



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

# URBAN DRAINAGE PROJECT IN THE CITY OF JAKARTA

PREQUALIFICATION DOCUMENTS  
FOR  
CIVIL WORKS CONSTRUCTION

FOR

PACKAGE 3

CONTRACT NO. 11

GEDEBOR DRAINAGE CHANNEL  
SALURAN CENGKARENG DRAINAGE CHANNEL  
MERCYA DRAINAGE CHANNEL

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FOR  
CIVIL WORKS CONSTRUCTION**

**FOR**

**PACKAGE - 3**

**CONTRACT NO :**

**GEDE/BOR DRAINAGE CHANNEL  
SALURAN CENGKARENG DRAINAGE CHANNEL  
MERUYA DRAINAGE CHANNEL**

**DECEMBER 1997**

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**Advertisement/Announcement**

**MINISTRY OF PUBLIC WORKS  
DIRECTORATE GENERAL OF HUMAN SETTLEMENTS  
PREQUALIFICATION FOR BIDDING  
URBAN DRAINAGE PROJECT  
IN  
THE CITY OF JAKARTA**

The Directorate General of Human Settlements, Ministry of Public Works announces that Prequalification Applications are invited from Contractors in order to qualify Applicants in an International Competitive Bidding for the Civil Works Construction of Urban Drainage Project in the City of Jakarta.

The project works are scheduled to be executed divided into three (3) Packages listed below:

**PACKAGE - 1** : Kamal Drainage Channel.

**PACKAGE - 2** : Tanjungan Drainage Channel, and  
PIK Junction Drainage Channel.

**PACKAGE - 3** : Gede/Bor Drainage Channel,  
Saluran Cengkareng Drainage Channel, and  
Meruya Drainage Channel.

The works are to receive Financial Assistance by a loan from the International Financing Agency (to be named).....

The Applicants, who are allowed to apply for the prequalification, are :

(A) Indonesian Contractors (Class A, Civil Works Division, Water Resources Sub-division).

(B) Other Contractors who satisfy all the following conditions :

- (1) That a majority of the subscribed shares shall be held by nationals of the Eligible Source Countries specified in the Loan Agreement concerned (List attached with the Prequalification Documents).
  - (2) That a majority of the full-time directors shall be nationals of the Eligible Source Countries specified in the Loan Agreement concerned.
  - (3) That such Contractors shall be incorporated and registered in the Eligible Source Countries specified in the Loan Agreement concerned.
  - (4) That such Contractors shall obtain the Licensing of Foreign Construction Services Representative Office in accordance with the Decree by the Minister of Public Works, Republic of Indonesia.
- (C) To have been in business as General Contractor for the last 8 years or more for individual or leading firm of a joint operation and 5 years or more for member firm(s) of a joint operation.
- (D) The Applicant (as Single Firm) should have experience in implementing successfully at least one (1) contract as a Main Contractor with the value of equal to or more than US\$ 5 million of civil works.
- (E) The Applicant (as Joint Operation) should have experience in implementing successfully at least one (1) contract with the value of equal to or more than US\$ 6 million of civil works. However, the amount of each contract should be more than US\$ 4 million for Leading Firm and more than US\$ 2 million for Member(s).

In case of a member of joint operation, his sharing in implementing of such Contract should not be less than the amount or value mentioned above. Each experience shall be supported by a completion certificate by the relevant owner or engineer. If the Applicant is a joint operation, this provision is mandatory to the firm who will act as the leading firm of the joint operation. In addition, Directorate General of Human Settlements strongly encourages that Foreign Contractors work in partnership with bonafide Indonesian Contractor(s) (Class A, Civil Work Division, Water Resources Sub-division).

A formal application for prequalification must be submitted by completing the "Prequalification Documents", a copy of which can be obtained from:

**The Local Public Works**

**DPU DKI Jakarta (Special Region of Capital City Jakarta)**

**Urban Drainage Project Executing Agency,**

**Jalan Taman Jatibaru No. 1,**

**Jakarta Pusat (10260), Indonesia (Telp. No. 021-3846608).**

From ..... during office hours (from 07:30 a.m. to 04:00 p.m.) upon submission of proof of payment to Treasury Office/KAS NEGARA of a non-refundable amount of Rp. .... per document.

The Applicants are advised to purchase one set of Documents for each Package separately. Each Applicant will be permitted to apply for a maximum of any two of the three Packages for Prequalification.

The "Prequalification Documents", shall be returned to the above mentioned address not later than ....., 12:00 o'clock, West Indonesian Standard Time. It may be noted that one set of Prequalification Documents is to be submitted for each Package individually.

DIRECTORATE GENERAL OF  
HUMAN SETTLEMENTS  
URBAN DRAINAGE PROJECT





**REPUBLIC OF INDONESIA  
MINISTRY OF PUBLIC WORKS  
DIRECTORATE GENERAL OF HUMAN SETTLEMENT  
URBAN DRAINAGE PROJECT EXECUTING AGENCY**

**URBAN DRAINAGE PROJECT IN THE CITY OF JAKARTA  
CIVIL WORKS CONSTRUCTION PACKAGE - 3**

**SECTION - 1 PREQUALIFICATION OF APPLICANTS**

1.1 The Directorate General of Human Settlements, Ministry of Public Works of the Government of the Republic of Indonesia invites applications for prequalification of bidders in order to qualify Applicants in the International Competitive Bidding for the Construction of Civil Works of Urban Drainage Project in the City of Jakarta. The works in connection with this project are expected to be financed by a loan from the International Financing Agency (to be named).....

1.2 Formal application for prequalification must be submitted by completing the Prequalification Documents, copy of which can be obtained from :

The Local Public Works,  
DPU DKI Jakarta (Special Region of Capital City Jakarta)  
Project Manager  
Urban Drainage Project Executing Agency  
Jalan Taman Jatibaru No. 1,  
Jakarta Pusat (10260), INDONESIA

Upon payment of a non-refundable fee of Rp. .... (..... )

Eligible Applicants may obtain the Prequalification Documents in person by letter or by writing, faxing or telexing to the address given above clearly stating, "Request for Prequalification Documents for Urban Drainage Project - Package-3 Gede/Bor Drainage Channel, Saluran Cengkareng Drainage Channel, and Meruya Drainage Channel".

and giving the following details :

Address : .....  
Fax : .....  
Telex : .....  
Phone : .....  
( Separate letter/request may be sent for each individual Package ).

The Prequalification Documents will promptly be dispatched by registered mail, but under no circumstances hold responsibility for late delivery or loss of the documents so mailed.

1.3 The Prequalification Documents shall be duly filled in and returned in an original along with four (4) extra copies as detailed in Section-6 not later than 12.00 hours, West Indonesian Standard time on ..... 199... . The envelopes should be marked as follows :

"Prequalification for Construction Contract for Civil Works of the Urban Drainage Project - Package - 3 Gede/Bor Drainage Channel, Saluran Cengkareng Drainage Channel, and Meruya Drainage Channel." (One set of Prequalification Documents to be submitted for each Package).

The Prequalification Documents should be completed strictly in accordance with the attached format except Annexes wherein additional information may be included to support the application for Prequalification.

No responsibility will be accepted for applications not received or received late.

1.4 It may be noted that the Government of Indonesia encourages the Foreign Contractor to form a joint operation with bonafide Indonesian Contractor ( Class A, Civil Works Division, Water Resources Sub-Division ).

1.5 Applicants will be advised, in due course, of the result of their application, and only successful Applicants under this procedure will be invited to bid.

## SECTION - 2 GENERAL INFORMATION ON BIDDING PROCEDURES

### 2.1 Introduction to Bidding Procedures

This document details the procedure to be followed in the Prequalification of Bidders for the Construction of Civil Works of the Urban Drainage Project in the City of Jakarta in accordance with the Bid and Contract documents to be issued in various packages listed in Section - 4 by :

Urban Drainage Project Executing Agency  
Directorate General of Human Settlements  
Ministry of Public Works  
Republic of Indonesia

hereinafter known as " Employer ".

The bidding procedure will consist of two stages :

- a) Prequalification of Applicants, and
- b) Submission of Tenders by the Prequalified Tenderers.

The bidding will be open to the Contractors duly prequalified by the Employer with their records and experience satisfactorily fulfilling all requirements specified in Section-5 and demonstrated in the manner prescribed in this volume.

### 2.2 Prequalification Time Schedule

2.2.1 The sequence of dates for carrying out this prequalification has been programmed as follows :

- a) Start of issue of Prequalification Documents .....
- b) Last date for Applicants to request for clarification .....
- c) Last date for Employer to issue adenda for  
Prequalification Documents .....
- d) Closing date for receipt of completed  
Prequalification Documents by the Employer  
from the Applicants .....

Notwithstanding any provisions contained in this Document, the Employer reserves his right to make any changes in the aforesaid time schedule.

2.2.2 If any Applicant is uncertain as to the true meaning of any Clause of the Prequalification Documents, he shall at once apply to the Employer by written request for clarification in accordance with the time schedule specified in Clause 2.2.1 above. All interpretation will be made only by official circular letter (Addenda) issued by the Employer. All Addenda issued will become part of the Prequalification Documents.

2.2.3 Addenda to the Prequalification Documents may be issued until the date indicated in the prequalification time schedule in Clause 2.2.1 hereof, in order to clarify provisions herein or to notify modifications. Each Addendum to be issued will be distributed to each Applicant, who shall acknowledge receipt of each Addendum by signing and returning the receipt form distributed with the Addendum. All Addenda issued will become part of the Prequalification Documents.

### **2.3 Duties and Taxes**

2.3.1 Prior to the submission of the Prequalification Documents, the Applicant shall obtain by independent inquiries from the Indonesian authorities, all necessary and reliable information on all applicable local laws as well as duties and taxes to be levied on the Contractors with reference to his status as a foreign firm, domestic firm, joint venture or joint operation and shall familiarise himself with the rules and regulations regarding the exemption from such duties and taxes for the Contractors and his expatriate personnel on construction of the Project with financial assistance by international loans and the official procedures required therefor. The Contractor and his personnel shall abide by all local laws and shall pay all applicable duties and taxes in connection with the Contract. Failure to obtain any part of the above information shall be at the Applicant's own risk regarding his cost expenses in case of award of the Contract.

### **2.4 Eligibility for Bidding**

2.4.1 The Applicant, firm, partnership or company either individually or severally in joint operation shall be from the Eligible Source Countries in the List (Appendix- PQ (1) ). The Contractor shall not make any expenditure in goods or services from territories which are not included in the list. The Contracting firm shall meet the requirement stipulated in the Prequalification Announcement hereof.

2.4.2 A joint operation is a form of partnership of two or more firms of established solely for a certain Project operation and one of its members will act as the leading firm of Joint Venture representing the joint operation and sign all documents including the Bid and the Contract. In case of award, however, all its members are jointly and severally liable for the obligations arising out of in the preparation of Bid and in the implementation of the Contract.

A Joint Venture is a new firm established on a permanent basis in accordance with the Indonesian Law, by two or more firms ( called the parent firms ).

2.4.3 In case of joint operation of Contractors, the Applicant, before submission of the Prequalification Documents, shall acquaint himself of all laws, regulation, orders and Decrees of Indonesian Government governing this formation and obtain information on all matter for implementation of the Works by a proposed joint operation including the time required to complete all necessary formalities both local and abroad for the registration of the joint operation in Indonesia. Any neglect or failure on the part of the Applicant in obtaining necessary and reliable information by himself upon the foregoing or any other matters affecting the joint operation, shall not relieve him from any responsibility or obligation under the Contract in case of award, nor entitle him to any time extension for the work schedule of the Project.

2.4.4 The shareholding structure of the Joint Venture or joint operation shall not be modified through the whole period of the Contract except with the prior written approval of the Employer; otherwise the Employer will be entitled to cancel the Contract without any formalities, and to apply the penalties stipulated in the Bid and Contract Documents concerning the cancelation of the Contract.

The membership of a joint operation at the time of Tender shall be the same as that presented for Prequalification. Any change without a prior written approval of the Employer will be grounds for rejecting the Bid.

2.4.5 Any firm, partnership or company can apply for Prequalification once only, either individually or in Joint Venture or in joint operation for each independent Contract Package. Each Applicant can apply for Prequalification for a maximum of any two of the Civil Works Contract Packages listed and can bid for maximum of two Packages, with due regard to having been duly prequalified for the Package, provided that the key personnel, plant and equipment shall be indicated different for each Package.

## **2.5 Qualifying the Applicants**

2.5.1 The Employer will notify each Applicant if he is qualified or not. The notification will be made by cable or telex or by letter. The Employer has the full right without giving any justification to disqualify any Applicant who, at the Employer's discretion, does not meet the requirements indicated in the Prequalification Documents, or does not submit the required documents or is not acceptable to the Employer for reasons in their opinion to be substantial. The Employer will not accept any claim regarding the results of the Prequalification.

2.5.2 All documents and information received from the Applicants are strictly confidential, and the documents will not be returned both in the event of rejection or acceptance of the Applicants for the Prequalification.

2.5.3 All expenses relating to the application for this Prequalification will be at the Applicant's charge.

2.5.4 The fact that the Applicant may be qualified for the Civil Works Contract for any one or more of the Packages of the Urban Drainage Project does not automatically qualify them as Tenderers for other Contracts under the Ministry of Public Works.

## SECTION - 3 BRIEF DESCRIPTION OF THE PROJECT

### 3.1 Background of the Project

Jakarta, the Capital of Indonesia, has been undergoing rapid urbanization and resultant explosive population increase in recent years : the population in Jakarta doubled from 4.6 million in 1975 to 8.8 million in 1988 and is expected to reach 12.8 million in 2010.

The urbanization and population increase have brought about not only serious sanitation impairment and other environmental problems in Jakarta but also appearance of new flood prone areas even in the relatively undeveloped fringe areas of Jakarta. The appearance of the new flood prone areas is considered to result mainly from drastic change in land use due to urbanization.

Under such circumstances "The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta" was carried by Japan International Cooperation Agency (JICA) during the period from March 1989 to March 1991, in response to the request from the Government of the Republic of Indonesia, of which the objectives were;

- Master plan study on drainage, sanitation and sewerage development in Jakarta, and
- Feasibility study on drainage and sewerage development in high priority areas identified by the master plan study.

The Study concluded through the master plan study that the northwestern region of Jakarta was the highest priority area for the urban drainage development and strongly recommended through the feasibility study that the drainage development in this area should be immediately implemented.

The Project area, of which the location is as shown in Fig. 1, suffers every rainy season from inundation, even during small floods, because of insufficiency of drainage capacity. In addition, the inundation frequently disturbs the operation of the Soekarno-Hatta International Airport and the function of Jakarta because traffic interruption is caused by the inundation in the highway and trunk roads between the Airport and the center area of Jakarta. To cope with these situations, it has been proposed in the feasibility study to implement the existing river/drainage channel improvement, to provide additional drainage channels with related

drainage structures in four areas, namely, Cengkareng West Area, Sepak River Area, Bojong Area and Meruya Ilir Area.

According to the above proposal, the Government of the Republic of Indonesia decided to implement the detailed design of the Urban Drainage Project in the City of Jakarta and requested technical assistance of the Government of Japan for the detailed design. In response to the request, JICA made an additional investigation and detailed design of this Project since August, 1996. Implementation Program for the Project was prepared in ....., 199..... by the Directorate General of Human Settlements.

A loan agreement was concluded between ..... International Financing Agency (to be named)..... and the Government of Indonesia in ....., 199..... to implement this Project and Tender Documents were updated in ....., 200..... by the Consultant, ..... (to be named).....

The basic concept for this Project was established considering rapid urbanization in the Cengkareng West and Meruya Areas represented by house development, drastic variation of the existing drainage networks due to construction of interchange of the Jakarta ring road, and anticipating future land use conditions.

The works intend to contain the frequent floods and habitual inundation and to relieve the urbanized region, farm lands and inhabitants in the Project area from sufferings, losses and damages caused by flooding. The completion of the Works under this Project will lead to better economic conditions and social welfare for the inhabitants of the Project area.

### **3.2 Description of the Project**

#### **3.2.1. Project Area**

The geographic location of the Project area is in the city of Jakarta, 106° 43' 30" East longitude and 06° 07' 30" South latitude. The Project area is located about 3 km east of the Soekarno-Hatta International Airport.

The Cengkareng West Area is located in the north-western part of Jakarta and bounded by highway connecting the international airport and city of Jakarta in west, Mookervaat canal in south, Cengkareng floodway in east and Jakarta bay in north. Drainage area of the Cengkareng West Area is About 40 km<sup>2</sup> and is characterized by remarkably low land elevation



having EL. 0 m to EL. 5 m, and almost all of the area has already been acquired by private house developers or enterprises.

The Meruya Area is located in the southern part of highway connecting Jakarta and Merak harbour and bounded by existing drainage canal in the west, higher elevated area in the south and higher elevated street in the east. Drainage area of the Meruya drainage system is about 1.5 km<sup>2</sup> and all of this area has been utilized as residential area.

Fig. 2 and Fig. 3 show habitual inundation areas in the Cengkareng West and Meruya Areas, respectively.

### 3.2.2 Climate

The climate in the Project area is characterised by tropical monsoon and classified into two seasons, the dry season from July to October and the wet season from November to April. Annual mean temperature is 26.5°C ranging from 35.2°C in November to 17.4°C in August. Monthly mean relative humidity ranges from 75 % to 89 % throughout a year.

Annual rainfall during the period from 1986 to 1955 at the international airport is around 1,800 mm. The monthly maximum rainfall is 644 mm in January and monthly minimum is 1 mm in October. The highest frequency and lowest frequency of rainy day occur in January and September, respectively.

Table 1, Table 2, Table 3 and Table 4 show temperature, relative humidity, prevailing wind and rainfall in Jakarta, respectively.

### 3.2.3 Existing Drainage System

#### (1) Package - 1 : Kamal Drainage Channel

The Kamal Drainage Channel has about 11.9 km in total length comprising about 9.7 km of wet masonry lining and 2.2 km of unlined channel. The channel is about 15 m wide and 2.5 to 3 m deep at the highway crossing and 10 m wide and 1.5 m deep at the junction portion of the existing drain cannal. The channel bed slope is 1 : 3,000 at about 2.3 km from the channel mouth and 1 : 1,700 at the upstream stretch.

No related structures such as gates and weirs have been provided along the drainage channel, except 31 bridges and a culvert. Majority of the bridges are single span and about 3 to 8 m in length.

(2) Package - 2 : Tanjungan Drainage Channel, and  
PIK Junction Drainage Channel

(a) Tanjungan Drainage Channel

The Tanjungan Drainage Channel has about 1.9 km in total length comprising about 1.7 km of wet masonry/concrete lining and 0.2 km of unlined channel. The channel is about 5 m wide and 0.8 m deep at the highway crossing. The channel bed slope is about 1 : 5,000 in all over the channel. Due to this gentle slope, drainage water is stagnating in the dry season.

A culvert, 3.4 m wide and 1.5 m high is provided under the Cengkareng highway but its drainage capacity is a little due to subsidence of the highway. Water drained through this culvert flows into fish pond and poured to the Jakarta bay.

No related structures have been provided along this channel, except 5 bridges and a culvert.

(b) PIK Junction Drainage Channel

The existing drainage system in this area has been drastically changed and interrupted by construction of the interchange of the Jakarta ring road. At present, 5 pipe culverts with 0.8 m in diameter are provided crossing the existing Cengkareng highway.

The new PIK Junction Drainage Channel will be about 1 km in total length. The water collected from the densely populated area in the left bank of the Cengkareng floodway will be drained through 7 pipe culverts with 0.8 m in diameter to be provided crossing the highway and a pipe culvert, 0.7 m in diameter, to be provided at the interchange.

No related structure will be provided except 4 culverts crossing the new channel.

(3) Package - 3 : Gede/Bor Drainage Channel,  
Saluran Cengkareng Drainage Channel, and  
Meruya Drainage Channel

(a) Gede/Bor and Saluran Cengkareng Drainage Channels

The existing Gede Drainage Channel, 3.4 km long in total, comprises 1.5 km constructed by DKI Jakarta and 1.9 km constructed by a private sector. The latter, having about 8 m wide and 2 m deep, is lined and drains into the Bor Drainage Channel. Flow direction of the Bor Drainage Channel is divided into two, namely the southern direction to the Mookervaat canal and the eastern direction to the Saluran Cengkareng Drainage Channel. The existing Bor Drainage Channel, having bed slope of about 1 : 1,100, is about 1.5 km in total length to the Mookervaat canal.

The Saluran Cengkareng Drainage Channel, having bed slope of about 1 : 3,000, is about 4.2 km in total length and drains into the Cengkareng floodway. Out of 4.2 km of the channel, 3.4 km is lined and the remainder is unlined. Its dimension is 5 to 8 m wide and 1.5 m deep at the upstream end, and about 10 m wide and 1.8 m deep at the confluence of the Cengkareng floodway. A sluiceway with 2 sets of spindle gates, 2.4 m wide x 2.6 m high, has been provided at the outlet of the Saluran Cengkareng Drainage Channel. 14 bridges cross this Channel.

(b) Meruya Drainage Channel

The Meruya Drainage Channel is secondary level and comprises about 0.6 km long concrete line ditch and another 0.6 km long unlined ditch. The channel is about 1 to 2 m wide and 1 m deep.

In the rainy season, habitual inundation with long duration takes place in the depression areas due to undulation of the ground surface and inadequate drainage canal alignment. Besides, the interchange of the highway is now under construction in the north-eastern part of this basin. Due to construction of the said interchange, the drainage effect will be disturbed considerably. 5 bridges and 3 culverts cross the existing Meruya Drainage Channel.

#### 3.2.4 Geology

The Project area is covered by Holocene and Pleistocene deposits, and is situated in the coastal plain with several meters of ground height above the mean sea level.

The sub-surface of the Jakarta plain consists of 250 m thick, Quaternary soils. Clays represent more than 70% of the soil cover. Thin sand layers are intercalated but laterally they

are not continuous. The sands are fine grained and silty. In general, the ground water level lies 2 m below the ground surface. The soils are softer in the coastal area and more consistent from highway to the south and in the Meruya Area.

Very soft and soft, clayey and silty soils having SPT-value of 0 to 3 blows, cover in the lower Kamal and Tanjung Areas, till the level of the highway. Their thickness is 9 to 11 m. Underneath, the soils are more consistent and SPT-values are gradually increase to 20 and 30 blows, for an investigation depth of 35 m.

South of the highway, towards the Daan Mogot road, mixed or clayey soft soils, where the SPT-value is less than 10 blows, extend from the ground surface to 5 or 7 m in depth. Underneath, 1.5 to 7 m thick, cemented sands having SPT-value of more than 50 blows, are found. This bed is not continuous over the entire area. The sands are underlain by stiff to hard clays having SPT-values of 15 to 30 blows.

The Meruya Area is covered with red soils. These are mixed type of soils, containing equal amounts of clay, silt and sand, locally with gravel. Such soils are generally stiff to hard. From the sounding data, a hard layer, possibly cemented sands, underlies the soil cover, at an average depth of 5 m.

Most of the soils analyzed in the laboratory are high plastic CH clays. The liquid limits are higher than 100%, the natural water content is 50 to 60% on an average and the degree of saturation is close to 100%. The wet unit weights are close to the saturated unit weights, that is  $1.654 \text{ t/m}^3$ . The soils referred to as "sandy" are composed of 67% of fines on an average, belong to the MH class of soils and have natural unit weights of  $1.775 \text{ t/m}^3$ .

The mean values of shearing strength characteristics of the saturated clayey soils are  $0.6 \text{ kg/cm}^2$  for the cohesion and  $6^\circ$  for the internal angle of friction. The shearing strength parameters of the sandy soils, 54 to 65% of fines, are  $0.45 \text{ kg/cm}^2$  for the cohesion and  $25^\circ$  for the internal angle of friction.

The consolidation characteristic of the clayey soils show that most soils can be considered overconsolidated, with consolidation yield stresses ranging from  $0.6$  to  $3 \text{ kg/cm}^2$ . The consolidation index values are generally higher than 0.4 indicating highly compressible soils.

The nature of the soils reflect a mixed marine and continental origin, typical for tidal flat deposits. During high tide, the sea water covers the entire flat area and submerges the creeks. After the withdrawal of the sea water a thin film of fine sediments is left. Organic matters and shell fragments are common in such deposits.

Besides, the settlement after the construction, the Project area and the entire Jakarta plain area affected by subsidence, due to self-weight consolidation in the deeper soil beds (40 to 250 m). This process is triggered by groundwater pumping from the deeper, confined aquifer and its impact on the sub-surface is far more important and the countermeasures imply long term decisions, on regional scale. At present there are 300 m long deep wells in the Cengkareng Area, where groundwater is pumped for industrial purposes. It has been reported that the maximum land subsidence rate in the Project area is about 8cm/year.

The physical characteristics of soils from all of the locations and all depth are fine, highly plastic soils, clayey, saturated and often overconsolidated.

The red soil is found in situ in the Meruya Area. It consists of sand, silt and clay mixtures, gravely, low plastic and with low compressibility. Only at few locations, the original surface soils are still in place,

### 3.3 Principal features of the Project

Major construction works comprise widening and deepening of the existing five (5) drainage channels in the Cengkareng West Area and construction of a drainage channel in the Meruya Area, including construction of revetments, levee embankment, sluiceway and gate facilities, and construction of bridges.

The principal features of the Urban Drainage Project are summarized as below :

<b>Package - 1 : Kamal Drainage Channel</b>	<b>(L = 7.2 km)</b>
Slope of channel bed	
Main channel	: 1:3,200, 1:1,800
Branch channel	: 1:1,800
Width of channel bed	
Main channel	: 30 ~ 35 m
Branch channel	: 2 ~ 13 m
Revetment	: Both side slopes

Bridges ( L = 2.3 ~ 56.7 m, W = 2.5 ~ 9.6 m )  
Girder type : 26 nos.  
Slab type : 2 nos.

Slide gates : 20 sets

Flap gates : 4 sets

**Package - 2 : Tanjungan Drainage Channel** (L = 2.5 km)  
Slope of channel bed : 1:5,000

Width of channel bed : 15 ~ 25 m

Revetment : Both side slopes

Bridges ( L = 18.5 ~ 40.6 m, W = 2.5 ~ 12.2 m )  
Girder type : 5 nos.

Slide gates : 7 sets

Flap gate : 1 set

**PIK Junction Drainage Channel** (L = 0.8 km)  
Slope of channel bed : 1:600

Width of channel bed : 2.2 m

Channel : Reinforced concrete

Bridges ( L = 2.8 m, W = 4.6 ~ 8.2 m )  
Slab type : 4 nos.

Slide gate : 1 set

**Package - 3 : Gede/Bor Drainage Channel** (L = 1.2 km)  
Slope of channel bed : 1:1,600

Width of channel bed : 10 ~ 11 m

Revetment : Both side slopes

Bridges ( L = 15.8 m, W = 3.5 ~ 9.6 m )  
Girder type : 10 nos.

Slide gates : 6 sets

<b>Saluran Cengkareng Drainage Channel (L = 4.2 km)</b>	
Slope of channel bed	: 1:3,000
Width of channel bed	: 6 ~ 10 m
Revetment	: Both side slopes
Open culver	: 391 m long
Bridges ( L = 10.5 ~ 15.8 m, W = 2.5 ~ 12.2 m )	
Girder type	: 13 nos.
Gates	
Slide gates	: 16 sets

<b>Meruya Drainage Channel (L = 2.3 km)</b>	
Slope of channel bed	: 1:260 to 1:2,000
Width of channel bed	: 1.2 ~ 8 m
Channel	: Reinforced concrete
Bridges ( L = 1.5 ~ 10.0 m, W = 1.5 ~ 10.6 m )	
Culvert type	: 16 nos.
Box culvert	: 794 m

The Urban Drainage Project aims at increasing the flow capacity of the said Drainage Channels up to the protection level of a probable 10-year flood for the Cengkareng West Area and 5-year flood for the Meruya Area by dredging the riverbed and heightening the levees.

The high tension electric lines, telephon cable ducts, and water and gas supply pipe lines are crossing the existing drainage channels. Due to expansion of the drainage channels, treatment of these lines are required. Furthermore, it is obliged to shift the existing telephone poles, concrete structures with gates for drainage facilities of highway, road signs, traffic signals, etc., due to expansion of the existing drainage channels.

Proposed drainage channel alignments are shown in Fig. 4 for the Cengkareng West Area, and in Fig. 5 for the Meruya Area.

Typical sections are shown in Fig. 6 for levee, in Fig. 7 for concrete wall, in Fig. 8 for revetment, in Fig. 9 for sluiceway, in Figs. 10 to 12 for outlet structures, in Fig. 13 for road bridge, and in Fig. 14 for pedestrian bridge.

Typical cross sections of the Gede/Bor, Saluran Cengkareng and Meruya Drainage Channels are shown in Fig. 15. Plans of the Gede/Bor Drainage Channel are shown in Fig. 16 to Fig. 19.

Plans of the Saluran Cengkareng Drainage Channel are shown in Fig. 20 to Fig. 25 and those of Meruya Drainage Channel are shown in Figs. 26 to 32.

The intended implementation programme is shown in Fig. 33.



## SECTION - 4 IMPLEMENTATION METHOD ( Tendering Packages )

4.1 The Project is intended to be implemented in the following Tendering Packages and major items of work to be carried out by the Contractor under each Contract Package are listed out in general, but not necessarily limited to these items ;

### Package - 1

(1) Improvement of the Kamal Drainage Channel, main canal and its branch, about 7.2 km in total length.

The Construction of Civil Works include among other items :

- (a) Temporary construction approach roads; L.S.
- (b) Coffering, river diversion and dewatering; L.S.
- (c) Works in main canal;

- Levee, embankment	:	4,829 m
Left bank	:	2,059 m
Right bank	:	2,770 m
- Levee, parapet wall	:	493 m (left bank)
- Revetment, type I	:	710 m
Left bank	:	288 m
Right bank	:	422 m
- Revetment, type I, w/o embankment	:	595 m
Left bank	:	433 m
Right bank	:	162 m
- Revetment, type II	:	1,590 m
Left bank	:	594 m
Right bank	:	966 m
- Inspection road	:	2,901 m
Left bank	:	2,269 m
Right bank	:	632 m

- Bridges : 9 nos.
- Road bridge : 6 nos.
- Pedestrian bridge : 3 nos.
- Slide gate : 16 sets
- Stoplog : 2 sets

(d) Works in branch canal;

- Revetment, type I : 1,528 m
- Left bank : 766 m
- Right bank : 762 m
- Revetment, type I w/o embankment : 186 m (right bank)
- Revetment, type II : 1,629 m
- Left bank : 1,103 m
- Right bank : 526 m
- Revetment, heightening : 624 m (right bank)
- Concrete ditch : 904 m
- Left bank : 452 m
- Right bank : 452 m
- Inspection road : 1,561 m
- Left bank : 189 m
- Right bank : 1,372 m
- Bridges : 19 nos.
- Road bridge : 14 nos.
- Pedestrian bridge : 3 nos.
- Box culvert : 2 nos.
- Gates : 8 sets
- Slide gate : 4 sets
- Flap gate : 4 sets

(e) Construction, completion and maintenance; L.S.

(f) Mobilization and demobilization of general facilities; L.S.

**Package - 2**

(1) Improvement of the Tanjungan Drainage Channel, about 2.5 km in total length.

(2) Construction of the new PIK Junction Drainage Channel, about 0.8 km in total length.

The Construction of Civil Works include among other items :

(a) Temporary construction approach roads; L.S.

(b) Coffering, river diversion and dewatering; L.S.

(c) Works in Tanjungan channel;

- Levee, dump fill	:	3,117 m
Left bank	:	1,454 m
Right bank	:	1,663 m
- Levee, embankment	:	363 m
Left bank	:	283 m
Right bank	:	80 m
- Revetment, type II	:	347 m
Left bank	:	204 m
Right bank	:	143 m
- Concrete wall	:	1,134 m
Left bank	:	567 m
Right bank	:	567 m
- Inspection road	:	500 m (right bank)
- Bridges	:	5 nos.
Road bridge	:	4 nos.
Pedestrian bridge	:	1 no.
- Gates	:	8 sets
Slide gate	:	7 sets
Flap gate	:	1 set
- Stoplog	:	3 sets

(d) Works in PIK Junction channel;

- Concrete ditch	:	765 m
- Bridges, box culvert	:	4 nos.
- Slide gate	:	1 set
- Stoplog	:	1 set

- (e) Construction, completion and maintenance; L.S.
- (f) Mobilization and demobilization of general facilities; L.S.

**Package - 3**

- (1) Improvement of the Gede/Bor Drainage Channel, about 1.2 km in total length.
- (2) Improvement of the Saluran Cengkareng Drainage Channel, about 4.2 in total length.
- (3) Improvement of the Meruya Drainage Channel, about 2.3 km in total length.

The Construction of Civil Works include among other items :

- (a) Temporary construction approach roads; L.S.
- (b) Coffering, river diversion and dewatering; L.S.
- (c) Works in Gede/Bor channel;

- Outlet structure : 20 m long
- Revetment, type I : 265 m (left bank)
- Revetment, type II : 2,101 m
  - Left bank : 918 m
  - Right bank : 1,183 m
- Inspection road : 265 m (left bank)
- Bridges : 10 nos.
  - Road bridge : 9 nos.
  - Pedestrian bridge : 1 no.
- Slide gate : 6 sets

- (d) Works in Saluran Cengkareng channel;

- Outlet structure : 20 m long
- Open culvert : 391 m
- Levee, embankment : 3,449 m
  - Left bank : 1,912 m

Right bank	:	1,537 m
- Levee, parapet wall	:	1,420 m
Left bank	:	569 m
Right bank	:	851 m
- Revetment, type I	:	977 m
Left bank	:	435 m
Right bank	:	542 m
- Revetment, type II	:	1,799 m
Left bank	:	906 m
Right bank	:	893 m
- Inspection road	:	3,928 m
Left bank	:	2,632 m
Right bank	:	1,296 m
- Bridges	:	13 nos.
Road bridge	:	9 nos.
Pedestrian bridge	:	4 nos.
- Slide gate	:	16 sets
- Stoplog	:	5 sets

(e) Works in Meruya channel;

- Concrete open culvert	:	1,475 m
- Concrete box culvert	:	794 m
- Heightening of existing road:		876 m
- Bridges, box culvert	:	16 nos.

(f) Construction, completion and maintenance; L.S.

(g) Mobilization and demobilization of general facilities; L.S.

Scope of permanent works of all Packages proposed have been stated above for information to the civil works Contractor of each package(s) as an overall view of the whole Project works and components. The scope of work as applicable to the Contractor for his Contract Package shall be considered in particular by him. Particular attention shall be given by the Contractor in co-operating with the other contractor for replacing utility facilities such as electric power, water supply pipe, gas supply pipe, telecommunication lines, etc.

4.2 The detailed design work of the Project was completed early 1998 and Tendering Documents for Civil Work Contracts were completed. After signing of the Loan Agreement with International Financing Agency (to be named), Tendering will be opened with the issue of Tender Documents for Package - 3 for the Urban Drainage Project by ..... 200..... The process of Tendering, Evaluation, Approval and Contract Award is likely to take about 8-10 months. The Contractor is expected to start work in three months thereafter.

4.3 The intended implementation programme is shown in the form of a bar chart in Section-7.

4.4 The Contractor shall be capable of mobilising in not exceeding ninety ( 90 ) days materials, equipment and services adequately for the tasks assigned in achieving the milestones and maintaining the Completion Time.

4.5 The Applicant is requested to submit in full all the documents along with supplementary information that he may like to give for each Package separately as set out in Section-5 hereof and indicate clearly the Packages for which Prequalification is applied for by the Applicant. Bidders shall be invited to submit their bids individually for each Package and a maximum of Two Packages by one Bidder.

4.6 The Applicant shall give adequate information on general experience, personnel capabilities, availability of construction equipment and financial position to substantiate his capability to complete the contractual obligations of this nature successfully.

## **SECTION - 5 PREQUALIFICATION DOCUMENTS**

### **5.1 Prequalification Requirements**

**5.1.1** In order to qualify for Prequalification, the following requirements must be fulfilled :

- (a) To be a firm, partnership or company duly organized and existing or registered under the laws of the Government of Indonesia or Eligible Source Country as listed in Appendix - PQ (1) under Section - 2.
- (b) To have been in business as a general contractor for civil works for the last 8 years or more and fulfil specific background and experience required for each Package as set out in Clause 5.1.2 herebelow.
- (c) To have no overdue debts of any kind towards the Revenue Authorities and the Customs of the Government of Indonesia.
- (d) In case of a joint venture, the joint venture company shall fulfil qualification requirements under paragraphs (a), (b), and (c).
- (e) In case of a joint operation of two or more firms, partnership or companies, one of these firms, partnerships or companies will be nominated as the Sponsor to represent the joint operation. The qualification requirements under paragraphs (a), (b), and (c) shall apply to the Sponsor who shall be entirely responsible for the works and execution of the Contract in case of award. Firms, partnership or companies other than the Sponsor shall fulfil qualification requirements under paragraphs (a) and (c) and possess adequate personnel and experience as may be applicable to the nature of works to be handled by them in this Project.
- (f) If the Applicant intends to sub-let part of the works under sub-contract, prospective sub-contractors shall be indicated in the prequalification forms to be filled in by the Applicant and will be subject to the evaluation of the Employer.

The main work shall not be sub-contracted and the work sub-let to any single sub-contractor shall not exceed thirty (30) percent and the total work under sub-contracts shall not exceed forty (40) percent.

- (g) International contracting firm or firms are strongly encouraged to work in partnership with bonafide Indonesian Contractor(s).

5.1.2 The intended implementation Packages for Tendering and major components thereof have been indicated in Section - 4 of this document. To be qualified for the Package(s) for which the application is made for Prequalification, minimum requirement of job experiences are as below ;

**PACKAGE - 1** The Applicant shall have in the past ten years satisfactorily carried out the construction of 8 km of river/drainage channel improvement works in low land areas involving excavation in foundation and drainage channel including dredging, precast concrete and steel sheet piling works, reinforced concrete works and slope stabilisation measures as well as drainage. At least 5 key personnel shall have such experience, from whom a field representative and an associate/ alternate will be selected.

**PACKAGE - 2** The Applicant shall have in the past ten years satisfactorily carried out the construction of 5 km of river/drainage channel improvement works in low land areas involving excavation in foundation and drainage channel including dredging, precast concrete and steel sheet piling works, reinforced concrete works and slope stabilisation measures as well as drainage. At least 5 key personnel shall have such experience, from whom a field representative and an associate/alternate will be selected.

**PACKAGE - 3** The Applicant shall have in the past ten years satisfactorily carried out the construction of 8 km of river/drainage channel improvement works in low land areas involving excavation in foundation and drainage channel, precast concrete and steel sheet piling works, reinforced concrete works and slope stabilisation measures as well as drainage. At least 5 key personnel with the above experience of constructing hydraulic structures shall be available, from whom a field representative and an associate/alternate will be selected.

The following minimum qualification and experience are required for supervisory personnel as may be nominated ;

**Project Manager** : - Graduate of University or equivalent in civil engineering.  
- 15 years or longer experience in the management of civil engineering projects of similar nature.



- Permanent staff of the Tenderer.

River/Drainage Engineer : - Graduate of University or equivalent in civil engineering.  
- 15 years or longer experience in construction of river/drainage channel improvement works under the conditions similar to the Project.

Civil Engineer : - Graduate of University or equivalent.  
- 8 years or longer experience in the earth and concrete works.

Mechanical Engineer : - Graduate of University or equivalent.  
- 8 years or longer experience in hydro-mechanical works, and repair and maintenance of construction equipment and plants under the conditions similar to the Project.

## **5.2 Submission of Prequalification Documents**

5.2.1 Prequalification Documents shall be submitted in an original and four (4) copies. Each set of Documents shall consist of the Prequalification Application in its original binding, including all addenda, if any, and of the supporting documents indicated in Clause 5.3 herebelow. It is reminded once again that separate set of Documents shall be submitted for each individual Package.

Each copy of the above mentioned documents shall be respectively marked "Original", " First Copy", "Second Copy", etc.

In case of discrepancy between the copies and the "Original", the "Original" shall prevail.

5.2.2 The Prequalification Application shall be completed in ink/typed and no changes shall be made to the wording printed thereon. If there are any mistakes in filling in the Document, corrections shall be only by means of writeovers initialled by the person signing the Prequalification Documents.

5.2.3 All documents shall be in English or accompanied by translation into English and when prepared abroad shall be duly authenticated by a Notary Public and certified by a Consulate or commercial agency of the Government of Indonesia.

5.2.4 The "Original" and four (4) copies of the Prequalification Documents shall reach the following address :

The Project Manager,  
Local Public Works,  
DPU DKI Jakarta (Special Region of Capital City Jakarta)  
Urban Drainage Project Executing Agency,  
Jalan Taman Jatibaru No. 1,  
Jakarta Pusat (10260), INDONESIA

not later than the time indicated under Clause 2.2.1.

5.2.5 Documents shall be enclosed in a sealed package showing outside the name and address of the Applicant and marked as follows ;

Prequalification Documents for Civil Works Construction  
Urban Drainage Project  
Package- 3 Gede/Bor Drainage Channel, Saluran Cengkareng Drainage Channel,  
and Meruya Drainage Channel

5.2.6 In order to fulfil all the requirements, the Applicant shall annex to the Prequalification Documents the following supporting documents/information in the Forms (Annexes 1 to 3) attached hereto and any other additional supporting data that the Applicant may like to give.

### 5.3 Prequalification Forms

5.3.1 The Letter of Intent (Annex - 1) and all Forms (Annexes - 2 and - 3) shall be filled in by the Applicant in accordance with the following instructions ;

(a) General :

Full name and title of the authorised representative should be mentioned where space for representative's signature is provided.

(b) Letter of Intent to apply for Prequalification :

The Applicant shall fill in this letter, stating whether it is a firm, partnership, company, joint venture or joint operation and indicating the names of all partners for partnership, all parent firms or companies for the joint venture, and the

Sponsor and all other member firms for the joint operation. In the letter, the full business address of the Applicant and his representative in Indonesia, if any, shall also be indicated.

5.3.2 Annex - 2 List of Prequalification Forms (General) :

The Applicant shall indicate in this list all the Forms ( - 1 to - 5 ) filled in together with the documents furnished as applicable under Supplementary Documents below and the progressive number which shall correspond to the number marked on the relevant document.

Form No. -1 : The Applicant firm, company, joint venture or joint operation and their prospective sub-contractors, if any, shall fill in and sign one copy of this form. If the Applicant is a joint venture, each and every parent firm or company must fill in a separate copy of Form No.- 1 in addition to that filled in for the joint venture. If the Applicant is a joint operation, one copy for each member of the same must be filled.

Form No.- 2 : A statement issued by a Bank in conformity with the text of the attached Form No. -2, which will undertake to issue the Bid-Bond and Guarantees in case of award of the Contract. The statement shall be from a foreign exchange bank operated in Indonesia or other banks appointed by Decree of Minister of Finance, No. 523/Km K.013/1989 dated May 18, 1989. If the Applicant is a foreign firm then he may provide a statement issued by an exchange bank as above or a foreign bank not operating in Indonesia but acceptable to Bank Indonesia.

Forms Nos.- 3 and - 4 : Balance sheet of the Applicant for the last three successive years to be attached with a statement of recapitulation of quick assets and liabilities.

In addition to Forms Nos. - 3 and - 4, the Applicant may attach his own balance sheets, if any. Financial statement and information shall be certified by public accountant.

Form No.- 5 : This form shall contain the names and addresses of public or private bodies of the Republic of Indonesia or foreign countries which are able to give technical and financial reference about the Applicant. One copy of Form

No.- 5 shall be filled in for each parent firm or company of the joint venture, each member of the joint operation and each prospective sub-contractors.

**Supplementary Documents ( General ) :**

(i) A photo copy of the business registration certificate by a competent National Authority stating the full name of the Applicant, the person, persons or board authorized to represent the Applicant, the date and place of registration as a Contractor, etc.

If the Applicant is a company or a joint venture, such certificate must state the scope, the paid up capital, the duration and the date of incorporation, the names of all directors including nationality and the shareholding structure of such company or joint venture.

In case of the Applicant being a joint venture, an affidavit duly signed by all parent firms or companies of the joint venture declaring that they shall be held jointly and severally liable for obligations arising out of the Contract if awarded to the joint venture.

In case of the Applicant being a joint operation, the document duly signed by all its members for establishing the joint operation (or the duly signed document of intent to form the joint operation) in which it is detailed precisely the condition under which it will function, its duration, the Sponsor authorized to represent it, to sign in its name all documents including the Bid and the Contract, and to take full responsibilities of the Works, and the shares of participation of each member thereof.

Such document shall contain particularly the obligation of all its members to be jointly and severally liable for the obligations arising out of the Contract in case of award and that such joint separate liability is not impaired by the special position of the Sponsor. A separate statement shall also be made by the Sponsor declaring that he, in addition to the liabilities mentioned above, shall be entirely responsible for the works and execution of the Contract.

(ii) Detailed information for any substantial change in the financial affairs of the Applicant after the last financial statement (balance sheet) which might affect the capability of the Applicant to successfully carry out the Works.

(iii) Detailed information of financial resources available including credit, loan or overdraft of a bank or loan from any other sources with supporting evidence.

(iv) Detailed information of current and future commitments of a contractual or other nature. In case of a joint operation, each member shall fulfil the above documentary requirements.

(v) A statement of the Applicant that he has no overdue debts towards the Revenue Authorities and the Customs of the Government of Indonesia.

5.3.3 Annex - 3 : The Applicant shall indicate the distinctive number and the page numbers of each Prequalification (Technical) Forms which have been filled in, and Supplementary Documents.

Form No.- 6 : The Applicant shall indicate the address and branch of specialization of the firms among which he proposes to select his sub-contractors for each Package for which this Prequalification Application is made.

Form No.- 7 : The Applicant shall fill in as many copies of this form as actually required for each position to show the experience of the field personnel to be fully assigned for construction of the works, classified for each Package for which Prequalification is applied for.

Forms Nos.- 8 and - 9 : The Applicants and their prospective sub-contractors shall fill in as many copies of these Forms as necessary for each Package separately to prove the fulfilment of the qualification requirements including those of each parent firm or company or joint venture and each member of the joint operation.

Form No.- 10 : The Applicant shall indicate in this form the Construction Plant and Equipment at his disposal which would be used for execution of the Contract, separately for each Package.

Form No.- 11 : The Applicant shall indicate the Applicant's plan of performing the Works including brief descriptions on use of construction equipment which would be applied to the Works.

**Supplementary Documents ( Technical ) :**

- (i) Attach any technical document which the Applicant considers suitable to present for the Prequalification. Attach photo copies of completion certificates issued by the relevant Owners or Engineers of such projects as listed in Prequalification Form No.- 8 to demonstrate that such projects were satisfactorily completed by the Applicant. Each parent firm or company of a joint venture and each member of a joint operation shall fulfill this documentary requirement.
- (ii) The Applicant shall provide accurate information on any litigation or arbitration resulting from contracts completed or under execution over the last five years. The information shall contain year, name of client, causes of litigation and matter under dispute, award for or against the Applicant and disputed amount. A consistent history of awards against the Applicant or any partner of a joint venture may result in failure of the application.

**5.4 Signatures and Other Conditions**

- (a) The signature of each Applicant required for his statements and information to be presented in the Prequalification shall be as follows :
  - (i) Where the Applicant is a firm, partnership or company (including a joint venture), one or more legal representatives of such firm, partnership or company shall sign. A power of attorney granting authority to sign by the said representative(s) shall be enclosed with the Prequalification Documents.
  - (ii) Where the Applicant is a joint operation, the Sponsor shall be authorized by all other members to sign all documents for the joint operation. A power of attorney granting authority to sign for the joint operation shall be enclosed with the Prequalification Documents.
- (b) A qualified firm or a member of a qualified joint venture may participate in only one Bid for the Works of each Package. If a firm submits more than one bid singly or in a joint venture, all Bids including that party will be rejected. This rule will

not apply in respect of specialist sub-contractors who are used by more than one Bidder.

- (c) Bidders shall be required to reconfirm the information used for Prequalification and indicate changes, if any, at the time of submitting their Bids, to confirm their continued compliance of the qualification criteria and verification of the information provided. The Bid shall be rejected if the Applicant's qualification shareholds are no longer met at the time of bidding.
- (d) The Employer and his authorised representative shall be authorised to conduct any inquiries or investigations to verify the statements, documents and information submitted in connection with this application, and to seek clarifications from Applicant's bankers and clients regarding any financial and technical aspects, should the Employer deem it necessary. Any individual or authorised representative or any institution referred to in the supporting information shall provide such information deemed necessary and requested by the Employer to verify the statements and information provided in the Documents with regard to resources, experience and competence of the Applicant.

***APPENDIX***



**LIST OF ELIGIBLE SOURCE COUNTRIES  
FOR  
INTERNATIONAL FINANCING AGENCY  
( To be filled in after the Loan Agreement is concluded )**

1. **Japan**

2. **Asia**

3. **Africa**

4. **America**

5. Europe

6. Oceania

7. All the member of Countries of the Organisation for Economic Cooperation and Development (OECD)

Countries mentioned above are subject to periodical amendment and the Applicant shall have this confirmed on the date, thirty (30) days before the date fixed for submission of the Prequalification Documents.

**SECTION - 6. ANNEXES**



**FORM OF LETTER OF INTENT TO APPLY FOR PREQUALIFICATION**

Urban Drainage Project

Package No. 3

To : The Local Public Works,  
DPU DKI Jakarta (Special Region of Capital City Jakarta)  
Urban Drainage Project Executing Agency  
Jalan Taman Jatibaru No. 1,  
Jakarta Pusat (10260),  
INDONESIA.

Sir,

In accordance with the prequalification documents, the undersigned representative

- ..... 1)
- legally authorized to act in name and on account of the applicant, Firm ..... 2)
- ..... 2)
- Company ..... 2)
- Partnership ..... 2)
- .....
- Joint venture company ..... 3)
- .....
- composed of : a. .... 4)
- .....
- b. .... 4)
- .....
- c. .... 4)
- .....
- d. .... 4)
- .....
- Joint operation ..... 5)
- .....
- composed of : a. Sponsor : ..... 6)
- .....
- .....

and the following other firms :

- b. .... 7)
- c. .... 7)
- d. .... 7)
- e. .... 7)
- f. .... 7)

by means of certified power of attorney ..... 8)

attached to these documents, hereby apply for prequalification for the **Construction of Civil Works, Package - 3 Gede/Bor Drainage Channel, Saluran Cengkareng Drainage Channel, and Meruya Drainage Channel of the Urban Drainage Project**. ..... 9)

By this letter, the undersigned representative, acting in name and on account of the applicant declares :

- a. To guarantee the truthfulness and exactness of all the statements and answers made in the Prequalification Documents and in the attached Statements.
- b. To authorize the Employer or his delegate to effect any investigation to prove the truthfulness of the statements and documents submitted and to obtain clarification and information on the technical and economical conditions of the Applicant.
- c. To accept unconditionally the dates and periods fixed or to be fixed by the Employer for prequalification and bidding, renouncing consequently to ask for extension.
- d. To accept unconditionally the procedure adopted for the bidding, the documents of the same and to renounce, consequently, to any claim.
- e. To have the widest authority to execute agreements and to effect all the necessary formalities for the Bid, including the signature of the Contract, by virtue of the power of attorney granted.

f. To give the Employer the full right without giving any justifications :

1. To disqualify any applicant who does not meet the requirements indicated in the Prequalification Documents or does not submit the required documentation or is not acceptable to the owner for reasons in his opinion to be substantial.
2. Not to accept any claim regarding the results of the Prequalification.
3. To re-evaluate the qualification and capability of the Applicant to implement the Project during evaluation of the Bid by the Employer.

g. To certify that the following circulation letter and addenda issued by the Employer has been received :

No. .... date..... 10)

No. .... date.....

h. To indicate the address in which he fixed his legal domicile to the effects of this application, to which the Employer may direct his correspondence :..... 11)

.....

- Representative in Indonesia.

..... 12)

.....

..... 13)

..... 14)

(Place and date )

(The representative)

**NOTE :**

- 1) = Insert full name and title
- 2) = Insert name and address of the Applicant
- 3) = Insert name of firm and address
- 4) = Insert name of parent firms of companies
- 5) = Insert name of Joint Operation and address
- 6) = Insert name of Leading Firm
- 7) = Insert names and address of the member(s) of Joint Operation
- 8) = Insert type, place, date of the power of attorney
- 9) = Insert name of one Package
- 10) = Insert numbers and date of addenda
- 11) = Insert mail, cable, telex address and telephone number
- 12) = Insert Representative in Indonesia
- 13) = Insert place and date
- 14) = Insert name of the Representative



**LIST OF PREQUALIFICATION FORMS (GENERAL) FILLED IN**

Name of firm, etc.....

Please indicate the Forms and pages filled in

Forms	Firm, Partnership,	Company	Pages
Form No.-1			
Form No.-2			
Form No.-3 (a)			
Form No.-3 (b)			
Form No.-4			
Form No.-5			
*			

\* Other supplementary information

(Place and date)

(The representative)

**FORM NO. - 1 STATEMENT OF APPLICANT AND HIS PROSPECTIVE  
SUB-CONTRACTORS ( if any)**

1. Name ( legal denomination ) ..... 1)

2. Address of the Head Office : ( mail, cable and telex ) ..... 2)

3. Date of establishment according to Articles of Association or by laws..

_____	_____	_____	_____	3)
Place	Day	Month	Year	

4. Nominal Capital : \_\_\_\_\_ 4)  
Original currency equivalent in US DOLLARS

Full paid-up  
Capital after  
\_\_\_\_\_ 5)  
Original currency equivalent in US DOLLARS

Full paid-up  
Capital plus  
reserve funds  
after  
\_\_\_\_\_ 5)  
Original currency equivalent in US DOLLARS

Statement of  
Capital resources  
(if not a company)  
\_\_\_\_\_ 4)  
Original currency equivalent in US DOLLARS

Exchange rate  
adopted for the  
equivalent in US \$ \_\_\_\_\_ 6)  
Original currency equivalent in US DOLLARS

5. Branch of Specialization

- Field of activities

1) Main field of activities..... 7)

.....  
.....

2) Other field of activities .....

.....  
.....

6. Average number of staff and labour owned over the past 24 months :

a. Engineers .....

b. Other technical staff employed on estimating, draughting and other technical office work .....

c. Foreman and supervisors .....

d. Other labour .....

Indicate estimated number of staff and labour who would be deployed on this contract :

	<u>Indonesian</u>	<u>Non-Indonesian</u>
a. Engineers	.....	.....
b. Other technical staff	.....	.....
c. Foreman and supervisors	.....	.....
d. Labour	.....	.....

and submit Biodata, on the sheets provided, for the principal staff who would be employed on the works such as Project Manager, Resident Engineer, Superintendent, Technicians and Foreman.

7. Places in which its branch offices operate : (Especially in Indonesia and South-East Asia

..... 8)

.....  
.....

8. Back-up services for this Project, if any :

..... 9)

.....

.....

10)

( Place and date )

11)

( The representative )

NOTE :

- 1) = Insert name of legal domination
- 2) = Insert address of the Head Office with mail, cable and telex
- 3) = Insert place, day, month, year
- 4) = Insert original currency and equivalent in US Dollars
- 5) = Insert date, original currency and equivalent in US Dollars
- 6) = Insert exchange rate between the original currency and US Dollars
- 7) = Which is (are) your field of activities among the following works :
  - a. River Improvement Works
  - b. Canal Systems
  - c. Tunnel
  - d. Hydraulic Structures
  - e. Dam Construction
  - f. Roads and Cross Drainages
  - g. Other Civil Works such as drilling/grouting, piling, etc.
- 8) = Insert place of branch office
- 9) = Insert matters available
- 10) = Insert place and date
- 11) = Insert name of the Representative

This form also applies to parent firms or companies of a joint venture.

**FORM NO. - 2 SPECIMEN OF BANK'S DECLARATION**

Ministry of Public Works  
Directorate General of Human Settlements  
Urban Drainage Project Executing Agency  
Jalan Raden Patah 1/1,  
Jakarta Selatan (12110),  
INDONESIA

Gentlemen,

This Bank ..... 1)

upon request of ..... 2)

irrevocably undertake to issue in favour of the Urban Drainage Project Executing Agency, Directorate General of Human Settlement, Ministry of Public Works, Republic of Indonesia, and to their full satisfaction, the surety Bonds and Guarantees assuring that in case of award of a Contract, the above mentioned ..... 2)

will faithfully perform the Contract for the Construction of Civil works, Package - 3 Gede/Bor Drainage Channel, Saluran Cengkareng Drainage Channel, and Meruya Drainage Channel of the Urban Drainage Project..... 3)

\_\_\_\_\_  
( Place and date )

\_\_\_\_\_  
( The representative )  
of the Bank

NOTE :

- 1) Insert name and address of the Bank
- 2) Insert name and address of Firm, Partnership, Company, Joint Venture or Joint Operation
- 3) Insert Package Number and description

**FORM NO.-3(a). BALANCE SHEET**

(Ending December 31, 199.../9.../9...)

**Assets**

**A. Current Assets**

All in US\$ Equiv.  
(Exchange rate used  
1 US\$ = \_\_\_\_\_)

1. Cash on hand .....	\$ .....
2. Cash in Bank .....	\$ .....
3. Account Receivable .....	\$ .....
4. Stock and bonds at present market value .....	\$ .....
5. Other current Assets :	
a. ....	\$ .....
b. ....	\$ .....
c. ....	\$ .....
d. ....	\$ .....
	..... (+)
	..... \$ ..... (+)

**Total Current Assets \$.....(A)**

**B. Fixed Assets**

1. Cost of Construction .....	\$ .....
2. Land .....	\$ .....
3. Building (Net) .....	\$ .....
4. Construction Equipment (Net) .....	\$ .....
5. Office Equipment (Net) .....	\$ .....
6. Vehicles (Net) .....	\$ .....
7. Other Fixed Assets :	
a. ....	\$ .....
b. ....	\$ .....
c. ....	\$ .....
d. ....	\$ .....
	..... (+)
	..... \$ ..... (+)

**Total Fixed Assets \$ .....(B)**

**Total Assets \$.....(A+B)**

## Liabilities and Capital

### A. Current Liabilities

1. Account Payable .....	\$ .....
2. Payable to Bank .....	\$ .....
3. Notes Payable .....	\$ .....
4. Other Current Liabilities :	
a. .... S .....	
b. .... S .....	
c. .... S .....	
d. .... S .....	
	_____ (+)
	\$ .....(+)
Total Current Liabilities	\$ .....(A)
B. Long Term Debt .....	\$ .....(B)

### C. Capital :

1. Stock Holders .....	\$ .....
2. Retained Earning .....	\$ .....
3. Allowance/Reserve .....	\$ .....
4. Profit for the Year .....	\$ .....
5. ....	\$ .....
6. ....	\$ .....
	_____ (+)
Total Capital	\$ .....(C)
Total Liabilities and Capital	\$ .....(A+B+C)

.....  
(Place and Date)

.....  
(The Representative)

Certified by ..... 1)

Date .....

Note: 1) = a. Registered Public Accountant,

b. Further certified according to Clause 5.2.3 hereof when prepared abroad.

2) If not submitted for 3 years, for years of non-submission score will be reduced.

**FORM NO.- 3(b). STATEMENT OF PROFIT AND LOSS**

(Ended December 31, 199.../9.../9...)

I. Revenue .....	\$ .....
II. Cost of Construction	
a. Finish Work .....	\$ .....
b. Work in Process .....	\$ .....
	_____ (+)
	\$ ..... (-)
	Cross Profit/Loss \$ .....

III. Operation Expenses	
a. Sales Expenses	
.....	\$ .....
.....	\$ .....
.....	\$ .....
	_____ (+)
	Total Sales Expense \$.....

b. General and Administration Expenses	
.....	\$ .....
.....	\$ .....
.....	\$ .....
	_____ (+)
Total General and Administration Expenses .....	\$.....(+)
Total Operation Expenses .....	\$.....(-)
Net Profit/Loss Operation before Taxes .....	\$.....

IV. Other Revenue	
.....	\$ .....
.....	\$ .....
.....	\$ .....
	_____ (+)
	Total Sales Expense \$.....



V. Other Expenses

..... \$ .....  
..... \$ .....  
..... \$ .....  
..... (+)

Net Profit /Loss before Taxes ..... \$ .....  
Taxes ..... \$ .....(-)  
Net Profit/Loss after Taxes ..... \$ .....  
=====

-----  
(Place and Date)

-----  
(The Representative)

Certified by .....1)  
Date .....

Note : 1) = a. Registered Public Accountant,  
          b. Further certified according to Clause 5.2.3 hereof when prepared abroad.  
2) If not submitted for 3 years, for years of non-submission score will be reduced.

**FORM NO.- 4      YEARLY TURN-OVER WITHIN LAST FISCAL  
FIVE YEARS IN US\$ EQUIVALENT**

Name of firm, etc. ....  
.....

Fiscal year	Amount/ Currency	Amount (Equivalent U.S. Dollars)
-------------	---------------------	-------------------------------------

.....  
(Place and date)

.....  
(The Representative)

Certified by .....  
date .....

**FORM NO. - 5 LIST OF REFERENCES**

.....  
( firm, partnership, company, joint venture or joint operation )

No.

(1) Name

(2) Address

.....  
(2) Address, Telex, Fax, Tel, Cable, etc.

.....  
( Place and date )

.....  
( The representative )

**This form also applies to parent firms or companies of a joint venture and to sub-contractors.**

**LIST OF SHAREHOLDING STRUCTURE**

(Paragraph 5.3.2(i))

No.	Name of Shareholder	Nationality of Shareholder	% of share	Remarks

.....  
(Place and Date)

.....  
(The Representative)

**LIST OF FULL - TIME DIRECTORS**  
(Paragraph 5.3.2(i))

No.	Name of Directors	Position	Nationality

.....  
(Place and Date)

.....  
(The Representative)

**LIST OF PREQUALIFICATION FORMS (TECHNICAL) FILLED IN**

Name of firm, etc. ....  
.....

---

No.	Title of contents	Page/ sheets
-----	-------------------	--------------

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- Form No.- 6
- Form No.- 7
- Form No.- 8
- Form No.- 9
- Form No.- 10
- Form No.- 11

\*

---

\* Other supplementary data

---

( Place and date )

---

( The representative )

**FORM NO. - 6 LIST OF PROSPECTIVE SUB-CONTRACTORS**

Name of firm, etc. ....  
.....

---

No.	(1) Name	(2) Address	(3) Branch of Specialization
-----	----------	-------------	------------------------------

---

---

(2) Address, Tel, Telex, Fax, etc.

---

( Place and date )

---

( The representative )

FORM NO. -7

**RESUME (CURRICULUM VITAE) OF APPLICANT'S KEY  
PERSONNEL TO BE FULLY ASSIGNED TO THE PROJECT**



-----  
( Firm, Partnership, Company, Joint Venture or Joint Operation )

Full name ....., Age ....., Educational .....  
Qualifications .....

Languages Known : .....

Present position in the firm : .....

Proposed position in the project : .....

Experience ( years )	Performed work	Responsibility
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....



Note : One form for each person.

Signature : .....

Date : .....





**FORM NO. - 8      PERFORMANCE RECORDS OF SIMILAR CONTRACTS  
FOR THE LAST 10 YEARS BY APPLICANT AND  
PROSPECTIVE SUB-CONTRACTORS**

( Name of firm, partnership of company or joint operation )

No.	Years of execution	Name and Location of Project	Name and Address of owner	Main or sub-contractor or member of joint operation	Contract or sub-contract amount in US\$ equivalent (2)	Description of Works (1)

Note : 1. Reference must be attached.

2. Amount listed for main contractor or for sub-contractor must not be less than US\$ 500,000.

\_\_\_\_\_ ( Place and date )

\_\_\_\_\_ ( The representative )

**FORM NO. - 9 PERFORMANCE RECORDS OF SIMILAR CONTRACTS ON HAND  
BY APPLICANT AND PROSPECTIVE SUB-CONTRACTORS**

( Name of firm, partnership of company or joint venture or joint operation )

No.	Type of works	Name and Location of Project	Name and Address of owner	Starting and expected completion date	Contract or sub-contract amount in US\$ equivalent (2)	Percentage of physical completion	Description of Works (1)
-----	---------------	------------------------------	---------------------------	---------------------------------------	--	-----------------------------------	--------------------------

Note: 1. Reference must be attached.

2. Amount listed for main contractor or for sub-contractor must not be less than US\$ 500,000.

( Place and date )

( The representative )

PQ - A22

**FORM NO.-10 LIST OF CONSTRUCTION PLANT AND EQUIPMENT  
PROPOSED TO BE USED FOR WORKS BY THE APPLICANT**

( Name of firm, partnership of company or joint venture or joint operation )

Item No.	Description	No. of Units	Capacity or output	Trade mark and type	Year of manufacture	Condition	Present location	Present value US \$	Ownership *
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

( Place and date )

( The representative )

\* It is to be clearly stated whether the plant or equipment is owned by the Applicant, is to be hired or is to be newly purchased. In case the plant and equipment is to be hired from a rental company, the intended rental shall be endorsed by the rental company.

**FORM NO. - 11      BRIEF DESCRIPTION ON THE APPLICANT'S PLAN  
OF PERFORMING THE WORKS**

Name of Applicant, etc .....

\_\_\_\_\_  
(Place and Date)

\_\_\_\_\_  
(The Representative)

**SECTION - 7 TABLES AND FIGURES**



## TABLES AND FIGURES FOR PRE-QUALIFICATION DOCUMENTS

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# TABLES



**Table 1 Temperature in Jakarta**

Station: Jakarta, Soekarno-Hatta International Airport

**Monthly Mean Temperature**

(unit: Celcius degree)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean
Jan.	26.0	25.8	26.5	26.2	25.8	26.1	26.2	25.9	25.0	26.5	25.9	26.0
Feb.	26.1	25.8	26.5	25.4	26.4	25.9	26.3	25.9	26.2	26.2	26.0	26.1
Mar.	26.4	26.7	26.9	26.3	26.5	26.7	26.8	26.3	26.0	26.2	26.6	26.5
Apr.	26.9	27.0	27.3	26.8	27.3	26.7	26.8	26.5	26.6	27.0	27.0	26.9
May	27.1	27.2	27.3	26.8	27.0	27.0	27.1	27.0	26.4	27.3	27.1	27.0
Jun.	26.8	27.2	26.6	26.5	26.6	26.8	26.9	26.7	26.5	26.9	27.0	26.8
July	26.0	26.6	26.4	26.5	26.1	26.5	26.2	26.6	25.6	26.4	27.0	26.4
Aug.	25.7	26.2	26.4	26.5	26.2	26.2	26.3	26.5	25.8	26.6	26.8	26.3
Sep.	26.1	26.9	26.9	26.8	26.7	26.8	26.5	26.6	26.3	26.6	26.9	26.6
Oct.	26.7	27.9	26.9	29.0	27.5	27.4	26.3	27.0	27.4	27.0	-	27.3
Nov.	26.3	27.7	27.1	27.2	27.7	27.4	26.3	26.7	27.6	26.4	-	27.0
Dec.	26.8	26.8	25.9	26.4	26.5	26.6	26.2	26.6	27.1	26.3	-	26.5

**Monthly Maximum Temperature**

(unit: Celcius degree)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Max
Jan.	31.6	32.2	32.4	31.4	32.1	31.4	32.4	31.8	31.2	32.4	32.1	32.4
Feb.	32.6	32.0	32.4	30.2	32.8	31.4	33.5	31.6	32.0	32.0	31.0	33.5
Mar.	32.6	33.2	33.4	32.8	33.6	31.8	32.2	33.7	33.0	32.0	32.1	33.7
Apr.	33.4	32.8	33.5	34.2	34.5	33.4	33.4	33.2	32.4	33.2	34.8	34.8
May	33.4	34.2	33.3	32.2	34.9	33.4	33.0	33.2	32.8	33.2	33.1	34.9
Jun.	33.6	33.2	33.1	33.4	33.0	34.4	32.8	33.2	32.7	32.9	33.2	34.4
July	33.9	32.8	32.5	33.2	32.6	33.2	32.4	32.4	32.3	32.1	32.7	33.9
Aug.	32.6	33.6	33.2	32.6	32.2	33.2	32.1	33.0	33.0	33.2	32.8	33.6
Sep.	32.7	33.4	33.8	33.9	32.8	34.2	32.7	33.5	34.2	33.2	33.2	34.2
Oct.	33.2	35.2	34.2	34.2	34.0	34.9	33.0	33.2	35.0	33.1	-	35.2
Nov.	33.5	35.2	34.4	33.6	35.2	33.4	33.0	33.6	34.4	32.8	-	35.2
Dec.	32.8	33.5	33.5	31.8	32.5	33.6	33.2	33.0	33.6	33.4	-	33.6
Max.	33.9	35.2	34.4	34.2	35.2	34.9	33.5	33.7	35.0	33.4	34.8	35.2

**Monthly Minimum Temperature**

(unit: Celcius degree)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Min
Jan.	20.2	22.0	21.9	20.0	22.2	22.8	22.1	22.4	22.0	22.6	22.0	20.0
Feb.	21.6	21.6	22.4	22.0	22.6	22.8	22.0	22.0	21.6	22.4	21.4	21.4
Mar.	22.4	22.8	22.9	21.8	22.7	22.8	23.0	22.0	22.7	22.6	22.0	21.8
Apr.	22.3	22.9	21.0	22.4	22.8	22.6	22.9	22.1	22.6	22.8	22.7	21.0
May	20.5	22.6	23.2	22.0	22.5	22.3	22.4	22.4	21.0	22.2	22.1	20.5
Jun.	21.3	22.2	21.6	21.6	21.0	20.3	21.6	22.0	21.0	22.9	21.6	20.3
July	18.5	21.3	21.3	21.2	20.7	20.6	21.0	21.6	18.6	21.8	22.0	18.5
Aug.	18.5	19.9	21.4	21.2	21.8	21.2	21.5	21.4	17.4	21.4	21.7	17.4
Sep.	20.0	20.6	21.2	21.9	21.6	20.8	21.8	21.3	19.7	21.4	21.6	19.7
Oct.	21.4	22.4	22.4	22.2	22.0	21.4	22.5	22.0	21.2	22.8	-	21.2
Nov.	21.8	23.0	22.9	22.0	22.0	22.6	22.1	22.0	22.8	22.5	-	21.8
Dec.	22.2	22.0	21.0	22.4	22.4	22.3	21.7	22.2	22.6	22.3	-	21.0
Min	18.5	19.9	21.0	20.0	20.7	20.3	21.0	21.3	17.4	21.4	21.4	17.4

**Table 2 Relative Humidity in Jakarta**

Station : Jakarta, Soekarno-Hatta International Airport

**Monthly Mean Relative Humidity**

(unit: %)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean
Jan.	88	87	86	87	88	88	88	88	88	87	86	87
Feb.	86	88	85	88	87	89	88	87	86	87	88	87
Mar.	85	84	85	84	86	87	87	83	87	87	85	85
Apr.	85	84	84	82	83	87	86	85	85	85	80	84
May	83	82	86	86	83	84	86	84	82	84	81	84
Jun.	83	81	83	83	83	93	83	84	80	85	79	83
July	82	79	80	81	83	80	82	81	78	83	79	81
Aug.	82	76	81	83	85	80	82	82	76	80	80	81
Sep.	83	76	78	80	82	77	83	79	75	80	80	79
Oct.	83	76	81	79	80	77	85	80	75	83	-	80
Nov.	84	77	81	80	80	83	83	83	79	85	-	82
Dec.	83	84	85	86	87	86	85	84	82	84	-	85

**Monthly Maximum Relative Humidity**

(unit: %)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Max
Jan.	98	98	100	100	98	99	98	98	98	98	98	100
Feb.	98	98	98	100	98	98	98	98	99	98	99	100
Mar.	97	98	98	98	99	98	98	98	98	98	99	99
Apr.	98	98	98	98	100	98	98	98	98	97	98	100
May	98	98	98	99	98	99	98	100	98	98	97	100
Jun.	98	98	99	98	98	98	98	98	98	98	98	99
July	98	98	99	98	98	97	98	98	98	98	97	99
Aug.	98	97	98	98	98	99	98	98	97	97	98	99
Sep.	100	97	98	98	98	98	98	98	98	97	98	100
Oct.	98	97	98	98	98	97	99	98	98	97	-	99
Nov.	98	97	97	97	98	99	98	98	98	98	-	99
Dec.	98	98	98	98	99	98	99	97	98	97	-	99
Max.	100	98	100	100	100	99	99	100	99	98	99	100

**Monthly Minimum Relative Humidity**

(unit: %)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Min
Jan.	64	62	53	63	64	65	67	66	59	60	57	53
Feb.	56	62	59	68	60	65	59	62	57	59	65	56
Mar.	58	58	55	58	63	63	54	54	57	58	57	54
Apr.	60	58	49	48	52	59	50	57	54	56	49	48
May	57	49	63	60	41	55	52	51	53	54	51	41
Jun.	53	50	49	49	53	49	51	54	51	58	56	49
July	46	43	47	45	54	47	50	52	39	50	44	39
Aug.	42	42	51	52	54	49	50	49	36	49	48	36
Sep.	55	44	48	43	51	47	55	41	40	45	52	40
Oct.	55	46	49	49	54	48	58	49	43	56	-	43
Nov.	53	40	50	52	51	50	55	53	52	59	-	40
Dec.	55	53	51	61	62	59	51	56	51	59	-	51
Min	42	40	47	43	41	47	50	41	36	45	44	36

**Table 3 Prevailing Wind in Jakarta**

Station: Jakarta, Soekarno-Hatta International Airport

Monthly Mean Speed of Prevailing Wind

(unit: Knots, 1Knot=1,852m/h)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean
Jan.	6	5	4	4	5	7	5	6	7	6	7	6
Feb.	4	4	5	6	5	7	5	6	7	6	7	6
Mar.	5	4	5	8	6	5	5	5	5	6	5	5
Apr.	4	4	6	7	5	5	5	4	5	5	5	5
May	4	5	5	5	6	5	5	4	5	5	5	5
Jun.	4	4	5	6	5	5	6	5	5	5	5	5
July	4	4	5	6	5	6	6	5	5	5	5	5
Aug.	4	4	5	5	6	6	5	6	7	5	6	5
Sep.	4	5	6	5	6	6	5	5	5	5	5	5
Oct.	4	5	6	5	7	6	4	5	6	5	-	5
Nov.	5	5	5	7	6	5	4	5	5	5	-	5
Dec.	4	6	7	5	6	5	7	6	6	7	-	6

Monthly Maximum Speed of Prevailing Wind

(unit: Knots, 1Knot=1,852m/h)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Max
Jan.	18	18	18	28	38	42	50	54	60	52	46	60
Feb.	24	18	18	28	22	46	50	54	60	52	52	60
Mar.	24	16	28	42	32	50	34	44	44	42	38	50
Apr.	16	18	22	36	26	44	50	42	40	58	38	58
May	18	20	40	18	38	40	36	38	46	60	52	60
Jun.	25	20	22	28	20	49	36	42	40	46	38	49
July	18	16	22	26	36	28	44	36	38	46	42	46
Aug.	20	18	24	28	40	36	36	38	42	34	46	46
Sep.	20	18	24	24	40	26	44	38	34	42	44	44
Oct.	20	24	34	22	46	28	39	44	42	44	-	46
Nov.	28	22	28	26	52	38	46	52	40	56	-	56
Dec.	16	20	34	30	48	70	48	56	50	46	-	70
Max.	28	24	40	42	52	70	50	56	60	60	52	70

Direction of Prevailing Wind

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Jan.	NW	NW	NW	N	W	W	N	W	NW	W	N
Feb.	NW	NW	W	W	W	SW	N	W	NW	W	NW
Mar.	NW	NW	W	W	W	E	NE	N	W	W	NE
Apr.	NE	E	E	W	NE	W	NE	SW	N	E	NE
May	SE	S	SW	S	NE	E	NE	E	E	N	NE
Jun.	E	E	E	SW	SE	E	NE	E	NE	N	NE
July	E	E	E	E	S	E	E	E	NE	E	NE
Aug.	NE	E	S	N	NE	E	S	E	E	NE	NE
Sep.	NW	E	NE	N	S	E	SW	NE	NE	NE	NE
Oct.	NW	NE	SW	S	S	NE	W	NE	NE	NE	-
Nov.	W	W	W	W	SW	S	N	W	NE	SW	-
Dec.	NW	SW	W	N	W	SW	W	W	W	W	-

**Table 4 Rainfall in Jakarta**

Station: Jakarta, Soekarno-Hatta International Airport

Monthly Rainfall

(unit: mm/month)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean
Jan.	503	644	371	209	533	349	398	494	392	403	346	422
Feb.	369	384	227	441	174	394	198	345	328	328	546	339
Mar.	195	104	106	155	73	197	255	88	341	198	116	166
Apr.	164	116	73	68	106	241	108	108	146	131	172	130
May	77	89	276	208	162	22	140	74	34	98	124	119
Jun.	23	13	67	41	57	30	78	54	40	112	57	52
July	93	68	17	51	124	-	35	41	-	115	74	69
Aug.	268	-	50	4	153	10	114	60	-	18	36	79
Sep.	124	5	17	64	57	-	88	36	-	48	105	60
Oct.	58	5	98	35	35	6	107	71	1	102	-	52
Nov.	114	81	52	35	29	91	131	102	102	244	-	98
Dec.	237	280	313	284	325	117	278	177	55	250	-	232
Total	2,225	-	1,667	1,595	1,828	-	1,930	1,650	-	2,047	-	1,818

Maximum Daily Rainfall

(unit: mm/day)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Max
Jan.	175	189	101	56	83	58	116	101	58	77	86	189
Feb.	133	118	47	71	36	98	50	136	85	50	107	136
Mar.	110	35	43	40	20	91	58	17	85	44	42	110
Apr.	46	45	27	15	27	58	48	25	31	35	55	58
May	58	55	57	78	56	15	41	37	21	39	55	78
Jun.	6	10	30	14	29	24	16	18	27	37	26	37
July	32	27	14	22	39	-	15	18	-	76	73	(76)
Aug.	77	-	22	2	43	10	67	39	-	18	15	(77)
Sep.	47	4	7	50	55	-	36	18	-	22	35	(55)
Oct.	26	5	23	23	19	6	25	50	1	38	-	(50)
Nov.	23	34	15	8	11	52	22	39	42	67	-	(67)
Dec.	79	71	87	86	77	28	108	39	16	80	-	(108)
Max	175 (189)	101	86	83 (98)	116	136	(85)	80	(107)	189		

Rainy Days

(unit: days/month)

Month	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Mean
Jan.	22	27	21	14	26	25	16	23	25	24	16	22
Feb.	14	22	12	25	15	21	16	14	16	23	24	18
Mar.	13	11	13	16	10	10	14	12	19	23	11	14
Apr.	12	12	6	12	12	13	8	13	14	13	14	12
May	4	5	13	13	13	4	11	7	3	9	8	8
Jun.	8	2	7	7	8	3	11	7	5	11	4	7
July	8	4	2	8	9	-	4	6	-	9	3	(6)
Aug.	9	9	3	12	1	7	7	-	3	7	7	(6)
Sep.	12	2	3	3	2	-	6	6	-	6	8	(5)
Oct.	8	1	11	7	5	1	17	7	2	10	-	7
Nov.	16	7	14	10	7	11	16	11	9	19	-	12
Dec.	9	16	19	20	21	15	16	15	12	14	-	16
Total	135	-	130	138	140	-	142	128	-	164	-	140

# FIGURES

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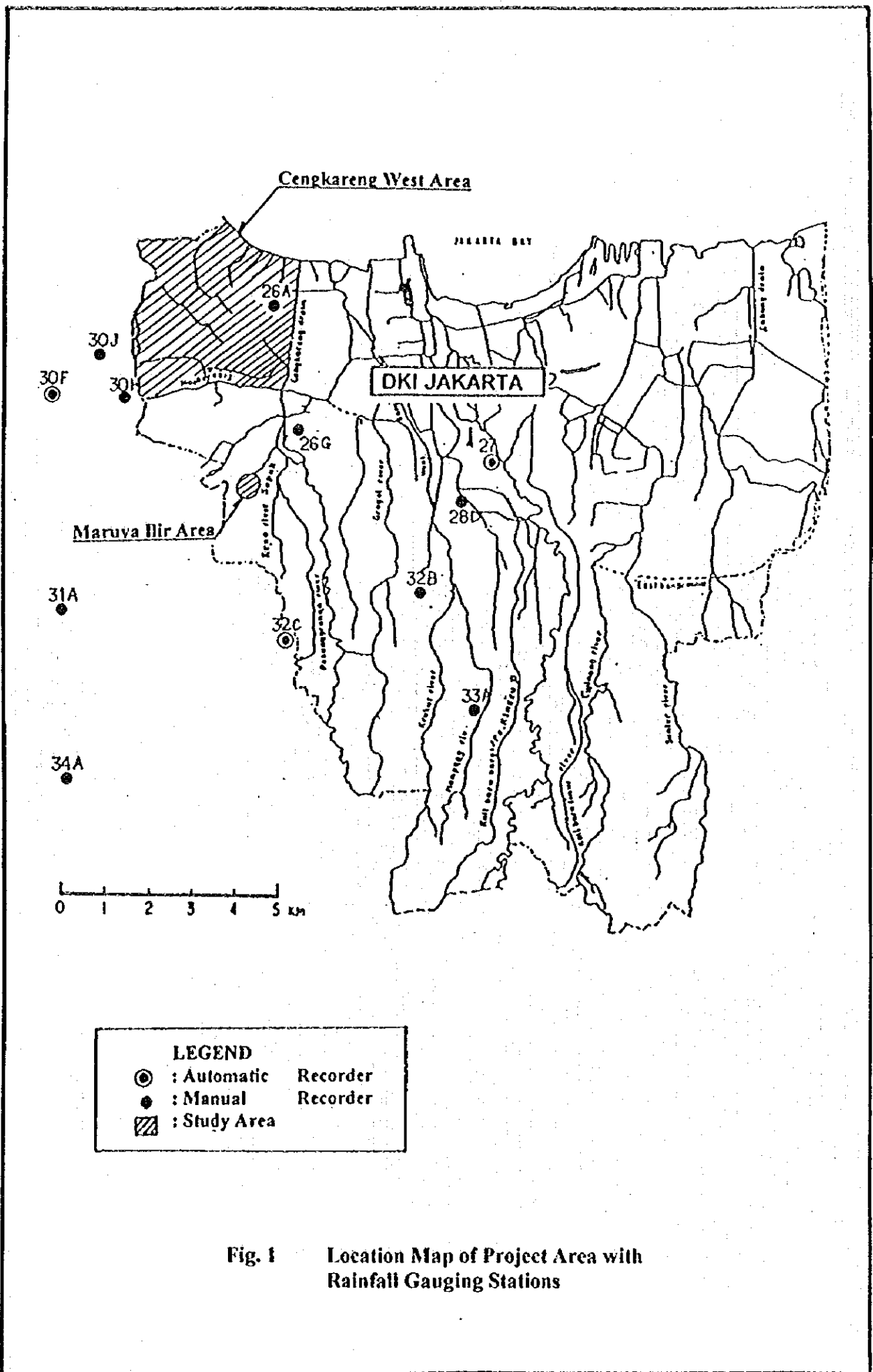
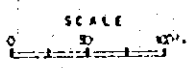
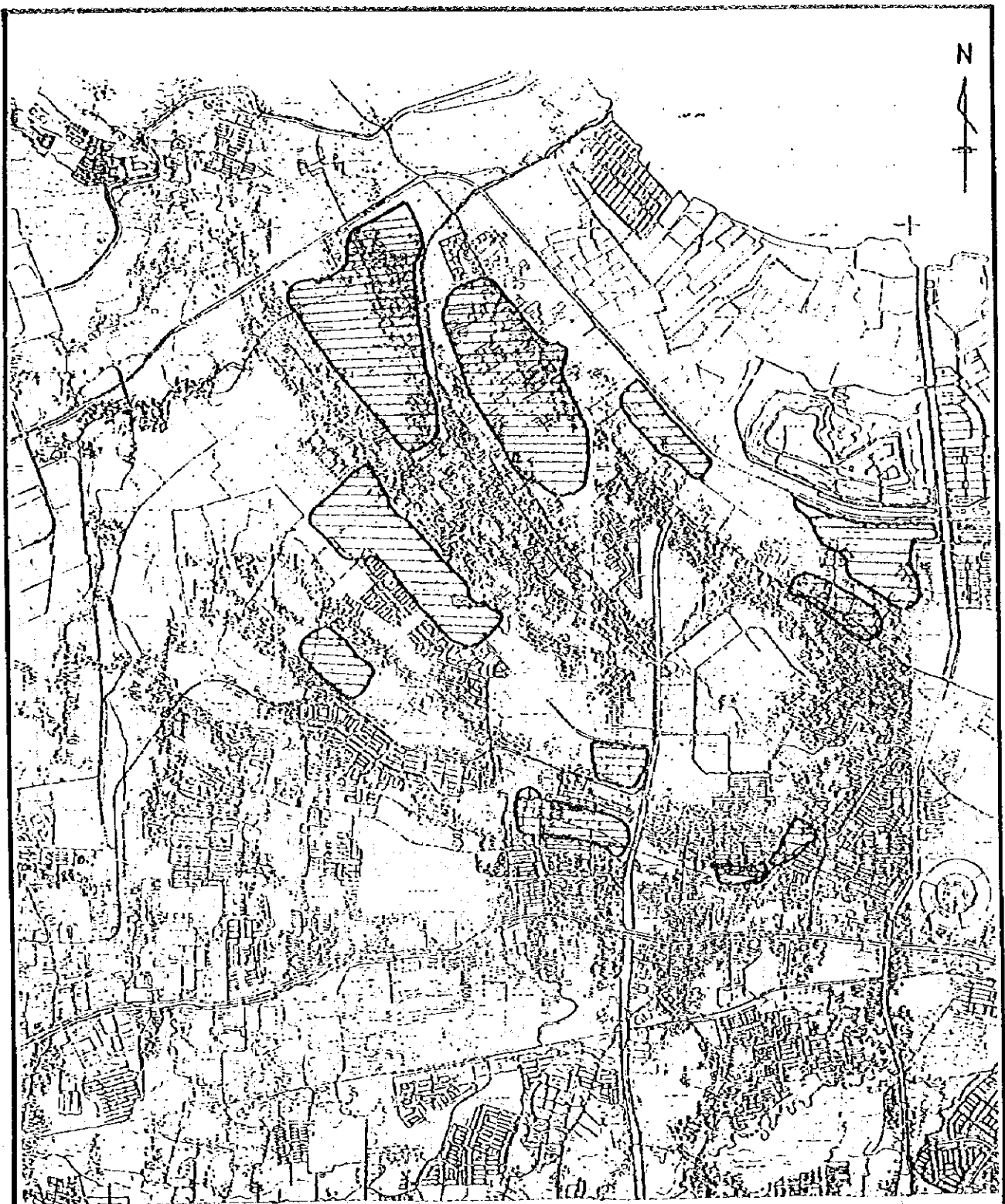

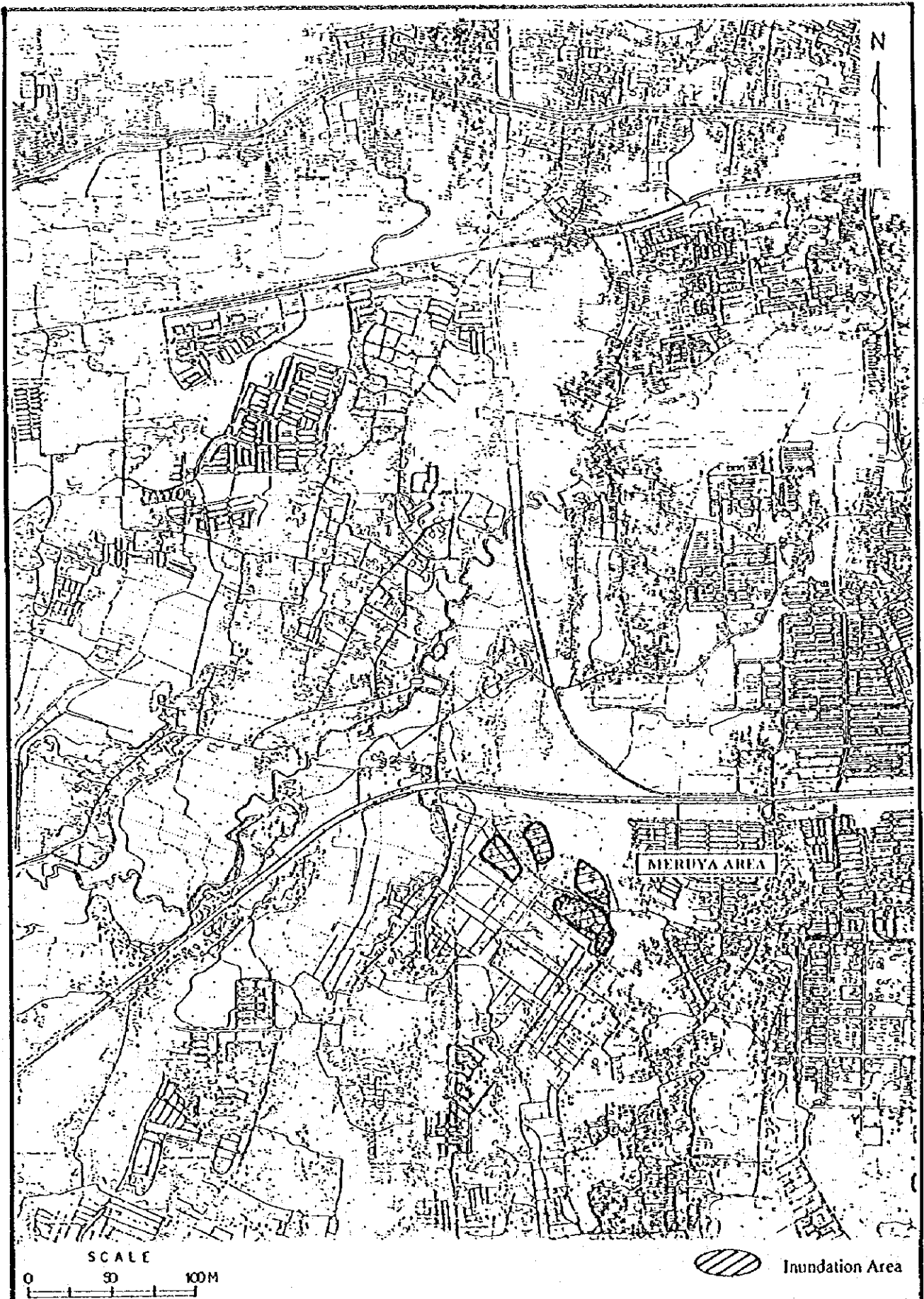


Fig. 1 Location Map of Project Area with Rainfall Gauging Stations

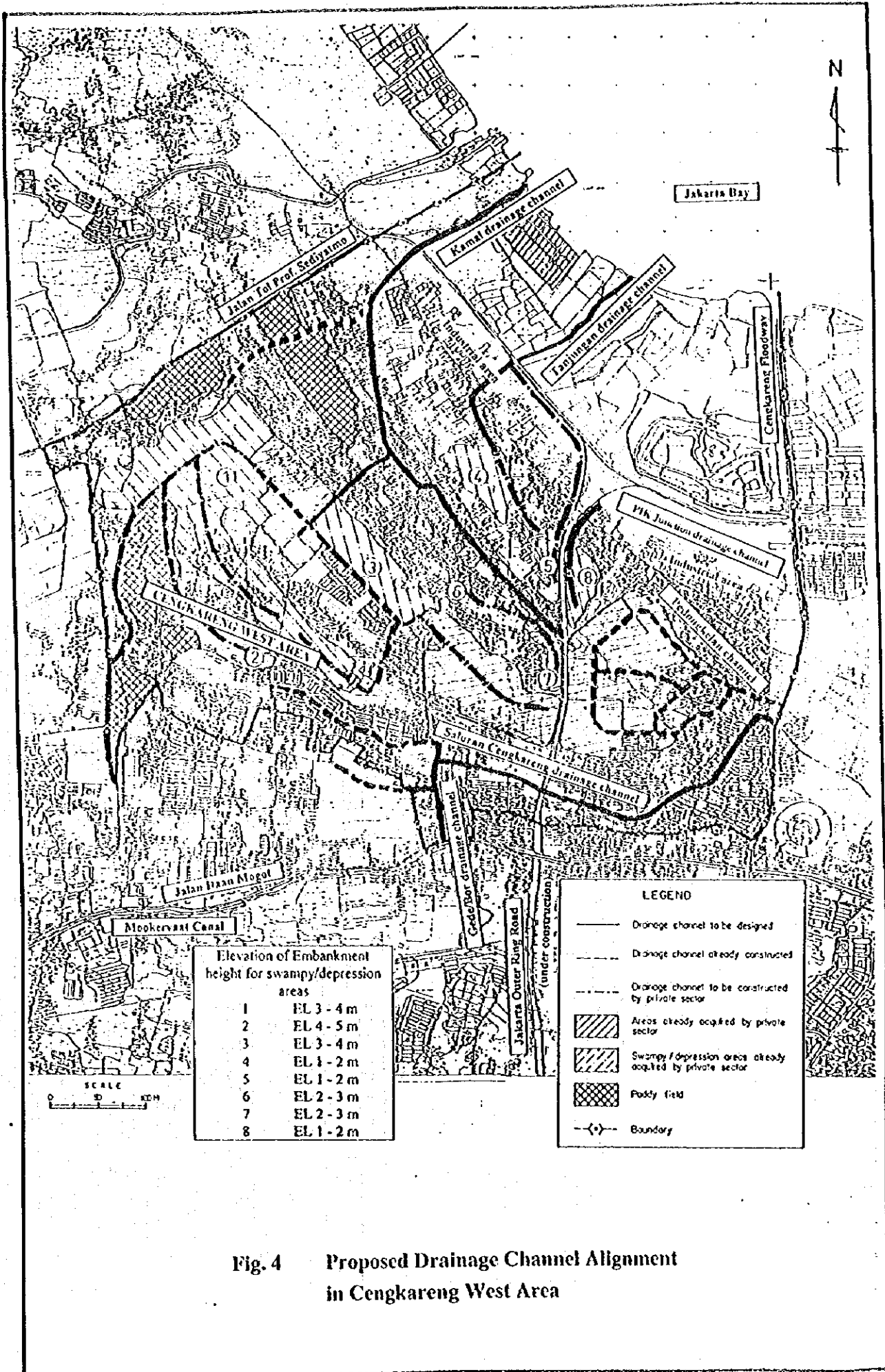


 Inundation Area

**Fig. 2** Habitual Inundation Map in Cengkareng West Area



**Fig. 3** Habitual Inundation Map in Meruya Area



**Fig. 4 Proposed Drainage Channel Alignment in Cengkareng West Area**

