

CHAPTER 3

IMPLEMENTATION PLAN

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3.1 Implementation Plan

3.1.1 Implementation Concept

The following are the main concepts in the implementation plan:

- The road will be constructed by a contractor employing labor from local subcontractors.
- Materials and equipment necessary for the project will be procured in Vanuatu as far as available. Items unavailable locally will be procured from Japan or third countries. Third countries will be selected based upon the items cost, quality and required delivery time.
- The construction method and progress schedule of the project will be planned reflecting local conditions of climate, topography, geology, transportation and others.
- Easy and low cost methods of construction will be adopted for the project.
- Organization for construction and supervision of the project will be proposed based upon standardization and specifications for construction as well as construction supervision.
- Traffic control during construction will be planned, to maintain passage for present traffic.
- Traffic control
Major components of the work are as follows.
 - Improvement of the existing road (5.792 km)
 - Construction of the new road (8.371 km)
 - Renovation of the existing bridges (2 bridges)

The existing road and bridges should be opened for traffic during construction. Traffic control and safety control should be considered carefully.

- One traffic lane will be closed during the improvement work and the other will be opened for traffic.

- Detour bridges will be installed for use during the renovation work.
 - Flagmen and facilities for traffic control should be arranged.
- Borrow pit and disposal area
- Candidates for the borrow pit are ① Coral Pit CH 6.70km ② Coral Pit CH 7.50km ③ Coral Pit CH 24.00km
- Candidates for the disposal area are ① Garbage dump area ② Right side at CH 5.70km ③ Left side at CH 5.70km

3.1.2 Implementation Conditions

The following are the basic conditions for implementing this project:

- This project, if approved, will be implemented in accordance with the provisions of Japan's Grant Aid Program, after the signing of the Exchange of Notes between the Governments of Japan and the Republic of Vanuatu.
- The Public Works Department is the responsible agency for implementing the project.
- Detailed design, tenders and construction supervision of the road project will be undertaken by a Japanese consulting firm, in accordance with a contract between the Public Works Department and the consultant.
- The construction of the road will be undertaken by the Japanese tenderer who is awarded the contract by the Public Works Department.

3.1.3 Scope of Works

The undertakings of both Governments, Japan and Vanuatu, are listed in Table 3.1.3-1.

Table 3.1.3-1 UNDERTAKINGS OF BOTH GOVERNMENTS

Item	Contents	Undertaken by		Remarks	
		Japan	Vanuatu		
Road Improvement	Procurement of materials and equipment	Procurement	○		
		Customs clearance		○	
	Temporary work	Acquisition of lots		○	Lots for field office, stock yard and work shop
		Other works than the above	○		
	Acquisition of right-of-way	Acquisition of ROW		○	
		Removal of existing properties		○	Fences, houses, etc.
		Clearing and grubbing	○		Trees
	Main work	Land for disposal of waste materials arising from existing facilities		○	
		Other works than the above	○		
	Equipment Procurement	Procurement and transportation	Fabrication	○	
Packing and shipping			○		
Marine transportation			○		Up to Vanuatu International Port
Unloading			○		
Customs clearance				○	
Inland transportation			○		
Turnover		Preparation and submission of operation and maintenance manuals	○		
		Assembly	○		
		Guidance of operation	○		
		Turnover	○		

The lots for field office, storage yard and work shop to be prepared by the Government of Vanuatu are estimated at 0.5 ha. They should be located near the Project area.

Encroachments within the Right of Way to be removed or replaced by the Government of Vanuatu are mainly as follows:

- Fence and hedge : 65 spots
- House : 3 houses
- Electric pole : Existing poles along the road

The Government of Vanuatu should examine cultural assets in the new alignment section to see how to avoid negative effects from the new road construction. (location, contents, scale schedule, etc.)

3.1.4 Consultant Supervision (Road improvement and equipment procurement)

A Japanese consultant will supervise the implementation of the project on behalf of the Government of Vanuatu. The consultant will carry out the detailed design and assist in tendering and construction supervision, in accordance with the consultant contract concluded between the Government of Vanuatu and the consultant.

Detailed Design

Major works in the detailed design to be carried out by the consultant are as follows:

- Supplemental Site Survey
- Detailed Design of the Road and related Structures
- Preparation of Drawings and Specifications
- Construction Schedule and Cost Estimates
- Preparation of Tender Documents
- Preparation of Specifications of equipment and spare parts

The necessary time for the detailed design is 4.0 months each, for the first and second phases.

Assistance in Tendering

- The consultant will render the following services during the period from tender publication to construction contract.
- Tender publication

- Pre-qualification
- Tendering
- Tender evaluation
- Contract facilitation

The necessary time for assistance in tendering is 4.0 months each, for road improvement and for equipment procurement.

Construction Supervision

The consultant will carry out supervision of the construction work, which will be executed by the contractor. The main work items are as follows:

- Inspection and approval of site survey
- Inspection and approval of construction planning
- Quality control
- Progress control
- Measurement of work
- Inspection of safety aspects
- Preparation of a road maintenance manual
- Final inspection and turnover

The construction period is 24.0 months. To successfully carry out supervision, the consultant personnel are required to be stationed on the site during the entire construction period.

3.1.5 Procurement Plan

In principle, materials, equipment and labor necessary for the project are planned to be procured locally as far as available. Items which are not available from local sources with required quality, quantity or cost are planned to be procured from Japan or third countries.

(1) Materials

The main construction materials which are produced in Vanuatu are aggregates and base course materials. Other materials can be purchased from local suppliers, but in many cases the stocks are not sufficient.

Table 3.1.5-1 shows the procurement plan for major materials.

Table 3.1.5-1 MATERIAL PROCUREMENT PLAN

	Procured from			Remarks
	Vanuatu	Japan	Third Country	
Material for Structure				
Crushed stone	<input type="radio"/>			
Base course material	<input type="radio"/>			
Cement	<input type="radio"/>			Imported
Sand for concrete	<input type="radio"/>			
Aggregate for concrete	<input type="radio"/>			
Aggregate for asphalt	<input type="radio"/>			Imported
Sand for asphalt pavement	<input type="radio"/>			
Bitumen for asphalt pavement	<input type="radio"/>		<input type="radio"/>	Imported
Road marking paint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Imported
Reinforcing steel	<input type="radio"/>			Imported
Wire mesh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Precast concrete products	<input type="radio"/>		<input type="radio"/>	
Guard rail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Imported
Gabion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Imported
Rubble	<input type="radio"/>			
Traffic sign boards		<input type="radio"/>	<input type="radio"/>	Imported
Material for temporary work				
Timber for forms	<input type="radio"/>			
Plywood for forms	<input type="radio"/>			Imported
Nails	<input type="radio"/>			Imported
Annealed wire	<input type="radio"/>			Imported
Timber for staging	<input type="radio"/>			
Sand bags	<input type="radio"/>			Imported
Electric welding bars	<input type="radio"/>			Imported
Oxygen and acetylene	<input type="radio"/>			Imported
Safety facilities	<input type="radio"/>			Imported
H-beams, sheetpiles	<input type="radio"/>			Imported
Oil, fuel and fat	<input type="radio"/>			Imported

(2) Equipment

In principle, it is planned to procure equipment from local contractors under lease contract. Equipment which is not available locally will be procured from Japan or third countries.

Procurement plan of the major equipment is shown in Table 3.1.5-2.

Table 3.1-5-2 EQUIPMENT PROCUREMENT PLAN

	Procured from			Remarks
	Vanuatu	Japan	Third Country	
Bulldozer (s)			○	
Backhoe excavator (s)	○		○	
Tractor shovel			○	
Dump truck(s)	○		○	
Cargo truck(s)	○			
Semi-trailer(s)	○			
Mobil crane(s)	○		○	
Diesel hammer			○	
Vibro hammer			○	
(Pick hammer)			○	
Breaker(s)			○	
Motor grader(s)			○	
Macadam roller			○	
Tire roller			○	
Vibration roller			○	
Tamper(s)	○			
Concrete plant(s)	○			
Asphalt kettle(s)			○	
Asphalt distributor(s)			○	
Chip spreader(s)			○	
Water tank truck(s)			○	
Air compressor(s)			○	
Submerged pump(s)	○		○	
Generator(s)			○	
Crushing and screening plants			○	
Mower(s)	○		○	
Chain saws(s)	○		○	
Pick-up truck(s)	○		○	

3.1.6 Implementation Schedule

Implementation schedules for the road improvement and the equipment procurement are shown in Table 3.1.6-1.

Table 3.1.6-1 IMPLEMENTATION SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32				
Detailed Design		■																																		
			□																																	
			■																																	
	Total 3 months																																			
Tendering																																				
Road Improvement																																				
	Total 7 months																																			
Equipment Procurement																																				
	Total 3 months																																			
	Total 7.5 months																																			
	Total 15.5 months																																			

□ : Work in Japan
 ■ : Work in Vanuatu

3.1.7 Obligations of the Republic of Vanuatu

The following necessary measures should be taken by the Government of Vanuatu on condition that the Grant Aid by the Government of Japan is extended to the Project:

- (1) To provide data and information necessary for the Project.
- (2) To secure the land necessary for the execution for the Project, such as the land for temporary offices, construction works, storage yards and others.
- (3) To clear the sites prior to the commencement of the construction.
- (4) To remove existing properties/obstacles such as houses, fences, etc. in the right of way.
- (5) To bear commissions to the Japanese foreign exchange bank for its banking services, based upon the Banking Arrangement, namely the advisory commission of the "Authorization to Pay" and payment commission.
- (6) To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in the Republic of Vanuatu, and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
- (7) To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in the Republic of Vanuatu with respect to the supply of the products and services under the verified contracts.
- (8) 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 Republic of Vanuatu and stay therein for the performance of their work.
- (9) To provide necessary permissions, licences and other authorizations for implementing the Project, if necessary.
- (10) To maintain and use properly and effectively the facilities constructed under the Project.

(11) To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants in the Project area during implementation of the Project.

(12) To bear all the expenses, other than those covered by the Japanese Grant Aid, necessary for the Project.

3.2 Maintenance Plan for the Project Road

Maintenance of the improved road will be carried out by Public Works Department (PWD). Although the PWD has neither sufficient budget nor equipment for the maintenance of sprayed seal pavement, the pavement is more durable when compared with the existing pavement, and is expected to largely reduce the time and expenses for maintenance.

In regard to the drainage facilities, maintenance or repair cost should be incurred. It will eventually be necessary to clean or repair the drainage facilities. Routine maintenance of roads and drainage facilities should be executed. Routine maintenance crews are set up and operated under the supervision of local engineers. As remarkable defects are found on roads during routine maintenance, the PWD should formulate special maintenance projects, based upon detailed inspections and the repairs required for both roads and drainage facilities.

The routine maintenance activities required for the project road are shown in Table 3.2-1.

Table 3.2-1 ROUTINE MAINTENANCE ACTIVITIES

Inspection	Remarks
Pavement	- settlement, crack, depress, scale, fracture
Shoulder	- scouring, settlement, deformation
Side ditch (gutter, lid)	- settlement, deformation, etc.
Drainage pipe	- choked, etc.
Permeable box	- sediment, etc.
Drain pit	- sediment, etc.
Outlet	- deformation, etc.
Others	

The annual cost necessary for maintenance of the Project road is estimated as follows: (refer to Table 3.2-2)

- Inspection, Repair and Cleaning VT 1,000,000

Table 3.2-2 MAINTENANCE PLAN FOR THE PROJECT ROAD

1. Routine Inspection

Facility	Inspection Item	Interval	Number of Staff	Equipment / Material	Days	Budget (VT)
<ul style="list-style-type: none"> • Ditches • Culvert crossing road • Sprayed seal • Cut slope • Embankment slope • Bridges • Road marking • Sign boards 	Existing of mud, sand, obstacles, etc.	12 times/year (one day/work) (2,000 VT/person·day)	2 persons	Meaning tape, scoop, hammer, bar, light	24 person·day/year	48,000
	Crack, deformation, potholes, etc. Collapse, erosion, etc. Collapse, erosion, etc. Surface of deck, abutment, pier, river condition Stain, discolor Damage, deformation, stain, discolor			Pick-up truck (15,000 VT/day)		
Sub-total						228,000

(Total road length : 14.2 km)

2. Cleaning

Facility	Cleaning Item	Interval	Number of Staff	Equipment / Material	Days	Budget (VT)
<ul style="list-style-type: none"> • Ditches • Culvert crossing road • Sprayed seal • Cut slope • Embankment slope • Bridges • Road marking • Sign boards 	Removal of deposit of mud, sand, obstacle	2 times/year (2 days/work) (2,000 VT/person·day)	5 persons	Scoop, bars brooms hand tools	30 person·day/year	60,000
				Pick-up truck (15,000 VT/day)		
Sub-total						150,000

3. Repair

Facility	Repair Item	Interval	Number of Staff	Equipment / Material	Days	Budget (VT)
<ul style="list-style-type: none"> • Ditches • Culvert crossing road • Sprayed seal • Cut slope • Embankment slope • Bridges • Road marking • Sign boards 	Repair of potholes	4 times/year (5 days/work) (2,000 VT/person·day)	4 persons	Plate tamper (2,000 VT/day)	30 person·day/year	160,000
	Removal of deposit of sand, obstacle			Pick-up truck (15,000 VT/day)		
				Base course : 0.2m x 5m ² x 14 spot Reseal : 1,000 VT/m ³ x 5m ² x 14 spots		56,000
						70,000
Sub-total						626,000
Grand Total						1,004,000

CHAPTER 4

PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

4.1 Project Effect

Efate's population in 1997 was estimated at 43,000, of whom nearly 30,000 (70%) live in Port Vila. The Project consists of the improving the Ring road from Tassiriki to the east which is 14.20 km length. The population of the road section is 1,900 and the entire people of Efate are indirect beneficiaries of the Project.

Traffic congestion in the center of Port Vila is often observed, and present traffic volume is counted at 1,100 vehicles per day at Tassiriki (the start of the Project) and 100 vehicles at the end of the Project. The Project road has a top priority among the Ring road because the future traffic volume is expected to be much increased by development of the city and a population increase.

The major direct effects of implementing the project are as follows:

<u>Direct effect</u>	<u>Expected effect by the Project</u>
• Reduction of travel time	<ul style="list-style-type: none">- Travel times on the Project road are expected to be much reduced (less than 15 minutes) by the improved road surface and a new realignment section (short-cut).- The realignment section shouldn't be affected by the cyclonic condition.
• Safety and comfort for traffic	<ul style="list-style-type: none">- Driving will be safe and comfortable on the road without deformations and holes.- Walking will be safe and comfortable on the road shoulders without potholes.
• Environment protection	<ul style="list-style-type: none">- Erosion on road shoulders will be stopped by road surface treatment.- Water pollution in the lagoon will be lessened, by reducing muddy water drained from road to the lagoon.
• Lower vehicle maintenance costs	<ul style="list-style-type: none">- Running on smooth pavement will result in lower costs and prolong the life of vehicles.- Wide shoulders and a smooth pavement will enable traffic to move more smoothly.

4.2 Recommendation

Since the Project will greatly contribute to improving residents' living standards and traffic conditions in the area, and the implementation organization is considered to have sufficient capacity to manage the Project, it is concluded that it is appropriate to implement this Project under Japan's grant aid. However, smooth operation of the plan will become difficult if the following points are not considered;

- The government of Vanuatu is expected to secure the unsettled land for the road section by the time of the implementation. It is necessary to confirm that the agreement between the Government and the landowner will be conducted smoothly.

- To confirm the following will be smoothly completed before the implementation of the Project by the Government of Vanuatu;
 - Investigation of cultural assets in the Project area.
 - The removal or relocation of obstacles such as fences and trees etc. along the Project road.
 - Removal or clearing of trees in the realignment section.
 - Securing land for a borrow pit and a disposal area.

APPENDICES

APPENDIX - 1

MEMBER LIST OF THE STUDY TEAM

APPENDIX – 1 MEMBER LIST OF THE STUDY TEAM

1. Site survey

Mr. Takeshi HIRAMATSU	Leader Assistant Director, Grant Aid Division Economic Cooperation Bureau Ministry of Foreign Affairs
Mr. Soichi SHIBATA	Project Coordinator Third Contract Division Procurement Department JICA
Mr. Minoru MIURA	Chief Consultant / Road Traffic Planner Katahira & Engineers International
Mr. Yoshiaki YANAGISAWA	Road Design Engineer Katahira & Engineers International
Mr. Tadashi SATO	Equipment & Construction Planning / Cost Estimator Katahira & Engineers International

2. Consultation on draft report

Mr. Kiyoshi ASAKO	Leader Assistant Director, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Mr. Minoru MIURA	Chief Consultant / Road Traffic Planner Katahira & Engineers International

APPENDIX – 2

STUDY SCHEDULE

APPENDIX – 2 STUDY SCHEDULE

1. Site Survey (June 29 to July 31, 1997)

No.	Date	Activities
1	Jun. 29 (Sun)	<ul style="list-style-type: none"> • Mr. Hiramatsu, Mr. Shibata, Mr. Miura, Mr. Yanagisawa Mr. Sato left Tokyo for Sydney
2	Jun. 30 (Mon)	<ul style="list-style-type: none"> • Above 5 members arrived at Port Vila
3	Jul. 1 (Tue)	<ul style="list-style-type: none"> • Courtesy call on Ministry of Foreign Affairs, Ministry of Transport, National Planning Office • Discussion with Public Works Department (PWD)
4	Jul. 2 (Wed)	<ul style="list-style-type: none"> • Site survey
5	Jul. 3 (Thu)	<ul style="list-style-type: none"> • Discussion with PWD, National Planning Office and Vanuatu Cultural Center • Site survey
6	Jul. 4 (Fri)	<ul style="list-style-type: none"> • Discussion with PWD • Signing on Minutes of Discussions
7	Jul. 5 (Sat)	<ul style="list-style-type: none"> • Site survey
8	Jul. 6 (Sun)	<ul style="list-style-type: none"> • Data collection
9	Jul. 7 (Mon)	<ul style="list-style-type: none"> • Data collection • Discussions at JOCV Office
10	Jul. 8 (Tue)	<ul style="list-style-type: none"> • Data collection • Mr. Hiramatsu, Mr. Shibata left for Nadi
11	Jul. 9 (Wed)	<ul style="list-style-type: none"> • Discussion with Vanuatu Cultural Center • Site survey
12	Jul. 10 (Thu)	<ul style="list-style-type: none"> • Discussion with ADB • Site survey
13	Jul. 11 (Fri)	<ul style="list-style-type: none"> • Site survey • Traffic survey
14	Jul. 12 (Sat)	<ul style="list-style-type: none"> • Site survey
15	Jul. 13 (Sun)	<ul style="list-style-type: none"> • Site survey
16	Jul. 14 (Mon)	<ul style="list-style-type: none"> • Discussion with PWD workshop • Topo. survey
17	Jul. 15 (Tue)	<ul style="list-style-type: none"> • Topo. survey
18	Jul. 16 (Wed)	<ul style="list-style-type: none"> • Topo. survey
19	Jul. 17 (Thu)	<ul style="list-style-type: none"> • Topo. survey
20	Jul. 18 (Fri)	<ul style="list-style-type: none"> • Site survey
21	Jul. 19 (Sat)	<ul style="list-style-type: none"> • Site survey
22	Jul. 20 (Sun)	<ul style="list-style-type: none"> • Site survey
23	Jul. 21 (Mon)	<ul style="list-style-type: none"> • Discussion with PWD
24	Jul. 22 (Tue)	<ul style="list-style-type: none"> • Bridge inspection

No.	Date	Activities
25	Jul. 23 (Wed)	• Data collection
26	Jul. 24 (Thu)	• Data collection
27	Jul. 25 (Fri)	• Discussion with PWD workshop • Topo. survey
28	Jul. 26 (Sat)	• Data collection
29	Jul. 27 (Sun)	• Mr. Sato left for Sydney
30	Jul. 28 (Mon)	• Discussions at JICA Australia (Mr. Sato)
31	Jul. 29 (Tue)	• Mr. Miura, Mr. Yanagisawa left for Nadi
32	Jul. 30 (Wed)	• Discussions at Embassy of Japan and JICA Fiji
33	Jul. 31 (Thu)	• Mr. Miura, Mr. Yanagisawa arrived at Tokyo from Nadi

2. Consultation on Draft Report (September 28 to October 9, 1997)

No.	Date	Activities
1	Sept. 28 (Sun)	• Mr. Asako, Mr. Miura, left Tokyo for Sydney
2	Sept. 29 (Mon)	• Above 2 members arrived at Port Vila
3	Sept. 30 (Tue)	• Courtesy call on Ministry of Foreign Affairs, Ministry of Transport, Public Works, Ports and Marine and Urban Water Supply, National Planning Office • Submission and explanation of Draft Report to Public Works Department (PWD)
4	Oct. 1 (Wed)	• Site survey
5	Oct. 2 (Thu)	• Discussion with PWD
6	Oct. 3 (Fri)	• Signing on Minutes of Discussions
7	Oct. 4 (Sat)	• Data collection
8	Oct. 5 (Sun)	• Data collection
9	Oct. 6 (Mon)	• Data collection
10	Oct. 7 (Tue)	• Mr. Asako, Mr. Miura left Port Vila for Nadi
11	Oct. 8 (Wed)	• Discussion at Embassy of Japan and JICA Fiji
12	Oct. 9 (Thu)	• Mr. Asako, Mr. Miura arrived at Tokyo from Nadi

APPENDIX – 3

**LIST OF PARTIES CONCERNED
IN THE REPUBLIC OF VANUATU**

APPENDIX – 3 LIST OF PARTY CONCERNED IN THE REPUBLIC OF VANUATU

Public Works Department (PWD)

Mr. Manasseh Tarry	Acting Director
Mr. Jone Roqara	Technical Advisor
Mr. Ray Roberts	Technical Advisor
Mr. J.E. Ngwero	Principal Mechanical Engineer

Ministry of Transport Public Works, Ports and Marine, and Urban Water Supply

Mr. Samson Bue MP	Minister
Mr. Anderson Garae	First Secretary

Ministry of Foreign Affairs

Mr. Vital Sokso	Minister
Mr. Bmno Sam	Secretary for the Minister
Mr. Jean Sese	Director
Mr. Japheth Cavao	Principal Assistant Secretary, Department of Foreign Affairs
Mr. Albert Willie	Asia / Pacific Division

National Planning Office

Mr. Georges Maniuri	Director
Mr. Ian Abbil	Infrastructure Planner

Vanuatu Cultural Center

Mr. Jean Paul Batick	Investigator
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Asia Development Bank, South Pacific Regional Mission

Mr. Michel D. Latendresse	Senior Project Implementation Specialist
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Embassy of Japan in Fiji

Mr. Jiro Kobayashi	Ambassador
Mr. Keiichi Hasegawa	Councilor
Mr. Tsuguyoshi Hada	Second Secretary
Mr. Takahiro Yano	Second Secretary

JICA, Fiji Office

Mr. Yasushi Inaba
Mr. Kyoji Mizutani
Mr. Takayuki Jimbo

Resident Representative
Deputy Resident Representative
Assistant Resident Representative

JOCV, Vanuatu Office

Ms. Kiyoko Tanaka

Coordinator

JICA, Australia Office

Mr. Katsuhiko Oshima
Mr. Ippei Hattori

Resident Representative
Deputy Resident Representative

APPENDIX – 4

MINUTES OF DISCUSSIONS

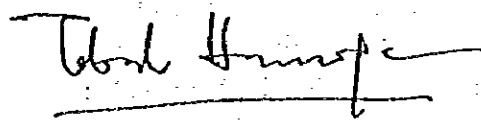
MINUTES OF DISCUSSIONS
ON
BASIC DESIGN STUDY
ON
THE PROJECT FOR IMPROVEMENT OF
THE RING ROAD IN EFATE ISLAND
IN
THE REPUBLIC OF VANUATU

Based on the results of the Preliminary Study, the Japan International Cooperation Agency (hereinafter referred to as "JICA") decided to conduct the Basic Design Study on the Project for the Improvement of the Ring Road in Efate Island (hereinafter referred to as "the Project").

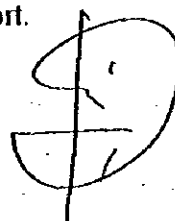
JICA sent to the Republic of Vanuatu a Basic Design Study Team (hereinafter referred to as "the Study Team"), which is headed by Mr. Takeshi HIRAMATSU, Assistant Director, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, and the Study Team is scheduled to stay in the country from June 30 to July 29, 1997.

The Study Team held a series of discussions with the officials concerned of the Government of Vanuatu and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The Study Team will proceed to the works and prepare the Basic Design Study Report.

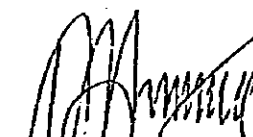
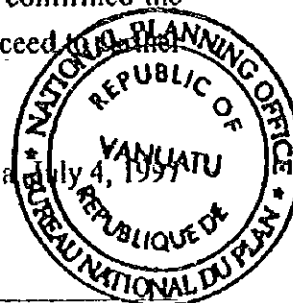


Takeshi HIRAMATSU
Leader,
Basic Design Study Team
JICA

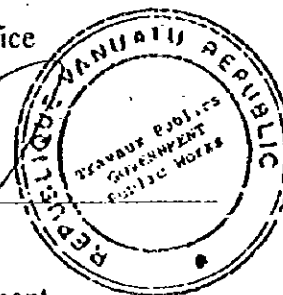


Georges MANIURI
Director,
National Planning Office

Port Vila



Manasseh TARRY
Acting Director,
Public Works Department



ATTACHMENT

1. Objectives

The objectives of the Project is to improve the roads between Tassiriki and first 734 meters from Rentapao bridge in Efate Island in order to improve resident's lives and the traffic situation.

2. Project Site

The Project site is located in Efate Island which is shown in ANNEX-1.

3. Responsible Organization and Implementing Agency

Responsible Organization : Ministry of Transport, Public Works, Ports and Marine, and Urban Water Supply

Implementing Agency : Public Works Department (PWD)

4. Major Items Requested by the Government of Vanuatu

After the series of discussions, the items listed in ANNEX-2 were finally requested by the Government of Vanuatu.

5. Management and Maintenance

The facility constructed under the Japan's Grant Aid will be operated and maintained by the Government of Vanuatu. The final contents and specifications of the equipment will be decided after further studies.

6. Japan's Grant Aid System

1) The Government of Vanuatu has understood the system of the Japan's Grant Aid explained by the Study Team; the main feature is described in ANNEX-3.

2) The Government of Vanuatu will take the necessary measures, described in ANNEX-4 for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

3) Concerning the item 2 in ANNEX-4, PWD has already reached an agreement in principle regarding the expropriation for the land with the landowners. The formalization of the agreement shall be made at the time of exchange of notes.

The compensation of the land should be completed before the implementation of the Project.

4) The study of the cultural assets shall be completed by July 18, 1997, the results of which should be reported immediately to the Basic Design Study Team.

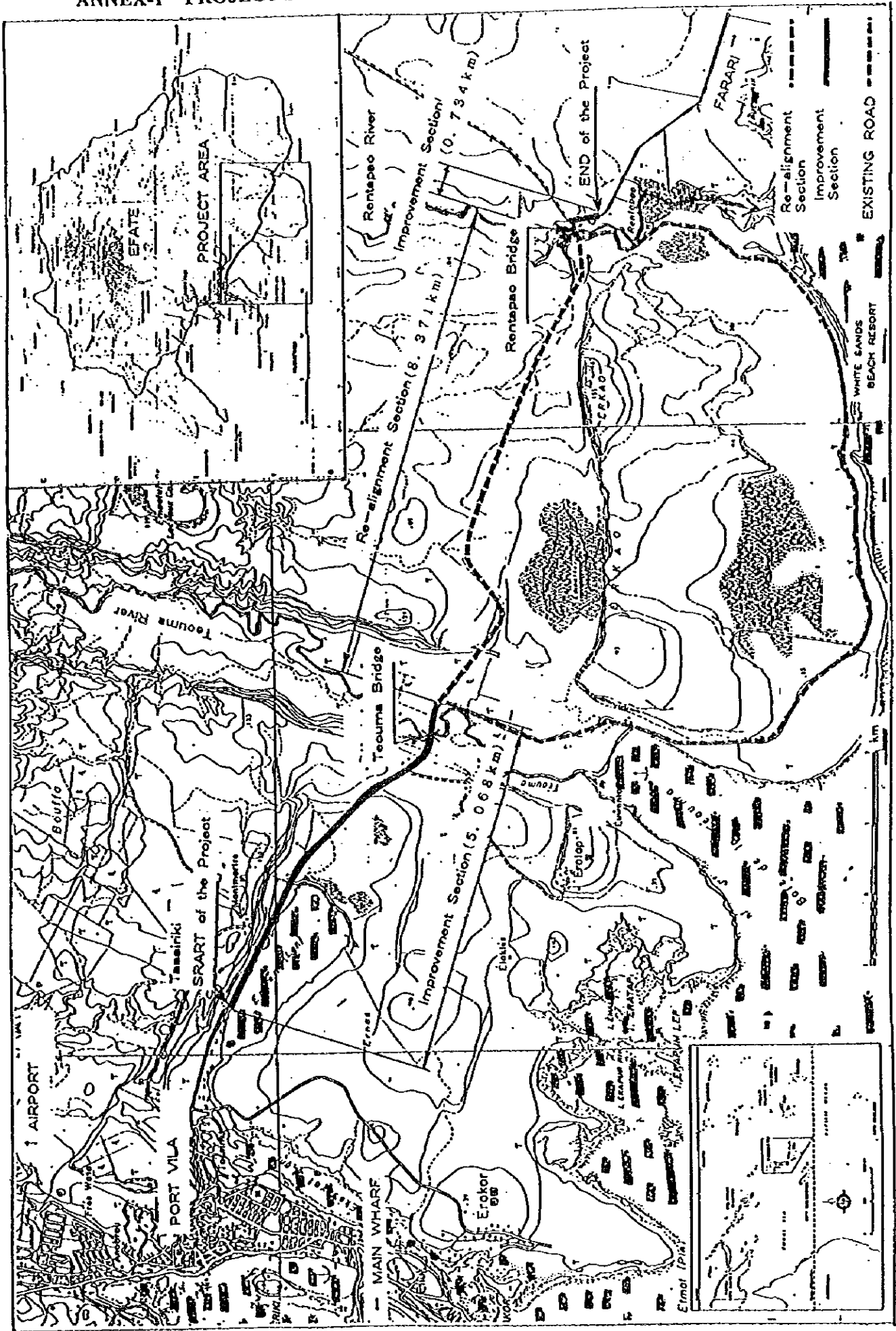
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7. Further Schedule of the Study

- 1) The Study Team will proceed further studies in the Republic of Vanuatu until July 29, 1997.
- 2) Based on the results of the Basic Design Study, JICA will prepare the Draft Basic Design and dispatch a team in the end of September 1997 in order to consult the Government of Vanuatu on outline of the Draft Basic Design.
- 3) Upon acceptance of the Draft Basic Design by the Government of Vanuatu, JICA will complete the Basic Design Study Report and forward it to the Government of Vanuatu in January, 1998.

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ANNEX-1 PROJECT SITE



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**ANNEX-2: ITEMS REQUESTED BY THE GOVERNMENT OF THE
REPUBLIC OF VANUATU**

The work items for the Project are as follows:

1. Road Improvement (Each work includes drainage improvement at where to be required)
 - 1) Improvement of the existing road between Tassiriki and Teouma bridge (CH *0.000 km ~ CH 5.068km :5.068km)
 - 2) Re-alignment of the road between Teouma bridge and Rentapao bridge (CH 5.093 km ~ CH 13.464km :8.371km)
 - 3) Improvement of the existing road between Rentapao bridge and Culvert No.20(CH 13.476 km ~ CH 14.210km :0.746km)

* CH means pegged channage in detailed design drawings in 1995 by PWD*
2. Renovation of Existing Bridges
 - 1) Teouma bridge (bridge length :25m)
 - 2) Rentapao bridge (bridge length : 12m)
3. Procurement of Road Maintenance Equipment

No.	Item	Quantity	**Specifications
1	Motor grader	1	3.1m blade length
2	Wheel loader with shovel	1	1.2m ³ bucket capacity
3	Dump truck	1	3.5MT, low-bed type
4	Flat-bed truck	1	3.5MT, with crane 3.0MT
5	Water tank truck	1	2,000-3,000 litter capacity
6	Baby roller	1	0.5MT
7	Plate tamper	1	20kgs
8	Asphalt sprayer	1	200 litter, kerosene heating type
9	Chain saw	1	
10	Grass cutter	1	
11	Double cab cargo truck	1	1,300-1,600cc
12	Spare parts	lump sum	

** specifications : similar type as mentioned

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ANNEX-3: JAPAN'S GRANT AID SCHEME

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures:

Application	:	Request made by a recipient country
Study	:	Basic Design Study conducted by JICA
Appraisal & Approval	:	Appraisal by the Government of Japan and Approval by Cabinet
Determination of Implementation	:	The Notice exchanged between the Governments of Japan and the recipient country

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese a consulting firm.

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Government of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aims of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the

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project by the Government of Japan. The contents of the Study are as follows:

- a) confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
- b) evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view;
- c) confirmation of items agreed on by both parties concerning the basic concept of the Project;
- d) preparation of a basic design of the Project;
- e) estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure 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 in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For smooth implementation of the Study, JICA uses a consultant firm selected through its own procedure (competitive proposal). The selected firm participates the Study and prepares a report based upon terms of reference set by JICA.

At the beginning of implementation after the Exchange of Notes, for the services of the Detailed Design and Construction Supervision of the Project, JICA recommends the same consulting firm which participated in the Study to the recipient country, in order to maintain the technical consistency

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between the Basic Design and Detailed Design as well as to avoid any undue delay caused by the selection of a new consulting firm.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

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

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

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5) Necessity of "Verification"

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

6) Undertakings required of 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 follows:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- c) To secure buildings prior to the procurement in case the installation of the equipment.
- d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
- f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

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

8) "Re-export"

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

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9) Banking Arrangements (B/A)

- (a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen 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 the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

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**ANNEX-4: NECESSARY MEASURES TO BE TAKEN BY THE
GOVERNMENT OF THE REPUBLIC OF VANUATU**

Following necessary measures should be taken by the Government of Vanuatu on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project;
2. To secure the land necessary for the execution of the Project, such as the Right of Way, Right of bridge, land for temporary offices, working areas, storage yards and others;
3. To clear the sites prior to the commencement of the construction;
4. To make passable all roads and bridges leading to the Project sites before the commencement of inland transportation of materials and equipment;
5. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission;
6. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Vanuatu and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid;
7. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Vanuatu with respect to the supply of the products and services under the verified contracts;
8. 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 Vanuatu and stay therein for the performance of their work;
9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary;
10. To maintain and use properly and effectively the facilities constructed and the equipment provided under the Project; and
11. To coordinate and solve any issues related to the Project which may be raised from third parties or inhabitants in the Project area during implementation of the Project.



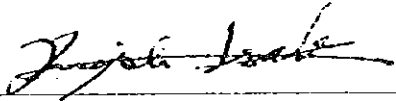
**MINUTES OF DISCUSSIONS
ON
BASIC DESIGN STUDY
ON
THE PROJECT FOR IMPROVEMENT OF
THE RING ROAD IN EFATE ISLAND
IN
THE REPUBLIC OF VANUATU
(Consultation on Draft Report)**

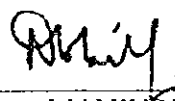
In July 1997, the Japan International Cooperation Agency (hereinafter referred as "JICA") dispatched a Basic Design Study on the Project for the Improvement of the Ring Road in Efate Island (hereinafter referred to as "the Project") to the Republic of Vanuatu. Through discussions, field survey, and technical examination of the results in Japan, JICA has prepared the Draft Report of the Study.

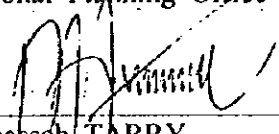
In order to explain and consult the Government of Vanuatu on the components of the Draft Report, JICA sent to Vanuatu a study team headed by Mr.Kiyoshi ASAKO, Assistant Director, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, which is scheduled to stay in the country from September 29 to October 7,1997.

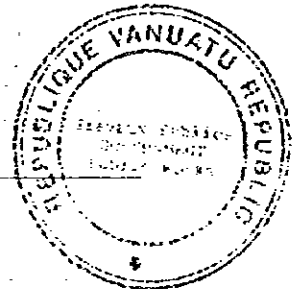
As a results of the discussions, both parties have confirmed the main items described on the attached sheets.

Port Vila, October 4 , 1997


Kiyoshi ASAKO
Leader,
Basic Design Study Team
JICA


Georges MANIURI
Director,
National Planning Office


Manasseh TARRY
Director,
Public Works Department



ATTACHMENT

1. **Components of the Draft Report**

The Government of Vanuatu has agreed and accepted in principal the components of the Draft Report proposed by the Team, with some minor changes agreed during the meetings. These amendments will be incorporated in the Basic Design. The major components of the Project are shown in ANNEX-2.
2. **Project Site**

The location of the Project road is shown in ANNEX-1
3. **Responsible Organization and Implementing Agency**

Responsible : Ministry of Transport, Public Works, Ports and
Organization : Marine, and Urban Water Supply
Implementing Agency : Public Works Department
4. **Coordination with Other Departments**

The Government of Vanuatu will coordinate between PWD and other departments related to the Project. Specially, to coordinate between the Department of Land for land acquisition and the Vanuatu Cultural Center for the cultural assets in the Project area.
5. **Land Acquisition**

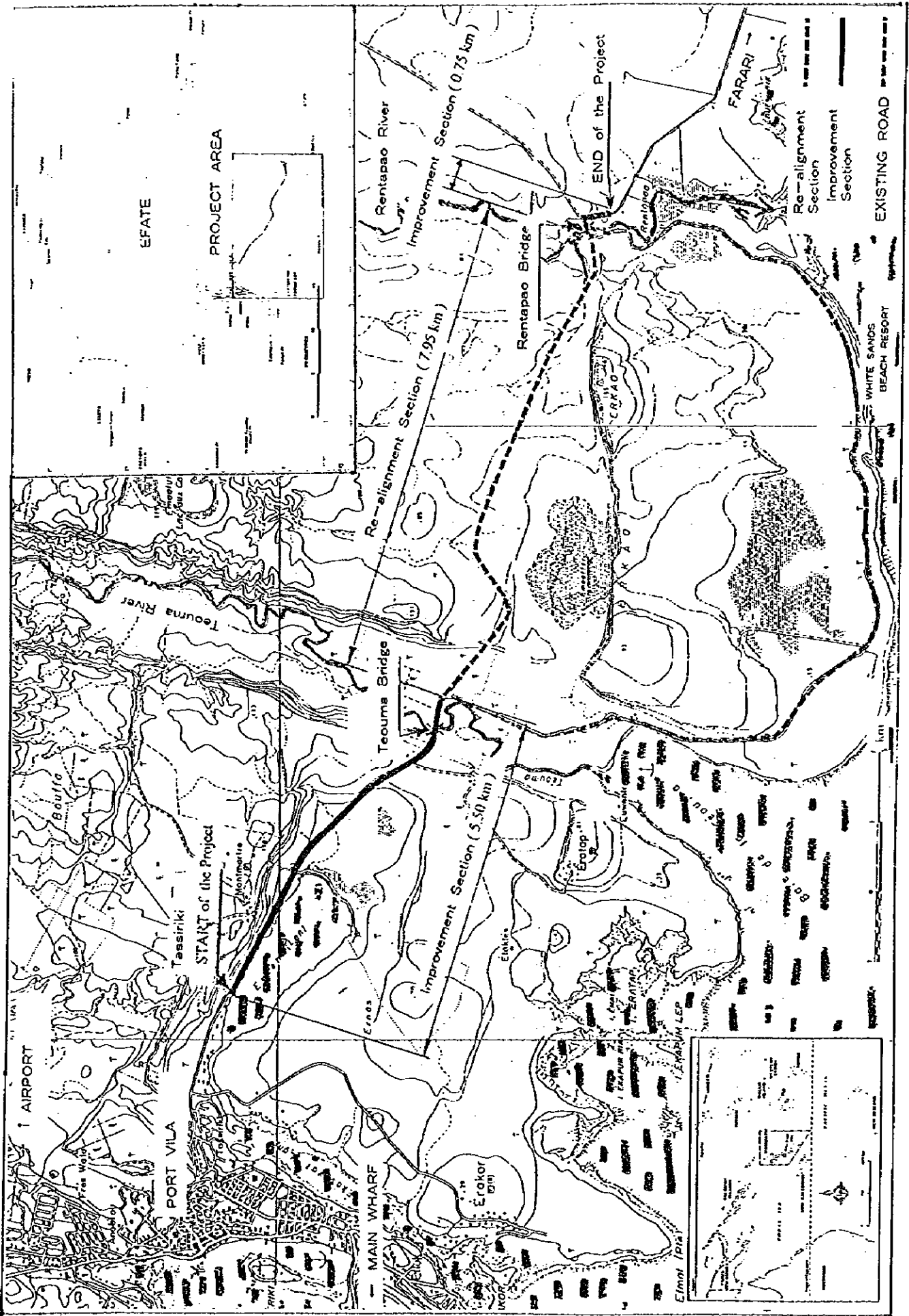
The Government of Vanuatu will secure the lots for the road section of the Project and remove encroachments in the Project area, such as fences, houses etc. PWD will provide the Study team the necessary information (number of spots, area size, location) regarding unsettled property (land) as soon as possible.
6. **Management and Maintenance**

The facilities constructed and equipment purchased under the Japan's Grant Aid Assistance will be maintained by PWD.
7. **Japan's Grant Aid System**
 - 1) The Government of Vanuatu has understood the system of the Japan's Grant Aid explained by the Study Team; the main feature is described in ANNEX-3.
 - 2) The Government of Vanuatu will take the necessary measures, described in ANNEX-4 for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.
8. **Further Schedule of the Study**

JICA will complete the Final Report in accordance with the confirmed items and forward it to the Government of Vanuatu by the end of January, 1998.

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LOCATION MAP

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ANNEX-2: MAJOR COMPONENTS OF THE PROJECT

The Project aims to improve the roads between Tassiriki and first 724 meters from Rentapao Bridge in Efate Island. The major components of the Project are as follows:

1. Road Improvement (Each work includes drainage improvement at where to be required)

- 1) Improvement of the existing road between Tassiriki and Teouma bridge (CH *0.000 km ~ CH 5.068km : 5.068km)
- 2) Re-alignment of the road between Teouma bridge and Rentapao bridge (CH 5.093 km ~ CH 13.464km : 8.371km)
- 3) Improvement of the existing road between Rentapao bridge and 58m from Culvert No.20 (CH 13.476 km ~ CH 14.200km : 0.724km)

* CH means pegged chainage in detailed design drawings in 1995 by PWD

2. Renovation of Existing Bridges

- 1) Teouma bridge (bridge length : 25m)
- 2) Rentapao bridge (bridge length : 12m)

3. Procurement of Road Maintenance Equipment

Item	Specifications	Quantity
1. Motor grader	blade length : 3.7m, with ripper	1
2. Wheel loader	1.2m ³ bucket, with shovel	1
3. Dump truck	4.0 MT, standard type	1
4. Flat bed truck	4.0 MT, with crane 3,000kg	1
5. Water tank truck	4,000 litter capacity	1
6. Baby roller	0.5 MT	1
7. Plate compactor	50-60kg	1
8. Asphalt sprayer	200 litter, kerosene heating type	1
9. Chain saw	cutter length : 50cm	1
10. Grass cutter	shoulder support cutter diameter : 23cm	1
11. Double cab cargo truck	4 x 2 double cabin,	1
12. Spare parts		lump sum

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ANNEX-3: JAPAN'S GRANT AID SCHEME

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures:

Application	:	Request made by a recipient country
Study	:	Basic Design Study conducted by JICA
Appraisal & Approval	:	Appraisal by the Government of Japan and Approval by Cabinet
Determination of Implementation	:	The Notice exchanged between the Governments of Japan and the recipient country

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese a consulting firm.

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Government of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

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2. Basic Design Study

1) Contents of the Study

The aims of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the project by the Government of Japan. The contents of the Study are as follows:

- a) confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
- b) evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view;
- c) confirmation of items agreed on by both parties concerning the basic concept of the Project;
- d) preparation of a basic design of the Project;
- e) estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure 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 in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

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2) Selection of Consultants

For smooth implementation of the Study, JICA uses a consultant firm selected through its own procedure (competitive proposal). The selected firm participates the Study and prepares a report based upon terms of reference set by JICA.

At the beginning of implementation after the Exchange of Notes, for the services of the Detailed Design and Construction Supervision of the Project, JICA recommends the same consulting firm which participated in the Study to the recipient country, in order to maintain the technical consistency between the Basic Design and Detailed Design as well as to avoid any undue delay caused by the selection of a new consulting firm.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

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

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed. However, in case

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of delay in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two governments.

- 4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However the prime contractors, namely, consulting constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

- 5) Necessity of "Verification"

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

- 6) Undertakings required of 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 follows:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- c) To secure buildings prior to the procurement in case the installation of the equipment.

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- d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
 - e) To exempt Japanese nationals from customs, duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.
 - f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.
- 7) "Proper Use"
The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.
- 8) "Re-export"
The products purchased under the Grant Aid should not be re-exported from the recipient country.
- 9) Banking Arrangements (B/A)
- (a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen 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 the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

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**ANNEX-4: NECESSARY MEASURES TO BE TAKEN BY THE
GOVERNMENT OF THE REPUBLIC OF VANUATU**

The following necessary measures should be taken by the Government of Vanuatu on condition that the Grant Aid by the Government of Japan is extended to the Project;

1. To provide data and information necessary for the Project.
2. To secure the land necessary for the execution of the Project, such as the Right of Way, Right of bridge, land for temporary offices, working areas, storage yards and others;
3. To clear the sites prior to the commencement of the construction;
4. To make passable all roads and bridges leading to the Project sites before the commencement of inland transportation of materials and equipment;
5. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commissions;
6. To ensure prompt unloading and customs clearance at ports of disembarkation in the Republic of Vanuatu and internal transportation therein on the products purchased under the Grant;
7. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Vanuatu with respect to the supply of the products and services under the Verified Contracts;
8. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contract such facilities as may be necessary for their entry into Vanuatu and stay therein for the performance of their work;
9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary;
10. To maintain and use properly and effectively facilities constructed and equipment provided under the Project;
11. To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants in the Project area during implementation of the Project; and
12. To bear all the expenses, other than those covered by Japanese Grant Aid, necessary for the Project.

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APPENDIX – 5

RESULTS OF TRAFFIC SURVEY

APPENDIX-5 RESULTS OF TRAFFIC SURVEY

LOCATION: TASSIRKI	DIRECTION: TO VILA												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	24	8	3	6	6	6	14	17	10	14	14	15	137
TAXI	3	2	4	2	3	4	2	0	2	4	3	5	34
BUS	10	4	6	10	6	6	9	4	8	7	9	5	84
TRUCK	23	9	20	15	13	9	24	17	25	20	20	13	208
HEAVY TRUCK	3	2	4	9	5	6	4	10	5	6	11	1	68
TOTAL	63	25	37	42	33	31	53	48	50	51	57	39	529

LOCATION: TASSIRKI	DIRECTION: TO other place												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	6	4	6	7	12	12	14	9	10	18	22	16	133
TAXI	6	2	2	3	2	3	1	3	4	4	2	4	36
BUS	3	7	9	9	6	7	10	4	11	8	13	6	93
TRUCK	12	16	22	15	14	18	18	18	15	18	21	17	202
HEAVY TRUCK	6	2	10	4	3	4	5	7	7	8	4	1	87
TOTAL	33	31	55	38	37	44	48	41	47	56	62	44	534

LOCATION: GABAGE DUMP	DIRECTION: TO VILA												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	8	1	1	1	2	5	4	6	3	3	3	4	41
TAXI	2	1	3	3	2	3	0	1	1	2	2	2	22
BUS	3	1	4	3	1	3	3	2	2	3	3	1	29
TRUCK	14	3	6	9	4	7	14	10	14	14	10	8	115
HEAVY TRUCK	1	2	3	2	1	2	2	4	2	3	4	0	28
TOTAL	28	8	19	18	10	20	23	23	22	25	22	15	233

LOCATION: GABAGE DUMP	DIRECTION: TO DUMP SITE												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	0	0	0	0	0	0	1	0	1	0	0	0	2
TAXI	2	0	0	0	0	0	0	0	0	0	0	0	2
BUS	0	0	1	0	1	0	0	0	0	0	0	0	2
TRUCK	1	2	12	3	3	0	3	5	5	2	0	0	38
HEAVY TRUCK	1	2	10	4	3	2	4	6	6	4	2	0	44
TOTAL	4	4	23	7	7	2	8	11	12	6	2	0	88

LOCATION: GABAGE DUMP	DIRECTION: TO OTHER PLACE												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	2	0	9	1	5	2	3	2	2	3	5	1	35
TAXI	4	2	2	3	5	0	0	2	0	3	1	3	25
BUS	2	2	7	2	4	0	4	1	2	2	6	4	36
TRUCK	9	7	12	7	12	7	11	10	9	8	20	15	127
HEAVY TRUCK	4	0	8	2	0	0	4	2	0	3	2	1	28
TOTAL	21	11	38	15	26	9	22	17	13	19	34	24	249

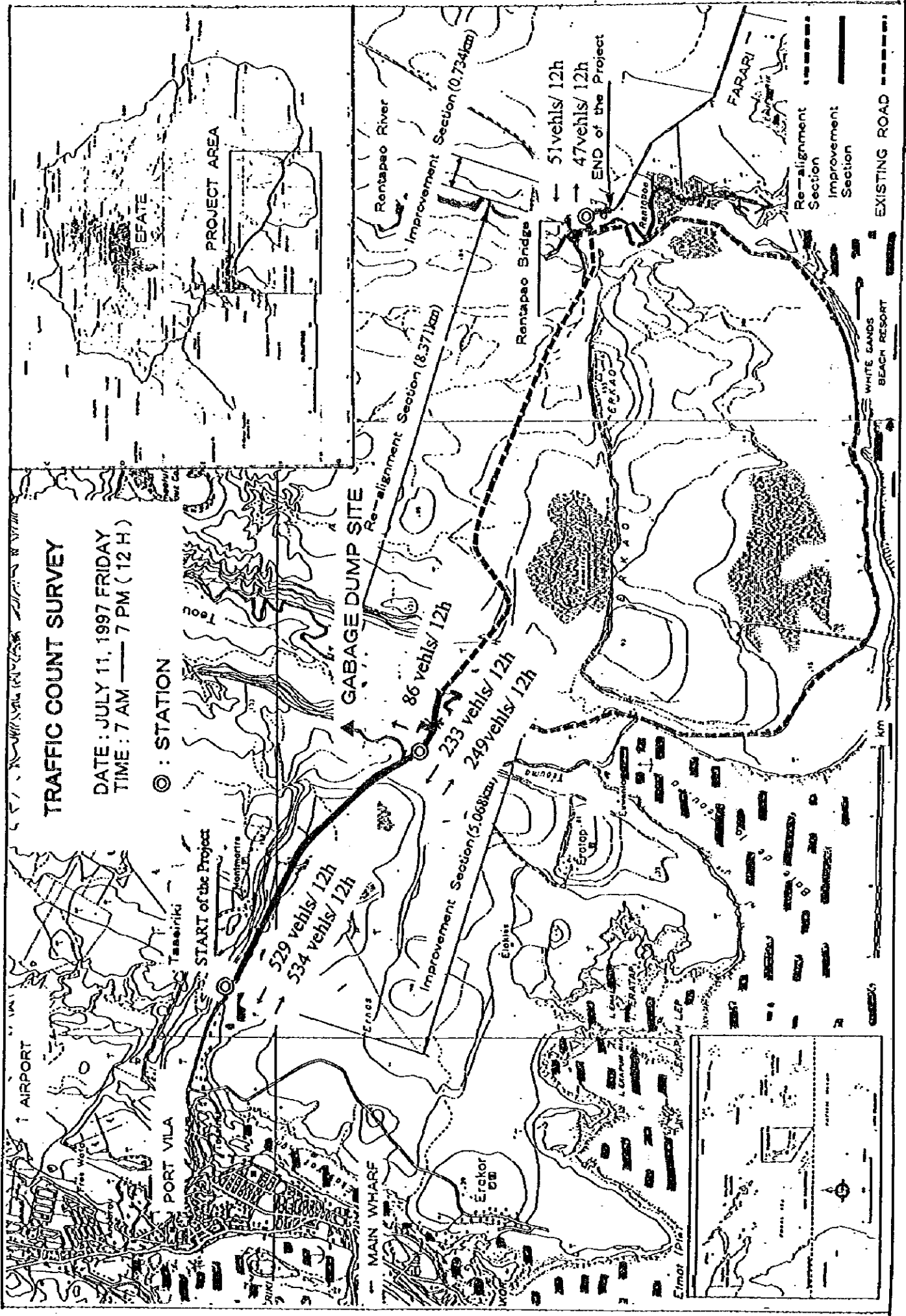
LOCATION: RENTAPAO BRIDGE	DIRECTION: TO VILA												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	0	1	0	1	0	0	0	1	0	1	2	4	10
TAXI	0	0	1	0	0	0	0	0	0	0	0	1	2
BUS	1	0	0	1	0	0	0	0	0	1	1	0	4
TRUCK	0	2	3	1	1	3	4	2	4	2	3	1	26
HEAVY TRUCK	0	2	0	0	1	1	1	2	1	0	1	0	9
TOTAL	1	5	4	3	2	4	5	5	5	4	7	6	51

LOCATION: RENTAPAO BRIDGE	DIRECTION: TO OTHER PLACE												TOTAL
	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
PRIVATE CAR	0	0	1	0	0	2	0	1	1	0	2	3	10
TAXI	0	2	0	0	0	0	0	0	0	0	1	0	3
BUS	0	0	0	3	1	0	0	0	0	0	2	0	6
TRUCK	0	3	2	3	3	0	2	2	0	0	3	4	22
HEAVY TRUCK	0	2	0	1	0	0	0	1	0	1	1	0	6
TOTAL	0	7	3	7	4	2	2	4	1	1	9	7	47

TRAFFIC COUNT SURVEY

DATE: JULY 11, 1997 FRIDAY
TIME: 7 AM — 7 PM (12 H)

◎ : STATION



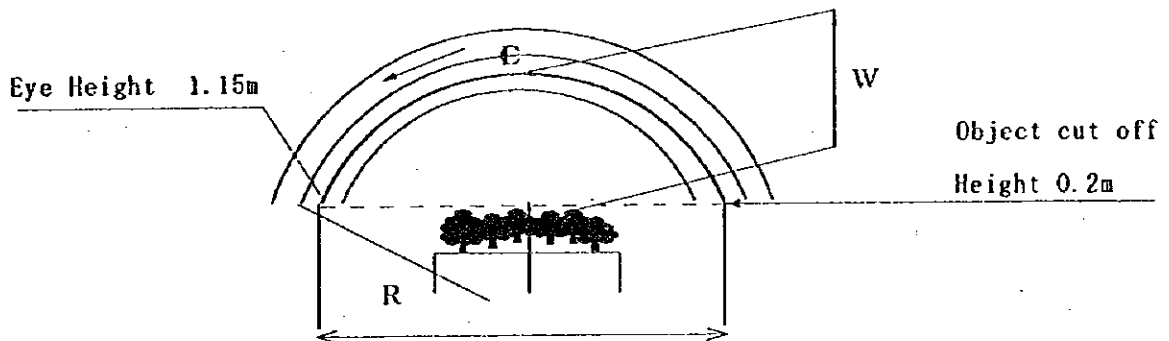
LOCATION MAP

APPENDIX – 6

DESIGN OF SIGHT DISTANCE

1) SIGHT DISTANCE OF HORIZONTAL CURVES

CURVES NO	CURVES R (M)	W = (M)	SIGHT DISTANCE L (M)	SLOPE CONDITION	STOPPING SIGHT DISTANCE		
					DESIGN SPEED	DESIGN SPEED	
2	500	4.375	132	Cut	100k/h → 80k/h = 170m = 115m		
3	550	4.375	139	Flat			
6	450	4.375	* 125	Cut			
7	450	4.375	* 125	Cut			
8	350	4.625	* 115	Flat			
12	500	4.375	132	Fill			
15	275	4.875	* 104	Flat	80k/h = 115m		Cutting Grass W=1.1m
16	190	4.875	* 87	Flat			Cutting Grass W=3.8m
18	200	4.625	86	Flat	70k/h → 60k/h = 85m = 65m		
20	300	4.375	102	Fill			
21	260	4.625	98	Cut			
29	300	4.375	102	Cut			
34	250	4.625	96	Fill			
36	100	5.375	* 66	Cut			
37	230	4.625	92	Cut			
38	150	4.625	* 74	Cut			



$$L = \sqrt{W \cdot 8R}$$

SIGHT DISTANCE OF VERTICAL CURVE (CREST) AND COMFORT CONSIDERATIONS (SAG)

I.P. of Grade No.	Pegged Chainage No.	Grade (%)	Change of Grade Δi (%)	Vertical Curve Length (M)	Crest	SAG	Sight Distance		Comfort Considerations	
							Design Speed	Design Speed	Design Speed	Design Speed
1	^k 0.000	%					100 k/h	80 k/h		
	^k 0.060	+ 1.580	2.454	100	☆	-	L = 153 m OUT	L = 59 m OK	-	-
8	^k 1.120	- 0.874					100 k/h	80 k/h		
		+ 1.023	2.624	160	☆	-	L = 164 m OUT	L = 63 m OK	-	-
13	^k 1.900	+ 0.978	4.038	60	-	☆	-	80 k/h	100 k/h	80 k/h
	^k 2.024	+ 5.016	3.113	180	☆	-	L = 195m OUT	L = 75m OK	L = 65m OUT	L = 40m OK
		+ 1.903								
56	Near Rentapao Br.	+ 0.649	7.214	50	-	☆	-	70 k/h	70 k/h	60 k/h
	^k 13.508	+ 7.863					-	L = 58m OUT	L = 43m OK	

CREST

$$L = \frac{D^2 \cdot \Delta i}{C = 461}$$

SIGHT DISTANCE

60 k/h : D = 65m	=	9.16 Δi
70 k/h : D = 85m	=	15.70 Δi
80 k/h : D = 105m	=	23.90 Δi
100 k/h : D = 170m	=	62.70 Δi

SAG

60 k/h	=	6.00 Δi
70 k/h	=	8.00 Δi
80 k/h	=	10.00 Δi
100 k/h	=	16.00 Δi

Factors of Vertical Alignment (1/2)

No.	Station	Gradient (%)	Length of Gradient (m)	Length of Curve (m)	Curve Radius (K)	Mountain Valley	Remarks
	0.000						
		+ 1.580	60.000				
1	0.000			100	40.749	Mountain	
		- 0.874	135.000				
2	0.195			50	35.768	Valley	
		+ 0.524	105.000				
3	0.300			50	118.274	Valley	
		+ 0.101	188.000				
4	0.488			50	190.424	Mountain	
		+ 0.364	99.000				
5	0.587			50	188.604	Mountain	
		+ 0.629	167.000				
6	0.754			180	106.631	Mountain	
		- 1.059	236.000				
7	0.990			80	38.417	Valley	
		+ 1.023	130.000				
8	1.120			160	60.953	Mountain	
		- 1.601	138.000				
9	1.258			100	31.275	Valley	
		+ 1.596	151.000				
10	1.409			160	68.238	Mountain	
		- 0.749	191.000				
11	1.600			50	61.638	Valley	
		+ 0.063	208.000				
12	1.808			50	54.599	Valley	
		+ 0.978	92.000				
13	1.900			60	14.859	Valley	
		+ 5.016	124.000				
14	2.024			180	57.813	Mountain	
		+ 1.903	113.000				
15	2.137			30	61.863	Valley	
		+ 2.388	129.000				
16	2.266			100	119.12	Mountain	
		+ 1.548	343.000				
17	2.609			300	65.247	Mountain	
		- 3.050	281.000				
18	2.890			50	33.337	Valley	
		- 1.550	300.000				
19	3.190			50	36.244	Valley	
		- 0.170	176.000				
20	3.366			150	33.050	Valley	
		+ 4.368	201.000				
21	3.567			110	137.031	Mountain	
		+ 3.565	214.000				
22	3.781			150	66.571	Valley	v=100k/h 4.050k to Bouffa Tip v=80k/h
		+ 5.819	386.000				
23	4.167			350	39.430	Mountain	
		- 3.058	277.000				
24	4.444			100	75.315	Valley	
		- 1.730	234.000				
25	4.678			240	25.470	Mountain	
		- 11.153	17.000				
26	4.895			140	14.648	Valley	
		- 1.595	152.348				
27	5.047			40	28.468	Valley	
		- 0.190	20.992				v=80k/h TEOUMA. Br. Centerline 5.08k v=70k/h

Factors of Vertical Alignment (2/2)

No.	Station	Gradient (%)	Length of Gradient (m)	Length of Curve (m)	Curve Radius (K)	Mountain Valley	Remarks
28	5.123	- 0.192	158.660	30	0.000	Mountain	
29	5.282	+ 1.963	109.000	50	23.203	Valley	
30	5.391	- 0.421	242.000	130	54.512	Mountain	
31	5.633	- 0.158	449.000	50	189.99	Valley	
32	6.132	+ 0.433	344.000	50	84.537	Valley	
33	6.476	+ 5.796	407.000	200	37.293	Valley	
34	6.883	+ 2.057	192.000	150	40.120	Mountain	
35	7.075	+ 3.200	250.000	100	87.511	Valley	
36	7.325	+ 4.279	323.000	100	92.710	Valley	
37	7.648	- 1.707	427.000	250	41.765	Mountain	
38	8.075	- 5.887	168.000	180	43.066	Mountain	
39	8.243	+ 1.750	300.000	120	15.713	Valley	
40	8.543	+ 2.964	197.000	50	41.170	Valley	
41	8.740	- 4.197	451.000	280	39.096	Mountain	
42	9.191	+ 1.313	310.000	250	45.370	Valley	
43	9.501	+ 1.888	303.000	50	86.974	Valley	
44	9.804	- 3.656	253.000	220	39.683	Mountain	
45	10.057	+ 3.002	447.000	180	27.034	Valley	
46	10.533	+ 0.453	254.000	150	58.839	Mountain	
47	10.788	- 2.041	269.000	150	60.153	Mountain	
48	11.057	- 0.604	217.000	100	69.580	Valley	
49	11.274	- 5.342	149.999	170	35.875	Mountain	
50	11.423	- 1.055	325.000	100	23.327	Valley	
51	11.748	- 0.163	565.000	100	112.038	Valley	
52	12.313	- 0.227	604.000	50	781.387	Mountain	
53	12.917	- 7.638	276.000	300	40.481	Mountain	
54	13.193	- 1.507	258.950	100	16.311	Valley	
55	13.451			20	19.146	Valley	
		0.00(+0.649)	-(31.900)				Rentapao Br. Centerline 13.470k
56	13.508	+ 7.863	304.000	50	6.931	Valley	
57	13.812	- 8.125	257.000	310	19.390	Mountain	
58	14.069	- 0.146	144.000	100	12.533	Valley	

APPENDIX – 7

**ESTIMATED COST TO BE BORNE
BY THE REPUBLIC OF VANUATU**

Custom Clearance Fee

(Unit : VATU)

No.	Equipment	Q'ty	Unit	Unit Cost	Amount
1	Wheel Loader with shovel	1	unit	20,442	20,442
2	Dump Truck	1	unit	10,238	10,238
3	Cargo Truck with crane	1	unit	16,191	16,191
4	Motor Grader	1	unit	19,201	19,201
5	Vibration Roller	1	unit	754	754
6	Plate Compactor	1	unit	87	87
7	Asphalt Sprayer	1	unit	1,406	1,406
8	Water Tank Truck	1	unit	12,368	12,368
9	Mower (shoulder harness)	1	unit	632	632
10	Chain Saw	1	unit	79	79
11	Pick-up Truck	1	unit	5,830	5,830
Total		11	-	-	87,208

Note: Unit cost includes spare parts

Operation Cost of Equipment

(Unit : VT)

No.	Item	Specifications	PS.	Qty	Fuel		Operations		Labor Unit Cost VT/day	Labor Productivity man/h	Cost / one unit / day		Yearly cost		
					Consumption Litter / PS* h	PS* h	Days/ year	h / day			Labor Cost	Fuel Cost	Labor Cost	Fuel Cost	Total
1	Motor grader	blade length : 3.7m. with ripper	151	1		0.081	100	5.9	5510	0.28	9.103	6.502	910,252	650,188	1,560,440
2	Wheel loader	1.2m ³ bucket with shovel	213	1		0.115	150	6.3	5510	0.28	9.720	13,904	1,457,946	2,085,615	3,543,561
3	Dump truck	4.0 MT. standard type	184	1		0.04	180	5.9	3869	0.16	3.652	3.913	657,420	704,250	1,361,671
4	Flat bed truck	4.0 MT. with crane 3,000kg	180	1		0.04	190	5.3	3869	0.20	4.101	3.438	779,217	683,261	1,432,478
5	Water tank truck	4,000 liter capacity	160	1		0.03	150	5.4	3869	0.20	4.179	2.335	626,778	350,309	977,087
6	Baby roller	0.5 MT	5	1		0.151	100	4.3	5456	0.28	6.569	2.93	656,902	29,251	686,153
7	Plate compactor	50 - 60kg	3	1		0.228	100	4.8	2426	0.22	2.562	2.88	256,186	28,826	285,012
8	Asphalt sprayer	200 liter. kerosene heating type	3.2	1		0.17	80	5.3	5510	0.22	6.425	2.53	513,973	20,252	534,224
9	Chain saw	cutter length : 50cm	0.8	1		0.432	90	4.8	2426	0.22	2.562	1.46	230,567	13,108	243,676
10	Grass cutter	shoulder support.	0.8	1		0.432	90	4.8	2426	0.22	2.562	1.46	230,567	13,108	243,676
		cutter diameter : 23cm													
11	Double cab cargo truck	4*2, double cabin	85	1		0.038	220	3.5	3869	0.20	2.708	993	595,826	218,367	814,193
	Total			11							54,142	32,210	6,915,634	4,766,536	11,682,170

Note: Diesel oil (unit cost) = 90.1 VT/L
Gasoline (unit cost) = 87.8 VT/L

Removal Expenses for Fences and Houses

- (1) New fence construction : Both side of 2.5 km section
 Total length 5,000 m
 Height 1.5 m
 50 cm interval
 Removal of fences : Total length 6,500 m
 (* recycle of 50% materials if relocation)
 Grand total length: 11,500 m
- (2) Newly collecting peg : 2 pieces / m
 $5,000 \div 0.5 = 10,000$ pieces (new location)
 $6,500 \times 0.5 \div 0.5 = 6,500$ pieces (relocation)
 Total 16,500 pieces
- (3) Barbwire : 4 lanes
 $5,000 \text{ m} \times 4 \text{ lanes} = 20,000 \text{ m}$ (new location)
 $6,500 \text{ m} \times 0.5 \times 4 \text{ lanes} = 13,000 \text{ m}$ (relocation)
 Total 33,000 m
 Price: 3,868 VT (280 m / roll, 25 kg)
 14 VT / m
 $3,300 \text{ m} \times 14 \text{ VT} = 46,000 \text{ VT}$
- (4) Labor cost : 2,000 VT / man / day
 Collecting peg : 200 pieces / man / day, $16,500 \text{ pieces} \div 200 \text{ pieces} = 84 \text{ man day}$
 Location of peg : 100 m / man / day, $11,500 \text{ m} \div 150 \text{ man day}$
 Total 119 \approx 200 man day
- (5) Relocation of houses : 3 houses
 $50 \text{ man day} \times 2,000 \text{ VT} = 100,000 \text{ VT}$ (10 days by 5 men)
 Materials = 100,000 VT (new materials)

Summary of Necessary Expenses

(VT)

	Fence	House	Total
Material	460,000	100,000	560,000
Labor cost	400,000	100,000	500,000
Total	860,000	200,000	106,000

JICA