

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: Kolaka

(Rpx10⁶)

COST	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
CONSTRUCTION	1,281	2,053	3,334
MAINTENANCE	69	270	339
SUPPLEMENTATION	441	-	441
WORKSHOP EQUIPMENT & TOOLS	28	-	28
LABORATORY EQUIPMENT	12	-	12
SURVEY EQUIPMENT	5	-	5
TOTAL	1,836	2,323	4,159

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

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

(Rpx10⁶)

COST	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL
CIVIL WORK	893	2,308	3,201
CONSTRUCTION & MAINTENANCE EQUIPMENT	836	-	836
SPARE PARTS	62	15	77
WORKSHOP/LABORATORY/SURVEY EQUIPMENT	45	-	45
TOTAL	1,836	2,323	4,159

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 5 links with the total length of 189 km which is 25% of the 754 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 : KOLAKA

REASON FOR SELECTION	ROAD LINK NO
Feasible	
- Primary	3,4,5,6
- Secondary	1
Engineering Point of View	-
Basic Human Needs	-

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

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

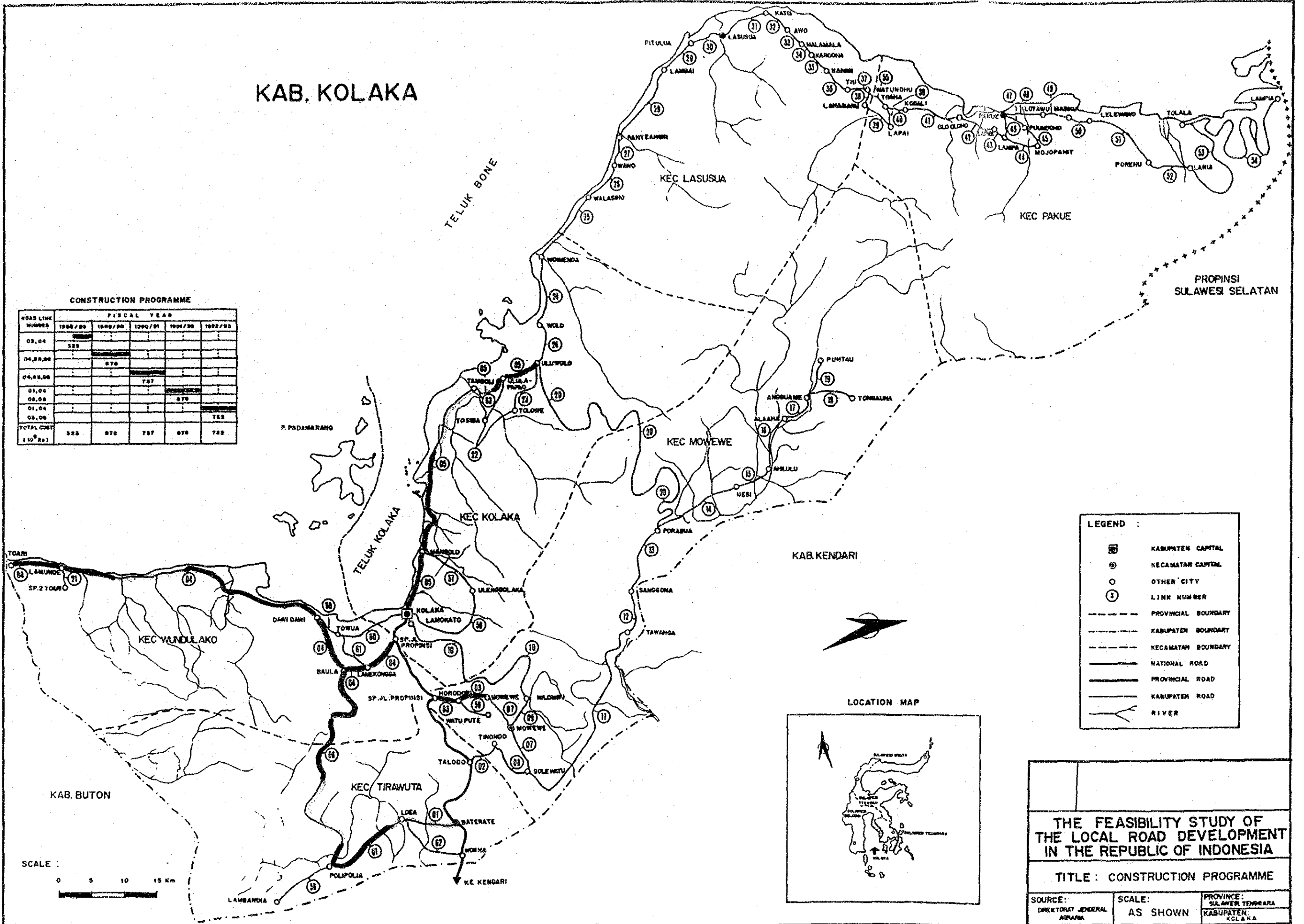
PROV : SULAWESI TENGGARA KAB : KOLAKA

YEAR	LINK NO	() : rate
1988	3, 4	(15%)
1989	4	(25%), 5 (20%), 6 (25%)
1990	4	(25%), 5 (30%), 6 (25%)
1991	1	(50%), 4 (15%), 5 (30%), 6 (35%)
1992	1	(50%), 4 (20%), 5 (20%), 6 (15%)

KAB. KOLAKA

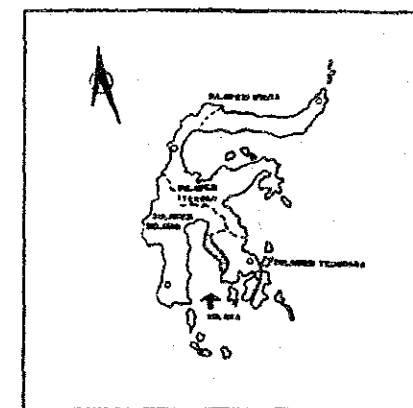
CONSTRUCTION PROGRAMME

ROAD LINE NUMBER	FISCAL YEAR				
	1988/89	1989/90	1990/91	1991/92	1992/93
03.04	323				
04.05.06		870			
04.05.06			737		
01.04				870	
05.06					737
01.04					737
03.06					737
TOTAL COST (10 ⁸ Rp)	323	870	737	870	737



LEGEND :

	KABUPATEN CAPITAL
	KECAMATAN CAPITAL
	OTHER CITY
	LINK NUMBER
	PROVINCIAL BOUNDARY
	KABUPATEN BOUNDARY
	KECAMATAN BOUNDARY
	NATIONAL ROAD
	PROVINCIAL ROAD
	KABUPATEN ROAD
	RIVER



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

TITLE : CONSTRUCTION PROGRAMME

SOURCE : DIREKTORAT JENDERAL AGRIKULTUR	SCALE : AS SHOWN	PROVINCE : SULAWESI TENGGARA KABUPATEN : KOLAKA
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(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 : SULAWESI TENGGARA KAB : KULAKA

(1000Rp)

LINK NO	LENGTH (Km)	BA (X)	SD (X)	RU (X)	RD (X)	ASPIAL (Km)	GRAVEL (Km)	EARTH (Km)	TH NO	AREA (m2)	RC NO	AREA (m2)	BRIDGE COST	LOCAL COST	FOREIGN COST	TOTAL COST
1	22	39.0	37.1	13.9	10.0	6	10	6	0	0.00	0	0.00	0	8,404	2,182	10,586
3	6	42.3	57.7	0.0	0.0	0	6	0	0	0.00	0	0.00	0	2,122	574	2,696
4	80	87.1	10.3	2.5	0.1	40	10	30	0	0.00	0	0.00	0	33,418	8,677	42,095
5	42	81.3	17.8	0.9	0.0	0	8	34	0	0.00	0	0.00	0	11,544	2,304	13,848
23	9	50.0	49.6	0.4	0.0	0	8	1	10	382.50	0	0.00	4,022	6,166	1,752	7,918
56	9	73.4	18.3	8.2	0.0	0	9	0	0	0.00	0	0.00	0	3,184	861	4,045
SUM	168					46	51	71	10	382.50	0	0.00	4,022	61,838	16,350	81,188

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 Kolaka 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 3,334 x 10⁶ and maintenance cost is Rp 339 x 10⁶ which is approximately 9% of the total expenditure.

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

PROV : SULAWESI TENGGARA KAB : KOLAKA

(UNIT : 1000Rp)

ITEM	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >	
LOCAL CURRENCY :	184,067	399,003	440,296	536,236	436,908	1,997,310	(59.9%)
Ownership Cost	3,408	7,630	8,438	10,747	8,508	38,731	(1.9%)
Operation Cost	64,582	142,741	157,614	204,116	161,441	730,494	(36.6%)
Material Cost	40,555	81,621	89,707	102,162	86,108	400,153	(20.0%)
Labour Cost	52,209	114,967	127,107	149,267	123,863	567,413	(28.4%)
Contingency	24,113	52,044	57,430	69,944	58,988	260,519	(13.0%)
FOREIGN CURRENCY :	140,476	271,359	297,011	342,253	205,592	1,336,691	(40.1%)
Ownership Cost	35,355	78,477	86,623	111,852	87,912	400,219	(29.9%)
Operation Cost	4,814	10,815	11,944	15,637	12,180	55,390	(4.1%)
Material Cost	81,984	146,672	159,703	170,122	148,249	706,730	(52.9%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	18,323	35,395	38,741	44,642	37,251	174,352	(13.0%)
TOTAL COST :	325,343	670,361	737,306	878,488	722,500	3,333,998	
Ownership Cost	38,763	88,107	95,061	122,599	96,420	438,950	(13.2%)
Operation Cost	69,396	153,556	169,558	219,753	173,621	785,884	(23.6%)
Material Cost	122,539	228,293	249,410	272,284	234,357	1,106,883	(33.2%)
Labour Cost	52,209	114,967	127,107	149,267	123,863	567,413	(17.0%)
Contingency	42,436	87,438	96,170	114,585	94,239	434,868	(13.0%)

< Contingency : 15% >

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

PROV : SULAWESI TENGGARA KAB : KOLAKA

(UNIT : 1000Rp)

ITEM	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >	
LOCAL CURRENCY :	30,614	60,697	60,117	59,690	59,429	270,547	(79.8%)
Ownership Cost	487	985	979	972	964	4,387	(1.6%)
Operation Cost	12,379	24,299	24,056	23,810	23,736	108,280	(40.0%)
Material Cost	834	1,730	1,728	1,725	1,707	7,724	(2.9%)
Labour Cost	16,914	33,683	33,354	33,183	33,022	150,156	(55.5%)
FOREIGN CURRENCY :	7,702	15,415	15,296	15,186	15,086	68,685	(20.2%)
Ownership Cost	5,783	11,381	11,275	11,154	11,114	50,707	(73.8%)
Operation Cost	695	1,369	1,356	1,340	1,334	6,094	(8.9%)
Material Cost	1,224	2,665	2,665	2,692	2,638	11,884	(17.3%)
Labour Cost	0	0	0	0	0	0	(0.0%)
TOTAL COST :	38,316	76,112	75,413	74,876	74,515	339,232	
Ownership Cost	6,270	12,366	12,254	12,126	12,078	55,094	(16.2%)
Operation Cost	13,074	25,668	25,412	25,150	25,070	114,374	(33.7%)
Material Cost	2,058	4,395	4,393	4,417	4,345	19,608	(5.8%)
Labour Cost	16,914	33,683	33,354	33,183	33,022	150,156	(44.3%)

Table 6-1-6 (3)

CONSTRUCTION AND MAINTENANCE COST
(TOTAL)

PROV : SULAWESI TENGGARA KAB : KOLAKA

(UNIT : 1000Rp)

ITEM	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >	
LOCAL CURRENCY :	215,481	459,700	500,413	595,926	496,337	2,267,857	(61.7%)
Ownership Cost	3,895	8,615	9,417	11,719	9,472	43,118	(1.9%)
Operation Cost	76,961	167,040	181,670	227,926	185,177	838,774	(37.0%)
Material Cost	41,389	83,351	91,435	103,887	87,815	407,877	(18.0%)
Labour Cost	69,123	148,650	160,461	182,450	156,885	717,569	(31.6%)
Contingency	24,113	52,044	57,430	69,944	56,988	260,519	(11.5%)
FOREIGN CURRENCY :	148,178	286,774	312,307	357,439	300,678	1,405,376	(38.3%)
Ownership Cost	41,138	89,858	97,898	123,006	99,026	450,926	(32.1%)
Operation Cost	5,509	12,184	13,300	16,977	13,514	61,484	(4.4%)
Material Cost	83,208	149,337	162,368	172,814	150,887	718,614	(51.1%)
Labour Cost	0	0	0	0	0	0	(0.0%)
Contingency	18,323	35,395	38,741	44,642	37,251	174,352	(12.4%)
TOTAL COST :	363,659	746,473	812,719	953,364	797,015	3,673,230	
Ownership Cost	45,033	98,473	107,315	134,725	108,498	494,044	(13.4%)
Operation Cost	82,470	179,224	194,970	244,903	198,691	900,258	(24.5%)
Material Cost	124,597	232,688	253,803	276,701	238,702	1,126,491	(30.7%)
Labour Cost	69,123	148,650	160,461	182,450	156,885	717,569	(19.5%)
Contingency	42,436	87,438	96,170	114,585	94,239	434,868	(11.8%)

< Contingency : 15% >

6.1.4 Construction and Maintenance Equipment Cost

(1) Required Number of Equipment

The required numbers of construction equipment for Kabupaten Kolaka 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-Bulldozer
- 1-Motor Grader
- 1-Steel Roller

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 Crane 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 : SULAWESI TENGGARA KAB : KOLAKA

EQUIPMENT NAME	WORKABLE	EXISTING	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >
Bulldozer/Ripper	240	1	0.21	0.51	0.53	0.74	0.48
Swamp Bulldozer	240	1	0.00	0.00	0.00	0.09	0.09
Motor Grader	250	0	0.38	0.94	1.05	1.31	0.99
Hand-guide Vib. Roller	250	0	0.25	0.68	0.75	0.71	0.61
Tire Roller	240	0	0.54	0.94	1.03	1.15	1.00
Vibratory Roller (D&T)	250	0	0.28	0.73	0.82	1.09	0.83
Hydraulic Excavator; Wheel	240	0	0.00	0.00	0.00	0.47	0.47
Wheel Loader	250	0	0.62	1.42	1.56	2.08	1.54
Water Tank Truck	250	0	0.18	0.47	0.54	0.72	0.54
Dump Truck	250	0	6.11	13.74	15.24	19.50	15.51
Flat Bed Truck with Crane	250	0	0.19	0.52	0.57	0.53	0.45
Flat Bed Truck	250	0	0.70	1.31	1.43	1.56	1.34
Portable Crusher/Screening	250	0	0.17	0.31	0.34	0.40	0.32
Concrete Mixer	240	0	0.07	0.20	0.22	0.21	0.17
Water Pump	240	0	0.06	0.17	0.18	0.17	0.14
Concrete Vibrator	240	0	0.04	0.10	0.11	0.10	0.08
Asphalt Sprayer	240	0	0.54	0.94	1.03	1.15	1.00

NOTE WORKABLE : workable days in a year

EXISTING : number of existing equipment

Table 6-1-8

EQUIPMENT PURCHASE COST

PROV : SULAWESI TENGGARA

KAB : KOLAKA

(1000 Rp)

EQUIPMENT NAME	CLASS	CIF (JAKARTA)	PURCHASE NO.	PURCHASE COST
Bulldozer	90 HP	49,150	-	-
Bulldozer/Ripper	90 HP	53,000	-	-
Swamp Bulldozer	90 HP	52,850	-	-
Swamp Bulldozer	65 HP	40,500	-	-
Motor Grader	75 HP	47,800	1	47,800
Road Stabilizer	M=1850 mm	85,950	-	-
Hand-guide Vib. Roller	1000 Kg	8,500	1	8,500
Tire Roller	8-15 ton	31,070	3	93,210
Vibratory Roller (D&T)	4 ton	29,000	-	-
Vibratory Roller	4 ton	29,000	-	-
Rough Terrain Crane	10 ton	100,400	-	-
Hydraulic Excavator; Wheel	0.3 m3	41,100	-	-
Wheel Loader	1.2 m3	70,200	2	140,400
Water Tank Truck	4000 ltr.	12,750	1	12,750
Dump Truck	3.0 ton	14,700	16	235,200
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	2	22,550
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	1	10,200
Service Car	3 ton	11,600	1	11,600
4 Wheel Drive Vehicle	70 HP	17,500	1	17,500
Motorcycle	100 cc	1,100	3	3,300

PURCHASE COST	TOTAL	835,570
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OWNERSHIP COST (FOREIGN)	394,539
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EQUIPMENT COST SUPPLEMENTED	441,031
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NOTE : OWNERSHIP COST (FOREIGN) for Existing Equipment

Bulldozer/Ripper	18,705
Motor Grader	21,469
Vibratory Roller (D&T)	16,213

TOTAL	56,387
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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 : SULAWESI TENGGARA KAB : KOLAKA

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
Site Clearance in Light Bush	m ²	16162.50	70062.50	70062.50	107287.50	53175.00	316750.00
Subgrade Preparation	m ²	27000.00	148900.00	167600.00	207850.00	144950.00	696300.00
Normal Fill	m ³	0.00	0.00	0.00	0.00	0.00	0.00
Fill in Swamp	m ³	0.00	0.00	0.00	3600.00	3600.00	7200.00
Normal Excavation to Spoil	m ³	1492.95	626.05	674.95	1413.15	1329.90	5537.00
Sub Base Course	m ³	4735.22	13686.03	15439.53	19570.12	14392.42	67823.30
Base Course	m ³	4080.00	7988.00	9017.00	11069.00	8496.00	40650.00
Shoulder	m ²	42000.00	86050.00	94450.00	117650.00	93850.00	434000.00
Asphalt Patching	m ²	116.40	194.00	194.00	426.40	465.20	1396.00
Surface Dressing (Single)	m ²	24000.00	108100.00	123100.00	166700.00	128800.00	551000.00
Surface Dressing (Double)	m ²	51000.00	40000.00	40000.00	24000.00	32000.00	187000.00
Earth Drain	m	35950.00	74800.00	83060.00	96408.00	81454.00	371680.00
Earth Drain in Swamp (by machine)	m ³	0.00	0.00	0.00	9000.00	9000.00	18000.00
Pipe Culvert Ø80cm	m	270.40	767.45	846.05	789.45	666.65	3340.00
Masonry Culvert (80x80cm)	m	0.00	0.00	0.00	0.00	0.00	0.00
Retaining Wall and Wing Wall (Timber)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Retaining Wall and Wing Wall (Masonry)	m ³	89.76	256.32	202.88	255.68	216.16	1100.80
Gabion Protection	m ³	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber; Span 3m; 10T)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber; Span 5m; 10T)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber; Span 8m; 10T)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber; Span 3m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber; Span 5m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Timber; Span 8m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete; Span 3m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete; Span 5m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete; Span 8m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete; Span 10m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Superstructure (Concrete; Span 15m; 8H50)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Pier; for Timber; 10T)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Abut; for Timber; 10T)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Pier; for Timber; 8H50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Abut; for Timber; 8H50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Pier; for Concrete; 8H50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Substructure (Abut; for Concrete; 8H50)	NO	0.00	0.00	0.00	0.00	0.00	0.00
Demolition of Bridge (Timber->Timber)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Demolition of Bridge (Timber->Concrete)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Demolition of Bridge (Concrete)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Manual routine maintenance of road	Km	79.50	153.80	151.70	150.20	150.30	685.50
Routine maintenance of earth road	Km	34.38	63.85	62.15	62.15	63.10	285.63
Routine maintenance of gravel road	Km	23.63	42.95	42.55	40.55	40.70	190.38
Routine maintenance of asphalt road	Km	21.50	47.00	47.00	47.50	46.50	209.50
Maintenance of Timber Bridge (New)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance of Concrete Bridge (New)	m ²	0.00	0.00	0.00	0.00	0.00	0.00
Maintenance of Timber Bridge (Exist)	m ²	191.25	382.50	382.50	382.50	382.50	1721.25
Maintenance of Concrete Bridge (Exist)	m ²	0.00	0.00	0.00	0.00	0.00	0.00

6.2 Organization and Construction System

6.2.1 Organization

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

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

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

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

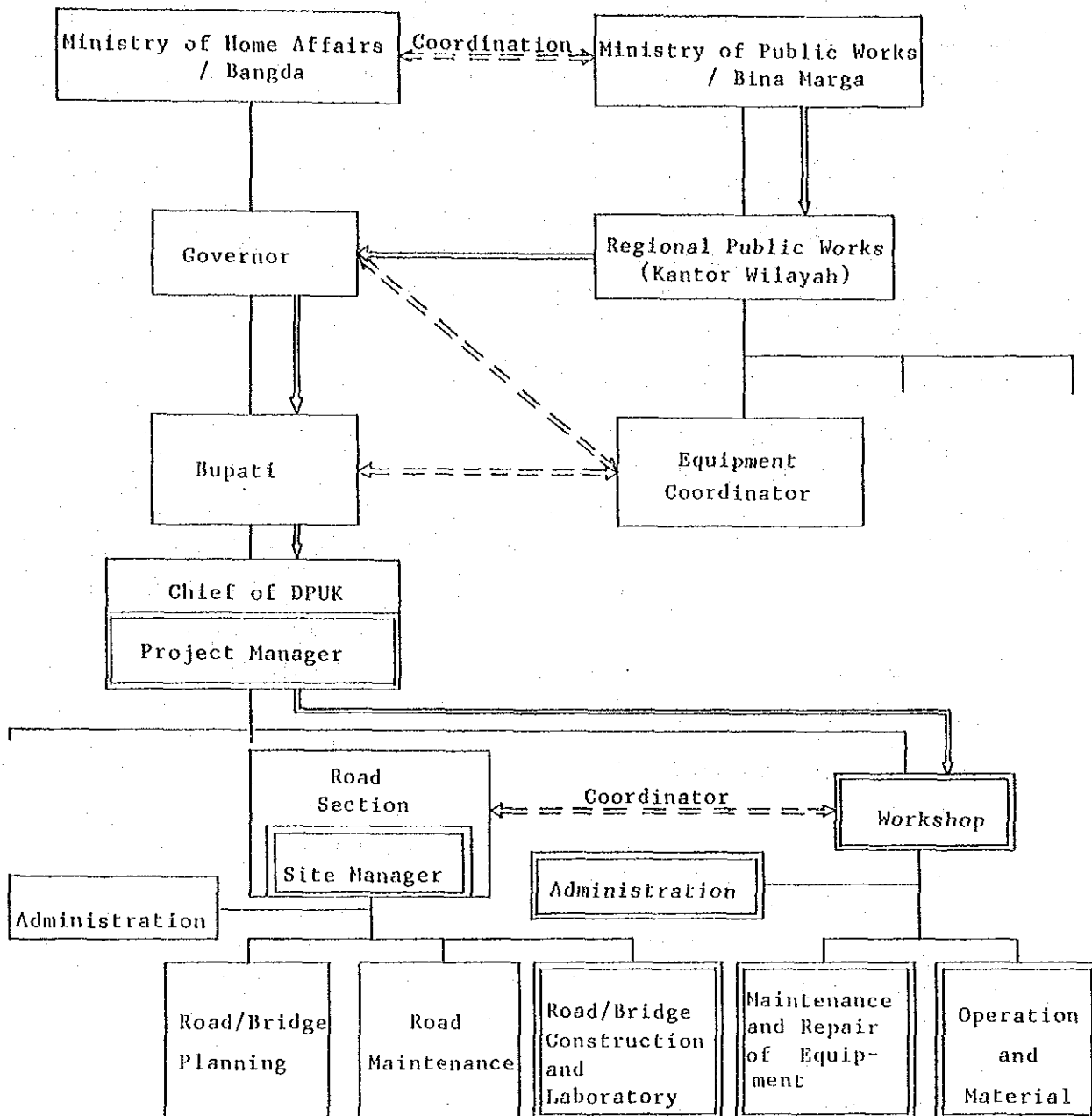
The sub-section of laboratory would be under the relevant Road Section. The proposed organization is shown in Fig. 6-2-1.

6.2.2 Construction System

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

Fig. 6-2-1

PROPOSED ORGANIZATION



: Equipment delivery flow



: New position/subsection

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. : SULAWESI TENGGARA KAB. : KOLAKA

SURVEY YEAR: 1983

[illegible]

	r_1	r_2	r_3	r_4
ANNUAL AVERAGE GROWTH RATE %	5.5	4.0	4.0	6.0

FARMER'S CONSUMPTION : (Cp)	NON-AGRO REQUIREMENT : (NG)
0.13 Ton/head/year	0.084 Ton/ton

	SEDAN	BUS	TRUCK	MOTOR CYCLE	AVERAGE FREIGHT TONAGE	
RATE OF EACH VEHICLE TYPE %	6.21	8.76	18.04	66.99		0.6 Ton/Truck

Appendix A-2 Engineering Data

ROAD LINK DATA

PROVINCE : SULAWESI TENGGARA

DATA RUAS

KABUPATEN: KOLAKA

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
01	Rate-rate	Poli-polia	22	Tirawuta	22	
02	Talodo	Tinondo	6	Mowewe	3	
				Tirawuta	3	
03	Simpang Jl.Propinsi	Mowewe	6	Mowewe	6	
04	Simpang Jl.Propinsi	Toari	80	Wundulako	80	
05	Kolaka	Uluwolo	42	Kolaka	42	
06	Baula	Poli-polia	39	Wundulako	16	
				Tirawuta	23	
07	Mowewe	Solewatu	7	Mowewe	7	
08	Solewatu	Tinondo	8	Mowewe	8	
09	Mowewe	Nilombu	5	Mowewe	5	
10	Nilombu	Lamokato	10	Mowewe	5	
				Kolaka	5	
11	Solewatu	Tawanga	35	Mowewe	35	
12	Tawanga	Sanggona	7	Mowewe	7	
13	Sanggona	Porabua	9	Mowewe	9	
14	Porabua	Uesi	14	Mowewe	14	
15	Ahilulu	Uesi	6	Mowewe	6	
16	Ahilulu	Alaaha	8	Mowewe	8	
17	Alaaha	Angguame	5	Mowewe	5	
18	Angguame	Tongauna	6	Mowewe	6	
19	Angguame	Puntau	6	Mowewe	6	
20	Porabua	Uluwolo	64	Kolaka	32	
				Mowewe	32	
21	Lamunde	Sp.2 Toari	3	Wundulako	3	
22	Tosiba	Tolowe	13	Kolaka	13	
23	Tolowe	Uluwolo	9	Kolaka	9	
24	Uluwolo	Woimenda	18	Kolaka	18	

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

ROAD LINK DATA

PROVINCE : SULAWESI TENGGARA

DATA RUAS

KABUPATEN: KOLAKA

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
25	Woimenda	Walasiho	11	Kolaka Lasusua	3 8	
26	Walasiho	Wawo	6	Lasusua	6	
27	Wawo	Ranteangin	4	Lasusua	4	
28	Ranteangin	Lambai	16	Lasusua	16	
29	Lambai	Pitulua	5	Lasusua	5	
30	Pitulua	Lasusua	20	Lasusua	20	
31	Lasusua	Katoi	8	Lasusua	8	
32	Katoi	A w o	4	Lasusua	4	
33	A w o	Mala-mala	3	Lasusua	3	
34	Mala-mala	Karoooha	2	Lasusua	2	
35	Karoooha	Kamisi	3	Lasusua	3	
36	Kamisi	T i u	4	Lasusua	4	
37	T i u	Watunohu	4	Lasusua	4	
38	Watunohu	Lahabaru	2	Lasusua	2	
39	Lahabaru	Toaha	9	Pakue	9	
40	Toaha	Kosali	3	Pakue	3	
41	Kosali	Olo-oloho	8	Pakue	8	
42	Olo-oloho	Lapibi	6	Pakue	6	
43	Lapibi	Lanipa	2	Pakue	2	
44	Lanipa	Mojopahit	5	Pakue	5	
45	Mojopahit	Puundoho	7	Pakue	7	
46	Lanipa	Pakue	7	Pakue	7	
47	Pakue	Puundoho	4	Pakue	4	
48	Pakue	Lotawu	6	Pakue	6	

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

ROAD LINK DATA

PROVINCE : SULAWESI TENGGARA

KABUPATEN: KOLAKA

DATA RUAS

LINK NO.	BEGINNING POINT (DESA NAME)	END POINT (DESA NAME)	LENGTH (KM)	THROUGH THE KEC. NAME & LENGTH		REMARKS
				KEC. NAME	LENGTH (KM)	
49	Lotawu	Masiku	4	Pakue	4	
50	Masiku	Lelewawo	3	Pakue	3	
51	Lelewawo	Porehu	10	Pakue	10	
52	Porehu	Larui	6	Pakue	6	
53	Larui	Tolala	20	Pakue	20	
54	Tolala	Batas Sulsel	45	Pakue	45	
55	Watunohu	Toaha	7	Lasusua	0.5	
				Pakue	6.5	
56	Poli-polia	Lambandia	9	Tirawuta	9	
57	Mangolo	Ulenggolaka	9	Kolaka	9	
58	Ulenggolaka	Kolaka	15	Kolaka	15	
59	Horodopi	Watupute	5	Mowewe	5	
60	Kolaka	Dawi-dawi	16	Kolaka	5	
				Wundulako	11	
61	Lamekongga	Towua	6	Wundulako	6	
62	Woiha	Loea	11	Tirawuta	11	
63	Tamboli	Ululapapao	11	Kolaka	11	

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

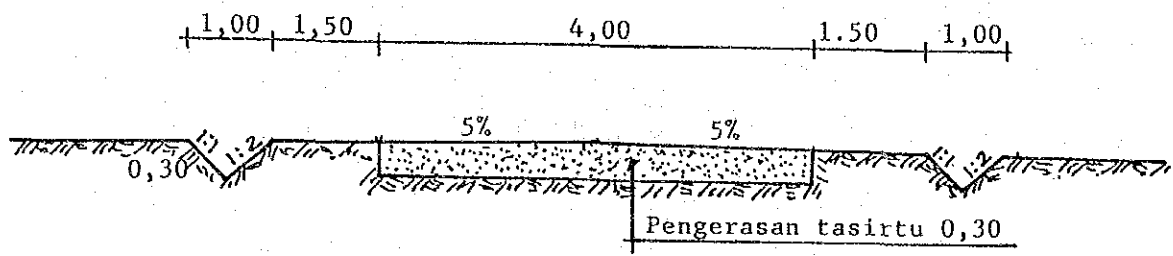
What Kind of Design Criteria has being applied for the new road construction and the improvement for the Kabupaten Road ?

Kriteria Perencanaan yang dipakai pada program penanganan jalan Kabupaten, baik untuk jalan lama maupun pembangunan baru.

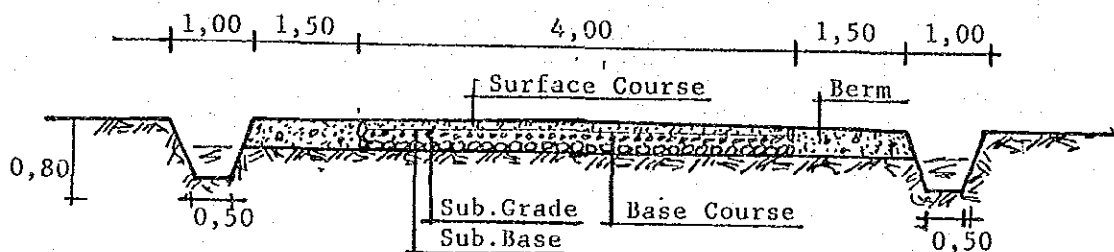
Please draw the Typical Cross Section of the Kabupaten Road.

Buat gambar dan penjelasan dari: Typical cross section yang dipakai pada program penanganan jalan selama ini (baik untuk jalan lama, maupun pembangunan baru)

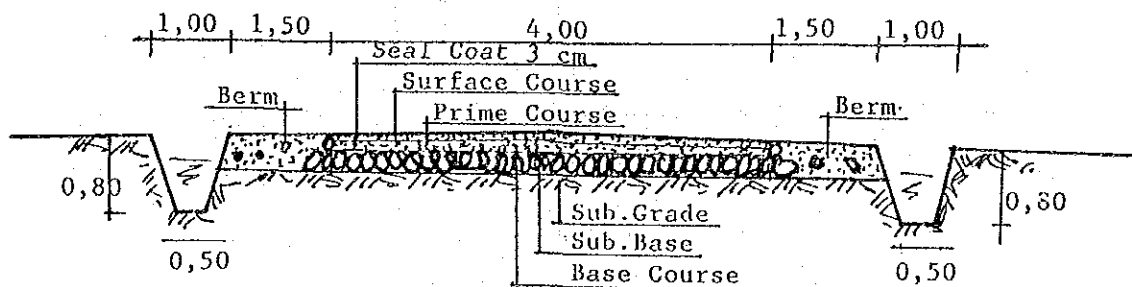
TYPICAL CROSS SECTION.



Jl. ACWAS/KERIKIL



JALAN ASPHALT



JALAN BUTAS

LOCATION AND COSTS OF THE KABUPATEN

ROADS CONSTRUCTED OR IMPROVED IN 1980/1981

Biaya konstruksi, penanganan

Jalan dan Jembatan Kabupaten tln. 1980/1981

[illegible]

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

LOCATION AND COSTS OF THE KABUPATEN

ROADS CONSTRUCTED OR IMPROVED IN 1981/1982

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

[illegible]

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

KABUPATEN: KOLAKA

LOCATION AND COSTS OF THE KABUPATEN

ROADS CONSTRUCTED OR IMPROVED IN 1982/1983

Biaya konstruksi, penanganan

Jalan dan Jembatan Kabupaten tln. 1982/1983

* 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

Biaya konstruksi penanganan

Jalan dan Jembatan Kabupaten ttn. 1983/1984

[illegible]

* 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

KABUPATEN: KOLAKA

LOCATION AND COSTS OF THE KABUPATEN

ROADS CONSTRUCTED OR IMPROVED IN 1984/1985

Biaya konstruksi penanganan

· jalan dan jembatan Kabupaten tbn. 1984/1985 ·

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

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

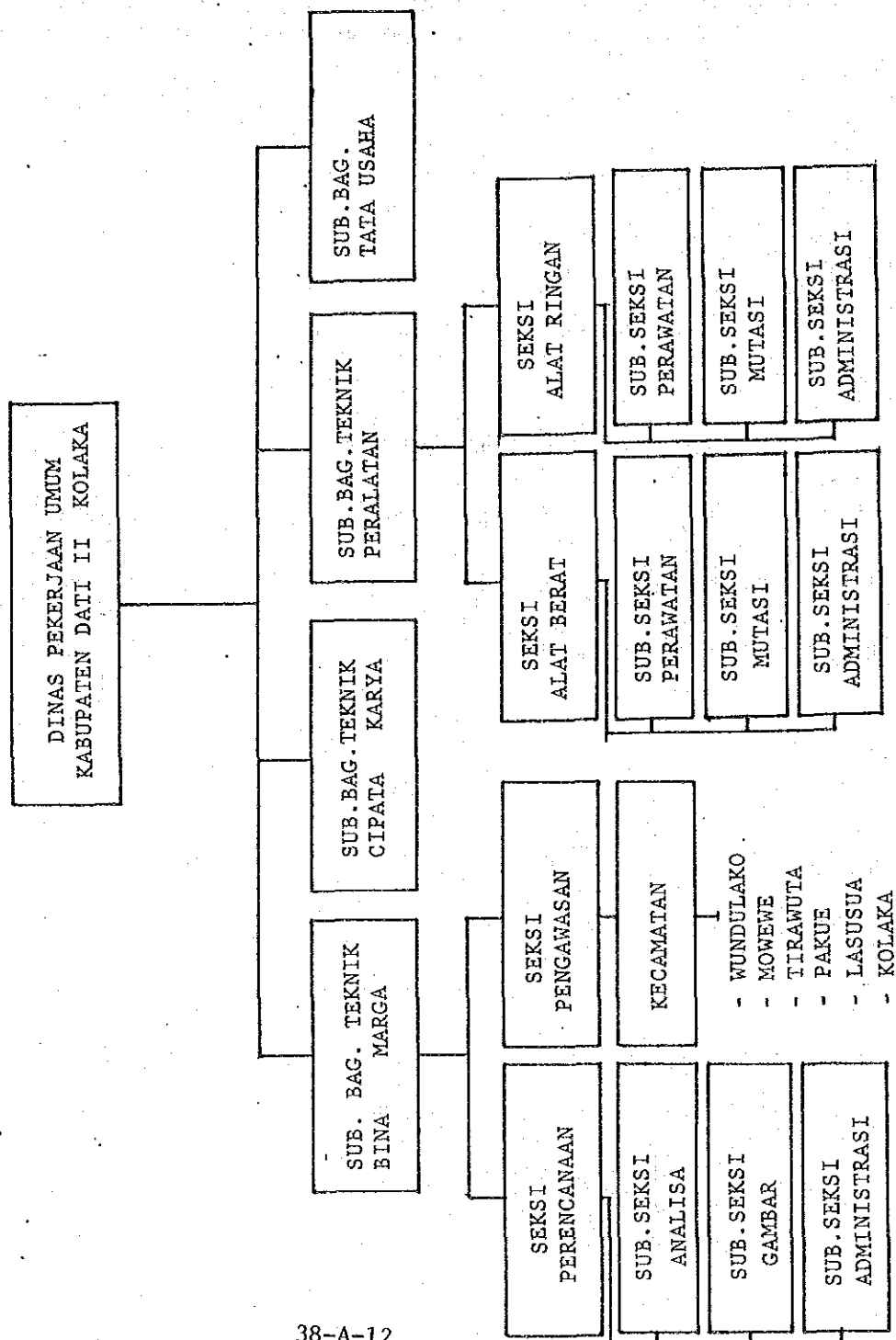
EXISTING ORGANIZATION IN KABUPATEN

Struktur Organisasi yang ada dari P.U Kabupaten

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

Harap digambar bagan organisasi dari DPUK.

STRUKTUR ORGANISASI DINAS PEKERJAAN UMUM
KABUPATEN DATI II KOLAKA



EXISTING STAFF RESOURCES OF BINA MARGA OF PU KABUPATEN

Tenaga Dinas PUK yang ada

PROPINSI: SULAWESI TENGGARA

KABUPATEN: KOLAKA

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

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

LOCATION AND AREA OF DPUK WORKSHOP

E-06

Lokasi Workshop DPUK

PROPINSI : SULAWESI TENGGARA

KABUPATEN: KOLAKA

LOCATION Lokasi	AREA (m2) Luas	NUMBER Jumlah	REMARKS Keterangan

PROPINSI: SULAWESI TENGGARA

E-07

KABUPATEN: KOLAKA

LAND ACQUISITION COST
Daftar harga pembebasan tanah

DESCRIPTION Uraian	UNIT Satuan	RATE (RP) Harga	REMARKS Keterangan
CITY/kota	M2	15,000	
VILLAGE / desa	M2	5,000	
RICE FIELD/sawah	M2	2,000	
DRY FIELD/ladang	M2	2,000	
MIX CROPS/panen	M2	2,000	
FOREST/hutan	M2	1,000	
SWAMP / rawa	M2	500	
OTHERS / lain-lain	M2		

KABUPATEN: K O L A K A

Classification of local contractors at Kabupaten level.
Klasifikasi kontraktor di Kabupaten

[illegible]

38-A-15

LIST OF EXISTING EQUIPMENT OF LOCAL CONTRACTOR

NAME OF EQUIPMENT Jenis peralatan	EXISTING CONDITION/ Kondisi Peralatan					REASON OF BAD CONDIT TION/Sebab Kerusakan	REQUIRE - MENT / Ke- butuhan peralatan baru
	TYPE/ Tipe	P.Y	NUMBER / Jumlah				
			GOOD Baik	BAD Rusak	TOTAL Jumlah		
Bulldozer							
Motor Grader							
Tyre Roller							
Steel Wheel 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							

LIST OF EXISTING EQUIPMENT OF P.U KABUPATEN

NAME OF EQUIPMENT	EXISTING CONDITION/ Kondisi Peralatan					REQUIRE - MENT / Ke- butuhan peralatan baru	
Jenis peralatan	TYPE/ Tipe	P.Y	NUMBER / Jumlah				REASON OF BAD CONDI TION/Sebab Kerusakan
			GOOD Baik	BAD Rusak	TOTAL Jumlah		
Bulldozer			1		1		
Motor Grader			1		1		
Tyre Roller							
Steel Wheel Roller			3	1	4		
Vibration Roller							
Wheel Loader				1	1		
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				1	1		
Fuel Tank Truck							
Pick Up							
Jeep			1		1		
Motorcycle			1		1		
Generator							
Water Pump							
Others							

Appendix A-3

CONSTRUCTION AND MAINTENANCE COST FOR PROPOSED ROAD LINKS

PROV : SULAWESI TENGGARA KAB : KOLAKA

LINK NO : 4 (IIIA) LENGTH : 80 Km

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

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>>		<<<< COST >>>>>		TOTAL
			LOCAL	FOREIGN	LOCAL	FOREIGN	
Site Clearance in Light Bush	m ²	7750.0	166	91	1,286,500	705,250	1,991,750
Subgrade Preparation	m ²	180000.0	21	11	3,780,000	1,980,000	5,760,000
Normal Fill	m ³	0.0	1,712	866	0	0	0
Fill in Swamp	m ³	0.0	2,561	1,059	0	0	0
Normal Excavation to Spoil	m ³	1553.0	1,002	525	1,556,106	815,325	2,371,431
Sub Base Course	m ³	18876.1	3,240	1,355	61,158,564	25,577,115	86,735,679
Base Course	m ³	12800.0	4,441	2,310	56,844,800	29,568,000	86,412,800
Shoulder	m ²	160000.0	302	146	48,320,000	23,360,000	71,680,000
Asphalt Patching	m ²	776.0	3,941	1,518	3,058,216	1,177,968	4,236,184
Surface Dressing (Single)	m ²	160000.0	656	766	104,960,000	122,560,000	227,520,000
Surface Dressing (Double)	m ²	160000.0	813	1,207	130,080,000	193,120,000	323,200,000
Earth Drain	m	159720.0	986	120	157,483,920	19,166,400	176,650,320
Earth Drain in Swamp (by machine)	m ³	0.0	1,225	476	0	0	0
Pipe Culvert Ø80cm	m	1776.0	46,535	44,416	82,646,160	78,882,816	161,528,976
Masonry Culvert (80x80cm)	m	0.0	62,846	38,045	0	0	0
Retaining Wall and Wing Wall (Timber)	m ²	0.0	12,810	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m ³	598.4	45,070	11,820	26,969,888	7,073,088	34,042,976
Gabion Protection	m ³	0.0	10,908	121	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
Sub Total					678,144,154	503,985,962	1,182,130,116
Overhead (15%)					101,721,623	75,597,894	177,319,517
TOTAL COST					779,865,777	579,583,856	1,359,449,633

Manual routine maintenance of road	Km	80.0	160,688	7,260	12,855,040	580,800	13,435,840
Routine maintenance of asphalt road	Km	80.0	394,100	151,800	31,528,000	12,144,000	43,672,000
Sub Total					44,383,040	12,724,800	57,107,840
Maintenance of Timber Bridge (New)	m ²	0.0	8,658	1,233	0	0	0
Maintenance of Concrete Bridge (New)	m ²	0.0	1,961	2,793	0	0	0
Maintenance of Timber Bridge (Exist)	m ²	0.0	8,052	2,462	0	0	0
Maintenance of Concrete Bridge (Exist)	m ²	0.0	4,115	2,404	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	16,993,120
Timber Bridge	Unit Cost	(Rp/m ²)	:	
Concrete Bridge	Unit Cost	(Rp/m ²)	:	
Survived Value		(Rp)	:	90,991,743
Maintenance Rate without Bridge		(%)	:	4.20
New Bridge Cost Rate		(%)	:	

PROV : SULAWESI TENGGARA KAB : KOLAKA

LINK NO : 3 (IIIA) LENGTH : 6 Km

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

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>>		<<<<< COST >>>>>		>>>>>
			LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL
Site Clearance in Light Bush	m2	15000.0	166	91	2,490,000	1,365,000	3,855,000
Subgrade Preparation	m2	0.0	21	11	0	0	0
Normal Fill	m3	0.0	1,712	866	0	0	0
Fill in Swamp	m3	0.0	2,561	1,058	0	0	0
Normal Excavation to Spoil	m3	1260.0	1,002	525	1,262,520	661,500	1,924,020
Sub Base Course	m3	1903.8	3,240	1,355	6,168,312	2,579,649	8,747,961
Base Course	m3	2160.0	4,441	2,310	9,592,560	4,989,600	14,582,160
Shoulder	m2	18000.0	302	146	5,436,000	2,628,000	8,064,000
Asphalt Patching	m2	0.0	3,941	1,518	0	0	0
Surface Dressing (Single)	m2	0.0	656	766	0	0	0
Surface Dressing (Double)	m2	27000.0	813	1,207	21,951,000	32,589,000	54,540,000
Earth Drain	m	12000.0	986	120	11,832,000	1,440,000	13,272,000
Earth Drain in Swamp (by machine)	m3	0.0	1,225	476	0	0	0
Pipe Culvert Ø80cm	m	4.0	46,535	44,416	186,140	177,664	363,804
Masonry Culvert (80x80cm)	m	0.0	62,846	38,045	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,810	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	0.0	45,070	11,820	0	0	0
Gabion Protection	m3	0.0	10,908	121	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
Sub Total					58,918,532	46,430,413	105,348,945
Overhead (15%)					8,837,779	6,964,561	15,802,340
TOTAL COST					67,756,311	53,394,974	121,151,285

Manual routine maintenance of road	Ka	6.0	160,688	7,260	964,128	43,560	1,007,688
Routine maintenance of asphalt road	Ka	6.0	394,100	151,800	2,364,600	910,800	3,275,400
Sub Total					3,328,728	954,360	4,283,088
Maintenance of Timber Bridge (New)	m2	0.0	8,658	1,233	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,961	2,793	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,052	2,462	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,115	2,404	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Ka)	:	20,191,881
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	10,643,908
Maintenance Rate without Bridge		(%)	:	3.54
New Bridge Cost Rate		(%)	:	

PRDV : SULAWESI TENGGARA KAB : KOLAKA

LINK NO : 1 (III B-1) LENGTH : 22 Km

UPGRADE : 6.5m road bed, 4.0m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>>		<<<<< COST >>>>>		TOTAL
			LOCAL	FOREIGN	LOCAL	FOREIGN	
Site Clearance in Light Bush	m2	21500.0	166	91	3,569,000	1,956,500	5,525,500
Subgrade Preparation	m2	63300.0	21	11	1,329,300	696,300	2,025,600
Normal Fill	m3	0.0	1,712	866	0	0	0
Fill in Swamp	m3	7200.0	2,561	1,058	18,439,200	7,617,600	26,056,800
Normal Excavation to Spoil	m3	1675.0	1,002	525	1,678,350	879,375	2,557,725
Sub Base Course	m3	7668.4	3,240	1,355	24,845,616	10,390,682	35,236,298
Base Course	m3	4480.0	4,441	2,310	19,895,680	10,348,800	30,244,480
Shoulder	m2	55000.0	302	146	16,610,000	8,030,000	24,640,000
Asphalt Patching	m2	620.0	3,941	1,518	2,443,420	941,160	3,384,580
Surface Dressing (Single)	m2	88000.0	656	766	57,728,000	67,408,000	125,136,000
Surface Dressing (Double)	m2	0.0	813	1,207	0	0	0
Earth Drain	m	43960.0	986	120	43,344,560	5,275,200	48,619,760
Earth Drain in Swamp (by machine)	m3	18000.0	1,225	476	22,050,000	8,568,000	30,618,000
Pipe Culvert D80cm	m	109.0	46,535	44,416	5,072,315	4,841,344	9,913,659
Masonry Culvert (80x80cm)	m	0.0	62,846	38,045	0	0	0
Retaining Wall and Wing Wall (timber)	m2	0.0	12,810	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	22.4	45,070	11,820	1,009,568	264,768	1,274,336
Gabion Protection	m3	0.0	10,908	121	0	0	0
New Bridge (timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
Sub Total					218,015,009	127,217,729	345,232,738
Overhead (15%)					32,702,251	19,082,659	51,784,910
TOTAL COST					250,717,260	146,300,388	397,017,648

Manual routine maintenance of road	Km	22.0	160,688	7,260	3,535,136	159,720	3,694,856
Routine maintenance of asphalt road	Km	22.0	394,100	151,800	8,670,200	3,339,600	12,009,800
Sub Total					12,205,336	3,499,320	15,704,656
Maintenance of Timber Bridge (New)	m2	0.0	8,658	1,233	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,961	2,793	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,052	2,462	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,115	2,404	0	0	0

Earthwork & Pavement	Unit Cost	(Rp/Km)	:	18,046,257
Timber Bridge	Unit Cost	(Rp/m2)	:	
Concrete Bridge	Unit Cost	(Rp/m2)	:	
Survived Value		(Rp)	:	30,714,304
Maintenance Rate without Bridge		(%)	:	3.96
New Bridge Cost Rate		(%)	:	

PROV : SULAWESI TENGGARA KAB : KOLAKA

LINK NO : 5 (IIIB-1) LENGTH : 42 Km

UPGRADE : 5.5m road bed, 3.5m road with surface Dressing (1)

(Rp)

ITEM	UNIT	QUANTITY	UNIT COST	LOCAL	FOREIGN	LOCAL	FOREIGN	TOTAL
Site Clearance in Light Bush	m2	0.0	166	91	0	0	0	0
Subgrade Preparation	m2	187000.0	21	11	3,927,000	2,057,000	5,984,000	0
Normal Fill	m3	0.0	1,712	866	0	0	0	0
Fill in Swamp	m3	0.0	2,561	1,058	0	0	0	0
Normal Excavation to Spoil	m3	487.0	1,002	525	489,978	256,725	746,703	0
Sub Base Course	m3	17535.0	3,240	1,355	56,813,400	23,759,925	80,573,325	0
Base Course	m3	10290.0	4,441	2,310	45,697,890	23,769,900	69,467,790	0
Shoulder	m2	84000.0	302	146	25,368,000	12,264,000	37,632,000	0
Asphalt Patching	m2	0.0	3,941	1,518	0	0	0	0
Surface Dressing (Single)	m2	147000.0	656	766	96,432,000	112,602,000	209,034,000	0
Surface Dressing (Double)	m2	0.0	813	1,207	0	0	0	0
Earth Drain	m	82600.0	986	120	81,443,600	9,912,000	91,355,600	0
Earth Drain in Swamp (by machine)	m3	0.0	1,225	476	0	0	0	0
Pipe Culvert Ø80cm	m	786.0	46,535	44,416	36,576,510	34,910,976	71,487,486	0
Masonry Culvert (80x80cm)	m	0.0	62,846	38,045	0	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,810	246	0	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	265.6	45,070	11,820	11,970,592	3,139,392	15,109,984	0
Gabion Protection	m3	0.0	10,908	121	0	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0	0
Sub Total					358,718,970	222,671,918	581,390,888	0
Overhead (15%)					53,807,845	33,400,787	87,208,632	0
TOTAL COST					412,526,815	256,072,705	668,599,520	0

Manual routine maintenance of road	Km	42.0	160,688	7,260	6,748,896	304,920	7,053,816	0
Routine maintenance of asphalt road	Km	42.0	394,100	151,800	16,552,200	6,375,600	22,927,800	0
Sub Total					23,301,096	6,680,520	29,981,616	0
Maintenance of Timber Bridge (New)	m2	0.0	8,658	1,233	0	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,961	2,793	0	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,052	2,462	0	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,115	2,404	0	0	0	0

Earthwork & Pavement Unit Cost	(Rp/Km)	:	15,919,036
Timber Bridge Unit Cost	(Rp/m2)	:	
Concrete Bridge Unit Cost	(Rp/m2)	:	
Survived Value	(Rp)	:	70,294,885
Maintenance Rate without Bridge	(%)	:	4.48
New Bridge Cost Rate	(%)	:	

PROV : SULAWESI TENGGARA KAB : KOLAKA

LINK NO : 6 (IITB-1) LENGTH : 39 Km

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

(Rp)

ITEM	UNIT	QUANTITY	<<< UNIT COST >>>		<<<<< COST >>>>>		TOTAL
			LOCAL	FOREIGN	LOCAL	FOREIGN	
Site Clearance in Light Bush	m2	272500.0	166	91	45,235,000	24,797,500	70,032,500
Subgrade Preparation	m2	266000.0	21	11	5,586,000	2,926,000	8,512,000
Normal Fill	m3	0.0	1,712	866	0	0	0
Fill in Swamp	m3	0.0	2,561	1,058	0	0	0
Normal Excavation to Spoil	m3	560.0	1,002	525	561,120	294,000	855,120
Sub Base Course	m3	21840.0	3,240	1,355	70,761,600	29,593,200	100,354,800
Base Course	m3	10920.0	4,411	2,310	48,495,720	25,225,200	73,720,920
Shoulder	m2	117000.0	302	146	35,334,000	17,082,000	52,416,000
Asphalt Patching	m2	0.0	3,941	1,518	0	0	0
Surface Dressing (Single)	m2	156000.0	656	766	102,336,000	119,496,000	221,832,000
Surface Dressing (Double)	m2	0.0	813	1,207	0	0	0
Earth Drain	m	73400.0	986	120	72,372,400	8,808,000	81,180,400
Earth Drain in Swamp (by machine)	m3	0.0	1,225	476	0	0	0
Pipe Culvert Ø80cm	m	665.0	46,535	44,416	30,945,775	29,536,640	60,482,415
Masonry Culvert (80x80cm)	m	0.0	62,846	38,045	0	0	0
Retaining Wall and Wing Wall (Timber)	m2	0.0	12,810	246	0	0	0
Retaining Wall and Wing Wall (Masonry)	m3	214.4	45,070	11,820	9,663,008	2,534,208	12,197,216
Gabion Protection	m3	0.0	10,908	121	0	0	0
New Bridge (Timber)	SET	1.0	--	--	0	0	0
New Bridge (Concrete)	SET	1.0	--	--	0	0	0
Sub Total					421,290,623	260,292,748	681,583,371
Overhead (15%)					63,193,593	39,043,912	102,237,505
TOTAL COST					484,484,216	299,336,660	783,820,876

Manual routine maintenance of road	Km	39.0	160,688	7,260	6,266,832	283,140	6,549,972
Routine maintenance of asphalt road	Km	39.0	394,100	151,800	15,369,900	5,920,200	21,290,100
Sub Total					21,636,732	6,203,340	27,840,072
Maintenance of Timber Bridge (New)	m2	0.0	8,658	1,233	0	0	0
Maintenance of Concrete Bridge (New)	m2	0.0	1,961	2,793	0	0	0
Maintenance of Timber Bridge (Exist)	m2	0.0	8,052	2,462	0	0	0
Maintenance of Concrete Bridge (Exist)	m2	0.0	4,115	2,404	0	0	0

Earthwork & Pavement Unit Cost	(Rp/Km)	:	20,097,971
Timber Bridge Unit Cost	(Rp/m2)	:	
Concrete Bridge Unit Cost	(Rp/m2)	:	
Survived Value	(Rp)	:	84,992,544
Maintenance Rate without Bridge	(%)	:	3.55
New Bridge Cost Rate	(%)	:	

Appendix A-4

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

PROV : SULAWESI TENGGARA KAB : KOLAKA

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
EQUIPMENT :							
Bulldozer/Ripper	hr	293.1	724.4	760.6	1061.9	690.0	3530.0
Swamp Bulldozer	hr	0.0	0.0	0.0	120.0	120.0	240.0
Motor Grader	hr	563.0	1405.0	1571.7	1963.4	1403.1	6986.2
Hand-guide Vib. Roller	hr	361.9	1010.0	1111.0	1058.9	910.3	4452.1
Tire Roller	hr	766.6	1347.7	1470.2	1655.7	1428.8	6669.0
Vibratory Roller (D&T)	hr	407.0	1091.9	1223.7	1628.8	1241.5	5592.9
Hydraulic Excavator; Wheel	hr	0.0	0.0	0.0	675.0	675.0	1350.0
Wheel Loader	hr	929.2	2125.1	2330.0	3107.8	2302.5	10794.6
Water Tank Truck	hr	256.5	705.0	795.2	1068.0	807.0	3631.7
Dump Truck	hr	9153.5	20597.4	22849.2	29241.5	23250.1	105091.7
Flat Bed Truck with Crane	hr	272.0	773.1	852.5	790.5	667.6	3355.7
Flat Bed Truck	hr	1038.1	1953.9	2135.4	2329.6	2004.0	9461.0
Portable Crusher/Screening	hr	247.9	454.0	504.9	593.3	478.3	2278.4
Concrete Mixer	hr	100.1	285.2	314.7	288.7	243.8	1232.5
Water Pump	hr	82.2	234.0	258.1	237.5	200.6	1012.4
Concrete Vibrator	hr	46.3	131.5	145.0	135.3	114.2	572.3
Asphalt Sprayer	hr	766.6	1347.7	1470.2	1655.7	1428.8	6669.0
LABOUR :							
Handur	man day	1244.5	2850.5	3148.5	3675.2	3040.6	13959.3
Skilled Labourer	man day	658.7	1359.1	1487.0	1582.5	1365.2	6452.5
Carpenter	man day	15.4	43.8	48.3	45.1	38.0	190.6
Mason	man day	89.7	256.3	282.8	255.6	216.1	1100.5
Labourer	man day	16426.0	35846.4	39661.7	46154.1	38660.3	176748.5
Driver	man day	1993.4	4372.9	4844.3	6069.2	4878.2	22158.0
Operator	man day	911.1	2113.7	2327.8	2898.9	2290.0	10541.5
MATERIAL :							
Bitumen	l	179282.0	293778.5	318891.0	350354.7	307327.9	1449634.1
Asphalt Oil	l	26900.0	51703.2	56725.7	65755.8	55739.9	256824.6
Kerosene	l	37017.3	65625.7	71628.2	80933.0	69729.6	324933.8
Sand	m ³	633.6	1473.1	1621.2	1709.0	1444.6	6881.5
Cement	bag	710.1	2016.0	2222.5	2070.7	1748.7	8768.0
River Stone	m ³	89.7	256.3	282.8	255.6	216.1	1100.5
Steel Houlds	set	270.4	767.4	846.0	789.4	666.6	3339.8
Timber	m ³	0.0	0.0	0.0	0.0	0.0	0.0
Paint	l	0.0	0.0	0.0	0.0	0.0	0.0
Reinforcing Steel	kg	8625.7	24481.6	26988.9	25183.4	21266.1	106545.7
Tying Wire	kg	78.4	222.5	245.3	228.9	193.3	968.4
Equivalent Royalty	m ³	12250.5	29224.4	32806.2	43760.7	34172.6	152214.4

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

PROV : SULAWESI TENGGARA KAE : KOLAKA

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
EQUIPMENT :							
Bulldozer/Ripper	hr	0.0	0.0	0.0	0.0	0.0	0.0
Swamp Bulldozer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Motor Grader	hr	243.8	448.6	440.0	431.0	435.5	1998.9
Hand-guide Vib. Roller	hr	322.5	705.0	705.0	712.5	697.5	3142.5
Tire Roller	hr	243.8	448.6	440.0	431.0	435.5	1998.9
Vibratory Roller (D&T)	hr	0.0	0.0	0.0	0.0	0.0	0.0
Hydraulic Excavator; Wheel	hr	0.0	0.0	0.0	0.0	0.0	0.0
Wheel Loader	hr	62.5	123.0	122.3	119.7	118.8	546.3
Water Tank Truck	hr	0.0	0.0	0.0	0.0	0.0	0.0
Dump Truck	hr	1020.0	2146.9	2143.1	2142.6	2107.0	9559.6
Flat Bed Truck with Crane	hr	220.5	441.0	441.0	441.0	441.0	1984.5
Flat Bed Truck	hr	1197.8	2294.2	2260.4	2233.4	2239.1	10224.9
Portable Crusher/Screening	hr	31.8	62.8	62.4	61.2	60.7	278.9
Concrete Mixer	hr	0.0	0.0	0.0	0.0	0.0	0.0
Water Pump	hr	0.0	0.0	0.0	0.0	0.0	0.0
Concrete Vibrator	hr	0.0	0.0	0.0	0.0	0.0	0.0
Asphalt Sprayer	hr	0.0	0.0	0.0	0.0	0.0	0.0
LABOUR :							
Handor	man day	484.8	962.2	952.3	946.9	942.8	4289.0
Skilled Labourer	man day	276.2	592.4	592.4	597.4	587.4	2645.8
Carpenter	man day	32.8	65.7	65.7	65.7	65.7	295.6
Mason	man day	0.0	0.0	0.0	0.0	0.0	0.0
Labourer	man day	5779.9	11471.9	11351.8	11288.3	11239.5	51131.4
Driver	man day	416.4	833.6	827.3	822.8	817.8	3717.9
Operator	man day	102.3	191.1	188.0	184.1	185.3	850.8
MATERIAL :							
Bitumen	l	2902.5	6345.0	6345.0	6412.5	6277.5	28282.5
Asphalt Oil	l	0.0	0.0	0.0	0.0	0.0	0.0
Kerosene	l	322.5	705.0	705.0	712.5	697.5	3142.5
Sand	m3	53.7	117.5	117.5	118.7	116.2	523.6
Cement	bag	0.0	0.0	0.0	0.0	0.0	0.0
River Stone	m3	0.0	0.0	0.0	0.0	0.0	0.0
Steel Moulds	set	0.0	0.0	0.0	0.0	0.0	0.0
Timber	m3	2.9	5.9	5.9	5.9	5.9	26.5
Paint	l	21.2	42.5	42.5	42.5	42.5	191.2
Reinforcing Steel	kg	0.0	0.0	0.0	0.0	0.0	0.0
Tying Wire	kg	0.0	0.0	0.0	0.0	0.0	0.0
Equivalent Royalty	m3	886.3	1741.8	1732.8	1696.0	1682.9	7739.8

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

PROV : SULAWESI TENGGARA KAB : KOLAKA

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
EQUIPMENT :							
Bulldozer/Ripper	hr	293.1	724.4	760.6	1061.9	690.0	3530.0
Swamp Bulldozer	hr	0.0	0.0	0.0	120.0	120.0	240.0
Motor Grader	hr	806.8	1853.6	2011.7	2394.4	1918.6	8985.1
Hand-guide Vib. Roller	hr	684.4	1715.0	1816.0	1771.4	1607.8	7594.6
Tire Roller	hr	1010.4	1796.3	1910.2	2086.7	1864.3	8667.9
Vibratory Roller (D&T)	hr	407.0	1091.9	1223.7	1628.8	1241.5	5592.9
Hydraulic Excavator; Wheel	hr	0.0	0.0	0.0	675.0	675.0	1350.0
Wheel Loader	hr	991.7	2248.1	2452.3	3227.5	2421.3	11340.9
Water Tank Truck	hr	256.5	705.0	795.2	1068.0	807.0	3631.7
Dump Truck	hr	10173.5	22744.3	24992.3	31384.1	25357.1	114651.3
Flat Bed Truck with Crane	hr	492.5	1214.1	1293.5	1231.5	1108.6	5340.2
Flat Bed Truck	hr	2235.9	4248.1	4395.8	4563.0	4243.1	19685.9
Portable Crusher/Screening	hr	279.7	516.8	567.3	654.5	539.0	2557.3
Concrete Mixer	hr	100.1	285.2	314.7	288.7	243.8	1232.5
Water Pump	hr	82.2	234.0	258.1	237.5	200.6	1012.4
Concrete Vibrator	hr	46.3	131.5	145.0	135.3	114.2	572.3
Asphalt Sprayer	hr	766.6	1347.7	1470.2	1655.7	1428.8	6669.0
LABOUR :							
Handur	man day	1729.3	3812.7	4100.8	4622.1	3983.4	18248.3
Skilled Labourer	man day	934.9	1951.5	2079.4	2179.9	1952.6	9098.3
Carpenter	man day	48.2	109.5	114.0	110.8	103.7	486.2
Mason	man day	89.7	256.3	282.8	255.6	216.1	1100.5
Labourer	man day	22205.9	47318.3	51013.5	57442.4	49899.8	227879.9
Driver	man day	2409.8	5206.5	5671.6	6892.0	5696.0	25875.9
Operator	man day	1013.4	2304.8	2515.8	3083.0	2475.3	11392.3
MATERIAL :							
Bitumen	l	182184.5	300123.5	325236.0	356767.2	313605.4	1477916.6
Asphalt Oil	l	26900.0	51703.2	56725.7	65755.8	55739.9	256824.6
Kerosene	l	37339.8	66330.7	72333.2	81645.5	70427.1	328076.3
Sand	m3	687.3	1590.6	1738.7	1827.7	1560.8	7405.1
Cement	bag	710.1	2016.0	2222.5	2070.7	1740.7	8768.0
River Stone	m3	89.7	256.3	282.8	255.6	216.1	1100.5
Steel Moulds	set	270.4	767.4	846.0	789.4	666.6	3339.8
Timber	m3	2.9	5.9	5.9	5.9	5.9	26.5
Paint	l	21.2	42.5	42.5	42.5	42.5	191.2
Reinforcing Steel	kg	8625.7	24481.6	26988.9	25183.4	21266.1	106545.7
Tying Wire	kg	78.4	222.5	245.3	228.9	193.3	968.4
Equivalent Royalty	m3	13136.8	30966.2	34539.0	45456.7	35855.5	159754.2

Appendix A-5

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

PROV : SULAWESI TENGGARA

KAB : KOLAKA

(1000 Rp)

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
EQUIPMENT :		108,159	239,663	264,619	342,352	270,041	1,224,834
Bulldozer/Ripper	15792	4,628	11,439	12,011	16,769	10,896	55,743
Swamp Bulldozer	11617	0	0	0	1,394	1,394	2,788
Motor Grader	13503	7,402	18,971	21,222	28,511	20,026	94,332
Hand-guide Vib. Roller	1613	583	1,629	1,792	1,708	1,468	7,180
Tire Roller	10622	8,142	14,315	15,616	17,586	15,176	70,835
Vibratory Roller (D&T)	6751	2,747	7,371	8,261	10,996	8,381	37,756
Hydraulic Excavator; Wheel	12597	0	0	0	8,502	8,502	17,004
Wheel Loader	16750	15,564	35,595	39,027	52,055	38,566	180,807
Water Tank Truck	3918	1,004	2,762	3,115	4,184	3,161	14,226
Dump Truck	5436	49,758	111,967	124,208	158,956	126,387	571,276
Flat Bed Truck with Crane	4969	1,351	3,841	4,236	3,927	3,317	16,672
Flat Bed Truck	3229	3,352	6,309	6,895	7,522	6,470	30,548
Portable Crusher/Screening	43744	10,844	19,859	22,086	25,953	20,922	99,664
Concrete Mixer	9179	918	2,617	2,888	2,649	2,237	11,309
Water Pump	482	39	112	124	114	96	485
Concrete Vibrator	309	14	40	44	41	35	174
Asphalt Sprayer	2105	1,613	2,836	3,094	3,485	3,007	14,035
LABOUR :		52,209	114,967	127,107	149,267	123,863	567,413
Handur	3300	4,106	9,406	10,390	12,128	10,033	46,063
Skilled Labourer	3000	1,976	4,077	4,461	4,747	4,095	19,356
Carpenter	3500	53	153	169	157	133	665
Mason	3500	313	897	989	894	756	3,849
Labourer	2200	36,137	78,862	87,255	101,539	85,052	388,845
Driver	3000	5,980	13,118	14,532	18,207	14,634	66,471
Operator	4000	3,644	8,454	9,311	11,595	9,160	42,164
MATERIAL :		122,539	228,293	249,410	272,284	234,357	1,106,883
Bitumen	400	71,712	117,511	127,556	140,141	122,931	579,851
Asphalt Oil	850	22,865	43,947	48,216	55,892	47,378	218,298
Kerosene	250	9,254	16,406	17,907	20,233	17,432	81,232
Sand	4000	2,534	5,892	6,484	6,836	5,778	27,524
Cement	4750	3,372	9,576	10,556	9,835	8,306	41,645
River Stone	5000	448	1,281	1,414	1,278	1,080	5,501
Steel Moulds	8500	2,298	6,522	7,191	6,709	5,466	28,386
Timber	110000	0	0	0	0	0	0
Paint	3000	0	0	0	0	0	0
Reinforcing Steel	800	6,900	19,585	21,591	20,146	17,012	85,234
tying Wire	1200	94	267	294	274	231	1,160
Equivalent Royalty	250	3,062	7,306	8,201	10,940	8,543	38,052

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

PROV : SULAWESI TENGGARA

KAB : KOLAKA

(1000 Rp)

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
EQUIPMENT :		19,344	38,034	37,666	37,276	37,148	169,468
Bulldozer/Ripper	15772	0	0	0	0	0	0
Swamp Bulldozer	11617	0	0	0	0	0	0
Motor Grader	13503	3,292	6,057	5,941	5,819	5,880	26,987
Hand-guide Vib. Roller	1613	520	1,137	1,137	1,149	1,125	5,068
Tire Roller	10622	2,589	4,765	4,673	4,578	4,625	21,230
Vibratory Roller (D&T)	6751	0	0	0	0	0	0
Hydraulic Excavator; Wheel	12597	0	0	0	0	0	0
Wheel Loader	16750	1,046	2,060	2,048	2,004	1,989	9,147
Water Tank Truck	3918	0	0	0	0	0	0
Dump Truck	5436	5,544	11,670	11,649	11,647	11,453	51,963
Flat Bed Truck with Crane	4969	1,095	2,191	2,191	2,191	2,191	9,857
Flat Bed Truck	3229	3,867	7,407	7,298	7,211	7,230	33,013
Portable Crusher/Screening	43744	1,391	2,747	2,729	2,677	2,655	12,199
Concrete Mixer	9179	0	0	0	0	0	0
Water Pump	482	0	0	0	0	0	0
Concrete Vibrator	309	0	0	0	0	0	0
Asphalt Sprayer	2105	0	0	0	0	0	0
LABOUR :		16,914	33,683	33,354	33,183	33,022	150,156
Handur	3300	1,599	3,175	3,142	3,124	3,111	14,151
Skilled Labourer	3000	828	1,777	1,777	1,792	1,762	7,936
Carpenter	3500	114	229	229	229	229	1,030
Mason	3500	0	0	0	0	0	0
Labourer	2200	12,715	25,238	24,973	24,834	24,726	112,486
Driver	3000	1,249	2,500	2,481	2,468	2,453	11,151
Operator	4000	409	764	752	736	741	3,402
MATERIAL :		2,058	4,395	4,393	4,417	4,345	19,608
Bitumen	400	1,161	2,538	2,538	2,565	2,511	11,313
Asphalt Oil	850	0	0	0	0	0	0
Kerosene	250	80	176	176	178	174	784
Sand	4000	214	470	470	474	464	2,092
Cement	4750	0	0	0	0	0	0
River Stone	5000	0	0	0	0	0	0
Steel Moulds	8500	0	0	0	0	0	0
Timber	110000	319	649	649	649	649	2,915
Paint	3000	63	127	127	127	127	571
Reinforcing Steel	800	0	0	0	0	0	0
Tying Wire	1200	0	0	0	0	0	0
Equivalent Royalty	250	221	435	433	424	420	1,933

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

PROV : SULAWESI TENGGARA

KAB : KOLAKA

(1000 Rp)

ITEM	UNIT	< 1988 >	< 1989 >	< 1990 >	< 1991 >	< 1992 >	< TOTAL >
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EQUIPMENT :		127,503	277,697	302,285	379,628	307,189	1,394,302
Bulldozer/Ripper	15792	4,628	11,439	12,011	16,769	10,896	55,743
Swamp Bulldozer	11617	0	0	0	1,394	1,394	2,788
Motor Grader	13503	10,894	25,028	27,163	32,330	25,906	121,321
Hand-guide Vib. Roller	1613	1,103	2,766	2,929	2,857	2,593	12,248
Tire Roller	10622	10,731	19,080	20,289	22,164	19,801	92,065
Vibratory Roller (D&T)	6751	2,747	7,371	8,261	10,996	8,381	37,756
Hydraulic Excavator; Wheel	12597	0	0	0	9,502	9,502	17,004
Wheel Loader	16750	16,610	37,655	41,075	54,059	40,555	189,954
Water Tank Truck	3918	1,004	2,762	3,115	4,184	3,161	14,226
Dump Truck	5436	55,302	123,637	135,857	170,603	137,840	623,239
Flat Bed Truck with Crane	4969	2,446	6,032	6,427	6,118	5,508	26,531
Flat Bed Truck	3229	7,219	13,716	14,193	14,733	13,700	63,561
Portable Crusher/Screening	43744	12,235	22,606	24,815	28,630	23,577	111,863
Concrete Mixer	9179	918	2,617	2,888	2,649	2,237	11,309
Water Pump	482	39	112	124	114	96	485
Concrete Vibrator	309	14	40	44	41	35	174
Asphalt Sprayer	2105	1,613	2,836	3,094	3,485	3,007	14,035
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LABOUR :		69,123	148,650	160,461	182,450	156,885	717,569
Mandur	3300	5,705	12,581	13,532	15,252	13,144	60,214
Skilled Labourer	3000	2,804	5,854	6,238	6,539	5,857	27,292
Carpenter	3500	167	382	398	386	362	1,695
Mason	3500	313	897	989	894	756	3,849
Labourer	2200	48,852	104,100	112,228	126,373	107,778	501,331
Driver	3000	7,229	15,618	17,013	20,675	17,087	77,622
Operator	4000	4,053	9,218	10,063	12,331	9,901	45,566
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MATERIAL :		124,597	232,688	253,803	276,701	238,702	1,126,491
Bitumen	400	72,873	120,049	130,094	142,706	125,442	591,164
Asphalt Oil	850	22,865	43,947	48,216	55,892	47,378	218,298
Kerosene	250	9,334	16,582	18,083	20,411	17,606	82,016
Sand	4000	2,748	6,362	6,954	7,310	6,242	29,616
Cement	4750	3,372	9,576	10,556	9,835	8,306	41,645
River Stone	5000	448	1,281	1,414	1,278	1,080	5,501
Steel Moulds	8500	2,298	6,522	7,191	6,709	5,666	28,386
Timber	110000	319	649	649	649	649	2,915
Paint	3000	63	127	127	127	127	571
Reinforcing Steel	800	6,900	19,585	21,591	20,146	17,812	85,234
Tying Wire	1200	94	267	294	274	231	1,160
Equivalent Royalty	250	3,283	7,741	8,634	11,364	8,963	39,985

Appendix A-6

QUANTITIES OF BRIDGE ON PROPOSED ROAD LINKS

PROV : SULAWESI TENGGARA KAB : KOLAKA

LINK NO	BRIDGE NAME	Km From	<< TYPE >> (EXIST) (NEW)	DESIGN LOAD	SPAN CLASS	SPAN LENGTH (m)	SPAN NO (no)	SPAN LENGTH (m)	WIDTH (m)	AREA (EXIST) (m2)	AREA (NEW) (m2)	PIER (no)	ABUT (no)	ROAD CLASS
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