6.6 COSTS OF PROJECT

21. The project costs must be converted from market prices into economic prices for the economic analysis. The costs arising from the implementation of this project are as follows:

6.6.1 Construction costs

22. Construction costs are converted by multiplying the market costs by the conversion factor for construction estimated in 6.5.2. Based on the construction schedule, the annual construction costs in economic prices are shown in Appendix 6-6(1) and 6-6(2), and a summary of which is given below. (Table 6-6(1)).

Table 6-6(1) Annual Construction Costs in Economic Price

(Unit : Million Rupiahs)

Year	Automatic Signalling	Doubling of Track
1995	499	499
1996	4,999	3,841
1997	13,987	12,459
1998	0	2,021
2001	3,732	3,732
2002	544	544
2003	24,381	26,480
2004	17,351	17,351
2006	217	0
2007	7,308	5,988
2008	3,792	0
2009	11,976	11,976
Total	88,786	84,891

6.6.2 Operation costs

23. Operation costs consist of maintenance costs, personnel costs, administration costs and other costs. Based on the estimation, the necessary operation costs for the additional trains and new facilities are considered as follows:

(1) Maintenance Costs

24. Maintenance costs for the new facilities and the installed handling machinery are considered at economic prices. The standard conversion factor is applied to convert the maintenance costs at market prices into the economic prices.

(2) Personnel Costs

25. The personnel costs that are salary for an additional number of operators, administrators and workers as estimated are considered at economic prices. The conversion factor for skilled labor is applied to convert the personnel costs at market prices into the economic prices.

(3) Other Costs

26. Other costs consist of fuel, lubricant, electricity and other expenses necessary for the operation. The economic costs of the other costs are calculated by multiplying the market costs by the conversion factor for consumer goods.

6.6.3 Replacement costs for equipment

27. The additional replacement costs for handling machinery and equipment such as locomotive, gantry cranes, trailers and forklifts after their useful lifetimes are considered. The economic cost of this machinery is considered in the same manner as the construction costs.

6.6.4 Costs of the project

28. All the costs measured at economic prices are summarized in Table 6-8(1) and 6-8(2).

6.7 BENEFITS OF PROJECT

6.7.1 Kinds of benefits

29. The development of the Gedebage dry port will greatly contribute to the national economy. Considering the "With" and "Without" case, the following items are identified as major benefits of the short term development plan for the Gedebage dry port from the viewpoint of the national economy.

(1) Savings in transportation costs of container cargo.
(2) Prevention of environmental pollution by decreasing exhaust of container trailer.
(3) Easing a traffic jam reduction of container trailer traffic.
(4) Savings in maintenance cost of road by reducing the trailer traffic.
(5) Promotion of regional economic development.
(6) Increase in employment opportunities and incomes.
(7) Reduction of road traffic accidents on the way to the port.

30. It is impossible to evaluate all these benefits in monetary terms, but the following item is considered countable and the monetary benefit of this item is calculated.

(1) Savings in transportation costs of container cargo.

31. The other benefition is considered uncountable and only a qualitative analysis is undertaken.

6.7.2 Calculation of countable benefits

(1) Savings in transportation costs of container cargo

32. Under the "Without" case, as described in chapter 6.3.4 of the container cargo flow for the " Without " case, the excess cargo volume would be transported by the trailers. The additional transportation costs under this case are the benefits of savings in transportation costs if the Short-term Development Plan is executed. Therefore, in this study, the difference of the transportation costs between the "Without" and "With" cases is calculated as the benefit. The benefit is calculated by the followings procedure.

(a) Difference of container cargo volume transported by trailer between "Without" case and "With" case

33. Based on chapter 6.3.4 Cargo flow for the "Without" case, the excess container cargos that will be transported by the trailer are estimated as shown in Appendix 6-7(1). A summary of difference between "Without" case and "With" case is given below. (Table 6-7(1)).

Table 6-7(1) Difference of Container Volume Transported by Trailer

	Difference	20 foot	40 foot
1998	14,000 (TEU)	5,900 (Box)	4,100 (Box)
2003	61,000 (TEU)	23,000 (Box)	19,000 (Box)
2008	107,000 (TEU)	36,900 (Box)	35,100 (Box)
2010	129,000 (TEU)	43,000 (Box)	43,000 (Box)

Source : Study team estimates.

(b) Additional transportation costs

34. The transportation costs by trailer are defined as the additional costs due to the lack of handling capacity of dry port and connecting railway in the "Without" case. In this study, the additional transportation costs are defined as the investment costs of purchasing new trailers (numbers of which are calculated based on the above), and its operation costs that are estimated in the same manner as "With" case. The additional transportation costs are estimated in Appendix 6-7(2).

6.7.3 Uncountable benefits

35. As described in Chapter 6.7.1, there are other benefits derived from the implementation of this project, however, they are difficult to appraise in monetary terms. Therefore, qualitative analyses are undertaken for the following.

(2) Prevention of environmental pollution by decreasing of exhaust of container trailer.

(3) Easing a traffic jam reduction of container trailer traffic.

(4) Savings in maintenance cost of road by reducing the trailer traffic.

(5) Promotion of Regional Economic Development

36. Without the implementation of this development project, the Gedebage dry port will handle a limited cargo volume, and the development or expansion of export industries and services that are dependent on the Dry Port will be stagnant. Furthermore, the limited dry port activity will diminish the probability of the establishment of new businesses. On the other hand, the new development project will make dry port-related industries, such as light-industries, more active, and the value added from those industries and the employment opportunities from them are therefore considered as economic benefits of this project.

(6) Increase in employment opportunities and incomes

37. Additional employment will arise directly from the project, both assumed employment for construction during the construction period and employment for operations after the construction. Therefore, this employment is one of the major benefits of the project.

38. Along with the increased direct employment, secondary employment will also occur based on the new demand from the expanding industries and services through the dry port activities. Similarly, the income of already employed local workers is also expected to rise. This rippling effect is also generated by the development.

(7) Reduction of road traffic accidents on the way to the port due to the decreasing trailer traffic.

6.8 EVALUATION AND CONCLUSION

6.8.1 Calculation of the EIRR

39. Here, the lifetime of the facilities is taken as 30 years, the same as the project lifetime. The cost-benefits analysis is carried out starting in 1995 (the first year of the investment schedule) and ending in 2024 (the 30 th year from the start of construction). The economic internal rate of return (EIRR) is calculated by using the formula that was mentioned in chapter 6.2. The calculated EIRR is shown in Table 6-8(1) and 6-8(2), and the results are as follows :

EIRR = 29.66% (Automatic Signalization Precedence : CASE-1)
EIRR = 32.33% (Doubling Track Precedence : CASE-2)

Table 6-8(1) Calculation of EIRR for Short Term Plan (Automatic Signalization Preceding)

EIRR = 29.664%

(Unit : Million Rupiahs)

	Years	Costs							Benefits (Saving Cost)					Cash Flow Benefits - Costs	Cash Flow		
		Construction and Installation			Operation Cost			Total	Transportation Cost				Total		Costs	Benefits	Difference
		Investment	Replacement	Sub-total	Operation		Sub-total										
1	1995	499		499	312		312	811	0				0	-811	625	0	-625
2	1996	4,999		4,999	625		625	5,624	0				0	-5,624	3,345	0	-3,345
3	1997	13,987		13,987	936		936	14,923	8,099				8,099	-6,824	6,845	3,715	-3,130
4	1998	0		0	1,278		1,278	1,278	9,651				9,651	8,372	452	3,414	2,962
5	1999	0		0	1,654		1,654	1,654	6,949				6,949	5,295	451	1,896	1,445
6	2000	0		0	2,089		2,089	2,089	7,739				7,739	5,649	440	1,628	1,189
7	2001	3,732		3,732	2,465		2,465	6,197	8,977				8,977	2,780	1,006	1,457	451
8	2002	544		544	2,900		2,900	3,444	9,879				9,879	6,435	431	1,236	805
9	2003	24,381		24,381	3,274		3,274	27,655	10,789				10,789	-16,867	2,669	1,041	-1,628
10	2004	17,351		17,351	3,836		3,836	21,187	12,113				12,113	-9,075	1,577	902	-675
11	2005	0	300	300	4,462		4,462	4,762	13,771				13,771	9,009	273	791	517
12	2006	217		217	5,023		5,023	5,240	14,766				14,766	9,526	232	654	422
13	2007	7,308		7,308	5,649		5,649	12,957	22,786				22,786	9,829	442	778	336
14	2008	3,792		3,792	6,209		6,209	10,001	23,802				23,802	13,801	263	627	363
15	2009	11,976		11,976	6,834		6,834	18,810	21,572				21,572	2,762	382	438	56
16	2010			0	7,390		7,390	7,390	23,978				23,978	16,588	116	376	260
17	2011			0	7,390		7,390	7,390	19,290				19,290	11,900	89	233	144
18	2012		3,550	3,550	7,390		7,390	10,940	19,185				19,185	8,245	102	179	77
19	2013		300	300	7,390		7,390	7,690	19,211				19,211	11,521	55	138	83
20	2014			0	7,390		7,390	7,390	19,554				19,554	12,164	41	108	67
21	2015			0	7,390		7,390	7,390	20,082				20,082	12,692	32	86	54
22	2016		71	71	7,390		7,390	7,462	19,977				19,977	12,515	25	66	41
23	2017		5,155	5,155	7,390		7,390	12,545	26,761				26,761	14,216	32	68	36
24	2018			0	7,390		7,390	7,390	26,550				26,550	19,160	14	52	38
25	2019		3,600	3,600	7,390		7,390	10,990	23,092				23,092	12,102	17	35	18
26	2020		3,550	3,550	7,390		7,390	10,940	24,016				24,016	13,075	13	28	15
27	2021		300	300	7,390		7,390	7,690	19,290				19,290	11,600	7	17	10
28	2022		6,360	6,360	7,390		7,390	13,750	19,185				19,185	5,434	10	13	4
29	2023		13,384	13,384	7,390		7,390	20,775	19,211				19,211	-1,563	11	10	-1
30	2024	-38,549		-38,549	7,390		7,390	-31,159	-2,544				-2,544	28,615	-13	-1	12
	Total	50,237	36,571	86,808	158,400		158,400	245,208	467,730				467,730		19,985	19,985	0

Source : Calculated by The Study Team

Table 6-8(2) Calculation of EIRR for Short Term Plan (Doubling Track Preceding)

EIRR = 32.328%
(Unit : Million Rupiahs)

	Years	Costs							Benefits (Saving Cost)					Cash Flow Benefits - Costs	Cash Flow		
		Construction and Installation			Operation Cost			Total	Transportation Cost				Total		Costs	Benefits	Difference
		Investment	Replacement	Sub-total	Operation		Sub-total										
1	1995	499		499	312		312	811						-811	613	0	-613
2	1996	3,841		3,841	625		625	4,466	0				0	-4,466	2,550	0	-2,550
3	1997	12,459		12,459	936		936	13,395	8,099				8,099	-5,296	5,781	3,495	-2,286
4	1998	2,021		2,021	1,278		1,278	3,299	9,651				9,651	6,351	1,076	3,147	2,071
5	1999	0		0	1,654		1,654	1,654	6,949				6,949	5,295	408	1,713	1,305
6	2000	0		0	2,089		2,089	2,089	7,739				7,739	5,649	389	1,441	1,052
7	2001	3,732		3,732	2,465		2,465	6,197	8,977				8,977	2,780	872	1,263	391
8	2002	544		544	2,900		2,900	3,444	9,879				9,879	6,435	366	1,051	684
9	2003	26,480		26,480	3,274		3,274	29,754	10,789				10,789	-18,966	2,392	867	-1,524
10	2004	17,351		17,351	3,836		3,836	21,187	12,113				12,113	-9,075	1,287	736	-551
11	2005	0	300	300	4,462		4,462	4,762	13,771				13,771	9,009	219	632	414
12	2006	0		0	5,023		5,023	5,023	14,766				14,766	9,743	174	512	338
13	2007	5,988		5,988	5,649		5,649	11,637	22,786				22,786	11,149	305	597	292
14	2008	0		0	6,209		6,209	6,209	23,802				23,802	17,593	123	472	349
15	2009	11,976		11,976	6,834		6,834	18,810	21,572				21,572	2,762	282	323	41
16	2010			0	7,390		7,390	7,390	23,978				23,978	16,588	84	271	188
17	2011			0	7,390		7,390	7,390	19,290				19,290	11,900	63	165	102
18	2012		3,550	3,550	7,390		7,390	10,940	19,185				19,185	8,245	71	124	53
19	2013		300	300	7,390		7,390	7,690	19,211				19,211	11,521	38	94	56
20	2014			0	7,390		7,390	7,390	19,554				19,554	12,164	27	72	45
21	2015			0	7,390		7,390	7,390	20,082				20,082	12,692	21	56	35
22	2016		71	71	7,390		7,390	7,462	19,977				19,977	12,515	16	42	26
23	2017		3,197	3,197	7,390		7,390	10,587	26,761				26,761	16,174	17	43	26
24	2018		1,273	1,273	7,390		7,390	8,663	26,550				26,550	17,887	10	32	22
25	2019		3,600	3,600	7,390		7,390	10,990	23,092				23,092	12,102	10	21	11
26	2020		3,550	3,550	7,390		7,390	10,940	24,016				24,016	13,075	8	17	9
27	2021		300	300	7,390		7,390	7,690	19,290				19,290	11,600	4	10	6
28	2022		6,360	6,360	7,390		7,390	13,750	19,185				19,185	5,434	5	8	2
29	2023		13,956	13,956	7,390		7,390	21,347	19,211				19,211	-2,135	6	6	-1
30	2024	-38,186		-38,186	7,390		7,390	-30,796	-2,544				-2,544	28,252	-7	-1	6
	Total	46,705	36,457	83,162	158,400		158,400	241,561	467,730				467,730		17,208	17,208	-0

6.8.2 Sensitivity analyses

40. In order to estimate the variation for the EIRR, sensitivity analyses are made for three alternatives.

(1) Case A : The construction costs increase by 10%
(2) Case B : The forecast benefits decreases by 10%
(3) Case C : The construction costs increase by 10% and the benefit decreases by 10%

41. The results of the sensitivity analyses are shown as follows.

Table 6-8(3) Results of Sensitivity analyses

EIRR (%)

Case	CASE-1	CASE-2
Base Case	29.66	32.33
Case A	23.18	24.91
Case B	22.56	24.21
Case C	17.22	18.36

Source : Calculated by The Study Team

6.8.3 Results and conclusion

42. From the above calculations, the EIRR of this project is in any case more than 17.2%. There are various views concerning the appropriate EIRR level used to guide the judgment as to whether a project is feasible or not. The leading view is that the project is feasible if the EIRR exceeds the opportunity cost of capital. The results of the EIRR calculation, taking into account the only one major quantitative benefit, shows more than 10% under every probable case and other uncountable benefits are expected to derive from the implementation of this project. Therefore, this Short-term Development Project is feasible from the viewpoint of the national economy.

7. FINANCIAL ANALYSIS

7.1 OBJECTIVE AND EXECUTING ENTITY OF ANALYSIS

1. The objective of a financial analysis is to evaluate the viability of a proposed project from the viewpoint of a private enterprise. Therefore, in a financial analysis, the executing entity of a proposed project has to be specified. In this financial analysis, PERUMKA is regarded as the executing entity of the project, i.e., all the expenses (including investment cost) will be assumed to be borne by PERUMKA.

2. According to government Regulation No.57 dated October 30, 1990, the legal status of PJKA (a state-owned enterprise) was changed to PERUMKA (a public corporation) on January 1, 1991. Accompanying this change in legal status, the ownership of the main railway infrastructures should have been transferred to the government. However, the relevant ministry ordinance or rule to regulate the details of this execution of ownership transfer of railway assets has not yet been issued. Therefore, all the infrastructures of the railway still belong to PERUMKA.

3. Taking the above situation into account, PERUMKA is assumed to be representative of the railway and the executing entity of the project.

7.2 PURPOSE OF ANALYSIS

4. The main objectives of the financial analysis are to examine the following from the standpoint of PERUMKA as the executing entity of the project.

(1) the examination of project profitability as per FIRR calculation;

The FIRR is calculated like the EIRR in the economic analysis, i.e., it is a discount rate at which the present value of the costs and the profits of the project during the project life become zero (0), and is obtained by the following formula :

$$\sum_{t-1}^{n} \textit{cash flow. } t \;/\; (1+\textit{FIRR})^{t-1} = 0$$

where, n : Period of project life
cash flow. t : Operating profit of each year (Gross revenues - Operating expenses + Depreciation - Investment)

(2) finance program to obtain the necessary funds for the execution of the project, taking into considering profitability;

(3) whether a government subsidy is necessary or not.

7.3 PRECONDITIONS

7.3.1 Project life

Thirty years.

7.3.2 Pricing date

May 1994.

7.3.3 Foreign exchange rate

1 US dollar = 2,134 Indonesian rupiah.
1 US dollar = 105.85 yen
1 Yen = 20.16 Indonesian rupiah.

7.3.4 Other assumptions

(1) A financial analysis will be made for the dry port and connecting railway as a whole. No financial analysis will be carried out for the dry port and connecting railway separately.

(2) The financial analysis will only consider the increase in container freight transportation revenues brought about by the execution of the project.

5. In this case, the project should bear a part of the investment in the main line, in proportion to the present number of freight trains with other trains.

(3) The financial analysis will cover the following two cases :

a. In the case of Automatic signalling preceding (Case 1)

b. In the case of Doubling of track preceding (Case 2)

(4) As for the dry port, the financial analysis will only consider the portion under control of PERUMKA. So no other government or private organization at the dry port should be included in the financial analysis.

(5) The bearers of the costs for the extension to TCT III are assumed to be as follows, based on The Minutes of Meeting for a gathering held on December 26, 1994 by MOC, DGLT and PERUMKA :

a. Land acquisition

The Port Authorities secure all necessary land space, including land for the approach track for the extension to TCT III.

b. Construction

i) PERUMKA will bear the expense for the new track extension work, including the new grade crossing.

ii) The Port Authorities will bear the construction expense for the TCT III platform and its relevant facilities.

c. Operation

Shunting operation is to be executed by PERUMKA.

(6) Sensitivity analysis is conducted on the above cases under each conditions of 10% decrease of transportation volume and 10% increase of investment.

Still the team tries to confine the construction to the urgent implementation plan stage that means F/S term until 2003.

7.4 ITEMS COMPOSING CASH FLOW

7.4.1 Gross revenues

6. Gross revenues mean in this analysis the increase in container cargo transportation revenues accompanying the execution of the project. Container cargo transportation revenues are calculated from the container cargo fare indicated in Table 7-4(1), and the volume of container cargo transportation derived from the traffic demand forecast.

7.4.2 Operating expenses

7. Operating expenses are divided into working cost and depreciation.
Working cost is the total for maintenance cost, personnel cost, fuel cost, and handling charges.
Working cost for the increase in container cargo transportation is summarized in Table 7-4(2).
Depreciation does not produce a cash outflow. At the calculation of FIRR, depreciation was added to the cash flow.

7.4.3 Operating profit and net profit

8. Operating profit is gross revenue less operating expenses.
Net profit is operating profit less expense and plus revenue accrued through activities other than business. However, in this analysis, net profit is to be operating profit less interest paid.

Table 7-4(1) Fare Tariff for Container Cargo Transportation

(Unit : Rupiah)

20 Feet			40 Feet		
Loaded		Empty	Loaded		Empty
Nonstuff	Stuffing	92,100	Nonstuff	Stuffing	164,250
171,000	190,700		290,650	321,000	

(Refer to Table 4-3(1))

Table 7-4(2) Annual Increase of Working Cost

(Unit : Mil. Rupiah)

	1997	2003	2010
Maintenance Cost	663	2,294	5,211
Personnel Cost	34	119	271
Fuel Cost	165	572	1,298
Handling Charge	122	458	991
Total	984	3,443	7,771

(Refer to Table 4-3(3))

7.5 INVESTMENT

7.5.1 Initial investment cost

9. The initial investment cost and schedule for Case 1 (the preceding of automatic signalling) and Case 2 (the preceding of doubling of track) are shown in Table 7-5(1) and Table 7-5(2). As mentioned in 7-3-4(2), the investment in the main line is adjusted in proportion to the number of container trains (20 trains) against the number of total trains (89 trains) at present. (For details of the investment, refer to Table 5-2(3).)

7.5.2 Additional investment cost

10. Additional investment cost and its schedule for Case 1 and Case 2 are shown in Table 7-5(3) and Table 7-5(4). The investment in the main line is also adjusted in the same manner mentioned above. (For details of the investment, refer to Table 5-2(3).)

7.5.3 Reinvestment

11. Reinvestment cost should be considered when the useful life of the asset expires within the project life. In this analysis, when an asset expires within the project life, it is assumed there will be a reinvestment for the same asset in the following year.

7.5.4 Residual value

12. The 30 year project life is defined only for the project evaluation. The assets invested in remain even after this period. The remaining value of the assets is appropriated as residual value at the last year of the project life.
Table 7-5(5) indicates the useful life and residual value of Case 1 and Case 2 by asset.

Table 7-5(5) Useful Life and Residual Value of Cases 1 and 2

(Unit : Years, Mil. Rupiah)

Asset	Useful Life	Residual Value	
		Case 1	Case 2
Land	-	4,979	4,979
Civil	40	3,284	2,908
Building	40	749	749
Track	20	14,515	15,018
Signalling	30	1,854	1,245
Electric Power	20	637	525
Telecommunication	20	745	990
Locomotive	25	11,214	11,214
Wagon	25	3,142	3,142
Gantry Crane	15	2,400	2,400
Forklift	8	1,963	1,963
Total	-	45,482	45,133

Note :
Case 1 : When automatic signalling precedes
Case 2 : When doubling of track precedes

Table 7-5(1) Financial Investment Cost of Dry Port and Connecting Railway Case 1 (When Automatic Signalling Precedes)

(Unit : Million Rp.)

Investment Item / Year	1995	1996	1997	1998	Total
Civil	459	1,514	0	0	1,973
Foreign Portion		994			994
Local Portion	459	520			979
Building	0	1,500	0	0	1,500
Foreign Portion		715			715
Local Portion		785			785
Track	0	75	3,036	0	3,111
Foreign Portion			2,563		2,563
Local Portion		75	473		548
Contingency	46	309	304	0	658
Foreign Portion	0	171	256	0	658
Local Portion	46	138	47	0	231
Signalling	0	1,249	1,580	0	2,829
Foreign Portion		1,249	1,142		2,392
Local Portion			438		438
Electric Power	0	0	507	0	507
Foreign Portion			441		441
Local Portion			67		67
Telecommunication	0	0	741	0	741
Foreign Portion			657		657
Local Portion			83		83
Locomotive	0	0	6,520	0	6,520
Foreign Portion			3,260		3,260
Local Portion			3,260		3,260
Forklift, Chassis	0	0	300	0	300
Foreign Portion			300		300
Local Portion					0
Management Cost	50	465	1,299	0	1,814
Foreign Portion	0	313	862	0	1,175
Local Portion	50	152	437	0	639
Grand Total	555	5,112	14,286	0	19,953
Foreign Portion	0	3,442	9,481	0	12,923
Local Portion	555	1,670	4,805	0	7,030

Table 7-5(2) Financial Investment Cost of Dry Port and Connecting Railway Case 2 (When Doubling of Track Precedes)

(Unit : Million Rp.)

Investment Item / Year	1995	1996	1997	1998	Total
Land Acquisition	0	1,085	0	0	1,085
Foreign Portion					0
Local Portion		1,085			1,085
Civil	459	1,514	1,109	398	3,479
Foreign Portion		994	882	289	2,165
Local Portion	459	520	226	109	1,314
Building	0	1,500	0	0	1,500
Foreign Portion		715			715
Local Portion		785			785
Track	0	75	3,036	1,007	4,118
Foreign Portion			2,563	886	3,449
Local Portion		75	473	121	669
Contingency	46	417	414	140	1,018
Foreign Portion	0	171	345	117	633
Local Portion	46	247	70	23	385
Signalling	0	0	0	57	57
Foreign Portion					0
Local Portion				57	57
Electric Power	0	0	42	42	84
Foreign Portion			36	36	72
Local Portion			6	6	12
Telecommunication	0	0	143	233	376
Foreign Portion			127	188	315
Local Portion			16	44	60
Locomotive	0	0	6,520	0	6,520
Foreign Portion			3,260		3,260
Local Portion			3,260		3,260
Forklift, Chassis	0	0	300	0	300
Foreign Portion			300		300
Local Portion					0
Management Cost	50	459	1,156	188	1,854
Foreign Portion	0	188	751	152	1,091
Local Portion	50	271	405	36	763
Grand Total	555	5,051	12,720	2,063	20,390
Foreign Portion	0	2,068	8,264	1,668	12,000
Local Portion	555	2,983	4,456	395	8,390

Table 7-5(3) Financial Additional Investment Cost of Dry Port and Connecting I Railway Case 1 (When Automatic Signalling Precedes)

(Unit : Million Rp.)

Investment Item / Year	1999	2000	2001	2002	2003	2004	2005
Land Acquisition	0	0	1,168	2,726	0	0	0
Foreign Portion							
Local Portion			1,168	2,726			
Civil	0	0	0	0	3,824	0	0
Foreign Portion					2,849		
Local Portion					975		
Building	0	0	0	0	630	0	0
Foreign Portion					347		
Local Portion					283		
Track	0	0	0	0	12,942	0	0
Foreign Portion					11,159		
Local Portion					1,783		
Contingency	0	0	117	273	1,740	0	0
Foreign Portion	0	0	0	0	1,436	0	0
Local Portion	0	0	117	273	304	0	0
Signalling	0	0	0	0	2,832	0	0
Foreign Portion					2,471		
Local Portion					361		
Electric Power	0	0	0	0	324	0	0
Foreign Portion					296		
Local Portion					28		
Telecommunication	0	0	0	0	209	0	0
Foreign Portion					192		
Local Portion					17		
Locomotive	0	0	3,260	0	0	6,520	0
Foreign Portion			1,630			3,260	
Local Portion			1,630			3,260	
Wagon	0	0	0	0	0	2,380	0
Foreign Portion							
Local Portion						2,380	
Gantry Crane	0	0	0	0	0	3,600	0
Foreign Portion						3,600	
Local Portion							
Forklift, Chassis	0	0	0	0	0	3,550	300
Foreign Portion						3,550	300
Local Portion						0	0
Management Cost	0	0	454	300	2,250	1,605	30
Foreign Portion	0	0	163	0	1,875	1,041	30
Local Portion	0	0	291	300	375	564	0
Grand Total	0	0	4,999	3,298	24,751	17,655	330
Foreign Portion	0	0	1,793	0	20,624	11,451	330
Local Portion	0	0	3,206	3,298	4,126	6,204	0

Table 7-5(3) Financial Additional Investment Cost of Dry Port and Connecting II Railway Case 1 (When Automatic Signalling Precedes)

(Unit : Million Rp.)

Investment Item / Year	2006	2007	2008	2009	Total
Land Acquisition	1,085	0	0	0	4,979
Foreign Portion					0
Local Portion	1,085				4,979
Civil	0	1,109	398	0	5,331
Foreign Portion		882	289		4,020
Local Portion		226	109		1,310
Building	0	0	0	0	630
Foreign Portion					347
Local Portion					283
Track	0	0	1,007	0	13,949
Foreign Portion			886		12,045
Local Portion			121		1,904
Contingency	109	111	140	0	2,489
Foreign Portion	0	88	117	0	1,641
Local Portion	109	23	23	0	848
Signalling	0	0	1,635	0	4,467
Foreign Portion			1,493		3,964
Local Portion			142		503
Electric Power	0	0	0	0	324
Foreign Portion					296
Local Portion					28
Telecommunication	0	0	323	0	532
Foreign Portion			245		437
Local Portion			78		95
Locomotive	0	3,260	0	6,520	19,560
Foreign Portion		1,630		3,260	9,780
Local Portion		1,630		3,260	9,780
Wagon	0	2,380	0	4,760	9,520
Foreign Portion					0
Local Portion		2,380		4,760	9,520
Gantry Crane	0	0	0	0	3,600
Foreign Portion					3,600
Local Portion					0
Forklift, Chassis	0	0	0	0	3,850
Foreign Portion					3,850
Local Portion					0
Management Cost	119	686	350	1,128	6,923
Foreign Portion	0	260	303	326	3,998
Local Portion	119	426	47	802	2,925
Grand Total	1,313	7,545	3,854	12,408	76,154
Foreign Portion	0	2,861	3,333	3,586	43,978
Local Portion	1,313	4,685	520	8,822	32,175

Table 7-5(4) Financial Additional Investment Cost of Dry Port and Connecting I Railway Case 2 (When Doubling of Track Precedes)

(Unit : Million Rp.)

Investment Item / Year	1999	2000	2001	2002	2003	2004	2005
Land Acquisition	0	0	1,168	2,726	0	0	0
Foreign Portion							
Local Portion			1,168	2,726			
Civil	0	0	0	0	3,824	0	0
Foreign Portion					2,849		
Local Portion					975		
Building	0	0	0	0	630	0	0
Foreign Portion					347		
Local Portion					283		
Track	0	0	0	0	12,942	0	0
Foreign Portion					11,159		
Local Portion					1,783		
Contingency	0	0	117	273	1,740	0	0
Foreign Portion	0	0	0	0	1,436	0	0
Local Portion	0	0	117	273	304	0	0
Signalling	0	0	0	0	4,124	0	0
Foreign Portion					3,421		
Local Portion					704		
Electric Power	0	0	0	0	493	0	0
Foreign Portion					452		
Local Portion					42		
Telecommunication	0	0	0	0	713	0	0
Foreign Portion					648		
Local Portion					65		
Locomotive	0	0	3,260	0	0	6,520	0
Foreign Portion			1,630			3,260	
Local Portion			1,630			3,260	
Wagon	0	0	0	0	0	2,380	0
Foreign Portion							
Local Portion						2,380	
Gantry Crane	0	0	0	0	0	3,600	0
Foreign Portion						3,600	
Local Portion							
Forklift, Chassis	0	0	0	0	0	3,550	300
Foreign Portion						3,550	300
Local Portion						0	0
Management Cost	0	0	454	300	2,447	1,605	30
Foreign Portion	0	0	163	0	2,031	1,041	30
Local Portion	0	0	291	300	416	564	0
Grand Total	0	0	4,999	3,298	26,913	17,655	330
Foreign Portion	0	0	1,793	0	22,342	11,451	330
Local Portion	0	0	3,206	3,298	4,571	6,204	0

Table 7-5(4) Financial Additional Investment Cost of Dry Port and Connecting II Railway Case 2 (When Doubling of Track Precedes)

(Unit : Million Rp.)

Investment Item / Year	2006	2007	2008	2009	Total
Land Acquisition	0	0	0	0	3,894
Foreign Portion					0
Local Portion					3,894
Civil	0	0	0	0	3,824
Foreign Portion					2,849
Local Portion					975
Building	0	0	0	0	630
Foreign Portion					347
Local Portion					283
Track	0	0	0	0	12,942
Foreign Portion					11,159
Local Portion					1,783
Contingency	0	0	0	0	2,129
Foreign Portion	0	0	0	0	1,436
Local Portion	0	0	0	0	694
Signalling	0	0	0	0	4,124
Foreign Portion					3,421
Local Portion					704
Electric Power	0	0	0	0	493
Foreign Portion					452
Local Portion					42
Telecommunication	0	0	0	0	713
Foreign Portion					648
Local Portion					65
Locomotive	0	3,260	0	6,520	19,560
Foreign Portion		1,630		3,260	9,780
Local Portion		1,630		3,260	9,780
Wagon	0	2,380	0	4,760	9,520
Foreign Portion					0
Local Portion		2,380		4,760	9,520
Gantry Crane	0	0	0	0	3,600
Foreign Portion					3,600
Local Portion					0
Forklift, Chassis	0	0	0	0	3,850
Foreign Portion					3,850
Local Portion					0
Management Cost	0	564	0	1,128	6,528
Foreign Portion	0	163	0	326	3,754
Local Portion	0	401	0	802	2,774
Grand Total	0	6,204	0	12,408	71,807
Foreign Portion	0	1,793	0	3,586	41,295
Local Portion	0	4,411	0	8,822	30,513

7.6 FINANCE PROGRAM

13. The financial soundness of a project depends largely on the fund procurement method. In this analysis, the finance program shown in Table 7-6(1) is assumed.

Table 7-6(1) Finance Program

	Foreign currency portion	Local currency portion
Case A	Government to government borrowing 2.5% p.a. 30 years incl. 10 years grace period	Government budget
Case B	Official overseas borrowing 7.5% p.a. 20 years incl. 5 years grace period	Government budget
Case C	Official overseas borrowing 7.5% p.a. 20 years incl. 5 years grace period	Domestic Rp. borrowing 13.5% p.a. 10 years incl. 4 years grace period

7.7 RESULTS OF ANALYSIS

7.7.1 Profitability of the project

14. The FIRR of Case 1 (when automatic signalling precedes) and Case 2 (when doubling of track precedes) are calculated on the basis of the cash flow derived from the premises mentioned above, and is 5.1% and 5.4%, respectively. For details of the

results, refer to Appendix 7-7(1), 7-7(2), 7-7(3) and 7-7(4).

15. The team also calculated the FIRR under the following hypothesis :
Investment is limited to the Urgent Implementation Plan stage, i.e., no investment after the year of 2002 is assumed to be made.
The FIRR on the basis of the above hypothesis for Case 1 and Case 2 is 10.9% and 10.8% respectively. For details of the results, refer to Appendix 7-7(5), 7-7(6), 7-7(7) and 7-7(8).

7.7.2 Sensitivity analysis

16. Table 7-7(1) shows the result of the sensitivity analysis for gross revenue and investment.

Table 7-7(1) Results of Sensitivity Analysis

	FIRR (%)			
	a) Base Case	b) Revenue 10% down	c) Investment 10% up	d) b) + c)
Case I				
Case 1	5.1	3.9	4.0	3.0
Case 2	5.4	4.2	4.3	3.2
Case II				
Case 1	10.9	9.6	9.7	8.5
Case 2	10.8	9.5	9.7	8.4

Case I : Short-term Development Plan stage
Case II : Urgent Implementation Plan stage
Case 1 : When automatic signalling precedes.
Case 2 : When doubling of track precedes.

7.8 ANALYSIS OF CASH FLOW

7.8.1 Net cash flow

17. Net cash flow is the difference between cash inflow and cash outflow. When net cash flow is negative, the capital on hand should be drawn on or government subsidies become necessary. In this analysis, "cash inflow" consists of net profit, depreciation and borrowing. "Cash outflow" consists of investment, interest during construction and repayment.

Table 7-8(1) shows the government subsidies necessary to meet net cash shortages as per case for the investment hypothesized in Table 7-7(1), i.e. Case I and Case II, with the finance program hypothesized in Table 7-6(1), i.e., Case A, Case B and Case C. The results reveal that the finance program Case A is desirable in any situation.

Table 7-8(2) shows the year when the project becomes profitable (= Year P) and the year when the accumulated deficit is eliminated (= Year E).

Table 7-8(2) Year P (project becomes profitable) and Year E (accumulated deficit is eliminated)

		Year P	Year E
Case I	Case A Case 1	1997	1997
	Case 2	1997	1997
	Case B Case1	2000	2001
	Case 2	1999	2000
	Case B Case 1	2007	2011
	Case 2	2007	2013
CaseII	Case A Case 1	1997	1997
	Case 2	1997	1997
	Case B Case 1	1999	1999
	Case 2	1999	2000
	Case C Case 1	2001	2006
	Case 2	2003	2021

7.8.2 Net cash flow analysis

18. Table 7-8(3) and Table 7-8(4) show the net cash flow of Case I and Case II according to the finance program respectively.

19. DSCR (debt service coverage ratio) indicates a borrower's ability to meet debt service payments (interest payments and repayment of principal). In order to repay the debt service completely within the project life, the average DSCR should be greater than 1.0.

20. In the case the ratio (net cash flow/gross revenue) is positive, it indicates the possible percentage of decrease in the present fare. In the case of the figure being negative, it indicates the necessary percentage of increase in the present fare in order to make net cash flow neutral (zero).

21. The results show that the finance program Case A at Case II is the most desirable from viewpoint of the DSCR and ratio. Case C-Case 1 and Case C-Case 2 at Case I present debt repayment problems, because both DSCR are below 1.0.

Table 7-8(1) Government Subsidy Necessary for Net Cash Shortage

(Unit : Million Rp.)

Case / Year	2001	2002	2003	2004	2007	2009	Total
Case I							
Case A							
Case 1			19,894	14,143		917	34,954
Case 2			22,037	14,117			36,154
Case B							
Case 1		2,165	23,465	15,747		5,854	47,231
Case 2		2,140	25,455	15,580			43,175
Case C							
Case 1	4,809	4,968	25,762	17,842	2,985	6,456	62,822
Case 2	6,609	5,241	28,167	18,055	519	2,326	60,917
Case II							
Case A							
Case 1	835						835
Case 2							0
Case B							
Case 1	2,828						2,828
Case 2							0
Case C							
Case 1	3,700						3,700
Case 2	1,228	371					1,599

Table 7-8(3) Net Cash Flow of Case I According to Finance Program

(Unit : Million Rp.)

	Items	1995-2004	2005-2014	2015-2024	Total
Common to Case 1	Gross revenues	38,078	133,369	151,075	322,523
	Operating expenses	25,666	100,767	113,533	239,966
	Operating profit	12,413	32,602	37,542	82,557
	Depreciation	6,285	32,285	35,825	74,394
	Net profit	9,771	29,693	36,273	75,737
	Investment	70,657	29,685	36,750	137,092
Case A-Case 1	Net cash flow	-34,037	26,879	28,581	21,423
	DSCR (Note 1)	-12.12	4.23	4.56	2.10
	Ratio (Note 2)	-89%	20%	19%	7%
Case B-Case 1	Net cash flow	-41,377	19,831	34,428	12,882
	DSCR (Note 1)	-2.86	2.29	16.73	1.38
	Ratio (Note 2)	-109%	15%	23%	4%
Case C-Case 1	Net cash flow	-53,381	16,244	34,428	-2,709
	DSCR (Note 1)	-1.27	1.86	16.73	0.86
	Ratio (Note 2)	-140%	12%	23%	-1%
Common to Case 2	Gross revenues	38,078	133,369	151,075	322,523
	Operating expenses	25,318	100,116	112,218	237,653
	Operating profit	12,760	33,253	38,857	84,870
	Depreciation	5,937	31,634	34,510	72,081
	Net profit	10,277	30,566	37,685	78,529
	Investment	73,256	23,177	37,842	134,274
Case A-Case 2	Net cash flow	-36,154	34,024	28,105	25,976
	DSCR (Note 1)	-13.76	5.43	4.79	2.45
	Ratio (Note 2)	-95%	26%	19%	8%
Case B-Case 2	Net cash flow	-43,175	27,656	33,524	18,005
	DSCR (Note 1)	-3.25	2.97	17.75	1.62
	Ratio (Note 2)	-113%	21%	22%	6%
Case C-Case 2	Net cash flow	-58,072	23,419	33,524	-1,129
	DSCR (Note 1)	-1.23	2.28	17.75	0.90
	Ratio (Note 2)	-153%	18%	22%	0% (Note 3)

(Note 1) DSCR=Debt service coverage ratio
=Operating profit+Depreciation-Additional investment/Debt service

(Note 2) Ratio=Net cash flow/Gross revenues X 100

(Note 3) Strictly speaking, 'Ratio' is -0.35%

Table 7-8(4) Net Cash Flow of Case II According to Finance Program

(Unit : Million Rp.)

	Items	1995-2004	2005-2014	2015-2024	Total
	Gross revenues	36,939	67,453	67,453	171,845
	Operating expenses	24,196	42,710	42,710	109,615
Common to	Operating profit	12,743	24,744	24,744	62,230
Case 1	Depreciation	5,405	8,278	8,278	21,960
	Net profit	10,102	21,834	23,475	55,410
	Investment	24,953	660	12,639	38,251
	Net cash flow	11,119	24,038	12,346	47,503
Case A-Case 1	DSCR (Note 1)	4.98	3.89	2.54	3.47
	Ratio (Note 2)	30%	36%	18%	28%
	Net cash flow	1,470	19,085	22,078	42,633
Case B-Case 1	DSCR (Note 1)	0.99	2.44	12.68	2.65
	Ratio (Note 2)	4%	28%	33%	25%
	Net cash flow	-7,602	16,375	22,078	30,851
Case C-Case 1	DSCR (Note 1)	0.47	2.02	12.68	1.73
	Ratio (Note 2)	-21%	24%	33%	18%
	Gross revenues	36,939	67,453	67,453	171,845
	Operating expenses	23,771	42,271	42,214	108,257
Common to	Operating profit	13,168	25,182	25,239	63,589
Case 2	Depreciation	4,981	7,839	7,782	20,602
	Net profit	10,685	22,495	24,068	57,247
	Investment	25,390	660	12,990	39,039
	Net cash flow	11,163	24,675	12,611	48,449
Case A-Case 2	DSCR (Note 1)	5.30	4.21	2.70	3.73
	Ratio (Note 2)	30%	37%	19%	28%
	Net cash flow	4,142	18,306	18,030	40,478
Case B-Case 2	DSCR (Note 1)	1.25	2.30	10.01	2.47
	Ratio (Note 2)	11%	27%	27%	24%
	Net cash flow	-10,755	14,070	18,030	21,345
Case C-Case 2	DSCR (Note 1)	0.47	1.77	10.01	1.37
	Ratio (Note 2)	-29%	21%	27%	12%

(Note 1) DSCR=Debt service coverage ratio
=Operating profit+Depreciation-Additional investment/Debt service

(Note 2) Ratio=Net cash flow/Gross revenues X 100

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

(1) The decrease in container transportation after a raise in fares is resolving the existing facilities bottleneck, so the execution of the Urgent Implementation Plan has some leeway.
The team can say that the growing speed in demand hereafter depends on the recovery of textile industry and new investment in other growth industries.

(2) The Urgent Implementation Plan was a facilities investment plan for a traffic demand forecast up until 1999.
However, this F/S shows the plan is applicable even for demand up until 2003.
The reason for this is that the former is based on another report assuming high economic growth and the latter is framed on the present economic situation.

(3) As a result of the economic analysis, it can be said that the opportunity cost of capital in Indonesia is 10 to 15%, which means the EIRR is feasible from the view point of the national economy.

(4) The result of the financial analysis proves the project is feasible in all cases corresponding to demand up until 2010.
As the profitability of the basic plan (Case I), when doubling of track is carried out at first is a little better than when automatic signalling is executed first, but the difference is so negligible that the investment order between them is irrelevant.
The team tried a sensitivity analysis when there is a 10% decrease in traffic demand, and found that the FIRR index is greater than the financed interest rate.

(5) Base on table 5-2(1), successive investment for the existing dry ports later than 2003, makes the feasibility inferior but profitable.
Investment later than 2003 should be reviewed, by examining the demand in Bd District at the beginning of the 21 st century. The team can then select suitable places needing only low investment cost, such as the following:

i) Eager sponsors (local government or private sector) are wanting investment.
ii) Huge investment is not needed (such as doubling track)
iii) No need for land acquisition

iv) Utilization of existing facilities (tracks and signals)

v) Auxiliary locomotives are not needed.

Pwk seems to be satisfied with the above conditions as long as the demand exists.

8.2 RECOMMENDATIONS

(1) Urgent implementation plan that is the front half of F/S, should be carried out as soon as possible, because both the storage capacity for container wagons at Gdb and track capacity between Gdb and Kac are in shortage even now.
Concerning the rear half of F/S additional execution will be examined again at the head of 2000, whether it is necessary or not, by considering demand forecast at that time, because violent economic deviation is anticipated in near future.

Further more,

(2) Normalization of train operation and bringing up of forwarders

On the 2 nd site survey, some customers were doubtful of the railway, since its arrival time is inaccurate. On the other hand, punctuality is a characteristic of direct cargo trains, therefore, this is an unexpected response. If a train delayed the departure time of a marine container ship, business customers would be greatly troubled.
High economic development requires accurate and quick service, as well as cost effectiveness, not only for the railway but for all means of transportation.
In Japan, regular conventional freight trains were slow and unpunctual, which resulted in their falling into disuse.
Unpunctual trains will lose the trust of customers and they will go elsewhere.

Locomotive break down occupies near half of the cause of the delay.
The above is already known and Bd Depot has been also improved. The study of the cause and countermeasure under the decision that the break down should be excluded, is desirable.
However, it would be sure that the almost delay of arrival time caused by railway operation is less than 30 minutes.
The complaint by customers on the big delay seems to be caused in the shortage of equipment such as trailer head and chassis owned by forwarder.

The foster of resourceful forwarders is also desirable as one of the resolutions on

the subject.

(3) Improvement of delivery capability

Due to transportation costs rising by 15 %, the volume of containers handled in July of last year decreased by about 15% as well, and container stocks in container terminals greatly decreased.
It was said that the excessive container stocks were caused by customers late taking up of their goods, but waiting theory teaches us that the more likely cause is in shortage of distributive capability.
Therefore, it is necessary for forwarder to have sufficient distributive capability (trailer truck head, chassis, and working force) when transportation demand for containers revive. Otherwise, even if the storage capacity of the tracks is enough, it will reproduce a huge excess of container stock once again.

(4) Co-operation between railway construction and urban planning

In relation with the above improvement, the New Bekasi Line will be constructed, new urban railway has a large influence on urban development and urban structure, so it is necessary to coordinate railway construction planning with urban planning.
If a new line is constructed without such coordination, buildings would be built on the predetermined line before the start of the construction project, or land prices would rise remarkably. This would then force a reexamination of land utilization and the public facilities related to it.
The team therefore recommends holding discussions with relevant government and private organizations concerning these problems, and drawing up countermeasures such as simultaneous execution with urban development and land use regulations.
By the way, Bekasi new line is not only effective for commuter service between Jng and Bks, but it has various merits, so we expect the promotion for the earlier construction.

(5) Promotion of submergence countermeasure at Gdb District

The submergence problem is not only for Gdb St, but for all Gdb District.
The arrangement of relevant drainage facilities should be executed by the public works. The team expects the negotiation for the early execution between relevant governmental organizations.

APPENDIX

APPENDIX

*The investment cost estimates of Doubling of Track Preceding are shown in Appendix 5-2(8)--(14).

Appendix 5-2(8)	Urgent Plan at Kiaracondong
Appendix 5-2(9)	Urgent Plan at Gedebage
Appendix 5-2(10)	By 2003 completed at Kiaracondong
Appendix 5-2(11)	By 2003 completed at Gedebage
Appendix 5-2(12)	Doubling of Track
Appendix 5-2(13)	At Pasoso St.
Appendix 5-2(14)	At TCT-III
Appendix 6-6(1)	Economic Price of Investment Cost of Gedebage Dry Port and Connecting Rail way (Automatic Signalling Preceding)
Appendix 6-6(2)	Economic Price of Investment Cost of Gedebage Dry Port and Connecting Rail way (Doubling of Track Preceding)
Appendix 6-7(1)	Difference of Container Volume Transported by Trailer between "Without" Case and "With" Case
Appendix 6-7(2)	Calculation of Additional Transportation Costs under "Without" Case
Appendix 7-7(1)	Profit & Loss Statement (Case I) (Automatic Signalling Preceding)
Appendix 7-7(2)	Profit & Loss Statement (Case I) (Doubling of Track Preceding)
Appendix 7-7(3)	Cash Flow Statement & Financial Analysis (Case I) (Automatic Signalling Preceding)
Appendix 7-7(4)	Cash Flow Statement & Financial Analysis (Case I) (Doubling of Track Preceding)
Appendix 7-7(5)	Profit & Loss Statement (Case II) (Automatic Signalling Preceding)
Appendix 7-7(6)	Profit & Loss Statement (Case II) (Doubling of Track Preceding)
Appendix 7-7(7)	Cash Flow Statement & Financial Analysis (Case II) (Automatic Signalling Preceding)
Appendix 7-7(8)	Cash Flow Statement & Financial Analysis (Case II) (Doubling of Track Preceding)
Appendix 9-1	Topographic Map at Gedebage(1)
Appendix 9-2	Topographic Map at Gedebage(2)
Appendix 9-3	Topographic Map at Gedebage(3)
Appendix 9-4	Topographic Map at Kiaracondong(1)
Appendix 9-5	Topographic Map at Kiaracondong(2)
Appendix 9-6	Topographic Map at Tg.Priok(1)
Appendix 9-7	Topographic Map at Tg.Priok(2)

Appendix 1-1(1) Statistics of Gedebade Dry Port

			1987	1988	1989	1990	1991	1992	1993	1994
Export										
Gedebage	Cargo Volume	Ton	7,754	31,569	61,688	90,385	142,279	212,942	423,570	416,025
		Increase		307.13%	95.41%	46.52%	57.41%	49.67%	98.91%	-1.78%
	Loaded	20 Feet								13,307
		40 Feet								14,428
		TEU	1,027	3,313	6,182	8,880	14,926	23,327	28,238	27,735
		Increase		222.59%	86.60%	43.64%	68.09%	56.28%	21.05%	-1.78%
		Ton/TEU	7.55	9.53	9.98	10.18	9.53	9.13	15.00	15.00
	Empty	20 Feet								110
		40 Feet								422
		TEU	336	1,159	1,153	2,722	2,996	2,498	2,610	532
		Increase		244.94%	-0.52%	138.08%	10.07%	-16.62%	4.48%	-79.62%
	Subtotal	TEU	1,363	4,472	7,335	11,602	17,922	25,825	30,848	28,267
		Increase		228.10%	64.02%	58.17%	54.47%	44.10%	19.45%	-8.37%
By Trailer		20 Feet				144	177	30	1,274	
		40 Feet				8,448	10,242	8,488	6,581	
	Subtotal	TEU	4,399	5,499	6,874	8,592	10,419	8,518	7,855	12,000
		Increase		25.00%	25.00%	25.00%	21.26%	-18.25%	-7.78%	52.77%
	Total	TEU	5,762	9,971	14,209	20,194	28,341	34,343	38,703	40,267
		Increase		73.04%	42.50%	42.13%	40.34%	21.18%	12.70%	4.04%
Import										
Gedebage	Cargo Volume	Ton	8,172	19,851	27,751	59,859	57,414	63,118	134,115	107,850
		Increase		142.91%	39.80%	115.70%	-4.08%	9.93%	112.48%	-19.58%
	Loaded	20 Feet								2,494
		40 Feet								4,696
		TEU	490	1,430	1,849	3,811	4,755	5,322	8,941	7,190
		Increase		191.84%	29.30%	106.11%	24.77%	11.92%	68.00%	-19.58%
		Ton/TEU	16.68	13.88	15.01	15.71	12.07	11.86	15.00	15.00
	Empty	20 Feet								11,228
		40 Feet								9,918
		TEU	742	2,985	5,623	7,652	13,159	20,861	21,129	21,146
		Increase		302.29%	88.38%	36.08%	71.97%	58.53%	1.28%	0.08%
	Subtotal	TEU	1,232	4,415	7,472	11,463	17,914	26,183	30,070	28,336
		Increase		258.36%	69.24%	53.41%	56.28%	46.16%	14.85%	-5.77%
By Trailer		20 Feet								
		40 Feet								
	Subtotal	TEU	4,470	5,588	6,985	8,731	10,427	8,160	8,633	12,000
		Increase		25.00%	25.00%	25.00%	19.43%	-21.74%	5.80%	39.00%
	Subtotal	TEU	5,702	10,003	14,457	20,194	28,341	34,343	38,703	40,336
		Increase		75.42%	44.53%	39.69%	40.34%	21.18%	12.70%	4.22%
Bandung	Total	TEU	11,464	19,974	28,665	40,388	56,682	68,686	77,406	80,603
		Increase		74.22%	43.52%	40.89%	40.34%	21.18%	12.70%	4.13%
Gedebage	Total	TEU	2,595	8,887	14,807	23,065	35,836	52,008	60,918	56,603
		Increase		242.47%	66.61%	55.77%	55.37%	45.13%	17.13%	-7.08%
	Cargo Volume	Ton	15,926	51,420	89,439	150,244	199,693	276,060	557,685	523,875
		Increase		222.87%	73.94%	67.98%	32.91%	38.24%	102.02%	-6.06%

Source : PERUMKA, Cabang Dinas Llajr Kabupaten DT. II Subang

Appendix 1-1(2) Estimation of Container Cargo Potential at Hinterland of Gedebage Dry Port

			Export																								Import			
	Total	Increa	Textile	Increa	Garment	Increa	Yarn	Increa	Tea	Increa	Shoes' Sandal	Increa	Wooden Products	Increa	Rubber	Increa	Other Textile Products	Increa	Electric Appliances	Increa	Light Industri Products	Increa	Farm Products	Increa	Others Empty	Increa	Raw Matriale	Increa	Others Empty	Increa
	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%	TEU	%
87	11,464		2,485		573		573		344		401		229		115		229		57		115		229		401		1,720		4,013	
88	19,974	74.2%	4,294	74.2%	999	74.2%	999	74.2%	599	74.2%	699	74.2%	399	74.2%	200	74.2%	399	74.2%	100	74.2%	200	74.2%	399	74.2%	699	74.2%	2,996	74.2%	6,991	74.2%
89	28,665	43.5%	6,163	43.5%	1,433	43.5%	1,433	43.5%	860	43.5%	1,003	43.5%	573	43.5%	287	43.5%	573	43.5%	143	43.5%	287	43.5%	573	43.5%	1,003	43.5%	4,300	43.5%	10,033	43.5%
90	40,368	40.9%	8,683	40.9%	2,019	40.9%	2,019	40.9%	1,212	40.9%	1,414	40.9%	806	40.9%	404	40.9%	806	40.9%	202	40.9%	404	40.9%	806	40.9%	1,414	40.9%	6,058	40.9%	14,136	40.9%
91	56,662	40.3%	12,187	40.3%	2,834	40.3%	2,834	40.3%	1,700	40.3%	1,984	40.3%	1,134	40.3%	567	40.3%	1,134	40.3%	283	40.3%	567	40.3%	1,134	40.3%	1,984	40.3%	8,502	40.3%	19,839	40.3%
92	68,686	21.2%	14,767	21.2%	3,434	21.2%	3,434	21.2%	2,061	21.2%	2,404	21.2%	1,374	21.2%	687	21.2%	1,374	21.2%	343	21.2%	687	21.2%	1,374	21.2%	2,404	21.2%	10,303	21.2%	24,040	21.2%
93	77,406	12.7%	16,642	12.7%	3,870	12.7%	3,870	12.7%	2,322	12.7%	2,709	12.7%	1,548	12.7%	774	12.7%	1,548	12.7%	387	12.7%	774	12.7%	1,548	12.7%	2,709	12.7%	11,611	12.7%	27,092	12.7%
94	80,603	4.1%	17,330	4.1%	4,030	4.1%	4,030	4.1%	2,418	4.1%	2,821	4.1%	1,612	4.1%	806	4.1%	1,612	4.1%	403	4.1%	806	4.1%	1,612	4.1%	2,821	4.1%	12,090	4.1%	28,211	4.1%
95	84,820	5.2%	18,235	5.5%	4,252	5.5%	4,252	5.5%	2,492	3.1%	2,977	5.5%	1,701	5.5%	831	3.1%	1,701	5.5%	430	6.7%	850	5.5%	1,661	3.1%	2,977	5.5%	12,757	5.5%	29,863	5.1%
96	90,204	6.3%	19,547	6.9%	4,546	6.9%	4,546	6.9%	2,542	2.0%	3,182	6.9%	1,818	6.9%	847	2.0%	1,818	6.9%	469	9.2%	909	6.9%	1,695	2.0%	3,182	6.9%	13,637	6.9%	31,485	6.1%
97	95,946	6.4%	20,892	6.9%	4,859	6.9%	4,859	6.9%	2,595	2.1%	3,401	6.9%	1,943	6.9%	865	2.1%	1,943	6.9%	513	9.2%	972	6.9%	1,730	2.1%	3,401	6.9%	14,576	6.9%	33,387	6.1%
98	102,068	6.4%	22,325	6.9%	5,192	6.9%	5,192	6.9%	2,653	2.2%	3,634	6.9%	2,077	6.9%	884	2.2%	2,077	6.9%	559	9.2%	1,038	6.9%	1,768	2.2%	3,634	6.9%	15,576	6.9%	35,458	6.2%
99	108,593	6.4%	23,852	6.8%	5,547	6.8%	5,547	6.8%	2,714	2.3%	3,883	6.8%	2,219	6.8%	905	2.3%	2,219	6.8%	611	9.1%	1,109	6.8%	1,809	2.3%	3,883	6.8%	16,641	6.8%	37,956	6.2%
0	115,547	6.4%	25,479	6.8%	5,925	6.8%	5,925	6.8%	2,779	2.4%	4,148	6.8%	2,370	6.8%	926	2.4%	2,370	6.8%	666	9.1%	1,185	6.8%	1,852	2.4%	4,148	6.8%	17,776	6.8%	39,998	6.2%
1	122,957	6.4%	27,211	6.8%	6,328	6.8%	6,328	6.8%	2,848	2.5%	4,430	6.8%	2,531	6.8%	949	2.5%	2,531	6.8%	727	9.1%	1,266	6.8%	1,899	2.5%	4,430	6.8%	18,985	6.8%	42,494	6.2%
2	130,839	6.4%	29,056	6.8%	6,757	6.8%	6,757	6.8%	2,919	2.5%	4,730	6.8%	2,703	6.8%	973	2.5%	2,703	6.8%	793	9.1%	1,351	6.8%	1,946	2.5%	4,730	6.8%	20,272	6.8%	45,148	6.2%
3	139,223	6.4%	31,020	6.8%	7,214	6.8%	7,214	6.8%	2,992	2.5%	5,050	6.8%	2,886	6.8%	997	2.5%	2,886	6.8%	864	9.0%	1,443	6.8%	1,995	2.5%	5,050	6.8%	21,642	6.8%	47,969	6.2%
4	148,137	6.4%	33,111	6.7%	7,700	6.7%	7,700	6.7%	3,067	2.5%	5,390	6.7%	3,080	6.7%	1,022	2.5%	3,080	6.7%	942	9.0%	1,540	6.7%	2,045	2.5%	5,390	6.7%	23,101	6.7%	50,966	6.3%
5	157,616	6.4%	35,336	6.7%	8,218	6.7%	8,218	6.7%	3,144	2.5%	5,752	6.7%	3,287	6.7%	1,048	2.5%	3,287	6.7%	1,026	8.9%	1,644	6.7%	2,096	2.5%	5,752	6.7%	24,653	6.7%	54,155	6.3%
6	167,694	6.4%	37,704	6.7%	8,768	6.7%	8,768	6.7%	3,222	2.5%	6,138	6.7%	3,507	6.7%	1,074	2.5%	3,507	6.7%	1,117	8.9%	1,754	6.7%	2,148	2.5%	6,138	6.7%	26,305	6.7%	57,542	6.3%
7	178,344	6.4%	40,207	6.8%	9,351	6.8%	9,351	6.8%	3,303	2.5%	6,545	6.8%	3,740	6.8%	1,101	2.5%	3,740	6.8%	1,216	8.8%	1,870	6.8%	2,202	2.5%	6,545	6.8%	28,052	6.8%	61,120	6.2%
8	189,592	6.3%	42,853	6.8%	9,966	6.6%	9,966	6.6%	3,386	2.5%	6,976	6.6%	3,986	6.6%	1,129	2.5%	3,986	6.6%	1,322	8.7%	1,993	6.6%	2,257	2.5%	6,976	6.6%	29,897	6.6%	64,999	6.2%
9	201,466	6.3%	45,647	6.5%	10,616	6.5%	10,616	6.5%	3,470	2.5%	7,431	6.5%	4,246	6.5%	1,157	2.5%	4,246	6.5%	1,437	8.7%	2,123	6.5%	2,313	2.5%	7,431	6.5%	31,847	6.5%	68,999	6.1%
10	213,992	6.2%	48,596	6.5%	11,301	6.5%	11,301	6.5%	3,557	2.5%	7,911	6.5%	4,521	6.5%	1,186	2.5%	4,521	6.5%	1,560	8.6%	2,260	6.5%	2,371	2.5%	7,911	6.5%	33,904	6.3%	73,092	6.1%
11	227,198	6.2%	51,706	6.4%	12,025	6.4%	12,025	6.4%	3,646	2.5%	8,417	6.4%	4,810	6.4%	1,215	2.5%	4,810	6.4%	1,693	8.5%	2,405	6.4%	2,431	2.5%	8,417	6.4%	36,074	6.4%	77,525	6.1%
12	241,070	6.1%	54,874	6.3%	12,765	6.3%	12,765	6.3%	3,737	2.5%	8,949	6.3%	5,114	6.3%	1,246	2.5%	5,114	6.3%	1,835	8.4%	2,557	6.3%	2,491	2.5%	8,949	6.3%	38,354	6.3%	82,181	6.0%
13	255,629	6.0%	58,404	6.2%	13,582	6.2%	13,582	6.2%	3,830	2.5%	9,508	6.2%	5,433	6.2%	1,277	2.5%	5,433	6.2%	1,987	8.3%	2,718	6.2%	2,554	2.5%	9,508	6.2%	40,747	6.2%	87,067	5.9%
14	270,896	6.0%	62,002	6.2%	14,419	6.2%	14,419	6.2%	3,926	2.5%	10,093	6.2%	5,768	6.2%	1,309	2.5%	5,768	6.2%	2,150	8.2%	2,884	6.2%	2,617	2.5%	10,093	6.2%	43,257	6.2%	92,191	5.9%
15	286,891	5.9%	65,772	6.1%	15,296	6.1%	15,296	6.1%	4,024	2.5%	10,707	6.1%	6,118	6.1%	1,341	2.5%	6,118	6.1%	2,324	8.1%	3,059	6.1%	2,683	2.5%	10,707	6.1%	45,887	6.1%	97,559	5.8%
16	303,634	5.8%	69,718	6.0%	16,213	6.0%	16,213	6.0%	4,125	2.5%	11,349	6.0%	6,485	6.0%	1,375	2.5%	6,485	6.0%	2,510	8.0%	3,243	6.0%	2,750	2.5%	11,349	6.0%	48,640	6.0%	103,177	5.8%
17	321,145	5.8%	73,845	5.9%	17,173	5.8%	17,173	5.9%	4,228	2.5%	12,021	5.9%	6,869	5.9%	1,409	2.5%	6,869	5.9%	2,708	7.9%	3,435	5.9%	2,819	2.5%	12,021	5.9%	51,520	5.9%	109,082	5.7%
18	339,441	5.7%	78,158	5.8%	18,176	5.8%	18,176	5.8%	4,334	2.5%	12,723	5.8%	7,270	5.8%	1,445	2.5%	7,270	5.8%	2,920	7.8%	3,635	5.8%	2,889	2.5%	12,723	5.8%	54,529	5.8%	115,192	5.6%

Appendix 1-2(1) Container handling volume at Gdb, Kac and Pasoso (Unit : TEU)

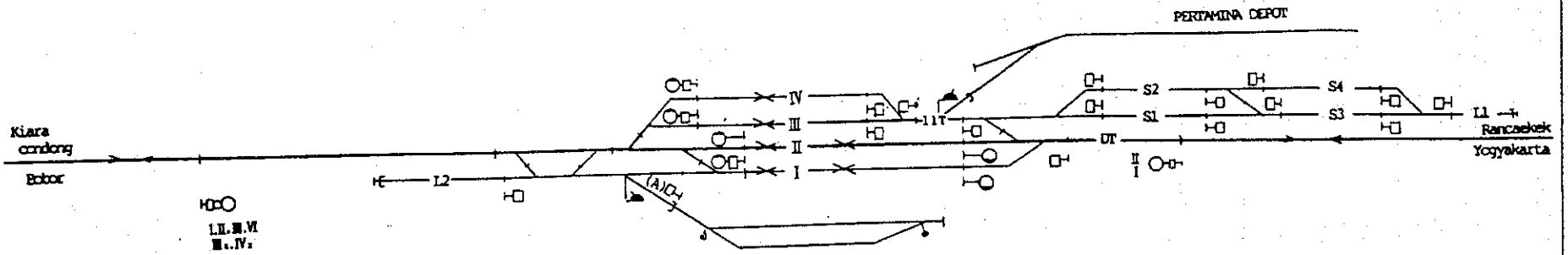
		Gedebage			Kiaracondong			Pasoso			Yearly increase
		Loaded	Empty	Total	Loaded	Empty	Total	Loaded	Empty	Total	
1993	S	28,238	2,610	30,848				28,238	2,610	30,848	
	A	8,941	21,129	30,070				8,941	21,129	30,070	
	T	37,179	23,739	60,918				37,179	23,739	60,918	
1994	S	34,000	2,000	36,000				34,000	2,000	36,000	
	A	10,000	26,000	36,000				10,000	26,000	36,000	
	T	44,000	28,000	72,000				44,000	28,000	72,000	
1995	S	36,000	2,500	38,500				36,000	2,500	38,500	2,500
	A	11,000	27,500	38,500				11,000	27,500	38,500	2,500
	T	47,000	30,000	77,000				47,000	30,000	77,000	5,000
1996	S	38,000	3,000	41,000				38,000	3,000	41,000	2,500
	A	12,000	29,000	41,000				12,000	29,000	41,000	2,500
	T	50,000	32,000	82,000				50,000	32,000	82,000	5,000
1997	S	40,000	3,500	43,500				40,000	3,500	43,500	2,500
	A	13,000	30,500	43,500				13,000	30,500	43,500	2,500
	T	53,000	34,000	87,000				53,000	34,000	87,000	5,000
1998	S	42,000	4,000	46,000				42,000	4,000	46,000	2,500
	A	15,000		15,000		31,000	31,000	15,000	31,000	46,000	2,500
	T	57,000	4,000	61,000		31,000	31,000	57,000	35,000	92,000	5,000
1999	S	45,000	4,000	49,000				45,000	4,000	49,000	3,000
	A	16,000		16,000		33,000	33,000	16,000	33,000	49,000	3,000
	T	61,000	4,000	65,000		33,000	33,000	61,000	37,000	98,000	6,000
2000	S	48,000	4,500	52,500				48,000	4,500	52,500	3,500
	A	17,000		17,000		35,500	35,500	17,000	35,500	52,500	3,500
	T	65,000	4,500	69,500		35,500	35,500	65,000	40,000	105,000	7,000
2001	S	51,000	4,500	55,500				51,000	4,500	55,500	3,000
	A	18,000		18,000		37,500	37,500	18,000	37,500	55,500	3,000
	T	69,000	4,500	73,500		37,500	37,500	69,000	42,000	111,000	6,000
2002	S	54,000	5,000	59,000				54,000	5,000	59,000	3,500
	A	19,000		19,000		40,000	40,000	19,000	40,000	59,000	3,500
	T	73,000	5,000	78,000		40,000	40,000	73,000	45,000	118,000	7,000
2003	S	57,000	5,000	62,000				57,000	5,000	62,000	3,000
	A	20,000		20,000		42,000	42,000	20,000	42,000	62,000	3,000
	T	77,000	5,000	82,000		42,000	42,000	77,000	47,000	124,000	6,000
2004	S	61,000	5,500	66,500				61,000	5,500	66,500	4,500
	A				21,500	45,000	66,500	21,500	45,000	66,500	4,500
	T	61,000	5,500	66,500	21,500	45,000	66,500	82,500	50,500	133,000	9,000
2005	S	66,000	5,500	71,500				66,000	5,500	71,500	5,000
	A				23,000	48,500	71,500	23,000	48,500	71,500	5,000
	T	66,000	5,500	71,500	23,000	48,500	71,500	89,000	54,000	143,000	10,000
2006	S	70,000	6,000	76,000				70,000	6,000	76,000	4,500
	A				24,500	51,500	76,000	24,500	51,500	76,000	4,500
	T	70,000	6,000	76,000	24,500	51,500	76,000	94,500	57,500	152,000	9,000
2007	S	75,000	6,000	81,000				75,000	6,000	81,000	5,000
	A				26,000	55,000	81,000	26,000	55,000	81,000	5,000
	T	75,000	6,000	81,000	26,000	55,000	81,000	101,000	61,000	162,000	10,000
2008	S	79,000	6,500	85,500				79,000	6,500	85,500	4,500
	A				27,500	58,000	85,500	27,500	58,000	85,500	4,500
	T	79,000	6,500	85,500	27,500	58,000	85,500	106,500	64,500	171,000	9,000
2009	S	84,000	6,500	90,500				84,000	6,500	90,500	5,000
	A				29,000	61,500	90,500	29,000	61,500	90,500	5,000
	T	84,000	6,500	90,500	29,000	61,500	90,500	113,000	68,000	181,000	10,000
2010	S	88,000	7,000	95,000				88,000	7,000	95,000	4,500
	A				30,000	65,000	95,000	30,000	65,000	95,000	4,500
	T	88,000	7,000	95,000	30,000	65,000	95,000	118,000	72,000	190,000	9,000

Notes ; 1. Container transportation demand refer to 1-1.
2. S : ship, A : arrival, T : total

Automatic Signalization
Preceding

G E D E B A G E

(URGENT PROGRAM BY 1997)



Signal	Route	Remarks
Home Signal	Kiaracondong - Ⅰ	
	〃 - Ⅱ	
	〃 - Ⅲ	
	〃 - Ⅳ	
Starting Signal	Ⅳ -Kiaracondong	
	Ⅲ - 〃	
	Ⅱ - 〃	
	Ⅰ - 〃	
	Ⅰ - Rancaekek	
	Ⅱ - 〃	
Home Signal	Rancaekek - Ⅱ	
	〃 - Ⅰ	
Calling on Signal	Kiaracondong - Ⅲ	
	〃 - Ⅳ	

Signal	Route	Remarks
Shunting Signal	L2 - (A)	
	〃 - Ⅰ	
	〃 - Ⅱ	
	〃 - Ⅳ	
	Ⅳ - L2	
	Ⅲ - 〃	
	Ⅰ - 〃	
	(A) - 〃	
	L1 - S4	
	〃 - S3	
	S4 - S2	
	S3 - 〃	
	〃 - S1	
	S2 - Ⅳ	
	〃 - Ⅲ	
	〃 - 11T	
	S1 - Ⅳ	
	〃 - Ⅲ	
	〃 - 11T	
	DT - Ⅱ	
	〃 - Ⅰ	

Signal	Route	Remarks
Shunting Signal	Ⅲ - DT	
	〃 - S1	
	〃 - S2	
	Ⅳ - DT	
	〃 - S1	
	〃 - S2	
	11T - DT	
	S1 - S3	
	S2 - 〃	
	〃 - S4	
	S3 - L1	
	S4 - 〃	

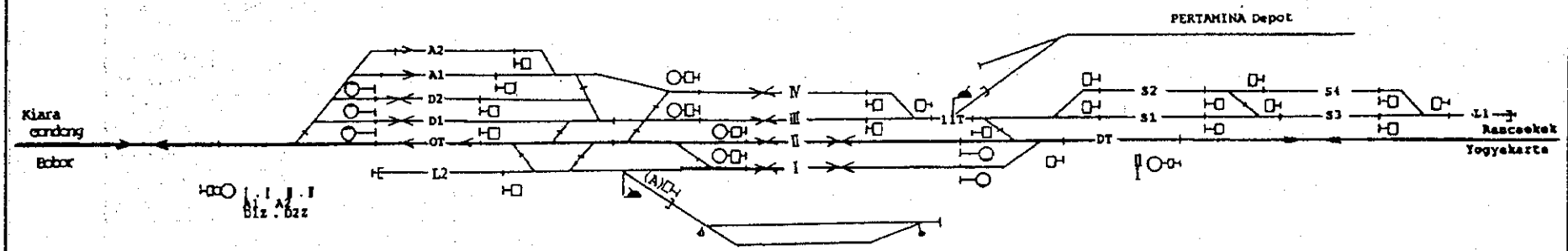
A-2-1

Appendix 2-3(1) Route Table at Gedebage (1997)

Automatic Signalization
Preceding

G E D E B A G E

(F/S PROGRAM BY 2003)



Signal	Route	Remarks
Home Signal	Kiaracondong- I	
	〃 - II	
	〃 - III	
	〃 - IV	
	〃 - A1	
	〃 - A2	
First Starting Signal	IV - OT	
	III - 〃	
	II - 〃	
	I - 〃	
Starting Signal	D2 - Kiaracondong	
	D1 - 〃	
Second Starting Signal	OT - 〃	
Starting Signal	I - Rancaekek	
	II - 〃	
Home Signal	Rancaekek - II	
	〃 - I	
Calling on Signa	Kiaracondong - D1	
	〃 - D2	

Signal	Route	Remarks
Shunting Signal	L2 - (A)	
	〃 - I	
	〃 - II	
	〃 - IV	
	D1 - III	
	D2 - 〃	
	A1 - 〃	
	〃 - IV	
	A2 - III	
	〃 - IV	
	IV - A2	
	〃 - A1	
	〃 - L2	
	III - A2	
	〃 - A1	
	〃 - D2	
	〃 - D1	
	II - L2	
	I - 〃	
	(A) - 〃	
	L1 - S4	
	〃 - S3	

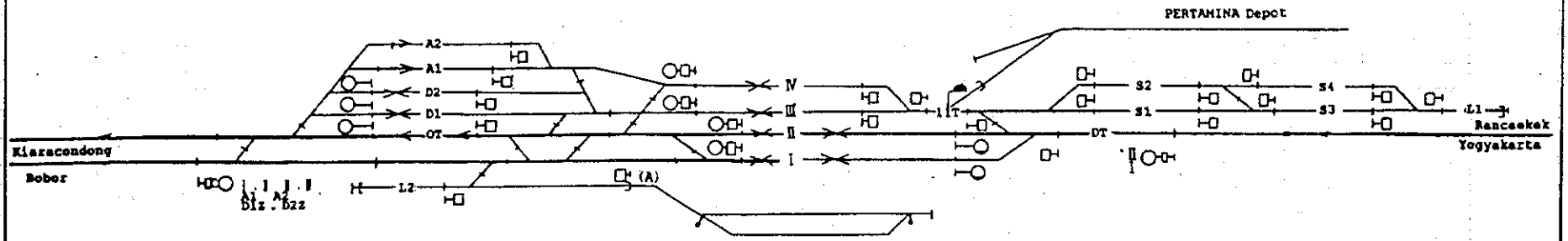
Signal	Route	Remarks
Shunting Signal	S4 - S2	
	S3 - 〃	
	〃 - S1	
	S2 - IV	
	〃 - III	
	〃 - 11T	
	S1 - IV	
	〃 - III	
	〃 - 11T	
	DT - II	
	〃 - I	
	III - DT	
	〃 - S1	
	〃 - S2	
	IV - DT	
	〃 - S1	
	〃 - S2	
	11T - DT	
	S1 - S3	
	S2 - 〃	
	〃 - S4	
	S3 - L1	
	S4 - 〃	

Appendix 2-3(2) Route Table at Gedebage (2003)

Automatic Signalization
Preceding

G E D E B A G E

(M/P PROGRAM BY 2008)



Signal	Route	Remarks	Signal	Route	Remarks	Signal	Route	Remarks
Home Signal	Kiaracondong- I		Shunting Signal	L2 - (A)		Shunting Signal	S4 - S2	
	〃 - II			〃 - I			S3 - 〃	
	〃 - III			〃 - II			〃 - S1	
	〃 - IV			〃 - IV			S2 - IV	
	〃 - A1			D1 - III			〃 - III	
	〃 - A2			D2 - 〃			〃 - 11T	
First Starting Signal	IV - OT			A1 - 〃			S1 - IV	
	III - 〃			〃 - IV			〃 - III	
	II - 〃			A2 - III			〃 - 11T	
	I - 〃			〃 - IV			DT - II	
Starting Signal	D2 - Kiaracondong			IV - A2			〃 - I	
	D1 - 〃			〃 - A1			III - DT	
Second Starting Signal	OT - 〃			〃 - L2			〃 - S1	
				III - A2			〃 - S2	
				〃 - A1			IV - DT	
Starting Signal	I - Rancaekek			〃 - D2			〃 - S1	
	II - 〃			〃 - D1			〃 - S2	
				II - L2			11T - DT	
Home Signal	Rancaekek - II			I - 〃			S1 - S3	
	〃 - I			(A) - 〃			S2 - 〃	
Calling on Signa	Kiaracondong - D1			L1 - S4			〃 - S4	
	〃 - D2			〃 - S3			S3 - L1	
							S4 - 〃	

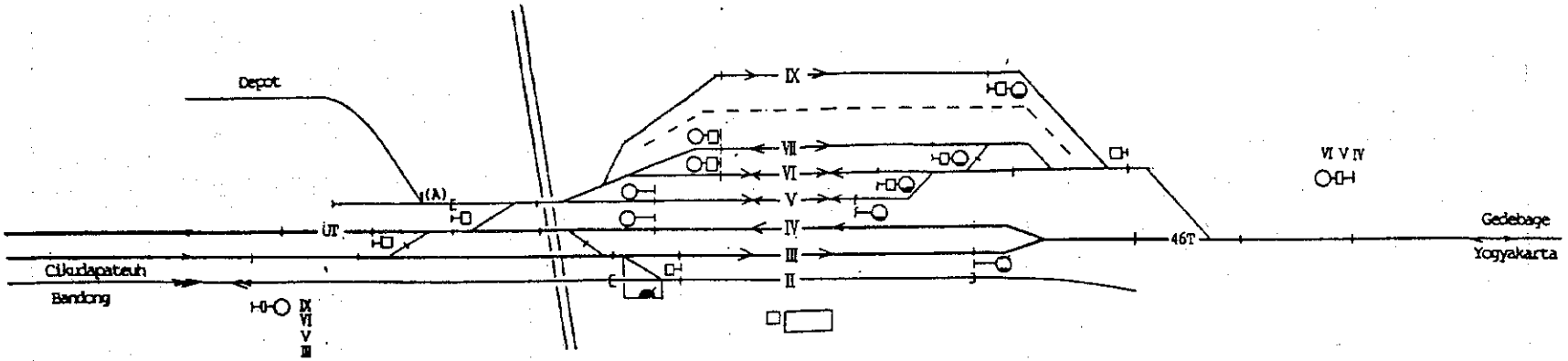
A-2-3

Appendix 2-3(3) Route Table at Gedebage (2008)

Automatic Signalization
Preceding

K I A R A C O N D O N G

(URGENT PROGRAM BY 1997)



Signal	Route	Remarks
Home Signal	Cikudapateuh - III	
	〃 - V	
	〃 - VI	
	〃 - IX	
Starting Signal	VII - Cikudapateuh	
	VI - 〃	
	V - 〃	
	IV - 〃	
	III - Gedebage	
	V - 〃	
	VI - 〃	
	VII - 〃	
	IX - 〃	

Signal	Route	Remarks
Home Signal	Gedebage - VI	
	〃 - V	
	〃 - IV	
Shunting Signal	UT - II	
	〃 - V	
	〃 - VI	
	〃 - VII	
	(A) - V	
	〃 - VI	
	〃 - VII	
	VII - UT	
	〃 - (A)	
	VI - UT	
	〃 - (A)	

Signal	Route	Remarks
Shunting Signal	II - UT	
	46T - IX	
	〃 - VII	
	〃 - VI	
	IX - 46T	
	VII - 〃	
	VI - 〃	

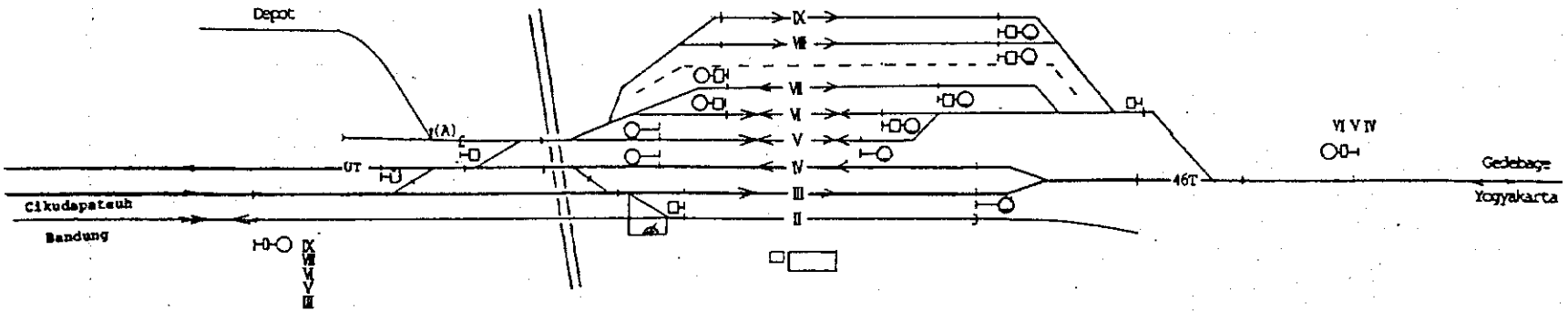
A-2-4

Appendix 2-3(4) Route Table at kiaracondong (1997)

Automatic Signalization
Preceding

K I A R A C O N D O N G

(F/S PROGRAM BY 2003)



Signal	Route	Remark
Home Signal	Cikudapateuh - III	
	〃 - V	
	〃 - VI	
	〃 - VIII	
	〃 - IX	
Starting Signal	VII - Cikudapateuh	
	VI - 〃	
	V - 〃	
	IV - 〃	
	III - Gedebage	
	V - 〃	
	VI - 〃	
	VII - 〃	
	VIII - 〃	
	IX - 〃	

Signal	Route	Remark
Home Signal	Gedebage - VI	
	〃 - V	
	〃 - IV	
Shunting Signal	UT - II	
	〃 - V	
	〃 - VI	
	〃 - VII	
	(A) - V	
	〃 - VI	
	〃 - VII	
	VII - UT	
	〃 - (A)	
	VI - UT	
	〃 - (A)	
	II - UT	

Signal	Route	Remark
Shunting Signal	46T - IX	
	〃 - VIII	
	〃 - VII	
	〃 - VI	
	〃 - V	
	IX - 46T	
	VIII - 〃	
	VII - 〃	
	VI - 〃	

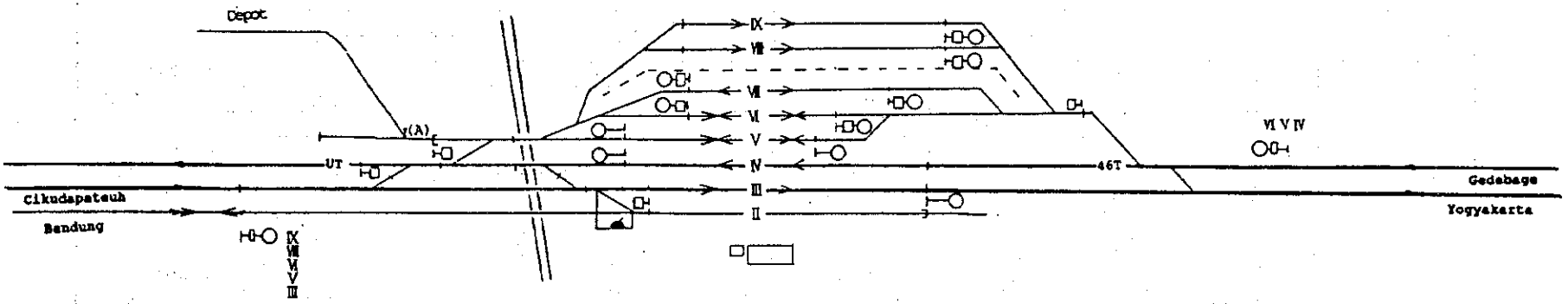
A-2-5

Appendix 2-3(5) Route Table at kiaracondong (2003)

Automatic Signalization
Preceding

K I A R A C O N D O N G

(M/P PROGRAM BY 2008)



Signal	Route	Remark
Home Signal	Cikudapateuh - III	
	〃 - V	
	〃 - VI	
	〃 - VIII	
	〃 - IX	
Starting Signal	VII -Cikudapateuh	
	VI - 〃	
	V - 〃	
	IV - 〃	
	III - Gedebage	
	V - 〃	
	VI - 〃	
	VII - 〃	
	VIII - 〃	
	IX - 〃	

Signal	Route	Remark
Home Signal	Gedebage - VI	
	〃 - V	
	〃 - IV	
Shunting Signal	UT - II	
	〃 - V	
	〃 - VI	
	〃 - VII	
	(A) - V	
	〃 - VI	
	〃 - VII	
	VII - UT	
	〃 - (A)	
	VI - UT	
	〃 - (A)	
	II - UT	

Signal	Route	Remark
Shunting Signal	46T - IX	
	〃 - VIII	
	〃 - VII	
	〃 - VI	
	〃 - V	
	IX - 46T	
	VIII - 〃	
	VII - 〃	
	VI - 〃	

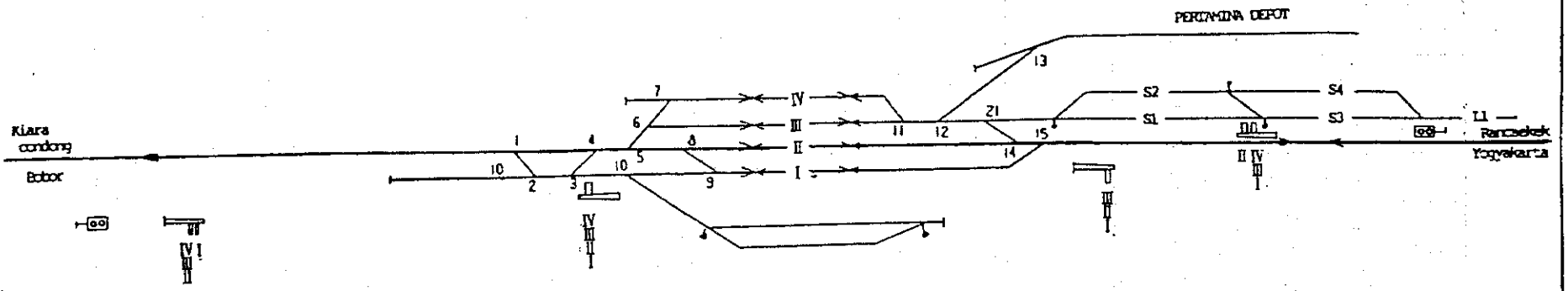
A-2-6

Appendix 2-3(6) Route Table at kiaracondong (2008)

Doubling Track Preceding

G E D E B A G E

(URGENT PROGRAM BY 1997)



Signal	Route	Remarks
Home Signal	Kiaracondong - Ⅰ	
	〃 - Ⅱ	
	〃 - Ⅲ	
	〃 - Ⅳ	
Direct Route	Kiaracondong - Rancaekek	
Starting Signal	Ⅳ - Kiaracondong	
	Ⅲ - 〃	
	Ⅱ - 〃	
	Ⅰ - 〃	

Signal	Route	Remarks
Starting Signal	Ⅰ - Rancaekek	
	Ⅱ - 〃	
	Ⅲ - 〃	
Direct Route	Rancaekek - Kiaracondong	
Home Signal	Rancaekek - Ⅲ	
	〃 - Ⅱ	
	〃 - Ⅰ	

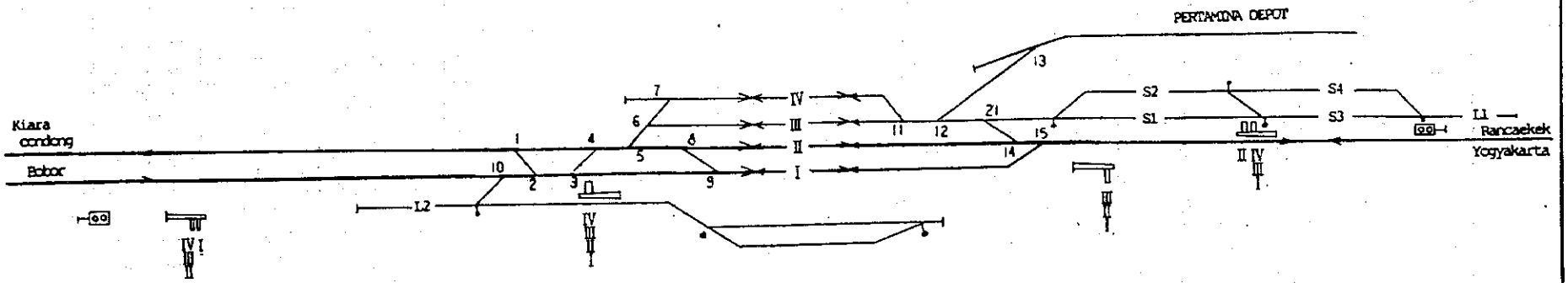
A-2-7

Appendix 2-3(7) Route Table at Gedebage (1997)

Doubling Track Preceding

G E D E B A G E

(URGENT PROGRAM BY 1998)



Signal	Route	Remarks
Home Signal	Kiaracondong – I	
	〃 – II	
	〃 – III	
	〃 – IV	
Direct Route	Kiaracondong – Rancaekek	
Starting Signal	IV – Kiaracondong	
	III – 〃	
	II – 〃	
	I – 〃	

Signal	Route	Remarks
Starting Signal	I – Rancaekek	
	II – 〃	
	III – 〃	
Home Signal	Rancaekek – III	
	〃 – II	
	〃 – I	

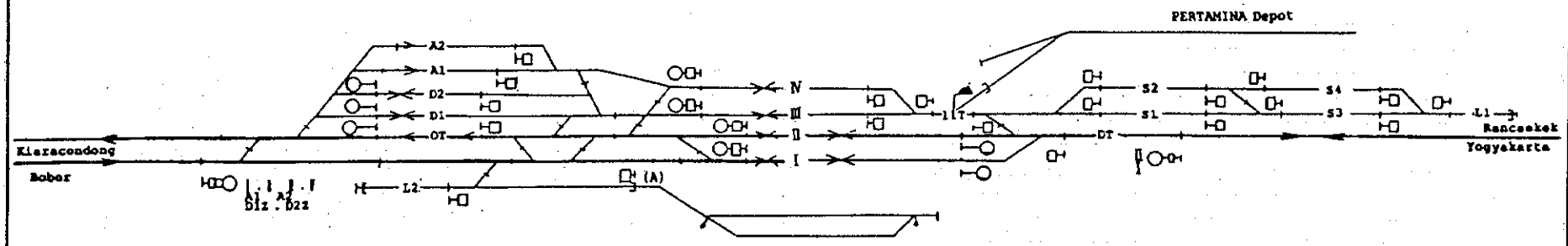
A-2-8

Appendix 2-3(8) Route Table at Gedebage (1998)

Doubling Track Preceding

G E D E B A G E

(F/S PROGRAM BY 2003)



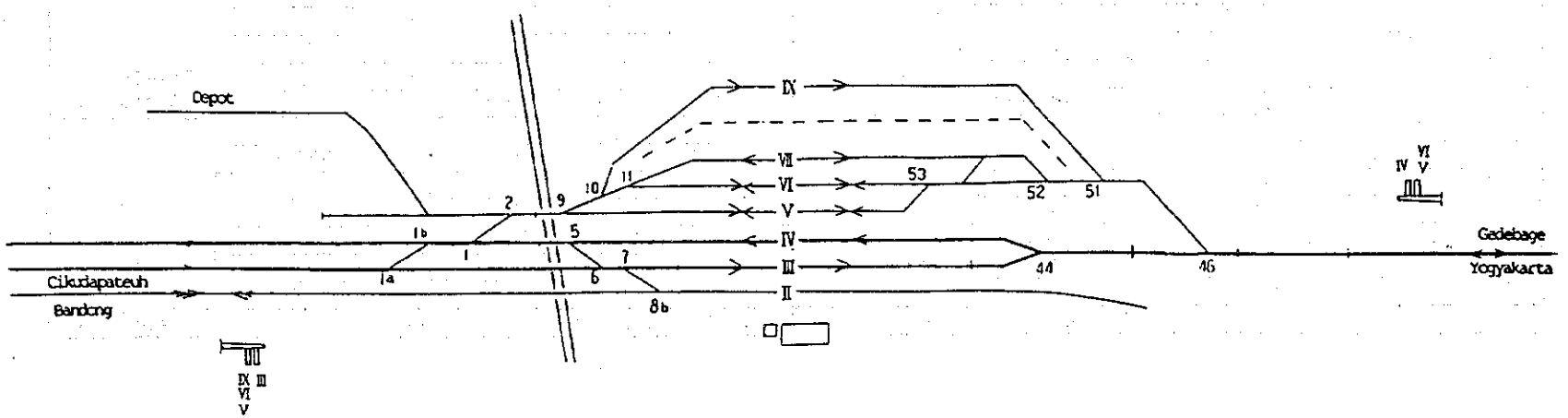
Signal	Route	Remarks	Signal	Route	Remarks	Signal	Route	Remarks
Home Signal	Kiaracondong- I		Shunting Signal	L2 - (A)		Shunting Signal	S4 - S2	
	〃 - II			〃 - I			S3 - 〃	
	〃 - III			〃 - II			〃 - S1	
	〃 - IV			〃 - IV			S2 - IV	
	〃 - A1			D1 - III			〃 - III	
	〃 - A2			D2 - 〃			〃 - 11T	
First Starting Signal	IV - OT			A1 - 〃			S1 - IV	
	III - 〃			〃 - IV			〃 - III	
	II - 〃			A2 - III			〃 - 11T	
	I - 〃			〃 - IV			DT - II	
Starting Signal	D2 - Kiaracondong			IV - A2			〃 - I	
	D1 - 〃			〃 - A1			III - DT	
Second Starting Signal	OT - 〃			〃 - L2			〃 - S1	
				III - A2			〃 - S2	
				〃 - A1			IV - DT	
Starting Signal	I - Rancaekek			〃 - D2			〃 - S1	
	II - 〃			〃 - D1			〃 - S2	
				II - L2			11T - DT	
Home Signal	Rancaekek - II			I - 〃			S1 - S3	
	〃 - I			(A) - 〃			S2 - 〃	
Calling on Signa	Kiaracondong - D1			L1 - S4			〃 - S4	
	〃 - D2			〃 - S3			S3 - L1	
							S4 - 〃	

Appendix 2-3(9) Route Table at Gedebage (2003)

Doubling Track Preceding

KIARACONDONG

(URGENT PROGRAM BY 1997)



Signal	Route			Remarks
Home Signal	Cikudapateuh	-	III	
	〃	-	V	
	〃	-	VI	
	〃	-	IX	
	Karees	-	II	
Direct Route	Cikudapateuh	-	Gedebage	
Starting Signal	VII	-	Cikudapateu	
	VI	-	〃	
	V	-	〃	
	IV	-	〃	

Signal	Route			Remarks
Starting Signal	II	-	Karees	
	III	-	Gedebage	
	V	-	〃	
	VI	-	〃	
	VII	-	〃	
	IX	-	〃	
Home Signal	Gedebage	-	VI	
	〃	-	V	
	〃	-	IV	

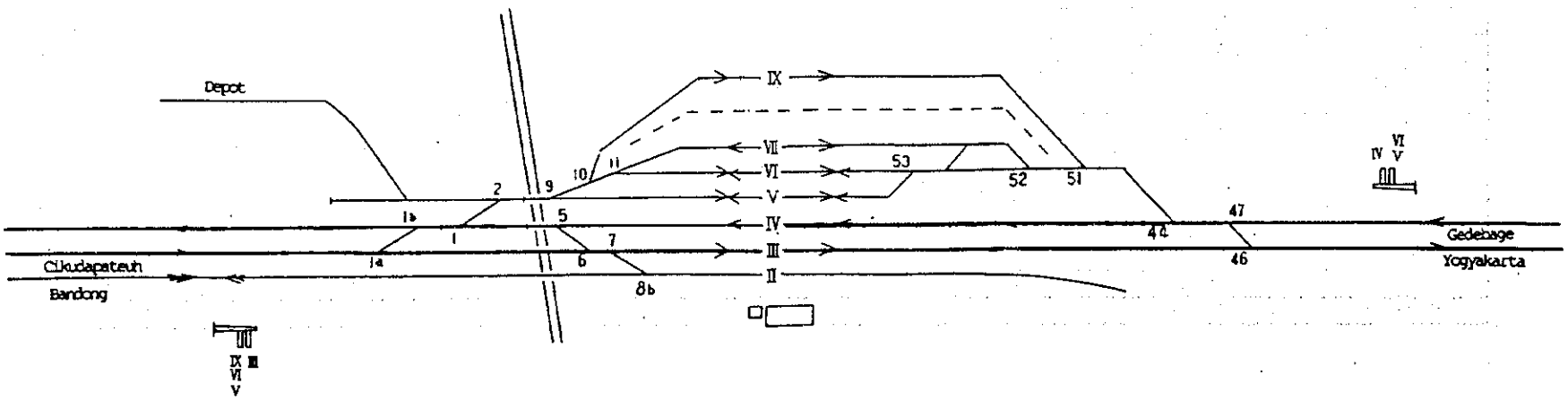
A-2-10

Appendix 2-3(10) Route Table at kiaracondong (1997)

Doubling Track Preceding

KIARACONDONG

(URGENT PROGRAM BY 1998)



Signal	Route	Remarks	Signal	Route	Remarks
Home Signal	Cikudapateuh - III		Starting Signal	III - Gedebage	
	〃 - V			V - 〃	
	〃 - VI			VI - 〃	
	〃 - IX			VII - 〃	
				IX - 〃	
	Karees - II				
Starting Signal	VII - Cikudapateu		Home Signal	Gedebage - VI	
	VI - 〃			〃 - V	
	V - 〃			〃 - IV	
	IV - 〃				
	II - Karees				

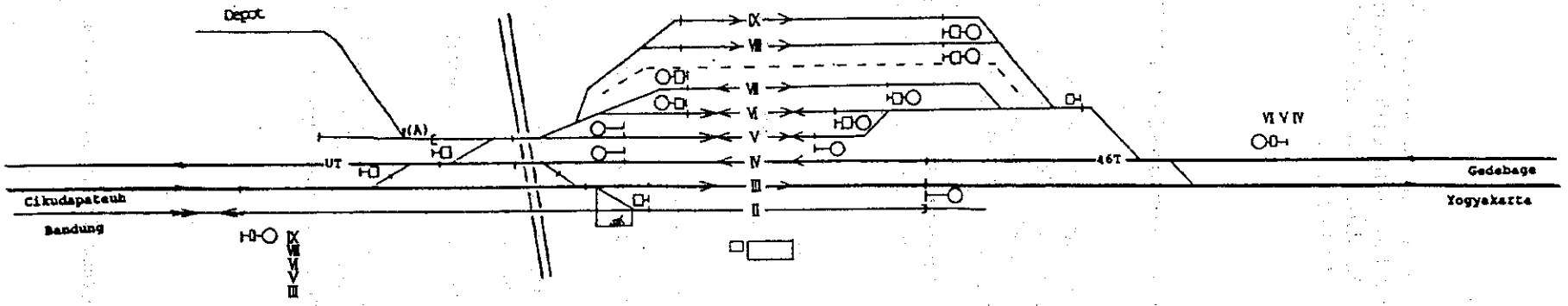
A-2-11

Appendix 2-3(11) Route Table at kiaracondong (1998)

Doubling Track Preceding

K I A R A C O N D O N G

(F/S PROGRAM BY 2003)



Signal	Route	Remark
Home Signal	Cikudapateuh - III	
	〃 - V	
	〃 - VI	
	〃 - VIII	
	〃 - IX	
Starting Signal	VII - Cikudapateuh	
	VI - 〃	
	V - 〃	
	IV - 〃	
	III - Gedebage	
	V - 〃	
	VI - 〃	
	VII - 〃	
	VIII - 〃	
	IX - 〃	

Signal	Route	Remark
Home Signal	Gedebage - VI	
	〃 - V	
	〃 - IV	
Shunting Signal	UT - II	
	〃 - V	
	〃 - VI	
	〃 - VII	
	(A) - V	
	〃 - VI	
	〃 - VII	
	VII - UT	
	〃 - (A)	
	VI - UT	
	〃 - (A)	
	II - UT	

Signal	Route	Remark
Shunting Signal	46T - IX	
	〃 - VIII	
	〃 - VII	
	〃 - VI	
	〃 - V	
	IX - 46T	
	VIII - 〃	
	VII - 〃	
	VI - 〃	

Appendix 2-3(12) Route Table at kiaracondong (2003)

Appendix 3-1

3 Environmental impact assessment(EIA)

Environmental impact assessment in railway division on THE STUDY ON THE MASTER PLAN OF CONTAINER CARGO HANDLING PORTS, DRY PORTS AND CONNECTING RAILWAYS IN THE REPUBLIC OF INDONESIA is conducted at three project location as follows :

i) Dry port Gedebage Bandung

ii) Dry port Kiaracondong Bandung

iii) Approach to Tanjung Priok container terminal-III(TCT-III) in Jakarta

Environmental impact assessment on the activity of three project sites above mentioned, improvement of dry port Gedebage, improvement of dry port Kiaracondong, approach to TCT-III, these three activities are not obliged to complete ANDAL study.

The word "ANDAL" stands for Environmental Impact Analysis(Analisis Dampak Linkungan) in government regulation of Indonesia.

3.1 Method of study

The methodology is carried out are by primary data and secondary data collecting.

3.1.1 Environmental component to be analyzed

The environmental component that should be analyzed in this study covers:

(1) Physical-chemical component, among others : climate, water quality, air quality, Noise, sediment

(2) Biological component that covers biota surrounding the project area.

(3) Socio-economic component that covers demography, economic activities, standard of living land use, public facilities infrastructure, public health and community perception to the development.

3.1.2 Data collecting method

(1) Primary data

The primary data which is collected comprises of primary data

of physical-chemical component, biological component and socio-economic component. Physical-chemical and biological primary data are collected directly from the fields, in taking the samples it should fallow the sampling and the method in sampling in line with the existing technical provisions. Socio-economic primary data are collected by direct interview upon the people who live at the border of the study area.

(2) Secondary data

Secondary data covers physical-chemical, biological and socio-economic data that are collected through literature study in the form of statistical data, research reports and working paper.

3.1.3 The method in analysis of a sample, management and processing of data

The result of sampling is analyzed according to type of data and existing technical requirements. The result of the analysis is presented in the form of table, figure/map.

3.1.4 The method of impact prediction and impact evaluation

To predict the impact of improvement activity of Gedebage dry port used for estimating the environmental impacts, among others, are built from series consultation and discussion with experts, resources, responsible institutions and the concerned societies, supported by field investigation and the observation result.

The objective of impact evaluation is to a get general conclusion of the environmental impacts that may happened because of implementing the project. The approach used in evaluating the environmental impacts is rating technique that accommodated elements, showing relative differences of one criterion from another criterion using the following scale :

i) Extremely significant is scored by " A "
ii) Significant is scored by " B "
iii) Almost significant is scored " C "
iv) Less significant is scored " D "

3.2 Environmental impact assessment at dry port Gedebage

3.2.1 Present environment situation

(1) Physical-chemical component

a. Water quality

The water samples is taken from 4 points within the Gedebage station(see Fig.3-2-1(1), Table A 3-2-1(1).

1) Ammonia(NH3-N) detected in Cisranten river ranges from 0.445 mg/1 - 0.916 mg/1 with the worth condition found in station A-4 in comparison with the other sample location. This Ammonia content (NH3-N) has exceeded maximum-limit standard decided which is 0.02mg/1.

2) Copper(Cu)detected in the water ranges from 0.030 mg/1- 0.044 mg/1, whereas the maximum limit of standard for Copper is only 0.02 mg/1.

3) Zinc(Zn)content in the water, has exceeded the maximum-limit of standard by 5 time, ever the station 4 sample had exceeded the maximum-limit of standard 10 times from. For that, it is detected that zinc content in water ranges from 0.114 mg/1-0.283 mg/1, whereas the maximum-limit is only 0.02 mg/1.

4) For lead content(Pb), it is only station A-1 and A-2 that has already exceeded the limited value. The lead content in station A-1 and A-2 detected range from 0.047 mg/1-0.072 mg/1.

5) For the whole stations, the selenium content(Se)detected ranges from 0.104 mg/1-0.m/1, whereas the maximum-limit standard is 0.m/1.

6) For detergent content, it is still one station (station 2) that has exceeded the maximum-limit of standard, while the other 3 station has nearly exceeded the standard of 0.02mg/1 with the content of 0.025mg/1.

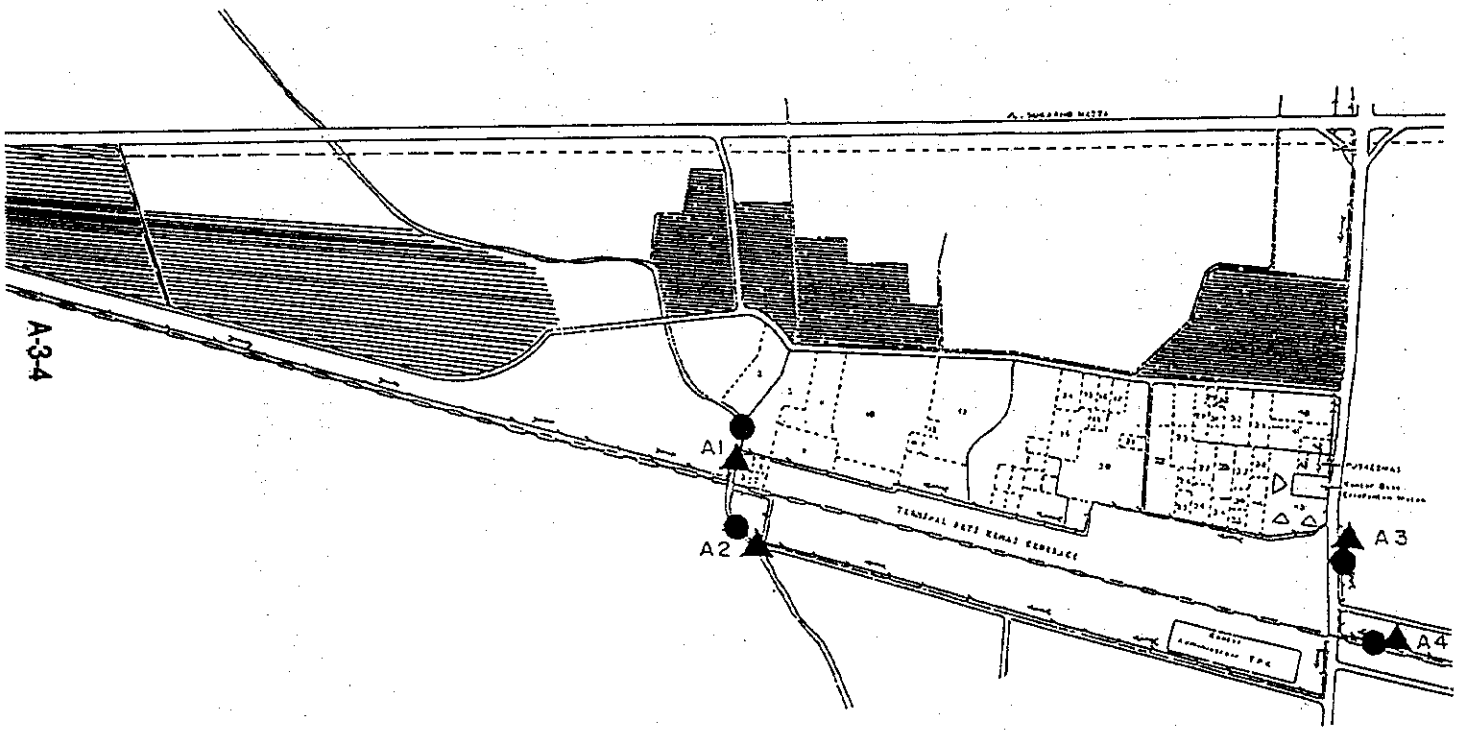
7) Cadmium(Cd)for the whole station has exceeded the maximum-limit of standard, where it is detected that Cd content ranges from 0.032mg/1-0.039mg/1 whereas the maximum-limit of standard is 0.01mg/1.

8) Only in station A-1 and A-2 where the Cianide(Cn)has exceeded the maximum limit of standard. Cn content in these locations ranges from 22.88 x 10 negative cubed mg/1, whereas the standard is 0.02 mg/1.

9) For Chrome Heksavalen(Cr6), the entire sampling water in Cisaranten river has exceeded the maximum limit of standard. The detected Cr6 content ranges from 0.127mg/1-0.157mg/1 whereas the quality standard is 0.05mg/1.

b. Air quality

The parameters of polluted substance that will be measured to know the air quality at the Gedebage container terminal and its



LEGEND :

HOUSING

STREET

DRAINAGE

RIVER

RAILWAY

SAMPLING LOCATION WATER QUALITY

SEDIMENT AND BENTHIC

Fig. 3-2-1(1) Sampling location at Gedebage station

surrounding are the level of noise, the level total dust content, sulphur dioxide(SO2), Hydrogen Sulfide(H2s), Nitrogen Dioxide(NO2), and Ammonia(NH3). It is estimated that the content of polluted substance has a strong connection with the activity of container transportation, both in the form of train of truck container. The other factors that could cause air pollution comes from the environment outside the activity of Gedebage container terminal such as the motor vehicle passing through the highway at the side of the container location terminal, which is relatively crowded. It is also caused by garbage and bad sanitation in the housing land around the location.

(2) Biological component

Water biota which is identified is listed in Table A 3-2-1(2)-(4).

(3) Socio-economic component

a. Land use

For the radius of about 2-3 kilometer from the container terminal location, the land use is dominated by agricultural and residential area.

In the west side of the container terminal location, the land use is dominated by housing land, although the existence of agricultural land is still quiet significant. In the northern side of container terminal, land use is dominated by agricultural land, such as farm land/wet rice field. In the northern east side of Soekarno-Hatta street in the northern side of container terminal location, there is industrial land use at many separated places. It could be said that the position of container terminal location is in the very marginal(outskirts) area of Bandung development city, specifically by observing the condition of container terminal location which apparently becomes a boarder between the developed area(housing in the western side) and the agricultural area(wet rice field in the eastern side).

In that regard, if the land use is more focused on the areas around the container terminal location, which are predicted to be affected by the impacts of container terminal,i.e. the Cisaranten Wetan subdistrict area, Cisaranten Kidul, and Derawati area.

b. Demography

The study area for the demography survey was administrated in Cisaranten Wetant subdistrict. The study location is decided by the though that those location will as most affected by the project's impact.

The number of households in the location is more-less 1,250 people in 250 households. About 63% of the people is local citizens, and 20% comes from Java, 3% from Sumatra and 12% others.

About 70% of the people have lived there for more 20 years. The people's education is 70% graduate from Senior high school, 36% graduate from elementary school, 16% graduate from junior high school, 7% experienced elementary school and 20% of people have no experience in formal education.

Economic activity which are available in trade area are; 52% of department store, 20% of clothing store, 10% of jewelry store, 10% of food store, 8% pharmacy.

The main occupation of respondent are 39% employee, 28% skilled worker, 13% unskilled worker, 10% agricultural worker and 3% others.

The respondent's earning per month are 33% have more than 250,000 Rp of income, 10% between Rp 201,000-250,000, 20% between Rp 151,000-200,000, 26% between 101,000-150,000 and 10% 50,000-100,000.

c. Housing condition

The housing status in this area as follows ; 83% own their own house, 13% rented or contracted house and 6% share other person house.

The land status is ; 86% of inheritance land and 14% of certificated land.

The source of drinking water usually supplied by well and PAM and waste discharge management is commonly done by burning the waste.

d. The society's health

The term of the society's health condition, this is studies by observing diseases that commonly harm the people in the study area which are cough,diarrhea and other minor disease.

The people habit treatment has shown good condition where the people has used to go to hospital, doctor and the Center of Society's Health (Puskesmas)for their treatment, even there is still some who do their own treatment.

e. The society security and orderliness

In term of society's security and orderliness in this area is found to be relatively good, where about 47% of people said

relatively secure condition of their neighborhood and 47% mentioned secure and very secure.

3.2.2 The predicted impact, management effort and consideration

(1) Construction phase

a. Physical-chemical component

i) The increase of dust

- Source of impact

  The increasing of dust in the environmental is predicted by the activities of digging and filling the land.

- Type of impact and its measurement

  The type of impact predicted by the activities of digging and filling the land is the increasing dust content in the environment. During the dry season the dust will fly all around that could disturb the environmental condition.

- Criteria of impact and impact characteristic

  The increase of dust content is considered as almost significant impact.

ii) Water quality

- Source of impact

  The change in water quality of Cisaranten river will come from the construction of bridge.

- Type of impact and its measurement

  The impact will be the increasing turbidity content of suspended solid, color and dissolved solid, also the relatively high physical alternation which will then affect the plankton and benthos. However, the impact will not go on too long and the intensity of impact is low. Viewing that condition, the impact is classified as almost significant impact.

- The criteria of impact and impact characteristic

  The decrease of water quality will affect the water biota and considered negative impact to be managed. The standard for evaluation is the affluence, diversity index.

(2) Service and maintenance phase

a. Physical-chemical component

i) The quantity of surface water

- Source of impact

Flood is the source of impact in the service and maintenance phase. Flood problem is not actually caused by the project activities, since the development of the residential area surroundings the container terminal as the silting up of Cisaranten river. The rain will cause the overflow of water to the residential area. The increase of water because of the overflow of water to the residential area. The increase of water to the residential area. The increase of water because of the overflow cannot be retain is not adequate to retain of water.

Table 3-2-2(1) shows the environmental management efforts and consideration for dry port Gedebage.

3.3 Environmental impact assessment at dry port Kiaracondong

3.3.1 Present environmental situation at dry port

(1) Physical-chemical component

a. Water quality

Water sample was taken in Cidurian river branch which constitutes the nearest waterbed in Kiaracondong station. The water samples was taken in two location which is essential enough to determine parameter condition of the river branch(see Fig.3-3-1(1)).

The results of the water quality analysis were compare with West Java standards as established by the namely Governor Decree Number 38, 1991 category B, C and D where this river branch of Cidrian is utilized for agriculture and fishery.

In general, water quality condition(see Table A 3-3-1(1)) at river branch Cidurian such as follows :

- Physical characteristics

1) Suspended solids in Cidurian river branch were detected to be in the range of 308-358mg/l which is below the standard level 1000 mg/l.

- Chemical characteristics

1) Chloride(Cl) in the river were detected to be in the range of 97.49mg/l-141.80mg/l. This values are exceeded the standards of 6.00mg/l.

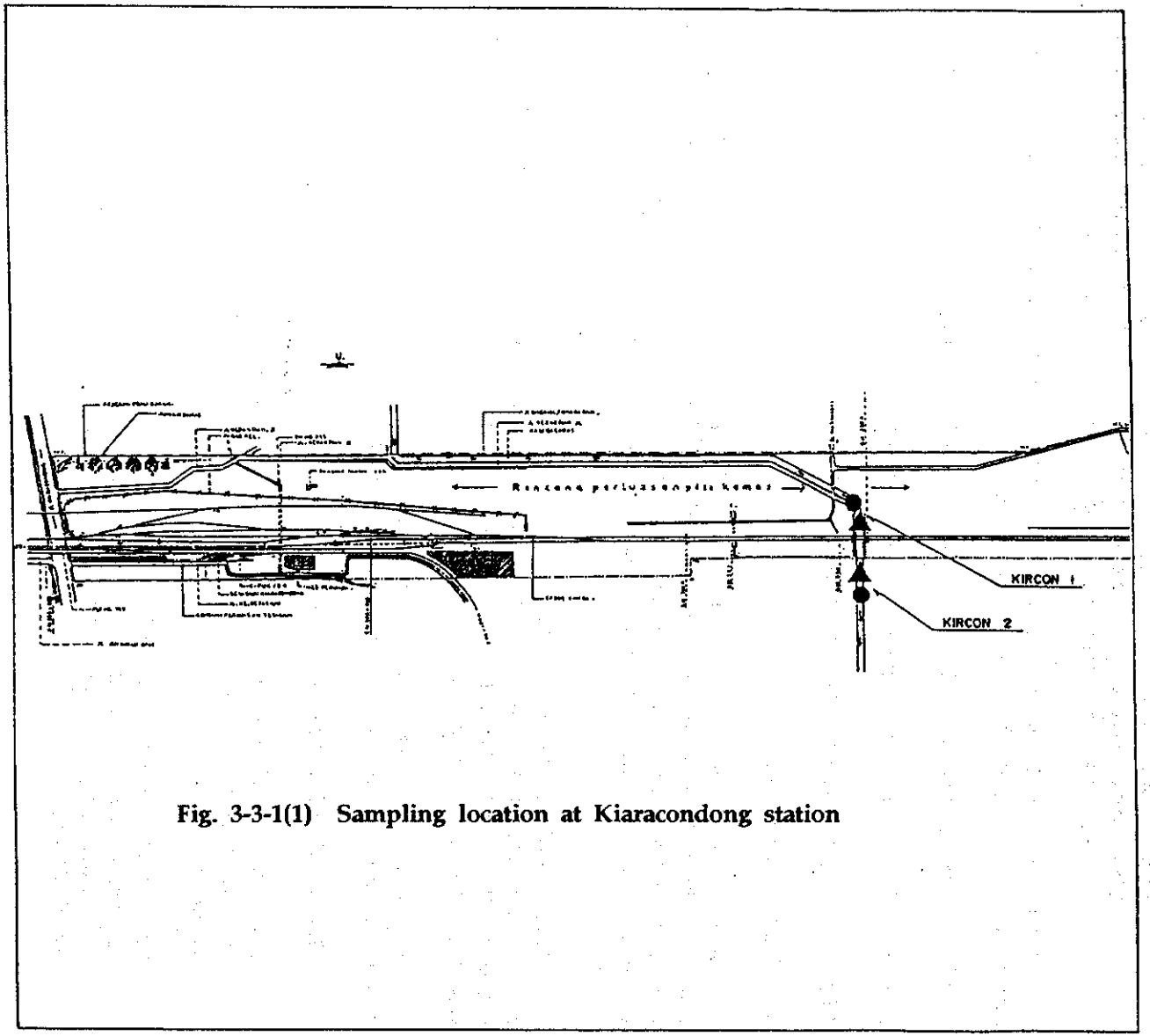


Fig. 3-3-1(1) Sampling location at Kiaracondong station

2) Ammonia(NH3-N) in Cidurian stream detected to be in the range of 0.061 mg/l-1.121mg/l. this values exceeded the standards of 0.02mg/l.

3) Copper(Cu) detected to be in the range 0.047mg/l-0.048. this values exceeded the standard of 0.02mg/l.

4) Zinc(Zn)in the stream is detected to be in the range of 0.201mg/l-0.203mg/l. The standard value is 0.02mg/l.

5) Lead(Pb)in the stream detected to be in the range of 0.036mg/l-0.056mg/l. The standard for this parameter is 0.03mg/l.

6) Selenium(Se) in the stream detected to be in the range of 0.117mg/l-0.121mg/l. The standard for this parameter is 0.01mg/l.

7) Cadmium(Cd) detected to be in the range of 0.044mg/l-0-.047mg/l. The standard value for this parameter is 0.01mg/l.

8) Chrome Hexavalent(Cr6+) also higher than the standard, Cr6+ detected to be in the range of 0.132mg/l-0.137mg/l.

(2) Biological component

a. Water biota

1) Plankton

Plankton is microorganism which is movement most affected by water hydrodynamic. Plankton posts the first rank in food-chain. Plankton, in this case phytoplankton could get the benefit of water nutrient. On the other hand, Zooplankton could enrich the quality of water nutrients by consuming photoplankton. The alternation of the environment influence to the plankton behavior and life cycle. Sensitivity against the alteration of environment will be an adequate indicator for ecological evaluation.

Bad river condition such as garbage, slow stream, etc. Will influence the type of plankton. Ecological stress affects the species of plankton. Only two species of phytoplankton were found in Cidurian river branch, but the abundance was fair enough.

2) Benthos

Benthos is a kind of fine biota that inhabits riverbed. Viewing the benthic manner of consuming food, benthic is classified as a filter feeder by filtering plankton, particles,etc. This life characteristics makes benthos a good indicator for ecological evaluation of substrate on sediment. Like plankton, benthos found in the Cidurian river branch, in

Kiaracondong has very few in species. Only three species of benthos was found with very low density.

Its diversity index was low, which means that the ecosystem was unstable. It is because of the poor condition river characterized by full of garbage and detritus deterioration. To summarize, ecological stress in the riverbed is quite high.

The list of the water biot in the Cidurian river branch is shown in Table A 3-3-1(2)-(4)

(3) Socio-economic component

a. Demography

Location of the study in Kiaracondong was divide four places :

i) Location where there is residential area which will be acquitted.
ii) Location where the residential area located in Perumka land.
iii) Location where the residential area located outside Perumka land.
iv) Location where the residential area located along the railway track from Kiaracondong station to Gedebage station.

i)Location where there is residential area which will be acquitted

The real of family head will be acquitted is about 250 which located along the railway track owned by Perumka. It covers around 500 meters length and 15 meter width. Origin of the population consists of 36% local people, 32% from West Java, 28% from Central Java and 4% from East Java.

Duration of stay 40% more than 16 years, 4% between 11-15 yr.,24% 6-10 yr. and 32% 0-5 yr..

Background education of respondent are 72% elementary school graduate, 8% junior high school graduate, 8% senior high school graduate, The rest are 8% not finished elementary school and 4% no formal education.

Main job of respondent are 40% unskilled labor, 20% skilled labor, 20% office employee, 12% merchant and 8% businessman.

Monthly income of respondents are 60% Rp. 100,000-200,000, 20% Rp.0 - 100,000, 16% Rp. 200,000-300,000 and 4% more Rp.300,000.

ii) Location where residential area located inside Perumka land

The total of family head is 1750 located inside Perumka land. Population origin comes 38% from West Java, 32% Central Java, 17% local people and 8% from East Java.

Duration of stay 40% between 0-5 years, 25% 6-10 yr., 18% 11-15 yr. and 16% more than 16 yr..

Background education of respondents are 39% elementary school graduate, 20% junior high school, 32% senior high school, 6 % academy/university and 2 % no formal education.

Main job of respondents are 41% office employee, 14% unskilled labor, 7% skilled labor and 14% others.

Monthly income of the respondents are 32% over Rp.250,000, 24% Rp. 200,000-250,000, 16% Rp.150,000-200,000, 16% Rp.100,000-150,000 and 12% Rp.50,000-100,000.

iii) Location where residential are located outside Perumka land

Population origin are 68% from West Java, 12% local people, 9% Central Java, 7% East Java and 4% others.

Duration of stay 28% between 16-20 years, 25% 0-5 yr., 21% 6-10 yr., 7% 11-15 yr. and 19% more than 20 yr..

Background education of respondents are 24% elementary school graduate, 13% junior high school, 33% senior high school, 22% academy/university and 4 % no formal education.

Main job of respondents are 43% office employee, 14% merchant, 9% unskilled labor, 13% skilled labor 8% businessman and 13% others.

Monthly income of the respondents are 33% over Rp.250,000, 10% Rp. 200,000-250,000, 20% Rp.150,000-200,000, 26% Rp.100,000-150,000 and 10% Rp.50,000-100,000.

iv) Location where residential area located along the railway track from Kiaracondong station and Gedebage station.

Population originate 80% from West Java, 16% from Central Java and 4% from others.

Duration of stay 35% between 0-5 years, 36% 6-10 yr., 16% 11-15 yr. and 8% 16-20 yr. and 4% more than 21 years.

Background education of respondents are 4% elementary school graduate, 16% junior high school, 48% senior high school, 32 % academy/university.

Main job of respondents are 84% office employee, 14% 4%

skilled labor 4% merchant, 4% businessman and 4% others.

Monthly income of the respondents are 32% more than Rp.400,000, 32% Rp. 300,000-400,000, 20% Rp.200,000-300,000 and 12% Rp.100,000-200,000.

b. Housing condition

i) Location where there is residential area which will be acquitted.

The status of the housing are 100 % owned by the community and the status of the land are free using of the government land(Perumka). The distance between the project and residential area is 50-100 meter.

The condition of houses are 93% good and the others(8%) are bad.

The sources of drinking water are : 76% from water pump, 10% from local water supply company and 8% from well. The quality of water : about 75% respondents gave bad point.

The waste disposal system : dumping the waste to a certain location nearby the railway track.

In general, 100% of the respondents, satisfied to live there and all of the realize that the location is highly populated yet.

ii) Location where the residential area located in Perumka land.

The status of the housing are 82% owned by the community, 14% rental, 2% stay with their family and 1% free using of the houses. The status of the land are 100% Per 100% Perumlka owned.

The distance between project to residential area are 90% around 50-100 m and 10% around 101-200 m. The house condition are 77% good and 13% fair.

The house condition are : 77% fair and 13% bad.

The drainage condition are 68% normal, 9% good and 8% bad.

The drinking water source consists of 46% from local water supply company, 41% water pump and 12% well. The water quality are : 32% of respondents gave good point, 25% fair point and 16% bad point.

The waste disposal system : all of the wastes collected by a certain appointed individual and they dumped.

In general, all the respondents said they are satisfied to live in neighborhood, although they still have some objections to their environment such as : 21% noise, 17% dirty surroundings, 14% very hard to get public transportation, 14% highly populated, 13% the lack of market place and 10% far from the market.

iii) Location where the residential area located outside Perumka land.

Status of housing are : 69% owned by the community, 24% rental, 4% live with their family and 3% free of using the houses.

The status of the land are : 49% certificated, 32% uncertificated and 5% inherited land.

The distance between project to the residential area the 37% around 100-200 m, 25% around 200-300 m, 21% 400-500 m, 13% 300-400 m and 3% 50-100 m.

The house condition are : 72% good, 20% fair and 8% bad.

The drainage condition are : 67% normal, 12% good and 21% bad.

The drinking water source consists of : 78% from local water supply company, 13% water pump and 8% well.

The water quality are :e about 81% respondents gave good point, 15% fair and 4% bad point.

The waste disposal system : all the waste collected by the certain appointed individual and then dumped.

In general, 98% respondents said they are satisfied to live in the neighborhood although they still have same objections to their environment such as : 35% highly populated, 24% dirty surrounding, 23% hard to get public transportation, 18% far from their own work places, 5% bad social facilities and 8% not harmonious with the neighborhood.

iv) Location where the residential area located along the railway track from Kiaracondong station to Gedebage station.

The status of the housing are : 100% owned and the status of the land are 100% certificated.

The distance from project to residential area are : 100% around 50-300 m. The house condition are good.

The drainage condition are 100% good.

The drinking water source consists of : 100% from the local water supply company. Water quality are good.

The disposal system : all the wastes collected by a certain appointed individual and dump to the public waste incineration race.

In general, 100% respondents said they are satisfied to live in the neighborhood although they still have some objections to their environment such as 28% highly populated, 20% dirty area, 20% far from their work place, 8% bad social facility and 20% noise.

3.3.2 The predicted impact, management effort and consideration

(1) Pre-construction phase

a. Socio-economic component

i) Residential area which will be acquitted.

- Source of impact

The activity which causes social unrest will be : plan of the acquisition of residential are located on the proposed double tracking area.

- Type of measurement of impact

The impact of the social unrest will be experienced by 250 family heads which live 500 m along the railway track and 15 m beside the rail.

- Characteristics and parameter of impact

The impact characteristic of residential acquisition is important to manage and the impact parameter is how much the compensation to be paid for residential acquisition.

- Management effort and consideration

Community social unrest in area where there will be the land acquisition for the construction of double track railways.

1) Giving information and clarification regarding the objectives of the project of double tracking railways construction in the interest of the state and for public importance.

2) Channeling the community to Perumka and the local government of Bandung in order to get the fair

figures of compensation based on mutual benefits.

(2) Construction phase

a. Dust increase

- Source of impact

The activities which causes the increasing of dust will be digging and fill works.

- Type and measurement of impact

The impact caused by digging and fill activities will be dust increased surrounding the project activity, especially during the dry season when the dust will spread according to the direction of the wind.

- Characteristics and parameter of impact

The impact increasing of the dust is important characteristics to be managed. The reference parameter used as per West Java Governor Decree No.660.31/SK/649-BKPMD/82.

- management effort and consideration

1) Routine watering, especially in dry season, especially in dry season, should be done in project location in order to keep the soil wet.

b. Water quality

- Source of impact

The activities which caused the alteration of the water quality in Cidurian river , branch will come from bridge construction activities.

- Type of turbidity, suspended solids, dissolved solids could increased surrounding Cidrian river branch.

- Characteristics and parameter of impact

The decrease of water quality of Cidurian branch river caused by railway bridge construction is important to be managed.

- Management effort and consideration

1) Protecting the water quality by means of Cidurian river branch surrounding the railway bridge construction, by meaning of simple screen such as : silt

screen made from bamboo.

2) Following proper method in railways bridge construction. Keep the river stream clean from spilled machinery oil originated from heavy equipment used.

c. River water biota

- Source of impact

Project activity of the railway bridge construction will influence the river biota in Cidurian river branch.

- Type and measurement of impact

Type of impact produced will be increased turbidity rate, suspended solid, color and dissolved solids and physical parameters alternation. In turn this change will affected the plankton and benthos. The impact is categorized almost significant .

- Characteristics and parameter of impact

Characteristics of impact of the biota aroused by the construction activity will be temporary. After the construction the impact will stop, the plankton and benthos will become normal naturally.

- Management effort and consideration

1) Protecting the water quality of simple material such as : silt screen made from bamboo.

2) Following proper method in railway bridge construction, in order to preserve benthos and plankton.

(3) Service and maintenance phase

a) Traffic congestion

- Source of impact

Increasing of the activities such as dry port project construction, the traffic of trailer container around the project location will arise the traffic jam, especially at Kiaracondong road which has heavy traffic load at this moment.

- Type and measurement of impact

The characteristics of impact is defined by the intensity of the impact such as increasing of the traffic jam. It is important to be managed by using reference of traffic frequency of the vehicle passing that

- Characteristics and parameter of impact

The characteristics of impact is defined by the intensity of the impact such as increased of the traffic jam. It is important to be managed by using reference of traffic frequency of the vehicle.

- Management effort and consideration

  1) Supporting the local government plan construction of wide road or fly-over in Kiaracondong road.

  2) Regulation the operation time of dry port container terminal.

3.4 Environmental impact assessment at Tanjung Priok container terminal III(TCT-III)

3.4.1 Present environmental situation

(1) Physical-chemical component

a. Water quality

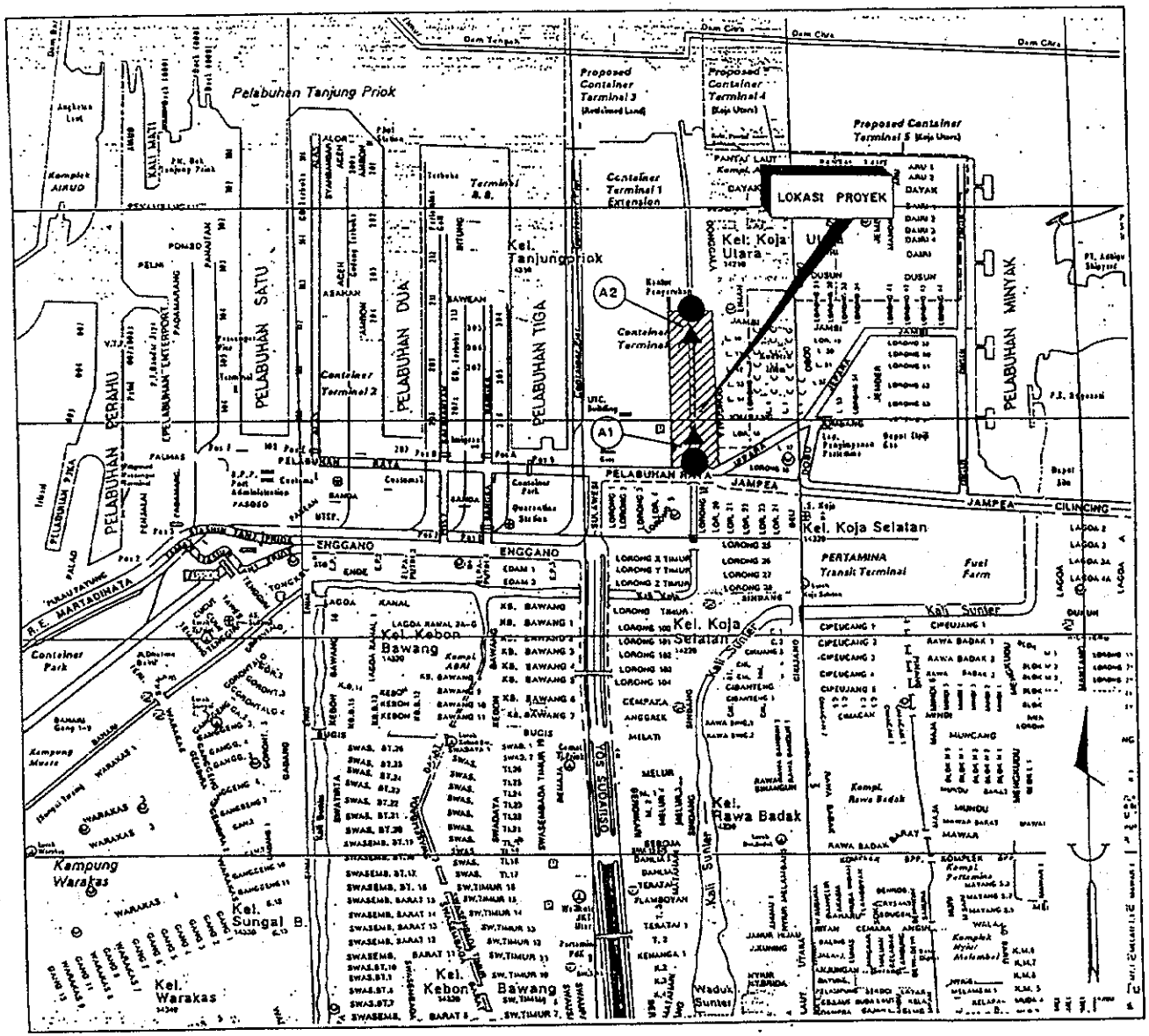
Water sample was taken in railway construction area in Tanjung Priok port, it was conducted in 2 locations(see Fig. 3-4-1(1)) in Koja River where is the main water stream, the stream will be directly impacted by construction of Tanjung Priok port railway.

According to government of Jakarta decree No. 1608 year 1988, Koja river was allocated for fishery B - Type. Sample analysis results were compare with type B reference standard value in that decree.

In general water quality of Koja river is still under standard value, except the following parameter :

i) Turbidity in water stream of Koja river is detected around 40 NTU - 93 NTU. This parameter exceeded the standard value of 50 NTU.But it was still under the maximum allowable limits.

ii) Ammonia(NH3-N) in river stream of Koja was detected in the range of 1.033mg/l - 1.075mg/l, it exceed maximum desirable limits.



LEGEND :

▲ : SAMPLE LOCATION WATER QUALITY

● : SAMPLE LOCATION SEDIMENT, PLANETON AND BENTIC

(A1) (S1) : SAMPLE CODE

Fig. 3-4-1(1) Sampling location at TCT-III

iii) COD was detected in the range of 64.48mg-70.

iv) BOD5 was detected in the range of 35mg/1-50mg/1. it exceeded the standard of 20mg/1.

v) Sulfide concentration(H2S)was detected only in sampling station a-2, which show the 0.14mg/1, it has exceeded the standard.

vi) Lead(Pb)concentration was detected in the range of 0.045-0.075mg/1. the standard is 0.03mg/1.

vii) Zinc(Zn) in sampling point A-2 has exceeded the maximal limits of 0.305 mg/1.

viii) Cadmium(Cd)was detected in the range of 0.039mg/1-0.036mg/1. it has exceeded standard.

ix) Selnium(Se)was detected in the range of 0.134mg/1-0.147mg/1.

x) Barium(Ba)was detected in the range of 0.238mg/1-0-.244mg/1, it exceeded the standard.

xi) Chromium Hexavalent(Cr6)was detected in the range of 0.147mg/1-0.158mg/1. the standard is 0.05mg/1.

xii) Oil and grease concentration was detected in the range of 0.64 - 0.67 mg/1. it exceeded the standard value.

xiii) Phenol was detected in the range of 0.024 - 0.026 mg/1. It has exceeded the standard.

b. Air quality

i) CO concentration was detected in the range 10.057-985ug/m3. The range is not exceeding the standard of 2,260ug/m3.

ii) Sulfer dioxyda(SO2) range 0.221-2.213 ug/m3. the standard is 160ug/m3. Ozon(O3) ranges 20.45-40.06 ug/m3. The standard is 200ug/m3. Nitrogen oxyside(Nox) ranges 23.48ug-98.40ug/m3, the standard is 902.5ug/m3.

iii) Total Hydrocarbon ranges 12.5ug/m3-47.5ug/m3, the standard value is 160ug/m3.

iv) Dust in the air ranges 60.5ug - 275ug/m3. it exceeded the standard of 260ug/m3.

c. Noise level

Noise level in project site ranges 60-85 dBA,it is exceeding

the standard for industrial area 80 dBA.

(2) Biological component

a. Water biota(see Table A 3-4-1(2)-(3))

In project location plankton detected such as 5 types phytoplankton and zooplankton, abundance of plankton was detected in the range 1803 - 15703 md/1.the area is the higher ecological stress.

Benthos community structure appointed poor species condition with index diversity below species this situation appointed less ecosystem stable and higher ecological stress.

(3) Socio-economic component

a. Demography

The location of social, economic and cultural case study was administered in North Koja subdistrict area.

This location was chosen because of the possibility to experience direct impacts of the project activities.

The total population in this area is about 1250 with 200 families head. The respondent's origin is mentioned, 36% local citizen, 48% Java origin, 4% Sumatra and rest 12 % others.

The duration of respondent resident in the location of the study is 64% living for 21 years and more 16% living for 6 - 10 years, 12% living for 16-20 years and 8% living for 11-15 years.

The respondents education is 32 % graduate senior high school, 32% elementary school, 12% formal education and 24% junior high school.

The main occupation of respondent are 48% skilled worker, 40% merchant, 8% unskilled worker and 4% others.

The respondents monthly earnings could be mentioned, 32% more than Rp. 250,000, 24% Rp. 200,000-250,000, 16% Rp.150,000-200,000, 16% Rp.150,000-200,000, 16% Rp.100,000- 150,000, 12% Rp. 50,000 - 100,000,

b. Housing condition

The housing status in this area as follows : most of the houses are owned by the respondents(56%), rented house(32%), free of using the house(10%), and only 1% shared with other person in the some house.

The land status is as follows : 56% of the land is state owned, 28% certificated house, 12% non-certificated land and 4% of communal land.

The level of house cleanliness which covers yard and house cleanliness, WC, bathroom and drainage sanitation are fairly guard.

Water supply by the local water supply company(PDAM) as the source of drinking water.

Management of waste disposal is done special individual who is paid to do the job.

c. Community perception against the project

The respondents opinion on the activity plan show good response by stating that they(60%)will be involved as manpower, but 40% will not join the project because they are employed yet.

Special response showed regarding the planning building acquisition which will be used for by-pass road to access existing railway.

Generally respondents agree with the project as long as they can get a reasonable compensation for plan the land acquisition.

d. Community health

The community habit of seeking medical help has the following pattern : most of them make the advantage of the presence of the health counters, practicing physicians, hospitals or having their own treatment.

3.4.2 The predicted impact, management effort and consideration

(1) Pre-construction phase

a. Socio-economic component

i) Community perception

- Source of impact
  The origin of impact of community perception will come from project of connecting railways and container terminal. In the community opinion, the activities of the project will cause acquisition of buildings and will create dust and noise

- Kind of impact
  Type of impact is community perception in the form of

complaints to the planned project. The intensity of impact is around 15 households who will experience the impact

- Parameter and characteristics of impact
  The impact characteristics is important enough to be managed. The parameter of impact can be measured by means of feedbacks and complaints given by around 250 households.
- Management effort and consideration
  - To maintain community perception about manpower issues dueling construction phase, it is very advisable to employ local manpower in the firstling.
  - To facilitate the effort of surrounding community, it is very advisable to let the community open food vendors, in order to fulfil the workers need.

(2) Construction phase

a. Physical-chemical component

i) Dust

- Source of impact

  Dust produced will be originated from the process of land hardening and project vehicles mobilization.

- Type of impact

  Kind of impact comes from land hardening and project vehicles mobilization which will increase dust concentration in and around the project location, especially during dry season.

- Parameter and characteristics of impact

  The increase of dust concentration should be managed and impact parameters should be measured with reference to in West Java Governor's Decree Number 660.

- Management effort and consideration

  - To keep wet the soil at project location, especially in dry season.

  - Using of mask for workers dealing with land hardening.

b. Biological component

i) Plankton and benthos

- Source of impact

  Project activity which will influence plankton life is land maturing and foundation construction around project location.

- Kind of impact

  Kind of impact aroused by activities during construction phase is physical and metabolism trouble in plankton and benthos. Physical trouble caused by operation of heavy equipments will cause the death of biota, especially benthos. Increase of turbidity will also create more ecological stress against plankton and benthos. Risen particle concentration will be a hindering factor for its metabolism process since its organ will be obstructed by the concentrated particle in water besides, increased turbidity will decrease light intensity in water color which in turn, will reduce photosynthetic rate.

- Parameter and characteristics of impact

  Disequilibrium of plankton and benthos is an important impact to be managed. Further effect will case the total death of community structure of plankton and benthos. Important impact criteria is only intensity of impact, which causes ecological change of short period.

- Management effort and consideration

  · Minimizing turbidity rate by effective operation of heavy equipments in dump area.
  · Localizing the turbidity spreading by isolating workers space
  · Efficient piling to reserve benthos habitat.

Table A 3-2-1(1) Cisaranten River Water Analysis

NO.	PARAMETER	Unit	SAMPLING LOCATION				BAKU MUTU JABAR NO. 38 TH. 1991 GOL. C, D
			A-1	A-2	A-3	A-4	
A.	FISIKA						
1.	Temperature	C	27	27	27	27	Suhu Normal
2.	Total Suspended Solid	mg/l	312	470	402	446	1000
B.	KIMIA						
1.	pH		7.4	7.56	7.8	7.96	6–9
1.	Barium (Ba)	mg/l	0.263	0.267	0.154	0.163	–
2.	Total Hardness	mg/l/l–$CaCO_3$	95.10	75.08	260.26	280.28	–
	BOD	mg/l	31	31.8	35	28	–
3.	Sulfide (H_2S)	mg/l	Nihil	Nihil	Nihil	Nihil	0,002
4.	Chloride (Cl)	mg/l	141.80	221.56	265.88	88.63	–
5.	NH_3-N (NH_3+NH_4) *)	mg/l	0.506	0.455	0.472	0.916	0,02
6.	NO_2-N	mg/l	0.019	0.017	0.001	0.004	0,06
7.	NO_3-N	mg/l	0.101	0.053	0.120	0.026	–
8.	Iron (Fe)	mg/l	0.570	0.622	1.270	2.015	–
9.	Mangan (Mn)	mg/l	0.408	0.319	1.612	1.678	2,0
10.	Copper (Cu) *)	mg/l	0.037	0.044	0.030	0.037	0,02
11.	Zinc (Zn) *)	mg/l	0.121	0.114	0.127	0.233	0,02
12.	Natrium (Na)	mg/l	146.70	106.10	54.40	43.10	–
13.	Silver (Ag)	mg/l	0.027	0.031	0.042	0.048	–
14.	Oil and grease	mg/l	0.44	0.47	0.38	0.40	1,0
15.	Lead (Pb) *)	mg/l	0.047	0.072	0.009	0.018	0,03
16.	Selenium (Se) *)	mg/l	0.104	0.110	0.127	0.132	0,05
17.	Detergent *)	mg/l	0.020	0.025	0.015	0.020	0,02
18.	Cadmium (Cd) *)	mg/l	0.032	0.039	0.038	0.039	0,01
19.	Arsen (As)	mg/l x 10^{-3}	0.05	0.05	0.08	< 0,01	1,0
20.	Cyanide (Cn)	mg/l x 10^{-3}	28.08	22.88	2.08	13.52	0,02
21.	Mercury (Hg)	mg/l x 10^{-3}	0.50	0.50	< 0,01	0.05	0,002
22.	Chrom Heksavalen (Cr^{6+}) *)	mg/l	0.127	0.134	0.147	0.157	0,05

Note
: *) Higher than standard value

Table A 3-2-1(2) Biologycal Analysis for Dry Ports of Gedebage

Zooplankton Abundance (Ind/l)

NO.	ORGANISME	A-1	A-2	A-3	A-4
A.	*RHIZOPODA*				
1.	*Arcella sp*	367	–	–	–
B.	*ROTIFERA*				
1.	*Asplanchna sp*	–	367	–	–
C.	*CLADOCERA*				
1.	*Moina sp*	367	367	367	–
	Taxa Quantity	2	2	1	–
	Quantity Ind/l	734	734	367	–
	Diversity	0.69	0.69	0	–
	Maximum H'	0.69	0.69	0	–
	Uniformity	1.00	1.00	0	–
	Dominantion	0.50	0.50	1	–

Note : A–1 – A–2 = Cisaranten River
A–3 – A–4 = Cisaranten Wetan Drainage

Table A 3-2-1(3) Biologycal Analysis for Dry Ports of Gedebage

Phytoplankton Abundance (Ind/l)

NO.	ORGANISM	A-1	A-2	A-3	A-4
A.	*MYXOPHYCEAE*				
1.	*Phormidium sp*	63404	11528	46112	8646
B.	*MASTIGOPHORA*				
1.	*Phacus sp*	5764	–	–	–
2.	*Lepooenolis sp*	17292	2882	–	–
C.	*CHLOROPHYCEAE*				
1.	*Closterium sp*	367	–	–	–
2.	*Pandorina sp*	367	2882	–	–
3.	*Chlorococcum sp*	–	–	–	–
D.	*BACILLARIOPHYCEAE*				
1.	*Fragilaria sp*	–	2882	–	–
2.	*Melosira sp*	367	1835	–	–
3.	*Pinnularia sp*	–	–	2882	–
4.	*Navicula sp*	–	–	2882	–
5.	*Nitzchia sp*	–	–	2882	–
6.	*Terpsinoe sp*	–	367	–	–
E.	*DYNOPHYCEAE*				
1.	*Gymnodinium sp*	–	–	–	367
	Taxa Quantity	6	6	4	2
	Quantity Ind/l	87561	22376	54758	9013
	Diversity	0.81	1.41	0.61	0.17
	Maximum H'	1.79	1.79	1.38	0.69
	Uniformity	0.45	0.78	0.44	0.25
	Dominantion	0.57	0.32	0.72	0.92

Note : A–1 – A–2 = Cisaranten River
A–3 – A–4 = Cisaranten Wetan Drainage

Table A 3-2-1(4) Biologycal Analysis for Dry Ports of Gedebage

Benthos Density (Ind/m²)

NO.	ORGANISME	A-1	A-2	A-3	A-4
A.	*CASTROPODA*				
1.	*Plysa sp*	400	–	25	25
2.	*Goniobasis sp*	–	–	–	25
B.	*OLIGOCHAETA*				
1.	*Tubifex sp*	75	–	625	–
	Taxa Quantity	2	–	2	2
	Quantity Ind/l	475	–	650	25
	Diversity	0.63	–	0.23	0.00
	Maximum H'	1.00	–	1.00	0.00
	Uniformity	0.63	–	0.23	0.00
	Domination	0.73	–	0.93	1.00

Note ; A–1 – A–2 = Cisaranten River
A–3 – A–4 = Cisaranten Wetan Drainage

Table A 3-2-1(5) 2.3.1 Land Use in The Surveyed Subdistrict (in hectare)

Subdistrict	Housing	Dry Field	Wet Rice Field	Industry	Others	total width
2) Derwati	17,495 (9,20%)	0,364 (0.19%)	170,967 (89,96%)	-	1,231 (0,65%)	190,057 (100%)
3) Cisaranten	98,251 (13,39%)	98,90 (13,48%)	530,821 (72,36%)	1,00 (0,14%)	4,588 (0,63%)	733,511 (100%)
3) Cisaranten Wetan	120,662	1)	70,00	1)	1)	1)

Table A 3-2-2(1) Environment management effort and consideration at Gedebage station

NO.	ENVIRONMENTAL SUB COMPONENT WOULD BE AFFECTED	THE AIM OF ENVIRONMENTAL MANAGEMENT	ENVIRONMENTAL MANAGEMENT PLAN	LOCATION OF ENVIRONMENTAL MANAGEMENT	PERIOD OF ENVIRONMENTAL MANAGEMENT	ENVIRONMENTAL MANAGEMENT INSTITUTION			FUNDING AGENCY FOR ENVIRONMENTAL MANAGEMENT
						EXCUTOR	SUPERVISOR	ADDRESS OF REPORT	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1.	SOCIO – ECONOMIC CULTURAL	To maintain – Social positive perception – Security	– To make sure that the land acquisition in line with procedure and based on mutual agreement between Perumka and Villages.	– Housing in Cisaranten Village, District of Gede Bage	– During pre construction stage.	– Perumka	– Regional Government of West Java.	– Regional Government of west Java. – Regional Office of Ministry of Communication.	– Perumka
2.	RIVER WATER QUALITY	– To maintain and to keep river water quality below the maximum standard.	– To make sure that the construction methode safe to the environment.	– Adjacent Cisaranten river.	– During construction period.	– Contractor	– Regional Government of West Java.	– Regional Government of west Java. – Regional Office of Ministry of Communication. – Board of Environmental Impact Protection. (Bapedal).	– Perumka
3.	RIVER WATER QUANTITY (FLOOD)	– To maintain and to keep river water elevation below the maximum level.	– To observe the elevation of Cisaranten river.	– Adjacent Cisaranten river.	– All of the stages, pre construction, construction, and post construction.	– Contractor	– Regional Government of West Java.	– Regional Government of west Java. – Regional Office of Ministry of Communication. – Board of Environmental Impact Protection (Bapedal).	– Perumka
4.	AIR QUALITY	– To maintain and to keep the air quality below the maximum standards.	– To make sure that the construction methode in proper way and safe to the environment.	– Housing in Cisaranten Village District of Gede Bage and in the projet side.	– Construction, and post construction.	– Contractor	– Regional Government of West Java.	– Regional Government of west Java. – Regional Office of Ministry of Communication. – Board of Environmental Impact Protection (Bapedal).	– Perumka

FILE : URL-GEDEBAGE

Table A 3-3-1(1) Quality Analysis for Dry Ports of Kiaracondong

NO.	PARAMETER	UNIT	KIRCON-1	KIRCON-2
A.	PHYSICS			
1.	Suspended Solid	mg/l	308	338
2.	Temperature	°C	28.00	28.00
B.	CHEMISTRY			
1.	pH		7.45	7.60
2.	Barium (Ba)	mg/l	0.144	0.142
3.	Total Hardness	mg/l$CaCO_3$	185.19	150.15
4	Sulfide (H_2S)	mg/l	Nihil	Nihil
5.	Chlorida (Cl)	mg/l	97.49	141.80
6.	NH_3–N (NH_3 + NH_4)	mg/l	0.061	1.121
7.	NO_2–N	mg/l	0.041	< 0,001
8.	NO_3–N	mg/l	0.078	0.001
9.	Iron (Fe)	mg/l	0.761	0.727
10.	Mangan (Mn)	mg/l	0.426	0.399
11.	Copper (Cu)	mg/l	0.047	0.048
12.	Zinc (Zn)	mg/l	0.201	0.203
13.	Natrium (Na)	mg/l	15.90	10.50
14.	Silver (Ag)	mg/l	0.034	0.041
15.	Oil and Grease	mg/l	0.44	0.47
16.	Lead (Pb)	mg/l	0.036	0.056
17.	Selenium (Se)	mg/l	0.117	0.121
18.	Detergent	mg/l	0.020	0.020
19.	Cadmium (Cd)	mg/l	0.044	0.047
20.	Arsen (As)	mg/l x 10^{-3}	0.01	0.01
21.	Cyanide (CN)	mg/l x 10^{-3}	35.36	41.60
22.	Mercury (Hg)	mg/l x 10^{-3}	0.05	0.05
23.	Chrom Heksavalen (Cr^{6+})	mg/l	0.132	0.137
24.	BOD_5	mg/l	32.00	30.00

Note : Kircon – Kircon–1 = Cidurian Branch River

Table A 3-3-1(2) Biologycal Analysis for Dry Ports of Kiaracondong

Phytoplankton Abundance (Ind/l)

NO.	ORGANISM	KIRCON-1	KIRCON-2
A.	*MYXOPHYCEAE*		
1.	*Phormidium sp*	17292	2882
B.	*MASTIGOPHORA*		
1.	*Phacus sp*	–	–
2.	*Lepooenolis sp*	–	–
C.	*CHLOROPHYCEAE*		
1.	*Closterium sp*	–	–
2.	*Pandorina sp*	–	–
3.	*Chlorococcum sp*	5674	–
D.	*BACILLARIOPHYCEAE*		
1.	*Fragilaria sp*	–	–
2.	*Melosira sp*	–	–
3.	*Pinnularia sp*	–	–
4.	*Navicula sp*	–	–
5.	*Nitzchia sp*	–	–
6.	*Terpsinoe sp*	–	–
E.	*DYNOPHYCEAE*		
1.	*Gymnodinium sp*	–	–
	Taxa Quantity	2	1
	Quantity Ind/l	22966	2882
	Diversity	0.56	0
	Maximum H'	0.68	0
	Uniformity	0.82	0
	Dominantion	0.83	1

Note : Kircon–1 – Kircon–2 = Cidurian Branch River

Table A 3-3-1(3) Biologycal Analysis for Dry Ports of Kiaracondong

Zooplankton Abundance (Ind/l)

NO.	ORGANISM	KIRCON-1	KIRCON-2
A.	*RHIZOPODA*		
1.	*Arcella sp*	–	–
B.	*ROTIFERA*		
1.	*Asplanchna sp*	–	–
C.	*CLADOCERA*		
1.	*Moina sp*	–	–
	Taxa Quantity	–	–
	Quantity Ind/l	–	–
	Diversity	–	–
	Maximum H'	–	–
	Uniformity	–	–
	Dominantion	–	–

Note : Kircon–1 – Kircon–2 = Cidurian Branch River

Table A 3-3-1(4) Biologycal Analysis for Dry Ports of Kiaracondong

Benthos Density (Ind/m²)

NO.	ORGANISME	KIRCON-1	KIRCON-2
A.	*CASTROPODA*		
1.	*Plysa sp*	–	25
2.	*Goniobasis sp*	–	50
B.	*OLIGOCHAETA*		
1.	*Tubifex sp*	25	50
	Taxa Quantity	1	3
	Quantity Ind/l	25	125
	Diversity	0.00	1.52
	Maximum H'	0.00	1.58
	Uniformity	0.00	0.96
	Domination	1.00	0.36

Note : Kircon–1 – Kircon–2 = Cidurian Branch River

Table A 3-4-1(1) Tanjung Priok Water Analysis

NO.	PARAMETER		UNIT	SAMPLE LOCATIO		GOLONGAN B	
				A.1	A.2	YDI	YDB
A.	**PHYSICS**						
1.	Turbidity	*)	NTU	93	40	< 50	100
2.	Total Dissolve Solid (TDS)	*)	mg/l	7330	8906	–	–
3.	Total Suspended Solid (TSS)	*)	mg/l	90	118	–	–
B.	**CHEMISTRY**						
1.	pH		–	7.45	7.54	6–8.5	6–8.5
2.	BOD	*)	mg/l	50	35	20	20
3.	COD	*)	mg/l	70.47	64.48	30	30
4.	NH_3–N (NH_3+NH_4)	*)	mg/l	1.075	1.033	< 1	< 2
5.	NO_2–N		mg/l	<0.001	<0.001	< 1	2
6.	NO_3–N		mg/l	0.001	0.001	10	10
7.	Sulfat (SO_4)	*)	mg/l	238.147	233.314	12	50
8.	Sulfide (H_2S)		mg/l	Nihil	0.14	Nihil	0.002
9.	Lead (Pb)	*)	mg/l	0.075	0.045	0.03	0.03
10.	Copper (Cu)		mg/l	0.008	0.020	0.02	0.02
11.	Zinc (Zn)	*)	mg/l	0.027	0.305	0.2	0.2
12.	Cadmium (Cd)	*)	mg/l	0.034	0.036	0.01	0.01
13.	Mangan (Mn)		mg/l	0.298	0.402	0.5	0.5
14.	Selenium (Se)	*)	mg/l	0.134	0.147	0.02	0.02
15.	Barium (Ba)		mg/l	0.238	0.244	< 1	1
16.	Iron (Fe)		mg/l	0.186	0.141	< 1	2
17.	Fluoride (F)		mg/l	0.224	0.251	1	1
18.	Stanum (Sn)		mg/l	0.112	0.118	–	–
19.	Mercury (Hg)	*)	mg/l x 10^{-3}	0.20	0.30	0.002	0.002
20.	Arsen (As)		mg/l x 10^{-3}	0.07	0.06	0.05	0.05
21.	Chrom Heksavalen (Cr^{6+})	*)	mg/l	0.147	0.158	0.05	0.05
22.	Oil and Grease	*)	mg/l	0.64	0.67	Nihil	Nihil
23.	Detergent		mg/l	0.030	0.035	0.1	0.5
24.	Phenol	*)	mg/l	0.024	0.026	0.01	0.02
25.	Dissolved Oksigen (DO)		mg/l	3.97	3.19	>4	>3

Note

Based on Decree DKI Jakarta Governoor NO.1608 th 1988
YDI : Desirable Limit
YDB : Allowable Limit

Table A 3-4-1(2) Biologycal Analysis Connecting Railways Tanjung Priok

Phytoplankton Density (Ind/l)

NO.	ORGANISM	A.1	A.2
A.	*MYXOPHYCEAE*		
1.	*Phormidium sp*	1167	14006
B.	*MASTIGOPHORA*		
1.	*Polytomella sp*	–	212
C.	*CHLOROPHYCEAE*		
1.	*Selenastrum sp*	212	–
D.	*BACILLARIOPHYCEAE*		
1.	*Melosira sp*	–	849
2.	*Navicula sp*	106	–
3.	*Nitzschia sp*	318	424
4.	*Skeletonema sp*	–	212
	Taxa Quantity	4	5
	Quantity Ind/l	1803	15703
	Diversity	1.00	0.47
	Maximum H'	1.38	1.61
	Uniformity	0.29	0.73
	Dominantion	0.47	0.80

Note : A.1 and A.2 = Koja

Table A 3-4-1(3) Biologycal Analysis Connecting Railways Tanjung Priok

Benthos Density (Ind/m²)

NO.	ORGANISM	A.1	A.2
A.	*GASTROPODA*		
1.	*Turbo sp*	25	–
2.	*Margenella sp*	25	–
3.	*Columbella sp*	25	–
4.	*Epithonium sp*	25	–
5.	*Turitelopsis sp*	50	–
6.	*Bedeva sp*	–	50
B.	*BIVALVIA*		
1.	*Tellina sp*	–	25
	Taxa Quantity	5	2
	Quantity Ind/l	150	75
	Diversity	2.25	0.92
	Maximum H'	2.32	1.00
	Uniformity	0.97	0.92
	Dominantion	0.22	0.55

Note : A.1 and A.2 = Koja

Appendix 4 - 2 (1)

Calculation process of income and expenditure for handling containers

(1) Income

a. Forecasted annual container volume (Section 1.), classified by full and empty TEUs, is still arranged by 20' : 40' handling component ratio on the basis of the activity in 1993.

b. The classified annual handling containers in TEUs are substituted by the each box numbers.

c. The box numbers calculated on the above are classified again by non stuffing (F.C.L) and Stuffing (L.C.L) whose occupancy rate is 5 % of all full containers.

d. All income caused by handling charge is calculated as follows.

All income caused by handling charge = Σ container boxes classified
by stuffing and non stuffing $\times$ respective handling unit charge in Tab. 4-3(1).

(2) Expenditure

a. Mean handling charge per unit container is calculated by all income of handling charge / all handling container volume.

b. Calculation of payment for container is as follows.

Mean handling charge per unit container $\times$ 2,000 TEUs $\times$ 12 months = A (Fixed amount)

All income caused by handling charge - A = B (Fluctuated amount)

All payment for contractor C = A $\times$ 0.45 + B $\times$ 0.4

Accordingly, PERUMKA earns residual revenue = A - C

c. The above payment is regarded as being conducted at both dry ports (Gdb, Kac) together with for the cost estimate.

Appendix 4-3 (1)

LAMPIRAN SURAT DIROP
NO.394/Dirop/94

TARIF ANGKUTAN PETIKEMAS TPKB GEDEBAGE - UTEP/UTPK TANJUNG-PRIOK DSBL-NYA

(LO/LO TERMASUK PPN 10 %)

11 Nov 1994

GERAKAN STANDAR	TPKB GEDEBAGE - UTEP TG. PRIOK						TPKB GEDEBAGE - UTPK TG. PRIOK							
	20 FEET			40 FEET			20 FEET				40 FEET			
	I S I		KOS	I S I		KOS	UTPK - I + II		Dermaga - 207		UTPK - I + II		Dermaga - 207	
	Nonstuff	Stuffing		Nonstuff	Stuffing		Nonstuff	Stuffing	Nonstuff	Stuffing	Nonstuff	Stuffing	Nonstuff	Stuffing
Lift off	17.500	9.700	0	25.700	15.000	0	17.500	9.700	17.500	9.700	25.700	15.000	25.700	15.000
Lift on	17.500	17.500	9.700	25.700	25.700	15.000	17.500	17.500	17.500	17.500	25.700	25.700	25.700	25.700
Stacking	4.000	4.000	1.750	7.750	7.750	3.500	4.000	4.000	4.000	4.000	7.750	7.750	7.750	7.750
Stuffing	0	27.500	0	0	41.050	0	0	27.500	0	27.500	0	41.050	0	41.050
JT-TPKB	39.000	58.700	11.450	59.150	89.500	18.500	39.000	58.700	39.000	58.700	59.150	89.500	59.150	89.500
Bea KA	124.000	124.000	80.850	223.500	223.500	145.750	124.000	124.000	124.000	124.000	223.500	223.500	223.500	223.500
Pengawalan	8.000	8.000	0	8.000	8.000	0	8.000	8.000	8.000	8.000	8.000	8.000	8.000	8.000
TOTAL-KA	132.000	132.000	80.850	231.500	231.500	145.750	132.000	132.000	132.000	132.000	231.500	231.500	231.500	231.500
Lift off	21.000	21.000	10.500	31.500	31.500	16.000	21.000	21.000	21.000	21.000	31.500	31.500	31.500	31.500
Lift on	21.000	21.000	10.500	31.500	31.500	16.000	21.000	21.000	21.000	21.000	31.500	31.500	31.500	31.500
Stacking	5.000	5.000	2.500	10.000	10.000	5.000	5.000	5.000	5.000	5.000	10.000	10.000	10.000	10.000
JP-UTEP	47.000	47.000	23.500	73.000	73.000	37.000	47.000	47.000	47.000	47.000	73.000	73.000	73.000	73.000
Haulage/truck	0	0	0	0	0	0	32.500	32.500	0	0	52.500	52.500	0	0
Haulage/KA	0	0	0	0	0	0	0	0	32.500	32.500	0	0	52.500	52.500
Lift off/on	0	0	0	0	0	0	21.000	21.000	21.000	21.000	31.500	31.500	31.500	31.500
Kartu ex/impor	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JP-UTPK	0	0	0	0	0	0	53.500	53.500	21.000	21.000	84.000	84.000	31.500	31.500
PELINDO-II	47.000	47.000	23.500	73.000	73.000	37.000	100.500	100.500	68.000	68.000	157.000	157.000	104.500	104.500
PERUMKA	171.000	190.700	92.100	290.650	321.000	164.250	171.000	190.700	200.500	223.200	290.650	321.000	343.150	373.500
TARIF ALL-IN	218.000	237.700	115.600	363.650	394.000	201.250	271.500	291.200	271.500	291.200	447.650	478.000	447.650	478.000

PEM-95LBXT

Appendix 4-3(2) Train operation cost by typical train

JARAK	195,0 KM	PERJALANAN KOSONG	0%
WAKTU TEMPUH	280 MENIT	BERAT RANGKAIAN(GRB ISI)	493
KECEPATAN RATA-2	42 KM / JAM	BERAT RANGKAIAN+LOK	653
RANGKAIAN / KA	17 (PP/PPCW)	LOKOMOTIF	2 CC 201
BERAT MUATAN	12,00 TON/GRB		

KERETA API BARANG ANTARA GEDEBAGE DAN TANJUNGPRIUK

NOMOR KA -> 2134 KOMODITI -> PETIKEMAS	(KLB)	(FAKULTATIF)	(REGULER)
BIAYA / NET TON-KM	78,74	82,72	95,77
BIAYA / TON	15.354,54	16.131,10	18.674,34

INFORMASI MANAJEMEN (%)	(KLB)	(FAKULTATIF)	(REGULER)
*> BIAYA VARIABEL :			
PENYUSUTAN LOK	0,00%	0,00%	9,24%
PERAWATAN LOK	24,18%	23,01%	19,88%
PENYUSUTAN GERBONG	0,00%	0,00%	4,38%
PERAWATAN GERBONG	15,43%	14,69%	12,69%
SETASIUN & LANGSIR	0,00%	3,19%	2,75%
PERAWATAN TRACK	4,26%	4,05%	3,50%
AWAK KA	0,57%	2,18%	1,88%
BBM	21,97%	20,91%	18,06%
BIAYA MALAPETAKA	0,17%	0,16%	0,14%
*> BIAYA TETAP :	33,43%	31,82%	27,49%
TOTAL	100%	100%	100%

INFORMASI MANAJEMEN (Rp.)	(KLB)	(FAKULTATIF)	(REGULER)
*> BIAYA VARIABEL :			
PENYUSUTAN LOK	0	0	352.106
PERAWATAN LOK	757.356	757.356	757.356
PENYUSUTAN GERBONG	0	0	166.716
PERAWATAN GERBONG	483.312	483.312	483.312
SETASIUN & LANGSIR	0	104.831	104.831
PERAWATAN TRACK	133.283	133.283	133.283
AWAK KA	18.000	71.587	71.587
BBM	688.058	688.058	688.058
BIAYA MALAPETAKA	5.191	5.191	5.191
*> BIAYA TETAP :	1.047.126	1.047.126	1.047.126
TOTAL BIAYA/KA	3.132.325	3.290.744	3.809.566

BOKA-B93/BRG93-WK1/2134/DIE-IKP/94

Appendix 4-3(3) Containers expenses of container train operation cost between Gedebage and Tg.Priok

Year	1996	1997	1998	1999	2000	2001	2002	2003
Increases traffic(TEU)	5,000	5,000	5,000	6,000	7,000	6,000	7,000	6,000
Maintenance of Loc.	111,331	111,331	111,331	133,295	156,015	133,295	156,015	133,295
Maintenance of wag.	71,047	71,047	71,047	85,063	99,562	85,063	99,562	85,063
Station and yard	15,410	15,410	15,410	18,450	21,595	18,450	21,595	18,450
Maintenance of track	22,194	22,194	22,194	26,572	31,102	26,572	31,102	26,572
Rehabilitation for derailment	763	763	763	914	1,069	914	1,069	914
Subtotal	220,745	220,745	220,745	264,294	309,343	264,294	309,343	264,294
Train crew personnel	11,495	11,495	11,495	13,762	16,108	13,762	16,108	13,762
Fuel	54,984	54,984	54,984	65,831	77,053	65,831	77,053	65,831
Total	287,224	287,224	287,224	343,887	402,504	343,887	402,504	343,887

Year	2004	2005	2006	2007	2008	2009	2010	
Increases traffic(TEU)	9,000	10,000	9,000	10,000	9,000	10,000	9,000	
Maintenance of Loc.	200,699	222,663	200,699	222,663	200,699	222,663	200,699	
Maintenance of wag.	128,078	142,094	128,078	142,094	128,078	142,094	128,078	
Station and yard	27,780	30,820	27,780	30,820	27,780	30,820	27,780	
Maintenance of track	40,009	44,388	40,009	44,388	40,009	44,388	40,009	
Rehabilitation for derailment	1,376	1,526	1,376	1,526	1,376	1,526	1,376	
Subtotal	397,942	441,491	397,942	441,491	397,942	441,491	397,942	
Train crew personnel	20,722	22,989	20,722	22,989	20,722	22,989	20,722	
Fuel	99,121	109,968	99,121	109,968	99,121	109,968	99,121	
Total	517,785	574,448	517,785	574,448	517,785	574,448	517,785	

Notes: 1. Expenses : Include personnel expenses and non-personnel expenses.

2. Train crew between Gdb and Pwk consists of 2drivers, 2co-drivers, 1conductor.

〃 between Pwk and Tpk consists of 1driver, 1co-driver, 1conductor.

3. Security between Gdb and Tpk consista of 2Army soldiers (non PERUMKA personnel)

Appendix 4-3(4) Containers income and expenditure for crane handling at Gedebage

year	Hndling volume TEU	Handling revenues 10^3Rp	Average TEU 10^3Rp	45% portion 10^3Rp	40% portion 10^3Rp	Total expenses 10^3Rp	yearly increase 10^3Rp	PERUMKAs income 10^3Rp
1993	60,918							
1994	72,000	1,530,903	21.263	229,640	408,236	637,876		893,027
1995	77,000	1,632,918	21.207	229,036	449,580	678,616	40,740	954,292
1996	82,000	1,735,625	21.166	228,593	491,056	719,649	41,033	1,015,976
1997	82,700	1,836,508	21.109	227,977	531,957	759,934	40,285	1,076,574
1998	92,000	1,955,312	21.253	459,068	374,064	833,132	73,198	1,122,180
1999	98,000	2,082,980	21.255	459,108	425,096	884,204	51,072	1,198,776
2000	105,000	2,221,818	21.160	457,056	482,455	939,511	55,307	1,282,307
2001	111,000	2,349,046	21.163	457,121	533,289	990,410	50,899	1,358,636
2002	118,000	2,486,049	21.068	455,069	589,914	1,044,983	54,573	1,441,066
2003	124,000	2,612,364	21.067	455,047	640,459	1,095,506	50,523	1,516,858
2004	133,000	2,793,976	21.007	453,751	714,256	1,168,007	72,501	1,625,969
2005	143,000	3,004,261	21.009	453,794	798,332	1,252,126	84,119	1,752,135
2006	152,000	3,184,301	20.949	452,498	871,500	1,323,998	71,872	1,860,303
2007	162,000	3,392,746	20.943	452,369	954,993	1,407,362	83,364	1,985,384
2008	171,000	3,571,648	20.887	451,159	1,027,629	1,478,788	71,426	2,092,860
2009	181,000	3,778,033	20.873	450,857	1,110,452	1,561,309	82,521	2,216,724
2010	190,000	3,947,056	20.774	448,718	1,179,962	1,628,680	67,371	2,318,376

Notes ;

1. Portion of handling company at Gedebage Dry Port.(Oct. 1994)

   until 2000TEUs 45%

   over 2000TEUs 40%

2. Tarif ; 11 Nov. 1994(Tab. 4.4(1))

Appendix 5-2(1)

(1) In the Case of Automatic Signalling Preceding

(a) Urgent Plan at Kiaracondong

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	1995 F/C	1995 D/C	1996 F/C	1996 D/C	1997 F/C	1997 D/C	19 98 F/C	19 98 D/C	Remarks
<1>	Land Acquisition	m2	0	0	0											
<2>	Widening Road															
	a) Widening of Pavement	m2	330	40	13,200	70	30			9,240	3,960					
	b) Sandy Gravel (t=0.5m)	m2	330	50	16,500	60	40			9,900	6,600					
	c) New Drainage 1m*1m	m	50	100	5,000	60	40			3,000	2,000					
	d) Removal of Lane Separator	m	10	30	300	0	100			0	300					
	e) relocation of Existing Fence	m	40	20	800	0	100			0	800					
	f) Removal of Existing Fence	m	10	30	300	0	100			0	300					
	g) Installation of New Gate	set	1	5,000	5,000	55	45			2,750	2,250					
					41,100					24,890	16,210					
<3>	Track and Turnout															
	a) Installation Turnout	set	1	150,000	150,000	88	12					132,000	18,000			
	b) Removal Turnout	set	5	1,700	8,500	50	50					4,250	4,250			
	c) Installation Railway	m	240	1,100	264,000	88	12					232,320	31,680			
	d) Removal Railway	m	1,065	50	53,250	50	50					26,625	26,625			
	e) others (track maintenance)	m	1,000	20	20,000	0	100					0	20,000			
					495,750							395,195	100,555			
<4>	Building															
	a) Signal Cabin	Ls	1	500,000	500,000	55	45			275,000	225,000					
<5>	Physical Contingency 10%				103,685					29,989	24,121	39,520	10,055	0	0	
	*Sub Total <1+---+5>				1,140,535			0	0	329,879	265,331	434,715	110,610	0	0	
<6>	Signalling															
	a) Electric Interlocking Device	set	1	2,360,000	2,360,000					2,340,000	0		20,000			
	b) Automatic Block System	set	1	60,340	60,340							59,700	640			
	c) Signal	set	24	9,400	225,600							184,000	41,600			
	d) Switch machine	set	16	18,413	294,608							270,400	24,208			

Appendix 5-2(1)

(1) In the Case of Automatic Signalling Preceding

(a) Urgent Plan at Kiaracondong

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	1995 F/C	1995 D/C	1996 F/C	1996 D/C	1997 F/C	1997 D/C	19 98 F/C	19 98 D/C	Remarks
	e) Track Circuit	set	23	19,416	446,568							359,260	87,308			
	f) Level Crossing Safety Device	set	1	125,000	125,000							117,000	8,000			
	g) Signal Cable	km	25	31,410	785,250							408,580	376,570			
	h) Removal of Signal	set	1	10,100	10,100							0	10,100			
					4,307,466					2,340,000	0	1,399,040	568,426			
<7>	Electric Power															
	a) Electric Power Source Device	set	3	295,900	887,700							815,700	72,000			
	b) Lighting Equipment	set	3	14,100	42,300							36,000	6,300			
					930,000					0	0	851,700	78,300			
<8>	Telecommunication															
	a) Telecommunication Cable	km	5	51,000	255,000							190,000	65,000			
	b) Linked Equipment	set	16	11,211	179,376							174,600	4,776			
					434,376					0	0	364,600	69,776			
	*Sub Total <6+7+8>				5,671,642			0	0	2,340,000	0	2,615,340	716,502			
<9>	Forklift (10t)	set	1	300,000	300,000	100	0			300,000	0					
<10>	*Management Cost 10%	Ls	1		711,238			0	0	296,988	26,533	305,006	82,711	0	0	
	(<1>---<9>)*0.1															
																Grand Total
	Total				7,823,615			0	0	3,266,867	291,864	3,355,061	909,823	0	0	7,823,615

*Excluding VAT

Appendix 5-2(2)

(1) In the Case of Automatic Signalling Preceding

(b) Urgent Plan at Gedebage

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	For. %	Dom. %	1995 F/C	1995 D/C	1996 F/C	1996 D/C	1997 F/C	1997 D/C	1998 F/C	1998 D/C	Remarks
<1>	Land Acquisition	m2	0	0	0											
<2>	Pavement(Container Yard)															
	a)Pavement (t=0.27m)	m2	2,920	40	116,800	0	100	0	116,800							
	b)Sandy Gravel (t=1.0m)	m2	2,920	80	233,600	0	100	0	233,600							Including pile
	c)Masonry Wall	m3	185	100	18,500	0	100	0	18,500							
	d)others(drainage.etc)	set	1	90,000	90,000	0	100	0	90,000							
					458,900			0	458,900							
<3>	Drainage Work (165k450m-166k150m)															
	a)Concrete Pile L=5m	m	677	700	473,900	66	34			312,774	161,126					
	b)Concrete Pile L=6m	m	737	900	663,300	66	34			437,778	225,522					
	c) Pile cap Concrete	m3	98	350	34,300	60	40			20,580	13,720					0.2*0.3*1,629m
	d)Steel Strut	t	34	1,300	44,200	75	25			33,150	11,050					
	e)Safety Passage	m	677	60	40,620	75	25			30,465	10,155					
	f)Common Excavation	m3	3,050	10	30,500	75	25			22,875	7,625					
	g)Borrow Material	m3	3,720	50	186,000	60	40			111,600	74,400					
					1,472,820					969,222	503,598					
<4>	Track and Turnout															
	a)Track raising	m	1,500	100	150,000	0	100			0	75,000	0	75,000			
	b)Installation Turnout	set	6	150,000	900,000	88	12					792,000	108,000			
	c)Removal Turnout	set	2	1,700	3,400	50	50					1,700	1,700			
	d)Installation Railway	m	1,420	1,100	1,562,000	88	12					1,374,560	187,440			
					2,615,400					0	75,000	2,168,260	372,140			
<5>	Building															
	a)Signal Cabin	Ls	1	500,000	500,000	55	45			275,000	225,000					
	b)Removal Signal Cabin	Ls	2	100,000	200,000	0	100			0	200,000					
	c)Management Office	Ls	1	300,000	300,000	55	45			165,000	135,000					
					1,000,000					440,000	560,000					

Appendix 5-2(2)

(1)In the Case of Automatic Signalling Preceding

(b)Urgent Plan at Gedebage

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	For. %	Dom. %	1995 F/C	1995 D/C	1996 F/C	1996 D/C	1997 F/C	1997 D/C	1998 F/C	1998 D/C	Remarks
<6>	*Physical Contingency 10%	Ls	1		554,712	0	0	0	45,890	140,922	113,860	216,826	37,214	0	0	
	*Sub Total <1>+---+<6>				6,101,832	0	0	0	504,790	1,550,144	1,252,458	2,385,086	409,354	0	0	
<7>	Signalling															
	a)Electric I.Device	set	1	3,240,000	3,240,000					3,220,000	0		20,000			
	b)Automatic Block System	set	1	60,340	60,340							59,700	640			
	c) Signal	set	32	8,425	269,600							221,200	48,400			
	d)Switch machine	set	18	18,600	334,800							307,600	27,200			
	e)Track Circuit	set	26	19,157	498,082							401,020	97,062			
	f)Level Crossing Safty Device	set	1	125,000	125,000							117,000	8,000			
	g)Signal Cable	km	30	32,833	984,990							520,750	464,240			
	h)Removal of Signal	set	1	10,100	10,100							0	10,100			
					5,522,912					3,220,000	0	1,627,270	675,642			
<8>	Electric Power															
	a)Electric Power Source Device	set	3	295,900	887,700	92	8					816,684	71,016			
	b)Lighting Equipment	set	3	14,100	42,300	86	14					36,378	5,922			
					930,000					0	0	853,062	76,938			
<9>	Telecommunication															
	a)Telecommunication Cable	km	5	51,000	255,000	75	25					191,250	63,750			
	b)Linked Equipment	set	28	13,906	389,368	97	3					377,687	11,681			
					644,368					0	0	568,937	75,431			
	*Sub Total <7+8+9>				7,097,280			0	0	3,220,000	0	3,049,269	828,011			
<10>	Locomotive	set	2	3,260,000	6,520,000	50	50			3,260,000	3,260,000			0	0	Bandung Depot

Appendix 5-2(2)

(1) In the Case of Automatic Signalling Preceding

(b) Urgent Plan at Gedebage

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	For. %	Dom. %	1995 F/C	1995 D/C	1996 F/C	1996 D/C	1997 F/C	1997 D/C	1998 F/C	1998 D/C	Remarks
<11>	*Management Cost 10%	Ls	1		1,971,911			0	50,479	803,014	451,246	543,435	123,737	0	0	
	(<1>---<10>)*0.1															
																Grand Total
	Total				21,691,023			0	555,269	8,833,158	4,963,704	5,977,790	1,361,102	0	0	21,691,023

*Excluding VAT

Appendix 5-2(3)

(1)In the Case of Automatic Signalling Preceding

(c)F/S : By 2003 Completed at Kiaracondong (Including Handling Mechine)

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2001 F/C	2001 D/C	2002 F/C	2002 D/C	2003 F/C	2003 D/C	Remarks
<1>	Land Acquisition	m2	0	300	0	0	100					0	0	
<2>	Earthwork													
	a)Installation Fence	m	300	120	36,000	55	45					19,800	16,200	
	b)Removal Fence	m	430	20	8,600	0	100					0	8,600	
	c)Embankment	m3	760	40	30,400	60	40					18,240	12,160	V=8*0.5*190m
	d)Retaining wall	m	220	70	15,400	55	45					8,470	6,930	H=0.5--1.5m
	e)Improvement Drainage	set	1	5,000	5,000	55	45					2,750	2,250	
					95,400							49,260	46,140	
<3>	Track and Turnout													
	a)Installation Turnout	set	6	150,000	900,000	88	12					792,000	108,000	
	b)Removal Turnout	set	7	1,700	11,900	50	50					5,950	5,950	
	c)Installation Railway	m	1,330	1,100	1,463,000	88	12					1,287,440	175,560	
	d)Removal Railway	m	1,380	50	69,000	50	50					34,500	34,500	
	e)Relocation of used railway	m	100	20	2,000	0	100					0	2,000	for depot
					2,445,900							2,119,890	326,010	
<4>	Pavement													
	a)Surface Course(t=5mm)	m2	23,350	20	467,000	70	30					326,900	140,100	
	b)Asphalt Treated Base(t=10mm)	m2	23,350	30	700,500	70	30					490,350	210,150	
					1,167,500							817,250	350,250	
<5>	Building													
	C.F.S	m2	700	600	420,000	55	45					231,000	189,000	
	Maintenance Shop	m2	150	400	60,000	55	45					33,000	27,000	
					480,000							264,000	216,000	
<6>	*Physical Contingency 10%	Ls	1		418,880							325,040	93,840	

Appendix 5-2(3)

(1)In the Case of Automatic Signalling Preceding

(c)F/S : By 2003 Completed at Kiaracondong (Including Handling Mechine)

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2001 F/C	2001 D/C	2002 F/C	2002 D/C	2003 F/C	2003 D/C	Remarks
	*Sub Total <2+---+6>				4,607,680							3,575,440	1,032,240	
<7>	Signalling													
	a)Electric I. Device	set	1	606,000	606,000							600,000	6,000	
	b)Signal	set	2	6,100	12,200							9,600	2,600	
	c)Switch Machine	set	2	20,100	40,200							37,200	3,000	
	d)Track Circuit	set	1	34,200	34,200							27,020	7,180	
	e)Signal Cable	km	5	34,060	170,300							91,150	79,150	
	f)Removal of Signal	set	1	2,000	2,000							0	2,000	
					864,900							764,970	99,930	
<8>	Electric Power													
	a)Electric Power Source D.	set	0		0							0	0	
	b)Lighting Equipment	set	0		0							0	0	
					0							0	0	
<9>	Telecommunication													
	a)Linked Equipment	set	1	17,500	17,500							17,100	400	
<10>	*Subtotal<7>+<8>+<9>				882,400							782,070	100,330	
<11>	Handling machine											<2004 Year>	<2004 Year>	
	a)Electric Equipment	Ls	1	1,000,000	1,000,000	100	0					1,000,000	0	Generator
	b)Gantry crane(42t)	set	1	3,600,000	3,600,000	100	0					3,600,000	0	
	C)Toplifter(35t)	set	1	1,400,000	1,400,000	100	0					1,400,000	0	
	d)Forklift(10t)	set	1	300,000	300,000	100	0					300,000	0	

Appendix 5-2(3)

(1)In the Case of Automatic Signalling Preceding

(c)F/S : By 2003 Completed at Kiaracondong (Including Handling Mechine)

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2001 F/C	2001 D/C	2002 F/C	2002 D/C	2003 F/C	2003 D/C	Remarks
	e)Forklift(3.5t)	set	1	90,000	90,000	100	0					90,000	0	
	f)Forklift(2.5t)	set	2	60,000	120,000	100	0					120,000	0	
	g)Chassis	set	4	50,000	200,000	100	0					200,000	0	
	h)Head truck	set	2	200,000	400,000	100	0					400,000	0	
	i)Hand Pallet(2.5t)	set	1	40,000	40,000	100	0					40,000	0	
					7,150,000							7,150,000	0	<2004 Year>
<12>	*Management Cost 10%	Ls	1	1,264,008	1,264,008							1,150,751	113,257	
	(<1>---<11>)*0.1													
														Grand Total
	Total				13,904,088							12,658,261	1,245,827	13,904,088

*Excluding VAT

Appendix 5-2(4)

(1)In the Case of Automatic Signalling Preceding

(d)F/S : By 2003 Completed at Gedebage (Including Locomotive and Wagon)

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2001 F/C	2001 D/C	2002 F/C	2002 D/C	2003 F/C	2003 D/C	Remarks
<1>	Land Acquisition													
	a)Land Acquisition	m2	9,480	300	2,844,000	0	100	0	853,200	0	1,990,800			
	b)Compensation Fee	house	50	21,000	1,050,000	0	100	0	315,000	0	735,000			
					3,894,000			0	1,168,200	0	2,725,800	0	0	
<2>	Earthwork													
	a)Common Excavation and Backfill	m3	2,600	15	39,000	70	30					27,300	11,700	
	b)Borrow Material	m3	4,220	50	211,000	60	40					126,600	84,400	
	c)Concerete Pile L=6m	m	215	900	193,500	66	34					127,710	65,790	
	d)Installation Fence	m	650	120	78,000	55	45					42,900	35,100	
					521,500			0	0	0	0	324,510	196,990	
<3>	Track and Turnout													
	a)Installation Turnout	set	17	150,000	2,550,000	88	12					2,244,000	306,000	
	b)Removal Turnout	set	2	1,700	3,400	50	50					1,700	1,700	
	c)Installation Railway	m	2,570	1,100	2,827,000	88	12					2,487,760	339,240	
	d)Relocation Railway	m	400	40	16,000	50	50					8,000	8,000	
	e)Removal Railway	m	30	50	1,500	50	50					750	750	
					5,397,900			0	0	0	0	4,742,210	655,690	
<4>	Bridge													
	a)Upper Structure	set	3	200,000	600,000	88	12					528,000	72,000	
	b)Lower Structure	set	3	300,000	900,000	88	12					792,000	108,000	
					1,500,000			0	0			1,320,000	180,000	
<5>	Building													
	a)Extension Office	m2	300	500	150,000	55	45					82,500	67,500	

Appendix 5-2(4)

(1)In the Case of Automatic Signalling Preceding

(d)F/S : By 2003 Completed at Gedebage (Including Locomotive and Wagon)

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2001 F/C	2001 D/C	2002 F/C	2002 D/C	2003 F/C	2003 D/C	Remarks
<6>	*Physical Contingency 10%													
	(<1>---<5>)*0.1	Ls	1		1,146,340			0	116,820	0	272,580	646,922	110,018	
	*Sub Total <2+---+6>				8,715,740			0	116,820	0	272,580	7,116,142	1,210,198	
<7>	Signalling													
	a)Electric I.Device	set	1	1,110,000	1,110,000							1,100,000	10,000	
	b)Signal	set	8	8,200	65,600							53,600	12,000	
	c)Switch Machine	set	10	20,100	201,000							186,000	15,000	
	d)Track Circuit	set	11	19,731	217,040							174,020	43,020	
	e)Signal Cable	km	12	30,993	371,920							192,610	179,310	
	f)Removal of Signal	set	1	2,000	2,000							0	2,000	
					1,967,560							1,706,230	261,330	
<8>	Electric Power													
	a)Electric Power Source D.	set	1	295,900	295,900							271,900	24,000	
	b)Lighting Equipment	set	2	14,100	28,200							24,000	4,200	
					324,100							295,900	28,200	
<9>	Telecommunication													
	a)Telecommunication Cable	km	1	51,000	51,000							38,000	13,000	
	b)Linked Equipment etc.	Ls	1	140,730	140,730							137,400	3,330	
					191,730							175,400	16,330	
<10>	*Sub Total<7>+<8>+<9>				2,483,390							2,177,530	305,860	

Appendix 5-2(4)

(1)In the Case of Automatic Signalling Preceding

(d)F/S : By 2003 Completed at Gedebage (Including Locomotive and Wagon)

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2001 F/C	2001 D/C	2002 F/C	2002 D/C	2003 F/C	2003 D/C	Remarks
<11>	Locomotive and Wagon											<2004 year>	<2004 year>	
	a)Locomotive	set	3	3,260,000	9,780,000	50	50	1,630,000	1,630,000			3,260,000	3,260,000	
	b)Wagon	set	17	140,000	2,380,000	0	100					0	2,380,000	
					12,160,000			1,630,000	1,630,000	0	0	3,260,000	5,640,000	
<12>	*Management Cost 10%	Ls	1	2,725,313	2,725,313			163,000	291,502	0	299,838	1,255,367	715,606	
	(<1>---<11>)*0.1													
														Grand Total
	Total				29,978,443			1,793,000	3,206,522	0	3,298,218	13,809,039	7,871,664	29,978,443

*Excluding VAT

Appendix 5-2(5)

(2) In the Case of Automatic Signalling Preceding

(e) F/S : Doubling of Track

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2006 F/C	2006 D/C	2007 F/C	2007 D/C	2008 F/C	2008 D/C	Remarks
<1>	Compensation fee	house	230	21,000	4,830,000	0	100	0	4,830,000					
<2>	Earthwork													
	a) Common Excavation and Backfill	m3	0	15	0	60	40			0	0			
	b) Borrow Material	m3	27,700	60	1,662,000	60	40			698,040	465,360	299,160	199,440	
	c) Retaining wall	m	2,800	70	196,000	55	45			53,900	44,100	53,900	44,100	
	d) Drainage (Width 1.0m)	m	3,430	100	343,000	55	45			94,325	77,175	94,325	77,175	
	c) Installation Fence	m	1,100	120	132,000	55	45					72,600	59,400	
					2,333,000					846,265	586,635	519,985	380,115	
<3>	Track and Turnout													
	a) Installation Turnout	set	1	150,000	150,000	88	12					132,000	18,000	
	b) Removal Turnout	set	1	1,700	1,700	50	50					850	850	
	c) Installation Railway	m	3,935	1,100	4,328,500	88	12					3,809,080	519,420	
	d) Removal Railway	m	0	50	0	50	50					0	0	
					4,480,200					0	0	3,941,930	538,270	
<4>	Bridge													
	a) 160K867M (Span 1.0m)	set	1	120,000	120,000	88	12					105,600	14,400	
	b) 161K010M (Span 10.0m)	set	1	600,000	600,000	88	12			528,000	72,000			
	c) 161K638M (Span 4.3m)	set	1	350,000	350,000	88	12			308,000	42,000			
	d) 161K654M (Span 0.7m)	set	1	110,000	110,000	88	12					96,800	13,200	
	e) 162K288M (Span 3.1m)	set	1	250,000	250,000	88	12			220,000	30,000			
	f) 162K528M (Span 8.0m)	set	1	500,000	500,000	88	12			440,000	60,000			
	g) 162K683M (Span 0.7m)	set	1	110,000	110,000	88	12					96,800	13,200	
	h) 163K234M (Span 10.0m)	set	2	600,000	1,200,000	88	12			1,056,000	144,000			
	i) 163K379M (Span 0.7m)	set	1	110,000	110,000	88	12					96,800	13,200	

Appendix 5-2(5)

(2) In the Case of Automatic Signalling Preceding

(e) F/S : Doubling of Track

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2006 F/C	2006 D/C	2007 F/C	2007 D/C	2008 F/C	2008 D/C	Remarks
	j)163K571M (Span 2.0m)	set	1	200,000	200,000	88	12					176,000	24,000	
	k)163K791M (Span 0.7m)	set	1	110,000	110,000	88	12					96,800	13,200	
	l)164K048M (Span 3.1m)	set	1	250,000	250,000	88	12			220,000	30,000			
	m)164K289M (Span 0.7m)	set	1	110,000	110,000	88	12					96,800	13,200	
	n)164K953M (Span 5.0m)	set	1	350,000	350,000	88	12			308,000	42,000			
					4,370,000					3,080,000	420,000	765,600	104,400	
<5>	Building													
	a)Extension Office	m2	0	350	0	0	100					0	0	
<6>	*Physical Contingency 10%	Ls	1		1,601,320			0	483,000	392,627	100,664	522,752	102,279	
	*Sub Total <2>+---+<6>				12,784,520					4,318,892	1,107,299	5,750,267	1,125,064	
<7>	Electric Reference at Kac													
	a)Electric I.Device	set	1	506,000	506,000							500,000	6,000	
	b)Automatic Blocking System	set	1	60,340	60,340							59,700	640	
	c)Switch Machine	set	3	20,100	60,300							55,800	4,500	
	d)Track Circut	set	4	22,550	90,200							70,180	20,020	
	e)Signal Cable	km	2.00	30,380	60,760							31,230	29,530	
	f)Telecommunication Cable	km	3.00	51,000	153,000							114,000	39,000	
					930,600							830,910	99,690	
<8>	Electric Reference at Gdb													
	a)Electric I.Device	set	1	506,000	506,000							500,000	6,000	
	b)Automatic Blocking System	set	1	60,340	60,340							59,700	640	

Appendix 5-2(5)

(2)In the Case of Automatic Signalling Preceding

(e)F/S : Doubling of Track

Unit:1000Rp

	Item	Unit	Total Qty	Unit Price	Total Budget	F/C %	D/C %	2006 F/C	2006 D/C	2007 F/C	2007 D/C	2008 F/C	2008 D/C	Remarks
	c)Signal	set	1	14,500	14,500							12,400	2,100	
	d)Switch Machine	set	4	20,100	80,400							74,400	6,000	
	e)Track Circuit	set	5	21,728	108,640							85,100	23,540	
	f)Signal Cable	km	3.00	29,153	87,460							44,230	43,230	
	g)Telecommunication Cable	km	3.00	51,000	153,000							114,000	39,000	
	h)Linked Equipment	set	1	17,500	17,500							17,100	400	
					1,027,840							906,930	120,910	
<9>	*Sub Total<7>+<8>				1,958,440							1,737,840	220,600	
<10>	Locomotive and Wagon	set	0	0	0	100	0					0	0	
<11>	*Management Cost 10%	Ls	1		1,957,296			0	531,300	431,889	110,730	748,811	134,566	
	(<1>---<10>)*0.1													
														Grand Total
	Total				21,530,256			0	5,844,300	4,750,781	1,218,028	8,236,917	1,480,230	21,530,256

*Excluding VAT