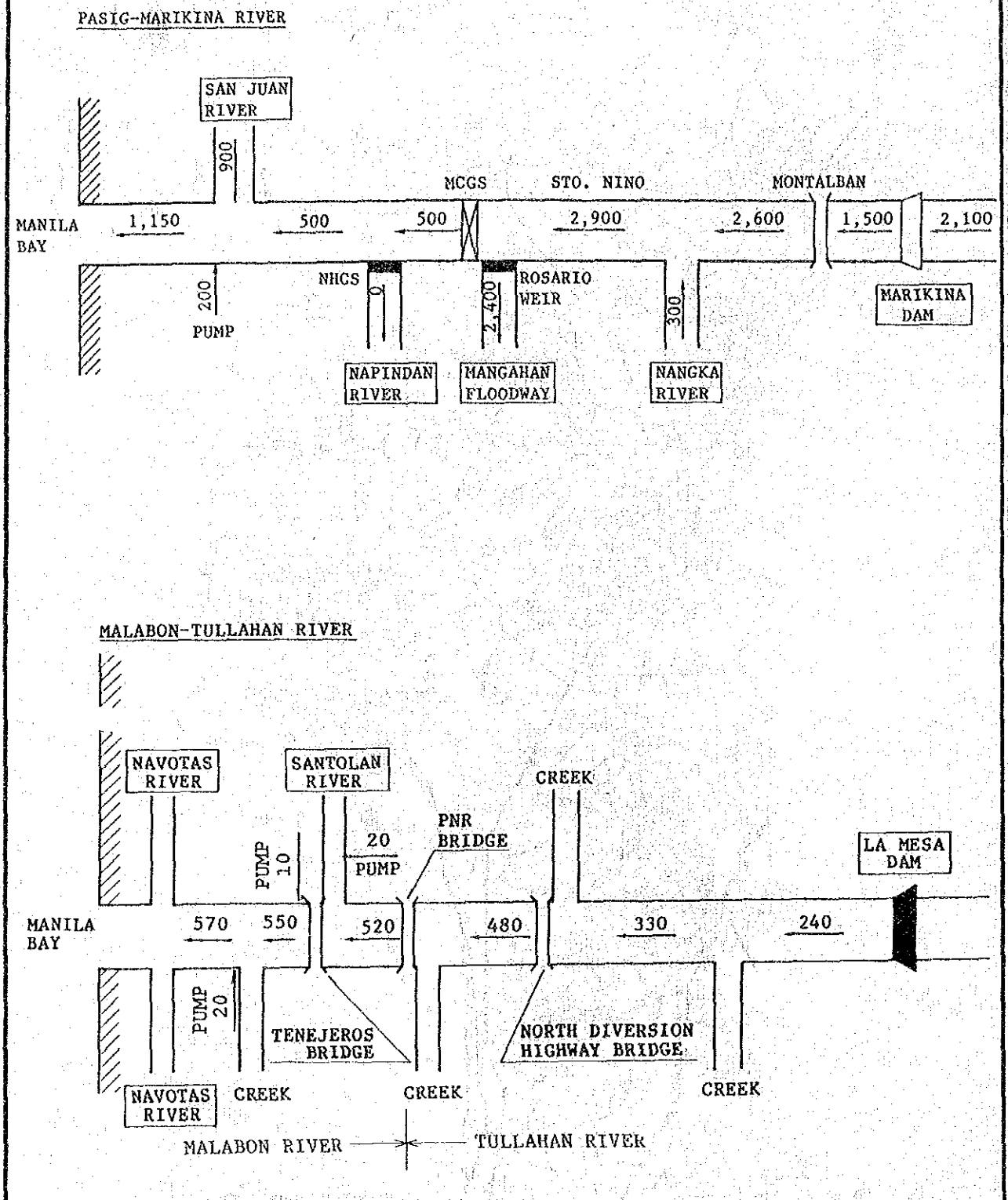
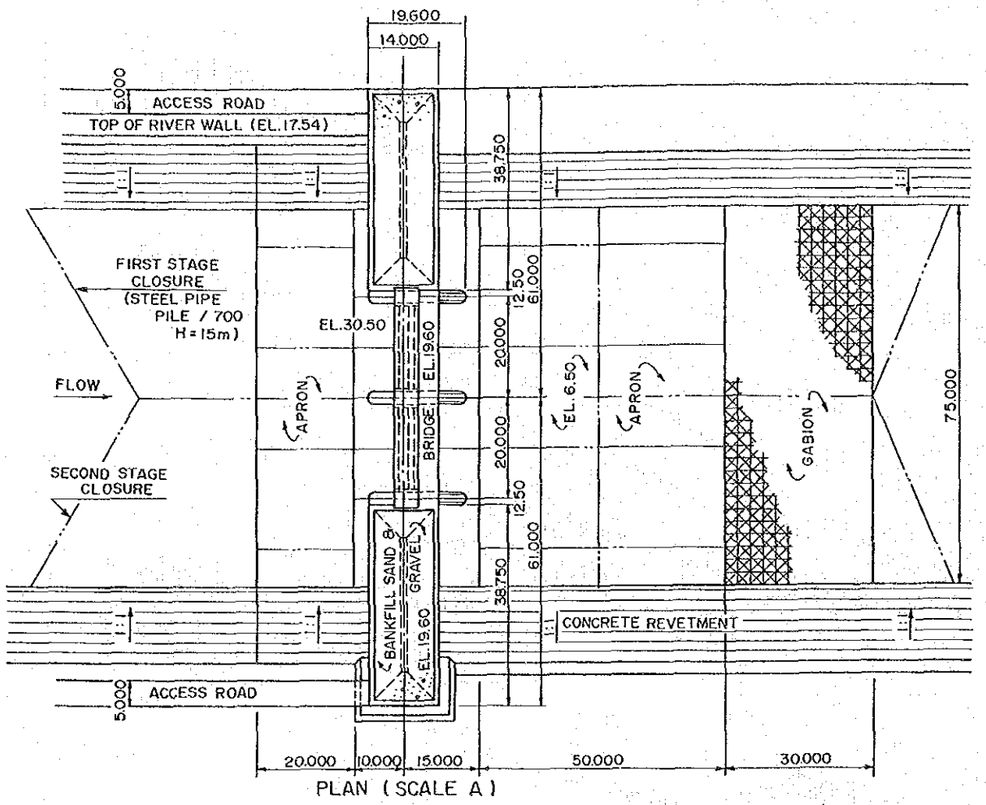
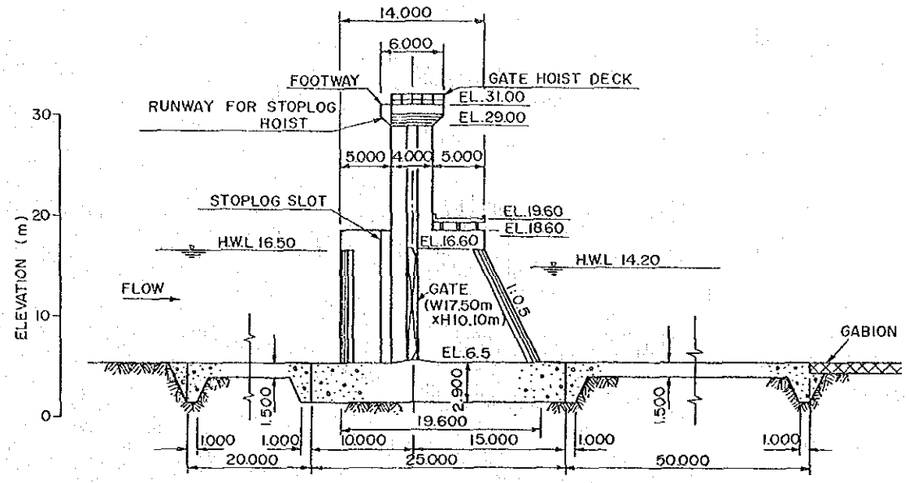


NOTE: FIGURES SHOW PEAK DISCHARGE OF 100-YEAR RETURN PERIOD (UNIT:m^3/s)

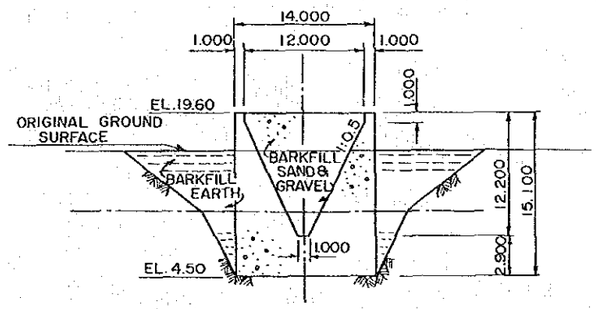
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	DESIGN DISCHARGE OF RIVERS FOR THE FRAMEWORK PLAN (PASIG-MARIKINA AND MALABON-TULLAHAN RIVERS) Fig.5.2-1



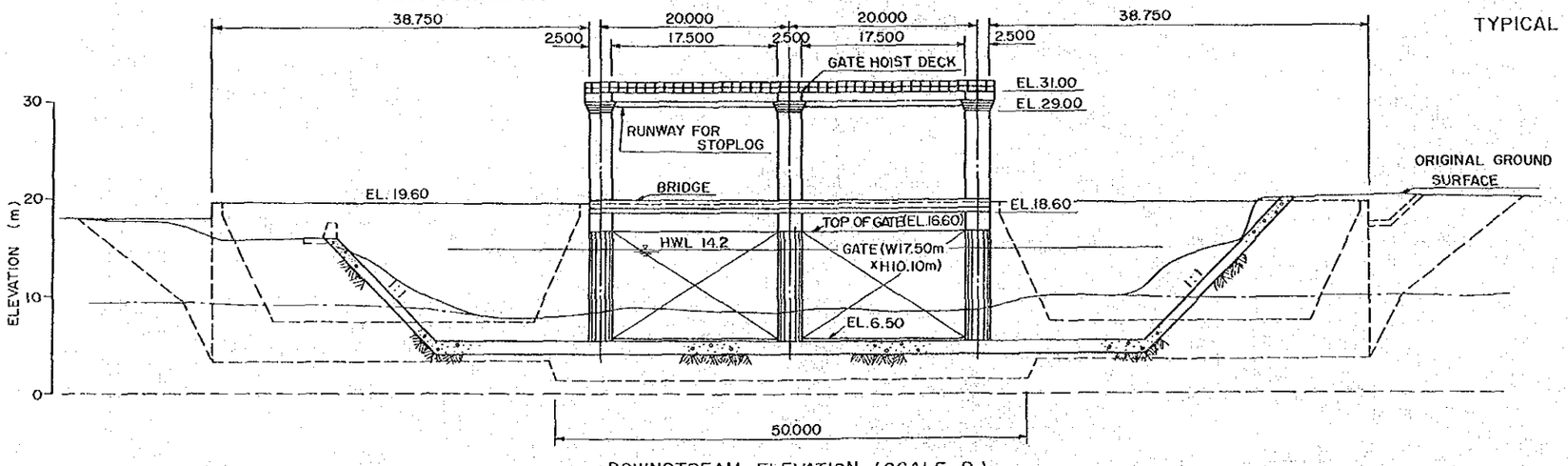
PLAN (SCALE A)



CROSS SECTION OF PIER (SCALE B)



TYPICAL SECTION OF ABUTMENT (SCALE B)

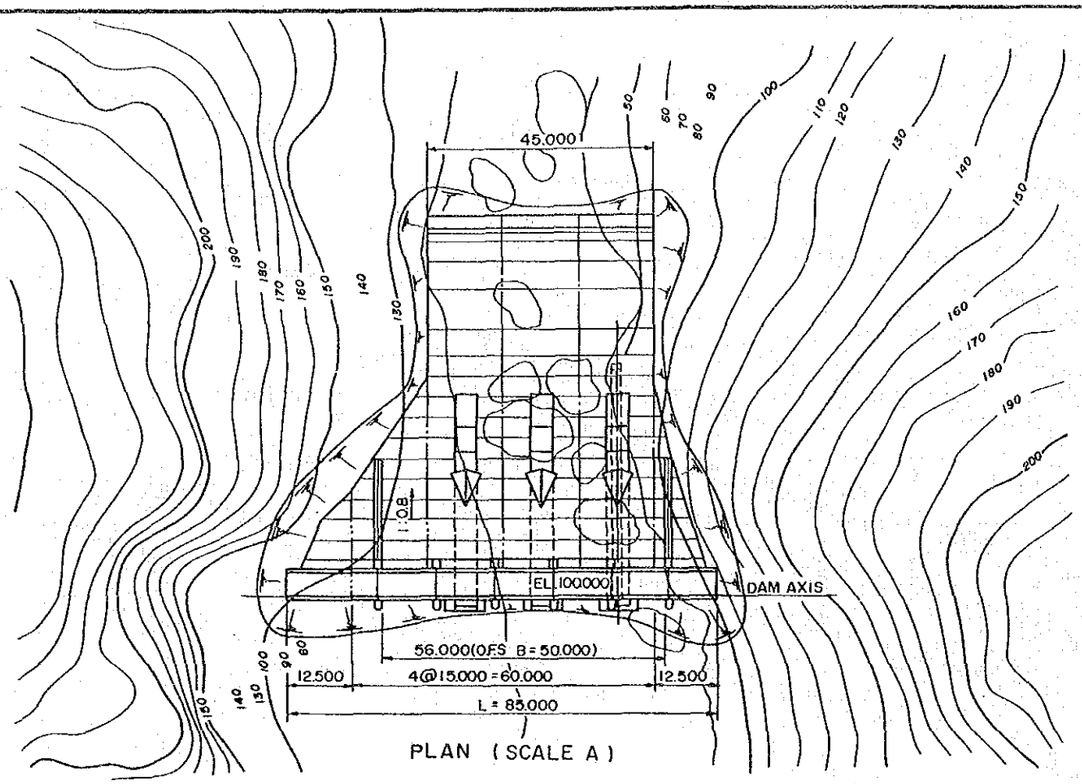


DOWNSTREAM ELEVATION (SCALE B)

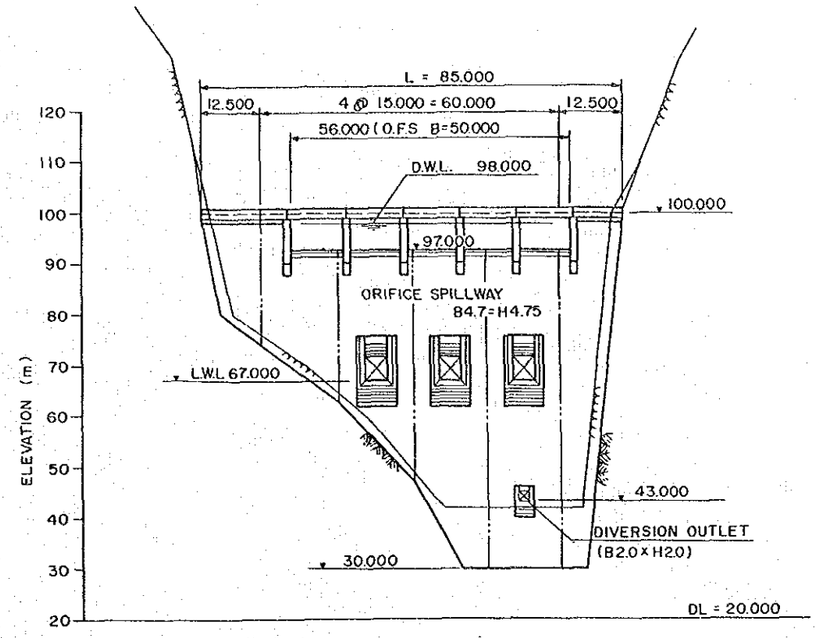
SCALE A 0 10 20 30 40 (m)

SCALE B 0 10 20 (m)

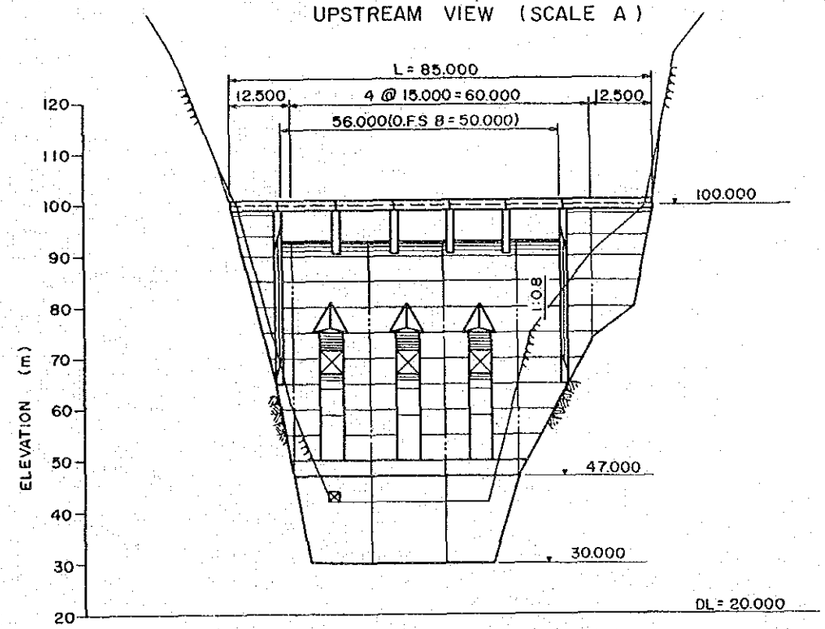
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES	MARIKINA CONTROL GATE STRUCTURE
JAPAN INTERNATIONAL COOPERATION AGENCY	Fig.5.2-2



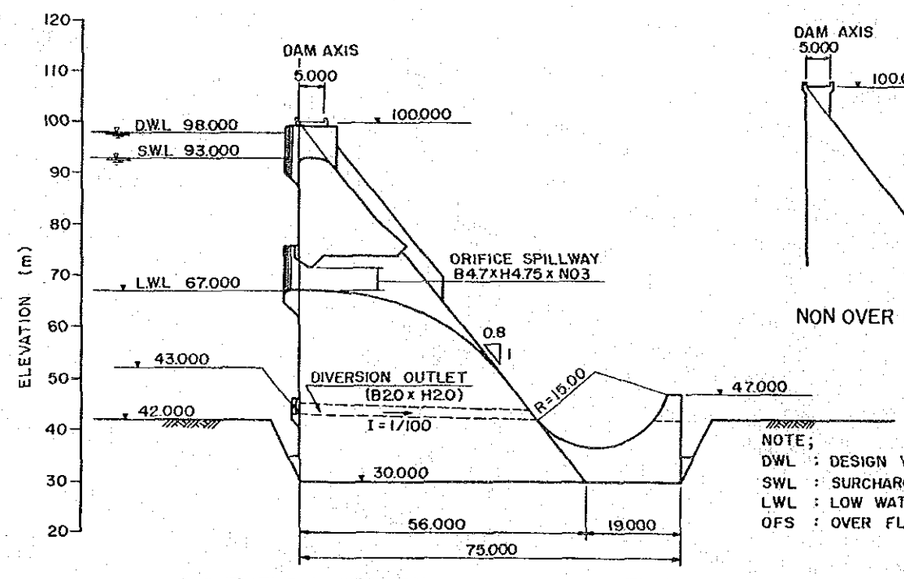
PLAN (SCALE A)



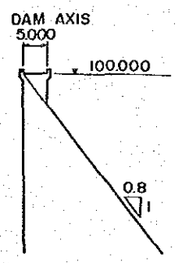
UPSTREAM VIEW (SCALE A)



DOWNSTREAM VIEW (SCALE A)



OVERFLOW SECTION



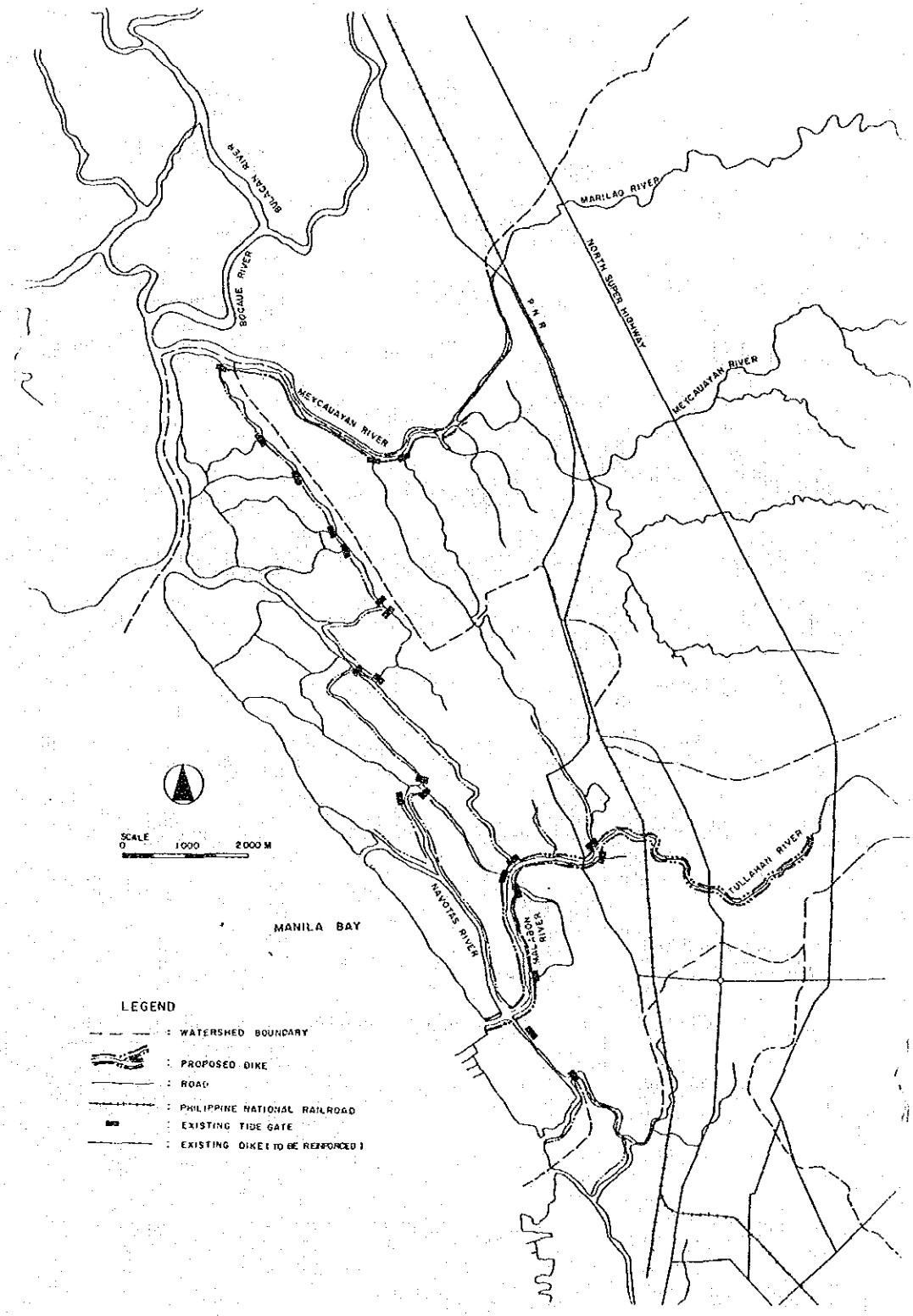
NON OVER FLOW SECTION

NOTE;
DWL : DESIGN WATER LEVEL
SWL : SURCHARGE WATER LEVEL
LWL : LOW WATER LEVEL
OFS : OVER FLOW SECTION

TYPICAL CROSS SECTION (SCALE A)

SCALE A 0 10 20 30 40 50 (m)

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	MARIKINA DAM Fig.5.2-3

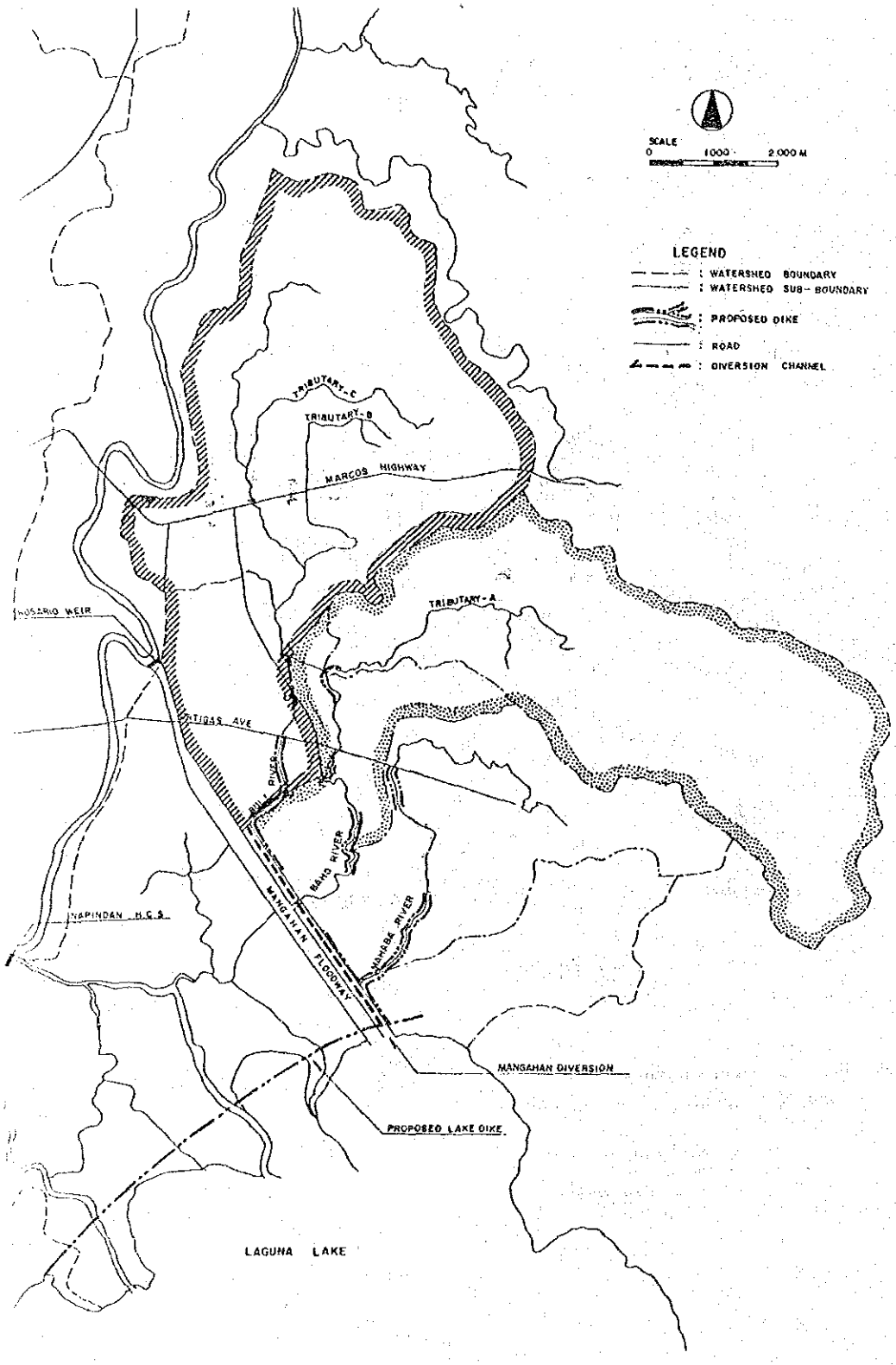


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

FRAMEWORK PLAN IN MALABON-TULLAHAN RIVER BASIN

Fig.5.2-4

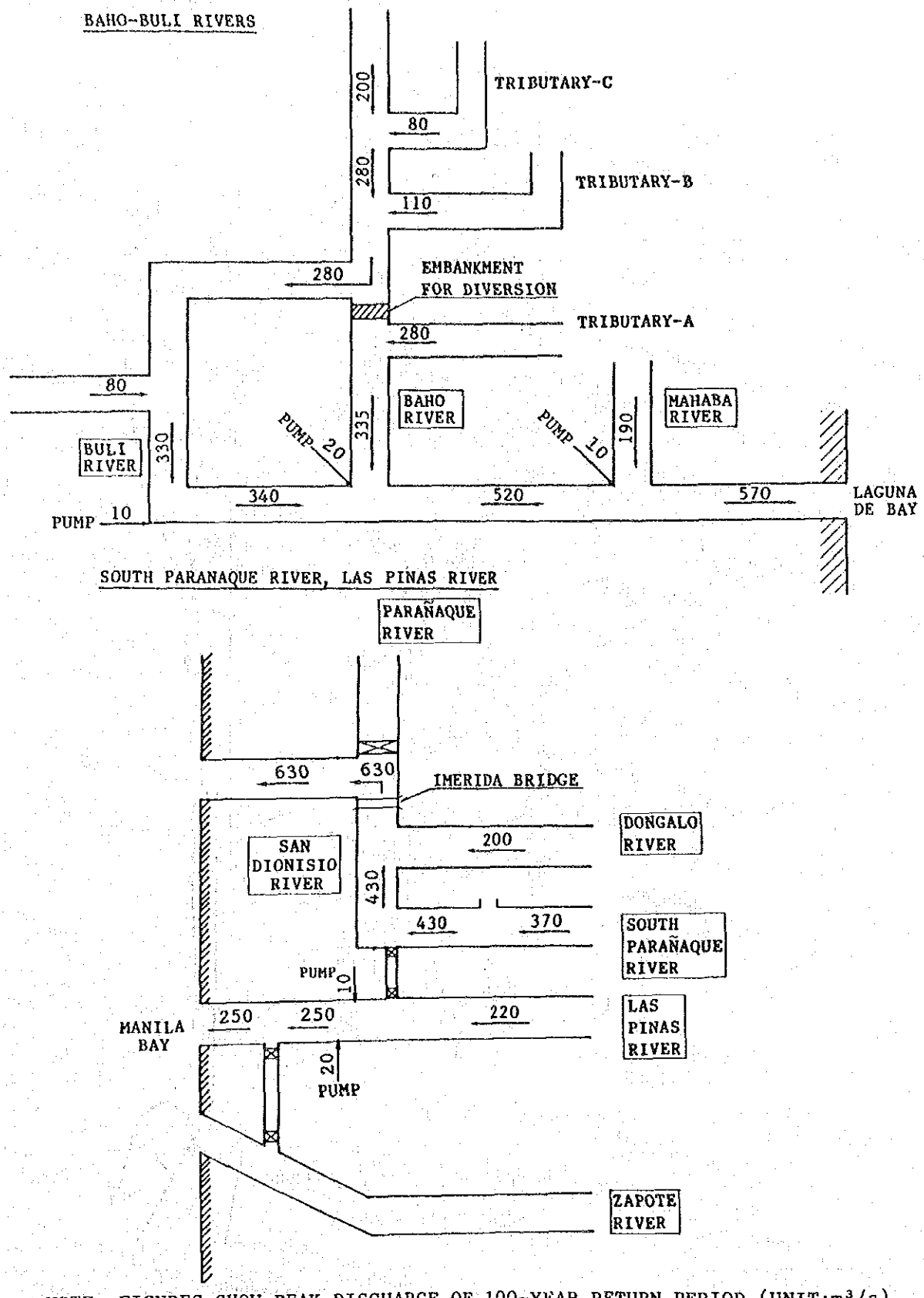


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

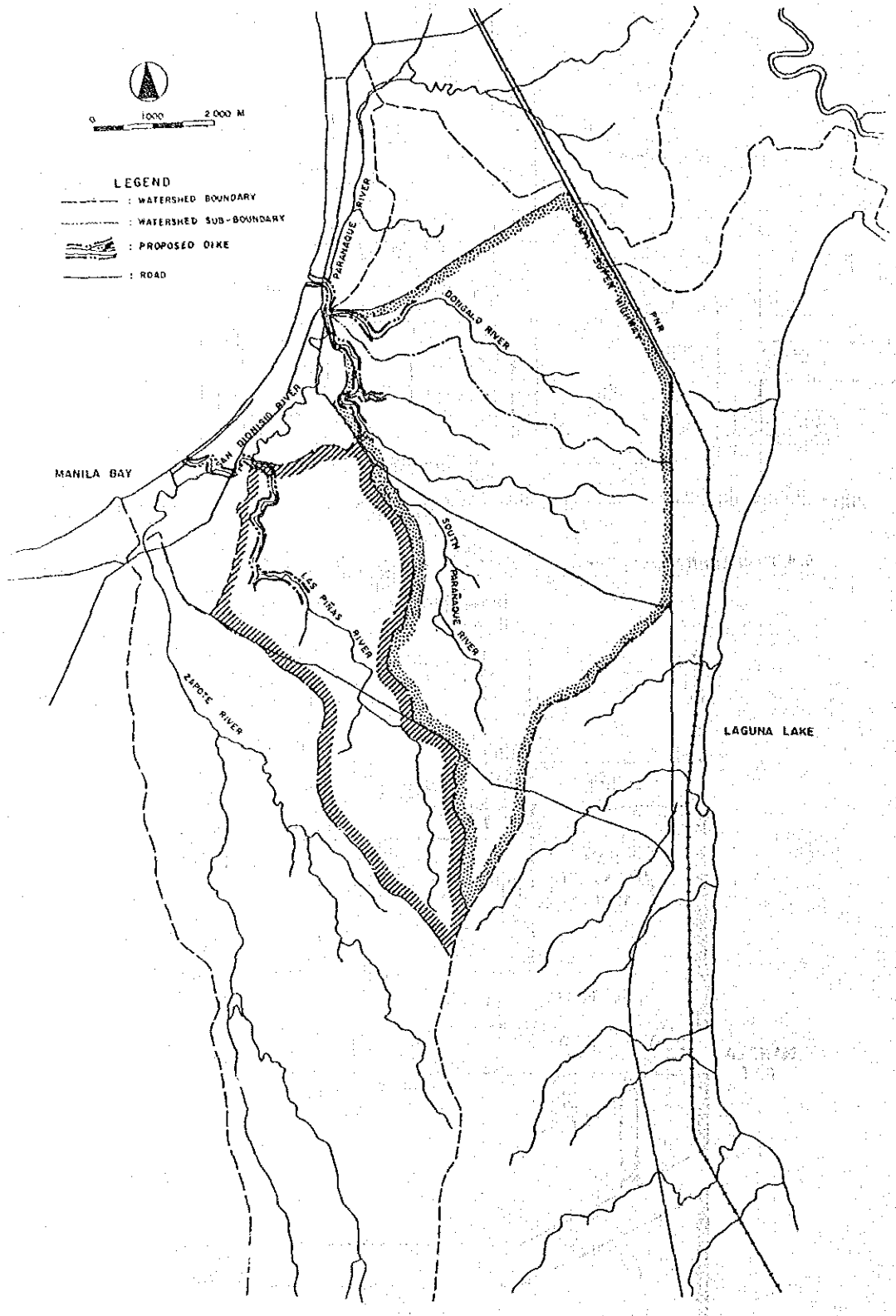
FRAMEWORK PLAN IN BULI, BAHO AND MAHABA RIVER BASINS

Fig.5.2-5



NOTE: FIGURES SHOW PEAK DISCHARGE OF 100-YEAR RETURN PERIOD (UNIT:m^3/s)

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	DESIGN DISCHARGE OF RIVERS FOR THE FRAMEWORK PLAN (BULI, BAHO, MAHABA, SOUTH PARANAQUE AND LAS PINAS) Fig.5.2-6

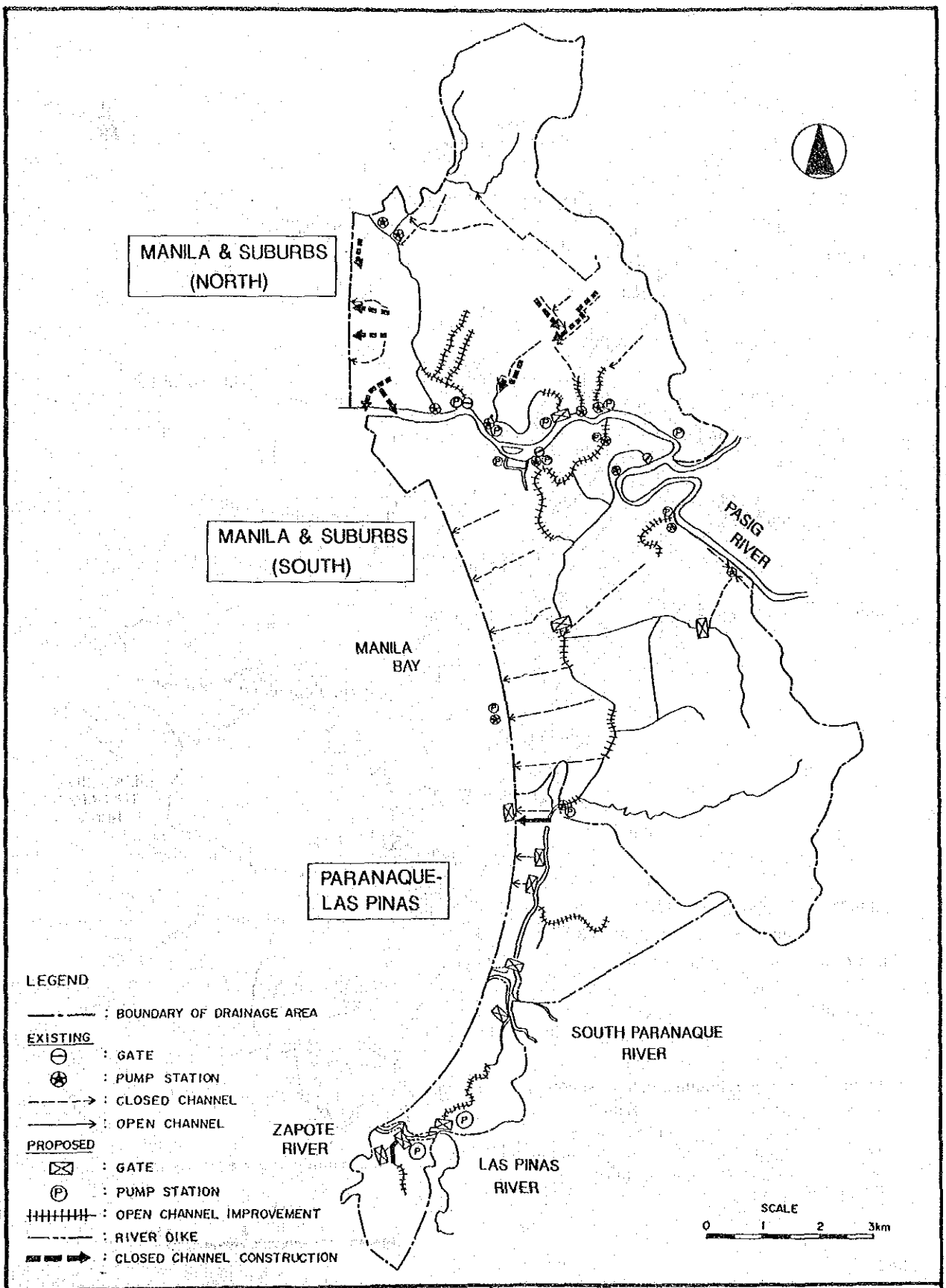


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

FRAMEWORK PLAN IN SOUTH PARANAQUE AND LAS PINAS RIVER BASINS

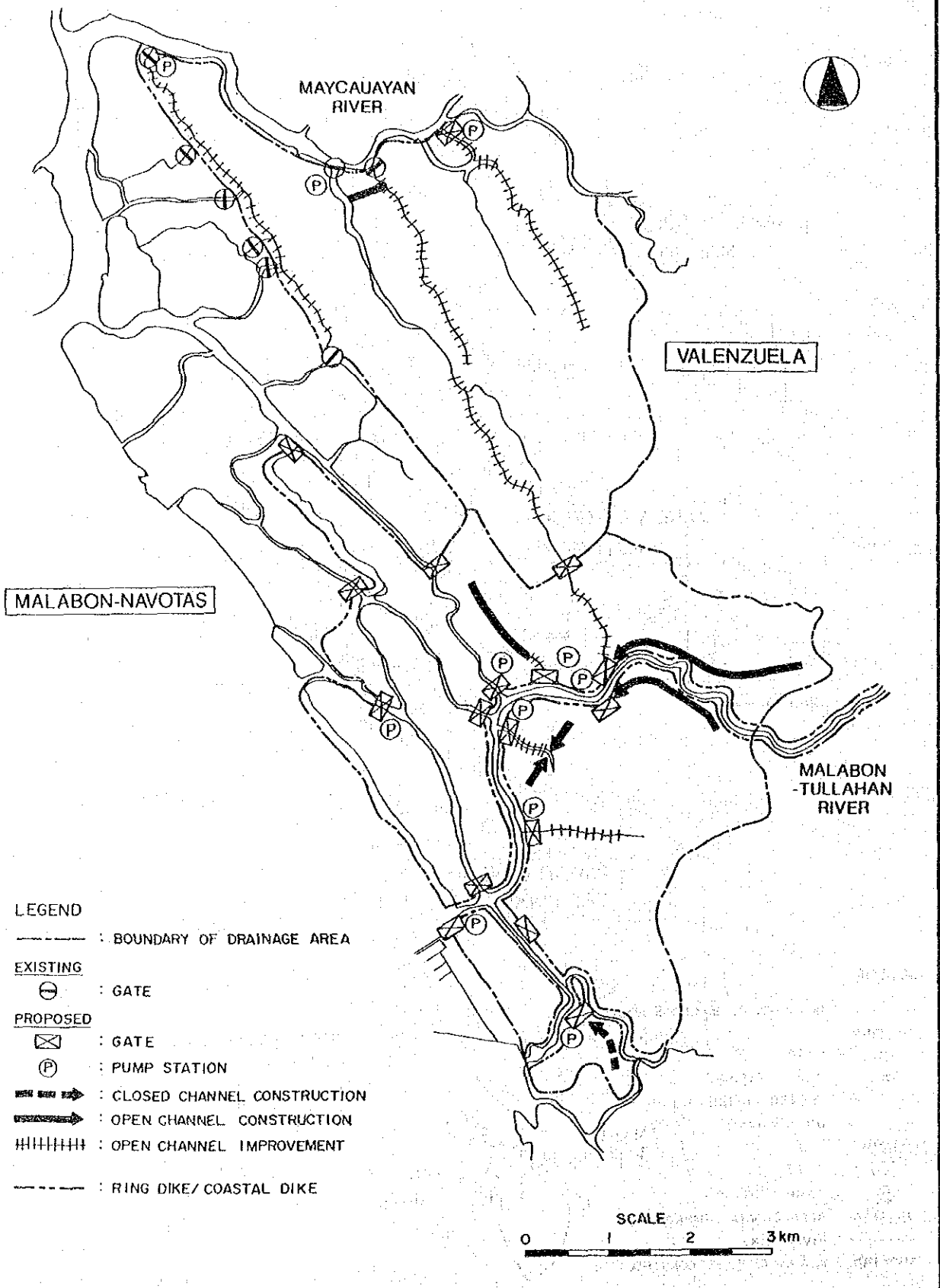
Fig.5.2-7



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

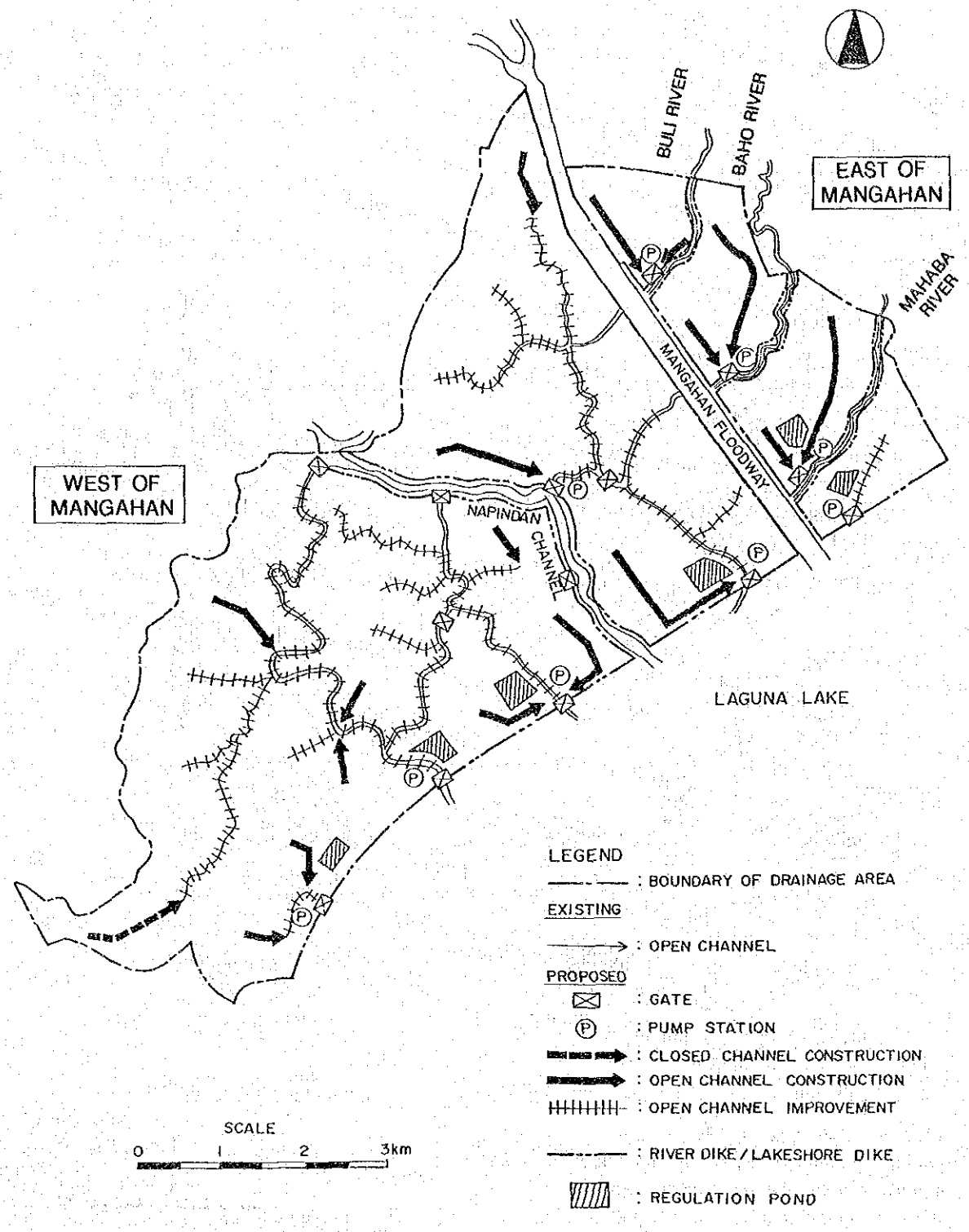
LAYOUT OF PROPOSED DRAINAGE SYSTEM
Fig.5.2-8(1/4)



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

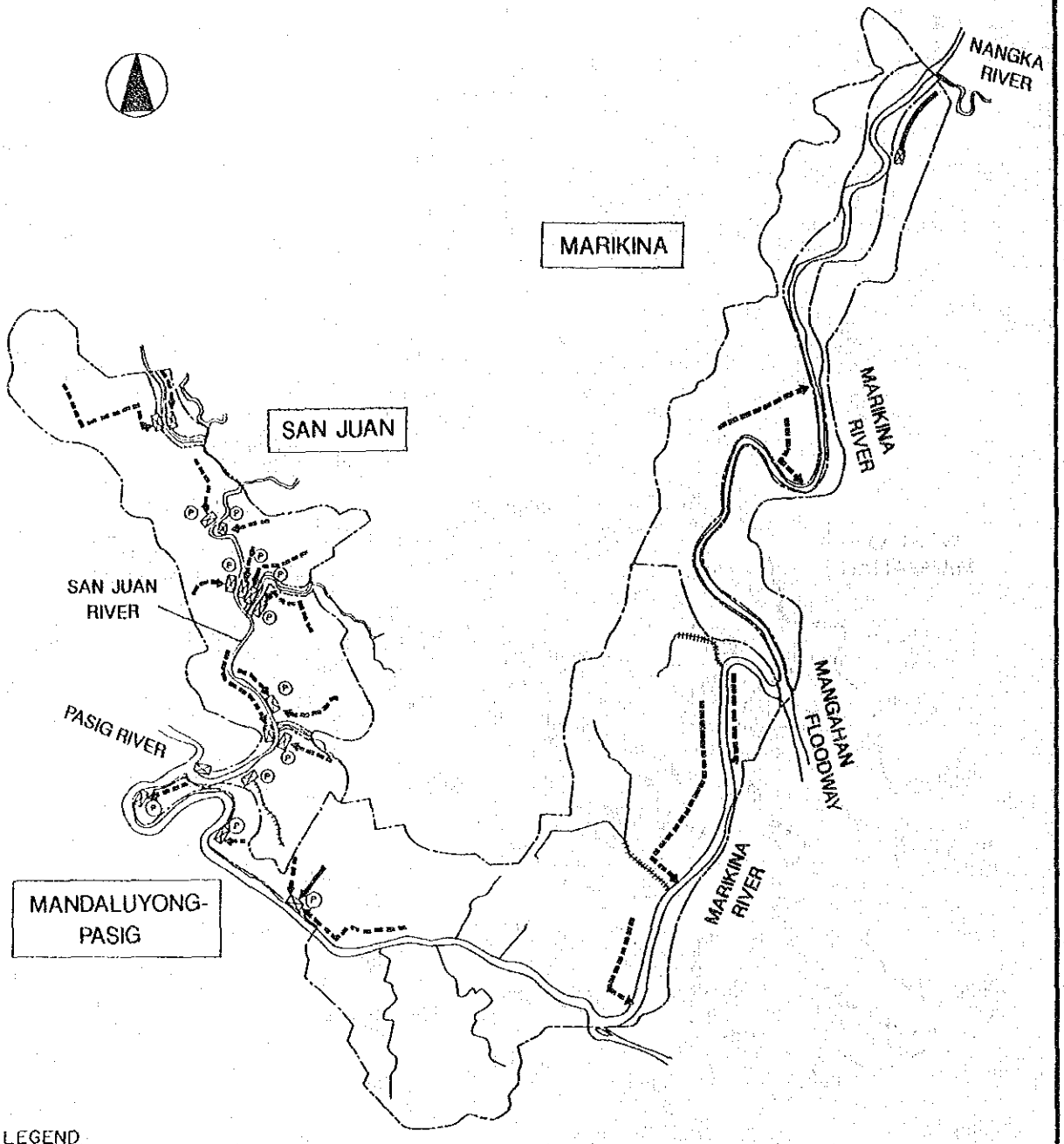
LAYOUT OF PROPOSED DRAINAGE SYSTEM
Fig.5.2-8(2/4)



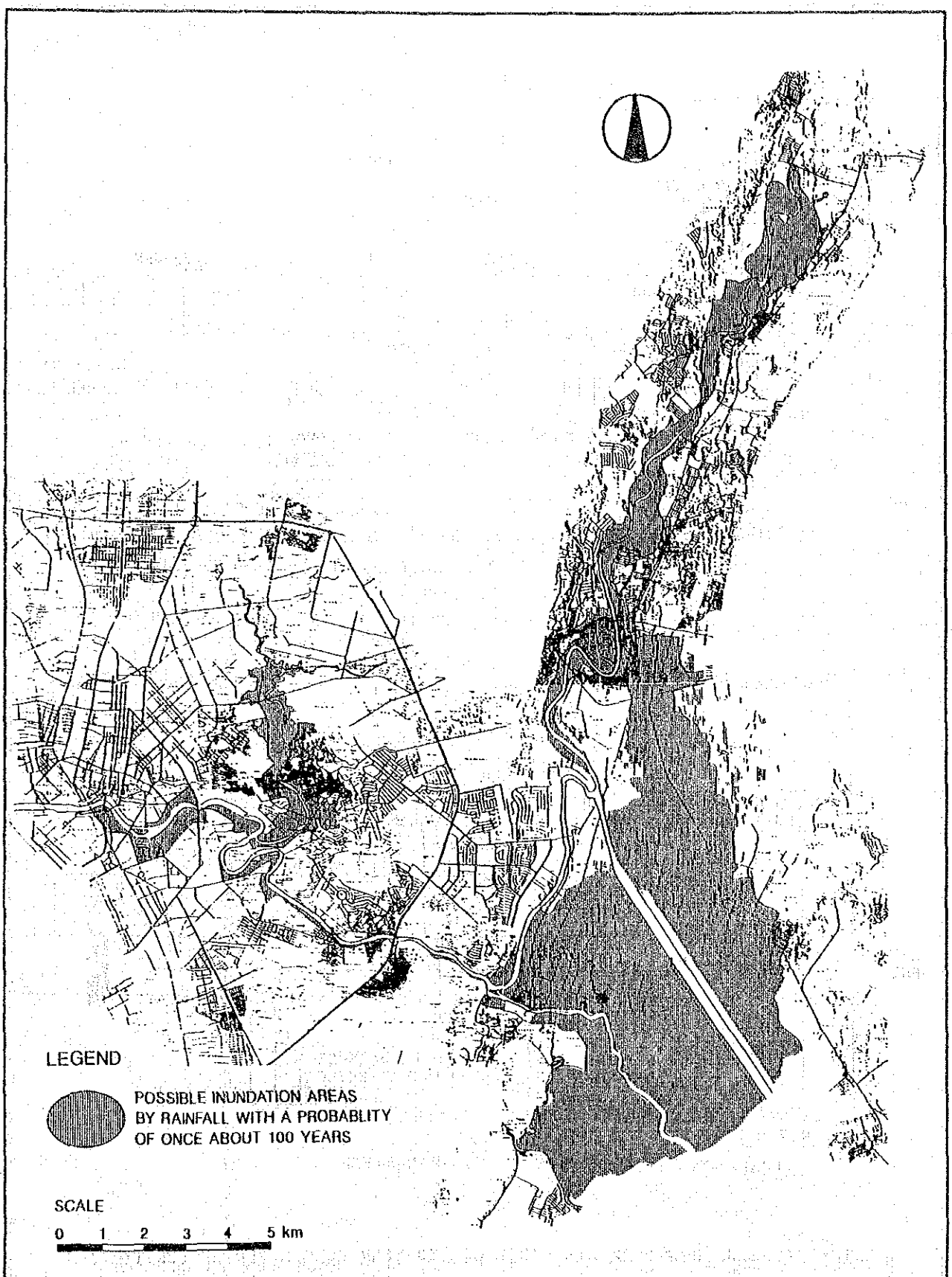
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

LAYOUT OF PROPOSED DRAINAGE SYSTEM
Fig.5.2-8(3/4)



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES	LAYOUT OF PROPOSED DRAINAGE SYSTEM Fig.5.2-8(4/4)
JAPAN INTERNATIONAL COOPERATION AGENCY	

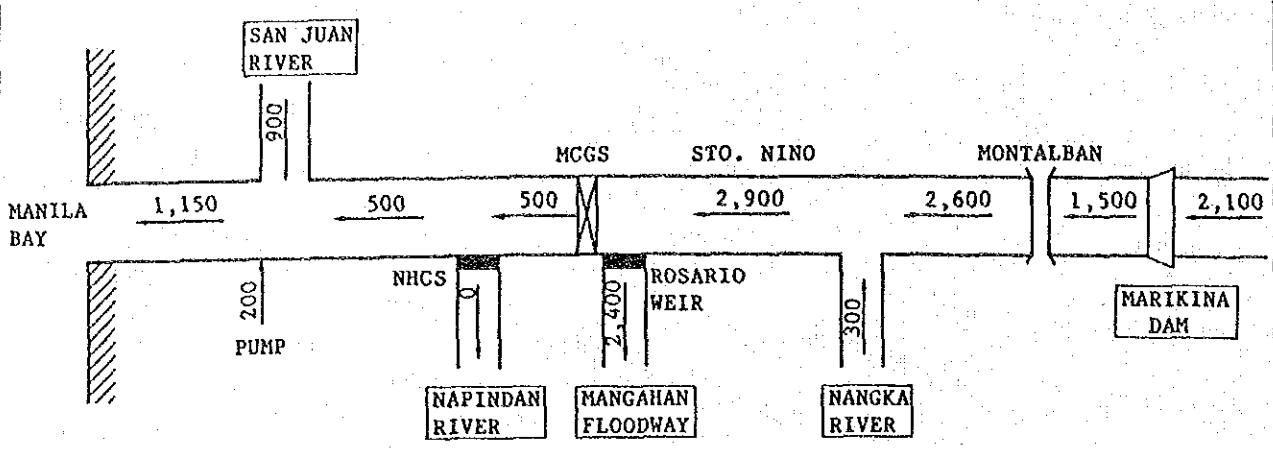


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

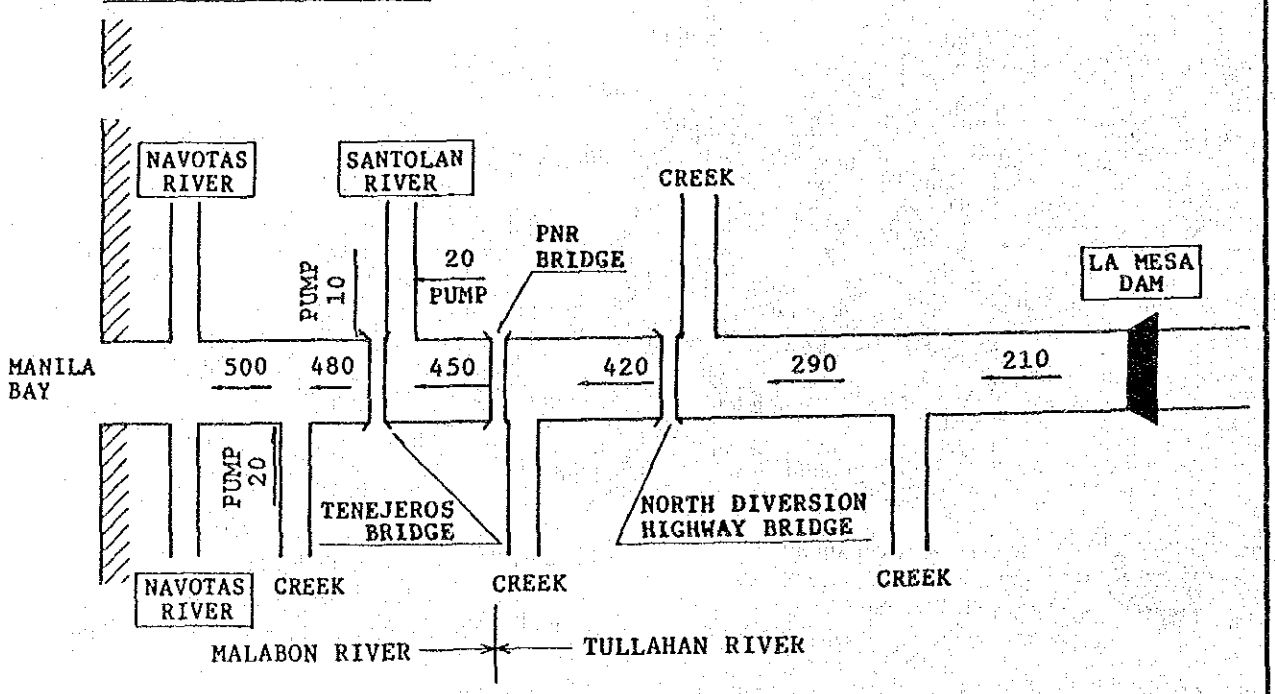
FLOOD RISK MAP OF PASIG, MARIKINA AND SAN JUAN RIVERS FOR 100-YEAR RETURN PERIOD FLOOD Fig.6.4-2

PASIG-MARIKINA RIVER



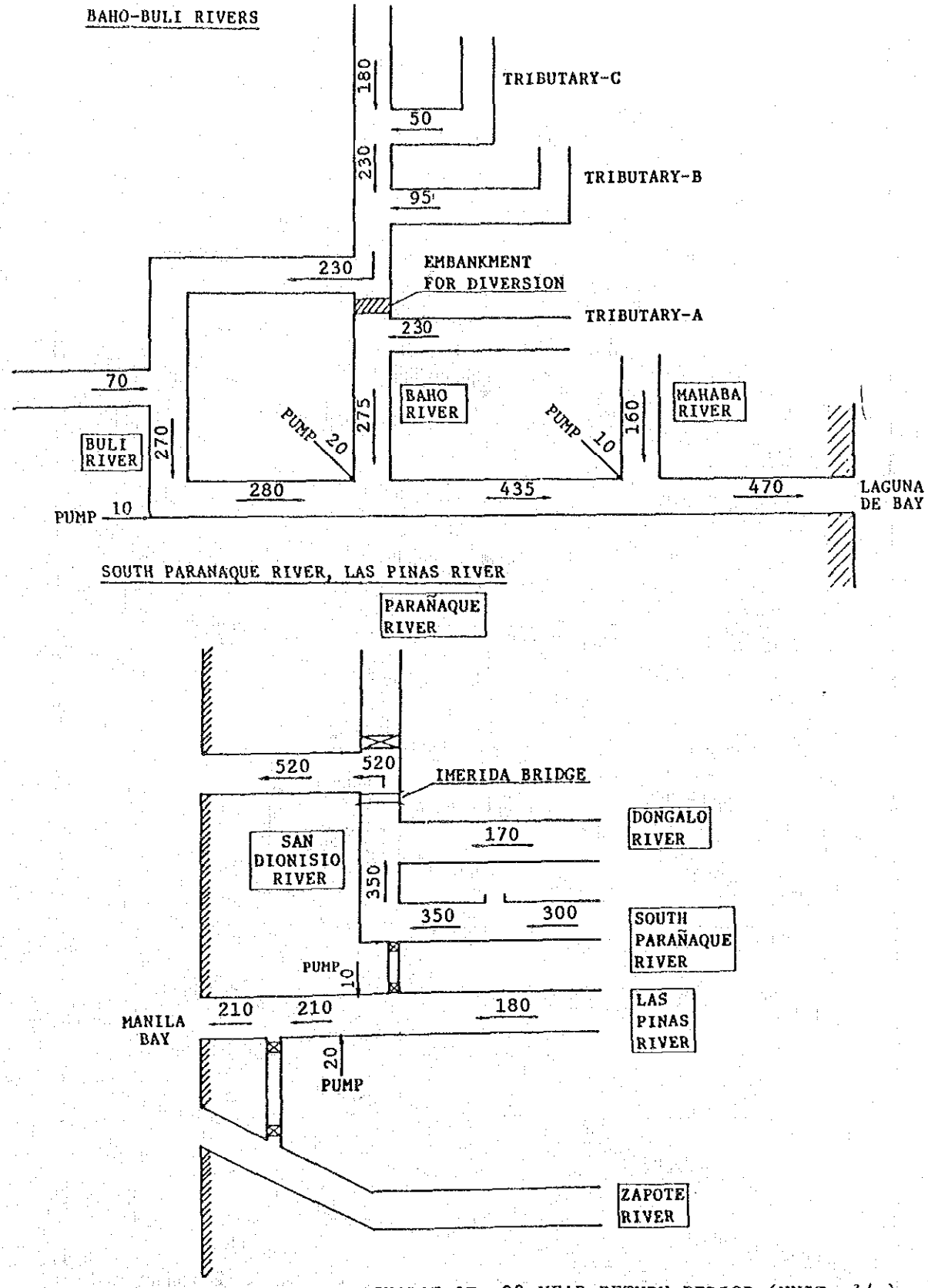
NOTE: FIGURES SHOW PEAK DISCHARGE OF 100-YEAR RETURN PERIOD (UNIT:M3/S)

MALABON-TULLAHAN RIVER



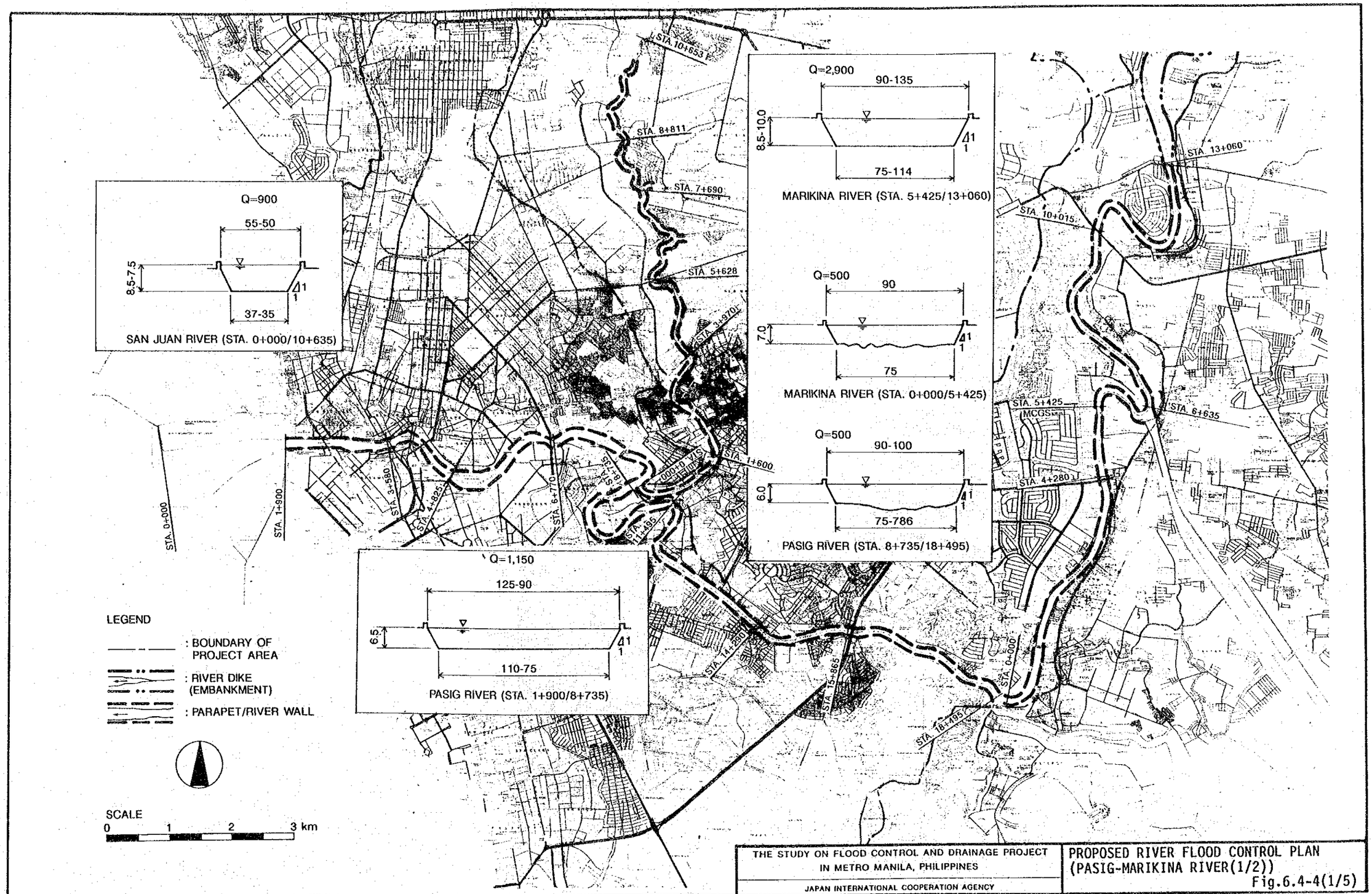
NOTE: FIGURES SHOW PEAK DISCHARGE OF 30-YEAR RETURN PERIOD (UNIT:m^3/s)

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	DISCHARGE DISTRIBUTION FOR RIVER IMPROVEMENT (PASIG-MARIKINA AND MALABON-TULLAHAN) Fig.6.4-3(1/2)



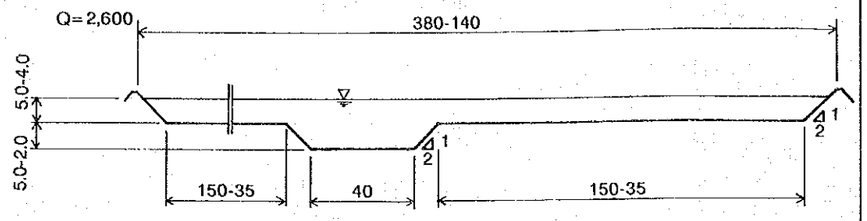
NOTE: FIGURES SHOW PEAK DISCHARGE OF 30-YEAR RETURN PERIOD (UNIT:m^3/s)

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	DISCHARGE DISTRIBUTION FOR RIVER IMPROVEMENT (BULI, BAHO, MAHABA, SOUTH PARANAQUE & LAS PINAS) Fig.6.4-3(2/2)

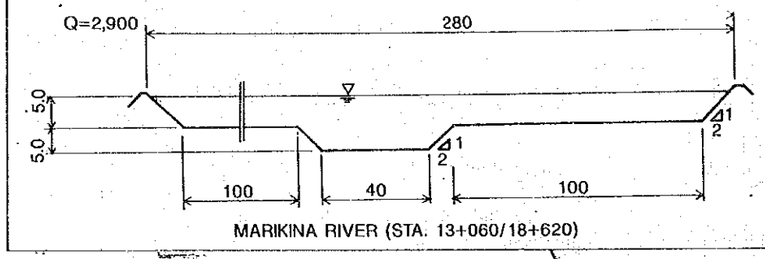


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	PROPOSED RIVER FLOOD CONTROL PLAN (PASIG-MARIKINA RIVER(1/2)) Fig.6.4-4(1/5)

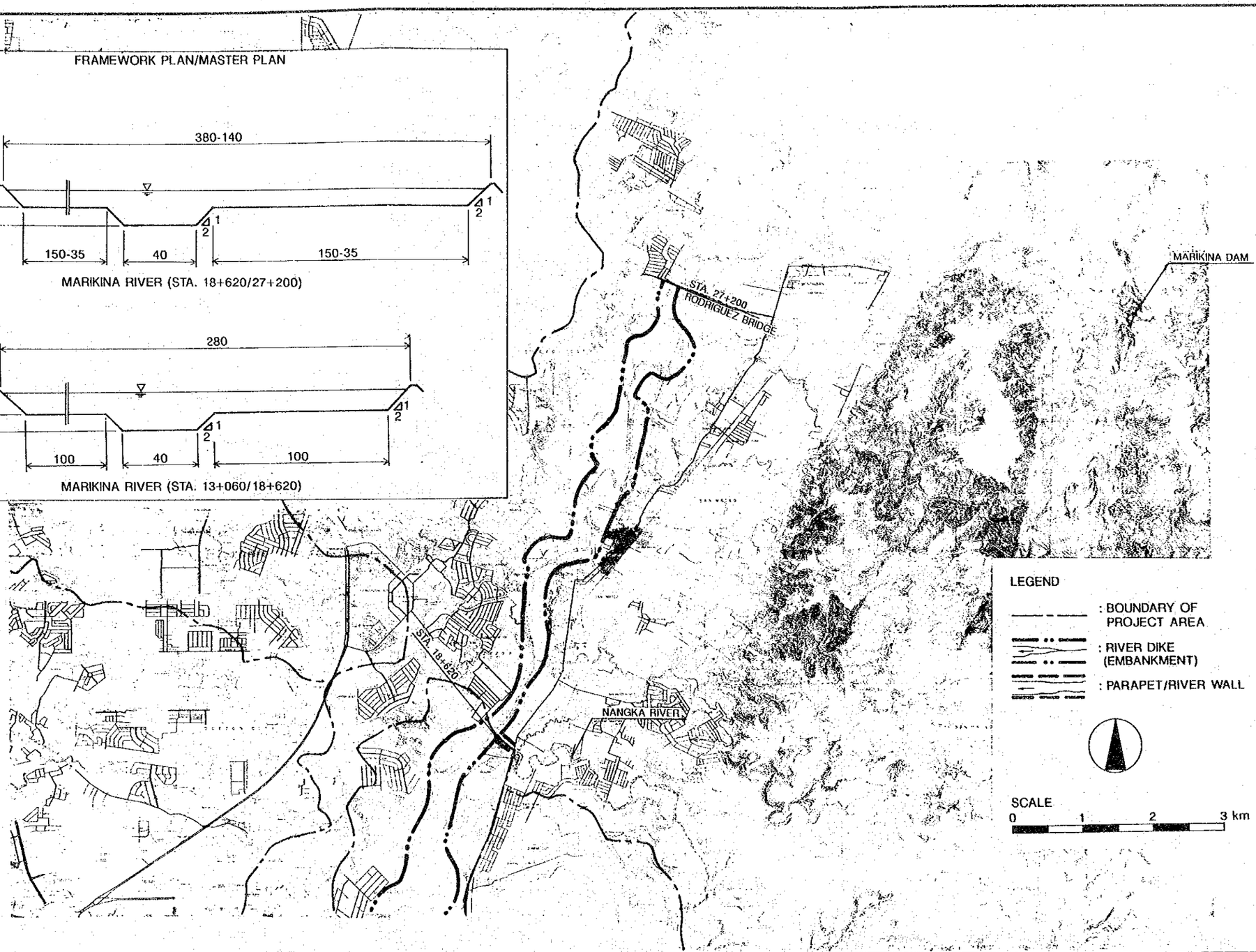
FRAMEWORK PLAN/MASTER PLAN



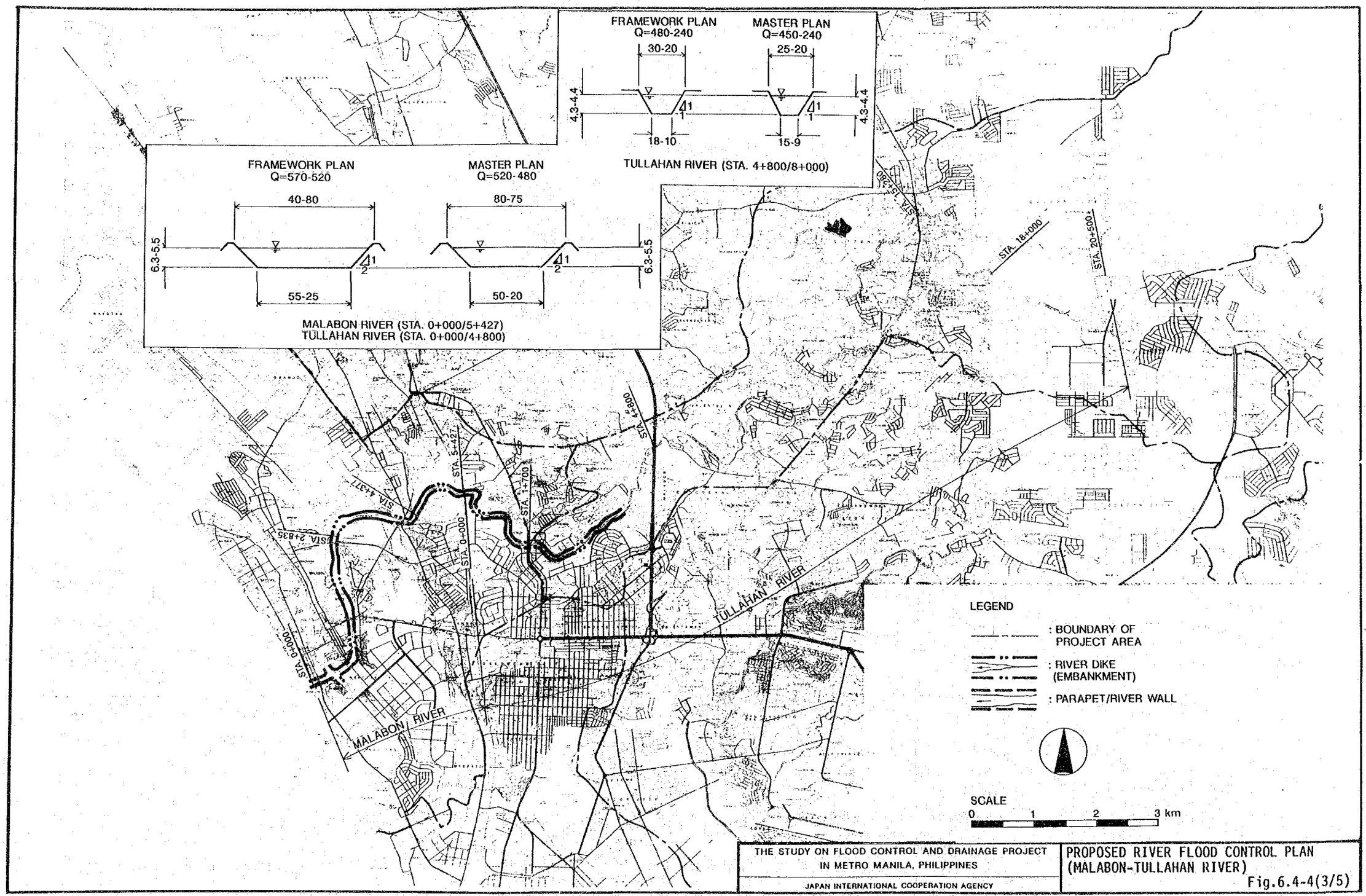
MARIKINA RIVER (STA. 18+620/27+200)



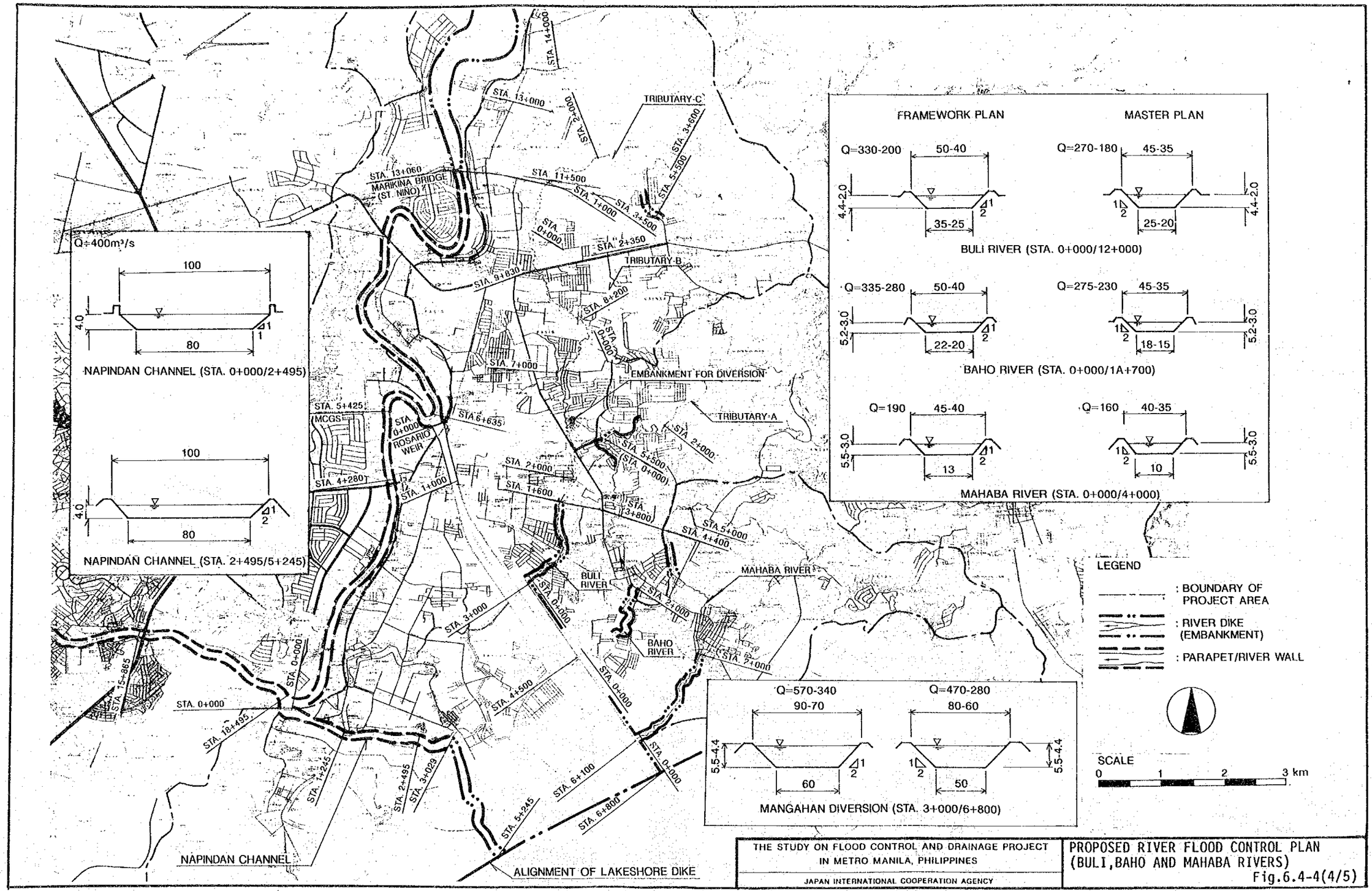
MARIKINA RIVER (STA. 13+060/18+620)



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	PROPOSED RIVER FLOOD CONTROL PLAN (PASIG-MARIKINA RIVER(2/2)) Fig.6.4-4(2/5)



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	PROPOSED RIVER FLOOD CONTROL PLAN (MALABON-TULLAHAN RIVER) Fig.6.4-4(3/5)

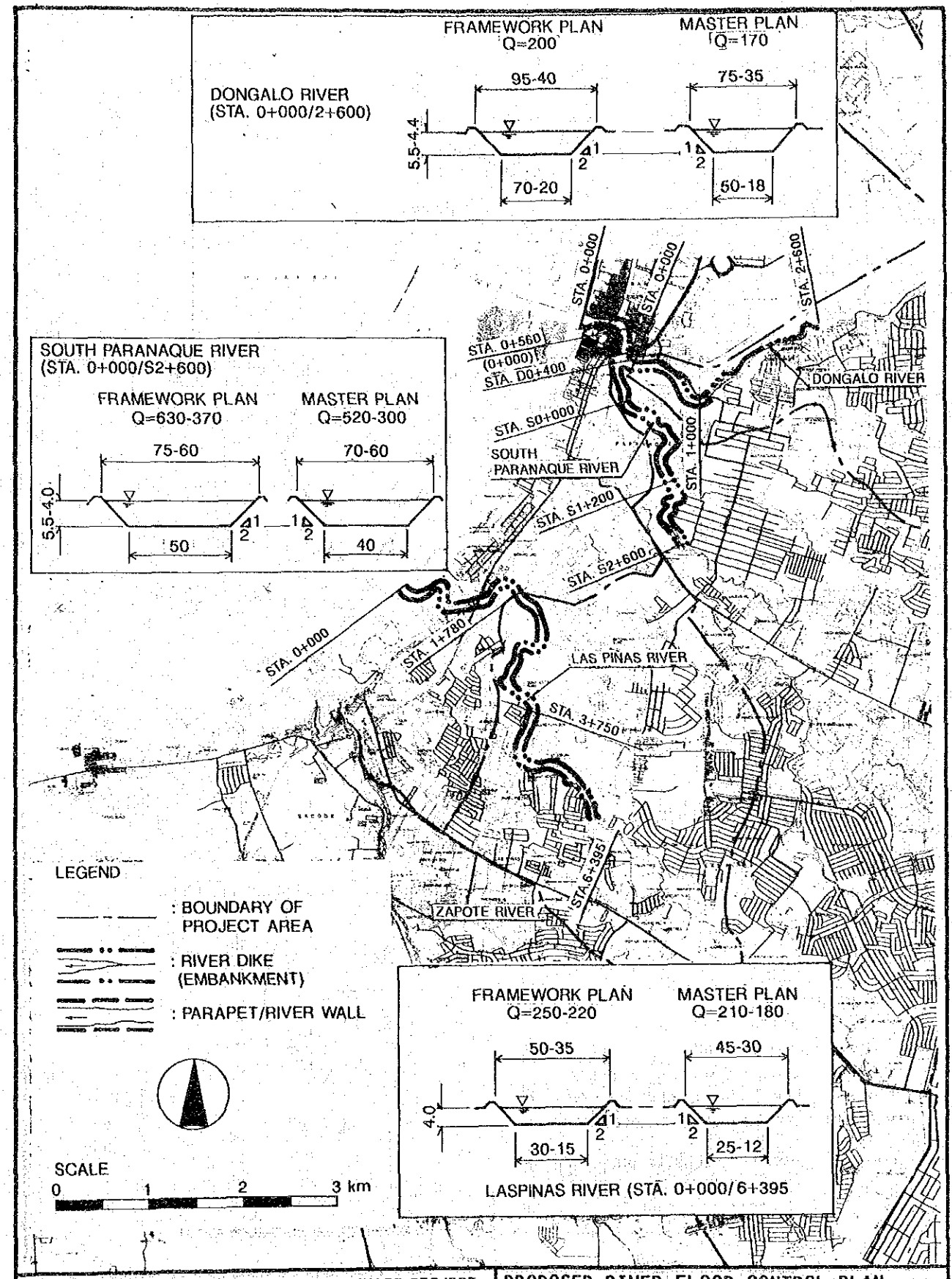


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

PROPOSED RIVER FLOOD CONTROL PLAN (BULI, BAHO AND MAHABA RIVERS)

Fig.6.4-4(4/5)

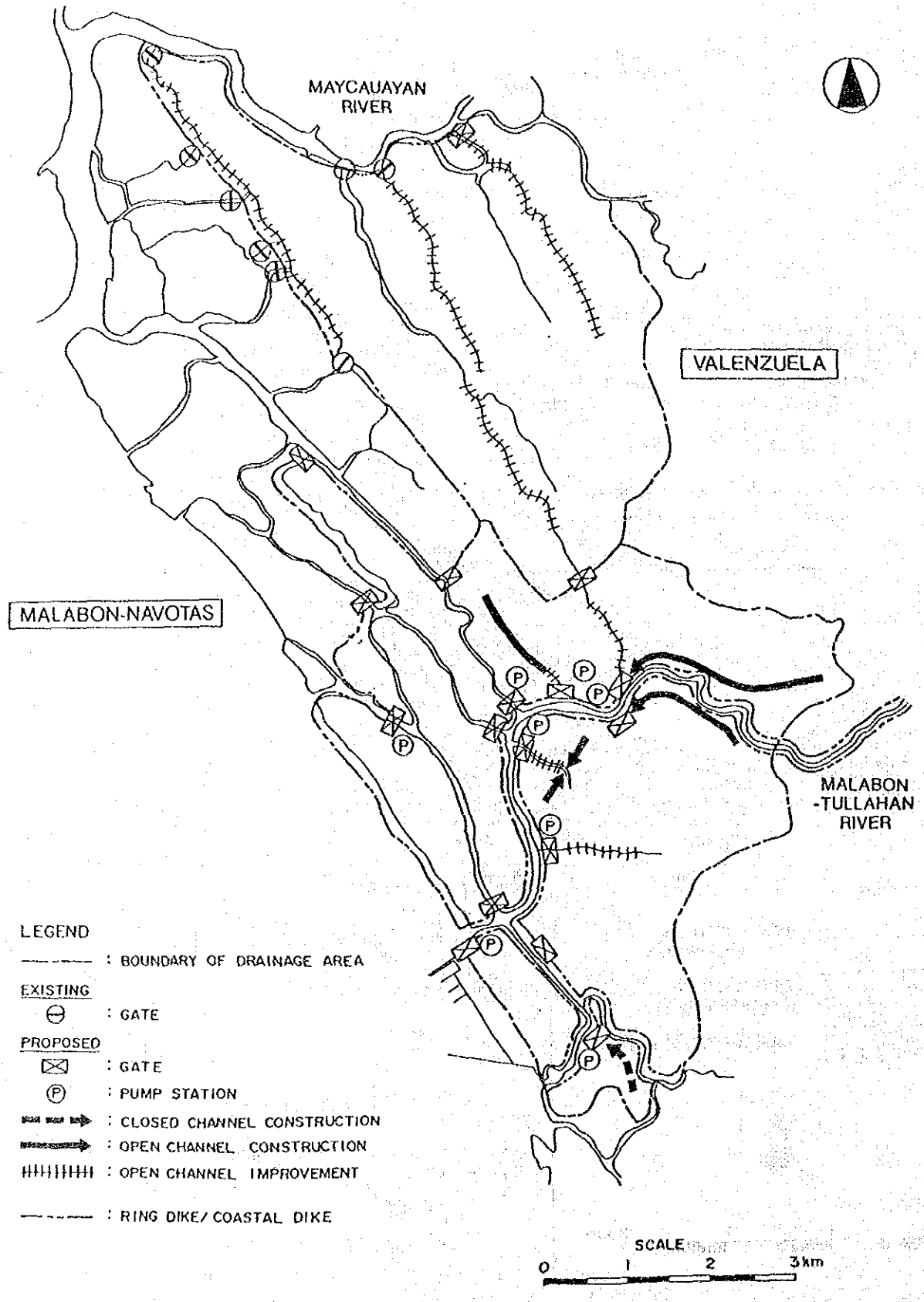


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

PROPOSED RIVER FLOOD CONTROL PLAN (SOUTH PARANAQUE AND LAS PINAS RIVERS)

Fig.6.4-4(5/5)



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

LAYOUT OF PROPOSED DRAINAGE SYSTEM

Fig.6.4-5

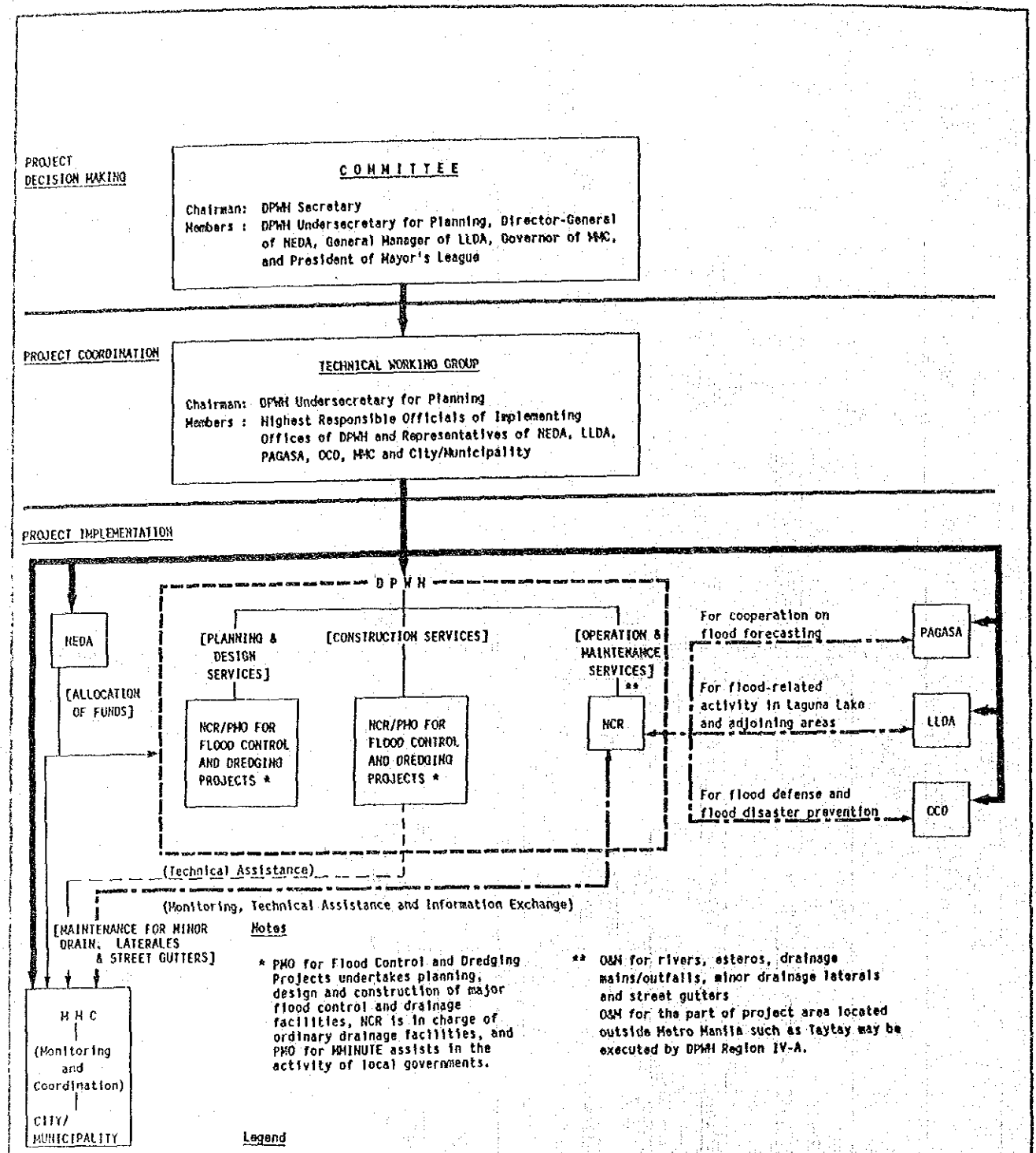
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

IMPLEMENTATION SCHEDULE FOR MASTER PLAN

PROJECT	PROJECT SCALE	CONSTRUCTION COST (million pesos)	YEAR 1991-2000	YEAR 2001-2010	YEAR 2011-2020
RIVER IMPROVEMENT		**7,390**			
Pasig River	100-Yr	963	P1,290		
Lower Marikina River	100-Yr	143	//////////		
Marikina Control Gate Structure	100-Yr	184			
Upper Marikina River	100-Yr	1,566		P1,566 //////////	
San Juan River	100-Yr	757			P4,534 //////////
Marikina Dam	100-Yr	800			
Baho, Buli, Mahaba Rivers	30-Yr	1,542			
Malabon-Tullahan River	30-Yr	655			
South Parañaque-Las Piñas River	30-Yr	780			
DRAINAGE IMPROVEMENT		**6,133**			
Malabon-Navotas (First Stage)	5-Yr	1,062	P3,387		
East & West of Mangahan	5-Yr	2,325	//////////		
Malabon-Navotas (Remaining)	5-Yr	89			
San Juan	3-Yr	962			
Mandaluyong-Pasig	3-Yr	721		P2,746 //////////	
Marikina	3-Yr	184			
Parañaque-Las Piñas	3-Yr	573			
Valenzuela	3-Yr	217			
T O T A L		**13,523**	PHASE I = P4,677 (@ P468 x 10 yrs)	PHASE II = P4,312 (@ P431 x 10 yrs)	PHASE III = P4,534 (@ P453 x 10 yrs)

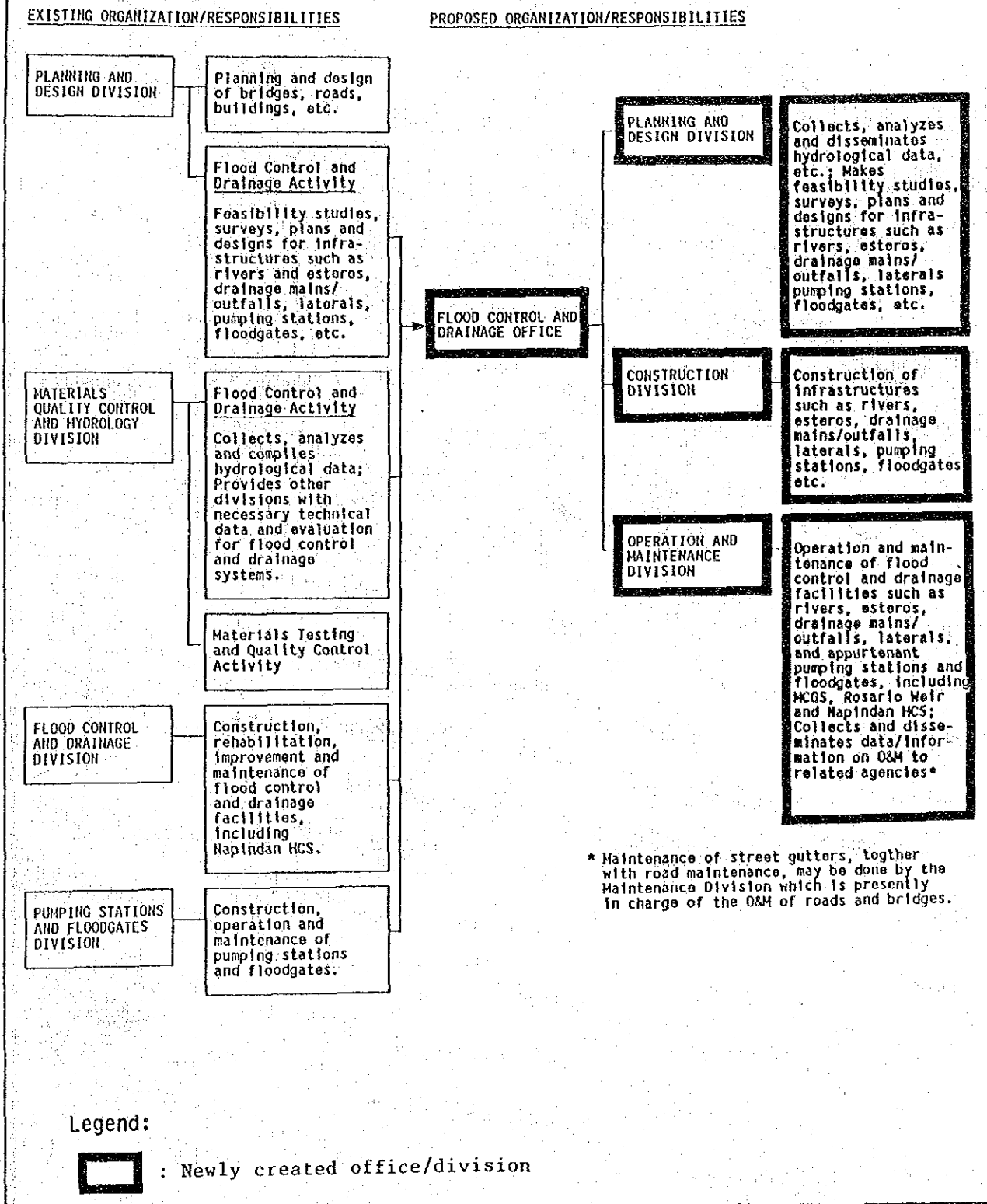
Fig.6.4-6



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

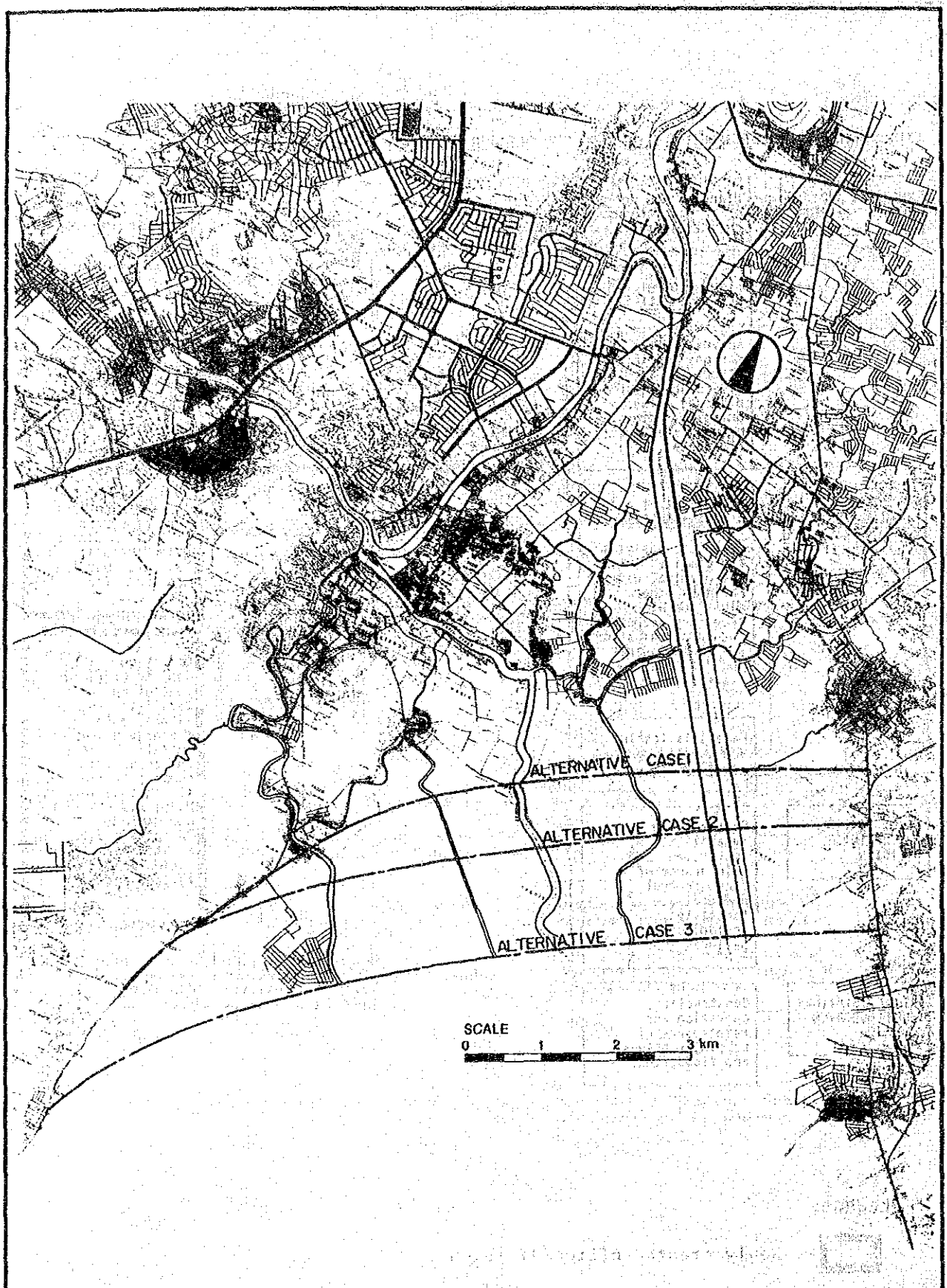
DIAGRAM OF PROPOSED ORGANIZATION OF FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA Fig.6.4-7



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

PROPOSED ORGANIZATIONAL SETUP OF FLOOD CONTROL AND DRAINAGE ACTIVITIES IN DPWH-NCR Fig.6.4-8

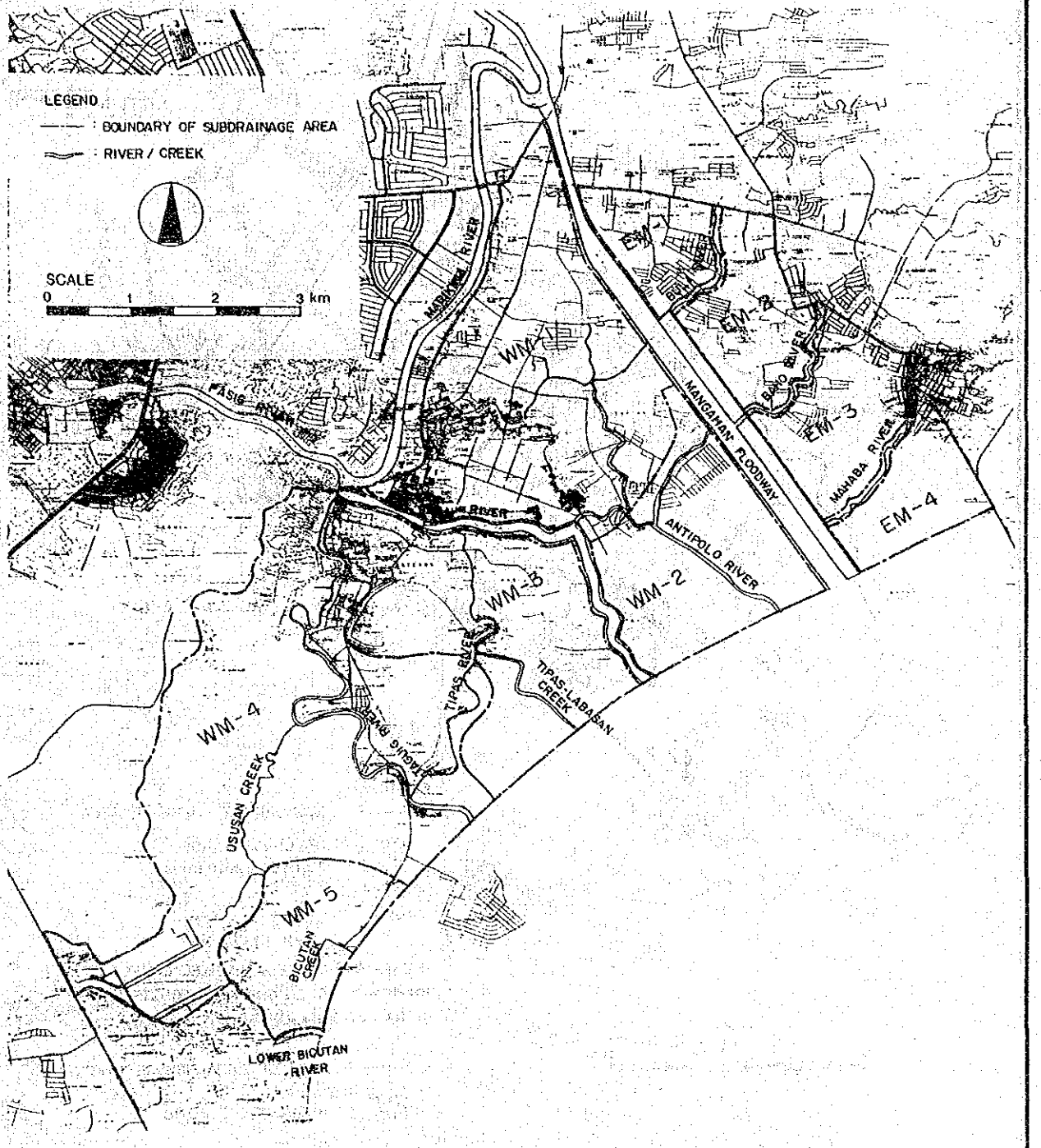


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

ALTERNATIVE ALIGINMENT OF LAKESHORE DIKE

Fig.7.2-1

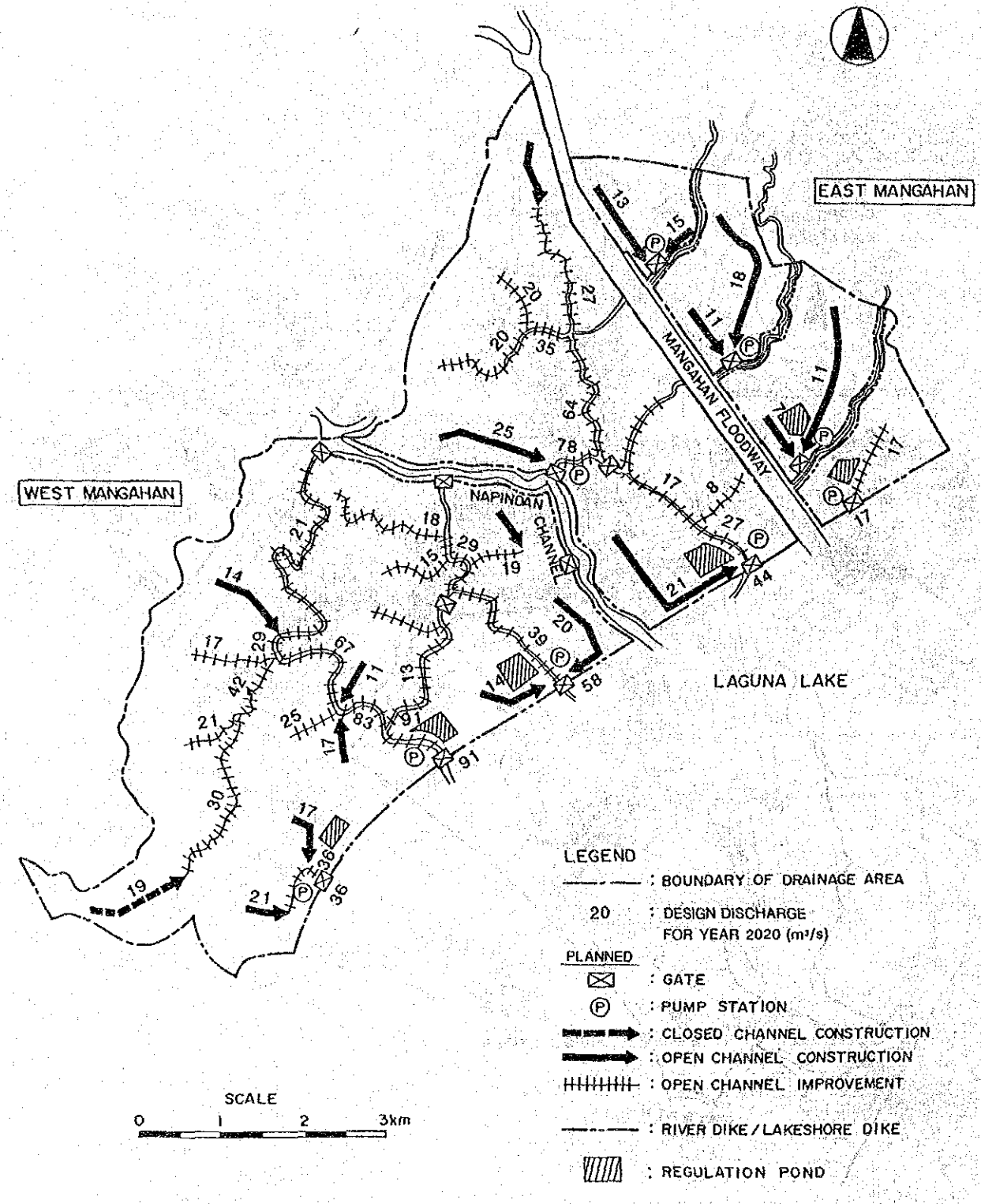


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

SUBDRAINAGE AREAS IN EAST AND WEST OF MANGAHAN

Fig.7.2-2



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

DESIGN DISCHARGE IN EAST AND WEST OF MANGAHAN

Fig.7.2-3

LEGEND

- : BOUNDARY OF DRAINAGE AREA
- : EARTH DIKE
- : PARAPET/RIVER WALL
- : CHANNEL IMPROVEMENT
- 10/800 : OPEN CHANNEL CONSTRUCTION (DESIGN DIS. (m^3/s)/STRETCH(m))
- 15/900 : CLOSED CHANNEL CONSTRUCTION (DESIGN DIS. (m^3/s)/STRETCH(m))
- : LAKE SHORE DIKE(W/ REVETMENT)
- 2.5×4.2×3 : SLUICE/FLOOD GATE (HEIGHT:m×WIDTH:m×UNITS)
- Ⓟ Q=3 : PUMP STATION (CAPACITY: m^3/s)
- V=18,000 : REGULATION POND (CAPACITY: m^3)
- : BRIDGE

SCALE
0

WM-1
WM-2
WM-3
WM-4
WM-5
EM-1
EM-2
EM-3
EM-4

MANGGAHAN FLOODWAY
TULL RIVER
LOWER BICUTAN RIVER
USUSAN CREEK
TIPAS RIVER
CAUSAWAN CREEK
BULI RIVER
BAHO RIVER
MAHABA RIVER

V=258,000
V=183,000
V=63,000
V=138,000
V=33,000
V=18,000

Q=31
Q=1
Q=32
Q=7
Q=2
Q=5
Q=8

6.5×15.2×2
3.0×4.7×5
3.0×13.0×2
3.0×4.4×4
2.5×2.9×3
2.5×4.4×3
2.5×4.2×3
3.0×4.8×3
2.0×2.0

L=2495
L=2800
L=2300
L=1800
L=2200
L=1000
L=800
L=1600
L=2400
L=3900
L=2147

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES	LAYOUT OF FACILITIES FOR EAST WEST OF MANGAHAN
JAPAN INTERNATIONAL COOPERATION AGENCY	

RY OF DRAINAGE AREA

DIKE

T/RIVER WALL

. IMPROVEMENT

HANNEL CONSTRUCTION
DIS. (m³/s)/STRETCH(m))

CHANNEL CONSTRUCTION
DIS. (m³/s)/STRETCH(m))

IORE DIKE(W/ REVETMENT)

FLOOD GATE
m×WIDTH:m×UNITS)

ATION (CAPACITY: m³/s)

ION POND (CAPACITY: m³)

SCALE
0 1 km

WM-1
WM-2
WM-3
WM-4
WM-5
EM-1
EM-2
EM-3
EM-4

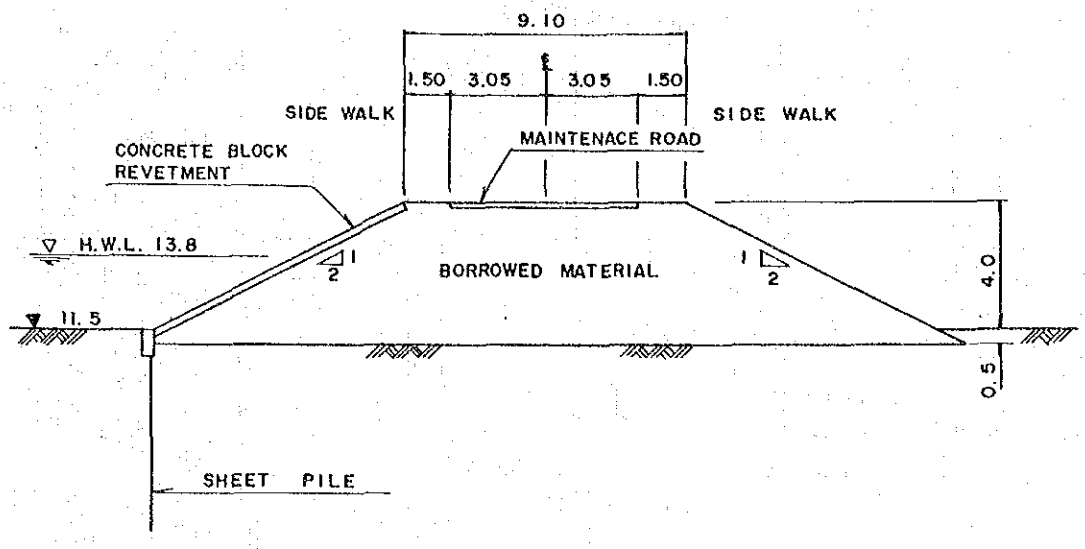
USUSAN CREEK
TIPAS RIVER
LUSAN CREEK
LOWER TAGUIG RIVER
BULI RIVER
BAHO RIVER
NAHABA RIVER
LOWER BICUTAN RIVER

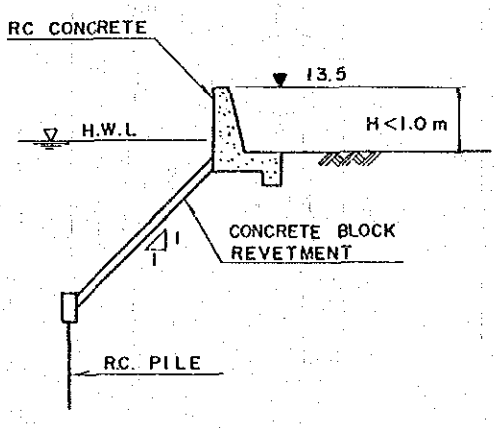
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

LAYOUT OF FACILITIES FOR EAST AND WEST OF MANGAHAN

Fig.7.2-4





PARAPET WALL

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT IN METRO MANILA, PHILIPPINES JAPAN INTERNATIONAL COOPERATION AGENCY	TYPICAL CROSS-SECTION OF LAKESHORE DIKE AND PARAPET WALL Fig.7.2-5