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 Indragiri Hulu and other Kabupatens in Riau 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
Indragiri Hulu	4,400	3,300	4,400	4,400	2,750	3,300	5,500
Indragiri Hilir	4,400	3,250	4,500	4,500	2,750	5,000	5,000
Bengkalis	3,000	3,000	3,500	3,500	2,500	3,500	4,500
Average	3,800	3,185	4,135	4,135	2,667	3,935	5,000

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 Indragiri Hulu together with for other Kabupatens in Riau Province.

Table 4-1-2 UNIT PRICE OF MATERIALS

(Rp)

MATERIAL	UNIT	INDRAGIRI HULU	INDRAGIRI HILIR	BENGKALIS	AVERAGE
Bitumen	L	400	750	350	500
Asphalt Oil	L	1,500	1,500	1,500	1,500
Gasoline	L	250	250	250	250
Sand	M^3	4,000	4,500	15,000	3,667
Cement	bag	4,500	6,000	4,800	5,100
River Stone	M^3	20,000	30,000	40,000	30,000
Steel moulds	Set	8,000	8,000	8,000	8,000
Timber	M^3	85,000	180,000	110,000	125,000
Paint	L	2,500	2,000	2,500	2,333
Reinforcing Steel	Kg	500	1,200	750	817
Tying	Kg	1,200	1,000	1,200	1,133

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 : RIAU
KABUPATEN : INDRAGIRI HULU

(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	195	13,993	14,188	7,769	1,019	8,788	22,976
	Bulldozer/Ripper	120 HP	213	14,999	15,212	8,499	1,568	10,067	25,279
	Swamp Bulldozer	120 HP	222	15,241	15,463	8,880	1,638	10,518	25,981
	Bulldozer	90 HP	123	9,530	9,653	4,914	644	5,558	15,211
	Bulldozer/Ripper	90 HP	133	10,118	10,251	5,299	977	6,276	16,527
	Bulldozer	65 HP	88	6,930	7,018	3,499	458	3,957	10,975
	Bulldozer/Ripper	65 HP	96	7,377	7,473	3,819	704	4,523	11,996
	Swamp Bulldozer	90 HP	133	10,109	10,242	5,284	974	6,258	16,500
	Swamp Bulldozer	65 HP	102	7,217	7,319	4,049	747	4,796	12,115
	Motor Grader	110 HP	173	12,053	12,226	6,920	1,276	8,196	20,422
	Motor Grader	75 HP	120	8,257	8,377	4,779	881	5,660	14,037
	Motor Grader	65 HP	108	7,256	7,364	4,299	793	5,092	12,456
	Road Stabilizer	W=1850 mm	215	3,365	3,580	8,594	422	9,016	12,596
	Vibratory Roller	4 ton	73	3,629	3,702	2,899	380	3,279	6,981
	Hand-guide Vib. Roller	1000 Kg	51	642	693	850	28	878	1,571
	Tire Roller	8-15 ton	78	8,259	8,337	3,106	101	3,207	11,544
	Vibratory Roller (D&T)	4 ton	73	3,629	3,702	2,899	380	3,279	6,981
	Hand-guide Vib. Roller	600 Kg	36	438	474	600	20	620	1,094
	Rough Terrain Crane	10 ton	251	14,070	14,321	10,040	740	10,780	25,101
	Hydraulic Excavator; Wheel	0.3 m3	103	8,589	8,692	4,109	538	4,647	13,339
	Wheel Loader	1.2 m3	176	9,053	9,229	7,019	920	7,939	17,168
	Wheel Loader	0.3 m3	57	3,175	3,232	2,269	297	2,566	5,798
	Water Tank Truck	4000 ltr.	53	3,187	3,240	868	117	985	4,225
	Fuel Tank Truck	4000 ltr.	53	3,193	3,246	882	119	1,001	4,247
	Dump Truck	3.0 ton	89	3,922	4,011	1,469	199	1,668	5,679
	Flat Bed Truck with Crane	3.0 ton	43	3,438	3,481	1,717	126	1,843	5,324
	Dump Loader Truck	12 ton	96	21,549	21,645	3,838	125	3,963	25,608
	Dump Truck	5.0 ton	132	6,501	6,633	2,189	296	2,485	9,118
	Flat Bed Truck	3.0 ton	15	3,014	3,029	562	41	603	3,632
	Portable Crusher/Screening	30-40 t/h	470	23,548	24,018	18,800	2,466	21,266	45,284
	Concrete Mixer	0.5 m3	324	2,403	2,727	5,400	412	5,812	8,539
	Water Pump	200 l/min	12	291	303	188	6	194	497
	Concrete Vibrator	3.3 HP	5	255	260	73	2	75	335
	Asphalt Sprayer	850 ltr.	62	799	861	1,019	138	1,157	2,018

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 : RIAU KAB : INDRAGIRI HULU

(Rp)

ITEM	UNIT	LOCAL	FOREIGN	TOTAL
Site Clearance in Light Bush	m2	184	91	275
Subgrade Preparation	m2	24	11	35
Normal Fill	m3	1,889	862	2,751
Fill in Swamp	m3	2,805	1,051	3,856
Normal Excavation to Spoil	m3	1,098	522	1,620
Sub Base Course	m3	3,529	1,345	4,874
Base Course	m3	4,861	2,296	7,157
Shoulder	m2	335	146	481
Asphalt Patching	m2	4,496	1,510	6,006
Surface Dressing (Single)	m2	912	766	1,678
Surface Dressing (Double)	m2	1,099	1,206	2,305
Earth Drain	m	1,182	119	1,301
Earth Drain in Swamp (by machine)	m3	1,392	473	1,865
Pipe Culvert D80cm	m	52,375	34,179	86,554
Masonry Culvert (80x80cm)	m	86,558	32,928	119,486
Retaining Wall and Wing Wall (Timber)	m2	12,274	246	12,520
Retaining Wall and Wing Wall (Masonry)	m3	67,053	11,667	78,720
Gabion Protection	m3	26,613	120	26,733
Manual routine maintenance of road	Km	198,048	7,236	205,284
Routine maintenance of earth road	Km	109,772	37,880	147,652
Routine maintenance of gravel road	Km	216,193	87,975	304,168
Routine maintenance of asphalt road	Km	449,600	151,000	600,600

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 : RIAU KAB : INDRAGIRI HULU

(Rp)

I T E M	UNIT	LOCAL	FOREIGN	TOTAL
Superstructure (Timber;Span 3m;10T)	m2	47,841	3,540	51,381
Superstructure (Timber;Span 5m;10T)	m2	52,990	3,909	56,899
Superstructure (Timber;Span 8m;10T)	m2	70,185	5,136	75,321
Superstructure (Timber;Span 3m;BM50)	m2	59,320	4,377	63,697
Superstructure (Timber;Span 5m;BM50)	m2	64,758	4,744	69,502
Superstructure (Timber;Span 8m;BM50)	m2	82,130	6,005	88,135
Superstructure (Concrete;Span 3m;BM50)	m2	56,851	64,668	121,519
Superstructure (Concrete;Span 5m;BM50)	m2	58,566	71,958	130,524
Superstructure (Concrete;Span 8m;BM50)	m2	60,465	78,193	138,658
Superstructure (Concrete;Span10m;BM50)	m2	66,307	88,519	154,826
Superstructure (Concrete;Span15m;BM50)	m2	71,757	103,897	175,654
Substructure (Pier;for Timber;10T)	NO	416,857	32,854	449,711
Substructure (Abut;for Timber;10T)	NO	1,184,284	154,288	1,338,572
Substructure (Pier;for Timber;BM50)	NO	613,092	48,620	661,712
Substructure (Abut;for Timber;BM50)	NO	1,332,636	171,456	1,504,092
Substructure (Pier;for Concrete;BM50)	NO	2,643,323	466,720	3,110,043
Substructure (Abut;for Concrete;BM50)	NO	5,287,354	981,821	6,269,175
Demolition of Bridge (Timber->Timber)	m2	13,511	1,372	14,883
Demolition of Bridge (Timber->Concrete)	m2	13,511	1,372	14,883
Demolition of Bridge (Concrete)	m2	113,679	54,439	168,118
Maintenance of Timber Bridge (New)	m2	8,755	1,121	9,876
Maintenance of Concrete Bridge (New)	m2	2,099	2,312	4,411
Maintenance of Timber Bridge (Exist)	m2	8,518	2,403	10,921
Maintenance of Concrete Bridge (Exist)	m2	4,560	2,305	6,865

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 Indragiri Hulu are shown in Table 5-1-1.

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

KABUPATEN : INDRAGIRI HULU

CRITERIA NO	ROAD LINK NO
(1)	11,22
(2)	58,59,60
(3)	49
(4)	32
(6)	24,64
(8)	07,39,49,61,62

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 : RIAU KABUPATEN : INDRAGIRI HULU

LINK NO	LENGTH	CLASS	IRR(%)	REMARK
41	20 Km	IIIA	81.393	VOC
55	67 Km	IIIA	42.306	Surplus
47	33 Km	IIIA	25.566	Surplus
21	28 Km	IIIA	24.235	Surplus
60	18 Km	IIIB-1	18.137	Surplus
37	15 Km	IIIB-2	15.473	VOC
30	10 Km	IIIB-2	8.384	VOC
36	4 Km	IIIB-2	6.220	VOC
23	30 Km	IIIB-1	5.831	Surplus
34	35 Km	IIIB-2	2.895	Surplus
51	18 Km	IIIB-1	2.761	Surplus
14	4 Km	IIIB-2	0.078	VOC
15	19 Km	IIIB-2	0.078	VOC
16	4 Km	IIIC	0.078	Surplus
17	19 Km	IIIB-2	0.078	Surplus
18	3 Km	IIIB-2	0.078	Surplus
19	4 Km	IIIB-2	0.078	Surplus
20	10 Km	IIIB-1	0.078	Surplus
1	12 Km	IIIA	0.078	VOC
2	57 Km	IIIA	0.078	VOC
25	12 Km	IIIB-2	0.078	VOC
26	12 Km	IIIC	0.078	Surplus
27	5 Km	IIIC	0.078	Surplus
28	25 Km	IIIA	0.078	Surplus
29	14 Km	IIIC	0.078	Surplus
3	6 Km	IIIB-1	0.078	VOC
31	10 Km	IIIC	0.078	Surplus
33	15 Km	IIIB-1	0.078	VOC
4	6 Km	IIIB-2	0.078	VOC
35	10 Km	IIIB-2	0.078	VOC
5	3 Km	IIIB-2	0.078	VOC
6	4 Km	IIIC	0.078	Surplus
38	35 Km	IIIB-1	0.078	VOC
40	4 Km	IIIC	0.078	Surplus
8	20 Km	IIIB-2	0.078	VOC
42	35 Km	IIIB-2	0.078	VOC
43	30 Km	IIIB-2	0.078	Surplus
44	20 Km	IIIB-2	0.078	Surplus
45	2 Km	IIIC	0.078	Surplus
46	3 Km	IIIC	0.078	Surplus
9	7 Km	IIIB-2	0.078	VOC
48	4 Km	IIIB-2	0.078	Surplus
50	3 Km	IIIC	0.078	Surplus
10	5 Km	IIIC	0.078	Surplus
52	4 Km	IIIC	0.078	Surplus
53	13 Km	IIIC	0.078	Surplus
54	6 Km	IIIB-2	0.078	Surplus
12	4 Km	IIIC	0.078	Surplus
56	18 Km	IIIB-2	0.078	Surplus
57	14 Km	IIIB-2	0.078	Surplus
63	4 Km	IIIC	0.078	Surplus
65	15 Km	IIIB-2	0.078	Surplus
66	26 Km	IIIC	0.078	Surplus
67	12 Km	IIIB-1	0.078	Surplus
13	4 Km	IIIC	0.078	Surplus

Table 5-2-2 RESULTS OF SECONDARY ANALYSIS

PROVINCE : RIAU KABUPATEN : INDRAGIRI HULU

LINK NO	LENGTH	CLASS	IRR(%)	REMARK
23	30 Km	IIIB-2	15.013	Surplus
51	18 Km	IIIB-2	13.419	Surplus
30	10 Km	IIIC	11.712	VOC
36	4 Km	IIIC	10.851	VOC
34	35 Km	IIIC	5.872	Surplus

Table 5-2-3 RANKING OF FEASIBILITY ROAD LINKS

PROVINCE : RIAU KABUPATEN : INDRAGIRI HULU

LINK NO	LENGTH	CLASS	NPV (1000Rp)	B/C	IRR (%)	REMARK
55	67 Km	IIIA	5144336	3.383	42.306	Surplus
41	20 Km	IIIA	1834961	4.730	81.393	VOC
47	33 Km	IIIA	1126024	1.977	25.566	Surplus
21	28 Km	IIIA	534950	1.750	24.235	Surplus
68	18 Km	IIIB-1	170767	1.432	18.137	Surplus
23	30 Km	IIIB-2	79431	1.243	15.013	Surplus
51	18 Km	IIIB-2	26997	1.156	13.419	Surplus
37	15 Km	IIIB-2	23701	1.173	15.473	VOC
30	10 Km	IIIC	4205	1.048	11.712	VOC
36	4 Km	IIIC	940	1.028	10.851	VOC
SUM	243 Km		8946312			

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: Indragiri Hulu

(Rpx10^6)

COST	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
CONSTRUCTION	1,530	2,914	4,444
MAINTENANCE	234	968	1,202
SUPPLEMENTATION	455	-	455
WORKSHOP EQUIPMENT & TOOLS	28	-	28
LABORATORY EQUIPMENT	12	-	12
SURVEY EQUIPMENT	5	-	5
TOTAL	2,264	3,882	6,146

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	1,086	3,857	4,943
CONSTRUCTION & MAINTENANCE EQUIPMENT	1,035	-	1,035
SPARE PARTS	98	25	123
WORKSHOP/LABORATORY/SURVEY EQUIPMENT	45	-	45
TOTAL	2,264	3,882	6,146

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 8 links with a total length of 229 km which is 25% of the 929 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 : INDRAGIRI HULU

REASON FOR SELECTION	ROAD LINK NO
Feasible	
- Primary	21,37,41,47,55,68
- Secondary	23,51.
Engineering Point of View	-
Basic Human Needs	-

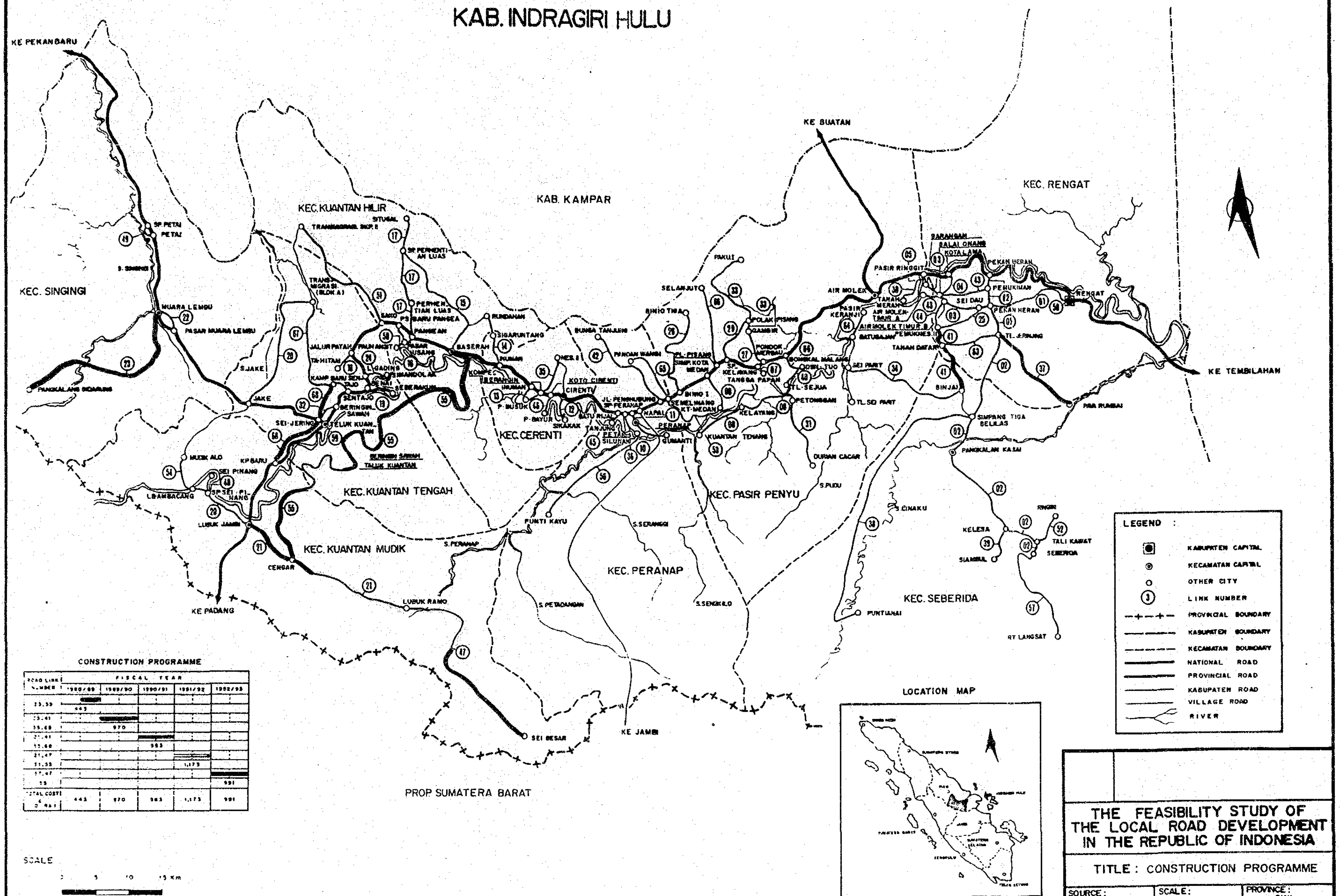
As the table shows all feasible road links except Road Links No 30 and No 36 are proposed to be improved.
Road Links No 30 and no 36 are not located at the strategic point to complete the local road network, therefore these road links are not selected.

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 : RIAU KAB : INDRAGIRI HULU

YEAR	LINK NO ( ) : rate
1988	23 (33%), 55 (20%)
1989	23 (67%), 41 (50%), 55 (20%), 68 (50%)
1990	21 (50%), 41 (50%), 55 (20%), 68 (50%)
1991	21 (50%), 47 (45%), 51, 55 (20%)
1992	37, 47 (55%), 55 (20%)



CONSTRUCTION PROGRAMME

ROAD LINK NUMBER	FISCAL YEAR				
	1988/89	1989/90	1990/91	1991/92	1992/93
23, 55	443				
23, 41, 55, 68		970			
21, 41, 55, 60			983		
21, 47, 51, 55				1,173	
37, 47, 55					991
TOTAL COST (Rp 10^6)	443	970	983	1,173	991

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

TITLE : CONSTRUCTION PROGRAMME

SOURCE :	SCALE :	PROVINCE : RIAU
DIREKTORAT JENDERAL AGRARIA	AS SHOWN	KABUPATEN : INDRAGIRI HULU

(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 : RIAU KAB : INDRAGIRI HULU

(1000Rp)

LINK NO	LENGTH (Km)	BA (%)	SD (%)	RU (%)	RB (%)	ASPHAL (Km)	GRAVEL (Km)	EARTH (Km)	TN NO	AREA (m2)	RC NO	AREA (m2)	BRIDGE COST	LOCAL COST	FOREIGN COST	TOTAL COST
1	12	99.0	0.0	1.0	0.0	1	11	0	2	144.00	0	0.00	1,573	6,431	1,552	7,983
2	57	92.3	7.7	0.0	0.0	6	51	0	20	966.77	2	470.00	13,785	35,390	9,212	44,602
3	6	93.7	6.2	0.2	0.0	0	6	0	2	189.83	1	112.50	2,845	4,615	1,287	5,902
4	6	83.3	15.0	1.7	0.0	0	6	0	1	105.00	0	0.00	1,147	3,380	824	4,204
5	3	56.7	15.0	28.3	0.0	0	3	0	1	18.80	0	0.00	205	1,403	331	1,734
9	7	0.0	70.7	29.3	0.0	0	7	0	4	152.00	1	48.00	1,990	4,413	1,142	5,555
11	2	92.5	5.0	2.5	0.0	1	1	0	0	0.00	0	0.00	0	1,062	253	1,315
14	4	78.8	3.8	17.5	0.0	0	4	0	0	0.00	0	0.00	0	1,657	381	2,038
15	19	89.5	8.7	1.8	0.0	0	19	0	3	190.80	0	0.00	2,084	9,496	2,268	11,764
17	19	76.5	17.9	5.6	0.0	0	19	0	3	100.00	0	0.00	1,092	8,722	2,049	10,771
25	12	55.8	34.2	10.0	0.0	0	12	0	3	92.00	0	0.00	1,005	5,755	1,364	7,119
27	5	16.0	76.0	8.0	0.0	0	5	0	0	0.00	0	0.00	0	2,071	476	2,547
29	14	78.9	14.6	6.4	0.0	0	14	0	0	0.00	0	0.00	0	5,799	1,333	7,132
33	15	87.7	12.3	0.0	0.0	0	15	0	3	75.57	0	0.00	825	6,857	1,610	8,467
35	10	79.0	10.5	10.5	0.0	0	10	0	0	0.00	0	0.00	0	4,142	952	5,094
37	15	84.7	6.5	8.7	0.0	0	6	9	4	130.00	0	0.00	1,420	6,363	1,290	7,653
38	35	87.6	12.4	0.0	0.0	0	33	2	7	221.69	0	0.00	2,421	16,174	3,765	19,939
42	35	62.0	21.1	11.4	5.4	0	35	0	3	87.20	0	0.00	952	15,241	3,542	18,783
43	30	54.7	26.0	13.0	6.3	0	30	0	1	41.60	0	0.00	454	12,782	2,956	15,738
44	20	52.5	28.0	15.0	4.5	0	20	0	3	134.31	0	0.00	1,467	9,429	2,227	11,656
45	2	92.5	0.0	7.5	0.0	0	1	1	1	60.00	0	0.00	655	1,233	285	1,518
50	3	99.0	0.0	1.0	0.0	0	3	0	0	0.00	0	0.00	0	1,243	286	1,529
58	27	42.0	58.0	0.0	0.0	23	2	2	1	60.00	0	0.00	655	16,851	4,064	20,915
67	12	74.6	17.1	6.7	1.7	0	12	0	7	372.63	0	0.00	4,069	8,145	2,038	10,183
SUM	370					31	325	14	69	3142.20	4	630.50	38,644	188,654	45,487	234,141

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 Indragiri Hulu 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 4,444 x 10^6 and maintenance cost is Rp 1,202 x 10^6 which is approximately 21% of the total expenditure.

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

PROV : RIAU KAB : INDRAGIRI HULU

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	280,658	552,452	583,441	709,936	604,384	2,730,871	(61.4%)
Ownership Cost	2,380	4,695	4,446	5,763	4,804	22,088	(0.8%)
Operation Cost	119,966	236,658	226,558	292,402	242,854	1,118,438	(41.0%)
Material Cost	53,993	112,594	150,320	170,399	141,875	629,181	(23.0%)
Labour Cost	67,711	126,446	126,016	148,772	136,018	604,963	(22.2%)
Contingency	36,608	72,059	76,101	92,600	78,833	356,201	(13.0%)
FOREIGN CURRENCY :	162,081	319,377	381,126	463,962	387,021	1,713,567	(38.6%)
Ownership Cost	61,007	120,599	114,914	149,254	123,811	569,585	(33.2%)
Operation Cost	8,322	16,472	15,335	20,056	16,609	76,794	(4.5%)
Material Cost	71,611	140,648	201,165	234,135	196,120	843,679	(49.2%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	21,141	41,658	49,712	60,517	50,481	223,509	(13.0%)
TOTAL COST :	442,739	871,829	964,567	1,173,898	991,405	4,444,438	
Ownership Cost	63,387	125,294	119,360	155,017	128,615	591,673	(13.3%)
Operation Cost	128,288	253,130	241,893	312,458	259,463	1,195,232	(26.9%)
Material Cost	125,604	253,242	351,485	404,534	337,995	1,472,860	(33.1%)
Labour Cost	67,711	126,446	126,016	148,772	136,018	604,963	(13.6%)
Contingency	57,749	113,717	125,813	153,117	129,314	579,710	(13.0%)

(Contingency : 15%)

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

(MAINTENANCE)

PROV : RIAU KAB : INDRAGIRI HULU

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	94,306	188,639	201,069	225,823	258,212	968,049	(80.5%)
Ownership Cost	602	1,203	1,283	1,462	1,686	6,236	(0.6%)
Operation Cost	43,089	86,194	92,030	100,247	113,242	434,802	(44.9%)
Material Cost	3,294	6,591	6,760	7,481	9,462	33,588	(3.5%)
Labour Cost	47,321	94,651	100,996	116,633	133,822	493,423	(51.0%)
FOREIGN CURRENCY :	22,743	45,491	48,351	54,384	62,805	233,774	(19.5%)
Ownership Cost	19,188	38,382	40,928	44,488	50,469	193,455	(82.8%)
Operation Cost	2,162	4,323	4,637	5,049	5,655	21,826	(9.3%)
Material Cost	1,393	2,786	2,786	4,847	6,681	18,493	(7.9%)
Labour Cost	0	0	0	0	0	0	(0.0%)
TOTAL COST :	117,049	234,130	249,420	280,207	321,017	1,201,823	
Ownership Cost	19,790	39,585	42,211	45,950	52,155	199,691	(16.6%)
Operation Cost	45,251	90,517	96,667	105,296	118,897	456,628	(38.0%)
Material Cost	4,687	9,377	9,546	12,328	16,143	52,081	(4.3%)
Labour Cost	47,321	94,651	100,996	116,633	133,822	493,423	(41.1%)

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

(TOTAL)

PROV : RIAU KAB : INDRAGIRI HULU

(UNIT : 1000Rp)

ITEM	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)	
LOCAL CURRENCY :	374,964	741,091	784,510	935,759	862,596	3,698,920	(65.5%)
Ownership Cost	2,982	5,898	5,729	7,225	6,490	28,324	(0.8%)
Operation Cost	163,055	322,852	318,588	392,649	356,096	1,553,240	(42.0%)
Material Cost	57,207	119,185	157,080	177,880	151,337	662,769	(17.9%)
Labour Cost	115,032	221,097	227,012	265,405	269,840	1,098,386	(29.7%)
Contingency	36,608	72,059	76,101	92,600	78,833	356,201	(9.6%)
FOREIGN CURRENCY :	184,824	364,868	429,477	518,346	449,826	1,947,341	(34.5%)
Ownership Cost	80,195	158,981	155,842	193,742	174,280	763,040	(39.2%)
Operation Cost	10,484	20,795	19,972	25,105	22,264	98,620	(5.1%)
Material Cost	73,004	143,434	203,951	238,982	202,801	862,172	(44.3%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	21,141	41,658	49,712	60,517	50,481	223,509	(11.5%)
TOTAL COST :	559,788	1,105,959	1,213,987	1,454,105	1,312,422	5,646,261	
Ownership Cost	83,177	164,879	161,571	200,967	180,770	791,364	(14.0%)
Operation Cost	173,539	343,647	338,560	417,754	378,360	1,651,860	(29.3%)
Material Cost	130,291	262,619	361,031	416,862	354,138	1,524,941	(27.0%)
Labour Cost	115,032	221,097	227,012	265,405	269,840	1,098,386	(19.5%)
Contingency	57,749	113,717	125,813	153,117	129,314	579,710	(10.3%)

(Contingency : 15%)

6.1.4 Construction and Maintenance Equipment Cost

(1) Required Number of Equipment

The required numbers of construction equipment for Kabupaten Indragiri Hulu 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-Motor Grader
- 1-Wheel Loader
- 10-Dump Truck

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 the 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 : RIAU KAB : INDRAGIRI HULU

EQUIPMENT NAME	WORKABLE	EXISTING	(1988)	(1989)	(1990)	(1991)	(1992)
Bulldozer/Ripper	220	0	0.53	0.96	0.79	0.98	0.89
Swamp Bulldozer	220	0	0.02	0.02	0.02	0.02	0.02
Motor Grader	240	1	0.93	1.94	1.66	2.20	1.76
Hand-guide Vib. Roller	240	0	0.23	0.30	0.28	0.28	0.30
Tire Roller	220	0	0.51	1.05	1.52	1.73	1.43
Vibratory Roller (D&T)	240	0	0.76	1.58	1.34	1.77	1.40
Hydraulic Excavator; Wheel	220	0	0.14	0.15	0.15	0.14	0.15
Wheel Loader	240	1	1.34	2.65	2.43	3.25	2.67
Water Tank Truck	240	0	0.51	1.05	0.92	1.26	0.98
Dump Truck	240	3	10.32	20.33	18.69	24.35	20.34
Flat Bed Truck with Crane	240	0	0.17	0.27	0.25	0.27	0.30
Flat Bed Truck	240	0	0.64	1.26	1.77	2.01	1.68
Portable Crusher/Screening	240	0	0.25	0.50	0.55	0.75	0.61
Concrete Mixer	220	0	0.07	0.13	0.13	0.15	0.16
Water Pump	220	0	0.06	0.23	0.23	0.27	0.31
Concrete Vibrator	220	0	0.03	0.05	0.05	0.05	0.06
Asphalt Sprayer	220	0	0.51	1.05	1.52	1.73	1.43

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

Table 6-1-8 EQUIPMENT PURCHASE COST

PROV : RIAU KAB : INDRAGIRI HULU

(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	2	95,600
Road Stabilizer	W=1850 mm	85,950	-	-
Hand-guide Vib. Roller	1000 Kg	8,500	1	8,500
Tire Roller	8-15 ton	31,070	2	62,140
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	1	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	12	176,400
Dump Loader Truck	12 ton	56,300	1	56,300
Flat Bed Truck with Crane	3.0 ton	25,190	1	25,190
Flat Bed Truck	3.0 ton	11,275	4	45,100
Portable Crusher/Screening	30-40 t/h	188,000	1	188,000
Concrete Mixer	0.5 m3	18,000	1	18,000
Water Pump	200 l/min	630	1	630
Concrete Vibrator	3.3 HP	740	1	740
Asphalt Sprayer	850 ltr.	10,200	2	20,400
Service Car	3 ton	11,600	1	11,600
4 Wheel Drive Vehicle	70 HP	17,500	1	17,500
Motorcycle	100 cc	1,100	3	3,300

PURCHASE COST TOTAL	1,034,650
OWNERSHIP COST (FOREIGN)	579,471
EQUIPMENT COST SUPPLEMENTED	455,179

NOTE : OWNERSHIP COST (FOREIGN) for Existing Equipment

Motor Grader	30,723
Wheel Loader	47,528
Dump Truck	105,318
TOTAL	183,569

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 : RIAU KAB : INDRAGIRI HULU

I T E M	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
Site Clearance in Light Bush	m2	69100.00	112000.00	94800.00	118200.00	105400.00	499500.00
Subgrade Preparation	m2	167490.00	352010.00	285000.00	346650.00	268350.00	1419500.00
Normal Fill	m3	310.00	310.00	310.00	310.00	310.00	1550.00
Fill in Swamp	m3	744.00	744.00	744.00	744.00	744.00	3720.00
Normal Excavation to Spoil	m3	1496.44	2630.56	2540.50	4155.60	4077.90	14901.00
Sub Base Course	m3	13877.30	29291.30	25028.00	34562.05	26142.55	128901.20
Base Course	m3	7200.00	15053.00	14709.00	21292.00	17136.00	75390.00
Shoulder	m2	69900.00	147500.00	115200.00	139750.00	124650.00	597000.00
Asphalt Patching	m2	0.00	0.00	0.00	0.00	0.00	0.00
Surface Dressing (Single)	m2	0.00	31500.00	31500.00	0.00	0.00	63000.00
Surface Dressing (Double)	m2	60300.00	100300.00	156300.00	205400.00	169200.00	691500.00
Earth Drain	m	23020.00	40850.00	40850.00	41767.00	45933.00	192420.00
Earth Drain in Swamp (by machine)	m3	2400.00	2400.00	2400.00	2400.00	2400.00	12000.00
Pipe Culvert D80cm	m	223.20	244.20	244.20	253.80	260.60	1226.00
Masonry Culvert (80x80cm)	m	0.00	3.00	3.00	0.00	0.00	6.00
Retaining Wall and Wing Wall (Timber)	m2	16.00	16.00	16.00	22.75	24.25	95.00
Retaining Wall and Wing Wall (Masonry)	m3	83.84	83.84	83.84	89.60	90.88	432.00
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	0.00	0.00	0.00
Superstructure (Timber;Span 5m;10T)	m2	5.28	10.72	0.00	0.00	0.00	16.00
Superstructure (Timber;Span 8m;10T)	m2	0.00	0.00	0.00	0.00	0.00	0.00
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	33.75	33.75	44.55	54.45	166.50
Substructure (Pier;for Timber;10T)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Abut;for Timber;10T)	NO	0.66	1.34	0.00	0.00	0.00	2.00
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	0.45	0.55	1.00
Substructure (Abut;for Concrete;BM50)	NO	0.00	1.00	1.00	0.90	1.10	4.00
Demolition of Bridge (Timber->Timber)	m2	0.00	0.00	0.00	0.00	0.00	0.00
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	185.00	370.00	400.00	438.00	476.50	1869.50
Routine maintenance of earth road	Km	7.00	14.00	14.00	14.00	9.50	58.50
Routine maintenance of gravel road	Km	162.50	325.00	355.00	355.00	370.00	1567.50
Routine maintenance of asphalt road	Km	15.50	31.00	31.00	69.00	97.00	243.50
Maintenance of Timber Bridge (New)	m2	0.00	0.00	0.00	16.00	0.00	16.00
Maintenance of Concrete Bridge (New)	m2	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance of Timber Bridge (Exist)	m2	1571.10	3142.20	3142.20	3142.20	4222.40	15220.10
Maintenance of Concrete Bridge (Exist)	m2	315.25	630.50	630.50	630.50	710.50	2917.25

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.

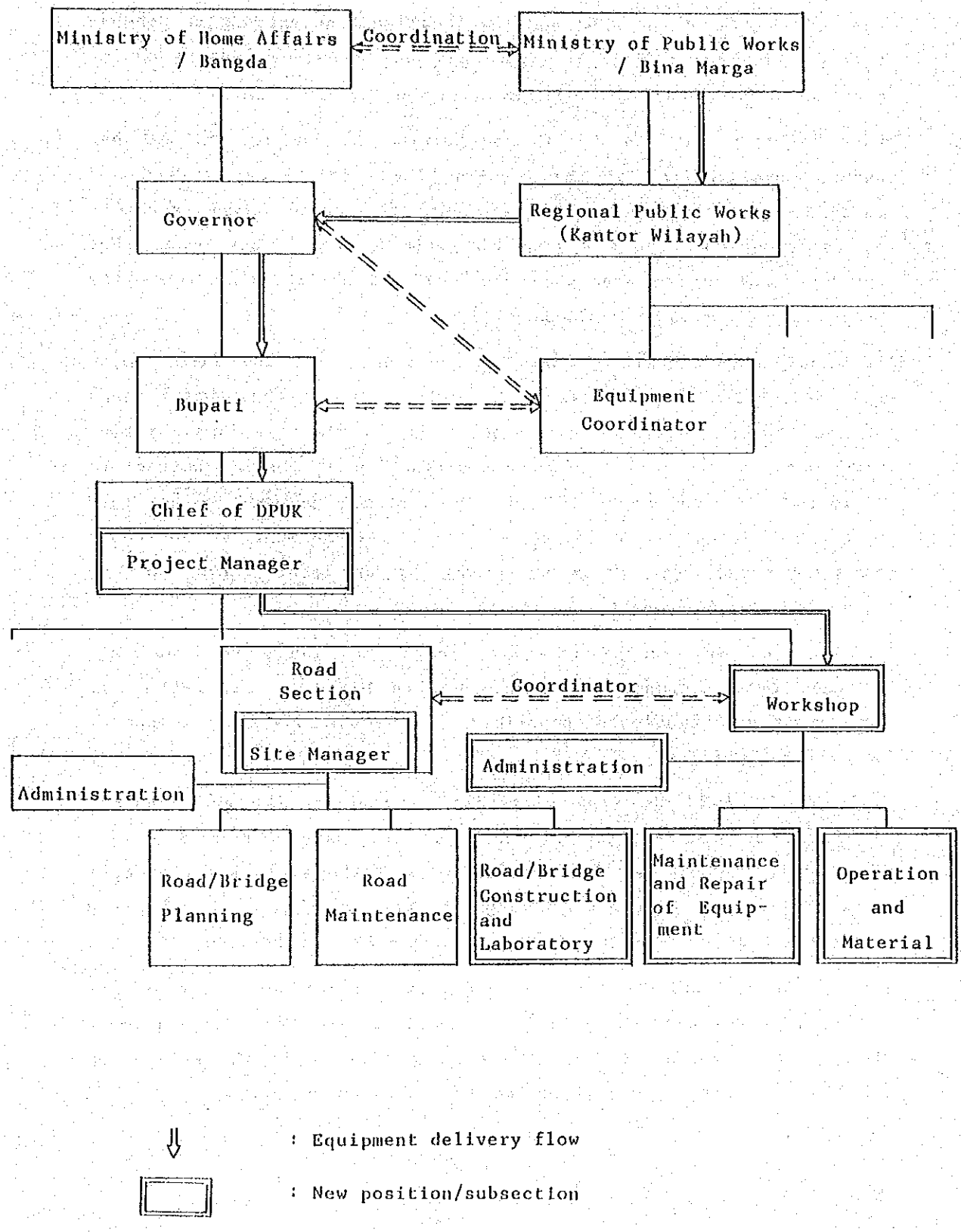
It is recommended that the workshop is newly organized to consist of three sub-sections, i.e. maintenance and repair of equipment, operation and materials, and administration to execute the main tasks described in Clause 3.5.

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

Appendix A-1

INPUT DATA

FOR ESTIMATION OF THE PRODUCER'S SURPLUS BENEFIT

PRV. : RIAU KAB. : INDRAGIRI HULU SURVEY YEAR: 1982

Code No.	KECAMATAN NAME	CULTIVATED AREA : (PA)	YIELD RATE : (Y)	FARMER'S POPULATION : (AP)	CIRCULATED COMMODITY : (PG)
01	KUANTAN MUDIK	1,191	1.62	18,710	0
02	KUANTAN TENGAH	956	1.00	30,040	0
03	SINGINGI	2,607	1.00	20,820	0
04	KUANTAN HILIR	771	1.00	9,970	0
05	CERENTI	304	1.79	15,400	0
06	PERANAP	830	2.31	32,140	0
07	PASIR PENYU	6,177	1.00	39,890	0
08	SEBERIDA	5,670	1.14	22,670	0
09	RENGAT	936	1.00	5,620	0

	r_1	r_2	r_3	r_4
ANNUAL AVERAGE % GROWTH RATE	7.0	10.0	5.0	4.2

FARMER'S CONSUMPTION : (Cp)	NON-AGRO REQUIRMENT : (NG)
0.13 Ton/head/year	0.05 Ton/ton

	SEDAN	BUS	TRUCK	MOTOR CYCLE
RATE OF EACH VEHICLE TYPE %	6.20	6.79	20.31	66.70

AVERAGE FREIGHT TONAGE	0.8 Ton/Truck

Appendix A-2 Engineering Data

ROAD LINK DATA

DATA RUAS

PROVINCE : RIAU

KABUPATEN: INDRAGIRI HULU

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
01	Rengat	Sp. Pekan Heran	12	Rengat	12	
02	Pekan Heran	Seberida	57	Rengat Siberida	11 46	
03	Pekan Heran	Barangan	6	Rengat Pasar Penyu	5 1	
04	Kota Lama	Balai Onang	6	Rengat	6	
05	Pasir Ringgit	Barangan	3	Pasir Penyu	3	
06	Bongkal Malang	Dusun Tuo	4	Pasir Penyu	4	
07	Sp.Kelayang	Tangga Papan		Pasir Penyu		
08	Petonggan	Kuatan Tenang	20	Pasir Penyu	20	
09	Sp.Kota Medan	Kota Medan	7	Pasir Penyu	7	
10	Peranap	Gumanti	5	Peranap	5	
11	Sp.Peranap	Peranap	2	Peranap	2	
12	Cerenti	Sikakak	4	Cerenti	4	
13	Inuman	Pulau Busuk	4	Cerenti	4	
14	Inuman I	Sigaruntang	4	Cerenti	4	
15	Baserah	Sp.Perhentian Luas	19	Kuantan Hilir	19	
16	Pangean	Pasar Usang	4	Kuantan Hilir	4	
17	Pangean	Situgal	19	Kuantan Hilir	19	
18	Jalur Patah	T.A.Hitam	3	Kuantan Tengah	3	
19	Benai	Seberakun	4	Kuantan Tengah	4	
20	Lubuk Jambi	Lubuk Ambacang	10	Kuantan Mudik	10	
21	Lubuk Jambi	Lubuk Ramo	28	Kuantan Mudik	28	
22	Muara Lembu	Pasar Muara Lembu	4	Singingi	4	
23	Muara Lembu	Pangkalang Indarung	30	Singingi	30	
24	Lepau Gading	Simandolak	3	Kuantan Tengah	3	

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

ROAD LINK DATA

DATA RUAS

PROVINCE : RIAU

KABUPATEN: INDRAGIRI

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
25	Sei.Dau	Pemukiman Nes II	12	Rengat	12	
26	Binio I	Binio, III	12	Pasir Penyu	12	
27	Pondok Merbau	Gambir	5	Pasir Penyu	5	
28	Jake	Transmigrasi Blok A	25	Kuantan Tengah	25	
29	Plangko	Polak Pisang	14	Pasir Penyu	14	
30	Pasir Ringgit	Tanah Merah	10	Pasir Penyu	10	
31	Petonggan	Durian Cacar	10	Pasir Penyu	10	
32	Sei Jering	Beringin Sawah	3	Kuantan Tengah	3	
33	Paku I	Gambir	15	Pasir Penyu	15	
34	Sei Parit	Binjai	35	Pasir Penyu	25	
				Seberida	10	
35	Nes II	Kompe Berangin	10	Cerenti	10	
36	Petar	Silunak	4	Peranap	4	
37	TL.Jerinjing	Payarumbai	15	Rengat	15	
38	Simp.Tiga Belilas	Puntianai	35	Siberida	35	
39	Kelesai	Siambul		Siberida		
40	Dusun Tuo	Teluk Sejua	4	Pasir Penyu	4	
41	Pemukiman Nes II	Binjai	20	Rengat	10	
				Siberida	10	
42	Jl. Penghubung	Bunga Tanjung	35	Peranap	35	
43	Air Molek Timur A	Pemukiman	30	Rengat	3	
				Pasir Penyu	27	
44	Air Molek Timur B	Pemukiman Nes II	20	Rengat	20	
45	Batu Rijal	Tanjung	2	Peranap	2	
46	Koto Cerenti	Pulau Bayur	3	Cerenti	3	
47	Lb.Ramo	Sei Besar	33	Kuantan Mudik	33	
48	Sp. Sei Pinang	Sei Pinang	4	Kuantan Mudik	4	

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

ROAD LINK DATA

DATA RUAS

PROVINCE : RIAU

KABUPATEN: INDRAGIRI HULU

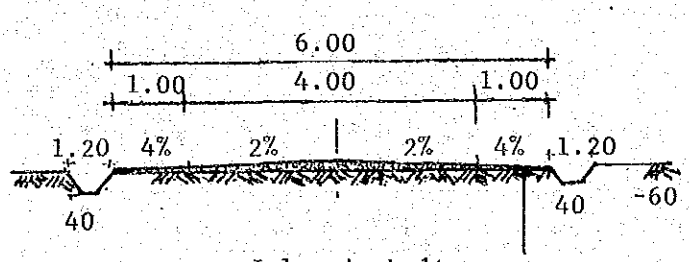
LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
49	Simp.Petai	Petai		Singingi		
50	Ps.Baru Pangean	Pauh Angit	3	Kuantan Hilir	3	
51	S a k o	Transmigrasi SKP II	18	Kuantan Hilir Kuantan Teng	13 5	
52	Ringin	Tali Kawat	4	Siberida	4	
53	Kota Medan	Semelinang	13	Peranap Pasir Penyu	1 12	
54	Lubuk Ambacang	Mudik Alo	6	Kuantan Mudik	6	
55	Cengar	Baserah	67	Kuantan Hilir Kuantan Teng Kuantan Mudik	13 41 13	
56	Silunak	Punti Kayu	18	Peranap	18	
57	Seberida	Rantau Langsat	14	Siberida	14	
58	Jalan-jalan	dalam kota Rengat	27	Rengat	27	Dalam Kota
59	Jalan-jalan	dalam kota Taluk	9	Kuantan Teng-	9	Dalam Kota
60	Jalan-jalan	dalan kota Air Molek	22	Pasir Penyu	22	Dalam Kota
61			12			
62			23			
63	Talang Jerinjing	Tanah Datar	4	Rengat		
64	Batu Gajah	Pasir Keranji	4	Pasir Penyu	4	
65	Pandan Wangi	Semelinang	15	Peranap	15	
66	Selanjut	Polak Pisang	26	Pasir Penyu	26	
67	Sentajo	Transmigrasi Blok A	12	Kuantan Teng	12	
68	Simpang Kamp Baru Sentajo	Kp.Baru	18	Kuantan Teng	18	

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

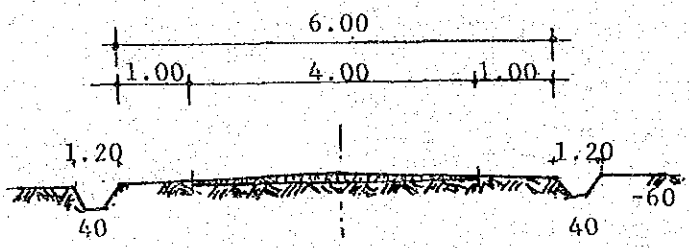
What Kind of Design Criteria has being applied for the new road construction and the improvement for the Kabupaten Road ?
Kriteria Perencanaan yang dipakai pada program penanganan jalan Kabupaten, baik untuk jalan lama maupun pembangunan baru.

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)

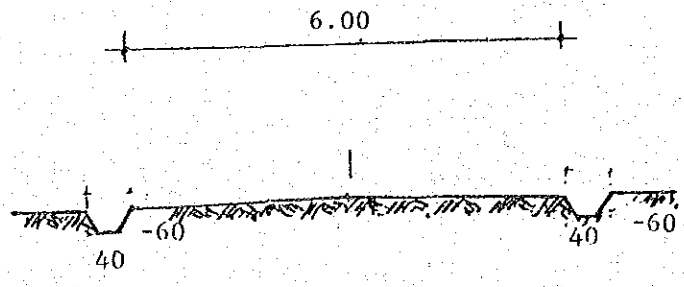
TYPICAL CROSS SECTION.



Jalan Asphalt



Jalan Kerikil



Jalan Tanah

PROPINSI: RIAU

E-03-(1)

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

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

LINK NO : Nomor Ruas	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) / Lebar Jembatan	Type perkerasan / Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan

* 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 : RIAU

KABUPATEN : INDRAGIRI HULU

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	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) Lebar Jembatan	Type perkerasan Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
34	Pemb.baru jalan Binjai - Sei.Parit	6	Tanah	11	71	
58	Pengaspalan jalan dalam kota Rengat	6	Aspal	1	36	
58	Jembatan kayu Sei.Sengkayan Kamp.Pulau.	2.5	Kayu	0.04	6	
37	Pemb.jalan Talang Jeringjing Payarumbai	6	Kerikil	9	51	

* 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: RIAU

E-03-(2)

KABUPATEN: INDRAGIRI HULU

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
60	Pembangunan Jalan Dalam Kota Air Molek	6	Kerikil	2	26	
60	Pembangunan Jalan Dalam Kota Air Molek	4	Kayu	16	5	
58	Pengaspalan Jalan-jalan dalam kota Rengat	4	Aspal	1.904	45	
11	Pengaspalan Jalan Simpang Peranap	4	Aspal	2	47	
59	Pengaspalan Jalan Limono Utara Taluk Kuatan	5	Aspal	0.8	22	
58	Pengaspalan Jalan R.Suprapto Rengat	6	Aspal	0.8	34	
16	Rehabilitasi Jalan Pasar Baru -Ps.Usang Pangean	6	Kerikil	4	23	

* 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: RIAU

KABUPATEN: INDRAGIRI HULU

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
15	Jalan Perhentian Luas Baserah	6	Kerikil	25	121	
15	Jalan Perhentian Luas - Baserah	4.5	K a y u	0.06	11	
33	Jalan Ness II Paku I,II	6	Kerikil	15	73	
33	Jalan Ness II Paku I, II	4	K a y u	0.02	4	
41	Jalan Ness II Pekanheran	6	Kerikil	20	96	
41	Jalan Ness II Pekanheran	4	K a y u	0.09	27	
35	Jalan Ness II Cerenti	6	Kerikil	10	64	

* 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: RIAU

E-03-(3)

KABUPATEN: INDRAGIRI HULU

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
58	Aspal jalan dalam kota Rengat	6	Aspal	0.9	11	
10	Rebab.jalan Peranap Gemanti	5	Kerikil	2,5	15	
59	Rehab.Jalan Lepau Gading Simandolak	5	Kerikil	2.2	14	
49	Pembangunan jalan Desa Petai	4	Kerikil	1.5	9	
17	Pembangunan jalan Logas Situgal	6	Tanah	3	18	
59	Pengaspalan jalan dalam kotaBenai	4	Aspal	0.750	17	
20	Pembangunan jembatan besi batang Antan	4	Besi	0.06	45	
58	Pembangunan baru jalan Panjaitan	6	Kerikil	0.704	28	

* 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: RIAU E-03-(3)

KABUPATEN: INDRAGIRI HULU 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
22	Pengaspalan jalan Muara Lembu	5	Aspal	1.4	38	
58	Pemb.jalan tanah lanjutan Azki Aris Bel.SMA Rgt	8	Tanah	2.8	44	
45	Pemb.jalan Kampung Tayas-Kampung Tanjung	5	Kerikil	1.5	11	
45	Pemb.jalan Kampung Tayas-Kampung Tanjung	4	Kayu	0.02	4	
59	Pengaspalan jalan dalam kota taluk Kuantan	6	Aspal	0.3	11	
58	Pembangunan Riol dalam kota Rengat	1.5	Beton	0.3	18	
59	Pembangunan Riol dalam kota Rengat	1.5	Beton	0.7	17	
58	Rehabilitasi Aspal dalam kota Rengat	6	Aspal	1.05	37	
60	Pemeliharaan jalan dalam kota Air Molek	6	Kerikil	6	20	

* 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: RIAU

E-03-(3)

KABUPATEN: INDRAGIRI HULU 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
42	Jalan Ness II Air Molek Barat	6	Kerikil	35	168	Proyek Terhenti
42	Jalan Ness II Air Molek Barat	4	Kayu	0.02	6	(Swakelola) 73%
43	Jalan Ness II Air Molek Timur A	6	Kerikil	30	144	Dalam Proses Pelaksanaan (70.83%)
43	Jalan Ness II Air Molek Timur A	4	Kayu	0.01	3	
44	Jalan Ness II Air Molek Timur B	6	Kerikil	20	96	Dalam Proses Pelaksanaan (88.83%)
44	Jalan Ness II Air Molek Timur B	4	Kayu	0.05	10	
17	Jalan perhentian Luas-Logas tanah darat	6	Kerikil	9.5	121	
17	Jalan perhentian Luas-Logas tanah darat	4	Kayu	0.06	11	
21	Jalan Cengar-Lubuk Ramo	4	Tanah	23	184	
21	Jalan Cengar-Lubuk Ramo	3.5	Kayu	266	7	

* 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: RIAU

E-03-(4)

KABUPATEN: INDRAGIRI HULU 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
21	Jalan Cengar-Lubuk Ramo	4	Kerikil	23	73	
21	Jalan Cengar-Lubuk Ramo	3.5	Kayu	0.021	38	
23	Jalan Muara Lembu-Pang kalan Indarung	6	Kerikil	30	197	
23	Jalan Muara Lembu-Pang kalan Indarung	4	Kayu	0.075	25	
47	Jalan Muara Petai-Ibul Sei Besar	6	Kerikil	19	122	
47	Jalan Muara Petai-Ibul Sei Besar	4	Kayu	0.013	28	
20	Jalan Lubuk Jambi-Lubuk Ambacang	6	Kerikil	9.45	31	
20	Jalan Lubuk Jambi-Lubuk Ambacang	4	Kayu	0.086	8	

* 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 :RIAU

E-03-(4)

KABUPATEN:INDRAGIRI HULU 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	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) Lebar Jembatan	Type perkerasan Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
54	Rehab.jalan Simpang Sei. Pinang-Sei.Pinang	4	Kerikil	3.5	21	
59	Pengaspalan jalan dalam kota teluk Kuatan	5	Aspal	0.23	29	
58	Pengaspalan jalan dalam kota Rengat	6	Aspal	0.68	36	
36	Rehab.jalan Petar Silunak	5	Kerikil	3.5	28	
50	Pembangunan jalan Ps.Baru Pauh Angit Pengean	6	Kerikil	3	20	
58	Pemb.Riollering pada jalan R.Suprapto Rengat	1.5	Beton	0.5	57	

* 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: RIAU

E-03-(4)

KABUPATEN: INDRAGIRI HULU 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
52	Pemb.jalan Desa Ringin Tali Kawat	4	Tanah	3.9	25	
52	Pemb.Jalan Desa Ringin Tali Kawat	3.5	Kayu	0.04	8	
13	Pemb.Jembatan Kayu Koto Inuman-Pulau Busuk	3	Kayu	0.04	7	
58	Pengaspalan jalan dalam Kota Rengat	6	Aspal	1.0	50	
59	Pemb.Jembatan Kayu Koto Taluk Kuatan	4	Kayu	0.02	5	
58	Pengaspalan Jalan Dalam Kota Rengat	4	Aspal	0.41	18	
17	Pemeliharaan JalanPangean Perhentiaan Luas	6	Kerikil	5	8	
11	Pemeliharaan jalan Simpang Peranap-Peranap	6	Aspal	1,5	8	
58	Pemeliharaan Jalan Aspal Kota Rengat	6	Aspal	1.5	8	
08	Pemb.Jalan Petonggan-Kelayang	4	Tanah	8	57	
60	Pengaspalan Jalan dalam kota Air Molek	3	Aspal	1.73	33	

* 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: RIAU

E-03-(5)

KABUPATEN: INDRAGIRI HULU 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	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) Lebar Jembatan	Type perkerasan Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
51	Jalan Sako-Transmigrasi	6	Kerikil	11	150	Baruselesai tender
51	Jalan Sako-Transmigrasi	4	Kayu	0.02	7	
53	Jalan Kota Medan-Semelinang Darat	5	Kerikil	14	149	
53	Jalan Kota Medan-Semelinang Darat	3.5	Kayu	0.04	17	Baru selesai tender
21	Peningkatan jalan Lb.Jambi Cengar	3	Aspal	5	156	
21	Peningkatan jalan Lb.Jambi Cengar	4	Besi	0.06	4	Rehab.Jbt lama
57	Penunjangan jalan seberida Rt.Langsat	6	Kerikil	14	157	Baru selesai tender
57	Penunjangan jalan Seberida Rt.Langsat	4	Kayu	0.07	22	

* 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: RIAU

E-03-(5)

KABUPATEN: INDRAGIRI HULU

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

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

LINK NO Nomor Ruas	L O C A T I O N From - To (dari - ke)	Lebar perkerasan(m) Lebar Jembatan	Type perkerasan Type Jembatan	LENGTH Panjang (KM)	COSTS Harga (Rp 10^6)	REMARKS Keterangan
11	Pengaspalan jalan dalam Komplek Ps.Peranap	8	Aspal	0.125	35	
58	Pembangunan parit beton Jl.R.Suprapto	1.5	Beton	0.024	29	

* 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: RIAU

E-03-(5)

KABUPATEN:INDRAGIRI HULU 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
60	Pengaspalan jalan dalam kota Air Molek	3	Aspal	1.9	54	
54	Peningkatan jalan Lubuk Ambacang-Mudik Ulo	4	Kerikil	6	44	
54	Peningkatan jalan Lubuk Ambacang-Mudik Ulo	3.5	Kayu	0.03	8	
16	Pengaspalan jalan Pangean Pasar Usang	2.5	Aspal	2.1	51	
58	Pembangunan Riollering da lam kota Rengat	1.5	Beton	1.24	29	
59	Pembangunan Riol dalam kota Teluk Kuatan	1.5	Beton	1	15	

* 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 : RIAU

E-04

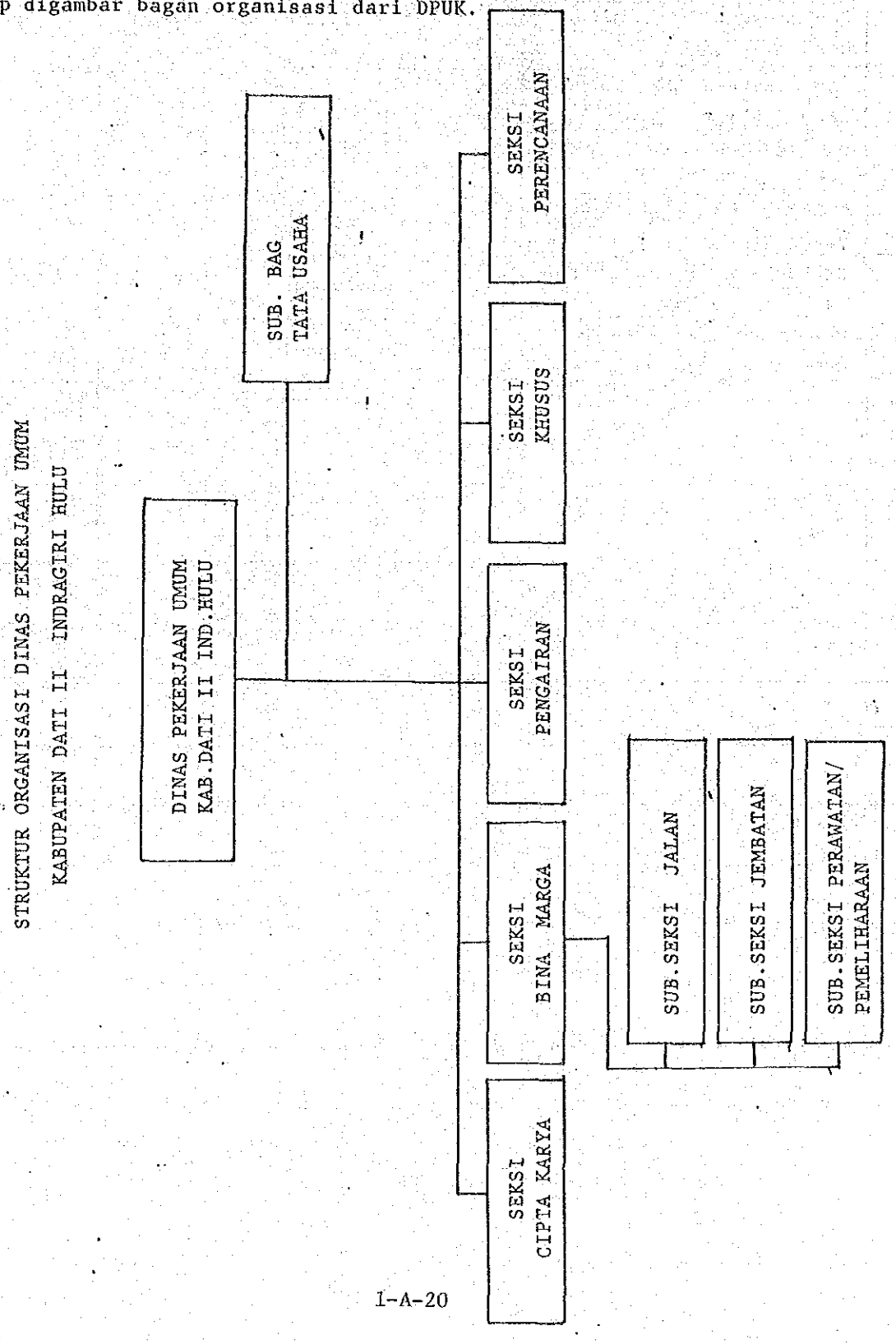
KABUPATEN: INDRAGIRI HULU

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: RIAU

KABUPATEN: INDRAGIRI HULU

DESCRIPTION /Uraian	NUMBER / Jumlah	REMARKS Keterangan
CONTROLING STAFF Staff teknis PUK	———	———
DPUK ENGINEED Sarjana Teknik		
ASSISTANT ENGINEER Sarjana Muda Teknik		
TECHNICIAN STAFF Staff Teknik (STM)	8	
ADMINISTRATION Tenaga Administrasi	4	
SUPERVISOR Tenaga Pengawas	5	
WORKING FORCE Tenaga Pelaksana Lapangan	———	———
OPERATORS Operators	1	
DRIVERS Supir		
MECHANICS Mechanic		
TRADESMAN Tukang		
L A B O U R Buruh / Pekerja		
OTHERS Lain-lain		
TOTAL / JUMLAH	18	

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

E-06

LOCATION AND AREA OF DPUK WORKSHOP

Lokasi Workshop DPUK

PROPINSI : RIAU

KABUPATEN: INDRAGIRI HULU

LOCATION Lokasi	AREA (m2) Luas	NUMBER Jumlah	REMARKS Keterangan
Rengat/Pmt Reba	2,000	1	Rencana

PROPINSI: RIAU

E-07

KABUPATEN: INDRAGIRI HULU

LAND ACQUISITION COST

Daftar harga pembebasan tanah

DESCRIPTION Uraian	UNIT Satuan	RATE (RP) Harga	REMARKS Keterangan
CITY/kota	M2	6,000 - 4,000	
VILLAGE / desa	M2	3,000 - 1,000	
RICE FIELD/sawah	M2	5,000	
DRY FIELD/ladang	M2	4,000	
MIX CROPS/panen	M2	1,000	
FOREST/hutan	M2	500 - 100	
SWAMP / rawa	M2	50	
OTHERS / lain-lain	M2		

PROPINSI: RIAU

KABUPATEN: INDRAGIRI HULU

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	A2	200 - 500 juta	25	
5	B1	100 - 200 juta	19	
22	B2	50 - 100 juta	18	
48	C1	20 - 50 juta	12	
20	C2	0 - 20 juta	9	

NOTE: DATI II

PROPINSI: RIAU

KABUPATEN: INDRAGIRI HULU

E-09

LIST OF EXISTING EQUIPMENT OF LOCAL 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							
Water Tank Truck							
Fuel Tank Truck							
Pick Up							
Jeep							
Motorcycle							
Generator							
Water Pump							
Others							
-							

PROPINSI: RIAU

KABUPATEN: INDRAGIRI HULU

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 Unit
Motor Grader	MG-3H		1		1		2 Unit
Tyre Roller	TS-7409			1	1		
Steel Whell Roller							1 Unit
Vibration Roller							
Wheel Loader	LK-300		1		1		2 Unit
Front End Loader and Backhoe							
Mobile Crane							1 Unit
Concrete Mixer							
Stone Crusher							
Portable Compressor							1 Unit
Hydraulic Excavator							1 Unit
Asphalt Paving Machine							
Asphalt Sprayer							1 Unit
Asphalt Mixing Machine							
Mobile Workshop							1 Unit
Mechanic Rammer							
Plate Tamper							
Pile Driver							
Leg Drill							
Hand Hammer							
Farm Tractor							
Dump Truck	V-22H		3		3		10 Unit
Water Tank Truck							1 Unit
Fuel Tank Truck							1 Unit
Pick Up	T-120		1		1		
Jeep							1 Unit
Motorcycle							9 Unit
Generator							1 Unit
Water Pump							1 Unit
Others							

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

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 68 (IIIB-1) LENGTH : 18 Km

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

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	COST TOTAL
Site Clearance in Light Bush	m2	45000.0	184	91	8,280,000	4,095,000	12,375,000
Subgrade Preparation	m2	117000.0	24	11	2,808,000	1,287,000	4,095,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	754.0	1,098	522	827,892	393,588	1,221,480
Sub Base Course	m3	8820.0	3,529	1,345	31,125,780	11,862,900	42,988,680
Base Course	m3	4410.0	4,861	2,296	21,437,010	10,125,360	31,562,370
Shoulder	m2	54000.0	335	146	18,090,000	7,884,000	25,974,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	63000.0	912	766	57,456,000	48,258,000	105,714,000
Surface Dressing (Double)	m2	0.0	1,099	1,206	0	0	0
Earth Drain	m	30260.0	1,182	119	35,767,320	3,600,940	39,368,260
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	24.0	52,375	34,179	1,257,000	820,296	2,077,296
Masonry Culvert (80x80cm)	m	6.0	86,558	32,928	519,348	197,568	716,916
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,274	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	67,053	11,667	0	0	0
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		177,568,350	88,524,652	266,093,002
Overhead (15%)					26,635,252	13,278,697	39,913,949
			TOTAL COST		204,203,602	101,803,349	306,006,951
Manual routine maintenance of road	Km	18.0	198,048	7,236	3,564,864	130,248	3,695,112
Routine maintenance of asphalt road	Km	18.0	449,600	151,000	8,092,800	2,718,000	10,810,800
			Sub Total		11,657,664	2,848,248	14,505,912
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	2,099	2,312	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,518	2,403	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	17,000,386
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	36,404,550
Maintenance Rate without Bridge		(%)	:	4.74
New Bridge Cost Rate		(%)	:	

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 21 (IIIA) LENGTH : 28 Km

UPGRADE : 6.0m road bed, 4.0m road with surface Dressing (2)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	COST TOTAL
Site Clearance in Light Bush	m2	46000.0	184	91	8,464,000	4,186,000	12,650,000
Subgrade Preparation	m2	138000.0	24	11	3,312,000	1,518,000	4,830,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	45.0	1,098	522	49,410	23,490	72,900
Sub Base Course	m3	13544.0	3,529	1,345	47,796,776	18,216,680	66,013,456
Base Course	m3	8960.0	4,861	2,296	43,554,560	20,572,160	64,126,720
Shoulder	m2	56000.0	335	146	18,760,000	8,176,000	26,936,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	112000.0	1,099	1,206	123,088,000	135,072,000	258,160,000
Earth Drain	m	0.0	1,182	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	0.0	52,375	34,179	0	0	0
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,274	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	67,053	11,667	0	0	0
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		245,024,746	187,764,330	432,789,076
Overhead (15%)					36,753,711	28,164,649	64,918,360
			TOTAL COST		281,778,457	215,928,979	497,707,436
Manual routine maintenance of road	Km	28.0	198,048	7,236	5,545,344	202,608	5,747,952
Routine maintenance of asphalt road	Km	28.0	449,600	151,000	12,588,800	4,228,000	16,816,800
			Sub Total		18,134,144	4,430,608	22,564,752
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	2,099	2,312	0	0	0
Maintenance of Timber Bridge (Exist)	m2	1145.2	8,518	2,403	9,754,813	2,751,915	12,506,728
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	17,775,266
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	68,042,444
Maintenance Rate without Bridge		(%)	:	4.53
New Bridge Cost Rate		(%)	:	

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 23 (IIIB-2) LENGTH : 30 Km

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

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	60000.0	184	91	11,040,000	5,460,000	16,500,000
Subgrade Preparation	m2	203000.0	24	11	4,872,000	2,233,000	7,105,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	168.0	1,098	522	184,464	87,696	272,160
Sub Base Course	m3	16470.6	3,529	1,345	58,124,747	22,152,957	80,277,704
Base Course	m3	7200.0	4,861	2,296	34,999,200	16,531,200	51,530,400
Shoulder	m2	90000.0	335	146	30,150,000	13,140,000	43,290,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	0.0	1,099	1,206	0	0	0
Earth Drain	m	0.0	1,182	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	0.0	52,375	34,179	0	0	0
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,274	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	67,053	11,667	0	0	0
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	3,216,408	371,120	3,587,528
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		142,586,819	59,975,973	202,562,792
Overhead (15%)					21,388,022	8,996,395	30,384,417
			TOTAL COST		163,974,841	68,972,368	232,947,209
Manual routine maintenance of road	Km	30.0	198,040	7,236	5,941,440	217,080	6,158,520
Routine maintenance of gravel road	Km	30.0	216,193	87,975	6,485,790	2,639,250	9,125,040
			Sub Total		12,427,230	2,856,330	15,283,560
Maintenance of Timber Bridge (New)	m2	16.0	8,755	1,121	140,080	17,936	158,016
Maintenance of Concrete Bridge (New)	m2	0.0	2,099	2,312	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,518	2,403	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	7,627,385
Timber Bridge	Unit Cost	(Rp/m2)	:	257,854
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	40,138,852
Maintenance Rate without Bridge		(%)	:	6.68
New Bridge Cost Rate		(%)	:	1.77

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 37 (IIIB-2) LENGTH : 15 Km

UPGRADE : 6.0m 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	184	91	0	0	0
Subgrade Preparation	m2	54000.0	24	11	1,296,000	594,000	1,890,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	229.0	1,098	522	251,442	119,538	370,980
Sub Base Course	m3	5789.2	3,529	1,345	20,430,086	7,786,474	28,216,560
Base Course	m3	3600.0	4,861	2,296	17,499,600	8,265,600	25,765,200
Shoulder	m2	30000.0	335	146	10,050,000	4,380,000	14,430,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	0.0	1,099	1,206	0	0	0
Earth Drain	m	0.0	1,182	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	0.0	52,375	34,179	0	0	0
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,274	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	67,053	11,667	0	0	0
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		49,527,128	21,145,612	70,672,740
Overhead (15%)					7,429,069	3,171,841	10,600,910
			TOTAL COST		56,956,197	24,317,453	81,273,650
Manual routine maintenance of road	Km	15.0	198,048	7,236	2,970,720	108,540	3,079,260
Routine maintenance of gravel road	Km	15.0	216,193	87,975	3,242,895	1,319,625	4,562,520
			Sub Total		6,213,615	1,428,165	7,641,780
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	2,099	2,312	0	0	0
Maintenance of Timber Bridge (Exist)	m2	130.0	8,518	2,403	1,107,340	312,390	1,419,730
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	5,418,243
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	14,108,280
Maintenance Rate without Bridge		(%)	:	9.40
New Bridge Cost Rate		(%)	:	

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 41 (IIIA) LENGTH : 20 Km

UPGRADE : 6.0m road bed, 4.0m road with surface Dressing (2)

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>> LOCAL	FOREIGN	<<<<<< COST LOCAL	FOREIGN	>>>>>> TOTAL
Site Clearance in Light Bush	m2	0.0	184	91	0	0	0
Subgrade Preparation	m2	114000.0	24	11	2,736,000	1,254,000	3,990,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	1400.0	1,098	522	1,537,200	730,800	2,268,000
Sub Base Course	m3	10808.0	3,529	1,345	38,141,432	14,536,760	52,678,192
Base Course	m3	6400.0	4,861	2,296	31,110,400	14,694,400	45,804,800
Shoulder	m2	40000.0	335	146	13,400,000	5,840,000	19,240,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	80000.0	1,099	1,206	87,920,000	96,480,000	184,400,000
Earth Drain	m	5400.0	1,182	119	6,382,800	642,600	7,025,400
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	18.0	52,375	34,179	942,750	615,222	1,557,972
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,274	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	67,053	11,667	0	0	0
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	15,418,305	8,976,689	24,394,994
			Sub Total		197,588,887	143,770,471	341,359,358
Overhead (15%)					29,638,333	21,565,570	51,203,903
			TOTAL COST		227,227,220	165,336,041	392,563,261
Manual routine maintenance of road	Km	20.0	198,048	7,236	3,960,960	144,720	4,105,680
Routine maintenance of asphalt road	Km	20.0	449,600	151,000	8,992,000	3,020,000	12,012,000
			Sub Total		12,952,960	3,164,720	16,117,680
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	67.5	2,099	2,312	141,682	156,060	297,742
Maintenance of Timber Bridge (Exist)	m2	0.0	8,518	2,403	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	18,225,451
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	415,618
Survived Value		(Rp)	:	65,791,250
Maintenance Rate without Bridge		(%)	:	4.42
New Bridge Cost Rate		(%)	:	7.15

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 47 (IIIA) LENGTH : 33 Km

UPGRADE : 9.0m road bed, 6.0m road with surface Dressing (2)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	102000.0	184	91	18,768,000	9,282,000	28,050,000
Subgrade Preparation	m2	207000.0	24	11	4,968,000	2,277,000	7,245,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	4378.0	1,098	522	4,807,044	2,285,316	7,092,360
Sub Base Course	m3	21657.0	3,529	1,345	76,427,553	29,128,665	105,556,218
Base Course	m3	15840.0	4,861	2,296	76,998,240	36,368,640	113,366,880
Shoulder	m2	99000.0	335	146	33,165,000	14,454,000	47,619,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	198000.0	1,099	1,206	217,602,000	238,788,000	456,390,000
Earth Drain	m	41660.0	1,182	119	49,242,120	4,957,540	54,199,660
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	68.0	52,375	34,179	3,561,500	2,324,172	5,885,672
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	15.0	12,274	246	184,110	3,690	187,800
Retaining Wall and Wing Wall (Masonry)	m3	12.8	67,053	11,667	858,278	149,337	1,007,615
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	20,321,974	12,716,165	33,038,139
			Sub Total		506,903,819	352,734,525	859,638,344
Overhead (15%)					76,035,572	52,910,178	128,945,750
			TOTAL COST		582,939,391	405,644,703	988,584,094
Manual routine maintenance of road	Ka	33.0	198,048	7,236	6,535,584	238,788	6,774,372
Routine maintenance of asphalt road	Ka	33.0	449,600	151,000	14,836,800	4,983,000	19,819,800
			Sub Total		21,372,384	5,221,788	26,594,172
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	99.0	2,099	2,312	207,801	228,888	436,689
Maintenance of Timber Bridge (Exist)	m2	0.0	8,518	2,403	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement		*Unit Cost*	*(Rp/Km)*	:	28,805,765
Timber	Bridge	Unit Cost	(Rp/m2)	:	
Concrete	Bridge	Unit Cost	(Rp/m2)	:	383,776
Survived	Value		(Rp)	:	129,305,763
Maintenance	Rate	without Bridge	(%)	:	2.80
New Bridge	Cost Rate		(%)	:	3.84

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 51 (IIIB-2) LENGTH : 18 Km

UPGRADE : 6.0m road bed, 4.5m road with surface Base Cource

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	0.0	184	91	0	0	0
Subgrade Preparation	m2	84000.0	24	11	2,016,000	924,000	2,940,000
Normal Fill	m3	0.0	1,889	862	0	0	0
Fill in Swamp	m3	0.0	2,805	1,051	0	0	0
Normal Excavation to Spoil	m3	722.0	1,098	522	792,756	376,884	1,169,640
Sub Base Course	m3	9602.4	3,529	1,345	33,886,869	12,915,228	46,802,097
Base Course	m3	4860.0	4,861	2,296	23,624,460	11,158,560	34,783,020
Shoulder	m2	27000.0	335	146	9,045,000	3,942,000	12,987,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	0.0	1,099	1,206	0	0	0
Earth Drain	m	0.0	1,182	119	0	0	0
Earth Drain in Swamp (by machine)	m3	0.0	1,392	473	0	0	0
Pipe Culvert D80cm	m	0.0	52,375	34,179	0	0	0
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,274	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	67,053	11,667	0	0	0
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		69,365,085	29,316,672	98,681,757
Overhead (15%)					10,404,762	4,397,500	14,802,262
			TOTAL COST		79,769,847	33,714,172	113,484,019
Manual routine maintenance of road	Km	18.0	198,048	7,236	3,564,864	130,248	3,695,112
Routine maintenance of gravel road	Km	18.0	216,193	87,975	3,891,474	1,583,550	5,475,024
			Sub Total		7,456,338	1,713,798	9,170,136
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	2,099	2,312	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,518	2,403	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	80.0	4,560	2,305	364,800	184,400	549,200

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	6,304,668
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	23,401,048
Maintenance Rate without Bridge		(%)	:	8.08
New Bridge Cost Rate		(%)	:	

PROV : RIAU KAB : INDRAGIRI HULU

LINK NO : 55 (IIIA) LENGTH : 67 Km

UPGRADE : 7.5m road bed, 4.5m road with surface Dressing (2)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST LOCAL	UNIT COST FOREIGN	COST LOCAL	COST FOREIGN	TOTAL
Site Clearance in Light Bush	m2	246500.0	184	91	45,356,000	22,431,500	67,787,500
Subgrade Preparation	m2	502500.0	24	11	12,060,000	5,527,500	17,587,500
Normal Fill	m3	1650.0	1,889	862	2,927,950	1,336,100	4,264,050
Fill in Swamp	m3	3720.0	2,805	1,051	10,434,600	3,909,720	14,344,320
Normal Excavation to Spoil	m3	7205.0	1,098	522	7,911,090	3,761,010	11,672,100
Sub Base Course	m3	42210.0	3,529	1,345	148,959,090	56,772,450	205,731,540
Base Course	m3	24120.0	4,861	2,296	117,247,320	55,379,520	172,626,840
Shoulder	m2	201000.0	335	146	67,335,000	29,346,000	96,681,000
Asphalt Patching	m2	0.0	4,496	1,510	0	0	0
Surface Dressing (Single)	m2	0.0	912	766	0	0	0
Surface Dressing (Double)	m2	301500.0	1,099	1,206	331,348,500	363,609,000	694,957,500
Earth Drain	m	115100.0	1,182	119	136,048,200	13,696,900	149,745,100
Earth Drain in Swamp (by machine)	m3	12000.0	1,392	473	16,704,000	5,676,000	22,380,000
Pipe Culvert D80cm	m	1116.0	52,375	34,179	58,450,500	38,143,764	96,594,264
Masonry Culvert (80x80cm)	m	0.0	86,558	32,928	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	80.0	12,274	246	981,920	19,680	1,001,600
Retaining Wall and Wing Wall (Masonry)	m3	419.2	67,053	11,667	28,108,617	4,890,806	32,999,423
Gabion Protection	m3	0.0	26,613	120	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
			Sub Total		983,872,787	604,499,950	1,588,372,737
Overhead (15%)					147,580,918	90,674,992	238,255,910
			TOTAL COST		1,131,453,705	695,174,942	1,826,628,647
Manual routine maintenance of road	Km	67.0	198,048	7,236	13,269,216	484,812	13,754,028
Routine maintenance of asphalt road	Km	67.0	449,600	151,000	30,123,200	10,117,000	40,240,200
			Sub Total		43,392,416	10,601,812	53,994,228
Maintenance of Timber Bridge (New)	m2	0.0	8,755	1,121	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	2,099	2,312	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,518	2,403	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,560	2,305	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	27,263,114
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived	Value	(Rp)	:	207,741,942
Maintenance Rate without Bridge		(%)	:	2.96
New Bridge Cost Rate		(%)	:	

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

PROV : RIAU KAB : INDRAGIRI HULU

ITEM	UNIT	(1988)	(1989)	(1990)	(1991)	(1992)	(TOTAL)
EQUIPMENT :							
Bulldozer/Ripper	hr	690.1	1256.2	1033.5	1293.0	1164.2	5437.0
Swamp Bulldozer	hr	24.8	24.8	24.8	24.8	24.8	124.0
Motor Grader	hr	1326.8	2793.5	2378.2	3163.4	2531.6	12193.5
Hand-guide Vib. Roller	hr	317.8	430.5	399.1	402.2	424.3	1973.9
Tire Roller	hr	670.0	1376.8	1999.0	2282.2	1879.9	8207.9
Vibratory Roller (D&T)	hr	1089.0	2262.0	1917.3	2537.3	2009.0	9814.6
Hydraulic Excavator; Wheel	hr	180.0	185.5	185.5	184.6	185.7	921.3
Wheel Loader	hr	1929.3	3809.4	3496.8	4674.3	3835.4	17745.2
Water Tank Truck	hr	725.5	1505.3	1320.6	1804.2	1398.3	6753.9
Dump Truck	hr	14859.5	29260.9	26905.8	35058.5	29288.5	135373.2
Flat Bed Truck with Crane	hr	240.3	376.1	358.8	387.6	422.4	1785.2
Flat Bed Truck	hr	911.0	1802.9	2539.1	2881.4	2407.7	10542.1
Portable Crusher/Screening	hr	348.8	716.8	789.6	1068.3	867.3	3790.8
Concrete Mixer	hr	88.5	167.8	167.8	185.4	207.0	816.5
Water Pump	hr	71.7	300.9	300.9	347.6	408.9	1430.0
Concrete Vibrator	hr	38.2	57.4	57.4	63.6	69.2	285.8
Asphalt Sprayer	hr	670.0	1376.8	1999.0	2282.2	1879.9	8207.9
LABOUR :							
Mandur	man day	1377.7	2525.3	2484.5	2946.9	2678.0	12012.4
Skilled Labourer	man day	646.0	1419.0	1636.8	1888.8	1725.7	7316.3
Carpenter	man day	60.7	208.5	125.6	157.0	187.3	739.1
Mason	man day	83.8	159.6	159.6	174.9	195.0	772.9
Labourer	man day	14744.3	26630.8	26961.8	30669.1	29198.9	128204.9
Driver	man day	2969.3	5870.2	5665.6	7242.3	6061.9	27809.3
Operator	man day	1552.8	2987.1	2834.7	3613.8	3010.8	13999.2
MATERIAL :							
Bitumen	l	163312.4	325458.2	477124.8	556291.6	458249.9	1980436.9
Asphalt Oil	l	22110.0	47539.1	68072.5	75313.3	62040.0	275074.9
Kerosene	l	32159.9	66355.7	96222.3	109546.6	90239.9	394524.4
Sand	m3	515.5	933.4	1213.4	1319.3	1155.8	5137.4
Cement	bag	589.8	906.0	906.0	1001.5	1093.0	4496.3
River Stone	m3	83.8	174.2	174.2	191.9	215.8	839.9
Steel Moulds	set	223.2	244.2	244.2	253.8	260.6	1226.0
Timber	m3	4.6	16.7	9.2	11.7	14.0	56.2
Paint	l	29.5	59.9	0.0	0.0	0.0	89.4
Reinforcing Steel	kg	7120.0	12478.3	12478.3	14226.8	15806.1	62109.5
Tying Wire	kg	64.7	113.4	113.4	129.3	143.6	564.4
Equivalent Royalty	m3	27193.1	55892.7	51799.0	71003.3	55485.6	261373.7