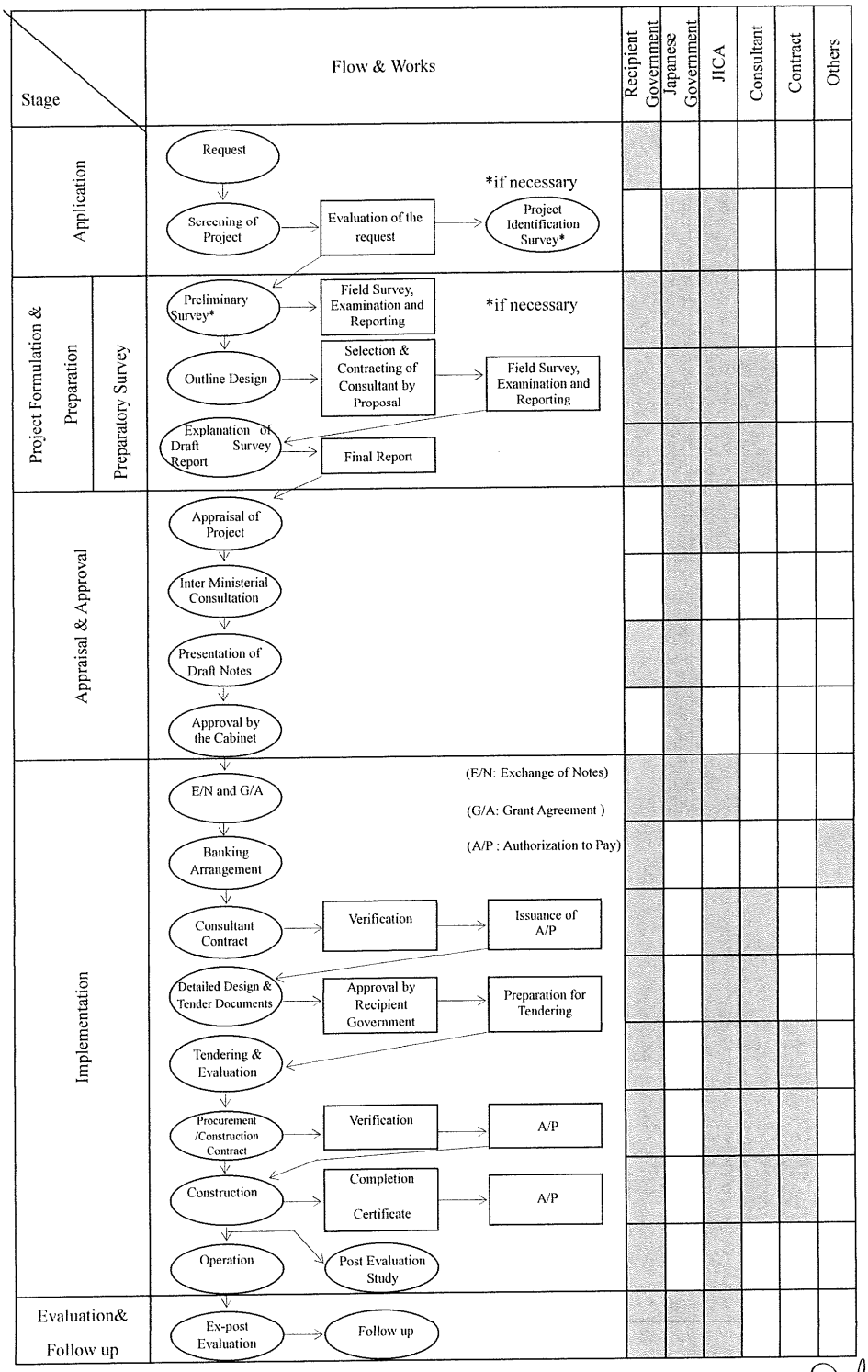
(11) Monitoring

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

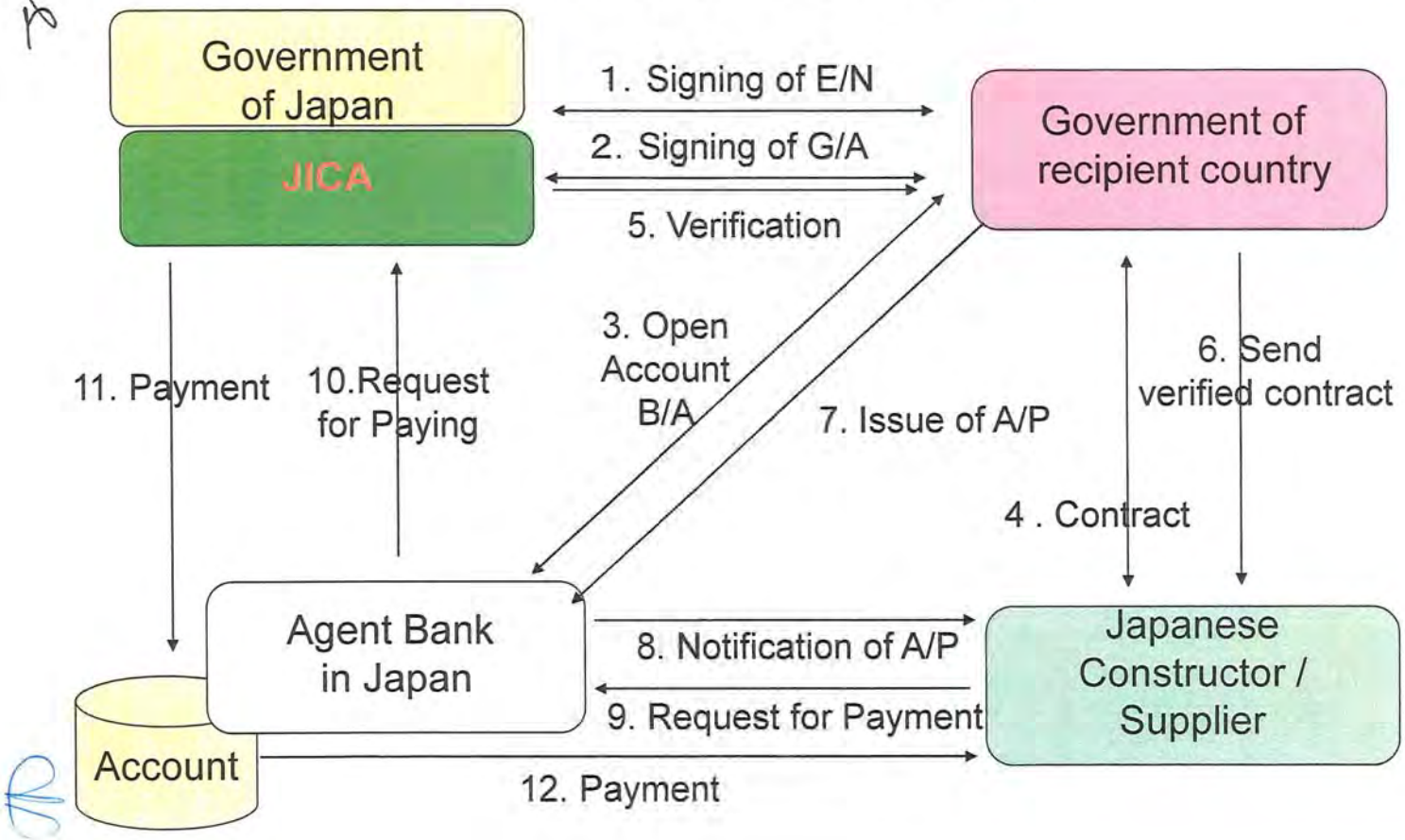
The Government of the recipient country must ensure that the safety is highly observed during the implementation of the Project.

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

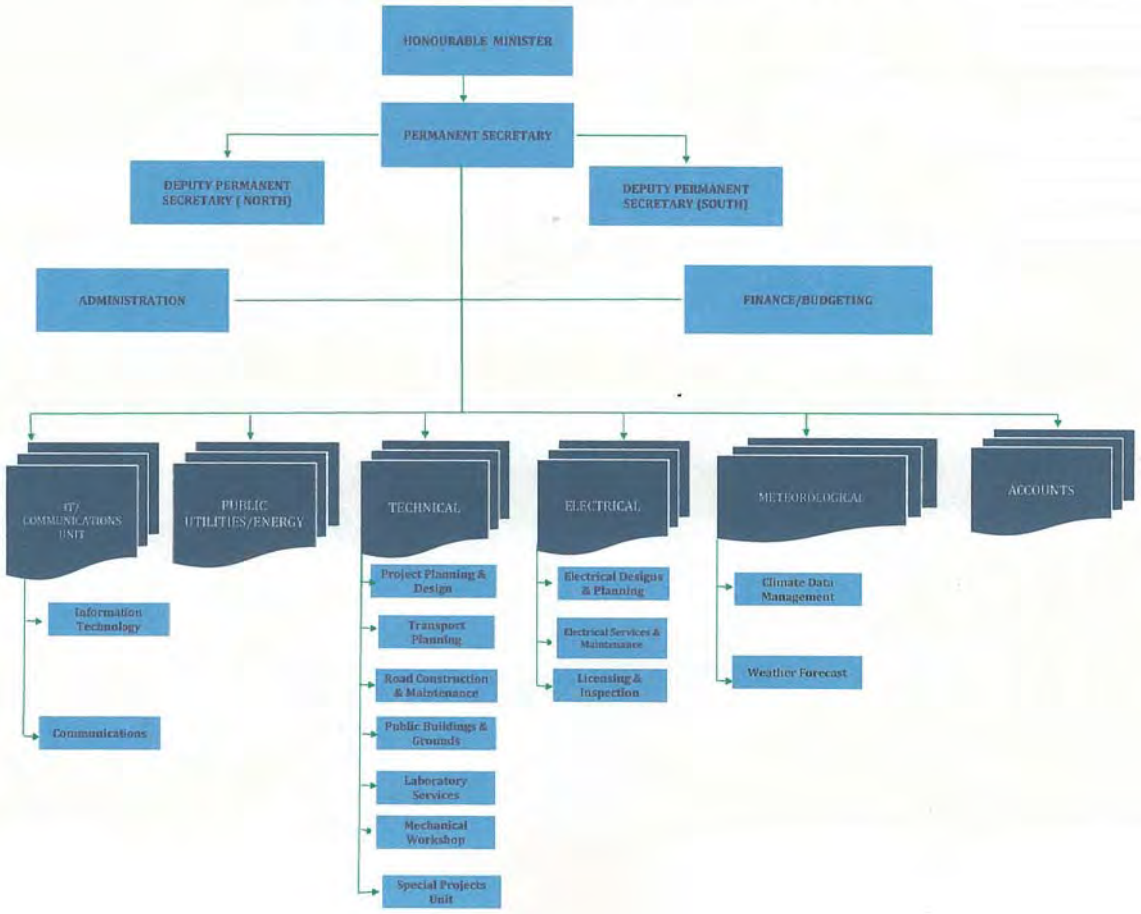
The Saint Lucia side agreed to construct a temporary traffic road diversion and a temporary bridge for detour during the construction period at their own expense. For the construction of these facilities, the Team will provide drawings for temporary traffic diversion and a temporary bridge to the Saint 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

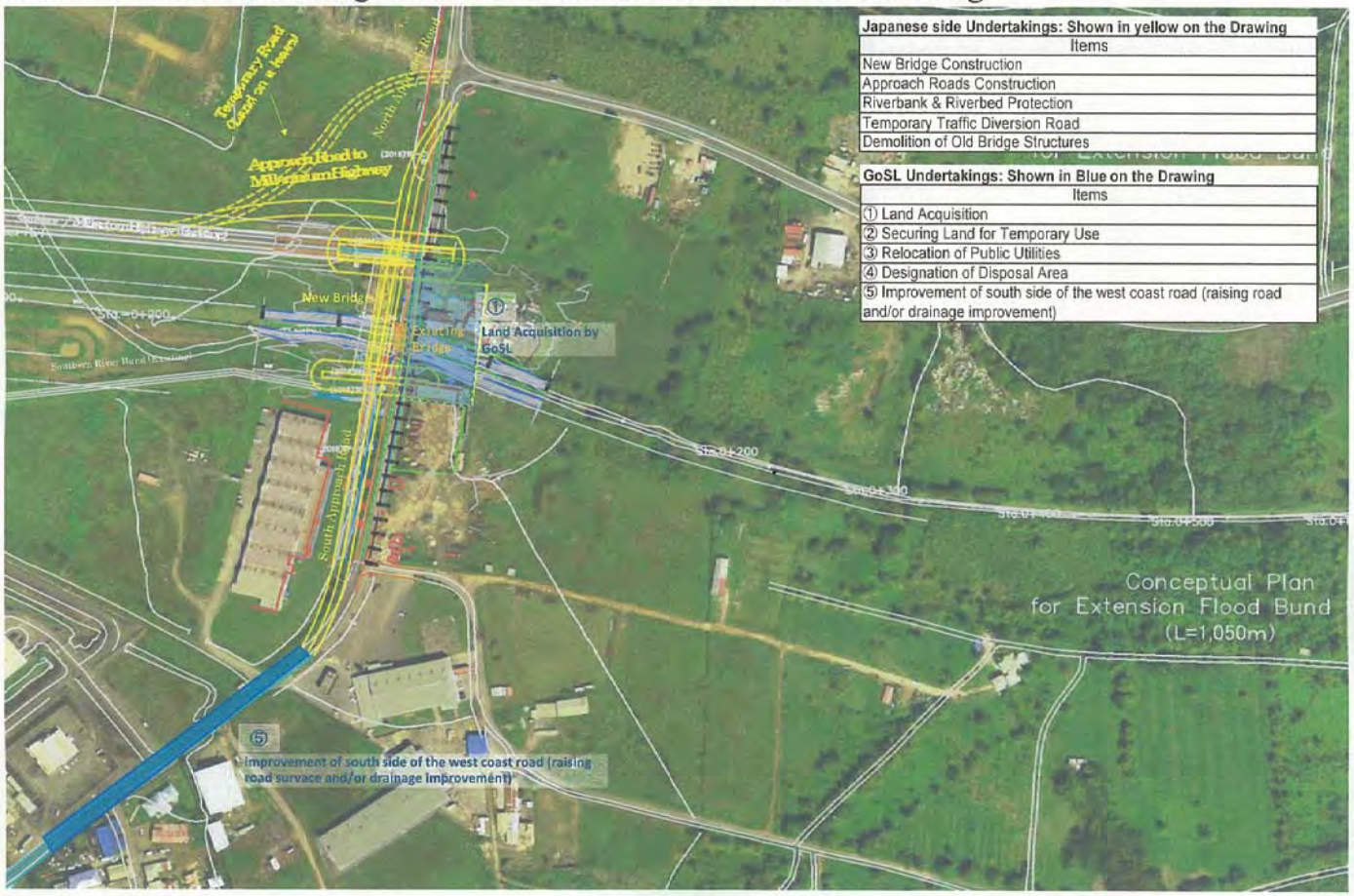
Annex-1 Modified Organization Chart

Ministry of Infrastructure, Ports, Energy and Labour

(Showing only Department of Infrastructure, Ports and Energy)



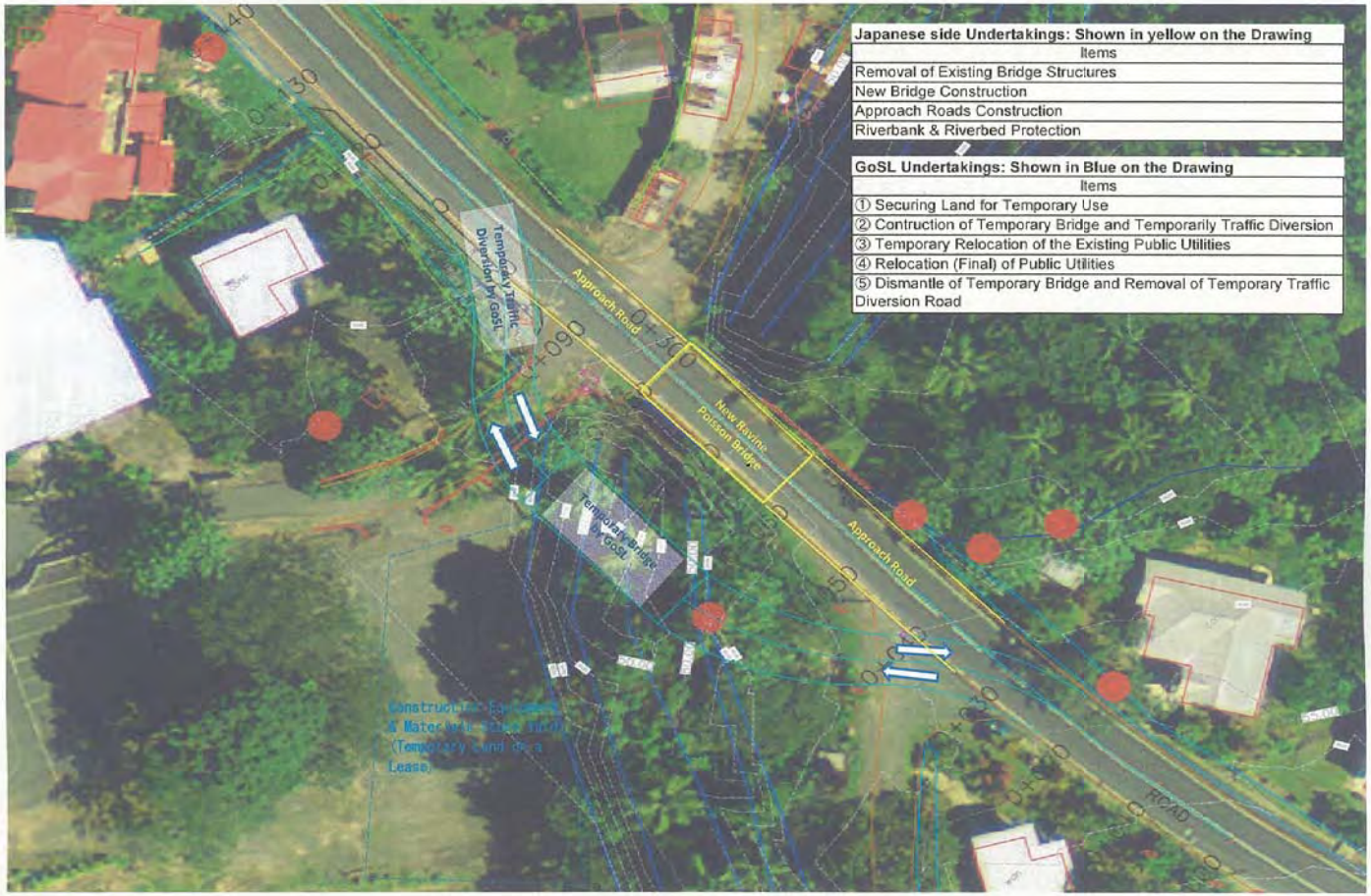
Annex-2 Recommended Bridge Reconstruction Plan for the Cul-De-Sac Bridge



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

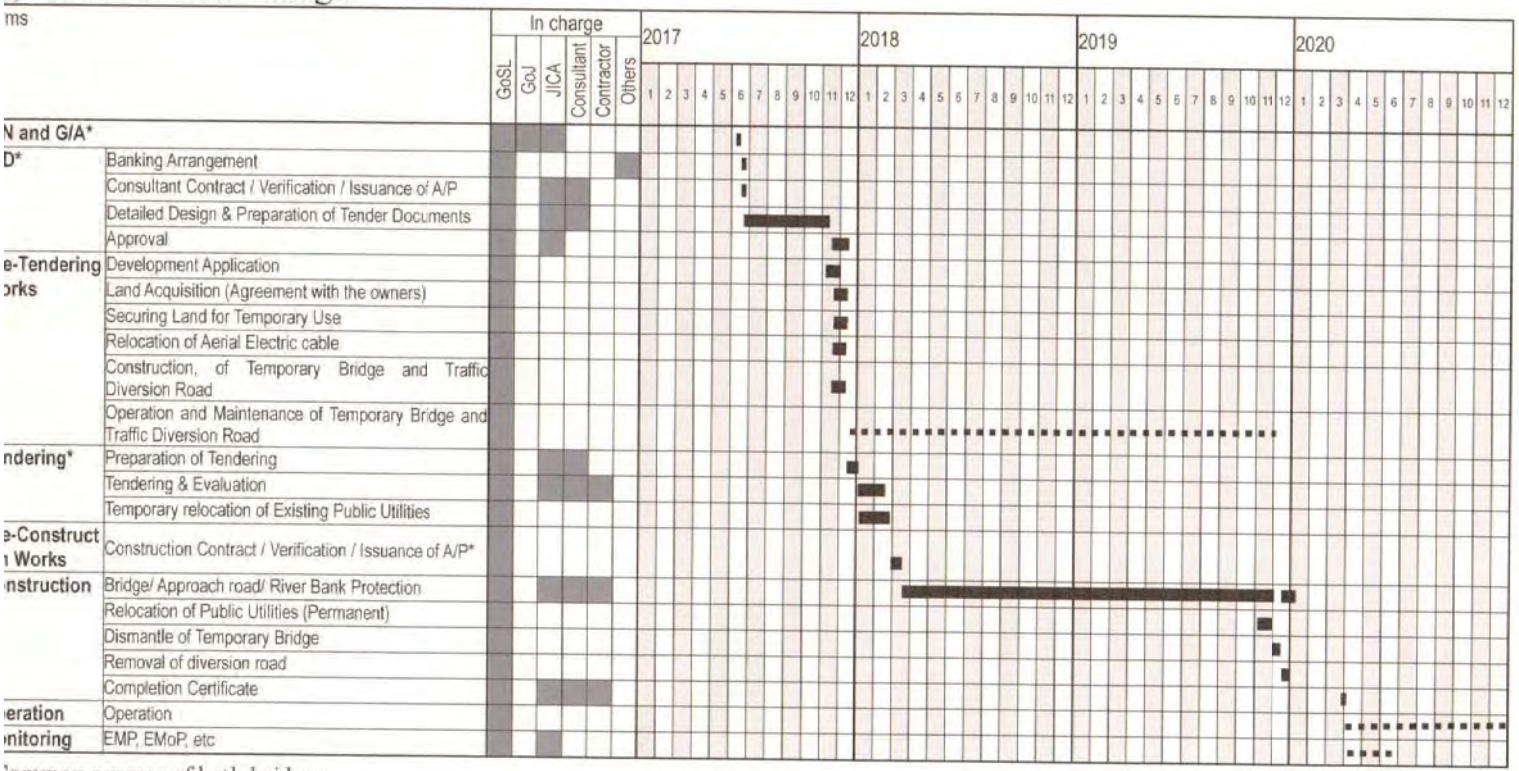
Items		In charge						2017												2018												2019												2020											
		GoSL	GoJ	JICA	Consultant	Contractor	Others	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
E/N and G/A*																																																						
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;

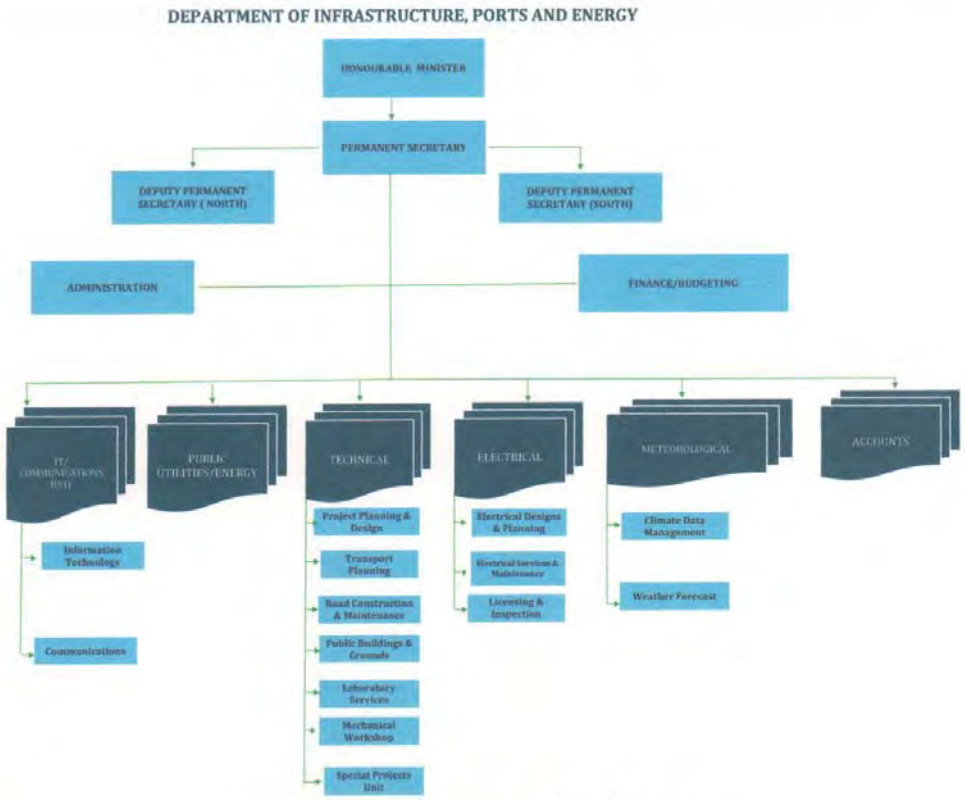


Figure Organization chart of MIPE&L

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)

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

8

	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

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

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

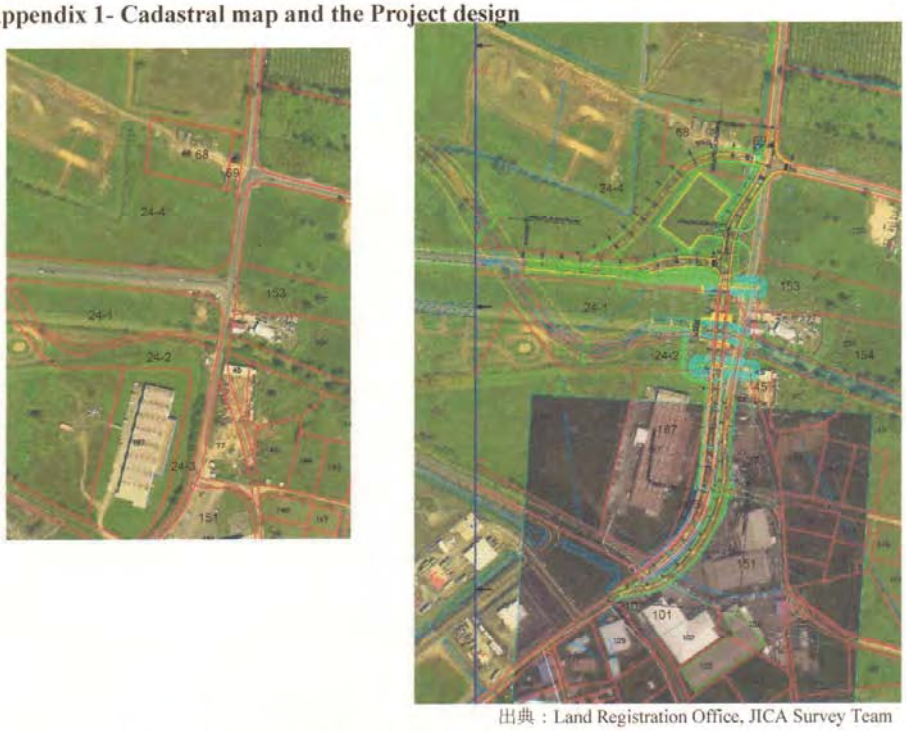
Grievances from affected parties	* Grievances made verbally to the Social Safeguards Officer
Access Point	* The SPU serves as the access point for grievances
Grievance Log	* Grievances received verbally are documented, verified and signed by both parties. * Grievances will be copied to the relevant authority 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

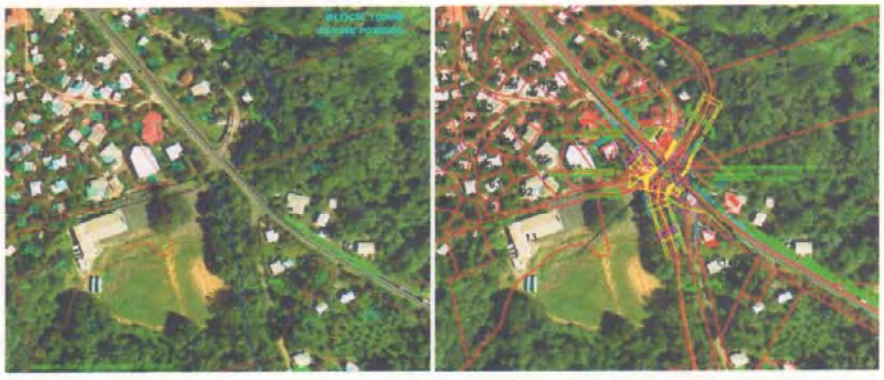
The cost of acquisition and associated administrative and logistical costs shall be provided for by the MIPE&L as part of the Project cost. Necessary budget shall be estimated after the official valuation of assets by Department of Physical Planning and Development.

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

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

153

24-2

24-1

24-1

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

５．参考資料

5-1 プロジェクトサイトの交通量調査データ

5-2 地質調査データ

5-3 環境社会配慮調査の付属資料

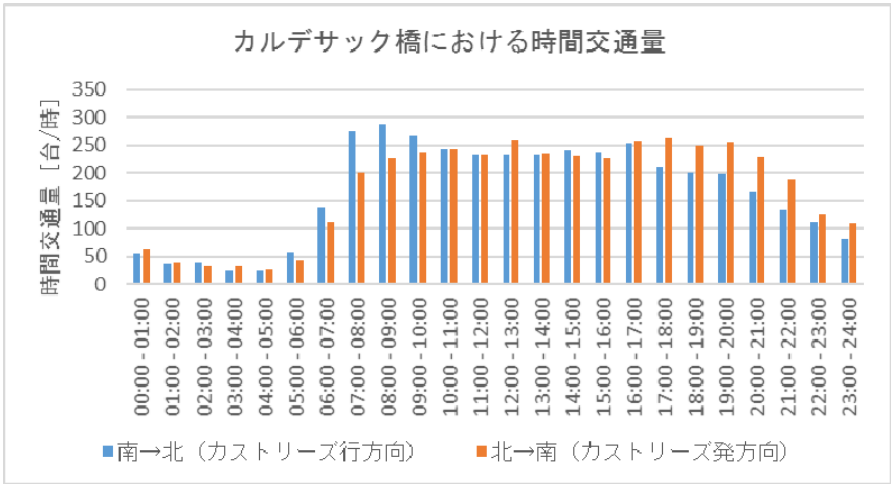
5-4 定量的指標算定表

参考資料 5-1

プロジェクトサイトの交通量調査データ

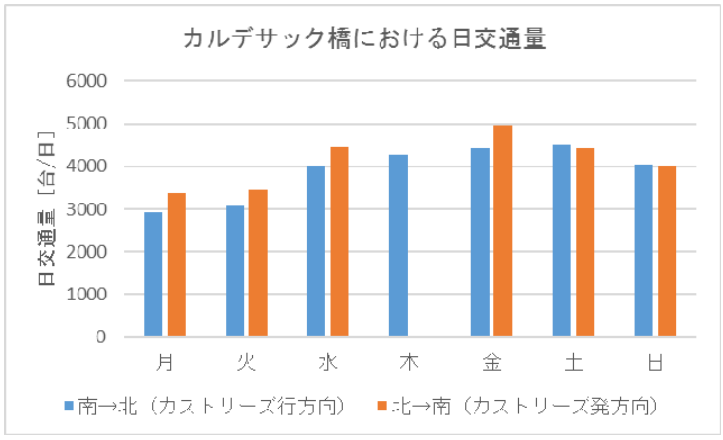
資料 5-1　プロジェクトサイトの交通量調査データ

(1) カルデサック橋



出典：JICA 調査団

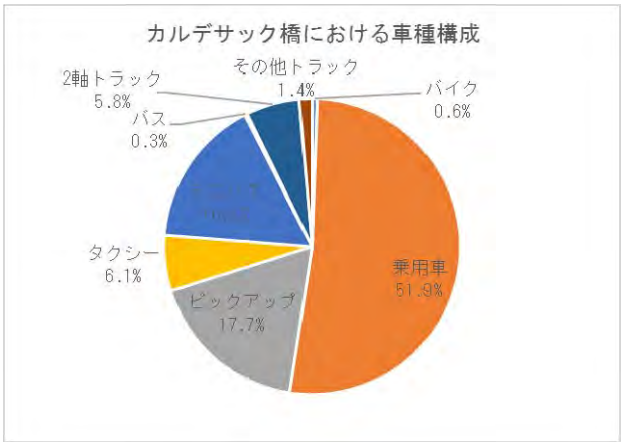
図１　カルデサック橋における交通量の時間推移



注：木曜日の北→南（カストリーズ発方向）については機器の不具合のため記録なし

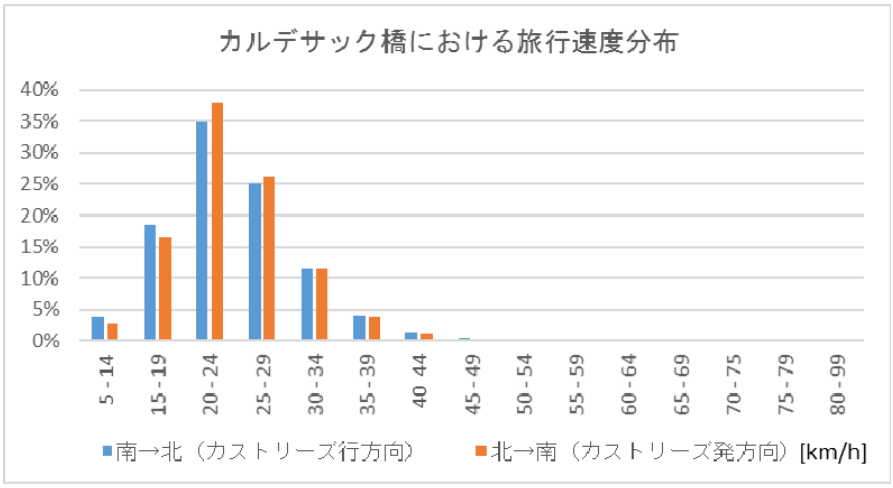
出典：JICA 調査団

図２　カルデサック橋における交通量の週間推移



出典：JICA 調査団

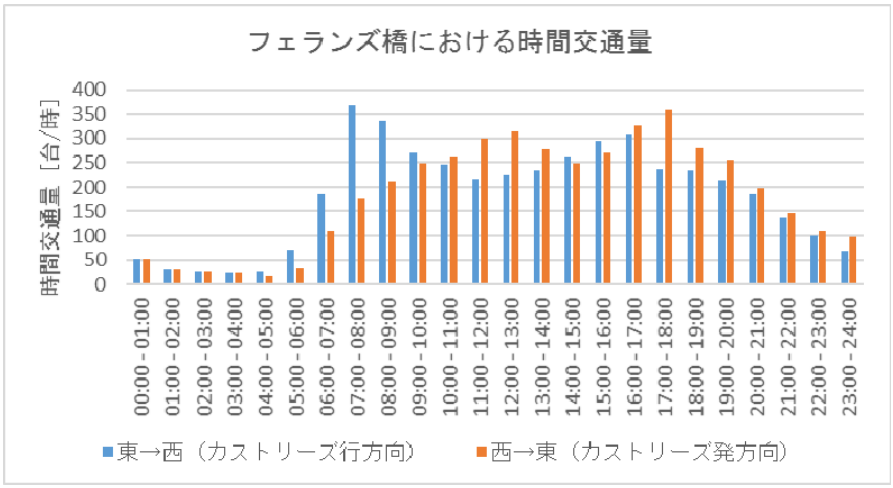
図３　カルデサック橋における車種構成



出典：JICA 調査団

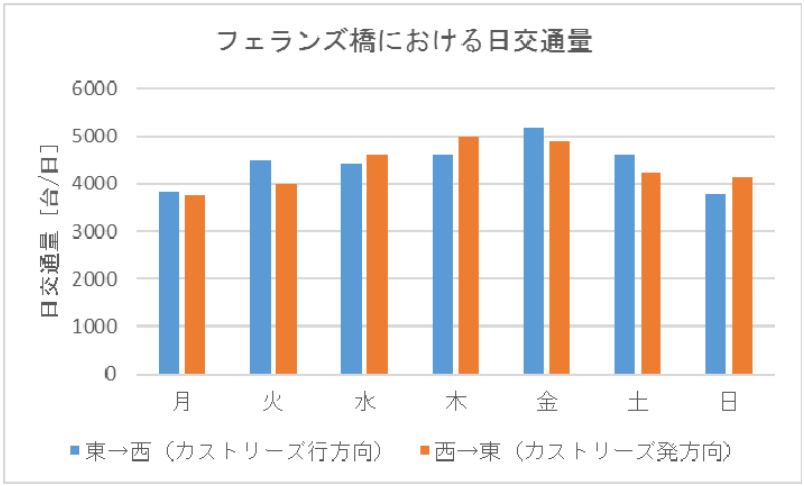
図４　カルデサック橋における旅行速度分布

(2) フェランズ橋



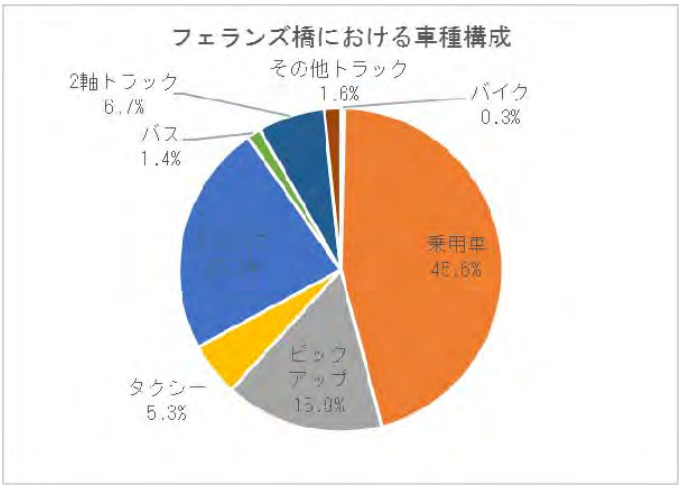
出典：JICA 調査団

図５　フェランズ橋における交通量の時間推移



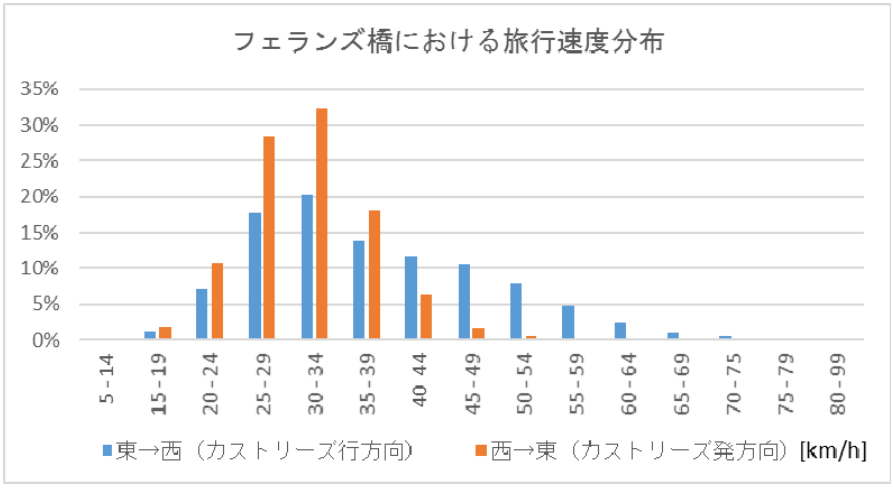
出典：JICA 調査団

図６　フェランズ橋における交通量の週間推移



出典：JICA 調査団

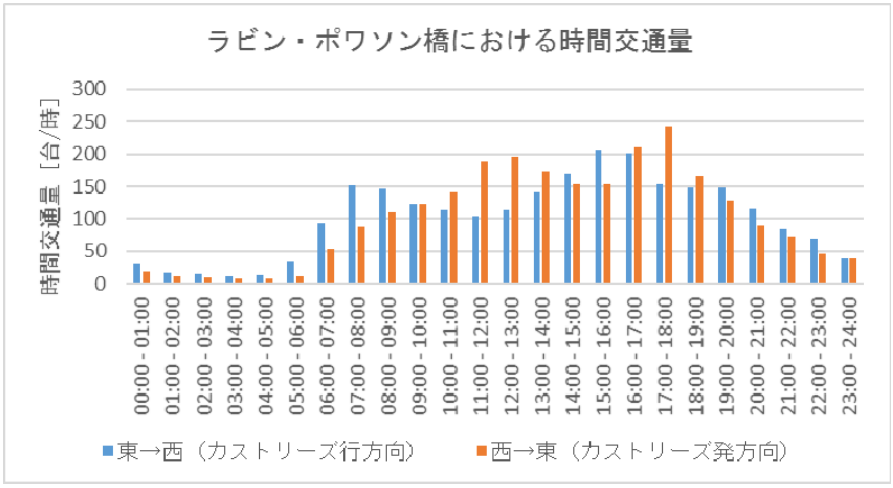
図７　フェランズ橋における車種構成



出典：JICA 調査団

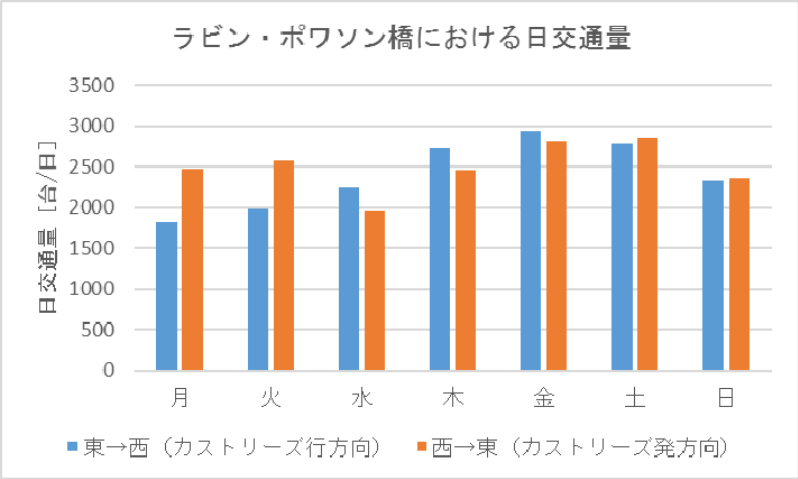
図８　フェランズ橋における旅行速度分布

(3)ラヴィン・ポアソン橋



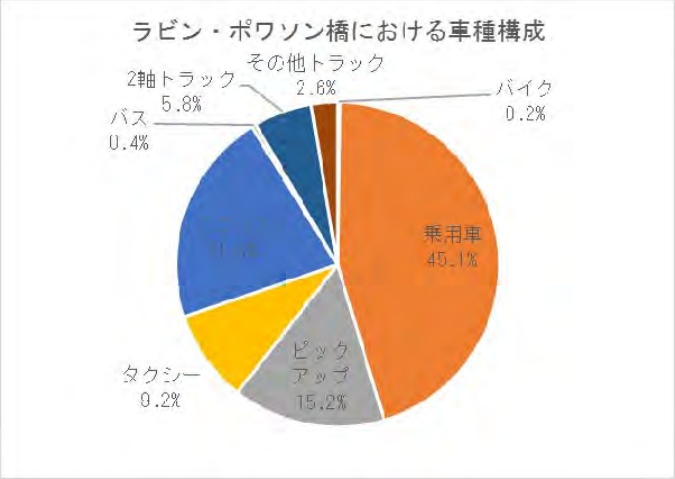
出典：JICA 調査団

図９　ラヴィン・ポアソン橋における交通量の時間推移



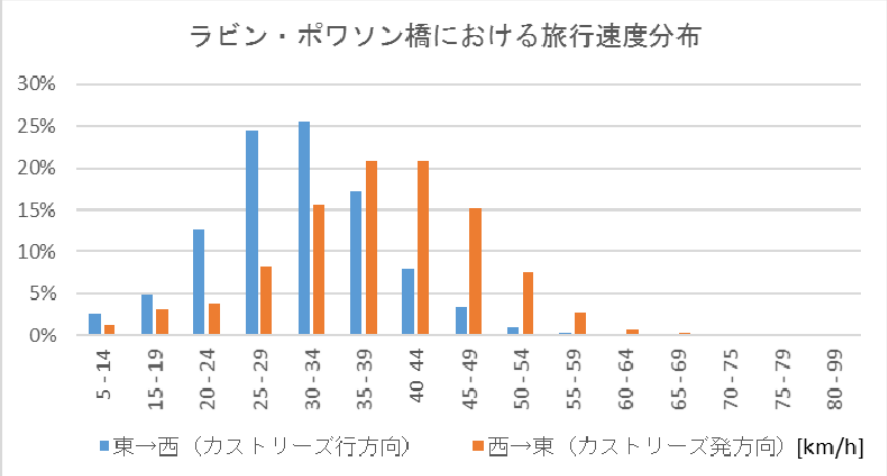
出典：JICA 調査団

図１０　ラヴィン・ポアソン橋における交通量の週間推移



出典：JICA 調査団

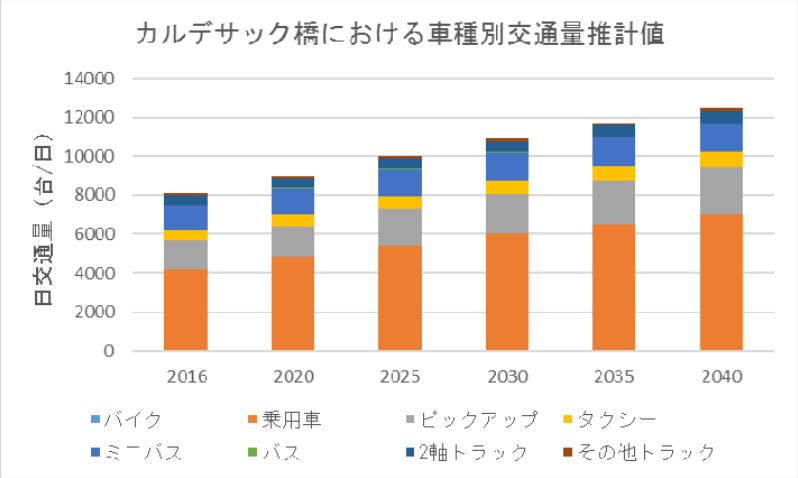
図１１　ラヴィン・ポアソン橋における車種構成



出典：JICA 調査団

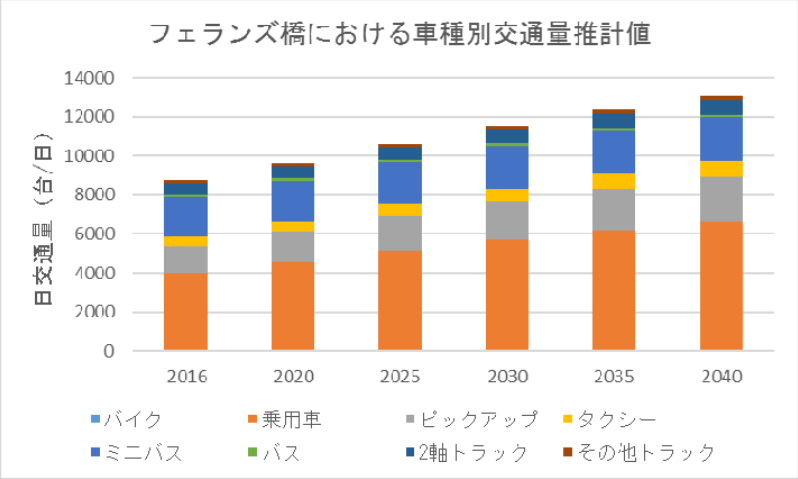
図１２　ラヴィン・ポアソン橋における旅行速度分布

(4)　将来交通量推計



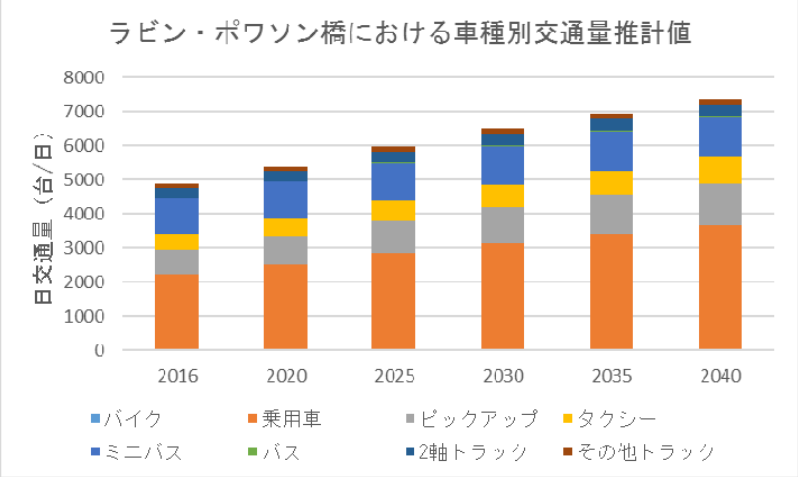
出典：JICA 調査団

図１３　カルデサック橋における車種別交通量推計値



出典：JICA 調査団

図１４　フェランズ橋における車種別交通量推計値



出典：JICA 調査団

図１５　ラヴィン・ポアソン橋における車種別交通量推計値

参考資料 5-2

地質調査データ

資料 5-2　地質調査データ

(1) 調査地点のボーリング柱状図

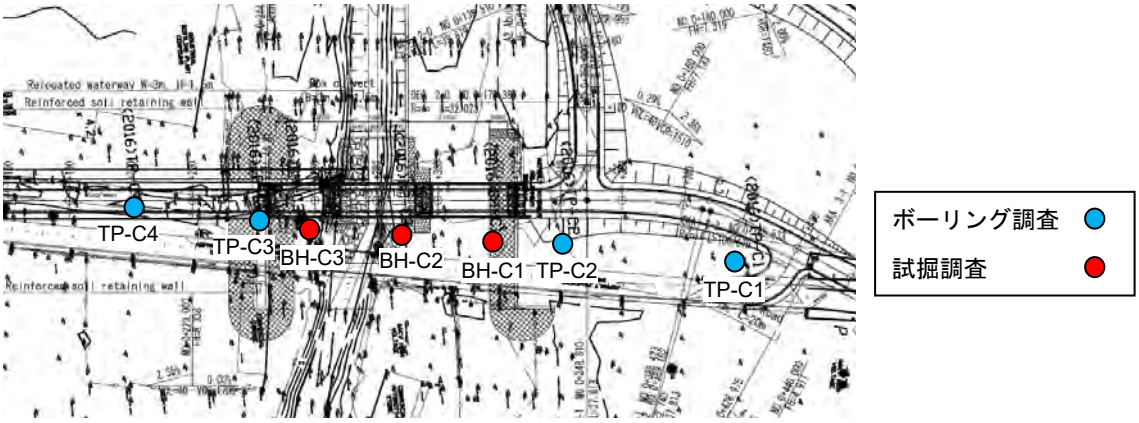


図１　調査位置図（カルデサック橋）

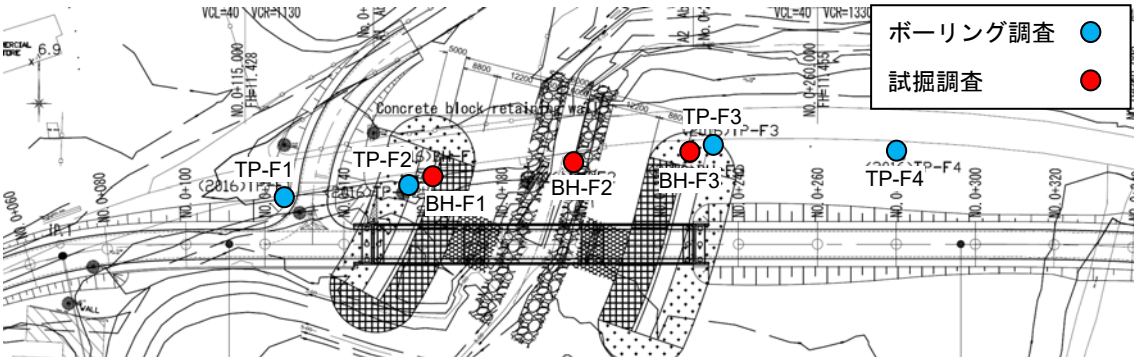


図２　調査位置図（フェランズ橋）

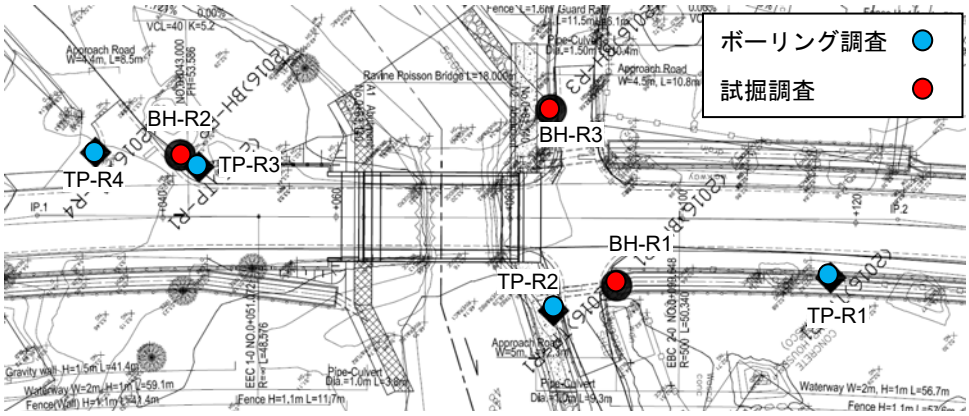


図３　調査位置図（カルデサック橋）

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 – 1			1, 2		
	Medium stiff, grey, SILTY CLAY.	1 – 3			3, 4		
	Very loose, grey, SILTY CLAY (0.15m) to c.m.f. SILTY SAND.	3 – 4			5		
	Very loose, grey, SANDY SILTY PEAT.	4 – 5			6		
	Loose, grey, c.m.f. SILTY SAND & GRAVEL, trace shells.	5 – 7			7, 8		
	Stiff, brownish black, SANDY SILTY PEAT.	7 – 8			9		
	Continued Next Page	8 – 12			10, 11, 12, 13		

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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		
	Medium stiff, brownish black, CLAYEY PEAT.	21			23		
		22			24		
	Stiff, brown & grey, SILTY CLAY.	23			25		
	Stiff, brown & grey, SILTY CLAY, trace Continued Next Page	24	93		26		

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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)	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			1		
	Loose, brown, SILTY SAND & GRAVEL, trace clay.	1			2		
	Medium dense, grey, CLAYEY SAND & GRAVEL.	2			3		
	Medium stiff, grey, SILTY CLAY.	3			4		
	Medium stiff, brown & grey, SILTY CLAY.	4			5		
	Medium stiff, grey, SILTY CLAY.	5			6		
	Medium stiff, grey, SILTY CLAY & blackish brown, PEAT.	6			7		
	Soft, grey, SILTY CLAY.	7			8		
		8			9		
	Loose, blackish brown & grey, SILTY SAND, with peat.	9			10		
	Loose, grey & dark brown, SILTY SAND & PEAT.	10			11		
	Loose, dark brown, SILTY CLAYEY SAND & PEAT.	11			12		
	Continued Next Page	12	95		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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GEOTECH ASSOCIATES LTD.
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	98				

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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)						
	Soft, grey, SILTY CLAY, with sand.	24			24		
		25			25		
	Stiff, brownish grey, SILTY CLAY, with sand & trace peat.	26			26		
		27			27		
		28			28		
	Hard, brownish grey, SILTY CLAY, with sand & trace peat.	29					
		30					
	End of Borehole at 31.1m.	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)
100

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. **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		
	Medium dense, brown, SILTY SAND and GRAVEL.	15			17		
		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					

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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		
	Very stiff, brown and grey, CLAYEY SILT, with sand.	34			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)	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, moist, SILTY SAND, CLAY and GRAVEL.				1		
	Stiff, brown, moist, SANDY SILT, with clay and gravel.	1			2		
		2			3		
		3			4		
	Medium stiff, brown, moist, CLAYEY SILT, trace gravel.	4			5		
	Medium stiff, light grey SILTY CLAY.	5			6		
		6			7		
	Very loose, grey, wet, SILTY SAND, some clay.	7			8		
	Soft, grey, wet, SANDY SILT, trace clay.	8			9		
		9			10		
	Medium stiff, light brown CLAY.	10			11		
		11			12		
	Continued Next Page	12	103		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		
	Medium dense, grey, wet, SILTY SAND, trace gravel.	15			17		
	End of Borehole at 17.1m.	16			18		
		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				

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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					
	Continued Next Page	36	107		31		

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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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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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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

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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TRINIDAD, WI

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)
	Ground Surface	0
	Dense, grey, SILTY SAND & GRAVEL.	1
	Medium stiff, brown, CLAYEY SILT, trace sand & gravel.	2
	Dense, brown, SANDY SILT, with clay & gravel.	3
	Medium dense, brown, SANDY SILT, with gravel & boulders.	4
	End of Borehole at 5.1m.	5

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

13, 49, 15, 60/2"

Sample Type	Sample Numb	Bulk Density kN/m3	Additional Tests and Remarks
	1		
	2		
	3		
	4		
	5		
	6		

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GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

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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RECITEL 16168-1.GPJ 12-9-16

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

参考資料 5-3

環境社会配慮付属資料

付属資料１　開発許可を要しない事業及び EIA の実施が必要な事業一覧

表１　開発許可を要しない事業一覧（付表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.

出典：Physical Planning and Development Act　(Amended by Act 3 of 2005)

表２　EIA の実施が必要な事業一覧（付表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;

出典：Physical Planning and Development Act

付属資料２　その他の環境配慮に関連する法令・基準等

(1) 環境保全及び社会配慮に関連する法令・基準等

セ国の法令のうち、環境保全、社会配慮、及び本事業（道路工事）に関連する法令には、表 1 に挙げるものがある。

表１　環境社会配慮に関連するセ国の法令・基準等

名称	概要	本事業との関連
空間計画・開発法(2005) 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)	・本法が定める手続きに従って用地取得・補償手続きを行う ・本法を根拠として、セ国制度に基づく環境影響評価手続きの要否が決定される ・本法に基づいて保護すべきエリアが設定される
レクリエーション用水域の水質ガイドライン 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	・本ガイドラインが定める排水基準が原則として工事区域や工事関連施設からの排水に対しても適用される
廃棄物法 Litter Act 1983	* 廃棄物の不法投棄は禁止する * 廃棄物の保管により健康被害や危険が発生すると判断される場合は撤去しなければならない	・本事業で発生する廃棄物も、本法に基づき適正に保管・処分する必要がある
開発行為に関する廃棄物管理計画提出ガイドライン 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	・本事業に関しても、計画段階、工事中の各段階で、発生する廃棄物等の種類・量・保管方法・移動方法・処分方法等を報告する義務がある
植物保護法 Chapter 7.12 Plant Protection Act (2005)	* Defines plant quarantine services, restriction of importation of plant material, safeguard measures, etc.	・本事業の各種調達においても、島外からの植物種の移入を回避する配慮を行うことが必要である
野生生物保護法 Wildlife Protection Act, 1980 (Act No. 9 of 1980).　stl10053	* Lists 6 plants, 14 birds, 2 reptiles, 21 fishes, and 11 Corals, Jellyfish, and Sea Anemones	・本事業の実施に当り、記載種に対する影響を回避・最小化することが必要である
土地収用法 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	・本法が定める手続きに従って用地取得・補償手続きを行う
土地開発許可取得のガイドライン Development Control Authority Guide to Obtaining Permission to Develop Land	* DCA minimum standards for river and ravine buffers (p.9)	・河川河岸から15.24 m (50 ft)、小川水際から4.57 m (15 ft)の範囲への建設行為を制限しており、この区域が河川区域と読み替えられる。補償の検討にあたり加味される。

名称	概要	本事業との関連
労働法 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	・本事業も、本法が定める労働契約、労働安全確保等を遵守する必要がある
労働保健安全法 SAINT LUCIA EMPLOYEES (OCCUPATIONAL HEALTH AND SAFETY) ACT CHAPTER 16.02 Revised Edition, 31 December 2001		・本事業も、本法が定める労働契約、労働安全確保等を遵守する必要がある
雇用と職業における機会均等法 SAINT LUCIA EQUALITY OF OPPORTUNITY AND TREATMENT IN EMPLOYMENT AND OCCUPATION ACT, CHAPTER 16.14, Revised Edition, 31 December 2001		・本事業も、本法が定める労働契約、労働安全確保等を遵守する必要がある

その他のセ国法令で、内容を確認したものの本事業との関連がないと判断したものは以下のとおり：
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)

出典：各法令・JICA 調査団

(2) 環境行政の主要機関

セ国における環境行政は、環境汚染等については持続的発展・エネルギー・科学技術省（Ministry of Sustainable Development, Energy, Science and Technology）、生物多様性保全については農業・漁業・計画・自然資源・コオペラティブ省(Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operatives)が所管しており、保護区域の保護・保全活動はセントルシア・ナショナルトラストが行っている。

また、開発事業の審査は先に述べたとおり同省の下部組織である計画開発部(Physical Planning and Development Division)が一括して行うこととなっており、開発申請書と併せて提出されるEIA報告書も同部によって審査される。

社会的弱者に対する施策の立案・実施を含む社会配慮政策は、主として公正・社会正義・エンパワーメント・青少年育成・スポーツ・地方自治体省 Ministry of Equity, Social Justice, Empowerment, Youth Development, Sports and Local Governmentの所管である。

(3) 環境基準

セ国における環境基準は1990年に開設されたThe Saint Lucia Bureau of Standardsが発行機関となっているが、これまでに公表された基準類は主として食品の安全衛生や工業、観光業関連施設等に関するもので、生活環境に関する基準は1980年に出された「レクリエーション用水域の水質基準」に記載されている、保護された水域及びレクリエーション用水域への排水水質基準のみである。（表2）

表2 保護された水域及びレクリエーション用水域への排水水質基準

Parameter	Effluent limit
Total Suspended Solids (TSS)	30 mg/l*
Biochemical Oxygen Demand (BOD)	20 mg/l
pH	5-10 pH units
Fats, Oil and Grease	15 mg/l
Faecal Indicators 1) Faecal Coliform OR a. *E. coli* b. enterococci	 200 mpn/100 ml 126 organisms/100ml 35 organisms/100 ml
Floatables	not visible
1) Parties may meet effluent limitations either for faecal coliform or for *E. coli* (freshwater) and for enterococci (saline water).	
*: Does not include algae from treatment ponds	

出典：SAINT LUCIA NATIONAL STANDARD SLNS 83: 2010
GUIDELINES FOR RECREATIONAL WATER QUALITY

(4) 廃棄物管理

セ国における廃棄物管理は1996年に設立された廃棄物管理局（Solid Waste Management Authority）が行っている。

廃棄物は以下のように区分され、収集される。

家庭ごみ：無料で週１回拠点回収

粗大ごみ：無料で月一回拠点回収

工場・事業所廃棄物：独自に回収・処分業者と契約

廃棄物の収集は民間業者に委託して行われており、処分は廃棄物管理局が運営する南北２か所の埋立処分場において行われている。（図1）

廃棄物管理局のホームページによると、埋立処分場で受け入れている廃棄物の種類は以表3のとおりである。

表3 埋立処分場で受け入れている廃棄物の種類

家庭ごみ	剪定枝等
商業・事業所廃棄物	アスベスト系廃棄物
行政・公共施設からの廃棄物	船舶廃棄物
工業廃棄物	その他（医薬品、ファイバーグラス、バイオメディカル）
建設廃棄物（廃材を含む）	

出典：http://www.sluswma.org/index.php?option= com_content&view=article&id=34&Itemid=123

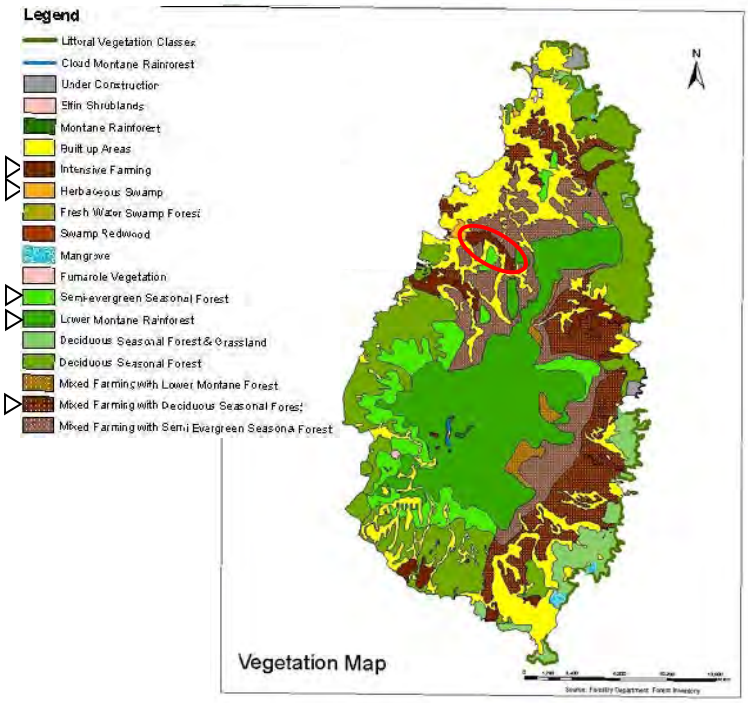
出典：http://www.sluswma.org/index.php?option=com_content&view =article&id=34&Itemid=123

図 1　北部の廃棄物を受け入れるデグロス埋立処分場

付属資料３　事業を実施する地域の特性及びスコーピング

(1) 植生及び土地利用

2009年に森林局によって作成されたセントルシア国の植生図を図1に示す。カルデサック川流域は、河口部にスゲ・ヨシ等が優先する樹木が少ない湿原(Herbaceous swamp)が広がり、その上流は集約的な農地（Intensive farming, バナナ園）が広がっている。上流部の樹林は常緑・落葉混交林(Semi-evergreen seasonal forest)及び低山地熱帯降雨林(Lower montane rainforest)であり、標高が低い丘陵地では森林と農地が混交している(Mixed farming with deciduous seasonal forest)。



出典：森林局

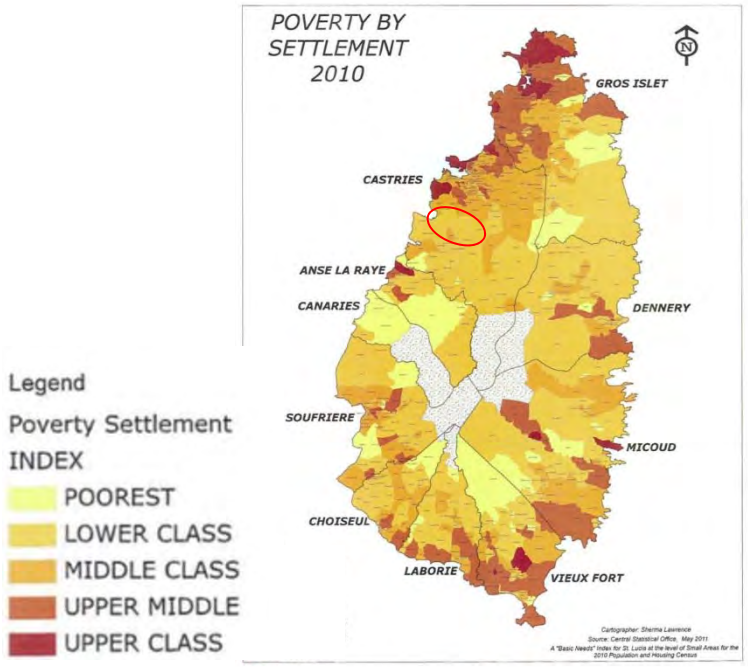
図 1　植生の種類と分布

(2) 貧困の状況

2015 年に策定された National Social Protection Policy は、2005 年に行われた recent Country Poverty Assessment (CPA) for Saint Lucia の調査結果を最新情報として引用している。これによると、セントルシア国の貧困率は 1995 年は 25.1%、2005 年は 28.8%であった。2005 年の貧困ラインは成人一人当たり 1 日 XCD 13.93 (USD 5.22)、1 ヶ月 XCD 423.83 (US 158.74)、年収では XCD 5,086.00 (USD 1,904.87)であった。世帯主が女性の場合の貧困率は 21.2%で、男性が世帯主の場合の貧困率 21.2%との間に著しい違いは見られなかった。

2010 年の人口・世帯センサスによると、貧困世帯の分布状況は図 2 に示すとおりで、本事業の対象区域は Lower Class に色分けされ、比較的貧しい地域である。

なお、2015 年 4 月 25 日の新聞記事(The Voice)によると、2014 年の失業率は 24.9%であった。



出典：2010年人口・世帯センサス

図 2　貧困世帯の分布状況

一方で、UNDP の Human Development Report 2015 によると、セントルシア国の 2014 年時点の Human Development Index は 1980 年の数値に比べて、出生時平均余命が 6.2 年伸びて 75.1 歳、教育期間の長さが 2.3 年伸びて中央値で 9.3 年、期待値で 12.6 年、一人当りの GNI 指数は 82.2%増加して 9,765(2011 PPP$)となっている。

同報告書において、セントルシア国の 2014 年時点の Human Development Index(HDI)は 0.729 で、不平等調整済み人間開発指数(IHDI)は表 1 に示すように 0.613 と 15.9 ポイント低下するものの、高 HDI 国の平均 0.600 及びラテンアメリカ及びカリブ諸国の平均 0.570 よりも高い値を維持している。出生時平均余命、教育期間、収入のいずれの項目においても、セントルシア国の不平等率は高 HDI 国及びラテンアメリカ及びカリブ諸国よりも小さくなっている。以上から、セントルシア国国民間の不平等は存在するものの著しい状態にはないと考えられる。

表 1　人間開発指数及び不平等調整済み人間開発指数の状況

	HDI value	IHDI value	Overall loss (%)	Human inequality coefficient (%)	Inequality in life expectancy at birth (%)	Inequality in education (%)	Inequality in income (%)
Saint Lucia	0.729	0.613	15.9	15.5	9.9	9.2	27.4
Latin America and the Caribbean	0.748	0.570	23.7	23.2	13.3	21.0	35.2
High HDI	0.744	0.600	19.4	19.0	10.7	16.8	29.4

出典：Human Development Report 2015, UNDP

(3) ジェンダーの状況

UNDPのHuman Development Report 2015でジェンダー開発指数(GDI)をみると、表2に示すように、セントルシア国のGDI値は0.991と高HDI国の0.954、ラテンアメリカ及びカリブ諸国の0.976よりも平等性が高い状況にある。

表 2　ジェンダー開発指数の状況

	Life expectancy at birth		Expected years of schooling		Mean years of schooling		GNI per capita		HDI values		F-M ratio GDI value
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	
Saint Lucia	77.8	72.4	13.0	12.1	9.4	9.3	8,018	11,576	0.725	0.731	0.991
Latin America and the Caribbean	78.2	71.7	14.4	13.7	8.0	8.1	10,194	18,435	0.736	0.754	0.976
High HDI	77.4	72.8	13.8	13.4	7.7	8.5	10,407	17,443	0.724	0.758	0.954

出典：Human Development Report 2015, UNDP

また、UNICEFのSAINT LUCIA MULTIPLE INDICATOR CLUSTER SURVEY 2012によると、表3、表4に示すとおり、無償で行われる義務教育である小学校（７年間：infant grades：K, 1, 2、primary grades：3 to 6）・中学校・高校（Secondary School ５年間）への就学率は、小学校の入学率が男子100%に対し女子94.8%と差があるものの、中学・高校の就学率は女子の方が高くなっている。

表 3　小学校への就学率

Primary school entry		%
Sex	Male	100.0
	Female	94.8
Area	Urban	100.0
	Rual	97.3
wealth	Poorest 40%	95.5
	Richest 60%	100.0

出典：SAINT LUCIA MULTIPLE INDICATOR CLUSTER SURVEY 2012, UNICEF p.82

表 4　中学校・高校への就学率

Secondary school entry		Male %	Female %
Sex		91.2	92.3
Area	Urban	89.8	91.9
	Rual	91.5	92.4
Wealth	Poorest 40%	86.7	90.0
	Richest 60%	94.4	94.3

出典：SAINT LUCIA MULTIPLE INDICATOR CLUSTER SURVEY 2012, UNICEF p.82

以上から、本事業の実施対象区域において、著しいジェンダー不平等の状態は存在しないと考えられる。

なお、第一次現地調査において建築物の建設工事現場を視察したところ、肉体労働作業員は全て男性であったものの、監督員及び施工管理エンジニアには女性も含まれており、聞取り調査の結果、同一労働同一賃金の方針は既に実施されていた。

(4) 地域の特性のまとめ及びスコーピング

事業を実施する地域の概況を調査し、事業内容から発生する可能性がある環境影響、及びスコーピング実施時点では影響発生の可能性が不明である項目を選定した。結果を表 5 に示す。

表５　事業を実施する地域の特性とスコーピング結果

項目		スコーピング結果		地域の特性	スコーピングの根拠
		工事前・工事中	供用時		
公害・環境汚染					
1	大気質	B-	D	* セ国では大気質の常時監視は行われていない * セ国の自動車登録台数は約６万台であり、現況において自動車に起因する著しい大気汚染は発生していないと考えられる * 事業対象地の周辺環境は緑の多い住宅地及び商業地であり、特段の大気汚染源は存在しない	＜工事中＞工事期間中のアクセス区間の盛土工事及び資材運搬、建設機械の稼動により、大気汚染が発生する可能性がある ＜供用時＞本事業は既存道路橋及びアクセス区間に対する洪水被害を軽減するための改善（架け替え）を行うものであり、供用時の道路・橋の位置は現況と大きく変わらず、本事業の実施が当該区間の交通量増加を招くものでもないため、大気環境への負荷は発生しない
2	水質	B-	D	* セ国では水質の定期的なモニタリングは行われていない * 事業対象地の周辺環境は緑の多い住宅地及び商業地であり、特段の水質汚染源は存在しない	＜工事中＞工事期間中の河道内の掘削工事等により、濁水が発生する可能性がある ＜供用時＞供用時には水質への影響は発生しない
3	廃棄物	B-	D	* 国内の廃棄物は、Solid Waste Management Authorityから委託を受けた民間企業により収集され、南北それぞれ１か所ある処分場で埋立て処分されている	＜工事中＞工事に伴い、残土、燃料容器等の廃棄物が発生する可能性がある ＜供用時＞供用時には特段の廃棄物は発生しない
4	土壌汚染	B-	D	* セ国においてこれまで特段の土壌汚染は発生していない	＜工事中＞工事期間中の燃料等の漏洩により土壌汚染が発生する可能性がある ＜供用時＞供用時には土壌汚染は発生しない
5	騒音振動	B-	D	* セ国では騒音・振動の常時監視は行われていない * セ国の自動車登録台数は約６万台であり、現況において自動車に起因する著しい騒音・振動は発生していないと考えられる * 事業対象地の周辺環境は緑の多い住宅地及び商業地であり、特段の騒音・振動の発生源は存在しない	＜工事中＞工事期間中の建設機械の稼動により、騒音・振動が発生する可能性がある ＜供用時＞本事業は既存道路橋及びアクセス区間に対する洪水被害を軽減するための改善（架け替え）を行うものであり、供用時の道路・橋の位置は現況と大きく変わらず、本事業の実施が当該区間の交通量増加を招くものでもないため、騒音・振動への負荷は発生しない
6	地盤沈下	D	D	* セ国においてこれまで特段の地盤沈下は発生していない	＜工事中＞本事業の工事では、地盤沈下の原因となりうる工事は行わない ＜供用時＞本事業の供用時には、地盤沈下の原因となりうる活動は行われない
7	悪臭	D	D	* セ国においてこれまで特段の悪臭被害は発生していない	＜工事中＞本事業の工事では、悪臭の原因となりうる活動は行わない

項目		スコーピング結果		地域の特性	スコーピングの根拠
		工事前・工事中	供用時		
					＜供用時＞本事業の供用時には、悪臭の原因となりうる活動は行われない
8	底質	D	D	* セ国においてこれまで特段の底質汚染は発生していない	＜工事中＞本事業の工事では河道内の掘削等の工事を行うが、底質汚染の原因となりうる重金属、ダイオキシン等は使用しない ＜供用時＞本事業の供用時には、底質汚染の原因となりうる活動は行われない
	自然環境				
9	保護区	D	D	* セ国では６種類の保護区等が合計 29 か所指定されている * 事業対象地はこれらの保護区内に配置しておらず、近隣にも保護区は存在しない	＜工事中＞本事業の工事は保護区等に影響を与えない ＜供用時＞本事業の供用時に、本事業に起因する保護区等への悪影響は発生しない
10	生態系	D	D	* 事業対象地の周辺環境は緑の多い住宅地及び商業地であり、特筆すべき生態系は存在しない	＜工事中＞本事業の工事は重要な生態系等に影響を与えない ＜供用時＞本事業の供用時に、本事業に起因する重要な生態系等への悪影響は発生しない
11	水象	C	D	* 本事業の対象地を含むカルデサック川は、支川の存在、急勾配、あるいは大きな屈曲など、比較的複雑な形状である	＜工事中＞本事業は、橋脚や護岸等の河道内の工事が必要であり、工事中カルデサック川の水象（水位・流速）に変化が発生する可能性がある ＜供用時＞本事業により大雨時の洪水（流出水の河道外への越流・氾濫）が抑制され、平常時の水象に対しては本事業に起因する悪影響は発生しない
12	地形・地質	D	D	* 本事業の対象地を含むカルデサック川は、支川の存在、急勾配、あるいは大きな屈曲など、比較的複雑な形状である * 事業対象地の表層地質は、主に安山岩(Andesite)と安山岩質の火山灰堆積物である * 事業対象地及びカルデサック川下流部には、特段の学術的に重要な地形・地質は存在しない	＜工事中＞本事業の工事は重要な地形・地質に影響を与えない ＜供用時＞本事業の供用時に、本事業に起因する重要な地形・地質への悪影響は発生しない
	社会環境				
13	非自発的移転・財産の消失	B-/C	D	* 本事業の対象地及び周辺はほとんどが民有地となっている * セ国の建設工事では、建設発生土は、盛土や地盤改良を必要とする土地所有者の所有地に搬入されるか、最終処分場に搬入処分され	＜計画段階＞本事業の着工に先立ち、新たなアクセス道路の用地あるいは工事中の仮設道路用地等について、事業主体による用地取得・借地契約・補償等への合意と支払いが必要となる可能性がある ＜工事中＞工事開始に先立ち高事

項目		スコーピング結果		地域の特性	スコーピングの根拠
		工事前・工事中	供用時		
				る	業者により資材ヤード等が確保される際、施工業者の所有地等事前に確保された土地でない場合、工事期間中の既存土地利用の停止、一時的借地が必要となる可能性がある。 本事業の工事中に発生土の土捨てが必要となった場合、工事期間中の既存土地利用の停止あるいは用地取得・借地が必要となる可能性がある ＜供用時＞本事業の供用時に新たな移転等は発生しない
14	貧困層	D	D	* 本事業の対象地及び周辺にはスラム地域等は存在しない	＜計画段階＞＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業の計画段階、工事中及び供用時に特定地域の貧困層に対する悪影響は発生しない
15	少数民族・先住民族	D	D	* セ国では、社会的に他と区分された少数民族、先住民族は存在しない	＜工事中＞＜供用時＞本事業による少数民族・先住民族に対する悪影響は発生しない
16	雇用や生計手段等の地域経済	D	D	* 本事業の対象地を含むカストリーズ（中心市街地を除く）の主な雇用分野は、Human health and social work activities（保険・福祉関連）(29%), Accommodation and food service activities（ホテル・飲食関連）(16%), Wholesale and retail trade; repair of motor vehicles and motorcycles（卸売り・小売・自動車修理）(11%), Public administration and defence; compulsory social security（公務員・軍・警備）(8%)である	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業による雇用や生計手段等の地域経済に対する悪影響は発生しない
17	土地利用・地域資源利用	D	D	* 本事業の対象地を含む地域の土地利用は主に森林・ココヤシ等の果樹園（斜面上部）、バナナ園等の農地・放牧地（平地）、緑の多い住宅地（前２タイプの境界部）であり、自然資源の採取は行われていない	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業による土地利用・地域資源利用に対する悪影響は発生しない
18	水利権・水利用	C	D	* セ国の主要な上水水源は各河川の表流水である * 流域はいずれも小さく、貯水ダムは全国で１か所しか整備されていないことから、渇水が発生するリスクは高く、全ての建物・施設では必要上水量の３日分を常に貯留しておくことが義務付けられている	＜工事中＞本事業の工事中に、ラヴィン・ポアソン橋上流の取水施設周辺の水位・流速が変化する場合、本事業による既存の水利用に対する悪影響が発生する可能性がある ＜供用時＞本事業により大雨時の洪水（流出水の河道外への越流・氾濫）が抑制されるが、大雨時・平常時とも、ラヴィン・ポアソン

項目		スコーピング結果		地域の特性	スコーピングの根拠
		工事前・工事中	供用時		
				* カルデサック川流域には、ラヴィン・ポアソン橋上流に The Water and Sewerage Company Inc.が管理する上水道の取水施設１か所が設置されている * 事業対象地及び周辺でその他の利水活動は確認されていない	橋上流の取水施設周辺の水象の変化は発生せず、本事業による既存の水利用に対する悪影響は発生しない
19	既存の交通施設・公共施設・社会インフラ・社会サービス	C	C	* 本事業の対象道路は国内幹線道路であるが、ほとんどの区間が片側１車線しか幅員がない * 起伏に富んだ地形を通過する道路であり、本事業の対象地周辺でも速度が遅い重量車両を追い抜けないことによる渋滞は時折発生している * ミニバス・ミニバンを使用した民営バスが市民の主要な公共交通機関として普及している * ラヴィン・ポアソン橋に隣接して教会と学校がある * カルデサック橋は首都と石油貯蔵所を結ぶ路線上に位置している	＜工事中＞本事業の工事期間中、仮設道路・仮設橋周辺で片側通行の規制が行われる場合、現況よりも交通渋滞が頻繁に発生する可能性がある また、ラヴィン・ポアソン橋に接する教会・学校へのアクセスが、交通渋滞や交通規制により、現況よりも困難になる可能性がある ＜供用時＞本事業の供用時には、新たな道路線形が現況と異なる場合、誘導・安全配慮が行われないと、供用開始後一時的に交通事故が増大する可能性がある
20	社会関係資本、地域の意思決定機関、社会組織	D	D	* 本事業の対象地は全て Castries South East 選挙区(Constitution)に含まれる * 行政区域としては、本事業の対象地は全て Castries 地区(Quarter)に含まれる	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業による社会関係資本、地域の意思決定機関、社会組織に対する悪影響は発生しない
21	便益と被害の偏在	D	D	* 本事業の対象道路は主要空港と首都を結ぶ最重要道路であり、国内の経済・社会と国民の生活が直接的・間接的に当該道路に依存していると考えられる	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業に起因する便益と被害の偏在は発生しない
22	地域内の利害対立	D	D	* 本事業の対象道路は主要空港と首都を結ぶ最重要道路であり、国内の経済・社会と国民の生活が直接的・間接的に当該道路に依存していると考えられる	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業による地域内の利害対立は発生しない
23	コミュニティの分断	D	D	* 本事業の対象道路は主要空港と首都を結ぶ最重要道路であるが、幅員は片側１車線で交通量は１日 5,000 - 9,000 台程度であり、道路を挟むコミュニティの分断は発生していない	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うもので、幅員の大幅な拡幅や交通量の増加につながるものではなく、本事業によるコミュニティの分断は発生しない
24	歴史的資源、文化的資源	D	D	* 本事業の対象地及び周辺には特筆すべき歴史的資源、文化的資源等は存在し	＜工事中: No＞＜供用時:No＞本事業は既存道路橋の改善を行うものであり、本事業による歴史・文

項目		スコーピング結果		地域の特性	スコーピングの根拠
		工事前・工事中	供用時		
				ない	化資源への悪影響は発生しない
25	景観	D	D	* 本事業の対象地及び周辺には特筆すべき景観資源、観光資源等は存在しない	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業による景観への悪影響は発生しない
26	ジェンダー	D	D	* 統計資料を見ると、セ国のジェンダー平等性は高く、本事業の実施対象区域において、著しいジェンダー不平等の状態は存在しないと考えられる	＜工事中＞＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業によるジェンダーへの悪影響は発生しない
27	子どもの権利	B-	D	* 基本的な子どもの権利である、ケア・遊び・教育等の供給、虐待・無視・搾取・差別からの保護、地域活動等への参加について、事業対象地及び周辺において特段の問題はない * ラヴィン・ポアソン橋に接して学校(12学年)及びグラウンドがある	＜工事中＞ラヴィン・ポアソン橋に接して学校及びグラウンドがあり、工事中は通学やグラウンド使用に当って事故リスクが高まる可能性がある ＜供用時＞ラヴィン・ポアソン橋は既存の位置に整備するため、供用時には、グラウンドを利用する児童の活動への制限や事故リスクは発生しない
28	衛生環境、公衆衛生、 HIV/AIDS を含む感染症	B-	D	* 国土が狭小な島国であるセ国では、工事労働者は通常自宅から通勤する * セ国では、蚊が媒介するデング熱、ジカ熱、チクングニヤ熱、マラリアが発生している *水中に病原菌・虫が存在するレプトスピラ症 leptospirosis、住血吸虫症 schistosomiasis は、カルデサック川の流速が極めて早い環境で発生する可能性は低い	＜工事中＞工事個所に発生する溜り水が蚊の発生源となる可能性がある。水中作業を行う際に病原虫等に感染する可能性は低いと考えられるが、ゴム長靴・ゴム手袋等の感染防止策の採用が望ましい。 事業に伴う労働者の越境移動や宿舎の建設・供用は行わないないため、衛生環境等に対する悪影響は発生しない ＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業による衛生環境等への悪影響は発生しない
29	労働安全衛生、労働環境	B-	D	* セ国の標準的な建設工事では労働安全衛生・労働環境に対する配慮が十分行われている	＜工事中＞十分な配慮を行っていても、予期せぬ事故等が発生する可能性があり、また、事故等の発生時の対応を十分準備しておく必要がある ＜供用時＞本事業は既存道路橋の改善を行うものであり、本事業の供用時に、本事業に起因する労働安全衛生等への悪影響は発生しない
	その他				
30	事故・犯罪	B-	B-	*セ国内の交通事故による死亡者数は概ね 15-30 人/年の間で、近年の最大値は 2011 年の 39 人であった * 2002 年から 2012 年の合計では、Castries/Gros Islet Highway が 42 人、ラヴィン・ポアソン橋とファランド橋が位置する Bexon	＜工事中＞本事業の工事期間中、通過交通を仮設道路に誘導する場合、十分な安全配慮が行われないと交通事故が増大する可能性がある。また、降雨時には短時間で流速が極めて大きくなる環境であり、河道内で作業を行う際には押し流される危険性がある。

項目		スコーピング結果		地域の特性	スコーピングの根拠
		工事前・工事中	供用時		
				Highway が 18 人、カルデサック橋に近い Millenium Highway が 12 人、セ国南東部の Micoud/Vieux Fort Highway が 18 人であった * ラヴィン・ポアソン橋及びフェランド橋の付近は、どちらも道路がゆるいカーブを描きかつ通過交通のスピードが極めて速い * カルデサック橋付近は直線道路であるがガスタンク車やトレーラー車等の大型車両が多く通過する	＜供用時＞本事業の供用時に、新たな道路線形が現況と異なる場合、十分な誘導・安全配慮が行われないと、供用開始後一時的に交通事故が増大する可能性がある
31	越境的影響、気候変動	D	D	* セ国は動植物の帰化種や気候変動による海面上昇・ハリケーン規模の拡大等の影響を受けやすい小島嶼国である	＜工事中＞本事業は既存道路橋の改善を行うもので、温室効果ガスの発生は小規模であること、使用する資機材はできる限り国内の市場から調達する方針であることから、本事業による越境的悪影響、気候変動への悪影響は発生しない ＜供用時＞本事業は既存道路橋の改善を行うもので、本事業の実施により交通量が大きく増大するものではないため、本事業による越境的悪影響、気候変動への悪影響は発生しない

出典： JICA 調査団

付属資料４ 調査計画及び調査結果

スコーピングの結果、影響が発生する可能性があると判断された項目及びスコーピング実施時点では影響発生の可能性が不明である項目について、調査計画を設定した。調査計画及び調査結果を表１に示す。

表１ 調査計画及び調査結果

	項目	調査計画	調査結果
公害・環境汚染			
1	大気質	工事中 ● 資材等の運搬車両の通行ルートを把握し、沿道の影響を受けやすい施設等の立地の有無を確認する ● 主要な排気ガス発生源となる建設機械等の種類、稼動位置、継続期間を把握し、近隣の影響を受けやすい施設等の立地の有無を確認する	● 工事中の運搬車両（搬入・搬出）は主に事業対象２橋間の東海岸道路を通行すると想定される。当該道路は片側１車線ずつの道路であり、舗装状況は比較的良好である。 ● 運搬車両の発生交通量は最大１日100台程度と想定される。東海岸道路の既存交通量はフェランズ橋で8735台、ラヴィン・ポアソン橋で4873台であった。 ● 工事個所近隣の影響を受けやすい施設としては、ラヴィン・ポアソン橋に近接する教会及び教会付属の学校がある。 ● 類似の土木工事・建築工事を視察したところ、低公害型重機は特段確認できなかったが、機械・車両とも良好な整備状況にあり、排気ガスによる特段の問題は目視・臭気等では確認されなかった。（図 1, 図 2）
2	水質	工事中 ● 河道内の工事及び河川隣接地での盛土・掘削工事の内容、規模、及び濁水流出防止策を確認する	● カルデサック橋において、新橋西側から既設橋東側まで掘削し河道断面を拡幅して洪水対応能力を改善する。低水路は新橋の前後を拡幅（掘削）し、護岸工の施工を行う。当該掘削工事は短期間で完了するが、当該期間中は濁水が発生すると予想されるため、土嚢を利用した施工箇所と水流との分離により、下流への濁水の流出を防止する。 ● ラヴィン・ポアソン橋における低水路部土工は、新橋建設地点における河川断面の拡幅のために実施する。濁水が発生する作業時には土嚢を利用した施工箇所と水流との分離により、下流への濁水の流出を防止する。 ● 対象２サイトの下流における飲用水の採取や養殖漁業等の水利用は、確認されなかった。
3	廃棄物	工事中 ● 工事区域及び資材ヤードから発生する建設廃棄物の種類・量を把握する ● セ国における建設廃棄物の処分方法を確認する	● 開発行為に関する廃棄物管理計画提出ガイドラインに基づき、開発事業実施主体は発生する廃棄物等の種類・量・保管方法・移動方法・処分方法等を Solid Waste Management Authority に報告する ● 廃棄物は国が定めた処分場に排出される。資源物は排出者との契約により民間業者が回収している ● 既設構造物撤去により発生する廃棄物の種類は主にコンクリート、アスファルト、路盤材、鉄骨、掘削土である。 ● 本事業により発生する掘削土量は 20,000m3 程度で、そのうち、盛土材として再利用可能な土砂は 5,500 m3 と想定される。再利用不可能な土砂は、

	項目	調査計画	調査結果
			既存の Deglos Sanitary Landfill に搬入し、覆土材として再利用する。（図 3）一方、必要となる盛土量は 13,500m3 程度と想定され、その差の 8,000m3 程度は許可を受けた販売業者から購入する。
4	土壌汚染	工事中 ● 資材ヤードの位置とヤード内で行われる保管・修理等の活動の内容、及び工事個所の位置と周辺状況を確認する ● 保管・使用される油類・薬品類のうち地下水汚染の原因となりうる資材の有無を確認する ● 資材ヤード及び工事個所周辺の地下水利用状況を確認する	● セ国の主要な上水水源は各河川の表流水であり、資材ヤード及び工事個所周辺の地下水利用は確認されなかった。 ● 工事個所は既存２橋の現位置及びごく近い位置である。 ● 資材ヤードの候補地は、カルデサック橋については工事個所に近い低未利用地（公有地で放牧地として利用されている）、ラヴィン・ポアソン橋では隣接する教会の所有地のうちの低未利用地（イベント時の駐車場として利用されている）を想定している。 ● 工事に使用される、汚染物質となりえる資材としては、燃料・潤滑油等の油分があるが、その他の重金属や化学物質が使用される予定はなく、現地の土壌・岩盤は自然由来重金属を含有するものではない。 ● 類似の土木工事・建築工事を視察したところ、場内の土壌に燃料漏れ等の土壌汚染の痕跡は確認されなかった。（図 1, 図 2）
5	騒音振動	工事中 ● 資材等の運搬車両の通行ルートを把握し、沿道の影響を受けやすい施設等の立地の有無を確認する ● 主要な騒音・振動発生源となる建設機械等の種類、工事個所、継続期間を把握し、近隣の影響を受けやすい施設等の立地の有無を確認する	● ラヴィン・ポアソン橋に隣接する学校には約 180 名８学年（幼稚園～小学校）の児童生徒が通学している。 ● 多くの児童生徒は４台のスクールバスで、残りは徒歩で通学しており、通学時間は７時～８時 30 分、下校時間は 15 時～16 時である。 ● 教会における祈祷は、土曜日の 10 時～15 時、水曜日及び日曜日の 19 時～20 時に行われている。 工事中 ● 工事中の運搬車両（搬入・搬出）は主に事業対象２橋間の東海岸道路を通行すると想定される。当該道路は片側１車線ずつの道路であり、舗装状況は比較的良好である。 ● 運搬車両の発生交通量は最大１日 100 台程度と想定される。東海岸道路の既存交通量はフェランズ橋で 8735 台、ラヴィン・ポアソン橋で 4873 台であった。 ● 工事個所近隣の影響を受けやすい施設としては、ラヴィン・ポアソン橋に近接する教会及び教会付属の学校がある。 ● 本事業で比較的大きな騒音の発生が予想される工種としては、ラヴィン・ポアソン橋では旧橋撤去工、掘削工、道路土工（基盤締固め）が、カルデサック橋では場所打ち杭、道路土工（補強土の運搬・盛土）が考えられる。 ● 類似の土木工事・建築工事を視察したところ、低公害型重機は特段確認できなかったが、機械・車両とも良好な整備状況にあり、通常想定される範囲を超える騒音・振動は確認されなかった。（図 1,

	項目	調査計画	調査結果
			図 2）
	自然環境		
11	水象	工事中 ● 一時的な河道付替えを含む河道内の工事内容、河道内の仮説施設等の内容と規模、工事期間中の流下能力を確認する	● カルデサック橋及びラヴィン・ポアソン橋における仮水路工では、既設橋の撤去工事を行う２ヶ月程度の期間、既設橋の水路部にパイプカルバートを設置し、河川水は通常時はカルバート内を流れる計画である。カルデサック橋では、高水時にカルバートの流下能力を超えた水量を放水するための仮水路を既存道路部の掘削により確保する計画である。 ● いずれの工事も、工事中のほとんどの期間はカルデサック川の河川水は既存の水路内を流れ、工事期間中の約２ヶ月の間のみ、既存水路に設置されるパイプカルバート内を流れることとなる。従って、本工事期間中、カルデサック側の水象（流速・水位）は、平常時、高水位時とも、現況から大きく変化しないものと想定される。
	社会環境		
13	非自発的移転・財産の消失	計画段階 ● 本事業の実施に必要な用地取得の範囲、影響を受ける民有・公有の既存施設等、必要な補償・支援費用、実施すべき手続き・協議等の内容とスケジュールを明らかにする 工事中 ● 本事業の工事中の発生土の量と処理・処分方針を明らかにする	計画段階 ● カルデサック橋周辺では、私有地4区画、合計約1,300m2を取得する必要がある。その他に、公有地約1.4haが、本事業の実施に当り道路・河川用地として必要となる。取得対象の民有地上には、外周フェンス・ゲート・看板４件、建築物１件、移動式屋台１件、植栽１件が存在する。公有地上には移動式屋台５件、植栽１件が存在する。公共物としては埋設高圧電線、電柱、電話線（埋設）、スクールゾーン標識、排水溝がある ● ラヴィン・ポアソン橋周辺では、工事期間中、私有地４区画、合計約 1,710m2 を仮設橋及び接続道路用地として借用する必要がある。その他に、公有地 240m2 の占有が必要である。借地対象の民有地上には、花弁畑１件、植栽１件、チェーンゲート１件が存在する。公有地上にはフェンス・高木・低木植栽が存在する。公共物としては電柱、電話線、水道、排水溝がある。 ● 本事業の実施に必要な用地取得及び補償・支援等の詳細は、2-3-5-11 節に記載した。 工事中 ● 本事業で建設発生土の廃棄が必要となった場合は、既存の Deglos Sanitary Landfill に搬入し、廃棄物の覆土として活用される計画である。（図 3）
18	水利権・水利用	工事中・供用時 ● 本事業の工事中の仮設施設等、及び供用時の河道設計により、ラヴィン・ポアソン橋上流の取水施設周辺の水象に生じる変化の有無と内容・程度を確認する	● セ国には日本の水利権に相当する権利を定めた法令は存在しない 工事中・供用時 ● ラヴィン・ポアソン橋の工事により、上流の取水施設周辺の水象（流速・水位）に変化は生じない計画・設計である。
19	既存の交通施設・公共施設・社会インフ	工事中 ● 本事業の工事期間中の仮設道路・仮設橋	工事中・供用時 ● 警察官による規制・誘導が必要な場合は、３橋と

	項目	調査計画	調査結果
	ラ・社会サービス	の計画・設計と、必要な交通規制について確認する ● ラヴィン・ポアソン橋に接する教会・学校へのアクセス確保策を確認する ● カルデサック橋付近の大型車両の通行への制限、渋滞発生の可能性を検討する ● 電気・電話等の一時的撤去及び再整備に必要な協議・手続きを明らかにする 供用時 ● 供用時の道路線形と、現況及び工事中の線形を比較する ● 供用時に提供される誘導・安全配慮を確認する	もカストリーズ署から警察官が派遣されることとなる 工事中 ● カルデサック橋付近の接続道路が現道と重なる部分の工事を実施する際に渋滞が発生する可能性がある。 ● ラヴィン・ポアソン橋に接する教会・学校へのアクセスは、交差点形状が三叉路状に変わるものの、アクセスに重大な困難は予想されない。 ● 電気・電話等の一時的撤去及び再整備については、各担当会社に対して本事業の目的の説明を現地において行い、通常の道路工事で行われる手続きに従って協議を進めることで合意を得た。 供用時 ● カルデサック橋付近は、供用時の道路線形と、現況及び工事中の線形が異なる計画である。そこで、工事中及び供用時の誘導・安全配慮策として、工事警告板を設置する。 ● ラヴィン・ポアソン橋では、工事中の線形が、現況及び供用時と異なる計画である。そこで、工事中の誘導・安全配慮策として、工事警告板ならびに減速ハンプを設置する。
27	子どもの権利	工事中 ● ラヴィン・ポアソン橋の工事中の通学やグラウンド使用への影響を検討する 供用時 ● 現存するグラウンドの一部が永続的に道路に転換される可能性の有無と、その場合のグラウンドを利用する児童の活動への制限や事故リスクを検討する	工事中 ● ラヴィン・ポアソン橋の工事にあたり、仮設橋と接続道路及び資材ヤードは学校グラウンドを使用しない計画である。 ● また、通学児童・生徒の多くは４台のスクールバスを利用して通学している。 ● 工事中、学校へのアクセスが仮設道路を利用することとなるため、歩行空間・横断空間の確保など、徒歩通学の児童生徒の安全確保策が必要である。 供用時 ● 本事業では現存するグラウンドを道路用地に転換しない。 ● 供用時には学校へのアクセスは現況と同じ道路を利用することとなるため、児童の事故リスクは現況から大きく変化しないと考えられる。
28	衛生環境、公衆衛生、HIV/AIDS を含む感染症	工事中 ● 施工計画において、蚊の発生源となりえる溜り水の発生防止策、水中作業における感染防止策を確認する	工事中 ● 施工計画において、特に資材ヤード内で、蚊の発生源となりえる溜り水が発生しないよう毎日のパトロールを行う必要がある。 ● また、水中作業ではゴム長靴・ゴム手袋等の感染防止策の採用が望ましい。
29	労働安全衛生、労働環境	工事中 ● 施工計画、作業工程を確認し、実施可能な事故防止策を把握する	工事中 ● 概況調査の結果、セ国の標準的な土木・建設工事（高所作業を含む）では労働安全衛生・労働環境に対する配慮が十分行われていることが判明し、本事業の工事においても同等の安全策等が実施されると期待できる。 ● ただし、十分な安全対策・労働環境整備を行った場合でも労働事故等の問題が発生する可能性はあり、また、本事業では水位の変動が大きい河道内の工事も行われる計画であることから、事故防止策及び発生時対応策を十分計画・実施する必要がある。

	項目	調査計画	調査結果
	その他		
30	事故・犯罪	工事中 ● 本事業の工事期間中の交通計画、及び実現可能な安全確保計画を把握する 供用時 ● 本事業の供用時の道路線形を確認する ● 設計において配慮・配置された誘導・安全施設や広報方法を確認する	工事中・供用時 ● 警察官による規制・誘導が必要な場合は、２橋ともカストリーズ署から警察官が派遣されることとなる 工事中 ● カルデサック橋については、工事期間中、東海岸道路とミレニアムハイウェイをつなぐ仮設道路を建設する。西海岸道路との接続は、新橋開通までの間、現道を使用する。設計において配慮・配置された誘導・安全施設や広報方法は工事警告板の設置である。 ● ラヴィン・ポアソン橋では、工事期間中、通過車両を仮設橋に誘導される。設計において配慮・配置された誘導・安全施設や広報方法は工事警告板の設置である。 供用時 ● カルデサック橋では、新橋開通後は現道が閉鎖され、新橋から東海岸道路とミレニアムハイウェイに接続する。設計において円滑な交通に配慮した線形計画を行っている。 ● ラヴィン・ポアソン橋では、新橋の開通後は仮設橋が撤去され、現況と同じ道路線形となる。

出典：JICA 調査団

路盤材の敷き均し作業

歩行者通路の確保状況

歩行者の転落防止策

危険防止看板（近隣建築工事現場）

撮影：JICA 調査団

図１ 類似の土木・建築工事の状況（排水・舗装工事）

重機の整備状況は良好　作業員の指揮系統も明瞭　安全装備の着用も徹底

残土搬出状況　過積載は行われていない

手前から守衛所、廃棄物保管所、オフィス、洗面・トイレ

ワークショップの状況

資材ヤードの状況　整頓されていた

撮影：JICA 調査団

図 2 類似の土木・建築工事の状況（デネリー小学校建築工事）

<table>
<tr><td> 
</td><td>  </td></tr>
<tr><td>入口看板　週末も稼動しているが夜間は閉鎖する</td><td>埋立て状況　覆土作業中</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>収集運搬車両　良好に整備されていた</td><td>タイヤの分別保管状況</td></tr>
</table>

撮影：JICA 調査団

図 3 Deglos Sanitary Landfill の状況

付属資料５　影響緩和策

発生が想定された環境及び社会に対する影響を回避・最小化するため、また、本事業が適正な手続に従いスムーズに推進されるため、以下に示す影響緩和策を実施する。

(1) 計画段階

項目・影響要因	環境項目	影響緩和策	実施主体
開発計画の承認	－	・遅滞なく設計図書及び必要申請書類を準備、提出する	インフラ省
用地の確保	非自発的移転・財産の消失	・セ国制度及びJICAガイドラインに基づき、適切なタイミングで用地取得・借地・補償等の手続きを開始し、予定する施工開始のタイミングまでに遅滞なく完了する	インフラ省
ユーティリティの仮設・撤去・回復	非自発的移転・財産の消失	・セ国慣習に基づき、適切なタイミングで既存ユーティリティ所有者・管理者との協議を開始し、予定する施工開始のタイミングまでに遅滞なく合意する	インフラ省
ラヴィン・ポアソン橋改善にかかる学校グラウンド・教会駐車場の機能保全・安全確保計画	子どもの権利	・ラヴィン・ポアソン橋の改善に当りグラウンド機能の改変を最小限とし、教会駐車場もあわせた安全確保を最大限とする ・供用時の交通事故発生を最小限とするための十分な安全策を講じる	インフラ省
取水施設への影響回避	水利権・水利用	・工事中及び供用時に、上流側の取水施設における流況が変化しない計画・設計であることを確認する	インフラ省

出典：JICA 調査団

(2) 工事中

項目・影響要因	環境項目	影響緩和策	実施主体
環境管理計画の承認	－	・必要・十分かつ実施可能な環境管理計画を立案し、インフラ省の承認を得る	施工業者
廃棄物計画の提出	廃棄物	・必要・十分かつ実施可能な廃棄物計画を立案し、SOLID WASTE MANAGEMENT AUTHORITYの承認を得る	施工業者
残土搬入に関する合意	廃棄物 大気質	・Deglos Sanitary Landfillへの約14,500m3の残土搬入と覆土としての再利用についてSOLID WASTE MANAGEMENT AUTHORITY等関係機関と合意する ・運搬中の土ぼこり発生を抑制するための対策を計画する	施工業者
ユーティリティ関連協議	非自発的移転・財産の消失	・セ国慣習に基づき、適切なタイミングで既存ユーティリティ所有者・管理者との協議を開始し、予定する施工開始のタイミングまでに遅滞なく合意する	施工業者
運搬車両の稼動	大気質 騒音振動	・使用する運搬車両は適正に整備されたものを使用する ・規定された積載重量を遵守する	施工業者
工事の存在	大気質	・使用される建設機械・車両を適切に維持管理する ・土ぼこりが発生する場合は、車両等のタイヤを洗浄し、路面に散水するなどの防止策を講じる ・発生土を搬出する際は、覆いをかける等	施工業者

項目・影響要因	環境項目	影響緩和策	実施主体
建設機械の稼動 交通規制の実施 通行ルートの変更　等		の土ぼこり抑止策を講じる	
	騒音振動	・建設機械や発電機は、騒音の発生レベルが低いものをできる限り使用する ・大きな騒音・振動が発生する機械・工種は、夜間を避けて稼動・施工する ・大きな騒音・振動が発生する機械・工種を稼動・施工するに先立ち、近隣の学校・教会・その他公共施設等に施工計画（開始時期・終了時期）を説明する	施工業者
	水質	・河道内の掘削工事等の期間を極力短くする。 ・濁水の発生・流出抑制策を確実に実施する	施工業者
	廃棄物	・工事に伴い発生する、残土、燃料容器等の廃棄物は、計画書どおり適切に処分する	施工業者
	土壌汚染	・工事個所、資材ヤード等における燃料、潤滑油、薬品等が直接地表に漏洩しないよう、室内保管、オイルパンの使用等の措置を講じる	施工業者
	既存の交通施設・公共施設・社会インフラ・社会サービス 子どもの権利 事故・犯罪	・仮設道路・仮設橋はできる限り事故が発生しづらい計画とする ・片側通行の規制を行わざるを得ない場合は十分な人員と交通整理員間の通信手段を確保し、追突事故の発生防止、渋滞の発生緩和に努める ・可能であれば迂回路の利用を広く呼びかける ・児童・生徒の通学時間や教会の集会時間には、集まる歩行者・自家用車の安全を確保し優先的に誘導するよう交通整理員に周知徹底する	施工業者
	労働安全衛生、労働環境	・セ国の安全基準を遵守する ・安全具等の着用を義務付ける ・作業員を対象とした定期ミーティングにおいて安全・衛生に関する周知徹底を図る	施工業者
	感染症	・工事個所及び資材ヤード等の溜り水は毎日巡回して解消するか殺虫剤の散布を行う ・水中作業を行う場合、病原虫等に感染することがないよう、防護策を講じる ・工事個所及び資材ヤード周辺の感染症発生状況、及び作業員の感染症発症状況を継続的にモニタリングする	施工業者

出典：JICA 調査団

(3) 供用時

項目・影響要因	環境項目	影響緩和策	実施主体
道路・橋梁の存在 新規ルートの開通 旧ルートの閉鎖	既存の交通施設・公共施設・社会インフラ・社会サービス 事故・犯罪	・新たな道路線形が現況と異なる場合、開通から当面の間、十分な誘導・安全策を講じ、交通事故の発生を最小化する	警察

出典：JICA 調査団

(4) 関係機関及び予算措置計画

影響緩和策及びモニタリング計画の関係機関は表1に示すとおりである。影響緩和策の実施に必

要な予算は、インフラ省が事業費として確保する計画であり、概算費用は現在調査中である。

表1　環境影響緩和策及びモニタリング計画の関係機関

	影響緩和策の実施	モニタリングの実施	JICA への報告
計画段階	インフラ省	インフラ省	インフラ省
工事中	施工業者	施工管理コンサルタント(CSC)	インフラ省
供用時	警察	インフラ省	インフラ省

出典：JICA 調査団

付属資料６　環境社会配慮のモニタリング計画

１．環境影響評価に関するモニタリング計画

影響緩和策が確実に実施されていること、及び、それらが期待された効果を挙げていることを確認するため、以下に示すモニタリングを実施する。

(1) 計画段階

環境項目	モニタリング対象	実施方法	頻度	実施場所	実施主体
開発計画の承認	・設計図書及び必要申請書類の準備、提出状況	聞取り調査	月１回	－	インフラ省
非自発的移転・財産の消失	・用地取得・借地・補償等の手続きの進捗状況	聞取り調査	月１回	－	インフラ省
	・既存ユーティリティ所有者・管理者との協議の進捗状況	聞取り調査	月１回	－	インフラ省
子どもの権利	・ラヴィン・ポアソン橋の改善に伴うグラウンド機能の改変計画、供用時の交通事故発生抑止計画 ・当該学校への説明及び協議状況	聞取り調査	月１回	－	インフラ省
水利権・水利用	・取水機関への事業計画説明及び協議状況	聞取り調査	月１回	－	インフラ省

出典：JICA 調査団

(2) 工事中

1) 着工前

環境項目	モニタリング対象	実施方法	頻度	実施場所	実施主体
環境管理計画の承認	・環境管理計画の準備、提出、承認状況	聞取り調査	月１回	－	CSC (construction supervision consultant)
廃棄物	・廃棄物計画の準備、提出、承認状況	聞取り調査	月１回	－	CSC
廃棄物（残土） 大気質	・既存処分場における残土受け入れの合意状況 ・運搬中の土ぼこり抑制対策の立案・準備状況	聞取り調査	月１回	－	CSC
非自発的移転・財産の消失	・既存ユーティリティ所有者・管理者との協議状況	聞取り調査	月１回	－	CSC

出典：JICA 調査団

2) 着工後

環境項目	モニタリング対象	実施方法	頻度	実施場所	実施主体
大気質 騒音振動	・運搬車両による影響 ・運搬車両の積載重量・積載方法等の遵守状況	パトロール確認（目視） 苦情受付対応	毎日～月２回（車両数が多い時期は頻度を高める）	・運搬車両の走行ルート沿道の影響を受けやすい施設付近	CSC
大気質	・建設機械・車両の維持管理状況 ・土ぼこりの発生状況 ・タイヤ洗浄、路面散水、発生土搬出の際の覆い等の土ぼこり抑止策の実施状況	パトロール確認（目視） 苦情受付対応	毎日～毎週（影響を発生させやすい工種の施工中は頻度を高める）	工事個所	CSC
騒音振動	・建設機械・発電機等の	パトロール確	毎日～毎週	工事個所	CSC

環境項目	モニタリング対象	実施方法	頻度	実施場所	実施主体
	騒音発生抑制状況（目視） ・夜間工事の騒音発生状況 ・近隣の学校・教会・その他公共施設等に対する施工計画（開始時期・終了時期）及び騒音発生の説明実施状況	認（目視） 苦情受付対応	（影響を発生させやすい工種の施工中は頻度を高める） 説明会については実施の都度	工事個所周辺の学校・教会等	
水質	・工事個所下流への濁水の流下状況 ・濁水の発生・流出抑制策の実施状況と効果	パトロール確認（目視） 苦情受付対応	毎日～毎週/降雨中・降雨後（影響を発生させやすい工種の施工中は頻度を高める）	工事個所及び下流	CSC
廃棄物	・残土・盛土材、燃料容器等の分別・保管状況 ・処分状況	パトロール確認（目視） マニフェストあるいは運搬処分業者の業務執行状況の確認	月２回	工事個所 資材ヤード等	CSC
土壌汚染	・燃料、潤滑油、薬品等の保管状況 ・工事個所・資材ヤード等の漏洩防止状況 ・工事個所・資材ヤード等における漏洩状況	パトロール確認（目視）	月２回	工事個所 資材ヤード等	CSC
既存の交通施設・公共施設・社会インフラ・社会サービス 子どもの権利 事故・犯罪	・交通渋滞発生状況 ・交通事故発生状況 ・通学や集会の時間帯の歩行者・自家用車等の安全確保状況	パトロール確認（目視） 交通事故発生状況記録	週２回～月２回（平日及び週末）（通行ルート変更後は頻度を高める） 交通事故については発生の都度	工事個所周辺 資材ヤード等周辺	CSC
労働安全衛生、労働環境	・高所作業等の安全基準の遵守状況 ・安全具・防護具等の着用状況 ・安全・衛生に関するミーティングの実施状況	パトロール確認（目視）	月２回	工事個所内 資材ヤード等内	CSC
感染症	・溜り水 ・作業員の感染症罹患状況 ・工事個所及び資材ヤード周辺の感染症発生状況	パトロール確認（目視） 聞取り調査	毎日～毎週/降雨中・降雨後（影響を発生させやすい工種の施工中は頻度を高める） 聞取りは月１回	工事個所内 資材ヤード等内 工事個所・資材ヤードの周辺地域	CSC

出典：JICA 調査団

(3) 供用時

環境項目	モニタリング対象	実施方法	頻度	実施場所	実施主体
既存の交通施設・公共施設・社会インフラ・社会サービス 事故・犯罪	・誘導・安全策の実施状況 ・工事個所周辺の交通事故の発生状況	聞取り調査 必要に応じて視察	月１回	－	インフラ省

出典：JICA 調査団

(4) モニタリングフォーマット

1) 計画時

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

出典：JICA調査団

2) 工事中

Prior to the 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

出典：JICA調査団

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					
5	Spread of infectious diseases among workers and surrounding areas					

出典：JICA調査団

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					

出典：JICA調査団

3) 供用時

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

出典：JICA調査団

(5) モニタリングの関係機関及び予算措置計画

モニタリング計画の関係機関は表1に示すとおりである。モニタリング計画の内容は、関係機関の聞取りやパトロールなど、いずれも行政機関や施工管理コンサルタントスタッフの日常業務人件費の範囲内で実施できる内容であり、特別な予算措置は不要である。

表1 影響緩和策及びモニタリング計画の関係機関

	影響緩和策の実施	モニタリングの実施	JICA への報告
計画段階	インフラ省	インフラ省	インフラ省
工事中	施工業者	施工管理コンサルタント(CSC)	インフラ省
供用時	警察	インフラ省	インフラ省

出典：JICA 調査団

２．ARAP に関するモニタリング計画

(1)　モニタリング計画

補償・支援の具体策影響緩和策が確実に実施されていることを確認するため、計画段階において表２に示すモニタリングを実施する。なお、地権者との合意形成に支障が生じた場合などで、当面の工事において当該土地区画が使用されない場合には、モニタリングを工事中も継続する。

表２　用地取得・補償支払い等に関するモニタリング計画

環境項目	モニタリング対象	実施方法	頻度	実施場所	実施主体
非自発的移転･財産の消失	・事業に関する情報公開・説明・協議	聞取り調査	月１回	Social Safeguards Officer, SPU, インフラ省	SPU, インフラ省
	・用地取得・私有財産の移転等に関する苦情・意見の受付・対応・合意形成	聞取り調査	月１回	Social Safeguards Officer, SPU, インフラ省	SPU, インフラ省
	・用地取得・補償費支払い手続きの進捗	聞取り調査	月１回	Social Safeguards Officer, SPU, インフラ省	SPU, インフラ省

出典：JICA 調査団

(2)　モニタリングフォーム

1) 情報公開・説明・協議　Record of public consultation

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

出典：JICA調査団

2) 苦情・意見の受付

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

出典：JICA調査団

3) 用地取得の進捗

土地区画番号	#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				

土地区画番号	#69	#187	#154	#45
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.

出典：JICA調査団

付属資料７　本事業において取得予定の土地区画の写真、及び当該土地区画に関係する自然人・法人に関するセンサス調査結果及び属性（家計・所得）調査結果

図１　本事業により影響を受ける土地区画・ビジネス・私有財産等

１）取得対象区画（全てカルデサック橋周辺）

69

24-4

187

24-3

154

45

153

24-2

24-1

24-1

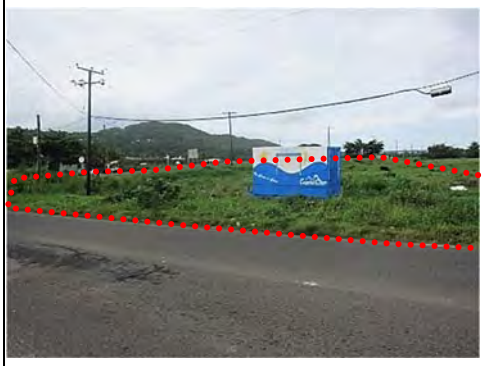
JICA 調査団撮影

2） 借地対象区画

カルデサック橋

69


68




24-4

77

151

101

ラヴィン・ポアソン橋

14

10-1 (迂回路及び仮設橋)


10-2 (仮設事務所、資材置き場、ヤード)



999/83

JICA 調査団撮影

1) 人口センサス調査

本事業において取得予定の土地区画に関係する自然人・法人等のタイプをまとめると表1のとおりである。

なお、カットオフデートは、センサス調査の開始日（2016年11月11日）ではなく、用地取得法

に基づき、「セ」国政府が当該ロットの用地取得の検討を開始する旨が公告及び新聞広告として公表された年月日とする。「セ」国制度では当該公告が出された時点で当該土地区画に存在している財産・住民等が補償対象となり、公告が出された後は当該土地区画の改変や新たな居住が法的に禁止されるためである。

従って、本調査の後の段階、あるいは詳細計画策定時に公告日を確認し、既に公告が行われていた場合は下記調査結果をアップデートする。

表 1 本事業で取得する土地区画及びステークホルダー数

Type of loss		No of Project Affected Units				No of Affected Persons		
		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 inmovable 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

2) 家計・所得調査

表2に表1に記載したPAUに対する聞取り調査で得られた特徴等の情報を示す。なお、ステークホルダー協議において、全ての関係機関から、「セ」国の文化において数値的な家計・所得・投資額等に関する質問は禁忌であり、現段階でJICA調査団が行う聞取り調査の質問に含めるべきでないこと、土地所有者へのコンタクトは避けるべきであることをアドバイスされたため、得られた情報は限られたものとなった。

なお、別途実施した「洪水被害状況調査」において「インフラ省による橋梁改善事業に対する意見」を尋ねたところ、既存橋梁周辺の事業所から反対意見は出されなかった。（「4-4-2　有効性」節参照）

表 2　本事業が取得・借地する土地区画及び関連するビジネス・私有財産等の所有者の特徴等

区画 No.	社名・所有者名	特徴等
民有地上の Business/ Structure Owner		
[redacted]	[redacted]	業種：食品販売(移動式バーガー・トラック)（商品は別の場所で

区画 No.	社名・所有者名	特徴等
		製造し搬送している） 顧客：不明（通過する自動車の乗客と思われる） 現位置での操業期間：不明（営業は金・土・日曜日のみ） 雇用：２名程度（目視） 立地の長所：不明 本事業のスケジュールに関する情報取得方法の希望：不明 土地所有者の承認・契約：聞取り調査では承認を得ているとの回答であったが、Crown Lands Commission からは「承認なしの占拠であり土地所有者は立退きを要求している」との情報もあった。
[redacted]	[redacted]	業種：自動車部品販売及び自動車修理 顧客：国内全域に分布 現位置での操業期間：25 年 雇用：５名及び夜間警備員１名 立地の長所：国内全域からアクセスしやすい 本事業のスケジュールに関する情報取得方法の希望：インフラ省職員と対面して得たい
[redacted]	[redacted]	業種：建設機械・重量車両修理 顧客：国内全域に分布 現位置での操業期間：不明 雇用：不明 立地の長所：不明 本事業のスケジュールに関する情報取得方法の希望：不明
[redacted]	[redacted]	業種：精肉及び物流 顧客：国内全域に分布 現位置での操業期間：2015 年設立 雇用：40 名 投資額：2500 万 XCD 出典：http://www.cpj.com/news/cpj-officially-opens-in-saint-lucia/
[redacted]	[redacted]	業種：自動車修理、パンク修理
[redacted]	[redacted]	業種：スーパーマーケット（国内全域に展開）
[redacted]	[redacted]	業種：ガソリンスタンド
[redacted]	[redacted]	業種：貿易業
公有地上の Business/ Structure Owner		
[redacted]	[redacted]	借地契約：１年契約。現在の契約は 2017 年４月まで。 業種：種子、野菜苗、花苗、樹木苗、観葉植物の生産、販売 顧客：カストリーズ周辺の個人、学校、農家等 現位置での操業期間：５年 雇用：３名 立地の長所：近接するスーパーの顧客が立ち寄りやすい 投資額：5000XCD 程度 本事業のスケジュールに関する情報取得方法の希望：インフラ省職員と対面して得たい カルデサック橋周辺における洪水防止事業の実施に対する意見：新しい橋への架け替えは賛成である。倒木等が流れてきてもボトルネックにならないよう、幅広く建設する必要がある。過去の洪水は、橋の上流側にデブリが溜まることでオーバーフローが起きることが主な原因であった。
[redacted]	[redacted]	移動式屋台５件は、2016 年 11, 12 月に行った３回の調査のいずれの日にも営業が確認できず、周囲の企業に尋ねても近年営業している所を見ていないとの回答であった。従って現時点で所有者等に関する情報は不明である。 なお、#24-3 に位置する植栽内の移動式屋台に対しては、過去に DCA から複数回の退去命令が出されているとの情報がある。（DCA への直接の確認は未実施）

区画 No.	社名・所有者名	特徴等
	用地取得対象 Land Owner	
[redacted]	[redacted]	インフラ省及び関係機関からのアドバイスに基づき 本調査では土地所有者に対する聞取りは行わなかった。
[redacted]		
[redacted]		
[redacted]		

出典：JICA調査団

付属資料８　ステークホルダー協議

第一次、第二次、第三次現地調査で実施した面談・協議の議事録を表1, 表2, 表3に示す。

表１ スコーピング段階のステークホルダー協議議事録

1	相手機関	Ministry of Infrastructure, Port Services and Transport
	年月日	June 8, 2016
	場所	Ministry of Infrastructure, Port Services and Transport
	出席者	Mr. Amos Hippolyte, Project Engineer Ms. Naomi Cherry, Assistant Engineer
	協議・聞取内容	・インセプションレポートを説明し、今後の調査方針、面談・情報収集すべき関係機関について協議した。 ・「セ」国には現在法的根拠を持つ「河川区域」は存在しない。Works and Roads Act (Chapter 8.05, 2005) Section 14 では、道路事業に伴い、道路の保全・維持のために河川の流路変更を行うことができるとしている。 ・「セ」国には Occupational health and Safety Act が施行されており、本省の工事では同法の遵守を施工業者に求めている。 ・「セ」国では公共事業による用地取得は非常にセンシティブな活動なので、測量を行うために本省から公式な Notification を発行する必要がある。 ・本省が実施した橋梁工事はこれまで EIA 報告書を作成していない。
2	相手機関	Ministry of Infrastructure, Port Services and Transport
	年月日	June 10, 2016
	場所	Ministry of Infrastructure, Port Services and Transport
	出席者	Mr. Guy Joseph, Member of Parlament, erected from Castries East Constituency （事業サイトを含む選挙区） Ms. Allison A. Jean, Permanent Secretary Mr. Albert John Baptiste, Chief Engineer
	協議・聞取内容	【地元選出議員に対する説明及び地元情報の聞取り】 ・このエリアの洪水リスクは極めて高い。橋梁の改善事業に地元からの反対は起きないと考える。 ・しっかりと調査・設計を行うことに時間がかかることは理解できるが、2017 年６～11 月のハリケーン期までに新橋が完成しないのは心配である。特にカルデサック橋は地域の最重要施設である。洪水は、数時間から最長３日間程度の通行止めを引き起こす。事業対象を１か所に減らしてでも最速で建設して欲しい。 ・過去に、WB が支援して建設された橋梁が洪水のボトルネックになった事例があるので、今回の橋ではそのようなことが起きないようにして欲しい。 ・ラヴィン・ポアソン橋はハリケーン・トーマスの際支障なく通行できた。 ・工事期間中の周辺への支障が最小になるよう設計して欲しい。
3	相手機関	Ministry of Infrastructure, Port Services and Transport
	年月日	June 13, 2016
	場所	Ministry of Infrastructure, Port Services and Transport
	出席者	Ms. Allison A. Jean, Permanent Secretary
	協議・聞取内容	【JICA ガイドラインの説明】 ・JICA ガイドラインの説明を行った。カリブ開発銀行のガイドラインとほぼ同じであり、本事業が JICA ガイドラインカテゴリＢの方針に沿って実施されることに同意を得た。 【橋梁事業の EIA 等】 ・主要なプロジェクトには、当該プロジェクト専任となる Special Project Unit を設置して、Project Coordinator がプロジェクト全体を監督・モニタリングする。 ・本省では過去４年半の間に 22 か所の橋梁の改善工事を実施したが、工事に伴う濁水の発生についての苦情は受けていない。また、これらの事業実施に当り EIA 報告書は作成・提出していない。Department of Physical Planning に事業実施の Notice も提出していないが、国際援助機関が関与する本事業については提出することが望ましいかもしれない。 ・なお、本省の Chief Engineer の Baptiste 氏は開発事業の審査を実施する Development Control Authority (DCA)のメンバーであるので、Notice 及び EIA の要否については同氏に確認されたい。 ・公共施設の建設に伴う用地取得は、まず当該土地の取得が必要であることについての閣

		議承認を受けた後、関係する可能性がある土地区画番号の公告を３回新聞等に掲載する。現地測量・境界決定、土地所有者との交渉といった具体的なアクションは、この３回の公告後に開始する。この公告が出されると、土地所有者は売買や現状の変更が禁止される。この手順に従うことで、不当な補償金の要求が行われることを回避している。
4	相手機関	Ministry of Infrastructure, Port Services and Transport
	年月日	June 23, 2016
	場所	Ministry of Infrastructure, Port Services and Transport
	出席者	Mr. Albert John Baptiste, Chief Engineer Mr. Amos Hippolyte, Project Engineer
	協議・聞取内容	【Department of Physical Planning との手続きについて】 ・本事業は公共事業であるので、Department of Physical Planning への開発事業許可申請は不要である。 ・DCA が関心を持つのは、この事業は何らか通常予想される程度・種類と異なる影響を発生させるのかどうかである。事業対象の橋梁は保護区域に位置していないので EIA 報告書の作成は義務付けられない。JICA ガイドラインに従って作成された Environmental Impact Statement 及び影響緩和策を DCA に提出することは差し支えないが、提出された文書に対し、DCA 及び Department of Physical Planning は特段の承認等を行うものではない。 【インフラ省が義務付ける環境管理計画について】 ・インフラ省が発注する工事については、施工業者が環境管理計画を作成しインフラ省の承認を得ることを義務付けている。本事業について JICA 調査団がドラフトを作成するのであれば、インフラ省と協議して最終化し、施工業者の決定後インフラ省の指導・監視の下施工業者が当該計画を実施する手順でよいと考える。 ・同計画には、洪水や交通事故などが発生した際の対応を記載した緊急時対策計画(emergency plan)を含める。 【用地取得及び関連調査について】 ・取得が必要な土地区画の情報は、設計がまとまった後、インフラ省の仲介を受けて調査して欲しい。あまり先走らず、地元政府からの紹介で調査することが望ましい。 ・JICA 調査団が土地所有者やビジネスオーナーに直接コンタクトすることは避けていただきたい。どのようなものであれ金儲けのチャンスに関する情報は「セ」国では極めて早いスピードで広まり、用地取得が困難になる。センサス調査、家計・所得調査も実施しないでほしい。特に収入に関する質問は「セ」国では禁忌である。橋梁周辺の立地企業等に対し、洪水被害の状況を調査することは差し支えない。 ・住民や私有財産等の移転・移動が必要な場合は、WB 支援事業の DVRP が策定した Resettlement Policy Framework に基づいて RAP を作成する必要がある。この RAP はインフラ省及び Department of Physical Planning が確認・承認を行う。 【警察の管轄区域について】 ・カルデサック橋、ラヴィン・ポアソン橋周辺の交通の誘導・監視等のため警察官の配置が必要な場合は、インフラ省からカストリーズ署に派遣を依頼することとなる。

表 2 第二次現地調査におけるステークホルダー協議議事録

1	相手機関	Ministry of Infrastructure, Port Services and Transport
	年月日	November 1, 2016
	場所	Ministry of Infrastructure, Port Services and Transport
	出席者	Mr. Amos Hippolyte, Project Engineer Ms. Donna Fletcher, Engineering Assistant
	協議・聞取内容	・JICA ガイドラインに基づく ARAP 作成に必要な情報リスト及び影響を受ける可能性がある土地区画図を提示し、今後の調査方針について相談すると同時に、同じ資料を関係機関に提示して聞き取りを行うことについての承認を得た。 【センサス等の調査について】 ・JICA のコミットメントが確定していない現時点でインフラ省の事業計画を PAP を含む地域住民・企業に対し公開することはできないので、ARAP 作成に必要な情報の収集は難しい。 ・どうしても直接住民・企業からの聞き取りを行う必要があるのであれば、質問表を事前に確認し添削させてもらいたい。また、調査を行う「セ」国コンサルタントは、「橋梁改善事業を計画しているので事業計画地周辺の社会状況調査に協力されたい」旨を記し Chief Engineer がサインしたレターを携帯することが必要だろう。*＜この後、現地コンサルタントが頻繁にインフラ省にコンタクトしたものの、このレターは発行されなかっ*

		た> ・JICA のコミットメントが得られた後の詳細設計段階には、インフラ省としても積極的にコミュニティー・ミーティングで事業を PR すると共に、個別の PAP に対し補償・支援の交渉を行う。 ・Board of Assessment における土地価格を含めた補償額の決定方法は、事業所管機関が査定した金額と、PAP の要求額の両方が Board に提出され、審査を行う。
2	相手機関	Land and Survey Division, Department of Physical Planning , Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation
	年月日	November 2, 2016
	場所	Department of Physical Planning
	出席者	Mr. John Labadie, Chief Surveyor
	協議・聞取内容	・事業内容を説明、影響を受ける可能性がある土地区画図を提示し、今後の調査方針について相談・聞き取りを行った。 【当 Division の役割について】 ・民有地の登記情報及び区画境界データを保有している。 ・用地取得が必要となった場合は、本 Division の測量士が境界測量を行う。ただし、インフラ省が待たされることを嫌う場合は、免許を持った民間の測量士に委託して測量を行うこともできる。 【行政提示額の決定】 ・当 Department 内の Evaluation Unit に所属する評価士が市場価格調査を行った上で行政提示額を決定する。土地、建物の評価及び営業損失補償、借地のリース額についても扱っている。 ・本事業の場合は、インフラ省の計画を受けて、評価士が価格を算定し、インフラ省がその予算を確保し、当該予算が当 Department に移管(transfer)されて実際の取得手続を行う段取りである。 【センサス等の調査について】 ・調査を行う場合はあくまで事業対象地域の社会状況調査として説明し、用地取得の可能性については話すべきではない。可能性があるとわかると建物が建ち始める。また、公有地上の占拠物の調査は、念のため Crown Lands Commission の職員に同行を求めるべきと考える。
3	相手機関	Development Control Authority, Department of Physical Planning , Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation
	年月日	November 2, 2016
	場所	Department of Physical Planning
	出席者	Ms. Joanna Reynolds Atherton, Permanent Secretary, Department of Physical Planning Mr. Hidreth Lewis, Deputy Permanent Secretary (in charge of DCA), Department of Physical Planning
	協議・聞取内容	・事業内容を説明、影響を受ける可能性がある土地区画図を提示し、今後の調査方針について相談・聞き取りを行った。 【開発許可申請及び EIA 報告書の要否】 ・本事業は、ラヴィン・ポアソン橋については現位置における橋梁の改善、カルデサック橋についても若干の位置の変更及びアクセス道路の移動があるが事業目的から考えて「既存橋梁の付替え」と考えることができるため、EIA 報告書の作成は不要である。 ・JICA として当部が事業を審査・承認した事実があることが望ましいのであれば、詳細設計段階のドラフトファイナルレポートをインフラ省が承認した後、同レポートを事業内容のサマリーに添付して当部に提出し、当部は本事業に関して Letter of Acknowledgement を発行することができる。通常の公共事業で義務付けられている手続きではない。 【河道内の工事】 ・建築物は水際から一定距離セットバックして建設するよう指導しているが、河川を保護することを目的とした指針ではなく、橋梁工事において河道内工事が発生することに対する特段の規制や許可制度はない。 【河岸の私有財産（販売用花卉）の補償】 ・借地に先立ち収穫を促した上で、借地料及び収入損失を支払うのが妥当かと考える。花卉の価格は農業局が把握していると思う。 【河岸の樹木の伐採】 ・森林局の管轄事項であるが、保護対象林でない限り伐採のための手続は不要と思われる。竣工後の植栽を求められる可能性がある。 【行政提示額の決定】 ・行政提示額は市場調査を行った上で決定している。

		【補償方針】 ・JICA の支援事業であるから JICA のガイドラインに沿って補償方針を立てることで差し支えない。ただし、WB 支援事業で「事業開始前に補償を支払う」との方針を守ろうとした結果、特定の地権者と合意に至らないためいつまでも事業に着手できず、回避できたはずの洪水被害が繰り返されるなど、関係者が皆苦しんでいる。「事業開始前に補償を支払う」方針を厳格に守ることは「セ」国の実情では極めて困難である。 ・住民移転が発生した場合、これまでの例では 2000XCD を移転支援金として支給した例がある。
4	相手機関	Commissioner of Crown Lands, Crown Lands Section, Department of Physical Planning Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation
	年月日	November 2, 2016
	場所	Crown Lands Commission
	出席者	Ms. Vernella Charlemagne, Commissioner of Crown Lands
	協議・聞取内容	・事業内容を説明、影響を受ける可能性がある土地区画図を提示し、今後の調査方針について相談・聞き取りを行った。 【公有地上の不法占拠者への対応】 ・対象の私有財産が可動である場合は所有者に移動を指示する。移動が不可能な場合は、１年以内にクリアランスするよう通知する。 ・本事業に必要となる公有地の占拠状況は事前に確認しておきたいので現地に同行したい。（11/5 に実施。居住者がいないことを確認。） 【公有地の貸出し】 ・#153 区画のように、公有地に対し企業等が借地を申し出て事業活動を行う場合があるが、契約期間は１年更新であり、公共目的で当該区画を使用する必要が発生した場合には３ヶ月以上前に通告することで契約更新を停止できる。その場合、当該土地上の私有財産の撤去は借地人の責任・負担で行うこととなっており、Crown Lands Commission は期限を過ぎて残されている私有物があれば撤去・廃棄する。現在#153 の契約は 2017 年４月までが期限となっているので、インフラ省から 2016 年 12 月に要請を受ければ契約更新を回避できる。

表 3 第三次現地調査におけるステークホルダー協議議事録

1	相手機関	Development Control Authority, Department of Physical Planning , Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation
	年月日	March 1, 2017
	場所	Department of Physical Planning
	出席者	Mr. Hidreth Lewis, Deputy Permanent Secretary (in charge of DCA), Department of Physical Planning
	協議・聞取内容	・Entitlement Matrix のドラフトを説明、補償・支援の内容及び実施機関・関係機関について相談・聞き取りを行った。 【ARAP の実施機関及びモニタリング機関】 ・土地取得法において土地・資産所有者と交渉できる者は Chief Surveyor と定められている。個別の PAP との交渉がまとまらなかった場合は Board of Assessment において、裁判官、関係者代表等の協議により裁決が下りる。 ・WB の事例で ARAP のモニタリング機関として挙げられている Project Coordination Unit は WB のやり方・名称であり、本事業については MIPE&L がどう進めるかによってモニタリング実施主体の名称が決まる。 【カットオフデート】 ・行政（総督）による用地取得意志の表明(Notice)が National Treasury に初めて公告された日がカットオフデートとなる。Official Gazette は毎週月曜日に公告される。 【Development Approval by DAC】 ・基本設計レベルの事業情報と IEE レベルの環境社会影響調査の情報が提供されれば、Develpment Approval と同等の審議を行うことが可能である。 ・詳細設計時の事業情報（最終的な設計図等）の提出は義務付けられていないが、Department of Physical Development 及び DAC が最新の事業情報を把握しておくために、事業主体が自主的に提出することが望ましい。例えば、近隣に開発申請が出ていた場合に調整の要否を検討する等の手段をとることが可能となる。
2	相手機関	Ministry of Infrastructure, Ports, Energy and Labour
	年月日	March 2, 2017

	場所	Ministry of Infrastructure, Ports, Energy and Labour
	出席者	Mr. Amos Hippolyte, Project Engineer Ms. Naomi Cherry, Assistant Engineer
	協議・聞取内容	・Entitlement Matrix のドラフトを説明、補償・支援の内容及び実施機関・関係機関について相談・聞き取りを行った。 【ARAP のモニタリング機関】 ・MIPE&L では国際支援機関が関係する事業には Special Project Unit を設立するので、ARAP のモニタリング機関は同 Unit となり、Chief Surveyor, Department of Physical Planning, Crown Lands Commission が実施する交渉、調査、取引、補償支払い等をモニタリングすることとなる。 【補償・支援の内容】 ・実際に補償・支援を行う Department of Physical Planning, Crown Lands Commission が合意する内容であれば MIPE&L に異存はない。必要な予算は事業費に含めて MIPE&L が予算申請を行い、上記２機関に必要に応じて移管する。 【事業スケジュール】 ・調査団から、土地所有者の売却への基本合意が 2017 年 11,12 月までに必要であること、土地代金の支払いが 2018 年の２月までに完了していることが必要であることを伝達し、了解を得た。 ・MIPE&L から、「何らかの行政内部の事情により Cash Transfer が間に合わなかった場合、支払い契約書を必要期日までに発行し、予算が確保出来次第支払う可能性がある」との発言があり、調査団は、「支払い意志が公的に確認できれば OK」である旨回答した。
3	相手機関	Ministry of Infrastructure, Ports, Energy and Labour
	年月日	March 3, 2017
	場所	Ministry of Infrastructure, Ports, Energy and Labour
	出席者	Hon. Mr. Stephenson King, Minister
	協議・聞取内容	・大臣より、MIPE&L の事業費として用地取得費の確保手続きは済んでいるとの発言を得た。
4	相手機関	Commissioner of Crown Lands, Crown Lands Section, Department of Physical Planning Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation
	年月日	March 4, 2017
	場所	Coco Palm Hotel
	出席者	Ms. Vernella Charlemagne, Commissioner of Crown Lands
	協議・聞取内容	・Entitlement Matrix のドラフトを説明、補償・支援の内容及び実施機関・関係機関について相談・聞き取りを行った。 【公有地上の私的財産の扱い】 ・公有地のクリアランスは、本事業とは切り離し、Crown Lands Commission の事業として実施することで了解を得た。 ・公有地上の私的財産の撤去等に当たって、現金補償を行わず、物的支援や移転支援で対応する方針について、了解を得た。(WB 支援事業で現金補償を行うよう強く要請されたことがあり、他の公共事業における対応との間に差ができて対応に苦慮した。) 【影響を受ける土地・私有財産への対応】 ・前回提示された情報に基づき、影響を受ける土地、借地人、私有財産所有者に対する説明やクリアランスに向けた交渉を既に開始している。
5	相手機関	Ministry of Infrastructure, Ports, Energy and Labour, Department of Physical Planning
	年月日	March 6, 2017
	場所	Ministry of Infrastructure, Ports, Energy and Labour
	出席者	Mr. Amos Hippolyte, Project Engineer Ms. Naomi Cherry, Assistant Engineer Ms. Magdalene Henry-Fontenelle, Physical Planning Officer, Development Control Agency Mr. Luther R. Goddard, Deputy Cheif Surveyor
	協議・聞取内容	・工事期間中は、MIPE&L が JICA に対し四半期ごとにモニタリング報告書を提出する必要があることを説明し、MIPE&L 及び DCA, Deputy Cheif Surveyor の合意を得た。
6	相手機関	Department of Physical Planning, Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operation
	年月日	March 7, 2017
	場所	Department of Physical Planning
	出席者	Mr. John Labadie, Chief Surveyor Mr. Luther R. Goddard, Deputy Cheif Surveyor
	協議・聞取内容	【用地取得手続きの開始】 ・2017 年２月２日付けで MIPE&L PS から Department of Physical Planning PS 宛に出された「Request of valuation of lands at Cul de Sac Bridge」を確認し、本レターをもって用地取得手続

		きの開始とすることができることを確認した。 【事業スケジュール】 ・調査団から、土地所有者の売却への基本合意が 2017 年 11,12 月までに必要であること、土地代金の支払いが 2018 年の２月までに完了していることが必要であることを伝達し、了解を得た。 【借地交渉の開始】 ・工事中に借地する必要がある土地については、建設業者の決定・工事開始を待たず、MIPE&L が土地所有者との交渉を開始し、合意を取っておくことが望ましい。建設業者に交渉に当たらせることはセ国では望ましくない。 【Entitlement Matrix】 ・これまで実施した各機関との協議・聞取り結果を反映した Entitlement Matrix の最終ドラフトを、関係する土地ロットごとの状況を含めて説明し、若干の追加修正を行うことで合意を得た。

付属資料９　JICA 環境チェックリスト

表1　JICA環境チェックリスト

分類	環境項目	主なチェック事項	Yes: Y No: N	具体的な環境社会配慮 (Yes/No の理由、根拠、緩和策等)
1 許認可・説明	(1)EIA および環境許認可	(a) 環境アセスメント報告書（EIA レポート)等は作成済みか。	(a) N	(a) 本事業は「セ」国制度において EIA 報告書の作成対象事業ではない。
		(b) EIA レポート等は当該国政府により承認されているか。	(b) N	(b) 本事業は「セ」国制度において EIA 報告書の作成対象事業ではない。
		(c) EIA レポート等の承認は付帯条件を伴うか。付帯条件がある場合は、その条件は満たされるか。	(c) N	(c) 本事業は「セ」国制度において EIA 報告書の作成対象事業ではない。
		(d) 上記以外に、必要な場合には現地の所管官庁からの環境に関する許認可は取得済みか。	(d) N	(d) 施工段階に河岸の樹木を伐採するに先立ち、森林省に対して通告し、竣工後は適切な護岸保護植栽を行う必要がある。
	(2)現地ステークホルダーへの説明	(a) プロジェクトの内容および影響について、情報公開を含めて現地ステークホルダーに適切な説明を行い、理解を得ているか。	(a) Y	(a) これまでに、事業実施機関(MIPE&L)及び事業対象サイトを含む選挙区から選出された国会議員に対し、調査スケジュール、想定される事業スケジュール、目標とする事業効果、現時点で想定される事業内容の説明を行い、理解を得ている。
		(b) 住民等からのコメントを、プロジェクト内容に反映させたか。	(b) Y	(b) これまでの現地確認調査において複数の地域住民との個別の対話・情報の聞き取りを行っており、洪水時の水位や水位変動のスピード・滞水期間、改善要望等のコメントを、プロジェクト内容に反映させている。
	(3)代替案の検討	(a) プロジェクト計画の複数の代替案は（検討の際、環境・社会に係る項目も含めて）検討されているか。	(a) Y	(a) 複数の代替案を検討した結果、社会的影響を最小化できるよう道路は閉鎖せず、仮設橋を使用する場合も通行車両の安全に最大限配慮した設計とした。
2 汚染対策	(1)大気質	(a) 通行車両等から排出される大気汚染物質による影響はあるか。当該国の環境基準等と整合するか。	(a) N	(a) 対象道路の交通量は比較的少なく、本事業実施に伴い大気汚染物質の増加及びそれによる影響は著しいものではないと考えられる。
		(b) ルート付近において大気汚染状況が既に環境基準を上回っている場合、プロジェクトが更に大気汚染を悪化させるか。大気質に対する対策は取られるか。	(b) N	(b) 本事業は既存道路の橋梁を改善するもので、本事業がさらに大気汚染を悪化させる可能性は考えられない。
	(2)水質	(a) 盛土部、切土部等の表土露出部からの土壌流出によって下流水域の水質が悪化するか。	(a) N	(a) 本事業で行われる盛土・切土の表面は植栽・玉石等で適切に保護され、供用時の土壌流出は発生しない。
		(b) プロジェクトによる周辺の井戸等の水源への影響はあるか。	(b) N	(b)対象箇所の周辺では井戸は水源として利用していない。
	(3)騒音・振動	(a) 通行車両や鉄道による騒音・振動は当該国の基準等と整合するか。	(a) Y	(a) 対象道路の交通量は比較的少なく、被影響対象となる家屋・学校・教会等もほとんどが道路から離れており、騒音・振動の影響は著しいものではない。

分類	環境項目	主なチェック事項	Yes: Y No: N	具体的な環境社会配慮 (Yes/No の理由、根拠、緩和策等)
		(b) 通行車両や鉄道による低周波音は当該国の基準等と整合するか。	(b) Y	(b) 対象道路の交通量は比較的少なく、被影響対象となる家屋・学校・教会等もほとんどが道路から離れており、低周波の影響は著しいものではない。
3 自然環境	(1)保護区	(a) サイトは当該国の法律・国際条約等に定められた保護区内に立地するか。プロジェクトが保護区に影響を与えるか。	(a) N	(a) サイトは保護区内あるいは近隣に位置しておらず、本事業が保護区に影響を与えることはない。
	(2)生態系	(a) サイトは原生林、熱帯の自然林、生態学的に重要な生息地（珊瑚礁、マングローブ湿地、干潟等）を含むか。	(a) N	(a) 本事業は既存道路橋の洪水に対するレジリエンスを強めるために行うものであり、河道の拡幅が必要な場合、過半の既存樹木を伐採する可能性があるが、改変の規模は小規模であり、改変対象となる環境は、原生林、熱帯の自然林、生態学的に重要な生息地（珊瑚礁、マングローブ湿地、干潟等）に該当しない。
		(b) サイトは当該国の法律・国際条約等で保護が必要とされる貴重種の生息地を含むか。	(b) N	(b) 本事業の対象サイトは、「セ」国の法律・国際条約等で保護が必要とされる貴重種の生息地を含まない。
		(c) 生態系への重大な影響が懸念される場合、生態系への影響を減らす対策はなされるか。	(c) N/A	(c) 本事業の実施は、生態系に対する重大な影響を発生させない。
		(d) 野生生物及び家畜の移動経路の遮断、生息地の分断、動物の交通事故等に対する対策はなされるか。	(d) N	(d) 本事業は既存道路橋を改修するものであり、新たに野生生物及び家畜の移動経路の遮断、生息地の分断、動物の交通事故等を発生させるものではない。工事期間中、既設橋の撤去工事期間の約２ヶ月、表流水を河道内に設置するパイプカルバートに誘導するが、河道の付け替えは行わないため、水生生物の持続的な生存に対する著しい影響は発生しないと考えられる。
		(e) 橋梁・道路が出来たことによって、開発に伴う森林破壊や密猟、砂漠化、湿原の乾燥等は生じるか。外来種（従来その地域に生息していなかった）、病害虫等が移入し、生態系が乱される恐れがあるか。これらに対する対策は用意されるか。	(e) N	(e) 本事業は既存道路橋の洪水に対するレジリエンスを強めるために行うものであり、改修後の橋梁の存在が周辺の森林における新たな森林破壊等の影響の原因となる恐れはない。
	(3)水象	(a) 構造物の設置による水系の変化に伴い、地表水・地下水の流れに悪影響を及ぼすか。	(a) N	(a) 本事業は既存道路橋を現位置及び至近距離で改善するものであり、構造物の設置による水系の変化、地表水・地下水の流れの変化は発生しない。
	(4)地形・地質	(a) ルート上に土砂崩壊や地滑りが生じそうな地質の悪い場所はあるか。ある場合は工法等で適切な処置がなされるか。	(a) N	(a) 事業対象の２橋周辺に土砂崩壊や地滑りが生じそうな地質の悪い場所はない。
		(b) 盛土、切土等の土木作業によって、土砂崩壊や地滑りは生じるか。土砂崩壊や地滑りを防ぐための適切な対策がなされるか。	(b) N	(b) 盛土、切土等の土木作業によって、土砂崩壊や地滑りは生じない。

分類	環境項目	主なチェック事項	Yes: Y No: N	具体的な環境社会配慮 (Yes/No の理由、根拠、緩和策等)
		(c) 盛土部、切土部、土捨て場、土砂採取場からの土壌流出は生じるか。土砂流出を防ぐための適切な対策がなされるか。	(c) N	(c) 本事業で行われる盛土・切土の表面は植栽・玉石等で適切に保護され、供用時の土壌流出は発生しない。新規の土捨場・土砂採取場は設置しない。
4 社会環境	(1)住民移転	(a) プロジェクトの実施に伴い非自発的住民移転は生じるか。生じる場合は、移転による影響を最小限とする努力がなされるか。	(a) N	(a) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。
		(b) 移転する住民に対し、移転前に補償・生活再建対策に関する適切な説明が行われるか。	(b) N	(b) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。
		(c) 住民移転のための調査がなされ、再取得価格による補償、移転後の生活基盤の回復を含む移転計画が立てられるか。	(c) N	(c) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。
		(d) 補償金の支払いは移転前に行われるか。	(d) Y	(d) 公共目的のための用地取得手続きでは、原則として取得前に土地価格及び生活再建支援の支払いが行われる。被影響者の要求額が妥当と考えられるレベルを超えた場合には支払い開始が遅れたケースがある。
		(e) 補償方針は文書で策定されているか。	(e) Y	(e) 本調査で作成する「補償・支援の方針(Entitlement Matrix)」を含む ARAP をインフラ省及び Department of Physical Planning, Crown Lands Commission に向けて説明し、合意を得た。今後、ARAP の実施機関である Department of Physical Planning の主任測量士が当該 ARAP の方針を踏まえて各 PAPs と個別に交渉し、合意に至る計画である。
		(f) 移転住民のうち特に女性、子供、老人、貧困層、少数民族・先住民族等の社会的弱者に適切な配慮がなされた計画か。	(f) Y	(f) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。本調査で実施した被影響者となる可能性があるビジネス等の調査では、特段の社会的弱者は含まれていなかった。今後具体的な用地取得手続を進める中で社会的弱者が含まれることが判明した場合は、ARAP の実施機関である Department of Physical Planning による各 PAPs との交渉において、個別事情に応じた検討が行われる。
		(g) 移転住民について移転前の合意は得られるか。	(g) Y	(g) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。「セ」国制度では用地取得及び補償・支援の対象者に対して Department of Physical Planning が個別にコンタクトを取り、協議・交渉を経て合意を得る手続きとなっている。
		(h) 住民移転を適切に実施するための体制は整えられるか。十分な実施能力と予算措置が講じられるか。	(h) Y	(h) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。本事業の実施に必要な予算の確保及びユーティリ

分類	環境項目	主なチェック事項	Yes: Y No: N	具体的な環境社会配慮 (Yes/No の理由、根拠、緩和策等)
				ティの移転はインフラ省が、用地取得、私有財産への補償は Department of Physical Planning が、公有地及び公有地上の占拠者等の扱いは Crown Lands Commission が責任を持って実施する点を合意済みである。
		(i) 移転による影響のモニタリングが計画されるか。	(i) Y	(i) 本事業による住民の移転は生じない。民有地４区画の一部を取得する必要があるが、いずれも残地での営業継続が可能と考えられ、経済的移転は生じない。WB 支援事業の先行例では Project Coordination Unit に配置される Social Coordination Specialist が ARAP の実施状況のモニタリングを行うこととされており、本事業でも同様のモニタリング計画とする。
		(j) 苦情処理の仕組みが構築されているか。	(j) Y	(j) 「セ」国土地取得法に基づく手続き及び司法手続きに沿って処理される。
	(2)生活・生計	(a) 新規開発により橋梁・アクセス道路が設置される場合、既存の交通手段やそれに従事する住民の生活への影響はあるか。また、土地利用・生計手段の大幅な変更、失業等は生じるか。これらの影響の緩和に配慮した計画か。	(a) N	(a) 本事業は既存道路橋を改修するものであり、既存の交通手段、土地利用・生計手段に影響を与えるものではない。工事中の迂回路は既設橋に隣接して整備されるもので、迂回路の整備による移動距離の増加や民有地へのアクセス困難は発生しない。また、迂回路の線形は十分な安全性を考慮して計画し、工事警告板、交通整理員を配置して、自動車・歩行者・横断者の安全を確保する計画である。
		(b) プロジェクトによりその他の住民の生活に対し悪影響を及ぼすか。必要な場合は影響を緩和する配慮が行われるか。	(b) N	(b) 本事業は既存道路橋を改修するものであり、既存の交通手段、土地利用・生計手段に影響を与えるものではない。
		(c) 他の地域からの人口流入により病気の発生（HIV 等の感染症を含む）の危険はあるか。必要に応じて適切な公衆衛生への配慮は行われるか。	(c) N	(c) 本事業は既存道路橋を改修するものであり、他の地域からの人口流入を引き起こすものではない。
		(d) プロジェクトによって周辺地域の道路交通に悪影響を及ぼすか（渋滞、交通事故の増加等）。	(d) N	(d) 本事業はカルデサック川が掘削した幅の狭い谷地形を走る幹線道路の既存道路橋を改修するものであり、本事業の実施により供用時の洪水発生時の道路閉鎖が削減され、周辺のより狭く急峻な道路への自動車交通の迂回を減らす正の影響が期待できる。
		(e) プロジェクトによって住民の移動に障害が生じるか。	(e) N	(e) 本事業は既存道路橋の洪水に対するレジリエンスを強めるために行うものであり、供用段階において、住民の移動に対する悪影響を引き起こすものではない。
		(f) 陸橋等による日照阻害、電波障害は生じるか。	(f) N	(f) 本事業では日照阻害、電波障害を生じる構造物は計画されていない。
	(3)文化遺産	(a) プロジェクトにより、考古学的、歴史的、文化的、宗教的に貴重な遺産、史跡等を損なう恐れはあるか。また、当該国の国内法上定められた措置が考慮されるか。	(a) N	(a) 本事業は既存道路橋を改修するものであり、これまでの現地確認及び情報収集では、本事業により影響を受ける可能性がある考古学的、歴史的、文化的、宗教的に貴重な遺産、史跡等は確認できていない

分類	環境項目	主なチェック事項	Yes: Y No: N	具体的な環境社会配慮 (Yes/No の理由、根拠、緩和策等)
				が、さらに情報収集を継続し、配慮すべき資源等が確認された場合には、「セ」国の国内法上定められた措置が行われるようにする。
	(4)景　観	(a) 特に配慮すべき景観が存在する場合、それに対し悪影響を及ぼすか。影響がある場合には必要な対策は取られるか。	(a) N	(a) 本事業は既存道路橋を改修するものであり、これまでの現地確認及び情報収集では、本事業により影響を受ける範囲内に「特に配慮すべき景観」は確認できていないが、さらに情報収集を継続し、配慮すべき資源等が確認された場合には必要な対策が行われるようにする。
	(5)少数民族、先住民族	(a) 当該国の少数民族、先住民族の文化、生活様式への影響を軽減する配慮がなされているか。	(a) N	(a) 「セ」国では法的に規定された少数民族、先住民族はない。ヨーロッパ系民族の入植に先立って定住していたカリブ族（Kalinago）の子孫にあたる人々は存在するが、ドミニカに設置されているような居住区は存在せず、一般社会に溶け込んでいる。
		(b) 少数民族、先住民族の土地及び資源に関する諸権利は尊重されるか。	(b) N/A	(b) 「セ」国には土地及び資源に関する諸権利において配慮すべき少数民族、先住民族は存在しない。
	(6)労働環境	(a) プロジェクトにおいて遵守すべき当該国の労働環境に関する法律が守られるか。	(a) Y	(a) 事業主体（Ministry of Infrastructure）の発注工事では国内の労働安全法 Employees (Occupational Health and Safety) Act、機会均等法 Equality of Opportunity and Treatment in Employment and Occupation Act が十分遵守される実績がある。
		(b) 労働災害防止に係る安全設備の設置、有害物質の管理等、プロジェクト関係者へのハード面での安全配慮が措置されているか。	(b) Y	(b) インフラ省及び CSC の監督により、安全設備の設置、有害物質の管理等の安全配慮が措置される。
		(c) 安全衛生計画の策定や作業員等に対する安全教育（交通安全や公衆衛生を含む）の実施等、プロジェクト関係者へのソフト面での対応が計画・実施されるか。	(c) Y	(c) インフラ省及び CSC の監督により、安全教育の実施等のソフト面の安全配慮が措置される。
		(d) プロジェクトに関係する警備要員が、プロジェクト関係者・地域住民の安全を侵害することのないよう、適切な措置が講じられるか。	(d) Y	(d) 「セ」国は治安が良く、小国であるためプロジェクトに関係する警備要員もプロジェクト実施地域から採用される可能性が高いため、プロジェクト関係者・地域住民の安全侵害が発生する危険性は極めて小さい。
5 その他	(1)工事中の影響	(a) 工事中の汚染（騒音、振動、濁水、粉じん、排ガス、廃棄物等）に対して緩和策が用意されるか。	(a) Y	(a) 本事業の工事規模は比較的小規模で、被影響対象となる家屋・学校・教会等もほとんどが道路から離れており、工事中の公害発生規模は小さく、被影響者も少ないと考えられる。 資材ヤードの稼動、運搬車両の通行、及び工事個所における建設機械等の稼動により発生する環境汚染に対し、適切な緩和策を用意・実施・モニタリングし、影響の発生を回避・最小化する計画である。
		(b) 工事により自然環境（生態系）に悪影響を及ぼすか。また、影響に対する緩和策が用意されるか。	(b) N	(b) 本事業の工事規模は比較的小規模で、河川環境・植生環境の改変規模は小さく、保護区や重要な生態系は存在しない。また、新規の土捨場、土採り場は設置しない。

分類	環境項目	主なチェック事項	Yes: Y No: N	具体的な環境社会配慮 (Yes/No の理由、根拠、緩和策等)
		(c) 工事により社会環境に悪影響を及ぼすか。また、影響に対する緩和策が用意されるか。	(c) N	(c) 本事業は既存道路橋の改修を行うもので、現況の車両交通の通過スピードはかなり高速である。工事中は、迂回路をより低速で通過するよう十分な誘導設備を設置し、渋滞及び交通事故の発生を回避・抑制する計画である。 恒久的構造物の整備に当り、民有地の取得が必要であるが、「セ」国法及び JICA ガイドラインに従った適正な協議・交渉による取得を行う。
	(2)モニタリング	(a) 上記の環境項目のうち、影響が考えられる項目に対して、事業者のモニタリングが計画・実施されるか。	(a) Y	(a) 計画段階、供用時には事業者（インフラ省）が、工事中は事業者から委託を受けた CSC が、モニタリングを実施する。
		(b) 当該計画の項目、方法、頻度等はどのように定められているか。	(b) Y	(b) モニタリング項目は影響緩和策に対応する。方法は、原則として聞取り調査及び目視・パトロールによる。頻度は項目ごとの状況変化のスピードに応じて、毎日～月１回実施する。
		(c) 事業者のモニタリング体制（組織、人員、機材、予算等とそれらの継続性）は確立されるか。	(c) Y	(c) モニタリング方法は現場監督員による目視・パトロール、聞取り等、現場監督員の通常業務の範囲内で行える内容であることから、インフラ省の通常の人件費内で実施可能であり、予算及び継続性は確保できる。
		(d) 事業者から所管官庁等への報告の方法、頻度等は規定されているか。	(d) Y	(d) CSC からインフラ省への月次報告、及びインフラ省から JICA への四半期ごとの報告が行われる計画である。
6 留意点	他の環境チェックリストの参照	(a) 必要な場合は、道路、鉄道、林業に係るチェックリストの該当チェック事項も追加して評価すること（大規模な伐採を伴う場合等）。	(a) N/A	(a) 本事業は大規模な伐採を伴わない。
		(b) 必要な場合には送変電・配電に係るチェックリストの該当チェック事項も追加して評価すること（送変電・配電施設の建設を伴う場合等）。	(b) N/A	(b) 本事業は送変電・配電施設の建設を伴わない。
	環境チェックリスト使用上の注意	(a) 必要な場合には、越境または地球規模の環境問題への影響も確認する（廃棄物の越境処理、酸性雨、オゾン層破壊、地球温暖化の問題に係る要素が考えられる場合等）。	(a) N	(a) 本事業は既存道路橋の洪水に対するレジリエンスを強めるために行うものであり、既存の環境の改変規模は小規模で、河川の流域の変更を行うものでもないため、越境的影響、地球規模の影響は発生しない。また、現在「セ」国では廃棄物を国内で埋立て処分しており、海洋投棄あるいは国外処分は行わない。

注１）　表中『当該国の基準』については、国際的に認められた基準と比較して著しい乖離がある場合には、必要に応じ対応策を検討する。当該国において現在規制が確立されていない項目については、当該国以外（日本における経験も含めて）の適切な基準との比較により検討を行う。
注２）　環境チェックリストはあくまでも標準的な環境チェック項目を示したものであり、事業および地域の特性によっては、項目の削除または追加を行う必要がある。

参考資料 5-4

定量的指標算定表

カルデサック橋

	基準旅客数ならびに積載量			定量的効果			
	旅客数	積載量	調査に基づく交通量（日平均）	旅客数		積載量	
	person	kg		基準値	目標値	基準値	目標値
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	
		合計		27,774		5,512,800	
		阻害日を除く年間日数		357	365	357	365
		年あたりの値		9,915,318	10,137,510	1,968,069,600	2,012,172,000
			数値丸め	9,900,000	10,000,000	1,950,000,000	2,000,000,000

ラヴィン・ポアソン橋

	基準旅客数ならびに積載量			定量的効果			
	旅客数	積載量	調査に基づく交通量（日平均）	旅客数		積載量	
	person	kg		基準値	目標値	基準値	目標値
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	
		合計		17,929		3,895,100	
		阻害日を除く年間日数		363	365	363	365
		年あたりの値		6,508,227	6,544,085	1,413,921,300	1,421,711,500
			数値丸め	6,500,000	6,550,000	1,410,000,000	1,420,000,000