JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

DIRECTORATE GENERAL OF WATER RESOURCES DEVELOPMENT
MINISTRY OF PUBLIC WORKS
THE REPUBLIC OF INDONESIA

THE STUDY ON COMPREHENSIVE RIVER WATER MANAGEMENT PLAN IN JABOTABEK

FINAL REPORT

VOLUME V

ANNEXES II

MARCH 1997

NIKKEN CONSULTANTS, INC.
NIPPON KOEI CO., LTD.

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FINAL REPORT

The Final Report consists of the following:

VOLUME I : EXECUTIVE SUMMARY

VOLUME II : MAIN REPORT (MASTER PLAN)

VOLUME III : MAIN REPORT(FEASIBILITY STUDY)

VOLUME IV : ANNEXES I

ANNEX 1	Socio-economy and Economic Evaluation
ANNEX 2	Geology
ANNEX 3	River Survey
ANNEX 4	Topographic Mapping
ANNEX 5	Hydrology
ANNEX 6	Flood Control

VOLUME V : ANNEXES II

ANNEX 7	Urban Flooding and Drainage
ANNEX 8	Design and Cost Estimate
ANNEX 9	Water Resources and River Water Quality
ANNEX 10	Environment
ANNEX 11	Comprehensive River Water Management Plan
ANNEX 12	Institutions

VOLUME VI : SUPPORTING PAPERS

VOLUME VII : DATA BOOK I
(River Survey and Topographic Mapping for Master Plan)

VOLUME VIII : DATA BOOK II
(River Survey and Topographic Mapping for Feasibility Study)

The costs are estimated based on October 1995 price level and the average exchange rate in October 1995. The average exchange rate in October 1995 is as follows:

US$ 1.00 = Rp.2,281
¥ 1.00 = Rp.22.70

ABBREVIATIONS

(1) Organization

DPU (Departemen Pekerjaan Umum)	:	Ministry of Public Work
DPUP (Dinas Pekerjaan Umum Propinsi)	:	Provincial Department Office of Public Works
P3SA (Proyek Perancang Pengembangan Sumber-sumber Air)	:	Water Resources Development Planing Project Division
Cipta Karya	:	Directorate General of Housing, Building Planing and Urban Development
DGWRD	:	Directorate General of Water Resources Development
POJ (Perusahaan Umum Otorita Jatiluhur)	:	Jatiluhur Authority Public Corporation
DPMA (Direktorat Penyelidikan Masalah Air)	:	Directorate of Hydraulic Engineering
DEG	:	Directorate of Environmental Geology
DKI Jakarta (Daerah Khusus Ibukota Jakarta)	:	Jakarta Municipal City of Capital = Jakarta Jakarta Municipality
PDAM (Perusahaan Umum Daerah Air Minum)	:	Regional Water Supply Public Corporation
JATS	:	JABOTABEK Advisory Team Services
JICA	:	Japan International Corporation Agency
JMDP	:	JABOTABEK Metropolitan Development Plan
JMDPR	:	JABOTABEK Metropolitan Development Plan Review
JWRMS	:	JABOTABEK Water Resources Management Study
BAPPENAS (Badan Perencanaan Pembangunan Nasional)	:	National Development Planning Agency
BAPPEDA	:	Regional Development Planning Agency
BPS (Biro Pusat Statistik)	:	Central Bureau of Statistics
DBPP (Directorat Bina Program Perencanaan)	:	Directorate of Planning and Programming
PMG (Pusat Metereologi dan Geofisika)	:	Metereological and Geographical Center
PT, or P.T (Perusahaan Terbatas)	:	Co. Limited (private firms)
PPWSCC (Proyek Pengembangan Wilayah Sungai Ciliwung-Cisadane)	:	Ciliwung-Cisadane River Basin Development Project Office

(2) Regional Administration

Propinsi	:	Province
Kab. (Kabupaten)	:	Regency
Kec. (Kecamatan)	:	Subdistrict
Kota	:	City
Kotip (Kota Administratip)	:	Administrative city (Semi municipal city)

Kodya (Kotamadya)	: Municipal city
Desa	: Village
Kp. (Kampung)	: Village (sometimes, smaller administrative community under "Desa" in West Java province)
Kelurahan	: Village, but belongs to "Kota"
Rw. (Rukun Warga)	: Small community belongs to "Kampung"
Rt. (Rukun Tetangga)	: Smallest community belongs to "Rukun Warga"

(3) Place Name or Geographical Name

G. or Gn.(Gunung)	: Mountain (or Mount.)
Pr. (Perkebunan Rakyat)	: Private Plantation (small scale holder plantation)
PTP (Perusahaan Terbatas Perkebunan)	: State owned plantation
Ci- (originated from "Cai = water")	: River
KCC	: Kopo-Cikande-Carenang Irrigation System
TJC	: Tarum Jaya Canal
WBC	: Western Banjir Canal
EBC	: Eastern Banjir Canal
CBL Floodway	: Cikarang-Bekasi-Laut Floodway
WTC	: West Tarum Canal

ABBREVIATIONS OF MEASUREMENT

Length

mm = millimeter
cm = centimeter
m = meter
km = kilometer
ft = foot
yd = yard

Area

cm^2 = square centimeter
m^2 = square meter
ha = hectare
km^2 = square kilometer

Volume

10^6 = million
cm^3 = cubic centimeter
l = litre
kl = kilolitre
m^3 = cubic meter
gal = gallon

Weight

Gwh = Gigawatthour
mg = milligramk
g = gram
kg = kilogram
ton = metric ton
lb. = pound

Time

s = second
min = minute
h = hour
d = day
y = year

Electrical Measurement

V = Volt
A = Ampere
hz = Hertz (cycle)
Ghz = Gigahertz
W = Watt
kW = kilowatt
MW = Megawatt
GW = Gigawatt
pr = pair

Other Measures

% = percent
PS = horsepower
o = degree
' = minute
" = second
10^3 = thousand
10^9 = billion

Derived Measures

m^3/s = cubic meter per second
cusec = cubic feet per second
mgd = million gallon per day
kWh = Kilowatthour
Mwh = Megawatthour
Wh/y = Killowatthour per year
kVA = kilovolt ampere
BTU = British Thermal Unit
psi = pound per square inch
lcd = litre per capita per day
Kb/s = Kilobot/second
Mb/s = Megabit/second

Currency

US$ = US Dollar
Rp = Indonesia Rupia

ANNEX 7

URBAN FLOODING AND DRAINAGE

THE STUDY
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IN
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1. DRAINAGE AND WASTEWATER TREATMENT

1.1 Urban Drainage in DKI Jakarta

1.1.1 Urban Drainage Technical Policy

The DKI Jakarta area is divided into two general zones in terms of the urban drainage policy. The first area is the central Jakarta area enclosed by the existing Western Banjir Canal and Cengkareng Floodway, and the proposed Eastern Banjir Canal. This area is mostly located in the low-lying area and always affected by the high tidal intrusion. The drainage condition cannot be improved only by gravity drain measure. The effective countermeasure is a combination one with gravity drain canal, retarding basin, drainage pump, gated weir and tidal gate.

The second area is out of the enclosed one by the banjir canals. The drainage measure is to drain off rain water through gravity flow channels including rivers and canals. Therefore, several low-lying area where area of the place is not so big, suffers rather serious inundation in water depth aspect with individual reasons. Inundation is sometimes caused by overtopping of river flood water in this area.

1.1.2 Zoning

The whole area of DKI Jakarta is divided into the following three(3) regions which is further divided into ten(10) drainage zones:

Region	Drainage Zone	Catchment Area(ha)	Drainage System
I. Western Region	Zone - 1	11,300	Cengkareng Floodway
	Zone - 2	4,500	Grogol - Sekretaris
II. Central Region	Zone - 3	500	Muara Karang
	Zone - 4	17,350	Ciliwung - Banjir Canal
	Zone - 5	1,900	Pluit
	Zone - 6	1,100	Ciliwung - Gunung Sahari
III .Eastern Region	Zone - 7	2,760	Sentiong - Pademangan
	Zone - 8	1,250	Sunter Utara(Barat)
	Zone - 9	12,575	Sunter - Cipinang
	Zone - 10	8,050	Buaran - Cakung

Figure 1 shows the above zones and drainage systems.

1.1.3 Urban Drainage Facilities Under Management of DKI Jakarta

According to the agreement between the D.P.U.and the D.K.I. Jakarta, it was agreed that DKI Jakarta takes a responsibility for the construction, operation and maintenance of the following facilities to be functioned as the urban drainage system:

River, Canal

Sepak riv.	Ciragil riv.	Ciliwung Gajah Mada riv.
Ulujami riv.	Mampang riv.	Anak Ciliwung riv.
Maruya riv.	Cideng riv.	Bara Timur riv.
Mookervaart riv.	Jelakeng riv.	Ancol riv.
Sekretaris riv.	Besar riv.	Sentiong-Sunter riv.
Pluis riv.	Krukut Bawah riv.	Cakung Lama riv.
Grogol riv.	Baru Barat riv.	Mati riv.
Sodetan Grogol Sekretaris	Kalibata canal	Podemangan Barat riv.
Jelambar riv.	Sodetan Bali Matraman	Podemangan Timur riv.
Duri riv.	Lower Ciliwung riv.	Other rivers in DKI Jakarta
Muara Karang riv.	Ciliwung Gunung Sahari riv.	

Gate/Syphon/Trash Rack

Pasar Ikan gate	Tangki gate	Cideng gate
Telukgon trash rack	Kali Duri gate	Bunderan Grogol gate
Pluit syphon/gate	Kampung Gusti gate	Kali Ciden syphone
Bendungan Jagi I&II gate	Jembatan Dua gate	Teluk Gong syphon
Manggarai II gate	Jembatan Merah gate	Gunung Sahari Trash rack
Krukut gate	Pekapuran gate	Other related facilities
Capitol gate		

Reservoir/Pump

Toman Barat res. and pump	Setia Budi Timur res. and pump	Sunter Timur III res. & pump
Grogol res. and pump	Pondok Bandung pump	Sunter Barat Utara res. pump
Rawa Kepa res. and pump	Cideng pump	Sunter Barat Selatan res.
Pluit res. and pump	Istana pump	Teluk Gong res. and pump
Muara Angke res. and pump	Mangga Dua Utara pump	Ancol res and pump
Setia Budi Barat res. and pump	Sunter Timur I res. and pump	Melati res.

Names of the drainage rivers and canals are systematically listed in Table 1. Figures 2 and 3 show the schematic diagram and locations of the drainage rivers and canals, respectively.

1.1.4 Urban Drainage Project

In the DKI Jakarta, various projects to mitigate the urban drainage problems have been carried out since 1920 when the Western Banjir Canal was completed. Many of the existing urban drainage facilities are concentrated to locate in the already urbanized area of the DKI Jakarta, in other words, in the area of north central Jakarta. At present, a big scale of new construction works have been progressing in the north west Jakarta to improve serious drainage condition in the area. Even in the other area in DKI Jakarta, many projects, mainly of river or channel improvement, have been implementing aiming at early completion.

The existing urban drainage facilities are shown in Tables 2 through 4 as well as in Figures 4 and 5 which will be discussed in the succeeding section 1.3. The Table 5 and Figure 6 show the having recently implemented projects. All of the projects incorporated in the above are categorized in a) under construction, b) detailed design on-going or completed, or c) proposed, as of 1991 when the previous JICA Master Plan Study was being conducted. The present status of implementation is also represented in the said table and figure. The zone numbering system in the table is the one referred in the said JICA Study(see Figure 7).

As seen in Figure 6, major problem areas in the north and central DKI Jakarta between Cengkareng Floodway and Cakung Drain are covered by projects recently completed or ones under construction or ones of completed detailed design. As to the western DKI Jakarta, the previous JICA study conducted the feasibility study for the area of north half of Zone-1(refer to Figure 8). For an improvement of four areas in the Zone-1 shown in Figure 8, the detailed design works is on going as of late 1996.

1.2 Urban Drainage in Jabotabek Urban Area

1.2.1 Tangerang City

(1) General

Tangerang City has no urban drainage system yet but be partly provided with the isolated local drain channel network in the respective area. Improvement works of local drainage channels in the central area have been progressing as shown in Figure 13.

(2) Drainage Zone

(a) Central Area on the Right Bank of the Cisadane River

This area is the most developed area of the city and has rather improved drain network towards the Mookervaart river as shown in Figure 13. There are some habitual inundation area which may be due to insufficient capacity of micro-drainage channel.

(b) Area on the Left Bank of the Cisadane River

The area is between the Cisadane river and the Sabi river. Some channel previously used for irrigation purpose and micro-drain network have been developed. Since the Cisadane river have been keeping high waterlevel due to an operation of the Pasar Baru weir aiming at irrigation water supply, the most of drainage channel, except area being just along the Cisadane river, flow down towards the Sabi river which has a confluence with the Cisadane river at downstream reaches of the Pasar Baru weir.

(c) Area Surrounded by Angke River, Ring Road and Jl.Ciledug Raya

Several tributary channel of the Angke rivers are used for a local drainage which cause inundation troubles due to its undevelopment. The Angke river may prevent this area from its well drainage condition due to backwater effect.

1.2.2 Kotip Bekasi

The city area of Bekasi (Kotip Bekasi) has no urban drainage system yet but only isolated local drain channels. Local water of the urban area is drained off through such channels mostly to either Bekasi river or its tributaries.

1.3 Drainage Facilities

Related facilities and structures to the urban drainage system are generally classified into the drainage channels(including river and canal) with related structures including siphon, sluice and culvert, and the other structures such as bridge, gated weir, drainage pump, reservoir, etc.

Urban drainage facilities other than the drainage channels in the Study Area are mostly such structures located in DKI Jakarta area.

(1) Pump Station

In the DKI Jakarta, eighteen(18) pump stations are exiting for the urban drainage purpose. Its total installed capacity is 121.8 m^3/s. The pump stations under construction is in four (4) locations and 39.7 m^3/s in its total capacity. The main features of those pump stations and locations are shown in Table 2 and Figure 5, respectively.

(2) Reservoir (Waduk)

There are eleven(11) reservoirs existing in DKI Jakarta, which are used as the retarding basin and regulation pond for the pump station. The reservoir total area is approximately 145 ha. Four(4) reservoirs are under construction with its total area of 23 ha. Features and locations of the existing and constructing ones are shown in Table 3 and Figure 5, respectively.

(3) Gated Weir

The existing gated weirs in the objective rivers are being operated for the purposes of flood control, irrigation, flushing and drainage. Type of the existing gated weir is classified in a semi-gravity weir and floating type weir, equipped with either sluice gate or roller gate. According to the investigation, the sluice gate type is major type in the Study Area. Table 6 presents major gated weirs being related to a flood control plan in the Study Area and those locations are shown in Figure 4. Besides, Table 4 shows the existing gated weir in DKI Jakarta mainly for urban drainage, flushing and flood control purposes, which locations are shown in Figure 4.

Among the above-listed gated weirs, the Pasar Baru weir, as illustrated in Figure 9, was constructed in 1935. In spite of rather well maintenance of mechanical equipment, it was investigated that a few units have been not operational and several units cannot be opened fully out of ten(10) units in total. It is mainly due to that floating matters jammed gate slots for its smooth operation. Similar floating matters are not scarce problem in the other gate operations. Replacement or rehabilitation of gates is necessary for an appropriate flood control operation of the Cisadane river.

The Bekasi Weir, located on Bekasi river also for intake purpose as shown in Figure 10 has been in good operational condition but gate is seldom opened so that a certain waterlevel is being maintained at intake site of the West Tarum Canal.

(4) Bridge

The study team of the previous JICA Master Plan Study(1991) conducted an inventory survey of all the existing bridges along the major urban drainage channels in order to examine an actual flow capacity at the respective bridge sites. Table 7 shows a number of bridges by major urban drainage channels.

Number of existing bridges located along the objective rivers in DKI Jakarta is approximately 230 of road bridges and 11 of railway bridges within a section that river improvement have been studied for flood control purpose. The number of bridges by river is as follows:

River Name	Number of Bridges		River Name	Number of Bridges	
	Road	Railway		Road	Railway
Mookelvaart	27	-	Sunter	29	1
Angke	2	-	Buaran	12	-
Pesanggraha	4	-	Cakung	21	-
Grogol	29	1	Cengkareng Floodway	13	-
Kurkut	28	1	Sodetan Grogol	2	-
Ciliwung	35	5	Western Banjir Canal	15	3
Cipinang	15	-			
				232	11

(5) Culvert

There are so many culverts along the objective rivers at crossing positions with the other rivers or canals as well as roads. It is sometimes observed that the culvert structure prevents river from smooth flow due to clogging of soil and/or garbage deposit or insufficient scale design. Rehabilitation may be necessary for such structure site.

1.4 Wastewater Treatment

1.4.1 On-site Sanitation Facilities

(1) Domestic On-site Sanitary Facilities

Toilet waste is either treated by individual septic tank or drained off without treatment. Gray water from kitchen, bathing and laundry is directly discharged to the drain.

(2) On-site Sanitary Facilities of Commerce and Institution

According to the survey conducted by the previous JICA Master Plan Study, only 5.6 % of existing commerce and institutions in DKI Jakarta area as of 1991 have on-site package treatment facilities capable of treating both toilet waste and gray water. The remaining is being equipped with a septic tank only for toilet waste, or without treatment.

1.4.2 Sludge Treatment

The existing sludge treatment are operated at Pulo Gabang, Kebon Nanas and Duri Kosambi plants ,respectively. A tonal capacity of those plants is 660 m^3/s.

1.4.3 JSSP

The JSSP is mostly completed sewerage and sanitation project that is also called as Setia Budi and Tebet pilot project. The area is surrounded by the Western Banjir Canal(north), Jl.Gadot Subroto(south), the Ciliwung river(east) and Jl.Jend.Sudirman(west), as shown in Figure 8. The feature of sewerage development in the JSSP is summarized herein.

(a) Wastewater treatment	: SBR type aerated lagoon treatment at the West Setia Budi and the East Setia Budi reservoir	
(b) Setia Budi reservoir	: Area	1.74 ha (east), 2.61 ha (west),
	Capacity	33,700 m^3 (east), 50,900 m^3 (west)
(c) Population Served	: 170,000	
(d) Direct House Connection	: 3,700	
(e) Total Sewer Length	: 46,000 m	
(f) Wastewater Treatment Plant Capacity	: 400 l/sec	

2. PREVIOUS STUDIES AND PLANS

2.1 Urban Drainage

Various studies on the urban drainage have been conducted in the Study Area. The objective area of those studies is mostly DKI Jakarta. Only one study is available for Tangerang city area, which was conducted under local fund, in case of the area out of Jakarta city. No specific study other than for Jakarta and Tangerang seems to be conducted in the Study Area.

The Master Plan for Drainage and Flood Control of Jakarta in December 1973 by NEDECO is the first and comprehensive study for improvement of Jakarta drainage system. The master plan has been the basis of the drainage activities in DKI Jakarta to date. The studies and works mentioned herein are major ones which have been conducted recently .

(1) Master Plan for Drainage and Flood Control of Jakarta (December 1973)

The master plan study had been conducted during a period from January 1972 until August 1974, as the Phase I of the Jakarta Drainage and Flood Control Project. The master plan was formulated that the urban drainage system would be established and improved in the area of a large part of Jakarta city enclosed by two flood diversion canals including the partially existed Western Banjir Canal at the time and the Eastern Banjir Canal to be constructed(approx. 240 km^2). The basic concept for drainage improvement applied in the master plan was as follows:

(a) Rehabilitation of the existing open canal,

(b) Establishment of an improved drainage system of the central and west Jakarta by incorporating the lower part of the existing Western Banjir Canal,

(c) Construction of two major evacuation drain including the Sunter West Drain and the Eastern Main Drain for the eastern urban area.

(d) Construction of pumped drainage for polder area on the west and east sides of the city,

- existing one to the west of the Ciliwung river with the Pluit reservoir
- three to the east to be constructed including polder and pump station

(e) Land fill for some isolated area, and

(f) Maintenance of drain canal by flushing.

(2) Jakarta Drainage and Flood Control Project Phase II (1974 - 1976)

Succeeding to the master plan study, the Phase II works were undertaken for the detailed design and preparation of specification for the following schemes:

East Jakarta

(a) Eastern Banjir Canal

(b) Improvement of the existing rivers(Cipinang, Sunter, Buaran, Cakung)

(c) Cakung and Marunda Drain and related catchment

(d) Terusan Sunter and related catchment

(e) Sunter West Drain and related drains

(f) Sunter West polder

(g) Sunter East polder

(h) Marunda polder

Central Jakarta

(i) Improvement of Ciliwung river and G.Sahari canal

(j) Ciliwung Kota drain system

(k) Ancol polder

(l) Cideng, Krukut, Duri, Karang and Pluit polder system

West Jakarta

(m) Cengkareng area

(n) Kebon Jeruk area

(o) Extension of Western Banjir Canal

Southern area of Western Banjir Canal

(p) Improvement of the existing rivers (Secretaris, Grogol, Krukut , Cideng)

(q) Improvement of drainage system (Krukut river area, Setia Budi area, Tebet area)

(3) West Jakarta Flood Control Project

In accordance with the master plan formulated in 1973, several projects and studies are implemented to date. Among those, the West Jakarta Flood Control Project was executed since 1985 for the detailed design works until 1992 when all of the works were completed. The whole project works were divided in two stages:

Project (I)

(a) Objectives of the project : To mitigate inundation in the area of Menteng, Sarinah and Thamrin by diverting flood discharge of 43 m^3/s of the Upper Cideng drain to the Western Banjir Canal(40 m^3/s) and the Lower Duri drain(3 m^3/s) through the Cideng pump station.

(b) Drainage area : 750 ha

(c) Scope of works :
- Improvement of approach channels (Siantar drain : 512 m, Cideng river : 83 m)
- Construction of Cideng pump station (6 units x 6.67m^3/s)
- Construction of telemetering system
- Improvement of Melati reservoir
- Improvement of Pluit reservoir (rehabilitation)

Project (II)

(a) Objectives of the project : To mitigate floods in the area of Grogol and Secretaris rivers catchment(approx. 30 km^2) by flowing out to Angke river through the Grogol Sekretaris which was to be improved.

(b) Diverted discharge : 130 m^3/s to the Angke from the Grogol(80m^3/s) and the Secretaris(50m^3/s)

(c) Scope of works :
- River channel improvement of the Grogol Secretaris and Grogol drain(7.2 km)
- Construction and/or re-construction of river structures

(4) East Jakarta Flood Control Project

The East Jakarta Flood Control Project has been executed since 1987 for the detailed design works and some portions are under construction as of 1995. The objective of the project is to mitigate the inundation of the area of 268.6 km^2 in the eastern part of DKI Jakarta. The design works were undertaken in four(4) stages and designed major facilities are as follows:

Designed Facilities	Design - I	Design - II	Design - III/IV
Channel Const/Improv.			
Eastern Banjir Canal			
(Cipinang riv.to weir I)	5.7 km	-	-
(Buaran riv. to Estuary)	-	-	18.0 km
Improv. of Buaran riv.	5.3 km	-	3.9 km
Improv. of Cipinang riv.	-	3.7 km	8.5 km
Improv. of Sunter riv.	15.6 km	2.2 km	9.1 km
Improv. of Jatikramat riv.	-	-	3.7 km
Cakung Floodway	4.5 km	-	5.3 km
Marunda Canal	-	-	6.4 km
Cakung riv.	-	-	18.7 km
Construction of Pump Station			
Sunter West	-	-	10.0 m^3/s
Sunter East II	-	5.2 m^3/s	-
Sunter East III Pump Sta.	-	15.5 m^3/s	-

(5) Ancol Drainage Pumping Station Project

The project area, located in the northern coastal area of DKI Jakarta, has been inundated due to heavy rain and tidal effect . The problems identified were:

(a) High tide intrusion to the low-lying area

(b) Backwater effect of the Ancol canal and the Sentiong-Sunter West drain to local drainage

(c) Insufficient channel capacity of the existing drains.

Among the several measures to solve the above problems such as provision of a drainage pump station, gated structures, embankment, improvement of the existing canals, the project includes the following works:

Ancol-Pademangan Drainage System (635 ha)

(a) Ancol drainage pumping station — Capacity : 5 m^3/s x 3 units

Total head : 3.3 m

Sentiong-Sunter drainage system (1,915 ha)

(b) Improvement of Sentiong-Sunter West drain : 4.48 km

(6) **The Study on Urban Drainage and Wastewater Disposal Project** in the City of Jakarta(Master Plan Study and Feasibility Study ; JICA ,1991)

Several projects which were based on the master plan formulated in 1973 have been implemented by the study period. However, due to the recent rapid urbanization and the resultant change in land use, new flood prone area which had been not considered in the previous master plan were created in the area outside of the two banjir canals. Furthermore, the previous plan had placed emphasis on the improvement of rather large rivers. In compliance with the current requirement, the study was conducted with the following objectives:

(a) Formulation of a master plan of drainage, sanitation and sewerage development encompassing the whole Jakarta city area for the target year of 2010

(b) To conduct a feasibility study for drainage and sewerage development for the priority areas selected by the master plan.

In accordance with the respective objectives, the master plan was formulated and the feasibility study was conducted following the master plan study.

Master Plan

The said study introduced drainage zones that divide whole DKI Jakarta area in six (6) regions as shown in Figure 7. A combination of unit projects were worked out in each zone and the master plan was formulated by developing implementation time sequence of each zone. The master plan consists of the implementation of on-going projects(as of 1991) and proposed projects by the study as follows:

Drainage Zone	On-going Project	Nos.of Proposed Unit Project				
		River/Canal Improv.	Bridge Improv/const.	Const. of Pump Sta	Const. of Channel	Implement. Priority
Zone I	1	10	1 / 3	-	-	(1)
Zone II	4	3	0 / 1	1	-	(5)
Zone III	1	3	2 / 2	-	-	(2)
Zone IV	6	-	-	-	-	-
Zone V	0	1	-	1	-	(3)
Zone VI	14	15	2 / 6	-	3	(4)
Total	26 (section)	32 (section)	5 / 12 (unit)	2 (unit)	3 (section)	

The name and general feature of the unit project incorporated in the master plan are summarized in Table 5 and locations are shown in Figure 6.

Feasibility Study

The priority drainage zone for implementation was selected at Zone-I in the master plan study. Among several unit projects in the Zone-I, four unit project area were further selected as the project area for the feasibility study. The project area is located out of the enclosed area by the

Western Banjir Canal and in the western part of the Cengkareng Floodway as shown in Figure 8. The project feature is summarized as follows:

Sub-project Area	Drainage Area (ha)	Construction Works		
		New Canal (km)	Canal Improv. (km)	Major Structure
Cengkareng West	3,823	6.5	21.0	imprv. of Culvert
Bojong	40	-	2.0	exist.Pump
Sepak River	C.A.=43.4 km^2	-	2.1	Bridge
Maruya Hir	157	-	2.5	(Outer Ring Road)

(7) Major Drainage Work Component in Jakarta Urban Development Project-II(1991)

The design works for the project of the Main Drainage Component in JUDP-II was completed in July 1991. The project area, which is located mainly in the North Jakarta District and Central Jakarta District, consists of the following six(6) drainage basins :

(a)	Pluit drainage basin	:	1,880 ha
(b)	Duri drainage basin	:	520 ha
(c)	Ciliwung - Gunung Sahari drainage basin	:	1,100 ha
(d)	Ancol - Pademangan drainage basin	:	1,010 ha
(e)	Sentiong drainage basin	:	1,750 ha
(f)	Lagoa - West Sunter drainage basin	:	1,250 ha
	Total	:	7,510 ha

The major construction works designed are as follows:

(a) Dredging of Pluit reservoir

(b) Rehabilitation of Pluit pumps and facilities

(c) Construction of Pekapuran tidal gate

(d) Improvement of the following rivers/ canals; Ciliwung river, Ancol canal, Pademangan canals, Besar river, Pakin canal, Jelakeng canal and Duri canal

(e) Construction of Sentiong cutoff channel

(f) Construction of Ancol gravity outlet

(g) Improvement of Papanggo drain and Lagoa tidal gate

The proposed sites/facilities designed in the said project are also shown in Table 5 and Figure 6, respectively.

(8) Studi Perencanaan Jaringan Pengairan Jangka Menengah

The study contains an inventory of drainage rivers and canals except the micro-drainage canals, survey of inundation in 1991/1992, and evaluation of projects for improvement of drainage system in DKI Jakarta. The projects evaluated, evaluation procedure and results were similar to those in the JICA Master Plan Study finalized in 1991. However, inventory data and survey information have been available for the Study Team:

(9) Proyek Perencanaan Teknis Sistem Drainase Kotamadya Tangerang 1993/1994

This study report is the sole one available for the Study Team on urban drainage in other city than DKI Jakarta. The following information is mainly available for the Study Team

(a) Survey on inundation area and scale in Tangerang city area

(b) Analysis on related factors to inundation of each area

(c) Improvement measures of urban drainage system in the Tangerang city area

2.2 Wastewater Treatment

Studies on wastewater treatment have been made not only in the exclusive study on its field but also in the comprehensive urban development study. The study and plan to be described herein are typical ones for the DKI Jakarta.

(1) The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta(Master Plan Study and Feasibility Study ; JICA ,1991)

Master Plan

The master plan proposed a sewerage development plan which covers an area of 16,604 ha in which the estimated population will be 6.35 million in year 2010. It was proposed that the area would be divided into six(6) sewerage development zones as shown in Figure 7. The proposed major facilities in each zone are summarized in Table 8.

For the other DKI Jakarta area than the sewerage development area described above, a domestic on-site development plan was proposed in the master plan. The area would be divided into two(2) area ,that is, the high level on-site treatment system development area and the simple on-site treatment system development area. In order to meet increasing requirement of sludge treatment , construction of sludge treatment plants was proposed in Kec.Pasar Minggu and Pasar Rebo, in addition to the existing plants in Pulo Gebang and Duri Kosambi. Total capacity of treatment would be 1,200m^3/day.

By means of the proposed sewerage development, on-site treatment system development and industrial waste control, pollution load discharge of the whole DKI Jakarta area would be reduced from 545,245 kg/day to 247,675 kg/day in 2010.

Feasibility Study

The feasibility study was conducted for the priority area selected out of six zones presented in Figure 7. The priority area is the northern portion of the central zone while southern portion is the project area of on-going(as of the study period) Jakarta Sewerage and Sanitation Project(JSSP). Out of the area of 6,107 ha of the central zone, the priority area(defined as North Central Sewerage Development Area) have an area of 4,300 ha excluding the JSSP project area. The priority area is shown in Figure 8. Out of the priority area, the area to be covered by sewerage development system is 3,847 ha excluding area for rivers, parks, ponds and reserved area.

Conventional separate collection system and interceptor collection system were applied for wastewater collection in the project area. Conventional sewerage collection system collects both toilet waste and gray water through a complete sewer pipe networks. While the interceptor system collects gray water only through the existing road side drainage ditches. The toilet waste in this area will be treated by on-site septic tank system. Conveyance sewer was proposed for a length of 10.34 km, from Menteng at southern boundary of the project area to the treatment plant to be constructed in Pluit reservoir.

Aerated lagoon treatment system with facultative/anaerobic pond was proposed in the Pluit reservoir where it is being used for the regulation pond for river flood water. Required capacity of the treatment plant in the year 2010 was estimated at 529,000m^3/day. Those capacities includes wastewater of the JSSP area of 140,000m^3/day.

(2) Sewerage Development Proposal by PAL Jaya in 1995

The Persahaan Daerah Pengelolaan Air Limbah(PD PAL Jaya) has just prepared in September 1995 the sewerage development proposal for DKI Jakarta. The general feature of the development is as follows :

No.	Service Area	Treatment Plant Type	Service Area (ha)	Plant Capacity (l / sec)
1	Complex Danayasa	WWTP	-	125
2	Senayan Square	WWTP	202	757
3	Waduk Melati Area	A.Lagoon	101	160
4	Waduj Grogol Area	A.Lagoon	562	890
5	Waduk Senter Area	A.Lagoon	759	1,202
6	Kemayoran Area	A.Lagoon	945	1,496
7	Lap.Banteng Area	WWTP	157	249
8	Pluit Area	A.Lagoon	900	1,425
9	Waduk Siantar Area	A.Lagoon	210	332
10	Kawasan Industri P.Gadung	WWTP	112	117
11	Gajahmada-Thamrin Area	WWTP	1,139	1,803
12	Blok M Area	WWTP	225	356
13	Pengembangan Pilot Projrct	WWTP	450	712

Note : A.Lagoon ; Aerated Lagoon
WWTP ; Waste Water Treatment Plant

3 URBAN FLOODING

3.1 Flooding Condition in DKI Jakarta

Many and large areas in DKI Jakarta have been suffered serious flooding and inundation of long duration due to various factors. Several inundation maps and survey report on inundation data are available for recent years(during 1991 to date) which information are integrated in Table 9 and Figure 12, respectively. The information incorporated and superimposed in the said table and figure are extracted from the following materials:

(a) Inundation data extracted from Buku Daftar Evaluasi Genangan Tahun 1991/1992 di DKI Jakarta

(b) Buku Pedoman Pelaksanaan Pengendalian Banjir Periode 1992/1993, PDKIJ DPU

(c) Peta Genangan Yang Terjadi Tahun 1993/1994, Wilayah DKI Jakarta, DPU DKI Jakarta

(d) Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995, PSAPB(Ciliwung - Cisadane), DPU

(e) Buku Pedoman Pelaksanaan Pengendalian Banjir Periode 1995/1996, PDKIJ DPU

(f) Information from DPU DKI Jakarta on Inundation Factors in each Habitual Area

Major inundation factors evaluated in Table 9 are generally summarized as follows:

(a) Low-lying area or located in flood plain

(b) Insufficient carrying capacity of the rivers and the existing drainage system

(c) Improvement/Construction works are not completed yet

(d) Backwater effect of a river on the related drainage canal(s)

(e) Clogging of canal with soil and/or garbage sediment

In Figure 12, the inundation locations are classified into the following three categories according to the inundation area and depth:

(a)	Class I	serious area	inundation area is bigger than 100,000 m^2, or inundation depth is higher than 1.0 m
(b)	Class II	rather serious area	inundation area is 50,000 m^2 to 100,000 m^2, and inundation depth is 0.5 m to 1.0 m

(c) Class III light area inundation area is 10,000 m^2 to 50,000 m^2, and inundation depth is 0.2 m to 0.5 m

It is observed in Figure 12 that the class I and class II locations are concentrated in the following area with some characteristics:

(a) East coastal area : It is most north-east part of DKI Jakarta and between the Sentiong river and the Cakung Drain. This area is very low-lying area where the Sunter east and Sunter west polder projects are on-going. Inundation area seems to be very big but depth is not so high.

(b) Cipinang river area : The area near the confluence with the Sunter river is located in low-lying area where both inundation area and depth are big.

(c) Ciliwung river area : The area along the Ciliwung river where is the upstream reaches of the confluence with the Eastern Banjir Canal suffers rather serious inundation.

(d) Krukut river area : The area near and upstream reaches with the Mampang river suffers one of the most serious inundation in the DKI Jakarta in terms of inundation area and depth. Some places located in the low-lying area where was previously the flood plain of the Krukut river.

(e) Pesanggrahan river area : There are some serious areas along the Pesanggrahan river. The most conceivable reason of serious inundation may be due to no improvement of the Pesanggrahan river and locations on the flood plain. Other factor may be insufficient existing pump capacity.

3.2 Flooding Condition in Tangerang City (Kotamadya Tangerang)

According to the information in the study report titled "Proyek Perencanaan Teknis Sistem Drainase Kotamadya Tangerang 1993/1994", the habitual inundation area in the Tangeran city is broadly classified in two (2) categories in location aspect. One is in and around the central town area of the city where is in the catchment of Cisadane river or nearby. The second one is in the catchment of the Angke river where is rather recently developed residential area. The all locations are shown in Table 10 and Figure 13, respectively.

Survey by the said study was conducted rather in detail for the shaded area in Figure 13 where the survey result is described in Table 10, while the other area have no data but only locations.

A scale of the inundation in both area is not so serious in terms of inundation area and depth as well as inundation duration as long as available data in Table 10. It is conceivable that the inundation places in the catchment of the Cisadane river may be affected by the high waterlevel of the said river due to the following reason:

(a) Difficulty of drainage of this area toward the Cisadane river since waterlevel of the river is always dammed up by the Pasar Baru weir.

(b) Backwater effect of the Cisadane river through the Sabi river during a flood of the Cisadane river.

As to the places located between the Angke river and the future Ring Road, it is conceived that the inundation factors are mainly due to the present condition of the local drainage and some effect of the Angke river as follows:

(a) No development yet of the drainage system

(b) Incomplete or deteriorated structure such as concrete wall, sluice gate, etc.

(c) Obstruction of garbage and soil deposit in river channel, and

(d) Backwater effect of the Angke river to the local drain channel.

3.3 Inundation in Jakarta During Floods in Jan. and Feb. 1996

(1) Flood in January 1996

The inundation which occurred during January 5th and 6th in Jakarta were caused mainly due to flooding of rivers. In particular the Ciliwung river seriously caused inundation at many places with large scale in the area along the Ciliwung river itself, the Western Banjir Canal and the old Ciliwung.

The locations of inundation area and these scale are summarized in Table 11. It is clearly observed that the inundation places were concentrated in the areas related to the Ciliwung river and the Western Banjir Canal. The areas other than the above are in and around the Polder Sunter Barat in North Jakarta as well as the Cipinang/Sunter in North and East Jakarta.

Figure 14 shows the above places by overlaying on the habitual inundation area in DKI Jakarta.

(2) Flood in February 1996

The inundation which occurred over DKI Jakarta area on February 10 have been observed that it is due to various problems of the urban drainage and that the intensity of a daily rainfall on the day exceeded the designed capacity. Most of the habitual inundation area suffered from damage except in the area along the Ciliwung river and old Ciliwung river. According to the survey report prepared by the DPU shows that areas along the Grogol Sekretaris, the Western Banjir Canal, the Cideng river and the Sunter river suffered from rather serious scale of inundation than the habitual ones.

The locations of inundation area and these scale are summarized in Table 11 in the same manner as for the January flood. Figure 15 shows the above places by overlaying on the habitual inundation area in DKI Jakarta.

4. SMALL SCALE IMPROVEMENT PLAN OF URBAN DRAINAGE

4.1 I.K.P.N. Complex Along Pesanggrahan River

Floods have been caused by river water flown into the area over the existing concrete wall along the left bank of the Pesanggrahan river as well as local rainwater on the area. It can be suggested that the following measures be taken for improvement of the present situation:

(i) Improvement and extension of the existing concrete wall(left bank only),

(ii) Improvement of river course along the area including widening and cleaning of garbage and soil deposit in the river,

(iii) Straightening of river course in downstream reaches of the area(between a confluence with the Sodetan Grogol and Pesanggrahan and the existing road bridge)

(iv) Improvement of local drainage channel in the area and replacement of the existing drainage pump.

The location of the area is indicated as S7 in Figure 12.

4.2 Tangerang City Area Between Cisadane and Sabi Rivers

Improvement of a local urban drainage system over this area has been on-going. Besides such improvement works, measures to lower the waterlevel of the Sabi river during flooding of the Cisadane river is necessary to be studied in order to improve a drain condition of the area. Due to no data availability of the Sabi river, specific measure is hard to propose at present, however a preliminary hydrological observation and investigation is recommended to conduct for the Sabi river. For an improvement of the present situation of the Pernahan Benua Indah area which locations is shown as L1in Figure13, a replacement of the existing small drainage pump is also necessary.

4.3 Ciledug Area Along Angke River

According to the preliminary investigation undertaken for the Ciledug Indah Complex area, indicated as R4 in Figure13, inundation have been caused by flood water of Angke river, not due to drainage problem of local rainfall. No overtopping of flood water has been observed according to inhabitants in this area. However, deteriorated structures such as concrete wall and sluice conduit allowed water intrusion during high waterlevel of the Angke river. Not only local river improvement works, but also removal of garbage deposit and trees in the river course maybe effective means for improvement of the present situation of the area.

5. DRAINAGE AND RELATED FACILITIES IN THE OBJECTIVE AREA OF THE FEASIBILITY STUDY

5.1 Urban Drainage Facilities in the WBC Area

(1) General

Several existing drainage facilities such as pumping stations and drainage channels are located along and connected to the Western Banjir Canal, respectively. All of the pumping stations listed in Table 12 drain water to the Western Banjir Canal directly as of now.

There are many drainage channels which have the outlet to the Western Banjir Canal through such structures as an outlet structure, a sluice and a gated structure. Furthermore, some drainage channels have an inlet from the Western Banjir Canal with gated structure or are crossing with a siphon.

(2) Pumping Station

(a) Drainage Pumping Stations

Seven drainage pumping stations are existing and discharging drained water to the Western Banjir Canal. General feature of those pumping station and related drainage facilities are presented in Table 13 and the locations are shown in Figure 16. Most of the stations except Muara Angke P.S. are located at inland along the Western Banjir Canal.

(b) Outlet Structure

According to the field investigation conducted by the Study Team, several structures, which are part of the pumping station facility, might be affected to some extent by the proposed river improvement works since locations of respective structures are inside the channel of the Western Banjir Canal. Most of those are the concrete outlet structure and the sluice pipe for drain.

(c) Sluice Pipe and Flapgate

Pumping stations such as Rawa Kepa P.S., Ponduk Bandung P.S. and Melati P.S. discharge each drain water to the Western Banjir Canal through some sluice pipes embedded in the present bank. A flapgate is equipped at the tip of each pipe, which is exposed in the channel of the Western Banjir Canal. According to the observation of the Study Team, some of flapgates seem to be so deteriorated that it might be hard to shut closely in order to keep away riverwater intrusion when it is under water level.

(d) Muara Angke Pumping Station

The Muara Angke pumping station is situated on the right bank of no elevated land and just beside the channel of the Western Banjir Canal. An embedded drain conduit in the river bank

connects the pump equipment and the channel, while there is a gated structure and sluiceway connecting the reservoir directly to the WBC.

Since the elevation of those structures are only a little higher than the present normal water level of the Western Banjir Canal, rather big scale of modification and construction of the related structures will be required in line with the river improvement plan of which construction of dike system may be a major one.

(3) Drainage Channel

Several rivers categorized as drainage channel are generally concerned to the Western Banjir Canal in the following manner with various structures:

Connection to WBC	Rivers	Related Structure
Crossing	Grogol riv.	Siphon
	K.Cideng	Siphon
	K.Baru Barat	Siphon
Joining (outlet to WBC)	Angke riv.	Gated structure
	K.Krendang	Channel
	Local Drain in Kel. Petamburan	Gated structure
	K.Cideng	Channel
	K.Baru Barat	Sluice Gate
	Branch of K.Baru Barat	Sluice
	S.Bali Matraman	Sluice
Diverting (inlet from WBC)	Krukut riv.	Gated structure
	K.Surabaya	Gated structure
	Old Ciliwung riv.	Gated structure

In case of rivers across the Western Banjir Canal by a siphon, only a siphon structure might be involved in the river improvement works.

The joining drainage channels discharge drain water from its drainage area to the Western Banjir Canal under a certain waterlevel condition. Since the water level of the Western Banjir Canal would be still same or be lowered after river improvement, respective drainage system will not be influenced , otherwise to be improved. However some structures such as those mentioned in Table 12 may be affected and may be necessary to be modified or replaced depending on the river improvement manner.

Rivers diverted from the Western Banjir Canal have been receiving flushing water under a regulated WBC water level by gated weir. The Krukut and Old Ciliwung rivers will not be

affected by the improvement, while the K.Surabaya structure will be modified in case that an improvement of the Manggarai Barrage is proposed.

(4) Local Drainage System

There are some local drainage networks which are of gravity drainage to the Western Banjir Canal and several sluice structures are located mainly on the left bank Table 14 and Figure 16 show those structures and their locations.

5.2 Drainage Facilities in the Cisadane River Area

(1) General

There is no facilities related to the urban drainage close to the Cisadane river in the downstream of the Pasar Baru Barrage, while there are several channels and creeks joining the Cisadane river, which seem to be utilized for the local drainage network of the nearby area or the drainage of paddy field. The channels related to the drainage in the area are summarized in Table 15 and these locations are shown in Figure 17.

(2) Sabi River

The Sabi river, which is a sole main tributary of the Cisadane river in the objective area of river improvement, joins the Cisadane river at about 2.0 km downstream from the Pasar Baru Barrage on the left bank of the Cisadane river.

The Sabi river functions as a principal channel of several local drain channel networks in Kec.Tangerang and Kec.Jatiwung, Kodja Tangerang(left bank of the Cisadane river). Since the Cisadane river have been keeping high water level due to an operation of the Pasar Baru Barrage aiming at steady supply of irrigation water, the most of drainage channels, except in the area being just along the Cisadane river, flow down towards the Sabi river.

There are some habitual inundation area in the Sabi river catchment, among which Perumahan Benua Indah area have been suffering from flooding damage due to not only insufficient drainage system of the area but also intruding backwater through the Sabi river during a flood period in the Cisadane river. For an improvement of drainage condition in the said area, the following measure may be necessary to be taken even if lowering highwater level to a considerable extent would be expected by the Cisadane river improvement:

(a) Improvement of the drainage facilities,

(b) Improvement of the Sabi river, and

(c) Measures to prevent the Cisadane backwater from intrusion.

(3) Channels from Irrigation Canal

The Pasar Baru Barrage is functioning to divert the Cisadane river water to the irrigation canals(one each to left and right banks) and the Mookervaart canal(right bank). From each irrigation canal, at some 200 m downstream of the gated intake weirs beside the Pasar Baru Barrage , a small and short natural channel is further diverted, with a small gated structure, to the Cisadane river as illustrated in Figure 17.

(4) Other Small Channels

Other than those specifically described above, there are several isolated small drain channels or creeks flowing to the Cisadane river as shown in Figure 17. Those channels seems to be draining irrigation waters spilled out from paddy fields and domestic waste water in the respective area.

5.3 Related Facilities

5.3.1 Western Banjir Canal Area

(1) Bridges

There are various traffic structures across the Western Banjir Canal between the river mouth and the Manggarai Barrage (20 nos. in total). Feature of those structures are summarized in Table 16 and locations are presented in Figure 16. Those traffic structures are generally classified into in terms of traffic use as follows:

(i) Bridges for Vehicle Traffic (with sidewalk) 16
- (a) Road Bridge ..... (11)
- (b) Road Flyover ..... (3)
- (c) Elevated Road(Toll Road) ..... (2)

(ii) Bridges for Railway 2

(iii) Pedestrian Bridge..... 2

Among those enumerated above, all of the bridges for vehicle traffic are built on the trunk line streets in D.K.I Jakarta. It is probable that there will be no more capacity for further increasing traffic and that the allowable load of some bridges are not sufficient enough for too crowded and heavy vehicles.

Out of 11 road bridges above, 3 to 4 bridges are found that it has no sufficient clearance above river water level since the bridge structures are presently constructed at too low position in the river channel space.

The existing bridge for the railway going to Tangerang is for a single track and the bridge may be an obstruction of the proposed design flood flow according to the investigation of the Study Team. While a new bridge for another single track is under construction beside the existing

one and to be raised up of its structure level. The existing one is planned to be reconstructed at same elevation as the constructing one.

(2) Other Structures

According to the investigation by the Study Team, various structures other than the traffic bridges and the drainage facilities are situated within the channel of the Western Banjir Canal. Major ones of those structures are main aqueduct, power supply cable duct of rather high voltage, main gas supply pipe, as listed in Table 17. The locations are shown in Figure 16.

At just upstream of the confluence of the Krukut river, the intake gates are existing of the PAMJAYA filtr

ation plant on the left bank of the Western Banjir Canal.

5.3.2 Cisadane River Area

There is only one existing bridge in the project area of the Cisadane river(between the Pasar Baru Barrage and the river mouth). The bridge is located on the province road in Desa Kalibaru, Kec.Sepatan as illustrated in Figure 17.

Outline of the bridge is indicated in Table 16. The height of the existing bridge seems to be at rather high level than the present river water level and levee crown level. However, it is subject to the further study whether the present bridge level is high enough against the design high water level and proposed dike improvement. The existing bridge is a steel truss one with one span, so that there is no pier but only abutments.

5.3.3 Ciliwung Floodway Area

There is one bridge each in the project area of the Ciliwung Floodway, across the Ciliwung river and the Cisadane river respectively, as shown in Table 16. The road bridge across the Ciliwung river exists at about 300 upstream of the proposed inlet site of the floodway in Kecamatan Bogor Selatan. This bridge is located on the national road (Jl. Pajajaran) going to Bandung via. Ciawi and Puncak.

A suspension bridge for only pedestrian is located at about 150 m downstream of the proposed outlet site of the floodway. The area beside the bridge and connecting path is a crowded residential quarter on the right bank, while the left bank side is a rather thinly settled area.

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(1/9)

A : WILAYAH ALIRAN BARAT(1/3)

System / Polder / Main River / Sub-system River / Related Canal			Length (m)	Width (m)
Aa	POLDER			
	Aa1	Bojong Indah(Waduk Pojong Indah)		
		Aa1.1 S.Pojjong Indah	792	2.0
	Aa2	Pedongkelan Timur (Waduk Pedongkelan Timur)		
		Aa2.1 K.Apuran	1,820	12.0
	Aa3	Teluk Gong(Waduk Teluk Gong)		
		Aa3.1 S.Penghubung Teluk Gong	1,155	2.0
	Aa4	Tomang Barat(Waduk Tomang Barat)		
		Aa4.1 S.Tomang Barat	1,225	4.0
		Aa4.2 S.Penghubung Tanjung Duren	360	1.0
	Aa5	Grogol(Waduk Grogol)		
		Aa5.1 S.makalive	630	4.0
		Aa5.2 S.Susilo	1,855	3.0
	Aa6	Jelambar(Waduk Jelambar)		
		Aa6.1 S.Penghubung BDN Jelambar	766	1.0
	Aa7	Hankam Slipi(Waduk Hankam)		
		Aa7.1 S.Hankam	380	1.2
Ab	CANAL			
	Ab1	K.Kamal	4,690	6.0-12.0
		Ab1.1 S.Citegal Alur	1,645	4.0-8.0
		Ab1.1.1 S.Tegal Alur	2,380	2.0-6.0
		Ab1.1.2 S.Menceng	2,030	1.0-2.0
		Ab1.1.3 S.Rawa Besar	1,060	3.0-6.0
		Ab1.1.4 S.rawa Bokor	5,250	3.0-6.0
		Ab1.1.5 S.Pengandungan	1,925	2.0-4.0
	Ab2	S.Tanjungan	2,070	4.0-8.0
		Ab2.1 S.Pembuang Komplek Taman Kencana	2,200	2.0-4.0
	Ab3	K.Mookervaart	8,600	25.0
		Ab3.1 S.Kalideres	1,100	2.0
		Ab3.2 S.Pekojan	1,450	1.5
		Ab3.3 S.Sumur Bor	980	6.0-8.0
		Ab3.3.1 S.Utan Jati	1,850	4.0-6.0
		Ab3.3.2 S.Cengkareng Barat	1,135	8.0-10.0
		Ab3.4 S.Tanan Tinggi	1,050	3
		Ab3.5 S.Poris	920	3
		Ab3.6 S.Semanan	1,210	8.0-15.0
		Ab3.6.1 S.Rawa Buaya	510	1.0
		Ab3.6.2 S.Kresek	2,300	2.5
		Ab3.6.3 S.Cipondoh	300	2.5
		Ab3.7 S.Duri Kosambi	1,200	2.0
		Ab3.8 S.Basmol	1,030	2.0
		Ab3.9 K.Angke Lama	1,645	10.0-15.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(2/9)

A : WILAYAH ALIRAN BARAT(2/3)

System / Polder / Main River / Sub-system River / Related Canal			Length (m)	Width (m)
Ab4	Cengkareng Floodway		7,700	40.0
	Ab4.1	S.Jl.Kapuk Raya	1,200	1.0
	Ab4.2	S.Kapuk Cisadane Timur	910	1.0
	Ab4.3	S.Perumunas Cengkareng	1,800	2.5
	Ab4.4	K.Apuran Atas	2,775	8.0
		Ab4.4.1 Sal.Kampung Utan	770	2
		Ab4.4.2 S.Cendrawasih Pasar Cengkareng	490	1.5
Ab5	K.Angke Bawah		3,900	20.0-30.0
	Ab5.1	S.Kapuk Muara I	2,600	-
	Ab5.2	S.Kapuk Muara II	2,050	-
	Ab5.3	S.Kapuk Muara III	2,050	-
	Ab5.4	S.Jl.Kapuj Raya	2,800	1.0
	Ab5.5	S.Apuran Bawah	2,750	8.0-12.0
	Ab5.6	S.Jelambar	1,470	18.0
		Ab5.6.1 S.Penghubung Jelambar	700	2.0
Ab6	K.Grogol Bawah		3,700	20.0
	Ab6.1	S.Komplek BNI Jelambar	980	2.0
	Ab6.2	S.Penguhubung Empang Bahagia	985	3.0
	Ab6.3	S.Kiai Tapa	1,400	5.0
		Ab6.3.1 S.Jati Pulo	3,185	2.0-3.0
		Ab6.3.2 S.Tomang Raya	710	1.5
Ab7	K.Angke Atas		5,900	10.0-15.0
	Ab7.1	S.Kompas	945	2.0
	Ab7.2	S.Kembangan	3,690	2.0
		Ab7.2.1 S.Kav.DKI Meruya	1,690	2.0
		Ab7.2.2 S.Labrata	945	5.0
	Ab7.3	S.Gabuyuran	4,200	4.0
		Ab7.3.1 S.Komp.Walikota Jakarta Barat	2,100	2.0
Ab8	K.Sepak		3,115	6.0-18.0
	Ab8.1	S.Meruya Ilir	2,940	12.0
		Ab8.1.1 S.Komp.DPR Meruya	860	4.0
		Ab8.1.2 S.Kreo	1,200	6.0
		Ab8.1.3 S.Petukangan	1,100	6.0
	Ab8.2	S.Srengseng	3,300	6.0-12.0
		Ab8.2.1 S.Ulujami	3,890	5.0-7.0
Ab9	K.Pesanggrahan		21,600	15.0-30.0
	Ab9.1	S.Duri Kedoya	1,035	2.0
	Ab9.2	S.Al Kamal	1,575	3.0
		Ab9.2.1 S.Lapangan Bola Kebon jeruk	560	2.0
	Ab9.3	S.BPP Teknologi	1,100	3.0
	Ab9.4	S.Penguhubung Pesanggrahan Kepala Dua	1,925	3.0
		Ab9.4.1 S.Komplek Deplu	1,630	2.0
	Ab9.4	S.Komplek IKPN	500	1.5

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(3/9)

A : WILAYAH ALIRAN BARAT(3/3)

System / Polder / Main River / Sub-system River / Related Canal			Length (m)	Width (m)
Ab10	Sedotan Grogol Sekretaris		1,900	20.0
	Ab10.1	S.Taman Kota	1,645	2.0
		Ab10.1.1 S.Kedoya Koneng	2,815	3.0
		Ab10.1.2 S.Komplek Sunrise Garden	710	4.0
Ab11	K.Sekretaris		18,375	8.0-15.0
	Ab11.1	S.Komplek Kodam Kebon Jeruk	2,520	4.0
	Ab11.2	S.Jl.Anggrek Kebon Jeruk	860	2.0
	Ab11.3	S.Cidodol	960	2.0
	Ab11.4	S.Kelapa Dua	940	2.0
Ab12	K.Grogol Atas		19,250	4.0-22.0
	Ab12.1	S.Harapan Kita	1,780	3.0-5.0
		Ab12.1.1 S.Kejaksaan S.Parman	750	1.0-2.0
		Ab12.1.2 S.R.S. Pelni	665	1.0-2.0
	Ab12.2	S.Komplek TVRI Kemanggisan	500	1.0-2.0
	Ab12.3	S.Kemanggisan Ilir III	770	1.0-1.5
	Ab12.4	S.Pluis	2,870	3.0-6.0
	Ab12.5	S.Jl.Asia Africa	1,400	1.0-3.0
		Ab12.5.1 S.Gedung Pemuda	830	1.0
		Ab12.5.2 S.Komp.Senayan	760	1.0-2.0
	Ab12.6	Saluran Jalawe	4,650	1.0-6.0
	Ab12.7	S.Fatmawati Pom Bensin	2,400	2.0-6.0
	Ab12.8	S.Torogong	2,240	2.0-4.0
	Ab12.9	S.Jl.Kerinci Kebayoran Baru	550	1.0-2.0
	Ab12.10	S.Lebak Bulus	1,400	2.0-4.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(4/9)

B : WILAYAH ALIRAN TENGAH(1/3)

System / Polder / Main River / Sub-system River / Related Canal	Length (m)	Width (m)
Ba POLDER		
Ba1 Muara Angke(Waduk Muara Angke)		
Ba1.1 S.Kampung Nelayan	500	2.0
Ba2 Pluit(Waduk Pluit)		
Ba2.1 S.Gendong Wd.Pluit	2,000	8.0
Ba2.2 S.Jl.Pluit Putra	2,450	2.0
Ba2.3 S.Jl.Pluit Selatan	710	1.0
Ba2.4 S.Jl.Pluit Raya	1,035	5.0
Ba2.4.1 S.Jl.Jembatan III	1,750	5.0
Ba2.5 K.Jelakeng	2,370	11.0
Ba2.5.1 K.Pakin	1,710	20.0
Ba2.5.1.1 K.Besar	1,820	20.0
Ba2.5.1.2 K.Anak Kali Ciliwung	2,940	15.0
Ba2.5.1.2.1 Ciliung Tangki	945	20.0
Ba2.5.1.2.1 K.Ciliung Gajah Mada	3,750	16.0
Ba2.5.1.2.2 S.Pinangsia	700	2.0
Ba2.5.1.2.3 K.Beton	2,205	6.5
Ba2.5.1.3.1 S.Batu Ceper/Batu Tulis	385	1.5
Ba2.5.1.2.4 S.Taman Sari	2,350	5.0
Ba2.5.1.4.1 S.Jl.Karang Anyar Utara	840	1.5
Ba2.5.1.4.2 S.Pintu Air	670	2.0
Ba2.5.1.2.5 S.Mangga besar XII	340	1.0
Ba2.5.2 S.Bandengan	1,470	5.0
Ba2.5.3 S.Tubugas Angke	1,840	14.0
Ba2.5.3.1 K.Duri	4,270	6.0-15.0
Ba2.5.4 S.Jembatan Lima	630	4.0
Ba2.5.4.1 S.Cibubur	700	9.0
Ba2.5.5 K.Cideng Bawah	7,840	15.0
Ba2.5.5.1 S.Kesehatan	1,925	4.0
Ba2.5.5.2 S.Krutuk Bawah	3,450	6.0
Ba2.5.5.2.1 S.Budi Kemuliaan	1,260	3.0
Ba2.5.5.2.2 S.Jl.Kebon Sirih	665	3.0
Ba2.5.5.3 S.Hati Suci	920	2.5
Ba2.5.5.4 S.Jl.Kebon Sirih	700	3.0
Ba2.5.5.5 S.Jl.Wahid Hasyim	1,280	1.5
Ba2.5.5.6 S.Surabaya	1,995	7.5
Ba2.5.5.6.1 S.Kebon Kacang	1,645	5.0
Ba2.5.5.7	700	10.0
Ba3 Setiabudi(Waduk Setiabudi)		
Ba3.1 S.Jl.H.R.Rasuna Said	1,050	2.0
Ba3.2 S.Jl.Setiabudi	810	2.0
Ba3.3 S.Kawi-kawi	725	2.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(5/9)

B : WILAYAH ALIRAN TENGAH(2/3)

System / Polder / Main River / Sub-system River / Related Canal				Length (m)	Width (m)
Bb	CANAL				
	Bb1	K.Ciliwung		46,445	30.0-40.0
		Bb1.1	S.Ancol	1,250	40.0
			Bb1.1.1 S.Ancol Barat	525	2.5
		Bb1.2	S.Mangga Dua Raya	1,160	2.5
		Bb1.3	S.mangga Dua Selatan	975	3.0
		Bb1.4	K.Mati	710	7.5
		Bb1.5	S.Kartini	600	2.5
		Bb1.6	S.Pasar Baru	800	1.5
		Bb1.7	S.Kali Lio	1,610	7.0
		Bb1.8	S.pejambon	700	2.0
		Bb1.9	S.Jl.Batu	350	2.0
		Bb1.10	S.Kali Pasir	425	2.0
		Bb1.11	S.Raden Saleh	665	3.0
		Bb1.12	S.Pegansaan	1,185	5.0
		Bb1.13	S.K.Bata Bawah	1,200	12.0
		Bb1.14	S.Sodetan Kali Baru Timur	1,016	8.0
		Bb1.15	S.Jl.Jatinegara Barat	590	1.2
		Bb1.16	S.Pembuangan Otista	270	1.5
		Bb1.17	S.Pembuangan Dewi Sartika	260	1.5
		Bb1.18	S.Pengadegan	385	2.0
		Bb1.19	S.Komp.DPR Kalibata	385	2.5
		Bb1.20	S.Kramat Jati	4,270	2.0-7.0
			Bb1.20.1 S.Condet Batu Amper	2,200	2.0-5.0
		Bb1.21	S.Rawa Gurih	760	1.0-1.5
		Bb1.22	S.Tanjung Barat	2,900	3.0
		Bb1.23	S.Komp.HAKA Tanjung Barat	1,645	3.0
		Bb1.24	S.Jl.Ienteng Agung	600	2.0
		Bb1.25	S.Cijantung	5,515	4.0
		Bb1.26	S.Kalisari	3,085	4.0
	Bb2	K.Krukut		34,425	5.0-22.0
		Bb2.1	S.Ciragil	2,115	4.8
			Bb2.1.1 S.Pulobangkeng	1,225	2.4
			Bb2.1.2 S.Melawai	605	1.5
		Bb2.2	S.Mampang	5,635	4.0-11.0
			Bb2.2.1 S.Pondok Jaya	1,505	3.0
			Bb2.2.2 S.Bangka	1,890	2.0
			Bb2.2.3 S.Pejaten Barat	1,540	2.0
			Bb2.2.4 S.Pulo	6,090	4.0-8.0
			Bb2.2.4.1 S.Kejaksaan Pejaten	1,195	3.0
			Bb2.2.4.2 S.Krobokan Pejaten	700	2.0
			Bb2.2.4.3 S.Jati Padang	1,085	2.0
			Bb2.2.4.4 ebayuran	910	2.0
			Bb2.2.5 S.Ragunan	3,255	4.0-8.0
			Bb2.2.6 S.Serua	5,495	3.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(6/9)

B : WILAYAH ALIRAN TENGAH(3/3)

System / Polder / Main River	Sub-system River	Related Canal	Length (m)	Width (m)
	Bb2.3	S.Pulo Raya	780	5.0
		Bb2.3.1 S.Dharmawangsa	800	3.0
		Bb2.3.1.1 S.Jl.Sawo	650	1.5
	Bb2.4	S.Prapanca	600	3.5
	Bb2.5	S.Jl.Damai	945	2.0
	Bb2.6	S.Jl.Abd Majid	1,505	3.0
	Bb2.7	S.Madrasah	2,650	2.5
	Bb2.8	S.Tundabaru	750	1.5
	Bb2.9	S.Kalijati Pondok Labu	2,100	3.0
		Bb2.9.1 S.Komp.DDn Pondok labu	1,225	1.5
	Bb2.10	S.Kandang Jagakarsa	1,325	2.5
	Bb2.11	S.Setu Ciganjur	3,185	2.5
Bb3	S.Cideng Atas		4,920	12.0-16.0
	Bb3.1	S.Warung Pedok	2,100	2.5
		Bb3.1.1 S.Komplek BBD	1,100	2.0
	Bb3.2	S.Jl.Kapten Tendean	545	1.5
	Bb3.3	S.Warung Bundit III	900	3.0
	Bb3.4	S.PLN Duren Tiga	1,170	3.0
	Bb3.5	S.Komp.Pertani Duren Tiga	2100	3.0
	Bb3.6	S.Komp.Auri Pancoran	800	2.0
Bb4	K.Komp.Baru Barat		1,040	8.0
	Bb4.1	S.Minangkabau	600	8.0
	Bb4.2	S.Menteng Atas	820	2.5
	Bb4.3	S.Saharjo	1,900	8.0
	Bb4.4	S.Supomo	750	8.0
	Bb4.5	S.Pasar Minggu	7,700	8.0
	Bb4.6	S.Lenteng Agung	5,500	8.0
	Bb4.7	S.Cabang tengah	2,650	5.0
Bb5	S.Bali Matraman		1,400	5.0
	Bb5.1	S.Kali Bata	550	7.0
		Bb5.1.1 S.Lapangan Ros	1,035	12.0
		Bb5.1.1.1 S.Asem Baris	1,070	5.0
		Bb5.1.1.2 S.Tebet Timur	1,650	2.5
		Bb5.1.2 S.Kalibata Atas	2,275	3.0
		Bb5.1.2.1 S.Cikoko	1,025	7.0
		Bb5.1.2.2 S.Komp.DPR Kalibatan	2,265	2.0
	Bb5.2	S.Rawa Bilal	1,040	7.0
		Bb5.2.1 S.Tebet Barat Dalam	1,400	4.0
		Bb5.2.2 S.Perdatam	630	5.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(7/9)

C : WILAYAH ALIRAN TIMUR(1/3)

System / Polder / Main River / Sub-system River / Related Canal	Length (m)	Width (m)
Ca POLDER		
Ca1 Sunter Barat(Waduk Sunter Barat)	-	
Ca1.1 S.Lagoa Tenggiri	4,550	6.0-25.0
Ca1.1.1 S.Sungai Bambu/Lagoa Buntu	1,540	25.0
Ca1.1.2 S.Warakas/Trio	1,545	4.0
Ca1.1.3 S.Kebon Bawang	2,080	5.0
Ca1.2 S.Penghubung Gaya Motor	3,250	4.0
Ca1.3 S.Penghubung Bisma Timur	1,200	3.0
Ca1.4 S.Penghubung Bisma Tengah	950	4.0
Ca1.5 S.Penghubung Bisma Barat	1,050	4.0
Ca1.6 S.Penghubung Sunter Permai	-	-
Ca2 Pademangan(Waduk Ancol)	-	-
Ca2.1 S.Pademangan	485	25.0
Ca2.1.1 S.Pademangan Timur	2,350	12.5
Ca2.1.2 S.Al-Pademangan	2,100	3.0
Ca2.1.3 S.Pademangan Barat	3,950	15.0
Ca2.1.3.1 K.Mati	700	7.5
Ca2.1.3.2 S.Pademangan IV	1,120	3.0
Ca3 Sunter Timur I (Waduk Komp.AL)	-	-
Ca3.1 S.Komp.AL	1,645	2.5
Ca4 Sunter Timur II (Waduk Sisi Kali Cakung Barat)	-	-
Ca4.1 K.Cakung Lama	10,270	7.0-16.0
Ca5 Sunter Timur III (Waduk Sisi Kali Sunter Timur)	-	-
Ca5.1 S.Rawa Badak	3,115	2.6
Ca6 Pulo Mas(Waduk Pulo Mas)	-	-
Ca6.1 S.Pulo Mas Barat	1,365	3.5
Ca6.2 S.Pulo Mas Utara	665	4.0
Ca6.2.1 S.Pulo Mas Timur	700	4.0
Ca6.2.2 S.ASMI	775	3.0
Cb CANAL		
Cb1 K.Sunter	42,650	7.0-30.0
Cb1.1 S.Kelapa Gading	2,870	8.0-13.0
Cb1.2 S.Sentiong Sunter(K.Item)	4,100	13.0
Cb1.2.1 S.Serdang	1,100	5.0
Cb1.3 S.Utan Kayu	6,370	12.0
Cb1.3.1 S.Rawa Kerbau	4,450	3.5
Cb1.3.2 S.Mardani	1,240	2.5
Cb1.3.3 S.Rawa Sari	700	3.0
Cb1.3.4 S.Kayu Manis	1,680	2.5
Cb1.4 S.Rawa Mangun	3,100	5.0-9.0
Cb1.5 S.Kampung Ambon	2,900	10.0
Cb1.6 S.Pemuda	1,050	4.0
Cb1.7 S.Persahabatan	3,570	5.0
Cb1.8 S.Kedongdong	1,050	4.0
Cb1.9 S.Pondok Bambu	1,440	1.0-4.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(8/9)

C : WILAYAH ALIRAN TIMUR(2/3)

System / Polder / Main River / Sub-system River / Related Canal					Length (m)	Width (m)
	Cb1.10	S.Penghubung Halim			1,890	4.0
	Cb1.11	S.Lobang Buaya			2,225	5.0
	Cb1.12	S.Taman Burung			1,100	4.0
	Cb1.13	S.Penghubung Irigasi Bambu Atas			3,850	3.0
Cb2	K.Cipinang				19,600	4.0-16.0
	Cb2.1	S.Rawa Bunga			1,750	2.0-4.0
	Cb2.2	S.Cipinang Jaya			2,200	6
	Cb2.3	S.Jl.By Pass			1,610	2
	Cb2.4	S.Cawang Baru			735	1.5
	Cb2.5	S.Cililitan Besar			3,900	2.7
		Cb2.5.1	S.Permata Kodam		700	3.0
	Cb2.6	S.Pinang Ranti			2,940	4.0
	Cb2.7	S.Penghubung SMA Budi Warman			400	2.0
	Cb2.8	S.Suplesi PA Hek			160	5.0
	Cb2.9	S.Ciracas			4,100	2.0-6.0
		Cb2.9.1	S.Pasar Rebo		2,730	2.0
	Cb2.10	S.Penghubung Kampung Dukuh			2,100	2.0
Cb3	K.Buaran				8,290	10.0-22.0
	Cb3.1	Sodetan Saluran PT Jiep			980	12.0
		Cb3.1.1	S.Petkangan PT Jiep		4,600	8.0-14.0
			Cb3.1.1.1	S.PLN Klender	1,240	3.0
			Cb3.1.1.2	S.Penghubung Kampung Bulak	350	3.0
			Cb3.1.1.3	S.Dermaga Duren Sawit	1,050	2.5
			Cb3.1.1.4	S.Jl.Tomini Arafuru	1,470	2.0
				Cb3.1.1.4.1 S.Komp.Kimia Farma Duren Sawit	1025	2.5
			Cb3.1.1.5	S.Abidin	840	2.0
			Cb3.1.1.6	S.Jl.Kelurahan Duren Sawit	1300	2.0
	Cb3.2	S.Prapanca		S.PIK Pulo Gadung	1,925	5.0
	Cb3.3	S.Jl.Damai		S.Perumnas Klender	1,470	4.0
	Cb3.4	S.Jl.Abd Majid		S.Malaka Permnas	1,280	3.0
	Cb3.5	S.Madrasah		S.Swadaya Buaran	1,680	1.0-2.0
	Cb3.6	S.Tundabaru		S.Jati Waringin	1,300	3.0
Cb4	S.Jati Kramat				3,645	6.0-10.0
	Cb4.1	S.Pondok Kelapa			2,100	5.0-7.0
Cb5	K.Cakung				6,050	10.0-15.0
	Cb5.1	S.Sentra Primer Timur			3,200	2.0-12.0
	Cb5.2	Gebang			800	4.0
Cb6	S.Sentiong Sunter				5,850	20.0
	Cb6.1	S.Sunter C			3,860	10.0-12.0
	Cb6.2	Danau Sunter Selatan			-	-
		Cb6.2.1	S.Penghubung Sunter Jaya Timur		2,100	2.0
		Cb6.2.2	S.Penghubung Sunter Jaya Tengah		1,900	2.0
		Cb6.2.3	S.Penghubung Sunter Jaya Barat		1,100	2.0
	Cb6.3	K.Baru Senen			1,400	7.0

Table 1 DRAINAGE CANAL SYSTEM IN DKI JAKARTA(9/9)

C : WILAYAH ALIRAN TIMUR(3/3)

System / Polder / Main River / Sub-system River / Related Canal			Length (m)	Width (m)
Cb6.4	S.Sentiong Salemba		3,600	8.0-15.0
	Cb6.4.1	S.Pal Putih	875	3.0
	Cb6.4.2	S.Johar Baru	945	2.5
Cb6.5	K.Baru Timur		19,110	8.0-12.0
	Cb6.5.1	S.Rawa Bunga	650	1.5
	Cb6.5.2	S.Penghubung SMA 14	560	1.5

Source : DPU DKI
Studi Perencanaan Jaringan Pengairan Jangka Menengah
Draft Final Report, Jan.,1993

Table 2 PUMPING STATION FOR DRAINAGE SYSTEM IN DKI JAKARTA

Pump Station			Capacity			Related
No.	Name	Drain. Area(ha)	Unit Capacity (m^3/s)	Unit Capacity (Nos.)	Total (m^3/s)	Reservoir / Rivers
EXISTING						
P01	Pluit Barat	3,430	4.0	4	16.0	Pluit Reservoir
P02	Pluit Timur		3.2	4	12.8	Pluit Reservoir
P03	Muara Angke	53	1.3	2	2.6	K.Angke, Banjir Canal
P04	Melati	185	0.5	6	3.0	Banjir Canal
P05	Setiabudi Barat	232	1.0	5	5.0	K.Cideng, Banjir Canal
P06	Setiabudi Timur		1.0	3	3.0	K.Cideng, Banjir Canal
P07	Grogol	60	0.5	2	1.0	K.Grogol, K.Jelambar
			0.7	1	0.7	
P08	Tomang Barat	170	1.0	4	4.0	K.Sekretaris
P09	Pulo Mas	25	2.5	3	7.5	K.Sunter
P10	Rawa Kepa	253	2.0	4	8.0	Western Banjir Canal
P11	Teluk Gong (Lower Angke)	-	0.5	4	2.0	Lower K.Angke
P12	Sunter Barat Utara	1,250	3.3	3	9.9	K.Lagoa Tenggiri K.Ancol
P13	Hankam Slipi	-	0.06	3	0.18	K.Grogol
P14	Cideng	750	6.7	6	40.0	Western Banjir Canal
P15	Pondok Bandung	90	1.3	2	2.6	Western Banjir Canal
P16	Istana	50	0.25	3	0.75	K.Ciliwung
P17	IKPN	-	0.06	3	0.18	K.Pesanggrahan
P18	Mangga Dua Utara	77	1.3	2	2.6	K.Ciliwung
UNDER CONSTRUCTION/PLAN						
P19	Ancol	630	-	-	15.0	K.Sunter
P20	Sunter Timur I	390	-	-	5.2	K.Sunter
P21	Sunter Timur III	570	-	-	15.5	K.Sunter
P22	Kemayoran Airport Re-development	380	-	-	4.0	

Source : (1) The Studu on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Main Report /Supporting Report Vol.I, JICA, 1991
(2) DPU DKI Jakarta
(3) Review Report of East Jakarta Flood Control Project, Aug.,1988

Table 3 RESERVOIR FOR DRAINAGE SYSTEM IN DKI JAKARTA

Reservoir			Drain	Related Structure				Related Rivers
				Pump Station		Gate	Syp'n	
No.	Name	Area (ha)	Area (ha)	No.	Name	Nos.	Nos.	
EXISTING								
R01	Wk. Pluit	80	3,430	P01 P02	Pluit Barat Pluit Timur	1	12	K.Jelakeng K.Pakin K.Jl.Pluit Selatan
R02	Muara Angke	0.5	53	P03	Muara Angke	1	-	K.Angke Banjir Canal
R03	Wk. Melati	3.5	185	P04	Melati			Banjir Canal
R04	Wk. Setibudi (East and West)	4	232	P05 P06	Setiabudi Barat Setiabudi Timur	1	1	Banjir Canal K.Cideng
R05	Wk. Grogol	3	60	P07	Grogol	1	-	K.Grogol K.Jelambar
R06	Tomang Barat	6.8	170	P08	Tomang Barat	-	-	K.Sekretaris
R07	Pulo Mas (to be extended)	5.3 9	25	P09	Pulo Mas	1	-	K.Sunter
R08	Wk.Rawa Kepa	0.5	253	P10	Rawa Kepa	-	-	Banjir Canal
R09	Wk.Teluk Gong	2.5	95	P11	Teluk Gong	1	-	K.Angke(Lower)
R10	Sunter Barat (Utara/Selatan)	30	1,250	P12	Sunter Utara /Barat	1	-	K.Lagra Tenggiri, K.Ancol
R11	Wk.Hankam Slipi	-	-	P13	Hankam Slipi	-	-	K.Grogol
UNDER CONSTRUCTION/PLAN								
R12	Sunter Timur I	15	390	P20	Sunter Timur I	1	-	K.Sunter
R13	Sunter Timur III	8	570	P21	Sunter Timur III	1	-	K.Sunter
R14	Wk.Sunter II	-	214		-	-	-	Cakung Drain
R15	Wk.Marunda	-	990		-	-	-	(Eastern Banjir Canal)

Source : (1) The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Main Report/Supporting Report Vol.I, JICA,1991
(2) PU DKI Jakarta
(3) Review Report of East Jakarta Flood Control Project, Aug.,1988

Table 4 GATED WEIR IN DKI JAKARTA

Gated Weir No.	Name	Related River/Channel	Function	Management
EXISTING				
G01	Cengkareng	Cengkareng Floodway	Flood	PWSCC
G02	Manggarai I	Ciliwung	Flood	DPU
G03	Karet I	Banjir Canal	Flood	DPU
G03a	Karet II	Banjir Canal	Flushing	DKI
G05	Pondok Pinang	Grogol	Drainage	DPU
G06	Sunter Hulu	Sunter	Drainage	DPU
G07	Polar	Angke	Irrigation Drainage	DPU
G08	Koneng	Pesanggrahan	- do -	DPU
G10	Tarum Barat to Saluran	Tarum Barat Canal	Water Supply /Irrigation	DPU
G11	Pulo Gadung	Sunter	Flood	DPU
G12	Sunter	Sunter	Flood	DPU
G13	Cakung	Cakung	Flood	DPU
G14	Pasar Ikan	Besal/Pakin/Ciliwung	Drainage	PU DKI
G15	Saringan Sampah Teluk Gong	Angke		PU DKI
G16	Syphon Pluit	Waduk Pluit	Flood	PU DKI
G17	Bendungan Jago(I,II)	Item	Flood	PU DKI
G18	Manggarai II	Ciliwung	Flood/Flushing	PU DKI
G18a	Manggarai III	Surabaya Canal	Flushing	PU DKI
G19	Tarum Barat II	Tarum Barat Canal	Flushing	PU DKI
G20	Capitol(Istiqlal)	Ciliwung	Flushing	PU DKI
G21	Tangki	Ciliwung	Flushing	PU DKI
G22	Kali Duri	Duri	Flood	PU DKI
G23	Kampung Gusti	Angke	Drainage	PU DKI
G24	Jembatan Dua	Grogol	Drainage	PU DKI
G25	Jembatan Merah	Gunung Sahari	Drainage	PU DKI
G26	Pekapuran	Gunung Sahari	Flood	PU DKI
G27	Cideng	Cideng	Flood	PU DKI
G28	Kyai Tapa	Ciliwung	Flood	PWSCC
G29	Syphon Cideng	Cideng	Flood	PU DKI
G30	Syphon Teluk Gong	Angke	Flood	PU DKI
G31	Saringan Sampah Gunung Sahari	Gunung Sahari		PU DKI

Source : (1) The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Main Report/Supporting Report Vol.I, JICA, 1991
(2) PU DKI Jakarta

Table 5 RECENT DRAINAGE PROJECT IN DKI JAKARTA (1/3)

NO.	Project Name	Project Feature: General	Drain Area (ha)	Imprv /Const Length(km)	Design Disch. (m3/s)	Related Facility / Structure	Project Status: As of Prev. JICA Study (1991)	Present Construction
Zone - I								
A	Sepak River .	imprv	-	3.3	-	Brg(2), Cvt(2)	D/D(1987)	Finish(part)
1	Kamal River .	imprv	1,640	7.4	45	Rvt	Proposed	
2	Tanjungan River	imprv	780	3.2	30	Rvt	Proposed	
3	Kali Gede/Kali Bor Channel .	imprv	560	-	-	Rvt	Proposed	
4	Sal.Cengkareng Channel	imprv	330	4.5	20	Rvt	Proposed	
5	Pondongkelan Channel	imprv	520	1.1	25	Rvt	Proposed	
6	Semanan River	imprv	-	0.5	10	Emb, Prp	Proposed	Completed
7	Kreo River	imprv	-	0.9	35	Rvt	Proposed	
8	Ulujami River	imprv	-	-	35	Brg(1)	Proposed	
9	Sepak River	imprv	-	0.6	70	Rvt	Proposed	Finish(part)
10	Lower Pesanggrahan River	imprv	-	1.1	20	Rvt	Proposed	
Zone - II								
B	Lower Angke Rive	imprv /const	-	4.5	-	Brg(2), Cvt(13) Pump(8 m³/s)	D/D(1987)	
C	Grogol Sekretaris	imprv	-	4.5	-	Brg(8), Cvt(22)	Under Const	Completed
	Intercept	/const		2.9	-	Channel		
D	Lower Sekretaris Riv.	imprv	-	2.1	-		Under Const	Completed
E	Upper Grogol River	imprv	-	5.7	-	Brg(4), Gate(1)	D/D	
11	Kedaung River	imprv	220	1.2	10	Rvt	Proposed	
12	Jelawe River	imprv	-	0.9	10	SP	Proposed	
13	Sekretaris River	imprv	-	6.0	25	Rvt, Brg	Proposed	
14	Kedaung Kali Angke Pump Station	const	480	0.6	-	Pump(2.5 m³/s) Reg.Pond(9 ha)	Proposed	
	/exist. canal	imprv						
a	Sekretaris	const	-	0.58	-	Rvt	-	on-going
Zone - III								
F	Setia Budi Reservoir	rehab	-	-	-	Deepning/Lining	Under Const	Completed
15	Mampang River	imprv	2,600	6.0	60 - 90	SP	Proposed	
16	Cideng Atas River	imprv	-	2.5	25 - 45	SP, Bank	Proposed	Finish(part)
17	Kali Bata River	imprv	-	0.4	55	SP	Proposed	
18	Menteng Wadas Pump Station	const	250	-	-	Pump(6.2 m³/s)	Proposed	
b	Sal.Situ Babakan	rehab/imprv (irrigation)		2.0	-		-	On-going
c	Sal.Karang Tengah	rehab/imprv (irrigation)		0.66	-		-	On-going

Note : (1) imprv ; Improvement const ; Construction rehab ; Rehabilitation
Brg ; Bridge Rvt ; Revetment Cvt ; Culvert Prp ; Parapet
Emb ; Embankment SP ; Sheet Pile CP ; Concrete Pile
(2) (Part) ; Partially
(3) On-going ; under construction and to be completed by March 1996

Table 5 RECENT DRAINAGE PROJECT IN DKI JAKARTA (2/3)

NO.	Project Name	Project Feature: General	Drain Area (ha)	Imprv /Const Length(km)	Design Disch. (m3/s)	Related Facility / Structure	Project Status: As of Prev. JICA Study (1991)	Present Construction
Zone - IV								
G	Sarinah Thamrin	imprv /const	-	7.8	-	Cideng P.S.(40 m³/s) Melati P.S.(0.3 m³/s) Melati Resvr(4.2 ha).	Under Const	Completed
H	Ciliwung Kota Drain	imprv	-	9.1	-	Brg(13)	D/D(1987)	Finish(part)/On-going
I	Waduk Pluit	rehab	-	-	-	Dredging. of Reservoir Rehab. of Pump	D/D(on-going)	On-going
J	K.Besar and Duri Canal	imprv	-	10.5	-		D/D(on-going)	Completed
K	Ciliwung River.	imprv	-	18.2	-	Tidal gate(1)	D/D(on-going)	
d	Turap K.Ciliwung Utr	const	-	0.4	-	Prp	-	On-going
e	Turap K.Jelakung	const	-	0.58	-	CP	-	On-going
Zone - V								
19	Sention River	imprv	-	1.2	15	Rvt	Proposed	
f	Sal.Situ Dongkelan	rehab/imprv (irrigation)		0.2	-	Rvt	-	On-going
g	PA Sunter Hulu	rehab (irrigation)		0.1	-	Rvt	-	On-going
h	Sal.Kramat Jati	const		0.38	-	Rvt	-	On-going
i	Sal.Condet Batu Ampar	const		0.46	-	Rvt	-	On-going
j	Sal.Cililitan	const		0.64	-	Rvt	-	On-going
k	Sal.Cipinang Squadran	const		0.15	-	Prp	-	On-going
l	K.Cipinang (I.G.Ngurah Rai)	rehab		0.14	-	Rvt	-	On-going
m	Sal.K.Baru Cawang	const		0.65	-	Rvt	-	On-going
Zone - VI								
L	Kemayoran Airport Drainage	imprv /const	-	0.8	-	Pump(4.0 m³/s) Reservoir(15 ha)	D/D(on-going)	Completed
M	Pademangang Canal	imprv	-	5.5	-		D/D(on-going)	Finish(part)/On-going
N	Ancol Canal	imprv /const	630	6.5	-	Pump(15 m³/s) Gate(2)	D/D(on-going)	On-going
O	Sentiong Cutoff Channel	const	191.5	40.0 (m)	-	Cvt(40 m), Rvt	D/D(on-going)	On-going
P	Sunter West Polder	const	-			Pump (10 m³/s) Reservoir, Gate(1)		
		" /imprv		0.5	-	Panango Drain	D/D(1989)	Completed
Q	Sunter River Imp.	imprv	-	19.3		Brg(8),SW(90)	D/D(1990)	Finish(part)/On-going
R	Sunter East III Polder	const	570	-	-	Pump (15.5 m³/s) Reservoir(8.1 ha)	D/D(1990)	On-going
S	Buaran River	imprv	-	9.8	-	Brg(1)	D/D(1990)	
T	Cakung River	imprv	-	5.2	-	Brg(3)	D/D(on-going)	
U	Petukangan River	imprv	-	0.8	-	Gate	Under Const	
V	Cakung Drain	imprv	-	5.9	-		D/D(1990)	

Note : (1) imprv ; Improvement const ; Construction rehab ; Rehabilitation
Brg ; Bridge Rvt ; Revetment Cvt ; Culvert Prp ; Parapet
Emb ; Embankment SP ; Sheet Pile CP ; Concrete Pile
(2) (Part) ; Partially
(3) On-going ; under construction and to be completed by March 1996

Table 5 RECENT DRAINAGE PROJECT IN DKI JAKARTA (3/3)

NO.	Project Name	Project Feature: General	Drain Area (ha)	Imprv /Const Length(km)	Design Disch. (m3/s)	Related Facility / Structure	Project Status: As of Prev. JICA Study (1991)	Present Construction
(Zone - VI)								
W	Marunda Canal	const	-	3.4	-	Brg(1), Syp(1)	D/D(on-going)	
X	Sunter East II Polder	const	-	-	-	Pump(5.2 m³/s) Resrvoir(25 ha) Drain(1.5 km), Gate(1)	D/D(on-going)	
Y	Marunda Polder	const.	-	-	-	Tidal Gate(1)	D/D(on-going)	
20	Kebon Bawang Riv.	imprv	-	1.6	15	SP	Proposed	
21	Lagoa Tenggiri Riv.	imprv	-	0.6/0.7/1.8	30/35/40	SP	Proposed	Finish(part)
22	Cipinang River	imprv	-	0.8	5		Proposed	
23	Tugu Batu River	imprv	-	1.3	45	Emb	Proposed	
24	Rawa Badak River	imprv	-	2.0/1.0	20/20		Proposed	Finish(part)
25	Pelumpang River	imprv	-	0.9	30	CP	Proposed	
26	Cakung Lama River	imprv	-	5.2/1.9	40/50	Rvt, Brg(1)	Proposed	
27	Cakung River	imprv	-	5.2	20	Rvt, Brg(2)	Proposed	
28	Jati Bening River	imprv	-	1.4	20	SP	Proposed	
29	Kali Item River	imprv	-	0.6	20	Prp	Proposed	Finish
30	Sentiong River	imprv	-	1.4/0.5	60/65	Prp, Emb	Proposed	On-going(part)
31	Lower Marunda Channel	const	540	1.3	15	Rvt	Proposed	
32	Upper Marunda Channel	const	1,300	4.1	20 - 40	Rvt	Proposed	
				3.5	20 - 30	Rvt		
n	Sal.Induk Cabang Tmr	rehab/imprv (irrigation)	-	0.2	-	Rvt	-	On-going
o	Sal.Induk Bekasi Tgh	rehab/imprv (irrigation)	-	2.0	-		-	On-going
p	Sal.Kayu Tinggi	rehab/imprv (irrigation)	-	3.0	-		-	On-going
q	Sal.Sentra Primer Tmr	const	-	0.14	-		-	On-going
r	Sal.Sedap Malam	const	-	0.27	-	Rvt	-	On-going
s	Sal Sentiong Salemba	const	-	0.43	-	Rvt	-	On-going
t	Sal.Valker	const	-	0.65	-	Rvt	-	On-going
u	Turap K.Lagoa Tengiri	const		0.42	-	Rvt	-	On-going
v	Sunter East I	const	390	-	-	Pump(5.2 m³/s), Rvt	-	On-going
w	Cipinang Sunter	const	520	-	-		-	On-going

Note : (1) imprv ; Improvement const ; Construction rehab ; Rehabilitation
Brg ; Bridge Rvt ; Revetment Cvt ; Culvert Prp ; Parapet
Emb ; Embankment SP ; Sheet Pile CP ; Concrete Pile
(2) (Part) ; Partially
(3) On-going ; under construction and to be completed by March 1996

Source : (1) The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Main Report/Supporting Report Vol.I, JICA, March 1991
(2) DPU DKI

Table 6 MAJOR GATED WEIR IN THE STUDY AREA

No.	Weir Name	Location			Purpose	Weir		Gate		
		District	Region	River		Length (m)	Height (m)	Type	Number	Dimension W(m) x H(m)
1.	Pasar Baru	Kel. Pasar Baru	Tanggerang	Cisadane	Irr.	122.5	7.4	Sluice Gate	10	10.0 x 8.0
2.	Cengkareng	Kel. Kapuk Muara	Cengkareng	Cengkareng Floodway	Flu.	29.5	1.5	Sluice Gate with Flap Gate	4	6.3 x 4.3
3.	Karet	Kel. Kebon Melati	Central JKT	Western Banjir Canal	Flc./ Ws.	36.0	-	Sluice Gate	4	5.5 x 4.3
4.	Manggarai I	Kel. Kebon Manggis	South JKT	Ciliwung	Flc./ Flu.	13.9	-	Sluice Gate	2	5.4 x 8.0
5.	Manggarai II	Kel. Kebon Manggis	South JKT	Ciliwung	Flc.	-	-	Sluice Gate	1	5.0 x 8.0
6.	Bekasi	Kel. Kebon Margahayu	Bekasi	Bekasi	Irr./ Flc.	43.5	9.3	Sluice Gate	3	10.0 x 8.5
7.	Cikarang	Cibitung	Bekasi	Cikarang	Irr.	33.0	6.8	Roller Gate with Flap Gate	2	16.6 x 5.6

Note : Irri. : Irrigation W : Water Supply
Flc. : Flood Control Fl : Flushing

Table 7 EXISTING BRIDGES ON MAJOR URBAN DRAINAGE CHANNELS IN DKI JAKARTA

River	Bridges Nos.	Bridges Total Length(m)	River	Bridges Nos.	Bridges Total Length(m)
1. Kamal	1	13.7	26. Utankayu	6	72.0
2. Kembangan	2	48.6	27. Lagoa	2	15.1
3. Sepak	3	54.3	28. Item	2	33.6
4. Kreo	5	79.4	29. Kebonbawang	14	115.6
5. Daanmogoot	4	52.4	30. Rawabadak	2	9.0
6. Sekretaris	23	250.2	31. Artonijom	2	60.0
7. Muara Karang	3	127.2	32. Pulomas Utara	4	49.2
8. Cilawe	5	40.0	33. Kayu Putih Selatan	6	46.3
9. Pluit	2	96.9	34. Kelapa Nias	3	30.7
10. Angke	2	23.9	35. Pulo Gadung	5	30.2
11. Cideng	21	393.2	36. Kayu Putih Utara	4	42.9
12. Ciliwung	6	137.2	37. Cakung	4	63.1
13. Ciliwung Gajahmada	3	42.5	38. Cakung Lama	2	20.6
14. Krukut	7	106.8	39. Malang	8	50.6
15. Ciragil	5	51.0	40. Sunter	20	513.5
16. Mampang	7	55.4	41. Petukangan	1	13.0
17. Cideng Atas	2	8.9	42. Grogol	24	391.7
18. Kalibaru Barat/Ps.Minggu	24	171.6	43. Jelangkeng	3	89.0
19. Kalibata Timur	27	234.7	44. East Baru Canal	1	20.0
20. Cijantung	1	11.5	45. Jembatan Lima	2	10.4
21. Goseng	1	11.0	46. Duri	2	48.1
22. Salemba	19	280.0	47. Anak Ciliwung	1	12.4
23. Kalibaru	1	6.0	48. Gajahmada	5	35.3
24. Cipinang	11	162.7	49. Sahari	1	20.3
25. Rawakerbau	3	22.9			

Source : The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta Master Plan Study, JICA, March 1991

Table 8 SEWERAGE DEVELOPMENT SYSTEM IN THE PREVIOUS MASTER PLAN (JICA, 1991)

Zone	Central	North West	South West	North East	South East	Tanjung Priok	Total
Service Area(ha)	6,107	2,016	2,170	3,566	1,243	1,502	16,604
(Conventional Area)	3,422	530	938	1,610	307	700	7,507
(Interceptor Area)	2,595	1,332	1,232	1,886	936	802	8,783
(No Sewerage Area)	90	154	0	70	0	0	314
Population Served in 2010 (x1,000)	2,466	642	674	1,383	523	663	6,351
(Conventional Area)	1,149	185	244	527	137	337	2,579
(Interceptor Area)	1,317	457	430	856	386	326	3,772
Lift Pump Station(location)	1	3	5	0	0	1	10
Treatment Plant							
System	A.L/F.P	A.L	A.L	A.S	A.L	A.L/F.P	
Capacity(1,000m3/day)	529	124	117	261	101	120	1,252
Bay / River to be Discharged	Jakarta B.	Cengkar.	Pesanggr	Sunter	Sunter	Cakung	

Note : A.L ; Aerated lagoon
A.L/F.P ; Aerated lagoon and falcultative pond
A.S ; Conventional activated sludge

Table 9 HABITUAL INUNDATION AREA IN DKI JAKARTA(1/7)

WILAYAH KOTA : JAKARTA PUSAT

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4) NO.	DEPTH (cm)	AREA (sq.m)	JICA1991 (5) NO.	AREA (sq.m)	DEPTH (cm) (6)	D'TION (hour) (7)	INUNDATION FACTOR (8) LOCA-TION	PROBLEM / REQUIREMENT
1	Tanah Abang	Petamburan+ Bend Hilir	Banjir Canal	34-J-16	II - 13	II - 13	8-a	60	4,000	-	-	-	-	11-32	1)Low lying area, 2)High waterlevel of Banjir Canal 3)To improve dyke,4)Installation of pump and gate.
2		Jl.Bendungan Hilir	Krukut	45-K-18	-	-	8-b	40	6,000	-	-	-	-	-	-
3		Penjernihan	Krukut	44-K-17	-	-	8-c	20	2,000	-	-	-	-	-	-
23			Krukut	35-K-15	-	-	-	-	-	5	527,000	30 - 14	75 - 19	-	-
24			Ciliwung	25-M-12	-	-	-	-	-	7	184,000	50 - 41	96 - 35	-	-
28			Cideng	35-L-14	-	-	-	-	-	13	172,000	25 - 14	24 - 7	-	-
29			Wk.Melati	35-L-16	-	-	-	-	-	15	86,000	30 - 15	24 - 7	-	-
4	Menteng	Jl. Sabang / Agus Salim	Cideng	35-M-14	II - 14	II - 14	-	-	-	14	160,000	25 - 13	24 - 7	10-30	The existing drainage canal has much garbage deposit and sediment.
5		Jl.Wahid Hasyim/Jaska	Cideng	35-M-14	-	-	7-a	20	1,500	8	245,000	50 - 21	24 - 8	10-31	-do above-
25			Sal.Surabaya	35-M-15	-	-	-	-	-	9	306,000	40 - 20	24 - 8	-	-
6	Kemayoran	Serdang Timur	Sentiong	26-Q-10	II - 15	II - 15	-	-	-	-	-	-	-	-	
7		Jl.Industri	Sal.Pademangan	15-N-08	II - 16	III - 14	2-b	40	3,750	-	-	-	-	21-70	1) Improvement of K.Pademangan Barat and K.Pademangan are not completed yet, 2) Sediment to be removed, 3)Construction of gate / pomp as a part of Ancol System Project is on-going.
8		Jl.Angkasa / Bungur	Sal.Pademangan	25-O-10	II - 17	III - 15	3-a	30	1,200	-	-	-	-	21-69	-do above-
9		Rajawari Selatan	K.Ciliwung/Mati	15-N-08	II - 18	III - 16	2-c	40	11,550	28	257,000	55 - 17	72 - 19	-	-
10		Komp.Ditjen Anggaran	-	**	-	-	3-b	30	2,500	-	-	-	-	-	-
11		Jl.Lapangan Ros	-	**	-	-	3-c	15	8,000	-	-	-	-	-	-
12	Mampang Prapatan	Jl.Pangeran Jayakarta	Beton	15-M-08	II - 19	II - 16	2-d	40	5,000	11	368,000	25 - 11	72 - 22	14-37	Tributary of K.Ciliwung not improved yet.
13		Mangga Dua Abdad	Beton	15-M-08	II - 20	II - 17	2-a	50	22,500	11				14-38	1) Low lying area, 2)No micro-drainage canal
14		Dwi Warna	Ciliwung	25-M-09	II - 21	II - 18	-	-	-	-	-	-	-	-	-
15	Gambir	Jl.Batu Tulis/Juanda III	Ciliwung	25-L-11	-	-	1-a	20	22,500	-	-	-	-	-	-
16		Jl.Batu Ceper	Ciliwung	25-L-11	-	-	1-b	20	30,000	-	-	-	-	-	-
17		Duri Pulo	Sal.Duri	24-I-11	-	-	1-c	20	30,000	45	478,000	75 - 27	168 - 20	-	-
18		Petojo Enclek	Krukut	25-L-12	-	-	1-d	20	24,000	6	404,000	20 - 17	48 - 18	-	-
19		Kebon Kelapa	Ciliwung	25-M-11	-	-	1-e	20	15,000	-	-	-	-	-	-
26			Ciliwung	25-M-13	-	-	-	-	-	10	245,000	50 - 22	24 - 8	-	-
20	Johar Baru	Jl.Percetakan Negara II	Sentiong	36-P-15	-	-	6-a	20	1,500	70	417,000	20 - 11	6 - 2	-	-
21	Cemaka Putih	Jl.A Yani Komp. BKKBN	-	**	-	-	5-a	30	5,000	-	-	-	-	-	-
22		Jl. Suprato in front of Coca-Cola	Sal.Utan Kayu	26-Q-13	-	-	5-b	20	1,500	-	-	-	-	-	-
27	Senen	-	Ciliwung	25-N-13	-	-	-	-	-	12	1,029,000	50 - 22	24 - 13	-	-
30	Sawah Besar	-	Ciliwung	15-M-06	-	-	-	-	-	25	698,000	50 - 16	168 - 17	-	-
31		-	Ciliwung	15-M-07	-	-	-	-	-	26	564,000	45 - 14	48 - 18	-	-

NOTE : (1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor ; P.T.Djambatan)
(2) Source: Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995, PSAPB(Ciliwung Cisadane), DPU
Same Index No.as indicated above is used in the source map.
(3) Source; Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta, DPU DKI
Same Index No.as indicated above is used in the source map.
(4) Source; Studi Perencanaan Jaringan Pengairan Jangka menengah, Draft Final Report, Jan.,1993, DPU DKI
Same Index No.as indicated above is used in the source report.
(5) Source ; The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Supporting Report Vol.I, JICA,Mar.,1991
(6) (Left : maximum depth) - (Right : average depth)
(7) (Left : maximum duration) - (Right : average duration)
(8) Source : DPU DKI

Table 9 HABITUAL INUNDATION AREA IN DKI JAKARTA(2/7)

WILAYAH KOTA : JAKARTA BARAT

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4) NO.	DEPTH (cm)	AREA (sq.m)	JICA1991 (5) NO.	AREA (sq.m)	DEPTH (cm) (6)	D'TION (hour) (7)	INUNDATION FACTOR (8) LOCATION	PROBLEM
1	Grogol Petamburan	Pal Merah	Grogol	44-H-18	I - 10	I - 10	-	-	-	-	-	-	-	-	
2		Jelambar Ilir	Angke	14-G-09	I - 18	I - 18	3-b	30	40,000	-	-	-	-	4-11	1)Reservoir constructed. 2)No drain canal yet
3		Kplx.Wali Kota JKT Barat	Grogol	24-H-12	II - 22	II - 19	3-a	25	10,000	-	-	-	-	5-15	Low lying area.
4		Pondok Bandung	Banjir Canal	34-J-15	II - 23	II - 20	4-b	25	10,000	-	-	-	-	11-33	1)Low lying area. 2)Pump is existing.
5		Komp.PU Tanjung Duren	-	**	-	-	3-c	20	10,000	-	-	-	-	-	-
43		-	Sodetan G - S	24-G-11	-	-	-	-	-	50	453,000	40 - 18	24 - 13	-	-
6	Cengkareng	Poglar	Angke	14-F-09	I - 11	I - 11	1-b	30	6,000	19	417,000	55 - 29	72 - 36	-	-
7		Jl.Kapuk Raya	Cengkaren Fw	13-D-07	-	-	1-a	30	20,000	44	613,000	20 - 18	2 - 2	-	-
8		Dum Kosambi /Bojong	Angke	22-Z-13	-	-	1-c	30	30,000	-	-	-	-	-	-
41		-	Sal.Cengkareng	13-B-09	-	-	-	-	-	42	294,000	20 - 17	36 - 22	-	-
46		-	-	13-C-07	-	-	-	-	-	77	790,000	20 - 20	24 - 18	-	-
9	Kebon Jeruk	Batu Sari	Sekretaris	34-G-16	I - 12	I - 12	-	-	-	-	-	-	-	6-20	1)Low lying area. 2)Improvement of K.Sekretaris is not completed yet.
10		Kelapa Dua/HUBAD	Sekretaris	44-F-19	I - 13	I - 13	-	-	-	54	747,000	60 - 36	5 - 3	6-21	- do above -
11		Meruya Ilir	Sal.Meruya	33-C-15	I - 14	I - 14	8-a	30	25,000	52	147,000	50 - 10	1 - 1	3-6	1)Drain canal is existing. 2)Improvement of Sal. Meruya is not completed yet.
12		Basmol	Sodetan	23-E-11	I - 15	I - 15	-	-	-	-	-	-	-	-	-
13		Duri kedoya	-	33-E-14	-	-	7-a	20	7,000	-	-	-	-	-	-
14		Komp.DPR Kebon Jerek	Secretaris	44-F-17	-	-	7-b	20	10,000	-	-	-	-	-	-
15		Sukabumi Utara	-	**	-	-	7-c	30	6,000	-	-	-	-	-	-
16		Pos Pengumben	Pessangrahan	43-E-19	-	-	7-d	40	20,000	-	-	-	-	-	-
17		Jl.Kebon Jerek	Pessangrahan	33-E-16	-	-	7-e	30	1,000	-	-	-	-	-	-
18	Kembangan	Taman Kota	Angke	23-D-11	I - 16	I - 16	-	-	-	-	-	-	-	-	1)Existing drain canal is to be cheked of its water-level and dimension. 2) K.Angke has no improvement yet.
19		Budi Mulya	Angke	33-C-14	I - 17	I - 17	-	-	-	-	-	-	-	4-8	No drain canal yet.
20		Meruya Udik	-	43-B-18	-	-	8-b	20	15,000	-	-	-	-	-	-
21		Kembangan	Pessangrahan	33-C-14	-	-	8-c	30	70,000	-	-	-	-	-	-
44		-	-	33-A-16	-	-	-	-	-	51	331,000	50 - 45	1 - 1	-	-
45		-	Sal.Merayu	43-C-19	-	-	-	-	-	53	282,000	20 - 11	1 - 1	-	-
47		-	Angke/Sepak	23-C-11	-	-	-	-	-	78	600,000	30 - 18	24 - 16	-	-
22	Taman Sari	Jl.Jembatan Batu Pinangsia	Ciliwung	15-L-07	II - 24	II - 21	5-a	20	20,000	27	123,000	55 - 18	48 - 16	-	-
23		Kali Beton	Beton	15-L-08	II - 25	II - 22	5-b	20	15,000	-	-	-	-	-	-
24		Mangga Besar I	Beton	15-L-08	II - 26	II - 23	"	-	-	46	221,000	50 - 17	36 - 13	14-36	1)Drain canal is existing. 2)Tributary of K.Ciliwung is not improved yet.
25		Mangga Besar IV	Beton	25-L-09	II - 27	II - 24	"	-	-	47	184,000	50 - 20	36 - 12	14-36	
26	Kali Deres	Kalideres	-	12-X-09	-	-	2-a	30	35,000	-	-	-	-	-	-
27		Kamal	-	12-Z-05	-	-	2-b	40	40,000	-	-	-	-	-	-
28		Pegadungan	Banjir Canal	12-Y-07	-	-	2-c	40	25,000	-	-	-	-	-	-
29		Semanan	-	22-W-11	-	-	2-d	30	30,000	43	735,000	30 - 18	24 - 16	-	-
30		Tegal Alur	-	12-Y-05	-	-	2-e	25	15,000	-	-	-	-	-	-
31	Pal Merah	Jati Pulo	-	34-J-13	-	-	4-a	30	10,000	-	-	-	-	-	-
37		-	Sal.Duri	24-J-12	-	-	-	-	-	3	270,000	25 - 10	68 - 16	-	-
32	Tambora	Jembatan Besi	Banjir Canal	24-I-09	-	-	6-a	30	20,000	-	-	-	-	-	-
33		Krendang	Krendang	24-J-09	-	-	6-b	30	25,000	49	453,000	50 - 22	36 - 15	-	-
34		Jambatan Lima	Krendang	14-J-08	-	-	6-c	20	20,000	49				-	-
35		-	Sal.Duri	24-J-10	-	-	-	-	-	1	306,000	25 - 10	77 - 18	-	-
36		-	Sal.Cideng	24-K-10	-	-	-	-	-	2	490,000	30 - 13	70 - 18	-	-
38		-	Grogol	14-H-08	-	-	-	-	-	21	257,000	45 - 25	72 - 30	-	-
39		-	Sal.Jembatan III	14-I-06	-	-	-	-	-	22	478,000	20 - 15	48 - 20	-	-
40		-	Waduk Pluit	14-J-05	-	-	-	-	-	24	368,000	50 - 27	24 - 19	-	-
42		-	Krendang	24-J-09	-	-	-	-	-	48	392,000	50 - 23	48 - 13	-	-

NOTE : (1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor : P.T.Djambatan)
(2) Source; Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995. PSAPB(Ciliwung Cisadane). Dikine Index No.as indicated above is used in the source map.
(3) Source; Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta. DPU DKIame Index No.as indicated above is used in the source map.
(4) Source; Studi Perencanaan Jaringan Pengairan Jangka menengah. Draft Final Report. Jan.,1993. DPU Dikine Index No.as indicated above is used in the source report.
(5) Source : The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta. Master Plan Study. Supporting Report Vol.I. JICA.Mar.,1991
(6) (Left : maximum depth) - (Right : average depth) (7) (Left : maximum duration) - (Right : average duration) (8) Source : DPU DKI

Table 9 HABITUAL INUDATION AREA IN DKI JAKARTA(3/7)

WILAYAH KOTA : JAKARTA UTARA(1/2)

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4) NO.	DEPTH (cm)	AREA (sq.m)	JICA1991 (5) NO.	AREA (sq.m)	DEPTH (cm) (6)	D'TION (hour) (7)	INUNDATION FACTOR (8) LOCA-TION	PROBLEM
1	Penjaringan	Teluk Gong	Angke/Bjr.C	14-G-07	I - 19	I - 19	1-b	40	50,000	20	441,000	40 - 24	96 - 39	4-10	1)Capacity of existing reservoir may be decreased due to development nearby. Improvement of reservoir is required. 2)Pump and drainage canal are existing. 3)Improvement of K.Angke is necessary.
2		Bunderan Pluit	Sal.Jembatan III	14-I-06	II - 28	-	-	-	-	23	306,000	25 - 18	24 - 23	-	-
3		Kapuk Muara	Angke	14-G-06	I - 20	I - 20	1-a	40	75,000	18	539,000	45 - 25	72 - 36	4-9	1)Low lying area where is lower than K.Angke waterlevel, 2)Design of drainage canal just finished, but not constructed yet.
4		Jembatan II & III Binoli	Sal.Muara Kang	14-H-07	II - 29	II - 25	1-c	30	40,000	-	-	-	-	12-34	1)Existing pump. 2)Drainage canal not completed yet.
28		-	Besar	14-K-06	-	-	-	-	-	4	245,000	20 - 10	65 - 15	-	-
29		-	West Banjir Canal	04-F-04	-	-	-	-	-	17	416,000	50 - 27	144 - 43	-	-
5	Pademangan	Kp.Pademangan Timur	Pademangan	15-P-07	II - 30	III - 35	2-b	40	80,000	33	466,000	50 - 20	60 - 33	21-72	1) Improvement of K.Pademangan Barat and K.Pademangan are not completed yet, 2) Sediment to be removed, 3)Construction of gate / pomp as a part of Ancol System Project is on-going.
6		Pademangan Barat	Pademangan	15-O-08	II - 31	III - 34	2-a	40	60,000	-	-	-	-	21-71	-do above-
7	Kelapa Gading	Kelapa Gading Vespa	Sunter	27-W-13	III - 13	-	-	-	-					-	
8		Perum Wali Kota JKT Utara	Sunter	26-U-12	III - 15	III - 19	5-b	30	10,000	39	907,000	25 - 11	36 - 17	19-60	1)Low lying area, 2)No drainage canal yet, 3)reservoir is under construction.
9		Kplx.A.L.Kodamar	Sunter	26-T-10	-	III - 17	5-a	50	60,000	38	417,000	30 - 15	168 - 40	19-59	-do above-
10		Perum H.I.Kelapa Gading	-	26-U-12	-	III - 18	-	-	-	40	1,531,000	35 - 17	48 - 18	-	
11	Cilincing	Kplx.Dewa Ruci	Sal.Tanah Merdeka	07-X-03	III - 14	-	6-b	30	20,000	-	-	-	-	23-74	1)Low lying area, 2)Improvement of K.Baru Tanah Merdeka not finished yet.
12		Kali Baru Tanah Merdeka	-	07-W-02	III - 16	III - 20	6-a	20	20,000	-	-	-	-	23-75	-do above-
13		Kp.Malaka	Cakung Drain	07-Z-05	III - 17	III - 21	6-d	35	35,000	-	-	-	-	-	
14		Kramat Jaya Baru	-	-	-	-	6-c	20	10,000	-	-	-	-	-	-
33		-	Wk.Marunda	07-Z-02	-	-	-	-	-	41	2,156,000	25 - 11	72 -24	-	-
15	Koja	Kp.Rawa Badak	Sal.Rawa Badak	07-V-04	III - 18	III - 22	4-a	40	150,000	35	245,000	45 - 25	24 - 15	22-73	1)Low lying area, 2)Improvement of Sal.Rawa Badak not completed yet, 3)Suntel III project on-going (reservoir,pump,gate; under construction)
16		Kp.Tugu Utara	Sal.Rawa Badak	17-X-06	III - 19	III - 23	4-b	40	150,000	-	-	-	-	23-76	-do above-
17		Jl.Donggala	Koja	07-U-02	III - 20	III - 24	4-c	20	40,000	-	-	-	-	-	
18		Lagoa	Lagoa Tirem	07-U-03	III - 21	III - 27	4-d	20	40,000	-	-	-	-	20-65	1)Sunter Barat reservoir and pump have been completed, 2)Improvement of K.Lagoa Tenggiri not completed yet.
30		-	Koja	07-U-03	-	-	-	-	-	34	294,000	50 - 29	24 - 18	-	-
31		-	Wk.Sunter Tmr.III	17-V-05	-	-	-	-	-	36	184,000	45 - 23	24 - 19	-	-
32		-		17-U-06	-	-	-	-	-	37	208,000	50 - 31	24 - 16	-	-

(1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor ; P.T.Djambatan)
(2) Source: Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995, PSAPB(Ciliwung Cisadane), DPU. Same Index No.as indicated above is used in the source map.
(3) Source: Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta, DPU DKI. Same Index No.as indicated above is used in the source map.
(4) Source: Studi Perencanaan Jaringan Pengairan Jangka menengah, Draft Final Report, Jan.,1993, DPU DKI. Same Index No.as indicated above is used in the source report.
(5) Source : The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Supporting Report Vol.I, JICA,Mar.,1991
(6) (Left : maximum depth) - (Right : average depth) (7) (Left : maximum duration) - (Right : average duration) (8) Source : DPU DKI

Table 9 HABITUAL FLOOD AREA IN DKI JAKARTA(4/7)

WILAYAH KOTA : JAKARTA UTARA(2/2)

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4)			JICA1991 (5)				FLOODING FACTOR (8)	
							NO.	DEPTH (cm)	AREA (sq.m)	NO.	AREA (sq.m)	DEPTH (cm) (6)	DTION (hour) (7)	LOCA-TION	PROBLEM
19	Tanjung Priok	Kp.Kebong Bawang	Lagoa Tirem	06-T-04	III - 22	III - 26	3-a	40	70,000	29	2,119,000	50 - 18	168 - 41	20-63	1)Sunter Barat reservoir and pump have been completed, 2)Improvement of K.Lagoa Tenggiri not completed yet.
20		Sungai Bambu	Lagoa Tirem	16-T-06	III - 23	III - 28	3-b	30	60,000	29				20-64	-do above-
21		Kp.Warakas	Lagoa Tirem	6-S-05	III - 24	III - 25	3-c	30	110,000	30	858,000	55 - 22	72 - 36	20-66	-do above-
22		Kp.Papanggo	Lagoa Tirem	16-R-07	III - 25	III - 29	-	-	-					20-67	-do above-
23		Jl.R.E Martadinata	Japat	06-Q-05	III - 26	III - 30	-	-	-					-	
24		(Sunter Jaya) / Muara Bahari	Sunter	06-R-04	III - 27	III - 31	3-e	50	130,000	31	588,000	55 - 25	48 - 24	19-61	Drainage canal is existing, but not complete yet.
25		Jl.Yos Sudarso/near Honda	Sunter	16-T-08	III - 28	III - 32	3-g	20	40,000					19-62	1)Low lying area, 2)Pump is not available yet.
26		Podomoro Sunter A	S.Sunter C	16-S-07	III - 29	III - 33	3-d	20	30,000	32	368,000	45 - 15	36 - 18	-	-
27		Kp.Bahari	Wk.Sunter Barat	06-S-04	-	-	3-f	20	10,000					-	-

(1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor : P.T.Djambatan)

(2) Source; Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995, PSAPB(Ciliwung Cisadane), DPU. Same Index No.as indicated above is used in the source map.

(3) Source; Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta, DPU DKI. Same Index No.as indicated above is used in the source map.

(4) Source; Studi Perencanaan Jaringan Pengairan Jangka menengah, Draft Final Report, Jan.,1993, DPU DKI. Same Index No.as indicated above is used in the source report.

(5) Source ; The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Supporting Report Vol.I, JICA,Mar.,1991

(6) (Left : maximum depth) - (Right : average depth) (7) (Left : maximum duration) - (Right : average duration) (8) Source : DPU DKI

Table 9 HABITUAL INUNDATION AREA IN DKI JAKARTA(5/7)

WILAYAH KOTA : JAKARTA SELATAN(1/2)

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4) NO.	DEPTH (cm)	AREA (sq.m)	JICA1991 (5) NO.	AREA (sq.m)	DEPTH (cm) (6)	D'TION (hour) (7)	INUNDATION FACTOR (8) LOCA-TION	PROBLEM
1	Cilandak	Kp.Cirendeu	Grogol	74-H-32	I - 1	I - 1	10-d	50	10.000	-	-	-	-	5-12	1)Located in flood plain, 2)Improvement of K.Angke is not completed yet.
2		Jl Ring Rd Sport Club CLDK	-	74-I-30	-	-	10-a	30	2.000	-	-	-	-	-	-
3		Gandaria Selatan	Grogol	64-H-26	-	-	10-b	20	10.000	-	-	-	-	-	-
4		Gandaria BDN Cilandak	-	64-I-28	-	-	10-c	20	20.000	-	-	-	-	-	-
5		Pondok Labu	Grogol	74-I-32	-	-	10-e	60	6.000	-	-	-	-	-	-
6	Pesanggrahan	Seskopol/Depdagri	Pesanggrahan	63-F-28	I - 2	I - 2	-	-	-	-	-	-	-	1-1	Located in flood plain.
7		IKPN Bintaro	Pesanggrahan	63-F-25	I - 3	I - 3	9-a	150	7.800	-	-	-	-	1-2	1)Located in flood plain, 2)Capacity of existing pump is not sufficient.
8		Kp.Ulujami	Sal.Ulujami	53-E-23	I - 4	I - 4	9-b	50	40.000	-	-	-	-	2-4	1)Improvement of Sal.Ulujami is not completed yet, 2)Improvement of waduk(situ) is planned.
9		Sangrila Indah	Sal.Ulujami	53-E-22	I - 5	I - 5	9-d	40	40.000	-	-	-	-	2-5	1)Low lying area, 2)Dimension of drain canal is to checked.
10		Pesanggrahan	Sal.Ulujami	53-D-25	-	-	9-c	50	30.000	-	-	-	-	-	-
11		Putukangan Utara	Sal.Meruya	43-D-20	-	-	9-e	50	110.000	69	735.000	50 - 27	24 - 10	-	-
12	Kebayoran Lama	Kp.Pondok Pinang	Grogol	64-G-25	I - 6	I - 6	8-e	40-150	40.000	-	-	-	-	5-13	1)Located in flood plain, 2)Improvement of K.Grogol is not completed yet.
13		Kp.Dukuh	Grogol	54-H-23	I - 7	I - 7	-	-	-	-	-	-	-	5-14	1)Located in flood plain, 2)Improvement of K.Grogol is not completed yet.
14		Jl.Cileduk Raya	Pesanggrahan	53-E-22	I - 8	I - 8	-	-	-	-	-	-	-	-	-
15		Kp.Cipulir	Pesanggrahan	53-E-22	I - 9	I - 9	8-c	20	20.000	-	-	-	-	1-3	Located in flood plain.
16		Kemandoran Pluit	Grogol	44-H-18	-	-	8-a	40	90.000	-	-	-	-	5-16	There is the existing drain canal which alignment shall be revised since flow is not smooth.
17		Grogol Selatan	Sekretaris	54-F-21	-	-	8-b	30	40.000	-	-	-	-	-	-
18		Kebayoran Lama		**	-	-	8-d	35	70.000	-	-	-	-	-	-
19	Pasar Minngu	Kp.Pertamina Pasar Minggu	Baru Barat	udr75-G	II - 1	II - 1	-	-	-	-	-	-	-	15-39	K.Baru Barat,which was formally used as irrigation canal, is not improved yet.
20		Kplx.Polri Pasar Minggu	Baru Barat	65-O-27	II - 2	II - 2	5-b	35	30.000	66	1.041.000	25 - 13	1 - 1	15-40	Located in low lying area.
21		Jati Padang	Sal.Jati Padang	75-M-31	-	-	5-a	30	50.000	-	-	-	-	-	-
22		Ragunan	Sal.Kejaksaan Peja	75-N-29	-	-	5-c	30	25.000	-	-	-	-	-	-
23		Cilandak Timur	-	65-K-29	-	-	5-d	30	22.000	-	-	-	-	-	-
24	Kebayoran Baru	Kp.Petogogan	Krukut	54-K-23	II - 3	II - 3	7-f	30-100	160.000	-	-	-	-	8-26	Located in flood plain.
25		Gandaria Urtara	Sal.Jilawe	54-I -25	II - 4	II - 4	7-a	30	10.000	-	-	-	-	7-23	1)Low lying area, 2)Improvement of K.Grogol and Sal.Jelawe have not completed yet, 3)Drain canals are not complete yet.
26		Hang Jebat	Sal.Jilawe	54-I -22	II - 5	II - 5	-	-	-	-	-	-	-	7-24	- do above -
27		Hang Lekir	Sal.Jilawe	54-I -21	II - 6	II - 6	-	-	-	-	-	-	-	7-25	- do above -
28		Kramat Pela	Sal.Jilawe	54-I -24	-	-	7-b	40	25.000	-	-	-	-	-	-
29		Cipete	-	64-J-28	-	-	7-c	40	35.000	-	-	-	-	-	-
30		Gunung	Sal.Jilawe	54-I-24	-	-	7-d	30-60	38.000	-	-	-	-	-	-
31		Melawai	Sal.Jilawe	54-I-23	-	-	7-e	20	20.000	68	221.000	60 - 34	48 - 31	-	-
32		Rawa Barat	Krukut	55-L-22	-	-	7-g	50-100	48.000	-	-	-	-	-	-

NOTE : (1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor : P.T.Djambatan)
(2) Source; Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995, PSAPB(Ciliwung Cisadane), DPI Same Index No.as indicated above is used in the source map.
(3) Source; Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta, DPU DKI. Same Index No.as indicated above is used in the source map.
(4) Source; Studi Perencanaan Jaringan Pengairan Jangka menengah, Draft Final Report, Jan.,1993, DPU DK Same Index No.as indicated above is used in the source report.
(5) Source : The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Supporting Report Vol.I, JICA,Mar.,1991
(6) (Left : maximum depth) - (Right : average depth) (7) (Left : maximum duration) - (Right : average duration) (8) Source : DPU DKI

Table 9 HABITUAL INUNDATION AREA IN DKI JAKARTA(6/7)

WILAYAH KOTA : JAKARTA SELATAN(2/2)

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4)			JICA1991 (5)				INUNDATION FACTOR (8)	
							NO.	DEPTH (cm)	AREA (sq.m)	NO.	AREA (sq.m)	DEPTH (cm) (6)	DTION (hour) (7)	LOCA-TION	PROBLEM
33	Tebet	Tebet	Bata	55-P-21	II - 7	II - 7	-	-	-	-	-	-	-	9-28	1)Low lying area, 2)There is existing drain canals which are not complete yet.
34		Kebon Baru	Ciliwung	56-Q-21	II - 8	II - 8	1-a	50-200	110,000	57	159,000	80 - 80	5 - 5	16-42	K.Ciliwung is not improved yet.
35		Bukit Duri Tanjakan	Ciliwung	46-Q-20	II - 9	II - 9	1-b	50-100	70,000	-	-	-	-	16-43	- do above -
36		Manggarai Selatan	Ciliwung	46-P-19	-	II - 10	1-c	20-50	60,000	-	-	-	-	16-44	- do above -
37		Kp.Melayu Kecil	Ciliwung	46-Q-20	II - 10	-	-	-	-	56	208,000	30 - 14	5 - 3	-	-
38		Menteng Dalam	Sal.Pasar Minggu	55-O-21	-	-	1-d	30	15,000	-	-	-	-	-	-
54		-	Sal.Sarrang	46-P-20	-	-	-	-	-	55	392,000	70 - 41	24 - 7	-	-
55		-	Sal.Sarrang	55-P-22	-	-	-	-	-	64	172,000	30 - 18	24 - 13	-	-
39	Mampang Prapatan	Kplx.Polri Pondok Karya	Mampang	55-L-23	II - 11	II - 11	3-b	50-120	200,000	62	564,000	100 - 44	72 - 26	17-46	1)Low lying area, 2)Improvement of K.Mampang is not completed yet.
40		Pulo Raya Tarakanita	Krukut	54-K-23	II - 12	II - 12	-	-	-	-	-	-	-	8-27	Located in flood plain.
41		Kuningan Barat	Mampang	55-L-22	-	-	3-a	40	80,000	61	404,000	10 - 10	12 - 12	-	-
42		Bangka and Kumang	Mampang	55-L-24	-	-	3-c	30	15,000	65	233,000	30 - 15	24 - 11	-	-
43		Mampang Prapatan	-	55-M-23	-	-	3-d	40	25,000	-	-	-	-	-	-
44	Setiabudi	Setiabudi Barat	(waduk)	45-L-18	-	-	2-a	30	30,000	16	245,000	30 - 14	48 - 17	-	-
45		Guntur Kawi-kawi	Cideng	45-N-18	-	-	2-b	30	40,000	-	-	-	-	-	-
46		Menteng Atas	Cideng	45-N-19	-	-	2-c	30	40,000	59	490,000	35 - 25	3 - 2	-	-
47		Karet Kuningan	Krukut	45-L-20	-	-	2-d	30	60,000	-	-	-	-	-	-
48		Kuningan Timur	-	45-M-21	-	-	2-e	40	90,000	-	-	-	-	-	-
56		-	Cideng	45-N-19	-	-	-	-	-	58	343,000	20 - 13	2 - 2	-	-
57		-	Sal.Pasar Minggu	45-O-18	-	-	-	-	-	60	392,000	40 - 28	3 - 2	-	-
49	Pancoran	Duren Tiga	Sal.	55-N-24	-	-	4-a	30	15,000	-	-	-	-	-	-
50		Pengadegan	Ciliwung	56-Q-24	-	-	4-b	40	25,000	-	-	-	-	-	-
51		Kalibata	Ciliwung	56-Q-25	-	-	4-c	30	10,000	-	-	-	-	-	-
52	Jagakarsa	Tanjung Barat	Sal.Pasar Minggu	75-N-32	-	-	6-a	30	15,000	-	-	-	-	-	-
53		Lenteng Agung	Sal.Pasar Minggu	75-N-33	-	-	6-b	20	10,000	-	-	-	-	-	-

NOTE : (1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor ; P.T.Djambatan)

(2) Source; Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995, PSAPB(Ciliwung Cisadane), DPUSame Index No.as indicated above is used in the source map.

(3) Source; Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta, DPU DKI. Same Index No.as indicated above is used in the source map.

(4) Source; Studi Perencanaan Jaringan Pengairan Jangka menengah, Draft Final Report, Jan.,1993, DPU DKSame Index No.as indicated above is used in the source report.

(5) Source ; The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Supporting Report Vol.I, JICA,Mar.,1991

(6) (Left : maximum depth) - (Right : average depth) (7) (Left : maximum duration) - (Right : average duration) (8) Source : DPU DKI

Table 9 HABITUAL INUNDATION AREA IN DKI JAKARTA(7/7)

WILAYAH KOTA : JAKARTA TIMUR

NO.	KECAMATAN	INUNDATION AREA	RELATED RIVER	MAP INDEX (1)	PSAPB 94-95 (2)	DKI 93-94 (3)	DKI 91 - 92 (4) NO.	DEPTH (cm)	AREA (sq.m)	JICA1991 (5) NO.	AREA (sq.m)	DEPTH (cm) (6)	D TION (hour) (7)	INUNDATION FACTOR (8) LOCA-TION	PROBLEM
1	Pasar Rebo	Cipinang Kumbaton	Cipinang	76-R-30	III - 1	III - 1	4-b	30	15,000	-	-	-	-	18-47	Located in flood plain.
2		Cijantung Kalisari	Ciliwung	76-Q-33	-	-	5-a	20	1,500	-	-	-	-	-	-
30		SD 03 Rambutan	Cipinang	76-R-31	-	-	6-b	20	2,000	-	-	-	-	-	-
31	Cipayung	Komp.Kodam Cipayung	-	**	-	-	7-c	20	7,000	-	-	-	-	-	-
3	Makasar	Kp.Makasar	Cipinang	66-R-28	III - 2	III - 2	10-a	40	20,000	-	-	-	-	18-48	Located in flood plain.
4		Kp.Kebon Pala	Cipinang	66-S-25	III - 3	III - 3	10-b	40	8,000	-	-	-	-	18-49	Located in flood plain.
5		Cipinang Melayu	Sunter	57-V-24	-	-	10-c	50	10,000	-	-	-	-	-	-
6	Kramat Jati	Sunter Halim Perdana Kusuma	Sunter	67-V-26	III - 4	III - 4	-	-	-	-	-	-	-	19-53	Low lying area.
7		Cawan Dewi Sartika	Ciliwung	56-Q-24	III - 5	III - 5	4-a	40-100	150,000	-	-	-	-	16-45	No improvement yet of K.Ciliwung.
8		Bidara Cina	Ciliwung	46-Q-20	III - 6	III - 6	3-b	70-150	260,000	-	-	-	-	-	-
9		Kp.Melayu	Ciliwung	"	"	"	3-a	70-120	110,000	56	208,000	30 - 14	5 - 3	-	-
10		Condet	Ciliwung	76-P-31	-	-	4-c	30	50,000	-	-	-	-	-	-
11		Kramat Jati	Sal. air	66-Q-27	-	-	4-d	20	15,000	-	-	-	-	-	-
38		-		76-Q-30	-	-	-	-	-	74	894,000	30 - 20	24 - 7	-	-
12	Jati Negara	Kebon Nanas/DI Panjaitan	Cipinang	46-S-21	III - 7	III - 7	-	-	-	-	-	-	-	18-50	Low lying area.
13		Cipinang Besar UtaraPrumpung	Cipinang	46-S-19	III - 8	III - 8	3-c	40-120	210,000	-	-	-	-	18-51	Low lying area.
14		Cipinang Muara	Cipinang	46-T-20	III - 9	III - 9	3-d	50	25,000	-	-	-	-	18-52	Low lying area.
15		Kp.Sodong	Sunter	36-U-17	-	III - 10	-	-	-	72	196,000	100 - 53	72 - 48	19-54	1)Low lying area, 2)Improvement of K.Suntel is not completed yet.
16		Kebon Pala Jatinegara	Ciliwung	46-Q-19	III - 10	-	-	-	-	-	-	-	-	-	-
17		Rawa Bunga	Sal.Sntiong	46-R-20	-	-	3-e	20	10,000	73	221,000	15 - 10	48 - 14	-	-
18		Jl.Jatinegara Timur	Sal.Sntiong	"	-	-	3-f	20	1,500	-	-	-	-	-	-
19	Pulo Gadung	Kplx.Palad	Sunter	37-V-15	III - 11	III - 12	2-b	20	24,000	76	490,000	100 - 48	72 - 45	19-56	1)Low lying area, 2)Improvement of K.Suntel is not completed yet.
20		Jl.Perintis Kemerdekaan	Sunter	26-T-12	-	III - 13	-	-	-	40	1,531,000	35 - 17	48 - 18	19-57	Construction/Installation ofdrainage canal, pump and dyke is required.
21		Perum HIKelapa Gading utara	Sunter	27-V-12	III - 12	III - 18*	-	-	-	-	-	-	-	19-58	- do above -
22		Jatinegara Kaum	Sunter	37-U-17	-	III - 11	2-d	50	30,000	71	233,000	150 - 53	48 - 22	19-55	1)Low lying area, 2)Improvement of K.Suntel is not completed yet.
23		Kayu Putih	S.Kampung Ambon	36-T-14	-	-	2-a	20	10,000	-	-	-	-	-	-
24		Kp.Jati Rawamangun	-	-	-	-	2-c	20	15,000	-	-	-	-	-	-
25		Cipinang Jagal	Sunter	36-U-17	-	-	2-e	40	10,000	-	-	-	-	-	-
26		Pisangan Timur		46-S-17	-	-	2-f	30	20,000	-	-	-	-	-	-
38		PT Jiep Pulo Gadung	Sal.P.PT Jiep	37-W-15	-	-	9-c	30	40,000	-	-	-	-	-	-
27	Matraman	Utan Kayu	Sal.Utang Kayu	36-R-16	-	-	1-a	20-60	16,000	-	-	-	-	-	-
28		Pal Meriam	-	-	-	-	1-b	20	2,000	-	-	-	-	-	-
29	Ciracas	Pasar Ciracas	-	udr76-R	-	-	6-a	30	4,000	-	-	-	-	-	-
32	Duren Sawit	Duren Sawit	Buaran	47-X-20	-	-	8-a	25	40,000	-	-	-	-	-	-
33		Klender	-	47-W-19	-	-	8-b	20	20,000	-	-	-	-	-	-
34		Pondok Bambu	-	57-U-21	-	-	8-c	30	45,000	-	-	-	-	-	-
35		Pondok Kelapa	Sal.Pondok Kelapa	57-Z-22	-	-	8-d	20	2,500	-	-	-	-	-	-
36	Cakung	Penggilingan	Cakung/Buaran	37-Y-14	-	-	9-a	30	4,000	-	-	-	-	-	-
37		Pulau Gebang	-	38-B-17	-	-	9-b	40	30,000	-	-	-	-	-	-

NOTE : (1) Innundation Area indicated by Map Index No.of the Jakarta Street Atlas and Names Index published by Gunther W.Holtorf(Distributor ; P.T.Djambatan)
(2) Source: Peta Lokasi Genangan Air DKI Jakarta, Tahun 1994/1995. PSAPB(Ciliwung Cisadane), DPU. Same Index No.as indicated above is used in the source map.
(3) Source: Peta Genangan Yang Terjadi Tahun 1993/1994 Wilayah DKI Jakarta, DPU DKI. Same Index No.as indicated above is used in the source map.
(4) Source: Studi Perencanaan Jaringan Pengairan Jangka menengah, Draft Final Report, Jan.,1993, DPU DKI. Same Index No.as indicated above is used in the source report.
(5) Source ; The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta, Master Plan Study, Supporting Report Vol.I, JICA,Mar.,1991
(6) (Left : maximum depth) - (Right : average depth) (7) (Left : maximum duration) - (Right : average duration) (8) Source : DPU DKI

Table 10 HABITUAL INUNDATION AREA IN KOTAMADYA TANGERANG (1/2)

No.	(Kecamatan) Innundation Area	Related River	Location Index	Inundation Area (m^2)	Inundation Depth (cm)	Inundation D'tion (hour)	Inundation Factor / Problem
TANGERANG							
1.	around Permahan Benua Indah	Sabi	L1	30,000	40 - 70	4 - 5	(1) Inadequate canal plan(alignment, cross-section, slope,bed) (2) Insufficient canal capacity (3) No improvement of upstream reaches of canal
2.	around Jl.Damyati	-	R1	10,000	20 - 40	2 - 3	(1) No improved drainage system network (2) Inadequate canal plan(alignment, cross-section, slope,bed) (3) Flow obstruction of garbage
3.	Kel. Grendeng /Jl. Sumur Pacing	-	L2	25,000	30 - 50	3 - 4	(1) No improved drainage system network (2) No drain canal
4.	Blok Karawaci Lama	Cisadane	L3	22,500	20 - 30	1 - 1.5	(1) No improved drainage system network (2) Inadequate canal plan(alignment, cross-section, slope,bed) (3) Flow obstruction of garbage and/or soil deposit
5.	around Jl. Nusa Indah	-	L4	15,000	20 - 40	1 - 2	(1) No improved drainage system network (2) Flow obstruction of garbage and/or soil deposit
6.	around Pasar Baru	-	L5	-	-	-	-
7.	Tanah Tinggi	-	R10	-	-	-	-
CILEDUG							
8.	DDN Complex	Tributary of Angke	R5	25,000	30 - 40	1 - 2	(1) No improved drainage system network (2) Sedimentation (3) Insufficient canal capacity (4) Low-lying area(overtopping, local water)
9.	Ciledug Indah Complex	Angke	R4	35,000	20 - 40	2 - 3	(1) Rehabilitation of existing canal is required (2) Insufficient canal capacity (3) Backwater of Angke river (4) Low-lying area(overtopping, local water)
10.	Karang Tengah	-	R6	-	-	-	-
11.	Desa Larangan Utara	-	R8	-	-	-	-
12.	Desa Kreo	-	R9	-	-	-	-
13.	Tajur	Angke	R7	-	-	-	-

Source : Proyek Perencanaan Teknis Sistem Drainase Kotamadya Tangerang 1993/1994, Final Report
Pemerintah Daerh TK.II Kotamadya Tangerang

Table 10 HABITUAL INUNDATION AREA IN KOTAMADYA TANGERANG (2/2)

No.	(Kecamatan) Innundation Area	Related River	Location Index	Inundation Area (m^2)	Inundation Depth (cm)	Inundation D'tion (hour)	Inundation Factor / Problem
CIPONDOH							
14.	Jl. Raya Cipondoh	-	R2	30,000	20 - 30	1 - 2	(1) No improved drainage system network (2) No drain canal (3) No improvement of downstream reaches of canal
15.	Desa Kunciran	-	R3	40,000	30 - 40	3 - 4	(1) Improvement of existing canal is required (2) Insufficient canal capacity (3) Outlet of drain conduit is too small
CURUNG							
16	Panunggangan	Cisadane	L8	-	-	-	-
JATIUWUNG							
17	Desa Priuk	Cirarab	L6	-	-	-	-
18	Jatiuwung	-	L7	-	-	-	-

Source : Proyek Perencanaan Teknis Sistem Drainase Kotamadya Tangerang 1993/1994, Final Report

Table 11 INUNDATION AREA IN DKI JAKARTA CAUSED BY JAN./FEB. 1996 FLOODS (1/4)

River	District	Inundation Area					Note	Map Index No
		Loc. No.	Kelurahan/Street(Jl.)	Jan.'96	Feb.'96			
				(ha)	(ha)	Depth(m)		
Kamal	West Jakarta	KL-01	Jl.Tol Sedyatmo	-	21	-		-
Grogol /Sekretaris	West Jakarta	GS-01	Jl.Daan Mogot	1	260	0.1 - 0.6		24-H-11
		GS-02	Jelambar	10	-	-	Rumah Sakit Jiwa Grogol	24-H-11
		GS-03	Jelambar Baru	25	63	-		24-H-13
		GS-04	Poglar	5	75	-		23-F-09
		GS-05	Pejagalan	650	31	-	Kamp.Gusti and Teluk Gong	14-G-07,08
		GS-06	Kedaung	10	92	0.1 - 1.4		23-E-09
		GS-07	Kelapa HUBAD	-	37	-		44-F-18
		GS-08	Batu Sari&Tnj.Duren	-	88	-		34-H-14
		GS-09	Permata Hijau	-	37	-		44-H-19
		GS-10	Pal Merah	-	21	-		44-H-17
	South Jakarta	GS-11	Pondok Pinang	-	50	-		64-H-25
		GS-12	Kamp.Dukuh	-	51	-		54-H-23
		GS-13	Gandaria	-	22	-		54-I-24
		GS-14	Jl.Hang Lekir	-	25	-		54-I-21
Pesanggrahan /Angke	North Jakarta	PA-01	Kapuk Muara	17	-	-	Tol Sediyatmo	13-E-05
		PA-04	Muara Karang	-	50	-		04-G-05
		PA-05	Jl.Pluit Barat raya	-	22	-		04-H-05
	West Jakarta	PA-02	Rawa Buaya	1	63	0.8 - 1.5		23-C-10
		PA-03	Tegal Alur	10	-	-		12-y-05
		PA-06	Kembangan	-	12	-		33-C-13
		PA-07	Meruya Ilir/Taman Aries	-	31	-		33-D-16
		PA-08	Budi Mulia	-	33	-		33-D-14
	South Jakarta	PA-09	Sangrila Indah	-	21	-		53-E-22
		PA-10	Komp.Depdagri	-	47	-		63-F-27
		PA-11	IKPN Bintaro	-	38	-		63-F-25
		PA-12	Ulu Jami	-	55	2.5- 6.5		53-E-23

Table 11 INUNDATION AREA IN DKI JAKARTA CAUSED BY JAN./FEB. 1996 FLOODS (2/4)

River	District	Inundation Area					Note	Map Index No
		Loc. No.	Kelurahan/Street(Jl.)	Jan.'96	Feb.'96			
				(ha)	(ha)	Depth(m)		
Ciliwung /Western Banjir Canal	South Jakarta	CW-01	Pejaten Timur	57	-	-		65-P-27
		CW-02	Rawajati	27	-	-		65-P-25
		CW-03	Pengadegan	45	-	-		55-P-24
		CW-04	Kebon Baru	37	33	-		56-Q-21
		CW-05	Bukit Duri	5	-	-		46-P-20
		CW-06	Guntur	30	47	-		45-M-18
	East Jakarta	CW-07	Balekambang	22	-	-		65-P-28
		CW-08	Cililitan	16	-	-		66-Q-25
		CW-09	Cawang	40	-	-		56-R-24
		CW-10	Bidaracina	50	-	-		56-Q-22
		CW-11	Balimester	14	-	-		46-Q-19
		CW-12	Kampung Melayu	10	-	-	Jl.Kebon Pala	46-Q-19
		CW-13	Kebon Manggis	0.1	-	-	Jl.Slamet Riyadi	46-P-18
	Central Jakarta	CW-14	Petamburan/Jati Pinggir	5	73	0.1 - 0.6		34-J-16
		CW-15	Cideng	12	47	-	Stasium Tanah Abang, Jatibaru, Tanjung Selor	24-J-13
		CW-19	Jl.MH.Thamrin	-	58	0.1 - 0.6		35-L-15
	West Jakarta	CW-16	Jatipulo	2	78	-		34-J-14
		CW-17	Tomang	37	31	-		24-I-12
		CW-18	Grogol	150	38	0.8 - 1.0		24-I-11
Ciliwung Hilir /Ciliwung Kota /Kali Beton	Central Jakarta	CH-01	Pegangsaan	1	-	-	Jl.Matraman Dalam	35-P-17
		CH-02	Kenari	2.5	-	-	Jl.Salemba 1, Jl.Kenari	35-O-16
		CH-03	Cikini	5	-	-	Kali Pasir	35-N-15
		CH-04	Mangga Dua Selatan	20	-	-	Jembatan Merah, Mangga Besar, Jl.Pangerang Jayakarta	15-M-08
	North Jakarta	CH-05	Mangga Besar	3	-	-		15-M-09
		CH-06	Tangki	2	21	-		15-L-08
		CH-07	Pinangsia	20	51	-		15-K-06

Table 11 INUNDATION AREA IN DKI JAKARTA CAUSED BY JAN./FEB. 1996 FLOODS (3/4)

River	District	Inundation Area					Note	Map Index No
		Loc. No.	Kelurahan/Street(Jl.)	Jan.'96	Feb.'96			
				(ha)	(ha)	Depth(m)		
Krukut	South Jakarta	KR-01	Petogogan	-	31	-		54-K-24
		KR-02	Tarakanita	-	34	0.0 - 1.0		54-K-23
		KR-03	Kompl.POLRI Pd.Karya	-	14	0.2 - 4.7		55-L-23
		KR-04	Bendungan Hilir	-	206	1.0 - 2.0		45-K-18
Cideng	South Jakarta	CD-01	Kompl.P.ABRI	-	26	-		55-M-21
Cideng / Krukut Hilir	West Jakarta	CK-01	Glodok	15	-	-	Jl.Pancoran	15-K-08
		CK-02	Kel.Jembatan Lima	-	93	0.1 - 1.1		14-I-07
Ciliwung Gunung Sahari	North Jakarta	CG-01	Komplek AIP, Mangga Dua Selatan, Mangga Dua	7	-	-		15-M-07
		CG-02	Jl.Rj.Wali Sel.&Jl.Industri	-	34	-		15-N-08
Polder Pluit	North Jakarta	PP-01	Penjaringan	8	183	0.1 - 0.8	Jl.Pluit Raya, Jl.Pluit Selatan Raya	14-I-05
Cipinang /Sunter	East Jakarta	CS-01	Makasar	5.5	40	-	Kampung Mahasar	66-S-28
		CS-02	Kebon Pala	5.5	19	2.2	Cipinang Halim	56-S-25
		CS-03	Cipinang Besar Selatan	5			Jl.Jend D.I Panjaitan, Jl.Penas	46-U-21
		CS-04	Cipinang Muara	10	21	0.8		46-T-19
		CS-05	Jl.Perintis Kemerdekaan	0.5	-	-		37-V-13
		CS-09	Cipinang Rambutan	-	47	-		66-R-31
		CS-10	Halim	-	54	-		67-V-27
		CS-11	Kebon Nanas	-	31	0.8 - 1.1		56-S-21
		CS-12	Rawamangun	-	78	-		46-U-17
		CS-13	Pulogadung	-	34	0.9 - 2.9		37-V-16
		CS-14	Pulomas	-	136	0.1 - 2.2		26-S-12
		CS-15	Perintis Kemerdekaan	-	42	-		26-T-12
		CS-16	Sumur Batu	-	29	0.2		26-R-12
Cipinang /Sunter	North Jakarta	CS-06	Jl.Yos Sudarso	0.6		-	Kel.Sungai Bambu	16-T-07
		CS-07	Rarwa Badak	600	382	0.5 - 1.4		07-U-04
		CS-08	Kelapa Gading Timur	800	76	0.3 - 1.6		27-V-11
		CS-17	Jl.Yos Sudarso	-	38	0.1 - 0.6	Kel.Kelapa Gading Barat	26-T-10

Table 11 INUNDATION AREA IN DKI JAKARTA CAUSED BY JAN./FEB. 1996 FLOODS (4/4)

River	District	Inundation Area					Note	Map Index No
		Loc. No.	Kelurahan/Street(Jl.)	Jan.'96	Feb.'96			
				(ha)	(ha)	Depth(m)		
Polder Sunter Barat	North Jakarta	SB-01	Warakas	10	58	0.1 - 1.3		06-S-05
		SB-02	Papanggo	7	36	-		16-S-06
		SB-03	Sungai Bambu	2	-	-		16-T-07
		SB-04	Kebon Bawang	7.5	35	-		16-T-05
		SB-05	Jl.R.E Martadinata	1	-	-		15-M-06
		SB-06	Sunter A,B,C	6	-	-		-
		SB-07	Sunter Agung Pdmoro	-	256	0.1 - 1.4		16-S-08
		SB-08	Koja	-	65	-		06-V-02
Suntiong /Pademangan	North Jakarta	SP-01	Pademangan	10	257	0.1 - 0.8		15-N-07
		SP-02	Gunung Sahari	2	-	-		15-N-09
K.Cakung	Kab.Bekasi	CA-01	Jatimekar	7	-	-		77-Z-31
		CA-02	Jatiasih	5	-	-		68-C-29

Source : Ciliwung-Cisadane River Basin Development Project Office, DPU

Remarks : Map Index No. shows the grid indices in the Jakarta Street Atlas & Names Index by Gunther W. Holtorf, distributed by P.T.Djambatan

Table 12 EXISTING MAJOR DRAINAGE FACILITIES IN WBC AREA (1/2)

Drainage Facility	Facility Name	Situation on WBC	Structure to be Affected by River Improvement	Scale						Conceivable Construction /Modification of Structures
				Structure	D (m)	W (m)	H (m)	L (m)	No.	
Pumping Station	Muara Angke P.S.	Outlet	- Outlet Structure of Pump Sta.	Outlet	-	3.7	-	3.0	1	New Sluice with Flapgate
			- Gated Structure in Channel fromReservoir	Gate	-	1.8	2.5	-	1	New Sluice Gate
				Channel	-	3.0	-	-	1	Reconstruction
	Rawa Kepa P.S.	Outlet	- Sluice with Flapgate	Sluice Pipe	0.8	-	-	-	4	Replacement of Flapgate
			- Outlet Structure	Outlet	-	2.7	2.6	-	4	Reconstruction
	Cideng P.S.	Outlet	- Outlet Structure	-	-	-	-	-	-	None
	Pondok Bandung	Outlet	- Sluice with Flapgate(from Pump)	Sluice Pipe	0.8	-	-	-	2	Replacement of Flapgate
			- Sluice with Flapgate(from Drain)	Sluice Pipe	0.8	-	-	-	2	Replacement of Sluice Pipe with Flapgate
	Melati P.S.	Outlet	- Sluice with Flapgate	Sluice Pipe	0.7	-	-	-	4	Replacement of Flapgate
			- Outlet Structure	Outlet	4.0	-	2.3	5.5	1	Replacement of Outlet Structure
	Setiabudi Barat P.S.	Outlet	- Outlet Structure	Outlet(A)	-	5.0	-	-	1	None
				Outlet(B)	-	4.0	-	-	1	None
	Setiabudi Timur P.S.	Outlet	- Outlet Structure	Outlet	-	3.0	-	-	1	None

Note : Construction/Modification works will be subject to the scale of river improvement works.

Table 12 EXISTING MAJOR DRAINAGE FACILITIES IN WBC AREA (2/2)

Drainage Facility	Facility Name	Situation on WBC	Structure to be Affected by River Improvement	Scale						Conceivable Construction /Modification of Structures
				Structure	D (m)	W (m)	H (m)	L (m)	No.	
Drainage River (Channel)	Grogol River (Teluk Gong Siphon)	Crossing	- Siphon	Inlet of Siphon	-	2.0	-	-	4	Not specified yet
	Angke River	Outlet	- Gate Structure on Outlet Channel	Gate	-	1.5	-	-	2	New Sluice Gate
				Sluiceway	-	7.0	-	-	1	Improvement
	K.Krendang	Outlet	- Closed Channel w/ Soil Embank.	Channel	-	3.0	-	-	1	New Sluice Gate
	Local Drain Channel (Kel.Petamburan)	Outlet	- Sluice Gate	Gate	-	0.9	-	-	3	None
			- Sluiceway	Sluiceway	-	30	-	-	1	Replacement of Channel and Masonry Wall
	Krukut River	Inlet	- Gated Structure	Gate	-	1.5	-	-	2	None
	K. Cideng	Crossing	- Siphon	-	-		-	-		Not specified yet
		Outlet	- Outlet Structure	Channel	-	12	-	-	1	None
	K.Baru Barat	Outlet	- Sluice Gate	Gate	-	2.5	-	-	1	None
			- Outlet Structure	Outlet	-	2.0	3.0	-	1	Partial Replacement
		Crossing	- Siphon (connected to local drain in Menteng Tenggulun)	Inlet Pipe of local drain	0.8	-	-	-	1	Not specified yet
	New Drain branched from K.Baru Barat	Outlet	- Sluice	Box Culvert	(2.5+3.0)		2.5	-	1	None
	S.Bali Matraman	Outlet	- Sluice	Box Culvert	(5.0+5.0)		2.0	-	1	None
	K.Surabaya	Inlet	- Gated Structure	Gate	-	1.5	-	-	1	Gate to be replaced; Channel under railway to be replaced.
	Old Ciliwun River	Inlet	- Gated Structure	-	-	-	-	-	-	None

Note : Construction/Modification works will be subject to the scale of river improvement works.

Table 13 EXISTING PUMPING STATIONS ALONG WBC

Station	Drainage Area (ha)	Reservoir Area (ha)	Pump Capacity			Start Year	Objective Drainage Area/River	
			Unit Capacity (m^3/s)	Unit (nos.)	Total (m^3/s)		River	Area
Muara Angke	53	0.5	0.5	2	1.0	1980	-	Muara Angke
Rawa Kepa	223	0.5	2.0	4	8.0	1984	-	Jati Petamburan, Tomang Timur
Cideng	750	-	6.7	6	40.0	1989	-	Thamrin, Medan Merdeka, Sabang, Kebon Sirih, Wahid Hasyim
Pondok Bandung	90	-	0.5	2	2.6	1979	-	Kel. Kota Bambu
Melati	185	3.5	1.1	4	4.4	1965	K.Cideng	
Setiabudi Barat	750	5.0	1.1	5	5.5	1969/75	K.Cideng	
Setiabudi Timur	90	2.0	1.1	3	3.3	1973	K.Cideng	Jl. Rasuna Said, Kel. Menteng Atas, Kel.Menteng Dalam (as retension pond for K.Cideng Bawah)

Source : Pengendalian Banjir dan Drainase di DKI Jakarta, DPU

Table 14 EXISTING STRUCTURE OF LOCAL DRAINAGE SYSTEM CONNECTED TO WBC

Facility Name	Section of WBC		Structure Located in River Channel	Scale
Drainage Outlet	Between	Jl.Mas Mansyur - Jl.Thamrin	Sluice	Single Pipe x 2 Double Pipe x 1 Rectangular t x 4
	Between	Jl.Thamrin - Jl.H.R.Rasuna	Sluice	Triple Pipe x 1
	Between	Jl.H.R.Rasuna - Jl.Madiun	Sluice	Single Conduit x 1
	Between	Jl.Madiun - Jl.Gunter	Sluice	(Conduit&Chuteway)x 1 Single Pipe x 1
	Between	Jl.Gunter - Jl.Sukabumi	Sluice / Outlet Structure	Single Pipe x 1

Table 15 DRAINAGE CHANNELS IN CISADANE RIVER AREA

Location		Present Condition			River Improvement					Proposed Works
No.	(Section No.)	Bank	Channel	Channel Width at Outlet(m)	Structure	Design W.L.(m)	Work	Elevation(El..m) New(Raised) Levee	Present Levee	Present Ground	
L-1	(3.5 K)- 100 m	Left	Local drain channel	3	-	+5.06	New Levee	+6.06	+4.90	+2.10	New Sluiceway w/ Flapgate
R-1	mid(6.8K/7.1K)	Right	Local drain channel	5	Sluiceway w/ Flapgate	+6.18	Levee Raising B.D. of Levee	+7.18	+6.30	+3.00	Replacement of existing Sluiceway w/ Flapgate
R-2	mid(12.7K/13.1K)	Right	Creek	5	-	+8.60	Levee Raising B.D. of Levee	+9.60	+9.20	+8.70	None
R-3	(14.4K)-120 m	Right	Local drain channel	2	-	+9.50	Levee Raising (Left bank only)	+10.50	-	-	New Sluiceway w/ Flapgate
L-2	(16.8K) - 300 m	Left	Irri. drain channel	3	Drop	+11.00	Levee Raising B.D. of Levee	+12.00	+11.90	+10.20	Existing Sluiceway under road to be Replaced with New Sluiceway w/ Flapgate
L-3	(17.4K)- 300 m	Left	Local drain channel	5	-	-	No Improv.	-	-	-	None
L-4	(19.1K) - 40 m	Left	Local drain channel	5	Drop	-	No Improv.	-	-	-	New Sluiceway w/ Flapgate udr. road
L-5	(19.5K) - 200 m	Left	Sabi River	5 - 7	-	-	No Improv.	-	-	-	None (Drainage Facility for Sabi River incl. Gated Structure and Pumping Station to be Provided in future improvement)
L-6	(20.7K) + 140 m	Left	Local drain channel	5 - 6	Sluiceway w/ Chute	-	No Improv.	-	-	-	None
L-7	(20.7K) + 300 m	Left	Drain from irri. canal	6 - 7	-	-	No Improv.	-	-	-	None (Parapet Wall to be Provided for Left Bank of Canal in future improvement)
R-4	(21.3K) - 80 m	Right	Drain from irri. canal	20 - 25	-	-	No Improv.	-	-	-	None (Parapet Wall to be Provided for Right Bank of Canal in future improvement)

Note : B.D.of Levee ; Backward Displacement of Levee

Table 16 EXISTING BRIDGES IN THE PROJECT AREA(1/2)

Name	Location	Classification	Structure	Scale Length (m)	Scale Width (m)	Scale Lane Nos.	Present Condition	Works to be Executed
(Western Banjir Canal)								
Permai	+1.9K	Road Br.	PSC	75.0	7.5 x 2	2 x 2	separate two bridges	protection works of exposed pier(s)
Jl.Tol Prof.Sediyatmo	+2.7K	Elevated Road	PSC	-	-	-	under const.; piers in river channel	protection works of exposed pier(s)
Jl.Tol Northern Extension	+4.7K	Elevated Road	PSC	-	-	-	piers in river channel	protection works of exposed pier(s)
Teluk Gong	+4.9K	Road Br.	Steel Truss	50.0	7.0	2	-	None
Pangeran Tubagus	+5.6K	Road Br.	RFC	50.0	7.0x 2	2 x 2	separate two bridges	protection works of exposed pier(s)
Dr. Latumeten	+6.9K	Road Br.	PSC	60.0	28.0	8	poor clearance above waterlevel	whole bridge to be replaced(raised)
Dr. Semeru	+7.9K	Railway Br.	Steel Truss	42.0	42.0	-	under replacement with new concrete bridge	None
Grogol - Duri Pulo	+8.1K	Pedestrian Br.	PSC	-	1.5	-	-	None
Kyai Tapa	+8.4K	Road Br.	PSC	50.0	23.0	8	poor clearance above waterlevel	whole bridge to be replaced(raised)
Tomang	+9.4K	Road Flyover	PSC	-	-	-	under construction	protection works of exposed pier(s)
Jati Pulo - Cideng	+10.7K	Pedestrian Br.	Steel	-	1.5	-	available for motorcycle	protection works of exposed pier(s)
Jatibaru	+10.9K	Road Flyover	PSC	-	-	-	-	protection works of exposed pier(s)
Aipda K.S. Tubun	+11.3K	Road Br.	PSC	-	-	-	separate two bridges	protection works of exposed pier(s)
Karet Barrage	-	Railway Br.	RFC	-	-	-	on the piers of weir	None
KH. Mas Mansyur	+13.1K	Road Br.	PSC	37.0	6.0 x 2	2 x 2	poor clearance above waterlevel	None
							separate two bridges	None
							another flyovers under construction	None

Note Br : Bridge PSC : Prestressed Concrete T : Truss
RFC : Reinforced Concrete

Table 16 EXISTING BRIDGES IN THE PROJECT AREA(2/2)

Name	Location	Classification	Structure	Scale			Present Condition	Works to be Executed
				Length (m)	Width (m)	Lane Nos.		
(Western Banjir Canal)								
M.H.Thamrin	+13.9K	Road Br.	PSC	-	-	8	abutement in river channel	None
H.R.Rasuna Said	+14.4K	Road Flyover	PSC	-	-	-	-	protection works of exposed pier(s)
Madiun Halimun	+15.2K	Road Br.	PSC	36.0	14.0	4	-	None
Guntur	+15.7K	Road Br.	Concrete T	30.0	7.0	2	-	None
Sukabumi	+16.0K	Road Br.	Steel Truss	36.0	8.0	2	-	None
(Cisadane River)								
Kali Baru	-	Road Br.	Steel Truss	60.0	6.0	2	-	None
Suspension Bridge	-	Pedestrian Br.	Suspension	23.0	1.3	-	downstream of the proposed floodway outlet	None
(Ciliwung River)								
Jl.Pajajaran(to Puncak)	-	Road Br.	RFC	50.0	13.0	4	upstream of the proposed floodway inlet	None

Note Br : Bridge PSC : Prestressed Concrete T : Truss
RFC : Reinforced Concrete

Table 17 MISCELLANEOUS FACILITIES CROSSING WBC

No.	Section			Facility Nos.			Others
	Downstream		Upstream	Aque-duct	Gas Supply Pipe	Power Supply Cable	
1	River Mouth	-	Permai Br.	-	-	-	-
2	Permai Br.	-	Teluk Gong Br.	2	-	4	-
3	Teluk Gong Br.	-	Pangeran Tubagus Br.	2	-	2	-
4	Pangeran Tubagus Br.	-	Dr. Latumeten Br.	3	-	1	-
5	Dr. Latumeten Br.	-	(Dr.Semeru)Railway Br.	-	-	1	-
6	(Dr.Semeru)Railway Br.	-	Kyai Tapa Br.	-	-	1	-
7	Kyai Tapa Br.	-	Tomang Br.	1	1	1	-
8	Tomang Br.	-	Jatibaru Br.	1	-	-	-
9	Jatibaru Br.	-	Aipda K.S.Tubun Br.	-	-	-	-
10	Aipda K.S.Tubun Br.	-	Karet Barrage	-	-	-	-
11	Karet Barrage	-	K.H.Mas Mansyur Br.	-	-	6 (1)	- Auto.W.L. Gauge - Gates of Filtration Plant Inlet
12	K.H.Mas Mansyur Br.	-	M.H.Thamrin Br.	2	-	-	-
13	M.H.Thamrin Br.	-	H.R.Rasuna Said Br.	-	1	1	- Panel Tower
14	H.R.Rasuna Said Br.	-	Madiun Harimun Br.	1	-	-	- Panel Tower
15	Madiun Harimun Br.	-	Guntur Br.	-	-	-	-
16	Guntur Br.	-	Sukabumi Br.	1	1	1	-
17	Sukabumi Br.	-	Manggarai Barrage	-	-	-	-

Note : Number of cable indicated in a parenthesis is for 150 kV transmission, while others are for 20 kV.

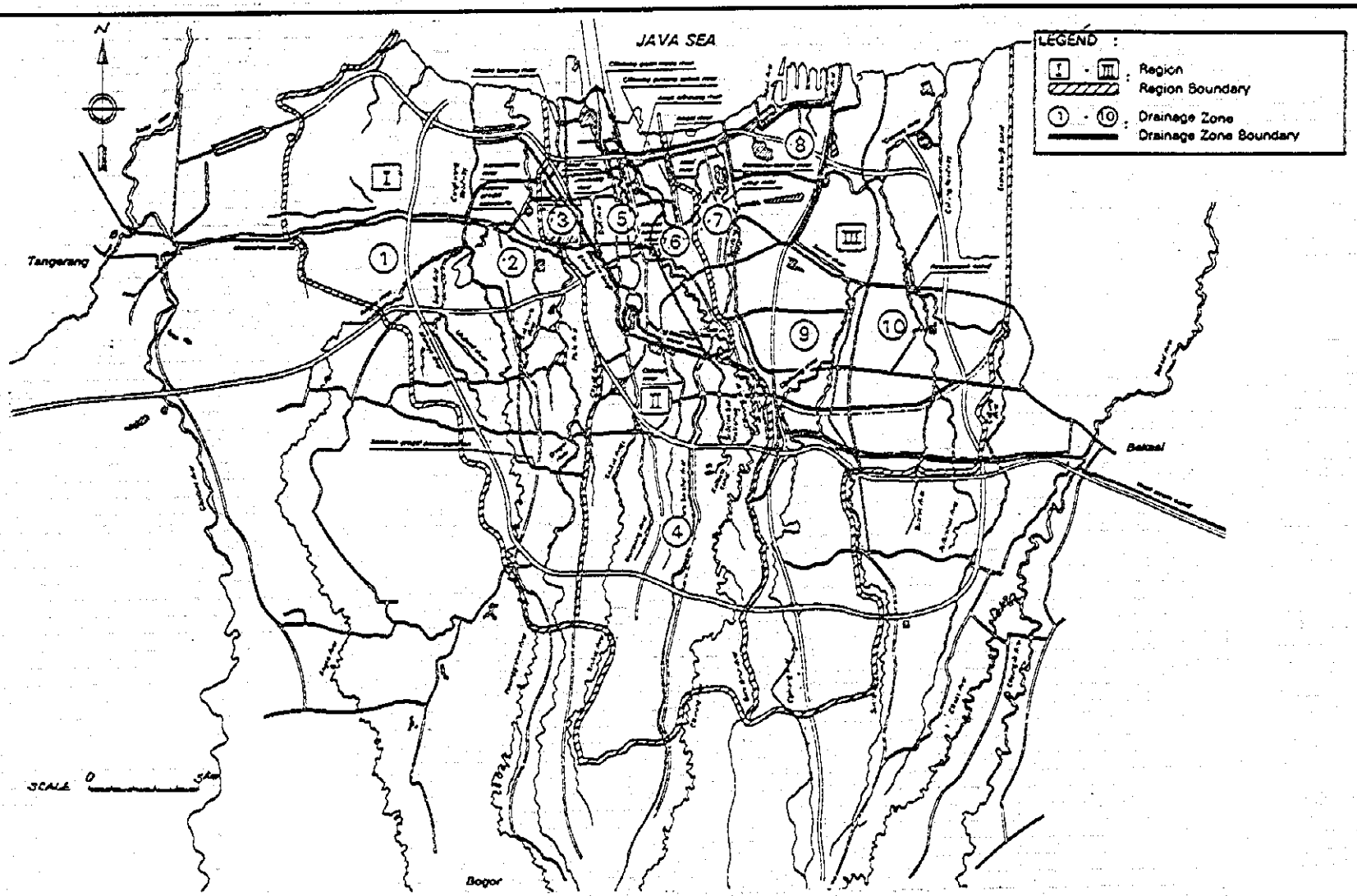


Figure 1 CATCHMENT OF DRAINAGE SYSTEM IN DKI JAKARTA

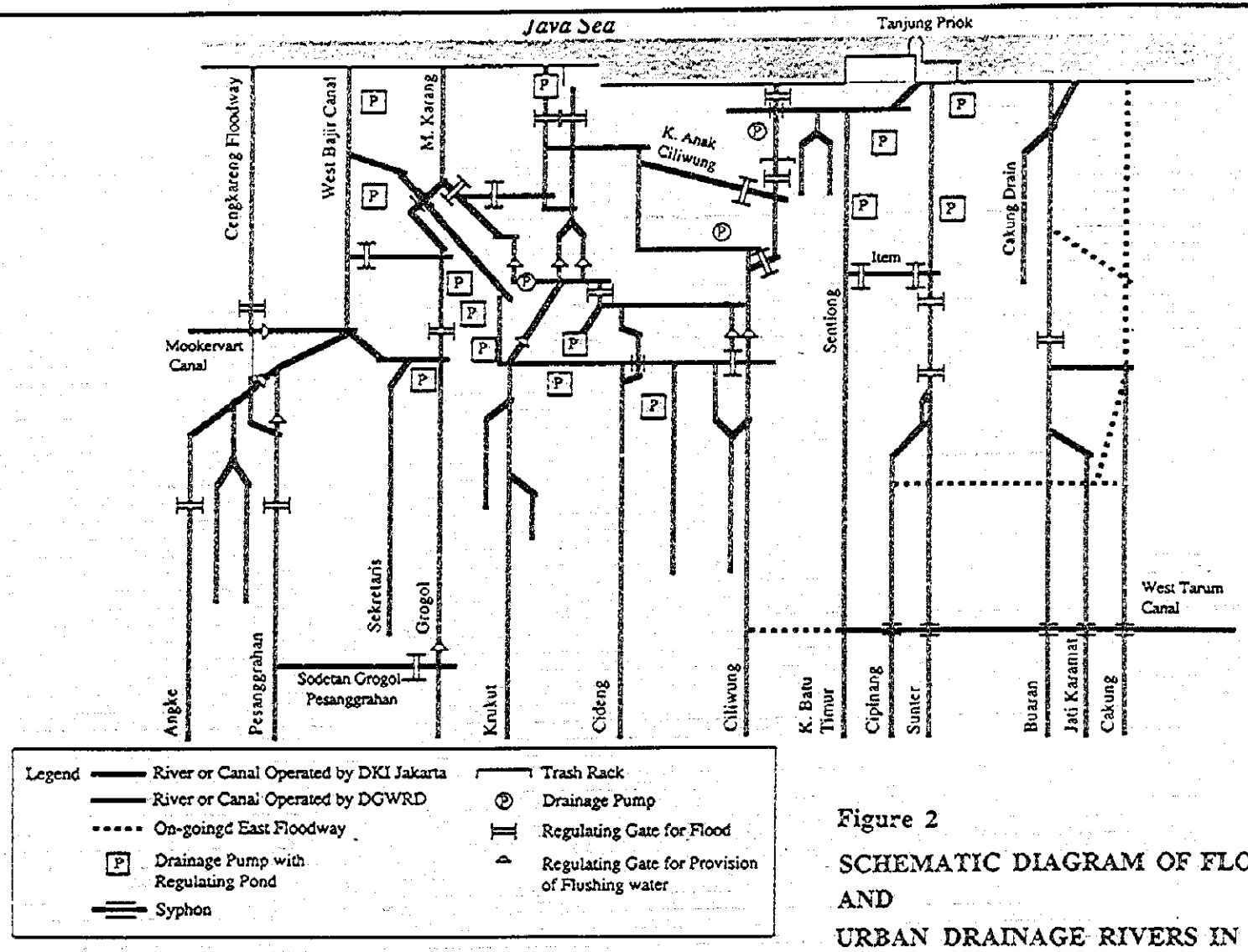


Figure 2

SCHEMATIC DIAGRAM OF FLOOD CONTROL AND URBAN DRAINAGE RIVERS IN DKI JAKARTA

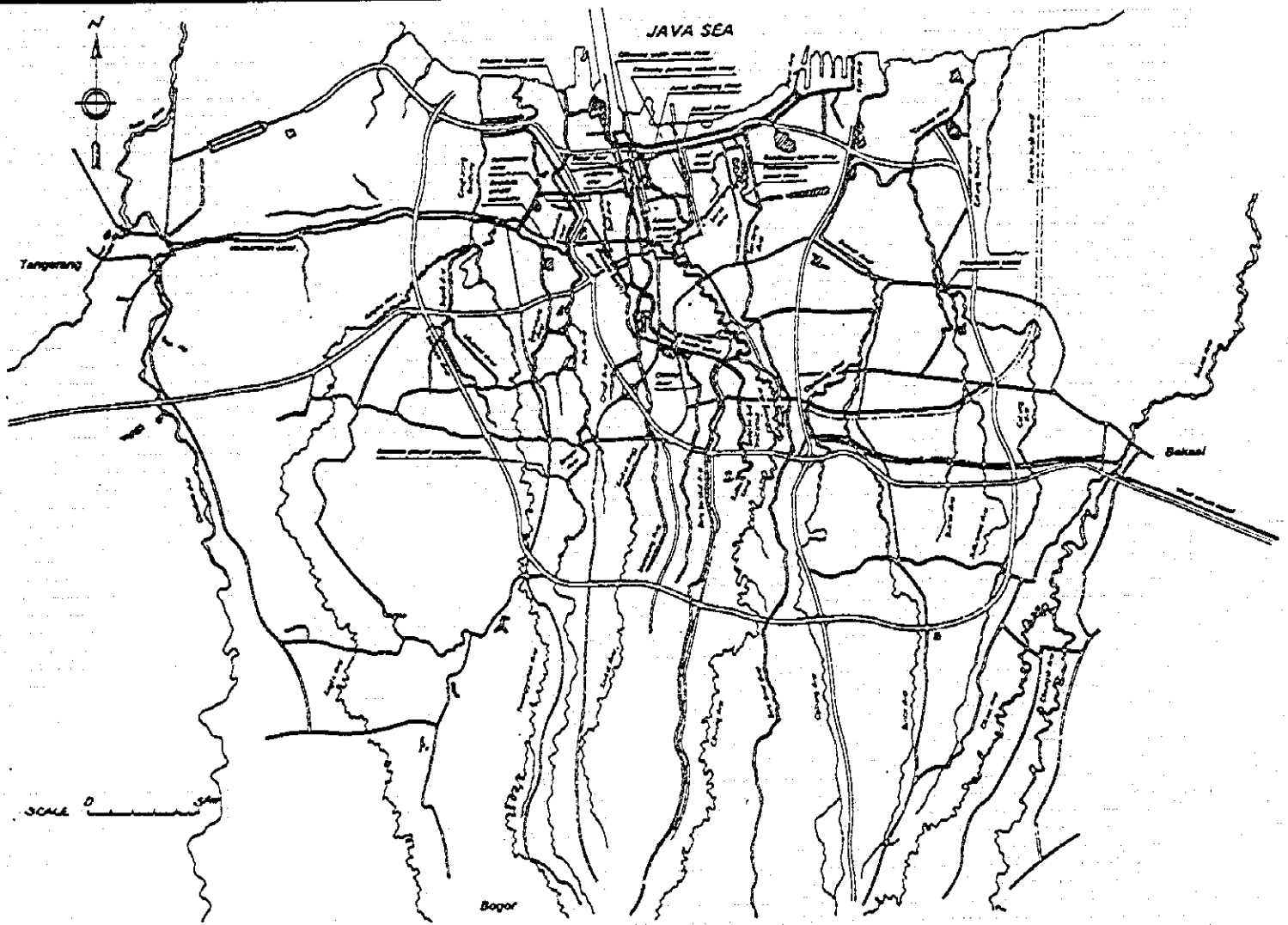
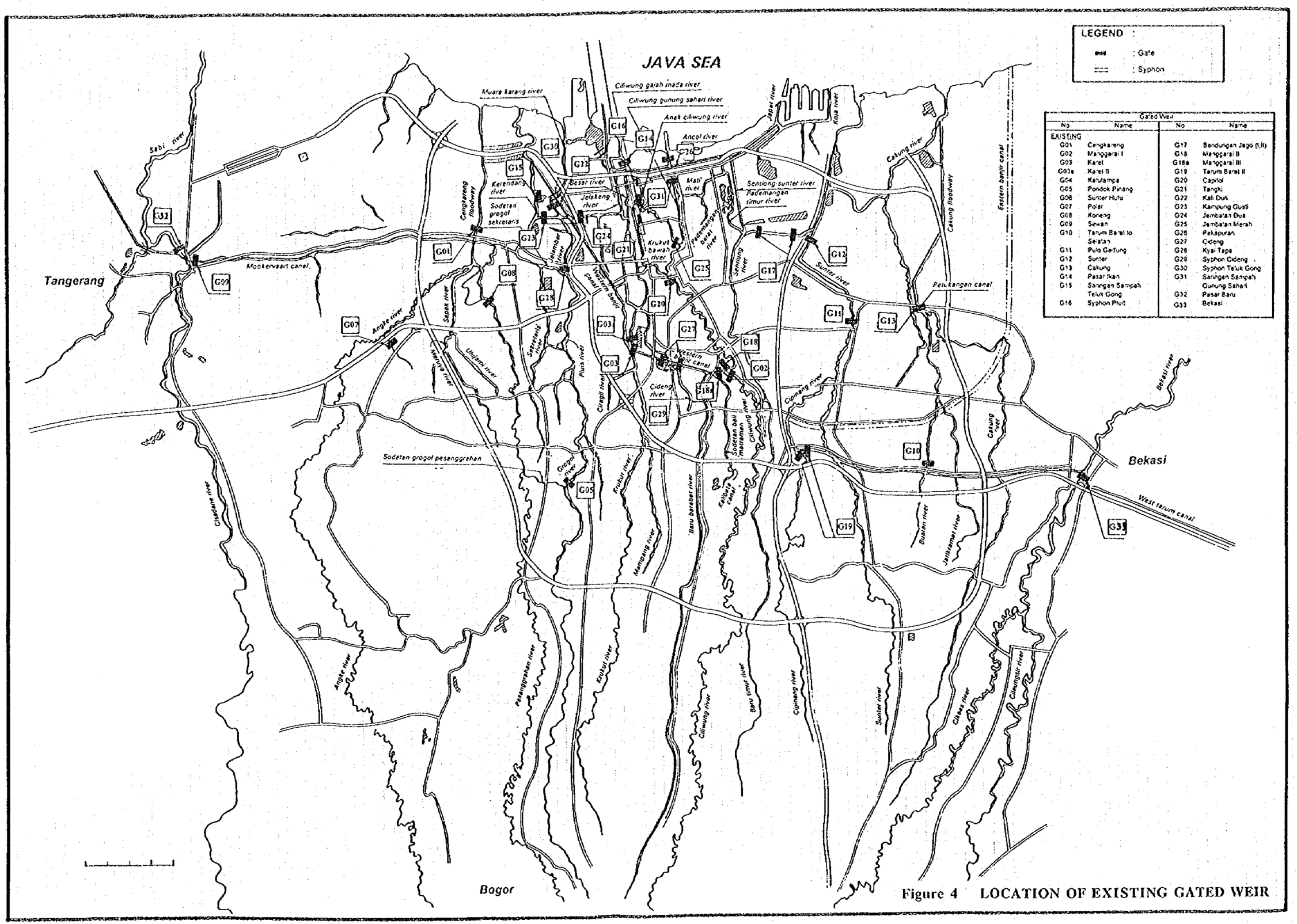


Figure 3 URBAN DRAINAGE RIVERS IN DKI JAKARTA



Gated Weir			
No	Name	No	Name
EXISTING			
G01	Cengkareng	G17	Bendungan Jago (I,II)
G02	Manggarai I	G18	Manggarai II
G03	Karet	G18a	Manggarai III
G03a	Karet II	G19	Tarum Barat II
G04	Kamlampa	G20	Capitol
G05	Pondok Pinang	G21	Tangki
G06	Sunter Hulu	G22	Kali Duri
G07	Polar	G23	Kampung Gusti
G08	Koneng	G24	Jembatan Dua
G09	Sewan	G25	Jembatan Merah
G10	Tarum Barat Ia Selatan	G26	Pekapuran
		G27	Cideng
G11	Pulo Gadung	G28	Kyai Tapa
G12	Sunter	G29	Syphon Cideng
G13	Cakung	G30	Syphon Teluk Gong
G14	Pasar Ikan	G31	Saringan Sampah Gunung Sahari
G15	Saringan Sampah Teluk Gong	G32	Pasar Baru
G16	Syphon Pluit	G33	Bekasi

Figure 4 LOCATION OF EXISTING GATED WEIR

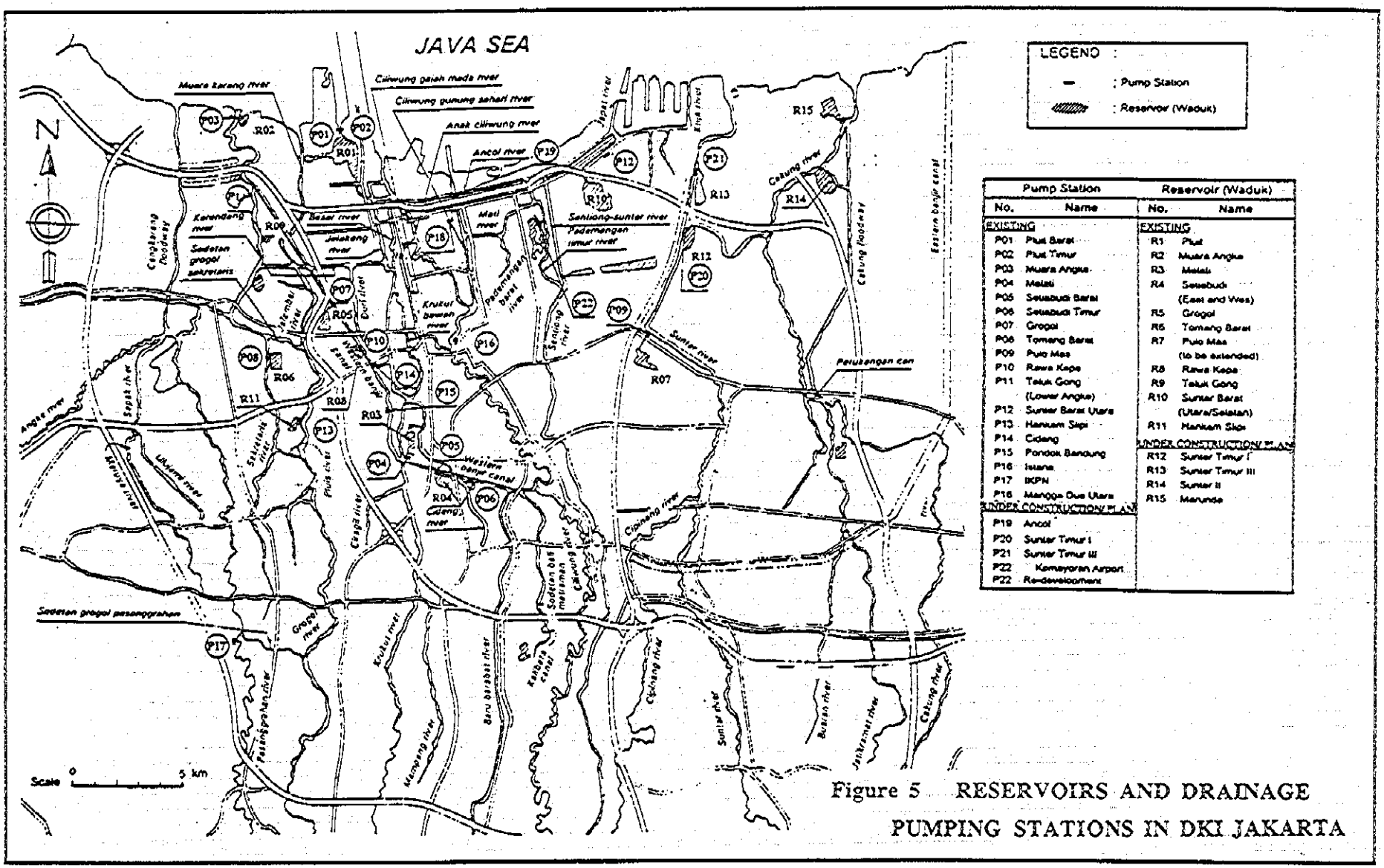


Figure 5 RESERVOIRS AND DRAINAGE PUMPING STATIONS IN DKI JAKARTA

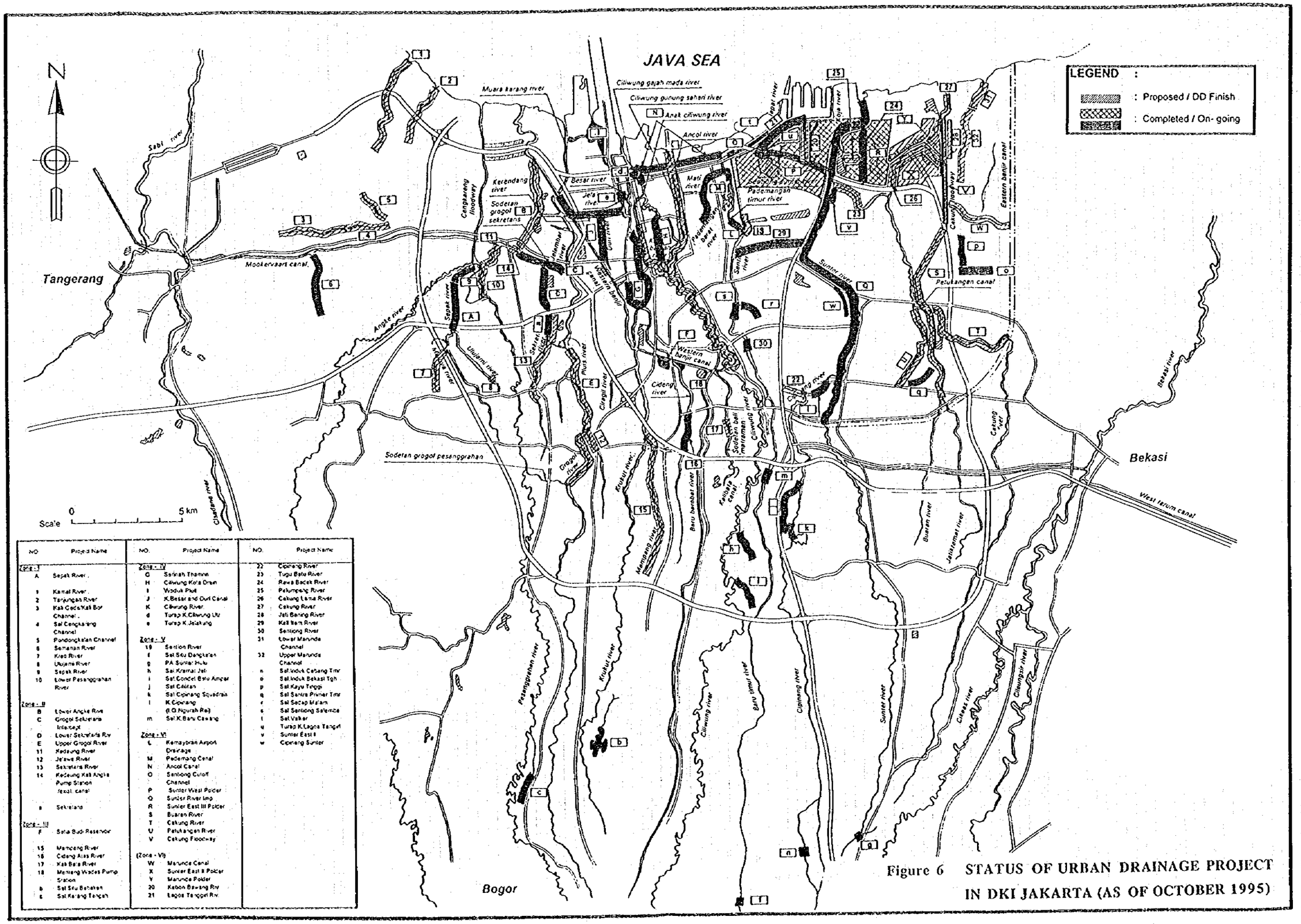


Figure 6 STATUS OF URBAN DRAINAGE PROJECT IN DKI JAKARTA (AS OF OCTOBER 1995)