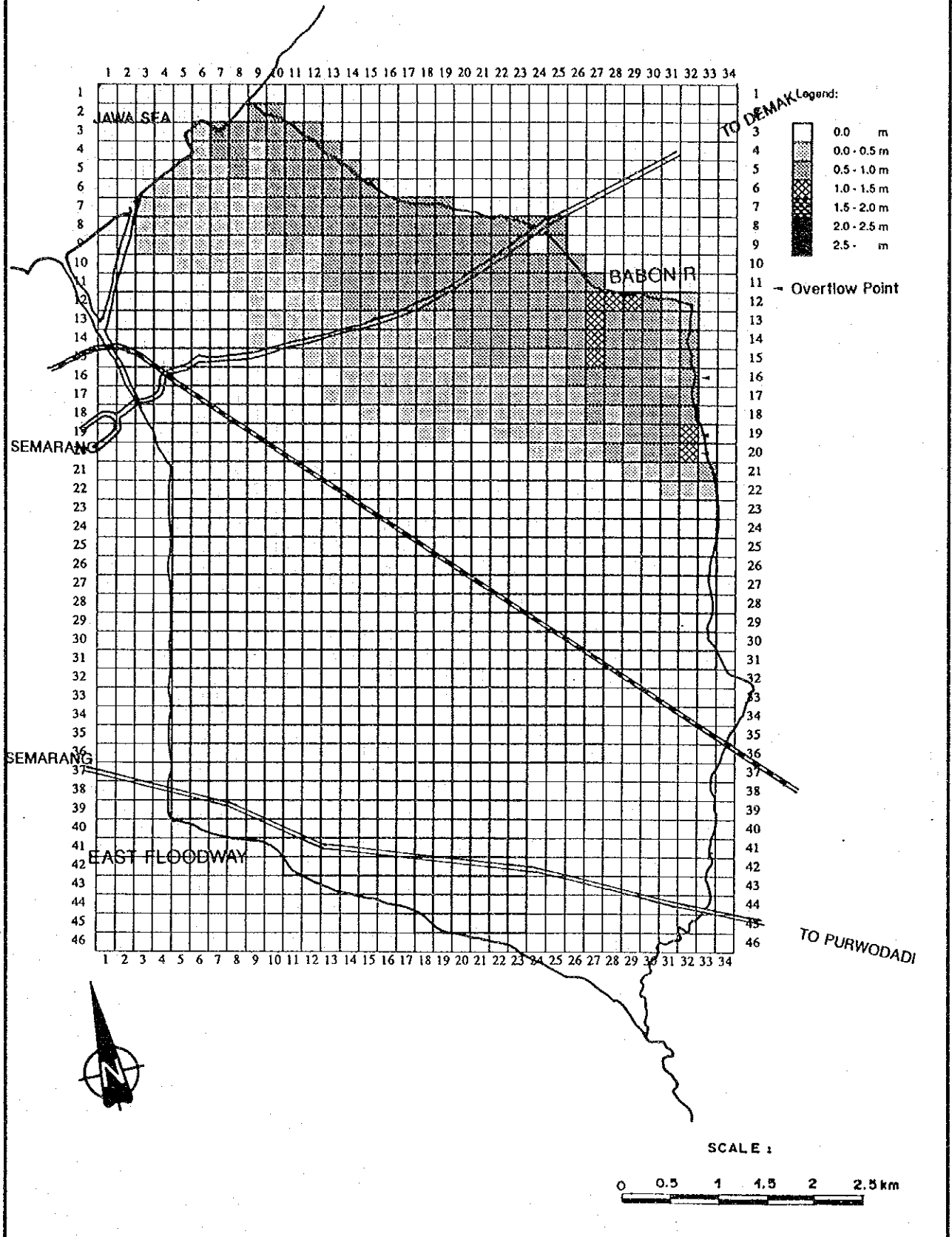


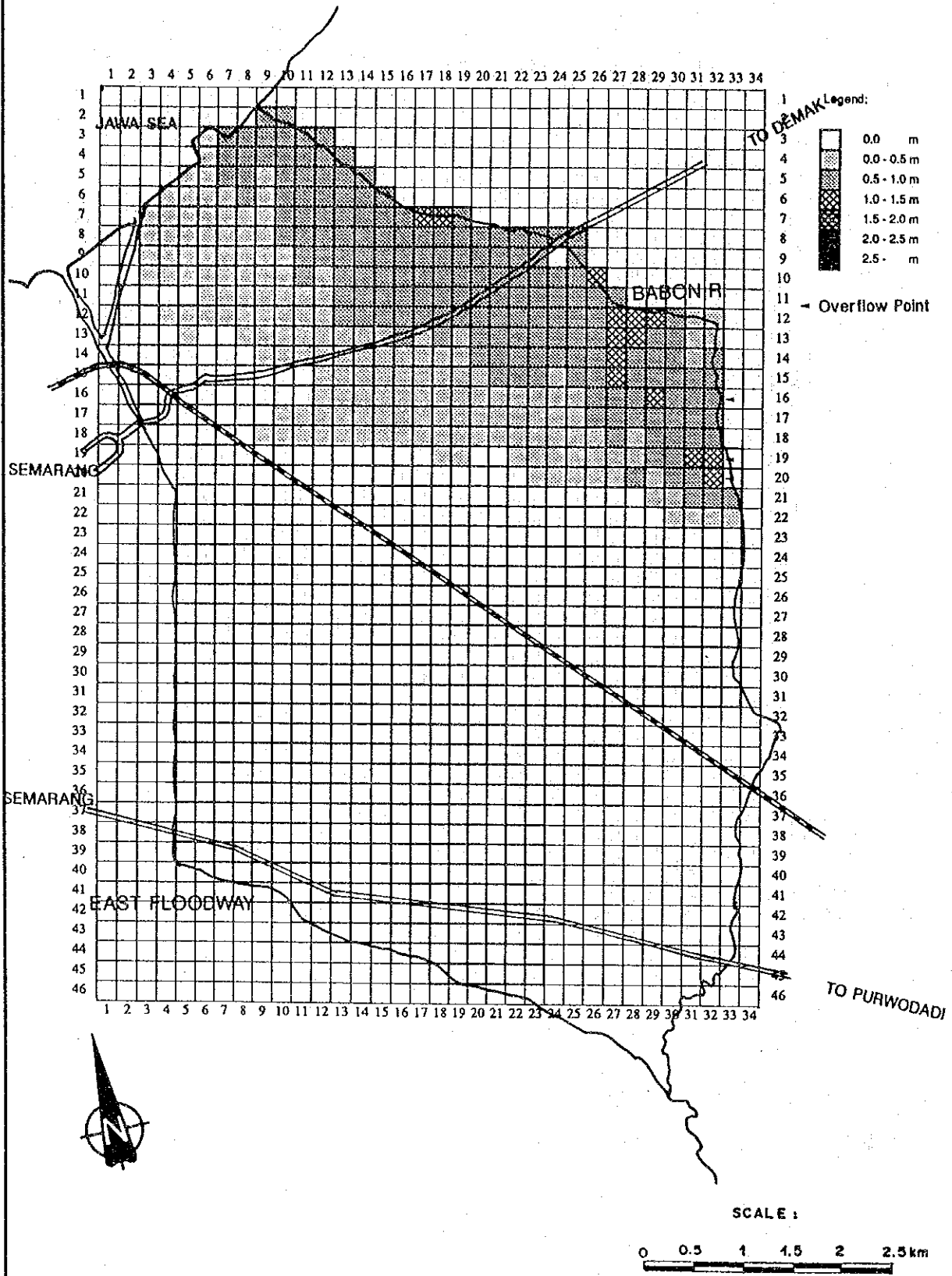
Babon, 25 year



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Fig. 4.9 (3/5)  
 PROBABLE INUNDATION AREA OF BABON RIVER  
 (25-YEAR RETURN PERIOD)

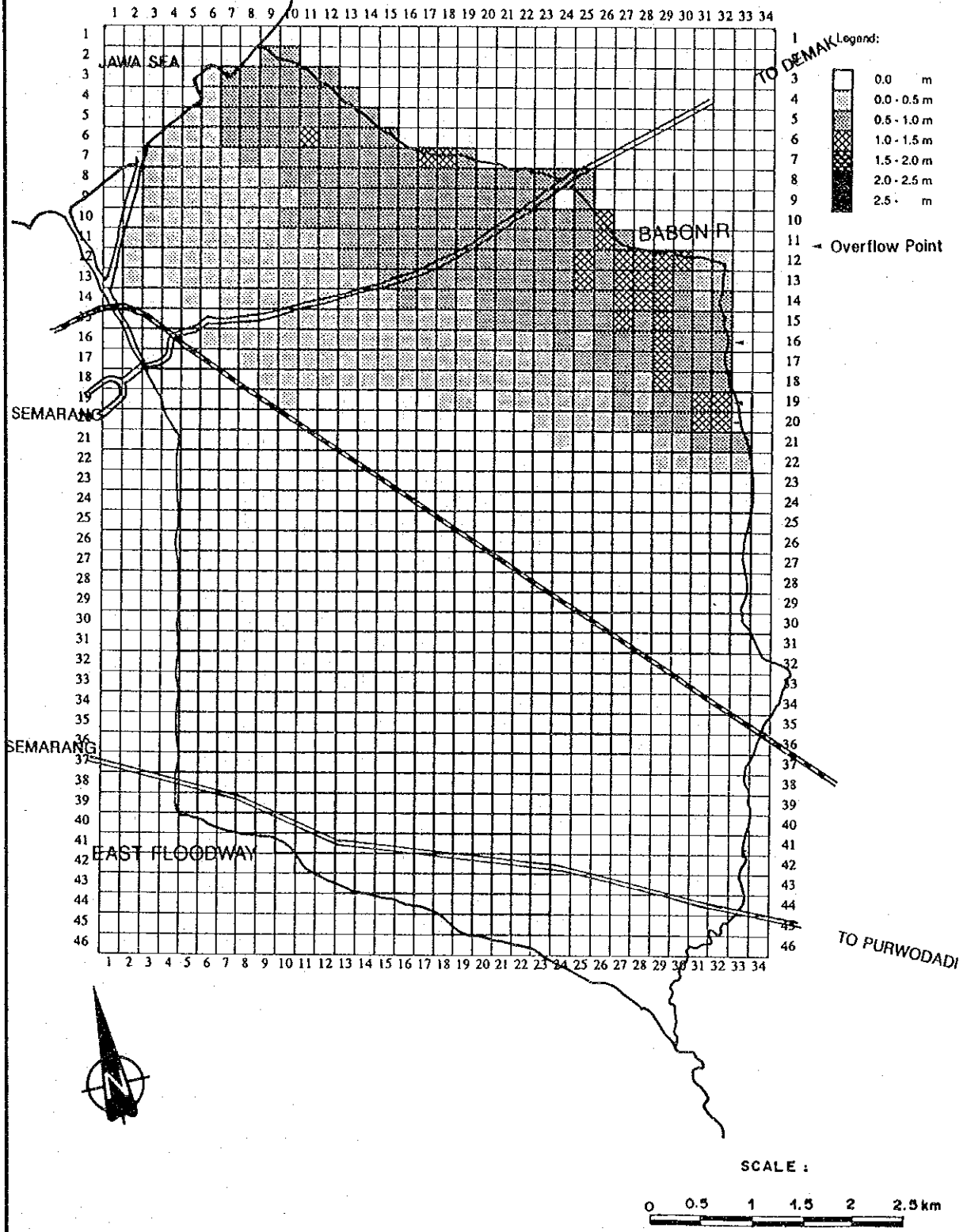
Babon, 50 year



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Fig. 4.9 (4/5)  
PROBABLE INUNDATION AREA OF BABON RIVER  
(50-YEAR RETURN PERIOD)

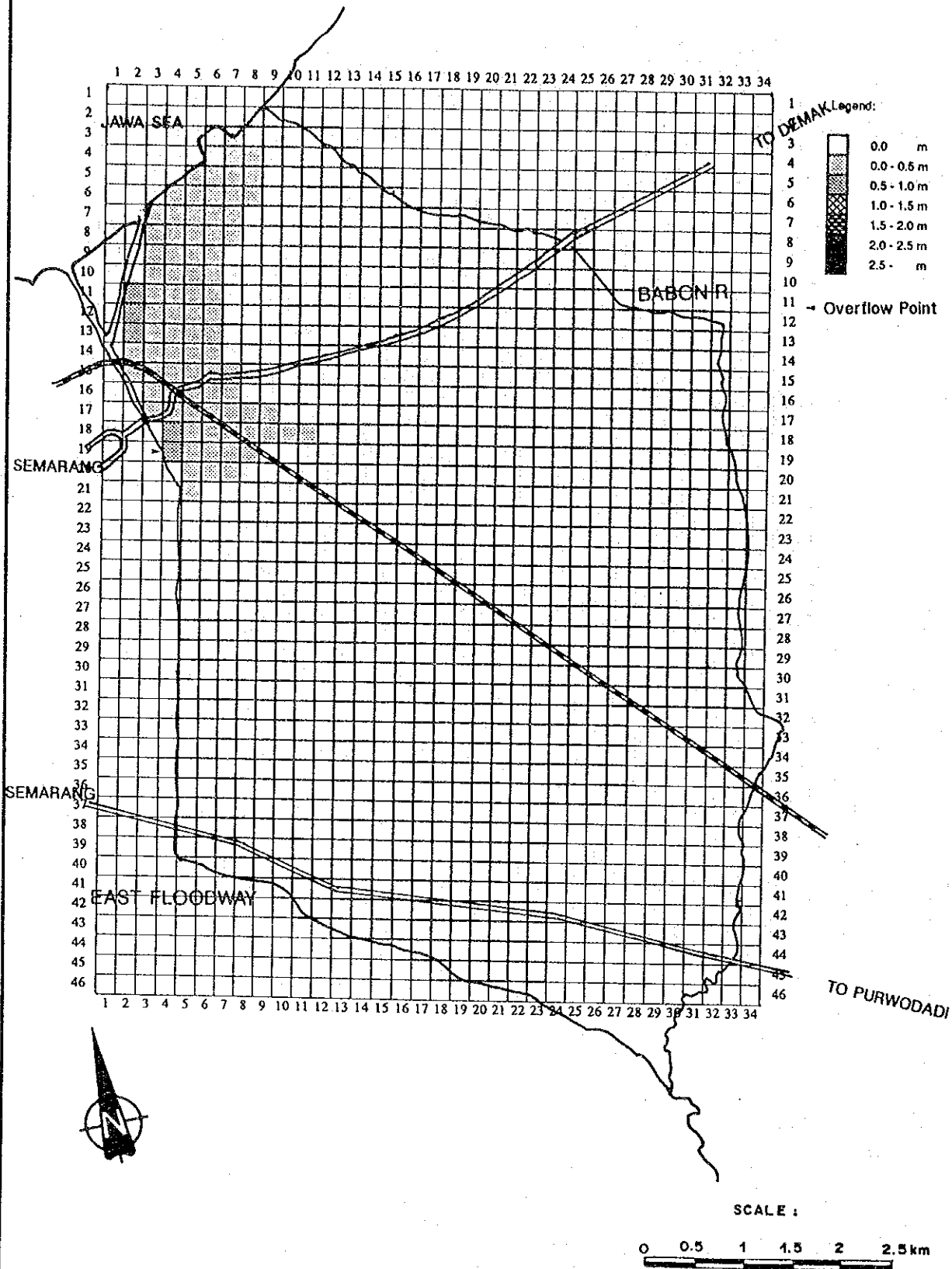
Babon, 100 year



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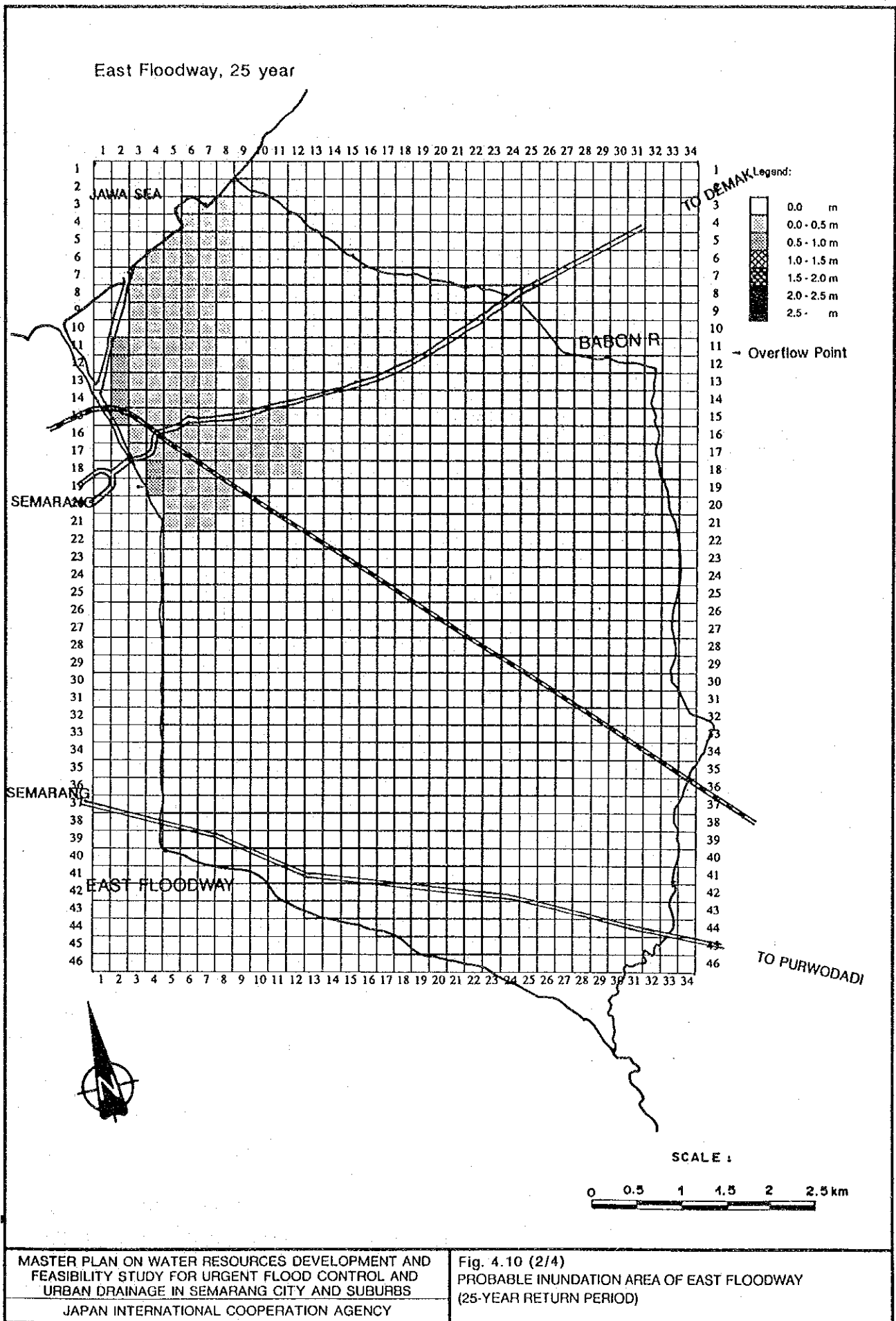
Fig. 4.9 (5/5)  
 PROBABLE INUNDATION AREA OF BABON RIVER  
 (100-YEAR RETURN PERIOD)

East Floodway, 10 year

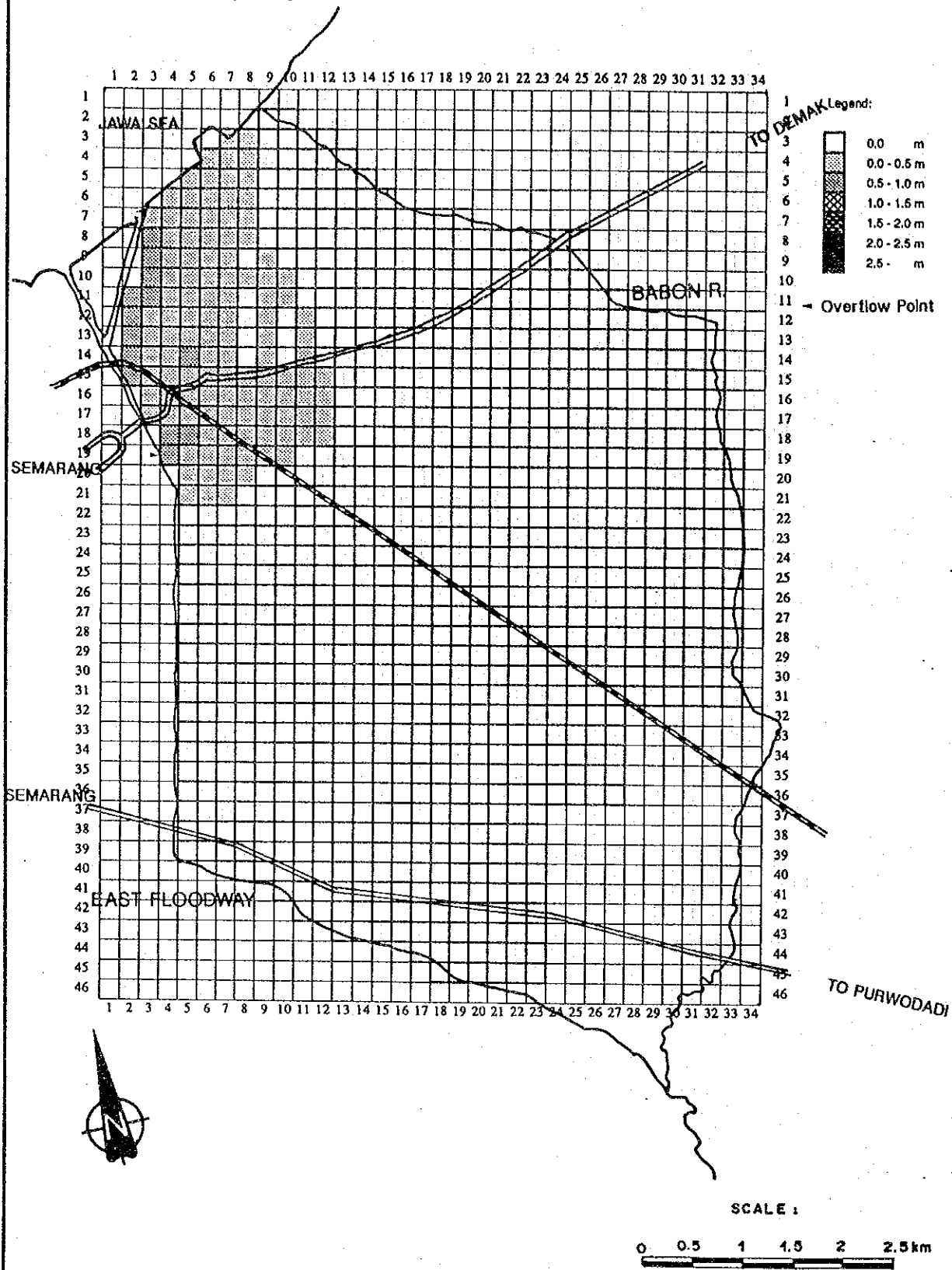


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Fig. 4.10 (1/4)  
 PROBABLE INUNDATION AREA OF EAST FLOODWAY  
 (10-YEAR RETURN PERIOD)



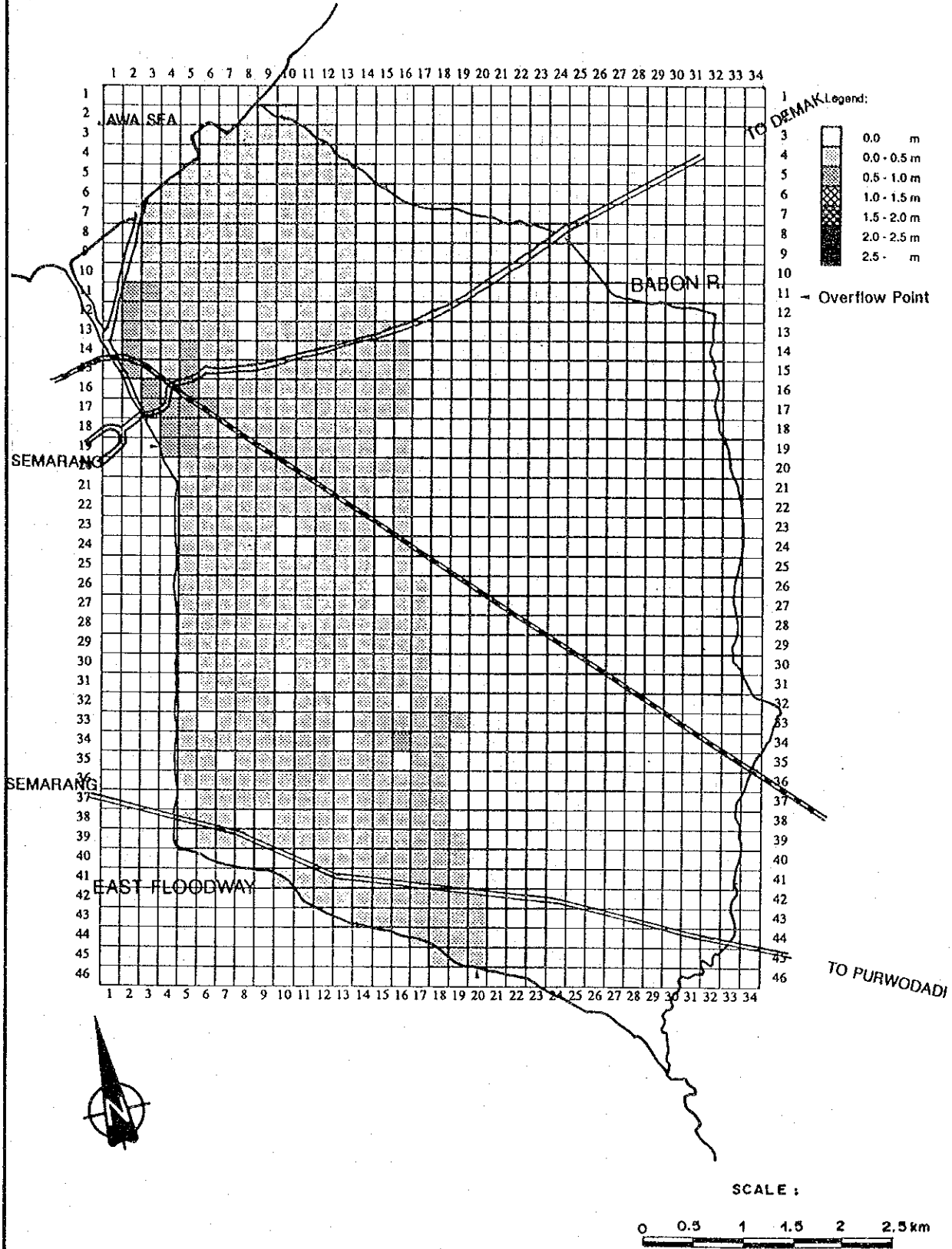
East Floodway, 50 year



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URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 4.10 (3/4)  
PROBABLE INUNDATION AREA OF EAST FLOODWAY  
(50-YEAR RETURN PERIOD)

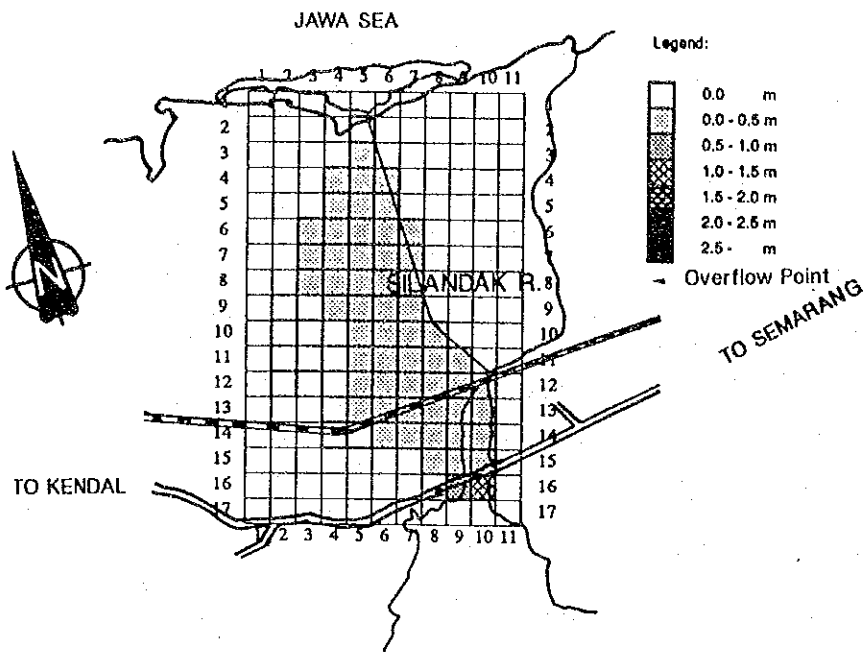
East Floodway, 100 year



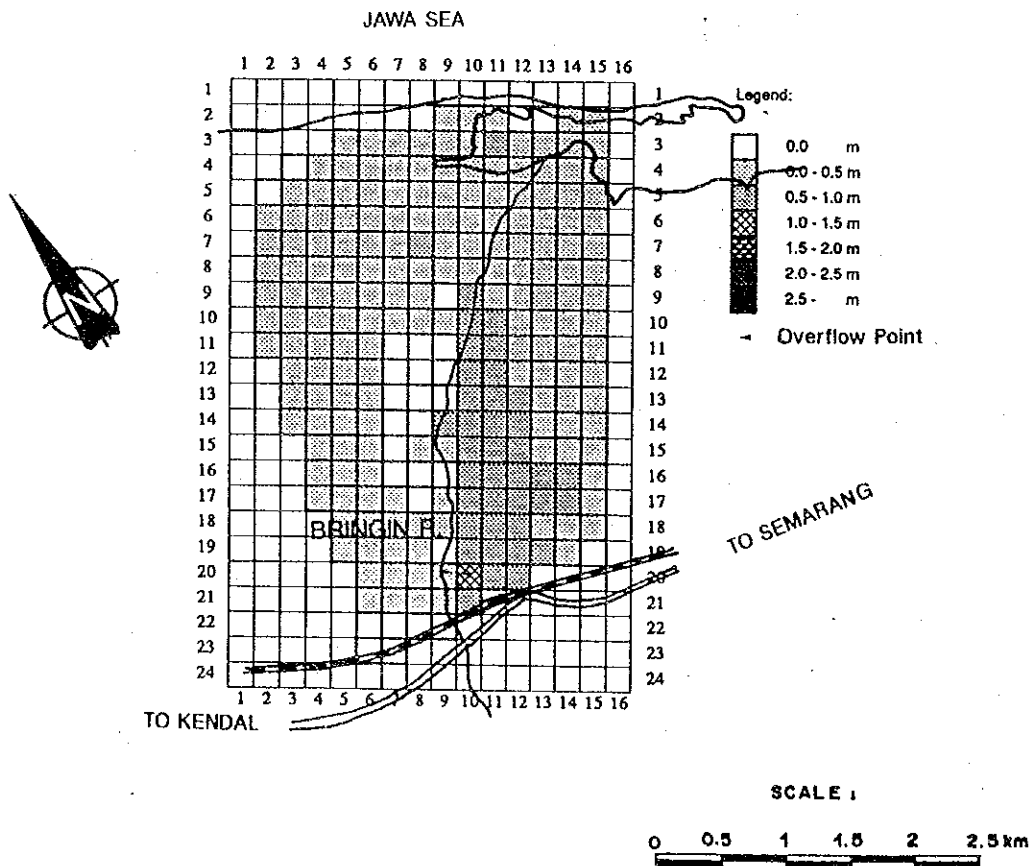
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Fig. 4.10 (4/4)  
 PROBABLE INUNDATION AREA OF EAST FLOODWAY  
 (100-YEAR RETURN PERIOD)

Silandak, 5 year

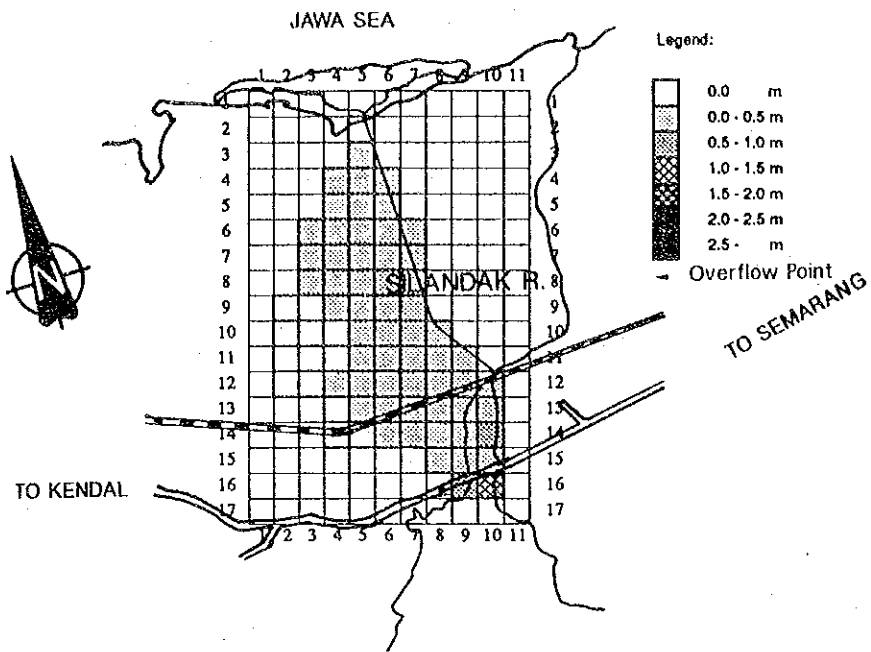


Bringin, 5 year

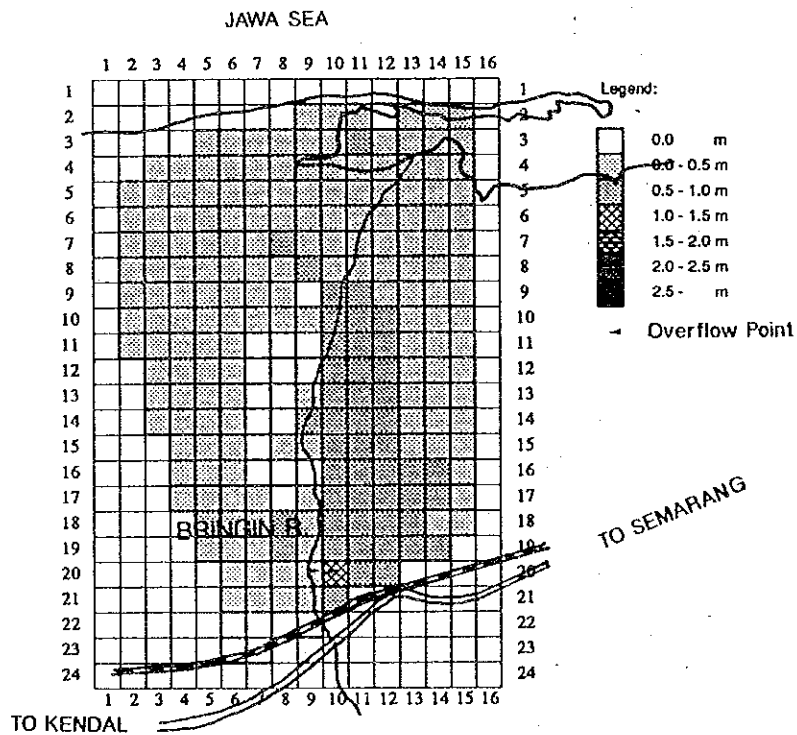




Silandak, 10 year



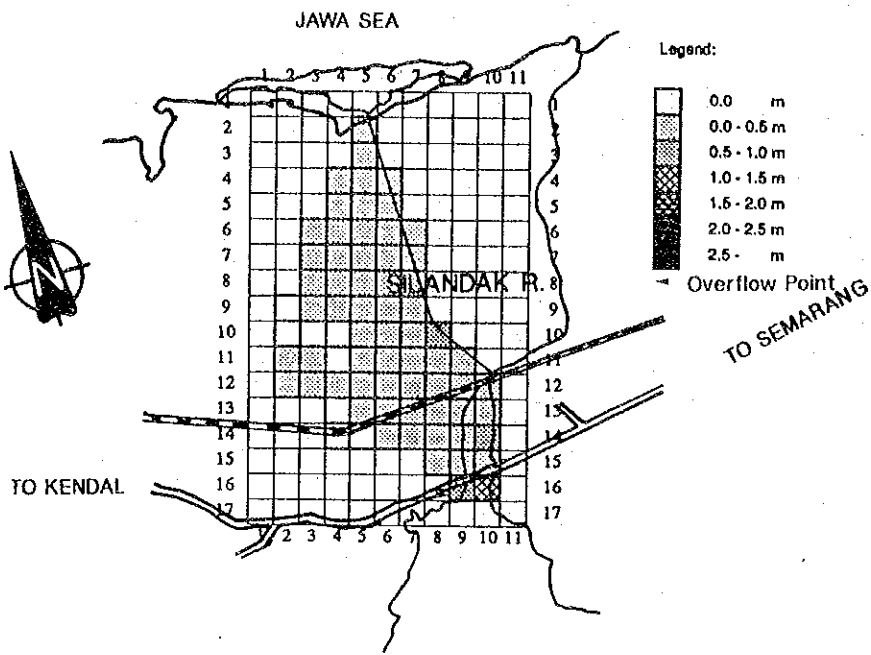
Bringin, 10 year



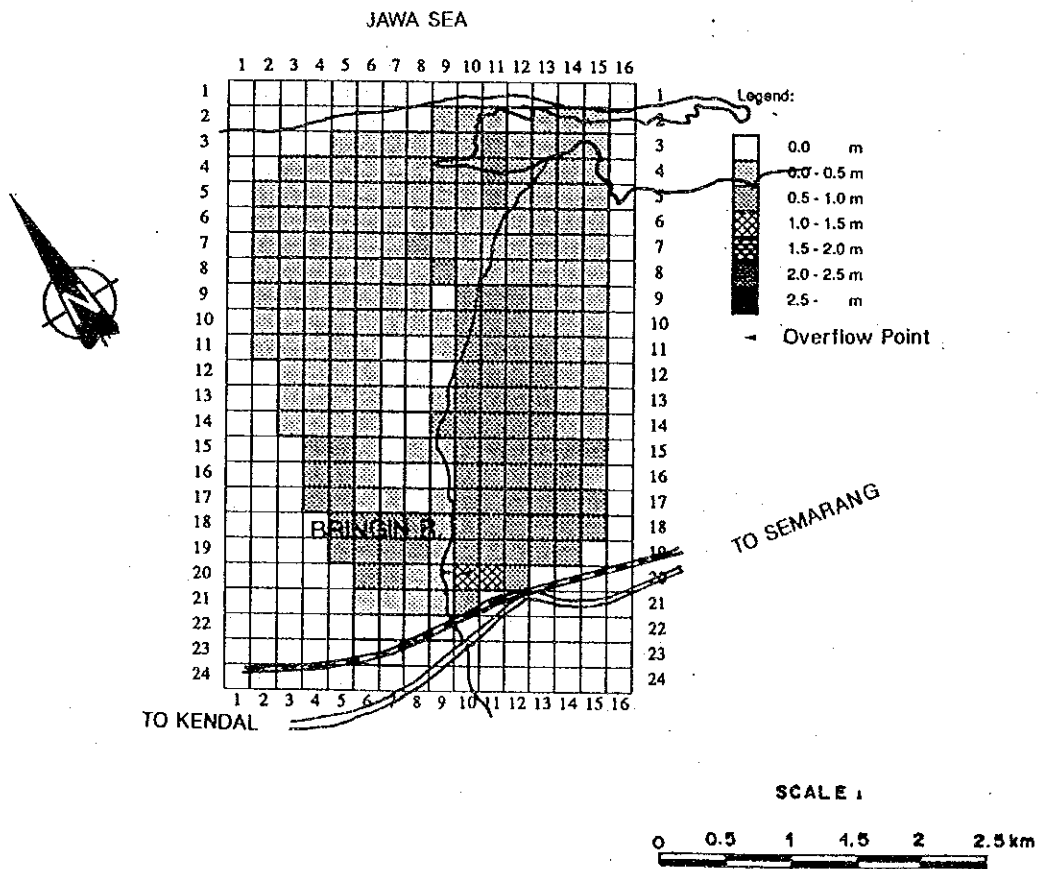
SCALE :



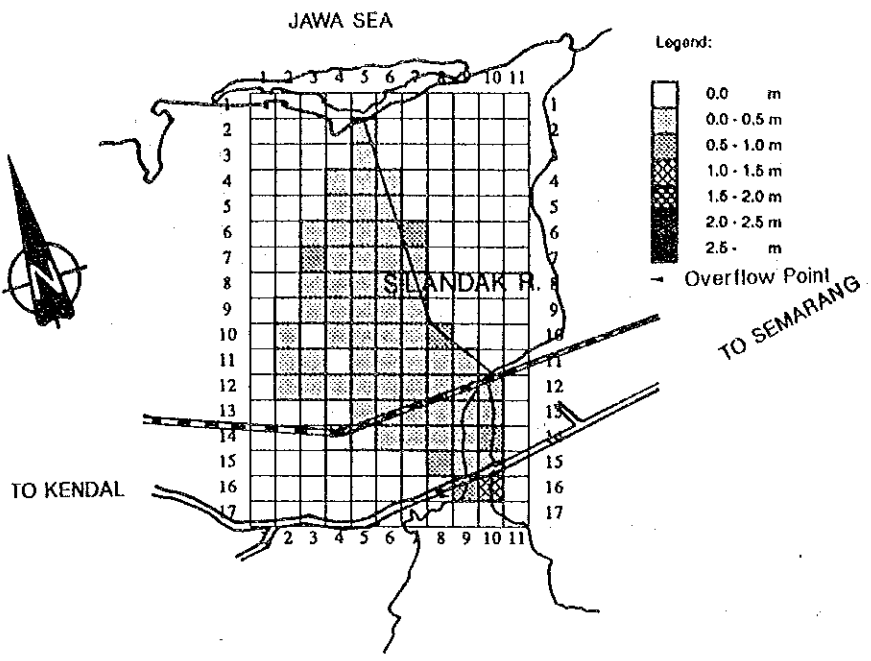
Silandak, 25 year



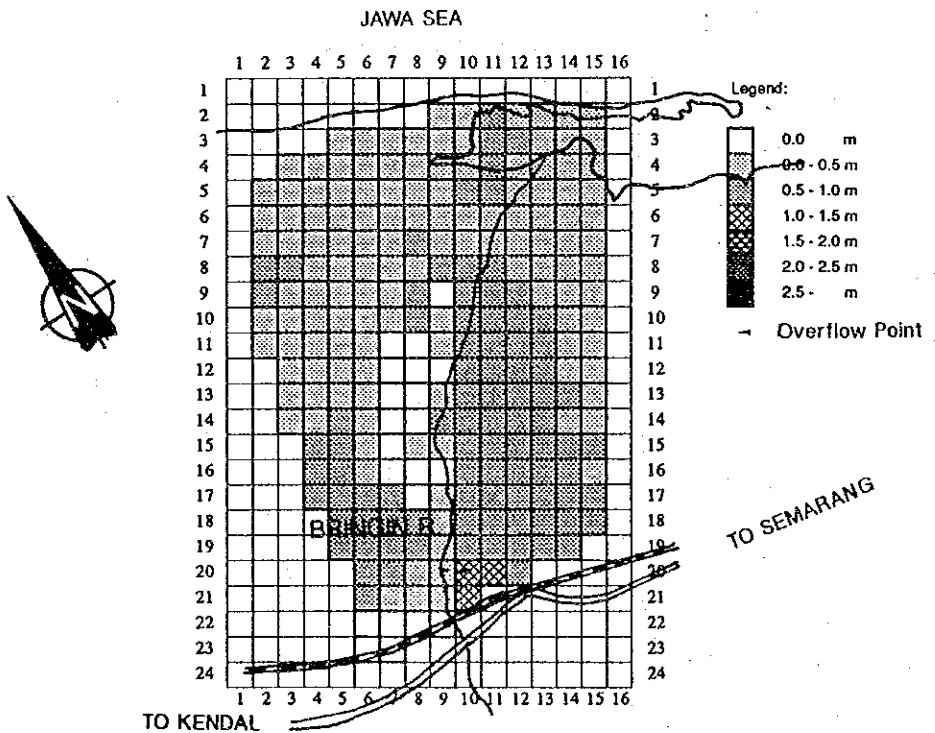
Bringin, 25 year



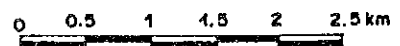
Silandak, 50 year



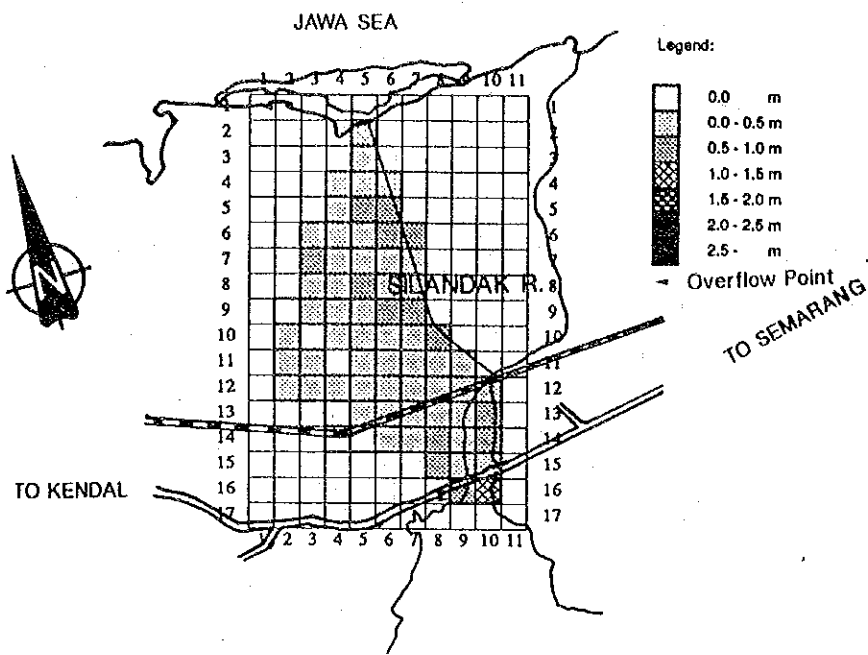
Bringin, 50 year



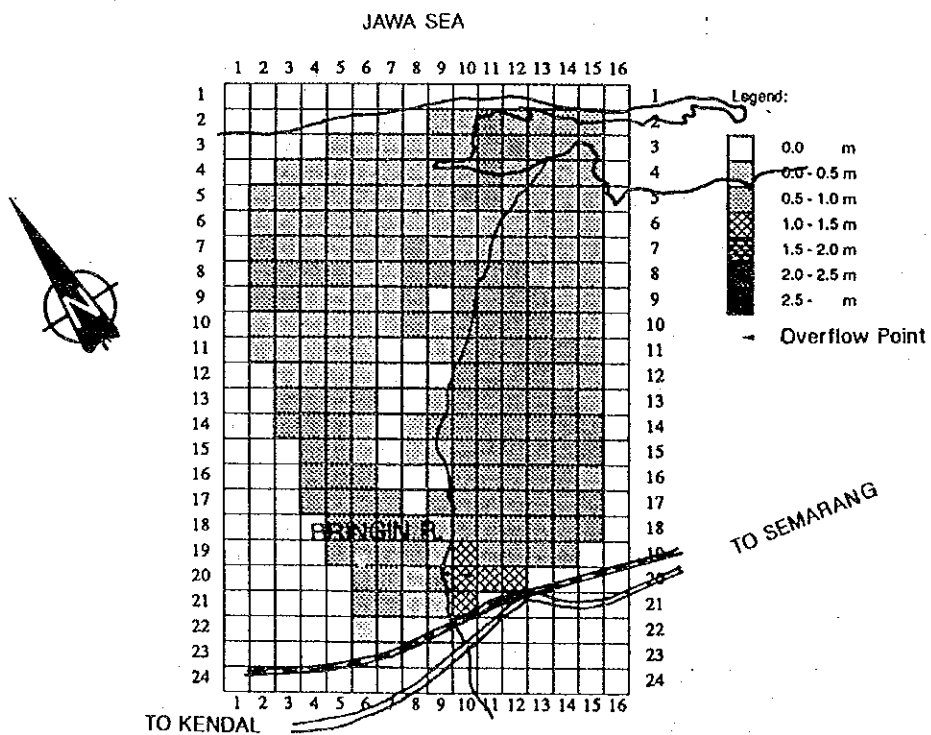
SCALE :



Silandak, 100 year

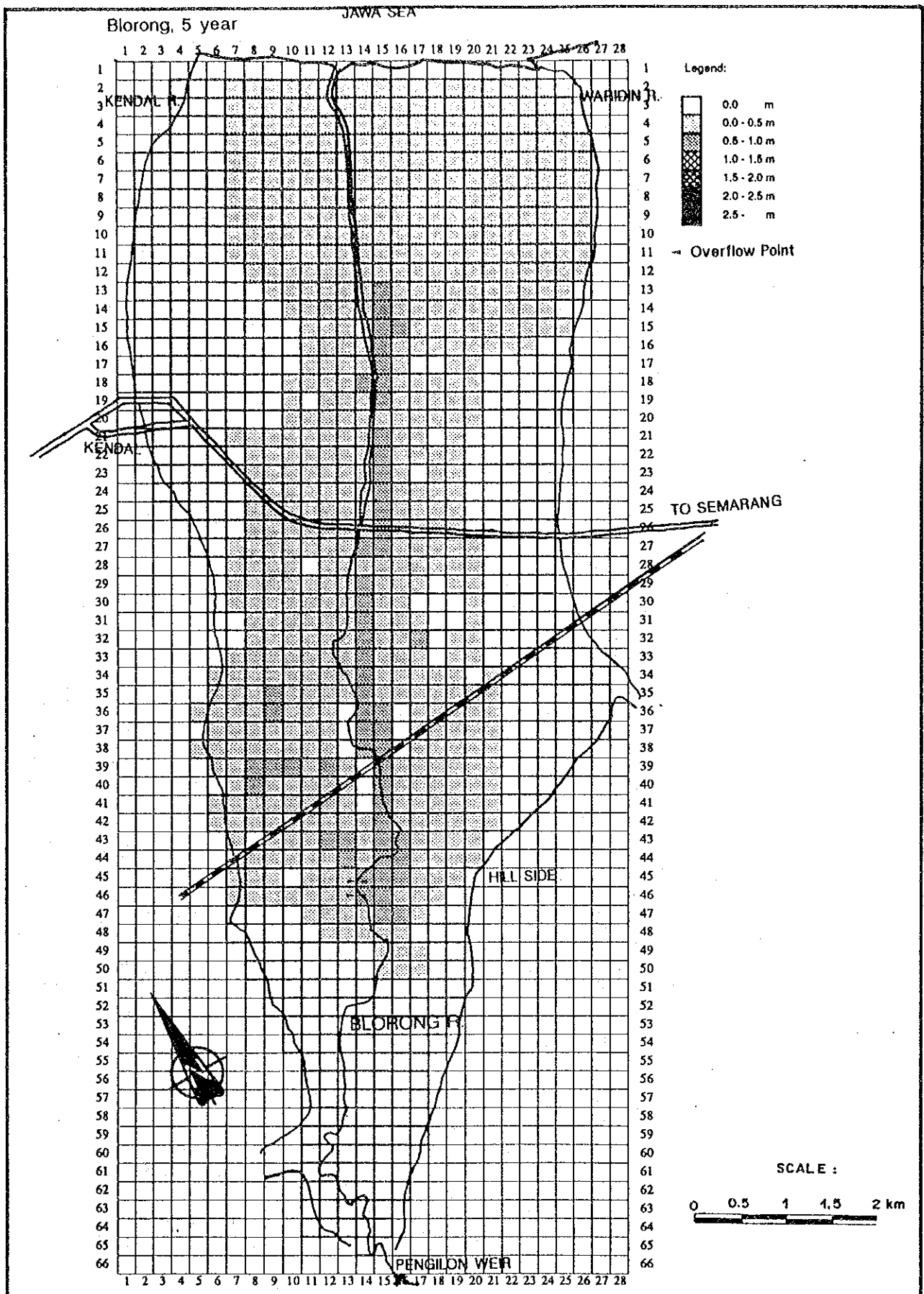


Bringin, 100 year



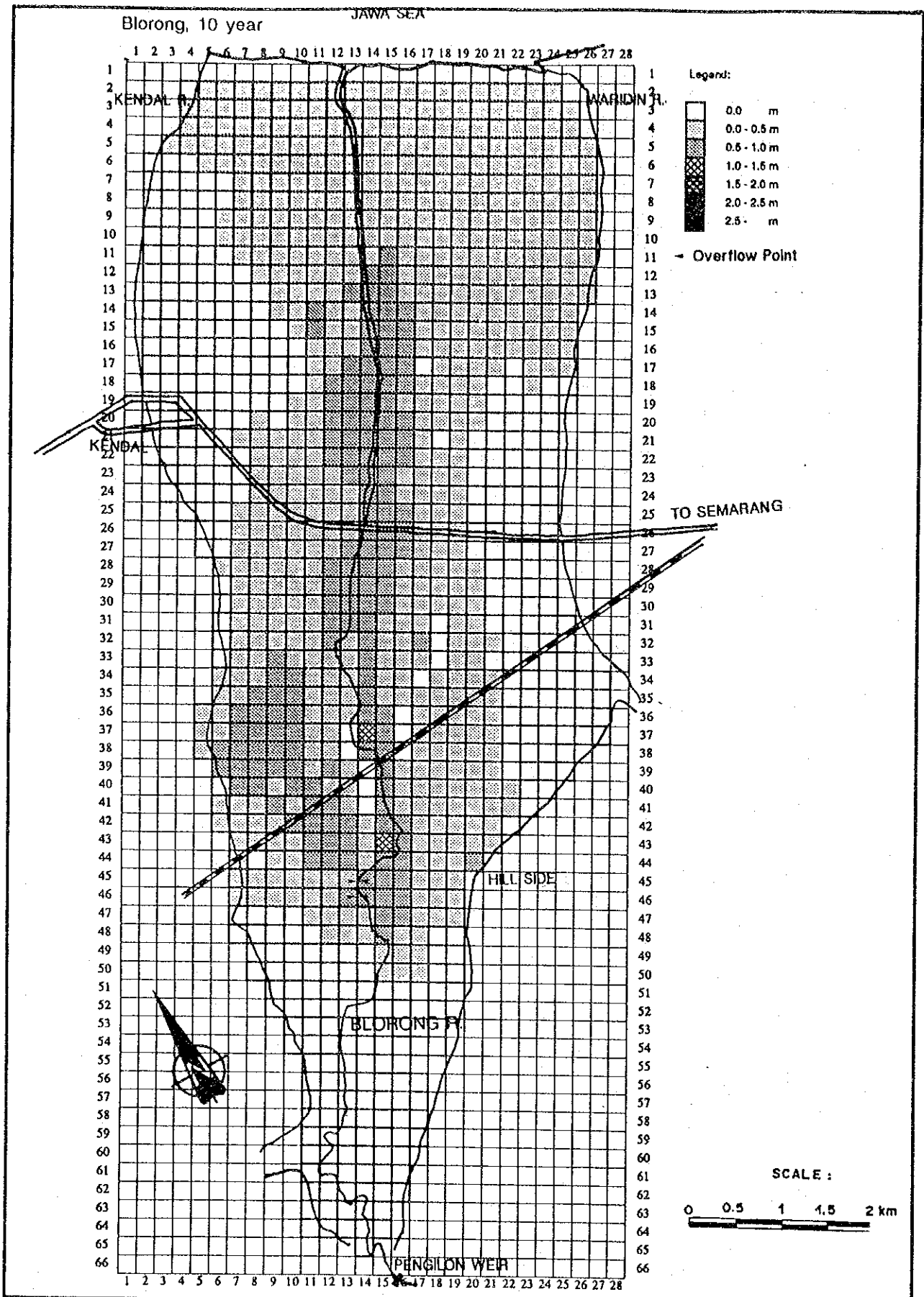
SCALE :





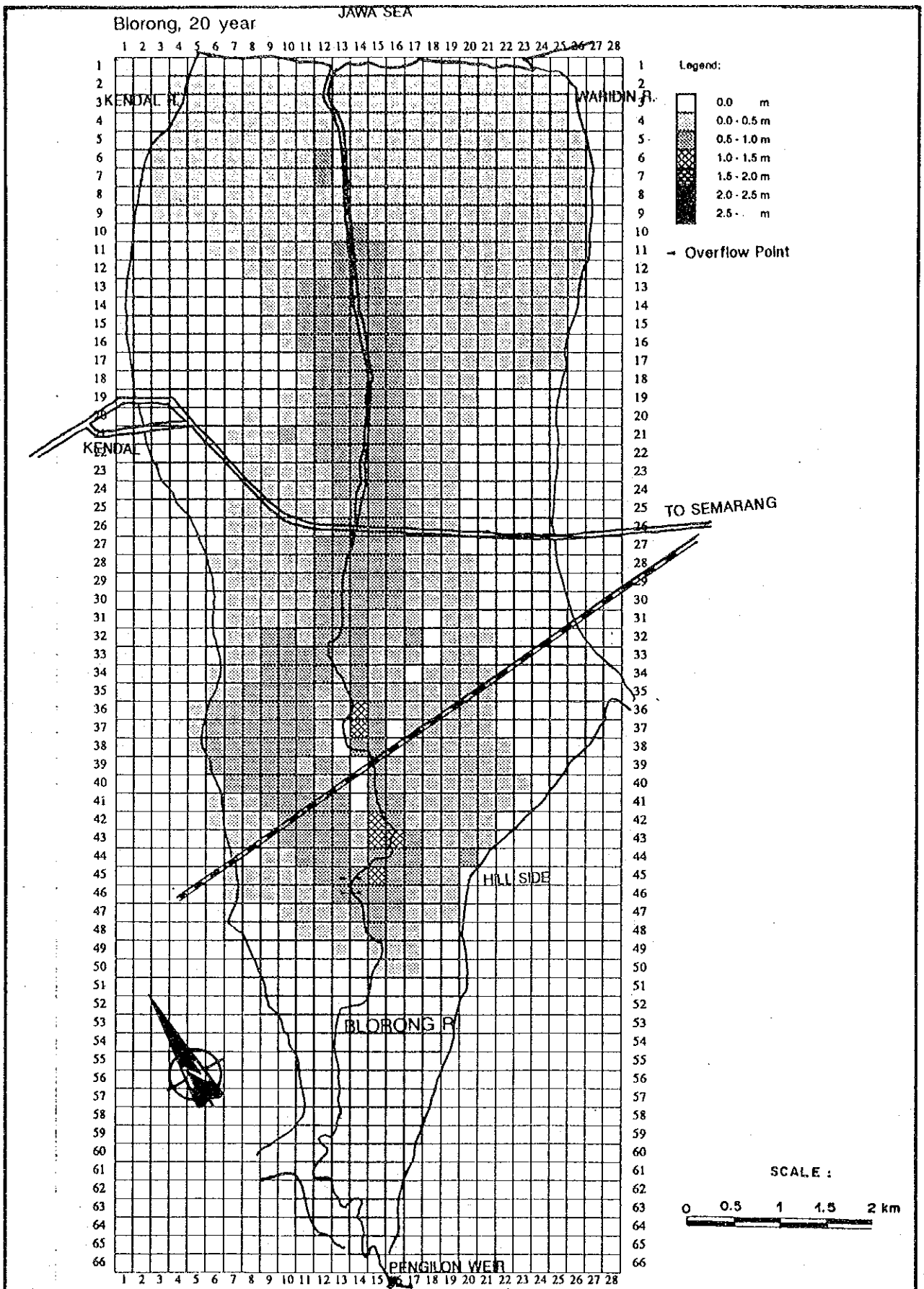
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Fig. 4.12 (1/6)  
PROBABLE INUNDATION AREA OF BLORONG RIVER  
(5-YEAR RETURN PERIOD)



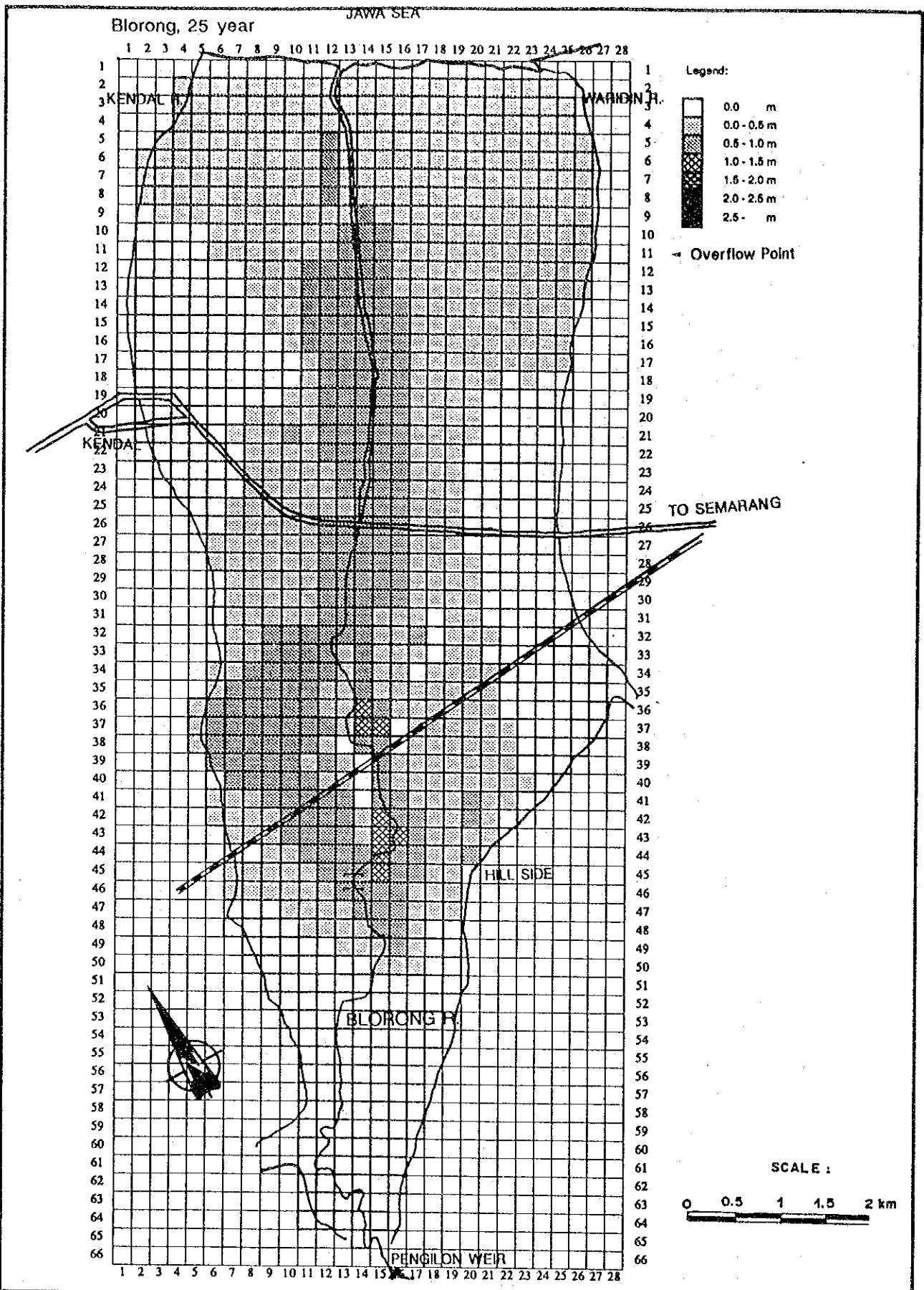
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Fig. 4.12 (2/6)  
 PROBABLE INUNDATION AREA OF BLORONG RIVER  
 (10-YEAR RETURN PERIOD)



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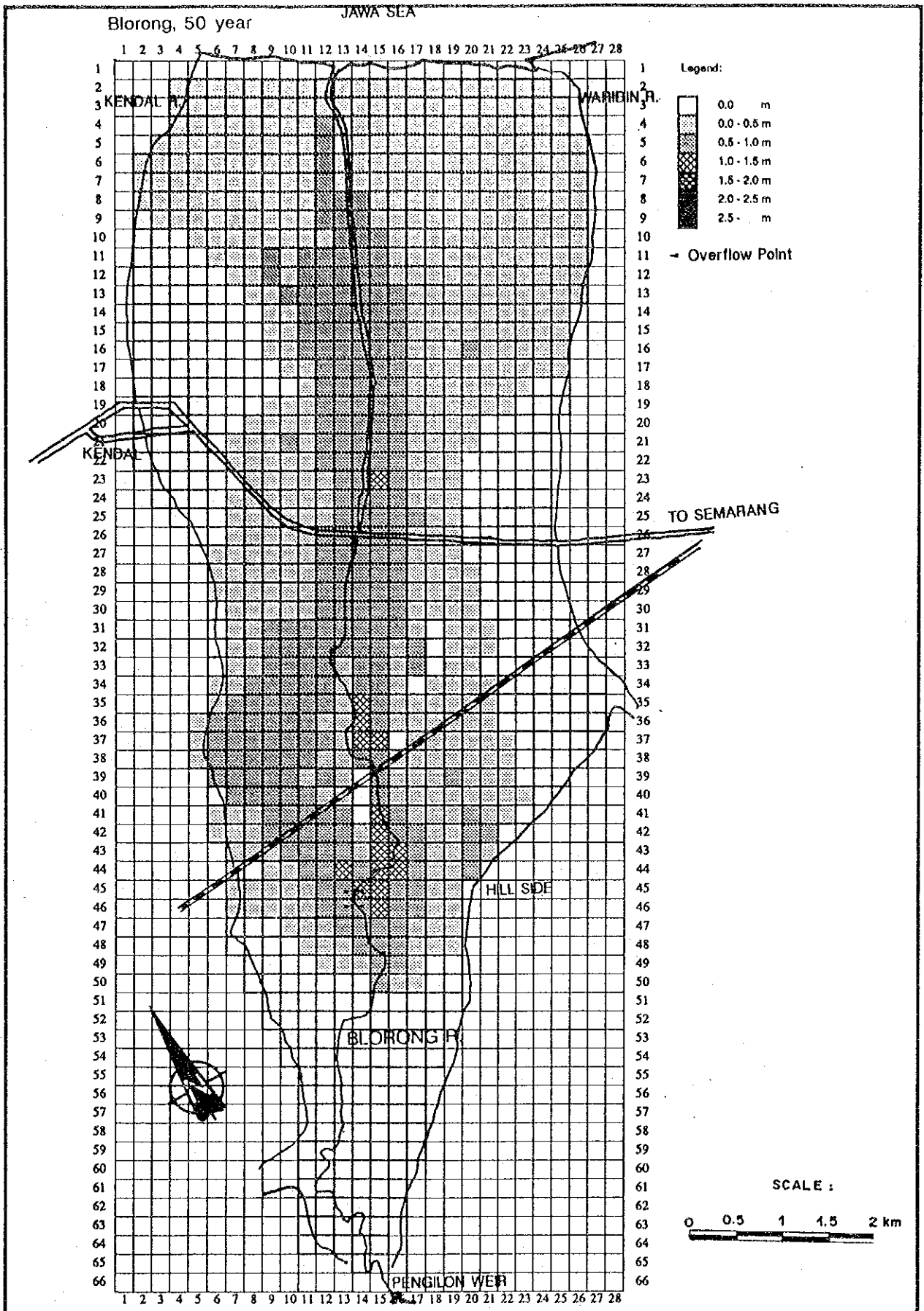
Fig. 4.12 (3/6)  
 PROBABLE INUNDATION AREA OF BLORONG RIVER  
 (20-YEAR RETURN PERIOD)



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 URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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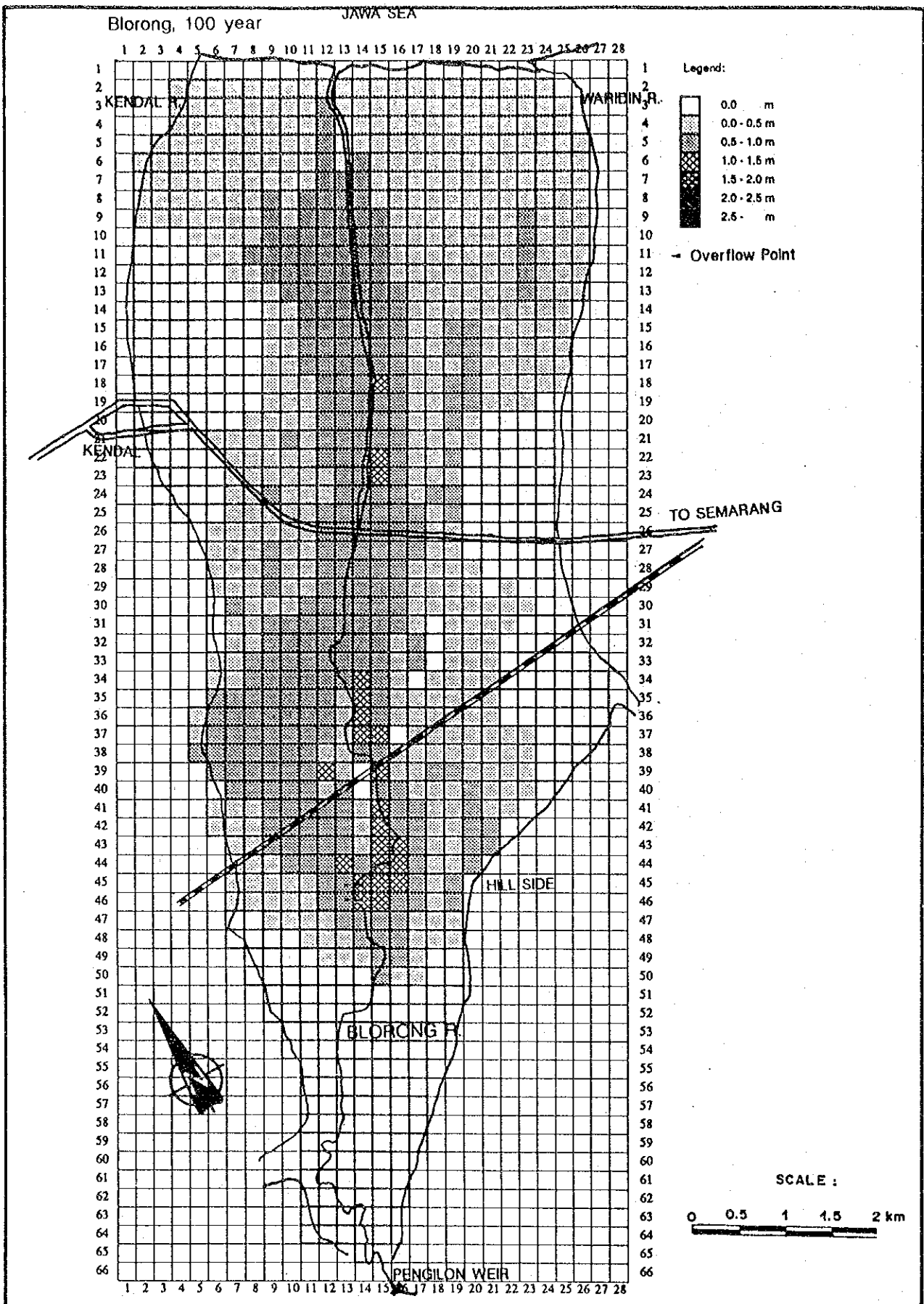
Fig. 4.12 (4/6)  
 PROBABLE INUNDATION AREA OF BLORONG RIVER  
 (25-YEAR RETURN PERIOD)





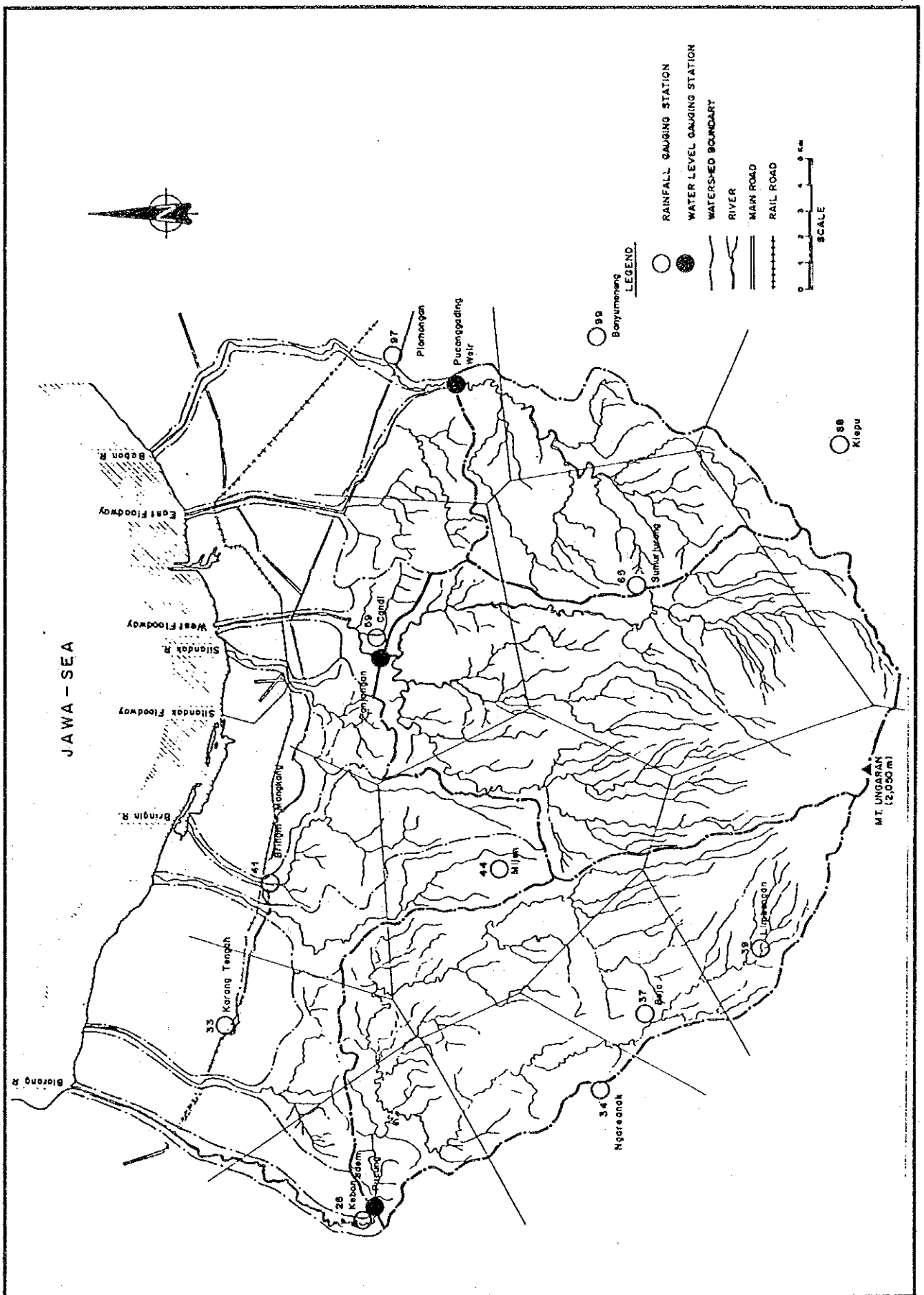
MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND  
FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 4.12 (5/6)  
PROBABLE INUNDATION AREA OF BLORONG RIVER  
(50-YEAR RETURN PERIOD)



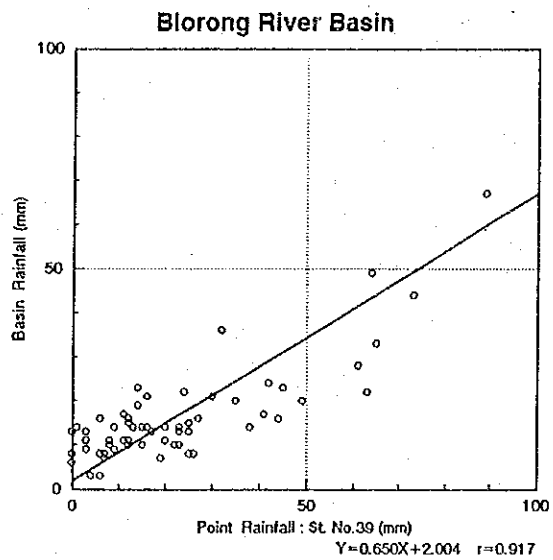
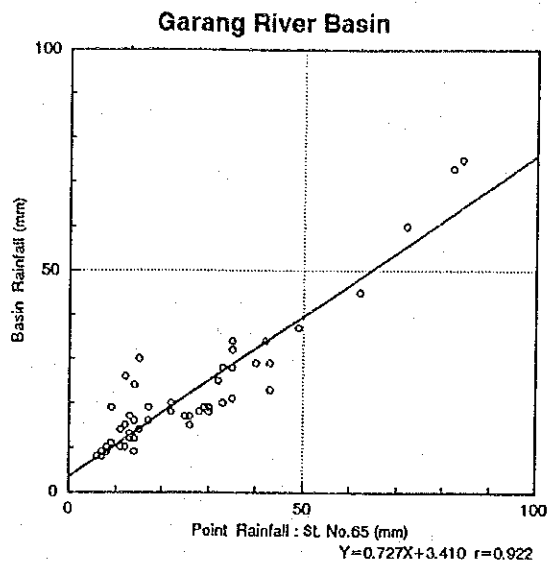
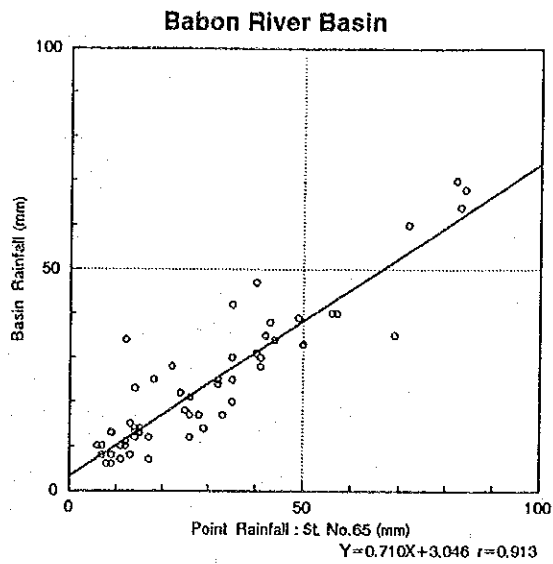
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 URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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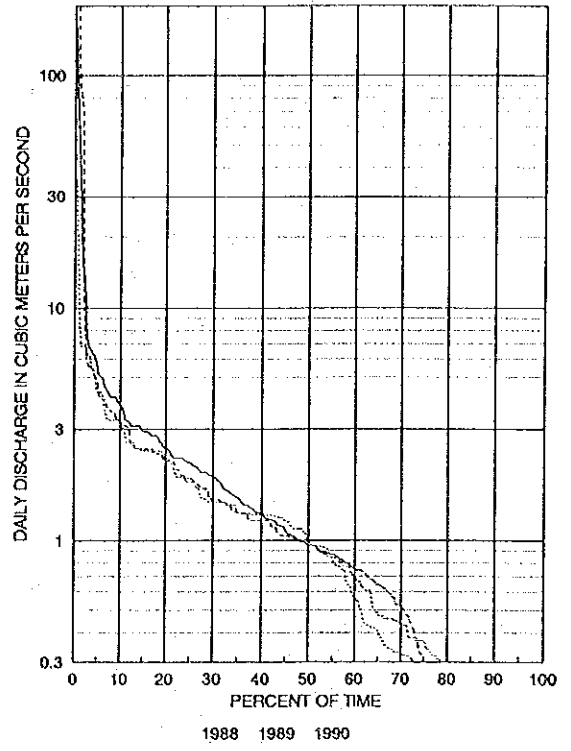
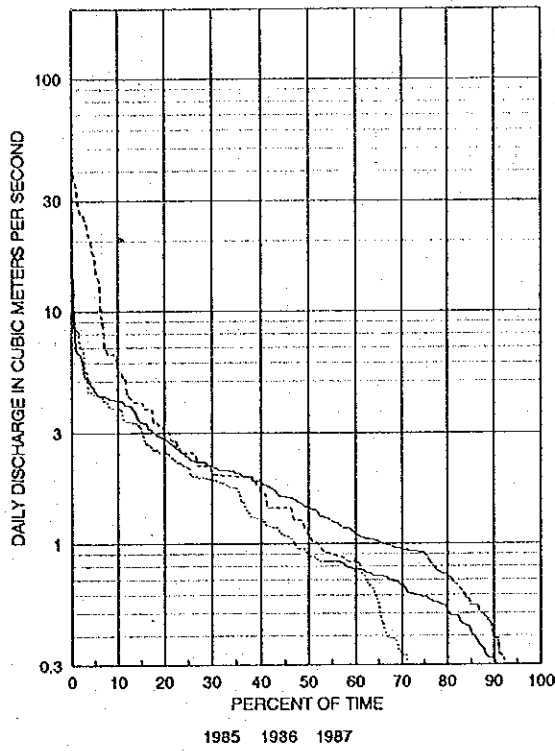
Fig. 4.12 (6/6)  
 PROBABLE INUNDATION AREA OF BLORONG RIVER  
 (100-YEAR RETURN PERIOD)



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 FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
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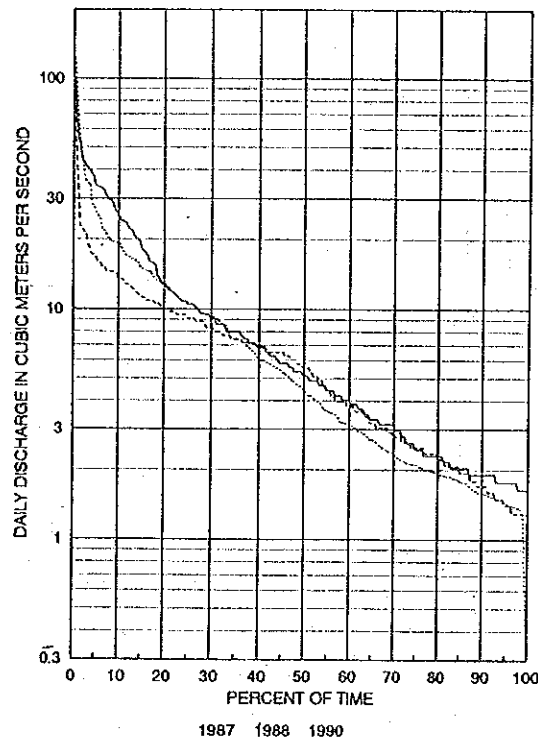
Fig. 4.13  
 LOCATION OF HYDROLOGICAL STATIONS AND  
 THIESSEN POLYGON



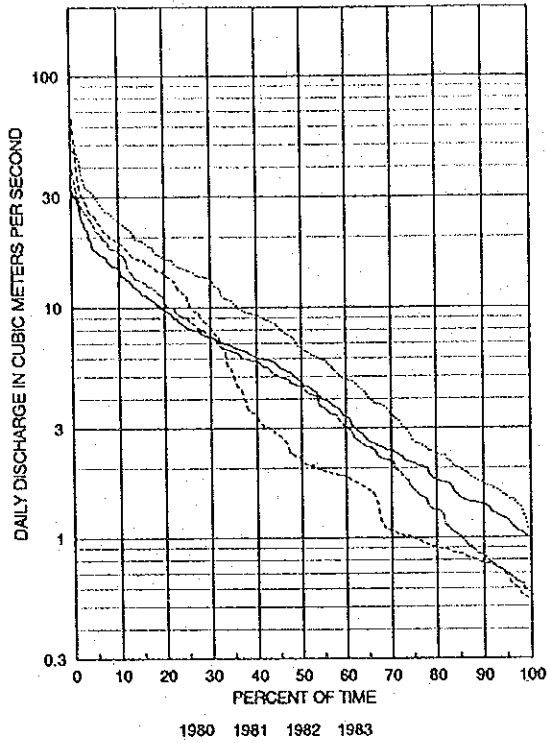


BABON R. (PUCANGGADING WEIR) -1

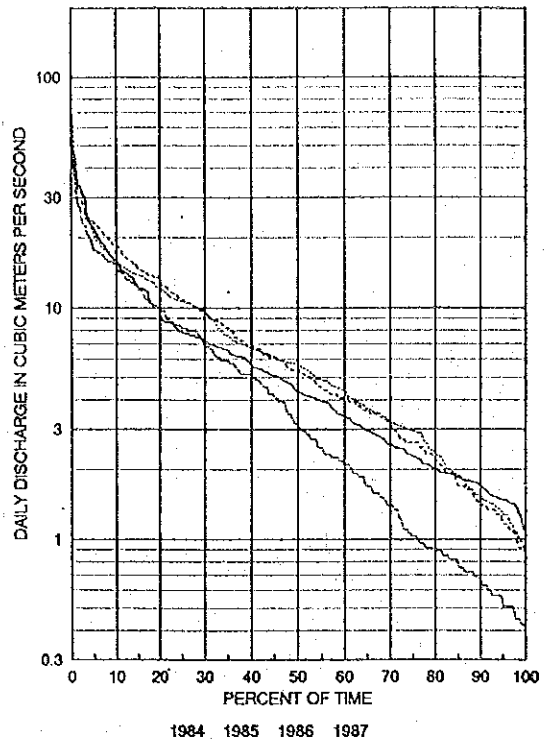
BABON R. (PUCANGGADING WEIR) -2



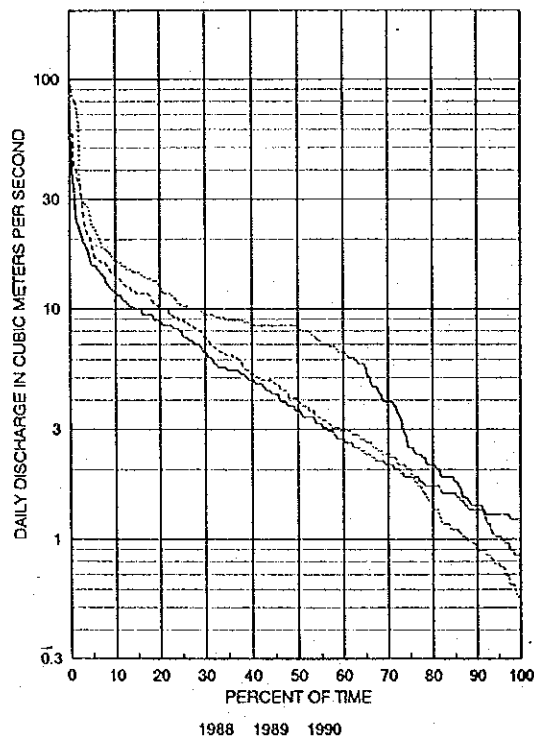
GARANG R. (PANJANGAN)



BLORONG R. (PUCUNG)-1



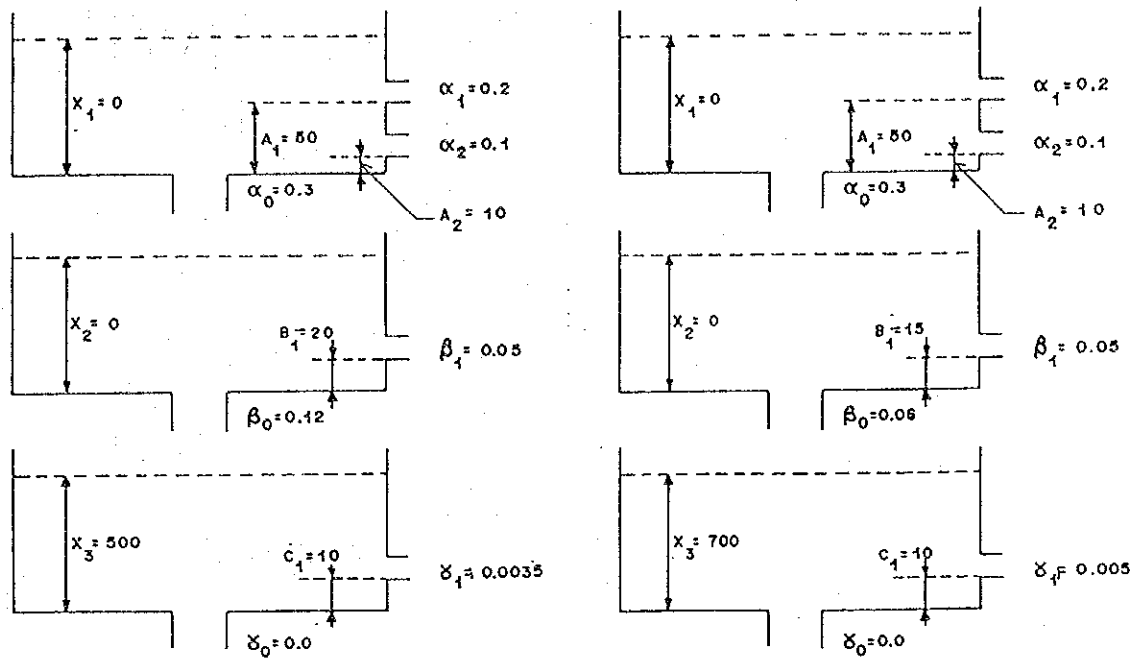
BLORONG R. (PUCUNG)-2



BLORONG R. (PUCUNG)-3

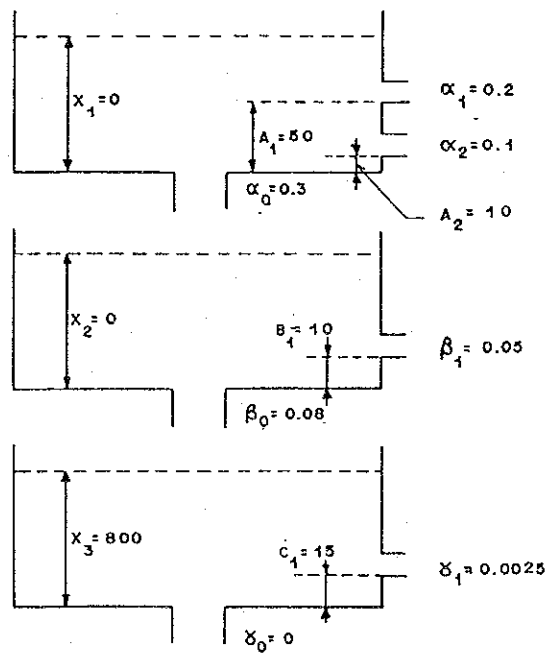
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FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 4.15 (2/2)  
FLOW-DURATION CURVES OF OBSERVED DAILY  
DISCHARGE

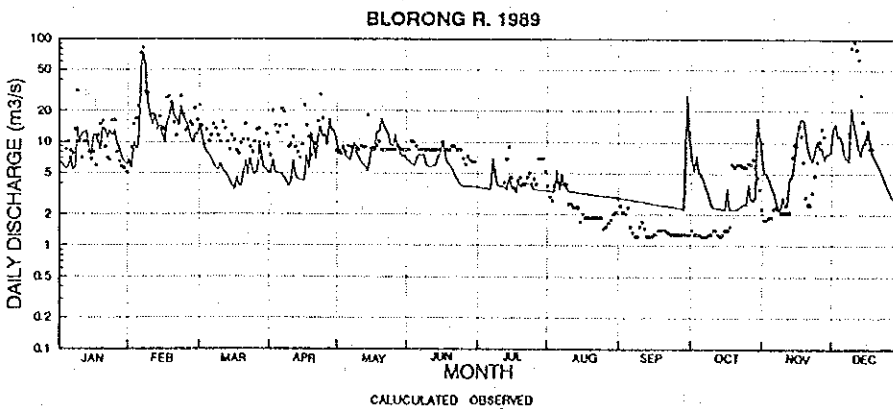
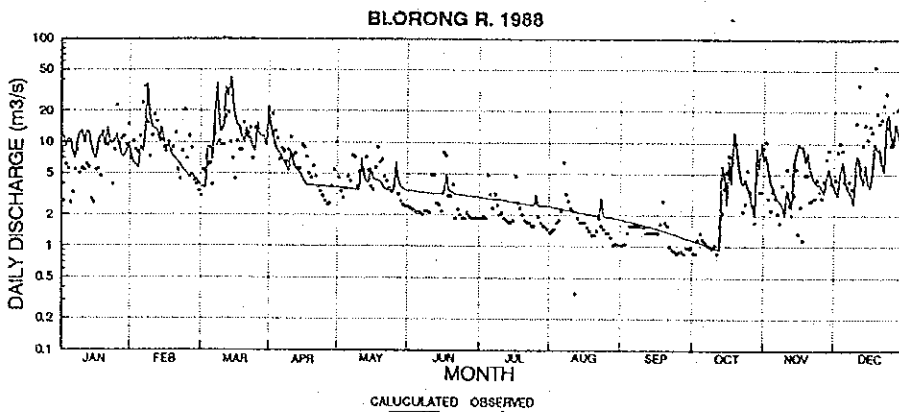
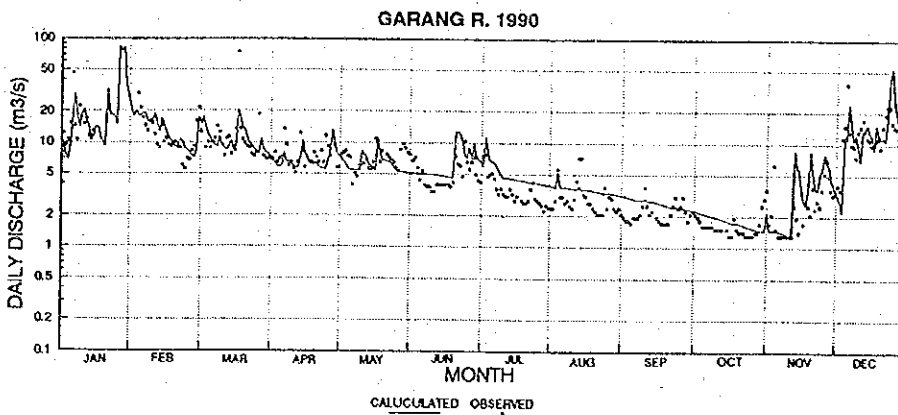
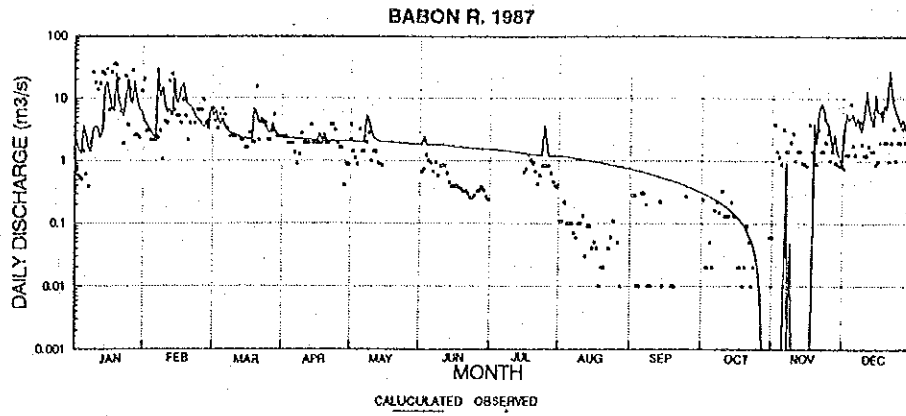


BABON R. (C. A = 77.0 Km<sup>2</sup>)

GARANG R. (C. A = 185.2 Km<sup>2</sup>)



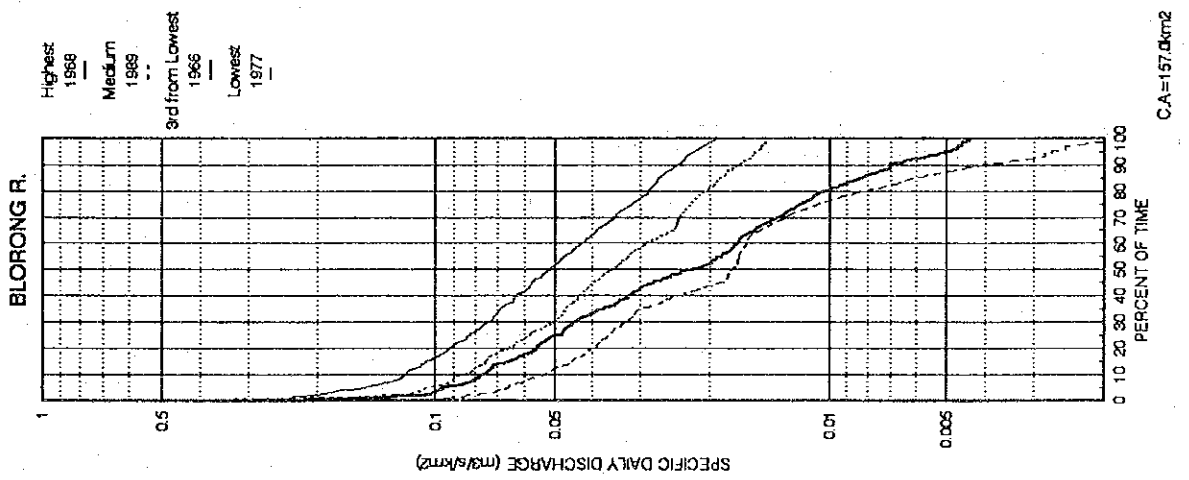
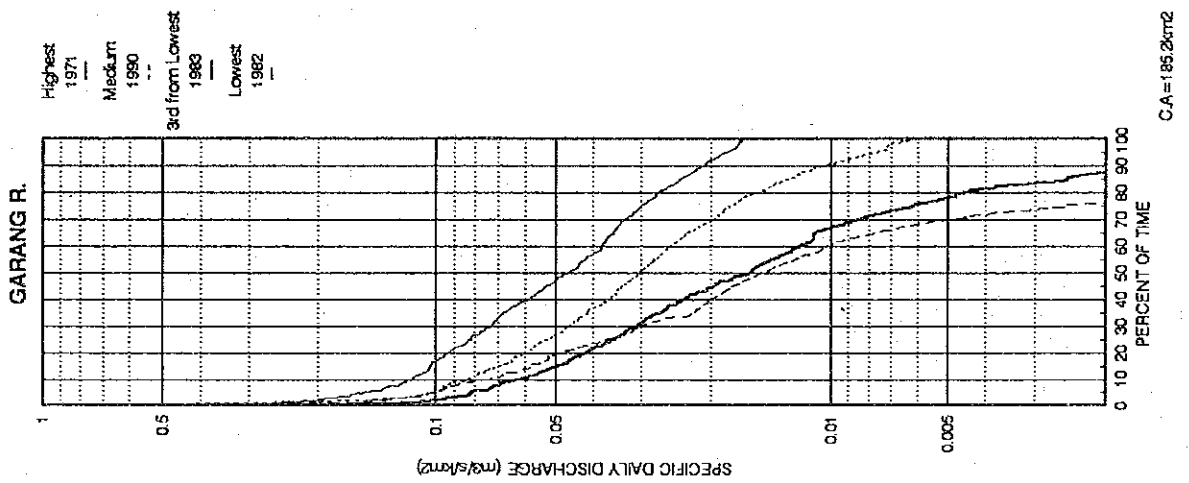
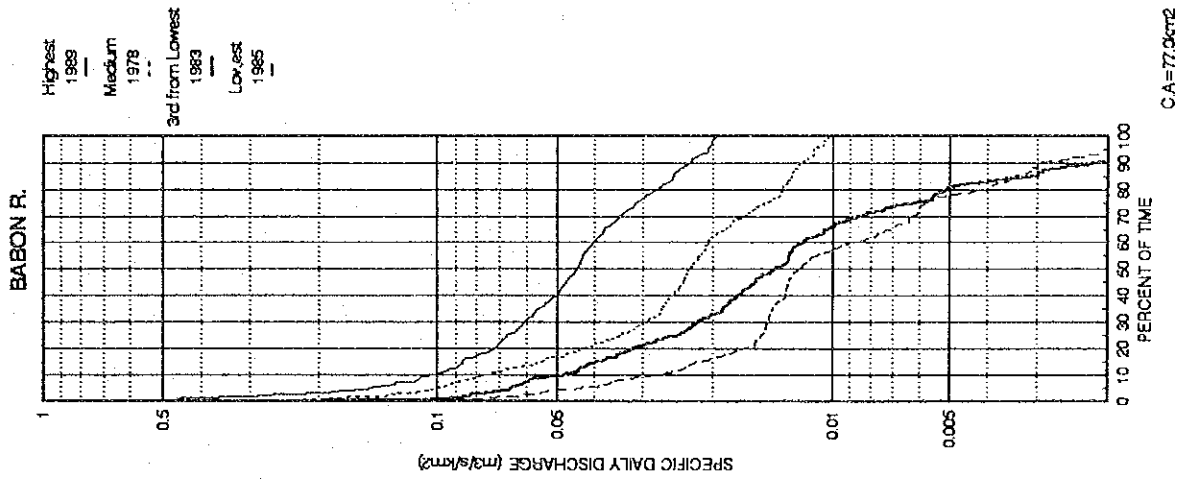
BLORONG R. (C. A = 157.0 Km<sup>2</sup>)



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URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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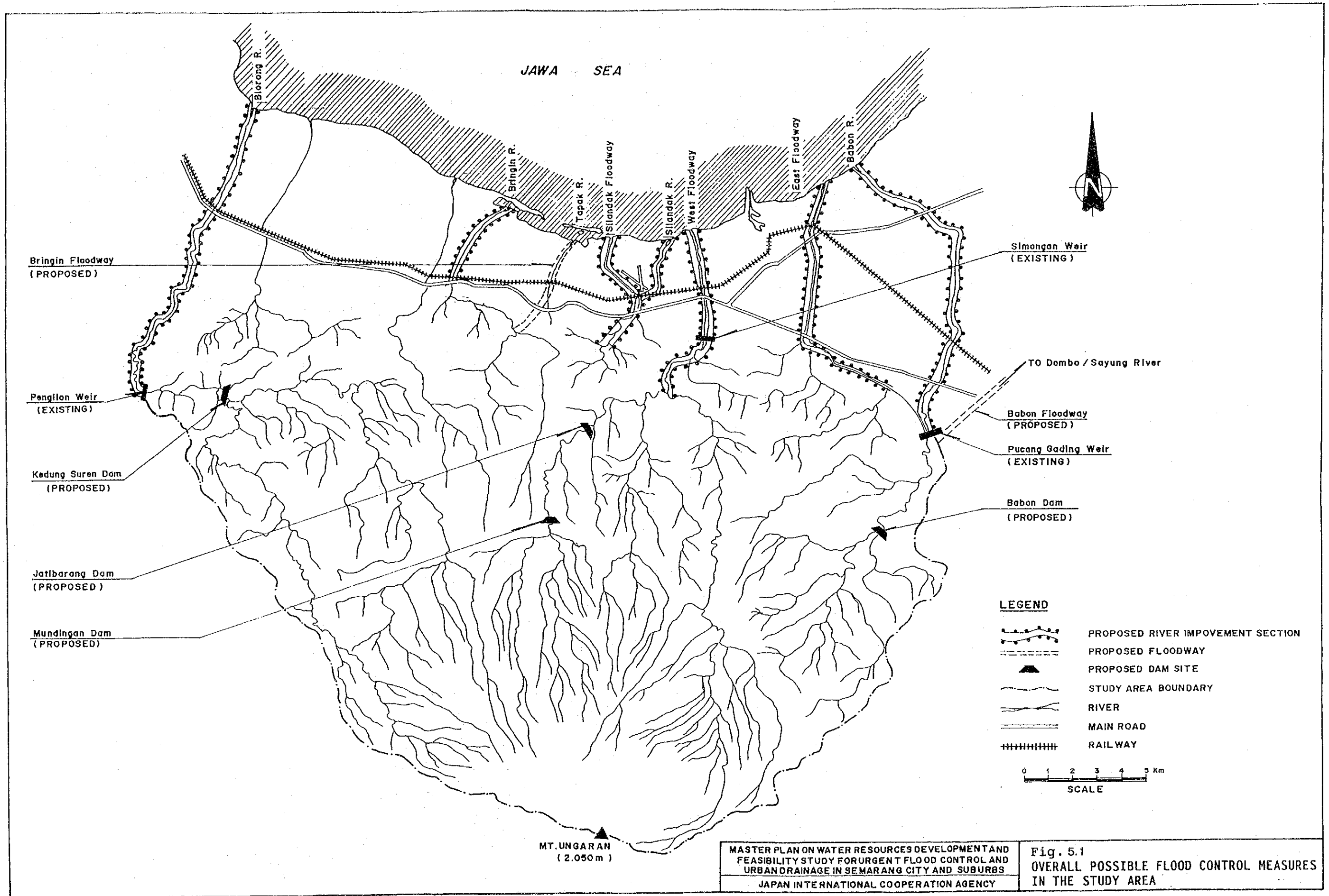
Fig. 4.17  
COMPARISON BETWEEN CALCULATED AND  
OBSERVED HYDROGRAPH



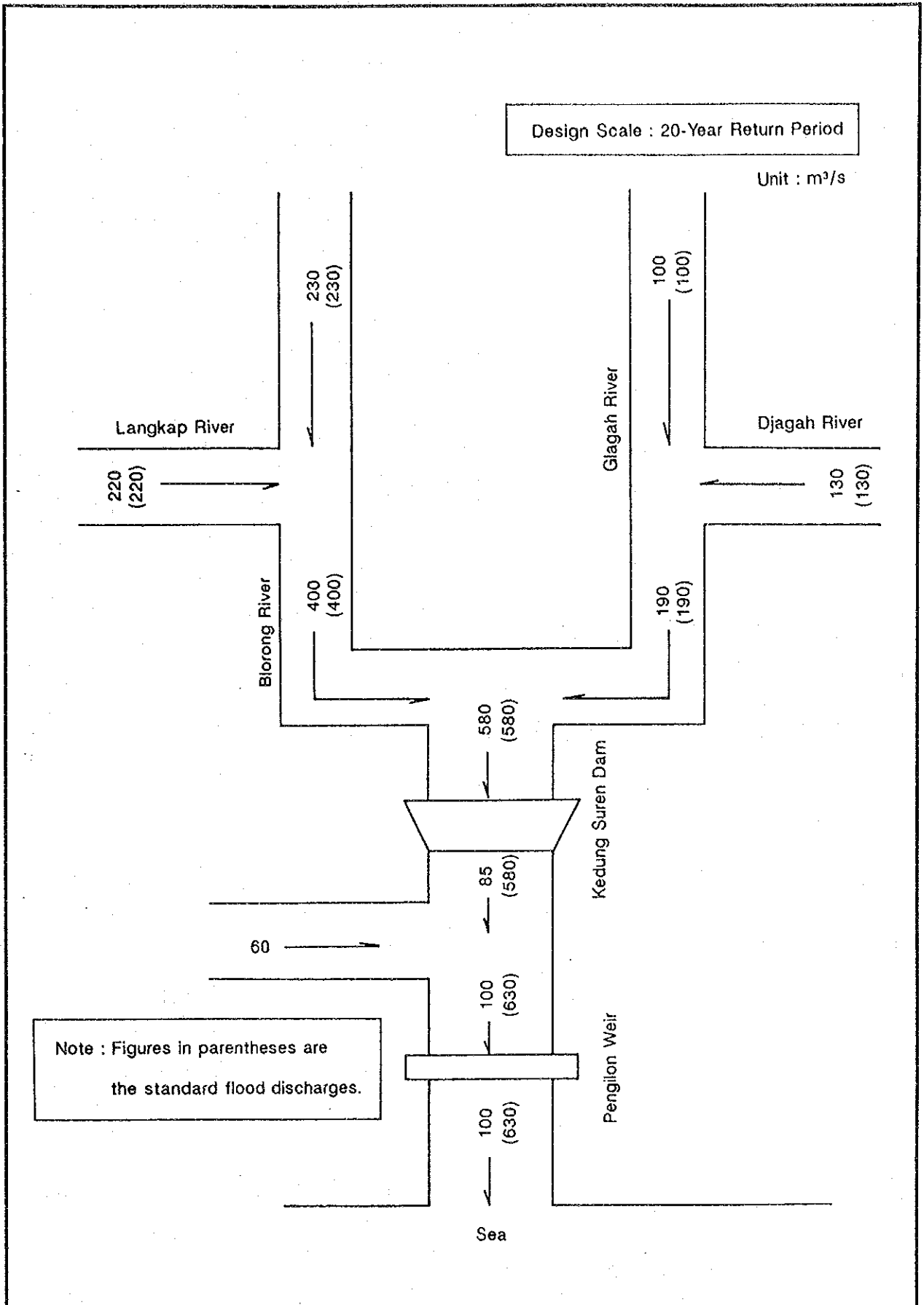


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URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 4.18  
CALCULATED FLOW-DURATION CURVES



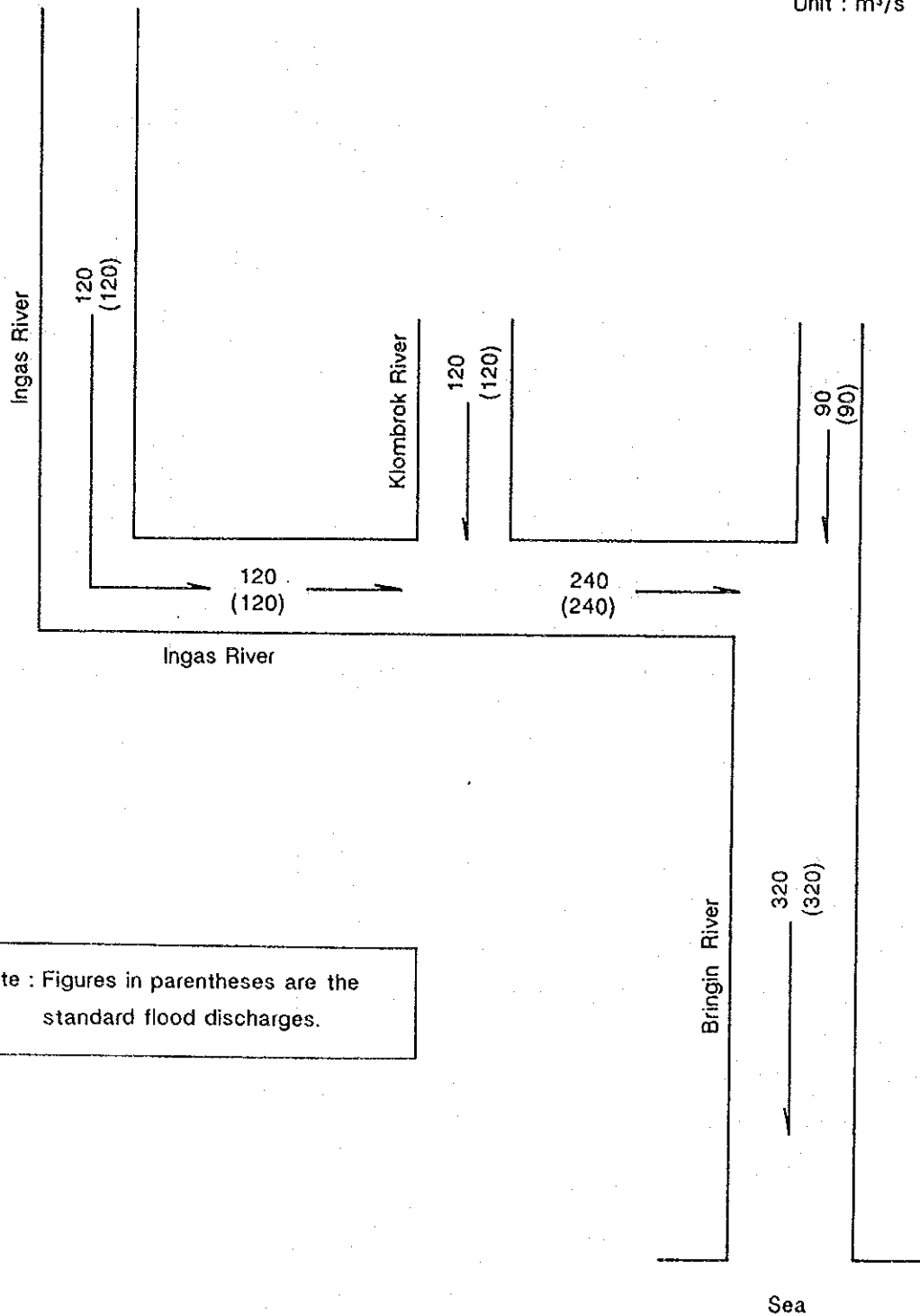




MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS JAPAN INTERNATIONAL COOPERATION AGENCY	Fig. 5.2 (1/5)      DISTRIBUTION OF DESIGN FLOOD DISCHARGE FOR OPTIMUM PLAN (BLORONG RIVER)
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Design Scale : 50-Year Return Period

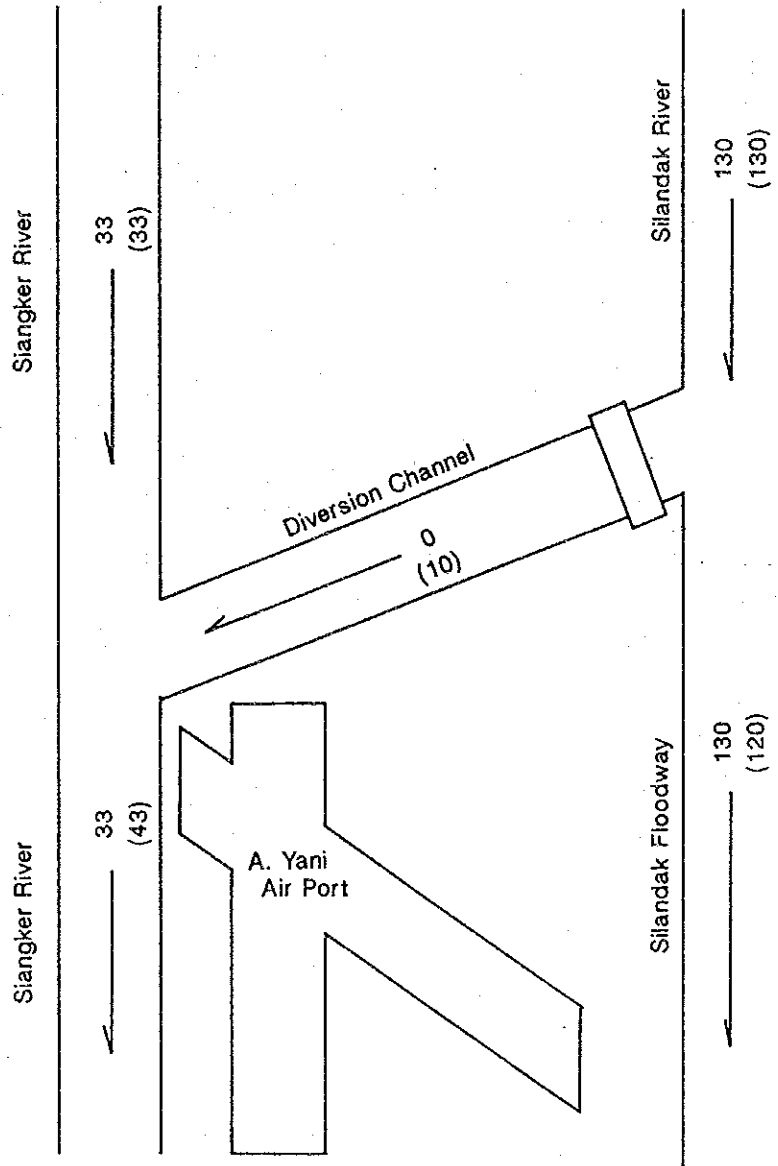
Unit : m<sup>3</sup>/s



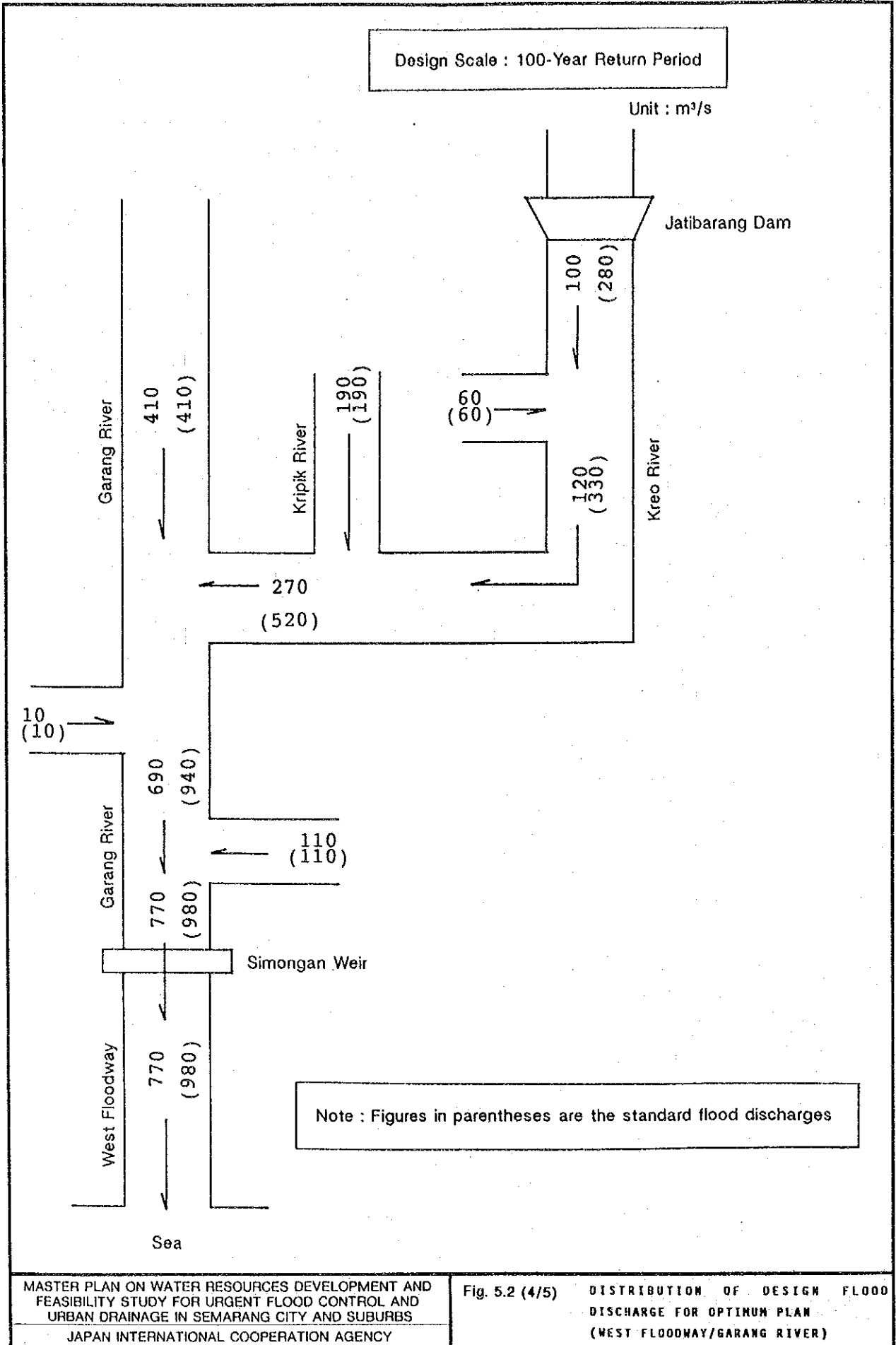
Note : Figures in parentheses are the standard flood discharges.

Design Scale : 100-Year Return Period

Unit : m<sup>3</sup>/s

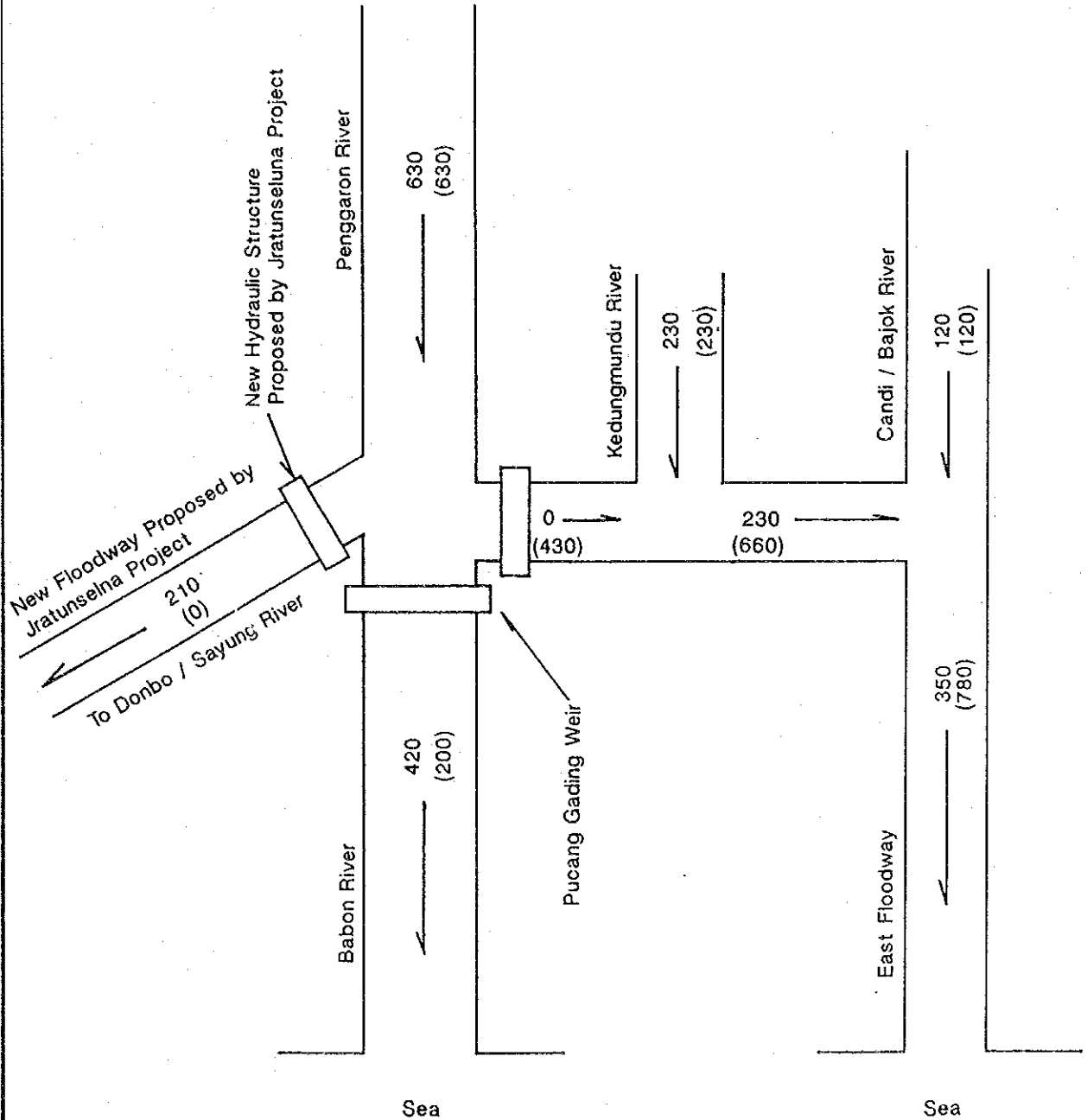


Note : Figures in parentheses are the standard flood discharges.



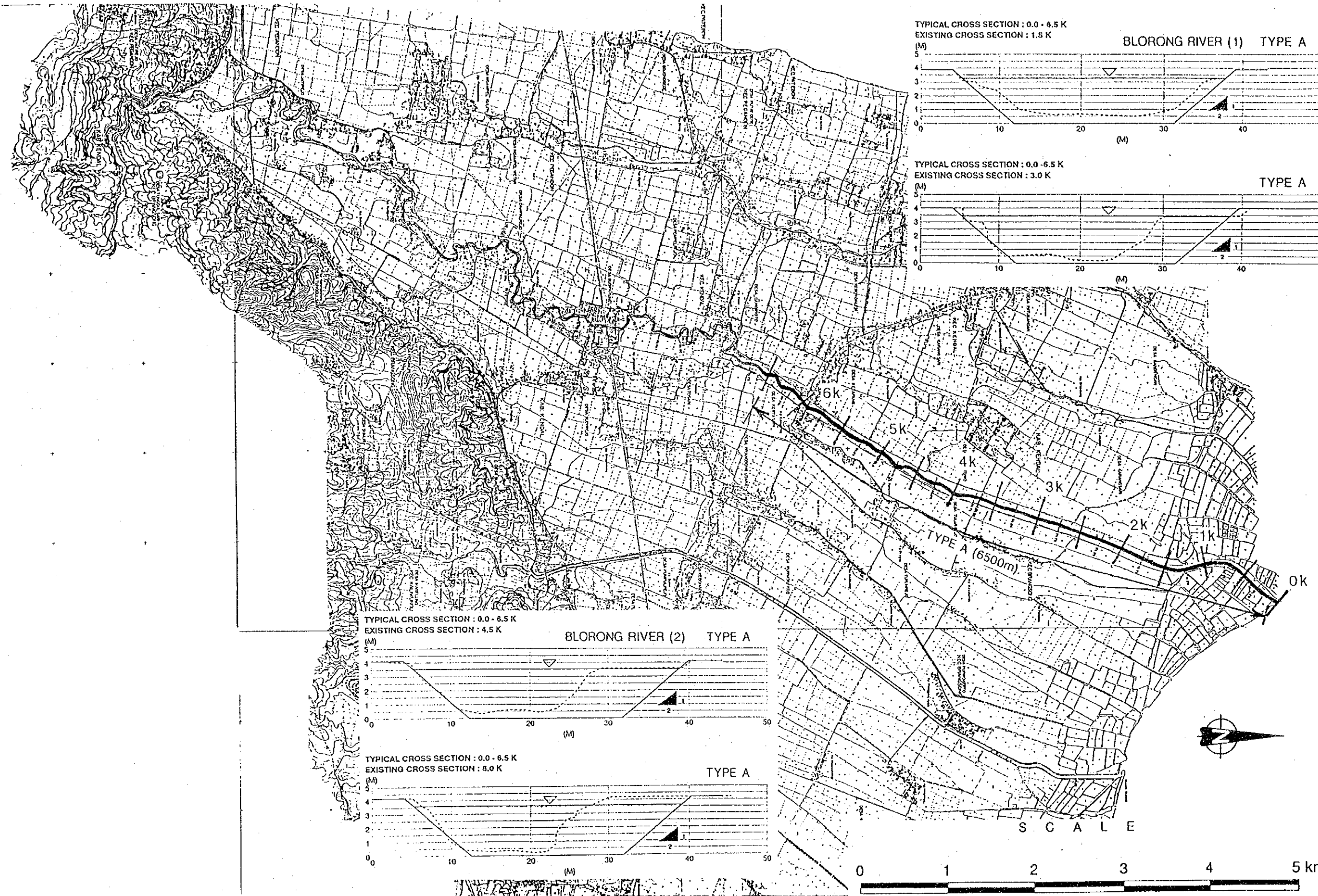
Design Scale : 50 - Year Return Period

Unit : m<sup>3</sup>/s



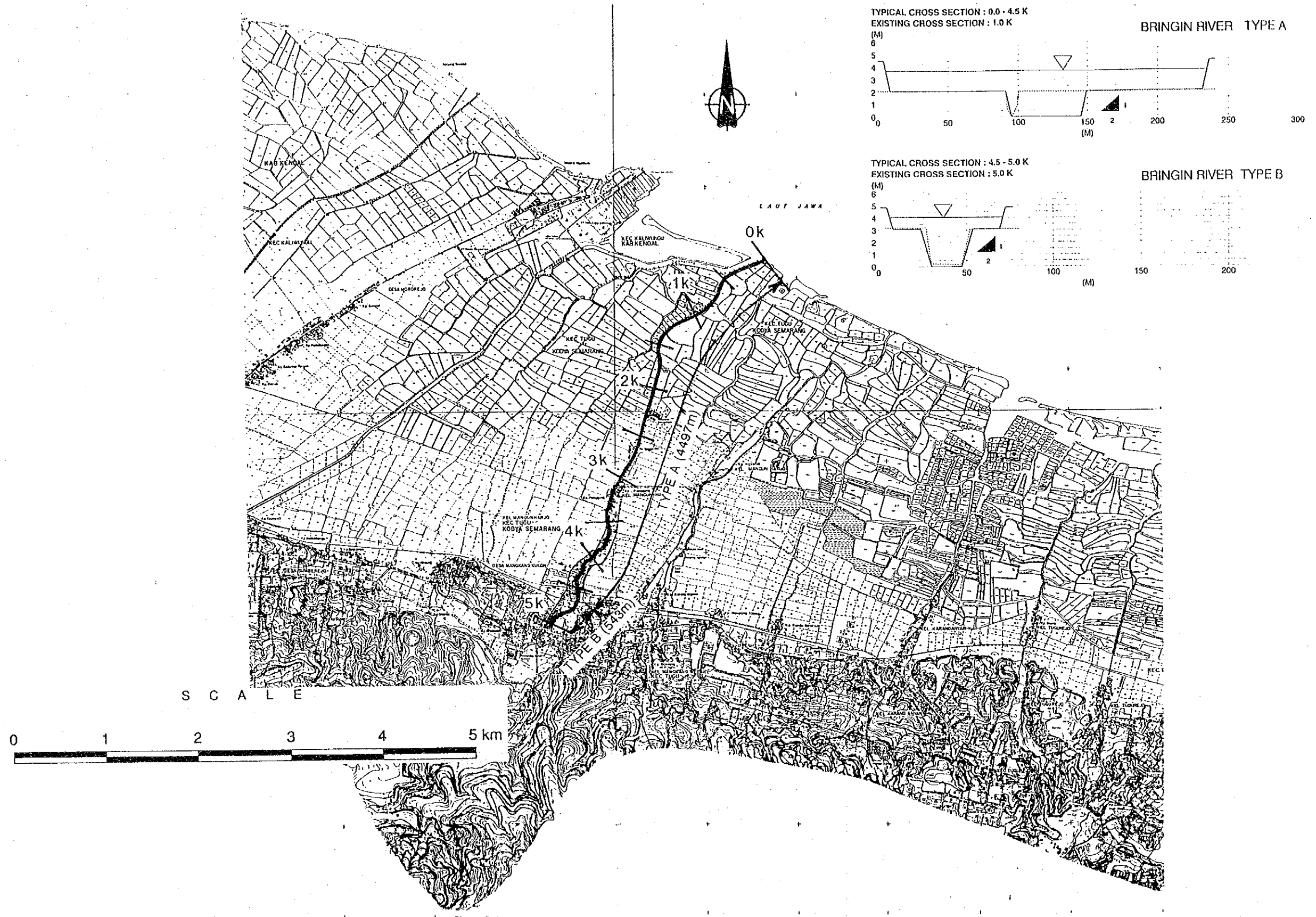
Note : Figures in Parentheses are the standard flood discharge





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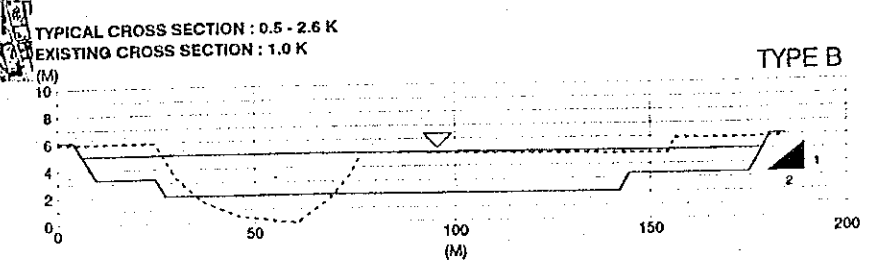
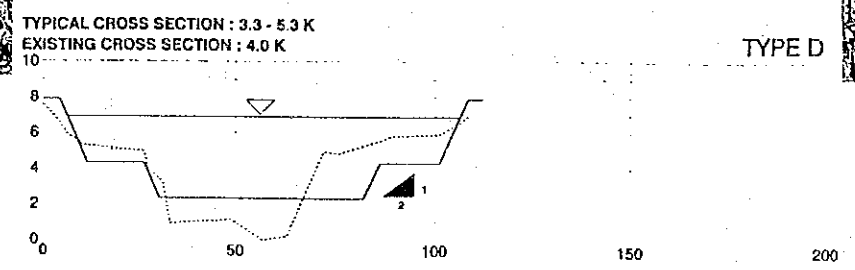
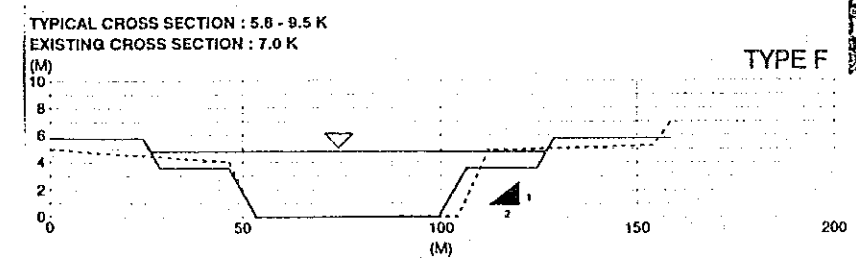
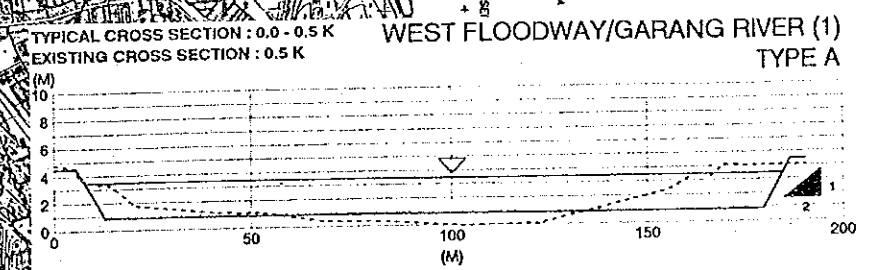
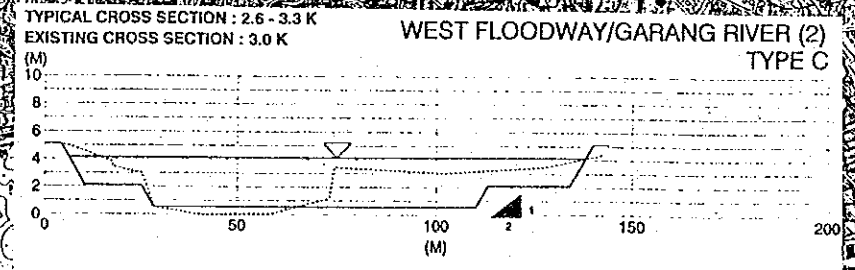
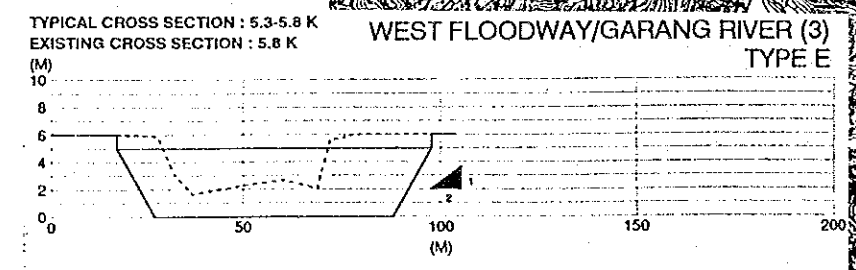
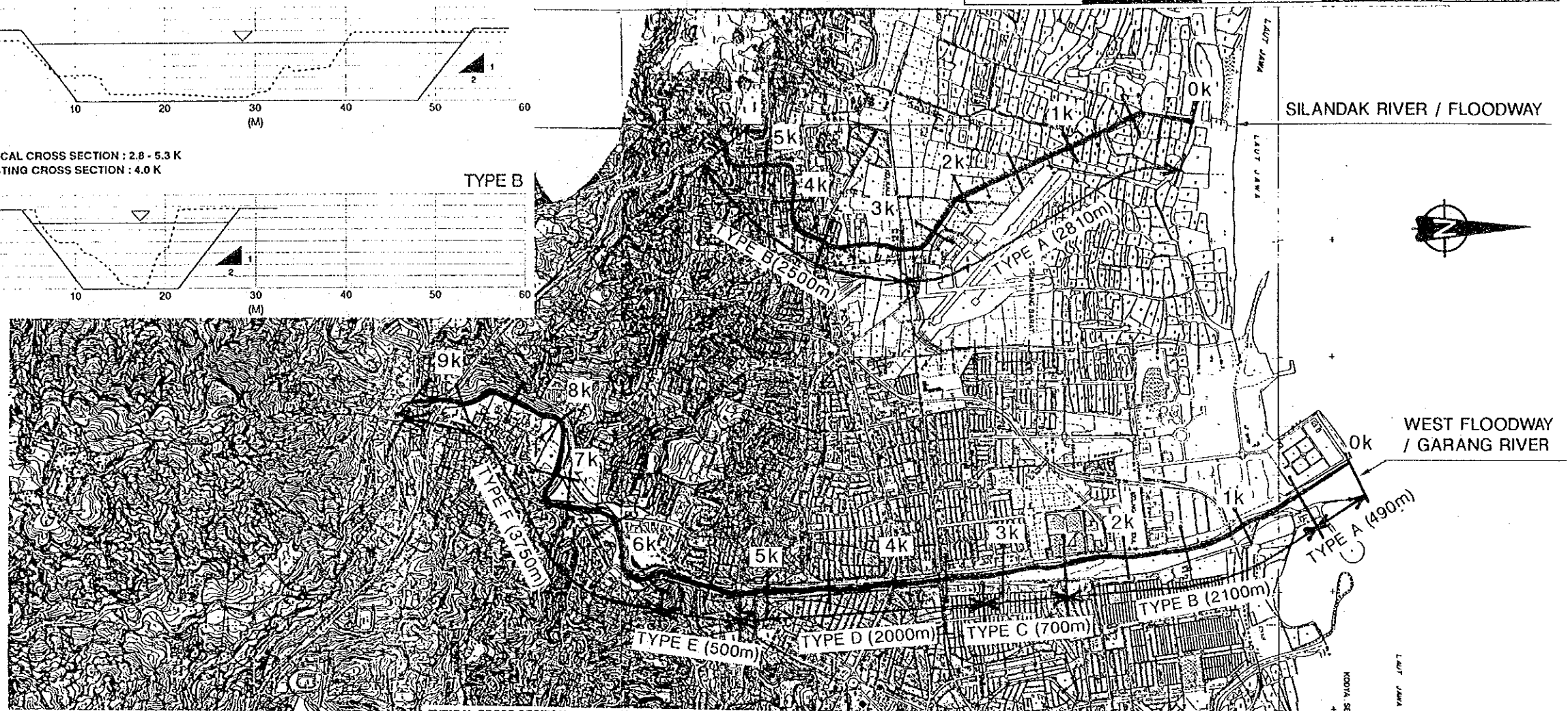
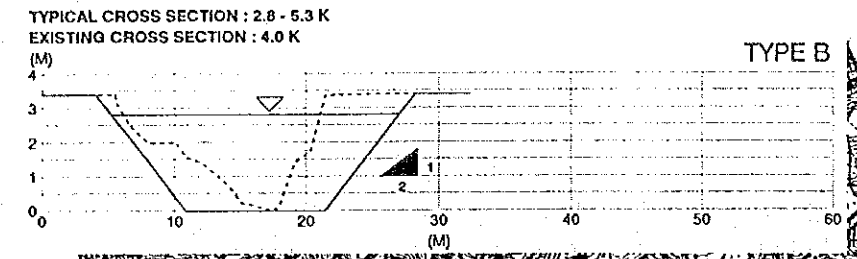
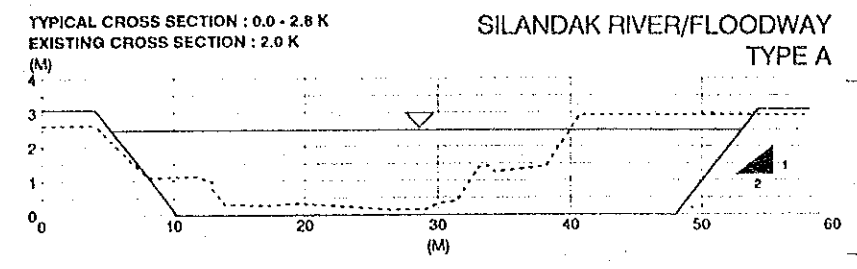
Fig. 5.3 (1/4) PROPOSED TYPICAL CROSS SECTION FOR  
OPTIMUM RIVER IMPROVEMENT PLAN  
(BLORONG RIVER)



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Fig. 5.3 (2/4) PROPOSED TYPICAL CROSS SECTION  
 FOR OPTIMUM RIVER IMPROVEMENT  
 PLAN (BRINGIN RIVER)

S C A L E



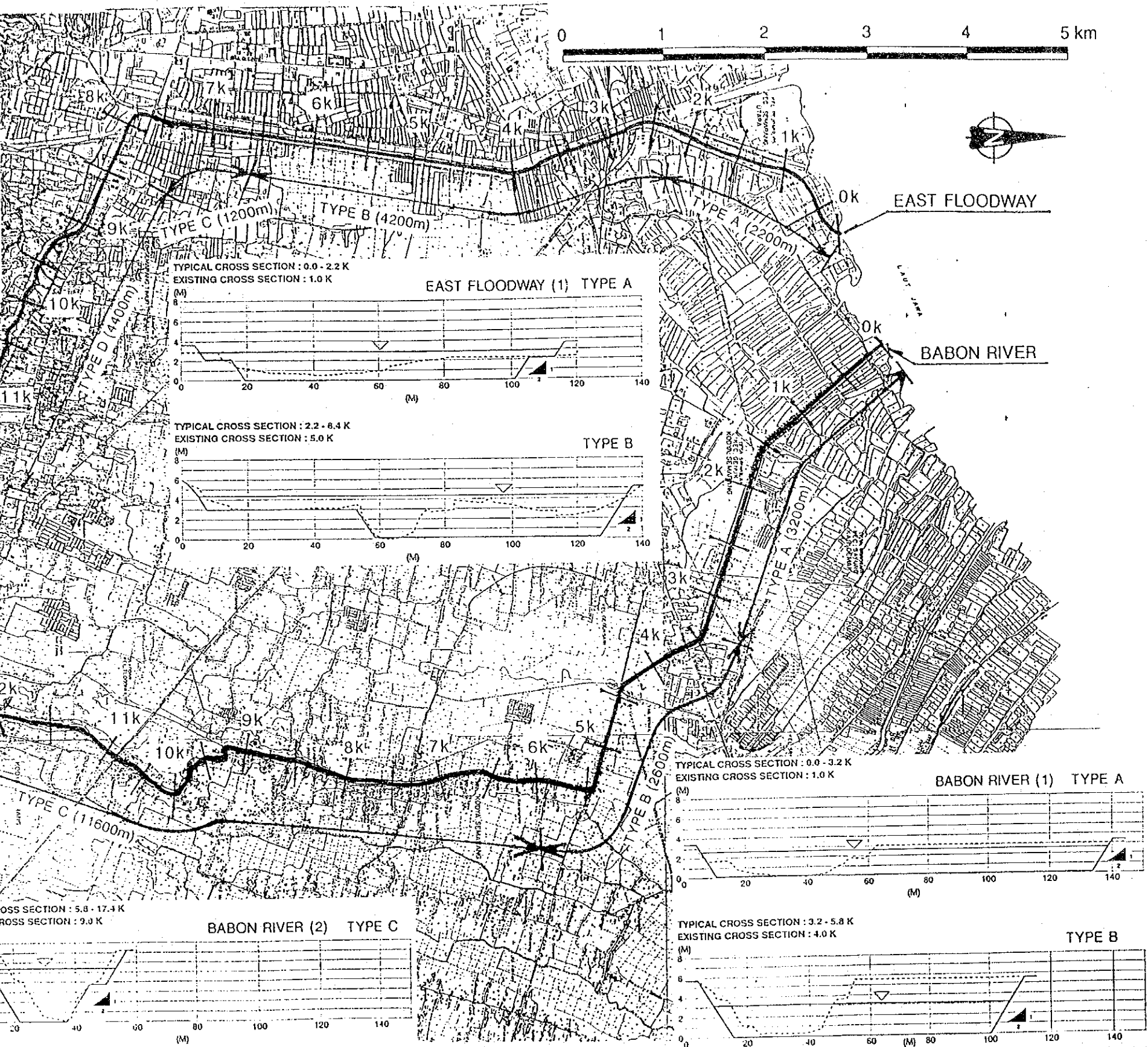
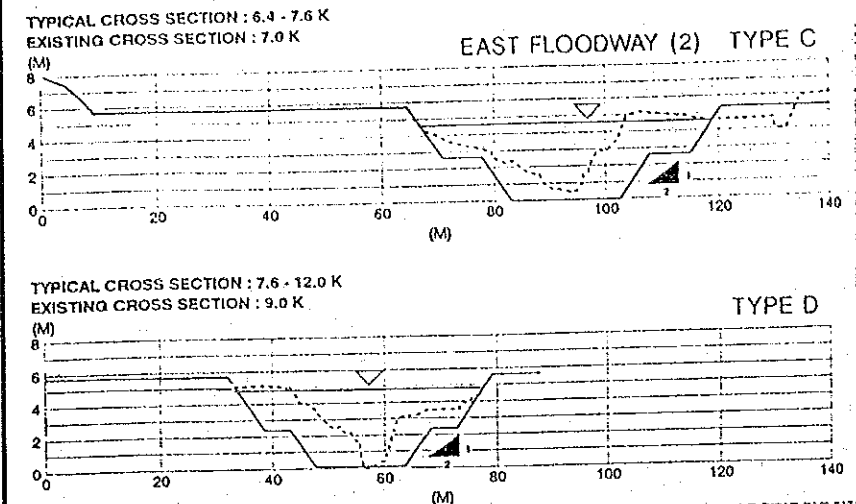
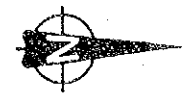
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URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 5.3 (3/4)

PROPOSED TYPICAL CROSS SECTION  
FOR OPTIMUM RIVER IMPROVEMENT  
PLAN (SILANDAK RIVER AND WEST  
FLOODWAY/GARANG RIVER)



SCALE

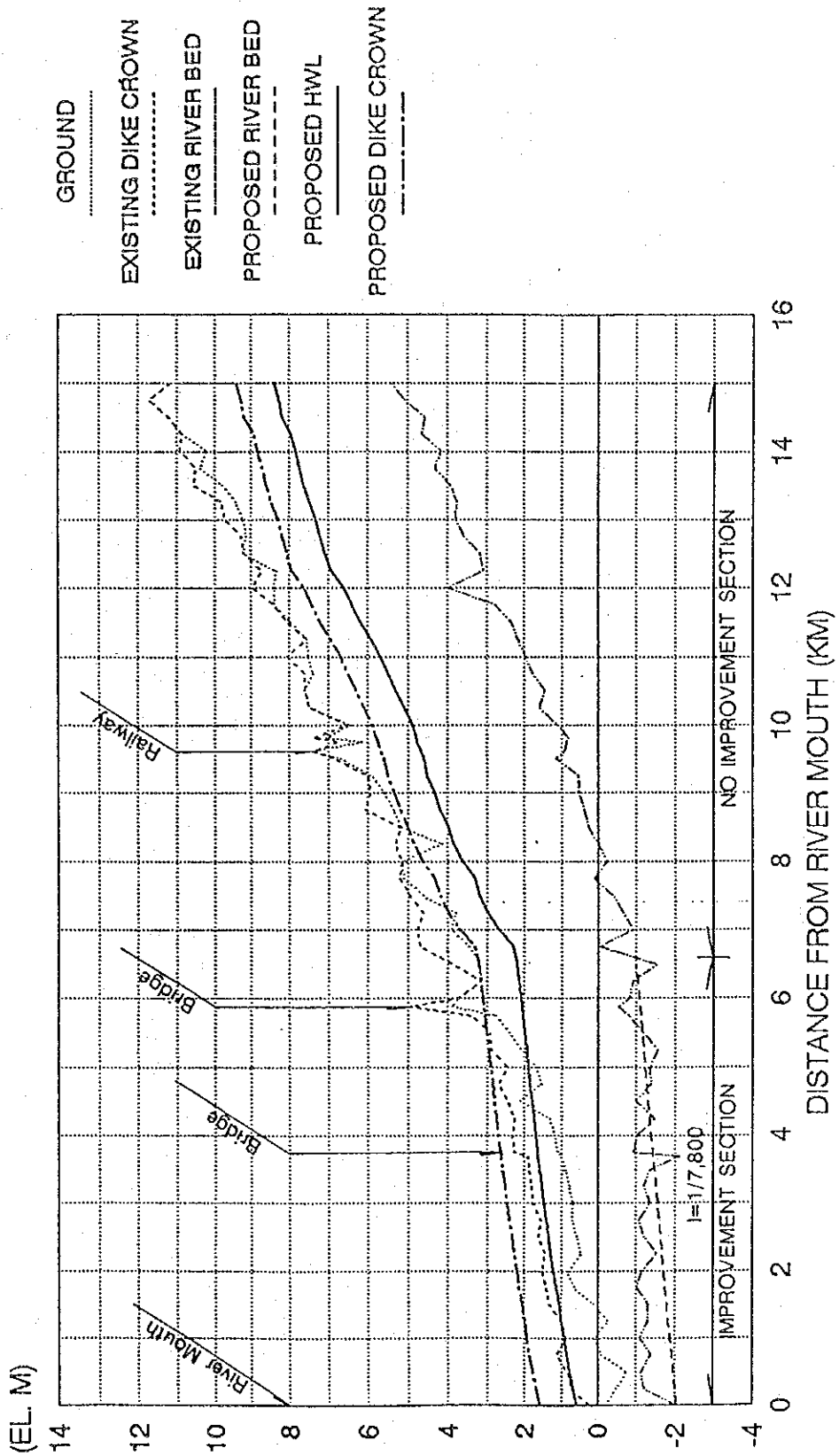


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URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 5.3 (4/4) PROPOSED TYPICAL CROSS SECTION FOR  
OPTIMUM RIVER IMPROVEMENT PLAN  
(EAST FLOODWAY AND BABON RIVER)



# BLORONG RIVER

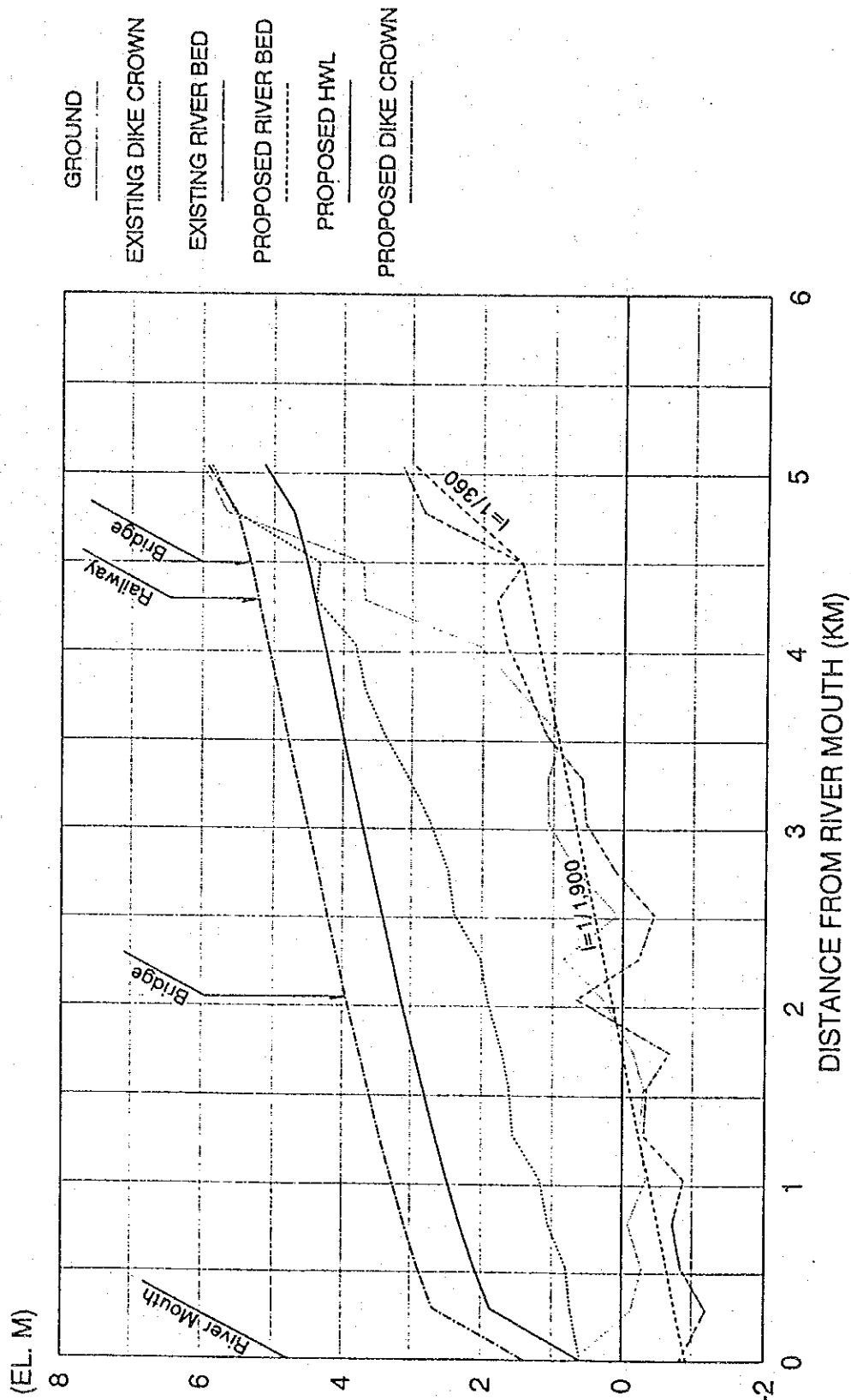


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 FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
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Fig. 5.4 (1/7)

PROPOSED LONGITUDINAL PROFILE FOR  
 OPTIMUM RIVER IMPROVEMENT PLAN  
 (BLORONG RIVER)

BRINGIN RIVER

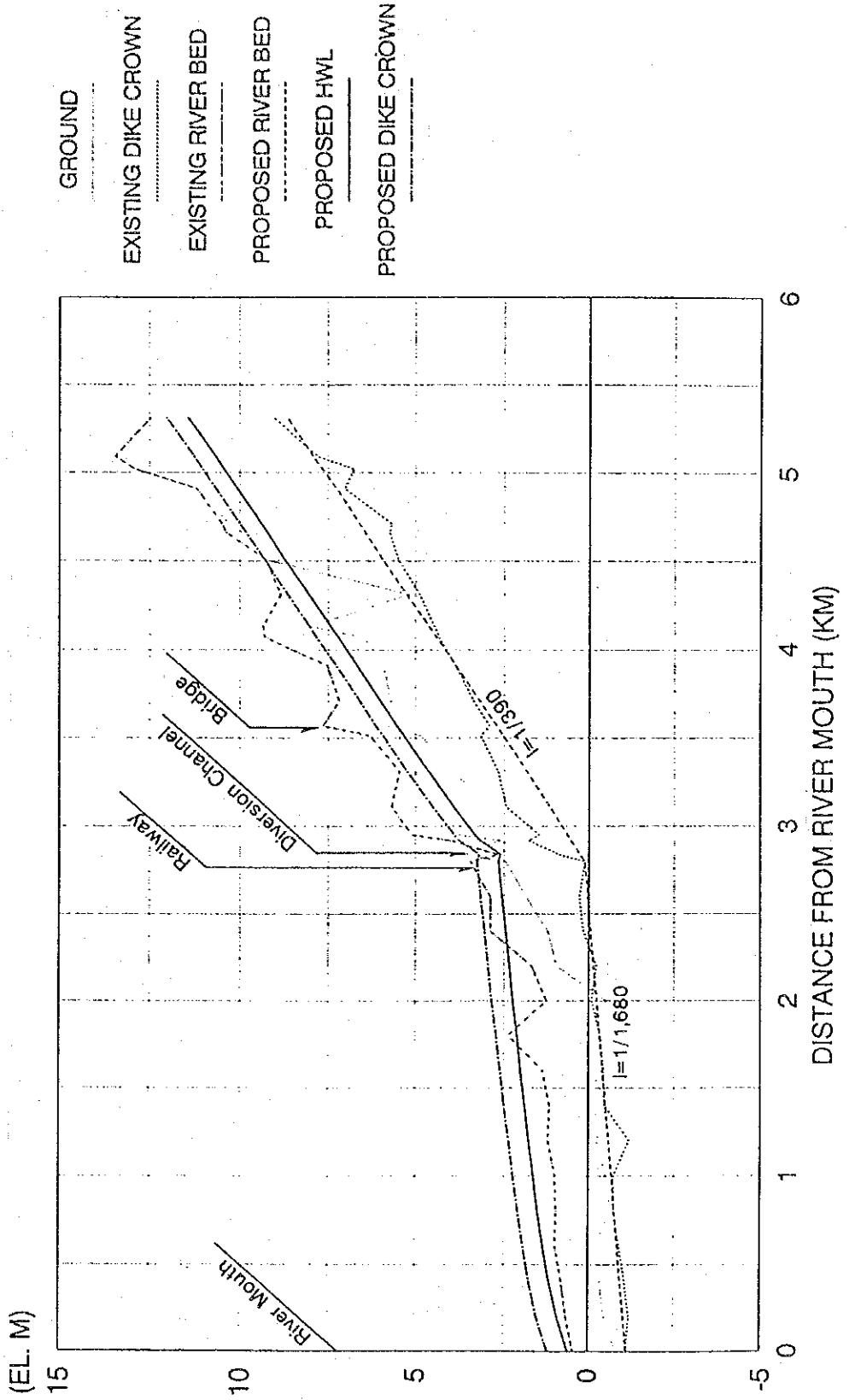


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Fig. 5.4 (2/7)

PROPOSED LONGITUDINAL PROFILE FOR  
 OPTIMUM RIVER IMPROVEMENT PLAN  
 (BRINGIN FLOODWAY)

SILANDAK RIVER/FLOODWAY



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Fig. 5.4 (3/7) PROPOSED LONGITUDINAL PROFILE FOR  
OPTIMUM RIVER IMPROVEMENT PLAN  
(SILANDAK RIVER)



WEST FLOODWAY

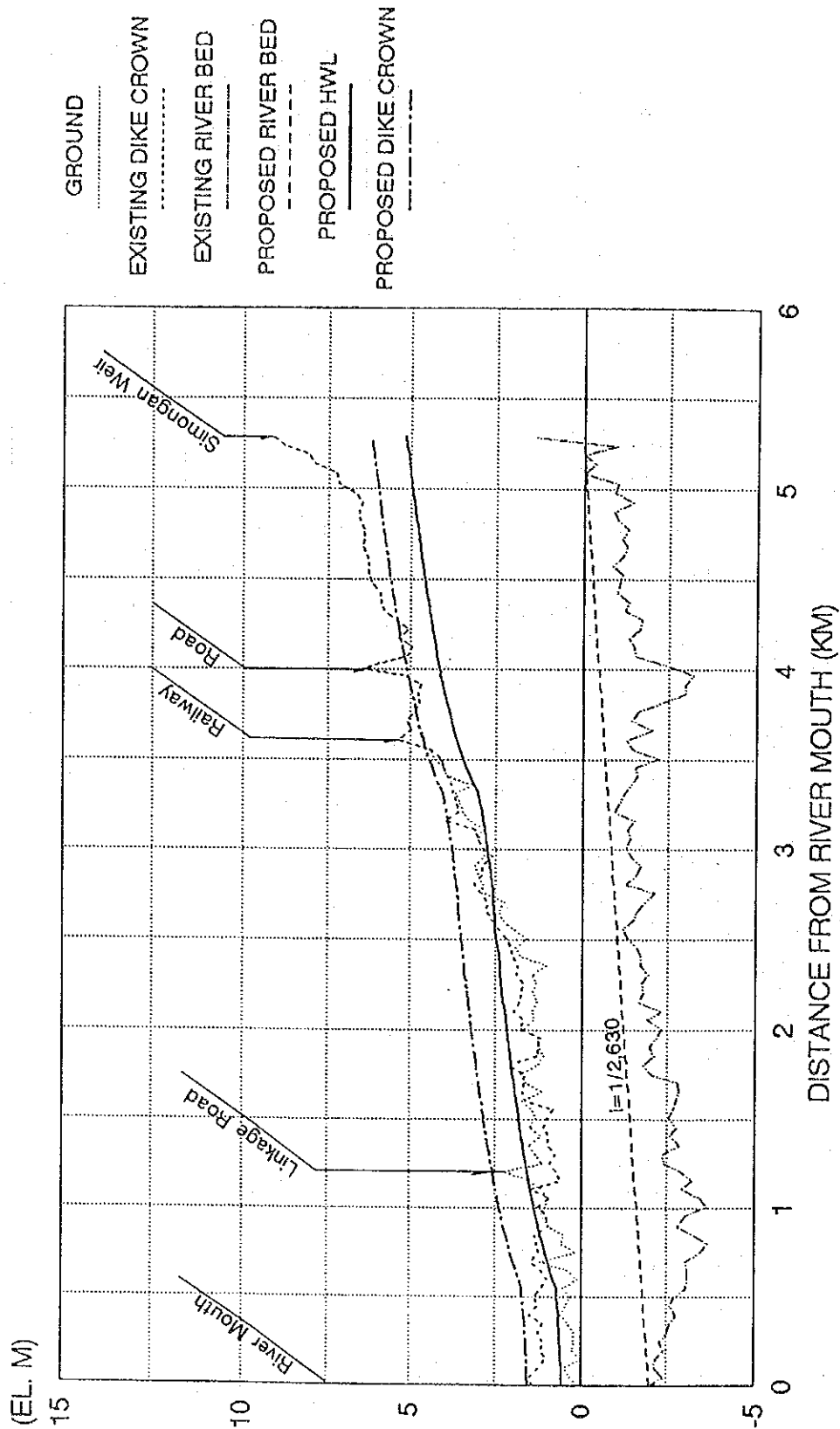
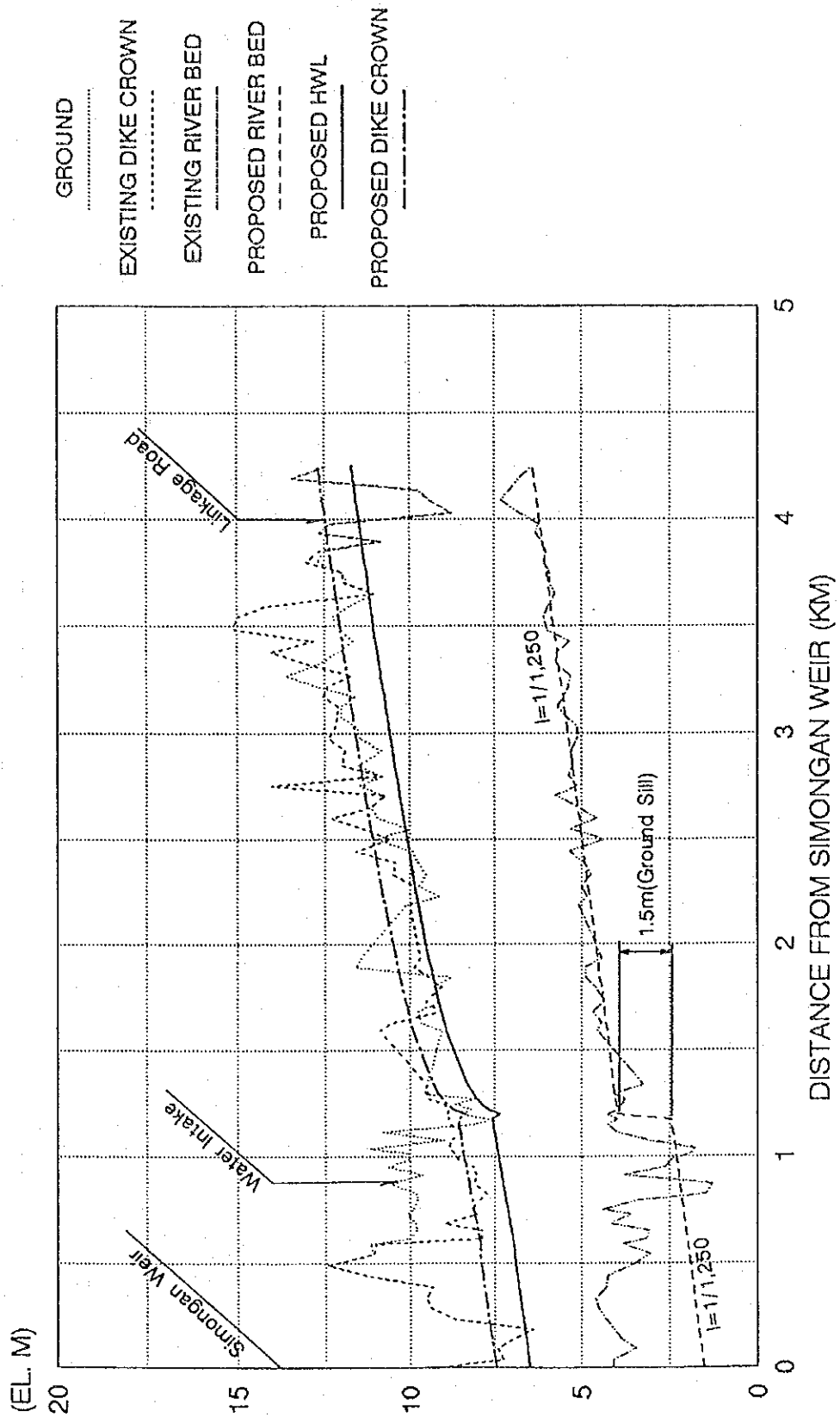


Fig. 5.4 (4/7) PROPOSED LONGITUDINAL PROFILE FOR  
 OPTIMUM RIVER IMPROVEMENT PLAN  
 (WEST FLOODWAY)

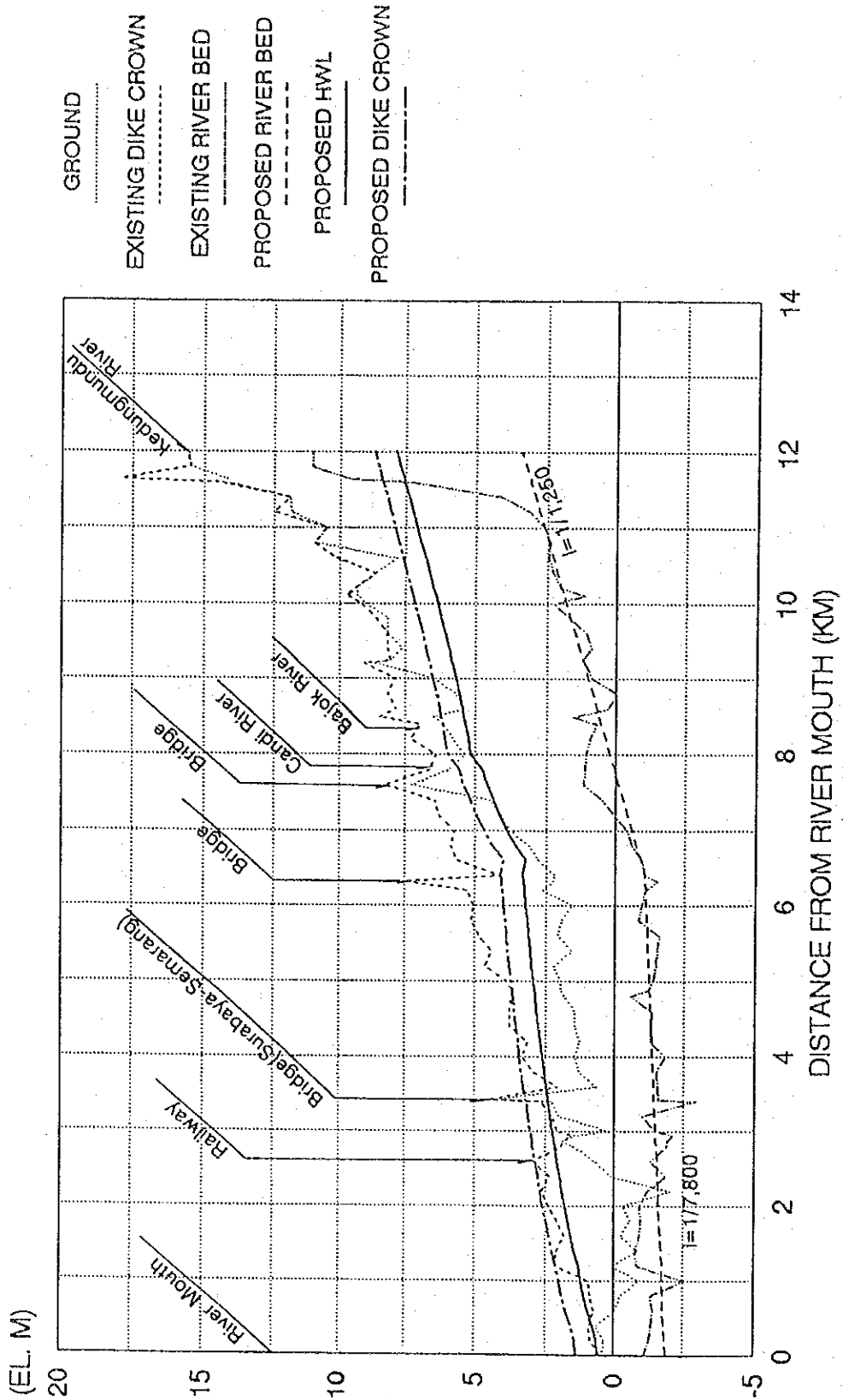
# GARANG RIVER



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URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 5.4 (5/7) PROPOSED LONGITUDINAL PROFILE FOR  
OPTIMUM RIVER IMPROVEMENT PLAN  
(GARANG RIVER)

EAST FLOODWAY

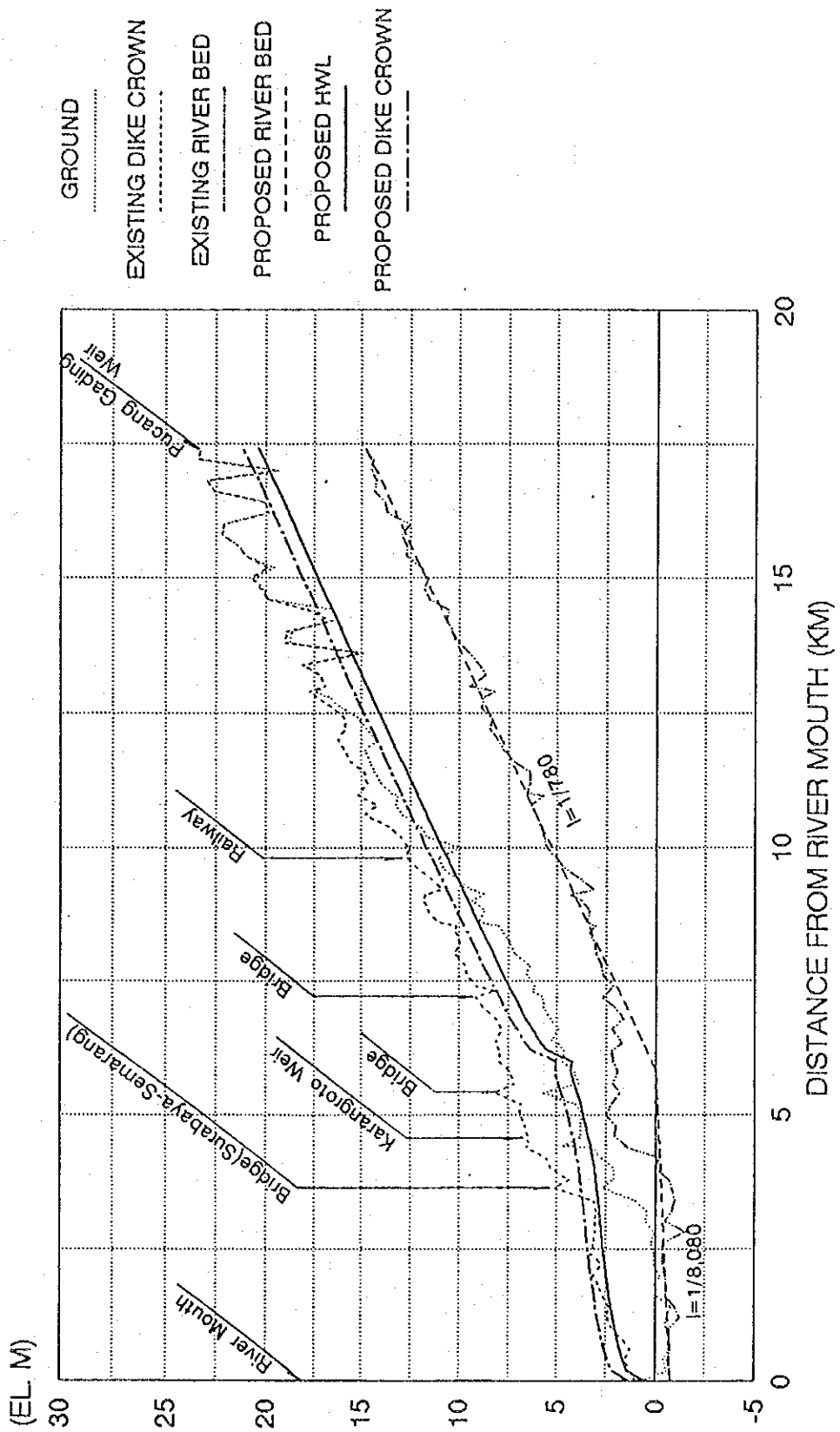


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 FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
 URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 5.4 (6/7)

PROPOSED LONGITUDINAL PROFILE FOR  
 OPTIMUM RIVER IMPROVEMENT PLAN  
 (EAST FLOODWAY)

# BABON RIVER



MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND  
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Fig. 5.4 (7/7)

PROPOSED LONGITUDINAL PROFILE FOR  
OPTIMUM RIVER IMPROVEMENT PLAN  
(BABON RIVER)

# FLOOD CONTROL PLAN

Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1. Babon River																						
Babon River Improvement																						
Babon Floodway																						
2. East Floodway																						
East Floodway Improvement																						
3. Garang River/West Floodway																						
Garang River Improvement																						
West Floodway Improvement																						
Jatibarang dam																						
4. Silandak River																						
Silandak River Improvement																						
5. Bringin River																						
Bringin River Improvement																						
6. Blorong River																						
Blorong River Improvement																						
Kedung Suren Dam																						



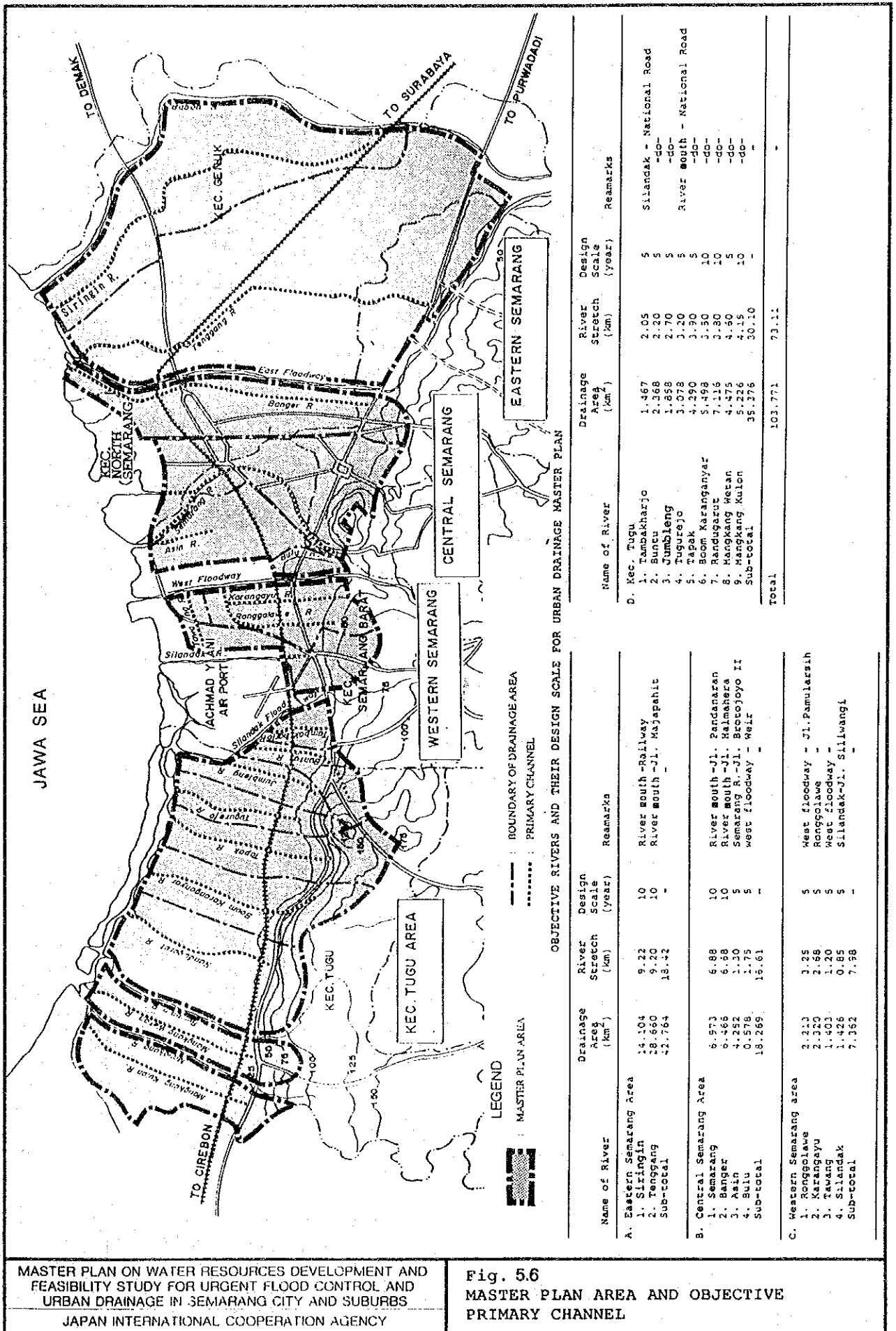
 On-going Project  
 Implemented by Master Plan

Fig. 5.5

IMPLEMENTATION SCHEDULE FOR MASTER PLAN OF FLOOD CONTROL WORKS

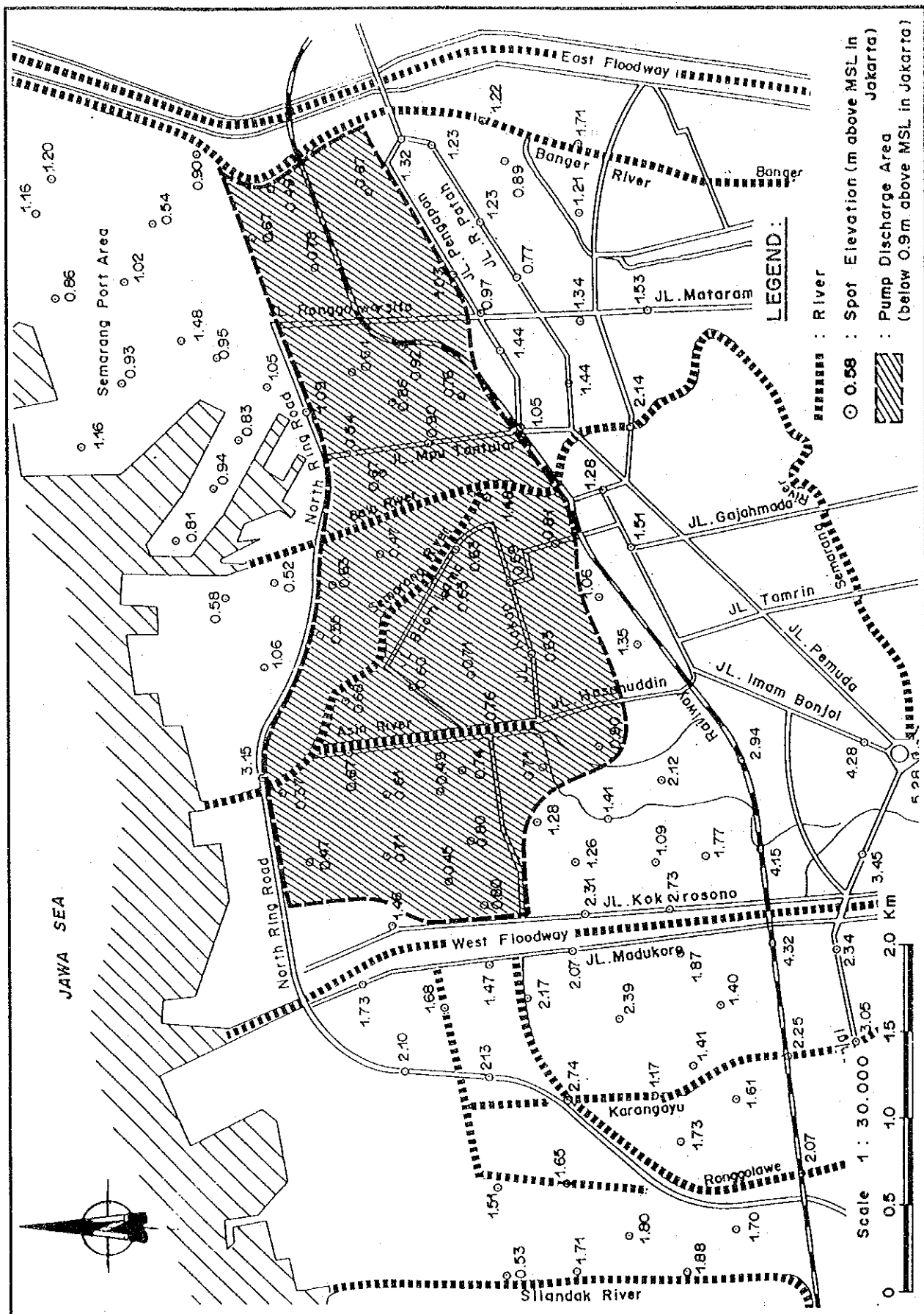


MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND  
 FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
 URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 56  
 MASTER PLAN AREA AND OBJECTIVE  
 PRIMARY CHANNEL

Name of River	Drainage Area (km <sup>2</sup> )	River Stretch (km)	Design Scale (year)	Remarks
<b>A. Eastern Semarang Area</b>				
1. Siringin	14.104	9.22	10	River mouth - Railway
2. Tenggang	28.660	9.20	10	River mouth - Jl. Majapahit
Sub-total	42.764	18.42	-	
<b>B. Central Semarang Area</b>				
1. Semarang	6.573	6.88	10	River mouth - Jl. Pandanaran
2. Banger	6.866	6.88	10	River mouth - Jl. Halmahera
3. Asin	4.252	1.30	5	Semarang R. - Jl. Brotojojo II
4. Sulu	0.578	1.75	5	West floodway - Weir
Sub-total	18.269	16.61	-	
<b>C. Western Semarang area</b>				
1. Ronggolawe	2.213	3.25	5	West floodway - Jl. Pamularsih
2. Karangayu	2.320	2.68	5	Ronggolawe
3. Tawang	1.403	1.20	5	West floodway -
4. Silandak	1.426	0.85	5	Silandak - Jl. Siliwangi
Sub-total	7.362	7.98	-	

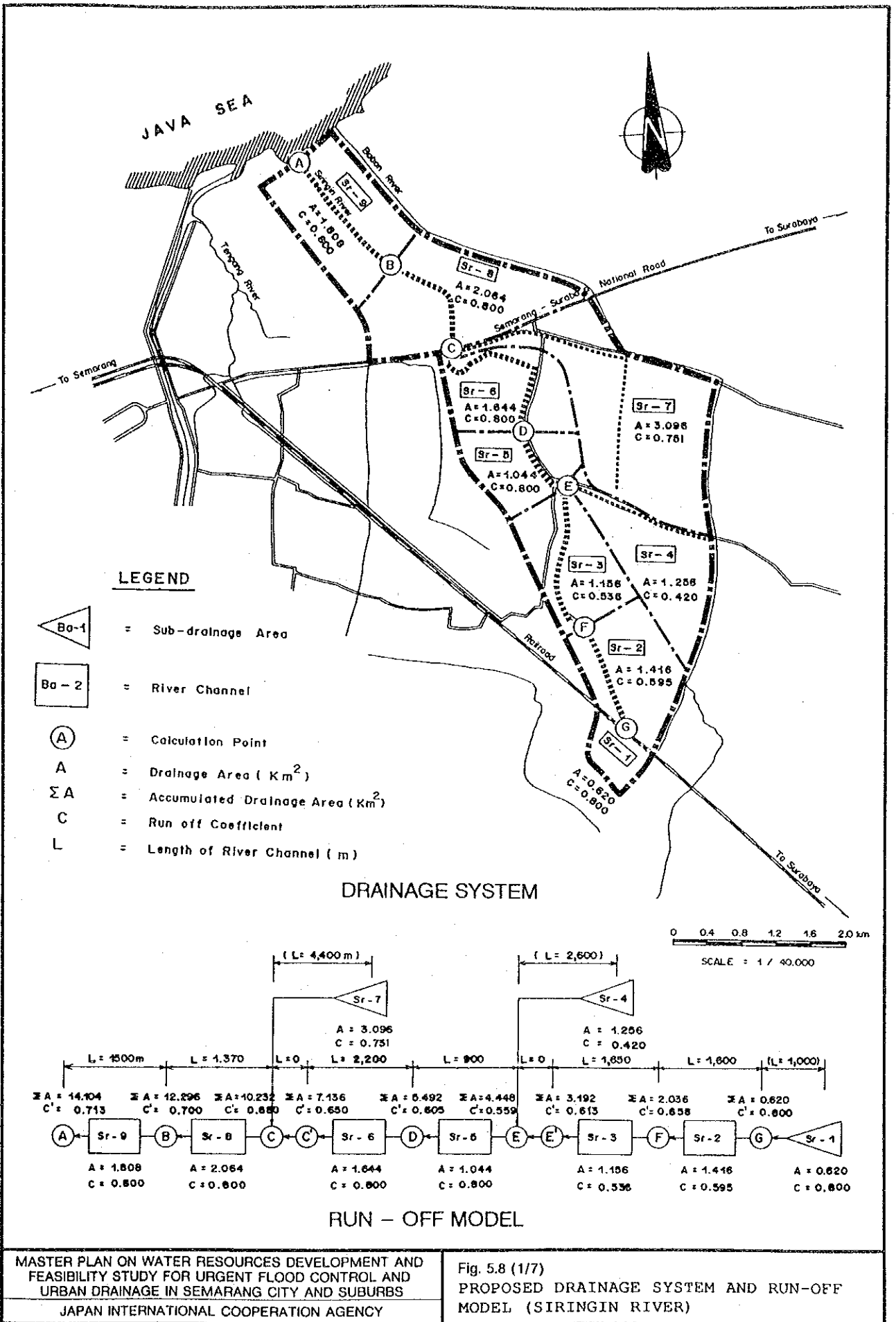
Name of River	Drainage Area (km <sup>2</sup> )	River Stretch (km)	Design Scale (year)	Remarks
<b>D. Kec. Tugu</b>				
1. Tambakharjo	1.487	2.05	5	Silandak - National Road
2. Buncu	2.388	2.20	5	-do-
3. Jumbleng	1.858	2.70	5	-do-
4. Tugurejo	3.078	3.20	5	River mouth - National Road
5. Tapak	4.290	3.90	5	-do-
6. Boom Karanganyar	5.468	3.30	10	-do-
7. Randugarat	7.116	3.80	10	-do-
8. Mangkang Wetan	4.475	4.90	5	-do-
9. Mangkang Kulon	5.226	4.15	10	-do-
Sub-total	35.376	30.10	-	
Total	103.771	73.11	-	



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Fig. 5.7

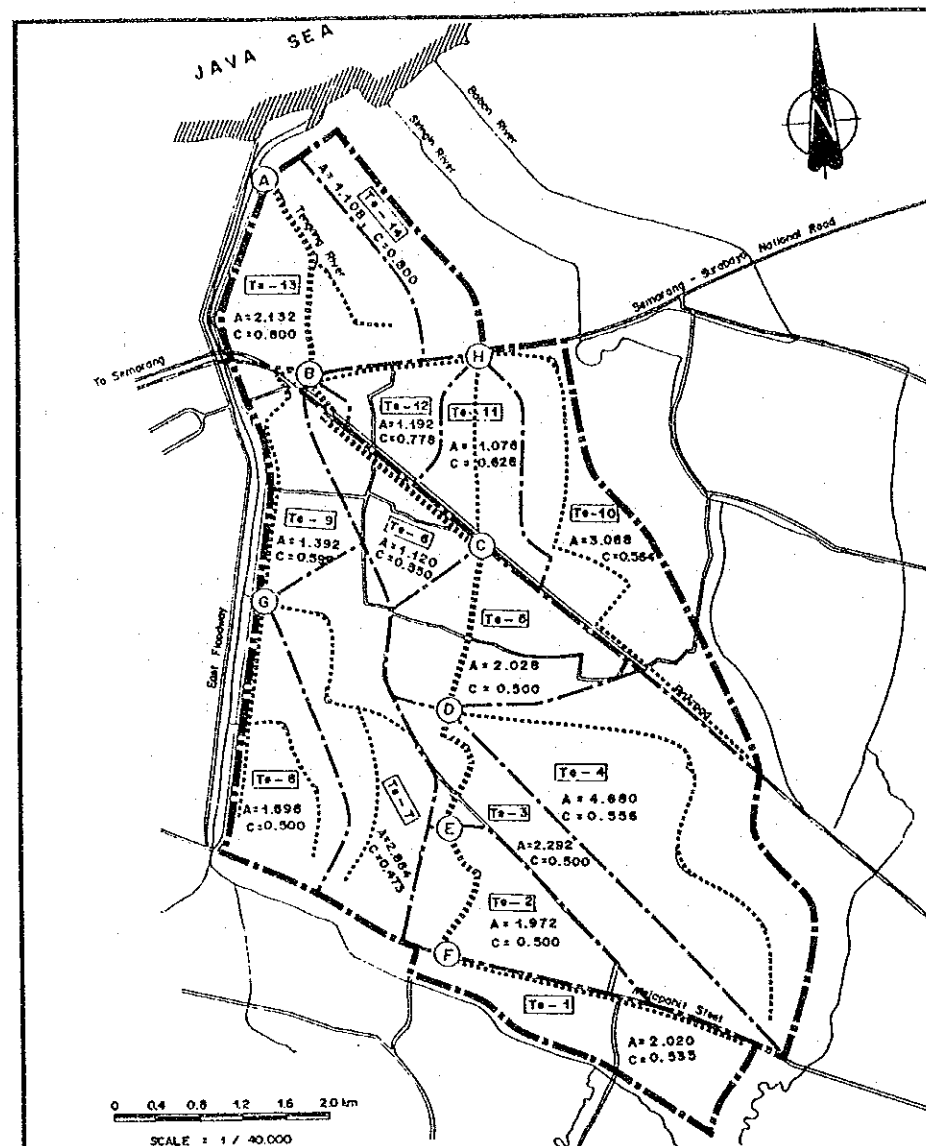
SPOT ELEVATION AND PROPOSED  
 PUMP DRAINAGE AREA



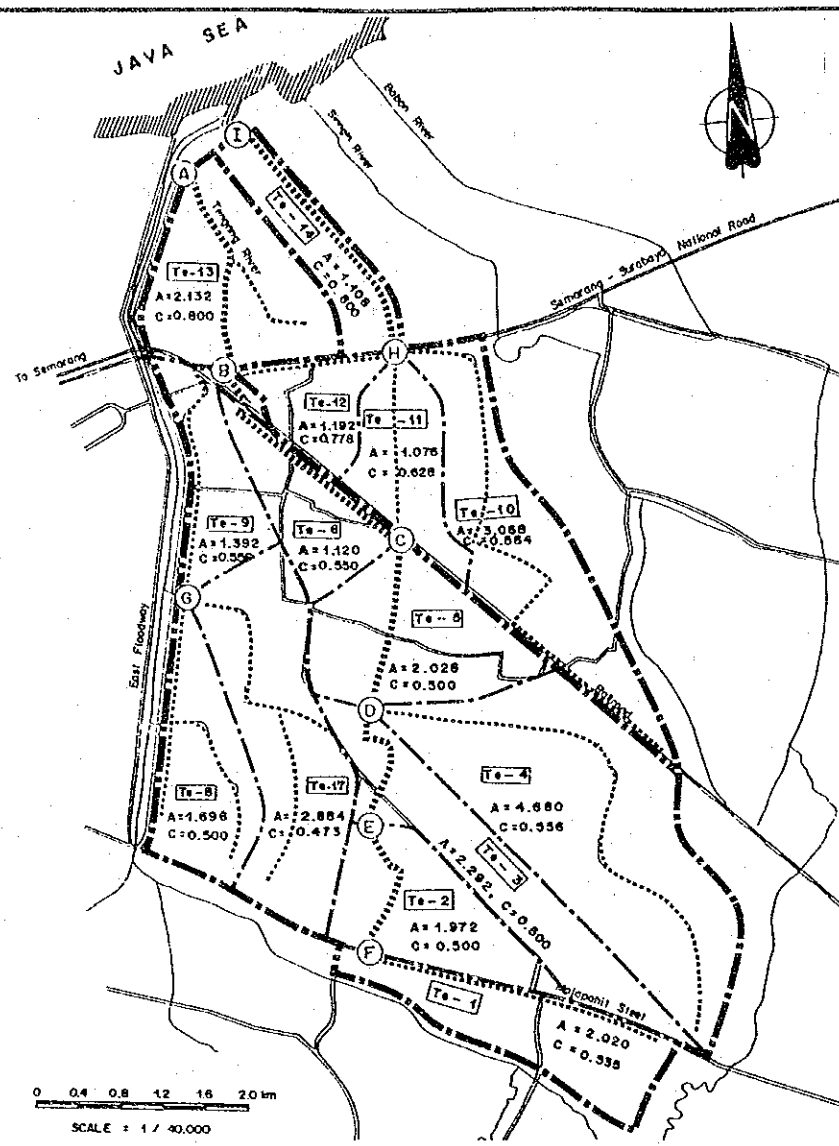
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FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 5.8 (1/7)  
PROPOSED DRAINAGE SYSTEM AND RUN-OFF  
MODEL (SIRINGIN RIVER)

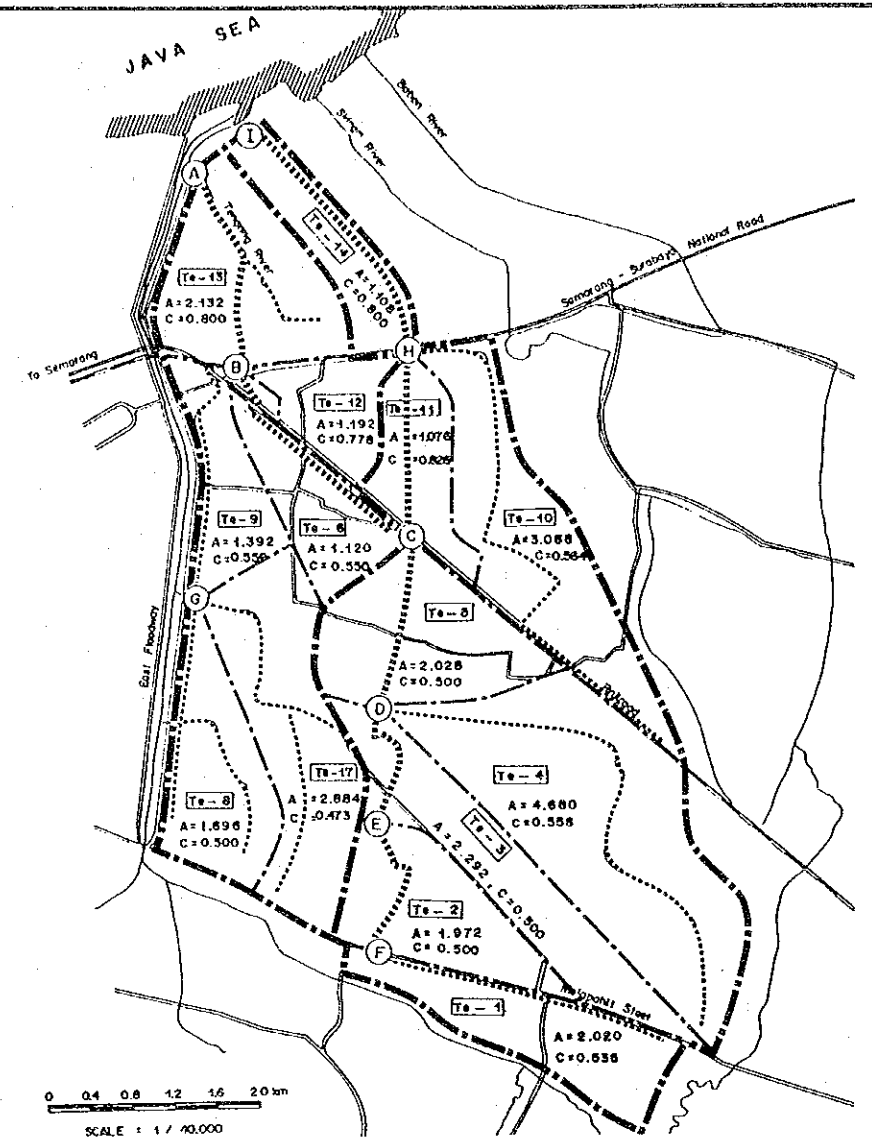




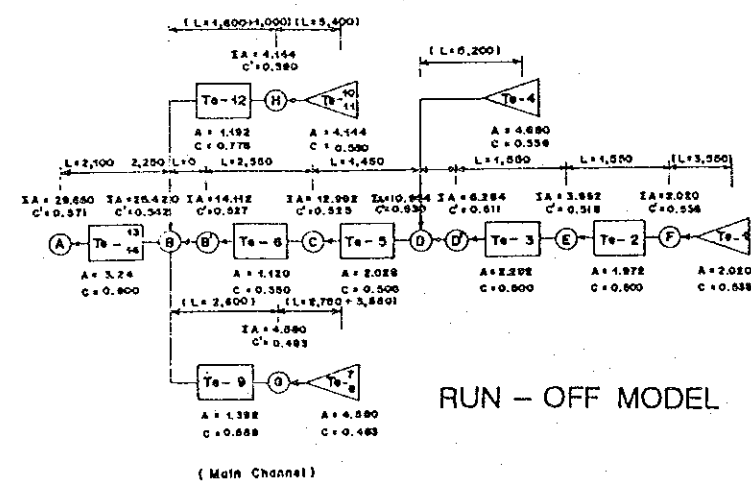
DRAINAGE SYSTEM



DRAINAGE SYSTEM

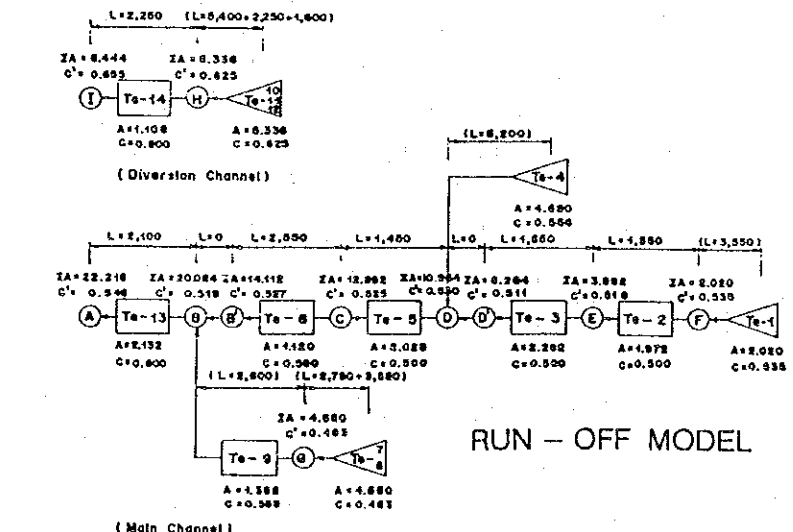


DRAINAGE SYSTEM



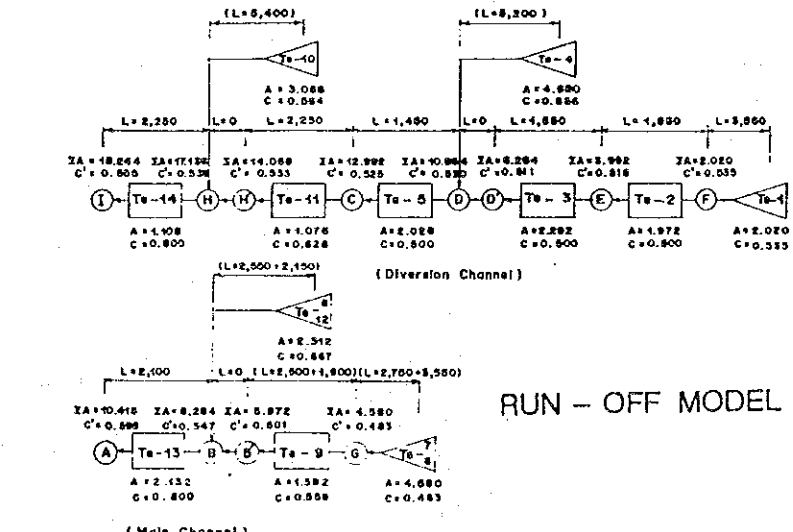
RUN - OFF MODEL

ALTERNATIVE I - A



RUN - OFF MODEL

ALTERNATIVE I - B



RUN - OFF MODEL

ALTERNATIVE I - C

- LEGEND**
- = Sub-drainage Area
  - = Calculation Point
  - = River Channel
  - = Drainage Area (Km<sup>2</sup>)

- ΣA = Accumulated Drainage Area (Km<sup>2</sup>)
- L = Length of River Channel (m)
- C = Run off Coefficient

MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND  
FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
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Fig. 5.8 (2/7)  
ALTERNATIVES OF DRAINAGE SYSTEM  
AND RUN-OFF MODEL (TENGGANG RIVER)