② 要請書(TOR)

Code Number: 14.1.03.941021
06950655

Project Title	:	JAKARTA URBAN DRAINAGE PROJECT (DED)
Theme(s)	:	Infrastructure
Sector	:	Housing and Human Settlement
Subsector	:	Housing and Human Settlement
Program	:	Human Settlement Sanitation Program
Impact	:	Provincial: DKI Jakarta
Location(s)	:	DKI Jakarta
Duration	:	11 months
Main Executing Agency	:	Ministry of Public Works
Implementation Status	:	Outline Term of Reference available

Background and Justification

Based on the JICA study in 1991, Jakarta is divided into six (6) drainage zones. The Master Plan described the respective drainage zones and running on the basis of a numerical rating system which rationally evaluates five items (1) extent of flood damage, (2) drainage requirements to meet future development, (3) coverage area, (4) population density and (5) income level of inhabitants.

The result marking is as given below :

Zone Scores allocated

No	1	2	3	4	5	Total
1	4	4	4	1	4	17
2	3	1	1	2	1	8
3	4	1	3	3	2	13
4	-	-	-	-	-	-
5	2	1	4	3	2	12
6	3	2	1	2	3	11

Note : zone no. 4 includes no proposed project

Objectives

To provide the engineering design and development for urgent urban drainage works in western districts of Jakarta (Zone 1), especially for the flood prone areas at Cengkareng, Sepak River, Bojong and Maruya Ilir, and north-eastern part of Jakarta (Zone 6), and also flood prone areas in Sunter, Cengkareng, Merunda.

Code Number: T.14.1.03.941021

Activities

1. Review on previous studies was completed in early 1991
2. Additional survey and investigation
3. Preparing the construction plan and cost estimate
4. Preparing the tender documents

Project Cost:

a. Expert Services	:	US $	3,500,000
b. Fellowships	:	US $	0
c. Equipment	:	US $	0
d. Other Costs	:	US $	0
Total Cost	:	US $	3,500,000

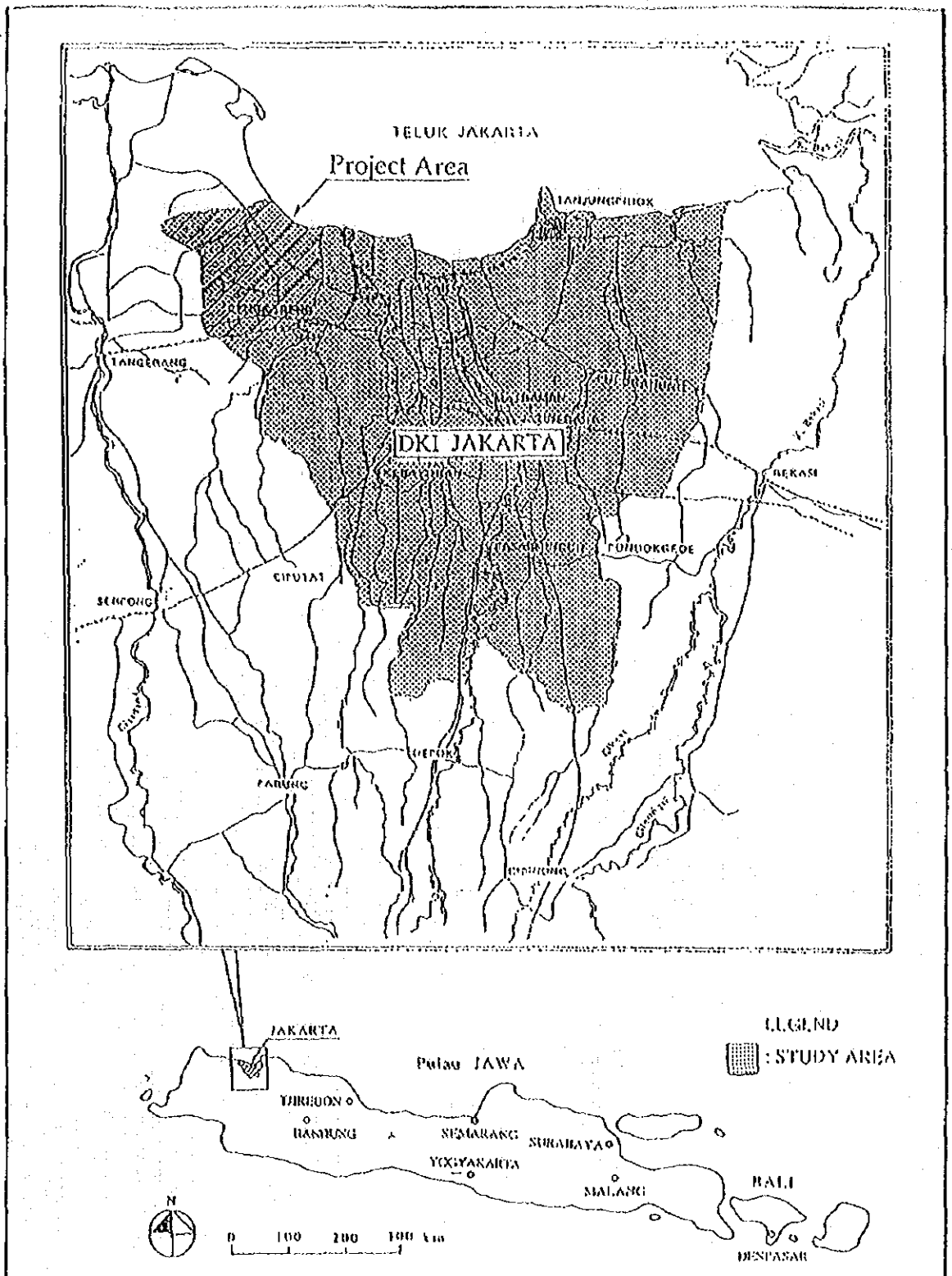
Preferred Financing Modality : Grant

14777

GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS
DIRECTORATE GENERAL OF HUMAN SETTLEMENTS

AID PROPOSAL
FOR
THE DETAILED DESIGN
FOR
URBAN DRAINAGE DEVELOPMENT
IN
THE CITY OF JAKARTA
(PHASE - I)

JANUARY 1994



LOCATION MAP OF PROJECT

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1. PROJECT BACKGROUND

1.1 Introduction

This is an Aid Proposal for the Detailed Design for Urban Drainage Development in the City of Jakarta, Phase - I (the Project). The objective of the Project is to construct the adequate urban drainage system in order to protect the Cengkareng West Area (the Project Area) from habitual innundation.

Jakarta, the capital of Indonesia, is undergoing rapid urbanization in recent years, resulting in an intense population growth that has almost doubled from 4.6 million in 1975 to 8.8 million in 1988, which is further expected to reach 12.8 million in 2010.

The first major project of flood control and drainage implemented in the Jakarta City is the West Banjir Canal completed in 1920. In addition, some major flood control and drainage projects have already been completed and also still on-going since 1972, under the Jakarta Flood Control Project, which include the East Banjir Canal Project.

Nevertheless, these projects are restricted to the improvement of large rivers only. Furthermore, the recent rapid urbanization and the resultant change in landuse has already created new flood prone areas not envisaged in the previous plans. Such flood prone areas are expected to expand further in the future, especially along the relatively undeveloped eastern and western regions.

As a consequence, formulation of an urban drainage development plan, conforming the present and future landuse of the Jakarta City, has become necessary. During the period from September 1989 to March 1991, the Japan International Cooperation Agency (JICA) conducted the Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta (the JICA Study) in response to the request from the Government of Indonesia.

1.2 Previous Study

The JICA Study which comprises the master plan study on urban drainage system and the feasibility studies on respective priority areas for drainage development. As shown in Fig. 1, the study area covered about 650 km^2, which is basically divided into six (6) drainage zones. The master plan was formulated for the respective drainage zone and a

ranking of the master plans was studied on the basis of numerical rating system which rationally evaluate five (5) items: (1) extent of flood damage, (2) drainage requirement to meet future land development, (3) progress rate of urban development, (4) population density, and (5) income level of inhabitants. The result of marking is as given below:

Zone	Scores Allocated					
No.	(1)	(2)	(3)	(4)	(5)	Total
1	4	4	4	1	4	17
2	3	1	1	2	1	8
3	4	1	3	3	2	13
4	-	-	-	-	-	-
5	2	1	4	3	2	12
6	3	2	1	2	3	11

Note: Zone No.4 includes no proposed project.

As shown in the above, Zone 1, Cengkareng West Area marked the highest score so that it is proposed to be implemented at the first among the six zones.

1.3 Needs for the Project

As the JICA Study clarified, the Project requires the most immediate implemntaion as an urban drainage development project in the City of Jakarta.

After completion of the JICA Study, the Cipta Karya recommended the implementation of the Projet to the National Planning and Development Board (Bappenas) .

2. PROJECT AREA

2.1 Location

Zone 1 covers the gross area of about 5,000 ha, of which 4,700 ha is being contemplated to be objective area of the Project. There is almost no urban drain.

The Project Area covers the area of 4,700 ha in the north west of the Jakarta City and is encompassed by the administrative boundary of DKI to the west, Mookervart River to the south and Cengkareng Floodway to the east.

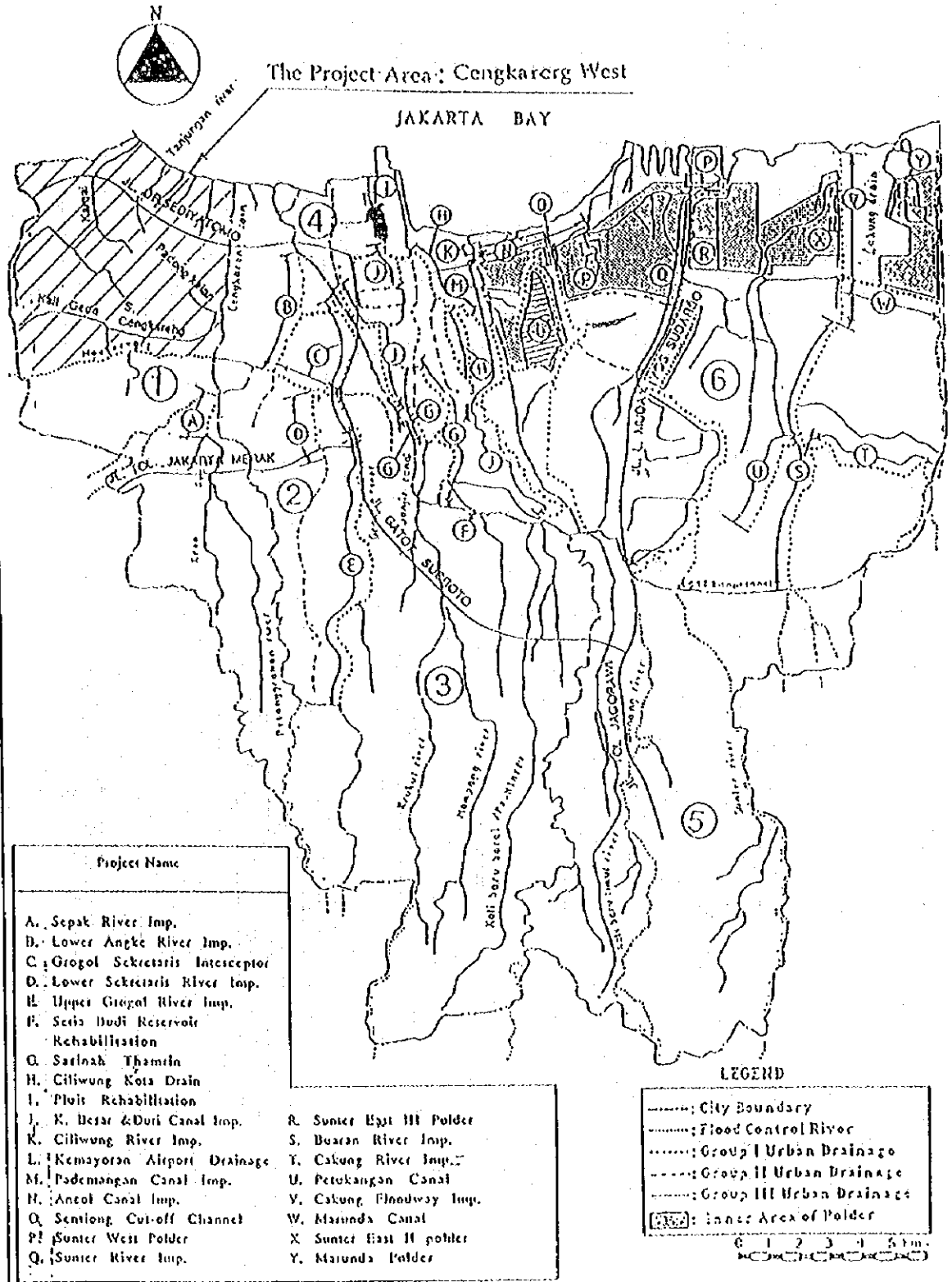


FIG. 1 ZONING OF THE STUDY AREA

2.2 Socio-Economy

Population in the Project Area was 263,000 in 1988 and is expected to increase to 456,000 in 2010, giving the average annual grown rate of 2.53%.

Households in the Project Area were classified into three (3) categories, i.e. high, middle and low income classes according to house types. The existing composition of high, middle and low income classes across the Project Area is estimated to be 3.9%, 48.6% and 47.5% respectively.

The average monthly income per capita in 1989 is estimated at Rp.115,189 for high class, Rp.57,527 for middle class and Rp.29,298 for low class. The average monthly income per household is calculated to be Rp.725,691 for high class, Rp.339,409 for middle class and Rp.152,350 for low class, based on their corresponding average family sizes of 6.3, 5.9 and 5.2.

The Project Area is undergoing a rapid land development to accommodate the increasing population. Urban land area including residential, commercial & institutional and industrial ones will increase from 2,350 ha in 1990 to 3,525 ha in 2005. Existing land use is as shown in Fig. 2.

2.3 Existing Drainage Facilities

The Project Area is divided into the five (5) objective sub-drainage basins based on the existing drainage system as shown in Fig. 3.

(1) Drainage basin "A" covers a catchment area of 777 ha. Storm water is drained directly into the Jakarta Bay through the Tanjungan River with a total length of 3.2 km. The river width is in the range of 2 m to 5 m. The river gradient is approximately 1/3,000.

(2) Drainage basin "B" drains a catchment area of 1,637 ha of the Kamal River and its tributaries also into the Jakarta Bay. The total river length is 11.8 km. The river width ranges from 3 m to 18 m. The river gradient is 1/2,000 - 1/3,000.

(3) Drainage basin "C" consists of the channels of Kali Cede and Kali Bor. Storm water of the basin of 563 ha is drained into the Mookervart River. The total river length is 4.8 km. The river width and slope are 2 - 4 m and 1/2,000 respectively.

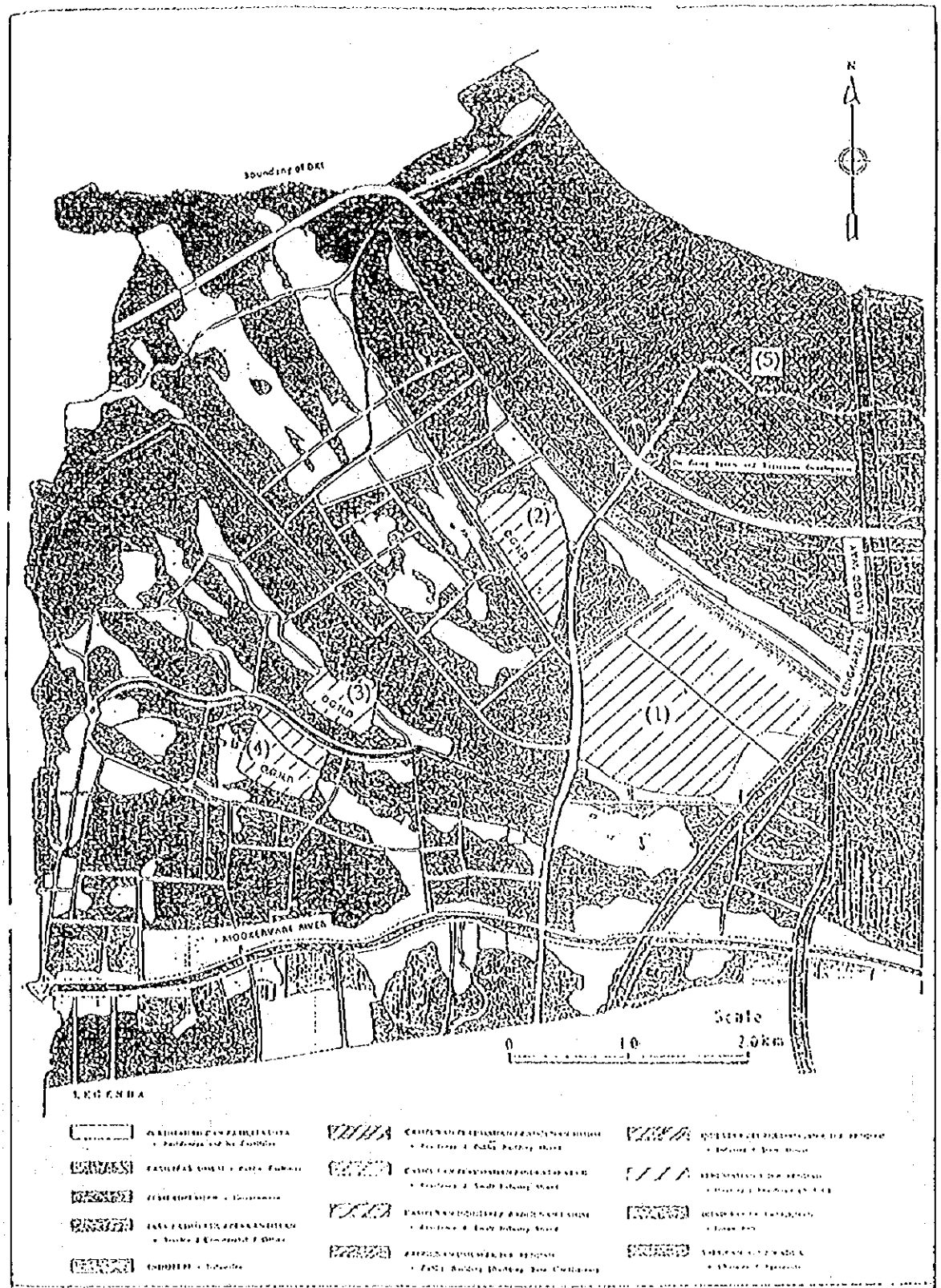
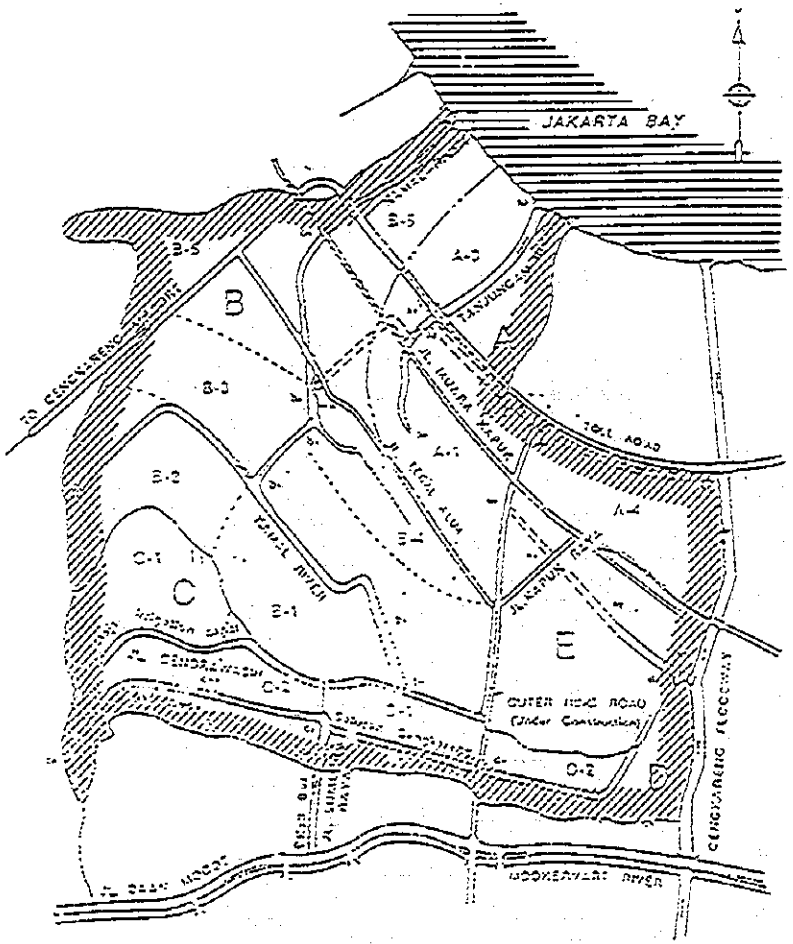


FIG. 2 EXISTING LAND USE OF PROJECT AREA (1990)



Length of Drainage Channel

Basin	Route	Length (km) Existing	Length (km) New Channel
A	a0-a1	5.10	
	a1-a2	0.15	
	a2-a3	1.00	
	a4-a2		1.70
	a5-a4		2.50
	Sub Total	6.15	4.20
B	b0-b1		3.52
	b1-b2	2.50	
	b2-b3	3.00	
	b3-b4	0.30	
	b4-b5	1.22	
	b5-b6	1.22	
	b7-b5	(1.60)	
	b6-b2	(2.80)	
	Sub Total	11.24	3.52
C	C0-C1	1.55	
	C1-C2	1.48	
	C1-C2	0.45	
	C2-C4	0.58	
	Sub Total	4.26	
D	d0-d1	1.05	
	d1-d2	2.83	
	Sub Total	4.53	
E	e0-e1		0.35
	e1-e2		1.50
	e2-e3	0.55	
	e3-e4	0.10	
	Sub Total	1.05	1.85
	Total	29.54	9.47

Catchment Area of Sub Basin

Basin	Sub-Basin	Area (km²)
A	A-1	1.9
	A-2	1.41
	A-3	2.11
	A-4	2.35
	Sub Total	7.77
B	B-1	4.64
	B-2	2.49
	B-3	2.18
	B-4	1.57
	B-5	3.77
	B-6	1.54
	Sub Total	16.37
C	C-1	2.32
	C-2	3.31
	Sub Total	5.63
D	D-1	1.29
	D-2	1.92
	Sub Total	3.21
E	Sub Total	5.15
	TOTAL	38.13

: Objective Drainage Basin

FIG. 3 DRAINAGE SYSTEMS IN PROJECT AREA

(4) Drainage basin "D" covers a catchment area of 331 ha of the Saluran Cengkareng channel. Storm water is drained into the Cengkareng Floodway through the Padongkelan channel. Its river width and slope is 2 - 6 m and 1/2,000 respectively.

(5) Drainage basin "E" drains a catchment area of 515 ha of the Padongkelan channel into the Cengkareng Floodway. Most part of the basin is undergoing housing development. A sluice gate is provided at the confluence to the Cengkareng Floodway to control backwater of the Cengkareng Floodway. Total length of the Padongkelan channel is 1.1 km. Its width and gradient is 2 - 5 m and 1/2,000 respectively.

The above five (5) drainage basins and five (5) channels are further divided into 15 sub-basins and 18 channel sections respectively as presented in Fig. 3. The main features the existing drainage system are as summarized in Table 1.

2.4 Floods and Flood Damages

There are 10 potential inundation areas, out of which six (6) areas are habitually inundated. The total hectareage of the potential inundation areas reaches 474.3 ha, while that of the habitual inundation areas comes to 273.4 ha. The inundation areas are as shown in Fig. 4. The habitual inundation areas are reported to be inferred from inundation twice a year.

The total average annual flood damage in 1988 is estimated to be Rp.1,262 million, and is also expected to increase to Rp.7,085 million in 2010. Both in detail is as shown in Table 2. The damage to properties is predominant, accounting for approximately 80%.

The depth of inundation in the potential inundation areas ranges from 30 cm to 60 cm, and the duration of inundation falls between one (1) day to 10 days. In the habitual inundation areas, inundation depth and duration are 20 to 50 cm, and one (1) to seven (7) days, respectively.

The number of the properties in the inundation areas in 1988 are estimated to be 4,888 for house, 37 for shop and 28 for factory. It is forecasted that they will increase to 8,393 for house, 173 for shop and 84 for factory in 2010.

Table 1 Main Features of Existing Drainage System

River Reaches	Catchment Area (ha)	River Length (km)	River Width (m)	River Gradient
Drainage System "A"				
- Tanjungan R. (a0-a3)	777	3.15	2-5	1:3,000
Drainage System "B"				
- Upper Kamal R. (b1-b2)	464	2.30	3-10	1:2,000
- Middle Kamal R. (b2-b5)	590	3.18	10-14	1:3,000
- Lower Kamal R. (b5-b6)	184	1.88	14-18	1:3,000
- Right Tributary (b7-b3)	152	1.60	3-4	1:3,000
- Left Tributary (b8-b2)	247	2.80	4-10	1:3,000
Total	1,637	11.76		
Drainage System "C"				
- Kali Gede R. (c0-c2)	563	3.43	2-4	1:2,000
- Kali Bor R. (c2-c4)	0	1.33	4	1:2,000
Total	563	4.76		
Drainage System "D"				
- Upper Saluran Cengkareng (d0-d1)	139	1.65	2-4	1:2,000
- Lower Saluran Cengkareng (d1-d2)	192	2.88	4-6	1:2,000
Total	331	4.53		
Drainage System "E"				
- Padongkelan R. (e2-e4)	515	1.14	2-5	1:2,000
Total	3,813	25.34		

FIG. 4 HABITUAL AND POTENTIAL INUNDATION AREAS

Table 2 Summary of Estimated Average Annual Flood Damages ("Without Project" Case)

(Unit: Rp.)

	Item	1988	2010
1.	Direct Damages to Property		
	1) House	934,091,000	4,416,614,000
	2) Shop	14,54,000	499,171,000
	3) Factory	50,407,000	436,338,000
	4) Other Specified Property 1/	31,712,000	392,072,000
	Sub-Total	1,017,664,000	5,744,195,000
2.	Indirect Damages		
	1) Income Losses due to Shop Closure		
	(1) Shop	926,000	32,671,000
	(2) Factory	11,555,000	91,805,000
	(3) Other Specified Property 2/	837,000	7,120,000
	Sub-Total	13,318,000	131,596,000
	2) Traffic Damages		
	(1) Time Cost	2,373,000	8,492,000
	(2) Incremental VOC	5,520,000	20,195,000
	Sub-Total	7893,000	28,687,000
	Total (1. + 2.)	1,051,575,000	5,904,478,000
3.	Damages to Other Unspecified Property Including Infrastructure (1. + 2.) x 20%	210,315,000	1,180,896,000
	Grand Total (1. + 2. + 3.)	1,261,890,000	7,085,374,000

Note: 1/ : Hotel, Restaurant, Hospital, Office, School, (Primary, Junior General High & High) and Religious Facilities (Mosque, Church & Temple)

2/ : Hotel, Restaurant and Hospital

3. THE PROJECT

3.1 Features of the Project

(1) Drainage System

The design flood distribution for the respective channels is given in Fig. 5 and location of the proposed channel improvement is as shown in Fig. 6.

All the drainage channels and facilities are designed to safely discharge the design flood with a return period of 10 years.

All the basins are proposed to be drained by gravity. No pump drainage is proposed. The existing main river and channel sections are designed to be widened/deepened to increase carrying capacity. The existing river/channel reaches will be extended to drain the upstream areas in the drainage systems of the Basin "A", "B" and "E". For extension, excavation of new drainage channel is proposed. Moreover, the existing sluice gate at the confluence of the Padongkelan channel to the Cengkareng Floodway will be improved.

The proposed design parameters are as summarized in Table 3.

Table 3 Design Parameters

Design System	Catchment Area (ha)	Design Discharge (m^3/s)	Channel Improvement			
			Length (km)	Gradient	Width (m)	Depth (m)
(A) Tanjungan	777	13-24	7.2	1/3,000	7.0-16.0	2.5
(B) Kamal	1,637	22-47	8.1	1/1,000-1/3,000	8.0-25.5	2.4
(C) Kali Gede/Kali Bor	563	23-27	4.8	1/2,000	8.2-8.5	2.5-3.0
(D) Saluran Cengkareng	331	13-18	4.5	1/2,000	6.5-7.5	2.5
(E) Padongkelan	515	12-30	2.8	1/2,000	5.9-10.7	2.5
Total	3,823	-	27.4			

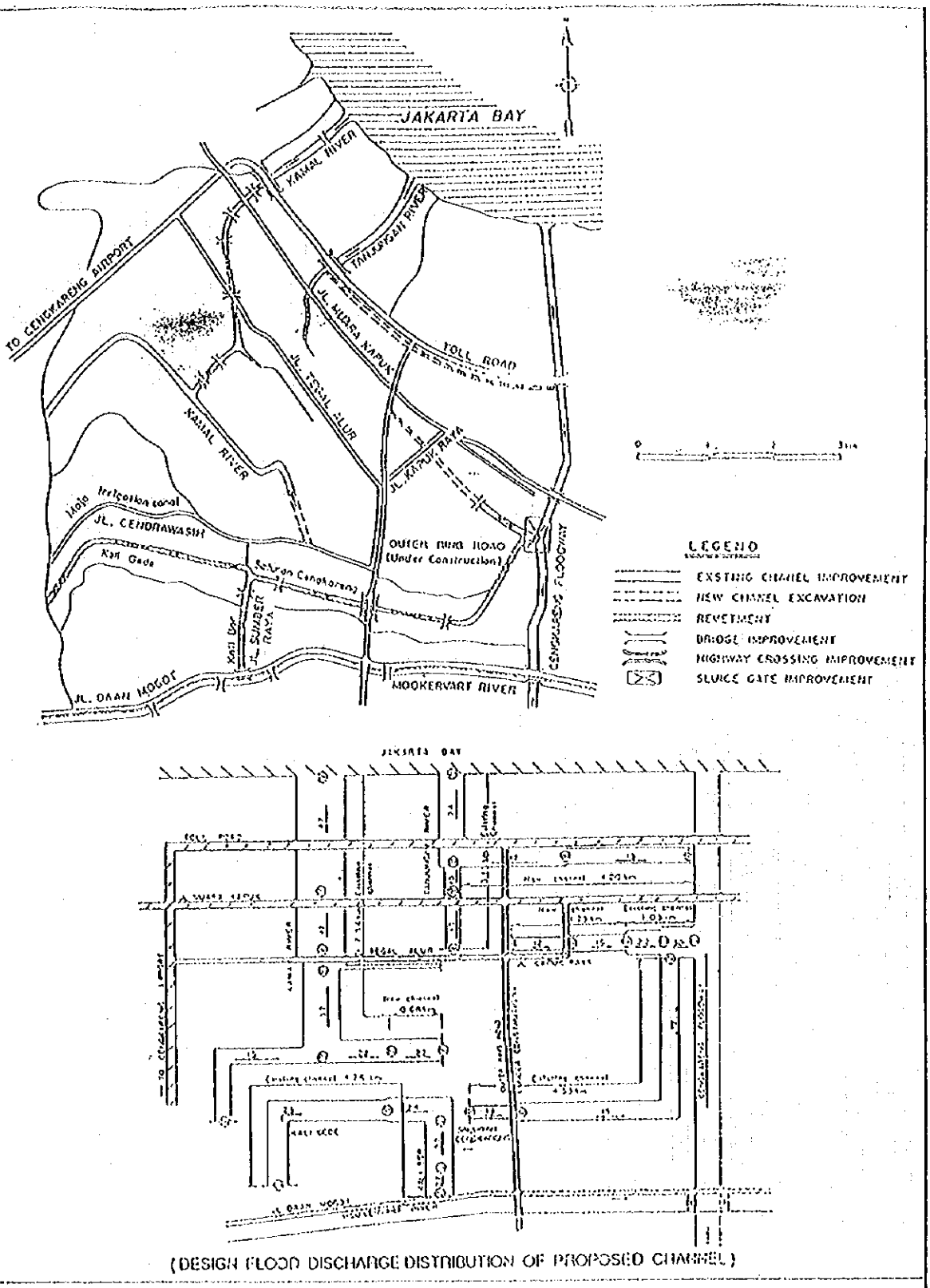


FIG. 5 DESIGN FLOOD DISTRIBUTION

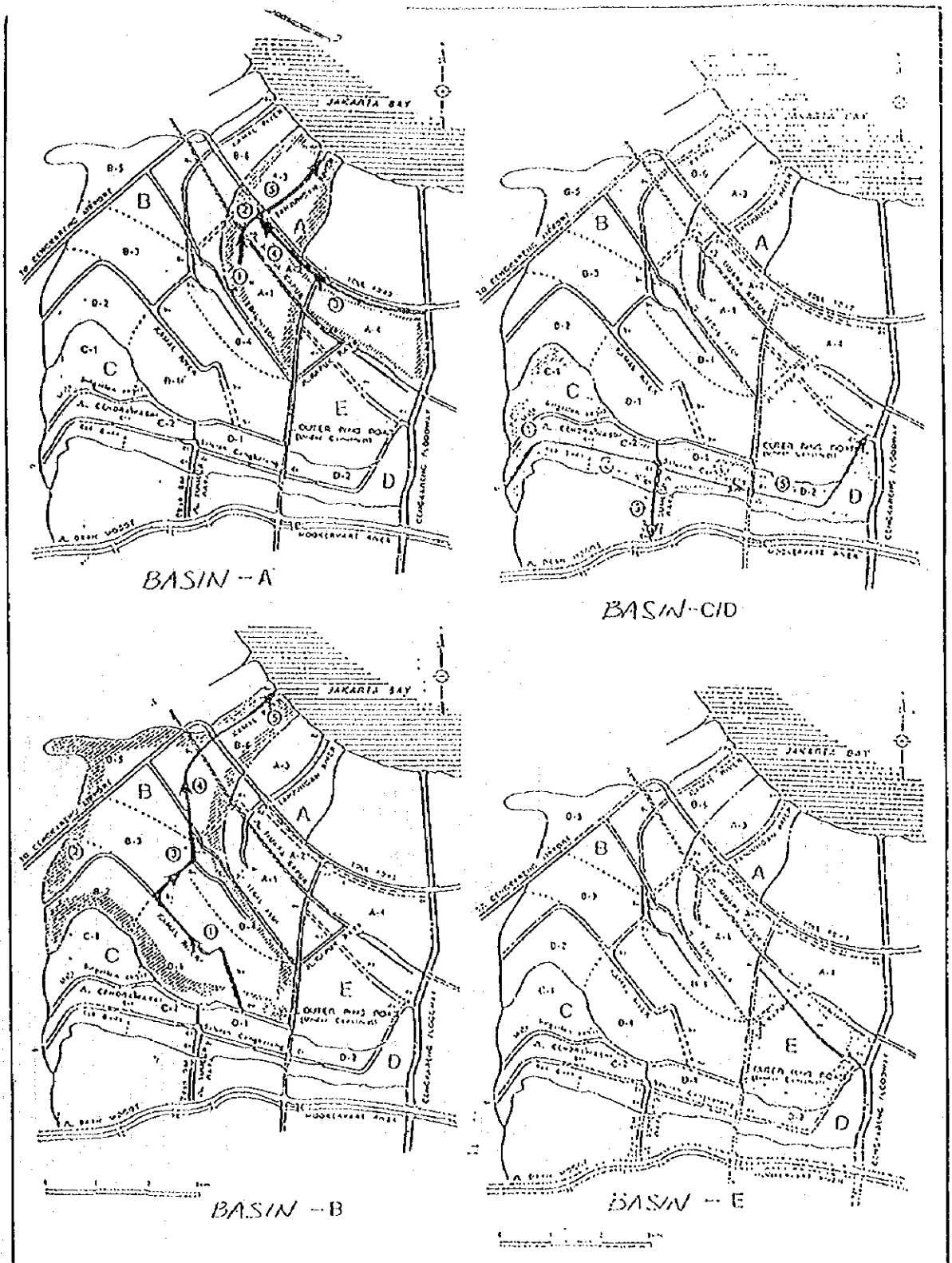


FIG. 6 LOCATION OF PROPOSED CHANNEL IMPROVEMENT

(2) Construction Works and Land Acquisition

The proposed major construction works, required land acquisition and compensation are estimated as summarized below:

(i) Construction Works

- Channel excavation : 469,000 m^3
- Embankment : 106,000 m^3
- Revetment works : 46 km, 195,000 m^2
- Bridge improvement : 15 places, 700 m^2
- Highway crossing : 2 places, 360 m^2
- Inspection road : 35 km, 138,000 m^2
- Sluice gate improvement : 1 place

(ii) Land Acquisition and Compensation

- Land Acquisition : 42 ha
- Resettlement/Compensation : 230 houses

3.2 Estimated Project Cost

The project cost estimated in the JICA Study at price level 1990 is as shown in Table 4.

Table 4 Estimated Project Cost

(Unit: million Rp.)

Item	Estimated Amount
1. Direct Construction	19,880
- System A	
- System B	
- System C	
- System D	
- System E	
2. Land Acquisition/Compensation	26,646
3. Engineering Services *	1,988
4. Administration	698
5. Physical Contingency	1,988
Total	51,200

(*) : for only Construction Supervision.

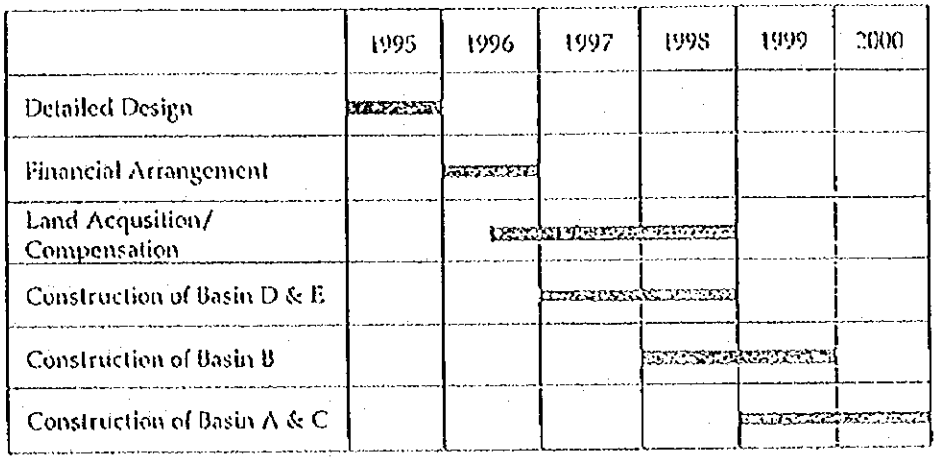
3.3 Organization for Implementation

The Directorate General of Human Settlements (Cipta Karya) will be the implementing agency for the Project.

3.4 Implementation Schedule

The tentative project implementation schedule is as given in Fig. 7. It is anticipated that the project will be completed within six (6) years from 1995 to 2000.

Fig. 7 Tentative Project Implementation Schedule



3.5 Project Evaluation

The major benefit of the Project is the elimination of flood damages. Those damages are direct damages to properties such as houses, shops and factories, income losses due to closure of commercial and industrial establishments, traffic damages, damages to infrastructure, etc.

The economic efficiency of the Project is evaluated in terms of benefit cost ratio (B/C), net present value (NPV) and economic internal rate of return (EIRR) as follows.

B/C : 2.18

NPV : Rp.20,822 million

EIRR : 20.0%

In this economic analysis, project life and opportunity cost of capital are assumed to be 50 years and 10% respectively.

4. PROPOSAL ON CONSULTING SERVICES FOR DETAILED DESIGN

4.1 Necessity of Consulting Services for Detailed Design

The JICA Study on this Project was completed in March 1991. Since this completion of the Study, about 3 years have passed and during this period prices related to construction materials and costs have gone up. Under such circumstances, consulting services for review of the previous study and detailed design of the related structures for the Project are inevitable and firstly proposed as the next step with the following points:

(1) Review of Previous Study

At first, the previous study should be reviewed and updated with the technical main points to be settled as follows:

- Definitive topographical and geological data.
- Definitive drainage canal route.
- Definitive hydrological analysis of the objective area in order to fix design flood discharge.

(2) Additional Survey and Investigation

In parallel with the above review of the previous study, the following additional survey and investigation are necessary:

- Topographic survey
- Geological investigation
- Hydrological investigation and analysis

(3) Environmental Aspects

The due attention should be paid appropriately to the environmental aspects of the whole project, such as resettlement, impact on natural condition, flora and fauna. Environmental Impact Analysis, Environmental Management Plan and Environmental Monitoring Plan should be prepared.

(4) Land Acquisition, Compensation and Resettlement

In order to secure the smooth implementation of the project as the further next step from detailed design, following points should be considered by the Government of Indonesia:

- Cipta Karya will take necessary, proper and prompt action for land acquisition, compensation and resettlement along with the implementation schdule to be proposed during datailed design.

- Cipta Karya will coordinate the activities with the activities by other concerned Ministries and Agencies for the preparation, construction of resettlement area and support for the people who would be removed.

- Cipta Karya will report to the funding agency these implementations periodcally.

4.2 Proposed Cost for Consulting Services

The proposed cost for consulting services for detailed design for the project are estimated in Table 5 and summarized as follows:

ITEM	Foreign Currency (1,000 Yen)	Local Currency (1,000 Rp.)	Total (1,000 Yen)
1. Consulting Services	192,000	600,000	223,579
2. Physical Contingency	9,600	30,000	11,179
3. T O T A L	201,600	630,000	234,758

*) Exchange Rate : 1 Yen = 19 Rp.

Table 5 COST BREAKDOWN OF CONSULTING SERVICES

A. FOREIGN CURRENCY PORTION (1,000 YEN)

1. Remuneration					151,000
1) Professional (A)	50	M/M	@	2,300	115,000
2) Professional (B)	120	M/M	@	300	36,000
2. Direct Cost					41,000
1) International Travel	16	RT	@	500	8,000
2) Accomodation	50	M/M	@	300	15,000
3) International Communication	10	M	@	200	2,000
4) Document Transportation	10	M	@	150	1,500
5) Office Equipment			L. S.		10,000
6) Other Cost			L. S.		4,500
				Yen	192,000

B. LOCAL CURRENCY PORTION (1,000 RP.)

1. Remuneration					125,000
1) Technician	50	M/M	@	1,500	75,000
2) Office Staff	50	M/M	@	1,000	50,000
2. Direct Cost					475,000
1) Office Cost with Furniture	10	M	@	5,000	50,000
2) Office Supply & Comsumables	10	M	@	1,000	10,000
3) Vehicle Allowance	50	M	@	2,000	100,000
4) Survey & Investigation			L. S.		200,000
5) Report & Printing			L. S.		100,000
6) Other Cost			L. S.		15,000
				Rp.	600,000

5. TERMS OF REFERENCE FOR CONSULTING SERVICES FOR DETAILED DESIGN

5.1 Objective

The objective of the Consulting Services will be as follows;

(1) To formulate a definite plan of the Project based on review of the JICA Study.

(2) To execute additional survey and investigation necessary for the detailed design.

(3) To prepare detailed design and the tender documents.

(4) To survey and establish environmental condition and resettlement /removal requirements of inhabitants.

5.2 Scope of Works

The scope of work will cover, but not limited to the following:

(1) Preparation of Definite Plan

- To review all the existing information, data and studies
- To carry out topographic survey and geotechnical investigation as required
- To prepare inventory of existing drainage facilities and assess their functions to reveal their improvement/rehabilitation requirement
- To update flood damages with and without the Project
- To review the previous drainage system development plan and establish a definite plan for implementation
- To assess economic feasibility of the Project

(2) Environemental and Resettlement

- To investigate environemental conditions prevailing over the Project Area
- To survey existing shanties/squatters along the drainages/rivers

- To establish appropriate resettlement/removal plan for inhabitants
- To assess the impacts of the Project on environment and formulate countermeasures to mitigate adverse effects, if any

(3) Detailed Design

- To establish planning and designing criteria in the light of the Indonesian criteria and codes
- To prepare tender design drawings for drainages/river improvement works and other related facilites
- To develop operation and maintenance system of the Project through preparation of operation and maintenance manual
- To estimate the financial cost of the Project
- To make a construction plan and construction time schedule
- To prepare prequalification and bidding documents

5.3 Reports and Drawings

The Consultant shall prepare the following reports, documents and drawings and shall submit these to CIPTA KARYA.

- Inception Report	10 copies
- Monthly Progress Report	10 copies
- Definitive Plan Report	10 copies
- Draft Prequalification Document	10 copies
- Final Prequalification Document	20 copies
- Draft Tender Documents	10 copies
- Final Tender Documents	10 copies
- Draft Final Detail Design Report	10 copies
- Final Detail Design Report	20 copies
- Implementation Programme	20 copies
- Engineer's Cost Estimate	5 copies

5.4 Tentative Work Schedule and Reports

The whole Consulting Services shall be completed within thirteen (13) months. A tentative Work Schedule is shown in Fig. 8 attached hereto.

5.5 Requirement Expertise Input

The expertise input requirement is estimated as shown in Fig. 9.

Fig. 8 WORK SCHEDULE

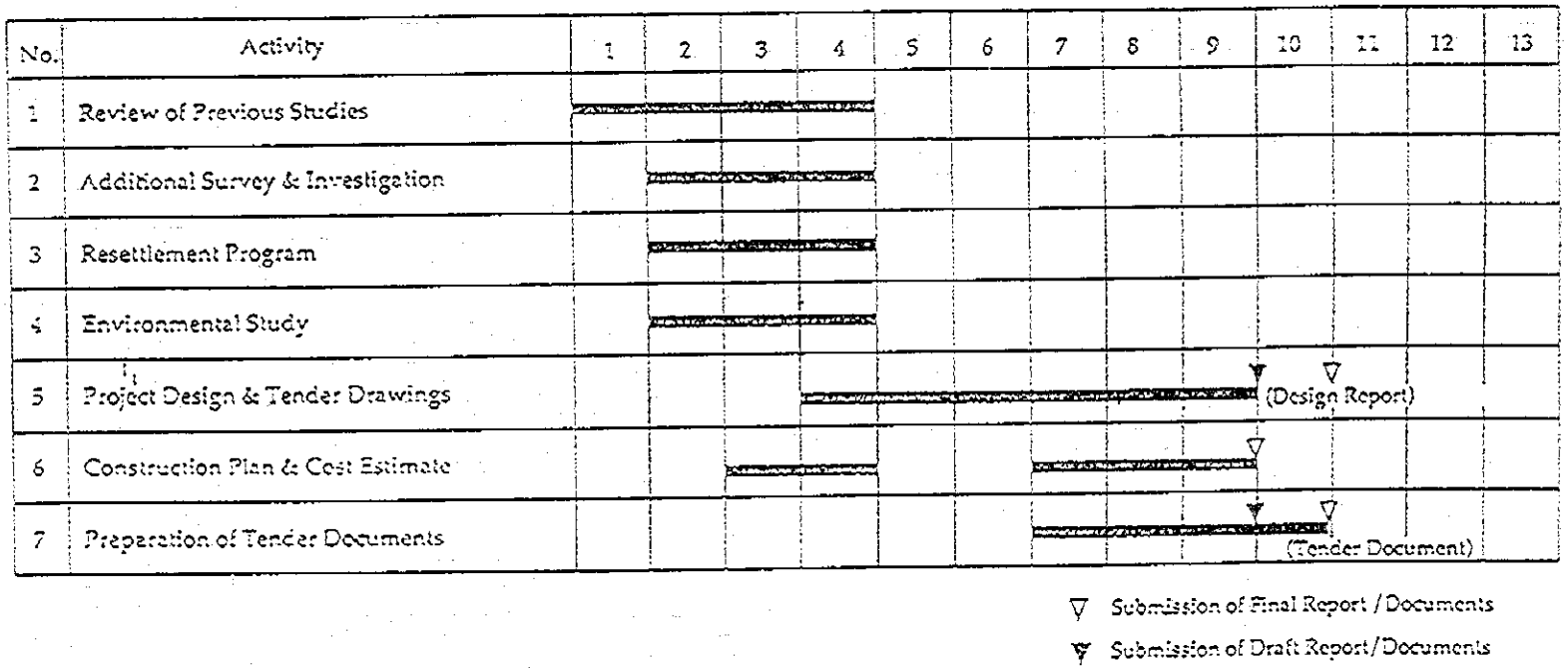


Fig. 9 STAFFING ASSIGNMENT SCHEDULE

POSITION	MONTH												MAN-MONTHS			TRIP
	1	2	3	4	5	6	7	8	9	10	11	12	Foreign	Local	Total	
1. Project Director													0.5		0.5	2
2. Team Leader													10.0		10.0	1
3. Co-Team Leader														10.0	10.0	
4. Sr. Drainage Engineer													9.0		9.0	1
5. Drainage Engineer (I)														10.0	10.0	
6. Drainage Engineer (II)														10.0	10.0	
7. Sr. Hydraulic Design Engineer													5.0		5.0	1
8. Hydraulic Design Engineer														8.0	8.0	
9. Hydrologist													2.0		2.0	1
10. Water Quality Analyst														3.0	3.0	
11. Sr. Geotechnical Engineer													2.0		2.0	1
12. Geotechnical Engineer														3.0	3.0	
13. Sr. Structural Engineer													4.0		4.0	1
14. Structural Engineer (I)														9.0	9.0	
15. Structural Engineer (II)														8.0	8.0	
16. Road Engineer														6.0	6.0	
17. Bridge Engineer														6.0	6.0	
18. Utility Engineer														7.0	7.0	
19. Sr. Mechanical Engineer													3.0		3.0	1
20. Mechanical Engineer														5.0	5.0	
21. Sr. Construction Planner													2.5		2.5	1
22. Construction Planner														3.0	3.0	
23. Sr. Cost Estimator													4.0		4.0	2
24. Cost Estimator (I)														5.0	5.0	
25. Cost Estimator (II)														5.0	5.0	
26. Sr. Document Specialist													2.0		2.0	1
27. Document Specialist (I)														4.0	4.0	
28. Document Specialist (II)														4.0	4.0	
29. Survey Engineer (I)														5.0	5.0	
30. Survey Engineer(II)														4.0	4.0	
31. Resettlement Engineer													3.0		3.0	1
32. Sr. Environmental Specialist													3.0		3.0	2
33. Environmental Specialist														5.0	5.0	
												TOTAL	50.0	120.0	170.0	16

(NOTE) ▬ : Foreign ▭ : Local

③ 質　問　表

Questionnaires
Regarding Drainage Facility & Plan

No. 1

	Item	Data/Contents	Availability
1	Sample of tender and contract documents	· Documents for tendering · General specification · Technical specification · Drawings	
2	Urban drainage project	· Section of the project implementing ·Organization /responsibility of the project implementing · Ongoing project · Under planning · Fund source for the project	
3	Urban drainage system	· Section for the maintenance ·Organization /responsibility for the maintenance · Way to confirm the boundary of channel	
4	Land use plan	· Organization of the planning · Future land use plan (target year)	
5	Criteria	· Design criteria · Structural criteria · Cost estimation standard	

	Item	Data/Contents	Availability
6	Road/Bridge	· Organization for maintenance	
7	Facilities of underground	· Organization for maintenance · Drawings such as; · Water supply · Sewerage · Electricity · Tele-communications	
8	Local consultant for design	· Classification of engineer · Payment · Equipmont of CAD system such as; · Personal computer · Plotter	
9	Unit cost of construction	· Labor cost · Construction material such as; · Cement · Aggregate · Reinforcing bar · Machinery cost · Fuel/oil · Wet masonry · Sluice gate · Wooden pile	

Regarding Soil Investigation

No. 3

Item	Data/Contents	Availability
1. Maps to be used for reconnaissance	(1) Topographic maps covering the Study area (1:250,000 to 50,000)	
2. Aerial photographs and topographic maps	(1) Aerial photographs(1:10,000 or larger scales such as 1:5,000, 1:2,500 etc.)	
3. Geological data	(1) Geological maps covering the Study area (2) Existing reports on such data/information as: - Distribution/location of soft ground - Results of geological/soil investigation (3) Possible locations of borrow pits/quarry sources and material types (4) Geotechnical problems on/around the Study area such as - salt weathering on concrete - sulfate attack on concrete - swelling ground - collapsible soil	
4. Geodetic data	(1) Existing horizontal ground controls networks such as triangulation, traversing and GPS stations (2) Existing vertical ground controls networks such as first and second order leveling (3) Coordinates and elevation data of existing horizontal and vertical ground controls mentioned above	
5. Meteorological data	(1) Monthly rainfall data (hourly and daily rainfall data)	

Item	Data/Contents	Availability
	(2) Temperature and humidity (3) Wind direction , velocity and others	
6. Hydrological data of rivers/ocean and marine	(1) Flow direction, velocity, volume and high water level (2) Tide table	
7. Data/information on related roads in the Study area	(1) Road maps (2) Road and bridge inventories (class length, surface type, etc.) (3) Record of past disaster/damages (flood, slope failure, etc.)	
8. Specifications and standard	(1) Geometric standards (2) Bridge/structure standards (3) Pavement standards (4) Standard specification for construction (5) Maintenance manual (6) Technical specifications on survey and mapping	
9.Transportation Network Map	(1) Network maps and capacity of national transport system roads/railways and commercial flights	

Regarding Environmental Affairs

Item	Data/Contents	Availability
Environmental data/ Government regulation	-Legisration related to land acquisition, compensation and resettlement/removal. (1)Responsible ministry or agency (2)Laws/guidelines -Resettlement plan on similar projects -Present situation of the proposed project sites other than performed in Feasibility Study in 1991. (1) Socio-economic environment (2) Natural environment (3) Quality of life -Environmental guidelines of Ministry of Public Works -RAL and RPR on similar projects	

④ S/W及びM/M

SCOPE OF WORK

FOR

THE DETAILED DESIGN FOR URBAN DRAINAGE PROJECT

IN THE CITY OF JAKARTA

IN

THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN

DIRECTORATE GENERAL OF HUMAN SETTLEMENTS,

MINISTRY OF PUBLIC WORKS

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

JAKARTA, 29th January, 1996

RACHMADI B.S.
Director General of Human Settlements,
(CIPTA KARYA)
Ministry of Public Works

Mr. Shosiro HORIGOME
Leader,
Preparatory Study Team,
Japan International Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Republic of Indonesia (hereinafter referred to as "the Government of Indonesia"), the Government of Japan decided to conduct the detailed design study for Urban Drainage Project in the City of Jakarta in the Republic of Indonesia (hereinafter referred to as "the Study")in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Indonesia.

The present document sets forth the scope work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are to carry out a detailed design for Urban Drainage Project, which consists of improvement work of four (4) sub-project areas indicated in "IV. STUDY AREA" with the total length of 35.1km and to pursue technology transfer to counterpart personnel in the course of the Study.

III. STUDY ORGANIZATION

1. Directorate General of Human Settlements, Ministry of Public Works (hereinafter referred to as "Cipta Karya") shall act as counterpart agency to the Japanese study team (hereinafter referred to as "the Team") and also as coordinating body in relation with other Governmental and non-governmental organization concerned for smooth implementation of the Study.

2.Cipta Karya shall be as the executing agency of the Project, responsible for the results of the execution of the Project on the basis of all documents and drawings of the detailed design prepared through the Study.

IV. STUDY AREA

The study area shall cover north west low-lying area of Jakarta City with an area of approximately 5,000ha of Cengkareng West, Sepak River, Bojong, and Maruya Ilir, that were project areas covered under the Feasibility Study of the Study on Urban Drainage and Waste water Disposal Project conducted by JICA in 1991, and shall consist of the numbers of sub-systems respectively described in the project component in Appendix II.

Project area is shown in APPENDIX I

V. SCOPE OF THE STUDY

In order to achieve the objective, the Study shall cover the following items(refer to APPENDIX II for details);

Phase I

1.Collection and review of relevant studies
2.Investigation and studies
3.Geoterchnical investigation and laboratory test
4.Design criteria and basic design
5.Survey and establishment of environmental condition and resettlement/removal requirements of inhabitant

Phase II

1.Detailed design (project components for the detailed design are listed in the APPENDIX II).
2.Preparation of construction plan
3.Project cost estimation
4.Preparation of implementation program
5.Preparation of tender and contract documents

VI. STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative study schedule (APPENDIX III).

VII. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Indonesia.

1. Inception report
   Thirty(30) copies
   Within one(1) month after the commencement of the Study.

2. Interim report
   Thirty(30) copies
   At the end of the Phase I of the Study.

3. Progress report
   Thirty(30) copies
   At the end of the Second work period in Indonesia.

4. Draft Final Report
   Forty(40) copies
   After third work period in Japan.
   The Government of Indonesia will provide JICA with its comments within 1(one)month after the receipt of the Draft Final Report.

5. Final Report
   Fifty(50) copies
   Within two(2) months after the receipt of the comments by Indonesian side.

VIII. UNDERTAKING OF THE GOVERNMENT OF INDONESIA

1. To facilitate smooth conduct of the Study, the Government of Indonesia shall take necessary measures:

(1) to secure the safety of the Team,

(2) to permit members of the Team to enter, leave and sojourn in Indonesia for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,

(3) to exempt the members of the Team from taxes, duties and other charges on equipment, machinery and other materials brought into Indonesia for the conduct of the Study,

(4) to exempt the non-Indonesian members of the Team from income tax and any charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,

(5) to provide necessary facilities to the Team for remittance as well as utilization of funds introduced into Indonesia from Japan in connection with the implementation of the Study,

(6) to secure data for the members of the Team to obtain data regarding private properties or restricted areas from Local Government for the implementation of the Study, if necessary,

(7) to secure all relevant data (including maps, photographs and so on) and documents related to the Study,

(8) to provide the medical services as needed. Its expenses will be chargeable on members of the Team.

2. The Government of Indonesia shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with , the discharge of their duties in the implementation of the Study, except when such claims arises from gross negligence or willful misconduct on the part the members of the Team.

3. Cipta Karya and Provincial Government DKI JAKARTA shall, at its own expense, provide the Team with the following, in cooperation with other organization concerned:

(1) available data and information related to the Study,

(2) counterpart personnel and supporting staff,

(3) suitable office space with necessary equipment in JAKARTA

(4) credentials or identification cards to the members of the Team.

IX. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

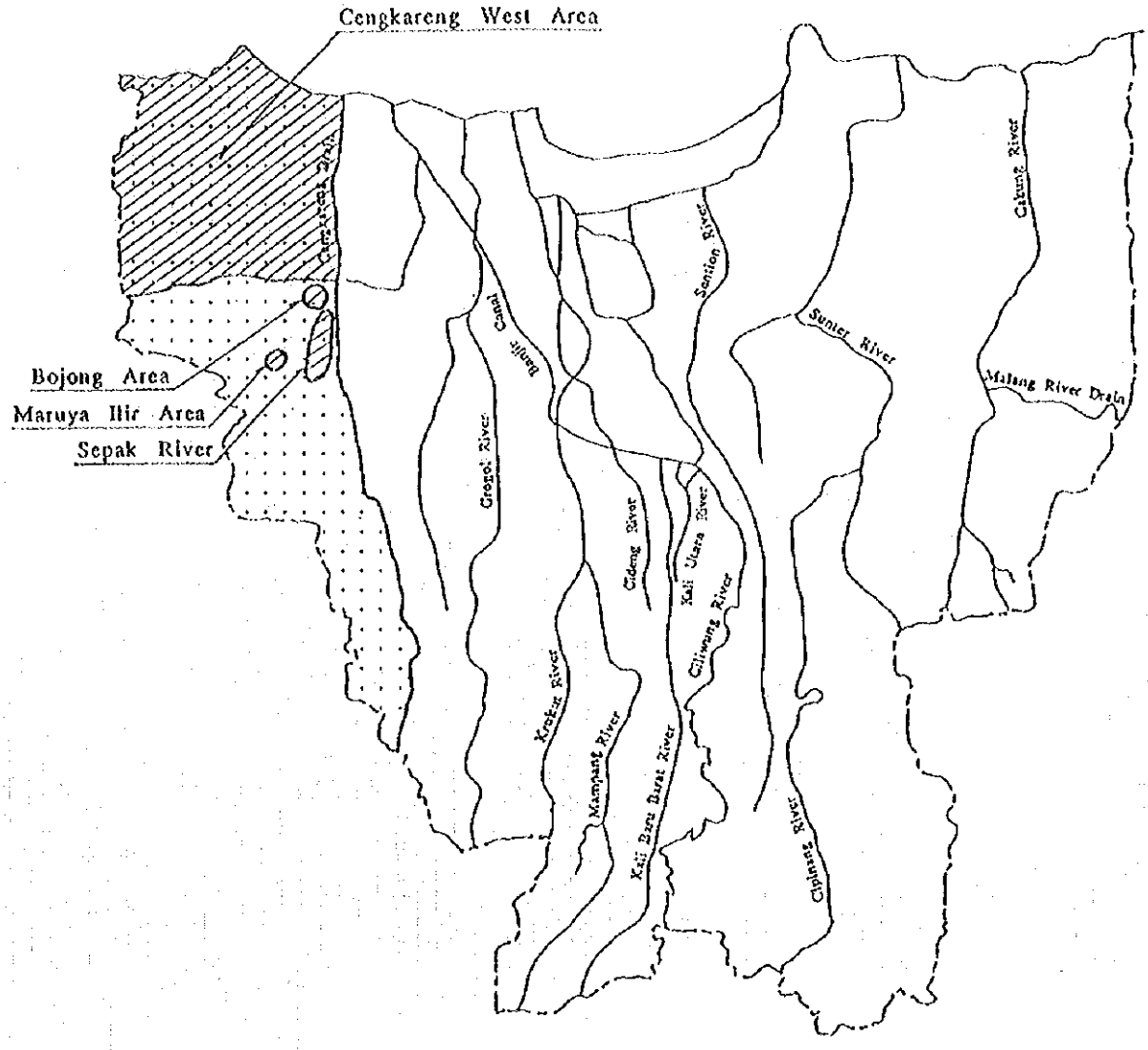
1. to dispatch, at its own expense, the Team to Indonesia,

2. to pursue technology transfer to the Indonesian counterpart personnel in the course of the Study.

X. CONSULTATION

JICA and Indonesian side (ie. Cipta Karya and DPU DKI JAKRTA) shall consult with each other on respect of any matter that arise from or in connection with the Study.

APPENDIX -- I STUDY AREA



LEGEND

: Priority Area of Drainage Development (Drainage Zone No.1)

: Project Area of Drainage Development

APPENDIX II

I. PROJECT COMPONENTS

The project components are tentatively described as follows, based on the feasibility study in "THE STUDY ON URBAN DRAINAGE AND WASTE WATER DISPOSAL PROJECT IN THE CITY OF JAKARTA".

The site areas of these components are indicated in those attachments of No.1 to No.4 respectively.

<Cengkareng West Improvement>

i) Basin A: Tanjungan River drainage system
ii) Basin B: Kamal River drainage system
iii) Basin C: Kali Gede and Kali Bor channel drainage system
iv) Basin D: Salurang Cengkareng channel drainage system
v) Basin E: Padongkelan channel drainage system

<Sepak River Improvement>

i) Kreo River
ii) Sepak River
iii) Kembangan River

<Bojong Improvement Drainage Improvement>

i) Channel Route I :Channel No.1, 2 and 17 drainage
ii) Channel Route II :Channel No.9, 11 and 13 drainage
iii) Channel Route III :Channel No.23, 25, 20, 24 and 21 drainage
iv) Channel Route IV :Channel No.29 and 31 channel drainage

<Maruya Ilir Drainage Improvement>

i) Channel No.1 drainage system
ii) Channel No.2 drainage system
iii) Channel No.3 drainage system
iv) Channel No.4 drainage system
v) Channel No.5 drainage system

1. Cengkareng West Drainage

The objective drainage basin in divided into five (5) sub-drainage basins based on the existing drainage system.

The length, gradient, width and depth of channels are summarized as follows.

Drainage System	Length (km)	Gradient	Width (m)	Depth (m)
Tanjungan	7.2	1/3,000	7.0-16.0	2.5
Kamal	8.1	1/6,000-1/3,000	8.9-25.2	2.4
Kali Gede/Kali Bor	4.8	1/2,000	8.2-8.5	2.5-3.0
Salurang Cengkareng	4.5	1/2,000	6.5-7.5	2.5
Padongkelan	2.8	1/2,000	5.9-10.7	2.5
Total	27.4			

2. Sepak River Improvement

The river system is composed of the main Sepak River, and the tributaries of Kembangan, Kreo and Ulujami. The three (3) unimproved river sections will be improved to meet increasing flood peaks due to the land development.

The length, gradient, width and depth of rivers are summarized as follows.

River	Length (m)	Gradient	Top Width (m)	Bottom Width (m)	Depth (m)
Kreo	1,000	1/540	10.1	7.2	2.9
Sepak	500	1/667	13.5	10.6	2.9
Kembangan	600	1/540	12.0	10.7	1.3
Total	2,100				

3. Bojong Drainage Improvement

The length, gradient, width and depth of channels are summarized as follows.

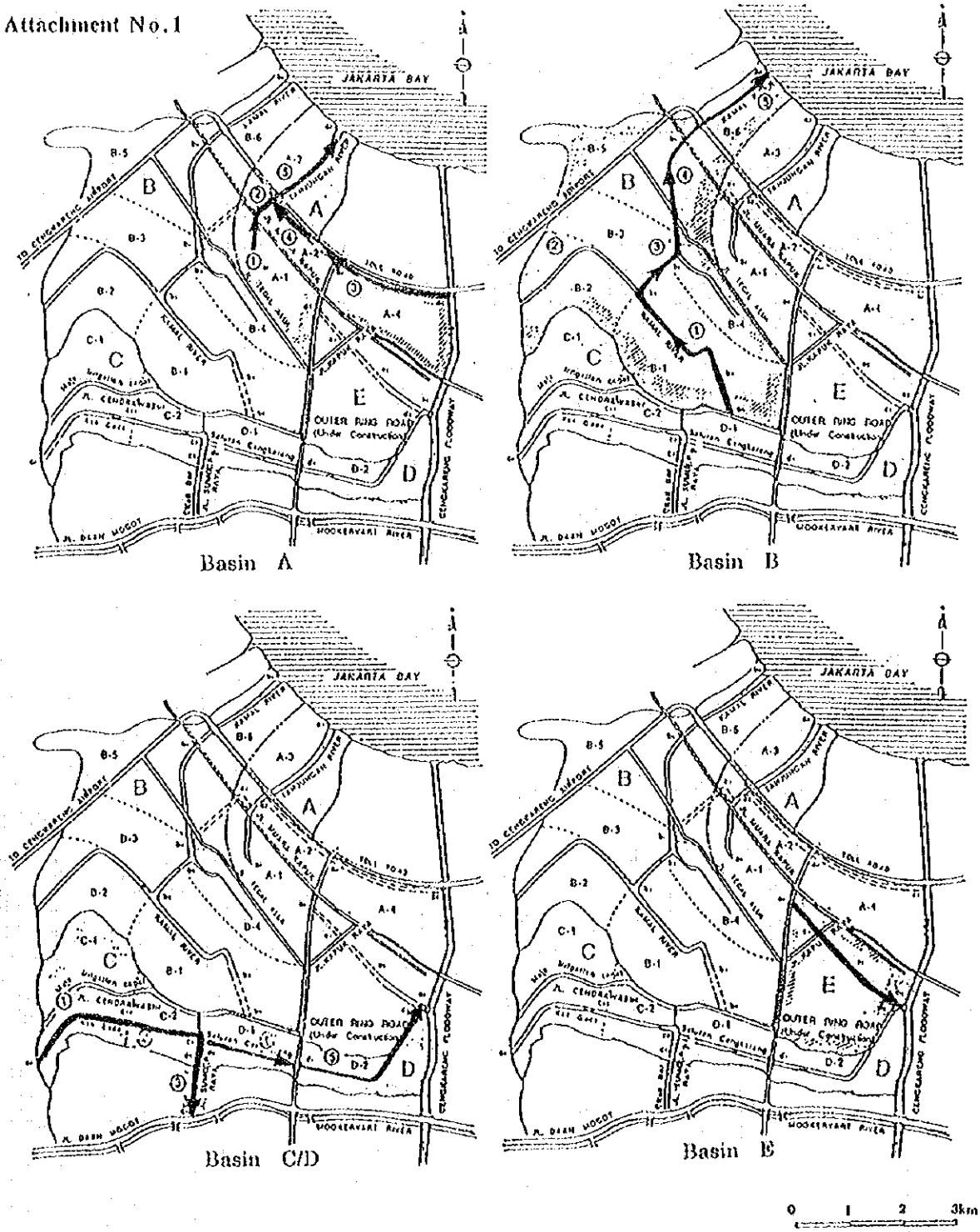
Channel Route	Channel No.	Length (m)	Slope (1/1000)	Top Width (m)	Bottom Width (m)	Depth (m)
I	1	145	2.0	0.50	0.50	1.00
	2	45	2.0	0.50	0.50	1.00
	17	190	0.3	1.44	0.50	1.25
II	9	110	4.0	0.50	0.50	0.50
	11	60	4.0	0.50	0.50	0.50
	13	180	3.0		∮ 0.7	
III	23	50	2.0	1.32	1.00	1.24
	25	60	2.0	1.32	1.00	1.24
	20	110	4.0	0.65	0.50	0.60
	24	300	3.9	0.79	0.40	0.50
	21	145	2.0	1.32	1.00	1.24
IV	29	300	0.5	0.77	0.77	0.68
	31	300	0.5	0.77	0.77	0.68
Total		1,995				

4. Maruya Ilir Drainage Improvement

The length, gradient, width and depth of channels are summarized as follows.

Channel No.	Length (m)	Gradient	Top Width (m)	Bottom Width (m)	Depth (m)
1	1,068	1/360	3.5	2.0	1.3
2	289	1/360	3.5	2.0	1.3
3	1,034	1/830	5.0	4.0	1.0
4	600	1/910	8.0	6.8	1.2
5	510	1/910	8.0	6.8	1.2
Total	3,501				

Attachment No.1



<Cengkareng West Improvement>

i) Basin A: Tanjungan River drainage system

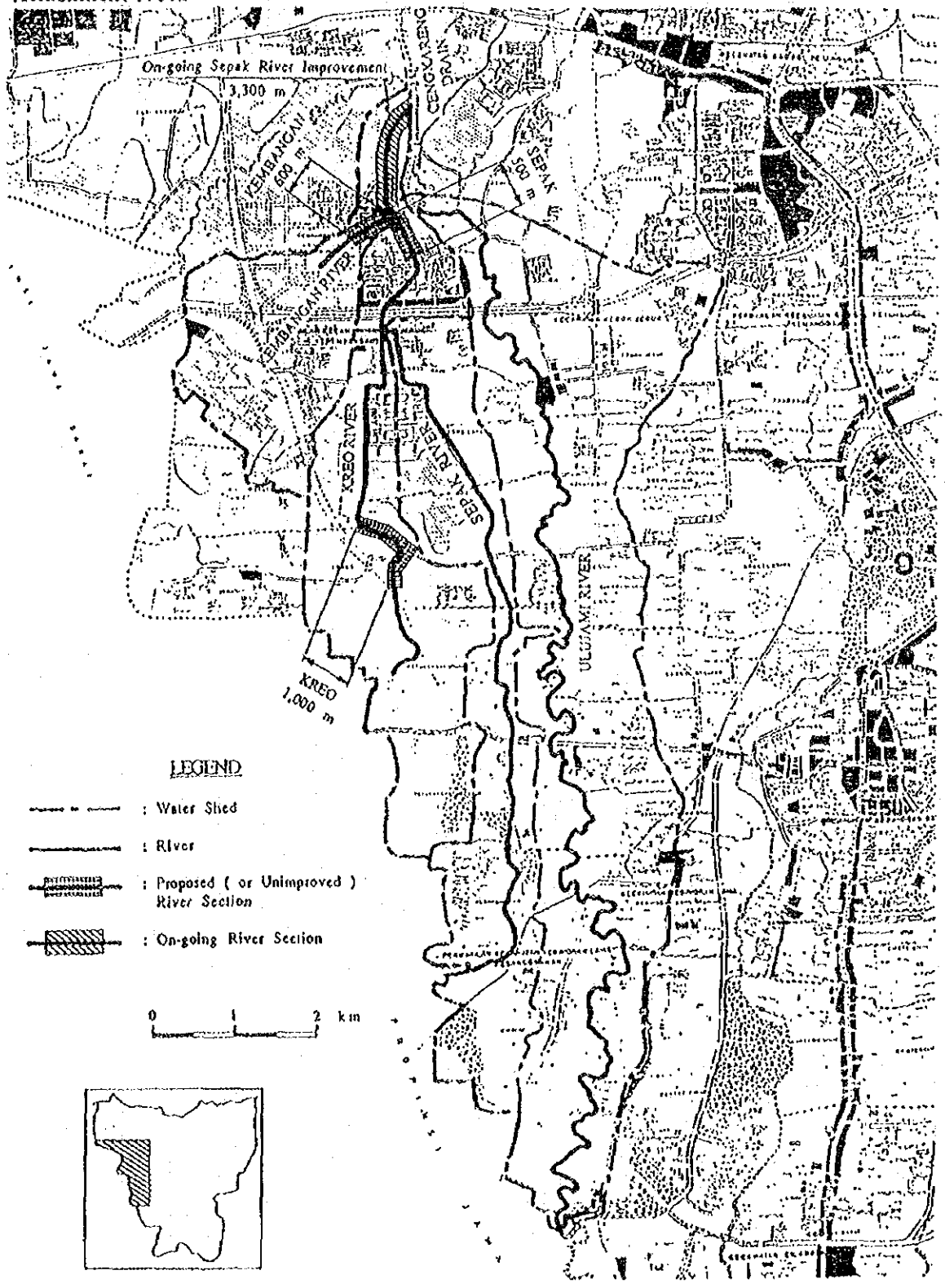
ii) Basin B: Kamal River drainage system

iii) Basin C: Kali Gede and Kali Bor channel drainage system

iv) Basin D: Salurang Cengkareng channel drainage system

v) Basin E: Padongkelan channel drainage system

Attachment No.2



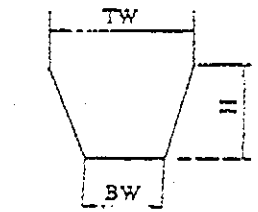
<Sepak River Improvement>

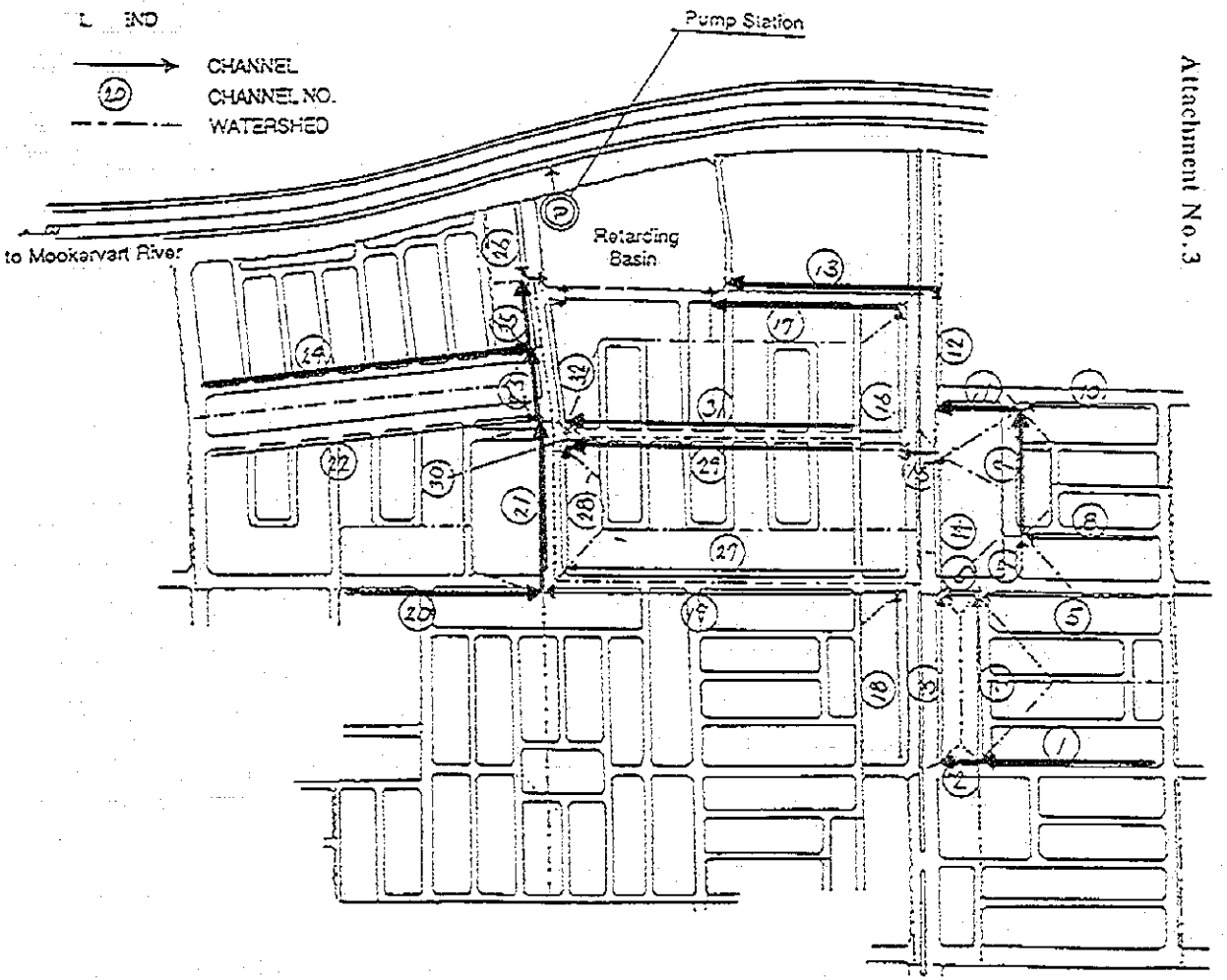
i) Kreo River

ii) Sepak River

iii) Kembangan River

Channel Route	Channel No.	Shape (m) BW	TW	H
I	1	0.20	0.45	0.56
	2	0.20	0.45	0.56
	3	0.50	1.44	1.22
	14	0.50	1.44	1.22
	15	1.10	1.20	1.10
	16	0.50	1.44	1.25
	17	0.50	1.44	1.25
	4	0.25	0.45	0.50
	6	0.40	1.10	1.10
	5	0.40	1.10	1.10
II	8	0.40	1.10	1.10
	9	0.20	0.42	0.50
	11	0.20	0.40	0.50
	12	φ 600		
	13	φ 600		
	7	0.40	1.10	1.10
	10	0.20	0.40	0.50
III	18	0.30	0.40	0.25
	19	0.60	1.30	1.30
	21	1.32	1.32	1.24
	23	0.22	0.44	0.40
	25	0.30	0.90	1.50
	20	0.50	0.65	0.60
	22	0.35	1.06	0.80
	24	0.35	0.79	0.40
	26	0.30	0.91	1.50
IV	27	0.60	1.50	1.00
	28	0.90	1.50	1.50
	30	0.90	1.50	1.50
	32	0.90	1.50	1.50
	29	0.35	0.77	0.60
	31	0.25	0.46	0.50





<Bojong Improvement Drainage Improvement>

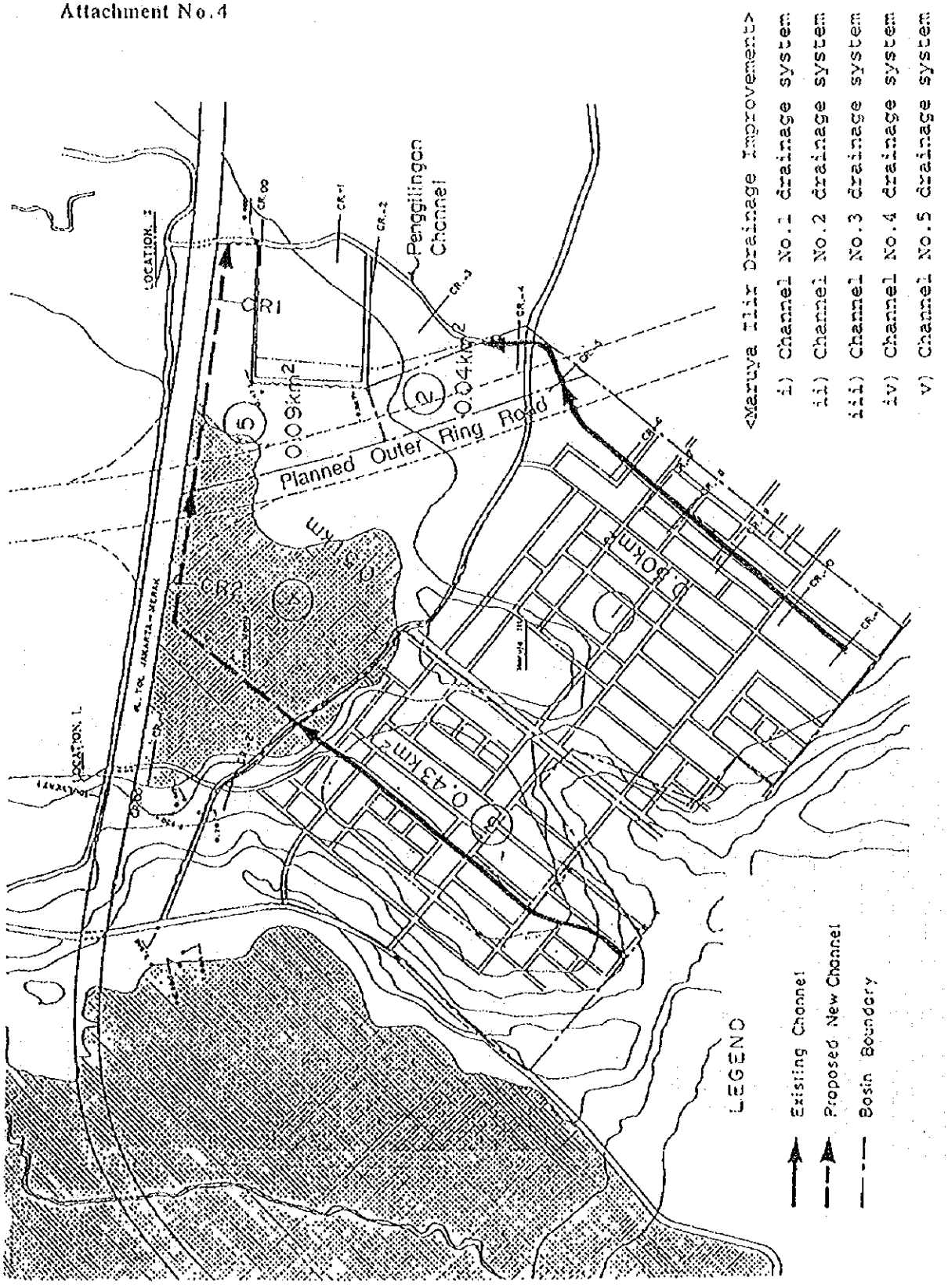
i) Channel Route I :Channel No.1, 2 and 17 drainage

ii) Channel Route II :Channel No.9, 11 and 13 drainage

iii) Channel Route III :Channel No.23, 25, 20, 24 and 21 drainage

iv) Channel Route IV :Channel No.29 and 31 channel drainage

Attachment No.4



II. DETAILED SCOPE OF THE STUDY

Phase I

1. Collection and review of relevant studies

All existing data, reports including master plan and feasibility study completed in 1991 and materials, as well as designs of river and channel improvement works conducted under Ministry of Public Works and Jakarta Metropolitan Government, should be reviewed for the purpose of specifying works required for preparation of final design, specifications and tender documents for construction of the Project.

2. Investigation and studies

Detailed investigations and studies shall be carried out as follows;

(1) Topographic survey and mapping

(a) Cengkareng West Drainage

Channel : covering 1,370,000 m^2 with a scale of 1/1,000

(b) Sepak River Improvement

Channel : covering 63,000 m^2 with a scale of 1/1,000

(c) Bojong Drainage Improvement

Channel : covering 40,000 m^2 with a scale of 1/1,000

(d) Maruya Ilir Drainage Improvement

Channel : covering 71,000 m^2 with a scale of 1/1,000

(2) Channel survey for longitudinal profile and cross-section

(a) Cengkareng West Drainage

Longitudinal profile : 27.4 km

Cross-sections : 350 sections with an interval of 100 m

(b) Sepak river Improvement

Longitudinal profile : 2.1 km

Cross-sections : 30 sections with an interval of 100 m

(c) Bojong Drainage Improvement

Longitudinal profile : 2.0 km

Cross-sections : 25 sections with an interval of 100 m

(d) Maruya Ilir Drainage Improvement

Longitudinal profile : 3.6 km

Cross-sections : 45 sections with an interval of 100 m

(3) Geotechnical investigation and laboratory soil test.

Geotechnical investigation and laboratory soil test shall be carried out to prepare geotechnical information and soil properties for the purpose of safe, efficient and economic foundation design as required. According to available geological information such as geological maps and deep boring log data, it is anticipated that hard tuff and/or dense sandy strata as bearing layers for foundations are distributing at the depth of 25m to 35m under the soft alluvial layers in the project area. Therefore detailed geotechnical investigations are deemed to be necessitate. The following table of contents to be investigated shall be undertaken, which is not limited to.

Deep Boring and Laboratory Soil Test

Boring No.	Depth (m)	SPT (nos.)	U-D Sampling (nos.)	Index Property Test (set)	Unconfined Compression Test (nos.)	Consolidation Test (nos)
A-1	35	32	3	3	3	2
B-1	35	32	3	3	3	2
B-2	30	27	3	3	3	2
C-1	20	18	2	2	2	1
D-1 (S. Gate)	20	27	3	3	3	2
O-1 (outside)	25	23	2	2	2	1
Total	175	159	16	16	16	10

Standard Penetration Test(SPT) shall be performed at 1m interval. Undisturbed(U-D) Samples be obtained in very soft clay layers encountered by using a specified thin-walled sampler for soil testing. These samples shall be tested on the specified test items shown in the above table. The deep

boring locations which are tentatively deployed in Fig.1 shall be determined to meet requirements of the actual site conditions and design criteria. These proposed boring locations are based on the objective drainage basin A to E. In addition, available existing data already performed by the Outer Ring ROad project shall be utilized for especially Channels No.4 and No.5 in Maruya Ilir as newly construction. site reconnaissance shall be made for Sepak River, Bojong and Maruya Ilir areas respectively. Necessary engineering analyses are as follows:

1)Consolidation settlements and slope stability of embankments,
2)Estimate of bearing pressures for foundations, and
3)Any problem related to soil conditions.

(4) Design criteria and basic design

Prior to commencement of the detailed design work, the design criteria on which the structural design will be based shall be set up. Based on the criteria, the basic design of all structural components of the project, such as revetment, gate, and so on, shall be prepared through necessary structural and economic analysis.

(5) Survey and establishment of environmental condition and resettlement/removal requirements of inhabitant

(a) Investigation of environmental condition prevailing over the Project Area
(b) Survey of existing shanties/squatters along the drainages/rivers
(c) Establishment of appropriate resettlement/removal plan for inhabitants
(d) Assessment of impacts of the Project on environment and formulate counter-measures to mitigate adverse effects, if any
(e) Preparation for the environmental management plan (RKL) and the environmental monitoring plan (RPL)

Phase II

1.Detailed design

(1) Detailed design

The detailed design for the purpose of international tendering and construction shall be prepared based on the definitive plan through examination from structural and economic aspects.

(2) Preparation of design report

Design report on the mentioned detailed design shall be prepared. The design report shall contain the design criteria established, basic design considerations, conditions, analysis, results, layout and structural drawing prepared.

(3) Design calculation report

Design calculation report shall consist of hydraulic calculation report and structural calculation report.

(4) Quantity calculation report

Quantity of all structures design shall be calculated and compiled in the quantity calculation report.

(5) Field investigation report with data book

2. Preparation of construction plan

The construction plan for a smooth progress of construction work and successful completion of the project in time shall be prepared.

The construction plan shall contain the construction schedule indicating the key datas/mile stones and particularly the critical paths, schedule of necessary construction equipment together with its type, capacity, number and period, and construction method and sequence.

3. Project cost estimation

A detail Bill of Quantities shall be prepared.

The project cost estimation shall be prepared based on the technical specification/dimensions of all the structural components including the preparatory works for construction, engineering and administration cost, compensation cost, physical contingency, price contingency and interest during construction.

The unit prices used shall be those prevailing at the time when the cost estimation is prepared.

4. Preparation of implementation program

An implementation program of the project shall be prepared.

The program shall include the description of project, project cost, financing arrangement, economic and financial justification, overall construction schedule, construction method and sequence of all structural components and all the relevant maps/drawing.

5. Preparation of tender and contract documents

The tender and contract documents shall include the following items;

(a) Instruction to tenderers

(b) General conditions of contract

(c) Conditions of particular application

(d) Contract forms

Form of tender with Bill of Quantities
Form of Agreement
Form of Tender Bond
Form of Performance Bond

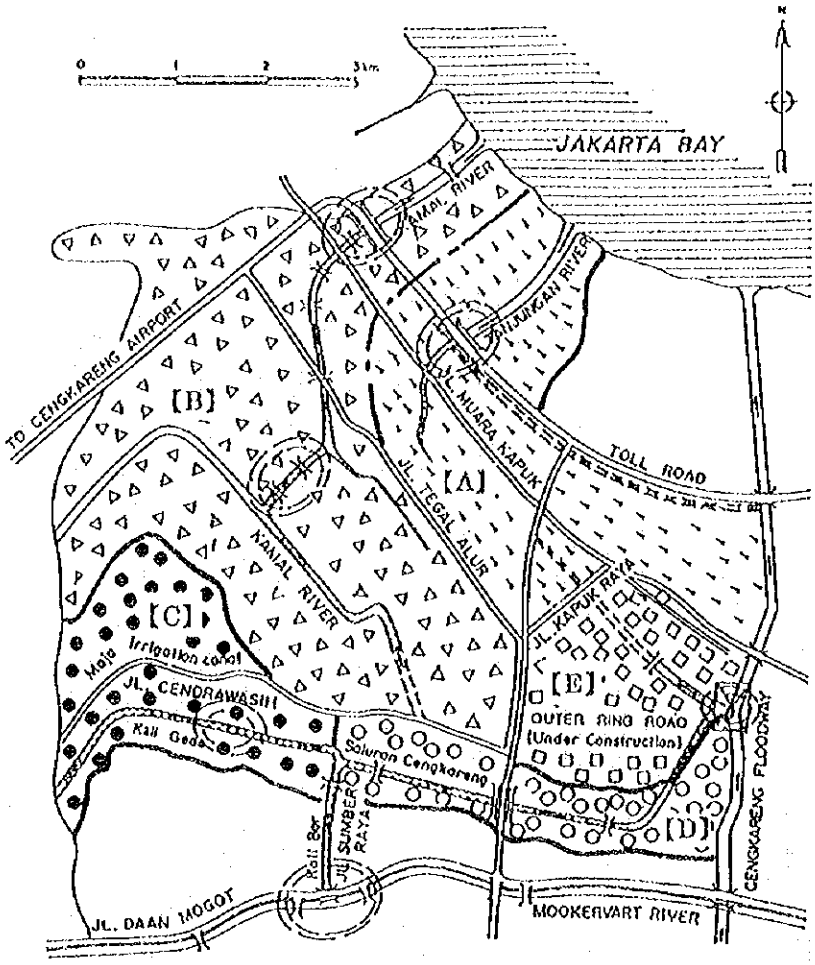
(e) General specifications

(f) Technical specification

(g) Tender drawings

(h) Bill of quantities

Preparation of construction plan and cost estimation in the form of priced Bill of Quantities with detailed breakdown of unit rates and prices to facilitate tender evaluation.



LEGEND

CLASSIFICATION OF DRAINAGE BASIN

- [A]
- [B]
- [C]
- [D]
- [E]

- PROPOSED BORING LOCATION
- EXSTING CHANEL IMPROVEMENT
- NEW CHANEL EXCAVATION
- REVETMENT
- BRIDGE IMPROVEMENT
- HIGHWAY CROSSING IMPROVEMENT
- SLUICE GATE IMPROVEMENT

FIGURE 1 PROPOSED BORING LOCATION

The Study on
the Detailed Design for Urban Drainage Project in the City of JAKRTA
in the Republic of Indonesia

TENTATIVE SCHEDULE

NOTE
IC/R : Inception Report
P/R : Progress Report
IT/R : Interim Report
DF/R : Draft Final Report
F/R : Final Report

MINUTES OF MEETINGS

ON

SCOPE OF WORK

FOR

THE DETAILED DESIGN FOR URBAN DRAINAGE PROJECT

IN THE CITY OF JAKARTA

IN

THE REPUBLIC OF INDONESIA

AGREED UPON BETWEEN

DIRECTORATE GENERAL OF HUMAN SETTLEMENTS,

MINISTRY OF PUBLIC WORKS

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

JAKARTA, 29th January, 1996

RACHMADI B.S.
Director General of Human Settlements,
(CIPTA KARYA)
Ministry of Public Works

Mr. Shosiro HORIGOME
Leader,
Preparatory Study Team,
Japan Intonational Cooperation Agency

Based on the official request of the Government of the Republic of Indonesia, The Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the preparatory study team (hereinafter referred to as "the Preparatory Team") headed by Mr. Shosiro HORIGOME from 21st January to 4th February, 1996 to discuss the Scope of Work for the study on the Detailed Design for Urban Drainage Project in the City of Jakarta in the Republic of Indonesia, (hereinafter referred to as "the Study")

The Preparatory Team had a series of discussions with the Indonesian authorities concerned such as Directorate General of Human Settlement, the Ministry of Public Works (hereinafter referred to as "Cipta Karya") and Provincial Government of DKI JAKARTA (hereinafter referred to as "DPU DKI JAKARTA"). The list of those who attended these discussions is shown in the Annex. Both sides agreed on the Scope of Work for the Study.

This document sets forth main items discussed.

1. Both side confirmed that Study area is just Zone I indicated in Appendix I of the Scope of Work.

2. Both side confirmed that Cipta Karya shall be responsible for the results of the execution of the Project on the basis of all documents and drawings of the detailed design prepared through the Study.

3. The Preparatory Team requested to the Indonesian side to appoint a counterpart team corresponding to the Team in order to execute the Study jointly and to achieve the effective technical transfer. The Indonesian side agreed to assign the necessary counterpart personnel for the Study which will be represented by combined personnels from Cipta Karya and DPU DKI JAKRTA.

4. The both side confirmed that the Study shall be conducted with taking it into consideration of following items;
   1) Rapid housing development in the Study area,
   2) Future land utilization (eg. reclamation along the sea shore)
   3) Land subsidence
   4) Mookervart river is listed in Indonesian nationwide clean river campaign ("Prokasih").
   5) Coordination with other projects and other facilities

5. Both side agreed that channel survey for cross-section shall be made with interval of 50m for special points planned to construct such facilities as bridges, box culvert, siphon and so on.

6. To guarantee the smooth conduct of the Study and promote technology transfer through on-the-job training, Indonesian side shall designate the appropriate number of counter part personnel such as:
   1) Leader of the counterpart (full time)
   2) Appropriate number of officers (full time)
   3) Secretary/typist/office clerk (full time)
   4) Others

7. The Preparatory Team requested the Indonesian side to prepare an office in DPU DKI JAKARTA for the Team. This office should be equipped with the followings:
   a) Desks, chairs, and air conditioners
   b) Telephone and Facsimile

c) Lighting and Electricity supply

Bill for telephone and facsomile shall be charged to the Study Team.

Cipta Karya and DPU DKI JAKARTA accepted the above request of the Preparatory Team.

8. The Indonesian side requested the Preparatory Team to supply the following equipment in conjunction with the Study:
   1) Two (2) vehicles of four wheels drive (4WD)
   2) A Normal vehicle

   The Preparatory Team clarified that the request would be considered by JICA based on the strict evaluation of the necessity of these equipment to conduct the Study

9. The Indonesian side requested the Preparatory Team to give training to counterpart personnel in Japan during the Study.

   The Preparatory Team took note of the request.

10. The Final Reports shall not be publicized until contract for construction finalized in order to keep fairness among those competitors who are interested in participation to the construction tender.

11. The both side confirmed that the land acquisition for the project implementation shall be completed by the Indonesian side (i.e. DPU DKI JAKARTA) prior to construction stage so that it will be carried out timely and smoothly.

Annex

LIST OF ATTENDANTS

1. Directorate General of Human Settlement (Cipta Karya)

Ir. Achmad Lanti	Secretary for Cipta Karya
Ir. Budiman Arief	Director for implementation Central region
Ir. Widia Alfisa	Bina Teknik
Ir. Reifeldi	Bina Teknik
Mr. Rudianto	ABLN
Mr. Mohamed	Central region

2. BAPPEDA DKI

Mr. Harmadi	

3. P.L.P. DKI JAKRTA

Mr. Iyus Ruskiman	Project manager
Mr. Dedy Sutardi	

4. D.P.U. DKI JAKARTA

Ir. Soeharto	
Ir. H. Amir Jayaatmaja SPI	
Ir. Sulaeman	
Ms. Ati Setiawati Angkasa	
Ir. Yayat Hidayat	

5. Public Works

Ir. Darminto	KLM
Ms. Lenny Marlani	KLM

6. JICA Expert

Mr. M. NOMURA	Cipta Karya
Mr. F. TANAKA	Cipta Karya

7. JICA Prepatory Team

Mr. Shosiro HORIGOME	Leader
Mr. Nobuaki MIYATA	Project officer
Mr. Yosifumi MITANI	Drainage system planning
Mr. Kaoru KITO	Construction planning
Mr. Mitsuru MOMOSE	Drainage facility design
Mr. Yoshihiro DAICHO	Soil investigation
Mr. Yuji HATAKEYAMA	EIA and Social Impact Assessment (SIA)

⑤　主要面会者リスト

主要面会者リスト

1. 公共事業省人間居住総局（Directorate General of Human Settlement (Cipta Karya)）

Mr. B.S.Raschmadi	Director General
Ir. Achmad Lanti	Secretary for Cipta Karya
Ir. Budiman Arief	Director for implementation Central region
Ir. Widia Alfisa	Bina Teknik
Ir. Reifeldi	Bina Teknik
Mr. Rudianto	ABLN
Mr. Mohamed	Central region

2. ジャカルタ特別区企画財政局（BAPPEDA DKI）

Mr. Harmadi

3. 公共事業省ジャカルタ特別区事務所（P.L.P. DKI JAKRTA）

Mr. Iyus Ruskiman	Project manager
Mr. Dedy Sutardi	

4. ジャカルタ特別区公共事業局（D.P.U. DKI JAKARTA）

Ir. Soeharto
Ir. H. Amir Jayaatmaja SPI
Ir. Sulaeman
Ms. Ati Setiawati Angkasa
Ir. Yayat Hidayat

5. 公共事業省国際協力局（Ministry of Public Works）

Ir. Darminto	KLN
Ms. Lenny Marlani	KLN

6. JICA派遣専門家

野村允伸［長期］	下水道計画（Cipta Karya）
田中文彦［長期］	下水道事業（Cipta Karya）
東嶋一夫［短期］	下水道経営（Cipta Karya）

7. 日本大使館

塚原健一	一等書記官

8. JICAインドネシア事務所

岡崎剛一郎	所長
中垣長睦	次長
片山裕之	所員

⑥　収集資料リスト

平成08年5月31日作成

資料リスト（収集資料）

主管部長	文書管理課長	主管課長	情報管理課長	技術情報課長

地域	アセアン	調査団名又は専門家氏名	ジャカルタ都市排水計画調査（実施設計）	調査の種類又は指導科目	事前調査	作成部課	社会開発調査第２課
国名	インドネシア国	配属機関名		現地調査期間又は派遣期間	平成8年1月21日 ～ 平成3年2月4日	所持者名	宮田伸昭

番号	資料の名称	形態	版型	ページ数	オリジナル・コピーの別	部数	収集先名称又は発行機関	寄贈・購入（価格）の別	取扱区分	利用表示	利用者所属氏名	納入予定日	納入確認欄
1	地区　S＝1/10.000		A1他	全10葉	コピー	1		購入					
2	地区　S＝1/5.000		A1他	全22葉	コピー	1		購入					
3	The Study on Comprehensive River Water Management Plan in Jabotabek Progress Report (1)		A4	372	コピー	2		コピー					
4	Outline of West Jakarta Flood Control Project and East Jakarta Flood Control Project		A4	34	コピー	2		寄贈					
5	East Jakarta Flood Control Project Design Report 1 (4/11) Volume IV : Hydrology and River Annex-1		A4	29	コピー	1		コピー					
6	Draft Final Report Cengkareng Drain System Study		A4	187	コピー	1		コピー					
7	Jakarta Water Front Strategy Rebirth of Jakarta Proposed Strategy		1.5A4	35	コピー	1		コピー					
8	インドネシア共和国セクター別基礎資料（第１巻）7.農業排水		A4	13(抜粋)	コピー	1		コピー					
9	Engineering Geologic Map of Jakarta - Bogor Area S=1/50.000		A0	1葉	コピー	1		コピー					
10	Geology of the Jakarta and the Thousand Island Quadrangle, Jawa S=1/100.000		A1	1葉	コピー	1		コピー					
11	Hydrogeological Map of Indonesia S=1/250.000		A1	1葉	コピー	1		コピー					
12	地質地盤調査報告 Muara Karang Power Plant		A4,A3	9(抜粋)	コピー	1		コピー					
13	地質地盤調査報告 East Jakarta Flood Control Project		A4,A3	15(抜粋)	コピー	1		コピー					

国際協力事業団

番号	資料の名称	形態	版型	ページ数	オリジナル/コピーの別	部数	収集先名称又は発行機関	寄贈・購入（価格）の別	取扱区分	利用表示	利用者所属氏名	納入予定日	納入確認欄
14	A Brief Outline of Seismicity and Earthquake Engineering Problems in Indonesia		A4	35	コピー	1		コピー					
15	Raft Foundation of Two Tall Building in Jakarta		A4	7	コピー	1		コピー					
16	下水道経営に関する技術指導		A4	65	コピー	1		コピー					
17	Statistik Air Minum 1993 (Water Supply Statistics)		A4	52	コピー	1		購入					
18	Draft Final Report TA 2209 : Land Acquisition and Resettlement Program for the Proposed North Java Road Improvement Project APPENDIXES		A4	310	コピー	1		コピー					
19	Resettlement Plan Proyek Pembangunan Jalan Pedurungan-Citarum Kotamadya Semarang		A4	60	コピー	1		コピー					
20	RPL Ruas Jalan Manado Pantai Kotamadya Manado		A4	26	コピー	1		コピー					
21	RPL Ruas Jalan Manado Pantai Kotamadya Manado		A4	29	コピー	1		コピー					
22	The Feasibility Study on Urban Arterial Road System Development in Jakarta Metropolitan Area		A4	28	コピー	1		コピー					
23	ローカルコンサルタントの技術者のランク別給与		A4	1	コピー	1		寄贈					
24	ローカルコンサルタントの技術者のランク別給与		A4	1	コピー	1		寄贈					
25	Labor Cost, Rental Cost of Equipment, Material Cost		A4	3	コピー	1		寄贈					
26	Price List of Reinforced Concrete Pipe		A4	1	コピー	1		寄贈					
27	建設機械損料及び4WD現地購入費		A4	1	オリジナル	1		寄贈					
28													
29													
30													
31													
32													
33													
34													

⑦　ジャカルタ洪水関連記事

当該プロジェクトに関連する現地新聞情報
(派遣期間中)

THE INDONESIA TIMES

WEDNESDAY JANUARY 24, 1996

Ministry to link rivers with tunnel

By Our Reporter

The Director General for Irrigation of the Public Works Ministry, Ir.Soeparmono, said that the agency would construct a tunnel to link the Ciliwung and Cisadane rivers in West Java.

He said that this would be one of the measures to counter the threat of flooding. The plan has ben submitted to Bappenas.

The two kilometres tunnel would go through the Kalulampa hill in Bogor, he stated.

The DG said that 40% of the water of the Ciliwung river came from Puncak and Bogor, damage to the catchment area making problem more complicated, especially after rain. He did not agree with the idea to widen the Ciliwung river as a way to overcome flooding in the city as this would create other problems through the build-up of water at the Manggarai water gate.

The director for the Ciliwung and Cisadane areas supervisory agency of the DKI encourages the idea of widening the rivers, which would be continued up to the estuary.

The volume of water at the Manggarai watergate cannot be controlled after rain because the old Ciliwung river and the Banjir Kanal cannot accomodate the flow of water, the DG said.

To overcome the bottle necks along the Ciliwung river would require a huge expenditure, and the DG hoped that public will understand that the plan to build the Banjir Kanal Timur water control station cannot be carried out yet as it would need Rp.1.4 trillion.

However, the DG said, to return the Ciliwung river from the Manggarai watergate to Istiqlal watergate to a condition similar to that of the 1970s must be done in those areas where the river banks have become crowded with houses. In 1970 the Ciliwung river was able to carry water at 80 m3 per second, not 50 m3 per second as stated recently, the DG said.

He said that it is possible to move people from the river banks to other places, and the removal of houses built along the river banks must be done. If not, the threat of floods, will remain, he added.

Owners of houses built along the river could show their permits, and he was sure that some officers have acted irregularly in this matter.

An agency of the DKI said that the latest survey revealed that flood prone areas reached into Central Jakarta in Tanah Abang, Menteng, Kemayoran, Johar Baru, Cempaka Putih and Kelapa Gading. Into North Jakarta in Kelapa Gading, Cilincing, Tanjung Priok, Pademangan Barat, Penjaringan. Into West Jakarta in Grogol, Grogol Barat, Petamburan, Cengkareng, Kedoya, Kebon Jeruk, Kembangan and Taman Sari. And into South Jakarta in Pengadegan, Pasar Minggu, Kebayoran Baru and Lama, Pela, Mampang Prapatan, Bintaro, Pesanggrahan, Kebon Baru, Tebet Timur, Pasar Rebo, Kampung Makassar, Cawang, Kramatjati, Jatinegara and Pulo Gadung. (As/04)

THE INDONESIA TIMES

TUESDAY JANUARY 23, 1996

Highrise buildings in Jakarta threatened by subsidence

By Our Reporter

The Director for Conservation and Water Resources of the Irrigation Agency of the Public Works Ministry, Rustam Syarif, said that some highrise buildings in the city would drop due to the instability of their foundations and to the possibility of subsidence made Worsen by the intrusion of sea water.

This intrusion would accelerate corrosion of the iron rods in the reinforced concrete foundations, and the uncontrolled absorption of ground water would cause subsidence, as has already occurred in Penjaringan and Jl. R.E. Martadinata in North Jakarta, he said.

The DKI PDAM water company can not yet meet the demand for water in Jakarta, and the director expected the introduction of a priority system for the distribution of water.

He recommended that people make well water catchments to conserve rainwater. A spokesman of the North Jakarta regional government said that subsidence was reported in RE Martadinata, Gunung Sahari, Ports, Yos Soedarso road, Kampung Bandan, Bandengan and on some of the protocol roads.

The Governor of Jakarta, Suryadi Soedirdja, said that he needs Rp.13 trillion to finance flood control projects in the city, a sum which is 5 times that of the 1996/1997 regional budget of Rp.2.6 trillion.

The capability of the regional government was very limited to develop dams for flood, control, but the city has pledged to improve the condition of the rivers through the Prokasih programme, and to free the river banks from huts. Due to the limited amount of land and a population of 8.9 million people, there was no alternative but to popularize apartments projects, he stated. (As/07)

THE INDONESIA TIMES

MONDAY JANUARY 29, 1996

MP calls for clarification of cause of floods in Jakarta

JAKARTA — A member of the House of Representatives (DPR) here has called on the Ministry of Public Works to clarify the causes of the recent floods which hit several parts of the capital city earlier this month.

Burhanudin of the Golkar Faction told the Minister of Public Works Radinal Moochtar that the floods were not mainly caused by the construction of cottages and other luxurious dwellings in Puncak mountainous ares of Bogor, West Java.

According to him, improper garbage disposal was a great contributing factor to such a natural disaster here.

"I hope that the ministry would make a clarification of the cause of the floods so as not to cause the wrong perception," he said.

Radinal Mooctar has reportedly inclined to respond the appeal. He instead explained the ministry's concrete plan to prevent the natural disaster from reoccurrence in the future.

The ministry would seriously deal with the worsening siltation in the river, especially along the flood-stricken areas, he said.

Director General of Irrigation Soeparmono, who accompanied Mooctar on the occasion. (Ant)

WEDNESDAY JANUARY 31, 1996

THE INDONESIA TIMES

Clean water supplies to consumers in Central Jakarta to be halted today

By Our Reporter

JAKARTA — Clean water supplies to consumers in Petojo, Jembatan Lima, Pejagalan, Tanah Abang, Pekapuran and surroundings will be halted today, Wednesday, at 20 pm., following the installation of a 600-mm diamatre valva on Cideng Barat road in Central Jakarta.

The consumers will resume to receive the clean water supplies as usual at 10 am. on Thursday, Feb. 1, said H. Agus Tabrani, marketing director of PAM Jaya, the Jakarta City Administration - run clean water distributing company.

(IS/07)

Jakarta strives to cope with floods

JAKARTA — The floods hitting the national capital earlier this month have made Jakartans more aware of the need to protect themselves from the dangers of such natural disasters.

Floods have become a perennial problem to the local administration and a common sight to those residing in the city's flood-prone areas. This was why, there was no special concern when the first signs of rising water levels occurred.

The first such sign was a reading of the water level indicator at the flood monitoring post in Depok, 30 km south of Jakarta.

It showd that on Saturday, January 6, 1969 the water level of Ciliwung river had reached 4.35 meters, which was a record high for many years.

"Indeed, the local authorities in Depok did report that the river's water level had surpassed four meters but they did not explain in detail the speed of the water flow," said Jakarta Vice Governor Museno at a meeting on flood prevention measures at the office of the Coordinating Minister of People's Welfare here on Thursday (Jan. 18).

Torrential rains in Jakarta and its environs caused Ciliwung River to overflow on Saturday (Jan 16) sweeping away tens of houses that had stood on its banks and forcing thousands of residents in Bidaracina and Kampung Melayu, East Jakarta, to flee their homes.

Ciliwung is the main river dividing the city in two halves from the upper south in Bogor resort town down to Tanjung Priok port at the northern tip.

The most serious flood-stricken areas included the areas of Kramatjati, Jatinegara and Cawang in East Jakarta and Tebet, Pancoran and Pasar Minggu in South Jakarta as well as other areas in West Jakarta such as Penjaringan, Grogol and Palmerah.

About 50,000 residents were evacuated from the flood-stricken areas since Saturday.

The flood waters also inundated several roads in East Jakarta to a height of 40 cm, causing traffic congestion. Among those roads were Jl. Jatinegara Barat, Jl. Otista Raya, and Jl. Cipinang Jaya in East Jakarta.

In several areas the flood waters reached the roofs of houses on Sunday.

Past midnight Sunday rising waters demolished the embankment of the Ciliwung river at Central Jakarta causing the immediate inundation of thousands of houses in the neighbourhood.

Flood waters also disrupted the city's transportation system and paralysed certain parts of the commuter railway routes in public work office, Soeharto attributed the floods to week-long incessant rains in Bogor, 60 km south of here.

Soeharto said garbage and refuse that had been accumulating in the 13 rivers in Jakarta had reached a volume of 1,400 cu. m/day but only 350 cu.m/day could be removed, 650 cu. m/day was disposed of into the sea and the rest remained in the rivers, shallowing the riverbeds.

The flash floods which inundated many parts of East Jakarta last week, took some lives and destroyed 177 houses, causing Rp 13.5 billion in material losses.

The floods caused by the overflowing of the Ciliwung river which flows through the hart of the capital city inundated 14 kelurahans (village level administrative areas) inhabited by a total of 18,108 families or 62,523 people, an official of the East Jakarta Administration, Nasrul Muluk, said in Jakarta Friday (Jan 12).

It was also reported later by the authorities that Jatinegara was the most stricken in terms of material losses as the value of damaged property and goods amounted to some five billion rupiahs.

Water Management

According to Museno, the recent floods were caused by the silting up of the Ciliwung river and the frequent and heavy rainfall earlier this month.

The Jakarta administration had therefore recognized the importance of forging closer cooperation with other relevant agencies to cope with the problem, he said.

But he also identified certain habits of the populace along the river banks as a contributing factor to the occurrence of the natural diaster.

"It is difficult to inform the people there about proper ways of disposing of garbage," he said.

The local administration had also striven to encourage people living on the river banks to move to more appropriate and safer places, but these efforts had proven to be of no avail, he added.

Apart from natural causes and the bad habits of the people living along the Ciliwung River, the excessive use of ground water was also a significant factor in the occurence of floods in the capit).

Director General of Irrigation at the Public Works Ministry Soepamono warned that excessive use of ground water in the capital, especiall in some areas in North Jakarta, would cause natural disasters greater than those happening earlier this month.

"If the problem remains unchecked, it is feared that some parts in North Jakarta will submerge constantly within four years since 2025," he said.

A survey also showed that some areas in North Jakarta have subsided by between 70 centimetres and one meter, making the areas now flood-prone areas.

"It is estimated that the areas will be four meters lower than the sea level," he said.

Flats

Some studies showed that Jakarta will this year be subject to a high rate of rainfall. Given this unfavorable condition, the government has started to take necessary measures, among othrs by concretely dealing with the silting up of the Ciliwung river bed and by encouraging people living on river banks to move to more suitable places.

Encouraging the people to live in flats is one of the government's strategies to prevent the reoccurrence of flood-related tragedies in the capital.

The city administration in cooperation with the Ministry of Social Affairs and the business community has constructed flats in Bidara Cina for the people residing on Ciliwung River banks.

"The recent floods here hopefully will remind the people about the importance of their safety and persoade them to move to the constructed flats," said Inten Suweno, the minister of social affairs.

What the government has done to prevent floods in the city has once again raised a relevant question for the people to seriously ponder their own safety.

"Is it pleasant to live along the Ciliwung while always being at risk of becoming a victim of a flood?" is basically the question the administration wants the river bank dwellers to ask themselves.

Ant

THE INDONESIA TIMES

THURSDAY JANUARY 25, 1996

THE JAKARTA POST

SATURDAY, FEBRUARY 3, 1996

AMONG US

Marsan simply watches Ciliwung River level

By Johannes Simbolon and Gedsiri Suhartono

JAKARTA (JP): His name is Marsan. He lives by the polluted Ciliwung River near the Panus bridge in Depok.

His job is simple. He watches and then reports the water level at the bridge. His job is so simple that his fellow villagers are quick to state: "Marsan *sleeps but gets a salary from* the government."

You don't need a university degree to do his job.

"I am only a junior high school's dropout," he says.

Simple as *his job is*, Marsan is crucial to the safety of the hundreds of thousands of Jakartans living along the Ciliwung River.

Flood conditions can be seen at the Panus bridge six hours before the flood waters hit Jakarta, 35.5 kilometers away.

"I must stay alert around the clock. Otherwise, the flood will come unannounced," he says.

The Ciliwung is one of 13 murky rivers that meander through Jakarta. It is the third largest, after the Cisadane and Citarum. A recent flood on the river killed six people and submerged thousands of houses.

Originating on Mt. Talaga near Tugu village in Bogor, the river makes its way to Jakarta past the Katulampa dam in Ciawi, Bogor and the Panus bridge in Depok.

The water level is first monitored at the Katulampa dam, and then again by Marsan or his cousin Imih at Panus bridge.

It takes three hours for flood waters to travel the 32 kilometers between Katulampa and Panus.

"My job is watching the watermark and radioing the level to the flood monitoring headquarters in Jatibaru, Tanah Abang, and the flood control station in Manggarai," Marsan explains, pointing to *the scale painted on the bul*wark of the Panus bridge.

The sturdy bridge was built by the Dutch around 1917.

The black and yellow scale goes from 60 to 400 centimeters.

During rainy season, from November to March, the level is normally between 120 to 150 centimeters. During the dry season it drops to between 80 and 100 centimeters, says Marsan.

"Jakarta will experience a flood if the water reaches 200 centimeters," he explains.

A flood at that level is considered normal by people living near the river, where flooding is a daily part of life.

last month's floods were beyond routine. The water level at Panus swept above the 400 centimeter mark.

"The scale was totally covered. After the flood, I took a measure and found that the water level was 435 centimeters," he says.

It surpassed the big floods of *1970 and 1980, which reached* 310 and 370 centimeters, says Marsan.

The 39-year-old Marsan can predict a flood by looking at the sky. The father of three has *developed his flood instinct so* sharply that he instantly wakes up when a flood is coming.

Marsan has been officially working at Panus since 1975, but assisted his grandfather much earlier.

He inherited the job from his grandfather. They lived together in a small hut under the bridge after Marsan's father died and his mother remarried.

"As a boy, I often accompanied my grandfather to phone in our report to Jatibaru and Manggarai. Depok was still an *empty and dark area. We* walked with a flashlight from the bridge for two kilometers to the nearest phone," he recalls.

After his grandfather retired in 1974, the government gave him the job because "no one was interested in the boring job," he says.

The situation has changed. Marsan and his family live in a government house near the bridge. He doesn't need to walk kilometers to send his reports *because he has been provided* with a two-way radio.

"Sometimes, however, if the electricity is off, I can't use the radio and must go find a public phone," he explains.

The facilities would be useless, however, if Marsan was not dedicated to his work. He could slack off if he wanted, since he has no one to watch him, but he never leaves his station.

"For me, work is number one. I prefer it to my family. If my *child fell ill when a flood was* coming, I would choose observing the river," he asserts.

His dedication gets him high marks on his assessment report.

JP/Iwa

FLOOD WATCH STAFFER: Marsan, who spends most of his days under the Panus bridge, points out the water level gauge he monitors. He says he loves his job.

FLOODS AND FOLLY: The recent floods may have been a calamity for thousands of families and motorists in the Kampung Melayu district, East Jakarta, but they also provided an occasion for some to play (*photo above*) and, for others to do some overdue cleaning (*right photo*). The floods that inundated Kampung Melayu and a number of other districts over the weekend were the worst to hit the capital in almost 20 years.

The Ciliwung river flooded villages along its banks and seen in the picture, taken on Sunday 16.05 pm, a car was drowned at Kampung Melayu Besar and according to people the water flooded their village at 23.00 pm Saturday. (TIMES PHOTO/DI).

INDONESIA TIMES January 8, 1996

Floods inflict $18.39m in losses

JAKARTA (JP): The recent floods which killed 10 people and devastated five mayoralties have inflicted a total of Rp 39.54 billion (US$18.39 million) in material losses.

The City Social Services Agency reported on Saturday that the amount was calculated on the basis of the number of houses and other items owned by the 60,110 families, or 354,015 residents, whose homes were either damaged or destroyed by the flooding from Jan. 4 to 8.

The records had been compiled up to Friday.

East Jakarta, the most devastated area, recorded the largest amount of losses at Rp 13.5 billion. Seven districts, or 18 subdistricts, with 15,614 families were hit by the worst floods in the capital in the last 20 years.

The second largest amount of losses, Rp 11.73 billion, was recorded in South Jakarta where as many as 7,722 families from five districts and nine subdistricts were forced out of their homes by the water.

Central Jakarta, with total losses of Rp 8.5 billion, ranked third. A total of 8,169 families in six districts were evacuated last week.

West Jakarta ranks fourth with Rp 3.62 billion in losses. As many as 3,400 families there lost their belongings during the flooding.

Ranked last is North Jakarta with Rp 2.17 billion losses suffered by 20,209 families.

The floods hit a total of 58 subdistricts in Jakarta early last week.

Jan. 15/96
Jakarta Post

Rp 182.5 million

The city administration has received Rp 182.5 million in cash for the flood victims from the Coordinating Ministry for People's Welfare, the Ministry of Social Services, the House of Representatives, the Ministry of Public Works and the Lippo and Sinar Mas business groups.

The administration has also received aid packages containing foodstuffs, books, clothes and mattresses valued at Rp 168.93 million from individuals, private companies and the Jakarta Social Services Agency.

"All the aid has been distributed," Emon Setia Sumantri, the head of the agency, said on Saturday.

The Ministry of Social Services will provide more aid packages worth a total of Rp 187.5 million for the victims.

The city administration has set aside Rp 350 million from its routine budget. East Jakarta and South Jakarta have received Rp 100 million each, while the remaining mayoralties got Rp 50 million each.

Governor Surjadi Soedirdja handed over the donations to district heads on Saturday during a tour of the flood-ravaged areas.

"Please distribute these funds wisely and make sure that all of the victims get their share," Surjadi said.

During the inspection tour, the governor visited Pengadegan subdistrict in South Jakarta which was still flooded by one meter of water on Saturday. Four suction pumps have been installed in the area to speed up the drying out process.

Surjadi told residents not to dump any garbage into waterways and not to build any structures along river banks in order to prevent floods in the future.

"I saw that some residents have started rebuilding their houses. I will order my subordinates to warn them," he told reporters.

The city administration plans to build barracks to temporarily relocate flood victims, especially former river bank squatters.

The city administration also plans to build low-cost apartments in Petamburan subdistrict, Central Jakarta, to relocate 9,600 flood victims from that area. (yns)

⑧ 環境スクリーニング・スコーピング結果

プロジェクト概要

項　　目	内　　容
プロジェクト名	ｼﾞｬｶﾙﾀ都市排水計画
背　　景	ｼﾞｬｶﾙﾀ首都圏の都市化の進行に伴う新たな浸水地域の発生と環境・衛生状況の悪化
目　　的	排水施設の事業化
位　　置	ｲﾝﾄﾞﾈｼｱ共和国ｼﾞｬｶﾙﾀ市北西部地区
実施機関	公共事業省人間居住総局(Cipta Karya)
裨益人口	不明
計画諸元	
計画の種類	水路改修
対象区域	面積：約 5,000ha、人口：263,000人(1988年)
排除方式	合流式、集水面積 3,823ha
処理場	設置せず
汚泥処理、処分方式	
管渠延長等	水路改修延長 27.5km
放流水域等	放流水域：ｼﾞｬｶﾙﾀ湾　　放流水質：
その他特記すべき事項	

プロジェクト立地環境

項　　目		内　　容
プロジェクト名		ｼﾞｬｶﾙﾀ都市排水計画
社会環境	地域住民（居住者／先住民／計画に対する意識等）	都市型住民 貧困地帯あり
	土地利用（都市／農村／史跡／景勝地／病院等）	都市型
	経済／交通（商業／農漁業・工業団地／ﾊﾞｽﾀｰﾐﾅﾙ等）	商業、住宅地域等
自然環境	地形・地質（急傾斜地・軟弱地盤・湿地／断層等）	低湿地帯、洪水の危険性
	海岸・海域の状況（浸食・堆砂／潮流・潮汐等）	河川流出土砂の滞留
	貴重な動植物・生息域（自然公園・指定種の生息域等）	特になし
公害	苦情の発生状況（関心の高い公害等）	ゴミ問題 河川の水質汚濁が深刻
	対応の状況（制度的な対策／補償等）	特になし
その他特記すべき事項		特になし

スクリーニング結果

	環境項目		内容	評定	備考（根拠）
社会環境	1	住民移転	用地占有に伴う移転（居住権、土地所有権の転換）	○有・無・不明	用地に住居が分布
	2	経済活動	土地等の生産機会の喪失、経済構造の変化	有・○無・不明	移転対象者以外は影響がない
	3	交通・生活施設	渋滞・事故等既存交通や学校・病院等への影響	有・○無・不明	交通を妨げない
	4	地域分断	交通の阻害による地域社会の分断	有・○無・不明	大規模施設はない
	5	遺跡・文化財	寺院仏閣・埋蔵文化財等の損失や価値の減少	有・無・○不明	埋蔵文化財が不明
	6	水利権・入会権	漁業権、水利権、山林入会権等の損害	有・○無・不明	水利用に影響はない
	7	保健衛生	ゴミや衛生害虫の発生等衛生環境の悪化	有・○無・不明	ゴミ等の大量発生はない
	8	廃棄物	建設廃材・残土、一般廃棄物等の発生	○有・無・不明	改修工事に伴う残土、河川底泥の発生
	9	災害（リスク）	地盤崩壊・落盤、事故等の危険性の増大	有・○無・不明	大規模造成はない
自然環境	10	地形・地質	掘削・盛土等による価値のある地形・地質の改変	有・○無・不明	大規模造成はない
	11	土壌侵食	土地造成・森林伐採後の雨水による表土流出	有・○無・不明	大規模造成はない
	12	地下水	掘削工事の排水等による枯渇、浸出水による汚染	有・○無・不明	大規模掘削はない
	13	湖沼・河川流況	埋立や排水の流入による流量、水質の変化	○有・無・不明	河川改修が行われる
	14	海岸・海域	埋立地や海況の変化による海岸侵食や堆積	有・○無・不明	流況を変化させる埋立工事や施設はない
	15	動植物	生息条件の変化による繁殖阻害、種の絶滅	有・○無・不明	貴重な動植物は生息していない
	16	気象	大規模造成や建築物による気温、風況等の変化	有・○無・不明	大規模な構築物はない
	17	景観	造成による地形変化、構造物による調和の阻害	有・○無・不明	景観的に重要な地域はない
公害	18	大気汚染	車両や工場からの排出ガス、有害ガスによる汚染	○有・無・不明	工事用車両の通行に伴う粉塵の発生
	19	水質汚濁	土砂や工場排水等の流入による汚染	○有・無・不明	河川の浚渫や護岸工事
	20	土壌汚染	排水・有害物質等の流出・拡散等による汚染	有・○無・不明	土壌汚染を引き起こす行為はない
	21	騒音・振動	車両処理場等による騒音・振動の発生	○有・無・不明	工事用機械からの発生
	22	地盤沈下	地盤変状や地下水位低下に伴う地表面の沈下	有・○無・不明	地下水の揚水はしない
	23	悪臭	下水処理場の稼働に伴う悪臭の発生	有・○無・不明	下水処理場は建設しない
総合評価：ＩＥＥあるいはＥＩＡの実施が必要となる開発プロジェクトか				○要・不要	影響の考えられる項目が多くある

スコーピング結果

	環境項目	評定	根拠
社会環境	1 住民移転	A	移転住民の生活基盤の喪失
	2 経済活動	D	マイナスのインパクトは考えられない
	3 交通・生活施設	D	交通の妨げになる施設はない
	4 地域分断	D	地域を分断する施設はない
	5 遺跡・文化財	C	埋蔵文化財が不明
	6 水利権・入会権	D	水利用に影響はない
	7 保健衛生	D	保健衛生状況は悪化しない
	8 廃棄物	B	工事中の残土、河川汚泥の発生
	9 災害（リスク）	D	平坦地で大規模な切土等は行わない
自然環境	10 地形・地質	D	大規模な地形改変はしない
	11 土壌侵食	D	大規模な地形改変、植生除去は行わない
	12 地下水	D	影響を与える工事、施設はない
	13 湖沼・河川流況	B	河川改修による流況の変化
	14 海岸・海域	D	海岸の地形や海況を変化させる工事や施設はない
	15 動植物	D	貴重な動植物は生息していない
	16 気象	D	気象への影響は考えられない
	17 景観	D	景観的に重要な地域はない
公害	18 大気汚染	B	工事用車両の通行に伴う粉塵の発生
	19 水質汚濁	B	工事中の水質汚濁が考えられる
	20 土壌汚染	D	有害物質の発生はない
	21 騒音・振動	B	工事中に騒音・振動が発生する
	22 地盤沈下	D	地下水揚水はしない
	23 悪臭	D	悪臭の発生はない

評定の区分　：
A：重大なインパクトが見込まれる
B：多少のインパクトが見込まれる
C：不明（検討をする必要はあり、調査が進むにつれて明らかになる場合も十分に考慮に入れておくものとする）
D：ほとんどインパクトは考えられないためＩＥあるいはＥＩＡの対象としない。

⑨　現地ローカルコンサルタント

○　現地ローカルコンサルタント会社

現地調査業務の１部を再委託するため、現地ローカルコンサルタント会社の実施及び技術能力等を調べ、S/W に則った見積と技術者単価（M/M rate)を入手した。調査期間中に接触した現地ローカルコンサルタント会社を次に示す。

(1) P.T. PONDASI KISOKON RAYA
20th Floor Summitmas Tower, Jl. jendral Sudirman Kav. 61-62, Jakarta 12190, Indonesia　Tel. : (021) 2523890, 2523907, 5200909　Fax : (021) 5253077
(2) PT. Exsa International Co., Ltd.
Jalan Tomang Raya No. 74, Tomang, Jakarta 11430, Indonesia
Phone: (021) 5604361 to 560304365　Fax : (62) 21-5672734
(3) PT. Wiratman & Associates
Jalan Bondungan Hilir Raya Kav. 36A Blok B No.13-19. Jakarta 102010
Phone : 5733407, 5737557, 5705456　Fax : 5737558
(4) PT. DACREA Design & Engineering Consultants
Head Office : Bendungan Hilir Raya Kav. 36A Blok B No. 8, Jakarta 10210
Phone : (021) 5737816, 5737818, 5737255　Fax : (021)5738329
Engineering Office : Sunrise Garden Complex-Blok A-2 No.7, Jakarta 11520
Phone : (021) 5800919　Fax : (021) 5803296
(5) PT. SUPERINTENDING COMPANY OF INDONESIA
Head Office : SUCOFINDO CENTER
Jalan Raya Pasar Minggu Kav. 34 Jakarta 12780
Phone : (021) 7983666　Fax : (021) 7983888
(6) PT. Mitrasetia Arimayasa
Jalan Kalibata Utara II No. 73A　Jakarta
Phone : 7362673, 7984362, 7362673　Fax : 7362662

上記の各社は、インドネシア国内における類似プロジェクトの実績とそれなりの名声もあるので、信頼できると判断された。

上記各社の専業分野の特色を次に記す。

a) P.T. Pondasi Kisocon Raya は、測量と地質・土質調査のコンサルティング業務を専業としている。同社は基礎地盤コンサルタンツ（株）の系列会社である。
b) PT.Exsa International Co., Ltd. は航空測量並びに測量全般、地形図作成業務を専業としている。同社は長年にわたって、アジア航測（株）と業務提携をしている。
d) PT. Wiratman & Associates と PT.DACREA Design & Engineering Consultants の 2 社は総合設計コンサルティング業務を行っている。
e) PT. SUPERINTENDING COMPANY OF INDONESIA は、SUCOFINDO（総合環境コンサルティング業務）グループに属している。また PT. Mitrasetia Arimayasa は、道路総局（Bina Marga)の環境関連業務の住民移転等についての実績を有している。

⑩　現地再委託費調査

○ 現地再委託費

地質・土質調査及び測量の見積もりは、Attachments 1 と 2 に示す。まとめると下表のとうりである。

現地再委託費

現地調査業務	現地通貨 Rupiah	日本通貨 Yen
地質・土質調査	89,126,400	4,244,100
測量	205,073,000	9,765,400

交換レート：¥=21Rp.

○ ローカルコンサルタントの人件費

河川・排水の水利関連技術者人件費を総合コンサルタントである PT.Wiratman & Associates と PT. DACREA Design & Engineering Consultants からの入手したので、下記にしめす。

M/M 技術者人件費 (unit : *1,000)

No.	Rank of Engineers	Experiance (years)	Monthly	Daily
A	Chief Engineer	more than 18	Rp. 6,500 - 7,600	450 - 550
B	Senior Engineer	9 - 17	Rp. 3,500 - 7,600	300 - 350
C	Engineer	3 - 8	Rp. 3,000 - 5,700	250 - 260

○ 現地車両借り上げ費並びに新車購入費

車両借り上げ費（月単価）

No.	Type	Year	Monthly Rate*
1	Daihatsu Hiline (Four wheel drive)	1995	Rp. 2,450,000
2	Suzuki Escudo (Four wheel drive)	1995	Rp. 2,450,000
3	Toyota Kijang 1800 cc	1995	Rp. 1,850,000
4	Corona Absolute 2000 cc	1995	Rp. 3,850,000

*..... Excluding a driver (Rp. 422,000./month) and fuel.

新車購入費

No.	Type	Year	Cash On Deliverry (Rp.)
1	Mitsubishi PAJERO 3000 CC, V6, (Manual)	1996	Rp. 98,250,000. (Duty Free Price)

社会影響／環境調査にかかる再委託経費の見積

1)見積条件

a. 住民移転調査

調査対象地域に推定される移転補償対象家屋230戸、不法占拠家屋約1,000戸に対して住民移転インベントリー調査を行う。

Q/Nの作成、戸別訪問、集計作業を行う。

b. 大気汚染

対象地域を代表する5地点について、平日の1日間に3回サンプル採取。

分析項目は、SO_2, CO, NO_2, 鉛, HC, Dust, O_xの7項目。

c. 水質

対象地域を代表する河川・排水路10地点について1回サンプル採取。

分析項目は、Water Quality (PPRI No.20, Col.B)及び Waste Water (KLH)に示されるもの。

d. 騒音・振動

対象地域を代表する5地点について平日の1日間（朝1回、昼間2回、夕1回、夜間1回）、騒音・振動調査を行う。

2)報告書

現地調査結果を取りまとめた図表類　1式

3)作業工期

概ね 2ヶ月

4)必要経費

必要経費は、下記のとおり　　金額：円

I．人件費	人	数量	単価	金額	備考
a．住民移転	4	2.0(月)	250,000	2,000,000	
b．大気汚染	4	0.5(月)	250,000	500,000	
c．水質汚濁	2	0.2(月)	250,000	100,000	
d．騒音・振動	2	0.5(月)	250,000	250,000	
ﾁｰﾑﾘｰﾀﾞ	1	2.0(月)	350,000	700,000	
				小計(3,550,000)	

II．調査・分析	数量(ｻﾝﾌﾟﾙ)	単価	金額	備考
a．住民移転	1230	250	307,500	1230戸
b．大気汚染	15	14,000	210,000	7項目、3(回)x5(地点)
c．水質汚濁	10	15,000	150,000	河川 10(地点)
d．騒音・振動	5	11,000	55,000	騒音 5(地点)
	5	23,000	115,000	振動 5(地点)
			小計(837,500)	

III．移動	台	数量	単価	金額	備考
ｼﾞｬｶﾙﾀ市内移動	2	6(週)	63,000	756,000	
				小計(756,000)	

IV．日当	人	数量	単価	金額	備考
a．住民移転	4	25(日)	1,500	150,000	
b．大気汚染	4	5(日)	1,500	30,000	
c．水質汚濁	2	2(日)	1,500	6,000	
d．騒音・振動	2	5(日)	1,500	15,000	
				小計(201,000)	

V．ﾃﾞｰﾀ整理・報告書	数量	単価	金額	備考
ﾊﾟｿｺﾝ	1		250,000	
ｺﾋﾟｰ	1		500,000	
			小計(750,000)	

VI．合　計	6,094,500
VII．税　金　(VAT10%)	609,450
VIII．総　計	6,703,950 円
	或め６７０万円

以　上