REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF HIGHWAYS

THE FEASIBILITY STUDY OF THE LOCAL ROAD DEVELOPMENT IN THE REPUBLIC OF INDONESIA

KABUPATEN REPORT 20

KABUPATEN BARITO KUALA

MARCH 1986

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

This is the Kabupaten Report of the Feasibility Study of the Local Road Development in the Republic of Indonesia for Kabupaten Barito Kuala in Kalimantan Selatan Province. The report has been prepared by the Study Team of the Japan International Cooperation Agency (hereinafter called JICA).

Based upon a request from the Government of Indonesia, the Government of Japan arranged for JICA to conduct the Study and JICA accordingly organized a Study Team. The study was carried out using data which were generally prepared by the Kabupaten, routed through the province, under the instructions of Bina Marga of the Ministry of Public Works and Bangda of the Ministry of Home Affairs.

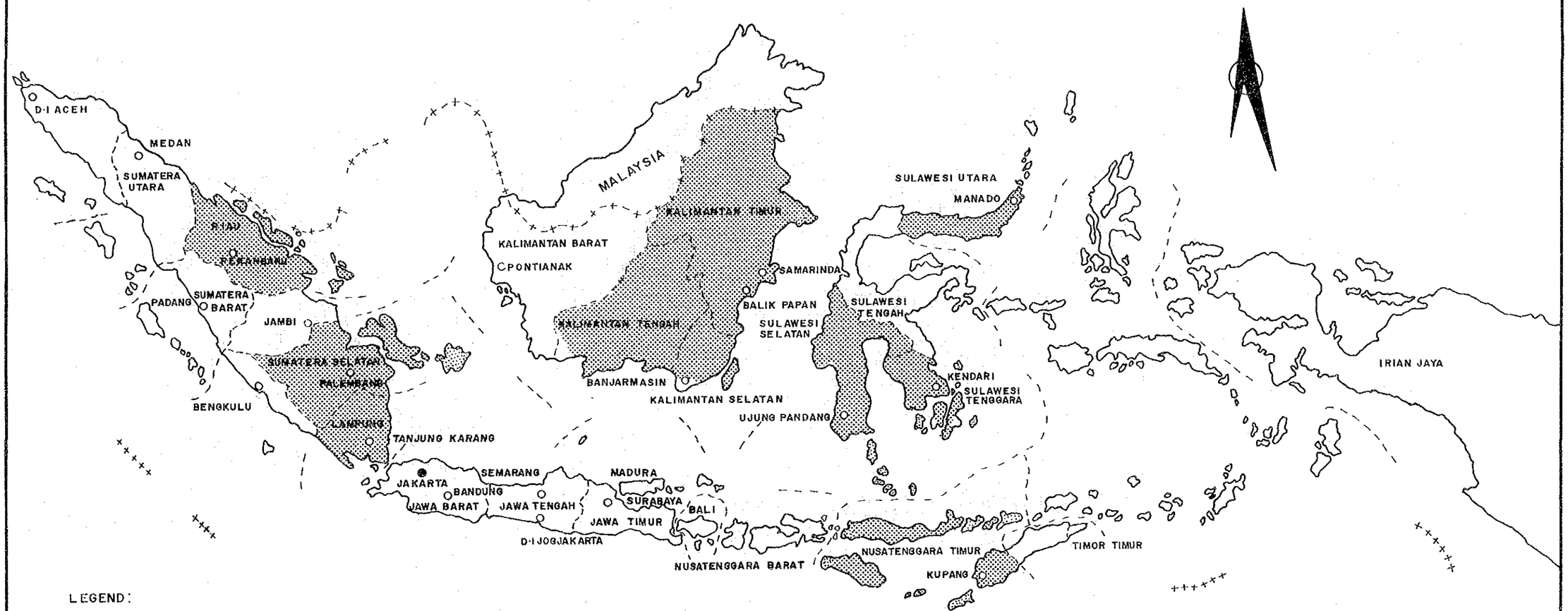
Since the study period was limited, without cooperation of Bina Marga, Bangda and local governments of both province and Kabupaten in collecting the data, the study would not have been completed within the period.

The report consists of the results of the feasibility study and proposed implementation programme of the local road development in the Kabupaten.

The simplified economic feasibility evaluation methodology utilized for the study was established by the Study Team in Phase I Study through a pilot study of seven (7) model Kabupatens, and is described in the Main Report.

The purpose of the study for the Kabupaten is mainly to estimate the total Project Cost for the local road development but only limited data is available for study base. Therefore a detailed survey and design for the improvement of the Kabupaten roads should be carried out before commencing the Project together with a review of this report.

LOCATION MAP OF THE PROJECT AREAS



LEGEND:

- CAPITAL CITY
- PROVINCIAL CITY
- NATIONAL BOUNDARY
- PPOVINCIAL BOUNDARY
- LOCATION OF THE PROJECT AREA

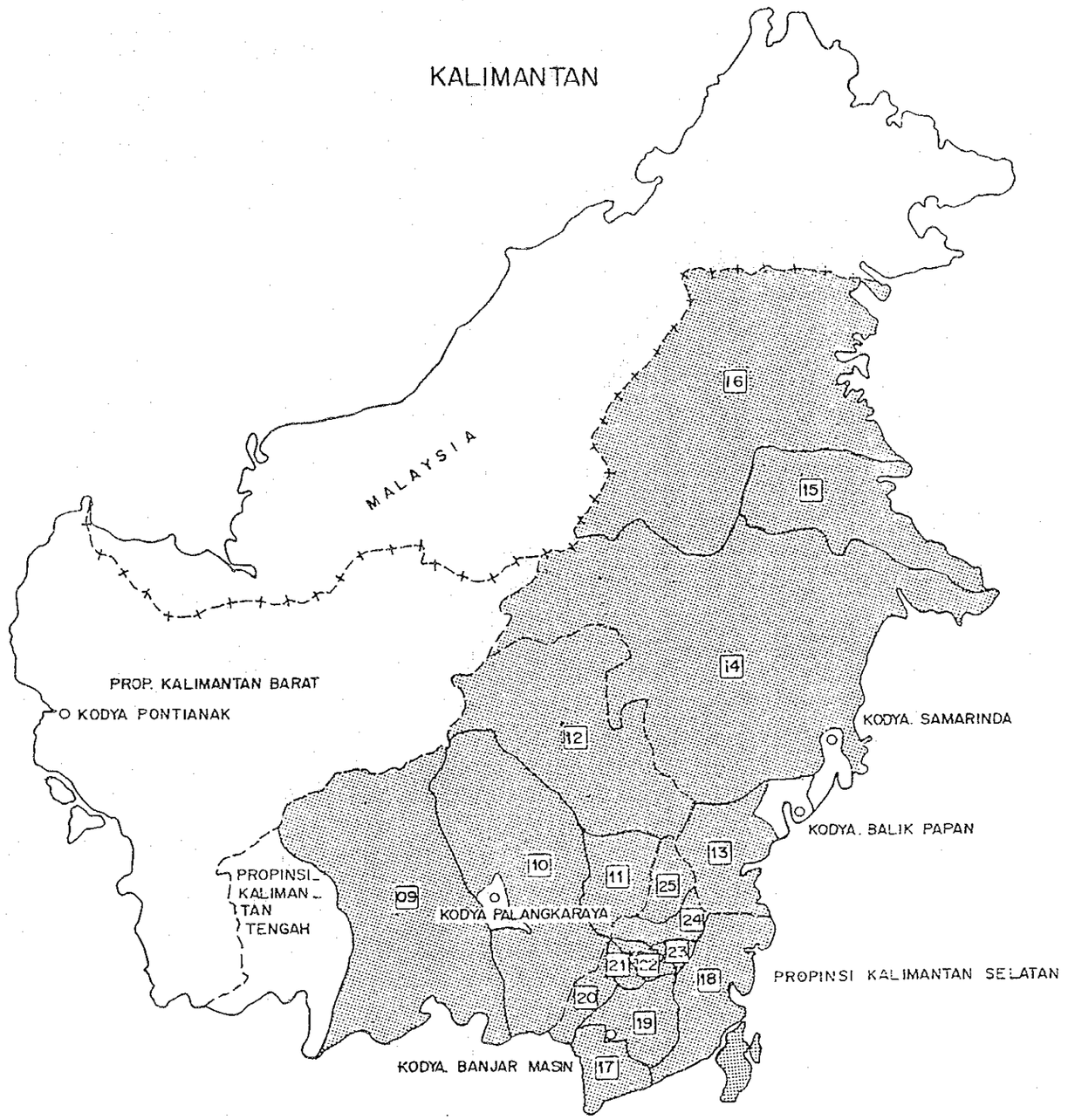
SCALE :

0 130 260 390 650 Km

IV · PROPINSI KALIMANTAN TENGAH
- 09 · KAB · KOTA WARINGIN TIMUR
- 10 · KAB · KAPUAS
- 11 · KAB · BARITO SELATAN
- 12 · KAB · BARITO UTARA

V · PROPINSI KALIMANTAN TIMUR
- 13 · KAB · PASIR
- 14 · KAB · KUTAI
- 15 · KAB · BERAU
- 16 · KAB · BULUNGAN

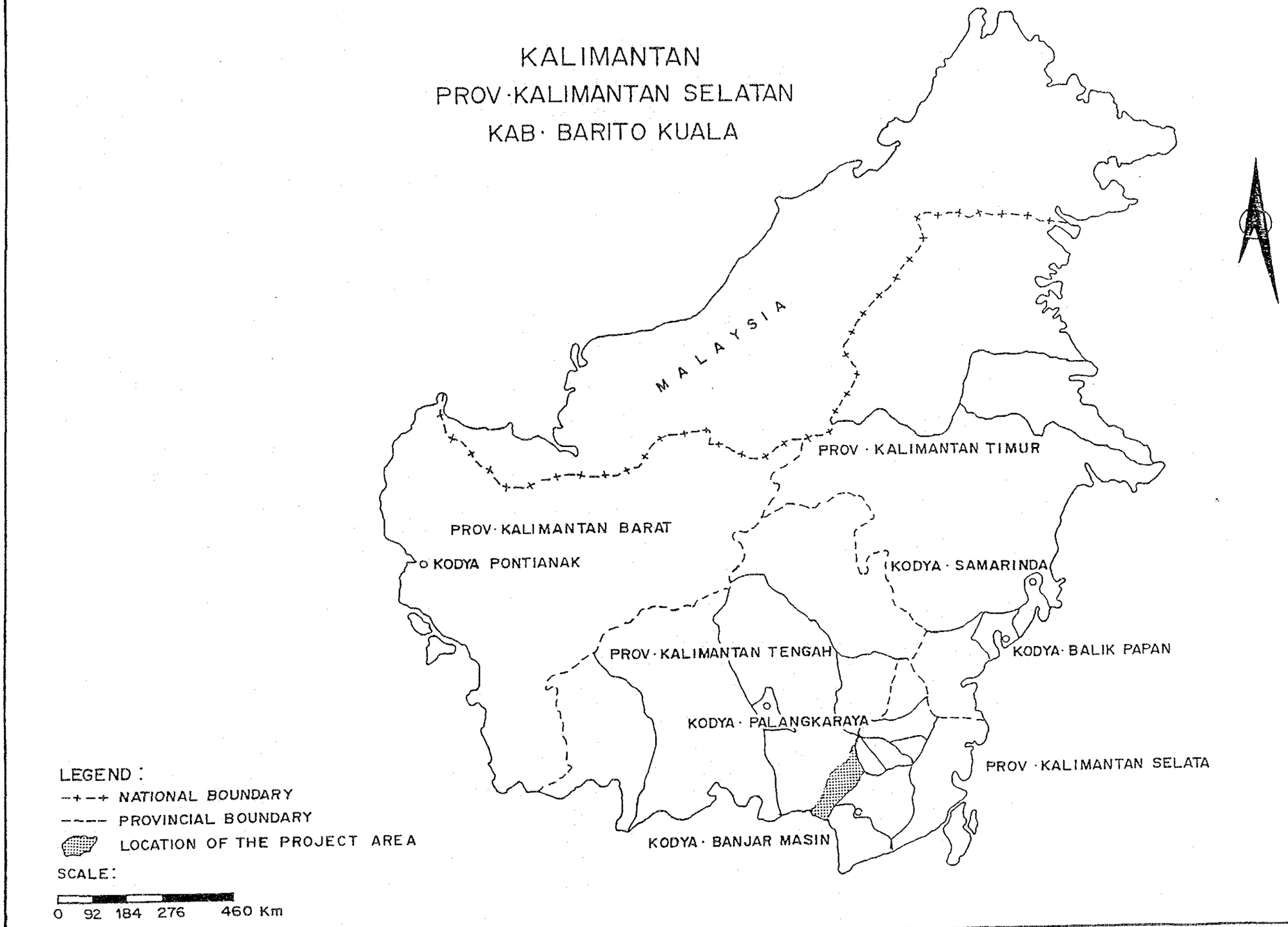
VI · PROPINSI KALIMANTAN SELATAN
- 17 · KAB · TANAH LAUT
- 18 · KAB · KOTA BARU
- 19 · KAB · BANJAR
- 20 · KAB · BARITO KUALA
- 21 · KAB · TAPIN
- 22 · KAB · HULU SUNGAI SELATAN
- 23 · KAB · HULU SUNGAI TENGAH
- 24 · KAB · HULU SUNGAI UTARA
- 25 · KAB · TABALONG



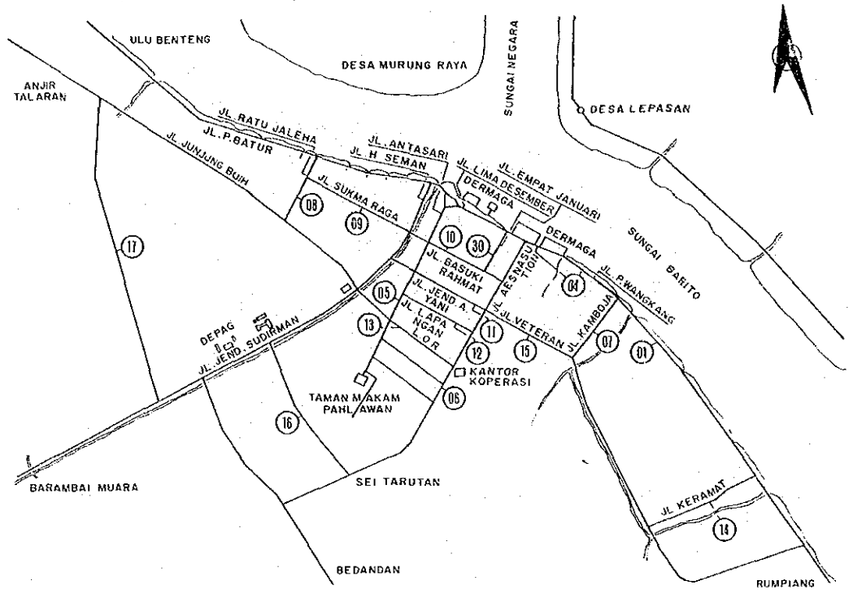
LEGEND :
- −+−+ NATIONAL BOUNDARY
- – – – PROVINCIAL BOUNDARY
- LOCATION OF THE PROPOSED AREA

SCALE :

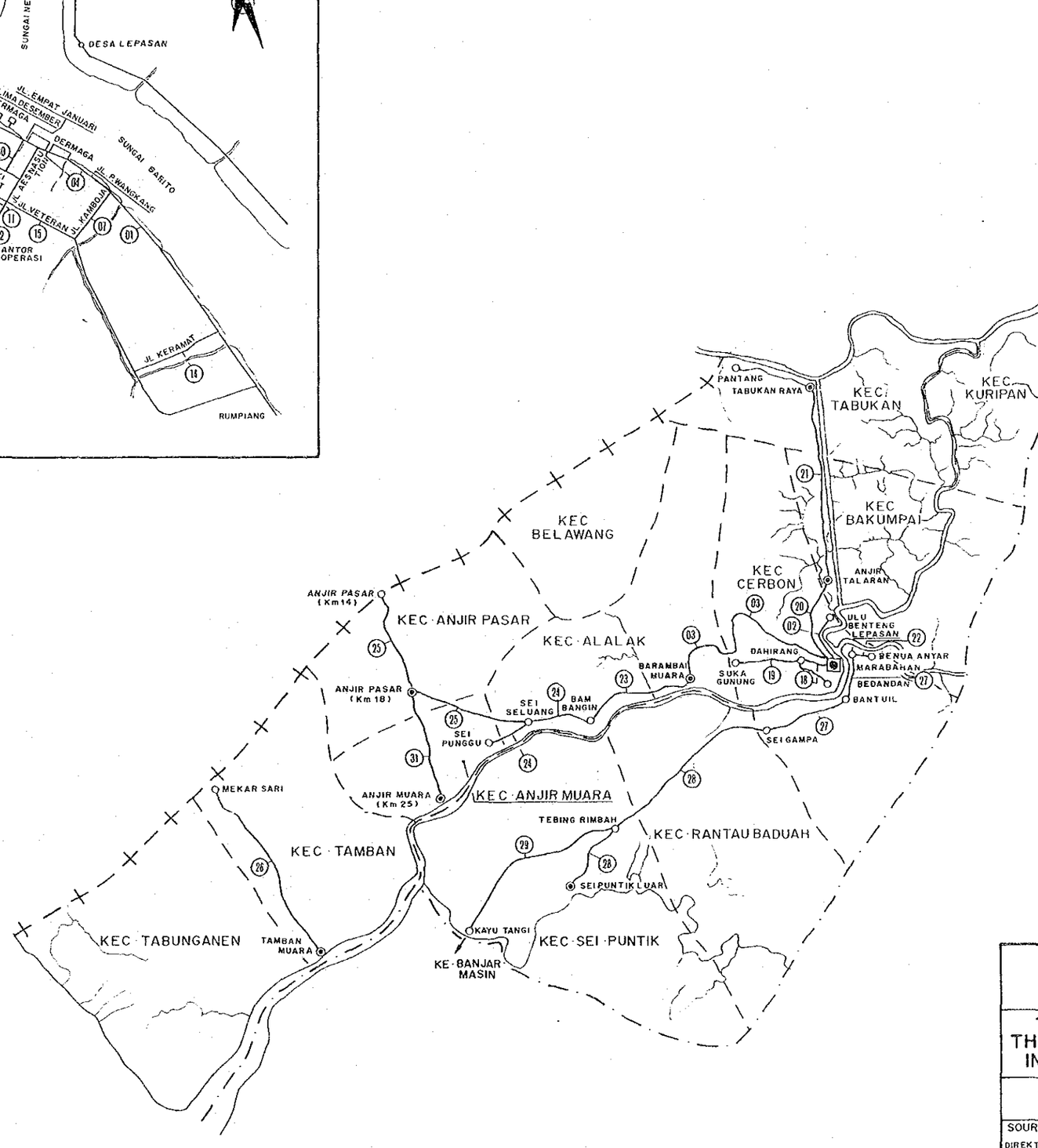
0 92 184 276 460 Km.


KALIMANTAN
PROV·KALIMANTAN SELATAN
KAB· BARITO KUALA
MALAYSIA
PROV · KALIMANTAN TIMUR
PROV·KALIMANTAN BARAT
KODYA PONTIANAK
KODYA · SAMARINDA
PROV·KALIMANTAN TENGAH
KODYA·BALIK PAPAN
KODYA · PALANGKARAYA
PROV · KALIMANTAN SELATA
KODYA · BANJAR MASIN
LEGEND :
NATIONAL BOUNDARY
PROVINCIAL BOUNDARY
LOCATION OF THE PROJECT AREA
SCALE:
0 92 184 276 460 Km

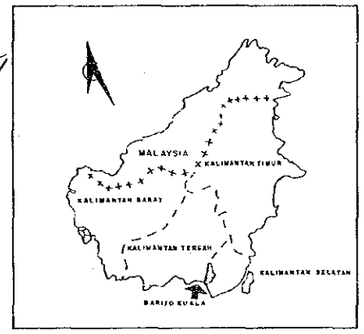
KOTA MUARA BAHAN



KAB · BARITO KUALA



LOCATION MAP



LEGEND :

- KABUPATEN CAPITAL
- KECAMATAN CAPITAL
- OTHER CITY
- (3) LINK NUMBER
- PROVINCIAL BOUNDARY
- KABUPATEN BOUNDARY
- KECAMATAN BOUNDARY
- NATIONAL ROAD
- PROVINCIAL ROAD
- KABUPATEN ROAD
- VILLAGE ROAD
- RIVER

SCALE :
0 5 10 15 Km

THE FEASIBILITY STUDY OF THE LOCAL ROAD DEVELOPMENT IN THE REPUBLIC OF INDONESIA

TITLE :

SOURCE:	SCALE:	PROVINCE : KALIMANTAN SELATAN
DIREKTORAT JENDERAL CIPTA KARYA	AS SHOWN	KABUPATEN : BARITO KUALA

C O N T E N T S

Chapter 1 BACKGROUND OF THE KABUPATEN

1.1 Topographic and Meteorological Conditions

1.1.1 Location and Topography

Kabupaten Barito Kuala is the westernmost in Kalimantan Selatan Province. It extends towards the north from the capital of the province, Banjarmasin, standing on the opposite shore of the Barito River. The Kabupaten is bordered on the west by Kalimantan Tengah Province, on the east by Kabupaten Tapin and on the south by Kabupaten Banjar. THe southern coast, which includes the mouth of the Barito River, the biggest river in the province, faces the Jawa Sea.

The main topographic feature of the Kabupaten is entirely the river basins of the Barito River and its tributaries which form a vast flat area covered with swamps. In the south of the Kabupaten two canals have been cut connecting the Barito River and Kapuas River in the neighboring province, Kalimantan Tengah. These are important routes for transporatation between Banjarmasin and the southeast area Kalimantan Tengah Province.

The area of the Kabupaten is about 3,284 square kilometers, approximately 9 percent of the total of the province. It consists administratively of 12 Kecamatans.

1.1.2 Meteorological Conditions

The average number of rainy days and the average amount of yearly rainfall in Kabupaten Barito Kuala are 74 days and 2,102 mm respectively.

One year in the Kabupaten consists of a rainy season and a dry season. The dry season is from May through October in general. However this is variable as Table 1-1-1 shows.

The number of working days which is necessary for planning the construction schedule in chapter 6, is estimated at 250 days using the following formula based upon the data shown in the table referred to above.

$$\text{Working Days} = 365 - \text{Holidays} - \text{Rainy Days} + \left(\text{Rainy Days} \times \frac{\text{Holiday}}{365}\right) + (0.10 \times \text{Rainy Days})$$

Where :

- Holidays consist of 52 Sundays and 13 national holidays; and
- 10% of rainy days are assumed to be workable days.

Table

METEOROLOGICAL CONDITIONS

PROVINCE : Kalimantan Selatan
KABUPATEN : Barito Kuala STATION : Marabahan

MONTH	1980		1981		1982		1983		1984	
	RAINY DAYS	RAINFALL (mm)	RAINY DAYS	RAINFALL (mm)	RAINY DAYS	RAINFALL (mm)	RAINY DAYS	RAINFALL (mm)	RAINY DAYS	RAINFALL (mm)
January	14	359	8	204	18	297	7	763	1	27
February	15	282	11	326	14	425	4	200	10	336
March	12	423	6	111	14	423	7	525	7	182
April	8	252	10	285	9	262	6	215	12	341
May	6	87	4	150	7	151	6	289	9	208
June	3	71	4	156	3	25	2	171	4	126
July	1	33	-	-	-	-	-	-	-	-
August	2	163	6	150	-	-	3	19	-	-
September	-	-	1	4	3	19	6	34	6	98
October	2	130	7	53	1	5	8	61	6	94
November	7	141	5	92	6	228	11	162	11	256
December	13	201	-	-	8	439	11	270	14	184
Total	73	2,142	62	1,531	83	2,274	71	2,709	80	1,852

1.2 Socio-Economic Conditions

1.2.1 Population

The population of Kabupaten Barito Kuala in 1984 was 198,282 which was approximately 8.8% of the 2,241,600 total population of Kalimantan Selatan Province as shown in Table 1-2-1.

The population density was 0.70 persons per ha which was higher than the provincial density of 0.58.

The recent annual average growth rate of population of the Kabupaten is 4.0% which is higher than both the provincial rate of 2.1% and the national rate of 2.2%. This may be a result of the on-going transmigration programme in the Kabupaten and the inflow of population from other Kabupatens in the province.

The population of each Kecamatan and its proportion to the Kabupaten population is shown in Table 1-2-2.

Table 1-2-1 POPULATION BY KABUPATEN

DESCRIPTION	POPULATION	AAGR (%)	AREA (ha)	POPULATION DENSITY (persons/ha)	SURVEY YEAR
KABUPATEN:					
TANAH LAUT	148,708	3.5	347,682	0.43	1984
KOTA BARU	253,400	5·6	1,426,432	0.18	1984
BANJAR	355,078	3·0	503,980	0.70	1982
BARITO KUALA	198,282	4·0	299,696	0.66	1984
TAPIN	115,752	3·0	270,062	0.42	1983
HULU SUNGAI SELATAN	187,161	3·5	189,261	0.99	1984
HULU SUNGAI TENGAH	205,266	0·5	147,200	1.39	1983
HULU SUNGAI UTARA	248,860	1·5	359,178	0.69	1984
TABALONG	130,218	2·0	394,600	0.33	1984
PROVINCE:					
KALIMANTAN SELATAN	2,155,700		3,766,000		1982
	2,198,400	2.1	3,766,000	0·58	1983
	2,241,600		3,766,000		1984
JAWA IS.(Excluding DKI JAKARTA)	91,126,900	1·7	13,159,700	6·92	-
INDONESIA	161,579,500	2·2	191,944,300	0·84	-

Notes :

1. Sources:

   Kabupaten; Kabupaten concerned with the study

   Province ; Jawa and Indonesia:

   Statistical yearbook of Indonesia 1984, published by the Central statistics Bureau.

2. AAGR ; Average Annual Growth Rate.

Table 1-2-2 POPULATION BY KECAMATAN

Year : 1984

PROVINCE : KALIMANTAN SELATAN

KABUPATEN : BARITO KUALA

KECAMATAN	POPULATION	PROPORTION (%)
TABUNGANEN	13,063	6.6
TAMBAN	42,497	21.4
ANJIR PASAR	13,993	7.1
ANJIR MUARA	14,209	7.2
ALALAK	19,202	9.7
SEI PUNTIK/MANDASTANA	16,015	8.1
RANTAU BADUAH	24,006	12.1
BELAWANG	22,803	11.4
CERBON	5,468	2.8
BAKUMPAI	16,537	8.3
KURIPAN	3,727	1.9
TABUKAN	6,725	3.4
TOTAL	198,282	100

1.2.2 Land Use

In Kabupaten Barito Kuala, 104,452 ha of the current available land use area, which is approximately 34.8% of the 299,696 ha total area of the Kabupaten, is used for living purposes and for industrial activity of the inhabitants of the Kabupaten. It is the total value of columns (1) through (6) in Table 1-2-3.

The current available land use area consists of 94,767 ha of agricultural harvest area, 6,006 ha of residential area and 3,678 ha of usable open space which are 90.7%, 5.8% and 3.5% of the current available land use area respectively.

The agricultural harvest area consists of 76,493 ha of paddy field and 18,274 ha of plantation area which are 80.7% and 19.3% of the agricultural harvest area respectively.

It can be realized from the land use that the main industrial production in the Kabupaten is food crops, especially paddy.

Table 1-2-3

LAND USE

PROVINCE : KALIMANTAN SELATAN

(ha)

KABUPATEN	WET PADDY FIELD	UPLAND PADDY FIELD	OTHER GUL-TIVATED AREA	PLANTATION AREA	RESIDENTIAL AREA	USABLE OPEN SPACE	RIVER & LAKE	FORESTRY AREA	OTHERS	TOTAL AREA	SURVEY YEAR
TANAH LAUT	53,787 (15.5)	9,266 (2.7)	6,890 (2.0)	30,350 (8.7)	13,839 (4.0)	15,000 (4.3)	300 (0.1)	173,539 (49.9)	44,712 (12.9)	347,683 (100)	1984
KOTA BARU	14,997 (1.1)	37,331 (2.6)	73,244 (5.1)	27,050 (1.9)	14,184 (1.0)	92,450 (6.5)	-	1,108,967 (77.7)	58,524 (4.1)	1,426,432 (100)	1984
BANJAR		52,360 (10.4)	17,590 (3.5)	22,850 (4.5)	16,000 (3.2)	-	12,500 (2.5)	248,340 (49.3)	134,340 (26.6)	503,980 (100)	1982
BARITO KUALA	76,493 (25.5)	-	-	18,274 (6.1)	6,006 (2.0)	3,678 (1.2)	1,408 (0.5)	121,494 (40.6)	72,343 (24.1)	299,696 (100)	1984
TAPIN	33,647 (12.5)	17,385 (6.4)	49,616 (18.4)	20,694 (77)	6,120 (2.3)	4,525 (1.7)	16,366 (6.1)	63,819 (23.6)	57,910 (21.4)	270,082 (100)	1983
HULU SUNGAI SELATAN	29,725 (15.7)	414 (0.2)	4,651 (2.5)	21,544 (11.4)	6,733 (0.9)	37,451 (19.8)	38,681 (20.4)	47,956 (25.3)	1,053 (0.6)	189,261 (100)	1984
HULU SUNGAI TENGAH	23,764 (16.1)	2,100 (1.4)	-	16,425 (11.2)	1,329 (0.9)	1,930 (1.3)	11,060 (7.5)	40,846 (27.7)	49,733 (33.8)	147,168 (100)	1984
HULU SUNGAI UTARA	99,035 (27.6)	7,828 (2.2)	48,032 (13.4)	66,068 (18.4)	11,586 (3.2)	15,000 (4.2)	69,866 (19.4)	33,482 (9.3)	10,055 (2.8)	359,178 (100)	1984
TABALONG	13,085 (3.3)	5,720 (1.4)	7,676 (1.9)	19,980 (5.1)	7,300 (1.8)	25,000 (6.3)	12,215 (3.1)	258,867 (65.7)	44,759 (11.4)	394,600 (100)	1984

Notes :

1. The value in ( ) denotes the proportion
2. Source : Kabupaten concerned with the study

1.2.3 Agriculture

The cultivated area and food crop production in Kabupaten Barito Kuala in 1984 were 81,145 ha and 174,491 ton respectively as shown in Table 1-2-4. Of food crops, the area and production of paddy, which consists of wet paddy and upland paddy, was 80,364 ha and 168,523 ton respectively which are 99.0% and 96.6% of the total food crops. The yield rate of paddy production is 2.10 ton per ha. Thus, paddy is the most predominant agricultural crop of the Kabupaten.

As the table shows, average annual growth rates of area and production of paddy in 1979 through 1984 were 3.0% and 6.0% respectively which indicate favorable development of the paddy production. A fall in production in 1983 may have been caused by irregular weather and this is taken into account for the estimation of growth rates. It is desirable that productivity of paddy increases and this depends upon the future development of irrigation.

The commodity crops, of which palm oil and orange are major, are produced in the plantations. The area and production of plantation crops in 1983 were 13,021 ha and 9,013 ton respectively with current growth rates of 4.0% and 11.8% as shown in Table 1-2-5. Thus the plantation crop, which is exported, is an important agricultural product. Some changes are expected considering the international balance of supply and demand.

The population of the agricultural sector which is assumed from the employment in the Kabupaten is 78.6% of the total population as shown in Table 1-2-6. Thus this is an agricultural Kabupaten.

It is suggested that the Kabupaten fosters cultivation of vegetable or fuit crops in addition to improving productivity of the present crops in conjunction with progres of the transmigration programme.

Table 1-2-4 AREA AND PRODUCTION OF FOOD CROPS

KABUPATEN : BARITO KUALA

CULTIVATED AREA

(ha)

ITEM	YEAR						AAGR (%)
	1979	1980	1981	1982	1983	1984	
PADDY	72,924	74,666	74,675	76,862	70,383	80,364	3.0
OTHERS	114	439	901	269	1,682	781	47.0
TOTAL	73,038	75,105	75,576	77,131	72,065	81,145	3.0

PRODUCTION

(ton)

ITEM	YEAR						AAGR (%)
	1979	1980	1981	1982	1983	1984	
PADDY	132,407	159,678	176,481	180,672	138,753	168,523	5.0
OTHERS	521	2,556	3,957	269	5,260	5,968	63.0
TOTAL	132,928	162,234	180,438	180,941	144,013	174,491	6.0

YIELD RATE

(ton/ha)

ITEM	YEAR						AAGR (%)
	1979	1980	1981	1982	1983	1984	
PADDY	1 82	2 14	2 36	2 35	1 97	2 10	4.5

Notes :

1. AAGR : Average annual growth rate
2. Source : Kabupaten concerned with the study

Table 1-2-5 AREA AND PRODUCTION OF PLANTATION CROPS
Year : 1983

PROVINCE : KALIMANTAN SELATAN

KABUPATEN	AREA (ha)	PRODUCTION (ton)	AAGR (%) AREA	AAGR (%) PRODUCTION
TANAH LAUT	9,095	1,500	6.3	18.0
KOTA BARU	9,517	703	3.4	0
BANJAR	-	-	-	-
BARITO KUALA	13,021	9,013	4.0	11.0
TAPIN	-	-	-	-
HULU SUNGAI SELATAN	12,603	6,165	11.3	10.0
HULU SUNGAI TENGAH	18,000	6,400	1.9	11.7
HULU SUNGAI UTARA	19,721	7,176	3.5	0
TABALONG	27,107	10,073	5.0	12.6

Table 1-2-6 POPULATION OF AGRICULTURAL SECTOR

PROVINCE : KALIMANTAN SELATAN

KABUPATEN	AGRICULTURAL SECTOR	TOTAL POPULATION	PROPORTION (%)	AAGR (%)	SURVEY YEAR
TANAH LAUT	122,000	148,708	82.3	3.5	1984
KOTA BARU	161,000	253,400	63.7	4.0	1984
BANJAR	312,000	355,078	88.0	3.0	1982
BARITO KUALA	156,000	198,282	78.6	5.0	1984
TAPIN	71,000	115,752	61.5	3.0	1983
HULU SUNGAI SELATAN	114,000	187,161	61.0	3.0	1984
HULU SUNGAI TENGAH	125,000	202,370	61.9	0.3	1984
HULU SUNGAI UTARA	192,000	248,860	77.0	1.5	1984
TABALONG	106,000	130,218	81.5	3.0	1984

Notes :

1. AAGR : Average annual growth rate
2. Kabupaten concerned with the Study

1.2.4 Other Economic Activities

Notable economic activities excluding agriculture in Kabupaten Barito Kuala are the forestry and livestock sectors. In this context forestry industry is presumed to mean the sawing or plywood industries. However recent production is tending to decline as shown in the figures below due to the influence of international stagnation. The sector is based upon foreign investment capital, therefore it is difficult to make analysis of the impact of this sector on other economic activities in the Kabupaten.

	1980	1984	AAGR (%)
Production (m^3)	13,665	10,871	- 5.5

Notes : 1. AAGR : Average annual growth rate
2. Source : Kabupaten data

The type of the industry in the livestock sector is not clear due to lack of data. However, the total current growth rates of production can be seen in the figures below.

	1980	1984	AAGR (%)
Production (ton)	2,787	3,494	5.8

Notes : 1. AAGR : Average annual growth rate
2. Source : Kabupaten data

Judging from the present conditions approximately 3,000 tons are exported out of the Kabupaten yearly. Taking into consideration the convenient position as a neighbouring Kabupaten of Banjarmasin, this sector seems capable of continuously developing in future.

1.3 Present Status of Kabupaten Roads

1.3.1 Outline of Road Networks

The whole area of Kabupaten Barito Kuala is covered by flat and low swamps because it is located in the flood area of the Barito river. There are no provincial roads leading to the neighbouring Kabupatens. Therefore the main transportation system of the Kabupaten depends upon the Barito river and its branches.

At present a Kabupaten road from Banjarmasin which is scheduled to connect with Kayu Tangi is now being constructed and on completion will consolidate the road transportation system in the areas on the left side of the Barito river.

Consequently the traffic demand in the areas along the right side of the Barito river will also be increased by the ferry boat services between Marabakan, the Kabupaten capital, and Lepasan on the opposit bank of the river. However the road networks on both sides are not yet developed, and the road standard is not designed for four wheel vehicles.

1.3.2 Road Inventory

From the road inventory data prepared by the Kabupaten, the number and total length of Kabupaten roads to be studied in Kabupaten Barito Kuala are confirmed as 31 links and 180 Km respectively. These figures exclude Kabupaten roads with no data.

According to the data the present status of the Kabupaten roads is as follows:

(1) Density of Kabupaten Roads

The density of the Kabupaten roads is 0.61 m per ha. This is higher than the national density of 0.48 m per ha but distinctly lower than 2.11 m per ha which is the density in Jawa Island, excluding DKI Jakarta, as shown in the following table. Thus, the Kabupaten is situated presently at the stage of road development.

	Total Length (km)	Area (ha)	Density (m/ha)
Kabupaten : Barito Kuala	180	299,696	0.61
Province : Kalimantan Selatan	3,029	3,938,091	0.77
Jawa Is.(Excluding DKI Jakarta)	27,715	13,159,700	2.11
Indonesia	92,038	191,944,300	0.48

Notes : 1. The value for the province is the total value for the Kabupatens included in the study.

2. The sources of data are as follows:
Kabupaten and Province : Bina Marga Inventory
Jawa and Indonesia : Statistical Yearbook of Indonesia 1984, published by the Central Statistics Bureau

(2) Kabupaten Road Surface Type

The type of surface on the Kabupaten roads in the Kabupaten is shown in Table 1-3-1.

The legend used in the table is as follows:

ASP : Asphalt

Table 1-3-1 EXISTING ROAD LENGTH BY SURFACE TYPE

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(Km)

102 (71)	KRK	TNH	ASP	TOTAL
LINK 1	4			4
LINK 2	1	2		3
LINK 3	7		7	14
LINK 4			1	1
LINK 5			1	1
LINK 6			1	1
LINK 7	1			1
LINK 8	1			1
LINK 9	1			1
LINK 10			1	1
LINK 11			1	1
LINK 12			1	1
LINK 13			1	1
LINK 14		1		1
LINK 15			1	1

(Km)

102 (71)	KRK	TNH	ASP	TOTAL
LINK 16	1			1
LINK 17	1			1
LINK 18	5			5
LINK 19	1	3		3
LINK 20	1		6	6
LINK 21	19			19
LINK 22	5			5
LINK 23	10			10
LINK 24	1	7		7
LINK 25	11			11
LINK 26	12	4		16
LINK 27	16			16
LINK 28	22			22
LINK 29	13			13
LINK 30	1		1	1
LINK 31	11			11
TOTAL	141	17	22	180
RATIO	78	9	12	(%)

KRK : Gravel/Stone/Telford/Water Bound Macadam

TNH : Earth

LL : Others

Comparison of the proportion of surface type in the Kabupaten with other regions is as follows:

	ASP	KRK	TNH/LL
Kabupaten : Barito Kuala	20.4	130.6	15.7
Province : Kalimantan Selatan	10.5	41.1	48.4
Jawa Is.(Excluding DKI Jakarta)	56.2	25.0	18.8
Indonesia	26.0	26.6	47.4

Thus, in the Kabupaten the proportion of Kabupaten roads with asphalt surface is lower than either that of Indonesia or of Jawa Island. The proportion of low grade roads such as earth roads and others is not so high. However, there is yet scope for further improvement of the Kabupaten roads.

(3) Surface Condition of Kabupaten Roads

The surface condition of the Kabupaten roads classified as good, fair, poor and bad which are shown as BA, SD, RU and RB respectively, are summarized in Table 1-3-2.

Comparison of the proportions of the various surface conditions of the Kabupaten roads in the Kabupaten with other regions is as follows:

	Good	Fair	Poor	Bad
Kabupaten : Barito Kuala	53.3	31.1	11.1	4.4
Province : Kalimantan Selatan	26.4	34.2	31.4	8.0
Jawa Is.(Excluding DKI Jakarta)	45.6	29.8	19.6	5.0
Indonesia	43.5	21.8	21.1	13.6

Table 1-3-2 EXISTING ROAD CONDITION BY SURFACE TYPE

PROVINCE : KALIMANTAN SELATAN

KABUPATEN : BARITO KUALA

(%)

ROAD (1)	KRK					YKH				ASP			
ROAD	BA	SD	RU	RB	BA	SD	RU	RB	BA	SD	RU	RB
LINK 1	75	25										
LINK 2	80	20				40	60					
LINK 3		99	1							99	1	
LINK 4									80	20		
LINK 5									50	40	10	
LINK 6									80	20		
LINK 7	75	25										
LINK 8	80	20										
LINK 9	80	20										
LINK 10									80	20		
LINK 11									80	20		
LINK 12									80	20		
LINK 13									60		40	
LINK 14						99	1					
LINK 15									80	20		
LINK 16	80	20										
LINK 17	80	20										
LINK 18	57	43										
LINK 19					83	17						
LINK 20									94	6		
LINK 21		40	60									
LINK 22			12	88								
LINK 23		80	20									
LINK 24					4	14	86					
LINK 25		99										
LINK 26	73		27				99	1				
LINK 27	99	1										
LINK 28	53	15	16	16								
LINK 29	80	20										
LINK 30									75	25		
LINK 31	82	13	5									
AVERAGE	55	31	8	6	17	34	48	0	69	26	5	0
LENGTH		141 Ke				17 Ke				22 Ke		
(Ke)	78	44	11	8	3	6	8	0	15	6	1	0

The surface condition level of the Kabupaten roads in the Kabupaten is higher than either that of Indonesia or of Jawa Island. The proportion in good condition is relatively high. It therefore seems that road maintenance is carried out diligently in the Kabupaten.

(4) Terrain Conditions of Kabupaten Roads

The difficulty of road improvement is mainly dependent upon the terrain conditions.

The terrain conditions of the Kabupaten roads, classified as flat, hilly, mountainous and swampy which are shown as DT, BK, GN and RW, are summarized in Table 1-3-3.

The terrain condition in the Kabupaten is entirely swampy. There are no hilly, flat or mountainous areas in the Kabupaten. Road construction is anticipated to be difficult because of the wide spread swamp.

1.3.3 Bridge Inventory

A bridge inventory showing the existing condition of bridges on the Kabupaten roads in Kabupaten Barito Kuala was prepared by the Kabupaten.

The bridge types are classfied as timber, concrete, steel and others which are shown in the inventory as KY, BT, BJ and LL respectively.

The inventories shown in Table 1-3-4 and Table 1-3-5 indicates a total of 448 bridges with a total length of 4,129 m of which 441 or 98.4% are timber, and 7 or 1.6% are others. On the other hand, 47 bridges with a total length of 429 m are required to be newly constructed.

Table 1-3-3 EXISTING ROAD LENGTH BY TERRAIN CONDITION

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(Km)

I02 (3)	DT
LINK 1	4
LINK 2	3
LINK 3	14
LINK 4	1
LINK 5	1
LINK 6	1
LINK 7	1
LINK 8	1
LINK 9	1
LINK 10	1
LINK 11	1
LINK 12	1
LINK 13	1
LINK 14	1
LINK 15	1
LINK 16	1
LINK 17	1
LINK 18	5
LINK 19	3
LINK 20	6
LINK 21	19
LINK 22	5
LINK 23	10
LINK 24	7
LINK 25	11
LINK 26	16
LINK 27	16
LINK 28	22
LINK 29	13
LINK 30	1
LINK 31	11
TOTAL	180
RATIO	

Table 1-3-4 NUMBER AND LENGTH OF BRIDGES

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

<<<< BRIDGE >>>> (UNIT: m)

	EXISTING		NOT EXIST		TOTAL	
LINK NO	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
1	24	284.45			24	284.45
2	10	153.00	1	12.00	11	165.00
3	23	123.00	6	97.00	29	220.00
4	2	24.30			2	24.30
5	1	16.20			1	16.20
6	2	11.00			2	11.00
10	1	10.30			1	10.30
11	1	9.00			1	9.00
13	1	7.50			1	7.50
15	4	49.40			4	49.40
16	2	12.50			2	12.50
17	2	11.50			2	11.50
18	7	31.00			7	31.00
19	4	37.50			4	37.50
20	11	111.00			11	111.00
21	31	206.00			31	206.00
22	17	119.00			17	119.00
23	28	453.00			28	453.00
24	26	319.00	1	4.00	27	323.00
25	21	128.50			21	128.50
26	46	416.00	39	316.00	85	732.00
27	83	915.00			83	915.00
28	37	232.00			37	232.00
29	20	159.00			20	159.00
30	1	12.30			1	12.30
31	43	278.00			43	278.00
TOTAL	448	4129.45	47	429.00	495	4558.45

Table 1-3-5 NUMBER OF EXISTING BRIDGES BY BRIDGE TYPE

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

<<< BRIDGE >>> (No)

103 (18)	KY	LL	TOTAL
LINK 1	21	3	24
LINK 2	10		10
LINK 3	23		23
LINK 4	2		2
LINK 5	1		1
LINK 6	2		2
LINK 10	1		1
LINK 11	1		1
LINK 13	1		1
LINK 15	3	1	4
LINK 16	2		2
LINK 17	2		2
LINK 18	7		7
LINK 19	4		4
LINK 20	11		11
LINK 21	31		31
LINK 22	17		17
LINK 23	28		28
LINK 24	25	1	26
LINK 25	21		21
LINK 26	45	1	46
LINK 27	83		83
LINK 28	37		37
LINK 29	20		20
LINK 30		1	1
LINK 31	43		43
TOTAL	441	7	448
RATIO	98	2	(%)

The number of existing bridges by span length is as follows:

Bridge Type	Span Length (m)										
	⟨3	⟨5	⟨8	⟨10	⟨12	⟨14	⟨16	⟨18	⟨20	⟨99	Total
Timber	315	120	6	-	-	-	-	-	-	-	441
Concrete	-	-	-	-	-	-	-	-	-	-	-
Steel	-	-	-	-	-	-	-	-	-	-	-
Others	3	4	-	-	-	-	-	-	-	-	7
Total	318	124	6	-	-	-	-	-	-	-	448

Thus, most of the existing bridges on the Kabupaten roads are timber and the majority of spanlengths is within the range of less than 3 m.

1.3.4 Traffic

Inventories of the average daily traffic (ADT) on the Kabupaten roads in Kabupaten Barito Kuala were prepared by the Kabupaten and are shown in Chapter 2.

From the inventories, total value of average daily trips by vehicle type and their proportions in the Kabupaten in 1985 are summarized as follows:

	SEDAN	BUS	TRUCK	MOTOR-CYCLE	TOTAL
Total Trips	10	0	0	4,442	4,452
Proportion (%)	0.22	0.00	0.00	99.78	100.00

Source : Bina Marga Inventory

The proportions of registered vehicles by vehicle type are as follows:

	SEDAN	BUS	TRUCK	MOTOR-CYCLE	TOTAL
Proportion (%)	0.00	0.00	0.00	100.00	100.00

Source : Kabupaten.

Thus, the proportion of motorcyles in the Kabupaten is by far the highest.

From the above tables the following can be observed:

- Number of total trips might be underestimated
- Proportions are probably reasonable.

Essentially, for estimation of future traffic volumes past and present traffic data together with the trend in the number of registered vehicles are important basic data. However the data obtained for the study was traffic count data for each road link in 1985 and of low reliability.

Therefore the future traffic volumes are estimated by the calculation process recommended in chapter 3 of the Main Report.

Chapter 2 ESTIMATIONS OF FUTURE TRAFFIC VOLUME AND BENEFIT

2.1 Future Traffic Volume

2.1.1 Traffic Growth Rate

The traffic growth rate used for estimation of the future traffic volume on the Kabupaten roads was estimated by the following calculation process.

Growth of Production Basis "A":

$$\sqrt{\text{Annual Population Growth of the Kabupaten} \times \text{Growth of the Total Cultivated Area}}$$

Growth of Productivity "B" :

$$\sqrt{\text{Growth of the Total Paddy Field Area} \times \text{Growth of the Paddy Production per ha}}$$

Traffic Growth Rate: Initial estimated figure:

$$\overline{GR'} = \sqrt{A \times B}$$

Traffic Growth Rate GR =Final adjusted figure:

$$\sqrt{GR' \times \text{Trend of GDP/Capita of the Province Concerned}}$$

Results of the estimation are shown in Table 2-1-1.

Table 2-1-1 TRAFFIC GROWTH RATE ESTIMATION

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

A)	Growth Rate of Population :	4.00 (%)
B)	Growth Rate of Cultivated Area :	3.00 (%)
C)	Growth Rate of Rice field :	3.00 (%)
D)	Growth Rate of Rice yield rate :	4.50 (%)
E)	Growth Rate of GDP / capita :	6.60 (%)
a)	Geometrical Mean (A x B) :	3.50 (%)
b)	Geometrical Mean (C x D) :	3.75 (%)
c)	Geometrical Mean (a x b) :	3.62 (%)
d)	Geometrical Mean (c x E) :	5.10 (%)
	TRAFFIC GROWTH RATE :	5.10 (%)

2.1.2 Present and Future Traffic Volume

The future traffic volumes on the Kabupaten roads in 1998 for the Project life time of ten years were estimated by the following formula :

$$Tn = Te\ (1 + r)^n$$

Where :

Tn : Future traffic volume n years later
Te : Traffic volume in 1985
r : Traffic growth rate

The results are shown in Table 2-1-2 together with the traffic volume in 1985.

Table 2-1-2 EXISTING AND FUTURE TRAFFIC VOLUME

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(SPD : 1/2)

	INVENTORY (1985)					RATE	AFTER 13 YEARS (1998)					CLASS
LINK NO	MBL	BUS	TRUK	SPD	TOTAL		MBL	BUS	TRUK	SPD	TOTAL	
1	10	0	0	102	61	5.1%	19	0	0	195	116	IIIB-2
2	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
3	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
4	0	0	0	300	150	5.1%	0	0	0	573	286	IIIB-1
5	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
6	0	0	0	250	125	5.1%	0	0	0	477	239	IIIB-1
7	0	0	0	200	100	5.1%	0	0	0	382	191	IIIB-2
8	0	0	0	200	100	5.1%	0	0	0	382	191	IIIB-2
9	0	0	0	200	100	5.1%	0	0	0	382	191	IIIB-2
10	0	0	0	190	95	5.1%	0	0	0	363	181	IIIB-2
11	0	0	0	50	25	5.1%	0	0	0	95	48	IIIC
12	0	0	0	300	150	5.1%	0	0	0	573	286	IIIB-1
13	0	0	0	40	20	5.1%	0	0	0	76	38	IIIC
14	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
15	0	0	0	200	100	5.1%	0	0	0	382	191	IIIB-2
16	0	0	0	20	10	5.1%	0	0	0	38	19	IIIC
17	0	0	0	10	5	5.1%	0	0	0	19	10	IIIC
18	0	0	0	25	13	5.1%	0	0	0	48	25	IIIC
19	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
20	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
21	0	0	0	200	100	5.1%	0	0	0	382	191	IIIB-2
22	0	0	0	30	15	5.1%	0	0	0	57	29	IIIC
23	0	0	0	90	45	5.1%	0	0	0	172	86	IIIB-2
24	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
25	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
26	0	0	0	400	200	5.1%	0	0	0	764	382	IIIB-1
27	0	0	0	100	50	5.1%	0	0	0	191	95	IIIB-2
28	0	0	0	280	140	5.1%	0	0	0	535	267	IIIB-1
29	0	0	0	300	150	5.1%	0	0	0	573	286	IIIB-1
30	0	0	0	30	15	5.1%	0	0	0	57	29	IIIC
31	0	0	0	125	63	5.1%	0	0	0	239	120	IIIB-2
PERCENT	0.22	0.00	0.00	99.78			0.22	0.00	0.00	99.78		

2.2 Benefit

2.2.1 Benefit Estimation Method

Generally, estimation of the benefit on each Kabupaten road due to the Project was made by analyzing the direct benefit i.e, the VOC reduction benefit, which was estimated by comparing "with project" and "without project" based upon the future traffic volume on the road. However for the following road links it was decided to estimate the indirect benefit through the producer's surplus benefit.

a) Road links with present traffic volume (ADT) less than 60 equivalent 4-wheel vehicles.

b) Road links with no 4-wheel vehicle operation at present.

The indirect benefit was changed into the future traffic volume and the VOC reduction benefit was estimated.

The VOC adopted for the estimation is shown in Table 2-2-1.

Table 2-2-1 VEHICLE OPERATION COST ON KABUPATEN ROADS

(RM)

SURFACE	CONDITION	SEDAN	BUS	TRUCK	MOTORCYCLE
ASPHALT	GOOD	104.7	86.2	85.4	15.9
	Fair	125.5	101.0	98.0	18,2
	Poor	164.1	135.2	138.5	22.8
	Bad	222.1	202.0	205,0	29.1
GRAVEL	Good	125.7	101.4	102.5	18.5
	Fair	145.0	124.6	127.1	21.1
	Poor	198.6	172.6	178.4	27,1
	Bad	242.7	228.9	231.2	31.8
EARTH	Fair	201.8	180.0	185.1	28.0
	Poor	240.7	218.2	225.8	31,8
	Bad	264.9	278.0	281.7	35,5

Source : Bina Marga

Table 2-2-2 FUTURE TRAFFIC VOLUME ESTIMATED

BY THE PRODUCER'S SURPLUS

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(1998)

LINK NO	CLASS	SURFACE	MOBIL	BUS	TRUCK	SEPEDA	TOTAL
1	IIIB-1	ASP	5	19	9	351	209
2	IIIB-2	KRK	4	17	8	301	180
3	IIIA	ASP	20	110	52	2003	1192
4	IIIC	KRK	1	3	1	50	30
5	IIIC	KRK	1	3	1	50	30
6	IIIB-2	KRK	2	8	4	150	89
7	IIIC	KRK	0	1	1	20	12
8	IIIC	KRK	0	1	1	20	12
9	IIIC	KRK	0	2	1	30	18
10	IIIC	KRK	0	2	1	30	18
11	IIIC	KRK	0	2	1	30	18
12	IIIC	KRK	0	1	1	20	12
13	IIIC	KRK	0	2	1	30	18
14	IIIC	KRK	0	2	1	30	18
15	IIIB-2	KRK	2	7	3	130	77
16	IIIC	KRK	1	2	1	40	24
17	IIIC	KRK	1	4	2	70	42
18	IIIB-1	ASP	7	26	12	471	281
19	IIIB-2	KRK	4	17	8	301	180
20	IIIA	ASP	31	123	58	2244	1334
21	IIIA	ASP	312	1233	577	22439	13342
22	IIIB-1	ASP	6	25	12	451	269
23	IIIA	ASP	30	120	56	2180	1296
24	IIIA	ASP	30	120	56	2180	1296
25	IIIA	ASP	135	535	250	9728	5784
26	IIIA	ASP	296	1171	548	21304	12667
27	IIIA	ASP	22	86	41	1603	953
28	IIIA	ASP	241	954	447	17367	10326
29	IIIA	ASP	88	350	164	6363	3784
30	IIIC	KRK	0	1	0	10	6
31	IIIA	ASP	197	778	364	14155	8417

2.2.2 Benefit

The benefit estimation was carried out for each Kabupaten road. Table 2-2-3 shows a sample of the result of benefit estimation. In the table "surplus" and "VOC" show the estimation method utilized and III A, III B-1, III B-2 and III C show the road classification.

Table 2-2-3

RESULTS OF BENEFIT ESTIMATION

KABUPATEN : BARITO KUALA

(1000Rupiah)

	LINK 1	LINK 2	LINK 3	LINK 4	LINK 5	LINK 6	LINK 7	LINK 8	LINK 9	LINK 10
	4 Ka	3 Ka	14 Ka	1 Ka	1 Ka	1 Ka	1 Ka	1 Ka	1 Ka	1 Ka
	IIIB-1	IIIB-2	IIIA	IIIC	IIIC	IIIB-2	IIIC	IIIC	IIIC	IIIC
YEAR	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus
1988	0	0	0	0	0	0	0	0	0	0
1989	1463	2530	34362	6	23	21	4	4	5	4
1990	1560	2635	37028	8	28	23	5	4	5	4
1991	1700	2997	39849	8	30	24	5	4	5	4
1992	1797	3178	42552	9	31	26	5	4	7	5
1993	1878	3377	45788	9	32	28	5	4	7	6
1994	2070	3598	49475	11	39	31	6	5	8	6
1995	2231	3832	53139	11	41	34	6	5	8	6
1996	2386	4202	56981	12	42	35	6	5	8	6
1997	2564	4453	61214	14	48	39	7	5	10	8
1998	2742	4870	65881	14	50	41	9	7	11	8
SUM	20391	35672	486269	102	364	302	58	47	74	57
COST	-9866	9918	206367	-3542	-3391	-3426	-3567	-3573	-3558	-3568
/Ka	-2467	3306	14740	-3542	-3391	-3426	-3567	-3573	-3558	-3568

Chapter 3 ENGINEERING

3.1 Design Criteria and Specification

3.1.1 Geometric Design Criteria

Currently a technical standard for improvement of Kabupaten roads i.e. PETUNJUK TEKNIS INPRES PENUNJANGAN JALAN KABUPATEN, TAHUN 1984-1985 is established by Bina Marga.

The geometric design criteria in the above standard are recommended to be adopted in general for the Project. Following discussions with Bina Marga, exceptions to this are allowed for Pavement width and pavement type to minimize the construction cost of the Kabupaten road improvement, if necessary. The geometric design criteria adopted for the Project are shown in Table 3-1-1. The typical cross sections of Kabupaten roads are shown in Fig. 3-1-1.

3.1.2 Loading Specification

The LOADING SPECIFICATIONS FOR HIGHWAY BRIDGES BY DIRECTORATE GENERAL BINA MARGA is used in principle as the basic specification of loading and the TECHNICAL STANDARD FOR KABUPATEN ROADS compiled by Bina Marga shows that the design live load for bridges on Kabupaten roads is 70% of the Bina Marga live road. However, after discussions with Bina Marga the following loads were decided as the design live loads for the standard bridges of Kabupaten roads:

a. 50% of Bina Marga live load (hereinafter BM 50) is applied for concrete and timber bridges on roads of III A classification.

b. 10-ton truck load is applied for timber bridges on roads of III B-1, III B-2 and III C classification.

Table 3-1-1

DESIGN CRITERIA FOR KABUPATEN ROADS

ROAD CLASSIFICATION		CLASS III A			CLASS III B-1			CLASS III B-2			CLASS III C		
SURFACE TYPE		ASPHALT SEAL (DOUBLE)			ASPHALT SEAL (SINGLE)			GRAVEL			GRAVEL		
TRAFFIC VOLUME : ADT (Forecast 10 th year average per day)		3000 - 500			500 - 200			200 - 50			50		
T E R R A I N		FLAT TO ROLLING	HILLY	MOUNT-AINOUS	FLAT TO ROLLING	HILLY	MOUNT-AINOUS	FLAT TO ROLLING	HILLY	MOUNT-AINOUS	FLAT TO ROLLING	HILLY	MOUNT-AINOUS
TRAFFIC LANES		1+	1+	1+	1+	1+	1+	1+	1+	1+	1	1	1
DESIGN SPEED (Km/hr)	DESIRABLE	70	60	40	70	40	30	60	40	30	50	30	AS PRACTI-CABLE
	MINIMUM	30	30	30	30	30	AS PRACTI-CABLE	30	30	AS PRACTI-CABLE	30	AS PRACTICABLE	
GRADIENT (LIMITING) (%)	DESIRABLE	4	5	8	4	6	8	4	7	8	5	8	12
	MAXIMUM	7	7	10	7	8	10	7	9	12	7	12	16
PAVEMENT WIDTH (M)	DESIRABLE	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	3.5	3.5	3.5
	MINIMUM	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0
SHOULDER WIDTH (M)	DESIRABLE	2.0	1.5	1.5	1.5	1.5	1.0	1.5	1.0	1.0	1.0	1.0	0.75
	MINIMUM	1.5	1.0	0.75	1.0	1.0	0.75	1.0	0.75	0.5	0.75	0.5	0.5
ROAD BED WIDTH (M)	DESIRABLE	10.0	9.0	9.0	8.0	7.5	6.5	7.5	6.5	6.5	5.5	5.5	5.0
	MINIMUM	6.0	6.0	6.0	5.5	5.5	5.0	5.5	5.0	4.5	4.5	4.0	4.0
RIGHT OF WAY (M)	DESIRABLE	16			12			12			12		
	MINIMUM	12			10			10			8		
ROAD CAMBER (%)	PAVEMENT	3			3			4			4		
	SHOULDER	4			4			5			5		

3.2 Pavement Design

3.2.1 Design Conditions

From the engineering data prepared by the Kabupaten it is noted that the pavement structure of the Kabupaten roads seems to have been determined without adequate designs, therefore the Kabupaten roads generally have insufficient capacity. The standards generally used for highway pavement design such as Road Note 29, Road Note 31 and AASHTO are not suitable for Kabupaten roads with small traffic volumes and loads.

Therefore formulae suitable for the pavement design of Kabupaten roads are recommended as described in Chapter 5 of the Main Report.

The following are important factors for the design of pavement thickness.

1) Design Traffic Volume

As the pavement thickness is designed for each road classification the design traffic volume of which the target year is 1998, is adopted for each classification as follows:

Road Classification	Design Traffic Volume (vpd)
III A	1,000
III B-1	500
III B-2	200
III C	50

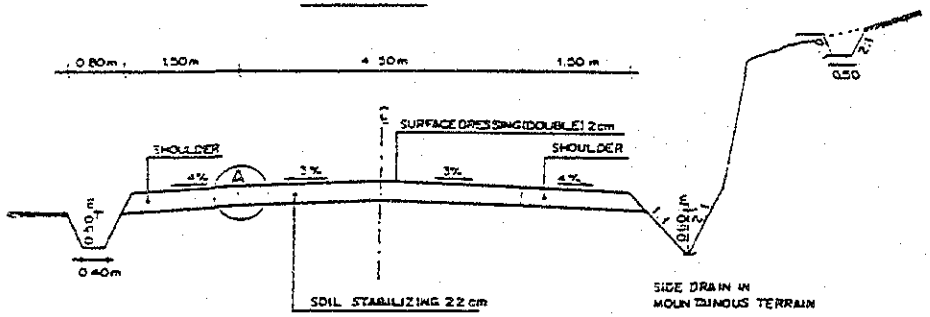
2) Strength of Roadbed

The CBR value of the existing roadbed is a very important factor for the pavement design but no results are available from CBR tests on the Kabupaten roads.

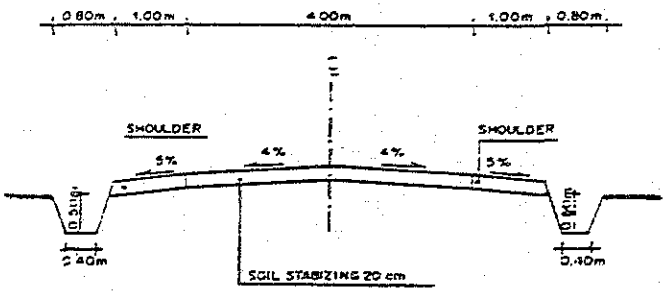
CBR of the laterite is generally in the range of CBR 4 to 10. However site CBR tests should be conducted before construction to finally decide the pavement thickness.

Fig. 3-1-1 STANDARD ROAD CROSS SECTIONS

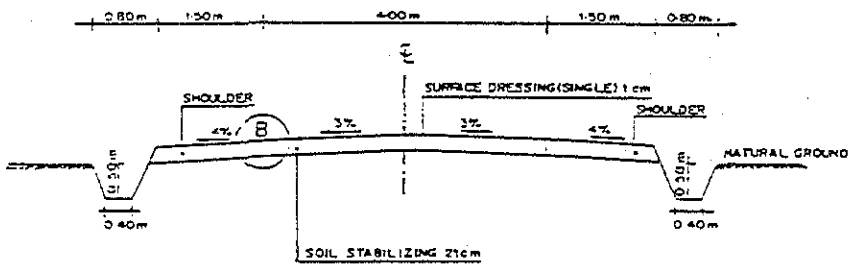
CLASS III A



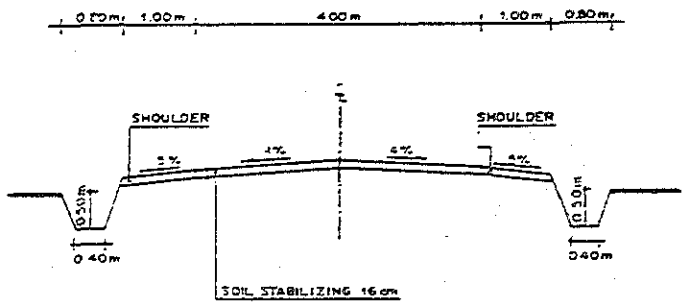
CLASS III B-2



CLASS III B-1



CLASS III C



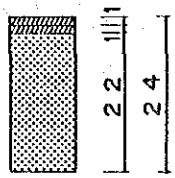
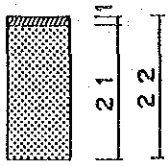
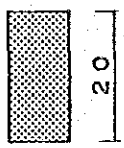
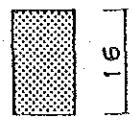
3.2.2 Pavement Structure

Fig. 3-2-1 shows the standard pavement structures adopted for the Kabupaten roads. In the Kabupaten aggregate material is difficult to obtain and so the price is extremely high, therefore the cement stabilization method is recommended for both the base and sub-base courses as a substitute for crusher run or river gravel.

Fig. 3-2-1

PAVEMENT STRUCTURE
(CEMENT STABILIZING)

(cm)

CBR	ROAD CLASSIFICATION			
	III A	III B-1	III B-2	III C
6				

= SURFACE DRESSING (ASPHALT)

= CEMENT STABILIZING

3.3 Design of Bridges and Other Structures

3.3.1 Standard Bridge

There are so many bridges to be improved or to be newly constructed on the Kabupaten roads in the Project Area that it is very difficult to prepare an individual design for each bridge. Therefore, standardization is recommended as being necessary for the bridge design with conclusions as deseribed below.

(1) Bridge Type

1) Superstructure

A timber beam bridge (hereinafter timber bridge has been finally selected regardless of road classification by the agreement of Bina Marga after studying the actual rurall condition of bridge construction. Fig. 3-3-1 shows the cross section of the standard type.

2) Substructure

Taking account of the actual combinations of super and substructure types noted from the field survey, timber pile barts are recommended as standard because of ease of construction and economy.

3) Foundation

There is no information of subsoil conditions in the inventory data. However, timber piles of 20 cm diamenter are generally recommended as piles of this type are in common use.

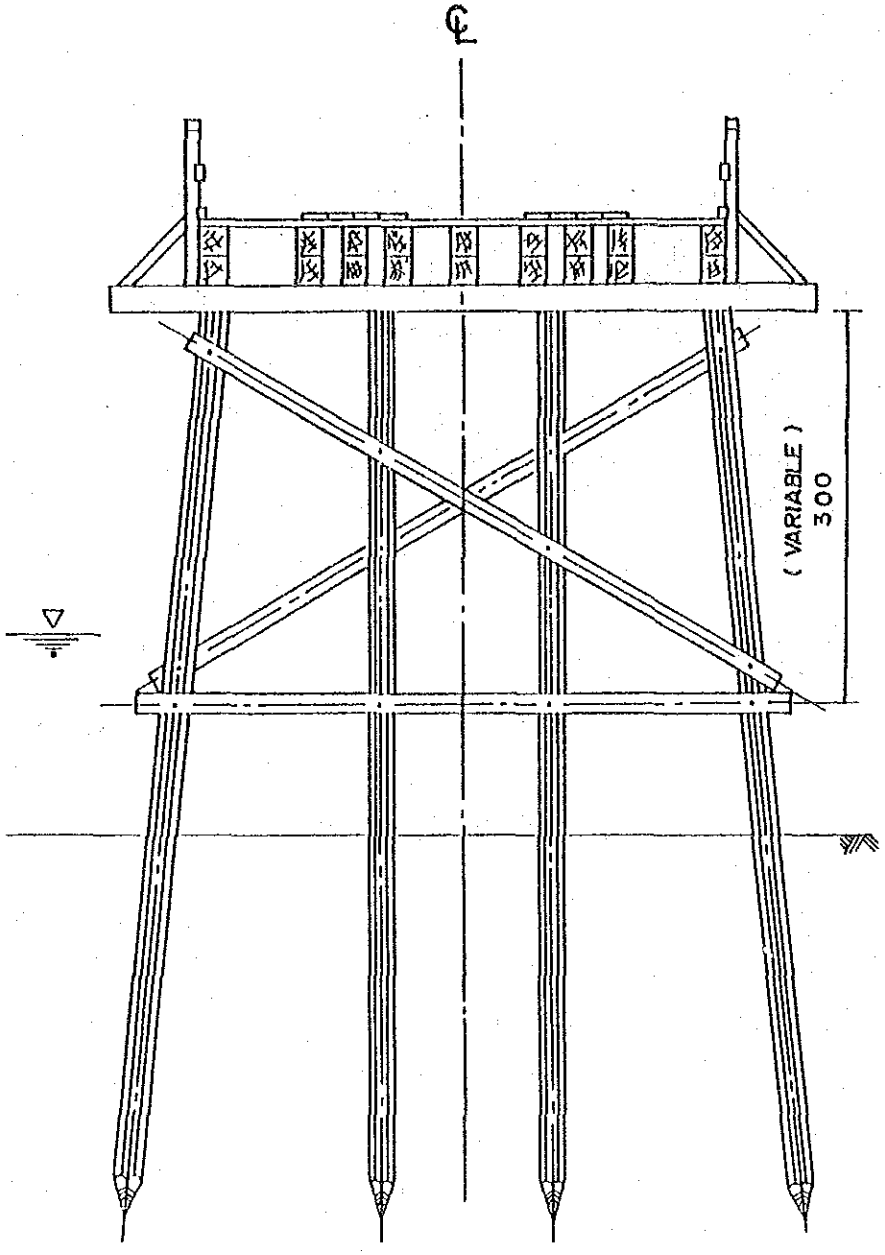
The pile length is suggested to be a minimum of 3 meters under the bottom of the foundation or river bed.
The length and number of piles should be decided in order to be adequate for the condition of the foundation materials.

(2) Bridge Width

The effective bridge width for the standard bridge has been generally decided as 4.0 m through discussions with Bina Marga and considering the actual width of Kabupaten roads.

Fig. 3-3-1 CROSS SECTION OF STANDARD BRIDGE

TIMBER BRIDGE



(3) Span Length

The range of span lengths are determined as:

Timber bridge: 3.0, 5.0 and 8.0 m

3.3.2 Other Structures

Culverts and retaining walls shown in Fig. 3-3-2 and Fig. 3-3-3 are recommended as standard structures.

(1) Culvert

The following two culvert types have been adopted for the tranverse drainage.

a) Reinforced concrete pipe culvert Ø 80 cm m
b) Rubble in mortar box culvert with RC slab 80 cm X 80 cm

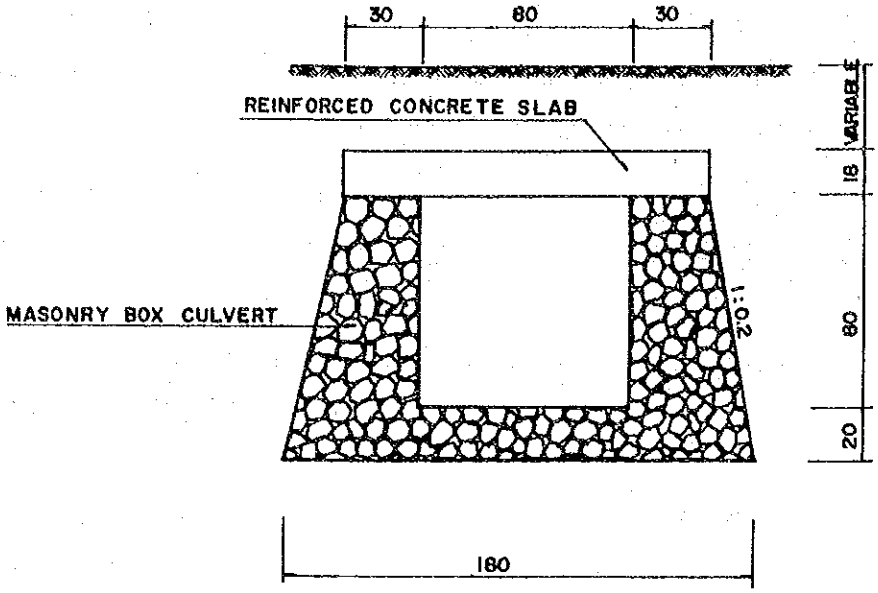
(2) Retaining Wall

The following two types of retaining walls have been adopted because of ease of construction, economy and familiarity in Indonesia.

a) Rubble in mortar retaining wall
b) Timber retaining wall

Fig. 3-3-2 STANDARD CULVERTS

80 x 80 RUBBLE IN MORTAR BOX CULVERTS



Ø 80 RENFORCED CONCRETE PIPE CULVERT

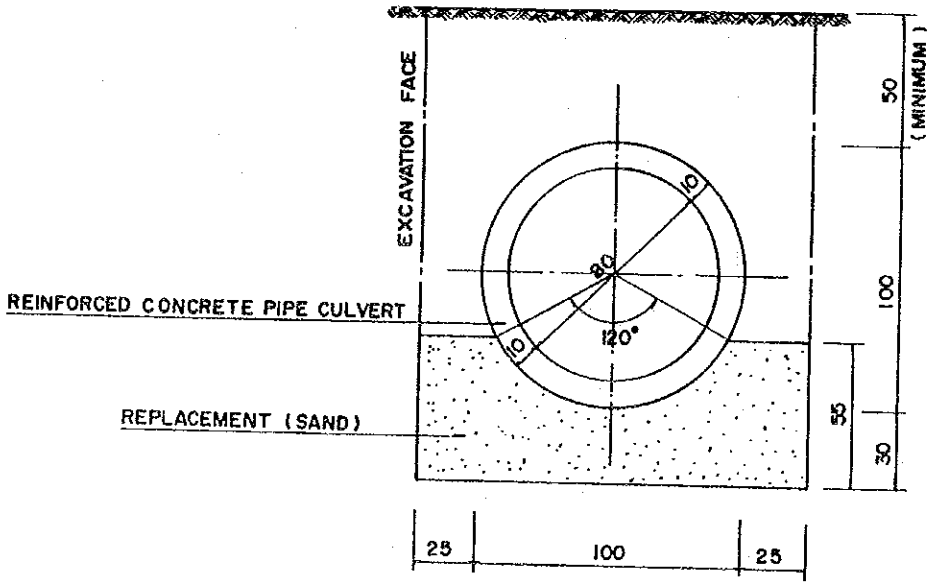
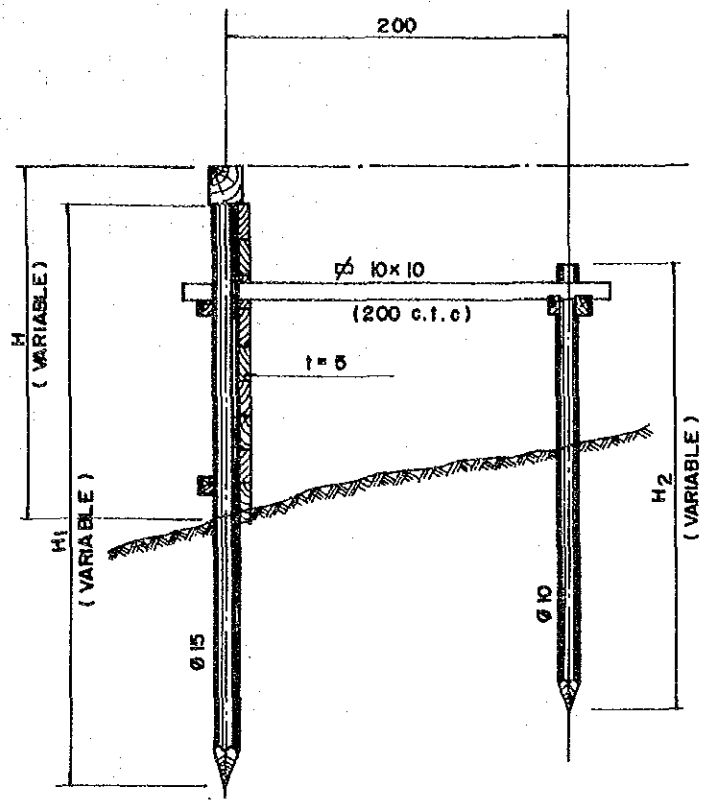
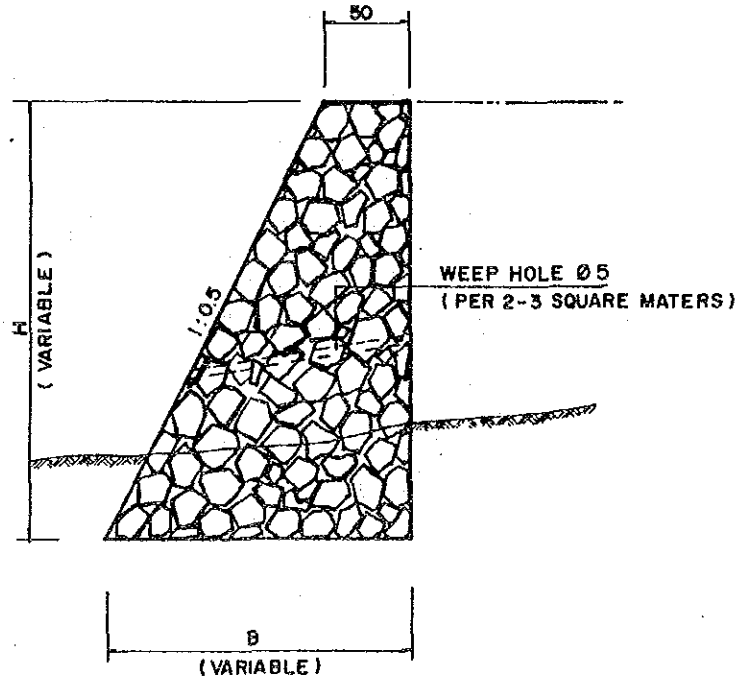


Fig. 3-3-3 STANDARD RETAINING WALLS

TIMBER RETAINING WALL



RUBBLE IN MORTAR WALL



3.4 Selection of Equipment Types

From the results of comparison of two types of Kabupaten road construction methods, i.e. equipment intensive method and labour intensive method construction methods for major works were basically decided as shown in Table 3-4-1.

Table 3-4-1 CONSTRUCTION METHODS FOR MAJOR WORKS

METHOD	WORK TYPE
Equipment Intensive	Earthwork, Base Course and Subbase Course
Labour Intensive	Surface Dressing, Drainage, Bridge and Other Structures.

3.4.1 Points to be Considered for the Selection

Full consideration was given to the following points in studying the selection of equipment type.

a. Most of the construction in the Project is pavement works for road improvement.

b. The pavement width adopted is equal to or less than 4.5 m and therefore large sized equipment is omitted from the selection process.

c. Equipment should be capable of with standing the heavy rainfall and poor soil quality. Equipment for construction in swampy areas is considered if necessary.

d. Uniformity of equipment types with existing equipment is considered to facilitate repair of the equipment in the provincial work shop.

e. Since the scale of the construction is small and transportation of equipment will frequently be necessary, wheel type equipment has been selected as much as possible as this can move by itself or by being towed.

f. The road like to be improved are scattered all over the Kabupatens and therefore a low bed truck or equivalent is necessary for transportation of crawler type equipment. It is desirable to protect the existing pavement from damage caused by the movement of crawler type equipment on the existing roads.

g. The capacity of the equipment has been decided taking into consideration the construction volume and the combination of equipment in the main work.

3.4.2 Combinations of Equipment for Major Works and Maintenance

The combinations of equipment for major works and maintenance are listed in Table 3-4-2 and 3-4-3 respectively.

Table 3-4-2 EQUIPMENT OF ONE WORK GANG FOR MAJOR TYPES OF WORK

TYPE OF WORK	EQUIPMENT REQUIRED	
1. Site Clearing in Light Bush	1- Bulldozer 90 HP 2- Dump Truck 3.0 Ton	1- Wheel Loader 1.2 m^3
2. Excavation & Embankment		
i) Normal Fill	1- Bulldozer 90 HP 1- Vibratory Roller 4.0 Ton (D&T)	1- Water Tank Truck 4,000 Ltr
ii) Fill by Borrow Material	1- Bulldozer 90 HP 3- Dump Truck 3.0 Ton	1- Wheel Loader 1.2 m^3
iii) Fill in Swamp	1- Swamp Bulldozer 90 HP 1- Water Tank Truck 4,000 Ltr	1- Vibratory Roller 4.0 Ton (D&T)
iv) Excavation to Spoil	1- Bulldozer 90 HP 1- Wheel Loader 1.2 m^3	4- Dump Truck 3.0 Ton
3. Subgrade Preparation	1- Motor Grader 75 HP 1- Vibratory Roller 4.0 Ton (D&T)	1- Water Tank Truck 4,000 Ltr
4. Subbase Course	1- Motor Grader 75 HP 1- Vibratory Roller 4.0 Ton (D&T)	1- Water Tank Truck 4,000 Ltr
5. Base Course	1- Motor Grader 75 HP 1- Vibratory Roller 4.0 Ton 1- Portable Crusher/Screens 30-40 Ton/H	1- Water Tank Truck 4,000 Ltr
6. Cement Stabilizing	1- Motor Grader 70 HP 1- Bulldozer 90 HP 1- Wheel Loader 1.2 m^3 1- Flat Bed Truck 3.0 Ton	1- Vibratory Roller 4.0 Ton (D&T) 1- Road Stabilizer 1- Water Tank Truck 4,000 Ltr
7. Surface Course	1- Asphalt Sprayer 850 Ltr 1- Tyre Roller 8-15 Ton 1- Portable Crusher/Screens 30-40 Ton/H	1- Flat Bed Truck 3.0 Ton
8. Concrete	1- Concrete Mixer 0.5 m^3 1- Water Pump 200 Ltr/Min 1- Concrete Vibrator 3.3 HP	1- Flat Bed Truck 3.0 Ton 1- Hand-Guided Vibratory Roller 1000 Kg

Table 3-4-3 EQUIPMENT OF ONE WORK GANG FOR MAINTENANCE

TYPE OF WORK	EQUIPMENT REQUIRED
Road	1- Motor Grader
	1- Tyre Roller 8-15 Ton
	1- Hand-Guided Vibratory Roller 1000 Kg
	1- Flat Bed Truck 3.0 Ton
	1- Dump Truck 3.0 Ton
Bridge and Other Structure	1- Flat Bed Truck With Crane 3.0 Ton

3.5 Workshop and Laboratory

3.5.1 Policy of the Kabupaten Workshop

A workshop will be provided for each Kabupaten. The function of the workshop is to cope with requests from the construction site. The main service will be routine maintenance while the secondary service will be light repairs which can be carried out by changing parts. Dismantling and assembling of units which need setting or adjustment using special equipment or facilities will not be carried out in the Kabupaten workshop. Such repairs are planned to be carried out by the provincial workshop or the regional Workshop of Bina Marga.

Accordingly the main tasks of the Kabupaten workshop are as follows:

1) Administration for and storage of equipment
2) Routine maintenance and light repair of equipment
3) Storage and supply of spare parts
4) Operation of equipment including crushing plant.

3.5.2 Workshop Equipment and Tools

Equipment and tools for the workshop are recommended as shown in Table 3-5-1.

Table 3-5-1 WORKSHOP EQUIPMENT AND TOOLS

DESCRIPTION	QUANTITY
Upright Drilling Machine	1 Set
Electric Hand Drill	1
Electric Portable Grinder	1
Disc Grinder	1
Bench Electric Grinder	1
Engineer's Vice	1
DC Electric Welder with Engine	1 Set
Portable Hydraulic Jack, Screw Head	1
Hydraulic Jack	1
Grease Gun	2
Suction Pump for Oil Recovery	2
High Pressure Grease Pump	1

continued

DESCRIPTION	QUANTITY
Drum Opening Spanner	1
Silicon Normal Charger	1
Tyre Changer Air Operated	1
Tyre Service Tool Set	1
Tyre Pressure Gauge	1
Automatic Tyre Inflator	1
Plug Cleaner and Tester	1
Mechanics Tool Set, Heavy Equipment	1
Mechanics Tool Set, Large Vehicle	1
Portable Air Compressor	1
Electric Cord Reel, 15 A, 50 m	1
Oil Measure, Polyethylene	1
Funnel 200 mm, Steel	3
Hand Truck (Cart), 4-Wheel	1
Nylon Sling, 10 ton	2
Chain Block, 1 ton	2
Wire Rope (for sling), 1.8 ton	2
Wire Rope (for sling) 3.2 ton	2
Generator	1

3.5.3 Laboratory

For quality control of construction in the Project it is recommended that a laboratory is provided for each Kabupaten. For each laboratory, provision of laboratory test equipment for the following tests is recommended:

- Physical characteristic, compaction and strength tests for the road bed and pavement materials.
- Slump and strength tests for the bridge concrete.

In the laboratory a fixed water tank should be provided for CBR tests and curing of concrete specimens.

The proposed laboratory equipment is listed in Table 3-5-2.

Table 3-5-2 LABORATORY TEST EQUIPMENT

DESCRIPTION	QUANTITY
Soil Moisture Test Set (JIS A1203)	1
Liquid Limit Set (JIS A1205)	1
Plastic Limit Set (JIS A1206)	1
Compaction Set (JIS A1210)	1
CBR Laboratory Set, Mechanical (JIS A1211)	1
Sand Density Apparatus (JIS A1214)	1
Aggregate Test Sieve Set	1
Portable Cone Penetrometer	1
Compression & Bending Test Machine	1
Cylinder Mould (JIS A1132, 1108)	9
Slump Test Apparatus (JIS A1101)	2

To conduct the surveys necessary for road and structure construction such as centering, profile leveling, cross section leveling etc., the surveying equipment listed in Table 3-5-3 recommended.

Table 3-5-3 *SURVEYING EQUIPMENT*

DESCRIPTION	QUANTITY
Transit	1
Level	1
Staff	3

Chapter 4 CONSTRUCTION AND MAINTENANCE COST ESTIMATIONS

4.1 Unit Price

With regard to the unit prices of materials and labor, the data were collected from each Kabupaten through Bina Marga. The collected data were compared with those of Jakarta using BAHAN BANGUNAN DKI-JAKARTA MAY & JUNE 1985 compiled by PUSAT INFORMASI TEHNIK PEMBANGUNAN, and then finalized.

4.1.1 Unit Labour Price

The unit labour prices of Kabupaten Barito Kuala and other Kabupatens in Kalimantan Selatan Province are shown in Table 4-1-1.

Table 4-1-1 UNIT LABOUR PRICE

(Rp)

KABUPATEN	MAN	SKL LAB	CAP	MAS	LAB	DRIV	OPE
Tanah Laut	2,500	2,250	2,500	2,500	1,750	2,500	4,000
Kota Baru	2,750	2,750	3,500	3,500	2,500	2,500	4,000
Banjar	2,750	2,200	2,750	2,750	1,750	2,750	3,850
Barito Kuala	3,000	3,000	3,000	3,000	2,000	3,000	3,500
Tapin	3,000	2,500	3,250	3,250	2,000	3,000	4,000
Hulu Sungai Selatan	2,000	2,250	2,500	1,500	1,750	2,500	3,000
Hulu Sungai Tengah	2,000	1,750	2,500	1,500	1,250	2,500	3,000
Hulu Sungai Utara	3,500	2,500	3,000	3,000	2,000	3,000	2,000
Tabalong	2,500	2,500	3,000	3,000	2,000	3,000	3,500
Average	2,333	2,078	2,556	2,444	1,667	2,417	3,039

Notes :

MAN : Mandur
SKL LAB : Skilled Labour
CAP : Carpenter
MAS : Mason
LAB : Labourer
DRIV : Driver
OPE : Operater

4.1.2 Unit Price of Materials

Table 4-1-2 shows the unit price of materials for Kabupaten Barito Kuala together with for other Kabupatens in Kalimantan Selatan Province.

Table 4-1-2 UNIT PRICE OF MATERIALS

(Rp)

MATERIAL	UNIT	TANAH LAUT	KOTA BARU	BANJAR KUALA	BARITO	TAPIN
Bitumen	L	275	375	300	300	275
Asphalt oil	L	700	750	700	750	700
Gasoline	L	250	250	250	250	250
Sand	M^3	5,000	12,500	6,000	12,500	4,500
Cement	bag	4,000	5,300	4,500	5,000	5,000
River Stone	M^3	5,000	12,500	7,000	17,500	10,000
Steel moulds	Set	8,000	8,000	8,000	8,000	8,000
Timber	M^3	60,000	150,000	80,000	200,000	80,000
Paint	L	4,000	3,500	3,000	2,000	2,500
Reinforcing Steel	Kg	750	1,000	750	1,000	1,000
Tying Wire	Kg	1,000	1,200	1,000	1,200	1,200
Equivalent Royalty	M^3	250	250	250	250	250

Table 4-1-2 UNIT PRICE OF MATERIALS

(Rp)

MATERIAL	UNIT	HULU SUNGAI SELATAN	HULU SUNGAI TENGAH	SUNGAI UTARA	TABALONG	AVERAGE
Bitumen	L	450	300	300	300	385
asphalt oil	L	800	700	700	700	925
Gasoline	L	250	250	250	250	250
Sand	M^3	5,000	5,000	5,000	6,000	5,745
Cement	bag	4,350	5,000	5,000	5,000	4,687
River Stone	M^3	7,750	7,000	9,000	7,500	11,165
Steel moulds	Set	8,000	8,000	8,000	8,000	7,865
Timber	M^3	75,000	75,000	80,000	90,000	132,758
Paint	L	2,100	2,000	2,750	2,500	2,573
Reinforcing Steel	Kg	1,000	1,000	750	1,000	940
Tying Wire	Kg	1,200	1,200	1,100	1,200	1,897
Equivalent Royalty	M^3	250	250	250	250	-

4.1.3 Hourly Equipment Cost

The hourly equipment cost for Kabupaten is shown in Table 4-1-3.

Table 4-1-3

HOURLY EQUIPMENT COST

PROVINCE : KALIMANTAN SELATAN
KABUPATEN : BARITO KUALA

(UNIT : Rp) (6'85)

CODE NO	EQUIPMENT NAME	CLASS	LOCAL COST OWNERSHIP	LOCAL COST OPERATION	LOCAL COST SUB-TOTAL	FOREIGN COST OWNERSHIP	FOREIGN COST OPERATION	FOREIGN COST SUB-TOTAL	TOTAL COST
	Bulldozer	120 HP	234	16,127	16,361	7,769	1,024	8,793	25,154
	Bulldozer/Ripper	120 HP	255	17,138	17,393	8,500	1,575	10,075	27,468
	Swamp Bulldozer	120 HP	267	17,380	17,647	8,879	1,646	10,526	28,172
	Bulldozer	90 HP	148	11,034	11,182	4,914	647	5,561	16,743
	Bulldozer/Ripper	90 HP	159	11,625	11,784	5,300	982	6,282	18,066
	Bulldozer	65 HP	105	8,032	8,137	3,500	461	3,961	12,098
	Bulldozer/Ripper	65 HP	115	8,481	8,596	3,819	708	4,527	13,123
	Swamp Bulldozer	90 HP	159	11,615	11,774	5,284	979	6,263	18,037
	Swamp Bulldozer	65 HP	122	8,252	8,374	4,049	750	4,799	13,173
	Motor Grader	110 HP	208	13,764	13,972	6,919	1,282	8,201	22,173
	Motor Grader	75 HP	144	9,424	9,568	4,779	885	5,664	15,232
	Motor Grader	65 HP	129	8,268	8,397	4,300	797	5,097	13,494
	Road Stabilizer	W=1850 mm	258	3,381	3,639	8,594	424	9,018	12,657
	Vibratory Roller	4 ton	87	4,167	4,254	2,900	382	3,282	7,536
	Hand-guide Vib. Roller	1000 Kg	68	730	798	850	29	879	1,677
	Tire Roller	8-15 ton	94	9,802	9,896	3,106	102	3,208	13,104
	Vibratory Roller (D&T)	4 ton	87	4,167	4,254	2,900	382	3,282	7,536
	Hand-guide Vib. Roller	600 Kg	48	498	546	600	20	620	1,166
	Rough Terrain Crane	10 ton	302	16,091	16,393	10,039	744	10,783	27,176
	Hydraulic Excavator; Wheel	0.3 m3	124	9,983	10,107	4,109	541	4,650	14,757
	Wheel Loader	1.2 m3	211	10,193	10,404	7,019	925	7,944	18,348
	Wheel Loader	0.3 m3	69	3,600	3,669	2,269	299	2,568	6,237
	Water Tank Truck	4000 ltr.	70	3,812	3,882	868	120	988	4,870
	Fuel Tank Truck	4000 ltr.	71	3,819	3,890	882	121	1,003	4,893
	Dump Truck	3.0 ton	118	4,614	4,732	1,469	202	1,671	6,403
	Flat Bed Truck with Crane	3.0 ton	52	4,059	4,111	1,717	127	1,844	5,955
	Dump Loader Truck	12 ton	116	26,059	26,175	3,837	126	3,963	30,138
	Dump Truck	5.0 ton	176	7,678	7,854	2,189	302	2,491	10,345
	Flat Bed Truck	3.0 ton	17	3,634	3,651	563	41	604	4,255
	Portable Crusher/Screening	30-40 t/h	564	27,023	27,587	18,800	2,478	21,278	48,865
	Concrete Mixer	0.5 m3	432	2,520	2,952	5,400	419	5,819	8,771
	Water Pump	200 l/min	16	342	358	188	6	194	552
	Concrete Vibrator	3.3 HP	6	306	312	73	2	75	387
	Asphalt Sprayer	850 ltr.	82	886	968	1,019	140	1,159	2,127

4.2 Unit Construction Cost by Work Type

4.2.1 All Works Except Bridges

The unit construction costs by work type, excluding bridge construction costs, have been estimated using the combination of equipment described in Clause 3.4 and the unit prices already listed. The results are summarized in Table 4-2-1.

Table 4-2-1 UNIT COST BY WORK TYPE EXCEPT BRIDGE WORK

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(Rp)

ITEM	UNIT	LOCAL	FOREIGN	TOTAL
Site Clearance in Light Bush	m2	195	91	286
Subgrade Preparation	m2	25	11	36
Normal Fill	m3	2,030	863	2,893
Fill in Swamp	m3	13,190	267	13,457
Normal Excavation to Spoil	m3	1,186	522	1,708
Cement Stabilizing	m3	18,284	12,366	30,650
Cement Stabilizing	m3	18,284	12,366	30,650
Shoulder	m2	352	146	498
Asphalt Patching	m2	7,064	1,038	8,102
Surface Dressing (Single)	m2	1,037	554	1,591
Surface Dressing (Double)	m2	1,431	868	2,299
Earth Drain	m	995	119	1,114
Earth Drain in Swamp (by machine)	m3	1,431	474	1,905
Pipe Culvert D80cm	m	69,587	49,969	119,556
Masonry Culvert (80x80cm)	m	110,594	39,059	149,653
Retaining Wall and Wing Wall (Timber)	m2	18,301	246	18,547
Retaining Wall and Wing Wall (Masonry)	m3	78,946	10,455	89,401
Gabion Protection	m3	23,430	120	23,550
Manual routine maintenance of road	Km	161,812	7,248	169,060
Routine maintenance of earth road	Km	114,460	37,904	152,364
Routine maintenance of gravel road	Km	578,767	42,642	621,409
Routine maintenance of asphalt road	Km	706,400	103,800	810,200

4.2.2 Bridges

The unit construction costs by bridge type including the cost of demolition of existing bridges are shown in Table 4-2-2.

Table 4-2-2 BRIDGE COST

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(Rp)

ITEM	UNIT	LOCAL	FOREIGN	TOTAL
Superstructure (Timber;Span 3m;10T)	m2	64,381	2,998	67,379
Superstructure (Timber;Span 5m;10T)	m2	71,312	3,311	74,623
Superstructure (Timber;Span 8m;10T)	m2	94,456	4,352	98,808
Superstructure (Timber;Span 3m;BM50)	m2	79,830	3,708	83,538
Superstructure (Timber;Span 5m;BM50)	m2	87,152	4,020	91,172
Superstructure (Timber;Span 8m;BM50)	m2	110,532	5,089	115,621
Superstructure (Concrete;Span 3m;BM50)	m2	79,452	106,748	186,200
Superstructure (Concrete;Span 5m;BM50)	m2	82,029	119,368	201,397
Superstructure (Concrete;Span 8m;BM50)	m2	84,830	130,067	214,897
Superstructure (Concrete;Span10m;BM50)	m2	92,840	147,793	240,633
Superstructure (Concrete;Span15m;BM50)	m2	100,735	174,182	274,917
Substructure (Pier;for Timber;10T)	NO	560,783	27,729	588,512
Substructure (Abut;for Timber;10T)	NO	1,814,961	112,212	1,927,173
Substructure (Pier;for Timber;BM50)	NO	824,742	41,022	865,764
Substructure (Abut;for Timber;BM50)	NO	2,013,999	126,457	2,140,456
Substructure (Pier;for Concrete;BM50)	NO	2,616,791	477,161	3,093,952
Substructure (Abut;for Concrete;BM50)	NO	6,249,671	920,291	7,169,962
Demolition of Bridge (Timber->Timber)	m2	19,384	1,061	20,445
Demolition of Bridge (Timber->Concrete)	m2	19,384	1,061	20,445
Demolition of Bridge (Concrete)	m2	137,845	79,665	217,510
Maintenance of Timber Bridge (New)	m2	11,523	1,010	12,533
Maintenance of Concrete Bridge (New)	m2	3,114	3,061	6,175
Maintenance of Timber Bridge (Exist)	m2	10,472	2,349	12,821
Maintenance of Concrete Bridge (Exist)	m2	5,333	2,456	7,789

Chapter 5 RESULTS OF ECONOMIC FEASIBILITY EVALUATION

5.1 Preliminary Screening

The road links to be improved should be effective for development of the Project Area. The road links where improvements were assumed to be inefficient for development of the Project Area were generally screened out using the following cut-off criteria.

(1) Very short roads, less than 2 Km long, which have no connection with the trunk road network.

(2) Roads not connected to the network at any point

(3) Unpreferred roads, due to poor suitability for transportation compared to other existing alternative roads serving the same purpose.

(4) Road in good condition according to the Bina Marga road inventory which lists improvement projects carried out in the last two or three years

(5) Roads with asphalt surface in good condition

(6) Urban roads, except those forming part of a longer route

(7) Roads serving single large organizations rather than the general public

(8) Roads with no inventory data

(9) Kabupaten roads also assigned as provincial roads

The road links to be screened out in Kabupaten Barito Kuala are shown in Table 5-1-1.

Table 5-1-1 ROAD LINKS TO BE SCREENED OUT

KABUPATEN : BARITO KUALA

CRITERIA NO	ROAD LINK NO
(6)	01,04,05,06,07,08,09,10,11,12,13,14,1516,17,30

5.2 Evaluation

5.2.1 Primary Analysis

The Kabupaten roads were classified by using the future traffic volume on the road links in 1998. The primary analysis of the IRR was carried out using the construction and maintenance costs. Road links where IRRs were more than 10% were defined as feasible links.

Results of primary analysis are shown in Table 5-2-1.

5.2.2 Secondary Analysis

From the infeasible road links evaluated by the primary analysis, road links where the IRRs were between 1% and 10%, i.e. road links which could become feasible if down graded by one rank, in classification were down graded and the costs re-estimated. Using these costs, a secondary analysis of IRR was carried out. Road links where these IRRs were then more than 10% were also defined as feasible links. This reflected that even though the road classification was rather low the road link should be improved.

Results of secondary analysis are shown in Table 5-2-2.

5.2.3 Ranking of Feasible Road Links

From the results of the primary and secondary analysis, road links where the IRRs were more than 10% were selected and their NPVs and B/Cs were estimated. The ranking of feasible road links from the economic evaluation are decided in the order of the NPVs, i.e. the larger the NPV the higher the road link priority as shown in Table 5-2-3.

Table 5-2-1 RESULTS OF PRIMARY ANALYSIS

PROVINCE : KALIMANTAN SELATAN KABUPATEN : BARITO KUALA

LINK NO	LENGTH	CLASS	IRR(%)	REMARK
21	19 Km	IIIA	167.880	Surplus
28	22 Km	IIIA	107.583	Surplus
26	16 Km	IIIA	81.299	Surplus
31	11 Km	IIIA	33.626	Surplus
25	11 Km	IIIA	33.150	Surplus
29	13 Km	IIIA	19.451	Surplus
24	7 Km	IIIA	17.431	Surplus
23	10 Km	IIIA	0.752	Surplus
9	1 Km	IIIC	0.078	Surplus
10	1 Km	IIIC	0.078	Surplus
11	1 Km	IIIC	0.078	Surplus
12	1 Km	IIIC	0.078	Surplus
13	1 Km	IIIC	0.078	Surplus
14	1 Km	IIIC	0.078	Surplus
15	1 Km	IIIB-2	0.078	Surplus
16	1 Km	IIIC	0.078	Surplus
17	1 Km	IIIC	0.078	Surplus
18	5 Km	IIIB-1	0.078	Surplus
19	3 Km	IIIB-2	0.078	Surplus
20	6 Km	IIIA	0.078	Surplus
1	4 Km	IIIB-1	0.078	Surplus
22	5 Km	IIIB-1	0.078	Surplus
2	3 Km	IIIB-2	0.078	Surplus
3	14 Km	IIIA	0.078	Surplus
4	1 Km	IIIC	0.078	Surplus
5	1 Km	IIIC	0.078	Surplus
27	16 Km	IIIA	0.078	Surplus
6	1 Km	IIIB-2	0.078	Surplus
7	1 Km	IIIC	0.078	Surplus
30	1 Km	IIIC	0.078	Surplus
8	1 Km	IIIC	0.078	Surplus

Table 5-2-3 RANKING OF FEASIBILITY ROAD LINKS

PROVINCE : KALIMANTAN SELATAN KABUPATEN : BARITO KUALA

LINK NO	LENGTH	CLASS	NPV (1000Rp)	B/C	IRR (%)	REMARK
21	19 Km	IIIA	9432512	11.135	167.880	Surplus
28	22 Km	IIIA	5882083	6.869	107.583	Surplus
26	16 Km	IIIA	5846609	5.243	81.299	Surplus
25	11 Km	IIIA	856304	2.261	33.150	Surplus
31	11 Km	IIIA	745991	2.165	33.626	Surplus
29	13 Km	IIIA	197056	1.397	19.451	Surplus
24	7 Km	IIIA	177995	1.340	17.431	Surplus
SUM	99 Km		23138550			

Table 5-2-2 RESULTS OF SECONDARY ANALYSIS

Nil

Chapter 6 IMPLEMENTATION PROGRAMME

6.1 Implementation Schedule

6.1.1 Project Cost

The total Project Cost for the Kabupaten is composed of the cost of construction and maintenance, supplementation as described later, and workshop, laboratory and survey equipment. The total Project Cost for the Kabupaten is summarized in Table 6-1-1.

Table 6-1-1 TOTAL PROJECT COST (1)

KABUPATEN: Barito Kuala

(Rpx10^6)

COST	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
CONSTRUCTION	642	1,371	2,013
MAINTENANCE	66	422	488
SUPPLEMENTATION	328	-	328
WORKSHOP EQUIPMENT & TOOLS	28	-	28
LABORATORY EQUIPMENT	12	-	12
SURVEY EQUIPMENT	5	-	5
TOTAL	1,081	1,793	2,874

The total Project Cost can be divided into costs as shown in Table 6-1-2.

Table 6-1-2 TOTAL PROJECT COST (2)

(Rpx10^6)

COST	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
CIVIL WORK	506	1,788	2,294
CONSTRUCTION & MAINTENANCE EQUIPMENT	509	-	509
SPARE PARTS	21	5	26
WORKSHOP/LABORATORY/SURVEY EQUIPMENT	45	-	45
TOTAL	1,081	1,793	2,874

The cost for civil work is composed of the cost of labour and materials, operation cost excluding spare parts, indirect cost and transportation cost of equipment, and ownership cost for existing equipment.

6.1.2 Proposed Road Links

(1) Road Link to be Improved

The road links to be improved were generally selected taking into consideration the following criteria:

(1) Feasible road links
- Feasible road links from the primary evaluation
- Feasible road links from the secondary evaluation

(2) Road links selected from the engineering points of view

(3) Road links selected because of basic human needs.

The road links finally proposed to be improved in the Kabupaten are the 7 links with the total length of 86 km which is 48% of the 180 km total length of Kabupaten roads studied. The proposed road links are shown in Table 6-1-3.

Table 6-1-3 ROAD LINKS TO BE IMPROVED

KABUPATEN : BARITO KUALA

REASON FOR SELECTION	ROAD LINK NO
Feasible	
- Primary	21,24,25,28,31
- Secondary	-
Engineering Point of View	3,23
Basic Human Needs	-

As the table shows all feasible road links except Road Links No 26 and No 29 are proposed to be improved.
Road Links No 26 is an isolated road and existing conditions of Road Link No 29 is rather good, therefore these road links are not selected.

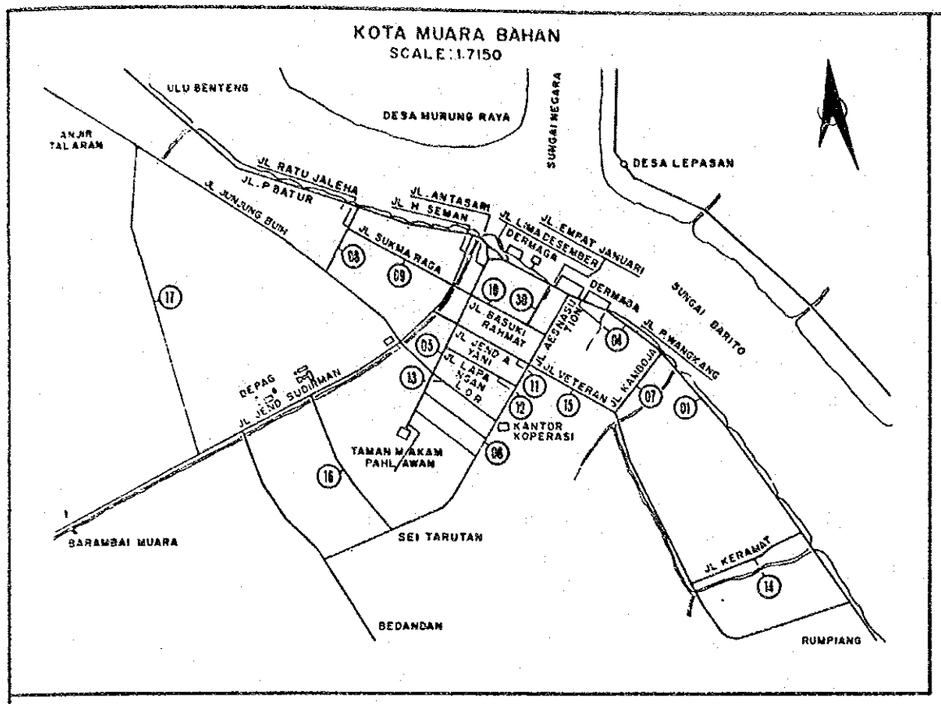
Since Road Links No 3 and No 23 are trunk roads which connect the Kabupaten capital, with Kecamatan capitals, these road links are selected from the engineering points of view.

The order of proceeding with the improvement of the proposed road links are decided as shown in Table 6-1-4.

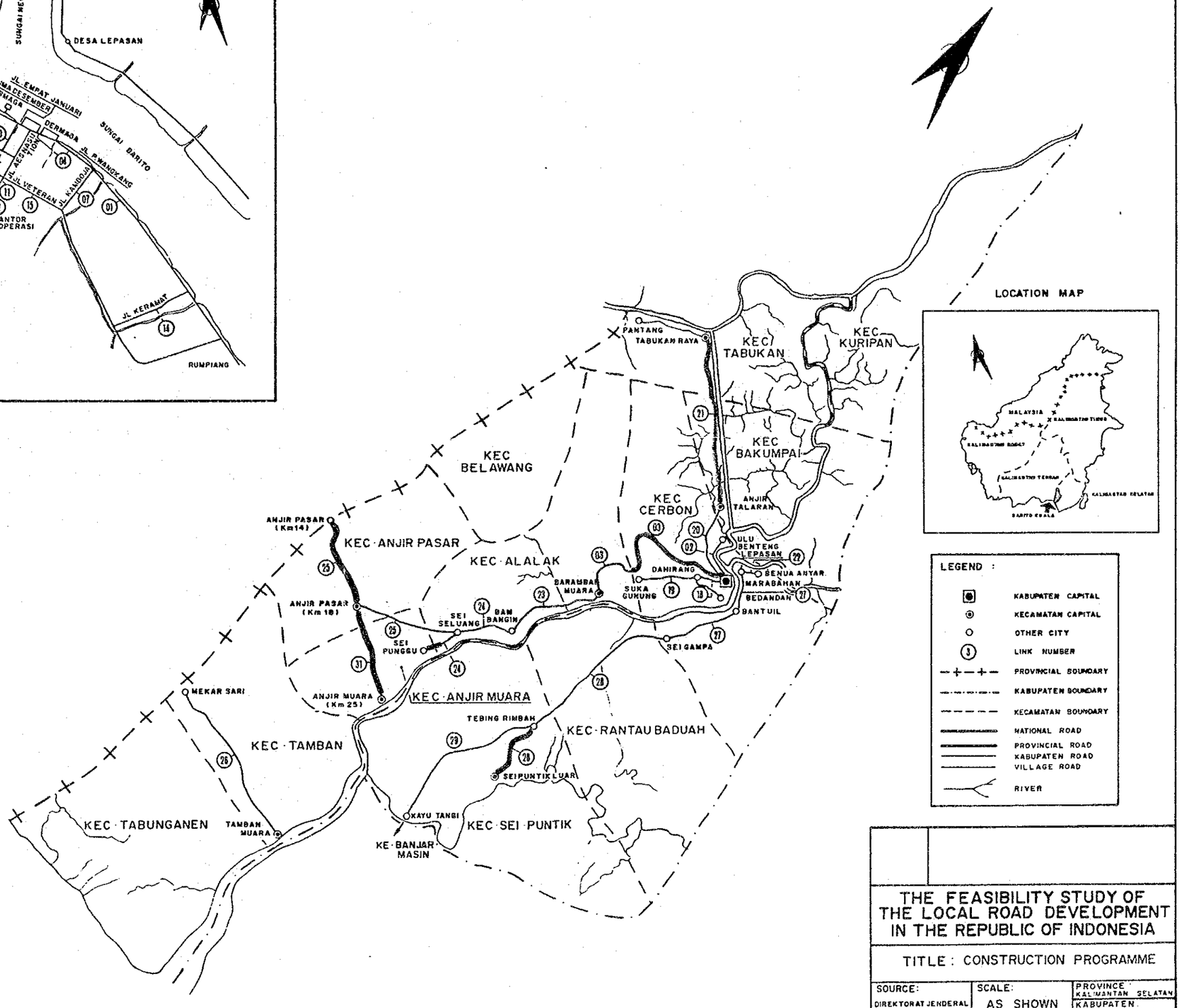
Table 6-1-4 ROAD LINKS TO BE IMPROVED BY YEAR

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

YEAR	LINK NO	( ) : rate
1988	21 (40%)	
1989	21 (60%), 28 (40%)	
1990	3 (80%), 28 (60%)	
1991	3 (20%), 23, 24 (50%)	
1992	24 (10%), 25 (50%), 31	



KAB · BARITO KUALA



LOCATION MAP

LEGEND :

- KABUPATEN CAPITAL
- KECAMATAN CAPITAL
- OTHER CITY
- (3) LINK NUMBER
- PROVINCIAL BOUNDARY
- KABUPATEN BOUNDARY
- KECAMATAN BOUNDARY
- NATIONAL ROAD
- PROVINCIAL ROAD
- KABUPATEN ROAD
- VILLAGE ROAD
- RIVER

CONSTRUCTION PROGRAMME

ROAD LINK NUMBER	FISCAL YEAR 1988/89	1989/90	1990/91	1991/92	1992/93
21	190				
21,28		414			
03,28			431		
03,23,24				510	
24,23,31					467
TOTAL COST (10^6 Rp)	190	414	431	510	467

SCALE :

0 5 10 15 Km

THE FEASIBILITY STUDY OF THE LOCAL ROAD DEVELOPMENT IN THE REPUBLIC OF INDONESIA

TITLE : CONSTRUCTION PROGRAMME

SOURCE:	SCALE:	PROVINCE : KALIMANTAN SELATAN
DIREKTORAT JENDERAL CIPTA KARYA	AS SHOWN	KABUPATEN : BARITO KUALA

(2) Road Links to Be Maintained

It is desirable that all Kabupaten roads are maintained. However, because of the limited budget it is inevitable that some road links in the Kabupatens will be left without maintenance for the time being. The budget should be used for those which are effective in producing more useful development of the Kabupaten through the road development project. The road links to be maintained are finally proposed as shown in Table 6-1-5.

Table 6-1-5 ROAD LINKS TO BE MAINTAINED

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(1000Rp)

LINK NO	LENGTH (Km)	BA (%)	SD (%)	RU (%)	RB (%)	ASPHAL (Km)	GRAVEL (Km)	EARTH (Km)	TN NO	AREA (m2)	RC NO	AREA (m2)	BRIDGE COST	LOCAL COST	FOREIGN COST	TOTAL COST
1	4	75.0	25.0	0.0	0.0	0	4	0	24	971.75	0	0.00	12,459	13,138	2,482	15,620
4	1	80.0	20.0	0.0	0.0	1	0	0	2	121.50	0	0.00	1,558	2,141	396	2,537
5	1	50.0	40.0	10.0	0.0	1	0	0	1	81.00	0	0.00	1,039	1,716	301	2,017
6	1	80.0	20.0	0.0	0.0	1	0	0	2	55.00	0	0.00	705	1,444	240	1,684
7	1	75.0	25.0	0.0	0.0	0	1	0	0	0.00	0	0.00	0	741	50	791
8	1	80.0	20.0	0.0	0.0	0	1	0	0	0.00	0	0.00	0	741	50	791
9	1	80.0	20.0	0.0	0.0	0	1	0	0	0.00	0	0.00	0	741	50	791
10	1	80.0	20.0	0.0	0.0	1	0	0	1	51.50	0	0.00	660	1,408	232	1,640
11	1	80.0	20.0	0.0	0.0	1	0	0	1	45.00	0	0.00	577	1,339	217	1,556
12	1	80.0	20.0	0.0	0.0	1	0	0	0	0.00	0	0.00	0	868	111	979
13	1	60.0	0.0	40.0	0.0	1	0	0	1	37.50	0	0.00	481	1,261	199	1,460
14	1	0.0	99.0	1.0	0.0	0	0	1	0	0.00	0	0.00	0	276	45	321
15	1	80.0	20.0	0.0	0.0	1	0	0	4	197.60	0	0.00	2,533	2,937	575	3,512
16	1	80.0	20.0	0.0	0.0	0	1	0	2	50.00	0	0.00	641	1,264	167	1,431
17	1	80.0	20.0	0.0	0.0	0	1	0	2	46.00	0	0.00	590	1,222	158	1,380
20	6	94.3	5.7	0.0	0.0	6	0	0	11	444.00	0	0.00	5,693	9,859	1,709	11,568
29	13	80.0	20.0	0.0	0.0	0	13	0	20	775.00	0	0.00	9,936	17,743	2,469	20,212
SUM	37					14	22	1	71	2875.85	0	0.00	36,871	58,839	9,451	68,290

6.1.3 Annual Construction and Maintenance Cost

The annual allocation of the total construction and maintenance cost in the five years programme for Kabupaten Barito Kuala is finally recommended as shown in Tables 6-1-6 (1), (2) and (3) for the construction, maintenance and total respectively.

The proposed construction cost is Rp 2,013 x 10^6 and maintenance cost is Rp 488 x 10^6 which is approximately 20% of the total expenditure.

Table 6-1-6 (1) CONSTRUCTION AND MAINTENANCE COST
(CONSTRUCTION)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	122,887	263,801	288,059	350,021	344,088	1,368,856	(68.0%)
Ownership Cost	550	1,320	1,333	1,330	1,210	5,743	(0.4%)
Operation Cost	26,972	63,576	64,389	65,816	57,467	278,220	(20.3%)
Material Cost	68,764	144,174	153,130	192,831	183,603	742,502	(54.2%)
Labour Cost	10,572	20,322	31,634	44,389	56,927	163,844	(12.0%)
Contingency	16,029	34,409	37,573	45,655	44,881	178,547	(13.0%)
FOREIGN CURRENCY :	66,690	151,082	142,977	159,862	123,712	644,323	(32.0%)
Ownership Cost	12,593	30,202	30,306	30,812	27,397	131,310	(20.4%)
Operation Cost	1,601	3,911	3,940	3,901	3,459	16,812	(2.6%)
Material Cost	43,797	97,263	90,082	104,297	76,720	412,159	(64.0%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	8,699	19,706	18,649	20,852	16,136	84,042	(13.0%)
TOTAL COST :	189,576	414,883	431,036	509,882	467,800	2,013,177	
Ownership Cost	13,143	31,522	31,639	32,142	28,607	137,053	(6.8%)
Operation Cost	28,573	67,487	68,329	69,717	60,926	295,032	(14.7%)
Material Cost	112,561	241,437	243,212	297,128	260,323	1,154,661	(57.4%)
Labour Cost	10,572	20,322	31,634	44,389	56,927	163,844	(8.1%)
Contingency	24,727	54,115	56,222	66,506	61,017	262,587	(13.0%)

(Contingency : 15%)

Table 6-1-6 (2) CONSTRUCTION AND MAINTENANCE COST

(MAINTENANCE)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	29,399	58,828	81,171	108,658	144,322	422,378	(86.5%)
Ownership Cost	135	270	395	482	687	1,969	(0.5%)
Operation Cost	9,757	19,517	25,799	33,526	45,286	133,885	(31.7%)
Material Cost	12,036	24,094	32,911	46,511	59,511	175,063	(41.4%)
Labour Cost	7,471	14,947	22,066	28,139	38,838	111,461	(26.4%)
FOREIGN CURRENCY :	4,725	9,452	12,874	16,281	22,475	65,807	(13.5%)
Ownership Cost	3,804	7,610	9,924	12,812	17,354	51,504	(78.3%)
Operation Cost	318	635	850	1,105	1,495	4,403	(6.7%)
Material Cost	603	1,207	2,100	2,364	3,626	9,900	(15.0%)
Labour Cost	0	0	0	0	0	0	(0.0%)
TOTAL COST :	34,124	68,280	94,045	124,939	166,797	488,185	
Ownership Cost	3,939	7,880	10,319	13,294	18,041	53,473	(11.0%)
Operation Cost	10,075	20,152	26,649	34,631	46,781	138,288	(28.3%)
Material Cost	12,639	25,301	35,011	48,875	63,137	184,963	(37.9%)
Labour Cost	7,471	14,947	22,066	28,139	38,838	111,461	(22.8%)

Table 6-1-6 (3) CONSTRUCTION AND MAINTENANCE COST

(TOTAL)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	152,286	322,629	369,230	458,679	488,410	1,791,234	(71.6%)
Ownership Cost	685	1,590	1,728	1,812	1,897	7,712	(0.4%)
Operation Cost	36,729	83,093	90,188	99,342	102,753	412,105	(23.0%)
Material Cost	80,800	168,268	186,041	239,342	243,114	917,565	(51.2%)
Labour Cost	18,043	35,269	53,700	72,528	95,765	275,305	(15.4%)
Contingency	16,029	34,409	37,573	45,655	44,881	178,547	(10.0%)
FOREIGN CURRENCY :	71,415	160,534	155,851	176,143	146,187	710,130	(28.4%)
Ownership Cost	16,397	37,812	40,230	43,624	44,751	182,814	(25.7%)
Operation Cost	1,919	4,546	4,790	5,006	4,954	21,215	(3.0%)
Material Cost	44,400	98,470	92,182	106,661	80,346	422,059	(59.4%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	8,699	19,706	18,649	20,852	16,136	84,042	(11.8%)
TOTAL COST :	223,700	483,163	525,081	634,821	634,597	2,501,362	
Ownership Cost	17,082	39,402	41,958	45,436	46,648	190,526	(7.6%)
Operation Cost	38,648	87,639	94,978	104,348	107,707	433,320	(17.3%)
Material Cost	125,200	266,738	278,223	346,003	323,460	1,339,624	(53.6%)
Labour Cost	18,043	35,269	53,700	72,528	95,765	275,305	(11.0%)
Contingency	24,727	54,115	56,222	66,506	61,017	262,587	(10.5%)

(Contingency : 15%)

6.1.4 Construction and Maintenance Equipment Cost

(1) Required Number of Equipment

The required numbers of construction equipment for Kabupaten Barito Kuala are estimated from the annual proposed construction quantities as shown in Table 6-1-7.

The proposed numbers of equipment to be purchased are finally decided considering the following number of existing equipment in the Kabupaten which are available for the Project.

- 1-Asphalt Sprayer

The proposed numbers of maintenance equipment have been decided as shown below from the proposed annual maintenance volume taking into account the capacity of the proposed maintenance gangs.

a. Equipment for Road Maintenance

- 1-Flat Bed Truck 3 Ton

b. Equipment for Bridge Maintenance

- 1-Flat Bed Truck with Grane 3 Ton

(2) Equipment Cost

The proposed construction and maintenance equipment and their purchase costs are shown in Table 6-1-8. In the Project the supplementation cost or equipment cost supplemented is the difference between the purchase cost for newly supplied equipment and depreciated value.

This comes about because full depreciation of the supplied equipment would not be completed within the Project Period of 5 years.

Table 6-1-7 REQUIRED NUMBER OF EQUIPMENT

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

EQUIPMENT NAME	WORKABLE	EXISTING	(1988)	(1989)	(1990)	(1991)	(1992)
Bulldozer	250	0	0.11	0.27	0.24	0.25	0.21
Bulldozer/Ripper	250	0	0.11	0.24	0.28	0.26	0.24
Swamp Bulldozer	250	0	0.00	0.00	0.00	0.00	0.00
Motor Grader	250	0	0.24	0.59	0.58	0.56	0.49
Road Stabilizer	250	0	0.11	0.27	0.24	0.25	0.21
Hand-guide Vib. Roller	250	0	0.07	0.10	0.18	0.15	0.71
Tire Roller	250	0	0.15	0.23	0.22	0.33	0.13
Vibratory Roller (D&T)	250	0	0.20	0.51	0.49	0.49	0.42
Hydraulic Excavator; Wheel	250	0	0.00	0.00	0.00	0.00	0.00
Wheel Loader	250	0	0.26	0.64	0.63	0.63	0.55
Water Tank Truck	250	0	0.16	0.40	0.36	0.39	0.32
Dump Truck	250	0	1.31	3.27	3.35	3.11	2.80
Flat Bed Truck with Crane	250	0	0.05	0.08	0.21	0.37	0.54
Flat Bed Truck	250	0	0.36	0.70	0.67	0.81	0.70
Concrete Mixer	250	0	0.00	0.00	0.00	0.00	0.01
Water Pump	250	0	0.00	0.00	0.00	0.00	0.01
Concrete Vibrator	250	0	0.00	0.00	0.00	0.00	0.01
Asphalt Sprayer	250	1	0.15	0.23	0.22	0.33	0.13

NOTE WORKABLE : workable days in a year
EXISTING : number of existing equipment

Table 6-1-8 EQUIPMENT PURCHASE COST

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(1000 Rp)

EQUIPMENT NAME	CLASS	CIF (JAKARTA)	PURCHASE NO.	PURCHASE COST
Bulldozer	90 HP	49,150	1	49,150
Bulldozer/Ripper	90 HP	53,000	-	-
Swamp Bulldozer	90 HP	52,850	1	52,850
Swamp Bulldozer	65 HP	40,500	-	-
Motor Grader	75 HP	47,800	1	47,800
Road Stabilizer	W=1850 mm	85,950	1	85,950
Hand-guide Vib. Roller	1000 Kg	8,500	1	8,500
Tire Roller	8-15 ton	31,070	-	-
Vibratory Roller (D&T)	4 ton	29,000	1	29,000
Vibratory Roller	4 ton	29,000	-	-
Rough Terrain Crane	10 ton	100,400	-	-
Hydraulic Excavator; Wheel	0.3 m3	41,100	-	-
Wheel Loader	1.2 m3	70,200	1	70,200
Water Tank Truck	4000 ltr.	12,750	1	12,750
Dump Truck	3.0 ton	14,700	4	58,800
Dump Loader Truck	12 ton	56,300	-	-
Flat Bed Truck with Crane	3.0 ton	25,190	2	50,380
Flat Bed Truck	3.0 ton	11,275	1	11,275
Portable Crusher/Screening	30-40 t/h	188,000	-	-
Concrete Mixer	0.5 m3	18,000	-	-
Water Pump	200 l/min	630	-	-
Concrete Vibrator	3.3 HP	740	-	-
Asphalt Sprayer	850 ltr.	10,200	-	-
Service Car	3 ton	11,600	1	11,600
4 Wheel Drive Vehicle	70 HP	17,500	1	17,500
Motorcycle	100 cc	1,100	3	3,300

PURCHASE COST TOTAL	509,055
OWNERSHIP COST (FOREIGN)	181,231
EQUIPMENT COST SUPPLEMENTED	327,824

NOTE : OWNERSHIP COST (FOREIGN) for Existing Equipment

Asphalt Sprayer	1,583

6.1.5 Other Costs

Cost other items includes the costs of workshop equipment and tools, laboratory test equipment and survey equipment which are recommended in Sub-Clause 3.5. These total costs are summarized in Table 6-1-1.

6.1.6 Quantities by Work Type

The annual construction and maintenance quantities for all proposed road links are shown in Table 6-1-9.

Table 6-1-9 CONSTRUCTION QUANTITIES FOR ALL PROPOSED LINKS

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

ITEM	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
Site Clearance in Light Bush	m2	11400.00	22700.00	25200.00	33200.00	27550.00	120050.00
Subgrade Preparation	m2	0.00	0.00	0.00	24500.00	4900.00	29400.00
Normal Fill	m3	0.00	0.00	0.00	0.00	0.00	0.00
Fill in Swamp	m3	0.00	0.00	0.00	0.00	0.00	0.00
Normal Excavation to Spoil	m3	0.00	196.00	294.00	372.00	74.40	936.40
Cement Stabilizing	m3	1223.60	3267.00	2933.40	3626.50	2401.90	13452.40
Cement Stabilizing	m3	1862.00	4641.00	4144.00	3773.00	3853.50	18273.50
Shoulder	m2	22800.00	56200.00	66600.00	48900.00	51600.00	246100.00
Asphalt Patching	m2	0.00	0.00	285.60	71.40	0.00	357.00
Surface Dressing (Single)	m2	26600.00	39900.00	39200.00	50800.00	22050.00	186550.00
Surface Dressing (Double)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Earth Drain	m	0.00	0.00	0.00	0.00	0.00	0.00
Earth Drain in Swamp (by machine)	m3	0.00	0.00	0.00	0.00	0.00	0.00
Pipe Culvert D80cm	m	0.00	0.00	0.00	0.00	2.50	2.50
Masonry Culvert (80x80cm)	m	0.00	0.00	0.00	0.00	0.00	0.00
Retaining Wall and Wing Wall (Timber)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Retaining Wall and Wing Wall (Masonry)	m3	0.00	0.00	0.00	0.00	0.00	0.00
Gabion Protection	m3	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber;Span 3m;10T)	m2	51.20	76.80	0.00	0.00	431.00	559.00
Superstructure (Timber;Span 5m;10T)	m2	0.00	0.00	28.80	575.20	25.60	629.60
Superstructure (Timber;Span 8m;10T)	m2	0.00	0.00	281.60	70.40	106.00	458.00
Superstructure (Timber;Span 3m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber;Span 5m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber;Span 8m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete;Span10m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete;Span15m;BM50)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Pier;for Timber;10T)	NO	2.80	4.20	6.40	29.10	24.80	67.30
Substructure (Abut;for Timber;10T)	NO	4.00	6.00	9.60	7.40	43.60	70.60
Substructure (Pier;for Timber;BM50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Abut;for Timber;BM50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Pier;for Concrete;BM50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Abut;for Concrete;BM50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Demolition of Bridge (Timber->Timber)	*m2*	*25.60*	*38.40*	*0.00*	*280.00*	*280.50*	*624.50*
Demolition of Bridge (Timber->Concrete)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Demolition of Bridge (Concrete)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Manual routine maintenance of road	Km	18.50	37.00	56.00	78.00	102.00	291.50
Routine maintenance of earth road	Km	0.50	1.00	1.00	1.00	1.00	4.50
Routine maintenance of gravel road	Km	11.00	22.00	22.00	44.00	44.00	143.00
Routine maintenance of asphalt road	Km	7.00	14.00	33.00	33.00	57.00	144.00
Maintenance of Timber Bridge (New)	m2	0.00	0.00	0.00	128.00	0.00	128.00
Maintenance of Concrete Bridge (New)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance of Timber Bridge (Exist)	m2	1437.93	2875.85	3434.85	4362.85	5919.85	18031.33
Maintenance of Concrete Bridge (Exist)	m2	0.00	0.00	0.00	0.00	0.00	0.00

6.2 Organization and Construction System

6.2.1 Organization

The Bupati as head of the Kabupaten has been authorized by Law No. 13, 1980 as an official responsible for the Local Road Development Project implementation. This means that the DPUK is considered as a responsible agency for the actual execution of the Project.

According to instruction letter dated June 24, 1982 Ref. No. 620/975-/BANGDA, the Project Manager appointed by the Bupati will be responsible for the operation and maintenance of the equipment. Accordingly the Equipment Coordinator appointed from the staff of the Regional Public Works (Kantor Wilayah) by Bina Marga as a coordinator between the Governor and the Bupati will be responsible for delivery, effectual utilization and maintenance of the equipment.

The standard organization of DPUK consists of a minimum of four sections, i.e. Road Section, Housing and City Planning Section, Irrigation Section and Administration Section. For execution of the Project it is strongly recommended that the structural organization of DPUK is established. It will be necessary not only to organize new sections but also to reorganize the current structure through a review of the roles and responsibilities of each inter-related section.

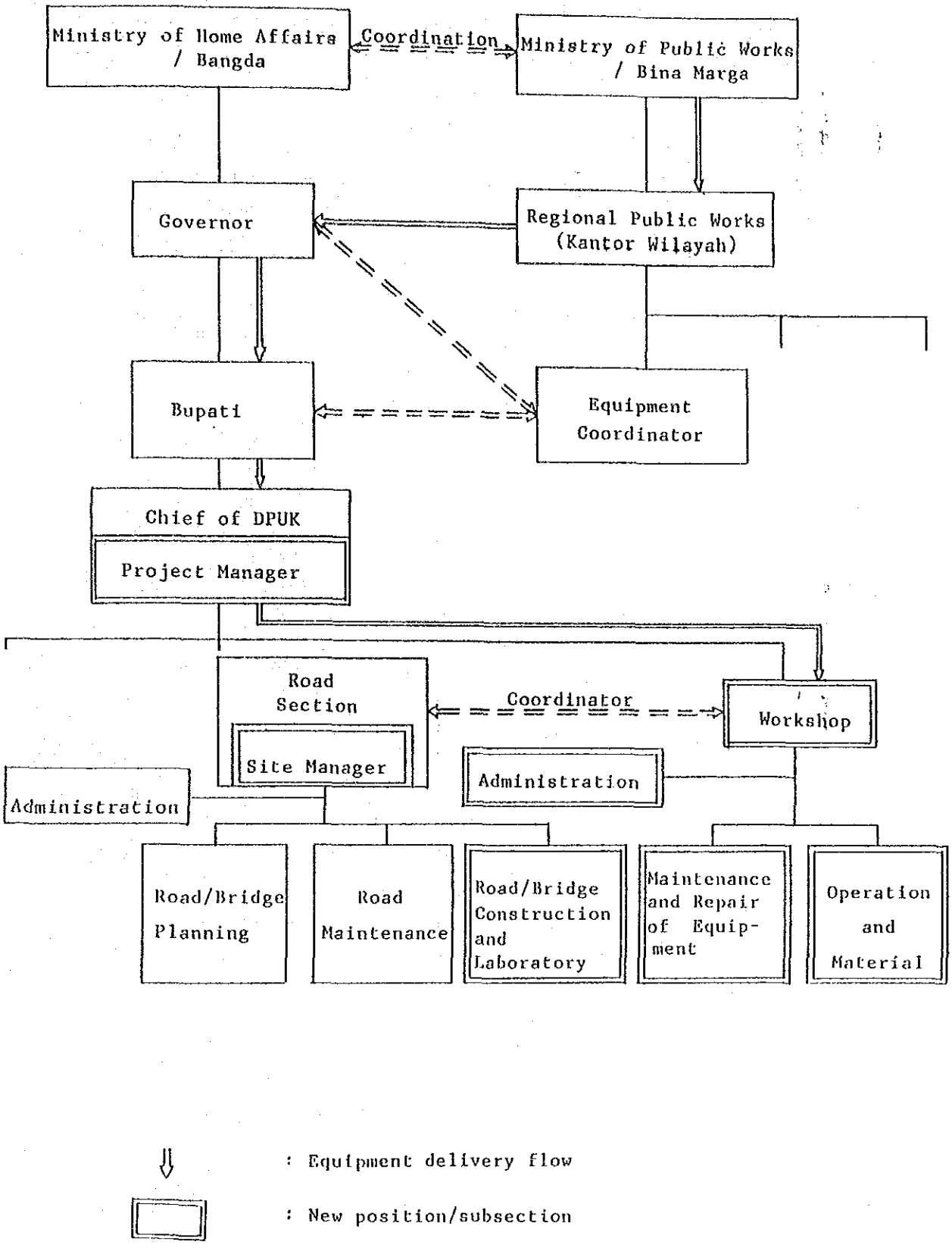
It is recommended that the workshop is newly organized to consist of three sub-sections, i.e. maintenance and repair of equipment, operation and materials, and administration to execute the main tasks described in Clause 3.5.

The sub-section of laboratory would be under the relevant Road Section. The proposed organization is shown in Fig. 6-2-1.

6.2.2 Construction System

For the construction of Kabupaten roads with a ten year effective design life, it has been recommended in Clause 3.4 that the equipment intensive method should be adopted for earth work and pavement work with the exception of surface dressing.

Fig. 6-2-1 PROPOSED ORGANIZATION



Current road construction in the Kabupatens is obliged to rely upon the traditional labour intensive method. It is therefore assumed that both the DPUK and the local contractors in the Kabupatens do not have sufficient experience and technique for the equipment intensive method of road construction.

For realization of the Local Road Development Project the GOI has ensured availability of the required human resources of DPUK and intends to conduct training programmes for those human resources as described in Clause 8.3 of the Main Report. This means that the GOI intends the Kabupatens to have the ability to execute the Project by force account (Swakelola).

It should be recognized from the experiences in the first local road project, which was assisted by OECF, ADB and IBRD, that because of their poor construction management and traditional labour intensive methods most of the road construction by local contractors could not be completed within the contract periods. Therefore execution of the road improvement by force account is desirable as recommended from their experience by the consultants for the first local road project.

It is strongly recommended that except for labourers the staff of the force account team should not be hired by the day as it would then not be able to consolidate the foundations for development of self reliability.

However, it will be very difficult to execute all the Projects by force account because of the need for many Kabupaten staff. The GOI has emphasized the need to promote the employment of local weak contractors in order to up-grade their capability in the road project schemes within the Fourth Five-Year Plan (REPELITA)

Taking into consideration the conditions mentioned above it is strongly recommended that the DPUK is obliged to lend some equipment with skilled operators to the local contractors in the Kabupatens for the execution of a part of the road improvement works.

The types of work executed only by force account are recommended as follows:

- Routine maintenance work for the Kabupaten roads
- Laboratory tests
- Production of crushed stone
- Technical service for the equipment

APPENDIX

INPUT DATA

Appendix A-1 FOR ESTIMATION OF THE PRODUCER'S SURPLUS BENEFIT

PRV. : KALIMANTAN SELATAN KAB. : BARITO KUALA SURVEY YEAR : 1984

Code No.	KECAMATAN NAME	CULTIVATED AREA : (PA)	YIELD RATE : (Y)	FARMER'S POPULATION : (AP)	CIRCULATED COMMODITY : (PG)
01	TABUNGANEN	5,435	1.91	5,140	0
02	TAMBAN	11,065	2.11	16,667	0
03	ANJIR PASAR	9,335	2.17	5,530	0
04	ANJIR MUARA	7,327	2.17	5,608	0
05	ALALAK	2,995	1.91	7,554	0
06	SEI PUNTIK	7,212	1.97	6,309	0
07	RANTAU BADUAH	6,789	2.22	9,424	0
08	BELAWANG	14,075	2.25	8,957	0
09	CERBON	3,152	1.96	2,180	0
10	BAKUMPAI	8,109	2.03	6,464	0
11	KURIPAN	16	1.66	1,480	0
12	TABUKAN	4,589	1.91	2,648	0

	r_1	r_2	r_3	r_4
ANNUAL % AVERAGE GROWTH RATE	3.6	3.6	5.0	5.1

FARMER'S CONSUMPTION : (Cp)	NON-AGRO REQUIRMENT : (NG)
0.108 Ton/head/year	0.011 Ton/ton

	SEDAN	BUS	TRUCK	MOTOR CYCLE
RATE OF EACH VEHICLE TYPE %	0.22	0.0	0.0	99.78

AVERAGE FREIGHT TONAGE	0.3 Ton/Truck

Appendix A-2 Engineering Data

ROAD LINK DATA

PROVINCE : Kalimantan Selatan

KABUPATEN: Barito Kuala

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
01	Marabahan	Rumpiang	4	Cerbon	4	1
02	Marabahan	Ulu Benteng	3	Cerbon	3	9
03	Marabahan	Barambai Muara	14	Cerbon	14	3
04	Jl. Lima Desember		1	Cerbon	1	Dalam Kota
05	Pert.Jl.Lima Desember	Taman Makam Pahlawan	1	Cerbon	1	Dalam Kota
06	Jl. A.E.S Nasution		1	Cerbon	1	Dalam Kota
07	Jl.Kamboja		1	Cerbon	1	Dalam Kota
08	Jl. Ratu Jaleha		1	Cerbon	1	Dalam Kota
09	Jl.Sukmaraga		1	Cerbon	1	Dalam Kota
10	Jl. Basuki Rahmat		1	Cerbon	1	Dalam Kota
11	Jl.Jend.A Yani		1	Cerbon	1	Dalam Kota
12	Jl.Lapangan		1	Cerbon	1	Dalam Kota
13	Kantor Koperasi	Simp.4Jl.Jend Sudirman	1	Cerbon	1	Dalam Kota
14	Jl.Keramat		1	Cerbon	1	Dalam Kota
15	Jl.Veteran		1	Cerbon	1	Dalam Kota
16	Sei Tarutan	Jl. Jend.Sudirman	1	Cerbon	1	Dalam Kota
17	Jl.Jend.Sudirman	Jl. Junjung Buih	1	Cerbon	1	Dalam Kota
18	Marabahan	Bedandan	5	Cerbon	5	
19	Dahirang	Suka Gunung	3	Cerbon	3	
20	Marabahan	Anjir Talaran	6	Cerbon		
21	Anjir Talaran	Tabukan Raya	19	Bakumpai Tabukan	8 11	
22	Lepasan	Benua Anyar	5	Cerbon	5	
23	Barambai Muara	Bambangin	10	Alalak	10	5
24	Bambangin	Sei.Punggu	7	Alalak	7	10

Please note the priority No. in the Remarks of this list for each links No, according to the each Kabupaten's development plan.

ROAD LINK DATA

PROVINCE : Kalimantan Selatan

KABUPATEN: Barito Kuala

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
25	Sei Seluang	Anjir Pasar (Km 14)	11	Anjir Pasar	7	
				Anjir Muara	2	
				Alalak	2	
26	Tamban Muara	Mekarsari	16	Tamban	16	4
27	Lepasan	Sei Gampa	16	Cerbon	16	
28	Sei Gampa	Sei Puntik Luar	22	Sei.Puntik L	7	6
				Rantau Baduah	15	
29	Tebing Rimbah	Kayu Tangi	13	Sei.Puntik Luar	13	
30	Jl. Empat Januari		1	Cerbon	1	Dalam Kota
31	Anjir Pasar (Km 18)	Anjir Muara (Km 25)	11	Anjir Pasar	7	
				Anjir Muara	4	

Please note the priority No. in the Remarks of this list for each links No. according to the each Kabupaten's development plan.

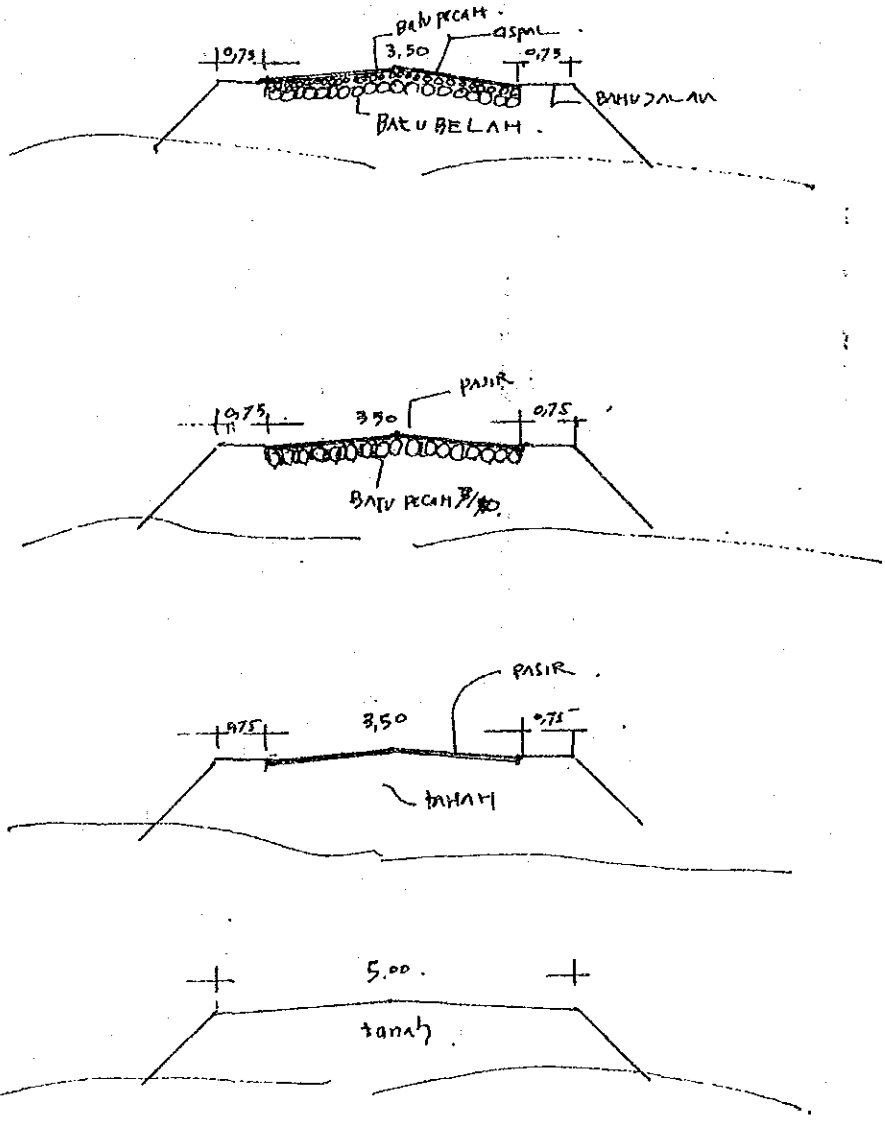
PROPINSI: Kalimantan Selatan

KABUPATEN: Barito Kuala

What Kind of Design Criteria has being applied for the new road construction and the improvement for the Kabupaten Road ?
Kriteria Perencanaan yang dipakai pada program penanganan jalan Kabupaten, baik untuk jalan lama maupun pembangunan baru.

Please draw the Typical Cross Section of the Kabupaten Road,
Buat gambar dan penjelasan dari: Typical cross section yang dipakai pada program penanganan jalan selama ini (baik untuk jalan lama, maupun pembangunan baru)

TYPICAL CROSS SECTION.



PROPINSI: Kalimantan Selatan

KABUPATEN: Barito Kuala

LOCATION AND COSTS OF THE KABUPATEN ROADS CONSTRUCTED OR INPROVED IN 1980/1981

Biaya konstruksi penanganan jalan dan jembatan Kabupaten thn. 1980/1981

LINK NO : Nomor Ruas	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) Lebar Jembatan	Type perkerasan Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
	Bambangin-Sei.Seluang	3	Earth	10	21.2929	
		3	Timber			
	Sei.Pantai-Sesi Puntik	3	Earth	11		
		3	Timber		26.752	
	Pelebaran jalan dalam Kota Marabahan	5	Gravel	1.8	26.644	
	Sei.Seluang-Sei.Punggu	3	Earth			

* PAVEMENT TYPE : Pls note the appropriate No. below.

1. : Asphalt surface / penetrasi macadam
2. : Asphalt seal / pelaburan aspal
3. : Gravel / kerikil
4. : Gravel /AWCAS / kerikil / japat

PROPINSI: Kalimantan Selatan E-03-(2)

KABUPATEN: Barito Kuala

LOCATION AND COSTS OF THE KABUPATEN ROADS CONSTRUCTED OR INPROVED IN 1981/1982

Biaya konstruksi penanganan jalan dan jembatan Kabupaten thn. 1981/1982

LINK NO. : Nomor Ruas	LOCATION From - To (dari - ke)	Lebar perkerasan(m) / Lebar jembatan	Type perkerasan / Type jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
	Jalan Veteran	5	Gravel	1.23	27.702	
		4	Timber			
	Marabahan-Talaran	5	Gravel	5.87	71.287	
		4	Timber			
	Lepasan-Bahalayung	4	Gravel			
		3	Timber			
	Lepasan-Sei.Gampa	5	Gravel	16.75	108.674	
		3	Timber			
	Sei.Seluang-Anj.Pasar	3.5	Gravel	11	70.826	
		2	Timber			
	Marabahan-Barambai	5	Gravel	6.75	43,374	
		3	Timber			

* PAVEMENT TYPE : Pls note the appropriate No. below.

1. : Asphalt surface / penetrasi macadam
2. : Asphalt seal / pelaburan aspal
3. : Gravel / kerikil
4. : Gravel /AWCAS / kerikil / japat

PROPINSI: Kalimantan Selatan E-03-(3)

KABUPATEN: Barito Kuala LOCATION AND COSTS OF THE KABUPATEN ROADS CONSTRUCTED OR INPROVED IN 1982/1983

Biaya konstruksi penanganan jalan dan jembatan Kabupaten thn. 1982/1983

LINK NO : Nomor Ruas	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) / Lebar Jembatan	Type perkerasan / Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
	Marabahan-Dahirang	5	Gravel	4.145	71.447	
		3	Timber			
	Bahalayung-Benua Hanyar	3.5	Gravel	2.7	55.475	
		3	Timber			
	Tamban Muara-Mekar Sari	5	Gravel	13.2	55.990	
		3	Timber			
	Pengaspalan dalam kota Marabahan	3.5	Macadam	1.6	60.800	

* PAVEMENT TYPE : Pls note the appropriate No. below.

1. : Asphalt surface / penetrasi macadam
2. : Asphalt seal / pelaburan aspal
3. : Gravel / kerikil
4. : Gravel /AWCAS / kerikil / japat

PROPINSI: Kalimantan Selatan

E-03-(4)

KABUPATEN: Barito Kuala

LOCATION AND COSTS OF THE KABUPATEN ROADS CONSTRUCTED OR INPROVED IN 1983/1984

Biaya konstruksi penanganan jalan dan jembatan Kabupaten thn. 1983/1984

LINK NO Nomor Ruas	LOCATION From - To (dari - ke)	Lebar perkerasan(m) / Lebar jembatan	Type perkerasan / Type jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
	Jend.Sudirman-Junjungbuih	5	Earth	0.650	13.345	
		4	Timber			
	Sei.Tarutan-Jend.Sudirman	5	Earth	0.337	17.227	
		4	Timber			
	Barambai Muara-Hdl.Barambai	5	Earth	5.580	88.896	
		4	Timber			
	Pengaspalan dalam kota Marabahan	3.5	Macadam	7	29.450	
	Kec.Bakumpai-Kec.Tabukan	5	Gravel	8	114.000	
		3	Timber			
	Marabahan-Anjir Talaran	5	Gravel	6	55.100	
		3	Timber			
	Kec.Cerbon - Kec.Rt Badauh	5	Gravel	6	73.150	
		3	Timber			

* PAVEMENT TYPE : Pls note the appropriate No. below.

1. : Asphalt surface / penetrasi macadam
2. : Asphalt seal / pelaburan aspal
3. : Gravel / kerikil
4. : Gravel /AWCAS / kerikil / japat

PROPINSI: Kalimantan Selatan

E-03-(5)

KABUPATEN: Barito Kuala

LOCATION AND COSTS OF THE KABUPATEN ROADS CONSTRUCTED OR INPROVED IN 1984/1985

Biaya konstruksi penanganan jalan dan jembatan Kabupaten thn. 1984/1985

LINK NO Nomor Ruas	LOCATION From - To (dari - ke)	Lebar perkerasan(m) / Lebar Jembatan	Type perkerasan / Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
	Dahirang-Saka Gunung	5 / 4	Earth	3.1	39.771	
	Hdl.Barabai-Bambangin	5 / 3	Earth	3.52	50.693	
	Marabahan-Rumpiyang	5 / 4	Gravel	3.12	65.265	
	Marabahan-Barambi	3.5	Macadam	2.75	86.968	
	Marabahan-Barambi	3.5	Macadam	3.88	107.267	
	Jl.Veteran	3.5	Macadam	1.23	39.275	
	Jl.Junjung Buih	3.5	Macadam	1.50	41.195	
	Jl.Sukma Raga	5	Gravel	0.29	10.295	

* PAVEMENT TYPE : Pls note the appropriate No. below.

1. : Asphalt surface / penetrasi macadam
2. : Asphalt seal / pelaburan aspal
3. : Gravel / kerikil
4. : Gravel /AWCAS / kerikil / japat

PROPINSI : Kalimantan Selatan

KABUPATEN: Barito Kuala

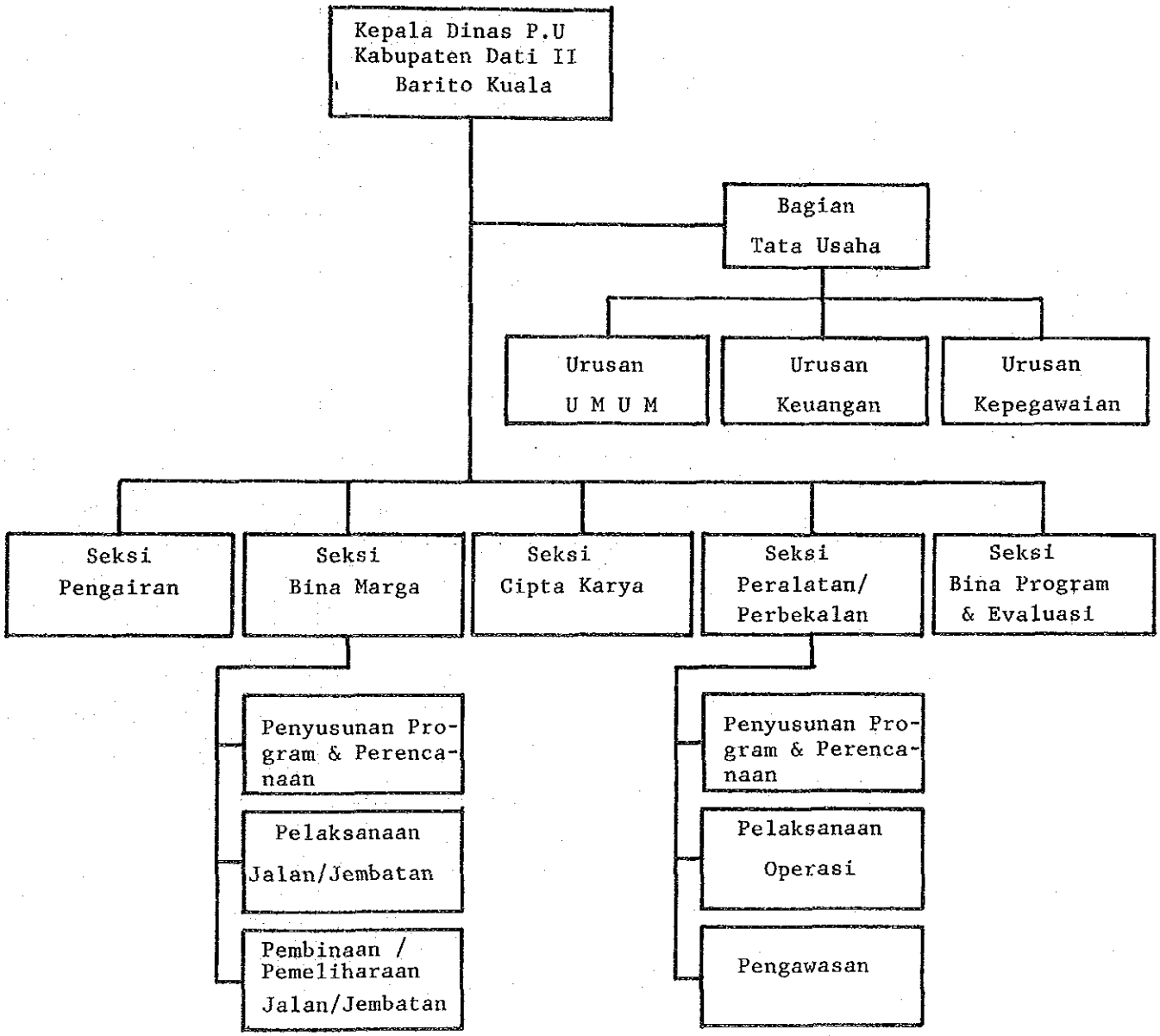
E-04

EXISTING ORGANIZATION IN KABUPATEN

Structur Organisasi yang ada dari P.U Kabupaten

Please draw the Cart of the Existing Organization in the Kabupaten.

Harap digambar bagan organisasi dari DPUK.



EXISTING STAFF RESOURCES OF BINA MARGA OF PU KABUPATEN

Tenaga Dinas PUK yang ada

PROPINSI: Kalimantan Selatan

KABUPATEN: Barito Kuala

DESCRIPTION /Uraian	NUMBER / Jumlah	REMARKS Keterangan
CONTROLING STAFF Staff teknis PUK	———	———
DPUK ENGINEED Sarjana Teknik		
ASSISTANT ENGINEER Sarjana Muda Teknik	1	
TECHNICIAN STAFF Staff Teknik (STM)	8	5
ADMINISTRATION Tenaga Administrasi	2	
SUPERVISOR Tenaga Pengawas	2	
WORKING FORCE Tenaga Pelaksana Lapangan	———	———
OPERATORS Operators	1	
DRIVERS Supir	1	
MECHANICS Mechanic		
TRADESMAN Tukang		
L A B O U R Buruh / Pekerja		
OTHERS Lain-lain		
TOTAL / JUMLAH	15	

Catatan ; Untuk kolom keterangan harap diisi berapa orang yang telah mendapat Training.

LOCATION AND AREA OF DPUK WORKSHOP E-06

Lokasi Workshop DPUK

PROPINSI : Kalimantan Selatan

KABUPATEN: Barito Kuala

LOCATION Lokasi	AREA (m2) Luas	NUMBER Jumlah	REMARKS Keterangan
Halaman Mess Pemda	200	1	

PROPINSI: Kalimantan Selatan

KABUPATEN: Barito Kuala

E-07

LAND ACQUISITION COST

Daftar harga pembebasan tanah

DESCRIPTION Uraian	UNIT Satuan	RATE (RP) Harga	REMARKS Keterangan
CITY/kota	M2	3.500	
VILLAGE / desa	M2	500	
RICE FIELD/sawah	M2	200	
DRY FIELD/ladang	M2	250	
MIX CROPS/panen	M2	250	
FOREST/hutan	M2	50	
SWAMP / rawa	M2	25	
OTHERS / lain-lain	M2		

PROPINSI: Kalimantan Selatan E-08

KABUPATEN: Barito Kuala

Classification of local contractors at Kabupaten level.

Klasifikasi kontraktor di Kabupaten

COMPANY NAME Nama Kontraktor	CLASS Kelas	CAPITAL Modal (Rp)	NUMBER OF EMPLOYEE Jumlah pegawai	REMARKS Keterangan
1	B2	104.530.500	32	
1	C1	42.725.000	25	
5	C2	28.915.000	9	
83	C3	20.594.000	7	

NOTE: DATI II

PROPINSI: Kalimantan Selatan

KABUPATEN: Barito Kuala

E-09

LIST OF EXISTING EQUIPMENT OF LOCAL CONTRACTOR

Name of contractor

NAME OF EQUIPMENT Jenis peralatan	EXISTING CONDITION/ Kondisi Peralatan						REQUIRE - MENT / Ke-butuhan peralatan baru
	TYPE/ Tipe	P.Y	NUMBER / Jumlah			REASON OF BAD CONDITION/Sebab Kerusakan	
			GOOD Baik	BAD Rusak	TOTAL Jumlah		
Bulldozer							2
Motor Grader							1
Tyre Roller							2
Steel Whell Roller			12		12		5
Vibration Roller							6
Wheel Loader							2
Front End Loader and Backhoe							1
Mobile Crane							2
Concrete Mixer							2
Stone Crusher							2
Portable Compressor							2
Hydraulic Excavator							2
Asphalt Paving Machine							2
Asphalt Sprayer							2
Asphalt Mixing Machine							2
Mobile Workshop							3
Mechanic Rammer							1
Plate Tamper							3
Pile Driver							3
Leg Drill							5
Hand Hammer			6				10
Farm Tractor			85				17
Dump Truck			47				13
Water Tank Truck			13				20
Fuel Tank Truck			23				15
Pick Up			20				14
Jeep							16
Motorcycle			69				43
Generator			13				15
Water Pump			27				5
Others							

PROPINSI: Kalimantan Selatan

KABUPATEN: Barito Kuala

LIST OF EXISTING EQUIPMENT OF P.U KABUPATEN

NAME OF EQUIPMENT Jenis peralatan	EXISTING CONDITION/ Kondisi Peralatan						REQUIRE - MENT / Kebutuhan peralatan baru
	TYPE/ Tipe	P.Y	NUMBER / Jumlah			REASON OF BAD CONDITION/Sebab Kerusakan	
			GOOD Baik	BAD Rusak	TOTAL Jumlah		
Bulldozer							1
Motor Grader							1
Tyre Roller							1
Steel Whell Roller	MEB I	1982	2		2		
Vibration Roller							1
Wheel Loader							1
Front End Loader and Backhoe							1
Mobile Crane							1
Concrete Mixer							1
Stone Crusher							1
Portable Compressor							1
Hydraulic Excavator							2
Asphalt Paving Machine							1
Asphalt Sprayer	ESGD-3K	1984	1		1		
Asphalt Mixing Machine							1
Mobile Workshop							2
Mechanic Rammer							2
Plate Tamper							1
Pile Driver							2
Leg Drill							1
Hand Hammer							2
Farm Tractor							1
Dump Truck							2
Water Tank Truck							1
Fuel Tank Truck							1
Pick Up	L.300	1980	1		1		2
Jeep							1
Motorcycle	Honda	~~1982~~ 1984	2		2		
Generator							3
Water Pump							2
Others	GE36-D		4		4		

Appendix A-3 CONSTRUCTION AND MAINTENANCE COST FOR PROPOSED ROAD LINKS

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 31 (IIIB-2) LENGTH : 11 Km

UPGRADE : 6.5m road bed, 3.5m road with surface Base Cource

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	16500.0	195	91	3,217,500	1,501,500	4,719,000
Subgrade Preparation	m2	0.0	25	11	0	0	0
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	0.0	1,186	522	0	0	0
Cement Stabilizing	m3	1241.8	18,284	12,366	22,705,071	15,356,098	38,061,169
Cement Stabilizing	m3	2310.0	18,284	12,366	42,236,040	28,565,460	70,801,500
Shoulder	m2	33000.0	352	146	11,616,000	4,818,000	16,434,000
Asphalt Patching	m2	0.0	7,064	1,038	0	0	0
Surface Dressing (Single)	m2	0.0	1,037	554	0	0	0
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	0.0	69,587	49,969	0	0	0
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	69,081,327	3,872,579	72,953,906
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		148,855,938	54,113,637	202,969,575
Overhead (15%)					22,328,390	8,117,045	30,445,435
			TOTAL COST		171,184,328	62,230,682	233,415,010
Manual routine maintenance of road	Km	11.0	161,812	7,248	1,779,932	79,728	1,859,660
Routine maintenance of gravel road	Km	11.0	578,767	42,642	6,366,437	469,062	6,835,499
			Sub Total		8,146,369	548,790	8,695,159
Maintenance of Timber Bridge (New)	m2	280.0	11,523	1,010	3,226,440	282,800	3,509,240
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	827.0	10,472	2,349	8,660,344	1,942,623	10,602,967
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	13,592,547
Timber Bridge	Unit Cost	(Rp/m2)	:	299,632
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	19,030,584
Maintenance Rate without Bridge		(%)	:	5.82
New Bridge Cost Rate		(%)	:	35.94

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 28 (IIIB-2) LENGTH : 22 Km

UPGRADE : 6.0m road bed, 3.5m road with surface Base Cource

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	COST TOTAL
Site Clearance in Light Bush	m2	14000.0	195	91	2,730,000	1,274,000	4,004,000
Subgrade Preparation	m2	0.0	25	11	0	0	0
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	490.0	1,186	522	581,140	255,780	836,920
Cement Stabilizing	m3	3579.0	18,284	12,366	65,438,436	44,257,914	109,696,350
Cement Stabilizing	m3	4620.0	18,284	12,366	84,472,080	57,130,920	141,603,000
Shoulder	m2	55000.0	352	146	19,360,000	8,030,000	27,390,000
Asphalt Patching	m2	0.0	7,064	1,038	0	0	0
Surface Dressing (Single)	m2	0.0	1,037	554	0	0	0
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	0.0	69,587	49,969	0	0	0
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		172,581,656	110,948,614	283,530,270
Overhead (15%)					25,887,248	16,642,292	42,529,540
			TOTAL COST		198,468,904	127,590,906	326,059,810
Manual routine maintenance of road	Km	22.0	161,812	7,248	3,559,864	159,456	3,719,320
Routine maintenance of gravel road	Km	22.0	578,767	42,642	12,732,874	938,124	13,670,998
			Sub Total		16,292,738	1,097,580	17,390,318
Maintenance of Timber Bridge (New)	m2	0.0	11,523	1,010	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	928.0	10,472	2,349	9,718,016	2,179,872	11,897,888
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	14,820,900
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	54,848,175
Maintenance Rate without Bridge		(%)	:	5.33
New Bridge Cost Rate		(%)	:	

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 25 (IIIB-1) LENGTH : 11 Km

UPGRADE : 6.5m road bed, 3.5m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	16500.0	195	91	3,217,500	1,501,500	4,719,000
Subgrade Preparation	m2	0.0	25	11	0	0	0
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	0.0	1,186	522	0	0	0
Cement Stabilizing	m3	1536.2	18,284	12,366	28,087,880	18,996,649	47,084,529
Cement Stabilizing	m3	2695.0	18,284	12,366	49,275,380	33,326,370	82,601,750
Shoulder	m2	33000.0	352	146	11,616,000	4,818,000	16,434,000
Asphalt Patching	m2	0.0	7,064	1,038	0	0	0
Surface Dressing (Single)	m2	38500.0	1,037	554	39,924,500	21,329,000	61,253,500
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	5.0	69,587	49,969	347,935	249,845	597,780
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	130,211,095	7,284,994	137,496,089
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		262,680,290	87,506,358	350,186,648
Overhead (15%)					39,402,043	13,125,953	52,527,996
			TOTAL COST		302,082,333	100,632,311	402,714,644
Manual routine maintenance of road	Km	11.0	161,812	7,248	1,779,932	79,728	1,859,660
Routine maintenance of asphalt road	Km	11.0	706,400	103,800	7,770,400	1,141,800	8,912,200
			Sub Total		9,550,332	1,221,528	10,771,860
Maintenance of Timber Bridge (New)	m2	514.0	11,523	1,010	5,922,822	519,140	6,441,962
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	10,472	2,349	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	22,235,831
Timber Bridge	Unit Cost	(Rp/m2)	:	307,627
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	49,479,520
Maintenance Rate without Bridge		(%)	:	4.40
New Bridge Cost Rate		(%)	:	39.26

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 24 (IIIB-1) LENGTH : 7 Km

UPGRADE : 7.0m road bed, 4.0m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	COST TOTAL
Site Clearance in Light Bush	m2	28000.0	195	91	5,460,000	2,548,000	8,008,000
Subgrade Preparation	m2	49000.0	25	11	1,225,000	539,000	1,764,000
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	744.0	1,186	522	882,384	388,368	1,270,752
Cement Stabilizing	m3	3920.0	18,284	12,366	71,673,280	48,474,720	120,148,000
Cement Stabilizing	m3	1960.0	18,284	12,366	35,836,640	24,237,360	60,074,000
Shoulder	m2	21000.0	352	146	7,392,000	3,066,000	10,458,000
Asphalt Patching	m2	0.0	7,064	1,038	0	0	0
Surface Dressing (Single)	m2	28000.0	1,037	554	29,036,000	15,512,000	44,548,000
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	0.0	69,587	49,969	0	0	0
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	38,761,897	2,008,685	40,770,582
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		190,267,201	96,774,133	287,041,334
Overhead (15%)					28,540,080	14,516,119	43,056,199
			TOTAL COST		218,807,281	111,290,252	330,097,533
Manual routine maintenance of road	Km	7.0	161,812	7,248	1,132,684	50,736	1,183,420
Routine maintenance of asphalt road	Km	7.0	706,400	103,800	4,944,800	726,600	5,671,400
			Sub Total		6,077,484	777,336	6,854,820
Maintenance of Timber Bridge (New)	m2	256.0	11,523	1,010	2,949,888	259,560	3,209,448
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	777.0	10,472	2,349	8,136,744	1,825,173	9,961,917
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Paveaent	Unit Cost	(Rp/Km)	:	40,458,766
Timber Bridge	Unit Cost	(Rp/m2)	:	183,149
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	96,118,400
Maintenance Rate without Bridge		(%)	:	2.42
New Bridge Cost Rate		(%)	:	14.20

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 23 (IIIB-1) LENGTH : 10 Km

UPGRADE : 6.5m road bed, 3.5m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	15000.0	195	91	2,925,000	1,365,000	4,290,000
Subgrade Preparation	m2	0.0	25	11	0	0	0
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	0.0	1,186	522	0	0	0
Cement Stabilizing	m3	1470.0	18,284	12,366	26,877,480	18,178,020	45,055,500
Cement Stabilizing	m3	2450.0	18,284	12,366	44,795,800	30,296,700	75,092,500
Shoulder	m2	30000.0	352	146	10,560,000	4,380,000	14,940,000
Asphalt Patching	m2	0.0	7,064	1,038	0	0	0
Surface Dressing (Single)	m2	35000.0	1,037	554	36,295,000	19,390,000	55,685,000
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	0.0	69,587	49,969	0	0	0
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	51,048,125	2,496,993	53,545,118
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		172,501,405	76,106,713	248,608,118
Overhead (15%)					25,875,210	11,416,006	37,291,216
			TOTAL COST		198,376,615	87,522,719	285,899,334
Manual routine maintenance of road	Km	10.0	161,812	7,248	1,618,120	72,480	1,690,600
Routine maintenance of asphalt road	Km	10.0	706,400	103,800	7,064,000	1,038,000	8,102,000
			Sub Total		8,682,120	1,110,480	9,792,600
Maintenance of Timber Bridge (New)	m2	440.0	11,523	1,010	5,070,120	444,400	5,514,520
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	1126.0	10,472	2,349	11,791,472	2,644,974	14,436,446
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	22,432,245
Timber Bridge	Unit Cost	(Rp/m2)	:	139,947
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	46,557,350
Maintenance Rate without Bridge		(%)	:	4.37
New Bridge Cost Rate		(%)	:	21.54

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 21 (IIIB-1) LENGTH : 19 Km

UPGRADE : 6.5m road bed, 3.5m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	28500.0	195	91	5,557,500	2,593,500	8,151,000
Subgrade Preparation	m2	0.0	25	11	0	0	0
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	0.0	1,186	522	0	0	0
Cement Stabilizing	m3	3059.0	18,284	12,366	55,930,756	37,827,594	93,758,350
Cement Stabilizing	m3	4655.0	18,284	12,366	85,112,020	57,563,730	142,675,750
Shoulder	m2	57000.0	352	146	20,064,000	8,322,000	28,386,000
Asphalt Patching	m2	0.0	7,064	1,038	0	0	0
Surface Dressing (Single)	m2	66500.0	1,037	554	68,960,500	36,841,000	105,801,500
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	0.0	69,587	49,969	0	0	0
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	31,556,435	1,767,871	33,324,306
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		267,181,211	144,915,695	412,096,906
Overhead (15%)					40,077,181	21,737,354	61,814,535
			TOTAL COST		307,258,392	166,653,049	473,911,441
Manual routine maintenance of road	Km	19.0	161,812	7,248	3,074,428	137,712	3,212,140
Routine maintenance of asphalt road	Km	19.0	706,400	103,800	13,421,600	1,972,200	15,393,800
			Sub Total		16,496,028	2,109,912	18,605,940
Maintenance of Timber Bridge (New)	m2	128.0	11,523	1,010	1,474,944	129,280	1,604,224
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	559.0	10,472	2,349	5,853,848	1,313,091	7,166,939
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	22,925,710
Timber Bridge	Unit Cost	(Rp/m2)	:	299,398
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	94,165,995
Maintenance Rate without Bridge		(%)	:	4.27
New Bridge Cost Rate		(%)	:	8.09

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 3 (IIIB-1) LENGTH : 14 Km

UPGRADE : 6.5m road bed, 3.5m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	21000.0	195	91	4,095,000	1,911,000	6,006,000
Subgrade Preparation	m2	0.0	25	11	0	0	0
Normal Fill	m3	0.0	2,030	863	0	0	0
Fill in Swamp	m3	0.0	13,190	267	0	0	0
Normal Excavation to Spoil	m3	0.0	1,186	522	0	0	0
Cement Stabilizing	m3	982.5	18,284	12,366	17,964,030	12,149,595	30,113,625
Cement Stabilizing	m3	1715.0	18,284	12,366	31,357,060	21,207,690	52,564,750
Shoulder	m2	42000.0	352	146	14,784,000	6,132,000	20,916,000
Asphalt Patching	m2	357.0	7,064	1,038	2,521,848	370,566	2,892,414
Surface Dressing (Single)	m2	49000.0	1,037	554	50,813,000	27,146,000	77,959,000
Surface Dressing (Double)	m2	0.0	1,431	868	0	0	0
Earth Drain	m	0.0	995	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,431	474	0	0	0
Pipe Culvert D80cm	m	0.0	69,587	49,969	0	0	0
Masonry Culvert (80x80cm)	m	0.0	110,594	39,059	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	18,301	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	78,946	10,455	0	0	0
Gabion Protection	m3	0.0	23,430	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	62,081,540	3,219,476	65,301,016
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		183,616,478	72,136,327	255,752,805
Overhead (15%)					27,542,471	10,820,449	38,362,920
			TOTAL COST		211,158,949	82,956,776	294,115,725
Manual routine maintenance of road	Km	14.0	161,812	7,248	2,265,368	101,472	2,366,840
Routine maintenance of asphalt road	Km	14.0	706,400	103,800	9,889,600	1,453,200	11,342,800
			Sub Total		12,154,968	1,554,672	13,709,640
Maintenance of Timber Bridge (New)	m2	388.0	11,523	1,010	4,470,924	391,880	4,862,804
Maintenance of Concrete Bridge (New)	m2	0.0	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	431.0	10,472	2,349	4,513,432	1,012,419	5,525,851
Maintenance of Concrete Bridge (Exist)	m2	0.0	5,333	2,456	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	15,644,254
Timber Bridge	Unit Cost	(Rp/m2)	:	193,547
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	31,592,487
Maintenance	Rate without Bridge	(%)	:	6.26
New Bridge	Cost Rate	(%)	:	25.53

Appendix A-4 CONSTRUCTION AND MAINTENANCE QUANTITIES
FOR ALL PROPOSED ROAD LINKS
(CONSTRUCTION)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

I T E M	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :							
Bulldozer	hr	154.2	395.3	353.8	369.9	312.6	1585.8
Bulldozer/Ripper	hr	152.0	352.5	410.8	379.0	354.5	1648.8
Swamp Bulldozer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader	hr	345.3	874.0	863.8	829.9	733.2	3646.2
Road Stabilizer	hr	154.2	395.3	353.8	369.9	312.6	1585.8
Hand-guide Vib. Roller	hr	97.1	145.6	268.1	220.1	1060.9	1791.8
Tire Roller	hr	221.6	332.4	326.6	489.9	183.7	1554.2
Vibratory Roller (D&T)	hr	299.7	761.6	730.6	732.1	630.0	3154.0
Hydraulic Excavator; Wheel	hr	0.0	0.0	0.0	0.0	0.0	0.0
Wheel Loader	hr	383.3	945.5	941.6	933.8	823.6	4027.8
Water Tank Truck	hr	231.3	593.0	530.8	573.1	472.7	2400.9
Dump Truck	hr	1958.8	4896.5	5013.9	4657.9	4192.0	20719.1
Flat Bed Truck with Crane	hr	72.6	109.1	311.0	544.8	798.3	1835.8
Flat Bed Truck	hr	529.6	1040.5	997.9	1212.6	1043.3	4823.9
Concrete Mixer	hr	0.0	0.0	0.0	0.0	0.4	0.4
Water Pump	hr	0.0	0.0	0.0	0.0	0.4	0.4
Concrete Vibrator	hr	0.0	0.0	0.0	0.0	0.4	0.4
Asphalt Sprayer	hr	221.6	332.4	326.6	489.9	183.7	1554.2
LABOUR :							
Handur	man day	276.0	539.8	811.6	1108.2	1457.5	4193.1
Skilled Labourer	man day	782.5	1173.7	2981.3	5117.3	7221.4	17276.2
Carpenter	man day	348.0	522.0	1487.6	2606.4	3809.5	8773.5
Mason	man day	0.0	0.0	0.0	0.0	0.0	0.0
Labourer	man day	1801.3	3653.3	4623.0	5584.9	6395.5	22058.0
Driver	man day	523.9	1194.2	1248.0	1310.2	1277.8	5554.1
Operator	man day	337.4	779.6	801.7	799.0	811.2	3528.9
MATERIAL :							
Bitumen	l	45441.6	68162.4	67352.1	100546.2	37668.7	319171.0
Asphalt Oil	l	9088.3	13632.5	13393.3	20090.0	7533.7	63737.8
Kerosene	l	10861.6	16292.4	16049.4	24020.6	9003.7	76227.7
Sand	m3	3348.1	8301.8	7580.9	7974.4	7782.3	34987.5
Cement	bag	5939.7	15222.8	13623.9	14244.0	12047.7	61078.1
River Stone	m3	0.0	0.0	0.0	0.0	0.0	0.0
Steel Moulds	set	0.0	0.0	0.0	0.0	2.5	2.5
Timber	m3	31.5	47.4	135.1	236.7	346.0	796.7
Paint	l	233.9	350.8	879.2	1457.1	2551.6	5472.6
Reinforcing Steel	kg	0.0	0.0	0.0	0.0	79.7	79.7
Tying Wire	kg	0.0	0.0	0.0	0.0	0.7	0.7
BaseCourse Material	m3	0.0	0.0	42.8	10.7	0.0	53.5
Crushed Stone	m3	443.3	665.0	657.5	981.0	368.2	3115.0

CONSTRUCTION AND MAINTENANCE QUANTITIES
FOR ALL PROPOSED ROAD LINKS
(MAINTENANCE)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

ITEM	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :							
Bulldozer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Bulldozer/Ripper	hr	0.0	0.0	0.0	0.0	0.0	0.0
Swamp Bulldozer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader	hr	51.5	103.0	103.0	202.0	202.0	661.5
Road Stabilizer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Hand-guide Vib. Roller	hr	105.0	210.0	495.0	495.0	855.0	2160.0
Tire Roller	hr	51.5	103.0	103.0	202.0	202.0	661.5
Vibratory Roller (D&T)	hr	0.0	0.0	0.0	0.0	0.0	0.0
Hydraulic Excavator; Wheel	hr	0.0	0.0	0.0	0.0	0.0	0.0
Wheel Loader	hr	0.0	0.0	0.0	0.0	0.0	0.0
Water Tank Truck	hr	0.0	0.0	0.0	0.0	0.0	0.0
Dump Truck	hr	210.0	420.0	990.0	990.0	1710.0	4320.0
Flat Bed Truck with Crane	hr	1658.1	3316.2	3960.8	5070.1	6826.3	20831.5
Flat Bed Truck	hr	273.5	547.0	775.0	1138.0	1426.0	4159.5
Concrete Mixer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Water Pump	hr	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Vibrator	hr	0.0	0.0	0.0	0.0	0.0	0.0
Asphalt Sprayer	hr	0.0	0.0	0.0	0.0	0.0	0.0
LABOUR :							
Mandor	man day	180.4	360.9	556.3	712.6	985.5	2795.7
Skilled Labourer	man day	530.3	1060.6	1429.5	1808.5	2465.0	7293.9
Carpenter	man day	247.1	494.2	590.3	793.8	1017.4	3142.8
Mason	man day	0.0	0.0	0.0	0.0	0.0	0.0
Labourer	man day	1617.2	3234.5	5397.0	6815.6	9624.3	26688.6
Driver	man day	435.4	871.0	1142.0	1443.6	1984.0	5876.0
Operator	man day	17.1	34.3	34.3	67.3	67.3	220.3
MATERIAL :							
Bitumen	l	945.0	1890.0	4455.0	4455.0	7695.0	19440.0
Asphalt Oil	l	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene	l	105.0	210.0	495.0	495.0	855.0	2160.0
Sand	m3	17.5	35.0	82.5	82.5	142.5	360.0
Cement	bag	0.0	0.0	0.0	0.0	0.0	0.0
River Stone	m3	0.0	0.0	0.0	0.0	0.0	0.0
Steel Moulds	set	0.0	0.0	0.0	0.0	0.0	0.0
Timber	m3	22.4	44.9	53.6	72.1	92.4	285.4
Paint	l	160.0	320.1	382.3	514.2	659.0	2035.6
Reinforcing Steel	kg	0.0	0.0	0.0	0.0	0.0	0.0
Tying Wire	kg	0.0	0.0	0.0	0.0	0.0	0.0
BaseCourse Material	m3	352.5	705.0	990.0	1485.0	1845.0	5377.5
Crushed Stone	m3	10.5	21.0	49.5	49.5	85.5	216.0

CONSTRUCTION AND MAINTENANCE QUANTITIES
FOR ALL PROPOSED ROAD LINKS
(TOTAL)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

I T E M	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :							
Bulldozer	hr	154.2	395.3	353.8	369.9	312.6	1585.8
Bulldozer/Ripper	hr	152.0	352.5	410.8	379.0	354.5	1648.8
Swamp Bulldozer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader	hr	396.8	977.0	966.8	1031.9	935.2	4307.7
Road Stabilizer	hr	154.2	395.3	353.8	369.9	312.6	1585.8
Hand-guide Vib. Roller	hr	202.1	355.6	763.1	715.1	1915.9	3951.8
Tire Roller	hr	273.1	435.4	429.6	691.9	385.7	2215.7
Vibratory Roller (D&T)	hr	299.7	761.6	730.6	732.1	630.0	3154.0
Hydraulic Excavator; Wheel	hr	0.0	0.0	0.0	0.0	0.0	0.0
Wheel Loader	hr	383.3	945.5	941.6	933.8	823.6	4027.8
Water Tank Truck	hr	231.3	593.0	530.8	573.1	472.7	2400.9
Dump Truck	hr	2168.8	5316.5	6003.9	5647.9	5902.0	25039.1
Flat Bed Truck with Crane	hr	1730.7	3425.3	4271.8	5614.9	7624.6	22667.3
Flat Bed Truck	hr	803.1	1587.5	1772.9	2350.6	2469.3	8983.4
Concrete Mixer	hr	0.0	0.0	0.0	0.0	0.4	0.4
Water Pump	hr	0.0	0.0	0.0	0.0	0.4	0.4
Concrete Vibrator	hr	0.0	0.0	0.0	0.0	0.4	0.4
Asphalt Sprayer	hr	221.6	332.4	326.6	489.9	183.7	1554.2
LABOUR :							
Mandor	man day	456.4	900.7	1367.9	1820.8	2443.0	6988.8
Skilled Labourer	man day	1312.8	2234.3	4410.8	6925.8	9686.4	24570.1
Carpenter	man day	595.1	1016.2	2077.9	3400.2	4826.9	11916.3
Mason	man day	0.0	0.0	0.0	0.0	0.0	0.0
Labourer	man day	3418.5	6887.8	10020.0	12400.5	16019.8	48746.6
Driver	man day	959.3	2065.2	2390.0	2753.8	3261.8	11430.1
Operator	man day	354.5	813.9	836.0	866.3	878.5	3749.2
MATERIAL :							
Bitumen	l	46306.6	70052.4	71807.1	105001.2	45363.7	338611.0
Asphalt Oil	l	9088.3	13832.3	13393.3	20090.0	7533.7	63737.8
Kerosene	l	10966.6	16502.4	16544.4	24515.6	9858.7	78387.7
Sand	m3	3365.6	8336.8	7663.4	8056.9	7924.8	35347.5
Cement	bag	5939.7	15222.8	13623.9	14244.0	12047.7	61078.1
River Stone	m3	0.0	0.0	0.0	0.0	0.0	0.0
Steel Moulds	set	0.0	0.0	0.0	0.0	2.5	2.5
Timber	m3	53.9	92.3	188.7	308.8	438.4	1082.1
Paint	l	393.9	670.9	1261.5	1971.3	3210.6	7508.2
Reinforcing Steel	kg	0.0	0.0	0.0	0.0	79.7	79.7
Tying Wire	kg	0.0	0.0	0.0	0.0	0.7	0.7
BaseCourse Material	m3	352.5	705.0	1032.8	1495.7	1845.0	5431.0
Crushed Stone	m3	453.8	686.0	707.0	1030.5	453.7	3331.0

Appendix A-5

CONSTRUCTION AND MAINTENANCE COSTS FOR ALL PROPOSED ROAD LINKS (CONSTRUCTION)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(1000 Rp)

I T E M	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :		41,716	99,009	99,968	101,859	89,533	432,085
Bulldozer	16743	2,581	6,618	5,923	6,193	5,233	26,548
Bulldozer/Ripper	18066	2,746	6,368	7,421	6,847	6,404	29,786
Swamp Bulldozer	13173	0	0	0	0	0	0
Motor Grader	15232	5,259	13,312	13,157	12,641	11,168	55,537
Road Stabilizer	12657	1,951	5,003	4,478	4,681	3,956	20,069
Hand-guide Vib. Roller	1677	162	244	449	369	1,779	3,003
Tire Roller	13104	2,903	4,355	4,279	6,419	2,407	20,363
Vibratory Roller (D&T)	7536	2,258	5,739	5,505	5,517	4,747	23,766
Hydraulic Excavator; Wheel	14757	0	0	0	0	0	0
Wheel Loader	18348	7,032	17,348	17,276	17,133	15,111	73,900
Water Tank Truck	4870	1,126	2,887	2,584	2,790	2,302	11,689
Dump Truck	6403	12,542	31,352	32,104	29,824	26,841	132,663
Flat Bed Truck with Crane	5955	432	649	1,852	3,244	4,753	10,930
Flat Bed Truck	4255	2,253	4,427	4,246	5,159	4,439	20,524
Concrete Mixer	8771	0	0	0	0	3	3
Water Pump	552	0	0	0	0	0	0
Concrete Vibrator	387	0	0	0	0	0	0
Asphalt Sprayer	2127	471	707	694	1,042	390	3,304
LABOUR :		10,572	20,322	31,634	44,389	56,927	163,844
Mandur	3000	828	1,619	2,434	3,324	4,372	12,577
Skilled Labourer	3000	2,347	3,521	8,943	15,351	21,664	51,826
Carpenter	3000	1,044	1,566	4,462	7,819	11,428	26,319
Mason	3000	0	0	0	0	0	0
Labourer	2000	3,602	7,306	9,246	11,169	12,791	44,114
Driver	3000	1,571	3,582	3,744	3,930	3,833	16,660
Operator	3500	1,180	2,728	2,805	2,796	2,839	12,348
MATERIAL :		112,561	241,437	243,212	297,128	260,323	1,154,661
Bitumen	300	13,632	20,448	20,205	30,163	11,300	95,748
Asphalt Oil	750	6,816	10,224	10,044	15,067	5,650	47,801
Kerosene	250	2,715	4,073	4,012	6,005	2,250	19,055
Sand	12500	41,851	103,772	94,761	99,680	97,278	437,342
Cement	5000	29,698	76,114	68,119	71,220	60,238	305,389
River Stone	17500	0	0	0	0	0	0
Steel Moulds	8000	0	0	0	0	20	20
Timber	200000	6,300	9,480	27,020	47,340	69,200	159,340
Paint	2000	467	701	1,758	2,914	5,103	10,943
Reinforcing Steel	1000	0	0	0	0	79	79
Tying Wire	1200	0	0	0	0	0	0
BaseCourse Material	20000	0	0	856	214	0	1,070
Crushed Stone	25000	11,082	16,625	16,437	24,525	9,205	77,874

CONSTRUCTION AND MAINTENANCE COSTS
FOR ALL PROPOSED ROAD LINKS
(MAINTENANCE)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(1000 Rp)

I T E M	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :		14,014	28,032	36,968	47,925	64,822	191,761
Bulldozer	16743	0	0	0	0	0	0
Bulldozer/Ripper	18066	0	0	0	0	0	0
Swamp Bulldozer	13173	0	0	0	0	0	0
Motor Grader	15232	784	1,568	1,568	3,076	3,076	10,072
Road Stabilizer	12657	0	0	0	0	0	0
Hand-guide Vib. Roller	1677	176	352	830	830	1,433	3,621
Tire Roller	13104	674	1,349	1,349	2,647	2,647	8,666
Vibratory Roller (D&T)	7536	0	0	0	0	0	0
Hydraulic Excavator; Wheel	14757	0	0	0	0	0	0
Wheel Loader	18348	0	0	0	0	0	0
Water Tank Truck	4870	0	0	0	0	0	0
Dump Truck	6403	1,344	2,689	6,338	6,338	10,949	27,658
Flat Bed Truck with Crane	5955	9,873	19,747	23,586	30,192	40,650	124,048
Flat Bed Truck	4255	1,163	2,327	3,297	4,842	6,067	17,696
Concrete Mixer	8771	0	0	0	0	0	0
Water Pump	552	0	0	0	0	0	0
Concrete Vibrator	387	0	0	0	0	0	0
Asphalt Sprayer	2127	0	0	0	0	0	0
LABOUR :		7,471	14,947	22,066	28,139	38,838	111,461
Mandur	3000	541	1,082	1,668	2,137	2,956	8,384
Skilled Labourer	3000	1,590	3,181	4,288	5,425	7,395	21,879
Carpenter	3000	741	1,482	1,770	2,381	3,052	9,426
Mason	3000	0	0	0	0	0	0
Labourer	2000	3,234	6,469	10,794	13,631	19,248	53,376
Driver	3000	1,306	2,613	3,426	4,330	5,952	17,627
Operator	3500	59	120	120	235	235	769
MATERIAL :		12,639	25,301	35,011	48,875	63,137	184,963
Bitumen	300	283	567	1,336	1,336	2,308	5,830
Asphalt Oil	750	0	0	0	0	0	0
Kerosene	250	26	52	123	123	213	537
Sand	12500	218	437	1,031	1,031	1,781	4,498
Cement	5000	0	0	0	0	0	0
River Stone	17500	0	0	0	0	0	0
Steel Moulds	8000	0	0	0	0	0	0
Timber	200000	4,480	8,980	10,720	14,420	18,480	57,080
Paint	2000	320	640	764	1,028	1,318	4,070
Reinforcing Steel	1000	0	0	0	0	0	0
Tying Wire	1200	0	0	0	0	0	0
BaseCourse Material	20000	7,050	14,100	19,800	29,700	36,900	107,550
Crushed Stone	25000	262	525	1,237	1,237	2,137	5,398

CONSTRUCTION AND MAINTENANCE COSTS
FOR ALL PROPOSED ROAD LINKS
(TOTAL)

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

(1000 Rp)

ITEM	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :		55,730	127,041	136,936	149,784	154,355	623,846
Bulldozer	16743	2,581	6,618	5,923	6,193	5,233	26,548
Bulldozer/Ripper	18066	2,746	6,368	7,421	6,847	6,404	29,786
Swamp Bulldozer	13173	0	0	0	0	0	0
Motor Grader	15232	6,043	14,880	14,725	15,717	14,244	65,609
Road Stabilizer	12657	1,951	5,003	4,478	4,681	3,956	20,069
Hand-guide Vib. Roller	1677	338	596	1,279	1,199	3,212	6,624
Tire Roller	13104	3,577	5,704	5,628	9,066	5,054	29,029
Vibratory Roller (D&T)	7536	2,258	5,739	5,505	5,517	4,747	23,766
Hydraulic Excavator; Wheel	14757	0	0	0	0	0	0
Wheel Loader	18348	7,032	17,348	17,276	17,133	15,111	73,900
Water Tank Truck	4870	1,126	2,887	2,584	2,790	2,302	11,689
Dump Truck	6403	13,886	34,041	38,442	36,162	37,790	160,321
Flat Bed Truck with Crane	5955	10,305	20,396	25,438	33,436	45,403	134,978
Flat Bed Truck	4255	3,416	6,754	7,543	10,001	10,506	38,220
Concrete Mixer	8771	0	0	0	0	3	3
Water Pump	552	0	0	0	0	0	0
Concrete Vibrator	387	0	0	0	0	0	0
Asphalt Sprayer	2127	471	707	694	1,042	390	3,304
LABOUR :		18,043	35,269	53,700	72,528	95,765	275,305
Mandur	3000	1,369	2,701	4,102	5,461	7,328	20,961
Skilled Labourer	3000	3,937	6,702	13,231	20,776	29,059	73,705
Carpenter	3000	1,785	3,048	6,232	10,200	14,480	35,745
Mason	3000	0	0	0	0	0	0
Labourer	2000	6,836	13,775	20,040	24,800	32,039	97,490
Driver	3000	2,877	6,195	7,170	8,260	9,785	34,287
Operator	3500	1,239	2,848	2,925	3,031	3,074	13,117
MATERIAL :		125,200	266,738	278,223	346,003	323,460	1,339,624
Bitumen	300	13,915	21,015	21,541	31,499	13,608	101,578
Asphalt Oil	750	6,816	10,224	10,044	15,067	5,650	47,801
Kerosene	250	2,741	4,125	4,135	6,128	2,463	19,592
Sand	12500	42,069	104,209	95,792	100,711	97,059	441,840
Cement	5000	29,698	76,114	68,119	71,220	60,238	305,389
River Stone	17500	0	0	0	0	0	0
Steel Moulds	8000	0	0	0	0	20	20
Timber	200000	10,780	18,460	37,740	61,760	87,680	216,420
Paint	2000	787	1,341	2,522	3,942	6,421	15,013
Reinforcing Steel	1000	0	0	0	0	79	79
Tying Wire	1200	0	0	0	0	0	0
BaseCourse Material	20000	7,050	14,100	20,656	29,914	36,900	108,620
Crushed Stone	25000	11,344	17,150	17,674	25,762	11,342	83,272

Appendix A-6 QUANTITIES OF BRIDGE ON PROPOSED ROAD LINKS

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO	BRIDGE NAME	Km	From	<< TYPE >> (EXIST)	(NEW)	DESIGN LOAD	SPAN CLASS	LENGTH (m)	SPAN NO (no)	SPAN LENGTH (m)	WIDTH (m)	AREA (EXIST) (m2)	AREA (NEW) (m2)	PIER (no)	ABUT (no)	ROAD CLASS
31	N.I	8	AP14	KK				7.00	4	1.75	4.00	28.00		3	2	IIIB-2
	N.I	8	AP14	KK	TM	10T	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
	N.I	9	AP14	KK	TM	10T	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
	N.I	9	AP14	KK	TM	10T	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	9	AP14	KK	TM	10T	(A)	6.00	2	3.00	4.00	12.00	24.00	1	2	
	N.I	10	AP14	KK	TM	10T	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
	N.I	10	AP14	KK	TM	10T	(A)	7.00	3	2.33	4.00	14.00	28.00	2	2	
	N.I	11	AP14	KK	TM	10T	(A)	6.00	2	3.00	4.00	12.00	24.00	1	2	
	N.I	11	AP14	KK	TM	10T	(A)	5.00	2	2.50	4.00	10.00	20.00	1	2	
	N.I	11	AP14	KK	TM	10T	(A)	4.00	2	2.00	4.00	8.00	16.00	1	2	
	N.I	11	AP14	KK	TM	10T	(A)	7.00	3	2.33	4.00	14.00	28.00	2	2	
	N.I	11	AP14	KK	TM	10T	(A)	5.00	2	2.50	4.00	10.00	20.00	1	2	
	N.I	11	AP14	KK				4.00	2	2.00	4.00	16.00		1	2	
	N.I	11	AP14	KK				11.00	4	2.75	4.00	44.00		3	2	
	N.I	11	AP14	KK				7.00	4	1.75	4.00	28.00		3	2	
	N.I	11	AP14	KK				5.00	3	1.67	4.00	20.00		2	2	
	N.I	11	AP14	KK				6.00	3	2.00	4.00	24.00		2	2	
	N.I	11	AP14	KK				5.00	3	1.67	4.00	20.00		2	2	

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO	BRIDGE NAME	Km	From	<< TYPE >> (EXIST)	(NEW)	DESIGN LOAD	SPAN CLASS	LENGTH (m)	SPAN NO (no)	SPAN LENGTH (m)	WIDTH (m)	AREA (EXIST) (m2)	AREA (NEW) (m2)	PIER (no)	ABUT (no)	ROAD CLASS
28	N.I	9	SGMP	KK				4.00	1	4.00	4.00	16.00		0	2	IIIB-2
	N.I	10	SGMP	KK				3.00	1	3.00	4.00	12.00		0	2	
	N.I	10	SGMP	KK				7.00	2	3.50	4.00	28.00		1	2	
	N.I	11	SGMP	KK				5.00	1	5.00	4.00	20.00		0	2	
	N.I	11	SGMP	KK				7.00	2	3.50	4.00	28.00		1	2	
	N.I	12	SGMP	KK				4.00	1	4.00	4.00	16.00		0	2	
	N.I	12	SGMP	KK				3.00	1	3.00	4.00	12.00		0	2	
	N.I	12	SGMP	KK				4.00	1	4.00	4.00	16.00		0	2	
	N.I	13	SGMP	KK				4.00	1	4.00	4.00	16.00		0	2	
	N.I	13	SGMP	KK				8.00	2	4.00	4.00	32.00		1	2	
	N.I	14	SGMP	KK				2.00	1	2.00	4.00	8.00		0	2	
	N.I	14	SGMP	KK				2.00	1	2.00	4.00	8.00		0	2	
	N.I	15	SGMP	KK				3.00	1	3.00	4.00	12.00		0	2	
	N.I	15	SGMP	KK				8.00	2	4.00	4.00	32.00		1	2	
	N.I	16	SGMP	KK				4.00	2	2.00	4.00	16.00		1	2	
	N.I	17	SGMP	KK				4.00	2	2.00	4.00	16.00		1	2	
	N.I	17	SGMP	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I	18	SGMP	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I	18	SGMP	KK				12.00	4	3.00	4.00	48.00		3	2	
	N.I	18	SGMP	KK				9.00	4	2.25	4.00	36.00		3	2	
	N.I	19	SGMP	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I	19	SGMP	KK				2.00	1	2.00	4.00	8.00		0	2	
	N.I	19	SGMP	KK				6.00	2	3.00	4.00	24.00		1	2	
	N.I	20	SGMP	KK				9.00	3	3.00	4.00	36.00		2	2	
	N.I	21	SGMP	KK				24.00	8	3.00	4.00	96.00		7	2	
31	H. UBAK	1	API4	KK				5.00	2	2.50	3.00	15.00		1	2	IIIB-2
	H. PANGHULU	1	API4	KK				7.00	5	1.40	4.00	28.00		4	2	
	H. MASJID	1	API4	KK				9.00	5	1.80	4.00	36.00		4	2	
	H. S.SELUANG	1	API4	KK				10.00	5	2.00	4.00	40.00		4	2	
	H. AIR MAS	2	API4	KK				7.00	5	1.40	4.00	28.00		4	2	
	H. TURAI	2	API4	KK				5.00	3	1.67	4.00	20.00		2	2	
	H. BARUNAI	2	API4	KK				6.00	3	2.00	4.00	24.00		2	2	
	H. ULIS	3	API4	KK				5.00	2	2.50	4.00	20.00		1	2	
	H. HANSKA	4	API4	KK				6.00	3	2.00	4.00	24.00		2	2	
	H. RANLI	4	API4	KK				7.00	3	2.33	4.00	28.00		2	2	
	N.I	4	API4	KK				7.00	3	2.33	4.00	28.00		2	2	
	N.I	4	API4	KK				7.00	3	2.33	4.00	28.00		2	2	
	N.I	4	API4	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I	5	API4	KK				9.00	3	3.00	4.00	36.00		2	2	
	N.I	5	API4	KK				7.00	3	2.33	4.00	28.00		2	2	
	N.I	5	API4	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I	6	API4	KK				4.00	2	2.00	4.00	16.00		1	2	
	N.I	6	API4	KK				7.00	3	2.33	4.00	28.00		2	2	
	N.I	6	API4	KK				6.00	3	2.00	4.00	24.00		2	2	
	N.I	7	API4	KK				6.00	3	2.00	4.00	24.00		2	2	
	N.I	7	API4	KK				8.00	3	2.67	4.00	32.00		2	2	
	N.I	7	API4	KK				10.00	4	2.50	4.00	40.00		3	2	
	N.I	7	API4	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I	7	API4	KK				4.00	2	2.00	4.00	16.00		1	2	
	N.I	7	API4	KK				6.00	3	2.00	4.00	24.00		2	2	

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO	BRIDGE NAME	Km	From	<< TYPE >> (EXIST)	(NEW)	DESIGN LOAD	SPAN CLASS	LENGTH (m)	SPAN NO (no)	SPAN LENGTH (m)	WIDTH (m)	AREA (EXIST) (m2)	AREA (NEW) (m2)	PIER (no)	ABUT (no)	ROAD CLASS
21	SAKA RAY XX	13	ATRN	KK				9.00	3	3.00	3.00	27.00		2	2	IIIB-1
	SAKA RAY XXI	14	ATRN	KK				7.00	3	2.33	3.00	21.00		2	2	
	SAKA RAY XXII	14	ATRN	KK				7.00	3	2.33	3.00	21.00		2	2	
	SAKA RAY XXIII	15	ATRN	KK				11.00	5	2.20	3.00	33.00		4	2	
	SAKA RAY XXIV	15	ATRN	KK				5.00	3	1.67	3.00	15.00		2	2	
	SAKA RAY XXV	17	ATRN	KK	TM	10T	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	SAKA RAY XXVI	19	ATRN	KK	TM	10T	(A)	7.00	3	2.33	4.00	14.00	28.00	2	2	
	SAKA RAY XXVII	19	ATRN	KK	TM	10T	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
	SAKA RAYXXVIII	19	ATRN	KK	TM	10T	(A)	4.00	2	2.00	4.00	8.00	16.00	1	2	
	SAKA RAY XXIX	19	ATRN	KK	TM	10T	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
23	N.I	0	BMAR	KK				30.00	8	3.75	4.00	120.00		7	2	IIIB-1
	N.I	0	BMAR	KK				6.00	3	2.00	4.00	24.00		2	2	
	N.I	1	BMAR	KK				16.00	5	3.20	3.00	48.00		4	2	
	N.I	2	BMAR	KK				30.00	8	3.75	3.00	90.00		7	2	
	N.I	2	BMAR	KK				6.00	3	2.00	3.00	18.00		2	2	
	N.I	2	BMAR	KK				22.00	7	3.14	3.00	66.00		6	2	
	N.I	2	BMAR	KK				13.00	5	2.60	3.00	39.00		4	2	
	N.I	2	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	2	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	2	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	3	BMAR	KK				6.00	3	2.00	3.00	18.00		2	2	
	N.I	3	BMAR	KK				30.00	9	3.33	4.00	120.00		8	2	
	N.I	4	BMAR	KK				13.00	5	2.60	4.00	52.00		4	2	
	N.I	5	BMAR	KK				16.00	7	2.29	3.00	48.00		6	2	
	N.I	5	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	6	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	6	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	7	BMAR	KK				18.00	6	3.00	3.00	54.00		5	2	
	N.I	7	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	7	BMAR	KK				3.00	2	1.50	3.00	9.00		1	2	
	N.I	7	BMAR	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	8	BMAR	KK				11.00	4	2.75	3.00	33.00		3	2	
	N.I	8	BMAR	KK				16.00	7	2.29	3.00	48.00		6	2	
	N.I	8	BMAR	KK				3.00	2	1.50	4.00	12.00		1	2	
	N.I	8	BMAR	KK				6.00	4	1.50	3.00	18.00		3	2	
	N.I	9	BMAR	KK				11.00	5	2.20	3.00	33.00		4	2	
	N.I	9	BMAR	KK				15.00	6	2.50	4.00	60.00		5	2	
	N.I	9	BMAR	KK	TM	10T	(B)	110.00	22	5.00	4.00	220.00	440.00	21	2	
24	N.I	0	BBGN	--	TM	10T	(B)	4.00	1	4.00	4.00	0.00	16.00	0	2	IIIB-1
	N.I	0	BBGN	KK				11.00	4	2.75	3.00	33.00		3	2	
	N.I	0	BBGN	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	0	BBGN	KK				6.00	3	2.00	3.00	18.00		2	2	
	N.I	1	BBGN	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	1	BBGN	KK				3.00	2	1.50	3.00	9.00		1	2	
	N.I	2	BBGN	KK				3.00	2	1.50	3.00	9.00		1	2	
	N.I	3	BBGN	KK	TM	10T	(B)	29.00	7	4.14	4.00	58.00	116.00	6	2	
	N.I	3	BBGN	KK				8.00	4	2.00	3.00	24.00		3	2	
	N.I	3	BBGN	KK				9.00	4	2.25	3.00	27.00		3	2	
	N.I	3	BBGN	KK				17.00	6	2.83	3.00	51.00		5	2	

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO	BRIDGE NAME	Km	From	<< TYPE >> (EXIST)	(NEW)	DESIGN LOAD	SPAN CLASS	LENGTH (m)	SPAN NO (no)	SPAN LENGTH (m)	WIDTH (m)	AREA (EXIST) (m2)	AREA (NEW) (m2)	PIER (no)	ABUT (no)	ROAD CLASS
3	N.I.1	1	MRBN	KK				3.00	1	3.00	4.00	12.00		0	2	IIIB-1
	N.I.2	1	MRBN	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I.3	1	MRBN	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I.4	2	MRBN	KK				5.00	2	2.50	4.00	20.00		1	2	
	N.I.5	3	MRBN	KK				5.00	2	2.50	5.00	25.00		1	2	
	N.I.6	3	MRBN	KK				5.00	2	2.50	5.00	25.00		1	2	
	N.I.7	4	MRBN	KK				5.00	2	2.50	5.00	25.00		1	2	
	N.I.8	6	MRBN	KK				5.00	2	2.50	5.00	25.00		1	2	
	N.I.9	7	MRBN	KK				4.00	2	2.00	4.00	16.00		1	2	
	N.I.10	7	MRBN	KK				4.00	2	2.00	3.00	12.00		1	2	
	N.I.11	8	MRBN	KK				4.00	2	2.00	3.00	12.00		1	2	
	N.I.12	8	MRBN	KK				4.00	2	2.00	3.00	12.00		1	2	
	N.I.13	8	MRBN	KK				4.00	2	2.00	3.00	12.00		1	2	
	N.I.14	9	MRBN	KK				3.00	1	3.00	3.00	9.00		0	2	
	N.I.15	9	MRBN	KK				6.00	2	3.00	3.00	18.00		1	2	
	N.I.16	9	MRBN	KK				7.00	3	2.33	3.00	21.00		2	2	
	N.I.17	10	MRBN	KK				6.00	2	3.00	3.00	18.00		1	2	
	N.I.18	10	MRBN	KK				6.00	2	3.00	3.00	18.00		1	2	
	N.I.19	11	MRBN	KK				10.00	3	3.33	3.00	30.00		2	2	
	N.I.20	11	MRBN	KK				5.00	2	2.50	3.00	15.00		1	2	
	N.I.21	12	MRBN	KK				6.00	2	3.00	3.00	18.00		1	2	
	N.I.22	12	MRBN	KK				7.00	3	2.33	3.00	21.00		2	2	
	N.I.23	13	MRBN	KK				9.00	3	3.00	3.00	27.00		2	2	
	N.I.24	14	MRBN	--	TM	10T	(C)	7.00	1	7.00	4.00	0.00	28.00	0	2	
	N.I.25	14	MRBN	--	TM	10T	(C)	20.00	3	6.67	4.00	0.00	80.00	2	2	
	N.I.26	14	MRBN	--	TM	10T	(B)	5.00	1	5.00	4.00	0.00	20.00	0	2	
	N.I.27	14	MRBN	--	TM	10T	(C)	8.00	1	8.00	4.00	0.00	32.00	0	2	
	N.I.28	14	MRBN	--	TM	10T	(B)	4.00	1	4.00	4.00	0.00	16.00	0	2	
	N.I.29	14	MRBN	--	TM	10T	(C)	53.00	7	7.57	4.00	0.00	212.00	6	2	
21	SAKA RAMA I	1	ATRN	KK				12.00	3	4.00	4.00	48.00		2	2	IIIB-1
	SAKA RAMA II	3	ATRN	KK				6.00	2	3.00	4.00	24.00		1	2	
	SAKA RAY I	3	ATRN	KK				12.00	3	4.00	4.00	48.00		2	2	
	SAKA RAY II	4	ATRN	KK				7.00	3	2.33	4.00	28.00		2	2	
	SAKA RAY III	5	ATRN	KK				5.00	2	2.50	3.00	15.00		1	2	
	SAKA RAY IV	6	ATRN	KK				3.00	1	3.00	3.00	9.00		0	2	
	SAKA RAY V	6	ATRN	KK				4.00	2	2.00	3.00	12.00		1	2	
	SAKA RAY VI	7	ATRN	KK				3.00	1	3.00	3.00	9.00		0	2	
	SAKA RAY VII	7	ATRN	KK				3.00	1	3.00	3.00	9.00		0	2	
	SAKA RAY VIII	7	ATRN	KK				6.00	2	3.00	3.00	18.00		1	2	
	SAKA RAY IX	8	ATRN	KK				5.00	2	2.50	3.00	15.00		1	2	
	SAKA RAY X	9	ATRN	KK				12.00	4	3.00	3.00	36.00		3	2	
	SAKA RAY XI	9	ATRN	KK				4.00	2	2.00	3.00	12.00		1	2	
	SAKA RAY XII	9	ATRN	KK				9.00	3	3.00	3.00	27.00		2	2	
	SAKA RAY XIII	10	ATRN	KK				7.00	3	2.33	3.00	21.00		2	2	
	SAKA RAY XIV	10	ATRN	KK				5.00	2	2.50	3.00	15.00		1	2	
	SAKA RAY XV	11	ATRN	KK				9.00	3	3.00	3.00	27.00		2	2	
	SAKA RAY XVI	11	ATRN	KK				6.00	2	3.00	3.00	18.00		1	2	
	SAKA RAY XVII	12	ATRN	KK				4.00	2	2.00	3.00	12.00		1	2	
	SAKA RAY XVIII	12	ATRN	KK				6.00	2	3.00	3.00	18.00		1	2	
	SAKA RAY XIX	12	ATRN	KK				7.00	3	2.33	3.00	21.00		2	2	

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO	BRIDGE NAME	Km	From	<< TYPE >> (EXIST)	(NEW)	DESIGN LOAD	SPAN CLASS	LENGTH (m)	SPAN NO (no)	SPAN LENGTH (m)	WIDTH (m)	AREA (EXIST) (m2)	AREA (NEW) (m2)	PIER (no)	ABUT (no)	ROAD CLASS
24	N.I	3	BBGN	KK				8.00	4	2.00	3.00	24.00		3	2	IIIB-1
	N.I	4	BBGN	KK				4.50	2	2.25	3.00	13.50		1	2	
	N.I	4	BBGN	KK				29.00	8	3.63	3.00	87.00		7	2	
	N.I	4	BBGN	KK				10.00	6	1.67	3.00	30.00		5	2	
	N.I	4	BBGN	KK				5.00	2	2.50	3.00	15.00		1	2	
	N.I	4	BBGN	KK				22.00	6	3.67	3.00	66.00		5	2	
	N.I	4	BBGN	KK				3.50	2	1.75	3.00	10.50		1	2	
	N.I	4	BBGN	KK				25.00	8	3.13	3.00	75.00		7	2	
	N.I	4	BBGN	KK				20.00	6	3.33	3.00	60.00		5	2	
	N.I	5	BBGN	KK	TH	IOT	(B)	31.00	8	3.88	4.00	62.00	124.00	7	2	
	N.I	5	BBGN	KK				4.00	3	1.33	3.00	12.00		2	2	
	N.I	5	BBGN	KK				19.00	6	3.17	3.00	57.00		5	2	
	N.I	6	BBGN	KK				7.00	4	1.75	3.00	21.00		3	2	
	N.I	6	BBGN	KK				3.00	2	1.50	3.00	9.00		1	2	
	N.I	6	BBGN	KK				12.00	5	2.40	3.00	36.00		4	2	
	N.I	7	BBGN	KK				12.00	5	2.40	3.00	36.00		4	2	
25	N.I	1	SSLG	KK	TH	IOT	(A)	2.50	1	2.50	4.00	5.00	10.00	0	2	IIIB-1
	N.I	1	SSLG	KK	TH	IOT	(A)	2.00	1	2.00	4.00	4.00	8.00	0	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	7.00	3	2.33	4.00	14.00	28.00	2	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	5.00	2	2.50	4.00	10.00	20.00	1	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	9.00	3	3.00	4.00	18.00	36.00	2	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	6.00	2	3.00	4.00	12.00	24.00	1	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	2.00	1	2.00	4.00	4.00	8.00	0	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	2.00	1	2.00	4.00	4.00	8.00	0	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	4.00	2	2.00	4.00	8.00	16.00	1	2	
	N.I	1	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	3	SSLG	KK	TH	IOT	(A)	2.00	1	2.00	4.00	4.00	8.00	0	2	
	N.I	3	SSLG	KK	TH	IOT	(C)	53.00	9	5.89	4.00	106.00	212.00	8	2	
	N.I	4	SSLG	KK	TH	IOT	(A)	2.00	1	2.00	4.00	4.00	8.00	0	2	
	N.I	4	SSLG	KK	TH	IOT	(A)	2.00	1	2.00	4.00	4.00	8.00	0	2	
	N.I	6	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	8	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
	N.I	11	SSLG	KK	TH	IOT	(A)	3.00	1	3.00	4.00	6.00	12.00	0	2	
28	N.I	1	SGMP	KK				4.00	1	4.00	4.00	16.00		0	2	IIIB-2
	N.I	1	SGMP	KK				10.00	3	3.33	4.00	40.00		2	2	
	N.I	2	SGMP	KK				4.00	1	4.00	4.00	16.00		0	2	
	N.I	2	SPKL	KK				4.00	1	4.00	4.00	16.00		0	2	
	N.I	2	SPKL	KK				7.00	2	3.50	4.00	28.00		1	2	
	N.I	3	SPKL	KK				7.00	2	3.50	4.00	28.00		1	2	
	N.I	4	SPKL	KK				7.00	2	3.50	4.00	28.00		1	2	
	N.I	5	SPKL	KK				10.00	3	3.33	4.00	40.00		2	2	
	N.I	6	SPKL	KK				14.00	4	3.50	4.00	56.00		3	2	
	N.I	7	SPKL	KK				5.00	1	5.00	4.00	20.00		0	2	
	N.I	8	SPKL	KK				7.00	2	3.50	4.00	28.00		1	2	
	N.I	9	SPKL	KK				4.00	1	4.00	4.00	16.00		0	2	

Appendix A-7 CONSTRUCTION AND MAINTENANCE COST OF BRIDGES ON PROPOSED ROAD LINKS

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 3 (IIIB-1) LENGTH : 14 Km

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Superstructure (Timber;Span 3m;10T)	m2	0.00	64,381	2,998	0	0	0
Superstructure (Timber;Span 5m;10T)	m2	36.00	71,312	3,311	2,567,232	119,196	2,686,428
Superstructure (Timber;Span 8m;10T)	m2	352.00	94,456	4,352	33,248,512	1,531,904	34,780,416
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	8.00	560,703	27,729	4,486,264	221,832	4,708,096
Substructure (Abut;for Timber;10T)	NO	12.00	1,814,761	112,212	21,779,532	1,346,544	23,126,076
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	6,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	388.00	11,523	1,010	4,470,924	391,880	4,862,804
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	431.00	10,472	2,349	4,513,432	1,012,419	5,525,851
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				62,081,540	3,219,476	65,301,016
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				62,081,540	3,219,476	65,301,016
(Overhead : 15%)	TOTAL COST (Timber Bridge)				71,393,771	3,702,397	75,096,168
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				71,393,771	3,702,397	75,096,168

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 21 (IIIB-1) LENGTH : 19 Km

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Superstructure (Timber;Span 3m;10T)	m2	128.00	64,381	2,998	8,240,768	383,744	8,624,512
Superstructure (Timber;Span 5m;10T)	m2	0.00	71,312	3,311	0	0	0
Superstructure (Timber;Span 8m;10T)	m2	0.00	94,456	4,352	0	0	0
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	7.00	560,783	27,729	3,925,481	194,103	4,119,584
Substructure (Abut;for Timber;10T)	NO	10.00	1,814,961	112,212	18,149,610	1,122,120	19,271,730
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	6,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	64.00	19,384	1,061	1,240,576	67,904	1,308,480
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	128.00	11,523	1,010	1,474,944	129,280	1,604,224
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	559.00	10,472	2,349	5,853,848	1,313,091	7,166,939
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				31,556,435	1,767,871	33,324,306
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				31,556,435	1,767,871	33,324,306
(Overhead : 15%)	TOTAL COST (Timber Bridge)				36,289,900	2,033,052	38,322,952
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				36,289,900	2,033,052	38,322,952

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 23 (IIIB-1) LENGTH : 10 Km .

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Superstructure (Timber;Span 3m;10T)	m2	0.00	64,381	2,998	0	0	0
Superstructure (Timber;Span 5m;10T)	m2	440.00	71,312	3,311	31,377,280	1,456,840	32,834,120
Superstructure (Timber;Span 8m;10T)	m2	0.00	94,456	4,352	0	0	0
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	21.00	560,783	27,729	11,776,443	582,309	12,358,752
Substructure (Abut;for Timber;10T)	NO	2.00	1,814,961	112,212	3,629,922	224,424	3,854,346
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	6,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	220.00	19,384	1,061	4,264,480	233,420	4,497,900
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	440.00	11,523	1,010	5,070,120	444,400	5,514,520
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	1126.00	10,472	2,349	11,791,472	2,644,974	14,436,446
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				51,048,125	2,496,993	53,545,118
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				51,048,125	2,496,993	53,545,118
(Overhead : 15%)	TOTAL COST (Timber Bridge)				58,705,344	2,871,542	61,576,886
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				58,705,344	2,871,542	61,576,886

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 24 (IIIB-1) LENGTH : 7 Km

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Superstructure (Timber;Span 3m;10T)	m2	0.00	64,381	2,998	0	0	0
Superstructure (Timber;Span 5m;10T)	m2	256.00	71,312	3,311	18,255,872	847,616	19,103,488
Superstructure (Timber;Span 8m;10T)	m2	0.00	94,456	4,352	0	0	0
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	13.00	560,783	27,729	7,290,179	360,477	7,650,656
Substructure (Abut;for Timber;10T)	NO	6.00	1,814,961	112,212	10,889,766	673,272	11,563,038
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	6,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	120.00	19,384	1,061	2,326,080	127,320	2,453,400
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	256.00	11,523	1,010	2,949,888	258,560	3,208,448
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	777.00	10,472	2,349	8,136,744	1,825,173	9,961,917
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				38,761,897	2,008,685	40,770,582
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				38,761,897	2,008,685	40,770,582
(Overhead : 15%)	TOTAL COST (Timber Bridge)				44,576,182	2,309,988	46,886,169
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				44,576,182	2,309,988	46,886,169

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 25 (IIIB-1) LENGTH : 11 Km

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Superstructure (Timber;Span 3m;10T)	m2	302.00	64,381	2,998	19,443,062	905,396	20,348,458
Superstructure (Timber;Span 5m;10T)	m2	0.00	71,312	3,311	0	0	0
Superstructure (Timber;Span 8m;10T)	m2	212.00	94,456	4,352	20,024,672	922,624	20,947,296
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	17.00	560,783	27,729	9,533,311	471,393	10,004,704
Substructure (Abut;for Timber;10T)	NO	42.00	1,814,961	112,212	76,228,362	4,712,904	80,941,266
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	6,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	257.00	19,384	1,061	4,981,688	272,677	5,254,365
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	514.00	11,523	1,010	5,922,822	519,140	6,441,962
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.00	10,472	2,349	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				130,211,095	7,284,994	137,496,089
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				130,211,095	7,284,994	137,496,089
(Overhead : 15%)	TOTAL COST (Timber Bridge)				149,742,759	8,377,743	158,120,502
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				149,742,759	8,377,743	158,120,502

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 28 (IIIB-2) LENGTH : 22 Km

(Rp)

I T E M	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Superstructure (Timber;Span 3m;10T)	m2	0.00	64,381	2,998	0	0	0
Superstructure (Timber;Span 5m;10T)	m2	0.00	71,312	3,311	0	0	0
Superstructure (Timber;Span 8m;10T)	m2	0.00	94,456	4,352	0	0	0
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	0.00	560,783	27,729	0	0	0
Substructure (Abut;for Timber;10T)	NO	0.00	1,814,961	112,212	0	0	0
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	4,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	0.00	11,523	1,010	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	928.00	10,472	2,349	9,718,016	2,179,872	11,897,888
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				0	0	0
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				0	0	0
(Overhead : 15%)	TOTAL COST (Timber Bridge)				0	0	0
	(Concrete Bridge)				0	0	0
	TOTAL COST (without Maintenance)				0	0	0

PROV : KALIMANTAN SELATAN KAB : BARITO KUALA

LINK NO : 31 (IIIB-2) LENGTH : 11 Km

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Superstructure (Timber;Span 3m;10T)	m2	280.00	64,381	2,998	18,026,680	839,440	18,866,120
Superstructure (Timber;Span 5m;10T)	m2	0.00	71,312	3,311	0	0	0
Superstructure (Timber;Span 8m;10T)	m2	0.00	94,456	4,352	0	0	0
Superstructure (Timber;Span 3m;BM50)	m2	0.00	79,830	3,708	0	0	0
Superstructure (Timber;Span 5m;BM50)	m2	0.00	87,152	4,020	0	0	0
Superstructure (Timber;Span 8m;BM50)	m2	0.00	110,532	5,089	0	0	0
Superstructure (Concrete;Span 3m;BM50)	m2	0.00	79,452	106,748	0	0	0
Superstructure (Concrete;Span 5m;BM50)	m2	0.00	82,029	119,368	0	0	0
Superstructure (Concrete;Span 8m;BM50)	m2	0.00	84,830	130,067	0	0	0
Superstructure (Concrete;Span10m;BM50)	m2	0.00	92,840	147,793	0	0	0
Superstructure (Concrete;Span15m;BM50)	m2	0.00	100,735	174,182	0	0	0
Substructure (Pier;for Timber;10T)	NO	15.00	560,783	27,729	8,411,745	415,935	8,827,680
Substructure (Abut;for Timber;10T)	NO	22.00	1,814,961	112,212	39,929,142	2,468,664	42,397,806
Substructure (Pier;for Timber;BM50)	NO	0.00	824,742	41,022	0	0	0
Substructure (Abut;for Timber;BM50)	NO	0.00	2,013,999	126,457	0	0	0
Substructure (Pier;for Concrete;BM50)	NO	0.00	2,616,791	477,161	0	0	0
Substructure (Abut;for Concrete;BM50)	NO	0.00	6,249,671	920,291	0	0	0
Demolition of Bridge (Timber->Timber)	m2	140.00	19,384	1,061	2,713,760	148,540	2,862,300
Demolition of Bridge (Timber->Concrete)	m2	0.00	19,384	1,061	0	0	0
Demolition of Bridge (Concrete)	m2	0.00	137,845	79,665	0	0	0
Maintenance of Timber Bridge (New)	m2	280.00	11,523	1,010	3,226,440	282,800	3,509,240
Maintenance of Concrete Bridge (New)	m2	0.00	3,114	3,061	0	0	0
Maintenance of Timber Bridge (Exist)	m2	827.00	10,472	2,349	8,660,344	1,942,623	10,602,967
Maintenance of Concrete Bridge (Exist)	m2	0.00	5,333	2,456	0	0	0
(Without Overhead)	TOTAL COST (Timber Bridge)				69,081,327	3,872,579	72,953,906
	(Concrete Bridge)				0	0	0
	TOTAL COST (Without Maintenance)				69,081,327	3,872,579	72,953,906
(Overhead : 15%)	TOTAL COST (Timber Bridge)				79,443,526	4,453,466	83,896,992
	(Concrete Bridge)				0	0	0
	TOTAL COST (Without Maintenance)				79,443,526	4,453,466	83,896,992