

- Factories, schools, market place, etc. 34 places.

9.4 Cost of Compensation and Land Acquisition

9.4.1 Cost of compensation for relocation

Total cost of compensation including the cost of individual plot, house and improvement, as well as others such as factories etc. are summarized as follows:

a. Local residents with land certificate;		
Rp.42.01 million /household x 196 households		Rp. 8,232.8 million
b. Squatters;		
Rp.200,000 /household x 407 households		Rp. 81.4 million
Rp. 50,000 /household x 570 households		Rp. 28.6 million
c. <u>Factories and others;</u>		<u>Rp. 7,077.4 million</u>
Total		Rp. 15,420.2 million

9.4.2 Cost of land acquisition

There are open spaces such as unused low lying areas, agricultural land, and fish pond with in the project area that are subject to acquisition for drainage channel construction works. These areas necessary for drainage channels are subject to land acquisition in addition to the compensation for individual houses, factories, and others. Total required area of land acquisition and its cost are as follows

- Overall land area for the project	259,304.2 m ²
- Total cost of land acquisition	Rp. 42,785.2 million

9.5 Resettlement Areas for Those with Land Certificate

Based on the past experiences of the Department of Housing, DKI Jakarta, approximately 75 % of the local residents involved in the development project and that they became subject to relocation would move into the low cost apartment. Relocation area available within the project area, Bulak Wadon, is wide enough to accept the local families subject to relocation from the drainage areas within the project area. The area has been developed by the Department of Housing in 1995 and it is capable to construct sufficient units of low cost apartment blocks. The cost of construction of these low cost

apartments would be separate account of the project as the Department of Housing, DKI Jakarta is responsible for budgeting of the cost of construction.

9.6 Implementation Program

9.6.1 Budget plan

Disbursement plan has been elaborated in order to distribute a large amount of budget for compensation and relocation evenly over 9 years as follows:

	(Unit: Rp.million)	
Fiscal Year 1 (1997/1998)	2,000.0	(3.4 %)
Fiscal Year 2 (1998/1999)	1,473.5	(2.5 %)
Fiscal Year 3 (1999/2000)	5,447.3	(9.4%)
Fiscal Year 4 (2000/2001)	7,910.1	(13.6 %)
Fiscal Year 5 (2001/2002)	17,669.7	(30.4 %)
Fiscal Year 6 (2002/2003)	19,136.1	(32.9 %)
Fiscal Year 7 (2003/2004)	4,570.8	(7.8 %)
Total	58,207.2	(100 %)

9.6.2 Method of relocation operation

(1) Land procurement committee

As is shown in the Fig 9.1, Land Procurement Committee is formed as soon as the project implementation is approved at the government level. Kotamadya Jakarta Barat and Jakarta Utara will establish their own Land Procurement Committee for assessment of the rate of compensation for the area within their administrative areas. In the case of the project area, a portion of the Kamal, Tanjungan and PIK Junction drainage channels to the northeast of Jl.Kamal Muara are inside of Jakarta Utara. Thus Land Procurement Committee of Jakarta Utara will make decision on the rate of compensation. The rest is in the jurisdiction of Jakarta Barat.

(2) Establishment of the drainage area

As soon as the project implementation is determined, parallel to the formation of Land Procurement Committee, the person-in-charge of the project should establish geographical are of the drainage channels prior to negotiation with individual households, factories and others owning building and land within the boundaries of the drainage channels.

Upon consultation with the Department of Urban Planning, DKI Jakarta, for demarcation of each drainage channel area and its area for right-of-way according to the Local Government Act of the West Jakarta No.2/1985 regarding Demarcation for Urban Drainage, each drainage channel area is established.

(3) Negotiation and evaluation

As soon as the geographical area of drainage area is established, the person-in-charge of the project should begin a series of sessions of negotiation with the households and others owning building and/or land within the boundaries of drainage channel.

(4) Payment procedure

As both parties of the person-in-charge of the project and the households reached an agreement of relocation, the agreed amount of compensation is paid in cash in person with witnesses from the kelurahan and kecamatan. The resettlement plan is financed by the Regional Budget of APBD TK II allocated to each kotamadya.

Upon payment, land certificate is exchanged. This concludes the negotiation and that the formal hand over of the land is completed. If certificate is not exchanged for the reasons that it is used for bank/loan guarantee, etc. the relevant third party with original certificate should be present at the time of payment. Depending on the contents of agreement, type of disbursement for relocation will be subdivided as follows:

- Resettling in the low cost apartment in Bulak Wadon as part of compensation is spent on the down payment and loan of the low cost apartment, or receiving the balance of compensation;
- Resettling in individual resettlement area as they choose to receive full amount of compensation in cash;
- Squatters; and
- Tenant residents that have no right to any part of compensation. Only the owner will deal with compensation for relocation.

(5) Registration of the drainage area

Upon payment, land clearing is conducted. Parallel to the clearing operation, invitation and consultation with the Regional Office of National Land Administration in Jakarta Barat and Jakarta Utara for the survey result of acquired land is conducted. Thereby the Regional Office of National Land Administration in Jakarta Barat and Jakarta Utara will

declare the acquired land as state land specifically make use of for drainage channels in the name of the Head of Land Registration. The procedure is further approved by the Head of National Land Administration.

(6) Resettlement arrangement

Whether the local residents resettle in the low cost apartment or individual resettlement areas, the person-in-charge of the project will coordinate with the Department of Housing for preparation of the low cost apartment for allocation of unit to those entitled to moving into the low cost apartment. Same consultation is conducted for those resettling in their own resettlement areas. Actual moving operation is conducted by the Department of Housing, DKI Jakarta.

Upon completion of resettlement operation, arrangement for issuing of official certificate of resettlement for those subject to resettlement should be conducted with the Regional Office of Land Administration in Jakarta Barat and Jakarta Utara.

(7) Organizations concerned with the resettlement program

As described above, a large number of organizations required to be informed of the progress of the resettlement program and its timing as well as the completion. The person-in-charge of the project is responsible to notify, request assistance and clarification, and disseminate information on the completion of the resettlement of the project.

The person-in-charge of the project is responsible to notify, request assistance and clarification, and disseminate information on the project.



10 PROJECT IMPLEMENTATION PROGRAM

10.1 Implementation of the Project

10.1.1 Project organization

The proposed organization for implementation of the packages-1 and 2 is shown in Fig 10.1. An Executing Agency of the project will be CIPTA KARYA which is responsible for management of the project works including loan appraisal, loan agreement and overall management of the project works. The construction works will be entrusted and carried out by Project Management Office, DPU DKI Jakarta.

Upon approval of the local project fund, DPU DKI Jakarta will carry out land acquisition and compensation works for households with assistance and cooperation of department of housing.

The implementation of the packages-1 and 2 works will be administrated by DPU DKI Jakarta. The construction works will be entrusted and carried out by Project Management Office, DPU DKI Jakarta, which will be controlled by steering committee and technical committee. The Project Management Office, DPU DKI Jakarta will also controlled by Director General of CIPTA KARYA. KANWIL PU will function as administrative support which will be instructed by Minister, PU. Overall management by Director General of CIPTA KARYA will be transmitted to the Project Manager of Project Management Office, DPU DKI Jakarta through the Steering Committee. The technical management by DPU DKI and DINAS PU will be also transmitted to the Project Management Office, DPU DKI through the Technical Committee.

Consultant will functions as technical assistance for staffs of the Project Management Office, DPU DKI Jakarta for construction works of the packages-1 and 2 and also coordination between Project Management Office and official foreign loan agency for technical aspects.

10.1.2 Financial source

All the foreign currency portion and a part of the local currency portion of the construction cost are expected to be financed by an international organization with its

soft loan. The remaining local currency portion will be covered by the Indonesian national budget.

10.1.3 Engineering services

A selected competitive bid will be applied for procurement of engineering consultant for assistance of the tendering matters during pre-construction period and construction supervision matters during construction period.

10.1.4 Implementation schedule

It was requested by DKI Jakarta that the first priority should be given to package-1 and next priority is package-2, due to the reason that the drainage areas along the Jl. Tol Prof. Sedyatmo are quite populated and the highest economic development zones, and early implementation of the drainage channels for these two packages was requested. In consideration of this request, it was proposed to proceed with the construction works of the drainage channels in accordance with the implementation schedule as shown in Fig 10.2.

Upon approval of the project loan, selection of consultant for tendering and construction supervision, selection of contractor including pre-qualification and tendering will be carried out. The package-1 works which include construction of the Kamal drainage channel consists mainly of widening of the existing drainage channel and construction of earth type levee, concrete parapet, revetment and bridges and installation of slide and flap gates. The package-2 works which include construction of the Tanjungan and PIK Junction drainage channels comprise excavation of the drainage channels, construction of revetment and bridges and installation of slide and flap gates. It is scheduled to execute the drainage works from year, 2000 from Package-1 as initial phase, Package-2 from 2003 as second phase.

10.2 Construction Method

10.2.1 Basic conditions

(1) Structural feature and major work quantities

The structural feature and major work quantities are calculated as follows:

(a) Package 1

- (i) Kamal drainage channel (main) : 4,463 lin.m
- Levee embankment 5,568 lin.m
 - Concrete parapet wall 484 lin.m
 - Revetment, type I 1,741 lin.m
 - Revetment, type II 1,591 lin.m
 - Sluiceway 15 nos.
 - Roadway girder bridge 6 nos.
 - Pedestrian girder bridge 3 nos.
- (ii) Kamal drainage channel (branch) : 2,755 lin.m
- Levee embankment 1,528 lin.m
 - Heightening of exist. masonry 624 lin.m
 - Revetment, type I 1,714 lin.m
 - Revetment, type II 1,629 lin.m
 - Concrete ditch 452 lin.m
 - Sluiceway 8 nos.
 - Sluice culvert 2 nos.
 - Sluice ditch 2 nos.
 - Roadway girder bridge 14 nos.
 - Pedestrian girder bridge 3 nos.
 - Roadway in-situ bridge 2 nos.
- (b) Package 2
- (i) Tanjungan drainage channel : 2,536 lin.m
- Levee embankment 3,531 lin.m
 - Concrete wall 1,134 lin.m
 - Revetment, type II 347 lin.m
 - Sluiceway 7 nos.
 - Roadway girder bridge 4 nos.
 - Pedestrian girder bridge 1 nos.
- (ii) PIK Junction drainage channel : 765 lin.m
- Concrete ditch 765 lin.m
 - Sluiceway 1 no
 - Roadway in-situ bridge 4 nos.

(2) Working conditions

(i) Workable day and hour

Workable day was assumed as follows:

Work	Dry Season May - Oct.	Rainy Season Nov. - Apr.	Annual Total
Excavation, earth	24	18	252
Filling, earth	22	16	228
Concrete	23	23	276
Piling	24	24	288

The actual operation hour is assumed to be 8 hours per day out of 10-working hour per shift in principle.

(ii) Hauling distance

The material subject to transportation will be excavated material to be disposed and demolished structures. The planned spoil bank is located at Teluknaga area in Tangerang region. Hauling distance for disposal is assumed at around 15 km on an average for each package.

(3) Plan of procurement method of major construction materials

(i) Excavated earth materials in every site may not be suitable for embankment and filling works. Furthermore, embankment materials are restricted to be procured in DKI Jakarta area by the local government. In this connection, embankment materials for levee and pavement foundation is planned to be procured from Serpong in Tangerang region at around 20 km far from the project sites. Such material is scheduled to be procured to necessary sites through licensed suppliers. Excavated materials above water level will be selectively utilized for back filling. Excavated earth material will be selected and stocked just beside excavated site till back filling is carried out.

(ii) Aggregates for concrete and pavement works and stone materials for masonry and drainage works will be procured through licensed suppliers due to costly quarry development in West Java because of small work quantities.

(iii) Precast concrete products are satisfactorily available in Jakarta city with various kinds of dimensions and suppliers by a ready-made or an order-made system.

10.2.2 Construction works

Outline of construction plan of major structures described herein is developed taking into account the present site conditions and assuming that the construction works will be performed by an international contractor for each package employing mechanized construction methods. On the same time, conventional construction

methods are also considered taking into account capability of local labors. Construction works of river structures will be principally executed from downstream part. Construction of sluiceways will be executed at the location where land compensation completed. For bridge construction, neighboring bridges shall never be constructed on the same time to keep detour way. For the bridges having heavy traffic condition, temporary bridge and relocation road may be provided prior to demolition of the existing bridge.

10.3 Construction Time Schedule

10.3.1 Basic conditions for setting of construction time schedule

The drainage channel stretches are divided into several sections for construction purpose in consideration of characteristics of compensation as well as construction orders of river structures in drainage channel and bridges.

In viewpoint of compensation, construction priority is given to the section having fewest number of households. In this sense, embankment type levee has priority over parapet type levee, because parapet wall will be constructed at the sections having dense households.

While, in viewpoint of construction purpose, construction priority is given by the criteria shown below.

- Sluiceway under revetment shall be constructed during revetment construction period.
- Sluiceway under levee shall be constructed during levee construction period.
- Channel structures under and around a bridge shall complete prior to commencement of the bridge construction at least for 10 m long in both the upstream and downstream parts of the bridge.
- Bridge construction in each section shall be made from downstream part in order to follow river structure construction.
- The construction periods of neighboring bridges shall not be overlapped.

10.3.2 Construction time schedule for each package

The construction time schedule was formulated based on the above conditions.

Relationship between channel stretch and working period for each package is as follows:

(1) For contract package-1

Section	Length (m)	Priority	Work Period
1. Kamal drainage channel (main)	4,299		
Stage I			
KM 00+0m - KM 15+0m	1,257	1	Aug. 2000 - Aug. 2003
Stage II			
KM 16+0m - KM 21+0m	312	3	Jan. 2001 - Sep. 2002
KM 21+0m - KM 26+0m	434	2	May 2001 - Jul. 2002
KM 26+0m - KM 40+32m	992	4	Jul. 2001 - Sep. 2003
KM 40+32m - KM 48+0m	542	5	Aug. 2001 - Jan. 2004
Stage III			
KM 48+0m - KM 57+0m	762	6	Jun. 2002 - Apr. 2004
2. Kamal drainage channel (branch)	2,755		
KE 00+0m - KE 10+7m	626	1	Apr. 2000 - Oct. 2003
KE 10+7m - KE 21+34m	905	2	Jul. 2001 - May. 2004
KE 31+34m - KE 30+4m	772	3	Jan. 2002 - Feb. 2004
KE 30+4m - KE 33+0m	452	4	Nov. 2002 - Feb. 2004

(2) For contract package-2

Channel Stretch	Length (m)	Priority	Work Period
1. Tanjungandrainage channel	2,610		
TM 00-100m-TM 17-0m	1,530	1	May 2003-Oct. 2004
TM 18+0m-TM 25+5m	527	3	Jan. 2004-Jan.2005
TM25+5m-EP	553	2	Aug. 2003-Feb. 2005
2. PIK Junction drainage channel	716		
BP-NM32-0m	455	1	Apr.2003-Mar. 2004
NM32-EP	261	2	Apr. 2003-Jan. 2004

Tables



Table 4.1 EXISTING RELATED STRUCTURES

No.	Structure	Work	Kamal		Tanjungan		PIK Junction		S.Cengkarang		Gede/boe		Menyua		Total
			(KM)	(KE)	(TM)	(VA)	(NM)	(CM)	(CM)	(MA)	(MM)	(MA)			
1-1	Bridge	Reconstruction*													0
1-2	Road, large **	Reconstruction*													2
1-3	Road, 3-lane	Reconstruction*	4	7	4				2						2
1-4	Road, 2-lane(W>5m)	Reconstruction*	2	10					6					9	35
1-5	Road, 1-lane(W<5m)	Reconstruction*	4	3					1						18
1-6	Pedestrian	Reconstruction*							4						13
2-1	Gate	Relocation							2						4
2-2	Culvert	Reconstruction*							1						2
3-1	Concrete pipe	Reconstruction*							1						2
3-2	Concrete box	Reconstruction*							1						2
3-3	Concrete, Left bank	Relocation	2		2				12					4	36
3-4	Concrete, Right bank	Relocation	11	13	1				5					14	54
4-1	Steel, Left bank	Relocation	1	8	1				4					1	35
4-2	Steel, Right bank	Relocation	9	8	11				2					8	41
4-3	Cable & duct	Reconstruction	4	3	1				2					1	23
4-4	Steel girder	Reconstruction	4		1				2					1	8
5	Transformer	Relocation													1
6-1	Telephone pole	Relocation												4	5
6-2	Concrete, Left bank	Relocation													0
6-3	Concrete, Right bank	Relocation													0
6-4	Steel, Left bank	Relocation	6	20	2				6					22	50
6-5	Steel, Right bank	Relocation							2					8	35
7-1	Telephone line	Reconstruction		5	1				2					1	13
7-2	Concrete duct	Reconstruction													1
7-3	Steel girder	Reconstruction	3												4
7-4	Manhole&conduit	Reconstruction												3	4
7-5	Control box	Relocation													4
8	Water tank	Relocation	2												2
9	Water pipe	Reconstruction													2
10	Gate structure	Relocation							1						1
11	Monument	Removal	2												2
12	Telecommunication antenna	Relocation	3												1
13	Water pump	Relocation	1												1
14	Advertising board	Relocation													2
15-1	Large	Relocation													0
15-2	Small	Relocation							1						4
16-1	Large	Relocation													1
16-2	Medium	Relocation							2						0
16-3	Small	Relocation													2
17	Traffic signal	Relocation							1						1

Note : * : Reconstruction with same width or diameter
 ** : Out of scope of work

Table 6.1 SUMMARY OF FINANCIAL COST

Description	Amount (1,000 US \$)		
	Foreign Portion	Local Portion	Total
A Construction Cost	8,037	5,209	13,246
1 Package 1	5,304	3,617	8,921
Stage I	791	472	1,263
Stage II	2,196	1,544	3,740
Stage III	2,317	1,601	3,918
2 Package 2	2,733	1,592	4,325
Tanjungan	2,579	1,490	4,069
PIK Junction	154	102	256
B Government Administrative Expense	0	662	662
C Engineering Services	5,006	3,233	8,239
Total A to C	13,043	9,104	22,147
D Compensation Cost	0	24,769	24,769
E Physical Contingency (10 % for A to D)	1,304	3,389	4,693
F Price Escalation (2 % p.a. for A to E)	1,552	3,283	4,835
G Tax (10 % for A, C and E&F for A&C)	0	2,618	2,618
H Interest during Construction	718	1,975	2,693
Total Project Cost	16,617	45,138	61,755

Table 6.2 CONSTRUCTION COST FOR PACKAGE I

Description	OVERALL			Stage I			Stage II			Stage III		
	F.C.	L.C.	Total	F.C.	L.C.	Total	F.C.	L.C.	Total	F.C.	L.C.	Total
	(Unit : US\$)											
0 GENERAL ITEM	580,085	520,061	1,100,146	112,298	95,010	207,308	246,918	222,739	469,657	220,869	202,312	423,181
1 RELOCATION/RECONSTRUCTION OF PUBLIC FACILITIES	0	577,030	577,030	0	16,700	16,700	0	349,220	349,220	0	211,110	211,110
2 DRAINAGE CHANNEL	536,557	296,370	832,927	154,276	84,707	238,983	231,402	127,336	358,738	150,879	84,327	235,206
2.1 Drainage Channel	1,001,724	553,116	1,554,840	438,554	235,175	673,729	449,032	247,690	696,722	114,138	70,251	184,389
2.2 Levee and Inspection/Relocation Road	295,101	104,808	399,909	0	0	0	295,101	104,808	399,909	0	0	0
2.3 Concrete Parapet Wall	1,637	1,276	2,913	0	0	0	0	0	0	1,637	1,276	2,913
2.4 Heightening of Existing Masonry Revetment	422,063	276,102	698,165	3,851	2,505	6,356	181,418	119,102	300,520	236,794	154,495	391,289
2.5 Masonry Revetment, type I	409,311	273,128	682,439	0	0	0	108,614	72,839	181,453	300,697	200,289	500,986
2.6 Masonry Revetment, type II	117,896	76,818	194,714	0	0	0	0	0	0	117,896	76,818	194,714
2.7 Concrete Ditch and Culvert	2,784,289	1,581,618	4,365,907	596,681	322,387	919,068	1,265,567	671,775	1,937,342	922,041	587,456	1,509,497
Total of 2	211,401	91,692	303,093	0	0	0	148,918	66,534	215,452	62,483	25,158	87,641
3 DRAINAGE FACILITIES	141,389	75,015	216,404	7,195	3,752	10,947	61,963	32,617	94,580	72,231	38,646	110,877
3.1 Sluiceway	352,790	166,707	519,497	7,195	3,752	10,947	210,881	99,151	310,032	134,714	63,804	198,518
3.2 Connection Canal/Cross Drain	93,615	35,281	128,896	4,600	1,701	6,301	24,349	9,199	33,548	64,666	24,381	89,047
Total of 3	173,086	82,331	255,417	9,094	4,279	13,373	54,293	25,562	79,855	109,699	52,490	162,189
4 BRIDGE AND ROAD	816,880	274,740	1,091,620	44,627	16,685	61,312	308,835	103,943	412,778	463,418	154,112	617,530
4.1 Demolition of Existing Bridge and Road	503,606	379,264	882,870	16,641	11,432	28,073	85,513	62,039	147,552	401,452	305,793	707,245
4.2 Foundation and Substructure	1,587,187	771,616	2,358,803	74,962	34,097	109,059	472,990	200,743	673,733	1,039,235	536,776	1,576,011
4.3 Superstructure	5,304,351	3,617,032	8,921,383	791,136	471,946	1,263,082	2,196,356	1,543,628	3,739,984	2,316,859	1,601,458	3,918,317
4.4 Approach Road	0	0	0	0	0	0	0	0	0	0	0	0
Total of 4	5,304,351	3,617,032	8,921,383	791,136	471,946	1,263,082	2,196,356	1,543,628	3,739,984	2,316,859	1,601,458	3,918,317
Total	5,304,351	3,617,032	8,921,383	791,136	471,946	1,263,082	2,196,356	1,543,628	3,739,984	2,316,859	1,601,458	3,918,317

Note : Foreign Exchange Rates :

1.0 US\$ = Rp. 2,350 = Yen 115.0 as of June 1997

Table 6.3 CONSTRUCTION COST FOR PACKAGE 2

Description	OVERALL			Tanjung			PIK Junction		
	F.C.	L.C.	Total	F.C.	L.C.	Total	F.C.	L.C.	Total
	(Unit : US\$)								
0 GENERAL ITEM	319,815	321,224	641,039	306,133	305,158	611,291	13,682	16,066	29,748
1 RELOCATION/RECONSTRUCTION OF PUBLIC FACILITIES	0	118,020	118,020	0	118,020	118,020	0	0	0
2 DRAINAGE CHANNEL	115,794	66,763	182,557	115,786	66,756	182,542	8	7	15
2.1 Drainage Channel	532,869	372,922	905,791	532,869	372,922	905,791	0	0	0
2.2 Levee and Inspection/Relocation Road	721,418	278,460	999,878	721,418	278,460	999,878	0	0	0
2.3 Concrete Wall	43,131	28,869	72,000	43,131	28,869	72,000	0	0	0
2.4 Masonry Revetment, type II	116,116	75,368	191,484	0	0	0	116,116	75,368	191,484
2.5 Concrete Ditch and Culvert	1,529,328	822,382	2,351,710	1,413,204	747,007	2,160,211	116,124	75,375	191,499
Total of 2	53,119	19,196	72,315	46,830	17,061	63,891	6,289	2,135	8,424
3 DRAINAGE FACILITIES	20,731	10,941	31,672	17,847	9,432	27,279	2,884	1,509	4,393
3.1 Sluiceway	75,850	30,137	105,987	64,677	26,493	91,170	9,173	3,644	12,817
3.2 Connection Canal/Cross Drain	65,769	22,441	88,210	65,694	22,383	88,077	75	58	133
Total of 3	49,620	25,291	74,911	41,686	20,017	61,703	7,934	5,274	13,208
4 BRIDGE AND ROAD	566,554	161,295	727,849	559,903	159,098	719,001	6,651	2,197	8,848
4.1 Demolition of Existing Bridge and Road	2,067	1,250	3,317	2,067	1,250	3,317	0	0	0
4.2 Foundation and Substructure	125,339	90,505	215,844	125,339	90,505	215,844	0	0	0
4.3 Superstructure	809,349	300,782	1,110,131	794,689	293,253	1,087,942	14,660	7,529	22,189
4.4 Approach Cushion Slab	2,732,342	1,592,545	4,324,887	2,578,703	1,489,931	4,068,634	153,639	102,614	256,253
4.5 Approach Road									
Total of 4									
Total									

Note : Foreign Exchange Rates :
1.0 US\$ = Rp. 2,350 = Yen 115.0 as of June 1997

Table 6.4 ANNUAL DISBURSEMENT SCHEDULE (1/2)

Description	Total Cost (1,000 US\$)		1997		1998		1999		2000		2001	
	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local
A Construction Cost	8,037	5,209	0	0	0	0	0	0	1,139	771	1,210	824
1 Package I	5,304	3,617	0	0	0	0	0	0	1,139	771	1,210	824
Stage I	791	472	0	0	0	0	0	0	237	142	198	118
Stage II	2,196	1,544	0	0	0	0	0	0	439	309	549	386
Stage III	2,317	1,601	0	0	0	0	0	0	463	320	463	320
2 Package 2	2,733	1,592	0	0	0	0	0	0	0	0	0	0
Tanjungan	2,579	1,490	0	0	0	0	0	0	0	0	0	0
PIK Junction	154	102	0	0	0	0	0	0	0	0	0	0
B Government Administrative Expense	0	662	40	40	60	60	86	86	93	93	106	106
C Engineering Services	5,006	3,233	0	0	0	0	651	420	1,001	647	801	517
Total A to C	13,043	9,104	40	40	60	60	506	506	2,140	1,511	2,011	1,447
D Compensation Cost	0	24,769	851	851	627	627	2,318	2,318	3,366	3,366	7,519	7,519
E Physical Contingency (10% for A to D)	1,704	3,389	89	89	69	69	282	282	214	488	201	897
F Price Escalation (2% p.a. for A to E)	1,552	3,283	0	0	15	15	29	125	144	328	182	813
G Tax (10% for A, C and E&F for A&C)	0	2,618	0	0	0	0	123	123	415	415	399	399
H Interest during Construction	718	1,975	0	15	15	41	75	86	60	194	113	355
Total Project Cost	16,617	45,138	995	995	812	812	3,429	4,185	2,558	6,302	2,507	11,430
	100.00%	100.00%	1.61%	1.61%	1.31%	1.31%	6.78%	6.78%	14.35%	14.35%	22.57%	22.57%

Basic Data

Foreign exchange rates	Rp/US\$	Year/US\$	115
A Progress rate of construction works	100%	0%	0%
Package 1, Stage I	100%	0%	0%
Package 1, Stage II	100%	0%	0%
Package 1, Stage III	100%	0%	0%
Package 2, Tanjungan	100%	0%	0%
Package 2, PIK Junction	100%	0%	0%
B Government Administrative Expense	5%	6%	6%
C Engineering Services	100%	0%	0%
D Compensation Cost	10%	0.00%	0.00%
E Physical Contingency (10% for A to D)	10%	0.00%	0.00%
F Price Escalation (2% p.a. for A to E)	10%	0.00%	0.00%
G Tax (10% for A, C and E&F for A&C)	10%	0.00%	0.00%
H Interest during Construction			
Annual amount	0	980	771
Due Amount	0	490	373
Rate	3%	3%	3%
Interest during Construction	15	15	41
Disbursed Amount at the end year	0	995	812

Table 6.4 ANNUAL DISBURSEMENT SCHEDULE (2/2)

Description	Total Cost (1,000 US\$)		2002		2003		2004		2005		2006						
	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local					
	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total					
A Construction Cost	8,037	5,209	13,246	1,286	880	2,166	1,965	1,247	3,212	1,793	1,115	2,908	644	372	1,016	0	0
1 Package I	5,304	3,617	8,921	1,286	880	2,166	977	689	1,666	692	473	1,165	0	0	0	0	0
Stage I	791	472	1,263	158	94	252	119	71	190	79	47	126	0	0	0	0	0
Stage II	2,196	1,544	3,740	549	386	935	395	278	673	264	185	449	0	0	0	0	0
Stage III	2,317	1,601	3,918	579	400	979	463	320	783	349	241	590	0	0	0	0	0
2 Package 2	2,733	1,592	4,325	0	0	0	988	578	1,566	1,101	642	1,743	644	372	1,016	0	0
Tanjung	2,579	1,490	4,069	0	0	0	903	522	1,425	1,032	596	1,628	644	372	1,016	0	0
PIK Junction	154	102	256	0	0	0	85	56	141	69	46	115	0	0	0	0	0
B Government Administrative Expense	0	662	662	0	106	106	79	79	79	73	73	73	20	20	20	-1	-1
C Engineering Services	5,006	3,233	8,239	801	517	1,318	801	517	1,318	801	517	1,318	150	97	247	0	1
Total A to C	13,043	9,104	22,147	2,087	1,503	3,590	2,766	1,843	4,609	2,594	1,705	4,299	794	489	1,283	0	0
D Compensation Cost	0	24,769	24,769	8,143	8,143	8,143	1,945	1,945	1,945	0	0	0	0	0	0	0	0
E Physical Contingency (10% for A to D)	1,204	3,389	4,693	209	965	1,174	277	379	656	259	171	430	79	49	128	0	0
F Price Escalation (2% p.a. for A to E)	1,552	3,283	4,835	239	1,105	1,344	384	526	910	424	279	703	150	92	242	0	0
G Tax (10% for A, C and E&F for A&C)	0	2,618	2,618	423	423	423	561	561	561	156	212	368	134	99	233	0	0
H Interest during Construction	718	1,975	2,693	113	525	638	131	459	590	156	212	368	134	99	233	0	0
Total Project Cost	16,617	45,138	61,755	2,648	12,664	15,312	3,558	5,713	9,271	3,433	2,901	6,334	1,157	892	2,049	0	0
		100.000%		24.79%			15.01%				10.26%		3.32%			0.000%	

Basic Data
Foreign exchange rate

Rp/US\$ 2,350

A Progress rate of construction works	100%	100%	100%	20%	20%	15%	15%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%
Package 1, Stage I	100%	100%	100%	25%	25%	18%	18%	12%	12%	0%	0%	0%	0%	0%	0%	0%	0%
Package 1, Stage II	100%	100%	100%	25%	25%	20%	20%	15%	15%	0%	0%	0%	0%	0%	0%	0%	0%
Package 1, Stage III	100%	100%	100%	0%	0%	35%	35%	40%	40%	0%	0%	0%	0%	0%	0%	0%	0%
Package 2, Tanjung	100%	100%	100%	0%	0%	55%	55%	45%	45%	0%	0%	0%	0%	0%	0%	0%	0%
Package 2, PIK Junction	100%	100%	100%	0%	0%	12%	12%	11%	11%	0%	0%	0%	0%	0%	0%	0%	0%
B Government Administrative Expense	5%	100%	100%	16%	16%	16%	16%	16%	16%	0%	0%	0%	3%	3%	0%	0%	0%
C Engineering Services	100%	100%	100%	16%	16%	16%	16%	16%	16%	0%	0%	0%	3%	3%	0%	0%	0%
D Compensation Cost																	
E Physical Contingency (10% for A to D)	10%																
F Price Escalation (2% p.a. for A to E)																	
G Tax (10% for A, C and E&F for A&C)	10%			10.41%	10.41%	12.62%	12.62%	14.87%	14.87%	14.87%	14.87%	17.17%	17.17%	17.17%	19.51%	19.51%	19.51%
H Interest during Construction																	
Amount				2,535	12,139	3,427	5,254	3,277	2,689	1,023	793	1,023	793	793	793	0	0
Over Amount				3,773	17,500	4,362	15,291	5,197	7,058	4,456	3,209	4,456	3,209	4,456	3,209	0	0
Rate				3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	0%	0%
Interest during Construction				113	525	131	459	156	212	134	99	157	134	99	212	0	0
Disturbed Amount at the end year				2,648	12,664	3,558	5,713	3,433	2,901	1,157	892	1,157	892	892	892	0	0

Table 7.1 SUMMARY OF ECONOMIC COST

(Unit: 10³ US\$)

DESCRIPTION		F.C	L.C	TAX	TOTAL
1. Direct Cost	(1) Base Cost	8,037	4,688	0	12,725
	(2) Price Escalation	0	0	0	0
	(3) Sub-total(1)+(2)	8,037	4,688	0	12,725
Sub-total(A)		8,037	4,688	0	12,725
2. Physical Contingency (10% of (A))		804	469	0	1,273
3. Sub-total(B):(1+2)		8,841	5,157	0	13,998
4. Land Acquisition	(1) Base Cost	0	22,292	0	22,292
	(2) Price Escalation	0	0	0	0
	(3) Sub-total(1)+(2)	0	22,292	0	22,292
	(4) Physical Contingency (10% of 3(3))	0	669	0	669
	(5) Sub-total(3)+(4)	0	22,961	0	22,961
5. Consulting Service	(1) Base Cost	5,006	2,910	0	7,916
	(2) Price Escalation	0	0	0	0
	(3) Sub-total(1)+(2)	5,006	2,910	0	7,916
	(4) Physical Contingency (10% of 4(3))	501	291	0	792
	(5) Sub-total(3)+(4)	5,507	3,201	0	8,708
6. Administration Cost	(1) Direct Cost(5% of (A))	0	596	0	596
	(2) Land Acquisition (5% of 3(3))	0	0	0	0
	(3) Sub-total(1)+(2)	0	596	0	596
7. Ground Total (3+4+5+6)		14,347	31,915	0	46,262

Exchange Rate: Rupiah/US\$: 2350
 Yen/US\$: 115
 Yen/Rupiah: 0.05

(1) Price escalation rate: 2 %
 (2) Physical contingency: 10 %
 (3) Administration cost: 5 %

Table 7.2 ESTIMATE OF ASSETS IN THE RESIDENTIAL AREAS

(1) Residence

House

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
Permanent	88	68	36.9%	26	7,333	190,667
Semi-permanent	64	101	34.5%	35	3,419	119,658
Simple	49	143	28.6%	41	1,571	64,391
Total						374,716

Household Goods

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
Permanent	88	68	36.9%	26	8,120	211,111
Semi-permanent	64	101	34.5%	35	1,709	59,829
Simple	49	143	28.6%	41	385	15,769
Total						286,709

The average value for housing

661,425

(2) Commercial Sector

Building for Commercial Use

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
Large Shop	1,300	4	44.0%	2	222,222	444,444
Medium Small Shop	40	150	56.0%	84	2,564	215,385
Total						659,829

Facilities in the Building for Commercial Use

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
Large Shop	1,300	4	44.0%	2	69,231	138,462
Medium Small Shop	40	150	56.0%	84	513	43,077
Total						181,538

Merchandise

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
Large Shop	1,300	4	44.0%	2	166,667	333,333
Medium Small Shop	40	150	56.0%	84	1,923	161,538
Total						494,872

The average value for commercial sector

1,336,239

(3) Office

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
Office(Building)	120	50	100.0%	50	10,000	500,000
Facilities	120	50	100.0%	50	7,265	363,248
Total						863,248

(4) Public Buildings

Public Buildings

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
mosque,church	550	11	84.0%	10	47,009	470,085
Medical facility	600	10	16.0%	2	51,282	102,564
Total						572,650

Public Buildings (properties)

	Average Floor area(m ²)	Unit/ha	Ratio by Type	Unit/ha by ratio	Unit Value(US\$)	Total Value(US\$/ha)
mosque,church	550	11	84.0%	10	small	
Medical facility	600	10	16.0%	2	7,692	15,385
Total						15,385

The average value for public sector

588,034

Table 7.3 TOTAL ASSETS IN THE RESIDENTIAL AREAS

	Ratio by Type	Value per Type (US\$/ha)	Value/ratio (US\$/ha)
Residence	95.2%	661,425	629,677
House	95.2%	374,716	356,730
Household goods	95.2%	286,709	272,947
Commercial	2.4%	1,336,239	32,070
Building	2.4%	659,829	15,836
Facilities	2.4%	181,538	4,357
Merchandise	2.4%	494,872	11,877
Office	1.8%	863,248	15,538
Building	1.8%	500,000	9,000
Facility	1.8%	363,248	6,538
Public Building	0.6%	588,034	3,528
Building	0.6%	572,650	3,436
Facility	0.6%	15,385	92
Total	100.0%		680,813

Table 7.4 ESTIMATE OF ASSETS IN THE INDUSTRIAL AREA

I. Factory

Building for Factory

	Floor Area(m ²)	Unit/ha	Ratio by Type	Unit/ha by Ratio	Unit Value(US\$)	Total Value(US\$/ha)
Large scale	2,520	2	34.10%	1	323,077	323,077
Medium scale	360	16	40.60%	7	30,770	215,390
Small scale	40	150	25.30%	38	2,137	81,206
Total						619,673

Property in Factory Building

	Average Floor Area(m ²)	Unit/ha by Ratio	Unit Value(US\$)	Unit/ha by Ratio	Unit Value(US\$)	Total Value(US\$/ha)
Large scale	2,520	1	34.10%	1	1,861,962	1,861,962
Medium scale	360	7	40.60%	7	258,883	1,812,181
Small scale	40	38	25.30%	38	6,638	252,244
Total						3,926,387

The average value in industrial area

4,546,060

Table 7.5 FLOOD DAMAGE RATE PER HECTARE

(Unit: US\$/ha)

Area	Item	Unit price	Inundation Depth(m)						Deeper than 2.0			
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0			1.0 to 2.0		
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage		Damage Rate	Damage	
Residential area	House	356,729	0.03	10,702	0.053	18,907	0.072	25,684	0.109	38,883	0.152	54,223
	Household goods	272,947		0	0.086	23,473	0.191	52,133	0.331	90,345	0.499	136,201
	Commercial (building)	15,836		0	0.180	2,850	0.314	4,973	0.419	6,635	0.539	8,536
	Commercial (facility)	4,357		0	0.180	784	0.314	1,368	0.419	1,826	0.539	2,348
	Commercial(merchandise)	11,877		0	0.127	1,508	0.276	3,278	0.379	4,501	0.479	5,689
	Office(building)	9,000		0	0.180	1,620	0.314	2,826	0.419	3,771	0.539	4,851
	Office(facility)	6,538		0	0.180	1,177	0.314	2,053	0.419	2,739	0.539	3,524
	Public office(building)	3,436		0	0.180	618	0.314	1,079	0.419	1,440	0.539	1,852
	Public office(facility)	92		0	0.086	8	0.191	18	0.331	30	0.499	46
	Total in residential area		680,812		10,702	50,946	93,411	150,172	217,269			
Industrial area	Industry(building)	619,673		0	0.180	111,541	0.314	194,577	0.419	259,643	0.539	334,004
	Industry(Inventory)	3,926,387		0	0.127	498,651	0.276	1,083,683	0.379	1,488,101	0.479	1,880,739
	Total	4,546,060		0	610,192	1,278,260	1,747,744	2,214,743				

Table 7.6 DIRECT DAMAGE PER HECTARE WITH INUNDATION DEPTH

Area	Item	Inundation Depth(m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
Residential Area	Unit Damage(USS/ha)	10,702	50,946	93,411	150,172	217,269
	Area(ha)	135	149	176		
Industrial area	Direct Damage(USS)	1,444,752	7,565,545	16,393,705	0	0
	Unit Damage(USS/ha)	0	610,192	1,278,260	1,747,744	2,214,743
	Area(ha)	4	4	5		
Total	Direct Damage(USS)	0	2,684,846	6,646,953	0	0
		1,444,752	10,250,391	23,040,658	0	0

Table 7.7 PROBABLE FLOOD DAMAGE

Return Period(year)	General Assets	Total of Direct Damage	Indirect Damage	Infrastructure	Other Damage	Total of Probable Damage
2	1,444,752	859,581	2,304,333	158,260	435,519	3,338,979
5	8,330,939	1,504,266	9,835,205	590,112	1,858,854	14,251,212
10	11,487,783	3,724,155	15,211,938	912,716	2,875,056	22,042,098

Table 7.8 ANNUAL AVERAGE FLOOD DAMAGE

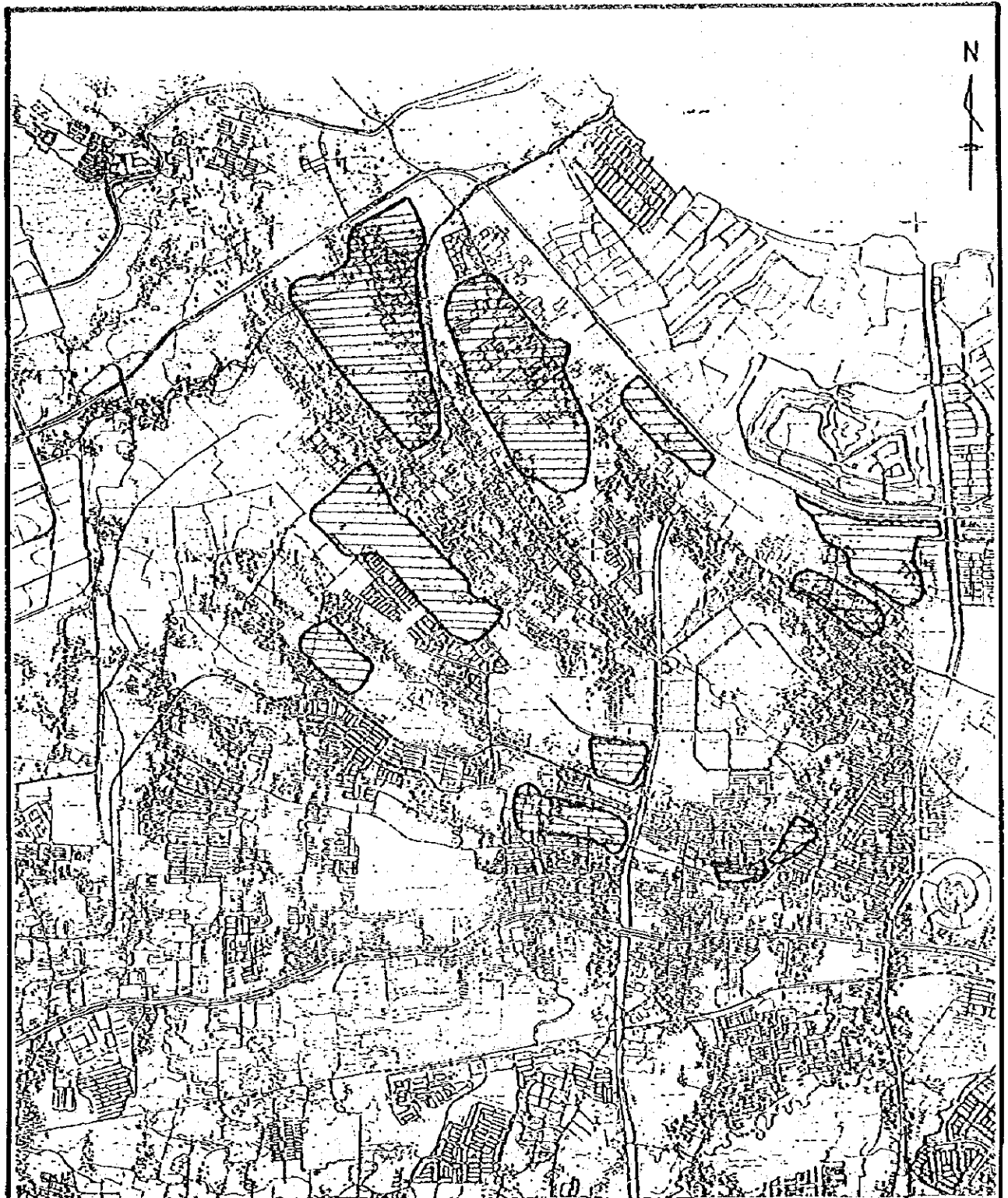
Return Period(year)	Exceedence	Difference of Exceedence	Damage(USS)		Annual Flood Damage(USS)	
			Amount	Average	Segment	Cumulative
2	1	0.5	3,338,979	1,114,490	835,868	835,868
5	0.5	0.3	14,251,212	8,795,096	3,078,284	3,914,151
10	0.2	0.1	22,042,098	18,146,655	2,721,998	6,636,149

Table 7.9 COST BENEFIT FLOW

No.	Year	Const. Cost	OM Cost	Total Cost	Benefits	B-C
1	1997	745		745		-745
2	1998	606	3,725	609,725	107	-502,725
3	1999	3,136	7	3,143	193	-2,950
4	2000	6,639	22	6,661	644	-6,017
5	2001	10,441	56	10,497	1,596	-8,901
6	2002	11,468	108	11,576	3,093	-8,483
7	2003	6,944	165	7,109	4,738	-2,371
8	2004	4,747	200	4,947	5,735	788
9	2005	1,536	224	1,760	6,416	4,656
10	2006		231	231	6,636	6,405
11	2007		231	231	6,636	6,405
12	2008		231	231	6,636	6,405
13	2009		231	231	6,636	6,405
14	2010		231	231	6,636	6,405
15	2011		231	231	6,636	6,405
16	2012		231	231	6,636	6,405
17	2013		231	231	6,636	6,405
18	2014		231	231	6,636	6,405
19	2015		231	231	6,636	6,405
20	2016	1,440	231	1,671	6,636	4,965
21	2017	2,160	239	2,399	6,636	4,237
22	2018	2,760	257	3,017	6,636	3,619
23	2019	8,280	288	8,568	6,636	-1,932
24	2020	2,760	362	3,122	6,636	3,514
25	2021		449	449	6,636	6,187
26	2022		449	449	6,636	6,187
27	2023		449	449	6,636	6,187
28	2024		449	449	6,636	6,187
29	2025		449	449	6,636	6,187
30	2026		449	449	6,636	6,187
31	2027		449	449	6,636	6,187
32	2028		449	449	6,636	6,187
33	2029		449	449	6,636	6,187
34	2030		449	449	6,636	6,187
35	2031		449	449	6,636	6,187
36	2032		449	449	6,636	6,187
37	2033		449	449	6,636	6,187
38	2034		449	449	6,636	6,187
39	2035		449	449	6,636	6,187
40	2036		449	449	6,636	6,187
41	2037		449	449	6,636	6,187
42	2038		449	449	6,636	6,187
43	2039		449	449	6,636	6,187
44	2040		449	449	6,636	6,187
45	2041		449	449	6,636	6,187
46	2042		449	449	6,636	6,187
47	2043		449	449	6,636	6,187
48	2044		449	449	6,636	6,187
49	2045		449	449	6,636	6,187
50	2046		449	449	6,636	6,187
51	2047		449	449	6,636	6,187
52	2048		449	449	6,636	6,187
53	2049		449	449	6,636	6,187
54	2050		449	449	6,636	6,187
55	2051		449	449	6,636	6,187
56	2052		449	449	6,636	6,187
57	2053		449	449	6,636	6,187
58	2054		449	449	6,636	6,187
59	2055		449	449	6,636	6,187
Total		62,311	20,168	82,479	354,215	271,736
IRR						13.8%

Figures





SCALE
0 50 100

 Inundation Area

Fig 2.1 Habitual Inundation Map in Cengkareng West Area

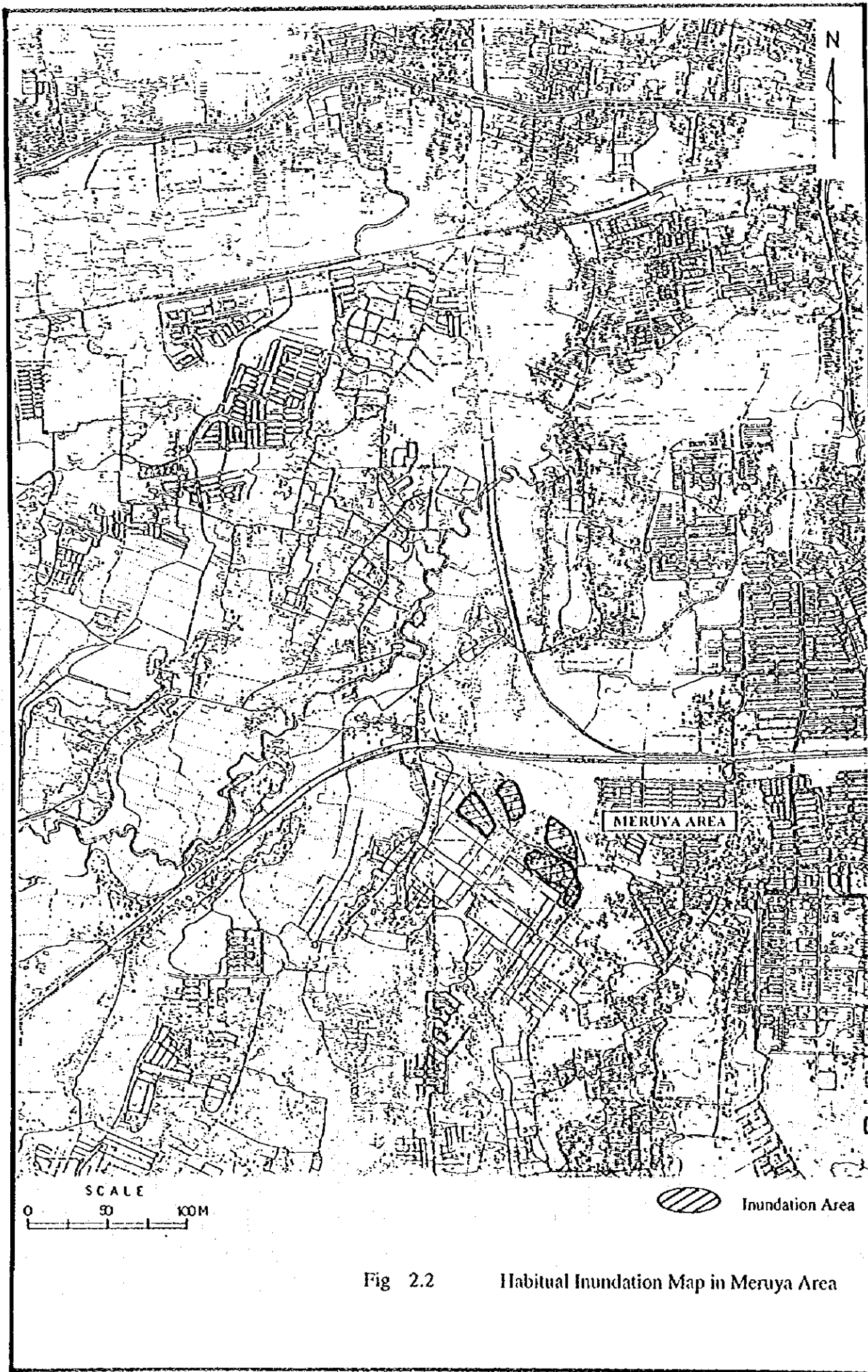
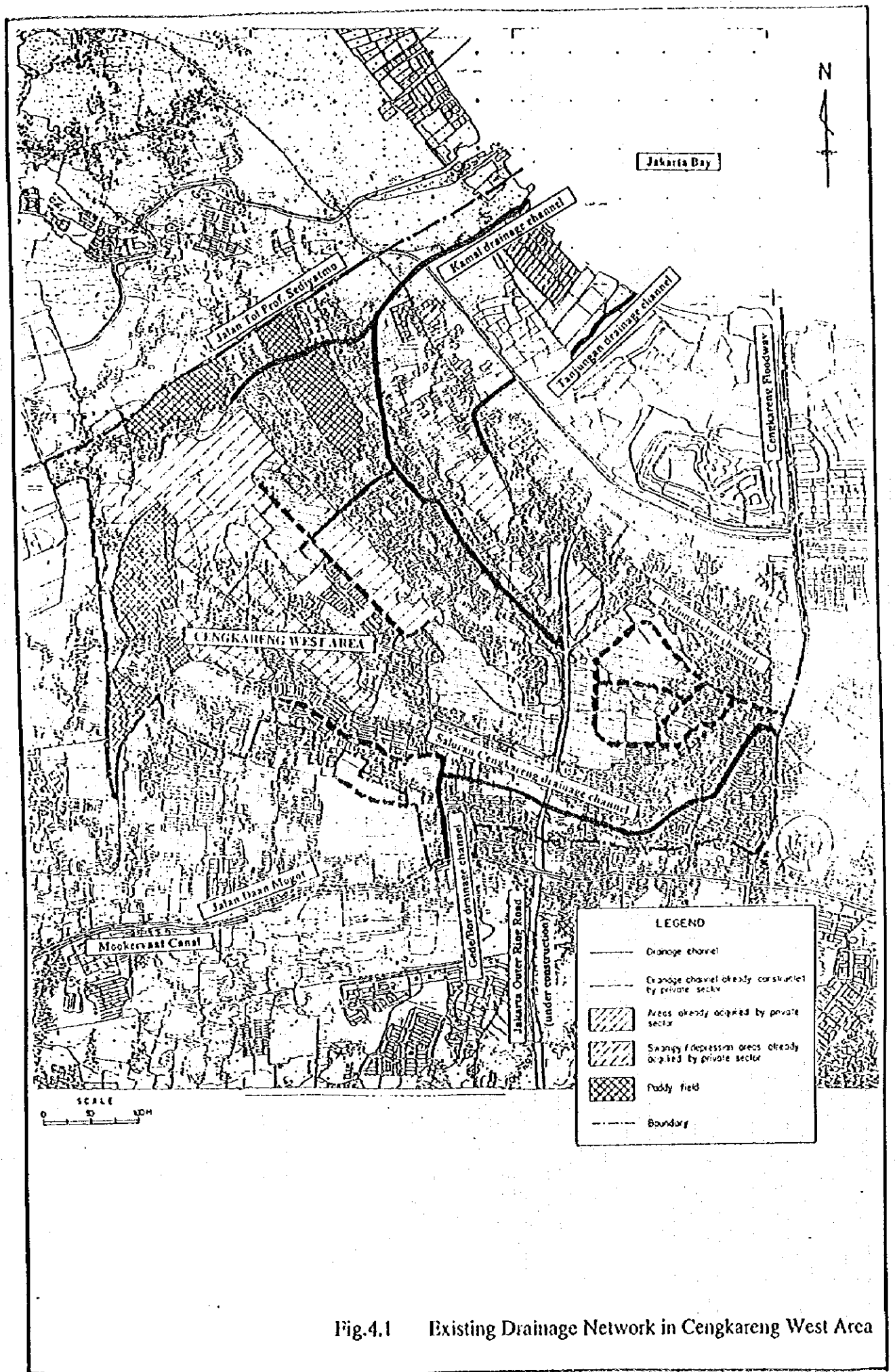


Fig 2.2 Habitual Inundation Map in Meruya Area



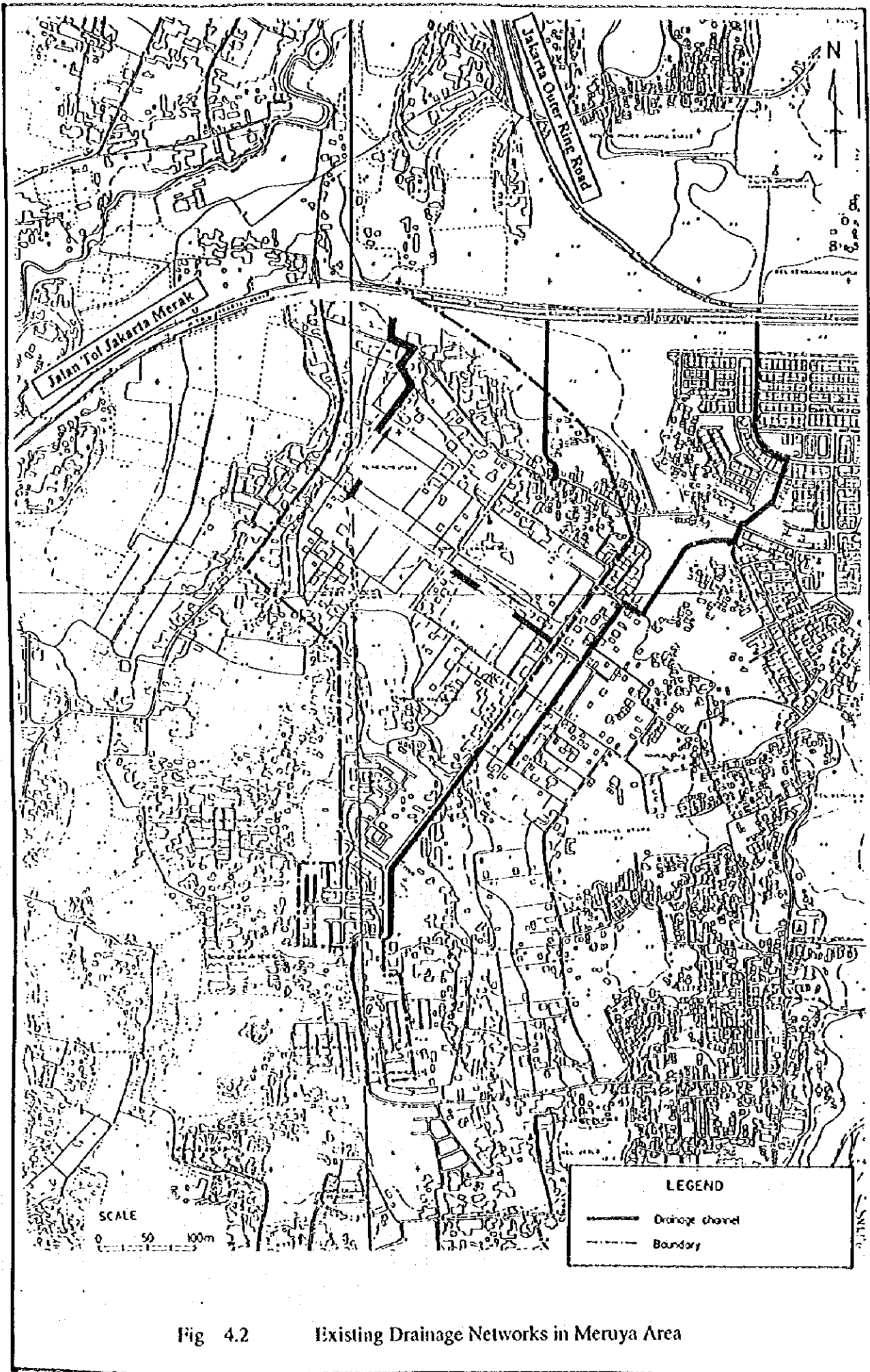


Fig 4.2 Existing Drainage Networks in Meruya Area

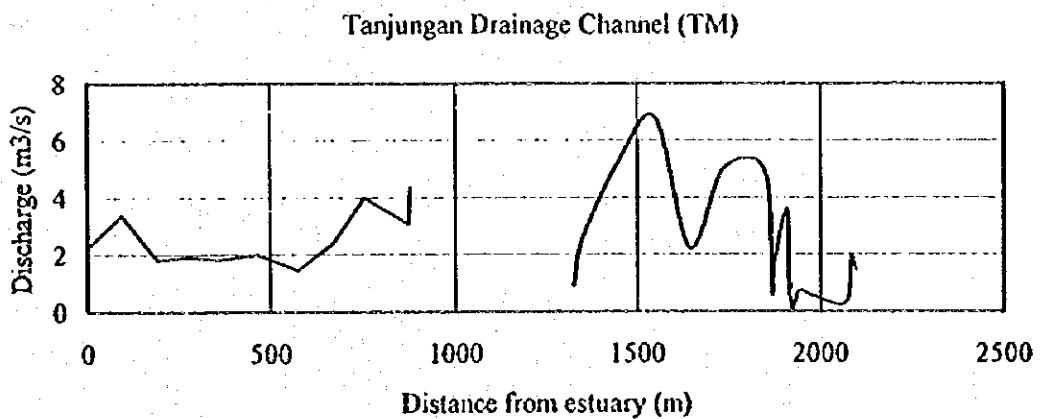
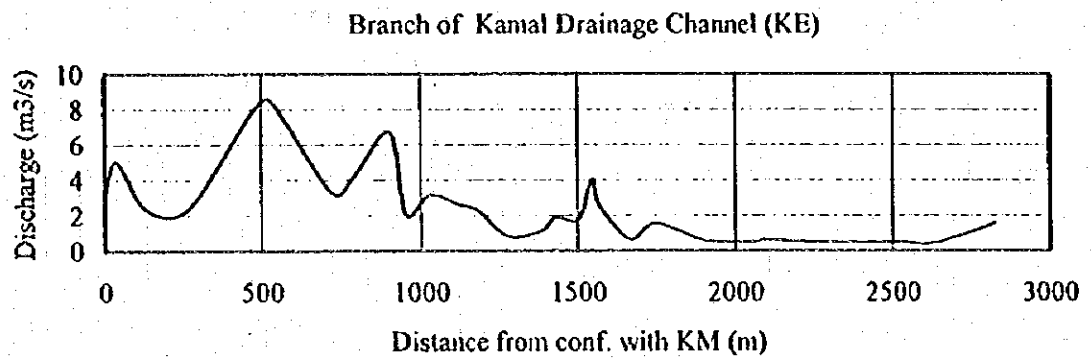
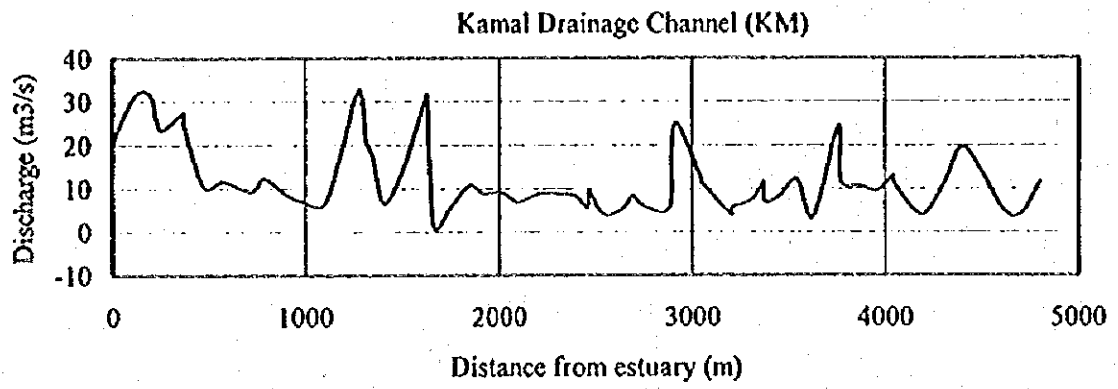


Fig 4.3 Bankful Flow Capacity of Existing Drainage Channel in Cengkareng West Area (1/2)

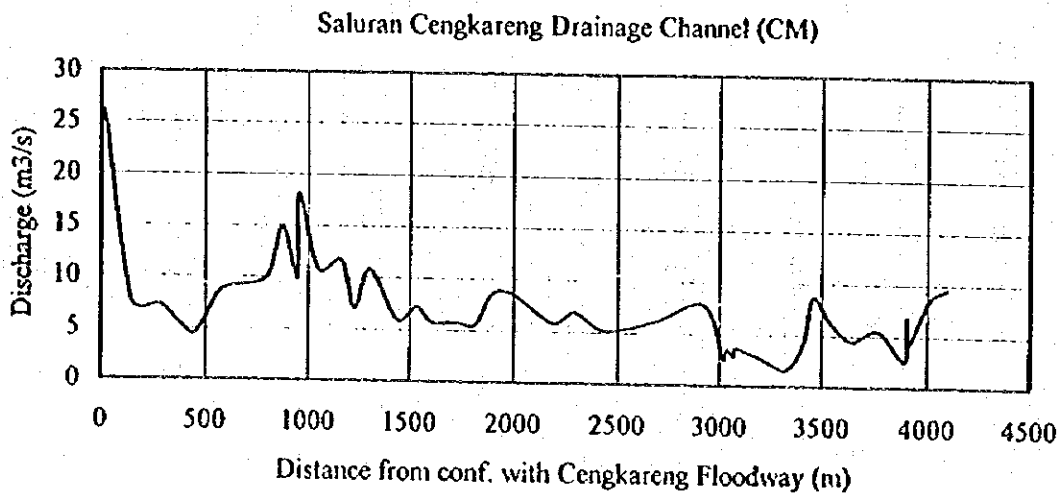
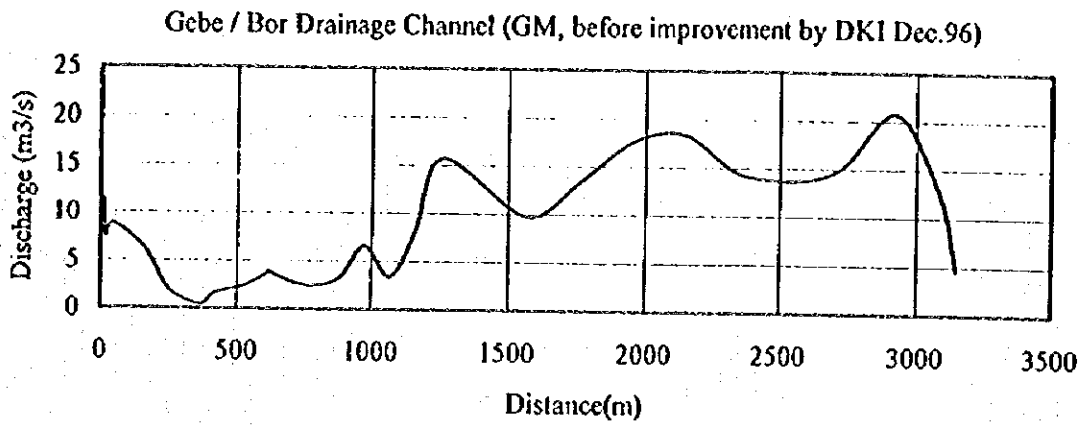


Fig 4.3 Bankful Flow Capacity of Existing Drainage Channel in Cengkareng West Area (2/2)

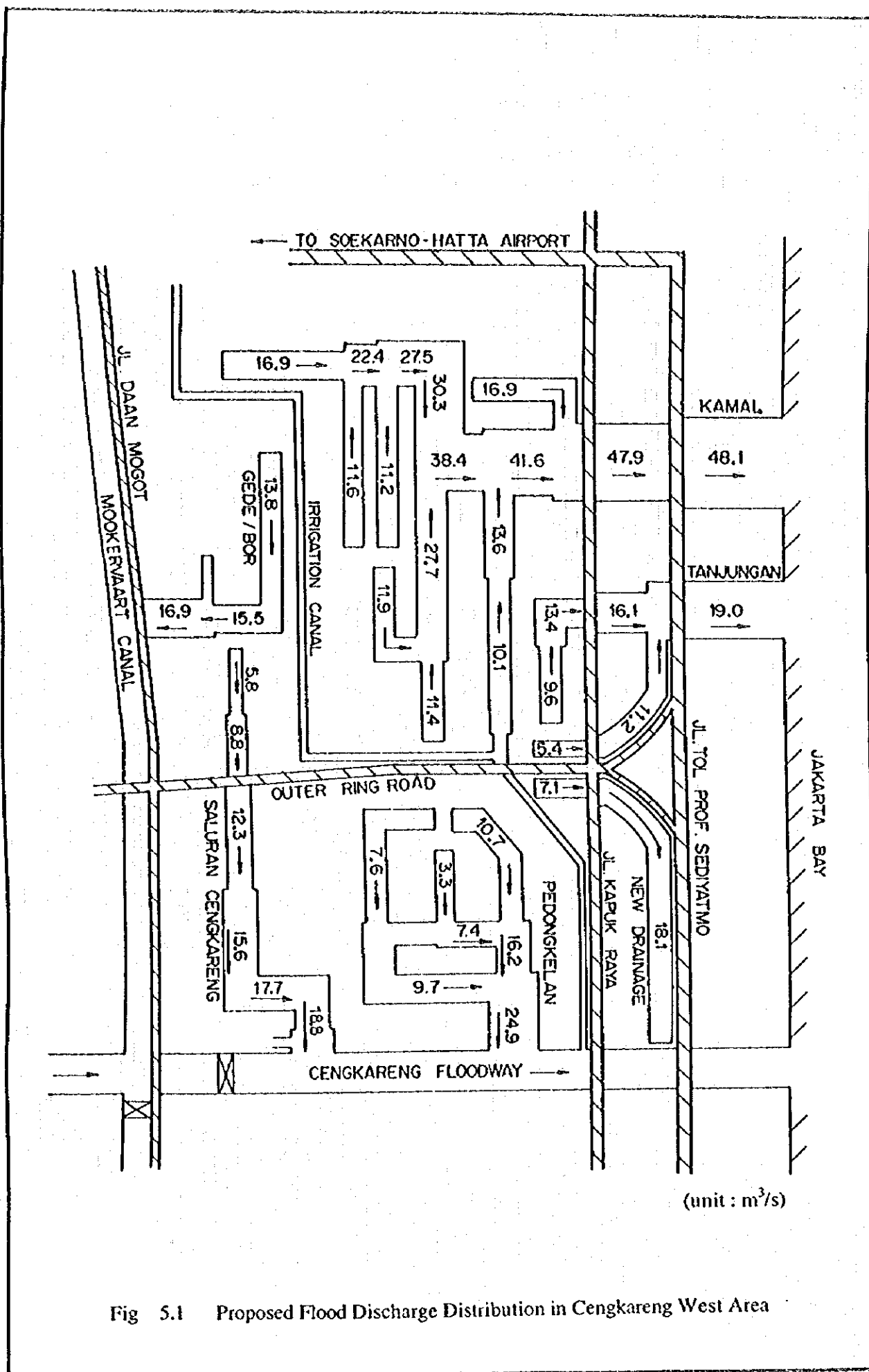
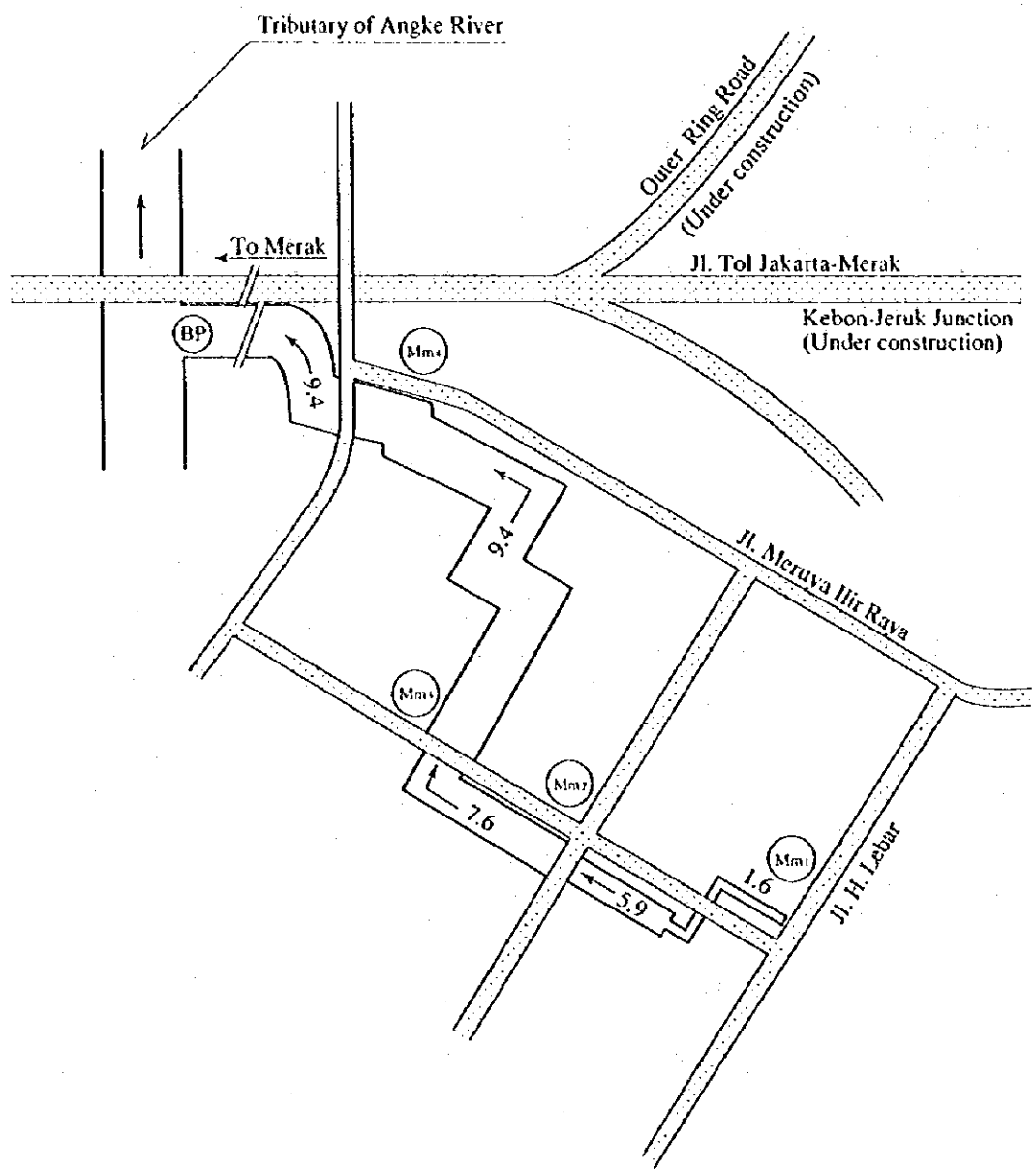


Fig 5.1 Proposed Flood Discharge Distribution in Cengkareng West Area



Note: Value : Design Discharge (m³/s)
 (Mm) : Code No.

Fig 5.2 Proposed Flood Discharge Distribution in Menya Area

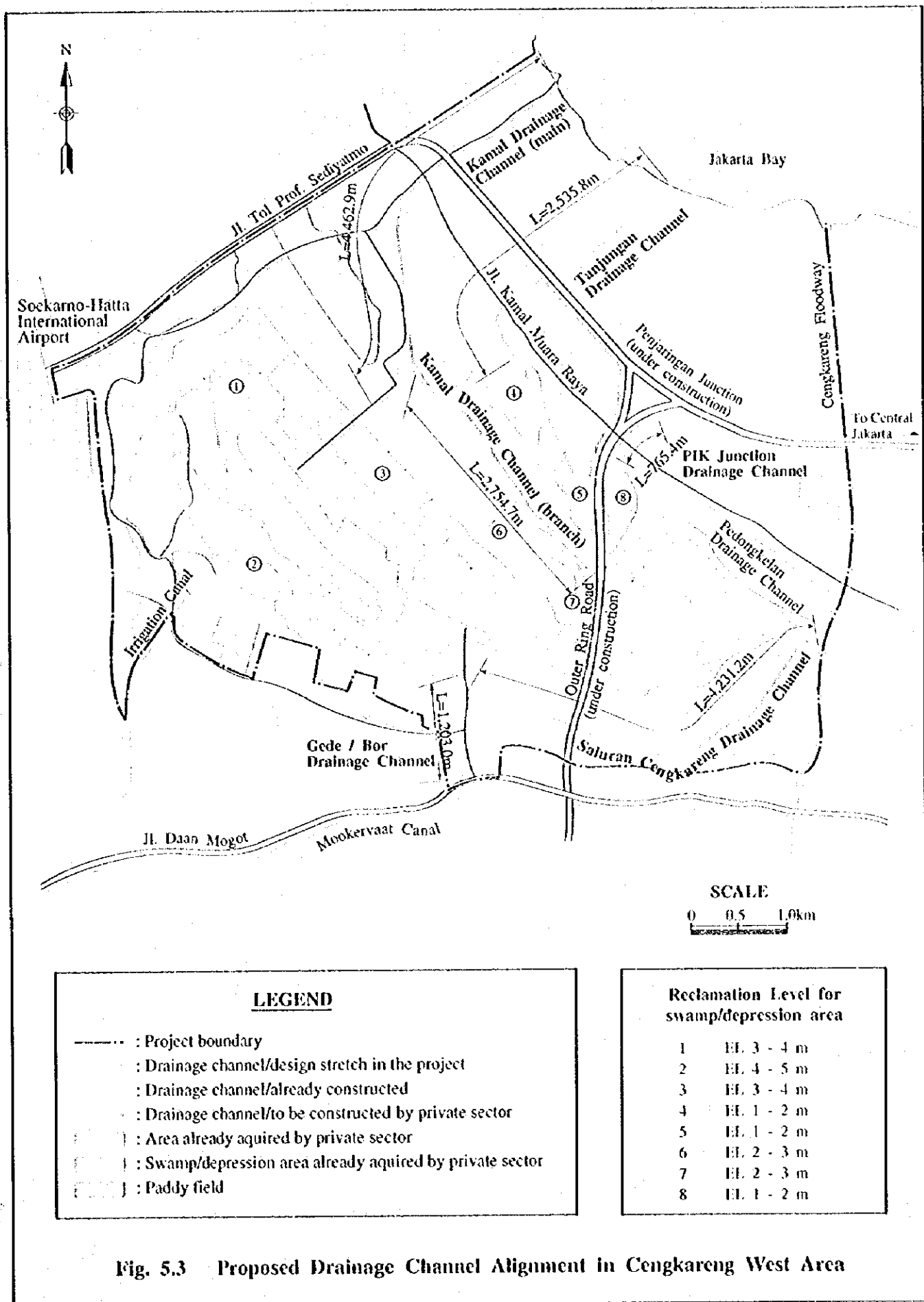


Fig. 5.3 Proposed Drainage Channel Alignment in Cengkareng West Area

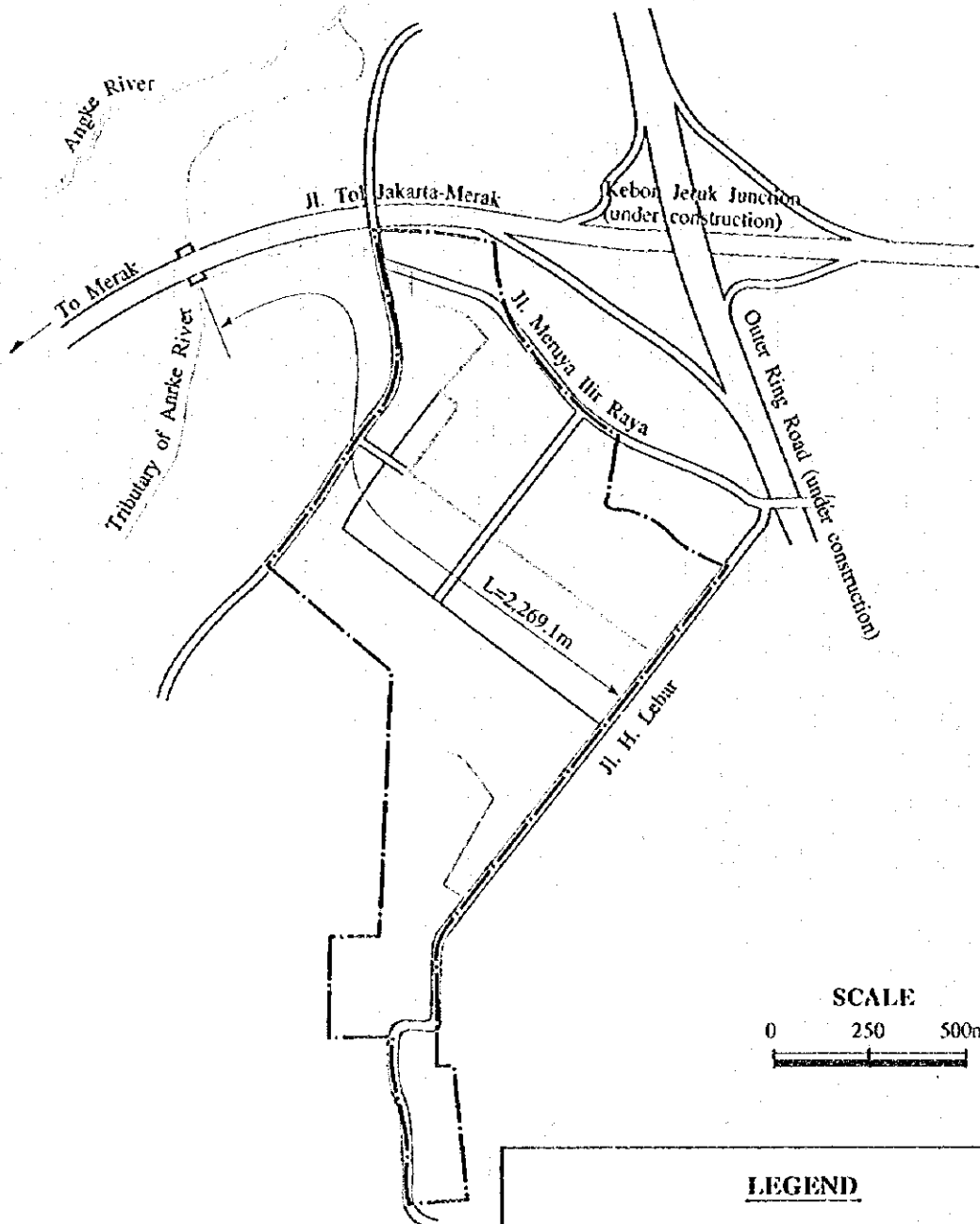


Fig. 5.4 Proposed Drainage Channel Alignment in Meruya Area

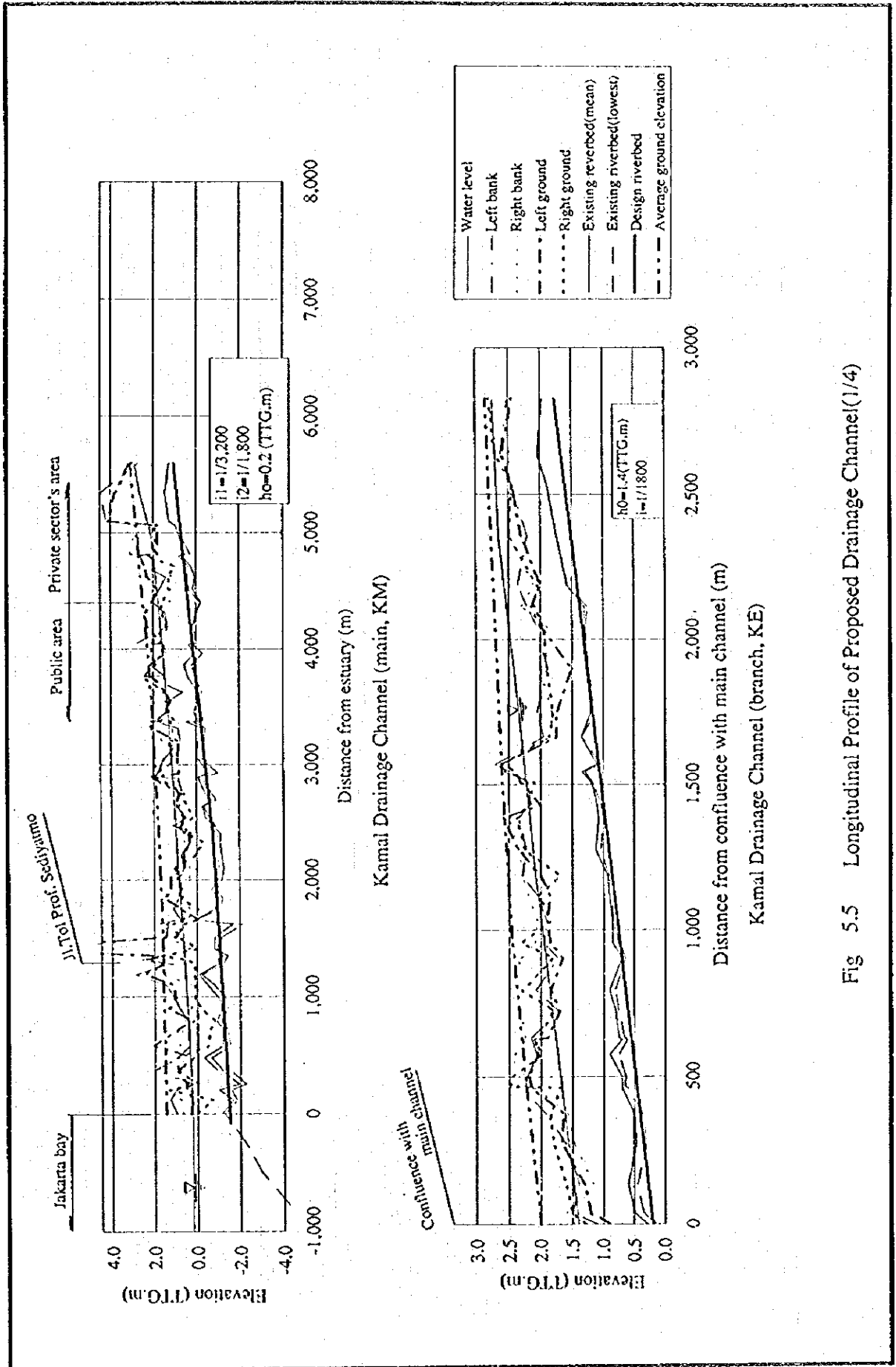


Fig 5.5 Longitudinal Profile of Proposed Drainage Channel(1/4)

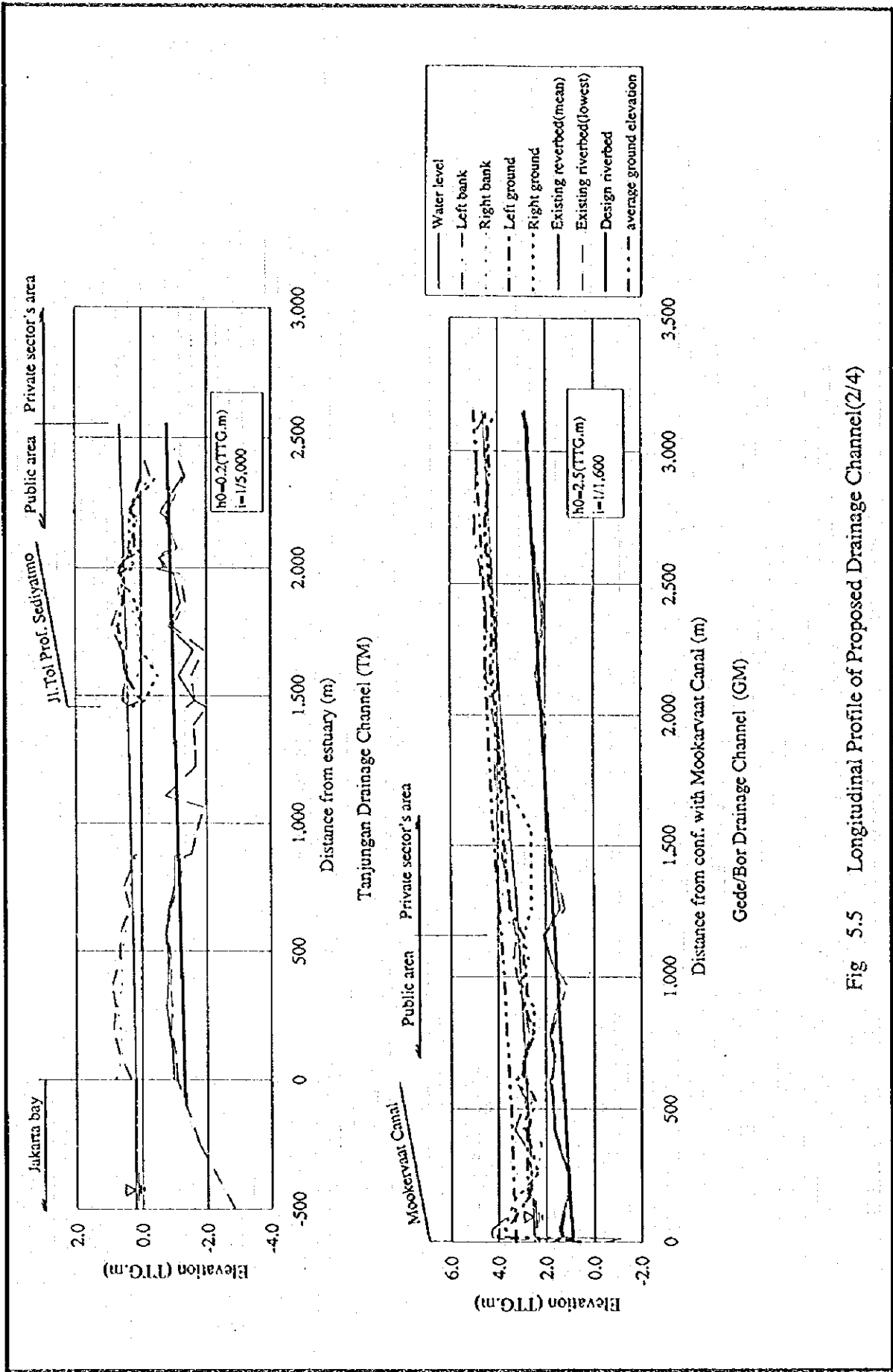


Fig 5.5 Longitudinal Profile of Proposed Drainage Channel(2/4)

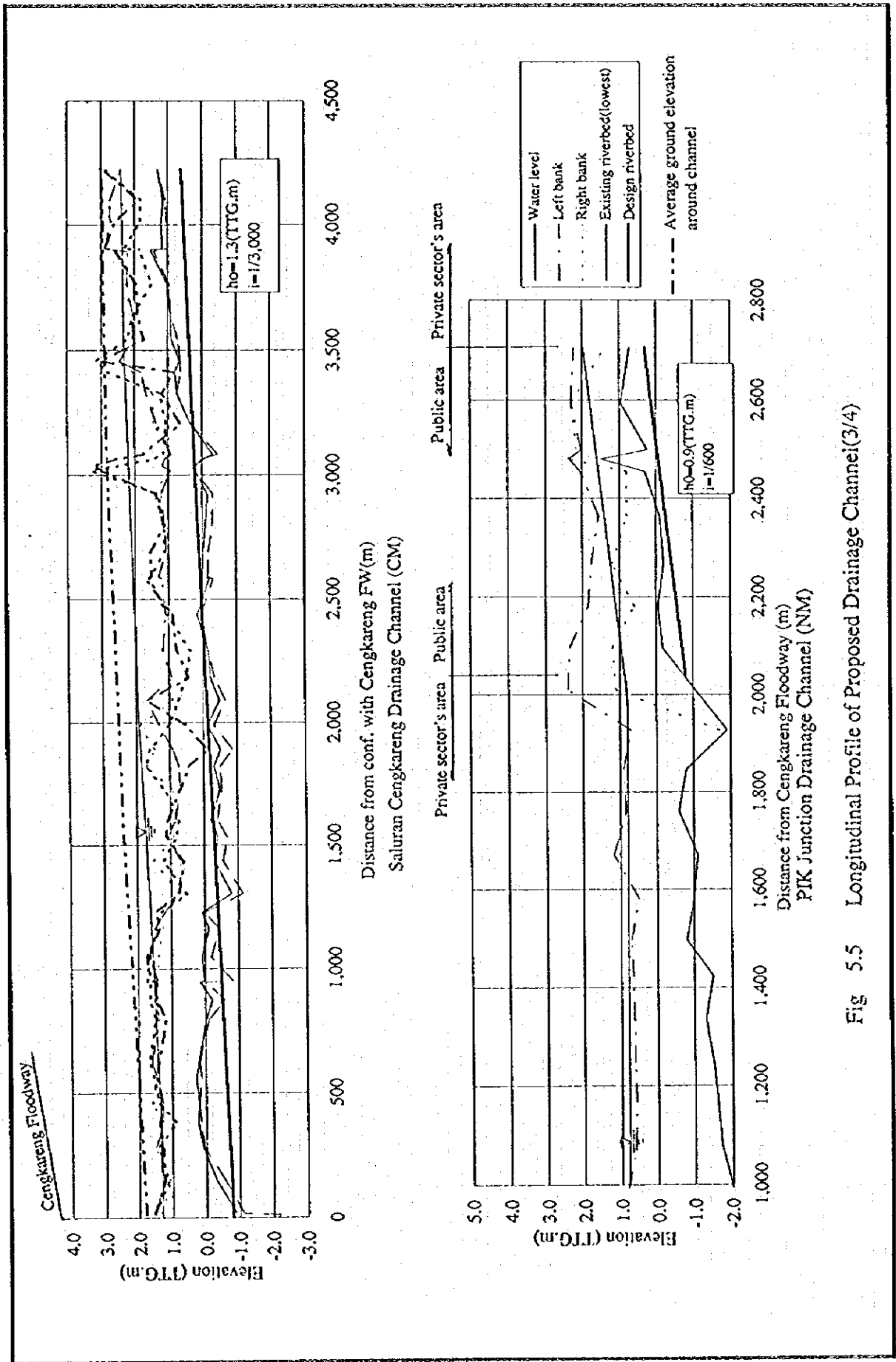


Fig 5.5 Longitudinal Profile of Proposed Drainage Channel(3/4)

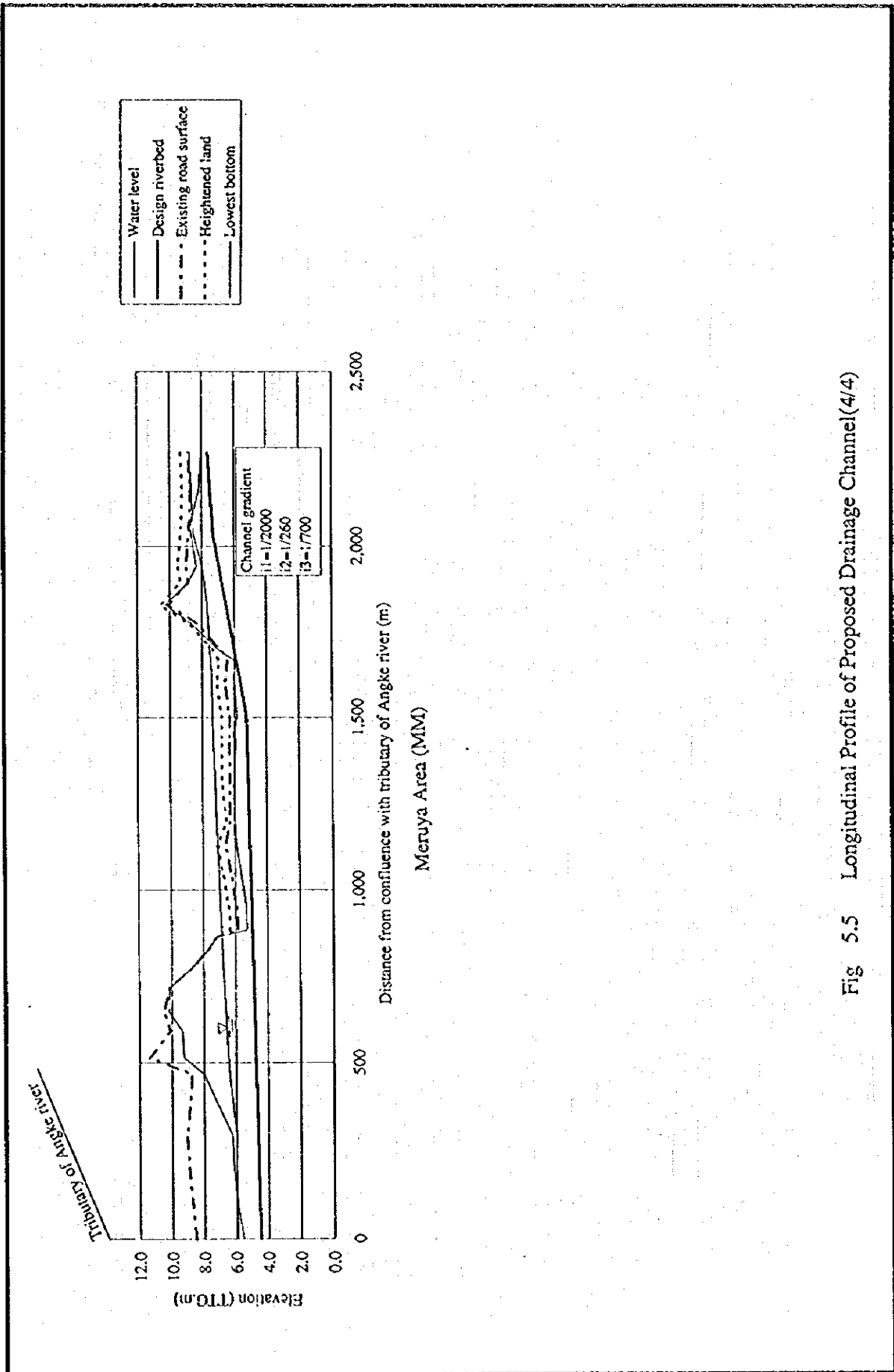
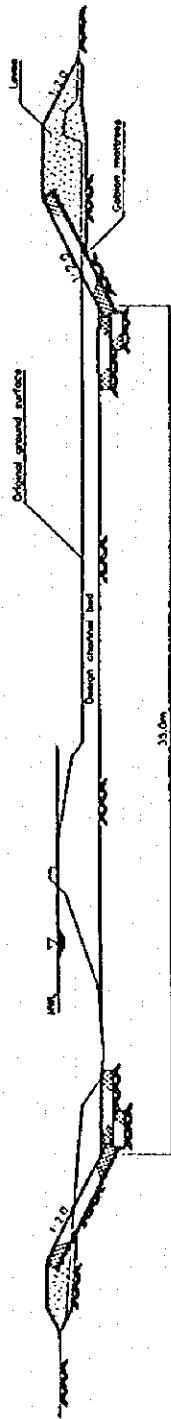
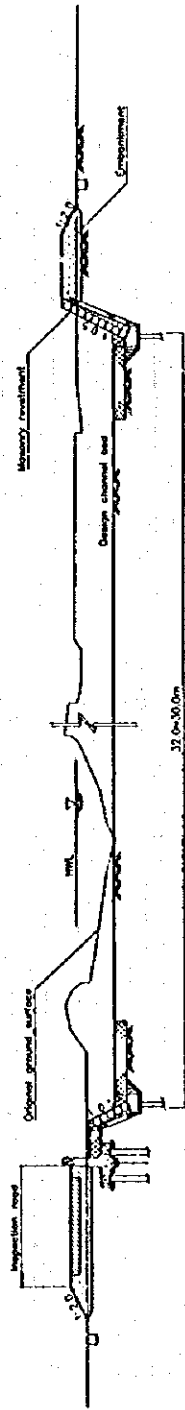


Fig 5.5 Longitudinal Profile of Proposed Drainage Channel(4/4)

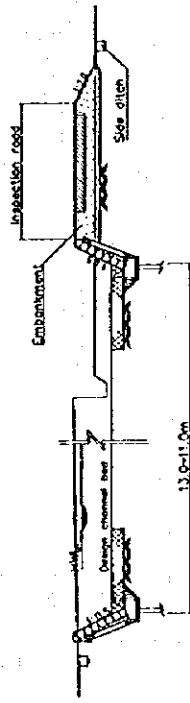


(a) Downstream of J. Tal Prof. Salyalmo

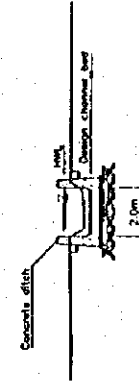


(b) Upstream of J. Tal Prof. Salyalmo

(1) Kamal Drainage Channel (Main)



(a) Downstream Stretch



(b) Upstream Stretch

(2) Kamal Drainage Channel (Branch)

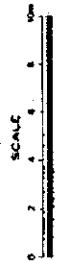
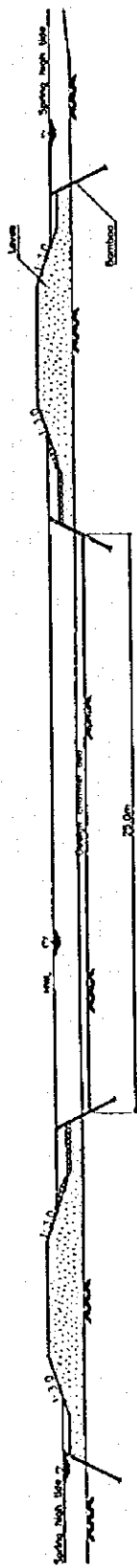
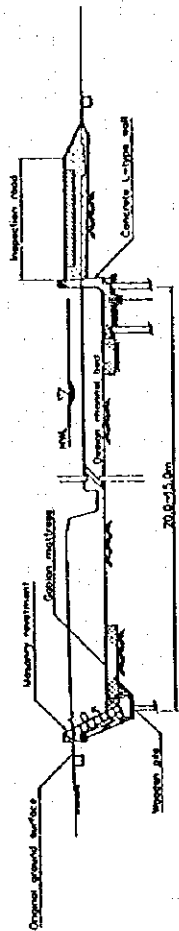


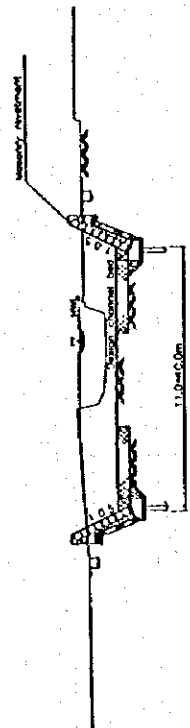
Fig 5.6 Typical Cross Sections (1/3)



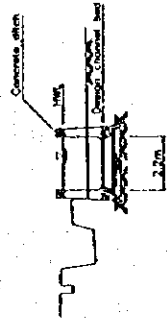
(a) Downstream of JI, Tol Prof Sediyatno



(b) Downstream of JI, Tol Prof. Sediyatno
(3) Tanjungan Drainage Channel



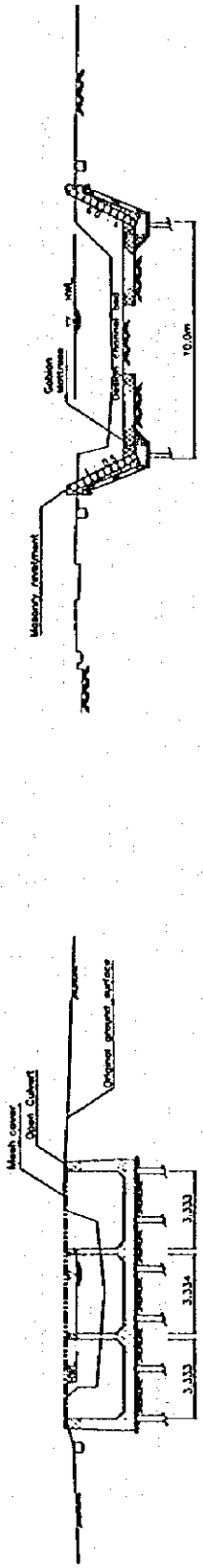
(4) Gede/Bar. Drainage Channel



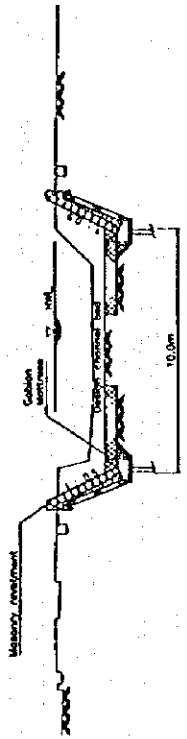
(5) PIK Junction Drainage Channel



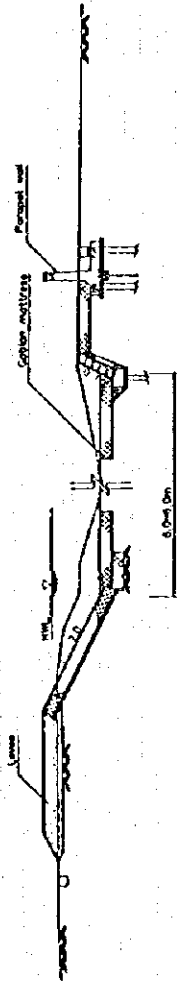
Fig 5.6 Typical Cross Sections (2/3)



(a) Open Culvert

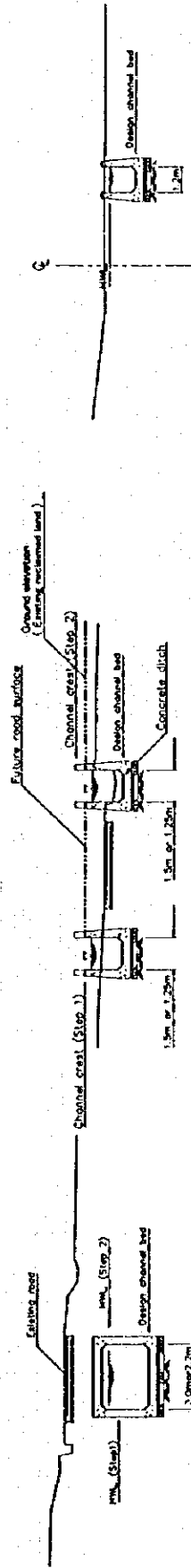


(b) Upstream of Open Culvert

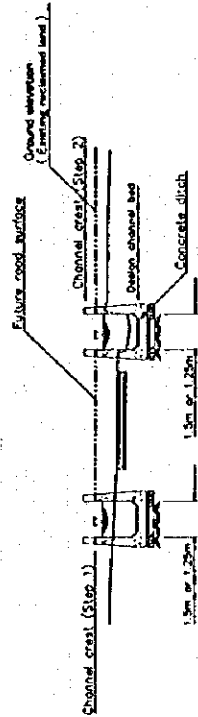


(c) Upstream Stretch

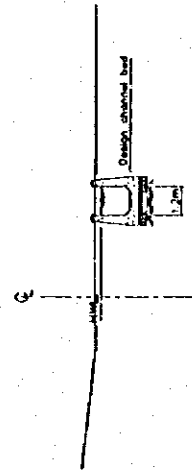
(6) Saluran Cengkareng Drainage Channel



(e) Box Culvert



(b) Open Culvert (Both Side Drain, Stepwise Construction)

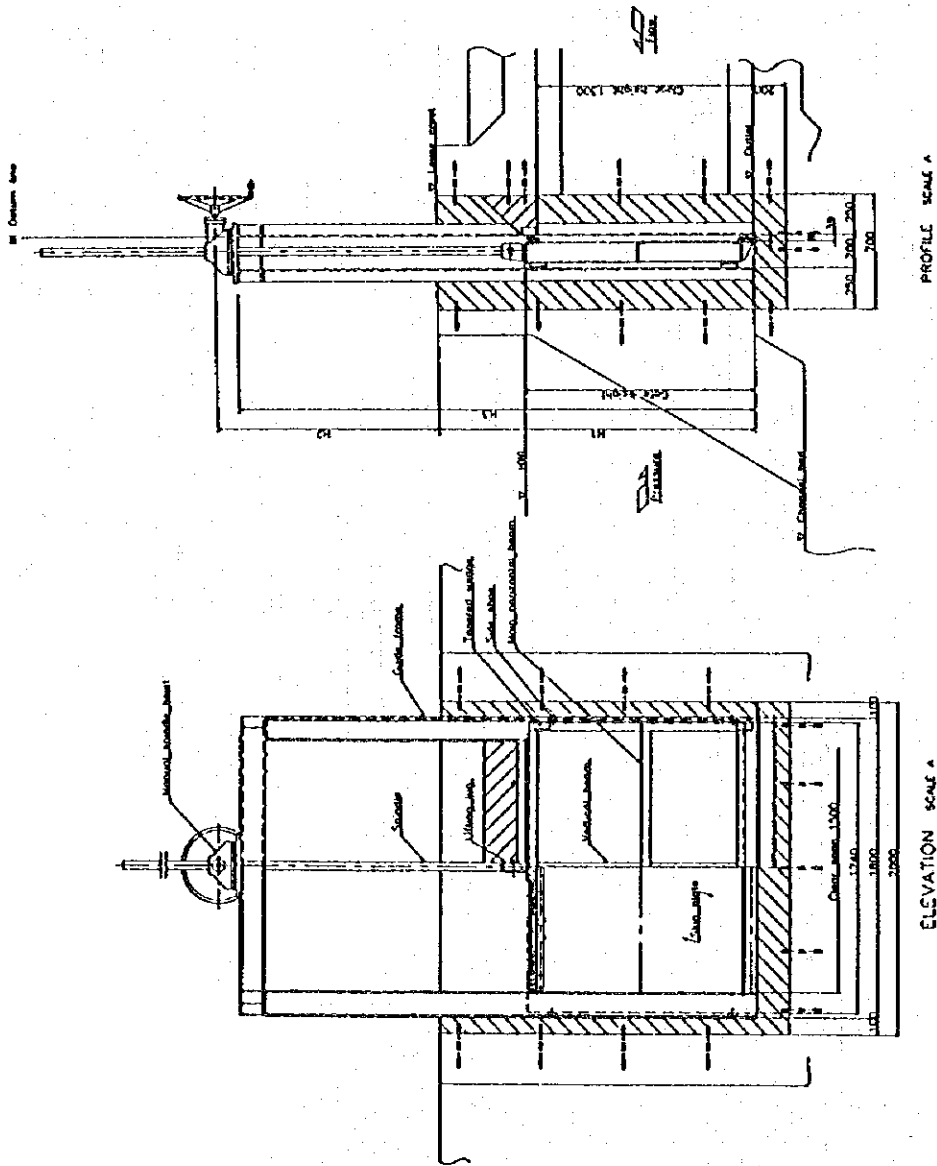


(c) Open Culvert (One Side Ditch, Upstream Stretch)

(7) Menyuga Area

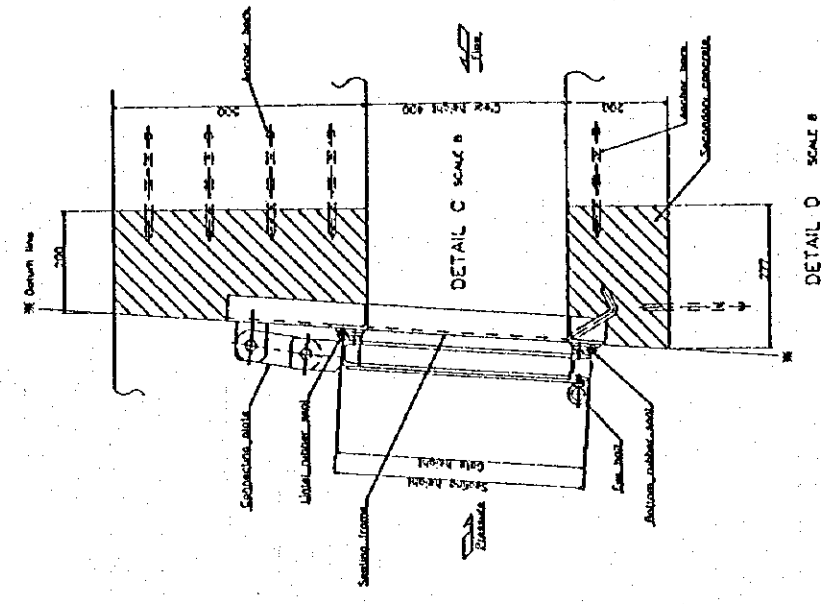
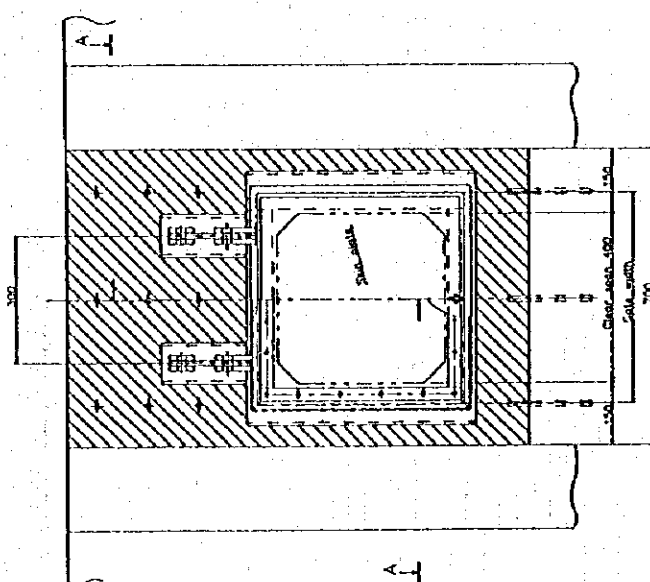


Fig 5.6 Typical Cross Sections (3/3)



SLIDE GATE

Fig 5.7 Typical Section of Slide and Flap Gates (1/2)



FLAP GATE

Fig. 5.7 Typical Section of Slide and Flap Gates (2/2)

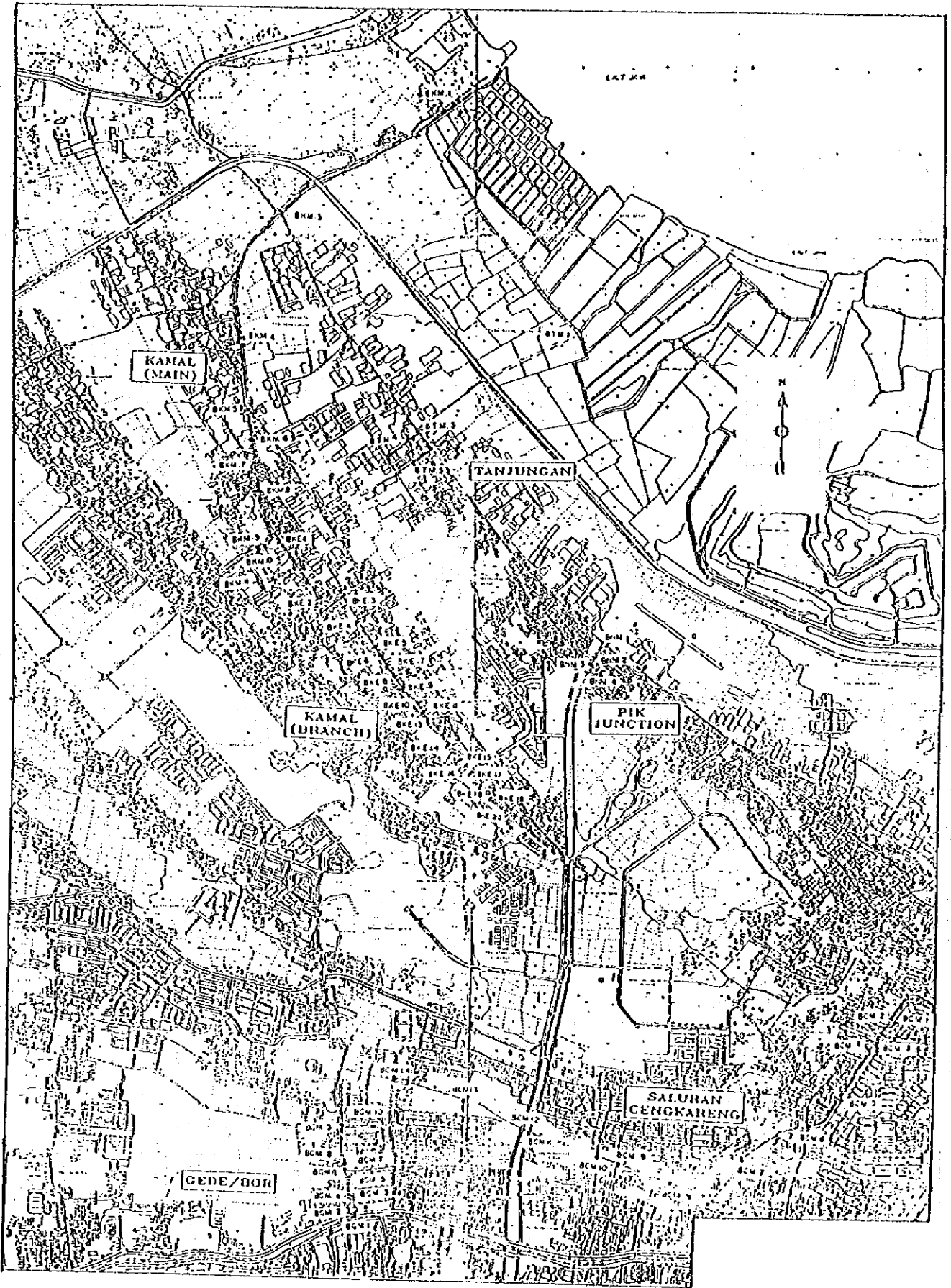


Fig 5.8 Location Map of Bridges (1/2)
(Cengkareng West Area)

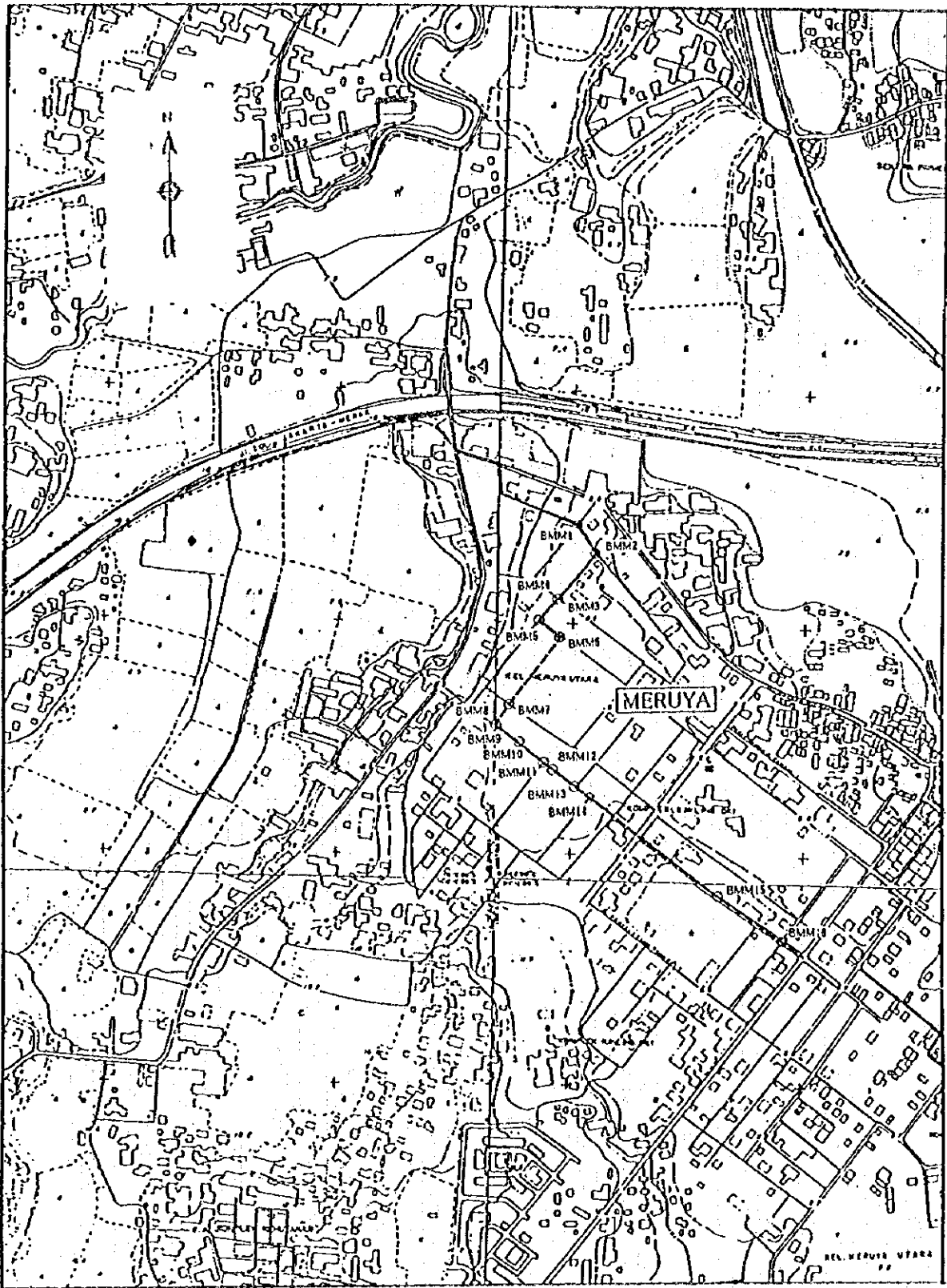


Fig 5.8 Location Map of Bridges (2/2)
(Meruya Area)

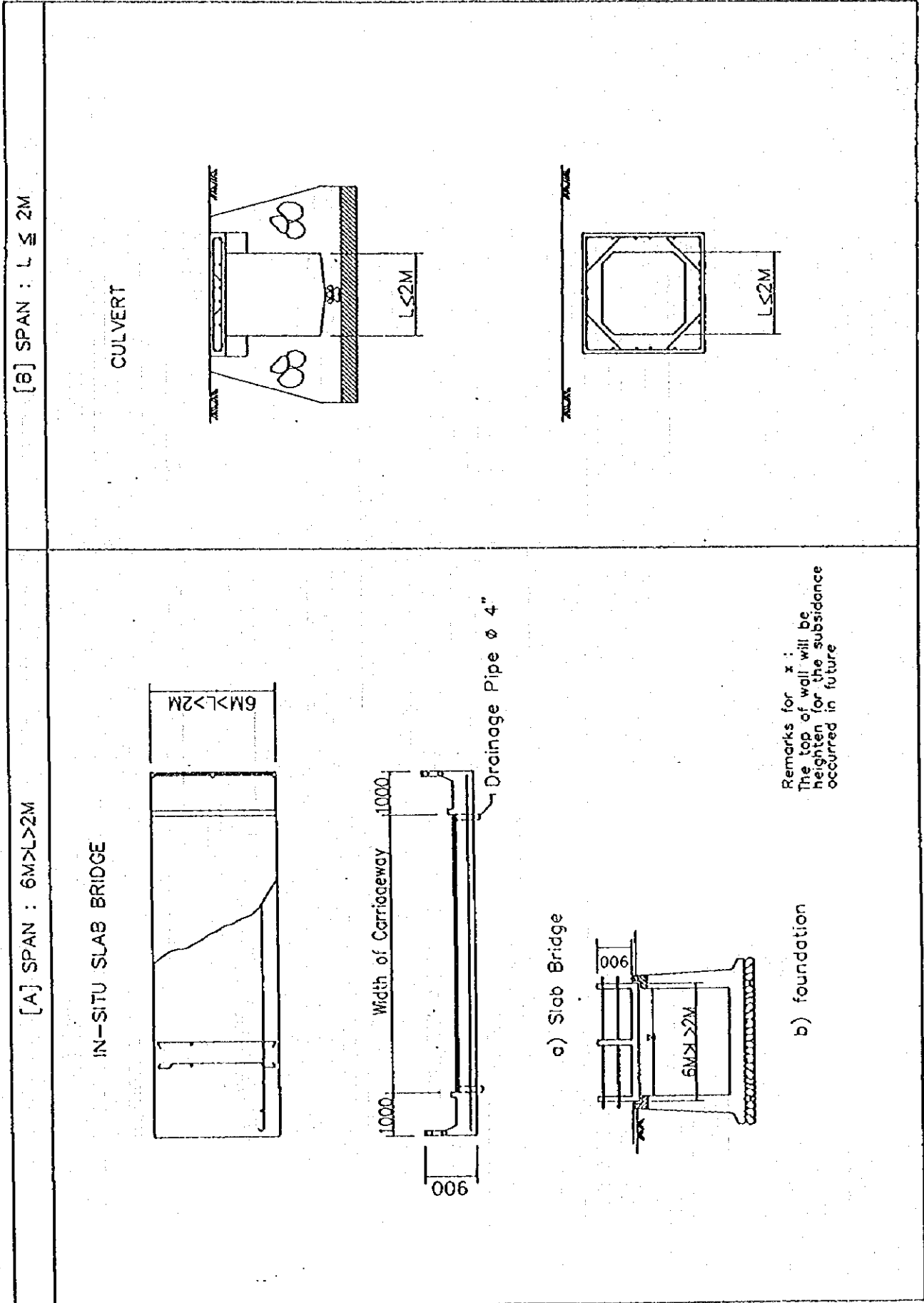


Fig 5.9 Type of Bridges (2/2)

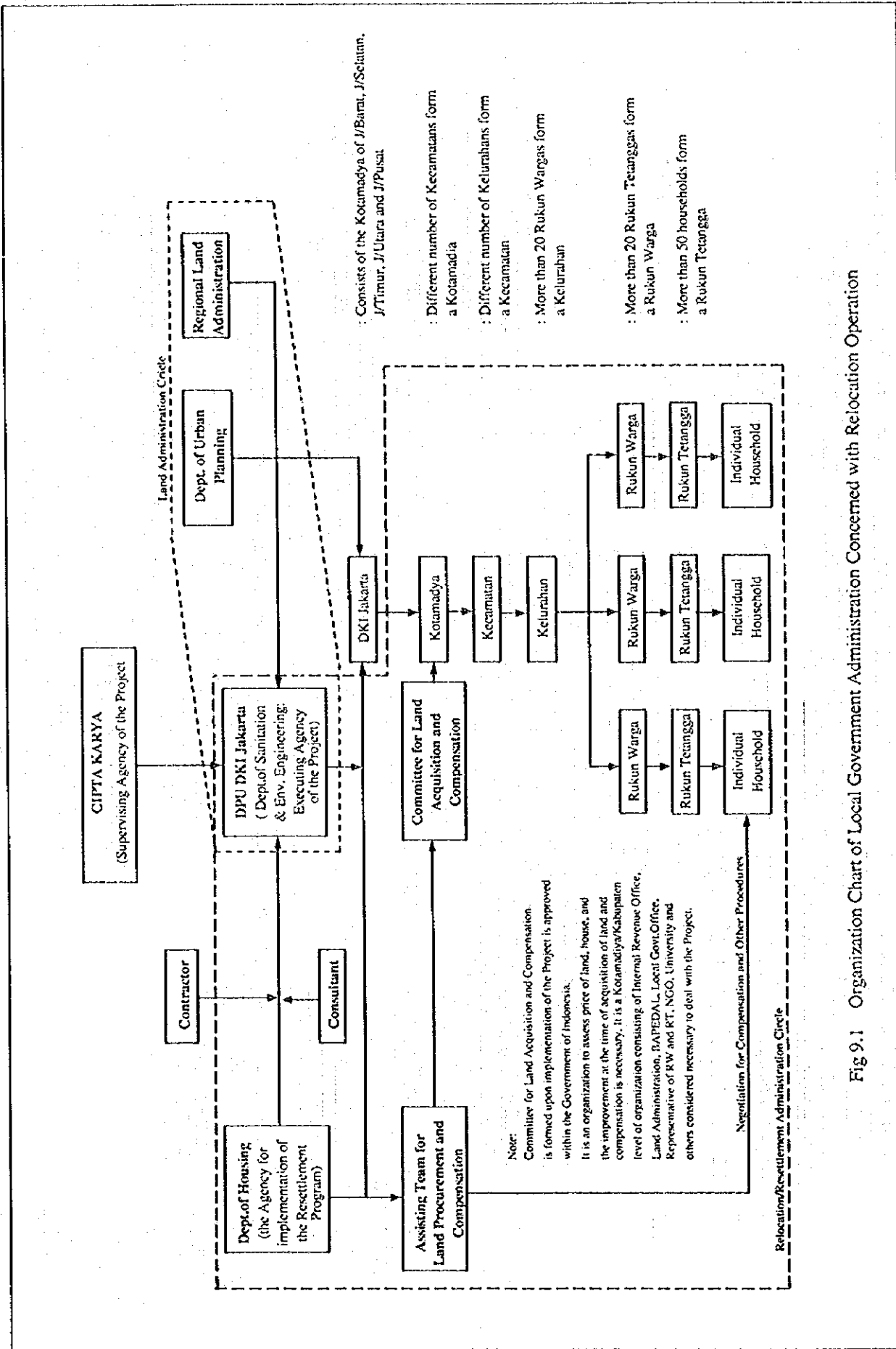


Fig 9.1 Organization Chart of Local Government Administration Concerned with Relocation Operation

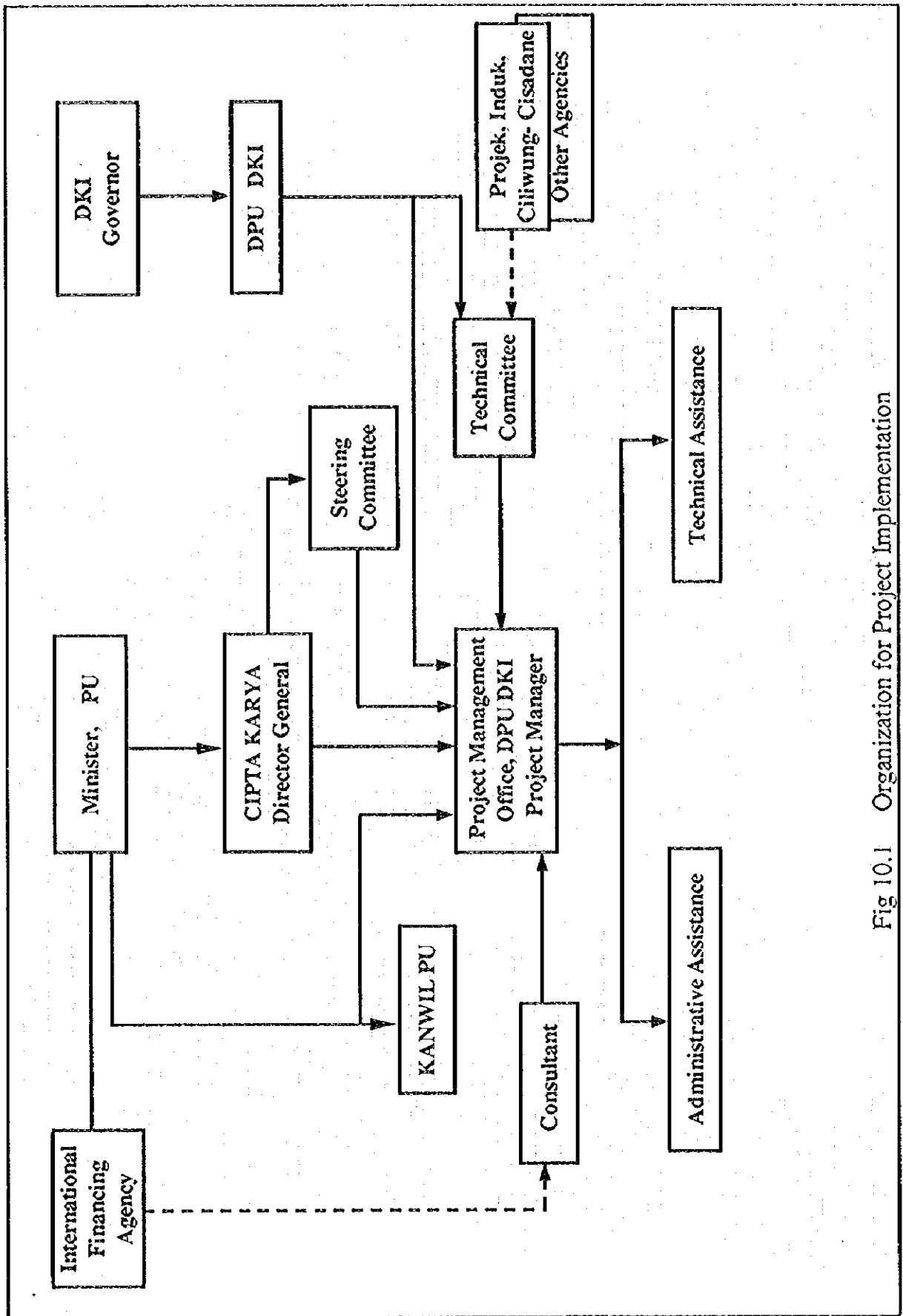
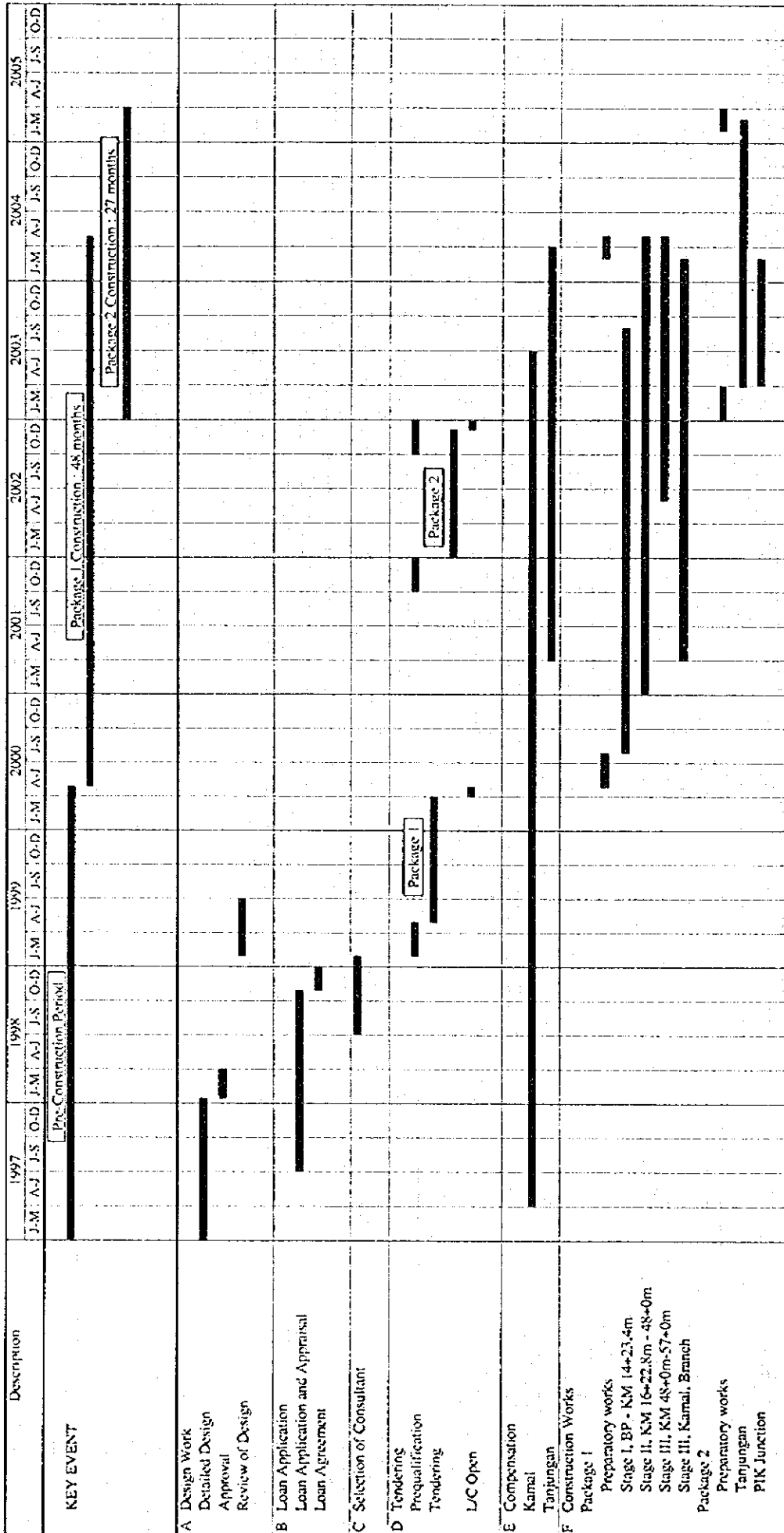


Fig 10.1 Organization for Project Implementation

Fig. 10.2 Overall Implementation Schedule (for packages 1 and 2)



Annex



ANNEX. TERMS OF REFERENCE FOR THE ENGINEERING SERVICES FOR SUPERVISION OF CONSTRUCTION

1 General

In view of magnitude and complexity of the proposed project, technical assistance to the Government of the Indonesia (GOI) for engineering services by consulting firms will be required in the supervision of construction including assistance of tendering in an initial stage.

The consulting services rendered should cover two phases, namely, assistance of tendering and design modification for drainage facilities in the pre-construction stage and assistance of supervision in the construction stage. The consulting services are expected to be completed within 74 month period.

2 Scope of Works

The scope of works of the consulting services shall cover the following items:

- Assistance of the Government in tendering
- Review of design for drainage facilities
- Supervision of construction for the project works
- Transfer of knowledge and experience to the counterpart personnel of the Government.

The detailed scope of works of the services is explained below:

2.1 Assistance in Tendering

- To update and/or review the tender documents
- To assist the Government in tender calling, site inspection/verification, answers to tenderer's question, etc.
- To assist the Government in the pre-qualification of contractors
- To assist the Government in contract negotiations

2.2 Review of Design for Drainage Facilities

- To review and revise the drainage facilities
- To revise design and tender drawings
- To revise work quantity and cost estimate of the detailed design
- To revise tender documents
- To prepare Addendum for tender documents

2.3 Supervision of Construction for the Following Works:

- To check the detailed work drawings for construction of the structures and facilities.
- To revise the design if it is deemed necessary in the course of construction.
- To carry out additional investigation and surveys if necessary in the course of construction.
- To review and approve work and shop drawings, construction program and schedule to be submitted by contractor(s).
- To assist the Government in carrying out inspection and supervision of the construction works.
- To assist The Government to keep the progress of the construction works including revision of construction schedule in response to change of situation.
- To assist the Government in undertaking safety operation of the construction works and to give advice for establishing safety regulation and practices.
- To assist the Government in evaluating the progress of the construction works and to certify the payment to the contractor(s).
- To assist the Government in the final inspection and tests of completed works.
- To assist field superintendents in all aspects of construction works of the project, providing them with necessary advice during the construction works.

2.4 Transfer of Technology

The consultants shall provide:

- On-the-job training for the counterpart personnel throughout the period of the services, especially for:
 - (i) Quality control of the project works
 - (ii) Project implementation management
 - (iii) Operation and maintenance of the drainage channels and related structures
- Necessary arrangement for overseas training for the Government Staff.

4.6 Reporting

In the course of the consulting services, the consultants shall prepare and submit the following reports:

- Monthly Progress Report
- Annual Report
- Engineering Study Report on the Specific Topics as Required
- Maintenance Report
- Completion Report

4.7 Work Schedule and Staff Assignment

Total period of the consulting services will cover 74 months from February 1999 to March 2005. Within the first 15 months, the assistance of tendering will be carried out. Review of design for drainage facilities will be carried out in the first 3 months. The required man-month was estimated at 133 M/M for Professional-A and 332 M/M for Professional-B.

The final completion report will be submitted to the Government within three months after the end of the services.

4.8 Scope of Works for Each Consulting Engineer

4.8.1 Professional -A

(1) Resident Engineer

The Resident Engineer will represent and manage the consulting team and coordinate with the Government with review of design and supervision of construction of at least 15 years experience in similar projects. Main tasks of the Resident Engineer are:

- To supervise the review works of design for the project works.
- To assist in preparation of addenda to bidders and replies to bidder's questions.
- To assist in evaluation of pre-qualification of tenderers.
- To assist in preparation of replies to bidder's questions.
- To assist in evaluation of tender.

- To assist in preparation of evaluation report.
- To assist in preparation of completion report.
- To assist the Government in contract negotiation.
- To assist in supervision of overall construction works.

(2) Structural Engineer

The Structural Engineer will carry out review of design estimate the work quantity, with at least 12 years experience of similar projects. Main tasks of the Structural Engineer are:

- To review the design of the drainage facilities
- To estimate work quantities for drainage project.
- To revise the design and tender drawings

(3) Cost Estimator

The Cost Estimator will review the unit costs and revise bill of quantities, with at least 12 years experience of similar projects. Main tasks of the Cost Estimator are:

- To estimate or review the unit costs and to estimate the construction cost for the revised drainage facilities.
- To revise bill of quantities.

(4) Foundation Engineer

The Foundation Engineer will engage in assistance of supervision works of bridge foundation and foundation works of other civil works, with at least 13 years experience of similar projects. Main tasks of the: Foundation Engineer are:

- To assist in supervision of construction works of bridge substructures and foundation works of sluiceway structures.
- To assist modification works of design for bridge substructures

(5) Bridge Engineer

The Bridge Engineer will engage in assistance of supervision works of bridge construction works, with at least 13 years experience of similar projects. Main tasks of the: Bridge Engineer are:

- To assist in supervision of construction works of bridges.

- To assist modification works of design for bridges and related structures.

(6) Mechanical Engineer

The Mechanical Engineer will carry out assistance of supervision works of metal works including installation of sluice gates and flap gates, with at least 13 years experience of similar projects. Main tasks of the: Mechanical Engineer are:

- To assist in supervision of mechanical works for the sluiceway structures, spindle type gates and flap gates.
- To assist modification works of design for mechanical works.

4.8.2 Professional-B

(1) Assistant Resident Engineer

The Assistant Resident Engineer will assist the Resident Engineer, with at least 15 years experience of similar projects. Main tasks of the Assistant Resident Engineer are:

- To assist in supervision of the overall construction works in collaboration with Resident engineer.
- To prepare completion report in collaboration with other engineers.

(2) Structural Engineer(A)

The Structural Engineer(A) will carry out review of design and assistance of a series of supervision of the project with collaboration with the Civil Engineer, with at least 15 years experience of similar projects. Main tasks of the Structural Engineer(A) are:

- To review the design of drainage project.
- To estimate work quantities for drainage facilities.
- To revise the design and tender drawings
- To assist in supervision of construction works of drainage channel and drainage facilities for all Packages.
- To assist modification works of design for drainage channel and drainage facilities for all Packages.
- To prepare completion report in collaboration with other engineers.

(3) Structural Engineer(B)

The Structural Engineer(B) will carry out review of design and assistance of a series of supervision of the project with collaboration with the Civil Engineer, with at least 13 years experience of similar projects. Main tasks of the Structural Engineer(B) are:

- To review the design of drainage project.
- To estimate work quantities for drainage facilities.
- To revise the design and tender drawings
- To assist in supervision of construction works of drainage channel and drainage facilities for Packages-1 and 2.
- To assist modification works of design for drainage channel and drainage facilities for Packages-1 and 2.
- To prepare completion report in collaboration with other engineers.

(4) Structural Engineer(C)

The Structural Engineer(C) will carry out review of design and assistance of a series of supervision of the project with collaboration with the Civil Engineer, with at least 10 years experience of similar projects. Main tasks of the Structural Engineer(C) are:

- To assist in supervision of construction works of drainage channel and drainage facilities for Packages-1 and 2.
- To assist modification works of design for drainage channel and drainage facilities for Packages-1 and 2.
- To prepare completion report in collaboration with other engineers.

(5) Foundation Engineer(A)

The Foundation Engineer(A) will engage in assistance of supervision works of bridge foundation and foundation works of other civil works, with at least 13 years experience of similar projects. Main tasks of the Foundation Engineer(A) are:

- To assist in supervision of construction works of bridge substructures and foundation works of sluice way structures for all Packages.
- To assist modification works of design for bridge substructures for all Packages.

(6) Foundation Engineer(B)

The Foundation Engineer(B) will engage in assistance of supervision works of bridge foundation and foundation works of other civil works, with at least 13 years experience of similar projects. Main tasks of the: Foundation Engineer(B) are:

- To assist in supervision of construction works of bridge substructures and foundation works of sluice way structures for all Packages.
- To assist modification works of design for bridge substructures for all Packages.

(7) Bridge Engineer(A)

The Bridge Engineer(A) will engage in assistance of supervision works of bridge construction works, with at least 13 years experience of similar projects. Main tasks of the: Bridge Engineer(A) are:

- To assist in supervision of construction works of bridges for all Packages.
- To assist modification works of design for bridges and related structures for all Packages.

(8) Bridge Engineer(B)

The Bridge Engineer(B) will engage in assistance of supervision works of bridge construction works, with at least 13 years experience of similar projects. Main tasks of the: Bridge Engineer(B) are:

- To assist in supervision of construction works of bridges for all Packages.
- To assist modification works of design for bridges and related structures for all Packages.

(9) Cost Estimator

The Cost Estimator will review the unit costs and revise bill of quantities, with at least 10 years experience of similar projects. Main tasks of the Cost Estimator are:

- To estimate or review the unit cost and to estimate construction cost for the revised drainage project.
- To revise bill of quantities.

(10) Concrete Engineer

The Concrete Engineer will carry out assistance of supervision of concrete works for bridges and sluiceway structures, with at least 13 years experience of similar projects.

Main tasks of the Concrete Engineer are:

- To assist in supervision of concrete works for bridges and sluiceway structures.
- To assist modification works for concrete structures.

4.9 Undertaking of the Government

The Government shall undertake the following arrangements required for the effective performance of the engineering services:

- Exemption of tax on materials, equipment and other materials which are needed for performing the engineering services
- Assignment of counterpart staff
- Office spaces at the project site with furniture and telecommunication sets.
- All the available data, reports and information related to the project.
- Coordination of the project with other related works and plans in the project area

COST FOR ENGINEERING SERVICES (1/2)

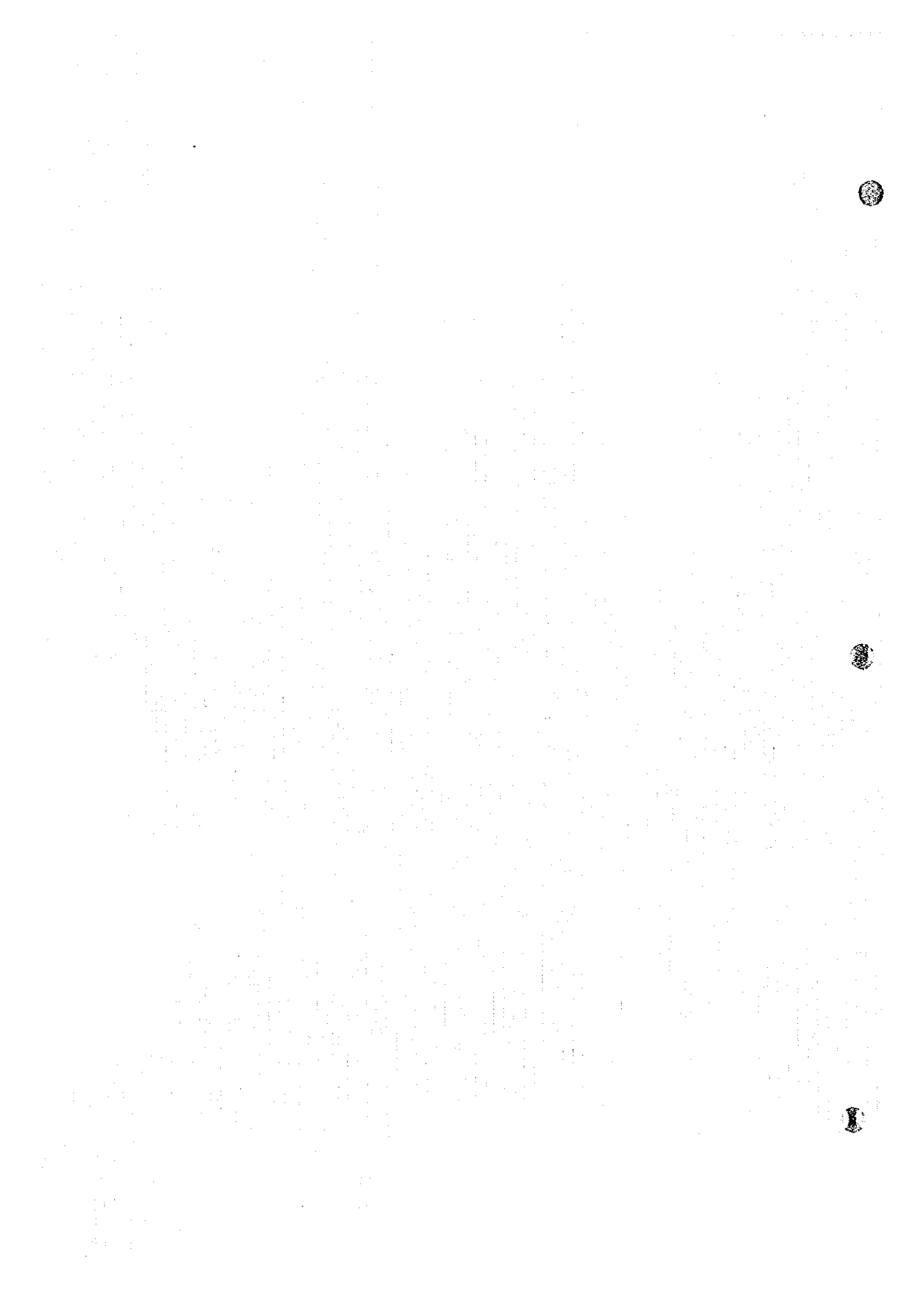
ITEM	AMOUNT
<u>Yen Currency Portion</u>	
I Remuneration	¥ <u>319,200,000</u>
Professional-A	
¥2,400,000 x 133 M/M	= ¥319,200,000
II Direct Cost	¥ <u>256,450,000</u>
1 International Travel Cost	¥ <u>21,660,000</u>
(1) Airfare(Tokyo-Jakarta)	<u>¥12,540,000</u>
- Engineer	
¥330,000 x 28 trips	= ¥9,240,000
- Family	
¥330,000 x 10 trips	= ¥3,300,000
(2) Excess baggage charge	<u>¥4,560,000</u>
- Engineer	
¥3,000 x 20 kgs x 2 times x 28 trips	= ¥3,360,000
- Family	
¥3,000 x 20 kgs x 2 times x 10 trips	= ¥1,200,000
(3) Miscellaneous Travel Expenses	<u>¥4,560,000</u>
- Engineer	
¥120,000 x 28 trips	= ¥3,360,000
- Family	
¥120,000 x 10 trips	= ¥1,200,000
2 International Communication Cost	¥ 7,400,000
¥100,000 x 74 months	
3 Cost of Technical Supplies and Reference Materials	¥ 2,000,000
4 Cost of Family Moving	¥ 700,000
¥700,000 x 1 families	
5 Computer Charge	¥ 3,250,000
¥250,000 x 5 hours (Japan)	= ¥1,250,000
¥100,000 x 20 hours (Indonesia)	= ¥2,000,000
6 Procurement of Equipment	¥ 35,000,000
(1) Laboratory Equipment	= ¥20,000,000
(2) Office Equipment	= ¥15,000,000
7 Transportation Cost for Consultants(vehicle rent)	¥ 93,240,000
¥180,000 x 74 car-month x 7 nos	
8 Report Printing Cost(I.S)	¥ 20,000,000
9 Cost of GOI Overseas Participation(I.S)	¥ 20,000,000
10 Subsistence Allowance and Per Diem of Foreign Consultants	¥ 53,200,000
¥400,000 x 133 M/M	
TOTAL (Yen Currency)	¥ <u>575,650,000</u>

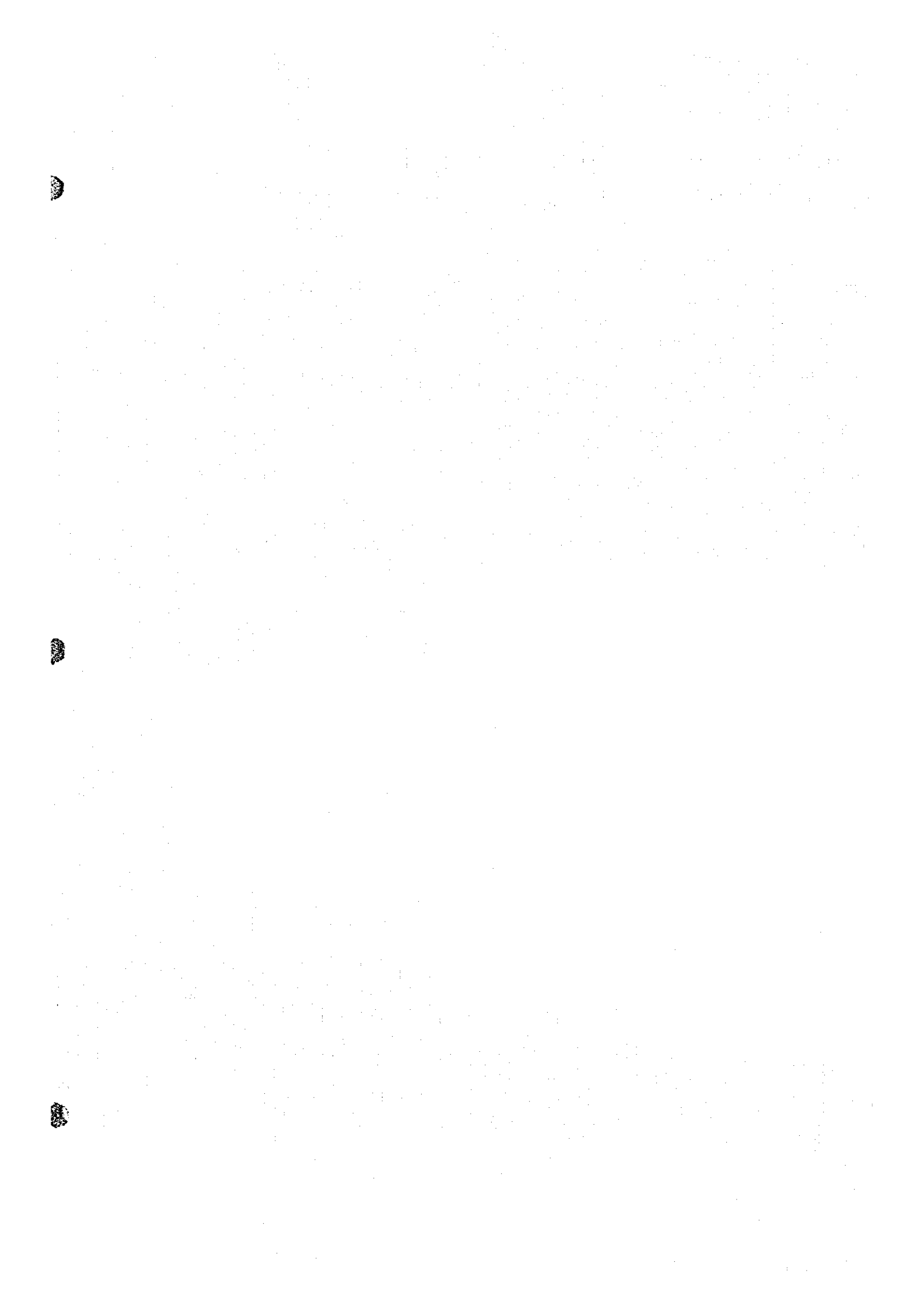
COST FOR ENGINEERING SERVICES (2/2)

	ITEM	AMOUNT
<u>Rupiah Currency Portion</u>		
I	Remuneration	Rp <u>2,988,000,000</u>
	(1) Professional-B	
	Rp 9,000,000 x 332 M/M	= Rp 2,988,000,000
II	Salary of Sub-Professional & Office Staff	Rp <u>2,900,000,000</u>
	(1) Sub-Professional	
	Rp 2,500,000 x 1,000 M/M	= Rp 2,500,000,000
	(2) Office Supporting Staff	
	Rp 800,000 x 500 M/M	= Rp 400,000,000
III	Direct Cost	Rp <u>1,710,000,000</u>
1	Mobilization Cost	Rp 10,000,000
	Rp 500,000 x 20 times	
2	Office Cost	Rp 1,482,000,000
	(1) Office establishment cost	1,334,000,000
	- Rent of office	
	Rp/m ² 40,000 x 400 m ² x 74 M	= Rp 1,184,000,000
	- Furniture	= Rp 150,000,000
	(2) Office supplies and consumables	Rp 74,000,000
	Rp/month 1,000,000 x 74 months	
	(3) Office running cost	Rp 74,000,000
	Rp/month 1,000,000 x 74 months	
3	Communication Cost	Rp 148,000,000
	Rp/month 2,000,000 x 74 months	
4	Computer Cost (Establishing Inter-net system, software, royalty, etc. L.S)	Rp 50,000,000
5	Miscellaneous Expenses (official expenses excluding above items)	Rp 20,000,000
TOTAL (Rupiah Currency Portion)		Rp <u>7,598,000,000</u>

ASSIGNMENT SCHEDULE FOR ENGINEERING SERVICES

DESCRIPTION	Total MM	Year						
		1999	2000	2001	2002	2003	2004	2005
1. Pre-construction and tendering stage								
1.1 Professional-A								
- Tendering Works								
(1) Resident Engineer	15							
- Design review works								
(2) Structural engineer	3							
(3) Cost Estimator	2							
Sub-total	20							
1.2 Professional-B								
- Design review Works								
(1) Structural Engineer(A)	3							
(1) Structural Engineer(B)	3							
(2) Cost Estimator	2							
Sub-total	8							
Total of 1	28							
2. Construction Stage								
2.1 Professional-A								
(1) Resident Engineer	55							
(2) Foundation Engineer	20							
(3) Bridge Engineer	15							
(4) Mechanical Engineer	15							
(5) Unallocated	5							
(6) Home Support	3							
Sub-total	113							
2.2 Professional-B								
(1) Assistant Resident Engineer	59							
(2) Structural engineer(A)	59							
(3) Structural engineer(B)	34							
(4) Structural Engineer(C)	34							
(5) Foundation Engineer(A)	25							
(6) Foundation Engineer(B)	25							
(7) Bridge Engineer(A)	30							
(8) Bridge Engineer(B)	30							
(9) Concrete Engineer	28							
Sub-total	324							
Total of 2	352							
Grand Total	380							







JICA