

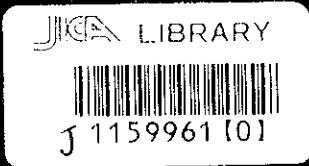
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF SETTLEMENT AND REGIONAL DEVELOPMENT
THE REPUBLIC OF INDONESIA

**THE DETAILED DESIGN
OF
FLOOD CONTROL, URBAN DRAINAGE AND
WATER RESOURCES DEVELOPMENT IN
SEMARANG IN THE REPUBLIC OF INDONESIA**

FINAL REPORT

COMPLETION DATE: / /
WORKS STARTED: / /
WORKS COMPLETED: / /



AUGUST 2000

CTI ENGINEERING INTERNATIONAL CO., LTD.
IN ASSOCIATION WITH
PACIFIC CONSULTANTS INTERNATIONAL
AND
PASCO INTERNATIONAL INC.

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FINAL REPORT

**COMPONENT A:
WEST FLOODWAY / GARANG RIVER IMPROVEMENT**

VOLUME VI COST ESTIMATE

AUGUST 2000

CTI ENGINEERING INTERNATIONAL CO., LTD.

IN ASSOCIATION WITH

PACIFIC CONSULTANTS INTERNATIONAL

AND

PASCO INTERNATIONAL INC.



ESTIMATE OF PROJECT COST

Price Level	:	As of July 1999		
Currency Conversion Rate	:	US\$1.00	=	Rp. 6,885
		1 Yen	=	Rp. 60.39

CONSTITUTION OF THE REPORT

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2. COMPONENT A : WEST FLOODWAY/GARANG RIVER IMPROVEMENT

VOLUME I	MAIN REPORT
VOLUME II	DESIGN CRITERIA
VOLUME III	DESIGN NOTES
VOLUME IV	WORK QUANTITY CALCULATION
VOLUME V	CONSTRUCTION PLANNING
VOLUME VI	COST ESTIMATE
VOLUME VII	DATA BOOK

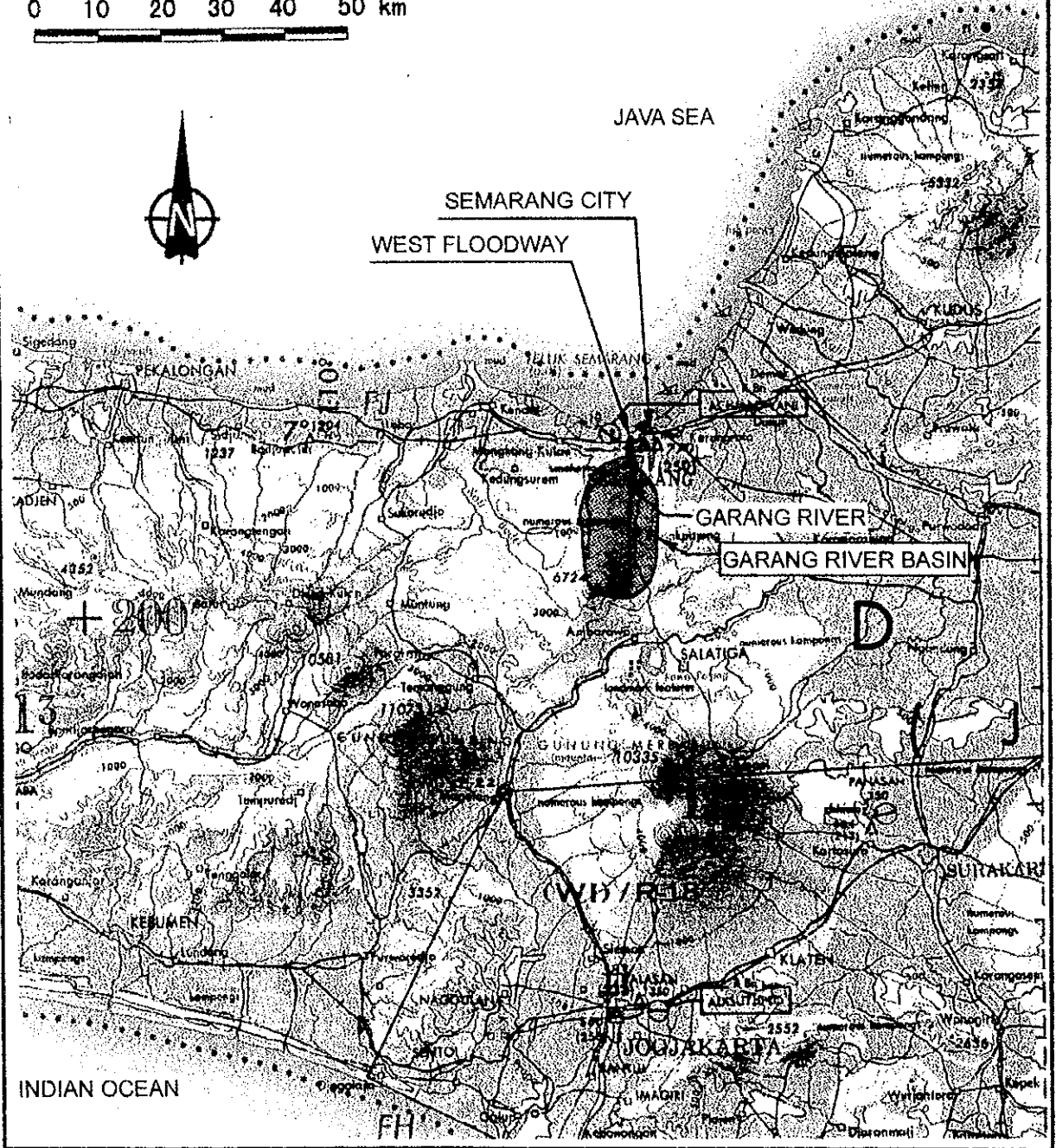
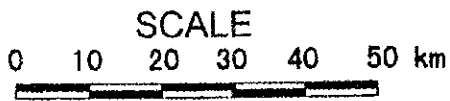
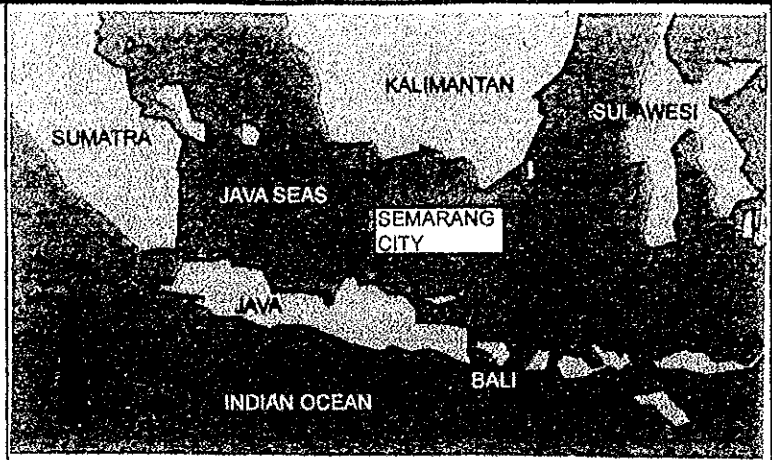
3. COMPONENT B : JATIBARANG MULTIPURPOSE DAM CONSTRUCTION

VOLUME I	MAIN REPORT
VOLUME II	DESIGN CRITERIA
VOLUME III	DESIGN NOTES
VOLUME IV	WORK QUANTITY CALCULATION
VOLUME V	CONSTRUCTION PLANNING
VOLUME VI	COST ESTIMATE
VOLUME VII	DATA BOOK
VOLUME VIII	ANNEX

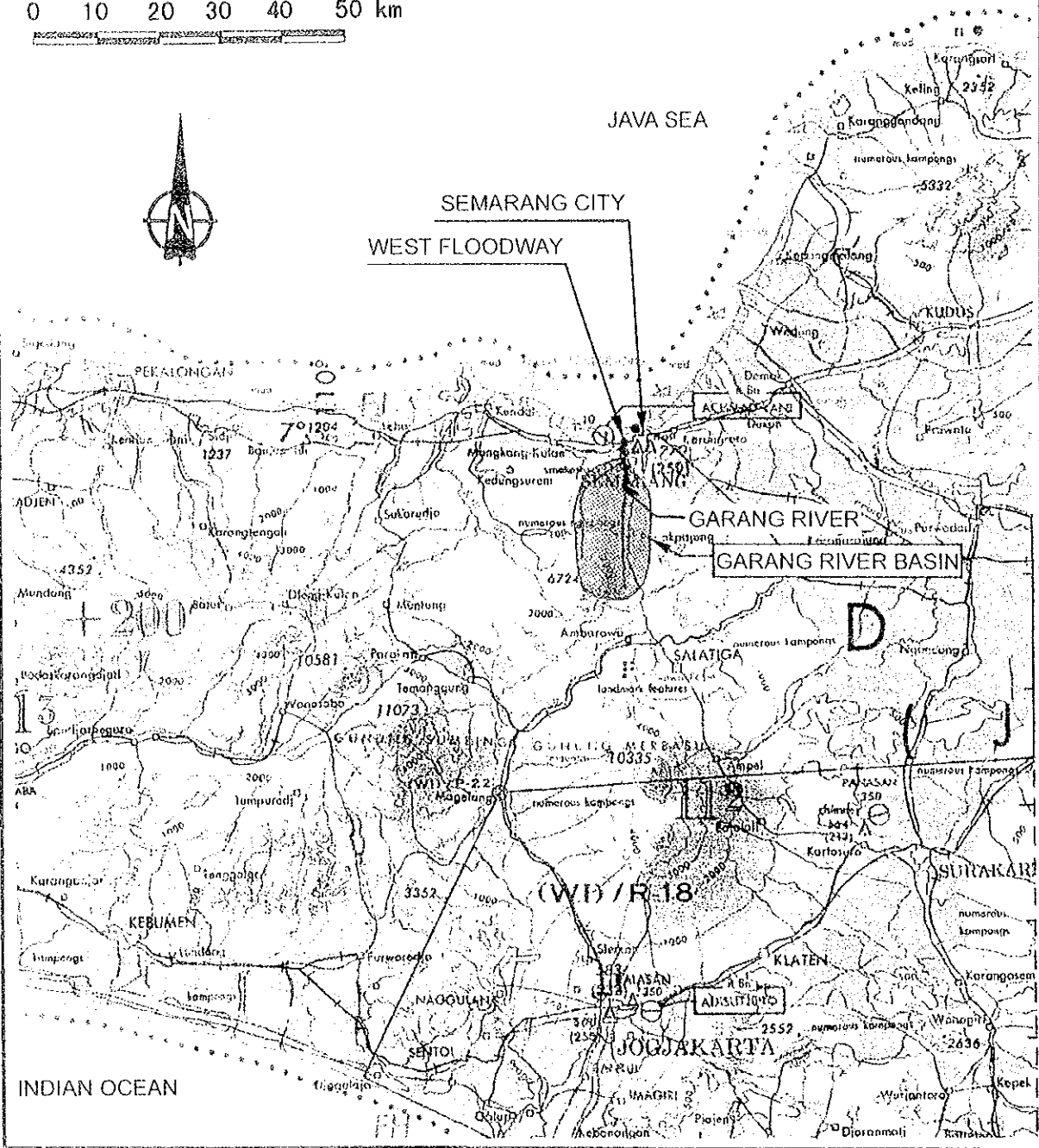
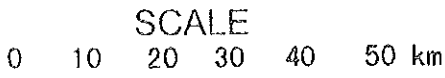
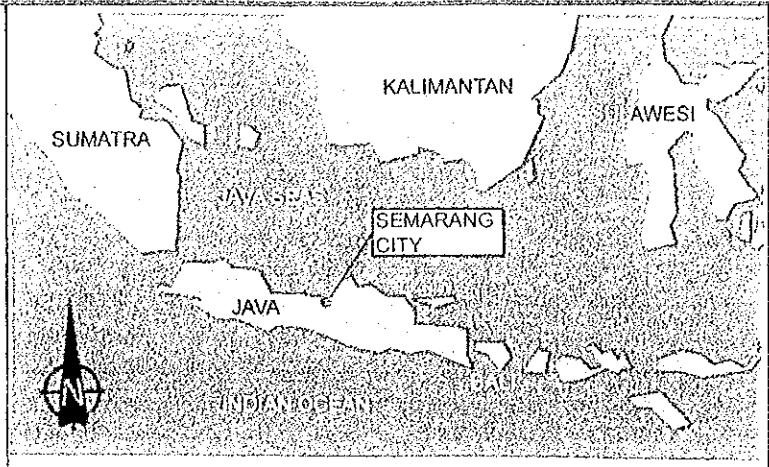
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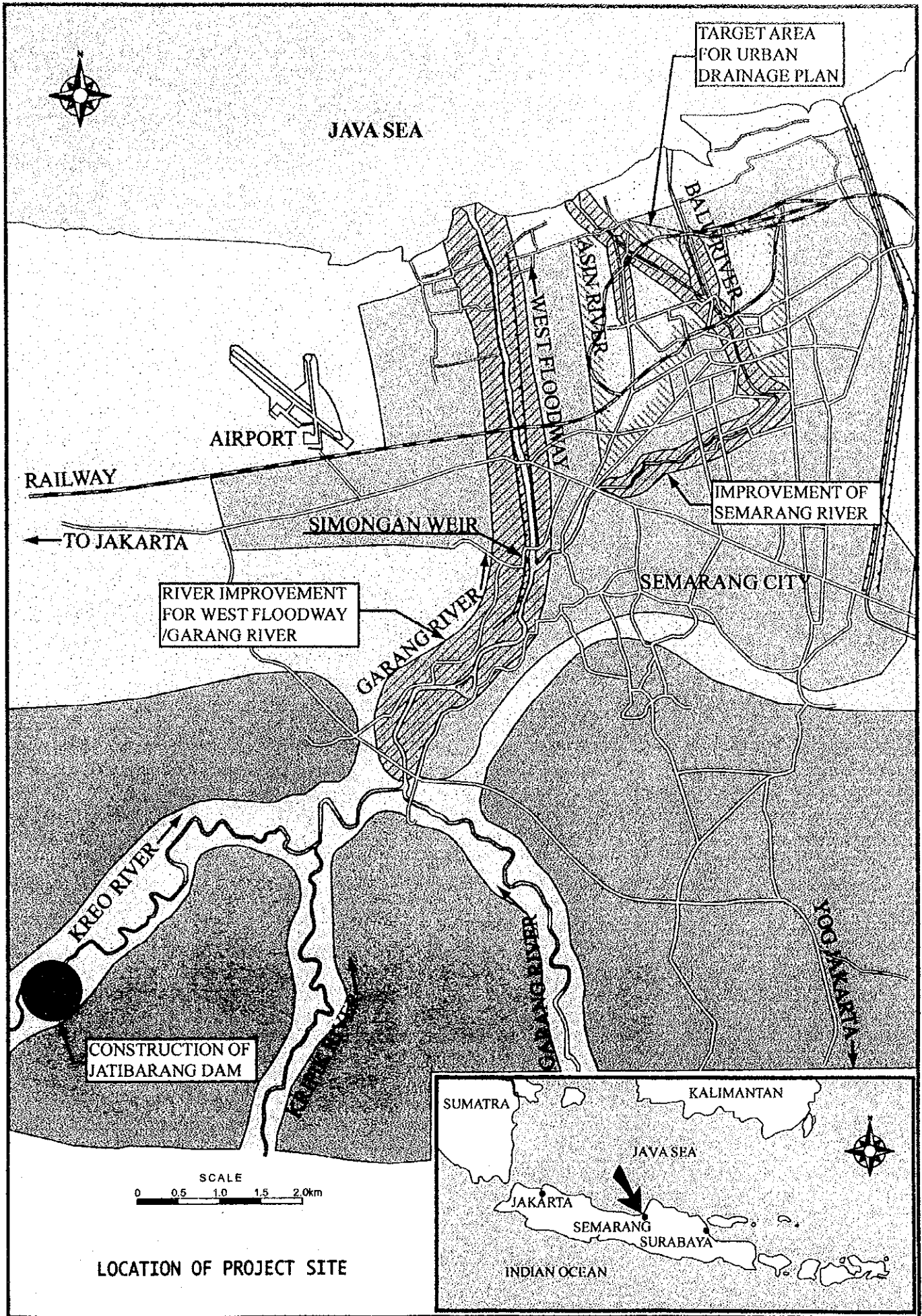
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VOLUME II	DESIGN NOTES
VOLUME III	WORK QUANTITY CALCULATION
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VOLUME V	COST ESTIMATE
VOLUME VI	DATA BOOK

GENERAL MAP



GENERAL MAP





TARGET AREA
FOR URBAN
DRAINAGE PLAN

JAVA SEA

AIRPORT

RAILWAY

← TO JAKARTA

SIMONGAN WEIR

RIVER IMPROVEMENT
FOR WEST FLOODWAY
/GARANG RIVER

IMPROVEMENT OF
SEMARANG RIVER

SEMARANG CITY

GARANG RIVER

KREO RIVER

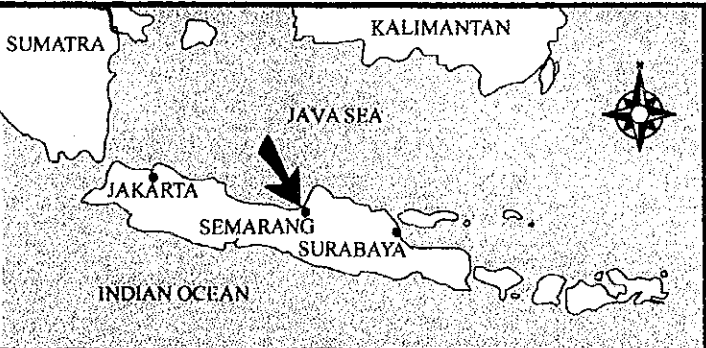
CONSTRUCTION OF
JATIBARANG DAM

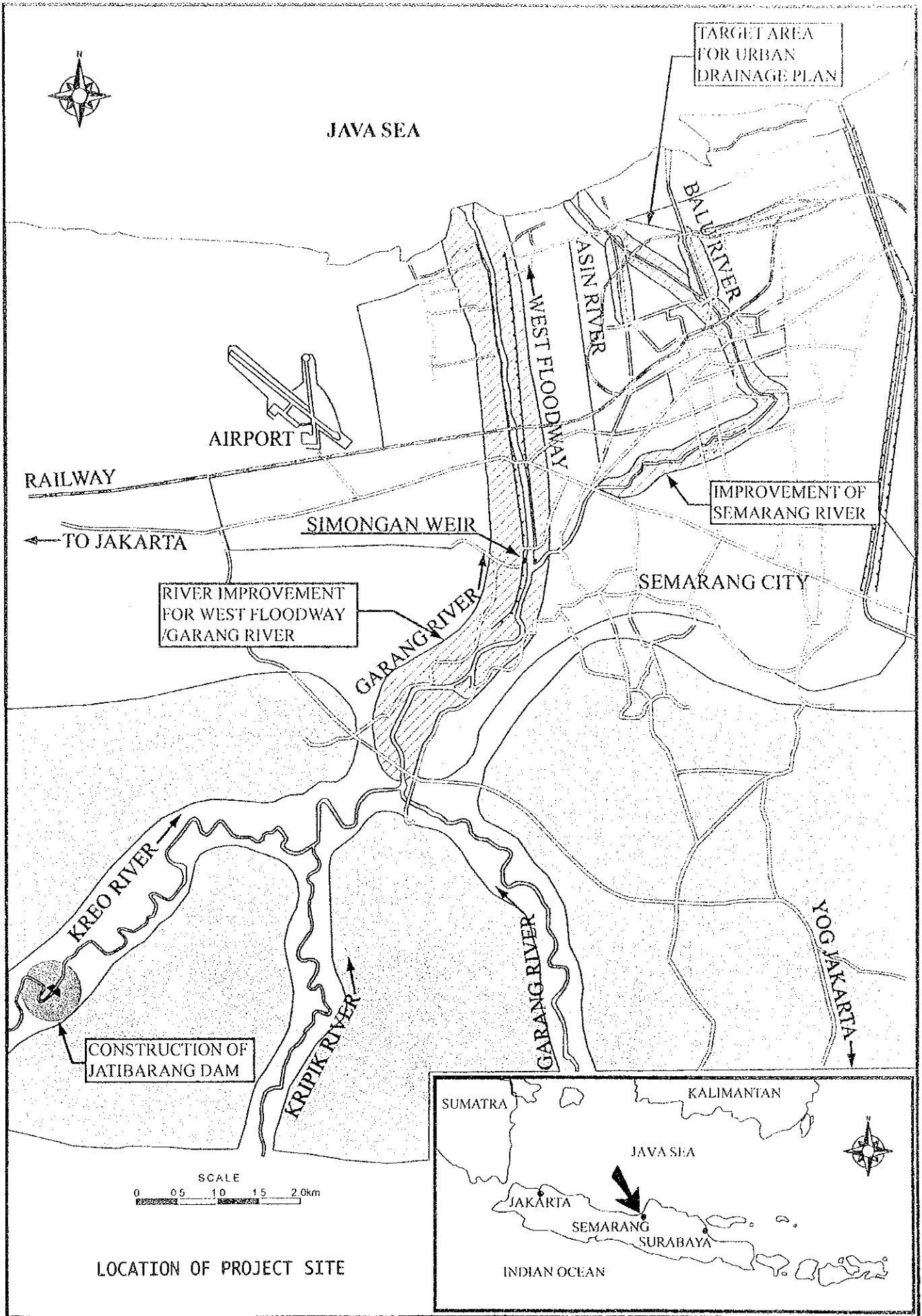
GARANG RIVER

YOGANARTA

SCALE
0 0.5 1.0 1.5 2.0km

LOCATION OF PROJECT SITE





VOLUME VI COST ESTIMATE

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TERMS AND ABBREVIATIONS

1. INDONESIAN GOVERNMENT AGENCIES AND ORGANIZATIONS

GOI	:	Government of Indonesia
BAPPENAS	:	Badan Perencanaan Pembangunan Nasional (National Development Planning Board)
BAPPEDA	:	Badan Perencanaan Pembangunan Daerah (Provincial Development Planning Board)
BINAMARGA	:	Directorate General of Road and Bridge, Ministry of Public Works
BAPEDAL	:	Badan Pengendalian Dampak Lingkungan (Environmental Impact Assessment Board)
BPN	:	Badan Pertanahan Nasional (National Land Agency)
BPP	:	Balai Penyuluhan Pertanian (Agricultural Extension Center)
DPU	:	Departemen Pekerjaan Umum (Ministry of Public Works)
DGWRD	:	Directorate General of Water Resources Development, Ministry of Public Works
DGCK	:	Directorate General of Cipta Karya (Housing, Building and Urban Development, Ministry of Public Works)
DGRD	:	Directorate General of Research and Development, Ministry of Public Works)
DOR	:	Directorate of Rivers
DPUP	:	Dinas Pekerjaan Umum Propinsi (Provincial Public Works Services)
IHE	:	Institute of Hydraulic Engineering (Bandung)
PJKA	:	Perusahaan Jawatan Kereta Api (Railway Company, Old Name)
PERUMKA	:	Perusahaan Umum Kereta Api (Indonesian Railway Public Corporation, New Name)
PDAM	:	Perusahaan Daerah Air Minum (Water Works Company)
PMG	:	Pusat Meteorologi dan Geofisika (Center of Meteorology and Geophysics)
PLN	:	Perusahaan Listrik Negara (State Electricity Corporation)
P3SA	:	Proyek Pengembangan dan Penyelidikan Sumber-Sumber Air (Water Resources Development and Investigation Project)

2. JAPANESE GOVERNMENT / INTERNATIONAL ORGANIZATIONS

GOJ	:	Government of Japan
JICA	:	Japan International Cooperation Agency
MOC	:	Ministry of Construction, Japan
JEM	:	Japan Electric Machine Industry

ADB	:	Asian Development Bank
IBRD	:	International Bank for Reconstruction and Development (World Bank)
UNDP	:	United Nations Development Program
WMO	:	World Meteorological Organization
ASTM	:	American Society for Testing and Materials
ASME	:	American Society of Mechanical Engineer
USASI	:	United States of America Standards
IEC	:	International Electrotechnical Committee
NEMA	:	National Electrical Manufacturers Association

3. MEASUREMENT UNITS

(Length)

mm	:	millimeter(s)
cm	:	centimeter(s)
m	:	meter(s)
km	:	kilometer(s)

(Weight)

g, gr	:	gram(s)
kg	:	kilogram(s)
t, ton	:	tonnage (s)

(Area)

mm ²	:	square millimeter(s)
cm ²	:	square centimeter(s)
m ²	:	square meter(s)
km ²	:	square kilometer(s)
ha(has)	:	hectare(s)

(Time)

sec., s	:	second(s)
min	:	minute(s)
h (hrs)	:	hour(s)
d (dys)	:	day(s)
y, yr(yrs)	:	year(s)

(Volume)

cm ³	:	cubic centimeter(s)
m ³	:	cubic meter(s)

(Discharge)

l, ltr	:	liter(s)
EL., El.	:	Elevation

(Combined Units)

Speed/Velocity

cm/sec, cm/s	:	centimeter per second
m/sec, m/s	:	meter per second
km/hr, km/h	:	kilometer per hour

Stress

kgf/cm ²	:	kilogram per square centimeter
tf/m ²	:	ton per square meter
N/mm ²	:	newton per square millimeter
Mpa	:	mega pascal

Discharge

ltr/sec, l/s	:	liter per second
m ³ /sec, m ³ /s	:	cubic meter per second
m ³ /yr, m ³ /y	:	cubic meter per year

(Note : Other combined units may be constructed similarly as above)

Electricity

MW	:	megawatt	GW	:	gigawatt
MWh	:	megawatt hour	GWh	:	gigawatt hour
kV	:	kilovolt			

4. MONETARY TERMS

¥	:	Japanese Yen
US\$ or USD	:	United States Dollar
Rp.	:	Indonesian Rupiah

5. INDONESIAN TERMS

JKT	:	Jakarta
Jawa	:	Java
Propinsi	:	Province
Kabupaten, Kab.	:	District (Regency)
Kotamadya, Kodya	:	Municipality
Kecamatan, Kec.	:	Sub-District
Desa	:	Village (Rural Area)
Kampung, Kp.	:	Village (Rural Area)
Kelurahan	:	Village (Urban Area)
Kali, Sungai	:	River
Gunung	:	Mountain
Rawa	:	Swamp
Danau	:	Lake
Laut	:	Sea
PT.	:	Incorporated or Limited
PPT	:	Panitia Pembebasan Tanah (Land Acquisition Committee)
KOMPUS	:	Komisi Pusat (Central Committee for Environmental Impact Assessment)
KA-ANDAL	:	Terms of Reference of Environmental Impact Statement
ANDAL	:	Environmental Impact Statement
RKL	:	Environmental Management Plan

RPL	:	Environmental Monitoring Plan
AMDAL	:	Environmental Impact Assessment
BPPM2	:	Semarang Port Bench Mark
SPB	:	Semarang Peil Baru (New Semarang Level)
TTG	:	Tanda Tinggi Geodesi (National Bench Mark)

6. OTHERS

JRATUNSELUNA PROJECT : Water Resources Development Projects for Jragung, Tuntang, Serang, Lusi and Juwana Rivers

SSUDP	:	Semarang and Surakarta Urban Development Program
IUIDP	:	Integrated Urban Infrastructures Development Program
SWL	:	Surcharge Water Level
DFWL	:	Design Flood Water Level
PMP	:	Probable Maximum Precipitation
PMF	:	Probable Maximum Flood
EIRR	:	Economic Internal Rate of Return
JIS	:	Japanese Industrial Standard
USASI	:	United States of America Standards
SWR	:	Shadow Wage Rate
CIF	:	Cost, Insurance and Freight
VAT	:	Value Added Tax.

CHAPTER 1 INTRODUCTION

This sector report is prepared for the cost estimate of the project cost for the component of West Floodway/Garang River Improvement, which consists of West Floodway/Garang River Improvement (referred to as Package-1), Simongan Weir Reconstruction (Package-2) and Raising Existing Railway Bridge (Package-3).

CHAPTER 2 CONSTITUTION OF PROJECT COST

2.1 Composition of Project Cost

Project cost is composed of such items as construction base cost, engineering service cost, compensation cost, administration cost, physical contingency, price contingency and tax. In addition, construction base cost is divided into many sub-cost items as illustrated in Fig. 2.1.1.

The explanation of each project cost item is described below. Administration cost, physical contingency, price contingency and tax are calculated by ratios which are explained in percentage to other cost items (refer to Table 2.1.1) :

Construction Base Cost : Construction base cost is composed of direct cost estimated based on the work quantities and indirect cost which is estimated in percentage. (refer to sub-section 2.2 "Composition of Construction Base Cost")

Engineering Service Cost :Engineering Service cost is mainly expended for the construction supervision service of consultants. It is estimated based on the number of consultant engineers and other expenses, necessary for the supervision service and data collected from the previous and current similar project.

Compensation Cost :Compensation cost is based on the land acquisition and house evacuation cost.

Administration Cost :This cost is Project Owner's expenditures. Proper management shall be done to proceed the project implementation smoothly. **Seven (7) %** of the sum of the construction base cost and the compensation cost is adopted.

Physical Contingency :**Six (6) %** of the sum of the construction base cost, the engineering service cost and the compensation cost is considered for contingent expenses for the incidental construction tasks.

Price Contingency :This contingency is the cost for consideration of price escalation. From the economic point of view, it is assumed and adopted that **three (3) %** of all costs in foreign currency portion and **eight (8) %** of all costs in local currency portion are the ratios of price

escalation for one (1) year. Therefore, aforementioned numbers increase every year. (Refer to Tables 2.1.2 and 2.1.3)

Value Added Tax :Ten (10) % of the construction base cost, contingencies and the engineering service cost shall be considered.

2.2 Composition of Construction Base Cost

The construction base cost is calculated in the following manner.

Construction Base Cost = Σ (Unit Cost for a Payment Item x Quantity for a Payment Item)

The unit costs for payment items are estimated as the sum of the direct cost and indirect cost.

2.2.1 Direct cost

The estimate for direct costs is performed based on the quantities of all construction tasks shown on drawing and described in project requirements. The direct cost includes all of countable element due to the type, size, design, construction procedures and quality of the intended structure, which are taken into account when deriving the cost for each work item.

Direct costs are broken down into the following costs and rates.

(1) Basic Cost

Basic costs are determined at first for cost estimate of the project. Basic costs consist of labor wage, prices of materials and driving costs of equipment. Details of each basic cost are explained in Chapter 3.

(2) Unit Rate

Using the basic costs, unit rates are estimated for basic work items such as excavation rate by backhoe having a bucket of 0.6m³, rate of concrete form work using plywood per 1 m², etc. Basic costs and unit rates were used directly to compute unit costs for each payment item, which corresponds with item of bill of quantities. Unit rates are estimated in Chapter 4.

2.2.2 Indirect Cost

The indirect cost on the project is an integral part for estimate. "Site expense", "Overhead and profit" and parts of "Preparatory and Temporary works ("General" in payment items and items of bill of quantities) are considered as the indirect cost.

“Site expense” includes the cost items such as staffing, job office expenses, consumables, small tools and insurance for labor at a site. **Fifteen 15%** of direct costs of each payment item are adopted.

“Overhead and Profit” includes the cost items such as home office support, profit and insurance at head office. **Ten 10%** of the sum of the direct costs of each payment item and site expense is adopted.

“Site expense” and “Overhead and Profit” are added in unit costs of payment items.

“Preparatory and Temporary works includes countable and uncountable items, direct cost and indirect cost, such as temporary buildings, electrical facilities, water supply system, construction and maintenance for access road, investigation and temporary utilities. These costs for each payment item are added up as countable cost or appropriated as percentage. Lump sum for each facilities, system and maintenance is adopted referring to similar and recent project or quotation by private firms through the formal letter.

2.3 Conditions of Project Cost Estimate

2.3.1 Price Level and Exchange Rate

The cost estimation is made on the price level as of **the end of July 1999**, since the cost data of materials, labors, equipment and other necessary for the cost estimation are collected in this period. The exchange rate applied to the cost estimation is **US\$ 1.0 = Rp. 6,885** and **¥1 = Rp. 60.39** of the International Banking Rate at the time.

2.3.2 Currency Component

The project cost is divided into the foreign currency components representing the pure and indirect foreign currencies and pure local currency component. The pure local currency for cost estimate is expressed in Rupiah currency. Moreover, the pure foreign and the indirect foreign currencies and total cost are expressed in Rupiah after exchanging from Yen, US\$ or Other Currencies to Rupiah. The pure foreign currency, indirect foreign currency and pure local currency comprise the following items respectively:

Pure Foreign Currency (Rp.) : Cost of wage for foreign engineer and foreman,
Base Cost of all Components for construction plants and heavy equipment except local mechanic, maintenance, repairing, fuel and labor,

Chapter 2 Constitution of Project Cost

Cost of imported materials and
Cost of materials which are produced in Indonesia by
Foreign-Indonesian joint enterprise with the capital of the
foreign firm which occupy 10% over.

Indirect Foreign Currency (Rp.) : Cost of foreign portion of local materials and
Cost of foreign portion of equipment produced in
Indonesia.

Pure Local Currency (Rp.) : Cost of per diem portion for foreign personnel,
Cost of local labors,
Cost of local portion of local materials,
Cost of local portion of equipment produced in Indonesia
and
Inland transportation cost exclusive of foreign portions.

Refer to Chapter 3 for further details.

CHAPTER 3 BASIC COSTS

3.1 Constitution of Currency Portion

The basic costs are estimated in terms of pure and indirect foreign currencies and local currency. The constitution of currency component is explained below.

3.1.1 Laborer Cost

The labor cost is computed in the local currency portion in the cost estimate. The foreign labor wage is computed in the pure foreign and local currency taking into account the annual income, air fare and living allowance, etc.

3.1.2 Material Cost

Materials are counted into the local currency portion and indirect or pure foreign currency portion taking account into their usage of imported raw or processed materials, costs of production facilities and amount imported as a pure or secondary indirect foreign currency. The price ratios of some material groups divided into every portion are listed in Table 3.1.1.

3.1.3 Equipment Cost

The currency portion of the equipment driving cost is taking account into the following currency portion.

Pure Foreign Currency (Rp.) : Hourly depreciation costs,
Spare parts and foreign mechanic costs for repairing, and
Parts of annual management costs

Indirect Foreign Currency (Rp.) : Foreign portion of local material such as tire, fuel, etc.

Pure Local Currency (Rp.) : Local mechanic cost for repairing,
Local labor for repairing, and
Parts of annual management costs.

3.2 Basic Cost of Laborer

The costs of labor wages are shown in Table 3.2.1 including the labor's all fringe benefits, such as vacation and sick leave, charge of insurance, living allowance and others according to the Labor Law in Indonesia.

3.3 Basic Cost of Material

Prices of materials required for construction are canvassed from “Daftar Harga Satuan Bahan Bangunan Untuk Bulan: Apr-May 1999/2000 Sumber Data: Pasaran Bebas, Daerah : Semarang dan Sekitarnya, DPU”(referred to as “DPU Cost Table”), some cost reports published periodically and domestic market price survey as well as Japanese market price (see Chapter 6 Reference Material).

Table 3.3.1 shows basic cost of material divided into each currency portion.

3.4 Basic Cost of Equipment

The equipment cost for the work consists of the hourly depreciation cost, repairing cost, annual management cost and operator cost for driving, which are calculated by using a rate of delivered cost, proper economical life and repairing rate in Indonesia.

Hourly driving equipment cost calculated is shown in Table 3.4.1. In addition, Table 3.4.2 shows calculation sheet of driving equipment cost.

3.5 Reference Books

The following reference books are referred for the estimate of the basic costs.

No.	Data in Indonesia		Data in Japan
	Indonesian Word	English Word	
1	Daftar Harga Satuan Bahan Bangunan, DPU	The list of Construction Material Unit Price, DPU	
2	Jurnal Bahan Bangunan, Konstruksi dan Interior	Journal of Building & Interior	
3	Petunjuk Teknik Analisa Biaya dan Harga Stuan Pekerjaan Kabupaten, Bina Marga 1995	Technical Guide of Cost Analysis & Unit Price of Work in Semarang, Bina Marga 1995	
4			Construction Equipment/Machine Catalogue in Japan
5			Depreciation Calculation Table by Japanese Construction Equipment Society
6			Journal of Cost Estimate, July 1999

CHAPTER 4. UNIT RATES FOR WORK ITEMS AND UNIT COSTS FOR PAYMENT ITEMS

Based on the basic costs mentioned in the preceding chapter, unit rates for work items and unit costs for payment items will be calculated in the manner mentioned hereinafter.

4.1 Unit Rate

It is important for estimate of unit rates, such as excavation by excavator, or concreting works by m³, etc. to decide production rates. Most of production rates are quoted from Japanese and Indonesian Standard. Japanese standard rates are utilized in case of construction by using equipment for weir, bridge, dredging, earth work and so on. On the other hand, Indonesian Standard rates are utilized in case of construction by manpower mainly, such as building, masonry work and etc. The summary of unit rates is enumerated in Tables 4.1.1.

4.1.1 Unit Rate of Common Work by Using Equipment

Unit rates of common works such as earth works and concrete works mainly using equipment are calculated in Tables 4.1.2. Working coefficients due to kind of equipment, amount of capacity, quantity of working volume and laborer rate are indicated in Table 4.1.3.

4.1.2 Unit Rate of Common Work by Manpower

Based on "DPU Cost Table", unit rates of common works by manpower are calculated in Table 4.1.4.

4.1.3 Unit Rate of Foundation Work

Based on the Japanese Standard rates, driving piles and the appurtenant works are calculated in Table 4.1.5. Working coefficients due to kind of equipment, amount of capacity, quantity of working volume and labor rate are indicated in Tables 4.1.6 and 4.1.7.

4.1.4 Other Unit Rates

Unit rates for other works such as rail works and temporary works in general etc. are computed in Table 4.1.8 and 4.1.9.

4.2 Unit Costs for Payment Item

4.2.1 General

As described in Fig. 2.1.1, a unit cost for a payment item consists of basic costs, unit rates and their production rates.

The other conditions for the estimates of unit costs are as follows:

(1) Quotation

Quotations of electrical and mechanical facilities for gates are asked to private firms for certainty.

(2) Mobilization and Demobilization

Based on the construction schedule established in "Volume VI Construction Planning", numbers of mobilization and demobilization of equipment for cost estimates are counted. Tables 4.2.1 and 4.2.2 show the number of mobilization and demobilization of equipment. The results, which are adopted to the unit costs for payment items, of the number of trailer, track and vessel for mobilization and demobilization are summarized in Tables 4.2.3 and 4.2.4.

4.2.2 Amount of Unit Costs for Payment Items

(1) Unit Costs for Payment Items

The unit costs for payment items, which are tabulated in the Volume IV, Work Quantity Calculation, in three (3) packages are broken down into basic costs and unit rates in Table 4.2.5.

(2) Unit Costs for Buildings/Complexes

Besides civil works, appurtenant buildings such as the Gate Control Buildings and Management Offices etc. are constructed in Package-1 and 2. Unit costs for buildings and calculation sheets are indicated in Tables 4.2.6 to 4.2.8.

4.3 Reference Book

In addition to the reference book enumerated in Sub-section 3.5, the following books/materials are referred to for computation of unit rates and costs.

No.	Data in Indonesia		Data in Japan
	Indonesian Word	English Word	
1	Dasar Penyusunan Anggaran Biaya Bangunan	Standard of Building Cost Estimate	
2			Standards Outline of Production Rate for Construction (1998)
3			Manual for Cost Estimate Standard for Civil Work by Ministry of Construction (1999)
4			Construction Equipment/Machine Catalogue in Japan
5			Standard of Cost Estimate for Civil Work by Ministry of Construction (1999)

CHAPTER 5. PROJECT COST

5.1 Construction Schedule

When the price contingency and disbursement schedule are considered, it is necessary to make out annual construction schedule. Hereinafter, the schedule are prepared under the assumption that the project starts on beginning of 2001 with arrangements in 2000 such as tendering, contract and etc. The project is completed until the end of 2003. Tables 5.1.1, 5.1.2 and 5.1.3 indicate annual distribution for disbursement drawn up based on Construction Schedule. The schedules of main Items are assumed as follows (refer to “Volume VI Construction Planning”);

Package-1

- | | | |
|--------------------------------|---|-----------------------|
| 1. Preparation Works | : | Feb. 2001 – Mar. 2001 |
| 2. Construction | : | Apr. 2001 – Oct. 2003 |
| 3. Relocation of Existing Weir | : | Apr. 2001 – Nov. 2001 |

Package-2

- | | | |
|------------------|---|-----------------------|
| 1. West Floodway | : | Feb. 2001 – Mar. 2001 |
| 2. Garang River | : | Apr. 2001 – Oct. 2003 |

Package-3

- | | | |
|---------------------------|---|-----------------------|
| 1. Raising of Main Bridge | : | Apr. 2002 – Jun. 2002 |
| 2. Truck Work | : | Apr. 2002 – Oct. 2002 |
| 3. Other Facilities | : | Apr. 2001 – Sep. 2002 |

The annual disbursement schedule for budget is shown in Table 5.3.1 in “sub-section 5.3 Disbursement Schedule”.

5.2 Project Cost

5.2.1 Construction Base Cost

Based on the unit costs for each payment item, construction base costs of three (3) packages are computed respectively and summarized as follows:

(1) Package-1: Improvement of West Floodway and Garang River

Payment items and the work quantities for Package-1 are indicated in Table 5.2.1. Soil and masonry works account for main item in this package. Specially speaking, dredging works are implemented in payment item "Excavation below Water Level" (B.2.1).

(2) Package-2: Reconstruction of Simongan Weir

Payment items and the work quantities for Package-2 are indicated in Table 5.2.2. The main purpose of this package is reconstruction of the Simongan Weir. Therefore, the major items are concrete and gate works including furnishing and installation. In addition to concrete and gate, another main works are to dismantle existing weir for preservation of historical structure. Specially, when the existing structure is cut into some hundred blocks for transportation, new technology named "Wire Saw Method" is utilized for smooth cutting. It is necessary for implementation of the work to use special equipment and engineers.

(3) Package-3: Raising of Railway Bridge

Payment items and the quantities for Package-3 are indicated in Table 5.2.3. There are also particular works undertaken with maintaining regular operation of train. Therefore, the one of the most important work is the temporary work as well as Bridge Work from the cost's points of view.

(4) Total Construction Base Cost

The results of calculation of the construction base cost are summarized in the following table.

Name of Package	Currency	Construction Base Cost			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Package-1 (the West Floodway/Garang River Improvement)	Rp x 10 ⁶	52,579	3,343	47,600	103,521
Package-2 (Simongan Weir Reconstruction)	Rp x 10 ⁶	61,201	3,632	24,128	88,960
Package-3 (Raising Existing Railway Bridge)	Rp x 10 ⁶	5,804	838	9,871	16,514
Total	Rp x 10 ⁶	119,583	7,813	81,599	208,995
	Yen x 10 ⁶	1,980	129	1,351	3,461
	US\$ x 10 ³	17,369	1,135	11,852	30,355

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.2 Engineering Service Cost

The total man-month of foreign engineer has been assumed at 79 man-months for 1 year of preliminary term and 3 years construction in which package-1, 2 and 3 are undertaken. (See Tables 5.2.4 and 5.2.5.) In addition, local engineer remuneration, international and local transportation fee, office staff and establishment and etc. are summed up, total engineering service cost are tabulated below:

Name of Package	Currency	Engineering Service Cost			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Three (3) packages in Total	Rp x 10 ⁶	11,950	0	6,220	18,170
	Yen x 10 ⁶	198	0	103	301
	US\$ x 10 ³	1,736	0	903	2,639

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.3 Compensation Cost

Some land areas and parts of houses/buildings should be expropriated for construction. Each unit construction cost is decided below under the results of consultation between the Jratunseluna and the Study Team;

Land : 25,000 rupiah/m²

Building : 30,000,000 rupiah/houses repaired

There are 26,000 m² of land and 2 houses in the three (3) packages.

As the results, total compensation cost is shown in the following Table (refer to Table 5.2.6);

Name of Package	Currency	Compensation Service Cost (million rupiah/yen)			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Three (3) packages in Total	Rp x 10 ⁶	0	0	710	710
	Yen x 10 ⁶	0	0	12	12
	US\$ x 10 ³	0	0	103	103

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.4 Administration Cost

As described in “sub-section 2.1 Basic Composition of Project Cost”, the administration cost for owner’s expenditures is estimated at 7% of construction base cost. The amount of administration cost is as follows;

Name of Package	Currency	Administration Cost (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Three (3) packages in Total	Rp x 10 ⁶	0	0	14,679	14,679
	Yen x 10 ⁶	0	0	243	243
	US\$ x 10 ³	0	0	2,132	2,132

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.5 Physical Contingency

Physical contingency is considered as local portion at six (6) % of the sum of the construction base cost, engineering service cost and the compensation cost.

Name of Package	Currency	Physical Contingency (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Three (3) packages in Total	Rp x 10 ⁶	7,892	469	5,312	13,673
	Yen x 10 ⁶	131	8	88	226
	US\$ x 10 ³	1,146	68	771	1,986

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.6 Price Contingency

Based on the description in sub-section "5.1 construction schedule", Table 5.2.7 shows summary of price contingency between years of 2,000 and 2,003.

Name of Package	Currency	Price Contingency (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Three (3) packages in Total	Rp x 10 ⁶	11,867	735	24,886	37,849
	Yen x 10 ⁶	197	12	412	621
	US\$ x 10 ³	1,724	107	3,615	5,445

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.7 Value Added Tax

Value added tax is considered as local portion at ten (10) % of the sum of the construction base cost and engineering service cost including physical and price contingencies. The amount of value added tax is shown in the following table.

Name of Package	Currency	Value Added Tax (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Pure Local Portion	Total
Three (3) packages in Total	Rp x 10 ⁶	0	0	27,554	27,554
	Yen x 10 ⁶	0	0	456	456
	US\$ x 10 ³	0	0	4,002	4,002

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.2.8 Total Project Cost and Contingencies

Total project cost summed up aforementioned item with physical contingency and tax is as follows;

Project Cost of Package-1

Name of Package	Currency	Project Cost (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Local Portion	Total
Construction Base Cost	Rp x 10 ⁶	52,579	3,343	47,600	103,521
Engineering Service Cost	Rp x 10 ⁶	5,253	0	3,627	8,880
Compensation Cost	Rp x 10 ⁶	0	0	710	710
Administration Cost	Rp x 10 ⁶	0	0	7,373	7,373
Physical Contingency	Rp x 10 ⁶	3,470	201	3,116	6,787
Price Contingency	Rp x 10 ⁶	5,201	311	14,506	20,017
Value Added Tax	Rp x 10 ⁶	0	0	13,756	13,756
Total	Rp x 10 ⁶	66,502	3,854	90,688	161,044
	Yen x 10 ⁶	1,101	64	1,502	2,667
	US\$ x 10 ³	9,659	560	13,172	23,391

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

Project Cost of Package-2

Name of Package	Currency	Project Cost (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Local Portion	Total
Construction Base Cost	Rp x 10 ⁶	61,201	3,632	24,128	88,960
Engineering Service Cost	Rp x 10 ⁶	6,117	0	1,838	7,955
Compensation Cost	Rp x 10 ⁶	0	0	0	0
Administration Cost	Rp x 10 ⁶	0	0	6,116	6,116
Physical Contingency	Rp x 10 ⁶	4,039	218	1,558	5,815
Price Contingency	Rp x 10 ⁶	6,089	344	7,469	13,901
Value Added Tax	Rp x 10 ⁶	0	0	11,566	11,566
Total	Rp x 10 ⁶	77,445	4,193	52,675	134,313
	Yen x 10 ⁶	1,282	69	872	2,224
	US\$ x 10 ³	11,248	609	7,651	19,508

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

Project Cost of Package-3

Name of Package	Currency	Project Cost (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Local Portion	Total
Construction Base Cost	Rp x 10 ⁶	5,804	838	9,871	16,514
Engineering Service Cost	Rp x 10 ⁶	580	0	755	1,335
Compensation Cost	Rp x 10 ⁶	0	0	0	0
Administration Cost	Rp x 10 ⁶	0	0	1,190	1,190
Physical Contingency	Rp x 10 ⁶	383	50	638	1,071
Price Contingency	Rp x 10 ⁶	578	81	2,912	3,570
Value Added Tax	Rp x 10 ⁶	0	0	2,231	2,231
Total	Rp x 10 ⁶	7,345	969	17,597	25,912
	Yen x 10 ⁶	122	16	291	429
	US\$ x 10 ³	1,067	141	2,556	3,764

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

Total Project Cost of Three Packages

Name of Package	Currency	Project Cost (million rupiah)			
		Pure Foreign Portion	Indirect Foreign Portion	Local Portion	Total
Construction Base Cost	Rp x 10 ⁶	119,583	7,813	81,599	208,995
Engineering Service Cost	Rp x 10 ⁶	11,950	0	6,220	18,170
Compensation Cost	Rp x 10 ⁶	0	0	710	710
Administration Cost	Rp x 10 ⁶	0	0	14,679	14,679
Physical Contingency	Rp x 10 ⁶	7,892	469	5,312	13,673
Price Contingency	Rp x 10 ⁶	11,867	735	24,886	37,489
Value Added Tax	Rp x 10 ⁶	0	0	27,554	27,554
Total	Rp x 10 ⁶	151,292	9,017	160,961	321,270
	Yen x 10 ⁶	2,505	149	2,665	5,320
	US\$ x 10 ³	21,974	1,310	23,379	46,662

Note ; Conversion Rate : US\$ 1.0 = Rp. 6,885, ¥ 1.0 = Rp. 60.39

5.3 Disbursement Schedule

Table 5.3.1 shows summary of disbursement schedule and Table 5.3.2 shows detail disbursement schedule of construction base cost including price contingency.

