

FIGURES

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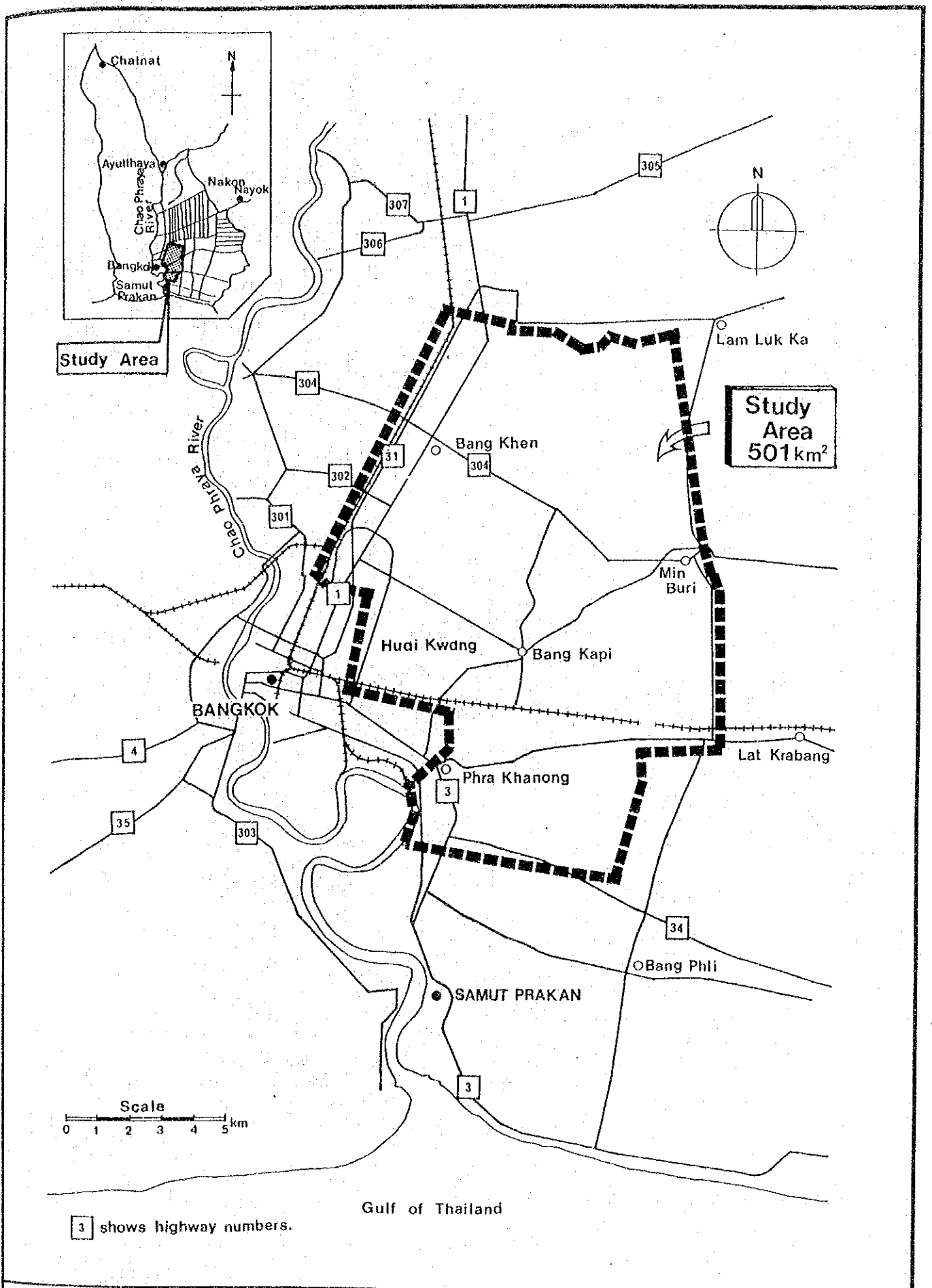
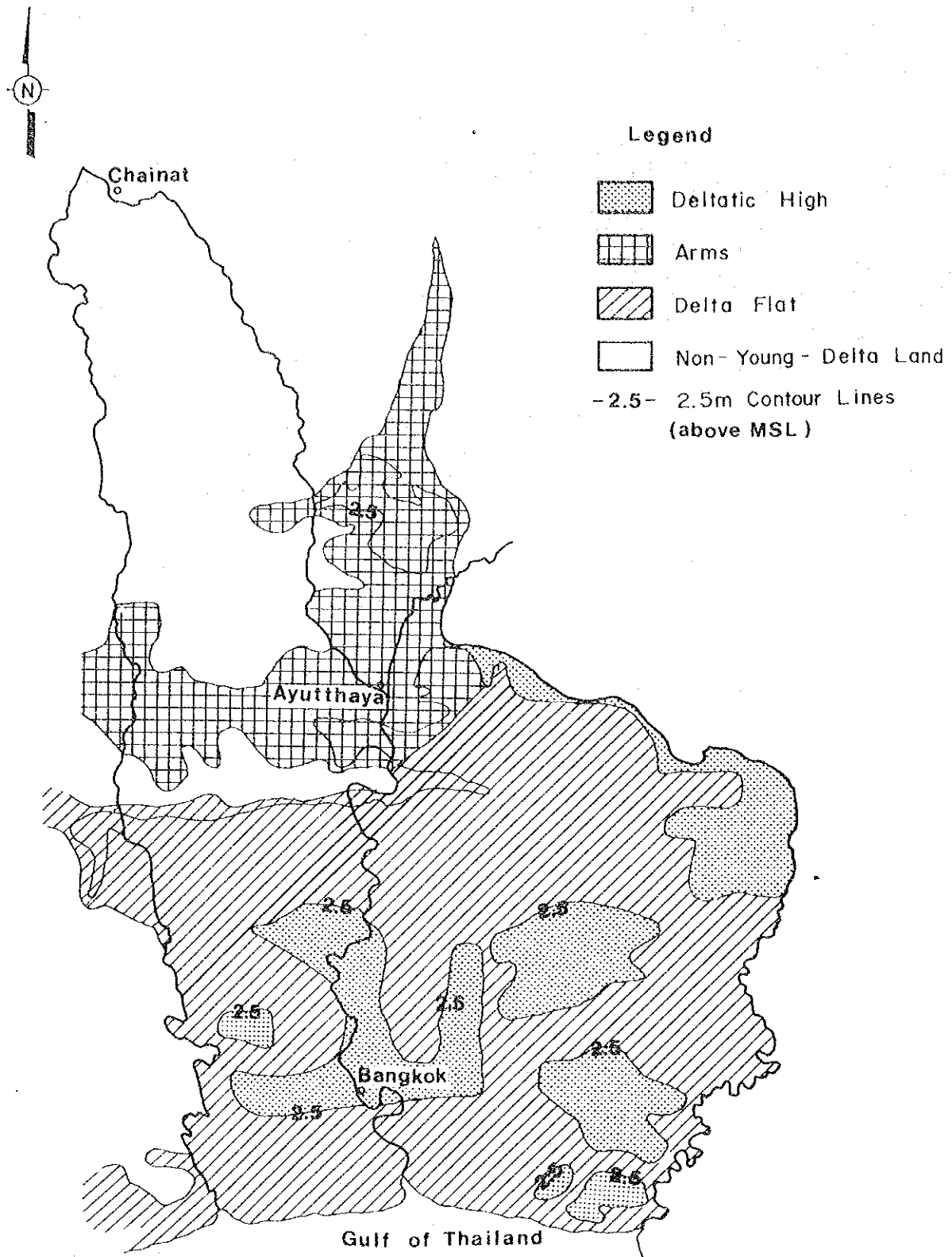


FIG. 2.1

Location of the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



(Source : A RICE-GROWING SOCIETY)

(Surveyed in 1989)

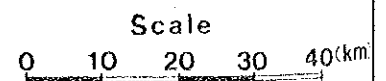


FIG. 2.2

Topography of the Lower Chao Phraya Delta

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

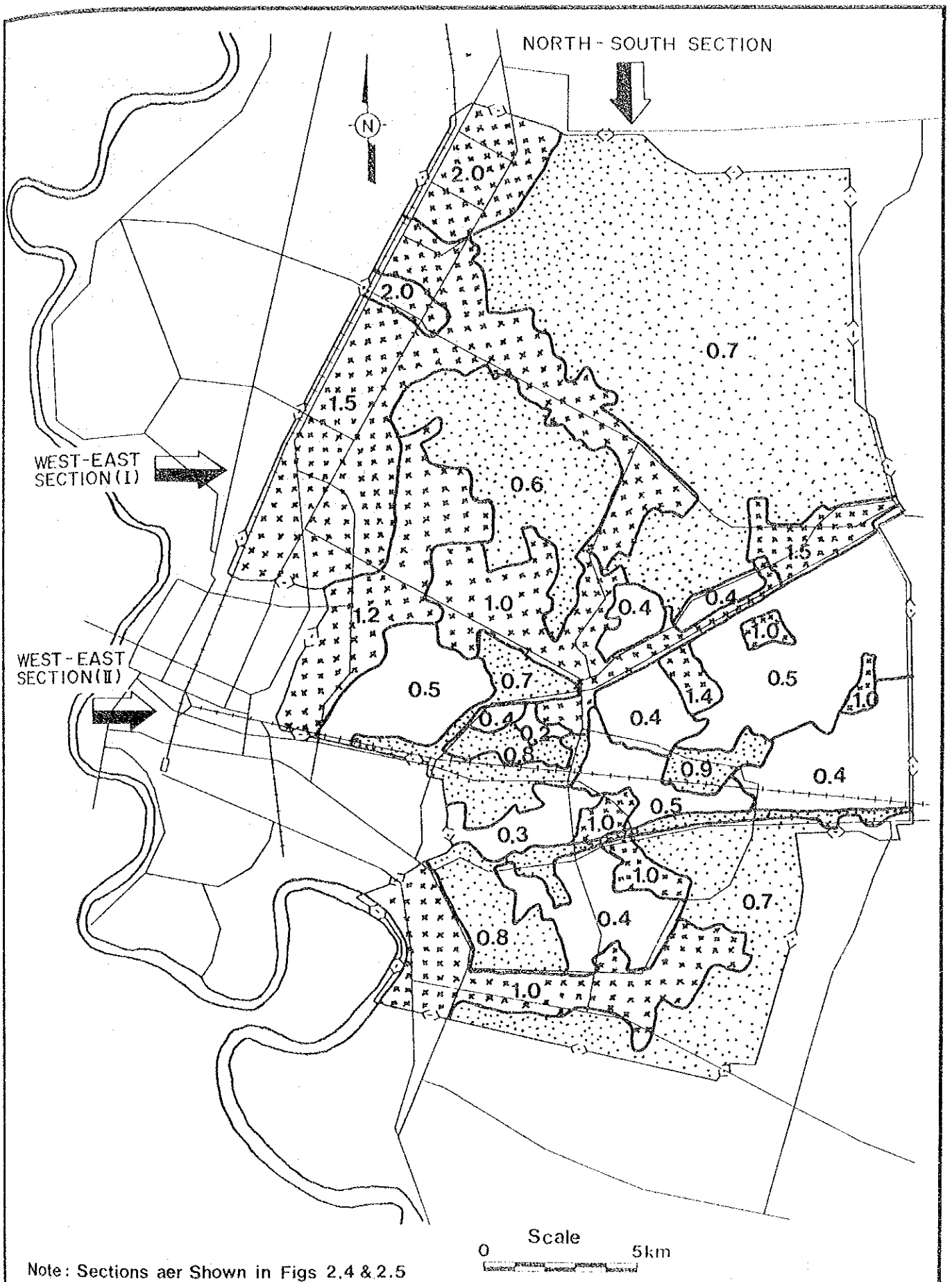
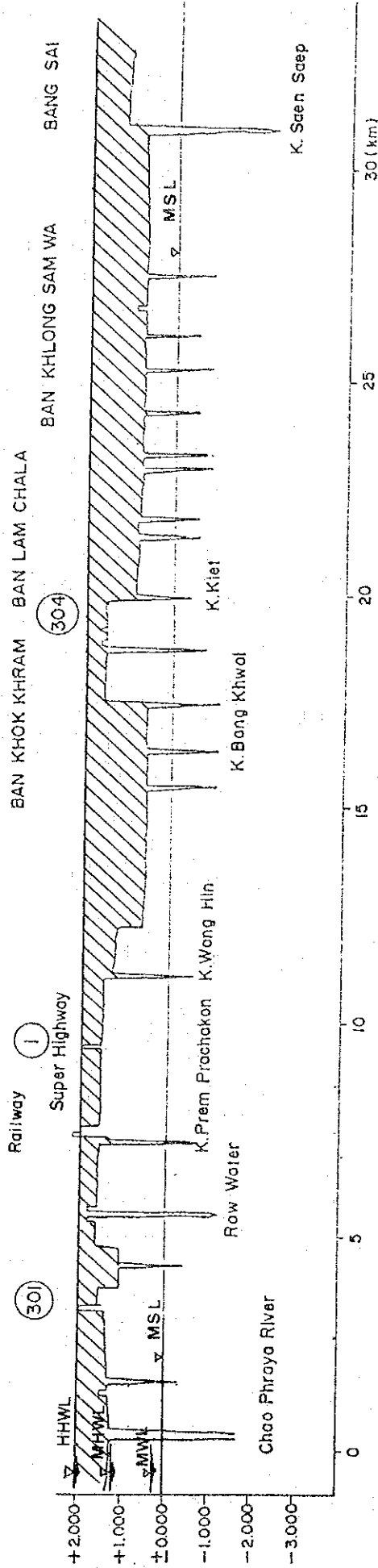


FIG. 2.3

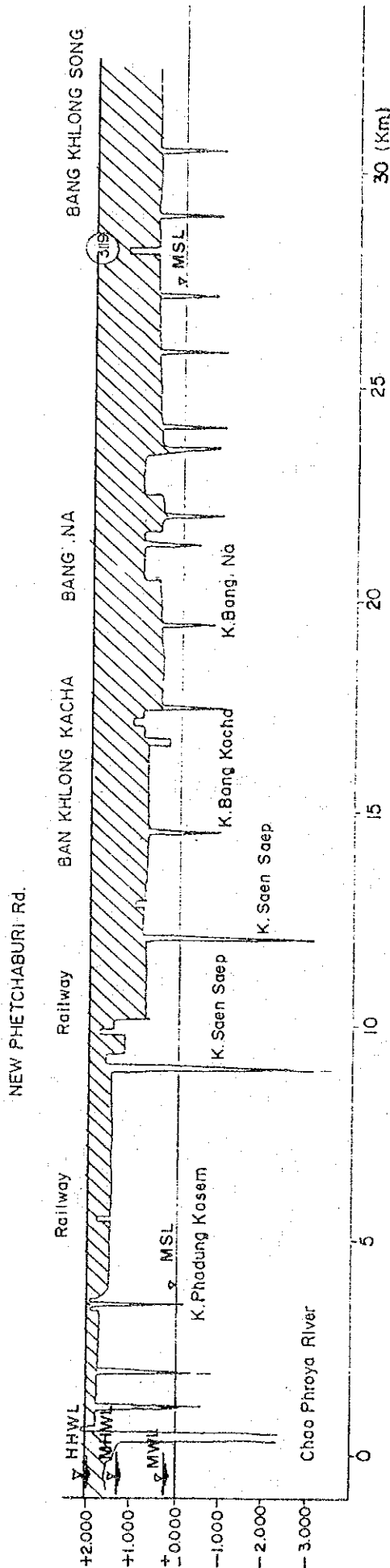
Ground Elevation in the Study Area as of 1983

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

WEST - EAST SECTION (I)



WEST - EAST SECTION (II)



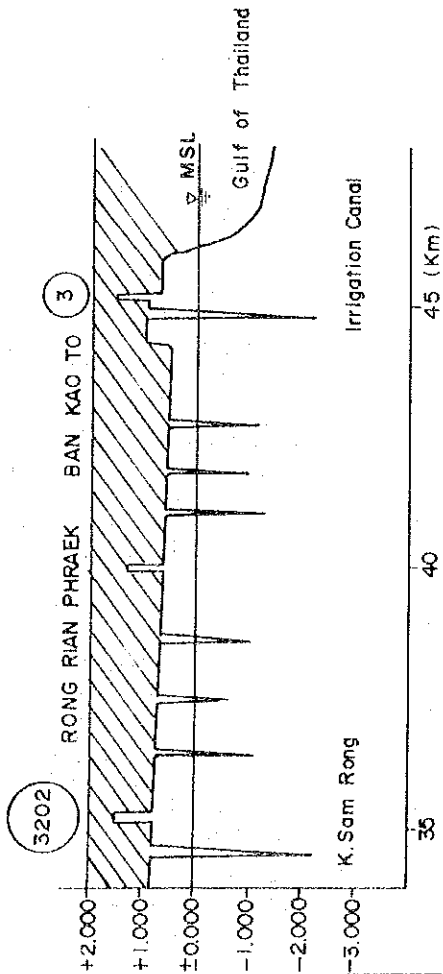
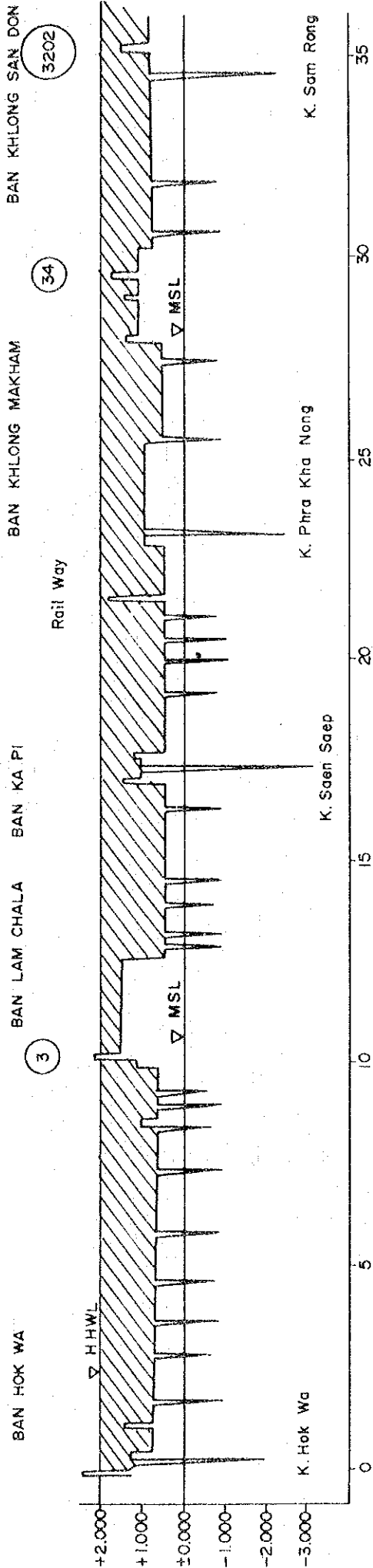
Note: 1. ① shows No. of National Road.

2. The shaded area is the assumed portion to be inundated provided with no flood protection measures against H.H.W.L. of the Chao Phraya River.

FIG. 2.4 West - East Profile of the Study Area

FLOOD PROTECTION / DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

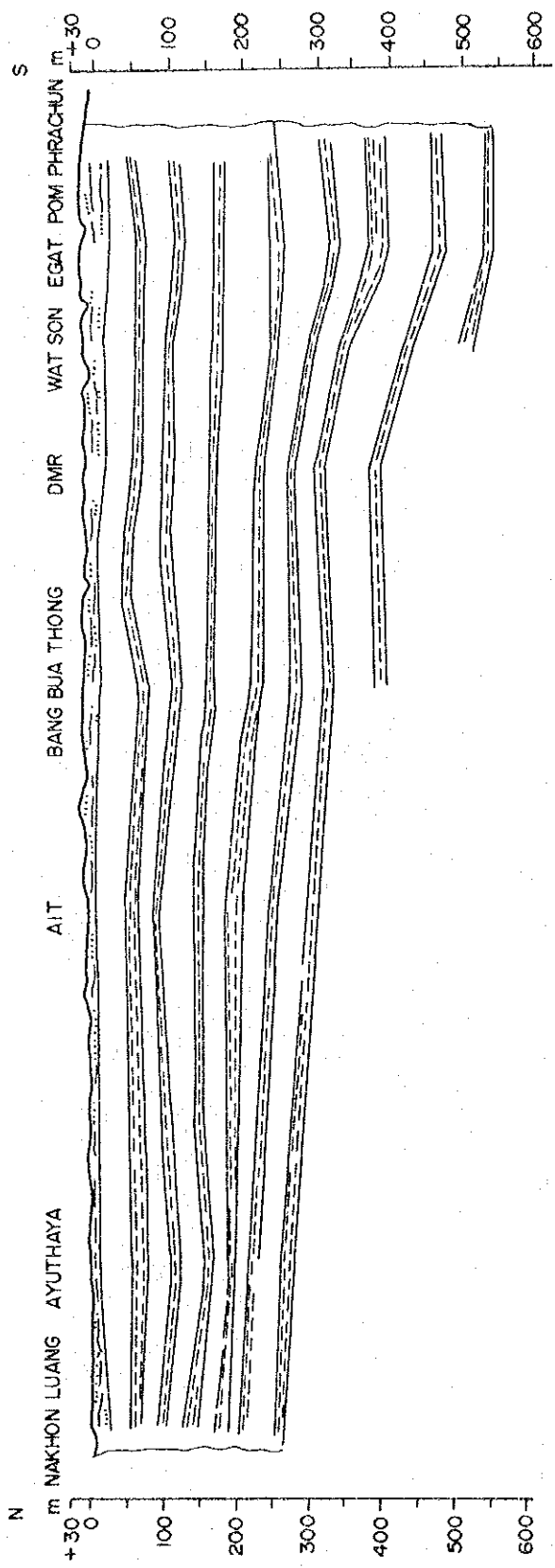
NORTH - SOUTH SECTION (I)



- Note: 1. (3202) shows No. of National Road.
 2. The shaded area is the assumed portion to be inundated provided with no flood protection measures against H.H.W.L. of the Chao Phraya River.

FIG. 2.5 North - South Profile of the Study Area

FLOOD PROTECTION/ DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



EXPLANATION

- Clay: Bangkok clay, soft on top, stiff at bottom
- Clay (confining bed): Consists predominantly of stiff clay; with sandy clay or fine sand layers or lenses.
- Sand and gravel (aquifer): consists of sand and gravel of various sizes and colours moderately to well sorted, subangular to rounded. The aquifers are commonly interbedded with clay layers and lenses.

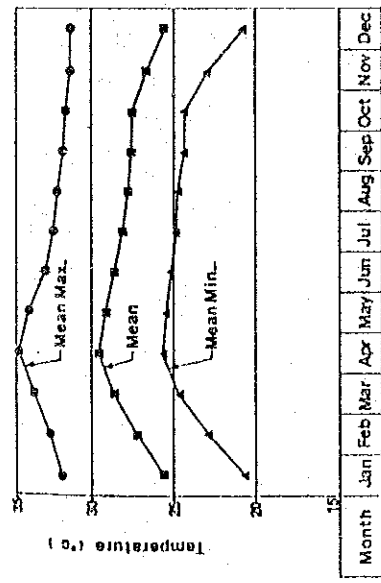
Scale

Horizontal : 1:400,000
 Vertical : as indicated

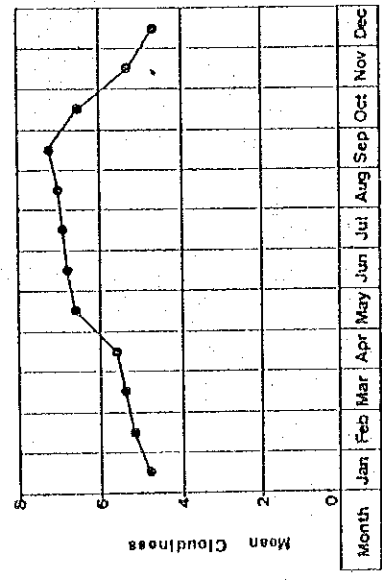
Source : Investigation of Land Subsidence, AIT

FIG. 2.6 North-South Geologic Profile of the Lower Chao Phraya Basin

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



Temperature



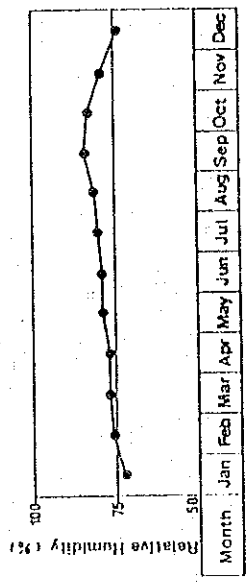
Cloudiness

Note
1. Source

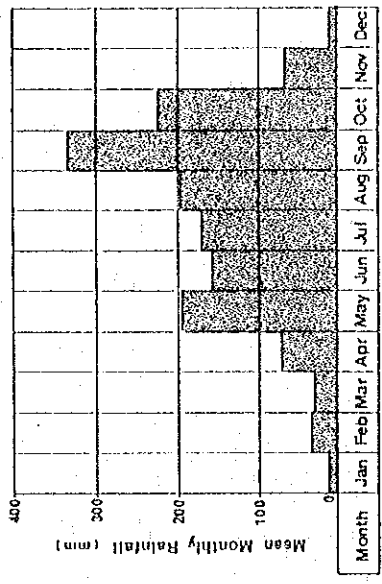
Evaporation: AIT, Rainfall and Evaporation Analysis of Thailand, 1980 12.

Evapotranspiration: NES, Groundwater Resources in Bangkok Area Development and Management Study, 1982

Others: Meteorological Department



Humidity

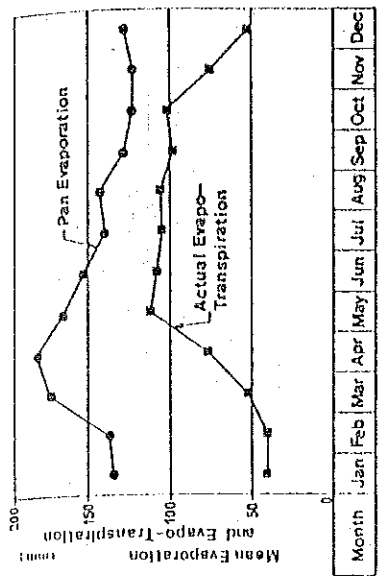


Monthly Rainfall

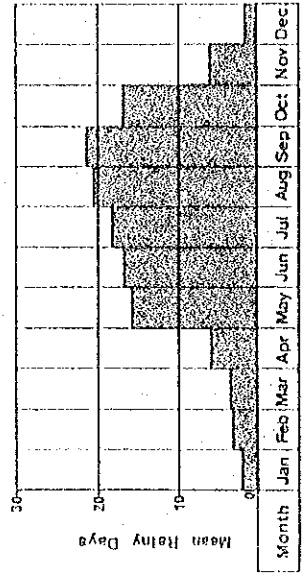
2. Period

Evaporation: 17 years

Evapotranspiration: 1956 - 1974



Evaporation and Evapotranspiration



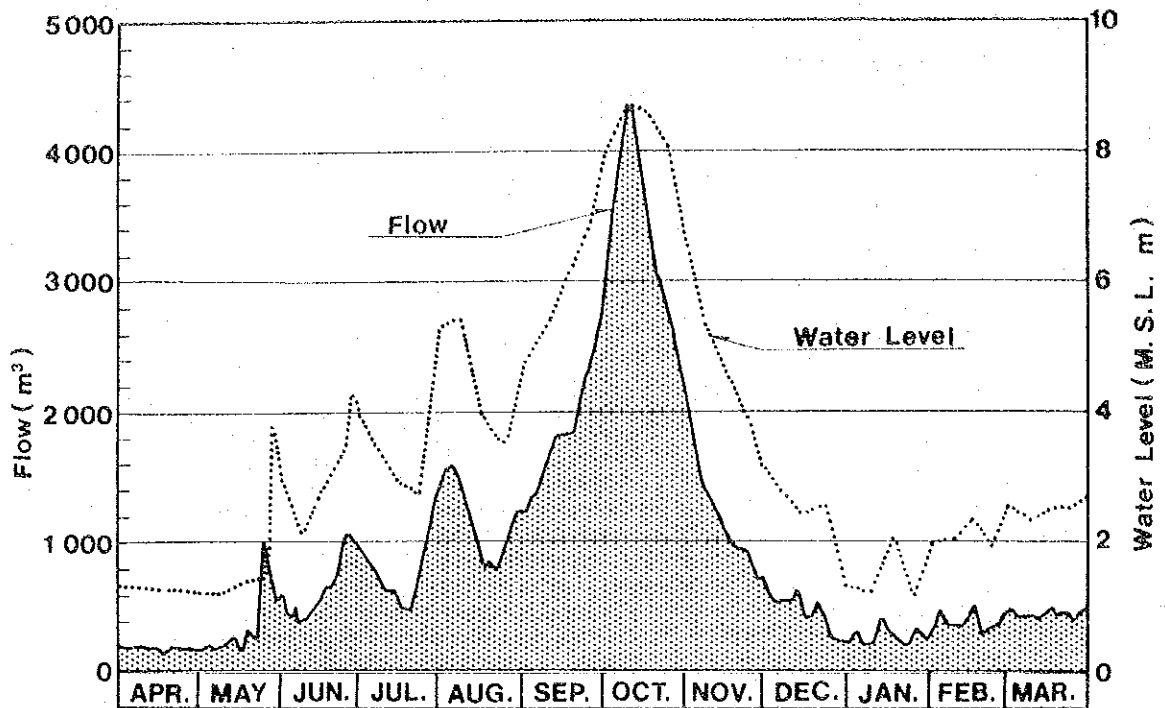
Rainy Days

Rainfall and Rainy Days: 1951 - 1982

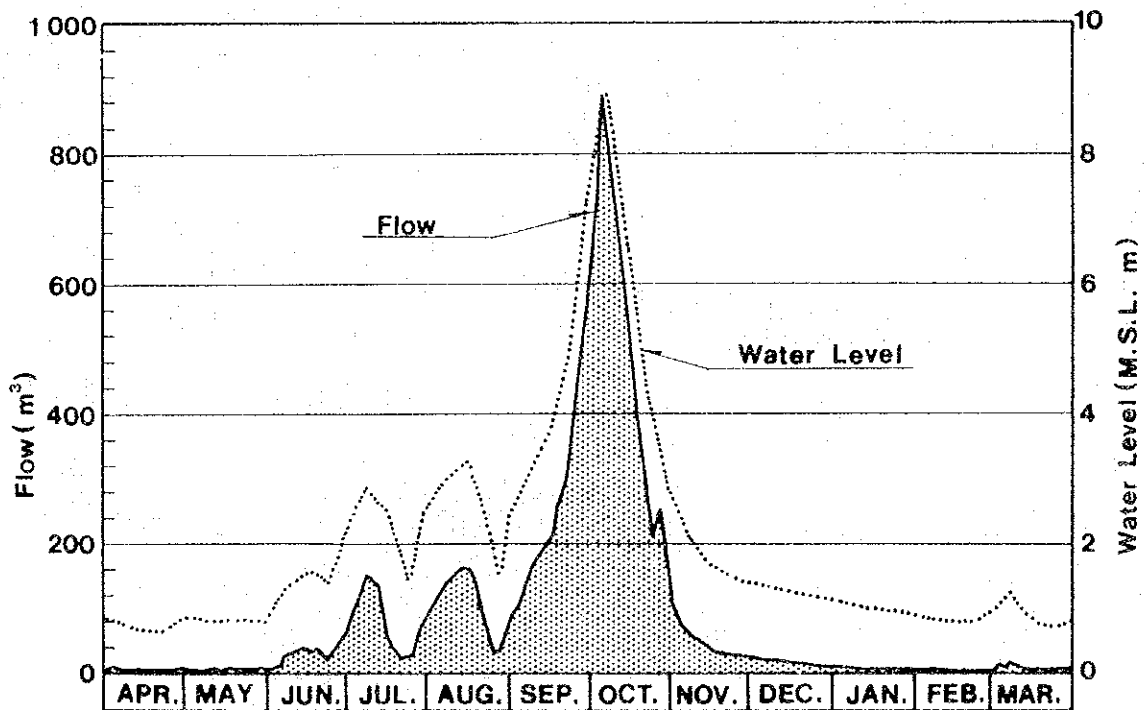
Others: 1951 - 1980

FIG. 2.7 Climatological Data in Bangkok

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN BANGKOK



Flow and Water Level of Chao Phraya River
at Nakhon Sawan in 1980



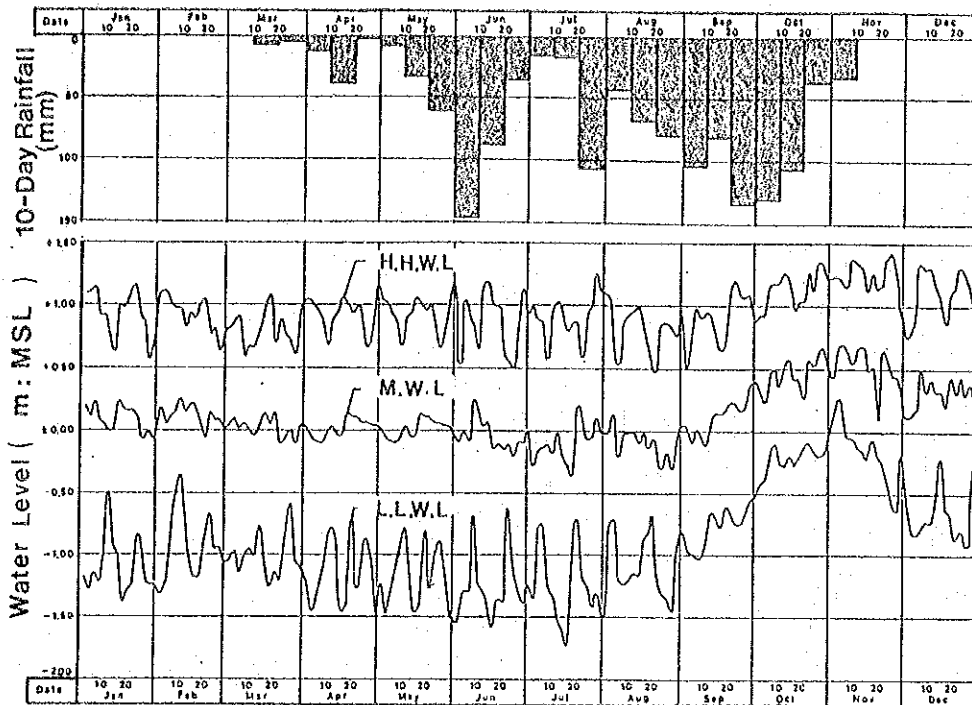
Flow and Water Level of Pa Sak River
at Ban Muang Nua in 1980

[Source: RID]

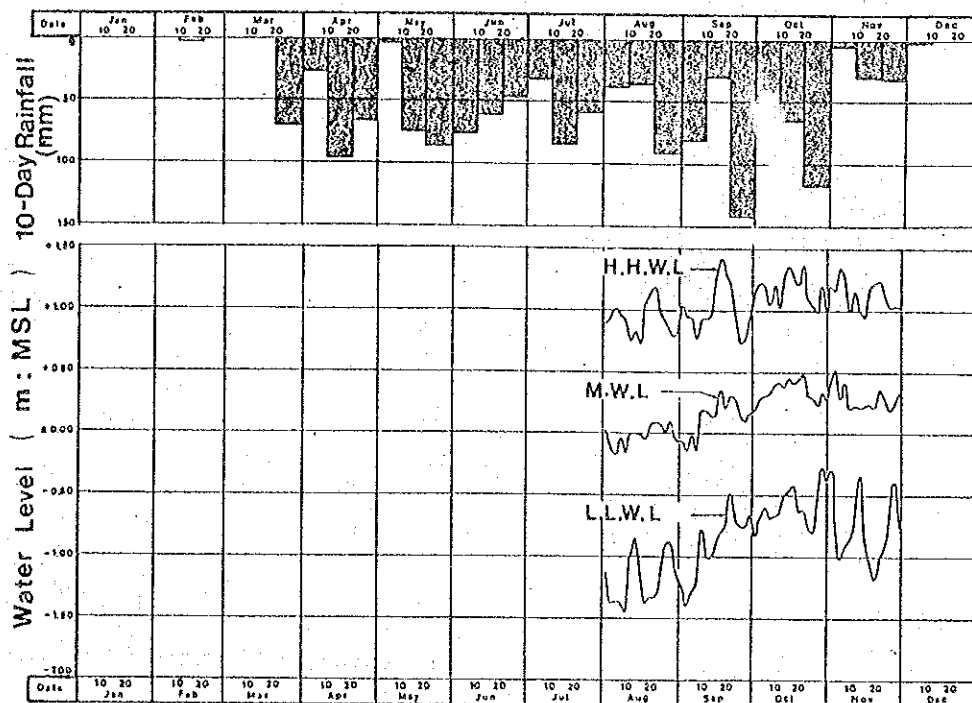
FIG. 2.8

Daily Flow and Water Level of Chao Phraya River
and Pasak River in 1980

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



(1980)



(1982)

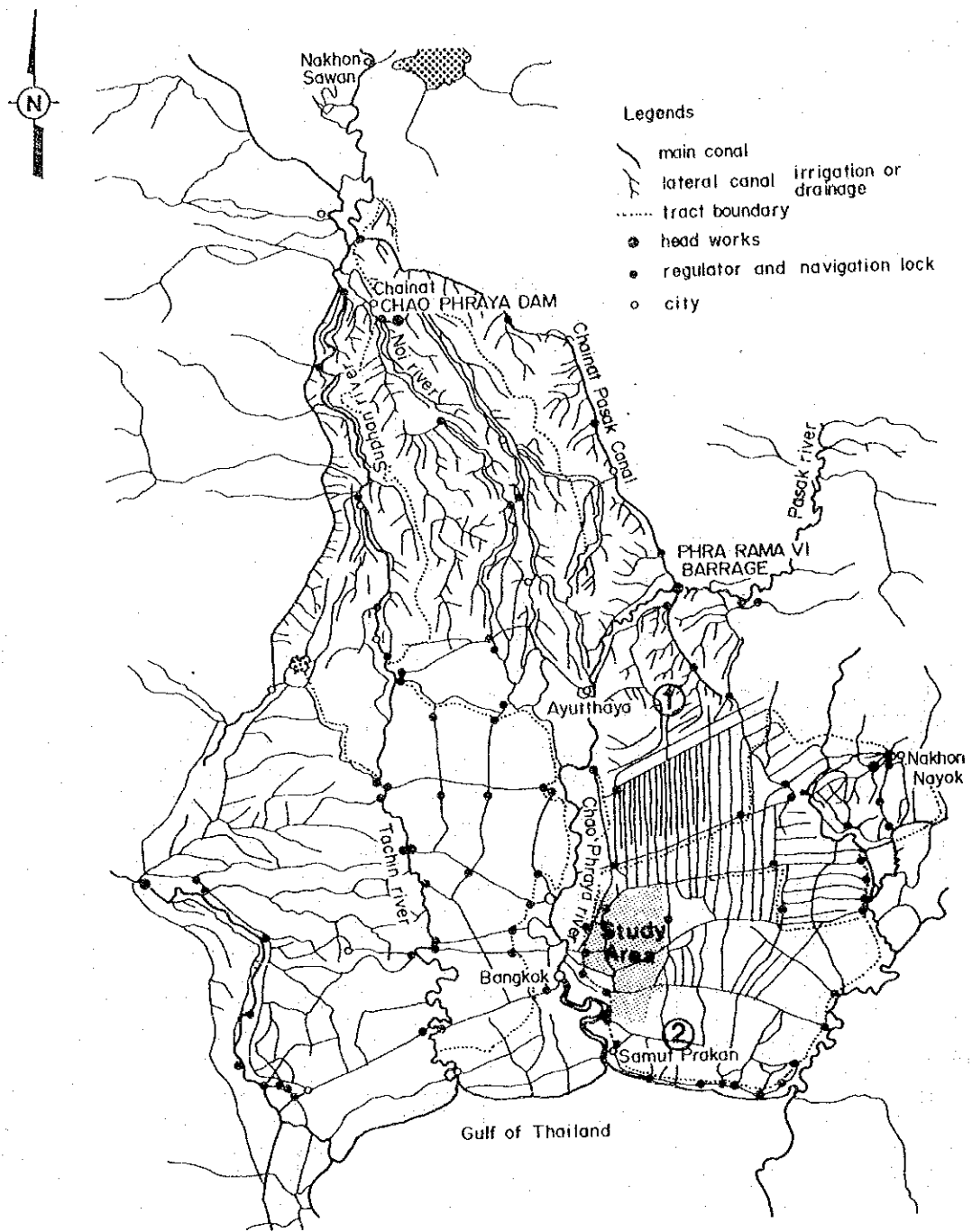
Source:

10-Days Rainfall: Meteorological Department
 Water Level : Port Authority of Thailand

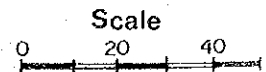
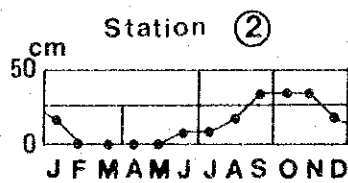
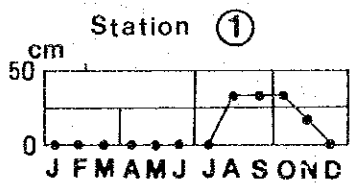
FIG. 2.9

Seasonal Changes of Rainfall in the Study Area & Water Level at Bangkok Port of Chao Phraya River

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



Inundation Depth

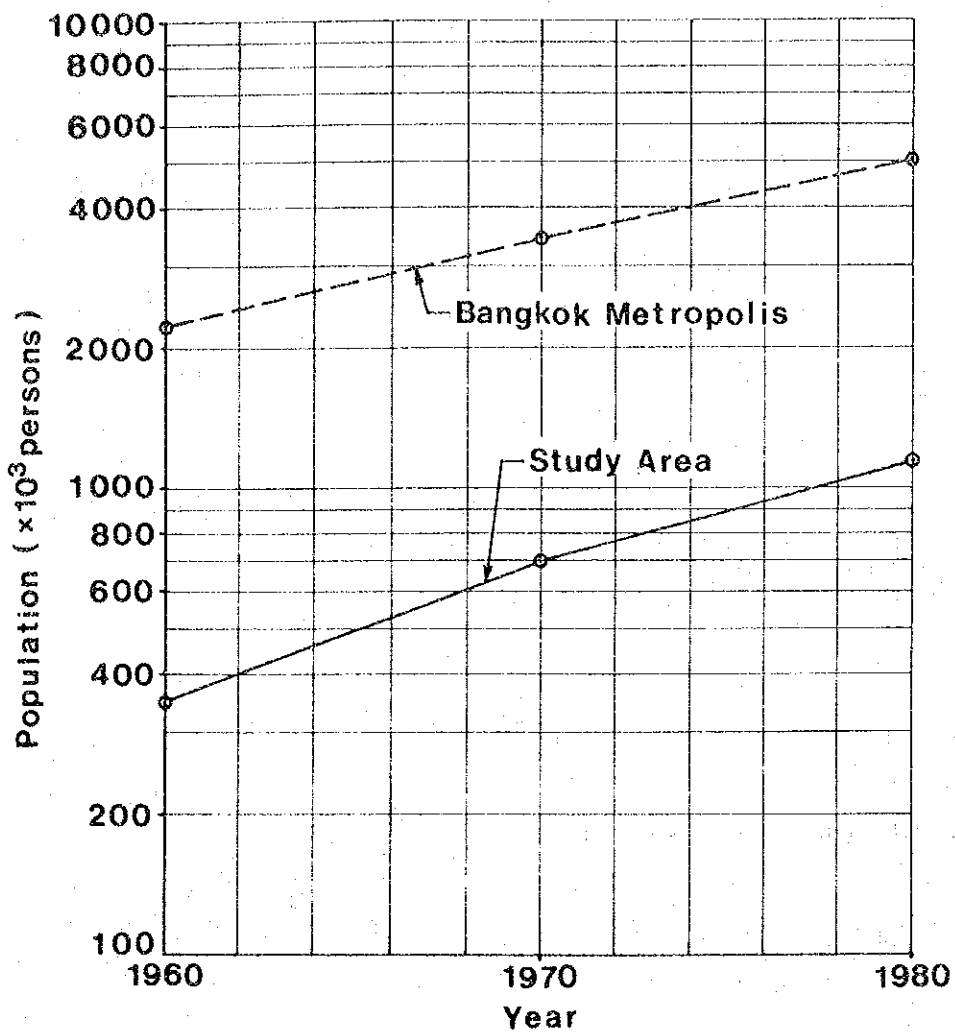


[Source:RID]

FIG. 2.10

Irrigation Canal Network for the Greater Chao Phraya Project

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



Area	1960	1970	1980
Bangkok Metropolis	Persons 2,250,000	Persons 3,440,000	Persons 5,070,000
Study Area	350,000	700,000	1,160,000

(Source : BMA)

FIG. 2.11

Population of Bangkok Metropolis and the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

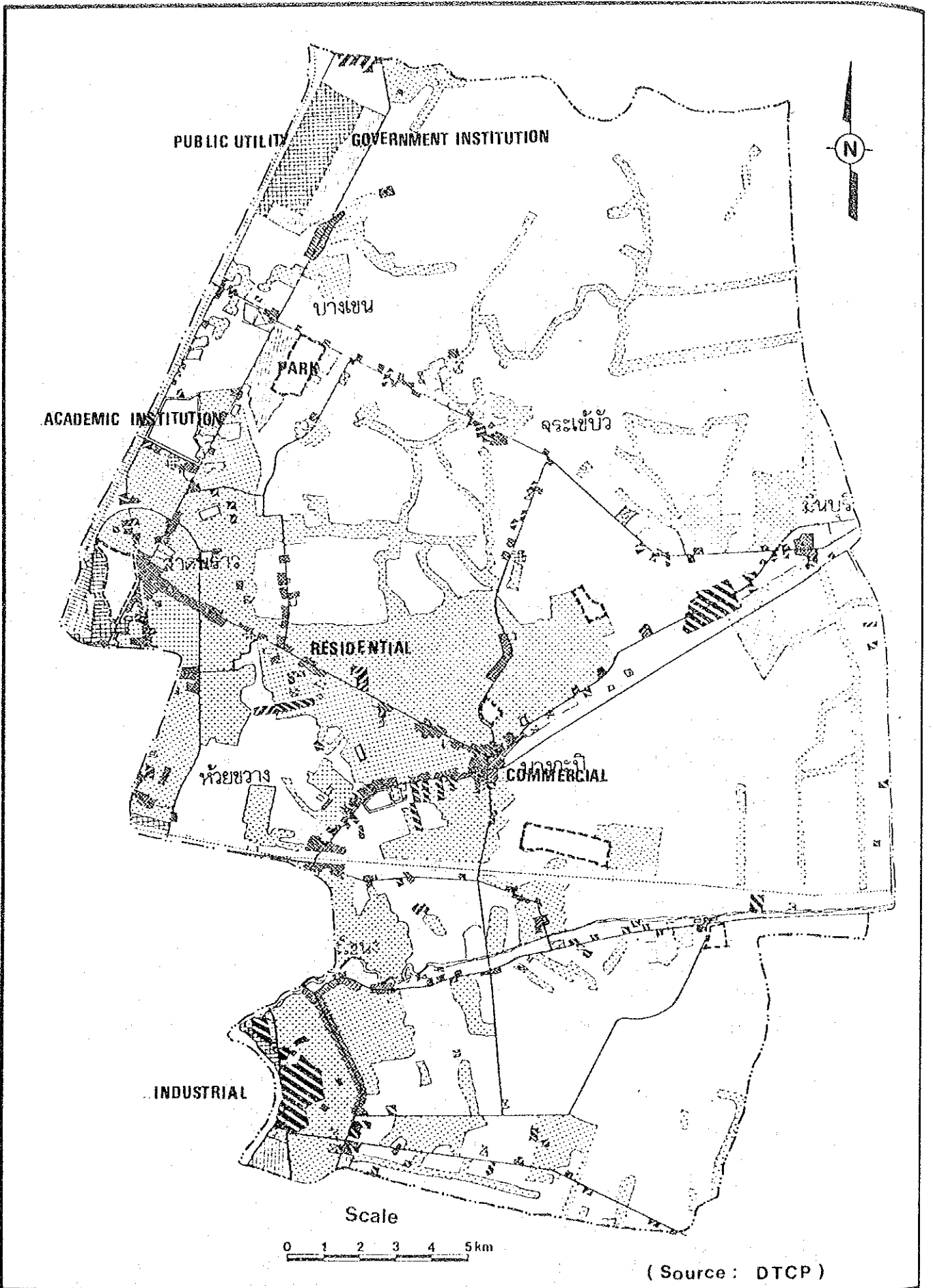


FIG. 2.12

Existing Land Use - 1980 - in the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

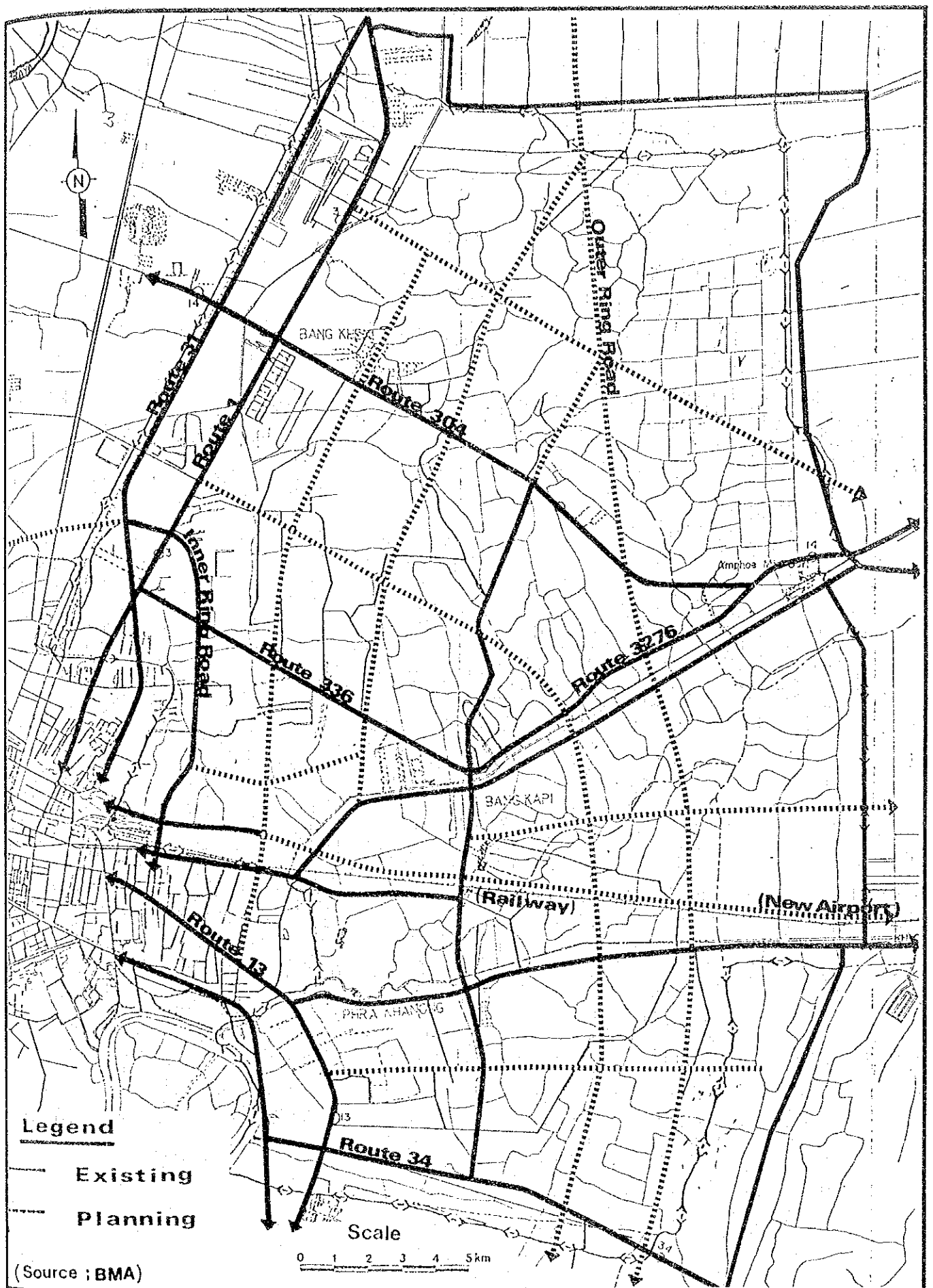


FIG. 2.13

Road Network in the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

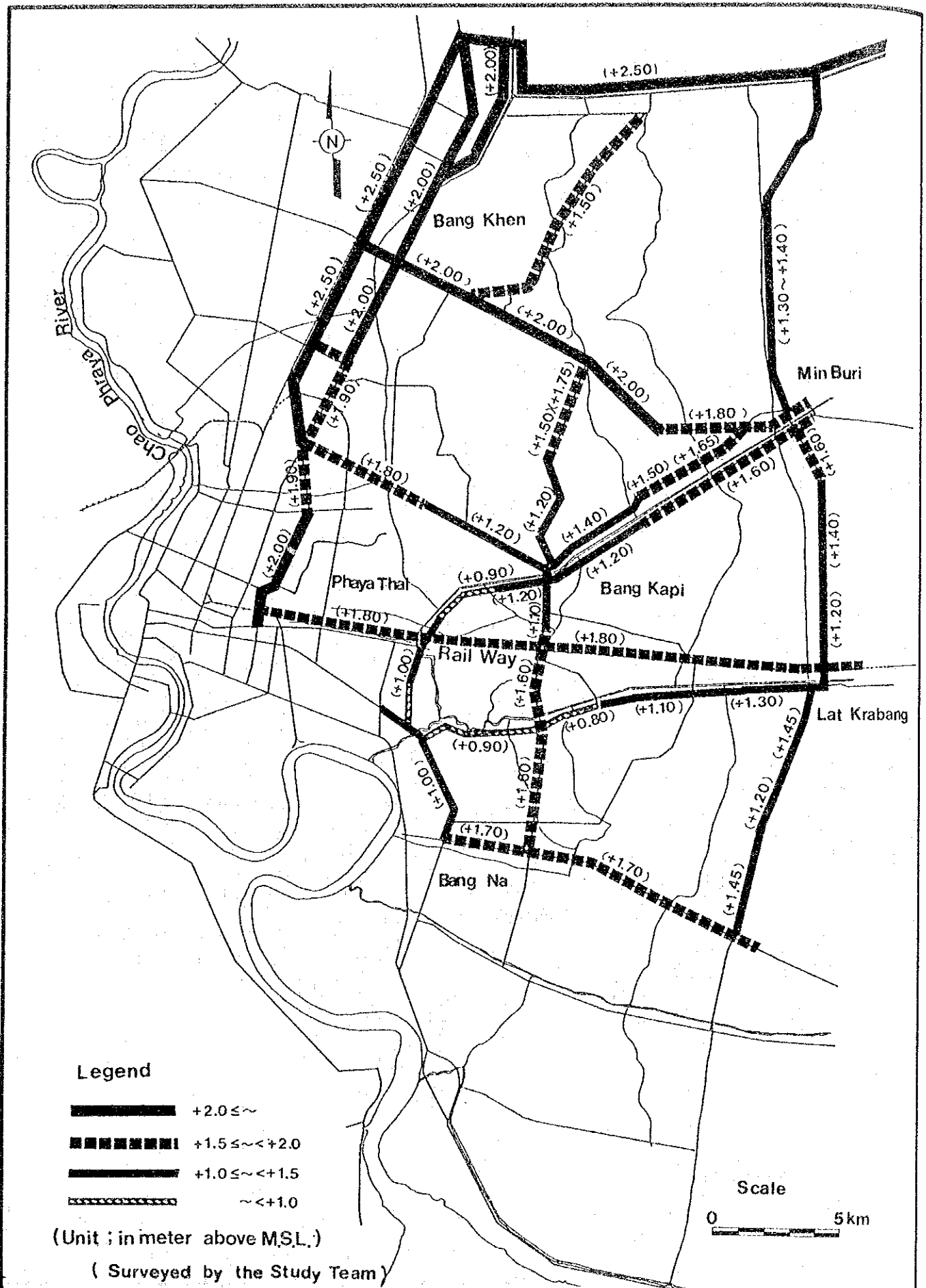


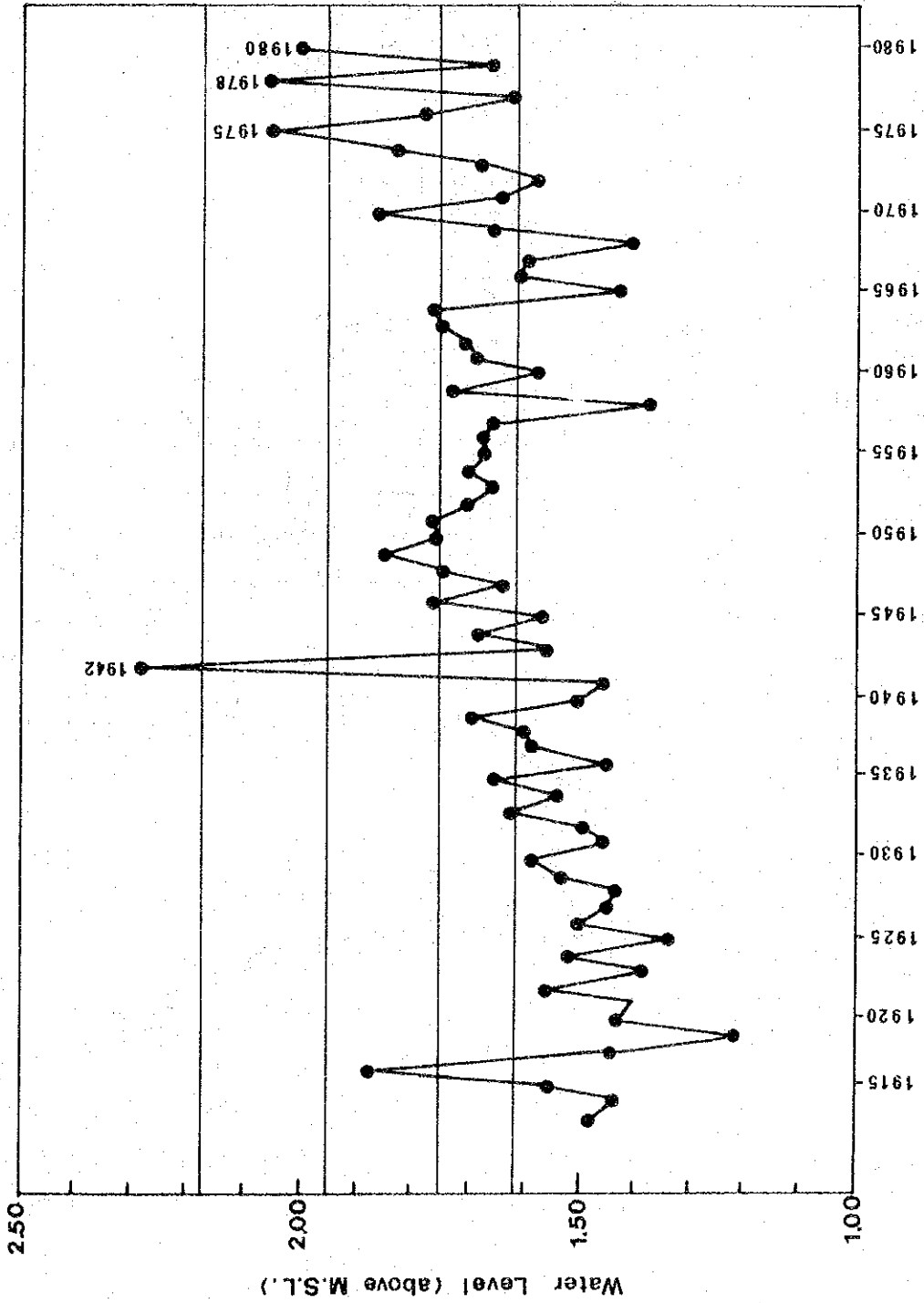
FIG. 2.14

Top Elevations of Existing Road

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

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Note: 48 Kilometers from Mouth of River

[Source : RID]

FIG. 3.1

Annual Highest Water Level at Memorial Bridge

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

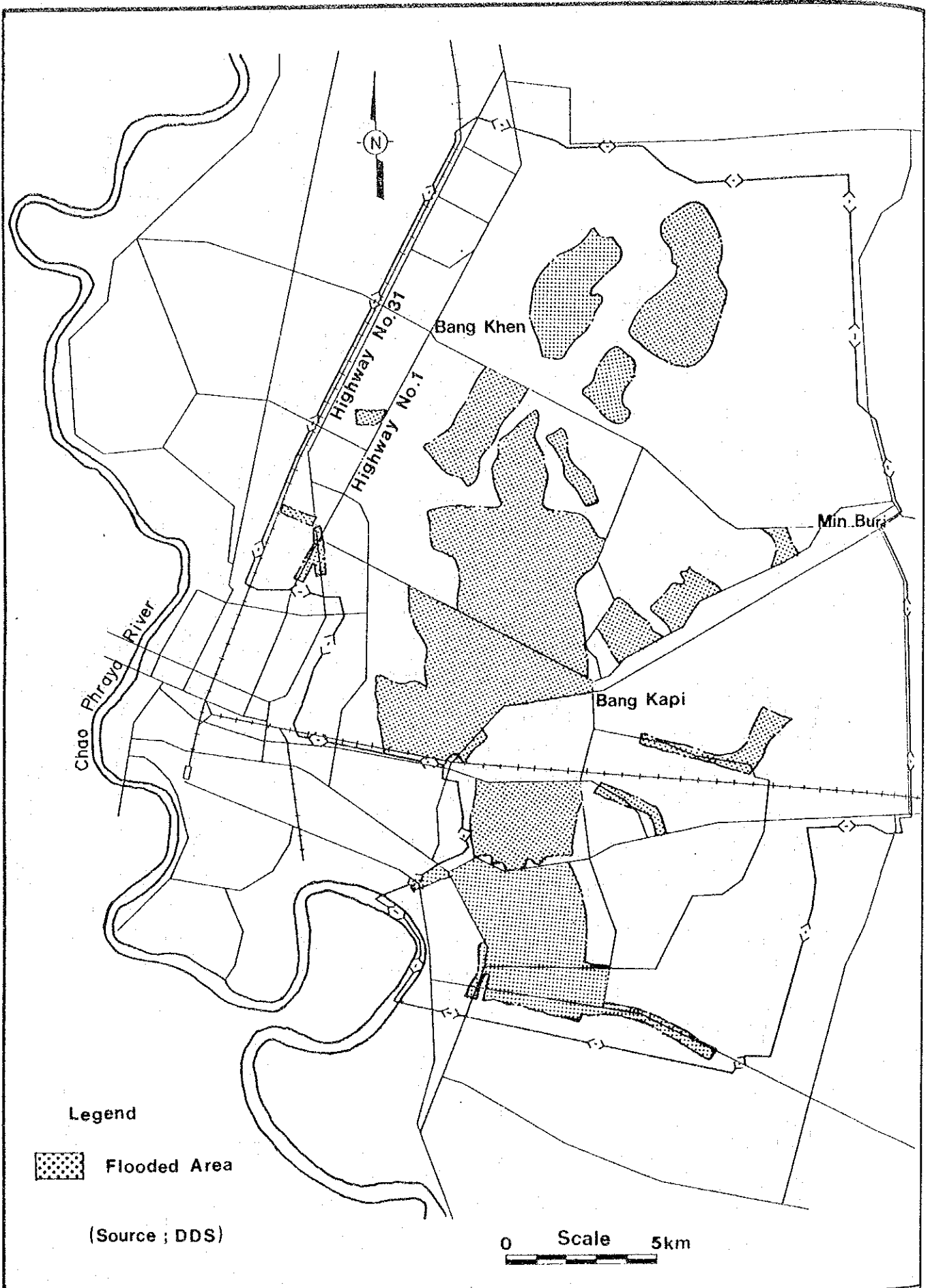


FIG. 3.2

Flooded Area in 1982 in the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



FIG. 3.3

Flood Depth in the Study Area in 1982

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

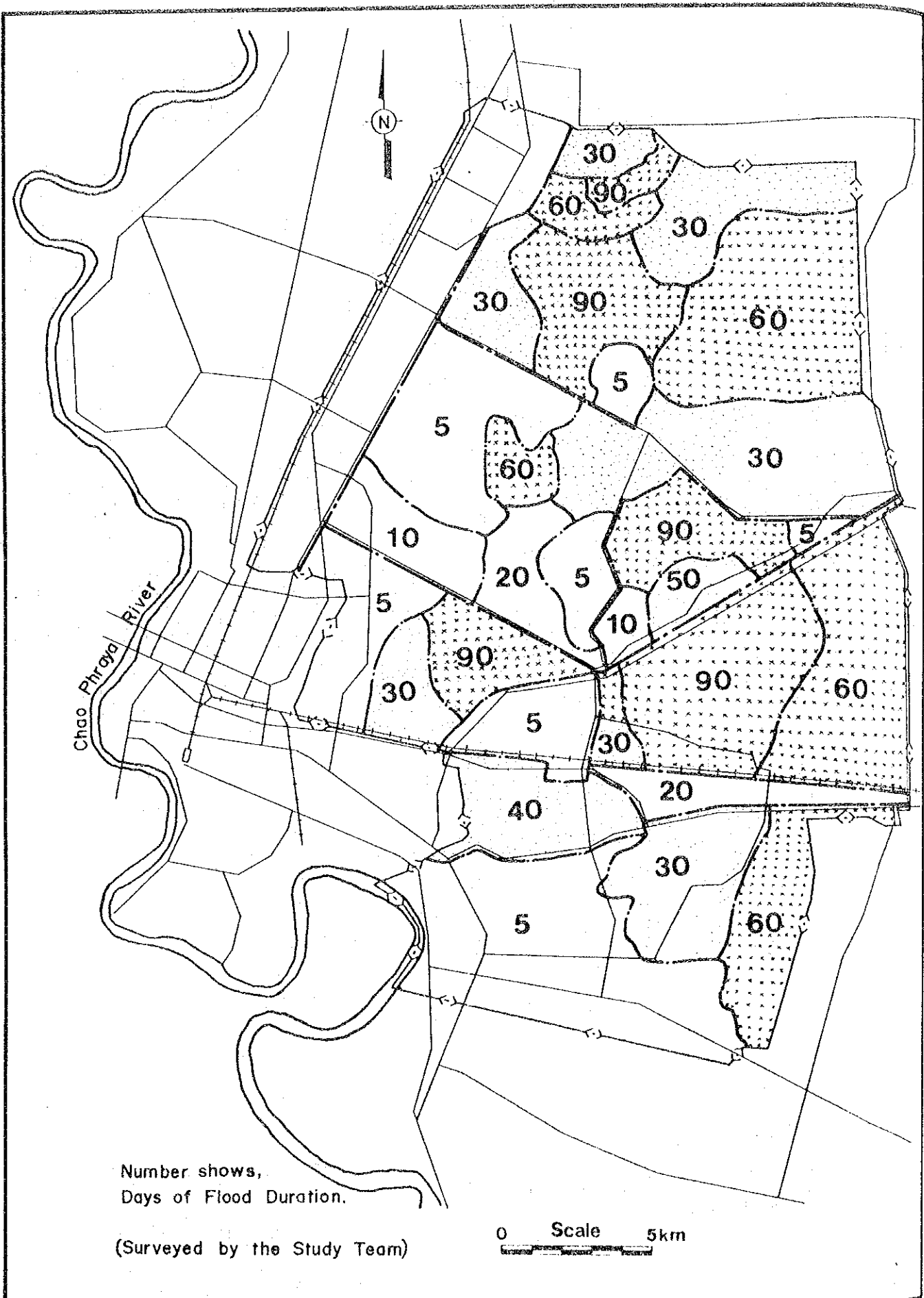


FIG. 3.4

Flood Duration in the Study Area in 1982

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

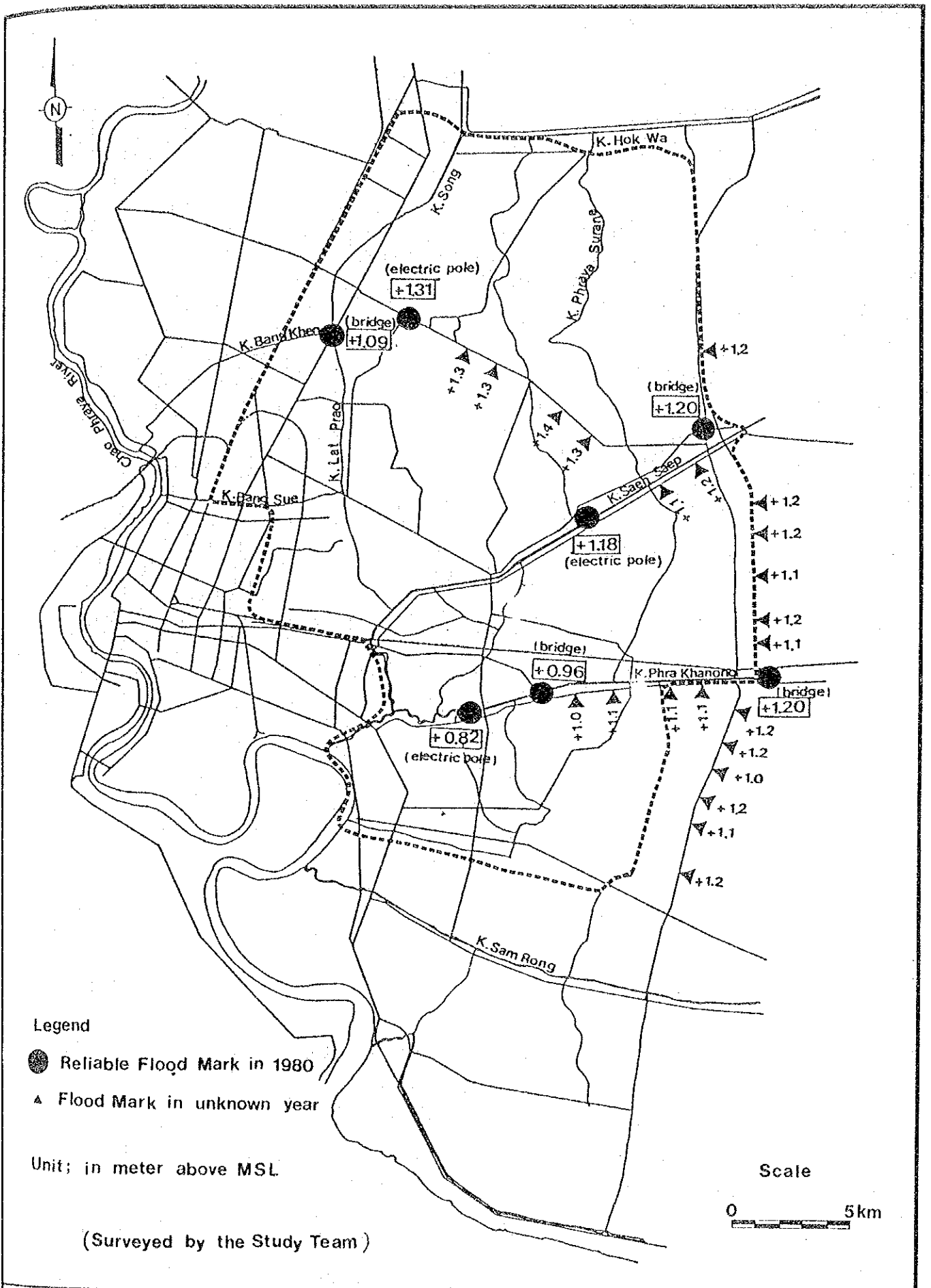


FIG. 3.5

Observed Flood Marks in the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

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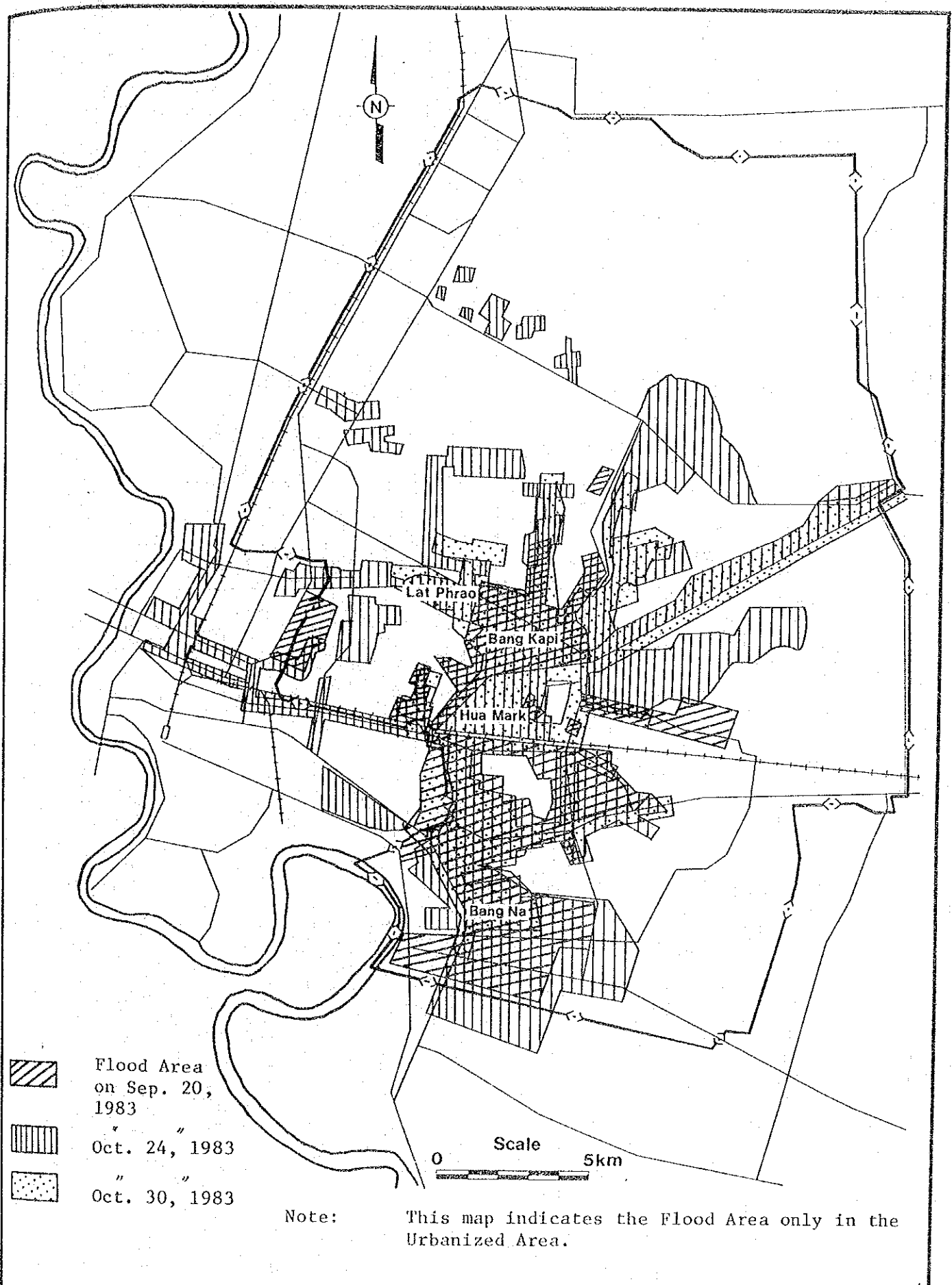
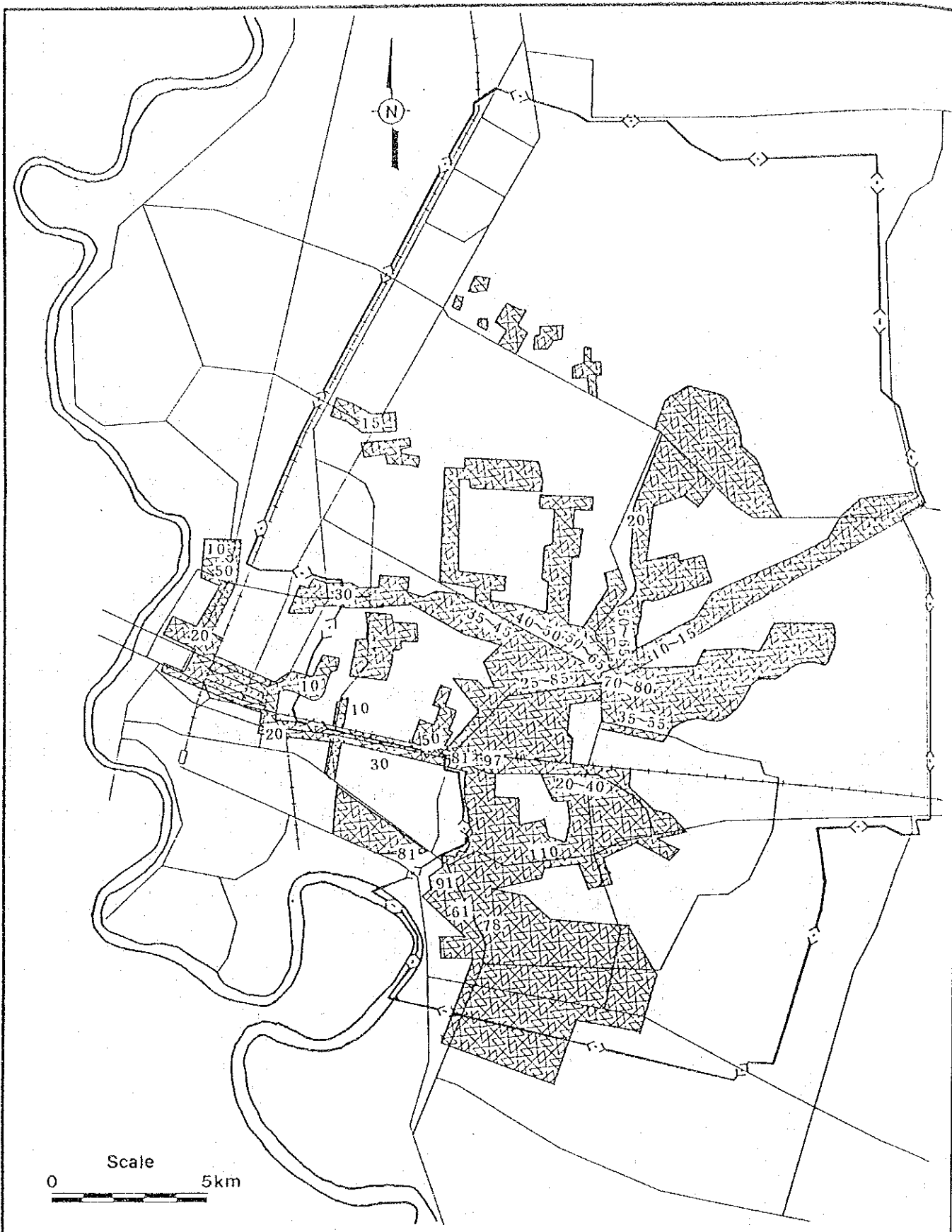


FIG. 4.1

Variation of the Flood Area in 1983

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



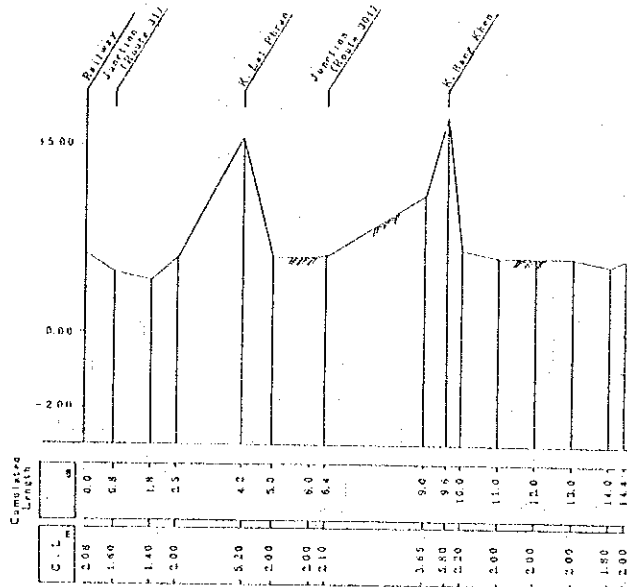
- Note: (1) This map indicates the flood area only in the urbanized Area.
 (2) Figures mean the depth of the flood water on the road in centimeter.

FIG. 4.2

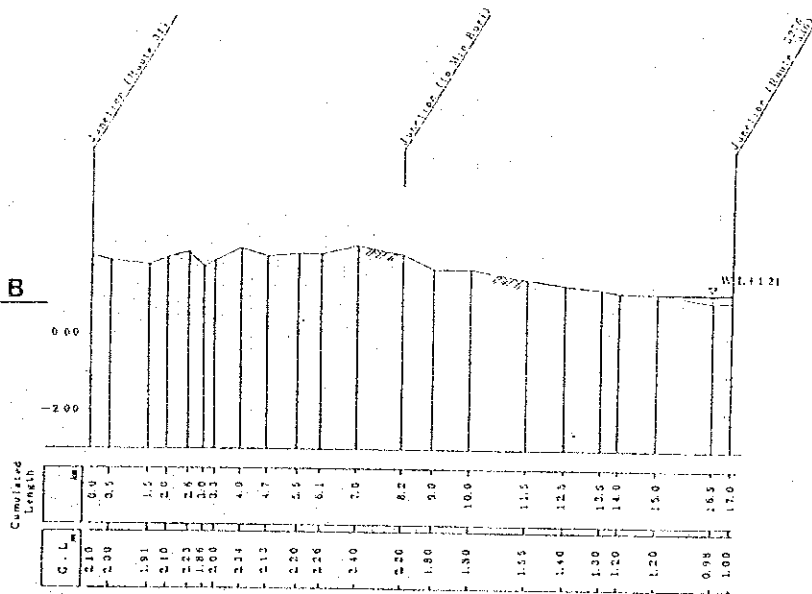
Flood Area in the Urbanized Area on Oct. 24. 1983

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

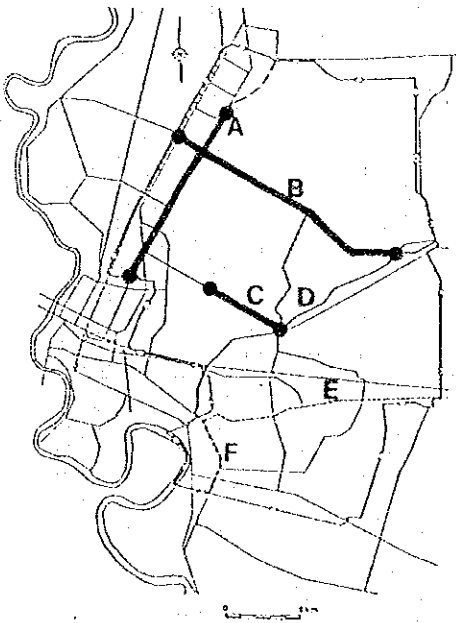
Route A



Route B



Key Map



Route C

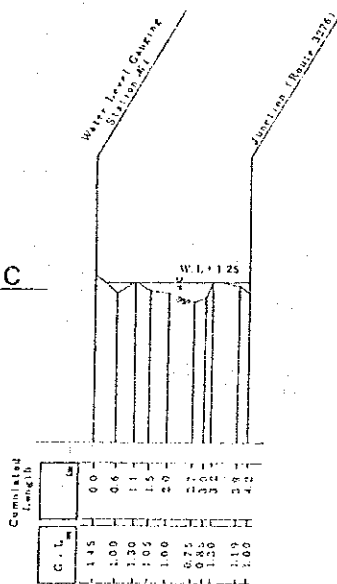
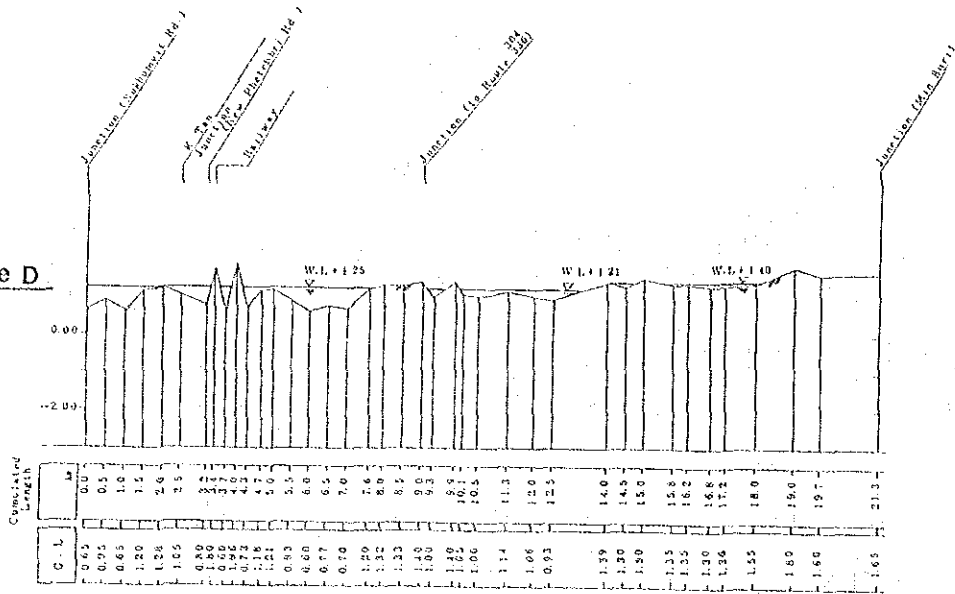


FIG. 4.3

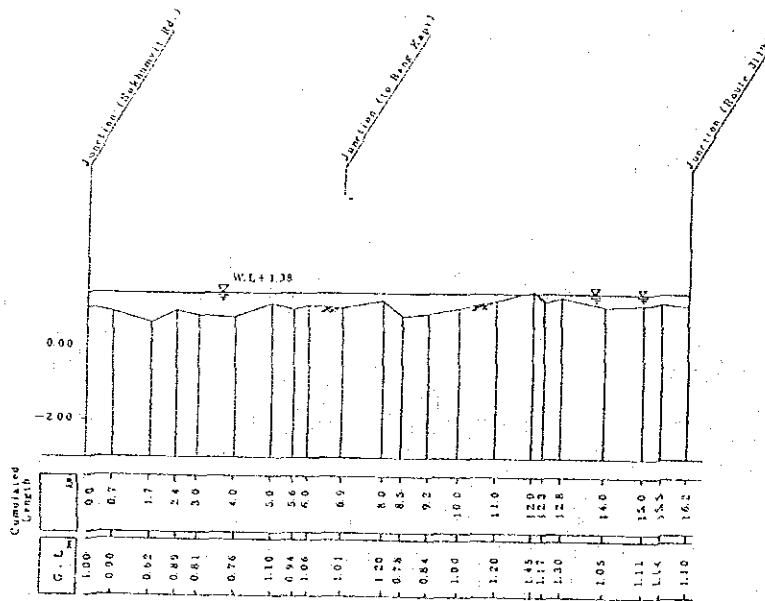
Longitudinal Profile of Main Roads and Elevation of Floodwater on Oct. 24, 1983 (1)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

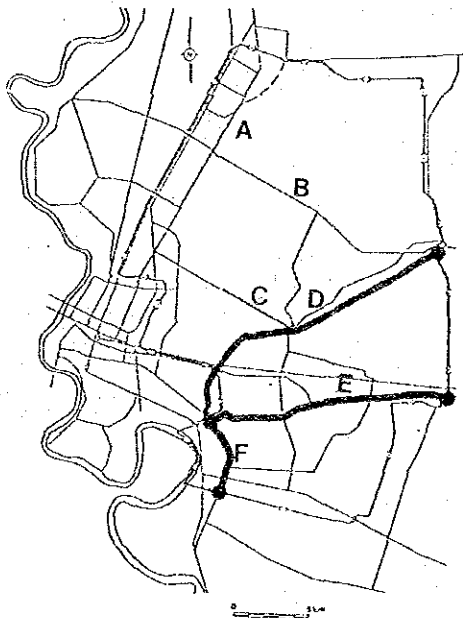
Route D



Route E



Key Map



Route F

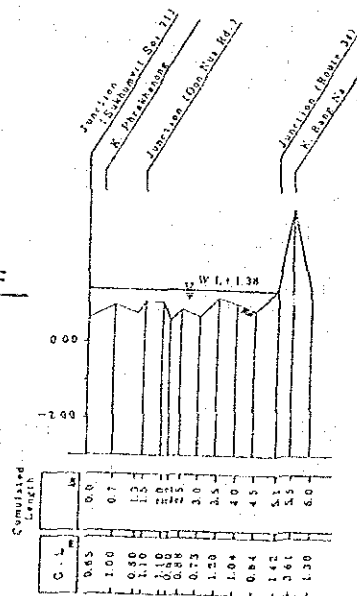


FIG. 4.4

Longitudinal Profile of Main Roads and Elevation of Floodwater on Oct. 24, 1983 (2)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

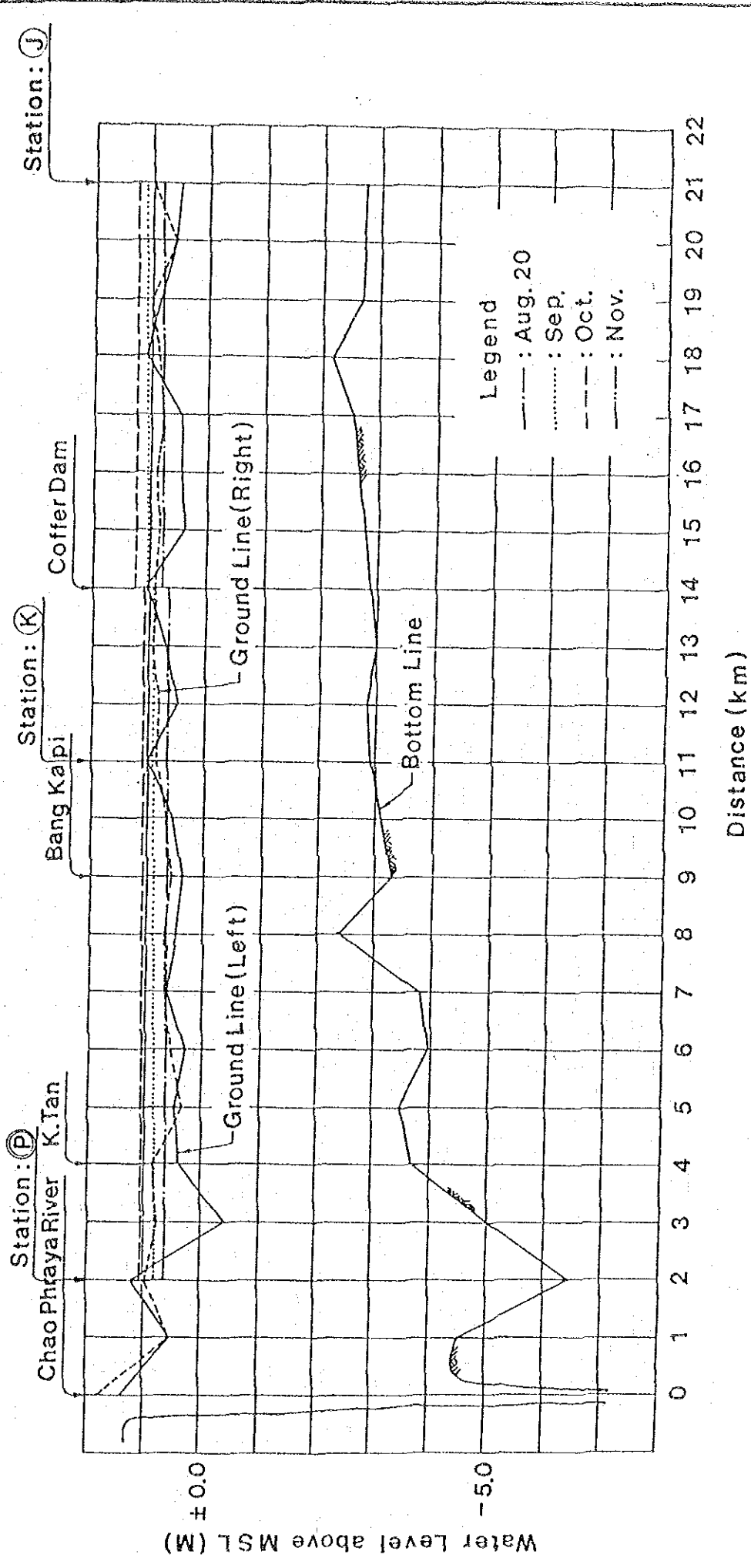


FIG. 4.5 Profile of Observed Water Level in Klong Phra Khanong between Aug. and Nov. in 1983

(Refer to Fig. 5.6)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

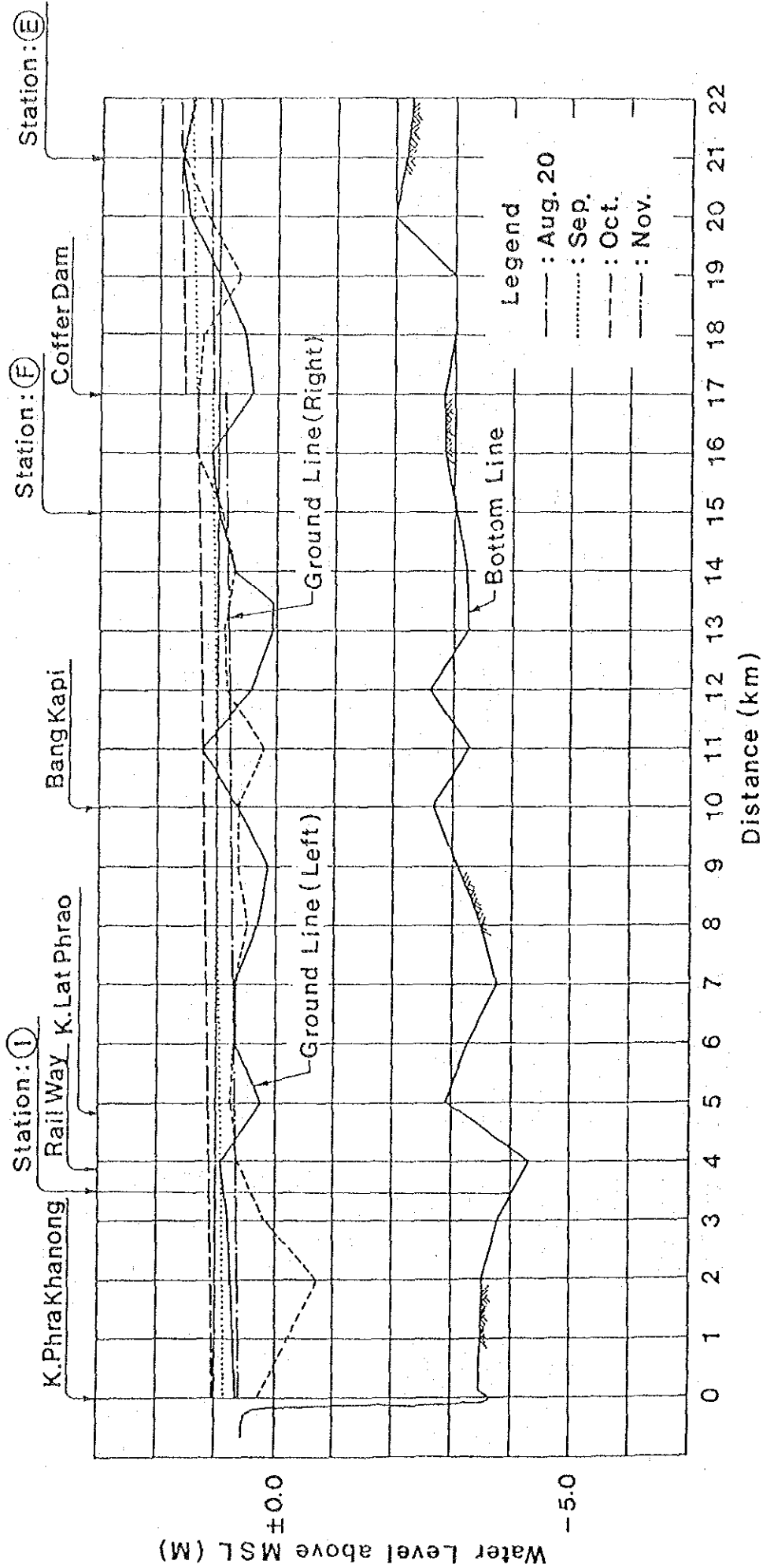


FIG. 4.6 Profile of Observed Water Level in Klong Saen Saep between Aug. and Nov. in 1983

(Refer to Fig. 5.6)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

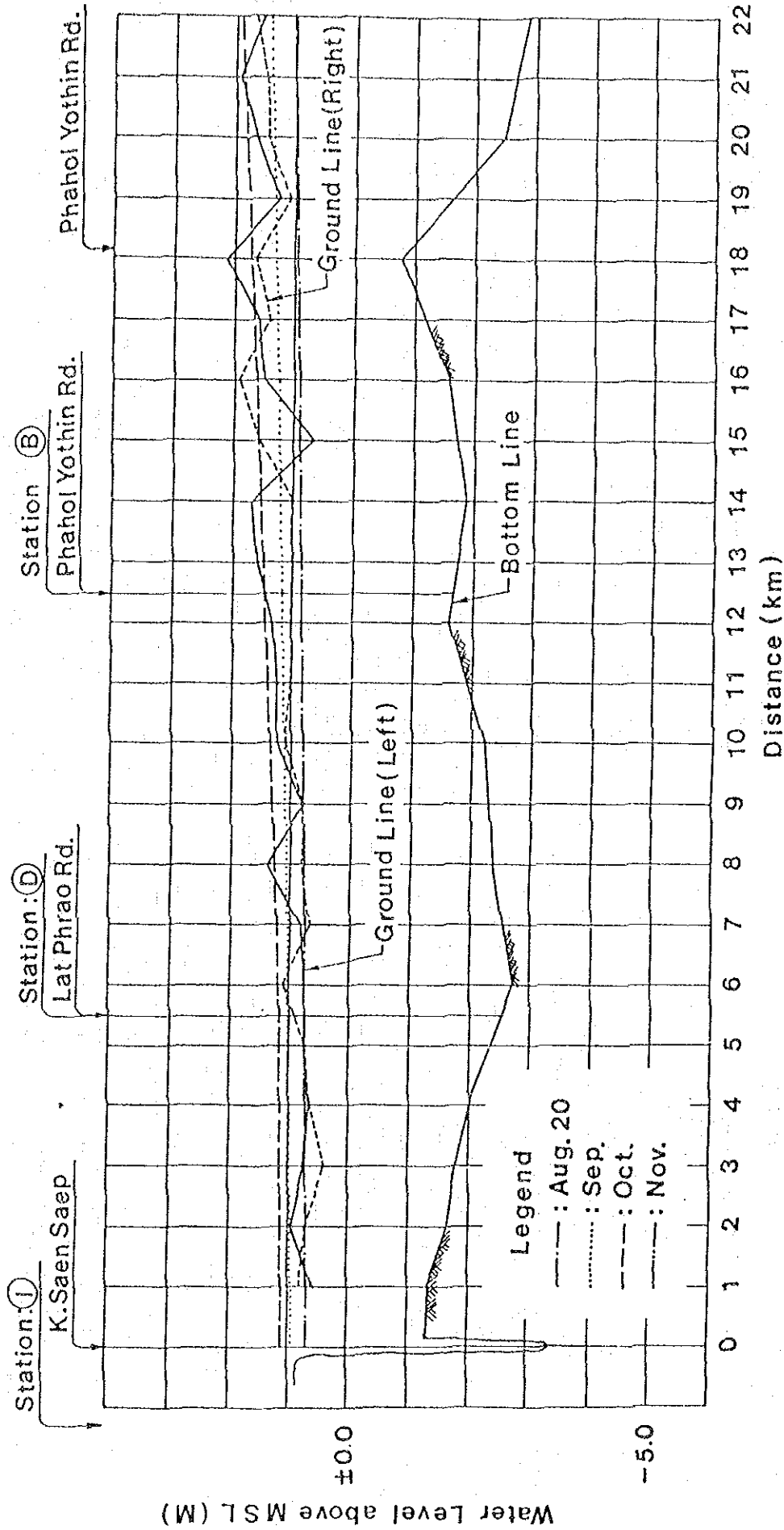
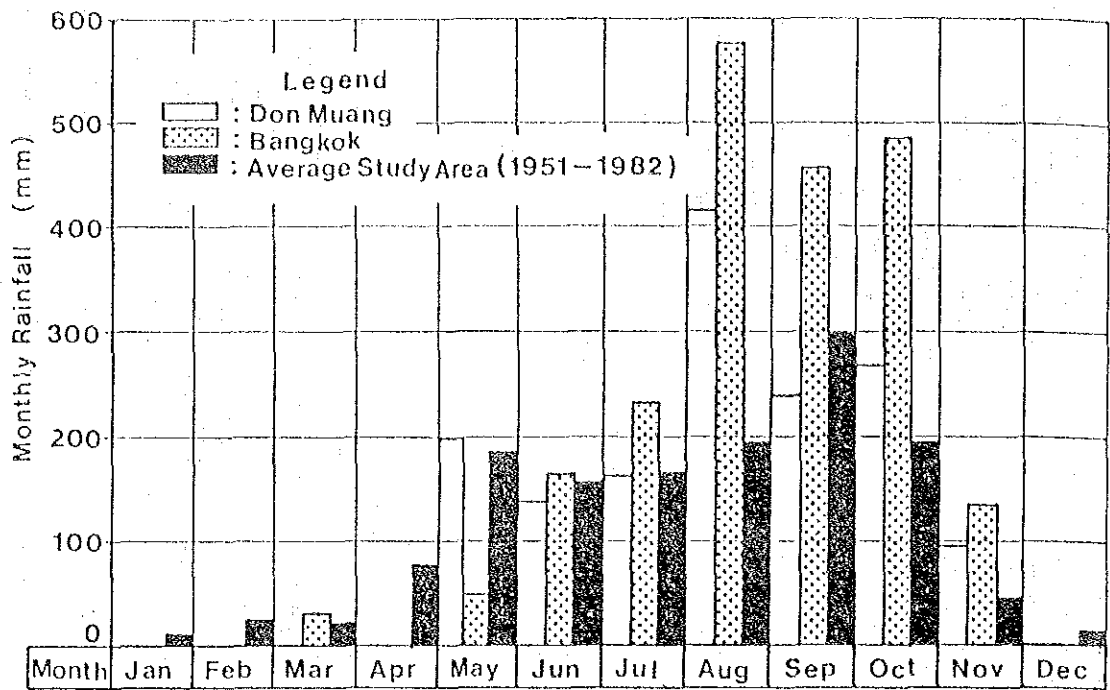


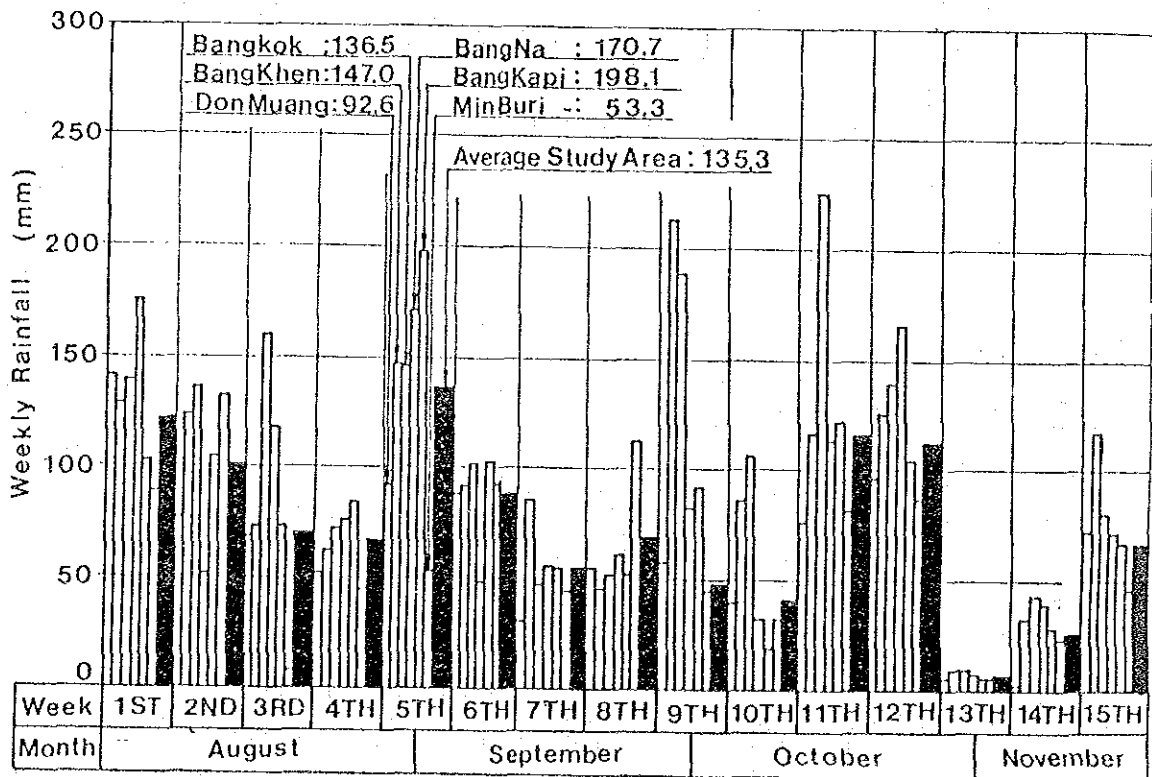
FIG. 4.7 Profile of Observed Water Level in Kiong Lat Phrao between Aug. and Nov. in 1983

(Refer to Fig. 5.6)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



Monthly Rainfall in 1983

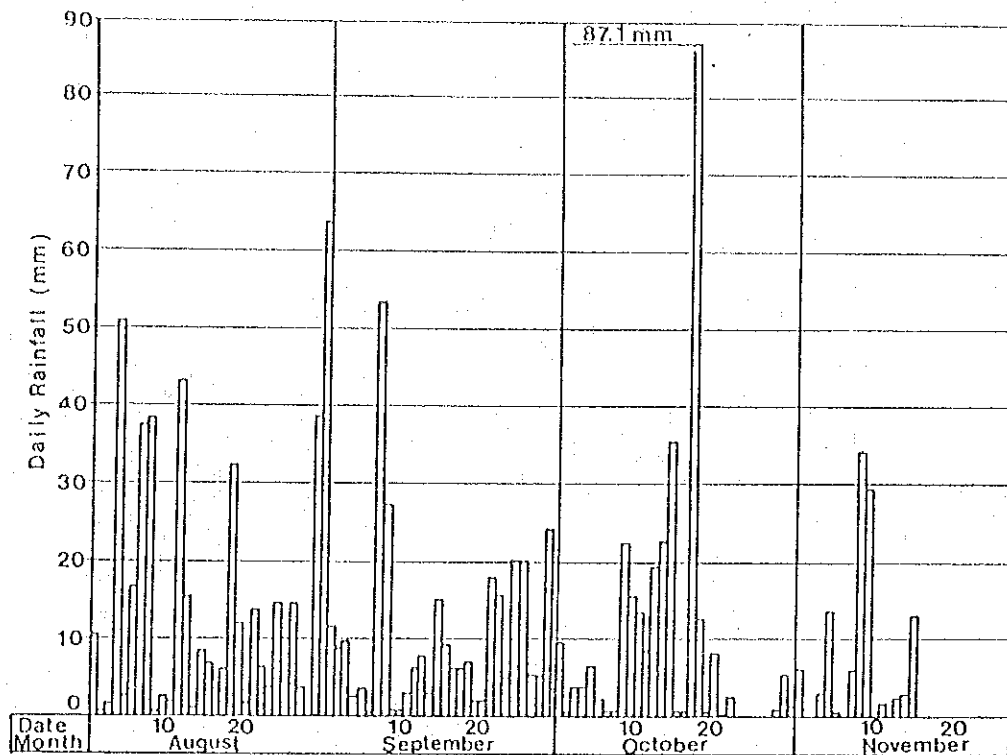


Weekly Rainfall in 1983

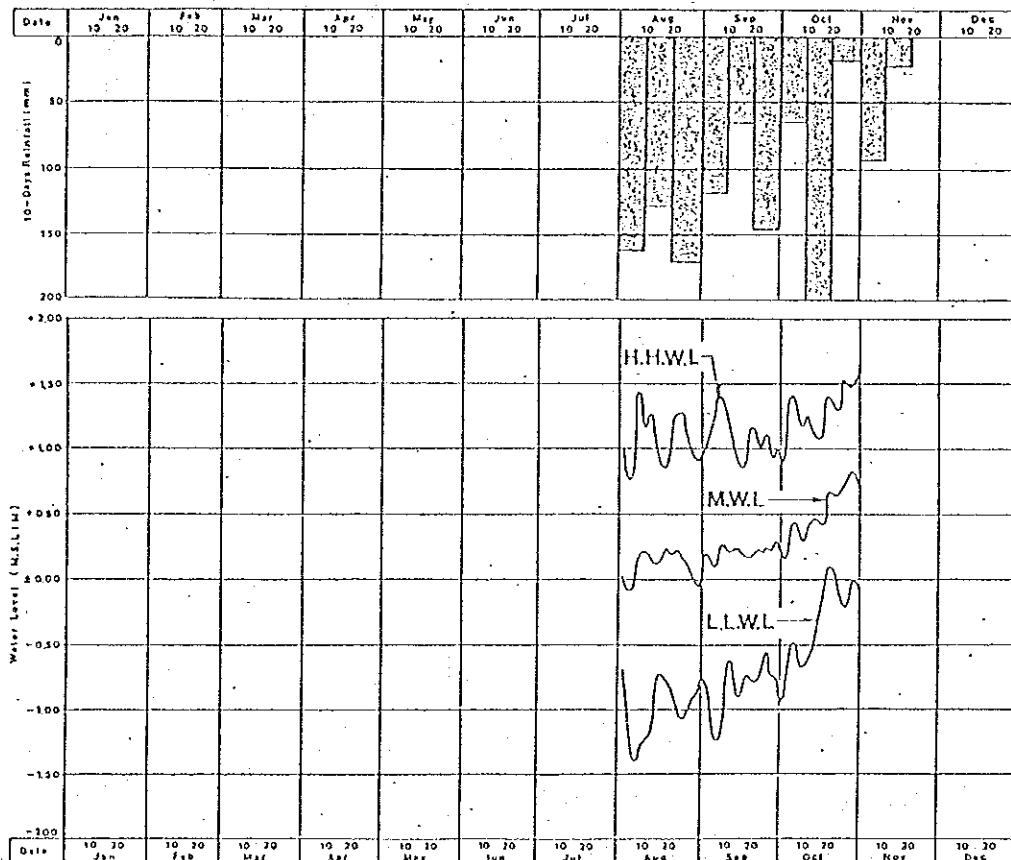
Note : 1st column shows data at Don Muang
 2nd column shows data at Bang Khen
 3rd column shows data at Bangkok
 4th column shows data at Bang Na
 5th column shows data at Bang Kapi
 6th column shows data at Min Buri

FIG. 4.8

Monthly and Weekly Rainfall in 1983



Average Areal Daily Rainfall in the Study Area

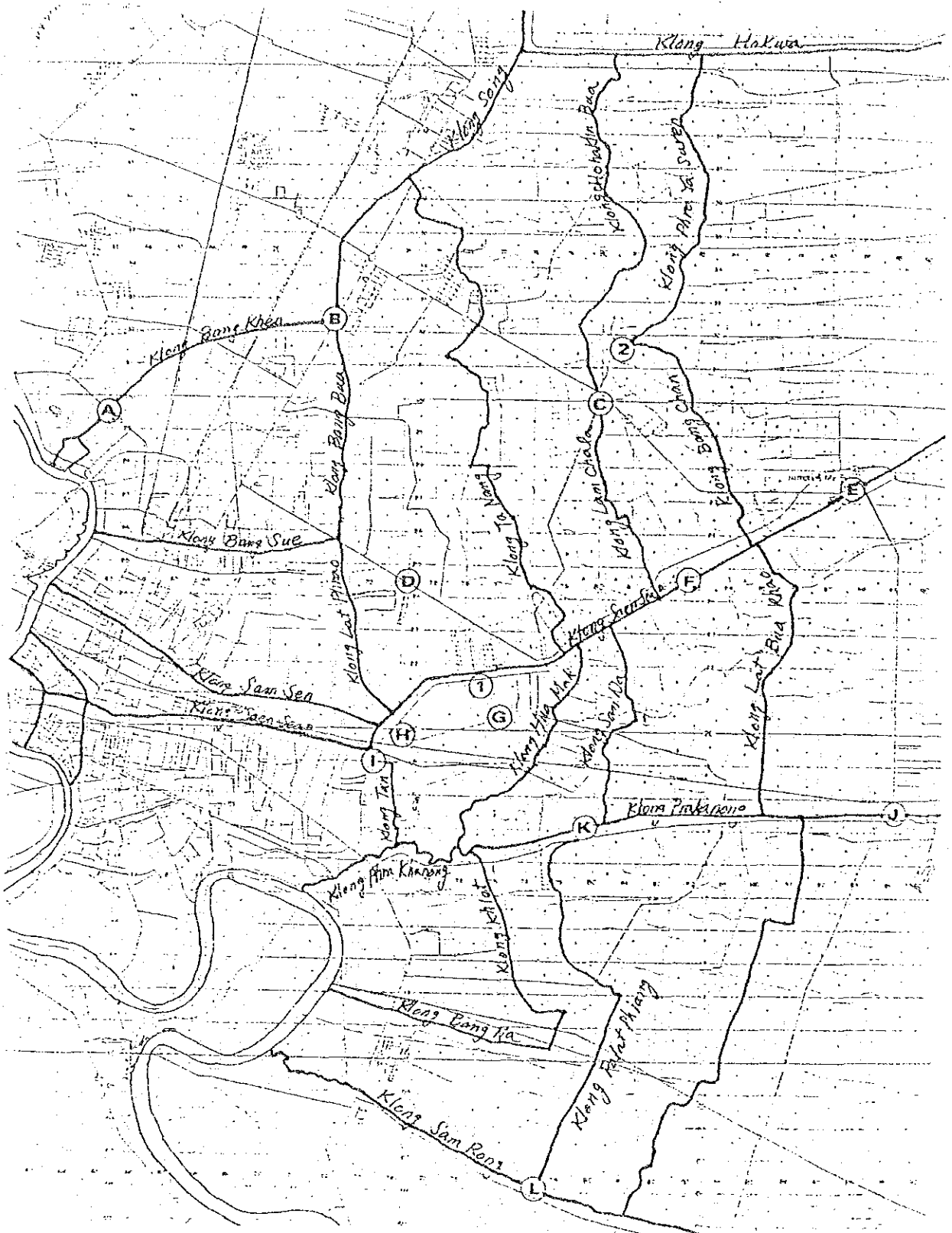


10 Days Rainfall in the Study Area and Water Level at the Bangkok Port

FIG. 4.9

Daily Rainfall in the Study Area and Water Level of Chao Phraya River

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



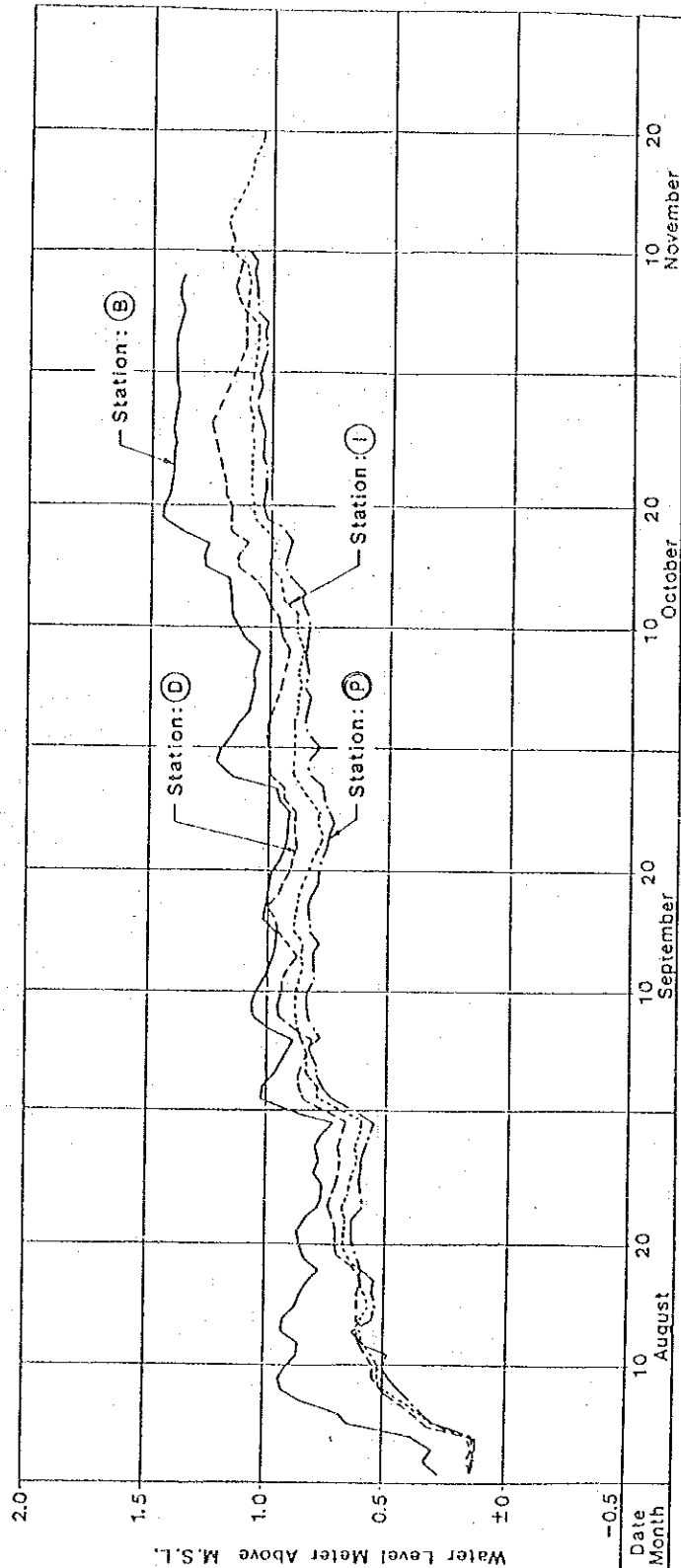
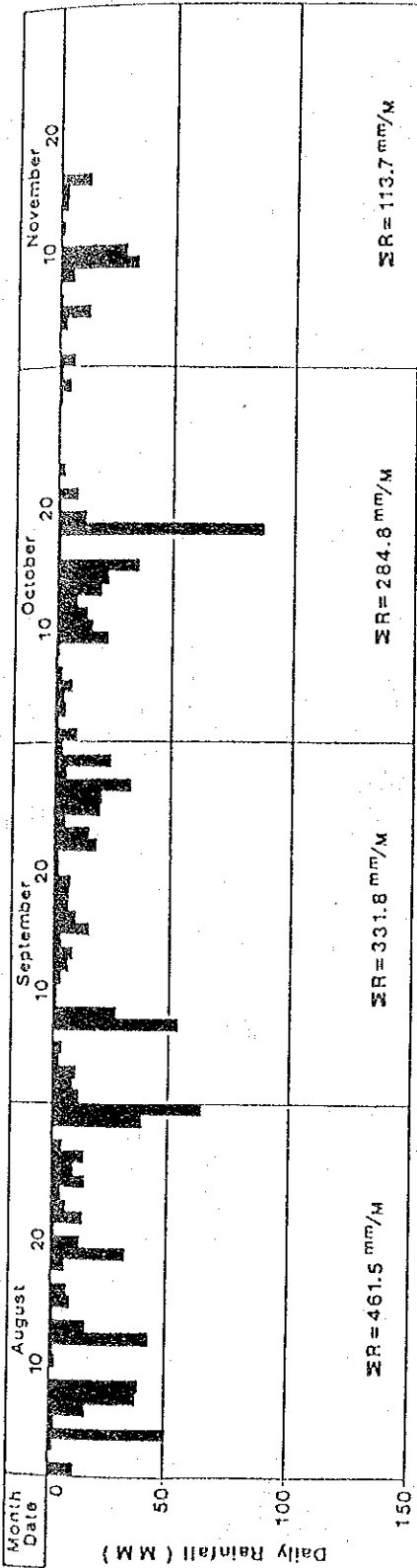
LEGEND

- ① & ② : NEWLY INSTALLED RAIN GAUGE
- Ⓐ - Ⓛ : NEWLY INSTALLED LEVEL WATER GAUGE

FIG. 4.10

Location of Gauging Stations

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

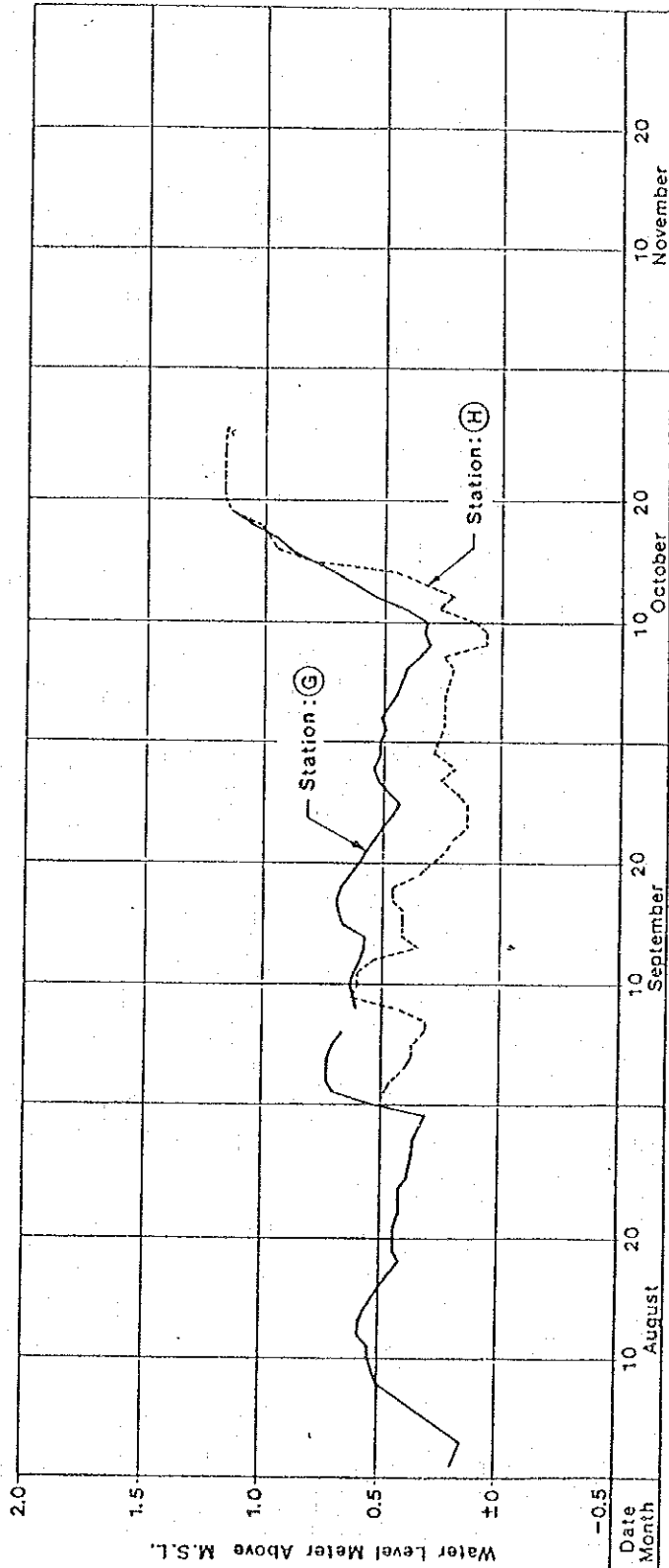
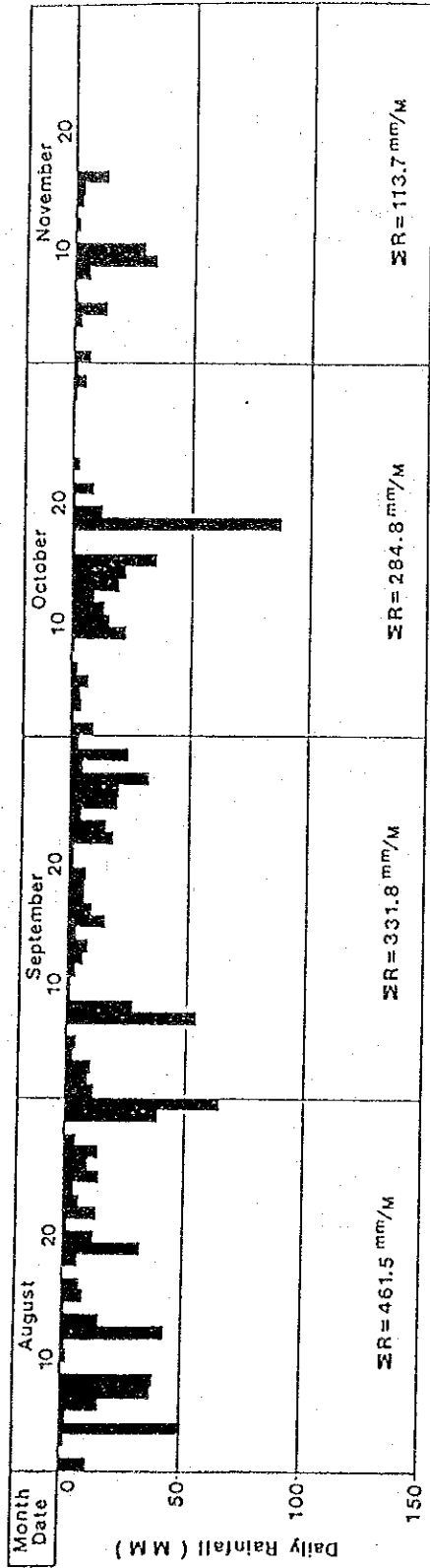


Ground Elevation at Surrounding Area

- Sta. B : 1.5 m + MSL
- Sta. D : 1.0 m + MSL
- Sta. I : 0.7 m + MSL
- Sta. P : 1.0 m + MSL

FIG. 4.11 Average Areal Daily Rainfall in the Study Area & Water Level in the Klongs between Aug. & Nov. in 1983

FLOOD PROTECTION / DRAINAGE PROJECT IN EASTERN SUBURBAN BANGKOK



Ground Elevation at Surrounding Area

Sta. G. : 0.4 m + MSL
 Sta. H. : 0.8 m + MSL

FIG. 4.12 Average Area Daily Rainfall in the Study Area & Water Level in the Klongs between Aug. & Nov. in 1983

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

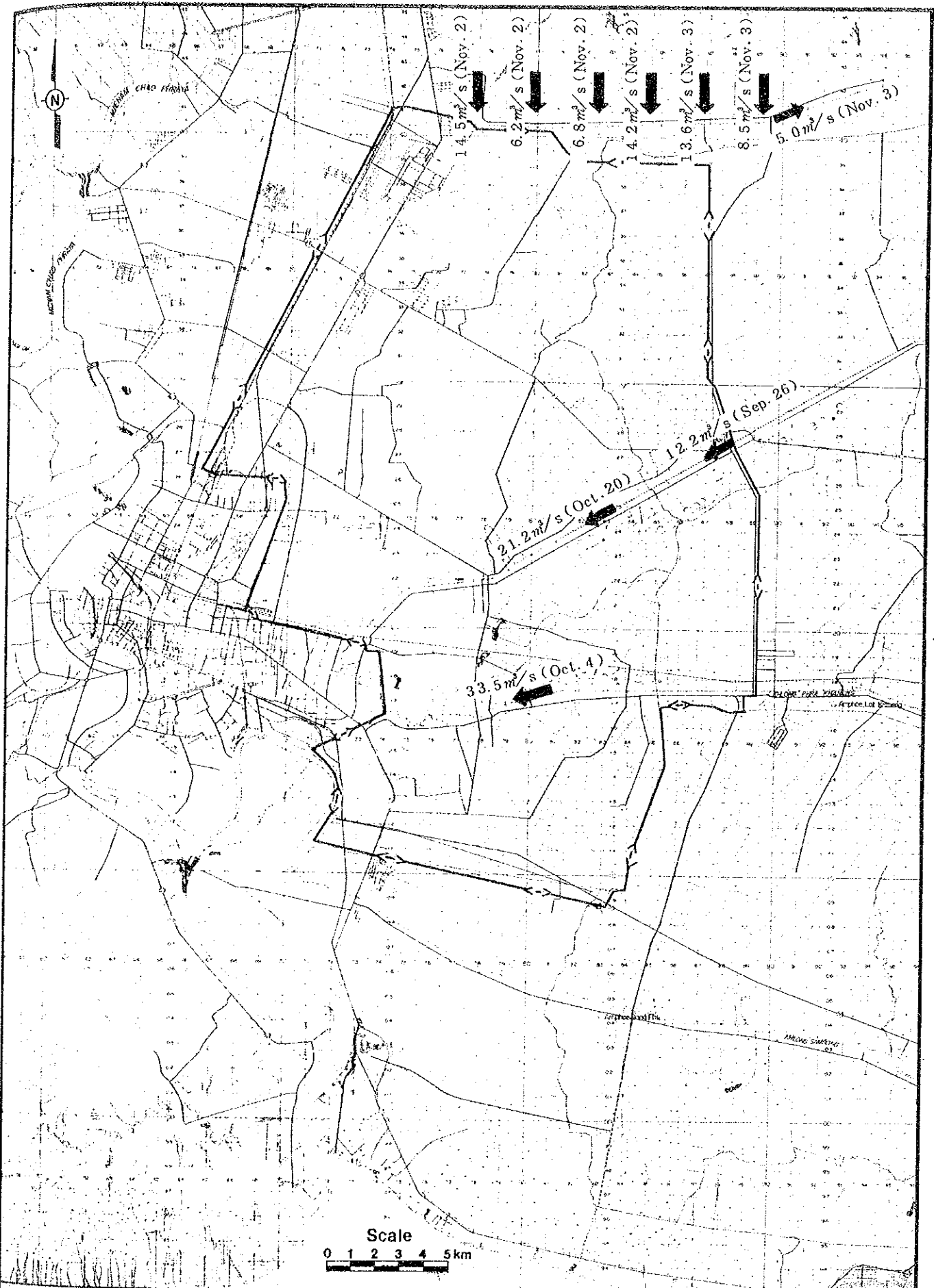


FIG. 4.13

Amount of the Water Flow at 10 points on Several Days in 1983

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

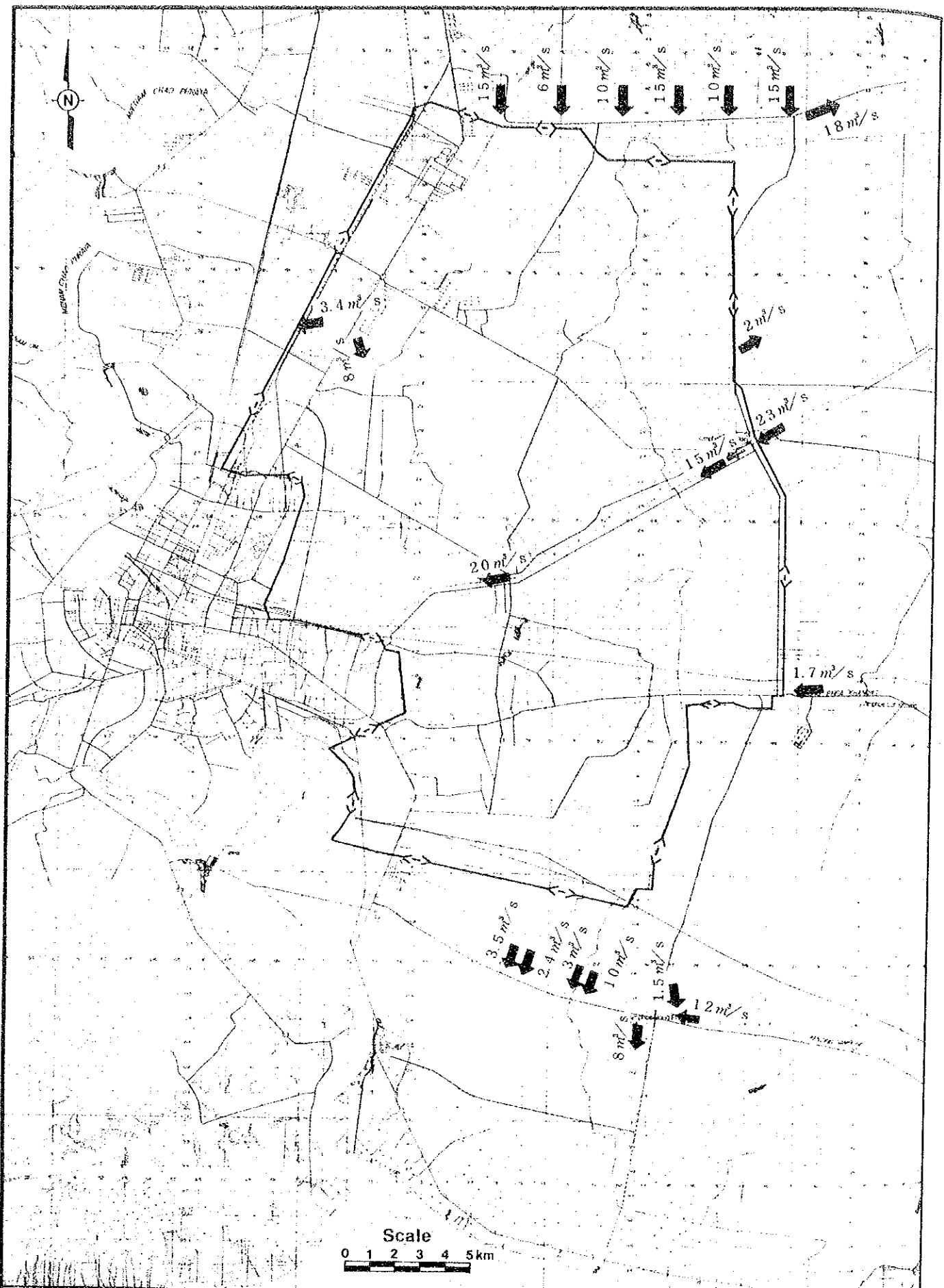


FIG. 4.14

Amount of the Water Flow at Several Points on Nov.19 and 23 in 1983

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

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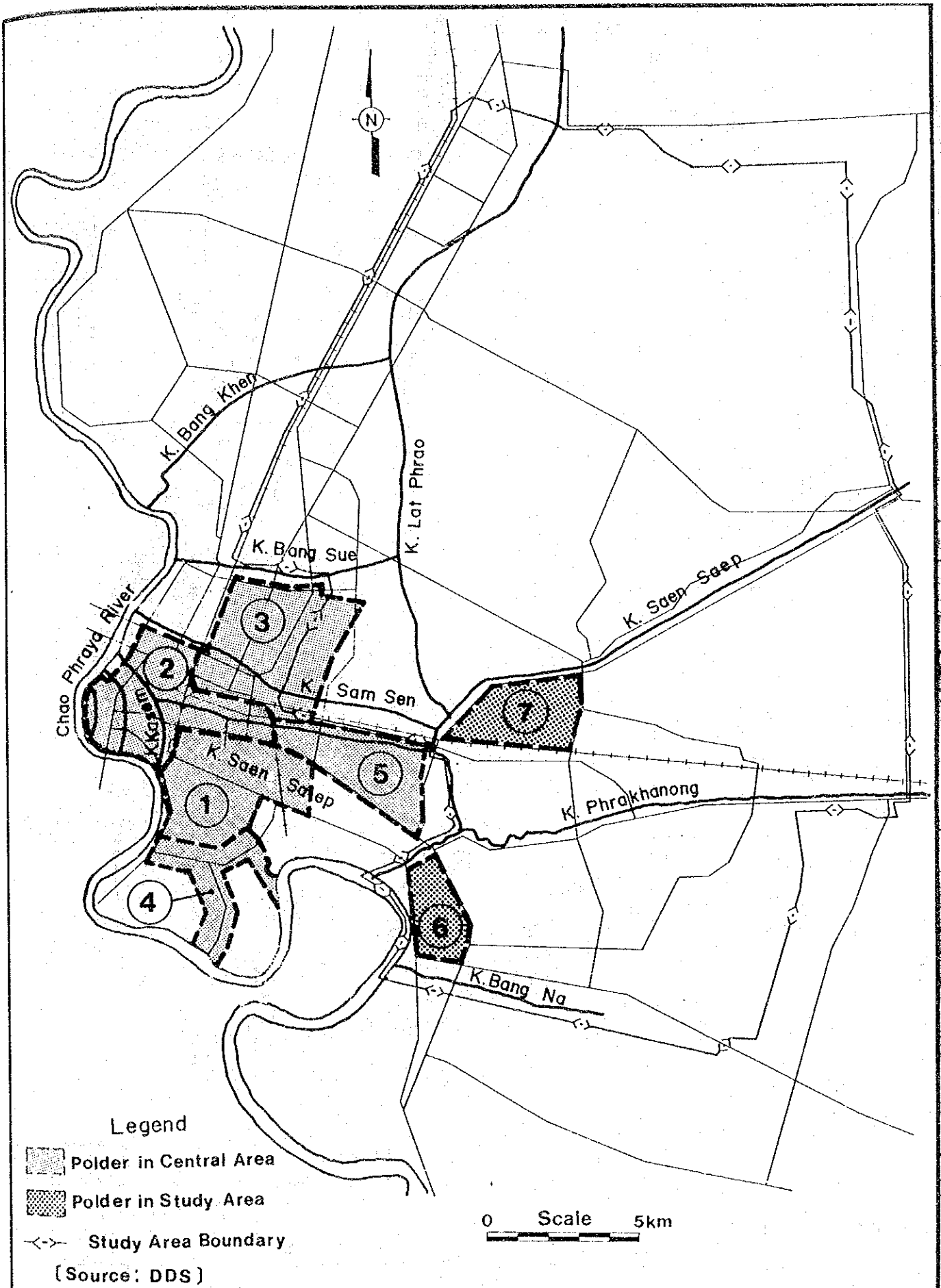


FIG. 5.1 Areas Protected from Flooding Due to Stormwater
FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

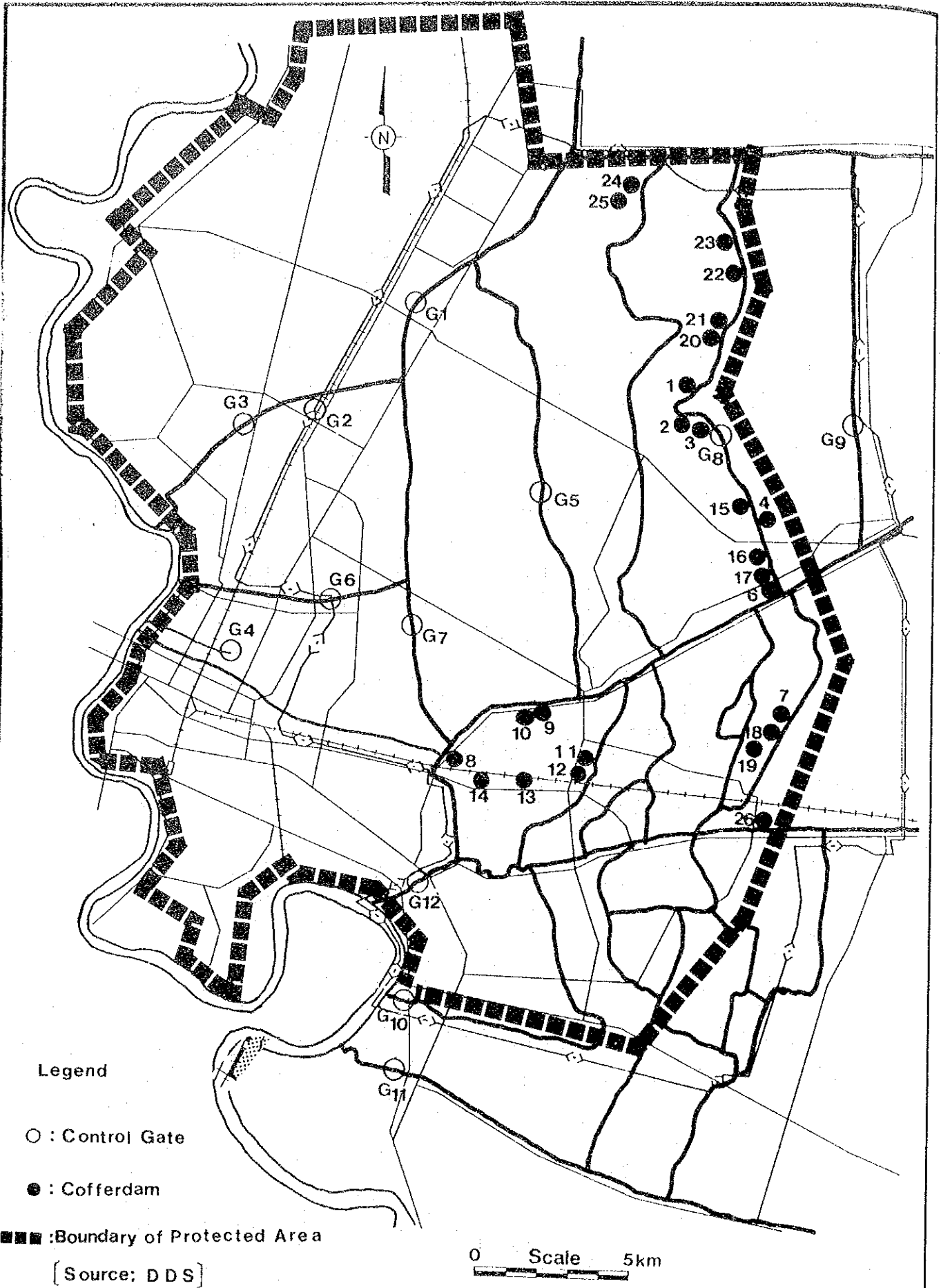


FIG. 5.2

Area Protected from Outside Flow

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

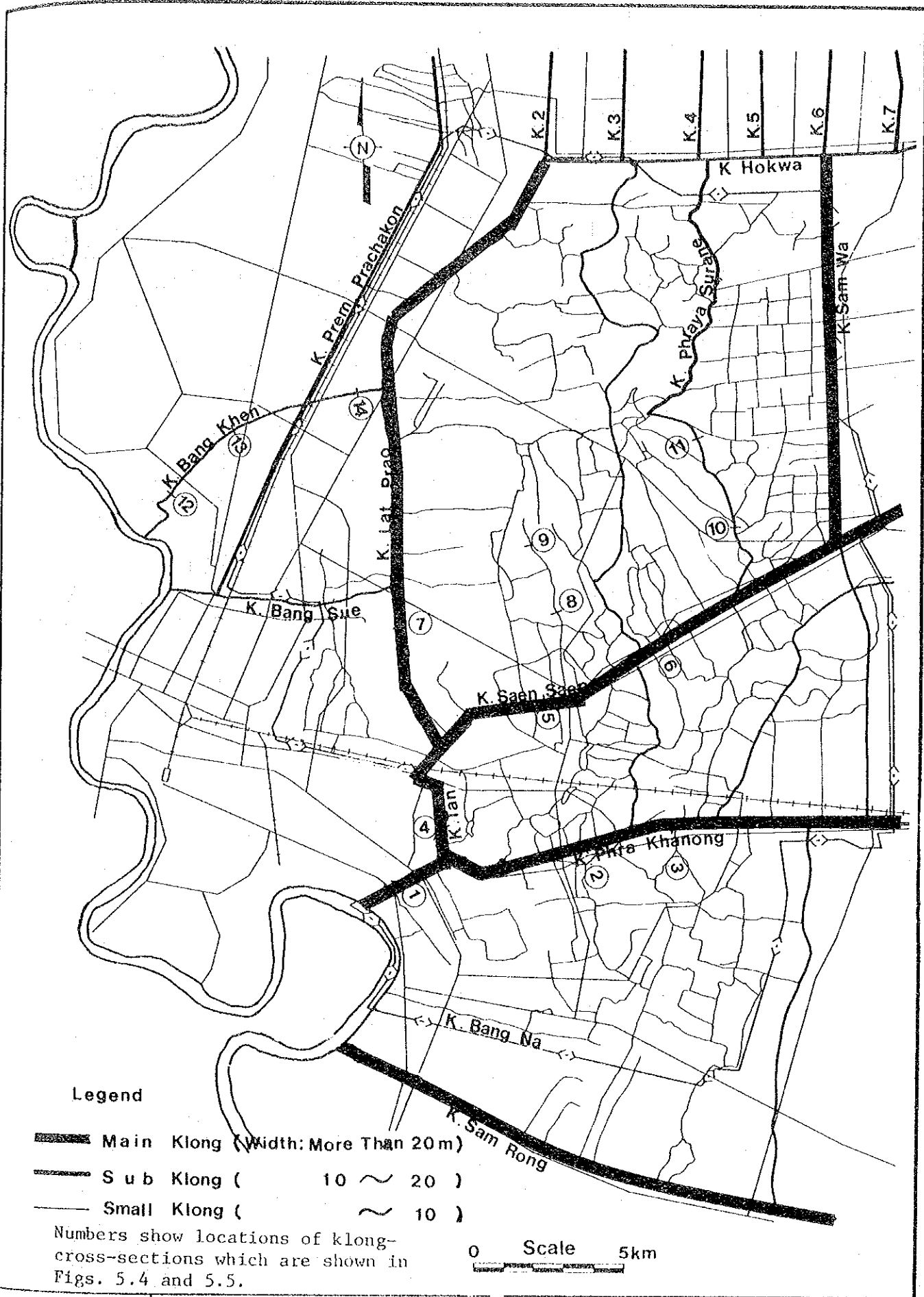
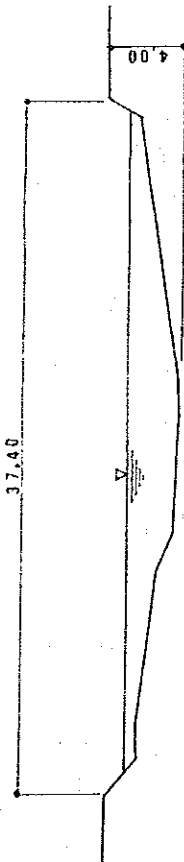


FIG. 5.3

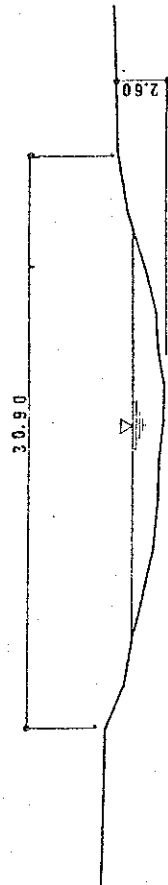
Klong Network within the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

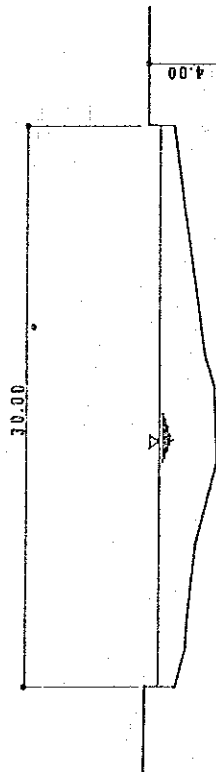
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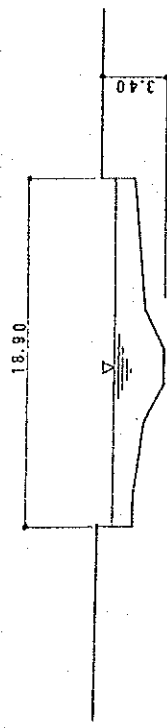
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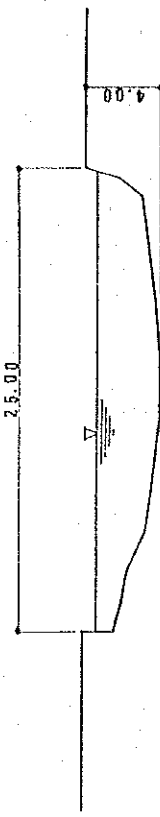
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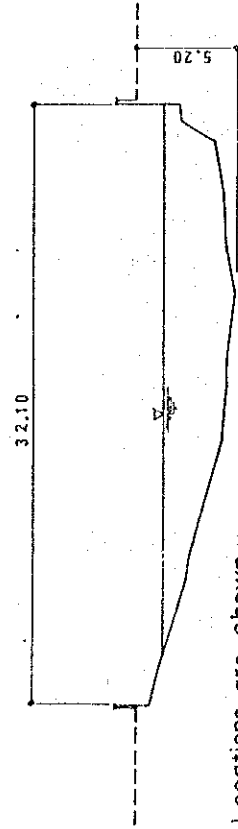
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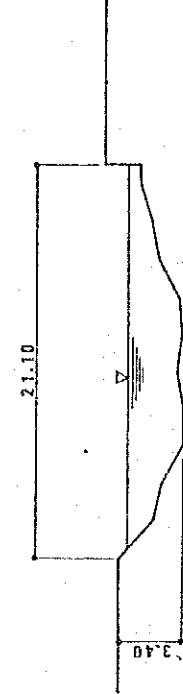
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NO 1



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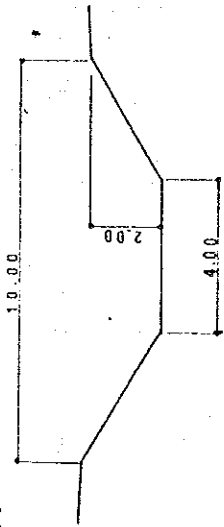
Note : Locations are shown
in Fig 5.3

Scale
Not to Scale

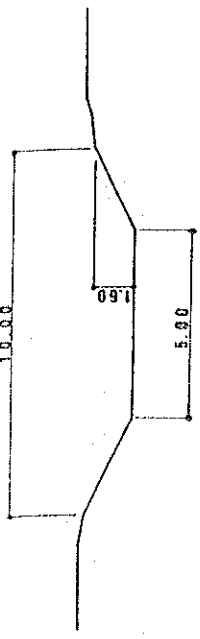
FIG. 5.4 Cross Sections of Main Klongs (1)

FLOOD PROTECTION / DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

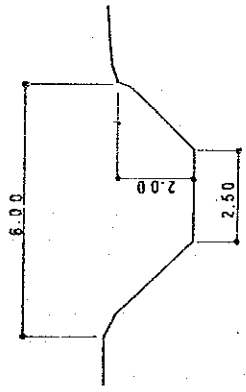
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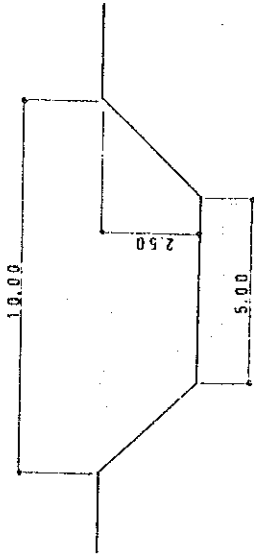
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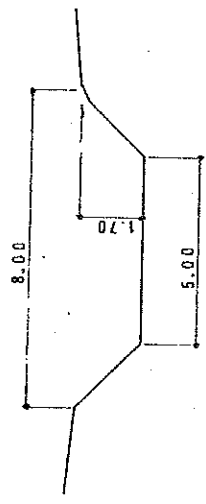
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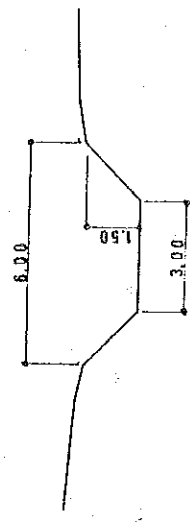
NO 13



NO 8



NO 12



Note : Locations are shown in Fig 5.3

Scale Not to Scale

FIG. 5.5

Cross Sections of Main Klongs (2)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

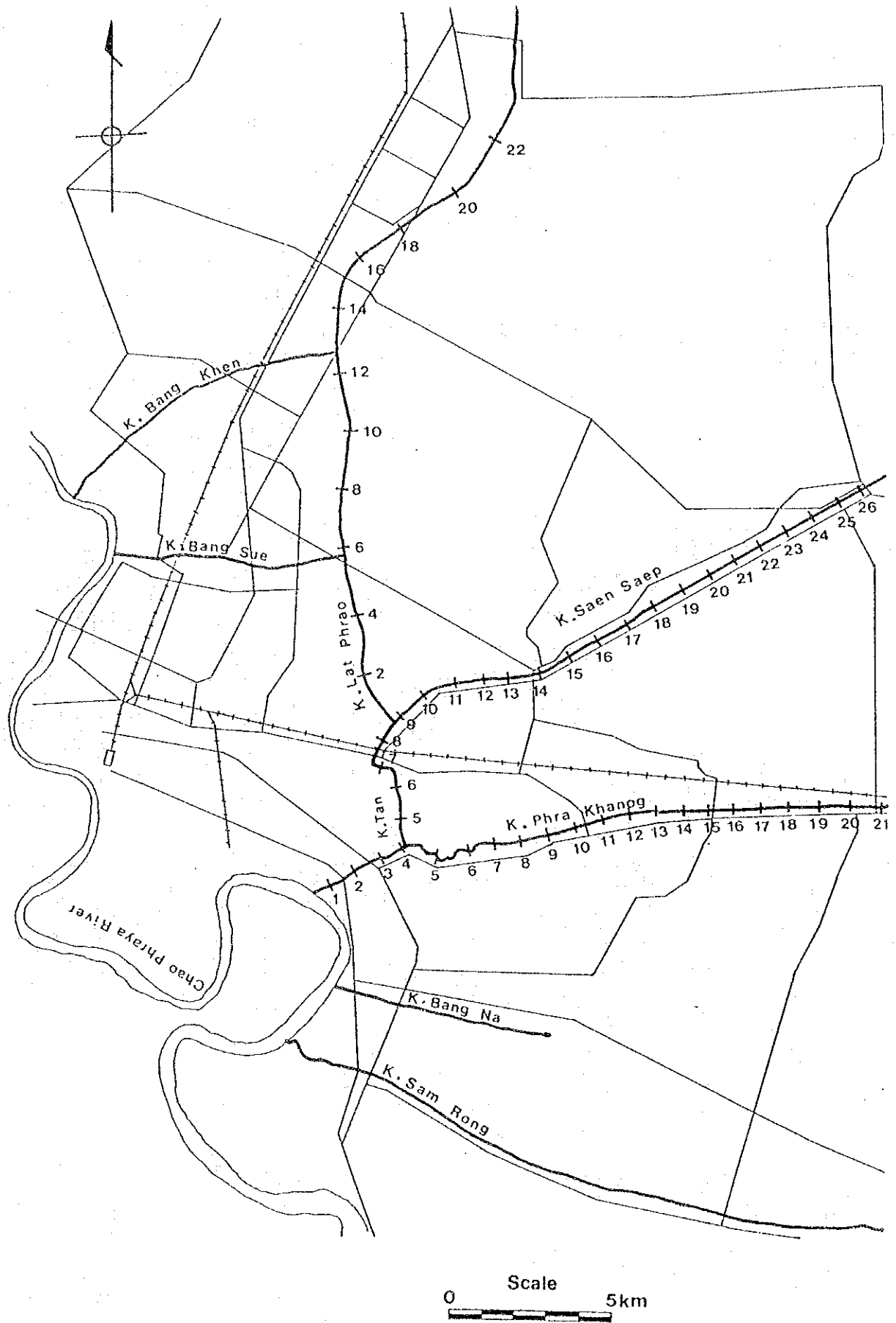


FIG. 5.6

Main Klong Routes Calculated by Uniform & Non-Uniform Flow Method

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

K. Phra Khanong

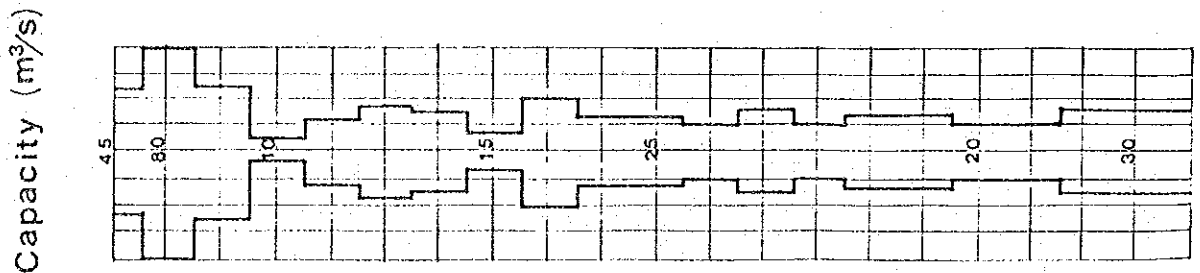
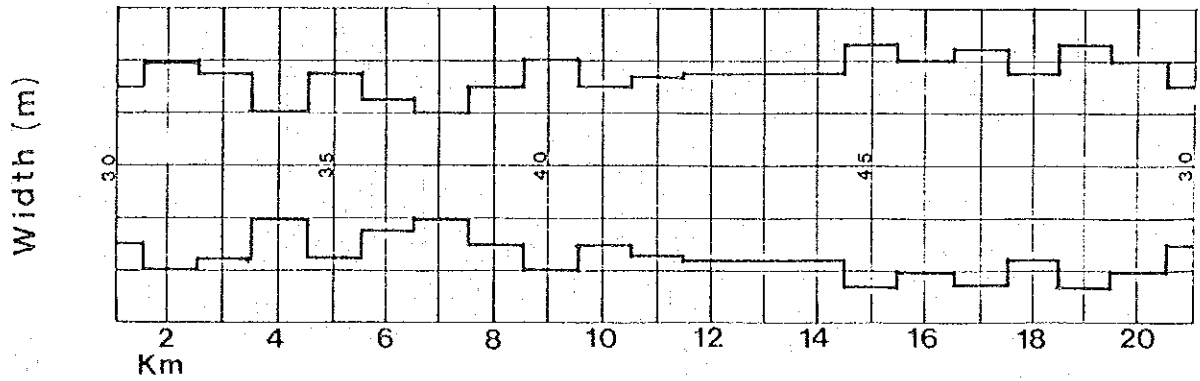
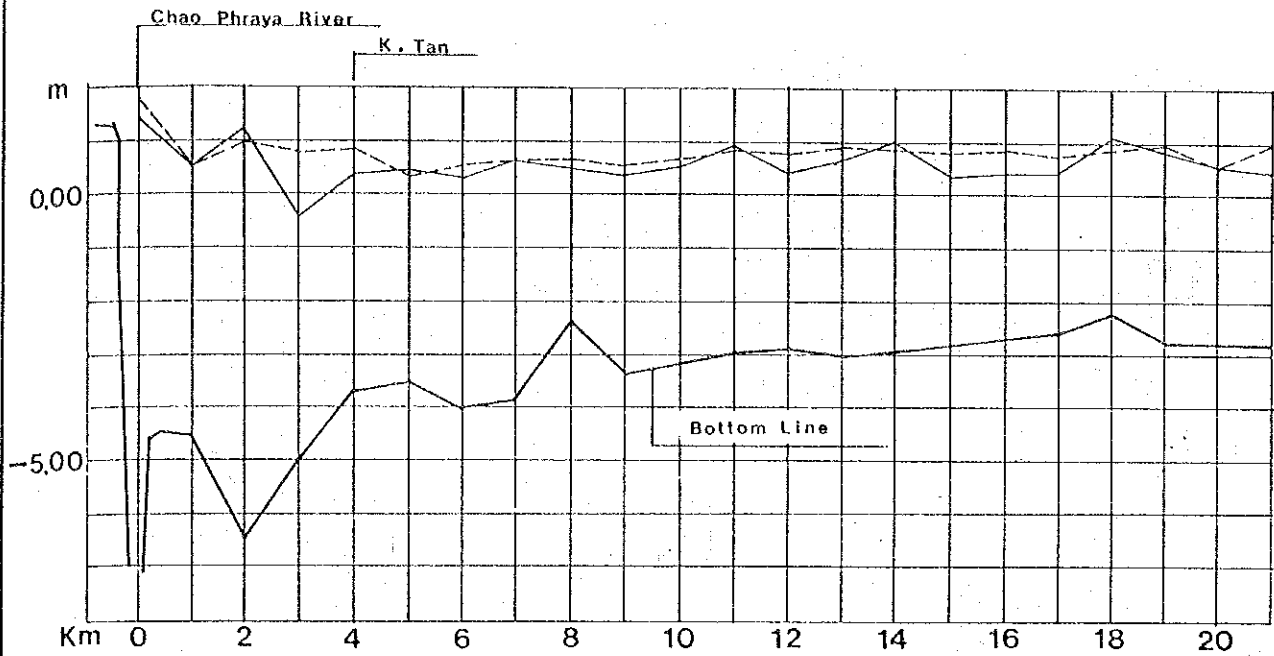


FIG. 5.7

Flow Capacity of Klong Phra Khanong Calculated by Uniform Flow Method

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

K. Tan & K. Saen Saep

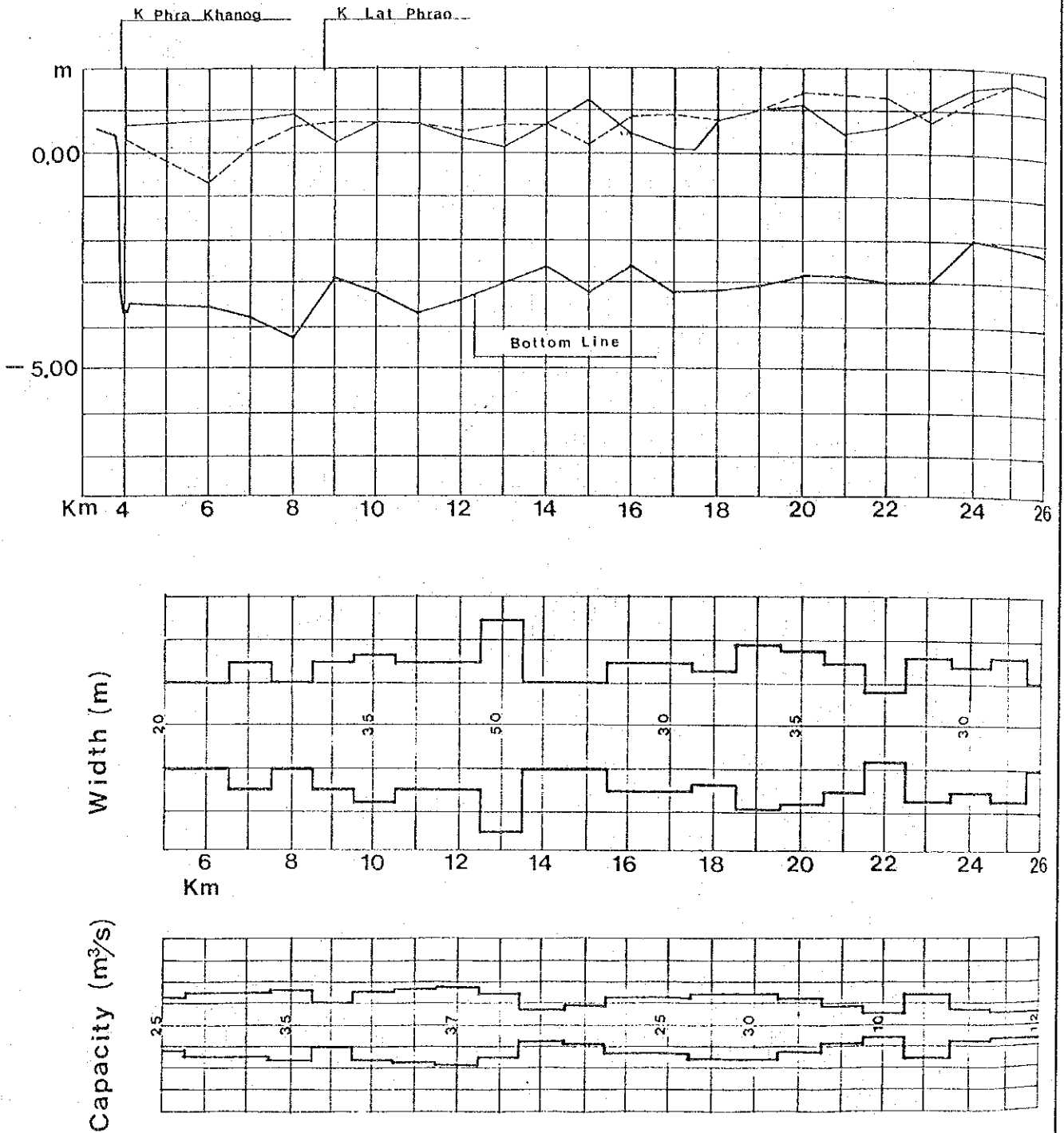


FIG. 5.8 Flow Capacity of Klongs Tan & Saen Saep Calculated by Uniform Flow Method

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

K. Lat Phrao

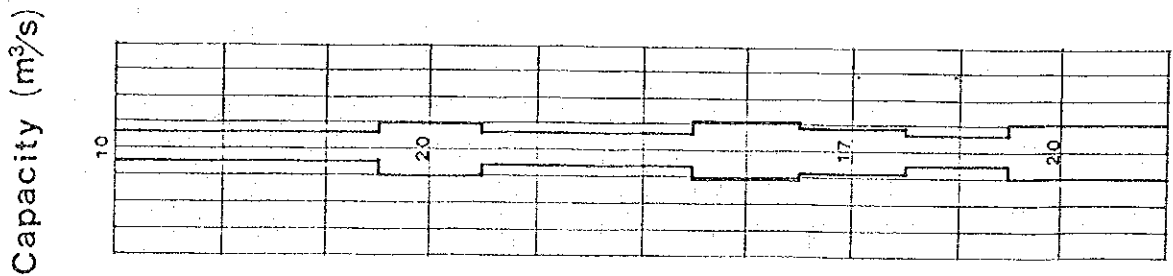
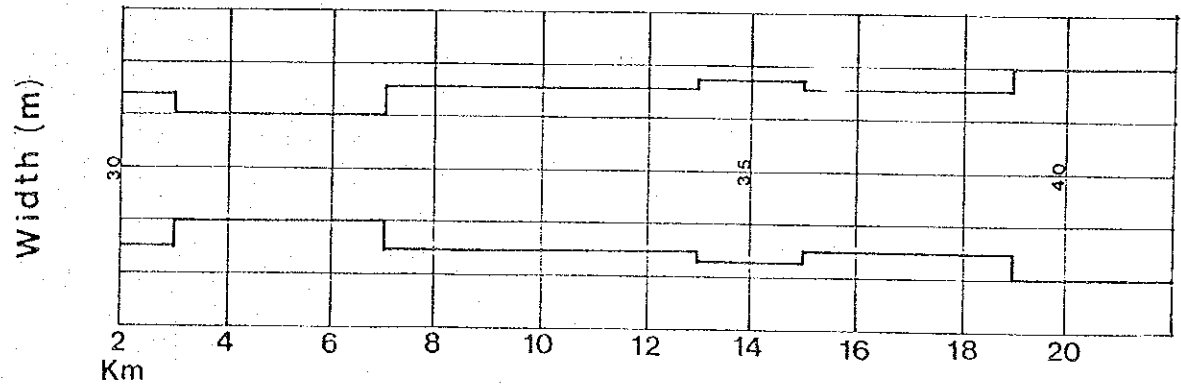
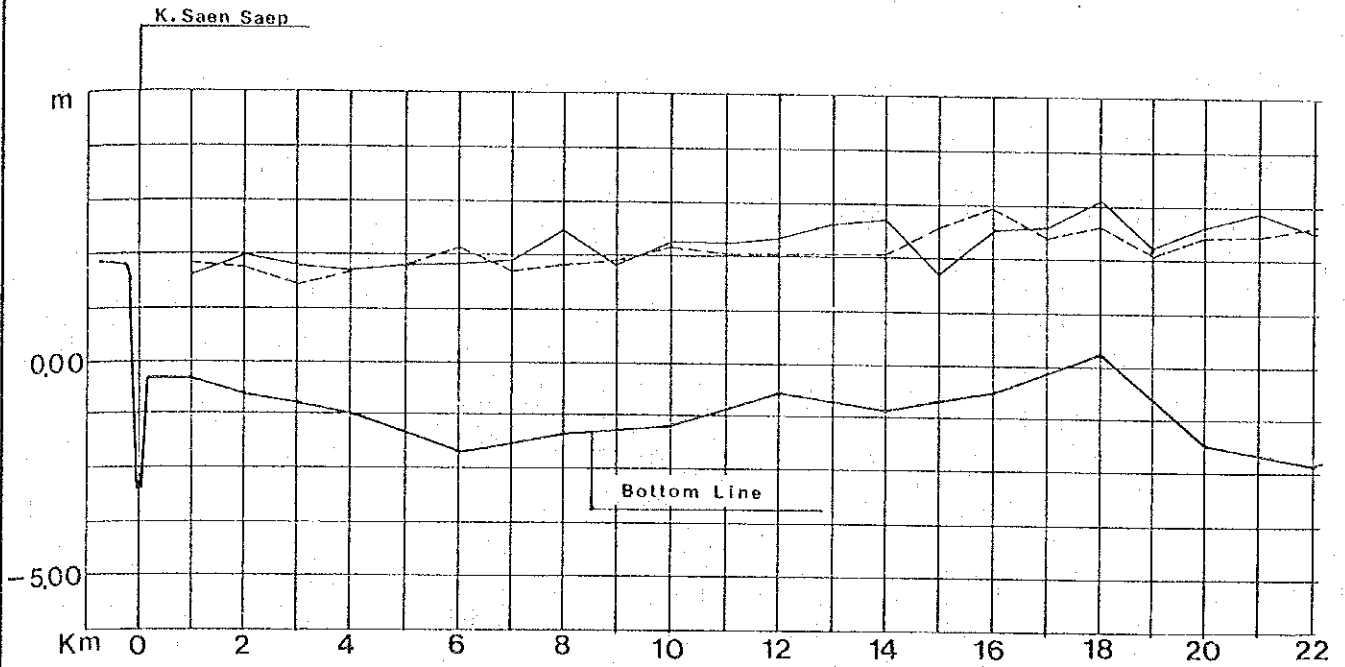
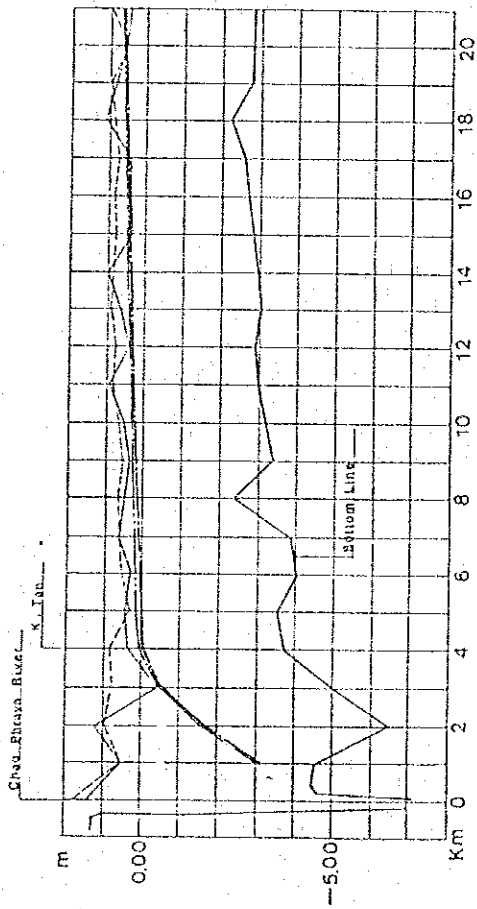


FIG. 5. 9

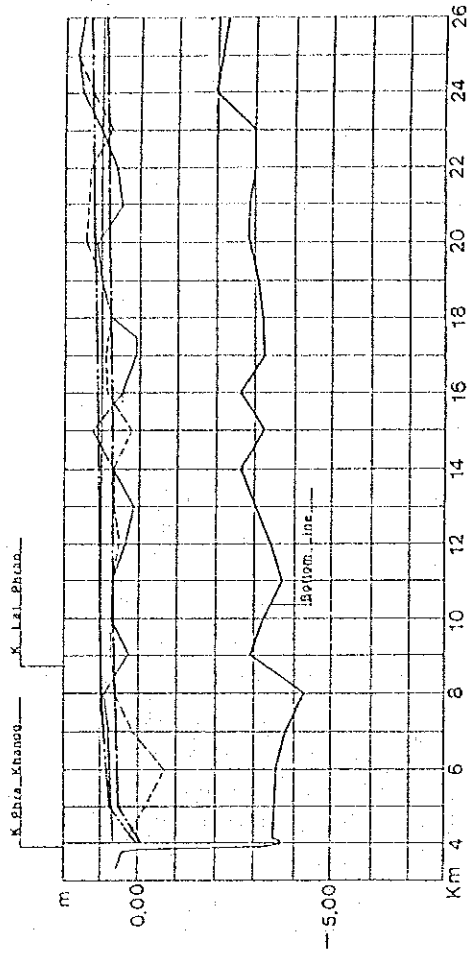
Flow Capacity of Klong Lat Phrao Calculated by Uniform Flow Method

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

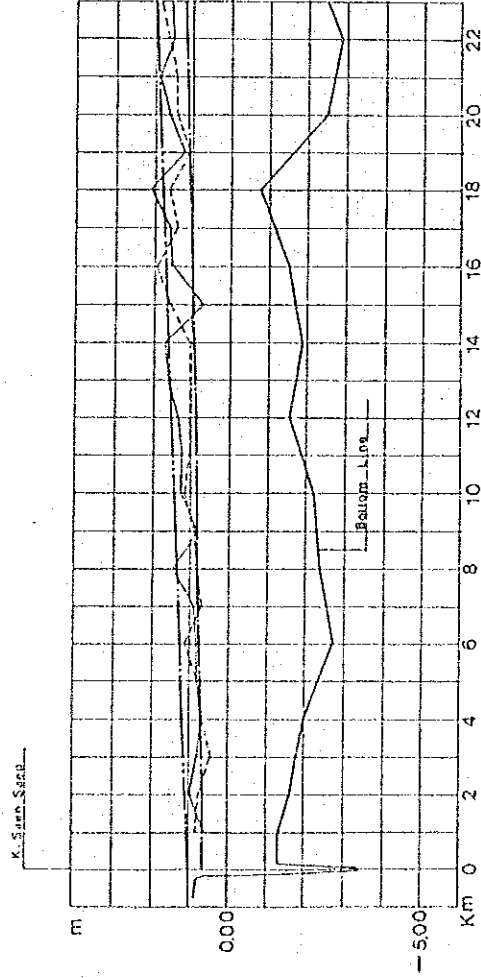
K. Phra Khanong



K. Tan & K. Saen Saep

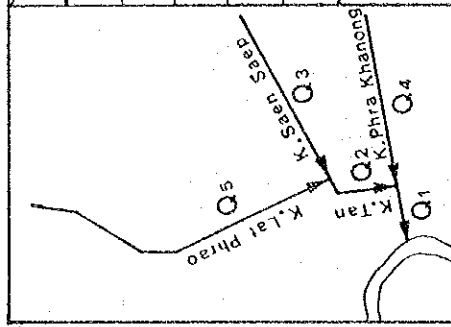


K. Lat Phrao



Assumed Water Quantity

	Case 1 M ³ /S	Case 2 M ³ /S
Q1	50.0	60.0
Q2	30.0	40.0
Q3	20.0	20.0
Q4	20.0	20.0
Q5	10.0	20.0

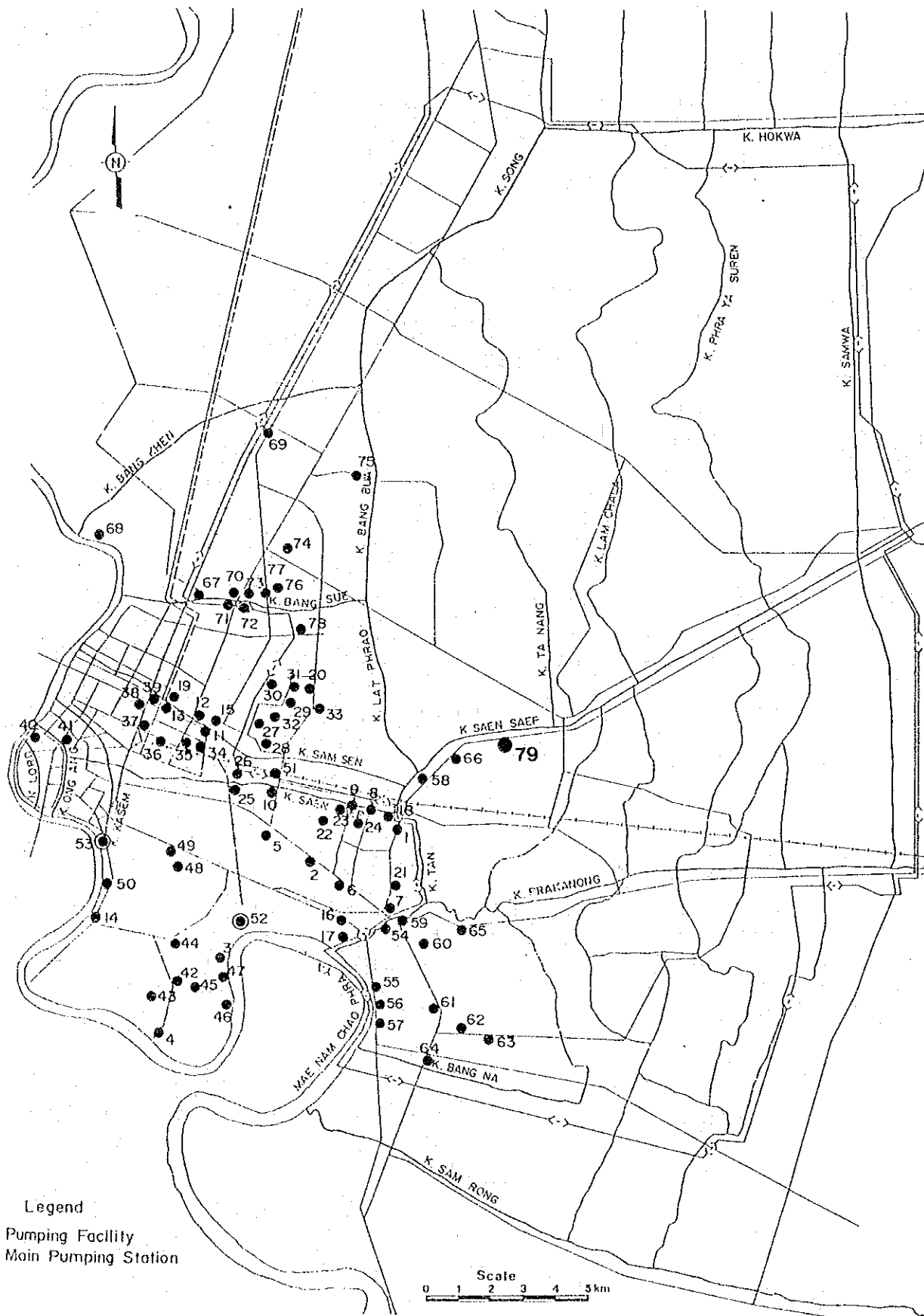


Legend

- Ground Line (Right)
- " (Left)
- Water Surface Elevation Calculated by Non-Uniform Flow Method (Case 1)
- " (Case 2)

FIG. 5.10 Water Surface Elevation Calculated by Non-Uniform Flow Method

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



[Source: DDS]

FIG. 5.11

Location of Pumps by DDS

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

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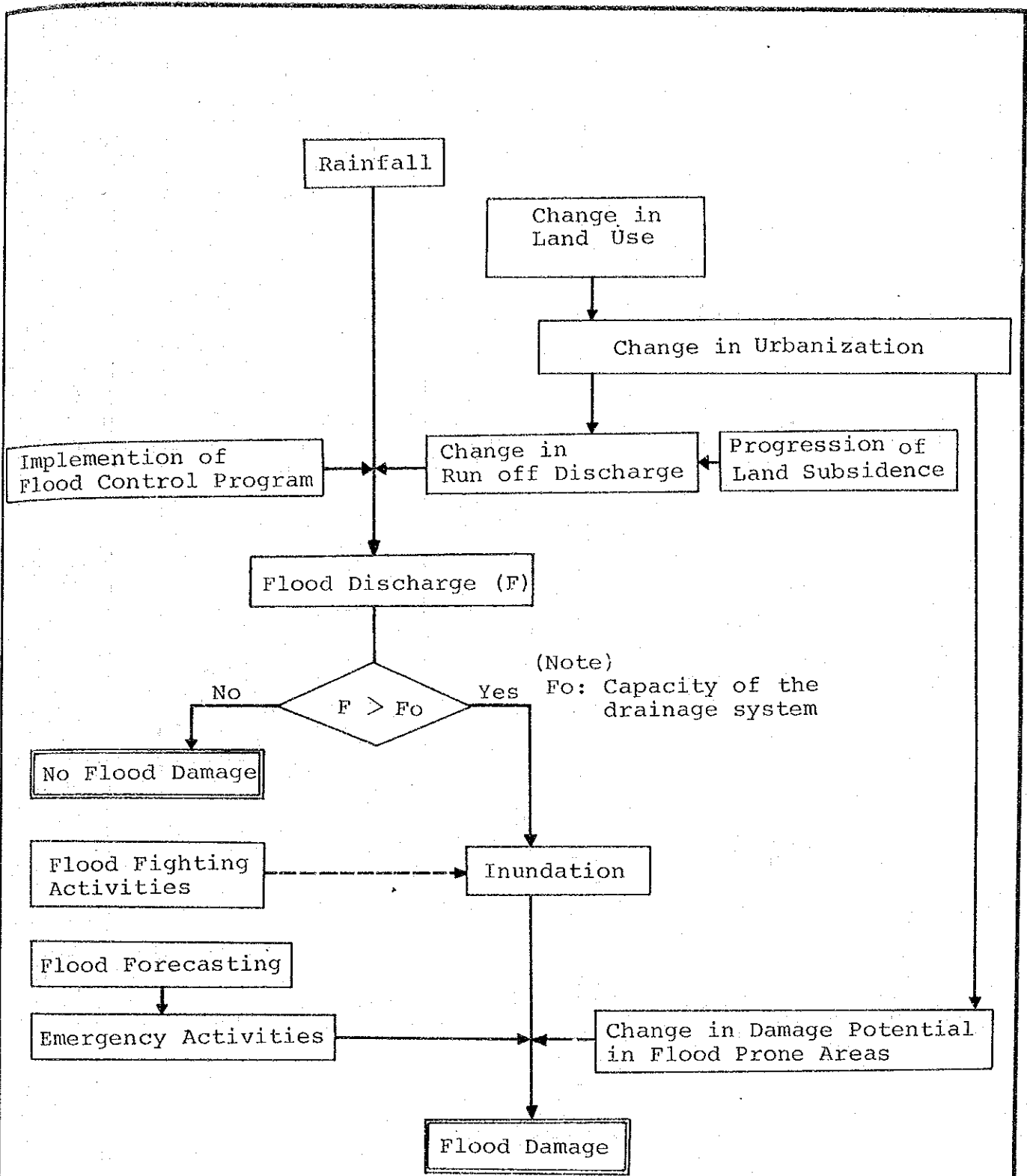


FIG. 6.1

Schematic Diagram for the Mechanism of Flood Damage

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

Present Status of Flood Protection Plan by National Economic and Social Development Board

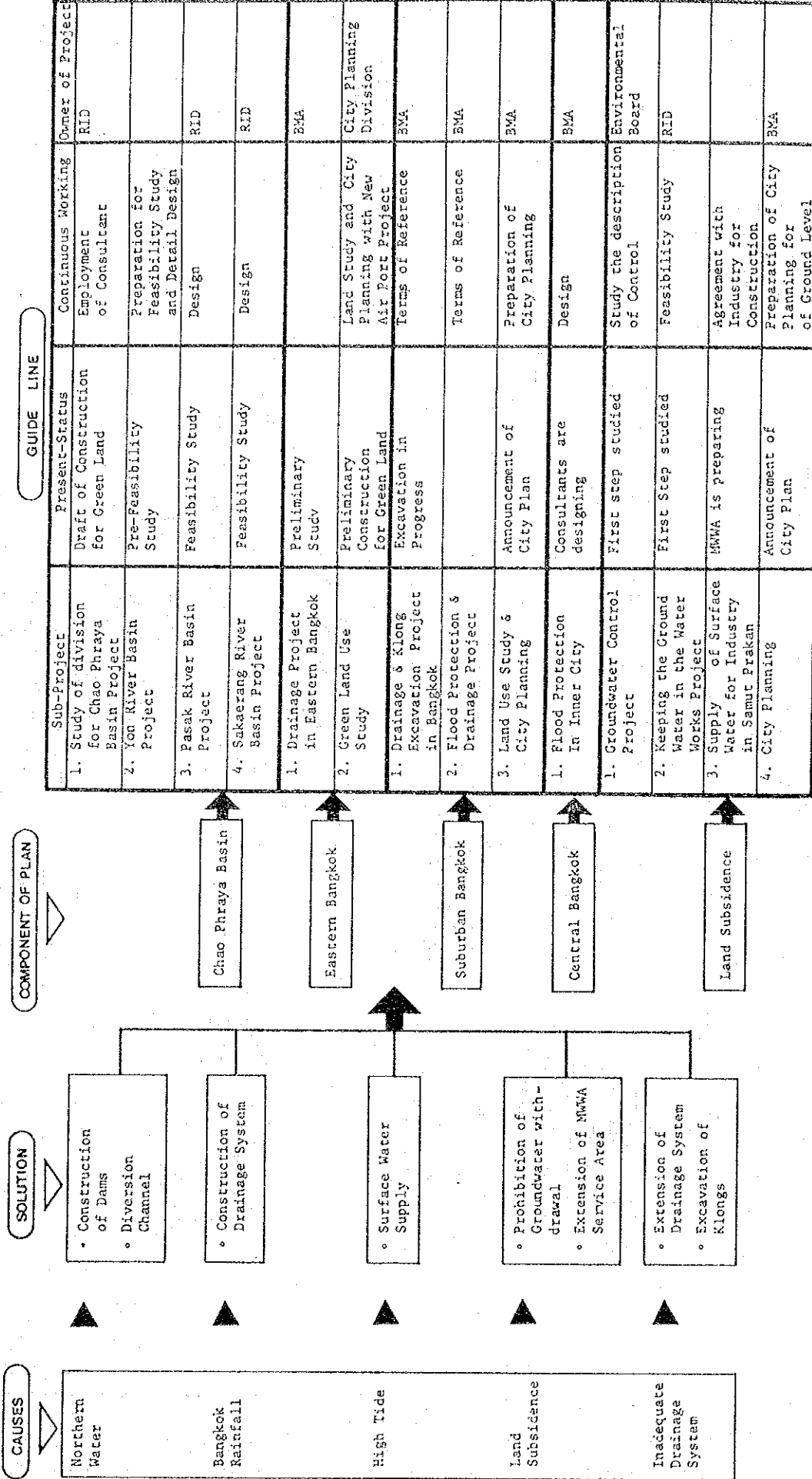


FIG. 6.2

Present Status of Flood Protection Plan

FLOOD PROTECTION / DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

Source: NESDB

Major Causes of Flood Damage	Relevant Study	Relevant Chapters
1) Rainfall	<ul style="list-style-type: none"> • Probability of Scale • Pattern of Hyetograph 	Chapter 13
2) Change in Land Use Condition	<ul style="list-style-type: none"> • Estimation of Population and Urban Area within the Study Area 	Chapter 8, 10 & 15
3) Low Flat Plain and High Water Level of the Chao Phraya River	<ul style="list-style-type: none"> • Ground Surface Elevation in the Study Area • Seasonal Changes of Water Level of the Chao Phraya River 	Chapter 3, 5, 9 & 13
4) Inflow from Outer Area	<ul style="list-style-type: none"> • Impact of the Green Belt Project 	Chapter 7 & 14
5) Progression of Land Subsidence	<ul style="list-style-type: none"> • Estimation of Future Land Subsidence 	Chapter 9
6) Insufficient Drainage Capacity	<ul style="list-style-type: none"> • Estimation of Existing Drainage Capacity of Klong Network, Pump and Gate • Impact of Improvement of Drainage Facilities 	Chapter 5 & 14

FIG. 6.3

Major Causes of Flood

FLOOD PROTECTION / DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

Inundated Water Level -
Damage Amount Model

Elevation - Property Amount Model

Inundated Water Level - Damage Amount Model

$$D = D(F, F_0, S, L_s)$$

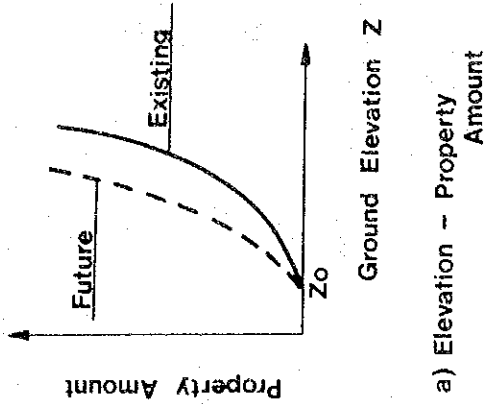
D : Flood Damage

F : Rainfall or Inflow from outer Area

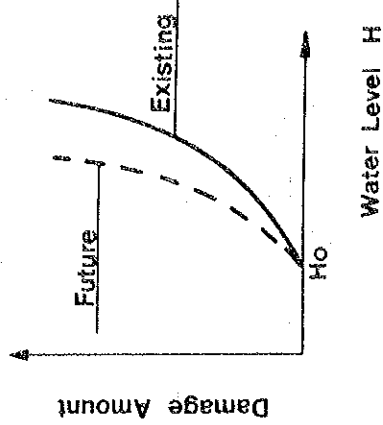
F₀ : Insufficient Capacity of Flood Control Facilities

S : Damag Potential

L_s : Land Subsidence



a) Elevation - Property Amount



b) Inundated Water Level - Damage Amount

Annual Average Flood
Damage Model

$$\bar{D} = \int_{F_0}^{\infty} \text{Pr}(F) \cdot D(F, F_0, S, L_s) \cdot dF$$

\bar{D} : Annual Average Flood Damage

Pr(F): Probability Density Function of F

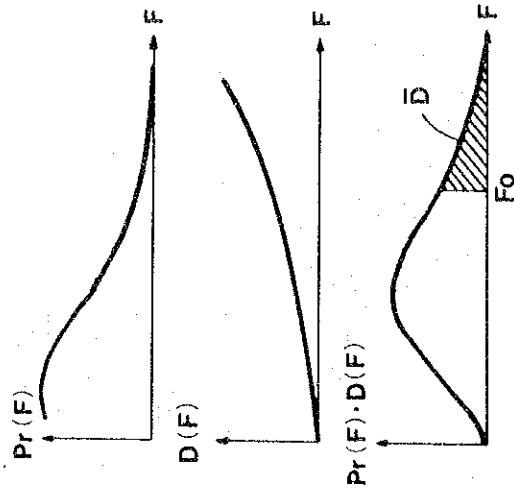


FIG. 6.4

Examples of Flood Damage Models

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

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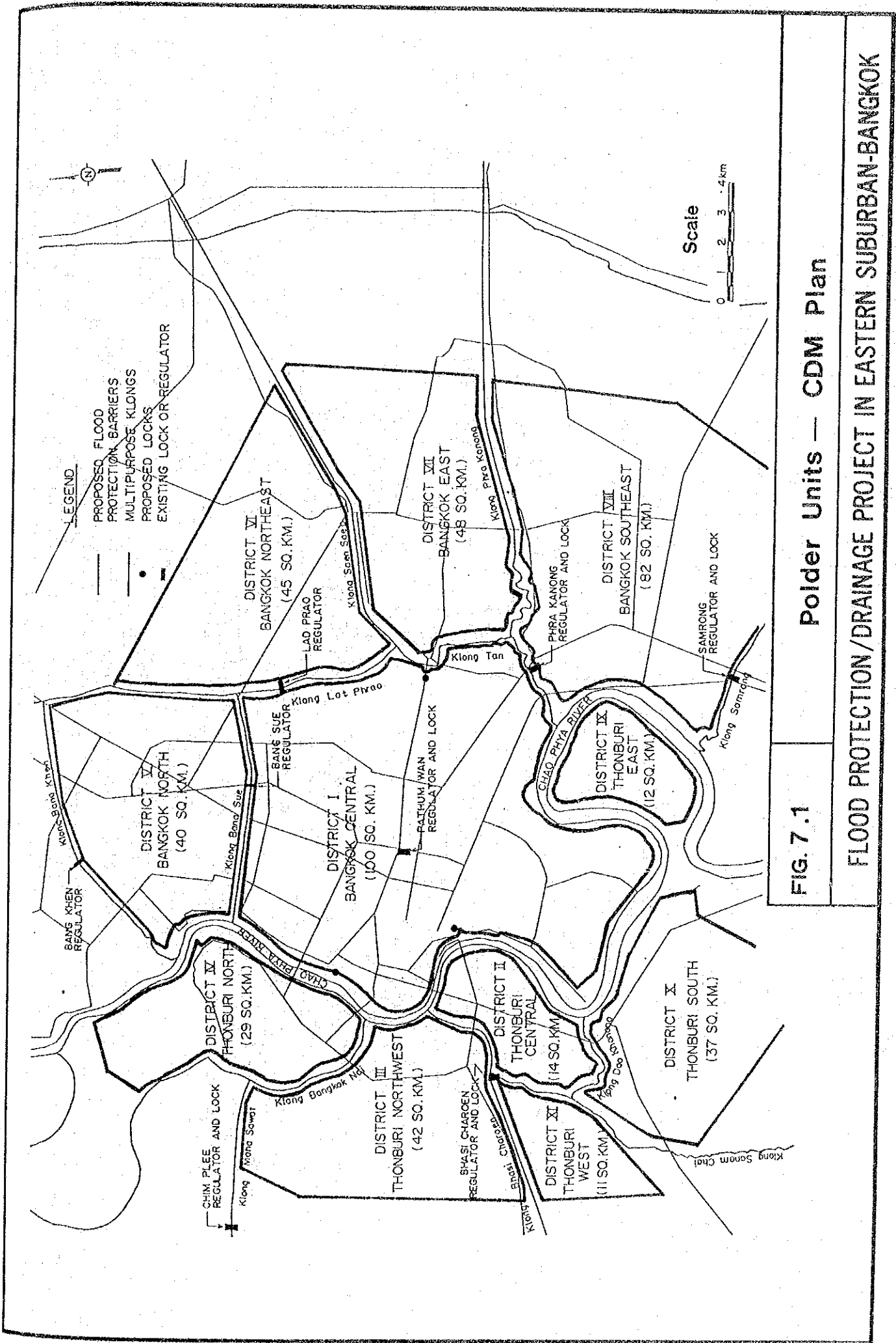


FIG. 7.1

Polder Units — CDM Plan

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

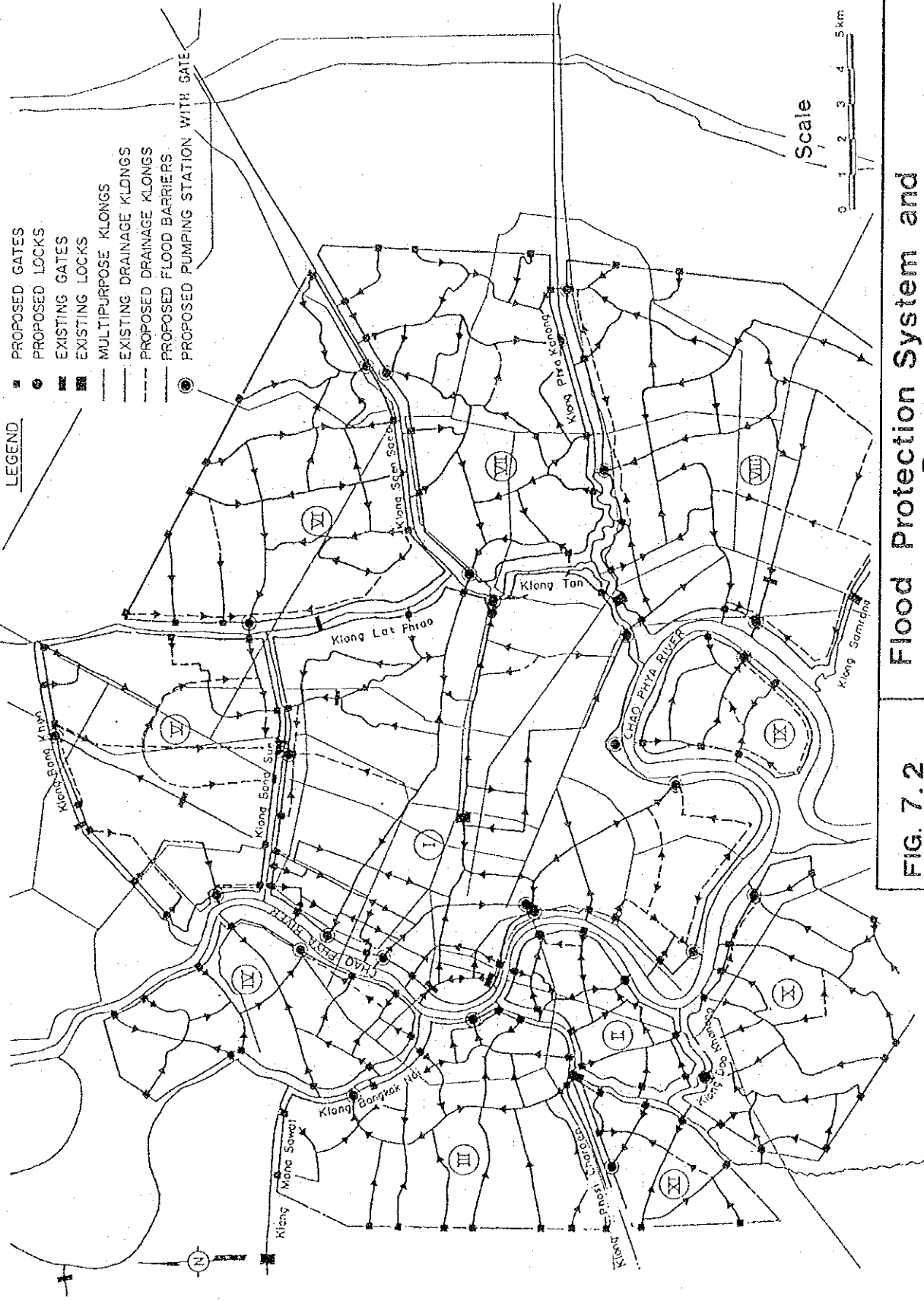
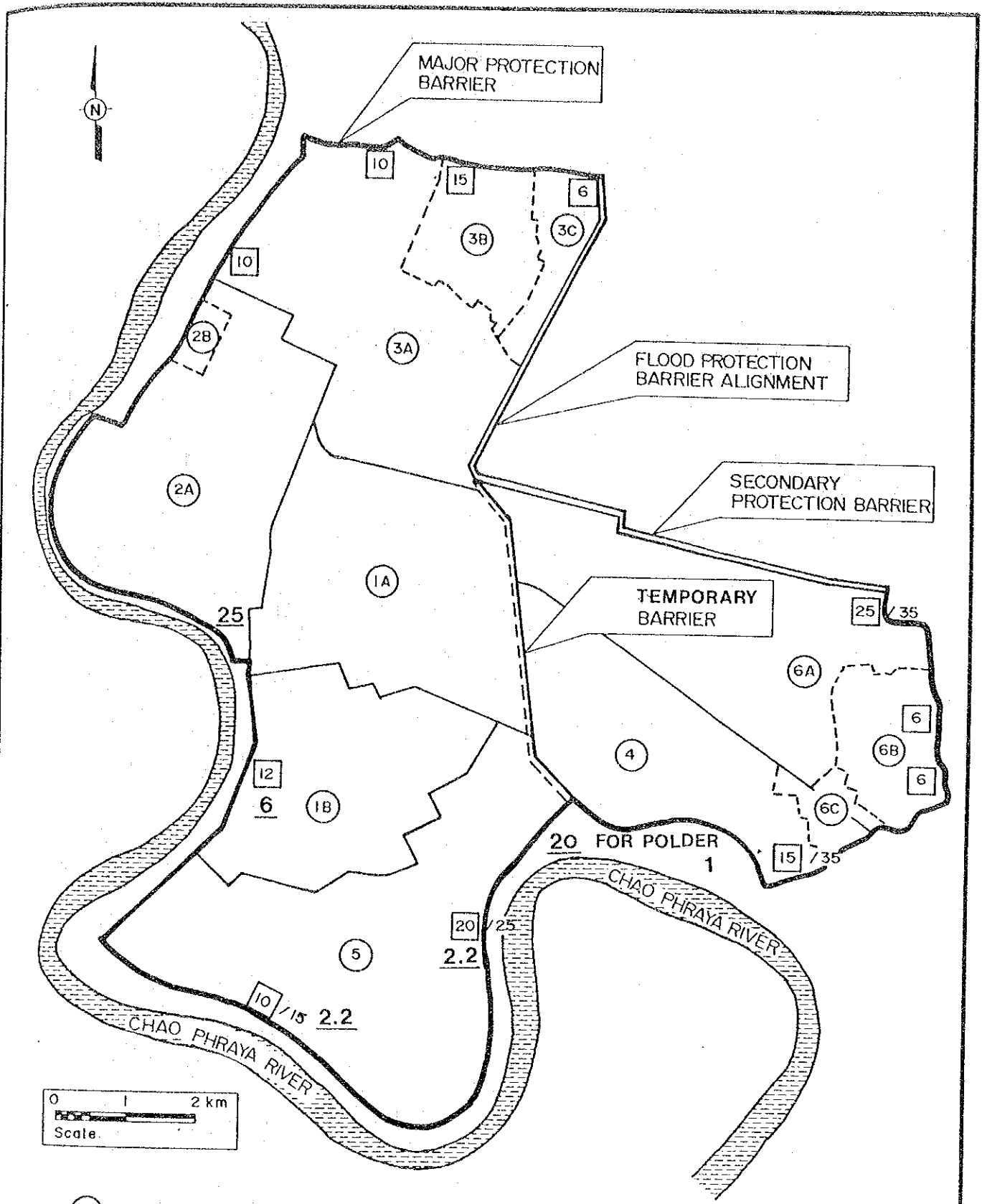


FIG. 7.2 Flood Protection System and Direction of Flow — CDM Plan

FLOOD PROTECTION / DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



- (1A) PROPOSED POLDER
- 6 EXISTING PUMPING STATION WITH CAPACITY OF 6 m³/s
- 25 NEW PUMPING STATION WITH CAPACITY OF 25 m³/s
- /35 CAPACITY REQUIRED IN FUTURE

FIG. 7.3

Polders & New Pumping Stations (City Core Project)

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

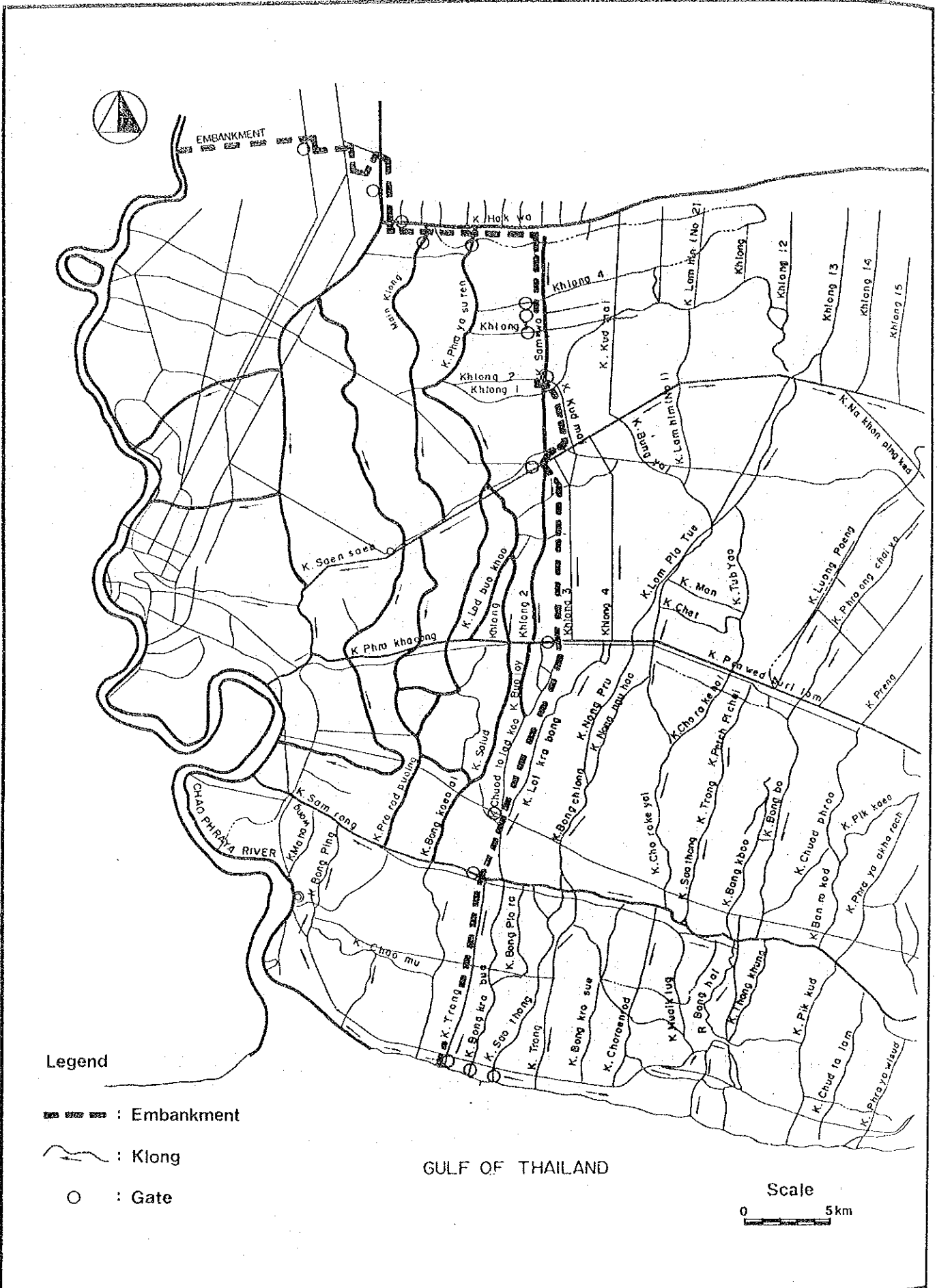
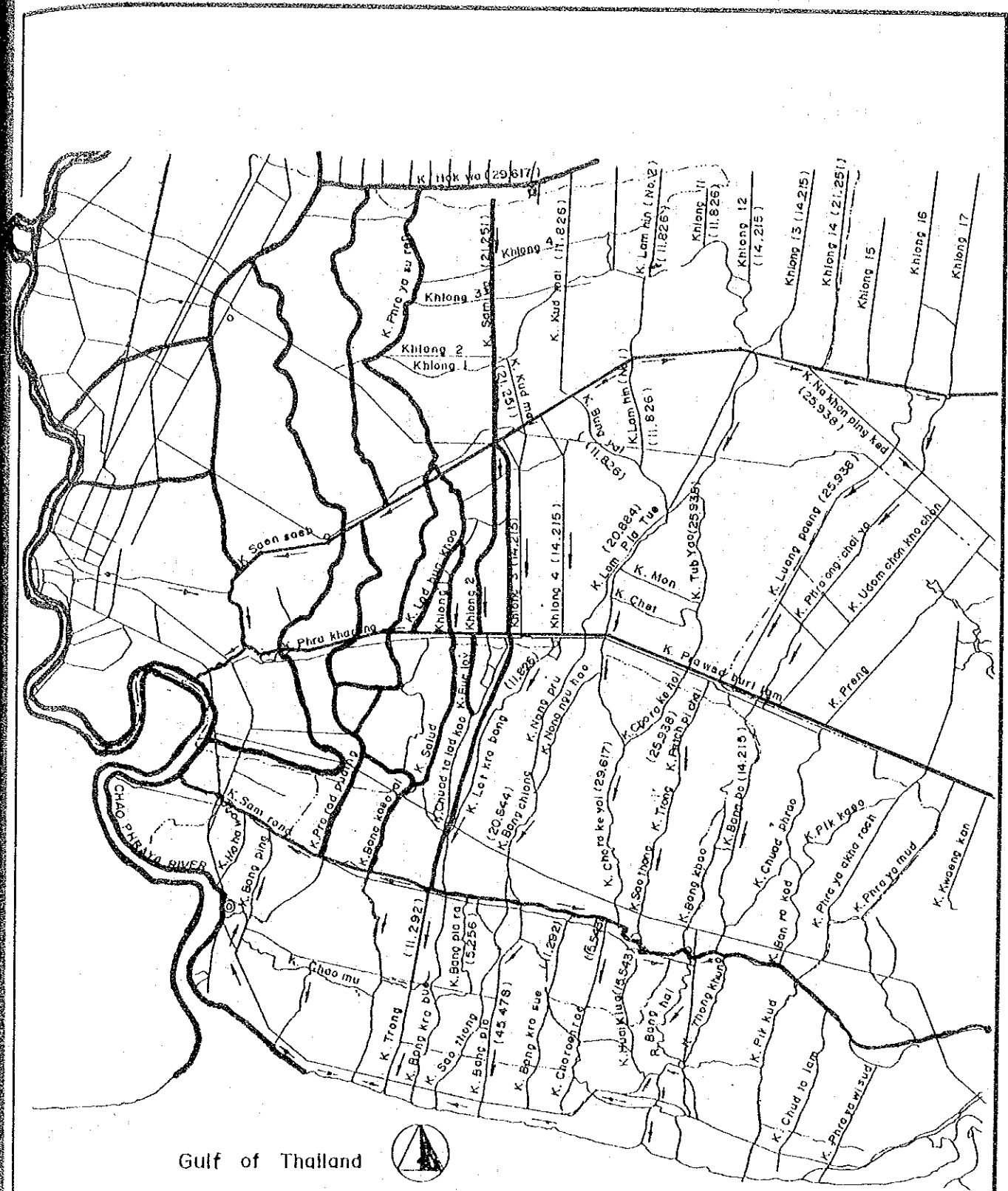


FIG. 7.4 Green Belt Project

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



Gulf of Thailand



unit : m^3/sec

Source : Green Belt Project

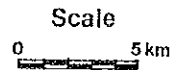


FIG. 7.5

**Improvement of Discharge Capacities
in the Green Belt Area**

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

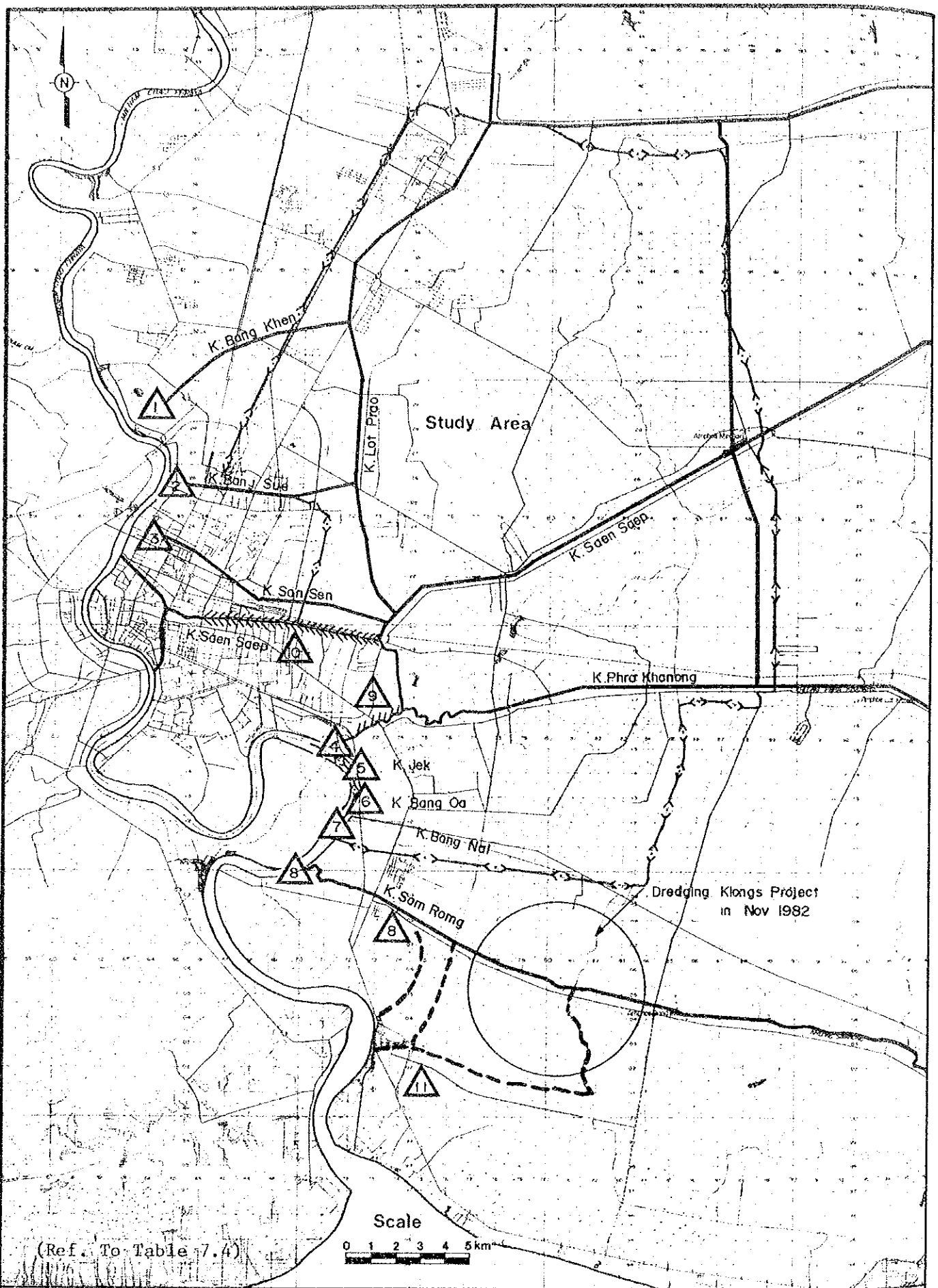


FIG. 7.6

Urgent Flood Protection Measures due to 1983 Flood

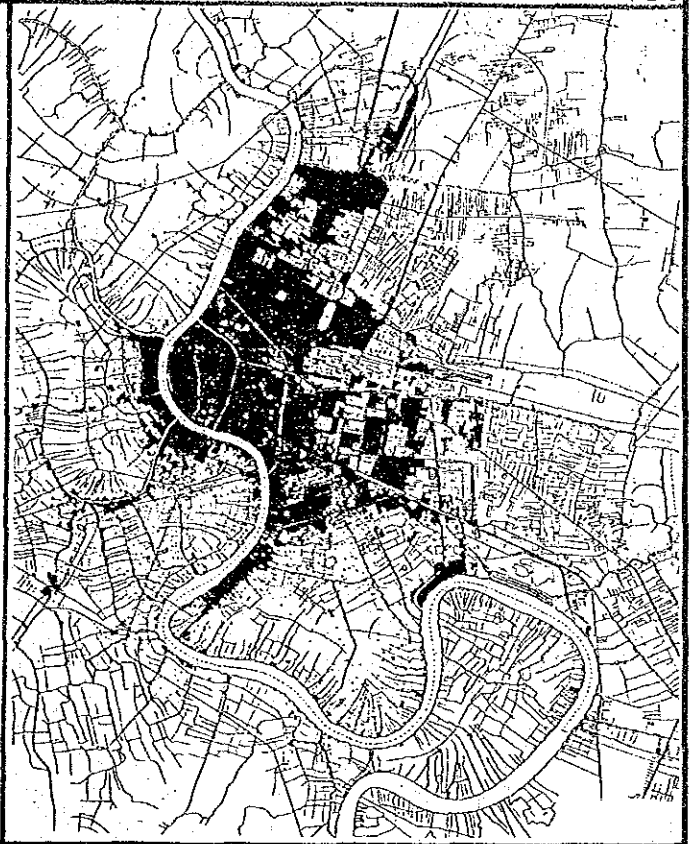
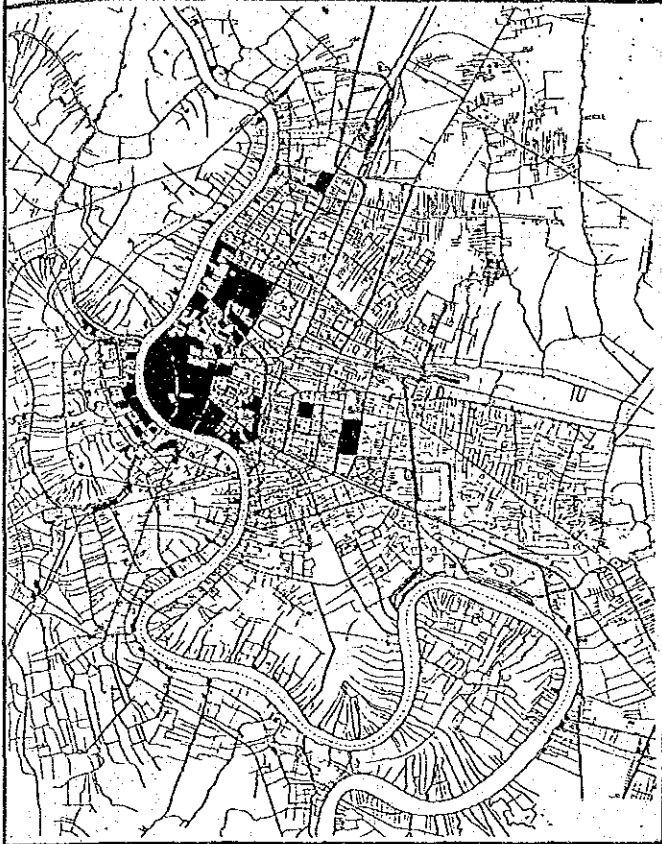
FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

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1900

1936



1953

1958

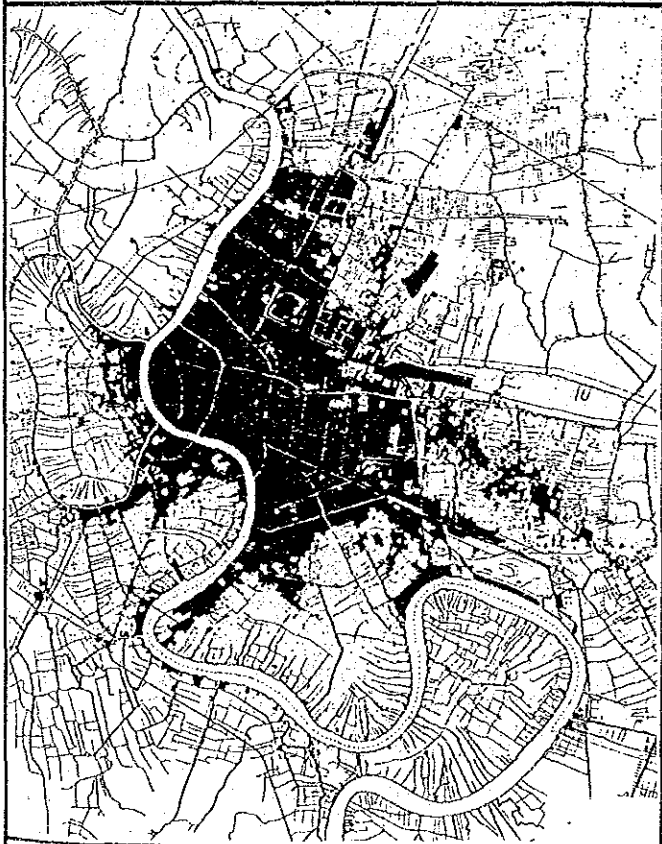


FIG. 8.1

Urbanization of Bangkok from 1900 to 1958

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

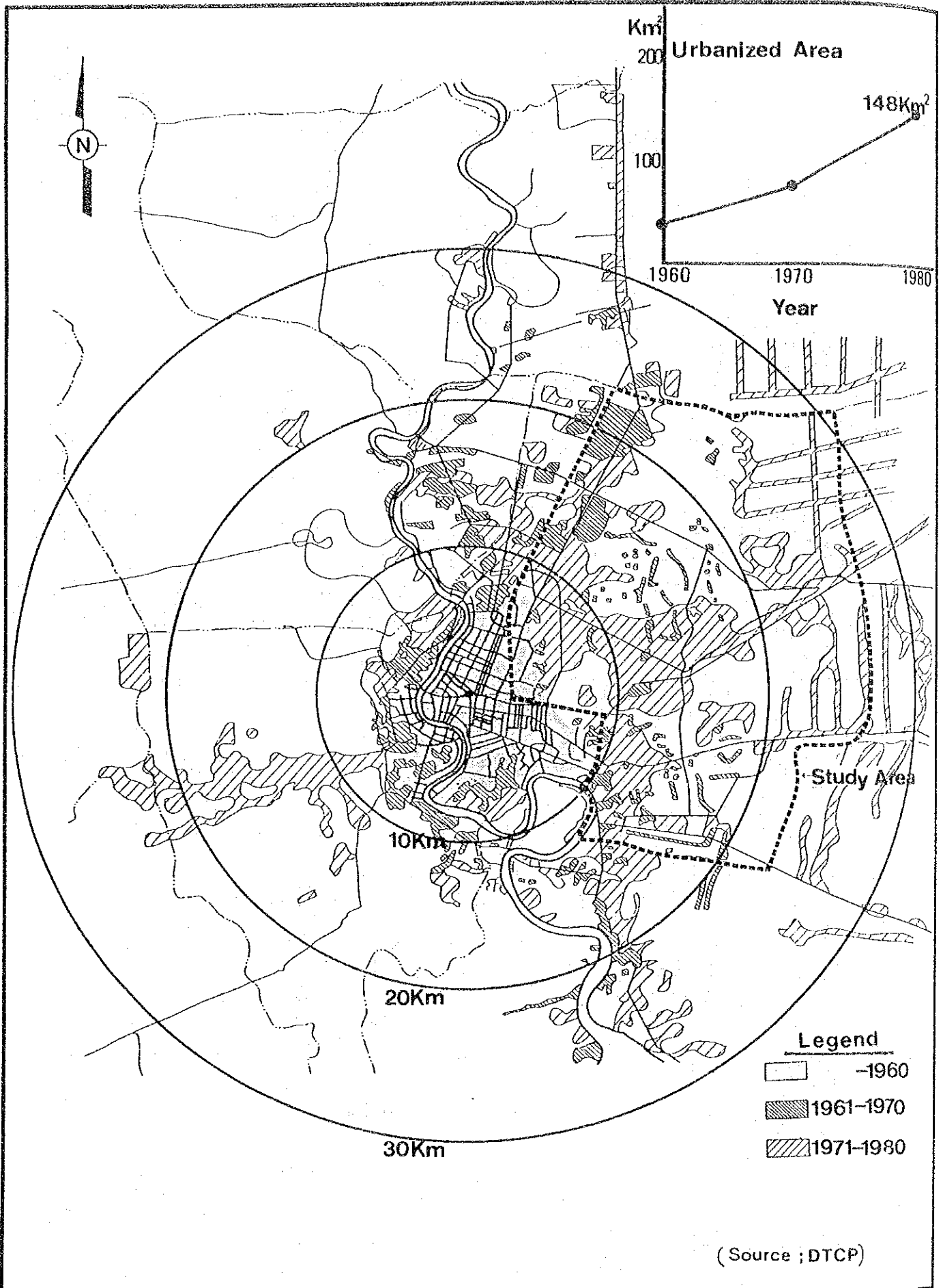
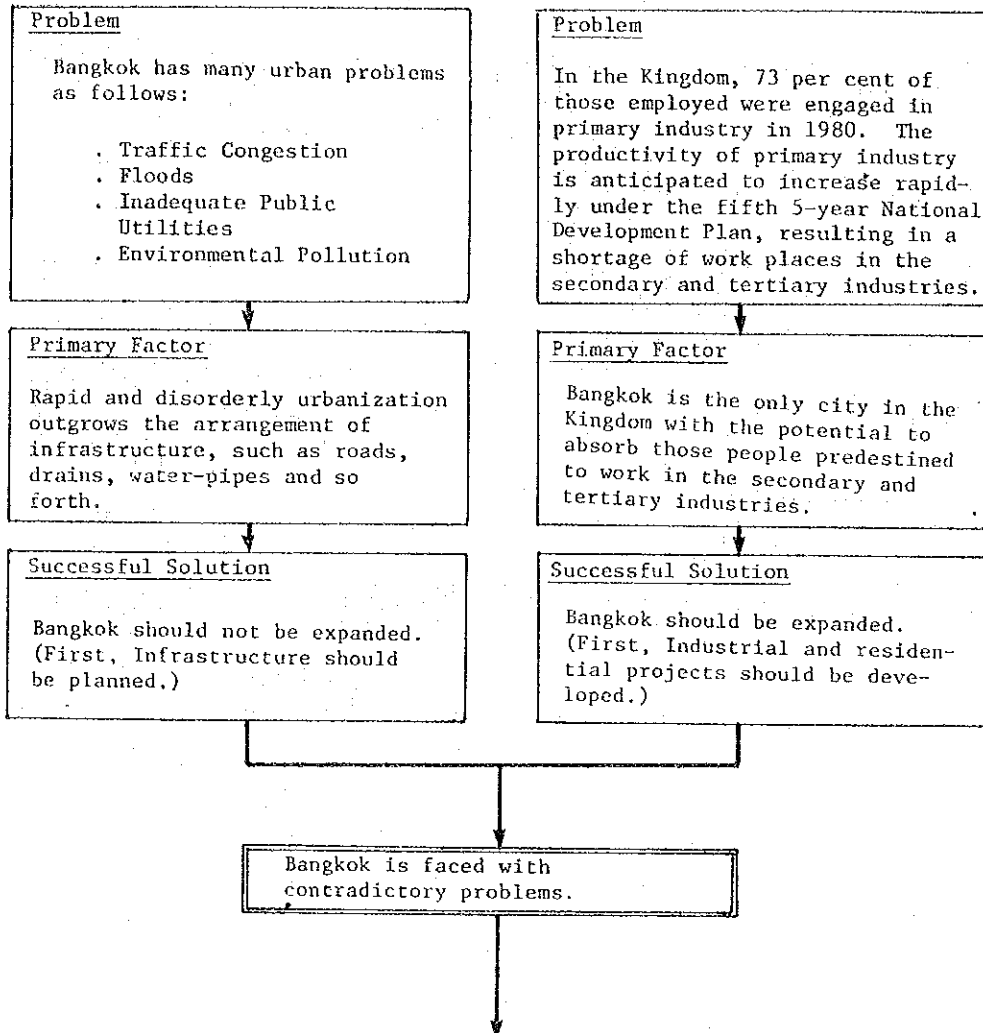


FIG. 8.2

Urbanization of Bangkok from 1960 to 1980

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



To resolve these contradictory problems, the following three areas should be prepared:

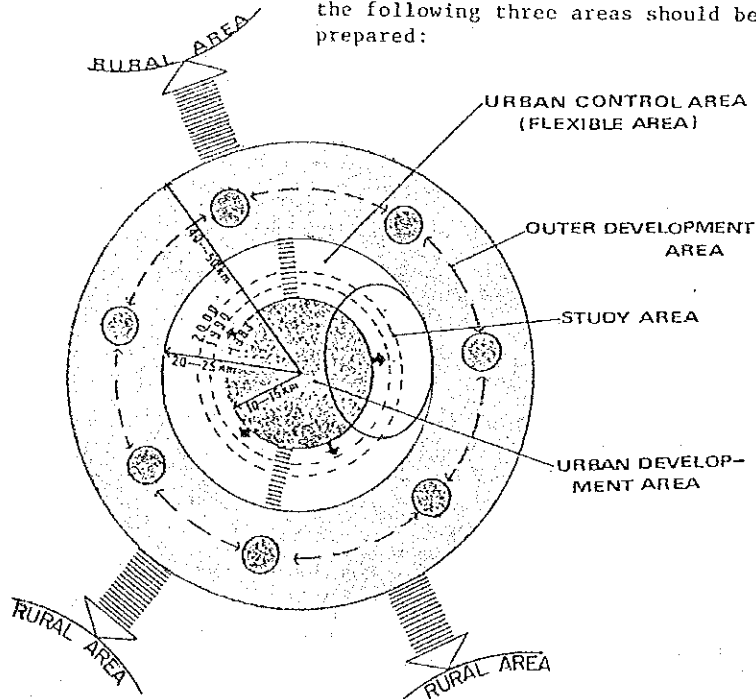


FIG. 8.3 (1)

Urban Development Policy for Bangkok

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

Urban Development Area

Taking into account the economical viewpoints for infrastructure which are immediately desirable, this area should be developed as a high density populated area.

To install the infrastructure immediately, some type of urban development projects such as land re-adjustment projects and re-development projects should be implemented and enforced.

The Administration should take the responsibility for installing the infrastructure in this area.

Urban Control Area

In this Area, any building except farm houses and other special buildings, should not be permitted.

This Area is to be utilized for provision of infrastructure in the Urban Development Area.

The inner boundary adjoining the Urban Development Area will be expanded each 5 or 10 years in relation to the installation of infrastructure in the Urban Development Area

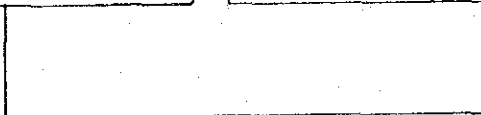
This Area will eventually be phased out.

Outer Development Area

This Area should be developed as industrial area, to absorb workers from rural areas and to control the concentration of population to the Urban Development Area.

Chiefly, self-contained projects such as large industrial and residential estates which are able to install the infrastructure by their own should be permitted.

In this Area, owners who execute self-contained projects should be responsible for the infrastructure.



Development Policy For the Study Area

Under the development policy of Bangkok, the Study Area should be divided into the Urban Development Area and the Urban Control Area targeting for the year of 2000.

FIG. 8.3 (2)

Urban Development Policy for the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

Estimated Population of the Bangkok Metropolis

Year	Method of Estimation			
	Under regression curve (Method A)	Estimated figure from NSO* (Method B)	Estimated figure from DTCP (Method C)	Estimated figure from Chulalongkorn University (Method D)
1980	5,070,000	5,070,000	5,070,000	5,070,000
1990	6,390,000	6,890,000	6,360,000	6,380,000
2000	7,780,000	8,640,000	7,260,000	7,640,000

(Medium figure is adopted)

Bangkok Metropolis	
1980	5,070,000
1990	6,400,000
2000	7,700,000

Estimated Population of the Study Area

Under the development policy, future industrial population is first distributed to the Suburban Area. The remaining population is then distributed to each Area based on the past trend.

Urban Core Area	
1980	390,000
1990	320,000
2000	270,000

Core Fringe Area	
1980	2,580,000
1990	2,840,000
2000	3,070,000

Suburban Area	
Study Area	Remaining Area
1980 1,160,000	1980 940,000
1990 1,790,000	1990 1,450,000
2000 2,500,000	2000 1,860,000

District Name

- . Phra Nakhon
- . Pom Prap
- . Sam Phan Thawong

District Name

- . Patum Wan
- . Bang Rak
- . Yannawa
- . Dusit
- . Phayathai
- . Thonburi
- . Klong San
- . Bangkok Noi
- . Bangkok Yai

(Summary Table)

Area	1980	1990	2000
Bangkok Metropolis	5,070,000	6,400,000	7,700,000
Study Area	1,160,000	1,790,000	2,500,000

*NSO : National Statistical Office, DTCP ; Department of Town and Country Planning

FIG. 8.4(1) Estimation of Population within the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

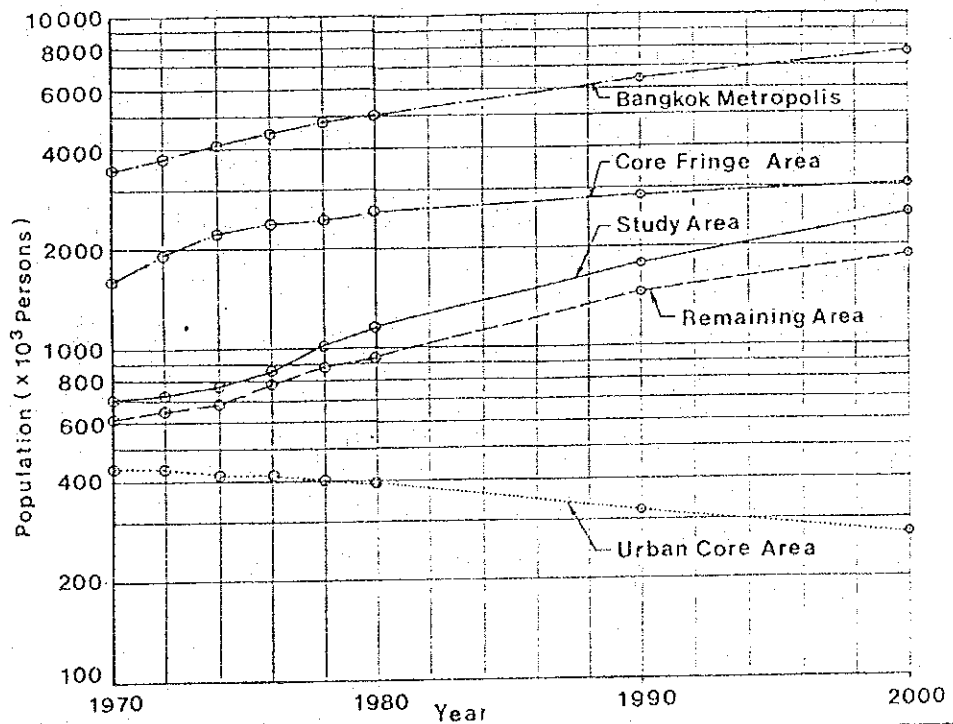
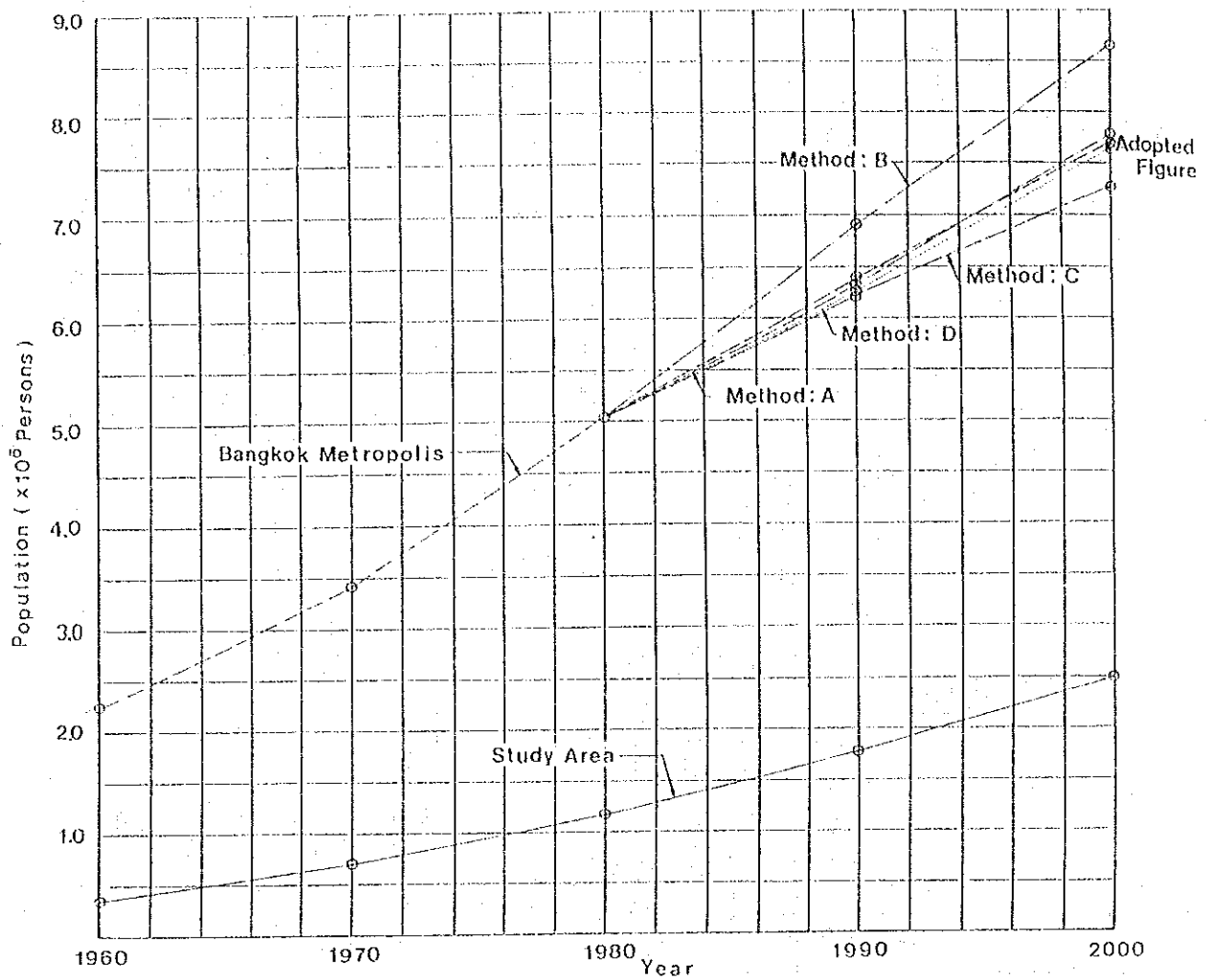


FIG. 8. 4(2) Future Population in the Study Area in the Year 2000

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

Method 1 : Estimation of the relationship between the existing population density and the built-up proportion in the Districts.

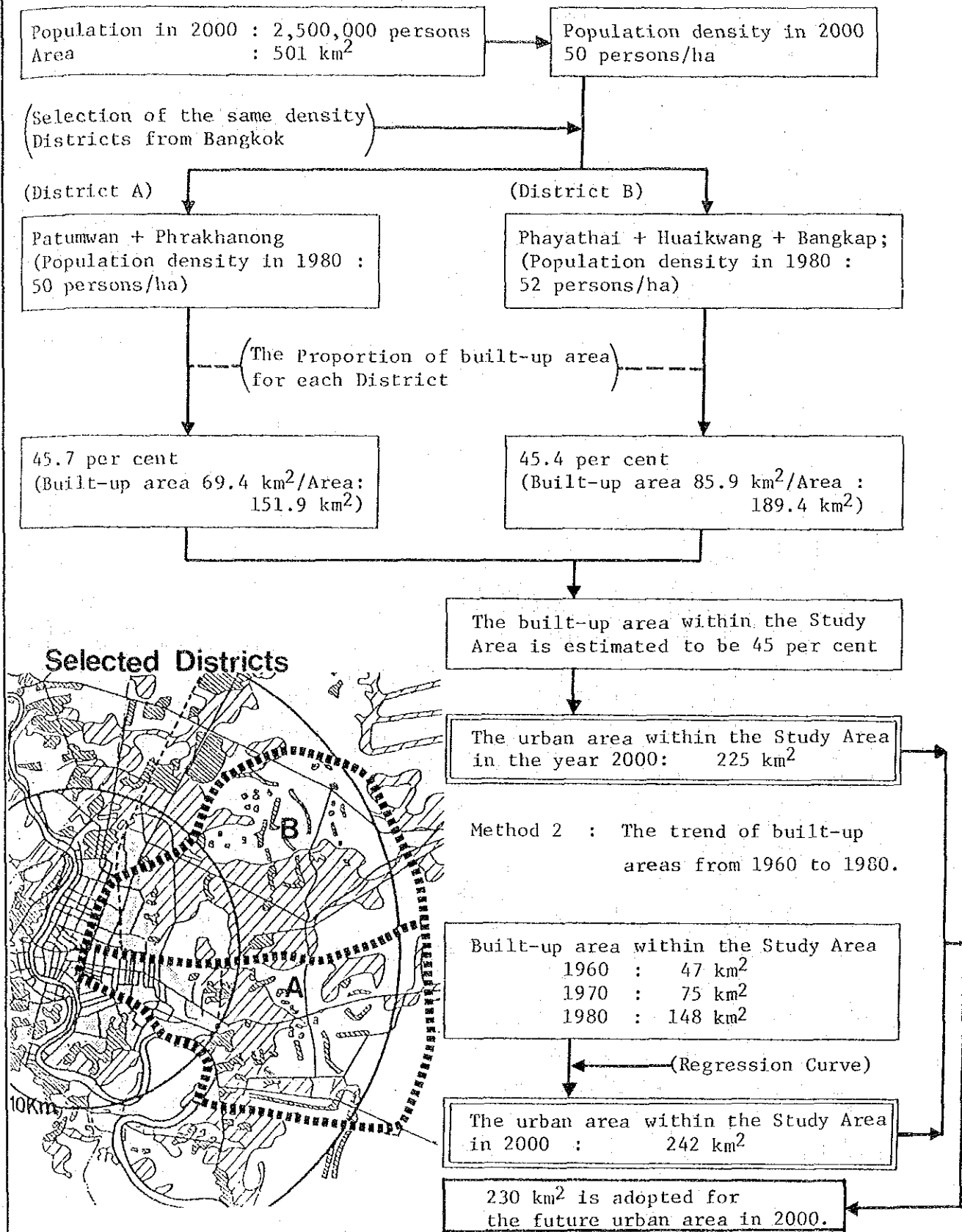
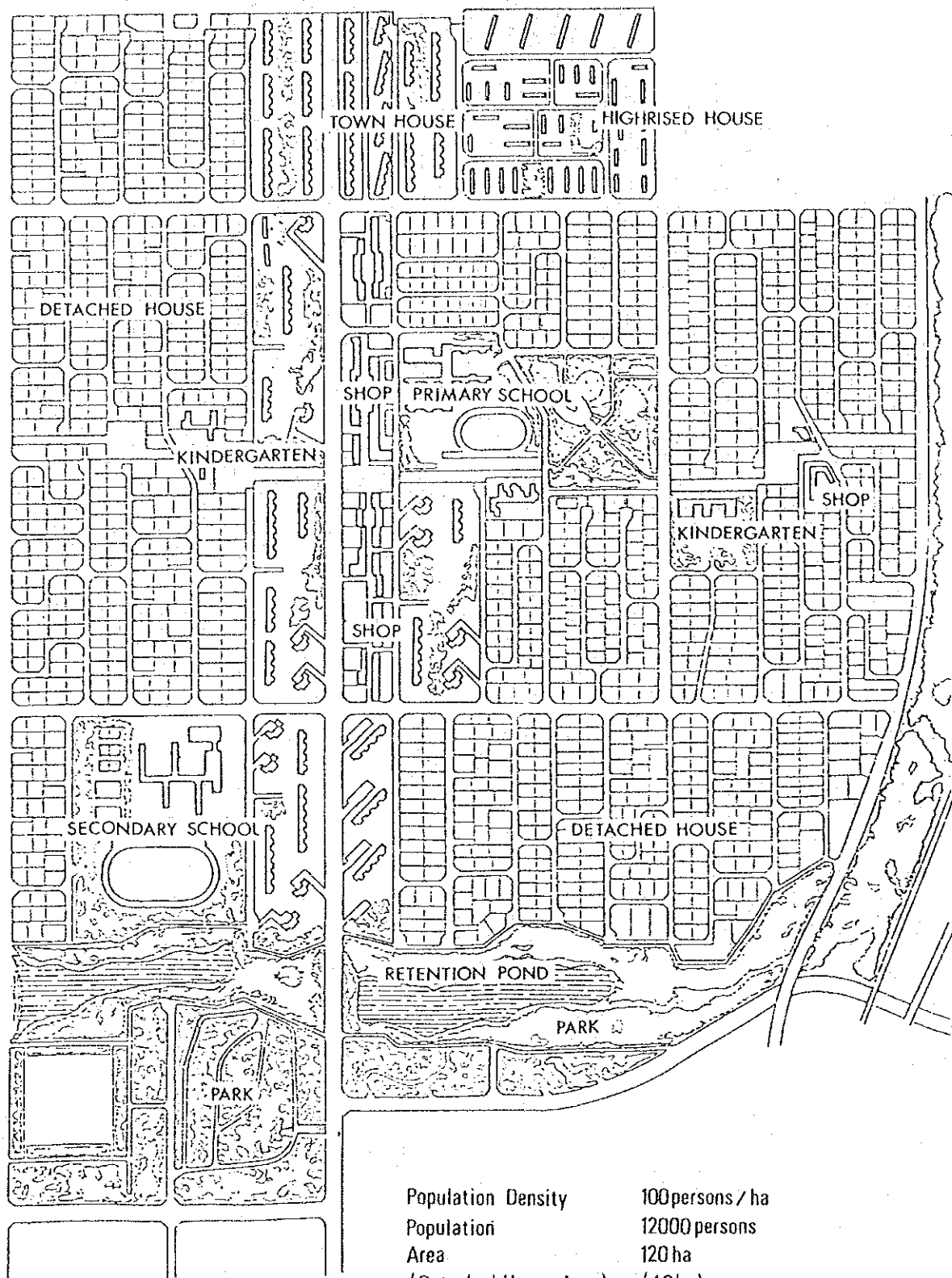


FIG. 8.5

Estimation of Urban Area within the Study Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK



0 100 200 m

Population Density	100persons / ha
Population	12000 persons
Area	120 ha
(Detached House Area)	(40ha)
(Other House Area)	(20ha)
(Others)	(60ha)
House Unit	2300 units
(Detached House)	(1200 units)
(Other House)	(1100 units)

FIG. 8.6

Example of the Housing Estate (with 100 ^{Persons}/_{Hectare}) in the Proposed Master Plan Area

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

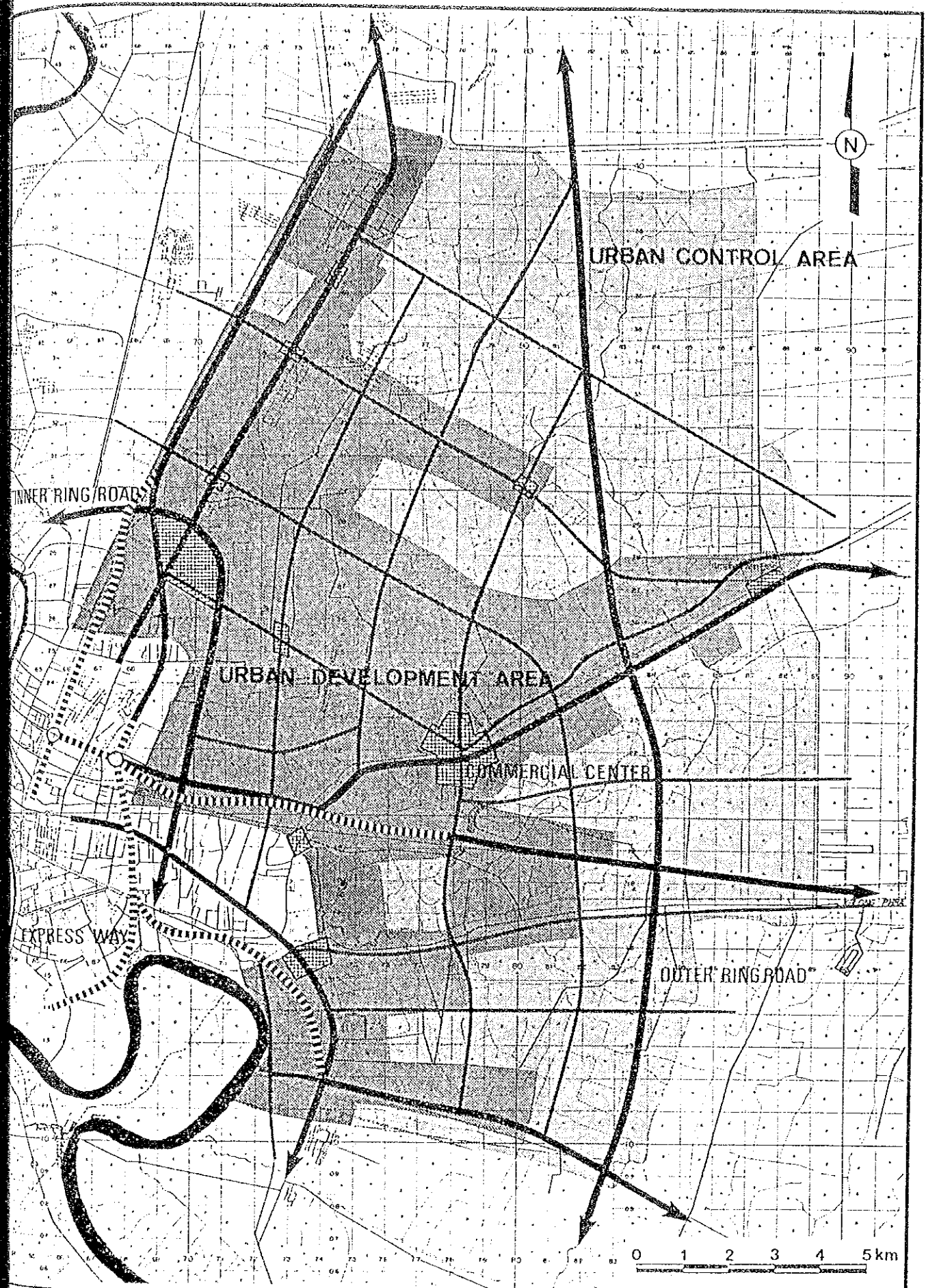


FIG. 8.7

Urban Development Area and Urban Area
in the Year 2000

FLOOD PROTECTION/DRAINAGE PROJECT IN EASTERN SUBURBAN-BANGKOK

