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 17

KABUPATEN TANAH LAUT

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 Tanah Laut 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

IV · PROPINSI KALIMANTAN TENGAH

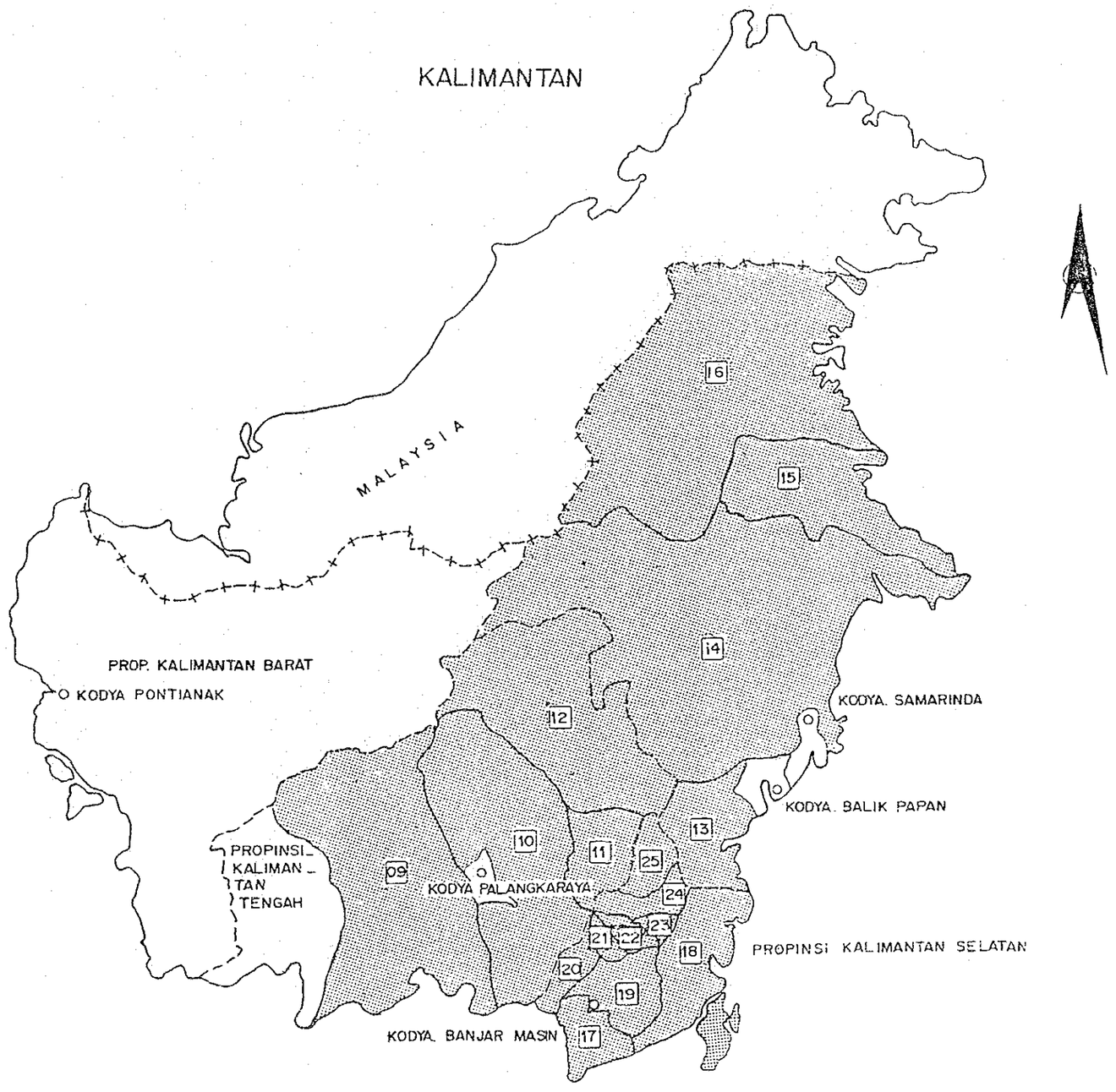
09 · KAB · KOTA WARINGIN TIMUR
10 · KAB · KAPUAS
11 · KAB · BARITO SELATAN
12 · KAB · BARITO UTARA

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 :

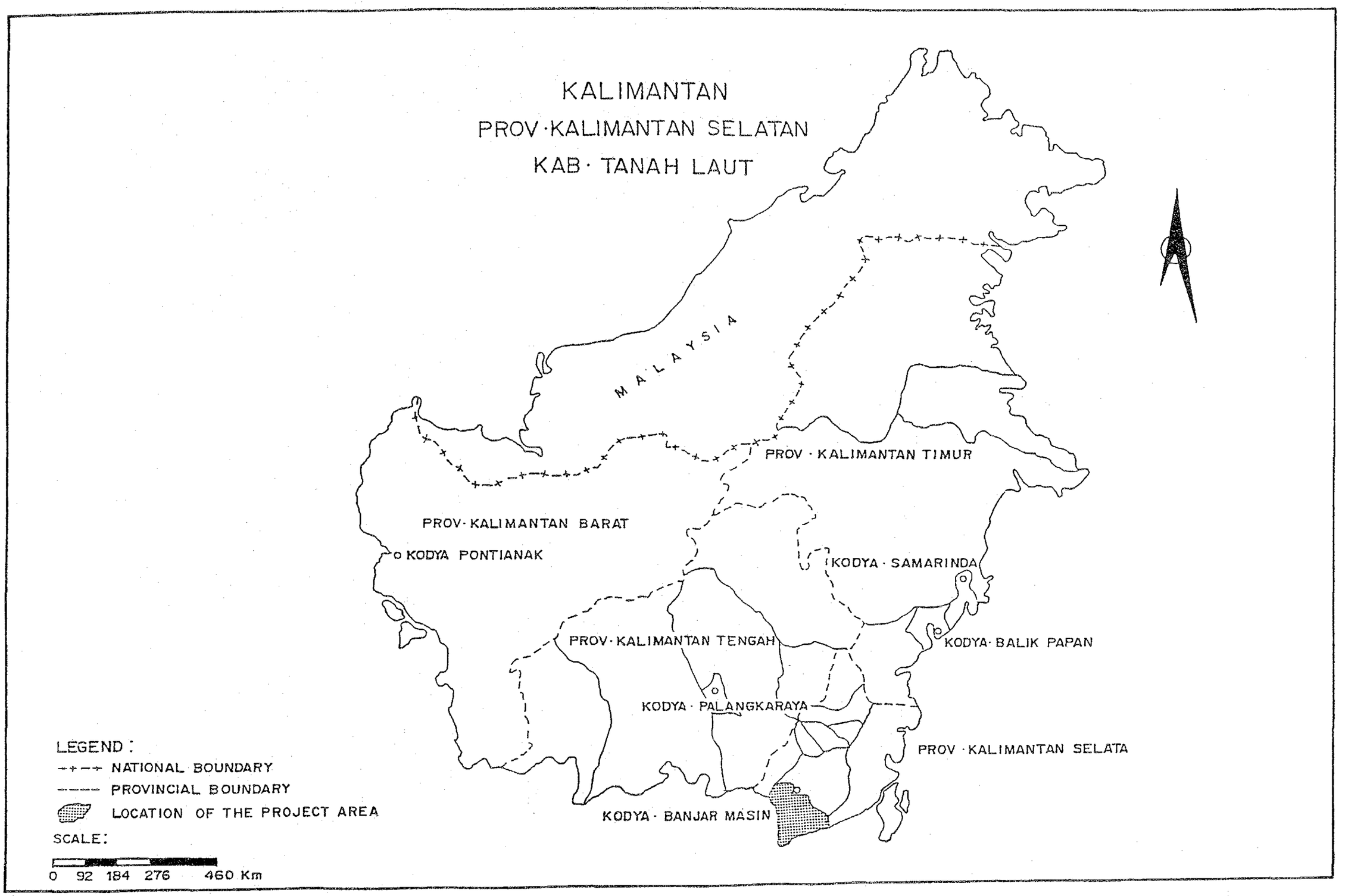
−+−+ NATIONAL BOUNDARY

– – – – PROVINCIAL BOUNDARY

LOCATION OF THE PROPOSED AREA

SCALE :

0 92 184 276 460 Km.


KALIMANTAN
PROV·KALIMANTAN SELATAN
KAB· TANAH LAUT
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

KAB · TANAH LAUT

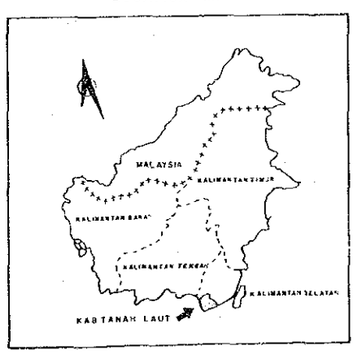
KEC · KURAU
KEC · BATI-BATI
KEC · PELAIHARI
KEC · KINTAP
KEC · JORONG
KEC · TAKISUNG
KEC · PANYIPATAN
LAUT JAWA

HANDIL HANDIL
HANDIL BABIRIK
HANDIL ILUNG
HANDIL BABISIK
HANDIL GAYAM
SEIRASAU
KURAU
HANDIL NEGARA
KE MARTAPURA
KE BANJAR MASIN
KAIT KAIT
BANYUIRANG
LIANGANGGANG
BUNTOK
ASAHAN
IMBAN
KAMPUNG BATI BATI
BATI BATI
MARTADAH
GUNUNG RAJA
PADANG LUAS
PULAU SARI
TAMBANG ULANG
MALUKA
AMBUNGAN
SEI · BAKAU
UJUNG-BATU
TUNGKARAN
TELEKOMUNIKASI
ATILAM
TANGSAU
PELAIHARI
PANJARATAN
TABANIO
BALIREJO
TELAGA
TANJUNG
BAJUIN
AIR TERJUN
KUNYIT
DAMIT
DURIAN BUNGKUK
TAJAU PECAH
JILATAN
ALUR
PULAU RAMANIA
JORONG
MUARA JORONG
SUKA DAMAI
BENUA-TENGAH
SEIRIAM
SUMBER MULYA
TAKISUNG
GUNUNG MAKMUR
TANGKE WANG
PANYIPATAN
KUALA TAMBANGAN
KAMPUNG BARU
KURINGKIT
BATU TUNGKU
SABUHUR
KERAMAT
PANTAI CABE
TANJUNG DEWA
SIMP. BATAKAN
BATAKAN
KURANJI
KE KOTA BARU
PASIR PUTIH
KINTAP
KINTAP KAMPUNG
SIMPANG 4 SEBAMBAN
MUARA KINTAP
PANDAN SARI
SEI RAKIN
SIMP. 3 ASAM-ASAM
ASAM-ASAM
MUARA ASAM-ASAM

SCALE:
0 5 10 15 Km

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

LOCATION MAP



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

TITLE:

SOURCE:	SCALE:	PROVINCE:
DIREKTORAT JENDERAL CIPTA KARYA	AS SHOWN	KALIMANTAN SELATAN
		KABUPATEN: TANAH LAUT

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 Tanah Laut is the southernmost Kabupaten not only in Kalimantan Selatan Province but also in the whole of Kalimantan Island. The Kabupaten faces the Jawa Sea on the west and south coasts and is bordered on the east by Kabupaten Kotabaru, and on the north by Kabupaten Banjar.

The main topographic feature of the Kabupaten is the Kusan mountians, 1000 meter high or over, running along the boundary of Kabupaten Banjar and moderately transformed into many hills towards the south coast. The Kusan mountains stand on the southernmost part of the Meratus mountain system. Meanwhile, in the coastal area of the west the river rising from the Kusan mountains forms an inundated area and west of the capital of the Kabupaten, Pelaihari, is entirely covered with swamps.

The area of the Kabupaten is about 3,477 square kilometers, approximately 9 percent of the total of Kalimantan Selatan Province. It consists administratively of 7 Kecamatans.

1.1.2 Meteorological Conditions

The average number of rainy days and the average amount of yearly rainfall in Kabupaten Tanah Laut are 132 days and 3,243 mm respectively.

One year in the Kabupaten consists of a rainy season and a dry season. The dry season is from June 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 230 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 : Tanah Laut

STATION : Pelaihari

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	22	480	15	490	18	770	14	407	21	454
February	14	389	10	292	13	320	14	320	22	261
March	14	232	6	138	19	308	12	269	19	655
April	18	440	9	350	13	310	11	258	22	402
May	9	61	11	270	3	135	14	88	20	241
June	10	205	3	121	4	188	8	93	11	133
July	3	140	9	140	1	7	14	192	10	213
August	5	34	-	-	-	-	4	54	3	33
September	1	5	7	241	2	6	6	23	9	227
October	6	68	8	135	3	23	11	180	5	133
November	17	450	17	962	7	68	18	880	15	170
December	21	477	18	612	18	341	14	656	21	694
Total	140	2,981	113	3,751	101	2,476	140	3,420	178	3,616

1.2 Socio-Economic Conditions

1.2.1 Population

The population of Kabupaten Tanah Laut in 1984 was 148,708 which was approximately 6.6% of the 2,241,600 total population of Kalimantan Selatan Province as shown in Table 1-2-1.

The population density was 0.43 persons per ha which was lower than the provincial density of 0.58.

The recent annual average growth rate of population of the Kabupaten is 3.5% which is higher than both the provincial rate of 2.1% and the national rate of 2.2%. Since the provincial and national growth rates are almost the same this may be a result of the inflow of population from other Kabupatens in the province and because of the transmigration programme in the Kabupaten.

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 : TANAH LAUT

KECAMATAN	POPULATION	PROPORTION (%)
TAKISUNG	17,773	12.0
JORONG	19,481	13.1
PELAIHARI	36,804	24.7
KURAU	19,446	13.1
BATI BATI	21,503	14.4
PANYIPATAN	15,098	10.2
KINTAP	18,603	12.5
TOTAL	148,708	100

1.2.2 Land Use

In Kabupaten Tanah Laut, 129,132 ha of the current available land use area, which is approximately 37.2% of the 347,683 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 100,293 ha of agricultural harvest area and 23,839 ha of residential area which are 77.7% and 10.7% of the current available land use area respectively.

The agricultural harvest area consists of 63,053 ha of paddy field, 30,350 ha of plantation and 6,890 ha of other cultivated area which are 62.9%, 30.3% and 6.8% 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. Sonrce : Kabupaten concerned with the study

1.2.3 Agriculture

The cultivated area and food crop production in Kabupaten Tanah Laut in 1984 were 51,425 ha and 146,300 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 40,952 ha and 124,139 ton respectively which are 79.6% and 84.9% of the total food crops. The yield rate of paddy production is 3.03 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 1982 through 1984 were 3.5% and 6.6% respectively which indicate favorable development of the paddy production.

The commodity crops are produced in the plantations. The area and production of plantation crops in 1984 were 9,095 ha and 1,500 ton respectively with current growth rates of 6.3% and 18.0% as shown in Table 1-2-5. Thus the plantation crop has the possibility of being agriculturally important in the future. 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 82.3% of the total population as shown in Table 1-2-6. Thus this is an agricultural Kabupaten.

Future agricultural development of the Kabupaten depends upon consolidation of the infrastructures of each sector concerned.

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

KABUPATEN : TANAH LAUT

CULTIVATED AREA

(ha)

ITEM	YEAR						AAGR
	1979	1980	1981	1982	1983	1984	(%)
PADDY	35,402	38,818	-	38,432	43,951	40,952	3.5
OTHERS	7,010	4,901	6,171	4,816	6,450	10,473	20.4
TOTAL	42,412	43,719	6,171	43,248	50,401	51,425	9.0

PRODUCTION

(ton)

ITEM	YEAR						AAGR
	1979	1980	1981	1982	1983	1984	(%)
PADDY	83,788	102,659	-	109,210	133,631	124,139	6.6
OTHERS	12,534	9,533	20,022	12,892	13,376	22,161	3.4
TOTAL	96,322	112,192	20,022	122,102	147,007	146,300	9.5

YIELD RATE

(ton/ha)

ITEM	YEAR						AAGR
	1979	1980	1981	1982	1983	1984	(%)
PADDY	2.37	2.64	-	2.84	3.04	3.03	3.5

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 Tanah Laut are forestry, fishery and livestock sectors.

The forestry sectors, among the above sectors, recently had a remarkable growth of the production as shown in the following table. However, this sector is based upon the foreign investment capital. Therefore it is difficult to make further analysis on the impact to the whole industrial activities in the Kabupaten due to the lack of data.

	1980	1984	AAGR (%)
Timber production (m^3)	6,127	42,927	62.7

	1980	1984	AAGR (%)
Catch (ton)	11,089	11,918	1.8

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

Athough a growth rate of the catch indicates no remarkable tendency to increase, yearly approx. 10,000 tons are presumed to export out of the Kabupaten.

The following table shows the current growth of the livestock production.

	1980	1984	AAGR (%)
Production (ton)	498	841	14.0

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

The recent livestock productions indicate a remarkable growth rate, therefore yearly approx. 500 tons excluding the consumption of the Kabupaten itself are presumed to export out of the Kabupaten.

1.3 Present Status of Kabupaten Roads

1.3.1 Outline of Road Networks

The road network in Kabupaten Tanah Laut is divided into two main regional trunk lines. These provincial roads lead to the neighbouring Kabupaten Kota Baru from the northwest boundary of the Kabupaten via Pelaihari, the Kabupaten capital, and lead to Takisung from Pelaihari, junction with the said provincial road. Therefore the Kabupaten road networks are also developed to the west of Pelaihari as the central developed area of the Kabupaten.

However the southern coastal and northeastern inland areas are covered by hills and mountains and there does not appear to be any Kabupaten road networks due to the geographical conditions.

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 Tanah Laut are confirmed as 67 links and 420 Km respectively. These figures exclude Kabupaten roads with 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 1.21 m per ha. This is higher than the national density of 0.48 m per ha but 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 presently progressing with road development.

	Total Length (km)	Area (ha)	Density (m/ha)
Kabupaten : Tanah Laut	420	347,682	1.21
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 source 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 : TANAH LAUT

(Km)

102 (7)	DIB	THN	ASP	L.L	KRK	TOTAL
LINK 1	4	3				7
LINK 2			3			3
LINK 3			2			2
LINK 4			2			2
LINK 5			4			4
LINK 6		2				2
LINK 7		2				2
LINK 8		5				5
LINK 9		6	1			7
LINK 10		12				12
LINK 11		5				5
LINK 12		3		2		5
LINK 13		10				10
LINK 14		6				6
LINK 15		14				14
LINK 16	1	14		1		16
LINK 17		20	3			23
LINK 18		4				4
LINK 19		15				15
LINK 20					6	6
LINK 21		16	4			20
LINK 22		8				8
LINK 23		8				8
LINK 24		11				11
LINK 25		11				11
LINK 26		13				13
LINK 27		7				7
LINK 28		10				10
LINK 29		7				7
LINK 30		12				12
LINK 31		12				12
LINK 32		3				3
LINK 33		5				5

(Km)

102 (7)	BIB	THN	ASP	L.L	KRK	TOTAL
LINK 34		10				10
LINK 35						
LINK 36						
LINK 37						
LINK 38		7				7
LINK 39		2				2
LINK 40						
LINK 41		2				2
LINK 42		12				12
LINK 43		18				18
LINK 44						
LINK 45		4				4
LINK 46		3				3
LINK 47						
LINK 48		4				4
LINK 49		7				7
LINK 50						
LINK 51		3				3
LINK 52						
LINK 53						
LINK 54						
LINK 55		4				4
LINK 56			10			10
LINK 57						
LINK 58						
LINK 59						
LINK 60		8				8
LINK 61		18				18
LINK 62		7				7
LINK 63		4			2	6
LINK 64		1			6	7
LINK 65		1				1
LINK 66		3				3
LINK 67		7				7
TOTAL	5	369	29	3	14	420
RATIO	1	88	7	1	3	(%)

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 : Tanah Laut	6.9	4.5	88.6
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 much lower than either that of Indonesia or of Jawa Island. The proportion of low grade roads such as earth roads and others is distinctly high. This means that the road classification in the Kabupaten is low.

(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 : Tanah Laut	34.3	29.5	31.9	4.3
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 : TANAH LAUT

(%)

NO (%)	[illegible]				[illegible]				ASP				L.L				KRK			
NO	BA	SD	RU	RB	BA	SD	RU	RB	BA	SD	RU	RB	BA	SD	RU	RB	BA	SD	RU	RB
LINK 1	89	11				68	32													
LINK 2									47	33	20									
LINK 3									35	30	35									
LINK 4									50	25	25									
LINK 5									48	28	25									
LINK 6					35	25	40													
LINK 7					40	30	30													
LINK 8					9	18	36	37												
LINK 9					53	22	25		50	20	30									
LINK 10					19	23	41	17												
LINK 11					34	29	37													
LINK 12					23	23	53						10	10	80					
LINK 13					17	19	51	10												
LINK 14					56	33	12													
LINK 15					44	31	25													
LINK 16	50	30	20		50	39	11						10	70	20					
LINK 17					32	29	39		90	10										
LINK 18					18	23	60													
LINK 19					19	22	23	36												
LINK 20																	63	30	7	
LINK 21					29	26	39	8	78	23										
LINK 22					18	14	69													
LINK 23					45	41	14													
LINK 24					35	35	30													
LINK 25					21	20	34	25												
LINK 26					58	29	13													
LINK 27					39	23	17	21												
LINK 28					40	36	20	4												
LINK 29					44	27	29													
LINK 30					19	17	64													
LINK 31					34	31	35													
LINK 32					7	70	23													
LINK 33					59	26	6	10												
LINK 34					66	23	10													
LINK 35																				
LINK 36																				
LINK 37																				
LINK 38					41	30	29													
LINK 39					45	40	15													
LINK 40																				
LINK 41					20	35	45													
LINK 42					38	28	34													
LINK 43					90	10														
LINK 44																				
LINK 45					25	28	43	5												
LINK 46					43	30	27													
LINK 47																				
LINK 48					18	73	43	18												
LINK 49					10	16	47	27												
LINK 50																				
LINK 51					33	33	33													
LINK 52																				
LINK 53																				
LINK 54																				
LINK 55					10	10	70	10												
LINK 56									46	28	26									
LINK 57																				
LINK 58																				
LINK 59																				
LINK 60					31	30	39													
LINK 61					32	37	34													
LINK 62							69	31												
LINK 63					30	30	40										70	30		
LINK 64					50	20	30										67	33		
LINK 65						90	10													
LINK 66						63	37													
LINK 67					29	26	46													
AVERAGE	70	21	10	0	31	30	34	5	56	25	20	0	10	40	50	0	67	31	2	0
LENGTH	5 Km				369 Km				29 Km				3 Km				14 Km			
(Km)	4	1	1	0	114	111	125	18	16	7	6	0	0	1	2	0	9	4	0	0

The surface condition level of the Kabupaten roads in the Kabupaten is lower than both that of Indonesia and of Jawa Island. The proportion in good condition is relatively low. Therefore improvement of Kabupaten roads in poor or bad condition is desirable.

(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 proportions of terrain conditions in the Kabupaten are 60.0% flat, 40.0% hilly, and 1.0% swampy. There is no mountainous area in the Kabupaten. Road construction is anticipated to be not so difficult because of the small proportion of swamp.

1.3.3 Bridge Inventory

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

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

The inventory shown in Table 1-3-5 indicates a total of 237 bridges with a total length of 1,660 m of which 234 or 98.7% are timber, and 2 or 0.8% are others. One bridge with a length of 46 m is required to be newly constructed.

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

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(Km)

I02 (3)	DT	BK	RW	TOTAL
LINK 1	7			7
LINK 2	3			3
LINK 3	2			2
LINK 4	2			2
LINK 5	4			4
LINK 6	2			2
LINK 7	2			2
LINK 8		5		5
LINK 9	7			7
LINK 10		12		12
LINK 11	2	3		5
LINK 12	5			5
LINK 13	10			10
LINK 14	6			6
LINK 15	12	2		14
LINK 16	16			16
LINK 17	13	10		23
LINK 18	2	2		4
LINK 19	7	5	3	15
LINK 20	4	2		6
LINK 21	15	5		20
LINK 22	8			8
LINK 23	8			8
LINK 24	7	4		11
LINK 25	6	5		11
LINK 26	5	8		13
LINK 27	3	3		7
LINK 28	1	9		10
LINK 29		7		7
LINK 30	5	7		12
LINK 31	12			12
LINK 32	3			3
LINK 33	5			5
LINK 34	10			10
LINK 35				
LINK 36				
LINK 37				
LINK 38		7		7
LINK 39	2			2
LINK 40				
LINK 41	2			2
LINK 42		12		12
LINK 43	6	12		18
LINK 44				
LINK 45		4		4
LINK 46	3			3
LINK 47				
LINK 48	2	2		4
LINK 49		7		7
LINK 50				
LINK 51		3		3
LINK 52				
LINK 53				
LINK 54				
LINK 55	4			4
LINK 56	4	6		10
LINK 57				
LINK 58				
LINK 59				
LINK 60		8		8
LINK 61	10	8		18
LINK 62	7			7
LINK 63	2	4		6
LINK 64	3	4		7
LINK 65	1			1
LINK 66	3			3
LINK 67	7			7
TOTAL	250	166	4	420
RATIO	60	40	1	(%)

Table 1-3-4 NUMBER AND LENGTH OF BRIDGES

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

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

	EXISTING		NOT EXIST		TOTAL	
LINK NO	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
1	5	56.00			5	56.00
5	2	6.00			2	6.00
8	2	17.00			2	17.00
9	3	44.00			3	44.00
10	8	71.00			8	71.00
11	9	82.50			9	82.50
12	3	43.00			3	43.00
13	5	30.00			5	30.00
14	2	7.00			2	7.00
15	8	35.00	1	46.00	9	81.00
16	6	87.00			6	87.00
17	29	167.00			29	167.00
18	4	15.00			4	15.00
19	19	112.00			19	112.00
21	17	116.00			17	116.00
22	8	52.00			8	52.00
23	3	17.00			3	17.00
24	7	25.00			7	25.00
25	1	12.00			1	12.00
26	5	33.00			5	33.00
27	7	109.00			7	109.00
28	1	25.00			1	25.00
29	8	46.00			8	46.00
30	3	14.00			3	14.00
31	2	20.00			2	20.00
32	1	3.00			1	3.00
33	3	9.00			3	9.00
34	4	28.00			4	28.00
38	4	23.00			4	23.00
39	1	8.00			1	8.00
41	4	29.50			4	29.50
42	4	38.00			4	38.00
43	1	7.00			1	7.00
48	2	16.00			2	16.00
49	4	28.00			4	28.00
51	1	12.00			1	12.00
55	2	8.00			2	8.00
56	1	6.00			1	6.00
60	6	45.00			6	45.00
61	26	128.50			26	128.50
63	2	12.00			2	12.00
66	2	8.00			2	8.00
67	2	9.00			2	9.00
TOTAL	237	1659.50	1	46.00	238	1705.50

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

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(<<< BRIDGE >>>) (No)

ID3 (10)	KY	LL	BT	TOTAL
LINK 1	5			5
LINK 5	2			2
LINK 8	2			2
LINK 9	3			3
LINK 10	8			8
LINK 11	9			9
LINK 12	3			3
LINK 13	5			5
LINK 14	2			2
LINK 15	7	1		8
LINK 16	6			6
LINK 17	28	1		29
LINK 18	4			4
LINK 19	19			19
LINK 21	17			17
LINK 22	8			8
LINK 23	3			3
LINK 24	7			7
LINK 25	1			1
LINK 26	5			5
LINK 27	7			7
LINK 28	1			1
LINK 29	8			8
LINK 30	3			3
LINK 31	2			2
LINK 32	1			1
LINK 33	3			3
LINK 34	4			4
LINK 38	4			4
LINK 39	1			1
LINK 41	4			4
LINK 42	4			4
LINK 43	1			1
LINK 48	2			2
LINK 49	4			4
LINK 51	1			1
LINK 55	2			2
LINK 56	1		1	1
LINK 60	6			6
LINK 61	26			26
LINK 63	2			2
LINK 66	2			2
LINK 67	2			2
TOTAL	234	2	1	237
RATIO	99	1	0	(%)

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

Bridges Type	Span Length (m)										
	〈3	〈5	〈8	〈10	〈12	〈14	〈16	〈18	〈20	〈99	Total
Timber	111	113	7	3	-	-	-	-	-	-	234
Concrete	-	-	1	-	-	-	-	-	-	-	1
Steel	-	-	-	-	-	-	-	-	-	-	-
Others	1	1	-	-	-	-	-	-	-	-	2
Total	112	114	8	3	-	-	-	-	-	-	237

Thus, most of the existing bridges on the Kabupaten roads are timber and the majority of spanlengths is within the range of 0 m to 5 m.

1.3.4 Traffic

Inventories of the average daily traffic (ADT) on the Kabupaten roads in Kabupaten Tanah Laut 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	198	0	405	1,064	1,667
Proportion (%)	11.88	0	24.30	63.82	100.00

Source : Bina Marga Inventory

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

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

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 : TANAH LAUT

A)	Growth Rate of Population :	3.50 (%)
B)	Growth Rate of Cultivated Area :	8.00 (%)
C)	Growth Rate of Rice field :	3.50 (%)
D)	Growth Rate of Rice yield rate :	3.50 (%)
E)	Growth Rate of GDP / capita :	6.60 (%)
a)	Geometrical Mean (A x B) :	5.73 (%)
b)	Geometrical Mean (C x D) :	3.50 (%)
c)	Geometrical Mean (a x b) :	4.61 (%)
d)	Geometrical Mean (c x E) :	5.60 (%)
	TRAFFIC GROWTH RATE :	5.60 (%)

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 (1) EXISTING AND FUTURE TRAFFIC VOLUME

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(SPD : 1/2)

	INVENTORY (1985)					RATE	AFTER 13 YEARS (1998)					CLASS
LINK NO	MBL	BUS	TRUK	SPD	TOTAL		MBL	BUS	TRUK	SPD	TOTAL	
1	5	0	15	25	33	5.6%	10	0	30	51	67	IIIB-2
2	20	0	10	50	55	5.6%	41	0	20	102	112	IIIB-2
3	20	0	10	30	45	5.6%	41	0	20	61	91	IIIB-2
4	10	0	10	25	33	5.6%	20	0	20	51	67	IIIB-2
5	10	0	10	50	45	5.6%	20	0	20	102	91	IIIB-2
6	5	0	10	20	25	5.6%	10	0	20	41	51	IIIB-2
7	2	0	8	20	20	5.6%	4	0	16	41	41	IIIC
8	0	0	6	10	11	5.6%	0	0	12	20	22	IIIC
9	4	0	10	20	24	5.6%	8	0	20	41	49	IIIC
10	2	0	8	20	20	5.6%	4	0	16	41	41	IIIC
11	4	0	12	80	56	5.6%	8	0	24	162	114	IIIB-2
12	0	0	0	20	10	5.6%	0	0	0	41	20	IIIC
13	4	0	6	20	20	5.6%	8	0	12	41	41	IIIC
14	4	0	6	15	18	5.6%	8	0	12	30	37	IIIC
15	5	0	10	20	25	5.6%	10	0	20	41	51	IIIB-2
16	5	0	5	20	20	5.6%	10	0	10	41	41	IIIC
17	5	0	10	20	25	5.6%	10	0	20	41	51	IIIB-2
18	2	0	4	15	14	5.6%	4	0	8	30	28	IIIC
19	0	0	10	8	14	5.6%	0	0	20	16	28	IIIC
20	5	0	10	20	25	5.6%	10	0	20	41	51	IIIB-2
21	4	0	10	20	24	5.6%	8	0	20	41	49	IIIC
22	0	0	0	20	10	5.6%	0	0	0	41	20	IIIC
23	10	0	10	30	35	5.6%	20	0	20	61	71	IIIB-2
24	0	0	10	20	20	5.6%	0	0	20	41	41	IIIC
25	2	0	8	15	18	5.6%	4	0	16	30	37	IIIC
26	2	0	8	15	18	5.6%	4	0	16	30	37	IIIC
27	2	0	8	20	20	5.6%	4	0	16	41	41	IIIC
28	4	0	11	20	25	5.6%	8	0	22	41	51	IIIB-2
29	2	0	8	20	20	5.6%	4	0	16	41	41	IIIC
30	2	0	8	20	20	5.6%	4	0	16	41	41	IIIC
31	4	0	11	20	25	5.6%	8	0	22	41	51	IIIB-2
32	0	0	0	5	3	5.6%	0	0	0	10	6	IIIC
33	2	0	8	20	20	5.6%	4	0	16	41	41	IIIC
34	0	0	10	15	18	5.6%	0	0	20	30	37	IIIC
35	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
36	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
37	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
38	4	0	11	20	25	5.6%	8	0	22	41	51	IIIB-2
39	4	0	6	20	20	5.6%	8	0	12	41	41	IIIC
40	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
41	0	0	2	10	7	5.6%	0	0	4	20	14	IIIC
42	6	0	9	25	28	5.6%	12	0	18	51	57	IIIB-2
43	0	0	0	5	3	5.6%	0	0	0	10	6	IIIC
44	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
45	6	0	9	20	25	5.6%	12	0	18	41	51	IIIB-2
46	2	0	4	10	11	5.6%	4	0	8	20	22	IIIC
47	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
48	4	0	16	20	30	5.6%	8	0	32	41	61	IIIB-2
49	2	0	8	10	15	5.6%	4	0	16	20	30	IIIC
50	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC

Table 2-1-2 (2) EXISTING AND FUTURE TRAFFIC VOLUME

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(SPD : 1/2)

	INVENTORY (1985)					RATE	AFTER 13 YEARS (1998)					CLASS
LINK NO	MBL	BUS	TRUK	SPD	TOTAL		MBL	BUS	TRUK	SPD	TOTAL	
51	5	0	10	25	28	5.6%	10	0	20	51	57	IIIB-2
52	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
53	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
54	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
55	2	0	2	10	9	5.6%	4	0	4	20	18	IIIC
56	4	0	11	30	30	5.6%	8	0	22	61	61	IIIB-2
57	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
58	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
59	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
60	2	0	8	10	15	5.6%	4	0	16	20	30	IIIC
61	5	0	10	20	25	5.6%	10	0	20	41	51	IIIB-2
62	0	0	0	10	5	5.6%	0	0	0	20	10	IIIC
63	2	0	8	15	18	5.6%	4	0	16	30	37	IIIC
64	4	0	11	20	25	5.6%	8	0	22	41	51	IIIB-2
65	0	0	0	6	3	5.6%	0	0	0	12	6	IIIC
66	0	0	0	0	0	5.6%	0	0	0	0	0	IIIC
67	0	0	0	10	5	5.6%	0	0	0	20	10	IIIC
PERCENT	11.88	0.00	24.30	63.83			11.88	0.00	24.30	63.83		

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

(KM)

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 : TANAH LAUT

(1998)

LINK NO	CLASS	SURFACE	MOBIL	BUS	TRUCK	SEPEDA	TOTAL
9	IIIB-2	KRK	14	0	28	73	79
10	IIIB-2	KRK	26	0	54	141	151
11	IIIB-2	KRK	11	0	22	59	63
12	IIIB-2	KRK	11	0	22	59	63
13	IIIB-2	KRK	22	0	45	117	126
14	IIIB-2	KRK	9	0	18	49	52
15	IIIB-2	KRK	20	0	41	108	115
16	IIIB-2	KRK	24	0	49	129	138
17	IIIB-2	KRK	32	0	65	170	182
18	IIIB-2	KRK	9	0	18	47	51
19	IIIB-2	KRK	10	0	21	54	58
20	IIIC	KRK	4	0	8	22	23
21	IIIB-1	ASP	58	0	118	311	332
22	IIIB-2	KRK	29	0	59	156	166
23	IIIC	KRK	5	0	11	29	31
24	IIIB-2	KRK	20	0	41	109	116
25	IIIC	KRK	2	0	3	9	10
26	IIIC	KRK	2	0	4	11	12
27	IIIC	KRK	1	0	2	6	6
28	IIIC	KRK	2	0	3	8	9
29	IIIC	KRK	1	0	2	5	6
30	IIIC	KRK	2	0	4	10	11
31	IIIC	KRK	1	0	3	7	8
32	IIIB-2	KRK	11	0	22	59	63
33	IIIB-2	KRK	18	0	37	98	104
34	IIIB-2	KRK	18	0	37	97	104
38	IIIC	KRK	3	0	6	16	17
39	IIIC	KRK	3	0	7	18	19
41	IIIC	KRK	4	0	9	23	25
42	IIIB-2	KRK	25	0	52	135	145
43	IIIB-2	KRK	14	0	29	77	82
45	IIIC	KRK	6	0	12	32	34
46	IIIC	KRK	0	0	1	2	2
48	IIIC	KRK	0	0	1	2	2
49	IIIC	KRK	1	0	2	4	5
51	IIIC	KRK	0	0	1	2	2
55	IIIB-2	KRK	15	0	30	78	84
56	IIIB-2	KRK	21	0	42	112	119
60	IIIC	KRK	2	0	4	10	11
61	IIIC	KRK	3	0	5	14	15
62	IIIC	KRK	1	0	2	5	6
63	IIIC	KRK	4	0	8	22	23
64	IIIC	KRK	5	0	10	25	28
65	IIIC	KRK	5	0	11	29	31
66	IIIB-2	KRK	11	0	22	59	63
67	IIIB-2	KRK	24	0	48	127	136

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 : TANAH LAUT

(1000Rupiah)

	LINK 9	LINK 10	LINK 11	LINK 12	LINK 13	LINK 14	LINK 15	LINK 16	LINK 17	LINK 18
	7 Ke	12 Ke	5 Ke	5 Ke	10 Ke	6 Ke	14 Ke	16 Ke	23 Ke	4 Ke
	IIIB-2	IIIB-2	IIIB-2	IIIB-2	IIIB-2	IIIB-2	IIIB-2	IIIB-2	IIIB-2	IIIB-2
YEAR	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus	Surplus
1988	0	0	0	0	0	0	0	0	0	0
1989	6184	28431	4368	3937	19353	3817	20617	24524	49125	2926
1990	6661	29655	4408	3973	20744	4030	21745	25200	52440	3106
1991	6919	31383	4626	4169	21763	4265	23348	27285	55034	3296
1992	7396	33166	5009	4515	23154	4309	24037	28442	59099	3487
1993	7677	35453	5227	4711	24590	4720	25693	30527	61773	3823
1994	8155	37236	5630	5075	25649	4955	27349	32201	65169	3857
1995	8460	39018	5868	5288	27507	5366	28952	33874	69395	4048
1996	9147	41360	6271	5652	28943	5623	30662	35976	72871	4384
1997	9648	44150	6509	5866	30424	6034	32318	38167	77818	4574
1998	10359	46545	6912	6230	32321	6100	34028	39841	81963	4927
SUM	80606	366397	54828	49416	254448	49219	268749	316037	644687	38428
COST	22236	172396	14293	11105	113624	7359	107640	128280	296245	8195
/Ke	3177	14366	2859	2221	11362	1227	7689	8017	12880	2049

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

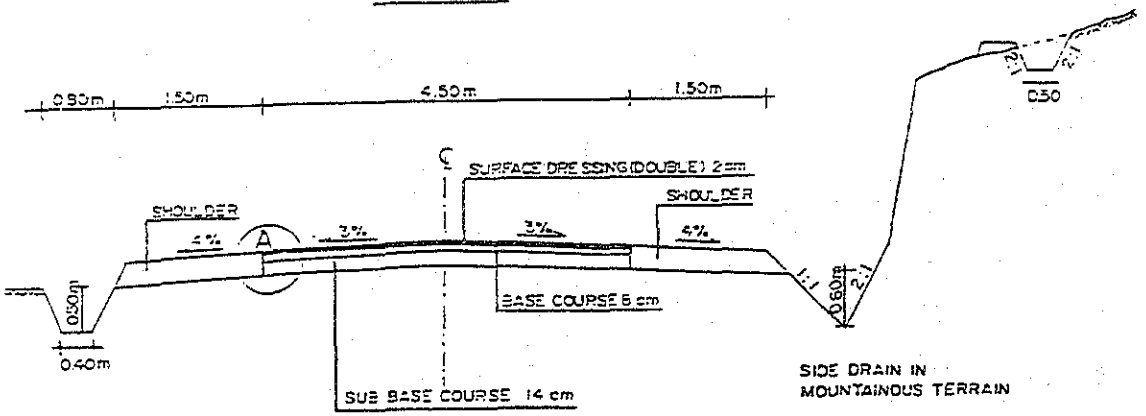
DESIGN CRITERIA FOR KABUPATEN ROADS

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		

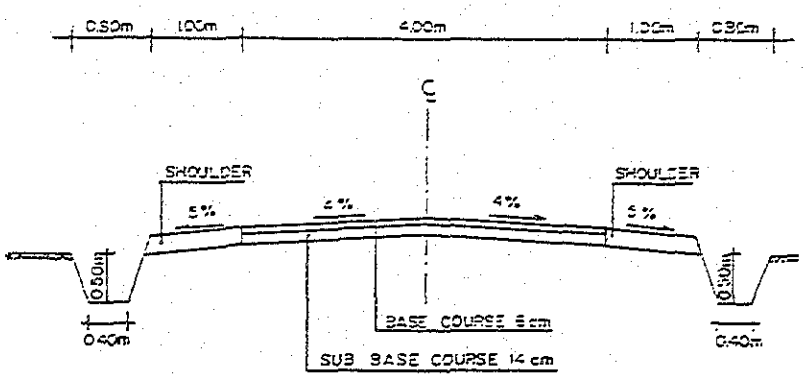
Fig. 3-1-1

STANDARD ROAD CROSS SECTIONS

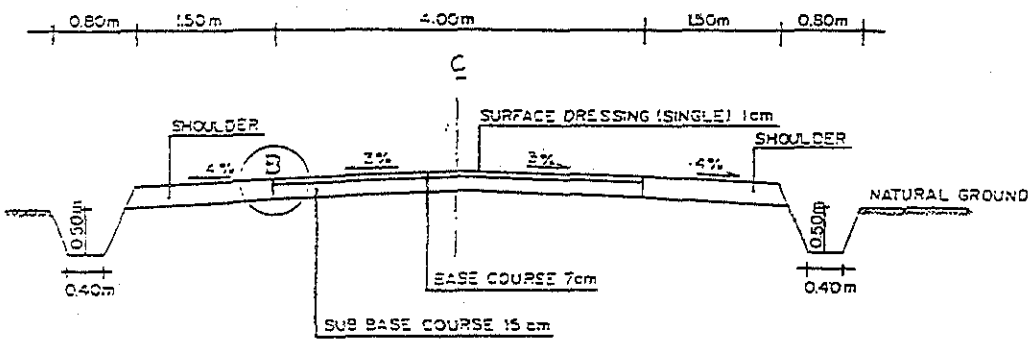
CLASS III A



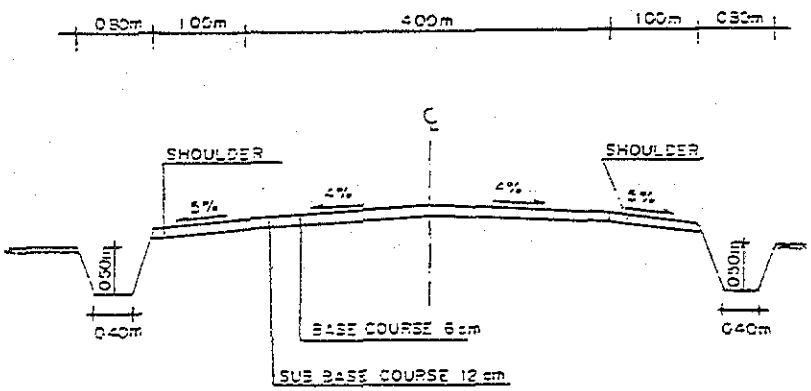
CLASS III B-2



CLASS III B-1



CLASS III C



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

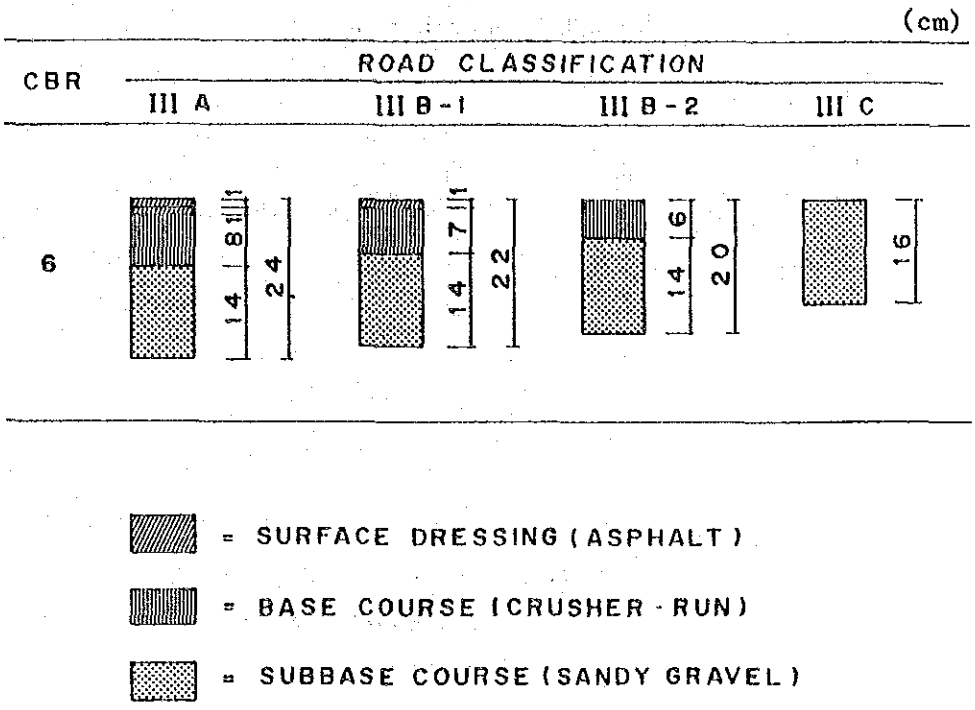
The CBR value of the existing roadbed is a very important factor for the pavement design but no results are available from CBR tests on the Kabupaten roads.

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.

3.2.2 Pavement Structure

Fig. 3-2-1 shows the standard pavement structure adopted for the Kabupaten roads.

Fig. 3-2-1 PAVEMENT STRUCTURE



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.

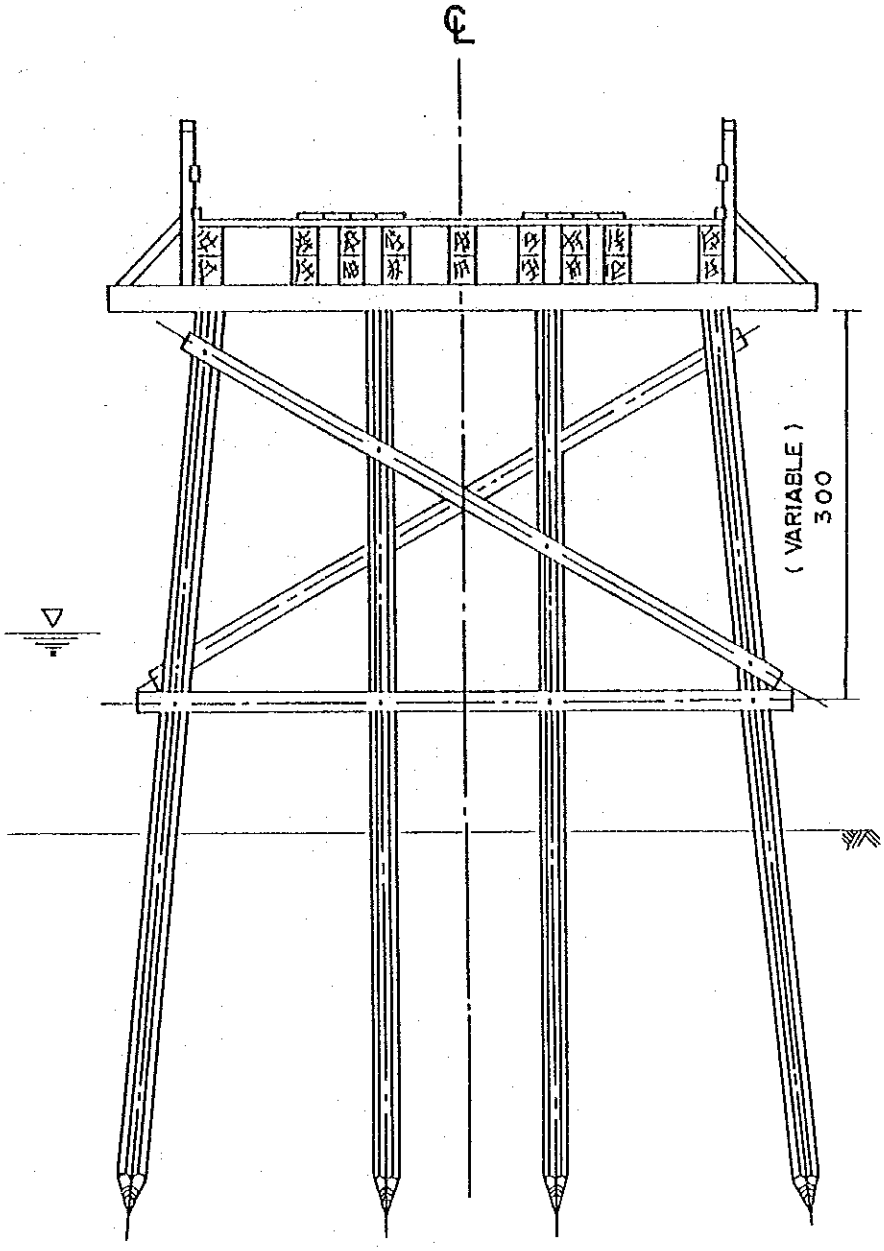
The length and number of piles should be decided in order to be adequate for the condition of the foundation materials.

(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

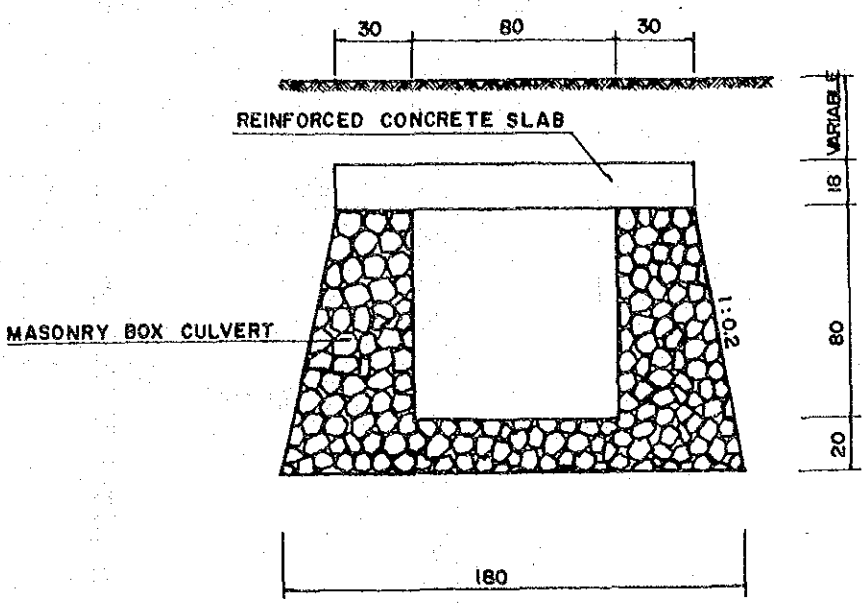
(2) Retaining Wall

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

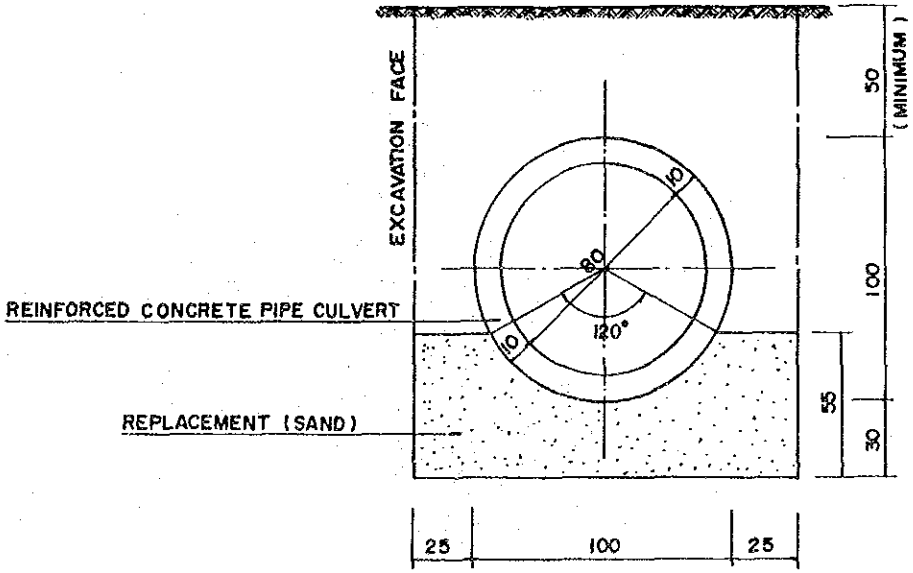
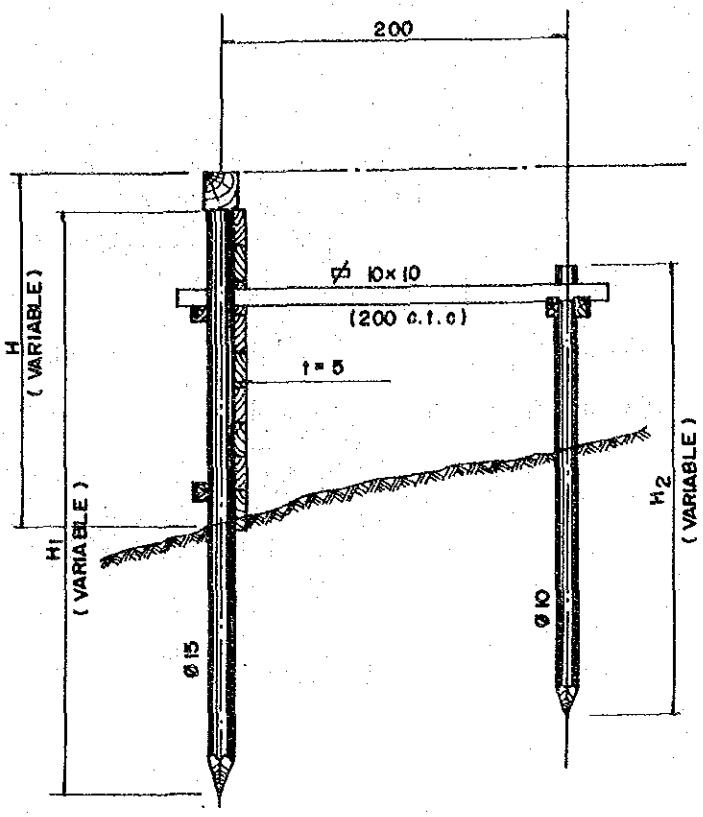
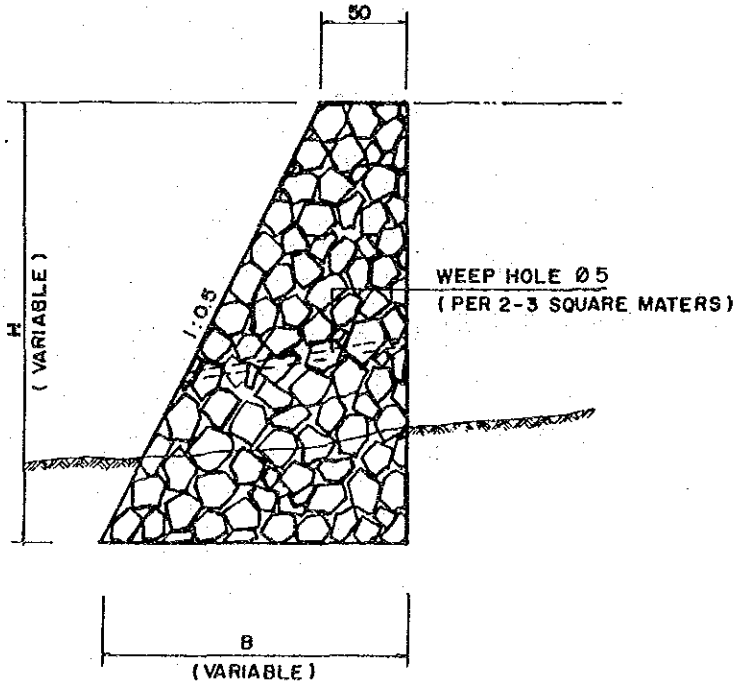


Fig. 3-3-3 STANDARD RETAINING WALLS

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 Tanah Laut 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 Tanah Laut 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

UNIT PRICE OF MATERIALS (CONT'D)

(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 : TANAH LAUT

(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	12,646	12,880	7,769	1,024	8,793	21,673
	Bulldozer/Ripper	120 HP	255	13,656	13,911	8,500	1,575	10,075	23,986
	Swamp Bulldozer	120 HP	267	13,899	14,166	8,879	1,646	10,525	24,691
	Bulldozer	90 HP	148	8,577	8,725	4,914	647	5,561	14,286
	Bulldozer/Ripper	90 HP	159	9,167	9,326	5,300	982	6,282	15,608
	Bulldozer	65 HP	105	6,231	6,336	3,500	461	3,961	10,297
	Bulldozer/Ripper	65 HP	115	6,680	6,795	3,819	708	4,527	11,322
	Swamp Bulldozer	90 HP	159	9,157	9,316	5,284	979	6,263	15,579
	Swamp Bulldozer	65 HP	122	6,567	6,689	4,049	750	4,799	11,488
	Motor Grader	110 HP	208	10,979	11,187	6,919	1,282	8,201	19,388
	Motor Grader	75 HP	144	7,525	7,669	4,779	885	5,664	13,333
	Motor Grader	65 HP	129	6,621	6,750	4,300	797	5,097	11,847
	Road Stabilizer	W=1850 mm	258	3,381	3,639	8,594	424	9,018	12,657
	Vibratory Roller	4 ton	87	3,290	3,377	2,900	382	3,282	6,659
	Hand-guide Vib. Roller	1000 Kg	68	591	659	850	29	879	1,538
	Tire Roller	8-15 ton	94	7,270	7,364	3,106	102	3,208	10,572
	Vibratory Roller (D&T)	4 ton	87	3,290	3,377	2,900	382	3,282	6,659
	Hand-guide Vib. Roller	600 Kg	48	404	452	600	20	620	1,072
	Rough Terrain Crane	10 ton	302	12,799	13,101	10,039	744	10,783	23,884
	Hydraulic Excavator; Wheel	0.3 m3	124	7,704	7,828	4,109	541	4,650	12,478
	Wheel Loader	1.2 m3	211	8,343	8,554	7,019	925	7,944	16,498
	Wheel Loader	0.3 m3	69	2,911	2,980	2,269	299	2,568	5,548
	Water Tank Truck	4000 ltr.	70	2,790	2,860	868	120	988	3,848
	Fuel Tank Truck	4000 ltr.	71	2,798	2,869	882	121	1,003	3,872
	Dump Truck	3.0 ton	118	3,499	3,617	1,469	202	1,671	5,288
	Flat Bed Truck with Crane	3.0 ton	52	3,037	3,089	1,717	127	1,844	4,933
	Dump Loader Truck	12 ton	116	18,632	18,748	3,837	126	3,963	22,711
	Dump Truck	5.0 ton	176	5,778	5,954	2,189	302	2,491	8,445
	Flat Bed Truck	3.0 ton	17	2,613	2,630	563	41	604	3,234
	Portable Crusher/Screening	30-40 t/h	564	21,360	21,924	18,800	2,478	21,278	43,202
	Concrete Mixer	0.5 m3	432	2,391	2,823	5,400	419	5,819	8,642
	Water Pump	200 l/min	16	258	274	188	6	194	468
	Concrete Vibrator	3.3 HP	6	222	228	73	2	75	303
	Asphalt Sprayer	850 ltr.	82	757	839	1,019	140	1,159	1,998

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 : TANAH LAUT

(Rp)

ITEM	UNIT	LOCAL	FOREIGN	TOTAL
Site Clearance in Light Bush	m2	158	91	249
Subgrade Preparation	m2	20	11	31
Normal Fill	m3	1,627	863	2,490
Fill in Swamp	m3	2,419	1,052	3,471
Normal Excavation to Spoil	m3	952	522	1,474
Sub Base Course	m3	3,072	1,347	4,419
Base Course	m3	4,222	2,299	6,521
Shoulder	m2	285	146	431
Asphalt Patching	m2	3,475	1,343	4,818
Surface Dressing (Single)	m2	590	552	1,142
Surface Dressing (Double)	m2	736	868	1,604
Earth Drain	m	829	119	948
Earth Drain in Swamp (by machine)	m3	1,145	474	1,619
Pipe Culvert D80cm	m	42,020	40,911	82,931
Masonry Culvert (80x80cm)	m	55,043	35,333	90,376
Retaining Wall and Wing Wall (Timber)	m2	8,258	246	8,504
Retaining Wall and Wing Wall (Masonry)	m3	39,839	11,488	51,327
Gabion Protection	m3	9,866	120	9,986
Manual routine maintenance of road	Km	134,060	7,248	141,308
Routine maintenance of earth road	Km	90,985	37,904	128,889
Routine maintenance of gravel road	Km	183,853	88,047	271,900
Routine maintenance of asphalt road	Km	347,500	134,300	481,800

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 : TANAH LAUT

(Rp)

ITEM	UNIT	LOCAL	FOREIGN	TOTAL
Superstructure (Timber;Span 3m;10T)	m2	31,812	5,168	36,980
Superstructure (Timber;Span 5m;10T)	m2	35,236	5,705	40,941
Superstructure (Timber;Span 8m;10T)	m2	46,669	7,489	54,158
Superstructure (Timber;Span 3m;BM50)	m2	39,445	6,389	45,834
Superstructure (Timber;Span 5m;BM50)	m2	43,061	6,919	49,980
Superstructure (Timber;Span 8m;BM50)	m2	54,612	8,757	63,369
Superstructure (Concrete;Span 3m;BM50)	m2	39,166	83,018	122,184
Superstructure (Concrete;Span 5m;BM50)	m2	40,438	92,732	133,170
Superstructure (Concrete;Span 8m;BM50)	m2	41,817	100,983	142,800
Superstructure (Concrete;Span10m;BM50)	m2	45,876	114,656	160,532
Superstructure (Concrete;Span15m;BM50)	m2	49,784	135,007	184,791
Substructure (Pier;for Timber;10T)	NO	277,196	48,249	325,445
Substructure (Abut;for Timber;10T)	NO	810,376	207,102	1,017,478
Substructure (Pier;for Timber;BM50)	NO	407,688	71,442	479,130
Substructure (Abut;for Timber;BM50)	NO	909,043	233,047	1,142,090
Substructure (Pier;for Concrete;BM50)	NO	1,435,872	457,078	1,892,950
Substructure (Abut;for Concrete;BM50)	NO	3,070,954	965,859	4,036,813
Demolition of Bridge (Timber->Timber)	m2	9,109	1,907	11,016
Demolition of Bridge (Timber->Concrete)	m2	9,109	1,907	11,016
Demolition of Bridge (Concrete)	m2	68,748	65,572	134,320
Maintenance of Timber Bridge (New)	m2	6,027	1,455	7,482
Maintenance of Concrete Bridge (New)	m2	1,585	2,522	4,107
Maintenance of Timber Bridge (Exist)	m2	6,602	2,571	9,173
Maintenance of Concrete Bridge (Exist)	m2	3,906	2,348	6,254

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 Tanah laut are shown in Table 5-1-1.

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

KABUPATEN : TANAH LAUT

CRITERIA NO	ROAD LINK NO
(6)	01,02,03,04,05,06,07,08,
(8)	35,36,37,40,44,47,50,52,54,57,58,59

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 : TANAH LAUT

LINK NO	LENGTH	CLASS	IRR(%)	REMARK
21	20 Km	IIIB-1	34.266	Surplus
22	8 Km	IIID-2	24.437	Surplus
17	23 Km	IIIB-2	23.456	Surplus
10	12 Km	IIIB-2	23.392	Surplus
13	10 Km	IIID-2	18.016	Surplus
42	12 Km	IIIB-2	17.424	Surplus
16	16 Km	IIIB-2	12.541	Surplus
33	5 Km	IIIB-2	10.999	Surplus
55	4 Km	IIIB-2	10.750	Surplus
15	14 Km	IIIB-2	9.520	Surplus
34	10 Km	IIID-2	8.604	Surplus
24	11 Km	IIIB-2	8.524	Surplus
67	7 Km	IIIB-2	6.773	Surplus
11	5 Km	IIIB-2	0.078	Surplus
23	8 Km	IIIC	0.078	Surplus
12	5 Km	IIIB-2	0.078	Surplus
25	11 Km	IIIC	0.078	Surplus
26	13 Km	IIIC	0.078	Surplus
27	7 Km	IIIC	0.078	Surplus
28	10 Km	IIIC	0.078	Surplus
29	7 Km	IIIC	0.078	Surplus
30	12 Km	IIIC	0.078	Surplus
31	12 Km	IIIC	0.078	Surplus
32	3 Km	IIIB-2	0.078	Surplus
9	7 Km	IIIB-2	0.078	Surplus
18	4 Km	IIIB-2	0.078	Surplus
38	7 Km	IIIC	0.078	Surplus
39	2 Km	IIIC	0.078	Surplus
41	2 Km	IIIC	0.078	Surplus
19	15 Km	IIIB-2	0.078	Surplus
43	18 Km	IIIB-2	0.078	Surplus
45	4 Km	IIIC	0.078	Surplus
46	3 Km	IIIC	0.078	Surplus
48	4 Km	IIIC	0.078	Surplus
49	7 Km	IIIC	0.078	Surplus
51	3 Km	IIIC	0.078	Surplus
20	6 Km	IIIC	0.078	Surplus
56	10 Km	IIIB-2	0.078	Surplus
60	8 Km	IIIC	0.078	Surplus
61	18 Km	IIIC	0.078	Surplus
62	7 Km	IIIC	0.078	Surplus
63	6 Km	IIIC	0.078	Surplus
64	7 Km	IIIC	0.078	Surplus
65	1 Km	IIIC	0.078	Surplus
66	3 Km	IIID-2	0.078	Surplus
14	6 Km	IIIB-2	0.078	Surplus

Table 5-2-2 RESULTS OF SECONDARY ANALYSIS

PROVINCE : KALIMANTAN SELATAN KABUPATEN : TANAH LAUT

LINK NO	LENGTH	CLASS	IRR(%)	REMARK
15	14 Km	IIIC	13.904	Surplus
34	10 Km	IIIC	12.614	Surplus
24	11 Km	IIIC	12.107	Surplus
67	7 Km	IIIC	8.742	Surplus

Table 5-2-3 RANKING OF FEASIBILITY ROAD LINKS

PROVINCE : KALIMANTAN SELATAN KABUPATEN : TANAH LAUT

LINK NO	LENGTH	CLASS	NPV (1000Rp)	B/C	IRR (%)	REMARK
21	20 Km	IIIB-1	367178	2.046	34.266	Surplus
17	23 Km	IIIB-2	128227	1.492	23.456	Surplus
10	12 Km	IIIB-2	75949	1.522	23.392	Surplus
22	8 Km	IIIB-2	57646	1.568	24.437	Surplus
42	12 Km	IIIB-2	41386	1.294	17.424	Surplus
13	10 Km	IIIB-2	37352	1.319	18.016	Surplus
15	14 Km	IIIC	16010	1.108	13.004	Surplus
16	16 Km	IIIB-2	15740	1.089	12.541	Surplus
24	11 Km	IIIC	9529	1.079	12.107	Surplus
34	10 Km	IIIC	8316	1.092	12.614	Surplus
33	5 Km	IIIB-2	1924	1.037	10.999	Surplus
55	4 Km	IIIB-2	1195	1.028	10.750	Surplus
SUM	145 Km		760452			

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: Tanah Laut

(Rpx10^6)

COST	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
CONSTRUCTION	427	1,052	1,479
MAINTENANCE	134	464	598
SUPPLEMENTATION	436	-	436
WORKSHOP EQUIPMENT & TOOLS	28	-	28
LABORATORY EQUIPMENT	12	-	12
SURVEY EQUIPMENT	5	-	5
TOTAL	1,042	1,516	2,558

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	126	1,501	1,627
CONSTRUCTION & MAINTENANCE EQUIPMENT	811	-	811
SPARE PARTS	60	15	75
WORKSHOP/LABORATORY/SURVEY EQUIPMENT	45	-	45
TOTAL	1,042	1,516	2,558

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 16 links with the total length of 188 km which is 45% of the 420 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 : TANAH LAUT

REASON FOR SELECTION	ROAD LINK NO
Feasible	
- Primary	10,13,16,17,21,22,33,42,55,
- Secondary	15,24,34
Engineering Point of View	9,25,29,61
Basic Human Needs	-

As the table shows all feasible road links are proposed to be improved.

The four key road links which are located at the strategic point to complete the local road network consisting of feasible 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 : TANAH LAUT

YEAR	LINK NO ( ) : rate
1988	21 (50%)
1989	9, 17 (50%), 21 (50%), 33
1990	10, 17 (50%), 22, 25
1991	13, 15, 16, 29, 34
1992	24, 42, 55, 61

KAB · TANAH LAUT

KEC · KURAU
KEC · BATI-BATI
KEC · PELAIHARI
KEC · KINTAP
KEC · JORONG
KEC · TAKISUNG
KEC · PANYIPATAN
LAUT JAWA

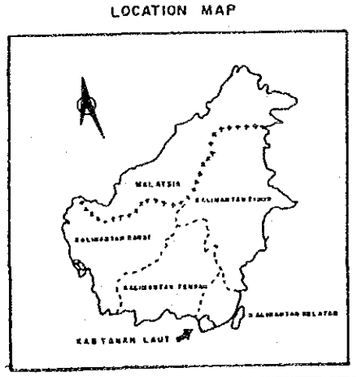
HANDIL HANDIL
HANDIL BABIRIK
HANDIL ILUNG
HANDIL BABISUK
HANDIL GAYAM
SEI RASAU
KURAU
HANDIL NEGARA
PADANG LUAS
MALUKA
SEI · BAKAU
TABANIO
TELEKOMUNIKASI
UJUNG-BATU
TUNGKARAN
PANJARATAN
TELAGA
SUKA DAMAI
SENUA-TENGAH
TAKISUNG
GUNUNG MAKMUR
KE MANTAPURA
KE BANJAR MASIN
LIANGANGGANG
BANYUIRANG
KAIT KAIT
SUNTOK
ASAHAN
IMBAH
MARTADAH
KAMPUNG BATI BATI
BATI BATI
GUNUNG RAJA
PULAU SARI
TAMBANG ULANG
AMBUNGAN
ATILAM
PELAIHARI
SALIREJO
TANJUNG
BAJUIN
AIR TERJUN
KUNYIT
DAMIT
DURIAN GUNGKUK
SELIRIAM
SUMBER MULYA
TAJAU PECAH
JILATAN
ALUR
PULAU RAMANIA
JORONG
MUARA JORONG
TANGKE-WANG
PANYIPATAN
KUALA TAMBANGAN
KAMPUNG BARU
KURINGKIT
BATU TUNGKU
SABUHUR
KERAMAT
PANTAI CAB
TANJUNG DEWA
SIMP. BATAKAN
BATAKAN
KURANJI
KE KOTA BARU
PASIR PUTIH
KINTAP
KINTAP KAMPUNG
SIMPANG 4 SEBAMBAN
MUARA KINTAP
PANDAN SARI
SEI RAKIN
SIMP. 3 ASAM-ASAM
ASAM-ASAM
MUARA ASAM-ASAM
LAUT JAWA

SCALE :
0 5 10 15 Km

CONSTRUCTION PROGRAMME

ROAD LINE NUMBER	FISCAL YEAR 1988/89	1989/90	1990/91	1991/92	1992/93
21	129				
39,17					
21,33		288			
10,17					
22,28			336		
15,18					
16,29,34				404	
24,42					
30,41					320
TOTAL COST ($ 10^6$ Rp.)	129	288	336	404	320

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

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 : TANAH LAUT

(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 : TANAH LAUT

(1000Rp)

LINK NO	LENGTH (Km)	BA (%)	SD (%)	RU (%)	RB (%)	ASPHAL (Km)	GRAVEL (Km)	EARTH (Km)	TH NO	AREA (m2)	RC NO	AREA (m2)	BRIDGE COST	LOCAL COST	FOREIGN COST	TOTAL COST
1	7	50.7	35.7	13.6	0.0	0	4	3	5	172.00	0	0.00	1,578	3,082	959	4,041
2	3	46.7	33.3	20.0	0.0	3	0	0	0	0.00	0	0.00	0	1,445	425	1,870
3	2	35.0	30.0	35.0	0.0	2	0	0	0	0.00	0	0.00	0	963	283	1,246
4	2	50.0	25.0	25.0	0.0	2	0	0	0	0.00	0	0.00	0	963	283	1,246
5	4	47.5	27.5	25.0	0.0	4	0	0	2	48.00	0	0.00	440	2,243	690	2,933
6	2	35.0	25.0	40.0	0.0	0	0	2	0	0.00	0	0.00	0	450	90	540
7	2	40.0	30.0	30.0	0.0	0	0	2	0	0.00	0	0.00	0	450	90	540
9	7	52.9	21.4	25.7	0.0	1	0	6	3	176.00	0	0.00	1,614	2,994	865	3,859
11	5	34.0	29.0	37.0	0.0	0	0	5	9	330.00	0	0.00	3,027	3,304	1,074	4,378
14	6	55.8	32.5	11.7	0.0	0	0	6	2	28.00	0	0.00	257	1,535	343	1,878
16	16	47.5	40.6	11.9	0.0	0	2	14	6	348.00	0	0.00	3,192	6,084	1,717	7,801
17	23	39.1	26.7	34.1	0.0	3	0	20	29	668.00	0	0.00	6,128	10,356	3,045	13,401
20	6	63.3	30.0	6.7	0.0	0	6	0	0	0.00	0	0.00	0	1,907	572	2,479
21	20	38.5	23.5	31.5	6.5	4	0	16	17	450.50	0	0.00	4,132	8,501	2,447	10,948
23	8	45.0	41.3	13.8	0.0	0	0	8	3	68.00	0	0.00	624	2,249	536	2,785
24	11	35.5	34.5	30.0	0.0	0	0	11	7	98.50	0	0.00	904	3,126	750	3,876
26	13	57.7	29.2	13.1	0.0	0	0	13	5	132.00	0	0.00	1,211	3,797	926	4,723
27	7	38.6	22.9	17.1	21.4	0	0	7	7	416.00	0	0.00	3,816	4,322	1,386	5,708
28	10	40.0	36.0	20.0	4.0	0	0	10	1	100.00	0	0.00	917	2,911	709	3,620
29	7	44.3	27.1	28.6	0.0	0	0	7	8	184.00	0	0.00	1,688	2,790	789	3,579
31	12	34.2	30.8	35.0	0.0	0	0	12	2	80.00	0	0.00	734	3,229	748	3,977
33	5	58.0	26.0	6.0	10.0	0	0	5	3	36.00	0	0.00	330	1,363	318	1,681
34	10	66.0	24.5	9.5	0.0	0	0	10	4	112.00	0	0.00	1,027	2,990	739	3,729
38	7	41.4	30.0	28.6	0.0	0	0	7	4	104.80	0	0.00	961	2,767	586	2,853
39	2	45.0	40.0	15.0	0.0	0	0	2	1	32.00	0	0.00	294	661	173	834
42	12	37.5	28.3	34.2	0.0	0	0	12	4	147.00	0	0.00	1,348	3,671	920	4,591
45	4	25.0	27.5	42.5	5.0	0	0	4	0	0.00	0	0.00	0	900	181	1,081
51	3	33.3	33.3	33.3	0.0	0	0	3	1	48.00	0	0.00	440	992	259	1,251
56	10	46.0	28.0	26.0	0.0	10	0	0	0	0.00	1	24.00	150	4,909	1,472	6,381
61	18	32.2	33.3	34.4	0.0	0	0	18	26	514.00	0	0.00	4,715	7,444	2,134	9,578
63	6	43.3	30.0	26.7	0.0	0	2	4	2	48.00	0	0.00	440	1,853	495	2,348
64	7	64.3	31.4	4.3	0.0	0	6	1	0	0.00	0	0.00	0	2,133	617	2,750
SUM	257					29	20	208	151	4340.80	1	24.00	39,968	95,884	26,621	122,505

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 Tanah Laut 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 1,479 x 10^6 and maintenance cost is Rp 598 x 10^6 which is approximately 29% of the total expenditure.

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

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	75,508	185,969	219,847	276,094	222,951	980,369	(66.3%)
Ownership Cost	1,012	3,045	4,047	4,732	3,925	16,761	(1.7%)
Operation Cost	37,288	109,594	143,870	167,074	141,144	598,970	(61.1%)
Material Cost	16,789	21,487	9,644	17,774	11,599	77,293	(7.9%)
Labour Cost	10,570	27,586	33,610	50,502	37,202	159,470	(16.3%)
Contingency	9,849	24,257	28,676	36,012	29,081	127,875	(13.0%)
FOREIGN CURRENCY :	49,302	103,666	109,600	129,358	107,342	499,268	(33.7%)
Ownership Cost	21,077	62,264	82,055	94,264	78,901	338,561	(67.8%)
Operation Cost	2,922	8,972	12,017	13,765	11,480	49,156	(9.8%)
Material Cost	18,872	18,908	1,232	4,456	2,960	46,428	(9.3%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	6,431	13,522	14,296	16,873	14,001	65,123	(13.0%)
TOTAL COST :	124,810	289,634	329,446	405,452	330,293	1,479,635	
Ownership Cost	22,089	65,309	86,102	98,996	82,826	355,322	(24.0%)
Operation Cost	40,210	118,566	155,887	180,839	152,624	648,126	(43.8%)
Material Cost	35,661	40,395	10,876	22,230	14,559	123,721	(8.4%)
Labour Cost	10,570	27,586	33,610	50,502	37,202	159,470	(10.8%)
Contingency	16,280	37,778	42,971	52,885	43,082	192,996	(13.0%)

(Contingency : 15%)

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

(MAINTENANCE)

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	46,869	88,975	98,252	109,701	120,661	464,458	(77.6%)
Ownership Cost	370	704	839	984	1,132	4,029	(0.9%)
Operation Cost	22,162	42,072	46,324	53,342	60,075	223,975	(48.2%)
Material Cost	2,321	4,358	4,972	5,584	6,079	23,314	(5.0%)
Labour Cost	22,016	41,841	46,117	49,791	53,375	213,140	(45.9%)
FOREIGN CURRENCY :	12,998	24,651	27,904	32,251	36,450	134,254	(22.4%)
Ownership Cost	10,494	19,912	22,199	26,009	29,676	108,290	(80.7%)
Operation Cost	1,040	1,977	2,234	2,682	3,130	11,063	(8.2%)
Material Cost	1,464	2,762	3,471	3,560	3,644	14,901	(11.1%)
Labour Cost	0	0	0	0	0	0	(0.0%)
TOTAL COST :	59,867	113,626	126,156	141,952	157,111	598,712	
Ownership Cost	10,864	20,616	23,038	26,993	30,808	112,319	(18.8%)
Operation Cost	23,202	44,049	48,558	56,024	63,205	235,038	(39.3%)
Material Cost	3,785	7,120	8,443	9,144	9,723	38,215	(6.4%)
Labour Cost	22,016	41,841	46,117	49,791	53,375	213,140	(35.6%)

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

(TOTAL)

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	122,377	274,944	318,099	385,795	343,612	1,444,827	(69.5%)
Ownership Cost	1,382	3,749	4,886	5,716	5,057	20,790	(1.4%)
Operation Cost	59,450	151,666	190,194	220,416	201,219	822,945	(57.0%)
Material Cost	19,110	25,845	14,616	23,358	17,678	100,607	(7.0%)
Labour Cost	32,586	69,427	79,727	100,293	90,577	372,610	(25.8%)
Contingency	9,849	24,257	28,676	36,012	29,081	127,875	(8.9%)
FOREIGN CURRENCY :	62,300	128,317	137,504	161,609	143,792	633,522	(30.5%)
Ownership Cost	31,571	82,176	104,254	120,273	108,577	446,851	(70.5%)
Operation Cost	3,962	10,949	14,251	16,447	14,610	60,219	(9.5%)
Material Cost	20,336	21,670	4,703	8,016	6,604	61,329	(9.7%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	6,431	13,522	14,296	16,873	14,001	65,123	(10.3%)
TOTAL COST :	184,677	403,260	455,602	547,404	487,404	2,078,347	
Ownership Cost	32,953	85,925	109,140	125,989	113,634	467,641	(22.5%)
Operation Cost	63,412	162,615	204,445	236,863	215,829	883,164	(42.5%)
Material Cost	39,446	47,515	19,319	31,374	24,282	161,936	(7.8%)
Labour Cost	32,586	69,427	79,727	100,293	90,577	372,610	(17.9%)
Contingency	16,280	37,778	42,971	52,885	43,082	192,996	(9.3%)

(Contingency : 15%)

6.1.4 Construction and Maintenance Equipment Cost

(1) Required Number of Equipment

The required numbers of construction equipment for Kabupaten Tanah Laut 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-Hand-guided Vibratory Roller
- 7-Dump Truck
- 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-Motor Grader 75 HP
- 1-Tire Roller 8-15 Ton
- 1-Dump Truck 3 Ton
- 1-Hand Guided Vibratory Roller 1000 Kg
- 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 : TANAH LAUT

EQUIPMENT NAME	WORKABLE	EXISTING	(1988)	(1989)	(1990)	(1991)	(1992)
Bulldozer/Ripper	230	0	0.22	0.70	1.08	1.00	0.90
Swamp Bulldozer	230	0	0.00	0.00	0.00	0.00	0.05
Motor Grader	250	0	0.35	1.25	1.60	2.07	1.50
Hand-guide Vib. Roller	250	3	0.01	0.02	0.03	0.12	0.08
Tire Roller	230	0	0.25	0.25	0.00	0.00	0.00
Vibratory Roller (D&T)	250	0	0.28	0.99	1.29	1.70	1.29
Hydraulic Excavator; Wheel	230	0	0.00	0.00	0.00	0.00	0.66
Wheel Loader	250	0	0.46	1.41	1.99	2.14	1.76
Water Tank Truck	250	0	0.16	0.55	0.75	0.98	0.76
Dump Truck	250	0	3.19	10.13	13.79	16.45	13.48
Flat Bed Truck with Crane	250	0	0.01	0.01	0.03	0.17	0.08
Flat Bed Truck	250	0	0.27	0.27	0.01	0.04	0.03
Portable Crusher/Screening	250	0	0.08	0.17	0.17	0.15	0.10
Concrete Mixer	230	0	0.01	0.01	0.01	0.02	0.02
Water Pump	230	0	0.01	0.01	0.01	0.02	0.02
Concrete Vibrator	230	0	0.01	0.01	0.01	0.01	0.01
Asphalt Sprayer	230	1	0.25	0.25	0.00	0.00	0.00

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

Table 6-1-8 EQUIPMENT PURCHASE COST

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

(1000 Rp)

EQUIPMENT NAME	CLASS	CIF (JAKARTA)	PURCHASE NO.	PURCHASE COST
Bulldozer	90 HP	49,150	-	-
Bulldozer/Ripper	90 HP	53,000	1	53,000
Swamp Bulldozer	90 HP	52,850	-	-
Swamp Bulldozer	65 HP	40,500	-	-
Motor Grader	75 HP	47,800	3	143,400
Road Stabilizer	W=1850 mm	85,950	-	-
Hand-guide Vib. Roller	1000 Kg	8,500	-	-
Tire Roller	8-15 ton	31,070	1	31,070
Vibratory Roller (D&T)	4 ton	29,000	2	58,000
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	2	140,400
Water Tank Truck	4000 ltr.	12,750	1	12,750
Dump Truck	3.0 ton	14,700	8	117,600
Dump Loader Truck	12 ton	56,300	-	-
Flat Bed Truck with Crane	3.0 ton	25,190	1	25,190
Flat Bed Truck	3.0 ton	11,275	1	11,275
Portable Crusher/Screening	30-40 t/h	188,000	1	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	1	1,100

PURCHASE COST TOTAL	810,885
OWNERSHIP COST (FOREIGN)	374,435
EQUIPMENT COST SUPPLEMENTED	436,450

NOTE : OWNERSHIP COST (FOREIGN) for Existing Equipment

Hand-guide Vib. Roller	2,407
Dump Truck	69,330
Asphalt Sprayer	679
TOTAL	72,416

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 : TANAH LAUT

ITEM	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
Site Clearance in Light Bush	m2	0.00	0.00	0.00	0.00	0.00	0.00
Subgrade Preparation	m2	64000.00	244000.00	328000.00	430000.00	320000.00	1386000.00
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	1740.00	1740.00
Normal Excavation to Spoil	m3	5206.00	13619.00	31002.00	18328.00	24084.00	92239.00
Sub Base Course	m3	4480.00	16720.00	23840.00	33592.00	25760.00	104392.00
Base Course	m3	2240.00	5840.00	7200.00	6240.00	3840.00	25360.00
Shoulder	m2	40000.00	148000.00	170000.00	218000.00	151000.00	727000.00
Asphalt Patching	m2	38.00	134.00	21.00	0.00	0.00	193.00
Surface Dressing (Single)	m2	40000.00	40000.00	0.00	0.00	0.00	80000.00
Surface Dressing (Double)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Earth Drain	m	1050.00	1350.00	1000.00	5300.00	800.00	9500.00
Earth Drain in Swamp (by machine)	m3	0.00	0.00	0.00	0.00	12000.00	12000.00
Pipe Culvert D80cm	m	2.00	2.00	36.00	72.00	69.00	181.00
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	3.20	16.00	6.40	25.60
Gabion Protection	m3	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber;Span 3m;10T)	m2	0.00	0.00	0.00	12.00	0.00	12.00
Superstructure (Timber;Span 5m;10T)	m2	0.00	0.00	0.00	0.00	40.00	40.00
Superstructure (Timber;Span 8m;10T)	m2	0.00	0.00	0.00	184.00	0.00	184.00
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	0.00	0.00	0.00	5.00	2.00	7.00
Substructure (Abut;for Timber;10T)	NO	0.00	0.00	0.00	4.00	2.00	6.00
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	0.00	0.00	0.00	12.00	40.00	52.00
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	126.00	240.25	251.25	271.50	291.50	1180.50
Routine maintenance of earth road	Km	102.00	193.50	176.00	145.50	109.50	726.50
Routine maintenance of gravel road	Km	10.00	20.00	32.00	85.00	141.00	288.00
Routine maintenance of asphalt road	Km	14.00	26.75	43.25	41.00	41.00	166.00
Maintenance of Timber Bridge (New)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance of Concrete Bridge (New)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance of Timber Bridge (Exist)	m2	2114.09	3955.18	4173.80	4558.80	4747.05	19550.91
Maintenance of Concrete Bridge (Exist)	m2	12.00	24.00	24.00	24.00	24.00	108.00

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.

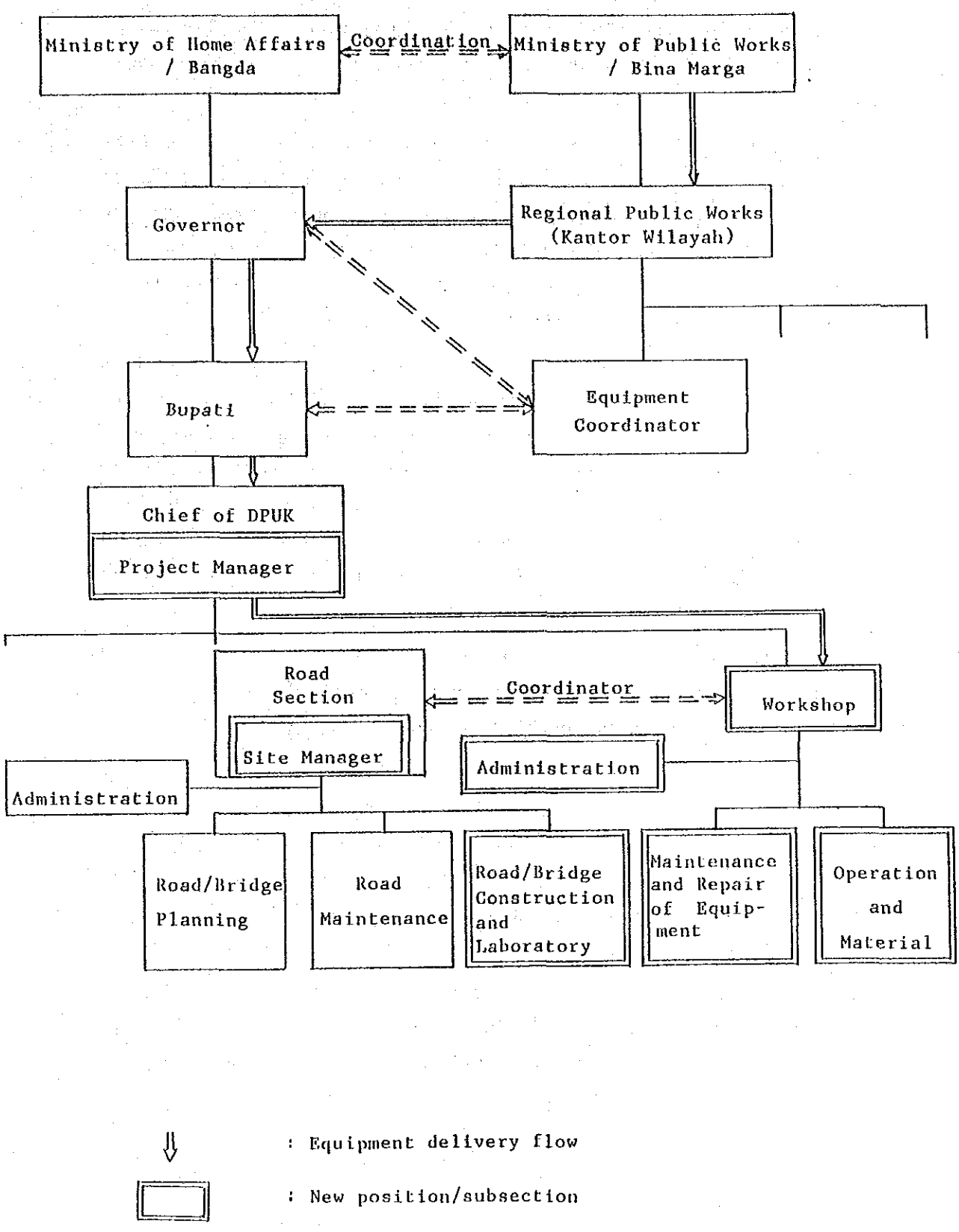
It is recommended that the workshop is newly organized to consist of three sub-sections, i.e. maintenance and repair of equipment, operation and materials, and administration to execute the main tasks described in Clause 3.5.

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. : TANAH LAUT SURVEY YEAR : 1984

Code No.	KECAMATAN NAME	CULTIVATED AREA : (PA)	YIELD RATE : (Y)	FARMER'S POPULATION : (AP)	CIRCULATED COMMODITY : (PG)
01	TAKISUNG	5,023	2.96	9,980	0
02	JORONG	1,086	2.18	5,250	0
03	PELAIHARI	18,090	2.97	10,300	0
04	KURAU	11,743	3.37	5,420	0
05	BATI BATI	3,545	2.93	5,590	0
06	PANYIPATAN	806	2.30	4,050	0
07	KINTAP	659	2.15	5,260	0

	r_1	r_2	r_3	r_4
ANNUAL AVERAGE % GROWTH RATE	2.6	3.0	3.5	5.6

FARMER'S CONSUMPTION : (Cp)	NON-AGRO REQUIRMENT : (NG)
0.13 Ton/head/year	0.13 Ton/ton

	SEDAN	BUS	TRUCK	MOTOR CYCLE
RATE OF EACH VEHICLE TYPE %	11.88	0.00	24.30	63.82

AVERAGE FREIGHT TONAGE	0.7 Ton/Truck

Appendix A-2 Engineering Data

ROAD LINK DATA

PROVINCE : Kalimantan Selatan

KABUPATEN: Tanah Laut

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
01	Sawahan	Beramban raya lok batu/A. Makmur	7	Pelaihari	7	Dalam Kota
02	Gagas	A.Yani	3	Pelaihari	7	Dalam Kota
03	Pangeran Antasari	Ujung Buruk	2	Pelaihari	2	Dalam Kota
04	Datu Daim I	Maja Keling	2	Pelaihari	2	Dalam Kota
05	Parit Mas	Gagas	4	Pelaihari	4	Dalam Kota
06	Gagas	Perum.Pemda	2	Pelaihari	2	Dalam Kota
07	Gagas	Balirejo	2	Pelaihari	2	Dalam Kota
08	Gagas	Sum-sum	5	Pelaihari	5	Dalam Kota
09	Balirejo	Bajuin	7	Pelaihari	7	1
10	Bajuin	Tanjung	12	Pelaihari	12	2
11	Bajuin	Air Terjun	5	Pelaihari	5	
12	Kunyit	Atilam	5	Pelaihari	5	2
13	Telaga	Panjaratan	10	Pelaihari	10	3
14	Takisung	Suka Damai	6	Takisung	6	1
15	Gunung Makmur	Kuala Tambangan	14	Takisung	14	
16	Takisung	Sei Bakau	16	Takisung	16	
17	Pelaihari	Kuringkit	22	Pelaihari Panyipatan	14 8	3
17 a	Kuringkit	Batakan	18	Panyipatan	18	I.L.N No. 61
17 b	Simp.Batakan	Pantai Cabe	7	Panyipatan	7	I.L.N No. 62
18	Ujung Batu	Tungkaran	4	Pelaihari	4	
19	Tambang Ulang	Martadah	15	Batibati	15	
19 a	Kait-kait	Asahan	6	Batibati	6	I.L.N No. 63
19 b	Asahan	Imban	7	Batibati	7	I.L.N No. 64
20	Asahan	Banyu Irang	6	Batibati	6	

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

I.L.N = Input Link Number

ROAD LINK DATA

PROVINCE : Kalimantan Selatan

KABUPATEN: Tanah Laut

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
21	Pulau Sari	Kurau	20	Kurau Batibati	15 5	
22	Kurau	Handil Babi-rik	8	Kurau	8	
23	Batibati	Kampung Bati-bati	8	Batibati	8	
24	Gunung Raja	Padang Luas	11	Kurau Batibati	5 6	
25	Pulau Ramania	Sabuhur	11	Jorong	11	
26	Jorong	Muara Jorong	13	Jorong	13	
27	Jilatan	Durian Bung-kuk	7	Jorong	7	
28	Alur	Damit	10	Jorong	10	
29	Sabuhur	Batu Tungku	7	Jorong PAnyipatan	1 6	
30	Asam-asam	Simp. 3 Asam-asam	12	Jorong	12	3
31	Simpang 4 Sebamban	Muara Kintap	12	Kintap	12	2
32	Kurau	Handil Gayam	3	Kurau	3	
32 a	Handil Gayam	Handil Babisik	1	Kurau	1	2 I.L.N No. 65
32 b	Handil Babi-sik	Handil ilung	3	Kurau	3	2 I.L.N No. 66
32 c	Handil ilung	Handil-handil	7	Kurau	7	2 I.L.N No. 67
33	Maluka	Sei.Bakau	5	Kurau	5	
34	Sei.Riam	Benua Tengah	10	Takisung Pelaihari	4.5 5.5	
35						2
36						
37						
38	Kampung baru	Tangkewang	7	Takisung Panyipatan	1.5 5.5	
39	Balirejo	Angsau	2	Pelaihari	2	
40						1
41	Angsau	Manaran	2	Pelaihari	2	

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

I.L.N = Input Link Number

ROAD LINK DATA

PROVINCE : Kalimantan Selatan

KABUPATEN: Tanah Laut

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
42	Tajau Pecah	Sumber Mulya	12	Jorong	0.5	
				Pelaihari	11.5	
43	Tambang Ulang	Ujung Batu	18	Pelaihari	1.5	3
				Batibati	16.5	
44						
45	Keramat	Kampung Baru	4	Takisung	4	
46	Batakan	Tanjung Dewa	3	Panyipatan	3	
47						
48	Kintap	Kintap Kampung	4	Kintap	4	1
49	Pandan Sari	Sei.Rakin	7	Kintap	7	
50						
51	Simp.3 Asam^2	Asam-asam	3	Jorong	3	
52						
53						
54						
55	Padang Luas	Handil Negara	4	Kurau	4	
56	Ambungan	Telekomunika-si	10	Pelaihari	10	
57						
58						
59						
60	Pasir Putih	Kuranji	8	Kintap	8	

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

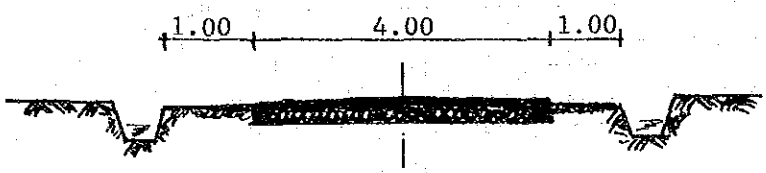
PROPINSI: Kalimantan Selatan

KABUPATEN: Tanah Laut

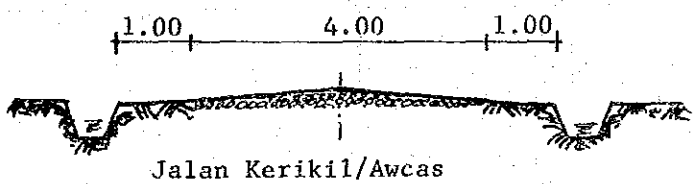
What Kind of Design Criteria has being applied for the new road construction and the improvement for the Kabupaten Road ?
Kriteria Perencanaan yang dipakai pada program penanganan jalan Kabupaten, baik untuk jalan lama maupun pembangunan baru.

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)

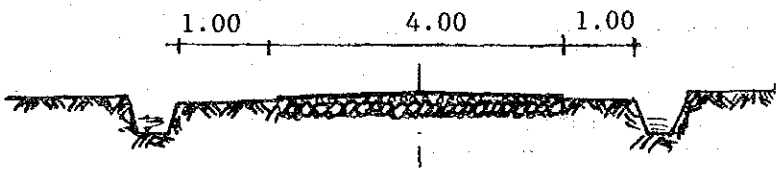
TYPICAL CROSS SECTION.



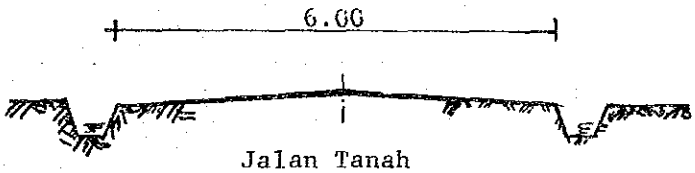
Jalan Asphalt



Jalan Kerikil/Awcas



Jalan Macadam/Batu Belah



Jalan Tanah

PROPINSI: Kalimantan Selatan

E-03-(1)

KABUPATEN: Tanah Laut

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	LOCATION From - To (dari - ke)	Lebar perkerasan(m) / Lebar Jembatan	Type perkerasan / Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
28	Jilatan - Sei Langsat	6	Gravel/Awcas		36,000	
		4	Timber			
7	Gagas - Sum.Sum	6	Gravel/Awcas		25,000	
		4	Timber			
11	Bajuin - Sei Bakar	6	Gravel/Awcas		25,000	
		4	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

KABUPATEN: Tanah Laut

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
17	Pelaihari - Panyipatan	6	Gravel/Awcas	20	113,208	
		4	Timber			
21	Pulau Sari - Kurau	6	Gravel/Awcas	20	113,812	
		4	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: Tanah Laut

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	LOCATION From - To (dari - ke)	Lebar perkerasan(m) / Lebar jembatan	Type perkerasan / Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
17	Panyipatan - Batakan	6	Gravel/Awcas	20	105,775	
		4	Timber			
15	G.Makmur - Kuda Tambangan	6	Gravel/Awcas	13.5	69,350	
		4	Timber			
22	Kurau - Handil Babirik	6	Gravel/Awcas	13.9	81,425	
		4	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-(4)

KABUPATEN: Tanah Laut

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
5	Angsau - Sarang Halang	7 / 8	Asphalt / Timber	3.9	58,900	
9	Balirejo -Banjuin	6 / 4	1/4 / Timber	7	71,250	
16	Takisung - Pagatan - Besar	6 / 4	Gravel/Awcas / Timber	7.6	65,550	
32	Kurau - Handil -Handil	6 / 4	Gravel/Awcas / Timber	15	76,000	

* 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: Dati II Tanah Laut

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
16	Pagatan Besar - Tabonio	6	Gravel	5	95,000	
		4	Timber			
17	Pelaihari - Karang Taruna	4	Asphalt Surface	3	52,250	
		4	Timber			
21	Kurau Padang Luas	4	Asphalt Surface	4	81,000	
		4	Timber			
17	Karang Taruna - Batakan	6	Gravel	10.5	57,000	
		4	Timber			
23	T.Ulang-U.Batu-T.Ulang	12	Gravel	12.2	95,000	
		-	-	-		
-	Martadah - Bentok Darat	6	Gravel	2.5		
		-	-	-		
-	-	12	Gravel	5.5		
		4	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-04

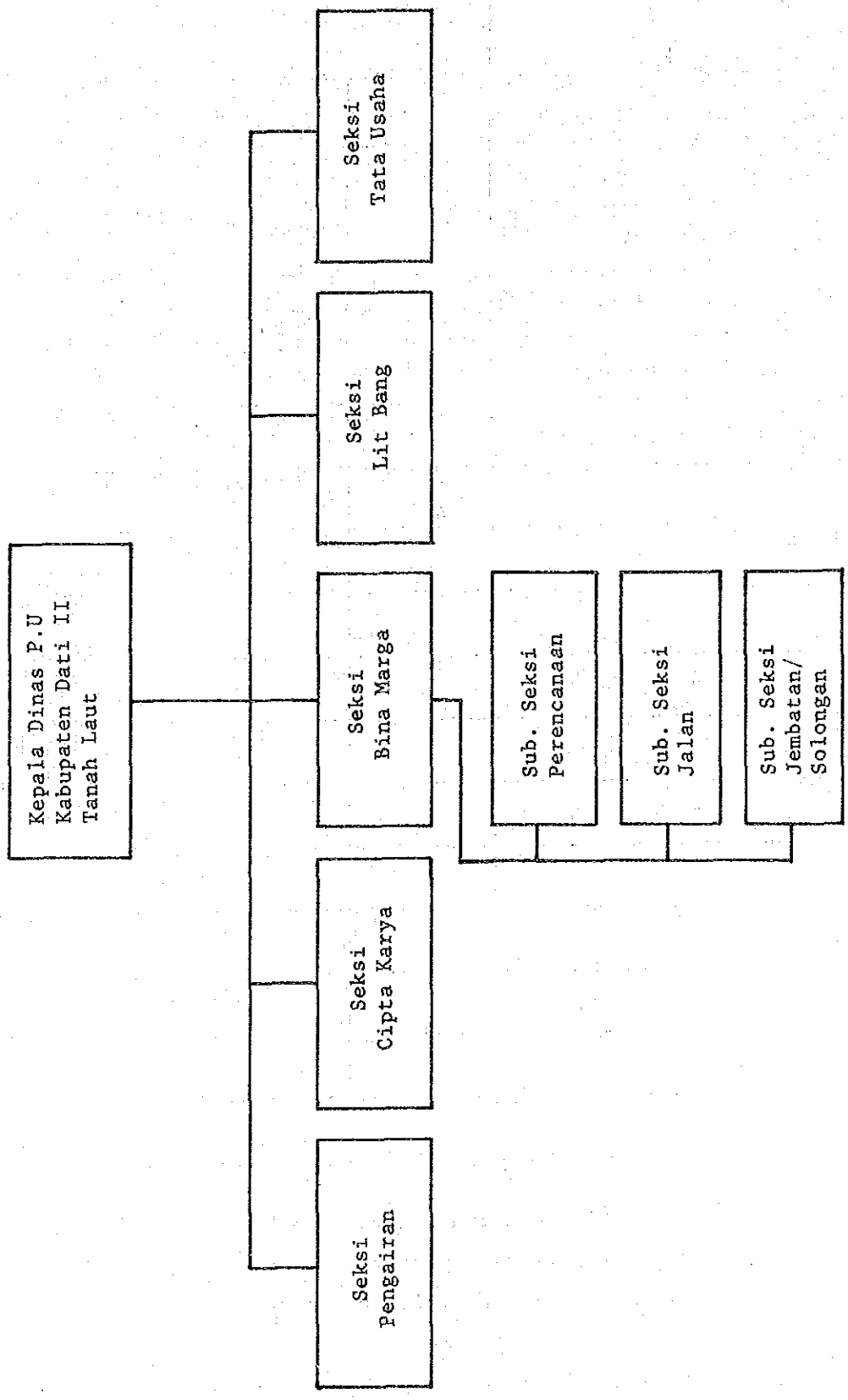
KABUPATEN: Tanah Laut

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: Tanah Laut

DESCRIPTION /Uraian	NUMBER / Jumlah	REMARKS Keterangan
CONTROLING STAFF Staff teknis PUK	(13)	
DPUK ENGINEED Sarjana Teknik		
ASSISTANT ENGINEER Sarjana Muda Teknik	1	
TECHNICIAN STAFF Staff Teknik (STM)	12	
ADMINISTRATION Tenaga Administrasi		
SUPERVISOR Tenaga Pengawas		
WORKING FORCE Tenaga Pelaksana Lapangan	(4)	
OPERATORS Operators	3	
DRIVERS Supir		
MECHANICS Mechanic	1	
TRADESMAN Tukang		
L A B O U R Buruh / Pekerja		
OTHERS Lain-lain		
TOTAL / JUMLAH	17	

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

E-06

LOCATION AND AREA OF DPUK WORKSHOP

Lokasi Workshop DPUK

PROPINSI : Kalimantan Selatan

KABUPATEN: Tanah Laut

LOCATION Lokasi	AREA (m2) Luas	NUMBER Jumlah	REMARKS Keterangan
Pelaihari	20.000	1	

PROPINSI: Kalimantan Selatan

KABUPATEN: Tanah Laut

E-07

LAND ACQUISITION COST

Daftar harga pembebasan tanah

DESCRIPTION Uraian	UNIT Satuan	RATE (RP) Harga	REMARKS Keterangan
CITY/kota	M2	4,000/7,500	
VILLAGE / desa	M2	1,250/3,000	
RICE FIELD/sawah	M2	50/ 70	
DRY FIELD/ladang	M2	50/ 70	
MIX CROPS/panen	M2	40/ 50	
FOREST/hutan	M2	50/ 70	
SWAMP / rawa	M2	35/ 50	
OTHERS / lain-lain	M2		

PROPINSI: Kalimantan Selatan

KABUPATEN: Tanah Laut

E-08

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	C1	99,000,000	5	
4	C2	44,599,625	4	
29	C3	30,467,400	4	

NOTE: DATI II

PROPINSI: Kalimantan Selatan

KABUPATEN: Tanah Laut

LIST OF EXISTING EQUIPMENT OF LOCAL CONTRACTOR

Name of contractor

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							
Motor Grader							
Tyre Roller							
Steel Whell Roller							
Vibration Roller							
Wheel Loader							
Front End Loader and Backhoe							
Mobile Crane							
Concrete Mixer							
Stone Crusher							
Portable Compressor							
Hydraulic Excavator							
Asphalt Paving Machine							
Asphalt Sprayer							
Asphalt Mixing Machine							
Mobile Workshop							
Mechanic Rammer							
Plate Tamper							
Pile Driver							
Leg Drill							
Hand Hammer							
Farm Tractor							
Dump Truck/Colt Disel	-	-	60	-	60	-	-
Water Tank Truck							
Fuel Tank Truck							
Pick Up /Colt	L 300	-	10	-	10	-	-
Jeep							
Motorcycle /Yamaha	L-S 100	-	15	-	15	-	-
Generator							
Water Pump							
Others							
-							

PROPINSI: Kalimantan Selatan

KABUPATEN: Tanah Laut

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	-	-	-	-	-	-	2
Motor Grader	-	-	-	-	-	-	2
Tyre Roller	-	-	-	-	-	-	1
Steel Whell Roller	-	-	-	-	-	-	2
Vibration Roller	DIG B I	1981	3	-	3	-	2
Wheel Loader	-	-	-	-	-	-	1
Front End Loader and Backhoe	-	-	-	-	-	-	1
Mobile Crane	-	-	-	-	-	-	1
Concrete Mixer	-		-	-	-	-	1
Stone Crusher	DDU	1978	-	1	1	R Berat	1
Portable Compressor	-	-	-	-	-	-	1
Hydraulic Excavator	-	-	-	-	-	-	1
Asphalt Paving Machine	-	-	-	-	-	-	1
Asphalt Sprayer	ESGD 3 K	1984	1	-	1	-	1
Asphalt Mixing Machine	-	-	-	-	-	-	1
Mobile Workshop	-	-	-	-	-	-	1
Mechanic Rammer	-	-	-	-	-	-	1
Plate Tamper	-	-	-	-	-	-	1
Pile Driver	-	-	-	-	-	-	1
Leg Drill	-	-	-	-	-	-	1
Hand Hammer	Barata	1982	4	-	4	-	-
Farm Tractor	-	-	-	-	-	-	-
Dump Truck	-	-	-	-	-	-	14
Water Tank Truck	-	-	-	-	-	-	1
Fuel Tank Truck	-	-	-	-	-	-	1
Pick Up	L 300	1982	1	-	1	-	-
Jeep	-	-	-	-	-	-	1
Motorcycle	GL	1982	2	-	2	-	4
Generator	-	-	-	-	-	-	1
Water Pump	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-

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

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 61 (IIIC) LENGTH : 18 Km

UPGRADE : 7.0m road bed, 4.0m road with surface Subbase Cource

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	0.0	150	91	0	0	0
Subgrade Preparation	m2	126000.0	20	11	2,520,000	1,386,000	3,906,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	7072.0	952	522	7,494,144	4,109,184	11,603,328
Sub Base Course	m3	11520.0	3,072	1,347	35,389,440	15,517,440	50,906,880
Base Course	m3	0.0	4,222	2,299	0	0	0
Shoulder	m2	54000.0	285	146	15,390,000	7,884,000	23,274,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	200.0	829	119	165,800	23,800	189,600
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	0.0	42,020	40,911	0	0	0
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	6,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	3,948,944	815,182	4,764,126
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		64,908,328	29,735,606	94,643,934
Overhead (15%)					9,736,249	4,460,340	14,196,589
			TOTAL COST		74,644,577	34,195,946	108,840,523
Manual routine maintenance of road	Km	18.0	134,060	7,248	2,413,080	130,464	2,543,544
Routine maintenance of gravel road	Km	18.0	183,053	88,047	3,309,354	1,584,846	4,894,200
			Sub Total		5,722,434	1,715,310	7,437,744
Maintenance of Timber Bridge (New)	m2	40.0	6,027	1,455	241,080	58,200	299,280
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	474.0	6,602	2,571	3,129,348	1,218,654	4,348,002
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	*Unit Cost*	*(Rp/Km)*	:	5,742,321
Timber Bridge	Unit Cost	(Rp/m2)	:	136,969
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	20,362,752
Maintenance Rate without Bridge		(%)	:	7.20
New Bridge Cost Rate		(%)	:	5.03

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 55 (IIIB-2) LENGTH : 4 Km

UPGRADE : 8.0m road bed, 4.0m 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	0.0	159	91	0	0	0
Subgrade Preparation	m2	32000.0	20	11	640,000	352,000	992,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	1500.0	952	522	1,428,000	783,000	2,211,000
Sub Base Course	m3	2240.0	3,072	1,347	6,881,280	3,017,280	9,898,560
Base Course	m3	960.0	4,222	2,299	4,053,120	2,207,040	6,260,160
Shoulder	m2	16000.0	285	146	4,560,000	2,336,000	6,896,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	400.0	829	119	331,600	47,600	379,200
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	0.0	42,020	40,911	0	0	0
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		17,894,000	8,742,920	26,636,920
Overhead (15%)					2,684,100	1,311,438	3,995,538
			TOTAL COST		20,578,100	10,054,358	30,632,458
Manual routine maintenance of road	Km	4.0	134,060	7,248	536,240	28,992	565,232
Routine maintenance of gravel road	Km	4.0	183,853	88,047	735,412	352,188	1,087,600
			Sub Total		1,271,652	381,180	1,652,832
Maintenance of Timber Bridge (New)	m2	0.0	6,027	1,455	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	32.0	6,602	2,571	211,264	82,272	293,536
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	7,658,115
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	4,949,280
Maintenance Rate without Bridge		(%)	:	5.40
New Bridge Cost Rate		(%)	:	

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 42 (IIIB-2) LENGTH : 12 Km

UPGRADE : 8.0m road bed, 4.0m road with surface Base Cource

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	0.0	158	91	0	0	0
Subgrade Preparation	m2	96000.0	20	11	1,920,000	1,056,000	2,976,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	7968.0	952	522	7,585,536	4,159,296	11,744,832
Sub Base Course	m3	6720.0	3,072	1,347	20,643,840	9,051,840	29,695,680
Base Course	m3	2880.0	4,222	2,299	12,159,360	6,621,120	18,780,480
Shoulder	m2	48000.0	285	146	13,680,000	7,008,000	20,688,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	0.0	829	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	54.0	42,020	40,911	2,269,080	2,209,194	4,478,274
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	6.4	39,839	11,488	254,969	73,523	328,492
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		58,512,785	30,178,973	88,691,758
Overhead (15%)					8,776,917	4,526,845	13,303,762
			TOTAL COST		67,289,702	34,705,818	101,995,520
Manual routine maintenance of road	Km	12.0	134,060	7,248	1,608,720	86,976	1,695,696
Routine maintenance of gravel road	Km	12.0	183,853	88,047	2,206,236	1,056,564	3,262,800
			Sub Total		3,814,956	1,143,540	4,958,496
Maintenance of Timber Bridge (New)	m2	0.0	6,027	1,455	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	147.0	6,602	2,571	970,494	377,937	1,348,431
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	8,499,627
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	14,847,840
Maintenance Rate without Bridge		(%)	:	4.86
New Bridge Cost Rate		(%)	:	

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 34 (IIIC) LENGTH : 10 Km

UPGRADE : 8.0m road bed, 4.0m road with surface Subbase Cource

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	0.0	158	91	0	0	0
Subgrade Preparation	m2	80000.0	20	11	1,600,000	880,000	2,480,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	688.0	952	522	654,976	359,136	1,014,112
Sub Base Course	m3	6400.0	3,072	1,347	19,660,800	8,620,800	28,281,600
Base Course	m3	0.0	4,222	2,299	0	0	0
Shoulder	m2	40000.0	285	146	11,400,000	5,840,000	17,240,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	0.0	829	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	0.0	42,020	40,911	0	0	0
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	2,111,804	499,104	2,610,908
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		35,427,580	16,199,040	51,626,620
Overhead (15%)					5,314,137	2,429,856	7,743,993
			TOTAL COST		40,741,717	18,628,896	59,370,613
Manual routine maintenance of road	Km	10.0	134,060	7,248	1,340,600	72,480	1,413,080
Routine maintenance of gravel road	Km	10.0	183,853	88,047	1,838,530	880,470	2,719,000
			Sub Total		3,179,130	952,950	4,132,080
Maintenance of Timber Bridge (New)	m2	12.0	6,027	1,455	72,324	17,460	89,784
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	100.0	6,602	2,571	660,200	257,100	917,300
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	5,636,807
Timber Bridge	Unit Cost	(Rp/m2)	:	250,212
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	11,312,640
Maintenance Rate without Bridge		(%)	:	7.33
New Bridge Cost Rate		(%)	:	5.06

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 29 (IIIC) LENGTH : 7 Km

UPGRADE : 8.0m road bed, 4.0m road with surface Subbase Cource

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	0.0	158	91	0	0	0
Subgrade Preparation	m2	56000.0	20	11	1,120,000	616,000	1,736,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	2212.0	952	522	2,105,824	1,154,664	3,260,488
Sub Base Course	m3	4480.0	3,072	1,347	13,762,560	6,034,560	19,797,120
Base Course	m3	0.0	4,222	2,299	0	0	0
Shoulder	m2	28000.0	285	146	7,980,000	4,088,000	12,068,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	0.0	829	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	0.0	42,020	40,911	0	0	0
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		24,968,384	11,893,224	36,861,608
Overhead (15%)					3,745,257	1,783,983	5,529,240
			TOTAL COST		28,713,641	13,677,207	42,390,848
Manual routine maintenance of road	Km	7.0	134,060	7,248	938,420	50,736	989,156
Routine maintenance of gravel road	Km	7.0	183,853	88,047	1,286,971	616,329	1,903,300
			Sub Total		2,225,391	667,065	2,892,456
Maintenance of Timber Bridge (New)	m2	0.0	6,027	1,455	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	184.0	6,602	2,571	1,214,768	473,064	1,687,832
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	6,055,836
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	7,910,848
Maintenance Rate without Bridge		(%)	:	6.82
New Bridge Cost Rate		(%)	:	

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 33 (IIIB-2) LENGTH : 5 Km

UPGRADE : 8.0m road bed, 4.0m road with surface Base Cource

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	0.0	158	91	0	0	0
Subgrade Preparation	m2	40000.0	20	11	800,000	440,000	1,240,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	1432.0	952	522	1,363,264	747,504	2,110,768
Sub Base Course	m3	2800.0	3,072	1,347	8,601,600	3,771,600	12,373,200
Base Course	m3	1200.0	4,222	2,299	5,066,400	2,758,800	7,825,200
Shoulder	m2	20000.0	285	146	5,700,000	2,920,000	8,620,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	100.0	829	119	82,900	11,900	94,800
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	0.0	42,029	40,911	0	0	0
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		21,614,164	10,649,804	32,263,968
Overhead (15%)					3,242,124	1,597,470	4,839,594
			TOTAL COST		24,856,288	12,247,274	37,103,562
Manual routine maintenance of road	Km	5.0	134,060	7,248	670,300	36,240	706,540
Routine maintenance of gravel road	Km	5.0	183,853	88,047	919,265	440,235	1,359,500
			Sub Total		1,589,565	476,475	2,066,040
Maintenance of Timber Bridge (New)	m2	0.0	6,027	1,455	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	36.0	6,602	2,571	237,672	92,556	330,228
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	7,420,713
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	6,186,600
Maintenance Rate without Bridge		(%)	:	5.5%
New Bridge Cost Rate		(%)	:	

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 24 (IIIC) LENGTH : 11 Km

UPGRADE : 6.0m road bed, 3.0m road with surface Subbase Cource

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	0.0	158	91	0	0	0
Subgrade Preparation	m2	66000.0	20	11	1,320,000	726,000	2,046,000
Normal Fill	m3	0.0	1,827	863	0	0	0
Fill in Swamp	m3	1740.0	2,419	1,052	4,209,060	1,830,480	6,039,540
Normal Excavation to Spoil	m3	6744.0	952	522	6,420,288	3,520,368	9,940,656
Sub Base Course	m3	5280.0	3,072	1,347	16,220,160	7,112,160	23,332,320
Base Course	m3	0.0	4,222	2,299	0	0	0
Shoulder	m2	33000.0	285	146	9,405,000	4,818,000	14,223,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	200.0	829	119	165,800	23,800	189,600
Earth Drain in Swamp (by machine)	m3	12000.0	1,145	474	13,740,000	5,688,000	19,428,000
Pipe Culvert D80cm	m	15.0	42,020	40,911	630,300	613,665	1,243,965
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		52,110,608	24,332,473	76,443,081
Overhead (15%)					7,816,591	3,649,870	11,466,461
			TOTAL COST		59,927,199	27,982,343	87,909,542
Manual routine maintenance of road	Km	11.0	134,060	7,248	1,474,660	79,728	1,554,388
Routine maintenance of gravel road	Km	11.0	183,853	88,047	2,022,383	968,517	2,990,900
			Sub Total		3,497,043	1,048,245	4,545,288
Maintenance of Timber Bridge (New)	m2	0.0	6,027	1,455	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	98.5	6,602	2,571	650,297	253,243	903,540
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	7,991,777
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	9,332,928
Maintenance Rate without Bridge		(%)	:	5.17
New Bridge Cost Rate		(%)	:	

PROV : KALIMANTAN SELATAN KAB : TANAH LAUT

LINK NO : 25 (IIIC) LENGTH : 11 Km

UPGRADE : 8.0m road bed, 4.0m road with surface Subbase Cource

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	0.0	158	91	0	0	0
Subgrade Preparation	m2	88000.0	20	11	1,760,000	968,000	2,728,000
Normal Fill	m3	0.0	1,627	863	0	0	0
Fill in Swamp	m3	0.0	2,419	1,052	0	0	0
Normal Excavation to Spoil	m3	9164.0	952	522	8,724,128	4,783,608	13,507,736
Sub Base Course	m3	7040.0	3,072	1,347	21,626,880	9,482,880	31,109,760
Base Course	m3	0.0	4,222	2,299	0	0	0
Shoulder	m2	44000.0	285	146	12,540,000	6,424,000	18,964,000
Asphalt Patching	m2	0.0	3,475	1,343	0	0	0
Surface Dressing (Single)	m2	0.0	590	552	0	0	0
Surface Dressing (Double)	m2	0.0	736	868	0	0	0
Earth Drain	m	0.0	829	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,145	474	0	0	0
Pipe Culvert D80cm	m	18.0	42,020	40,911	756,360	736,398	1,492,758
Masonry Culvert (80x80cm)	m	0.0	55,043	35,333	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	8,258	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	39,839	11,488	0	0	0
Gabion Protection	m3	0.0	9,866	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		45,407,368	22,394,886	67,802,254
Overhead (15%)					6,811,105	3,359,232	10,170,337
			TOTAL COST		52,218,473	25,754,118	77,972,591
Manual routine maintenance of road	Km	11.0	134,060	7,248	1,474,660	79,728	1,554,388
Routine maintenance of gravel road	Km	11.0	183,053	88,047	2,022,383	968,517	2,990,900
			Sub Total		3,497,043	1,048,245	4,545,288
Maintenance of Timber Bridge (New)	m2	0.0	6,027	1,455	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,585	2,522	0	0	0
Maintenance of Timber Bridge (Exist)	m2	48.0	6,602	2,571	316,896	123,408	440,304
Maintenance of Concrete Bridge (Exist)	m2	0.0	3,906	2,348	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	7,088,417
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	12,443,904
Maintenance Rate without Bridge		(%)	:	5.83
New Bridge Cost Rate		(%)	:	