

付属資料(1) 署名ミニッツ

**Minutes of Discussions  
on the Preliminary Study  
on the Project for Construction of Bridges on Bougainville Coastal Trunk Road  
in the Independent State of Papua New Guinea**


In response to a request from the Government of the Independent State of Papua New Guinea, the Government of Japan decided to conduct a Preliminary Study on the Project for Construction of Bridges on Bougainville Coastal Trunk Road (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

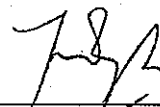
JICA sent to the Independent State of Papua New Guinea (hereinafter referred to as "PNG") the Preliminary Study Team (hereinafter referred to as "the Team"), headed by Kunihiro Yamauchi, Group Leader, Project Management Group I, Grant Aid Management Department, JICA, and is scheduled to stay in the country from August 20 to September 19, 2007.

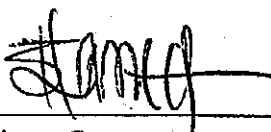
The Team held discussions with the officials concerned of the Government of PNG and conducted a field survey at the study area.

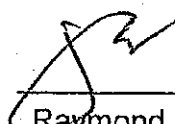
In the course of discussions and the field survey, both sides confirmed the main items described in the attached sheets.

Port Moresby, September 5, 2007

  
\_\_\_\_\_  
Kunihiro Yamauchi  
Leader  
Preliminary Study Team  
Japan International Cooperation Agency

  
\_\_\_\_\_  
Mosilayola Kwayaila  
Director  
Department of National Planning and Monitoring  
PNG

  
\_\_\_\_\_  
Hans Sarua  
Deputy Secretary (Technical)  
Department of Works  
PNG

  
\_\_\_\_\_  
Raymond Masono  
Acting Chief Administrator  
Autonomous Bougainville Government  
PNG

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to construct bridges and culverts on Bougainville Coastal Trunk Road, in order to support provincial security, secure economic development and provincial cohesion.

### 2. Project Site

The sites of the Project are on Bougainville Coastal Trunk Road between Kokopau and Arawa in Bougainville Autonomous Region, as shown in Annex-1.

### 3. Responsible and Implementing Organizations

3-1. The Responsible organization is the Department of National Planning and Monitoring (DNPM) of the Government of PNG. DNPM shall have the responsibility for the Project as a client when the Project is implemented, and also have the responsibility for coordinating Implementing Agencies.

3-2. The Implementing Agencies are the Department of Works (DOW) and the Autonomous Bougainville Government (ABG). DOW is responsible for the implementation of the Project and for maintenance after construction with support as required from ABG. PNG side proposed to organize a steering committee consisting DNPM, DOW, ABG and other stakeholders to coordinate implementation of the Project.

Organization charts of DNPM, DOW and ABG are shown in Annex-2.

### 4. Items Requested by the Government of PNG

After discussions with the Team, PNG side finally requested construction of fifteen bridges, which included additional two bridges to the original request, listed in Annex-1. PNG side shall submit an official document for additional request to the Embassy of Japan promptly.

PNG side indicated that the bridges in the Kokopau side have priority for construction, in case the Project is divided in 2 phases.

JICA will assess the appropriateness of the request and will report the findings to the Government of Japan.

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## 5. Japan's Grant Aid Scheme

5-1. PNG side understands the Japan's Grant Aid scheme explained by the Team, as described in Annex-3

5-2. PNG side will take the necessary measures, as described in Annex-4, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

## 6. Environmental and Social Considerations

6-1. The Team explained the outline of the JICA Environmental and Social Considerations Guidelines (hereinafter referred to as "the JICA Guidelines") to PNG side. PNG side took the JICA Guidelines into consideration, and shall complete the necessary procedures. PNG side will conduct the IEE (Initial Environmental Examination) together with the Team.

6-2. Based on "Environment (Prescribed Activities) Regulation 2002" of the Government of PNG, PNG side shall immediately submit a notification letter of the Project to the Department of Environment and Conservation (DEC) and report the result of categorization by DEC to JICA PNG Office by October 15, 2007.

6-3. PNG side shall organize Community Coordination Committees among local stakeholders and hold consultation meetings for each project site in order to inform residents of outline of the Project and possible negative impacts by the Project including the expropriation of small portions of customary land, and to collect comments on the Project from the stakeholders. PNG side has already launched the process and shall report the results of the meetings to the JICA PNG Office by October 15, 2007.

6-4. As a result of site survey, there is no resettlement for the Project: however, if resettlement is necessary for the Project, PNG side should hold meetings immediately with land owners in order to confirm the consensus on the resettlement due to implementation of the Project. PNG side shall complete the necessary procedures and acquire the consensus before Basic Design Study.

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## 7. Schedule of the Study

The Team will proceed to further studies in Japan until the middle of October 2007. If the Project is deemed feasible as a result of the Preliminary Study, JICA will send the Basic Design Study Team subject to the instruction by the Ministry of Foreign Affairs of Japan.

## 8. Other Relevant Issues

8-1. The name of the Project is "the Project for Construction of Bridges on Bougainville Coastal Trunk Road".

8-2. PNG side shall clarify that the definition of right of way for Bougainville Coastal Trunk Road, confirm that the right of way has been already secured, and report to the JICA PNG Office with an official document by September 17, 2007.

8-3. PNG side shall submit answers to the Questionnaire, which the Team handed to the PNG side, by September 17, 2007.

8-4. There is no duplication of similar support by other donors regarding the Project.

8-5. Since the Bougainville Coastal Trunk Road is a National Road, construction permission for the Project is not necessary.

8-6. PNG side shall provide necessary number(s) of counterpart personnel to the Team during the period of the study in PNG.

Annex-1: Location Map and List of Requested Bridges

Annex-2: Organization Chart of DNPM, DOW and ABG

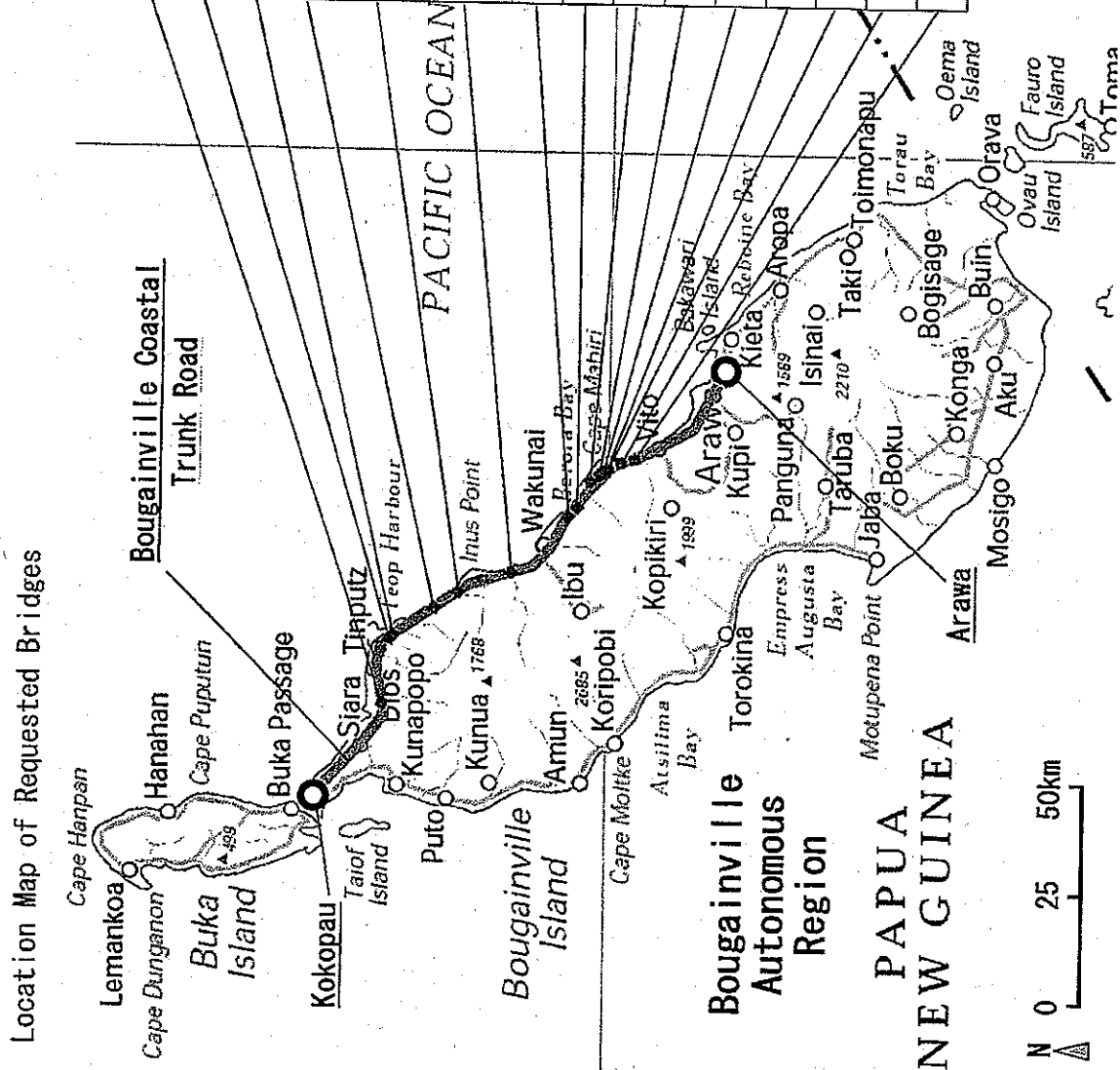
Annex-3: Japan's Grant Aid

Annex-4: Major Undertakings to be taken by Each Government

List of Requested Bridges

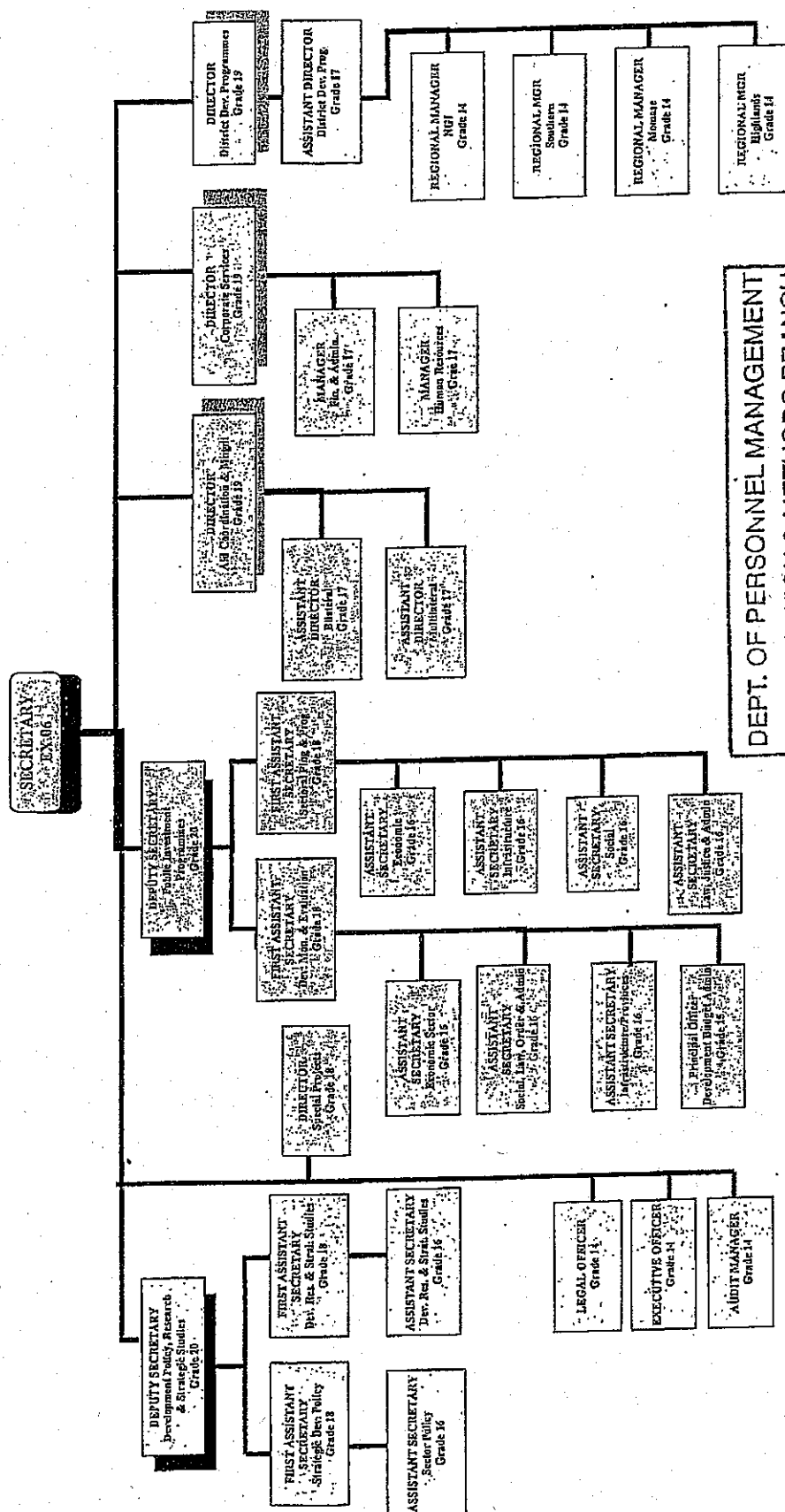
No. & Names of Bridges			Names in the Original Request
	Corrected Names		
35.	Rawa1		Rawa1
31.	Irung		Irung
30.	Warakapis		Tinputz
27.	Rotaovei		Rotaovei
24.	Kaskrus (Additional Request)		Kaskas (Not Requested)
19.	Ururva (Additional Request)		Tepro (Not Requested)
14.	Malas		Tepro
12.	Korova		Felorovia
11.	Iraka		Ivaka
10.	Ratavi		Mad Water1
9.	Creepers		Mad Water2
8.	Pukarobi 2		Mad Water3
7.	Pukarobi 1		Mad Water4
4.	Bove		Vove
3.	Bakanovi		Vakanovi

Annex-1



# ORGANISATIONAL AND MANAGEMENT STRUCTURE

## Department of National Planning and Monitoring

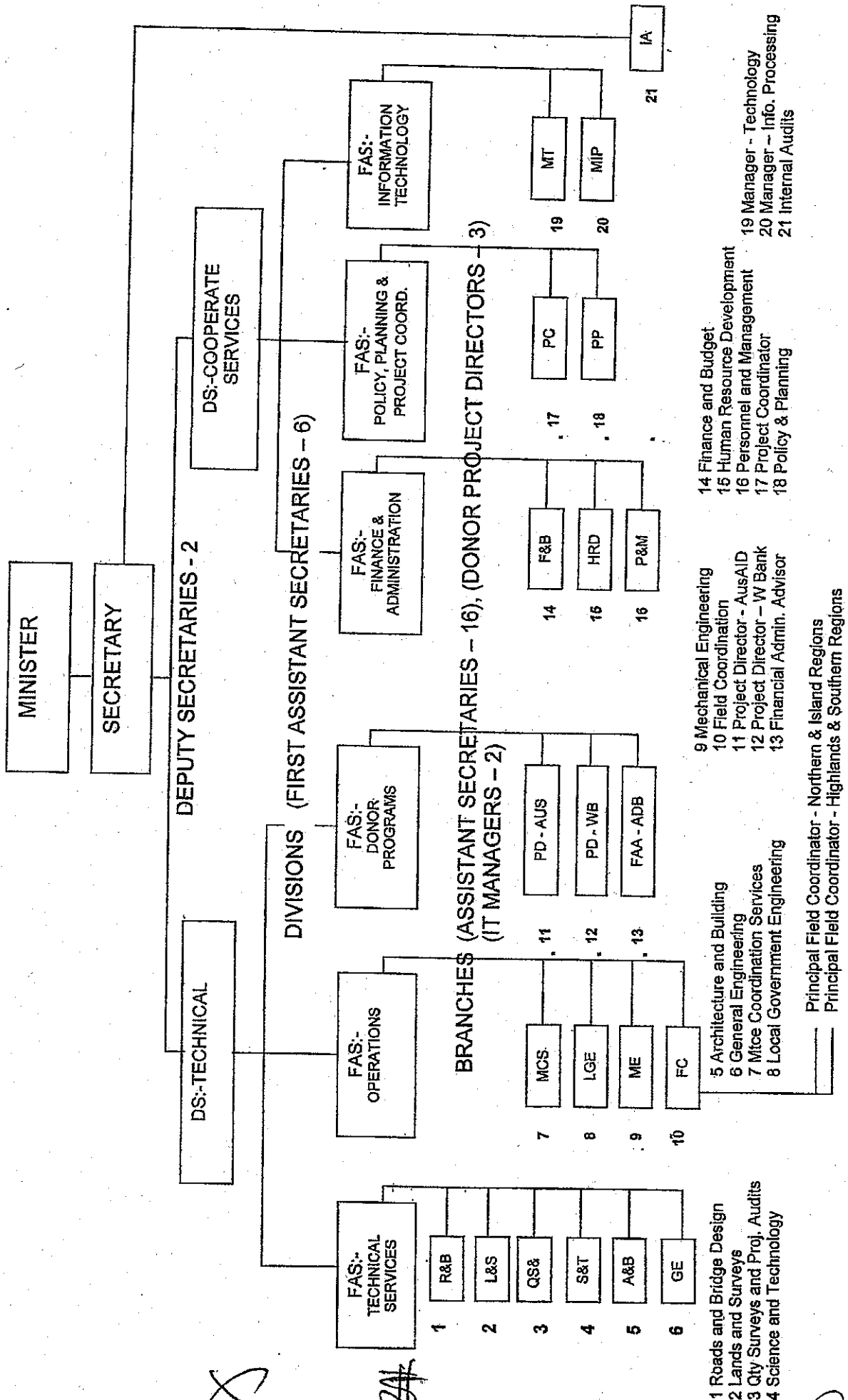


DEPT. OF PERSONNEL MANAGEMENT  
ORGANISATION & METHODS BRANCH  
APPROVED ORG. STRUCTURE

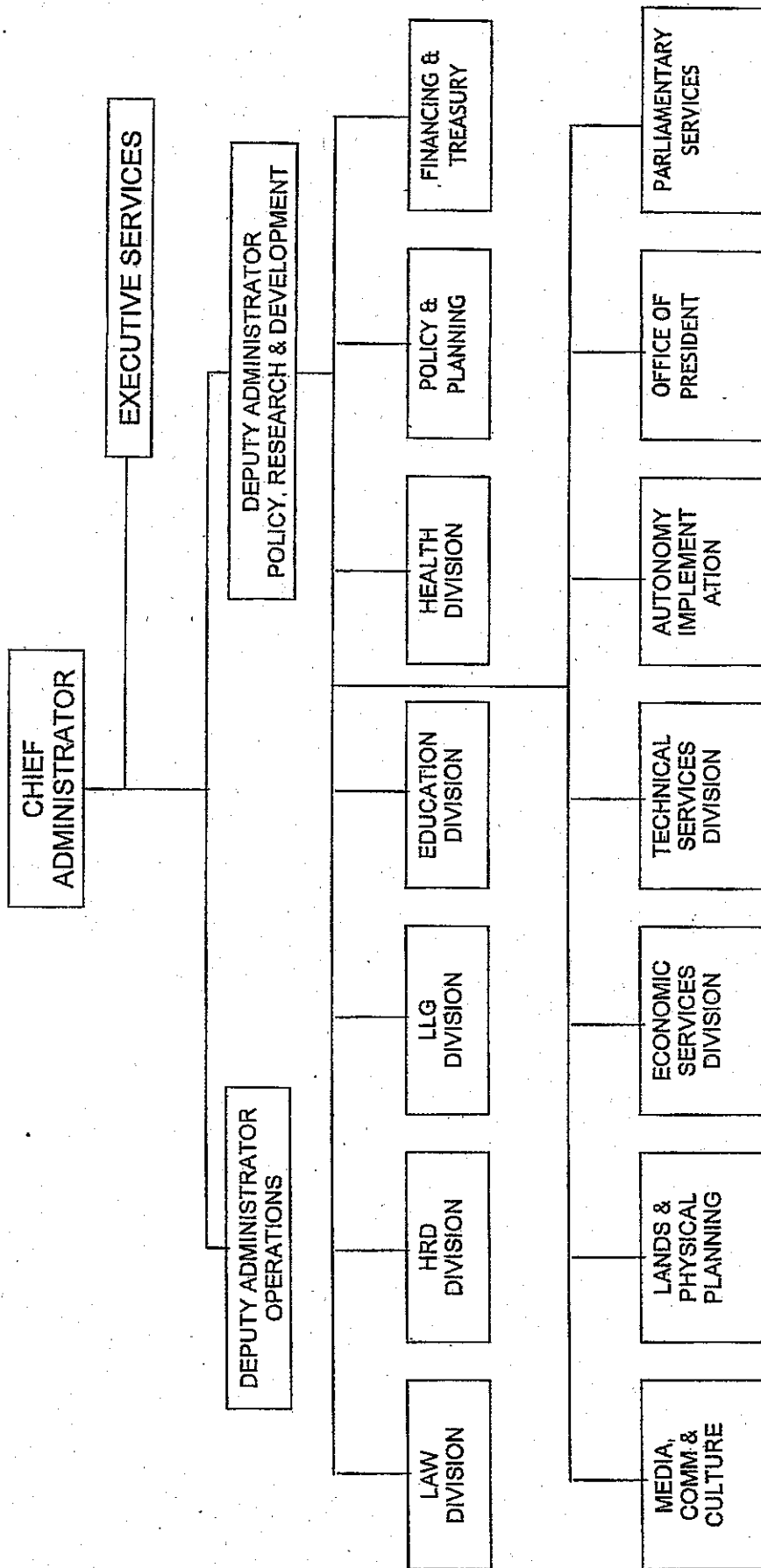
DATE 10 / 08 / 06

SIGNATURE

# DEPARTMENT OF WORKS TOP ORGANISATION STRUCTURE



# AUTONOMOUS BOUGAINVILLE GOVERNMENT ORGANISATION STRUCTURE





## Annex-3

## JAPAN'S GRANT AID SCHEME

The Grant Aid scheme provides a recipient country with non-reimbursable funds 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. The Grant Aid is not supplied through the donation of materials as such.

## 1. Grant Aid Procedures

Japan's Grant Aid Scheme 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 Notes exchanged between the Governments of Japan and the recipient country)

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 (Japan International Cooperation Agency) to conduct a study on the request.

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

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, 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 (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the smooth 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 aim 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:

1. 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.
2. Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view;
3. Confirmation of items agreed upon by both parties concerning the basic concept of the Project.
4. Preparation of a basic design of the Project.
5. Estimation of cost 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 through 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 registered consulting firms. JICA selects firms based on proposals submitted by interested firms. The firms selected carry out a Basic Design Study and write a report, based upon terms of reference set by JICA.

The consulting firms used for the Study are recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

### 3. Japan's Grant Aid Scheme

#### 1) 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.

- 2) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure 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 natural disaster, 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.

- 3) 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, contracting 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.)

#### 4) Necessity of "Verification"

The Government of the 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 of Japanese taxpayers.

#### 5) Undertakings required to 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 the following:

1. To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project,
2. To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

3. To secure buildings prior to the procurement in case the installation of the equipment,
4. To ensure all the expense and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
5. 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,
6. To accord Japanese nationals, whose services may be required in connection with 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.

6) "Proper Use"

The recipient country is required to operate and maintain 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.

7) "Re-export"

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

8) Banking Arrangement (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 a 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 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 to the Bank.

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## Annex-4

## Major Undertaking to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear, level and reclaim the side when needed		●
3	To construct gates and fences in and around the site		●
4	To bear the following commissions to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
5	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine and land transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)
6	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.		●
7	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		●
8	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
9	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to Pay)

付属資料(2) 要請15橋梁Bridge Inventory

List of Requested Bridges



No. & Name of Bridge	Length (m)	Type
35. Rawa1	45	Culvert
31. Irung	60	Truss
30. Warakapis	40	Truss
27. Rotaovei	36	Truss
24. Kaskrus	30	Culvert
19. Ururva	30	Truss
14. Malas	30	Truss
12. Korova	30	Culvert
11. Iraka	60	Truss
10. Ratavi	60	Truss
9. Creepers	20	Culvert
8. Pukarobi 2	20	Culvert
7. Pukarobi 1	25	Culvert
4. Bove	30	Truss
3. Bakanovi	70	Truss

Location Map of Applied Bridge



Bridge Inventory

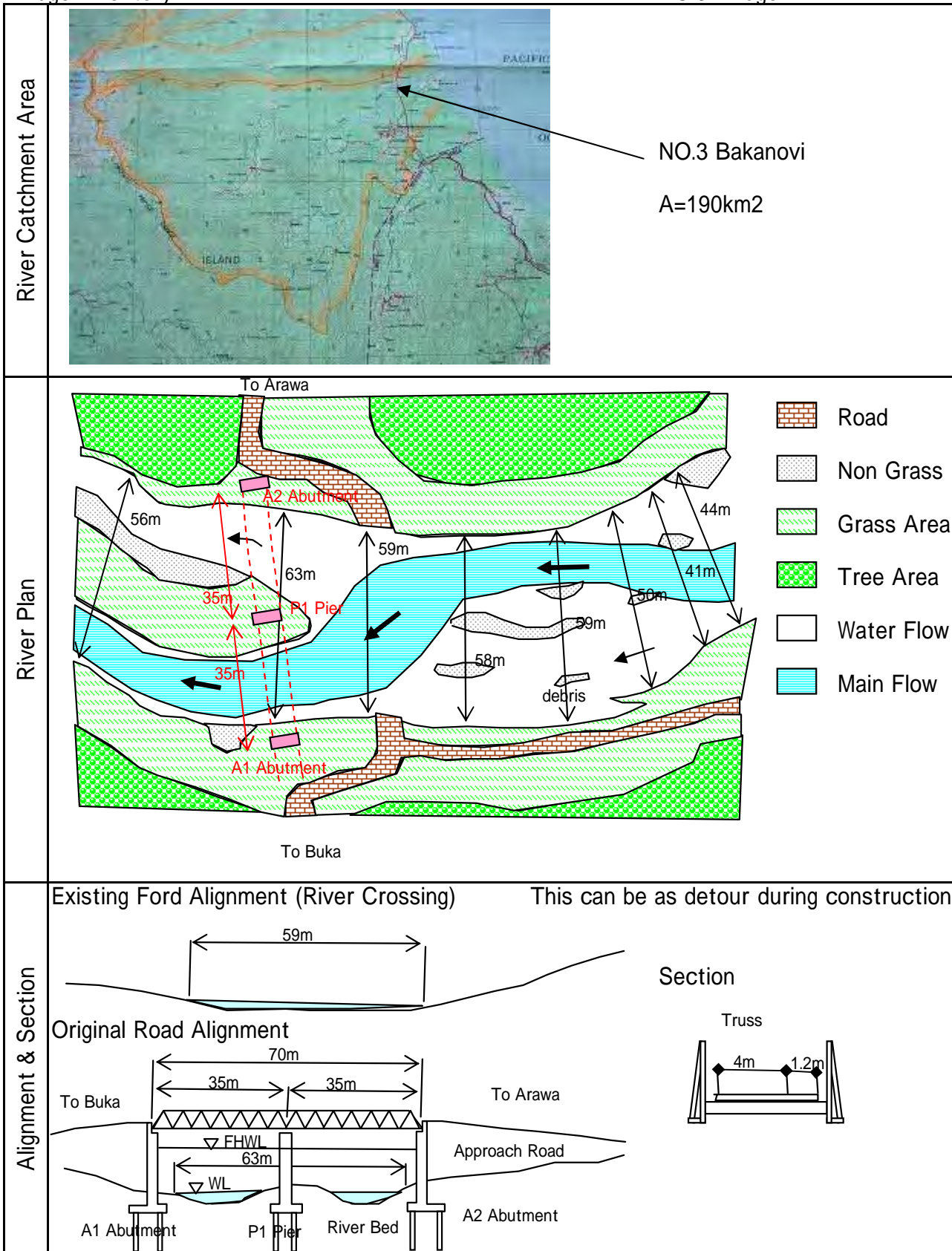
NO.3 Bridge

Photo		
		
General Information	Name of Bridge	Bakanovi
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 6km, From Arawa 31km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	1975 (1992flood washed out culvert)
	Donor	Non
	Design Report	Bridge Inventory
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width Full Width (m)	7.0
	Carriageway (m)	7.0
	Pedestrian way(m)	0.0
	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Vito River (A=190km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	meandering of main flow & channel (30m shift)
	Information of Flood Damage(river width)	1992 flood -120m, 1 year flood-70m
	Information of Flood Damage(river depth)	1992 flood -4.0m, 1 year flood-1.5m
	Information of Flood Damage(meandering)	
Proposed Bridge	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 1 (estimated i =1/400)
	Navigation	S 06 ° 05.616' E 155 ° 23.788'
	A1 Abutment Location	behind 5m from river side (avoid main flow)
	A2 Abutment Location	forward 5m to river side
	Bridge Length (m)	70m
	Span Length (m)	requested 60m, proposed 2span*35m=70m
Bridge Type	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (4,000people lives & across for church & school)
	Superstructure	Truss Bridge
	Substructure	abutment, pier (both's scouring depth 2m)
	Foundation	coco nut pile for scouring



# Bridge Inventory

## NO.3 Bridge





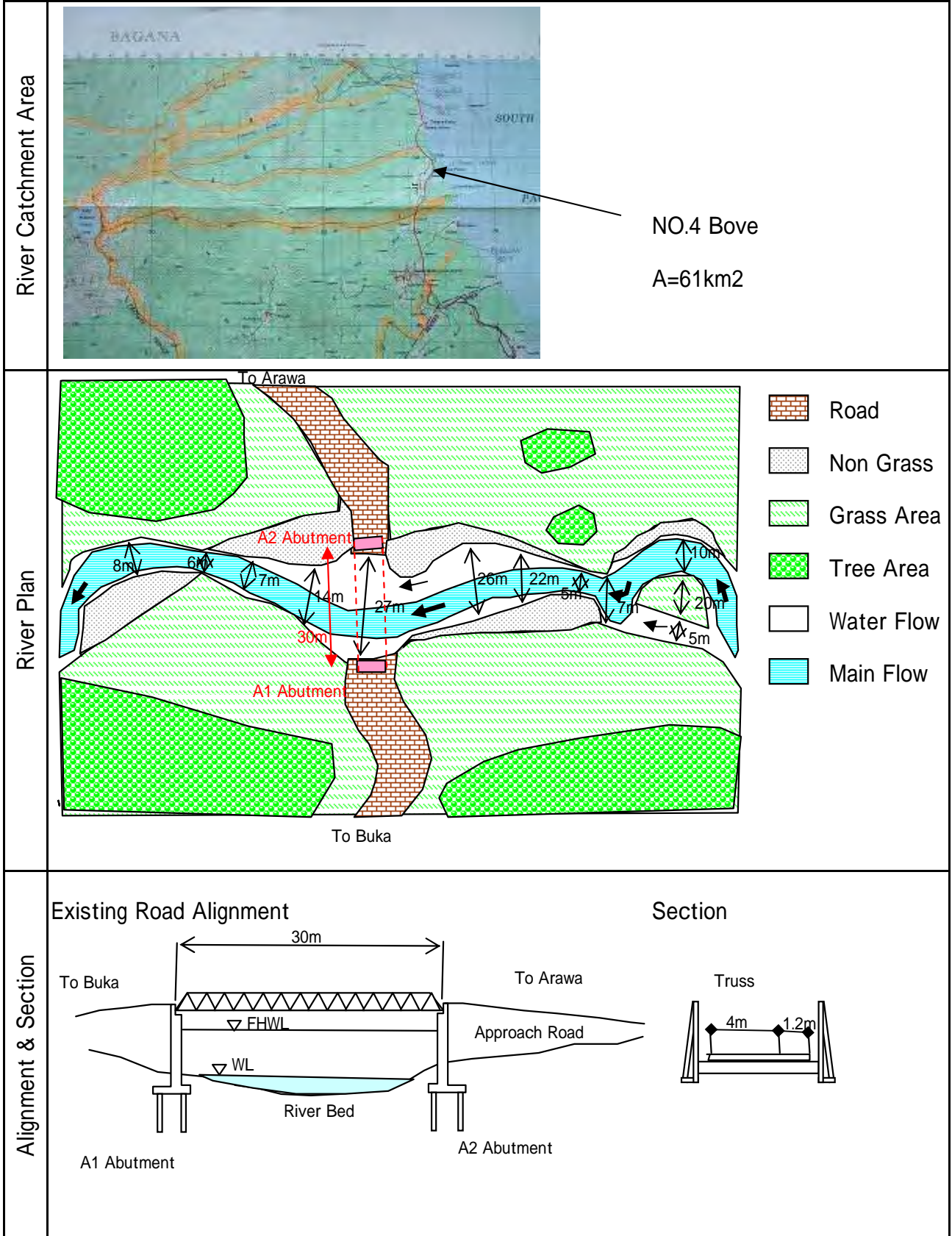
Bridge Inventory

NO.4 Bridge

Photo			
General Information	Name of Bridge	Bove	
	Name of Road	Bougainville Coastal Trunk Road	
	Chainage (km)	From Kokopau 3km, From Arawa 34km	
	Location (District)	Bougainville	
	Administrator	ABG (& Department of Works)	
	Year of Construction	1972 (1974flood washed out culvert)	
	Donor	Non	
	Design Report	Bridge Inventory	
Road	Applied Design Specification	Non	
	Design Live Load	20t	
	Regulated Traffic Load	5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0
		Carriageway (m)	7.0
		Pedestrian way(m)	0.0
	Type of Pavement	Gravel	
	Affixed Articles and Buried Article (Items, Administrator)	Non	
Repair Works by DoW (Items, Year)	Non		
River	Name of River	Bove River (A=61km2)	
	Station (River)	Unknown	
	Administrator	Non	
	Information of River Conditions	meandering of main flow	
	Information of Flood Damage(river width)	1974 flood -120m, 1 year flood-30m	
	Information of Flood Damage(river depth)	1974 flood -2.0m, 1 year flood-0.5m	
	Information of Flood Damage(meandering)		
	River Improvement Works	Non	
Others	Topographic Survey	Available 1:100,000 Scale Map	
	Geological Investigation	Segment 1 (estimated i =1/200)	
	Navigation	S 06 ° 04.031' E 155 ° 24.271'	
Proposed Bridge	A1 Abutment Location	behind the river side	
	A2 Abutment Location	behind the river side	
	Bridge Length (m)	30m	
	Span Length (m)	requested 60m, proposed 1span=30m	
	Skew ( ° )	90	
	Width	Full Width (m)	5.2
		Carriageway (m)	4
		Pedestrian way(m)	1.2 (400people lives & across for church, helthcenter & school)
	Bridge Type	Superstructure	Truss Bridge
		Substructure	abutment (scoaring depth 2m)
Foundation		coco nut pile for scouring	



# Bridge Inventory

## NO.4 Bridge



Bridge Inventory

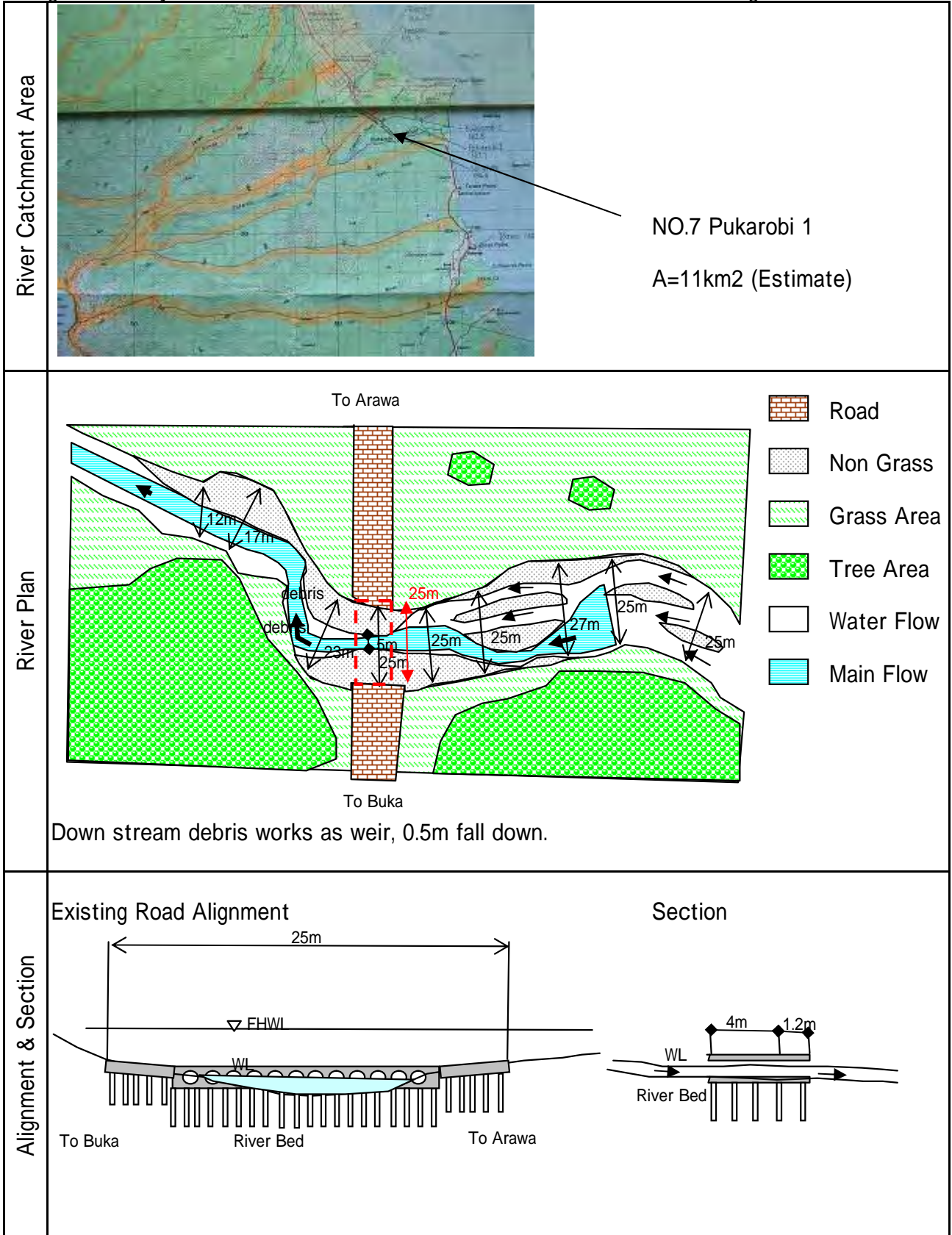
NO.7 Bridge

Photo		
		
General Information	Name of Bridge	Pukarobi 1
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 1km, From Arawa 45km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	2002(2003flood washed out culvert), 2006(2006flood washed out culvert)
	Donor	Non
	Design Report	Bridge Inventory
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width	Full Width (m)
		7.0
		Carriageway (m)
		7.0
		Pedestrian way(m)
		0.0
River	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
	Repair Works by DoW (Items, Year)	Non
	Name of River	Mad Water (Pukarobi River) (A=11km <sup>2</sup> )
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	meandering of main flow
	Information of Flood Damage(river width)	1980' flood -120m, 1 year flood-25m
Others	Information of Flood Damage(river depth)	1980' flood -4.0m, 1 year flood-1.0m
	Information of Flood Damage(meandering)	
	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 1 (estimated i =1/80)
	Navigation	S 06 ° 00.212' E 155 ° 22.049'
	A1 Abutment Location	behind the river area
	A2 Abutment Location	behind the river area
Proposed Bridge	Bridge Length (m)	25m
	Span Length (m)	requested 20m, proposed 25m
	Skew ( ° )	90
	Width	Full Width (m)
		5.2
		Carriageway (m)
		4
		Pedestrian way(m)
		1.2 (200people lives & across for church, helthcenter & school)
Bridge Type	Superstructure	Multi Cell Culvert
	Substructure	Non
	Foundation	coco nut pile for scouring (@1m*1m)





# Bridge Inventory

## NO.7 Bridge



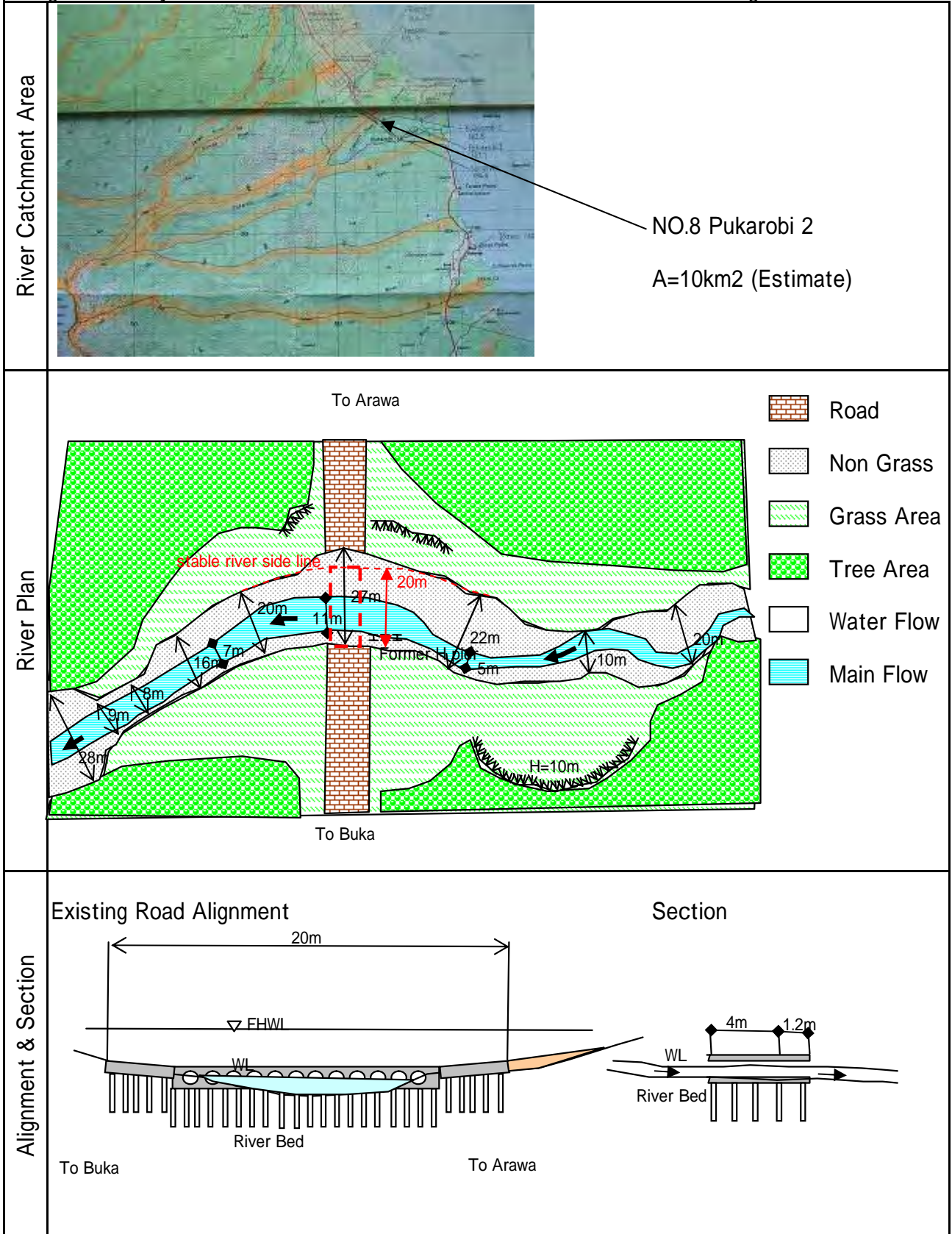
Bridge Inventory

NO.8 Bridge

Photo				
General Information	Name of Bridge		Pukarobi 2	
	Name of Road		Bougainville Coastal Trunk Road	
	Chainage (km)		From Kokopau 1km, From Arawa 46km	
	Location (District)		Bougainville	
	Administrator		ABG (& Department of Works)	
	Year of Construction		1980' (2 Hpile) (1980' flood washed out 1Hpile)	
	Donor		Non	
	Design Report		Bridge Inventory	
Road	Applied Design Specification		Non	
	Design Live Load		20t	
	Regulated Traffic Load		5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0	
		Carriageway (m)	7.0	
		Pedestrian way(m)	0.0	
	Type of Pavement		Gravel	
	Affixed Articles and Buried Article (Items, Administrator)		Non	
River	Repair Works by DoW (Items, Year)		Non	
	Name of River		Mad Water (Creepers River)(A=10km2)	
	Station (River)		Unknown	
	Administrator		Non	
	Information of River Conditions		rapid flow	
	Information of Flood Damage(river width)		1980' flood -50m, 1 year flood-20m	
	Information of Flood Damage(river depth)		1980' flood -3.0m, 1 year flood-0.5m	
	Information of Flood Damage(meandering)		meandering of main flow	
Others	River Improvement Works		Non	
	Topographic Survey		Available 1:100,000 Scale Map	
	Geological Investigation		Segment 1 (estimated i =1/200)	
	Navigation		S 05 ° 59.742' E 155 ° 21.587'	
Proposed Bridge	A1 Abutment Location		behind the river side	
	A2 Abutment Location		forward 6m to river area	
	Bridge Length (m)		20m	
	Span Length (m)		requested 20m, proposed 20m	
	Skew ( ° )		90	
	Width	Full Width (m)	5.2	
		Carriageway (m)	4	
		Pedestrian way(m)	1.2 (200people lives & across for church, helthcenter & school)	
	Bridge Type	Superstructure	Multi Cell Culvert	
		Substructure	Non	
		Foundation	coco nut pile for scouring (@1m*1m)	

# Bridge Inventory



## NO.8 Bridge





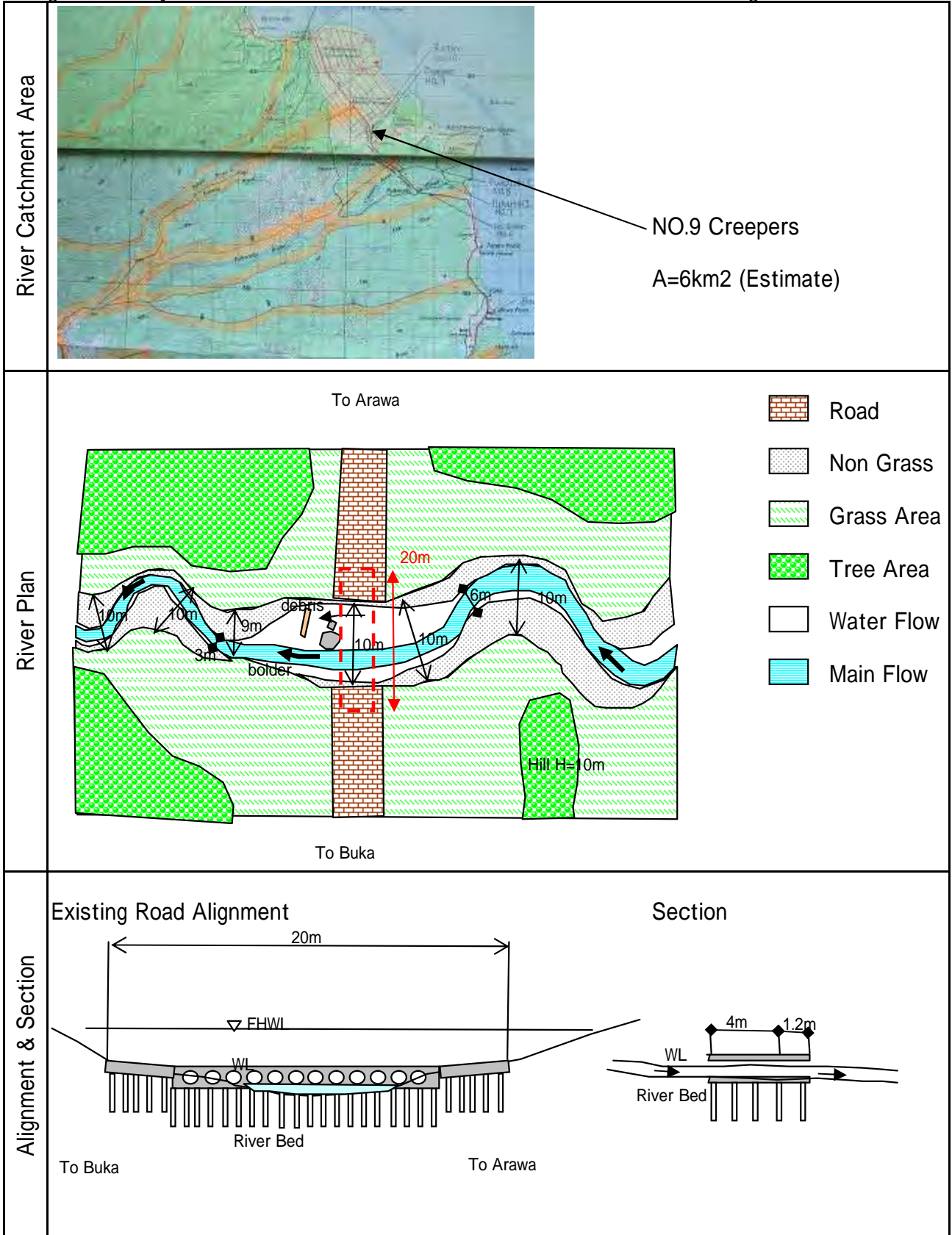
Bridge Inventory

NO.9 Bridge

Photo				
General Information	Name of Bridge		Creepers	
	Name of Road		Bougainville Coastal Trunk Road	
	Chainage (km)		From Kokopau 1km, From Arawa 47km	
	Location (District)		Bougainville	
	Administrator		ABG (& Department of Works)	
	Year of Construction		1980' (1980' flood washed out culvert)	
	Donor		Non	
	Design Report		Bridge Inventory	
Road	Applied Design Specification		Non	
	Design Live Load		20t	
	Regulated Traffic Load		5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0	
		Carriageway (m)	7.0	
		Pedestrian way(m)	0.0	
	Type of Pavement		Gravel	
	Affixed Articles and Buried Article (Items, Administrator)		Non	
River	Repair Works by DoW (Items, Year)		Non	
	Name of River		Mad Water (A=6km2)	
	Station (River)		Unknown	
	Administrator		Non	
	Information of River Conditions		unstable river bed & channel, big river bed load	
	Information of Flood Damage(river width)		1980' flood -50m, 1 year flood -20m	
	Information of Flood Damage(river depth)		1979 flood -3.0m, 1 year flood -0.5m	
	Information of Flood Damage(meandering)		meandering, main flow left side	
Others	River Improvement Works		Non	
	Topographic Survey		Available 1:100,000 Scale Map	
	Geological Investigation		Segment 1 (estimated i =1/100)	
Proposed Bridge	Navigation		S 05 ° 59.468' E 155 ° 21.539'	
	A1 Abutment Location		behind 5m river side	
	A2 Abutment Location		behind 5m river side	
	Bridge Length (m)		20m	
	Span Length (m)		requested 30m, proposed 20m	
	Skew ( ° )		90	
	Width	Full Width (m)	5.2	
		Carriageway (m)	4	
		Pedestrian way(m)	1.2 (500people lives & across for ministry school & high school	
	Bridge Type	Superstructure	Multi Cell Culvert	
		Substructure	Non	
		Foundation	coco nut pile for scouring (@1m*1m)	

Bridge Inventory



NO.9 Bridge





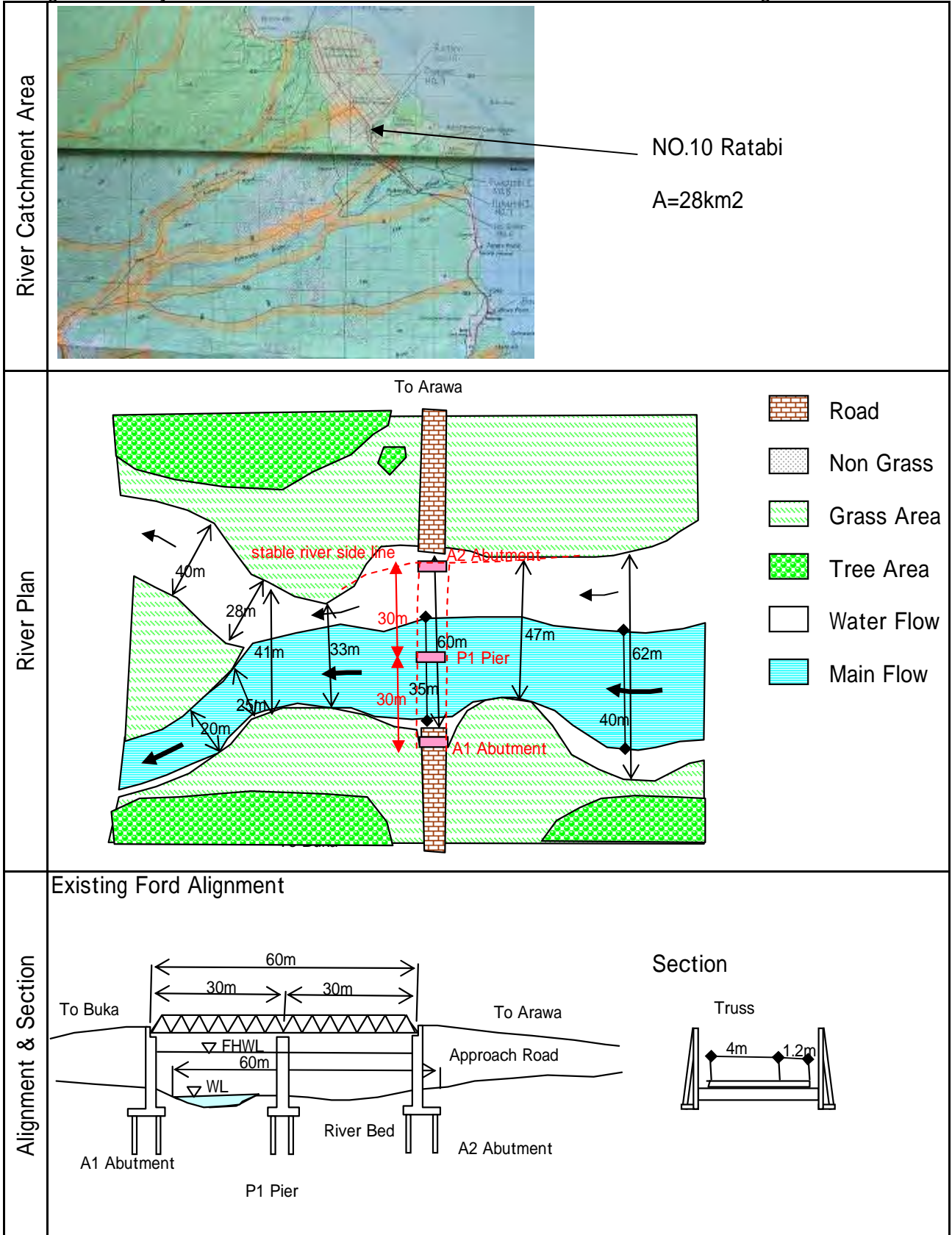
Bridge Inventory

NO.10 Bridge

Photo				
General Information	Name of Bridge		Ratavi	
	Name of Road		Bougainville Coastal Trunk Road	
	Chainage (km)		From Kokopau 0km, From Arawa 47km	
	Location (District)		Bougainville	
	Administrator		ABG (& Department of Works)	
	Year of Construction		1980' (1980'flood wash out culvert)	
	Donor		Non	
	Design Report		Bridge Inventory	
Road	Applied Design Specification		Non	
	Design Live Load		20t	
	Regulated Traffic Load		5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0	
		Carriageway (m)	7.0	
		Pedestrian way(m)	0.0	
	Type of Pavement		Gravel	
	Affixed Articles and Buried Article (Items, Administrator)		Non	
River	Repair Works by DoW (Items, Year)		Non	
	Name of River		Mad Water (Koreba River) (A=28km2)	
	Station (River)		Unknown	
	Administrator		Non	
	Information of River Conditions		unstable river bed & channel, big river bed load	
	Information of Flood Damage(river width)		1979 flood -300m, 1 year flood-60m	
	Information of Flood Damage(river depth)		1979 flood -3.0m, 1 year flood-0.5m	
	Information of Flood Damage(meandering)		meandering, main flow left side	
Others	River Improvement Works		Non	
	Topographic Survey		Available 1:100,000 Scale Map	
	Geological Investigation		Segment 2-2 (estimated i =1/500)	
Proposed Bridge	Navigation		S 05 ° 59.290' E 155 ° 21.475'	
	A1 Abutment Location		behind 5m from river side	
	A2 Abutment Location		forward 5m from river side	
	Bridge Length (m)		60m	
	Span Length (m)		requested 60m, proposed 2span*30m=60m	
	Skew ( ° )		90	
	Width	Full Width (m)	5.2	
		Carriageway (m)	4	
		Pedestrian way(m)	1.2 (500people lives & across for ministry school & high school	
	Bridge Type	Superstructure	Truss Bridge	
		Substructure	abutment, pier (scoaring depth 2m)	
		Foundation	coco nut pile for scouring	



Bridge Inventory

NO.10 Bridge



Bridge Inventory

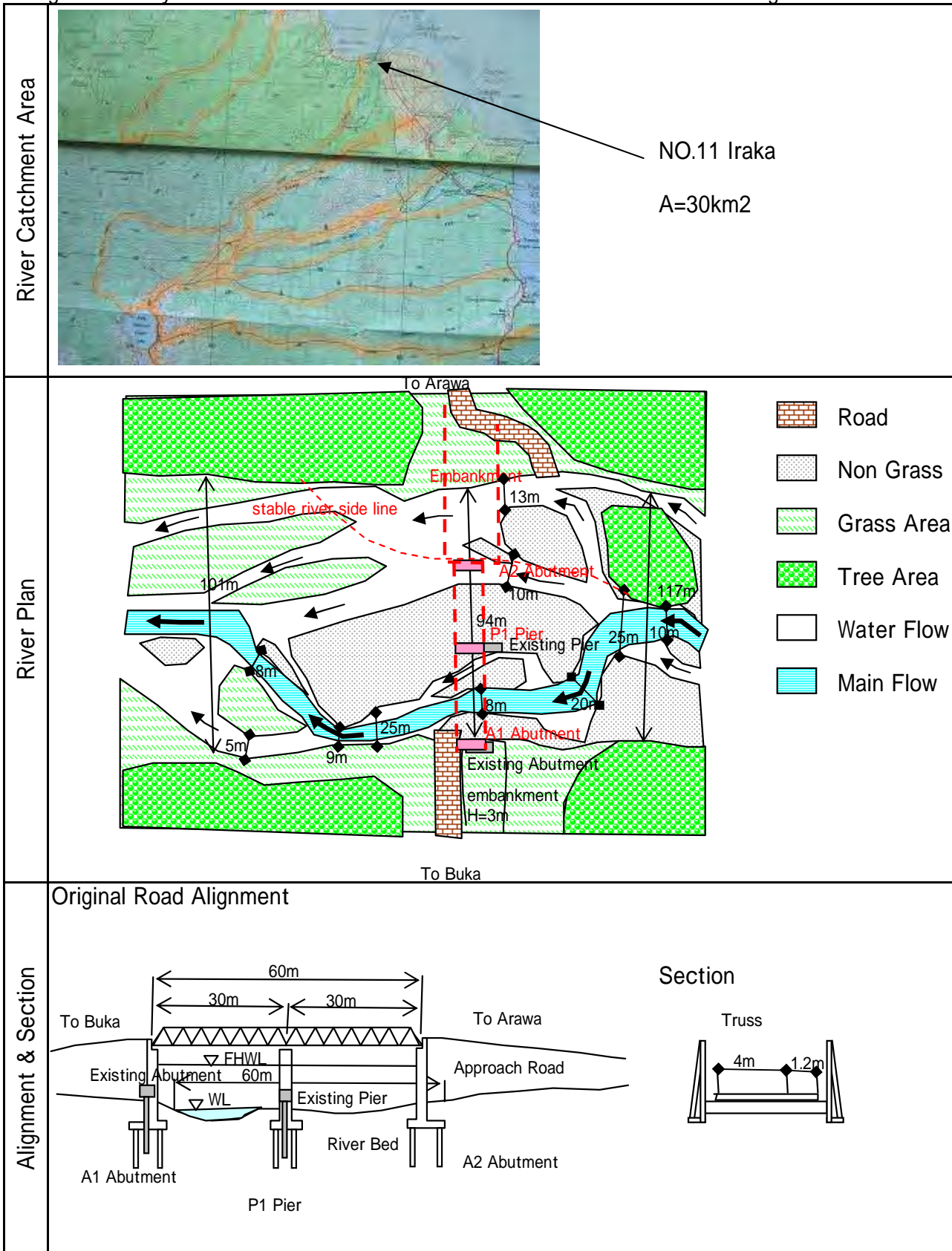
NO.11 Bridge

Photo		
		
General Information	Name of Bridge	Iraka
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 2km, From Arawa 52km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	1978 (1990flood chanel change 50m right)
	Donor	Non
	Design Report	Bridge Inventory
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width Full Width (m)	7.0
	Carriageway (m)	7.0
	Pedestrian way(m)	0.0
	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Iraka River (estimate A=30km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	unstable river bed & channel, big river bed load
	Information of Flood Damage(river width)	1990 flood -200m, 1 year flood-90m(60m)
	Information of Flood Damage(river depth)	1990 flood -4.0m, 1 year flood-1.0m
	Information of Flood Damage(meandering)	meandaring, main flow left side
Others	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 2-1 (estimated i =1/300)
Proposed Bridge	Navigation	S 05 ° 57.102' E 155 ° 19.702'
	A1 Abutment Location	existing location
	A2 Abutment Location	30m right side from pier
	Bridge Length (m)	60m
	Span Length (m)	requested 60, proposed 2span@30m=60m
	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (1,500people lives & across for school)
	Bridge Type	Superstructure
		Substructure
		Foundation
		Truss Bridge
		abutment, pier (scoaring depth 2m)
		coco nut pile for scouring





Bridge Inventory

NO.11 Bridge



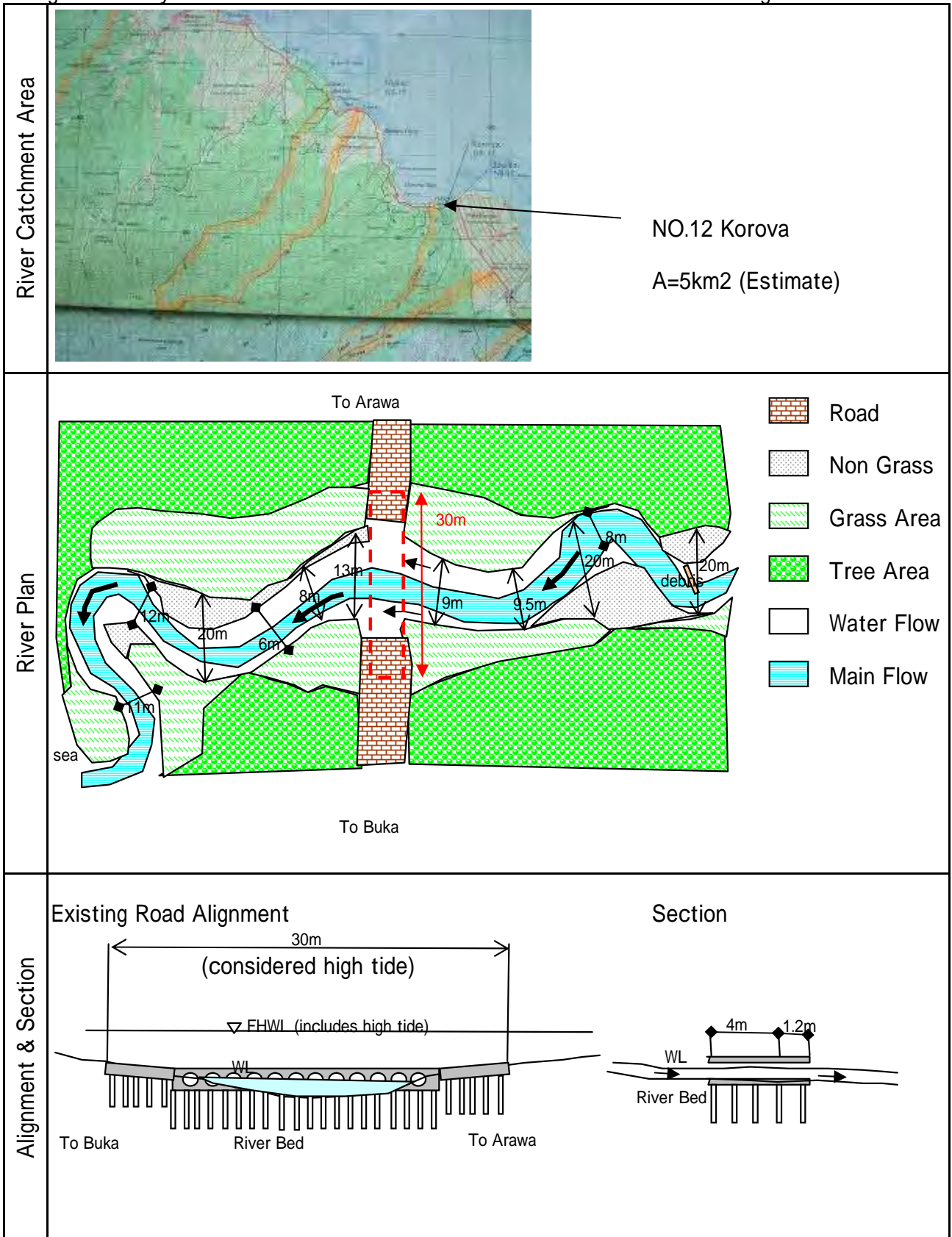
Bridge Inventory

NO.12 Bridge

Photo		
		
General Information	Name of Bridge	Korova
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 1km, From Arawa 53km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	1976 (1990flood washed out culvert)
	Donor	Non
	Design Report	Bridge Inventory
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width Full Width (m)	7.0
	Carriageway (m)	7.0
	Pedestrian way(m)	0.0
	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Korova River (A=5km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	near sea (high tide), sedimentation
	Information of Flood Damage(river width)	1990 flood -70m, 1 year flood-30m
	Information of Flood Damage(river depth)	1990 flood -1.5m, 1 year flood-1.0m
	Information of Flood Damage(meandering)	meandering
Others	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 2-1 (estimated i =1/300)
Proposed Bridge	Navigation	S 05 ° 57.030' E 155 ° 19.155'
	A1 Abutment Location	behind 10m river side
	A2 Abutment Location	behind 10m river side
	Bridge Length (m)	30m
	Span Length (m)	requested 40m, proposed 30m
	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (2,000people lives & across )
	Bridge Type	Superstructure
		Substructure
		Foundation
		coco nut pile for scouring

Bridge Inventory

NO.12 Bridge





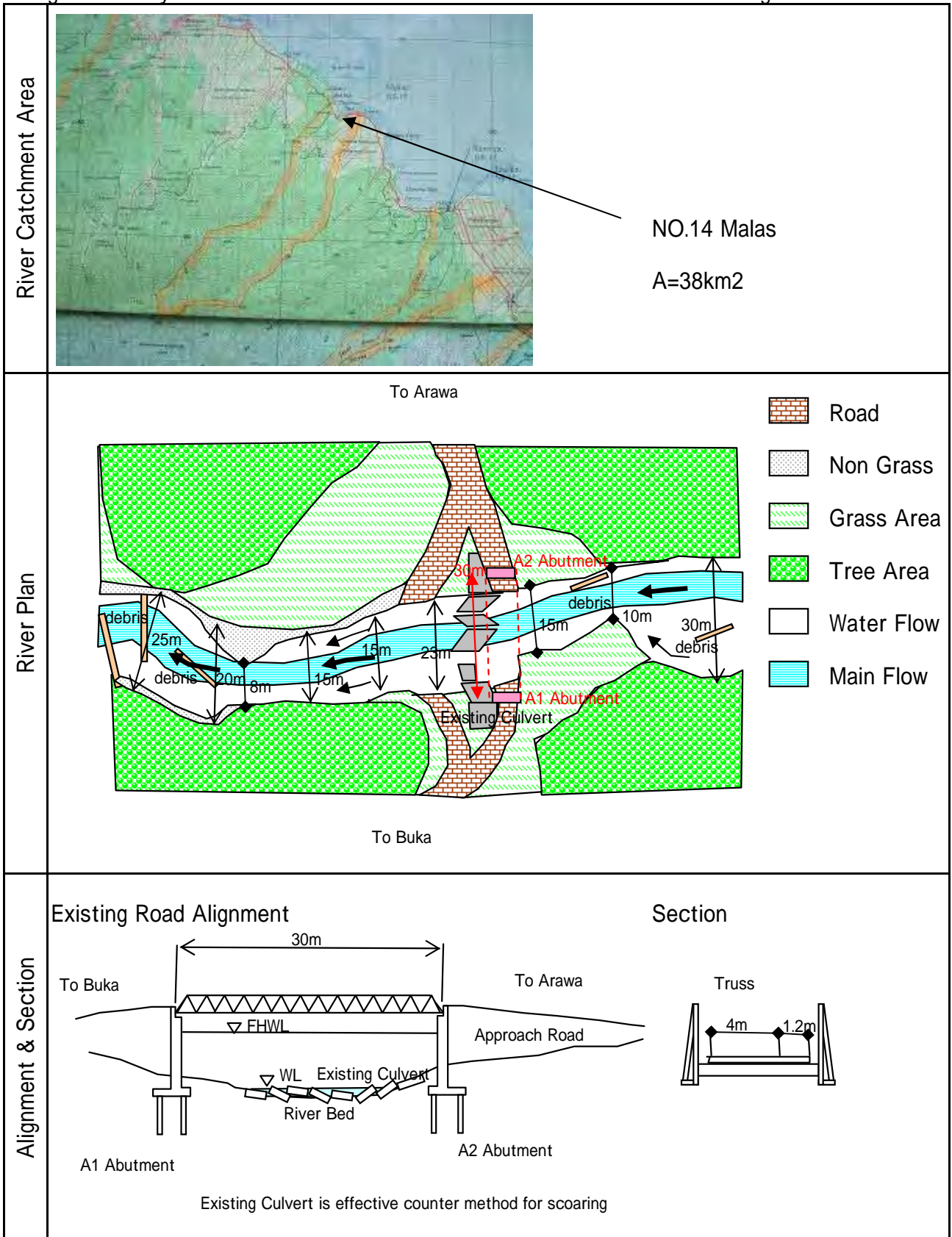
Bridge Inventory

NO.14 Bridge

Photo		
General Information	Name of Bridge	Malas
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 6km, From Arawa 61km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	1972 (1990flood damaged & heavy traffic load damaged)
	Donor	Non
	Design Report	Bridge Inventory
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width Full Width (m)	7.0
	Carriageway (m)	7.0
	Pedestrian way(m)	0.0
	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Malas River (A=38km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	heavy scouring
	Information of Flood Damage(river width)	1990 flood -200m, 1 year flood-30m
	Information of Flood Damage(river depth)	1990 flood -4.0m, 1 year flood-1.5m
	Information of Flood Damage(meandering)	meandering
Others	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 2-1 (estimated i =1/300)
Proposed Bridge	Navigation	S 05 ° 54.582' E 155 ° 16.844'
	A1 Abutment Location	behind 3m from river side
	A2 Abutment Location	behind 3m from river side
	Bridge Length (m)	30m
	Span Length (m)	requested 40m, proposed 1span@30m=30m
	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (200people lives & across for church, helthcenter & school)
	Bridge Type	Superstructure
		Truss Bridge
	Substructure	abutment (scoaring depth 2m)
	Foundation	coco nut pile for scouring

Bridge Inventory

NO.14 Bridge





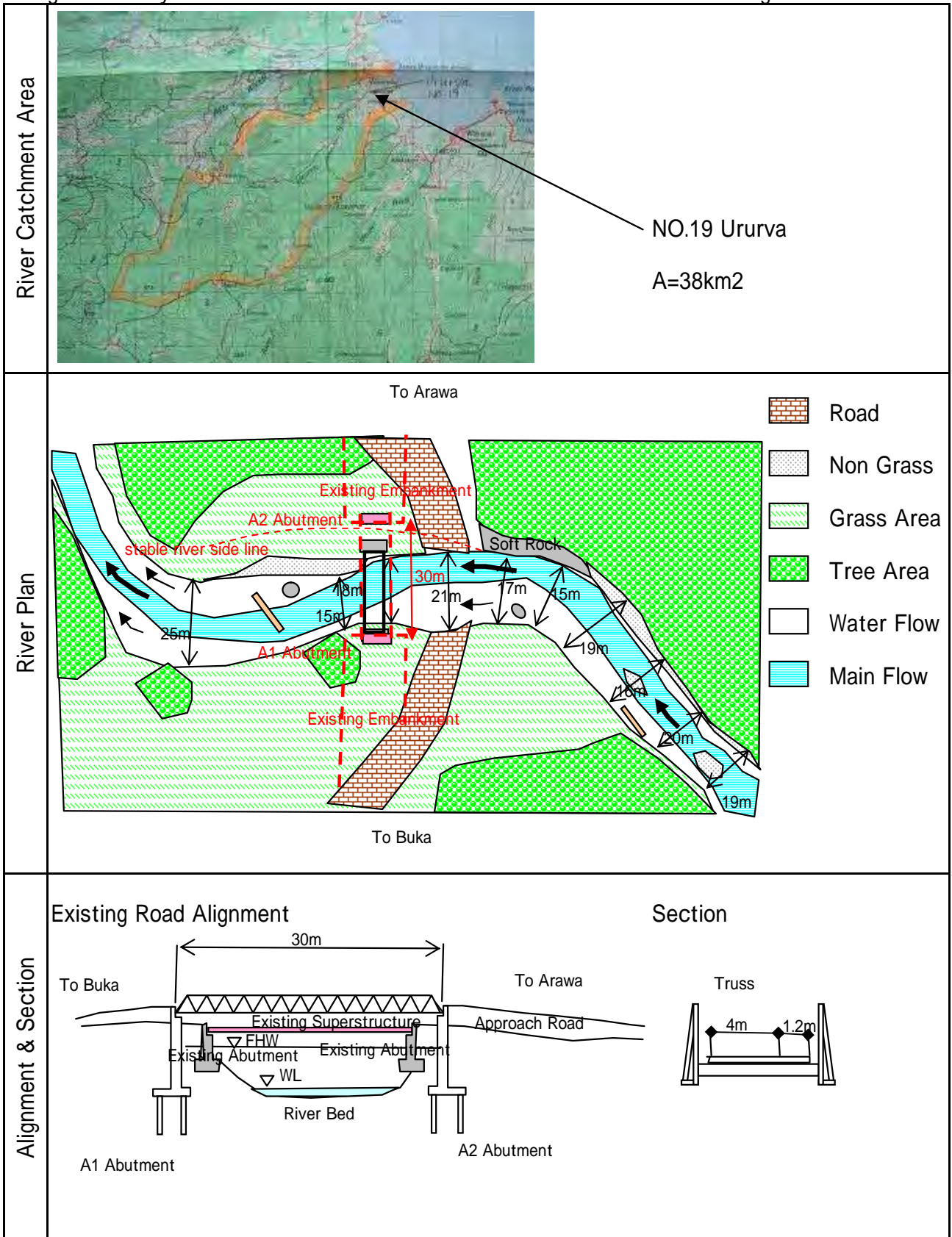
Bridge Inventory

NO.19 Bridge

Photo		
		
General Information	Name of Bridge	Ururva
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 6km, From Arawa km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	1970' (1993&1995flood scouring)
	Donor	Non
	Design Report	Bridge Inventory
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width Full Width (m)	7.0
	Carriageway (m)	7.0
	Pedestrian way(m)	0.0
	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Urunai River (38km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	right side soft rock
	Information of Flood Damage(river width)	1993 flood -30m, 1 year flood-30m
	Information of Flood Damage(river depth)	1993 flood -2.0m, 1 year flood-1.0m
	Information of Flood Damage(meandering)	strait and meandering
Others	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 2-1 (estimated i =1/200)
Proposed Bridge	Navigation	S 05 ° 51.535' E 155 ° 11.149'
	A1 Abutment Location	existing same location
	A2 Abutment Location	behind 10m from existing
	Bridge Length (m)	30m
	Span Length (m)	requested 40m, proposed 1span@30m=30m
	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (200people lives & across for church, helthcenter & school)
	Bridge Type	Superstructure
		Truss Bridge
	Substructure	abutment (scoaring depth 2m)
	Foundation	coco nut pile for scouring


# Bridge Inventory

## NO.19 Bridge



Bridge Inventory

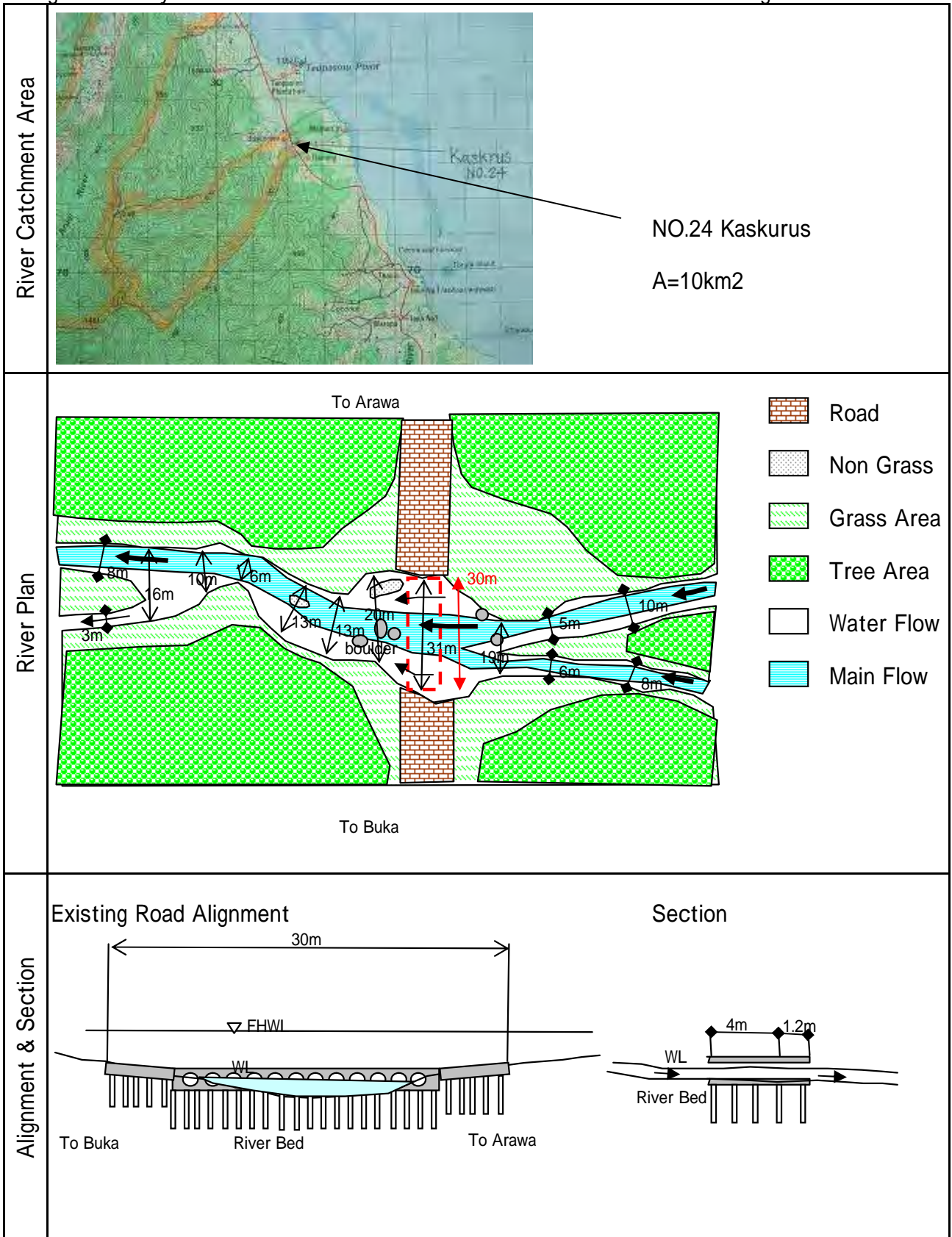
NO.24 Bridge

Photo		
General Information	Name of Bridge	Kaskrus
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 6km, From Arawa km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	No culvert
	Donor	Non
	Design Report	Non
Road	Applied Design Specification	Non
	Design Live Load	20t
	Regulated Traffic Load	5t (consideration of Bailey Bridge)
	Width Full Width (m)	7.0
	Carriageway (m)	7.0
	Pedestrian way(m)	0.0
	Type of Pavement	Gravel
	Affixed Articles and Buried Article (Items, Administrator)	Non
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Kaskas River (10km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	overflow left side area
	Information of Flood Damage(river width)	Big flood -80m, 1 year flood-30m
	Information of Flood Damage(river depth)	Big flood -1.5m, 1 year flood-1.0m
	Information of Flood Damage(meandering)	strait and meandering
Others	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment M (estimated i =1/50)
	Navigation	S 05 ° 39.614' E 155 ° 5.783'
Proposed Bridge	A1 Abutment Location	existing same location
	A2 Abutment Location	existing same location
	Bridge Length (m)	30m
	Span Length (m)	requested 40m, proposed 30m
	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (1,000people lives & across for helth center & scho
Bridge Type	Superstructure	Multi Cell Culvert
	Substructure	
	Foundation	coco nut pile for scouring




Bridge Inventory

NO.24 Bridge



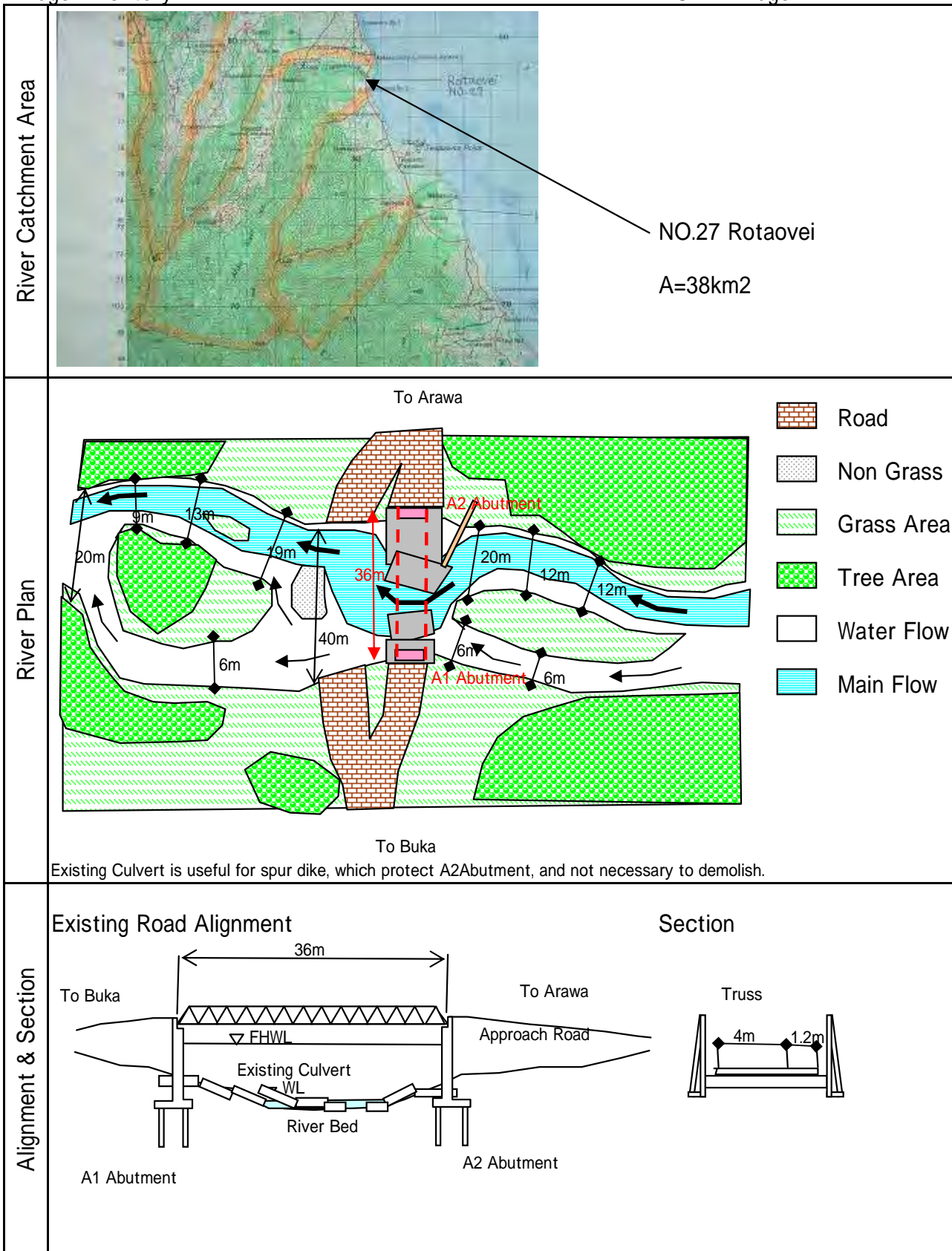
Bridge Inventory

NO.27 Bridge

Photo		
General Information	Name of Bridge	Rotaovei
	Name of Road	Bougainville Coastal Trunk Road
	Chainage (km)	From Kokopau 1km, From Arawa 113km
	Location (District)	Bougainville
	Administrator	ABG (& Department of Works)
	Year of Construction	1992 (1992 destroyed)
	Donor	Non
	Design Report	Non
Road	Applied Design Specification	Bridge Inventory
	Design Live Load	Non
	Regulated Traffic Load	20t
	Width Full Width (m)	5t (consideration of Bailey Bridge)
	Carriageway (m)	7.0
	Pedestrian way(m)	7.0
	Type of Pavement	0.0
	Affixed Articles and Buried Article (Items, Administrator)	Gravel
River	Repair Works by DoW (Items, Year)	Non
	Name of River	Arunai (Zupakau) River (A=38km2)
	Station (River)	Unknown
	Administrator	Non
	Information of River Conditions	unstable river bed, big river bed load
	Information of Flood Damage(river width)	1992 flood -100m, 1 year flood-36m
	Information of Flood Damage(river depth)	1992 flood -1.0m, 1 year flood-0.5m
	Information of Flood Damage(meandering)	confluence of main flow & Sub flow
Others	River Improvement Works	Non
	Topographic Survey	Available 1:100,000 Scale Map
	Geological Investigation	Segment 1 (estimated i =1/100)
	Navigation	S 05 ° 36.985' E 155 ° 04.845'
Proposed Bridge	A1 Abutment Location	behind 5m from the existing culvert
	A2 Abutment Location	behind the existing culvert
	Bridge Length (m)	33m
	Span Length (m)	requested 50m, proposed 36m-1span
	Skew ( ° )	90
	Width Full Width (m)	5.2
	Carriageway (m)	4
	Pedestrian way(m)	1.2 (7,000people lives & across for helth center & scho
Bridge Type	Superstructure	Truss Bridge
	Substructure	Abutment, existing is usefull for spur dike
	Foundation	coco nut pile for scouring

# Bridge Inventory



## NO.27 Bridge





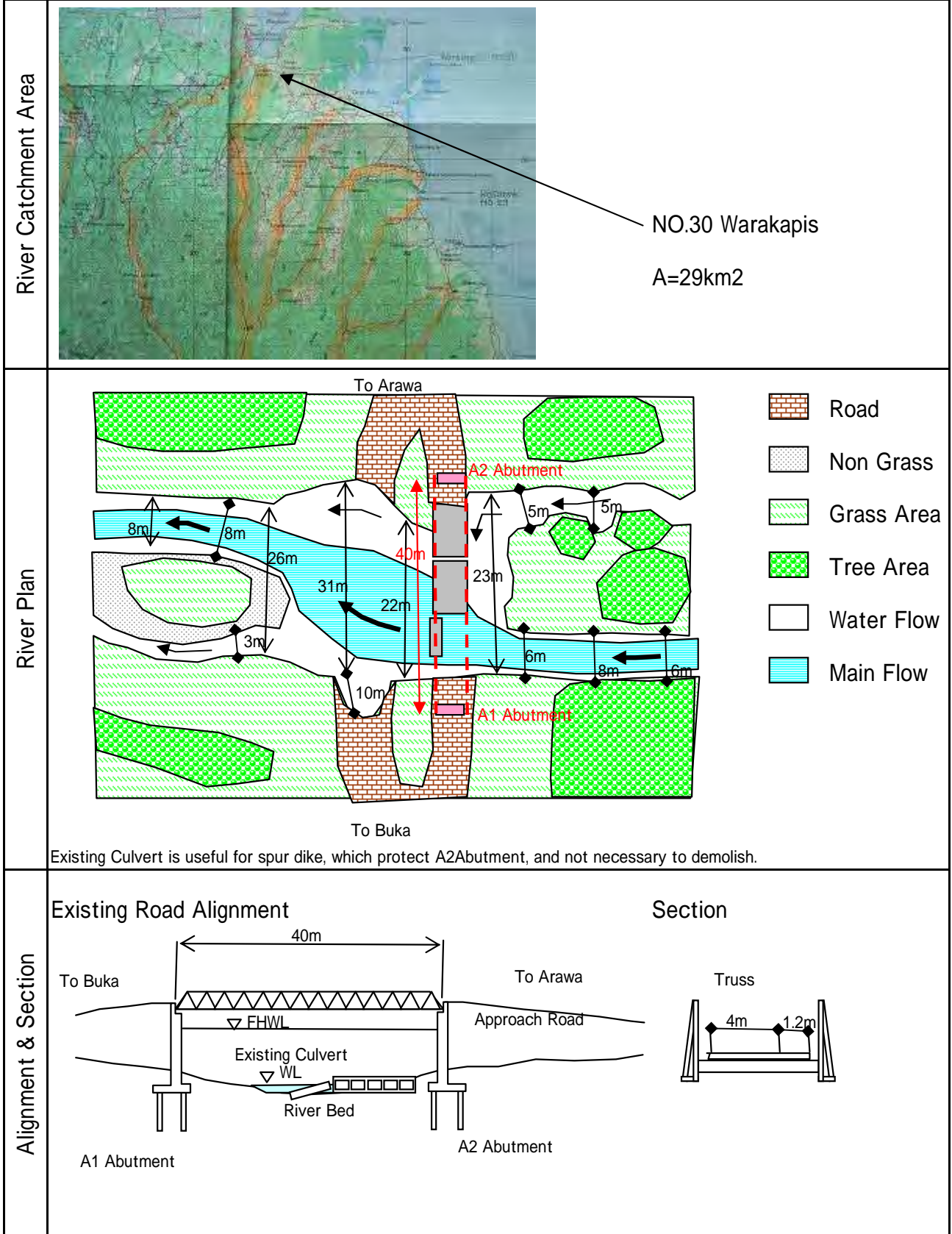
Bridge Inventory

NO.30 Bridge

Photo			
			
General Information	Name of Bridge	Warakapis	
	Name of Road	Bougainville Coastal Trunk Road	
	Chainage (km)	From Kokopau 5km, From Arawa 124km	
	Location (District)	Bougainville	
	Administrator	ABG (& Department of Works)	
	Year of Construction	1970 (1988flood damaged culvert)	
	Donor	Non	
	Design Report	Bridge Inventory	
Road	Applied Design Specification	Non	
	Design Live Load	20t	
	Regulated Traffic Load	5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0
		Carriageway (m)	7.0
		Pedestrian way(m)	0.0
	Type of Pavement	Gravel	
	Affixed Articles and Buried Article (Items, Administrator)	Non	
Repair Works by DoW (Items, Year)	Non		
River	Name of River	Tinputz River (A=29km2)	
	Station (River)	Unknown	
	Administrator	Non	
	Information of River Conditions	Flood overflow to left side (North)	
	Information of Flood Damage(river width)	1988 flood -100m, 1 year flood-40m	
	Information of Flood Damage(river depth)	1988 flood -2.0m, 1 year flood-1.0m	
	Information of Flood Damage(meandering)	meandering of mainflow	
	River Improvement Works	Non	
Others	Topographic Survey	Available 1:100,000 Scale Map	
	Geological Investigation	Segment 1 (estimated i =1/100)	
	Navigation	S 05 ° 33.953' E 155 ° 01.263'	
Proposed Bridge	A1 Abutment Location	behind 10m from the existing culvert	
	A2 Abutment Location	behind 5m from the existing culvert	
	Bridge Length (m)	40m	
	Span Length (m)	requested 60m, proposed 1span@40m=40m	
	Skew ( ° )	90	
	Width	Full Width (m)	5.2
		Carriageway (m)	4
		Pedestrian way(m)	1.2 (1,500people lives & across for administration center & school)
	Bridge Type	Superstructure	Truss Bridge
		Substructure	Abutment, existing is usefull for spur dike
Foundation		coco nut pile for scouring	

# Bridge Inventory

## NO.30 Bridge





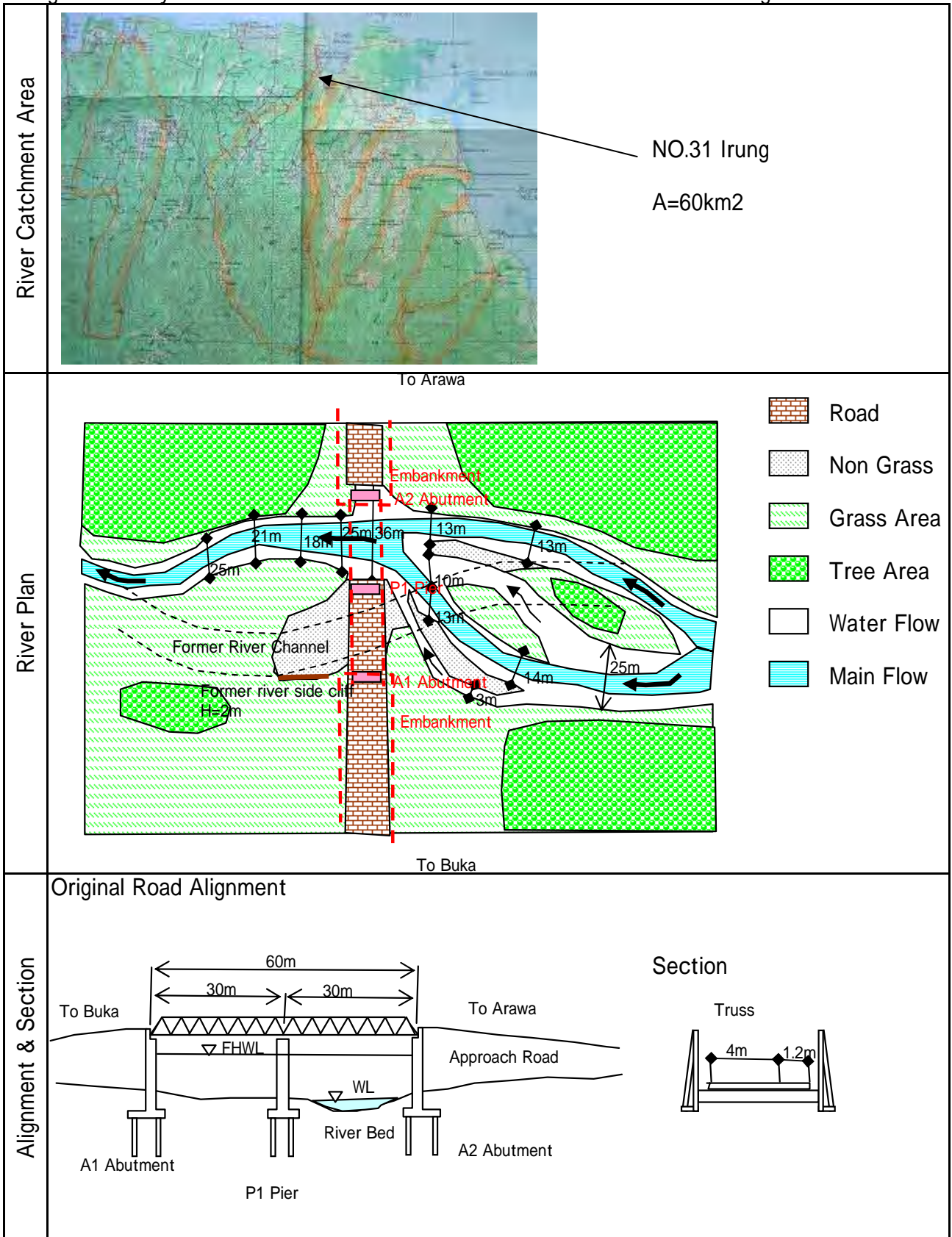
Bridge Inventory

NO.31 Bridge

Photo				
General Information	Name of Bridge		Irung	
	Name of Road		Bougainville Coastal Trunk Road	
	Chainage (km)		From Kokopau 2km, From Arawa 126km	
	Location (District)		Bougainville	
	Administrator		ABG (& Department of Works)	
	Year of Construction		1970' (1985flood washed out culvert)	
	Donor		Non	
	Design Report		Bridge Inventory	
Road	Applied Design Specification		Non	
	Design Live Load		20t	
	Regulated Traffic Load		5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0	
		Carriageway (m)	7.0	
		Pedestrian way(m)	0.0	
	Type of Pavement		Gravel	
	Affixed Articles and Buried Article (Items, Administrator)		Non	
Repair Works by DoW (Items, Year)		Non		
River	Name of River		Irung River (A=60km2)	
	Station (River)		Unknown	
	Administrator		Non	
	Information of River Conditions		Non	
	Information of Flood Damage(river width)		River chanel shifted after flood (40m)	
	Information of Flood Damage(river depth)		1985 flood -100m, 1 year flood-60m	
	Information of Flood Damage(meandering)		1985 flood -2.5m, 1 year flood-1.0m	
	River Improvement Works		meandering of mainflow	
Others	Topographic Survey		Available 1:100,000 Scale Map	
	Geological Investigation		Segment 2-1 (estimated i =1/300)	
	Navigation		S 05 ° 33.632' E 155 ° 00.515'	
Proposed Bridge	A1 Abutment Location		behind the before river side	
	A2 Abutment Location		behind the existing river side	
	Bridge Length (m)		60m	
	Span Length (m)		requested 60m, proposed 2span@30m=60m	
	Skew ( ° )		90	
	Width	Full Width (m)	5.2	
		Carriageway (m)	4	
		Pedestrian way(m)	1.2 (1,500people lives & across for administration center & school)	
	Bridge Type	Superstructure	Truss Bridge	
		Substructure	abutment, pier (scoaring depth 2m)	
Foundation		coco nut pile for scouring		



# Bridge Inventory

## NO.31 Bridge



Bridge Inventory

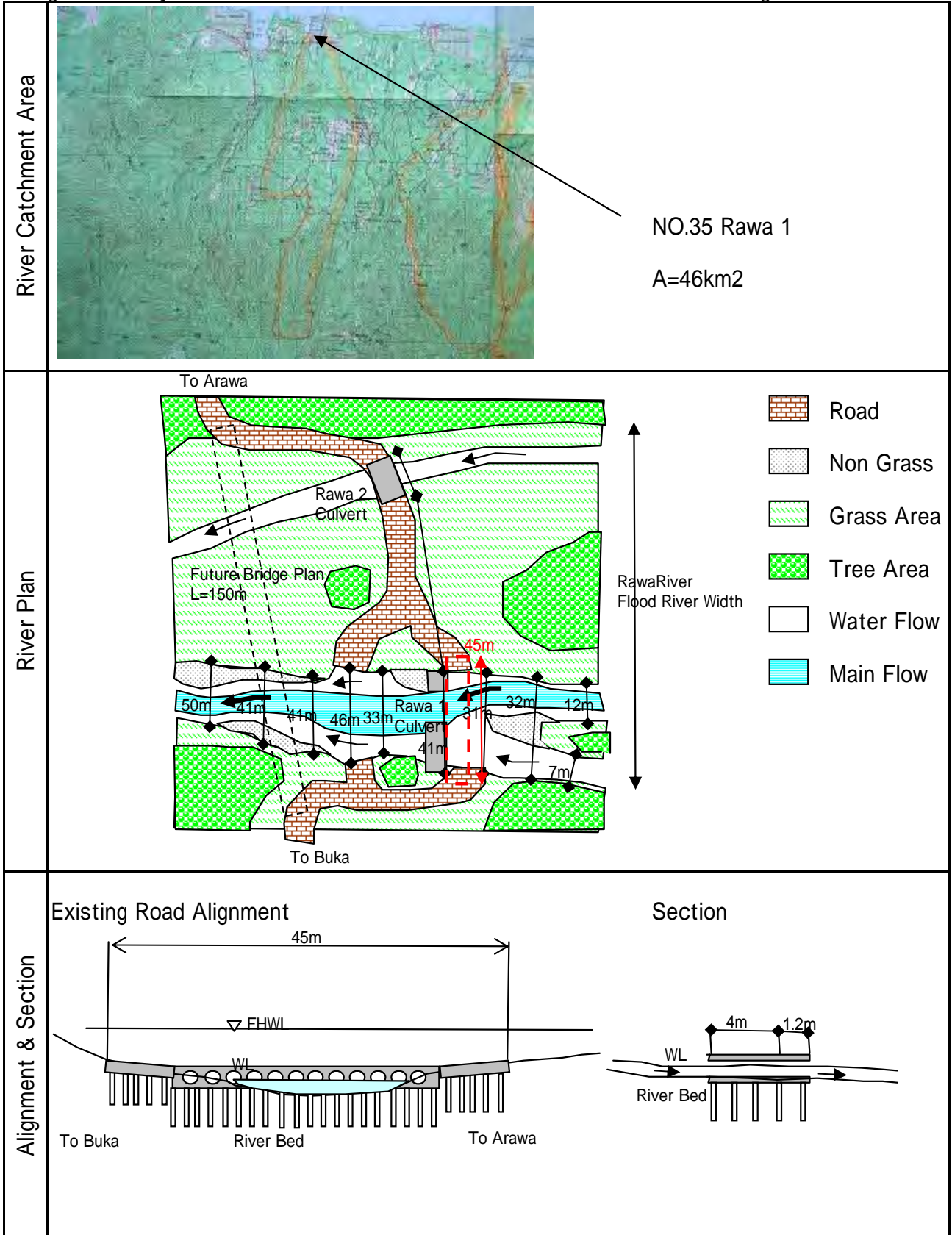
NO.35 Bridge

Photo				
General Information	Name of Bridge		Rawa 1	
	Name of Road		Bougainville Coastal Trunk Road	
	Chainage (km)		From Kokopau 0km, From Arawa 140km	
	Location (District)		Bougainville	
	Administrator		ABG (& Department of Works)	
	Year of Construction		1990 (2003Flood damaged)	
	Donor		Non	
	Design Report		Bridge Inventory	
Road	Applied Design Specification		Non	
	Design Live Load		20t	
	Regulated Traffic Load		5t (consideration of Bailey Bridge)	
	Width	Full Width (m)	7.0	
		Carriageway (m)	7.0	
		Pedestrian way(m)	0.0	
	Type of Pavement		Gravel	
	Affixed Articles and Buried Article (Items, Administrator)		Non	
River	Repair Works by DoW (Items, Year)		Non	
	Name of River		Rawa River (A=46km2)	
	Station (River)		Unknown	
	Administrator		Non	
	Information of River Conditions		River bed is unstable. Major debris observed.	
	Information of Flood Damage(river width)		2003 flood -150m, 1 year flood-45m	
	Information of Flood Damage(river depth)		2003 flood -1.5m, 1 year flood-0.4m	
	Information of Flood Damage(meandering)		Main river, Rawa1 & tributaries, Rawa2 are in same flood area in 2003	
Others	River Improvement Works		Non	
	Topographic Survey		Available 1:100,000 Scale Map	
	Geological Investigation		Segment 1(estimated i =1/200)	
Proposed Bridge	Navigation		S 05 ° 32.587' E 154 ° 54.789'	
	A1 Abutment Location		behind the existing culvert	
	A2 Abutment Location		behind the existing culvert	
	Bridge Length (m)		45m	
	Span Length (m)		Requested 45m, proposed 45m	
	Skew ( ° )		90	
	Width	Full Width (m)	5.2	
		Carriageway (m)	4	
		Pedestrian way(m)	1.2 (200people lives & across for church, helthcenter & school)	
	Bridge Type	Superstructure	Multi Cell Culvert	
		Substructure	existing is useful for Ground Sill (Weir)	
		Foundation	coco nut pile for scouring (@1m*1m)	



# Bridge Inventory

## NO.35 Bridge



付属資料(3) 橋梁リストと工事費

Bougainville Coastal Trunk Road (Application of PNG)

NO	Name of Bridges	Proposed Type	length (m)	Width (m)	Area (m2)	Rate (US\$/m2)	Amount (US\$)
1	Penei				0		0
2	Arakawau				0		0
3	Bakanovi	A	60	5.2	312	3,500	1092000
4	Bove	A	60	5.2	312	3,500	1092000
5	Tarara				0		0
6	"No River"	B	25	4	100	2100	210000
7	Pukarobi 1	B	20	4	80	2,100	168000
8	Pukarobi 2	B	30	4	120	2,100	252000
9	Creepers	B	25	4	100	2,100	210000
10	Ratavi	A	60	5.2	312	3,500	1092000
11	Iraka	A	60	5.2	312	3,500	1092000
12	Korova	B	40	4	160	2,100	336000
13	Tekanu				0		0
14	Malas	A	40	5.2	208	3,500	728000
15	Koikoi				0		0
16	Kokoavi				0		0
17	Uruavi 2				0		0
18	Uruavi 1				0		0
19	Ururva				0		0
20	Red River				0		0
21	Aita				0		0
22	Sivavi				0		0
23	Uruai				0		0
24	Kaskrus				0		0
25	Yokomori 1				0		0
26	Yokomori 2				0		0
27	Rotaovei	A	50	5.2	260	3,500	910000
28	Teroki 2				0		0
29	Teroki 1				0		0
30	Warakapis	A	60	5.2	312	3,500	1092000
31	Irung	A	60	5.2	312	3,500	1092000
32	Deos				0		0
33	Ramazon				0		0
34	Rawa 2				0		0
35	Rawa 1	B	40	5.2	208	3,500	728000
36	Chinpatz				0		0
	Total						10094000



Bougainville Coastal Trunk Road (Propose of ABG & JICA)

NO	Name of Bridges	Proposed Type	length (m)	Width (m)	Area (m2)	Rate (US\$/m2)	Amount (US\$)
1	Penei				0		0
2	Arakawau				0		0
3	Bakanovi	A	70	5.2	364	3,500	1274000
4	Bove	A	30	5.2	156	3,500	546000
5	Tarara				0		0
6	"No River"				0		0
7	Pukarobi 1	B	25	5.2	130	2,100	273000
8	Pukarobi 2	B	20	5.2	104	2,100	218400
9	Creepers	B	20	5.2	104	2,100	218400
10	Ratavi	A	60	5.2	312	3,500	1092000
11	Iraka	A	60	5.2	312	3,500	1092000
12	Korova	B	30	5.2	156	2,100	327600
13	Tekanu				0		0
14	Malas	A	30	5.2	156	3,500	546000
15	Koikoi				0		0
16	Kokoavi				0		0
17	Uruavi 2				0		0
18	Uruavi 1				0		0
19	Ururva	A	30	5.2	156	3,500	546000
20	Red River				0		0
21	Aita				0		0
22	Sivavi				0		0
23	Uruai				0		0
24	Kaskrus	B	30	5.2	156	2,100	327600
25	Yokomori 1				0		0
26	Yokomori 2				0		0
27	Rotaovei	A	36	5.2	187.2	3,500	655200
28	Teroki 2				0		0
29	Teroki 1				0		0
30	Warakapis	A	40	5.2	208	3,500	728000
31	Irung	A	60	5.2	312	3,500	1092000
32	Deos				0		0
33	Ramazon				0		0
34	Rawa 2				0		0
35	Rawa 1	B	45	5.2	234	2,100	491400
36	Chinpatz				0		0
	Total						9427600

付属資料(4) 社会環境配慮報告書概要

## Summary of Preliminary Study Result for Grant Aid Project

Date (prepared): October 30, 2007

### 1. Title of the cooperation project and name of project proponent

#### 1-1 Title of the cooperation project

Project for Construction of Bridges on Bougainville Coastal Trunk Road in the Independent State of Papua New Guinea

#### 1-2 Name of project proponent

Department of Works (DOW)

Autonomous Bougainville Government (ABG)

### 2. Categorization and its reason

Category: B

Reason:

- It has not been confirmed whether or not 30m-wide right of way for the proposed project has already been acquired.
- River water at the proposed project sites will become unavailable during construction.
- Soil run-off might cause adverse impacts on environments in adjacent and downstream areas unless an appropriate soil run-off control measure is adopted.

### 3. Laws and regulations relevant to environmental impact assessment and land acquisition

#### 3-1 Laws and regulations

- Environment Act 2000
- Environment (Prescribed Activities) Regulation 2002
- Environment (Permit and Transitional) Regulation 2002
- Environment (Water Quality Criteria) Regulation 2002
- Land Act (1996)
- Land Registration Act (1981)

#### 3-2 Guidelines and manual

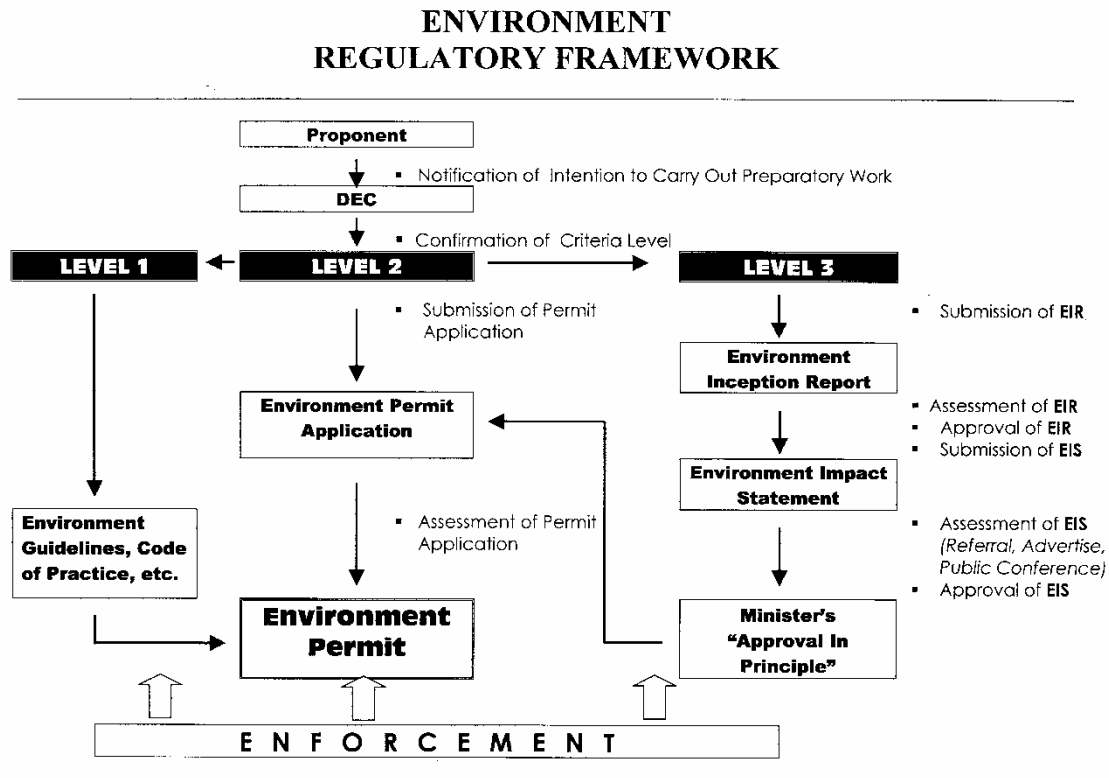
- Notification of preparatory work on level-2 and level-3 activities (Department of Environment and Conservation: DEC, 2004)
- Guideline for conduct of Environmental Impact Assessment & preparation of Environmental Impact Statement (DEC, 2004)
- Guideline for preparation of Environmental Inception Report (DEC, 2004)
- Guideline for submission of an application for an environment permit to discharge waste (DEC, 2004)
- Air discharges – Technical guideline - Additional Information (DEC, 2004)
- Noise Discharges – Technical guideline - Additional Information (DEC, 2004)
- Water and land discharges – Technical guideline - Additional Information (DEC, 2004)
- Land Acquisition Procedures - Dow & T Projects. In: Manual – “Functions, Responsibilities and Procedures”. Survey and Lands Branch, Technical Services Division, Department of Works and Transport Headquarters, year of preparation not described

#### 3-3 Procedures and requirements for environmental impact assessment

First of all, project proponent needs to submit “Notification of Preparatory Work” describing the outline of proposed project to DEC. Upon receiving the notification, DEC will make a decision about which category (Level 1, 2, or 3) the project falls into. Level 1 project does not need to apply for an environment permit, while Level 2 and 3 projects need to apply for a permit. Furthermore, Level 3 activities must go through the procedure of Environmental Impact Assessment (EIA).

Department of Works (DOW) and Autonomous Bougainville Government (ABG) submitted a notification to DEC and received a reply that DEC categorized the proposed project as Level 2. DOW and ABG are supposed to submit application documents, as the next step, for an environment

permit. Environmental regulatory framework for obtaining an environment permit is shown in **Fig. 1**.



**Fig. 1** Environmental regulatory framework for obtaining an environment permit (source: DEC)

The Environment Permit Application must cover the following topics (based on Guideline for submission of an application for an environment permit to discharge waste. DEC, 2004)

- Introduction
- Purpose of the activity
- Development time table
- Site selection
- Baseline environmental information/Data
- Description of the Activity
- Potential impacts of the activity
- Mitigation measures
- Confidential information
- Reference

The Environmental Impact Statement must cover the following topics (based on Guideline for conduct of Environmental Impact Assessment & preparation of Environmental Impact Statement. DEC, 2004)

- Executive summary or overview of proposal
- Purpose of the development
- Viability of the project
- Description of the proposed development activity
- Development timetable
- Characteristics of the receiving environment
- Potential impacts of proposal
- Mitigation measures
- Environmental management, monitoring and reporting
- Other statutory decisions
- Confidential information

- References
- Acknowledgements
- Study team

### 3-4 Information disclosure and public participation

Any Environmental Impact Statement (EIS) must be made available for public review. The Environment Act 2000 (section 55) prescribes the public review process of EIS for Level 3 projects (section 51).

### 3-5 Land acquisition

Procedures for land acquisition by state are prescribed in the national law, Land Act 1996. DOW has prepared a manual “Functions, Responsibilities and Procedures” and describes the procedures of land acquisition in Section 5 of the manual (including compulsory land acquisition) in compliance with the Land Act 1996. The land acquisition procedures are shown in **Table 1**.

**Table 1** Land acquisition procedures for DOW projects

Step	Procedure	Approximate time needed for the completion of step
1	A formal application is submitted to Department of Lands and Physical Planning (DLPP) to determine the status of the land to be affected, (State or Customary Land)	2 – 3 weeks
2	If the land is under customary ownership, the DLPP issues instructions or requests Department of Works and Transport to carry out the cadastral survey.	2 – 3 months
3	Upon completion of the cadastral survey by DOW, the plans are referred to DLPP HQ with request to issue instruction to DLPP provincial office to carry out a Land investigation. DOW Land Management Officers may assist in conducting the land investigation in conjunction with the DLPP officers of the provincial offices.	3 – 5 months
4	Any cost implication will be met by DOW if the project is under the National Government Works program.	-
5	The completed land investigation reports are submitted to DLPP HQ by the provincial officers and if accepted, copies are referred to Provincial Affairs to issue Certificate of Alienability and to the Valuer General's office to carry out valuation assessments on the land.	3 – 4 weeks
6	The Department of Lands and Physical Planning, upon receiving Certificates of Alienability and Valuation, prepares purchase / lease documents and requests DOW to raise payments for land compensation.	3 – 4 weeks
7	The purchase / lease documents together with cheque raised by DOW are dispatched to Provincial Affairs and Lands Department for the execution of land compensation payments.	2 weeks
8	The executed documents are returned to DLPP who register the documents and allocate NLD (Native Land Dealing) numbers.	1 week

Source: “Land Acquisition Procedures - Dow & T Projects In: Manual - Functions, Responsibilities and Procedures. Survey and Lands Branch Technical Services Division, Department of Works and Transport Headquarters, year of preparation not described)”

## 4. Proposed project and location

### 4-1 Background of the project

The Medium Term Development Strategy (MTDS) 1997-2000 of the PNG Government set out the direction and the vision for the PNG government to follow in implementing the priority areas of education, health, transport, infrastructure, promotion of private sector activity and Law & Order. The National Transport Development Plan (NTDP) 2001-2010 provides a clear and defined strategy for sustainable development in the transport sector. Bridges Replacement Programme in the NTDP 2001-2010 states that effective management of the bridge asset is imperative for protecting the financial investment that the bridge represents and to sustain the benefits of services provided by the bridge assets. Bougainville Restoration and Development Programme also aims at the provision of basic services and rehabilitation of basic infrastructure as well as establishing a basic socio-economic support structure for Bougainville to rebuild their lives.

Conditions of all bridges along the Bougainville Coastal Trunk Road have been severely deteriorated due to absence of maintenance for long period. There are many wet crossings where none of facility in any form is provided. It is vital to eliminate the wet crossing along the Trunk Road for restoration works in Bougainville. Actually there are 15 wet crossings between Kokopau and Arawa on the Trunk Road. The DOW and ABG intend to construct all single lane bridges or culverts



on all the wet crossing sites. Benefits derived from the construction of 15 bridges and culverts are substantial for the revitalization and development of the Bougainville economy. In August 2006, the DOW requested Japan's Grant Aid for the construction of the priority bridges and culverts on the Bougainville Coastal Trunk Road.

#### 4-2 Objectives of the project

The objective of the project is to construct bridges and culverts on Bougainville Coastal Trunk Road, in order to support provincial security and secure economic development and provincial cohesion.

#### 4-3 Project sites

The project sites are located between Kokopau and Arawa on Bougainville Coastal Trunk Road in Bougainville Autonomous Region. **Table 2** shows geographical position, existence of demolished bridge structure on river bed, and type, length & width of proposed bridges. **Figure 2** shows the Bougainville Coastal Trunk Road and the location of project sites. A wildlife management area and ecological priority area are also added to **Fig. 2** as a part of ecological information about Bougainville region.

**Table 2** Geographical position, existence of demolished bridge structure on river bed, and type, length & width of proposed bridges

ID	Name of Bridge	Geographical Position	Existence of demolished bridge structure on river bed	Proposed bridge		
				Type	Length (m)	Width (m)
3	Bakanovi	155° 23' 47.070"E, 6° 05' 38.142"S	none	Truss	60	5.2 (w/wal kway)
4	Bove	155° 24' 15.720"E, 6° 04' 05.616"S	none	Truss	60	
7	Pukarobi 1	155° 22' 03.150"E, 6° 00' 12.348"S	none	Culvert	20	
8	Pukarobi 2	155° 21' 36.852"E, 5° 59' 44.832"S	three H-section steel piles	Culvert	30	
9	Creepers	155° 21' 31.488"E, 5° 59' 28.536"S	none	Culvert	25	
10	Ratavi	155° 21' 27.918"E, 5° 59' 16.644"S	A pier in the midst of the river	Truss	60	
11	Iraka	155° 19' 42.678"E, 5° 57' 05.958"S	none	Truss	60	
12	Korova	155° 19' 09.918"E, 5° 57' 02.916"S	Demolished culvert	Culvert	40	
14	Malas	155° 16' 50.004"E, 5° 54' 35.784"S	Demolished truss bridge	Truss	30	
19	Ururua	155° 11' 09.150"E, 5° 51' 33.180"S	none	Truss	30	
24	Kaskrus	155° 05' 46.968"E, 5° 39' 36.360"S	Demolished culvert	Culvert	30	
27	Rotaovei	155° 04' 51.240"E, 5° 37' 00.252"S	Demolished culvert	Truss	36	
30	Warakapis	155° 01' 15.960"E, 5° 33' 57.660"S	Demolished culvert	Truss	60	
31	Irung	155° 00' 30.006"E, 5° 33' 38.124"S	none	Truss	60	
35	Rawal	154° 54' 46.992"E, 5° 32' 35.532"S	Demolished culvert	Culvert	40	



**Fig. 2** Satellite imagery (from Google with a registered license) showing the location of 15 project sites (white dots) on the Bougainville Coastal Trunk Road (white solid line). A wildlife management area and ecological priority area are additionally inserted.

#### 4-4 Project components

The project involves the construction of steel truss bridges and multi-cell culverts, which consist of one-lane with a sidewalk and access roads. Proposed width and length of bridges are indicated in **Table 2**.

#### 5. Analysis of alternatives (including no-action alternative)

Alternatives including no-action alternative for each project site are examined with the counterpart from the Autonomous Bougainville Government (ABG). **Table 3** shows the alternatives examined for each bridge site. The most appropriate alternative was selected taking into consideration “Necessity of Land Acquisition”, “Impact on Natural Environment”, “Construction Cost”, “Convenience for Pedestrians and Cars (users)” and “Safety”.

**Table 3** Alternatives examined for each bridge site

Bridge name & ID	Alternative ID	Alternative	Difference between alternatives in terms of “Necessity of Land Acquisition”, “Impact on Natural Environment”, “Construction Cost”, “Convenience for Pedestrians and Cars” and/or “Safety”
Bakanovi (3)	3-1 <input checked="" type="checkbox"/>	A truss bridge with a sideway will be constructed on the alignment where the former culvert existed.	Road and bridge will become more straight-shaped.
	3-2 <input type="checkbox"/>	A truss bridge with a sideway on the existing fording route	Road alignment is curved.
Bove (4)	4-1 <input checked="" type="checkbox"/>	A truss bridge with a sideway will be constructed on the alignment of fording route.	Safer than the alternative in terms of the stability of bridge.
	4-2 <input type="checkbox"/>	A culvert with a sideway will be constructed on the alignment of fording route.	Riverbed is unstable and river water is fast-flowing. Amount of soil run-off is greater than that of the alternative 4-2.
Pukarobi 1 (7)	7-1 <input checked="" type="checkbox"/>	A truss bridge with a sideway will be constructed on the alignment of the fording route. A detour will be needed.	Safest. Soil-runoff is much smaller than the alternative 7-2
	7-2 <input type="checkbox"/>	A culvert with a sideway will be constructed on the alignment of the fording route. A detour will be needed.	Water flow is fast. Riverbed conditions in upstream areas are unstable. Erosion might occur. Culverts were constructed twice before and washed away.
Pukarobi 2 (8)	8-1 <input checked="" type="checkbox"/>	A culvert with a sideway will be constructed on the alignment of the fording route. A detour will be needed.	Minimal soil run-off is generated. Provides a safer condition without wet crossing.
Creeper (9)	9-1 <input type="checkbox"/>	A truss bridge with a sideway will be constructed on the alignment of fording route. A detour will be needed.	More expensive than the alternative 9-2
	9-2 <input checked="" type="checkbox"/>	A culvert with a sideway will be constructed on the alignment of fording route. A detour will be needed.	Catchment area of this river is so small that river bed conditions do not change drastically. Construction cost is lower
Ratavi (10)	10-1 <input checked="" type="checkbox"/>	A truss bridge with a sideway will be constructed on the alignment of the fording route.	Many high school students will be able to cross river without getting wet.
Iraka (11)	11-1 <input checked="" type="checkbox"/>	A truss bridge with a sideway will be constructed on the former alignment.	Safest because the road and bridge will become more straight-shaped.
Korova (12)	12-1 <input checked="" type="checkbox"/>	A culvert with a sidewalk will be constructed on the line of the former alignment.	Pedestrians and sedan-size cars can cross the river without getting wet. Minimal soil run-off is generated.
Malas (14)	14-1 <input checked="" type="checkbox"/>	A truss bridge will be constructed on the alignment where demolished culvert existed.	Road and bridge alignment will become more straight-shaped.
	14-2 <input type="checkbox"/>	A truss bridge will be constructed next (upstream) demolished culvert existed.	Road alignment is the same.
Ururua (19)	19-1 <input checked="" type="checkbox"/>	A truss bridge will be constructed on the former alignment where demolished bridge structures remains.	Pedestrians and sedan-size cars can cross the river without getting wet. Minimal soil run-off may occur where heavy rain occurs. Springs might be affected by piling activities.
Kaskrus (24)	24-1 <input checked="" type="checkbox"/>	A culvert with a sideway will be constructed on the alignment of the fording route. A detour will be necessary.	Minimal soil run-off is generated. Pedestrians and sedan-size cars will be able to cross the river without getting wet. Minimal soil run-off occurs.
Rotaovei (27)	27-1 <input checked="" type="checkbox"/>	A truss bridge will be constructed about 2m downstream from the existing demolished culvert.	The existing demolished culvert can protect the new bridge from strong water flow.
	27-2 <input type="checkbox"/>	A truss bridge will be constructed on the alignment of the existing demolished culvert.	A bit higher construction cost than the alternative 27-1.
Warakapis (30)	30-1 <input type="checkbox"/>	A steel truss bridge with a sideway will be constructed on the alignment of the demolished culvert.	Some portions might need to be acquired. Some big trees might need to be cut down, but this might cause the erosion of river bank.
	30-2 <input checked="" type="checkbox"/>	A steel truss bridge with a sideway will be constructed slightly south of the alignment of the demolished culvert.	Probably no land acquisition is needed. No trees need to be cut.
Irung (31)	31-1 <input checked="" type="checkbox"/>	A truss bridge with a sideway will be constructed on the alignment of the fording route. A detour will be needed.	Many pedestrian and sedan-size cars will be able to cross the river without getting wet.
Rawa 1 (35)	35-1 <input type="checkbox"/>	A multi-cell culvert with sideway will be constructed on the alignment of the demolished culvert.	Erosion (scouring) of downstream side may occur again. Construction cost is slightly higher than that of the alternative 35-2 because the demolished culvert needs to be removed.
	35-2 <input checked="" type="checkbox"/>	A culvert with a sideway will be constructed on the alignment of the upstream fording route.	The existing demolished culvert could prevent erosion (scouring) of down-stream side of new culvert.
	35-3 <input type="checkbox"/>	A bridge will be constructed.	New bridge may alter the hydrodynamics of the river system. Consequently, Rawa 2 culvert might be damaged.
All bridges	<input type="checkbox"/>	No-action alternative	No land acquisition, no impact on natural environment, and no cost. Unsafe condition and inconveniency for pedestrians and cars continue.

The selected alternatives are expressed with a check mark “☒”.

## 6. Scoping and overall evaluation

### 6-1 Results of scoping in accordance with the JICA guideline.

Scoping was conducted for the selected alternatives according to the JICA Guidelines. **Table 4** shows the results of scoping.

**Table 4** Scoping checklist for the proposed bridge construction

Name of project		Project for Construction of Bridges on Bougainville Coastal Trunk Road in the Independent State of Papua New Guinea	
Possible impact		Rating (bridge ID)	Description
Social Environment (Impacts related to “gender” and “children’s right” may be considered in each item.)			
1	Involuntary resettlement	d (all bridge)	There is no house and economic activity on the sites.
2	Local economy such as employment and livelihood, etc.	d (all bridge)	A few coconut, banana or cocoa trees might need to be cut down (bride ID 3, 4, 12, 14). A market (bride ID 12) might be affected by construction work.
3	Land use and utilization of local resources	c (all bridge)	Acquisition of 30m-wide right of way has not been confirmed yet. Some small portions of customary land might be used for access roads (bride ID 3, 4, 10, 11, 14, 19, 27, 30, 31). Camp sites temporarily occupy some portions of customary lands.
4	Peace and security in the commune	d (all bridges)	People need bridges for peace and security, e.g. to urgently transport an injured person to a health center that is located beyond adjacent river(s).
5	Social institutions such as social infrastructure and local decision-making institutions	d (all bridges)	People, especially pedestrians, will be able to cross rivers more easily to go to school, health center, administration center, etc. Sedan-type cars will be able to cross rivers.
6	The poor, indigenous and ethnic people	d (all bridges)	
7	Misdistribution of benefit and damage	d (all bridges)	Situation will become better because local people will be able to transport crops and merchandise to Kokopau and Arawa more easily.
8	Cultural heritage	d (all bridges)	No cultural heritage nearby
9	Local conflict of interests	d (all bridges)	The bridge construction is a matter of urgency. People need bridges.
10	Water usage or water rights and rights of common	b (all bridges)	Village people use the river for bathing, subsistence fishing, drawing water for drinking and cooking, washing clothes, etc. During construction they will have to use upstream waters.
11	Public sanitation	d (all bridges)	Minimal impact during the implementation. Water quality and waste management regulations should be followed.
12	Hazards (risks) and infectious diseases such as HIV/AIDS	d (all bridges)	
Natural Environment			
13	Topography and geological features	d (all bridges)	Minimal topographic change in access roads for culverts. Topographic feature of access roads (elevations and slopes) for bridge (not culvert) will be altered (bride ID 3, 4, 10, 11, 14, 19, 27, 30, 31).
14	Soil erosion	b (all bridges)	Minimal scale of soil erosion and sedimentation occur during earth works where appropriate soil-erosion control measures are adopted. Vegetation (Kunai grass) on bare grounds will be re-established as soon as final grading is complete.
15	Groundwater	b (19) c (others)	Pile driving might generate turbid water from springs. Location of springs that local people use for drawing drinkable water needs to be checked on all sites.
16	Hydrological situation	d (all bridges)	Watercourse, depth and flow velocity in some areas will be temporarily altered. Impact is minimal.
17	Coastal zone	d (all bridges)	Impact on coastal zone is minimal under appropriate run-off control practices. There are dense grass areas on the riverbed that play important role in capturing soil particles before they reach the coastal zone. Bridge sites are 200m - 3.5km away from the coast.
18	Flora, fauna and biodiversity	d (all bridges)	There is no significant impact on terrestrial flora and fauna since the project sites are planned only on actually- and formerly-used road alignments. Impacts on aquatic flora and fauna are minimal provided that appropriate run-off control is practiced.
19	Meteorology	d (all bridges)	
20	Landscape	d (all bridges)	Access roads for truss bridges will be elevated.
21	Global warming	d (all bridges)	
Pollution			
22	Air pollution	d (all bridges)	There is no house within a 50 m radius. Minimal during implementation
23	Water pollution	d (all bridges)	Heavy equipment need to be stored away from the rivers, when not in use to minimize potential for petrol and hydraulic fluid spills and leaks. Vehicle refueling and maintenance should occur away from river water.
24	Soil contamination	d (all bridges)	
25	Waste	b (all bridges)	Removed bridge components, wooden frames for concrete works, etc. will turn into waste.
26	Noise and vibration	b	During construction noise and vibration will be generated by pile driving. Especially vibration might temporarily increase turbidity of water from two springs at the bridge site (ID 19). There is no significant adverse effect related to noise since there is no house within a 50 m radius of each bridge site.
27	Ground subsidence	d (all bridges)	
28	Offensive odor	d (all bridges)	
29	Bottom sediment	d (all bridges)	
30	Accidents	d (all bridges)	Impact may be minimal under a good traffic control practice. A detour of fording route will be located in the proximity of each bridge being constructed. After construction vehicles might drive at faster speed.

Rating a: Serious impact is expected. b: Some impact is expected.  
c: Extent of impact is unknown (Examination is needed. Impacts, however, may become clear as study progresses.)  
d: Minimal or little adverse impacts are expected.



## 6-2 Overall evaluation

The project is classified as category “B” according to the JICA Guidelines because of the following reasons.

- It has not been confirmed whether or not 30m-wide right of way for the proposed project has already been acquired.
- River water at the proposed project sites will become unavailable during construction.
- Soil run-off might cause adverse impacts on environments in adjacent and downstream areas unless an appropriate soil run-off control measure is adopted.

## 7 Stakeholder meeting

Implementation of the proposed project will cause some impacts, of which local people should be informed, although the impacts are expected to be minimal as explained above (6-2). Besides, the Government of Japan has been concerned about security situation during the implementation stage and conflict with local people about land use. Therefore, the JICA preliminary study team asked ABG to establish Community Coordination Committees that play key roles in settling any kind of problem between local people, project implementation organizations (ABG & DOW) and contractors and to hold stakeholder meetings to ask local residents’ opinions about the proposed project. The ABG and local communities have already selected Committee members for all (15) project sites, which consist of ABG staff, chief of clan, women’s representative, youth representative, land owner, church member, policeman, and so forth.

Two stakeholder meetings were held on Rawa 1 and Ururua sites inviting the Committee members and other local residents (non-committee members) on Sept. 1 and 10, respectively. There were no dissenting opinions about the proposed bridge construction for both sites. All attendees were keen that bridges would be constructed to eliminate the inconveniency (i.e. wet crossing). There were some local people’s concerns related to change in river water quality (Rawa 1) and temporal unavailability of spring water for drinkable water located close to the project site (Ururua) although these problems were at resolvable levels. Moreover, it was noted that local people look forward to having job opportunities related to the construction works.

A memo describing six major points, which was used for explanation to local people (**Fig. 3**), and Memorandum of Consultation Meeting, for which local attendees signed on (**Fig. 4**), are shown below.

<b>Consultation Meeting</b>	
Date:	<u>10/ September/ 2007</u>
Time:	<u>10:00 to 11:30 a.m.</u>
Community Name:	<u>Buristoro</u>
Venue:	<u>Brick store</u>
Bridge ID:	<u>19 (Ururua)</u>
*****	
<ol style="list-style-type: none"> <li>1. Some portions of customary lands might need to be acquired as a part of access road for the bridge although the portions are limited to some of surrounding area of the bridge and should be tiny area(s).</li> <li>2. Some area(s) on customary lands will need to be used temporarily as a camp site and, if necessary, a detour.</li> <li>3. Access to the river water at the bridge site will not be available during construction due to construction works. Murky river water may be generated at the site and downstream by soil run-off deriving from earthworks and other construction activities. Consequently, water usage for drinking, cooking, bathing, washing clothes &amp; plates and fishing will be limited to upstream areas during a construction period.</li> <li>4. Community Coordinating Committee members should try to let all other local people understand the importance of bridge construction and cooperate with contractors.</li> <li>5. When a problem arises between contractors and local people, committee members should hold meeting(s) and find out an effective solution in continuous communication with ABG and DOW. While the problem is not solved, the construction, unfortunately, will have to be suspended.</li> <li>6. Every problem related to local people and the customary land must be solved by efforts of the PNG side including the Committee members.</li> </ol>	

**Fig. 3** Memo describing six major points that need to be addressed to local people. This memo was handed out, beforehand, to the counterpart and representatives of local stakeholders.



**AUTONOMOUS BOUGAINVILLE GOVERNMENT  
DIVISION OF TECHNICAL SERVICES**

**PROPOSAL OF THE PROJECT FOR THE CONSTRUCTION OF RAWA 1 BRIDGE**

**MEMORANDUM OF CONSULTATION MEETING**

This Memorandum Of Consultation Meeting herein referred to as **MOCM** has been signed between the Division of Technical Services herein referred to as **DTS**, the Autonomous Bougainville Government herein referred to as **ABG**, the Department of Lands herein referred to as **Lands** all representing the State or National Government and **Buirao Sisio, Uvaio and Catholic Church** all representing Local Clans and **Usitokoru** villagers comprising the Community Coordination Committee for the smooth implementation of the **Ururua Bridge Construction Project** herein referred to as **The Project**.

**THE PROJECT**

The Project is funded through a generous Grant Aid from the Government of Japan through the Japanese International Cooperation Agency JICA.

**CONTENTS OF CONSULTATION MEETING**

- Explanation about the outline of proposed bridge construction
- Possibility about the expropriation of small portions of customary land for access road construction
- Possible impacts on natural and social environment
- Delivery of local people's opinions
- Presentment of MOCM and discussion
- Signing of the MOCM by assentients

**AGREEMENT**

We (whose name appear on the list attached), representing the above parties hereby agree that **The Project** will be implemented without any unnecessary interruptions to the contractor due to such factors as land disputes, crop compensations, gravel royalties, employment, provision of social services, or similar. We agreed that if any such issues arise, those issues shall be immediately brought to the attention of relevant agencies or Government Departments such as **DTS, Lands, Bougainville Police Services, Member of House of Representatives (MHR)**, etc, to resolve. We further agreed that this Committee will ensure that members of our respective clans & settlements are made aware of this MOCM and that any breach of this MOCM will be referred to appropriate Law Enforcement Agencies.

We acknowledge that we represent our respective clans and communities and hereby agree and undertake to abide by the above Agreement. And as a sign of our agreement and consent have caused our signatures to be signed below on the date shown.

Date: Monday, the 10th Day of September, 2007  
(day) (date) (month)

Venue: Brick store, Buristoro

**Fig. 4** Memorandum of Consultation Meeting for which attendees (Committee members) signed on

Minutes of the stakeholders meetings held for both sites are inserted below.

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**Meeting for the project site Rawa 1**

**Date:** September 1, 2007  
**Time:** 10:00 to 11:30 a.m.  
**Venue:** Kuri Lodge, Buka  
**No. of attendees:** 11 local stake holders (incl. 3 women) and Mr. Simeon Itamai from ABG  
 (Attendees list is attached to the Memorandum of Consultation Meeting)  
**Observers:** 3 members of the JICA preliminary study team and a staff from the JICA-PNG staff

- I. ABG explained the outline of the Proposed project of Rawa 1 bridge construction to the members of Community Coordination Committee.
  - II. All attendees hope earnestly that a bridge will be constructed. There were no dissenting opinions about the proposed project of the construction of new Rawa 1 Bridge.
  - III. One member expressed his hope that villagers will be able to have job opportunities with the project to make up for their livelihoods. ABG and JICA replied that the project may give job opportunities although the job may be offered through a sub-contractor of the project.
  - IV. One female member expressed that construction of a bridge is a matter of urgency. A JICA member showed his appreciation of the attendance of females at the meeting because women's opinions are influential for decision-making.
  - V. ABG and JICA explained potential environmental impacts as follows;
    - 1 ) During the construction water from the construction site and near downstream will not be unsuitable for drinking, cooking, washing clothes and bathing.
    - 2 ) Odd smells due to auto emissions may be generated during the construction works.
    - 3 ) Fishing activities also will be affected by some extent of soil run-off.
    - 4 ) The duration of above impacts will last approximately for 6 months.
    - 5 ) During the coconuts piling, which may last approximately for 2 weeks, vibrations and noises are generated.
  - VI. The local people members expressed their opinions about the above potential environmental impacts that they will use water upstream for domestic use and understand the inconveniences caused by the bridge construction and their priority is to have a bridge in Rawa 1 site. One member expressed his concern about the contamination of river water by chemicals during construction. The ABG and JICA study team replied that discharge of wastes to the river must be strictly controlled in the accordance with the national laws/regulations.
  - VII. ABG explained the envisioned location of a campsite and requested local people to understand that contractor will use the site during construction works. The local people member accepted the request because the priority is to have a bridge as soon as possible.
  - VIII. Contents of MOU were explained. Attendees that agreed to the MOU signed on the attendee list as the evidence of agreement.
  - IX. All attendees and observers shook each other's hands and the meeting was adjourned.
- =====

**Meeting for the project site Ururua**

**Date:** September 10, 2007  
**Time:** 10:00 to 11:30 a.m.  
**Bridge (ID):** Ururua (19)  
**Venue:** Brick store, Buristoro  
**No. of attendees:** 23 villagers including 9 Community Coordinating Committee members including 2 ladies  
 Mr. Simeon Itamai from ABG  
 (Attendees list is attached to the Memorandum of Consultation Meeting)  
 Mr. Hideki Yukihira, Mr. Hideo Matsushima (members of the JICA preliminary study team)

- I. ABG explained the outline of the proposed project of bridge construction at Ururua to the members of Community Coordination Committee.
- II. ABG explained six major points that local people should know about impacts of the project. (see **Fig. 3**)
- III. A woman said, "We use river water at the bridge site for washing and bathing. We go upstream during the construction of bridge." JICA explained that the construction work will use a range of area, approximately 10m upstream to 10m downstream from the bridge.
- IV. The same lady said, "A spring that we draw drinkable water is located 10 m downstream from the site." JICA added information that pile driving work might generate turbid water from the spring. The woman said there is another spring about 20m upstream from the site. JICA said, "The work probably does not cause serious problem since there is a spring 20 m upstream, however the location of spring needs to be checked before the work and water quality of the springs should be monitored during the work."
- V. A man asked whether the construction of new bridge is planned on a new alignment. ABG answered, "It is planned on the same alignment where the demolished bridge is located."
- VI. A land owner suggested that a camp site may be located on the Buka side from the bridge since Arawa side is occupied by plantations and has no enough space. ABG agreed with this. He said there is no problem in this project proposal and he will support it. He agreed about the use of his land that covers the project site.
- VII. JICA asked to the attendees about the information heard from the Deputy Secretary of DOW Headquarters that a road maintenance contractor was threatened by local people and robbed of money when working in Ururua. Regarding this information an attendee (man) gave information that the incident happened (in 1996) because the contractor, "Effective Constructor", did not make payment to its employees. The attendee and some more attendees (men) said that the incident was an internal problem of the contractor (i.e. between employer and employees), but not a problem between this community people and contractor. They concluded that the problem was caused by the contractor, but not community people.
- VIII. A man asked whether local people can have job opportunities as local workers from the project. ABG replied, "The decision will be made by contractor. JICA cannot give any commitment about this matter."
- IX. ABG and JICA concluded that there is no dissenting opinion about the proposed project and expressed their hope that local people will support the project.
- X. The attendees from the site said that there is no dissenting opinion and they will support the project. All attendees hope earnestly that a bridge will be constructed.
- XI. The meeting was adjourned.

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After the JICA Preliminary Study, ABG continued to hold stakeholder meetings on the remaining 13 sites and has already reported to JICA about results of the meetings. The results are all favorable, at this phase, as all participants have expressed their understanding and cooperation about the proposed project.



## 8. Mitigation and environmental management measures

Mitigation and environmental management measures were discussed with the counterpart. Proposed measures that should be taken into consideration at the Basic Design Study phase are shown in **Table 5**.

**Table 5** Proposed mitigation and environmental management measures that should be taken into consideration at the Basic Design Study phase

Bridge name & ID	Environmental and social impact	Mitigation measure / Environmental management measure
Bakanovi (3), Bove (4), Malas (14)	<b>Local economy such as employment and livelihood, etc.:</b> A few trees that yield fruits might need to be cut down.	Consideration of road alignments to avoid felling useful trees The ABG properly issues compensation if trees need to be cut.
Korova (12)	<b>Local economy such as employment and livelihood, etc.:</b> A market might be affected by construction work.	Work schedule and access road design needs to be made in consideration for the activity and location of market.
Ururua (19)	<b>Groundwater and vibration:</b> There are two springs (10 & 20m from the site) that local people draw drinkable water. Vibration caused by excavation, pile driving and drilling might temporarily cause turbidity of water.	Locations of the springs need to be checked. During the work water quality of the springs needs to be monitored on a regular basis.
All bridges	<b>Water usage or water rights and rights of common:</b> Village people use rivers for bathing, subsistence fishing, drawing water for drinking and cooking, washing clothes, etc. During construction they will have to use upstream waters.	All potential impacts should be notified to local residents in advance. Alternative river waters need to be secured for local people during construction.
	<b>Waste:</b> Removed bridge parts, wooden frames for concrete works, etc. will turn into waste.	A waste management plan needs to be prepared.
	<b>Groundwater and Vibration:</b> Spring water for potable water might become turbid by vibration derived from pile driving.	Locations of springs that are used for drinkable water by local people need to be checked in the proximity of each site except Ururua. If springs are found, the same mitigation measure as in the case of Ururua should be adopted.
	<b>Land use and utilization of local resources:</b> Some small portions of customary land might be used as a part of access roads. Camp sites temporarily occupy some customary lands. People are expecting job-opportunities that (sub-) contractor might give them.	All potential impacts should be notified to local residents well in advance. Every time a problem arises, the Community Coordination Committee makes efforts to solve it in cooperation with other stakeholders including local people (non Committee members), contractors, ABG and DOW. Continuous communication among stakeholders is essential for smooth advance of the project. The ABG or DOW properly issues compensation if land needs to be acquired.
	<b>Flora, fauna &amp; biodiversity, coastal zone and soil erosion:</b> Some soil run-off and sedimentation occur due to earth works such as cuts, fills and excavations, which might damage ecosystems of river and coastal zone unless appropriate soil run-off measures are practiced.	Appropriate design of run-off control, surface water management, spill prevention control must be adopted, which might include silt fence, temporary sediment detention basin, mulching (mulches & plastic sheeting), etc.
	<b>Flora, fauna &amp; biodiversity and Hydrological situation:</b> Watercourse, depth, flow velocity in some areas might be changed unless appropriate riverbank & riverbed stabilization methods are adopted, which might affect habitats of aquatic flora and fauna.	Some riverbank & riverbed stabilization methods may need to be considered, e.g. placement of sandbags, gabions, piles, ripraps, etc.
	<b>Accidents:</b> A detour of fording route will be located in the proximity of each bridge being constructed. After the completion of construction, vehicles might drive at faster speed.	Prior to and during construction, local people and other concerned parties need to be notified of construction period, any expected delays and potential temporary closures that may require short-term detours. A traffic control plan that would identify the sequence of construction activities and appropriate traffic control measures may be necessary, including control of driving velocity of vehicles during implementation and operation phases and control of passage of vehicles and pedestrians, e.g. designation of safe fording route for pedestrian, assignment of road guards, placement of sign-posts.

付属資料(5) 協議録  
協議面談議事録

訪問先	Department or Works (DOW)、Ministry of Works
面談者	Mr. Ken Saville (First Assistant Secretary, Technical Services) Mr. Mekelen Silip (Assistant Secretary, Roads & Bridges)
調査団	松島秀夫、行平英基
同行者	横田隆浩 (JICA パプアニューギニア事務所所員) Mr. Tony Ombo (Administration Manager)
日 時	8 月 20 日午後 1 時 45 分～2 時 30 分
内容	<p>1. 公共事業省表敬訪問と今後の協力依頼</p> <p>2. 調査日程の概要説明</p> <p>3. 今後の会議内容の協議および日程の調整</p> <p>4. ABG には橋梁建設・環境社会配慮の専門性を持った人材が少ない。現場での指導を通して DOW は、ABG に対して技術的支援を行っている。</p> <p>5. 住民説明会開催について 本調査期間中の住民説明会の開催（試行）を依頼した。その際、説明会を担当するのは ABG であることを確認。</p>

訪問先	AusAID (Austrian Agency for International Development)
面談者	Mr. Keith Joyce (First Secretary) Mr. Charles Vee (Senior Program Officer)
調査団	松島、行平
同行者	横田
日 時	8 月 21 日午前 8 時 15 分～8 時 30 分
内容	<p>1. 表敬訪問、今後の協力依頼、AusAID 協力事業に関わる資料の入手</p> <p>2. ブーゲンビル島における AusAID プロジェクトの内容と進捗状況 ブーゲンビルでは、橋梁改修の要請はあったものの、その案件は実施されていない。現在は、道路補修プロジェクトが実施されているのみであり、その事業に EIA は必要とされていない。</p> <p>3. ブーゲンビルでの AusAID 事業や環境社会配慮に関しての調査では、Mr. Bob Willis (AusAID スタッフ) が適任との情報を得る。</p>

訪問先	Environment Division, Department of Environment & Conservation (DEC)
面談者	Mr. Kelly Gawi (Acting Deputy Secretary)
調査団	松島、行平
同行者	横田
日 時	8 月 21 日午前 9 時 10 分～10 時 30 分
内容	<p>1. 表敬訪問、今後の協力依頼</p> <p>2. 環境関連法令の入手、環境保全省組織図に関する質問</p> <p>2. 本プロジェクト案件の環境カテゴリー分類 本案件は、Environment (Prescribed Activities) Regulation 2002 に従えば、骨材としてのサンゴ砂を近縁のサンゴ礁 (reef flat) から採取する場合は Level 3 に、また、それ以外の場合では Level 2 に分類されることを確認。サンゴ砂入手の方法を現地で確認す</p>

<p>る必要がある。</p> <p>3 .環境許認可申請書を提出して許認可が発行されるまで Level 3 の事業で約 3～4 ヶ月、Level 2 の事業で約 2 ヶ月を要する。</p> <p>4 . EIA の手続きに関する質問（フローチャート入手）</p> <p>5 . 希少動植物、保護区等の情報入手につき、Conservation Division の Dr. Gae Gowae との会合を 10 月 4 日午前 10 時に設定。</p>
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訪問先	Department or Works (DOW)、Ministry of Works
面談者	Mr. Ken Saville、Mr. Mekelen Silip Mr. Willie Asigau (Environmental Officer) Mr. Michael A. Sirabis (Assistant Secretary)
調査団	松島、行平
同行者	横田
日 時	8 月 21 日午前 9 時 10 分～10 時 30 分
<p>内容</p> <p>1 . インセプションレポート、初期環境影響評価（IEE）質問票の説明とそれらに関する討議</p> <p>2 . 用地確保に関して住民との合意が取り付けられていることが、B/D 派遣決定の前提条件であることを伝える。</p> <p>3 . 本計画の目的や内容に関して住民の合意が得られるよう、PNG 側は、住民説明会を開催し、10 月 15 日までに JICA に対し、その進捗状況を報告するよう伝える。</p> <p>4 . 土地収用手続きに関わる資料の請求</p> <p>5 . 住民説明会開催を担当するのは、ABG 側であり、用地確保を担当するのは DOW 側であるとの情報を DOW 側より聴取（ABG 側にも確認の必要あり）。</p> <p>6 . 環境配慮担当の Mr. Willie Asigau に JICA ガイドラインのスクリーニングフォーマットを記入するよう依頼。</p> <p>7 . ブーゲンビルでの土地・環境社会配慮に関する質問は、Provincial Works Manager（在ブーゲンビル）の Mr. Hillary Hakatsia が適当であるとの情報を得る。</p>	

訪問先	Division of Technical Services, Autonomous Bougainville Government (ABG)
面談者	Mr. John Kolan (CEO Technical Services、建設局長) Mr. Simeon Itamal (Civil Engineer, Division of Technical Services) Mr. Chan Sagolo (Public Relations Officer, Ministry or Works, ABG)
調査団	松島、行平
同行者	Mr. T. Ombo
日 時	8 月 22 日午後 1 時～2 時
<p>内容</p> <p>1 . 表敬訪問およびインセプションレポート・IEE・質問事項の概略説明</p> <p>2 . Buka から Arawa まで通ずる幹線道路の名前は、“Coastal Trunk Road”であることを確認</p> <p>3 . Mr. S. Itamal が、橋梁計画・環境社会配慮分野調査に同行し、情報収集等を行うことを確認。</p> <p>4 . 住民との合意形成に向けた Community Coordination Committee の設立 土地所有権がらみや治安上問題を避けるため、かつ、自然環境や住民の社会経済活動に配慮するため、各橋梁の建設サイト周辺の住民を対象とした住民説明会を開催するよう要請。試行的に Rawa 1 橋梁周辺の住民を招集し、9 月 1 日に meeting を実施し、Community Coordination Committee を設けることで了承を得る。また、その他の 12 地区においても 10 月 15 日までに Committee を設立し、その進捗について JICAPNG 事務所を報告するよう伝えた。</p> <p>5 . 2 種類の幅員が要請されているが、交通量に応じた幅員の設定があることを伝える。</p>	

6. Phase I および Phase II の地域では、Phase I 側の地域の交通量がより多い。
7. AusAID は ABG から要請のあった橋梁改修案件を実施していないため（実施の可否は未定）、日本政府へ要請のあった橋梁建設が行われたとしても、本幹線道路は全線開通せず、なお寸断状態になる可能性がある。したがって、AusAID に対して要請のあった橋梁も対象に加え、Phase I 区域内の橋梁改修から着手する選択肢について言及。官団員到着を待ち協議することとする。

訪問先	Administration Office (ABG)
面談者	Mr. Raymond Masono (Acting Chief Administrator、行政長官)
調査団	松島、行平
同行者	Mr. T. Ombo, Mr. S. Itamal
日 時	8 月 22 日午後 2 時 30 分～3 時 30 分
内容	<ol style="list-style-type: none"> <li>1. 表敬訪問およびインセプションレポートの概略説明</li> <li>2. Community Coordinating Committee 設立の必要性を説明し、DTS 主催により、9 月 1 日に Rawa 1 地区を対象とした住民説明会を行いたい旨を伝え、了承を受ける。その他の 12 地区においても 10 月 15 日までに Committee を設立し、JICA パプアニューギニア事務所に報告するよう伝える。</li> <li>3. 用地確保に関して住民との基本的合意が取り付けられていることが、B/D 派遣決定の前提条件であることを伝える。</li> <li>2. 環境影響評価や環境保全に関する ABG の法制度 自治政府発足後間もない ABG では、法体系の整備は準備段階であり、現段階でも PNG 政府の法制度を使用している。</li> <li>4. 同日 DTS を訪問した際の Mr. John Kolan との会合内容（幹線道路正式名称、要請されている 2 種類の幅員、AusAID プロジェクト等）を伝えた。</li> </ol>

訪問先	Division of Technical Services, Autonomous Bougainville Government (ABG)
面談者	Mr. John Kolan (CEO Technical Services、建設局長) Mr. Simeon Itamal (Civil Engineer, Division of Technical Services)
調査団	松島、行平
同行者	Mr. T. Ombo
日 時	8 月 23 日午後 1 時 30 分～3 時 50 分
内容	<ol style="list-style-type: none"> <li>1. インセプションレポート・IEE・質問事項に関する詳細な説明と質疑応答</li> <li>2. AusAID は、既に 4 橋梁を補修していることが判明。8 月 21 日 AusAID 訪問時の Mr. Keith からの返答は誤りであった（着任間もないためと思われる）。これらの 4 橋梁は、補修事業であったため、環境許認可を申請する必要はなかった。</li> <li>3. 本案件では、骨材としてのサンゴ砂を近縁のサンゴ礁から採掘して調達することはないことを確認。路床材や路盤材を他の地域から輸送して調達するとすれば、本プロジェクトは環境法（Environment Act 2000）に従い、Level 2 に分類されると予想される（最終的には環境省で確認する必要あり）。</li> <li>4. プロジェクトサイト内には、マングローブ林はなく、マングローブ林を切る必要はないことを確認。</li> <li>5. 本プロジェクト対象道路の正式名称は、Bougainville Coastal Trunk Road にしたい意向を ABG 側より確認。</li> <li>6. Minutes of Discussion (Draft) に記載するプロジェクト実施機関を Division of Technical Services に、管理機関を ABG にしたい意向を確認。</li> <li>7. 道路用地取得では、マイノリティーグループの人権や意見を尊重するよう確認。</li> <li>8. ABG の Strategic Plan に記載された EIA 用の予算の実施状況につき質問。現時点で、これ</li> </ol>



- らの予算は、EIA 実施に使用されていない。
- 9．予算計画と予算執行状況がわかりやすい資料を請求
- 10．既存の道路の両側各 6 mは、Right of Way として既に確保してあるとの情報を得る。

訪問先	Parliament office (ABG)
面談者	Mr. Joseph Kabur, MHR (ABG president)
調査団	江上雅彦、横田、松島、行平
同行者	
日 時	8 月 29 日午前 11 時 30 分～12 時 00 分
内容	<p>1．ブーゲンビル自治政府大統領への表敬訪問</p> <p>2．インセプションレポートの概略説明</p> <p>3．大統領より、物資や人の移動に、橋梁のない川を渡ることは大きな支障となっている。今回の橋梁建設は、経済復興を支援することになり、最も優先度の高い案件であることの説明があった。また、日本政府の援助への謝意が表明される。可能な限り早い段階での着工をお願いしたいとの強い意志表明を受ける。</p> <p>4．調査団側より、JICA スキームやタイムスケジュールを説明し、大統領側より一応の理解を得る。</p>

訪問先	AusAID Road Project Office at Bougainville
面談者	Mr. Bob Willis (AusAID consultant)
調査団	江上、横田、松島、行平
同行者	Mr. S. Itamal
日 時	8 月 29 日午後 2 時 30 分～3 時 30 分
内容	<p>1．AusAID 側のブーゲンビルでの今後の協力方針や JICA と AusAID の援助協調 (Demarcation) について質問。</p> <p>2．AusAID としては、今後橋を作る具体的な計画はない。JICA が橋梁建設分野で協力するのであれば、AusAID は、道路維持管理に集中したい。</p> <p>3．Asdavi, Kaskas, Rawa 1 を Youmiyet プロジェクトで実施する案もあるが、具体化していない。JICA が、Asdavi と Kaskas を計画の中に追加しない場合は、AusAID が支援することはあり得る。今後、AusAID で予算を配分できるよう検討することはできる。ただし、道路維持管理プロジェクトのコストが高いため、橋の建設まで着手できるかどうかは確約できない。</p> <p>4．これまで、ブーゲンビルでは、Ramazan, Arakawau, Bouin の 3 橋梁を建設した。</p> <p>5．現在、道路維持管理プロジェクトでは、DOW と DTS (Department of Technical Services, ABG) が、監督機関としての役割を果たしており、DOW 1 名と DTS 2 名がカウンターパートとして配置されている。しかし、実質的には、DOW は全く関わっておらず、本年 (2007 年) 12 月より、DOW は AusAID から離れ、DTS のみを監督機関とした体制に移行する予定である。</p> <p>6．道路維持管理プロジェクトは、新国道の建設ではないため、環境許認可を取得する必要はない。また、環境保全省 (DEC) への届出も行わなかった。</p> <p>7．道路維持管理プロジェクトでは、地域住民とのトラブルが多く生じた。JICA の橋梁建設プロジェクトにおいても、計画段階で住民との合意を取り付けたとしても、実施段階で住民との問題は起きるとの指摘があった。カウンターパートの役割は重要で、絶えず住民との良好なコミュニケーションを保つことが重要であるとの結論に達する。</p>

訪問先	Ministry of Works, Transport, Civil Aviation, Housing and Energy (公共事業部門), ABG
面談者	Mr. Patrick Nisira (公共事業部門担当大臣)
調査団	江上、横田、松島、行平
同行者	
日 時	8 月 29 日午後 3 時 40 分～4 時 20 分
<p>内容</p> <ol style="list-style-type: none"> <li>1. 公共事業部門担当大臣への表敬訪問</li> <li>2. インセプションレポートの概略説明</li> <li>3. JICA と AusAID が関わる橋梁建設に関わる援助調整について説明。</li> <li>4. 公共事業省より、2 つの橋梁を追加するのであれば、公共事業省から正式な要請書を出すとの申し出があった。これに対して、JICA 側より、AusAID 側の対応も見て判断したいと伝える。</li> <li>5. プロジェクトの実施段階で住民とのトラブルが発生した際、ABG 側が責任を持って住民と対話し、問題の解決を図るよう確認した。</li> </ol>	

訪問先	DOW Provincial Works (DOW ブーゲンビル事務所)
面談者	Mr. Hillary Hakatsia (Provincial Work Manager)
調査団	江上、横田、松島、行平
同行者	Mr. S. Itamai
日 時	8 月 31 日午後 2 時 15 分～2 時 50 分
<p>内容</p> <ol style="list-style-type: none"> <li>1. DOW ブーゲンビル事務所の果たす役割について質問 <ul style="list-style-type: none"> <li>● ABG と共同で AusAID 案件の道路維持管理事業を C/P としてサポートし、かつ監督している。</li> <li>● ABG が、自治政府であるため、ABG および DOW 双方の役割分担が、他の州政府における DOW の役割と比較して、不明確である。近い将来、DOW と DTS の役割は統合される予定である。</li> </ul> </li> <li>2. AusAID の TSSP プログラムにより、まもなくオーストラリアのコンサルタントの SMEC が AusAID による道路維持管理事業を実施することになっている。</li> <li>3. 本橋梁建設案件の管理責任機関は、DNPM (Department of National Planning and Monitoring) 実施機関は DTS (ABG) が良いのではないかと提案が Mr. Hakatsia と Mr. Itamai からなされた。</li> </ol>	

訪問先	Division of Land and Physical Planning (DLPP-ABG)
面談者	Mr. Andrew Dovaro (CEO、土地計画局長)
調査団	江上、横田、松島、行平
同行者	Mr. S. Itamai
日 時	8 月 31 日午後 3 時～3 時 50 分
<p>内容</p> <ol style="list-style-type: none"> <li>1. 橋梁建設に伴ない、取り付け道路両横の勾配部分を含めると、Right of Way を超えて Customary Land を使用することになるのではないかと質問。先方より、今回の事業の用地は全て確保してありなんら問題ないとの回答を得る。念のため、その旨を記した公式文書の発行を依頼したが、それについては、DOW に依頼するのが適当であるとの返答を得る。</li> <li>2. Right of Way の定義を当方から質問。先方より、DOW または DTS なら、その定義の説明ができるであろうとの返答を得る。</li> <li>3. 土地問題や補償は全て ABG 側が責任を持って行うので、JICA 側が心配する必要ないと先方よりコメントがあった。それに対し、JICA 側からはハイランド橋梁改修や AusAID の道</li> </ol>	

<p>路維持管理プロジェクトで過去に生じた問題について言及し、JICA 側の懸念を伝えた。</p>	
4 .	<p>討議の結果、住民との土地使用や治安に絡む問題を避けるためには、ABG 側が住民から取り付ける合意文書は有効であり、それに加え、JICA 側としては、DOW より道路用地は既に確保されていることを示す文書を取り付けたい旨を伝えた。</p>
5 .	<p>地籍図は、DLPP-ABG にはないが、DOW もしくは、DLPP-PNG にある可能性がある。DLPP-PNG に土地収用の手続き、Land Act 1996 の内容、地籍図等につき問い合わせるのであれば、Department of Land の Executive Officer の Mr. Fred Morove が良いとの情報を得る。</p>

訪問先	Department of Works (DOW)
面談者	Mr. K. Saville, Mr. M. Silip Mr. Andrew R. Bung, Assistant secretary (Plant Transport Branch: PTB)
調査団	山内邦裕 (調査団団長) 江上、松島、行平
同行者	横田
日 時	9月3日午前8時50分～10時45分
<p>内容</p> <ol style="list-style-type: none"> <li>1 . JICA 調査団から DOW に対してプロジェクトサイトの調査結果報告を行う。</li> <li>2 . DOW と ABG の役割分担について明確にしたい旨を伝える。これに対し DOW より、ブーゲンビル海岸幹線道路は国道であるため、原則的には、DOW が道路の維持管理を行う。本プロジェクトにより、橋梁が建設された後のメンテナンスも同様の理由で DOW の管理下になる。ABG からの要請があれば、技術支援を行うとのことである。これに対し、JICA 側より ABG が自治政府であることも考慮し、共同でプロジェクトの実施とその後の維持管理を実施していただきたい旨を伝える。役割分担については、M/D の中に言及することを確認する。</li> <li>3 . Right of Way の定義について質問。PNG では、Right of Way は 40m が標準規格であることが伝えられる。これは、ABG 側の説明 (Right of Way は 12 m と主張) と異なるため、確認の必要があることを確認。</li> <li>4 . Right of Way の収容は、ABG よりリクエストがあれば DOW が法に則して行う。</li> <li>5 . Right of Way の定義と Right of Way が既に取得されているか否かを文書で 9月17日に報告するよう JICA 側より要請する。</li> <li>6 . 本案件が仮に、Level 2 の環境カテゴリーに分類され、環境許認可を取得する必要がある場合は、DOW の環境担当の Mr. Willie Asigau が、環境許認可取得手続きを行うことになることを DOW より確認。</li> </ol>	

訪問先	Department of Works (DOW)
面談者	Mr. K. Saville, Mr. M. Silip, Mr. R. B. Andrew, Mr. W. Asigau, Mr. Eduardo U. Sangrados (DOW) Mr. Robert Gondo (Department of National Planning and Monitoring: DNPM) Mr. Toru Ogura (DNPM 配属の JICA 専門家) Mr. R. Masono (ABG 行政調査官)
調査団	山内、江上、松島、行平
同行者	横田
日 時	9月3日午後1時30分～3時45分
<p>内容</p> <ol style="list-style-type: none"> <li>1 . JICA 調査団から参加者に、プロジェクトサイトの調査結果報告を行う。</li> <li>2 . DOW と ABG の役割分担の明確化につき協議。また、ABG と中央政府との間で Steering Committee の設立が必要であることを確認。</li> <li>3 . Right of Way の収容は、ABG 側が担当する (ABG 側より) こと、および、環境影響評価は DOW が担当できる (DOW より) ことを確認。</li> </ol>	

訪問先	Department of Lands and Physical Planning (DLPP)
面談者	Mr. Jacob Waffinduo (Manager, Customary Land)
調査団	行平
同行者	Mr. Greg Mogia (Senior engineer, DOW)
日 時	9月3日午後1時分～1時30分
内容	<p>1. 地籍図は、PNG全土を未だ網羅しておらず、測量調査を実施した場所についてのみ図面が存在する。ブーゲンビル内の地籍図があるかどうかは、DLPPに所属するNational Mapping Bureauに問い合わせる必要がある。</p> <p>2. DOWは道路沿線の地籍図を扱っているので、まずはDOW内で地籍図の有無や土地収用の手続きを調査した方が良いとの助言を受ける。</p> <p>3. Land Act 1996は、DLPPで入手できるはずである。</p>

訪問先	Environment Division, Department of Environment & Conservation (DEC)
面談者	Mr. John Mosoro (Environmental Impact Assessment, Assistant Secretary) Mr. K. Gawi (Acting Deputy Secretary)
調査団	行平、江上
同行者	
日 時	9月4日午前9時～10時
内容	<p>1. 本プロジェクトの概要を説明し、本案件が環境保全省の定める環境影響カテゴリーの内、どのカテゴリーに分類されるかを質問。環境保全省側より、本プロジェクトは、Level 2の事業になると予想されるが、まずは、Notification Letterをガイドラインに基づいて作成し、環境保全省へ提出して頂きたいとの申し出があった。</p> <p>2. Notificationの内容を審査した上で、初めてカテゴリー分類についての判断が下されることを確認。</p> <p>3. Environment Permitを取得するには、まず、申請書類を作成し提出する必要がある。その際、Environment Permit Application Feeを支払う必要がある（費用は事業の内容に異なるがおおむね10,000～100,000キナ）。その後、Annual Feeを支払う必要がある（500～2,000キナ/年）。</p>

訪問先	Environment Division, Department of Environment & Conservation (DEC)
面談者	Mr. James Sabi (Manager, Species Management Branch, DEC) Mr. Pulus Kulmoi (Species Management Branch, DEC)
調査団	行平
同行者	
日 時	9月4日午前10時～11時
内容	<p>1. 本プロジェクトの概要を説明し、プロジェクトサイト周辺に自然保護区や絶滅危惧種等の保護対象野生生物がいるかについて質問。</p> <p>2. 環境保全省側より、ブーゲンビル島では、島の西側が、生態学的に重要な地域として保全されているが、東側のプロジェクト予定地周辺に保護区はないことを確認。</p> <p>3. 保護対象生物の存在について、本案件は既存の道路上の橋梁建設であることから問題はないと考えられる。念のため、ブーゲンビル島の保護対象種リストの提供を依頼する。</p>

訪問先	Division of Survey and Lands, DOW
面談者	Mr. Greg Mogia (Senior engineer, DOW)
調査団	行平



同行者	
日 時	9月4日午後1時30分～3時
内容	<p>1. DOW がブーゲンビル海岸幹線道路周辺の地籍図を保有しているかについて確認をする。</p> <p>2. ブーゲンビル海岸幹線道路（Kokopau-Arawa 間）では、Wakunai - Kumo 間の道路測量（Engineering survey または Road Survey と呼称）が行われている。しかし、この道路測量図には、土地所有情報（土地所有者、境界線）は記されていない。したがって、地籍図は、DOW にはないことが判明。</p> <p>3. Division of Lands（DLPP 内）の Surveyor General's Office を訪れれば、地籍図があるが、それには、プランテーションの境界線が記入されているだけで道路沿いの慣習的土地の境界線は記されていないとの情報を得る。確認のため Division of Lands を翌日訪問することとする。</p> <p>4. 道路用地収容の手続きに関する資料を入手。手続きの中の各段階（ステップ）での所要日数について質問。</p>

訪問先	DOW
面談者	<p>Mr. Hans Sarua (Deputy Secretary - Technical)</p> <p>Mr. Eric Sikam (Acting First Assistant Secretary)</p> <p>Mr. Wilfred Peko (Acting Assistant Secretary)</p> <p>Mr. M. Silip</p>
調査団	山内、江上、松島、行平
同行者	横田
日 時	9月5日午前11時～12時10分
内容	<p>1. 9月5日付けで新しい Deputy Secretary（Mr. Hans Sarua）が任命され、それに伴ない C/P である Mr. Ken Saville と Mr. Mekeleon Silip が異動となった。新しい C/P に対し、JICA 側より、インセプションレポート、これまでの調査結果および Minutes of Discussion の内容を説明した。</p> <p>2. JICA 側より以下のリクエストを行った。</p> <ul style="list-style-type: none"> <li>- 道路用地の確保が行われているのか否かについての公式文書の提出（9月17日まで）</li> <li>- 環境カテゴリーを確定するための Notification Letter を DEC へ提出し、その審査結果を10月15日までに JICA に通知する。</li> </ul> <p>3. Mr. H. Sarua より、ブーゲンビルの Asdavi 地区で以前道路維持管理中の業者が、地元住民の恐喝に会い、現金を強奪されたことを言及。地元住民からの合意取り付けと治安対策が最も重要な事項であるとの説明があった。さらに、PNG では船舶等による輸送コストが大変高くつくことが強調された。</p>

付属資料(6) 道路用地幅 (ROW) にかかる DOW 回答書

Row の定義に係了

DOW 回答  
(工芝事務局)

9月17日付

**DEPARTMENT OF WORKS**  
**OFFICE OF DEPUTY SECRETARY (TECHNICAL)**P O BOX 1108  
BOROKO, NCD  
Papua New GuineaTel 3241110  
Fax 3241102**Ref:****Date:** 17 September 2007 ✓Assistant Resident Representative  
JICA (PNG) Office,  
P O Box 1660,  
PORT MORESBY, NCD.,  
Papua New Guinea

ATTENTION: YOKOTA Takahiro

Dear Sir,

**RE: ITEM NO. 8.2 – CLARIFICATION OF RIGHT-OF-WAY (ROW) FOR**  
**BOUGAINVILLE COASTAL TRUNK ROAD**  
**BOUGAINVILLE BRIDGES** ✓

This letter is served to reaffirm our discussions pertaining to the captioned National Road.

The captioned road, is categorise as part of the National Road Network No. **NM-5001**, of Papua New Guinea. As such, the road corridor (referred to as ROW) is variable in total width ranging from 60 metres to 30 metres. As indicated 30 metres ROW has been adopted for the Bougainville Coastal Trunk Road.

The general width of the ROW is 40 metres (ie : 20 metres each side of the road centreline).

It is understood that The ROW land acquisition payment for this Road is not confirmed.  
However, we can make arrangements to survey and acquire the land for each of the individual 15 Bridge Sites, funds permitting, within 10 months.

We submit for your information.

Yours sincerely

**Hans Sarua**  
**Deputy Secretary (Technical)**



**DEPARTMENT OF WORKS**  
**OFFICE OF DEPUTY SECRETARY (TECHNICAL)**



P O Box 1108  
BOROKO, NCD  
Papua New Guinea

Tel : 3241110  
Fax : 3241102

Ref:

Date: 31st October 2007

Assistant Resident Representative  
JICA (PNG) Office  
P.O. Box 1660,  
Port Moresby, N.C.D.  
Papua New Guinea

Attention: YOKOTA Takahiro

Dear Sir,

**RE: ENVIRONMENTAL AND SOCIAL IMPACT CLEARANCE REQUIREMENTS FOR  
PROPOSED BRIDGE CONSTRUCTION PROJECT ON BOUGAINVILLE**

This letter is to confirm the official response we received from the Department of Environment and Conservation dated 12th October 2007 on the request for Environmental and Social impact clearance requirements for the proposed bridges as stated above.

Attached are copies of the relevant Application forms for an Environmental Permit to comply with the Department of Environment and Conservations Technical Guidelines as stipulated under the Acts of 2002 and 2000.

These documents were faxed to your office on the 12th October 2007 as discussed and confirmed during our meetings.

We submit for your information.

Yours Sincerely

**HANS SARUA**  
Acting Deputy Secretary (Technical)



**DEPARTMENT OF WORKS**  
**OFFICE OF THE SECRETARY**

P O Box 1108  
BOROKO, NCD  
Papua New Guinea

Tel: (675) 324 1114  
Fax: (675) 324 1102

Date: 1<sup>st</sup> October 2007

Dr. Wari Iamo  
Secretary  
Department of Environment and Conservation  
P.O.Box 6601  
BOROKO  
National Capital District

Dear Secretary,

**SUBJECT: LETTER OF NOTIFICATION FOR BRIDGE CONSTRUCTION  
PROJECT IN NORTH SOLOMONS PROVINCE.**

I write to inform you of my Department's intension to engage in a Bridge Construction Project in the North Solomons Province with financial assistance from the Japanese Government channelled through JICA here in PNG.

JICA has engaged a team of consultants who are currently working together with my Department and the administration of the North Solomons Provincial Government to put together the project for possible funding by the Japanese Government.

Attached find both "The Interim Report" and "The Inception Report" plus "The Interim Report on the Environmental and Social Considerations" for the bridges identified for replacement and improvement under this project.

The above reports stand to give you the scope of our project, which we believe will have no significant environmental nor social impact.

To help us proceed with the project could you kindly advise us on the environmental clearance requirements under the Environmental Act of 2002 for this project.

Yours sincerely

  
**JOEL LUMA**  
Acting Secretary





THE INDEPENDENT STATE OF PAPUA NEW GUINEA

NOTICE

*Act, Sec. 50*

*Environment Act 2000*

**NOTICE TO APPLY FOR AN ENVIRONMENT PERMIT**

**TO:** Department of Works

**OF:** PO Box 1108, Boroko, National Capital District.

Further to your notice of intention received on 1<sup>st</sup> October 2007 to carry out preparatory work in relation to the "Bridge Construction Project on Bougainville Trunk Road – from Buka to Arawa in North Solomons Province", please note that the proposal is categorized as a **Level 2 (Category A) activity** Under the **Environment (Prescribed Activities) Regulations 2002**.

In accordance with **Section 60 of Environment Act 2000**, you are required to apply for an Environmental Permit for the proposed activity. The application should consist of the following -

1. a completed Permit Application Form and a document containing the main submission, and
2. a Permit Application Fee of **K100.00**.

Attached is a copy of the Application Form and DEC Technical Guidelines for *Water/Land Discharges, Noise Discharges & Air Discharges* to assist you in completing and submitting your application.

Take note that the application should comply substantially with the DEC Technical Guidelines in terms of content before an application is lodged with the Director of Environment.

**FAILURE TO COMPLY WITH REQUIREMENTS IN THE TECHNICAL GUIDELINES MAY RESULT IN REJECTION OF AN APPLICATION.**

**Dated:** 12<sup>th</sup> October 2007

A handwritten signature in black ink, appearing to read "K. Gawi", written over a horizontal line.

**KELLY GAWI**

**Acting Deputy Secretary**

**Delegate of the**

**Department of Environment and Conservation**

encl.

# TECHNICAL GUIDELINE (Additional Information)



DEPARTMENT OF ENVIRONMENT  
AND CONSERVATION

Environment Division, 6<sup>th</sup> Floor, Somare Foundation House, Cnr. Sir John Guise Dr. & Independence Dr., Waigani.  
Phone (675) 325 0194, Fax (675) 325 0182.

DEC Publication: IB-ENV/04/2004.

1<sup>st</sup> January 2004.

## WATER & LAND DISCHARGES

In addition to the requirements set out in the DEC Information Guideline for *Submission of an Application for an Environment Permit to Discharge Waste*, the following information, where applicable, should be provided as part of an application for an Environment (Waste Discharge) Permit where WATER/LAND emissions may be generated.

### SITE PLANS & LOCATION

In addition to the A4 site plan (requested in Information Guideline), please provide two (2) large-scale drawings. All plans should be drawn to scale and indicate the following:

- (a) proposed treatment system indicating general layout, method of operation, dimensions, materials and grade.
- specifications describing proposed works (e.g. land irrigation system) if not indicated on drawings.
- (b) scale and direction of north showing the site in relation to roads, streams, residential allotments, and other landmarks, indicating:
  - boundaries and dimensions of the premises.
  - location and dimensions of proposed works.
  - zoning and/or land use within 1km of the premises.
  - location of any relevant site features, easements, or watercourse within or adjacent to the premises, including nearest residence.
  - location of proposed discharge point(s) and sampling point(s).

### INFORMATION

Provide details on the following:

- (a) design basis of the proposed wastewater treatment and disposal system, indicating:
  - treatment process including details of wastewater generation, waste minimization, waste collection and storage.

- design calculations or performance characteristics to show that the system will produce the stated results.
- disposal method (i.e. to land or water).
- effluent quality and quantify expected to be produced.
- proposed operational and maintenance procedures and plant failure contingency plans.

- (b) description of the discharge point from the premises, if it is proposed to discharge wastes to water, indicating:

- dimensions and materials of construction of discharge pipes or drains.
- location and name of receiving waters, both immediate (e.g. stormwater drain) and eventual (e.g. a particular creek, lake or bay).
- beneficial values of the receiving water (e.g. drinking, fishing, recreational, etc.), within 1km downstream of the discharge point.
- seasonal ambient water quality data and hydrological information.
- climate regime (e.g., rainfall, temperature, etc.).
- information on pre-existing pollution source(s), type(s) and level(s).

- (c) for wastewater discharges to land:

- details of groundwater regime (seasonal), groundwater quality and groundwater use within 1km of premises.
- characterisation of soils.
- water balance (e.g. losses due to evaporation, seepage, and runoff) to be provided for land disposal systems.

- (d) for wastewater discharges to land and/or water:

- water balance to be provided for water intake and wastewater produce from the premises.
- details of investigations into wastewater recycling and reuse.

- water balance to be provided for water intake and wastewater produce from the premises.
- details of investigations into wastewater recycling and reuse.
- water conservation measures taken to reduce water usage.
- source of wastewater and expected effluent quality and quantity.
- rates of discharge (litres per hour, hours per day, days per month, months per year).
- design basis of the treatment system using results of field evaluation studies and method of disposal:
  - i. *beneficial values used to assess effects of discharge against*
  - ii. *water quality criteria for protection of these values and which may be used in the Environment Permit.*
- availability of sewerage and/or expected date of availability.

#### **WASTE MINIMISATION**

Provide details on the following:

- (a) Information on different wastewater minimisation options applicable to the industry and details of the options examined.
  - details of investigations into wastewater recycling and reuse.
  - water conservation measures taken to reduce water usage.
- (b) Details of applicants proposed wastewater minimisation strategy (Avoidance, Reduction, Reuse, Recycle, Treatment & Disposal).
- (c) Information on alternative treatment and disposal system considered.
- (d) Basis for choosing the proposed treatment and disposal system.

#### **RISK ASSESSMENT**

- (a) An assessment of the likely risk of treatment and disposal system failure causing an environmental hazard.
  - Worse case scenarios (e.g. pond seepage)
  - Emergency situations (e.g. pond over-flow, flooding, etc.)
- (b) A description of treatment and disposal system safety measures to avoid an environmental hazard.
- (c) Contingency plan for the treatment and disposal system must be based on the findings of the risk assessment.

#### **AUTHORISATIONS**

If wastewater is to be discharged across or on to land owned by others or to a drain controlled by other, written proof that appropriate permission has been obtained.

Where the information exceeds 10 pages in length a summary is required and should include:

- Process description and waste discharge rate.
- Treatment plant description.
- Nature, composition and source of waste.

Where an application contains insufficient information the Director will request further information. The application cannot be acted upon until the further information sought is received and accepted as adequate.

# TECHNICAL GUIDELINE (Additional Information)



DEPARTMENT OF ENVIRONMENT  
AND CONSERVATION

Environment Division, 6<sup>th</sup> Floor, Somare Foundation House, Cnr. Sir John Guise Dr. & Independence Dr., Waigani.  
Phone (675) 325 0194, Fax (675) 325 0182.

DEC Publication: IB-ENV/02/2004.

1<sup>st</sup> January 2004.

## AIR DISCHARGES

In addition to the requirements set out in the DEC Information Guideline for *Submission of an Application for an Environment Permit to Discharge Waste*, the following information, where applicable, should be provided as part of an application for an Environment (Waste Discharge) Permit where AIR emissions may be generated.

### OUTLINE OF PROPOSAL

Describe the nature and extent of activities to be carried out on the premises including:

- (a) process description.
- (b) treatment plant description.
- (c) proposed source, nature, composition and rate of waste input and/or discharge.
- (d) impact of the proposal on the environment.

### SITE PLANS & LOCATION

In addition to the A4 site plan (requested in Information Guideline), please provide two (2) A3-size drawings. All plans should be drawn to scale and indicate the following:

- (a) dimensions of boundaries and site features.
- (b) scale and direction of north.
- (c) exact location of proposed discharge points to the environment (on A4 site plan as indicated above). Please number all discharge points.
- (d) elevations of buildings and discharge points.
- (e) name and exact location of equipment used in the processing, treatment and/or discharge of waste.
- (f) name and exact location of equipment giving rise to such waste.
- (g) land use within 2000 metres of the site boundary.
- (h) location of nearest residences.

### PROCESS DETAILS

Describe the manufacturing processes to be employed including:

- (a) flowsheet.
- (b) process and instrumentation diagrams.

- (c) material balance.
- (d) material safety data sheets for all chemicals used or manufactured.
- (e) contingency procedures to avoid discharges resulting from process failure and shutdown.
- (f) chemical storage and handling.

### WASTE MINIMISATION

Provide information on waste minimisation practices that will be employed including:

- (a) a preferred waste management plan by which the proponent will minimize the production of waste.
- (b) information on different process options applicable to the industry and details of the options examined.
- (c) details of proposed waste reclamation and recycling.

### RISK ASSESSMENT

Provide description of risk assessment that covers:

- (a) an assessment of the likely risk of plan failure causing an environmental hazard.
- (b) description of plant safety measures to avoid an environmental hazard.

### STACK EMISSION DETAILS

For each discharge point being applied for, please complete the table attached.

Please note - all discharge points on premises for prescribed activities require an Environment Permit. Refer to the *Environment (Prescribed Activities) Regulation 2002* for further definitions.

### ENVIRONMENTAL IMPACT OF THE PROPOSAL

Provide details of:

- (a) calculated ground level concentration of every waste proposed to be discharged to air under normal and maximum operating conditions and start up and shutdown conditions.

- (b) ground level concentrations are to be calculated using the 'Ausplume Gaussian Plume Dispersion Model' (computer package) or other DEC approved mathematical model.

A consultant who has experience in the use of the model may be engaged to do the calculations.

The data should be presented for each discharge point and for a multistack arrangement, which would lead to maximum potential emission characteristics at the boundary of the premises.

- (c) data should be presented for each discharge and for a multi-stack arrangement which would lead to maximum potential emission characteristics at the boundary of the premises.
- (d) results must be presented with all relevant input data, including any assumptions made in establishing model conditions, effects of existing on-site discharges and existing loadings from neighbouring industries
- (e) summary of the environmental impact of the proposal, e.g. what effects will emissions have on the receiving environment.

#### **POLLUTION CONTROL EQUIPMENT**

Provide details of control equipment with discharges to the environment:

- (a) for pollution control equipment, provide details on:
- type and manufacturer.
  - performance: destruction or removal efficiency.
  - design basis: calculations, empirical data from similar applications.
  - engineering drawings and manufacturer's brochures.
  - instrumentation to monitor performance (i.e., emissions and satisfactory operation of unit).
  - any pre or post treatment needed to supplement main control device, e.g., condensers, cyclones, mist eliminators.

Please note - specific information for fabric filters, afterburners and wet scrubbers is listed later.

- (b) the disposal of any collected material (i.e. what happens to bag filter dust or scrubbing liquor from a wet scrubber etc).
- (c) arrangements for the operation and management of the systems, training of plant

operators and the ongoing involvement of consultants and equipment suppliers (if any).

- (d) maintenance procedures, in particular, precautions to avoid occasional additional discharges to the environment resulting from plant breakdowns, power failures, accidental discharges and other reasonably foreseeable situations.

(Include details of process instrumentation, alarms and interlocks to control or stop processes).

#### **CONTROL EQUIPMENT**

Specific details for commonly used pollution control devices.

##### **Fabric Filter**

Additional information to be provided for the device should include:

- (a) model number
- (b) cleaning mechanism: dust collection and disposal.
- (c) air to cloth ratio
- (d) bag material
- (e) air flow rate
- (f) inlet gas temperature
- (g) moisture content of air/dew point
- (h) mass loading
- (i) particle size distribution
- (j) opacity/pressure drop monitoring
- (k) type/nature of particles to be filtered
- (l) noise level (particularly during cleaning)

##### **Afterburner**

Provide additional information on:

- (a) foul air flow and quality (calorific value if any)
- (b) dimensions of combustion chamber (primary and secondary)
- (c) inlet temperature
- (d) temperature and residence time
- (e) calculated gas flow rate
- (f) burner size
- (g) instrumentation and interlock specifications
- (h) excess air requirement
- (i) will solid or liquid particles be incinerated
- (j) details of waste heat recovery, including gas temperatures
- (k) fan specifications
- (l) ducting design

##### **Scrubber**

Additional information to be provided for the device should include:

- (a) gas stream:
  - flow rate
  - wastes to be scrubbed including dust loading
  - temperature



- (b) scrubbing liquor:
- flow rate
  - pH
  - temperature
  - quality (concentration of scrubbing liquid)
  - means of disposal

- (c) scrubber:
- material of construction
  - dimensions
  - spray mechanism
  - mist elimination mechanism
  - packing: type, size, material, depth

- (d) design basis:
- calculation for  $H_{lu}$  and  $N_{lu}$  equilibrium data
  - empirical data results from units operating elsewhere
  - throat velocity if venturi

Where an application contains insufficient information, the Director will request further information. The application cannot be acted upon until the further information sought is received and accepted as adequate.

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**DETAILS OF DISCHARGE POINTS (DP) AS NUMBERED ON SITE PLAN**

This table is an attachment to the Technical Guideline for Air Discharge.

Details	DP1	DP2	DP3	DP4, etc.
Fuel used and alternative fuel (if any)				
Maximum sulfur content of fuels, as %by weight				
Maximum fuel mass rates in kilograms per hour				
Incinerator -- maximum rate of disposal in kilograms per hour				
Aggregate number of hours of discharge per week				
Height of discharge point above ground level in meters				
Temperature of exhaust gases at the outlet in °C				
Volume flow of water vapour in m <sup>3</sup> per minute at discharge temperature				
Volume flow of dry gas in m <sup>3</sup> per minute at discharge temperature				
Geometric shape of outlet cross-section (circular, rectangle or square)				
Cross-sectional area of outlet in m <sup>2</sup>				
Velocity of discharge at point of discharge in metres per second				
Provide details of wastes which are not discharged freely and vertically				
Describe odorous waste, e.g. 'phenolic'				

# TECHNICAL GUIDELINE (Additional Information)



DEPARTMENT OF ENVIRONMENT  
AND CONSERVATION

Environment Division, 6<sup>th</sup> Floor, Somare Foundation House, Cnr. Sir John Guise Dr. & Independence Dr., Waigani.  
Phone (675) 325 0194, Fax (675) 325 0182.

DEC Publication: IB-ENV/03/2004.

1<sup>st</sup> January 2004.

## NOISE DISCHARGES

In addition to the requirements set out in the DEC Information Guideline for *Submission of an Application for an Environment Permit to Discharge Waste*, the following information, where applicable, should be provided as part of an application for an Environment (Waste Discharge) Permit where NOISE emissions may be generated.

### OUTLINE OF PROPOSAL

Describe the nature and extent of activities to be carried out on the premises.

### SITE PLANS & LOCATION

The A4 site plan (requested in Information Guideline) should also indicate:

- (a) scale, direction of north, boundaries, site features and buildings
- (b) the location of all external plant equipment including:
  - air cleaning equipment, e.g. cyclones, fabric filters and scrubbers
  - cooling towers
  - roof mounted exhaust fans
  - compressors
  - vehicle access, parking and loading bays
  - steam release/safety valves

### MAP OF SURROUNDING AREA

The map should indicate the zoned land use in the local planning scheme and the positions of nearby residences and residentially-zoned areas. A contour map of 1km radius should be provided for rural developments where the land is not predominantly flat.

### FLOOR PLAN OF INTERNAL PLANT

The floor plan of factory or manufacturing area should include:

- (a) major items of noise-producing plant and details of any existing or proposed noise suppression measures, e.g. enclosures, silencers or barriers. Please also supply details of material transfer lines (waste and product)
- (b) details of materials used for building walls and roofing; including window, vent (including ridge vent) and doorway dimensions

### SOUND POWER DATA

Sound power levels (or sound pressure levels at a specified distance) of all significant plant items and power ratings (kW) of all stationary motors.

### HOURS OF OPERATION OF THE PLANT

Background measurements should be taken over proposed operating period and be expressed in terms of hourly L90 measured in A-weighted decibels.

Where an application contains insufficient information, the Director will request further information. The application cannot be acted upon until the further information sought is received and accepted as adequate.



THE INDEPENDENT STATE OF PAPUA NEW GUINEA

Environment Act 2000

Act, Sec.60

APPLICATION FOR AN ENVIRONMENT PERMIT TO DISCHARGE WASTE

1. Details of Applicant:
  - 1.1 Name of Company or Individual (if not a Company): .....
  - 1.2 Registered Address: .....
  - 1.3 Head Office: .....  
Phone: ..... Facsimile: ..... E-mail: .....
  - 1.4 Site Address: .....  
(Section) (Allotment) (Street) (Suburb)  
Phone: ..... Facsimile: ..... E-mail: .....
2. Nature of application:
  - 2.1 Classification of activity (*Environment (Prescribed Activities) Regulation*): .....
  - 2.2 Reason for application: .....
3. Details of application:
  - 3.1 Legal description of land involved (customary/alienated): .....  
(a) Name of owner ..... (b) Tenure: .....
  - 3.2 Description of adjacent land: (a) Name of owner: ..... (b) Address: .....
  - 3.3 Brief description of the proposed works: .....
  - 3.4 Proposed works: (a) commencement date: ...../...../..... (b) completion date: ...../...../.....  
(c) estimated costs of works K.....00.
  - 3.5 Segments of the environment where wastes will be discharged: (a) air: ..... (b) land: ..... (c) water: .....  
(d) noise emission: ..... (e) no discharge: ..... (f) waste treatment/storage facility: .....
4. Period for which permit is required: .....  
(Period not exceeding 25 years)
5. Application fee: K .....00.

I declare that details in this application are true and correct to the best of my knowledge and belief.

Signed: .....

Name: .....  
(Authorized person)

Designation: .....

Date: .....

Office use only	
Date of Receipt:	/ /
Application No.:	

Company seal  
(where appropriate)

NOTE: Detail information on the application should be provided separately as a submission (refer to DEC Information Guideline for Submission of an Application for an Environment Permit to Discharge Waste). This completed Application Form is also required and must be provided with the submission.



THE INDEPENDENT STATE OF PAPUA NEW GUINEA

Environment Act 2000

Act, Sec.60

APPLICATION FOR AN ENVIRONMENT PERMIT  
TO TAKE, DAM, DIVERT OR OTHERWISE USE WATER

1. Details of Applicant:  
Name of Company or Individual (if not a Company): .....  
Registered Address: .....  
Site Address: .....  
Phone: ..... (Section) ..... (Attainment) ..... (Street) ..... (Suburb) .....  
Facsimile: ..... E-mail: .....
2. Details of proposal:  
Description of water source: .....  
Map coordinate (Easting and Northing) ..... and Diagram (include as attachment): .....  
Legal description of land involved (customary/alienated): .....  
Name of owner: ..... Tenure: .....  
Description of adjacent land: Name of owner: ..... Address: .....  
Plan of structure(s) for taking, damming or diverting water: .....  
Other relevant details: .....
3. Hydrological data on water source:  
Estimated annual flow (L/hr.): Minimum: ..... Maximum: ..... Mean: .....  
Estimated dry weather or low flow (L/hr.): Minimum: ..... Maximum: ..... Mean: .....  
Estimated wet weather or high flow (L/hr.): Minimum: ..... Maximum: ..... Mean: .....
4. Environmental values 1km downstream of proposed site that may be affected (indicate below):  
Aquatic ecosystem: ..... Drinking water: ..... Recreational: ..... Aesthetic: .....  
Transportation: ..... Cultural: ..... Others (specify): .....
5. Proposed volume of water to be used:  
Estimated quantity: Litres per hour: ..... Hours per day: ..... Days per month: ..... Months per year: .....  
Maximum rate in litres per hour: ..... Estimated quantity of water to be returned to water source:  
Litres per hour: ..... Hours per day: ..... Days per month: ..... Months per year: .....
6. Period for which permit is required: .....  
(Period not exceeding ten year)
7. Application fee: K 100.00

I declare that details in this application are true and correct to the best of my knowledge and belief.

Signed: .....

Name: .....

(Authorized person)

Designation: .....

Date: .....

Company seal  
(where appropriate)

Office use only	
Date of Receipt:	/ /
Application No.:	

NOTE: Additional details should be provided as an attachment to this completed Application Form.



付属資料(8) 参考資料入手リスト

番号	名称		形態	オリジナル・コピー	発行機関	発行年
1	Papua New Guinea 2000 Census	2000 年国勢調査抜粋	図書	コピー	National Statistical Office	2003
2	Population (Papua New Guinea 2000 Census Figures)	ブーゲンビル人口統計 (2000 年国勢調査)	図書	コピー	National Statistical Office	2003
3	Papua New Guinea 2000 Atlas	PNG 地図	地図	オリジナル	Department of Education PNG	1999
4	Number of Registered Cars in Bougainville	ブーゲンビル車両登録台数	印刷	コピー	ABG Financial Division	2006
5	PNG Standard, Code of Practice for General Structural Design and Design Loadings for Buildings	PNG 基準、一般構造物設計示方書 地震時設計荷重	図書	コピー	Papua New Guinea Standard Council	1982
6	Papua New Guinea Flood Estimation Manual	洪水流出量計算マニュアル	図書	コピー	PNG Dpt. of Env. & Cnvt. Bureau of Water Rsrcs.	1990
7	Department of Works Annual Report 2003	公共事業省 年次報告書 2003	図書	コピー	Department of Works	2004
8	Department of Works, Blueprint on Capital Works 1994-2003	公共事業省、主要工事計画 1994-2003	図書	コピー	Department of Works	1993
9	Department of Works Corporate Plan	公共事業省 基本計画	図書	コピー	Department of Works	2000
10	Road Status Report 2004	公共事業省 道路整備報告書 2004	図書	オリジナル	Department of Works	2005
11	Road Maintenance Specification	公共事業省 道路維持管理基準	図書	コピー	Department of Works	2006
12	Review of National Transport Development Plan 2001-2010	国家運輸開発計画 2001-2010	図書	オリジナル	Department of Transport	2005
13	National Transport Development Plan 2006-2010	国家運輸開発計画 2006-2010	図書	オリジナル	Department of Transport	2005
14	The Medium Term Development Strategy 2005-2010	中期開発戦略計画 2005-2010	図書	コピー	Department of National Planning and Monitoring	2004
15	Country Strategy and Program PNG (2006-2010)	PNG 国 ADB 開発戦略計画 2006-2010	図書	コピー	Asian Development Bank	2006

16	PNG-Australia Development Cooperation Strategy 2006-2010	PNG 国オーストラリア開発戦略計画 2006-2010	図書	コピー	Australian Government/ AusAID	2007
17	ABG Strategic Action Plan 2006-2010	ABG 自治政府開発戦略計画 2006-2010	図書	オリジナル	Bougainville Executive Council	2006
18	ABG 2007 Budget	ABG 自治政府 2007 年予算	図書	オリジナル	ABG	2006
19	ABG 2006 Budget	ABG 自治政府 2006 年予算	図書	オリジナル	ABG	2005
20	Geomorphology of Papua New Guinea	PNG 国の地質	図書	オリジナル	Australian National University	1977
21	Rainfall Data for Buka	ブカの降雨量	表	コピー	National Agricultural Research Institute	2007
22	North Solomons National Road Statistics	北ソロモン国道舗装状況	表	コピー	Department of Works	2007
23	Topographic Map (1: 100,000)	地形図 (10 万分の 1)	地図	オリジナル	Department of Land	1978
24	Environment (Prescribed Activities) Regulation 2002	環境規定 2002 (活動規定)	規則	コピー	Department of Environment and Conservation	2002
25	Environment (Water Quality Criteria) Regulation 2002	環境規定 2002 (水質基準)	規則	コピー	Department of Environment and Conservation	2002
26	Cadastral Map (Bougainville Coastal Trunk Road Side)	ブーゲンビル海岸幹線道路沿線の地籍図 (3,000~5 万分の 1)	地図	コピー (17 枚)	Surveyor General Office, Department of Lands & Physical Planning	1963
27	Cadastral Map (Bougainville Coastal Trunk Road Side)	ブーゲンビル海岸幹線道路沿線の地籍図 (5 万分の 1)	地図	コピー (5 枚)	Surveyors General Office, Department of Lands & Physical Planning	1971
28	Environment (Permits and Transitional) Regulation 2002	環境規定 2002 (許認可)	規則	コピー	DEC	2002
29	Organization chart of the Ministry of Environment & Conservation	DEC 組織図	図	コピー	DEC	2007
30	Application for an environment permit to	汚水を排出する際の環境許認可申請書	申請書	コピー	DEC	2000

	discharge waste					
31	Application for an environment permit to take dam, divert or otherwise use water	水の汲み上げ、せき止め、流路変更その他水を利用する際の環境許認可申請書	申請書	コピ -	DEC	2000
32	Summary: Environment Regulatory Process (Level 3 Activity)	Level 3 事業対象の環境規則プロセス要約	規則要約	コピ -	DEC	記載なし
33	Notification of preparatory work on level-2 and level-3 activities	Level 2 および Level 3 のプロジェクトの準備作業の通知	公報 (ガイドライン)	コピ -	DEC	2004
34	Guideline for conduct of Environmental Impact Assessment & preparation of Environmental Impact Statement	Level 3 のプロジェクトでの、EIA実施およびEIS作成のためのガイドライン	公報 (ガイドライン)	コピ -	DEC	2004
35	Guideline for preparation of Environmental Inception Report	Level 3 のプロジェクトでのインセプションレポート作成のガイドライン	公報 (ガイドライン)	コピ -	DEC	2004
36	Guideline for submission of an application for an environment permit to discharge waste	汚水排出の環境許認可申請書提出のためのガイドライン	公報 (ガイドライン)	コピ -	DEC	2004
37	Air discharges - Technical guideline (Additional Information)	汚水を排出する際の環境許認可申請書に付加する排気ガス排出の申告書	公報 (テクニカルガイドライン)	コピ -	DEC	2004
38	Noise Discharges - Technical guideline (Additional Information)	汚水を排出する際の環境許認可申請書に付加する騒音発生 of 申告書	公報 (テクニカルガイドライン)	コピ -	DEC	2004
39	Water and land discharges - Technical guideline (Additional Information)	汚水を排出する際の環境許認可申請書に付加する廃棄物排出の申告書	公報 (テクニカルガイドライン)	コピ -	DEC	2004
40	Environment Regulatory Framework	環境協認可取得のフローチャート	フローチャート	コピ -	DEC	記載なし
41	Land avulsion procedures - DOW & T Projects In: Functions Responsibilities and Procedures	DOW のプロジェクトにおける用地取得手続き	マニュアル	コピ -	Survey and Lands Branch, Technical Services Division, DOW	記載なし
42	Biodiversity Priorities for Papua New Guinea	生物多様性の視点から重要な地域 (1:2, 500, 000)	地図	オリジナル	Department of Environment and Conservation	1993
43	Environmental data of Bougainville for JICA	ブーゲンビルの自然環境に関わる情報 (DEC が JICA 用に準備した資料)	CD	オリジナル	Department of Environment and Conservation	2007

		集)				
44	Land Act 1996	土地法	法令	コト -	Independent State of Papua New Guinea	1996
45	Customary Land Reform - Reform agenda for customary land	慣習的所有制度の改革	論文	コト -	不明 (Year Book 2007 より)	2007







